

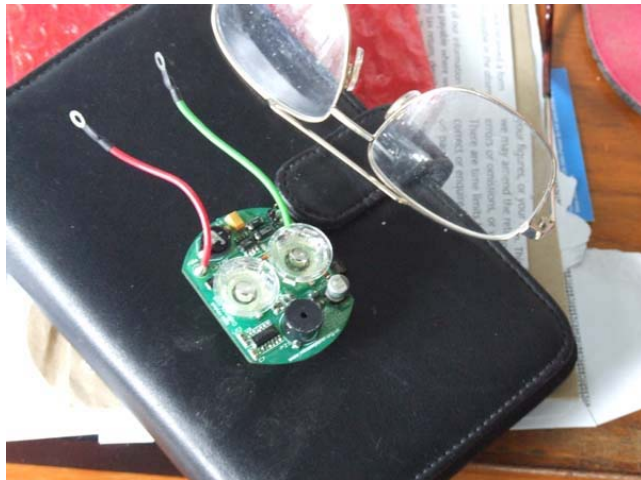
Lighting

By Roy Fellows

As most underground explorers will be aware, there is something of a revolution going on with cap lamps. The traditional bulb headsets are gradually been superseded by lights systems based on Light Emitting Diodes (LED's). There are a range of products on the market, and there seems to be a lot of discussion as to what is the best, the Stenlight, Scurion, and Speloetechnics Nova 3 running favourites. There are however, other contenders, and the most useful amongst these must be the Retro 2 manufactured by Technical Concepts Ltd. You can read all about it here: <http://www.mineexplorer.org.uk/ledlighting.htm>

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A while ago I spent a very full day underground in the Caplecleugh mine at Nenthead with its designer Mike Hrybyk. The trip was rather like an underground version of SAS selection with wet rises, chin deep water, muck crawls the full works. Coming out, my Oldham lamp went dim as I was underground longer than expected; however with Mike right behind me with his Retro on full blast it was no sweat finding my way. I left with a very favourable impression of this unit as seeing it in action for a full day under the most arduous conditions is worth a lot more than seeing something being demonstrated in a shop. I have to mention in passing that the unit has recently been up rated with more powerful Seoul P4 LED units which means there is now a total light output of 200 lumens, running on an Oldham battery. At higher voltages, say 6.5 volts there is even more light coming out.



The beauty of this unit is that it is intended as an upgrade for the standard Oldham GT caplamp 4 volt lead/acid or the Speleotechnics batteries, but can be connected to virtually any battery with output between 1.3 and 7 volts. You can run one on 3 or 4 AA rechargeable's if you want in a home made holder or the one that is sold for the Nova. This gives an incredible durability compared with the others intended to run on lithium ion batteries.

The main problem with the new generation of LED lighting is cost. Stenlight itself weighs in at £215-256 complete with battery and charger. To purchase a Scurion you may need a second mortgage as it weighs in at a hefty £325 or thereabouts dependant on the version you buy.

I purchased a Retro 2 and did some tests in Wilkinsons Level, a fairly dry walk in level at Talybont, where I seem to spend most of time these days. A friend from Welsh Mines Society had a standard Oldham T6 caplamp, I had the retro 2 and an Oldham T6 with a 1.5 amp (6 watt) halogen bulb conversion.

So what about the Retro 2. Well for a start the price is right at £60. Fitting is usually easy, full instructions supplied, and if you run it continuously on full power you will still get 23 hours out of an as new Oldham 16 amp hour battery. This is enough for a weekend with 2 full days and no recharge facility. To the best of my knowledge if you want to run really bright LED lighting on an Oldham or Raylight lead acid battery its the only ball park in town anyway.

