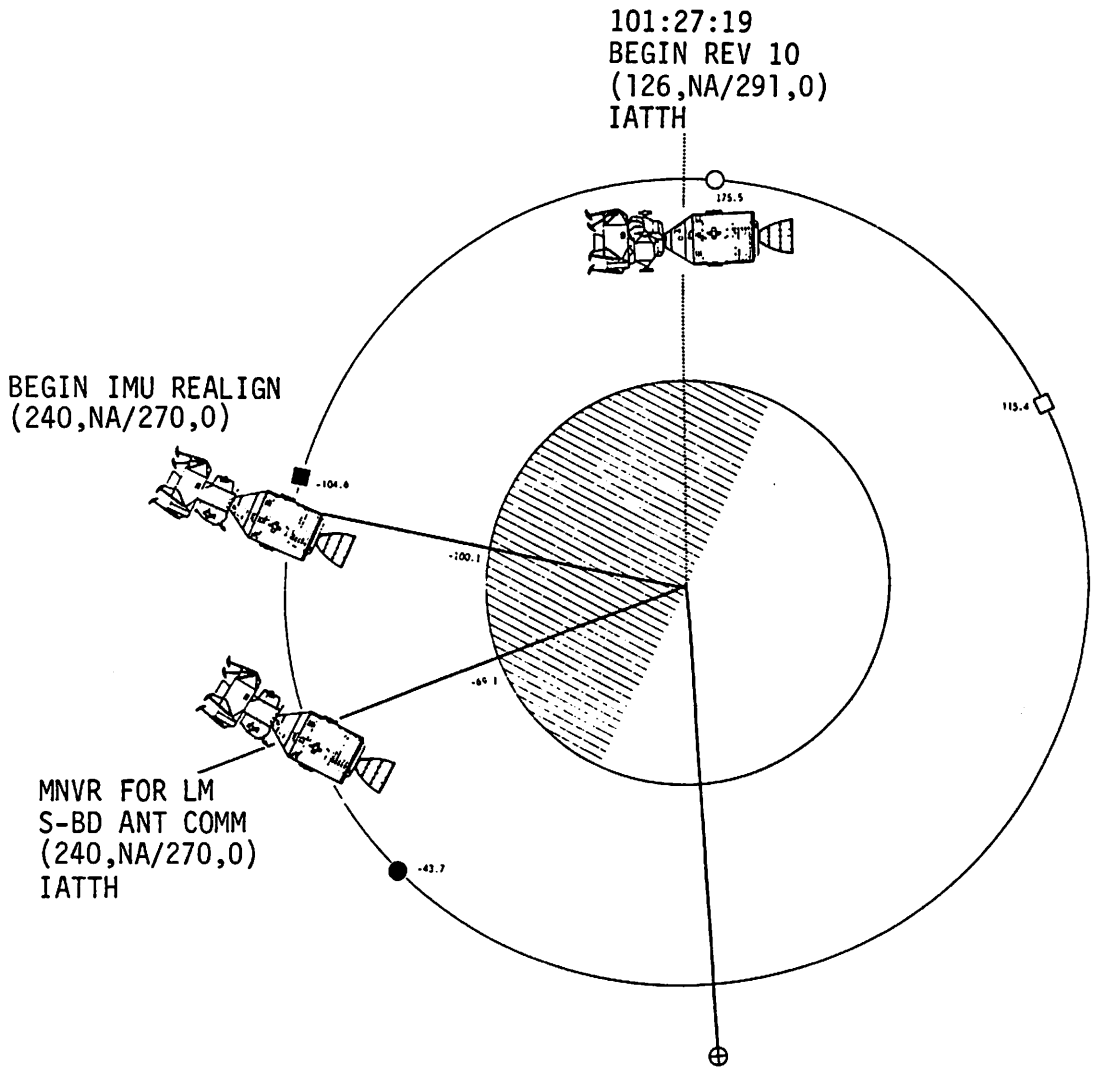
FAO

APOLLO 12	
CMP SOLO BOOK	
PART NO	S/N
SKB32100081-353	1002

REV 10



LEGEND:

- □ ■ MSFN AOS, LOS
- ○ ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION B

FLIGHT PLAN

MCC-H

1522 CST

101:00
:03
:15
REV 10
:29
101:30
:35
:45
:49
102:00

DUMP DSE

M S F N

VERIFY DSE MOTION AT LOS

WASTE WATER DUMP
O_2 FUEL CELL PURGE
EAT PERIOD

POSTSLEEP CHECKLIST

CREW STATUS REPORT
CONSUMABLES UPDATE
FLIGHT PLAN UPDATE
CYCLE H2, O2 FANS
~~POT H2O HTR ON~~
NORMAL LUNAR COMM EXCEPT:
S BD ANT - HI GAIN
CREW MANAGES ANT OPS

NOTES

CSM CONSUMABLES UPDATE
GET: __ __ __:__ __
RCS TOTAL _____%
QUAD A ____% B ____%
C ____% D ____%
H_2 TOTAL _____%
O_2 TOTAL ____ ____%

CREW STATUS REPORT

	CDR	CMP	LMP
SLEEP			
PRD			

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	101:00 - 102:00	5/9-10	3-77

FLIGHT PLAN

1622 CST

	CMP	CDR	LMP	MCC-H
102:00				
	EAT PERIOD	EAT PERIOD	EAT PERIOD	
:15				CSM UPDATE TO ~~LM~~ UPDATE T1 & T2 TIMES FOR FRA MAURO PHOTOS
	LiOH CANISTER CHANGE NO. 9-11 INTO A, STOW 9 IN A3			
102:30	TARGET OF OPPORTUNITY PHOTOS OF FRA MAURO OUT RT-HAND SIDE WINDOW CM4/EL/80/BW (f2.8,250,INF)10 T1 ___:___:___ T2 ___:___:___			UPDATE TO CSM TEI 34 PAD MAP UPDATE REV 11 CSM DAP PAD COMM ATT & HGA ↕'s (102:50) UPLINK TO CSM STATE VECTOR &V66 DESIRED ORIENT (LDG SITE)
:35		DON LCG	DON LCG	
:41				
:45	MNVR TO COMM ATT BY 102:50 FOR STEERABLE ANTENNA R240, P270, Y 0 HGA: P-35, Y117	DON LCG		MAP UPDATE REV 11 LOS : ___:___:___ 180° : ___:___:___ AOS : ___:___:___
103:00				

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	102:00 - 103:00	5/10	3-78

MSC Form 845B (Jan 69)

FLIGHT PLANNING BRANCH

FLIGHT PLAN

1722 CST

	CMP	CDR	LMP	MCC-H
103:00			VERIFY DSE MOTION AT LOS	
:01	P52 - IMU REALIGN OPTION 1 - (PREFERRED)			P52 (LDG SITE ORIENT) N71: __ __,__ __ N05: __ __ __.__ __ N93: X __ __.__ __ __ Y __ __.__ __ __ Z __ __.__ __ __ GET __ __ __:__ __:__ __
:15	DON PGA W/O HELMET & GLOVES			
REV 11				
:27				
103:30	EQUALIZE CM/LM PRESSURE			
:34				MAP UPDATE REV 12 LOS : __ __ __:__ __:__ __ 180° : __ __ __:__ __:__ __ AOS : __ __ __:__ __:__ __
:45	OPEN & STOW CM HATCH REMOVE & STOW PROBE & DROGUE		VERIFY DOCKING TUNNEL INDEX ANGLE	DUMP DSE
:47	CHECK LATCHES REACQUIRE MSFN HGA: P-35, Y117			
MSFN	REPORT DOCKING TUNNEL INDEX ANGLE	DON PGA W/O HELMET & GLOVES	OPEN LM HATCH IVT TO LM	UPDATE TO CSM MAP UPDATE REV 12
104:00				

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	103:00 - 104:00	5/10-11	3-79

