STEP	PROCEDURE
	Anytime the GGS is not in a GO status or cannot meet the time requirements for the next phase in the count down, press the GGS HOLD pushbutton indicator. If the GGS is returned to a GO status after pressing GGS HOLD pushbutton indicator, press HOLD RELEASE pushbutton, and continue the countdown. For handover operation, establish communication with MLO, insure target compatibility, and press HANDOVER ON pushbutton indicator. START LCH EXERCISE indicator will light white when the MLO places the weapon system in the CSE mode. The GEO will press the LAUNCH EXERCISE pushbutton indicator to yellow, and the STBY pushbutton indicator will light red. If the MLO takes the weapon system out of the CSE mode, the STBY pushbutton indicator will change from red to green, the LAUNCH EXERCISE pushbutton indicator will change from yellow to green, and the START LCH EXERCISE indicator will go out. The GGS may be taken out of the CSE mode by pressing STBY pushbutton indicator to green.
1	START CD..... Received The START CD indicator will light white when the LOAD PROPELLANTS pushbutton indicator on the launch control console is pressed. In the handover mode the remitting MLO gives the start countdown command verbally.
	Note Immediately upon receipt of a message that requires an actual countdown, if the guidance system is in standby, press POWER ON pushbutton indicator.
2	Press POWER ON..... White The POWER ON pushbutton indicator will remain white for 2 1/2 minutes to allow the magnetic drum in the computer to reach operating speed. The following indications for the selected antenna must be present: a. ANTENNA FACILITY SELECT, green b. ANTENNA FACILITY MAINT, green c. ANTENNA FACILITY FAULT, not lighted

Figure 3-31. Guidance Countdown Procedure (Sheet 1 of 8)

STEP	PROCEDURE
2 (cont)	d. CCW/CW indicator, CCW or CW portion green The following indications appear during power on sequence and should be observed: a. GUIDE X NOT RDY will light amber for approximately one minute while guidance exerciser resets. b. MAG OFF will light amber. c. Range indicator sweep will appear. d. TV monitor raster will appear. e. Constants registers should be enabled in approximately 60 seconds.
3	Index of refraction..... Inserted The index of refraction will be inserted into the right four digits of constants register 6 by first pressing the right-most constants register pushbutton indicator and adjusting the selection knob for the desired numeral. Repeat this procedure for the other three numerals.
4	POWER ON..... Green POWER ON pushbutton indicator will light green when all power feedback prerequisites are met. Note Steps 5 and 6 will be performed only if antennas have been switched during countdown.
5	Press GUIDE X NOT RDY..... Not lighted
6	Press START GUID X..... White The following indications appear after START GUID X pushbutton indicator is pressed and should be observed: a. The digital data printer will print out the contents of the constants register. b. A gated pulse will appear on the range indicator. c. TARGET GATED indicator will light green. d. The AGC meter will indicate in the normal segment.

Figure 3-31. Guidance Countdown Procedure (Sheet 2 of 8)

STEP	PROCEDURE
6 (cont)	If a gated pulse is not obtained, reset the guidance exerciser by pressing GUID X NOT RDY pushbutton indicator and then pressing START GUID X pushbutton indicator. During the guidance exerciser coast period, the following indications appear and should be observed: a. COAST indicator will light amber. b. TARGET GATED indicator will go out. c. AGC meter will indicate out of normal segment.
7	MAG RDY..... White MAG RDY indicator will light white approximately five minutes after POWER ON pushbutton indicator is pressed.
8	Press MAG ON..... White, then Green After the MAG ON pushbutton indicator is pressed, the MAG ON pushbutton indicator will turn from white to green in 10 to 12 seconds. The following indications appear after pressing MAG ON pushbutton indicator and should be observed: a. MAG READY will go out. b. MAG OFF will go out. c. The MAG-MOD CUR-VOLT meter will indicate 1.5 to 1.9 MA; press INC or DEC as required. Under no circumstances will the magnetron current be adjusted below 1.5 MA during a GUID X or after ACQ MISSILE has been pressed.
9	Magnetron tuning..... Accomplished The magnetron switch is held to the COARSE position. The MAG TUNE meter is checked for the approximate segment of the X-band. The MAGNETRON switch is released to PEAK. Adjust the FREQUENCY CONTROL switch as required to peak the MAG TUNE meter.

