

COMM BASIC CONFIGURATION	PRIOR TO DOCKING	PREP FOR UN DOCKING	LOS PRO-CEDURE	LM RELAY WITH VHF RNG	CSM RELAY	LUNAR STAY	PLSS/ EVCS WITH TV (EVA)
PANEL 11-ALL COMM CB'S-CLOSED							
PANEL 8 - AUDIO (CDR)					OFF		
S-BAND T/R SW - T/R							
ICS T/R SW - T/R							
RELAY ON SW - RELAY OFF							
MODE SW - ICS/PTT				VOX			VOX
AUDIO CONT SW - NORM							
VHF A SW - T/R						OFF	OFF
VHF B SW - OFF	RCV	RCV	RCV	RCV		RCV	
VOX SENS - MAX							
PANEL 16 - ALL							
ALL COMM CB'S-CLOSED							
CB(16 TV -) OPEN							CLOSED
PANEL 14 - UPLINK SQUELCH SW AS DESIRED	ENABLE	ENABLE	ENABLE	ENABLE	OFF	OFF*	ENABLE
PANEL 12, UPDATA LINK SW - OFF							
PANEL 12 - AUDIO (LMP)							
S-BANK T/R SW - T/R				RCV	OFF		
ICS T/R SW - T/R							
RELAY ON SW - RELAY - OFF				ON			ON
MODE SW - ICS/PTT				VOX			VOX
AUDIO CONT SW - NORM							
VHF A SW - T/R						OFF	
VHF B SW - OFF	RCV	RCV	RCV	RCV		RCV	RCV
VOX SENS - MAX INCR							
PANEL 12 - COMM							
S-BAND MODULAT SW-PM							FM
S-BANK XMTR/RCVR SW-PRIM							SEC
S-BAND PWR AMPL SW-PRIM							
S-BAND VOICE SW-VOICE			VOICE				
S-BAND PCM SW - PCM							
S-BAND RANGE SW-OFF/RESET		RANGE				AS REQ	
VHF A XMTR SW -VOICE	VOICE/RNG			VOICE OR VOICE/RNG (IF RNG REQ)		OFF	
VHF A RCVR SW - ON						OFF	
VHF B XMTR SW -OFF		DATA	DATA		DATA	OFF	
VHF B RCVR SW - OFF	ON	ON		ON		ON	ON
SQUELCH VHF A - NORM							N.T.+11/2
SQUELCH VHF B - NORM							N.T.+11/2
TLM BIOMED SW - AS REQ	RIGHT	RIGHT	OFF	OFF			OFF
TLM PCM SW - HI		LO	LO				
RECORDER SW - OFF	AS DES	AS DES	AS DES	AS DES	AS DES	AS DES	ON
PANEL 12 - COMM ANT:							
TRACK MODE SW - AUTO			SLEW			SLEW	OFF
PITCH CONT - COMPUTED ANGLE							
YAW CONT - COMPUTED ANGLE							
S-BAND SEL-SLEW			AFT OR FWD				AS REQ
VHF SEL - AFT OR FWD							EVA
*DURING EVA - ENABLE							

LOSS OF COMM (PDI)

- 1 Verify Standard Comm Configuration
- 2 S-BD SIG STR Low (<3.0) - Reacquire
With Steerable
- 3 STILL NO COMM (SIG STR LOW <3.0)
OMNI - Select Best OMNI
- 4 STILL NO COMM
S-BD: XMTR/RCVR - SEC
 : PWR/AMP - SEC
- 5 60 SEC, STILL NO COMM
DN VOICE BU (HOT MIKE)
BIOMED - OFF
- 6 60 SEC, STILL NO COMM
VOICE
FM
- 7 60 SEC, STILL NO COMM
CSM RELAY

PM

S-BD AUDIO (Both) - OFF
Notify CSM To Config
For Relay

LM COORDINATES	STEERABLE ANTENNA	
	PITCH	YAW
+X	90	-45
-X		
+Y	90	45
-Y		
+Z	0	0
-Z	180	0

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STAGING

ASC BATT (2)-ON(PRECONDITION)
 DES BATTs-OFF
 MODE CONTROL (BOTH)-ATT HOLD
 DEADFACE
 ✓GUID SW (IF PGNS: DAP 11002, V77)
 ATT CONT (3)-MODE CONT
 BAL CPL-ON
 DEAD BAND - MIN
 P47, 404,5,6=0
 470R
 HELIUM MON-✓ASC PRESS
 MASTER ARM-ON
 ASC He Se1-BOTH
 ✓CB ED LOGIC PWR (2)-CLOSED
 He PRESS ASC-FIRE
 STOP PB-PUSH
 -X TRANS 2fps
 STAGE-FIRE
 +X TRANS 2fps
 CB ED LOGIC PWR (2)-OPEN
 CABIN REPRESS-CLOSE
 DES O2-CLOSE, #1 ASC O2-OPEN
 H2O SEL-ASC
 DES H2O-CLOSE, ASC-H2O-OPEN
 PRESS REG A&B-EGRESS
 SUIT GAS DIV-EGRESS
 CABIN GAS RETURN - EGRESS
 ATT/TRANSL-2 JET
 POO
 STOP PB-RESET
 ✓GUID SW

500fps

200fps

0fps

DPS ABORT/APS INSERTION

✓GUID SW
 THROTTLE-UP
 ABORT PB-PUSH
 MODE CONT (BOTH)-AUTO
 YAW RT 30°
 623+1
 29% DES REG-CLOSE
 BURN DPS TO DEPLETION
 ABORT STAGE PB-PUSH
 ENG ARM-ASC
 START PB-PUSH
 ASC FEED(2)-OPEN+ (UNLESS
 MAIN SOV-CLOSE+ BUS LOSS)
 CABIN REPRESS - CLOSE
 DES O2-CLOSE, #1 ASC O2-OPEN
 H2O SEL-ASC
 DES H2O-CLOSE ASC H2O-OPEN
 PRESS REGS A&B-EGRESS
 SUIT GAS DIVERTER - EGRESS
 CABIN GAS RETURN - EGRESS
 PROP TEMP/PRESS-ASC
 He MON-ASC
 ✓XFEED
 ✓INVERTER
 THROTTLE/JET-JETS
 CB(11) RR(2) - CLOSED
 V16N85 (500R)
 MAIN SOV-OPEN+
 ASC FEED(2)-CLOSE+
 ENG ARM-OFF (UNLESS BUS LOSS)
 STANDBY TO COPY GET
 ABORT STAGE-RESET
 STOP PB-PUSH
 DET-STOP
 GET _____
 MODE CONT-ATT HOLD
 404,5,6=0 470R

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DPS ABORT/INSERTIONAPS ABORT/INSERTION

✓GUID SW
 THROTTLE-UP
 ABORT PB-PUSH
 MODE CONT(BOTH)-AUTO
 YAW RT 30°
 623+1

✓INVERTER
 V16N85 (500R)

29% DES REG-CLOSE
 200fps DES ENG CMD OVRD-OFF
 (UNLESS CDR BUS OUT)

TFC-10 DES REG-Close (<86%)
 STANDBY TO COPY GET

0fps STOP PB - PUSH

DET - STOP

GET _____

MODE CONT-ATT HOLD

ENG ARM-OFF

ABORT (STAGE)-RESET

STOP PB - RESET

404,5,6=0 470R

✓GUID SW
 ABORT STAGE PB-PUSH
 MODE CONT(BOTH)-AUTO
 ENG ARM-ASC
 START PB-PUSH
 ASC FEED(2)-OPEN+ (UNLESS
 MAIN SOV-CLOSE+ BUS LOSS)
 YAW RT 30°

623+1
 CABIN REPRESS - CLOSE
 DES O2-CLOSE, #1 ASC O2-OPEN
 PRESS REGS A&B - EGRESS
 SUIT GAS DIV - EGRESS
 CABIN GAS RETURN - EGRESS
 H2O SEL-ASC
 DES H2O-CLOSE, ASC H2O - OPEN
 PROP TEMP/PRESS-ASC
 He MON-ASC

✓XFEED

✓INVERTERS

THROTTLE/JETS-JETS

V16N85 (500R)

500fps MAIN SOV-OPEN+
 200fps ASC FEED(2)-CLOSE+
 ENG ARM-OFF (UNLESS BUS LOSS)
 0fps STANDBY TO COPY GET
 ABORT STAGE-RESET
 STOP PB-PUSH
 DET-STOP
 GET _____
 MODE CONT-ATT HOLD
 404,5,6=0 470R

ABORT RULES

1 ATT & RATE LIMITS

DPS >5° SEC

APS >10° SEC

2 DPS SHUTDOWN

<30 fps - STAGE & RCS

>30 fps - ABORT STAGE

3 APS UNDER BURN

PGNS	AGS
<400 NULL	AUTO,
RESIDUALS	A/H 15FPS
>400 A/H BURN	
Ha, Hp, HDOT	

4 INSERTION

WITH VOICE-GROUND RECOMMENDS TRIM SOURCE AT T GO~1 MIN

TRIM TO <2fps (AGS X AXIS ONLY) AND STANDBY FOR

TWEAK AT INSERTION +4 MINUTES(10° OHW OR 250° FDAI)

5 NO VOICE

AGS & PGNS <10fps TRIM ACTIVE SYSTEM

AGS & PGNS >10fps TRIM SYSTEM THAT AGREES WITH RR

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MISSION RULES NO-GO'S

	PRE PDI	PDI TO PDI +5+30	PDI +5+30 TO HI GATE	HI GATE TO LO GATE	LO GATE TO TD
EPS	ONE DC BUS ONE DESCENT FEEDER SHORTED ONE ASCENT FEEDER SHORTED 3 DESCENT BATS ONE ASCENT BAT BOTH INVERTERS AC BUS A AND B	ABORT ABORT ABORT ABORT ABORT ABORT ABORT	ABORT ABORT ABORT ABORT ABORT ABORT ABORT	ABORT ABORT ABORT ABORT GO ABORT ABORT	ABORT ABORT ABORT GO GO GO GO
ED	ONE PYRO SYSTEM ARMED ONE PYRO SYSTEM	ABORT ABORT	ABORT ABORT	ABORT ABORT	ABORT ABORT
ECS	CABIN PRESS <4.4 SUIT LEAK BOTH SUIT FANS BOTH DEMAND REGS BOTH H2O SEPS DESCENT O2 TANK TWO O2 TANKS PRI OR SEC COOLANT LOOP PRI AND SEC COOLANT LOOP PRI OR SEC H2O FEED PRI AND SEC H2O FEED DESCENT H2O TANK TWO H2O TANKS	ABORT ABORT ABORT GO GO GO ABORT GO ABORT GO ABORT GO ABORT	ABORT ABORT ABORT GO GO GO ABORT GO ABORT GO ABORT GO ABORT	ABORT ABORT ABORT GO GO GO ABORT GO ABORT GO ABORT GO ABORT	GO ABORT GO GO GO GO GO GO GO GO GO GO GO
G&C	PGNS GUID STEER 3 AXIS ATT CONT ACA PGNS RATE CMC & PGNS AUTO AGS RATE CMD 2 ACA AUTO +X & AUTO DPS IGNITION 2 FDAI-ATT/RATE/ERR LR RED APS ON P & R GDA TRIM (IMPING CONST VIOL) MANUAL THROTTLE (2 TTCA) & AUTO THROT	ABORT ABORT ABORT ABORT GO OPTION ABORT ABORT ABORT ABORT ABORT ABORT	ABORT ABORT ABORT ABORT GO OPTION ABORT GO ABORT ABORT ABORT ABORT	GO OPTION OPTION ABORT GO OPTION GO GO ABORT ABORT ABORT ABORT	GO OPTION OPTION ABORT GO OPTION GO GO ABORT ABORT ABORT ABORT
DPS	PROP LEAK (ΔQ FU/OX>13%) FU OR OX INLET/ULLAGE>65%<160 LO LEVEL <2%	ABORT ABORT	ABORT ABORT	ABORT ABORT ABORT	ABORT ABORT ABORT
APS	PROP LEAK FU/OX INLET PRESS<62,>220 APS HE 1 OR 2 DECREASING	ABORT ABORT ABORT	ABORT ABORT ABORT	ABORT ABORT ABORT	ABORT ABORT ABORT
RCS	HE/PROP LEAK HE/PROP LEAK (BETWEEN MAIN & ISO VLV) FU/OX MNFLD A OR B PRESS<100 PAIR ISOLATED 3 AXIS ATT CONT RED 3 AXIS ATT CONT	ABORT ABORT GO GO ABORT	ABORT ABORT GO GO ABORT	GO ABORT GO GO ABORT	GO ABORT GO GO ABORT

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ALARM CODES (PDI)

CODES	DEFINITION	ACTION
00214	PROG USING IMU WHEN TURNED OFF	GUID CONT - AGS
00402 (4 TIMES)	FIND CDUW ROUTINE NOT CONTROLLING ATTITUDE	GUID CONT - AGS
00511	NEITHER OR BOTH LR ANT POSITION DISCRETES PRESENT	LR ANT - HOVER, CONSULT MSFN
01107	PHASE TABLE FAILURE	GUID CONT-AGS (LAND MANUALLY IF DESIRED)
RECURRING 01406	BAD RETURN FROM ROOTPSRS	NO GUIDANCE, SWITCH TO P66 OR SWITCH TO AGS
RECURRING 01410	UNINTENTIONAL OVERFLOW IN GUIDANCE	NO GUIDANCE, SWITCH TO P66 OR SWITCH TO AGS
01412	DESCENT IGN ALGORITHM NOT CONVERGING	<u>PRIOR TO BURN</u> -SUSPECT BAD UPLINK SV OR RLS, HAVE MSFN SEND NEW UPLINK
01466	INSUFFICIENT THROTTLE SERVICING	GUID CONT - AGS, FLY PGNS ATTITUDE ERROR NEEDLES
01703	INTEGRATION CANNOT BE COMPLETED IN TIME FOR BURN	<u>IF LARGE IGNITION DELAY</u> -DO NOT BURN PDI <u>IF SMALL IGNITION DELAY</u> -MANUALLY THROTTLE UP AT DET N+26
2XXXX	ALL POODO'S (EXCEPT 21406)	GUID CONT - AGS
21406	BAD RETURN FROM ROOTPSRS	SUSPECT BAD UPLINK SV OR RLS, HAVE MSFN SEND NEW UPLINK
RECURRING 3XXXX	ALL SOFTWARE RESTARTS (BAILOUT)	CONTINUE-INSURE NO UNSAFE CONDITION DEVELOPS. IF IT DOES SWITCH TO AGS TO REDUCE LGC DUTY CYCLE AND FLY PGNS ATTITUDE ERROR NEEDLES
N49	RMAX VMAX >.3nm, 2.0fps	1. IF STEADY STATE-RESET 2. REJECT FIRST MARK THEN ACCEPT NEXT COUPLE OF MARKS AND MONITOR FOR NEXT CONVERGENCE >2.0nm OR 12.0fps PRIOR TO CSI OR >.8nm OR 5.0fps AFTER CSI CONSIDERED EXCESSIVE
F97N63	LGC THINKS ENG FAILED	PRO TO SET ΔV MON. DO NOT ENTER BECAUSE IT WILL SLIP TIG IF RECURRING, NO GUIDANCE

NO PDI+12 APS ABORT

APS BURN

ASSUMPTIONS:

PDI CHECKLIST COMPLETE TO TIG.
DPS INOPERATIVE.