FLIGHT PLAN

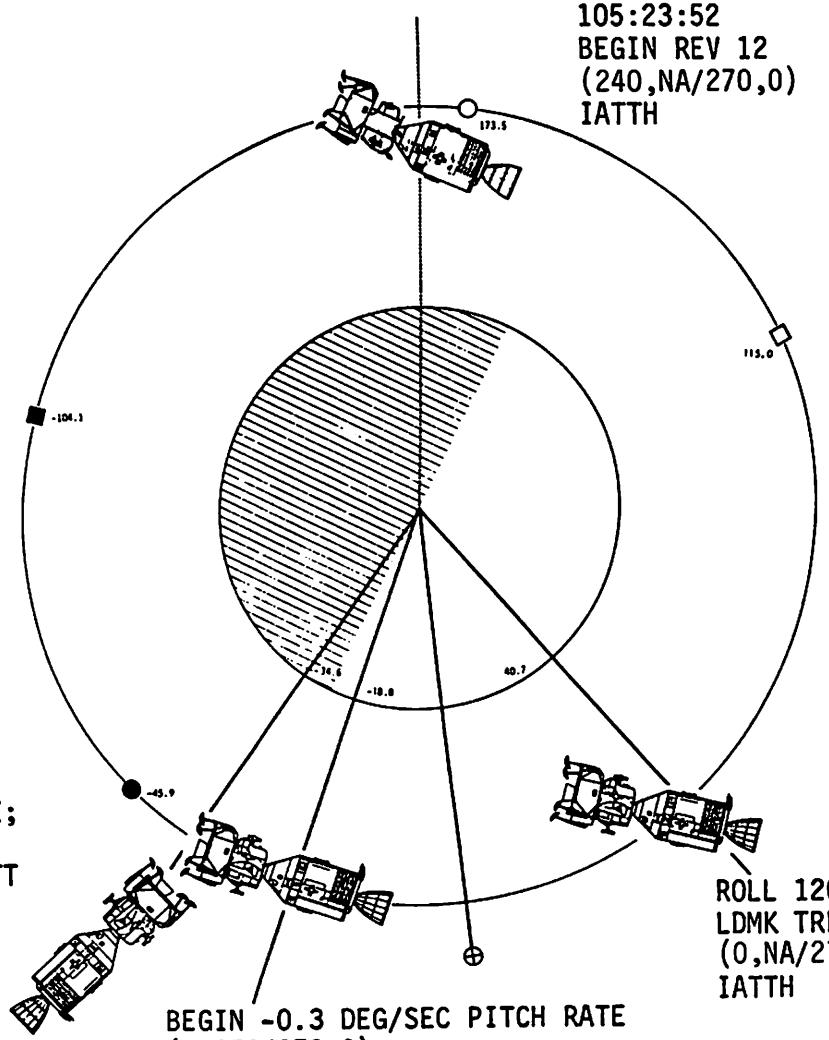
1822 CST

	CMP	CDR	LMP	MCC-H
104:00	CSM POWER TO LM OFF AT LMP'S REQUEST	DON PGA W/O HELMET & GLOVES	TRANSFER TO LM POWER LM FAMILIARIZATION & HOUSEKEEPING (IF NECESSARY)	
:15			EPS ACTIVATION S-BAND ACTIVATION MISSION TIMER ACTIVATION PRIMARY GLYCOL LOOP ACT	UPDATE TO CSM P22 LDMK TRACKING PAD
	CONFIGURE CAMERAS FOR UNDOCKING CM2/DAC/18/CEX-BRKT-MIR (f8,250,7) 6fps, 16 MIN CM4/TV-IN BRKT (f22)	DISCONNECT & STOW LM POWER UMBILICAL	CAUTION/WARNING C/O CB ACTIVATION TB VERIFICATION	
104:30	CM2/EL/80/CEX (f8,250, 50) 10	IVT TO LM TRANSFER HELMET & GLOVES	SEC S-BAND T/R & POWER AMPL CHECK	UPDATE TO LM STEERABLE ANT $\measuredangle$'s BY 104:30 (IF REQ'D)
:33	~~INHIBIT B3&C4 CSM THRUSTERS~~	ECS ACTIVATION & C/O CONNECT TO LM ECS	S-BAND STEERABLE ANTENNA ACT: P 68, Y 19	
:40	LM CLOCK SYNC: V06N65 T EPHEM: V05N01E 1706E	PGNCS TURN-ON & SELF TEST	SUIT FAN/H_2O SEP CHECK	UPDATE TO LM STEERABLE ANT $\measuredangle$'s (105:49) (IF REQ'D)
		LGC/CMC CLOCK SYNC T EPHEM UPDATE E MEMORY DUMP	GLYCOL PUMP CHECK	
:45	LM VHF CHECKOUT: VHF AM(B)-SIMPLEX VHF RCV ONLY-B DATA VHF AM(B)-OFF VHF AM(A)-SIMPLEX V06N20E (ON CDR'S MARK) MIN DB FOR LM ALIGN VERIFY DSE MOTION AT LOS RECORD LM PCM DATA		VHF CHECKOUT	
		DOCKED IMU COARSE ALIGN REPORT GIMBAL ANGLES & TIME TO MSFN	IVT TO CSM	
:59		FWD OMNI - LBR SLEW STEERABLE ANT: P 68, Y 19	DON PGA	
105:00				

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	104:00 - 105:00	5/11	3-80

REV 12



REVISION B

FLIGHT PLAN

CSM		LM		MCC-H
CMP	1922 CST	CDR	LMP	
	105:00		DON PGA IN CSM	
DON HELMET & GLOVES PGA PRESSURE INTEGRITY CHECK	:15		IVT TO LM TRANSFER HELMET & GLOVES CONNECT TO LM ECS & COMM	
	REV 12		ASCENT BATTERY ACTIVATION AND C/O RECORD ED BAT VOLTS AGS ACT & SELF TEST	
INHIBIT ROLL COMMANDS UNTIL LM/CM ΔP>3.5 PSID INSTALL DROGUE & PROBE PRELOAD PROBE COCK LATCHES (12) INSTALL HATCH VENT TUNNEL HATCH INTEGRITY CHECK CONFIGURE PANEL 10 FOR CSM RELAY	:26 105:30 :32	VERIFY DROGUE & PROBE INSTALLATION CLOSE AND SECURE HATCH		
REACQUIRE MSFN HGA: P-35, Y 117	:45	DEPLOY LANDING GEAR	STEERABLE ANTENNA: P 68, Y 19	DUMP DSE UPLINK TO CSM CSM STATE VECTOR & V66 UPDATE TO LM DAP DATA GYRO TORQUING ε's
V06N20E DOFF HELMET & GLOVES		POO & DATA FOR UPLINK DOCKED IMU FINE ALIGN V06 N20E ON MARK	BIOMED SW - LEFT V47-AGS INITIALIZATION	
	106:00			

MSFN

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	105:00 - 106:00	5/11-12	3-81