Figure 3-31. Guidance Countdown Procedure (Sheet 3 of 8)

STEP	PROCEDURE
10	Go code..... Verified Verification of the go code must be completed prior to initiation of the RAISE LAUNCHER phase.
10.1	Events recorder POWER switch..... ON
11	START GUID X..... Green START GUID X must be green or a NO-GO exists in the ground guidance system. The digital data printer will print out the code for a successful guidance exerciser run. The GUIDE X NOT RDY pushbutton indicator will light while the guidance exerciser resets.

Figure 3-31. Guidance Countdown Procedure (Sheet 3A of 8)

STEP	PROCEDURE
12	Single sideband antenna..... Lowered
13	GGS GO..... Reported If a No-Go exists, the GEO will report estimated hold time to MLO or have MLO request handover assistance. If handover is required, the remote GEO will report "ready to raise antenna" to the receiving MLO.
14	RAISE ANT (verbal in handover)..... White The RAISE ANT indicator will light white when the RAISE LAUNCHER pushbutton indicator on the launch control console is pressed. In the handover mode the remitting MLO gives the raise antenna command verbally. If a blast is detected prior to RAISE ANT indicator white, notify MLO to delay RAISE LAUNCHER phase until a satisfactory guidance antenna level program has been accomplished.
15	Press ANT RAISE..... White If a blast is detected after ANT RAISE pushbutton indicator is pressed, but prior to ACQ MISSILE pushbutton indicator green, the system is automatically placed in the power off condition and the antennas are automatically switched. Notify MLO and restart the countdown. The RAISE LAUNCHER phase will not start until after the antenna is raised and locked, and a successful level program is run.
16	ANT RAISE..... Green A level program is automatically run following ANT RAISE pushbutton indicator green if a blast was detected prior to pressing ANT RAISE pushbutton indicator. The digital data printer will printout if an automatic level program was run. If the TEST FAULT indicator remains not lighted, notify MLO that the RAISE LAUNCHER phase may proceed.
17	SELECT TARGET (handover only)..... Received, Accomplished, Acknowledged The MLO directs the GEO to select a specified target. The GEO will acknowledge and verify the TARGET SELECTED is green.

Figure 3-31. Guidance Countdown Procedure (Sheet 4 of 8)

STEP	PROCEDURE
18	SELECT LAUNCHER (handover only)..... Received; Accomplished; Acknowledged The MLO directs the GEO to select a specified launcher. The GEO will acknowledge and verify the LAUNCHER SELECT is white.
19	MISSILE READY..... White MISSILE READY indicator will light white after the LAUNCH pushbutton indicator on the launch control console is pressed. In handover, MISSILE READY will light white after the GEO has selected target and launcher. Prerequisites for the MISSILE READY indicator lighting white are SELECT TARGET pushbutton indicator green and SELECT LAUNCHER pushbutton indicator white. If the LAUNCH HOLD indicator lights red after MISSILE READY indicator is white but before ACQ MISSILE pushbutton indicator is pressed, then ACQ MISSILE pushbutton indicator must be pressed to enable the recycle function.
20	ACQ MISSILE..... Pressed The following occurs after ACQ MISSILE pushbutton indicator is pressed and should be observed: a. Antenna slews to preset coordinates. b. SELECT LAUNCHER pushbutton indicator will light green. c. The digital data printer will print out target verify. d. TARGET VERIFY pushbutton indicator will light green. In the handover mode, the ACQ MISSILE pushbutton indicator will be pressed immediately after selecting target and launcher as directed by the remitting MLO.
21	ACQ MISSILE..... White When ACQ MISSILE pushbutton indicator lights white, the following indications appear and should be observed except in handover when they will occur after lift off: a. TARGET GATED indicator will light green.

