

SECTION I - GENERAL

FLIGHT PLAN NOTES

A. Crew

1. Crew designations are as follows:

<u>Designation</u>	<u>Prime</u>	<u>Backup</u>
Commander (CDR)	Conrad	Scott
Command Module Pilot (CMP)	Gordon	Worden
Lunar Module Pilot (LMP)	Bean	Irwin

2. The nominal CM couch positions are:

<u>Activity</u>	<u>Left</u>	<u>Center</u>	<u>Right</u>
Launch thru TLI	CDR	CMP	LMP
T&D thru Entry	CMP	CDR	LMP

3. The PGA's will be worn as follows:

ACTIVITY	PRESSURIZED HARD SUIT	SUITED (SOFT SUIT)	PARTIAL SUIT W/O HELMET & GLOVES	SHIRT SLEEVES
LAUNCH		ALL		
EARTH ORBIT			ALL	
TLI THROUGH SLINGSHOT MNVR			ALL	
TLC & TEC				ALL
LM ACTIVATION			ALL	
UNDOCKING		CDR & LMP	CMP	
SEPARATION			ALL	
PDI & TD		CDR & LMP	CMP	
LUNAR STAY EXCEPT EVA	VARIES ACCORDING TO CHECKLIST FOR CDR & LMP. CMP WILL BE PARTIALLY SUITED W/O HELMET & GLOVES			
SURFACE EVA	CDR & LMP		CMP	
LIFTOFF THRU DOCKING		CDR & LMP	CMP	
POST JETTISON THRU TEI				ALL
ENTRY				ALL

4. Crew status reports will be voiced to MCC-H before and after crew sleep periods. After waking the crew will report sleep obtained and radiation doses received during the last 24 hours and before going to sleep the crew will report medication used and any other pertinent information on activities performed.

5. Negative reporting will be used in reporting completion of each checklist.

All onboard gauge readings will be read directly from the
6. gauges with no calibration bias applied.

B. CSM Systems

1. Communications

- (a) The preferred S-Band communication modes are:
 - (1) Uplink Mode 6 (Voice, PRN, and Udata)
 - (2) Downlink Mode 2 (Voice, PRN, TLM-HBR)
- (b) OMNI B and VHF LEFT will be selected for liftoff. OMNI D will be selected by the crew during boost if the launch azimuth is less than 96° or OMNI C if the launch azimuth is greater than 96° . OMNI D will probably be the best antenna for earth orbit.
- (c) VHF Duplex B will be used for launch, and Simplex A for earth orbit operations.
- (d) During TLC and TEC, OMNI antennas will nominally be used. The CSM X-axis will be pitched up 90° (North) for TLC and pitched down 90° (South) for TEC with the Y-Z axes in the plane of the ecliptic. These attitudes permit high gain antenna coverage and simultaneous viewing of the earth and moon through side windows for TV coverage.
- (e) The CSM communications with the LM while the LM is on the lunar surface is via MSFN relay.
- (f) Table 1-1 is a summary of the MSFN coverage available for the CSM.
- (g) Table 1-2 contains a summary of the scheduled CSM TV transmissions.
- (h) During PTC the OMNI antennas will be switched via ground command. During periods of attitude control other than PTC the crew will manage antenna operations.
- (i) The CSM will be configured to relay LM communications prior to undocking.

2. DSE

- (a) The DSE will be normally operated via ground command except for special cases where the operation is time limited. In these cases the crew may be asked to rewind the tape.

- (b) During the earth orbit phase, the CSM LBR data will be recorded when the CSM is not within MSFN coverage. The DSE will be dumped during the pass over the US and over CRO prior to TLI if possible.
 - (c) During lunar orbit phase, the CSM LBR data will be recorded when the CSM is not within MSFN coverage. The DSE will normally be dumped at AOS.
 - (d) CSM LBR data will be recorded during all P22 landmark tracking and dumped at completion of tracking.
 - (e) CSM HBR and voice will be recorded during all CSM engine burns when MSFN coverage is not available.
 - (f) All Entry data will be recorded in HBR during the blackout.
3. Electrical Power
- (a) The CSM will normally remain powered up throughout the mission.
 - (b) Table 1-3 lists the Fuel Cell Purges and waste water dumps.
 - (c) Based on cryo purity and performance, fuel cell O₂ purges will be stretched to a maximum of 24 hours to coincide with water dump times. The O₂ purge at 11 hours will allow a judgment to be made on the defined purge schedule.
 - (d) The cryogenic heaters will be in AUTO during the mission and the fans will be operated manually. The O₂ & H₂ fans will be cycled for one minute before and after each sleep cycle and before each SPS burn. The O₂ & H₂ fans will also be cycled prior to CSM LM Ejection.
 - (e) Table 1-9 contains the battery charge schedule.

4. ECS and Water Management

- (a) Potable water will be chlorinated once a day after eat period prior to each sleep period.
- (b) Waste Water dumps and fuel cell purge criteria:
 - 1. During TLC and TEC water dumps and fuel cell purges will be scheduled after the sextant star check and prior to each midcourse maneuver.
 - 2. Waste water dumps and fuel cell purges will not be scheduled during the following periods:
 - a. Between MCC-3 and LOI-1 plus two hours.
 - b. Within three revolutions of pre-DOI undocking.
 - c. Between TEI and sextant star check prior to MCC-5.
 - d. Within one hour prior to optical navigation sightings.
 - e. Between MCC-6 and EI.
 - 3. During lunar orbit waste water dumps and fuel cell purges should be scheduled as close to the LOS midpoint as possible.
 - 4. All waste water dumps will be manual.
- (c) Only one CO₂ absorber filter (LIOH canister) is changed at a time. Table 1-4 list the LIOH canister change schedule. There are 20 filters onboard with 18 stowed at launch.
- (d) At lift-off the cabin will contain 60% O₂ and 40% N₂. The CM will be purged after launch. The purge is terminated prior to LM pressurization after TLI. After the LM is configured for ejection, it will be isolated and the CM will be purged for eight more hours.