DOCKED LANDMARK TRACKING PROFILE

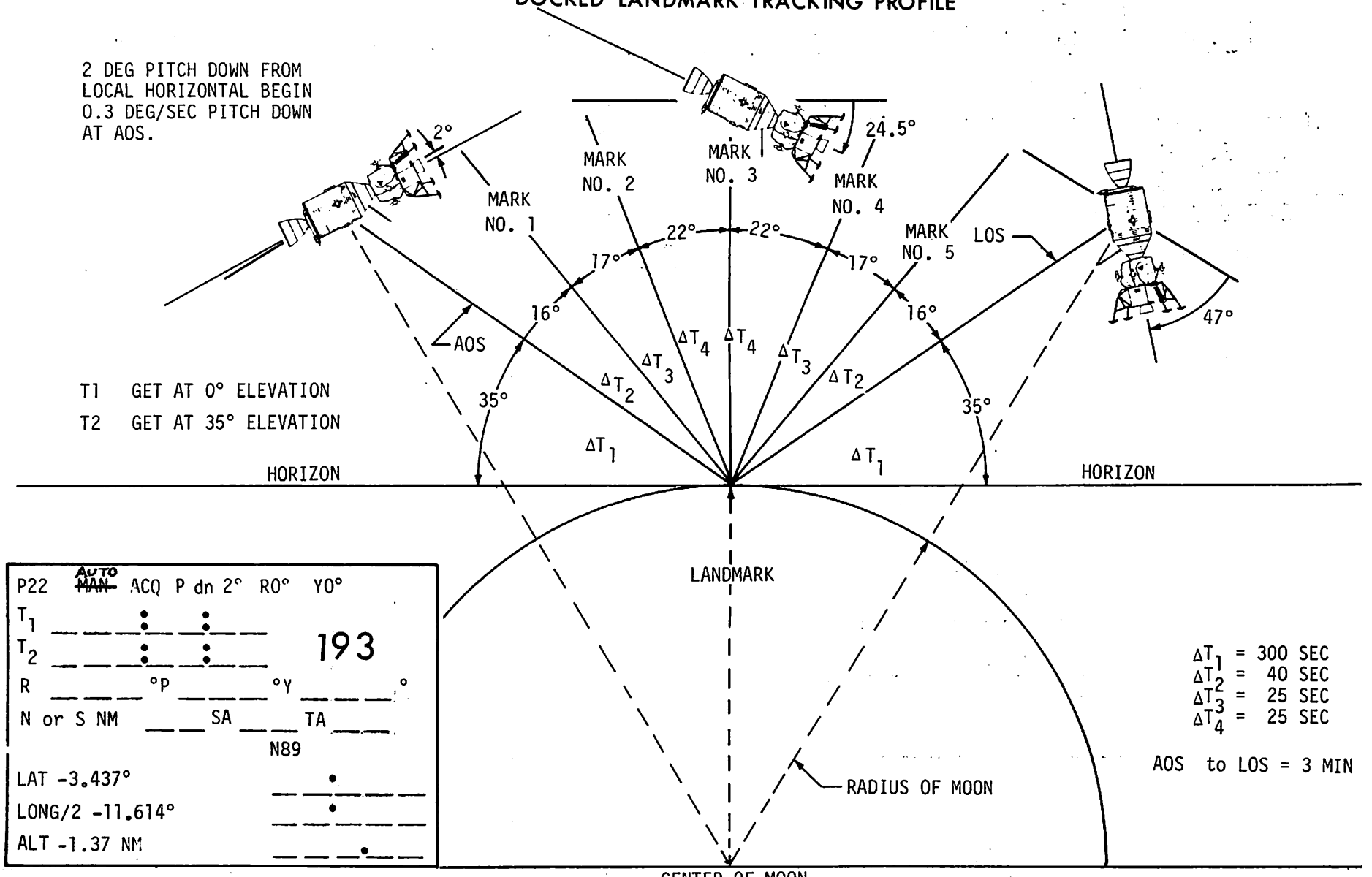


FIGURE 3-1

FLIGHT PLAN

CSM	2022 CST	LM		MCC-H
CMP		CDR	LMP	
	106:00	DAP SET - GIMBAL & THROTTLE TEST LOAD DAP - 32022	LOAD AGS PAD	UPLINK TO LM LS REFSMMAT LM SV & V66 LGC/CMC CLOCK SYNC PIPA BIAS LGC ABORT CONSTANT E-MEMORY UPDATE (IF REQ'D)
SELECT OMNI D ROLL 120° TO TRACKING ATT AT 106:10 R 0 , P270, Y 0	:15	RATE GYRO TEST V06N20 ON MARK	SELECT OMNI-FWD SLEW STEERABLE ANT: P 104, Y 01 FOR AGS CAL PITCH ATT	UPDATE TO CSM SEP TIME & UNDOCK TIME UPDATE TO LM AGS K FACTOR AGS ABORT CONSTANTS STEERABLE ANT θ's (IF REQ'D)
V06N20E VERIFY DSE MOTION P22-ORBITAL NAVIGATION ESTABLISH 0.3°/SEC PITCH RATE AT LDMK AOS		RCS PRESSURIZATION	RCS PRESSURIZATION	UPDATE TO CSM MAP UPDATE REV 13
TRACK LDG SITE LDMK 193 DO NOT PROCEED ON N89 25 SEC BETWEEN MARKS, 5 MARKS	106:30			
STOP AGS CAL PITCH@P158 BY 106:35 HGA: P-47, Y168 V06 N20E MNVR TO AGS CAL ATT BY 106:45 R 8 , P 158, Y 23 HGA: P-41 , Y 139 V06N20E SC CONTROL-SCS ~~MIN/MAX DB, LOW/HIGH RATE~~(AT CDR'S REQUEST) CMC FREE FOR RCS HOT FIRE VERIFY DSE MOTION AT LOS RECORD LM PCM DATA INHIBIT THRUSTER B3 FOR LM RR SELF TEST	:32 :38 :45 :57	V06 N20E ON MARK V06N20E ON MARK RCS CHECKOUT	RCS CHECKOUT	MAP UPDATE REV 13 LOS : __ __ __ : __ __ : __ __ 180° : __ __ __ : __ __ : __ __ AOS : __ __ __ : __ __ : __ __ UPDATE TO LM STEERABLE ANT θ's (107:47)
	107:00		FWD OMNI-LBR SLEW STEERABLE S-BD ANT: P 132, Y 24	

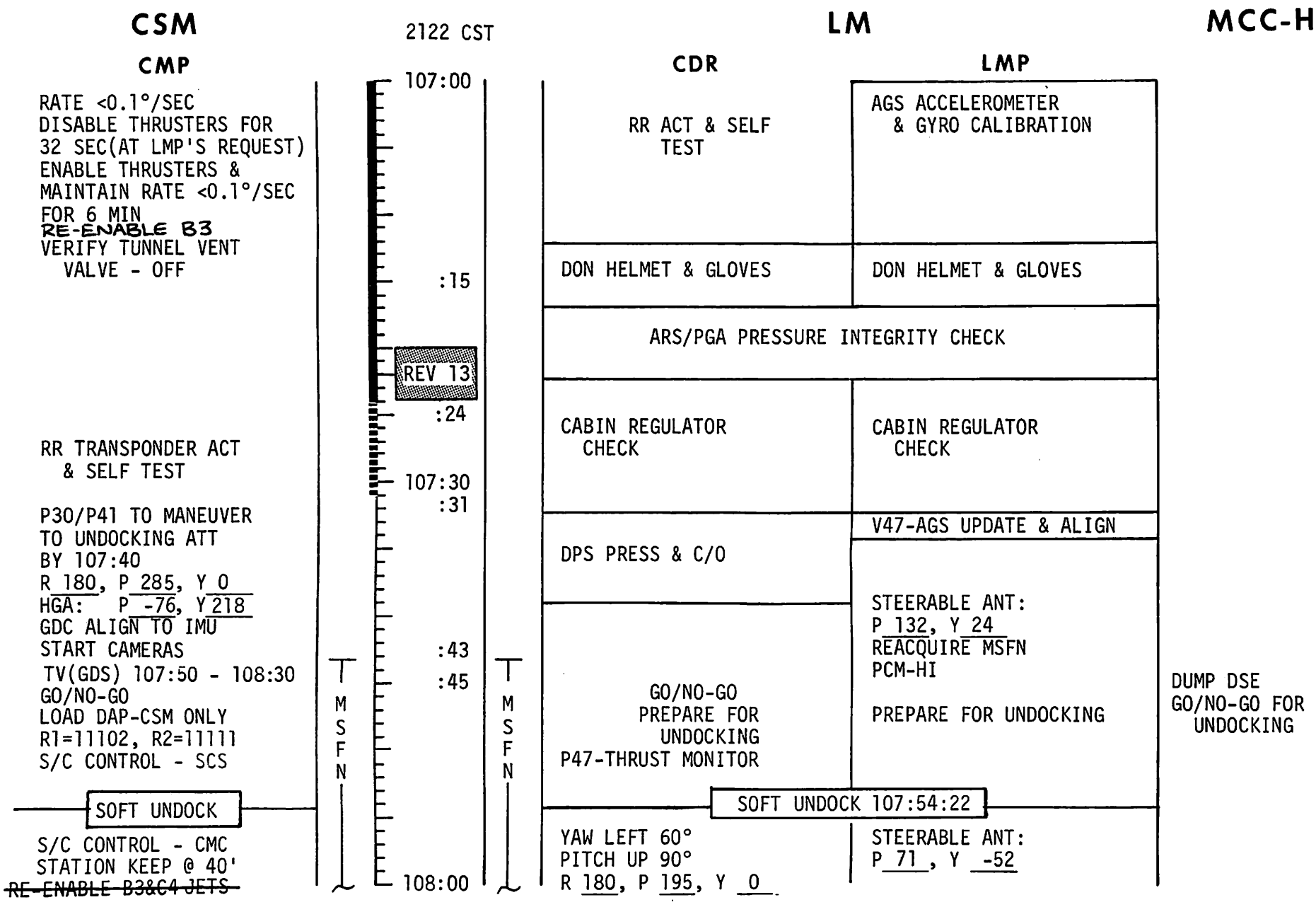
MSFN

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	106:00 - 107:00	5/12	3-83

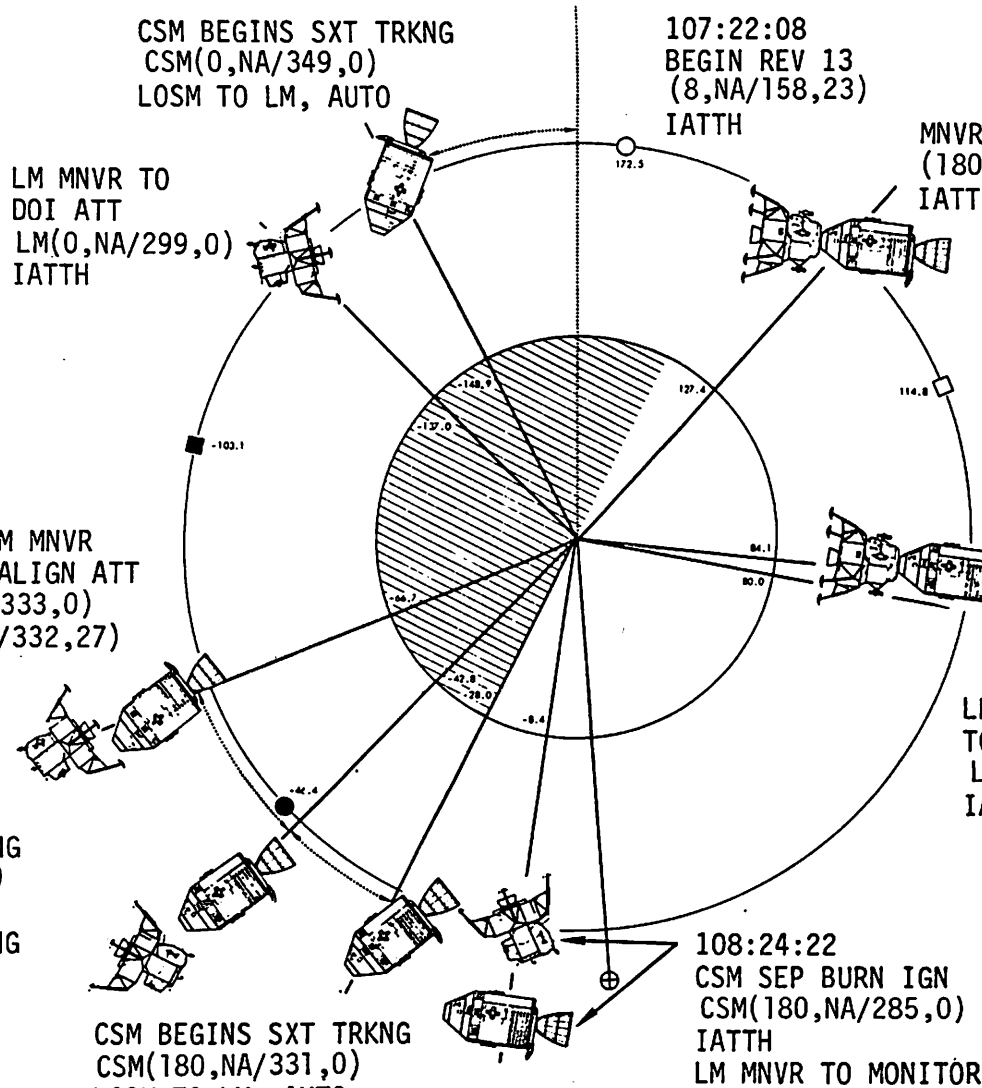
FLIGHT PLANNING BRANCH

REVISION A



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	107:00 - 108:00	5/12-13	3-84

