

STEP/STEP	PROCEDURE	PANEL	NOTES
<p>4.1 BOOST AND INSERTION</p> <p>4.1.1 BOOST</p> <p>00:00 Ignition</p> <p>00:01 LV ENG lts (5) - out</p> <p>00:08 LIFT OFF It - on & NO AUTO ABORT It - out</p> <p><u>WARNING</u></p> <p>Do not press LIFT OFF/NO AUTO ABORT pb if LV BATE or any LV ENG lts on.</p> <p>~~~~~</p> <p>Liftoff verified IF LIFTOFF It off - push IF NO AUTO ABORT It on - push</p> <p>~~~~~</p> <p>00:10 Verify EIGHT TWO ind reads to zero & starts counting up</p>	<p>00:00</p> <p>BOOST 1A</p> <p>RATES 210°/sec P,T 200°/sec R</p>	<p>1</p>	<p>LV engines lights (5) go on at T -4 min when D-DC Indirecting circuits are armed.</p> <p>Indicates all five engines have achieved over 90 percent of rated thrust.</p> <p>Additional lift-off cues: Boost Timer start Voice communications from MCPB CDEY displays Program 11</p> <p>Manual abort initiation may be required. (Refer to manual rules.)</p> <p>Guarded. Guarded.</p>

3000-00-0000 (13-01) (13-01)
 ABSOLUTE OPERATIONS HANDBOOK



STA./T STEP	PROCEDURE	PANEL	REMARKS
CRB	XXXXXXXXXXXXXXXXXXXX NEXT TWO START - START XXXXXXXXXXXXXXXXXXXX	1	START position is momentary.
CRP	Verify HSB TWO led reads to zero & starts counting up XXXXXXXXXXXXXXXXXXXXXXX HSB TWO - HSBT/CRSBT XXXXXXXXXXXXXXXXXXXXXXX Verify P11 (auto) XXXXXXXXXXXXXXXXXXXXXXX No P11 - say 1875 XXXXXXXXXXXXXXXXXXXXXXX	2	HSBT position is momentary.
		MODE 1A	VTS inserted in P02 prior to lift-off.
	P06 H02 H1 XXXX. PPO H det XXXX. PPD H pad XXXX.X PP		These parameters will be displayed throughout ascent. P1 = Inertial velocity. H det = Altitude rate. H pad = Altitude above pad radius.
CRB	17 LV RATE & LP CHID lts - on, From T +3 to T +2 min	1	

TIME/STEP	PROCEDURE	PANEL	REMARKS
OMP +00:00	LF QUID on - OMC if man. coast req Seq 402	MODE 18	Allows OMC automatic steering, all stages. Disables OMC steering and activates Saturn MAP; BMC provides steering commands to the 18 for booster control. These stick commands are discrete rate commands. The altitude error needles are not designed to provide meaningful "fly to" information in the manual mode.
CRB +00:10 +00:18	Roll prog report Pitch prog - report Roll prog - complete		
OMP +00:42	PRELIFT BUMP - RCC CMD MODE 18 - report	00-42 MODE 18	
CRB +00:50	Man. w/Pr led on to T +00:50	RATEC 14"/sec P, R 400"/sec R	
OMP 13K' to 23K'	CAB PRESS led - starts dear		
	----- If no dear by 23K' rb CAB PRESS HELP slv - OMP (safety latch off) w/kill	ATT 20000 25" P, Y	
CRB		105	

TIME/STEP	PROCEDURE	PANEL	REMARKS
CRS	CRS PRND (nd - 0 psia, then zero) (mainly latch on)		
CRS	MODE 10		
CRF	If still no decr CRS PRND zero vib - open (OCM) wait CRS PRND nd - 0 psia, then close (CR)	Side batch 3	
+01:00	MAX 4		
CRS	MODE 10 - report (#) = 16.5 sec		
CRF	IGC AUTO - OFF 2 ENG CRT on - OFF LV BATES on - OFF		
CRS	a/rts IND on - No LV BATE lt disabled on platform failure case 4 limits changed to 3.2 nd in Rnd	1	
+02:10	Report 00/00 00 for clearing		
+02:15	CRCS (LR ENG 5 lt - on) LIFT OFF 15 - set (CRSO +0.5 sec)		Center engine startoff.

