

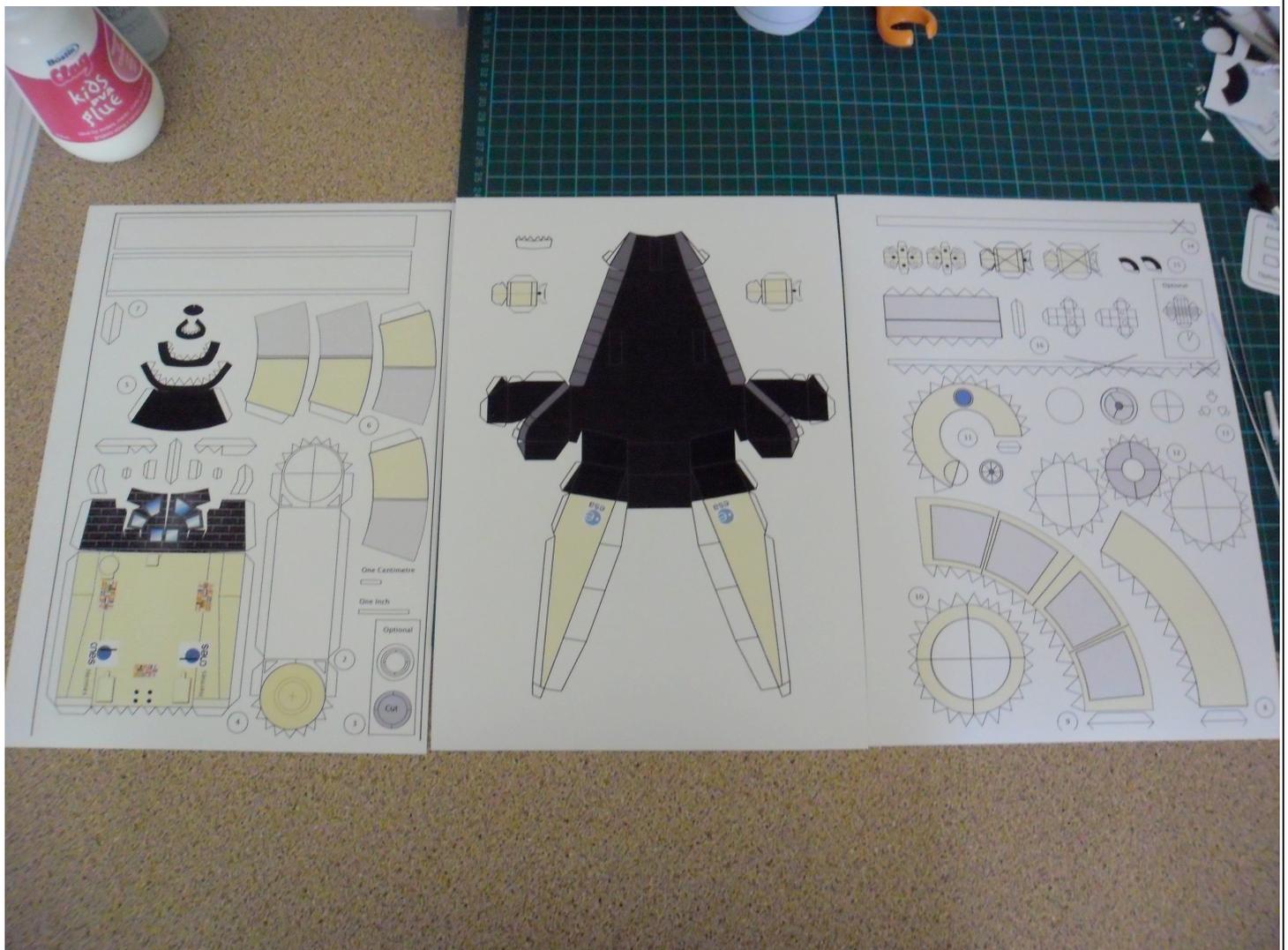
Instruction Manual: Ariane V

Hermes Space Shuttle

Designer's comments: This model has been designed based on engineering blueprints, conceptual diagrams and illustrations. No actual vehicle of this type has ever been built. As such, 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.

