

# Keyer on a Shoestring

*Hams are cheap and so is this keyer.  
Big spenders will build the deluxe, two-chip version.*

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**M**ost great keyers aren't very cheap, and most cheap keyers aren't particularly great. However, here's a fair-to-

good one you can build for around \$10.00 using all new parts. If you've got any sort of junk box at all, it should cost you quite a bit less. It's

not iambic or self-completing, it lacks contest memories, weight control, and a few other bells and whistles, but it is simple, draws very little current, fits nicely into a small package, and is capable of sending good, clean CW. A keying transistor and floating ground make it usable with just about every modern rig, and a sidetone circuit can be added easily if your rig lacks one. In short, it makes a good first keyer or a nice second circuit for the vacation or ORP set.

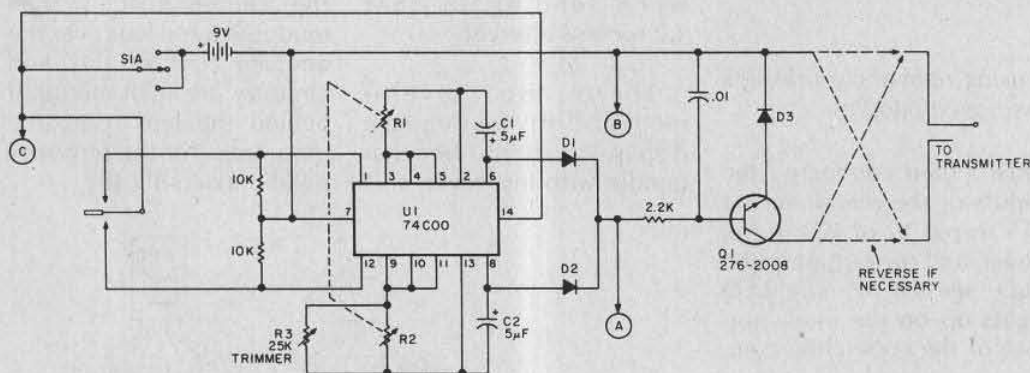


Fig. 1. One-chip keyer circuit. The entire circuit must be isolated from the enclosure. R1, R2—30k or 50k "stereo" linear taper dual pot. D1, D2, D3—any silicon diode. Q1 shown is a Radio Shack part number.

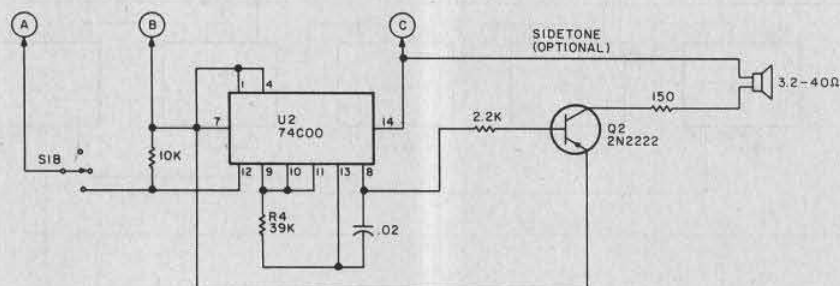


Fig. 2. Optional sidetone circuit connects to the keyer at points A, B, and C.

As shown in Fig. 1, the whole keyer is built around a 74C00 quad NAND gate which is connected to form two independent oscillators. The frequency of each oscillator is dependent upon a capacitor (C1 for one, C2 for the other) and a resistor (R1 for one, R2 for the other). By simultaneously varying R1 and R2, both oscillators can be sped up or slowed down, and a third resistor (R3) makes one of the oscillators run a

fixed percentage faster than the other, thereby providing a definite dash-to-dot ratio. The output of both oscillators is connected to the sidetone (if used) and to Q1, the keying transistor, through D1 and D2, which prevent one oscillator from interfering with the other. Q1 conducts whenever either oscillator is in the "on" state, thus keying the transmitter in step with the oscillators.

