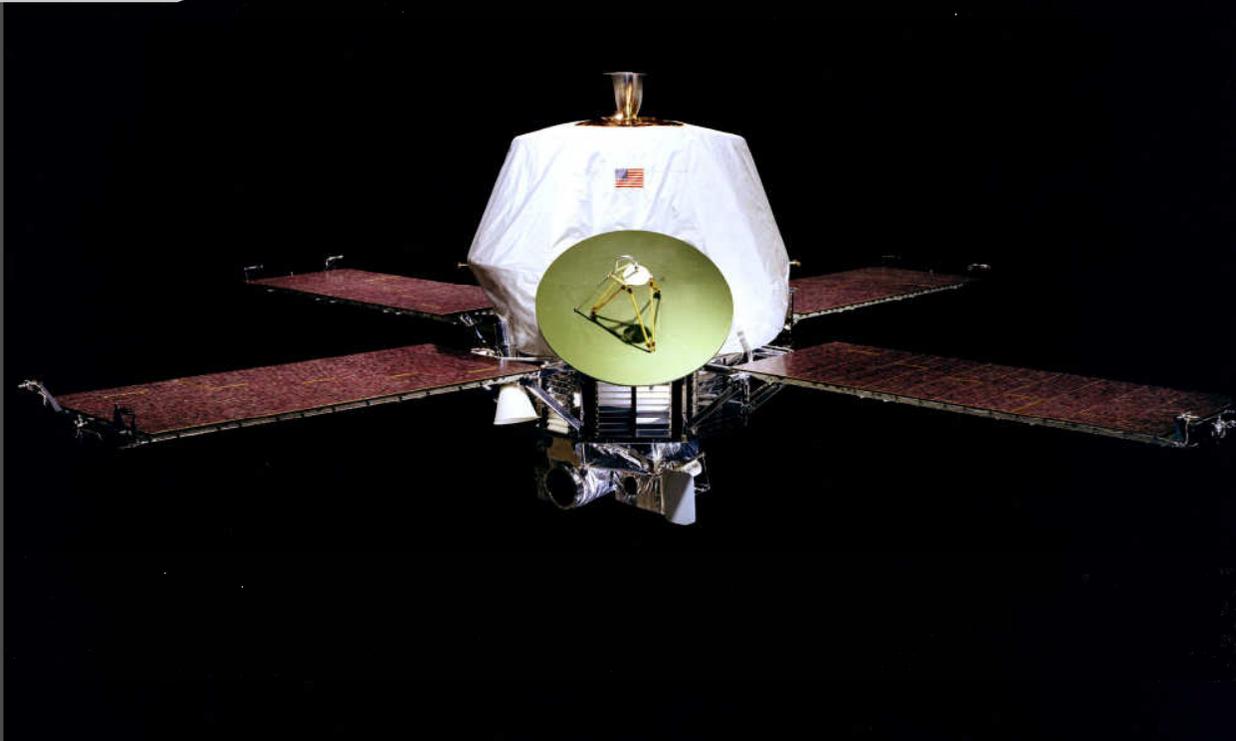


## Mariner 9

40th Anniversary Model



### History

Launched on May 30, 1972, Mariner 9 was the first spacecraft to orbit another planet. The spacecraft followed the same design as its predecessors, Mariners 6 and 7. However, Mariner 9, being an orbiter, would need a whole lot more muscle than her lanky older sisters to keep her in orbit.

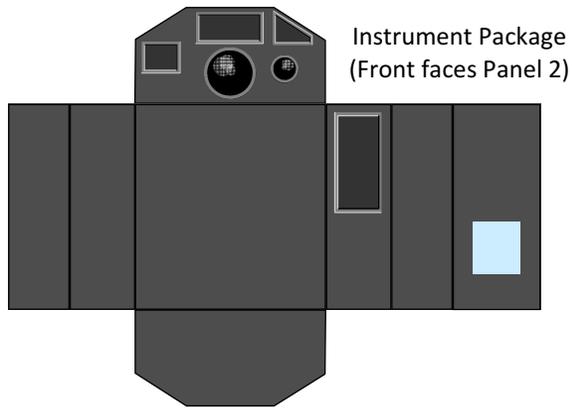
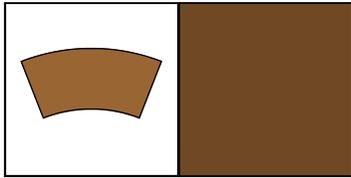
Up until the 1970s, planetary exploration had been done with flyby spacecraft, essentially artillery shells filled with instrumentation and basic attitude control. An orbiter would require a lot more computing capability in order to keep the ship in orbit; to make sure that the craft was never too high or too low, ascending too fast or descending into oblivion.

