NASA Hubble Space Telescope Model

Materials and Tools

Sharp paper scissors
Razor blade knife
Dull knife
Sharp punch (such as an ice pick or nail)
Cutting surfaces (such as a wooden board)
Glue stick or rubber cement
Cellophane tape
5- by 5-centimeter-square piece of aluminum foil
Two 20-centimeter pieces of 1/8-inch dowel rods
Colored sharp point marker pens (yellow and red)
Blue and orange highlighter pens

General Assembly Tips

- Copy all model pieces on heavy weight paper.
- Color all pieces as indicated before cutting any parts out.
- Cut out only those pieces needed for the section being assembled at the time.
- Use a cutting surface such as a wooden board to protect the table or desk from scratches or gouges.
- Cut out pieces along the solid exterior lines.
- Using the dull knife, lightly score all dashed fold lines to make accurate folds possible.
- Apply glue to the insertion tabs on the pieces and flaps where the slots are located. If using rubber cement, apply cement to both surfaces to be joined and permit them to dry before assembling. Using a double coating of rubber cement makes a stronger bond. After the pieces are assembled, lightly rub pieces to remove excess.
- Some pieces may require small holes to be punched through them. Those places are indicated with the ⊕ symbol.

#1 Assembling the AFT SHROUD

1. Carefully cut out the following pieces: AFT SHROUD cylinder, END CAP, and INNER RING. Use the razor blade to cut small slits for the insertion of the assembly tabs of the cylinder.
2. Shape the AFT SHROUD cylinder by curling the paper around the edge of a table or desk. This will permit the paper to be easily rolled into a cylinder.
3. Curl the paper to form a tube, and insert the tabs of the cylinder into the slits cut in step 1. Hold the cylinder together with a piece of tape pressed to the inside.
4. Fold the tabs of the INNER RING downward. Dashed lines indicate where the folds should be. Coat each tab with glue, and lay the ring upside down on a flat surface. Place the cylinder over the INNER RING so that all tabs are inside. The seam of the cylinder should align with the word "SMALL" on the INNER RING. Reach in with a finger and press each tab to the inside wall of the cylinder. You will need to support the outer wall of the cylinder with another finger to achieve a good bond.
5. Fold the tabs of the END CAP downward, and coat each with glue. Place the END CAP upside down on a flat surface, and place the other end of the cylinder over it. Press the tabs in place. If you have trouble reaching the tabs, use the eraser end of a pencil in place of your finger.
6. The AFT SHROUD is completed. Set it aside.

#2 Assembling the FORWARD SHELL and LIGHT SHIELD

1. Carefully cut out the FORWARD SHELL and LIGHT SHIELD assembly. Use the razor blade to cut the slits for the insertion of the assembly tab.
2. Shape the tube by pulling the paper over the edge of a table or desk.
3. Curl the paper to form a tube and insert the tabs into the slit. Use tape to hold the tube together.

#3 Joining the AFT SHROUD and the FORWARD SHELL and LIGHT SHIELD

1. Bend the four glue tabs at the lower end of the FORWARD SHELL and LIGHT SHIELD inward, and cover with glue.
2. Place the AFT SHROUD on a flat surface with the INNER RING pointed up. Insert the FORWARD SHELL and LIGHT SHIELD with the glue tab end down. Align the seam of the two cylinders.
3. Make sure the FORWARD SHELL and LIGHT SHIELD are standing straight up. Use a long piece of dowel rod to reach inside the tube, and press the tabs to the END CAP so that they will bond to the inside of the END CAP.

#4 Assembling the OTA EQUIPMENT SECTION

1. Carefully cut out the OTA EQUIPMENT SECTION. Cut the slots for tab insertion with the razor blade knife.
2. Curl the bay section to form a semicircle.
3. Fold the tabs downward and the curved sections downward.
4. Apply glue to the tabs, and insert them into the slots to join the segments as indicated in the diagram.

#5 Joining the OTA EQUIPMENT SECTION to the AFT SHROUD

1. Apply glue to the OTA EQUIPMENT SECTION where indicated.
2. Press the OTA EQUIPMENT SECTION to the INNER RING where indicated.

