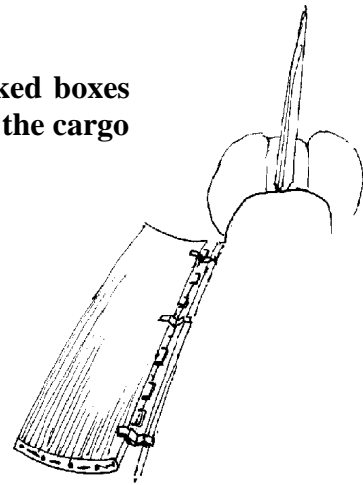
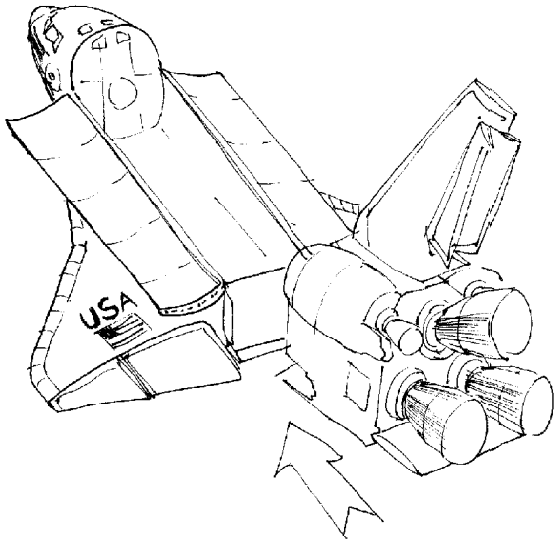
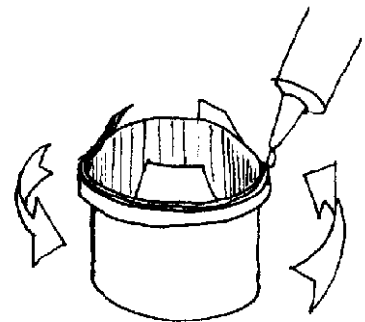
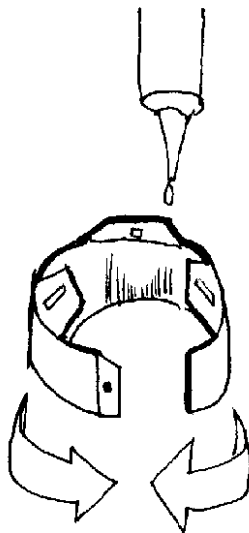
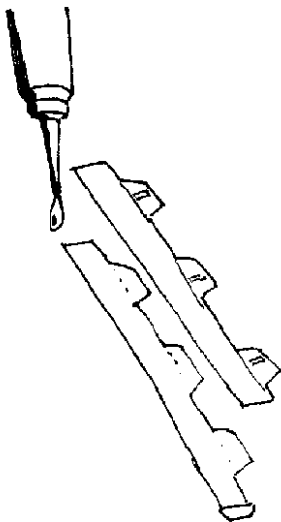


Glue them on the marked boxes and attach the doors to the cargo bay.

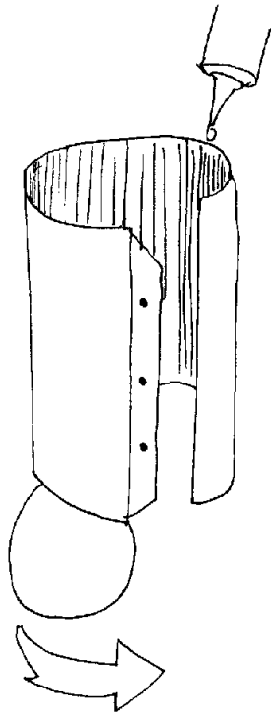


Insert and glue the shuttle motor block to the model.

SHUTTLE CARGO BAY SUB-SYSTEMS

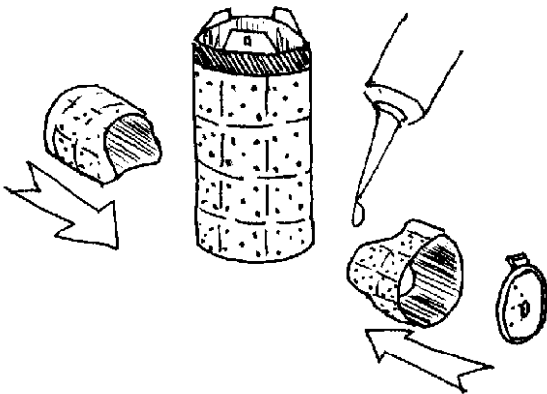
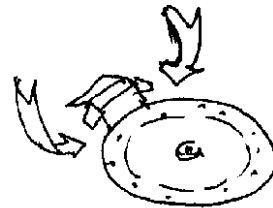
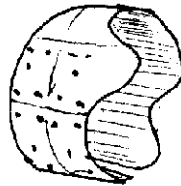
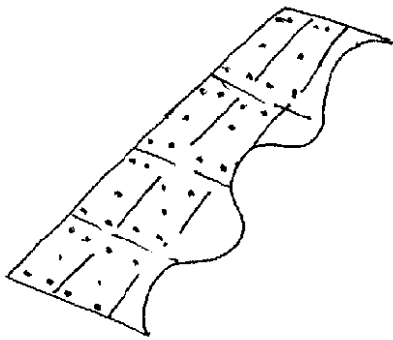
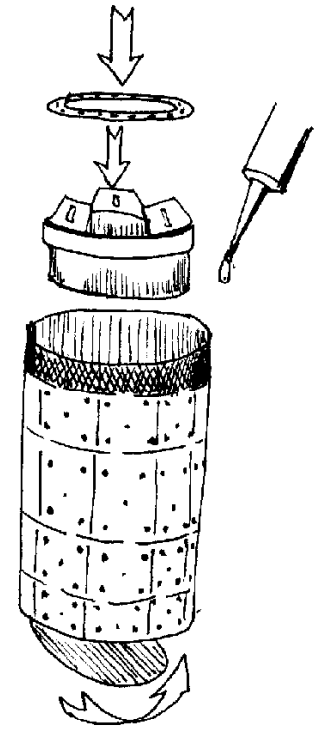


Cut the two parts of the shuttle-ISS hatch 12-45 and 12-46. Bend them on a sharp edge. The 12-46 yellow wall is the internal side. Once the circular shape has been achieved, glue them together and attach the gluing tab internally so that the yellow wall cover completely the tab. Cut the 12-35 thin stripe and glue it around the hatch as indicated in the right drawing.