I set my digital camera on a tripod and did a few preliminary tests to get the best picture using the Retro 2, and then using the same settings took some pictures using the other light sources. My camera is another really good piece of kit, its the Fujifilm S9500 which has a fixed 28mm to 300 mm telephoto zoom lens, as well as an external flash socket, essential for underground use. Its made of high impact plastic same as the Styr AUG Assault Rifle, and high impact means what it says. In Brownley Hill mine I knocked the tripod over and the camera crashed onto some rocks but was completely undamaged. My setting was ASA 400, 2 seconds exposure at F4. The pictures cannot really tell the full story, as there is no lens made that can duplicate the human eye. My friends standard Oldham was basically as dim as proverbial TOC H lamp, I don't think he had even fitted a halogen bulb. I would not go underground with it. My up rated Oldham was a real searchlight, I always refer to them as a "Caving Supplies Flamethrower" as these are the people where I get the up rated bulbs. The range was especially good, mainly because it was focused to a narrow beam. By the way, if you don't know this, a prefocus bulb can be focused by rotating it in the housing until the desired beam pattern is achieved. It marginally beat the Retro 2 on this, but at the price of peripheral illumination. I have to say that the outright winner was the Retro, the quality of light is such that you can see all the natural colours underground as you would in daylight.

The real tie breaker is the power consumption. Oldham lead acid batteries at the moment seem to start life giving almost 20 hours on the standard bulb, but within 12 months fall back dramatically. I am hearing this all round. I would expect a 16 ampere hour battery that does what it says on the tin to give 16 hours on a 1 amp bulb, about 10 or 11 on the up rated 1.5 amp bulb, and 21 hours on the Retro 2 on full power. So its really no contest.



This is the Oldham standard 1 amp caplamp. One could try eating carrots.



This is the Oldham modified with a 1.5 amp halogen bulb.



This is the Retro 2 on full power. This was off a 4 volt Oldham battery. Run it at 6.5 using AA rechargeable NiMH batteries and its brighter.



This is the Retro 2 on medium power



This is the Retro 2 on low power



This is a painted in photo of Paul Smyth using the the Retro 2 on full power



This is a painted in photo of Paul Smyth using the 1.5 amp halogen. Note the yellow appearance and streaky effect

The Others:

Stenlight: My good friend Ian Hebson uses these and I met him on the car park, he just come out of Caplecleugh, me out of Rampgill. As I was cold and just got changed we compared lighting by shining into the mouth of Rampgill, it being quite dusk outside. He agreed that the Retro was probably putting out more light, however the Stenlight was more focused. This was some time ago, and at that time the Stenlight was rated at 160 lumens. It was also a very impressive piece of kit, the headset being extremely small. The whole thing was surprisingly tiny, they aught to pack them in jewel cases! I was very impressed, but not so with the battery lead. The latest model has been upgraded with 2 Luxeon Rebels and is capable of outputting 360 lumens. It's a lot in a small package but cost £175 on its own. With battery and charger its £215-256. I have to say that it now looks as though someone has designed the "better mousetrap" as they say in the States. They also supply a kit to run it on rechargeable AA batteries, which many will prefer. And also a new large capacity battery which effectively kills my earlier criticism. I am also lead to understand that support for the product is first class with the manufacturer readily upgrading the earlier models on demand, however I do not have any indications of cost. I think that anyone now considering purchasing a new lamp will do well to look in this direction, however I have not changed my opinion on the Retro 2, it is still the cost effective alternative for anyone who has old Oldham kit, and the seller has just reduced the price to £60.

I also enjoyed the company of Steve Holding who was using the Retro connected to a SpeleoTechnics AA battery pack, Caving Supplies sell these for about £8. Its a very cheap lightweight powerful lamp.

I have just had a rather drastic rethink on batteries, basically, to me, now, the belt mounted Oldham is dead. One has to carry emergency lighting and I have standardised on rechargeable AA batteries, which is the same as my photographic equipment. This has started me thinking about main lighting power supply. Maplins do USA 2 pin Mains Line Socket and Plugs with long brass prongs nearly 2 cms long. Part Nos HL19V and HL17T. These are both in 2 halves held together with a set screw that passes right through to a captive nut. Basically, use a longer setscrew and you can attach the plug to the back of your helmet using the hole for the tie cord. A Maplins AA battery box HP29G and HF28 wiring clip can be adapted using some strong elastic or whatever to just snap in and out, the prongs on the plug are long enough to hold the battery holder securely. Make up spares and you have an extremely lightweight lighting system. The caplamp must be a Retro 2 as it is not voltage fussy up to 7 volts and it has polarity protection by removing the little jumper. I use an extended setscrew on the cable plug so as to ensure correct polarity. This is a low cost, lightweight, and really wicked, lighting setup.