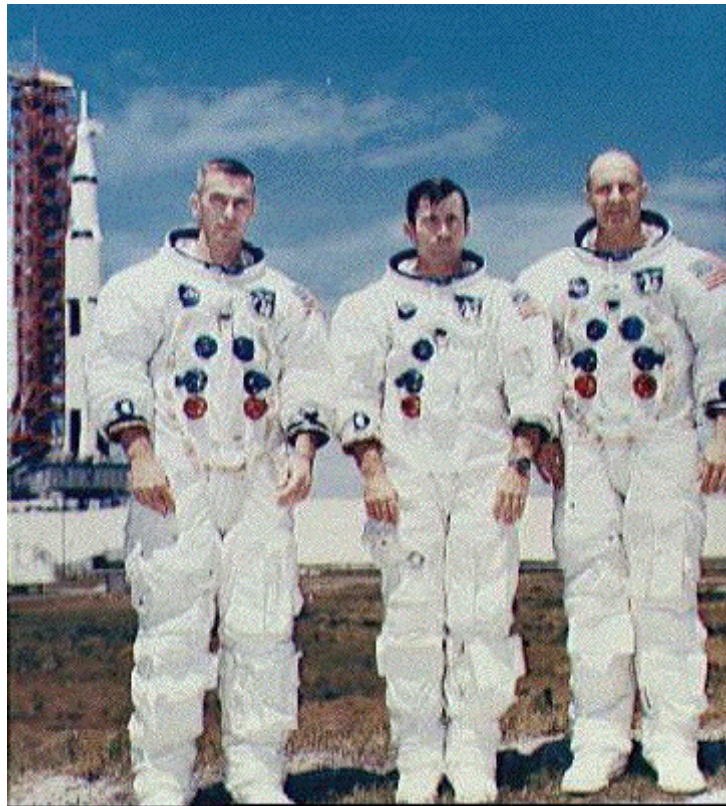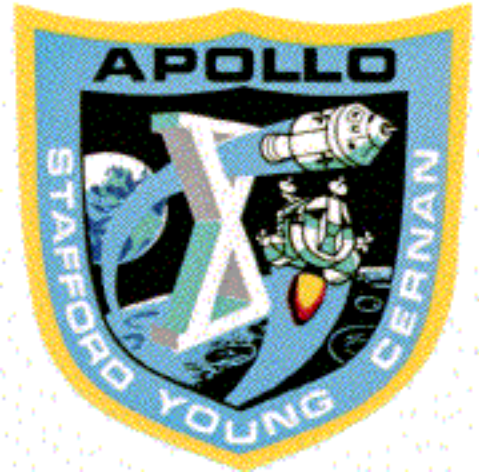# The Apollo 10 Mission
Compiled by Daniel R. Adamo

All Illustrations Published by NASA Unless Otherwise Noted


Crew
<u>Mission Commander</u>   Thomas Patten Stafford
<u>Command Module Pilot</u>   John Watts Young
<u>Lunar Module Pilot</u>   Eugene Andrew Cernan

Notes
1) All distances are measured in statute miles (mi) units.
2) All speeds are measured in statute miles per hour (mph) units.
3) "Height" is distance from the earth's (assumed by default) or moon's center, minus the pertinent equatorial radius. "Altitude" is distance above an ellipsoid approximating earth's figure at mean sea level.
4) Apogee/perigee and apocyntheon/pericyntheon are maximum/minimum heights with respect to the earth and moon, respectively.
5) "Speed" is magnitude of inertial velocity with respect to the earth's (assumed by default) or moon's center.
6) "Flight path angle" and "heading" pertain to inertial velocity referenced to true north in a local horizontal plane whose normal points from the earth's (assumed by default) or moon's center.
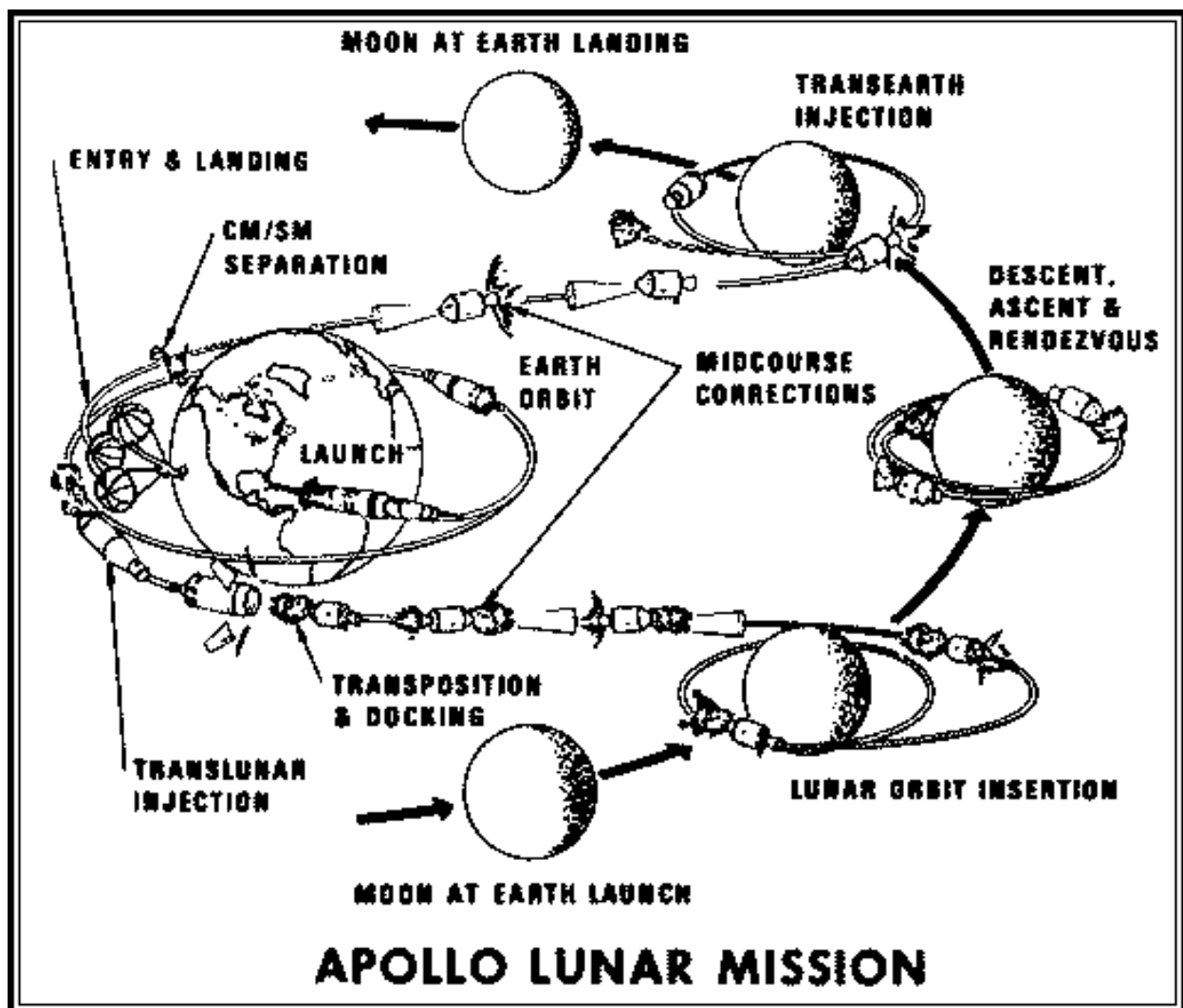
Apollo 10 Mission Summary

