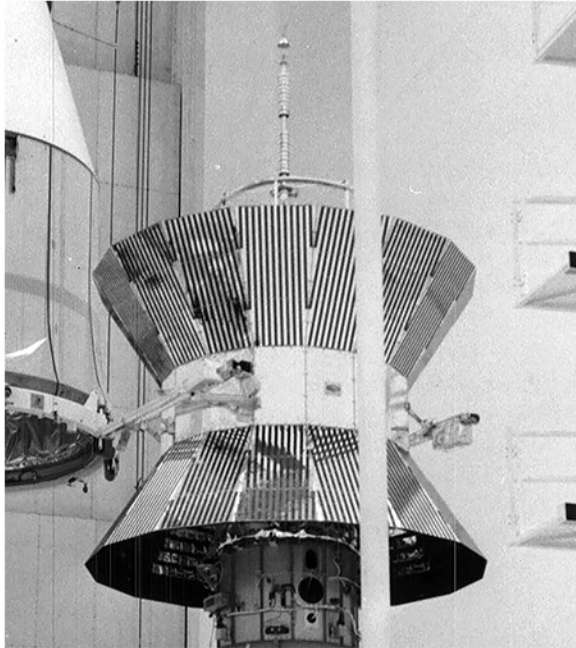


Helios 1



Helios-A and Helios-B (Helios 1 and Helios 2) are a pair of probes launched into heliocentric orbit for the purpose of studying solar processes. A joint venture of West Germany's space agency DFVLR (70 percent share) and NASA (30 percent), the probes were launched from Cape Canaveral Air Force Station, Florida, on December 10, 1974, and January 15, 1976, respectively. Built by the main contractor Messerschmitt-Bölkow-Blohm, they were the first spaceprobes built outside both the United States and the Soviet Union to leave Earth orbit.

The probes set a maximum speed record for spacecraft of 252,792 km/h (157,078 mph; 70,220 m/s). Helios-B flew 3,000,000 kilometres (1,900,000 mi) closer to the Sun than Helios-A, achieving perihelion on April 17, 1976, at a record distance of 43.432 million km (26,987,000 miles), closer than the orbit of Mercury. Helios-B was sent into orbit 13 months after the launch of Helios-A. The Helios space probes completed their primary missions by the early 1980s, and continued to send data up to 1985.

Electrical power is provided by solar cells attached to the two truncated cones. To keep the solar panels at a temperature below 165 °C (329 °F) in the proximity of the Sun, the solar cells are interspersed with mirrors, covering 50% of the surface and reflecting part of the incident sunlight while dissipating the excess heat. The energy supplied by the solar panels is a minimum of 240 watts when the probe is in the farthest part of its orbit from the Sun.

Helios-A

Helios-A was launched on December 10, 1974, from Cape Canaveral Air Force Station Launch Complex 41 in Cape Canaveral, Florida. This was the first operational flight of the Titan IIIE rocket. The probe was placed in a heliocentric orbit of 192 days with a perihelion of 46,500,000 km (28,900,000 mi) from the Sun. Several problems affected operations. One of the two antennas did not deploy correctly, reducing the sensitivity of the radio plasma apparatus to low-frequency waves. When the high-gain antenna was connected, the mission team realized that their emissions interfered with the analyzer particles and the radio receiver.

During the first perihelion in late February 1975, the spacecraft came closer to the Sun than any previous spacecraft. The temperature of some components reached more than 100 °C (212 °F), while the solar panels reached 127 °C (261 °F), without affecting probe operations. During the second pass on September 21, however, temperatures reached 132 °C (270 °F), which affected the operation of certain instruments.

