

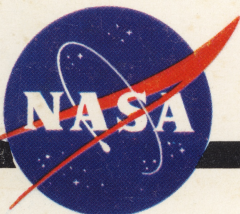
## VOLUME II

# SATURN I COUNTDOWN MANUAL

JOHN F. KENNEDY SPACE CENTER, NASA

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SA-7





SATURN I COUNTDOWN MANUAL

(VOL. 11)

SA-7

TEST NUMBER

7-LSVI-300

LAUNCH COUNTDOWN

SEPTEMBER 5, 1964

JOHN F. KENNEDY SPACE CENTER  
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
CAPE KENNEDY, FLORIDA



SATURN I COUNTDOWN MANUAL

(VOL. I & VOL. II)

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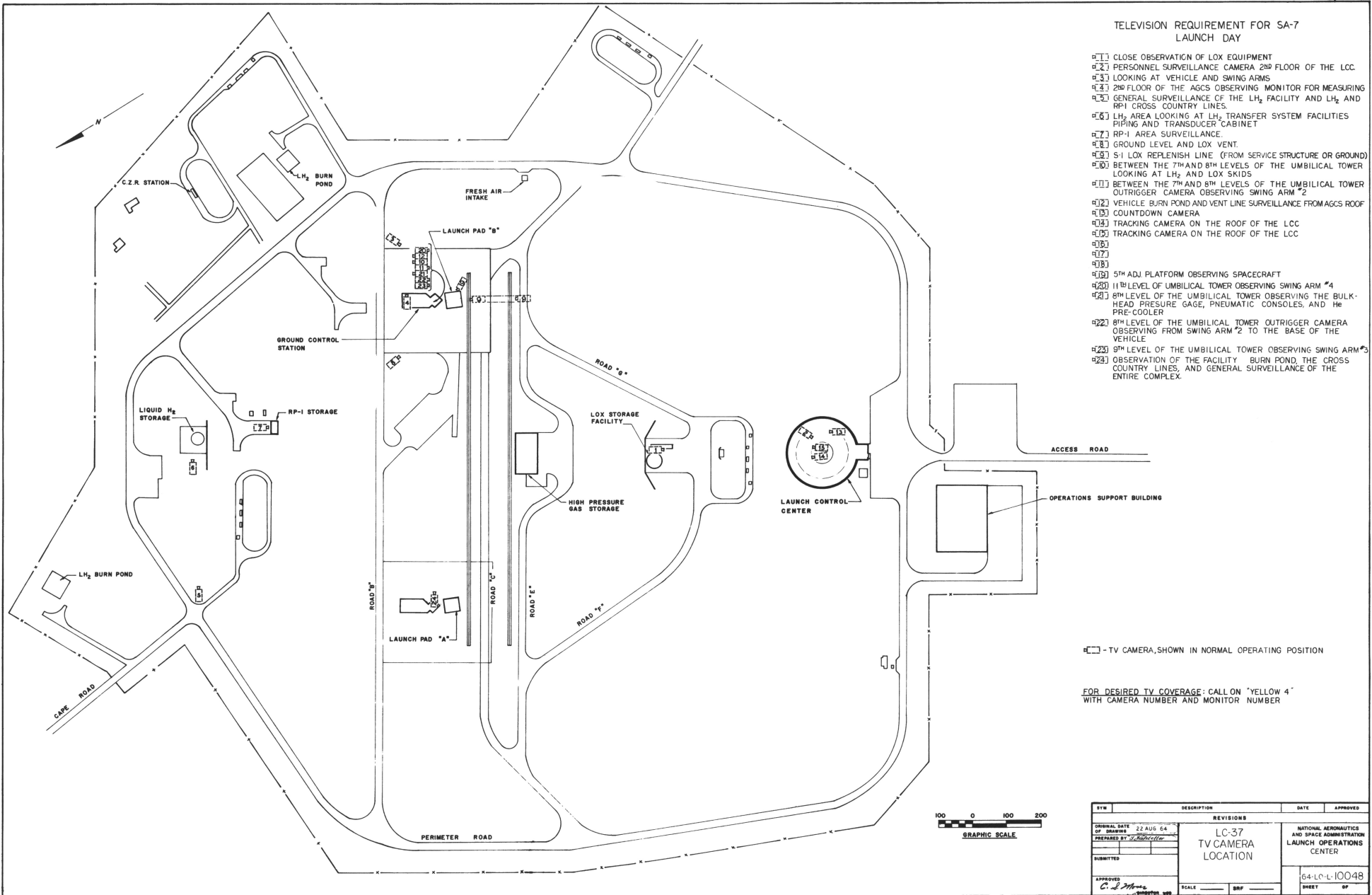
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## LAUNCH OPERATIONS TEST

<b>1. TITLE:</b>  LAUNCH COUNTDOWN		<b>2. TEST NUMBER</b>  7-LSVI-300
<b>4. OBJECTIVES:</b> TO PROVIDE A SEQUENCE OF OPERATION REQUIRED TO PREPARE THE LAUNCH VEHICLE TO THE POINT OF FIRING COMMAND (INITIATION OF TERMINAL FIRING SEQUENCE); TO PROVIDE EMERGENCY PROCEDURES FOR SAFING OF VEHICLE IN THE EVENT OF STANDARD MALFUNCTIONS; TO PROVIDE THE AMR RANGE AND OTHER NASA CENTERS WITH A LISTING OF INTERRELATED ITEMS FOR ACCOMPLISHMENT BEFORE AND AFTER LIFTOFF; AND TO PROVIDE THE COMPLEX CREWS WITH THE IMMEDIATE POST-LAUNCH SECURING OPERATIONS.		<b>3.</b>  SA-7
<b>5. TEST DESCRIPTION:</b>  1. THE COUNTDOWN INCLUDES OR REFERENCES ALL ACTIVITIES REQUIRED TO ACCOMPLISH THE LAUNCH OF THE SATURN I VEHICLE. THIS OPERATION IS DIVIDED INTO TWO PARTS (SPLIT COUNT) NORMALLY TO BE PERFORMED ON TWO CONSECUTIVE DAYS AFTER THE COMPLETION OF FIRST STAGE RP-1 FUEL TANKING AND ASSOCIATED OPERATIONS.  2. EMERGENCY PROCEDURES FOR STANDARD SAFING OPERATIONS ARE INCLUDED AS A PART OF THE COUNTDOWN MANUAL.  3. POST-LIFTOFF OPERATIONS TERMINATE WITH PAYLOAD INJECTION INTO ORBIT.		
<b>6. STATUS:</b>  1. ALL PRELAUNCH PREPARATIONS AND CHECKOUT SATISFACTORILY COMPLETED.		
<b>7. PREPARED BY:</b>	<b>9. NASA SYSTEMS ENGINEER</b>	<b>11. DATE</b>  SEPTEMBER 4, 1964
<b>8. CONTRACTOR GROUP ENGINEER</b>	<b>10. NASA SYSTEMS SUPERVISOR</b>  	<b>12. CONTRACTOR REFERENCE NR.</b>





TELEVISION REQUIREMENT FOR SA-7  
LAUNCH DAY

- 1.1 CLOSE OBSERVATION OF LOX EQUIPMENT
- 1.2 PERSONNEL SURVEILLANCE CAMERA 2ND FLOOR OF THE LCC
- 1.3 LOOKING AT VEHICLE AND SWING ARMS
- 1.4 2ND FLOOR OF THE AGCS OBSERVING MONITOR FOR MEASURING
- 1.5 GENERAL SURVEILLANCE OF THE LH<sub>2</sub> FACILITY AND LH<sub>2</sub> AND RP-1 CROSS COUNTRY LINES.
- 1.6 LH<sub>2</sub> AREA LOOKING AT LH<sub>2</sub> TRANSFER SYSTEM FACILITIES PIPING AND TRANSDUCER CABINET
- 1.7 RP-1 AREA SURVEILLANCE
- 1.8 GROUND LEVEL AND LOX VENT.
- 1.9 S-1 LOX REPLENISH LINE (FROM SERVICE STRUCTURE OR GROUND)
- 1.10 BETWEEN THE 7TH AND 8TH LEVELS OF THE UMBILICAL TOWER LOOKING AT LH<sub>2</sub> AND LOX SKIDS
- 1.11 BETWEEN THE 7TH AND 8TH LEVELS OF THE UMBILICAL TOWER OUTRIGGER CAMERA OBSERVING SWING ARM #2
- 1.12 VEHICLE BURN POND AND VENT LINE SURVEILLANCE FROM AGCS ROOF
- 1.13 COUNTDOWN CAMERA
- 1.14 TRACKING CAMERA ON THE ROOF OF THE LCC
- 1.15 TRACKING CAMERA ON THE ROOF OF THE LCC
- 1.16
- 1.17
- 1.18
- 1.19 5TH ADJ PLATFORM OBSERVING SPACECRAFT
- 1.20 11TH LEVEL OF UMBILICAL TOWER OBSERVING SWING ARM #4
- 1.21 8TH LEVEL OF THE UMBILICAL TOWER OBSERVING THE BULK-HEAD PRESSURE GAGE, PNEUMATIC CONSOLES, AND HE PRE-COOLER
- 1.22 8TH LEVEL OF THE UMBILICAL TOWER OUTRIGGER CAMERA OBSERVING FROM SWING ARM #2 TO THE BASE OF THE VEHICLE
- 1.23 9TH LEVEL OF THE UMBILICAL TOWER OBSERVING SWING ARM #3
- 1.24 OBSERVATION OF THE FACILITY BURN POND, THE CROSS COUNTRY LINES, AND GENERAL SURVEILLANCE OF THE ENTIRE COMPLEX.

□ - TV CAMERA, SHOWN IN NORMAL OPERATING POSITION

FOR DESIRED TV COVERAGE: CALL ON "YELLOW 4" WITH CAMERA NUMBER AND MONITOR NUMBER

SYM	DESCRIPTION	DATE	APPROVED
ORIGINAL DATE OF DRAWING	22 AUG 64		
PREPARED BY	<i>S. H. Miller</i>		
SUBMITTED			
APPROVED	<i>C. J. Moore</i>		
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION <b>LAUNCH OPERATIONS CENTER</b>		64-LC-L-10048 SHEET <span style="float: right;">OF</span>	



## ENGINE CUTOFF AND EMERGENCY OPERATIONS

### 1. NETWORK PANEL CUTOFF

CUTOFF FROM THE NETWORK PANEL SHOULD BE INITIATED ONLY IN A SITUATION WHERE A TURBINE SPINNER SQUIB INADVERTENTLY IGNITES PRIOR TO THE IGNITION COMMAND. THE CUTOFF BUTTON SHOULD BE DEPRESSED UNTIL PREVALVES 1-8 SWITCHES ARE TURNED OFF. (FOR DETAILED PROCEDURE SEE "EMERGENCY PROCEDURE" INCORPORATED IN THE LAUNCH COUNTDOWN.)

### 2. FIRING PANEL CUTOFF

ONCE FIRING COMMAND HAS BEEN INITIATED AT T-2'33" AND THE AUTOMATIC SEQUENCE BEGINS, IT IS NECESSARY TO GIVE CUTOFF FROM THE FIRING PANEL TO STOP THE SEQUENCE AND INTERRUPT THE ASSOCIATED FIRING CIRCUITRY. THIS CUTOFF WILL NOT FIRE THE CONAX VALVE SQUIBS NOR CLOSE THE PREVALVES UNLESS IGNITION COMMAND HAS BEEN INITIATED. (FOR DETAILED PROCEDURE SEE "EMERGENCY PROCEDURE" INCORPORATED IN THE LAUNCH COUNTDOWN.)

3. AUTOMATIC MALFUNCTION CUTOFFS

TYPE OF CUTOFF	ACTIVE		DESCRIPTION
	FROM	TO	
PREMATURE COMMIT	POWER ON	TIME FOR COMMIT	THIS CIRCUIT WILL DETECT PREMATURE VOLTAGE ON THE +1D14 BUS.
SEQUENCE FAILURE	TIME FOR IGNITION	IGNITION COMMAND	THIS CUTOFF WILL COME AT "TIME FOR IGNITION" IF ANY ONE OR MORE OF THE PREREQUISITES IN THE "READY FOR IGNITION" CHAIN IS NOT MET.
S-I VOLTAGE FAILURE	IGNITION COMMAND	COMMIT	THIS CIRCUIT DETECTS LOSS OF THE S-I INVERTER BUS.
S-IV FAILURE	IGNITION COMMAND	COMMIT	THIS CUTOFF WILL BE INITIATED IF ANY ONE OR MORE OF THE PREREQUISITES FOR "S-IV READY TO LAUNCH" ARE NOT MET BY THE TIME S-I IGNITION COMMAND OCCURS.
IU FAILURE	IGNITION COMMAND	COMMIT	THIS CUTOFF WILL BE INITIATED IF ANY OF THE PREREQUISITES IN THE "IU READY" CHAIN ARE NOT MET BY THE TIME S-I IGNITION OCCURS.



TYPE OF CUTOFF	ACTIVE		DESCRIPTION
	FROM	TO	
FIRE DETECTION	IGNITION COMMAND	COMMIT	THIS CIRCUIT WILL INITIATE CUTOFF IF THERMOCOUPLES MOUNTED ON THE HEAT SHIELD DETECT A PREDETERMINED RATE OF HEAT RISE.
ROUGH COMBUSTION	IGNITION COMMAND	COMMIT	THIS CIRCUIT WILL DETECT ROUGH COMBUSTION OF ANY ENGINE, CUTOFF THIS ENGINE IMMEDIATELY AND INITIATE SEQUENCE CUTOFF TO THE REMAINING ENGINES.
THRUST FAILURE	TIME FOR COMMIT	COMMIT	THIS CIRCUIT WILL INITIATE CUTOFF IF ANY ONE OR MORE OF THE S-1 ENGINES IS NOT RUNNING BY "TIME FOR COMMIT"
LAUNCH FAILURE	IGNITION COMMAND	LIFTOFF	THIS CIRCUIT WILL INITIATE CUTOFF 8 SECONDS AFTER IGNITION IF THE VEHICLE HAS NOT LIFTED OFF BY THIS TIME. (NOMINAL TIME IS APPROXIMATELY 3.4")

#### 4. PRIMARY (60 CYCLE AC) POWER FAILURES

A MOMENTARY LOSS OF AC POWER (CAPE CRITICAL OR INDUSTRIAL) WILL CAUSE ALL GENERATORS TO DROP OUT; HOWEVER, BACKUP BATTERIES (160 AMPERE-HOUR) ACROSS THE GENERATOR OUTPUT LINES PROVIDE 28 VDC POWER FOR MAINTAINING THE VEHICLE IN A SAFE CONDITION. DURING ANY EXTENDED LOSS OF AC POWER, ANY UNNECESSARY LOADS WILL BE REMOVED FROM THE BUSES.



COMPLEX 37 COMMUNICATIONS  
-----

INTERCOM: (IC)

TO BE UTILIZED FOR "T" COUNT ANNOUNCEMENTS,  
OPERATIONAL AND EMERGENCY ANNOUNCEMENTS, AND  
FOR PAD NORCOM REQUEST ANNOUNCEMENTS.

PAGING: (PA)

TO BE UTILIZED FOR ADMINISTRATIVE PHONE CALL  
ANNOUNCEMENTS, "T" COUNT ANNOUNCEMENTS, AND  
PAGING SPECIFIC PERSONNEL TO A HEADSET CHANNEL.

NORCOM: (OIS)

THE TEST AND CHECKOUT OPERATIONAL COMMUNICATIONS  
UTILIZED AS ASSIGNED OR INDICATED IN THE  
PROCEDURE FOR THE TEST OPERATIONS. TEST  
SUPERVISORY PERSONNEL SHOULD ALWAYS BE AVAILABLE  
IN THE FOLLOWING CIRCUITS,

S-I CHIEF OPERATIONS ENGINEER (CHRYSLER)	SI
S-IV CHIEF OPERATIONS ENGINEER (DOUGLAS)	SIV
LAUNCH VEHICLE TEST CONDUCTOR (NASA-KSC)	S
SPACECRAFT TEST CONDUCTOR (NASA-MSD)	SC
VEHICLE TEST SUPERVISOR	S,SRO

RANGE PHONE: (SRO)

A SPECIAL COMMUNICATIONS NETWORK IS ESTABLISHED  
BETWEEN THE TEST SUPERVISOR AND THE EASTERN TEST  
RANGE SUPERVISOR OF RANGE OPERATIONS. THIS  
CIRCUIT WILL BE UTILIZED FOR ALL TEST RELATED  
COMMUNICATIONS BETWEEN THE LAUNCH COMPLEX AND  
CENTRAL CONTROL. IT WILL BE BUSSED TO THE OIS  
AS REQUIRED BY THE TEST PROCEDURE OR AT THE  
DISCRETION OF THE TEST SUPERVISOR.

NORCOM CHANNEL ASSIGNMENTS  
 -----

CHANNEL -----		PRIMARY FUNCTION -----
*RED 1	(RD1)	S-I VEHICLE MECHANICAL
RED 2	(RD2)	S-IV VEHICLE MECHANICAL
*RED 3	(RD3)	ALL LAUNCH VEHICLE GSE (MECHANICAL)
RED 4	(RD4)	PROPELLANTS
YELLOW 1	(YW1)	GYRO AND LAYING
YELLOW 2	(YW2)	LAUNCH VEHICLE CONTROL
YELLOW 3	(YW3)	GUIDANCE AND RCA 110 COMPUTER
*YELLOW 4	(YW4)	PAD SAFETY, TV AND COMMUNICATIONS
YELLOW 5	(YW5)	( NOT ASSIGNED)
BROWN 1	(BR1)	S-I MEASURING AND BH MONITOR CIRCUIT
BROWN 2	(BR2)	S-IV MEASURING
BROWN 3	(BR3)	FACILITY AND GSE MEASURING
BROWN 4	(BR4)	SERVICE STRUCTURE MEASURING STATION
*BLUE 1	(BL1)	NASA GROUND ELECTRICAL NETWORK
BLUE 2	(BL2)	DAC GROUND ELECTRICAL NETWORK
*BLUE 3	(BL3)	S-I, IU VEHICLE NETWORK
BLUE 4	(BL4)	DAC S-IV VEHICLE NETWORK
GRAY 1	(GY1)	TELEMETER S-I AND S-IV
GRAY 2	(GY2)	ALL OTHER RF VEHICLE SYSTEMS
GREEN 1	(GN1)	SC TEST PROJECT ENGINEER
GREEN 2	(GN2)	SC LAUNCH ESCAPE SYSTEM/ORDNANCE
GREEN 3	(GN3)	MSC QUALITY CONTROL
GREEN 4	(GN4)	NAA QUALITY CONTROL
GREEN 5	(GN5)	(NOT ASSIGNED)



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WHITE 3	(WH3)	SC FACILITIES
WHITE 4	(WH4)	SC ENVIRONMENTAL CONTROL
WHITE 5	(WH5)	SC ELECTRICAL POWER SYSTEM
PURPLE 1	(PR1)	SC INSTRUMENTATION
PURPLE 2	(PR2)	SC RF SYSTEMS
PURPLE 3	(PR3)	SC GROUND SUPPORT EQUIPMENT
*S-I (WHITE 1)	(SI)	S-I, IU TEST CONDUCTOR
*S-IV (WHITE 2)	(SIV)	S-IV TEST CONDUCTOR
SC	(SC)	SPACECRAFT TEST CONDUCTOR
*S	(S)	SPACE VEHICLE TEST SUPERVISOR
* CHANNELS LOCATED ON "ALL" END UNITS		

-----

OPERATING STATIONS CODE IDENTIFICATION  
-----

BLOCKHOUSE CONSOLES

C1CM	S-I CAMERA PANEL
C1CT	S-I COMPONENT TEST PANEL
C1DP	S-I DESTRUCT PANEL
C1FP	S-I FIRING PREP PANEL
C1FR	S-I FIRING PANEL
C1LS	LAUNCH SEQUENCER PANEL
C1MP	S-I MEASURING PANEL
C1NP	S-I NETWORKS PANEL
C1OP	S-I ORDNANCE MONITOR PANEL
C1TC	S-I TEST CONDUCTOR
C1VP	S-I VEHICLE PRESSURE PANEL
C4DP	S-IV DESTRUCT PANEL
C4OP	S-IV ORDNANCE MONITOR PANEL
C4TC	S-IV TEST CONDUCTOR
CATE	S-IV ASTRIONICS TEST ENGINEER
CDCG	DC GENERATOR PANELS
CDIR	DIRECTOR KSC
CETE	S-IV ELECTRICAL EQUIPMENT TEST ENGINEER
CGCM	GROUND CAMERA PANEL
CINV	INVERTER PANELS
CIPC	S-IV INSTRUMENTATION POWER CONTROL AND MONITOR PANEL
CISP	INSTRUMENTATION STATUS PANEL
CLTC	LAUNCH VEHICLE TEST CONDUCTOR
CLVN	VEHICLE NETWORKS PANEL
CNTS	NASA TEST SUPERVISOR
CPER	PERISCOPE
CPPC	S-IV PROPULSION SYSTEM PREPARATION AND CONTROL PANEL
CPSC	S-IV PNEUMATIC SYSTEM CONTROL PANEL
CPSO	PAD SAFETY OFFICER
CPSP	POWER SWITCHING PANEL
CPTC	S-IV PROPULSION TEST ENGINEER
CSPC	S-IV STAGE POWER CONTROL AND MONITOR PANEL
CSRP	SEQUENCE RECORDER READOUT PANEL
CSSP	S-IV STAGE SYSTEM STATUS PANEL
CSTC	SPACECRAFT TEST CONDUCTOR
CUMP	IU MEASURING PANEL
CUNC	IU NITROGEN CONTROL PANEL
CUNP	IU NETWORKS PANEL
CVMP	S-IV VACUUM MONITOR PANEL
CVTE	S-IV VEHICLE DESIGN TEST ENGINEER

BLOCKHOUSE RACKS

R4FC	HYDRAULIC CONTROL AND MONITOR PANEL
RATC	AUTOMATIC THEODOLITE CONTROL
RBHM	BLOCKHOUSE MEASURING
RCSM	COMBUSTION STABILITY MONITOR
RECS	ENVIRONMENTAL CONTROL SYSTEM
RFCE	S-IV FLIGHT CONTROL ENGINEER
RFDM	FIRE DETECTION MONITOR
RFSR	S-IV FLIGHT SEQUENCE RECORDER
RGCC	GUIDANCE COMPUTER CONTROL
RGMC	GUIDANCE MONITOR CONTROL
RGPP	GROUND PRESSURE PANEL
RGRM	GROUND FACILITY MEASURING
RLFO	LIFTOFF CLOCK
RLHC	LH2 CONTROL
RLHM	LH2 MONITOR
RLOC	LOX COMPUTER
RLOO	LOX CONTROL
RPLC	S-IV PROPELLANT LOADING CONTROL
RPRR	PROPELLANT RECORDER READOUTS
RPSQ	PROPELLANT SEQUENCE RECORDERS
RPUP	S-IV PROPELLANT UTILIZATION PANEL
RRPC	RP-1 COMPUTER
RRPO	RP-1 CONTROL
RS4C	ST-124 CONTROL PANEL
RSCR	S-IV STRIP CHART RECORDERS
RSEQ	S-I AND IU SEQUENCE RECORDER
RTLK	TRAFFIC LIGHT CONTROL PANEL
RUAC	UMBILICAL ARM CONTROL
RVFC	VEHICLE FLIGHT CONTROL
RVIS	S-I AND IU VISICORDER
RWCP	WATER CONTROL PANEL
R4VC	S-IV VISICORDER