Figure 3-31. Guidance Countdown Procedure (Sheet 5 of 8)

STEP	PROCEDURE
21 (CONT)	b. AGC meter will indicate in normal segment. c. Gated pulse will appear on the range indicator. In the handover mode, the digital data printer will print out the contents of the constants register.
22	Ready to guide (handover only).....Reported
23	LIFT OFF (handover only).....White If GGS HOLD indicator lights red after lift off, continue countdown. At a predetermined time after the lift off signal is received, the guidance computer sends a signal to the radar to begin frequency sweep and places the range computer in automatic track. When the radar locks on the missile the following indications occur: a. TARGET GATED indicator will light green. b. AGC meter will indicate in normal segment. c. Gated pulse will appear on the range indicator.
24	ACQ MISSILE.....Green The ACQ MISSILE pushbutton indicator will light green after LOOP CHECK complete. The digital data printer will print out the contents of the constants register. If the LAUNCH HOLD indicator lights red after the ACQ MISSILE pushbutton indicator is green, the GGS HOLD pushbutton indicator must be pressed to enable the recycle function. If a blast is detected after ACQ MISSILE pushbutton indicator is green, continue the countdown. In the handover mode the ACQ MISSILE pushbutton indicator will light green when the radar has locked on in automatic track.
25	LIFT OFF.....White If the LAUNCH HOLD indicator red or GGS HOLD pushbutton indicator red is received after the LIFT OFF indicator lights white, continue the countdown.
26	Press GUID IN PROGRESS.....Green

Figure 3-31. Guidance Countdown Procedure (Sheet 6 of 8)

STEP	PROCEDURE
26 (CONT)	The GUID IN PROGRESS pushbutton indicator will be pressed to green after all indicators indicate that the radar is guiding the missile.
27	END OF GUID . . . . . White The digital data printer will print out the miss distance; then the END OF GUID indicator lights white.
28	End of guidance . . . . . Reported
29	RECYCLE . . . . . Pressed The following indications occur after the RECYCLE pushbutton is pressed and should be observed: a. TARGET GATED indicator not lighted b. END OF GUID indicator not lighted c. GUID IN PROGRESS indicator not lighted d. LIFT OFF indicator not lighted e. ACQ MISSILE pushbutton indicator not lighted f. MISSILE READY indicator not lighted g. SELECT TARGET pushbutton indicator not lighted h. SELECT LAUNCHER pushbutton indicator not lighted The recycle function places the GGS in a status just prior to the LAUNCH phase of the next missile. In the handover mode, coordinate with the MLO for further target and launcher selections.
30	Repeat steps 17 through 29 for remaining missiles . . . . . Accomplished Before proceeding, the GEO will confer with the MLO for possible acceptance of handover.
31	Press ANT LOWER . . . . . White During the lowering of the antenna, the POWER ON push-button indicator may light white.

Figure 3-31. Guidance Countdown Procedure (Sheet 7 of 8)

STEP	PROCEDURE
32	ANT LOWER . . . . . Green The GGS FAULT pushbutton indicator and ANTENNA FACILITY FAULT indicator may light after ANT LOWER pushbutton indicator is green. If the fault indications appear, wait until the ANTENNA FACILITY FAULT indicator goes out and press the HOLD RELEASE pushbutton.
33	Press MAG OFF . . . . . Amber
34	Events recorder POWER switch. . . . . OFF
35	(Prior to incorporation of TCTO 31X7-2-11-512) Press POWER OFF . . . . . White
36	GGS alert status monitoring . . . . . Reported Following a combined systems exercise, perform guidance electronics officer alert status monitoring procedure.
37	Printout. . . . . Analyzed The printout will be analyzed for proper computer constants register numbers and flight data.
38	Events recorder records . . . . . Analyzed The record will be analyzed for the performance of the GGS in accordance with T.O. 21M-HGM25A-2-7-5

