

APOLLO 11

LM TIMELINE BOOK

June 21, 1969

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

0930 EDT

96:00

96:22

96:30

96:51

96:58

97:00

MSFN

V64 ACQUIRE MSFN
CREW STATUS REPORT
REPORT DOCKING TUNNEL
INDEX ANGLE TO MSFN
P27 UPDATE

LOAD DAP R1 = 21112
R2 = 11111

RECORD LMK 130 PAD
DATA (SEE GET 98:35)
TEI 28 BLOCK DATA
AND CSM DAP DATA

UNSTOW OPTICS

DON LCG AND PGA
W/O HELMET AND
GLOVES

CSM POWER TO LM-OFF
(AT LMP REQUEST)

DISCONNECT AND STOW
LM POWER UMBILICAL

IVT TO LM
TRANSFER HELMET & GLOVES

ECS ACTIVATION AND C/O
CONNECT TO LM ECS

LM POWER-ON

EPS ACTIVATION
MISSION TIMER ACTIVATION
PRIMARY GLYCOL LOOP ACT

CAUTION/WARNING CHECKOUT
CB ACTIVATION
TB VERIFICATION

PGNCS TURN - ON AND
SELF TEST

BIO MED SWITCH - LEFT

DUMP DSE

UPLINK CMC

CSM STATE VECTOR
DESIRED ORIENT
(LS REFSMMAT)

UPDATE CSM

LMK 130 PAD
BLOCK DATA
CSM DAP DATA

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 11	FINAL	JULY 1, 1969	96:00 - 97:00	5/1	3-63

FLIGHT PLAN

CSM

LM

MCC-H

REPORT: CMP

1030 EDT
97:00

P52 (LDG SITE REFSMMAT)

N71: _____

N05: _____

N93: _____

X _____

Y _____

Z _____

GET _____

VHF CHECKOUT
CSM TIME MARK TO LM
STOW OPTICS

VO6N20E
(ON MARK FROM CDR)

DON HELMET AND GLOVES
PGA PRESSURE INTEGRITY
CHECK
INSTALL DROGUE & PROBE,
PRELOAD PROBE
INHIBIT ROLL COMMANDS
UNTIL LM/CM $\Delta P > 3.5$ psia

COCK LATCHES (12)
VENT TUNNEL
HATCH INTEGRITY CHECK
INSTALL AND ALIGN DOCK-
ING TARGET

MSFN

97:30

97:34

97:44

97:49

98:00

CDR

LMP

SUIT FAN/H2O SEP CHECK	SEC S-BAND T/R AND POWER AMPLIFIER CHECK
GLYCOL PUMP CHECK	S-BAND STEERABLE ANTENNA ACTIVATION
VHF-B ACTIVATION	
E MEMORY DUMP	IVT TO CSM
VHF CHECKOUT (COMM CHECK WITH CSM)	
LGC/CMC CLOCK SYNC T EPHEM UPDATE	DON PGA
DOCKED IMU COARSE ALIGN REPORT GIMBAL ANGLES TO MSFN	
SLEW STEERABLE ANTENNA	IVT TO LM TRANSFER HELMET & GLOVES
VERIFY DROGUE AND PROBE INSTALLATION CLOSE AND SECURE HATCH	CONNECT TO LM ECS AND COMM
	ASCENT BATTERY ACTIVATION AND CHECKOUT RECORD ED BAT VOLTS

UPDATE LM
STEERABLE ANTENNA
ANGLES (GET :97:10)

COPY GIMBAL ANGLES

UPDATE LM

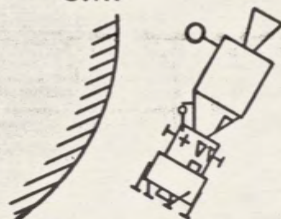
STEERABLE ANTENNA
ANGLES (GET: 98:21)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 11	FINAL	JULY 1, 1969	97:00 - 98:00	5/11-12	3-64

FLIGHT PLAN

CSM

CMP



MANEUVER TO TRACKING
ATTITUDE

R P / Y

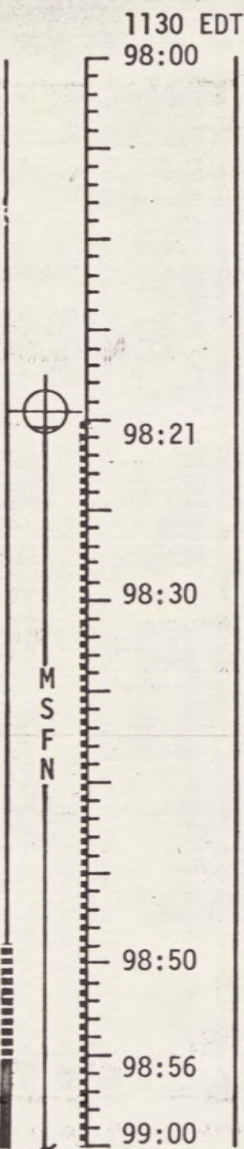
SELECT OMNI B

GO INERTIAL
UNSTOW OPTICS
P22 ORBITAL NAVIGATION

TRACK LDG SITE LANDMARK
(5 MARKS ON LDMK 130)
PITCH DOWN
DO NOT INCORPORATE MARKS

PITCH DOWN, 0.5°/SEC

STOP PITCH AND GO INERTIAL
REACQUIRE MSFN



LM

CDR

LMP

DON HELMET & GLOVES	DON HELMET & GLOVES
ARS/PGA PRESSURE INTEGRITY CHECK	ARS/PGA PRESSURE INTEGRITY CHECK
CABIN REGULATOR CHECK	CABIN REGULATOR CHECK
DOFF HELMET & GLOVES COPY DAP DATA COPY GYRO TORQUE ANGLES AND FINE ALIGN IMU X __, Y __, Z __ DRIFT CHECK	DOFF HELMET & GLOVES SELECT OMNI <u>FWD</u> BIO MED SWITCH - RIGHT
RATE GYRO CHECK	AGS ACT & SELF TEST
R P / Y HGA P Y	REACQUIRE MSFN ANT P Y

MCC-H

UPDATE LM
DAP DATA
GYRO TORQUE ANGLES

P22 AUTO OPTICS
LMK ID 130
T1 _____ (HOR)
T2 _____ (35°)
NM (N OR S)
N 89
LAT _____
LONG/2 _____
ALTITUDE- _____ NM

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 11	FINAL	JULY 1, 1969	98:00 - 99:00	5/12	3-65