Cut the pressurized vertical tunnel 12-54. Roll it on a sharp edge and glue it forming a tube. Bend the lower "cap" and glue it through the tabs.

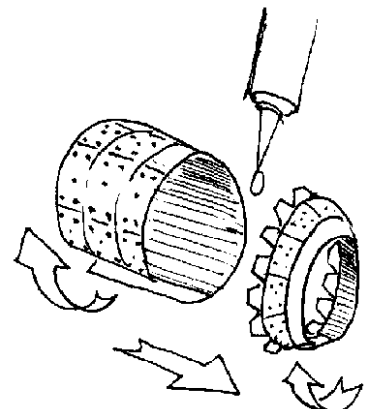
Insert the hatch from above and glue it. Cut the connectors ring 12-6 and glue it in the space from the hatch and the external tube.

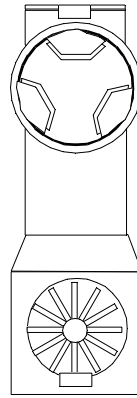
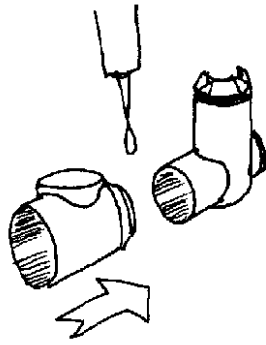
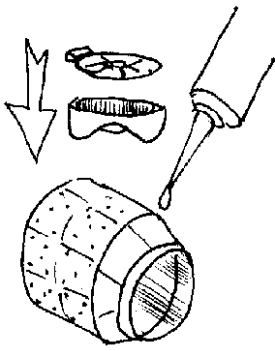


Cut the tube 12-47, roll it and form a tube. Glue it on the back side of the vertical tube in the circular area located on the gluing line.

Cut the hatch 12-33 and bend the small elements attached to it to form a small box. Cut the short tube 12-50, roll it and glue it. Glue the hatch on the flat part of the 12-50 tube. Glue the saddle-shaped side on the vertical tube on the circular area below the two black spots.

Cut the horizontal tube 12-38, roll it and form a tube. Cut the cone 12-34 and form a shroud. Glue the shroud on the 12-34 tube using the gluing tabs. The horizontal tube has to be mounted so that the circular area is located exactly on the upper side. Also the handles on the shroud should be located on the upper side once glued.

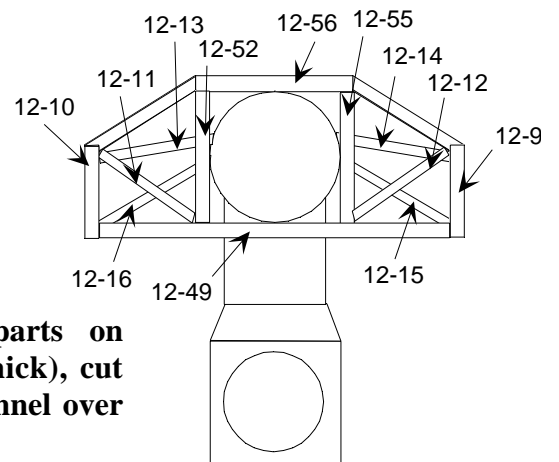
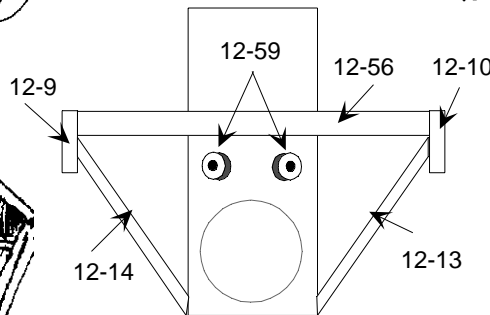
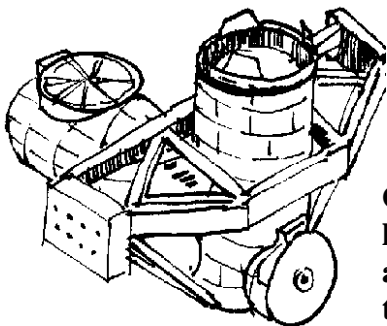
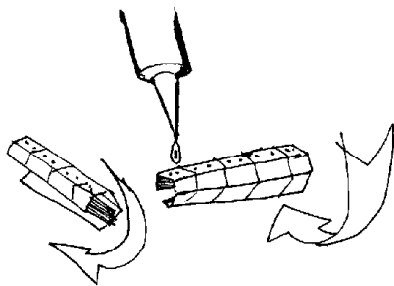
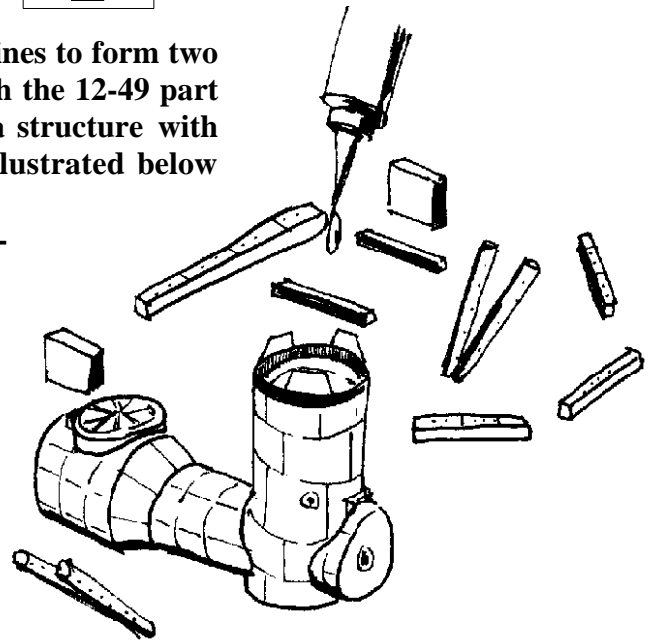




