MR Bulk
Flashaholic

Reged: Aug 12 2002
Posts: 5480
Loc: Hawaii

Space Needle II Build - Photos and Instructions

#644367 - Thu Aug 05 2004 02:08 AM

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Since I don't make Space Needles any more, and with the recent advent of a new, self-centering heatsink made expressly for new-version Maglite C bodies (exterior serial number must begin with a "C"), I figured I'd show everybody how to make their own in case they absolutely had to have one.

First of all you will need to get an "o-sink C" from Yaesumofo. I know there are other heatsinks in existence, but the fact that Yaesu's version features a machined cutout in the center of its focal spacing post makes it one I would recommend over any other. It is maddening to finally get a light all sewn up only to find the emitter is off-center.

Here's a picture of both his D and C heatsinks, with the C on the right (obviously):

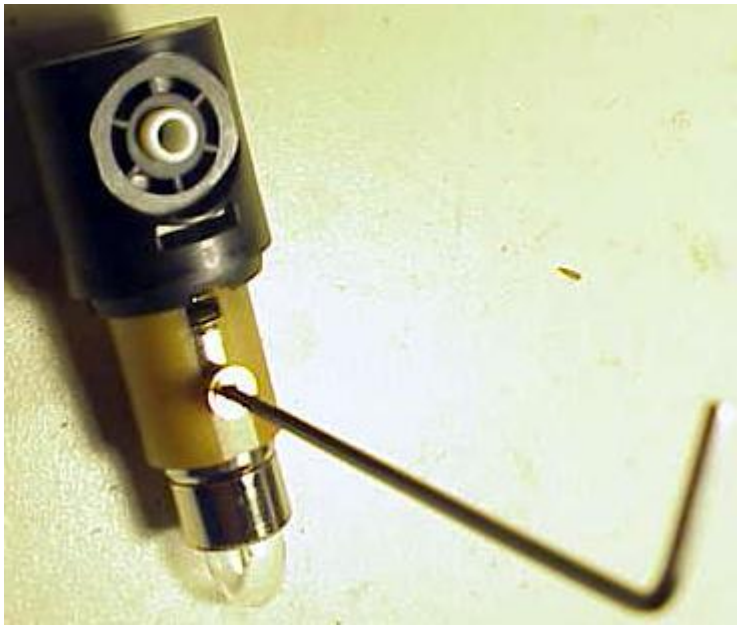
You can see that the machined central depression is of the exact shape as a Luxeon's bottom metal slug.

Let's proceed:

Start by unscrewing the head and then removing the rubber switch cap (make sure button is depressed into the "On" position), then stick a 5/64th" allen key into the hole to loosen the setscrew that holds the switch body against the battery tube:

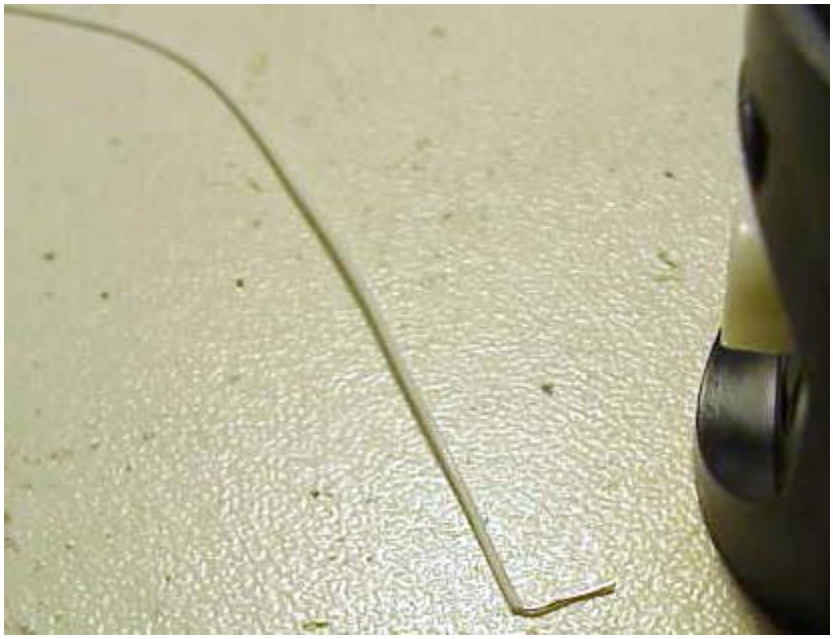
Unscrew it two or three turns and the switch drops right out the bottom:

