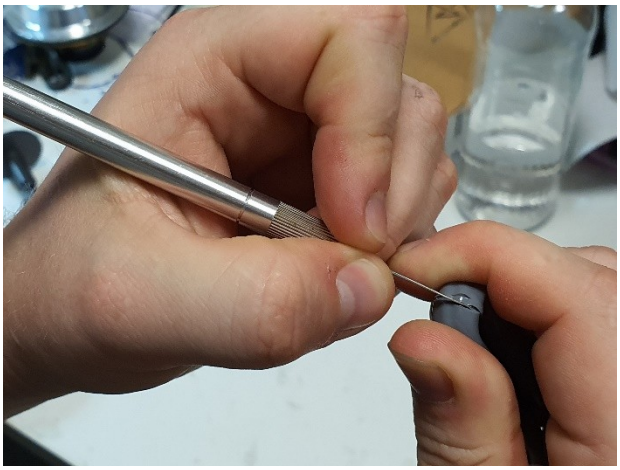
Fireball Observatory Power Cable Assembly

Author: Robert Howie, August 2020

Tools

1. Sharp hobby knife or scalpel for cutting cable jacket



2. Wire strippers & cutters

3. Crimp tool

4. Contact insertion tool

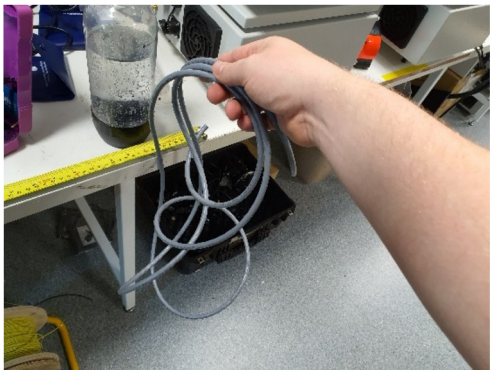
5. Multimeter

Materials

1. 3 metres Alphawire EcoFlex PUR 4 conductor 16 AWG cable (Alphawire 80043 SL005)

   Manufacturer's page:

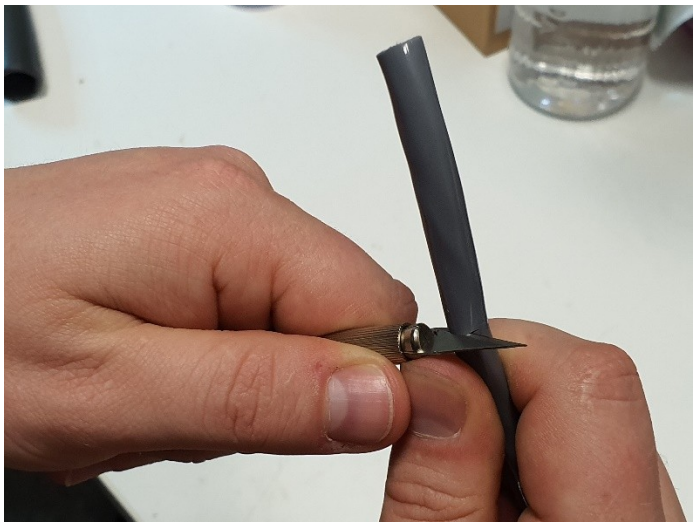
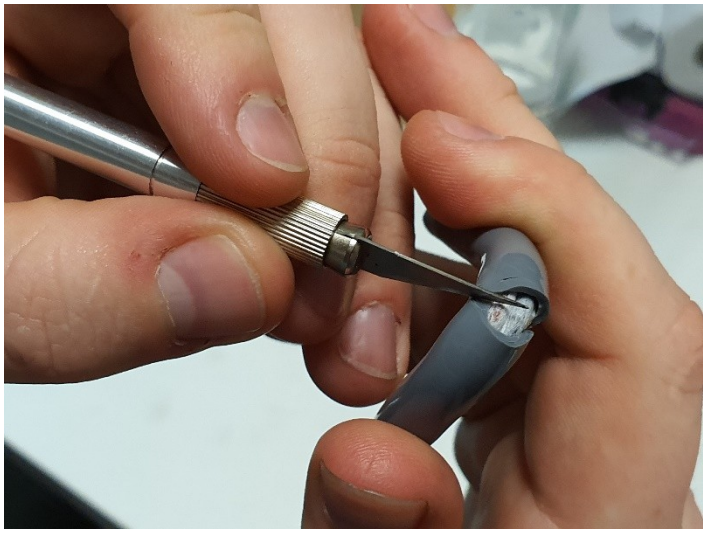
https://www.alphawire.com/en/Products/Cable/EcoGen/EcoFlex-PUR/80043
Purchase from: https://www.digikey.com.au/product-detail/en/alpha-wire/80043-SL005/80043SL005-ND/5271245