V37E 30E, LOAD NO PDI+12 PAD

V37E 42E

01706 ALARM, PRO

N86

410+5, LOAD ΔV

267 R

411+1

407+0

N18 R, P, Y (0, 270, 0)

SET DET

He MON - ASC PRESS

MASTER ARM - ON

ASC He SEL - BOTH

CB(11)&(16)

✓ED LOGIC PWR(2)-CLOSED

He PRESS ASC - FIRE

DES 02 - CLOSE

#1 ASC 02 - OPEN

H20 SEL - ASC

DES H20 - CLOSE

ASC H20 - OPEN

V48, 11002

CHECK APS BURN

CB(16)

DISP/ENG OVRD/LOGIC - CLOSED

CB(11)&(16)

STAB/CONT (ALL) - CLOSED

EXCEPT

CB(11) AEA AND DECA PWR AND

CB(16) DES ENG OVRD - OPEN

CB(16) EPS:

CROSS TIE BAL LOADS - OPEN

RATE SCALE - 25°/SEC

ATT/TRANSL - 4 JETS

BAL CPL - ON

DEAD BAND - MIN

ABORT/ABORT STAGE - RESET

ATT CONT(3) - MODE CONT

MODE CONT - ASCENT - PGNS - AUTO
AGS - AUTO

STOP PB (2) - RESET

TTCA (2) - JETS

411+1

-2:00 400+1

AGS/PGNS

-1:00 MASTER ARM - ON

RCS STAGE

-:14 MANUAL ULLAGE

-:10 STAGE-FIRE

-:10 ABORT STAGE PB - PUSH(T=0 FOR AGS)

ENG ARM - ASC

-:05 PRO

:00 ENG ON

+ :01 ENG START - PUSH

200 fps ENG ARM - OFF

0 fps ABORT STAGE - RESET

STOP PB - PUSH

CB(11) DECA GMBL AC - CLOSED
 CB(16) DISP/ENG OVRD/LOGIC - CLOSED
 CB(11)&(16) STAB/CONT CB'S(ALL) - CLOSED
 EXCEPT CB(11) AEA - OPEN

RATE SCALE PDI - 25°/SEC

THR CONT - MAN/CDR
 - PDI AUTO/CDR

ATT/TRANSL - 4 JETS
 BAL CPL - ON
 ENG GMBL - ENABLE
 DES ENG CMD OVRD - OFF
 ABORT/ABORT STAGE - RESET
 DEADBAND - MIN
 ATT CONT(3) - MODE CONT

MODE CONT PDI PGNS - AUTO
 AGS - AUTO

STOP PB (2) - RESET
 TTCA (2) - THROT/Min PDI LMP TTCA-SOFT STOP

FOR PDI GO TO TIMELINE BOOK

-2:00 400+1

-1:00 MASTER ARM - ON (1st BURN)

- :30 ENG ARM - DES

FOR AGS BURN ABORT PB - PUSH (T=0 FOR AGS)

-:07.5 ULLAGE (MANUAL FOR AGS)

- :05 PRO

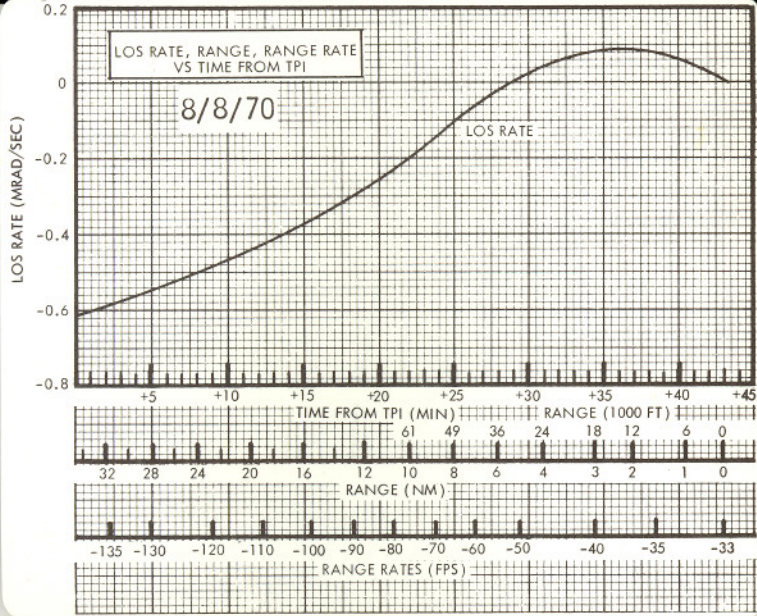
+ :01 DES REG (2)-OPEN (>29%)

TFC-10 DES REG (2) - CLOSE (<86%)

ΔV=0 STOP PB - PUSH

ENG ARM - OFF

ABORT PB - RESET



LPD CHANGES

ALT	UP	DN	X
6	725	775	800
5	650	700	675
4	550	575	550
3	425	450	400
2	275	300	275
1	100	115	125
0.5	35	40	50

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RR RANGE VS AGC VOLTS

RANGE	VOLTS
400 nm	1.6
200 nm	2.0
100 nm	2.2
50 nm	2.5
25 nm	2.7
12.5 nm	2.8

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CDR BUS LOST	LMP BUS LOST	12/21/70
AGS INV 2 SUIT FAN 2 CDR AUDIO CONT-BU ACTIVATE SEC GLY LOOP SEE EPS 1, BLOCK 17	INV 1 SUIT FAN 1 LMP AUDIO CONT - BU S-BD SEC/SEC/DN VOICE BU/BIOMED-OFF S-BD ANT - OMNI SEE EPS 1, BLOCK 28	

DEDA ADDRESSES

R DOT - 440	Y DOT - (Present)(-)270
R - 317	- (Next Man)(-)263
Ha - 315	STORE δ -415 & 1E
Hp - 403	STORE R DOT -503E
VI - 433	STORE R -316E
H DOT - 367	V16N78 RR RNG/RNG RT
H - 337	V16N92 %THROT/HDOT/H
- 277	V21N69 Δ RLS
Δ V 404, 5,6=0 470,71,72R	

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S-BAND
ANTENNA ANGLES
DESCENT REFSMMAT

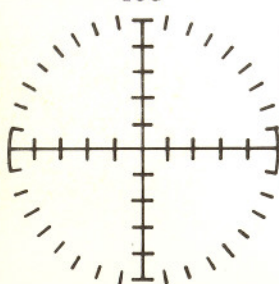
11/10/70

YAW=0°		IGA (PITCH)	YAW=180°	
ANTENNA			ANTENNA	
P	Y		P	Y
121	-38	0	57	-43
108	-41	10	70	-46
95	-42	20	84	-48
82	-42	30	99	-47
69	-40	40	113	-45
57	-37	50	126	-42
46	-32	60	138	-37
36	-27	70	148	-32
27	-21	80	157	-25
19	-15	90	165	-19
12	-8	100	172	-12
5	-1	110	179	-5
-2	6	120	186	2
-10	13	130	194	9
-17	20	140	201	16
-25	27	150	209	23
-35	33	160	218	28
-45	38	170	228	34
-57	43	180	239	38
-70	46	190	252	41
276	48	200	265	42
261	47	210	278	42
247	45	220	-69	40
234	42	230	-57	37
222	37	240	-46	32
212	32	250	-36	27
203	25	260	-27	21
195	19	270	-19	15
188	12	280	-12	8
181	5	290	-5	1
174	-2	300	2	-6
167	-9	310	10	-13
159	-16	320	17	-20
151	-23	330	25	-27
142	-28	340	35	-33
132	-34	350	45	-38

ft	nm
500	= 0.08
1000	= 0.16
1500	= 0.25
2000	= 0.33
2500	= 0.41
3000	= 0.49
3500	= 0.57
4000	= 0.66
4500	= 0.74
5000	= 0.82
5500	= 0.90
6000	= 0.99
6500	= 1.07
7000	= 1.15
7500	= 1.23
8000	= 1.32
8500	= 1.40
9000	= 1.48
9500	= 1.56

8/8/70

COAS BORESIGHT
LOG



DAP DATA LOAD

A 1=STAGED	2=UNSTAGED	3=DOCKED
B 0=RCS A	1=RCS B	2 OR 3=RCS A&B
C 0=FINE	1=NORM	
D 0=0.3°	1=1.0°	2 & 3=5.0°
E 0=0.2°/SEC	1=0.5/SEC	2=2.0°/SEC
		3=10.0°/SEC

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DPS	APS	RCS
TEMP/PRESS MON >30 PSI @ PDI	TEMP PRESS MON >78 PSI OX	He >1400 PSI PRPLNT
HELIUM NOM >1000<1150 PSI PRE PDI	>114 PSI FU 50 - 90°F ΔT<60°F FOR BT<100 SEC HELIUM NOM PRESS 3125 PSI	PRESS >100 PSI TEMP 40 - 100°F FUEL/OXID MANF PRESS >100 PSI ΔP <80 PSI QUAD TEMP >119°F (25 MIN TO FIRING)

PDI + LV	DPS/APS				APS				PDI + LV	DPS/APS (CONT)				APS (CONT)			
	FDAI		OHW		FDAI		OHW			FDAI		OHW		FDAI		OHW	
	ABORT + 0:20 →300° →37°				ABORT + 0:20 →300° →37°					ABORT + 0:20 →300° →37°				ABORT + 0:20 →300° →37°			
	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN		T1 →270°	T2 SHDN	T1 →α2	T2 SHDN	T1 →270°	T2 SHDN	T1 →α2	T2 SHDN
0:30	NA	2:00	NA	2:00	NA	1:55	NA	2:00	5:30	7:10	9:55	7:10(9°)	9:40	8:20	11:05	8:25(8°)	11:00
1:00	NA	2:40	NA	2:40	NA	2:35	NA	2:40	6:00	7:40	11:00	7:35(10°)	11:05	9:10	12:00	9:20(8°)	11:55
1:30	NA	3:20	NA	3:25	NA	3:15	NA	3:25	6:30	8:10	12:10	8:05(12°)	12:10	10:05	13:00	10:15(7°)	12:50
2:00	2:40	4:15	2:40(0°)	4:20	2:40	4:20	2:30(1°)	4:10	7:00	8:45	13:05	8:35(13°)	13:05	10:50	13:40	11:05(7°)	13:40
2:30	3:15	5:05	3:15(4°)	5:05	3:20	5:15	3:10(5°)	5:10	7:30	9:20	14:00	9:10(14°)	14:00	11:35	14:25	11:50(7°)	14:25
3:00	3:50	5:55	3:50(7°)	5:55	4:00	6:10	3:55(7°)	6:10	8:00	10:00	14:55	9:40(15°)	14:50	12:15	15:15	12:25(7°)	15:10
3:30	4:30	6:45	4:25(8°)	6:40	4:40	7:00	4:40(8°)	7:05	8:30	10:35	15:45	10:05(17°)	15:35	12:45	16:00	13:00(8°)	15:55
4:00	5:10	7:35	5:05(9°)	7:35	5:35	8:05	5:30(9°)	8:05	9:00	11:10	16:20	10:25(17°)	16:35	13:00	16:35	13:20(11°)	16:35
4:30	5:50	8:15	5:45(9°)	8:15	6:30	9:05	6:25(9°)	9:00	9:30	11:45	16:55	10:50(18°)	17:05	13:20	17:10	13:35(12°)	17:10
5:00	6:30	9:00	6:25(9°)	9:00	7:20	10:00	7:25(9°)	10:00	10:00	12:20	17:30	11:25(18°)	17:45	13:40	17:40	13:55(13°)	17:40

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CABIN PREP-Perform EVA 1 Or 2 As Reqd

EQPT PREP-Perform EVA 1 Or 2 As Reqd

PLSS DONNING-Perform EVA 1 or 2 As Reqd

Position Post EVA 1 or 2 Cue Card
For Post EVA

NON EVA CREWMAN-Connected To LM 02,
Comm, & H2O
Gas Connector Plugs In PGA
PGA Diverter Vlvs - Horizontal

EVA CREWMAN: PGA Diverter Vlvs -
Vertical
For EVA 1 (MIN TIME) - CSRC
In PGA Pocket

PLSS COMM CHECK

Verify Powerdown CB Configuration
Verify LM EVA Antenna Deployed
COMM: MODULATE-FM
CB(16) COMM: TV-Close
Verify Voice Comm With Hou

Audio (Non EVA Crewman)
S-BAND - T/R
ICS - T/R
RELAY - OFF
MODE - VOX (VOX SENS MAX)
VHF A - RCV
VHF B - T/R

Audio (EVA Crewman)
S-BAND - T/R
ICS - T/R
RELAY - ON
MODE - VOX (VOX SENS MAX)
VHF A - RCV
VHF B - T/R

ONE MAN EVA

COMM:

VHF-OFF, ON, VOICE, ON, NON EVA
CREWMAN POSITION, HI
SQUELCH A & B - Noise Thres + 1-1/2
RECORDER - ON
VHF Antenna - EVA

EVA Crewman Connect to PLSS Comm
(Audio CB Open/Close)

RCU PTT - MAIN (Rt)

PLSS Mode-B, Blade-CCW (Tone-On, Vent
Flag-P, Press Flag-0, 02 Mom)

PLSS 02 Press Gage >85%
Perform Comm Check With CDR

NOTE: Unstow PLSS Antenna If It Trans-
mits Garbled And/Or Loses TM.