Helios-B

Before Helios-B was launched, some changes were made to this spacecraft based on the lessons learned from the operations of Helios-A. The small engines used for attitude control were improved. Changes were made to the implementation mechanism of the flexible antenna and high gain antenna emissions. The X-ray detectors were improved so that they could detect gamma ray bursts and be used in conjunction with Earth-orbiting satellites to triangulate the location of the bursts. Because temperatures on Helios-A were always more than 20 °C (36 °F) below the design maximum at perihelion, it was decided that Helios-B would orbit even closer to the Sun. The thermal insulation was enhanced so that the satellite could support 15 percent greater heat flux.

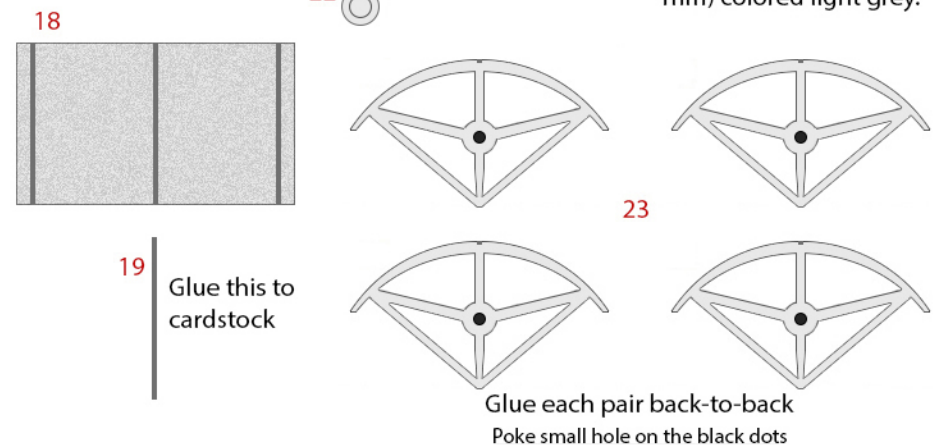
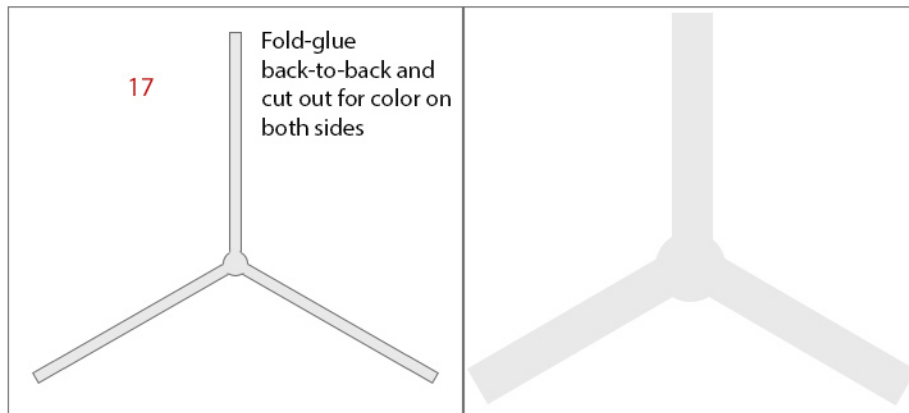
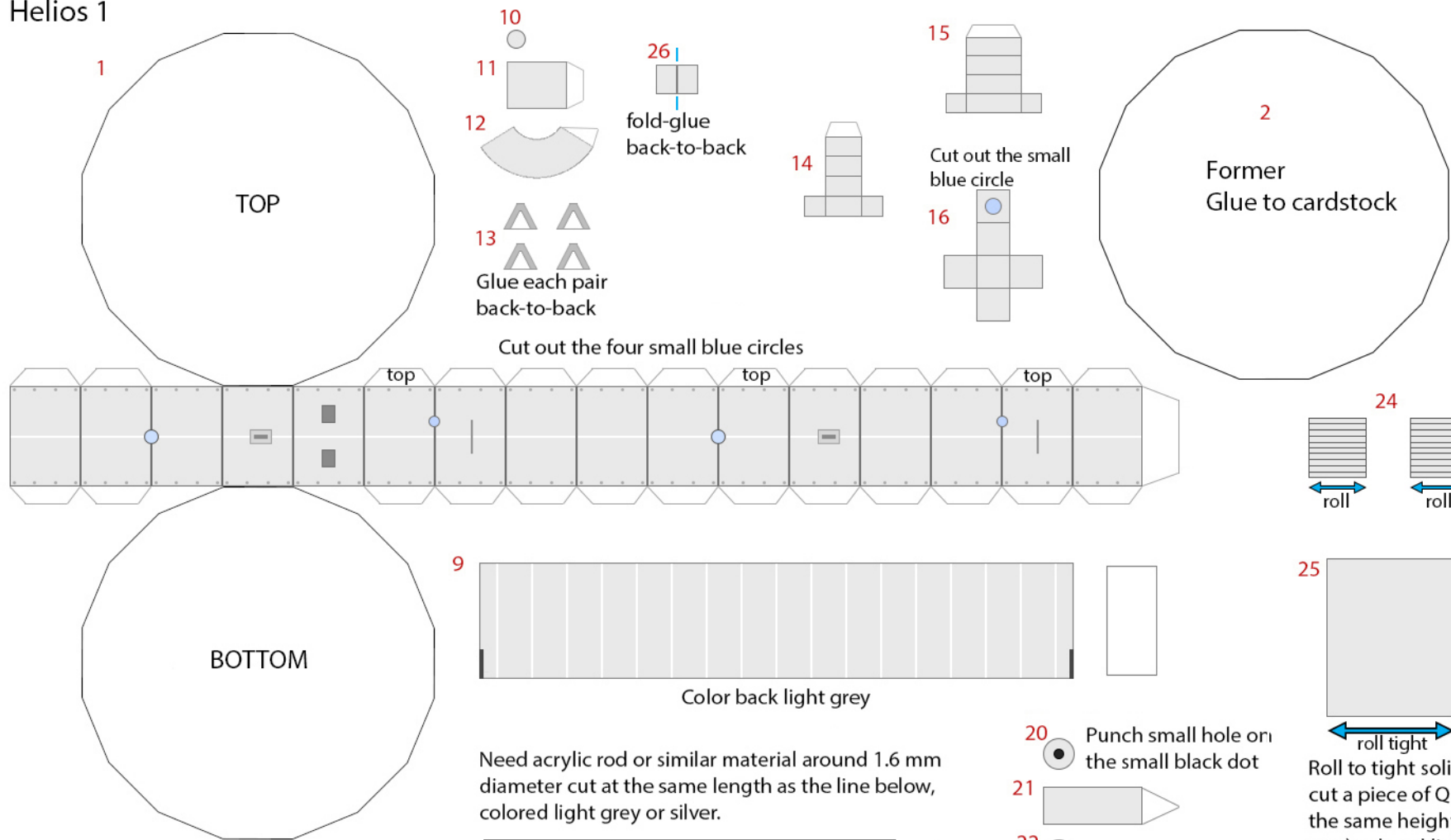
Helios-B was launched on January 10, 1976, by a Titan IIIE rocket. The probe was placed in an orbit with a 187-day period and a perihelion of 43,500,000 km (27,000,000 mi; 0.291 AU). The orientation of Helios-B with respect to the ecliptic was reversed 180 degrees compared to Helios-A so that the micrometeorite detectors could have 360 degree coverage. On April 17, 1976, Helios-B made its closest pass of the Sun at a record heliocentric speed of 70 kilometres per second (250,000 km/h; 160,000 mph). The maximum recorded temperature was 20 °C (36 °F) higher than measured by Helios-A.

