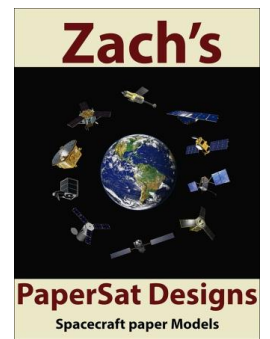


Nimbus-1

1/25 Scale Paper Model Instructions



May see some differences between the test build model in these instructions and your model, some adjustments were made during this final test build.

Named after the Latin word for rain cloud, the Nimbus satellites were a series of seven Earth-observation satellites launched over a 14-year time period from 1964 to 1978, one of which did not achieve orbit. In total, the satellites provided Earth observations for 30 years and collectively carried a total of 33 instruments, including ozone mappers, the Coastal Zone Color Scanner instrument and microwave and infrared radiometers.

“Nimbus is the granddaddy of the current Earth-observing fleet,” said Piers Sellers, deputy director of the Sciences and Exploration Directorate and acting director of the Earth Sciences Division at NASA’s Goddard Space Flight Center in Greenbelt, Maryland. “When you look at all the incredible science we are doing from Earth orbit right now, you can trace it back to Nimbus. By any measure – scientific, engineering, operational, economic, human – the program was a smashing success and a huge return on investment.”

These satellites revolutionized weather forecasting to accomplish accurate long-term forecasts and demonstrated location and related search-and-rescue technology. They provided some of the first consistent global measurements of Earth, such as sea measurements, oceanic plant life and the ozone layer.

“There’s never been quite another program like Nimbus in terms of a such a dedicated series of satellites and instruments, pushing the boundaries of our technology and expanding our scientific understanding of our world,” said Gene Feldman, oceanographer at Goddard.

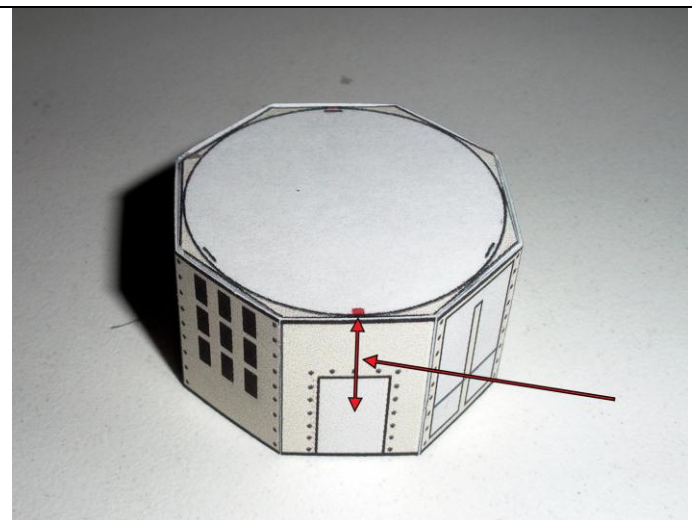
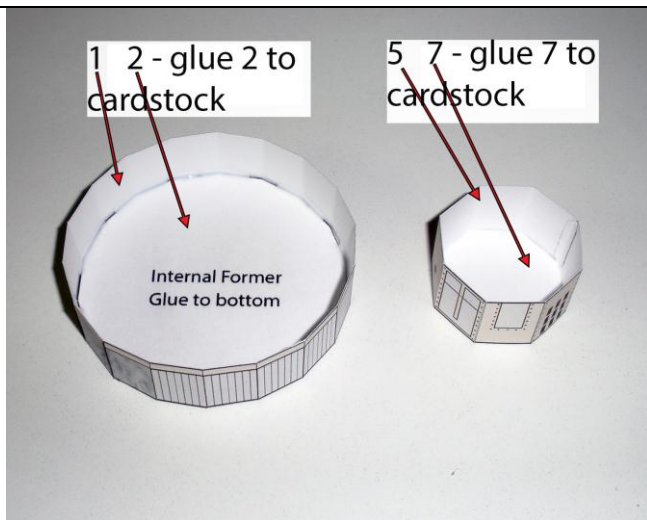
Nimbus paved the way for future Earth-observing systems such as Aqua, Terra, Aura, Landsat, Sea-Viewing Wide Field-of-View Sensor (SeaWiFS), Tropical Rain Measuring Mission and many more.

In celebration of the 50th anniversary of the first Nimbus satellite’s launch in 1964, NASA takes a look at some, but certainly not all, of the “first-ever” observations from the Nimbus satellites.

