

## The "WO7T Cootie" by Mark Gustoff

While it would be a stretch to lay claim to a new design of a cootie key, I can at least lay claim to this cobbled together set of components and assembly ideas for this economical cootie key also known as a sideswiper. You will likely be out the cost of a modest dinner to replicate this project.

### Materials:

- (1) Wood flooring sample from Home Improvement Store 4" wide
- (1) Jeweler's Solid Rubber Bench Block - 4" x 4" \$9.50 -Amazon
- (1) K&S 5078 Flat Brass Strip 0.032" X 1/2" X 12" \$5.00 from Hobby Lobby
- (1) Copper tape from Hobby Lobby
- (2) 1-1/2" brass angle corner L bracket \$3.00
- (4) 1/2" small brass wood screws that recess flush in above corner brace
- (1) #10-24 3/4" brass bolt with screw head ground off
- (2) Brass #10-24 acorn nuts
- (2) Brass 3/4" #6-32 Round Head bolts
- (2) Brass #8 flat washers which will be a bit oversized
- (2) #6-32 knurled brass hand screw knobs
- (2) Brass #8 1" Brass Wood Screws
- (2) Brass Shelf Bracket Pegs
- (2) Finger pieces of your own creation (see text)



I opted for hard rubber jewelers block, for some heft, and a 1" height off table, along with belief a

block of rubber would stay put on a smooth operating table. Rubber, was also appealing, for ability to drill, carve, or melt wire channels into it.

I also chose not to use a hacksaw blade, finding it overly flexible, and instead used brass strip that was 1/2" wide as the paddle lever.

Be forewarned that acquiring the materials will take longer than building this key. And in the end, owing to the price of brass these days, the last 10 items on the materials list will cost more than the rubber block.

I decided on hardware that was brass at all contact points. The flat brass strips come with enough to build out (4) "WO7T Cooties", with 5"x 1/2" lever arms, should you wish to turn this into a group or club project. All mounting was intentioned to be screwed or bolted to the wood flooring sample with the rubber block just serving as an anchor block to be secured to at final assembly stage.

Prepare materials, beginning with placing a small piece of color tape on the rear of the rubber block, just to always be working with it in the same orientation. Trim the sample wood flooring piece to a 4"x4" dimension, so it will fit atop the 4" jewelers rubber block. With sandpaper smooth any rough edges, and apply a minor rounding on the corners of the wood block. Next take the brass corner L-bracket braces consisting of two holes on each arm and cut off one of the holes with a hacksaw on both the brackets. The upright portion only needs to be 1" high. If desired, use a file or grinder to square off or put a smooth curve back into the top edge of brass. *(Note: if you want a higher brass strip lever, then leave L-brackets in original form, and mount brass strip lever in top holes of L-bracket).*

Cut the 0.032 1/2" brass strip to 5 inches. In my design one end (back) was left with square cut, and finger end (front) was rounded with file or grinder. At the back of the brass strip 3/8" from the square end, drill a hole in middle of strip of size to take the #10 brass bolt.

Take the two brass shelf pegs and file smooth the actual peg ends enough that they will take solder. Put a light drop of flux on the peg ends, and then heat them up to take drop of solder to form a round silvered end of the post pegs.

Pay heed that assembly should proceed with multiple measurements, before you drill and lock down to the wood flooring sample, especially for the shelf peg spacing to the brass strip at the front. Also leverage the photos for details on placement.

