

# KM4CFT KX1 Iambic Paddle Kit

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Thank you for your purchase of the KM4CFT KX1 Iambic Paddle kit! This kit is a morse code paddle that is intended to pair with the Elecraft KX1 Transceiver. It takes some inspiration from the CW Morse 3D Printed Paddles with the use of hex standoffs as the center post, and is a continuation of the popular KM4CFT Elecraft Paddle Lineup. It fully takes advantage of 3D printing techniques by having magnets embedded into the print leaving it completely hidden! It is an excellent addition for anyone who wants more comfort when operating!

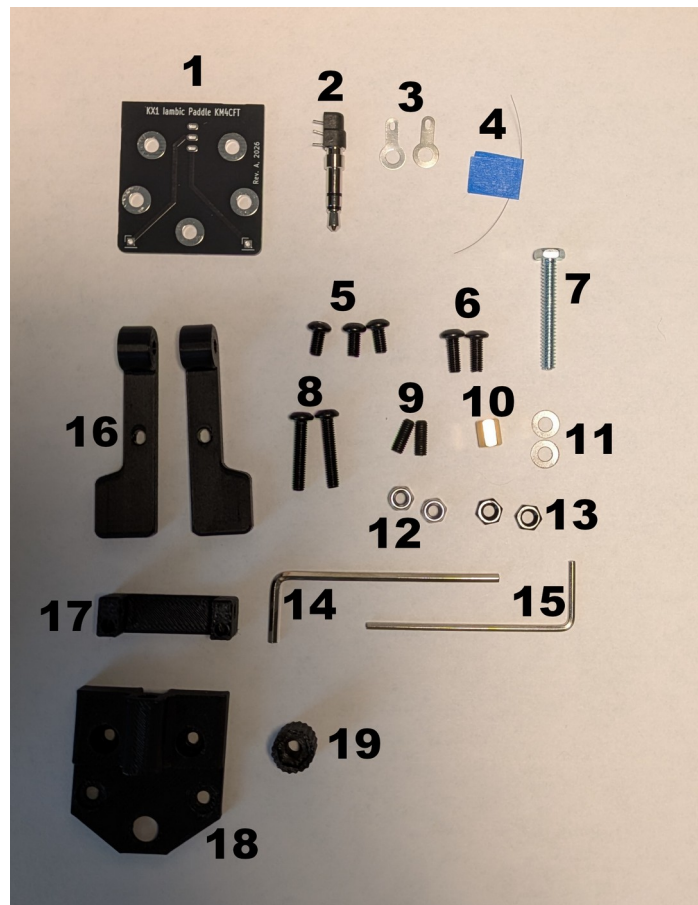
Special Thanks to Leo, W8LEO for lending his KX1 to me for the development of this paddle!



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## Parts List:

	Item	Qty/Length		Item	Qty/Length
1	Printed Circuit Board	1x	11	M3 Washer	2x
2	3.5mm Male Audio Plug	1x	12	M3 Nylock Nut	2x
3	M3 Solder Tabs	2x	13	M3 Nut	2x
4	36 AWG Nichrome Wire (Painter's Tape for Visibility)	2-3"	14	2mm Hex Wrench	1x
5	M3 x 6mm Screw	3x	15	1.5mm Hex Wrench	1x
6	M3 x 8mm Screw	2x	16	(3D Printed) Paddle Arms w/ Embedded Magnets	1 pair
7	#6-32 x 1" Hex Bolt	1x	17	(3D Printed) Travel Adjustment Arch	1x
8	M3 x 16mm Screw	2x	18	(3D Printed) Baseplate	1x
9	M3 x 8mm Grubscrew	2x	19	(3D Printed) Thumbscrew Head	2x
10	M3 x 6mm Hex Standoff	1x			

## Counterfeit Warning

Beware of Chinese Counterfeit Paddles! If you did not purchase your paddle from RadioDan-W7RF or HamGadgets then it is a counterfeit! All KM4CFT products are sold in the USA only! There are elements of the paddles that the Chinese sellers did not incorporate into the design so if you build one of theirs then it WILL NOT WORK!