Figure 3-31. Guidance Countdown Procedure (Sheet 8 of 8)

STEP	PROCEDURE
1	ALERT..... Received When the MLO alerts the complex for a launch or exercise countdown, one EPPT immediately monitors the countdown net while the other EPPT starts the standby generators.
2	Start standby diesel engine..... Accomplished The EPPT starts the standby diesel engine(s) by performing the following procedures: (LAFB 724TH/725TH SQDN) a. Position engine console power supply switch to ON. Note * If engine fails to start automatically, set engine console power supply switch to OFF and start engine manually. b. Press engine START pushbutton. The prelube pump runs for approximately 20 seconds. If engine lube oil pressure gage does not indicate 4 to 5 PSI, set console power switch to OFF and repeat steps a and b. Engine starts at approximately 450 RPM. c. Close starting air supply valve. d. Close air intake manifold, air intake aftercooler, and turbo charger drain valves. (VAFB, BAFB, LAFB, MHAFB) a. The EPPT starts the precirculating LUBE OIL, CRANKCASE VACUUM, and ENGINE JACKET WATER pumps by pressing the respective START push-buttons. b. Start engine by pressing engine START pushbutton.
3	Standby generator on line..... Accomplished The EPPT places the standby generator on the line by performing the following procedures:

Figure 3-32. Power House Countdown Procedure (Sheet 1 of 4)

STEP	PROCEDURE
3 (CONT)	a. Remove synchroscope key from running generator SYNCHROSCOPE SWITCH and insert in standby generator panel SYNCHROSCOPE switch. b. Position standby SYNCHROSCOPE switch to on. c. (LAFB 724TH/725TH SQDN) Rotate standby generator manual field rheostat counterclockwise to 35 VDC. d. Close standby GENERATOR FIELD circuit breaker. CAUTION (LAFB 724TH/725TH SQDN) Manual field rheostat must be rotated SLOWLY counterclockwise or to the RAISE VOLTAGE position to prevent damage to incoming voltmeter. e. (LAFB 724TH/725TH SQDN) Rotate standby generator manual field rheostat counterclockwise to the fully raised position. f. Adjust GOVERNOR MOTOR CONTROL until synchroscope pointer is rotating slowly in the fast direction. g. Adjust standby generator regulator pre-set rheostat for required incoming voltage; the incoming voltmeter must indicate the same as the running voltmeter. CAUTION Do not close standby GENERATOR circuit breaker until synchroscope pointer is at the 12 o'clock position. h. Close standby GENERATOR circuit breaker. i. (LAFB 724TH/725TH SQDN) Immediately turn GOVERNOR MOTOR CONTROL to the raise position and hold until on coming generator KW meter indicates approximately 100 K.W. and using pre-set rheostat on voltage regulator adjust KVAR'S. j. Balance K.W. load between operating generators.

Figure 3-32. Power House Countdown Procedure (Sheet 2 of 4)

STEP	PROCEDURE
3 (CONT)	k. (LAFB 724TH/725TH SQDN) Adjust KVAR meter. l. (EAFB, BAFB, LAFB, MHAFB) Adjust POWER FACTOR meter. Note During an EWO launch countdown position the START-RUN switch to the START position on all generators connected to the bus, all other times perform step m. m. Position generator START-RUN switch to RUN. n. Return synchroscope switch key to the leading generator or to the lowest numbered operating generator.
4	Communications with control center.....Established EPPT established communications with control center and remains on net until countdown is completed or until he is released by the MLO.
5	Power House status.....Reported EPPT informs the MLO of the status of the power house, that the standby generator is on the line, and the powerhouse is in a go condition.
6	Post diesel engine start checkout.....Accomplished (Refer to power house alert status monitoring.)
7	Return power house to alert status monitoring.....Received
8	Standby generator off the line.....Accomplished The EPPT removes the standby generator from the line by performing the following procedures: a. Position the DIESEL ENGINE START-RUN switch to the START position. b. (LAFB 724TH/725TH SQDN) Remove KW and KVAR load. c. (LAFB 724TH/725TH SQDN) Simultaneously trip GENERATOR circuit breaker and rotate manual field rheostat clockwise to the lower position. If this is not done simultaneously, damage will occur to the DC voltmeter.