27 November 1968

Launch vehicle AS-505 begins arriving at KSC. Apollo 10 spacecraft are CSM-106 *Charlie Brown* and LM-4 *Snoopy*.
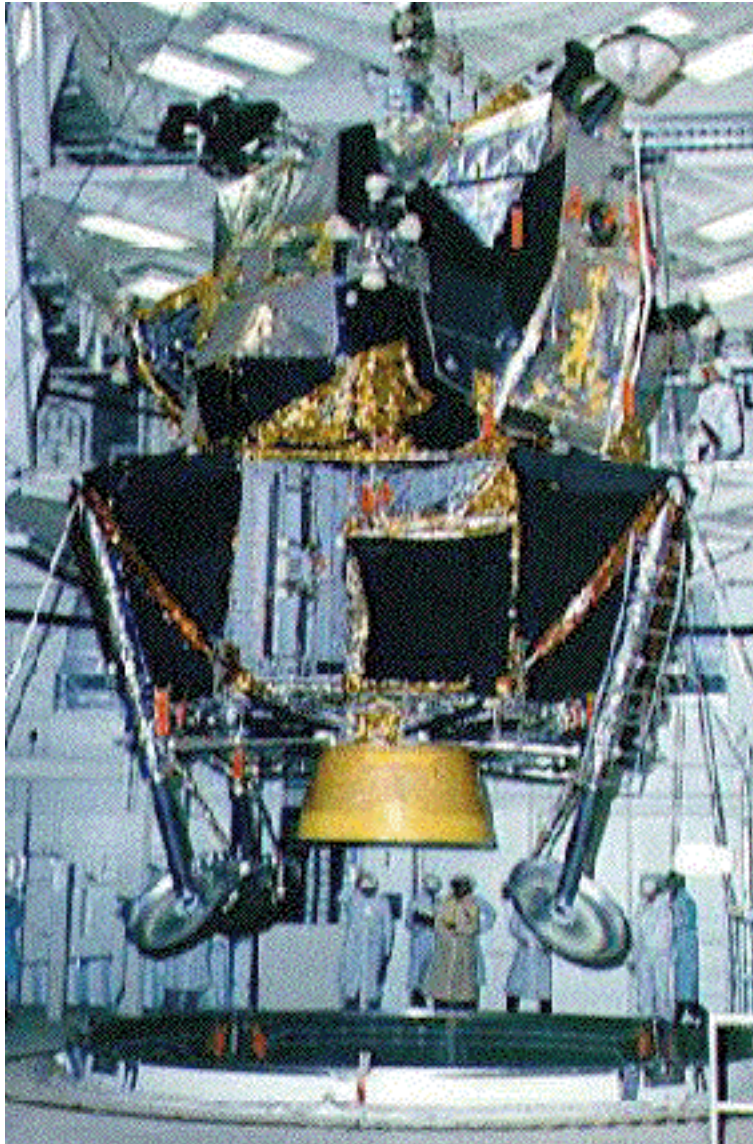
LM-4 Stowage in SLA on 13 January 1969

11 March 1969

Launch vehicle and spacecraft are moved to LC-39B by MLP #3

2 May 1969

Saturn IC RP-1 kerosene fuel loading is completed.

13 May EDT

12:00 M   countdown begins.

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17 May EDT
02:49 AM	T-028:00	final countdown begins.
03:19 AM	T-027:30	launch vehicle flight battery installation, together with LM stowage and cabin closeout, begin.
07:19 AM	T-023:30	launch vehicle flight battery installation is complete.
09:49 AM	T-021:00	LM super-critical helium top off begins.
11:49 AM	T-019:00	LM super-critical helium top off is complete.
02:49 PM	T-016:00	launch vehicle range safety checks begin.
03:49 PM	T-015:00	LM stowage and cabin closeout, together with launch vehicle range safety checks, are complete.
07:19 PM	T-011:30	installation of launch vehicle destruct devices, along with CSM pre-ingress operations, begin.
08:04 PM	T-010:45	launch vehicle destruct devices are installed.
08:49 PM	T-010:00	initiate mobile service structure move to its park site.
09:49 PM	T-009:00	6-hour built-in hold begins.