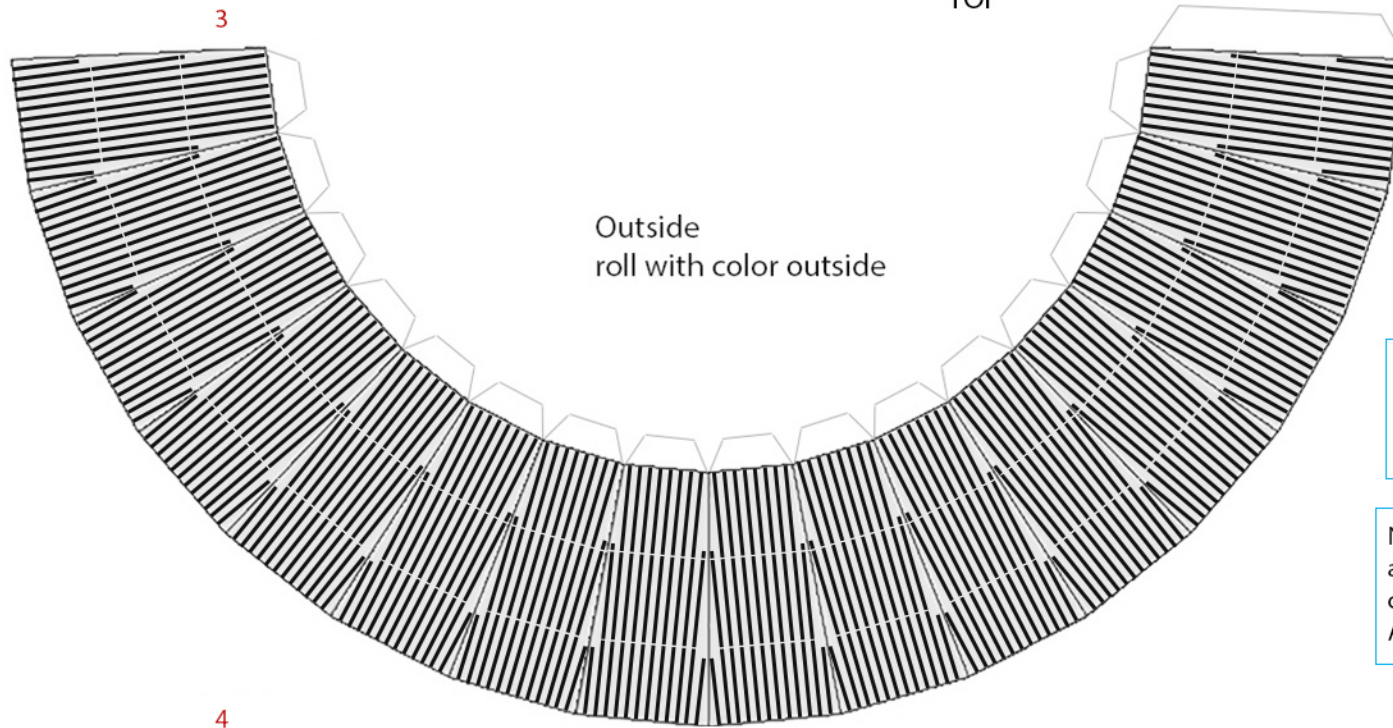
The primary mission of each probe spanned 18 months, but they operated much longer. On March 3, 1980, four years after its launch, the radio transceiver on Helios-B failed. On January 7, 1981, a stop command was sent to prevent possible radio interference during future missions.

In 1984, the main and backup radio receivers failed on Helios-A, indicating that the high-gain antenna was no longer pointed towards Earth. The last telemetry data was received on February 10, 1986. As of 2016, the probes are no longer functional, but still remain in their elliptical orbits around the Sun.