#6 Assembling the BARREL INSERT

1. Cut out the BARREL INSERT, MIRROR SUPPORT, and SECONDARY MIRROR SUPPORT.
2. Trace the circle of the MIRROR SUPPORT on the aluminum foil, and cut out the circle. Glue the foil to the MIRROR SUPPORT.
3. Glue the SECONDARY MIRROR SUPPORT onto the aluminum foil.
4. Cut the slits for the assembly tabs on the BARREL INSERT. Curl the paper to form a tube by dragging it over the edge of a table or desk.
5. Form the BARREL INSERT by rolling the paper, with the black side inward, and inserting the tabs into the slits. Hold the tube together by applying tape to the outside.
6. Fold the glue tabs of the MIRROR SUPPORT inward toward the foil side. Coat the tabs with glue. Bond the MIRROR SUPPORT to the end of the BARREL INSERT with the glue tabs to the outside.

#7 Joining the APERTURE DOOR to the BARREL INSERT

1. Cut out the APERTURE DOOR.
2. Apply glue to the back side of the middle glue tab and to the front side of the remaining two tabs.
3. Spread the glue tabs, and attach the APERTURE DOOR to one end of the BARREL INSERT over the seam. The middle tab should be on the inside and the other tabs on the outside. Press the tabs to the tube.

#8 Inserting the SOLAR ARRAY and ANTENNA Rods

1. Use the punch to make four small holes in the side of the FORWARD SHELL and LIGHT SHIELD at the places indicated. (Look for the ⊕.)
2. Carefully insert the two dowel rods into the holes so that each extends through to the opposite side. The ANTENNA rod is inserted through the holes closest to the AFT SHROUD. The SOLAR ARRAY rod is inserted through the holes closest to the APERTURE end of the FORWARD SHELL and LIGHT SHIELD.

#9 Assembling the SOLAR ARRAYS

1. Cut out each SOLAR ARRAY. Punch out the small circular holes in the two tabs. When the front and back sides of the arrays are together, both tabs should stick out. You will slide the tabs over the ends of the SOLAR ARRAY rod you inserted into the FORWARD SHELL and LIGHT SHIELD in the previous step.
2. Fold the two back side panels of each array along the dotted line. Coat the inside of the front array with glue, and press the back panels to it. When the glue is dry, slip the SOLAR ARRAY rod through the holes in the two tabs for each array.

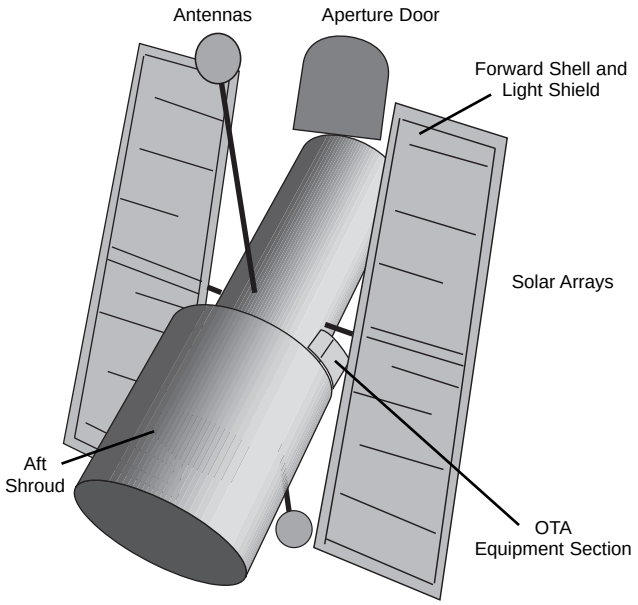
#10 Assembling the ANTENNAS

1. Cut out the ANTENNAS.
2. Glue the back side of each ANTENNA assembly. Fold the front and back of each ANTENNA over the ends of the ANTENNA rod. Press the front and back together. Then, fold the reinforcing strips around the back of each ANTENNA to help hold the pieces together.

