

**Solar Probe Plus**  
**Approx 1:40 scale**



# Solar Probe Plus Approx 1:40 scale

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Sunshield bottom

Sunshield top

Sunshield edge

Align shade with secondary solar array

Secondary solar array, extended. Fold track into box beam.  
Position in sunshield truss as shown in drawings.  
Fold struts down and trim to meet sunshield truss.

Dot indicates alignment  
with HGA. See sunshield, bus  
top, and sunshield truss.

Secondary solar array, retracted

Instrument  
boom-roll  
tightly or use  
toothpick

BOOM  
END  
PLATE

BOOM

NGS

Main bus

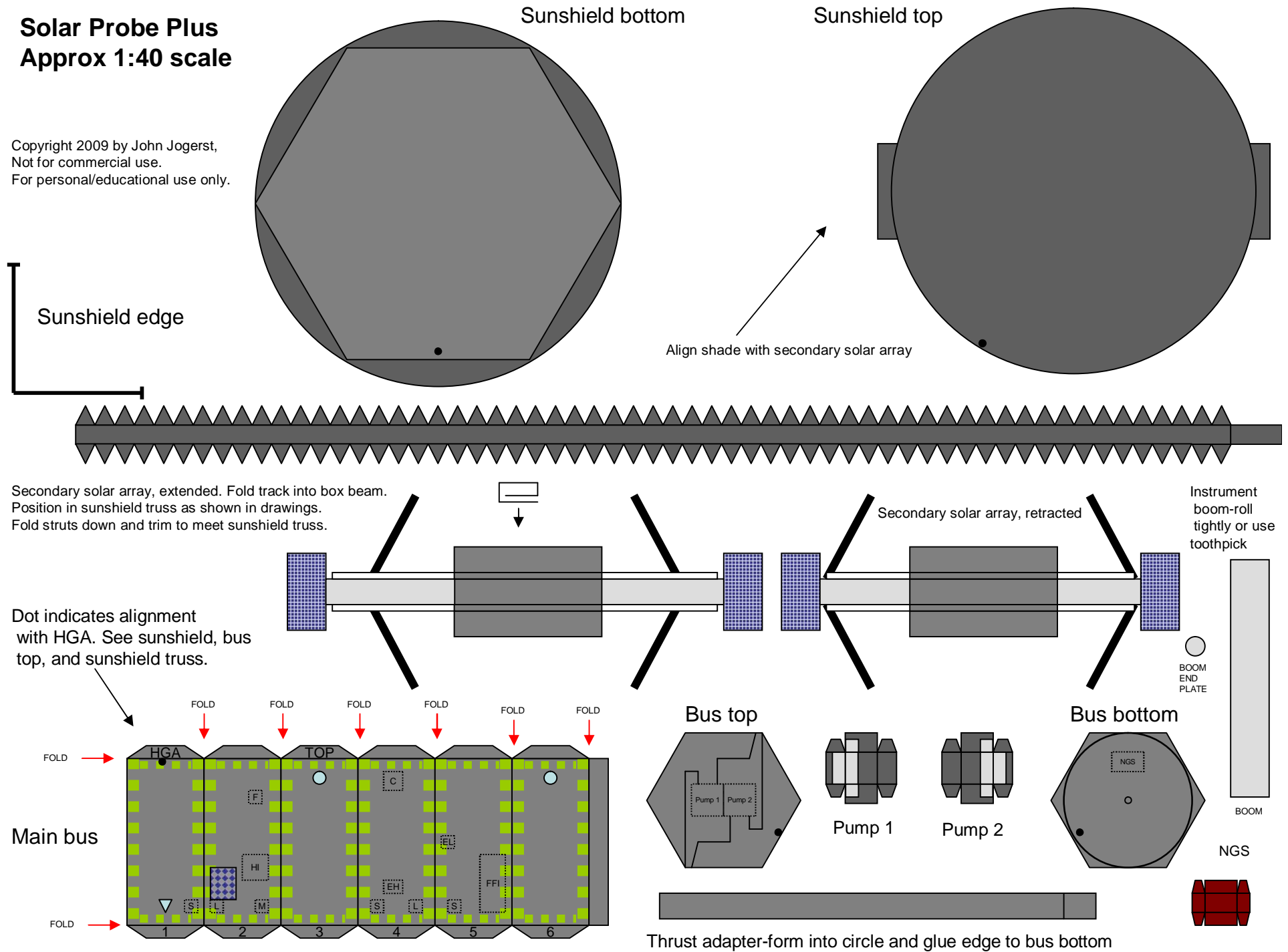
Bus top

Bus bottom

Pump 1

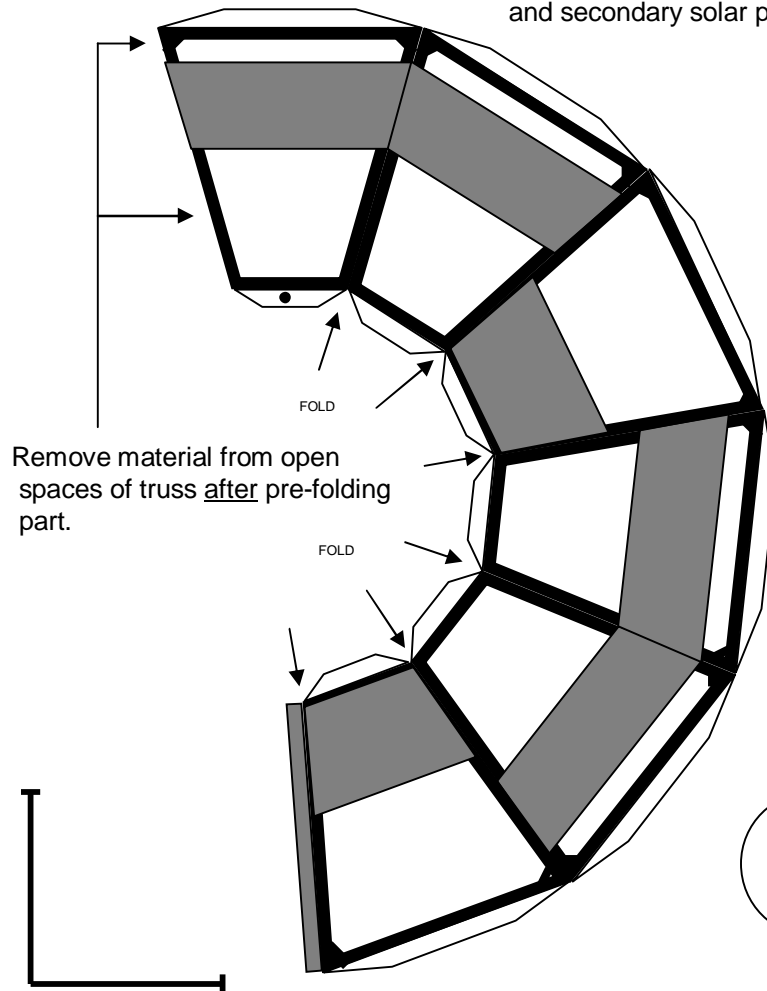
Pump 2

Thrust adapter-form into circle and glue edge to bus bottom

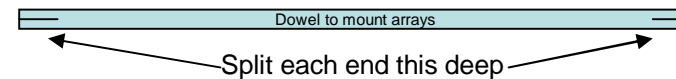
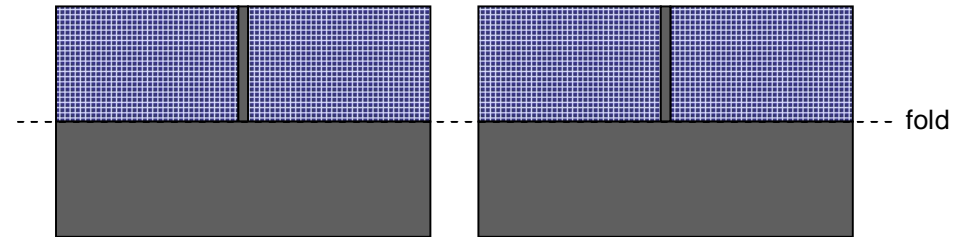


Sunshield truss. Glue to another layer of cardstock if using light weight material. Fold between the panels and fold the tabs inward. Mount to main bus first, then glue bus top in place. Mount pumps and secondary solar panels, then attach to bottom of sun shield.

Align this segment with HGA

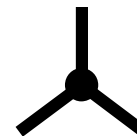
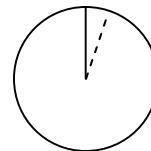


Primary solar arrays, deployed.  
Fold and glue gray side on back of arrays. Cut dowel as shown. Place dowel through circles, top of main bus, panels 3 and 6. mount arrays in split ends of dowel.



Primary solar arrays, for solar encounter mode fold in half and mount at bottom of main bus panels 3 and 6.

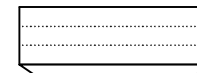
HGA dish



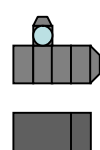
Reflector tripod

HGA mast, fold into triangular beam.

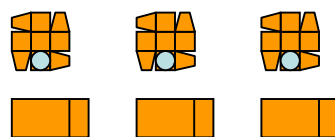
Attach to triangle at bottom of bus panel 1.  
For solar encounter, mount mast flat to panel with HGA positioned as shown in diagrams.



