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JOHN F. KENNEDY
SPACE CENTER

TCP NO.
REVISION
DATE
EFFECTIVITY

V-20060
015
OCTOBER 29, 1969
AS-507 & SUBS

RELEASED
FOR AS 507

LAUNCH VEHICLE OPERATIONS FOR
SUPPORT OF SPACE VEHICLE COUNTDOWN
DEMONSTRATION TEST AND LAUNCH COUNTDOWN

VOLUME II OF III

ASSEMBLED FOR CD

Prepared For
LAUNCH VEHICLE OPERATIONS
Prepared By
THE BOEING COMPANY
ATLANTIC TEST CENTER
SATURN Y-LAUNCH OPERATIONS

THIS TCP CONTAINS
HAZARDOUS OPERATIONS

TCP NO V-20060
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 NO OF PAGES 361
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 DEMONSTRATION TEST AND LAUNCH COUNTDOWN

VOLUME II OF III

**THIS TCP CONTAINS
HAZARDOUS OPERATIONS**

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INTRODUCTION
COUNTDOWN DEMONSTRATION TEST & COUNTDOWN
VOLUME II OF III
COUNT PROCEDURE

THIS LAUNCH VEHICLE TEST AND CHECKOUT PROCEDURE IS A TIME SEQUENCE OF OPERATIONS REQUIRED TO PREPARE THE LAUNCH VEHICLE FOR FLIGHT. THIS VOLUME CONTAINS THE OPERATIONS NECESSARY TO COMPLETE PREPARATION OF THE LAUNCH VEHICLE & GSE FOR INITIATION OF THE AUTOMATIC TERMINAL COUNT SEQUENCE.

LAUNCH VEHICLE TEST AND CHECKOUT PERSONNEL WILL USE THIS PROCEDURE AS THE OFFICIAL DOCUMENT FOR LAUNCH VEHICLE OPERATIONS. THIS DOCUMENT IS ONE OF FIVE RELATED DOCUMENTS USED DURING LAUNCH OPERATIONS. THE OTHER FOUR DOCUMENTS ARE:

1. SPACECRAFT COUNTDOWN PROCEDURE K-0007
2. LUNAR MODULE COUNTDOWN PROCEDURE KL-0007
3. SPACE VEHICLE COUNTDOWN PROCEDURE (INCLUDES INFORMATION TO DIRECT INTERFACE OPERATIONS AMONG L/V, S/C, SUPPORT & RANGE)
V-40310 (CDDT ONLY)
V-40300 (CD ONLY)
4. APOLLO/SATURN V LAUNCH MISSION RULES AS-507 K-V-05.10/7

IN ADDITION, UNDER EMERGENCY CONDITIONS SPECIFIED THEREIN, THE SATURN V LAUNCH VEHICLE EMERGENCY PROCEDURE, V-20056, WILL BE USED.

INTEGRATED TCP INTERFACE

THE SYMBOL TCPI FOLLOWING CERTAIN SEQUENCES IN THIS PROCEDURE, IDENTIFIES THOSE SEQUENCES AS BEING A DIRECT INTERFACE WITH OTHER TCP'S WHICH ARE USED DURING THIS TEST. BOTH THE WORDING OF THE SEQUENCE AND ITS LOCATION IN THE PROCEDURE ARE PART OF THIS INTERFACE. IF CHANGES TO THESE SEQUENCES BECOME NECESSARY, COORDINATION WITH THE ORGANIZATION WHOSE TCP IS AFFECTED IS REQUIRED.

CDDT & COUNTDOWN PROCEDURE EXPLANATION

THE CDDT/CD WILL BE TREATED AS ONE PROCEDURE BUT WILL BE PUBLISHED SEPARATELY AS FOLLOWS:

IN THE ISSUE RELEASED FOR CDDT, THE PAGES HAVING A STEP UNIQUE TO COUNTDOWN WILL BE CONTAINED IN APPENDIX G. SUCH PAGES WILL HAVE A COUNTERPART PAGE IN THE PROCEDURE MARKED "CDDT ONLY". THIS ISSUE OF THE PROCEDURE WILL BE PROMINENTLY MARKED ON THE FRONT COVER "ASSEMBLED FOR CDDT".

FOLLOWING CDDT, THE "CDDT ONLY" PAGES WILL BE REMOVED, THE "CD ONLY" PAGES WILL BE INSERTED, ALL APPROVED PERMANENT PROCEDURE CHANGES WILL BE INCORPORATED, THE PROCEDURE REVISION NUMBER WILL BE RAISED ONE DIGIT, THE FRONT COVER WILL BE PROMINENTLY MARKED "ASSEMBLED FOR CD" AND THE PROCEDURE WILL BE REPUBLISHED AND REDISTRIBUTED.

THE "ASSEMBLED FOR CD" VERSION WILL NOT BE DISTRIBUTED UNTIL 4 CALENDER DAYS PRIOR TO THE START OF CD TO AVOID THE RISK OF HAVING THE TWO PROCEDURES CONFUSED.

PAGES WITH BLACK BARS ARE TO BE USED ONLY DURING THE COUNTDOWN DEMONSTRATION TEST

PAGES WITH BLACK DIAMONDS ARE TO BE USED ONLY DURING THE LAUNCH COUNTDOWN

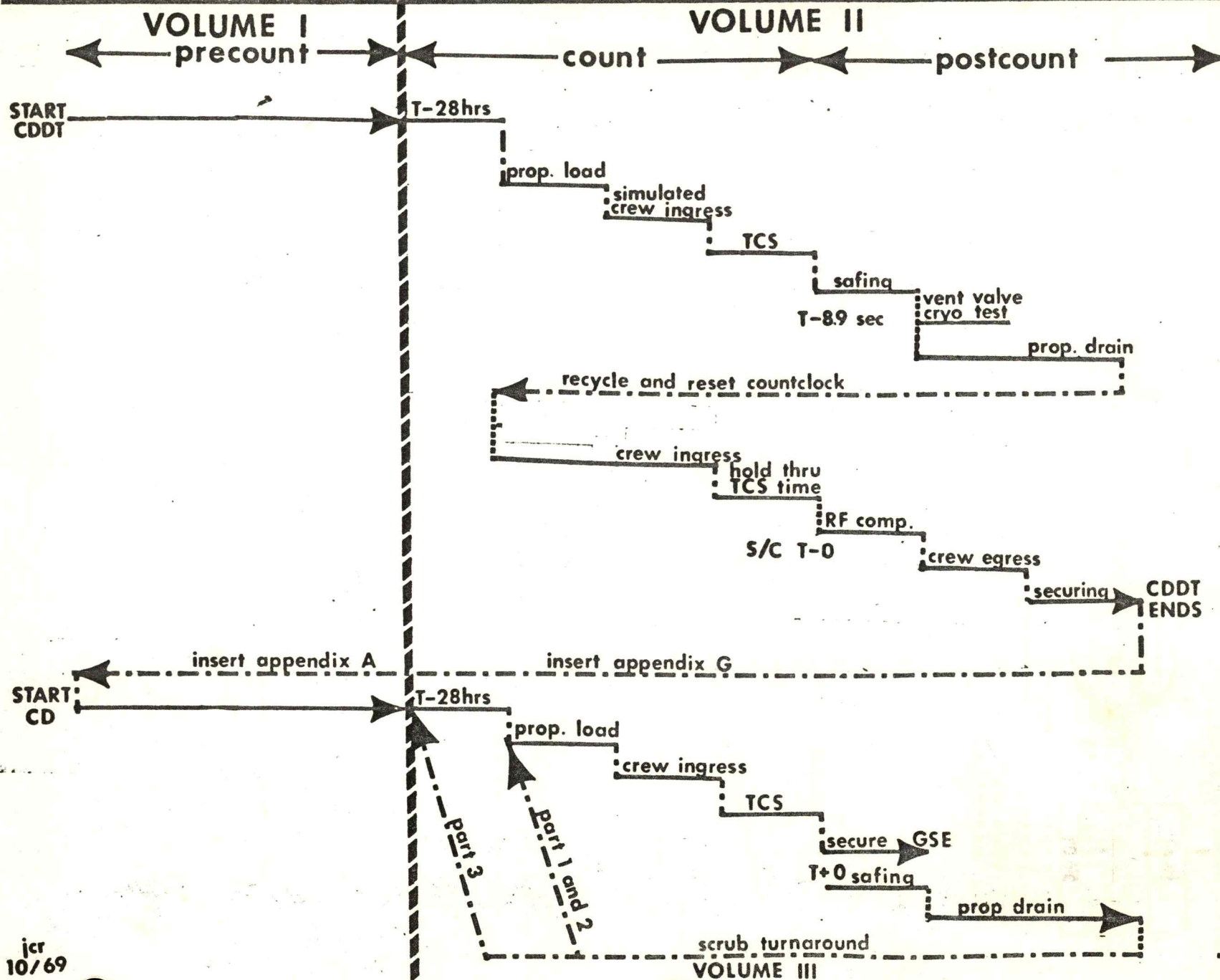
"*" INDICATES INFORMATION UNIQUE TO CDDT

"#" INDICATES INFORMATION UNIQUE TO LAUNCH CD

"A" INDICATES SEQUENCES FOR AN AS-507 CDDT ONLY S-II LOX HELIUM INJECTION TEST

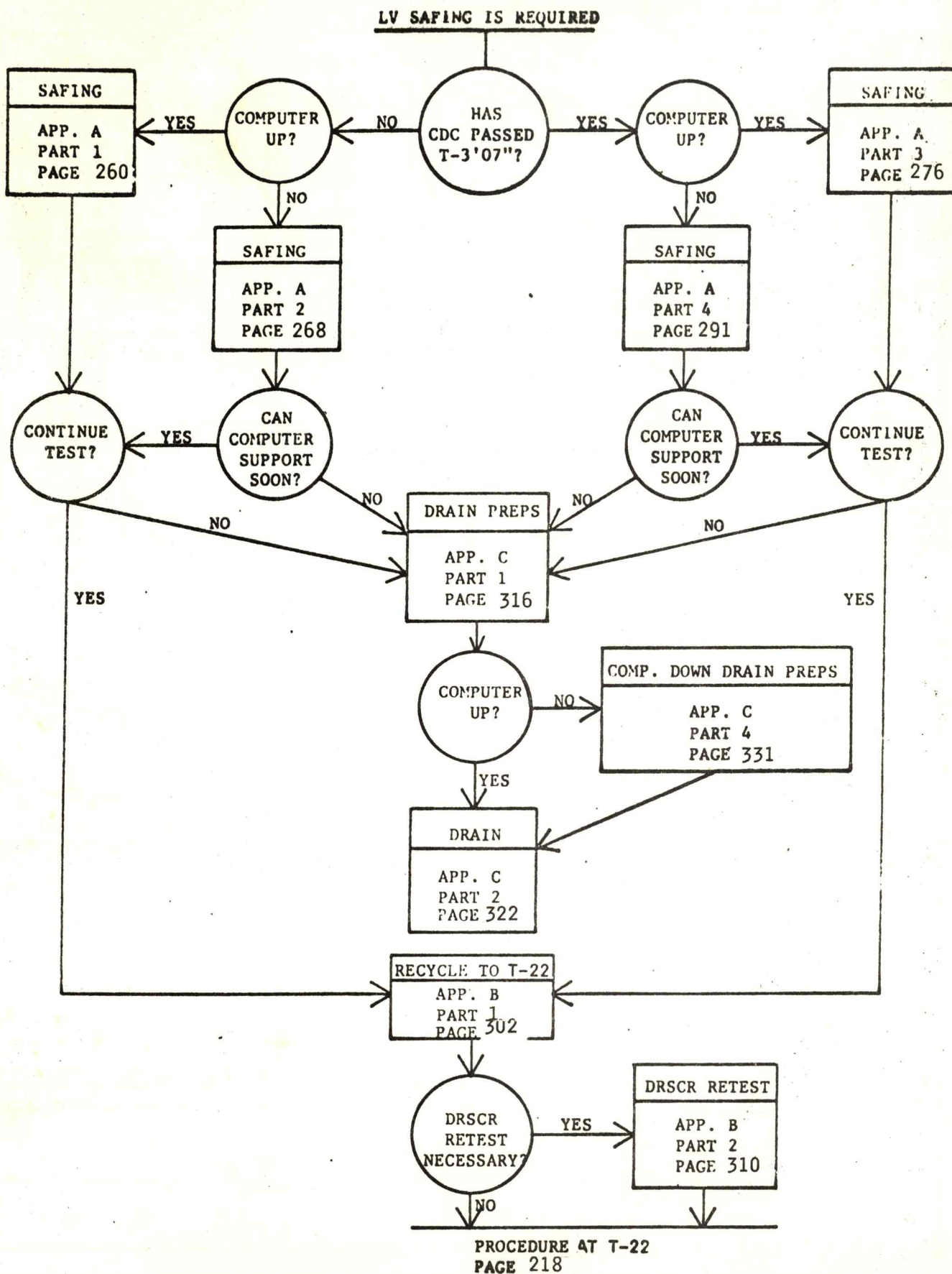
V-20060

CDDT & COUNTDOWN PROCEDURE

jcr
10/69
 LV CDDT & CD, VOL. II
 DATE: OCT 16 1969
 REVISION: 013

 APOLLO/SATURN
 LAUNCH OPERATIONS

 PAGE 5251.60
 TEST NUMBER 20060, VOL. II
 VEHICLE AS-507
 4-1



**KSC OPERATIONS
APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET**

PAGE 1 OF 4

1. TEST TITLE

Launch Vehicle Operations in Support of Space
Vehicle Countdown Demonstration and Countdown

2. KSC TEST NUMBER

V-20060

3. EFFECTIVITY

AS-507 & Subs

4. TEST OBJECTIVES

- CDDT 1. To demonstrate the time phasing of the sequences necessary to prepare the launch vehicle for launch.
2. To verify that the launch vehicle and the ground support equipment are in launch status.
3. To demonstrate the ability to safe and drain the launch vehicle.
- CD 1. To accomplish the operations required to prepare the launch vehicle for launch.
2. To launch the space vehicle.

5. TEST DESCRIPTION/EQUIPMENT STATUS/CONFIGURATION

THIS TEST ☒ DOES ☐ DOES NOT CONTAIN HAZARDOUS OPERATIONS.

It is classified as a
test or operation.

Hazards include propellant transfer, ordnance installation and connection, equipment pressurization, hazardous environmental conditions, radiation hazard, swing arm pressurization, engine gimbaling and heavy equipment movement.

With the Space Vehicle on the pad, all tests must have been completed.

Test and Checkout Procedure Description

The basic procedure is written for CDDT. Insert pages are provided in appendicies to convert the CDDT procedure to a CD procedure. It is divided into three volumes.

Volume I operating steps will cover launch vehicle operations through spacecraft cryogenic loading.

Volume II operating steps will include launch vehicle operations from the completion of spacecraft cryogenic loading through the terminal count sequence. Appendicies will include:

- a) Safing Procedures
- b) Recycle Procedure
- c) Drain Operations
- d) Contingency Procedures
- e) Pad Access During Hazardous Operations
- f) Reconfiguration for Dry CDDT, Dry CDDT and LV Securing from Dry CDDT

Volume III operating steps will include operations necessary to prepare the launch vehicle for another window after a scrubbed launch attempt.

PRIOR REVISIONS TABULATED ON PAGE 4

H	10/6/9	VOLUME III DESCRIPTION TO INCLUDE 2 DAY SCRUB-TURNAROUND. UPDATE TEST REQUIREMENTS.	<i>John C. Doherty</i> 10/8/9	<i>Frank Byron</i> 10/15
6. REV.	DATE	REASON	Contractor Approval	KSC Approval
7. CONTRACTOR APPROVAL		8. ORGANIZATION	9. DATE	
s/J. C. Doherty		BATC 5-8553	9/24/68	
10. NASA-KSC APPROVAL		11. ORGANIZATION	12. APPROVAL DATE	
s/I. A. Rigell		LV-ENG	10/28/68	

APOLLO/SATURN TEST AND OPERATIONS CATALOG (SHEET 2)		PAGE <u>2</u> OF <u>4</u>
1. TEST TITLE Launch Vehicle Operations in Support of Space Vehicle Countdown Demonstration and Countdown		2. KSC TEST NUMBER V-20060
		3. EFFECTIVITY AS-507 & Subs
13. LOCATION Pad 39	14. COMPUTER PROC. IDENTIFICATION BE-01, BE-02, BT-01, CTC1, CTC2, CTC3, CTC4, CTC5	15. EST. TEST TIME CDDT 138 Hrs; CD 108 Hrs
16. SUPPORT REQUIREMENTS		
SD/RD 40000 SD/RD 40001 Ground Power S-IC Stage Power S-II Stage Power S-IVB Stage Power IU Stage Power	ETR Range Safety KSC Pad Safety Security Police Fire Fighting Medical Propellants DC Power PTCS (All Systems) DTS DEE-3	RCA-110A Computers CM W-G ECS CCF Searchlights DEE-6
17. OTHER APPLICABLE REFERENCE DOCUMENTATION		
L/M Procedure KL-0007 S/V Procedure V-40310 LMRD K-V-05.10	ETR OD 40001 ETR OD 40000	S/C Procedure K-0007 S/V Procedure V-40300 S/V Scrub Turnaround V-40305
18. ITEM CONTINUATION		
(14) FE-05, FT-03, FT-04, FT-05, FT-06, FT-08, FT-10, FT-20, FT-23, FT-25, FT-33, FT-35, FT-37, FT-42, FT-43, FT-45, FT-47, FT-49, FT-55, GT-16, KAOS, KAPW, ME-01, MT-01, NT-60, NT-98, QALS, QAMS, QAPU, QASP, VAED, VALK, VALL, VAMC, VAPX, VATC, VATS, VZ33, VZEA, VZRE, VZSA, WAPO, WASL, WAST, WASV, WATL, XADS, XAPU, XASS, NT99, KAF1, KAG1, XAPS, NU-10, QAES		
(5) <u>Countdown/Countdown Demonstration Comparison</u>		
The wet countdown demonstration will be performed the same as the launch countdown with the following major exceptions: Hypergol cartridges, igniters, initiators, safe and arm devices and exploding bridge wire detonators will be inert; DRSCS test code plugs will be used instead of flight code plugs; the service arm and tail service mast pressure hold test will be performed, service arms 1 & 2 will not be retracted; and astronauts will not enter the spacecraft. The dry countdown demonstration will be the same as the last 3 1/2 hours of the launch countdown with the following major exceptions: LV cryogenic propellants, and the radioisotope thermal generator will not be on board; the primary damper and service arms 1 through 8 will not be retracted; and service arm 9 will be extended and reconnected as soon as the system has stabilized in the park position.		

APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET)	PAGE <u>3</u> OF <u>4</u>
1. TEST TITLE Launch Vehicle Operations in Support of Space Vehicle Countdown Demonstration and Countdown	2. KSC TEST NUMBER
	V-20060
ITEM CONTINUATION	3. EFFECTIVITY
	AS-507 & Subs

ITEM CONTINUATION

(5) Test Description (Countdown Demonstration)Volume I

Launch vehicle operations will include the following major operations: Service arm and tail service mast pressure hold test, propellant tank purging, digital range safety command checks, ordnance installation and connection and functional test (with pulse sensors), propulsion system checks, and propellant utilization system calibration.

Volume II

Launch vehicle operations will include the following major operations: Flight battery installation and connection, launch vehicle emergency detection system checks, telemetry radio frequency checks, launch vehicle power transfer test, range safety command checks, guidance system checks, mobile service structure platform opening and move from the pad, propellant dispersion safe and arm device connection, launch vehicle closeout and access door securing and pad evacuation for launch vehicle propellant loading.

Also included will be launch vehicle cryogenic propellant loading, primary damper retraction, computer programs for automated launch vehicle checks, simulated astronaut ingress and terminal count sequence up to interrupt at time for ignition.

Launch vehicle safing, drain, and securing operations will be included as will reconfiguration for dry CDDT. Dry CDDT will include operations to simulate the launch vehicle launch configuration at time for closeout crew to leave the mobile service structure parksite, launch vehicle power transfer test, range safety command checks, guidance system checks, propellant dispersion receiver checks, astronaut ingress and service arm 9 disconnect and reconnect. The launch vehicle terminal count sequence will not be run. Launch vehicle securing, radio frequency compatibility test, systems securing, astronaut egress, ground support equipment and launch vehicle securing operations will conclude the CDDT.

Test Description (Countdown)

The sequence of operations will be the same as the wet countdown demonstration test except the terminal count will result in launch of the space vehicle. Operations to secure ground support equipment after launch will be included. In the event of a scrubbed launch, cryogenic propellants would be drained prior to use of Volume III.

Volume III

Launch vehicle operations for a 24 hour scrub turnaround will include: Service arm 2 and 3 tip extension and retraction, launch vehicle re-entry and closeout, propellant storage tank sampling and fill, launch vehicle tank sampling, verification of S-IC forward umbilical reconnection and preparation for propellant loading starting at T-8:59 hours in Volume II.

APOLLO/SATURN TEST AND OPERATIONS CATALOG SHEET (CONTINUATION SHEET)

PAGE 4 OF 4

1. TEST TITLE

Launch Vehicle Operations in Support of Space
Vehicle Countdown Demonstration and Countdown

2. KSC TEST NUMBER

V-20060

3. EFFECTIVITY

AS-507 & Subs

ITEM CONTINUATION

- (5) Launch vehicle operations for a 2 day scrub turnaround will include extension and retraction of S/A 2, 3, 6 & 7 tips, MSS move to and from the pad, launch vehicle re-entry and closeout, installation and removal of work platforms and equipment to enable SHe reservicing, propellant tank sampling and fill, launch vehicle tank sampling, verification of S-IC forward umbilical reconnection and preparation for propellant loading starting at T-8:59 hrs in Volume II.

Launch vehicle operations for a 3 day scrub turnaround will include extension of S/A tips, MSS move to pad, launch vehicle re-entry, work platform installation, disconnection of propellant dispersion detonators and confined detonating fuses, connection of pulse sensors, propellant tank sampling and fill, launch vehicle tank sampling, battery removal and systems retests in preparation for resumption of the launch vehicle countdown at the start of Volume II.

Test Requirements, MSFC

LV - TM-010-002-2H; C.2.3.1, C.2.3.2, C.2.3.3, C.2.3.4, C.2.5.1,
B.13.0.1, B.1.8.1.2, B.1.8.1.4, B.1.2.3,
B.1.9.1, B.10.0.1.3, B.10.0.1.4,
B.1.5.1.1, B.1.5.3, B.1.5.3.1, B.1.5.3.4, B.1.6.1.1,
B.1.6.1.2.1, B.1.2.1, B.1.2.2.1, B.1.2.2.2, B.1.2.2.3,
B.1.5.2, B.1.9.2, B.3.0.1, B.12.0.1, C.2.1.1, THRU
C.2.1.9.
S-IC - 66B13618A 4.4.4.3.1,
S-II - SIB 66-1465-7 2.3.3.1, 2.4.2.5.1,
S-IVB - IB 76996 None
IU - 7916404 0.3.4.1.1.1.1, 0.3.5.2.5.2

(6)	<u>Revision</u>	<u>Date</u>			
	A	12/18/68	Pad A, S-IC film camera system, appendices, computer programs, MSFC requirements.	Doherty/Rigell	12/21/69
	B	1/29/69	Make TCP multiple effective	Doherty/Rigell	2/10/69
	C	4/01/69	Update computer programming	Doherty/ Bryan for Rigell	4/02/69
	D	4/10/69	Include programs WATL and WASL. Update MSFC requirements for AS-506 & Subs.	Doherty/Rigell	5/01/69
	E	6/02/69	Update computer programs and MSFC requirements	Doherty/Rigell	6/09/69
	F	8/06/69	Update computer programs and test description	Doherty/ Bryan for Rigell	8/13/69
	G	9/12/69	Update computer programs and test requirements	Doherty/ Bryan for Rigell	9/19/69

TEST OUTLINE

1. TCP TITLE LV Operations in Support of Manned SV CDDT & CD	2. TCP NUMBER V-20060	3. REV. 001	4. VEHICLE NUMBER AS-507	5. PAGE <u>1</u> OF <u>4</u>
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6. CONTENT:

This procedure includes launch vehicle operations for both the Countdown Demonstration Test and Countdown. It is divided into three volumes.

Volume I covers launch vehicle precount operations.

Volume II covers launch vehicle count operations as well as safing and securing operations.

Volume III includes operations necessary to recycle the launch vehicle for another launch window.

- Radio Frequency Systems: All RF systems will be functionally checked out by ground stations and the RF checkout equipment. The MSS will be in place and passive repeaters will be connected to the various systems through antenna couplers. All stage command destruct systems will be checked. Antenna couplers will be removed prior to removal of the MSS after all systems have been validated and turned off. The C-band transponder and the CCS will be turned off after validation. All RF systems will be turned on prior to launch and will again be interrogated and performance evaluated at the ground stations, the RF checkout station, and by correlation of these sources with the digital data acquisition system.
- Telemetry Systems: The telemetry systems will be turned on from the LCC measuring and RF panels and parameter checks conducted by the CIF ground station. Following these checks, the system will be used as required.
- Measurement System: The measurement system will be verified after verification of the telemetry systems. The verification will primarily be performed under programmed control of the 110A computer.
- Guidance, Control and Stabilized Platform: Functional tests of the guidance control and stabilized platform (GC&SP) system will be conducted. These tests will: (a) visually verify system configuration, (b) run automatic turn-on procedures early in the countdown and (c) verify subsystem operation.

The flight computer subsystem checks include a repeatable simulated flight sequence, system interface test sequence (discrete check), and L/V steering tests.

The control computer nulls will be checked for acceptable values during warmup before the vehicle prelaunch checks are made.

The ST-124M stabilized platform subsystem will be checked. The automatic long range theodolite true azimuth will be re-established using the reference benchmark and the theodolite system will be functionally tested before ST-124M platform tests are run.