Use the same key to unscrew the focusing wheel and remove all the metal internals and discard (hint - push down slightly on the bulb to relieve pressure on the wheel while unscrewing):



There will remain a long flat metal contact strip (with a threaded section at one end) for ground on the side of the switch body; it simply drops out the side. You'll need this later for the ground wire that goes to the Luxeon's negative lead.

Strip about 3/16th" off the end of some VERY thin solid-core wire (teflon-jacketed 30-gauge is what I use) and bend it at about 90 degrees:



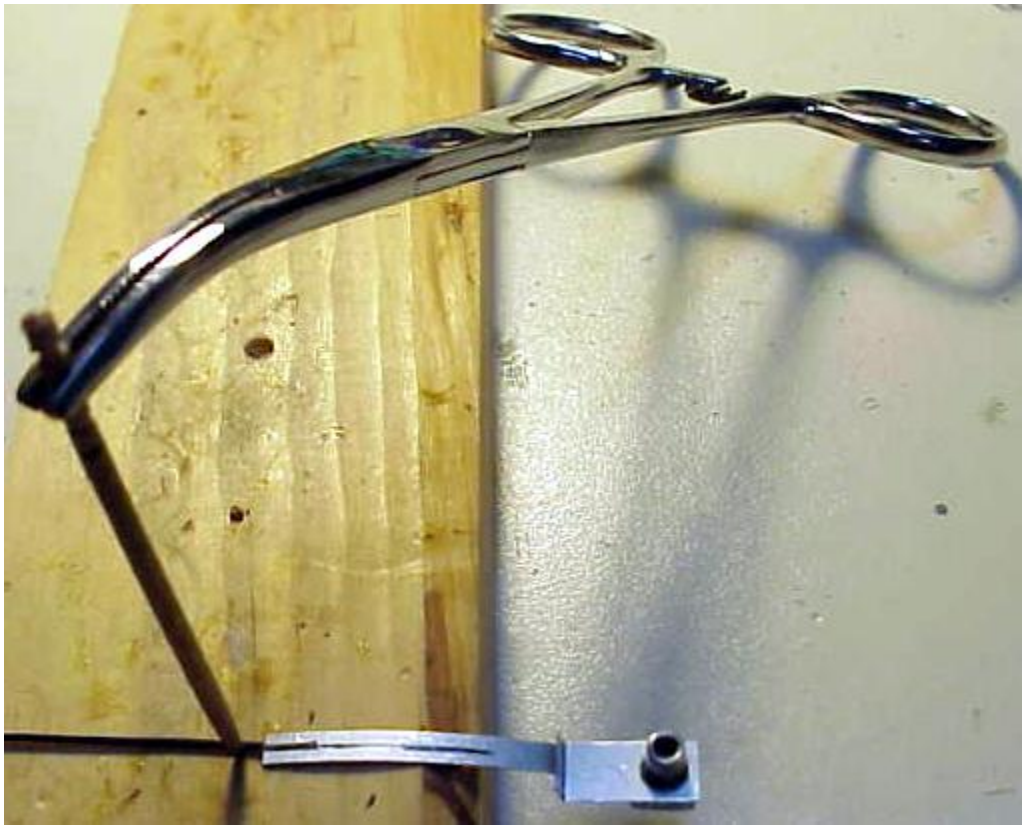
and then stick it down the now-empty tube of the switch body so that the 90 degree stripped end makes flat contact with the metal plate at the bottom. From above, carefully hold the stripped wire tip down against the plate with the flat portion of a chisel-tipped soldering iron and with your other hand, feed some solder line through the side slot onto this joint:

This is the purpose of using teflon jacketed wire; if it contacts the shaft of the soldering iron during this operation the insulation won't melt. As soon as adequate solder flows onto both the plate and wire:

1) pull the solder line out and drop it

2) use that hand to now grasp the wire from above and press down gently while removing the iron. Hold for a second or two while it cools and forms a solid joint.

