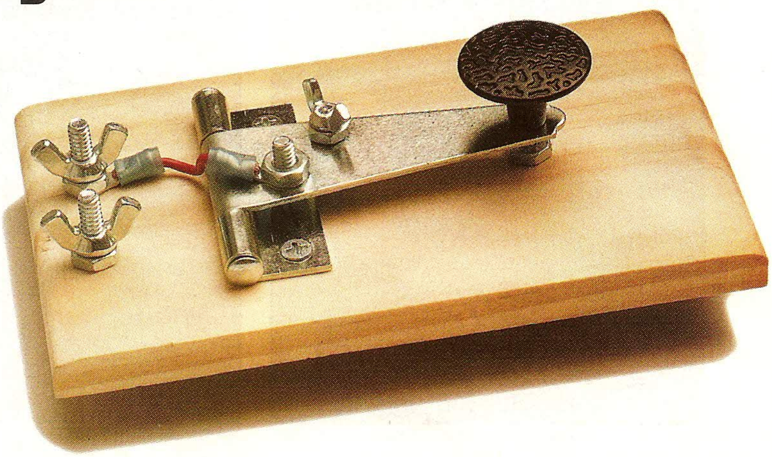
A Low Cost Code Key for Your License Class



Don't let the cost of a new key get in the way of a successful license upgrade class — use Steve's design and keep costs low.

Steve Lalonde, WA7WKX

For many years I have been working with students in an after school electronics program related to helping them study for and pass their Amateur Radio license exams. The program included student construction of code practice oscillators built around inexpensive type 555 integrated circuit timers. With careful buying, I have managed to keep cost of these down to about $5. The problem came when they wanted to have their own code key. The cheapest key I could readily find was about $15 plus shipping.

The Solution

This project came about in an effort to provide the students with a low-cost code key that they could build. I wanted to use parts that were readily available at most hardware stores. The cost using all new parts (see Table 1) came to $5.18 each. To keep the construction simple I cut and pre-drilled the wood bases in my shop at home. That reduced the necessary tool list to a Phillips screwdriver, a slotted screwdriver, a needle nose pliers, a side cutter and scissors. Parts and tools are shown in Figure 1.

Table 1
Code Key Project Unit Costs

Quantity is 1 Unless Otherwise Specified

Hinge, 3″	$ 1.40
Cabinet knob	.97
Bolt with nut, 6 × 32 × 1″	.10
Wing nut, 6 × 32	.33
Wood screws 6 × ½ (qty 3)	.15
Bolt with nut, 10 × 24 × ½″ (qty 2)	.20
Bolt with nut, 10 × 24 × 1″ (qty 2)	.34
Wing nut, 10 × 24 (qty 2)	.98
Soft pine block, ⅜″ × 4″ × 6″	.45
Self adhesive felt strips, 1″ × 6″	.26
Total	$ 5.18

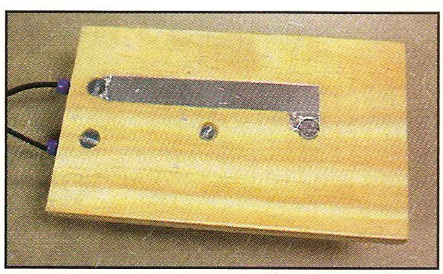


Figure 2 — Detailed view of foil strip interconnection.

The one part that was harder to find was the spring. The hardware store I went to had a box of assorted springs that included several that would work in this project. It may be possible to use the spring found in many ballpoint pens.

Putting the Parts Together

After laying the parts out and marking the drill points, I chose drill bits slightly undersized for the bolts so they could be threaded into place. Since I use soft pine, I was able to undersize enough to allow the bolts to thread pretty tightly into place. Don't forget to countersink for the bolt heads on the bottom of the board.

The first step in assembly is to use double-sided adhesive tape to make an L-shaped self-adhesive foil strip. That strip is then placed on the board connecting the two points shown in Figure 2.

Thread a 10 × 24 × ½ inch bolt into the hole at the end of the short leg of the foil tape. Install a nut on that bolt. The nut and the end of the bolt form one side of the contact for the code key.

