

Introduction:

This kit is intended to provide an inexpensive, adjustable paddle for an iambic keyer. The kit is essentially two momentary contact switches. The spring tension and contact spacing are both adjustable. The arms and base are made from an etched circuit board which can be snapped apart into the 5 separate pieces of the paddle.

General notes on building the Snapaddle kit

Some hand tools will be required to build this kit including a screwdriver, an adjustable “Crescent” wrench and possibly for the optional base, a drill and bits, and finally a scissors (that you don’t care about) or a tin snips OR a file.

The builder should note that a thin trace of solder plate surrounds each fiberglass piece. This line can be used as a guide for cutting the boards down to size. Later the builder may wish to remove the traces on the finger pieces or just cover them with some tape to prevent having to touch the solder (containing lead) traces.

When working with the fiberglass pieces, the builder should be careful with the small “crumbs” of fiberglass that result when cutting the pieces to size, avoid breathing in the dust and getting it on the skin. I use tape to remove whatever clings to the pieces after cutting.

The L brackets supplied have one side that is a little longer than the other, orient the longer side vertically for all L brackets for the best fit.

Building the Snapaddle

Step 1) Get the parts together: All of the board mounted components have been supplied but you will still have to provide off-board items to fully implement the kit. These items include:

Shielded cable to keyer  
strain relief / clamp for cable  
wood or metal base  
mounting hardware, 4-40 sized to connect to the base

Step 2) Leaving the board in the sealed bag, snap apart the left (L) and right ( R ) arms first and then the base. Leave the finger pieces joined together. Open the bag, remove the base and arms - use a scissors (that you don’t care about) or a file to cut the bumpy edges down to size and then use some adhesive tape to tack up any clinging fiberglass dust. The two finger pieces can’t be snapped apart directly - use the scissors to cut the connective fiberglass between the 8 holes on either side. Then the two L shaped pieces can be snapped apart and cleaned up.

Step 3) Before assembling the paddle, the wooden or metal base should be prepared. Use the square fiberglass base as a template for the 9 holes on the base. The four corner holes should go through the base, the five interior holes should just be shallow countersinks to allow the fiberglass base to rest flat. If you are using a metal base, you’ll probably use some kind of spacer at the corners to prevent the need to countersink the middle 5 holes.

Step 4) Use an L bracket with two 1/8 inch machine screws (the smallest ones) to connect the left paddle arm and left finger piece (both marked with an L). Be sure to bolt the longer side of the L bracket to the finger piece. Repeat this assembly for the right side except that the finger piece is now on the other (left or inboard) side as shown on the diagram. The holes on the right paddle arm are off slightly compared to the left paddle arm, so some extra material may need to be removed from either the right finger piece or the right paddle arm end to make it fit together.

Step 5) Attach the L brackets for the spring on the top of the two paddle arms (top side has the L and R designations) with two 1/8 inch 4-40 machine screws - be sure to bolt the shorter side of the L bracket to the paddle arm. The vertical part of the L bracket should be “outboard” of the paddle arm as shown in the diagram. The 1/2 inch and 3/4 inch (Phillips head) machine screws should be threaded fully into the L brackets - I put the 3/4 inch (Phillips head) machine screw on the right paddle arm and then thread a 4-40 nut on the other side. This nut will be used to control the spring tension.

Step 6) Attach the 5/8 inch machine screws to the paddle arms using a 4-40 nut to hold them. Be sure to fasten them tightly. Thread the 1/2 inch brass hex standoff onto each of the 5/8 inch machine screws fully but not tight.

Step 7) Now is a good time to solder the wires to the right and left finger pieces for the dah and dit connections.

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Step 8) Attach the 3/8 inch brass hex standoff to the top side (L, R and WB9KZY markings are on the top side) of the base using the 1/4 inch machine screw. Orient the standoff so that two of the six corners or apexes (NOT the flat sides) will meet the finger pieces. Tighten the screw.