Nimbus Firsts

- First to provide daylight and night-time pictures of intense hurricane clouds viewed from space, which initiated the use of satellite technology to provide hurricane warnings.
- First to measure ozone columns and profiles from space, which led to the first confirmation of the ozone hole and the documentation of the recurrence of the hole every year during the southern-hemisphere springtime.
- First to provide quantitative data on the size of volcanic eruptions by measuring sulfur dioxide, a unique tracer of volcanic eruptions. This led the path for other volcanic ash cloud tracking instruments such as the Ozone Monitoring Instrument.
- First to provide extensive global observations of spectral signatures of ice that indicate the age of the sea ice and first to provide snow depth and snow accumulation rates over the Arctic and Antarctica. This paved the way for other NASA satellites such as Aqua and Terra.
- First to provide global, direct observations of the amount of solar radiation entering and exiting Earth’s system. This helped to confirm and improve the earliest climate models and laid the groundwork for Cloud and the Earth’s Radiant Energy System (CERES) instruments on NASA’s Terra and Aqua satellites and now on Suomi National Polar-orbiting Partnership satellite.
- First to create a map of global distribution of photosynthetic organisms, such as phytoplankton, in the world’s ocean from space. This helped scientists understand the ocean’s role in the exchange of carbon around the world and led the way for missions such as SeaWiFS, Aqua and Terra.
- First microwave devices to distinguish rain over ocean and between snow and ice in polar areas.
- First capability to globally measure the temperature in a planetary atmosphere quantitatively and qualitatively from space. This paved the way for instruments on NASA’s Voyager, Cassini, Aqua and Terra.
- First to map topography and Earth’s mineral resources from space, which laid the groundwork for similar instruments on Earth-observing mapping satellites such as Landsat.
- First satellite to reveal an ice-free opening in the Antarctica ice pack. This patch of open water, called a polynya, appeared during the winters of 1974-76 in the Weddell Sea and has not been observed since.
- First meteorological satellites to provide day and night local area coverage every 24-hours, repeated at the same time daily. This sun-synchronous orbit became the norm for satellites.

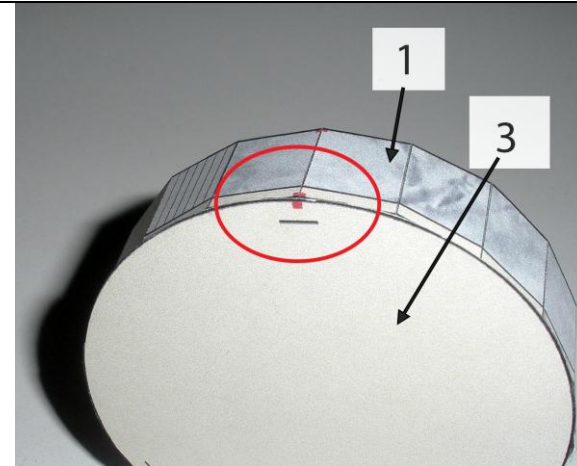
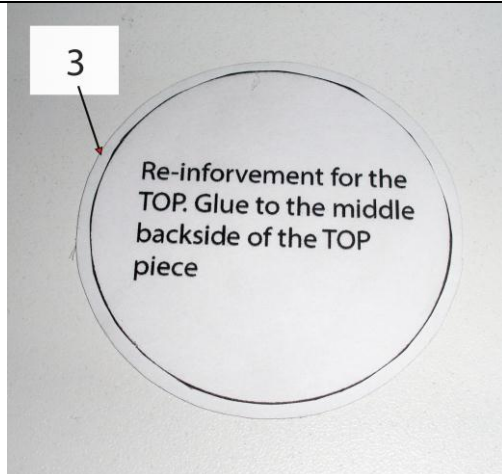
- First solar panels on a satellite that track the sun during the daylight portion of an orbit, an advancement adapted to many of today's satellites. This sun-tracking arrangement allows the solar panels to harness more power than if the solar cells were fixed to the spacecraft body.
- Demonstrated the first technology that allowed satellites to track movements of people, animals and items on Earth. This paved the way for GPS technology and international search and rescue satellite-aided tracking programs.



Poke small holes on the black dots on **Part 5**.
 Glue **Parts 2 and 7** to cardstock for strength and makes it easier to slide and stay inside **Parts 1 and 5** multi-sided rings.
 Glue 2-7 at the bottom-inside of 1 and 5. Apply plenty of glue around the seems inside Parts 5-7 for strength.

