

W5AWS Feeler Gauge Key

1 Motivation

As Hamsters, we are always on the lookout for a better mousetrap. Specifically, a better way of sending CW. About the only way to find out what works best is to try operating with various keys, consequently I suspect that CW aficionados have several keys in their collection as I have.

While riding along with Mike, KI5EGH, during the 2022 Tour de Tulsa bicycling event, when we were one unit of nine with the Tulsa Amateur Radio Club who provided SAG radio coverage of the various routes, our conversation turned to CW operation. I was intrigued by Mike's mention of a straight key that he made from the blade of a feeler gauge, see Figure 1.



Attraction of this idea is the thought that the operator can rest the arm relaxed on the desk while merely lifting the finger. KI5EGH said that he found that he preferred operating with this key in the field.

In general, we stand on the shoulders of others. The pictures of the feeler-gauge straight key provided by KI5EGH are the inspiration for my version of this good idea. Here I explain my production process.

2 W5AWS Implementation

KI5EGH determined that the best feeler for the job is a 0.016" (0.40 mm) gauge. Not having a set of gauges, I found an inexpensive model on Amazon made of stainless steel; this set is shorter than shown in Figure 1.

2.1 Baseboard

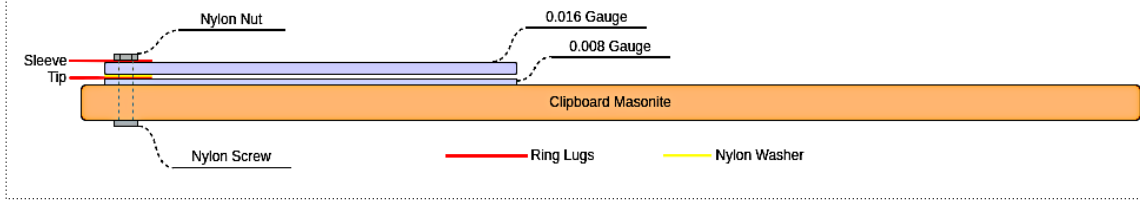
Instead of plywood, I thought a 6×9" clipboard would provide a good base that can be comfortably held down by the hand.

2.2 Feeler Gauges

Looking at the picture and mulling the idea, I decided that I could get this to work with the connections entirely at one end, using a second gauge as the lower contact separated by a nylon washer, held together by a nylon screw and nut, with ring lugs making connection with the feeler gauges, as shown in Figure 2.

W5AWS Feeler Gauge Key

Figure 2: Side view of the W5AWS Feeler gauge straight key



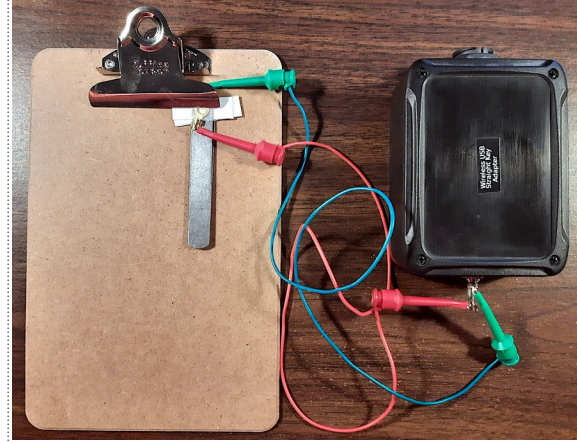
For the lower contact the 0.008" (0.20 mm) gauge is an arbitrary choice, half the thickness of the upper gauge yet still stiff enough to lie flat on the clipboard; if necessary it could be glued to the board.

2.3 Connections

The nylon washer on top of the ring lug electrically separates the lower gauge from the upper. Both washer and lug serve to create a gap between the two gauges. The lug makes electrical contact with the lower gauge, wired to the tip of the $\frac{1}{8}$ " (3.5 mm) audio plug.

The nylon nut secures the ring lug to the upper gauge where it makes electrical contact, wired to the sleeve of the $\frac{1}{8}$ " (3.5 mm) plug. Holding the whole assembly together is the nylon screw.

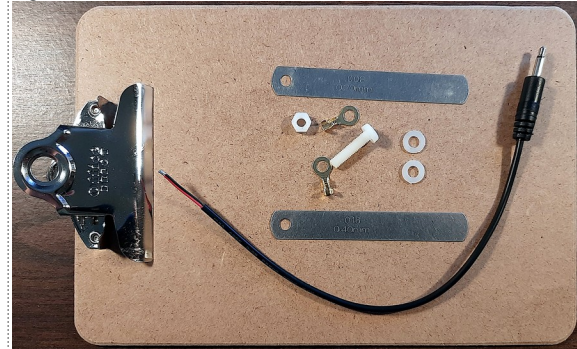
Figure 3: Jury-rig proof of concept



2.3.1 Warning

My operations are QRP with modern equipment, so I'm not expecting high voltage or RF energy to appear on the key. Usually, a straight key provides a ground to signal circuitry internal to the radio when it is active. Usually the sleeve of a barrel plug is ground, so I deliberately connected the upper feeler gauge to the sleeve for safety of operation.