Audio (CDR & LMP)
VHF A - T/R
VHF B - RCV

COMM:

VHF A XMTR - VOICE
VHF B XMTR - OFF

PLSS Mode - A, Wheel-CCW (Tone-On)
Perform Comm Check With Each Other &
Comm & TM Check With Hou

Read PLSS 02 Qty To Hou

NOTE: IF Comm Is NO GO With Hou
S-BD MOD - PM
Verify Comm & TM

CB(16) COMM: TV - Open (EVA 1)

FINAL SYSTEMS PREP

CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FLOW CONT- Open

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT

Unstow OPS 02 Actuator
Connect Actuator To RCU
SUIT ISOL - SUIT DISC
Discon LM 02 Hoses, Secure About PGA

Connect OPS 02 Hose To PGA B/B
Retrieve Purge Valve (Purse) -
Verify Closed, Locked & LO
Install Purge Valve In PGA R/R

FOR EVA 2:

Verify Items Prepared For Jettison -
ECS LiOH Cartridge & Brkt
Hammocks
PLSS Batteries & LiOH Carts
Food Waste, Urine Bags
Feedwater Bags & Scale

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets, Check Drink Bag Position
Don LEVA

EVA Crewman:
LCG - COLD, As Reqd
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses

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ONE MAN EVA

Verify EVA Crewman in CDR's Station

Verify The Following:

Helmet & Visor (2) - Aligned & Adjusted
Torso Tiedown (2) - Adjusted
O2 Connectors (7) - Locked
Purge Valve (1) - Locked
H2O Connectors (2) - Locked
Comm Connectors (2) - Locked

Verify No Fog RH Window

If BSLSS Not Req'd, Stow In Jett Bag
Tie Jett Bag & Transfer To Eng Cover

Don EV Gloves & Verify:

Wrist Locks (4) - Locked
Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON

PRESSURE INTEGRITY CHECK

(Non EVA Crewman)

NOTE: LM Suit Circuit Shall Not Be
Maintained At Elevated Press >5 min

SUIT GAS DIVERTER - PULL-EGRESS (Verify)
CABIN GAS RETURN - EGRESS (Verify)
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor Cuff Gage To 3.7 - 4.0 Psig
Then PRESS REG B - EGRESS (Cuff Gage
Decay <.3 Psig In 1 min)

SUIT CIRCUIT RELIEF - AUTO (Suit Ckt
Press Decays To 4.8 Psia)

PLSS/OPS/PGA (EVA Crewman)

PLSS O2 - ON (Tone-On, O2 Flag-0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3
Psig In 1 Min)
PLSS O2 - ON (Cuff Gage 3.7-4.0
Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CABIN REPRESS VLV - Close

Ovhd Or Fwd Dump Valve - OPEN Then AUTO
At 3.5 Psia (Verify EVA Crewman Cuff
Gage Does Not Drop Below 4.8 Psig)

Verify:
Cabin At 3.5 Psia
LM Suit Circuit 3.6 to 4.3 Psia &
Decaying
PLSS/OPS/PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
Tone-On & H2O Flag - A (1.3-1.6 Psia)
LM Suit Circuit 3.6 To 4.3 Psia &
Decaying
PLSS/OPS/PGA > 4.8 Psig & Decaying

Partially Open Fwd hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag -
Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient
Verify:

PLSS/OPS/PGA 3.7 To 4.8 Psig
CWEA Status:

Caution
PREAMPS

CB(16) COMM: TV - Close

Release PLSS Antenna
Lower EV Visor :10

POST ONE-MAN EVA

Perform POST EVA 1 or 2 As Applicable

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LIGHT	MEANING	IMMEDIATED ACTION (POSSIBLE OPERATIONAL IMPLICATIONS)
STAGE SEQ RELAY LT. OFF AT PDI	Possible Relay Fail	<u>AT PDI</u> : MASTER ARM - OFF, Open LOGIC PWR CB On System Which Had SEQ LT - ON, MASTER ARM - ON. At Ignition Monitor DPS SHe And FUEL/OXID PRESS. SHe Tank Inoperative: STOP PB - PUSH, ENG ARM - OFF. SHe Tank OK: MASTER ARM - OFF, LOGIC PWR CB - CLOSE (M71)
DES REG	220 psi>He Press>260psi	DES He REG 1 - CLOSE, DES He REG 2 - OPEN Monitor TEMP/PRESS, Maintain FUEL & OXID>160psi (M31)
ASC PRESS	Either He Press<2775psi (Before Staging)	<u>IF APS NOT PRESSURIZED</u> - CONSULT MSFN, GO TO MAL PROC APS-1 <u>IF APS PRESSURIZED</u> - CLOSE ASC He REG 1 & 2: MONITOR ASC He PRESS; IF BOTH <2775 AND DECREASING - <u>IMMEDIATE LIFTOFF</u> MONITOR FUEL/OXID PRESS; IF EITHER DECREASING - <u>IMMEDIATE LIFTOFF</u> (M37)
ASC HI REG	Manf Press>220psi	ASC He REG 1 & 2 CLOSE, When <220psi, Open Each REG Separately. (M38)
ASC QTY	<10 Sec Burn Time	MAIN SOV (2) - OPEN, ASC FEED 2 (2) - CLOSE (M38)
RCS A REG RCS B REG	165psi>Reg Press>218psi	Monitor MANF PRESS, When <100psi: Bad System MAIN SOV - CLOSE, CRSFD - OPEN (M42)
RCS	A OR B He Press<1770	Monitor He PRESS & RCS QUANTITY. Affected Sys: QUAD ISOL (4) - CLOSE, MAIN SOV - CLOSE. Monitor MANF PRESS. (Translation May Be Lost In One Or More Axis With A Single System Out.) (M41)
RCS TCA	One Or More Thrusters Fail Off, Collinear Thrusters Firing Simultaneously	If Stable, Recycle CWEA. If Unstable: Affected QUAD ISOL - CLOSE, Monitor MANF PRESS. Between Ullage And Throttle-up Wait 2 Sec, Affected QUAD ISOL - CLOSE (M42)
ENG GMBL	GMBL Cmd/Response Discrepancy	ENGN GMBL - OFF. If Lt Still ON: ENG GMBL - ENABLE (CWEA FAIL) (M25)
LGC	LGC Power, Scaler, or Counter Fail	GUID CONT - AGS. Poss No Auto Eng Shutdown. <u>IF RESTART Lt ON</u> , LGC Fail. CB(11)AEA - CLOSE (M10)
ISS	IMU, ICDU or PIPA (Trusting) FAIL	GUID CONT - AGS. Pos No Auto Eng Shutdown. <u>IF PROG Lt NOT ON</u> , CWEA Fail. CB(11) AEA - CLOSE (M9)
CES AC	ATCA AC Out of Tolerance	GUID CONT - PGNS, GYRO TEST - POS RT. <u>If Light Stays ON</u> , CWEA Fail. Poss Loss of AGS Control, FDAI Rate Needles Unreliable, RR Usable In LGD Mode Only. (M27)
CES DC	ATCA DC Out of Tolerance	GUID CONT - PGNS, GYRO TEST - POS RT. <u>If Lt Stays ON</u> , CWEA Fail, If Lt OFF - Cycle CWEA CB, If Lt Stays OFF, Cycle DECA GMBL AC CB To Unlock Throttle. If Lt Reappears: Poss GDA Lock-up, DPS To 100%, No AGS Attitude Control (M27)
AGS	AGS Power Supply Out of Tolerance, AGS Heater Failed ON, AGS Self Test Failed	GUID CONT - PGNS. If PGNS Unavailable: MODE CONT (AGS) - ATT HOLD, AGS RATE CMD OK, But NO ATT HOLD (Free Drift). 412R, Self Test. (M17)

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<u>ABNORMAL VEHICLE DYNAMICS</u> Use ACA Hardover to Stabilize Vehicle If <u>RCS TCA LT ON</u> -Affected QUAD-CLOSE GUID CONT-AGS, MODE CONT-ATT HOLD, ATT CONT(3)-MODE CONT, V77E If Not Stabilized-CB(11) STAB/CONT:ATT DIR CONT-OPEN If Not Stabilized-TTCA/TRANSL(2)-DISABLE, DEADBAND-MAX If Not Stabilized-ACA PROP(2)-DISABLE	<u>RAPID IMU REALIGN</u> 1) AGS INERTIAL FDAI TO 0°, 0°, 0° 2) V41 N20E, E, E, E, 3) V40 N20 0°, 0°, 0° ON AGS FDAI, ENTR WAIT 15 SEC. 4) P51E, PRO, POOE 5) V25N07E, 77E, 10000E, 1E 6) PERFORM P52, OPTION 3 (AUTO OPTICS ARE GOOD) <u>NOTE:</u> FOR TEMPORARY LOSS OF CDR'S BUS, UPDATE LGC CLOCK WITH V55 TO COMPLETE RECOVERY.
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LIGHT	MEANING	IMMEDIATE ACTION (POSSIBLE OPERATIONAL IMPLICATIONS)
DC BUS BATTERY FEEDER FAULT COMPONENT ~7 W&C LTS	CDR BUS FAILURE	(DPS GOES TO 100%) GUIDE CONT - AGS, SUIT FAN - 2, CDR AUDIO CONT - BU, INV 2, Activate Sec Glycol Loop <u>TO START DPS:</u> DES ENG CMD OVRD - ON <u>TO STOP DPS:</u> DES ENG CMD OVRD - OFF, ENG STOP - PUSH, ENG ARM - OFF <u>TO START APS:</u> AGS Auto ON <u>TO STOP APS:</u> AGS Auto OFF, ABORT STAGE - Reset <div style="float: right;"> UNSTAGED (M45) STAGED (M47) </div>
DC BUS BATTERY FEEDER FAULT COMPONENT ~7 W&C LTS	LMP BUS FAILURE	(DPS GOES TO 100% And GDA LOCKED) GUID CONT - PGNS, SUIT FAN - 1, LMP AUDIO CONT - BU, INV - 1 <u>TO START APS/DPS:</u> ENG START - PUSH <u>TO STOP APS/DPS:</u> ENG STOP - PUSH <div style="float: right;"> UNSTAGED (M45) STAGED (M47) </div>
BATTERY	BATT OVERTEMP REV CURRENT >10A OVERCURRENT	<u>UNSTAGED:</u> Check All BATS VOLTS, AMPS & TB'S If VOLTS, AMPS OK: Faulty BAT - OFF Then ON If VOLTS, AMPS NOT OK: Faulty BAT - OFF, CB (11&16) CROSS TIE BAL LOADS - CLOSE (M48) <u>STAGED:</u> Check BAT 5, 6 VOLTS, AMPS & TB'S If VOLTS, AMPS NOT OK: CB (11&16) CROSS TIE BUS - CLOSE Faulty BAT: NORMAL FEED - OFF, Good BAT: BACKUP FEED - ON (M48)
INVERTER	AC VOLTS <112 398>FREQ>402	Check AC VOLTS & FREQ. Switch to INV - 2. Bus A&B BUS TIE INV 1 (2) - OPEN (INV 1 Feeder Short). BUS B: BUS TIE INV 2 - OPEN (BUS B Short) BUS A&B: BUS TIE INV 1 (2) - CLOSE. Select INV 1. BUS A: BUS TIE INV 2 - OPEN (INV 2 Feeder Short). BUS A: BUS TIE INV 1 - OPEN (BUS A Short, Lt Stays ON; Close BUS B: BUS TIE INV 2 Before Selecting INV 2). (M49)
ED RELAY	ED Relays K1 To K6 CLOSE With MASTER ARM - OFF	<u>BEFORE PDI:</u> Do <u>NOT</u> Set MASTER ARM-ON, STAGE RELAY - RESET, Appropriate LOGIC POWER CB - OPEN <u>AFTER PDI:</u> Do <u>NOT</u> Set MASTER ARM - ON, STAGE RELAY - RESET If STAGE SEQ RELAYS LT Still ON: ASC He PRESS - FIRE, Monitor ASC Fuel/Oxid Press. If APS Pressurizes, ABORT (M71)

PLSS COMM CHECK :18

Verify Powerdown CB Configuration
COMM: MODULATE - FM
CB(16) COMM: TV - Close
Verify Voice Comm With Hou

Audio (CDR)
S-BAND - T/R
ICS - T/R
RELAY - OFF
MODE - VOX (VOX SENS MAX)
VHF A - T/R
VHF B - RCV

Audio (LMP)
S-BAND - T/R
ICS - T/R
RELAY - ON
MODE - VOX (VOX SENS MAX)
VHF A - T/R
VHF B - RCV

COMM:
S-BD XMTR/RCVR-SEC
VHF - VOICE, ON, OFF, ON, OFF, HI
RANGE - RANGE
SQUELCH A & B - Noise Thres + 1-1/2
RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