Figure 3-32. Power House Countdown Procedure (Sheet 3 of 4)

STEP	PROCEDURE
8 (CONT)	d. (EAFB, BAFB, LAFB, MHAFB) Trip GENERATOR circuit breaker. e. Verify that GENERATOR circuit breaker indicator is lighted green. f. (LAFB 724TH/725TH SQDN) Clear GENERATOR FIELD circuit breaker red target and reposition RESET TRIP relay. g. Trip GENERATOR FIELD circuit breaker and verify indicator lighted green. Note Following an EWO launch countdown, position the START-RUN switch to the RUN position on generators connected to the bus.
9	Shut down standby diesel engine.....Accomplished The EPPT will shutdown the standby diesel engine by performing the following procedures: (LAFB 724TH/725TH SQDN) a. Allow engine to run at 450 RPM for approximately 30 minutes. b. Press engine STOP pushbutton. c. After engine has completely stopped rotating, position engine console power supply switch to OFF. d. Open starting air valve. e. Open turbocharger, after cooler, and intake air manifold drain valves. (VAFB, EAFB, BAFB, LAFB, MHAFB) a. Press engine STOP pushbutton.

Figure 3-32. Power House Countdown Procedure (Sheet 4 of 4)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
		Note All T times listed in this procedure are approximate times. (M) designates a momentary signal and (C) designates a continuous signal.					
TSI	001		LCC				LOAD PROPELLANTS pushbutton pressed.
				LS		Start first timing sequence.	Missile/facility go and item 016 not generated.
TSI	008	Launch sequence started (M)	LS				First timing sequence started.
				ES		Energize 28 VDC Operating bus to AOE.	
						Energize 60 CPS bus to AOE.	
						Start ground 400 CPS motor-generator.	
						Start ground inverter start unit.	
						Start missile air conditioning unit.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 1 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
TSI	008	(Continued)					
				ES (Cont)		Energize missile 28 VDC buses.	28 VDC operating bus to AOE energized
						Apply standby power to AOE.	
						Energize missile battery heater control circuits.	
				ECS		Energize ECS AOE	
						Energize (1), (2), and (3) TPA heater switches and apply (3) TPA heater preheat.	
					008	Reset Stage II airborne sequencer.	
						Energize re-entry vehicle battery heaters. (Mark 3 R/V)	
						Freeze RVS go status.	
				FCS		Freeze FCS go status.	
TSI	016	Launch sequencer operating (C)	LS				First timing sequence started and 28 VDC operating bus to AOE energized.
				TDB		Start countdown timer.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 2 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
TSI	016	(Continued)		CCC		LOAD PROPELLANTS white on LCC.	
						Disable manual missile facility no go.	
				LS		Inhibit exercise mode initiation.	
				TCS		Freeze target go status.	
TSI	024	Start power pack (M)	LS				First timing sequence started.
				LCS		Start launcher power pack pump motors.	
TSI	032	Energize RGS (C)	LS				First timing sequence started.
				RGS		Energize GMTS	
				GMTS		Energize MGS	
TSI	040	Countdown started (C)	CCC				Item 016 received.
				GGS		START CD white on MGC	
					040	Press POWER ON push-button indicator on MGC (manual).	START CD white.
						POWER ON pushbutton indicator white on MGC.	POWER ON pushbutton indicator pressed.
TSI	052	Start propellant loading (C).	ES				Item 008 received; 28 VDC