Should you buy one from a Chinese seller, I recommend giving them a 1 star review, reporting them and requesting you get your money back!

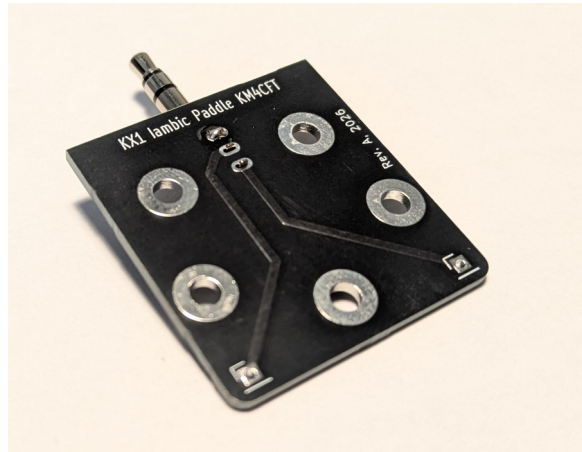
## KX1 Paddle Assembly Instructions

Before we begin assembly you will need the following tools:

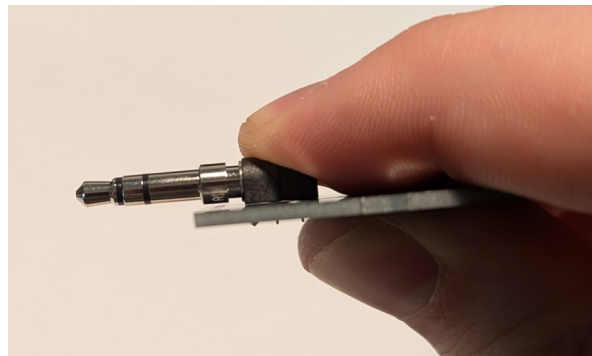
- Soldering Iron
- Solder
- (optional) Helping Hands
- Flush cutters
- (optional) Superglue
- One of the following:
  - Pliers
  - 5.5mm wrench
  - 5.5mm Socket with driver (best option)

### **Step 1: Solder on the 3.5mm Plug**

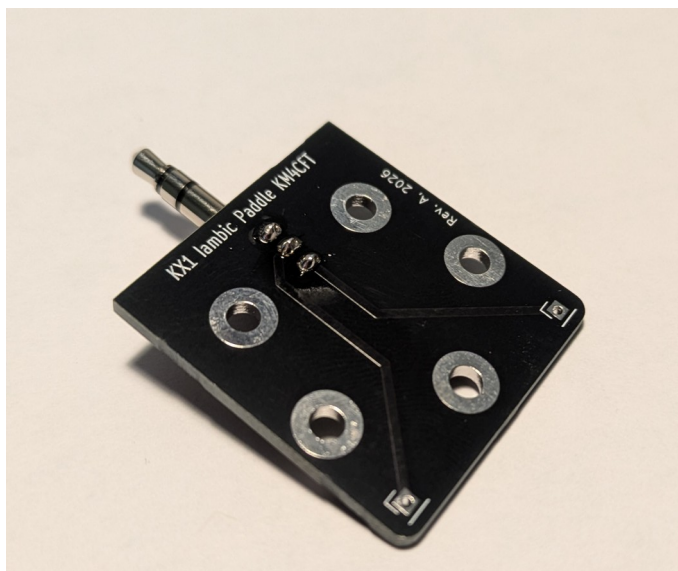
First, take a look at the supplied PCB. The top side of the PCB is the one with the “KX1 Iambic Paddle KM4CFT” written on it. The 3.5mm Plug will be attached to the *bottom* side and soldered on the top. Put the plug in place and solder only a **single** terminal as shown in the picture:



We are soldering a single terminal so that we can ensure the connector is perfectly aligned! Using your fingers and squeezing the plastic portion of the connector (touching the metal part might result in a burn) use the soldering iron to adjust the connector:



Next, insert the connector into the KX1 and ensure it is aligned with the transceiver. If it isn't make adjustments. If it is, proceed to soldering the other two terminals.

