

Mariner 4



Mariner 4 was the fourth in a series of spacecraft used for planetary exploration in a flyby mode and represented the first successful flyby of the planet Mars, returning the first pictures of the martian surface. These represented the first images of another planet ever returned from deep space. Mariner 4 was designed to conduct closeup scientific observations of Mars and to transmit these observations to Earth. Other mission objectives were to perform field and particle measurements in interplanetary space in the vicinity of Mars and to provide experience in and knowledge of the engineering capabilities for interplanetary flights of long duration.

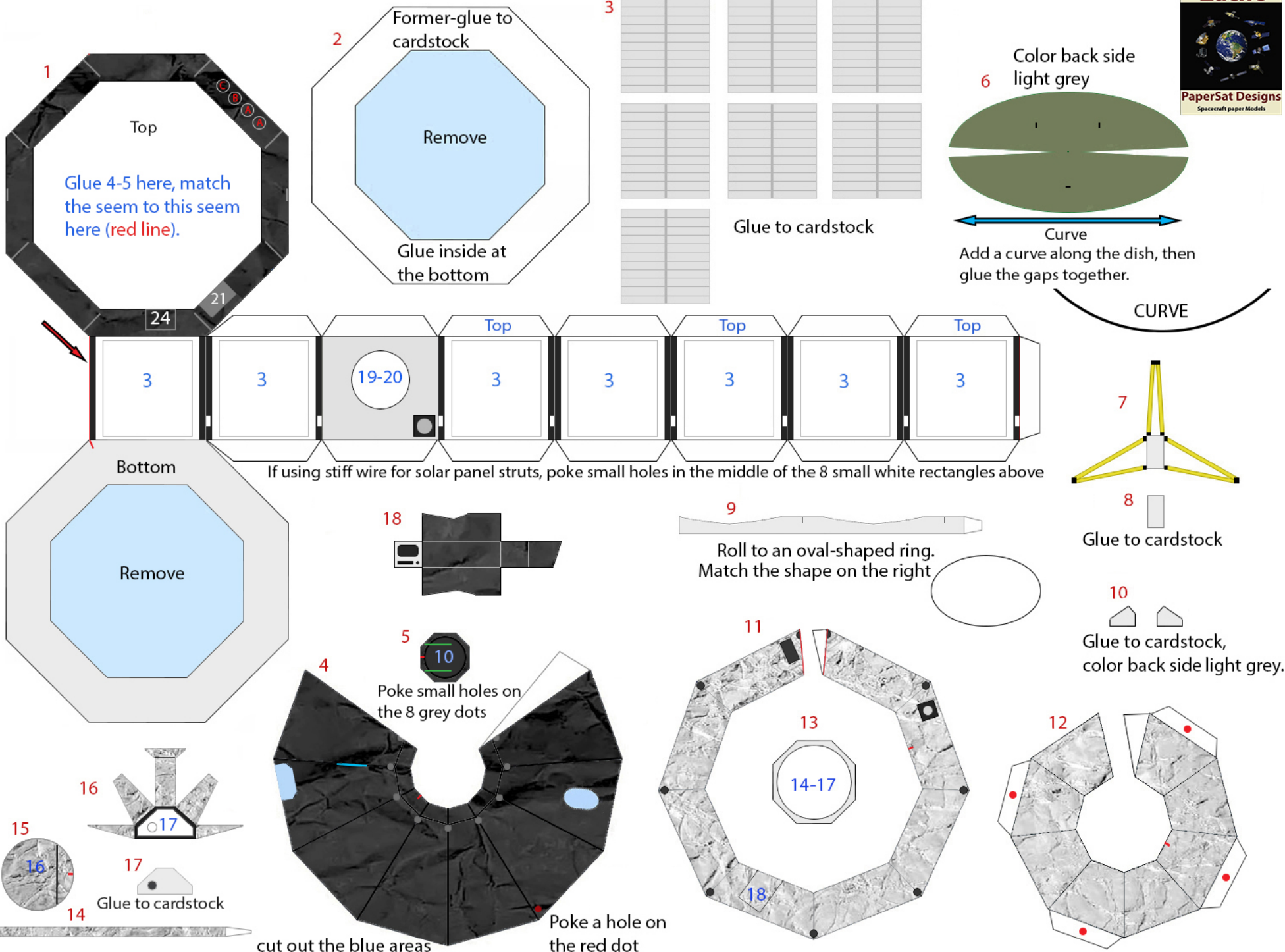
The total data returned by the mission was 5.2 million bits. All experiments operated successfully with the exception of the ionization chamber/Geiger counter which failed in February, 1965 and the plasma probe, which had its performance degraded by a resistor failure on 6 December 1964. The images returned showed a Moon-like cratered terrain (which later missions showed was not typical for Mars, but only for the more ancient region imaged by Mariner 4). A surface atmospheric pressure of 4.1 to 7.0 mb and daytime temperatures of -100 degrees C were estimated and no magnetic field was detected, leading to the conclusion that the solar wind may have direct interaction with the martian atmosphere, and that the atmosphere and surface are fully exposed to solar and cosmic radiation.



