

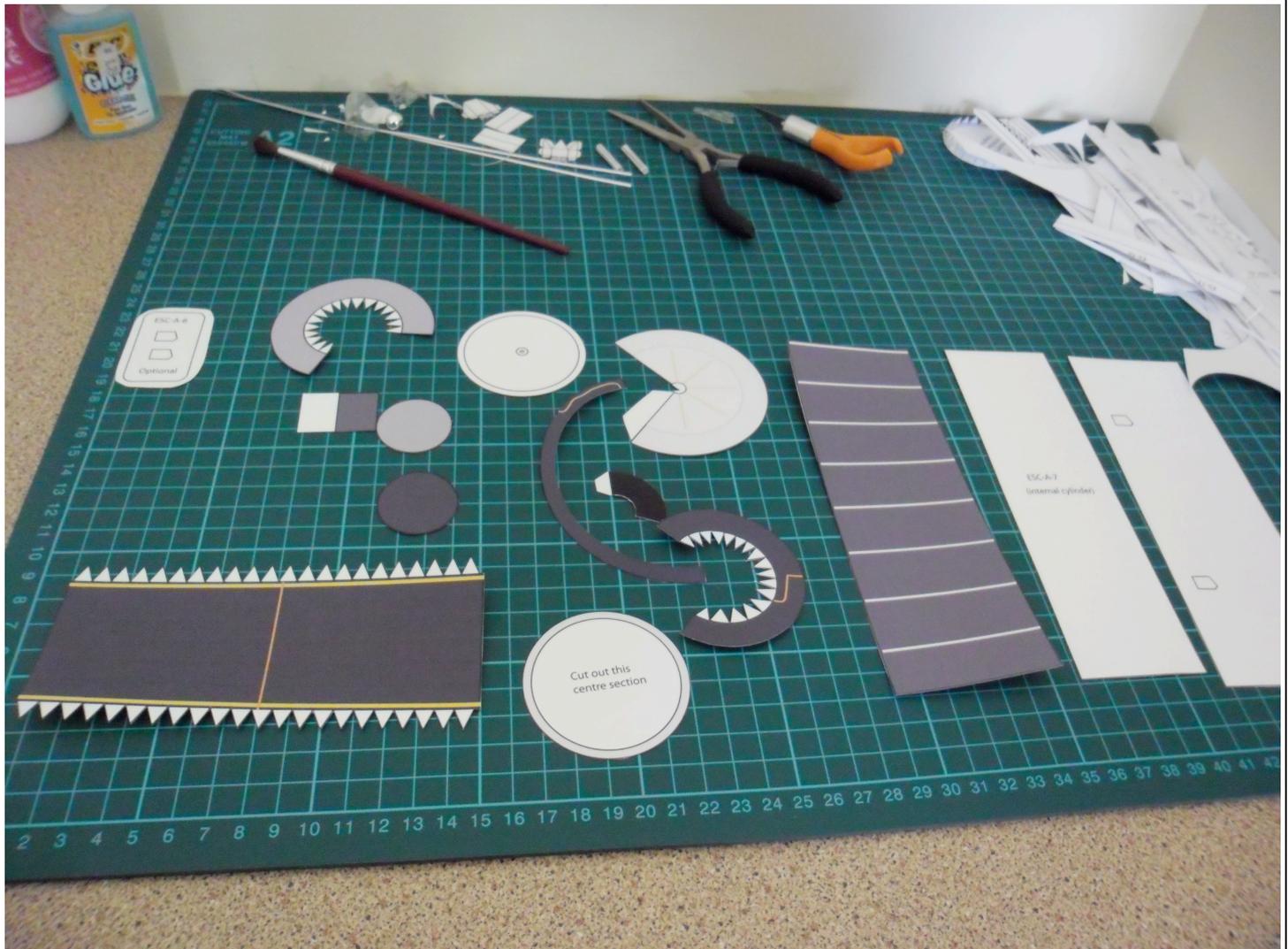
# Instruction Manual: Ariane V

## *ESC-A (cryogenic upper stage)*

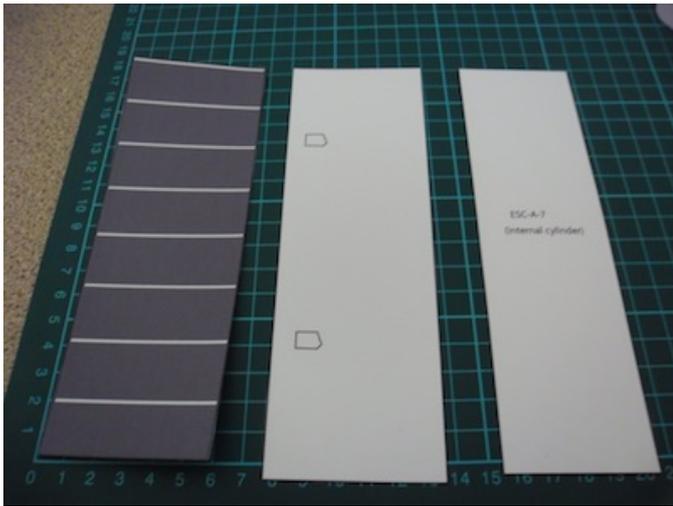
**Designer's comments:** This model has been designed based on engineering blueprints, conceptual diagrams and illustrations. A certain degree of 'artistic licence' has been used to create a model that exhibits at least a modicum of realism.

The assembly of a model should follow a procedure that vaguely resembles the method for cooking a meal; i.e.

- Prepare a place where you can work, without distractions.
- Get all of your equipment (utensils) out and ready.
- Get all of your parts for the model (ingredients) printed, cut out and ready to start.
- Lastly, try to have a location for your model prepared in advance, so that when it is finished, you will know where to place it.



1. These are the parts that you will need to create the ESC-A



2. The parts ESC-A-8, 6, and 7 will create the cylindrical structure.