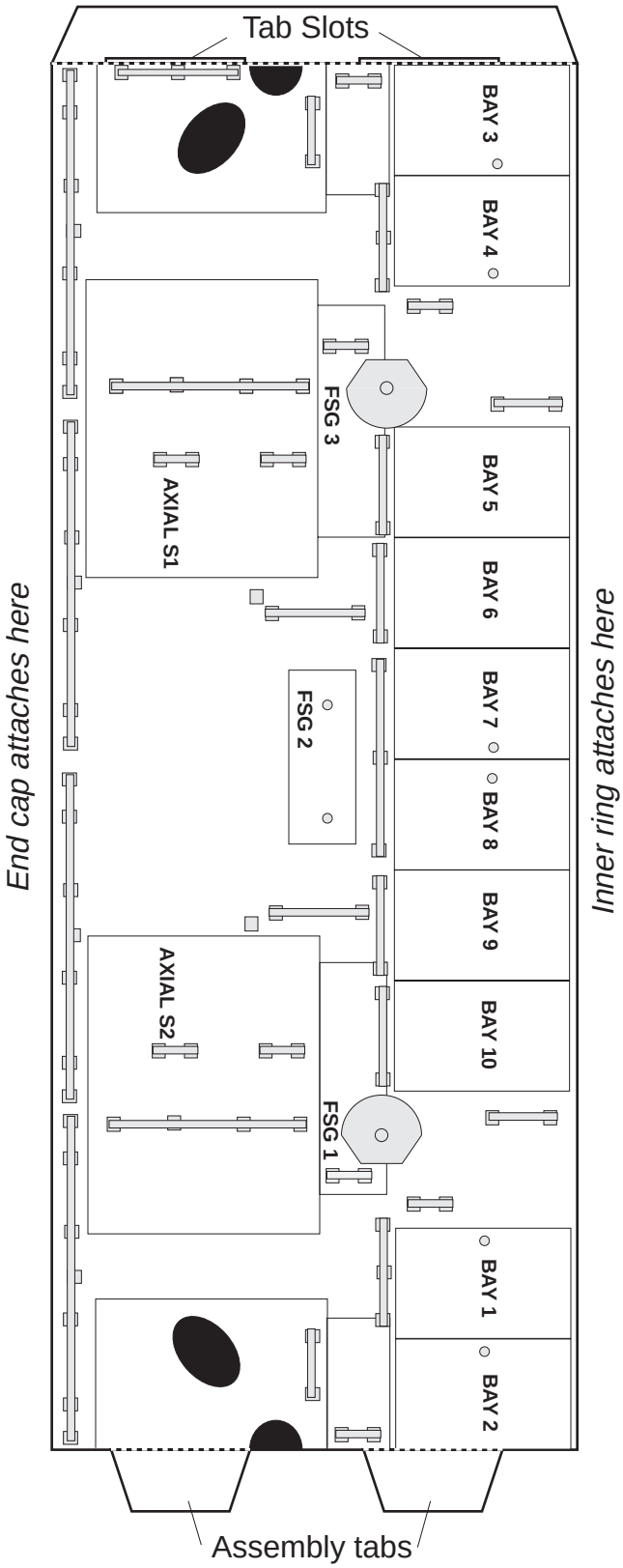
#11 Inserting the BARREL INSERT

1. Insert the BARREL INSERT into the FORWARD SHELL and LIGHT SHIELD so that the APERTURE DOOR is opposite the seam of the cylinder.

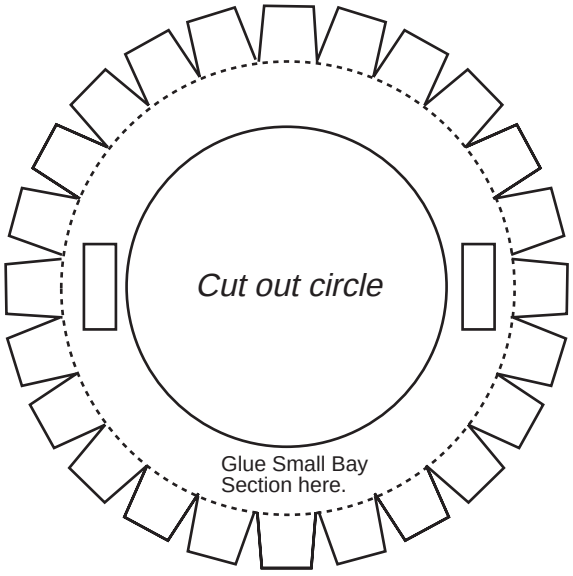
The NASA Hubble Space Telescope model is now complete. You can display it by suspending it from the ceiling by a piece of thread or monofilament fishing line or by creating a base for it.