7. PREPARED BY <i>Graham A. Darnell</i>	8. DATE 8/6/69	9. CHIEF ENGINEER <i>Frank Darnell for I. Ryell LV-ENG</i>	10. DATE 8/13/69
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TEST OUTLINE

1. TCP TITLE LV Operations in Support of Manned SV CDDT & CD	2. TCP NUMBER V-20060	3. REV. 001	4. VEHICLE NUMBER AS-507	5. PAGE <u>2</u> OF <u>4</u>
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6. CONTENT:

The combined GC & SP will be brought to an operating condition to support the space vehicle power transfer test and operation on internal power will be verified to be acceptable. A few hours before T-0, the long range theodolite system will be set up to maintain the ST-124M platform azimuth alignment. The platform will be powered-up, aligned to the launch azimuth and held there until guidance release. In the final minutes of countdown, the combined GC & SP system will be utilized in the stage steering tests. These will be run on the S-IVB stage, then the S-II stage and finally the S-IC stage just before the terminal count sequence.

5. Networks: The networks countdown activities include performance of electrical support equipment (ESE) preparation in the launch umbilical tower (LUT) and pad terminal connection room (PTCR) prior to evacuation of those areas.

Preparations of the LUT ESE will include performing bus resistance checks from the LUT power distributors to the stage bus line before applying vehicle power. The various power and control distributors will be inspected for proper cable connections and switch positions. A check will be made to ensure that all cables are clear of movable mechanisms. Final checks will be made of recorder calibration digital events evaluator (DEE) operation and sequencer operation under launch control center (LCC) control. Associated indications at the LCC will be checked against existing conditions in the LUT. Preparations of a similar nature will be given to the PTCR ESE with emphasis on propellants and gases, electrical equipment and data transmission system.

The LCC ESE preparations will be performed in conjunction with and following those in the LUT & PTCR. These will consist of visual inspection of power, instrumentation, and control distributors for proper cable connections and switch positions. Patch panel connections to the recorders and between the firing room and the PTCR will be visually inspected. Final recorder calibrations will be completed together with checks on the DEE printout devices.

Power transfer tests will be conducted early in the count with final power transfer initiated late in the count. Proper transfer and correct vehicle battery loading will be verified. Late in the count, approximately T-5 minutes, the terminal countdown and ignition sequencers will be armed in preparation for the automatic terminal sequence start of T-3 minutes 7 seconds.

6. Emergency Detection System: The EDS will be functionally tested after final power up and again shortly before T-0. The ground computer will program simulated malfunctions of input parameters and verify proper voting of the EDS logic units.

7. PREPARED BY	8. DATE	9. CHIEF ENGINEER	10. DATE
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TEST OUTLINE

1. T.C.P. TITLE LV Operations in Support of Manned SV CDDT & CD	2. T.C.P. NUMBER V-20060	3. REV. 001	4. VEHICLE NUMBER AS-507	5. PAGE <u>3</u> OF <u>4</u>
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6. CONTENT:

7. Propellants: The LOX & LH2 systems will be prepared for tanking during precount operations. Valves will be prepositioned and electrical controls checked. Propellant loading sensors will be checked and the propellants tanking computer system tested. During CDDT, an actual cryogenic propellant loading will be performed. Following the terminal count sequence, an S-II LH2 vent valve cryogenic test will be conducted and the propellants will be drained.
8. Propulsion: The propulsion system launch countdown operations will be a direct continuation of the precount operation. The S-IC LCC propulsion panels will be continually manned and the condition of the engines monitored. During the last 10 minutes of the count, the S-IC thrust chamber fuel jacket will be topped-off with ethylene glycol. During the last minute of the count, the S-IC engine calorimeter purge will be turned on. The engine checkout valves will be sequenced to the engine position and the high LOX dome and the gas generator LOX injector purge will be initiated by the sequencer. The ignition command will be given. In the demonstration, cutoff will be indicated at T-8.9 seconds. In the countdown, the start sequence will be automatically controlled through launch.
9. Pneumatics: Pneumatics system operations will consist of a visual inspection, verification checks of critical components, pressurization of pneumatic system consoles and supply lines and support of other system preparations. Pneumatics system will supply pressure to required systems upon request or at predetermined times.
10. Hydraulics: Hydraulics system operations will consist of visual inspection, verification checks of critical ground and airborne components, system operation in support of other tests and final hydraulic system operation for terminal count and flight.

The S-IVB & S-II auxiliary hydraulic pumps will be turned on to support guidance gimbal commands. Visual inspection of the hydraulic system will be made prior to removal of the last work platforms to verify there is no leakage.

11. Air Frame: Upon completion of the precountdown operation, internal stage work platforms which are not required for the countdown operation will be removed and stored.

Prior to removal of the mobile service structure (MSS), test equipment, tools and loose items will be removed from the structure platforms. The structure clamshells will be opened from around the space vehicle, ground connections disconnected and stored and the MSS transferred to its parking area by the crawler-transporter.

7. PREPARED BY	8. DATE	9. CHIEF ENGINEER	10. DATE
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TEST OUTLINE

1. TCP TITLE LV Operations in Support of Manned SC CDDT & CD	2. TCP NUMBER V-20060	3. REV. 001	4. VEHICLE NUMBER AS-507	5. PAGE <u>4</u> OF <u>4</u>
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6. CONTENT:

The remaining internal stage platforms will be removed and the access doors secured for flight upon completion of all vehicle checks and connection of the Safe and Arm devices. Stage compartments will be inspected for loose equipment or damage prior to the removal and storage of the platforms.

12. Environmental Control: L/V interstage areas and various electronic cannisters will be provided with air from prior to test start. These areas will be supplied with gaseous nitrogen prior to cryogenic loading and continued for the duration cryogenics are on board. The Launch Vehicle compartments must be verified clear of personnel prior to performing air to GN2 change-over operations. The SIC, SII, SIVB, IU and SLA compartments will be provided with GN2 to maintain compartment temperature within limits and to provide for purge of any minor LOX or LH2 leaks. The ECS will function through launch. ECS will provide conditioned air to S/A 9 White Room continually through launch.
13. Water Systems: The water system dry electromechanical check of critical components will be completed early in the precount. The hydro-pneumatic water tanks will be filled and pneumatically charged. All manual valves and components will be visually inspected.
14. Firing Accessories: A visual inspection will be conducted during the countdown to ensure that all loose equipment has been removed from the LUT. The hammerhead crane will be secured in the launch position.

After removal of vehicle internal work platforms and securing of all access doors the service arm extension platforms and service arm #3 will be uncoupled from the vehicle, retracted, and locked. Prior to propellant tanking, all LUT tiedowns, supports and support columns will be inspected.

The service arms and tail service masts hydraulic and pneumatic control accumulator pressures will be verified at the pad and at the LCC control and monitor consoles.

15. Safing, Recycle to Hold and Scrub Procedures: Assuming propellants are on board safing operations will be included to bring ordnance, tank and vessel pressures, and propellant flows to a safe condition quickly. A recycle procedure will be included to restore the launch vehicle to a T-22 minute configuration after a hold at any point later in the count than T-22 minutes. A drain procedure will be included to terminate the count if conditions warrant. A flow diagram will be included in the procedure to illustrate when and under what conditions the various procedures are to be utilized.
16. Recycle to Launch Procedure: A recycle procedure will be included to bring all equipment to a launch condition again if the primary launch window is missed.

7. PREPARED BY	8. DATE	9. CHIEF ENGINEER	10. DATE
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LIST OF EFFECTIVE PAGES

THIS IS REVISION 015 OF THIS PROCEDURE. IT CONTAINS 361 PAGES AS FOLLOWS;

<u>PAGE NO.</u>	<u>REVISION</u>	<u>PAGE NO.</u>	<u>REVISION</u>	<u>PAGE NO.</u>	<u>REV</u>
COVER	015	121 THRU 125	012	288 THRU 290	J15
1 & 2	015	126	015	291	012
3 THRU 4	012	127	012	292	014
4-1	013	128	U15	293	015
5	012	129	012	294 THRU 296	012
6 THRU 6-3	H	130	015	297 & 298	015
7 THRU 7-3	001	131 THRU 134	012	299 & 299-1	012
8 THRU 15	015	135	015	300 THRU 317	012
		136 THRU 141	012	G318 THRU G321	012
		142	015	G322	015
16	DELETED	143 & 144	012	G323	012
17	015	G145 & G146	012	324 & 325	012
18 THRU 18-2	012	147 & 148	012	326 & 327	015
19 THRU 21-6	012	149	015	328 THRU 331	012
22 THRU 26	012	150	012	G332 & G333	012
27	015	151 & 152	013	334 & 335	012
28 THRU 36	012	153	012	336 THRU 350	OMITTED
37	015	154	013	351 THRU 359	012
38 THRU 42	012	155 & 156	012	359-1	012
43	015	G157 & G158	012	360 THRU 363	012
44	012	159 THRU 166	012		
45	015	G167 & G168	012		
46	012	169 THRU 174	012		
47	015	G175 THRU G181	012		
48 THRU 50	012	G182 THRU G184	DELETED		
G51	012	G185 THRU G190	012		
G52 & G53	015	191 THRU 194	012		
G54	012	G195 & G196	012		
55	015	197 THRU 200	012		
56	015	G201 & G202	012		
G57 & G58	012	203 THRU 213	012		
59 THRU 80	012	214	014		
G81 THRU G84	012	215 THRU 219	012		
85 & 86	012	220 & 221	013		
G87	012	222	012		
G88	013	223	013		
89	012	224	012		
90	015	225 & 226	013		
G91	012	G227 & G228	012		
G92	015	229 THRU 240	012		
93	013	G241 & G242	012		
94	015	243 & 244	012		
95 & 96	012	G245 THRU G257-3	012		
G97 THRU G103	012	258 THRU 276	012		
G104	015	277	014		
105 THRU 108	012	278 & 279	012		
109	013	280	014		
110 THRU 116	012	281	012		
117 & 118	013	282	014		
G119 & G120	012	283 THRU 287	012		

REVISION RECORD PAGE (CURRENT REVISION)

PAGES AFFECTED

REV.	REVISED	ADDED	DELETED	REASON/SUPPORTING DOCUMENT
015	COVER, 1, 2, 8 THRU 11, 13 THRU 15, 17, 27, 37, 39, 43, 45, 47, G52, G53, 55, 56, 90, G92, 94, G104, 126, 128, 130, 135, 142, 149, 288, 289/290, 293, 297, 298, 322, 326 & 327	32-1	16, 33-36, 51-54, 57, 58, 81-84, 87, 88, 91, 92, 97-104, 119, 120, 145, 146, 157, 158, 167, 168, 175-181, 185-190, 195, 196, 201, 202, 227, 228, 241, 242, 245, 246, 318-323, 332, 333 & 364-439	INCORPORATED PCR'S B-204-111, B-206-112, I-100-113, XB-150-114, B-208-115, N-120-117, XB-149-118, B-212-119, XB-151-120 AND I-101-121. RELEASED FOR AS-507 CD 10/ 29/69.

PRIOR REVISION HISTORY ON NEXT PAGE

REVISION RECORD PAGE (PRIOR REVISIONS)

PAGES AFFECTED

REV.	REVISED	ADDED	DELETED	REASON/SUPPORTING DOCUMENT
BASIC				RELEASED FOR AS-504 CDDT 1/17/69
001				PARTIAL REVISION RELEASED FOR AS-504 CDDT 2/3/69.
002				RELEASED FOR AS-504 CD 2/19/69
003				PRERELEASE FOR AS-505 DATED 3/3/69.
004				RELEASED FOR AS-505 CDDT 3/29/69
005				PARTIAL REVISION RELEASED FOR AS-505 CDDT 4/18/69.
006				RELEASED FOR AS-505 CD 5/7/69
007				PRERELEASE FOR AS-506 DATED 4/24/69.
008				RELEASED FOR AS-506 CDDT 5/26/69
009				PARTIAL REVISION RELEASED FOR AS-506 CDDT 6/17/69.
010				RELEASED FOR AS-506 CD 7/3/69
011				PRERELEASE FOR AS-507 8/13/69
012				RELEASED FOR AS-507 CDDT 9/19/69
013				PARTIAL REVISION RELEASED FOR AS-507 CDDT 10/16/69.
014				PARTIAL REVISION RELEASED FOR AS-507 CDDT 10/23/69.

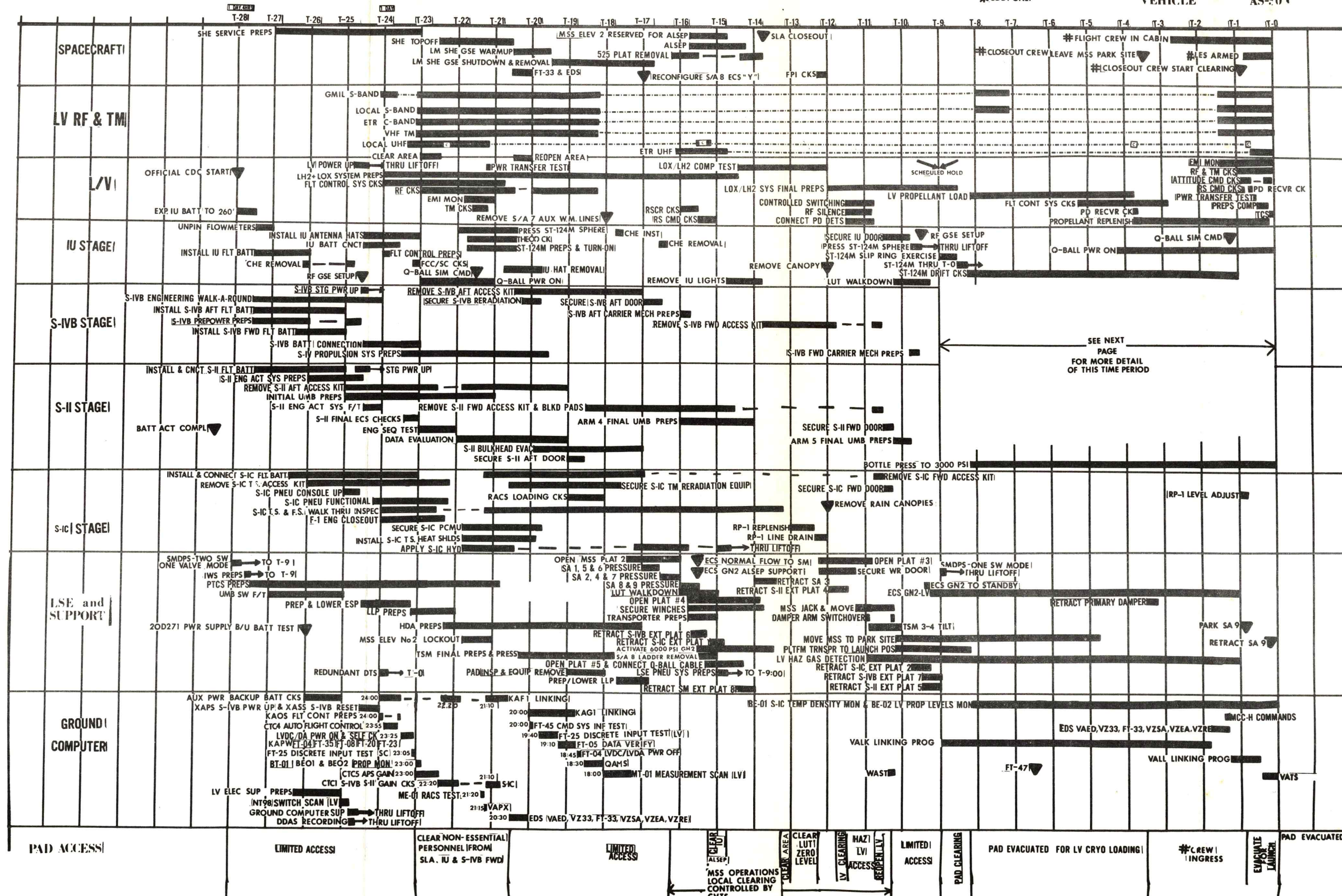
DATE 10 28 69
REVISIO 015

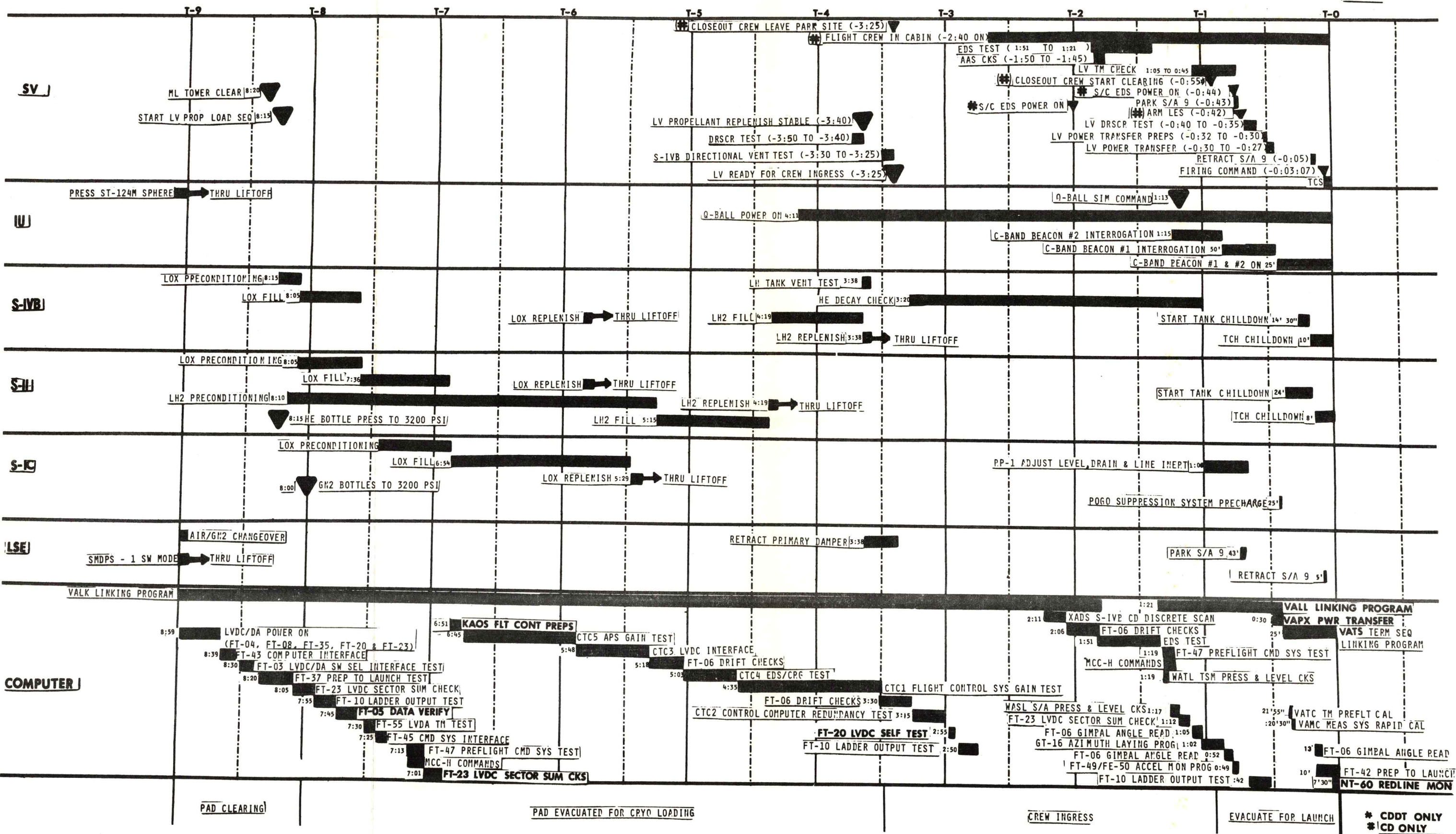
COUNT

L/V COUNTDOWN DEMONSTRATION & L/V COUNTDOWN

#CD ONLY
*CDDT ONLY

PAGE 12
TEST NO. V-20060 VOL II
VEHICLE AS-507





IU/S-IVB AREA MANLOADING

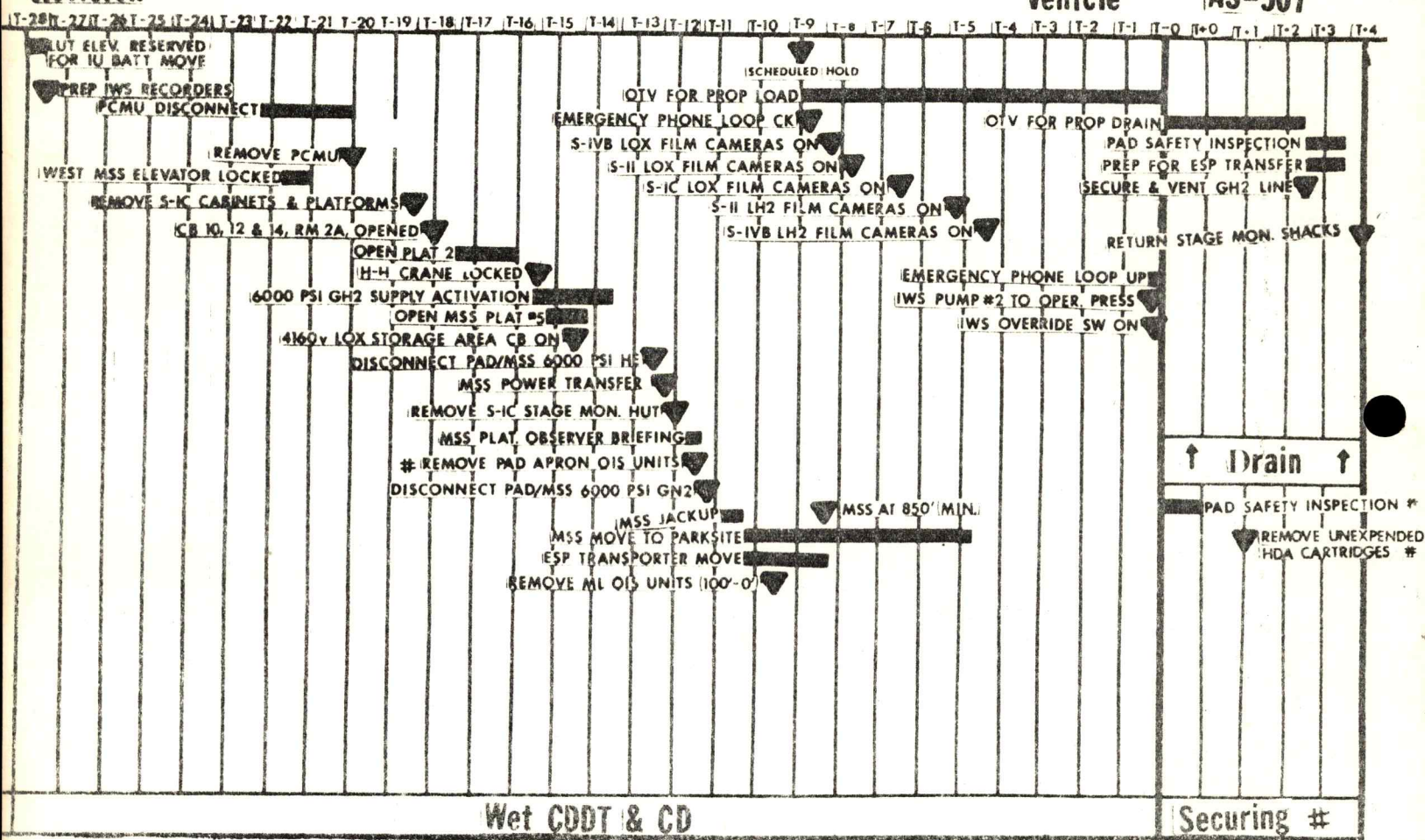


Date OCTOBER 28, 1969
Revision 015

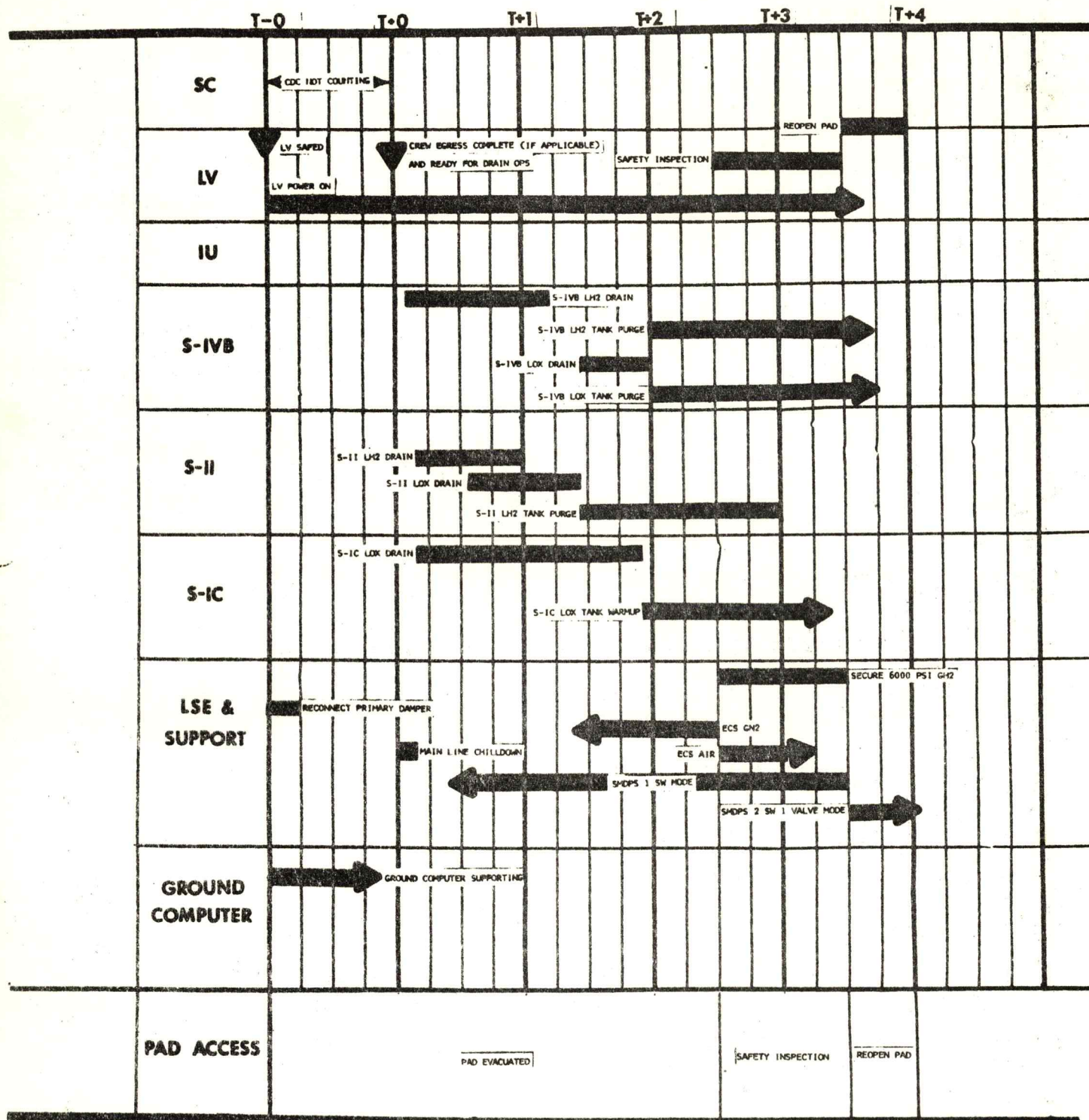
LV CDDT & CD SUPPORT REQUIREMENTS

Page
Test No.
Vehicle

V-20060, Vol II
AS-507



LV DRAIN OPERATIONS



LIST OF UNIQUE PAGES

"CDDT ONLY" AND "CD ONLY" PAGES IN THIS PROCEDURE ARE REQUIRED TO ACCOMMODATE THE FOLLOWING DIFFERENCES BETWEEN CDDT AND CD:

- 1D 3H 30' 0" FUSED JUMPERS INSTALLED FOR CDDT ONLY.
- 1D 3H 0' 0" G-BALL PORT PLUGS REMOVED DURING CD ONLY.
- 23H 0' 0" ST-124M PURGE LINE AND PLENUM CHECK VALVE REMOVED DURING CD ONLY.
- 22H 30' 0" ST-124M PURGE LINE AND PLENUM CHECK VALVE REMOVED
- 20H 15' 0" ST-124M SYSTEM PURGED DURING CDDT ONLY.
- DURING CD ONLY
- 22H 5' 0" ST-124M PURGE SUPPLY VALVE CLOSED DURING CDDT ONLY
- 20H 30' 0" S-IC TM RERADIATION SYSTEM REMOVED DURING CD ONLY.
- 19H 0' 0" DRSCS FLIGHT CODE PLUG INSTALLED IN LCC DECODER DURING CD ONLY.
- 18H 0' 0" WATER METHANOL LINES REMOVED DURING CD ONLY.
- 18H 0' 0" LH2 VENT VALVE CHECKOUT DURING CDDT ONLY
- 18H 0' 0" CRD'S TORQUED DURING CD ONLY.
- 17H 45' 0" S-IC TM RERADIATION SYSTEM REMOVED DURING CD ONLY.
- 16H 30' 0" SUBLIMATOR VENT COVERS REMOVED DURING CD ONLY.
- 16H 0' 0" S-II LH2 VENT VALVE CRYO TEST RUN DURING CDDT ONLY.
- 16H 0' 0" DEE 6 DISCRETES MASKED DURING CDDT ONLY.
- 15H 53' 0" DRSCR INDICATIONS DIFFERENT FOR CDDT AND CD.
- 15H 50' 0" DRSCR INDICATIONS DIFFERENT FOR CDDT AND CD.
- 15H 45' 0" RANGE RECONFIGURES TO DRSCS FLIGHT CODE PLUGS DURING CD ONLY.
- 15H 45' 0" DEE 6 DISCRETES UNMASKED DURING CDDT ONLY.
- 14H 30' 0" LH2 VENT VALVE CRYO TEST CHECKOUT RUN DURING CDDT ONLY
- 14H 0' 0" ST-124M SYSTEM PURGED DURING CDDT ONLY.
- 8H 59' 0" S/C EDS POWER TURNED ON AT THIS TIME DURING CDDT ONLY.
- 8H 59' 0" LH2 VENT VALVE INST. VERIFICATION DURING CDDT ONLY.
- 7H 10' 0" S-IVB APS PRESSURIZED DURING CD ONLY.