FLIGHT PLAN

CSM

CMP

STOW FLIGHT PLAN
UNSTOW SOLO BOOK
COPY PADS

P27 UPDATE

SC CONT - SCS
MIN/MAX DB, LOW/HIGH
RATE
(AT REQUEST OF CDR)
GO/NO-GO FOR UNDOCKING
DISABLE ROLL JETS FOR
RCS HOT FIRE

RR XPONDER- HEATER
MANEUVER TO
AGS CALIBRATION ATTITUDE

RATES $<0.1^\circ/\text{SEC}$
DISABLE THRUSTERS FOR
32 SEC
(AT REQUEST OF LMP)
MANEUVER TO UNDOCKING
ATTITUDE

R P / Y

M
S
F
N

1230 EDT
99:00

99:30
99:32

99:43

99:49
REV 13

100:00

CDR

DEPLOY LANDING GEAR

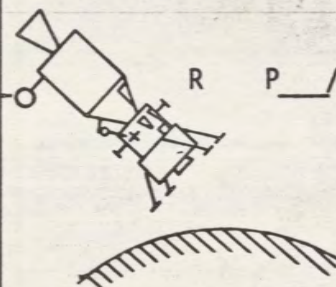
ORDEAL INITIALIZATION

DAP DATA LOAD
DPS GIMBAL DRIVE
& THROTTLE TEST

RCS PRESSURIZATION

RCS CHECKOUT

RR ACT & SELF TEST



DPS PRESS & CHECKOUT

LM

LMP

P27 UPDATE

V47 INITIALIZE AGS

COPY AGS ABORT CONSTANT
AND K FACTOR

RCS PRESSURIZATION

GO/NO-GO FOR UNDOCKING
RCS CHECKOUT

SLEW STEERABLE ANTENNA
ANT P Y

AGS ACCEL & GYRO
CALIBRATION

MCC-H

UPLINK LGC

LS REFSMMAT
LM & CSM STATE
VECTORS
LGC/CMC CLOCK SYNC
PIPA BIAS
LGC ABORT CONSTANT

UPDATE LM

AGS ABORT CONSTANT
AGS K FACTOR
UPLINK CMC

LM & CSM STATE
VECTORS
UPDATE CSM

P30 MNVR PAD
(SEPARATION)
GO/NO-GO
UPDATE LM

STEERABLE ANTENNA
ANGLES(GET:100:25)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 11	FINAL	JULY 1, 1969	99:00 - 100:00	5/12-13	3-66

FLIGHT PLAN

CSM

CMP

RR TRANSPONDER
ACT & SELF TEST

LOAD DAP R1 = 11102
R2 = 11111
SC CONT - SCS

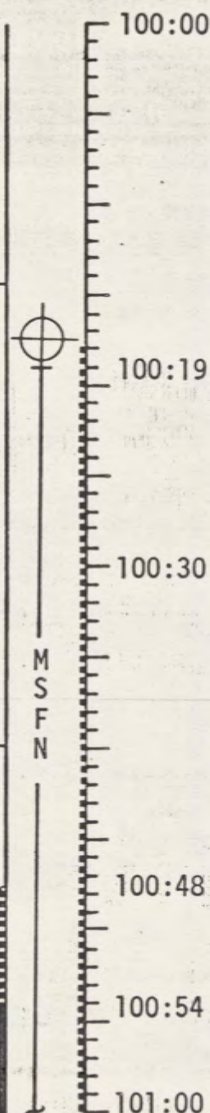
UNDOCK

ENABLE B3 & C4 RCS JETS
V64 ACQUIRE MSFN
LM INPECTION, PHOTO

COPY PADS
SC CONT - CMC
P30 EXT ΔV
P41 RCS THRUST

CSM SEPARATION
GET: 100:39:59
BT: 8.0 SEC
 ΔV_T : 2.3 FPS
-X THRUSTERS
ORBIT: 63.1 X 55.6

P20 AUTO MANEUVER
SXT & VHF TRACKING



LM

CDR

DAP DATA LOAD

DON HELMETS AND GLOVES
PREPARE FOR UNDOCKING

UNDOCK

YAW LEFT 60°, PITCH UP 110°
SET ORDEAL
YAW 360°, LM INSPECTION

R P Y

SEPARATION

LR ACT AND SELF TEST

P30 EXT ΔV
RR MAN LOCK - ON

VHF RANGING
RR - OFF

LMP

V47 AGS ALIGN

R P Y

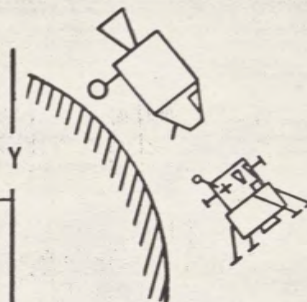
ACQUIRE MSFN
ANT P Y
P27 UPDATE

COPY PADS

P27 UPDATE
V47 AGS UPDATE
AGS ALIGN

COPY PAD

MCC-H



UPLINK LGC
LM STATE VECTOR
(DOI - 10)
DOI TARGET LOAD
PIPA BIAS

UPDATE CSM
DOI P76 PAD
PDI, +12 ABORT
P76 PAD

UPDATE LM
DOI MNVR PAD
PDI PAD
PDI +12 PAD

UPDATE LGC
CSM STATE VECTOR
(PDI + 25)

UPDATE LM
LUNAR SURFACE PAD

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 11	FINAL	JULY 1, 1969	100:00 - 101:00	5/13	3-67

APOLLO 11 ABBREVIATED TIMELINE

JUNE 19, 1969

UNDOCKED TO SEP

+30 USE ACTIVATION & C.O.
C/L TO 5 MIN BEFORE UNDOCK
V77E
V62E
V48 21102

+35 UNDOCK (100:15)
YAW LT 60° (ATT CONT P&R - MODE CONT)
PITCH UP 110° (ATT CONT R&Y - MODE CONT)
FDAI (0,305,0)
V83 SET ORDEAL
VERIFY TRACKING LT-ON, THEN OFF
✓ S BD P-123 Y-20-40
VERIFY COMM, AUTO TRACK

+40 PCM-HI
YAW 360° FOR INSPECTION ATT CONT P&R -
MODE CONT

+45 V76E
GUID CONT - PGNS
LM ACTIVE STATION KEEP (CAMERAS)
HELMETS & GLOVES - OFF (OPT)

+50

+50 P00, UPDATA LINK - DATA
(S.V., TARGETING, PIPA BIAS,
& PADS FOR DOI, PDI,
PDI +12)
UPDATA LINK - OFF

+55 232+00600,233+00250 224+(+60271)
464+00500,465+00195 225+(+58148)
616+0 226+(+83884)
623+0 227+(+50457)
231+(+56936)

+0 CSM SEP (100:40)

240 +56936
262 -00150
254 +0767.2

SEP TO DOI

June 21, 1

+0 SEP (100) TTCA (CDR)-DISABLE
 CB LR-CLOSE, CK TEMP (50°-70°)
 RATE ERR MON-LDG RDR/CMPTR
 X-PNTRS-HI MULT, TM SW-H/H
 LDG ANT-DES, MODE SEL-LR
 RDR TEST - LDG
 TEST MON-ALT/VEL EXTR (2.1-5.0), AGC
 RECORD TM H/H
 V63E, N12 OPT CODE, V22E, 2E, PRO
 N66 SLANT RANGE, ANT POSIT, PRO
 +5 N67 V_x V_y V_z
 V34E, LDG ANT - AUTO, V60E
 V63E, N12 OPT CODE, V22E, 2E, PRO
 LDG ANT-DES (√522 ALARM), THEN AUTO
 V34E, RDR TEST OFF
 V63E, V34E, CB LR - OPEN
 UPDATA LINK-DATA (CSM S.V.), OFF
 V47E, 414+1, 414R+0, 400+3, 400R+0
 V83, SET ORDEAL, 317R, 440R, 277R