SERVICE STRUCTURE, LAUNCH PEDESTAL AND VEHICLE

S124	ST-124 IU
S1FC	FLIGHT CONTROL S-I ENGINE
S1NA	NETWORKS UNIT 1-9
S1NF	NETWORKS UNIT 10-12
S1TM	S-I TM
S1VM	S-I VEHICLE MECHANICAL PLATFORM NO. 1
S4AE	S-IV VEHICLE ASTRONICS ENGINEER
S4CC	S-IV CREW CHIEF
S4EE	S-IV VEHICLE ELECTRICAL EQUIPMENT ENGINEER
S4FC	FLIGHT CONTROL S-IV STAGE
S4ME	S-IV MECHANICAL EQUIPMENT ENGINEER
S4OE	S-IV ORDNANCE ENGINEER
S4PE	S-IV PROPULSION ENGINEER
S4SE	S-IV STRUCTURES ENGINEER
S4VE	S-IV VEHICLE DESIGN ENGINEER
SESP	ENGINE SERVICE PLATFORM
SGNP	GROUND NETWORKS ON PEDESTAL
SGMP	GSE MECHANICAL ON PEDESTAL
SHZN	HORIZON SENSOR
SMRP	S-IV MATERIAL RESEARCH AND PROCESS ENGINEER
SMTE	S-IV MECHANICAL TEST ENGINEER
SOBR	OVERALL TEST BATTERY ROOM
SOPS	S-IV OPERATIONS ENGINEER
SGFC	FLIGHT CONTROL Q-BALL
SSM1	SHORT CABLE MAST NO. 1
SSM2	SHORT CABLE MAST NO. 2
SSMS	STRUCTURE MEASURING STATION
SSSC	SERVICE STRUCTURE CONTROL
SUFC	FLIGHT CONTROL IU
SUGU	GUIDANCE IU
SUTM	IU TM
SUVM	IU VEHICLE MECHANICAL PLATFORM NO. 3
SUVN	NETWORKS IU
SVME	VEHICLE MEASURING
SVMP	VEHICLE MECHANICAL ON PEDESTAL
SVOC	VEHICLE NETWORKS OAT CONSOLE
SVOR	VEHICLE NETWORKS RECORDERS
SVRF	VEHICLE RF



AGCS

A4AE	S-IV AGCS ELECTRICAL
AEBR	EMERGENCY BATTERY ROOM
AGAA	ST-124 ALIGNMENT AMPLIFIER
ANAG	AGCS NETWORKS
APCD	PNEUMATIC CONTROL DISTRIBUTOR
AECS	ECS ON AGCS ROOF

BLOCKHOUSE FIRST FLOOR

B1TM	S-1 BLOCKHOUSE TELEMETER STATION
B4TM	S-IV BLOCKHOUSE TELEMETER STATION
BCDC	COUNTDOWN CLOCK
BCOM	COMMUNICATIONS AND TV CONTROL
BDOP	ODOP GROUND STATION
BGRN	LCC NETWORKS
BRCA	RCA SEQUENCER
BRFS	BLOCKHOUSE RF STATION
BSOC	SATURN OPERATIONAL COMPUTER

UMBILICAL TOWER

U4PE	S-IV PROPULSION ENGINEER
UECS	ECS ON UMBILICAL TOWER
UGRN	UMBILICAL GROUND NETWORKS
UGSE	UMBILICAL GSE
UPNC	S-IV PNEUMATIC CONSOLES A AND B
UQBL	Q-BALL GSE
USA1	UMBILICAL SWING ARM NO, 1 CONTROL PANEL
USA2	UMBILICAL SWING ARM NO, 2 CONTROL PANEL
USA3	UMBILICAL SWING ARM NO, 3 CONTROL PANEL
USA4	UMBILICAL SWING ARM NO, 4 CONTROL PANEL

PAD AND OTHER COMPLEX AREAS

PALN	VEHICLE ALIGNMENT STATIONS
PATB	AUTOMATIC THEODOLITE BLDG,
PHPF	HIGH PRESSURE FACILITY
PLHF	LH2 FACILITY
PLOF	LOX FACILITY
PPSO	PSO ON PAD
PRPF	RP-1 FACILITY
PVP1	VALVE PIT NO, 1

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STATIONS EXTERNAL TO COMPLEX 37

OCCF	CONVERTER COMPRESSOR FACILITY
ORNG	RANGE OPERATIONS THROUGH THE SRO
OTMD	TELEMETER HANGAR D STATION

PRELAUNCH PREPARATIONS - L-1 DAY  
PART IV

LAUNCH COUNTDOWN  
PART V



BUILT IN HOLD

TIME IN MINUTES

LIFTOFF

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART IV LAUNCH PRECOUNT	
-875 <sup>1</sup>						
	SRO	1	CNTS	ORNG	VERIFY COMPLEX IS ON CRITICAL POWER,	
		2		S1VM SUVN	OPEN VEHICLE.	
	BL1	3		CINV	GROUND INVERTER 2 AND 60 KW GENERATOR "ON".	
		4		SVME	REMOVE ALL PNEUMATIC CALIBRATION LINES AND SAFETY WIRE CALIBRATION VALVES.	
		5		APCD	PREPARE THE PNEUMATIC DISTRIBUTION SYSTEM FOR PRELAUNCH OPERATIONS PER PROCEDURE LVO-E-7015.	
	PA	6		CNTS	RF SILENCE "ON".	
	RD3	7		RWCP	PREPARE WATER SYSTEM PER PROCEDURE LVO-E-7014, PART I.	
	RD4	8		PLHF	SET UP LH2 TRANSFER SYSTEM PER PROCEDURE LVO-L-1034.	
	SIV	9	C4TC	CSPC	APPLY POWER TO S-IV PER PROCEDURE DAC-N-7001.	
	SIV	10	C4TC		VERIFY UMBILICAL TOWER WATER SYSTEM "ON".	
	BL4	11	C4TC	CATE	BEGIN S-IV BATTERY INSTALLATION PER PROCEDURE DAC-N-7005.	
	RD2	12	C4TC	CPTC	BEGIN S-IV PROPULSION PRELIMINARY PREPS PER PROCEDURE DAC-P-7005, PART I.	
	RD1	13	S4PE	SVMP	REMOVE CHILLDOWN DUCT DESSICATORS AND STUB FIN MAST ADAPTERS.	
	RD2	14	C4TC	CPTC	PERFORM PROPELLANT LINES VACUUM CHECK PER DAC-P-7005, PART II.	
	RD3	15		RECS	PERFORM ECS PREPARATIONS AND OPERATIONS PER PROCEDURE LVO-E-7018.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-875 <sup>0</sup>	GY1	16	B1TM	SUTM S1TM B1TM	PREPARE S1 & IU TELEMETER SYSTEMS PER PROCEDURE LVO-R-3001.	
	GY2	17	BRFS	SVRF	PREPARE S1 & IU RF SYSTEMS PER PROCEDURE LVO-R-3002.	
	WH2	18	C4TC	S4AE	PERFORM RF & TM SYSTEMS PRE-TEST PREPARATIONS PER PROCEDURE LVO-R-3003.	
-865 <sup>0</sup>	SIV	1	C4TC	SMTE	VERIFY QUICK DISCONNECTS AND UMBILICAL CARRIERS PROPERLY INSTALLED, (SWING ARM NO. 2 AND GH2 VENT COUPLING),	
					NOTE	
					STEEL SHEAR PINS, SAFETY BLOCKS AND SAFETY WIRE INSTALLED, LANYARDS NOT CONNECTED, AND EJECT ACTUATOR PNEUMATIC LINES NOT CONNECTED.	
	S	2	CLTC	C4TC	VERIFY POWER ON S-IV.	
	SIV	3	C4TC		ALL STATUS SELECT SWITCHES TO "ON SCHEDULE".	
-845 <sup>0</sup>	RD2	1	C4TC	CPTC	VERIFY COMPLETION OF S-IV PROPULSION PRELIMINARY PREPS PER DAC-P-7005, PART I.	
	RD2	2	C4TC	CPTC	VACUUM PUMP HELIUM HEATER AND ENGINE IGNITERS PER PROCEDURE DAC-P-7005, PART III.	
	RD2	3	C4TC	CPTC	PERFORM LH2 AND LOX SYSTEMS PURGES AND SAMPLING PER PROCEDURE DAC-P-7005, PART V.	
	RD2	4	C4TC	CPTC	PERFORM BULKHEAD SAMPLING PER PROCEDURE DAC-P-7005, PART IV.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-830 <sup>o</sup>		1		S1NF SVOC	VERIFY DESTRUCT MONITOR SYSTEM READY.	
-825 <sup>o</sup>	BL1	1		C1NP	APPLY POWER TO S-I.	
	BL1	2		CUNP	APPLY POWER TO IU.	
		3		SVMP	CHECK MAIN FUEL VALVES FOR LEAKAGE AND RECORD IF LEAKAGE IS NOTED.	
		4		SVMP	INSTALL FUEL DRAIN SCREWS/WASHERS.	
		5		SVMP	CHECK THAT THE CONTROL 750 REGULATOR IS STILL ADJUSTED TO 750 PSIG.	
	BL1	6		CPSP	SERVICE STRUCTURE OAT POWER "ON".	
	BL1	7		SVOC	PULSE SENSOR POWER "ON".	
	BL1	8		SVOC	TEST DESTRUCT PULSE SENSORS AND RESET.	
	BL1	9	C4TC	S1NA	BEGIN NO VOLTAGE AND CONTINUITY CHECKS ON TURBINE SPINNER INITIATOR CIRCUITS PER PART I OF PROCEDURE 1-LSII-709.	
-820 <sup>o</sup>	RD1	1	C1CT	RBHM	VERIFY S-I LOX TANK PRESSURE MEASUREMENTS INDICATE TANK PRESSURE BEFORE VENTING.	
-815 <sup>o</sup>	BL1	1		ANAG	STANDBY TO TURN IGNITION CIRCUIT BREAKER AND CONTACTOR "ON".	
	RD1	2	C1TC	SVMP SGMP	PREPARE TO RUN ELECTRO-MECHANICAL TEST PER PROCEDURE LVO-MV-P-1006.	
		3		SHZN	HORIZON SENSOR CHECKS.	
	RD2	4	C4TC	CPTE	VERIFY COMPLETION OF HELIUM HEATER AND ENGINE IGNITER VACUUM PUMPING PER DAC-P-7005, PART III.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-815'	RD2	5	C4TC	CPTC	VERIFY COMPLETION OF PROPELLANT LINES VACUUM CHECK PER DAC-P-7005, PART II	
	BL4	6	C4TC	CATE	VERIFY COMPLETION OF S-IV BATTERY INSTALLATION PER DAC-N-7005.	
	RD2	7	C4TC	CPTC	VERIFY COMPLETION OF BULKHEAD SAMPLING PER DAC-P-7005, PART IV.	
-800'	RD2	1	C4TC	CPTC	VERIFY COMPLETION OF LH2 AND LOX SYSTEM PURGES AND SAMPLING PER DAC-P-7005, PART V.	
	RD2	2	C4TC	CPTC	PERFORM PROPELLANT VALVES AND IGNITERS FUNCTIONAL CHECK PER PROCEDURE DAC-P-7005, PART VI.	
-790'	SRO	1	CNTS	ORNG	DO NOT INTERROGATE C-BAND BEACON WITH 1.16 RADAR UNTIL REQUESTED.	
-785'	BL1	1	C1TC	S1NA	VERIFY NO VOLTAGE AND CONTINUITY CHECKS COMPLETE ON S.P.G.G. INITIATOR CIRCUITS PRIOR TO RF CHECKS,	
		2	C1TC	C1NP	RESET IGNITION SEQUENCER	
		3	CATE	S4CC	START FORWARD INTERSTAGE AUXILIARY BLOWER.	
	SRO	4	CNTS	ORNG	RF CLEARANCE FOR ALL SYSTEMS AND VERIFY READY FOR READOUTS.	
	SRO	5	CNTS	ORNG	DO NOT INTERROGATE C-BAND BEACON WITH 1.16 RADAR UNTIL REQUESTED.	
		6			RF AND TM CHECKS. -----	
	PA	6-1		CNTS	RF SILENCE "OFF".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-785'						
	S	6-2	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1 AND S2 "ON".	
	S	6-3	CLTC	CUMP	TELEMETERS F5, F6, S3 AND P1 "ON".	
	S	6-4	CLTC	C1MP, CUMP	AUXILIARY EQUIPMENT "ON".	
	S	7	CLTC	C1MP CUMP	MEAS. ON DDAS "ON".	
	S	7-1	CLTC	C1MP CUMP	SWEEP FREQUENCY CALIBRATOR "ON".	
	S	7-2	CLTC	BDOP	ODOP GROUND TRANSMITTER NO. 2 "ON".	
	S	7-3	CLTC	CUMP	ALTIMETER "ON".	
	S	7-4	CLTC	CUMP	GUIDANCE COMMAND RECEIVER "ON".	
	S	7-5	CLTC	CUMP	ODOP "ON".	
	S	7-6	CLTC	CUMP	MINITRACK "ON".	
	S	7-7	CLTC	CUMP	AZUSA "ON".	
	S	7-8	CLTC	CUMP	C-BAND BEACON (RADAR) TO "ON".	
	S	7-9	CLTC	CUMP	MISTRAM "ON".	
	SRO	7-10	CNTS	ORNG	CHECK MISTRAM AND AZUSA AND REPORT READOUT.	
	S	7-11	CLTC	CIPC	TELEMETER D1, D2, AND D3 "ON".	
	S	7-12	CLTC	C1MP CUMP CIPC	VERIFY TAPE RECORDER READY INDICATIONS.	
	S	7-13	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT".	
	S	7-14	CLTC	CIPC	CALIBRATION SWITCH TO MANUAL (VERIFY VCO CALIBRATION LIGHT OUT),	
	S	7-15	CLTC	C1MP CUMP	PRE-FLIGHT CALIBRATION TO 50%.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-785 <sup>0</sup>	S	7-16	CLTC	B4TM	TELEMETER RECORDINGS "ON".	
	S	7-17	CLTC	B4TM	PERFORM TELEMETER CHANNEL READOUTS.	
					NOTE	
					VERIFY CHANNEL 21-24 OF TELEMETER D2 HIGH LEVEL PDM READING 100%.	
-782 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	OTMD	TELEMETER RECORDINGS "ON".	
	S	1-2	CLTC	ORNG	COMMAND CARRIER "ON".	
	S	1-3	CLTC	RBHM	SANBORN RECORDER TO 2 MM/SEC.	
	S	1-4	CLTC	CSSP	VERIFY MSFC TALKBACK ENABLE.	
	S	1-5	CLTC	CLVN	DESTRUCT ENABLE "ON".	
	S	1-6	CLTC	C4DP	VERIFY SAFETY BUS INDICATION "ON".	
	S	1-7	CLTC	C1DP	S-I CDR'S NO. 1 AND NO. 2 "ON".	
	S	1-8	CLTC	C10P	MODULE POWER SUPPLY "ON".	
	S	1-9	CLTC	C10P	FUNCTION SELECTOR TO FIRING UNIT VOLTAGE CHECK.	
	S	1-10	CLTV	C40P	PANEL SELECT TO "AUXILIARY RECORDER".	
	S	1-11	CLTC	R4VC	VISICORDER "ON".	
	S	1-12	CLTC	RFSR	SEQUENCE RECORDERS TO 10 MM/SEC.	
	S	1-13	CLTC	C4DP	S-IV CDR #1 AND #2 "ON".	
	S	1-14	CLTC	C1DP C4DP	VERIFY EBW'S #1 AND #2 "OFF" AND "NOT READY".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-780'		1			RF AND TM CHECKS. -----	
	SRO	1-1	CNTS	ORNG	INTERROGATE IU AND SPACECRAFT C-BAND BEACONS WITH 1.16 RADAR AND 0.18 RADAR RESPECTIVELY.	
	S	1-2	CLTC	RSEQ	S-I RECORDERS TO MINUTE SPEED AND TIME PULSE "ON",	
	S	1-3	CLTC	C1CM	TELEVISION TO "FILAMENT".	
	S	1-4	CLTC	C4DP	S-IV CDR #1 AND #2 TO "INTERNAL",	
	S	1-5	CLTC	RBHM	SANBORN RECORDER TO 25 MM/SEC.	
	S	1-6	CLTC	RSEQ	RECORDERS FAST.	
	S	1-7	CLTC	ORNG	DESTRUCT COMMAND (MOMENTARILY THROUGH CUTOFF).	
	S	1-8	CLTC	RSEQ	RECORDERS SLOW.	
	S	1-9	CLTC	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	1-10	CLTC	C4DP	VERIFY S-IV EBW NO. 1 AND NO. 2 GO TO INTERNAL AND CHARGE.	
	S	1-11	CLTC	C1DP	VERIFY S-I EBW'S NO. 1 AND NO. 2 LATCH INTERNAL AND CHARGE ON GROUND POWER.	
	S	1-12	CLTC	CNTS	VERIFY CUTOFF COMMAND FOR 2.0 SECONDS.	
	S	1-13	CLTC	CNTS	VERIFY DESTRUCT COMMAND 2.0 SECONDS AFTER CUTOFF RECEIVED.	
	S	1-14	CLTC	SVOC	VERIFY S-I AND S-IV DESTRUCT DOES NOT OCCUR AT THE VEHICLE.	
	S	1-15	CLTC	ORNG	RELEASE DESTRUCT COMMAND.	
	S	1-16	CLTC	C4DP	S-IV CDR SWITCHES NO. 1 AND NO. 2 "OFF" (VERIFY CDR'S REMAIN ON).	
	S	1-17	CLTC	ORNG	"SAFE" COMMAND AND RELEASE UPON REQUEST.	
	S	1-18	CLTC	C4DP	VERIFY "SAFE" COMMAND.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-780'						
	S	1-19	CLTC	C4DP B4TM	VERIFY S-IV CDR #1 AND #2 AND EBW #1 AND #2 REMAIN "ON".	
	S	1-20	CLTC	C1DP C4DP	EBW #1 AND #2 TO "EXTERNAL" (VERIFY "OFF" AND "NOT READY").	
	S	1-21	CLTC	C4DP	S-IV CDR'S #1 AND #2 TO "EXTERNAL" AND VERIFY "OFF".	
	S	1-22	CLTC	C1DP	S-I CDR NO. 1 AND NO. 2 "OFF".	
	S	1-23	CLTC	CLVN	DESTRUCT ENABLE "OFF".	
	S	1-24	CLTC	RFSK	SEQUENCE RECORDERS TO 2 MM/SEC.	
	S	1-25	CLTC	R4VC	VISICORDER "OFF".	
		1-26	CLTC	BDOP	ODOP GROUND TRANSMITTER #2 "OFF" AND #1 "ON".	
	S	1-27	CLTC	RSEQ	RECORDERS TO HOUR SPEED, TIME PULSE "OFF".	
	S	1-28	CLTC	RBHM	SANBORN RECORDER TO 2 MM/SEC.	
	SRO	1-29	CNTS	ORNG	COMMAND CARRIER "OFF".	
	SRO	1-30	CNTS	ORNG	REPORT COMMAND CARRIER DEVIATION, ANTENNA, ANTENNA ORIENTATION, AND POWER OUTPUT.	
	RD3	2	CLTC	APCD	VERIFY COMPLETION OF PNEUMATIC PREPS FOR PRELAUNCH PROCEDURE LVO-E-9015.	
	SC	3	CNTS	CSTC	PERFORM SPACECRAFT PREPARATIONS.	
-776'		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	CIPC	MANUAL CALIBRATION TO 0 VOLTS.	
	S	1-2	CLTC	B1TM	TELEMETER RECORDINGS "ON".	
	S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATION TO "AC COMMAND".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-775' 15"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" AND "OFF",	
-775'		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	TELEMETER CALIBRATION TO PREFLIGHT,	
	S	1-2	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMAND,	
	S	1-3	CLTC	C1MP CUMP	PREFLIGHT CALIBRATION TO 0%.	
	S	1-4	CLTC	C1PC	MANUAL CALIBRATION TO +2.5 VOLTS,	
	S	1-5	CLTC	C1CM	TELEVISION TO "B*",	
	RD1	2		C1CT C1FP S1VM	VENT LOX TANK STANDBY PRESSURE,	
	RD1	3		C1TC SVMP SGMP	PERFORM ELECTRO-MECHANICAL TEST PER PROCEDURE LVO-MV-P-1006.	
-774'		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1PC	MANUAL CALIBRATION TO +5 VOLTS,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
=773 <sup>0</sup> 30"		1			RF AND TM CHECKS. -----		
	S	1-1	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 100%.		
	S	1-2	CLTC	CIPC	MANUAL CALIBRATION TO 0 VOLTS.		
	=772 <sup>0</sup> 30"		1			RF AND TM CHECKS. -----	
		S	1-1	CLTC	C1MP CUMP	RECORDER TRANSFERS "ON".	
		S	1-2	CLTC	B1TM OTMD	8 KC OSCILLATORS "ON".	
		S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS.	
		S	1-4	CLTC	CIPC	MANUAL CALIBRATION TO LIGHTS OFF STEP.	
		S	1-5	CLTC	C1MP CUMP CIPC	TAPE RECORDERS TO RECORD.	
		S	1-6	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 0%, 25%, 50%, 75%, AND 100% IN 2 SECOND INCREMENTS.	
		S	1-7	CLTC	CIPC	STEP THROUGH MANUAL CALIBRATION IN 2 SECOND INCREMENTS.	
		S	1-8	CLTC	C1MP CUMP CIPC	TAPE RECORDERS "OFF".	
S		1-9	CLTC	C1MP CUMP	TELEMETER CALIBRATION TO INFLIGHT.		
S		1-10	CLTC	CIPC	CALIBRATION TO AUTOMATIC.		
S		1-11	CLTC	CIPC	GIVE CAL START.		
S	1-12	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMAND "ON" FOR 5 SECONDS.			