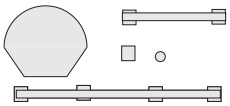
AFT SHROUD



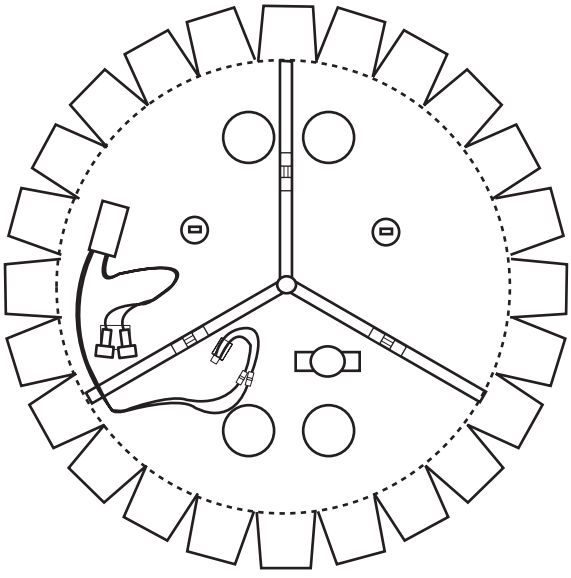
INNER RING



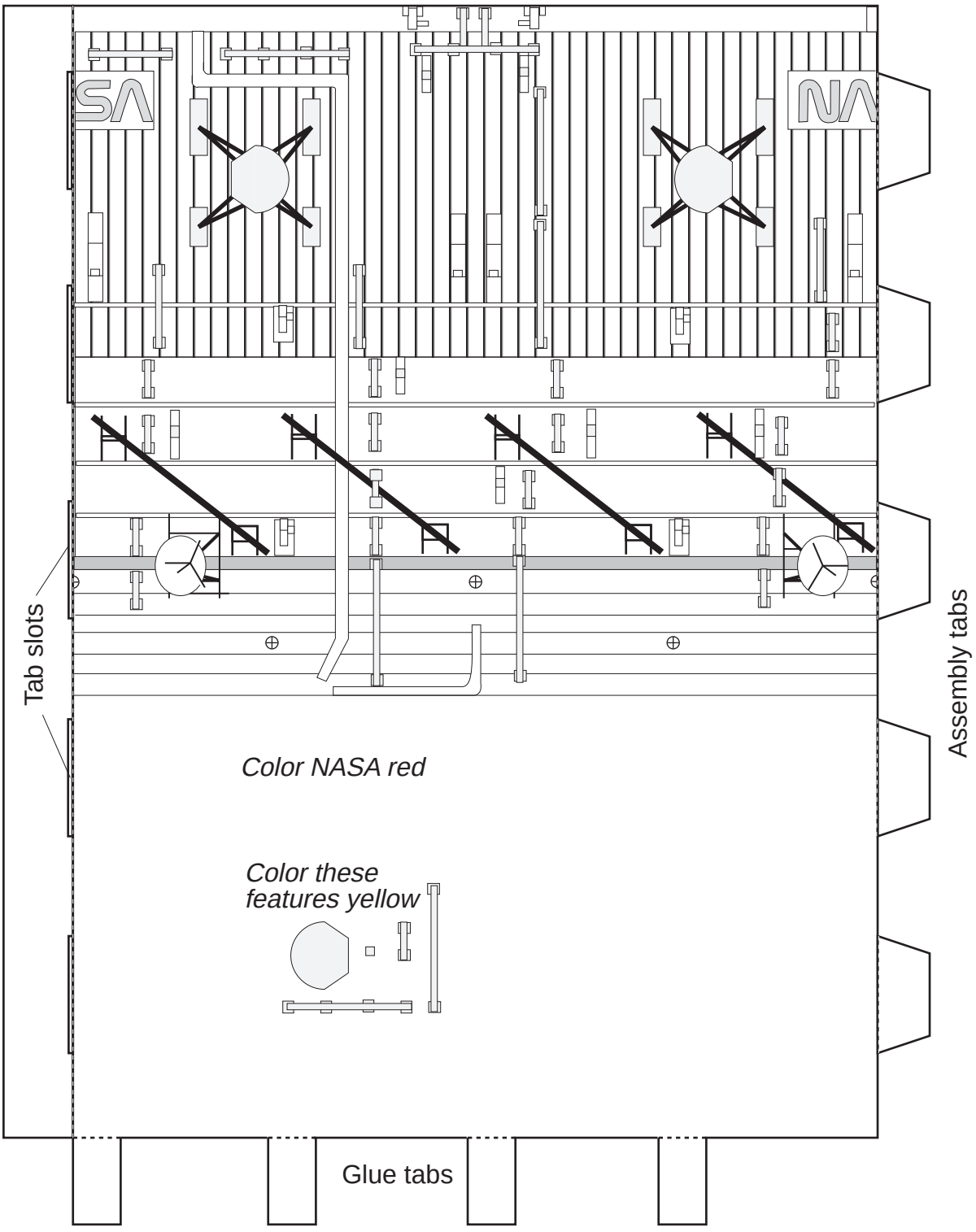