-3H 45' 0" DRSCS TEST CODE PLUGS INSTALLED DURING CDDT ONLY
-3H 45' 0" DRSCS FLIGHT CODE PLUGS INSTALLED DURING CD ONLY.
-3H 30' 0" S-II LOX HE BLOWDOWN TEST RUN DURING CDDT ONLY.
-3H 20' 0" S-IVB HE SUPPLY PRESSURE DECREASED DURING CDDT ONLY.
-3H 20' 0" S-II LOX HE BLOWDOWN TEST RUN DURING CDDT ONLY.
-3H 15' 0" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-3H 0' 0" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 29' 30" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 38' 30" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 36' 30" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 34' 30" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 33' 0" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 32' 0" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 31' 0" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 30' 30" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 29' 36" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 26' 39" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 26' 30" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 23' 50" S-II LOX HELIUM INJECTION TEST RUN DURING CDDT ONLY.
-2H 5' 0" S/C EDS POWER TURNED ON AT THIS TIME DURING CD ONLY.
-1H 51' 0" PROGRAM VZSA IN EDS TEST RUN DURING CD ONLY.
-1H 27' 0" CCS BLOCK EXERCISED DURING CD ONLY.
-1H 21' 0" EDS POWER OFF, CSM READY FOR G-BALL CAL AND CCS
ENABLED DURING CD ONLY
-1H 21' 0" IU COMMAND SYSTEM ENABLED DURING CDDT ONLY.
-1H 19' 0" CBS BLOCK EXERCISED DURING CD ONLY.
-1H 19' 0" IU SWITCH ACTION (IN PLACE OF MSTC & SCDR) DURING CDDT
ONLY.

-1H 0' 0" HELIUM SUPPLY OPENED DURING CD ONLY.

-45' 0" DIGITAL PRINTER POWER ON DURING CDDT ONLY.

-44' 0" S/C EDS POWER IS ON AT THIS TIME DURING CD ONLY.

-40' 0" DRSCS TEST CODE PLUGS INSTALLED DURING CDDT ONLY

-40' 0" DRSCS FLIGHT CODE PLUGS INSTALLED DURING CD ONLY.

-8' 0" S/A 1 ARMED FOR RETRACTION DURING CD ONLY.

-0' 30" S/A 1 ARMED FOR RETRACTION DURING CD ONLY.

-16' TO +2H 30" DIFFERENT TCS AND PLUS TIMES FOR CD AND CDDT.

APP C1 S-II LH2 VENT VALVE TEST RUN DURING CDDT DRAIN ONLY.

APP C1 S/C EDS POWER TURNED OFF DURING CD SCRUB ONLY.

APP C1 DRSCS FLIGHT CODE PLUG SECURED DURING CD SCRUB ONLY

APP C2 S-II LH2 VENT VALVE TEST RUN DURING CDDT DRAIN ONLY

APP C4 +0' 0" MDO 0449 OFF APPLICABLE TO CD ONLY

APP F APPLICABLE TO CDDT ONLY.

APP G APPLICABLE TO CD ONLY.

LAUNCH OPERATIONS COMMUNICATIONS

COMPLEX 39 PA SYSTEM: -----

TO BE UTILIZED FOR ADMINISTRATIVE PHONE CALL ANNOUNCEMENTS, "T" COUNT ANNOUNCEMENTS, PAGING SPECIFIC PERSONNEL TO AN OIS CHANNEL, OPERATIONAL & EMERGENCY ANNOUNCEMENTS, AND FOR PAD ACCESS ANNOUNCEMENTS.

INTERCOMMUNICATIONS: -----

THE TEST AND CHECKOUT OPERATIONAL COMMUNICATIONS ARE TO BE UTILIZED AS ASSIGNED OR INDICATED IN THE PROCEDURE. TEST SUPERVISORY PERSONNEL MUST BE AVAILABLE AT THE FOLLOWING STATIONS.

		ACTIVE -----	MONITOR -----
S-IC TEST CONDUCTOR (BOEING)	C1TC	181	121
S-II TEST CONDUCTOR (NR)	C2TC	171	121
S-IVR TEST CONDUCTOR (DOUGLAS)	C4TC	161	121
IU TEST CONDUCTOR (IBM)	CUTC	151	121
L/V TEST CONDUCTOR (LVO)	CLTC	121	
S/V TEST SUPERVISOR (DLO)	CVTS	111	
SYSTEMS SAFETY (BENDIX)	CPSS	141	121
TEST SUPPORT CONTROLLER (TSM)	CTSC	112	

LV EMERGENCY COMMUNICATIONS:

IN THE EVENT OF AN OIS FAILURE, AN EMERGENCY SYSTEM UTILIZING THE BLACK PHONE WILL BE IMPLEMENTED. PRIOR TO CRYOGENIC LOADING, THE LV TEST CONDUCTOR WILL REQUEST THAT PERSONNEL ASSIGNED TO THE EMERGENCY LOOP DIAL THEIR ASSIGNED CODES AS A COMMUNICATIONS CHECK. AT APPROXIMATELY T-24 MINUTES, CLTC WILL AGAIN REQUEST THE CODES BE DIALED. THE PHONES WILL THEN REMAIN OFF THE HOOK WITH THE CIRCUIT ACTIVE THROUGH T-0. THE FOLLOWING OPERATING STATIONS WILL BE ASSIGNED CODES:

LVO:

CLTC (LV TEST CONDUCTOR)
CLES (LV ELEG ENGINEER)
CLMS (LV MECH ENGINEER)
CIAR (LV CHIEF ENGINEER)
ELSR (LV CIF 307 COOR)

S-1C:

C1TC (S-1C TEST CONDUCTOR)
C1MS (S-1C MEAS. SYS.)
CHGD (HAZARDOUS GAS DET.)
C1PE (S-1C PROP & MECH)
*C1NE (S-1C ELEC NETS)
CWCP (IND. WATER CONTROL)
*CPDC (PNEU. DIST. SYS.)
*CSAC (SA CONTROL COOR.)
*CHDA (HOLD DOWN ARM CONTROL)
*CECS (ECS CONTROL)
CCRP (RP-1 CONTROL)
*CCLO (LOX CONTROL)
*CCLH (LH2 CONTROL)
*RPDC (PROP D0 PWR NETS)

S-II:

C2TC (S-II TEST CONDUCTOR)
C2EV (S-II EVENTS DISPLAY)
*C2AE (S-II ENGINES)
*C2FC (S-II HYDRAULICS/EAS)
*C2SP (S-II PRESSURIZATION)
*C2PM (S-II PROP MON.)
*C2NP (S-II NETS)
C2IP (S-II MEAS.)

* EXTENSION PHONE

S-IVB:

C4TC (S-IVB TEST CONDUCTOR)
C4ES (S-IVB ELECTRONIC SYS)
*C4PS (S-IVB PROPUL SYS)
*C4SM (S-IVB MECH. SYS.)
C4IP (S-IVB MEAS.)

S-IU:

CUTC (IU TEST CONDUCTOR)
CUNP (IU NETS & SW SEL.)
*CCAP (AUX. POWER)
CLGK (GUID. CRT KYBD)
CUPC (ST-124M PLATFORM)
*CUFS (FLIGHT CONTROL INTEG)
CUIP (IU INSTR.)
BGCC (GROUND COMP.)

DLO:

CVTS (TEST SUPERVISOR)

SUPPORT:

BCFM (LCC MEAS.)
BCWC (FIREX CONTROL)

LAUNCH VEHICLE CALL STATIONS

BCBX BENDIX SUPPORT SUPERVISOR
BCFM FACILITY MEASUREMENTS
BCRL RCA/LTV SUPPORT SUPERVISOR
BCSC VEHICLE SUPPORT CONTROLLER
BCWC WATER CONTROL (CCC-CONSOLES)
BDDS LCC DATA DISPLAY STATION
BDTS DATA TRANSMISSION (2P12) INFORMATION SYSTEM
BEHZ HAZARDS MONITORING, INFORMATION SYSTEMS
BELT LIGHTNING WARNING
BGCC GROUND COMPUTER COMPLEX FIRING ROOM
BLTM LVO TM ENGINEER
BOSC SUPPORT CONTROLLER, OPERATIONS (AAS CUE PANEL RN 1P9)
BOTV OTV SYSTEM CENTER
BPHO PHOTOGRAPHY (TECHNICOLOR)
BRFS RF GROUND STATION LCC, RF-DRSCS GND STATION - 2P10A
BTMC TM CHECKOUT EQUIPMENT, COMMON MODULE - ROOM 2P10
BTMI CIF INTERFACE MODULE - RM 2P10
BTTM TEST COORDINATOR - RF & TM
BUTM IU TM CHECKOUT EQUIPMENT
B1RF S-IC RF SYSTEMS ENGINEER
B1TM TM CHECKOUT EQUIPMENT
B2RF S-II RANGE SAFETY ENGINEER
B2TM TM CHECKOUT EQUIPMENT, S-II MODULE - ROOM 2P10
B4IE S-IVB INSTRUMENTATION ENGINEER
B4RF LCC RF STATIONS
B4TM S-IVB TM CHECKOUT EQUIPMENT
CAJP A. J. PICKETT
CCAP AUXILIARY POWER CONSOLE
COLH LH2 CONTROL CONSOLE
CCLO LOX CONTROL CONSOLE
CCPM NETWORKS POWER MONITOR
CCRP RP-1 CONTROL CONSOLE
CCTC TEST SUPPORT CONTROLLER (SOP)
CECS ECS CONTROL CONSOLE
CEDK CRT KEYBOARD - EDS OPERATOR
CGIC INSTRUMENTATION CONTROLLER
CHCU HYDRAULIC CHARGING UNIT CONTROL CONSOLE
CHDA HOLDDOWN ARMS CONTROL PANEL
CHGD HAZARDOUS GAS DETECTION SYSTEM - LCC
CHG2 ABORT MON HAZ GAS CUE PANEL CONSOLE BE-11
CIAR I. A. RIGELL
CLCD LVO GROUND COMPUTER SYSTEM ENGINEER
CLCE LVO CHIEF ENGINEER
CLCP LVO COMPUTER AUTOMATION PROGRAMMING ENGR
CLEG LVO CHIEF LV ELECTRICAL G&C SYSTEM
CLEI LVO INTEGRATION EQUIP ELEC SYS ENGR
CLEL LVO LAUNCH EQUIP ELEC SYST ENGR
CLEP LVO PROPELLANTS ELEC SYST ENGR
CLES ELECTRICAL NETWORKS SYSTEMS ENGINEER
CLEU ELEC NETWKS SYST ENGR IU
CLEW LVO WATER SYST ELEC SYST ENGR
CLE1 ELEC NETWKS SYST ENGR S-IC
CLE2 ELEC NETWKS SYST ENGR S-II

CLE4	ELEC NETWKS SYST ENGR S-IVB
CLFK	CRT KEYBOARD - FLIGHT CONTROL
CLFS	LVO FLIGHT GONTROL SYSTEM ENGINEER
CLGC	LVO GUIDANCE & CONTROL SYSTEM ENGINEER
CLGK	CRT KEYBOARD - GUIDANCE
CLGS	LVO GYRO AND STABILIZER SYSTEM ENGINEER
CLIK	L/V CRT KEYBOARD - MEASURING
CLIS	LVO INSTRUMENTATION SYSTEM ENGINEER
CLMS	L/V MECHANICAL SYSTEMS ENGINEER
CLNS	LVO FLIGHT COMPUTER SYSTEMS ENGR
CLOM	LVO OPERATIONS MANAGER
CLPS	L/V PROPELLANT SYSTEMS ENGINEER
CLQO	LV GAL B/U F/R
CLQS	LV GAL CHIEF
CLSK	LSE & ECS CRT
CLTC	LAUNCH VEHICLE TEST CONDUCTOR
CLVN	VEHICLE NETWORKS PANEL
CPDC	PNEUMATIC DISTRIBUTION SYSTEM CONTROL CONSOLE
CPH1	LH2 COMPONENTS PANEL #1
CPH2	LH2 COMPONENTS PANEL #2
CP01	LOX COMPONENTS PANEL #1
CP02	LOX COMPONENTS PANEL #2
CP03	LOX COMPONENTS PANEL #3
CPRK	PROPELLANTS DISPLAY COMPUTER CONSOLE
CPRP	RP-1 COMPONENTS PANEL
CPSS	SYSTEMS SAFETY
CQAA	Q-BALL PANEL
CRSS	RANGE SAFETY SUPERVISOR PANEL
CSAC	SERVICE ARMS CONTROL CONSOLE
CSAD	DRRS CONSOLE
CSAK	LSE CRT CONSOLE NO. 8
CSAM	SERVICE ARMS MEASUREMENTS PANEL
CSA1	SERVICE ARM #1 CONTROL CONSOLE (S-IC INTER TANK)
CSA2	SERVICE ARM #2 CONTROL CONSOLE (S-IC FORWARD)
CSA3	SERVICE ARM #3 CONTROL CONSOLE (S-II AFT)
CSA4	SERVICE ARM #4 CONTROL CONSOLE (S-II INTERMEDIATE)
CSA5	SERVICE ARM #5 CONTROL CONSOLE (S-II FORWARD)
CSA6	SERVICE ARM #6 CONTROL CONSOLE (S-IVB AFT)
CSA7	SERVICE ARM #7 CONTROL CONSOLE (S-IVB FORWARD)
CSA8	SERVICE ARM #8 CONTROL CONSOLE (SERVICE MODULE)
CSA9	SERVICE ARM #9 CONTROL CONSOLE (COMMAND MODULE)
CSPP	SERVICE ARMS POWER PANEL
CTSC	TEST SUPPORT CONTROLLER
CTS1	TAIL SERVICE MAST 1-2 FIRING AND MONITOR TEST CONSOLE
CTS2	TAIL SERVICE MAST 2-3 FIRING AND MONITOR TEST CONSOLE
CTS3	TAIL SERVICE MAST 3-4 FIRING AND MONITOR TEST CONSOLE
CUOP	IU COOLING GONTROL CONSOLE
CUCR	IU FLIGHT CONTROL RECORDER PANEL
CUCS	AIRBORNE COMMAND SIMULATOR
CUDE	DIGITAL EVENTS EVALUATOR PRINTER
CUEF	EDS FLIGHT MONITOR
CUES	EDS PREPARATION
CUEV	EVENTS DISPLAY PANEL

CUFE	IU FLIGHT CONTROL SYSTEMS ENGINEER
CUFS	FLIGHT CONTROL SYSTEM INTEGRATOR
CUGA	IU FLIGHT CONTROL EDS RATE GYRO/CONTROL
CUIE	INTEGRATION/AUX POWER SYSTEM ENGINEER
CUIP	IU INSTRUMENTATION PANEL
CUNE	IU GROUND NETWORKS ENGINEER
CUNP	IU NETWORKS PANEL
CUPC	ST-124M SYSTEM ENGINEER
CUPP	IU AC & DC POWER
CUSP	FLT CONT COMP INPUT SUBSTITUTE PANEL
CUSW	SWITCH SELECTOR PANEL
CUTC	IU TEST CONDUCTOR
CVTS	SPACE VEHICLE TEST SUPERVISOR
CWCP	INDUSTRIAL WATER CONTROL PANEL
C1CS	CUTOFF SENSORS PANEL
C1DE	DEE PRINTER
C1DP	PROPELLANT DISPERSION AND ORDNANCE (DESTRUCT) PANEL
C1EH	ENGINE HEATERS PANEL
C1EN	S-IC ENGINE PANEL
C1EV	EVENT DISPLAY DISCRETE READOUT PANEL
C1FC	S-IC ENGINE DEFLECTION PANEL
C1FE	FLIGHT CONTROL SYSTEM ENGINEER
C1FR	FIRING CONSOLE AND OCOMPONENT TEST PANEL
C1HP	HYDRAULICS PANEL
C1IP	MEASURING PANEL
C1LO	S-IC LOX CONSOLE
C1MS	MEASURING SYSTEM TEST OPERATIONS
C1NP	NETWORKS PANEL
C1NE	GROUND ELECTRICAL ENGINEER
C1OU	LOX TANKING COMPUTER
C1PC	CONTROL AND PURGE PANEL (STAGE PNEUMATICS CONTROL)
C1PE	PROPULSION AND MECHANICAL SYSTEMS ENGINEER
C1PK	CRT KEYBOARD - PROPULSION
C1PS	GROUND POWER POWER SUPPLY ENGINEER
C1PU	S-IC PREFILL PANEL
C1RP	RP-1 SYSTEM PANEL
C1RU	RP-1 TANKING COMPUTER PANEL
C1SN	S-IC STAGE NETWORKS ENGINEER
C1SP	SEQUENCER PANEL
C1TC	S-IC STAGE TEST CONDUCTOR
C2AE	ALL ENGINE PANEL
C2DP	PD AND EBW AND ORDNANCE PANELS
C2EC	ENGINE COMPONENTS PANEL
C2EV	EVENTS DISPLAY PANEL
C2FC	HYDRAULICS PANEL
C2FE	ENGINE DEFLECTION PANEL
C2GP	GROUND PNEUMATICS PANEL
C2HU	LH2 TANKING COMPUTER
C2IP	MEASURING AND RF PANEL
C2LA	S-II PROPELLANT LOADING ELECTRICAL ADVISOR
C2LD	LEAK DETECTION AND PURGE PANEL
C2NK	CRT KEYBOARD - NETWORKS
C2NP	NETWORKS PANEL

C2OU	LOX TANKING COMPUTER
C2PA	S-II PRESSURIZATION ELECTRICAL ADVISOR
C2PC	DC POWER CONTROL PANEL #1
C2PK	CRT KEYBOARD - PROPULSION
C2PM	PROPELLANT MONITOR PANEL
C2PU	PROPELLANT UTILIZATION AND DEPLETION PANELS
C2RP	RECIRCULATION PANEL
C2RR	RELAY RACKS (#1 AND #2)
C2SI	S-II ACCESS/STRUCTURES
C2SP	PRESSURIZATION PANEL
C2TC	S-II STAGE TEST CONDUCTOR
C2TV	S-II TV CONTROLLER
C4AL	APS LAUNCH & MONITOR PANEL
C4DP	PROPELLANT DISPERSION AND ORDNANCE PANEL
C4EP	ENGINE PREPARATION PANEL
C4ES	S-IVB ELECTRONICS SYSTEM ENGINEER
C4ET	ENGINE TEST PANEL
C4EV	S-IVB EVENTS DISPLAY PANEL
C4FC	S-IVB FLIGHT CONTROL PANEL
C4FS	S-IVB FLIGHT CONTROL SYSTEM ENGINEER
C4HC	S-IVB HE CONTROL PANEL
C4HN	S-IVB GH2/GN2 CONTROL PANEL
C4HU	LH2 TANKING COMPUTER
C4HY	HYDRAULIC PANEL
C4IP	S-IVB MEASURING PANEL
C4NK	CRT KEYBOARD - NETWORKS
C4NP	S-IVB NETWORK PANEL
C4OH	O2/H2 BURNER PANEL
C4OU	LOX TANKING COMPUTER
C4PK	S-IVB PROPELLANTS KEYBOARD
C4PP	S-IVB DC POWER SUPPLY PANELS
C4PR	S-IVB PROPELLANT STATUS PANEL
C4PS	S-IVB PROPULSION SYSTEM ENGINEER
C4PU	S-IVB PROPELLANT UTILIZATION SYSTEMS PANEL
C4SM	S-IVB MECH/STRUCTURES SYSTEM ENGINEER
C4SP	S-IVB STAGE PRESSURE PANEL
C4TC	S-IVB STAGE TEST CONDUCTOR
EASM	CIF ANTENNA SITE
ECOM	COMPUTER FACILITY
ECOP	CIF COMPUTER
EDDS	CIF DATA DISPLAY ROOM (307)
EDTS	DATA TRANSMISSION STATION
ETMS	TELEMETRY GROUND STATION (CIF)
E1CP	ABORT MONITOR - THRUST CHAMBER PRESS
E1EG	CIF S-IC ENG GIMBAL POSITION ABORT MON.
E1EN	CIF S-IC ENGINE PANEL
E1FC	CIF S-IC FLIGHT CONTROL ENGR
E1NE	CIF S-IC ELECTRICAL ENGINEER
E1NK	CIF S-IC NETWORKS CRT KEYBOARD
E1PE	CIF S-IC PROPULSION ENGINEER
E1PK	CIF S-IC PROPULSION CRT KEYBOARD
E1TC	CIF S-IC TEST CONDUCTOR
E1TP	CIF S-IC MEASURING

E2AE	CIF S-II ENG
E2FC	CIF S-II HYDRAULICS (EAS)
E2IM	CIF S-II MEASURING
E2MI	CIF S-II ELECTRICAL
E2TM	CIF S-II TM ENGR MONITOR
GMIL	UNIFIED S BAND GROUND STATION
KSTC	SPACECRAFT TEST CONDUCTOR
LASE	LSE ELEC ENGR, LUT BASE
LAS1	LSS POWER SUPPLY AND DIST. RACKS
LCDC	COUNT CLOCK (ML)
LDAS	DDAS (ML)
LEBS	EMERGENCY BACKUP BATTERIES (ML)
LESP	ENGINE SERVICE PLATFORM
LGCC	GROUND COMPUTER COMPLEX (ML)
LHDA	HOLDDOWN ARMS
LLDE	DIGITAL EVENT EVALUATOR (ML) DEE-6
LLRS	DIGITAL RANGE SAFETY COMMAND SYSTEM GSE
LOM	LAUNCH OPERATIONS MANAGER
LPDC	PNEUMATIC DISTRIBUTION COMPLEX
LPLX	PROPELLANT LOADING COMPUTERS
LP7B	POWER SUPPLY SYSTEM RACKS, AREA 7B
LRPR	INTEGRATION NETWORK (ML)
LSCP	LUT SIGNAL CONDITIONING TEST PANELS
LTSM	LUT TAIL SERVICE MAST ENGINEER
LUNW	IU NETWORKS
L1EP	S-IC ENGINE AREA
L1FH	HANDLING & ORDNANCE ENGINEER, FORWARD SKIRT, S-IC
L1GH	S-IC GROUND HYDRAULICS SUPPLY & CHECKOUT
L1HC	MOTOR CONTROL CENTER S-IC GRND HYD SUPPLY & C/O
L1IC	S-IC INSTRUMENTATION ENGINEER (ML)
L1IH	HANDLING & ORDNANCE ENGINEER, INTERTANK, S-IC
L1LS	LUT SUPERVISOR
L1NE	LUT NETWORKS ENGR (S-IC STAGE)
L1OE	S-IC ORDNANCE ENGINEER
L1PS	GROUND POWER POWER SUPPLY ENGINEER
L1PU	S-IC PREFILL UNIT
L1RS	RELAY RACKS AND SEQUENCER RACK
L1SM	STAGE MONITOR/OPERATIONS COORDINATOR
L1TH	HANDLING & ORDNANCE ENGINEER, THRUST STRUCTURE, S-IC
L1TT	TM & RF THRUST STRUCTURE
L2PD	POWER DISTRIBUTION RACKS (ROOM 8B)
L2RR	S-II RELAY RACKS (1 THROUGH 5) (ROOM 7A)
L4CE	CONTROL ELECTRONIC ENGINEER
L4JR	JUNCTION RACKS
L4PR	S-IVB POWER RACS (ROOM 7B)
MGNR	GUID & NAV RIGHT SIDE UNIT 4, S/C
MSTC	NASA S/C TEST CONDUCTOR
MTPE	TEST PROJECT ENGINEER
PEST	ENGINE SERVICE PLATFORM TRANSPORTER
PLQG	LV-QAL-35 GSE & ML
PLQU	LV-QAL-34 IU
PLQ1	LV-QAL-31 S-IC
PLQ2	LV-QAL-32 S-II