LMP Connect To PLSS Comm (Audio CB
Open/Close)

PLSS PTT (LMP) - MAIN (Rt)
PLSS Mode(LMP) - A, Wheel-CCW (Tone-On,
Vent Flag- P, Press Flag- 0, O2 Mom)
PLSS O2 Press Gage > 85%
Perform Comm Check With CDR

NOTE: Unstow PLSS Antenna If It
Transmits Garbled And/Or Loses TM

CDR Connect To PLSS Comm (Audio CB
Open/Close)

Audio (CDR)
VHF A - OFF
VHF B - OFF
PLSS PTT (CDR) - MAIN (Rt)

NOTE: No MSFN Reception In PLSS Mode B

PLSS Mode(CDR) - B, Blade-CCW (Tone-On,
Vent Flag- P, Press Flag- 0, O2 Mom)
PLSS O2 Press Gage > 85%
Perform Comm Check With LMP

PLSS Mode (LMP)- B, Blade-CCW (Tone-On)
PLSS Mode (CDR)- A, Wheel-CCW (Tone-On)
Verify Voice Comm With Each Other

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou &
Comm Check With Each Other
Read PLSS O2 Qty to Hou

NOTE: If Comm Is NO GO With Hou
S-BD MOD - PM
Verify Comm & TM

CB(16) COMM: TV - Open

FINAL SYSTEMS PREP :28

CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FAN ΔP - Open
SUIT FAN 2 - Open
SUIT FAN Sel - 2
Verify ECS Caution & H2O SEP COMP
Lts - On (~ 1 Min)

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT :29

LMP 1st - Unstow OPS O2 Actuator
Connect Actuator To RCU
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse)-
Verify Closed, Locked & LO
Install Purge Valve In PGA R/R
PGA Diverter Valves - Vertical

CDR Repeat OPS CONNECT

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING :38

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets, Check Drink Bag Position
Don LEVA's

LCG - Cold, As Reqd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:
Helmet & Visor (2) - Aligned &
Adjusted
Torso Tiedown (2) - Adjusted
O2 Connectors (6) - Locked
Purge Valves (2) - Locked
H2O Connectors (2) - Locked
Comm Connectors(2) - Locked

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EQUIPMENT PREP EVA 1

DET-Set/Up :15
Unstow BSLSS, Remove From Bag
Stow BSLSS RH Fwd Cabin
Stow BSLSS Bag In Jett Bag (LHSSC)
Stow RCU Brkt Bag (Purse) In Jett Bag
Stow Jett Bag On LH Fwd Floor

Unstow PLSS On Floor, Set Against Hatch
Stow COAS In FWD Window Mount
Secure Util Lts Back Of AOT
Verify 02 EVA Stowage Straps Accessible

Empty UCTA's
Check PGA Zippers, Verify Lock-Lock
Fill Drink Bags(Back ISA)-Evac, Install

Stow PGA Gas Conn Plugs In Purse
Empty PGA Pockets Into Purse
Verify Watch On PGA

Unstow CSRC (LHSSC), Remove Bag, Stow
In LMP Pkt
Unstow Sur Seq Cam (LHSSC) Install Lens
Stow Sur Seq Camr Bag In Jett Bag
Install Mag CC (Purse)
Connect Power Cable, Ver Ops

Settings 2.8/60, TIME FR (2 Places)
Stow Sur Seq Cam In LHSSC,
Handle Aft, Lens Outboard
Unsnap LEC Compt (Aft LHSSC)

Stow LEVA Bags On Floor, 1 Left, 1 Rt
Position Helmets On Armrests

CDR Move To Aft Cabin Area
Deploy LM EVA Antenna
Unstow B&W TV, Stow On Mid-Step
Unstow RCU's, Resnap Flaps
Stow RCU's On Data File

EVA 1 PREP & POST

Unstow CDR Boots, Purge Valve In Purse
CDR Don Boots
LMP Move To Aft Cabin Area
Unstow LMP Boots, Purge Valve In Purse

Stow IV Gloves In Bot Boot Comp
LMP Don Boots
Unstow LMP OPS
Remove Pallet, Stow In Jett Bag

Hand LMP OPS To CDR For Checkout
Unstow CDR OPS
Remove Pallet, Stow In Jett Bag
Perform OPS Check (Both)

Stow LMP OPS On RH Floor Under Dump Vlv
LMP Move To LMP Station
Stow CDR OPS On LH Eng Cover

Apply Antifog (ISA Back Pkt) *2 COATS*
Stow EMU Maint Kit In Purse
Unstow LEVA's
Stow LEVA's, Then Helmets On RH Eng Cov

Stow EV Gloves On Comm Panels
Stow LEVA Bags In SRC Area
Disconnect 3 Armrests, CDR LH,
LMP RH & LH, Stow In Jett Bag

P06E
CB(11) PGNS: IMU OPR - Open
PRO (Hold In Until STBY Lt - On)
UPDATA LINK - OFF

Fwd Hatch Handle - UNLOCK

PLSS DONNING :58

LMP 1st:
Set PLSS On Mid-Step
Retrieve OPS, Unstow Antenna Lead
Verify OPS Reg Decay, Unstow Nozzle
Secure Flap

Attach OPS To PLSS
Connect OPS Antenna Lead To PLSS
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses
Remove Elect Dust Cap, Stow In Purse
Verify DIVERTER, O2, FEEDWATER - OFF
Connect Battery Cable

Verify The Following Locked:
OPS To PLSS
OPS Antenna To PLSS
PLSS Battery Connection

Don PLSS/OPS, Lift PLSS Hoses Above
LH Lower Strap

Connect PLSS O2 Hoses To PGA
Verify DIVERTER, O2, FEEDWATER - OFF
Unstow OPS O2 Hose

CDR Repeat PLSS DONNING

Unstow RCU's
Connect RCU To PGA Upper Straps
Verify RCU Controls:
PUMP, FAN - OFF (Left) MODE SEL-0

Connect RCU To PLSS, Snap OPS O2 Hose
To Side of PLSS

(Leave Cabin Repress CB Open For
Manual Repress)

Disconnect PLSS H20 From PGA
Connect LM H20

CB(16) ECS: LCG PUMP - Close
Adjust LCG Cooling Gradually

PLSS Mode (Both) - 0
Connect To LM Comm(Audio CB, Biomed Sw)

AUDIO (CDR & LMP)

VHF A - RCV

VHF B - OFF

MODE - ICS/PTT

RELAY - OFF

COMM:
S-BD XMTR/RCVR - PRIM
VHF - OFF, ON, OFF, OFF, LEFT, HI
RECORDER - OFF
UPLINK SQUELCH-OFF

PLSS 02 RECHARGE :10

Verify DES 02 >38%

Connect LM 02 To PLSS (LMP's 1st)
PLSS FILL - OPEN Then CLOSE After 2 Min

PLSS Mode - AR (02 QTY ~85%)
PLSS Mode - 0

Repeat 02 Recharge For CDR PLSS

Stow 02 Supply Hose

PLSS/OPS DOFFING :16

Disconnect OPS, Actuator From RCU's
Disconnect RCU's From PGA
Verify Pump, Fan, Mode Sel-Off
Discon RCU's From PLSS, Stow On Mid-Step

Disconnect PLSS 02 Hoses
Doff PLSS/OPS (LMP 1st)
Stow OPS 02 Hose, Actuator, & Antenna
Blade, Leave Flaps Open For Checkout
Stow LMP PLSS On Floor
Stow CDR PLSS On Mid-Step

Unstow Disp Cont (LHSSC), Set On LH
Fwd Floor
Install Gas Conn Plugs (Purse) In PGA

CAUTION: Insure PLSS LiOH Carts & Batts
Numbered 1 & 2 Replaced With 3 Or 4

CDR 1st:
Change PLSS Batt, Stow In Disp Cont
Connect Cable To Battery
Stow PLSS Hoses & Straps
Change LiOH Cart, Temp < 130° - Read Decals

Disconnect OPS Antenna Connector
Remove OPS & Stow Antenna Connector
Verify OPS 02 Press 5380 - 6380
Stow CDR OPS On LH Eng Cover, End Up
Stow CDR PLSS In Recharge Station

Stow LMP PLSS On Mid-Step, Repeat Above

Stow LMP OPS On Floor Under Dump Vlv
Stow PLSS On Floor Against Hatch

Stow RCU's On Data File
Stow Disp Cont On Mid-Step Under PLSS

POST EVA CABIN CONFIGURATION :43

Stow CSRC (Mid-Step) In ISA Top Pkt
Unstow Scale (Bot LHSSC)

Empty ETB As Follows:
Weigh Sample Bag, Report To Hou,
Stow Bag In LHSSC
Replace 70mm Camr Mag With B&W LL, MM
Stow 3-16mm Mags In RHSSC
Stow Map As Reqd
Stow Return Items In ISA Back Pkt
Stow Lens/Scribe/Brush In ISA Back Pkt

Stow In ETB:
BSLSS
2-70mm Camrs With B&W Mags
1-B&W Mag KK
Polarizing Filter (RHSSC)
3-16mm Mags FF, GG, HH
EVA 2 Map

Unstow Jett Bag (LHSSC)
Place ETB Inside Jett Bag, Stow On RH
Cabin Floor, Fwd

Weigh SRC, Report To Hou
CDR Move To Aft Cabin
Stow SRC In Lower Comp

Stow CDR OPS In Top Comp
Stow Scale In Purse

Verify Powerdown CB Configuration
MODULATE - PM

Unstow Lunar Surface Checklist, 4-4
Stow EVA 1 Prep & Post Card

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EVA 1

Verify EVA CB Configuration
Verify No Fog RH Window
Tie Jett Bag, Transfer to Eng Cover

Don EV Gloves & Verify:
Wrist Locks (4) - Locked
Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON, Rt

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK :52

PLSS O2 - ON (Tone-On, O2 Flag-0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3
Psig In 1 Min)
PLSS O2 - ON (Cuff Gage 3.7-4.0
Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS :57

Confirm Go For Depress From Hou
CB(16)ECS: CABIN REPRESS - Open
CABIN REPRESS Vlv - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @
3.5 Psia (Verify Cuff Gage Does
Not Drop Below 4.8 Psig)

Verify:
Cabin At 3.5 Psia
LM Suit Circuit 3.6 To 4.3 Psia
PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN
Verify:
Tone-On & H2O Flag - A (1.2-1.7 Psia)
PGA > 4.8 Psig & Decaying

Partially Open Fwd Hatch

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag -
Clear In About 4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient

Verify:
PGA 3.7 To 4.8 Psig
CWEA Status:
Caution
PREAMPS
ECS

H2O SEP COMP Lt - ON

Lighting: ANUN/NUM - DIM
DET - STOP

Release PLSS Antennas
Lower EV Visor :10

POST EVA 1

PLSS FEEDWATER - CLOSE
Fwd Hatch - Close & Lock
Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come
On During Repress. If PLSS O2 <10%
Manually Control Cabin Repress To
Maintain Positive PGA Pressure.
(Leave Cabin Repress CB Open For
Manual Repress)

Lighting: ANUN/NUM - BRIGHT

CABIN REPRESS - AUTO
CB(16)ECS: CABIN REPRESS - Close
MASTER ALARM & CABIN Warning Lt - On
Verify Cabin Press Increasing
PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off
Verify Cabin Press Stable At 4.6-5 Psia
Use Purge Valve To Depress PGA As Req'd
DET - Set/Up :00

POST EVA SYSTEMS CONFIGURATION :00

CABIN GAS RETURN - AUTO
SUIT CIRCUIT RELIEF - AUTO (Verify)
SUIT GAS DIVERTER - PUSH-CABIN

Verify EVA CB Configuration
CB(16) ECS: SUIT FAN 2 - Close
SUIT FAN ΔP- Close
ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panels
Doff Helmets With Visors, Stow On
RH Eng Cover, Top ETB

Verify Safety On Dump Valve
DES H2O Vlv - OPEN
Remove Purge Valve, Stow In Purse
Discon OPS O2 Hose

Connect LM O2 Hoses

SUIT ISOL (Both) - SUIT FLOW
PLSS PUMP - OFF (Left)
PLSS FAN - OFF (Left)