Next, thread a 10 × 24 × 1 inch bolt into

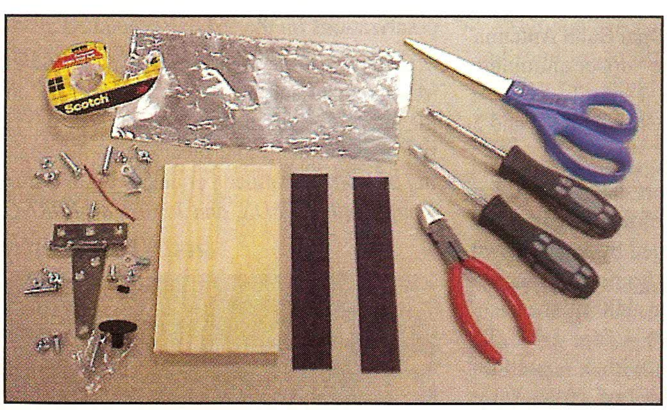


Figure 1 — Collection of parts and tools needed for the assembly of a no-frills code key.

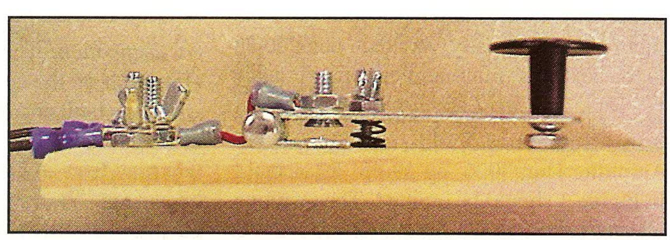
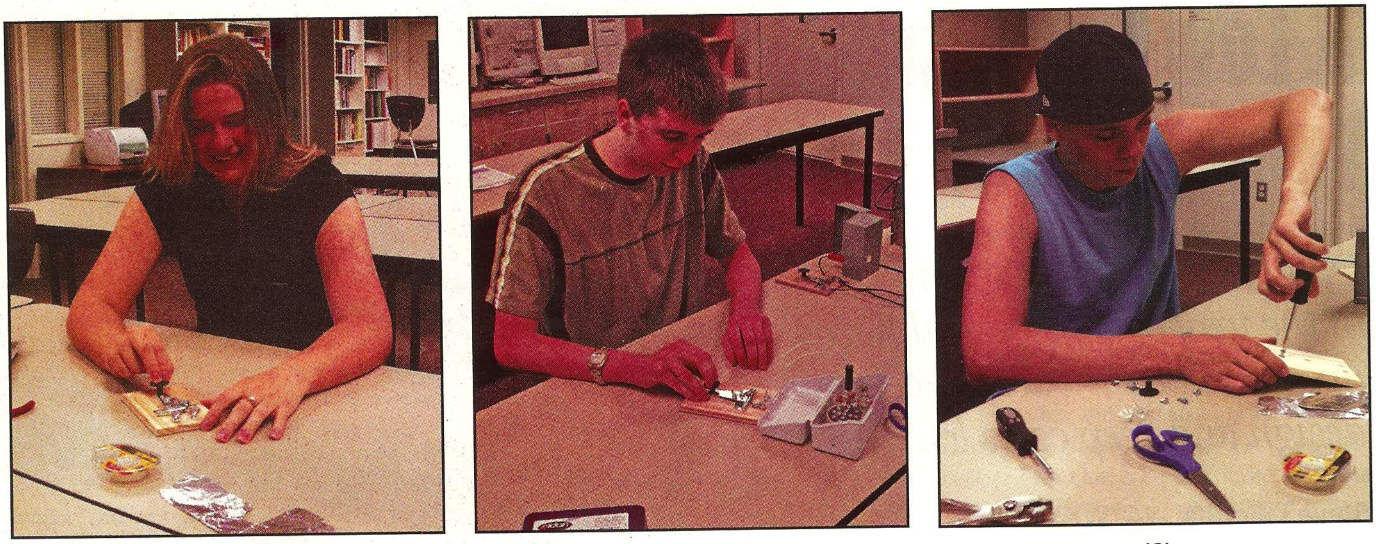


Figure 3 — Completed code key ready for practice or on-air use.



(A) (B) (C)

Figure 4 — Students building their keys at University High School in Spokane, Washington. At A, Katie Dowling, KD7SZG; at B, Matt Poppe, AD7HF and at C, Chris Milton. Katie and Matt now have their Amateur Extra class licenses.

the hole at the other end of the foil tape. Thread another 10 × 24 × 1 inch bolt into the other hole at that end of the board. Install and tighten the hex nuts on those two bolts.