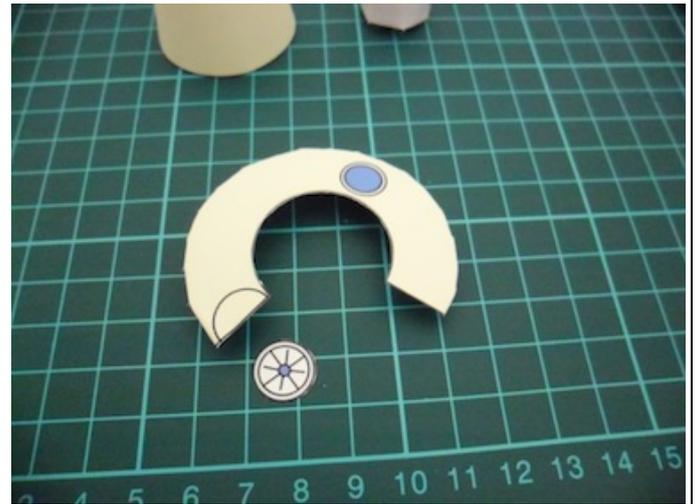


1. Gather all of the parts necessary for the model, cut them out and arrange them so that they are all easily visible and accessible. The three parts sheets seen in the above image are (from left to right): the fuselage parts, the wing(s) and the rear service module.

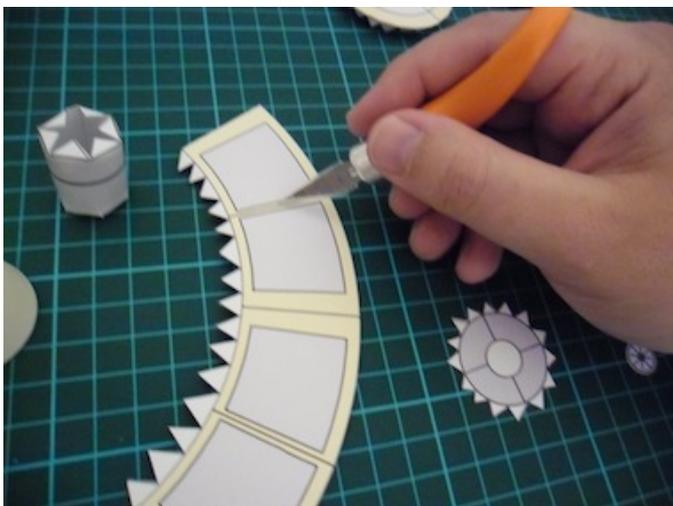
I originally drew the model on a simple type of 2D CAD software – only to discover that I could not apply any colour to my drawings. I then had to copy the images into Adobe Illustrator (as background images) and then draw/colour over them. This means that any corrections have been drawn over the original CAD images.



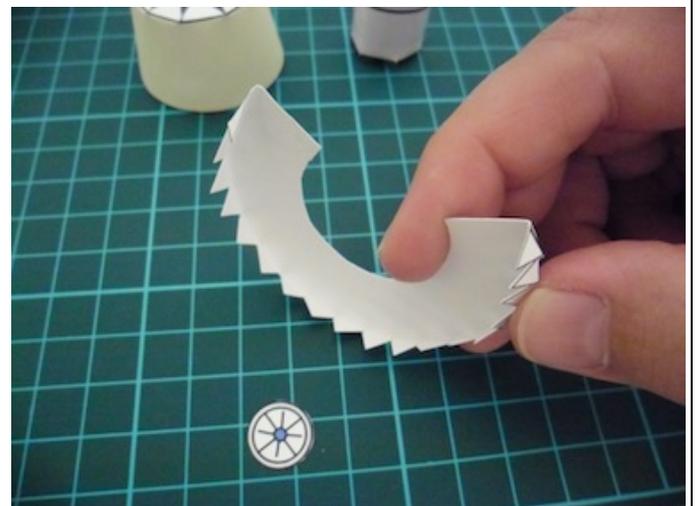
2. The pieces for the rear “resource/service module” are gathered.