+10 DEADBAND - MIN, 400+2, 507+0
 SS AGS-AUTO, ✓ERROR NEEDLE, ATT HOLD
 100 P-30 TARGET PGNS FOR DOI, N33 TIG,
 +54 N81 ΔVX, ΔVY, ΔVZ: N42 HA, HP, ΔVT:
 N45 M, TFI, MGA: RESET ET UP
 PRO, P00
 V76

CB RR(2) CLOSE, CHECK TEMP (10°-50)
 V63, RR TEST
 RR-SLEW. MANUAL LOCK-ON
 RR-LGC

+15 VHF A XMTR - VOICE/RNG
 B XMTR - OFF
 COMPARE LGC, TM, CSM VHF, CMC-RECORD

V34E, 400+0
 V41N72E (+00000 TRUN, +28300 SHFT)
 CB RR (2) - OPEN, V44

+20

+20 P52 OPT3
 CB(11) AC BUS A-AOT LAMP CLOSE
 AOT - DETENT F/0.0°
 1st STAR _____
 2nd STAR _____
 N05 ANG DIFF _____
 PRO
 N93 TORQUING ANG
 X _____
 Y _____
 Z _____

+25 PRO
 N25
 PRO TO PICAPAIR N15
 3rd STAR _____

+30 DETENT CL {5}
 CB(11) AC BUS A-AOT LAMP-OPEN LOS
 V34E
 INSTALL AOT SUN FILTER
 PGNS MODE CONT - ATT HOLD
 P00, V77

+35 CHECK DPS, APS, RCS, EPS,
 CYCLE CWEA CB
 THROT CONT-MAN/CDR
 TTCA(BOTH) - THROTTLE (MIN)
 DEADBAND - MIN
 PRPLNT QTY - DES 1
 DON HELMETS & GLOVES

+40

+40

+45 P40, N18(0, 285, 0), N86 AUTO MNVR

+50 CB (11) EPS: INV 1-CLOSE
 TM SW-R/RDOT, MODE SEL-PGNS.
 V47, 414+1, 414R+0
 S-BD 90, 0. THEN P₊213 Y₊27
 +30 OMNI-AFT, PCM-LO
 VHF A XMTR-VOICE
 B XMTR-DATA
 V83, 317R, 440R

+54 N20E, V40E, 400+3, 400R+0, -277R
 400+1

+55 PRO
 410+5, LOAD ΔV
 411R+0, 407R+0

-4:00 ✓DPS CONFIG CARD
 V77E

-1:00 MASTER ARM-ON
 -:35 ENG ARM - DES
 500R

-0:00 DOI (101:38:48) +15s THROTTLE UP 40%
 ENG ARM, MASTER ARM - OFF
 TTCA (CDR) - ENABL/JETS, NULL VGX

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DOI TO PDI

SR
101
+41

+0 DOI(101:38:48)+15s THROTTLE UP 40%
ENG ARM. MASTER ARM - OFF
TTCA (CDR)-JETS & ENABLE, NULL VGX
POO MODE CONT (PGNS)-ATT HOLD
PITCHDOWN, P=195, POINT AT CSM
410+0, 407+0
V82E
PRPLNT QTY MON - OFF
IF AGS ΔVGX >2.0:
CB RR(2) - CLOSE, RR MODE - LGC
V95, TTCA(CDR) - DISABLE
+5 MAN LOCK-ON, P20
400+2
MODE CONT (PGNS) - ATT HOLD
V76, AGS AUTO, ✓ERROR NEEDLES, ATT HOLD
POO, V63
VHF A XMTR - VOICE/RNG
B XMTR - OFF
COMPARE RANGE WITH CSM
+10 V34, CB RR(2) - OPEN

+15 P30 TGT PGNS FOR PDI+12 ABORT:
N33 TIG
N81 ΔVX, ΔVY, ΔVZ
N42, HA, HP, ΔVT
N45 M, TFI, MGA
PRO
PITCH DWN TO 125° (P52 PITCH)

V48 21112

+20

SET CAMERA

+20 YAW LEFT 180°, FACE RETRO
V77E
V83E SET ORDEAL

COAS TO OVHD WINDOW

P52 OPT 3
F 50 25, E
F 01 70, V21E, 00546E
PRO, F 50 18, PRO (AUTO MNVR)
V76E
+25 V06N20E, ENTER ON MARK
RECORD R2
N22E, RECORD R2
V34E PITCH TO FDAI 180, 285, 0
+30 SELECT INV 1, ✓INV 1
CB AELD(2) - CLOSE
CB ABORT STAGE (2) - CLOSE
CYCLE CWEA CB
RESET ENG STOP PB
SET WINDOW BARS
THROT CONT-AUTO
ACA/4 JET (CDR) - ENABLE
TTCA (CDR)-ENABLE
BOTH TTCA-THROTTLE, MIN

+35 BATS 5&6 NORM FEED - ON
CB RR(2) - CLOSE
CHECK DPS, APS, RCS, ECS, EPS
P20 MODE II LOCK-ON
N18, R, P, Y, ENTR, ✓MAIN LOBE
RR-AUTO TRACK, V56E
P63
N61 TGO, TFI, CR
N33 TIG
RESET ET UP
N25 00014 FINE ALIGN
ENTR-BYPASS ALIGN
N18 R, P, Y
+40 PRPLNT QTY MON - DES 1

AOS
102
+19

+40 S-BD OMNI-AFT, ACQUIRE MSFN
✓SB P +213 Y +27
VERIFY COMM, AUTO TRACK
PCM - HI
UPDATA LINK - VOICE BU
BIOMED LEFT
DOI POST BURN REPORT
HELMETS AND GLOVES ON
SUIT GAS DIVERter - EGRESS
CABIN REGS A&B - EGRESS

+45 MODE CONT (PGNS) - AUTO
AUTO MNVR
ALT, ATT, POS CHECKS

+50 V47, 414+1, 414R+0
V83E, 317R, 440R
+52 OHW 34°

+54 N20E, V40E, 400+3, 400R+0
CONFIRM NO CDU TRANSIENTS
400+1, 433R VI

240=231
262=-00150
254+07672

+55 CB LR - CLOSE
+56 PRO-FINAL TRIM
ENTR, N62 VI, TFI, ΔVM, ✓DET
✓DPS CONFIG CARD,
GO/NO GO

+57 ALT, ATT CHECK
SEQ CAMR - ON
V77E
-:35 ENG ARM - DES:
-:07.5 ULLAGE

-0:00 PDI (102:35:13)
+0:05 DES ENG CMD OVRD - ON

SOURCE
DATE

V 25 NOTE
77E
10000E 1E
JUNE 26, 1969-CHG "C"