Color these features yellow



END CAP

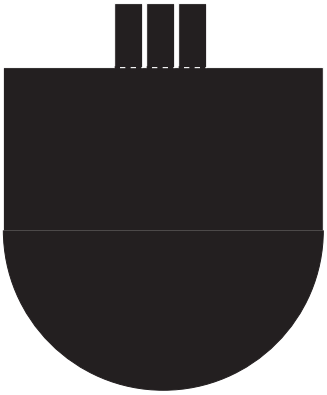


FORWARD SHELL AND LIGHT SHIELD



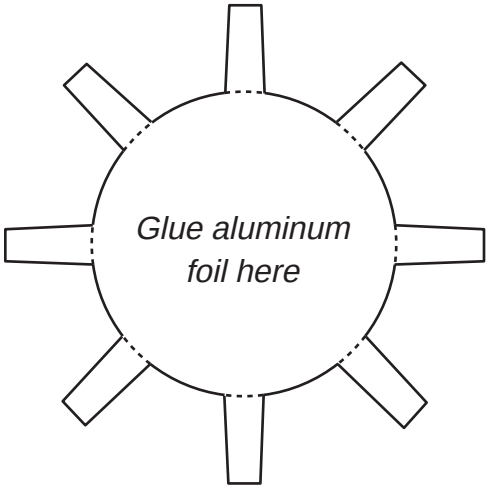