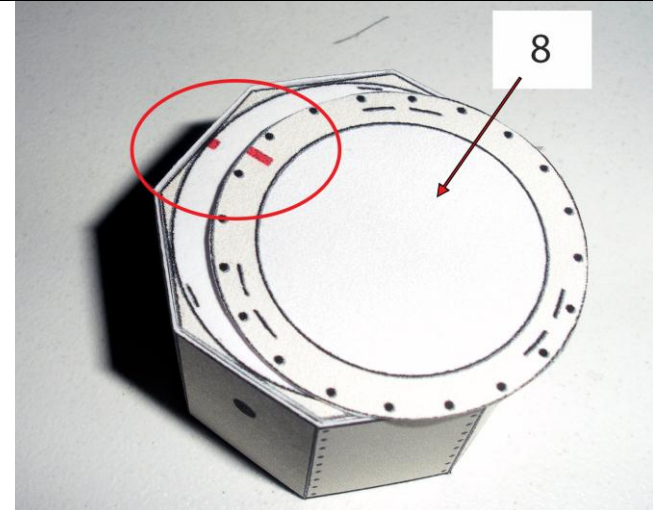
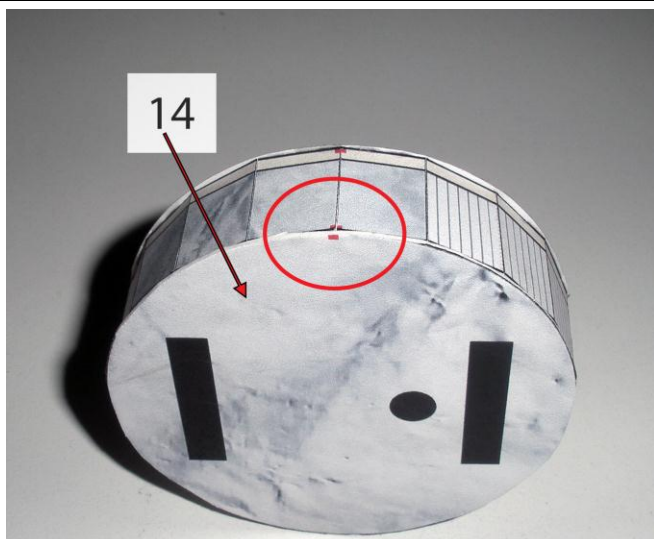
The small RED MARKER on other side of Part 7 must match with the side with the rectangle graphic as shown.

This is the top piece.



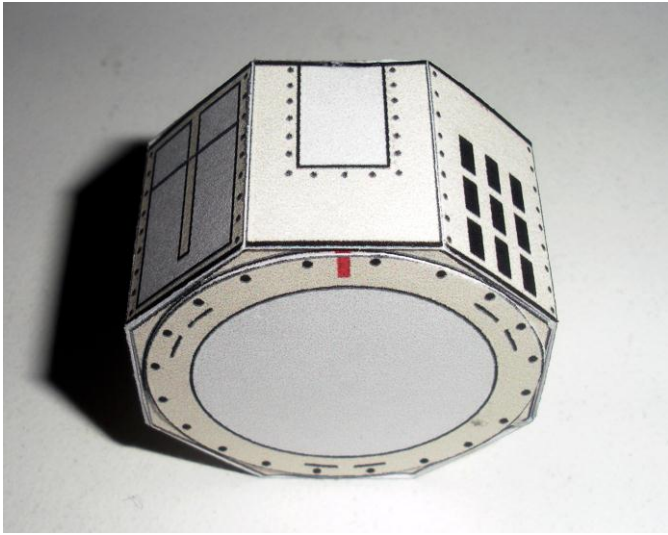
Re-inforcement piece is glued in the middle backside of **3**

3 is glued to the TOP of 1 (marked by a light yellow strip), Match to two small RED MARKERS.