18 May EDT
03:49 AM	T-009:00	clear LC-39B for launch vehicle propellant loading.
04:19 AM	T-008:30	backup crew arrives for prelaunch spacecraft checks.
04:34 AM	T-008:15	launch vehicle cryogenic propellant loading begins.
07:49 AM	T-005:00	crew wake-up.
08:04 AM	T-004:45	crew medical examination begins.
08:34 AM	T-004:15	crew breakfast beings.
08:47 AM	T-004:02	based on 0.25 measured winds, 18 May's launch window is closed by Range Safety at an azimuth of 95.99°. This equates to a latest permissible launch time of 4:21 PM EDT.
09:04 AM	T-003:45	crew begins donning space suits.
09:11 AM	T-003:38	launch vehicle cryogenic propellant loading is complete.
09:19 AM	T-003:30	crew departs Manned Spacecraft Operations Building.
09:35 AM	T-003:14	crew arrives at LC-39B.
10:09 AM	T-002:40	crew starts CM ingress.
10:54 AM	T-001:55	MCC performs spacecraft command checks.
10:59 AM	T-001:50	abort advisory system checks are conducted.
11:03 AM	T-001:46	Emergency Detection System test is performed.
11:49 AM	T-001:00	final systems check begins.
12:06 PM	T-000:43	Apollo access arm is retracted to its standby position at 12°.
12:07 PM	T-000:42	LES is armed.
12:09 PM	T-000:40	final launch vehicle range safety checks begin.
12:14 PM	T-000:35	final launch vehicle range safety checks are complete.
12:19 PM	T-000:30	launch vehicle power transfer test is performed, and LM is placed on internal power.
12:29 PM	T-000:20	LM operational instrumentation shutdown begins.
12:34 PM	T-000:15	spacecraft is placed on internal power.
12:39 PM	T-000:10	LM operational instrumentation shutdown is complete.
12:43 PM	T-000:06	final status checks are performed.
12:43:30 PM	T-000:05:30	destruct system is armed.
12:44 PM	T-000:05	Apollo access arm is fully retracted.

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12:45:50 PM T-000:03:10   Launch Director activates the automatic sequencer.
12:47 PM   T-000:02   launch vehicle propellant tanks begin pressurization.
12:48:10 PM T-000:00:50   launch vehicle is placed on internal power.
12:48:43 PM T-000:00:17   LC-39B swing arms are retracted.
            T-000:00:16.978   spacecraft is placed on internal guidance.
12:48:51 PM T-000:00:08.9   ignition sequence begins.
12:48:54 PM T-000:00:06.4   Saturn IC inboard engine ignition.
12:48:58 PM T-000:00:01.6   all 5 Saturn IC engines running at full thrust.
12:49:00 PM T-000:00:00.25   weight = 6412918 lbs. Hold-down arms are released.

T+000:00:00.58   latitude 28.4658° N, longitude = 80.6209° W, altitude = 0.040 mi, flight path angle = 0.06°, heading = 90°, speed = 913.9 mph. Soft release mechanism is deactivated. Saturn V liftoff.

12:49:01 PM T+000:00:01.6   tower clearance yaw maneuver is initiated.
12:49:10 PM T+000:00:10.0   tower clearance yaw maneuver is completed.
12:49:13 PM T+000:00:13.05   Saturn IC engines clear LC-39B tower. Control is switched from KSC to MSC. Launch vehicle begins pitch maneuver and roll from 90° azimuth.
12:49:32 PM T+000:00:32.3   launch vehicle attains flight azimuth = 72.03°. Roll maneuver complete.
12:50:06 PM T+000:01:06.8   altitude = 4.884 mi, range = 1.193 mi, speed = 1383.1 mph. Launch vehicle attains local sonic speed.
12:50:22 PM T+000:01:22.6   altitude = 8.213 mi, range = 3.329 mi, speed = 1804.0 mph. Maximum dynamic pressure = 694.232 lbs/ft^2.
12:51:15 PM T+000:02:15.16   altitude = 26.963 mi, range = 28.780 mi, speed = 4413.55 mph, weight = 2434985 lbs. Saturn IC center engine shutdown.
12:51:38 PM T+000:02:38.7   pitch maneuver complete.
12:51:41 PM T+000:02:41.63   altitude = 40.562 mi, range = 58.021 mi, speed = 6155.85 mph, weight = 1842997 lbs. Saturn IC outboard engines shutdown.
12:51:42 PM T+000:02:42.31   altitude = 40.945 mi, range = 58.946 mi, speed = 6172.36 mph, weight = 1465702 lbs. Saturn IC jettison.
12:51:44 PM T+000:02:44.05   weight = 1465123 lbs. Saturn II ignition.
12:52:12 PM T+000:03:12.3   altitude = 56 mi, speed = 6423 mph. Saturn II aft interstage jettison.
12:52:17 PM T+000:03:17.8   altitude = 59 mi, speed = 6493 mph. LES jettison.
12:52:22 PM T+000:03:22.9   altitude = 61 mi, speed = 6561 mph. Initiate IGM.
12:53:26 PM T+000:04:26.87   maximum Saturn IC altitude.
12:56:40 PM T+000:07:40.61   altitude = 111.292 mi, range = 689.408 mi, speed = 12702.38 mph, weight = 644128 lbs. Saturn II center engine shutdown.
12:57:59 PM T+000:08:59.12   latitude = 30.188° N, longitude = 74.207° W, distance downrange = 401.39 mi. Estimated Saturn IC splashdown.
12:58:12 PM T+000:09:12.64   altitude = 116.463 mi, range = 1016.909 mi, speed = 15430.92 mph, weight = 471494 lbs. Saturn II outboard engines shutdown.
12:58:13 PM T+000:09:13.50   altitude = 116.513 mi, range = 1020.320 mi, speed = 15436.32 mph, weight = 364429 lbs. Saturn II jettison.

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12:58:16 PM T+000:09:16.81   weight = 364343 lbs. Saturn IVB ignition.

12:58:25 PM T+000:09:25.4   Saturn IVB ullage case jettison.

12:58:57 PM T+000:09:57.21   maximum Saturn II altitude.

01:00:43 PM T+000:11:43.76   altitude = 118.973 mi, range = 1646.739 mi, speed = 17428.91 mph, weight = 295153 lbs. Saturn IVB shutdown.

01:00:53 PM T+000:11:53.76   latitude = 32.5303° N, longitude = 52.5360° W, altitude = 118.915 mi, range = 1691.404 mi, flight path angle = -0.0049°, heading = 89.933°, speed = 17432.65 mph, weight = 295008 lbs, apogee = 115.45 mi, perigee = 114.74 mi, period = 88.20 min. Earth parking orbit insertion at 32.546° inclination.

01:01:04 PM T+000:12:04.1   maneuver to local horizontal attitude is initiated.

