

## Orion EZ Finder Deluxe II Adjustments

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The Orion EZ Finder Deluxe II is a wonderful finder. It has both green and red lights for spotting. The ability to change the finder from a dot to a cross hair to several other different displays. The supplied pier brings the device up high enough so that even my big fat head can get down to see the sight easily. In general, it is a great product... almost.

It's first problem is that it is WAY too bright. Even on Jupiter, the finder is overpowered and difficult to use... even on Jupiter. Additionally the switch seems a bit tight and hard to turn. While Orion does know about this, you can do something while they work with the manufacturer to remind them that this is for astronomy use and not daytime observing, you can modify the finder yourself.

It looks like the problem for our piece was that the fit is VERY close... a bit too close so it grinds. Additionally, the 'spring' for the switch is very stiff. It could be a tiny bit weaker.

Remove the four screws on the silver plate. (Circled in red in the picture.) Rotate the plate so it can pass the outer contacts. Remove the outer casing of the switch. (NOTE: Both the bottom of the plate and the switch casing has grease on them.) Apply a small amount of grease to the outside of the casing where it rubs. Put the outer casing back into the finder. Now you have two choices: 1) Reduce the notch on the plate or to have the screws holding the plate a bit loose but kept in place by the thread lock. I choose both. I SLIGHTLY bent the notches in plate back the same amount. Make sure if you do adjust the notches to make sure they are symmetric and still have a decent peak to the notch to match the detents on the switch housing.

Put the plate back into the finder and rotate the plate back to it's original position so that the two remaining screws are in the gap. Tighten all 4 screws. (Remember that the PC board that they screw into is not very strong and you can easily strip the screw holes!) Temporarily put the battery cover back on and try the switch for how stiff it is. If it's too tight, loosen each screw 1/4 turn and try again. Repeat until you reach the desired tightness. Ours needed about 3/4 turn from 'tight' to get into the right range of stiffness. At this point, use a toothpick to put a very small drop of thread lock where the screw/plate meet. (Try very hard to not fill the screw head since you may wish to regrease or tight the screws in the future.)

If you are not comfortable soldering surface mount components, reassemble the finder (Step 4) and go from there.



## Required skills and materials:

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Orion EZ Finder Deluxe

A STIFF wire - Small hex wrench will work.

Soldering iron with a relatively fine tip and lead free solder

Desoldering braid

0805 resistors in 47k, 82k, 100k, 150k and 200k - Yes, these are tiny beasts.

Grease (Petroleum Jelly is what I used.)

Small Phillips screwdriver

Thread lock/nail polish & toothpick



## Step 1: Disassemble the switch

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Note the position of the trace on the circuit board with relation to the outer casing - it lines up with the 'R'. You'll want to remember that when this gets assembled again. Use the stiff wire/small hex wrench to remove the holder ring. Alternate between the two notches and it will come off with minimal effort. (Yes, it is stiff but take your time. Don't mess up the threads on outer switch housing.

## Step 2: Fix the switch tightness.

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Put the board back into the switch housing with the resistors down. Start screwing the holder back into the switch frame. After you've got it slightly tight, position the board so that the trace on top points to the middle of the 'R'. Push down on the board with one finger and tighten the holder ring. (Basically when you are tight enough to start turning the board while turning the ring, you are done.) Put the battery back in and the battery cover. You are done!



### Step 3: Removing the old resistors.

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The OEM resistors are 2200 at position 1, 1500, 900, 620 and 500 at position 5. For a 3.3 volt battery, this means that the LED is operating at it's brightest in position 5 and assuming current to brightness is a linear cooraltion, position 1 is a bit over 4 times dimmer or about 1.5 magnitude. In my opinion, that range is a bit limiting in addition to bright. I settled on 47k, 82k, 100k, 150k and 200k.

Prepare the board. I put a dab of petroleum jelly on each pad as the solder will easily and quickly flow over the gold plate. (I'd rather keep the gold plate than the solder for the connection within the switch.) As long as you are quick, you should be able to keep the solder isolated to just where it's wanted. As you can see, I didn't think of the petroleum jelly until I'd messed up on of the pads.

Using solder braid and a tip that is large enough to cover both ends of the resistor. You should be able to lift the resistor quickly. Do not force it (or you'll mess up the board). Remove the excess solder using the solder braid. Remember to let the board cool and to keep the petroleum jelly covering the pads.

Solder the new resistors in place. I choose the 47k value by trial and error on a bright night. Several of us looked at Jupiter on partly cloudy night with a full moon. The other resistors are about 1.5x the value of the prior value. Assuming a linear relationship of current to brightness, the values should be changing by about .5 magnitude for each position and a total range of about





#### Step 4: Reassemble the finder

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Put the board back into the switch housing with the resistors down. Start screwing the holder back into the switch frame. After you've got it slightly tight, position the board so that the trace on top points to the middle of the 'R'. Push down on the board with one finger and tighten the holder ring. (Basically when you are tight enough to start turning the board while turning the ring, you are done.) Put the battery back in and the battery cover. You are done!