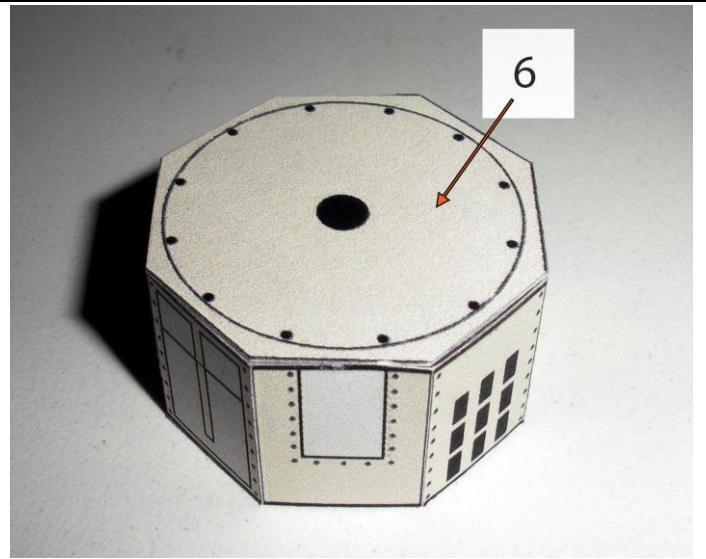


Glue **14** to the bottom , match the two RED MARKERS
This is the bottom piece

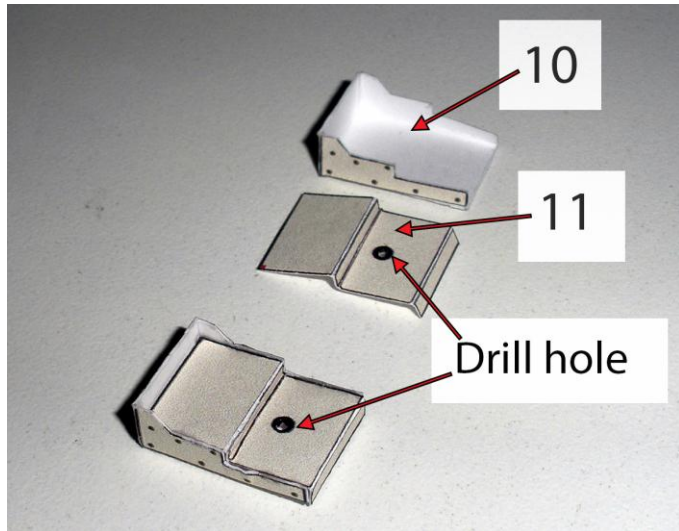
Poke small holes into the 20 black dots on **8**. Glue **8** onto circle graphic on the top piece. Match the two RED MARKERS.



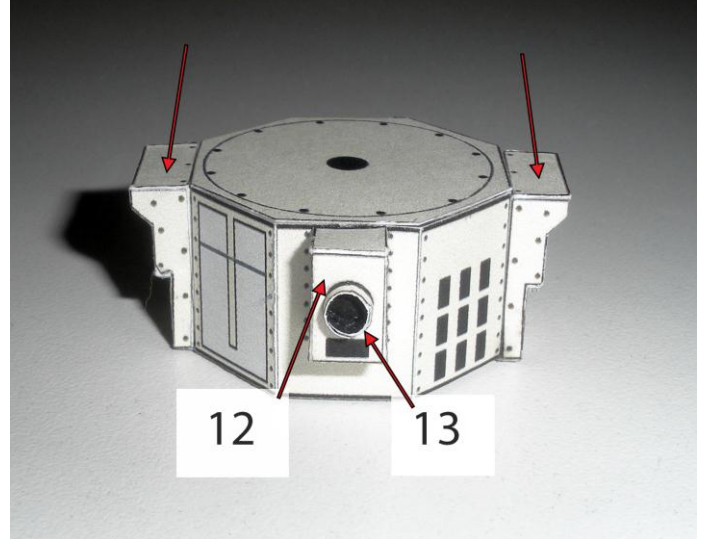
Bottom of the top piece



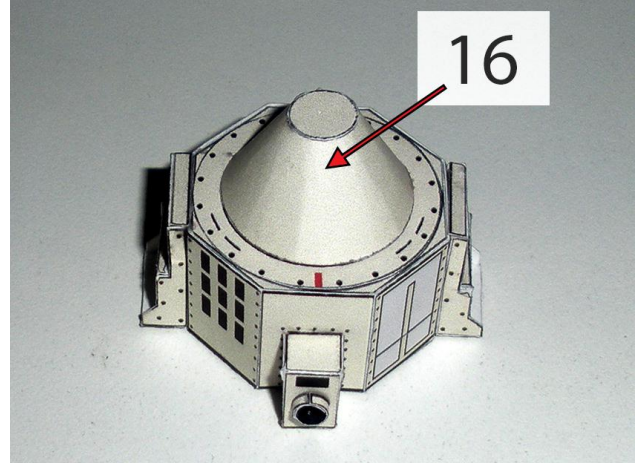
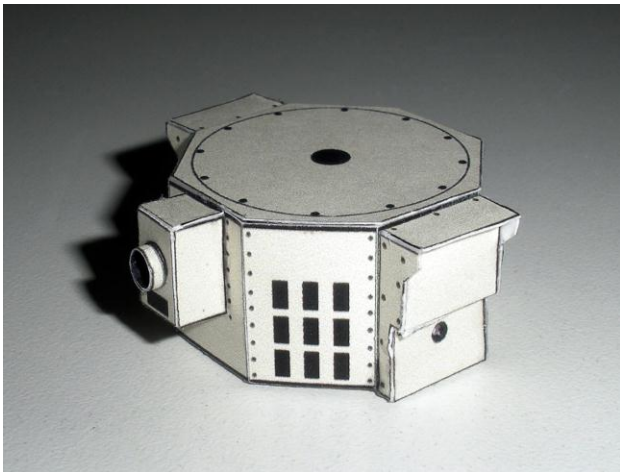
Poke small holes onto the 12 dots on **Part 6**. Holes holds the small rods in place better. Glue **Part 6** to the top



Poke small holes on the black dots on **11**
Score-fold **11** as shown. Remove the small blue square from Parts **10**. Make two pairs of these.
Solar panel rod will pass through these parts.