Solder another wire onto the flat end of the long metal strip you saved (no cutting needed):



Notice I use a hemostat to clamp a toothpick, together the weight of which holds the wire down against the strip while soldering.

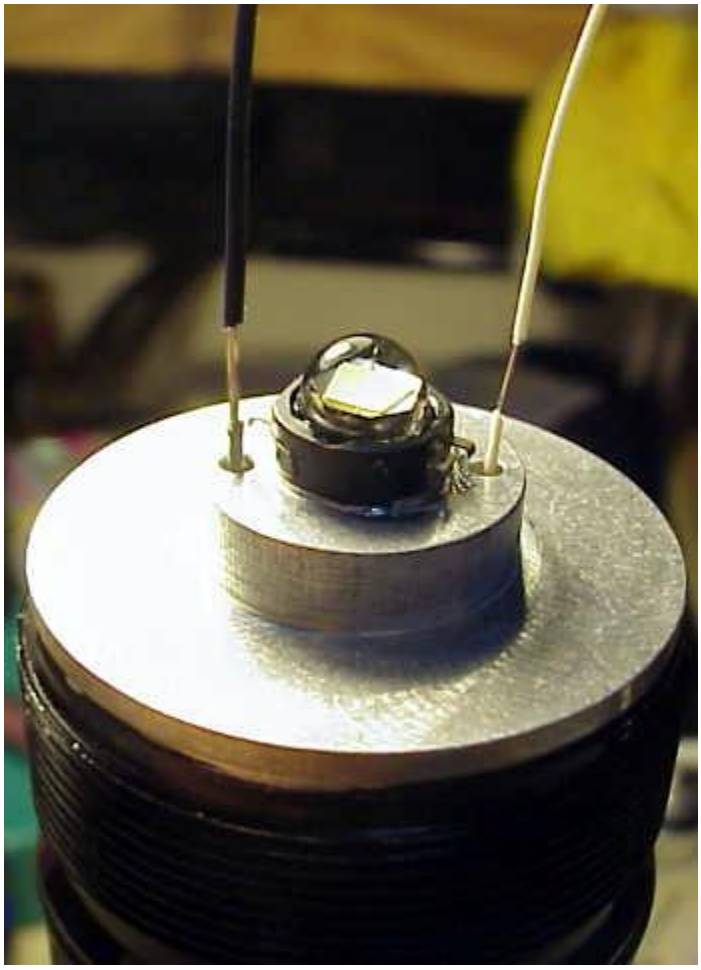
Feed the wire and metal strip back up into the small slot of the switch body. The switch soldering is now complete and should look like this:

With a black Mag body the fit between the o-sink and the top of the tube lip is tight. I have heard that different Mag colors are of differing thicknesses and YMMV here. After the next following step you could simply tap it into the tube firmly, but it would never easily come back out if you needed to get in there later so I opted to wirebrush the anodizing from around the inside of the lip opening for a "snug" fit since I would be using some Arctic Alumina (non-adhesive) to fill in any gaps, thus ensuring a good thermal pathway:

I took off the first 3/8ths" or so which is about the depth of the o-sink:

Drop the switch body back down into the tube from the bottom, line up the switch with the hole and tighten firmly:

Apply thermal compound around the inside of the tube (where the anodizing was wirebrushed away), feed the two wires through the holes in the o-sink and press in:



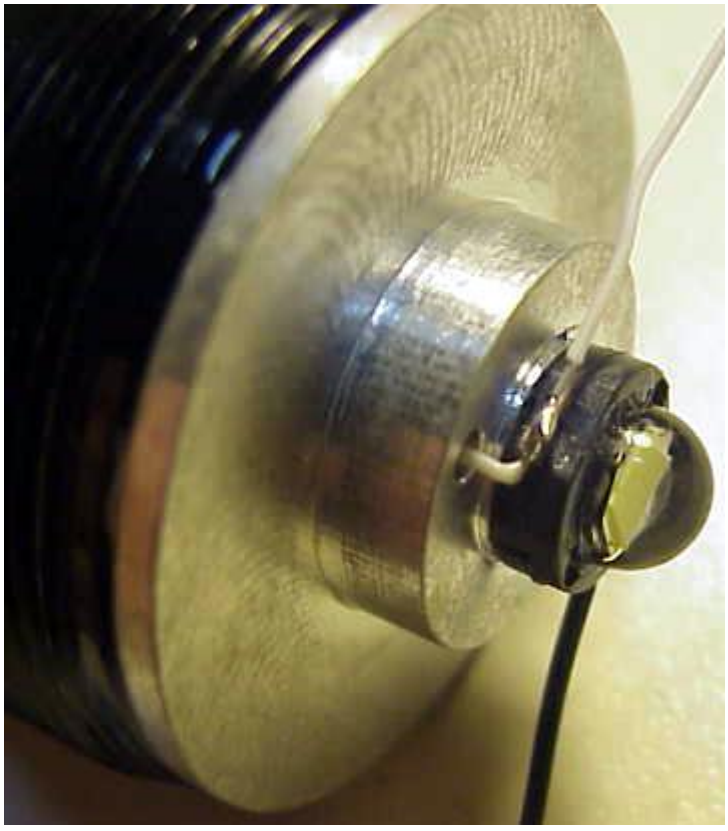
You will note that the 5W Luxeon (a U3V Bin Code used here for nice white output coupled with a Vf Bin towards the higher end for best longevity) has already been Arctic epoxied into the self-centering depression (I use Arctic Alumina as it sets up much more quickly than Arctic Silver but either one is good) and the wires stripped; however, before installing the Luxeon I first stripped the wires just above the hole openings and the amount of insulation left was initially measured relative to where they would make contact with the Luxeon's leads. It is more difficult to strip the wires this closely to the holes if the Luxeon is already glued in place. This is just one of several little idiosyncracies throughout this mod that are better left to "doing" than taking paragraphs to explain, but once you're in the middle of it you will immediately understand them very clearly.

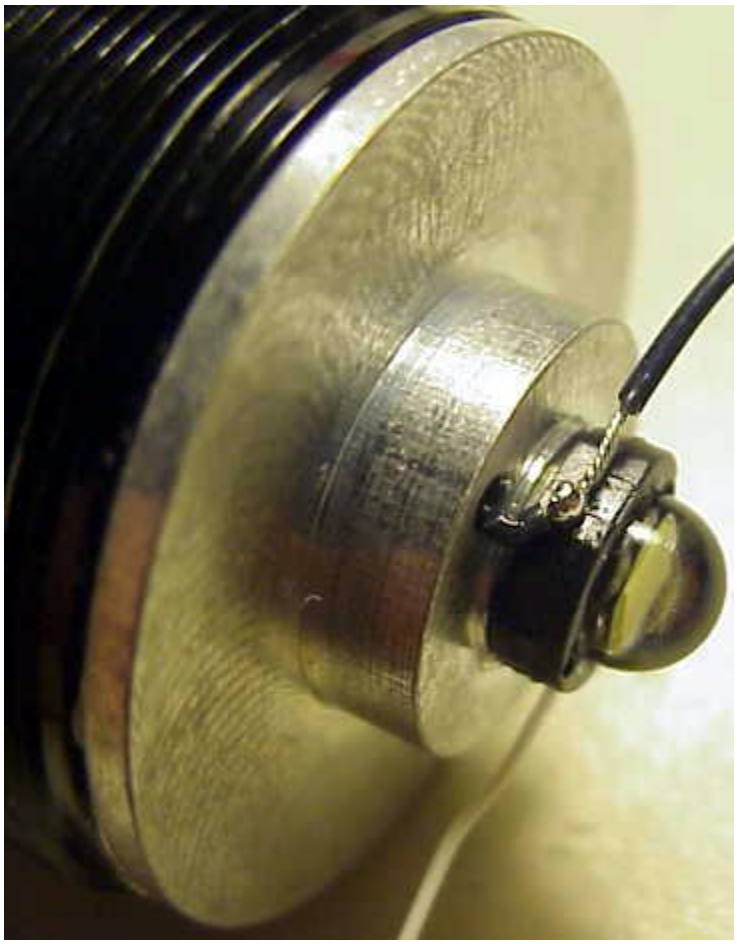
Take a heavy cutter and clip the tail spring as indicated:

leaving about 2-1/2 coils at the bottom (widest part of spring).

Use a couple of pliers to bend the end of the cut spring inwards towards the middle so that it will make good contact with the negative end of the CR123 battery:

After the Arctic epoxy is set, bend the wires under the Luxeon leads (I clip these leads just below the first bend coming out from the Luxeon's black case as they form nice little 90 degree elbows under which you can then easily "hook" the stripped portions of the wires) and solder:





Now cut the cam end off the reflector (I use a bandsaw):

It should look something like this when done, although if you leave just a small amount of the tube (I leave maybe 1/32" to 1/16" or so) it will prevent you from cutting too closely into the bell, which could widen the hole and lose you precious reflective real estate. But it does not have to be exact, we're not splitting atoms here, just make sure you don't cut it TOO close:

The point here is that the post of the o-sink will fit up into the opening of the reflector anyway so leaving a bit of the "collar" does not hurt. It's not like people (except maybe anally-challenged Flashoholics) are going to look inside there anyhow!

Rinse reflector with water and PAT dry with a clean paper towel (I do it this way on every Space Needle) but do not RUB in any direction! Then clean up any leftover flanging with a sharp X-acto or similar:

Clean up any remaining debris with a soft brush (note the white specks), I use a SIMA Lens Pen from www.flashlightlens.com (this is NOT an endorsement, it's the only place I can find them reasonably. Try pricing one at a carmera shop some time):

Replace reflector in head and screw head down onto body until the base of the Luxeon is about even with the reflector hole, this is close to the optimum spot focus point:

(Hey, you can see the brand of my camera in there...)

Next you can go buy one a those expensive custom-made battery holders that adapt three CR123s to a C-sized Maglite tube, or you can go with my original idea for a rattle-free battery carrier and use a length of 5/8" ID rubber automotive heater hose split down one side. Push three batteries into it:

TA-DA!

Light it up and adjust for desired focus, then go dazzle the neighbors...

BTW this light was freshy made just tonight only to facilitate these instructions and is a redundant extra to my photonic arsenal. As such it is For Sale - $90 plus shipping...

Post Extras:

raggie33
Flashaholic*

Reged: Aug 11 2003
Posts: 4390

Re: Space Needle II - How To Build Your Own [Re: MR Bulk]

#644369 - Thu Aug 05 2004 02:12 AM

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very good post charlie.

Post Extras:

MR Bulk
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Reged: Aug 12 2002
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Re: Space Needle II - How To Build Your Own [Re: raggie33]

#644376 - Thu Aug 05 2004 02:33 AM

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Hey Ragzz, don't you have most a these parts already anyways? Go make one!

Post Extras:

mudmojo
Flashaholic

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Posts: 72
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Re: Space Needle II - How To Build Your Own [Re: MR Bulk]

#644382 - Thu Aug 05 2004 02:59 AM

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Hi Charlie. Nice writeup! While most of it was greek to me, I would like a chance to own this light if its performance is similar to this SN II's 216 lumen output as described at this webpage...

http://darkgear.com/mrbulk/spaceneedle2.htm

Is there any way this can be modified to run with eight 2300MAh NiMH AA batteries (for a nominal voltage of 9.6V)instead of the 3 123A's since it's a DD? I'm still interested in purchasing it... I'm just wondering if it can be done then I'd be willing to pay more if you're willing to set it up.

Post Extras:

KevinL

Re: Space Needle II - How