99 Cent Cap Clip on Light Modifications using a CREE 3W LED

Clip-Lite or Clip-ON to cap lights have been sold at \$0.99 cent store for a number of years now. They can be found other places and on-line. "Astro Lite" and "Miraclebeam" are some of the trade names.

They can be modified to become a light weight, long burning basic task light that can be clipped to the bill of a base ball type cap. Works well for working around the camp or bass site. Use the case and toss all of the internal components and use a 3 watt high efficiency heat sink led for the light source and a resistor to limit current flow.

The XR-E 7090 Q5 WC Emitter High Power LED (228lm) can be found on eBay for about \$4.00/each.

A resistor between 20 and 30 ohms can be used. We liked using one X-miss tree bulb in series with the battery. This was a 99 cent store purchase from several years ago. This was from a single 35 bulb string of 115 volt X-miss tree lights. Its negative resistance factor, for less and less battery voltage, allows it to deliver more useful light for longer.

Typically a NiMH 4 cell AA battery fully charged delivers about 5.5V and the current it allows to the led is about 100 ma. At 4Vs when the cells are discharged it allows 68 ma and the filament is not hot (in the X-miss tree bulb) and so the resistance is very much lower. In this way the X-miss tree bulb acts to a degree like a current regulator circuit and thus the brightness drops off very slowly as voltage drops. This arrangement is more efficient than a special circuit that regulates current.

The unit off the shelf when taken apart looks like the following:



Keep the clip, case, plastic lens, reflector cone and screw on front ring. Toss aside the rest. You might be able to use the switch on another project.



Push the X-mass tree bulb into the back end so the leads stick out the front. Solder it in series with the battery.



Srink wrap the result. Push it back so the led is sticking out the back end with some amount of wire showing. Put front end back together after pushing the wires and LED into place. Use a bit of black electrical tape around the thread area to keep the water out. Stuff a small chunk of toilet paper down the back end to seal off around the wires. Push it in a bit past the back end rim. Clip the unit to a cup so the back in is sticking up. Use a small amount of 5min epoxy to hold this and seal it from water getting in. As an option the plastic lenses could be put together with a bit of silicon rubber around the edges on it.

Most of the time before soldering it together one will need to file or sand down the diameter of the LED aluminum heat sink a bit to make sure it fits inside the screw on frontend.

This unit uses the same battery as the CREE Q4 task light.