PLQ4	LV-QAL-33 S-IVB
PRF1	EMC MONITOR INFORMATION SYSTEM
PUPL	IU PAD LEADER
PUSD	IBM PAD SAFETY
PVTS	TEST SUPERVISOR, PAD
P1ES	S-IC GROUND LEVEL ENGINE SERVICING
RAS1	LSE FIRING ROOM NETWORKS ENGR
RCDC	COUNTCLOCK (LCC)
RDAS	DDAS GSE RACKS
RDT5	DATA TRANSMISSION SYSTEM ENGINEER
RDSC	L/V E & I RECORDERS
RLDE	DEE 6 (LCC)
RLDR	LOX NETWORKS ENGINEER
RLSC	TSM & S/A RECORDERS
RPDC	PROPELLANTS D.C. POWER - LCC
RRSC	RANGE SAFETY OFFICER STRIP CHARTS
RUBM	IU STRIP CHARTS
R1JR	LCC RACKS PATCH DIST.
R1NE	S-IC MEASURING STRIP CHARTS
R1SC	STRIP CHARTS
R2LD	LEAK DETECTION RECORDERS
R2RL	S-II ENGINES REDLINE ENGINEER
R2SC	STRIP CHARTS
R4EI	S-IVB GROUND BUSS E & I RECORDERS
R4HY	S-IVB HYDRAULIC STRIP CHARTS
R4PS	S-IVB PROPULSION STRIP CHARTS
R4PU	S-IVB PU STRIP CHARTS
R4SC	STRIP CHART RECORDERS
SCDR	S/C COMMANDER
SRO	SUPERINTENDENT OF RANGE OPERATIONS
SUNE	IU VEHICLE NETWORKS ENGINEER
SUQI	STRUCT. QUALITY INSPECTOR
SURF	IU RF STRUCTURE
SUTM	TM IU STRUCTURE
SUVE	IU VEHICLE NETWORKS
SUVM	IU VEHICLE MECHANICAL
S4CE	S-IVB CONTROL ELECTRONICS ENGINEER
S4FC	S-IVB FLIGHT CONTROL ENGINEER
S4HY	S-IVB HYDRAULICS ENGINEER
S4IE	INSTRUMENTATION ENGINEER
S4MA	AFT STRUCTURAL/MECH ENGR
S4MF	FWD STRUCTURAL/MECH ENGR

S4ML	S-IVB STRUCTURE MEASURING STATION
S4MM	SERVICE STRUCTURE MECH/ENGR
S4OR	S-IVB ORDNANCE ENGINEER
S4PC	S-IVB PAD CONTROL
S4PE	S-IVB PROPULSION ENGINEER
S4SY	S-IVB SAFETY ENGINEER
USAE	LSE ELEC ENGR - TOWER
USA8	SERVICE ARM #8 SYSTEM
UUCU	GROUND SUPPORT COOLING UNIT
UUPC	IU PNEUMATIC CONSOLE
UUVN	IU MECHANICAL, UMBILICAL TOWER
U1FN	FORWARD SKIRT ELECTRICAL NETWORKS
U1FT	S-IC FORWARD SKIRT TM & RF
U2AM	S-II AFT MONITOR
U2AN	AIRBORNE SYSTEMS ENGINEER
U2A1	S-II AIRBORNE NETWORKS FWD
U2A2	S-II AIRBORNE NETWORKS AFT
U2EC	ENVIRONMENTAL CONTROL ENGINEER
U2EO	S-II ELECTRICAL ORDNANCE ENGINEER
U2FE	S-II FLIGHT CONTROL
U2FM	S-II FWD MONITOR
U2HO	HANDLING AND ORDNANCE ENGINEER
U2IE	S-II INSULATION ENGINEER
U2J2	ENGINE SYSTEMS ENGINEER
U2LH	S-II HYDRAULIC LEADMAN
U2LN	S-II LUT NETWORKS ENGINEER
U2LP	S-II PRESSURIZATION LEADMAN
U2MH	MECHANICAL AND HYDRAULICS ENGINEER
U2MO	S-II MECHANICAL ORDNANCE ENGINEER
U2MU	MECH/UMBILICAL ENGINEER
U2PE	PROPELLANT/PRESSURIZATION ENGINEER
U2PF	PROPELLANT FILL ENGINEER
U2PM	PROPELLANT MANAGEMENT ENGINEER
U2SE	S-II PAD LEADER
U2SI	STRUCTURES AND INSULATION ENGINEER
U2SY	SAFETY ENGINEER
U2TM	TM ENGINEER
U245	INSULATION PURGE PNEUMATIC CONSOLE, S7-45
U4A6	S-IVB AFT MONITOR
U4A7	S-IVB FORWARD MONITOR
U4PE	PROPULSION ENGINEER
VUMS	IU MEASURING STATION
VURF	RF, "C" BAND RADAR & CCS CHECKOUT
V1MS	MEASURING GSE STATION
V2EC	S-II ECS/EAS ENGINEER
V2MS	MEASURING GSE STATION
V4MS	S-IVB MEASURING STATION
Z1	ABORT MON VISUAL OBSERVER (CX 20, UC4 OR UC5)
Z2	ABORT MON VISUAL OBSERVER (CX 34, UC16)
Z3	ABORT MON VISUAL OBSERVER (CX 37, UC17 OR UC9)

OIS - RF CHANNELIZATION LC-39
 FOR
 AS-503 & UP (MANNED)

LO 111 TEST SUPER. R U	LV 121 L/V TEST COND. R U	IN 131 DATA DISPLAY (CIF)	SF 141 PAD SAFETY	LV 151 IU TFST COND.	LV 161 S-IVB TEST COND.	LV 171 S-II TEST COND.	LV 181 S-IC TEST COND.	LS 211 CHIEF S/C TEST COND. U	LS 221 CSM PAD LEADER	LS 231 LM PAD LEADER	IN 241 ODOP	IN 251 INST CONTROLLER	SO 261 SUPPORT CONTROLLER
TS 112 TEST SUPPORT CONTROLLER R	IN 122 FAC & ENVIRON. MEAS.	LV 132 LAUNCHER SYSTEMS	LV 142 S/V PNEU. ECS	LV 152 IU MECH.	LV 162 S-IVB MECH. & ORD.	LV 172 S-II GND & STAGE PNEUM.	LV 182 S-IC MECH. & OPD.	LS 212 CSM STC U	LS 222 CSM TPF	LS 232 LM STF	LS 242 LM STC U	IN 252 LM TROUBLE SHOOTING	IS 262 INSL SUPPORT CONTROLLER
SG 113 OTV CONTROL ENG.	LV 123 L/V FLIGHT CONTROL	LV 133 L/V OXIDIZER	LV 143 L/V FUEL	LV 153 IU FLIGHT COMP.	LV 163 S-IVB PROP. (STAGE)	LV 173 S-II PROP.	LV 183 S-IC PROP.	LS 213 CSM INST. U	LS 223 CSM FPS	LS 233 LM EPS	LS 243 LM INST. U	IN 253 FACILITY & ENVIRON. MEAS.	SO 263 HPG GN 2 & HE PURGING
LV 114 L/V STAB. & LAYING	LV 124 LSE ELECT.	LV 134 L/V PROP. ELEC.	LV 144 S-IC MEAS. & HGD	LV 154 IU FLECT. (STAGE)	LV 164 S-IVB GND. PNEUMATICS	LV 174 S-II ELECT. (STAGE)	LV 184 S-IC FLECT. (STAGE)	LS 214 CSM COMM. R U	LS 224 CSM F/C CRYO	LS 234 LM RADAR	LS 244 LM COMM. R U	IN 254 FACILITY & ENVIRON. MEAS.	SO 264 HPG MON. SYS.
SO 115 CRAWLER OP'S	LV 125 L/V TROUBLE SHOOTING	LV 135 L/V TROUBLE SHOOTING	LV 145 L/V DDAS	LV 155 RCA 110A GND COMP.	LV 165 S-IVB ELEC. SYSTEM	LV 175 S-II GND ELECT.	LV 185 S-IC GND ELECT.	LS 215 CSM GEN	LS 225 CSM SCS	LS 235 LM SCS	LS 245 LM GEN	IN 255 FACILITY & ENVIRON. MEAS.	SO 265 HPG ELECT. CONT'S
LV 116 S-IC MEAS.	LV 126 S-II LEAK DETECT.	LV 136 SERVICE ARM (MECH)	LV 146 IU MEAS. (GND)	LV 156 IU TM	LV 166 S-IVB STATUS MONITORING	LV 176 S-II TM	LV 186 S-IC TM	LS 216 CSM RCS SA	LS 226 CSM SPS SA	LS 236 LM RCS SA	LS 246 LFM PROP.	IN 256 CIF TELEM. GND STA.	SO 266 O2 FAC OPNS
SO 117 OIS CONTROL ENG	LV 127 L/V TM R U	LV 137 L/V RF R U	LV 147 CNTD'N CLOCK & DEE 6	LV 157 IU RF	TS 167 SUPPORT TROUBLE SHOOTING	LV 177 LV QAL	LV 187 S-IC RF	LS 217 CSM AERO-MED	LS 227 CSM ECS	LS 237 LM ECS	LS 247 SC Q/C	IN 257 CIF TELEM. GND STA.	SO 267 KSC TIMING
LV 118 SERVICE ARM MECH.	LV 128 S-II MEAS.	LV 138 S-IVB DDAS & MEAS.	LV 148 IU MEAS.	LV 158 IU GND ELECT.	LV 168 S-IVB RF & TM	LV 178 S-II FLIGHT CONTROL & HYDRAULICS	188 PAGING	LS 218 CSM GSF	LS 228 CSM ACE	LS 238 LM ACF	LS 248 LM GSF	LO 258 TFST SUPER (BACK-UP)	LS 268 CSM TROUBLE SHOOTING

R = AVAILABLE TO ETR
 U = AVAILABLE TO USB - MILA
 SA = FOR TEMPORARY USE DURING SERVICE ARM OPERATIONS

APPROVAL *[Signature]*
 R.E. Moser, LO-PLN 6/27/68
 DATE

TELEVISION CAMERA LOCATIONS

CAMERA NO. -----	LOCATION -----	SUBJECT VIEWED -----
1	ML ROOM 4A	HYDRAULIC SERVICE UNIT
2	ML ROOM 15A	COMPUTER TAPE DECK
3	NORTH SIDE OF ML	LH2 VENT PIPING FLAME DEFLECTOR
4	ML ROOM 15A	COMPUTER ASTRIONICS EQUIPMENT
5, 7	ML 0' LEVEL	TAIL SERVICE MAST 1-2, 3-2, 3-4, & S-IC LOX VENT VALVE
9	ML 160' LEVEL	S-II STORAGE INSULATION
10	ML 30' LEVEL	LOX VALVE COMPLEX
11	ML 60' LEVEL	ML DECK
12	ML 100' LEVEL	S-IC INTERTANK AREA EJECTION OF CARRIER ASSEMBLY
13	ML 120' LEVEL	LH2 VALVE COMPLEX
14	ML 120' LEVEL	LOX VALVE COMPLEX
15	ML 130' LEVEL	SERVICE ARM #4 & RETRACTION S-II UMBILICAL DRAIN
16	ML 180' LEVEL	SERVICE ARM #4
17	ML 180' LEVEL	S-II LH2 HEAT EXCHANGER
18	ML 200' LEVEL	LH2 VALVE COMPLEX
19	ML 200' LEVEL	LOX VALVE COMPLEX & S-IVB PNEUMATIC CONSOLES
20	ML 220' LEVEL	SERVICE ARM #6, 7, 10
21	ML 240' LEVEL	SERVICE ARM #6 & LH2 UMBILICAL
22	ML 240' LEVEL	SERVICE ARM #5 S-IVB APS MODULE
23	ML 240' LEVEL	S-IVB HEAT EXCHANGER 7 VALVE PANEL
24	ML 260' LEVEL	SWING ARM 7 AND S-IVB UMBILICAL, S-II H2 VENT VALVE
25	ML 300' LEVEL	WHITE ROOM, SC INTERIOR
26	ML 320' LEVEL	SWING ARM 8, LES, SWING ARM 9
27	ML 340' LEVEL	ACCESS ARM 9 C/M, S/M LEM WHITE ROOM BULKHEAD PLATES, Q-BALL COVER & PRIMARY DAMPER ARM
28	LOX STORAGE FACILITY	LOX TANKS, PUMP & LINES
29	LOX STORAGE FACILITY	LOX TANKS, PUMP & LINES
30	LH2 STORAGE FACILITY	LH2 STORAGE TANKS & LINES
31	PERIMETER CAMERA SITE 1	VEHICLE, LH2 STORAGE TANK, VALVES AND LINES
32	LH2 STORAGE FACILITY	LH2 STORAGE TANKS & LINES
33	RP-1 STORAGE FACILITY	RP-1 STORAGE TANK PUMPS, VALVES AND LINES
34	PAD APRON SW CORNER	VEHICLE, LOX VENT VALVE AT 120' LEVEL

TELEVISION CAMERA LOCATIONS (CONT)

CAMERA NO. -----	LOCATION -----	SUBJECT VIEWED -----
35	PAD APRON SE CORNER	VEHICLE, LOX VENT VALVE AT 120' LEVEL
36	PAD APRON CENTER E SIDE	VEHICLE
37	ON PAD W. SIDE OF FLAME TRENCH	S-IC ENGINES
37A	PAD SURFACE MSS S. LEG	LH2 TANKER GAUGES
38	NW CORNER PAD APRON	LH2 EXPANSION JOINTS, DISCONNECT TOWER
39	PAD SURFACE E. FLAME TRENCH	S-IC ENGINES
46	MSS 22' LEVEL SE SIDE	RCS & CRYOGENIC FUEL TRANSFER CONSOLES
47	MSS 22' LEVEL SW SIDE	RCS & CRYOGENIC FUEL TRANSFER CONSOLES
48	MSS 45' LEVEL	FUEL GSE ON PAD
49	MSS 45' LEVEL	OXIDIZER GSE ON PAD
52	MSS 265' LEVEL PLATFORM 3 SOUTH	LM FUELING FUNCTIONS
53	MSS 300' LEVEL PLATFORM 4A	FUEL LINES, OXIDIZER AND FUEL FILL PORTS, UMB DISCONNECTS, RCS
54	MSS 300' LEVEL PLATFORM 4A	FUEL LINES, OXIDIZER AND FUEL FILL PORTS, UMB DISCONNECTS, RCS
55	MSS 300' LEVEL PLATFORM 4A	FUEL LINES, OXIDIZER AND FUEL FILL PORTS, UMB DISCONNECTS, RCS
56	MSS 310' LEVEL PLATFORM 4C	UMB DISCONNECT, FLUID LINES AND GSE INTERFACE
57	MSS 310' LEVEL PLATFORM 4C	UMB DISCONNECT, FLUID LINES AND GSE INTERFACE
AAS-1	ML 330' LEVEL	SPACE VEHICLE ML 0' LEVEL
AAS-2	ML 330' LEVEL	SPACE VEHICLE
AAS-3	CAMERA SITE #2	SPACE VEHICLE
AAS-4	CAMERA SITE #5	SPACE VEHICLE
ETR	UCS #17	LV VERTICAL MOTION

LAUNCH VEHICLE RF FREQUENCIES

SYSTEM	LOCATION	RECEIVE	TRANSMIT
RSCR	S-IC	450 MHZ	-
RSCR	S-II	450	-
RSCR	S-IVB	450	-
C-BAND RADAR	IU	5690	5765 MHZ
CCS	IU	2101.8	2282.5

LAUNCH VEHICLE TM FREQUENCIES

STAGE	LINK	FREQUENCY
S-IC	AF-1	256.2 MHZ
	AP-1	244.3
S-II	BF-1	241.5
	BF-2	234.0
	BP-1	248.6
S-IVB	CP-1	258.5
	CS-1	253.8
IU	DF-1	250.7
	DP-1	245.3

LAUNCH PAD ACCESS CONTROL

DUE TO HAZARDS WHICH EXIST DURING THIS TEST, CONTROL OF PERSONNEL IN THE PAD AREA IS MANDATORY. THE FOLLOWING IS A SUMMARY OF SYSTEMS SAFETY ITEMS RELATING TO THE LAUNCH VEHICLE PORTION OF THE COUNTDOWN.

DEFINITION:

LAUNCH PAD:

THE AREA WITHIN THE SECURITY FENCE
SURROUNDING THE LAUNCH SITE.

WARNING LIGHTS:

RED:

PAD CLOSED

CONDITION 1

THIS CONDITION WILL EXIST DURING EXTREMELY
HAZARDOUS OPERATIONS. ACCESS TO THE PAD
AREA DURING THIS PERIOD OF TIME SHALL BE
PROHIBITED OR SHALL BE RIGIDLY CONTROLLED BY
THE TEST SUPERVISOR AND SAFETY. ACCESS
SHALL BE BY SPECIAL PERMISSION ONLY.

FLASHING AMBER:

HAZARDOUS ACCESS

CONDITION 2

THIS CONDITION SHALL EXIST DURING HAZARDOUS
OPERATIONS ON THE PAD WHEN ONLY SPECIFIED
TASKS MAY BE WORKED.

AMBER:

LIMITED ACCESS

CONDITION 3

THIS CONDITION SHALL EXIST DURING HAZARDOUS
OPERATIONS IN THE PAD AREA WHEN ONLY ACCESS
TO THE IMMEDIATE AREA MUST BE CONTROLLED.
PERSONNEL ENTERING THE PAD AND/OR CONTROLLED
ACCESS AREA MUST OBSERVE THE PRECAUTIONS
ESTABLISHED FOR THE AREA.

GREEN:

PAD OPEN

CONDITION 4

THIS CONDITION EXISTS WHEN THE PAD AREA IS
OPEN FOR NORMAL WORK. PAD ACCESS BADGES
WILL BE REQUIRED AND PAD SECURITY WILL BE IN
EFFECT.

DANGER AREAS:
-----SPECIAL CONTROL
AREA:THE AREA REQUIRING SPECIAL PERSONNEL CONTROL
DURING WARNING PERIODS.BLAST DANGER
AREA:THE AREA WITHIN A 7,000 FOOT RADIUS OF THE
VEHICLE. IN EFFECT WHEN LV CRYOGENIC
PROPELLANTS ARE LOADED.LAUNCH DANGER
AREA:THE AREA WITHIN A 9,500 FOOT RADIUS OF THE
VEHICLE AND BOUNDED BY TANGENTS PARALLEL TO
THE FLIGHT AZIMUTH.EXPANDED LAUNCH
DANGER AREA:THE AREA BETWEEN THE 9,500 AND 13,500 FOOT
RADIUS OF THE VEHICLE AND BOUNDED BY
TANGENTS PARALLEL TO THE FLIGHT AZIMUTH.PAD ACCESS ROAD BLOCKS:

1. LIMITED ACCESS IN EFFECT AT GATES A2 THROUGH A8, THE 7000 FT BLAST DANGER AREA, TO T-9 HRS. (ONE HR PRIOR TO START OF LV CRYOGENIC PROPELLANT TANKING).
2. HAZARDOUS ACCESS IN EFFECT AT GATES A15 THROUGH A21, THE EXPANDED LAUNCH DANGER AREA, FROM T-9 HRS TO T-45 MIN.
3. PAD CLOSED IN EFFECT AT GATES A15 THROUGH A21, THE EXPANDED LAUNCH DANGER AREA, FROM T-45 MIN UNTIL THE S/V TEST SUPERVISOR SHALL DECLARE THE SPECIAL CONTROL AREA IS OPEN FOR LIMITED ACCESS.

RESTRICTED ACCESS CONDITIONS (WET CDDT AND COUNTDOWN)

1. T-23 HRS TO 20:30 HRS: THE LM DESCENT AREA INTERNAL TO SLA, IU & S-IVB FORWARD AREA WILL BE CLEARED FOR LM SHE TOPOFF.
2. T-16 HRS TO T-10:45 HRS: MSS PLATFORM OPENINGS WILL REQUIRE LOCAL CLEARING WHICH WILL BE CONTROLLED BY S/V TEST SUPERVISOR.
3. T-15:15 HRS TO T-14:45 HRS: THE SLA, IU, S-IVB FORWARD, S/A 7 AND A 10 FOOT PATHWAY UP THE MSS TO PLATFORM 3A WILL BE CLEARED FOR ALSEP FCA INSTALLATION. RADIATION AREA CONTROL WILL BE IN EFFECT FROM T-15:15 HRS TO T+ 9:15.
4. T-13 HRS TO T-11:30 HRS: ML ZERO LEVEL WILL BE CLEARED (EXCEPT PATH TO ELEVATOR) FOR RP-1 REPLENISH OPERATIONS
5. T-11:30 HRS TO T-10:45 HRS: THE INTERIOR OF THE LV (EXCEPT FOR THE CSM AND S-IC BOATTAIL) WILL BE CLEARED OF ALL PERSONNEL NOT REQUIRED FOR ORDNANCE (LV PROPELLANT DISPERSION S+A DEVICE) CONNECTIONS.

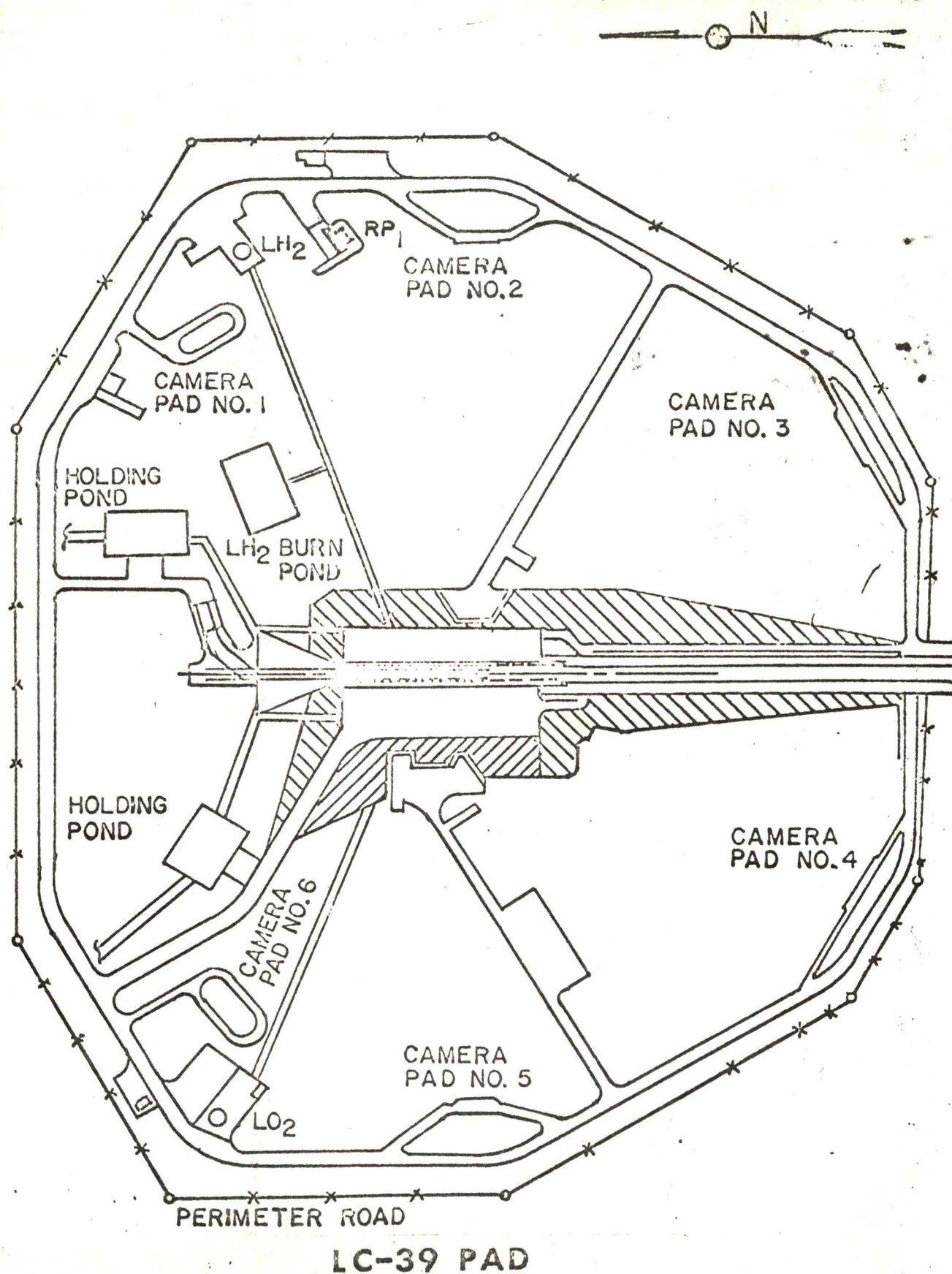
LV CDDT & CD, VOL II
DATE: OCTOBER 28, 1969
REVISION 015