01:09:17 PM T+000:20:17.89   latitude = 31.522° N, longitude = 34.512° W, distance downrange = 2749.55 mi. Estimated Saturn II splashdown.
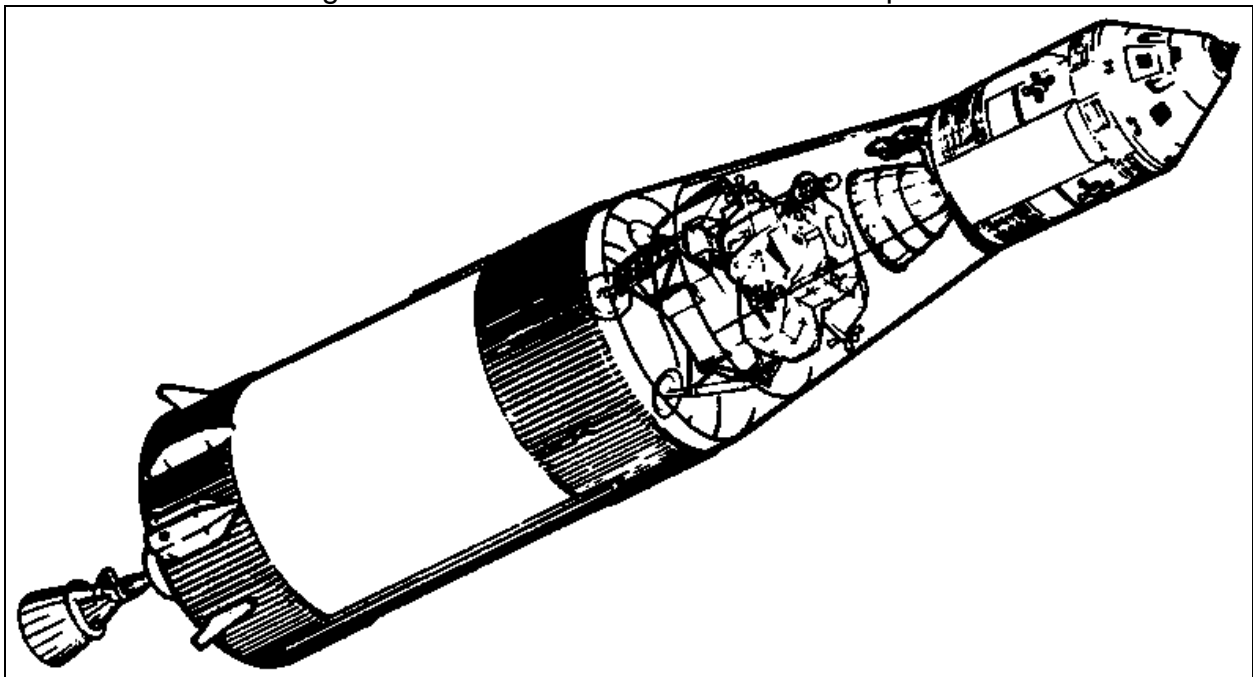
Saturn IVB and Apollo Spacecraft In Earth Parking Orbit

03:22:27 PM T+002:33:27.52   speed = 17428.2 mph. Saturn IVB ignition over Australia for a 5 min 43.06 sec TLI burn.

03:28:10 PM T+002:39:10.58   speed = 24263.07 mph, inclination = 31.710°. Saturn IVB shutdown.

03:28:20 PM T+002:39:20.58   height = 207.048 mi, flight path angle = 7.379°, heading = 61.065°, speed = 24247.47 mph. TLI into an earth free-return trajectory with pericyntheon near 69 mi. Earth splashdown at latitude = 24.9° S, longitude = 84.3° E would occur about 06:37 PM EDT on 24 May with only SM RCS burns if the free-return option is exercised.

03:28:29 PM T+002:39:29.6   Saturn IVB initiates LVLH attitude hold.

03:43 PM   T+002:54   Saturn IVB maneuvers to spacecraft separation attitude.

03:51:42 PM T+003:02:42.4   height = 4030.750 mi, speed = 17419.58 mph. CSM separates from the SLA at 1 mph relative speed with 3.3-sec RCS burn.

03:53 PM   T+003:04   CSM begins pitch maneuver to docking attitude.
03:55:00 PM T+003:06:00   height = 4120 mi. 22-min telecast from CM begins.
04:06:36 PM T+003:17:36.0   CSM docks with LM.
04:45:00 PM T+003:56:00   13 min 25 sec telecast from CM begins.
04:45:25 PM T+003:56:25.7   docked spacecraft is ejected from Saturn IVB at 1 mph.
05:28:09 PM T+004:39:09.8   height = 20643.3 mi, speed = 9695.6 mph. SPS ignition
                for a 2.9-sec in-plane evasive burn, imparting   V = 12.78 mph and
                placing the spacecraft a safe distance from the Saturn IVB when it
                performs its propellant dump to target lunar gravity assist into solar orbit.
                Height after burn = 20650.4 mi, flight path angle = 65.1°, heading =
                91.22°, speed = 9684.3 mph.
05:31:15 PM T+004:42:15.8   Saturn IVB initiates maneuver to propellant dump
                attitude.
05:34:36 PM T+004:45:36.4   Saturn IVB APS initiates a 4 min 40.6 sec propellant
                dump.
05:43:15 PM T+004:54:15.79   Saturn IVB initiates a 5 min 0.21 sec LOX dump.
05:55:34 PM T+005:06:34   height = 22781 mi. 13 min 15 sec telecast from CM
                begins.
06:17:55 PM T+005:28:55.8   Saturn IVB APS initiates a 9.1-sec propellant dump.
                Weight following dump = 31000 lbs.
07:24 PM   T+006:35   MCC updates CSM weight = 63308 lbs, LM weight = 30719
                lbs.
08:00:27 PM T+007:11:27   24-min telecast from CM begins.
08:29 PM   T+007:40   CSM water dump is initiated.
11:59 PM   T+011:10   GDS Saturn IVB LOS due to battery power depletion.

19 May EDT

02:44 AM   T+013:55   height = 76882 mi. Assuming no further burns, MCC predicts
                pericyntheon = 331 mi at 076:40:03 GET.
10:46 AM   T+021:57   MCC updates CSM weight = 63153 lbs.
12:18 PM   T+023:29   8-min CSM water dump is initiated.
03:21:56 PM T+026:32:56.8   height = 126758.6 mi, speed = 3473.5 mph. SPS
                ignition for a 7.09-sec MCC-2 burn, imparting   V = 33.5 mph. Height
                after burn = 126765.1 mi, flight path angle = 77.8°, heading = 108.92°,
                speed = 3484.1 mph, weight = 93419 lbs.
03:49:48 PM T+027:00:48   27 min 43 sec telecast from CM begins.
04:34 PM   T+027:45   MCC updates SPS model with thrust = 21360 lbs, flow rate =
                67.83 lbs/sec.