5. Guidance and Navigation

- (a) During lunar orbit, the CSM and LM will utilize the same landing site and lift-off REFSMMATS such that the gimbal angles would be 0,0,0 with the LM sitting face forward on the landing site and the CSM over the landing site pitched up 90° from local horizontal "heads up."

- (b) The CSM tracking light will be on continuously from the undocking to landing and from LM lift-off to docking.
- (c) After each landmark tracking period, the CSM will reacquire MSFN so that N49 ($\Delta R, \Delta V$) is displayed on TLM for data retrieval.
- (d) The time tags on maneuvers in Section 3 indicate the completion time of the maneuver unless otherwise stated. All maneuver angles are the FDAI angles after the completed maneuver.
- (e) CSM/LM and CSM attitude maneuvers will normally be at a rate of $0.2^\circ/\text{sec}$ or $0.5^\circ/\text{sec}$ unless other rates are required.
- (f) Undocking will be done radially using the soft-undocking procedure. The probe will be extended its full length with the lm held on by the capture latches. When the rates are nulled, the CSM will then release the LM.

6. Propulsion Systems

- (a) The SPS engine will be used to "back-up" all LM rendezvous burns except CDH to conserve SM RCS. The nominal CDH burn magnitude is small thus it is backed up by the SM RCS. The SPS gimbal motors will not be turned on during the back-up maneuver preparation.
- (b) The SPS will always be started using a single bank, however, the other bank will be opened 2 to 5 seconds after ignition for burns longer than 6 seconds. Bank A will be used for the first engine ignition.
- (c) Table 1-5 lists the CSM propulsion burns.

C. LM Systems

1. Communications

- (a) The preferred S-Band communications are:
 - (1) Uplink Mode 7 (Voice, Updata)
 - (2) Downlink Mode 1 (Voice, TLM-HBR)
- (b) The LM voice recorder will be used to record LM voice during undocked operations. Table 1-8 is a schedule of LM voice recorder usage.
- (c) Figure 1-1 shows the communications mode for the first part of the EVA (CDR EVA only) and the one man contingency EVA. Figure 1-2 shows the nominal two-man EVA comm configuration.

2. ECS

- (a) The LM will contain ambient air at lift-off. During launch the pressure will bleed to zero. CSM 02 will be used to pressurize the LM after T&D. After T&D, the LM will be isolated and allowed to bleed down via leakage. For each entry into the LM before undocking the CSM 02 will be used to equalize LM pressure. After each entry, the LM will be isolated and allowed to leak down. This procedure insures a pure oxygen environment in the LM at the first EVA.
- (b) There are a total of six LM repressurizations, three docked and three on the lunar surface.

3. Guidance Systems

- (a) The LGC and CMC will use the same landing site and lift-off REFSMMATS.
- (b) The AGS will be placed in standby after the "GO" is given for lunar stay.
- (c) The RR and IMU will be powered down and the LGC placed in standby after TD plus two hours until lift-off preparation.
- (d) The rendezvous radar will be pointed away from the sun and will be turned off when no functional use is required to prevent overheating of the antenna. The LM tracking light will be on continuously between separation and touchdown and between launch and docking.

4. Propulsion Systems

(a) The APS/RCS interconnect will be used during the lunar lift-off and ascent only.

(b) Table 1-6 lists the LM propulsion burns.

D. Procedures

1. CSM

Crew procedures called out in the flight plan may be found in the following documents:

- (a) Apollo Operations Handbook - CSM-108 (AOH), Volume 2
- (b) Crew Checklists
- (c) CSM Rendezvous Procedures
- (d) Launch Abort Procedure
- (e) Reentry Procedures
- (f) Photographic Operations Plan
- (g) Lunar Landmark Tracking Attitude Studies
- (h) Lunar Orbit Attitude Sequence for Mission H