REV 13



LEGEND:

□ ■	MSFN AOS, LOS
○ ●	S/C SUNRISE, SUNSET
⊕	SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION B

SOURCE MOSEL
DATE OCT. 23, 1969

CMP SOLO BOOK

Flight Pages not like this

undock 107:54:00

CSM SEP PAD

33	00	108:	000	24:	042
81	+	0002.5	+	0000.0	+ 0000.0
22	XXX	182	XXX	288	XXX 000

DOI PAD

33			
84			

NO PDI ONE + 12 PAD

33			
84			

"CSM RESCUE" PAD

PDI TIGN	00	000	0
TPI (PDI<10) 37	00	000	0
TPI (PDI>10) 37	00	000	0
(T2)	00	000	0
TPI (T2) 37	00	000	0
(T3)	00	000	0

"CSM RESCUE UPDATE" PAD

TPI (PDI<14.5) 37	00	000	0
(T2)	00	000	0
TPI (T2) 37	00	000	0

RESCUE TWO PAD

47	+	+	00000.
48			
33	00	000	0
81			
22	XXX	XXX	XXX
ΔV_C	X		
11	00	000	0
37	00	000	0
N			

CSI ONE

11		000	0
81			
N			

P22 PAD

T1		(HOR)
T2		(LMK)
	NM (N OR S)	
89		
	LAT LONG/2 ALT	

NOMINAL LM IGNITION TIMES

CSI 11	00	000	0
PC 33	00	000	0
TPI 37	00	000	0

CSI TWO

11	00	000	0
81			
N			

CSI THREE

11	00	000	0
81			
N			

CSI FOUR

11	00	000	0
81			
N			

CDH

13	00	000	0
81			

TPI

37	00	000	0
81			
59			
LOS BT	XX	XX	XX

UNDOCK PAD

33			
81	+0000.0	+0000.0	+0002.5

SEP PAD

33			
81	+0002.5	+0000.0	+0000.0
22			

106:50 — COPY CSM UNDOCK AND SEP PADS

CONFIRM UNDOCK GET (107:54:22)

CONFIGURE SWITCHES: SC CONT-CMC/AUTO
VHF A-SIMPLEX/DATA
VHF ANT-RT(VERIFY)

LOS

VERIFY DSE MOTION AT LOS
RNDZ XPNDR-HTR (VERIFY)
AUTO RCS SELECT B3 -OFF [FOR CMC-FREE](FOR RR SELF TEST)
DAMP RATE<.1°/SEC
107:00 — CMC MODE-FREE AT LM REQUEST FOR 32 SEC
CMC MODE-AUTO
MAINTAIN RATE<.1°/SEC FOR 6 MINUTES

107:10 — AUTO RCS SELECT B2 ~~OFF~~ ON (AFTER RR SELF TEST)

V48 (21102)(36509)(-00083) (X1111)(33664)(+00043) ; V46

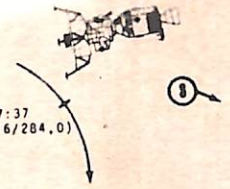
107:20 — CONFIGURE CAMERA:(VERIFY)
CM2/DAC/18/CEX-BRKT (LEFT WND) | HBLAD CM2/EL80/CEX
MIR (f8 ,250, 7) 6FPS, 16 MIN | (f8,250,FOCUS)10F

CONFIGURE TV: CM4(RT WND)(f22)

-58 — SET DET COUNT DWN TO SEP

107:30 — RR XPNDR ACTIVATION AND SELF TEST
(VERIFY LM RR SELF TEST COMPLETE)
cb RNDZ XPNDR FLT BUS-CLOSE (VERIFY)
RNDZ XPNDR-HTR (VERIFY)
RNDZ XPNDR-PWR
SYS TEST (lh)-XPNDR
SYS TEST (rh)-A (RRT XMTR OUT PWR)
SYS TEST ind >1 vdc (3.7-4.2)
SYS TEST (rh)-B (RRT AGC SIG)
RNDZ XPNDR-TEST (HOLD)
SYS TEST ind >1 vdc (1.8-2.2)
RNDZ XPNDR-OPERATE
SYS TEST ind 0-4.5 vdc
SYS TEST (rh)-C (RRT FREQ LOCK)
SYS TEST ind <.8 vdc UNLOCKED, >4 vdc LOCKED
SYS TEST (rh)-B

V49 MNVR (180,284.0) ~~V42~~



107:40

-76 P
218 Y

AOS

GDC ALIGN
VERIFY ORDEAL (V83)

V64; ACQ HGA
START TV

P30; LOAD UNDOCK TIME (107:54:22)
AND VGZ=+2.5

SOURCE MOSEL

OCT. 23, 1969
11/8/69

SOURCE MOSEL

11/8/69
OCT. 23, 1969

-38
107:50
-30
108:00
108:10
-13

MSFN

P30; LOAD UNDOCK TIME (107:54:22) AND VGZ=+2.5

P41 (TRIM)(180,252/284,0)

START 16MM CAMERA

P00;BMAG-ATT 1/RATE 2 SC CONT-SCS; V48 (11102 / X1111) ; V46

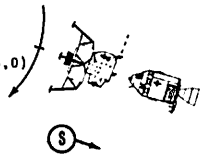
UNDOCKING (107:54:22)(180,270/284,0)

CONFIGURE SWITCHES:
DV CG-CSM
RR XPNDR-PWR (VERIFY)
SC CONT-CMC
~~AUTO RCS SEL-B3,G4 ON~~

COPY DOI P76
NO PDI, +12 P76,CSI AND TPI
PDI TIGN
PDI ABORT TPI TIGNS
T2 AND T3 TIGNS

SOFT UNDOCKING CHECKLIST

PROBE EXT/REL-EXT/REL (Momentary)
VERIFY PROBE EXTENDED, LM ATTACHED
ALLOW MOTION TO DAMP (5 SEC)
PROBE EXT/REL-EXT/REL (HOLD)
AFTER 2 SEC XLATE (4 JET) AFT FOR 1 SEC
AFTER PROBE/DROGUE DISENGAGED-
PROBE EXT/REL-OFF



MAP UPDATE REV 13			
LOS	:	:	:
180°	:	:	:
AOS	:	:	:

DAC-OFF

LM DOI P76 (+20.)

33			
84			
	(-71.1)	(0.0)	(+18.6)

P30;LOAD SEP TIGN(108:24:22) AND VGX=+2.5

LM NO PDI ONE +12 P76 (+34.)

33			
84			
	(+118.3)	(0.0)	(+128.2)

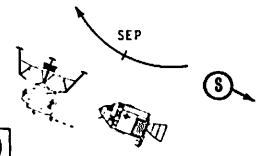
-7
108:20
0
108:30
-46
108:40
-38

MSFN

P41(TRIM)
(180,336/284,0)

LM NO PDI ONE +12 CSI AND TPI

11			
37			
N	+00001		



RCS CHECKLIST

(108:24:22)
CSM SEP (+0.0,+0.0,+2.5)
(180,0/284,0)
(THRUST UP)
(BURN VGZ TO +2.5; TRIM VGZ ONLY)