<p><u>PREP FOR EQUIPMENT JETTISON</u> :26</p> <p>Verify DES O2 QTY > 20%</p> <p>Fwd Hatch Handle - UNLOCK</p> <p>Doff Lunar Boots, Stow In Disp Cont</p> <p>Stow RCU's In Disp Cont</p> <p>Unstow PLSS Condensate Container, Stow In Disp Cont</p>	<p><u>CABIN DEPRESS FOR JETTISON</u> :41</p> <p>CB(16)ECS: CABIN REPRESS - Open Ovhd Or Fwd Dump Valve - OPEN Then AUTO At 3.5 Psia (Verify Cabin Press 3.5 Psia & LM Suit Circuit 3.6 To 4.3 Psia & Decaying)</p> <p>Ovhd Or Fwd Dump Vlv - OPEN (Verify LM Suit Circuit 3.6 To 4.3 Psia)</p>	<p><u>CABIN REPRESS</u> :48</p> <p>Dump Valves(Both)- AUTO (Verify) CABIN REPRESS - AUTO (Verify)</p> <p>CB(16)ECS: CABIN REPRESS - Close MASTER ALARM & CABIN Warning Lt - On Verify Cabin Press Increasing PRESS REG A & B - CABIN</p>
<p>Remove Armrest, Stow In Disp Cont</p> <p>Tie Disp Cont</p> <p>Position PLSS's For Jettison, Eng Cover & Mid-Step</p> <p>Clean & Lub Wristings As Reqd</p> <p>PGA Diverter Vlvs - Horizontal</p> <p>Don EV Gloves</p> <p>Check PGA Connectors</p>	<p><u>HATCH OPENING</u> :44</p> <p>Partially Open Fwd Hatch Ovhd Or Fwd Dump Valve - AUTO</p> <p>Fwd Hatch - Full Open</p> <p>Jettison The Following: Disp Cont PLSS On Mid-Step PLSS On Eng Cover</p>	<p>CABIN Warning Lt - Off Verify Cabin Press Stable At 4.6-5 Psia</p> <p>CABIN GAS RETURN - AUTO SUIT GAS DIVERTER - PUSH-CABIN</p> <p>Doff Gloves, Stow On Comm Panels Doff Helmets W/Visors, Stow On Eng Cov VHF ANT SEL - AFT Verify Safety On Dump Valve</p>
<p><u>PRESS INTEGRITY CHECK</u> :38</p> <p><u>NOTE:</u> LM Suit Circuit Shall Not Be Maintained At Elevated Press >5 Min</p> <p>SUIT GAS DIVERTER - PULL-EGRESS (Ver)</p> <p>CABIN GAS RETURN - EGRESS (Verify)</p> <p>SUIT CIRCUIT RELIEF - CLOSE</p> <p>PRESS REG A - EGRESS</p> <p>PRESS REG B - DIRECT O2</p> <p>Monitor Cuff Gage To 3.7 - 4.0 Psig Then PRESS REG B - EGRESS (Cuff Gage Decay <.3 Psig In 1 Min)</p> <p>SUIT CIRCUIT RELIEF - AUTO (Suit Ckt Press Decays To 4.8 Psia)</p>	<p>Verify Items Clear Of Ascent Stage</p> <p>Fwd Hatch - Close & Lock</p>	<p>Unstow Lunar Surface Checklist, 7-4 Stow EVA 2 Prep & Post Card</p>

12/21/70

EVA 2

FINAL PREP FOR EGRESS :03

PLSS FEEDWATER - OPEN (H2O Flag -
Clear In 2-4 Min)

Fwd Hatch - Open

Rest Until Cooling Sufficient

Verify:

PGA 3.7 To 4.8 Psig

CWEA Status:

Caution

PREAMPS

ECS

H2O SEP COMP Lt - ON

Lighting: ANUN/NUM - DIM

DET - STOP

Release PLSS Antennas

Lower EV Visor :10

POST EVA 2

PLSS FEEDWATER - CLOSE

Fwd Hatch - Close & Lock

Dump Valves (Both) - AUTO

NOTE: PLSS O2 & PRESS Flags May Come
On During Repress. If PLSS O2 <10%
Manually Control Cabin Repress To
Maintain Positive PGA Pressure.
(Leave Cabin Repress CB Open For
Manual Repress)

Lighting: ANUN/NUM - BRIGHT

CABIN REPRESS - AUTO

CB(16)ECS: CABIN REPRESS - Close

MASTER ALARM & CABIN Warning Lt - On

Verify Cabin Press Increasing

PRESS REG A & B - CABIN

PLSS O2 - OFF @ Cabin > 2.5 Psia

CABIN Warning Lt - Off

Verify Cabin Press Stable At 4.6-5 Psia

Use Purge Valve To Depress PGA As Req'd

DET - Set/Up :00

POST EVA SYSTEMS CONFIGURATION :00

Verify EVA CB Configuration

CB(16) ECS: SUIT FAN 2 - Close

SUIT FAN ΔP - Close

ECS Caution & H2O SEP Comp Lts - Out

Doff Gloves, Stow On Comm Panels

Verify Safety On Dump Valve

DES H2O VLV - OPEN

Remove Purge Valves, Stow In Purse

Discon OPS O2 Hose

Connect LM O2 Hoses, R/R & B/B

SUIT ISOL (Both) - SUIT FLOW

PLSS PUMP - OFF (Left)

PLSS FAN - OFF (Left)

Disconnect PLSS H2O From PGA

Connect LM H2O To PGA

CB(16) ECS: LCG PUMP - Close

PLSS Mode (Both) - 0

Connect To LM Comm(Audio CB, Biomed Sw)

AUDIO (CDR & LMP)

VHF A - OFF

VHF B - OFF

MODE - ICS/PTT

RELAY - OFF

COMM:

S-BD XMIR/RCVR - PRIM

VHF - OFF, OFF, OFF, OFF, LEFT, HI

RECORDER - OFF

PLSS/OPS DOFFING :10

Disconnect OPS Actuator From RCU's

Disconnect RCU's From PGA

Verify Pump, Fan, Mode Sel - Off

Disconn RCU's From PLSS, Stow On

Mid-Step

Disconnect PLSS O2 Hoses

Doff PLSS/OPS (LMP 1st)

Stow OPS O2 Hose, Actuator & Antenna

Blade - Leave Flaps Open For Checkout

Stow LMP PLSS On Floor

Stow CDR PLSS On Mid-Step

Unstow Disp Cont(LHSSC), Set On LH Fwd
Floor

Install Gas Conn Plugs (Purse) In PGA

CDR 1st:

Disconnect OPS Antenna Connector

Remove OPS, Stow Antenna Connector

Perform OPS Checkout

Stow OPS On Engine Cover, Top ETB

Stow PLSS Hoses & Upper Straps

Remove Lower PLSS Straps, Clip Straps

Together, D-Ring (Name-To-Name)

Remove Yo-Yo, Stow In Disp Cont

Stow Straps In RHSSC (FECAL EMESIS)

Stow PLSS On Floor

LMP Stow PLSS On Mid-Step, Repeat Above

Verify Powerdown CB Configuration

CB(11) HEATERS: RR OPR - Close

RR STBY - Open

NOTE: No MSFN Reception In PLSS Mode B

PLSS Mode(CDR) - B, Blade-CCW (Tone-On,
Vent Flag - P, Press Flag- 0, O2 Mom)
PLSS O2 Press Gage >85%
Perform Comm Check With LMP

PLSS Mode (LMP)- B, Blade-CCW (Tone-On)
PLSS Mode (CDR)- A, Wheel-CCW (Tone-On)
Verify Voice Comm With Each Other

PLSS Mode (Both) - AR (Tone-On)

NOTE: (AR) Wheel-Hou, Blade-EVA

Perform Comm & TM Check With Hou &
Comm Check With Each Other
Read PLSS O2 Qty To Hou

NOTE: If Comm Is NO GO With Hou
S-BD MOD - PM
Verify COMM & TM

FINAL SYSTEMS PREP :27

CB(16) ECS: CABIN REPRESS - Close (Ver)
SUIT FAN ΔP - Open
SUIT FAN 2 - Open
Verify ECS Caution & H2O SEP COMP
Lts - On (~1 Min)

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - AUTO (Verify)

OPS CONNECT :28

LMP 1st - Unstow OPS O2 Actuator
Connect Actuator To RCU
SUIT ISOL - SUIT DISC
Discon LM O2 Hoses, Secure About PGA

Connect OPS O2 Hose To PGA B/B
Retrieve Purge Valve (Purse) -
Verify Closed, Locked & LO
Install Purge Valve In PGA R/R
PGA Diverter Valves - Vertical

CDR Repeat OPS CONNECT

Verify Items Prepared For Jettison:
ECS LiOH Cartridge & Brkt
Hammocks
PLSS Batteries & LiOH Carts
Food Waste, Urine Bags
Feedwater Bags & Scale

Drink
DES H2O VLV - CLOSE

HELMET/GLOVE DONNING :37

Position Mikes (Both)
PLSS FAN - ON, Rt (Vent Flag - Clear)
Don Helmets With LEVA's, Check Drink
Bag Position

LCG - COLD, As Req'd
CB(16) ECS: LCG PUMP - Open
Disconnect LM H2O Hose
Connect PLSS H2O Hose
Stow LM Hoses (CDR's To ECS Handhold)

Verify The Following:
Helmet & Visor (2) - Aligned &
Adjusted
Torso Tiedown (2) - Adjusted
O2 Connectors (6) - Locked
Purge Valves (2) - Locked
H2O Connectors (2) - Locked
Comm Connectors (2) - Locked

Verify EVA CB Configuration

Don EV Gloves & Verify:
Wrist Locks (4) - Locked
Glove Straps (4) - Adjusted

NOTE: If PGA Biting, PLSS O2 - ON/OFF

PLSS DIVERTER - MIN (Verify)
PLSS PUMP - ON, Rt

PRESS REG A & B - EGRESS

PRESSURE INTEGRITY CHECK :52

PLSS O2 - ON (Tone-On, O2 Flag - 0)
Press Flag Clear (3.1-3.4 Psid)
Cuff Gage 3.7-4.0 Psig
O2 Flag Clear

PLSS O2 - OFF (Cuff Gage Decay <.3
Psig In 1 Min)
PLSS O2 - ON (Cuff Gage 3.7-4.0
Psig, Tone & O2 Flag May Come On)

CABIN DEPRESS :57

Confirm Go For Depress From Hou
CM(16)ECS: CABIN REPRESS - Open
CABIN REPRESS VLV - CLOSE

Ovhd Or Fwd Dump Vlv - OPEN Then AUTO @
3.5 Psia (Verify Cuff Gage Does
Not Drop Below 4.8 Psig)

Verify:
Cabin At 3.5 Psia
LM Suit Circuit 3.6 To 4.3 Psia
PGA > 4.8 Psig & Decaying

Start Wrist Watch :00

Ovhd Or Fwd Dump Valve - OPEN

Verify:
Tone-On & H2O Flag - A (1.2-1.7 Psia)
PGA > 4.8 Psig & Decaying

Partially Open Fwd Hatch

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EQUIPMENT PREP EVA 2

DET-Set/Up :30
Empty UCTA's
Check PGA Zippers, Verify Lock-Lock
Fill Drink Bags, Evac, Install

Stow Gas Connector Plugs In Purse
Empty PGA Pockets Into Purse
Verify Watch On PGA
CDR Move To Aft Cabin

CDR Don Boots
Unstow CDR OPS
Perform OPS Check (Both)
Stow Both OPS On Floor

Remove ETB From Jett Bag, Stow In LHSSC
Verify Eqpt In ETB:

- 2-70mm Camrs With B&W Mags LL, MM
- Polarizing Filter
- 1-Spare B&W Mag KK
- 3-16mm Mags FF, GG, HH
- EVA 2 Map
- BSLSS

Stow ETB On Mid-Step

LMP Don Boots
Unstow PLSS Condensate Container, Stow
On Rock Box

Apply Antifog (Purse) *2 COATS*
Stow Visors & Helmets On RH Eng Cover
Tie Disp Cont, Stow On LH Eng Cover
FWD Hatch Handle - UNLOCK

PLSS DONNING :57

LMP 1st:
Set PLSS On Mid-Step
Retrieve OPS, Unstow Antenna Lead
Verify OPS Reg Decay, Unstow Nozzle
Secure Flap

EVA 2 PREP & POST

Attach OPS To PLSS
Connect Antenna Lead To PLSS
Verify Sublimator Exhausts Clear

Unstow PLSS Straps & Hoses
Verify DIVERTER, O2, FEEDWATER - OFF
Verify The Following Locked:
OPS To PLSS
OPS Antenna To PLSS
PLSS Battery Connection

Don PLSS/OPS, Lift PLSS Hoses Above
LH Lower Strap

Connect PLSS O2 Hoses To PGA
Verify DIVERTER, O2, FEEDWATER - OFF
Unstow OPS O2 Hose

CDR Repeat PLSS DONNING

Unstow RCU's
Connect RCU To PGA Upper Straps
Verify RCU Controls:
PUMP, FAN - OFF (Left) MODE SEL - 0

Connect RCU To PLSS, Snap OPS O2 Hose
To Side Of PLSS

PLSS COMM CHECK :17

Verify Powerdown CB Configuration
COMM: MODULATE - FM
CB(16) COMM: TV - Close (Verify)
Verify Voice Comm With Hou

Audio (CDR)
S-BAND - T/R
ICS - T/R
RELAY - OFF
MODE - VOX (VOX SENS MAX)
VHF A - T/R
VHF B - RCV

Audio (LMP)
S-BAND - T/R
ICS - T/R
RELAY - ON
MODE - VOX (VOX SENS MAX)
VHF A - T/R
VHF B - RCV

COMM:
S-BD XMTR/RCVR - SEC
VHF - VOICE, ON, OFF, ON, OFF, HI
RANGE - RANGE
SQUELCH A & B - Noise Thres + 1-1/2
RECORDER - ON
VHF Antenna - EVA
UPLINK SQUELCH - ENABLE

LMP Connect To PLSS Comm (Audio CB
Open/Close)

PLSS PTT (LMP) - MAIN (Rt)
PLSS Mode(LMP) - A, Wheel-CCW (Tone-On,
Vent Flag- P, Press Flag- 0, O2 Mom)
PLSS O2 Press Gage >85%
Perform Comm Check With CDR

NOTE: Unstow PLSS Antenna If It
Transmits Garbled And/Or Loses TM

CDR Connect To PLSS Comm (Audio CB
Open/Close)

Audio (CDR)
VHF A - OFF
VHF B - OFF
PLSS PTT(CDR) - MAIN (Rt)

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PREP FOR EGRESS

Configure CB's As Required
Doff IV Gloves, Stow Under Netting
Behind LMP
Doff Helmets, Verify Feedport Cover
Installed, & Stow Helmets On Ceiling
Verify Wristwatch Donned
FWD Hatch Handle - UNLOCK
Verify With CMP That Tunnel Is Depressed

Verify - PGA Zipper Locked
Stow COAS On Fwd Window Mount
Stow DEDA & DSKY Desk, Loose Items
Unstow CSRC (ISA, Top Pkt) Put in
PGA Pkt
Stow Other Items As Desired For XFER
SEQ MAGS (6-RHSSC, 1-CAM, 1-ISA)
70mm MAGS (3-RHSSC 2nd Shelf,
1-CAM-RHSSC, 1-ISA)
CSC CASSETTE MAG-ISA
PPK-RHSSC, LHSSC
TOOL B 1st REQD

