

American Morse Equipment

Bushwacker Single Lever/Sideswiper Paddle Kit



Thank you for purchasing an American Morse Bushwacker Paddle kit! Please be sure to **open the parts bag over a container**; there are a number of very small parts that are easily lost. Open the small parts bag carefully; many of the parts can bounce right out of your container if dumped. Note that the smallest parts are in a separate section of the bag. These are listed together in the parts list.

Check against the parts list to make sure they are all there. In addition to the Allen key wrenches included in the kit, you will need a #1 Philips screwdriver, needle nose pliers, and perhaps a piece of 220 grit sandpaper.

Bushwacker Parts List

	QTY
Base	1
Retainer	1
Paddle Lever	1
Contact Lever, Right	1
Contact Lever, Left	1
#4 Set Screw x 1/8 (Lever Set Screw)	4
#4 Set Screw x 1/4 (Lever Stop Screw)	2
#4 Set Screw x 7/16 (Paddle Stop Screw)	2
#4 Nut	2
Delrin Nut	1
#4 Pan Head Screw x 3/16	1
## Pan Head Screw x 1/4	1
#5 Washer	3
#4 Washer	2
#4 Shoulder Washer	4
#4 Socket Head Cap Screw x 1/4	2
#4 Flat Head Screw	2

#4 Solder Lug	3
Dowel Pin, 1/8 x 3/4	3
#4 Socket Head Cap Screw (SHCS) x 3/4	3
#4 Socket Head Cap Screw x 1/2	2
#4 Thumbscrew x 1/2	2
#4 Thumbscrew x 7/8	1
Spring, Return	1
Spring, Return Adjust	1
Spring, Contact Adjust	2
#4 Pan Head Screw x 3/8	1
#4 x 1/8 Cable Stay	1

It's not likely, but If you are missing any parts, please contact us & we will get them to you as soon as possible: <dwhauff@digitalputty.com>

Once you have checked the parts inventory, you are ready to begin assembly. The Bushwacker parts are all finished and ready for assembly, but you may want to do a little prep on the contacts, the #4 x 1/2 inch thumbscrews. The mill leaves a rather rough finish on the ends of the #4 screws; it is not required, but it's not a bad idea to smooth the ends of the contact thumbscrews on a piece of 220 or so grit sandpaper.



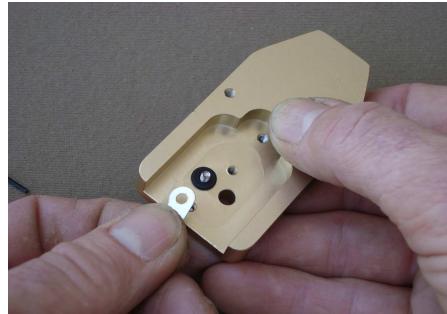
Locate the four shoulder washers, two #4 x 1/2 SHCS, two #4 nuts, and two #4 solder lugs. Push the washers into the corresponding holes in larger boss in the paddle base.



Slide a #4 washer over a #4 x ½ SHCS, and insert it into a step washer from the top of the base. The #4 and #5 washers look very similar; an easy way to sort them is see if they will slide over one of the 1/8" dowel pins. The #4 washers WILL NOT fit over the 1/8" dowel pin. Get it right now or you will be regretting it later!



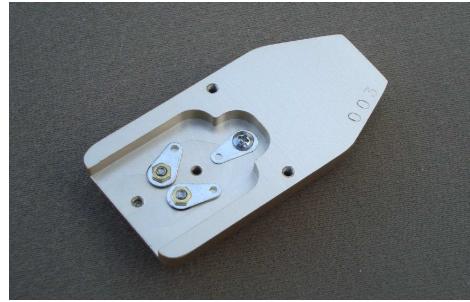
Turn the base over & slide a solder lug & #4 nut over the SHCS & snug the nut down.