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 3 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
TSI	052	(Continued)		PLPS		Energize 750 PSI pneumatic supply valve (FCV 508) open.	
						Close Stage I/II fuel pressure regulators.	
						Open Stage I/II fuel tank vent and relief valves.	
TSI				PLPS	052	Desiccant breather valves.	
						Close missile blanketing nitrogen supply valve.	
						Close lox line blanket valve.	
						Open helium transfer valve and regulate to 3100 PSI.	
						Open Stage I/II lox tank vent and relief valves.	
						Close Stage I/II lox pressure regulator.	
						Open Stage I/II lox fill and drain valves.	Stage I/II lox tank vent and relief valves open.
						Turn on lox vent exhaust blower.	Stage I/II lox tank vent and relief valves open.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 4 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
TSI		(Continued)		PLPS	052		
						Close lox storage tank vent valve.	Lox storage tank above minimum level.
						Open Stage I/II lox fine load valves.	Lox storage tank above minimum level.
						Open Stage I/II lox rapid load valves.	Lox storage tank above minimum level.
						Open Stage I/II lox topping control valves.	
						Open lox transfer pressure valve(s) and regulate to set point 1.	Lox storage tank vent valve closed.
						(After incorporation of TCTO 31X3-10-11-621) Open lox transfer pressure valve(s) and regulate to set point 2.	
						Open Stage I/II lox line end valves.	Stage I/II lox tank vent valves and lox fill and drain valves open.
						Open Stage I/II lox topping line end valves.	Stage I/II lox tank vent valves and lox fill and drain valves open.
						Close warm helium line valve.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 5 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
TSI		(Continued)				Open cold helium line valve.	Nitrogen unloading supply valve closed.
						Open Stage I/II primary pressure regulators.	
				ES	008	Energize 400 CPS bus to AOE.	400 CPS generator output up to 90 percent of rated voltage.
T-870	072	Apply missile 400 CPS (M)	LS				
				ES		Apply 400 CPS ground power to missile AC bus.	
						Energize missile inverter output transfer relay.	
						Initiate monitoring for missile AC and DC.	
				ES	072	Voltages and air conditioning unit on.	
						(After incorporation of TCTO 21-SM68-790) Apply 28 VDC sensor power.	
T-870	076	Transfer gyro monitor (C)	ES				28 VDC and 400 CPS power on missile buses.
				FCS		De-energize 28 VDC gyro standby heaters.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 6 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-870		(Continued)				Reset missile programmer and verify reset. Reset verification readout delayed to item 144.	
T-850	085	Lox loading (C)	PLPS				(Prior to incorporation of TCTO 21-SM68-853) Lox storage tank fully pressurized, lox rapid load valves open, and lox in Stage I/II umbilicals. (After incorporation of TCTO 21-SM68-853) Lox storage tank fully pressurized and lox rapid load valves open.
				CCC		LOX LOADING white on LCC.	
				PLPS	052	(Prior to incorporation of TCTO 31X3-10-11-621) Regulate lox transfer pressure valve(s) to set point 2.	(Prior to incorporation of TCTO 21-SM68-853) Lox in Stage I/II fill lines and umbilicals.
						Energize Stage I lox fill and drain valve heater.	Lox in Stage I umbilical.
T-820				GGS	081	Adjust constants register 6 (manual). Enter meteorological data.	Data from latest measurement.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 7 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-820	080	Launcher power pack operating (C)	LCS				Launcher power pack operating properly.
				LS		Provide ready to raise prerequisite.	
				GGS	040	POWER ON pushbutton indicator green on MGC.	GGS in full power on condition.
						Press START GUID X pushbutton indicator on MGC.	POWER ON pushbutton indicator green.
						START GUID X pushbutton indicator white on MGC.	START GUID X pushbutton indicator pressed.
T-700	104	Start hydraulics (M)	LS				
				PLPS		Check 28 VDC sensor power applied.	
				ES		Start ground hydraulic unit.	400 CPS power present on missile bus.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 7A of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-580				GGS	040	MAG RDY indicator white on MGC.	Approximately five minute time delay elapsed.
						Press MAG ON pushbutton indicator on MGC.	MAG RDY indicator white.
						MAG ON pushbutton indicator white on MGC.	MAG ON pushbutton indicator pressed.
						MAG ON pushbutton indicator green on MGC.	Magnetron power on and missing pulses within tolerance.
T-570				FCS	076	Transfer from standby to operating gyro temperature monitor.	Item 076 received and approximately five minute delay expired.
T-470				PLPS	052	Close Stage I/II lox rapid load valves.	Stage I/II lox tanks 95 percent full.
T-360				GGS	040	START GUID X pushbutton indicator green on MGC.	Guidance exercise complete.
T-281	136	Lox loaded (C)	PLPS				Stage I/II lox tanks 100 percent full and Stage I/II helium tanks at normal pressure. (Normal clock jump time is approximately T-420).
				CCC		LOX LOADED white on LCC.	
				PLPS		Initiate monitoring of Stage I/II lox tanks above 95 percent level.	Stage I/II lox tanks 100 percent full.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 8 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-281	136	(Continued)		PLPS		Close Stage I/II lox fine load valves.	
						Close Stage I/II lox line end valves.	
					136	Open Stage I/II lox line vent valves.	Stage I/II lox rapid load and lox fine load valves closed.
						Throttle Stage I/II lox topping control valves.	
				LS		Provide ready to raise prerequisite.	
T-281	144	Check ready to raise (M)	LS				
				PLPS		Check item 136 initiated and initiate monitoring for helium tanks above minimum pressures.	
				TCS		Unfreeze target go status.	
				TDB		Stop countdown timer clock at first hold position.	
						Start digital hold time indicator.	
				FCS		Unfreeze FCS go status.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 9 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-281	144	(Continued)				Check gyro spin motors operating.	
						Check programmer reset.	
						Check gyro temperatures.	
						Check engine nulls.	
				FCS	144	Check missile 25 VDC.	
				RVS		Unfreeze RVS go status.	
						Check R/V fuze setting.	
						Check arming and fuzing safety monitor (Mark 4 R/V only).	
				ES		Initiate monitoring of Stage I/II missile hydraulic reservoir levels.	
T-281	152	Check power pack (M)	LS				
				LCS		Check launcher power pack operating properly.	
First hold	160	Ready to raise (C)	LS				Launcher power pack operating (item 080), lox loaded (item 136), missile/facility go, first timing sequence completed, and launcher raising enabled from CCC and either launch

