I built this 1/24 scale model in 2011 for the IPMS/USA National Convention in Columbus, Ohio. The model entry took a 2nd place in Unmanned – Space Historical at the contest.

The craft was hexagonal and just large than a hexagonal drafting pencil lead box. I cut a section of the box to length, and plated the sides with 0.75 mm styrene sheet.
Pencil lead box

Adding 0.75 mm styrene sheet

End pieces and a wood dowel inserted for stiffness

After cutting off excess, sanded it all smooth
I used a Dremel Moto-Tool in a mini drill press and an abrasive wheel to cut a brass tube for the mounting ring. I sanded the ring edges with fine sandpaper to true up the width and remove any burrs. The 2 magnetometer booms and wobble damper boom were made from 0.75 mm steel wire, 1/16 inch aluminum tubing and a block of styrene.
I drilled holes for the booms and antenna

I cemented the brass ring to the body with 2-part epoxy after painting the body gold with spray paint. I added orange foil to the center of the ring.
I used a photo to scale the solar cells then drew them with a CAD program.

White on black

I flipped white for black so the cells would be black and the lines white (clear on the decal film).

Black on white for decals (white will be clear)

I used large Avery (8163) clear film letter label for the decals
I then trimmed each decal carefully and applied them carefully. The film had a matte finish, so on top of the gold paint it became nearly invisible.

Styrene blocks and strips were applied to the body for the instruments. Booms were cemented in place.
The S-band antenna was a styrene cylinder mounted to a steel wire based on the artwork I could find. I am not certain the antenna was on a boom. I applied silver foil to the booms, covered the top with orange foil and made a stand.
Resources:

NASA NSSDC info:

**Apollo 15 Subsatellite**  
**NSSDC ID:** 1971-063D

**Description**

The Apollo 15 subsatellite (PFS-1) was a small satellite released into lunar orbit from the Apollo 15 Service Module. Its main objectives were to study the plasma, particle, and magnetic field environment of the Moon and map the lunar gravity field. Specifically, it measured plasma and energetic particle intensities and vector magnetic fields, and facilitated tracking of the satellite velocity to high precision. A basic requirement was that the satellite acquire fields and particle data everywhere on the orbit around the Moon. A virtually identical subsatellite was also deployed by Apollo 16. The Moon's roughly circular orbit about the Earth at ~380,000 km (60 Earth radii) carried the subsatellite into both interplanetary space and various regions of the Earth's magnetosphere. The satellite orbited the Moon and returned data from 4 August 1971 until January 1973.

**Spacecraft and Subsystems**

The Apollo 15 subsatellite was a hexagonal cylinder 78 cm in length and approximately 36 cm across opposite corners of the hexagon with a mass of 36.3 kg. Three equally-spaced 1.5-meter-long deployable booms were hinged to one of the end platforms. A fluxgate magnetometer was on the end of one boom and the other two carried tip masses to provide balance. A short cylinder was attached to the end platform opposite the booms and was used for the initial deployment and spin-up of the satellite, which was achieved using a spring loaded mechanism in the SM bay. A wobble damper inside the satellite removed precessional and nutational motions. An S-band antenna protruded from the panel opposite the booms.

Solar panels covering the six sides provided about 24 W of energy in sunlight and an average power of 14 W over one orbit of the Moon. The power subsystem also included a battery pack of 11 silver cadmium cells. An S-band transmitter was capable of sending 128 bits/s to the Earth. A magnetic core memory unit provided a storage capacity of 49,152 bits when the spacecraft could not transmit directly. Two solid state particle telescopes were mounted on an end panel of the spacecraft and four particle analyzer devices were attached to the sides.

**Mission Profile**

Apollo 15 launched at 13:34:00 UT (09:34:00 a.m. EDT) on 26 July 1971 and went into orbit around the Moon on 29 July at 20:06 UT. The Apollo 15 subsatellite was deployed on 4 August 1971 at 21:00:31 UT by launching it from the scientific instrument module of the Service Module at a relative velocity of approximately 1.2 m/s using a spring loaded device which also imparted a spin of 140 rpm to the satellite. After release, the booms were deployed, lowering the spin rate to 12 rpm. The spin axis was normal to the ecliptic plane within 1 degree. The orbital period was approximately 120 minutes, clockwise as viewed from the north. The perilune of the first orbit was 102 km, the apolune 139 km, and the inclination 28.5 degrees with respect to the Moon’s equator, but the orbit was rapidly altered by gravitational perturbations. The geocentric ecliptic longitude of the Moon at the time of launch was 155 degrees. The subsatellite provided about 6 months of data coverage before two successive electronic failures in February 1972 caused the loss of most of the data channels. The surviving data channels were monitored intermittently until June 1972 and then more or less continuously until late January 1973, when ground support was terminated. It is assumed the subsatellite orbit decayed and it impacted the Moon sometime after this, the impact site is unknown.
Smithsonian National Air and Space Museum:

**Subsatellite:** Ejected into lunar orbit from the SIM bay and carried three experiments: S-Band Transponder, Particle Shadows/Boundary Layer Experiment, and Subsatellite Magnetometer Experiment. The subsatellite was 31 inches long, (78.7 cm) had a 14-inch (35.6 cm) hexagonal diameter and weighed 78.5 pounds (35.6 kg).