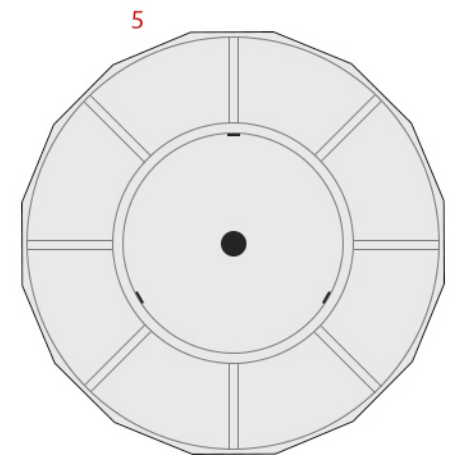
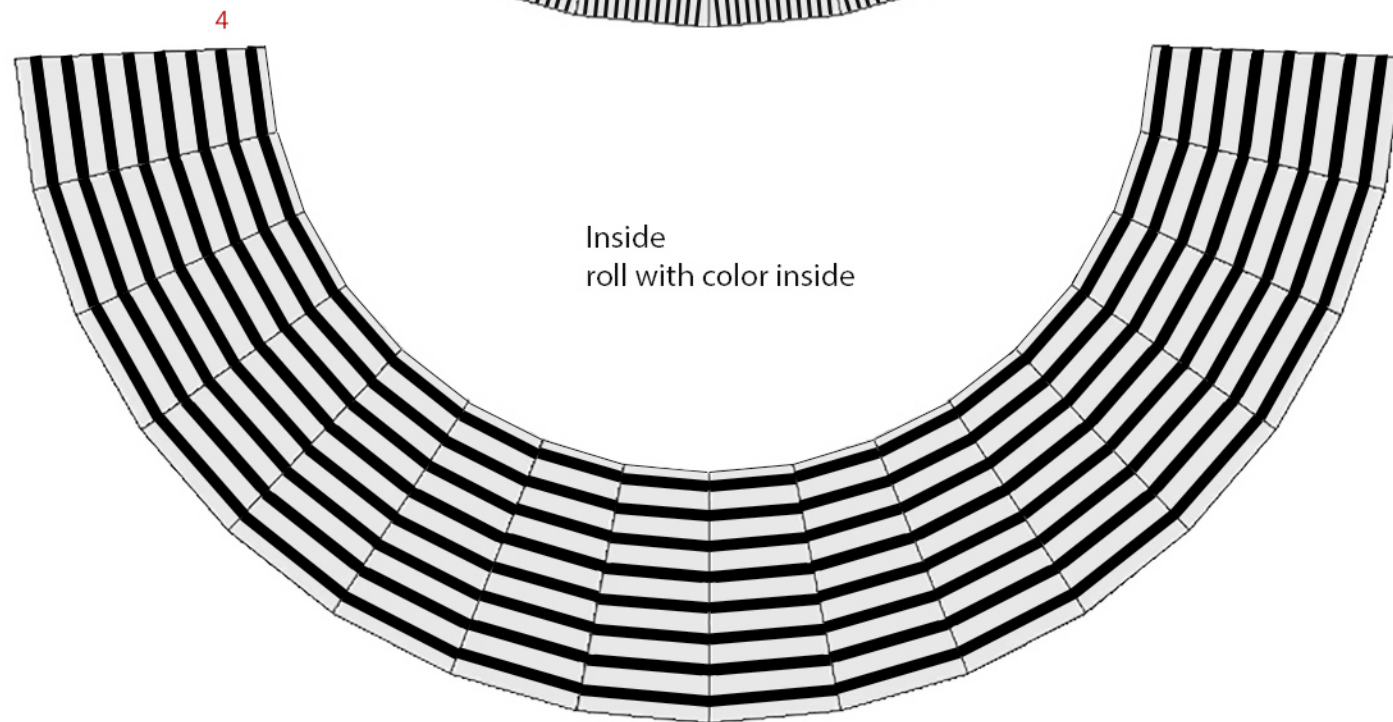
Helios 1