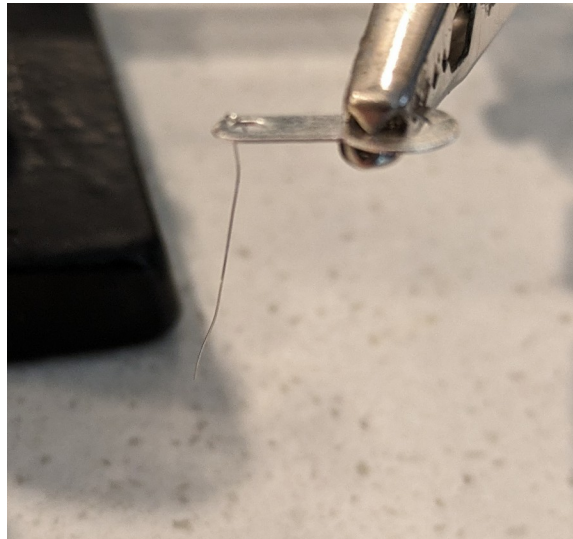


## ***Step 2: Soldering the Nichrome Wire to the Solder Lugs***

First, find the small piece of nichrome wire. It is super thin so make sure to keep a close eye on it! Next, cut it in half, so that you have one piece for each contact.



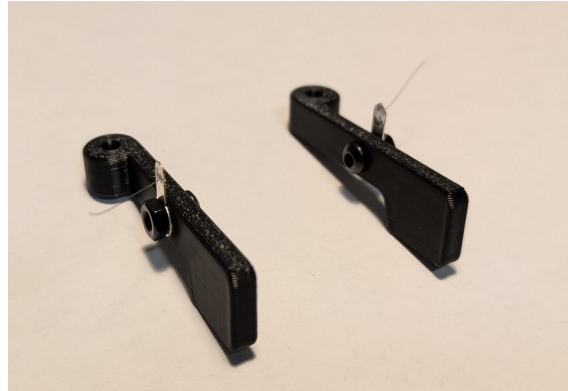
Next, wrap the wire around the small hole as shown in the photo below. You will want it to come out at a 90 degree angle. Secure the wire in place with some solder.



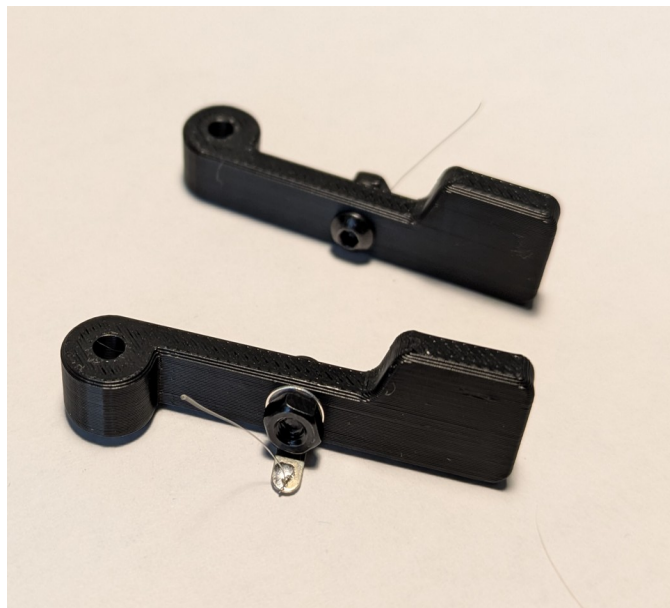
### **Step 3: Install Lever Contacts**

For this step you will need an M3x6 screw, an M3 nut, your 3D printed paddle arm and the solder lug with wire you prepared in the previous step. Looking at the paddle arm there is one side that is completely flat. This is the side that the screw head will sit. Push the screw through the hole on the arm. On the opposite side, insert the solder lug such that the perpendicularly soldered wire points *away* from the screw head. We will be installing these arms upside down, so the tabs will be on the *bottom*. Secure the solder lug in place with your M3 nut.

Repeat for the other arm.