BARREL INSERT

APERTURE DOOR



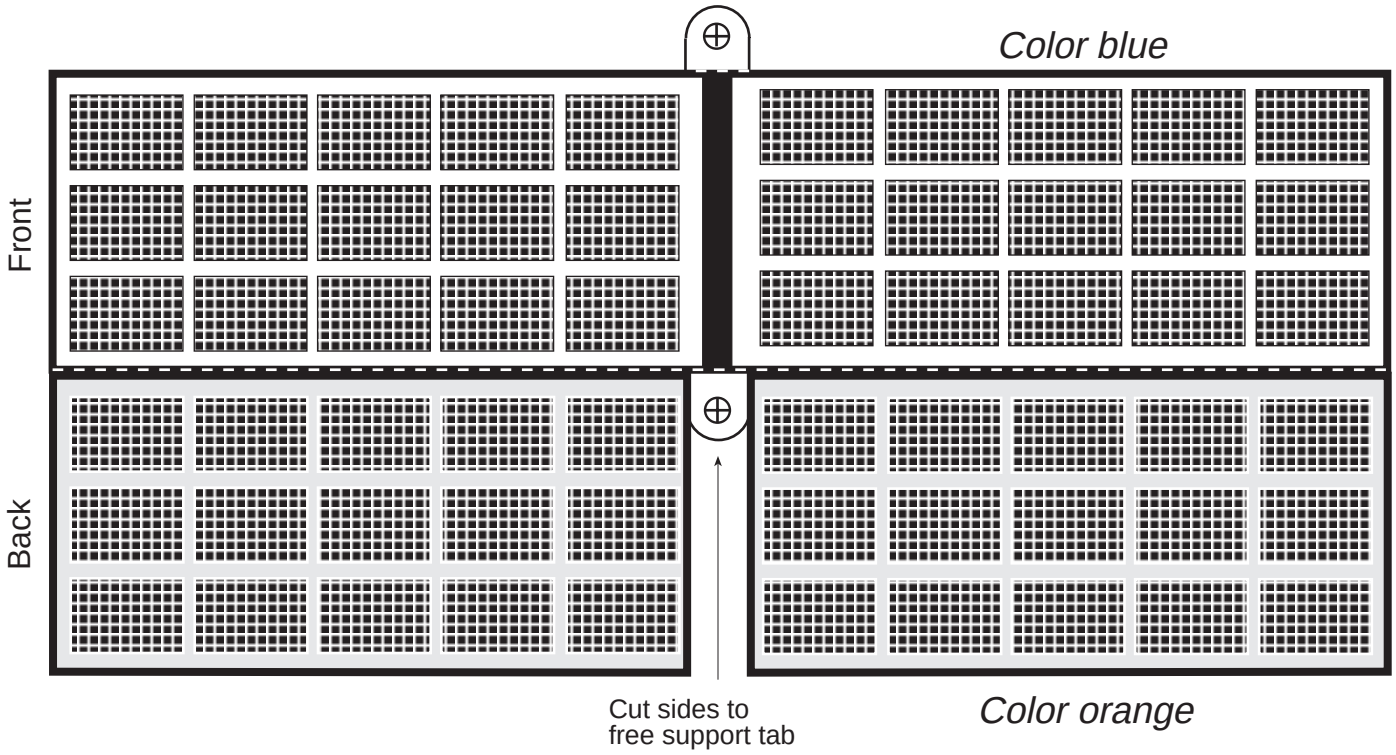
SECONDARY MIRROR SUPPORT

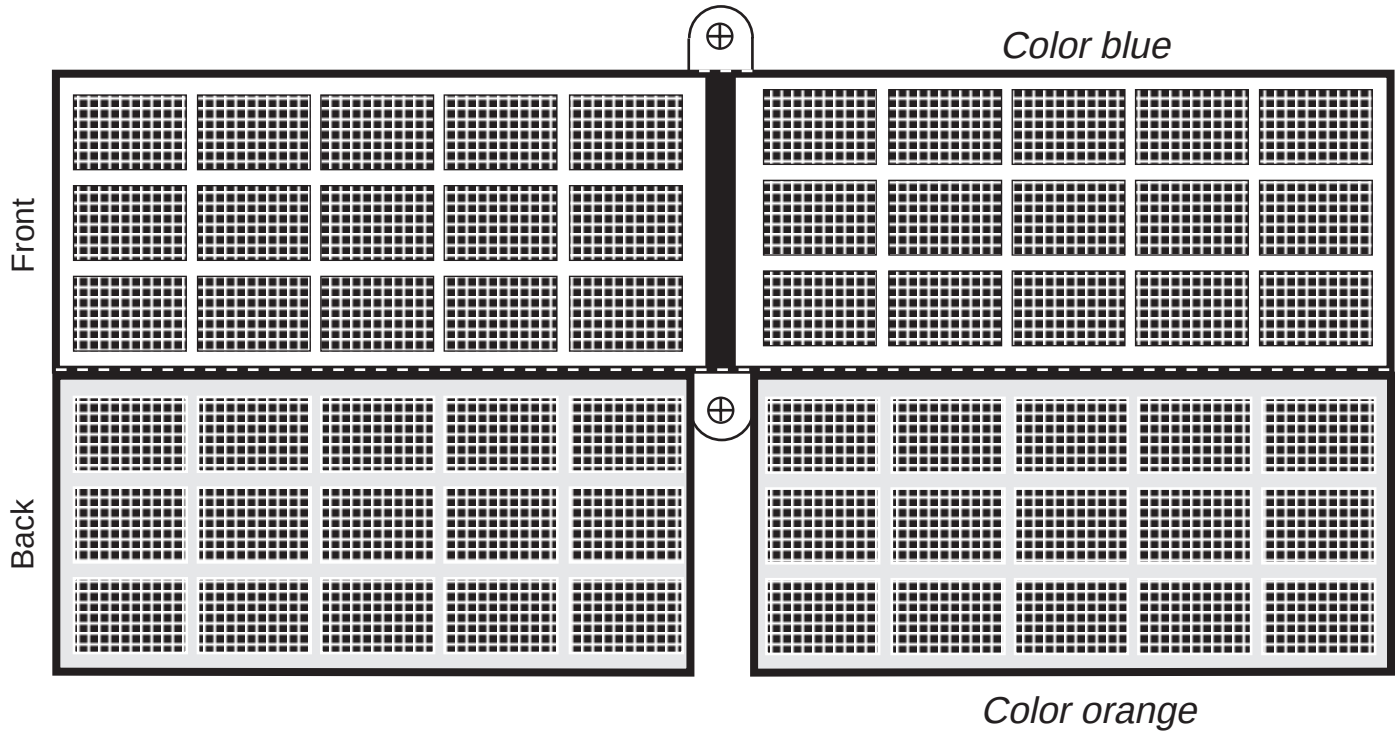
MIRROR SUPPORT



