Introducing: EDC Two-Cell LCD Light Feeler (CAD) SPY005

Hello everybody! I am excited about the prospect of manufacturing and offering a run of flashlights to the CPF community. After several months designing the light and bouncing the ideas off many of my personal CPF friends, it is now ready for its introduction. Please take a look at this proposed design and let me know what you think.

The SPY is a two-cell every-day-carry using 123s. At less than 3.2" long the CAD pictures below show this to be a tiny light (the US quarter is to scale). In a very retro-spy-gear style, the light employs a super micro rotary switch that controls 6 levels of output. See the small round chrome rotary dial just parallel to the bezel. To operate the light you turn the rotary switch one click at a time, from off up through ever-higher light levels. The switch has a stop at off and high so the user will be able to feel the switch and get to the light level desired and also be able to turn the light off without looking at the beam.

My prime goals for this light are; it must be bright and dim, it must be long lasting for work and play and I want it in my pocket. My intention is to make it high quality, fun with cool features and beautiful.

The time frame for the completed light is December 2005. It will be as powerful as leading edge (4th quarter 2005) LED technology will permit but also with a practical run time indicative of a two-cell light. In the November time frame a decision will be made to go with the best LED immediately available. If that is not the K2 then I am planning to provide an upgrade path to the K2 when it becomes available.

Specifications:
Proposed name: " SPY005 " (SPY released in 2005)
Batteries: two CR123 run in series (or rechargeable RCR123s)
Proposed LED; Luxeon 3 or K2, Under 4Vf and up to 1500 mA, Lambertian projection
Six regulated light levels, high efficiency buck/boost converter
Proposed current levels: 1500, 750, 300, 125, 15, 2
Rotary switch is mil-spec and rated for a minimum of 10,000 full cycles
Reflector is IMS 20 or McR-20 TBD (pictures below show IMS 20)
Switch can not come on accidentally in pocket because it is smooth and must be purposefully rotated
Body made of 6061-T6 aluminum HA III natural finish and other finishes
Bezel is 1" in diameter and is chrome plated on outside surface
Water resistant with o-ring seals at the head, cap and dial
1.4% of gross sales will be donated to CPF
Six month comprehensive warranty, replacement parts and service will be available for 5 years

My specialty is machining. A large production CNC vertical machining center is my primary tool. It is only natural for my concept light to be a machined product and not a turned product. A two-cell light fits nicely in your pocket if the batteries are side by side (parallel). My design keeps the light short and thin. It is actually smaller than the average flip cell phone. I am a very proud machinist and my perspective is to make this a high-end intricately machined product like other very fine custom light products found here on CPF.

The SPY005 has a few unique features worthy of note. The bezel is made of chrome-plated aluminum. The bezel and the case of the light make up the exterior heat sync area. Inside the light, the bezel is thermally connected directly to the LED mounting plate with thermal paste. The lens and reflector are secured with a screw on ring and sealed with an o-ring. There is also an o-ring at the body. The reflector and bezel are designed to fit together with high tolerance. This affords a very compact unit that is always perfectly aligned. The outside diameter of the bezel is only 1" but, here is the good part, the light path is .75" in diameter.

Another unique feature is the battery cap. It is smooth and clean because of a trick hidden latching mechanism that can be operated with any type of stylus. You push on the button inset in the edge of the cap and pull the cap off to replace the batteries. This cap is o-ring sealed to the back of the light. I am still contemplating an o-ring around the release pin button verses a smooth tolerance fit there. Without an o-ring some gas venting is allowed for. The button can be

pressed with any pointy object like a car key, ballpoint pen, small screwdriver, matchstick etc. You get the idea.

The control knob is also o-ring sealed to the body. It is attached with a snap ring and cannot come off with out disassembling the light from the inside. It interfaces to the rotary switch with a blade protrusion. There is a physical stop built into the knob so that no high level of torque can be transmitted to the switch's internal stop. The switch is mounted directly to the converter board. The battery pushing on the converter board springs hold the converter board in place and engaged to the control knob. No service is necessary because of the placement of the o-ring, no dirt can get to the knob's bearing surface.

I am planning a lanyard that is all cloth and leather that will fit around the bezel. Taking the bezel off and sliding it around like a collar will attach it. For those of us who do not use lanyards it will of course not change the appearance of the light because no attachment point is needed for this design. I am talking with a local beading shop to design a fun optional lanyard that is very cool too. It may be pricy though.

Some but not all of my advisers think the 1500mA level is too high. I know it is not very useful with a Lux3. At 1500mA the Lux3's life is shortened and the increase in flux output is minimal over a 1000mA level. However with a K2 or similar LED this will enable my light to output in excess of 100 lumens. And that is the eventual goal. If you do not agree with this plan then please let me know. Nothing is set in stone yet.

I will not be selling the first run of ~20 lights. They will be prototypes and as such will likely be flawed. Some will be available to select fellow CPF'rs to peruse and review and in some cases beat with a metal rod. ;) I am planning to start prototype production of this light as soon as its design phase is complete (a few weeks yet). I will not be selling pre invention lights either. The prototypes will be complete before I will except orders for the final production run. The numbers, quantities, costs, lead times and the final configuration including the what LED will be used will all be known before hand. Also, it is my plan to only require down payments at the time of the signup.

As some of my CPF friends know I run an invention consulting business and a machine shop. This affords me the control and creativity to make this complicated light a reality. In comparison to other projects on CPF this will be very heavy on the machining, polishing and plating requirements. My estimate for the final cost of the light is $345 (preliminary estimate). With such a short-run specialized product no phase of this project will be profitable for me and I am OK with that. I am doing this to keep my machine shop busy and because I am a hopeless flashaholic. I have donated the time to design this light and I know I will be donating much more time yet. The only part I can't give away is the machining phase, this will meet my machine shop minimum requirements or I cannot move forward.

I am of course searching for suppliers for various components. I have recruited a CPF electronics guru, Wayne Yamaguchi, for partnering with me on this project. Wayne is custom designing a controller board that will be regulated at each light level and that will interface with the rotary switch. Another of my established partners is a best friend who owns a large job shop and who will be producing the turned components. I also have a long time relationship with a good metal plating company. I will be using Chris at flashlightlens.com for the lenses. I currently lack an LED acquisition and sorting partner. I also will need some CPF liaisons. All partners will be compensated for their time.

It is important to point out here that I owe a lot to several CPF people for guidance on this project. The first is dat2zip for guiding me to what kind of emitter and electronics make the most sense for my light. Secondly, several people (andrewwynn, tweek, Mr Bulk, tvodrd, DaGunn, Ginseng and others) have given me very valuable feedback that has steered me in the right direction on options and features. I could not have gotten this far on my own.

I love lights and our community and want very much to produce a light for CPF. Being in the manufacturing business I realize this flashlight is an extensive project. I welcome everyone's perspective and input to ensure it turns out good. At this point I am testing the waters with this concept and need feedback from you. So, I am looking for a show of hands to determine the interest for a light of this type and cost.

The series of pictures below show the light outfitted with some different bezels. These options are a work in progress. Also near the end you will see a bezel design I have shamelessly stolen from Ginseng's Aurora2. ;) Comments on these and other ideas are greatly encouraged. So without further gilding the lily and with no more ado, I bring you the

SPY005.

This is not a sign up thread, but please post with your reactions and comments.

THANKS FOR LOOKING.

Sincerely

David Livingston
��have recruited a CPF electronics guru, Wayne Yamaguchi, for partnering with me on this project. Wayne is custom designing a controller board that will be regulated at each light level and that will interface with the rotary switch. Another of my establishe