APOLLO 11 - PAGE 9
LM TIMELINE BOOK

TOP

(DES O₂ ≈ 91

PDI THRU TD +3 MIN

ENG ARM - DES
IGNITION

DES ENG CMD OVRD - ON
TTCA - UP @ 26 SEC
V21 N01 E
1252 E
22462 E
WAIT 3 SEC
TTCA - 10%

LPD ALT CHK
TM - H/H DOT

LPD POS CHK
YAW RT 174°
SBD P -14 Y +12
✓ ED BATTS
V16 N68 E
V57E - ENABLE LR

THROTTLE DOWN

EVAL MAN CONT

(OHW)	θ	TFI	VI	-HDOT	(ΔH) H	DPS
(7)	286	-0:35 0:00				
	286	0:00	5560.0	4.3	48800	95
	285	0:05 0:30				
(10)	285	0:30	5500.0	4.8	48700	95
	279	1:00	5200.0	14.0	48400	89
	275	1:30	4900.0	21.0	47900	84
(16)	271	2:00	4600.0	30.0	47100	79
	268	2:30	4300.0	40.0	46100	74
(19)	267	3:00	4000.0	53.0	44700	68
	264	3:30	3600.0	67.0	42900	63
	82	4:00	3300.0	80.0	40700	58
	80	4:30	2900.0	95.0	38000	53
	78	5:00	2600.0	109.0	34800	47
	76	5:30	2200.0	122.0	31200	42
	72	6:00	1800.0	123.0	27500	37
	68	6:30	1400.0	114.0	24300	32
	63	7:00	1200.0	143.0	20200	29
	60	7:30	1000.0	157.0	16200	25

V16 N68 E

P64

LDG ANT - HOVER

SBD P +17 Y -14

223+00020 @ 2 K

PGNS MODE CONT-
ATT HOLD

P65

P66

X-PNTR-LO MULT

TOUCHDOWN

ENG STOP - PUSH
ACA - OUT OF DETENT
MODE CONTROL (BOTH) - AUTO
DES ENG CMD OVRD - OFF
ENG ARM - OFF
ASC FEED 2 (2) - CLOSE
413+1
223+00001

NO STAY

ABORT STAGE - PUSH
ENG ARM - ASC
ENG STOP - RESET
ENG START - PUSH
MODE CONTROL (2) - AUTO

θ	TFI	VI	(HMAX) -HDOT	H	HOR	DPS
57	8:00	700.0	157.0	11500	60	22
47	8:30	500.0	139.0	7000	49	19
			TR-LPD (186.0)			
43	8:44	99 60	112.0	5000	45	
			(163.0)			
40	8:54	99 56	95.0	4000	42	
			(136.0)			
36	9:06	98 52	76.0	3000	38	16
			(104.0)			
31	9:22	82 47	55.0	2000	33	
			(63.0)			
24	9:44	61 39	32.0	1000	25	
			(35.0)			
18	10:06	40 33	16.0	500	18	12
			(29.0)			
16	10:14	32 31	12.0	400	16	
			(21.0)			
13	10:26	20 31	7.0	300	13	10
			(12.0)			
9	10:48	0 43	3.0	200	9	
2	11:26		3.0	100	2	
2	11:42		3.0	50	2	6

RIGHT-HAND PAGE 1

THRU TD +3MIN

June 21, 1969

(DES $O_2 \approx 91$)

ENG ARM SW - DES

ENG IGNITION

DES ENG CMD OVRD - ON

LPD ALT CHECK

TM - H/ HDOT

YAW RT 180°

S-BD P = -11 Y = +14

VED BATTS

V16 N68E

V57- ENABLE LR UPDATE

THROTTLE DOWN

EVALUATE MAN CONT

TFI	VI	HDOT	(ΔH) H	(SHE) DPS	(OHW) RCS
-0:35					(5)
0:00	5550.0	-7.6	50000	(1300) 95	89
0:05					
0:30	5500.0	-8.0	49800	95 (1400)	(12)
1:00	5200.0	-17.0	49400	91	88
1:30	4900.0	-25.0	48800	86 (1400)	(17)
2:00	4600.0	-34.0	47900	80	88
2:30	4300.0	-44.0	46800	76	
			(17,500)	(1340)	(21)
3:00	4000.0	-55.0	45300	69	88
3:30	3600.0	-68.0	43400	69 (1230)	
4:00	3300.0	-82.0	41200	58	88
4:30	3000.0	-98.0	38500	53 (17,500)	
5:00	2600.0	-113.0	35300	(1090) 47	88
5:30	2200.0	-130.0	31600	42 (17,500)	
6:00	1800.0	-132.0	27600	(920) 36	88
6:30	1400.0	-115.0	(14,000) 23900	31	
			(10,000)	(810)	
7:00	1200.0	-149.0	19900	28	88

VI6N68E

P64

LDG ANT - HOVER

SBD P 15 Y -10

223+ 00020 @ 2000FT

PGNCS MODE CONT-
ATT HOLD

P65

P66

X-POINTER-LO MULT

TOUCHDOWN

ENG STOP - PUSH
ACA - OUT OF DETENT
MODE CONTROL (BOTH)-AUTO
DES ENG CMD OVRD - OFF
ENG ARM - OFF
ASC FEED2(2) - CLOSE NO STAY
223+0000I
413+I

TFI	VI		(HMAX) HDOT	H	HOR	(SHE) DPS	RCS
7:30	900.0		-160.0	15200	59	25	
8:00	700.0		-154.0	10500	56	(740) 22	87
8:30	500.0		-128.0	6200	48	18	
	TG-LPD		(-186)				
8:40	99	61	-110.0	5000	44		
8:50	99	57	-94.0	4000	41		
			(-136)			(660)	
9:02	99	53	-76.0	3000	37	16	86
9:16	99	48	-57.0	2000	33		
			(-63)				
9:38	98	40	-33.5	1000	26		
			(-35)			(620)	
9:58	79	33	-17.7	500	20	12	85
10:06	71	31	-12.9	400	18		
			(-21)				
10:14	63	29	-8.9	300	16		
10:32	47		-3.0	200	12	9	84
11:22	12		-2.9	100	2.5		
11:40			-2.9	50	1		
11:53			-2.9	10		5	83

ABORT STAGE - PUSH
ENG ARM - ASC
ENG STOP - RESET
ENG START - PUSH
MODE CONTROL(2)-AUTO

JUNE 16, 1969

14:00 MASTER ARM - ON
DES VENT - FIRE
MASTER ARM - OFF
OXID VENT - OPEN
ENG STOP - RESET

15:00 NOMINAL T 1, ABORT TIME
CB(11) PGNS: LDG RDR - OPEN
AOT - FWD
SLEW RR TO +X AXIS
AOT - CL
CB(11) PGNS: RNDZ RDR - OPEN
AC BUS A: RNDZ RDR - OPEN

V37E68E
N43 LAT, LONG, ALT
PRO

16:00 V37E12E
N33 TIG (PDI + 23 MIN)
N76 V HOR, V VERT, CROSS RNG
N74 TFI, YAW, PITCH

V47E, 414+1, 414R+0, 400+3, 400R+0

400 + 1
225 + (TBD) αL LOWER
226 + (TBD) αL UPPER
410 + 0
411 + 1

MODE SEL - PGNS

PRPLNT QTY MON - OFF
PRPLNT TEMP PRESS MON - ASC
ASC HE MON - CYCLE
02/H2O QTY MON - ASC 1, 2

STAY/NO STAY

19:30

NO STAY

-2:00 BAT 1,3 - OFF
DES H2O - OFF
SELECT ASC H2O TANK
DES 02 - CLOSE
ASC 1 02 - OPEN
MASTER ARM - ON
CABIN REPRESS - CLOSE
ASC H_E SEL - BOTH
ASC H_E PRESS - FIRE
ASC HE REGS 1,2 - OPEN
ASC FEED 2 (2) - OPEN
CRSFD - OPEN
CB RR (2) - CLOSE, RR-LGC