COLOR TV-OFF

P20 (63°)(180,67/331,0)
VHF B-DUPLEX/RANGING
COMPARE EMS VHF AND V83 RANGE
MONITOR LM RR CHECKS FROM 108:37 TO 108:45

PDI TIGN

108:37
R=+000.37
R=+0003.5

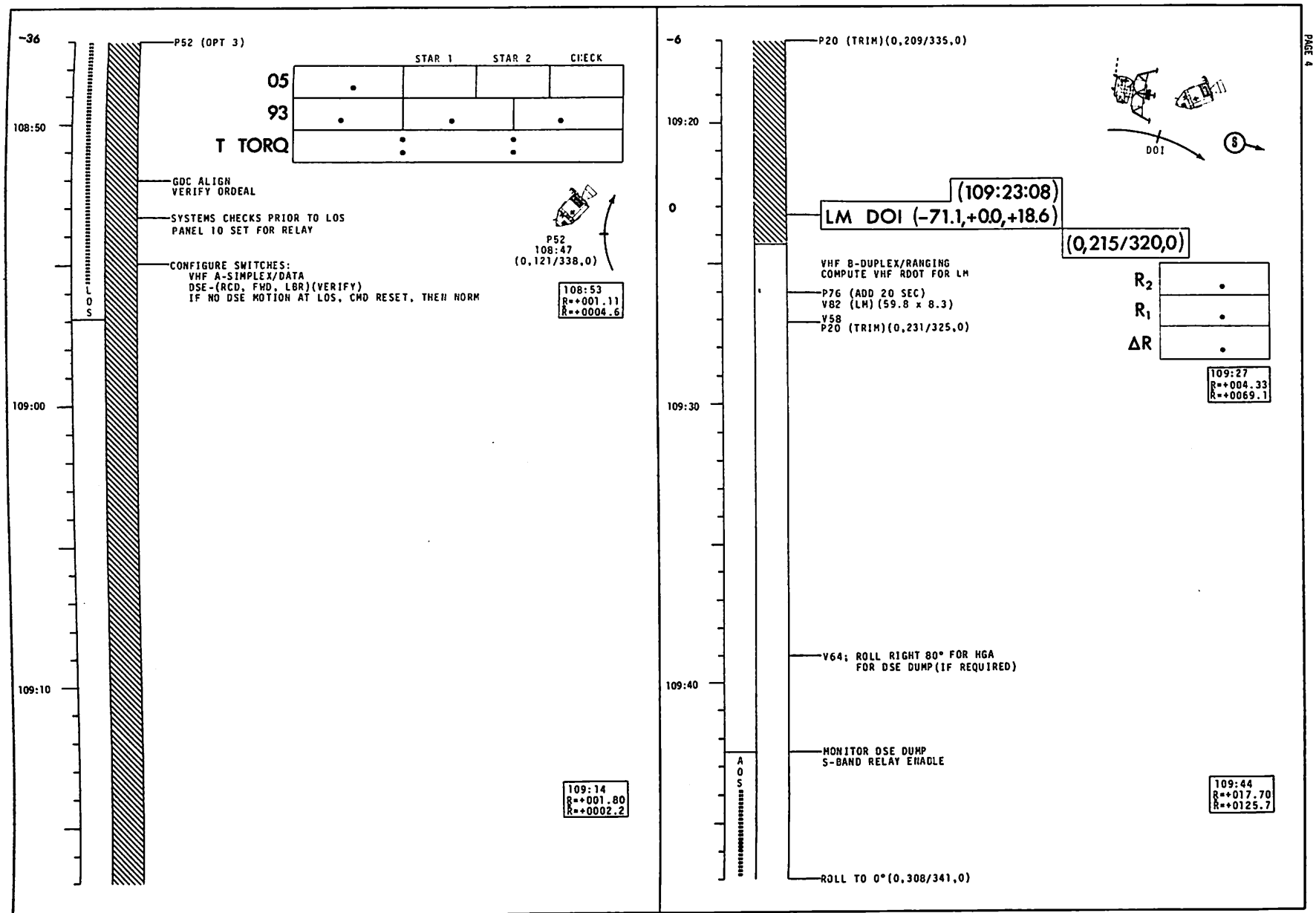
P00; MCC-H UPLINK CSM AND LM VECTORS

37			
	(CSM TPI TIGN <PDI ONE +10)		
37			
	(CSM TPI TIGN >PDI ONE +10)		

(AFTER LM RR CHECKS)
ROLL TO 0°
(0,115/338,0)

T2			
37			
	(CSM TPI TIGN FOR T2)		
T3			

PAGE 3



SOURCE MOSEL

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11/8/69

SOURCE MOSEL

OCT. 23, 1969

ROLL TO 0°(0,308/341,0)

109:50

P20 (6°) (0,322/347,0)
V67 (+10000,+00100,+00001)

V57
V87 (V16N02,46E

MAP UPDATE REV 18
LOS : ___:___:___
180° : ___:___:___
AOS : ___:___:___

109:59
R=+050.70
R=+0324.7

110:00
+40

+45

110:10

+54

+56

GO/NO-GO PDI

110:14
R=+110.50
R=+0457.1

P20
110:02
(0,350/339,0)

110:20
0

-30
175

110:30
+11

110:40

-51
13

V44; OPTICS SHFT=0, TRUN=22
SC CONT-CMC/FREE
NULL LM LOS RATES WITH MIC

LM PDI (110:20:00)
(0,9/304,0)

PDI

SWITCH TO OMNI-A(AS REQD)

V64; ACQ HGA

TOUCHDOWN

TOUCHDOWN (110:31:19)
(0,236/134,0)

LOS OF LM

V44 (SET SURFLG)
CONFIGURE SWITCHES: VHF RANGING-OFF
VHF T/R (PANEL 9) TO RCV
~~RR XPNDR OFF~~

SC CONT-CMC/HOLD AT (0,208/81,0)

P52
(0,228/81,0)

SYSTEMS CHECKS PRIOR TO LOS	STAR 1	STAR 2	CHECK
05	•		
93	•	•	•
T TORQ	:	:	•

P52(OPT 3);GDC ALIGN

FOLLOW FLIGHT PLAN UNTIL 141 07

PAGE 5

141:10

141:20

141:30
-31

AOS

MSFN

CONFIGURE DOCKING CAMERAS
CM2/DAC/18/CEX-BRKT,MIR
(f8,250, 7) 6 FPS, 16 MIN
CM2/EL/80/CEX
(f8,250,FOCUS)10F
TV-CM4(RT WND)(f22)

V64; ACQ HGA

COPY PADS

L/O			
11			
55	+00001	+208.30	+130.00
37			
T_1			
T_2			
NM(N OR S)			
89			
	LAT	LONG/2	ALT

V49 MNVR
(0,303,0)

GDC ALIGN

VERIFY ORDEAL (V83)

SET DET COUNTDOWN TO L/O

CONFIGURE SWITCHES
VHF B-DUPLEX/RANGING
VHF AM-T/R
RNDZ XPNDR-PWR(VERIFY)

141:40
-21

141:50

-8

142:00

0

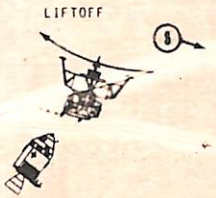
-48 P
172 Y

MSFN

P22
SC CONT-CMC/AUTO(VERIFY)
VERIFY LOCAL HORIZONTAL(0,338/303,0)
V79 (-0.0507, +000.50, +11111)

T1 (HORIZON)

L.O.-6 MIN - MSFN RELAY DISABLED

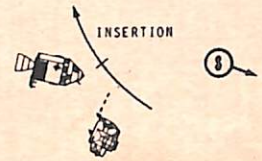


T2 (SIGHT LM; SHFT=0°,TRUN=40°)

WHEN TRUN=22°; P00
SC CONT-CMC/ERASE
MSFN LM LOS RATES WITH MIC

LIFTOFF (142:01:18)

(0,259/165,0)



SOURCE MOSEL

OCT. 23, 1969

11/8/69

SCURCE MOSEL

TPI COMPARISON LIMIT = VGX ±2; VGY ±5; VGZ ±6
BURN: LGC IF LGC=CMC
LGC IF LGC=AGS AND RR=VHF
CMC IN AGS IF AGS=CMC
CMC

OCT. 23, 1969

144:10
-24
144:20
-15
-12
-8
144:30
-6
0

MSFN LOS

V57
5
COPY LM TIGN
5
V88
V32 RECYCLE; LM COMPARISON
VERIFY DSE MOTION AT LOS
P34 RECALL (TIGN OPTION AND LM TPI TIGN)
V56
P40 (52°)
(0,191/5,0)
COPY LM TPI P76 PAD
SPS CHECKLIST
P76 (ADD 12 SEC)

P34 RECYCLE: LM COMPARISON

37
58
59

144:09
R=+062.19
R=-0122.4

37

(UPDATED) 37

55	+00000	+000.00	+130.00
58			
81			
59			

(+12.)

33
84

(144:36:26)
LM TPI (+22.0,+0.0,-11.0)
CSM TPI (-22.2,+0.0,+11.3)
(0,208/5,0)

TPI

144:40
+4
+11
+12
144:50
+15
+18
145:00
+26
+27
+30

AUTO RCS SEL(16)-MNA
P20 (38°)(0,251/43,0)
P35
V93 (IF SXT OR VHF ONLY, NO V93)
V57
V87
5
3
V88
P35 FINAL COMP
COPY LM MCC1 P76 PAD
P41 (BYPASS MNVR)
MCC1 (144:51:26)
P76
V58
P35 (TRIM)
(0,270/23,0)
V93 (IF SXT OR VHF ONLY, V93 AFTER 3 MARKS)
V57
V87
5
3
V88
P35 FINAL COMP
COPY LM MCC2 P76 PAD
P41 (BYPASS MNVR)
MCC2 (145:06:26)
P76 V58
(0,308/15,0)

81
59
33
84

MCC1
MCC2

PAGE 9

145:10

AOS

MSFN

V77; P20 (35°)(0.281/340.0)
V83/VHF/LM RR COMPARISONS
AUTO RCS SEL (16)-MNA

VERIFY CAMERA SETTINGS

ROLL 60° RIGHT

BRAKING GATES			
R(FPS)	R(FT)	R(NM)	RETICLE ANGLE (DEG)
30	6000	1.0	.13
20	3000	.5	.26
10	1500	.25	.54
5	500	.08	1.6
	300	.05	2.7
	200	.03	4.0
	100	.02	8.5