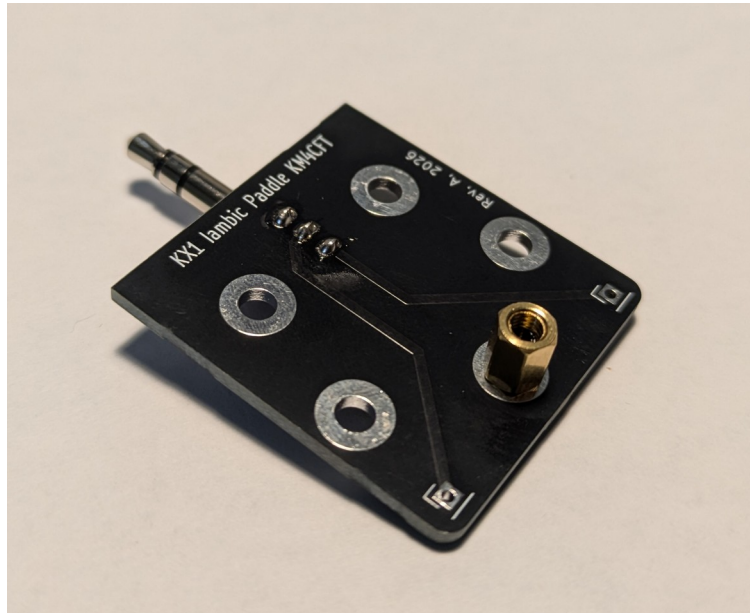


Next, bend the soldered tabs 90 degrees so that the Nichrome wire is pointing up.



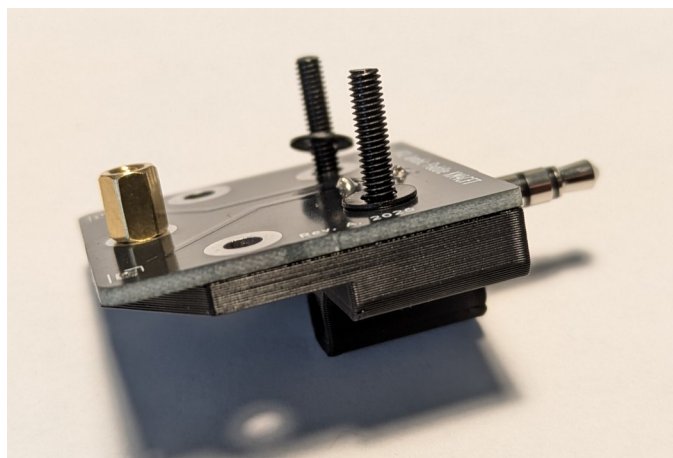
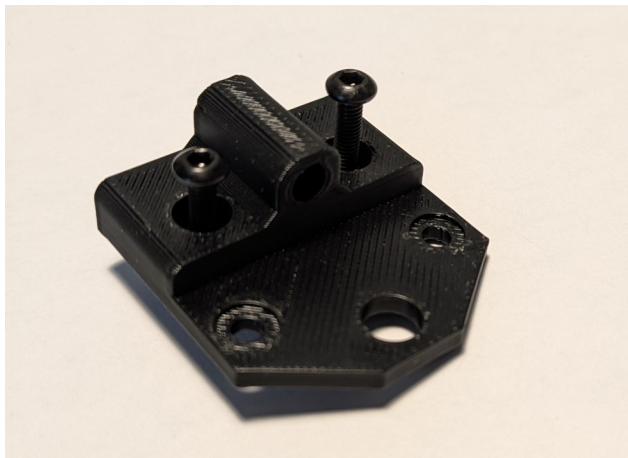
#### **Step 4: Install the Center Standoff**

For this step you will need your M3 Hex Standoff and an M3x6 screw. Insert the screw from the bottom side and secure the standoff on the top side. You will likely need to fiddle around some to get the sides aligned. You want it so that a flat face is parallel to the left and right sides of the PCB as shown in the photo.