Stow PGA Gas Connector Plugs In RHSSC
(Fecal Emesis)
Unstow OPS Straps & Purge Valves
From RHSSC (Fecal Emesis)
Purge Vlvs - Hi
Don Purge Valves (R/R) (LH Side)
Don OPS Straps (Break Stitches 2 Places,
Remove Keeper, Extend To Max Length,
Route Thru PGA LH D-RING With
Adjustable Strap On RH Side)

OPS DONNING (LMP 1st)

Unstow OPS & Checkout
Verify OPS Reg Decays To 2.5 PSI (~3 Min)
Unstow OPS O2 Gas Hose
Secure OPS To OPS Straps (Route
Under LM Hoses, Do Not Twist Strap)
Connect O2 Hose To PGA (B/B)
Fix OPS Flaps To Expose Press Gage
CDR Repeat OPS DONNING

CONTINGENCY EVT (2 OPS)

CB(11) ECS: CABIN FAN - OPEN (VERIFY)

CDR Unstow Lifeline/Tethers - LHSSC
Attach Waist Tether Hooks To PGA
(Connect To LMP RH Side, Route In
Front of LMP & Behind CDR & Connect
To CDR LH Side, Verify Hooks Locked)
Verify LM O2 Hoses - R/R, B/B

PGA Diverter Valves - Vertical
Don Helmets
Don LEVA's, Verify Helmet Aligned

Secure Transfer Items
CK Conn - Hel, O2, Comm, Purge Vlvs
Verify LM Restraints Removed
Don EV Gloves, Verify Locked

SUIT INTEGRITY CHECK

SUIT GAS DIVERTER - PULL-EGRESS
CABIN GAS RETURN - EGRESS
SUIT CIRCUIT RELIEF - CLOSE

PRESS REG A - EGRESS
PRESS REG B - DIRECT O2
Monitor CUFF GAGE 3.7-4.0 PSIG Then
PRESS REG B - EGRESS (Cuff Gage
Decay <.3 Psig in 1 Min)
Verify Purge Valves Accessible

SUIT CIRCUIT RELIEF - AUTO (SUIT CKT
PRESS DECAYS TO 4.8 PSIA)
Confirm CSM Side Hatch Open And
CMP Go For LM Depress

LCG - COLD, As REQ'D
CB(16) ECS: LCG Pump - Open
Disconnect LM H2O Hoses
Inspect EMU

CABIN DEPRESS

CB(16) ECS: CABIN REPRESS-OPEN
CABIN REPRESS VLV - CLOSE (VERIFY)
Fwd Dump Valve - OPEN Then AUTO
At 3.5 Psia
Verify LM Suit Press 3.6-4.3 Psia
And Decaying Slowly
Fwd Dump Valve - OPEN
Monitor Cabin Press To 0 Psia
Verify LM Suit Press 3.6-4.3 Psia

HATCH OPENING

Open Hatch
LMP Verify XFER Items Ready

VERIFY/PERFORM:

CB(11) STAB/CONT: ATCA (PGNS) - OPEN
AELD - OPEN
ATT DIR CONT- OPEN
CB(16) STAB/CONT: ATCA (AGS) - OPEN
AELD - OPEN

Turn Card Over And Review Transfer
Method

EVT (DOCKED)

CDR Egress Feet First and Transfer To CSM, LMP Tend Lifeline

CDR Ingress CSM Head First, Face Toward MDC, and Move To LEB
Retrieve C O2 Hoses and Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired

CDR Secure Position In LEB & Tend Lifeline For LMP

LMP Egress Feet First and Transfer to CSM

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area

CDR Connect R Electrical Umbilical to LMP

CMP Close Hatch

EVT (UNDOCKED, STABLE)

CSM Maneuver Apex to LM Forward Hatch

CDR, Then LMP, Egress Feet First, Move Along Handrails to CSM
LMP Tend Lifeline

CDR Ingress CSM, Head First, Face Toward MDC, And Move To LEB
Retrieve C O2 Hoses And Comm Umbilical

CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired
Secure Position In LEB And Tend Lifeline For LMP

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area

CDR Connect R Electrical Umbilical To LMP

CMP Close Hatch

LEVA - Lower As Required

OPS O2 - On

SUIT ISOL VALVES (Both) - SUIT DISC
Purge Valves - OPEN (Give Mark To CMP For T+25 Min On OPS)

Verify O2 Flow & PGA Press 3.4-4.0 Psig

Disconnect LM O2 Hoses

Disconnect LM Comm Umbilical
Stow LM Hoses

CDR Transfer To CSM LEB (LMP Manage Lifeline)

LMP Transfer To CSM Center Couch Area (CDR Manage Lifeline)

EVT (UNDOCKED), UNSTABLE

CSM Maneuver to LM

CDR Egress Feet First, Move to EVA Handrail Clear of Hatch
LMP Tend Lifeline

LMP Egress, Move Up EVA Handrail

CDR and LMP Push Away from LM at Same Time (Give Signal, Pull In, Push Off)

CSM Maneuver Apex to CDR and LMP

CDR and LMP Use CSM Handholds to Move To Side Hatch

CDR Ingress CSM, Head First, Face Toward MDC, And Move To LEB
Retrieve C O2 Hoses And Comm Umbilical

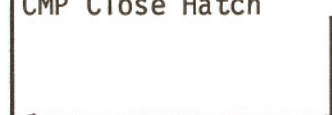
CMP Connect C Comm Umbilical To CDR

CDR Configure Audio Panel As Desired
Secure Position in LEB And Tend Lifeline For LMP

LMP Ingress CSM Feet First, Face Toward MDC, and Assume Position In Center Couch Area

CDR Connect R Electrical Umbilical To LMP

CMP Close Hatch



Applo Flight Data File
Pen & Ink

Distribution List

Bond Distribution List

2	J. L. Nevins	}	MIT Instrument Lab.	
			75 Cambridge Parkway	
			Cambridge, Mass. 02142	
1	R. Larson			
1	PA/J. A. McDivitt			
1	PP3/H. L. Tash	1		CB/H. H. Schmitt
1	PD6/MSE - S. Blackmer	1		CB/Heize
1	PA/R. L. Kubicki	1		CB/Parker
1	CA/D. K. Slayton	1		CB/B. McCandless
1	CF/W. J. North	16		CF21/W. H. Todd/J. Pearce
1	CF14/J. W. Bilodeau	35		FC/Division Office
1	CF41/P. C. Kramer	15		EA8/P. Deans
1	CF51/L. G. Richard	1		CF62/S. H. Gardner
3	CF71/H. A. Kuehnel	2		TA/A. J. Calio
2	CF31/L. D. Allen	1		CB/T. P. Stafford
1	CF61/J. W. O'Neill	1		CB/Conrad - Skylab
1	CF81/S. Faber	1		CB/F. Haise
1	CF21/M. E. Dement	1		CB/J. W. Young
1	CF62/T. R. Lindsey	1		CB/T. K. Mattingly
1	CF62/E. Pippert	1		CB/C. M. Duke
1	CF62/C. L. Stough	6		CFK/Frank Hughes - Console
3	CF61/J. Owens			Copies
2	CF61/W. Beheler	1		CFK/Chuck Bennett
1	CF62/T. W. Holloway			
1	CF43/C. Lewis			
1	CF44/S. Grega			
1	NA/M. L. Raines			
3	CF22/C. Thomas			
1	CF23/D. J. Hudson			
1	CF24/J. Baker			
1	CF24/G. F. Steele			
1	CF51/J. Covington			
7	FM13/M. A. Collins, Jr.			
2	CF81/M. O. Brown			
1	CF8/L. Harvey			
1	CF413/J. Shacter			
2	TM/J. Zarcaro			
2	CF81/G. F. Prude			
1	CB/D. Scott			
1	CB/A. Worden			
1	CB/J. Irwin			
1	CB/D. Gordon			
1	CB/V. Brand			


LM CUE CARD
Pen & Ink 1/26/71


FLIGHT DATA FILE PEN & INK CHANGES

The enclosed pen and ink changes are Flight Data File (FDF) approved and are to be included in the Apollo 14 FDF articles as defined below.

1. Page i
 - a) Following "Pen & Ink 1/21/71" add "Pen & Ink 1/26/71"
 - b) Change "4 thru 6 . . . 12/21/70" to "4 . . . 1/26/71 (P&I)
5 and 6 . . . 12/21/70"

2. Page 4
 - a) Change date on page from "12/21/70" to "1/26/71"
 - b) Change date on cue card face from "11/9/70" to "1/26/71"
 - c) Add "Y-211 (-)(100 FT)" above "Y DOT - (PRESENT)
(-) 270"


Book Manager


Supervisor

LANDING SITE 1

EVA 1

STATION	TASKS
A	<ul style="list-style-type: none"> Deploy ALSEP Comprehensive sample Do cuff checklist
r.	<ul style="list-style-type: none"> Documented sample Pan
z.	<ul style="list-style-type: none"> Documented sample "Football" size rock

EVA 2

STATION	CDR	TASKS COORDINATED	LMP
a.	<ul style="list-style-type: none"> TDS MET Track Photos Describe Surface 	<ul style="list-style-type: none"> Double Core (M) Describe Surface Documented Sample 	<ul style="list-style-type: none"> LPM Point (M) Pan
b.	<ul style="list-style-type: none"> Pan 	<ul style="list-style-type: none"> Documented sample Compare with Surface at a. 	
b-c	<ul style="list-style-type: none"> Watch for radial variations in materials toward Sunrise Watch for changes in patterned ground; fillets 		
c. Sunrise Rim	<ul style="list-style-type: none"> Polarimetric Surveys 	<ul style="list-style-type: none"> Collect rock & Soil samples Roll boulder, take 24 fps movie, crew movement, pan east, pan crater Describe, photo boulders EVA Comm 	<ul style="list-style-type: none"> Two pans on rim > 300 ft baseline
c.-d.	<ul style="list-style-type: none"> Watch for radial variations in materials 		
d.	<ul style="list-style-type: none"> Description contrast rock types, sizes, with Sunrise 	<ul style="list-style-type: none"> Documented Sample 	<ul style="list-style-type: none"> Pan LPM
d-e	<ul style="list-style-type: none"> Watch for radial variations in materials; sample 		
e.	<ul style="list-style-type: none"> Describe Surface 	<ul style="list-style-type: none"> Trench - do cuff checklist Documented Sample Single Core (HD) 	<ul style="list-style-type: none"> LPM (M) Pan
f.	<ul style="list-style-type: none"> Describe Surface 	<ul style="list-style-type: none"> Triple Core (M) Documented Sample Radial/diametric samples at a 10 m crater 	<ul style="list-style-type: none"> Pan
g.	<ul style="list-style-type: none"> Pan Description patterned ground 	<ul style="list-style-type: none"> Gas Sample (HD) MSSC (HD) Fillet Sample (HD) Single core through large rock fillet (HD) 	

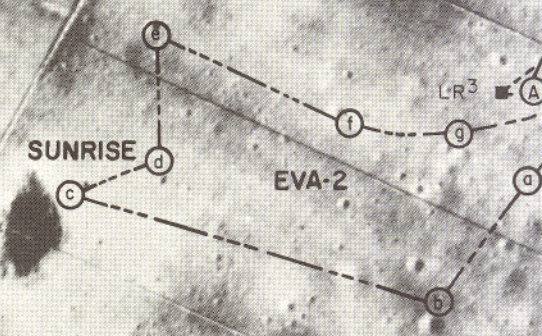
LANDING SITE 2

EVA 1

STATION	TASKS
A	<ul style="list-style-type: none"> Do cuff checklist Deploy ALSEP Comprehensive sample
h.	<ul style="list-style-type: none"> Documented sample Pan
i.	<ul style="list-style-type: none"> Documented sample
j.	<ul style="list-style-type: none"> Documented sample Football size rock

EVA 2

STATION	CDR	TASKS COORDINATED	LMP
k.	<ul style="list-style-type: none"> TDS MET Track Photos Describe Surface 	<ul style="list-style-type: none"> Double Core (M) Describe Surface Documented Sample 	<ul style="list-style-type: none"> LPM Point (M) Pan
k-m	<ul style="list-style-type: none"> Observations on character of patterned ground relative to slope 		
m.	<ul style="list-style-type: none"> Pan 	<ul style="list-style-type: none"> Documented sample Compare with Surface at k. 	
n. Star Rim	<ul style="list-style-type: none"> Polarimetric Surveys 	<ul style="list-style-type: none"> Collect rock & soil samples Roll boulder, take 24 fps movie, crew movement, pan South, pan crater Describe, photo boulders EVA Comm 	<ul style="list-style-type: none"> Two pans on rim > 300 ft baseline
n-o	<ul style="list-style-type: none"> Look for changes in patterned ground toward center of crater 		
o. Star Center	<ul style="list-style-type: none"> Description contrast rock types, sizes, with Star rim (n) 	<ul style="list-style-type: none"> Documented Sample 	<ul style="list-style-type: none"> Pan
o-p	<ul style="list-style-type: none"> Look for surface changes that may be related to approximate contact between Ridgey (west) and Smooth (east) units 		
p.	<ul style="list-style-type: none"> Describe Surface 	<ul style="list-style-type: none"> Trench - do cuff checklist Documented Sample Single Core (HD) 	<ul style="list-style-type: none"> LPM (M) Pan
q. Halfway	<ul style="list-style-type: none"> Describe Surface 	<ul style="list-style-type: none"> Triple Core (M) Documented Sample Radial/diametric samples at a 10 m crater 	<ul style="list-style-type: none"> Pan
q-r	<ul style="list-style-type: none"> Observe possible changes in patterned ground; fillet development 		
r. Doublet	<ul style="list-style-type: none"> Pan Description, patterned ground 	<ul style="list-style-type: none"> Gas Sample (HD) MSSC (HD) Fillet Sample (HD) Documented Sample Single core through large fillet 	<ul style="list-style-type: none"> LPM (HD)