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-772 <sup>0</sup> 30"	S	1-13	CLTC	CIPC	BRIDGE CALIBRATE HIGH FOR 10 SECONDS.	
	S	1-14	CLTC	CIPC	BRIDGE CALIBRATE LOW FOR 10 SECONDS.	
	S	1-15	CLTC	CUMP	P1 TELEMETER CALIBRATION.	
	S	1-16	CLTC	RBHM	S-I AND IU HIGH CALIBRATE COMMAND (15 SEC.),	
	S	1-17	CLTC	RBHM	S-I AND IU LOW CALIBRATE COMMAND (15 SEC.),	
	S	1-18	CLTC	RBHM	S-I AND IU RUN COMMAND.	
	S	1-19	CLTC	R1TM OTMD	8 KC OSCILLATOR "OFF".	
-770 <sup>0</sup>	RD2	1	C4TC	CPTC	VERIFY COMPLETION OF PROPELLANT VALVES AND IGNITERS FUNCTIONAL CHECK PER DAC-P-7005, PART VI.	
	RD2	2	C4TC	CPTC	PERFORM S-IV ENGINE AND HELIUM HEATER PURGE PER PROCEDURE DAC-P-7005, PART VII.	
					NOTE	
					THERE WILL BE NO ACTIVITY IN THE S-IV AFT INTERSTAGE UNTIL THE COMPLETION OF PART VII OF PROCEDURE DAC-P-7005.	
	RD3	3	CPTC	RECS	PROVIDE ECS AIR TO S-IV AFT SECTION DURING HELIUM PURGE OPERATIONS AS REQUESTED.	
-769 <sup>0</sup>		1			RF AND TM CHECKS -----	
	S	1-1	CLTC	C1MP CUMP	RECORDER TRANSFERS "OFF".	
	S	1-2	CLTC	CIPC	GIVE CAL START.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-769 <sup>9</sup>	S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" FOR 5 SECONDS.	
	S	2	CLTC	CUMP	P1 CALIBRATION COMMAND "ON" AND "OFF".	
	S	2-1	CLTC	C1MP CUMP CIPC	TAPE RECORDERS TO "PLAYBACK".	
	S	2-2	CLTC	CUMP	C-BAND BEACON (RADAR) "OFF" WHEN READOUT COMPLETE.	
	S	2-3	CLTC	CUMP	AZUSA "OFF" (WHEN READOUT IS COMPLETE).	
-766 <sup>9</sup> 30"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP CIPC	CONFIRM TAPE RECORDER READY INDICATIONS (BEFORE PROCEEDING).	
	S	1-2	CLTC	C1MP CUMP CIPC	TAPE RECORDERS "OFF".	
	S	1-3	CLTC	CIPC	VERIFY VCO CALIBRATION "OFF" AND "AUTO"	
	S	1-4	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1 AND S2 "OFF".	
	S	1-5	CLTC	CUMP	TELEMETERS F5, F6, S3 AND P1 "OFF".	
	S	1-6	CLTC	C1MP CUMP	SWEEP FREQUENCY CALIBRATOR "OFF".	
	S	1-7	CLTC	C1MP CUMP	AUXILIARY EQUIPMENTS "OFF".	
	S	1-8	CLTC	CIPC	TELEMETERS D1, D2 AND D3 "OFF".	
	S	1-9	CLTC	B1TM B4TM OTMD	TELEMETER RECORDINGS "OFF".	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-766 <sup>0</sup> 30"	S	1-10	CLTC	CUMP	ALTIMETER "OFF".	
	S	1-11	CLTC	C1CM	TELEVISION "OFF".	
		2			RF AND TM CHECKS. -----	
	S	2-1	CLTC	CUMP	ODOP "OFF".	
	S	2-2	CLTC	CUMP	MINITRACK "OFF".	
	S	2-3	CLTC	CUMP	MISTRAM "OFF".	
	S	2-4	CLTC	CUMP	GUIDANCE COMMAND RECEIVER "OFF".	
	S	2-5	CLTC	BDOP	ODOP GROUND TRANSMITTER NO. 1 "OFF".	
	S	2-6	CLTC	B4TM	NORMALIZE ALL SWITCHES AND SECURE STATION.	
	RD1	3	C1TC	SVMP	BEGIN FUEL JACKET FILL PREPARATIONS.	
-755 <sup>0</sup>	BR1	1	C1TC	RFDM	VERIFY FIRE DETECTION PROBE COVERS ARE REMOVED.	
	BR1	2	C1TC	RCSM	VERIFY CSM ACCELEROMETERS INSTALLED.	
	RD1	3	C1TC	SVMP	VERIFY COMPLETION OF FUEL JACKET PREPS.	
-745 <sup>0</sup>	RD1	1	C1TC	C1CT	VERIFY COMPLETION OF THE ELECTRO-MECHANICAL TEST PER LVO-MV-P-1006.	
		2		SVMP	VERIFY THAT GEARCASE PRESSURE IS INDICATING BETWEEN 2 AND 10 PSIG AT EACH ENGINE POSITION.	
-740 <sup>0</sup>		1		SVMP	REMOVE PROTECTIVE COVERS FROM HEAT SHIELD PANEL MEASUREMENTS.	
		2		SVMP	REMOVE TURBINE TACHOMETER PROTECTIVE COVER, 8 PLACES.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-730 <sup>0</sup>	SC	1	CNTS	CSTC	VERIFY PREPARATIONS COMPLETE.	
	SC	2		CSTC	STATUS CHECK.	
-725 <sup>0</sup>	RD2	1	C4TC	CPTC	VERIFY COMPLETION OF S-IV ENGINE AND HELIUM HEATER PURGES PER DAC-P-7005, PART VII.	
	RD2	2	C4TC	CPTC	PERFORM S-IV PROPULSION SECURING PER PROCEDURE DAC-P-7005, PART VIII.	
		3	S4PE	SVMP	INSTALL H2 DUCT DESSICATORS	
-720 <sup>0</sup>	PA	1		CNTS	RF SILENCE ON AND CONTROLLED SWITCHING.	
	SC	2		CSTC	VERIFY SPACE VEHICLE RF SILENCE AND COMPLEX 37 RF SILENCE AND ORDNANCE CREW ON STATION.	
	SC	3		CSTC	BEGIN LES TOWER ORDNANCE CONNECTION PER C-10001.	
-695 <sup>0</sup>	SIV	1	C4TC	CPTC	VERIFY COMPLETION OF S-IV PROPULSION SECURING PER DAC-P-7005, PART VIII.	
	RD1	2	C1TC	S1VM	BEGIN INSTALLATION OF FLIGHT CLOSURES ON THE FORWARD END OF FUEL TANKS 3 AND 4.	
		3		RECS	DISCONTINUE ECS AIR TO THE S-IV AFT SECTION AFTER OK FROM C4TC.	
	RD3	4	CLTC	RUAC	PERFORM UMBILICAL SWING ARM PREPARATIONS FOR LAUNCH PER PROCEDURE LVO-E-7016.	
	RD3	5	C1TC	SGMP	VERIFY LIFTOFF AND SWING ARM CONTROL SWITCHES ARE CALIBRATED FOR LAUNCH AND PURGE HOSES ARE CONNECTED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-695 <sup>0</sup>						
	RD3	6	C1TC	SGMP	PREPARE HOLDDOWN ARMS FOR LAUNCH PER PROCEDURE LVO-E-7017.	
	BL1	7	CNTS	ANAG	TURN BREAKER 66A5A10-1 "OFF" (Q-BALL POWER BREAKER).	
	SC	8		CNTS	VERIFY TO SPACECRAFT TC THE Q-BALL POWER BREAKER IS "OFF".	
	RD2	9	C4TC	CVTE	VERIFY COMPLETION OF S-IV ORDNANCE INSTALLATION PRELIMINARY CHECKS PER DAC-0-7011, PART I.	
	RD2	10	C4TC	CVTE	PERFORM ULLAGE ROCKET JETTISON DETONATOR INSTALLATION AND CONNECTION PER PROCEDURE DAC-0-7011, PART II.	
	RD2	11	C4TC	CVTE	PERFORM ULLAGE ROCKET INITIATORS INSTALLATION AND CONNECTION PER DAC-0-7011, PART VI.	
-685 <sup>0</sup>						
	RD1	1		S1VM	VERIFY S-IV ENGINE CHAMBER SIDE AND EXIT COVERS INSTALLED AND REMOVE PROTECTIVE COVER FROM LOX/SOX PLENUM.	
-680 <sup>0</sup>						
	RD1	1	C1TC	S1VM	INSTALL S-I DESTRUCT S&A UNIT.	
	BL3	2	C1TC	S1NF	PERFORM S&A UNIT CHECK PER PROCEDURE	
	GY2	3	BRFS	SVRF	SECURE S1 AND IU RF SYSTEMS FOR B.I.H. I-LSII-710, PART I.	
	SC	4		CSTC	VERIFY COMPLETION OF LES TOWER ORDNANCE CONNECTION BEGIN LES IGNITER INSTALLATION.	
-660 <sup>0</sup>						
	BR1	1	CLTC	SSMS	VERIFY MEASURING READY TO SECURE IU.	
	BL1	2	CLTC	SUVN	VERIFY NETWORKS READY TO SECURE IU.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-660'	RD1	3	CLTC	SUVM	INSTALL IU 70 INCH TUBE DOOR,	
	RD1	4	C1TC	S1VM	INSTALL DOORS ON INSTRUMENT CONTAINERS SECURE DOOR 1 FOR FLIGHT. SECURE DOOR 2 FOR BUILT IN HOLD.	
-650'	RD1	1	CLTC	SUVM	BEGIN INSTALLATION OF IU DOORS AT TUBES 1 AND 2 FOR LAUNCH, TUBE 3 AND 4 FOR B,I,H., AND STOW WORK STANDS,	
	RD1	2	C1TC	S1VM	VERIFY ALL BLAST PLATES ON S-I FORWARD ARE SECURED FOR LAUNCH.	
-645'	GY1	1	B1TM	S1TM SUTM	SECURE S1 AND IU TELEMETER SYSTEMS FOR B,I,H.	
	BR1	2	C1TC	SVME	VERIFY PRESSURE MEASUREMENTS FOR AIR BEARINGS OPEN AND SAFETY WIRED.	
	RD1	3	C1TC	S1VM	VERIFY FUEL TANK 3 AND 4 FORWARD CLOSURES ARE INSTALLED FOR FLIGHT.	
		4		S1VM	SET UP GN2 PURGE LINES AND HAND VALVES FOR RETROCKET INITIATOR CONNECTION.	
	RD3	5	C1TC	SGMP	PERFORM SHORT CABLE MAST PREPARATIONS FOR LAUNCH PER PROCEDURE LVO-E-7013.	
	RD1	6	C1TC	S1VM	VERIFY COMPLETION OF S-I DESTRUCT S&A INSTALLATION.	
	RD2	7	C4TC	CVTE	VERIFY COMPLETION OF ULLAGE ROCKET JETTISON DETONATOR INSTALLATION AND CONNECTION PER DAC-O-7011, PART II.	
	RD2	8	C4TC	CVTE	PERFORM STAGE SEPERATION DETONATOR INSTALLATION AND CONNECTION PER PROCEDURE DAC-O-7011, PART III.	
		9		C1CT C1FP SVMP	APPLY LOX TANK STAND-BY PRESSURE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-645 <sup>0</sup>	SC	10		CSTC	VERIFY COMPLETION OF LES IGNITER POST INSTALLATION CHECKS.	
	RD1	11	C1TC	CVMP	VERIFY COMPLETION OF THRUST CHAMBER FUEL JACKET FILL PER LVO-MV-P-1002.	
-635 <sup>0</sup>	BR1	1		SVME	VERIFY ALL COVERS INSTALLED ON UMA RACKS.	
	BR1	2		SVME	VERIFY CALIBRATE PLUGS ARE REMOVED FROM LIQUID LEVEL RACKS.	
	RD2	3	C4TC	CVTE	PERFORM S-IV ORDNANCE INSTALLATION PRELIMINARY CHECKS PER PROCEDURE DAC-0-7011, PART I.	
		4		RGCC	FLIGHT COMPUTER SYSTEM "OFF" AFTER VERIFICATION PROCEDURE 5-LIUI-749A IS COMPLETE.	
		5		CNTS	RELEASE SPACECRAFT PERSONNEL FROM STATIONS.	
-620 <sup>0</sup>	RD3	1	C1TC	SGMP	VERIFY THAT THE FUEL MAST AND LOX MAST ARE IN A STATE OF OPERATIONAL READINESS FOR LAUNCH AS FOLLOWS:  A. VERIFY THAT WEATHER PROTECTIVE TAPES AND COVERS HAVE BEEN REMOVED FROM THE MASTS.  B. AFTER VERIFYING WITH C1CT THAT THE RELEASE VALVE SWITCHES ARE IN THE "OFF" POSITION, CONNECT THE RETRACT CYLINDERS TO THE MASTS AND VERIFY THAT THE CONNECTING PINS ARE SECURED WITH BALLLOC PINS.  C. VERIFY THAT THE AUTOMATIC RETRACT LINES ARE CONNECTED AND THE FITTINGS ARE TIGHT.  D. VISUALLY INSPECT THE LOX AND FUEL MAST ASSEMBLIES FOR PROPER	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-620 <sup>0</sup>					MECHANICAL INSTALLATION AND NON-INTERFERENCE WITH ASSOCIATED HARDWARE.  E. VERIFY FUEL MAST PURGE LINE CONNECTED .  F. VERIFY VACUUM LINE SCREEN INSTALLED AT LAUNCHER LEG.	
	RD2	2	C4TC	CVTE	VERIFY COMPLETION OF STAGE SEPARATION DETONATOR INSTALLATION AND CONNECTION PER DAC-0-7011, PART III.	
	RD2	3	C4TC	CVTE	PERFORM VENT PANELS RELEASE DETONATORS INSTALLATION AND CONNECTION PER DAC-0-7011, PART IV.	
-595 <sup>0</sup>						
	BR1	1	C1TC	SVME	VERIFY ALL INSTALLED RADIATION SHIELD PNEUMATIC TUBING AND TEMPERATURE MEASUREMENTS ARE CONNECTED.	
		2		SVME	REMOVE COVERS FROM CALORIMETER FACES.	
	RD2	3	C4TC	CVTE	VERIFY COMPLETION OF VENT PANELS RELEASE DETONATORS INSTALLATION AND CONNECTION PER DAC-0-7011, PART IV.	
	RD2	4	C4TC	CVTE	PERFORM DESTRUCT S&A INSTALLATION AND CONNECTION PER DAC-0-7011, PART V.	
-570 <sup>0</sup>						
	RD1	1	C1TC	SVMP	PERFORM THRUST CHAMBER FUEL JACKET FILL PER PROCEDURE LVO-MV-P-1002.	
-545 <sup>0</sup>						
	RD2	1	C4TC	CVTE	VERIFY COMPLETION OF S-IV DESTRUCT S&A FUNCTIONAL TEST PER DAC-0-7011, PART VII, INCLUDING ORDNANCE SECURING OPERATION.	
		2	CNTS	C4TC	VERIFY THAT S-IV FLIGHT S&A DEVICE IS ELECTRICALLY DISCONNECTED AND THAT DUMMY DEVICE IS CONNECTED.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-545 <sup>0</sup>		3		PPSO	VERIFY THAT S-IV DUMMY S&A DEVICE IS CONNECTED, AND THAT FLIGHT S&A IS DISCONNECTED FROM S-IV ELECTRICAL		
		4		C1NP	REMOVE POWER FROM S-I.		
		5		CUNP	REMOVE POWER FROM IU.		
		6		RBHM	SANBORN RECORDER "OFF".		
		7		S1VM SUVM	SECURE VEHICLE FOR STANDBY,		
			1	CNTS	"BUILT IN HOLD". -----		
		S	1-1	CNTS	CSTC	PROCEED TO ARM AND SAFE THE LES.	
			1-2	C4TC	S4ME	PRESSURIZE REMAINING S-IV FORWARD ELECTRONIC BOXES.	
		SRO	1-3	CNTS	ORNG	LOAD COMPLEX CAMERAS AND CHECKOUT TO BE COMPLETED PRIOR TO RESUMPTION OF COUNT.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART V  LAUNCH COUNTDOWN  PRIOR TO PICKUP	
		2		S1VM	OPEN S-I FOR BATTERY INSTALLATION.	
		3		SUVM	OPEN IU FOR BATTERY INSTALLATION.	
		4		S1VM	INSTALL S-I FLIGHT BATTERIES.	
		5		S1NF	CONNECT S-I FLIGHT BATTERIES.	
		6		SUVM	INSTALL IU FLIGHT BATTERIES.	
		7		SUVN	CONNECT IU FLIGHT BATTERIES.	
		8		RVFC	PERFORM FLIGHT CONTROL PREPARATIONS PER PROCEDURE 5-LLVI-319.	
		9			MAKE ALL PREPARATIONS NECESSARY FOR S-I AND IU POWER APPLICATION PRIOR TO T=545 MIN PICKUP TIME.	
		10		RGCC	BEGIN FLIGHT COMPUTER SYSTEM PREPARATIONS PER PROCEDURE 5-LIUI-749.	
		11		SUVM	REMOVE REMAINDER OF S-IV/IU ACCESS KIT.	
	GR1	12	B1TM	S1TM SUTM	PREPARE S1 & IU TELEMETER SYSTEMS PER LVO-R-3001.	
	GR2	13	BRFS	SVRF	PREPARE S1 & IU RF SYSTEMS PER LVO-R-3002.	
-545 <sup>0</sup>						
	SR0	1	CNTS	ORNG	VERIFY COMPLEX IS ON CRITICAL POWER.	
	SIV	2	C4TC		VERIFY UMBILICAL TOWER WATER "ON".	
	YW3	3	CLTC	BSOC	VERIFY COMPLETION OF 5-LLVI-722.	
	YW3	4	CLTC	BSOC	START DISCRETE MONITORING.	
	SIV	5	C4TC	CSPC	APPLY S-IV STAGE POWER PER PROCEDURE DAC-N-7001.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-545 <sup>0</sup>						
	BL2	6		R4FC	SET UP S-IV HYDRAULICS FOR OPERATION.	
	RD2	7	C4TC	CPTC	PERFORM S-IV PROPULSION PRELIMINARY PREPARATIONS PER DAC-P-7009, PART I.	
	BL1	8	CSRP	S1NF	VERIFY S-I SAFETY SWITCHES ARE INSTALLED.	
	BL1	9	CSRP	SUVN	VERIFY IU SAFETY SWITCHES ARE INSTALLED	
	BL1	10	CSRP	SVOC S1NF	VERIFY DESTRUCT MONITORING SYSTEM READY	
	BL1	11	CSRP	CSCG	APPLY S-I GROUND POWER.	
	BL1	12	CSRP	CSCG	APPLY IU GROUND POWER.	
		13		C1NP	APPLY S-I STAGE POWER.	
		14		CUNP	APPLY IU STAGE POWER.	
		15		C1MP	GROUND MEASURING VOLTAGE "ON".	
		16		C1MP	VEHICLE MEASURING VOLTAGE "ON".	
	BL1	17	CSRP	C1MP	MEASURING RACKS "ON".	
	BL1	18	CSRP	CUMP	VEHICLE MEASURING VOLTAGE "ON".	
	BL1	19	CSRP	CUMP	MEASURING RACKS "ON".	
	BL1	20	CSRP	CUMP	GROUND MEASURING VOLTAGE "ON".	
	BL1	21	CSRP	CINV	S-I VEHICLE INVERTER #1 "ON".	
	BL1	22	CSRP	CINV	IU VEHICLE INVERTER #1 "ON".	
	BL1	23	CSRP	CINV	IU VEHICLE INVERTER NO. 2 "ON".	
	BL1	24	CSRP	CPSP	SERVICE STRUCTURE OAT POWER "ON".	
	BL1	25	CSRP	RBHM	SANBORN RECORDER TO 2 MM/SEC.	
	BL1	26	CSRP	SVOC	PULSE SENSOR POWER "ON".	
	BL1	27	CSRP	SVOC	PULSE SENSOR TEST VOLTAGE "ON" AND "OFF".	
	BL1	28	CSRP	SVOC	VERIFY S-I AND S-IV DESTRUCT INDICATIONS "ON".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-545'						
	BL1	29	CSRP	SVOC	RESET PULSE SENSORS.	
	BL1	30	CSRP	SVOC	VERIFY S-I AND S-IV DESTRUCT INDICATIONS "OFF".	
	BL1	31	CSRP	C1NV	GROUND INVERTER NO. 1 "ON".	
	BL1	32	CSRP	C1NV	GROUND INVERTER NO. 2 "ON".	
	BL1	33	CSRP	C1OP	MODULE POWER SUPPLY "ON".	
	RD2	34	C4TC	CPTC	PERFORM PROPELLANT LINES VACUUM CHECKS PER DAC-P-7009, PART II.	
	RD2	35	C4TC	CPTC	PERFORM COMMON BULKHEAD MONITOR PREPARATIONS PER DAC-P-7009, PART III.	
	RD1	36	S4PE	SVMP	REMOVE CHILLDOWN DUCT DESSICATORS AND STUB FIN MAST ADAPTERS.	
		37		SVMP	PRECHARGE HYDRAULIC ACCUMULATORS TO 1600 PSIG AND LEAK CHECK SHRADER FITTING: POSITION 1 : POSITION 2 : POSITION 3 : POSITION 4 :	
	YW4	38	CLTC	SSSC	OPEN SILO C-3 AND B-1.	
	SC	39	CSTC	SSCO	INSTALL AND CONNECT SPACECRAFT INSTRUMENTATION BATTERIES PER PROCEDURE C-0007.	
-540'						
	YW3	1		RGCC	FLIGHT COMPUTER POWER "ON".	
	SC	2	CSTC	CPWR	APPLY SPACECRAFT GSE POWER PER PROCEDURE C-0007.	
		3		S1VM	BEGIN REMOVING S-I ENVIRONMENTAL PROTECTION.	
		4		SQFC	REMOVE PROTECTIVE COVER FROM Q-BALL.	
	RD3	5		APCD	PREPARE THE PNEUMATIC DISTRIBUTION SYSTEM FOR PRELAUNCH OPERATIONS PER PROCEDURE LVO-E-7015.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-540°	BL1	6		ANAG	TURN BREAKER 66A5A10-1 "ON" (Q-BALL POWER BREAKER).	
	BL1	7		SUVN	VERIFY IU FLIGHT BATTERIES ARE INSTALLED AND ELECTRICALLY CONNECTED.	
	BL1	8		CUNP	VERIFY +8D10 AND +8D20 BATTERY INDICATIONS.	
	BL1	9		S1NF	VERIFY S-I FLIGHT BATTERIES ARE INSTALLED AND ELECTRICALLY CONNECTED.	
	BL1	10		C1NP	VERIFY +1D10 AND +1D20 BATTERY INDICATIONS.	
	BL1	11	RS4C	ANAG	ST-124 HEATER SWITCH TO NORMAL POSITION	
-535°	RD2	1		SMTE	VERIFY QUICK DISCONNECTS AND UMBILICAL CARRIERS PROPERLY INSTALLED (SWING ARM 2 AND GH2 VENT COUPLING.  NOTE  STEEL SHEAR PINS, SAFETY BLOCKS AND SAFETY WIRE INSTALLED, LANYARDS NOT CONNECTED, AND EJECT ACTUATOR PNEUMATIC LINES NOT CONNECTED.	
		2		C4TC	VERIFY S-IV POWER "ON".	
	SIV	3		C4TC	ALL S-IV STATUS SELECT SWITCHES TO "ON SCHEDULE".	
	BR1	4		SVME RBHM	VERIFY CONNECTION OF SPGG TEMPERATURE MEASURING AND PROPER INDICATION.	
	SC	5		CSTC	VERIFY COMPLETION OF SPACECRAFT POWER APPLICATION.	
	SRO	6	CNTS	ORNG	VERIFY FREQUENCY CLEARANCE FOR ALL SPACE VEHICLE RF SYSTEMS.	
	SRO	7	CNTS	ORNG	VERIFY PATRICK 0-18 RADAR READY TO SUPPORT SPACECRAFT BEACONS AND THAT RADAR IS AWAY FROM THE PAD.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-535 <sup>1</sup>						
	SRO	8	CNTS	ORNG	VERIFY 1.16 RADAR READY TO SUPPORT LAUNCH VEHICLE (IU) BEACON AND THAT RADAR IS AWAY FROM THE PAD AND WILL NOT INTERROGATE UNTIL REQUESTED.	
	SRO	9	CNTS	ORNG	STANDBY FOR READOUT OF SPACECRAFT TM.	
-530 <sup>1</sup>						
	S	1	CLTC	RVFC	CONTROL COMPUTER "ON".	
	S	2	CLTC	RVFC	CHECK CONTROL COMPUTER NULLS.	
	S	3	CLTC	RVFC	CONTROL VOLTAGE "ON".	
	S	4	CLTC	RVFC	Q-BALL "ON".	
	S	5	CLTC	RVFC	CONTROL ACCELEROMETER CHECK.	
	S	6	CLTC	RVFC	IU RATE GYRO CHECK.	
	S	7	CLTC	RVFC	S-I RATE GYRO CHECK.	
	S	8	CLTC	RVFC	ACCELEROMETER SWITCH CHECKS.	
	RD3	9		RECS	OPERATE THE ENVIRONMENTAL CONTROL SYSTEM PER PROCEDURE LVO-E-7018.	
		10		RECS	START ECS AIR TO THE IU.	
		11		SVMP	BEGIN REMOVAL OF STRIPPABLE COATING FROM FIN BASE (8 PLACES).	
	RD1	12		C1FP	VERIFY THAT POWER IS APPLIED TO S-I, THEN OPERATE PRE-VALVES 1 THRU 8 SWITCHES TO "OPEN".	
		13		SVMP	REMOVE CAPS FROM PRE-VALVE CONTROL VALVE VENT PORTS (8 PLACES).	
		14		S1VM RUAC	DISCONNECT HEISE PANEL CONNECTED TO FUEL VENT CONTROL LINE. RESTORE CONTROL LINE TO NORMAL AND VERIFY THAT FUEL VENTS 1 AND 2 "CLOSE".	
		15			RF AND TM CHECKS -----	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-530'						
	PA	15-1		CNTS	RF SILENCE "OFF".	
	S	15-2	CLTC	CUMP	IU C-BAND BEACON (RADAR) "ON".	
	SC	15-3	CSTC	CICM	SPACECRAFT TELEMETER A (LINK 1) "ON".	
	SC	15-4	CSTC	SICM	SPACECRAFT TELEMETER B (LINK 6) "ON".	
	SC	15-5	CSTC	SICM	SPACECRAFT TELEMETER C (LINK 14) "ON".	
	SC	15-6	CSTC	SICM	SPACECRAFT RADAR BEACON NO. 1 "ON".	
	SRO	15-7	CNTS	ORNG	PROCEED WITH TM READOUT AND REPORT WHEN AVAILABLE.	
	S	15-8	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1, AND S2,	
	S	15-9	CLTC	CUMP	TELEMETERS F5, F6, S3, P1 AND MINITRACK "ON".	
	S	15-10	CLTC	C1MP CUMP	AUXILIARY EQUIPMENTS "ON".	
	S	15-11	CLTC	C1MP CUMP	MEAS. ON DDAS "ON".	
	S	15-12	CLTC	C1MP CUMP	SWEEP FREQUENCY CALIBRATOR "ON".	
	S	15-13	CLTC	C1MP CUMP C1PC	VERIFY TAPE RECORDER READY INDICATIONS.	
	S	15-14	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT".	
	S	15-15	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 50%.	
		15-16		CIPC	TELEMETERS D1, D2, AND D3 "ON".	
	S	15-17	CLTC	CIPC	CALIBRATION SWITCH TO "MANUAL" (VERIFY VCO CALIBRATION LIGHTS "OFF").	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-530 <sup>9</sup>	S	15-18	CLTC	B4TM	PERFORM TELEMETER CHANNEL READOUTS.  NOTE  VERIFY CHANNELS 21-24 OF TELEMETER D2, HIGH LEVEL PDM READING 100%.	
	S	15-19	CLTC	CUMP	RADAR ALTIMETER "ON".	
	S	16	CLTC	CUMP	GUIDANCE COMMAND RECEIVER "ON".	
-525 <sup>9</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	ORNG	BEGIN INTERROGATION OF SPACECRAFT BEACON WITH 0.18 RADAR AND PROCEED WITH READOUT, REPORT WHEN COMPLETE.	
	S	1-2	CLTC	ORNG	INTERROGATE IU C-BAND BEACON WITH 1.16 RADAR AND REPORT READOUT WHEN COMPLETE.	
	S	1-3	CLTC	B1TM OTMD B4TM	TELEMETER RECORDINGS "ON".	
	S	1-4	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "AC COMMAND".	
	S	1-5	CLTC	C1MP CUMP	TM CALIBRATION COMMANDS "ON" AND "OFF". (DELAY 10 SEC BEFORE NEXT ITEM).	
	S	1-6	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT".	
	S	1-7	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS.	
	S	1-8	CLTC	C1PC	STEP THRU MANUAL CALIBRATION IN 2 SEC INCREMENTS.	
	S	1-9	CLTC	C1PC	BRIDGE CAL "HIGH" FOR 10 SECONDS.	
		1-10	CLTC	C1PC	BRIDGE CAL "LOW" FOR 10 SECONDS.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-525 <sup>0</sup>						
	S	2	CLTC	RPUP	PERFORM P,U. SLEW CHECKS.	
	S	3	CLTC	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	4	CLTC	RS4C	BRING ST=124 UP TO OPERATING CONDITIONS PER PROCEDURE LVO=G-7040.	
	S	5	CLTC	RATC	BRING AUTO THEODOLITE UP TO OPERATING CONDITIONS PER PROCEDURE LVO=G-7044.	
	BR1	6		SVME	VERIFY ALL SOUND INTENSITY MICROPHONE COVERS ARE REMOVED.	
	BRU	7		SVME	VERIFY ALL AMBIENT PRESSURE MEASUREMENTS ARE "OPEN" TO ATMOSPHERE.	
	BL1	8		SGNP	CHECK ESE LIMIT SWITCHES PER PROCEDURE 1-LLVI-716.	
	RD3	9		RWCP	PREPARE THE PAD WATER SYSTEM FOR LAUNCH PER PROCEDURE LVO=E-7014, PART II.	
		10		ORNG	BRING WATER PRESSURE TO 175 PSI ON 36-INCH LINE WITH 1 PUMP.	
	RD1	11		S1VM C1FP	VENT LOX TANK STANDBY PRESSURE.	
		12		S1VM	AFTER LOX TANKS ARE VENTED, INSTALL CAP ON LOX TANK TEST SENSING LINE AT LOX TANK 4.	
		13		SQFC UQBL	START INSTALLATION OF O-BALL RETRACTABLE COVER.	
		14		PLHF	SET UP LH2 SYSTEM PER LVO=L-1032.	
	SC	15		CSTC	VERIFY COMPLETION OF FLIGHT BATTERY INSTALLATION AND CONNECTION.	
	SC	16		CSTC	BEGIN SPACECRAFT POWER TRANSFER TEST PER PROCEDURE C-0007.	
		17		SVME	BEGIN MANUAL PREFLIGHT PHOTOGRAPHIC INSTRUMENTATION SYSTEM PURGE.	
	YW3	18	CLTC	RGCC	REQUEST APS-102 (SHORT COMMAND SYSTEM TEST).	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-525 <sup>0</sup>	SRO	19	CNTS	ORNG	BEGIN GUIDANCE COMMAND SHORT TEST). TRANSMISSION.	
-522 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 0%.	
	S	1-2	CLTC	C1CM	TV TO "FILAMENT".	
	S	1-3	CLTC	CUMP	AZUSA "ON".	
	S	1-4	CLTC	CUMP	MISTRAM "ON".	
	S	1-5	CLTC	CUMP	ODOP "ON".	
	S	1-6	CLTC	BDOP	ODOP GROUND TRANSMITTER NO. 1 "ON".	
-520 <sup>0</sup> 30"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	PREFLIGHT CALIBRATION TO 100%.	
-520 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1CM	TV TO "B+".	
	S	1-2	CLTC	C1MP	VERIFY EBW MEAS. "OFF".	
	S	1-3	CLTC	CLVN	DESTRUCT ENABLE "ON".	
	S	1-4	CLTC	C4DP	VERIFY SAFETY BUS INDICATION "ON".	
	S	1-5	CLTC	R4VC	VISICORDER "ON".	
	S	1-6	CLTC	C10P	PERFORM MODULE CHECK.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-520'						
	S	1-7	CLTC	C1DP	S-I CDR #1 AND #2 "ON".	
	S	1-8	CLTC	C10P	CHECK S-I EBW #1 AND #2 VOLTAGES.	
	S	1-9	CLTC	C1DP	S-I CDR #1 AND #2 TO "INTERNAL".	
	SRO	1-10	CNTS	ORNG	INTERROGATE MISTRAM AND REPORT READ OUT.	
	SRO	1-11	CNTS	ORNG	INTERROGATE AZUSA AND REPORT READ OUT.	
	RD1	2	RVFC	SVMP	VERIFY HYDRAULIC ACCUMULATOR PRECHARGE COMPLETE.	
	BL1	3	RVFC	ANAG	CLOSE S-I HYDRAULIC PUMP CIRCUIT BREAKERS.	
	RD1	4		C1FP	AFTER VERIFICATION THAT PRE-VALVE CONTROL VALVES HAVE BEEN RESTORED TO "NORMAL", CYCLE EACH PRE-VALVE FROM "OPEN" TO "CLOSE" TO "OPEN".	
	RD1	5		C1FP	AFTER VERIFICATION THAT FUEL VENT CONTROL LINE IS RETURNED TO "NORMAL", OPERATE FUEL VENT SWITCH TO "OPEN".	
		6		S1VM	LEAK CHECK FUEL VENT CONTROL LINE.	
		7		S1VM	INSTALL CAP ON FUEL TANK TEST SENSING LINE AT LOX TANK 4 AFTER FUEL VENTS ARE "OPEN".	
-516' 30"						
		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	B1TM OTMD	8 KC OSCILLATORS "ON".	
	S	1-2	CLTC	C1PC	CALIBRATION SWITCH TO "AUTOMATIC" AND GIVE CAL. START.	
	S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS.	
	S	1-4	CLTC	C1MP CUMP C1PC	TAPE RECORDERS TO "RECORD".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-516 <sup>0</sup> 30"	S	1-5	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 0%, 25%, 50%, 75%, AND 100% IN 2 SEC INCREMENTS.		
	S	1-6	CLTC	C1MP CUMP	RECORDER TRANSFERS "ON".		
	S	1-7	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "INFLIGHT".		
	S	1-8	CLTC	CUMP	P1 TELEMETER CALIBRATION COMMAND.		
	S	1-9	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" FOR 5 SECONDS.		
	S	1-10	CLTC	CIPC	GIVE TELEMETER CALIBRATION COMMAND.		
	S	1-11	CLTC	RBHM	S-I AND IU HIGH CALIBRATE COMMAND (15 SECONDS).		
	S	1-12	CLTC	RBHM	S-I AND IU LOW CALIBRATE COMMAND (15 SECONDS).		
	S	1-13	CLTC	RBHM	S-I AND IU RUN COMMAND.		
	S	1-14	CLTC	C1MP CUMP	RECORDER TRANSFERS "OFF".		
	-515 <sup>0</sup>		1	CLTC	RGCC	INITIATE APS 103 (CHI-ALIGN).	
			2			RF AND TM CHECKS. -----	
		S	2-1	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" FOR 5 SEC.	
		S	2-2	CLTC	CUMP	P1 TELEMETER CALIBRATION COMMAND.	
S		2-3	CLTC	C1MP CUMP CIPC	TAPE RECORDERS "OFF". (DELAY 10 SEC BEFORE NEXT STEP)		
S		2-4	CLTC	C1MP CUMP			

