

Simulating PFS-2

Apollo 16 Subsatellite

Background

See the following page for background information on PFS-2:

<https://nssdc.gsfc.nasa.gov/nmc/spacecraft/display.action?id=1972-031D>

“Nominal” Initial State

Event	Reference body	Time hr:min:sec	Latitude deg:min	Longitude deg:min	Altitude n. mi.	Space-fixed velocity ft/sec	Space-fixed flight-path angle, deg	Space-fixed heading angle, deg E of N
Docking	Moon	177:41:18	10:32 S	55:39 W	65.6	5 313.7	-0.04	-90.33
Lunar module jettison	Moon	195:00:12	01:08 N	70:28 E	59.2	5 347.9	0.39	-100.50
Subsatellite launch	Moon	196:02:09	00:01 S	115:59 W	58.4	5 349.4	-0.41	-79.43

*Altitude relative to landing site...1737.85 km

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GMAT A16_PFS.CoordinateSystem = LunaFixed;
GMAT A16_PFS.DisplayStateType = Planetodetic;
GMAT A16_PFS.PlanetodeticRMAG = 1846.010000000015;
GMAT A16_PFS.PlanetodeticLON = -115.9830000000007;
GMAT A16_PFS.PlanetodeticLAT = -0.01700000000003051;
GMAT A16_PFS.PlanetodeticVMAG = 1.635345395189182;
GMAT A16_PFS.PlanetodeticAZI = -80.71234259600929;
GMAT A16_PFS.PlanetodeticHFP = -0.4087844556797506;

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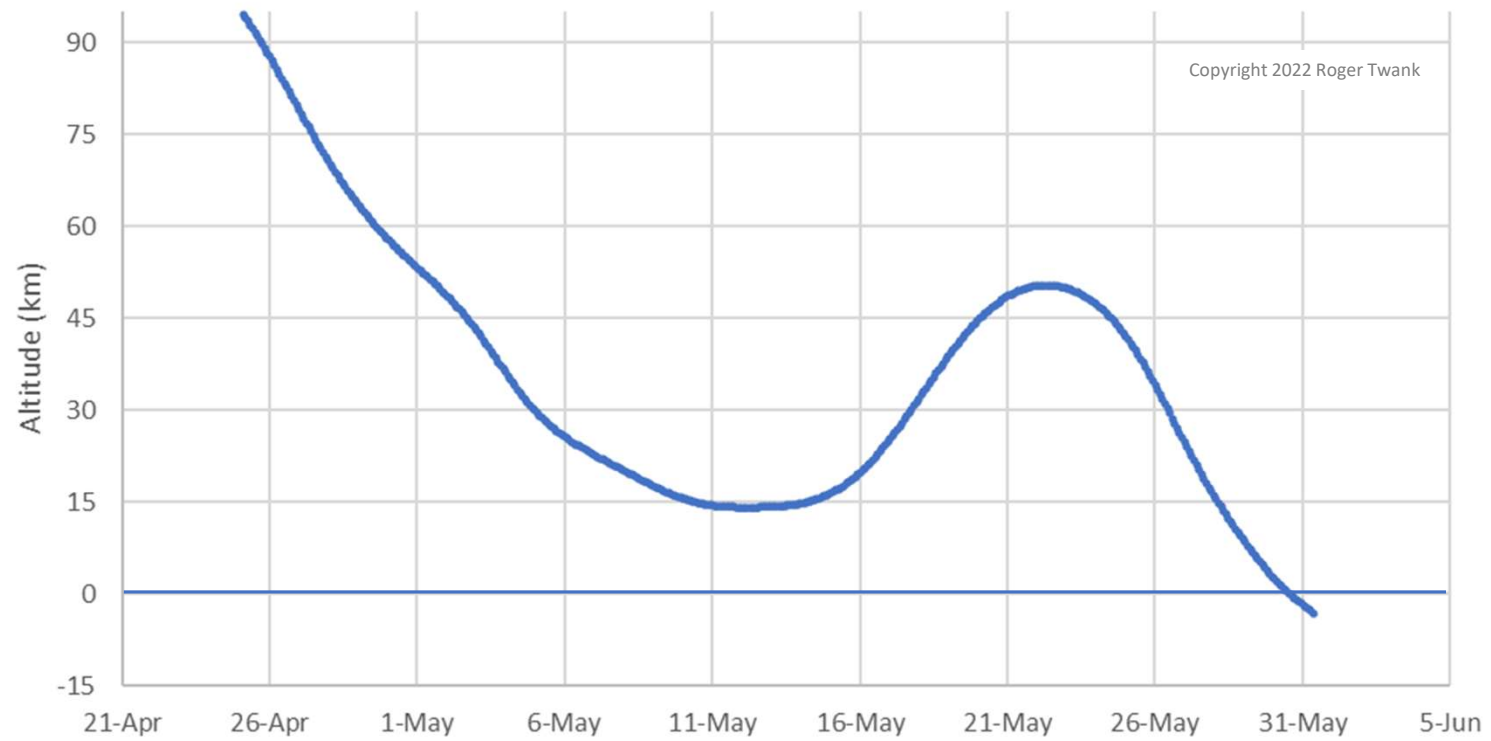
% relative to mean radius, not landing site

% adjusted for inertial

% adjusted for inertial

% adjusted for inertial

Apollo 16 PFS-2 Perilune Altitude Simulation



	Date/Time (UTC)	Longitude	Latitude
NASA 1972 Estimated Impact	5/29/1972 20:31:00	111.94	10.16
"Nominal" Simulation Impact	5/30/1972 11:01:39	98.94	8.88
"Nominal 2" Simulation Impact	5/29/1972 17:15:38	107.89	10.16