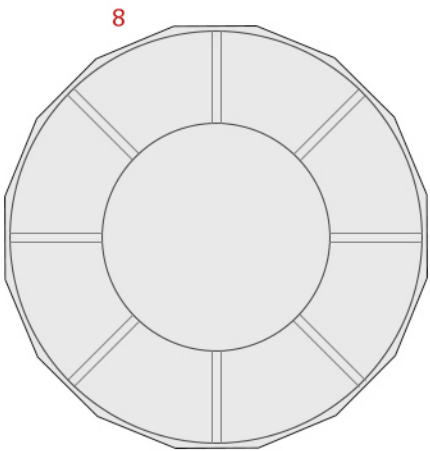
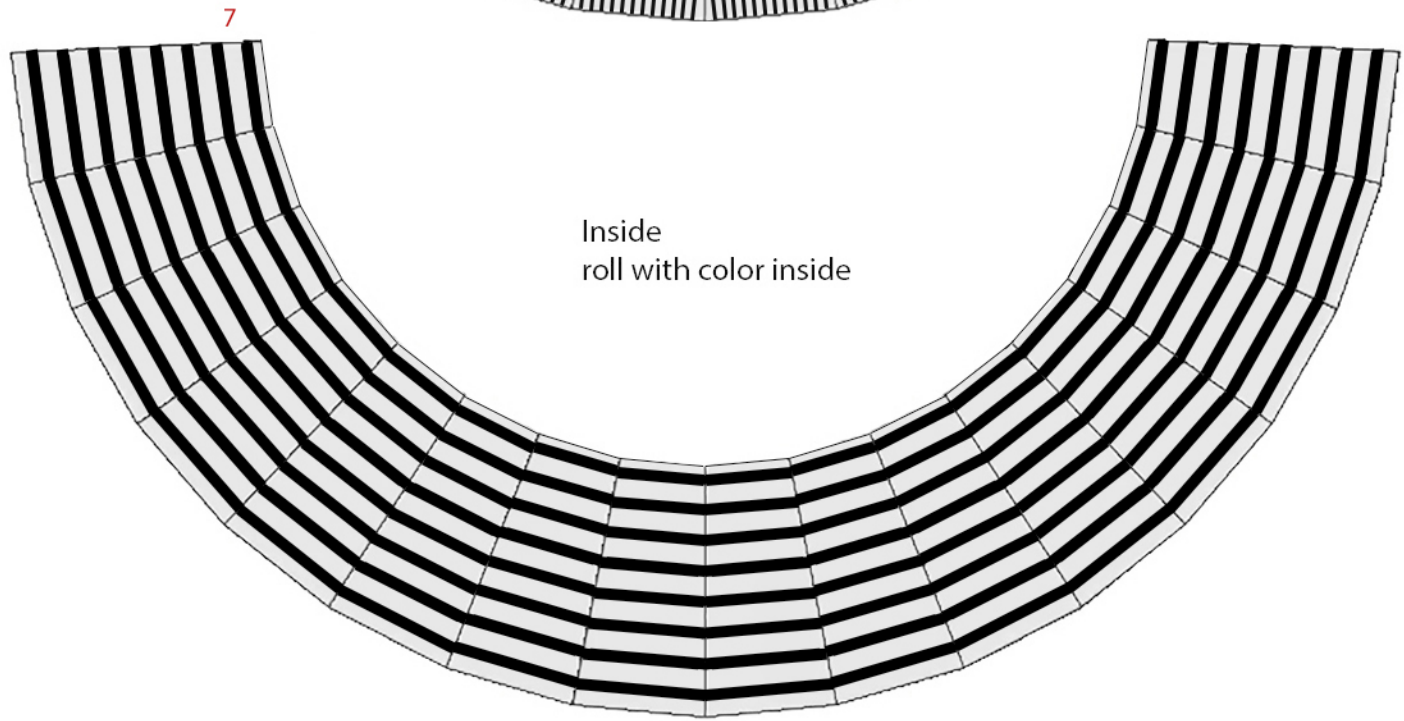
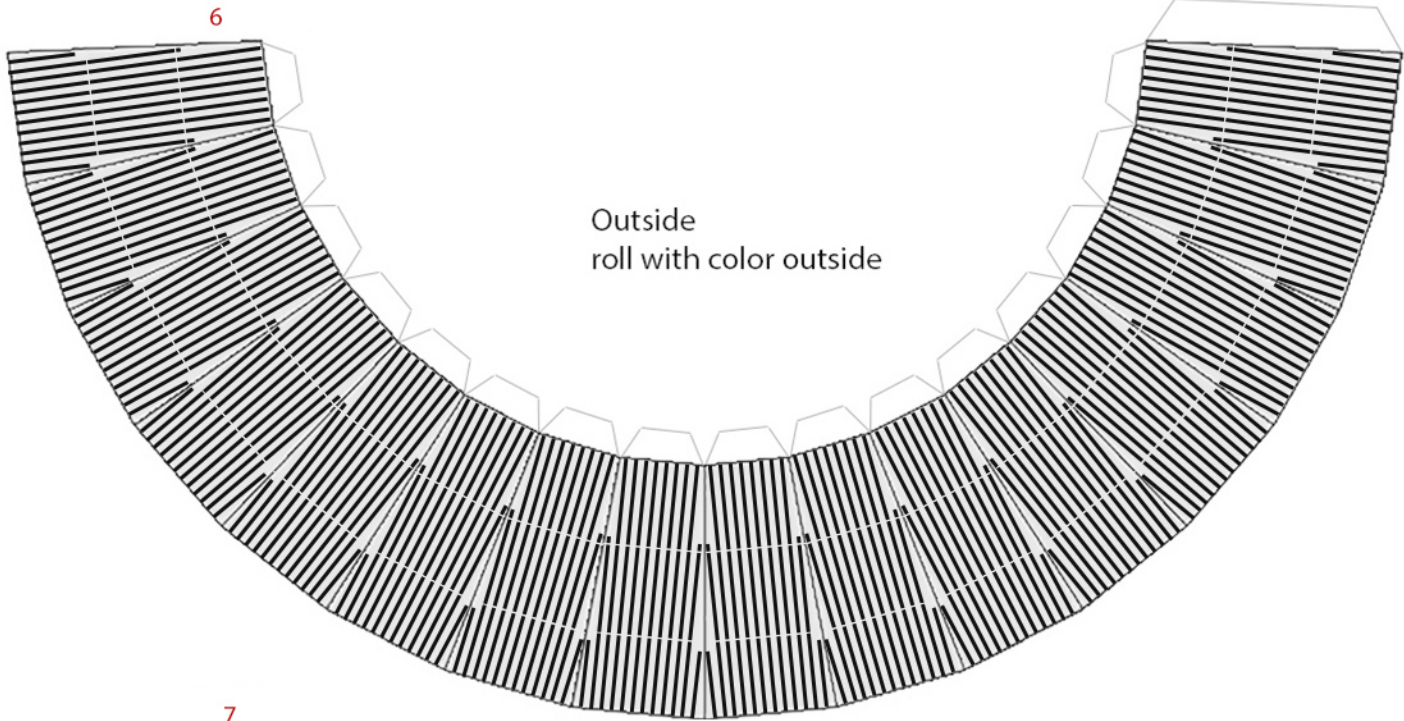
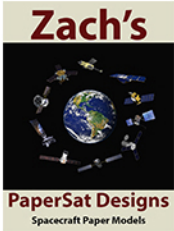


Need a wood or plastic skewer around 2 mm diameter, cut at 10.5 inches (269 mm) long, colored light grey or silver for the Magnetometer booms.

Need two (2) acrylic rods (or similar material) around 1.6 mm diameter cut at 110 mm long, colored light grey or silver for the Electric Field Antennas.



Glue to cardstock



Glue to cardstock