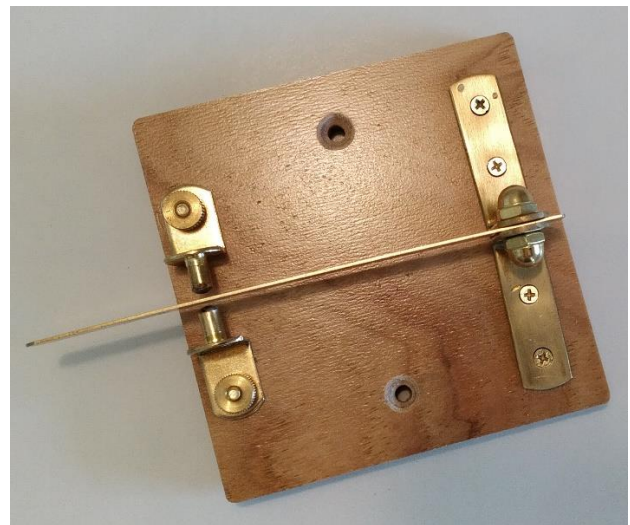
First assemble the 5" brass lever strip square end to the 1-hole side of the L-brackets. I chose to grind off the head of the 10-24 brass bolt, so that two 10-24 brass acorn nuts could be fitted on each side of the shortened L-brackets. Snug up the acorns, and insure everything is square and the 2-hole portion of the L-brackets will sit flat on the sample wood block. Measure back from the wood edge about 3/8" from the L bracket start and carefully mark and drill holes one at a time for the inner two holes of the L-brackets

You may also need to drill one small hole right near the mated L-brackets joint, all the way through the wood stock. This is where you will install a small uninsulated shorting wire between the brass lever strip, through the board, and onto the backside for final wire-up of cable. *(Note: alternate wiring with copper tape likely eliminates need of this shorting wire, but I would drill the hole anyway).* With three holes drilled, screw down the inner most screws on bracket. Then carefully mark, drill, and install the outer most screws of L bracket.

With the rear L-brackets holding the brass strip still only snugged up at the acorn nuts, hand place a shelf bracket peg on the front edge of the wood, and adjust the brass strip lever up or down so it will hit the peg post right in the middle of the 1/2" strip, and then tighten the acorn nuts at the rear post to permanently hold that strip in place horizontally. Insure the strip has not been bent, and if so bend back to perpendicular to front edge.

The spacing between peg contact and lever is one of personal choice. I used a paper business card, for a looser spacing you might use a credit card. I suppose you could even go wider with a credit card + business card, but stick the spacer of your choosing between the brass lever strip and the brass post peg with back edge of the peg bracket set in about 1/8" from edge of wood block to precisely mark where to drill from the top. *(Note: Insure you are NOT applying any pressure on the lever strip with the card in there).* Drill the hole, then mount the first peg bracket with bolt and washer on bottom, and the brass thumb screw tightened on the top of brass shelf peg.

We do one at a time, because if you did get too close and you are touching/shorting with the business card pulled out, you can still bend the brass strip ever so slightly to not touch, and then carefully install the other post. To insure equal spacing use equal cards on both sides of posts when installing second bracket peg. You should end up with components mounted to the 3/8" thick wood flooring looking like following photo with the brass strip centered between the two pegs.

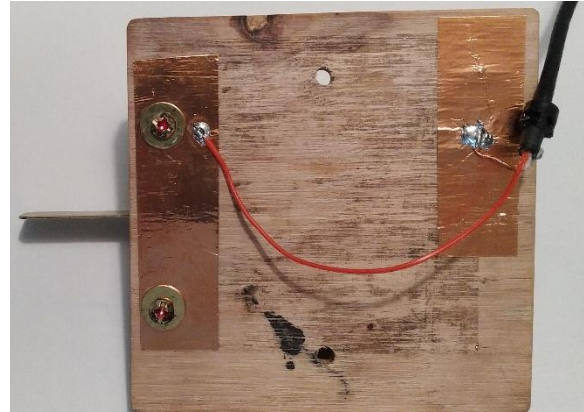


To prepare for final mounting, place the wood flooring on top of the rubber block and align up square. Drill a hole from the top, on opposite sides of brass lever strip, much smaller than the #8 1"

brass wood screws through the wood and into the rubber a good 3/4".

Separate the rubber block and mark an X with pencil across those small holes on the rubber which tend to close up after drilling. Move up in drill bit size to open up the hole on just the wood to easily accept the #8 1" brass screws. Take a countersink bit, and by hand, twist open a concave recess for the wood screw to sit into at final assembly.