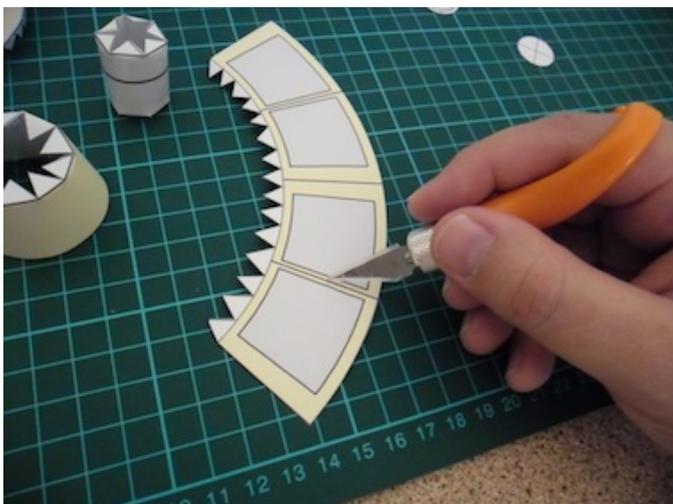
5. Gather the pieces for the rear truncated cone. This will be a part of the docking connection.



3. Carefully slice along the edge of one side of the radiator panel sections.



6. Make sure that you bend the glue tabs inward. They should not be visible on the finished model.



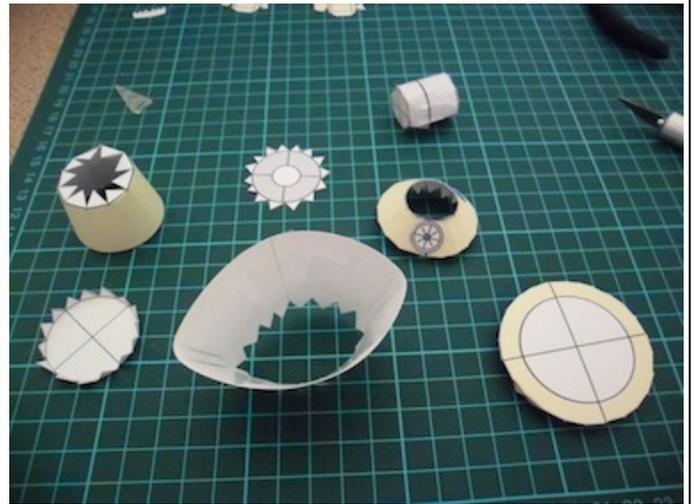
4. Make sure that you only slice one side of each four-sided radiator – and only at the narrow section (see above images).



7. The cylinder for the docking connection and the truncated cone of the resource module are both glued into their final shape(s).



8. The “airlock hatch” is glued over the join on the rear docking cone – concealing the connection.



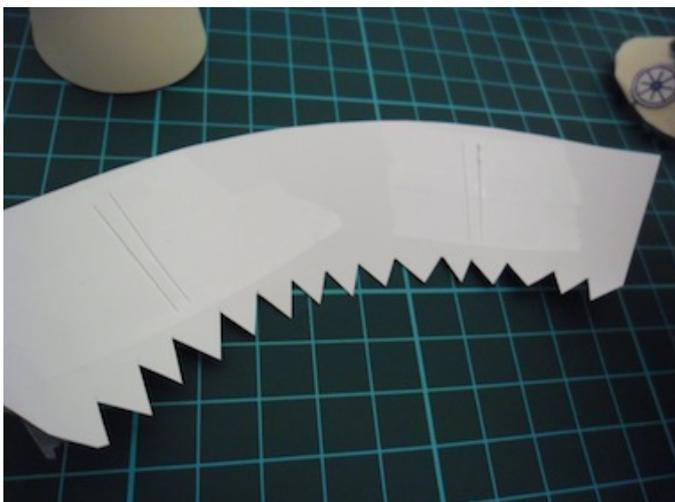
11. The pieces of the rear “resource module” – prepped and ready for final assembly.