APOLLO/SATURN
LAUNCH OPERATIONS

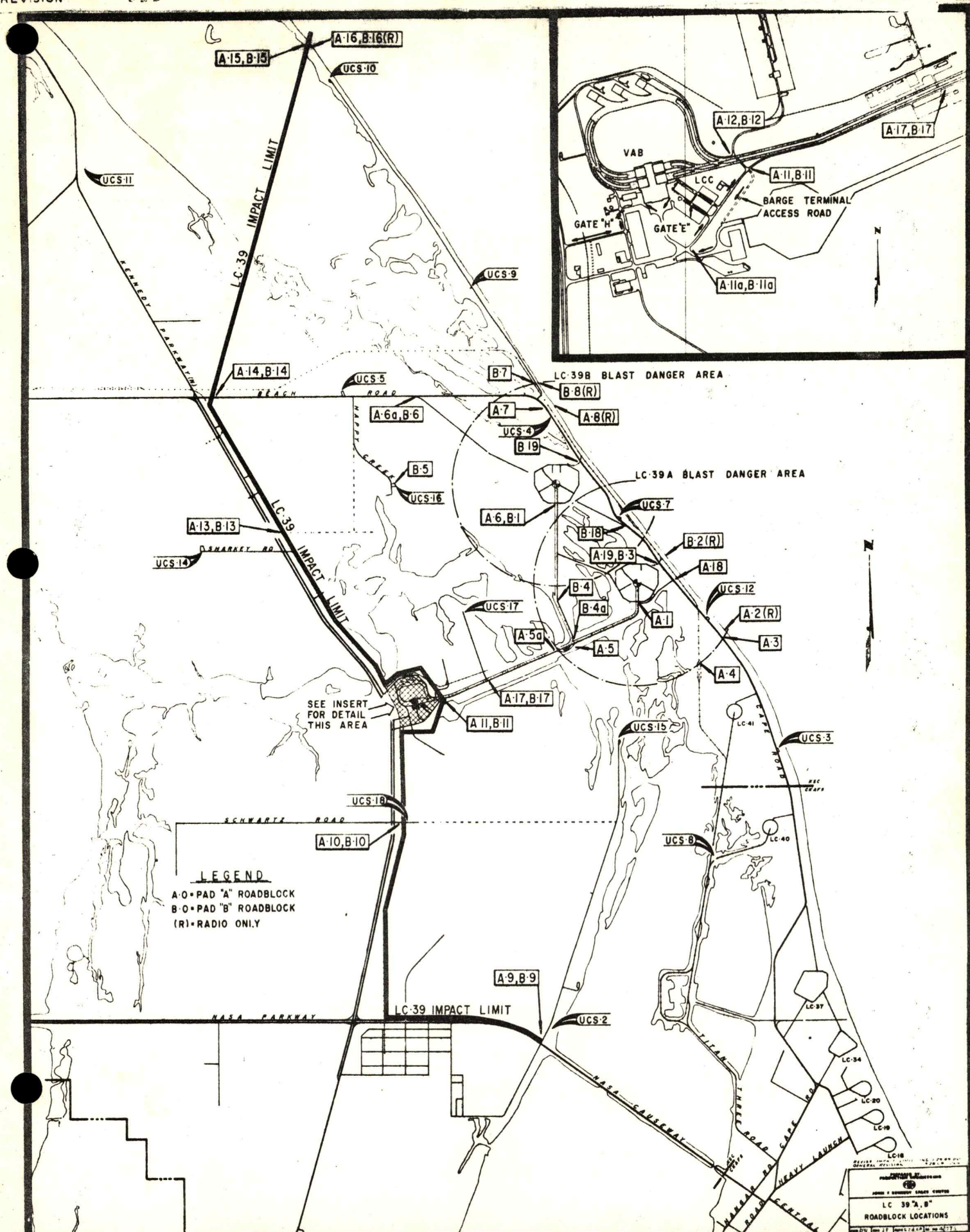
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6. T-8:59 HRS TO T-8 HRS: ALL PERSONNEL WILL BE LEAVING THE BLAST DANGER AREA.
7. T-8 HRS TO T-3:25 HRS: THE BLAST DANGER AREA WILL BE CLEAR OF ALL PERSONNEL.
8. T-3:25 TO T-45 MIN: THE LAUNCH DANGER AREA WILL BE CLEARED OF ALL PERSONNEL NOT REQUIRED FOR FLIGHT CREW INGRESS OPERATIONS.
9. T-45 MIN AND ON: THE EXPANDED LAUNCH DANGER AREA WILL BE CLEARED OF ALL PERSONNEL UNTIL THE S/V TEST SUPERVISOR SHALL DECLARE THE SPECIAL CONTROL AREA OPEN FOR LIMITED ACCESS (T+2 AFTER LAUNCH; T+3:30 FOLLOWING WET CDDT)

EMERGENCY AND PAD CREWS WILL BE STATIONED IN VAB HIGH BAY NO. 1 WITH REQUIRED EQUIPMENT AND VEHICLES.



LC-39 PAD



L/V PROPELLANT LOADING OPERATION:

LOADING SEQUENCE -----	TIME -----	REQUIRED MSS DISTANCE FROM L/V -----
START REPLENISH LINE CHILLDOWN	T-8:15	850 FT.
START S-II LH2 PRECONDITION	T-8:10	850 FT.
START S-IVB LOX	T-8:05	850 FT.
START MAIN LINE CHILLDOWN	T-8:01	850 FT.
START S-II LOX	T-7:36	850 FT.
START S-IC LOX	T-6:54	850 FT.
LOX ALL STAGE REPLENISH	T-5:29	3600 FT.
START S-II LH2	T-5:15	3600 FT.
100% S-II LH2	T-4:19	4600 FT.
START S-IVB LH2	T-4:19	4600 FT.
100% S-IVB LH2	T-3:38	4800 FT.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					VOLUME II ----- COUNT -----	
- 1 DAY 4 HRS 0' 0"	111	1	CLTC	CVTS	VERIFY LUT ELEVATOR #1 RESERVED FOR 30 MINUTES FOR LV BATTERY MOVE	TOP!
- 1 DAY 3 HRS 45' 0"	181	1	C1TC	L1TC	START THRUST STRUCTURE AND HEAT SHIELD INSTRUMENTATION PROTECTIVE COVERS REMOVAL PER V-27195. REPORT WHEN COMPLETE.	
	161	2	C4TC	L4CE	START BURNER RECORDER SETUP PER V-30539, SECT J. REPORT WHEN COMPLETE. SECT J. REPORT WHEN COMPLETE.	
	161	3	C4TC	S4MF	REMOVE LM ACCESS STEPS PER V-30539, APPENDIX D. REPORT WHEN COMPLETE. (COORDINATE DIRECTLY WITH PAD LEADER)	
- 1 DAY 3 HRS 30' 0"	171	1	C2TC	C2LD	VERIFY OR MAINTAIN LEAK DETECTION EQUIPMENT IN OPERATIONAL STATUS.	
	171	2	C2TC	U2J2	START PROPULSION SYSTEM ENGINEERING WALKDOWN PER V-30029 (M020) TASK 44. REPORT WHEN COMPLETE.	
	171	3	C2TC	U2J2	START PROPELLANT FEED SYSTEM VACUUM JACKETED LINE PRESSURE CHECKS PER V-24116 (J001). REPORT WHEN COMPLETE.	

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VEHICLE

AS-507

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APOLLO/SATURN LAUNCH OPERATIONS

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
151		4	CUTC	SUTM SUVE	INSTALL IU TM RERADIATION ANTENNA PER V-31062, PART III	
151		5	CUTC	SUVM	INSTALL CHE HOIST AND IU FLIGHT BATTERIES PER V-34047	
121		6	CLTC	C4TC	START S-IVB BATTERY INSTALLATION	
151		7	C4TC	S4PC S4CE S4MA	INSTALL S-IVB AFT FLIGHT BATTERIES PER V-30539 SECT. H.	
151		8	CLTC	CSPP	DELETED CDDT ONLY	
121		9	CLTC	BCPM RESC	VERIFY READY TO RECORD ECS MEASUREMENTS	
121		10	CLTC	C2TC C4TC	S-II & S-IVB STAGE SUPPORT WILL BE REQUIRED FOR UMB, RELEASE SENSOR CHECKS.	
151		11	C4TC	S4MA	STANDBY TO SUPPORT UMBILICAL RELEASE SENSOR CHECK PER V-30539, SEC I.	
171		12	C2TC	U2MU	STANDBY TO SUPPORT UMBILICAL RELEASE SENSOR CHECKS PER V-31045	
171		13	C2TC	U2AN	INSTALL AND CONNECT S-II FLIGHT BATT, PER V-21111 (B013). REPORT WHEN COMPLETE	
171		14	C2TC	B2TM	INSTALL/VERIFY INSTALLED S-II TM RERADIATION ANTENNA SYSTEM PER V-30029 (M020) TASK 20.	
171		15	C2TC	V2MS	START INSTRUMENT SYSTEM WALKDOWN AND PROTECTIVE COVER REMOVAL PER V-27208 (X044). REPORT WHEN COMPLETE.	

1 DAY
 3 HRS
 30 MIN

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 VEHICLE AS-307

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GO ONLY						
1 DAY 3 HRS 30 MIN						
101	16	CLTC	CHOP		PREPARE INDUSTRIAL WATER SYSTEM PER V-86113.	
112	17	CLTC	CTSC		HAVE INDUSTRIAL WATER RECORDERS READY TO START ON REQUEST OF CHOP AND INDUSTRIAL WATER ENGINE READY TO START UPON 30 MINUTES NOTIFICATION FROM CHOP.	TCPI
101	18	CLTC	CHOP		NOTIFY BOSC 30 MIN PRIOR TO HAVING INDUSTRIAL WATER ENGINE START.	
121	19	C2TC	U2GC		CONTINUE CLOSEOUT INSP PER ITI LS008	
121	20	CLTC	CLTC C2TC C4TC		START LV POWER UP PREPS.	
101	21	CLTC	LPLK		START PTOB PREPS PER V-25199.	
101	22	CUTC	SUTM		START UNPINNING FLOWMETERS, LV-OAL PARTICIPATION REQUIRED.	
101	23	C4TC	S4MY S4FC		START S-1VB PRE-POWER PREPS PER V-30539, SECT J.	
101	24	C4TC	S4PC		START S-1VB ENGINEERING WALKAROUND APT AND ESE	
101	25	C4TC	C4EB		START S-1VB PREPOWER PREPS PER V-30539, APPENDIX A.	
1 DAY 3 HRS 0 MIN						
121	1	CLTC	CLTC C2TC C4TC		START UMBILICAL RELEASE SENSOR CHECK PER V-81045 AND V-30539, REPORT WHEN COMPLETE.	
101	2	CLTC	CSPP		START UMBILICAL RELEASE SENSOR CHECKS PER V-81045.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
1 DAY 3 HRS 01 00						
171:		3	C2TC	U2MU	GO TO CH 181 AND SUPPORT UMBILICAL RELEASE SENSOR CHECKS PER V-31045.	
171			C2TC	U2MU	WHEN COMPLETE, START S-11 INITIAL UMBILICAL PREPS PER V-30029 (M020) TASK 22, REPORT WHEN COMPLETE.	
171:		4	C2TC	R2SC	SETUP LCC MEASURING STATION PER V-27154 (G031), REPORT WHEN COMPLETE.	
171:		5	C2TC	V2MS	SETUP VAB MEASURING STATION PER V-27183 (G032), REPORT WHEN COMPLETE.	
171:		6	C2TC	B2TM	SETUP TCE GROUND STATION PER V-28181 (G125) & V-28135 (G050), REPORT WHEN COMPLETE.	
151:		7	CUTC	SUTM	VERIFY FLOWMETER UNPINNING COMPLETE	
		7-1:			VERIFICATION BY LV - GAL	
151:		8	CUTC	SUTM	REMOVE PLUGS FROM O-BALL PORTS, REPORT # WHEN COMPLETE.	
181:		9	CLTC	BLTM	START S-1C TM GSE READINESS CHECK PER V-38004.	
181:		10	CLTC	BTMC	START TCE DAILY READINESS CHECKS PER V-28009.	
151:		11	CUTC	BUTM	SETUP TCE GROUND STATION PER V-28072.	
181:		12	CLTC	V1MS	START S-1C VEHICLE MEASURING STATION PREPS PER V-27098.	
1 DAY 2 HRS 30 00						
181:		1	C4TC	S4MF S4PC S4CE	INSTALL S-1VB FORWARD BATTERIES PER V-30539, SECT H.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
1 DAY 2 HRS 30' 00"	101	2	CLTC	C1NE	INSTALL SLC FLIGHT BATTERIES PER V-21204, START FINAL ML GSE CLOSEOUT PER V-21035, START FLIGHT CONTROL PREPS PER V-33030.	
1 DAY 2 HRS 15' 00"	121	1	CLTC	CUTC	START LV ELECTRICAL SUPPORT PREPS PER V-31062, APPENDIX B.	
	121	2	CLTC	CUTC	START ALTERNATE FIRING ROOM ELECTRICAL SUPPORT PREPS PER V-21243, PART 1A.	
	101	3	CLTC	C1PE	START F-1 ENGINE CLOSEOUT PER V-34012	
1 DAY 2 HRS 10' 00"	151	1	CUTC	SUVM	REMOVE CHE DOLLY	
1 DAY 2 HRS 0' 00"		1			DELETED	
	101	2	S4PD	S4CE S4MF	START FINAL ENGINEERING WALKAROUND FWD.	
	151	3	CUTC	SUVM	VERIFY IU FLIGHT BATTERY INSTALLATION COMPLETE	
	151	4	CUTC	SUVM	VERIFY CHE DOLLY HAS BEEN REMOVED	
	151	5	CUTC	SUVE	START MONITORING FLIGHT BATTERIES PER IV-21254.	
	171	6	C2TC	U2S1	FOLD BACK AND REMOVE SECTIONS OF A7-84 PLATFORM FOR CTC1 ENGINE GIMBALING PER V-26008 (G042) IN CONJUNCTION WITH V-50029 (M020), TASK 13.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1 DAY 2 HRS 0' 0"						
	171	7	C2TC	C2FC	START S-II ENGINE ACTUATION SYSTEM PREPS PER V-30029 (M020) TASK 13. REPORT WHEN COMPLETE.	
	111	8	CLTC	CVTS	INFORM KSTC THAT BACKUP BATTERY CHECKS ON 20D271 POWER SUPPLY WILL BE PERFORMED	TCPI
	121	9	CLTC	CUTC	START AUXILIARY POWER BACKUP BATTERY CHECKS	
	151	10	CUTC	CCAP	START BACKUP BATTERY CHECKS ON AUXILIARY POWER SUPPLIES PER V-31062, APPENDIX J. REPORT WHEN COMPLETE.	
	181	11	C1TC	C1PE	START REMOVAL OF THRUST STRUCTURE INTERNAL ACCESS EQUIPMENT PER V-24010	
	181	12	L1TC	C1TC	STAGE INSTRUMENTATION COVERS REMOVED	
- 1 DAY 1 HRS 35' 0"						
	121	1	CVTS	CLTC	GMIL BRINGING UP CCS S-BAND CARRIER FOR GMIL ON-STATION CALIBRATION.	TCPI
- 1 DAY 1 HRS 30' 0"						
	161	1	C4TC	C4PS	START PROPULSION PREPOWER PREPS PER V-30539, SECTION J	
	181	2	C1TC	C1NE	VERIFY F/C PREPS COMPLETE PER V-33030.	
- 1 DAY 1 HRS 15' 0"						
	181	1	C1TC	LESP	PREP ESP FOR LOWERING PER V-36070. REPORT WHEN READY TO LOWER.	B-204-111

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1 DAY 1 HRS 0' 0"						
121		1	CUTC	CLTC	SUPPORT PREPS ARE COMPLETE - READY TO APPLY S-IC, S-II & S-IVB SWITCH POWER.	
121		2	CUTC	CLTC	BACKUP BATTERY CHECKS ARE COMPLETE.	
111		3	CLTC	CVTS	BACKUP BATTERY CHECKS ARE COMPLETE.	TOPI
121		4	CLTC	C1TC C2TC C4TC	APPLY SWITCH POWER. REPORT WHEN COMPLETE	
121		5	CLTC	CUTC	SWITCH POWER IS ON - INITIALIZE DISCRETES	
151		6	CUTC	BGCC	INITIALIZE DISCRETES PER V-22006 (PROGRAMS NT99 & NT98). REPORT WHEN SWITCH SCAN IS BEING DISPLAYED.	
161		7	C4TC	S4PC	VERIFY FLIGHT FWD & AFT BATTERY INSTALLATION COMPLETE.	
181		8	C1TC	CECS	VERIFY LV ECS COOLING AIR ON PER V-26247	
121		9	C1TC	CLTC	LV ECS IS SUPPORTING	
181		10	C1TC	E1TC	VERIFY READY TO SUPPORT COUNT	
181		11	C1TC	LHGD	VERIFY HGD SYSTEM PREPS ARE IN PROCESS PER V-27087.	
171		12	U2AN	C2TC	S-II BATTERY INSTALLATION & CONNECTION COMPLETE.	
171		13	C2TC	C2NP R2SC	CYCLE MAIN, INSTR AND IGN BATTERY BLEED SWITCHES TO VERIFY NOTED BUS CURRENT RECORDERS READ APPROXIMATELY 8 AMPS.	
171		14	C2TC	U2SE	VERIFY OK TO REMOVE STA 114 A7-84 ACCESS PLATFORMS.	
171		15	C2TC	U2SI	START REMOVAL OF STA 114 A7-84 ACCESS PLATFORMS PER V-26008 (G042), EXCEPT THOSE SECTIONS NEEDED FOR BATTERY ACCESS.	

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- 1 DAY 1 HRS 0' 0"	171	16	C2TC	U2QC U2AN	START PERFORMANCE OF V-30029 (M020) TASK 47 (NON-FLIGHT HARDWARE REMOVAL FROM AFT INTERSTAGE). REPORT WHEN COMPLETE.	N-120-117
	161	17	C4TC	S4PC	CONTINUE S-IVB PREPOWER PREPS FWD.	
	181	18	C1TC	C1PE	CONFIGURE S-IC PNEUMATIC CONSOLES PER V-24327 PREPOWER ON	
	151	19	CUTC	SUVM	REMOVE CHE HOIST	
-24 HRS 50' 0"	121	1	CUTC	CLTC	SWITCH SCAN IS BEING DISPLAYED FOR VERIFICATION.	
	121	2	CLTC	C1TC C2TC C4TC CUTC	SWITCH SCAN IS BEING DISPLAYED FOR VERIFICATION - REPORT WHEN SATISFACTORY.	
	151	3	CUTC	CLVN	ML COMPUTER INHIBIT - AUTO	
	151	4	CUTC	CLVN	COMPUTER TEST SWITCH ON AND VERIFY DISCRETE CYCLING	
	151	5	CUTC	CCPM	APPLY 400 HERTZ POWER AND START REDUNDANT POWER SUPPLY PER V-21222. REPORT WHEN COMPLETE.	
	121	6	CLTC	CUTC	SWITCH SCAN IS SATISFACTORY - BRING UP COMPUTER.	
	151	7	BUTM	CUTC	TCE STATION SETUP IS COMPLETE.	
	171	8	B2TM	C2TC	TCE STATION SETUP IS COMPLETE.	
	171	9	R2SC	C2TC	LCC MEASURING STATION SETUP IS COMPLETE.	
	171	10	V2MS	C2TC	VAB MEASURING STATION SETUP IS COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 50' 0"	181	11	C1TC	B1TM	VERIFY TM GSE PREPS COMPLETE	
	181	12	C1TC	BTMC	VERIFY TCE PREPS COMPLETE.	
-24 HRS 45' 0"	121	1	CUTC	CLTC	ALTERNATE FIRING ROOM IS SUPPORTING PER V-21243.	
	151	2	CUTC	BGCC	ENTER SGO AND PERFORM DATA LINK SWITCHOVER PER V-22006. REPORT WHEN COMPLETE.	
	121	3	CUTC	CLTC	GROUND COMPUTER IS SUPPORTING	
	188	4	CLTC	ALL	GROUND COMPUTER IS SUPPORTING	
		4-1			*** NOTE ALL DISPLAY CONSOLE OPERATORS, PRIOR TO SELECTING ANY COMPUTER PROGRAM, ACCOMPLISH THE FOLLOWING:	
					1. MOMENTARILY DEPRESS TV TRANSMIT	
					2. TYPE "1"	
					3. MOMENTARILY DEPRESS EXECUTE	
					4. MOMENTARILY DEPRESS CLEAR	
	121	5	CLTC	C1TC CUTC	APPLY STAGE POWER.	
	121	6	CLTC	RDAS	TAPE RECORDERS ON	
	161	7	C4TC	C4ES	APPLY S-IVB GROUND POWER PER V-30539, APPENDIX B.	
	181	8	C1TC	C1NE	APPLY S-IC ESE GROUND AND STAGE POWER PER V-21038 AND VERIFY EMERGENCY BACKUP BATTERIES ON THE LINE. START BACKUP BATTERY TEST PER V-21035. REPORT WHEN COMPLETE.	

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-24 HRS 45' 0"						
	181	9	C1TC	RRSC	RECORDER ON	
	151	10	CUTC	CUNP	APPLY IU STAGE POWER PER V-21223. REPORT WHEN COMPLETE	
	181	11	C1TC	C1NE	VERIFY CIRCUIT BREAKER LOCKS HAVE BEEN INSTALLED PER V-21035	
	181	12	C1TC	C1NP	POSITION 1D181 BUS TO ON. VERIFY INDICATION	
	121	13	CLTC	C2TC	APPLY STAGE POWER	
	171	14	C2TC	R2SC	VERIFY READY FOR S-II STAGE POWER	
	171	15	C2TC	C2NP	APPLY S-II STAGE POWER PER V-21103 (8011). REPORT WHEN COMPLETE.	
	121	16	C2TC	CLTC	S-II STAGE POWER IS ON	
	171	17	C2TC	L2PD	CLOSE S-II AUX MOTOR PUMP 400 HERTZ POWER CIRCUIT BREAKERS	
	171	18	C2TC	L2PD	INSTALL CIRCUIT BREAKER LOCKS PER V-30029 (M020) TASK 14. REPORT WHEN COMPLETE.	
	171	19	C2TC	C2GP	ACTIVATE S-II GROUND PNEUMATICS PER V-30029 (M020) TASK 15. REPORT WHEN COMPLETE.	
	171	20	C2TC	B2TM	START PCM/DDAS CHECKS PER V-28144 (R014) MODE 1. REPORT WHEN COMPLETE.	
	151	21	CUTC	SUVM	VERIFY CHE HOIST REMOVED	
-24 HRS 30' 0"						
	121	1	CUTC	CLTC	IU STAGE POWER ON AND COOLING IS SUPPORTING.	
	121	2	CLTC	CUTC	START ELECTRICAL CONNECTION OF LAUNCH VEHICLE FLIGHT BATTERIES	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 30' 0"						
151		3	CUTC	CUNE SUVE RUBM	CONNECT IU FLIGHT BATTERIES PER V-21254 ON CH154	
151		4	CUTC	SURF	START ANTENNA COUPLER INSTALLATION AND CONFIGURE PER V-28069. REPORT WHEN COMPLETE.	
151		5	CUTC	VURF	START GSE SETUP PER V-28069. REPORT WHEN COMPLETE.	
181		6	C1TC	C1NE	START TCS FUNCTIONAL TEST PER V-21035. REPORT WHEN COMPLETE.	
171		7	C2FC	C2TC	S-II ENGINE ACTUATION SYSTEM PREPS ARE COMPLETE.	
171		8	U2SI	C2TC	A7-84 PLATFORMS ARE SECURED FOR ENGINE GIMBALLING	
171		9	C2TC	C2FC	START EAS FUNCTIONAL CHECKOUT PER V-30029 (M020) TASK 16. REPORT WHEN COMPLETE.	
171		10	U2J2	C2TC	PROPULSION SYSTEM WALKDOWN IS COMPLETE	
161		11	C4TC	C4HY C4ES C4PS S4FC	VERIFY S-IVB PRE-POWER PREPS COMPLETED.	
181		12	C1TC	V1MS	VERIFY S-IC VEHICLE MEASURING STATION PREPS COMPLETED PER V-27098.	
181		13	C1TC	C1NE	CONNECT S-IC FLIGHT BATTERIES PER V-21204.	
181		14	C1TC	B1TM	START S-IC TM DDAS CHECKS PER V-38004	
181		15	C1TC	C1EN	PLACE IGNITORS INSTALLED TO ARM MOMENTARILY THEN AUTO AND VERIFY ALL IGNITOR AND HYPERGOL INSTALLED INDICATIONS ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 30' 0"						
	121	16	CLTC	C4TC	APPLY S-IVB STAGE POWER AND START ELECTRICAL CONNECTION OF FLIGHT BATTERIES.	
	161	17	C4TC	C4ES	APPLY STAGE POWER PER V-30539, APP B.	
	161	18	C4TC	C4ES	CONNECT S-IVB FLIGHT BATTERIES PER V-30539, SECT H.	
	161	19	C4TC	C4NK	MONITOR BATTERY VOLTAGES, CURRENTS AND TEMPERATURES AND RECORD DATA PER V-21413	
	161	20	C4TC	C4NP	VERIFY +4D10, +4D20, +4D30 & +4D40 BATTERY INDICATIONS ON	
	161	21	C4TC	C4NP	TURN ON 4D10 BATTERY LOAD SW UNTIL 4D10 VOLTAGE INDICATES LESS THAN 30 VOLTS.	
	161	22	C4TC	C4NP	APPLY 4D10 LOAD AS REQUIRED TO STABILIZE BATTERY VOLTAGE.	
	161	23	C4TC	C4NP	BATTERY MONITOR TO AUTO AFTER BATTERY VOLTAGES ARE RECORDED.	
	121	24	CVTS	CLTC	GMIL ON-STATION CALIBRATION IS COMPLETE. GMIL CCS S-BAND CARRIER IS OFF.	TCPI
	181	25	C1TC	C1PE	START PROPULSION SYSTEM FUNCTIONAL TEST PER V-34012. REPORT WHEN COMPLETE.	
	151	26	C2TC	CUTC	CLOSE S-II 400 HZ CIRCUIT BREAKER	
	171	27	C2TC	C2FC	S-II/IU 400 HZ BREAKERS CLOSED	
	161	28	C4TC	S4CE S4MF	VERIFY FINAL ENGINEERING WALKAROUND FORWARD COMPLETE	
	181	29	C1TC	C1PE C1NE	VERIFY READY TO LOWER ENGINE SERVICE PLATFORM.	
	181	30	C1TC	LESP	START LOWERING ENGINE SERVICE PLATFORM PER V-36070.	B-204- 111

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 15' 0"	181	1	C1TC	C1PE	START S-IC PNEUMATIC SYSTEM FUNCTIONAL TEST PER V-24327.	
-24 HRS 5' 0"	121	1	CVTS	CLTC	GMIL BRINGING UP CCS S-BAND CARRIER FOR MCC COMMAND VALIDATION TEST. VERIFY COMMAND DECODER IS OFF.	TCPI
	121	2	CLTC	CUFS	PLACE ALL FCC, CCIS AND EDS/CRG PANEL SWITCHES TO AUTO	
-24 HRS 0' 0"	181	1	C1TC	CCLO	START LOX SYSTEM PREPS FOR LOADING PER V-25340.	
	181	2	C1TC	CCLH	START LH2 SYSTEM PREP FOR LOADING PER V-35004.	
	161	3	S4PC	S4HY S4CE S4MA	VERIFY FINAL ENGINEERING WALKAROUND AFT COMPLETE.	
	121	4	CLTC	C1NP C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT - OFF	
	111	5	CLTC	CVTS	LV POWER IS ON.	TCPI
	181	6	C1TC	C1NE	VERIFY COMPLETION OF FLIGHT BATTERY INSTALLATION	
	181	7	C1TC	C1PE C1NE	START FINAL THRUST SECTION WALK THRU. LV-QAL PARTICIPATION REQUIRED.	
	181	8	C1TC	C1PE	REMOVE FINAL PORTION OF S-IC THRUST STRUCTURE INTERNAL ACCESS EQUIPMENT PER V-24010.	