NOTES

- Mariner 4 became the world's first successful mission to Mars.
- Mariner 4 was the first spacecraft to navigate using the stars, like ancient mariners that sailed the seas.
- Mariner 4 went farther than any other human-made object at the time, and used the bright star Canopus as a reference.
Once its star sensor found Canopus, gas jets on the spacecraft kept the vehicle locked in the correct orientation for the trip to the Red Planet.
- Mariner 4 reached Mars on July 14, 1965, and took 22 pictures as it flew by. They were the first pictures ever taken of another planet from deep space.
The pictures showed moon-like craters, shattering the idea of finding life on the surface, but opening the age of scientific Mars exploration.
- Mariner 4 carried an analog television camera, the best technology at the time.
- Mariner 4 also discovered that Mars has a very thin atmosphere. This discovery was made by the spacecraft sending radio signals through the Martian atmosphere as it passed behind the planet.
- This first ever visit to Mars was a boost for the United States in the midst of the Cold War with the Soviet Union.
- President Lyndon Johnson passed out medals to NASA and the Jet Propulsion Laboratory for the success of Mariner 4.
- Mariner 4 was launched on November 28, 1964.

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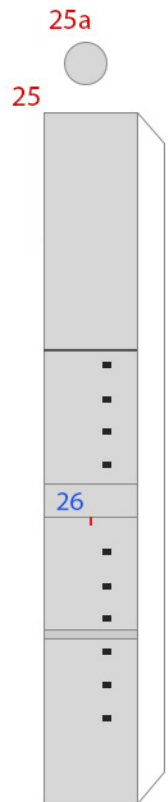
Mariner 4

Need 8 plastic broom straws or similar material, cut at the same length as the line below, colored light grey with a black tip.



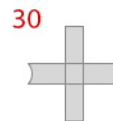
Use the two lines on the right to glue the 8 pieces you made at the proper angle.

bottom of spacecraft

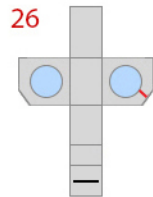


You can roll this into a long narrow tube, or glue around a BBQ skewer just under 3mm (0.12 inch or 0.3 cm) in diameter.

Need a small round ball around 5 mm diameter colored light grey - or use the part below to simulate one.

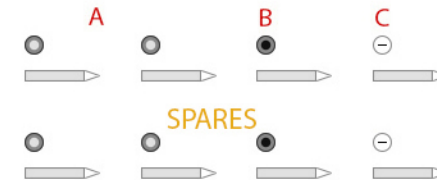
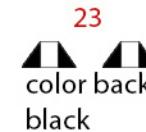
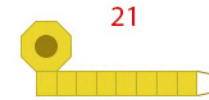
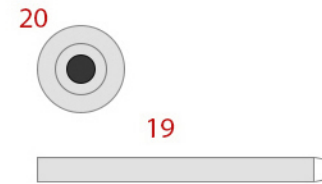


Need a small round ball around 5 mm diameter colored black - or use the part below to simulate one.