The sidetone circuit (Fig. 2) also consists of a 74C00 connected as an oscillator, but with R and C values changed so as to produce an audio-frequency tone. The output of this oscillator is switched by Q2, which provides enough drive to power a small speaker. The pitch of the sidetone may be changed by using a slightly different value for R4. The sidetone circuit connects to the keyer at points A, B, and C.

I mentioned earlier that this circuit has a floating ground. As shown on the schematic, no connections are to be made to the keyer cabinet. This eliminates expensive and hard-to-find reed relays, lowers power consumption, and sidesteps the need to modify the keyer whenever a different transmitter is used. Also, it is suggested that you stick to a battery to power your keyer unless you are certain that your power supply is isolated from ground. When connecting the keyer for the first time, it may be necessary to reverse the two keyer output leads to prevent the transmitter from being keyed all the time (wrong polarity to Q1). After the correct way has been found, a connector can be soldered on.

Adjustment consists of merely trimming R3 until the dits are about one-third as long as the dahs. Once this has been done, it will probably never have to be

done again, since this ratio stays about the same over a fairly wide range of keying speeds and battery voltages. However, if it is anticipated that several operators of widely varying proficiencies will be using the same keyer, it might be better to make R3 a front-mounted control or at least provide a hole in the cabinet for quick screwdriver adjustments.

It seems kind of pointless to blow a considerable amount of money on a keyer paddle when the actual circuitry costs so little, so I would like to suggest a rather unoriginal but appropriately frugal alternative. It consists of a short piece of steel packing strap or hacksaw blade sandwiched between two telephone switch or relay contacts. The packing strap or blade is scraped clean of all paint in the contact area, and a piece of paddle-shaped Plexiglas™ which protrudes through the front of the cabinet is bolted to one end. When the paddle is moved in either direction, the strap touches one of the contacts. The strap need not make a perfect connection for the keyer to operate, since the CMOS oscillators will operate even with several thousand Ohms of contact crud. The strips of phenolic that insulated the switch or relay before modification are used in the same application; they make sure that neither the strap nor the contacts make an electrical connection with the cabinet. Fig. 3 shows one possible arrangement for the entire keyer, including the paddle.

Rf shielding for this circuit is not too critical; the prototype worked fine with no case at the 100-Watt level. I used a 1- by 1½-inch piece of perfboard for the keyer circuit, and the sidetone was added as an afterthought on another small piece of board. A center-off

# NOT-A-KEYER



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switch was used to control both the keyer power and sidetone, as the HW-101 already has a sidetone built in.

With the cost of amateur radio equipment what it is today, CW just has to offer one of the best potentials for having a lot of fun without spending a lot of money.

Vintage CW rigs abound on the used market, and a good QRP rig can be purchased new without going too far into debt. Costing about as much as a cheap microphone, this circuit reflects the same spirit of fun on a shoestring. Use and enjoy. ■

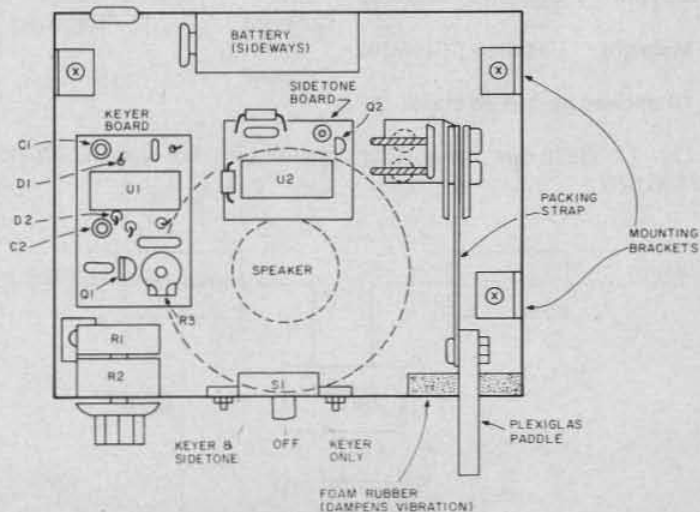


Fig. 3. Typical arrangement of circuit boards, controls, and paddle.