9. The slices on the main section (cone) of the resource module should now be finished.



12. The rear docking port, with the docking hatch facing up.



10. You can clearly see the “slices” in the main cone of the resource module.



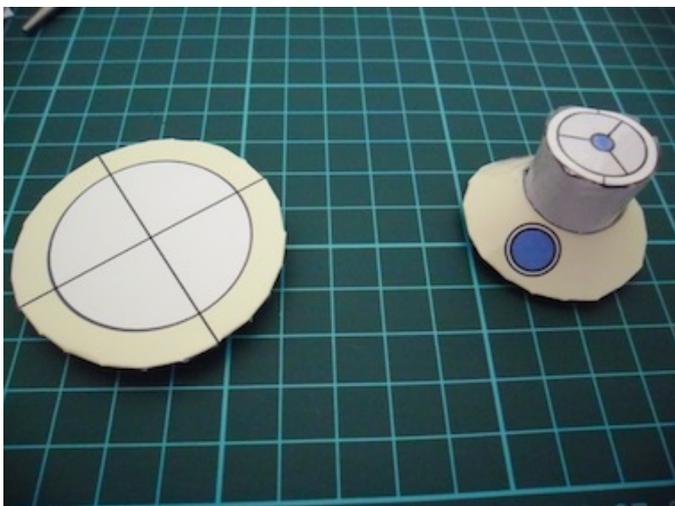
13. The rear docking port, with the docking hatch facing down.



14. The docking connection is pushed through the rear docking cone.



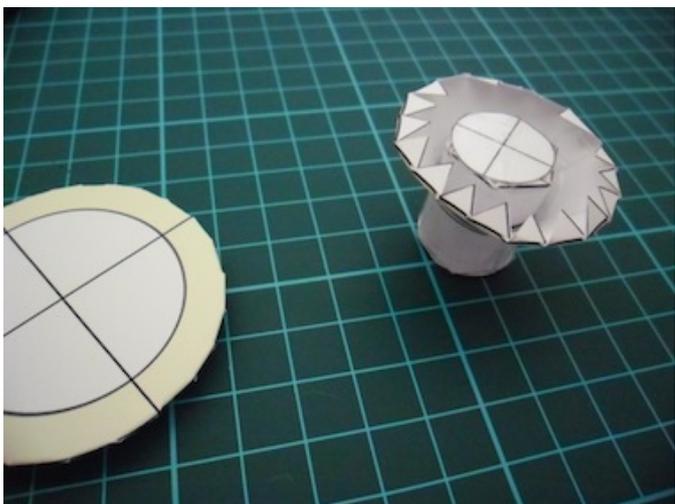
17. The rear of the resource module. Do not attach the other cone until the radiators are glued on.



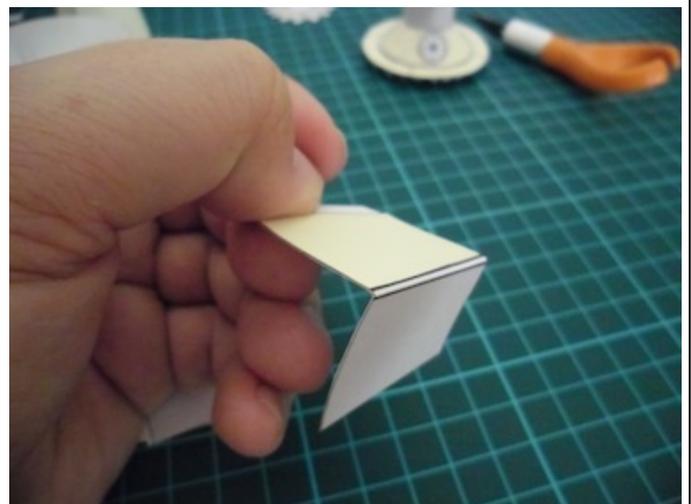
15. The docking part is then to be glued onto the rear circle (which also doubles as a support brace).