Figure 4: Parts illustration



2.4 Jury-rig Proof of Concept

Figure 3 shows a jury-rig that proved my intention will work as planned. Four small pieces of index card separate the two feeler gauges.

2.5 Parts

Figure 4 shows a view of the parts ready for assembly.

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2.6 Final Assembly

Figure 5 shows the assembled clipboard straight key.

2.6.1 Clipboard Clip

Removing and discarding the clipboard clip was a simple matter of drilling out the rivets.

2.6.2 Securing Screw

A 10 × 5 mm nylon-screw instead of 20 × 5 mm provided an exact fit.

2.6.3 Ring Terminal Clearance

To give sufficient clearance between the ring lugs, I used two nylon washers one on top of the other.

2.6.4 Identification & Insulation

Before assembly, I added a label to the top gauge of the key, which provides both identification and insulation for the finger.

2.6.5 Strain Relief

To relieve pull-strain on the connecting cable, I bored four $\frac{1}{8}$ " holes, two on each side of the cable placement, then used black waxed lacing tape to lash the cable to the clipboard.

2.6.6 Connecting Cable

The connecting cable is deliberately short to make stowage easier, and to reduce clutter on the operating surface. Usually my FT-818ND transceiver or laptop computer is near at hand, which makes long cables a nuisance. When needed, the cable can be lengthened easily with an extension cable as shown coiled in Figure 5.

2.7 Contact Cleaning

Pulling a piece of paper kitchen towel through the pressed feeler-gauge is enough to clean the contact surfaces of any accumulated dust or dirt.

2.8 Operation

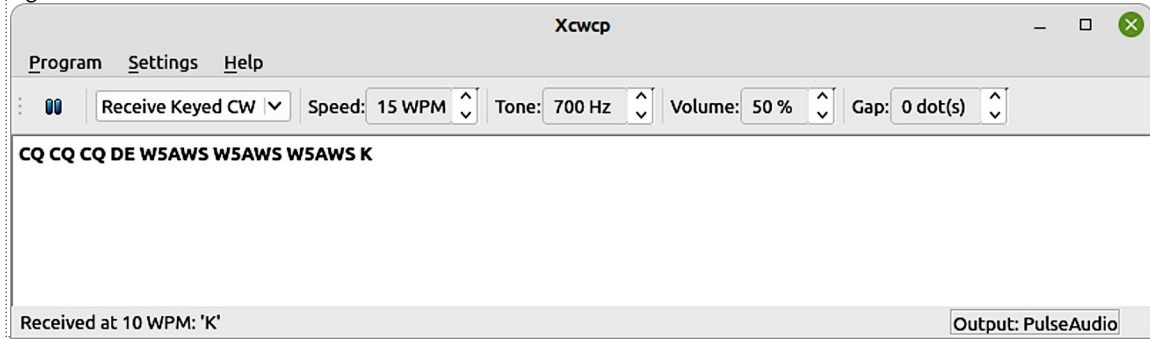
Figure 6 shows the results of a test using *xcwcp*, the X Window-based Morse tutor program.

Figure 5: W5AWS Feeler gauge CW key complete



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Figure 6: Morse test



Operation is smooth with the palm of the right-hand resting relaxed on the clipboard, with the index finger raised above the end of the feeler-gauge while the thumb and tips of the remaining fingers rest on the surface of the clipboard. Only the index finger moves while keying CW. This key should work equally well under the left-hand.

3 Bill of Material

For those who are reading this as a paper copy, there are QR-Codes of the live URL links in the electronic version. Obscure the adjacent QR-Codes with your fingers then scan the code of interest with your mobile phone.

i.	Stainless Steel Feeler Gauge	https://www.amazon.com/dp/B07XPD9L1C	
ii.	Nylon Screw, Nut, Washer Assortment	https://www.amazon.com/dp/B0744MMJ9V	
iii.	Mono TS 3.5mm Male Plug to Bare Wire Open End Audio Cable	https://www.amazon.com/dp/B082VVPTN6	
iv.	Non-insulated Ring Lugs	https://www.amazon.com/gp/product/B07RDD842G	
v.	Memo Size Clipboard, 6x9"	https://www.officedepot.com/a/products/982134	
vi.	Waxed Lacing Tape, Black	https://www.amazon.com/gp/product/B005PQRLYC	
vii.	3.5 mm Mono Extension Cable	https://www.amazon.com/gp/product/B07SBRC4SY	

4 Glossary

CW.....Continuous Wave, synonymous with operation via Morse code

W5AWS Feeler Gauge Key

PEP.....Peak Envelope Power

QRP.....Reduce Power, or operations at 5W or less PEP

RF.....Radio Frequency

SAG.....Safety And Gear