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-515 <sup>0</sup>					CIPC TAPE RECORDERS TO "PLAYBACK".	
	S	2-5	CLTC	C1MP CUMP CIPC	CONFIRM TAPE RECORDERS READY INDICATIONS (BEFORE PROCEEDING).	
	S	2-6	CLTC	B1TM OTMD	8 KC OSCILLATORS "OFF".	
	S	2-7	CLTC	B1TM OTMD B4TM	TELEMETER RECORDINGS "OFF".	
	RD2	3	C4TC	CPTC	VERIFY COMPLETION OF S-IV PROPULSION PRELIMINARY PREPS PER DAC-P-7009, PART I.	
	RD2	4	C4TC	CPTC	VERIFY COMPLETION OF BULKHEAD VACUUM MONITOR PREPS PER DAC-P-7009, PART III.	
	RD2	5	C4TC	CPTC	VERIFY COMPLETION OF PROPELLANT LINES VACUUM CHECK PER DAC-P-1002, PART II.	
	RD2	6	C4TC	CPTC	PERFORM L02 AND LH2 SYSTEM PURGES AND COMPONENTS CHECK PER DAC-P-7009, PART IV	
		7		S1VM	VERIFY LOX VENT AND RELIEF VALVES "OPEN" AND THEN INSTALL LOX VENT LINES.	
	SRO	8	CNTS	ORNG	COMMAND CARRIER "ON".	
	S	9	CLTC	CUNP	HORIZON SENSOR POWER "ON".	
	S	10	CLTC	CUNP	HORIZON SENSOR "ON".	
	S	11	CLTC	RFSR	SEQUENCE RECORDERS TO 10 MM/SEC.	
	S	12	CLTC	RSEQ	SEQUENCE AND E+1 RECORDERS TO MINUTE SPEED AND TIME PULSE ON.	
	S	13	CLTC	RSEQ	VERIFY VOLTAGE RECORDERS TO FINE RANGE.	
	S	14	CLTC	SVOR	SEQUENCE RECORDERS TO MINUTE SPEED AND TIME PULSE ON.	
	S	15	CLTC	CDCG	CHECK VEHICLE GROUND POWER GENERATOR SETTINGS FOR POWER TRANSFER.	
	S	16	CLTC	B4TM	TELEMETER RECORDING ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-515'						
	S	17	CLTC	C4DP	TEST S=IV EBW'S FOR READY	
	S	18	CLTC	C4DP	VERIFY S&A "SAFE".	
	S	19	CLTC	CSRP	VERIFY S-I AND IU FLIGHT SEQUENCER ZERO INDICATIONS.	
	S	20	CLTC	C4DP	S=IV CDR NO. 1 AND NO. 2 "ON".	
	S	21	CLTC	C4DP	VERIFY S-IV EBW NO. 1 AND NO. 2 "OFF" AND "NOT READY".	
	S	22	CLTC	CSPC	S=IV EBW EXTERNAL "ON".	
	S	23	CLTC	C4DP	S=IV CDR NO. 1 AND NO. 2 TO "INTERNAL".	
	S	24	CLTC	C4DP	VERIFY ALL S=IV NOT READY INDICATIONS "ON" AND READY INDICATION "OFF".	
	S	25	CLTC	CUNC	COOLING TO PREFLIGHT.	
	S	26	CLTC	SUVN	VERIFY ST=124 BLOWER "ON".	
	S	27	CLTC	CUNC	COOLING TO "INFLIGHT".	
	S	28	CLTC	SUVN	VERIFY PRIMARY BLOWER ON (AFTER 40 SECONDS).	
	S	29	CLTC	RBHM	SANBORN RECORDER TO 25 MM/SEC.	
	SRO	30	CNTS	ORNG	CUTOFF COMMAND AND RELEASE AT TEST SUPERVISOR REQUEST.	
	S	31	CLTC	C1DP C4DP	VERIFY S=I AND S=IV EBW #1 AND #2 ON "INTERNAL" AND CHARGED.	
	S	32	CLTC	C4DP	S=IV EBW #1 AND #2 TO EXTERNAL AND VERIFY "OFF".	
	S	33	CLTC	C1DP	S=I EBW #1 AND #2 TO EXTERNAL AND VERIFY "OFF".	
-510'						
	SC	1		CSTC	VERIFY COMPLETION OF POWER TRANSFER TEST.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-510 <sup>0</sup>						
	S	2	CNTS	ORNG	VERIFY 0-18 RADAR AWAY FROM THE PAD (AFTER BEACON NO. 1 READOUT).	
	S	3	CSTC	CICM	SPACECRAFT RADAR BEACON NO. 1 "OFF".	
	S	4	CSTC	CICM	SPACECRAFT RADAR BEACON NO. 2 "ON".	
	S	5	CNTS	ORNG	ONE (1) MINUTE AFTER NOTIFICATION OF BEACON ON, BEGIN INTERROGATION AND PROCEED WITH READOUT, REPORT READOUT WHEN COMPLETE.	
	RD4	6		PRPF	SET UP RP-1 SYSTEM PER LVO-L-1031.	
	SRO	7	CNTS	ORNG	MONITOR ALL RF SYSTEMS AND REPORT ANY CHANGE IN INTERNAL POWER.	
	S	8	CLTC	B1TM OTMD	TELEMETER RECORDINGS "ON".	
	S	9	CLTC	CUNP	VERIFY IU READY FOR POWER TRANSFER ON.	
		10	CLTC	RVFC	HYDRAULIC PUMPS ENABLE "ON".	
	S	11	CLTC	RVFC	S-I HYDRAULIC PUMPS ON.	
	S	12	CLTC	RGCC	INITIATE S-I STEERING COMMANDS (APS-104)	
	S	13	CLTC		PERSONNEL CONNECTED WITH S-IV POWER TRANSFER SWITCH TO S-IV CIRCUIT.	
	SIV	14	C4TC	CIPC	INSTRUMENTATION SYSTEM TO "INTERNAL". *****	
	SIV	14-1	C4TC	CSPC	STAGE POWER SYSTEMS TO "INTERNAL". *****	
		14-2	C4TC	CSPC CIPC	READOUT BATTERIES.	
	SIV	14-3	C4TC	CIPC	PERFORM AUTOMATIC VCO CALIBRATION.	
	SIV	14-4	C4TC	CSPC CIPC B4TM	VERIFY SATISFACTORY ON INTERNAL POWER.	
	SIV	14-5	C4TC	CSPC	STAGE POWER SYSTEMS "EXTERNAL". *****	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-510 <sup>0</sup>						
	SIV	14-6	C4TC	CIPC	INSTRUMENTATION SYSTEMS "EXTERNAL", *****	
	SIV	14-7	C4TC	C4DP	S=IV CDR'S #1 AND #2 "EXTERNAL" AND "OFF".	
	SIV	14-8	C4TC	C4DP	S=IV EBW'S #1 AND #2 "EXTERNAL" AND VERIFY "OFF".	
	SIV	14-9		C4TC	S=IV POWER TRANSFER PERSONNEL SWITCH TO S=CIRCUIT.	
	S	14-10		C4TC	VERIFY S=IV POWER TRANSFER SATISFACTORY.	
	S	15	CLTC	C1CM	CAMERA LIGHTS "ON" (HOLD ON).	
	S	16	CLTC	C1NP	S=I STAGE POWER TEST #1 "ON". *****	
	S	17	CLTC	CSRP	NOTE S=I POWER TRANSFER OK.	
	S	18	CLTC	C1CM	CAMERA LIGHTS "OFF".	
	S	19	CLTC	CUNP	IU STAGE POWER TEST #1 "ON". *****	
	S	20	CLTC	CSRP	NOTE IU POWER TRANSFER OK.	
	S	21		CSRP	VERIFY SATISFACTORY S=I AND IU POWER TRANSFER.	
	S	22		C1NP	S=I STAGE POWER TEST #1 "OFF". *****	
	S	23		CUNP	IU STAGE POWER TEST #1 "OFF". *****	
	S	24	CLTC	C1DP	S=I CDR #1 AND #2 TO "EXTERNAL" AND "OFF".	
	S	25	CLTC	CSPC	S=IV EBW EXTERNAL "OFF".	
	S	26	CLTC	RBHM	SANBORN RECORDER TO 2 MM/SEC.	
	S	27	CLTC	R4VC	VISICORDER TO "OFF".	
	S	28	CLTC	RVFC	S=I HYDRAULIC PUMPS "OFF".	
		29	CLTC	RVFC	HYDRAULIC PUMPS ENABLE "OFF".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-510 <sup>0</sup>						
	S	30	CLTC	CUNP	HORIZON SENSOR "OFF".	
	S	31	CLTC	CUMP	AZUSA "OFF".	
	S	32	CLTC	ORNG	COMMAND CARRIER "OFF".	
	S	33	CLTC	CUMP	C-BAND BEACON (RADAR) "OFF".	
	S	34	CLTC	CUMP	ALTIMETER "OFF".	
	S	35	CLTC	CUMP	MISTRAM "OFF".	
	S	36	CLTC	CUMP	GUIDANCE COMMAND RECEIVER "OFF".	
	S	37	CLTC	CUMP	ODOP "OFF".	
	S	38	CLTC	C1CM	TV CAMERA "OFF".	
		39	CLTC		PERSONNEL CONNECTED WITH S-IV CONTROL CHECKS SWITCH TO YW2 CIRCUIT.	
	YW2	39-1		C4TC	CLEAR S-IV ENGINE AREA OF UNNECESSARY PERSONNEL AND EQUIPMENT.	
	YW2	39-2		RVFC	STAGE SELECTOR SWITCH TO "S-IV".	
	YW2	40		RVFC	HYDRAULIC PUMPS ENABLE "ON".	
	YW2	40-1	RVFC	R4FC	S-IV HYDRAULIC PUMPS "ON".	
	YW2	40-2	RVFC	RGCC	INITIATE S-IV STEERING COMMANDS (APS-105)	
	YW2	40-3		RVFC	IU RATE GYRO TORQUER COMMANDS.	
	YW2	40-4	RVFC	R4FC	"CLOSE" S-IV HYDRAULIC ACCUMULATOR VALVES.	
	YW2	40-5	RVFC	R4FC	VERIFY S-IV HYDRAULIC PUMPS "OFF".	
	YW2	40-6		RVFC	FLIGHT CONTROL SWITCH TO "S-I".	
	YW2	40-7		RVFC	CONTROL VOLTAGE "OFF".	
	YW2	40-8		RVFC	CONTROL COMPUTER "OFF".	
	YW2	40-9		RVFC	IU RATE GYROS "OFF".	
	YW2	40-10		RVFC	CONTROL ACCELEROMETERS "OFF".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-510 <sup>9</sup>						
	YW2	40-11		RVFC	S-I RATE GYROS "OFF".	
	YW2	40-12		RVFC	Q-BALL SYSTEM "OFF".	
	YW2	40-13		RVFC	Q-BALL HEATERS "OFF".	
	YW2	40-14		RVFC	ACCELERATION SWITCH "OFF".	
	GY1	40-15	RGCC	R1TM OTMD	TELEMETER RECORDING "OFF".	
	S	41	CLTC	CUNP	HORIZON SENSOR POWER "OFF".	
	S	42	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1 AND S2 "OFF".	
	S	43	CLTC	C1MP CUMP	TELEMETER AUXILIARY EQUIPMENT "OFF".	
		44	CLTC	C1MP CUMP	SWEEP FREQUENCY CALIBRATOR "OFF".	
		45	CLTC	CUMP	TELEMETERS F5, F6, P1, S3 AND MINITRACK "OFF".	
	S	46	CLTC	CLVN	DESTRUCT ENABLE "OFF".	
	S	47	CLTC	RSEQ	SEQUENCE AND E+1 RECORDERS TO "HOUR SPEED" AND TIME PULSE "OFF".	
	S	48	CLTC	SVOR	SEQUENCE RECORDERS TO "HOUR SPEED" AND TIME PULSE "OFF".	
	S	49	CLTC	C1MP CUMP	TELEMETER CALIBRATION TO PREFLIGHT.	
	S	50	CLTC	CIPC	VERIFY VCO CALIBRATION "OFF" AND "AUTO".	
	S	51	CLTC	RFSR	SEQUENCE RECORDERS TO 2 MM/SEC.	
	S	52	CLTC	CUNC	COOLING TO PREFLIGHT.	
	S	53	CNTS	ORNG	REPORT ANY CHANGE OR DEVIATIONS OF RF EQUIPMENTS DURING INTERNAL RUN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-505 <sup>0</sup>	YW2	1		RVFC	S-IV CONTROL CHECKS PERSONNEL SWITCH TO S-CIRCUIT.	
	S	2	CLTC	RVFC	VERIFY COMPLETION OF S-IV CONTROL CHECKS.	
		3		CIPC	TELEMETER D1, D2 AND D3 OFF AFTER COMPLETION OF S-IV CONTROL CHECKS.	
		4		B4TM	TELEMETER RECORDING OFF AFTER S-IV TELEMETERS "OFF".	
		5		C4TC	OPEN S-IV ENGINE AREA FOR NORMAL ACCESS	
	YW1	6		RS4C	SECURE ST-124 PER PROCEDURE LVO-G-7040 AFTER CLEARANCE FROM RGCC AND RVFC.	
	YW1	7		RATC	SECURE AUTO THEODOLITE AFTER CLEARANCE FROM RS4C PER PROCEDURE LVO-G-7044.	
		8		CUNC	COOLING "OFF".	
		9		BDOP	ODOP GROUND TRANSMITTER NO. 1 "OFF".	
-500 <sup>0</sup>		1		RGCC	FLIGHT COMPUTER SYSTEM POWER "OFF".	
		2		SVMP	INSTALL DRAIN SCREW ACCESS COVERS ON OUTBOARD ENGINES.	
		3		SVMP	RECORD GEAR CASE PRESSURE FOR EACH ENGINE: POSITION 1 . POSITION 2 . POSITION 3 . POSITION 4 . POSITION 5 . POSITION 6 . POSITION 7 . POSITION 8 .	
		4		SVMP	REMOVE GEAR CASE MONITOR GAGES AND INSTALL AN 929-4C CAP ON PORT OF CROSS.	
		5		S1TM SUTM S4ME	CONNECT TELEMETER SYSTEMS TO VEHICLE TELEMETER ANTENNAS.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-495 <sup>o</sup>	RD4	1		PLOF	SET UP LOX SYSTEM PER PROCEDURE LVO-L-1002.	
-490 <sup>o</sup>	SRO	1	CNTS	ORNG	VERIFY 0-18 RADAR AWAY FROM THE PAD (AFTER BEACON #2 READOUT).	
	SC	2	CSTC	CICM	SPACECRAFT RADAR BEACON #1 "ON".	
	SRO	3	CNTS	ORNG	ONE (1) MINUTE AFTER NOTIFICATION OF BEACON "ON", BEGIN INTERROGATION OF BOTH BEACONS AND PROCEED WITH READOUT. REPORT READOUT WHEN COMPLETE.	
	PA	4	CNTS		ANNOUNCE: COUNTDOWN READOUTS WILL BE INTERRUPTED.	
		5		CGCM	PERFORM LIFTOFF CHECKS WITH BDOP, ANEMOMETER RECORDERS, HANGAR D AND COUNTDOWN CLOCK.	
	BL1	6		CGCM	PERFORM RCA SEQUENCER CHECKS.	
-485 <sup>o</sup>	RD3	1		SGMP	PREPARE THE HOLDDOWN ARMS FOR LAUNCH PER PROCEDURE LVO-E-7016.	
	RD1	2	C1TC	S1VM	SECURE INSTRUMENT CONTAINER #2.	
	RD1	3	CLTC	SUVM	SECURE IU TUBE 4 FOR FLIGHT.	
	S	4	CLTC	S1TM SUTM S4AE	VERIFY TELEMETER SYSTEMS CONNECTED TO VEHICLE TELEMETER ANTENNAS.	
-480 <sup>o</sup>		1		ANAG	CLOSE ENGINE HEATER CIRCUIT BREAKERS.	
	RD3	2		RECS	START ECS TO S-IV ENGINE COMPARTMENT.	
	S	3	CLTC	C2MP	TELEMETER S1 AND S2 ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-480 <sup>0</sup>	S	4	CLTC	CUMP	TELEMETER S3 ON.	
	S	5	CLTC	C1PC	TELEMETER D2 ON.	
-476 <sup>0</sup>	S	1	CLTC	B1TM B4TM	VERIFY RECEPTION OF TELEMETER SIGNALS S1, S2, S3 AND D2.	
	S	2	CLTC	C1MP	TELEMETER S1 AND S2 OFF.	
	S	3	CLTC	CUMP	TELEMETER S3 OFF.	
	S	4	CLTC	C1PC	TELEMETER D2 OFF.	
					NOTE: IU TUBE DOOR #3 CAN BE SECURED FOR FLIGHT AFTER COMPLETION OF STEPS AT T=476 <sup>0</sup>	
					NOTE: S-I CANISTER 13 CAN BE SECURED FOR FLIGHT AFTER COMPLETION OF STEPS AT T=476 <sup>0</sup>	
-475 <sup>0</sup>	RD1	1		C1FP SVMP	REQUEST S-I COMPONENT HEATERS ON AND PERFORM HEATER CHECKS PER PROCEDURE LVO-MV-P-1003.	
		2		SVMP	CHECK SETTING OF CONTROL REG (750 PSIG) AND THEN SECURE FOR LAUNCH.	
		3		SVMP	INSTALL AN 929-4C CAP ON 750 PRESSURE MEASUREMENT CALIBRATION TEE AND SAFETY WIRE.	
		4		SVMP	OPEN 750 OK PRESSURE SWITCH CALIBRATION HAND VALVE AND SAFETY WIRE "OPEN".	
	BR1	5	C1TC	SVME	VERIFY CONTROL SUPPLY AND REGULATOR MEASUREMENTS HAND VALVE OPEN AND SAFETY WIRED (FUEL BAY 3).	
		6		C1CM	BEGIN LOX TANK CAMERAS LENS PURGE.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-475 <sup>0</sup>	BR1	7	C1TC	SSMS	VERIFY MEASURING READY TO SECURE FUEL BAYS.	
	BL1	8	C1TC	S1NA	VERIFY NETWORKS READY TO SECURE FUEL BAYS.	
-470 <sup>0</sup>		1	C1TC	SVMP	INSTALL FUEL BAY DOORS 1, 2 AND 4 (REMOVE INTERNAL ACCESS LADDERS).	
	SRO	2	CNTS	ORNG	VERIFY RADAR AWAY FROM PAD.	
	SC	3	CSTC	CICM	SPACECRAFT RADAR BEACON NO. 1 "OFF".	
	SC	4	CSTC	CICM	SPACECRAFT RADAR BEACON NO. 2 "OFF".	
	SC	5	CSTC	CICM	SPACECRAFT TELEMETER A (LINK 1) "OFF".	
	SC	6	CSTC	CICM	SPACECRAFT TELEMETER B (LINK 6) "OFF".	
	SC	7	CSTC	CICM	SPACECRAFT TELEMETER C (LINK 14) "OFF".	
	PA	8		CNTS	RF SILENCE "ON".	
-465 <sup>0</sup>	BR1	1	C1TC	RFDM	VERIFY FIRE DETECTION CALIBRATION PER PROCEDURE 2-LSII-707	
	BR1	2	C1TC	RCSM	VERIFY CSM CALIBRATION PER PROCEDURE 2-LSII-706.	
		3	C1TC	SVMP	VERIFY REMOVAL OF STRIPPABLE COATING FROM FIN BASE.	
	SC	4	CSTC	CPWR	VERIFY POWER IS REMOVED FROM THE SPACECRAFT.	
	BL1	5	C1TC	S1NF	BEGIN S-I RETROROCKET INITIATOR CONNECTION PER PROCEDURE 1-LSII-707.	
	BL1	6	CLTC	SUVN	BEGIN CONNECTION OF HORIZON SENSOR DOME THRUSTER SQUIB PER PROCEDURE 1-LIUI-302	
		7		SGMP	SECURE DOOR ON ENGINE SERVICE PANEL AT NW PEDESTAL LEG OF LAUNCHER.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-465 <sup>0</sup>		8		CSTC	VERIFY SPACECRAFT BATTERIES DISCONNECTED	
	BL1	9	CNTS	ANAG	TURN BREAKER 66A5A10-1 "OFF" (Q-BALL POWER BREAKER).	
-455 <sup>0</sup>						
	RD2	1	C4TC	CPTE	VERIFY COMPLETION OF S-IV LOX AND LH2 SYSTEM PURGES AND COMPONENT CHECKS PER DAC-P-7009, PART IV.	
	RD2	2	C4TC	CPTE	PERFORM AUTOMATIC VALVE CONTROL FUNCTIONAL CHECK PER DAC-P-7009, PART V.	
	S	3	CSTC	CNTS	VERIFY SPACE VEHICLE AND LAUNCH COMPLEX RF SILENCE AND Q-BALL HEATER BREAKER "OFF".	
	SC	4	CSTC	CPYE	CONNECT SPACECRAFT LES IGNITER PER PROCEDURE C-10001.	
-450 <sup>0</sup>						
		1		SUVM	INSTALL HORIZON SENSOR COVER.	
-435 <sup>0</sup>						
	BL1	1	C1TC	S1NF	VERIFY COMPLETION OF RETROCKET INITIATOR CONNECTION.	
-430 <sup>0</sup>						
	RD1	1	C1TC	SVMP	VERIFY COMPLETION OF HYPERGOL INSTALLATION.	
	RD3	2	SVMP	RECS	BEGIN ECS AIR TO S-I ENGINE COMPARTMENT	
	BR1	3	C1TC	SVME	END MANUAL PREFLIGHT PHOTOGRAPHIC INSTRUMENTATION.	
	BR1	4	C1TC	SVME	REMOVE PREFLIGHT MOD A EJECT TUBE COVERS.	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-425 <sup>0</sup>		1	PPSO	ORNG	BRING UP 4 PUMPS TOTAL ON 36-INCH WATER SYSTEM (175 PSI).	
		2		PPSO	ESTABLISH COMPLEX ROADBLOCKS ( ACCESS TO PAD AFTER THIS TIME BY ACCESS LIST).	
		3		C1FP	VERIFY FUEL LOADING PANEL FUEL BUBBLING ON THEN OPERATE FUEL BUBBLING SWITCH ON	
	RD2	4	C4TC	CPTE	VERIFY COMPLETION OF AUTOMATIC VALVE CONTROL FUNCTIONAL CHECK, DAC-P-7009, PART V, INCLUDING SECURING OPERATIONS.	
	SC	5	CSTC	CPYR	VERIFY COMPLETION OF SPACECRAFT LES IGNITER CONNECTION.	
	PA	6		CNTS	ALL PERSONNEL CLEAR PAD AREA EXCEPT THOSE PERSONNEL SPECIFICALLY LISTED ON ACCESS. PERSONNEL ON ACCESS LIST REPORT TO STANDBY POSITIONS.	
-420 <sup>0</sup>		1		RWCP	ARM WATER SYSTEM.	
	BL1	2	CNTS	ANAG	TURN BREAKER 66A5A10-1 "ON" (Q-BALL POWER BREAKER).	
	SC	3	CNTS	CSTC	VERIFY SPACECRAFT PERSONNEL ARE CLEARING THE PAD.	
	SC	4	CSTC	CPWR	APPLY SPACECRAFT POWER PER PROCEDURE C-0007.	