Cut the hatch 12-19 and bend the small elements attached to it to form a small box. Cut the short tube 12-51, roll it and glue it. Glue the hatch on the flat part of the 12-51 tube. Glue the saddle-shaped side on the horizontal tube on the circular area. The shape of the cargo bay tunnel is depicted in the sketch illustrated above on the right side.

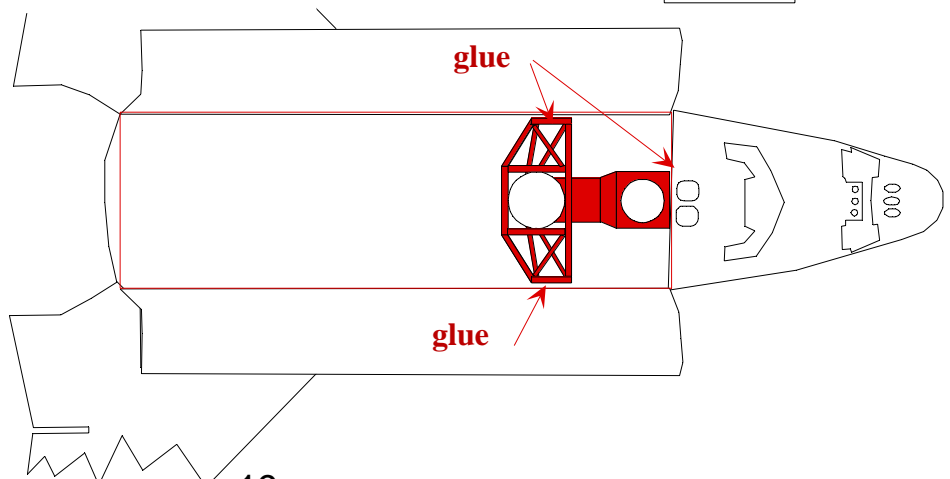
Cut the two parts 12-52 and 12-55. Bend on the lines to form two rectangular-section structures. Do the same with the 12-49 part that is a longer strut. Cut the 12-56 and form a structure with rectangular-section as indicated in the sketch illustrated below that can be used as mounting reference.

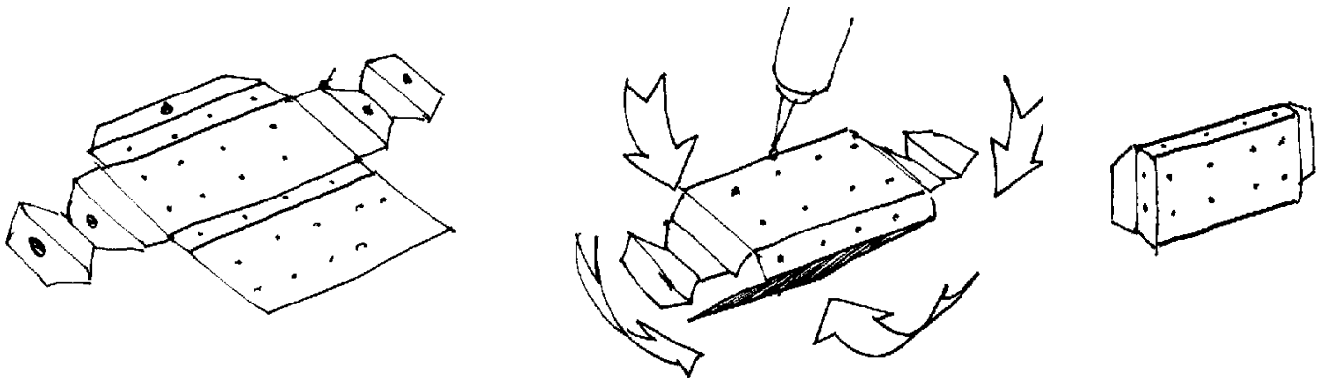
The parts 12-11, 12-12, 12-13, 12-14, 12-15 and 12-16 are tubes used as struts in the hatch-tunnel locking structure. The tubes have to be cut at the right length once in place. The parts 12-9 and 12-10 represent the fixation panels on the cargo bay.



Once completed glue the 12-59 parts on heavy cardboard (0.7-1.0 mm thick), cut and glue them on the vertical tunnel over the already marked spots.

Insert the ISS tunnel and hatch in the cargo bay and glue it. The glue has to be placed on the two hatch attachment located on the wall of cargo bay and on the crew compartment wall.





Cut the parts 12-1, 12-2, 12-3, 12-4 and 12-5. They are the panels used to lock Get Away Special (GAS) containers and electronic boxes to the cargo bay. Bend the parts to form a box with two flat lateral appendices used to attach it to the cargo bay attachment points.

Once the five boxes have been mounted cut the two electronic boxes 12-43 and 12-44 and glue on one of the panels as indicated below in the sketch a).