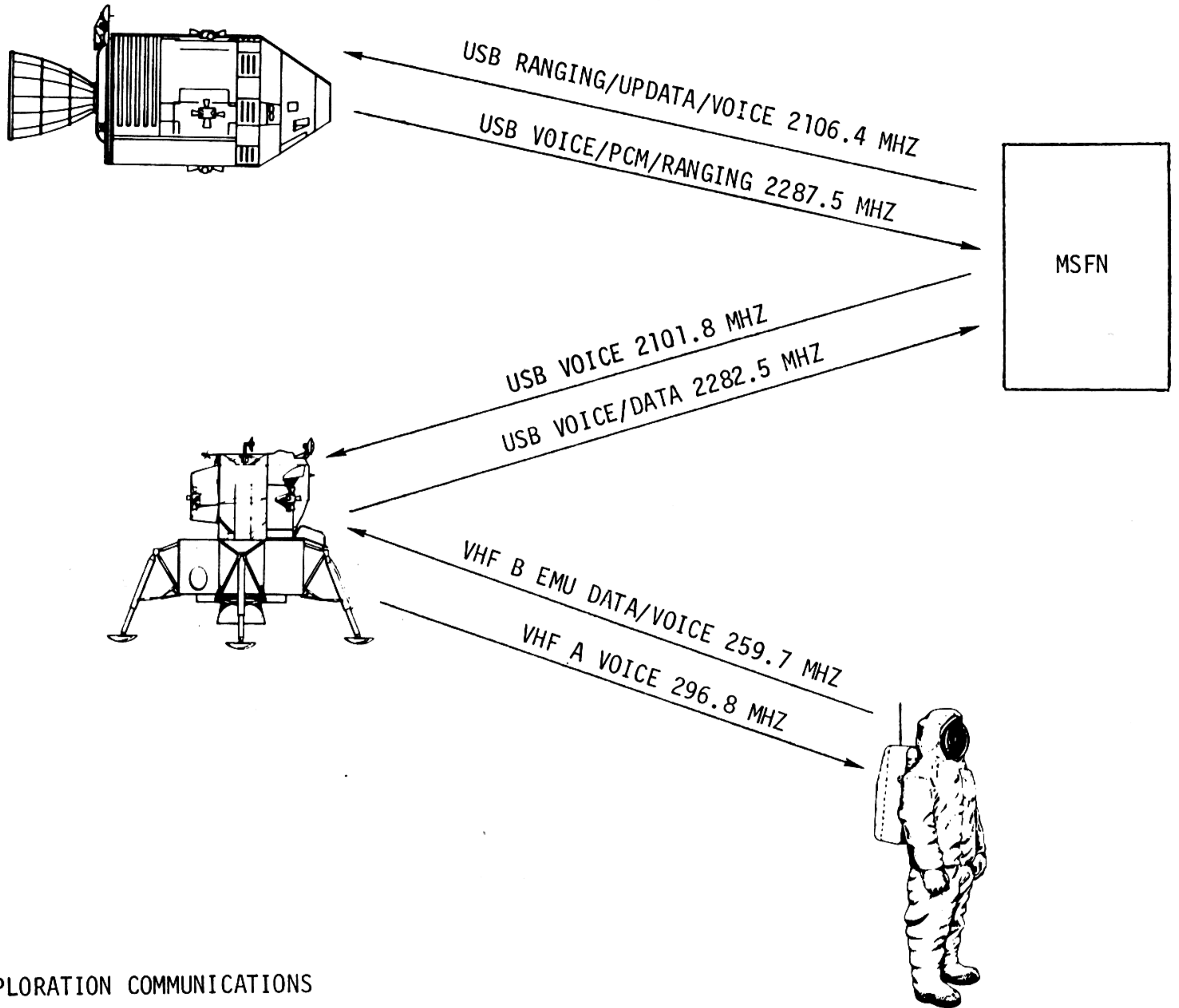
2. LM

Crew procedures called out in the flight plan may be found in the following documents:

- (a) Apollo Operations Handbook LM-6 Volume 2
- (b) Crew Checklists
- (c) LM Rendezvous Procedures
- (d) LM Descent/Ascent Procedures
- (e) Photographic Operations Plan
- (f) Orbital EVA Procedures
- (g) Lunar Surface Procedures

E. Summary

- 1. Table 1-7 contains a summary of the expected block data update times.
- 2. Table 1-10 the landmark tracking sites.
- 3. Table 1-11 is the mission activity summary.



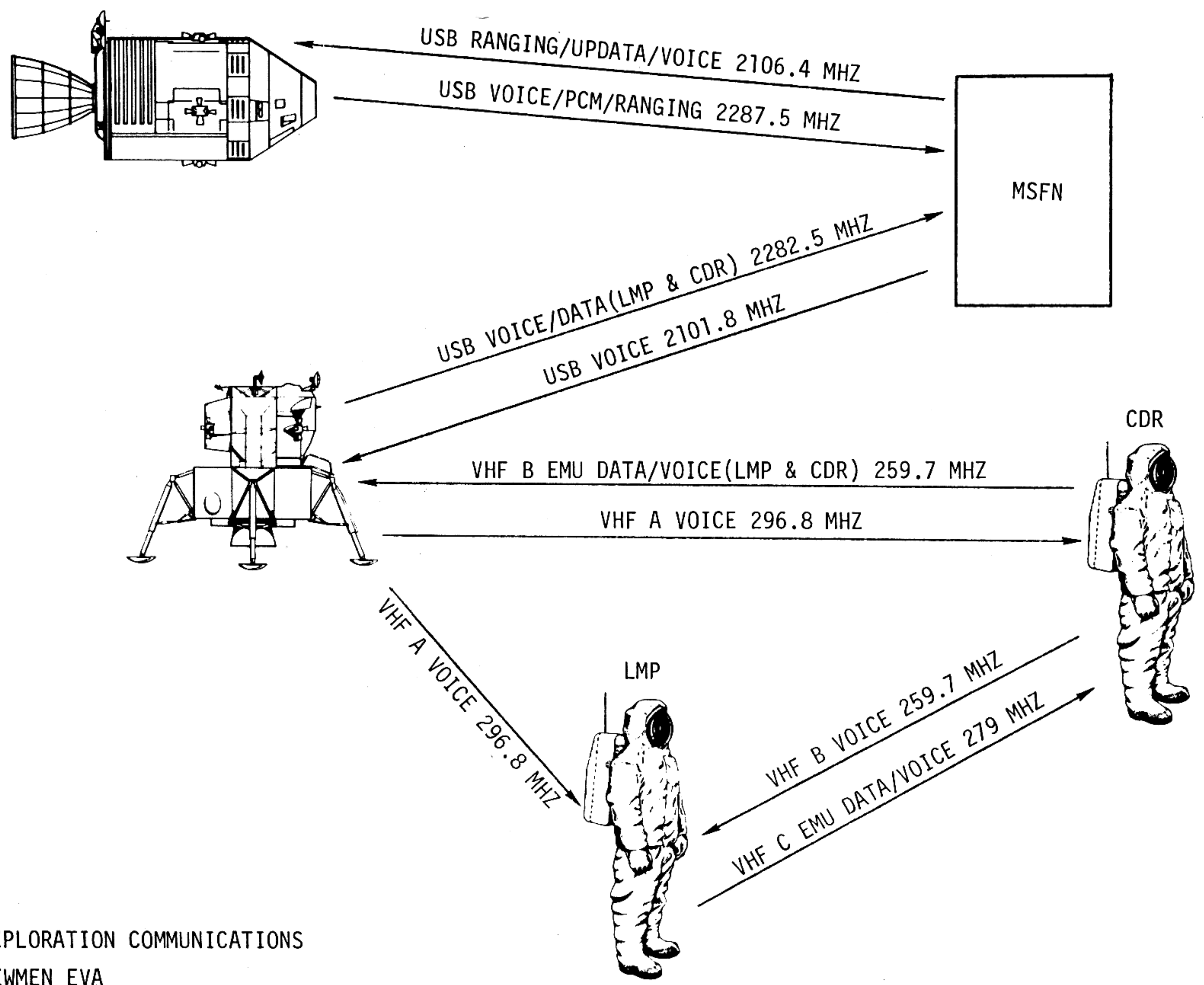
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LUNAR EXPLORATION COMMUNICATIONS
 ONE CREWMAN EVA
 PRIMARY MODE