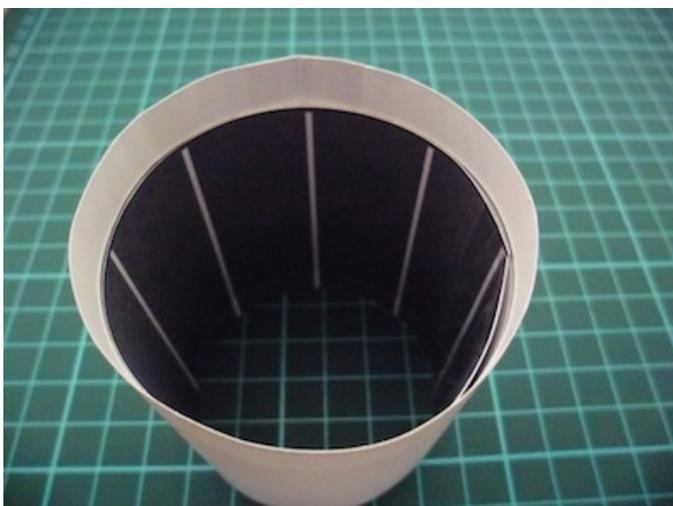
5. The bottom of ESC-A-8 will protrude out from the bottom of the cylinder. This is perfectly OK.



3. ESC-A-6 (exterior) is glued to ESC-A-7 (interior). ESC-A-7 acts as a giant 'glue tab', while ESC-A-8 is made into another cylinder – but with the printed side facing inwards.



6. The base of ESC-A-8 acts as a connector between the entire upper stage and the cryogenic core stage. The parts have been checked and have the correct measurements... simple cut and glue.



4. Glue ESC-A-8 inside ESC-A-7, making sure that the top of ESC-A-8 is lined up with ESC-A-7.



7. There are exterior markings for access panels. Optional parts for the panels are provided.



8. The cylinder is then placed on top of the core module, to test whether it has been assembled correctly.



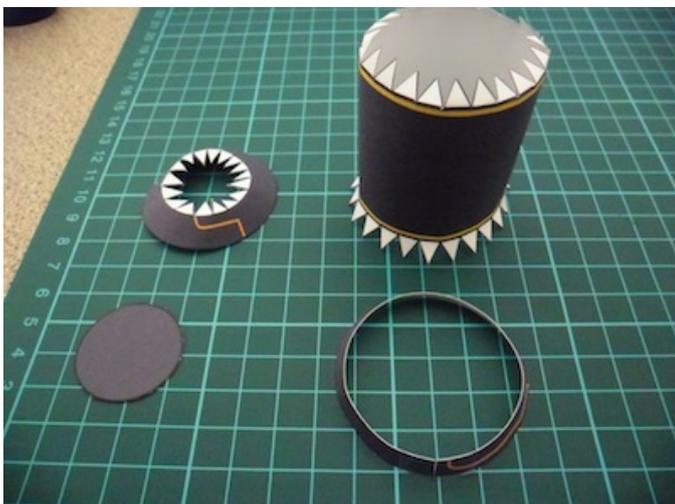
11. Glue them in numerical order; i.e. SYLDA-1, 2, 3 and 4 – to create the final structure. The above image is the interior.