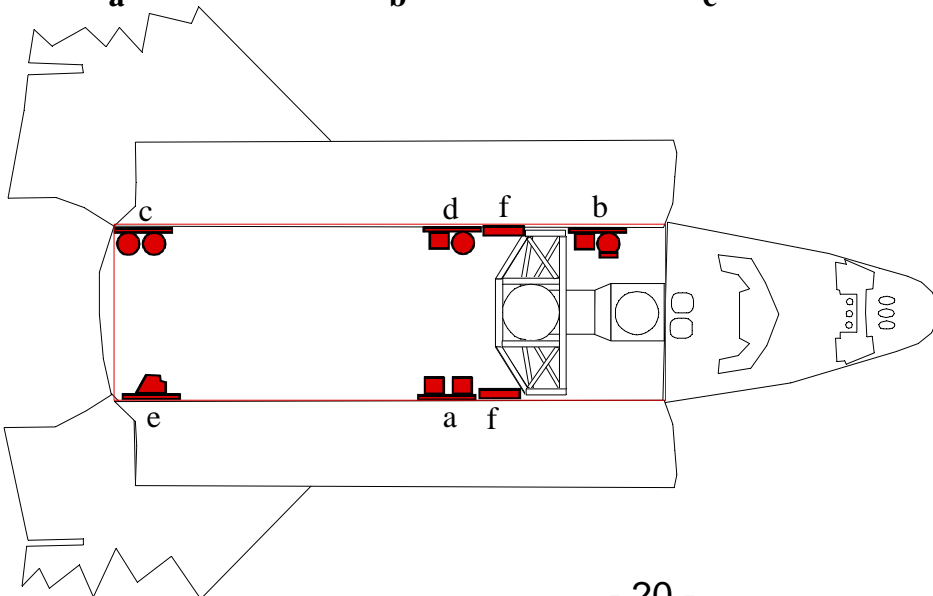
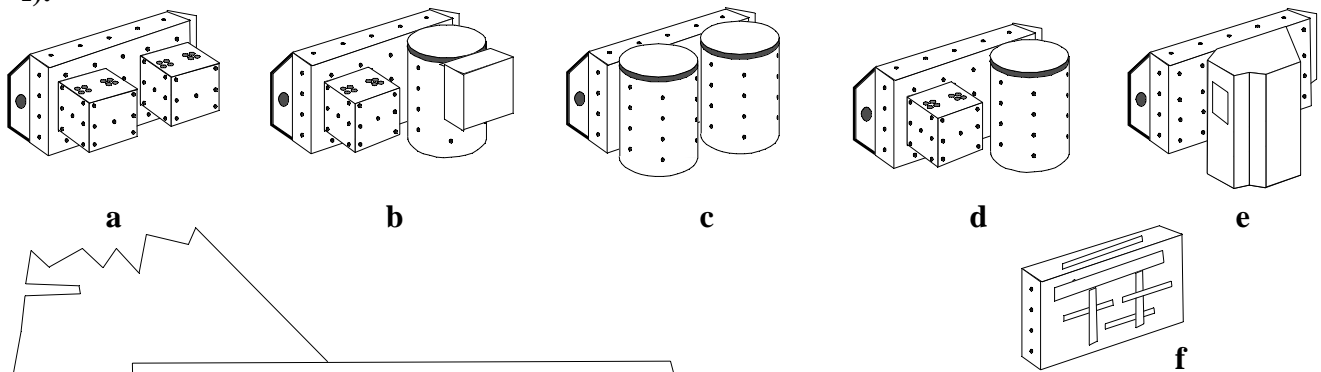
Cut the GAS container 12-36 together with its electronic boxes. This GAS is equipped with an opening lid so that it has a small box mounted on a side containing the related mechanism. Glue the GAS and the electronic box as indicated in the sketch b).

Cut the two GAS containers 12-39 and 12-40. Roll them on a sharp edge and glue as a cylinder. Bend the upper and lower lids and glue them on the tube. These GAS's are mounted on the same panel. Glue the GAS's as indicated in the sketch c).

Cut the GAS container 12-48 together with its electronic boxes 12-41. Glue the GAS and the electronic box as indicated in the sketch d).

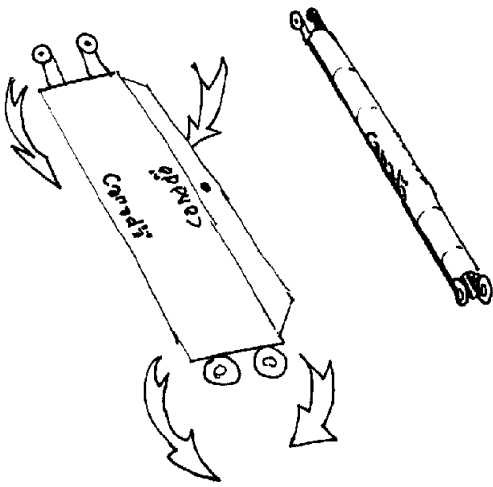
Cut the IMAX container 12-37. Bend it an form a box. Glue the IMAX as indicated in the sketch e).

Cut the two support panels 12-7 and 12-8. Mount them as flat boxes as indicated in the sketch f).

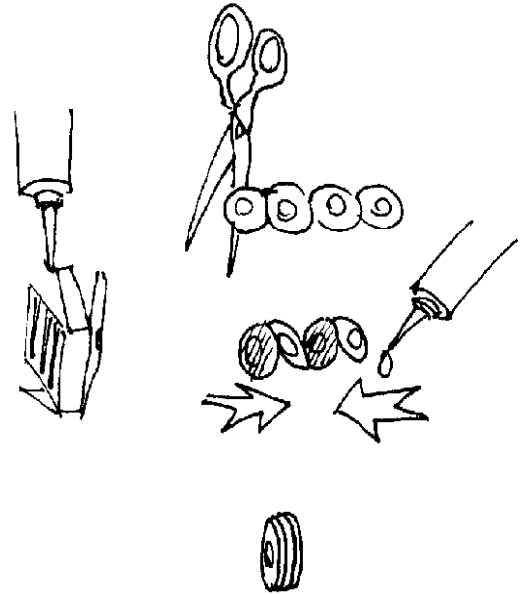


Glue the seven pallets at the locations indicated in the cargo bay by a white box with a red spot in the middle. On the page 3 of the ISS Model, around the cargo bay arrows and lables clarify the position of each subsystem. In the left sketch is illustrated the rough position of each pallet.