2. 2x observatory cable mount power connector (Amphenol MS4106F-14S-2S-624)

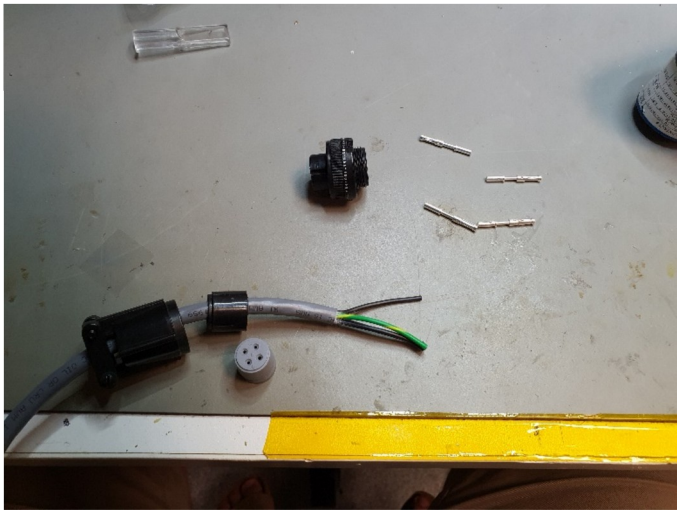
(Should be in the lab store, but you can order them from petergraham@amphenol.com.au)

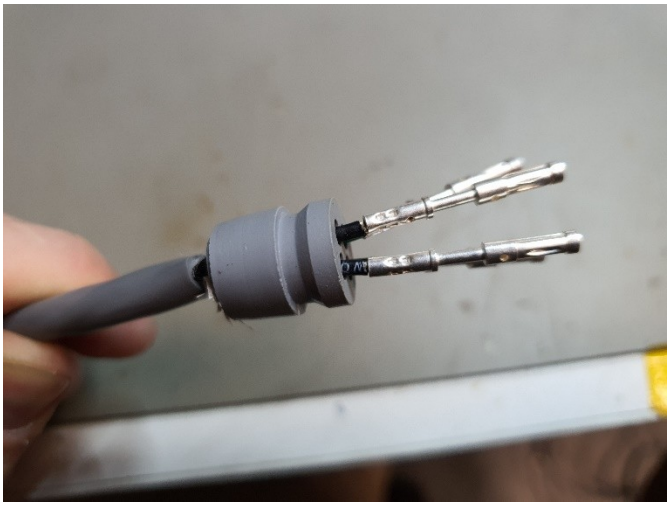
Procedure

1. Take 3 metre length of cable and trim the jacket off one end using the hobby knife. 
2. Bend the cable and nick the jacket without cutting the insulation around the conductors. 

3. Cut away the excess filler material.

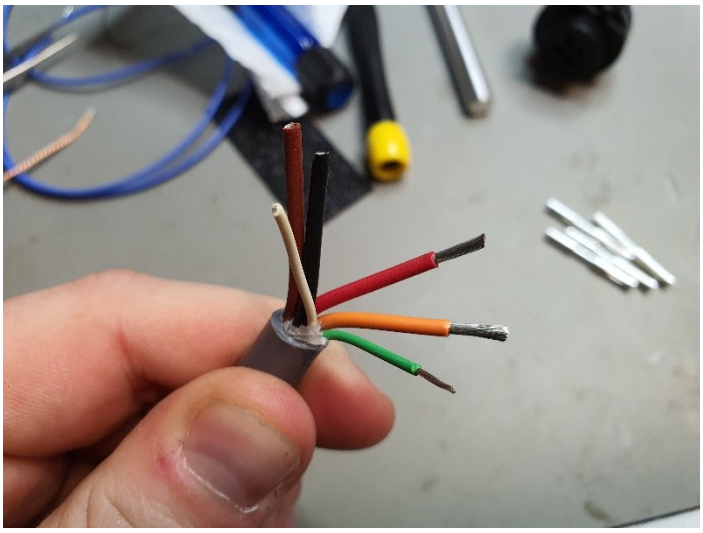
4. Even though these photos show the backshell, plastic cylinder and grey seal being added later in the process, it would be best to do this now.