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-24 HRS 0' 0"						
	181	9	C1TC	R1SC	MONITOR VOLTAGE AND CURRENT PER V-21204 FOR 1D10 AND 1D20. REPORT ANY ANOMALIES TO C1NE ON CH 181.	
	181	10	C1TC	C1MS	VERIFY MLME LOX/FUEL DIGITAL/ANALOG CONVERTER IS TURNED ON AND CALIBRATED	
	121	11	CLTC	CLFK	REQUEST & EXECUTE KAF1 LINKING PROGRAM, OPTION 1 (KAOS PART II, CTC4 & KAOS PART I)	
		11-1	CLTC		NOTE ----- WHERE KAF1 LINKING PROGRAM IS BEING UTILIZED, DO NOT PERFORM THOSE SEQUENCES WHICH ARE FOLLOWED BY THREE ASTERISKS IN THE REMARKS COLUMN	
	121	12	CLTC	CLFK	REQUEST & EXECUTE KAOS (FLIGHT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 3 (EDS/CRG PREPS) SECONDARY OPTION 1 (COMPARATORS RESET)	***
	151	13	CUPS	CUES	VERIFY EDS AUTO ABORT BUS DEENERGIZED AND WILL REMAIN OFF UNTIL COMPLETION OF CTC4.	
	171	14	C2FC	C2TC	S-II EAS FUNCTIONAL CHECKOUT IS COMPLETE	
	161	15	C4TC	S4MA	START FINAL CLOSEOUT OF FLAME IMPINGEMENT CURTAIN.	
	181	16	C1TC	LESP	REMOVE GIMBAL PLATFORMS FROM AROUND ENGINES AS REQUIRED BY PROPULSION SYSTEM ENGINEER. USE TAG LINE TO KEEP SECTION FROM FALLING.	B-204- 111
	151	17	CUTC	CCAP	INSTALL AUXILIARY POWER CIRCUIT BREAKER LOCKING PINS PER V-31062, APPENDIX E. REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 0' 0"						
	181	18	C1TC	CECS	START ECS PREPS PER V-36074, PART A	
	181	19	C1TC	RDTS	START DTS PREPS IN BACKUP FIRING ROOM PER V-25077.	
-23 HRS 55' 0"						
	121	1	CLFK	CLTC	KAOS COMPLETE	CTC4
	121	2	CLTC	CUFS	REQUEST AND EXECUTE CONTROL/EDS RATE GYRO SUBSYSTEM TEST (CTC4) ON CHANNEL 123. REPORT WHEN COMPLETE.	***
	123	3	CUFS	CLFK	REQUEST AND EXECUTE CTC4 OPTIONS NORM AND B, F, GH, I (CRG CALIB TEST; P, Y, R AXES; POS & NEG; B1-LEVEL PKG; COMPARATOR TEST AND RATE EXCESSIVE TEST). REPORT WHEN COMPLETE.	***
-23 HRS 50' 0"						
	121	1	C4TC	CLTC	APS ENGINE VALVE POWER OFF AND WILL REMAIN OFF UNTIL T-10 MINUTES. SAFETY LOCK IS INSTALLED.	
	181	2	C1TC	B1TM	VERIFY S-IC TM DDAS CHECKS COMPLETED PER V-38004	
	181	3	C1TC	C1NE	VERIFY TCS FUNCTIONAL TEST IS COMPLETE	
-23 HRS 40' 0"						
	121	1	CVTS	CLTC	MCC COMMAND VALIDATION TEST IS COMPLETE. GMIL CCS S-BAND CARRIER IS OFF.	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 30' 0"						
	123	1	CLFK	CUFS	CTC4 COMPLETE	
	121	2	CUFS	CLTC	CONTROL/EDS RATE GYRO SUBSYSTEM TEST (CTC4) COMPLETE.	
	161	3	C4TC	C4PS	START PROPULSION FINAL CHECKS PER V-30539, SECT K.	
	121	4	CLTC	CLFK	REQUEST & EXECUTE KAOS (FLT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 2 (FCC PREPS) SECONDARY OPTION 1 (COMPARATORS RESET)	XXXX
	121	5	CLTC	CUSP	FLIGHT CONTROL COMPUTER SYSTEM POWER - ON.	
	171	6	C2TC	U2EC	START S-II FINAL ECS CHECKS PER V-30029 (M020) TASK 17. REPORT WHEN COMPLETE	
	151	7	CUTC	CUNE	VERIFY IU BATTERY CONNECTIONS ARE COMPLETE	
-23 HRS 25' 0"						
	121	1	CLFK	CLTC	KAOS AND KAF1 COMPLETE	
	121	2	CLTC	CLGK	POWER ON LVDC/LVDA PER V-33033, SECT I. (KAPW, FT-04, FT-08, FT-35, FT-20 AND FT-23)	
-23 HRS 16' 0"						
	181	1	C1TC	CSPP	VERIFY RELEASE SENSOR CHECKS ARE COMPLETE PER V-31045.	
	181	2	C1TC	CSPP	START 43D100 & 43D200 BUS CHECKS PER V-21194.	
	181	3	C1TC	LESP	VERIFY ENGINE SERVICE PLATFORM IS REMOVED AND CONNECT WINCH CABLES TO LLP PER V-36070.	B-204-111

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 16' 0"	121	4	CLTC	CLTC	REQUEST CLOSED LOOP CLEARANCE FOR 450 MHZ FOR DRSCS PREPS (PROTECTION NOT REQUIRED)	
	111	5	CLTC	CVTS	REQUEST CLOSED LOOP CLEARANCE FOR 450 MHZ FOR DRSCS PREPS (PROTECTION NOT REQUIRED)	TOPI
-23 HRS 15' 0"	121	1	CVTS	CLTC	SPACECRAFT IS READY FOR S/C CONTROL OF SATURN ATTITUDE COMMAND CHECKS	TOPI
	121	2	CLTC	ALL	FOLLOWING PERSONNEL GO TO CHANNEL 212 TO SUPPORT S/C CONTROL OF SATURN ATTITUDE COMMAND CHECKS ON CH 212 CUPS, CUSP, CUF, CUCR, CUSW, C4FC, C4FS	TOPI
	212	3	MSTC	CUSP CUCR CUSW C4FC	VERIFY READY FOR S/C GUIDANCE ATTITUDE CONTROL TEST	TOPI
	212	4	MSTC	CUSW	ISSUE IU OCTAL 031 (S/C CONTROL OF SATURN ENABLE)	TOPI
	212	5	MSTC	SCDR	LV GUID SW - CMC	TOPI
	212	6	MSTC	MGNR	S/C CONTROL OF SAT LIGHT ON/SAT TAKEOVER ENABLE LITE ON	TOPI
	212	7	MSTC	CUSP	VERIFY S/C CONTROL INDICATION ON	TOPI
	212	8	MSTC	SCDR	RHC2 ARMED	TOPI
	212	9	MSTC	CUSP	S-IVB COAST MODE SWITCH TO ON	TOPI
	212	10	MSTC	SCDR	RHC2 - (+) ROLL SOFT STOP	TOPI
	212	11	MSTC	CUCR C4FC	VERIFY PLUS ROLL COMMAND, I-IV AND III-11 APS FIRING	TOPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 15' 0"						
		212 12	MSTC	SCDR	RHC2 -- (-) ROLL SOFT STOP	TCPI
		212 13	MSTC	CUQR C4FC	VERIFY MINUS ROLL COMMAND, I-II AND III-IV APS FIRING	TCPI
		212 14	MSTC	SCDR	RHC2 -- (+) PITCH SOFT STOP	TCPI
		212 15	MSTC	CUQR C4FC	VERIFY PLUS PITCH COMMAND, I-P APS FIRING	TCPI
		212 16	MSTC	SCDR	RHC2 -- (-) PITCH SOFT STOP	TCPI
		212 17	MSTC	CUQR C4FC	VERIFY MINUS PITCH COMMAND, III-P APS FIRING	TCPI
		212 18	MSTC	SCDR	RHC2 -- (+) YAW SOFT STOP	TCPI
		212 19	MSTC	CUQR C4FC	VERIFY PLUS YAW COMMAND, I-II AND III-II APS FIRING	TCPI
		212 20	MSTC	SCDR	RHC2 -- (-) YAW SOFT STOP	TCPI
		212 21	MSTC	C4FC CUQR	VERIFY MINUS YAW COMMAND, I-IV AND III-IV APS FIRING	TCPI
		212 22	MSTC	SCDR	RHC2 -- NEUTRAL THEN LOCK	TCPI
		212 23	MSTC	CUSW	ISSUE IU OCTAL 051 (S/C CONTROL OF SATURN DISABLE)	TCPI
		212 24	MSTC	CUSP	VERIFY S/C CONTROL INDICATION OFF	TCPI
		212 25	MSTC	CUSP	S-IVB COAST MODE SWITCH TO OFF	TCPI
		212 26	MSTC	SCDR	LV GUID. SW -- IU	TCPI
		212 27	MSTC	CUSP CUQR CUSW C4FC	TEST COMPLETE. RETURN TO ASSIGNED CHANNELS	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 15' 0"	121	28	02TC	CLTC	VERIFY RF CLEARANCE FOR TM FREQUENCIES 234.0 (BF-2), 241.5 (BF-1) AND 248.6 (BP-1) MHZ.	
-23 HRS 5' 0"	121	1	CUFS	CLTC	S/C CONTROL OF SATURN ATTITUDE COMMAND CHECKS COMPLETE	TOPI
	111	2	CLTC	CVTS	REQUEST SCO PERSONNEL ON CH 223 TO PERFORM FT-25.	TOPI
	121	3	CLTC	CLGK	SCO PERSONNEL SWITCHING TO CH 223 TO PERFORM FT-25	
	111	4	CLTC	CVTS	ADVISE SCO PERSONNEL Q-BALL POWER IS COMING ON IN 5 MINUTES.	TOPI
	121	5	CLGK	CLTC	LVDC/LVDA POWER ON COMPLETE	
	121	6	CLTC	CLGK	REQUEST AND EXECUTE FT-25 (S/C DISCRETE INPUT TEST) ON CH 223	
		6-1		CLGK	*** NOTE VERIFY DIN 4, 6, 9, 17, 20 & 22 OFF.	
	223	7	CLGK	SCDR	PANEL 2, LV S-II/S-IVB SWITCH TO LV STAGE.	TOPI
		7-1		CLGK	*** NOTE VERIFY INT 2 & DIN 22 ON	
	223	8	CLGK	SCDR	PANEL 2, LV S-II/S-IVB SWITCH TO OFF.	TOPI
		8-1		CLGK	*** NOTE VERIFY INT 2 & DIN 22 OFF	
	223	9	CLGK	SCDR	PANEL 2, LV GUID SWITCH TO CMC.	TOPI
		9-1		CLGK	*** NOTE VERIFY DIN 9 ON	
	223	10	CLGK	MGNS	TURN ON S-IV IGNITION SEQUENCE START	TOPI
		10-1		CLGK	*** NOTE DIN 20 ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
-23 HRS 51 ON						
223		11	CLGK	MGNS	TURN OFF S-IV IGNITION SEQUENCE START	TCPI
		11-1		CLGK	*** NOTE VERIFY DIN 20 OFF	
223		12	CLGK	SODR	PANEL 2, LV TRANSLUNAR SWITCH TO SAFE,	TCPI
		12-1		CLGK	*** NOTE VERIFY DIN 6 ON	
223		13	CLGK	SODR	PANEL 2, LV TRANSLUNAR SWITCH TO INJECT,	TCPI
		13-1		CLGK	*** NOTE VERIFY DIN 6 OFF	
223		14	CLGK	SODR	PANEL 2, LV GUID SWITCH TO IU,	TCPI
		14-1		CLGK	*** NOTE VERIFY DIN 9 OFF	
223		15	CLGK	SODR	SUPPORT NO LONGER REQUIRED,	TCPI
-23 HRS 01 ON						
121		0	CLGK	CLTC	FF-23 COMPLETE (S/C DISCRETE INPUT TEST),	
111		1	CLTC	CVTS	VERIFY GRUMMAN PAD LEADER ON LUT LEVEL 260 FOR COORDINATION OF SLA CLOSEOUT,	TCPI
188		2	CVTS	PA	ALL NON-ESSENTIAL PERSONNEL ARE TO CLEAR THE CONTROL AREA FOR LM SHE TANK TOPOFF OPERATIONS,	TCPI
		2-1			*****WARNING***** * THE CONTROL AREA FOR LM * * SHE TANK TOPOFF * * OPERATIONS CONSISTS OF * * THE LM DESCENT AREA * * INTERNAL TO SLA, IU, * * AND S-IVB FORWARD, * *****	
161		3	C4TC	C4ES	VERIFY S-IVB FLIGHT BATTERIES CONNECTED	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-23 HRS 01 ON						
121		4	CLTC	SURF	VERIFY ANTENNA COUPLER INSTALLATION COMPLETE AND CONFIGURED FOR CCS CHECKS PER V-28060.	
151		5	CUTC	SUVM	REMOVE ST-124M PURGE LINE AND PLENUM CHECK VALVE PER V-81062, PART III.	#
111		6	CLTC	CVTS	REQUEST CLEARANCE FOR ALL LV RF & TM SYSTEMS, VERIFY CIF & USB STATION READY TO SUPPORT COUNTDOWN.	TCPI
121		7	CLTC	B1TM B2TM B4TM BUTM	VERIFY TM RERADIATION SYSTEM INSTALLED	
121		8	CLTC	CUIP	VERIFY RF SILENCE OFF	
121		9	CLTC	CGAA	Q-BALL POWER ON THEN - AUTO Q-BALL HEATER POWER - ON	TCPI
171		10	C2TC	C2NP	START ONE POINT CAL PER V-30029 (M020) TASK 18, REPORT WHEN COMPLETE.	
121		11	CLTC	CPRK	REQUEST AND EXECUTE BT01 (PROPELLANT MONITOR UPDATE) AND BE01 AND BE02 (PROPELLANT MONITOR PROGRAMS).	B-206-112
11-1			CPRK	***	NOTE IF RCA 110A COMPUTER SUPPORT IS LOST BETWEEN T-23 HRS AND T-20 MIN, THE FOLLOWING SEQUENCES ARE TO BE ACCOMPLISHED WHEN THE COMPUTER IS AGAIN SUPPORTING: 1. VERIFY WITH CLTC THAT PROGRAM BE-01 AND BE-02 MEMORY IN ML COMPUTER IS LOST. 2. REQUEST RE-INITIALIZATION OF BT-01 TEST PROGRAM & INSERTION OF BT-01 PARAMETER CARDS INTO LCC CARD READER, AS REQUIRED. 3. IF T-20 TIME IS PAST T-8:15 HRS WHEN RCA-110A COMPUTER SUPPORT IS LOST, RE-INITIALIZE THE BE-01 AND BE-02 PROGRAMS WITH OPTIONS AND TIME SCAN AS REQUIRED. (REFERENCE: PROCEDURE V-35014).	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-23 HRS 01 00						
	121	12	CLTC	ALL	FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO SUPPORT APS GAIN TEST CTC5: CLGK, CUFE, CUGA, CUSP, CUCR, CLFK, C4FC, C4FS, S4FC, E4IM.	
	121	12-1	CPRK	CLTC	BT01 COMPLETE	(CTC5)
		13			DELETED	C-200-112 I-101-121
	121	14	CLTC	CUFS	REQUEST AND EXECUTE APS GAIN TEST (CTC5) ON CHANNEL 123. REPORT WHEN COMPLETE.	I-101-121
	123	15	CUFS	C4FC	VERIFY PREPS COMPLETE	
	123	16	CUFS	CLGK	VERIFY READY TO SUPPORT.	
	123	17	CUFS	CLFK	REQUEST AND EXECUTE CTC5, OPTIONS AB, CD, EFG, H, J, (AO, A1, BURN, COAST, P, Y, R, ACTIVE AND APS POWER OFF). REPORT WHEN COMPLETE.	I-101-121
		17-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE	
		17-2		CUNP	*** NOTE GROUP 1 RESET WILL BE ISSUED PERIODICALLY DURING THIS PROGRAM	
	171	18	U2EC	C2TC	S-II FINAL ECS INSPECTION COMPLETE AND SYSTEM IN FLIGHT CONFIGURATION.	
	171	19	C2GP	C2TC	S-II GROUND PNEUMATICS ACTIVATED	
	181	20	C1TC	C1PE	PREPARE S-IC HYDRAULIC UNIT PER V-34012. REPORT WHEN COMPLETE.	
	181	21	C1TC	BRFS	TURN ON ML AND LCC GSE POWER	
	171	22	C2TC	C2AE	START ENGINE SEQUENCE TEST PER V-34014 (E023). REPORT WHEN COMPLETE.	
	181	23	C1TC	RDTs	VERIFY DTS PREPS IN BACKUP FIRING ROOM COMPLETE PER V-25077	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-22 HRS 45' 0"	161	1	C4TC	S4MF	INSTALL LM ACCESS STEPS PER V-30539 APPENDIX D, REPORT WHEN COMPLETE.	
-22 HRS 30' 0"	171	1	C2TC	C2AE C2EC C2RP	START ENGINE/RECIRC PANEL STATUS CHECKS PER V-30029 (M020) TASK 19. REPORT WHEN COMPLETE.	
	151	2	CUTC	SUVM	VERIFY ST-124M PURGE LINE AND PLENUM CHECK VALVE REMOVED.	#
	171	3	L2PD	C2TC	CIRCUIT BREAKERS LOCK INSTALLATION IS COMPLETE.	
	121	4	CLTC	CUSW	ISSUE IU OCTAL 007 (CCS HIGH GAIN).	
	121	5	CLTC	VURF	ENABLE LOCAL CCS CARRIER AND VERIFY.	
	121	6	CLTC	CUIP	C-BAND BEACON #1 & #2 - ON C-BAND BEACON #1 & #2 INHIBIT - ON C-BAND BEACON #1 & #2 INHIBIT - OFF C-BAND BEACON #1 INHIBIT - ON CCS TRANSPONDER POWER - ON	
	121	7	CLTC	VURF	VERIFY CCS IN LOCK, START CCS CHECKS PER V-28069.	
	111	8	CLTC	CVTS	LV COMMAND DECODER COMING ON	TCPI
	121	9	CLTC	CUIP	COMMAND DECODER POWER - ON.	
-22 HRS 25' 0"	111	1	CLTC	CVTS	REQUEST RANGE INTERROGATE C-BAND BEACON #2, REPORT RANGE READOUTS TO VURF ON CHANNEL 137.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22 HRS 20' 0"						
123		1	CLFK	CUFS	CTC5 COMPLETE.	
123		2	CUFS	CUGA	PLACE EDS/CONTROL RATE GYRO SYSTEM POWER SWITCH TO ON.	
121		3	CUFS	CLTC	APS GAIN TEST CTC5 IS COMPLETE	
121		3-1	CLTC	CLFK	REQUEST & EXECUTE KAF1, OPTION 4 (CTC1 S-IVB & S-IC STAGES)	
121		4	CLTC	C4TC	VERIFY S-IVB ENGINE SEQUENCE TEST COMPLETE OR WILL NOT BE RUN PRIOR TO COMPLETION OF CTC1.	I-101- 121
121		5	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO SUPPORT S-IVB, S-11 FLIGHT CONTROL SYSTEM GAIN TEST (CTC1):	
					CLGK CUSP CUNP R4HY CUF5 CUOR E4IM E4FC CUGA CLFK S4HY C2FC C2FE U2LH U2MH U2FE U2LF R2SC V2MS C4FC C4HY C4NP S4FC C4FS	
		5-1	CUFS	***	NOTE IF A DELAY IN EXECUTION OF ANY PROGRAM CALLED BY KAF1 IS DESIRED, PUT S-IC BURN MODE SWITCH IN OFF POSITION. TO CONTINUE, PUT S-IC BURN MODE SWITCH TO AUTO.	
121		6	CLTC	CUFS	REQUEST AND EXECUTE FLIGHT CONTROL SYSTEMS GAIN TEST (CTC1). REPORT WHEN COMPLETE.	***
		6-1	CUNP	***	NOTE GROUP 2 RESET WILL BE ISSUED PERIODICALLY DURING THIS PROGRAM.	
123		7	CUFS	CLGK	VERIFY READY FOR SUPPORT	
123		8	CUFS	CUSP	VERIFY ALL CCIS PANEL SWITCHES IN AUTO POSITION	
123		9	CUFS	CUGA	VERIFY ALL EDS/CONTROL RATE GYRO PANEL SWITCHES IN AUTO POSITION EXCEPT SYSTEM POWER	
123		10	CUFS	S4HY	VERIFY ENGINE AREA CLEAR FOR HYDRAULIC OPERATION	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22 HRS 20' 0"						
	123	11	CUFS	C4NP	4D411 POWER ON OR VERIFY ON	
	123	12	CUFS	C4HY	AUXILIARY PUMP POWER SWITCH TO AUTO	
	123	13	CUFS	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS AB, C, G, IJ, M (AO, A1, S-IVB ACTIVE, P & Y, SW. PT. ZERO). REPORT WHEN COMPLETE.	***
		13-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE.	
-22 HRS 15' 0"						
	151	1	CUTC	SUNE	START IU ELECTRICAL WALK AROUND. LV-QAL PARTICIPATION REQUIRED.	
	171	2	C2AE	C2TC	ENGINE/RECIRC PANEL STATUS CHECKS ARE COMPLETE	
	121	3	CLTC	GMIL	VERIFY GROUND STATION IN LOCK FROM CCS PCM SOURCE.	
	181	4	C1TC	CHDA	START HDA PRELAUNCH PREPS PER V-36069	
	181	5	C1TC	CPDC	VERIFY REQUIRED LLP GIMBAL PLATFORM SECTIONS REMOVED AND WINCH CABLES CONNECTED TO LLP.	B-204-111
	181	6	C1TC	C1PE	VERIFY FUNCTIONAL TEST OF S-IC PNEUMATIC SYSTEMS COMPLETE	
	181	7	C1TC	C1PE	VERIFY S-IC AIRBORNE GN2 AND HELIUM BOTTLES CHARGED TO 1500 PSIG.	
	171	8	U2SI	C2TC	STA 114 A7-84 REMOVAL IS COMPLETE LESS LADDER AND FOUR SECTIONS.	