-1:00 BAT 2,4 - OFF
DES BAT - DEADFACE
VOLTMETER - 5,6 LMP, CDR

- :30 ENG ARM - ASC
- :05 ABORT STAGE - PUSH
PRO
+ :01 ENG START - PUSH

STAY

V37E00E GO TO LUNAR SURFACE C/L

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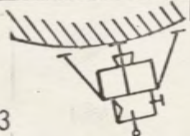
CSM

CDR

LMP

TOUCHDOWN

102:47:11



PERFORM LUNAR CONTACT CHECKLIST
STAY/NO STAY FOR PDI+13 MINUTES
PDI + 13 MINUTES CHECKLIST
STAY/NO STAY FOR PDI + 23 MINUTES

INITIATE DPS VENTING
V76 RCS MIN IMPULSE

RR TO STANDBY
MAKE ESTIMATE OF LANDED
LOCATION
CLOSE SHADES, DOFF HELMET
AND GLOVES

ASCENT BATTERIES OFF
REPORT 047, 053

AGS LUNAR SURFACE GYRO
CALIBRATION
LOAD AGS ASCENT TARGET
H=6000 FT, H DOT=32 FPS
CLOSE SHADES, DOFF
HELMET AND GLOVES

BEGIN SIMULATED COUNTDOWN

REPORT ESTIMATE OF LANDED
LOCATION

P57-IMU ALIGN (REFSMAT)
GRAVITY MEASUREMENT
N04: _____

AGS LUNAR ALIGNMENT

P57-IMU ALIGN (REFSMAT)
2 CELESTIAL BODIES

N04: _____

N05: _____

N71: _____

N93: _____

X _____

Y _____

Z _____

N89: _____

LAT _____

LONG/2 _____

ALT _____

GET _____ : _____ : _____

ALIGN AGS TO PGNC
REPORT 057, 053

COPY AND LOAD
ASCENT PAD DATA
VERIFY AGS ASCENT PROGRAM

102:53

1630 EDT
103:00

103:29

103:30

103:39

103:45

REV 15

104:00

PHOTOGRAPH LUNAR
SURFACE

CSM

1730 EDT

104:00

CDR

REPORT: LMP

P57 - GRAVITY AND ONE
CELESTIAL BODY (T-ALIGN)

N04: _____

N71: _____

N93: _____

X _____

Y _____

Z _____

GET _____ : _____ : _____

STAY/NO STAY FOR LUNAR SURFACE OPERATIONS

P12 - ASCENT PROGRAM

AGS LUNAR ALIGN
BIOMED SWITCH-RIGHT

END SIMULATED COUNTDOWN AT TIG -1 MINUTE
1st REV L0:104:42:05

DOFF HELMET & GLOVES

DOFF HELMET & GLOVES

EAT PERIOD
(40 MIN)

EAT PERIOD
(40 MIN)

104:45

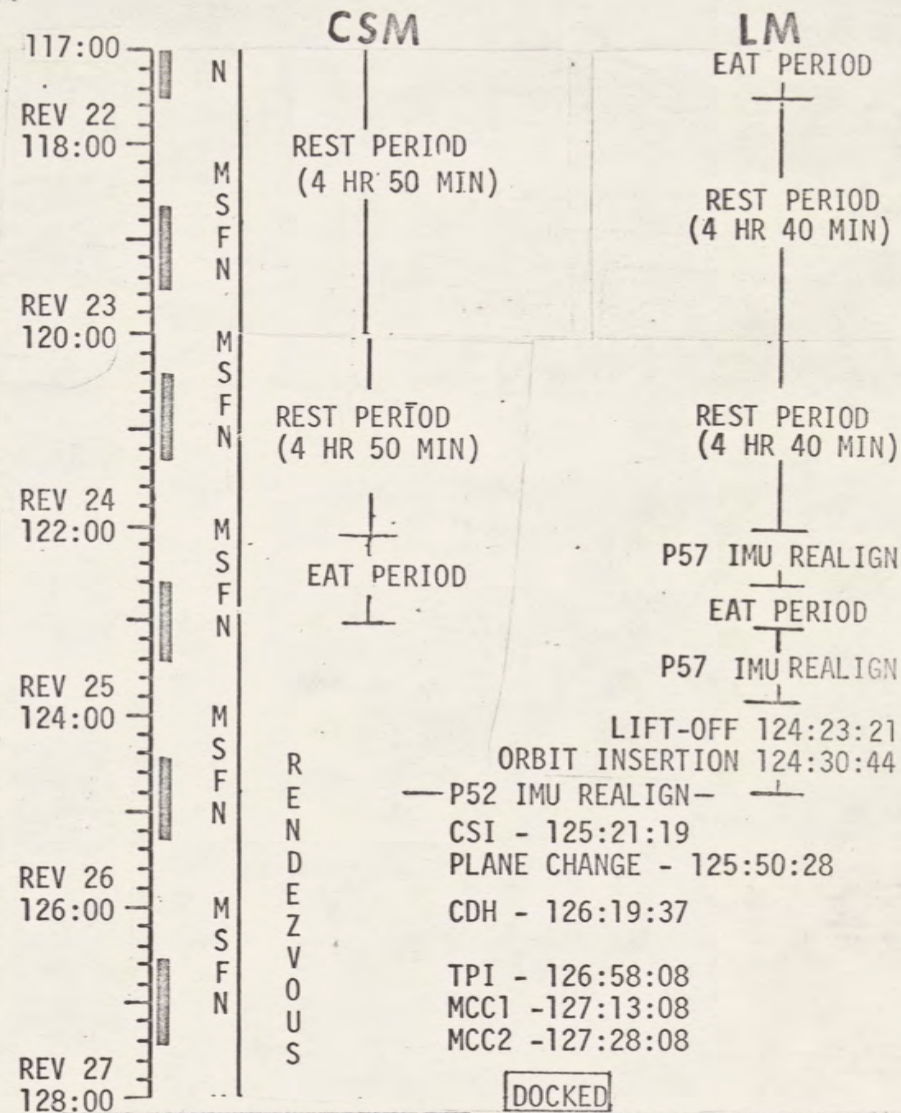
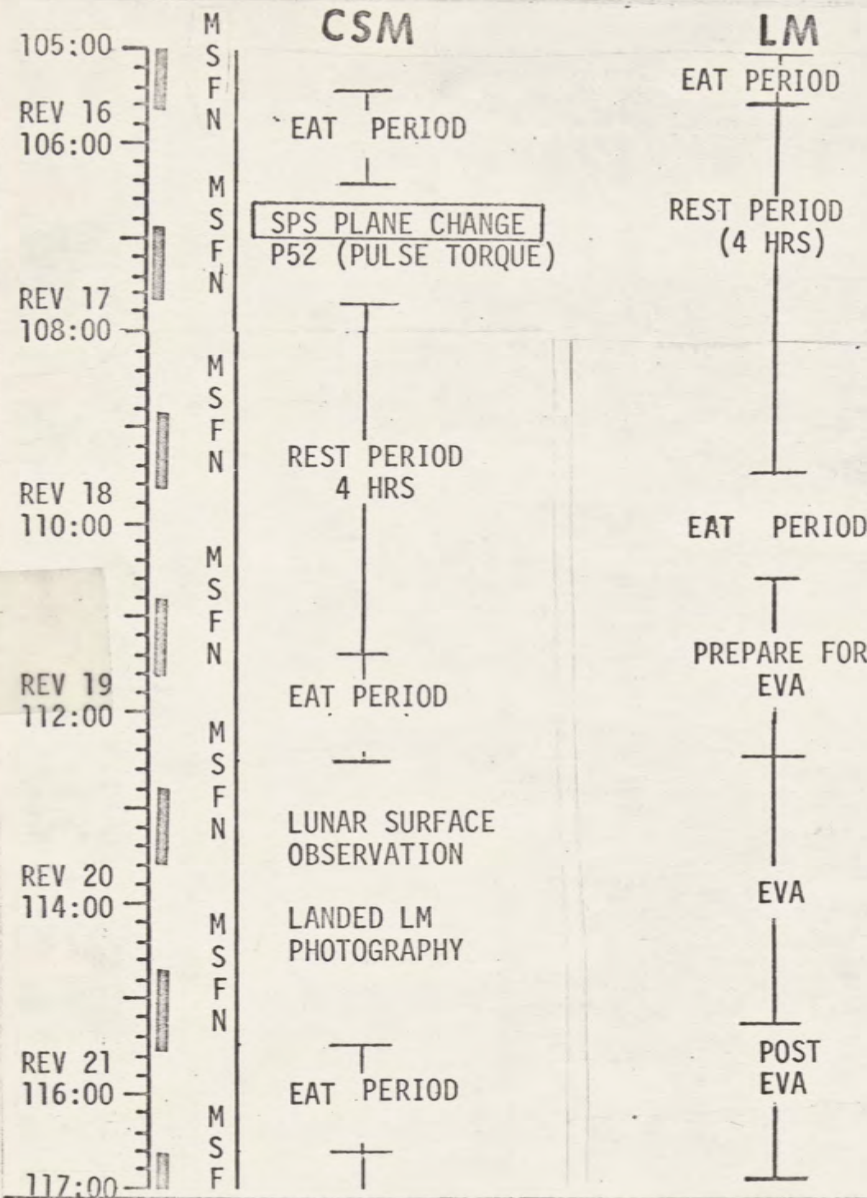
104:51