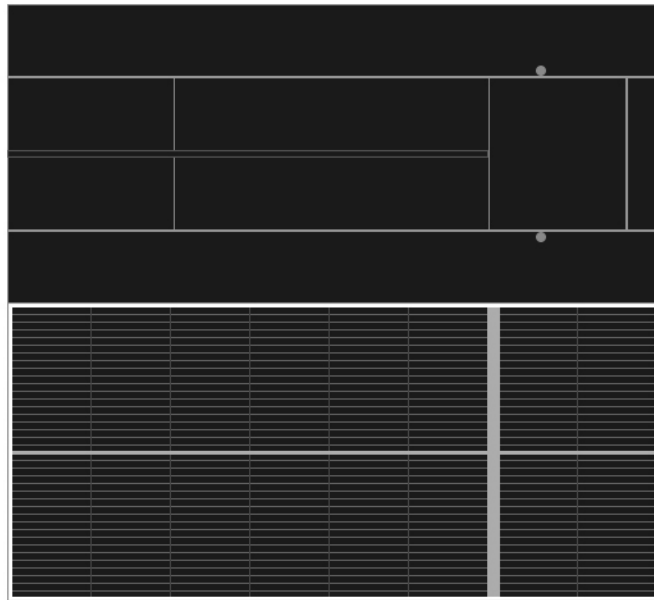


Cut out the blue areas.

Need plastic broom straw or similar material cut at the same length as the line below, colored light grey

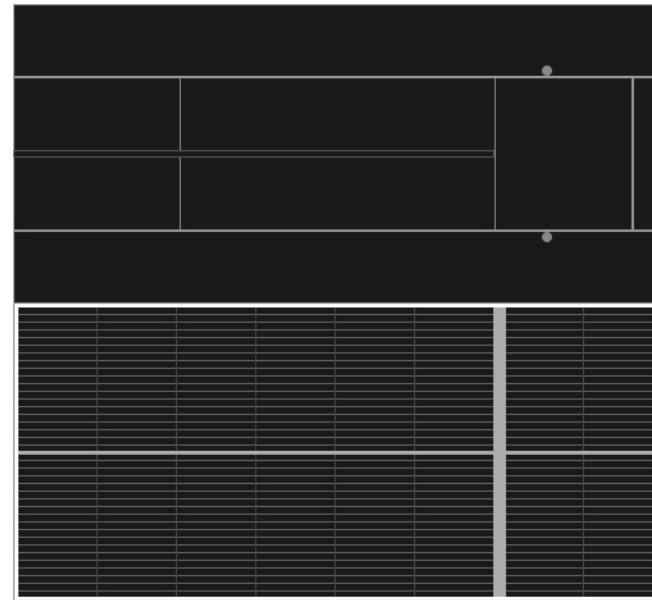


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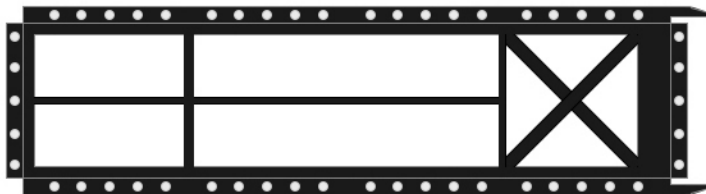


31

Fold in half, glue back-to-back

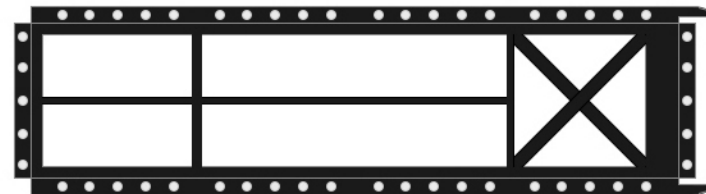


Fold in half, glue back-to-back



32

Color back Black



33



Fold-glue back-to-back,
then cut out for color on both sides.

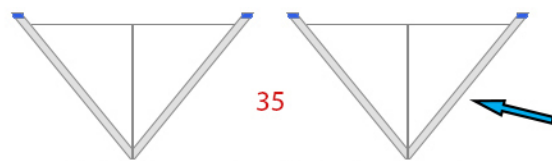
34



Fold-glue back-to-back,
then cut out for color on both sides.