145:10
R=+003.05
Ṙ=-0039.5

V64; ACQ HGA
TV-ON

P47
AT R=1.25 N.M.
V83
N83
KEY REL

LM PHOTOS

58 [.] TPF ΔV

TPF (145:18:17)

+43

145:20

-51 P
350 Y

FLY FORMATION
LM PHOTOS
EXT RNDZ LT-OFF

MNVR TO (180,336,0)

PRE-DOCK CHECKLIST

MAN ATT(3)-RATE CMD
LIM CYCLE-OFF
ATT DB-MIN
RATE-LO
TRANS CONTR PWR-ON(UP)
ROT CONTR PWR DIR(BOTH)-MNA/MNB
SC CONT-CMC
CMC MODE-AUTO
BMAG MODE(3)-ATT 1/RATE 2

AUTO RCS SELECT(16)-MNA OR MNB
CB DOCK PROBE(2)-CLOSE
PROBE RETR(2)-OFF(VERIFY)
PROBE EXTD/REL-RETR
PROBE EXTD/REL TB(2)-GRAY(VERIFY)
CB SECS ARM(2)-CLOSE
SECS LOGIC(BOTH)-ON(UP)
EXT RUN/EVA LT-ON(UP)VERIFY
COAS PWR-ON(UP)

MSFN CONFIRM GO FOR PYRO ARM
SECS PYRO ARM (2)-ARM

START 16 MM CAMERA

145:30

TRANSLATE TO CAPTURE LATCH

145:40

145:50

146:00

MSFN

CSM ACTIVE DOCKING (145:37:00)

AT CAPTURE

PROBE EXTD/REL TB(2)-BP
CONFIRM CAPTURE LATCH TO LM
SC CONT-CMC/FREE
ALLOW PROBE TO DAMP SC MOTION (10 SEC)
WHEN WITHIN ±2° OF DOCKING ATTITUDE
PROBE RETRACT PRIM-2 (SEC-1 IF REQD)

AT DOCK LATCH

PROBE EXTD/REL TB-GRAY(5 SEC)

AFTER HARD DOCK

SECS PYRO ARM(2)-SAFE
SECS LOGIC (2) - OFF
CB SECS ARM (2) - OPEN
CB DOCK PROBE (2) - OPEN
BMAG MODE (3) - RATE 2
EXTD/REL-OFF
PROBE RETRACT (2) - OFF
EXT RUN/EVA LT - OFF
EXT RNDZ LIGHT - OFF
COAS PWR - OFF
RNDZ XPNDR - OFF
LIMIT CYCLE - ON
ATT DB - MAX
BMAG MODE (3) - ATT 1/RATE 2
SC CONT - SCS
V48 (61102 / 11111) ; V46

CMC MODE - HOLD
SC CONT - CMC

FOLLOW FLIGHT PLAN FOR
POST-DOCKING CHECKLIST

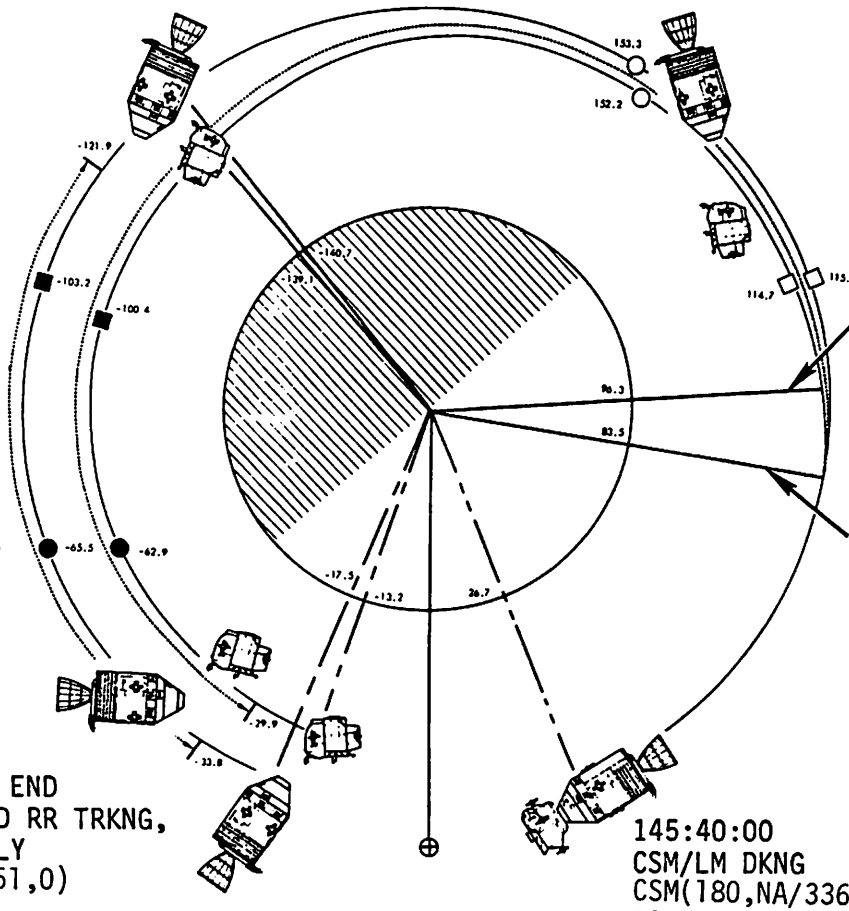
SOURCE MOSEL

OCT. 23, 1969

NASA — MSC

REV 32

144:36:50
TPI BURN IGN
CSM(0,NA/4,0)
IATTH
LM(0,NA/273,0)
LOSM TO CSM



145:17:39
FIRST LM BRAKING
BURN
CSM(60,NA/9,0)
LOSM TO LM
LM(0,NA/238,0)
LOSM TO CSM

145:21:51
FINAL LM BRAKING
BURN
CSM(0,NA/334,0)
LOSM TO LM ALONG
X-AXIS
LM(0,NA/244,0)
LOSM TO CSM

CSM AND LM BEGIN
VHF RNG AND RR TRKNG,
RESPECTIVELY
CSM(0,NA/129,0)
LOSM TO LM
LM(0,NA/4,0)
LOSM TO CSM

CSM AND LM END
VHF RNG AND RR TRKNG,
RESPECTIVELY
CSM(0,NA/161,0)
IATTH
LM(0,NA/36,0)
IATTH

145:40:00
CSM/LM DKNG
CSM(180,NA/336,0)
IATTH
LM(180,NA/336,300)
IATTH

LEGEND:

- □ ■ MSFN AOS, LOS
- ○ ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION B

FLIGHT PLAN

CSM	1122 CST	LM		MCC-H
CMP		CDR	LMP	
FINAL MCC-1 COMP	145:00			
P41 - RCS THRUSTING CONFIRM LM MCC-2 P00 (TERMINATE P20)	:05	P41 - RCS THRUSTING	LOAD AGS MCC-2 EXT ΔV	
		RCS MCC-2		TIG: 145:06:25.7
V64 - ACQUIRE MSFN TV (MAD) 145:15 TO 145:45	:11	NULL RESIDUALS P00 (TERMINATE P20) V48 - LOAD DAP, N46-11002 V63 - RR SELF TEST	OMNI-AFT, BIOMED-~~LEFT~~ RIGHT PCM-HI V64-ACQUIRE MSFN SET UP CAMERA FOR DOCKING LM/DC/60/HCEX (f11,250,FOCUS) 5	
CONFIGURE FOR DOCKING	:15	RR-OFF		
GO/NO-GO FOR PYRO ARM (CUE MSFN)				GO/NO GO FOR PYRO ARM
LOGIC-ON START 16MM CAMERA (16 MINUTES)				
DOCKING ATTITUDE R 180 P 336 Y 0 HGA P -51 Y 350	:30		DOCKING ATTITUDE R 180 P 336 Y 300 STEERABLE ANGLES P 181 Y 61	
PYRO ARM				
CSM ACTIVE DOCKING		DOCKING		GET: 145:40
POST DOCKING CHECKLIST V48-LOAD DAP, R1(61102) R2(11111)	:45	CONFIGURE PGNCS & AGS V48 LOAD DAP, N46-12021		DUMP DSE
PRESSURIZE CM TO 5.5PSIA ADJUST O_2 FLOW TO 0.6#/HR PRESS TUNNEL TO 3 PSID FOR LEAK CHECK, THEN EQUALIZE CM/LM ΔP		PREP FOR TRANSFER		
REMOVE AND STOW HATCH VERIFY LATCHES COLLAPSE PROBE AND PASS TO CDR	146:00	DOFF HELMET & GLOVES OPEN HATCH REMOVE & STOW DROGUE RECEIVE & STOW PROBE	DOFF HELMET & GLOVES ASSIST CDR	

MSFN (CSM) — MSFN (LM)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	145:00 - 146:00	6/32	3-125