Orbiters had been sent to the moon (after all, the testflights and eventual Apollo Missions

were orbiters), however, Mars was a much more distant body, and getting a spacecraft to orbit a planet one au away would be an infinitely more complex task. While a flyby would be akin to shooting a .22 Long Rifle *past* a boulder some three miles away, an orbiter mission would be something along the lines of using that same round to only graze the moss along the entire side of the boulder without embedding the round in the rock itself. Also, our poor rifleman would have the added inconvenience of the boulder moving at some 30 mph.

Despite what seemed to be a nigh-impossible task, Mariner 9 arrived at Mars on November 13, 1972, establishing orbit nine miles above Mars' surface. The ship is still in orbit as of November 2011, forty years after her launch.

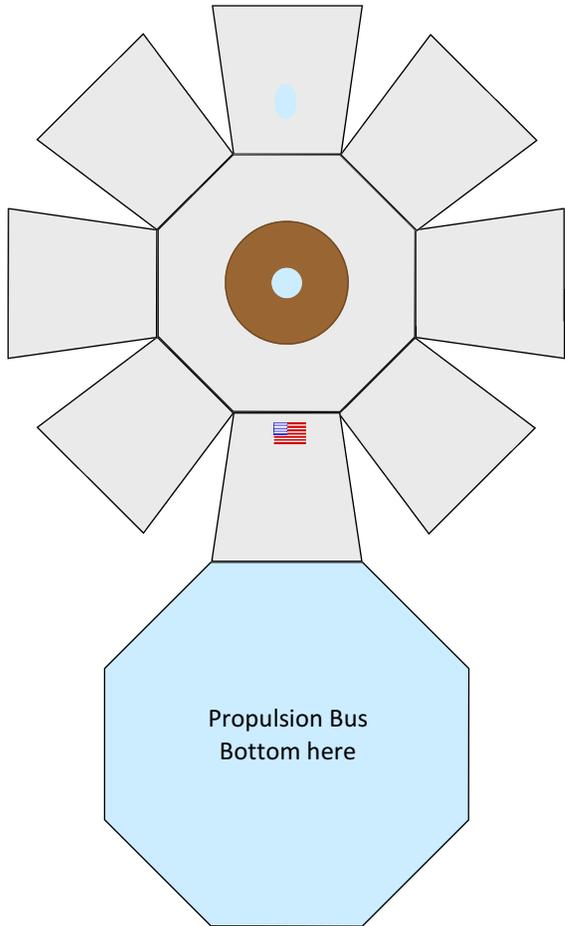
Maneuvering Thruster goes on bus top



Instrument Package (Front faces Panel 2)

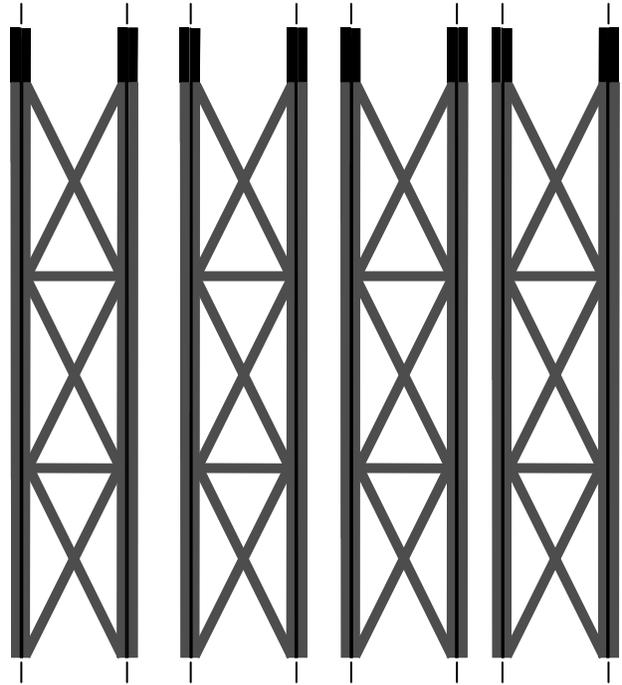


Position Instrument Mount so that the Instrument Package tilts down.

