Powerful Lightweight Lighting System

The carrying of heavy Olham belt mounted batteries is becoming a burden, and an unnecessary one at that with modern LED lighting systems.
This paper illustrates a new system based on the Retro 2 conversion for Oldham GT caplamps, and fast changeover, lightweight battery pods made up from cheap components purchased from Maplins Electronics stores.

Parts List

From Mike Hrybyk

Retro 2 caplamp conversion.

From Maplins Electronics Store

ABS Box LH20
USA 2 pin Line Socket HL19V
USA 2 pin plug HL17T
Extended setscrews for USA plugs and sockets
Large battery crocodile clip FS87U
Leads/clip pp3 YR61R
Cable. Flexible rubber covered microphone 2 core. This has unnecessary inner metal sheath but was the most flexible cable I could find.
6 x AA Battery holder
5 AA rechargeable 1.2 volt
Aluminium rod length of battery blanking, door latch or curtain rail etc, reduce 6 AA holder to 5

(To make up 2 battery units purchase Maplins 12 AA pack at £19.99 and have 2 spare for the Tesco Cree illustrated, and double up on parts above)

Description

The length of aluminium rod is used to blank off one of the battery compartments in Maplins battery holder while maintaining contacts, so 5 x AA @ 1.2 volts = 6 volts. On a meter the actual voltage is about 6.5, but within the Retro 2 upper limit of 7 volts. This allows the Retro 2 to function on the full 4 power settings with No 4 giving noticeably extra light above the maximum obtained with an Oldham 4 volt belt cell.
The Oldham battery lead is shortened to reach the rear of the helmet and fitted to the Maplins US plug using one of the extended set screws by the helmets pre existing tie cord hole. On some helmets you will need to make a new hole, use a hot nail rather than drilling.
NOTE POLARITY: I FIT WITH POSITIVE AT THE BOTTOM, hence red tape indication.
The socket is assembled using an extended screw so as to foul the helmet if fitted polarity reversed. Removal of the red jumper from the Retro 2 gives polarity protection, so if reversed it just does not come on rather than frying the LEDs.
These line plug and sockets are really substantial and ideal for underground use, unlike some expensive alternative arrangements.

The plug is used rather than the socket as it can be made water tight with silicone sealer, the sockets will ultimately become corroded / dirt ingress and have to be replaced.

The crocodile clip allows a variety of wearing options, clipped to side of helmet, lapel of over suit etc.

The battery older is fitted is assembled inside the plastic box and wired using the pp3 clip/wires.

The side mount on the helmet is a fish tank heater mounting bracket, the torch is a Tesco Cree Q5 costing £10

In Use
The extra light from the Retro 2 on full power was very noticeable; I now call it "Turbo". Using 5 AA 2000 mAH (0.2 ampere hours in English) I got 4.5 hours before it shut down to low output. The changeover to the spare pack took a no messing, unplug and plug in 5 seconds and I could have stayed underground for 9 hours on the 2. Pay more money for the high performance 2800 mAH batteries and get longer still, but not really worth it.
The Retro was so bright that switching on the Cree only gave improved distance vision