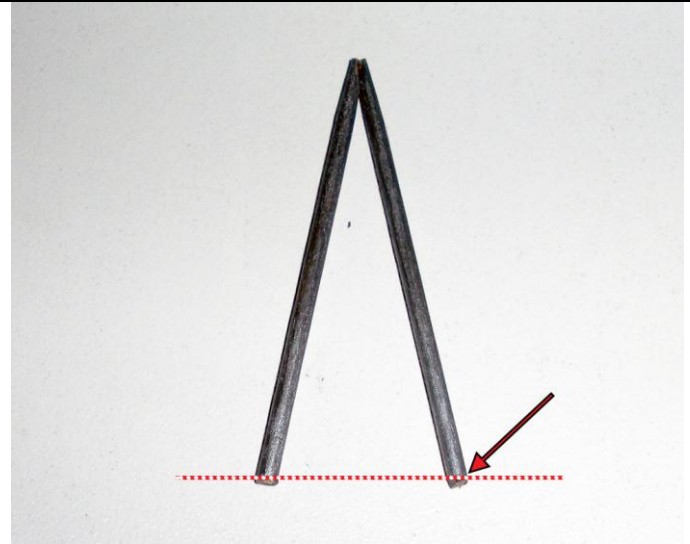
Glue the two pairs of **10-11** assembly and **12-13** into the labeled areas on the top piece.





Can use the struts (**Parts 15**). For realistic look, use long tooth pics – colored light grey - to create the struts. Cut a sharp angle at one end to glue them together as shown. Use the struts provided (Parts 15) as a pattern.

IMPORTANT – make sure all the pieces of the struts are exactly the same length.

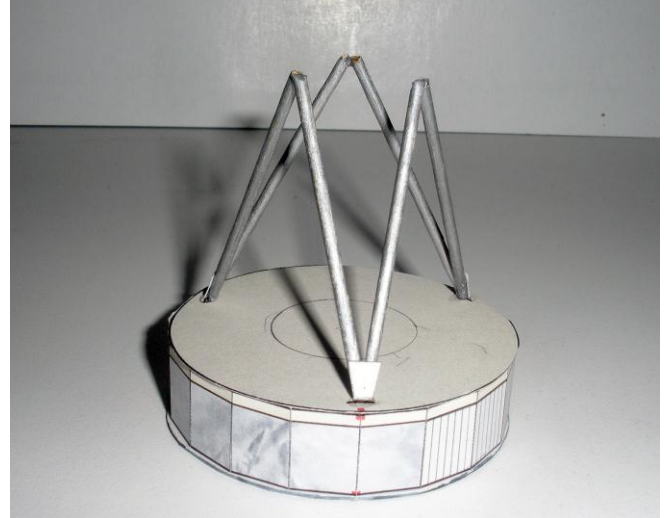


The bottom part of the struts should be the same width as the legs (Parts 15).

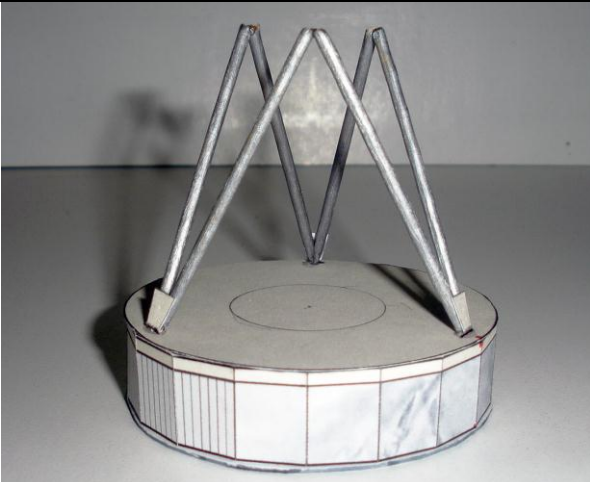
Cut the bottom of the struts flat.