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 10 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
First hold	160	(Continued)					Enabled from LES or exercise enables.
				CCC		RAISE LAUNCHER indicator green on LCC.	
T-279.9	179	Start launcher raising	LC				RAISE LAUNCHER push-button pressed.
				LS		Start second timing sequence.	Ready to raise (item 160).
T-279.9	180	Launcher raising started (C)	LS				Second timing sequence started.
				CCC		RAISE LAUNCHER indicator white on LCC.	
						Disable ready to raise on other two missiles.	
						Disable ready to lower on other two missiles.	
				PLPS		Discontinue monitoring lox above 95%.	
						Open Stage I/II missile fuel storage valves.	Not in exercise mode.
						Simulate Stage I/II missile fuel storage valves open.	In exercise mode.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 11 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-279.9	180	(Continued)		ECS		Energize gas generator valve pilot valve open solenoid (GGVPV).	
				TCS		Freeze target go status.	
				TDB	180	Restart countdown timer clock.	
						Stop digital hold time indicator and reset to zero.	
				RVS		Freeze RVS go status.	
				FCS		Freeze FCS go status.	
		(After incorporation of TCTO 21-SM68-859) Fuel storage valves opened.	PLPS	CCC		Turn on white FUEL PRE-VALVES OPEN indicator on LCC.	
T-279.9	184	Raise launcher (M)	LS				Second timing sequence started.
				ES		(After incorporation of TCTO 31X3-10-12-545) Discontinue monitoring of missile AC, DC and air conditioning.	
				LCS		Fill cable equalizer measuring vessel.	
						Insert horizontal crib lock.	