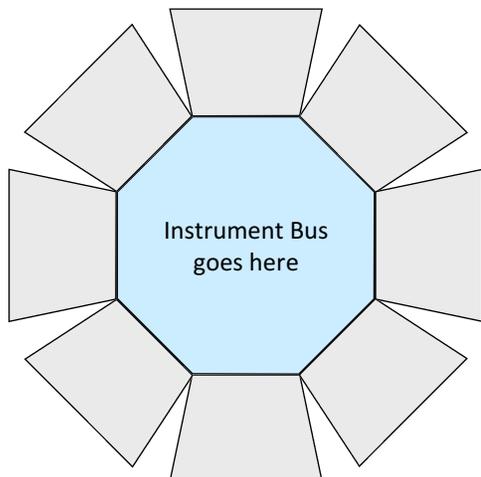


Propulsion Bus Bottom here

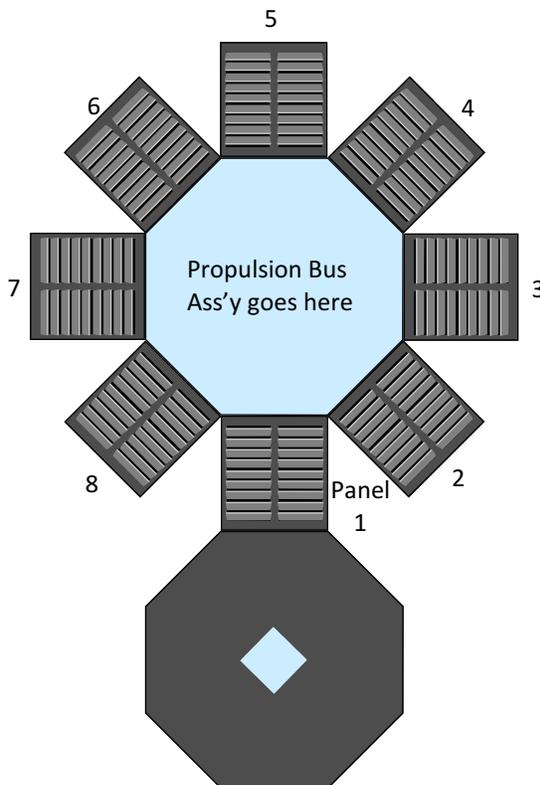
Propulsion Bus Top



(Optional) Solar Array Support Struts

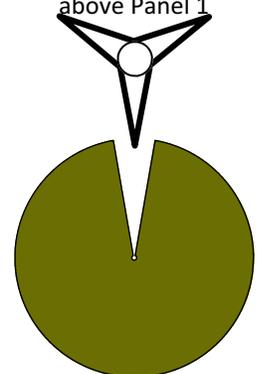


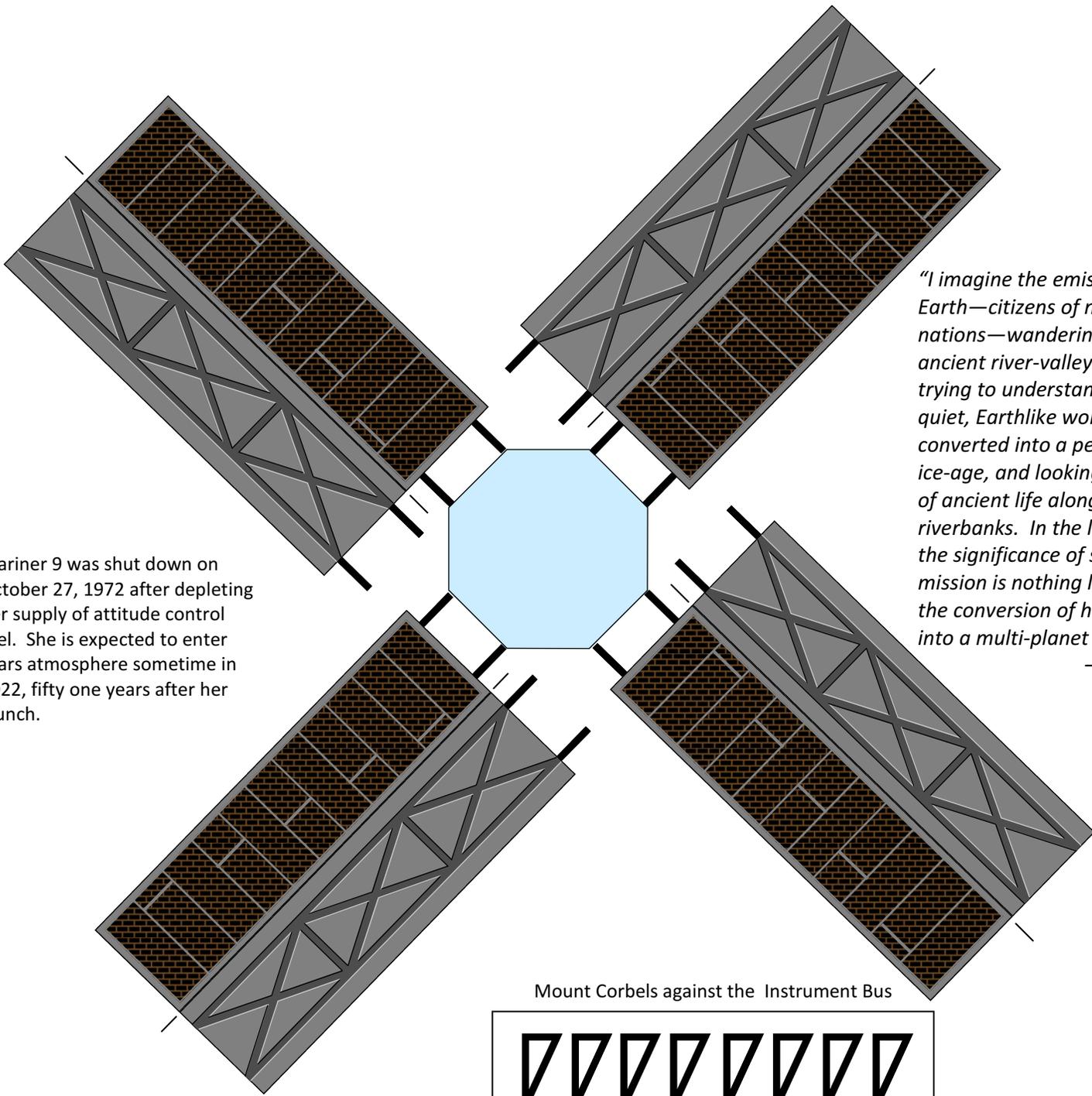
Propulsion Bus Bottom



November 13, 2011 marked the 40th anniversary of Mariner 9's Mars arrival.

Place HGA above Panel 1

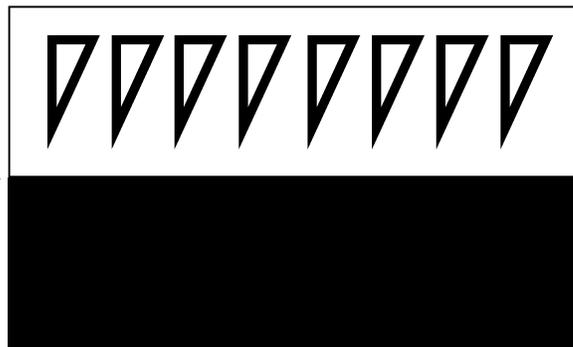




Mariner 9 was shut down on October 27, 1972 after depleting her supply of attitude control fuel. She is expected to enter Mars atmosphere sometime in 2022, fifty one years after her launch.

*"I imagine the emissaries of Earth—citizens of many nations—wandering down an ancient river-valley on Mars, trying to understand how a quiet, Earthlike world was converted into a permanent ice-age, and looking for signs of ancient life along the riverbanks. In the long run, the significance of such a mission is nothing less than the conversion of humanity into a multi-planet species."*  
 —Carl Sagan

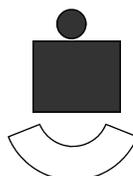
Mount Corbels against the Instrument Bus



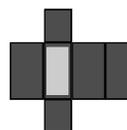
**Mariner 9's Instrumentation:**

- UVS**— Ultraviolet Spectrometer
- IRIS**— Infrared Interferometer Spectrometer
- Canopus Sensor**— The ship's "sextant"; used Canopus as the main reference point for attitude control.
- Sun Sensor**— Same as the Canopus sensor, but used the sun instead.
- HGA, MGA, and LGA**
- Wide & Narrow-Angle TV Cameras**
- IRR**— Infrared Radiometer

MGA goes on left side of Panel 8



Star sensor goes to the right of Panel 2



LGA goes behind the Propulsion Bus