FLIGHT PLANNING BRANCH

REVISION A

CSM

CMP

TRANSFER BAGS, VACUUM BRUSH, AND HOSE TO LM

LiOH CANNISTER CHANGE
NO 11 - 13 INTO A,
STOW 11 IN A3

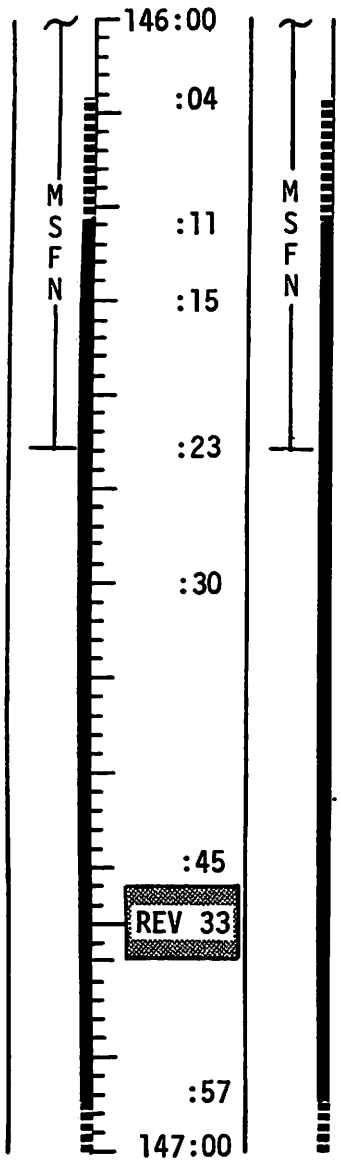
STOW LM EQUIPMENT

VERIFY DSE MOTION @ LOS

TRANSFER B5 AND B6 CONTAINERS TO LM

MANEUVER TO LM JETTISON ATTITUDE BY 146:51
R 219 P 358 Y 342
HGA P -41 Y +5

1222 CST



LM

CDR

CONFIGURE SUIT LOOP FOR VACUUMING

UNSTOW SRC'S, VACUUM & BAG, AND PASS TO CSM

VACUUM, BAG, & TRANSFER TO THE CSM:
- CSRC
- CSC CASSETTE
- 70MM MAGS(2)
- GLOVES (4)
- HELMETS(2)
- LUNAR BOOTS
- SURVEYOR TOOLS AND HARDWARE

VACUUM PGA'S

STOW VACUUM BRUSH AND HOSE

RECEIVE B5 & B6 FROM CMP AND STOW

LM JETTISON ATTITUDE
R 63 P 240 Y 290
STEERABLE ANGLES
P 201 Y 73

LMP

ASSIST CDR (DECONTAMINATION)

MCC-H

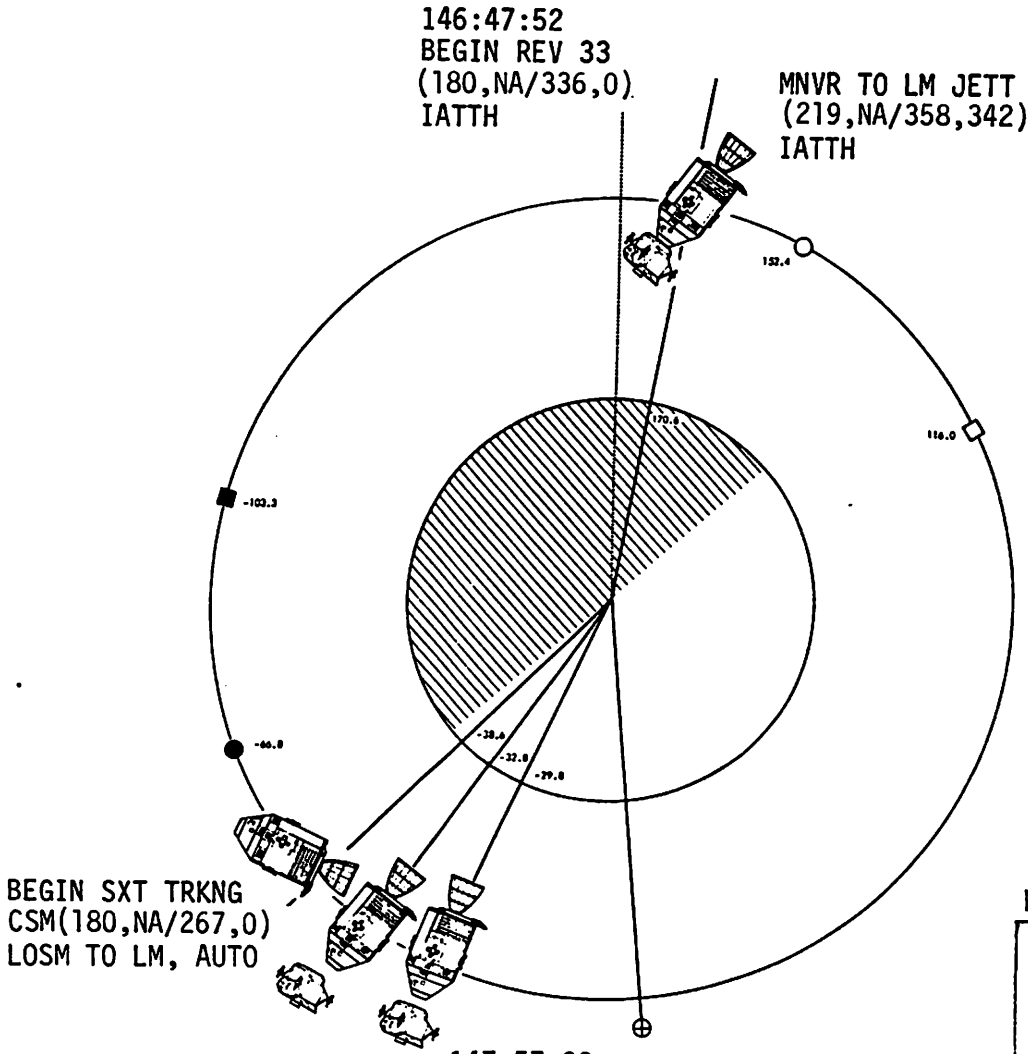
UPDATE TO CSM
MAP UPDATE REV33
SEP BURN PAD
LM JETT ATT
LM JETT TIME
UPLINK TO CSM
CSM S.V. (TIG-10)*
LM S.V. (TIG-10)*
UPLINK TO LM
LM S.V. (TIG-10)*
P30 TARGET LOAD
UPDATE TO LM
DEORBIT BURN PAD

*TIG OF LM DEORBIT BURN

MAP UPDATE REV 33
LOS : ___:___:___
180°W: ___:___:___
AOS : ___:___:___

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	146:00 - 147:00	6/32-33	3-126

REV 33



LEGEND:

□ ■	MSFN AOS, LOS
○ ●	S/C SUNRISE, SUNSET
⊕	SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION B

FLIGHT PLAN

CSM		LM		MCC-H
CMP	1322 CST	CDR	LMP	
	147:00	DISCONNECT FROM LM IVT TO CM		
	:04			
REACQUIRE MSFN HGA P-41 Y 5	:09		CONFIGURE S-BAND VERIFY COMM ALIGN AGS TO PGNCS V47-AGS INITIALIZATION P30-TARGET PGNCS TARGET AGS ΔV CONFIGURE FOR LM JETT CLOSE HATCH, IVT TO CM	DUMP DSE UPDATE TO CSM P76 PAD MAP UPDATE REV 34
UNSTOW & INSTALL HATCH HATCH INTEGRITY CHECK GO/NO-GO FOR PYRO ARM (CUE MSFN) LOGIC-ON	:15			
DEPRESS TUNNEL				GO/NO-GO FOR LM JETT & PYRO ARM
CONFIGURE CSM FOR JETT SET UP CAMERA FOR JETT CM4/DAC/18/CEX-BRKT, MIR(f8,250,7)12FPS, 0.5 MAG, 4 MIN	:30			MAP UPDATE REV 34 LOS : ___:___:___ 180°W: ___:___:___ AOS : ___:___:___
PYRO ARM V48-LOAD DAP,N46- R1(11102) R2(01111)	:45			
P47-THRUST MONITOR				
LM JETTISON SET ORDEAL	148:00			LM JETTISON GET: 147:57:00 ΔV_R: 0.5 FT/SEC ORBIT: 59.9x59.1

MSFN

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	147:00 - 148:00	6/33	3-127

FLIGHT PLANNING BRANCH

REVISION A

FLIGHT PLAN

MCC-H

UPLINK TO LM
P42-APS THRUSTING

1422 CST

148:00
:03
:10
:15
:21
:30
:45
REV 34
:56
149:00

MSFN

CSM SEPARATION

CSM SEP ATTITUDE
R180 P90/NA Y 0
HGA P-36 Y352

SET ORDEAL

P20-RENDEZVOUS NAVIGATION
AUTO MNVR TO LM TRACK ATT
SET UP CAMERA FOR LM IMPACT
CM/DAC/SXT/CEX
(FIXED,250,FIXED) 1 FPS,0.5MAG,46 MIN
TRACK LM AND PHOTOGRAPH THROUGH SEXTANT
VERIFY DSE MOTION @ LOS