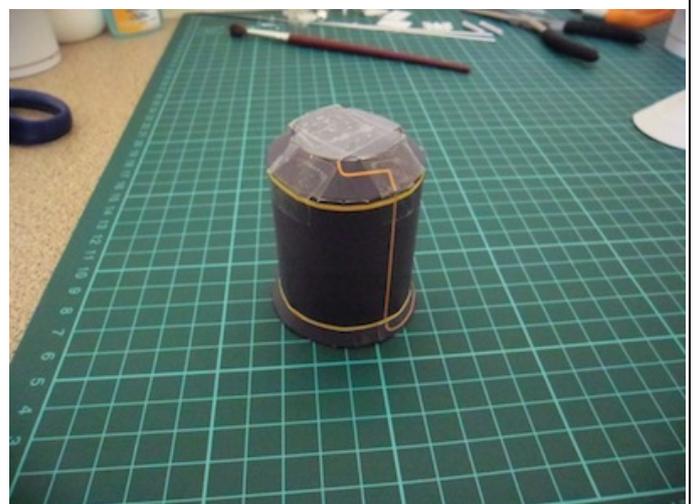
9. If done correctly, it should be a firm fit... it should not fall out even when tipped on it's side.



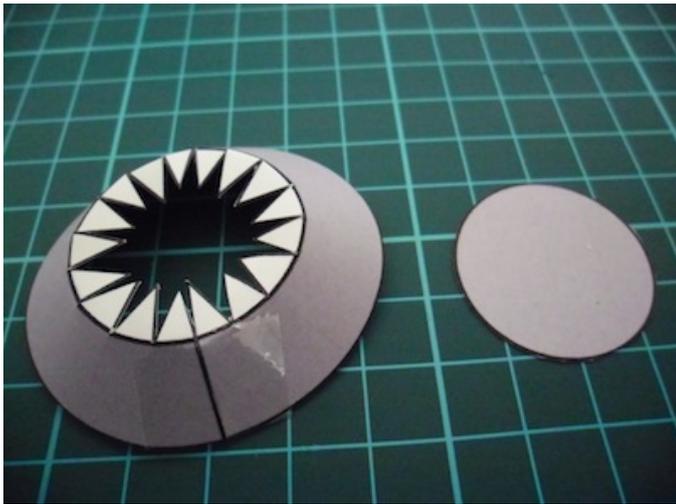
12. The exterior should have the [orange] cabling lined up correctly.



10. The SYLDA module parts are now collected, ready to assemble.



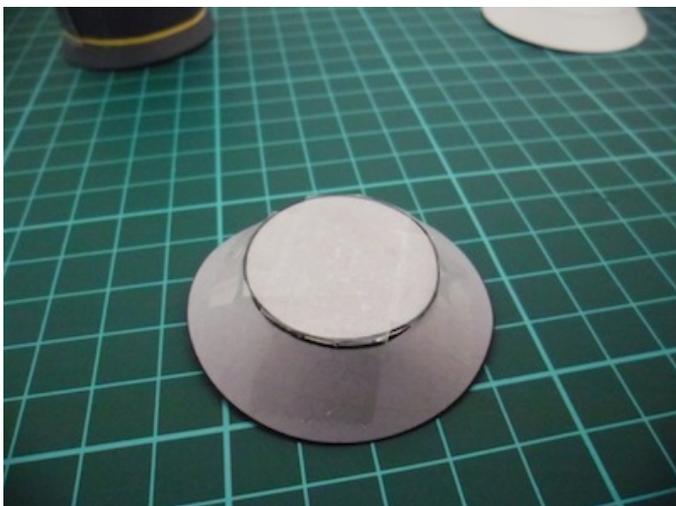
13. This is what the finished SYLDA module should look like (mine was made with sticky tape).