105:00

MISSION	EDITION	DATE
APOLLO 11	FINAL	JULY 1, 1969
TIME		DAY/REV
103:00 - 105:00		5/14-15

LUNAR SURFACE
FLIGHT PLAN

LUNAR SURFACE FLIGHT PLAN



CSM REV	EST TIG	NEW TIG
16	106:40:13	
17	108:38:20	
18	110:36:28	
19	112:34:35	
20	114:32:43	

CSM REV	EST TIG	NEW TIG
21	116:30:51	
22	118:28:58	
23	120:27:06	
24	122:25:14	
25	124:23:21	

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APOLLO 11

FLIGHT DATA FILE

TOP

APOLLO ASCENT

R 12.0
44 +1.4

June 21, 1969

RCS ≈ 78 PERCENT	TIME FROM L/O	VI	HDOT	H	PITCH /OHW	He
ENG ARM-ASC PRO	-0:05					
ABORT STAGE-PUSH ENG START-PUSH	0:00	15	0	0	01.5	3000
N63 MONITOR YAW MNVR PITCH INITIATE BAL CPL-OFF	+0:10	55	53	263	351.5	2950
MODE SEL-AGS	+0:30	165	90	1,815	308 39	2800
	+1:00	430	125	5,050	305 37	2600
	+1:30	710	150	9,200	302 35	2400
	+2:00	1020	170	14,000	299 33	2200
S-BD P = 134 Y = -32	+2:30	1350	185	19,300	296 31	2050
	+3:00	1690	190	24,950	293 29	1900
	+3:30	2060	190	30,600	289 27	1700
	+4:00	2440	185	36,300	285 24	1550
N76E, V _H V _V ΔR	+4:30	2850	175	41,650	282 22	1400
	+5:00	3280	155	46,700	278 19	1300
V16 N77E N85E	+5:30	3740	135	50,950	278 16	1150
	+6:00	4220	110	54,750	273 13	1000
500R RNG/ALT MON-RNG/RNG RT	+6:30	4730	80	57,450	265 10	900
200 FPS MAIN SOV(2)-OPEN ASC FEED (4)-CLOSE	+7:00	5260	50	59,550	260 7	750
50 FPS ENG ARM-OFF 0 FPS ABORT STAGE-RESET STOP-RESET MODE CONT(2)-ATT HOLD BAL CPL-ON ΔVX NULL, KEY REL VI, HDOT, H PRO, ΔV'S V82E, 315R, 403R, 313R PRO, PRO OOE, RR-AUTO TRACK DAP 1(2) 2002	+7:14	5540	30	60,150	257	700
MONITOR						
PGNS			AGS			
06 63 V _I , H, H			500 VG			
16 77 T _{G0} , V _Y			367 HDOT			
16 85 VGX, VGY, VGZ			433 V _I			
			357 T _{G0}			

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INSERTION THRU CSI

705-10425

08220
01033

60
55
50
45
40
SS
124
+37
42
40

08220
01033

INSERTION (124:30:39)
P00, RECORD RDOT/R
V48, 1 (2) 2002, RR-LGC, V63, V34
ATT TRANSL-2JETS (4JETS)
V41N72 (+00000, +28300)
CB RR(2)-OPEN, V44
TTCA (BOTH)-OFF
ACA 4JET (BOTH)-OFF 417+1 RDOT
INV 2, CB INV 1-OPEN
EXT LTG-TRACK
P52 OPT3
CB AOT LAMP CLOSE
AOT-DETENT F/0.0°, V76 RDOT }R
1st STAR
2nd STAR
410+1 TGT CSI
373 TIG CSI
275 TIG TPI
605 COTAN 0 + 00777 RDOT
416+1 1/2 PERIOD
623+0 ZERO YAW
451+0 Y DOT RDOT }R