Step 9) Attach the two remaining L brackets with two 1/8 inch machine screws with the short sides to the base and the longer sides vertical and outboard of the base.

Step 10) Solder the ground wire to the base connection hole near the hex standoff.

Step 11) Connect the paddle arms to the base using two 1/8 inch machine screws. You may need to back off on the hex standoffs slightly to get a tight fit. The idea is to allow the paddle arms to move freely on the standoff without too much play when the finger pieces are moved up and down. Once the hex standoff and the 1/8 inch machine screw are tight, you can loosen the paddle arm movement by using an adjustable wrench to turn the hex standoffs clockwise (as you look downward on the base). You can tighten the paddle arm movement by using a screw driver on the bottom of the base to tighten the hex standoffs. The right paddle arm is easier to adjust than the left side due to the action of the paddle “loosening” on the right side while “tightening” on the left side, but it is possible to get them to both work freely.

Step 12) Once the paddle arms are adjusted, the spring can be put on the two machine screws on the top of the two paddle arms. Finally, thread on the two thumb screw, thumb nut assemblies onto the two L brackets on the base. The paddle contact spacing can now be adjusted with the thumb screws and tightened down with the brass thumb nuts. The spring tension can be adjusted with the 4-40 nut. I usually connect the paddle to the keyer and then tighten down the thumb nuts until both the dit and dah are being sent. Then I loosen the thumb nuts until the dit (or dah) stops being sent and tighten down the thumb nut to preserve the spacing. The spring tension can be set to taste - the thumb screws will probably have to be repositioned slightly with different spring tension. Also, attaching the paddle to the wooden or metal base will affect the contact spacing.

### Operation:

The idea for the hex standoff bearing isn't my idea, I'm afraid I lost the name/call of the fellow who mentioned this idea - I think that this implementation is a little different than his but the idea is similar. The hex standoff should be firmly attached to the base. The paddle arm should be firmly attached to the 5/8 inch machine screw. The screw should then be able to move freely in the standoff while minimizing any up and down movement of the paddle arm.

### Modification ideas:

- 1) If you don't care for the spring provided with the kit, a replacement is as near as that dried up retractable pen. Remove the cylindrical spring from the pen and use it to replace the kit spring for more or less tension.
- 2) The contact life of the plated circuit board and the plated brass standoff are unknown. But the more finicky user can try soldering contacts from a small relay or switch onto the contact area of the paddle arms and the flat side of the hex standoff. Smaller width standoffs are available if this idea is tried to keep from moving the paddles farther apart.
- 3) If the finger pieces are too small, wrong spacing, the wrong height, not long enough or whatever, the user may elect to add extension finger pieces using plastic scrap, poker chips, guitar picks or some other suitable finger pieces.

Please feel free to email with any questions, comments, suggestion or problems with this kit. My email address is:

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Thanks for choosing the Snapaddle kit and  
Best Regards,

Chuck Olson, WB9KZY

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List of parts included with the Snapaddle kit

quantity	Description
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1	circuit board
2	brass thumb nut on stainless steel thumb screw assembly
6	steel L bracket, both holes threaded for 4-40 hardware
2	1/2 inch brass (nickel plated) hex 4-40 threaded standoff
1	3/8 inch brass (nickel plated) hex 4-40 threaded standoff
1	3/4 inch 4-40 Phillips head machine screw
2	5/8 inch 4-40 pan head machine screw
1	1/2 inch 4-40 pan head machine screw
1	1/4 inch 4-40 pan head machine screw
10	1/8 inch 4-40 pan head machine screw
3	4-40 hex nut
1	cylindrical spring

Items you may need to provide to complete the Snapaddle kit

- wood or metal base
- 4-40 sized (1/8 inch hole) mounting hardware
- shielded cable to connect to keyer
- strain relief for cable
- solder
- finger pieces (guitar picks, poker chips or ??) to extend the paddle arms