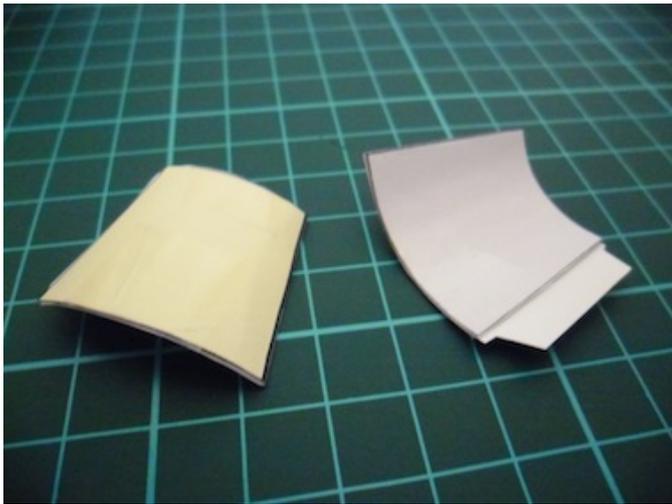
18. These are the main radiator panels for the resource module.



16. The underside of the docking cone. Notice the large surface area for gluing onto the rear circle.



19. The panels are folded along the white strip. I have made the fold as a small rectangle to provide enough room for the paper to be forced into shape.



20. The radiator panel is to be glued together so that it dries as a curved piece of paper.



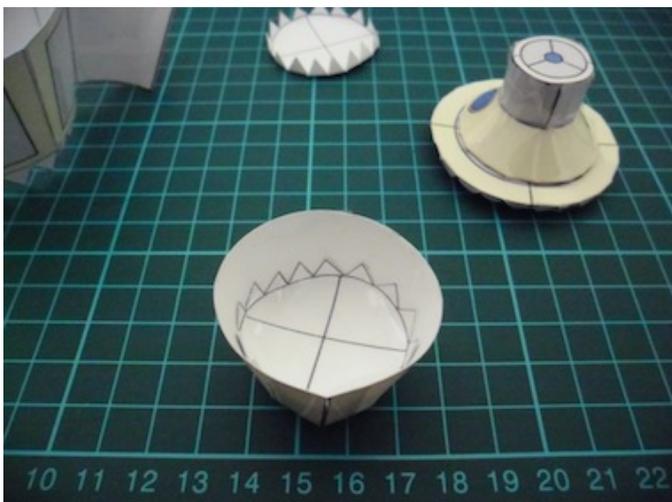
23. The radiator panels can also be glued on in a “launch ready mode” – i.e. flat against the side.



21. The parts of the resource module. The radiator panels are configured for orbital operations (open).



24. If you intend to make your Hermes as a “launch ready” model, then you can cut off the glue tabs.



22. The internal reinforcers are glued inside the two cones... but only glue in the larger reinforcer after the radiator panels are attached.