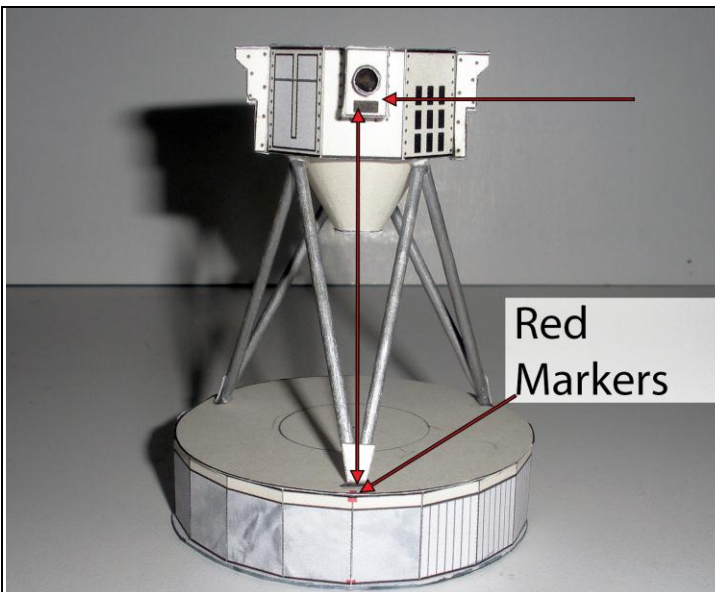


19 is glued at the bottom of each pair of struts.



Glue each pair of struts onto the three line markers on the bottom part as shown. Angle them inward so the tops of each pair of struts can be glued together with the other struts. The circle indicates the center.

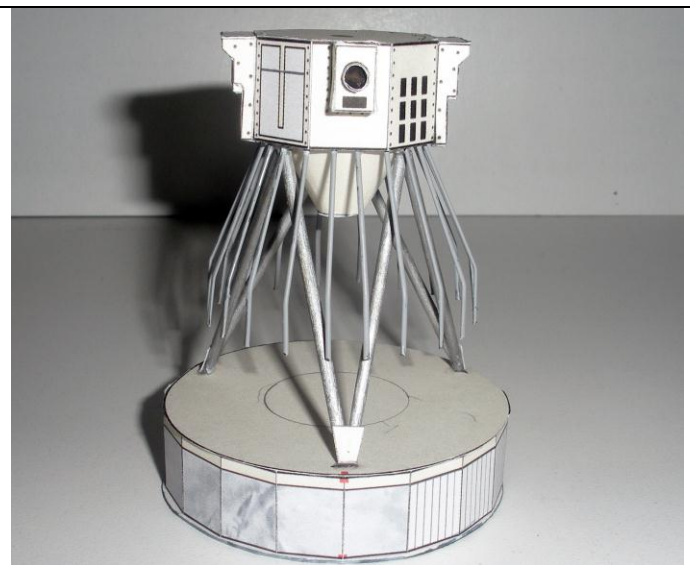




Glue the top piece in place, The camera should be lined with the RED MARKERS on the bottom.

If the top piece does not sit completely level with the rest of the spacecraft, glue a very small piece of thick cardstock under the area of the top piece that need to be raised.

The following steps are quite delicate and requires time and patience. Take you time and take a break if need to during the next few steps.

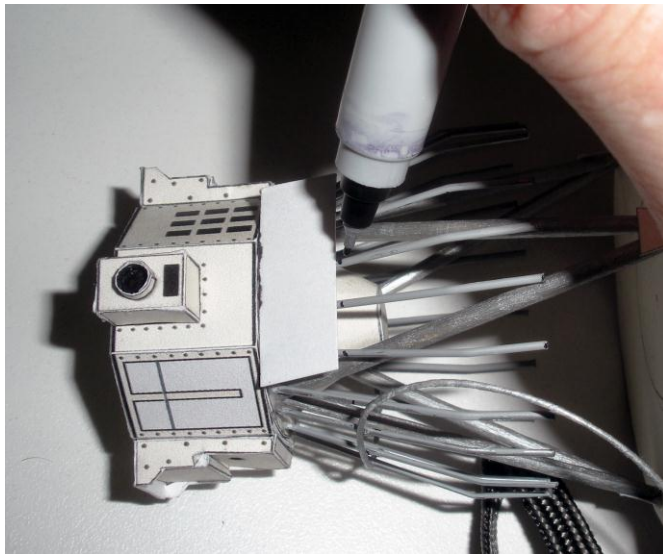


Cut out 20 plastic broom straws (Or other material) colored light grey. Angled one end and cut the proper length using the pattern on the parts sheet.

Turn the model up-side-down.

Glue the long end each onto the black dots on the bottom of the top piece. Angled end should be straight up and down as shown above.

The holes on the black dots simply allows the 20 pieces to hold better onto the spacecraft. Super glue is good for this.



When the glue is dry,
Cut a piece of cardstock at 10mm wide and about 15mm long.

Place it as shown and use a fine tip marker to place a small black mark onto each of the 20 parts (10mm from the top). Do the same thing with a piece of cardstock at 20mm wide to make black marks at 20mm from the top.