Figure 1-1

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LUNAR EXPLORATION COMMUNICATIONS
BOTH CREWMEN EVA
EVCS DUAL MODE (RELAY)

Figure 1-2

TABLE 1-1
S/C COVERAGE BY MSFN STATIONS USING 85-FT/210-FT DISH/ANTENNA

	*GOLDSTONE (GDS)		*PARKS		HONEYSUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
EARTH ORBIT					0:59:38	1:05:41		
	1:29:04	1:33:44						
	2:55:31	16:00:18					3:17:35	8:00:23
			13:10:32	19:53:11	10:37:17	22:22:52		
							20:52:49	32:45:16
	28:04:35	40:20:40						
			37:18:16	44:31:12	34:49:51	46:55:10		
							45:21:13	56:51:14
	52:54:28	64:25:17						
			61:33:52	68:45:47	58:52:27	71:09:03		
							69:33:52	80:48:59
	77:05:04	83:12:10						
					82:47:21	83:11:45		
							172:34:25	180:44:07
	174:41:50	188:06:30						
			185:25:52	190:05:03	182:33:22	192:51:23		
							191:06:11	204:50:33
	198:49:51	210:16:42						
			209:38:10	214:16:05	206:44:24	217:04:01		
							215:23:10	229:12:33
	223:13:44	236:55:11						
			234:28:27	239:05:44	231:22:48	244:17:39		
							242:02:02	242:37:25

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*210 FT DISH ANTENNAS

TABLE 1-1 (Cont'd.)
S/C COVERAGE BY MSFN STATIONS USING 85-FT/210-FT DISH/ANTENNA

REV.	* GOLDSTONE (GDS)		* PARKS AUSTRALIA		HONEY SUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
1	83:44:40	85:09:07			83:44:12	85:08:41		
2	85:52:51	87:17:18	85:52:27	87:16:50	85:52:25	87:16:50		
3	88:01:53	88:32:43	88:01:27	89:13:03	88:01:26	89:13:02		
4			89:59:37	91:11:32	89:59:35	91:11:31		
5			91:58:10	93:00:56	91:58:09	93:09:52		
6					93:56:27	95:08:05	93:56:11	95:07:57
7							95:54:34	97:06:20
8							97:52:53	99:04:36
9							99:51:15	101:03:15
10	101:49:19	103:00:58					101:49:39	103:01:22
11	103:47:32	104:59:35					103:47:51	104:59:52
12	105:46:01	106:57:41						
13	107:44:13	108:56:00			107:47:55	108:55:34		
14	109:42:36	110:54:40	110:25:53	110:53:56	109:42:13	110:53:59		
15	111:41:04	112:52:42	111:40:30	112:52:12	111:40:29	112:52:13		
16			113:38:53	114:50:51	113:38:53	114:50:51		
17			115:37:21	116:48:58	115:37:20	116:48:58		
18					117:35:31	118:47:26	118:10:02	118:47:22
19					119:34:02	119:50:32	119:33:46	120:45:25
20							121:32:02	122:43:58
21							123:30:35	124:42:11
22	125:49:57	126:40:20					125:28:42	126:40:38
23	127:26:58	128:38:34					127:27:21	128:38:56
24	129:25:09	130:36:58					129:25:34	130:37:14