LANDING SITE 1

EVA 1

STATION	TASKS
A	<ul style="list-style-type: none"> ALSEP deployment Do cuff checklist
CS	<ul style="list-style-type: none"> Comprehensive sample
U Doublet (Intersection of N and S)	<ul style="list-style-type: none"> Description Documented sample "Football" size rock Pan
V Doublet (N)	<ul style="list-style-type: none"> Description Documented sample
W Doublet (S)	<ul style="list-style-type: none"> Documented sample

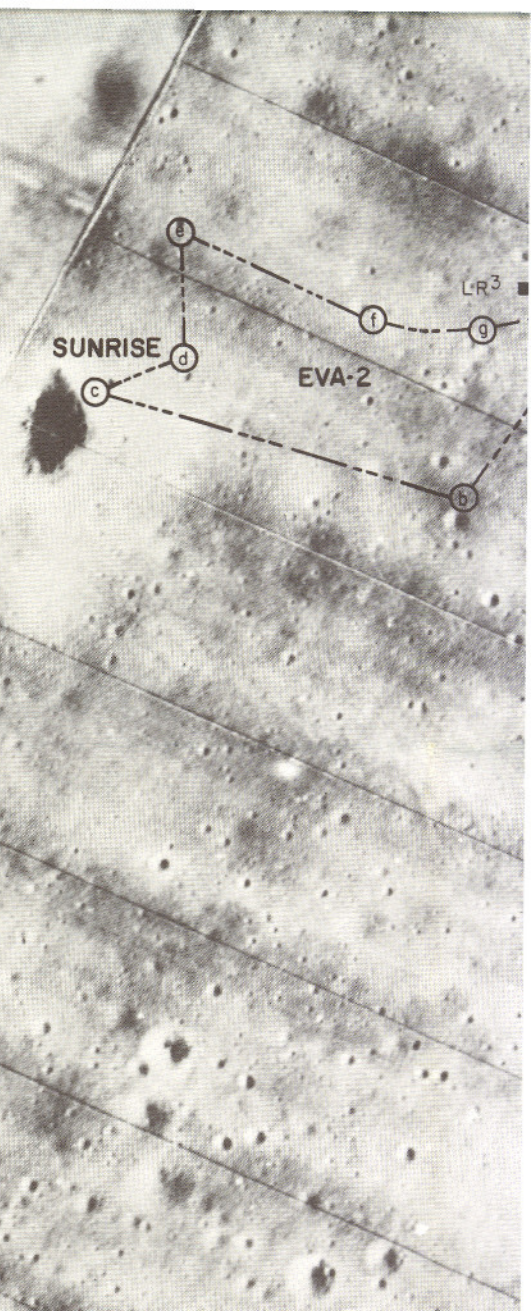
GENERAL FEATURES (Docum

- Solder-like glass blebs
- Patterned ground
- Changes in block and fragment
- Fragments in or near elongated secondary craters
- Proportion of microbreccia
- Crystalline rock types
- Boulder tracks and slope re
- Rock fillets

EVA 2

STATION	CDR
a.	<ul style="list-style-type: none"> TDS MET Track Photos Describe Surface
	<ul style="list-style-type: none"> Pan

b.	• Pan	• Documented sample	• Compare with Surface at a.
b-c	• Watch for radial variations in materials toward Sunrise	• Watch for changes in patterned ground; fillets	
c. Sunrise Rim	• Polarimetric Surveys	• Collect rock & Soil samples	• Two pans on rim > 300 ft baseline
		• Roll boulder, take 24 fps movie, crew movement, pan east, pan crater	
		• Describe, photo boulders	
		• EVA Comm	
c.-d.	• Watch for radial variations in materials		
d.	• Description, contrast rock types, sizes, with Sunrise	• Documented Sample	• Pan • LPM
d-e	• Watch for radial variations in materials; sample		
e.	• Describe Surface	• Trench - do cuff checklist	• LPM (M)
		• Documented Sample	• Pan
		• Single Core (HD)	
f.	• Describe Surface	• Triple Core (M)	• Pan
		• Documented Sample	
		• Radial/diametric samples at a 10 m crater	
g.	• Pan	• Gas Sample (HD)	
	• Description patterned ground	• MSSC (HD)	
		• Fillet Sample (HD)	
		• Single core through large rock fillet (HD)	



LANDING SITE 2

EVA 1

STATION	TASKS
A	• Do cuff checklist • Deploy ALSEP • Comprehensive sample
h.	• Documented sample • Pan
i.	• Documented sample
j.	• Documented sample Football size rock

EVA 2

STATION	CDR	TASKS COORDINATED	LMP
k.	• TDS • MET Track Photos • Describe Surface	• Double Core (M) • Describe Surface • Documented Sample	• LPM Point (M) • Pan
k-m	• Observations on character of patterned ground relative to slope		
m.	• Pan	• Documented sample • Compare with Surface at k.	
n. Star Rim	• Polarimetric Surveys	• Collect rock & soil samples	• Two pans on rim > 300 ft baseline
		• Roll boulder, take 24 fps movie, crew movement, pan South, pan crater	
		• Describe, photo boulders	
		• EVA Comm	
n-o	• Look for changes in patterned ground toward center of crater		
o. Star Center	• Description, contrast rock types, sizes, with Star rim (n)	• Documented Sample	• Pan
o-p	• Look for surface changes that may be related to approximate contact between Ridgey (west) and Smooth (east) units		
p.	• Describe Surface	• Trench - do cuff checklist	• LPM (M)
		• Documented Sample	• Pan
		• Single Core (HD)	
q. Halfway	• Describe Surface	• Triple Core (M)	• Pan
		• Documented Sample	
		• Radial/diametric samples at a 10 m crater	
q-r	• Observe possible changes in patterned ground; fillet development		
r. Doublet	• Pan	• Gas Sample (HD)	• LPM (HD)
	• Description, patterned ground	• MSSC (HD) • Fillet Sample (HD) • Documented Sample • Single core through large fillet	

LANDING SITE 1

EVA 1

STATION	TASKS
A	• ALSEP deployment • Do cuff checklist
CS	• Comprehensive sample
U Doublet (Intersection of N and S)	• Description • Documented sample • "Football" size rock • Pan
V Doublet (N)	• Description • Documented sample
W Doublet (S)	• Documented sample

GENERAL FEATURES (

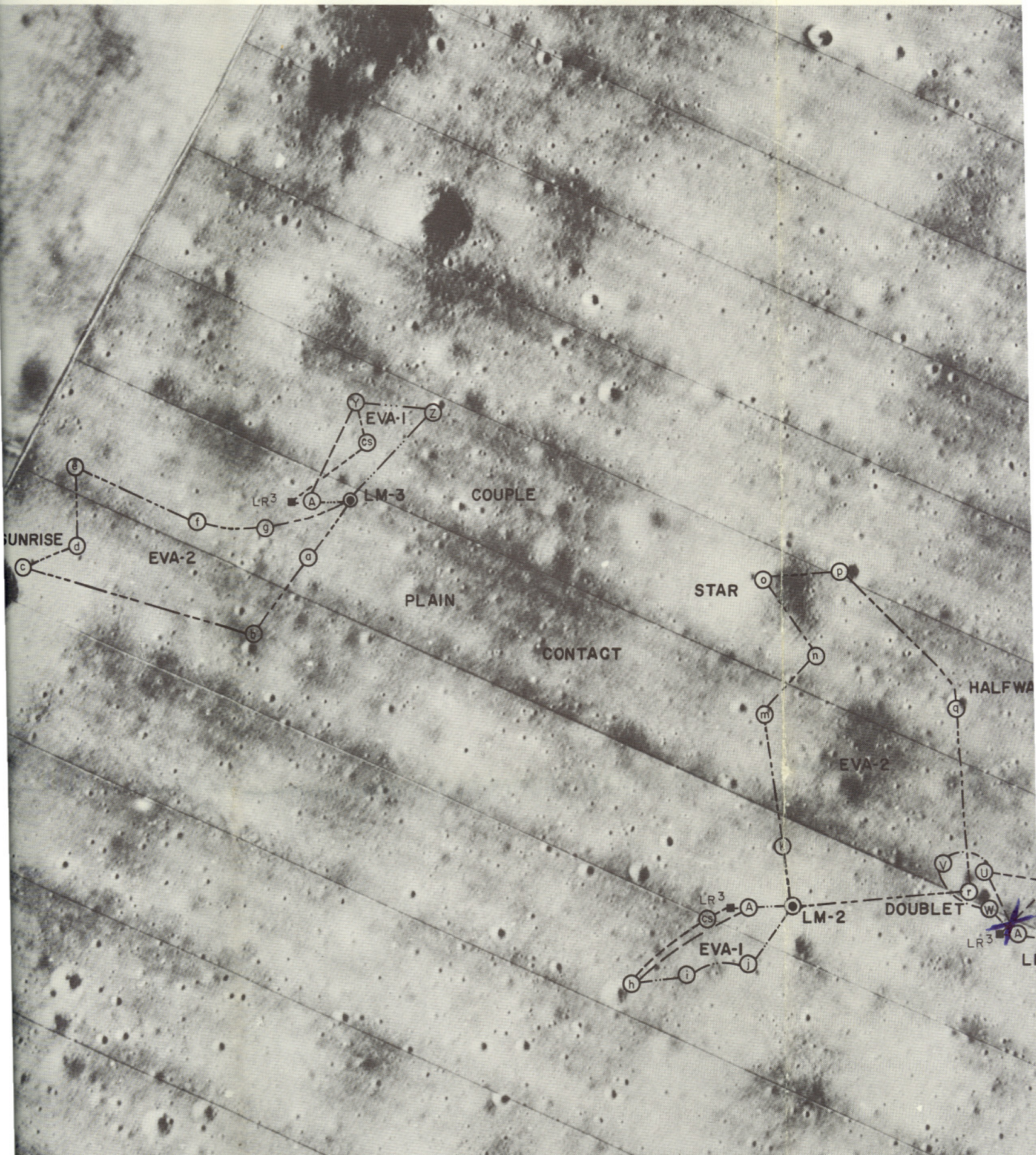
- Solder-like glass bleb
- Patterned ground
- Changes in block and J
- Fragments in or near secondary craters
- Proportion of microbre crystalline rock type
- Boulder tracks and sl
- Rock fillets

EVA 2

STATION	CDR
a.	• TDS • MET Track Photos • Describe Surface
b.	• Pan

FRA MAURO

APOLLO 14 LANDING SITE



LANDING SITE 1
EVA 1

STATION	TASKS
A	<ul style="list-style-type: none"> ALSEP deployment Do cuff checklist
CS	<ul style="list-style-type: none"> Comprehensive sample
V Doublet (Intersection of N and S)	<ul style="list-style-type: none"> Description Documented sample "Football" size rock Pan
V Doublet (N)	<ul style="list-style-type: none"> Description Documented sample
W Doublet (S)	<ul style="list-style-type: none"> Documented sample

GENERAL FEATURES (Document and Sample)

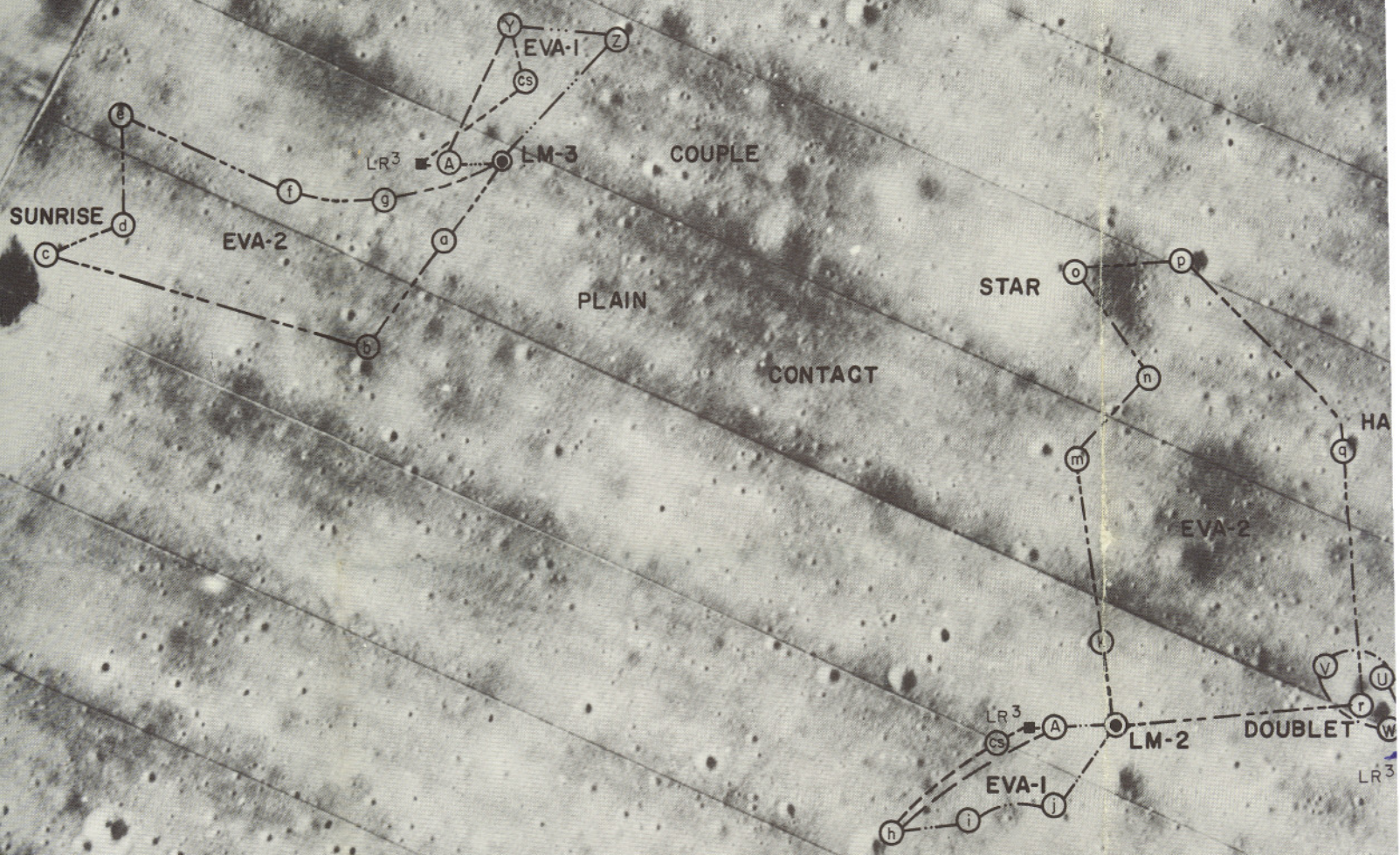
- Solder-like glass blebs
- Patterned ground