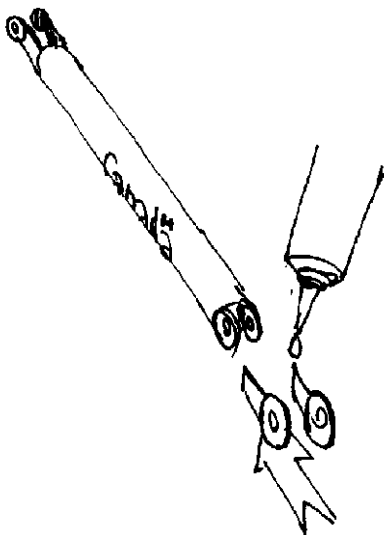
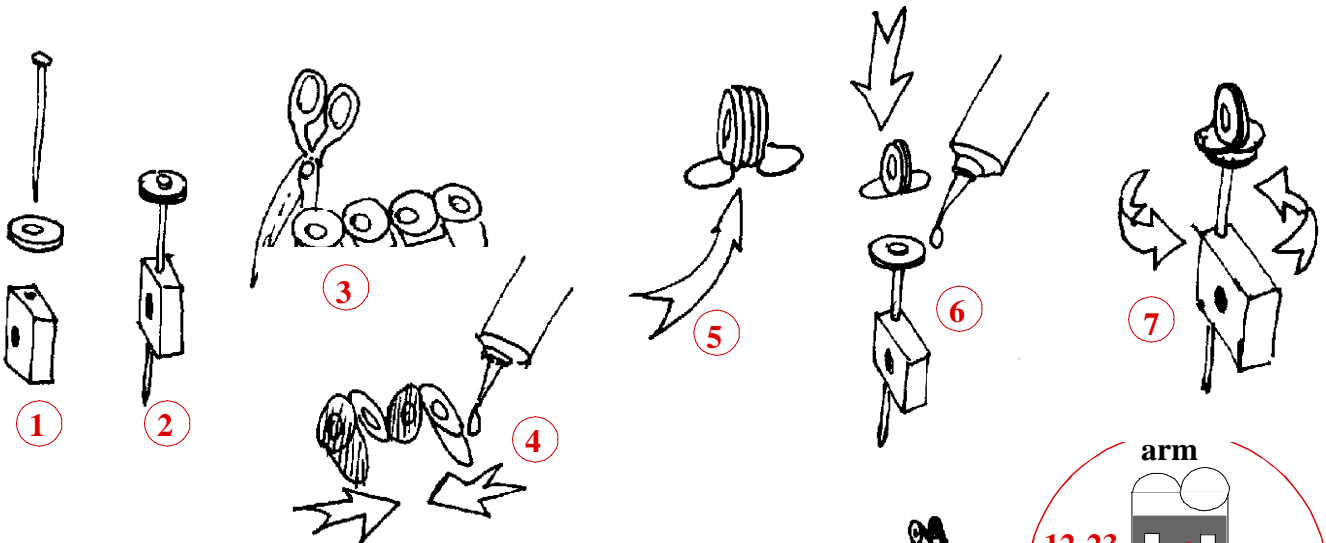
Before to start the assembly of the Canadian robotic arm (Remote Manipulator System) cut the area containing the parts 12-21, 12-28, 12-23 12-22, 12-29 and 12-25 and glue it on a thick card-board (around 0.5 mm).



Cut the 12-26 arm and roll it. Pay attention on the shoulder and elbow hinges that should be kept flat. Increase the strength of the hinges by gluing them on the card-board (only the hinges not the tube). Glue the tube inserting a pen refill or a wooden stick inside to keep the circular section.

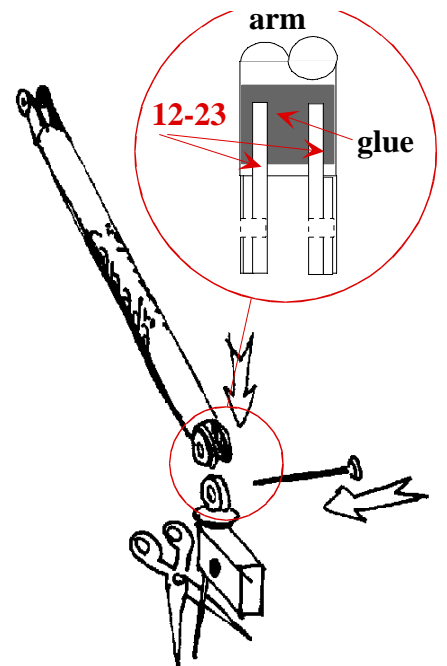


Cut the box 12-31 and mount it. Cut the horizontal bearing 12-25, bend it and glue the disks together to form a thick disk. Insert a pin into the disk and in the box. The pin ensures the shoulder yaw motion. Cut the shoulder pitch hinge 12-24. Bend it and glue it. Bend the lower flaps horizontally and glue them on the horizontal bearing. Don't spread the glue on the box to avoid to stack the rotating mechanism. The different assembling phases are illustrated below.