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CD ONLY						
-22 HRS 10: 00						
123		1	CLFK	CUSF	CTC1 COMPLETE (S-IVB)	
123		2	CUSF	CAHY	AUXILIARY PUMP POWER SWITCH TO OFF.	
123		3	CUSF	U2LH	VERIFY S-II ENGINE AREAS CLEAR FOR AUTOMATIC APPLICATION OF HYDRAULIC PRESSURE AND ENGINE GIMBALING	
123		4	CUSF	C2FC	ALL CONTROL SWITCHES TO AUTO POSITION, EXCEPT AUX PUMPS SWITCH IN ENABLE POSITION, THERMAL CONTROL SWITCH IN OFF POSITION AND MAIN PUMP CASE BYPASS VALVE SWITCH IN CLOSED POSITION.	
123		5	CUSF	R2SC V2MS	HYDRAULIC RECORDERS TO FAST SPEED.	
123		6	CUSF	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS AB, C, F, IJK, M (A0, A1, S-II GAIN, P, Y, R, SW PT ZERO); REPORT WHEN COMPLETE.	***
		6-1:	CLFK		*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON THE SANDERS CONSOLE	
121		7	CLTC	CLTC	REQUEST CTSC PROVIDE SUPPORT FOR PCMU DISCONNECT	
112		8	CLTC	CTSC	REQUEST SUPPORT FOR PCMU DISCONNECT.	TCPI
-22 HRS 5: 00						
121		1	CLTC	VURF	VERIFY CCS CHECKS COMPLETE;	
121		2	CLTC	CUSW	ISSUE IU OCTAL 072 (CCS OMNI)	
121		3	CLTC	VURF	DISABLE LOCAL CCS CARRIER AND VERIFY.	
111		4	CLTC	CVTS	CCS TRANSPONDER IS ON FOR UN-LOCKED FREQUENCY READOUT, IU COMMAND SYSTEM IS DISABLED.	TCPI
111		5	CLTC	CVTS	VERIFY C-BAND BEACON #2 READOUT COMPLETE; STANDBY FOR C-BAND BEACON #1.	TCPI

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CD ONLY						
-22 HRS 5' 0"						
121		6	CLTC	CUIP	C-BAND BEACON #2 INHIBIT - ON C-BAND BEACON #1 & #2 INHIBIT - OFF C-BAND BEACON #2 INHIBIT - ON	
111		7	CLTC	CVTS	REQUEST RANGE INTERROGATE C-BAND BEACON #1, REPORT READOUTS TO VURF ON CH 137,	TCPI
-22 HRS 0' 0"						
171		1	C2AE	C2TC	ENGINE SEQUENCE TEST IS COMPLETE	
181		2	C1TC	BRFS	START DRSCS CHECKS PER V-38000,	
171		3	C2NP	C2TC	ONE POINT CALIBRATION IS COMPLETE	
171		4	C2TC	C2IP	PLACE PANEL SWITCHES IN COUNT CONFIGURATION PER V-30029 (M020) TASK 20, REPORT WHEN COMPLETE,	
111		5	CLTC	CVTS	REQUEST GMIL INTERROGATE IU CCS AND REPORT GO/NO GO, REPORT READOUT TO VURF ON CHANNEL 137, COMMAND DECODER IS ON, IU COMMAND SYSTEM IS DISABLED,	TCPI
151		6	CUTC	UUPC	DELETED CDDT ONLY	
151		7	CUTC	CUCP	PRESSURIZE ST-124M GN2 SPHERE TO 1700 PER V-34006,	
7-1					*****CAUTION***** * * ST-124M SUPPLY SPHERE * * WILL BE PRESSURIZED TO * * 1700 PSI, * * *****	
151		8	CUTC	LUNW	ST-124M HEATERS FROM STANDBY TO NORMAL,	
181		9	C1TC	C1PE C1NE	VERIFY THRUST SECTION FINAL WALK THROUGH IS COMPLETE AND AREA IS READY FOR FINAL CLOSEOUT	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 55' 0"						
	188	1	CLTC	ALL	FOLLOWING STATIONS SWITCH TO CH 123 TO SUPPORT S-IC FLIGHT CONTROL SYSTEM GAIN TEST: C1FE C1PC C1HP C1FC L1EP	
	123	2	CLFK	CUFS	CTC1 COMPLETE (S-II)	
	123	3	CUFS	C2FC	RETURN PANEL SWITCHES TO COUNT CONFIGURATION. ALL FUNCTIONAL SWITCHES DOWN OR OFF EXCEPT ALL ACCUM CONTROL SWITCH IN AUTO AND METER SWITCHES OPTIONAL.	
	123	4	CUFS	V2MS R2SC	RECORDERS TO SLOW SPEED	
	171	5	C2FE	C2TC	FLIGHT CONTROL TEST CTC1 IS COMPLETE.	
	171	6	C2FC	C2TC	ENGINE GIMBALING IS COMPLETE. PERSONNEL ARE IN PROCESS OF REMOVING EQUIPMENT AND STARTING FINAL WALKDOWN.	
	123	7	CUFS	C1PC	LOW LOX DOME PURGE ON	
	123	8	CUFS	C1HP	APPLY S-IC HYDRAULICS. REPORT WHEN COMPLETE.	
	123	9	CUFS	L1EP	VERIFY S-IC ENGINE AREA CLEAR FOR GIMBALING	
	123	10	CUFS	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS B, C, E, IJK, M (A1, S-IC GAIN, P, Y, R, SW PT ZERO). REPORT WHEN COMPLETE.	***
		10-1	CLFK		*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 50' 0"						
171		1	C2IP	C2TC	C2IP PANEL IS IN COUNT CONFIGURATION	
181		2	C1TC	CSPP	VERIFY 43D100 & 43D200 BUS CHECKS COMPLETE PER V-21194	
181		3	C1TC	CSPP	APPLY 43D100 AND 43D200 FIRING SYSTEM POWER AND START BATTERY SWITCHOVER TEST PER V-21194. REPORT WHEN COMPLETE.	
181		4	C1TC	C1PE	DISCONNECT & SECURE FUSU (OR PCMU) PER V-24327.	
-21 HRS 45' 0"						
123		1	CLFK	CUFS	CTC1 COMPLETE (S-IC)	
123		2	CUFS	CLFK	TERMINATE CTC1. REPORT TERMINATED.	***
123		3	CLFK	CUFS	KAF1 COMPLETE	
123		4	CUFS	CUSP	VERIFY/ACCOMPLISH NO MODE LIGHTS ILLUMINATED	
123		5	CUFS	C1PC	LOW LOX DOME PURGE OFF.	
123		6	CUFS	ALL	ALL PERSONNEL CONCERNED WITH FLIGHT CONTROL CHECKS RETURN TO CHANNEL 121	
121		7	CUFS	CLTC	FLIGHT CONTROL SYSTEMS GAIN TEST (CTC1) AND KAF1 COMPLETE.	
		7-1		CLTC	*** NOTE CTC1 MUST BE COMPLETE PRIOR TO STARTING TM CHECKS	
111		8	CLTC	CVTS	VERIFY C-BAND INTERROGATION COMPLETE. STANDBY TO MONITOR POWER TRANSFER AT T-21:15.	TOPI
121		9	CLTC	CUIP	C-BAND BEACON #1 INHIBIT ON C-BAND BEACON #1 AND #2 INHIBITS OFF	
		9-1		CUIP	*** NOTE BOTH BEACONS ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 45' 0"						
	121	10	CLTC	ETMS BTMI	VERIFY CIF DATA TRANSMISSION LINK ON	
	121	11	CLTC	ETMS	VERIFY CIF READY TO SUPPORT TM CHECKS	
	121	12	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT TEST	
	111	13	CLTC	CVTS	REQUEST ELECTROMAGNETIC COMPATIBILITY MONITORING (ALLOW FIVE MINUTES TO OPERATING STEPS)	TCPI
	181	14	C1TC	C1PE	START FINAL INSTALLATION OF BASE HEAT SHIELD ACCESS PANELS PER V-29003 OPERATING STEPS -----	
	121	15	CLTC	C1IP C2IP C4IP CUIP	VERIFY RF SILENCE OFF	
	121	16	CLTC	C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT OFF	
	121	17	CLTC	C1IP	400 HZ CAL POWER, 28 VDC RACS AND LOX & FUEL RACS - ON	
	121	18	CLTC	C2IP	VERIFY GROUND POWER ON (CAL POWER)	
	121	19	CLTC	C1IP	VERIFY TM MODE SELECT SWITCH - ANTENNA.	
	121	20	CLTC	C2IP	RF COUPLER TO ANTENNA	
	121	21	CLTC	C4IP	TM MODE SELECT SWITCH TO COAX.	
	121	22	CLTC	CUIP	RF DUMMY LOAD - ON.	
	121	23	CLTC	ETMS BTMC	TM TAPE RECORDING - ON.	
	121	24	CLTC	CUIP	F1 TM - ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 45' 0"						
	121	25	CLTC	C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS ON IN SEQUENCE LISTED AND MARKED OVER CHANNEL 121.	
	121	26		C1IP	F1 & P1 RF - ON.	
	121	27		C2IP	F1, F2, & P1 RF - ON.	
	121	28		C4IP	P1 - ON AND SSB TO ENABLE	
	121	29		CUIP	F1 AND P1 RF - ON	
	121	30	CLTC	C1IP CUIP	TM CALIBRATOR POWER - ON.	
	121	31	CLTC	C1IP C2IP CUIP	TM CAL MODE - PREFLIGHT & PREFLIGHT LEVELS - 50%	
	121	32	CLTC	C4IP	TM CAL MODE TO PREFLIGHT	
	121	33	CLTC	BTTM	ALLOW 5 MIN WARMUP THEN CONDUCT L/V TM CHECKS ON CHANNEL 127, REPORT WHEN COMPLETE.	
	188	34	CLTC	ALL	ALL PERSONNEL SUPPORTING L/V TM CHECKS SWITCH TO CHANNEL 127 ACTIVE AND MONITOR TO CHANNEL. (DELAY 5 MINUTES MINIMUM FOR TM TRANSMITTER WARM UP)	
-21 HRS 40' 0"					L/V TELEMETRY CHECKS -----	
	127	1	BTTM	BTMC B1TM B2TM B4TM BUTM BTMI	VERIFY MODULES PATCHED PER TCE DATA COORDINATION SHEET FOR THIS TEST.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 40' 0"						
127		2	BTTM	ETMS	START TM PARAMETERS CHECK. (DELAY NEXT STEP 2 MIN)	
127		3	BTTM	C1IP C2IP CUIP	PREFLIGHT LEVELS TO 0 PERCENT (IU TO AUTO)	
127		4	BTTM	C4IP	SSB CAL COMMAND ON THEN OFF (DELAY NEXT STEP 1 MIN)	
127		5	BTTM	C1IP C2IP CUIP	PREFLIGHT LEVELS TO 100 PERCENT (DELAY NEXT STEP 1 MIN)	
127		6	BTTM	C1IP C2IP CUIP	PREFLIGHT LEVELS TO AUTO	
127		7	BTTM	C1IP C2IP C4IP CUIP	TM CAL MODE TO INFLIGHT	
188		8	BTTM	ALL	ANNOUNCE: TM INFLIGHT CAL WILL INTERRUPT DDAS MEASUREMENTS MOMENTARILY	
127		9	BTTM	C1IP	TM CAL CMD ON FOR 5 SEC.	
127		10	BTTM	C2IP	FM/FM INFLIGHT ON FOR 5 SEC., THEN OFF	
127		11	BTTM	C4IP	TM CAL CMD ON FOR 5 SEC. THEN OFF.	
127		12	BTTM	CUIP	TM CAL CMD ON FOR 5 SEC	
127		13	BTTM	C4IP	REGULAR CAL COMMAND ON FOR 5 SEC	
127		14	BTTM	ALL	L/V TM CHECKS ARE COMPLETED. ALL PERSONNEL CONNECTED WITH TM CHECKS SWITCH TO CHANNEL 121.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 40' 0"						
	121	15	BTTM	CLTC	L/V TM CHECKS ARE COMPLETED.	
	111	16	CLTC	CVTS	VERIFY WEST MSS ELEVATOR #2 LOCKED OUT ABOVE MSS A3 LEVEL TO SUPPORT LONG RANGE THEODOLITE CHECKS AND REQUEST GMIL TO STANDBY ON CH 121 FOR CCS GAIN CHANGE	TCPI
	121	17	CLTC	CUPC	TURN ON ST-124M SYSTEM PER V-33011.	
	121	18	CLTC	GMIL	VERIFY READY FOR CCS LOW GAIN	
	121	19	CLTC	CUSW	ISSUE IU OCTAL 052 (CCS LOW GAIN)	
	171	20	U2MH	C2TC	HYDRAULIC PERSONNEL HAVE COMPLETED FINAL WALKDOWN AND REMOVAL OF NON-FLIGHT EQUIPMENT.	
	171	21	C2TC	U2SE	VERIFY OK TO REMOVE STA 30 AND HEAT SHIELD A7-84 ACCESS PLATFORMS.	
	171	22	C2TC	U2SI	START COMPLETE REMOVAL OF STATION 30/A7-84 PLATFORMS (S-II AFT ACCESS PLATFORMS) PER V-26008 (G042) EXCEPT THOSE SECTIONS NEEDED FOR ACCESS TO FLIGHT BATTERIES.	
	171	23	C2TC	U2SI	START REMOVAL OF A7-84 HEAT SHIELD COVER PER V-26008 (G042).	
-21 HRS 35' 0"						
	111	1	CLTC	CVTS	ADVISE SCO PERSONNEL THAT Q-BALL SIM COMMAND WILL BE SENT IN 5 MINUTES.	TCPI
	111	2	CLTC	CVTS	REQUEST MTPE MONITOR CHANNEL 121 FOR Q-BALL SIM COMMAND IN 5 MINUTES AND PROVIDE READINGS TO VUMS ON CH 148.	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 30' 0"						
	121	1	CLTC	CQAA	Q-BALL SIM COMMAND ON FOR 10 SECONDS	TCPI
	121	2	CQAA		3-2-1, MARK	TCPI
	121	3	CLTC	GMIL	VERIFY READY FOR CCS HIGH GAIN.	
	121	4	CLTC	CUSW	ISSUE IU OCTAL 007 (CCS HI GAIN)	
-21 HRS 20' 0"						
	121	1	CLTC	C4IP	PRELAUNCH CHECKOUT GROUP - ON	
	121	2	CLTC	C2NP	RACS POWER - ON	
	121	3	CLTC	C2IP	FREQ MEAS CAL ON	
	121	4	CLTC	CLIK	REQUEST & EXECUTE ME01 (RACS RAPID CONTROL) - ALL STAGES, REPORT WHEN COMPLETE.	
		4-1			*** NOTE STAGE MEASUREMENTS WILL BE INTERRUPTED DURING ME-01	
	181	5	C1TC	CSPP	VERIFY FIRING SYSTEM BATTERY SWITCH OVER TEST COMPLETE AND REMOVE 43D100 AND 43D200 POWER	
-21 HRS 17' 0"						
	121	1	CLIK	CLTC	ME01 COMPLETED.	
	121	2	CLTC	C4IP	PRELAUNCH CHECKOUT GROUP - OFF.	
	121	3	CLTC	C1IP	28 VDC RACS, LOX & FUEL RACS AND 400 HZ POWER - OFF	
	181	4	C1TC	BRFS	VERIFY DRSCS/GSE READY TO SUPPORT L/V POWER TRANSFER TEST	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
	111	1	CLTC	CVTS	REQUEST GMIL VERIFY CCS INTERROGATION COMPLETE. STANDBY TO MONITOR CCS DURING POWER TRANSFER. COMMAND DECODER ON. IU COMMAND SYSTEM IS DISABLED.	TCPI
	121	2	CLTC	C2IP	FREQ MEAS CAL OFF	
	121	3	CLTC	C2NP	RACS POWER OFF	
	111	4	CLTC	CVTS	L/V PROCEEDING WITH POWER TRANSFER. REQUEST RANGE INTERROGATE AND MONITOR C-BAND FOR ANY CHANGES AND GMIL MONITOR CCS FOR ANY CHANGES. REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN.	TCPI
		4-1			*** NOTE BOTH C-BAND BEACONS ON	
	121	5	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS. <u>POWER TRANSFER TEST</u>	
	111	6	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP LOCAL UHF COMMAND CARRIER (PROTECTION REQUIRED)	TCPI
	121	7	CLTC	BRFS	DRSCS RF CARRIER ON AND VERIFY.	
	121	8	CUPC	CLTC	ST-124M POWER ON COMPLETE.	
	121	9	CLTC	C1DP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT: PD RSCR ENABLE - OFF SYSTEM STATUS SWITCH - OFF S & A SWITCH - SAFE	
	121	10	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE.	
		10-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON	
	121	11	CLTC	RRSC	<u>VERIFY DRSCS RECORDERS ON</u>	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"		12		C2NP	ACTIVATE BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE.	
121		13	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 INTERNAL AND VERIFY	
		13-1		C1DP C2DP C4DP	*** NOTE EBW'S 1 & 2 OFF.	
		13-2		B1RF B2RF B4RF CRSS	*** NOTE ALL RSCR LIMITER VOLTAGES RECEIVED	
188		14	CLTC	ALL	ALL PERSONNEL SUPPORTING POWER TRANSFER TEST MONITOR CHANNEL 121 AND SWITCH TO INDIVIDUAL "STAGE TC" ACTIVE CHANNELS TO PREPARE FOR POWER TRANSFER.	
121		15	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO SUPPORT FLIGHT CONTROL SYSTEM PREPS FOR POWER TRANSFER CUFS CUCR C1FE L1EP CUSP C1PC CUGA	
121		16	CLTC	CUFS	PREPARE FLIGHT CONTROL FOR POWER TRANSFER	
123		17	CUFS	C1PC	LOW LOX DOME PURGE ON	
123		18	CUFS	L1EP	VERIFY S-IC ENGINE SECTION CLEAR FOR ENGINE GIMBALING	
123		19	CUFS	CUSP	CONTROL COMPUTER - S-IC BURN MODE (ON THEN AUTO)	
123		20	CUFS	CUGA	S-IC ATTITUDE RATE COMMAND (PLUS 10 DEG/SEC ROLL) AND HOLD UNTIL POWER TRANSFER COMPLETE	
121		21	CUFS	CLTC	FLIGHT CONTROL READY FOR POWER TRANSFER	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
181		22	C1TC	C1NP	VERIFY INTERNAL AND EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
181		23	C1TC	C1NP	POWER TRANSFER TO AUTO	
181		24	C1TC	C1IP	VERIFY ON OR TURN ON THE FOLLOWING SWITCH: TM CALIB - ON.	
181		25	C1TC	C1NP	BATTERY INSTALLED ENABLE SWITCH TO ON THEN AUTO	
		25-1		C1NP	*** NOTE S-IC READY FOR POWER TRANSFER ON THEN OFF	
181		26	C1TC	C1NE R1SC	VERIFY READY FOR POWER TRANSFER.	
121		27	C1TC	CLTC	S-IC READY FOR POWER TRANSFER PROGRAM REQUEST	
171		28	C2TC	C2NP	BATTERY INSTALLED TO AUTO.	
171		29	C2TC	C2NP	IGN BATT BLEED TO ON	
171		30	C2TC	C2NP	VERIFY MAIN, INSTR & RECIRC POWER TRANSFER SWITCHES IN AUTO.	
171		31	C2TC	C2NP	APPLY PM POWER	
171		32	C2TC	C2NP R2SC	VERIFY READY FOR POWER TRANSFER.	
121		33	C2TC	CLTC	S-II READY FOR POWER TRANSFER PROGRAM REQUEST.	
161		34	C4TC	C4NP	EMERGENCY POWER TRANSFER SWITCH OFF.	
161		35	C4TC	C4NP	BATTERY MONITOR TO AUTO	
161		36	C4TC	C4HY	VERIFY FLIGHT MODE IS IN AUTO OR POSITION TO AUTO.	
161		37	C4TC	C4NP	4D411 POWER ON.	
161		38	C4TC	S4HY	VERIFY S-IVB ENGINE SECTION AREA CLEAR. FOR HYDRAULICS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
	161	39	C4TC	R4EI R4SC	RECORDERS FAST.	
	161	40	C4TC	C4IP	PRELAUNCH CHECKOUT GROUP TO AUTO	
	181	41	C4TC	C4EP	CLOSE LOX AND LH2 CHILLDOWN VALVES.	
	161	42	C4TC	C4PU	PU POWER ON.	
	161	43	C4TC	C4NP	POWER TRANSFER SWITCH TO AUTO	
	161	44	C4TC	C4NP C4PP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
	161	45	C4TC	C4NP C4NK R4EI R4SC	VERIFY READY FOR POWER TRANSFER.	
	121	46	C4TC	CLTC	S-IVB READY FOR POWER TRANSFER PROGRAM REQUEST.	
	151	47	CUTC	CUNP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
	151	48	CUTC	CUNP RUBM	VERIFY READY FOR POWER TRANSFER.	
	151	49	CUTC	CUNP	IU TO REMAIN ON INTERNAL POWER FOR 3 MINUTES	
	151	50	CUTC	CUNP	POWER TRANSFER TEST TO AUTO	
	121	51	CUTC	CLTC	IU READY FOR POWER TRANSFER PROGRAM REQUEST	
	121	52	CLTC	C1NK C2NK C4NK CUNK	MONITOR CONSOLE #12 DURING VAPX	
	121	53	CLTC	C1TC C2TC C4TC CUTC	AFTER TRANSFER TO INTERNAL SECURE STAGES FROM POWER TRANSFER ON STAGE "TC" CHANNELS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"		53-1		ALL	*** NOTE S-IC, S-II, S-IVB STAY ON INTERNAL POWER FOR 30 SEC MINIMUM. I.U. STAY ON INTERNAL POWER FOR 3 MIN. MINIMUM. REPORT BATTERY VOLTAGES AND CURRENTS TO CLES ON CH 125.	
121		54	CLTC	C1PK	REQUEST & EXECUTE VAPX (SPR5 OPTION)	
121		55	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3".	
121		56	C1PK	ALL	VAPX WILL TRANSFER STAGES INTERNAL IN 5 SEC. 5-4-3-2-1 MARK	
		56-1		C1NP C2NP C4NP CUNP	*** NOTE ON INTERNAL POWER	
		56-2		CUDE	*** NOTE 0777 & 0779 ON, 0781 OFF	
121		57	C1PK	CLTC	ALL STAGES INTERNAL FOR 30 SECONDS. TRANSFER EXTERNAL INDIVIDUALLY USING STAGE SWITCHES.	
		57-1		C1NP	*** NOTE POWER TRANSFER EXTERNAL OFF	
		57-2		C1NP	*** NOTE POWER TRANSFER INTERNAL ON	
181		58	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) - ON	
		58-1		R1SC	*** NOTE VOLTAGE FOR STAGE BUSES 1D11 & 1D21 AND VOLTAGE AND CURRENT FOR BUSES 1D10 & 1D20.	
		58-2		C1NP	*** NOTE +1D111, +1D211, +1D121 BUS INDICATIONS OFF	
181		59	C1TC	C1NP	POWER TRANSFER SWITCH - EXTERNAL THEN AUTO.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
		59-1		C1NP	*** NOTE S-IC POWER TRANSFER COMPLETE OFF	
		59-2		C1NP	*** NOTE POWER TRANSFER INTERNAL OFF	
	181	60	C1TC	C1NP	VERIFY POWER TRANSFER EXTERNAL ON	
		60-1		C1NP	*** NOTE BUS +1D121 ON	
		60-2		C1NP	*** NOTE BUS +1D211 ON	
		60-3		C1NP	*** NOTE BUS +1D111 ON	
	181	61	C1TC	R1SC	READOUT 1D11 & 1D21 VOLTAGE AND 1D10 & 1D20 VOLTAGE AND CURRENT DURING INTERNAL THEN REPORT TO CLES ON CH 125.	
	181	62	C1TC	ALL	ALL STATIONS RETURN TO CH 121	
	121	63	C1TC	CLTC	S-IC POWER TRANSFER TEST IS COMPLETE	
		63-1		C2NP	*** NOTE POWER TRANSFER COMPLETE ON	
		63-2		R2SC	*** NOTE RECORD THE FOLLOWING: MAIN BATT CURRENT (XM0021-207) ----- MAIN DC BUS VOLTAGE 2D11 (XM0020-207) ----- INSTR BATT CURRENT (XM0024-207) ----- INSTR DC BUS VOLTAGE 2D21 (XM0023-207) ----- RECIRC BUS CURRENT (XM0114-207) ----- RECIRC DC BUS VOLTAGE 2D51 (XM0111-207) ----- IGN DC BUS VOLTAGE 2D61 (XM0125-207) -----	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
	171	64	C2TC	C2NP	TRANSFER MAIN, INST., AND RECIRC. TO EXTERNAL, AFTER 30 SECONDS MINIMUM ON INTERNAL	
		64-1		C2NP	*** NOTE MAIN BUS EXTERNAL ON	
		64-2		C2NP	*** NOTE INST. BUS EXTERNAL ON	
		64-3		C2NP	*** NOTE RECIRC. BUS EXTERNAL ON	
		64-4		C2NP	*** NOTE POWER TRANSFER COMPLETE OFF	
	171	65	C2TC	C2NP	REMOVE PM POWER	
	171	66	C2TC	C2NP	IGN BATT BLEED TO OFF	
	171	67	C2TC	ALL	ALL STATIONS RETURN TO CH 121	
	121	68	C2TC	CLTC	S-II POWER TRANSFER IS COMPLETE	
	171	69	C2TC	R2SC	READOUT RECORDED BUS VOLTAGES TO CLES ON CH 125	
	161	70	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE	
	161	71	C4TC	R4SC	NOTE VOLTAGE AND CURRENT FOR STAGE BUSSES. REPORT WHEN COMPLETE	
	161	72	C4TC	C4NP	POWER TRANSFER SWITCH - EXTERNAL THEN AUTO	
	161	73	C4TC	C4NP	VERIFY STAGE ON EXTERNAL POWER	
	161	74	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE OFF	
	161	75	C4TC	C4NP	EMERGENCY POWER TRANSFER TO EXTERNAL	
	161	76	C4TC	C4HY	FLIGHT MODE - OFF THEN AUTO	
	161	77	C4TC	C4NP	4D411 POWER OFF	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
161		78	C4TC	R4SC	TRANSMIT POWER TRANSFER DATA TO GDC-28 ON CH 125	
161		79	C4TC	C4EP	OPEN LOX AND LH2 CHILLDOWN VALVES	
161		80	C4TC	C4PU	PU POWER OFF.	
161		81	C4TC	ALL	ALL STATIONS RETURN TO CH. 121.	
121		82	C4TC	CLTC	S-IVB POWER TRANSFER TEST COMPLETE	
		82-1		CUTC	*** NOTE DELAY NEXT STEP FOR 3 MINUTES.	
151		83	CUTC	CUNP	POWER TRANSFER TO EXTERNAL ON YOUR MARK	
151		84	CUNP		3-2-1, MARK	
		84-1		CUNP	*** NOTE IU GROUND POWER ON AND POWER TRANSFER COMPLETE OFF (0777 & 0779 OFF, 0781 ON)	
151		85	CUTC	CUNE	VERIFY POWER TRANSFER SATISFACTORY	
151		86	CUTC	RUBM	READOUT VOLTAGE AND CURRENTS TO CLES ON CH 125	
151		87	CUTC	ALL	ALL STATIONS RETURN TO CH 121	
121		88	CUTC	CLTC	IU POWER TRANSFER TEST IS COMPLETE	
121		89	CLTC	ALL	ALL RECORDERS - SLOW SPEED.	
121		90	C1PK	CLTC	VAPX IS COMPLETE.	
121		91	CLTC	C1DP C2DP C4DP	VERIFY EBW'S EXTERNAL AND NOT CHARGED	
		91-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED.	
		91-2		RRSC	*** NOTE PROPER DRSCS INDICATIONS DURING POWER TRANSFER (DRSCS RECORDER)	
121		92	CLTC	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
	121	93	CLTC	C1DP C2DP C4DP	VERIFY RSCR POWER OFF	
	121	94	CLTC	CLVN	DESTRUCT SYSTEM - OFF. DELIVER DESTRUCT SYSTEM KEY TO CPSS. REPORT WHEN COMPLETE.	
	121	95	CLTC	C1DP C2DP C4DP	VERIFY SAFETY BUS OFF	
	121	96	CLTC	C1DP C2DP C4DP	STATUS SYSTEM SWITCH - SAFE	
	121	97	CLTC	BRFS	DRSCS RF CARRIER - OFF	
	121	98	CLTC	CUFS	SECURE FLIGHT CONTROL SYSTEM FROM POWER TRANSFER CONFIGURATION	
	123	99	CUFS	CUCR C1FE	VERIFY ATTITUDE RATE COMMAND UNDISTURBED BY POWER TRANSFER	
	123	100	CUFS	CUGA	REMOVE PLUS ROLL ATTITUDE RATE COMMAND	
	121	101	CUFS	CLTC	FLIGHT CONTROL SYSTEM IS SECURE FROM POWER TRANSFER	
	111	102	CLTC	CVTS	POWER TRANSFER TEST IS COMPLETED. DESTRUCT SYSTEM KEY RETURNED TO CPSS. VERIFY C-BAND AND CCS HAD NO CHANGES. ELECTROMAGNETIC COMPATIBILITY MONITORING NO LONGER REQUIRED.	TCPI
	111	103	CLTC	CVTS	LOCAL COMMAND CARRIER IS OFF.	TCPI
	171	104	C2TC	C2NP	VERIFY BATTERY PERFORMANCE IS SATISFACTORY AND OK TO REMOVE BATTERY ACCESS PLATFORMS.	
	171	105	C2TC	U2SI	POWER TRANSFER TEST IS COMPLETE. BATTERY ACCESS PLATFORMS MAY BE REMOVED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 15' 0"						
	181	106	C1TC	C1PE	START REMOVAL OF S-IC FWD SKIRT BULKHEAD COVERS AND ACCESS PLATFORMS EXCEPT AS REQUIRED FOR S & A DEVICE CONNECTION PER V-24011 & V-24010	
	181	107	C1TC	C1NE C1PE	START FORWARD SKIRT WALK THROUGH WHEN BULKHEAD COVERS AND PLATFORMS ARE CLEARED. LV-QAL PARTICIPATION REQUIRED.	
	151	108	CUTC	SUNE	VERIFY IU ELECTRICAL WALKAROUND COMPLETE AND SATISFACTORY	
		108-1			VERIFICATION BY LV-QAL -----	
	188	109	CLTC	ALL	STAGE DDAS MEASUREMENTS MAY BE INTERRUPTED DURING CIF - DRS CHECKS FOR APPROXIMATELY 1 MINUTE	
	121	110	CLTC	RDAS	SWITCH FROM UMBILICAL TO CIF DATA FOR ONE MINUTE AND RETURN TO UMBILICAL ON YOUR MARK	
	121	110-1	RDAS		ESE DRS SYNCHRONIZER TO POSITION 3 AND PCM/PCM/FM CONTROL SWITCH TO SWITCHED ON MY MARK	
		110-2		RDAS	*** NOTE VERIFY SYNC	
	121	110-3	RDAS		ESE DRS SYNCHRONIZER TO POSITION 2 AND PCM/PCM/FM CONTROL SWITCH TO NORMAL ON MY MARK	
		110-4		RDAS	*** NOTE VERIFY SYNC	
	121	111	RDAS	CLTC	DRS-CIF CHECKS COMPLETE	
	121	112	CLTC	C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS OFF IN THE SEQUENCE LISTED AND MARKED OVER CHANNEL 121	
	121	112-1		C1IP	F1, P1 RF - OFF	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-21 HRS 15' 0"							
121		112-2		C2IP	F1, F2, P1 RF - OFF		
121		112-3		C4IP	P1 OFF AND SSB TO DISABLE		
121		112-4		CUIP	F1 & P1 RF - OFF		
121		113	CLTC	CUIP	F1 TM OFF		
121		114	CLTC	ETMS BTMC	TM TAPE RECORDING OFF		
121		115	CLTC	ETMS	REPORT OUT OF TOLERANCE PARAMETERS TO BLTM ON CHANNEL 127 WHEN ANALYSIS IS COMPLETE.		
121		116	CLTC	C1IP CUIP	TM CALIBRATOR OFF.		
121		117	CLTC	CUIP	C-BAND BEACON #1 - OFF C-BAND BEACON #2 - OFF		
-21 HRS 10' 0"							
188		1	CLTC	ALL	THE FOLLOWING STATIONS ARE TO SWITCH TO CHANNEL 123 TO SUPPORT IU/S-IC FLIGHT CONTROL SYSTEM GAIN TEST (CTC1):		
				CLGK	CUSP	C1FE	L1EP
				CUSE	CUCR	C1FC	C1PC
				CUGA	CLFK	C1HP	CUNP
121		2	CLTC	CLFK	REQUEST & EXECUTE KAF1 LINKING PROGRAM OPTION 3		
		2-1		CUFS	*** NOTE IF A DELAY IN EXECUTION OF ANY PROGRAM CALLED BY KAF1 IS DESIRED, PUT S-IC BURN MODE SWITCH IN OFF POSITION. TO CONTINUE, PUT S-IC BURN MODE SWITCH TO AUTO.		
121		3	CLTC	CUFS	REQUEST & EXECUTE FLIGHT CONTROL SYSTEMS GAIN TEST (CTC1) ON CHANNEL 123. REPORT WHEN COMPLETE.	***	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 10' 0"						
	123	4	CUFS	CLGK	VERIFY READY FOR SUPPORT	
	123	5	CUFS	CUSP	VERIFY ALL CCIS PANEL SWITCHES IN AUTO POSITION	
	123	6	CUFS	CUGA	VERIFY ALL EDS/CONTROL RATE GYRO PANEL SWITCHES IN AUTO POSITION EXCEPT SYSTEM POWER	
		6-1		CUNP	*** NOTE GROUP 2 RESET WILL BE ISSUED PERIODICALLY THROUGHOUT THIS PROGRAM	
	123	7	CUFS	C1HP	VERIFY S-IC HYDRAULICS SUPPORTING	
	123	8	CUFS	L1EP	VERIFY S-IC ENGINE AREA CLEAR FOR GIMBALING	
	123	9	CUFS	C1PC	VERIFY LOW LOX DOME PURGE ON	
	123	10	CUFS	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS A, C, E, IJK, M (AO, S-IC GAIN, P, Y, R, SW PT ZERO). REPORT WHEN COMPLETE.	***
		10-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE	
-21 HRS 5' 0"						
	111	1	CLTC	CVTS	ADVISE SCO PERSONNEL Q-BALL POWER WILL BE TURNED OFF IN 5 MIN.	TCPI
-21 HRS 0' 0"						
	121	1	CUPC	CLTC	THEODOLITE CHECKS ARE COMPLETE. READY TO RELEASE MSS #2 ELEVATOR	
	111	2	CLTC	CVTS	THEODOLITE CHECKS ARE COMPLETE. RELEASE MSS #2 ELEVATOR.	TCPI
	121	3	CLTC	CQAA	Q-BALL POWER OFF Q-BALL HEATER POWER OFF	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 0' 0"						
	151	4	CUTC	SUQI SUVM	START IU MECHANICAL WALK AROUND PER V-31062, PART III.	
	121	5	CLTC	ETMS	VERIFY OUT OF TOLERANCE PARAMETERS REPORTED TO BLTM.	
	181	6	C1TC	CSPP	HAVE USAE AND LASE START LUT WALKDOWN	
	161	7	C4TC	S4MA	START AFT INTERSTAGE FINAL WALKAROUND	
	181	8	C1TC	CHCU	PREP HCU PER V-36079. REPORT WHEN COMPLETE	
-20 HRS 55' 0"						
	111	1	CLTC	CVTS	REQUEST GMIL BRING DOWN IU CCS CARRIER AND REPORT CARRIER IS OFF. IU COMMAND SYSTEM IS DISABLED.	TOPI
	121	2	CLTC	VURF	ENABLE LOCAL CCS CARRIER AND VERIFY CCS IN LOCK.	
	111	3	CLTC	CVTS	LOCAL CCS CARRIER IS ON. CCS TRANSPONDER AND COMMAND DECODER ARE ON. IU COMMAND SYSTEM IS DISABLED	TOPI
-20 HRS 45' 0"						
	151	1	CUTC	BUTM	VERIFY READY FOR SECURING TM RERADIATION SYSTEM.	
	151	2	CUTC	SUVE	START SECURING TM RERADIATION SYSTEM PER V-31062, PART III.	
	121	3	CLTC	SURF	REMOVE G-BAND ANTENNA COUPLERS PER V-28069	
	181	4	C1TC	LPLX	VERIFY PTCS PREPS COMPLETED PER V-25159	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-20 HRS 35' 0"						
123		1	CLFK	CUFS	CTC1 COMPLETE (S-IC)	
123		2	CUFS	CLFK	TERMINATE CTC1 AND REPORT TERMINATED	***
123		3	CLFK	CUFS	KAF1 COMPLETE	
121		3-1	CUFS	CLTC	CTC1 AND KAF1 COMPLETE	
121		4	CLTC	CUEV	SWITCH TO CHANNEL 123 TO SUPPORT S-IC ALL ENGINES NULL TEST.	
121		5	CLTC	CUFS	CONDUCT S-IC ALL ENGINES NULL TEST ON CHANNEL 123. REPORT WHEN COMPLETE	
123		6	CUFS	CUSP	VERIFY/ACCOMPLISH CONTROL COMPUTER IN S-IC BURN MODE (ON THEN AUTO)	
123		7	CUFS	CUEV	VERIFY IU READY TO LAUNCH ON	
123		8	CUFS	C1FC	VERIFY ALL ENGINES NOT ZERO INDICATIONS OFF	
123		9	CUFS	CUGA	RAMP PITCH AXIS POSITIVE UNTIL PITCH ENGINE NOT ZERO INDICATION ON.	
		9-1		CUGA	*** NOTE 5.8 DEG/SEC WILL PRODUCE 4 DEG BETA, THE UPPER LIMIT OF NOT ZERO.	
123		10	CUFS	C1FC	VERIFY PITCH ENGINE NOT ZERO INDICATIONS ON	
123		11	CUFS	CUEV	VERIFY IU READY TO LAUNCH OFF	
123		12	CUFS	CUGA	ZERO RAMP	
123		13	CUFS	C1FC	VERIFY ALL ENGINES NOT ZERO INDICATIONS OFF	
123		14	CUFS	CUEV	VERIFY IU READY TO LAUNCH ON	
123		15	CUFS	CUGA	RAMP PITCH AXIS NEGATIVE UNTIL PITCH ENGINE NOT ZERO INDICATIONS ON.	
123		16	CUFS	C1FC	VERIFY PITCH ENGINE NOT ZERO INDICATIONS ON.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-20 HRS 35' 0"						
123		17	CUFS	CUEV	VERIFY IU READY TO LAUNCH OFF.	
123		18	CUFS	CUGA	ZERO RAMP	
123		19	CUFS	C1FC	VERIFY ALL ENGINES NOT ZERO INDICATIONS OFF.	
123		20	CUFS	CUEV	VERIFY IU READY TO LAUNCH ON.	
123		21	CUFS	CUGA	RAMP YAW AXIS POSITIVE UNTIL YAW ENGINE NOT ZERO INDICATIONS ON.	
123		22	CUFS	C1FC	VERIFY YAW ENGINE NOT ZERO INDICATIONS ON	
123		23	CUFS	CUEV	VERIFY IU READY TO LAUNCH OFF	
123		24	CUFS	CUGA	ZERO RAMP	
123		25	CUFS	C1FC	VERIFY ALL ENGINE NOT ZERO INDICATIONS OFF	
123		26	CUFS	CUEV	VERIFY IU READY TO LAUNCH ON	
123		27	CUFS	CUGA	RAMP YAW AXIS NEGATIVE UNTIL YAW ENGINE NOT ZERO INDICATIONS ON.	
123		28	CUFS	C1FC	VERIFY YAW ENGINE NOT ZERO INDICATIONS ON.	
123		29	CUFS	CUEV	VERIFY IU READY TO LAUNCH OFF.	
123		30	CUFS	CUGA	ZERO RAMP.	
123		31	CUFS	C1FC	VERIFY ALL ENGINES NOT ZERO INDICATIONS OFF.	
123		32	CUFS	CUEV	VERIFY IU READY TO LAUNCH ON.	
123		33	CUFS	C1FE	DETERMINE ACTUATION POINT OF NOT ZERO CIRCUIT. REPORT TO C1NE	
123		34	CUFS	ALL	ALL STATIONS CONCERNED WITH S-IC ALL ENGINES NULL TEST RETURN TO CHANNEL 121.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
-20 HRS 35' 0"						
181	35	C1TC	C1NE		VERIFY READY TO SUPPORT EDS TEST.	
121	36	CLTC	C1TC C2TC C4TC CUTC		START PREPS FOR EDS TEST PER V-21096. REPORT WHEN READY TO SUPPORT EDS TEST.	
171	37	C2TC	C2AE C2EC C2NP		PREP FOR EDS TEST. REPORT WHEN COMPLETE.	
-20 HRS 30' 0"						
188	1	CVTS	PA		LM SHE TANK TOPOFF IS COMPLETED. THE CONTROL AREA IS OPEN FOR NORMAL WORK.	TPCI
121	2	CUFS	CLTC		S-IC ALL ENGINES NULL TEST IS COMPLETE	(EDS)
121	3	CLTC	CUSP		POSITION S-II BURN MODE ON THEN OFF	
121	4	CLTC	CUSP		VERIFY NO MODE LIGHTS ILLUMINATED.	
121	5	CLTC	CUFC		CONTROL COMPUTER SYSTEM POWER - OFF	
121	6	CLTC	CUGA		CONTROL/EDS RATE GYRO SYSTEM POWER - OFF	
121	7	CLTC	CUFS		PLACE ALL CCIS AND EDS/CRG PANEL SWITCHES - OFF	
121	8	CLTC	C1HP		TURN OFF S-IC HYDRAULIC UNIT	
121	9	CLTC	CIPC		LOW LOX DOME PURGE OFF	
121	10	CLTC	CUPC		POWER DOWN THE ST-124M SYSTEM PER V-33011 (LEAVE HEATER SWITCH ON AND ST-124M HEATERS TO NORMAL)	
111	11	CLTC	CVTS		L/V READY FOR EDS TEST. REQUEST SCO PERSONNEL SWITCH TO CHANNEL 223.	TCPI
121	12	CVTS	CLTC		SCO PERSONNEL STANDING BY TO SUPPORT EDS TEST	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-20 HRS 30' 0"						
	121	13	CLTC	CEDK	PERFORM EDS TEST PER V-21096 (PROGRAM VZ33, FT-33, VAED, VZEA, VZRE, VZSA). REPORT WHEN COMPLETE.	
	121	14	CLTC	ALL	ALL L/V PERSONNEL SUPPORTING EDS TEST GO TO CHANNEL 223 ACTIVE AND MONITOR CHANNEL 121.	TCPI
	161	15	C4TC	S4MA S4PC	START REMOVAL OF AFT ACCESS KIT PER V-30539, SECT M.	
	161	16	C4TC	S4MA	VERIFY FLAME IMPINGEMENT CURTAIN CLOSEOUT COMPLETE.	
	181	17	C1TC	CTS1	START FINAL TSM PREPS PER V-36039	
		18			NOTE ----	
					CTS1 REQUIRES USE OF OTV CAMERAS 5, 6 & 7 UNTIL T+0	
	181	19	C1TC	B1TM	DELETED CDDT ONLY	*
	181	20	C1TC	B1TM	REMOVE TM RERADIATION SYSTEM PER V-28070.	#
-20 HRS 20' 0"						
	121	1	CLTC	CUTC	VERIFY TM RADIATION SYSTEM IN FLIGHT CONFIGURATION	
	121	2	CLTC	CUIP	RF DUMMY LOAD OFF	
	121	3	CLTC	BTMC	TM TAPE RECORDING - ON	
	121	4	CLTC	CUIP	P1 - RF ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-20 HRS 15' 0"						
	151	1	CUTC	CUCP	DELETED CDDT ONLY	*
	151	2	CUTC	CUCP	SECURE ST-124M AIR BEARING SYSTEM PER V-34006	#
	151	3	CUTC	CUCP	SETUP HIGH PRESSURE REGULATOR PER IV-36038. REPORT WHEN COMPLETE.	
	161	4	C4TC	S4TM	DISCONNECT S-IVB RERADIATION SYSTEM PER V-30539, SECT L.	
	121	5	C4TC	CLTC	VERIFY OPEN LOOP CLEARANCE ON 253.8 MHZ AND 258.5 MHZ FOR VEHICLE ANTENNA CHECKS.	
20 HRS 0' 0"						
	121	1	CEBK	CLTC	EDS TEST IS COMPLETED	
	111	2	CLTC	CVTS	EDS TEST IS COMPLETED.	TCPI
	171	3	C2TC	C2AE C2EC C2NP	SECURE FROM EDS TEST. REPORT WHEN COMPLETE.	
	121	4	CLTC	CUNP	SWITCH SELECTOR INHIBIT OFF.	
	121	5	CLTC	CUSW	ISSUE IU OCTAL 026 (CMD SYS ENABLE)	
	121	6	CLTC	VURF	VERIFY READY TO SUPPORT FT-45	
	121	7	CLTC	CUCS	VERIFY ACS IN COMP/COMP MODE	
	121	8	CLTC	CLGK	REQUEST & EXECUTE KAG1 LINKING PROGRAM	
		8-1		CLTC	NOTE ----	
WHERE KAG1 LINKING PROGRAMS ARE BEING UTILIZED, DO NOT PERFORM THOSE SEQUENCES WHICH ARE FOLLOWED BY THREE						