25. The rear section of the resource module. This is how it would look if the Hermes were launching.



26. The rear section of the resource module (looking down). Now to glue on the other parts ...



29. Glue the internal reinforcer to inside of the main cone.



27. The other cone (which will be attached to the rear of the Hermes on the finished model).



30. Glue the rear docking section to the main cone. Now you can start on the rest of the model.



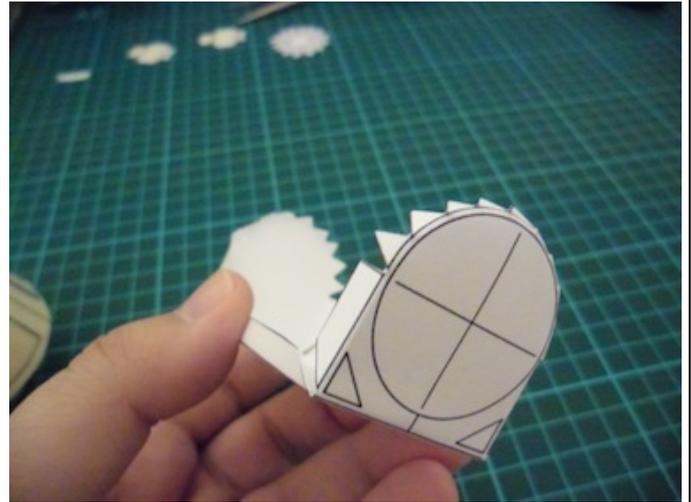
28. Notice how the gluing of the radiator panels adds depth and detail to the final design. It's not just a simple (flat) cone.



31. The rear of the resource module, complete with three small windows (blue), an airlock door and the central docking connection.



32. The rear (circular) section of the resource module should match up with the exterior lines.



35. This is the internal brace of the central fuselage of the Hermes. The forward section is shown.



33. Notice how the “cross” on the circle is aligned with the four quadrants of the rear cone.



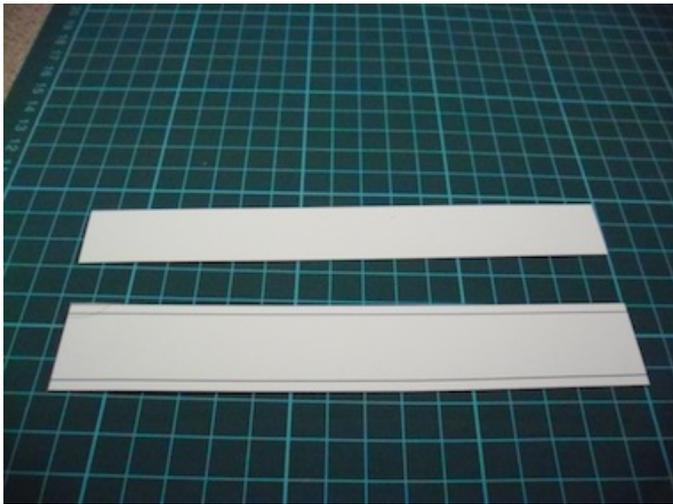
36. This is not how you glue it. This was done just to show how they would eventually fit together.



34. This is the internal brace of the central fuselage of the Hermes. The rear door is shown.



37. If you prefer, you can glue a circular panel over the end of the resource module – making it appear as though it has been separated prior to re-entry.



38. These two strips will form the cylindrical support to attach the Hermes to the Ariane V.



41. As you can see, the support ring will provide the necessary height for the docking connection.



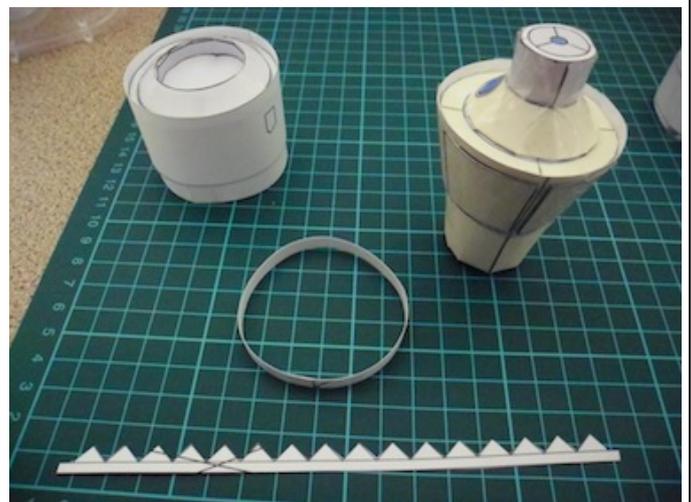
39. When glued together, the two strips will create a support that will fit inside an Ariane upper stage.