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*210 FT DISH ANTENNAS

TABLE 1-1 (Cont'd.)
S/C COVERAGE BY MSFN STATIONS USING 85-FT/210-FT DISH/ANTENNA

REV	* GOLDSTONE (GDS)		*PARKS AUSTRALIA		HONEYSUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
25	131:23:41	132:35:24						
26	133:22:01	134:33:39			133:21:30	134:33:13		
27	135:20:22	136:32:13	135:34:08	136:31:31	135:19:55	136:31:33		
28	137:18:48	138:30:18	137:18:15	138:29:54	137:18:15	138:29:54		
29			139:16:36	140:28:29	139:16:37	140:28:30		
30			141:15:05	141:42:56	141:15:04	142:26:37		
31					143:13:18	144:17:27	143:13:06	144:24:59
32							145:11:30	146:23:07
33							147:09:41	148:21:32
34	150:17:19	150:19:32					149:08:13	150:19:44
35	151:06:00	152:17:51					151:06:26	152:18:08
36	153:04:30	154:15:59					153:04:50	154:16:26
37	155:02:40	156:14:23					155:03:05	156:04:42
38	157:01:05	158:12:44			157:59:50	158:12:14		
39	158:59:19	159:01:46			158:58:47	159:01:46		
40	159:02:04	160:10:45			159:02:04	160:10:17		
41	160:57:35	162:09:02	160:57:07	162:08:27	160:57:07	162:08:26		
42	162:55:46	163:47:51	162:55:13	164:06:42	162:55:14	164:06:43		
43			164:53:30	165:58:52	164:53:29	166:04:52		
44					166:51:42	168:03:04	166:56:03	168:02:52
45							168:49:36	170:00:54
46							170:47:39	171:03:59

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*21 DISH ANTENNAS

TABLE 1 - 2

APOLLO 12 TV SCHEDULE

DAY	DATE	CST	GET	DURATION	ACTIVITY/SUBJECT	VEH	STA
FRIDAY	NOV. 14	1:50 PM	03:28	1 HR 02 MIN	TRANSPOSITION & DOCKING	CSM	GDS
SATURDAY	NOV. 15	4:47 PM	30:25	35 MIN	SPACECRAFT INTERIOR	CSM	GDS
MONDAY	NOV. 17	1:52 AM	63:30	50 MIN	INTERIOR & IVT TRANSFER	CSM	GDS
MONDAY	NOV. 17	7:52 PM	81:30	20 MIN	PRE LOI 1	CSM	GDS
MONDAY	NOV. 17	10:22 PM	84:00	30 MIN	PRE LOI 2	CSM	GDS
TUESDAY	NOV. 18	10:12 PM	107:50	40 MIN	UNDOCKING & FORMATION FLYING	CSM	GDS
WEDNESDAY	NOV. 19	5:02 AM	114:40	3 HR 25 MIN	LUNAR SURFACE ACTIVITIES	LM	PARKS/HSK
WEDNESDAY	NOV. 19	11:32 PM	133:10	6 HR 05 MIN	LUNAR SURFACE ACTIVITIES	LM	GDS
THURSDAY	NOV. 20	11:37 AM	145:15	30 MIN	DOCKING	CSM	MAD
FRIDAY	NOV. 21	3:17 PM	172:55	20 MIN	POST TEI - LUNAR SURFACE	CSM	MAD
SUNDAY	NOV. 23	5:37 PM	223:15	30 MIN	EARTH & INTERIOR	CSM	GDS

TABLE 1-3
FUEL CELL PURGE AND WATER DUMP SCHEDULE

<u>GET</u>	<u>O₂ FUEL CELL PURGE AND WATER DUMP</u>		<u>H₂ FUEL CELL PURGE</u>		<u>REMARKS</u>
	<u>NUMBER</u>	<u>ΔTIME</u>	<u>NUMBER</u>	<u>ΔTIME</u>	
		11:30			
11:30	1			41:10	MCC 1
		19:00			
30:30	2				MCC 2
		10:10			
41:10	3	—————	1		Presleep
		19:50			
61:00	4			44:20	MCC 3
		24:30			
85:30	5	—————	2		LOI ₁ + 2 hrs
		16:00			
101:30	6				LOS Midpoint/ Post Sleep
		19:22			
120:52	7			55:30	LOS Midpoint/ Presleep
		20:08			
141:00	8	—————	3		LOS Midpoint
		23:15			
164:15	9			46:00	LOS Midpoint
		22:45			
187:00	10	—————	4		MCC 5
		21:00		35:00	
208:00	11				Post Sleep
		14:00			
222:00	12	—————	5		MCC 6

LiOH CANISTER CHANGE SCHEDULE

TABLE 1-4

CHG. NO.	APPROX. GET HRS	APPROX. ΔT HRS	INSTALL		REMOVE & STOW	
			CAN NO.	POSITION	CAN NO.	STOWAGE LOCATION
1	9:00	9 12 11 14 11 11 11 14 19 25 13 14 12 11 12 13 14	3	A	1	B5
2	18:00		4	B	2	B5
3	30:00		5	A	3	B5
4	41:00		6	B	4	B5
5	55:00		7	A	5	B6
6	66:00		8	B	6	B6
7	77:00		9	A	7	B6
8	88:00		10	B	8	B6
9	102:00		11	A	9	A3
10	121:00		12	B	10	A3
11	146:00		13	A	11	A3
12	159:00		14	B	12	A3
13	173:00		15	A	13	A4
14	185:00		16	B	14	A4
15	196:00		17	A	15	A4
16	208:00		18	B	16	A4
17	221:00		19	A	17	A6
18	235:00		20	B	18	A6