40
37
35
32
30
27
25
22
20

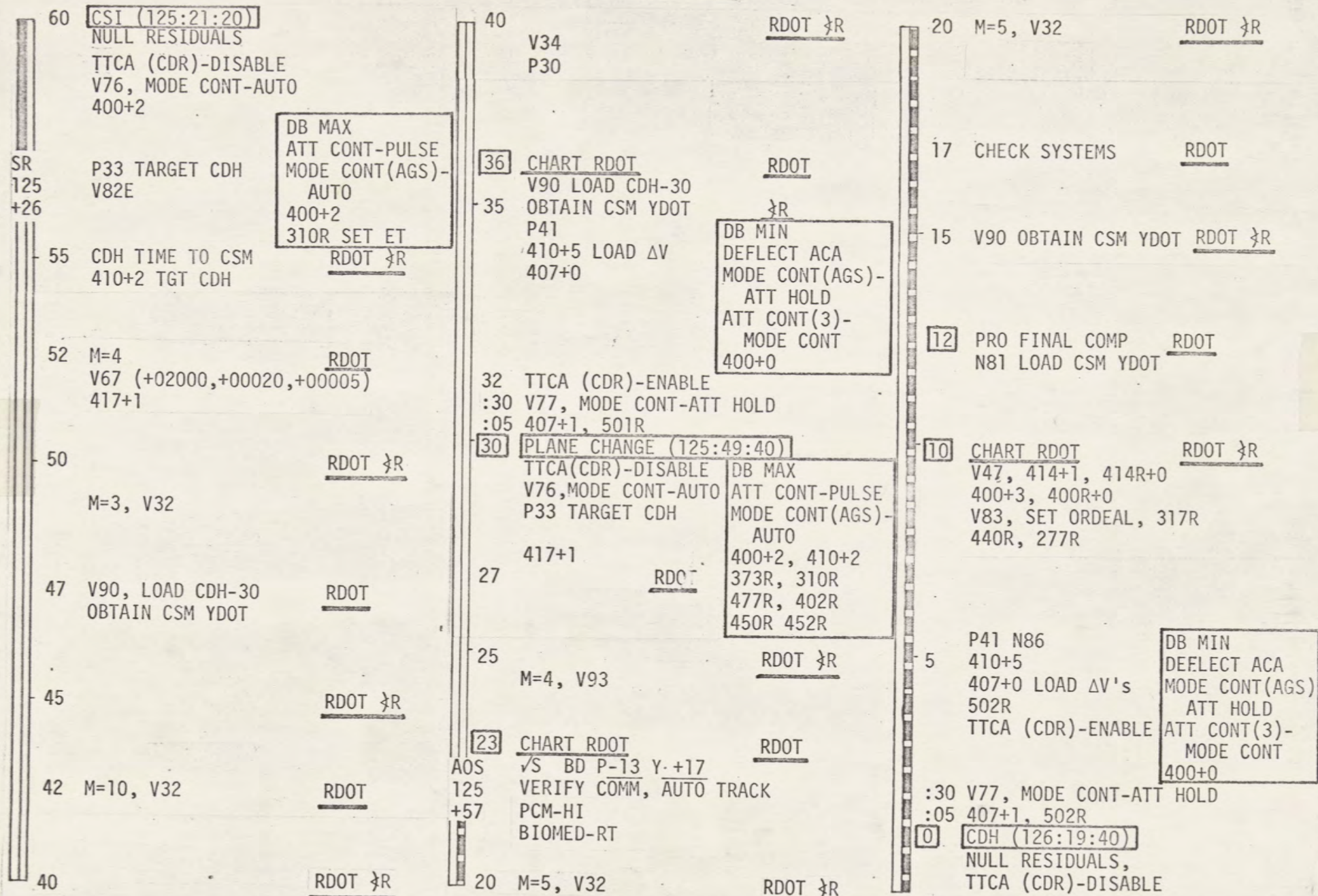
N05 ANG DIFF
PRO
N93 TORQUING ANG
X
Y
Z
PRO, GET
N25 RDOT
PRO TO PICAPAIR N15
3rd STAR
DETENT CL
CB AOT LAMP-OPEN RDOT }R
V34E
V48 1(2) 1C12
CB RR (2)-CLOSE
V95
V67 (+10000, +00100, +00015)
P20, AUTO MNVR
V80, M=1, V67 RDOT
P32, TARGET CSI
400+2
CHART RDOT RDOT }R
V47, 414+1, 414R+0
400+3, 400R+0
V83, SET ORDEAL, 317R
440R, 277R
310 ΔT CSI RDOT
SET ET
4100+2
M=10, V32 RDOT
CHART RDOT RDOT }R

20
17
15
12
10
5
30
05
00

CHART RDOT RDOT }R
CHECK SYSTEMS RDOT
V90 OBTAIN CSM YDOT RDOT }R
PRO-FINAL COMP RDOT
N81-LOAD CSM YDOT
S BD 90, 0;
THEN P-13 Y +17
OMNI-FWD
CHART RDOT/R RDOT }R
PCM-HI
V47, 414+1, 414R+0
400+3, 400R+0
V83, SET ORDEAL, 317R
400R, 277R
PCM-LO
P41, N86
410+5, LOAD ΔV
407+0
ΔV'S TO CSM
502R
TTCA (CDR)-ENABLE
DB MIN
DEFLECT ACA
MODE CONT(AGS)-
ATT HOLD
ATT CONT(3)-
MODE CONT
400+0
:30 V77, MODE CONT-ATT HOLD
:05 407+1, 502R
:00 CSI (125:21:20)
NULL RESIDUALS
TTCA (CDR)-DISABLE

INSERTION-CSI
CSI-CDH

NOT-FRONT PAGE



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CDH THRU TPI

一〇

APOLLO 11 FLIGHT DATA FILE

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[illegible]

TPI THRU DOCKING

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0 TPI (126:58:27)
NULL RESIDUALS
TTCA (CDR)-DISABLE
P35
V76, MODE CONT-AUTO
M=0, V93
404+0, 405+0, 406+0
400+2
V82E

DB MAX
ATT CONT-PULSE
MODE CONT(AGS)-
AUTO
400+2

20
SR
127
+21

24 CHART 0 (277R)
25

27 PRO-FINAL COMP

28 CHART 0 (277R), TM R/RDOT
P41
TTCA (CDR)-ENABLE
V77, MODE CONT-ATT HOLD
:05 407+1, 472R
30 MCC2

P00
V48,11002 (22002)
P47
V63
404+0, 405+0, 406+0
BAL CPL - ON

DB MIN
MODE CONT(AGS)-
ATT HOLD
ATT CONT (3)-
MODE CONT

DB MAX
ATT CONT(3)-
PULSE

40

BRAKING:

30 FPS - 6000 FT
20 FPS - 3000 FT
10 FPS - 1500 FT
5 FPS - 600 FT

45

50

AOS
127
+53

55

OMNI-AFT
VERIFY COMM, AUTO TRACK
PCM HI
BIOMED LEFT
DOCKING
TTCA (CDR) - DISABLE
COAS SW-FWD
EXT LTG-DOCK
SHFT/TRUN-±50
V41N72 (+00000,+32000)
PITCH 90°, YAW 120°