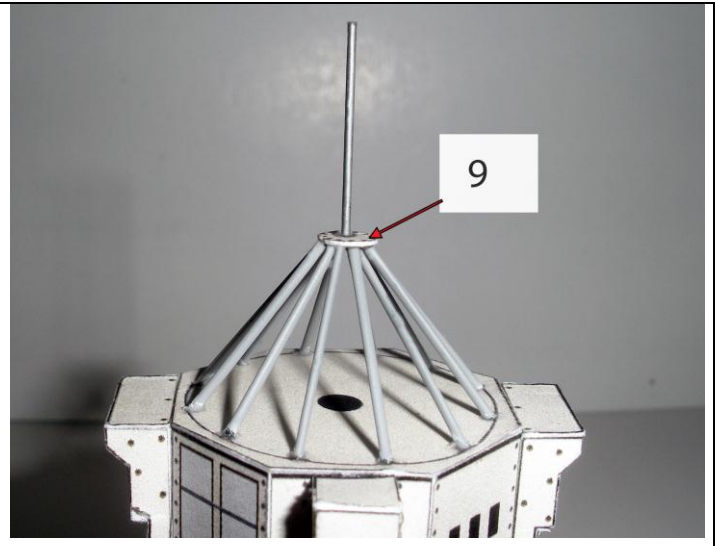
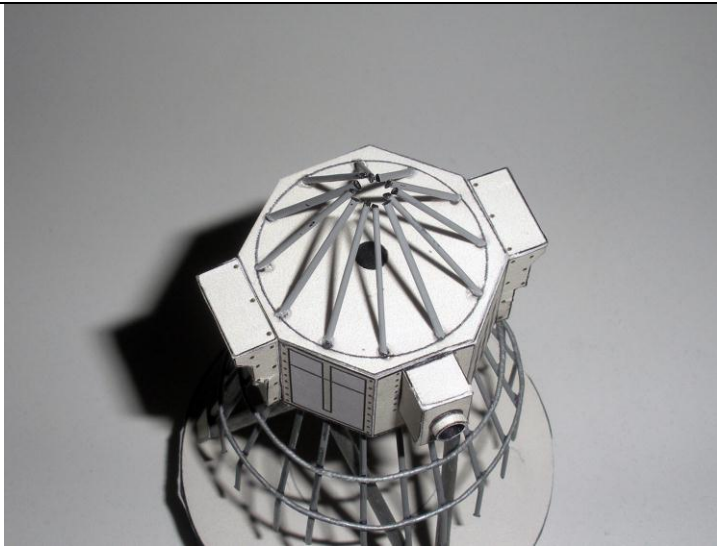
Now the more delicate step.

I used a string, colored light grey and slowly glue it around on the black marks you just made. One at 10mm, the other at 20mm from the top.

Don't pull the string at all, just let it rest straight on the black marks while gluing in place.

See above.

If you model looks like this, congratulations, the hard part is done.



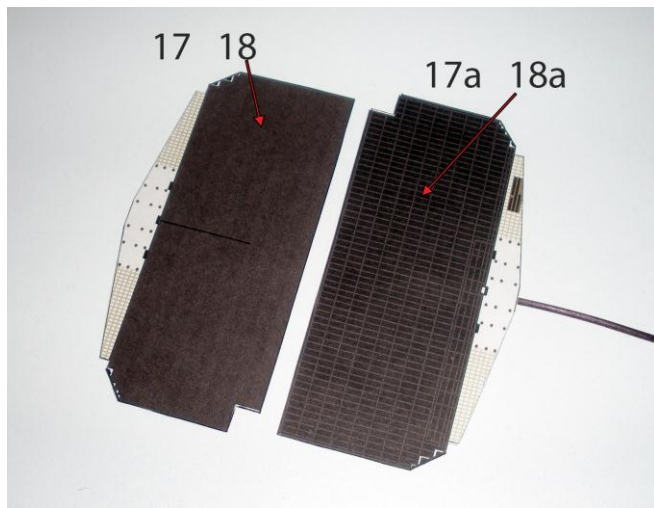
Cut 13 plastic broom straws (Or other material) colored light grey the same length as the pattern on the parts sheet.

Glue 12 of them onto the black dots as shown. Angle them inward towards the black circle on top.

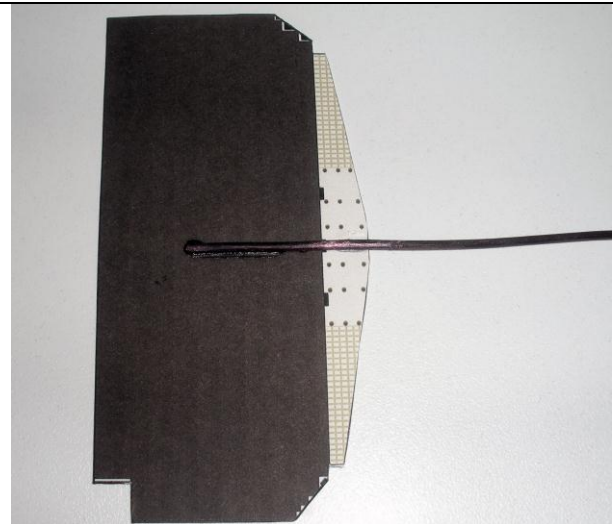
May need to angle some in or out so **Part 9** can sit on top perfectly straight. See next photo.