M - MGA

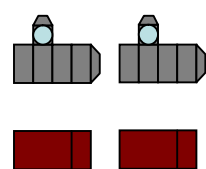


Fold along lines into box



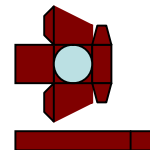
Color back black, roll into tube

S - Star tracker (3)



Color back maroon, roll into tube

L - LGA (2)



HI - Inst-HI

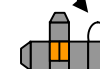


F - FEA



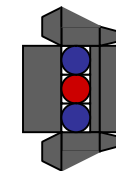
EH - EPI-Hi

Leave loop vertical, do not fold

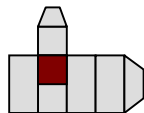


EL-EPI-Low

Color back gray, roll into tube



FFI - FIA/FEA/ICA



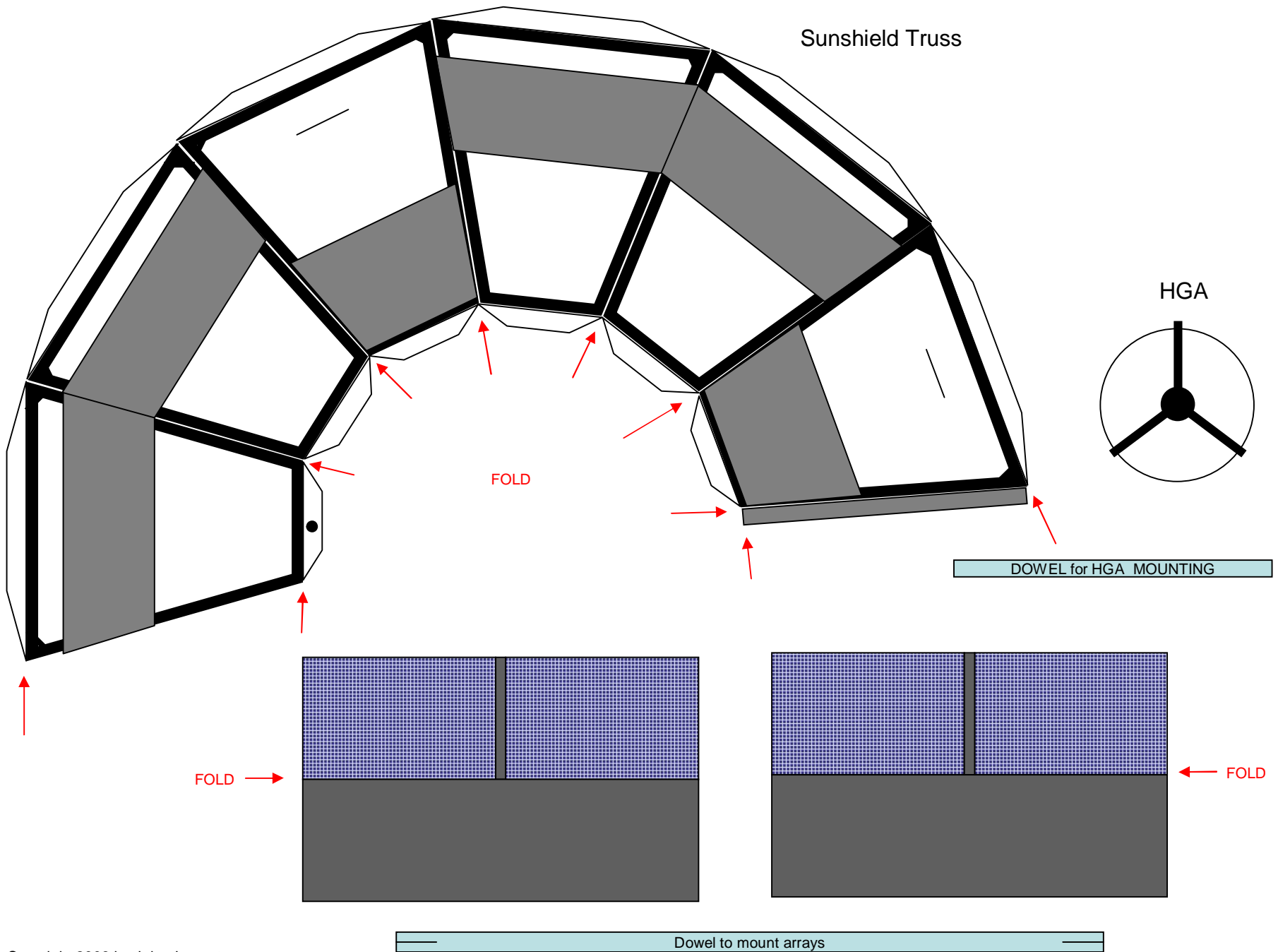
C - CD

## Instructions

- Cut out the sunshield top, bottom and edge pieces. Roll the edge piece into a circle and glue. Fold the tabs on the edge part inward and glue it to the back of the sunshield bottom. Flip the assembly over and glue on the top of the sunshield, aligning the dots – the small rectangular shades on the top should be aligned with, and centered on, one side of the hexagon on the bottom sunshield part.
- Cut out the main bus, bus top, and bus bottom. Fold the main bus on the vertical lines and glue it to form a hexagonal column. Fold the top and bottom tabs inward. Glue on the bus bottom, aligning the dot with panel 1.
- Cut out the sunshield truss. Score and pre-fold the tabs and panels away from the printed side. Cut out the white spaces within the truss panels. Color the back side of the truss members black, the back of the radiator panels gray. Refold and glue the panels together to form a tapered hexagonal form.
- Glue the small end of the sunshield truss to the top of the main bus, aligning the dots. Then, glue the bus top in place inside the truss on top of the main bus.
- Cut out pumps 1 & 2, fold on the lines and glue into box shapes. Apply glue to the back edges of the pumps and fix them in the indicated places on the bus top.
- Cut out the secondary solar array you intend to use. Color the back of the solar cells gray. Fold the center section of the track into a box beam, overlapping and gluing the gray rectangles. The outer track will be a C section. Fold down the mounting struts and position the secondary array in the sunshield truss as shown on the spacecraft diagrams. Glue the ends of the mounting struts to the corners of the large truss opening, trimming if necessary. The secondary array should end up about a quarter inch below the sun shield, centered in the truss opening, and symmetrically positioned.
- Cut out the various instruments, fold and glue into shape. Fold the boxes along the lines. The star trackers, LGA, MGA, and HI have cylinders attached. Roll and glue these, then attach to the blue circles on the instrument boxes. Apply glue to the back edges of the instruments and glue them to the main bus in the positions indicated. Refer to the spacecraft diagrams as needed.
