TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-0		(Continued)					
						De-energize (close) Stage I lox bleed valve pilot valve (1 and 2) (OSBVPV).	
						De-energize (close) ATPA fuel discharge bleed valve (FDBVAP).	
						De-energize (close) gas generator valve fuel bleed valve (GGVFBV).	
						De-energize Stage I TPA heaters.	
						Energize Stage I thrust chamber igniters (TCIGN).	Power is sensed on GGVPV closed solenoid.
						Energize (open) TPA starter valve (TPAXV).	Power is supplied to TCIGNS.
				LS		Provide internal signal to back up LCS go.	
T-0				ECS	648	De-energize gas generator valve pilot valve close solenoid (GGVPV).	Both TCV 65 percent open (TCV switches actuated).
						Energize Stage I gas generator igniters (GGIGN).	Both TCV 65 percent open (TCV switches actuated).

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 35 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-0				ECS	648	Energize GGVPV open solenoid.	Both TCV 65 percent open (TCV switches actuated).
						Close TPA starter valve (TPAXV).	Either GGV 30 percent open (GGV switches actuated).
						De-energize thrust chamber igniters (TCIGN).	Either GGV 30 percent open (GGV switches actuated).
						De-energize (close) gas generator oxidizer.	Either GGV 30 percent open (GGV switches actuated).
						De-energize GGVPV open solenoid.	Either GGV 30 percent open (GGV switches actuated).
						De-energize Stage I gas generator igniters (GGIGN).	Either GGV 30 percent open (GGV switches actuated).
T+2	656	Start missile release (C)	ECS				Both thrust chambers up to 440 PSIG (thrust chamber pressure switches actuated for 50 milliseconds).
T+4				ES	656	Fire missile support explosive bolts.	Item 512 received and approximately 2-second time delay expired after item 656 received.

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 36 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T+4		(Continued)					
						Fire umbilical tower explosive bolts.	Item 512 received and approximately 2-second time delay expired after item 656 received.
T+4	660	Fire bolts (C)	ES				Item 656 generated.
				LS		Inhibit automatic shutdown generation.	
				PLPS	660	Discontinue monitoring of Stage I fuel and lox tanks above minimum pressures.	
T+4	664	Lift off (C)	ES				Item 656 received and missile support bolts fired.
				CCC		LIFT OFF indicator white on LCC.	
				LS		Provide enable launcher raising prerequisite.	
				IRSS		Provide lift off signal to ICC (range safety officer).	
T+4	672	Missile launched (C)	CCC				Item 664 received.
				GGS		LIFT OFF indicator white on MGC.	

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 37 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T+7	680	Check lift off (M)	LS				
				ES		Check item 664 initiated interrupt item 660.	
T+10				GGS	672	Press GUID IN PROGRESS pushbutton indicator on MGC (manual).	LIFT OFF white and missile actually in flight (determined from TV monitor).
						GUID IN PROGRESS pushbutton indicator green on MGC.	GUID IN PROGRESS pushbutton indicator pressed.
T+10	696	Guidance in progress (C)	GGS				GUID IN PROGRESS pressed.
				CCC		Provide missile in flight and raise/lower launcher interlock prerequisite.	
T+10	704	Missile in flight (C)	CCC				Item 696 received.
				LS		Item 725 locked out until T+170.	
				PLPS		Close 750 PSI nitrogen supply valve.	
T+10	712	Ready to lower (C)	LS				Launcher lowering enabled from the CCC (item 436) and launch sequence generates enable lowering signal.

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 38 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T+10		(Continued)					
				CCC		LOWER LAUNCHER indicator green on LCC.	
T+170	725	Enable launcher raising (C)	LS				
				CCC		Enable ready to raise on other two missiles of the complex.	
T+XXX				GGS	696	END OF GUID indicator white on MGC.	Guidance satisfactorily completed and IBDA printed out.
						Press RECYCLE pushbutton indicator on MGC (manual).	END OF GUID white.
						RECYCLE pushbutton indicator white on MGC.	RECYCLE pushbutton indicator pressed.
						Drop out launcher and target selections. GGS recycles to prepare for acquisition of next missile.	
						RECYCLE pushbutton indicator not lighted on MGC.	Recycle complete.
T+1HR				PLPS	224	Close lox return line vent valve.	Drain line not above minimum vent pressure.
						Close lox drain line vent valve.	Drain line not above minimum vent pressure.

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 39 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T+1HR		(Continued)					
						Open lox drain blanket valve.	Lox return line vent and drain line vent valves closed.
T+2HR				PLPS	224	Close Stage I/II lox line vent valves.	Stage I/II fill lines not above minimum vent pressure.
						Open lox line blanket valve.	Stage I/II lox line vent valves closed.
H+0	800	Start launcher lowering.	LC				LOWER LAUNCHER push-button pressed.
				LS		Provide lower launcher prerequisite.	
H+0	808	Launcher lowering started (C)	LS				Ready to lower (item 712) and start launcher lowering (item 800).
				CCC		LOWER LAUNCHER indicator white on LCC.	
						Disable ready to lower on other launchers.	
						Disable ready to raise on other launchers.	
H+0	816	Lower launcher (C)	LS				Ready to lower (item 712) and start launcher lowering (item 800). Fire Stage I engines (item 648).