20 May EDT

09:25 AM   T+044:36   MCC updates CSM weight = 62548 lbs.
09:39:00 AM T+044:50:00   height = 180202 mi, speed = 2589.6 mph.
11:50 AM   T+047:01   assuming no further burns, MCC predicts pericyntheon = 71.1
                mi at 076:00:13 GET.
12:09 PM   T+047:20   crew sights the Saturn IVB at a range from CSM = 3500 mi.

12:49:51 PM T+048:00:51   height = 188700 mi, speed = 2618 mph. Recorded 14 min 39 sec telecast from CM begins.
01:13:00 PM T+048:24:00   recorded 3 min 51 sec telecast from CM begins.
02:43:00 PM T+049:54:00   4 min 49 sec telecast from CM begins.
04:11:05 PM T+051:22:05   height = 196118.3 mi, speed = 2383 mph.
04:29 PM   T+051:40   at LOI SPS shutdown, MCC predicts pericyntheon will be at lunar longitude 160° E with the spacecraft 15° uprange of pericyntheon.

At that time, the earth antipode will lie at lunar longitude 176° E.
05:04 PM   T+052:15   CSM initiates 12 min 40 sec water dump.
06:24:30 PM T+053:35:30   height = 201000 mi, speed = 2300 mph. 25-min telecast from CM begins.
07:49 PM   T+055:00   MCC computes a   V = 8.9 mph is required to hit the free return reentry corridor from the current trajectory.
10:49 PM   T+058:00   height = 211000 mi.

21 May EDT
02:39:49 AM T+061:50:49   height = 219264 mi, speed = 2127 mph, lunar height = 38919 mi, speed = 2588 mph. Spacecraft enters lunar gravitation sphere of influence.
03:49 AM   T+063:00   height = 222000 mi.
08:49 AM   T+068:00   height = 232000 mi.
12:49:00 PM T+072:00:00   lunar height = 11948.7 mi, speed = 2865.0 mph, pericyntheon = 79.0 mi, CSM weight = 62554 lbs, LM weight = 30727 lbs.
01:26:26 PM T+072:37:26   17 min 16 sec telecast from CM begins.
01:43:40 PM T+072:54:40   spacecraft sunset.
03:39:11 PM T+074:50:11   spacecraft sunrise.
04:37:41 PM T+075:48:41   first lunar occultation LOS.
04:44:54 PM T+075:55:54.0   height = 248224 mi, lunar height = 109.4 mi, speed = 5612.9 mph. SPS ignition for a 5 min 56.1 sec LOI-1 burn, imparting   V = 2033.5 mph. Lunar height after LOI-1 = 70.4 mi, speed = 3730.8 mph, apocyntheon = 195.6 mi, pericyntheon = 69.3 mi.
05:11:49 PM T+076:22:49   first lunar occultation AOS.
06:09:00 PM T+077:20:00   lunar height = 192.2 mi, speed = 3377.9 mph. CSM weight = 38650 lbs.
07:43:04 PM T+078:54:04   lunar latitude = 1.58 N, longitude = 65.45 E, height = 2016 mi. Saturn IVB pericyntheon. Resulting aphelion = 94.55 million mi, perihelion = 84.39 million mi.
09:14:08 PM T+080:25:08.1   lunar height = 69.5 mi, speed = 3739.6 mph. SPS ignition for a 13.9-sec LOI-2 burn, imparting   V = 94.8 mph. Apocyntheon after LOI-2 = 70.2 mi, pericyntheon = 68.1 mi.
09:33:40 PM T+080:44:40   29 min 9 sec telecast from CM begins.
10:19 PM   T+081:30   LM cabin is pressurized.
10:34 PM   T+081:45   Cernan enters LM for a 2-hour checkout.
11:01 PM   T+082:12   MCC updates CSM weight = 37624 lbs.

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22 May EDT

09:59 AM   <u>T+093:10</u>   MCC updates CSM weight = 36688 lbs, LM weight = 31117 lbs.

11:51 AM   <u>T+095:02</u>   Stafford and Cernan enter LM.

02:49 PM   <u>T+098:00</u>   LM landing gear are deployed.

03:00:57 PM <u>T+098:11:57</u>   lunar height = 66.9 mi, speed = 3653.0 mph, apocyntheon = 72.4 mi, pericyntheon = 66.4 mi. LM undocks from CSM.

03:18:20 PM <u>T+098:29:20</u>   20 min 10 sec telecast from CM begins.
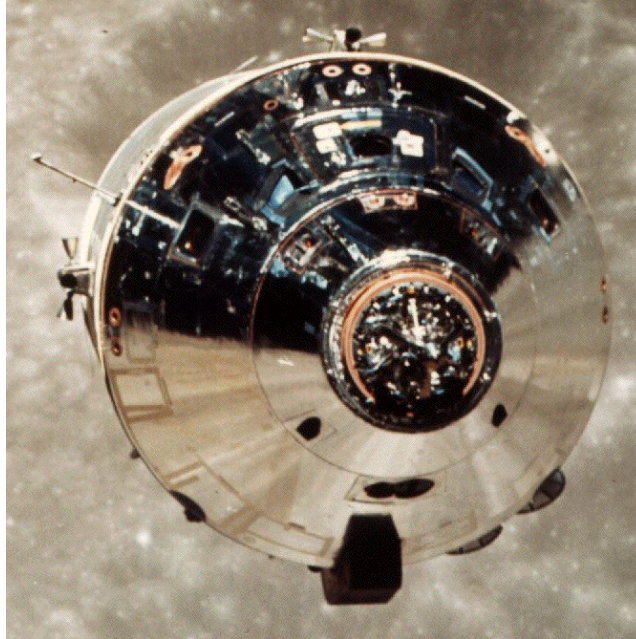
CSM *Charlie Brown* Prior to Separation From LM *Snoopy*
(Note LM Reflection at 10-O'clock Near CM Apex)

03:36:17 PM <u>T+098:47:17.4</u>   lunar height = 68.1 mi, speed = 3649.2 mph, range from LM = 30 ft. CSM 8.3-sec RCS burn establishes initial 1.7 mph radial down motion with respect to LM. Height after burn = 68.1 mi, speed = 3649.2 mph, apocyntheon = 72.4 mi, pericyntheon = 66.4 mi.