Repeat with the second #4 SHCS. Now please locate the #4 x ¼ SHCS. These screw into the two #4 threaded holes in the smaller boss in the paddle base. Tighten securely. The base should now look like this:



Locate the #4 x 3/16 Pan Head Screw and the remaining #4 solder lug. Slide the lug over the screw and thread into the grounding hole in the base underside. The underside should look like this:



Now please locate the two black anodized Contact Levers. Look carefully and you will see that while appearing identical, they are actually a matched pair; orient the pieces so that the edge with THREE holes is up on each part. Observe that the milled step location is reversed on the two pieces; they are a mirrored pair.



The Levers are pictured in their orientation when installed in the paddle; the "Right" lever has the step milled in the "left" side of the lever and the opposite for the "Left" lever.

Locate the #4 set screws. Using one of the furnished .050" Allen keys, thread the set screws into the levers. The Paddle Stop Screw (longest set screws) goes into the end side holes, the Lever Stop Screw (middle size) in the adjacent hole, and the Lever Set Screw (1/8 set screws) goes into the top two threaded holes.



Note that the screws are threaded into the lever from the outboard or flat side of the lever.



Here is the pair of levers with set screws installed:



Now locate the remaining parts of the right lever. Note that it uses two of the 4 springs provided in the kit. To separate the springs, line them up together. There will be one long spring, two similar shorter springs, and one slightly longer than the two similar shorter springs. The two similar springs each fit on the two contact thumbscrews; the slightly longer one goes under the Return Adjust Thumbscrew head, and the longest spring is the return.



First please slide the middle size spring onto the Return Adjust Thumbscrew. Note that all springs have a closed end and an open trimmed end. The closed

end goes under the thumbscrew head; this provides smoother action. Thread the Return Adjust Thumbscrew into the right lever, into the hole between the pivot bore and the stepped end. Thread the thumbscrew thru the lever until 1/4 inch or so extends through. Locate the white Delrin round threaded nut. Start this onto the Return Adjust Thumbscrew from the inboard side of the lever. The Delrin nut is much like the insert in a Nyloc self-locking nut; the threads are designed to be a slight interference on the threads of the thumbscrew, providing a self-locking feature. This means a tight fit on the screw and it will take some effort to thread on. Get it started with your fingers, making sure it is square to the screw axis. If you have strong fingers, you can probably thread it as far as necessary with your fingers; otherwise, you can use a needle nose pliers to grip the nut & thread it on the thumbscrew. Thread it on leaving about 3/16" of thread exposed.

Locate one of the Contact Thumbscrews & slide it's spring over the threads, closed end towards the head. Screw this assembly into the end hole of the lever.



Do the same for the left lever Contact Thumbscrew, threading it into the left lever. Locate the #4 x 3/8 Pan Head Screw and thread it into the left lever center hole corresponding to the Return Adjust Thumbscrew on the right lever.

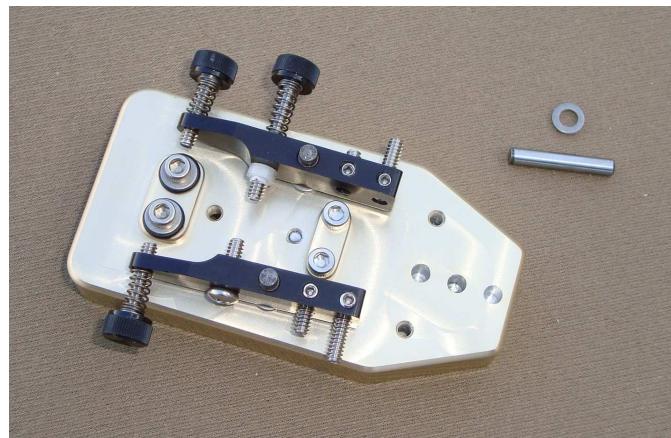
Here are the two levers ready to install in the paddle:



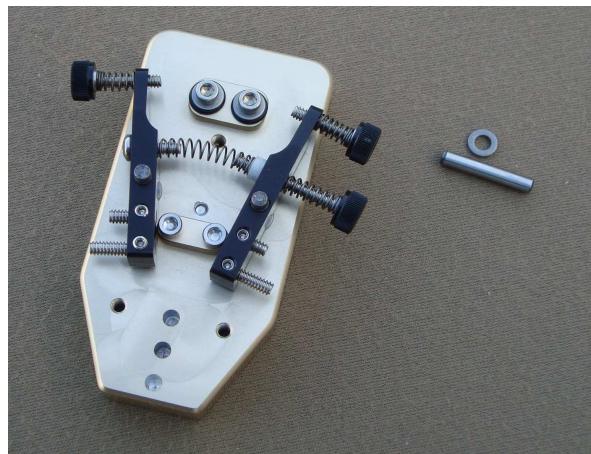
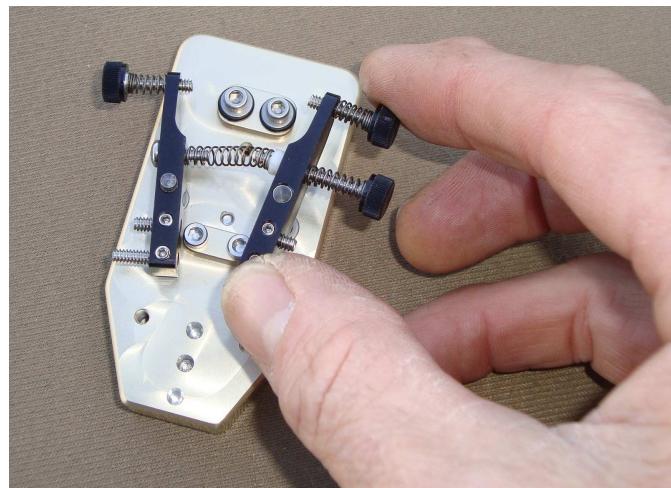
We are now ready for the final assembly. Locate the 1/8" dowel pins & #5 washers. Slide a dowel pin in each of the 1/8' reamed holes in the center of the base near each outer edge. Make sure there is no debris in the holes, they are a very close fit to the pins, less than 1/2 of one thousandth of an inch clearance. Slide one of the #5 washers over each pin.



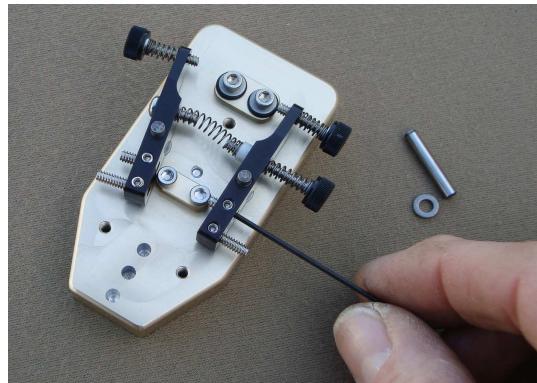
Now slide each of the levers onto it's corresponding pin, noting the orientation.



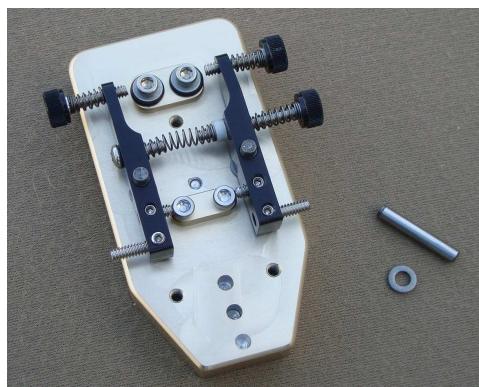
Locate the Return Spring. Lift the right lever so it is barely engaged with the dowel pin. Slide the open end of the Return spring over the pan head screw in the left lever, engage the closed end with the Return Adjust Thumbscrew, (it's a bit of a stretch), and slide the lever down over the pin.