Final Assembly and Making it Play

Secure the hinge to the board with three 3/8 inch wood screws. Make a short jumper wire to run from the hole on the long side of the hinge closest to the hinge pin to the 1 inch bolt that is not connected to the foil strip. I used crimp connectors for this but they are not included in the parts list. Secure the wire to the hinge using a 10 × 24 × 1/2 bolt and nut. Place the other end of the wire under the hex nut on the 1 inch bolt. Put the wing nuts on the two 1 inch bolts.

The cabinet knob usually comes with a bolt that is too long to tighten the knob down on the hinge. I used the bolt cutter portion of my crimper / wire stripper to cut the bolt to an appropriate size. You could also just buy a bolt of the correct size. Attach the cabinet knob to the hinge and tighten.

Next, begin threading the 6 × 32 × 1 inch bolt into the hole aligned with the remaining hole in the long portion of the hinge. When about 1/2 inch of the bolt is protruding above the surface, place the spring over the bolt and then continue to thread the bolt the rest of the way into the board. Adjust the bolt as necessary, by bending it, so that the edges of the hole do not rub against the threads. Put the hex nut on and thread it down until you have the gap you desire at the contact points. Use the #6 wing nut to lock the hex nut in place.

Turn the assembly over and attach the two felt strips to the outside bottom edges of the assembly. The "feel" of this key is significantly improved by the felt strips. The completed key is shown in Figure 3, with builders shown in Figure 4.

Steve Lalonde, WA7WKX, was first licensed as WN7QLF in 1970. He upgraded to General class and his current call sign in 1973, and then to Advanced class in 1988. His Elmer was Sig, W7GTJ, now a Silent Key. Steve continued the Elmer tradition by helping a couple of dozen hams get started between 1973 and 2002, mostly students at his school, University High School in Spokane, Washington. His school became a pilot school for the Big Project and he has helped 55 students earn 69 licenses, including four Amateur Extras since then.

Steve has been teaching Media Production and Classical Mythology at University High for 22 years. Steve and Audrey, his wife of 36 years, live in Spokane Valley. They have two sons, Brian, KB7IQR, and Barry. Steve can be reached at 304 N Adams Rd, Spokane, WA 99216 at **stevel18@comcast.net**. QST

Feedback

◊ In my article "When Will the Bands Improve?" [Jul 2006, p 46] the definition of the length of a sunspot cycle should read: "The average length of a sunspot cycle, from solar minimum with a minimum number of sunspots (low electron density) to solar maximum with a maximum number of sunspots (high electron density) and then back down to the next solar minimum, is approximately 11 years." — *Carl Luetzelschwab, K9LA*

◊ In "Homebrew Solid-state 600 W HF Amplifier [Jun 2006, pp 39-43] R3 and R4 in Figure 1 should be omitted. The resulting bleeder current is 1.1 A; the value in the text is in error for either configuration.

◊ *Update:* In the "A CAT5 Cable and Connector Tester" [Jul 2006, pp 52-53] the CAT5 crimping tool listed in the article, #115-1321 is no longer available. The correct item number is #115-2158.

◊ In my article, "A Neat Dual Band Antenna" [Aug 2006, pp 50-51] the "upper aluminum tube" length in Figure 4 should be 22 1/8 inches as shown correctly in Figures 2 and 3. — *Geoff Haines, N1GY*

◊ *Clarification:* The impressive AO-40 satellite dish on the cover of the August 2006 issue was built and installed by Jerry Brown, MØMOE/K5OE, at his home in Houston. (He now lives in London, UK.) "The dish," he writes, "is a surplus 4 foot UHF TV antenna (from the '60s) with a homebrew L/S dual-band feed. The two cross-Yagis (V/UHF) are PVC pipe and copper wire using a folded-dipole feed from a satellite-specific design I presented at the AMSAT-UK Colloquium in 2000. The two boxes contain coaxial relays for switching antenna polarizations on the V/UHF antennas."

◊ *Clarification:* Re the sidebar, "Power Measurement and the Alpha Power 4510" in the July 2006 issue [Product Review, p 63], power is defined more precisely as the quantity of work performed per unit of time. — *tnx Doug Smith, KF6DX, and Jon Tandy, K9KNC*