

Variations on a European Key Theme

By Richard A Meiss, WB9LPU

Introduction

A very striking key design was produced in several European countries at times during the past century. They are sometimes known as "Swedish Keys"; I am aware of such designs from Sweden, Denmark, Great Britain, and Italy. The design feature that they have in common is that their electrical contacts are on the end of the lever that is opposite from the operator's knob. This means that the contact closure involves an upward movement. Usually the contacts are borne on a thin steel member that gives a slight cushioning to the closure and contributes to their excellent feel. Some designs use ball-bearing pivots, while others use a leaf spring arrangement with no parts moving against each other. A very fine example is the key by Lennart Pettersson of Sweden, as distributed in the USA by Morse Express. See photo below.



I have admired this design for a long time and have the good fortune to have two commercial examples and one (bad) amateur example in my collection. The idea of exploring this design has been in my head for some time. Recently I learned about a new aluminum alloy called Fortal, and I decided to try my hand with some designs using this metal.

Design Goals

A number of ideas were incorporated into the design. These included the forward-mounted contact assembly and the long lever extending beyond the base. Having acquired some small micrometer heads at a hamfest, I wanted to use one of them in the height adjusting mechanism, and I also wanted to try out some magnetic tensioning ideas.

My first experiment was not in the Swedish mode - I just wanted to try out a pivot design and experiment with the materials. The quick-and-dirty key below was made from odds and ends in the shop. It has a lever that is well-ventilated for reduced mass and employs ball bearings in the pivot. Restoring force is provided by a tension spring rather

than the usual American compression spring. The key is rather light and is nicely responsive to the touch.

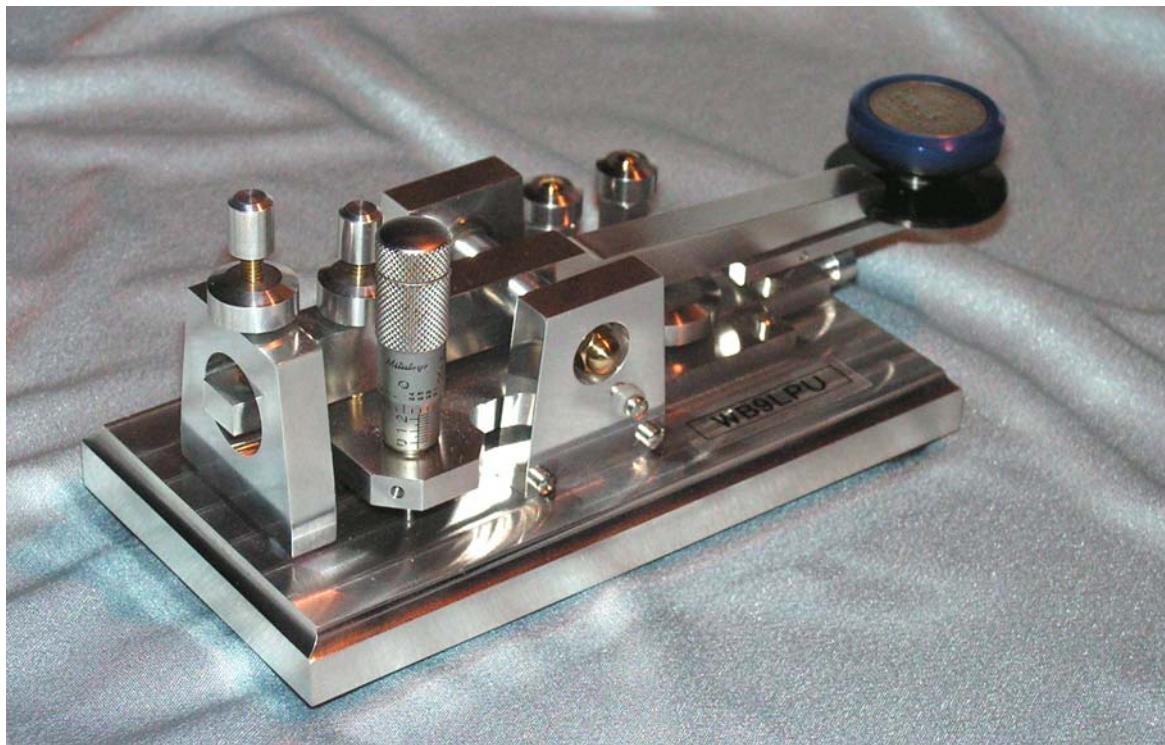


The First Attempt

I decided on a big key for the first try, and the results are shown below. The overall length is about eight inches, with a width of around three inches. Restoring force is set by a pair of rare-earth magnets, one set in the lever, and the other in a sliding carrier in the base. The slide is locked by the large round knob under the lever.



The micrometer adjustment and the front contact assembly are shown in this view. In this design, the contact is borne on directly on the lever instead of on a steel spring. To increase or decrease the contact spacing, the micrometer lowers or raises a hinged plate which the coarse adjustment screw (on the lever) works against. This allows the range to be roughly set at the lever and fine-tuned by the micrometer. A planned version will use a shock-mount system for the contact extension of the lever.



All of the parts except for the turned ones are made of Fortal and satin finished with fine sandpaper and steel wool, followed by buffing with a fine abrasive compound. The base is also of Fortal, with the milling tool impressions lightly polished. In the several months since the key was built there has been no apparent tendency to tarnish. For a touch of local pride, the Hoosier version of the quarter-dollar coin was incorporated into the knob. The "navy style" knob skirt was a concession to my own sending comfort - I find the high European knob to be hard to use. (It is for the same reason that I had trouble with the Palmer Penmanship method in grade school - lack of fine motor control in an unsupported forearm.)

The Second Attempt

I liked using this key, but, given the clutter of my operating desk, I thought of making something smaller. This would also give me time to incorporate some features that I had thought of too late to put into the first model. My aim this time was to make a smaller key with the same basic attributes as the first one. I decided to use a base of Cocobola wood to set off the aluminum of the key. The contact spacing adjustment is more in the traditional European mode, with a stop that rides up or down on a threaded rod. The contact is again mounted directly on the key lever, and the return of the lever against the stop is cushioned with a piece of hard rubber. The lever with the red knob controls the position of the lower magnet to change the return force.

Here are some views of the second effort:



This key is significantly shorter (some might call it "dumpy"), but it has a nice feel and is very quick and solid in its action. The red knob moves the magnet slide, and the lock is on the other side of the small adjustment lever.



This is a close-up of the spacing adjustment mechanism. One side of the trapezoid is cut away to allow a 10-32 threaded rod to carry the rest stop.



This top view shows the bearing assembly and all of the adjustment mechanisms. All of the parts of the key are mounted on an aluminum frame which is in turn mounted on the wooden base.