VACUUM, DOFF, BAG, AND STOW PGA'S

EAT PERIOD

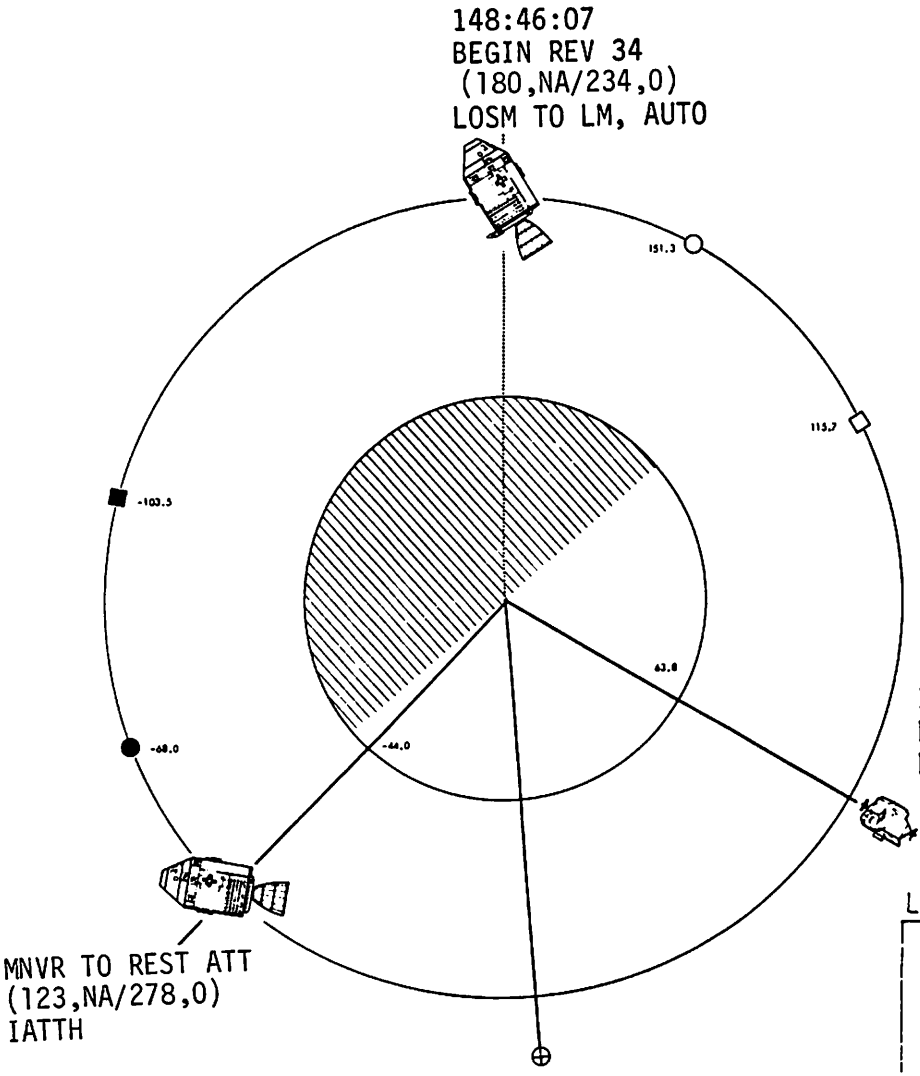
PRESLEEP CHECKLIST
E-MEMORY DUMP
CREW STATUS REPORT (medication)
ONBOARD READOUTS to MSFN
CYCLE H2, O2 FANS
CHLORINATE WATER
VERIFY
WASTE MNGT OVBD DRAIN vlv - OFF
WASTE STOW VENT vlv - CLOSED
EMER CABIN PRESS vlv - BOTH
SURGE TK O2 vlv - ON
REPRESS O2 vlv - OFF
LM TUNNEL VENT vlv - OFF
NORMAL LUNAR COMM EXCEPT
S BD SQUELCH - ENABLE
HI GAIN ANTENNA TRACK - REACQ
HI GAIN ANTENNA BEAM - NARROW
S BD ANT - HI GAIN

NOTES

CSM SEPARATION
BT: ~~2.7 SEC~~ 5.5 SEC
ΔV_R: 1.0 FT/SEC
ORBIT: 59.7x58.6
SM RCS Z-AXIS BURN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	148:00 - 149:00	6/33-34	3-128

REV 34



LEGEND:

- □ ■ MSFN AOS, LOS
- ○ ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-128A

REVISION B

FLIGHT PLAN

MCC-H

1522 CST

149:00
:02
:08
:15
:30
:45
150:00

~~DUMP DSE~~
~~UPLINK TO LM~~
~~P42 APS THRUSTING~~

UPDATE TO CSM
TEI 39 PAD

UPLINK TO LM
COMMAND ULLAGE OFF

DUMP DSE

MSFN

OMNI D

EAT
PERIOD

P76 - TARGET ΔV

PHOTOGRAPH LM
THROUGH SEXTANT

MNVR TO REST ATT BY 150:00
R123, P278, Y 0, GO INERTIAL
HGA P-24 Y243
LOAD DAP, R1(11112)R2(X1111)
V21 N01
3255E, 1616E

LM DEORBIT BURN
TIG: 149:24:41.2
BT: 83.8 SEC
ΔV_R: 189.7 FT/SEC

LM LUNAR IMPACT
GET: 149:52:50.5
LAT: 3°17'S
LONG: 23°23'W

NOTES

LM IS TARGETED FOR APS IMPULSE BURN. THRUST IS RCS ULLAGE ONLY.

TEI 39 PAD ASSUMES NO PLANE CHANGE 2

ONBOARD READOUT

BAT C _____
PYRO BAT A _____
PYRO BAT B _____
RCS A _____
B _____
C _____
D _____

DC IND SEL - MNA OR B

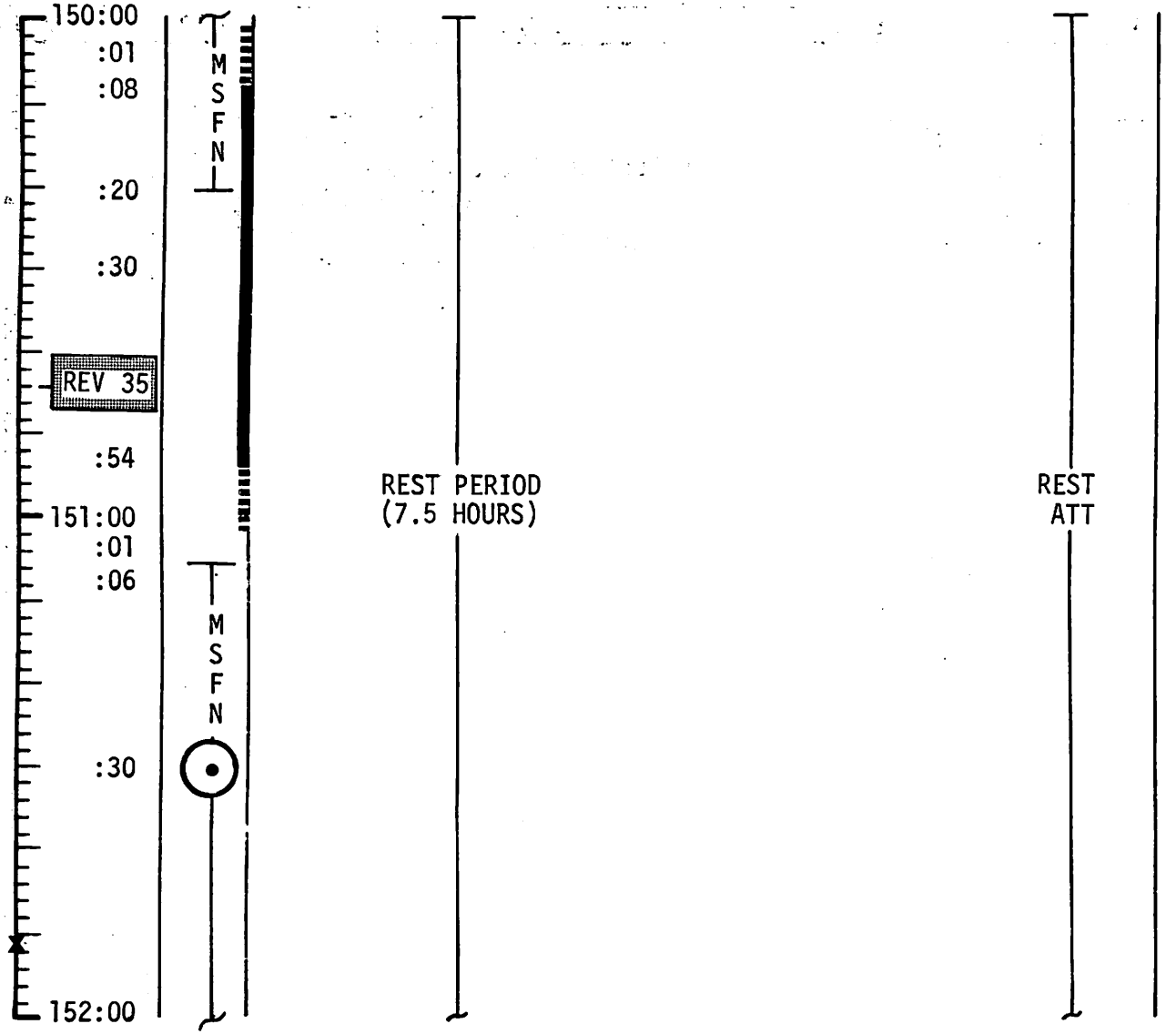
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	149:00 - 150:00	6/34	3-129

FLIGHT PLAN

MCC-H

1622 CST

NOTES



DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	150:00 - 152:00	6/34-35	3-130