04:35:01 PM <u>T+099:46:01.6</u>   lunar height = 70.9 mi, speed = 3640.6 mph, range to CSM = 2 mi. LM DPS ignition for a 27.4-sec DOI burn. A retrograde V = 48.6 mph is achieved by throttling at 10% for 15 sec and 40% for 12.4 sec. Apocyntheon after burn = 70.1 mi, pericyntheon = 9.8 mi. Pericyntheon is located 15° uprange of Apollo Landing Site 2 (lunar latitude = 0.7° N, longitude = 23.7° E).

05:25 PM   <u>T+100:36</u>   MCC updates LM weight = 30891 lbs.

05:30:43 PM <u>T+100:41:43</u>   speed = 3800 mph. LM pericyntheon = 47400 ft (8.98 mi) is recorded.

05:47:25 PM <u>T+100:58:25.93</u>   lunar height = 20.4 mi, speed = 3758.5 mph. LM DPS ignition for a 39.95-sec phasing burn. A posigrade V = 120 mph is achieved by throttling at 10% for 26 sec and 100% for 13.95 sec. Height after burn = 21.9 mi, speed = 3867.9 mph, apocyntheon = 218.8 mi, pericyntheon = 13.9 mi.

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07:33:49 PM T+102:44:49   inadvertent LM AGS mode to AUTO (vice the intended ATTITUDE HOLD mode) triggers start of a slow yaw maneuver to acquire the CSM via rendezvous radar.

07:34:12 PM T+102:45:12   LM AGS initiates rapid roll, together with smaller pitch and yaw rates, under AUTO mode.

07:34:16 PM T+102:45:16.9   lunar height = 36.1 mi speed = 3822.0 mph. LM descent stage jettison and ascent stage separation. Stafford assumes LM manual attitude control and stabilizes rates in 8 sec.

07:44:02 PM T+102:55:02.13   lunar height = 13.3 mi, speed = 3889.9 mph. LM APS ignition for a 15.55-sec ascent insertion simulation burn. A retrograde   V = 150.6 mph is achieved. Height after burn = 13.5 mi, speed = 3764.0 mph, apocyntheon = 53.5 mi, pericyntheon = 12.7 mi.

07:51 PM   T+103:02   MCC updates LM weight = 8051 lbs.

08:20 PM   T+103:31   CSM/LM range = 188 mi.

08:34:55 PM T+103:45:55.3   lunar height = 51.4 mi, speed = 3637.8 mph. LM RCS ignition interconnected to APS for a 27.3-sec, 30.9 mph posigrade CSI burn. Height after burn = 51.3 mi, speed = 3669.3 mph, apocyntheon = 56.0 mi, pericyntheon = 46.8 mi.

09:32:53 PM T+104:43:53.28   lunar height = 51.0 mi, speed = 3678.2 mph. LM RCS ignition for a 1.65-sec, 2.0 mph posigrade CDH burn. Speed after burn = 3678.3 mph, apocyntheon = 56.2 mi, pericyntheon = 48.4 mi.

10:03 PM   T+105:14   CSM/LM range = 48 mi. Young reports seeing LM flashing beacon.

10:11:55 PM T+105:22:55.58   lunar height = 55.7 mi, speed = 3660.8 mph, CSM elevation angle = +26.6°. LM RCS ignition for a 16.50-sec, 16.4 mph TPI burn thrusting along the CSM line-of-sight. Speed after burn = 3679.6 mph, apocyntheon after burn = 67.1 mi, pericyntheon = 53.9 mi.

10:24 PM   T+105:35   MCC updates LM weight = 7544 lbs.

10:26:56 PM T+105:37:56   LM MCC-1 burn achieves   V = 0.87 mph.

10:19 PM   T+105:30   MCC updates LM weight = 7488 lbs.

10:41:56 PM T+105:52:56   LM MCC-2 burn achieves   V = 1.25 mph.

10:54:49 PM T+106:05:49   LM braking burn achieves   V = 21.5 mph. Apocyntheon after burn = 72.8 mi, pericyntheon = 64.9 mi.
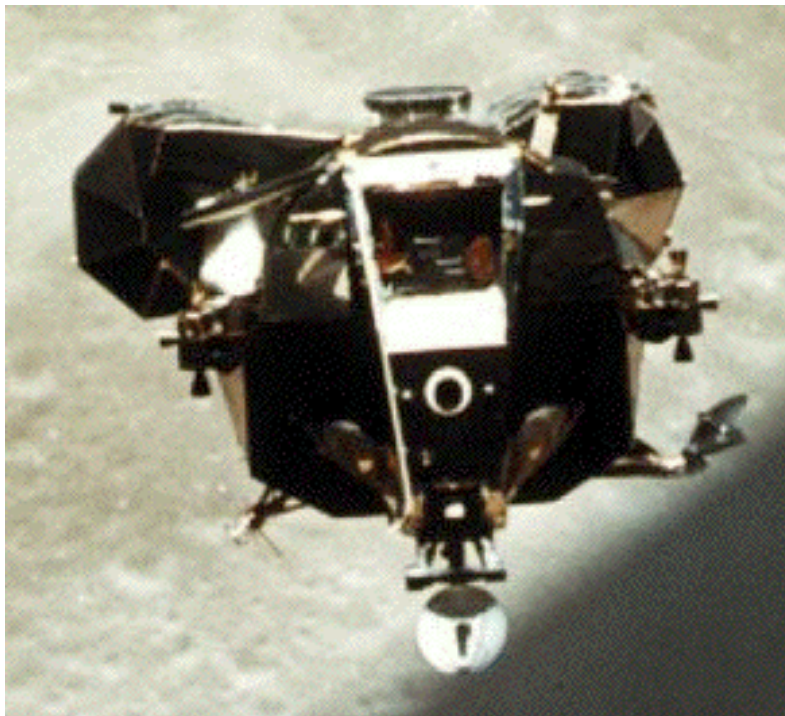
LM *Snoopy* Prior to Docking with CSM *Charlie Brown*

11:11:02 PM <u>T+106:22:02</u>   lunar height = 62.9 mi, speed = 3658.6 mph. LM soft docks with CSM.