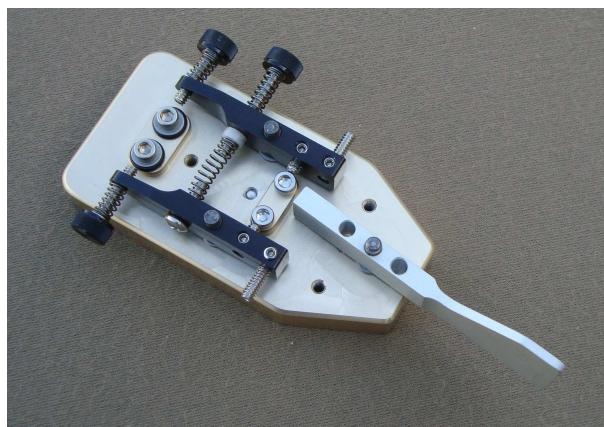
Now, using one of the .050 Allen keys, adjust the Lever Stop Screw in the right lever to align the lever with the base - just screw the set screw in until the lever is parallel with the base; lock with top set screw:



Do the same with the left lever:

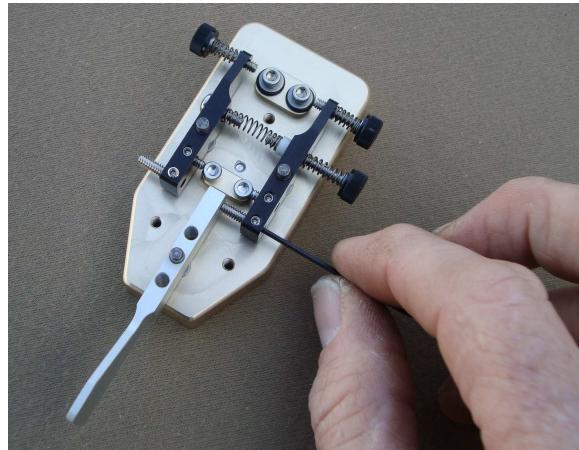


Locate the Paddle Lever & the remaining 1/8" dowel pin & #5 washer. There are three positions for the Paddle Lever pivot , yielding three possible lever ratios. The three positions will provide a tremendous variation in resistance. It is very easy to change the pivot position once the paddle is assembled, so your choice of position is not critical at this time. Start with the middle position; slide the dowel pin into the middle hole in the base, slide the remaining #5 washer over the pin, and slide the middle hole in the Paddle Lever over the pin.

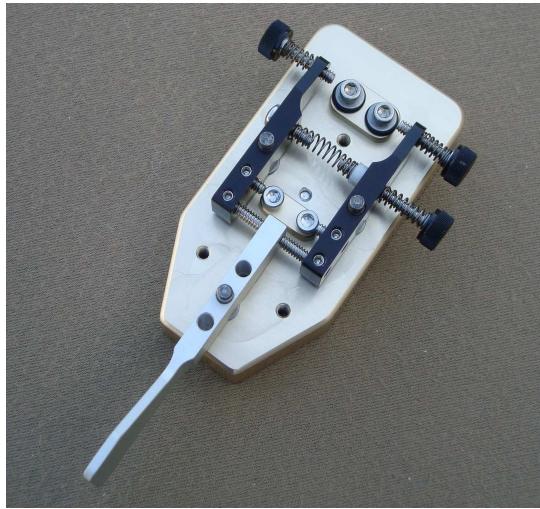


With a .050 Allen key, screw in the Paddle Adjust Set Screw until the Paddle

Lever is centered in the base:

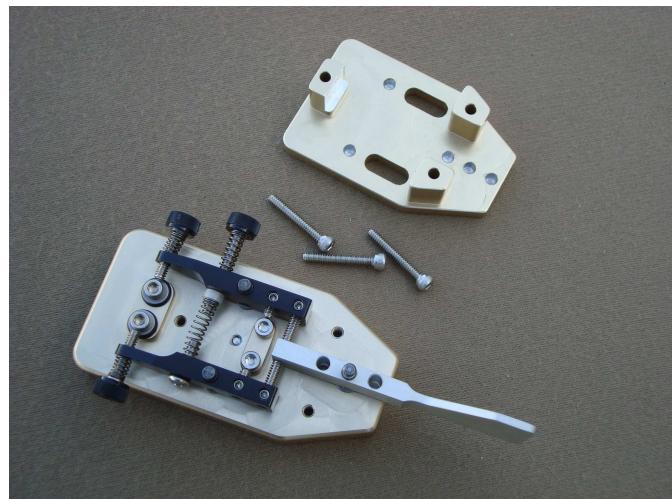


Now do the same with the left lever, screwing in the set screw until it just kisses the Paddle Lever. What you want here is no play, but you do not want either Contact Lever to be pushed from its stop position. Easy way to gauge this; if you move the Paddle Lever, you should see only one Contact Lever move; if adjustment is not correct, you will see one lever close slightly as the other opens as you move the Paddle Lever. (Both Contact Levers should be at rest against the SHCS stops and not levered by the Paddle Lever when in the neutral position.) Note the top cover of the Bushwacker, the Retainer, has slots milled into the top allowing fine adjustment after final assembly. (We have not found this to be necessary as yet - the Bushwacker is machined to such close tolerances that adjustments do not change with Retainer on or off the Base.)



Your Bushwacker is now ready for the Retainer and final adjustment. Slide the Retainer over the three dowel pins; it is a snug but not tight fit. Make sure it is aligned correctly over the dowels and the Retainer will slide down over the dowels and bottom on the base. It may "snap" down the first time; again we

have less than $\frac{1}{2}$ of one thousandth of an inch clearance between the dowel pins & holes, providing a snug fit. Slide the three #4 x $\frac{3}{4}$ SHCS into the three counterbored holes & thread into the base, making snug, not super-tight; no heavy hands.



Here it is!

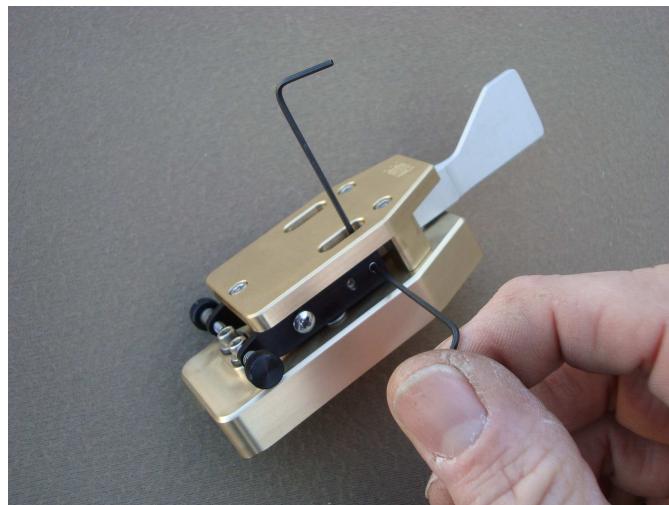


Use the thumbscrews to adjust contact gap & spring return. You can change the Paddle Lever ratio at any time by just removing the Retainer & changing the pivot pin position. Nothing else will change; just lift the Retainer, remove Paddle Lever, dowel pin & washer & reposition, reinstall Retainer. You will find that the Bushwacker can be adjusted for feel from feather-soft to rock-hard and anything in between. Note that return force is totally independent from the lever ratio allowing for infinite adjustment.

Don't forget to use the strain relief (with the #4 x $\frac{1}{4}$ Pan Head Screw) with your 1/8" cable.



You can adjust the Paddle Lever & Contact Lever stops at any time:



We provide two .050 Allen keys so that you may hold an exact adjustment with one key while tightening the set screw with the other, allowing for extremely precise adjustments.

We hope you have enjoyed assembling and using your Bushwacker Paddle! Please do not hesitate to contact us with any questions, concerns, comments, or suggestions.