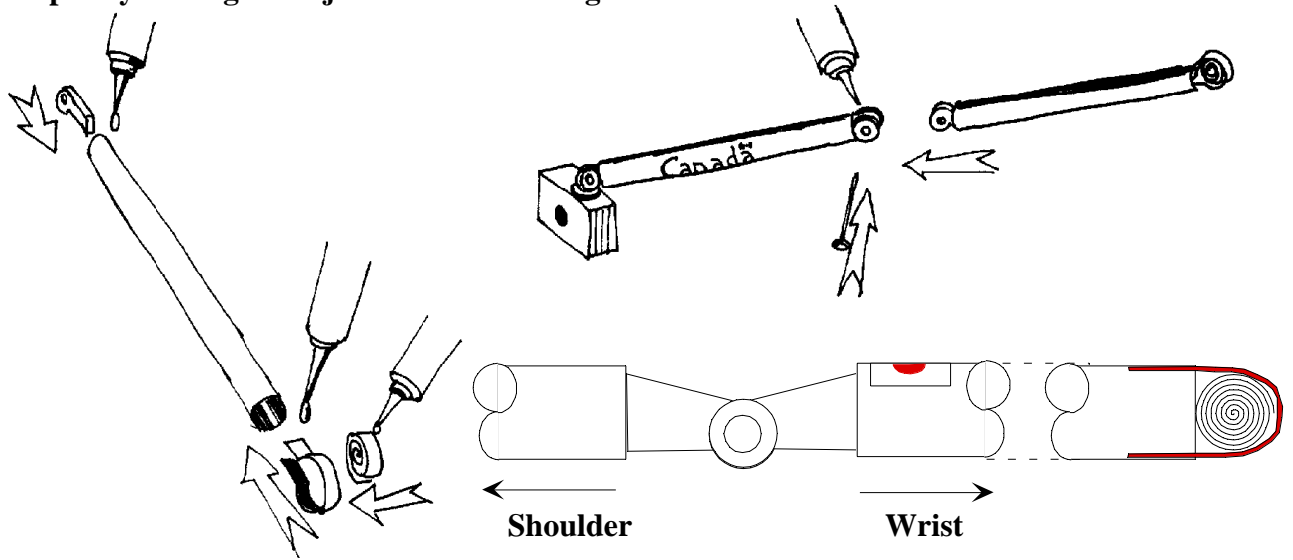
Insert the reinforced 12-23 hinges in the arm shoulder and glue them in place.

Insert the arm on the shoulder yaw box and fix it by using a second pin to ensure the shoulder pitch mechanism. Trim both pins by cutting them just outside the hinges



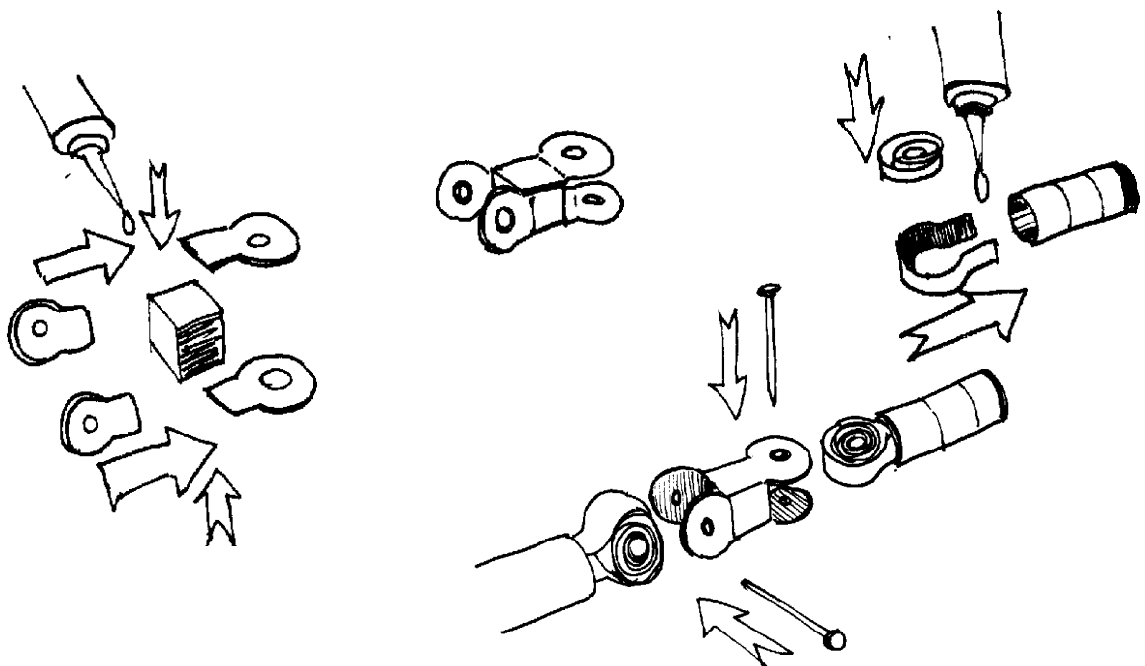
Cut and roll the arm part 12-27 as you did for the 12-26. Glue it as a tube. Cut the elbow hinge 12-21 part, bend it and glue it. Once the glue is dry insert it in the tube through the side marked with e box. Glue it in place so that it is symmetric respect to the other part of the hinge located on the other tube of the arm. The box indicate the top side while the hinge is glued as indicated in the sketch below. Roll as a spiral one the stripes 12-57. Roll one the two 12-58 parts around the spiral and insert the it inside the tube gluing in place

Joint the two elbow parts and fix them by using a third pin to ensure the elbow pitch mechanism. Trim the pin by cutting them just outside the hinges