TABLE 1-5 CSM BURN SCHEDULE

BURN/ MNVR	GETI/ BURN TIME	ΔV_R (FPS)	ULLAGE/ ΔV (FPS)	REFSMAT	REFSMAT HA & HP(NM)	REMARKS
TLI	2:47:19.8 5Min.45.0Sec	--	--	--	--	S-IVB BURN
CM/LM EJECTION	4:07:19.8 3 Sec	0.4	NOT REQUIRED	PAD	--	RCS BURN
MCC-1	11:47:19.8	--	--	PTC	--	NOM. ZERO
MCC-2	30:52:43.7 10.0 Sec	68.8	NOT REQUIRED	PTC		SPS BURN
MCC-3	61:25:18.2	--	--	PTC	--	NOM. ZERO
MCC-4	78:25:18.2	--	--	LDG SITE		NOM. ZERO
LOI-1	83:25:18.2 5 Min.55.4 Sec	2889.9	NOT REQUIRED	LDG SITE	HA 168.9 HP 58.7	SPS BURN
LOI-2	87:44:10.0 17.6 Sec	169.6	2 JET 19.0 Sec	LDG SITE	HA 64.8 HP 53.0	SPS BURN
CSM/LM SEP	108:24:21.9 15.5 Sec	2.5	--	LDG SITE	HA 63.0 HP 54.5	RCS BURN
CSM P.C. #1	119:47:02.0 19.4 Sec	372.4	2JET 15.0 Sec	PLANE CHANGE	HA 61.5 HP 55.6	SPS BURN
CSM SEP MNVR	147:58:00.7 2.7 Sec	1.0	--	LIFT OFF	HA 59.7 HP 58.6	RCS BURN
CSM P.C. #2	159:01:46.0 18.0 Sec	360.0	4 JET 11 Sec	PLANE CHANGE	HA 58.6 HP 56.5	SPS BURN
TEI	172:21:14.7 2 Min 08.9 Sec	3035.9	4 JET 12 Sec	TEI	-- --	SPS BURN
MCC-5	187:21:14.7	--	--	PTC	--	NOM. ZERO
MCC-6	222:21:48	--	--	PTC	--	NOM. ZERO
MCC-7	241:21:48	--	--	ENTRY	--	NOM. ZERO

NOTE: HA & HP ARE CALCULATED FROM THE LANDING SITE ELEVATION

TABLE 1-6 LM BURN TABLE

BURN/ MNVR	GETI/ BURN TIME	Δ VR (FPS)	ULLAGE/ Δ V(FPS)	REFSMMAT	REFSMMAT HA & HP (NM)	REMARKS
DOI	109:23:00 BT- 28.2 sec	72.1	2 JET 7.5 Sec	LDG SITE	HA 59.3 HP 8.3	DPS
PDI	110:20:00 BT-11Min.18.5 SEC	6612.6	2 JET 7.5 Sec	LDG SITE	-- --	DPS
ASCENT	142:01:17.9 BT-7Min10.0 Sec	6046.2	None	LIFT OFF	HA 44.7 HP 8.3	APS
CSI	142:58:05.2 BT - 45.3 Sec	50.3	--	LIFT OFF	HA 45.6 HP 44.6	RCS BURN
PLANE CHANGE	143:26:27.5	0.0	--	LIFT OFF	HA 45.6 HP 44.6	RCS BURN NOM. ZERO
CDH	143:56:27.5	0.0	--	LIFT OFF	HA 45.6 HP 44.6	RCS BURN NOM. ZERO
TPI	144:36:25.7 BT 22.1 Sec	24.6	--	LIFT OFF	HA 61.9 HP 44.2	RCS BURN
MCC-1	144:51:25.7	--	--	LIFT OFF	HA 61.9 HP 44.2	RCS BURN NOM. ZERO
MCC-2	145:06:25.7	--	--	LIFT OFF	HA 61.9 HP 44.2	RCS BURN NOM. ZERO
LM DEORBIT	149:24:41.2 1 MIN 23.83 SEC	189.7	--	ASCENT	--	RCS BURN

NOTE: HA & HP ARE CALCULATED FROM THE LANDING SITE

TABLE 1-7

BLOCK DATA UPDATES

<u>TYPE DATA</u>		<u>GET</u>	<u>REV</u>
TLI + 90 Min	(P30)	01:30	
L/O + 8 Hrs	(P37)	01:30	
L/O + 15 Hrs	(P37) ¹	05:55	
L/O + 25 Hrs	(P37)	14:00	
L/O + 35 Hrs	(P37) ²	14:00	
L/O + 45 Hrs	(P37) ²	14:00	
L/O + 60 Hrs	(P37) ²	14:00	
LOI - 5 Abort Pad	(P30)	35:00	
PC + 2	(P30)	77:30	
TEI 1	(P30) ^{3,4}	81:15	
TEI 4	(P30) ^{4,5}	81:15	
TEI 5	(P30) ^{3,6}	86:15	2
TEI 11	(P30) ⁵	91:00	4
TEI 34	(P30) ⁵	102:30	10
TEI 39	(P30) ^{5,7}	149:15	34
TEI 41	(P30) ³	158:00	38
TEI 43	(P30) ⁵	161:30	40
TEI 45	(P30) ⁵	165:00	42
TEI 45(Prelim.)	(P30)	169:00	44
TEI 45 (Nominal)	(P30 & TGT LOAD)	171:20	45
TEI 46	(P30)	171:20	45

(1) Assumes No MCC-1

(2) Assumes MCC-2

(3) Abbreviated P30 Pad: Includes - Purpose, Propulsion, Weight, Pitch & Yaw Trim, Time, ΔV_x , ΔV_y , ΔV_z , and Pitch

(4) Assumes No LOI-2

(5) Abbreviated P30 Pad: Includes - Purpose, Propulsion, Time, ΔV_x , ΔV_y , ΔV_z , and Pitch