The wiring of this cootie is largely left to your own discretion, but one thing that I suggest is copper tape on the underside of the wood floor piece. I have a strip at the front, where the brass shelf pegs sit, and where both 6/32 bolts and washers mate up with the tape and thus short the two pegs. I have a strip at the rear which was placed to touch and poke through at the very tips of the L-bracket brass screws that screwed through the wood. The blob of solder for the braid connection is actually soldered to copper tape at the very tip of a brass screw just poking through the tape.. *(Note: If copper tape is not used, you will have to get that braid attached to a semi-stiff wire or old resistor lead that passes up through the wood, and is soldered to the brass lever strip that sticks out towards rear of cootie between the L-brackets. Likewise, without copper tape, your plugs' tip wire needs to connect to both of the brass washers (shorted) together at the pegs)* I took the additional step on the rubber block to mark where the brass bolts were going to sit when assembled, and took a hot soldering iron, and melted out a mild recess in the rubber, so the wood flooring would seat tightly onto rubber block.

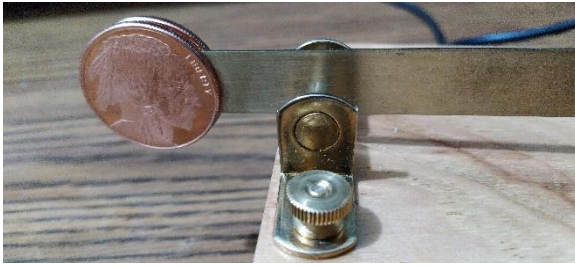


The (S)hield of 3.5mm plug connects to the blade anchor L-brackets at the rear, and the (T)ip of the 3.5mm plug is connected to the two shorted pegs at the front.

Where the bare wires exited the cables' plastic jacket, I added a couple 4mm long strips of heat shrink tubing over that jacket, and then cut a very shallow 'V' in the rear edge of the rubber block, of 5mm length from the back edge. With the rubbery texture of the heat-shrink and the shallow 'V' slice the cable should sit in the 'V' just before the wires come out, and connect up on the underside of the wood base. At final assembly, screw the wood top down tightly to the rubber block, with the two #8 1" wood screws, with the heat-shrink part of the cord compressing tightly and stay put in the shallow 'V' of the rubber block.

Lastly, the brass strip is a little narrow for my comfortable sideswiping grip, so I installed finger pieces for the end of the brass lever strip. In the past, I have made use of guitar pics, wood shims, binder clips, plexiglass pieces, glass beads, or whatever the imagination brings to bare. This time, I went for something reflecting the mining heritage of Arizona. The finger pieces are copper, with a minted face of some past U.S. coinage. The company selling my "finger pieces" calls them copper rounds or 1/4 oz. copper coins at an online bidding site which increased the cost \$10. You can test fit these or any of your own ideas with double-stick scotch tape, until you decide what if any finger

pieces you wish to glue on or leverage HD 3M double-stick tape to stick them more permanently.



Lessons learned: Should I construct another “WO7T Cootie”, I believe I would leverage a hunk of 2x6 lumber to make the base versus the rubber jewelers block since it still required some rubber feet to be placed on the bottom to keep from sliding on the desk. I experimented with brass strips that were also much stiffer at .064” thick, but I reverted back to the thinner .032” stock and leveraged a brass stair gauge about 1/3 from the rear for this sideswiper. I did find that the thicker .064”stock brass strip would have been better leveraged if this were a single lever paddle project. In pondering paddle prospects, next time, I would probably split the front copper foil, and fashion some sort of thin brass shorting lever on the front edge, and then wire the 3.5mm stereo connector to both the front edge brass shelf pegs so I could choose to use this as a paddle tied to use with an electronic keyer as well. There is ample contact spacing adjustment by bending in or out the two shelf pegs or sanding solder off the peg tips. However, an alternate version might have leveraged nuts and bolts that could be adjusted in or out to the brass lever.



Should you build the “WO7T Cootie”, I hope you are as pleased as I am with the look and finger feel of this sideswiper. I believe this build may have been the easiest part of this whole pursuit, as now the real work begins to learn and practice how to alternate my finger motion in successfully keying the cootie.