Figure 3-33. Launch Countdown System Functions (Operational Bases)(Sheet 12 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-279.9	184	(Continued)				Close flame deflector water valve.	
T-279.9				LCS	184	Close engine compartment water valve.	Flame deflector water spray valve closed.
T-279.9	192	Raise antenna (C)	CCC				Item 180 received.
				GGS	192	RAISE ANT indicator white on MGC.	
						Press ANT RAISE pushbutton indicator on MGC (manual).	RAISE ANT indicator white.
						ANT RAISE pushbutton indicator white on MGC.	ANT RAISE pushbutton indicator pressed.
T-250				LCS	184	Insert vertical crib lock.	Horizontal crib lock inserted.
						Insert oblique crib locks.	Horizontal crib lock inserted.
T-250	224	Stop topping (M).	LS				
				PLPS		Open FCV-201 and FCV-202.	
						(After incorporation of TCTO 31X3-10-11-617) Discontinue monitoring helium pressure switches.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 13 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-250	224	(Continued)				(After incorporation of TCTO 31X3-10-11-613) Check fuel pre-valves open.	
						Open lox storage tank vent valve.	
						Close lox transfer pressure control valve(s).	
						Close Stage I/II lox topping line end valves. Close Stage I/II lox fill and drain valves.	Stage I/II lox line end valves and lox topping line end valves closed.
						Open Stage I/II lox umbilical drain valves.	Stage I/II lox fill and drain valves closed.
						Open Stage I/II lox umbilical purge valves.	Stage I/II lox fill and drain valves closed.
						Open lox return line vent valve.	Stage I/II lox umbilical drain valves open.
T-250				PLPS	224	Open lox drain line vent valve.	Stage I/II lox umbilical drain valves open.
						Close lox drain blanket valve.	Lox drain line vent valve or lox return line vent valve open.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 14 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-250	224	(Continued)				Close cold helium line valve.	
						Open warm helium line end valve (FCV 604).	
T-240			PLPS			De-energize Stage I lox fill and drain heater.	No liquid in Stage I umbilical (LS203).
T-235				LCS	184	Open upper shelter door.	Crib leveled and locked and measuring vessel filled.
						Activate cable tension equalizer cylinder.	Crib leveled and locked and measuring vessel filled.
						Insert forward spring capsule locks.	
						Insert rear drive base to silo locks.	
T-225	233	Enable umbilicals disconnect (C)	LS				
				PLPS		(Prior to incorporation of TCTO 31X3-10-11-613) Disconnect Stage I lox fill line (1E1L).	(Prior to incorporation of TCTO 31X3-10-11-613) FCV-215 and FCV-217 open; and either no liquid at the umbilical or no liquid at umbilical drain of each stage; and item 233 received.

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 15 of 39)

TIME	REF	ROUTINE COMMAND	SOURCE	DESTINATION	REF	SUB-COMMAND	PREREQUISITES
T-225	233	(Continued)					(After incorporation of TCTO 31X3-10-11-613) FCV-215 and FCV-217 open; no liquid at either umbilical; and item 233 received.
						(Prior to incorporation of TCTO 31X3-10-11-613) Disconnect Stage II lox fill line (3B1L).	(Prior to incorporation of TCTO 31X3-10-11-613) FCV-215 and FCV-217 open; and either no liquid at the umbilical or no liquid at umbilical drain of each stage; and item 233 received.
T-225	235	Start HPC (C)	PLPS				(After incorporation of TCTO 31X3-10-11-613) FCV-215 and FCV-217 open; no liquid at either umbilical; and item 233 received.
				ES		(Prior to incorporation of TCTO 31X3-10-12-545) Discontinue monitoring of missile AC and DC voltages and air conditioning.	
				LCS		Start launcher raising.	
				ES		Turn off air conditioning.	

Figure 3-33. Launch Countdown System Functions (Operational Bases) (Sheet 16 of 39)