(6) Assumes LOI-2 Accomplished

(7) Assumes No Plane Change

APOLLO 12/LM-6

DSEA SCHEDULE

TABLE 1-8

GET	DSEA MODE	Tape Time		Activity
		Activity	Total	
90:40	ICS/PTT	*100%	00:15	S-Band/VHF Simplex Voice & TM Test
90:55	OFF	00:15		
107:51	ICS/PTT	*100%	3:00	Prep for Undocking Post Lunar Touchdown
110:36	OFF	2:45		
113:52	VOX	*33%	4:26	PLSS Comm Act. (Pre-EVA1) Post EVA-1 Comm
118:11	OFF	1:26		
132:28	VOX	*33%	5:53	PLSS Comm Act. (Pre-EVA 2) Post EVA-2 Comm
136:50	OFF	1:27		
141:45	ICS/PTT	*100%	9:53	Liftoff Comm Post Docking
145:45	OFF	4:00		

*Estimated duty cycle in mode indicated

10 October 1969

TABLE 1-9
BATTERY CHARGE SCHEDULE

GET HR:MIN	BATTERY
04:30	B
11:30	A
62:00	B
76:30	A
88:10	B
131:30	A
137:25	B
186:00	B
193:15	A

LANDMARK TRACKING TABLE

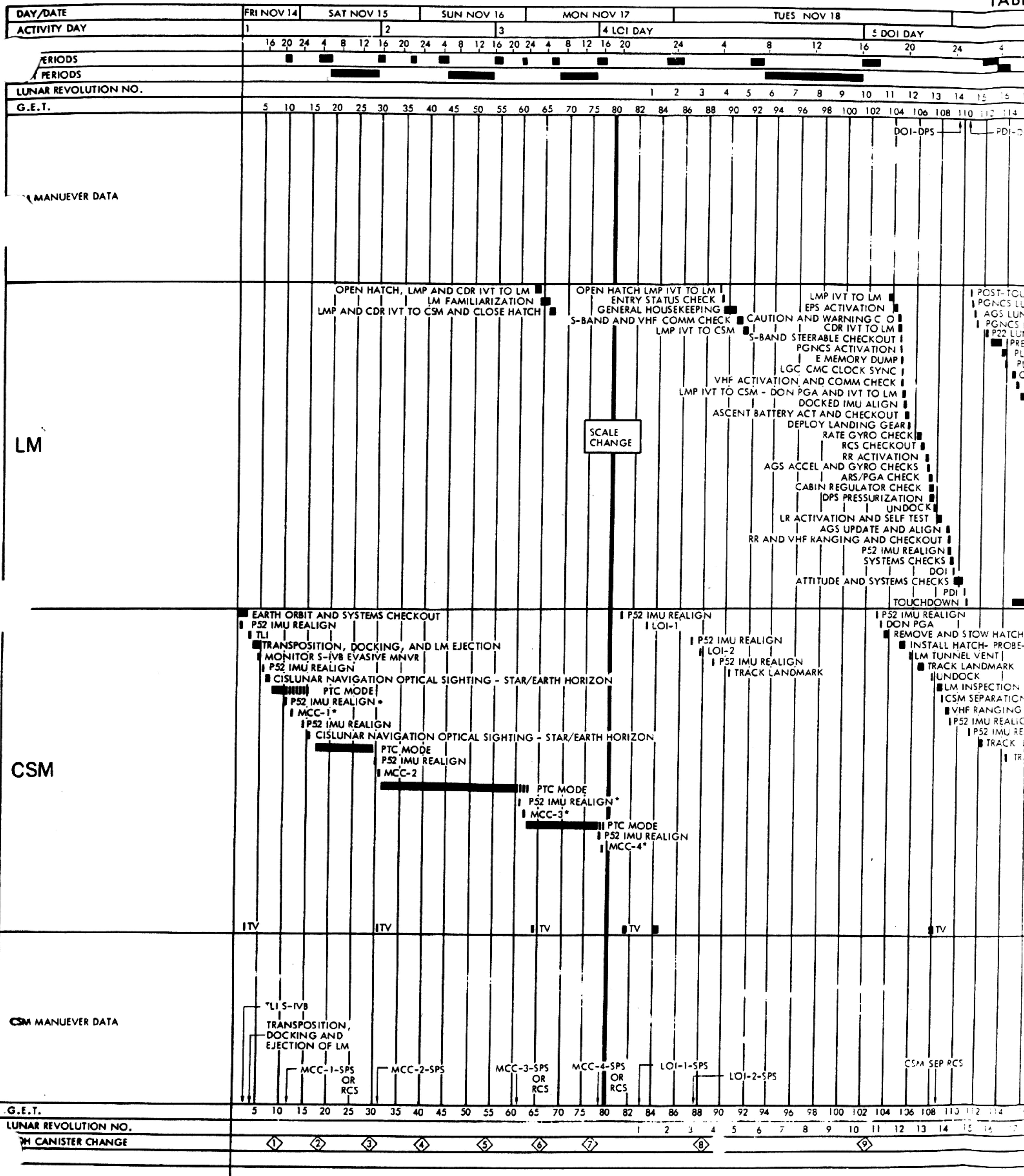
TABLE 1-10

<u>LANDMARKS</u>	<u>LATITUDE</u>	<u>LONGITUDES</u>	<u>ELEVATIONS (N.M.)</u>
H1*	1.517° S	15.250° W	-1.9438 n.m.