60

LOS
127
+06
S BD 90, 0
OMNI-FWD
MODE CONT-AUTO
PCM-LO

9 CHART 0 (277R)

DB MIN
DEFLECT ACA
MODE CONT(AGS)-
ATT HOLD
ATT CONT(3)-
MODE CONT
400+0

12 PRO-FINAL COMP

13 CHART 0 (277R), TM R/RDOT
P41
TTCA (CDR)-ENABLE
V77, MODE CONT-ATT HOLD
:05 407+1, 472R

15 MCC1

V76, MODE CONT-AUTO
TTCA (CDR)-DISABLE
P35
M=0, V93
404+0, 405+0, 406+0

DB MAX
ATT CONT(3)-
PULSE
MODE CONT(AGS)-
AUTO

35

40

20

SOURCE
ATE

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TOP

CONFIGURE PGNS And AGS

1 MODE CONT: AGS - ATT HOLD
ATTITUDE CONTROL (3) - PULSE
GUID CONT - AGS
DEADBAND - MAX
BAL CPL - ON

2 Verify FWD DUMP VLV - AUTO

3 V48E
N46 11011
PRO
N47 _____ LM WT

PRO _____ CSM WT

4 V37E00E
V76E

EQUIP PREP FOR TRANSFER

1 Stow The Following In ISA:
Rndz charts
16 mm Film
Flight Data
P.P.K. (2)
DSEA
Flag Kit

2 Install Crash Bars
Install Window Shades (3)

PREP FOR TRANSFER

1 Verify Tunnel Pressurized from CSM
PRESS REGS A&B - EGRESS
OVHD DUMP VLV - OPEN

2 Doff Helmets

POST - DOCKING

3 Doff Gloves,
Move HSB's Aft From ASC Eng Cover
Unstow CSRC Pocket And Place In TSB

4 When Pressures Equal, OVHD DUMP VLV - AUTO

5 Open Hatch
Stow: Probe On Left Hand Side Using
Outboard (Double) Restraint Cable
: Droque Over Probe Using Inboard
(Single) Restraint Cables Through
Droque Handles

6 Receive Bags And Vacuum Brush
From CSM, Place Behind ISA

7 Verify: CABIN GAS RETURN VLV - EGRESS
SUIT GAS DIVERter VLV - EGRESS
SUIT CKT RELIEF VLV - CLOSE
CDR's SUIT ISOL - SUIT DISC

8 Disconnect CDR O2 Red Hose From PGA,
Attach Vacuum Brush To Nozzle Of
CDR O2 Red Hose
CDR SUIT ISOL VLV - SUIT FLOW

9 Vacuum Brush Filter On FWD DUMP VLV

10 Partially Close Hatch And Unstow
One SRC
LMP Hold SRC, CDR Vacuum
Place SRC In Bag And Transfer To CSM
Repeat For Second SRC

- 11 LMP Hold The Following For CDR To Vacuum:
CSRC
CSC Cassette
70mm Magazine Bag
Gloves (4)
Helmets (2)
LMP Place Items In Bag While CDR Holds Bag (Individually)
Transfer Bagged Items To CSM (Individually)

- 12 Vacuum PGA's

- 13 Stow Vacuum Brush and 3 Foot Hose in RHSCC
Receive B5 & B6 From CMP And Stow

CDR IVT TO CSM

- 1 CB(11) COMM: CDR AUDIO - OPEN
CDR SUIT ISOL - SUIT DISC
- 2 Disconnect LM Hoses And Stow
Transfer To CSM With ISA

CSM MNVR TO JETTISON ATTITUDE

CONFIGURE S-BAND

- 1 Verify Jettison Attitude, CSM In Narrow Dead-band, Attitude Hold
- 2 S-BAND - PM, PRIM, PRIM, OFF, PCM, OFF/RESET, OFF, HI
VHF A: XMTR - VOICE/RANGE
: RCVR - OFF
VHF B: XMTR - OFF
: RCVR - ON
TRACK MODE - SLEW
PITCH _____

YAW _____

ANTENNA: S-BAND - SLEW

Slew For Max Signal.

UPDATE LINK - DATA

ACTIVATE SECONDARY GLYCOL LOOP

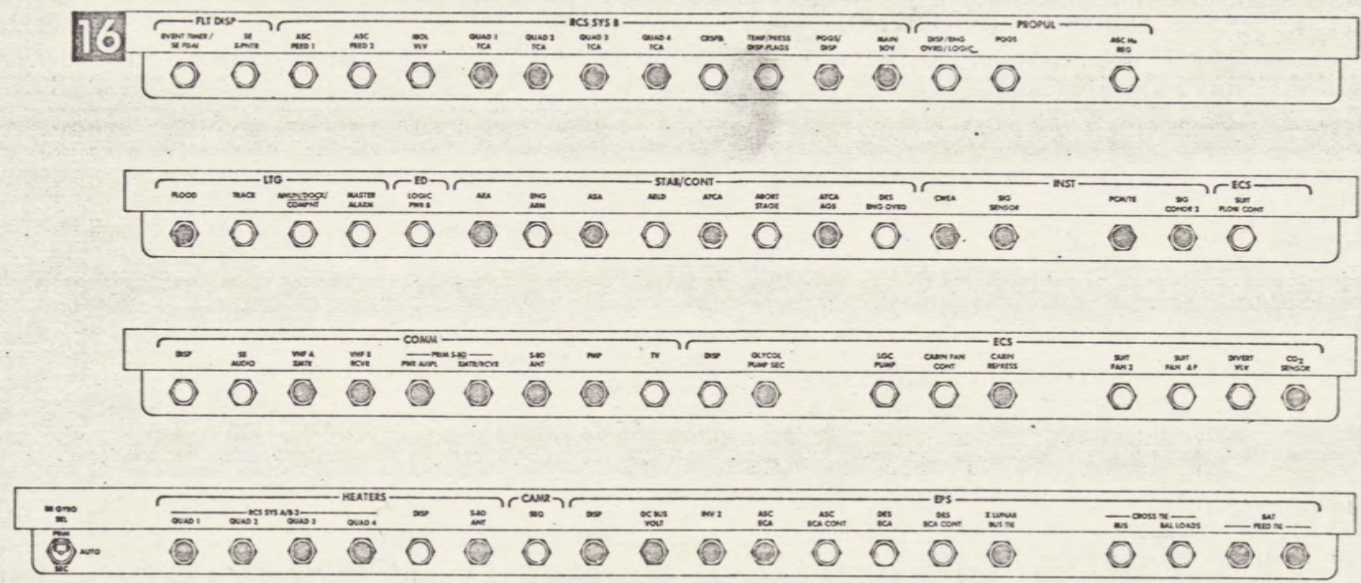
- 1 WATER TANK SEL - SEC
- 2 CB(16) ECS: GLYCOL PUMP SEC - CLOSE
GLYCOL - INST (SEC)
SEC EVAP FLOW VLV - OPEN
- 3 CB(11) ECS: GLYCOL PUMP 2 - OPEN
GLYCOL PUMP 1 - OPEN
GLYCOL PUMP AUTO TRNSFR - OPEN
- 4 PRIM EVAP FLOW #1 And #2 - CLOSE
CB(11) ECS: CABIN FAN - OPEN

CONFIGURE LM FOR JETTISON

- 1 MODE CONT: PGNS - ATT HOLD
GUID CONT - PGNS
ATT CONT (3): MODE CONT
V77E
- 2 SYS A&B FUEL & ASC OXID (4) - tb-bp
SYS A&B QUADS (8) - tb-gray
CRSFD - tb-bp
SYS A&B MAIN SOV (2) - tb-gray
- 3 SUIT CIRCUIT RELIEF - AUTO
- 4 Configure CB's Per Chart



16



LMP IVT TO CSM

- 1 Install ISA on panels 1&2
Stow HSB's on floor
Disconnect LM Hoses And Stow
- 2 FLOOD Lt - OFF
- 3 Transfer To CSM