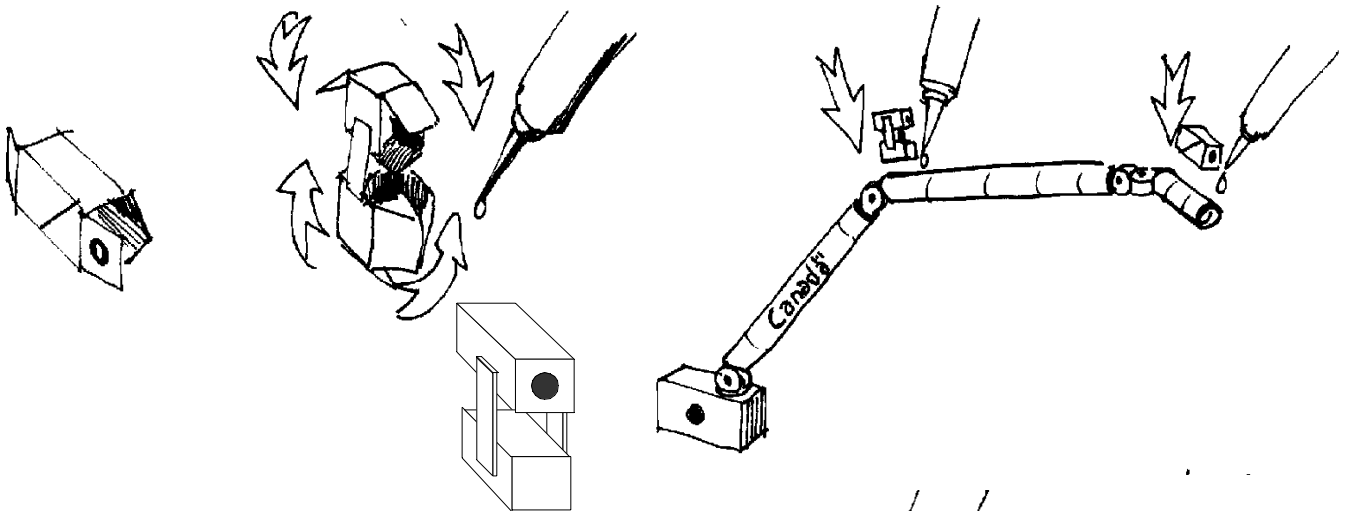
Cut and mount the small squared box 12-29. Glue it as a cube. Cut the wrist hinge 12-28 part, that should be reinforced with thick cardboard. Bend it and glue it on the small cube. Roll as a spiral the second stripe 12-57. Cut the 12-18 arm grapple and form a tube. Roll the last 12-58 parts around the spiral and insert it inside the grapple tube gluing in place. Be aware that the spiral has to be mounted horizontally in the grapple to ensure the wrist yaw rotation while the other spiral is used for the wrist pitch. The grapple top is indicated by the gluing box.

Joint the two wrist parts and fix them by using two pins to ensure the wrist pitch and yaw mechanism. Trim the pins by cutting them just outside the hinges. Put a small amount of fast glue on the four pins to fix them in place. Cover the pin heads with white corrector liquid

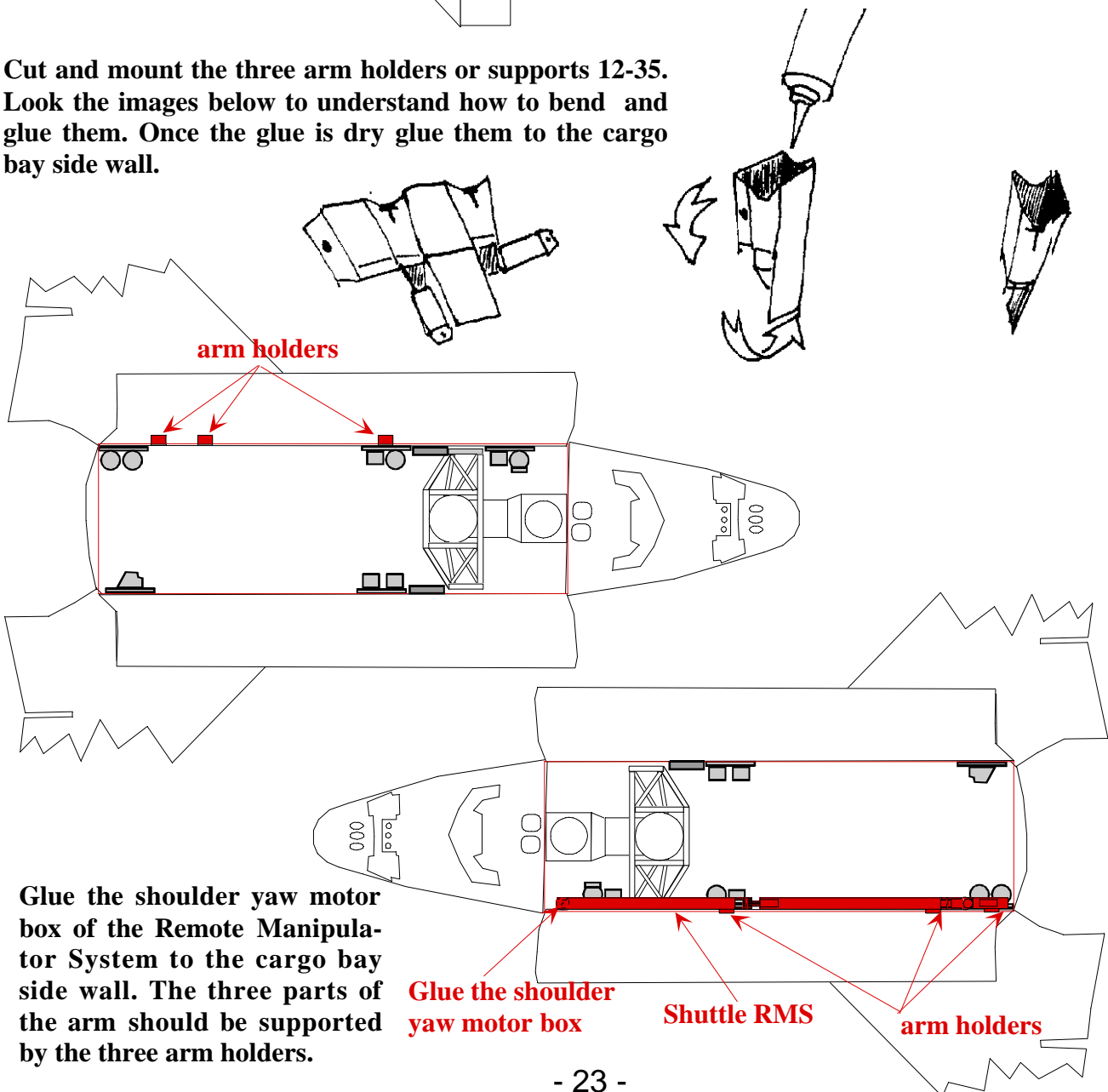


Cut and mount the external camera 12-17. It is a very small box. The black dot on a small side represents the lens and indicate the camera front side. Mount the camera on the arm grapple.

Cut and mount the external camera 12-20. It is a formed by two boxes connected by two supports. The black dot on a small side of the upper box represents the lens and indicate the camera front side. Mount the camera on the arm gluing box located close the elbow.