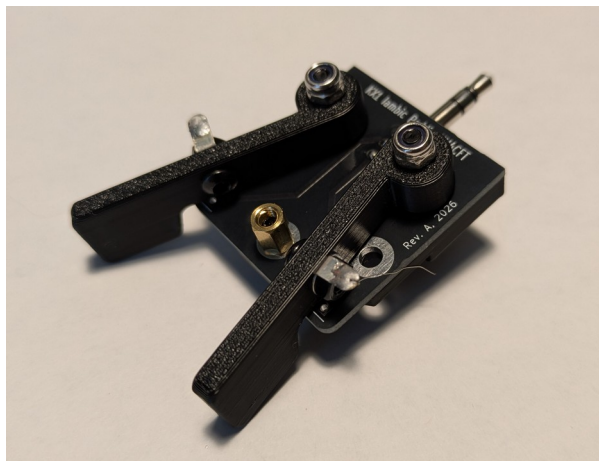
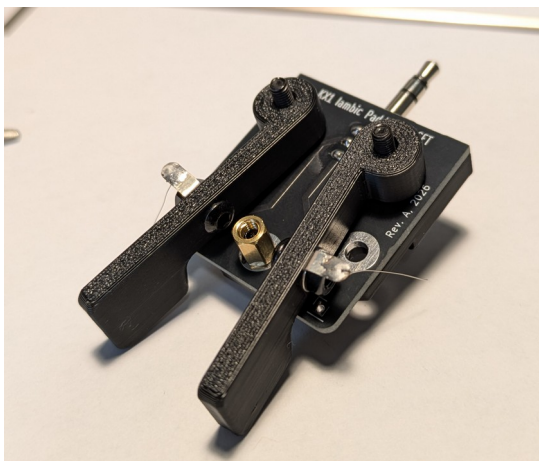


### Step 5: Attach the Lever Arms

For this step you will need an M3x16 screw, an M3 washer, your paddle arm, the Baseplate, and an M3 nylock nut. Insert the M3x16 screw through the Baseplate (into the counter-bored hole) and up from the bottom of the board. You may need to screw it through the print! Next, drop in a washer from the top like in the picture:



Next, drop in the paddle arm. Be sure to choose the arm that has the screw head pointing towards the center like in the photo! Also, note that the arms are **upside down**! Next, secure the arm in place using the nylock nut. This will require some adjustment, but you want to adjust the screw such that the paddle arm can easily rotate but not so loose that it wobbles around. I prefer to fully tighten the screw and then slowly loosen it until this is achieved. Repeat for the other arm.

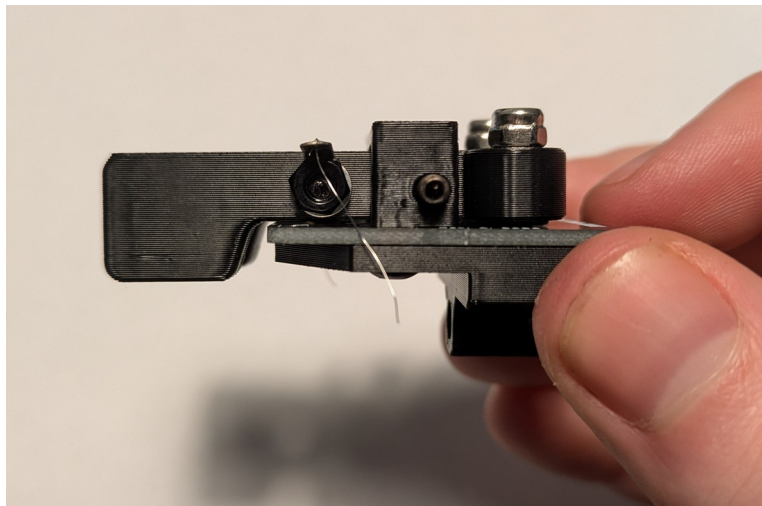


### ***Step 6: Install the Travel Adjuster Arch***

For this step you will need the travel adjuster 3D print (the print that looks like an arch), two of the grub screws and two M3x8 screws. Take the grub screws and screw them into the travel adjuster from the outside as shown in the following photo. Don't screw them in all the way just yet; we want it to be flush with the inside face for now!