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 40 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
H+0		(Continued)		LCS		Open flame deflector cooling spray valve.	
						Position umbilical tower.	
H+10	176	IRSS shutdown	O&C			Position lower tower umbilical mechanism. De-energize O&C console.	
H+90	177	Inspect above ground and silo areas	CSO	CSO/CST/ MAET		Dispatch MAET teams to missile silo and above ground area.	
H+91				LCS	816	Close water supply valve.	
H+101				LCS	816	Retract flame deflector extension.	Engine compartment water spray valve closed.
H+101				LCS	816	Retract launcher platform lateral load locks.	Engine compartment water spray valve closed.
H+117				LCS	816	Drive launcher platform up.	Lateral load locks retracted.
H+122				LCS	816	Retract vertical load locks.	Launcher platform driven up.
H+132				LCS	816	Turn off launcher platform oil pressure.	Vertical load locks retracted.

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 41 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
H+132		(Continued)					
						Lower launcher platform.	Vertical load locks retracted.
H+150	178	Report area safe	CSO			Report missile silo and above-ground area clear for limited access.	
H+253				LCS	816	Turn on launcher platform oil pressure.	Launcher platform lowered.
						Shut off launcher platform drive.	Launcher platform lowered.
						Close lower shelter door.	Launcher platform lowered.
						Rotate launcher platform counterweight support.	Launcher platform lowered.
						Extend Stage I lox vent duct (1C1LV) support mechanism.	Launcher platform lowered.
						Extend Stage II lox vent duct no. 1 (2B1LV) support mechanism.	Launcher platform lowered.
						Extend Stage II lox vent duct NO. 2 (2B2LV) support mechanism.	Launcher platform lowered.
H+254				LCS	816	Open engine compartment water spray valve.	Water supply valve closed.

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 42 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
H+262				LCS	816	Pressurize rod end slacking cylinder.	Counterweight support rotated.
H+264				LCS	816	Release counterweight cylinder locks.	Rod end slacking cylinder pressurized.
H+274				LCS	816	Lower counterweight cylinder.	Counterweight cylinder locks released.
H+280				LCS	816	Close wire rope locks.	Counterweight on support.
						Rotate counterweight support lock.	Counterweight on support.
H+281				LCS	816	Close upper shelter door.	Lower shelter door closed.
H+304				LCS	816	Release cable equalizer.	Counterweight support lowered.
						Retract horizontal and vertical crib locks.	Counterweight support lowered.
H+334				LCS	816	Retract oblique crib locks.	Horizontal and vertical crib locks retracted.
H+354	920	Shelter doors closed (C)	LCS				Shelter doors closed and crib locks retracted.
				LS		Provide launch sequence complete prerequisite.	
				LCS		Shut off power pack pump motors.	

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 43 of 44)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
H+354	928	Launch sequence complete (C)	LS				Item 920 received subsequent to generation of item 808.
				ES		Power to the AOE.	and shutdown signal.
H+354	928	Complete (C)	LS				Subsequent to generation.

Figure 3-34. Launch Countdown System Functions (VAFB) (Sheet 44 of 44)

STEP		PROCEDURE
A	L+0	Start launcher lowering
B	L+0	Open flame deflector cooling valve
	Note:	After T-O and with no lift-off occuring, any shutdown will result in engine compartment water spray.
C	L+0	Erect umbilical tower
D	L+90	Close main water supply valve
E	L+91	Retract flame deflector extension
F	L+91	Retract lateral load locks
G	L+101	Retract vertical load locks
H	L+120	Shut off launcher platform oil pressure
I	L+121	Lower launcher platform
		The following times will be approximate for an empty launcher and will be different for a DPL, a lox, only and a fuel only exercise; however, the sequence of events will be the same.
J	L+606	Turn on launcher platform oil pressure
K	L+606	Shut off launcher drive
L	L+606	Close lower silo door
M	L+606	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Raise counterweight lifting cylinder
N	L+606	(VAFB) Rotate counterweight support
O	L+614	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Insert CWT to drive base locks
P	L+616	(VAFB) Pressure CWT lift cylinder raise
Q	L+618	(VAFB) Release CWT cylinder locks
R	L+619	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Deenergize CWT lift cylinders.
S	L+621	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) lower tension equalizer cylinders.

Figure 3-35. Launch Countdown System Functions Launcher Control System Lower Launcher (Sheet 1 of 2)

STEP		PROCEDURE
T	L+628	(VAFB) Lower CWT lift cylinders.
U	L+636	Close upper door
V	L+643	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Unlock spring capsules
W	L+648	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Retract stub rail latch
X	L+653	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Retract rear drive base lock
Y	L+658	(VAFB) Extend tension equalizer cylinders.
Z	L+658	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Retract Horizontal crib locks
AA	L+673	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Retract oblique crib locks
BB	L+678	(VAFB) Rotate CWT support lock
CC	L+683	(VAFB) Extend tension equalizer cylinders.
DD	L+683	(VAFB) Retract horizontal crib locks
EE	L+694	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Retract vertical crib locks
FF	L+704	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) System hard: doors closed, crib on shock mounts
GG	L+704	(LAFB 724TH/725TH SQDN, EAFB, BAFB, LAFB, MHAFB) Shut off power pack
HH	L+713	(VAFB) Retract oblique crib locks
II	L+733	(VAFB) Retract vertical crib locks
JJ	L+743	(VAFB) System hard: crib on shock mounts, doors closed
KK	L+743	(VAFB) Shut off power pack

Figure 3-35. Launch Countdown System Functions Launcher Control System Lower Launcher (Sheet 2 of 2)