	YW3	5	CLTC	BSOC	VERIFY CONSTANTS AND SCAN RATE OF ONE MINUTE INSERTED INTO PROPELLANT SCAN PROGRAM.	
-410 <sup>0</sup>	RD4	1		PPSO	VERIFY AREA CLEAR FOR S-I LOX LOADING.	
	YW3	2	CLTC	BSOC	INITI/TE PROPELLANT LOADING SCAN PROGRAM.	
	RD4	3	CLTC	RL00	LOAD S-I LOX TO 18 PERCENT PER PROCEDURE LVO-L-1004.	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
~410 <sup>o</sup>					NOTE	
					IN EVENT OF ACCIDENTAL LOX PREVALVE CLOSURE, REFER TO EMERGENCY PROCEDURE.	
~395 <sup>o</sup>		1		S1VM	S=I LOX LOADING CREW RETURN TO SERVICE STRUCTURE AND PEDESTAL (AFTER TANK PRESSURE IS BELOW 2 PSI).	
	PA	2		CNTS	RF SILENCE "OFF".	
~390 <sup>o</sup>		1		SVMP	BEGIN S=I LOX LEAK CHECKS PER PROCEDURE LVO=MV=P=1007.	
	PA	2		CNTS	AFTER VERIFICATION OF NO GROSS LEAKS ON S-I, ANNOUNCE CLEARANCE FOR OPERATIONAL PERSONNEL TO RETURN TO THE PAD AND VEHICLE (BY ACCESS LIST).	
~385 <sup>o</sup>	BR1	1	C1TC	SSMS	VERIFY MEASURING READY TO SECURE LOX BAYS.	
	BL1	2	C1TC	S1NA	VERIFY NETWORKS READY TO SECURE LOX BAYS.	
~380 <sup>o</sup>	RD4	1	C1TC	RLOO	VERIFY S=I LOX LOADED TO 18 PERCENT.	
		2		SVMP	AFTER LOX LEAK CHECK IS COMPLETE REMOVE INTERNAL ACCESS LADDERS. SECURE LOX BAYS: #1, 2, 3 AND 4 DOOR.	
		3		SVMP	AFTER LEAK CHECKING (LEAK TEC) LOX DIFFERENTIAL STEP PRESSURE SWITCH SENSING LINE, REMOVE INTERNAL ACCESS LADDER. SECURE FUEL BAY 3 DOOR.	
	RD3	4		RUAC	BEGIN PREPARATIONS OF THE UMBILICAL SWING ARMS FOR LAUNCH PER PROCEDURE	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-380°					LVO-E-7016.	
	RD3	5		UQBL	BEGIN PREPARATIONS OF Q-BALL COVER RETRACT SYSTEM PER PROCEDURE LVO-E-7019	
-375°		1		SVMP	INSTALL CENTER BARREL COVER.	
		2		ANAG	INSTALL JUMPER FOR CDR LIFTOFF (84A1J17/LITTLE J TO 84A1J20/BIG F).	
		3		SVOR RSEQ	SEQUENCE RECORDERS TO MINUTE SPEED AND TIME PULSE "ON".	
	PA	4		CNTS	ANNOUNCEMENT - ALL PERSONNEL CONNECTED WITH COMMAND CHECKS, MAN APPOINTED STATIONS (NORCOM S CIRCUIT).	
	S	5		C1MP	TELEMETER F2 "ON".	
	S	6		C1MP	AUXILIARY EQUIPMENT "ON".	
	S	7		C1MP	TM CALIBRATION TO INFLIGHT.	
-370°						
	BL2	1	C4TC	SMTE	PERFORM S-IV AFT ACCESS KIT REMOVAL PER DAC-L-7002.	
		2			COMMAND CHECKS. =====	
	S	2-1	CNTS	S40E	VERIFY MODEL 243 PULSE SENSORS CONNECTED TO 410A14P2 AND 410A19P2.	
	S	2-2	CNTS	S1NF S40E	VERIFY INERT DESTRUCT S&A UNITS ARE ELECTRICALLY CONNECTED.	
	S	2-3		CNTS	VERIFY PSO ON HAND TO OBSERVE DESTRUCT CHECKS ON VEHICLE AND IN BLOCKHOUSE.	
	S	2-4	CNTS	CSPC	VERIFY 400 CYCLE POWER "ON".	
	S	2-5	CNTS	C4DP	VERIFY MODULE POWER SUPPLY "ON" AND CHECK FOR 5 PLUS OR MINUS 0.2 VOLTS.	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
~370'						
	S	2-6	CNTS	C10P	VERIFY MODULE POWER SUPPLY "ON".	
	S	2-7	CNTS	C4DP	TEST S-IV EBW'S FOR READY.	
	S	2-8	CNTS	C4DP	VERIFY S-IV S&A SAFE.	
	S	2-9	CNTS	SVOC	VERIFY PULSE SENSOR POWER "ON".	
	S	2-10	CNTS	CSSP	VERIFY MSFC TALKBACK ENABLE "ON".	
	S	2-11	CNTS	CLVN	DESTRUCT ENABLE "ON".	
	S	2-12	CNTS	C4DP	VERIFY SAFETY BUS INDICATION "ON".	
	S	2-13	CNTS	CIPC	TELEMETER D2 "ON".	
	S	2-14	CNTS	B4TM	VERIFY RASTER.	
	S	2-15	CNTS	B4TM OTMD	TELEMETER RECORDERS "ON".	
	S	2-16	CNTS	R4VC	VERIFY VISICORDER "ON".	
	S	2-17	CNTS	RFSR	SEQUENCE RECORDERS TO 10 MM/SEC.	
	S	2-18	CNTS	C10P	FUNCTION SELECTOR TO FIRING UNIT VOLTAGE CHECK.	
	S	2-19	CNTS	ORNG	COMMAND TRANSMITTER NO. 1 "ON".	
	S	2-20	CNTS	C40P	VERIFY PANEL SELECT TO AUXILIARY RECORDER.	
	S	2-21	CNTS	C1DP	S-I CDR'S #1 AND #2 "ON".	
	S	2-22	CNTS	RHBM	SANBORN RECORDER TO 5 MM/SEC.	
	S	2-23	CNTS	C1DP	S-I CDR'S #1 AND #2 TO "INTERNAL".	
	S	2-24	CNTS	C4DP	S-IV CDR'S #1 AND #2 "ON".	
	S	2-25	CNTS	C4DP	VERIFY S-IV EBW'S #1 AND #2 "OFF" AND "NOT READY".	
	S	2-26	CNTS	C4DP	S-IV CDR'S #1 AND #2 TO "INTERNAL".	
	S	2-27	CNTS	RBHM	SANBORN RECORDER TO 25 MM/SEC.	
	S	2-28	CNTS	ORNG	CUTOFF COMMAND AND RELEASE UPON REQUEST	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-370 <sup>0</sup>						
	S	2-29	CNTS	C1DP C4DP	VERIFY CDR'S #1 AND #2 CUTOFF.	
	S	2-30	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 ON INTERNAL AND CHARGED.	
	S	2-31		B4TM RFSR	NOTE ALL ENGINE CUTOFF NOT RECEIVED.	
	S	2-32		RFSR	NOTE HELIUM HEATER CUTOFF NOT RECEIVED.	
	S	2-33	CNTS	CPSO	VERIFY S-I AND S-IV EBW'S #1 AND #2 VOLTAGE INDICATIONS.	
	S	2-34	CNTS	ORNG	DESTRUCT COMMAND.	
	S	2-35	CNTS	SVOC	VERIFY S-I AND S-IV DESTRUCT DOES NOT OCCUR ON VEHICLE.	
	S	2-36	CNTS	ORNG	RELEASE DESTRUCT COMMAND.	
	S	2-37	CNTS	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	2-38	CNTS	C1DP C4DP	S-I AND S-IV EBW'S #1 AND #2 TO "EXTERNAL".	
	S	2-39	CNTS	C1DP	VERIFY S-I EBW'S #1 AND #2 VOLTAGES "OFF".	
	S	2-40	CNTS	C4DP	VERIFY S-IV EBW'S #1 AND #2 "OFF" AND NOT READY.	
	S	2-41	CNTS	C1DP	ARM S-I DESTRUCT S&A (INERT).	
	S	2-42	CNTS	C4DP	ARM S-IV DESTRUCT S&A (INERT).	
	S	2-43	CNTS	CLVN	LIFTOFF ENABLE "ON".	
	S	2-44	CNTS	C1DP C4DP	SIMULATED LIFTOFF "ON".	
	S	2-45	CNTS	RBHM	SANBORN RECORDER TO 25 MM/SEC.	
	S	2-46	CNTS	ORNG	CUTOFF COMMAND AND RELEASE UPON REQUEST	
	S	2-47	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 ON "INTERNAL" AND "CHARGED".	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-370'						
	S	2-48	CNTS	CPSO	VERIFY S-I AND S-IV EBW'S #1 AND #2 VOLTAGE INDICATIONS.	
	S	2-49		CSRP	NOTE S-I ENGINES CUTOFF DOES NOT OCCUR.	
	S	2-50		RFSR B4TM	NOTE ALL ENGINE CUTOFF COMMAND. CUTOFF COMMAND.	
	S	2-51	CNTS	RFSR	VERIFY HELIUM HEATER THERMAL CUTOFF COMMAND INDICATION,	
	S	2-52	CNTS	ORNG	DESTRUCT COMMAND.	
	S	2-53	CNTS	SVOC	VERIFY S-I AND S-IV DESTRUCT ON VEHICLE	
	S	2-54	CNTS	ORNG	RELEASE DESTRUCT COMMAND.	
	S	2-55	CNTS	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	2-56	CNTS	ORNG	SWITCH TO COMMAND TRANSMITTER #2.	
	S	2-57	CNTS	SVOC	RESET PULSE SENSORS.	
	S	2-58	CNTS	C1DP C4DP	S-I AND S-IV EBW'S #1 AND #2 TO "EXTERNAL"	
	S	2-59	CNTS	RFSR B4TM	VERIFY ALL ENGINE CUTOFF COMMAND REMOVED.	
	S	2-60	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 "OFF" AND "NOT READY".	
	S	2-61	CNTS	CSPC	SEQUENCER RELAY POWER "OFF", THEN "ON".	
	S	2-62	CNTS	RFSR	VERIFY LOSS OF HELIUM HEATER CUTOFF COMMAND INDICATION.	
	S	2-63	CNTS	RBHM	SANBORN RECORDER TO 25 MM/SEC.	
	S	2-64	CNTS	ORNG	CUTOFF COMMAND AND RELEASE UPON REQUEST	
	S	2-65	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 ON "INTERNAL" AND "CHARGED".	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-370 <sup>o</sup>						
	S	2-66	CNTS	CPSO	VERIFY S-I AND S-IV EBW'S #1 AND #2 VOLTAGE INDICATIONS.	
	S	2-67		CSRP	NOTE S-I ENGINES CUTOFF DOES NOT OCCUR.	
	S	2-68	CNTS	RFSR B4TM	VERIFY ALL ENGINE CUTOFF COMMAND.	
	S	2-69	CNTS	RFSR	VERIFY HELIUM HEATER CUTOFF COMMAND INDICATION.	
	S	2-70	CNTS	ORNG	DESTRUCT COMMAND.	
	S	2-71	CNTS	SVOC	VERIFY S-I AND S-IV DESTRUCT ON VEHICLE	
	S	2-72	CNTS	ORNG	RELEASE DESTRUCT COMMAND.	
	S	2-73	CNTS	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	2-74	CNTS	SVOC	RESET PULSE SENSORS.	
	S	2-75	CNTS	C1DP C4DP	SIMULATED LIFTOFFS "OFF".	
	S	2-76	CNTS	RFSR B4TM	VERIFY ALL ENGINE CUTOFF REMOVED.	
	S	2-77	CNTS	C1DP C4DP	S-I AND S-IV EBW'S #1 AND #2 TO "EXTERNAL".	
	S	2-78	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 "OFF" AND "NOT READY".	
	S	2-79	CNTS	CSPC	SEQUENCER RELAY POWER "OFF", THEN "ON".	
	S	2-80	CNTS	RFSR	VERIFY LOSS OF HELIUM HEATER CUTOFF COMMAND INDICATION.	
	S	2-81	CNTS	RBHM	SANBORN RECORDER TO 25 MM/SEC.	
	S	2-82	CNTS	ORNG	CUTOFF COMMAND AND RELEASE UPON REQUEST	
	S	2-83	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 TO "INTERNAL" AND "CHARGED".	
	S	2-84		RFSR B4TM	NOTE ALL ENGINE CUTOFF NOT RECEIVED.	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-370 <sup>1</sup>						
	S	2-85	CNTS	RFSR	NOTE HELIUM HEATER CUTOFF COMMAND NOT RECEIVED.	
	S	2-86	CNTS	CPSO	VERIFY S-I AND S-IV EBW'S #1 AND #2 VOLTAGE INDICATIONS.	
	S	2-87	CNTS	ORNG	DESTRUCT COMMAND.	
	S	2-88	CNTS	SVOC	VERIFY S-I AND S-IV DESTRUCT DOES NOT OCCUR ON VEHICLE.	
	S	2-89	CNTS	ORNG	RELEASE DESTRUCT COMMAND.	
	S	2-90	CNTS	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	2-91	CNTS	C4DP	S-IV CDR SWITCHES #1 AND #2 "OFF".	
	S	2-92	CNTS	C4DP	VERIFY S-IV CDR'S #1 AND #2 REMAIN "ON"	
	S	2-93	CNTS	ORNG	SAFE COMMAND AND RELEASE UPON REQUEST.	
	S	2-94	CNTS	C4DP	VERIFY SAFE COMMAND RECEIVED.	
	S	2-95	CNTS	C4DP B4TM	VERIFY S-IV CDR'S #1 AND #2 AND EBW'S #1 AND #2 REMAIN "ON".	
	S	2-96	CNTS	C1DP C4DP	S-I AND S-IV EBW'S #1 AND #2 TO "EXTERNAL".	
	S	2-97	CNTS	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 "OFF" AND "NOT READY".	
	S	2-98	CNTS	RBHM	SANBORN RECORDER TO 2 MM/SEC.	
	S	2-99	CNTS	C1PC	TELEMETER D2 "OFF".	
	S	2-100	CNTS	B4TM	TELEMETER RECORDING "OFF".	
	S	2-101	CNTS	C1MP	TELEMETER F2 "OFF".	
	S	2-102	CNTS	C1MP	AUXILIARY EQUIPMENT "OFF".	
	S	2-103	CNTS	OTMD	TELEMETER RECORDING "OFF".	
	S	2-104	CNTS	C1MP CUMP	TELEMETER CAL TO "PREFLIGHT".	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-370'						
	S	2-105	CNTS	C1DP	SAFE S-I DESTRUCT S&A (INERT),	
	S	2-106	CNTS	C4DP	SAFE S-IV DESTRUCT S&A (INERT),	
	S	2-107	CNTS	CLVN	LIFTOFF ENABLE "OFF",	
	S	2-108	CNTS	C4DP	S-IV CDR'S #1 AND #2 TO "EXTERNAL" AND VERIFY "OFF",	
	S	2-109	CNTS	C1DP	S-I CDR'S #1 AND #2 TO "EXTERNAL",	
	S	2-110	CNTS	C1DP	S-I CDR'S #1 AND #2 "OFF",	
	S	2-111	CNTS	ORNG	COMMAND CARRIER "OFF",	
	S	2-112	CNTS	CLVN	DESTRUCT ENABLE "OFF",	
	S	2-113	CNTS	C4DP	VERIFY LOSS OF SAFETY BUS ON INDICATION	
	S	2-114	CNTS	RFSR	SEQUENCE RECORDERS TO 2 MM/SEC,	
	S	2-115	CNTS	R4VC	VISICORDER "OFF",	
	S	2-116	CNTS	CLVN	REMOVE DESTRUCT AND LIFTOFF ENABLE SWITCH KEYS AND GIVE TO THE PAD SAFETY REPRESENTATIVE IN THE BLOCKHOUSE,	
	S	2-117	CNTS	ANAG	REMOVE JUMPER 84A1J17/LITTLE J TO 84A1J20/BIG F,	
	S	2-118	CNTS	RSEQ	SEQUENCE RECORDERS TO HOUR SPEED, TIME PULSE "OFF",	
	S	3	CNTS		VERIFY COMMAND CHECKS COMPLETE,	
		4	SVME		REMOVE PRELAUNCH COVERS FROM STROBE LIGHTS AND FIBEROPTIC LENSES AFTER S-IV AFT ACCESS KIT REMOVAL,	
-365'						
		1	S1VM		REMOVE LOX VENT LINES (DO NOT REMOVE VENT II-III UNTIL IMMEDIATELY AFTER S-I S&A CONNECTION),	
		2	SVMP		INSTALL HEAT SHEILD PANELS 30M03497 (FOUR EACH),	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-365 <sup>0</sup>		3		SVMP	INSTALL ESCAPE CHUTE COVER AND CONNECT CALORIMETER PURGE LINE.	
		4		S1VM	STOW WORK PLATFORMS ON ADJUSTABLE ONE.	
		5	C1TC	SVME	VERIFY ESCAPE CHUTE AND HEAT SHEILD PANEL MEASUREMENTS ARE CONNECTED AND PROTECTIVE COVERS REMOVED.	
-360 <sup>0</sup>		1	CLTC	RGCC	REQUEST APS 100 FLIGHT COMPUTER SYSTEM POWER "ON".	
		2		C1NP	VERIFY LCC ESE PER PROCEDURE 1-LLVI-706	
		3		SVOR	SEQUENCE RECORDERS "OFF", TIME PULSE "OFF".	
		4		CPSP	AFTER ROGER FROM SVOC, TURN SERVICE STRUCTURE OAT POWER "OFF".	
-355 <sup>0</sup>		1		SVMP	VERIFY ALL BAY DOORS SECURED FOR LAUNCH	
		2		PLOF	TOP OFF LN2 150-GALLON TANK.	
		3		SGMP	VERIFY ALL LAUNCHER AUXILIARY PLATFORMS ARE REMOVED AND SECURED FOR LAUNCH.	
		4	SC	CSTC	VERIFY FLIGHT BATTERIES CONNECTIONS COMPLETE.	
-350 <sup>0</sup>		1	PA	CNTS	RF SILENCE "ON" AND CONTROLLED SWITCHING.	
		2		SGNP	AFTER ROGER FROM SVOC, C4TC, BCDC AND SCTC, DISCONNECT SERVICE STRUCTURE TEST CABLES.	
		3		SGMP	SECURE TEST CABLE AND LOX REPLENISH ACCESS COVER ON SOUTH SIDE OF LAUNCHER.	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-350'		4		SUVN S1NF	DISCONNECT PULSE SENSORS AND ASSOCIATED CABLING FOR S-I AND S-IV DESTRUCT.	
		5		SVOC	SECURE 136 FOOT LEVEL OAT ROOM.	
	BL1	6	C1TC	S1NF	CONNECT S-I DESTRUCT S&A UNIT PER PROCEDURE 1-LSII-710, PART II.	
	BL1	7	C1TC	S1NF	CONNECT S-I DESTRUCT DETONATORS PER PROCEDURE 1-LSII-708.	
	RD2	8	C4TC	CVTE	CONNECT S-IV DESTRUCT S&A PER PROCEDURE DAC-0-7012.	
		9		SUMP	CHARGE HYDRAULIC ACCUMULATORS TO 1600 PSIG, LEAK CHECK SHRADER FITTING AND SECURE FOR LAUNCH: POSITION 1 . POSITION 2 . POSITION 3 . POSITION 4 .	
		10		SVMP	INSTALL AN 929-12C CAPS ON HYDRAULIC SYSTEM LOW PRESSURE RELIEF VALVES: POSITION 1 . POSITION 2 . POSITION 3 . POSITION 4 .	
		11		SVMP	INSTALL FINAL HEAT SHIELD PANELS.	
	SIV	12	C4TC	S4ME	PREPARE S-IV AREAS FOR SERVICE STRUCTURE REMOVAL.	
		13		S4ME	VERIFY ALL LOOSE ITEMS ON ADJUSTABLE LEVELS 1, 2 AND 3 REMOVED OR MOVED BACK AND TIED DOWN SECURELY.	
		14		S4ME	VERIFY ALL ELECTRICAL, MECHANICAL AND PNEUMATIC CONNECTIONS BETWEEN FIXED AND MOVEABLE PLATFORMS ON ADJUSTABLE LEVELS 1, 2 AND 3 DISCONNECTED.	
		15	C4TC	S4ME	VERIFY EJECT PNEUMATIC LINES CONNECTED TO EJECT MECHANISMS ON SWING ARM 2 AND GH2 VENT COUPLING.	
		16		S4ME	REMOVE SAFETY WIRE FROM SWING ARM 2 AND GH2 VENT COUPLING EJECT	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-350'					MECHANISMS,	
		17		S4ME	REPLACE STEEL SHEAR PINS WITH ALUMINUM SHEAR PINS ON SWING ARM 2 EJECT MECHANISM,	
		18		S4ME	REMOVE SAFETY BLOCK FROM GH2 VENT COUPLING EJECT MECHANISM,	
		19		S4ME	VERIFY SWING ARM 2 AND GH2 VENT COUPLING SOLENOIDS ELECTRICALLY CONNECTED,	
		20		S4ME	CONNECT BUNGEE LANYARD TO GH2 COUPLING,	
		21		S4ME	CONNECT RETRACT LANYARDS TO SWING ARM 2 AND GH2 VENT COUPLING CARRIERS,	
		BL1	22	C4TC	CSPC SERVICE TOWER POWER ENABLE "OFF",	
		23		RECS	START ECS AIR TO THE S-IV AFT SECTION,	
-345'						
		RD3	1		APCD PREPARE THE PNEUMATIC DISTRIBUTION SYSTEM FOR LAUNCH PER PROCEDURE LVO-E-7020,	
		RD3	2	C1TC	RUAC COMPLETE SWING ARM PREPARATIONS PER LVO-E-7016,	
		RD3	3	C1TC	UQLB COMPLETE Q-BALL RETRACT SYSTEM PREPARATIONS PER LVO-E-7019,	
		4		SVMP	REMOVE BAY EXTERNAL ACCESS LADDERS,	
-340'						
		YW4	1		SSSC OPEN SERVICE STRUCTURE SILO C-1 AND RETRACT PLATFORM #4.	
-335'						
		YW3	1	CLTC	RGCC INITIATE APS 101, PSEUDO FLIGHT TEST.	
		2		S1VM	REMOVE PROTECTIVE COVERS FROM TEMP, MEASUREMENTS ON BLAST PLATES AND LOX/SOX SYSTEM,	