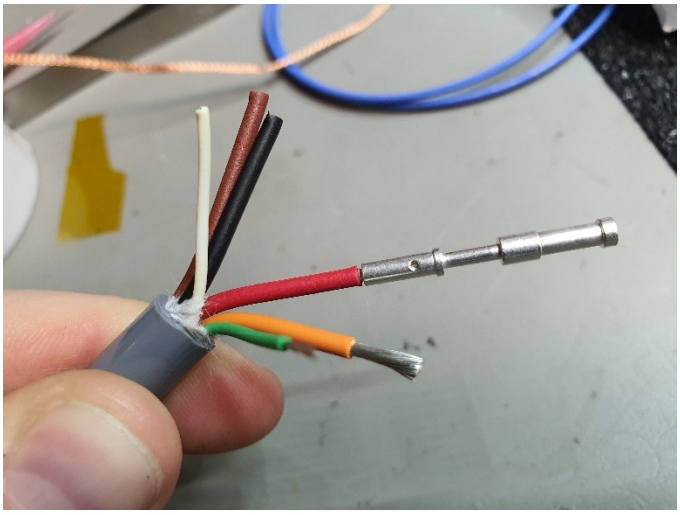
(ignore the crimped contacts, you will just have wires at this stage)

5. Trim the length of the wires and strip the insulation conductors can be fully inserted into the contacts, but do not strip so much so that bare conductor will be showing the conductor is inserted into the contact.

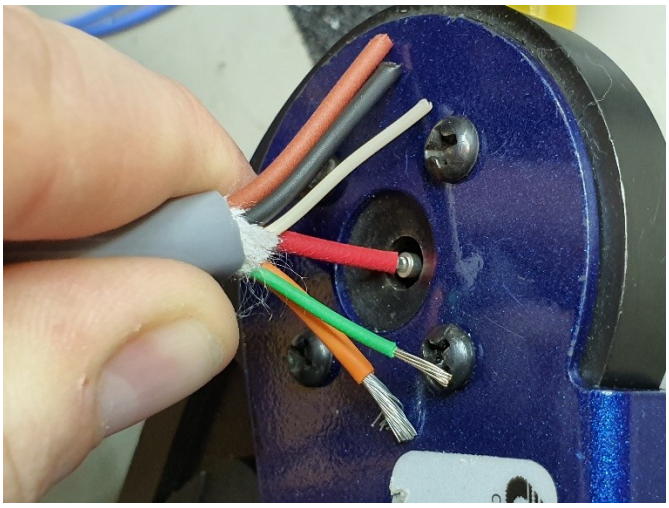


(different cable shown here)

