

VISTALITE TYPE “NIGHTSTICK” BATTERY PACK FOR CYCLE LIGHTING

Simon Ballantyne ~ Christchurch, <stball@paradise.net.nz>

A couple of years ago, when VistaLite was sold to Bell Helmets, our local Christchurch retailers (and world-wide) quitted their VistaLite stocks at bargain prices. I acquired for myself a Code 15 (5W and 10W) and for my wife a Code 5 set (5W). We have been very pleased with them. With the two sets were a 2.2Ah NiMH battery stick (C15), and a 2.0Ah Ni-Cad stick (C5). By and large these gave around one and a half hour's burn time. Needing a couple of spare sticks for excess running, the difficulties began – availability and price!

TradeMe suppliers have sub-C type 3.7Ahr NiMH batteries with solder tabs at around \$9.00 each so why not make my own 'nightstick' battery holders? Offered below is a way to utilise plastic PVC water piping and two commercial hose fittings to achieve this end. A basic workshop tool is required though – access to a thread cutting lathe with the expertise to use it (See Note at 3. below). A 260mm tube holds five sub-C batteries with room for a fuse holder which I consider being essential, and for the bulkhead socket terminal with the solder tabs of both bent down.

A SPARE OR TWO? It is a good idea perhaps to make two or more tubes and turn their threads, even if you don't intend to complete them all at this time.

1. Final assembly can be a little tricky; accommodating tight threads; oversize batteries; getting the negative return wire through between cells and case etc. However with a 3.7Ah battery stick costing \$NZ120 or more, the project is worthwhile pursuing.
2. PVC TUBE: Cut PVC pipe length to 265mm and clean up to 260mm. Clean off burring. A tube cutter can cut neatly and squarely to the 260mm size. *NOTE: There are variations +/- 0.5mm on pipe sizes and also sub-C cell diameters, so take a cell with you when selecting the PVC pipe. There are also variations on cell length so err on the generous side when cutting pipe to length.*
3. THREAD CUTTING: It is unlikely that your lathe can take a 26mm PVC tube through the headstock so turn up a shouldered plug to fit in the tube, centre drill, and then use a live centre on the lathe tailstock to steady the extended length. Set up the tube for turning the end thread 14 TPI to a length of 10mm. Offer the hose cap fitting from time to time without disturbing the tube in the chuck to check progress. As the cap begins to slip on proceed very carefully as by now the tube at the thread roots will be getting very thin! When satisfied reverse the tube in the chuck and cut another 14 TPI thread also 10mm, on the other end. This process is rather fiddly and especially with the now thin walled tube the final cuts should be done very carefully. *Note: If thread cutting is a little daunting an alternative could be to bore out the hose fittings to be a push fit over the tube and then secure through to the end pieces with small self tapping stainless steel screws.*
4. END PIECES: Make two 8mm end pieces out of 25mm aluminium (or plastic) rod with the smaller diameter 6mm long to a push fit inside the tube and the larger 2mm diameter to clear the thread peaks of the hose fitting. Centre drill 8mm (13mm for fuse piece) and bore recesses out to 18mm to 6mm depth before parting off. *Note:*

the large nut on the fuse holder should just grab the counter bored diameter sufficiently to embed itself when tightened up.

5. TOP END CAP: Take a hose fitting (tap connector) and remove the washer. Mount in three jaw chuck and saw off the spigot at the O groove buttress. True up the cut and drill through 10mm to clear the VistaLite charger/cable connectors. Most commercial plugs have a hexagon shank and will need their corners turned down to fit. Note too that the tap fittings usually have a tapered shape and can be difficult to hold in the three jaw chuck – *the Warehouse black ones are the best having a near cylindrical body and an easy running thread.*
6. BOTTOM END CAP: The whole spigot of the tap fitting is sawn off, faced off and then bored out to 18mm to clear fuse holder cap.
7. THE INTERNAL GROOVE for the negative return wire in the tube. The simplest way to do this is to thread the tube onto a hacksaw blade, secure the hacksaw in the vice and make a number of passes with the tube until a groove of sufficient depth is formed.
8. Firmly secure the fuse holder and the bulkhead socket to their respective end pieces. Do not insert a fuse in the holder until all is finished!
9. Soldering the five sub-C cells together is facilitated if you have a length of aluminium



Fuse end assembly. Note groove in tube

angle to act as a trough which aligns the cells as you solder them together. Slide them into the tube together with a length of tinned wire down the side groove.

10. Use a short flexible insulated wire to connect the centre tab of the fuse holder at one end to the negative tab of the pack and likewise at the other end with the socket's centre terminal to the pack's positive tab.

11. Trim the return wire close to the tube ends, slip a sleeve over each end and solder to the side terminals of the fuse holder and socket. Carefully twist and push end pieces into the tube ends. Secure with end caps, insert fuse, and charge.