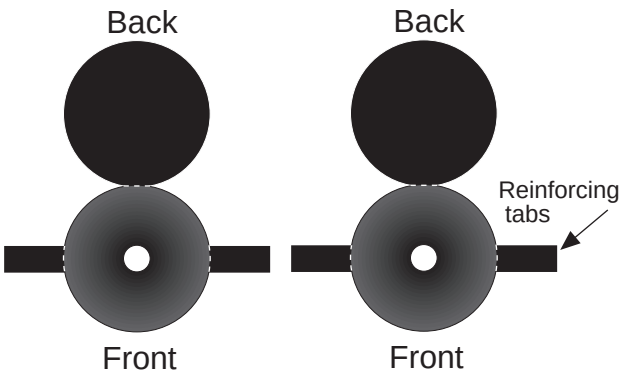
Glue Tabs

SOLAR ARRAYS

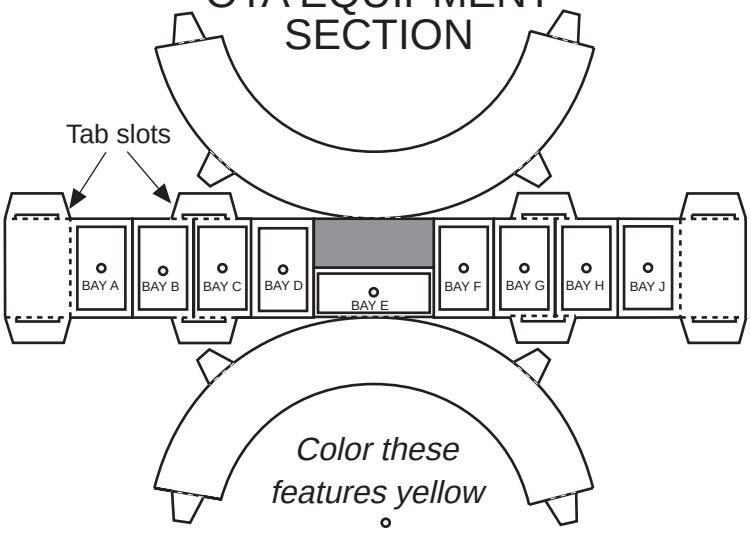




ANTENNAS



OTA EQUIPMENT SECTION



OTA ASSEMBLED