11:11:15 PM <u>T+106:22:15</u>   LM hard docks with CSM.

11:31 PM   <u>T+106:42</u>   Stafford and Cernan enter the CM.

23 May EDT

01:13:36 AM <u>T+108:24:36</u>   CSM jettisons LM.

01:32:23 AM <u>T+108:43:23.3</u>   lunar height = 65.9 mi, speed = 3649.3 mph. CSM RCS ignition for a 6.5-sec, 1.4 mph radial down separation burn. Speed after burn = 3649.2 mph, apocyntheon = 73.6 mi, pericyntheon = 64.8 mi.

01:34 AM   <u>T+108:45</u>   MCC updates CSM weight = 36818 lbs.

01:41:05 AM <u>T+108:52:05.5</u>   lunar height = 68.0 mi, speed = 3643.0 mph. APS ignition for a 4 min 9 sec, 3136.4 mph posigrade depletion burn over the moon's nearside, placing the LM ascent stage in solar orbit. Height after burn = 103.2 mi, speed = 6174.8 mph, pericyntheon = 64.7 mi, weight = 4744 lbs.

07:59:00 AM <u>T+115:10:00</u>   LM RCS ignition for a 32-sec, 27.5 fps burn.

12:06:25 PM <u>T+119:17:25</u>   LM longitude = 30° E, height = 266000 mi, flight path angle = 27°, speed = 5585 mph, lunar longitude = 127° W, height = 38919 mi, flight path angle = 87°, speed = 3665 mph.

12:49 PM   <u>T+120:00</u>   LM communications terminate following ascent stage battery depletion.

03:38 PM   <u>T+122:49</u>   MCC updates SPS model with thrust = 21500 lbs, flow rate = 69 lbs/sec.

06:57 PM   <u>T+126:08</u>   at orbit 26 AOS, crew reports sighting jettisoned LM descent stage ahead of CSM over the lunar farside.

07:08 PM   <u>T+126:19</u>   17-min telecast from CM begins.

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11:32 PM   T+130:43   MCC updates CSM weight = 36685 lbs.

24 May EDT

12:56:12 AM T+132:07:12   24 min 12 sec telecast from CM begins.

01:05:27 AM T+132:16:27   lunar longitude = 52° E. Crew reports LM descent stage is 10 mi below CSM.

01:28:50 AM T+132:39:50   CSM sunset near its point of closest approach to LM descent stage. MCC estimates range to descent stage will be 700 mi at TEI.

02:50:57 AM T+134:01:57   lunar latitude = 0.97° N, longitude = 86.97° E, apocyntheon = 78.8 mi, pericyntheon = 61.6 mi.

03:48 AM   T+134:59   MCC estimates LM descent stage will trail CSM by 980 mi at a lunar height 150 mi above CSM at TEI.

05:52 AM   T+137:03   CSM LOS.

06:12:32 AM T+137:23:32   CSM sunrise.

06:25:28 AM T+137:36:28.9   lunar longitude = 155° E, height = 64.4 mi, speed = 3656.4 mph. SPS ignition for a 2 min 44.8 sec, 2509.3 mph TEI burn. Lunar height after burn = 65.0 mi, flight path angle = 2.53°, heading = -76.68°, speed = 6127.6 mph.

06:34:26 AM T+137:45:26   CSM AOS.

06:39:51 AM T+137:50:51   43 min 3 sec telecast from CM begins. Height at end of telecast = 235900 mi, speed = 3300 mph.

08:19:16 AM T+139:30:16   6 min 55 sec telecast from CM begins.

08:49 AM   T+140:00   MCC updates CSM weight = 25240 lbs.

09:02 AM   T+140:13   height = 231000 mi.

09:28 AM   T+140:39   MCC updates SPS model with thrust = 20380 lbs, flow rate = 65.5 lbs/sec.

12:07 PM   T+143:18   minimum transearth speed = 3251.2 mph.

03:51 PM   T+147:02   height = 211905 mi, speed = 3290 mph, lunar height = 33355 mi, speed = 3453 mph.

04:12:00 PM T+147:23:00   11 min 25 sec telecast from CM begins.

05:28:03 PM T+148:39:03   height = 206588 mi, flight path angle = -82.4°, speed = 3320 mph, inclination = 29.22°, lunar height = 38918 mi, flight path angle = 86.74°, speed = 3443 mph. CSM departs lunar gravitation sphere of influence.

05:39 PM   T+148:50   speed = 3324 mph, lunar speed = 3442 mph.

06:49 PM   T+150:00   height = 201473 mi.

09:18:19 PM T+152:29:19   29 min 5 sec telecast from CM begins.

10:19 PM   T+153:30   11-min CSM water dump is initiated.

11:43 PM   T+154:54   height = 185545 mi, flight path angle = -81.6°, speed = 3486 mph, lunar height = 60557 mi, flight path angle = 87.2°, speed = 3454 mph.

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25 May EDT
08:49 AM   T+164:00   height = 152384 mi, speed = 3815 mph.

10:39:48 AM T+165:50:48 CSM initiates a 7 min 50 sec water boiler dump.

11:38 AM   T+166:49   CSM initiates 3-hour fuel cell hydrogen purge.

02:19 PM   T+169:30   MCC estimates EI flight path angle = -6.77°.

02:50 PM   T+170:01   height = 129162 mi, speed = 4185 mph.

04:40 PM   T+171:51   height = 121221 mi.

06:16:17 PM T+173:27:17 10 min 22 sec telecast from CM begins.

26 May EDT
02:49 AM   T+182:00   MCC estimates EI flight path angle = -6.67°. An MCC-7 burn will be required for EI flight path angles less than -6.62° or greater than -6.32°.

06:19 AM   T+185:30   assuming no further burns, MCC predicts flight path angle = -6.70° and speed = 24760 mph at EI.

06:49 AM   T+186:00   MCC updates CSM RCS model with thrust = 187.64 lbs, flow rate = 0.766 lbs/sec.