6. Insert the conductor into the crimp contact (note fit & conductor visibility through viewing hole).

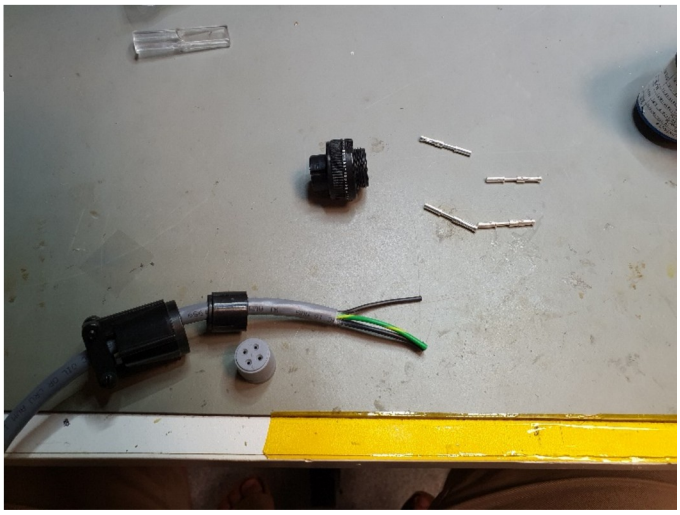


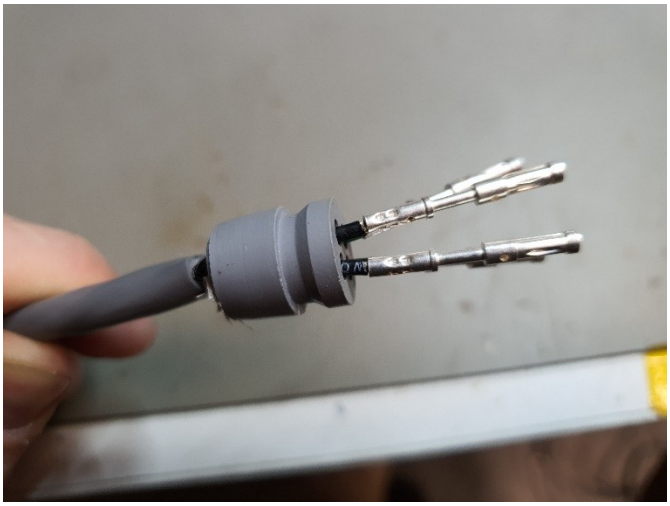
7. Insert contact into crimp tool and crimp in one smooth motion.



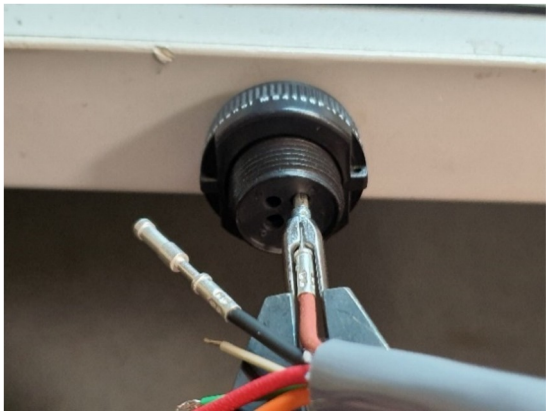
8. Repeat for remaining three conductors.

   If you have not done so yet, thread the cable through the backshell with integrated strain relief and little plastic piece with a cone to compress the seal and then place grey seal over wires.



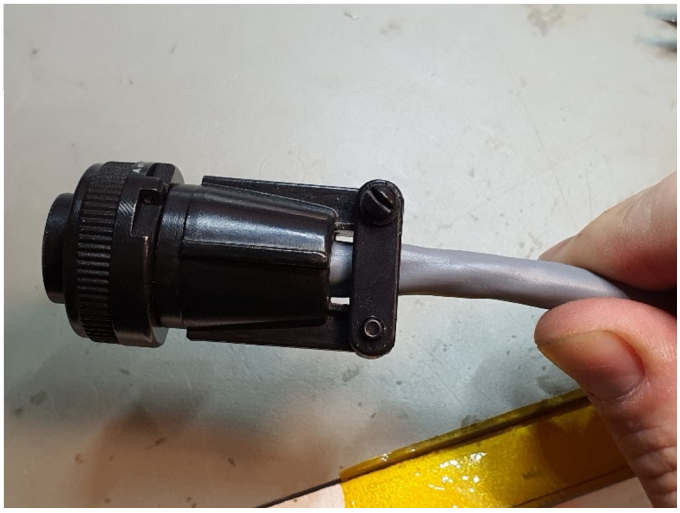


9. Insert contacts into shell using the insertion tool. Work carefully to avoid bending them. You may need to insert them in a few stages, and re-grip them in the insertion tool as you go. You may need to lubricate the insert (isopropyl alcohol is recommended, but we have used silicone grease in the past).



10. Screw on the backshell. You may want to plug the insert into a camera box to make this easier.

11. Stand on the other end of the cable with one foot and then pull the jacket along the cable until it passes through the strain relief and hides the wires.



12. Repeat for the other end of the cable, using the multimeter on the continuity checker mode to ensure that the wires are connected to the same contacts at each end. There are faint letter markings on the rubber insert next to the holes that the contacts sit in. The connectivity should be: A → A, B → B, C → C & D → D.