Cut and mount the three arm holders or supports 12-35. Look the images below to understand how to bend and glue them. Once the glue is dry glue them to the cargo bay side wall.

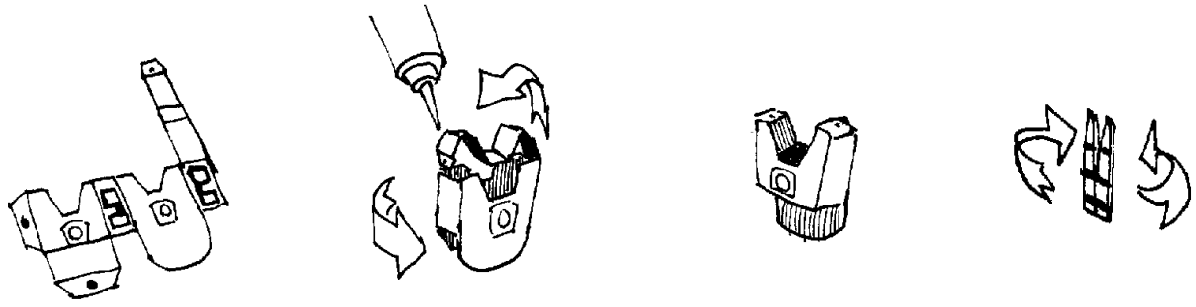


Glue the shoulder yaw motor box of the Remote Manipulator System to the cargo bay side wall. The three parts of the arm should be supported by the three arm holders.

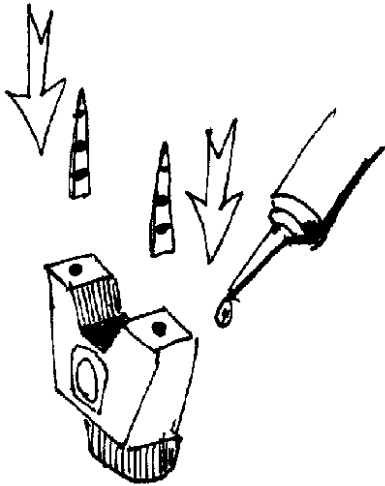
Glue the shoulder yaw motor box

Shuttle RMS

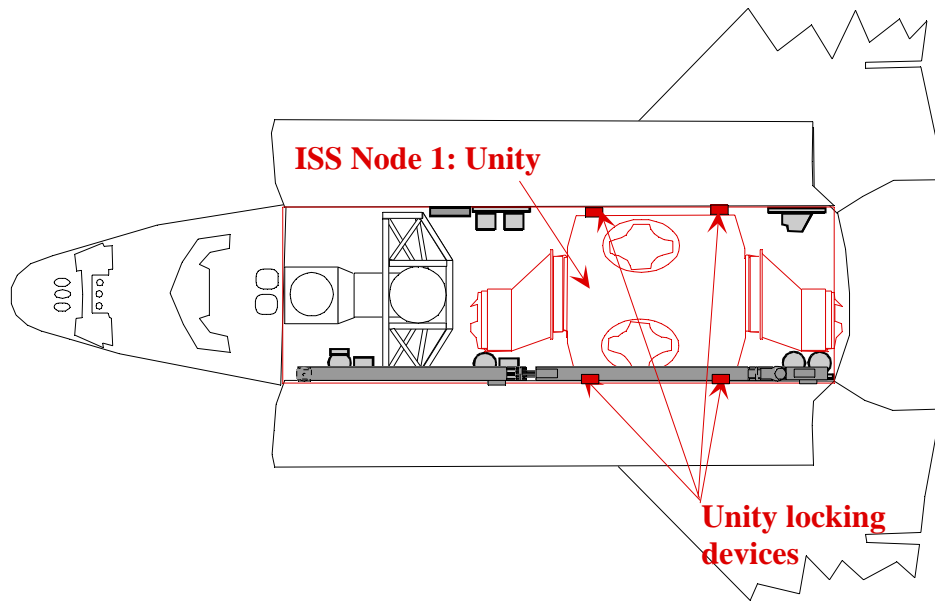
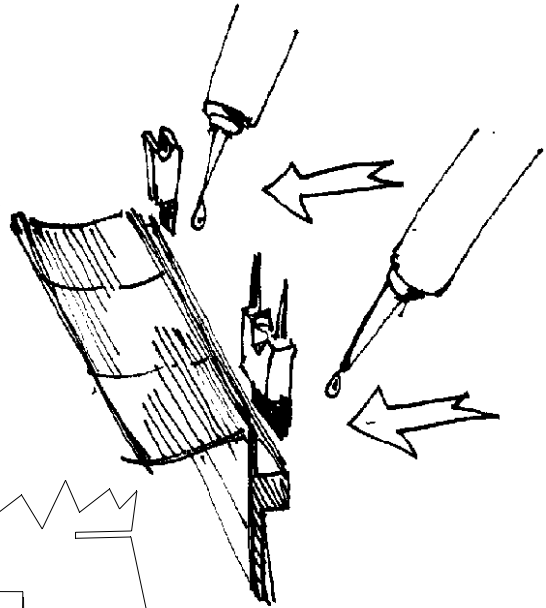
arm holders



Cut and mount the four Unity attachment point 12-17. Mount the box as illustrated above. Cut the small yellow-black striped guides, bend them and glue two of them on each locking device.



Look the sketch beside to understand how to bend and glue them. Once the glue is dry fix them to the cargo bay side wall with a small drop of glue.



If you want you can include in the cargo bay also a Model of Unity that was the main payload of the STS-88 flight. To improve the realism you can use four parts of a metallic pin as fixation rod that have to be inserted in the Unity locking mechanism

Congratulation, you finished !!

If you enjoyed and if you like your new Shuttle Model, why don't joint the ISS Paper Model Supporter group by providing a financial help to the designer? Please send your contribution in your national currency in a closed envelop directly to:

**Raimondo Fortezza
Via A. Falcone, 58
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Italy**