The holes on the black dots simply allows the 12 pieces to hold better onto the spacecraft.
Super glue will be good for this.

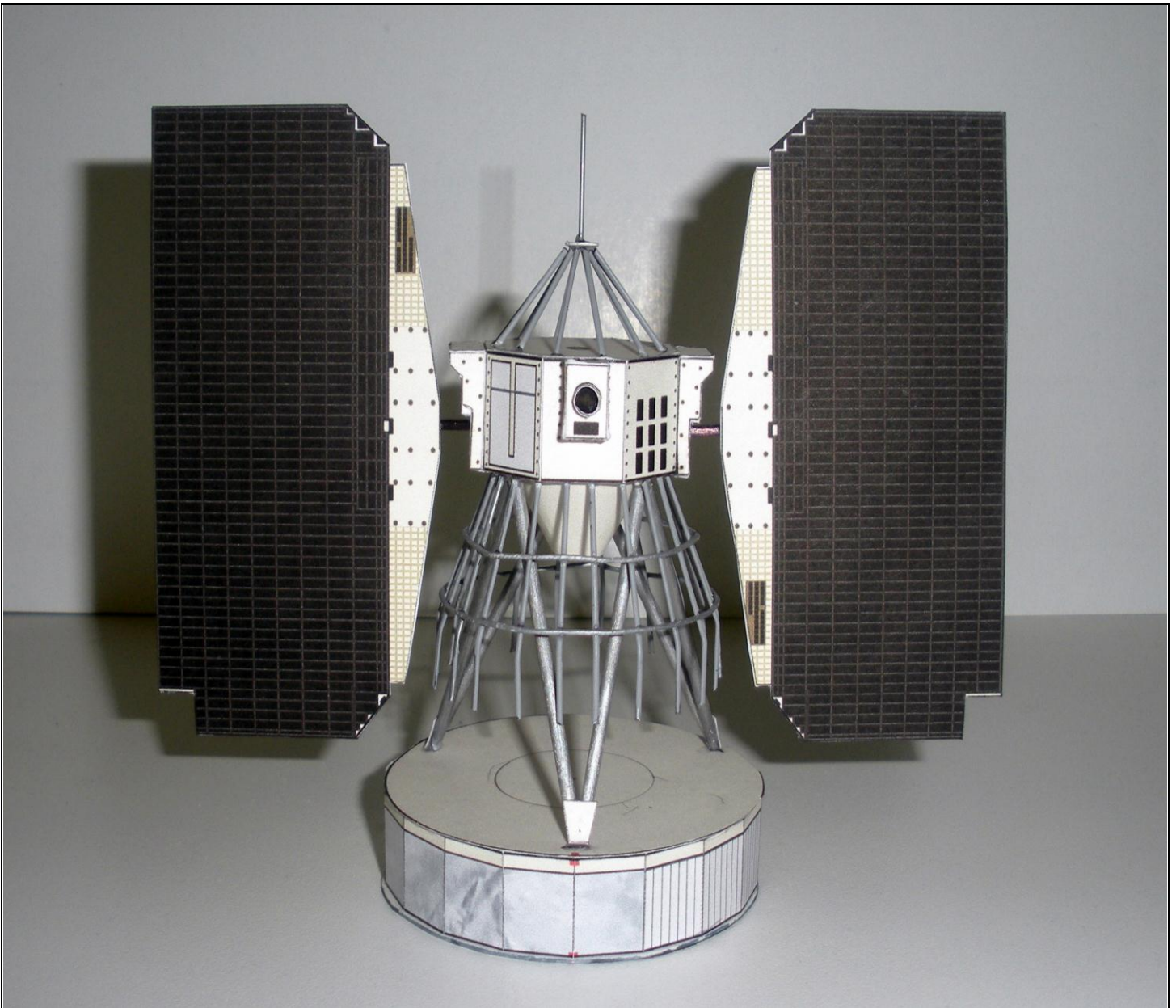
The 13th piece is glue on top of **9**



Glue each pair (17, 17a – 18, 18a) back-to-back.



Cut a thick copper wire at around $4\frac{1}{8}$ long. Glue one end on the black line behind one pair of solar panels as shown.



Slide the other end through the top part as shown and glue the other solar panel on. Each solar panel should be around 1/8 inch from side of the top part of the satellite.

Your model is done.