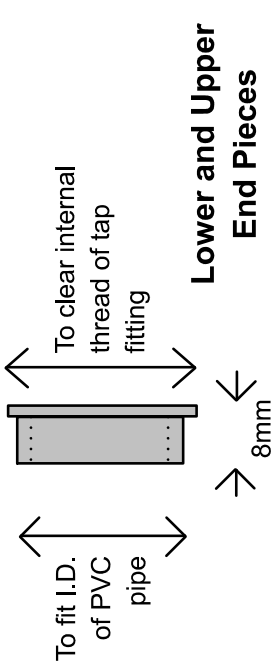
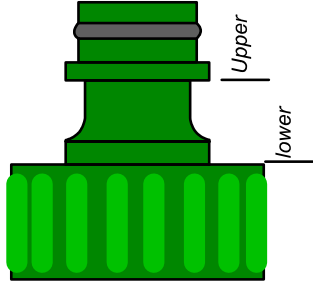
12. PVC pipe takes enamel paint very well – I prefer to leave all in the natural state as being less inviting to the “light fingered!” The tubes fit neatly into the Vistalite pump brackets.

CYCLE BATTERY HOLDER

VistaLite Nightstick type

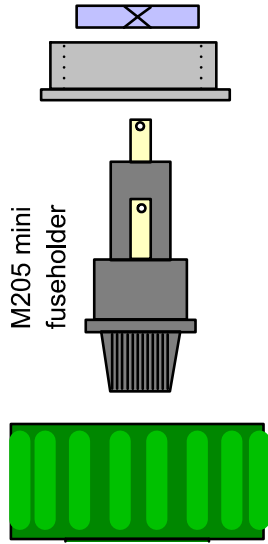
"el cheapo" hose fittings

Lower turned flat and bored 16-17 mm to clear M205 mini fuseholder head.
Upper has spigot turned down to O ring buttress, trued and then drilled 9.5mm to clear VistaLite charging plugs. Note DSE plugs have hexagon shanks and may need a little turning in the lathe to clear the 9.5mm hole.

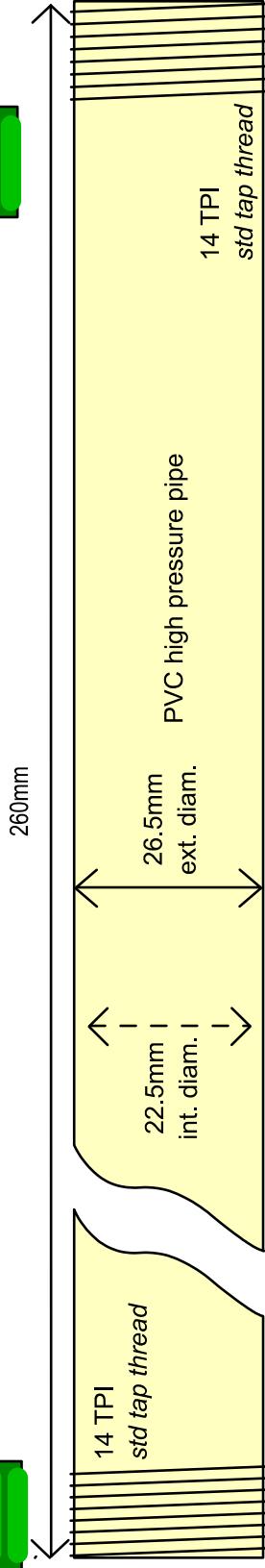
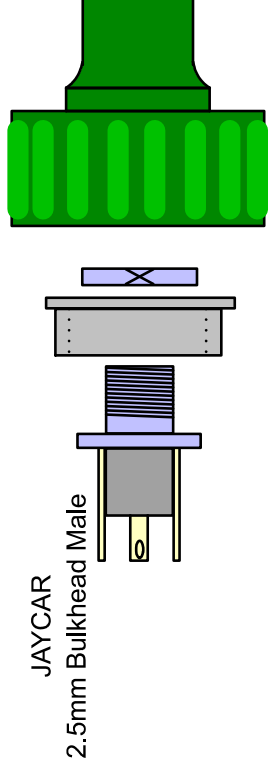


Two off from 25mm aluminium rod
 Bottom (fuse end) drilled 13mm* for M205 fuseholder before partingoff
 Upper (plug end) drilled 8mm for 2.5mm socket before parting off
 *Note fuseholder hole could be drilled smaller for subsequent shaping of 'flat sides'

Lower fuseholder end assembly



Upper socket end assembly



PVC pipes: My original nitesticks were made from an old length of Marley 1" pipe that had an internal diameter of 22.5mm. New Marley pipes are 22mm I.D. and cannot take the sub-C cells. Wakefield plumbing supplies have an "Innes" pipe with an I.D. of 23mm which makes for perilous threadcutting but does allow the use of brass shim for the negative return without the need for a groove to be cut. Take a sub-C cell with you when finding pipe to check I.D. fit - the old (Imperial?) Marley is the best!

A PICTURE IS WORTH A THOUSAND WORDS!