SECRET

STR/T STEP	PROCEDURE	PANEL	REMARKS
CLB +00:40	0800 1&V 880 1, 2, 3 & 4 1&v - on	MODE 10	1 Outboard engine cutoff.
+00:43	All eng lts - out 081/019V staging capability armed 0800 +1.4 sec		0-10/011 separation.
CLB +00:44	081/019V staging capability 1r ready 081/019V staging req. LV BEAC - on (ap)	MODE 10	2 Guarded.
CLB +00:44	08 880 1, 2, 3, 4 & 5 1&v - on 081 SEP 24 - on		1 SII engine ignition.
+00:45	All eng lts - out	2	SII 2nd plane separation circuitry armed. SII engines 45 percent rated thrust.
CLB +00:45	CLF 08AP 01M AUTO - AUTO CLF 08AP 820 FLOW - AUTO		
CLB +00:13	081 SEP 1r - out	MODE 11	1 SII Interstage jettisoned.
CLB +00:18	081 JETT (back) - on (up) 11FF +1.00		2 Guarded. On position is momentary.
	081 JETT & MODE 11 report		
	No lower jett Go to 0808 PROCEDURE, 3.3.2.6		

SM-10-MODE 11-1-151
APOLLO OPERATIONS HANDBOOK

FLIGHT STEP	PROCEDURE	PANEL	REMARKS	
040	IF IV GUID ON - CRD Key WASC for max dist.	MODE 11	Initiated before 040, provides steering commands to the IF for booster control. These WASC commands are discrete WASC commands. Altitude error needles are not designed to provide meaningful "fly to" information in manual mode.	
050	MAN ANT STROB - CRD CRD			2
+03:23	IV guidance init CRD CRD 443 sec			
+03:33	Guidance good			
+04:00	Report status			
LMP				
+05:00	Report status			
CRP				
+05:40	Spillage capability to CRD			
+05:50	IVB in orb capability			
CRB				
+06:00	Report status			
CRP	IF IND/CPE on - CRP	3		
	Man main bus voltages during auto main check			
CRB	ORNL ROT (%) - STAGE	1	START position is necessary. Start CRP global motors sequentially at 1-second intervals to avoid power surges.	
	IF IND/CPE on - CRD/CRB			
LMP				
+06:15	IF AZ +06° 0 OR ANT ORNL 1 - D IF AZ +06° 0 OR ANT ORNL 1 - C	2		
		MODE 11		

TIME	PROCEDURE	PANEL	REMARKS
08:			
+07:00	Report status	MODE II	
+07:42	CSO (LV ENG 3 It - on)		1 SII center engine cutoff.
08:			
+08:00	Report status		
08:			
+09:00	MODE II report	09:00 MODE II	
+09:11	CSO (LV ENG 1, 2, 3 S It - on)		2 SII outboard engines cutoff.
+09:12	All eng Its - out		2 SII/SIVB separation.
	----- If no SII/SIVB staging LV STAGE - on (up)		3 Staged.
08:			
08:			
+09:13	LV ENG 1 It - on		1 SIVB ignition.
+09:14	LV ENG 1 It - out		SIVB thrust to 63 percent.
08:			
+10:00	Report/confirm COE MODE IV		Coast orbital insertion.
		10:00 MODE III	
+11:00	Report status If COE takeover occurred during braking go to backup for CSO	MODE II	SIVB cutoff must be manually initiated at a TEO time calculated during the coast.

STA/T STEP	PROCEDURE	PANEL	REMARKS
040	LF 000 1 in - out 10000 *00 sec	1	
	Red from 0000	2	
	V1	XXXX. FFO	V1 = Horizontal velocity.
	E dot	XXXX. FFO	E dot = Altitude rate.
	E pad	XXXX.X MM	E pad = Altitude above pad radius. VFD should not be selected during P00 or P11 attitude 5 seconds of liftoff time (this applies to any extended verb which sets bit 1 of flagword 4).
	1030, Orbital Parameters		Displays orbital parameters (044). A meaningful display of R3P and R3Q is available only during P30.
Key 0000	FL V10 044		
	Is	XXXX.X MM	Is = Apogee altitude.
	Ip	XXXX.X MM	Ip = Perigee altitude.
	TTP	XXXX MIN-SEC	TTP = Time of Free Fall to 49.6 MM (300,000 feet).
Key 0500	Op/ash err	XXXX.X MM	
	Op	XXXX.X MM	Negative for undershoot, positive for overshoot.
	TTP	XXXX MIN-SEC	
	KEY REL		
FL V10 044			
	Is	XXXX.X MM	
	Ip	XXXX.X MM	
	TTP	XXXX MIN-SEC	If TTP = -90000, TP perigee is available by keying 032E.
	FRO		

START STEP	PROCEDURE	PANEL	REMARKS	
1001	YES 800 71 8 det 8 pad SAFE ORBIT key 8778 000	SCHEM. FPD SCHEM. FPD SCHEM. X 80	3	

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