Next, we want to attach the travel adjuster to the PCB. Place the travel adjuster so that it arches over the paddle arms and so that the grub screws are closer to the hinges. Secure the arch in place with the two M3x8 screws, going through the stiffener from the bottom. Be careful not to over tighten the screws as the screw can easily strip out the threads inside the print. (the screw is tapping the threads into the print!)

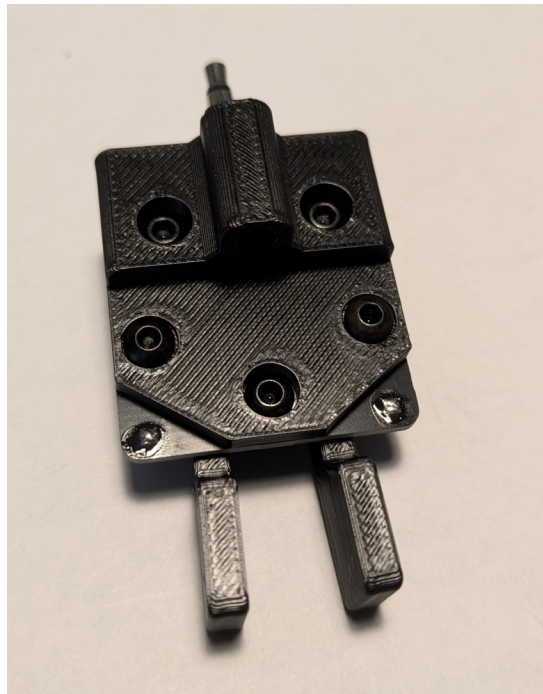


### **Step 7: Solder the Nichrome Wires to the PCB**

First, feed the nichrome wires through the small holes on the corners of the board. Be sure to leave a small amount of slack by making the wire form a curve to the hole. We need that slack so that the lever can rotate freely without pulling on the wire.



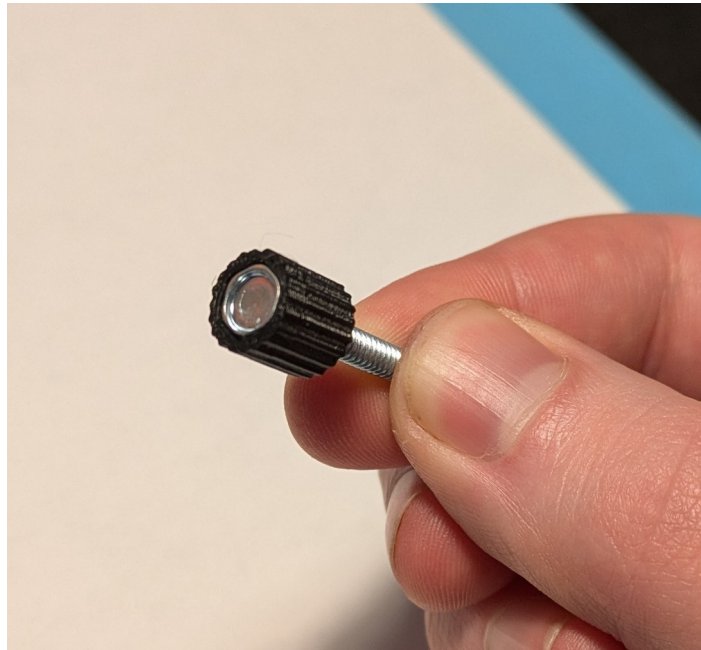
Finally, solder the wire in place and trim off the extra wire.



### **Step 8: Prepare the Thumbscrew**

Finally, take your #6-32 x 1" hex bolt and the 3D printed thumbscrew head. Press the bolt into the print so that the head sits inside the hexagon shaped impression. Optionally, you can also secure the print to the bolt using a dab of superglue.

**Note:** Your kit may come with 2 of these prints, with differing heights. If you find that the thumbscrew bottoms out (hitting the PCB on the KX1) before fully engaging with the paddle, swap it out with the longer piece.



With that, your paddle has been assembled! Use the 1.5mm Allen wrench to adjust the contact distance and test out the paddle on your KX1. Congrats!