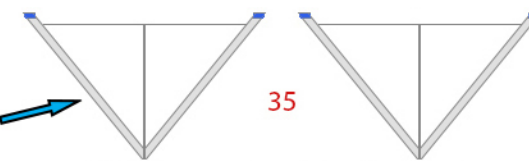
35



Fold-glue each pair back-to-back

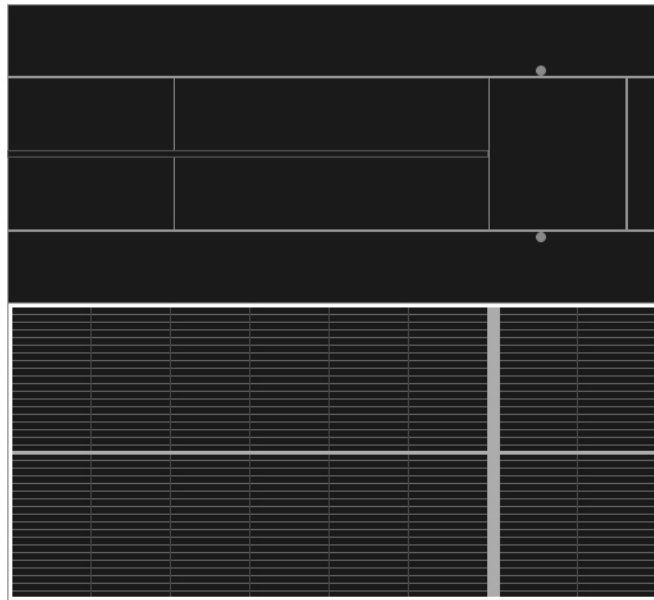
For more realistic look, cut
thin music wire or plastic
broom straw the same length
as the struts colored light grey.

35



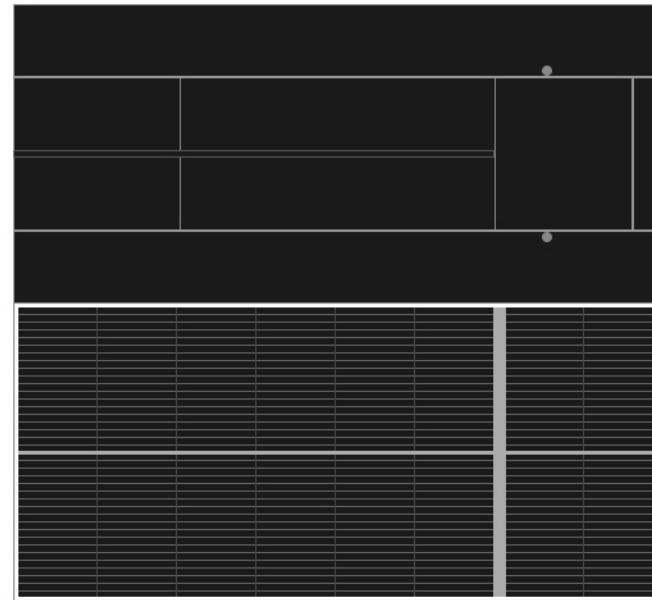
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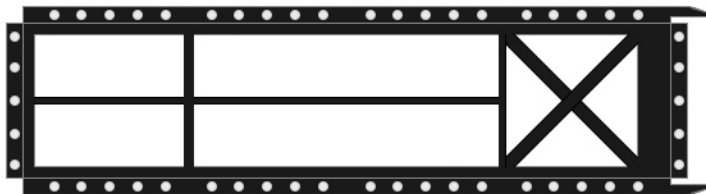


31

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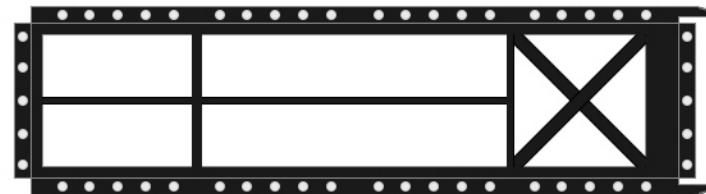


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32

Color back Black



33



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then cut out for color on both sides.

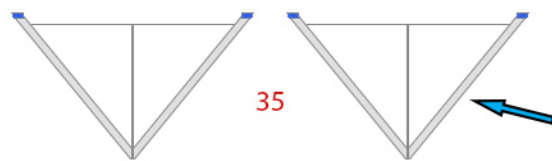
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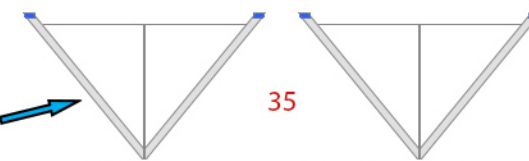
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