07:40:49 AM T+186:51:49 height = 43000 mi. 11 min 53 sec telecast from CM begins.

09:38:58 AM T+188:49:58.0 height = 29425.9 mi, speed = 8550.0 mph. CSM RCS ignition for a 6.7-sec, 1.5 mph MCC-7 burn. Height after burn = 29410.9 mi, flight path angle = -69.64°, heading = 119.34°, speed = 8552.4 mph.

10:06 AM   T+189:17   MCC updates CSM weight = 25221 lbs, CM weight = 12155 lbs.

10:29 AM   T+189:40   CSM maneuvers to reentry attitude.

12:08:54 PM T+191:19:54 CSM sunset.

12:22:26 PM T+191:33:26 SM is jettisoned. Forward-firing RCS jets burn until depletion (Quad A for 325 sec, Quad B for 464 sec, Quad C for 428 sec, and Quad D for 432 sec). SM splashdown is estimated at latitude = 19.4° S, longitude = 173.4° W.

12:37:48 PM T+191:48:48.52 latitude = 23.77° S, longitude = 173.87° E, altitude = 425000 ft (80.5 mi), speed = 24745.6 mph.

12:37:54 PM T+191:48:54.5 latitude = 15.07° S, longitude = 164.67° W, altitude = 400000 ft (75.8 mi), flight path angle = -6.52°, speed = 24760 mph. CM reenters earth's atmosphere.

12:38:12 PM T+191:49:12 altitude = 300000 ft. CM enters radio blackout.

12:39:14 PM T+191:50:14 altitude = 200000 ft, exterior temperature = 5000° F, maximum acceleration = 6.78 Gs.

12:40 PM   T+191:51   recovery forces establish visual contact with CM.

12:42 PM   T+191:53:40 CM exits radio blackout.

12:44 PM   T+191:55   altitude = 60000 ft. Reentry computer guidance ends.

12:46:18 PM T+191:57:18.0 altitude = 23000 ft, speed = 300 mph. Drogue parachutes are deployed and unreefed.

12:47:05 PM T+191:58:05 altitude = 10000 ft. Drogue parachutes are released. Pilot and main parachutes are deployed an unreefed.

12:48 PM   T+191:59   CM radio antenna and flashing beacon are deployed.
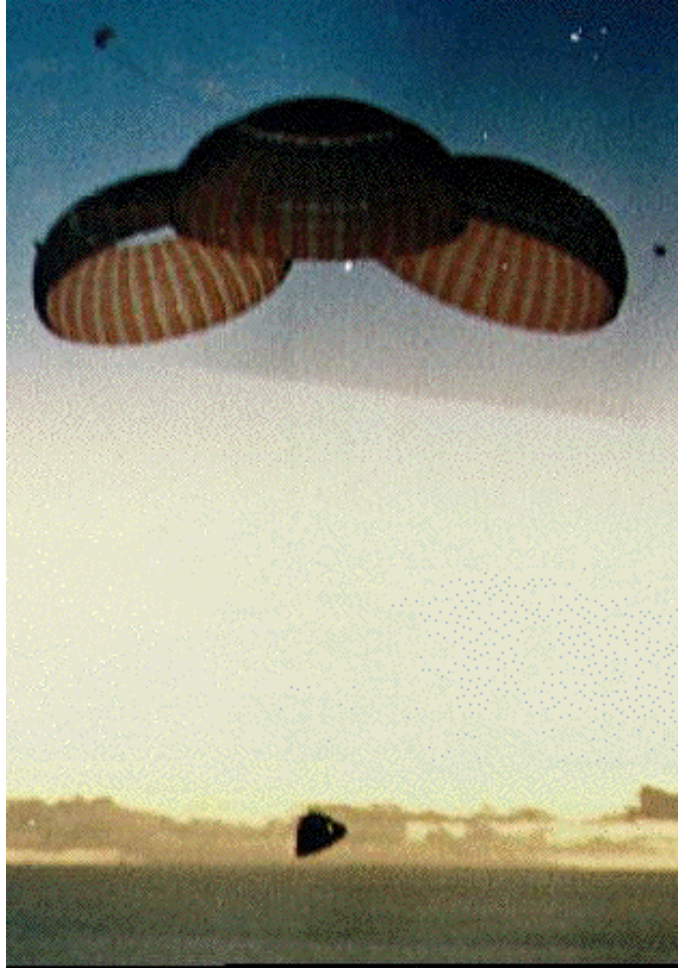
CM Approaching Splashdown

12:52:23 PM T+192:03:23   latitude = 14° S, longitude = 170° W, speed = 17 mph, weight = 10901 lbs. CM splashdown 3.9 mi from the USS Princeton. CM attains Stable 1.

12:54 PM   T+192:05   sunrise.
01:17 PM   T+192:28   CM hatch is opened.
01:31 PM   T+192:42   crew arrives aboard USS Princeton.
02:28 PM   T+193:39   CM arrives aboard USS Princeton.

The Apollo 10 Mission Acronym List: Compiled by Daniel R. Adamo

AGS: Abort Guidance System
AOS: Acquisition Of Signal
APS: Auxiliary Propulsion System (Saturn IVB); Ascent Propulsion System (LM)
AS: Apollo-Saturn
CDH: Constant Delta Height
CM: Command Module
CSI: Coelliptic Sequence Initiate
CSM: Command-Service Module
DOI: Descent Orbit Insertion
DPS: Descent Propulsion System
EDT: Eastern Daylight Time
GET: Ground Elapsed Time
GDS: GolDStone
IGM: Iterative Guidance Mode
KSC: Kennedy Space Center
LC: Launch Complex
LES: Launch Escape System
LM: Lunar Module
LOI: Lunar Orbit Insertion
LOS: Loss Of Signal
LVLH: Local Vertical Local Horizontal
MCC: Mission Control Center; Mid-Course Correction
MLP: Mobile Launch Platform
MSC: Manned Spacecraft Center
NASA: National Aeronautics and Space Administration
RCS: Reaction Control System
SM: Service Module
SLA: Spacecraft Lm Adapter
SPS: Service Propulsion System
TEI: Trans-Earth Injection
TLI: Trans-Lunar Injection
TPI: Terminal Phase Initiate
USS: United States Ship