SITE 7*	2°58'56" S (2.9822°)	23°23'31" W (23.39194°)	-1.28164 n.m.
190	2.957° S	23.024° W	-1.23 n.m.
191	3.437° S	23.202° W	-1.36 n.m.
193*	3.437° S	23.229° W	-1.37 n.m.
194	3.009° S	23.573° W	-1.38 n.m.
195	3.377° S	24.008° W	-1.53 n.m.
Lalande Site **	4.783° S	8.667° W	-0.3239 n.m.
CP 1*	5.667° S	112.000° E	0.00 n.m.
CP 2*	10.250° S	56.183° E	-0.81 n.m.
Descartes Site **	8.858° S	15.517° E	-1.7 n.m.
DE 1*	8.883° S	15.550° E	-1.7 n.m.
DE 2	9.333° S	15.067° E	-1.7 n.m.
DE 3	8.767° S	14.983° E	-1.7 n.m.
Fra Mauro Site **	3.617° S	17.550° W	-1.8628 n.m.
FM 1*	3.228° S	17.3305° W	-1.5631 n.m.
FM 2	4.117° S	16.908° W	-1.8088 n.m.
FM 3	4.567° S	17.517° W	-1.7818 n.m.
Lansberg A *	0.150° N	31.150° W	-0.54 n.m.

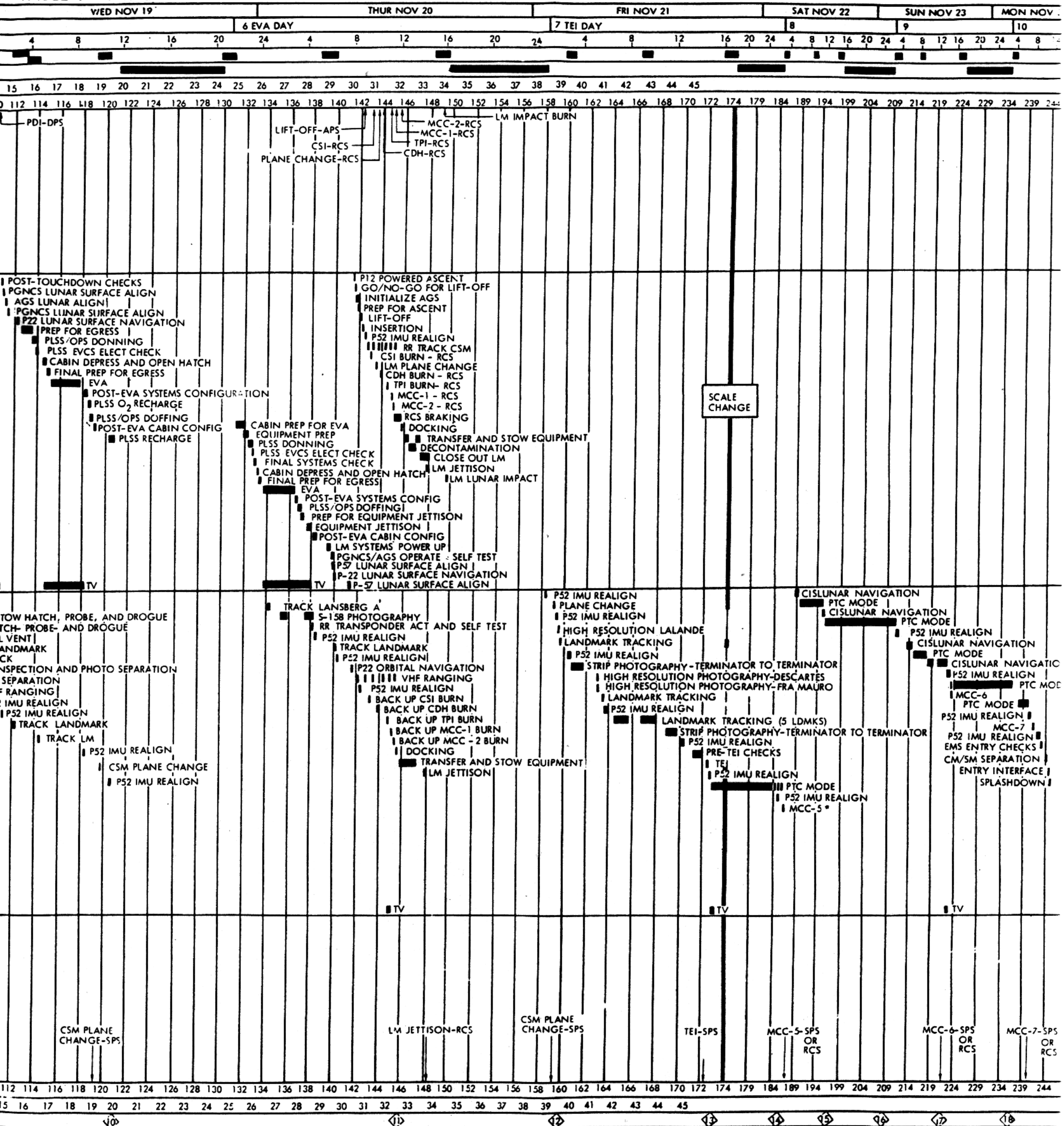
*Used in the nominal mission

**Future Landing Site

Note: Data was provided by the Mapping Sciences Laboratory.
Elevations are based on a mean lunar radius of
938.4449184 n m (1738.09 K M)



APOLLO 12 TABLE 1 - 11



*MAY NOT BE REQUIRED