- c. Cone Rim
- Polarimetric Surveys
- Collect rock & soil samples
- Roll boulder, take fps movie, crew movement, pan we pan crater
- Describe, photo bo
- EVA Comm

- c.-d.
- d. Plank
- Watch for radial v
- Documented Sample

- e.
- Describe Surface
- Trench - do cuff checklist

- Describe, contrast rock types, sizes, with Cone



LANDING SITE 1
EVA 1

STATION	TASKS
A	<ul style="list-style-type: none"> ALSEP deployment Do cuff checklist
CS	<ul style="list-style-type: none"> Comprehensive sample
U Doublet (Intersection of N and S)	<ul style="list-style-type: none"> Description Documented sample "Football" size rock Pan
V Doublet (N)	<ul style="list-style-type: none"> Description Documented sample
W Doublet (S)	<ul style="list-style-type: none"> Documented sample

GENERAL FEATURES (Document and Sample)

- Solder-like glass blebs
- Patterned ground
- Changes in block and fragment angularity
- Fragments in or near elongate or secondary craters
- Proportion of microbreccia to crystalline rock types
- Boulder tracks and slope relations
- Rock fillets

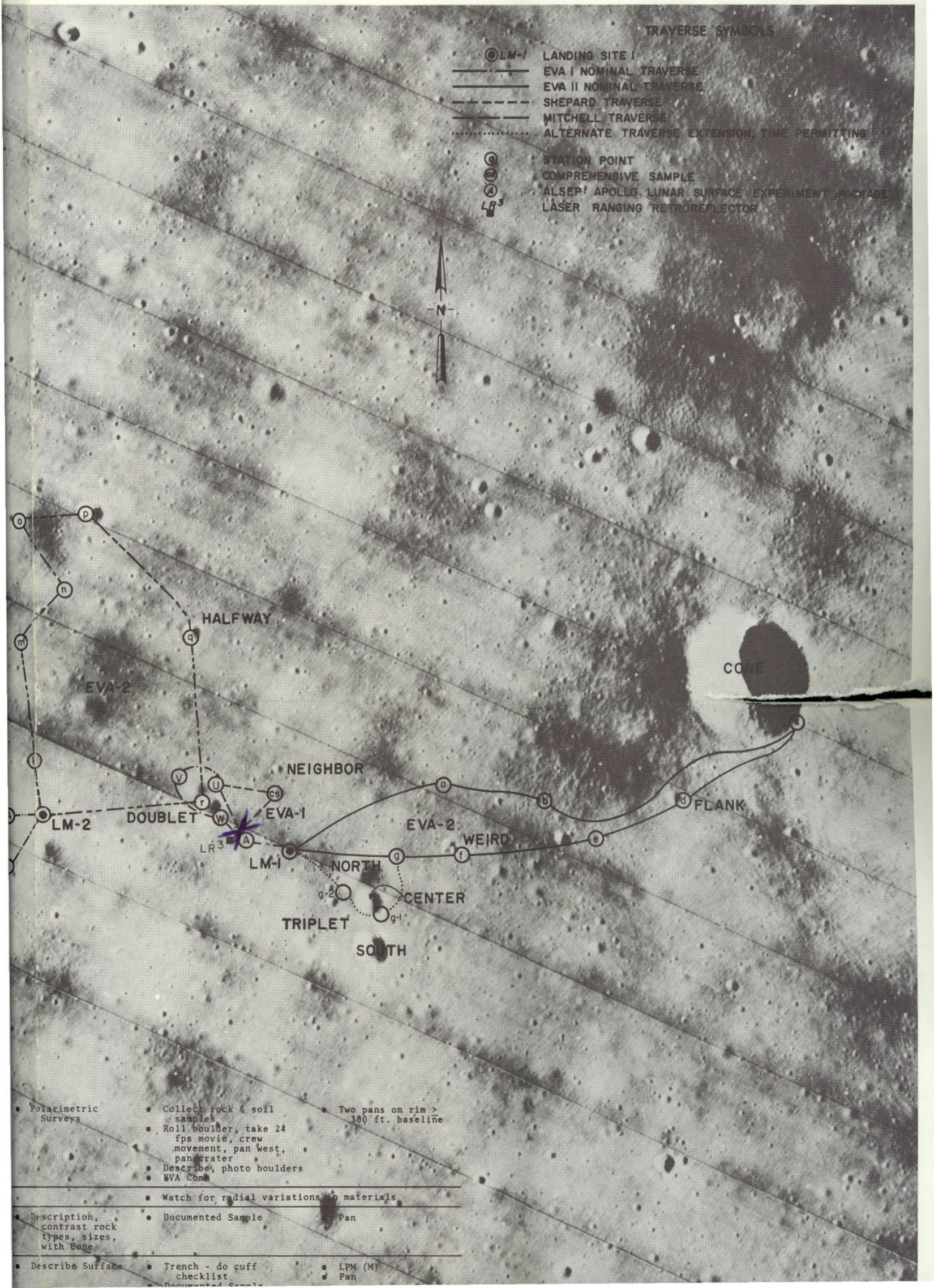
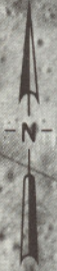
EVA 2

STATION	CDR	TASKS Coordinated	LMP
a.	<ul style="list-style-type: none"> TDS MET Track Photos Describe Surface 	<ul style="list-style-type: none"> Double Core (M) Describe Surface Documented Sample 	<ul style="list-style-type: none"> LPM Point (M) Pan
b.	<ul style="list-style-type: none"> Pan 	<ul style="list-style-type: none"> Documented Sample Compare with Surface at a. 	

c. Cone Rim	<ul style="list-style-type: none"> Polarimetric Surveys 	<ul style="list-style-type: none"> Collect rock samples Roll boulder fps movie movement, pan crater Describe, pl EVA Comm
c.-d.		<ul style="list-style-type: none"> Watch for r
d. Flank	<ul style="list-style-type: none"> Description, contrast rock types, sizes, with Cone 	<ul style="list-style-type: none"> Documented S
e.	<ul style="list-style-type: none"> Describe Surface 	<ul style="list-style-type: none"> Trench - do checklist Documented S Single Core
f. Weird	<ul style="list-style-type: none"> Describe Surface 	<ul style="list-style-type: none"> Triple Core Documented S Radial/dia samples at crater
g. Triplet	<ul style="list-style-type: none"> Pan Description 	<ul style="list-style-type: none"> Gas Sample (MSSC (HD) Fillet Sampl Football-siz
g.-1 (S)		<ul style="list-style-type: none"> ALTERNATE Documented S Pan
g.-2 (N)		<ul style="list-style-type: none"> Documented S

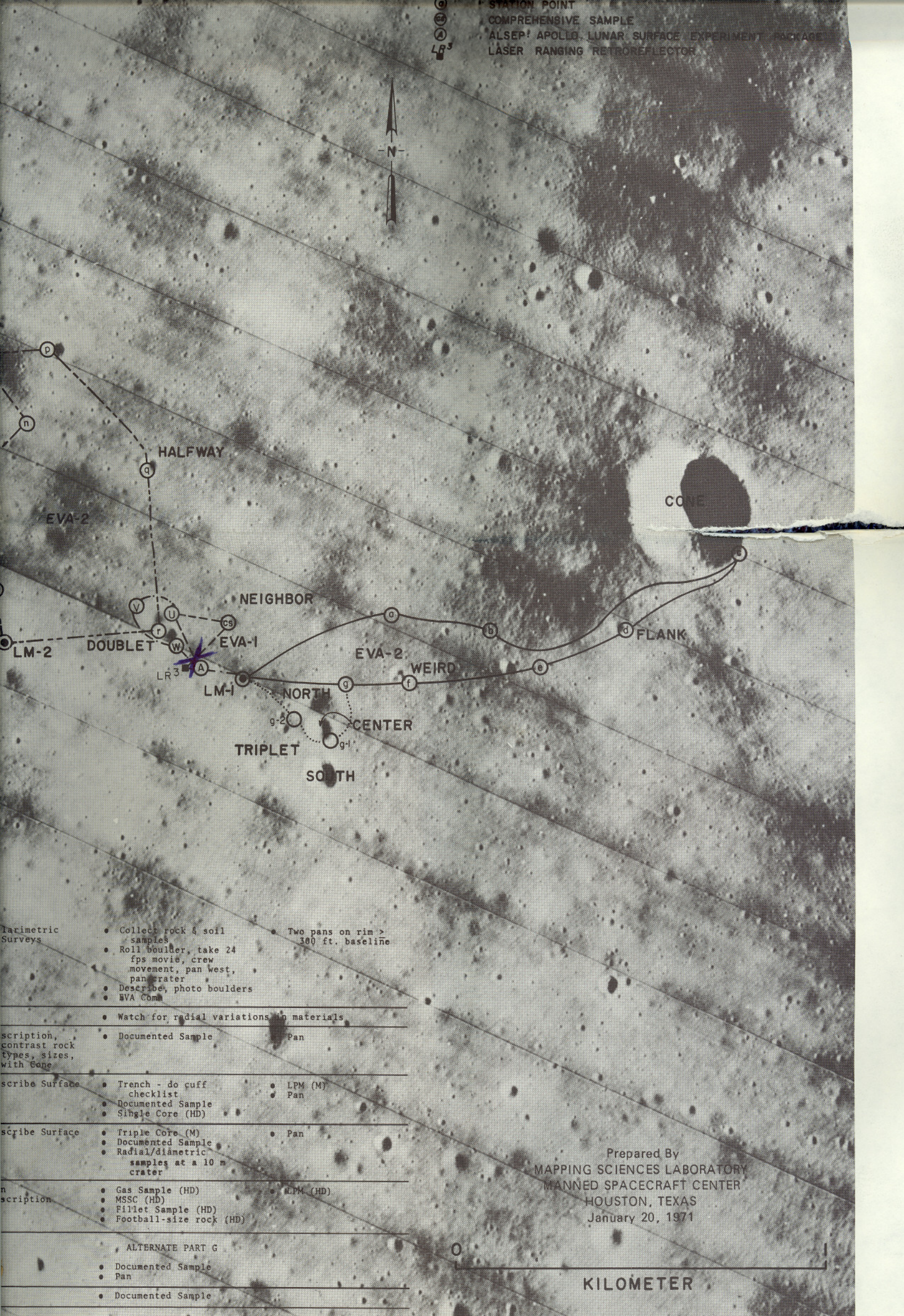
TRAVERSE SYMBOLS

- ⊙ LM-1 LANDING SITE I
- EVA I NOMINAL TRAVERSE
- EVA II NOMINAL TRAVERSE
- - - SHEPARD TRAVERSE
- MITCHELL TRAVERSE
- ⋯ ALTERNATE TRAVERSE EXTENSION, TIME PERMITTING
- ⊙ STATION POINT
- ⊙ COMPREHENSIVE SAMPLE
- ⊙ ALSEP: APOLLO LUNAR SURFACE EXPERIMENT PACKAGE
- LP³ LASER RANGING RETROREFLECTOR



- Polarimetric Surveys
- Collect rock & soil samples
- Roll boulder, take 24 fps movie, crew movement, pan west, pan crater
- Describe, photo boulders
- EVA Com
- Watch for radial variations in materials
- Documented Sample
- Pan
- Describe Surface
- Trench - do cuff checklist
- Documented Sample
- LPM (M)
- Pan
- Two pans on rim > 300 ft. baseline

● STATION POINT
 ● COMPREHENSIVE SAMPLE
 ● ALSEP: APOLLO LUNAR SURFACE EXPERIMENT PACKAGE
 ● LASER RANGING RETROREFLECTOR



- Parametric Surveys
 - Collect rock & soil samples
 - Roll boulder, take 24 fps movie, crew movement, pan west, pan crater
 - Describe, photo boulders
 - EVA Comm
 - Two pans on rim > 300 ft. baseline

- Description, contrast rock types, sizes, with Cone
 - Watch for radial variations in materials
 - Documented Sample
 - Pan

- Describe Surface
 - Trench - do cuff checklist
 - Documented Sample
 - Single Core (HD)
 - LPM (M)
 - Pan

- Describe Surface
 - Triple Core (M)
 - Documented Sample
 - Radial/diametric samples at a 10 m crater
 - Pan

- Description
 - Gas Sample (HD)
 - MSSC (HD)
 - Fillet Sample (HD)
 - Football-size rock (HD)
 - LPM (HD)

- ALTERNATE PART G
 - Documented Sample
 - Pan
 - Documented Sample

Prepared By
 MAPPING SCIENCES LABORATORY
 MANNED SPACECRAFT CENTER
 HOUSTON, TEXAS
 January 20, 1971

KILOMETER