EMERGENCY PROCEDURE (T-410' TO T-0')

(AFTER S-I LOX TANKING)

PREMATURE CLOSURE OF S-I PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED, AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
  
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

LAUNCH COUNTDOWN  
DATE SEPTEMBER 5, 1964  
REVISION

SATURN/APOLLO  
LAUNCH OPERATIONS

PAGE  
TEST NO.  
VEHICLE

193  
7-LSVI-300  
SA-7

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-335'		3			CSTC VERIFY COMMAND MODULE INSPECTION COMPLETED.	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
~ 330'	BL1	1	C1TC	S1NA	CONNECT S <sub>1</sub> P <sub>1</sub> G <sub>1</sub> G <sub>1</sub> INITIATORS PER PROCEDURE 1-LSII-709, PART II.  NOTE  IF CUTOFF IS REQUIRED BECAUSE OF AN ACCIDENTAL IGNITION, HOLD THE CUTOFF BUTTON UNTIL PREVALVES 1 THRU 8 ARE "OFF".	
		2		SVMP	INSTALL INITIATOR ACCESS HAND HOLE COVERS AS INITIATOR CONNECTIONS ARE COMPLETED.	
	BL1	3	C1TC	S1NF	VERIFY S-I DESTRUCT S&A UNIT AND DETONATORS CONNECTED.	
	RD2	4	C4TC	CVTE	VERIFY S-IV S&A CONNECTED FOR FLIGHT.	
		5	CVTE	S4ME	REMOVE THE REMAINING 2 LH2 TANK PROTECTIVE PADS FROM THE FORWARD INTERSTAGE.	
		6	CVTE	SUVM	REMOVE IU/S-IV FORWARD ACCESS KIT DOOR PAN.	
		7	CVTE		VERIFY S-IV FORWARD INTERSTAGE HAS BEEN INSPECTED FOR FLIGHT CONFIGURATION	
		8		S4SE	INSTALL AND SECURE THE 586 S-IV FORWARD INTERSTAGE DOOR.	
		9		S1VM	REMOVE LOX TANK CAMERA PURGE VENT LINE.	
		10		S1VM	REMOVE REMAINING LOX VENT LINE BETWEEN II-III AFTER S-I S&A CONNECTION IS COMPLETED.	
	11		S4PE	VERIFY ECS AIR ON IN THE S-IV AFT SECTION. OPEN ENGINE INJECTOR PURGE HAND VALVE AND LOX VENT PILOT HAND VALVE AND SAFETY WIRE BOTH IN OPEN POSITION.		
	BL2	12	C4TC	SMTE	VERIFY COMPLETION OF S-IV AFT ACCESS KIT REMOVAL PER PROCEDURE DAC-L-7002.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-325 <sup>o</sup>		1		SVMP	SECURE GN2 PANELS ON ENGINE SERVICE PLATFORM.	
		2		SGMP	SECURE AUXILIARY GN2 CONNECTIONS INSIDE LAUNCHER RING FOR LAUNCH.	
-315 <sup>o</sup>	BL1	1	RS4C	ANAG	ST-124 HEATER SWITCH TO NORMAL POSITION.	
-310 <sup>o</sup>	S	1	CLTC	SVME	VERIFY MEASURING READY TO OPEN SILO B-3	
	RD2	2	C4TC	CVTE	VERIFY COMPLETION OF S-IV DESTRUCT BLOCK CONNECTION PER PROCEDURE DAC-0-7012.	
	SIV	3		S4ME	VERIFY S-IV AREAS READY FOR SERVICE STRUCTURE REMOVAL.	
-305 <sup>o</sup>	BL1	1		UGRN	SECURE UMBILICAL TOWER ESE PER PROCEDURE 1-LLVI-715.	
	YW4	2	CLTC	SSSC SMTE	OPEN SERVICE STRUCTURE SILO B-3 AND RETRACT PLATFORMS #2 AND #3.	
	SC	3		CSTC	BEGIN SPACECRAFT ECS PURGE.	
-295 <sup>o</sup>		1		SGMP	BEGIN PREPARATIONS TO SECURE ENGINE SERVICE PLATFORM BENEATH LAUNCHER PER PROCEDURE LVO-E-7020.	
-290 <sup>o</sup>	BL1	1	C1TC	S1NA	VERIFY S,P,G,G. INITIATOR CONNECTION COMPLETE.	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

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3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-290 <sup>o</sup>		2		SVMP	FINAL S-I TAIL SECURING OPERATIONS.	
-285 <sup>o</sup>		1		C1TC RBHM	PERFORM LOX BUBBLING CHECK.	
		2		SVMP	COMPLETE INITIATOR ACCESS HAND HOLE COVER INSTALLATION.	
		3		C1FP SVMP	INITIATE CALORIMETER PURGE AND VERIFY FLOW AT ALL 10 LOCATIONS.	
-280 <sup>o</sup>	S	1	CLTC	SGNP	VERIFY ALL NETWORK CABLES ARE CLEAR FOR STRUCTURE REMOVAL.	
-275 <sup>o</sup>	BL1	1		SGNP	SECURE LAUNCHER ESE PER PROCEDURE 1-LLVI-714.	
	S	2	CLTC	RWCP	VERIFY LAUNCH VALVE "OPEN".	
-270 <sup>o</sup>		1		SVMP	COMPLETE S-I TAIL SECURING OPERATIONS.	
	RD3	2	C1TC	SGMP	SECURE ENGINE SERVICE PLATFORM FOR LAUNCH PER PROCEDURE LVO-E-7021.	
		3	CLTC	SGMP	OBTAIN PPSO VERIFICATION THAT INSIDE OF LAUNCHER IS CLEAR OF ALL PERSONNEL AND SECURE LAUNCHER BLAST DOOR AND WINDOW FOR LAUNCH.	
	SC	4		CSTC	VERIFY COMPLETION OF SPACECRAFT HATCH INSTALLATION.	
	SC	5		CSTC	VERIFY COMPLETION OF SPACECRAFT ECS PURGE.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-265 <sup>0</sup>	SC	1		CSTC	VERIFY ALL SPACECRAFT PERSONNEL ARE CLEARING THE PAD AREA.	
	YW3	2	CLTC	SSSC	OPEN SERVICE STRUCTURE SILO C-2 AND RETRACT PLATFORMS NO. 5 AND 6. NOTE SPACECRAFT PAD LEADER WILL REMAIN UNTIL SILO CLEARS SPACECRAFT.	
	PA	3		CNTS	ANNOUNCE TO CLEAR PAD FOR S-IV LOX TANKING.	
-260 <sup>0</sup>	BL1	1		ANAG	IGNITION CIRCUIT BREAKER "ON".	
	BL1	2		ANAG	IGNITION CONTACTOR ON AND SAFETY WIRE,	
	BL1	3		ANAG	VERIFY IGNITION RACK SWITCH IN SAFE POSITION.	
	BL1	4		ANAG	VERIFY AGCS ESE SECURED PER PROCEDURE 1-LLV1-713.	
-245 <sup>0</sup>	PA	1		CNTS	RF SILENCE "OFF".	
	SRO	2	CNTS	ORNG	FREQUENCY CLEARANCE FOR THE FOLLOWING TM LINKS = 244.8, 251.5, AND 258.5 MC.	
	S	3	CLTC	PPSO	VERIFY PAD AREA CLEAR FOR S-IV LOX LOADING.	
	RD4	4	CLTC	RL00	LOAD S-IV LOX PER PROCEDURE LVO-L-1004. NOTE TM SYSTEMS ON AND OFF AS REQUIRED.	
	RD1	5	C1TC	C1VP	PRESSURIZE CONTROL SPHERES TO 3000 PSIG	
-215 <sup>0</sup>	RD4	1		RL00	VERIFY S-IV LOX LOADING COMPLETE.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-215'	RD4	2			CIPC TELEMETERS D1, D2 AND D3 "OFF".	
		3			S4PE U4PE S-IV LEAK CHECK CREW RETURN TO SERVICE STRUCTURE AND UMBILICAL TOWER AND LEAK CHECK PER PROCEDURE DAC-P-7007.	
-195'		1			C4TC VERIFY S-IV LEAK CHECKS COMPLETE PER PROCEDURE DAC-P-7007.	
		2			S4SE CLOSE S-IV AFT INTERSTAGE.	
-185'	YW4	1			C4TC VERIFY AFT INTERSTAGE SECURE FOR FLIGHT PER PROCEDURE DAC-P-7007.	
		2	CLTC		SSSC SMTE OPEN SERVICE STRUCTURE SILO B-2 AND RETRACT PLATFORM #1.	
-180'	YW1	1			CUNC COOLING TO PREFLIGHT.	
		2	CLTC		RS4C BRING ST-124 TO OPERATING CONDITIONS PER PROCEDURE LVO-G-7041.	
		3	CLTC		RATC BRING AUTO THEODOLITE UP TO OPERATING CONDITIONS PER PROCEDURE LVO-G-7044.	
-170'	YW1	1	CLTC		SSSC MOVE SERVICE STRUCTURE TO LAUNCH LOCATION PER PROCEDURE LSO-F-1001.	
-165'	PA	1			CNTS CLEAR BLOCKHOUSE AND PARKING LOT OF NON-ASSIGNED PERSONNEL TO THE ROAD BLOCKS.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-150 <sup>0</sup>	SRO	1		CPSO	SET BLAST DANGER AREA ROAD BLOCKS. AREA TO BE CLEAR BY T-115.	
		2	CNTS	ORNG	DO NOT INTERROGATE C-BAND BEACON WITH 1,16 RADAR UNTIL REQUESTED.	
-145 <sup>0</sup>	S	1	CLTC	RWCP	VERIFY WATER PRESSURE TO 175 PSIG.	
		2			RF AND TM CHECKS. -----	
	S	2-1	CLTC	BDOP	ODOP GROUND TRANSMITTER NO. 2 "ON".	
	S	2-2	CLTC	C1CM	TV TO FILAMENT.	
	S	2-3	CLTC	CUMP	ALTIMETER "ON".	
	S	2-4	CLTC	CUMP	ODOP "ON".	
	S	2-5	CLTC	CUMP	MINITRACK "ON".	
	S	2-6	CLTC	CUMP	AZUSA "ON".	
	S	2-7	CLTC	CUMP	C-BAND BEACON (RADAR) "ON".	
	S	2-8	CLTC	CUMP	MISTRAM "ON".	
	S	2-9	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1 AND S2 "ON".	
	S	2-10	CLTC	C1MP	VERIFY TAPE RECORDER READY INDICATION.	
	S	2-11	CLTC	CUMP	TELEMETERS F5, F6, S3, AND P1 "ON".	
	S	2-12	CLTC	CUMP	VERIFY TAPE RECORDER READY INDICATION.	
	S	2-13	CLTC	C1MP CUMP	AUXILIARY EQUIPMENTS "ON".	
	S	2-14	CLTC	C1MP CUMP	SWEEP FREQUENCY CALIBRATOR "ON".	
S	2-15	CLTC	CIPC	TELEMETERS D1, D2 AND D3 "ON".		
S	2-16	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT".		

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
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4. C1FP: FUEL BUBBLING SWITCH OFF
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6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-145 <sup>0</sup>	S	2-17	CLTC	CIPC	CALIBRATION SWITCH TO MANUAL (VERIFY VCO CALIBRATION LIGHT OFF).	
	S	2-18	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO "50%".	
	SRO	2-19	CNTS	ORNG	INTERROGATE MISTRAM AND AZUSA AND REPORT READOUT.	
-140 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1CM	TV TO B+.	
	S	1-2	CLTC	B1TM B4TM OTMD	TELEMETER RECORDINGS "ON".	
	S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "AC COMMAND".	
	SRO	1-4	CNTS	ORNG	INTERROGATE IU C-BAND BEACON WITH 1.16 RADAR AND REPORT READOUT.	
-139 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" AND "OFF".	
-138 <sup>0</sup> 45"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT".	
	S	1-2	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-138 <sup>0</sup> 45"	S	1-3	CLTC	C1MP CUMP	PREFLIGHT CALIBRATION TO "0%".	
-137 <sup>0</sup> 30"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO "100%".	
-136 <sup>0</sup> 30"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	RECORDER TRANSFERS "ON".	
	S	1-2	CLTC	B1TM OTMD	8 KC OSCILLATORS "ON".	
	S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS COMMANDS.	
	S	1-4	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 0%, 25%, 50%, 75%, AND 100% (IN 2 SECOND INCREMENTS).	
	S	1-5	CLTC	CIPC	STEP THROUGH MANUAL CALIBRATION IN 2 SECOND INCREMENTS.	
	S	1-6	CLTC	C1MP CUMP	TELEMETER CALIBRATION TO "INFLIGHT".	
	S	1-7	CLTC	RBHM	S-I AND IU HI CAL. COMMAND FOR 15 SEC.	
	S	1-8	CLTC	RBHM	S-I AND IU LOW CAL COMMAND FOR 15 SEC.	
	S	1-9	CLTC	RBHM	S-I AND IU RUN COMMAND.	
	S	1-10	CLTC	CIPC	CALIBRATION TO AUTOMATIC.	
	S	1-11	CLTC	CIPC	GIVE CAL START.	
	S	1-12	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" FOR 5 SECONDS.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-136' 30"	S	1-13	CLTC	CIPC	BRIDGE CALIBRATION HIGH FOR 10 SECONDS.	
	S	1-14	CLTC	CIPC	BRIDGE CALIBRATION LOW FOR 10 SECONDS.	
		1-15	CLTC	CUMP	P1 CALIBRATION COMMAND "ON" AND "OFF".	
	S	1-16	CLTC	B1TM, OTMD	8 KC OSCILLATOR OFF.	
-135'	RD4	1	C1TC	PPSO	VERIFY PAD AREA CLEAR TO BEGIN S-I LOX PRECOOL.	
	RD4	2	C1TC	RL00	BEGIN S-I FINAL LOX TANKING PER PROCEDURE LVO-L-1004 (AFTER RECORDER TRANSFER OFF).	
-134' 30"		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1MP CUMP	RECORDER TRANSFERS "OFF".	
	S	1-2	CLTC	CIPC	GIVE CAL START.	
	S	1-3	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMAND "ON" FOR 5 SECONDS.	
	S	1-4	CLTC	CUMP	P1 CALIBRATION COMMAND "ON" AND "OFF".	
	S	1-5	CLTC	C1MP	TELEMETER CALIBRATION TO "PREFLIGHT".	
-134'		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	CUMP	ODOP "OFF".	
	S	1-2	CLTC	BDOP	ODOP GROUND TRANSMITTERS #2 "OFF".	
	S	1-3	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1 AND S2 "OFF".	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