42. Even with the large, protruding, docking connection, the module will still stand correctly.



40. This is what the support will look like when glued and finished (I made a mistake when cutting, so the interior is slightly smaller – notice the gap?).



43. There are two thin rectangular parts and a glue strip. These will create a small rear cylinder on the resource module to “rest” onto the support ring.



44. The rear of the resource module will have to have this [ridiculously] small cylinder attached.



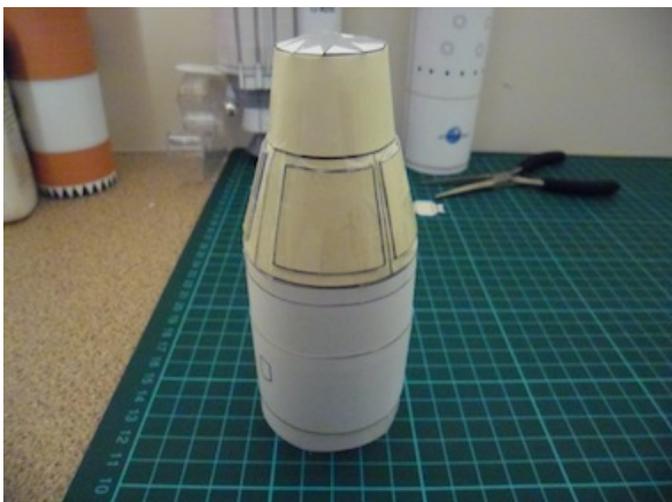
47. These are the parts for the orbital thrusters. These parts will be extremely difficult to glue.



45. Once glued down, this is what the rear cylinder will look like on the resource module.



48. These are the tabs for the docking connection around the rear docking port.



46. This is what you resource module will look like when it is [almost] finished and ready to be glued to the forward section of the Hermes space shuttle.



49. These tabs will be glued in-line with the three lines on the rear docking hatch.



50. Your rear hatch should look like this when finished.



53. Looking at the size of the parts in comparison to my thumb, you can see how tiny they will be.



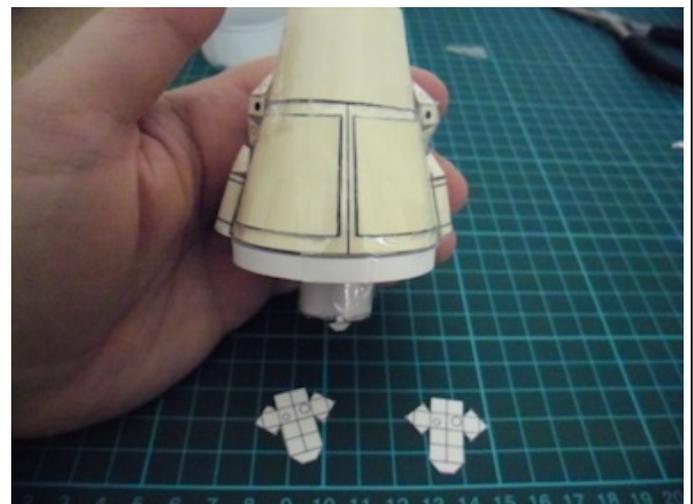
51. The part on the left should (after folding and gluing) resemble the thruster pod on the right.



54. The thruster pods are glued to the empty areas of the resource module - between the radiators.



52. Due to the very small size of the thruster pod, you have the option to attach the engine – or simply to leave it off.



55. Once the pods are attached, you have the option of creating “external science pods” for the resource module.