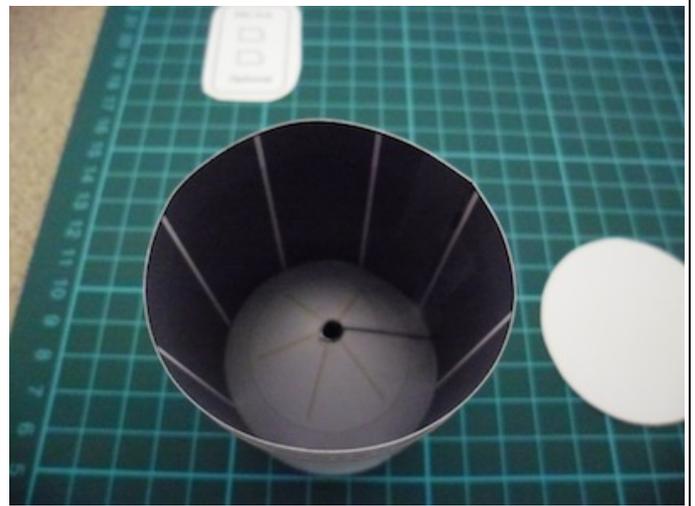
14. Parts SYLDA-5 (right) and SYLDA-6 (left). These are simple glued together.



17. The SYLDA module should then fit (rest) perfectly on top of SYLDA-6.



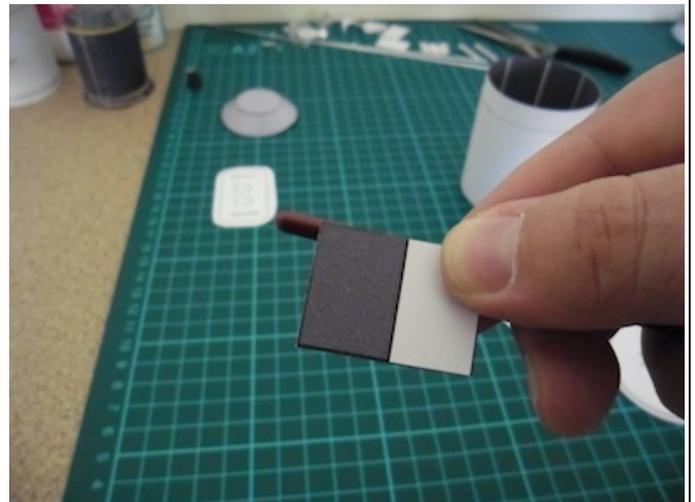
15. When glued together, you end up with a satellite support structure.



18. The thrust structure (ESC-A-3) is glued together and placed in the cylinder to check the size (fit).



16. You have the option of making a small satellite and placing it on top of SYLDA-5.



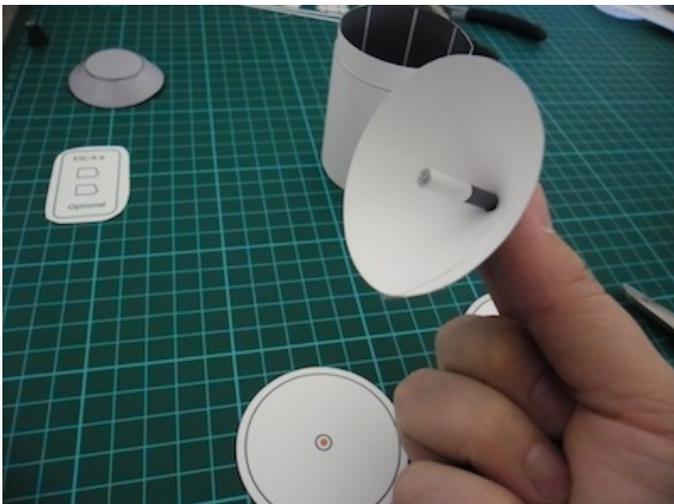
19. Roll the engine mount (ESC-A-4) over a small pencil so that it becomes a small cylinder.



20. The cylinder should appear (as above) if done correctly.



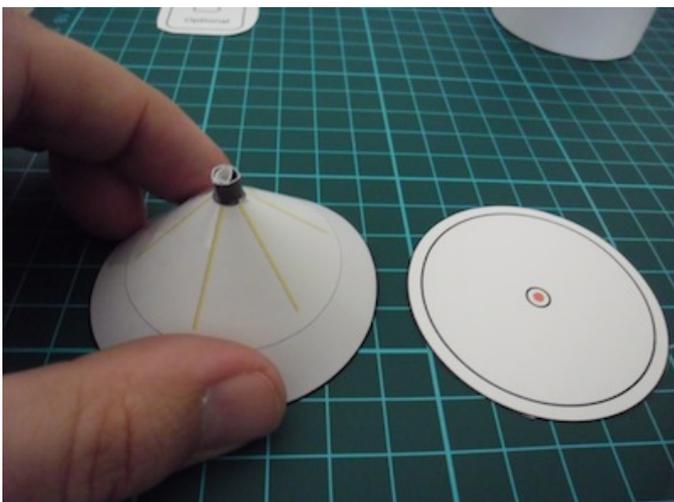
23. Remove the cylinder from the cone and place it over the circle (red dot) in the middle of ESC-A-2.