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6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-134 <sup>0</sup>	S	1-4	CLTC	CUMP	TELEMETERS F5, S3 AND MINITRACK "OFF".	
	S	1-5	CLTC	C1MP	TELEMETER AUXILIARY EQUIPMENT "OFF".	
	S	1-6	CLTC	CIPC	TELEMETERS D1, D2, AND D3 "OFF".	
	S	1-7	CLTC	B4TM	S-IV TELEMETER RECORDING "OFF".	
-130 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	C1CM	TV "OFF".	
	S	1-2	CLTC	CUMP	C-BAND BEACON (RADAR) "OFF" WHEN READOUT COMPLETE.	
	S	1-3	CLTC	CUMP	AZUSA "OFF" WHEN READOUT IS COMPLETE.	
	S	1-4	CLTC	CUMP	MISTRAM "OFF" WHEN READOUT IS COMPLETE.	
-120 <sup>0</sup>		1			RF AND TM CHECKS. -----	
	S	1-1	CLTC	CUMP	ALTIMETER "OFF".	
	S	1-2	CLTC	CUMP	TELEMETERS F6 AND P1 "OFF".	
	S	1-3	CLTC	CUMP	TELEMETER AUXILIARY EQUIPMENT "OFF".	
	S	1-4	CLTC	CUMP	TELEMETER CALIBRATION TO "PREFLIGHT".	
	S	1-5	CLTC	OTMD B1TM	TELEMETER RECORDINGS "OFF".	
	YW1	2		RATC	ST-124 TO FLIGHT AZIMUTH PER PROCEDURE LVO-G-7042.	
	S	3	CLTC	RVFC	CONTROL COMPUTER "ON" (VERIFY "CAT ZERO").	
	S	4	CLTC	RVFC	CONTROL ACCELEROMETERS "ON".	
	S	5	CLTC	RVFC	IU RATE GYROS "ON".	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-120'	S	6	CLTC	RVFC	S-I RATE GYROS "ON".	
	S	7	CLTC	RVFC	Q-BALL SYSTEM "ON".	
	S	8	CLTC	RVFC	Q-BALL HEATERS "ON".	
	S	9	CLTC	RVFC	ACCELERATION SWITCH "ON".	
-115'	S	1	CLTC	RGCC	INITIATE APS 103, FLIGHT COMPUTER SYSTEM FINAL LAUNCH PREPARATION.	
-100'	S	1		RECS	SWITCH ECS MODE FROM AIR TO GN2 PER PROCEDURE LVO-E-7018.	
	YW4	2		SSSC	VERIFY SERVICE STRUCTURE SECURED AT LAUNCH LOCATION. PERSONNEL CLEAR AREA TO ROADBLOCK OR BLOCKHOUSE AS ASSIGNED.	
-90'		1		CPSO	VERIFY COMPLEX CLEAR OF ALL PERSONNEL AND SECURE BLOCKHOUSE DOOR.	
	S	2	CLTC	RVFC	CONTROL VOLTAGE "ON".	
-85'		1		C1FP	DELUGE PURGE TO AUTO.	
	S	2	CLTC	CPSP	GENERATOR COMMIT ON ALL GENERATORS.	
	S	3	CLTC	CPSO	RELEASE DESTRUCT ENABLE KEY TO CLVN.	
	S	4	CLTC	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	5	CLTC	C4DP	VERIFY S&A SAFE.	
	S	6	CLTC	CLVN	DESTRUCT ENABLE ON.	
	S	7	CLTC	C4OP	PANEL SELECT TO AUXILIARY RECORDER	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

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2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-85 <sup>1</sup>	S	8	CLTC	R4VC	VERIFY VISICORDER ON.	
	S	9	CLTC	C1DP C4DP	S-I AND S-IV EBW'S #1 AND #2 ON.	
	S	10	CLTC	C1DP C4DP	VERIFY S-I AND S-IV EBW #1 AND #2 VOLTAGES OK.	
	S	11	CLTC	C1DP C4DP	S-I AND S-IV EBW'S #1 AND #2 "OFF".	
	S	12	CLTC	RBHM	SANBORN RECORDERS TO 2 MM/SEC.	
	S	13	CLTC	CLVN	DESTRUCT ENABLE OFF AND DELIVER DESTRUCT ENABLE KEY TO CPSO.	
		14		CPSO	VERIFY BLAST DANGER AREA SECURE FOR LH2 TANKING.	
-80 <sup>1</sup>	RD4	1		RLOO	COMPLETE S-I LOX LOADING TO 95%.	
	RD4	2		RLOO	BEGIN S-I AND S-IV LOX REPLENISH.	
	RD4	3	RLHC	RECS	VERIFY VEHICLE HAS BEEN PURGED WITH GN2 FOR AT LEAST 15 MINUTES PRIOR TO LH2 LOADING.	
	RD4	4		RLHC	BEGIN S-IV LH2 LOADING PER PROCEDURE LVO-L-1033 (NOTE: TM SYSTEMS "ON" AND "OFF" AS REQUIRED).	
		5		CPSO	SET LAUNCH DANGER AREA ROADBLOCKS (CAPE ROAD TO REMAIN OPEN UNTIL T-50).	
-72 <sup>1</sup>	SC	1		CSTC	SPACECRAFT EXTERNAL POWER ON.	
-70 <sup>1</sup>	RD1	1		C1CT RBHM	PERFORM S-I LOX BUBBLING CHECK (10 MINUTES AFTER S-I LOX LOADING COMPLETE)	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
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6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-70'	RD1	2	C1TC	C1VP	PRESSURIZE HELIUM SPHERE TO 3000 PSIG,	
	RD1	3	C1TC	C1VP	PRESSURIZE FUEL SPHERES AND CAMERA PURGE SPHERES TO 3000 PSIG,	
	RD1	4	C1TC	C1VP	PRESSURIZE CAMERA EJECT SPHERE TO 3000 PSIG,	
	RD1	5	CLTC	CUNC	OPERATE GAS BEARING SWITCH "ON".	
-62'	SC	1	CSTC	CICM	SPACECRAFT TELEMETER A (LINK 1) "ON".	
	SC	2	CSTC	CICM	SPACECRAFT TELEMETER B (LINK 6) "ON".	
	SC	3	CSTC	CICM	SPACECRAFT TELEMETER C (LINK 14) "ON".	
-60'	SRO	1	CNTS	ORNG	VERIFY PATRICK 0-18 RADAR AWAY FROM PAD	
	SC	2	CSTC	CICM	SPACECRAFT RADAR BEACON #1 "ON".	
	SC	3	CSTC	CICM	SPACECRAFT RADAR BEACON #2 "ON".	
	SRO	4	CNTS	ORNG	ONE (1) MINUTE AFTER NOTIFICATION OF BEACON ON, BEGIN INTERROGATION OF BOTH BEACONS AND PROCEED WITH READOUT. REPORT READOUT WHEN COMPLETE.	
-55'	SRO	1	CNTS	ORNG	BEGIN READOUT OF SPACECRAFT TELEMETERS.	
-50'		1		CPSC	START INCREASING COLD HELIUM SPHERES PRESSURE TO 3000 PSIG WHEN LH2 LEVEL REACHES 70%.	
	S	2	CLTC	C1NP CUNP	VERIFY FLIGHT SIMULATION SWITCHES "OFF"	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

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2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-40'	SRO	1	CNTS	ORNG	REPORT STATUS OF SPACECRAFT RADAR BEACONS (GO/NO GO).	
-35'	RD4	1		RLHC	COMPLETE LH2 LOADING.	
		2		CIPC	TELEMETERS D1, D2 AND D3 OFF.	
	SIV	3		C4TC	PERFORM S-IV TERMINAL COUNTDOWN PER PROCEDURE DAC-N-1004.	
	RD4	4		CPTC RL00	PERFORM S-IV LOX BUBBLING CHECK PER PROCEDURE DAC-P-7010 (AFTER LH2 LOADING IS COMPLETE).	
-32'	SRO	1	CNTS	ORNG	REPORT STATUS OF SPACECRAFT TELEMETERS (GO/NO GO).	
-30'	S	1	CLTC	RGCC	VERIFY FLIGHT COMPUTER CHECK-OUT COMPLETE AND READY FOR S-IV AND S-I STEERING.	
	S	2	CLTC	C1FP RBHM	PERFORM GG LOX INJECTOR PURGE TEST.	
	S	3	CLTC	CUNC	FILL INFLIGHT COOLER SYSTEM.	
	S	4	CLTC	CUMP	ALTIMETER "ON".	
	S	5	CLTC	CPSO	VERIFY HOLD FIRE CHECKS COMPLETE.	
	S	6	CLTC	CISP	GODDARD SYSTEMS STATUS CHECK.	
	GY1	7		C1TC	MAKE COMMUNICATION CHECK WITH HANGAR D TM STATION IN GRAY 1 CIRCUIT.	
-25'	S	1	CLTC	C1CM	TELEVISION TO "FILAMENT".	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-25'						
	S	2	CLTC	CUMP	AZUSA "ON",	
	S	3	CLTC	C1FP	G,G. LOX INJECTOR PURGE TO "AUTOMATIC",	
	S	4	CLTC	C1FP	LOX DOME PURGE TO "AUTOMATIC",	
	S	5		C1FR	NOTE PURGES ARMED INDICATION,	
	S	6	CLTC	CIPC	TELEMETERS D1, D2 AND D3 "ON",	
	S	7	CLTC	CIPC	VERIFY VCO CALIBRATION OFF AND AUTO,	
	S	8	CLTC	B4TM	S-IV TELEMETER RECORDER "ON",	
	S	9	CLTC	R4VC	VISICORDER "ON",	
	S	10	CLTC	B4TM	PERFORM TM CHANNEL READOUTS (NOTE: VERIFY CHANNELS 21-24 OF TELEMETER D2 HIGH LEVEL PDM READING 100%),	
	S	11	CLTC		PERSONNEL CONNECTED WITH S-IV STEERING COMMANDS SWITCH TO YW2 CIRCUIT,	
		12			S-IV STEERING COMMANDS. -----	
	YW2	12-1		RVFC	FLIGHT CONTROL SWITCH TO "S-IV",	
	YW2	12-2		RVFC	HYDRAULIC PUMP ENABLE "ON",	
	YW2	12-3	RVFC	R4FC	S-IV HYDRAULIC PUMPS "ON",	
	YW2	12-4	RVFC	RGCC	INITIATE S-IV STEERING COMMANDS (APS 105),	
	YW2	12-5		RVFC	IU RATE GYRO TORQUER COMMANDS,	
	YW2	12-6	RVFC	R4FC	CLOSE S-IV ACCUMULATOR VALVES,	
	YW2	12-7	RVFC	R4FC	VERIFY S-IV HYDRAULIC PUMPS "OFF"	
	YW2	12-8		RVFC	HYDRAULIC PUMPS ENABLE "OFF",	
	YW2	12-9	RVFC	R4FC	CHECK ACTUATOR ACCUMULATOR PRESSURES AT 2950 PSIA PLUS OR MINUS 150,	
	YW2	12-10		RVFC	STAGE SELECTOR SWITCH TO "S-I",	
	S	13	CLTC	RRPO	MAKE RP-1 LEVEL ADJUSTMENT PER PROCEDURE LVO=L-1030.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-25'	S	14	CLTC	C4TC	REPORT COMPLETION OF S-IV LOX BUBBLING CHECK	
	S	15	CLTC	C4TC	REPORT COMPLETION OF S-IV TERMINAL COUNTDOWN PREPARATIONS.	
	SRO	16	CNTS	ORNG	VERIFY 0,18 AND 1,16 RADARS AWAY FROM PAD.	
	SRO	17	CNTS	ORNG	DO NOT INTERROGATE C-BAND BEACON WITH 1,16 RADAR UNTIL REQUESTED.	
-24'	S	1	CLTC	C1MP	TELEMETERS F1, F2, F3, P2, S1 AND S2 "ON".	
	S	2	CLTC	CUMP	C-BAND BEACON (RADAR) "ON".	
	S	3	CLTC	C1MP	TELEMETER AUXILIARY EQUIPMENT "ON".	
	S	4	CLTC	CUMP	TELEMETERS F5, F6, S3, P1 AND MINITRACK "ON".	
	S	5	CLTC	CUMP	TELEMETER AUXILIARY EQUIPMENT "ON".	
	S	6	CLTC	C1CM	CYCLE ALL S-I CAMERAS AS REQUIRED.	
	S	7	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT".	
	S	8	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 50%.	
	S	9	CLTC	OTMD	SPECIAL RECORDER "ON".	
	S	10	CLTC	C1MP CIPC CUMP	VERIFY TAPE RECORDER READY INDICATIONS.	
-21'	S	1	CLTC	BSOC	VERIFY SCAN RATE OF 10 SEC INSERTED INTO PROPELLANT SCAN PROGRAM.	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-20'	S	1	CLTC	BDOP	ODOP GROUND TRANSMITTER "ON".	
	S	2	CLTC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 0%.	
	S	3	CLTC	CUMP	MISTRAM "ON".	
	S	4	CLTC	CUMP	ODOP "ON".	
	SRO	5	CNTS	ORNG	INTERROGATE AZUSA AND MISTRAM.	
		6	CNTS	CPSO	VERIFY LES ARMING KEY HAS BEEN RELEASED TO CSTC.	
	S	7	CLTC	BSOC	INITIATE PROPELLANT LOADING SCAN RATE OF 10 SEC.	
-19'	S	1	CLTC	RSEQ	SEQUENCE AND E&I RECORDERS TO "MINUTE SPEED" AND TIME PULSE "ON".	
	S	2	CLTC	RSEQ	VERIFY VOLTAGE RECORDERS TO "FINE RANGE".	
	SRO	3	CNTS	ORNG	INTERROGATE IU C-BAND BEACON WITH 1.16 RADAR.	
	SRO	4	CNTS	ORNG	INTERROGATE SC C-BAND BEACON WITH 0.18 RADAR.	
	S	5	CLTC	CPSO	RELEASE DESTRUCT ENABLE KEY TO CLVN.	
-18'	S	1	CLTC	C4DP	MODULE POWER SUPPLY ON AND CHECK FOR 5 PLUS OR MINUS 0.2 VOLTS.	
	S	2	CLTC	C4DP	TEST S-IV EBW'S FOR "READY".	
	S	3	CLTC	C4DP	VERIFY S-IV S&A "SAFE".	
	S	4	CLTC	CSRP	VERIFY S-I AND IU FLIGHT SEQUENCERS "ZERO".	
	S	5	CLTC	CSPC	S-IV EBW EXTERNAL "ON".	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-18'	S	6	CLTC	C40P	VERIFY ALL READY INDICATIONS "OFF" AND NOT READY INDICATIONS "ON",	
	S	7	CLTC	CSSP	VERIFY MSFC TALKBACK ENABLE "ON",	
-17'	S	1	CLTC	CLVN	DESTRUCT ENABLE "ON",	
	S	2	CLTC	C4DP	VERIFY SAFETY BUSS "ON" INDICATION.	
	S	3	CLTC	C1MP CUMP	PREFLIGHT CALIBRATION TO 100%.	
	S	4	CLTC	ORNG	BRING UP WATER PUMPS 5 AND 6 TO "STANDBY",	
-16'	S	1	CLTC	CUMP	HORIZON SENSOR POWER "ON",	
	S	2	CLTC	CDCG	CHECK VEHICLE GROUND POWER GENERATOR SETTINGS FOR POWER TRANSFER.	
-15'	SRO	1	CNTS	ORNG	GUIDANCE COMMAND CARRIER "ON",	
	SRO	2	CNTS	ORNG	RANGE SAFETY COMMAND CARRIER "ON",	
	YW2	3		RVFC	S-IV STEERING COMMAND PERSONNEL SWITCH TO S-CIRCUIT.	
	S	4	CLTC	RVFC	VERIFY S-IV STEERING COMMANDS COMPLETE.	
	S	5	CLTC	C1CM	TELEVISION TO "B+",	
	S	6	CLTC	CUMP	GUIDANCE COMMAND RECEIVER "ON",	
	S	7	CLTC	RRPO	RP-1 LINE INERT PER PROCEDURE LVO-L-1030.	
	SC	8	CNTS	CSTC	PROCEED WITH PREPARATIONS FOR SPACECRAFT INTERNAL POWER.	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-14:30"	S	1	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS.	
	S	2	CLTC	RBHM	SANBORN RECORDER TO 5 MM/SEC.	
	S	3	CLTC	C1OP	FUNCTION SELECTOR TO FIRING UNIT VOLTAGE CHECK.	
	S	4	CLTC	C1DP	S-I CDR #1 AND #2 TO "INTERNAL".	
	S	5	CLTC	C1MP CUMP	TELEMETER CALIBRATIONS TO "INFLIGHT".	
	S	6	CLTC	C4DP	S-IV CDR #1 AND #2 "ON".	
	S	7	CLTC	C4DP	VERIFY S-IV EBW #1 AND #2 "OFF" AND "NOT READY".	
	S	8	CLTC	C4DP	S-IV CDR #1 AND #2 TO "INTERNAL".	
-14'	S	1	CLTC	CIPC	GIVE CAL START.	
	S	2	CLTC	CUNP	VERIFY IU READY FOR POWER TRANSFER "ON"	
	SRO	3	CNTS	ORNG	CUTOFF COMMAND.	
	S	4	CLTC	C1DP C4DP	VERIFY EBW #1 AND #2 "INTERNAL" AND "CHARGED".	
	S	5		B4TM RFSR	NOTE ALL ENGINE CUTOFF NOT RECEIVED.	
		6		RFSR	NOTE HELIUM HEATER CUTOFF NOT RECEIVED.	
	SRO	7	CNTS	ORNG	RELEASE CUTOFF COMMAND.	
	S	8	CLTC	C1DP C4DP	S-I AND S-IV EBW #1 AND #2 TO "EXTERNAL".	
	S	9	CLTC	C1DP C4DP	VERIFY S-I AND S-IV EBW'S #1 AND #2 "OFF" AND "NOT READY".	
	S	10	CLTC	CUNP	HORIZON SENSOR "ON".	

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-14'	S	11	CLTC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" FOR 5 SECONDS.	
	S	12	CLTC	CUMP	P1 CALIBRATE COMMAND "ON" AND "OFF".	
-13'	S	1	CLTC	ORNG	MONITOR ALL RF SYSTEMS AND REPORT ANY CHANGE ON INTERNAL POWER.	
	S	2	CLTC	RVFC	HYDRAULIC PUMP ENABLE "ON".	
	S	3	CLTC	RVFC	S-I HYDRAULIC PUMPS "ON".	
	S	4	CLTC		PERSONNEL CONNECTED WITH S-IV POWER TRANSFER SWITCH TO S-IV CIRCUIT.	
	SIV	5	C4TC	CIPC	INSTRUMENTATION SYSTEMS TO "INTERNAL", *****	
	SIV	5-1	C4TC	CSPC	STAGE POWER SYSTEM TO "INTERNAL", *****	
	SIV	5-2	C4TC	CSPC CIPC	READOUT BATTERIES.	
	SIV	5-3	C4TC	CIPC	PERFORM AUTOMATIC VCO CALIBRATION.	
	SIV	5-4	C4TC	CSPC CIPC B4TM	VERIFY SATISFACTORY ON INTERNAL POWER.	
	SIV	5-5	C4TC	CSPC	STAGE POWER SYSTEM TO "EXTERNAL", *****	
	SIV	5-6	C4TC	CIPC	INSTRUMENTATION SYSTEMS TO "EXTERNAL", *****	
	SIV	5-7	C4TC	C4DP	CDR'S #1 AND #2 TO "EXTERNAL".	
	S	6	CLTC	RGCC	INITIATE S-I STEERING COMMANDS (APS-104).	
	S	7	CLTC	C1CM	CAMERA LIGHTS "ON" (HOLD ON).	
	S	8	CLTC	C1NP	ON MARK S-I STAGE POWER TEST #2 "ON". *****	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-13'	S	9		CSR	NOTE S-I POWER TRANSFER OK.		
	S	10	CLTC	C1CM	CAMERA LIGHTS "OFF".		
	S	11	CLTC	CUNP	ON MARK IU STAGE POWER TEST #2 "ON". *****		
	S	12		CSR	NOTE IU POWER TRANSFER OK.		
	S	13	CLTC	CSR	VERIFY SATISFACTORY S-I AND IU POWER TRANSFER.		
	S	14		C1NP	S-I STAGE POWER TEST #2 "OFF". *****		
	S	15		CUNP	IU STAGE POWER TEST #2 "OFF". *****		
	SIV	16		C4TC	S-IV POWER TRANSFER PERSONNEL SWITCH TO S-CIRCUIT.		
	S	17	CLTC	C4TC	VERIFY SATISFACTORY S-IV POWER TRANSFER		
	S	18	CLTC	CUNP	HORIZON SENSOR "OFF".		
	S	19	CLTC	CPSC	VERIFY TEMPERATURES OK FOR LOX BUBBLING.		
	-12'30"	SC	1	CNTS	CSTC	BEGIN TRANSFER OF SPACECRAFT TO "INTERNAL POWER".	
	-11'	S	1	CLTC	RFDM	ARM FIRE DETECTION AND RECORDERS TO SLOW SPEED.	
S		2	CLTC	RCSM	CSM POWER "ON".		
S		3	CLTC	RCSM	CSM ACTIVATE "ON".		
S		4		C1FR	NOTE CSM READY "ON".		
S		5		CLTC	PERSONNEL CONNECTED WITH TELEMETER PREFLIGHT CALIBRATION SWITCH TO GRAY 1 CIRCUIT.		

EMERGENCY PROCEDURE (T-330' TO T-2'33")

PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
=10:30"		1			TELEMETER PREFLIGHT CALIBRATION. -----	
	GY1	1-1	C1TC	B1TM OTMD	TELEMETER RECORDINGS "ON",	
	SRO	1-2	CNTS	ORNG	TELEMETER RECORDINGS "ON",	
	GY1	1-3	C1TC	C1MP CUMP	TELEMETER CALIBRATIONS TO AC COMMAND,	
	GY1	1-4	C1TC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" AND 10 SECONDS BEFORE NEXT STEP),	
	GY1	1-5	C1TC	CIPC	VCO CALIBRATION TO "MANUAL",	
	GY1	1-6	C1TC	C1MP CUMP	TELEMETER CALIBRATIONS TO "PREFLIGHT",	
	GY1	1-7	C1TC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS,	
	GY1	1-8	C1TC	C1MP CUMP	PREFLIGHT CALIBRATIONS TO 0%, 25%, 50%, 75%, AND 100% IN 2 SECOND INCREMENTS.	
	GY1	1-9	C1TC	CIPC	STEP THROUGH MANUAL CALIBRATION IN 2 SECOND INCREMENTS,	
	GY1	1-10	C1TC	C1MP CUMP	TELEMETER CALIBRATIONS TO "INFLIGHT",	
	GY1	1-11	C1TC	C1MP CUMP	RECORDER TRANSFERS "ON".	
	GY1	1-12	C1TC	C1MP CUMP	TELEMETER CALIBRATION COMMANDS "ON" FOR 5 SECONDS,	
	GY1	1-13	C1TC	CUMP	P-1 TELEMETER CALIBRATION COMMAND "ON" AND "OFF",	
	GY1	1-14	C1TC	CIPC	VCO CALIBRATION TO "AUTOMATIC",	
	GY1	1-15	C1TC	CIPC	GIVE CAL START.	
GY1	1-16	C1TC	RBHM	S-I AND IU HIGH CAL COMMAND FOR 15 SEC.		