- Cut out the HGA dish. Slit the circle along the solid line. Overlap to the dotted line to form the HGA dish into a shallow cone – glue into shape. Cut out the reflector tripod and bend the legs down to form a tripod. Glue one leg to the HGA along the seam. Glue the other two legs symmetrically, equally spaced around the HGA. Cut out the HGA mast, fold and glue it into a triangular beam. Cut out the triangle at the bottom of main bus panel 1, insert the mast in the hole and glue it in place. Mount the HGA dish to the end of the mast as shown in the spacecraft diagrams.
- Cut out the thrust adapter, form and glue it into a circle. Glue the adapter's edge to the bus bottom.
- Cut out the instrument boom and end plate. Roll and glue the boom into a tight rod (or use a very small dowel/toothpick). Attach the end plate to one end, glue the other end to the center of the bus bottom.
- Cut out the primary solar arrays. Fold and glue the front and backs together. Cut a dowel to the length indicated and split the ends of the dowel as shown (keep the splits aligned). Insert the dowel through the main bus at the circles at the tops of panels 3 & 6. Slip the solar arrays into the slits in the dowel and secure.







## Instructions for quick model

- Cut out the sunshield. The small rectangular shades should be aligned with the secondary solar arrays.
- Cut out the main bus, bus top, and bus bottom. Fold the main bus on the vertical lines and glue it to form a hexagonal column. Fold the top and bottom tabs inward. Glue on the bus bottom, aligning the dot with panel 1. Glue on the bus top.
- Cut out the sunshield truss. Score and fold the tabs and panels away from the printed side. Glue the panels together to form a tapered hexagonal form.
- Glue the small end of the sunshield truss to the top of the main bus, aligning the dots.
- Cut out the secondary solar array. Color the back of the solar cells gray. Fold the tabs down at a slight angle. Glue the arrays to the short lines in the large openings at the large end of the sunshield truss. When the glue is dry, carefully bend the arrays so they are horizontal.
- Cut out the HGA dish. Cut a small dowel to the indicated length for the HGA mast. Cut out the circle at the bottom of main bus panel 1, insert the mast in the hole and glue it in place. Mount the HGA dish to the end of the mast as shown in the spacecraft diagrams.
- Cut out the thrust adapter, form and glue it into a circle. Glue the adapter's edge to the bus bottom.
- Cut out the primary solar arrays. Fold and glue the front and backs together. Cut a dowel to the length indicated and split the ends of the dowel as shown (keep the splits aligned). Cut out the circles at the tops of panels 3 & 6. Insert the dowel through the main bus here. Slip the solar arrays into the slits in the dowel and secure.