21. Check the size of the cylinder by inserting it into the hole of the thrust structure (ESC-A-3).



24. Glue the cylinder onto ESC-A-2. This will provide a 'backbone' for attaching the engine.



22. Then the cone is pushed down, the cylinder should be forced up (slightly). This small piece of the cylinder is all that you have to glue on the engine.



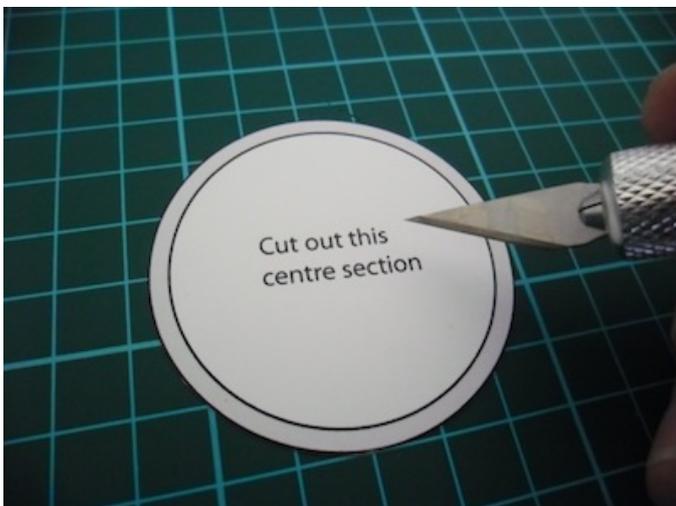
25. Now you can glue the cone onto the other parts: ESC-A-2 and the cylinder (ESC-A-4).



26. While it dries, you can prepare the next part: ESC-A-1.



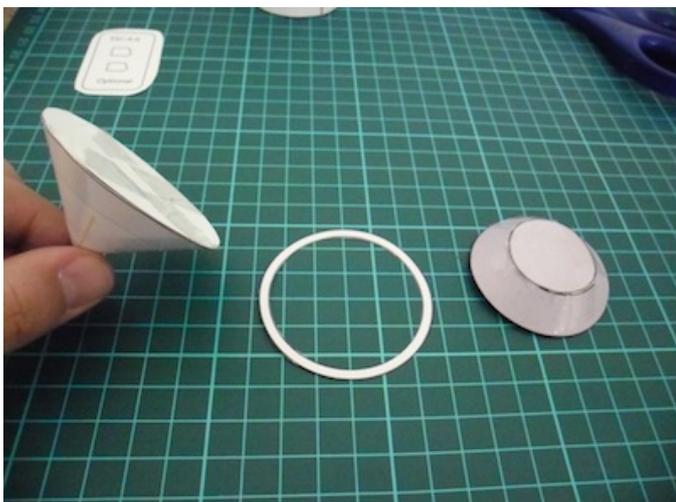
29. Glue ESC-A-1 onto ESC-A-2. This will create a 'recessed area' to glue the next part.



27. To state the obvious... cut out the centre of ESC-A-1.



30. Glue SYLDA-5 and 6 into the 'recessed area' of ESC-A-1.



28. The following three parts are then to be glued together. Make sure that they are dry before commencing.



31. You have the option of either gluing the upper stage into the cylinder or merely placing it there – so that it can be removed at a later time.



32. The finished model. No satellite models have been provided with this... I leave that up to you.



35. This is what the ESC-A upper stage looks like on the Ariane V core stage.



33. As already mentioned, you have the option of attaching the access panels. At smaller scales (1:144) this may not be necessary (or wise).



36. Your SYLDA module will sit on top. A small satellite model can be placed inside the SYLDA while another model sits on top of SYLDA.



34. The SYLDA module should balance and sit on the rest of the model.



37. The payload fairing should then be able to sit on top of the entire structure



38. The base of the payload fairing should fit snugly into the top of the upper stage.



39. Here is what it will look like. This is an image of my first test-model. Only one SRB was built.



40. The above image shows the relative height of the finished model when using the ESC-A upper stage. The model (at 1:96 scale) should stand at approximately 59 centimetres. Obviously, smaller scales (1:100 or 1:144) will result in shorter heights.