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10'30"						
	GY1	1-17	C1TC	RBHM	S-I AND IU LOW CAL COMMAND FOR 15 SEC,	
	GY1	1-18	C1TC	RBHM	S-I AND IU RUN COMMAND.	
	GY1	1-19	C1TC	C1MP CUMP	RECORDER TRANSFER "OFF".	
	GY1	1-20	C1TC	B1TM OTMD B4TM	TELEMETER RECORDING "OFF" (AND RELOAD IF REQUIRED).	
	SRQ	1-21	CNTS	ORNG	TELEMETER RECORDING "OFF".	
	GY1	1-22		C1TC	TELEMETER CALIBRATION PERSONNEL RETURN TO S CIRCUIT.	
	S	2		C1TC	TELEMETER PREFLIGHT CALIBRATION COMPLETE.	
	S	3	CLTC	CPPC	VERIFY ALL HELIUM SPHERE PRESSURES NORMAL AND SUFFICIENT COLD HELIUM MASS ABOARD.	
-10'10"						
	S	1	CLTC	CPSC	LOX BUBBLING TO "MANIFOLD COOLDOWN".	
-10'						
	S	1	CLTC	RVFC	S-I HYDRAULIC PUMPS "OFF".	
	S	2	CLTC	RVFC	HYDRAULIC PUMPS ENABLE "OFF".	
	S	3	CLTC	RGCC	VERIFY STEERING COMPLETE AND READY TO LAUNCH.	
-8'10"						
	S	1	CLTC	CPSC	LOX BUBBLING TO "BUBBLE SUPPLY".	
-8'						
	S	1	CLTC	CISP	GODDARD SYSTEMS STATUS CHECK.	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-8'	S	2	CLTC	RUAC	CONDUCT SWING ARM HYDRAULIC TEST PER LVO-E-7016.	
	S	3	CLTC	RVFC	REMOVE Q-BALL COVER.	
-7'30"	SRO	1	CNTS	ORNG	TELEMETER RECORDING "ON".	
	SC	2	CSTC		PROCEED WITH SPACECRAFT R AND Z CALIBRATIONS.	
-7'	S	1	CLTC	CPSO	PERMISSION TO ARM IGNITION "ON".	
		2	CLTC	C1LS	LAUNCH SEQUENCER ARM "ON".	
		3	CLTC	C1LS	TIME PULSE "ON".	
		4		C1FR	NOTE LAUNCH SEQUENCER READY.	
		5	CLTC	C4DP	VERIFY S-IV EBW'S #1 AND #2 "OFF" AND "NOT READY".	
		6	CLTC	RRPO	VERIFY RP-1 LEVEL ADJUST & LINE INERT COMPLETE.	
	SC	7	CSTC		VERIFY SPACECRAFT SATISFACTORY POWER TRANSFER.	
	S	8	CNTS	CSTC	PROCEED WITH LES ARM SEQUENCE.	
-6'30"	SRO	1	CNTS	ORNG	TELEMETER RECORDING "OFF".	
-6'	S	1	CLTC	CUNP	ARM IU SAFETY SWITCHES.	
	S	2	CLTC	C1NP	ARM S-I SAFETY SWITCHES.	
	S	3	CLTC	CGCM	CAMERA START TO "ARM".	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-6'	S	4	CLTC	C4DP	S-IV CDR #1 AND #2 TO "INTERNAL".	
	S	5	CLTC	C4DP	S-IV CDR #1 AND #2 SWITCHES "OFF" (VERIFY CDR'S REMAIN "ON").	
-5'	S	1	CLTC	CPER	VERIFY Q-BALL COVER REMOVED.	
	S	2	CLTC	C1FR	VERIFY RANGE SAFE.	
	S	3	CLTC	RGCC	VERIFY FLIGHT COMPUTER SYSTEM IN READY TO LAUNCH MODE.	
	S	4	CLTC	C1NP	FUNCTION SELECTOR TO "LAUNCH".	
	S	5	CLTC	C1NP	IGNITION ARMING "ON".	
	S	6		C1FR	NOTE IGNITION SEQUENCER READY.	
	S	7	CLTC	C4TC	VERIFY ALL STATUS SELECTOR SWITCHES TO "READY TO FIRE".	
	S	8	CLTC	RFSR	SEQUENCE RECORDERS TO 10 MM/SEC.	
-4'30"	SC	1		CSTC	SPACECRAFT TO "READY".	
	S	2	CLTC	RVFC	HYDRAULIC PUMPS ENABLE "ON".	
	S	3	CLTC	RVFC	S-I HYDRAULIC PUMPS "ON".	
-4'	S	1	CLTC	CUNC	SWITCH TO "INFLIGHT COOLING".	
	SRO	2	CNTS	ORNG	CLEARANCE FOR LAUNCH.	
	S	3	CLTC	C1CM	ZERO THE CAMERA TIMER.	
	S	4	CLTC	RVFC	RATE GYRO SIMULATED COMMANDS.	
	S	5	CLTC	RPSQ	SEQUENCE RECORDERS TO "MINUTE SPEED".	

## EMERGENCY PROCEDURE (T-330' TO T-2'33")

### PREMATURE ENGINE(S) IGNITION

1. C1NP: GIVE CUTOFF (CAUTION: HOLD ON)
2. C1FP: PREVALVES 1-8 OFF
3. C1NP: RELEASE CUTOFF
4. C1FP: FUEL BUBBLING SWITCH OFF
5. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
6. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-3' 40"	S	1	CLTC	B4TM	S-IV TELEMETER RECORDING "ON".	
	S	2	CLTC	C1DP	ARM DESTRUCT S&A.	
	S			C4DP		
	S	3		C1FR	NOTE S-IV SYSTEMS READY INDICATION "ON"	
	S	4		C1FR	NOTE SC SYSTEMS READY INDICATION "ON".	
			5	CLTC	BSOC	CDC INHIBIT "OFF".
		6	CLTC	BSOC	DISCRETE INHIBIT "OFF".	
-3' 10"	S	1	CLTC	CPSC	LOX BUBBLING "OFF".	
-3'	S	1	CLTC	BSOC	ENABLE GUIDANCE RELEASE.	
-2' 53"	S	1	CLTC	RGCC	VERIFY GUIDANCE RELEASE.	
	S	2		C1FR	NOTE "IU READY".	
	S	3	CLTC	C1FR	VERIFY "PREP COMPLETE".	
-2' 45"	SRO	1	CNTS	ORNG	TELEMETER RECORDING "ON".	
	S	2	CLTC	OTMD B1TM	TELEMETER RECORDINGS "ON".	
-2' 38"	S	1	CLTC	RSEQ	SEQUENCE RECORDERS TO "FAST SPEED".	

EMERGENCY PROCEDURE (T-2'33" TO T-3")

NOTE: SPACECRAFT HAS INDEFINITE RECYCLE CAPABILITY UNTIL T-18", LIMITED THEREAFTER

TO INTERRUPT AUTOMATIC LAUNCH SEQUENCE

1. C1FR: GIVE CUTOFF
2. C1NP: IGNITION ARMING OFF
3. CPSO: IGNITION PERMISSION OFF
4. CPSO: HOLD FIRE ON
5. RSEQ: RECORDERS TO SLOW SPEED
6. RWCP: OPERATE WATER CONTROL SYSTEM AS REQ'D
7. RVFC HYDRAULIC PUMPS 1, 2, 3, AND 4 OFF
8. RBHM: VERIFY FUEL AND LOX TANKS VENTED
9. RPLC: VERIFY LH2 AND LOX TANKS VENTED
10. C1NP: FUNCTION SELECTOR TO PRELAUNCH
11. C1LS: LAUNCH SEQUENCER ARM OFF
12. C1DP, C4DP: SAFE DESTRUCT
13. C1NP, CUNP: SAFETY SWITCH ARMING OFF
14. C1NP: RESET CUTOFF
15. C1NP: RESET IGNITION SEQUENCER
16. CNTS: SECURE ALL OTHER EQUIP. AS REQ'D AND MAKE ANNOUNCEMENT FOR ALL PERSONNEL TO STAND BY UNTIL DECISION IS MADE TO RECYCLE OR SCRUB

PREMATURE CLOSURE OF PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH -275°F.
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-2'33"	S	1	CLTC	C1FR	LAUNCH SEQUENCE START.	
	S	2		C1FR	MONITOR FUEL PRESSURIZING.	
	S	3		C1FR	MONITOR LOX BUBBLING.	
	S	4		CSSP	MONITOR S-IV STAGE POWER AND INSTRUMENTATION POWER SYSTEMS INTERNAL.	
-2'28"	S	1		C1FR	MONITOR S-I FUEL TANKS PRESSURIZED.	
	S	2		CSSP	MONITOR LO2 & LH2 SYSTEMS READY INDICATION.	
-2'23"	S	1		RSEQ	SEQUENCE RECORDERS TO SLOW SPEED.	
-2'3"	S	1		CSSP	REPORT S-IV READY FOR LAUNCH WHEN INDICATION APPEARS AND REMAINS FOR AT LEAST 5 SECONDS.	
	S	2		RPLC	S-IV UMBILICAL LINE VENT AND PURGE SWITCHES TO OPEN (AFTER S-IV READY FOR LAUNCH).	
-1'53"	S	1		RPLC	MONITOR S-IV LOX SYSTEM CONTROL TO LOCAL (AFTER LOX SYSTEM READY).	
-1'48"	S	1		RSEQ	SEQUENCE RECORDERS TO FAST SPEED.	
1'43"	S	1		C1FR	MONITOR S-I LOX BUBBLING "OFF".	

EMERGENCY PROCEDURE (T-2'33" TO T-3")

NOTE: SPACECRAFT HAS INDEFINITE RECYCLE CAPABILITY UNTIL T-18", LIMITED THEREAFTER

TO INTERRUPT AUTOMATIC LAUNCH SEQUENCE

1. C1FR: GIVE CUTOFF
2. C1NP: IGNITION ARMING OFF
3. CPSO: IGNITION PERMISSION OFF
4. CPSO: HOLD FIRE ON
5. RSEQ: RECORDERS TO SLOW SPEED
6. RWCP: OPERATE WATER CONTROL SYSTEM AS REQ'D
7. RVFC HYDRAULIC PUMPS 1, 2, 3, AND 4 OFF
8. RBHM: VERIFY FUEL AND LOX TANKS VENTED
9. RPLC: VERIFY LH2 AND LOX TANKS VENTED
10. C1NP: FUNCTION SELECTOR TO PRELAUNCH
11. C1LS: LAUNCH SEQUENCER ARM OFF
12. C1DP, C4DP: SAFE DESTRUCT
13. C1NP, CUNP: SAFETY SWITCH ARMING OFF
14. C1NP: RESET CUTOFF
15. C1NP: RESET IGNITION SEQUENCER
16. CNTS: SECURE ALL OTHER EQUIP. AS REQ'D AND MAKE ANNOUNCEMENT FOR ALL PERSONNEL TO STAND BY UNTIL DECISION IS MADE TO RECYCLE OR SCRUB

PREMATURE CLOSURE OF PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH -275°F.
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-1'43"	S	2		C1FR	MONITOR S-I LOX VENT AND RELIEF VALVES "CLOSE".	
	S	3		C1FR	MONITOR S-I LOX PRESSURIZING.	
	S	4		RBHM	REPORT S-I LOX TANK PRESSURES DURING LOX TANK PRESSURIZATION.	
-1'0"	S	1		RCSM	RECORDERS "ON".	
	S	2		RFDM	RECORDERS TO "FAST SPEED".	
	S	3		RBHM	OSCILLOGRAPH "ON".	
-38"	S	1		RWCP	MONITOR PAD FLUSH OPENING.	
	S	2		OTMD, B1TM	8 KC OSCILLATOR "ON".	
		3		ORNG	WATER PUMPS 5 AND 6 TO FULL SPEED.	
-28"	S	1		C1NP	VERIFY S-I POWER TRANSFER.	
	S	2		CUNP	VERIFY IU POWER TRANSFER.	
	S	3		C1FR	MONITOR TC FUEL INJECTOR PURGE "ON".	
	S	4		C1FR	MONITOR GG LOX INJECTOR PURGE "ON".	
	S	5		C1FR	MONITOR S-I LOX DOME PURGE "ON".	
	S	6		C1FR	MONITOR S-I LOX TANKS PRESSURIZED.	
-18"	S	1		CSRP	MONITOR READY FOR IGNITION "ON".	
	S	2		CSRP	MONITOR SC UMBILICAL ARM RELEASE.	

EMERGENCY PROCEDURE (T-2'33" TO T-3")

NOTE: SPACECRAFT HAS INDEFINITE RECYCLE CAPABILITY UNTIL T-18", LIMITED THEREAFTER

TO INTERRUPT AUTOMATIC LAUNCH SEQUENCE

1. C1FR: GIVE CUTOFF
2. C1NP: IGNITION ARMING OFF
3. CPSO: IGNITION PERMISSION OFF
4. CPSO: HOLD FIRE ON
5. RSEQ: RECORDERS TO SLOW SPEED
6. RWCP: OPERATE WATER CONTROL SYSTEM AS REQ'D
7. RVFC HYDRAULIC PUMPS 1, 2, 3, AND 4 OFF
8. RBHM: VERIFY FUEL AND LOX TANKS VENTED
9. RPLC: VERIFY LH2 AND LOX TANKS VENTED
10. C1NP: FUNCTION SELECTOR TO PRELAUNCH
11. C1LS: LAUNCH SEQUENCER ARM OFF
12. C1DP, C4DP: SAFE DESTRUCT
13. C1NP, CUNP: SAFETY SWITCH ARMING OFF
14. C1NP: RESET CUTOFF
15. C1NP: RESET IGNITION SEQUENCER
16. CNTS: SECURE ALL OTHER EQUIP. AS REQ'D AND MAKE ANNOUNCEMENT FOR ALL PERSONNEL TO STAND BY UNTIL DECISION IS MADE TO RECYCLE OR SCRUB

PREMATURE CLOSURE OF PREVALVES

1. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH -275°F.
2. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15"	S	1			RCSM CSM RECORDERS TO "FAST SPEED".	
-10"	S	1			CSRP MONITOR SC UMBILICAL ARM RETRACTED.	
-8"	S	1			CSRP MONITOR SHORT MAST 2 AND 4 PRESSURIZING VALVES #1 "OPEN".	

## EMERGENCY PROCEDURE (T-3" TO T-0")

### AUTOMATIC CUTOFF

1. C1FR: OBSERVE AUTOMATIC CUTOFF
2. C1FP: VERIFY DELUGE PURGE ON - IF NOT ON, OPERATE DELUGE PURGE TO MANUAL
3. RSEQ: SEQUENCE RECORDERS TO SLOW SPEED
4. RWCP: OPERATE WATER CONTROL SYSTEM AS REQUIRED
5. RVFC: HYDRAULIC PUMPS 1, 2, 3, AND 4 OFF
6. C1NP: FUNCTION SELECTOR TO PRELAUNCH
7. CGCM: CAMERA ARMING OFF
8. C1LS: LAUNCH SEQUENCER ARM OFF
9. C1DP, C4DP: SAFE DESTRUCT
10. RBHM: VERIFY FUEL AND LOX TANKS VENTED TO ZERO PSI
11. RPLC: VERIFY LH2 AND LOX TANKS VENTED TO ZERO PSI
12. C1NP, CUNP: SAFETY SWITCH ARMING OFF
13. THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH  $-275^{\circ}$  F.
14. UPON EXCEEDING 10 MINUTES, THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED, AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD, AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.
15. CAUTION: PRIOR TO RESETTING CUTOFF, VERIFY THE FOLLOWING:
  - A. C1FP: ALL PREVALVE SWITCHES TO OFF POSITION
  - B. C1FP: LOX DOME PURGE ON (REQUIRED FOR 15 SECONDS MINIMUM AFTER CUTOFF)
  - C. C1FP: GG LOX INJECTOR PURGE ON (REQUIRED FOR 10 MINUTE MINIMUM AFTER CUTOFF)
16. C1NP: IGNITION ARMING OFF
17. CNTS: SECURE ALL OTHER EQUIPMENT AS REQUIRED



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-3"	S	1		C1FR	VERIFY IGNITION COMMAND.	
-2.98"	S	1		CSRP	MONITOR IGNITION OF ENGINES #5 AND #7.	
-2.88"	S	1		CSRP	MONITOR IGNITION OF ENGINES #6 AND #8.	
-2.78"	S	1		CSRP	MONITOR IGNITION OF ENGINES #2 AND #4.	
-2.68"	S	1		CSRP	MONITOR IGNITION OF ENGINES #1 AND #3.	
	S	2		CSRP	ALL ENGINES RUNNING "ON".	
	S	3		C1FR	TC FUEL INJECTOR PURGE "OFF".	

EMERGENCY PROCEDURE (T-0" TO T+0")

AUTOMATIC CUTOFF

1. C1FR: OBSERVE AUTOMATIC CUTOFF
2. C1FP: ALL PREVALVE SWITCHES TO OFF POSITION
3. C1FP: VERIFY DELUGE PURGE ON - IF NOT ON, OPERATE DELUGE PURGE TO MANUAL
4. RWCP: OPERATE WATER CONTROL SYSTEM AS REQUIRED
5. C1MP: RECORDER TRANSFER SWITCH TO EMERGENCY POSITION
6. RVFC: HYDRAULIC PUMPS 1, 2, 3 AND 4 OFF
7. CINP: FUNCTION SELECTOR TO PRELAUNCH
8. CINP: VERIFY PREVALVE SWITCHES OFF THEN RESET CUTOFF
9. C1FP: GG LOX INJECTOR PURGE TO MANUAL
10. C1FP: LOX DOME PURGE TO MANUAL
11. RSEQ: SEQUENCE RECORDERS TO SLOW SPEED
12. CIDP, C4DP: SAFE DESTRUCT
13. CINP, CUNP: SAFETY SWITCH ARMING OFF
14. RBHM: VERIFY S-I FUEL AND LOX TANKS VENTED TO ZERO PSI
15. RPLC: VERIFY S-IV LH2 AND LOX TANKS VENTED TO ZERO PSI
16. CILS: LAUNCH SEQUENCER ARM OFF
17. NOTE: THE PREVALVES MAY REMAIN CLOSED FOR 10 MINUTES DURING WHICH THE LOX TANKS MUST BE PRESSURIZED, PREVALVES OPENED AND LOX BUBBLING INITIATED. THE LOX TANKS SHOULD THEN BE VENTED AND BUBBLING DISCONTINUED WHEN THE PUMP INLET TEMPERATURES REACH -275° F.
18. NOTE: UPON EXCEEDING 10 MINUTES THE PREVALVES MUST REMAIN CLOSED, LOX DRAINED AND STANDBY OBSERVED UNTIL ALL SUCTION LINE FROST IS MELTED. THE PUMP INLET PRESSURES MUST BE MONITORED DURING THIS PERIOD AND IF THE PRESSURE EXCEEDS 200 PSIG (FULL CHART SCALE) THE PREVALVES MUST BE OPENED.
19. CNTS: SECURE ALL OTHER EQUIPMENT AS REQUIRED.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-0'0"	S	1		CSR GSSP	MONITOR COMMIT.	
	S	2		CSR	HOLDDOWNS RELEASE.	
	S	3		CSR	S-I LOX AND FUEL MASTS EJECT VALVES "OPEN".	
+0'0"	S	1		CSR	VERIFY LIFTOFF.	
	S	2		CSR	SHORT MAST 2 AND 4 RELEASE.	
	S	3		CSR	UMBILICAL ARMS 1, 2 AND 3 RELEASE AND RETRACT.	
	S	4		CVMP	"CLOSE" VACUUM SUPPLY VALVES.	
	S	5		CVMP	"OPEN" PURGE SUPPLY.	
	S	6		RECS	PERFORM ECS POST LAUNCH OPERATIONS PER PROCEDURE LVO-E-7018.	
	SRO	7		ORNG	START GUIDANCE COMMAND TRANSMISSION.	
+5"	S	1		RWCP	TORUS RING WATER VALVES "OPEN".	
	S	2		RWCP	PAD FLUSH VALVE FAST "CLOSES".	
+6"	S	1		CPSP	LAUNCHER POWER "OFF".	
+8"	S	1		RSEQ	SEQUENCE RECORDERS TO "SLOW SPEED".	
+10"	S	1		RCSM	RECORDERS TO "SLOW SPEED".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+10"	S	2			RBHM SANBORN RECORDER "OFF".	
+30"		1			511 CAMERA OPERATION.	
	S	2			OCCF SHUT OFF ECS LOW PRESSURE GN2 SUPPLY.	
	S	3			<u>BSOC</u> TEST END SENSE SWITCH "ON".	
+1'	SIV	1			CSSP RESET TIMER.	
	SIV	2			RFSR SEQUENCE RECORDER TO 2 MM/SEC.	
	SIV	3			CPPC CLOSE CONTROL HELIUM SUPPLY.	
	SIV	4			CPSC DECREASE COLD HELIUM SUPPLY DOME PRESSURE TO 0 PSIG.	
	SIV	5			CPSC SWITCH COLD HELIUM SUPPLY MOMENTARILY TO VENT, THEN SUPPLY.	
	SIV	6			RPLC SWITCH S-IV LO2 CONTROL TO "MANUAL".	
	SIV	7			CPSC CLOSE LO2 NOZZLE PURGE.	
	SIV	8			CPSC CLOSE LH2 NOZZLE PURGE.	
	SIV	9			RPLC CHECK OR POSITION THE FOLLOWING SWITCHES:	
					A. LO2 UMBILICAL LINE PURGE "OPEN"	
					B. LO2 UMBILICAL LINE VFNT "OPEN"	
					C. LH2 UMBILICAL LINE PURGE "OPEN"	
					D. LH2 UMBILICAL LINE VENT "OPEN"	
					E. LH2 TRANSFER (MOMENTARILY) "SECURE"	
					F. LH2 TRANSFER "MANUAL"	
					G. LH2 REPLENISH "OPEN"	
					H. LH2 MAIN FILL "OPEN"	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+1'						
	SIV	10			RPLC SWITCH COMPUTER READOUT LOCK "ON".	
	SIV	11			RPLC SWITCH LOX AND LH2 COMPUTERS "OFF".	
	SIV	12			C4DP C4OP CSSP NORMALIZE ALL SWITCHES.	
	SIV	13			C4TC COMPLETE S-IV SECURING PER PROCEDURE DAC-P-7011.	
+1' 47.8"						
		1			SEPARATION CAMERA OPERATION.	
		2			LH2 PRESTART.	
+2' 14.9"						
		1			S-I STAGE LEVEL SENSORS ARMED.	
+2' 19.5"						
		1			FIRE VENT PORTS.	
+2'21"						
		1			S-I INBOARD ENGINE CUTOFF (NOMINAL).	
+2'26"						
+2' 26.9"						
		1			S-I OUTBOARD ENGINE CUTOFF (NOMINAL).	
+2' 27.6"						
		1			S-IV ULLAGE ROCKET IGNITION (NOMINAL).	
		2			SEPARATION (NOMINAL).	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+2' 27.72"		1			S-I RETROROCKET IGNITION (NOMINAL).	
+2' 29.4"		1			S-IV ENGINE START (NOMINAL).	
+3' 0"	RD4	1		RLHC	INERT LH2 SYSTEM PER LVO-L-1006.	
+6' 0"	RD3	1		RWCP	SECURE WATER SYSTEM PER PROCEDURE LVO-E-7014.	
+7' 30"		1		ORNG	AZUSA SWITCHOVER.	
+9' 43.5"		1			S-IV CUTOFF ARM (NOMINAL).	
+10' 19"		1			S-IV CUTOFF (NOMINAL).	
		1		ORNG	ACCORDING TO PREARRANGED CRITERIA AND TIME SEND "SAFE" COMMAND.	
		2		ORNG	PERFORM ORBITAL LOAD ACCORDING TO INFORMATION IN OD 2460.	
					NOTE  UPON RETURN TO PAD. -----	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		1		PPSO	KEEP LAUNCHER CLEAR OF ALL NON DESIGNATED PERSONNEL UNTIL SGMP VERIFIES ITEMS FOLLOWING ARE COMPLETE.	
		1-1		SGMP	INSTALL LAUNCHER SAFETY NET.	
		1-2		SGMP	OPEN LAUNCHER ACCESS DOOR AND VERIFY LAUNCHER INTERIOR CLEAR OF GN2.	
		1-3		SGMP	SAFETY WIRE HOLDDOWN ARM RELEASE PANEL SUPPLY VALVE (4444) "CLOSED" AND VENT VALVE (4442) "OPEN".	
		1-4		SGMP	VERIFY APCD HAS SECURED ALL LAUNCHER PNEUMATICS.	
		1-5		APCD	PERFORM POST LAUNCH PNEUMATIC OPERATIONS PER PROCEDURE LVO-E-7022.	
		2		RUAC	PERFORM USA POST LAUNCH OPERATIONS PER PROCEDURE LVO-E-7023.	