(CONTINUED)

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-20 HRS 0' 0"					ASTERISKS IN THE REMARKS COLUMN. PROGRAMS WILL BE RUN BY THE CLOCK UNLESS CLGK IS NOTIFIED ON CH 121 PRIOR TO EXECUTION TIME. PREREQUISITES FOR AUTOMATIC PROGRAM EXECUTION ARE INDICATED IN THE REMARKS COLUMN AS PROGRAM CALLOUTS.	
121		9	CLTC	CLGK	REQUEST & EXECUTE FT-45 (COMMAND SYSTEM INTERFACE TEST)	***
121		10	CLTC	ETMS	VERIFY RECEPTION OF TM LINK DP1	
121		11	CLTC	CUIP	P1 RF - OFF	
121		12	CLTC	BTMC	TM TAPE RECORDING OFF	
121		13	C4TC	CLTC	REQUEST ETMS TO MONITOR CH 127 FOR S-IVB TM VEHICLE ANTENNA SIGNAL RECEPTION TEST.	
171		14	C2TC	U2PF	START PROPELLANT FILL SYSTEM WALKAROUND INSPECTION PER V-30029 (M020) TASK 21. REPORT WHEN COMPLETE.	
171		15	C2TC	C2LD	START COMMON BULKHEAD EVACUATION PER V-26276 (Q058).	
171		16	C2TC	B2TM	SECURE S-II TM RERADIATION SYSTEM PER V-30029 (M020) TASK 20. REPORT WHEN COMPLETE.	
181		17	C1PE	C1TC	PCMU IS CLEAR FOR MOVE TO FALLBACK AREA	
121		18	C1TC	CLTC	REQUEST CTSC PROVIDE SUPPORT FOR REMOVAL OF PCMU.	
112		19	CLTC	CTSC	REQUEST SUPPORT REMOVE PCMU FROM ZERO LEVEL.	TOP1

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-19 HRS 55' 0"						
121		1	CLGK	CLTC	FT-45 COMPLETE	
121		2	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	
121		3	CLTC	CUIP	COMMAND DECODER - OFF CCS TRANSPONDER - OFF	
111		4	CLTC	CVTS	IU COMMAND SYSTEM IS DISABLED.	TCPI
121		5	CLTC	SURF	START FINAL CCS ANTENNA COUPLER REMOVAL PER V-28069	
121		6	CLTC	VURF	POWER DOWN RF GSE PER V-28069	
-19 HRS 45' 0"						
161		1	C4TC	S4TM	VERIFY S-IVB RERADIATION SYSTEM DISCONNECTED	
161		2	C4TC	S4MF	VERIFY THERMAL SHIELD INSTALLATION COMPLETE.	
121		3	CLTC	C1TC C2TC C4TC CUTC	START PREPS FOR FT-25 (L/V DISCRETE INPUT TEST). REPORT WHEN READY TO SUPPORT.	
171		4	C2TC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO AUTO	
171		5	C2TC	C2EC	MAINSTAGE OK SWITCHES TO AUTO	
171		6	C2TC	C2EC	ENGINE CUTOFF TO AUTO	
171		7	C2TC	C2NP	PM POWER AND SIM LAUNCH TO AUTO	
171		8	C2TC	C2PU	ALL SWITCHES TO AUTO	
161		9	C4TC	C4ET	ENGINE CONTROL POWER TO AUTO	
161		10	C4TC	C4ET	MAINSTAGE OK SIM TO AUTO	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-19 HRS 45' 0"						
	161	11	C4TC	C4ET	ENGINE COMPONENT TEST POWER ON	
	161	12	C4TC	C4OH	VOTING CIRCUIT ENABLE TO AUTO	
	161	13	C4TC	C4OH	VOTER CIRCUIT TEMP #1 SIM TO AUTO	
	161	14	C4TC	C4OH	VOTER CIRCUIT TEMP #2 SIM TO AUTO	
	161	15	C4TC	C4OH	VOTER CIRCUIT TEMP #3 SIM TO AUTO	
	161	16	C4TC	C4SP	MODE SELECT TO AUTO	
	151	17	CUTC	CUES	MODE SWITCH TO TEST AND VERIFY +1D199 BUS ON	
	151	18	CUTC	BGCC	LOAD FT-25 DECK IN CARD READER. REPORT WHEN COMPLETE.	
-19 HRS 42' 0"						
	121	1	CLTC	C1NP C4NP CUNP	SWITCH SELECTOR INHIBIT OFF	(FT25)
-19 HRS 40' 0"						
	121	1	CLTC	CLGK	REQUEST AND EXECUTE FT-25 (LV DISCRETE INPUT TEST). REPORT WHEN READY FOR INTERSTAGE OPTION.	***
	121	2	CLTC	CLGK	ENTER SP3 AND SP1 TO CONTINUE	***
	121	3	CLTC	SURF	VERIFY IU ANTENNA COUPLERS HAVE BEEN REMOVED.	
-19 HRS 30' 0"						
	151	1	CUTC	LUGI SUVV	VERIFY IU MECHANICAL WALK AROUND COMPLETE AND SATISFACTORY.	

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CD ONLY						
-19 HRS 30' 0"						
121		2	CLGK	CLTC	LV DISCRETE INPUT TEST (FT-25) IS COMPLETE	
121		3	CLTC	C1TC C2TC C4TC CUTC	SECURE FROM LV DISCRETE INPUT TEST. REPORT WHEN COMPLETE.	
171		4	C2TC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF	
171		5	C2TC	C2EC	CUTOFF TO OFF AND MAINSTAGE OK TO AUTO	
161		6	C4TC	C4OH	LOX SHUT DOWN VALVE (SW-SEL) TO CLOSE THEN AUTO	
161		7	C4TC	C4OH	LH PROPELLANT VALVE (SW-SEL) TO CLOSE THEN AUTO	
161		8	C4TC	C4ET	ENGINE CONTROL POWER OFF	
161		9	C4TC	C4ET	VOTING CIRCUIT ENABLE OFF	
161		10	C4TC	C4ET	MAINSTAGE OK SIM OFF	
161		11	C4TC	C4ET	ENGINE COMPONENT TEST POWER OFF	
151		12	CUTC	CUES	EDS MODE SWITCH TO MONITOR	
181		13	C1TC	C1NP	SWITCH SELECTOR INHIBIT - ON	
181		14	OWCP	C1TC	INDUSTRIAL WATER SYSTEM INITIAL PREPS ARE COMPLETE PER V-36113	
-19 HRS 25' 0"						
121		1	CLTC	CLGK	REQUEST & EXECUTE FT-05 (DATA VERIFY)	***

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-19 HRS 01 00						
181		1	C1TC	L1LS	START PAD INSPECTION. REPORT WHEN EQUIPMENT REMOVAL IS COMPLETE.	
171		2	U2PF	C2TC	PROPELLANT FILL SYSTEM WALK AROUND INSPECTION IS COMPLETE.	
171		3	U2SI	C2TC	REMOVAL OF ALL AFT SKIRT ACCESS EQUIPMENT (HEAT SHIELD COVER, STATION 30, AND STATION 114 OF THE A7-84) IS COMPLETE.	
171		4	C2TC	U2SE	VERIFY S-II AFT COMPARTMENT READY FOR CLOSE OUT	
181		5	C2TC	C1TC	REMOVAL OF S-II AFT ACCESS KIT IS COMPLETE.	
171		6	U20C	C2TC	VERIFY REMOVAL OF ALL NON-FLIGHT HARDWARE PER V-30029 (M020) TASK 47 AND THE INSPECTION PER ITI LS-008 FOR THE AFT INTERSTAGE COMPARTMENT IS COMPLETE.	
171		7	C2TC	U2SI	SECURE AFT DOOR	
171		8	C2TC	U2LN	CONTINUE ELECT INSP PER V-21253 (G060)	
161		9	C4TC	C4PS	VERIFY PROPULSION FINAL PREPS PARTS 1 THROUGH 4 ARE COMPLETE AND READY FOR MSS PLAT 2 OPENING	
161		10	C4TC	S4MM	VERIFY MSS PLAT 2 READY FOR OPENING	
121		11	C4TC	CLTC	MSS PLAT 2 READY FOR OPENING	
111		12	CLTC	CVTS	YOU ARE CLEARED TO OPEN MSS PLAT 2	TCPI
181		13	C1TC	BRFS	VERIFY DRSCS FLIGHT CODE PLUG INSTALLED IN LCC DECODER.	#
181		14	C1TC	L1IC	START RACS LOADING SYSTEM CHECKS PER V-27093. REPORT WHEN COMPLETE.	
121		15	C1TC	CLTC	REQUEST CLIK TO SWITCH TO CH. 116 TO SUPPORT L1IC WITH RACS LOADING SYSTEM CHECKS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-19 HRS 0' 0"						
181	15	C1TC	CSAC		START PRELAUNCH PREPS	
118	16	CSAC	CSA1		START PRELAUNCH PREPS PER V-36077.	
118	17	CSAC	CSA2		START PRELAUNCH PREPS PER V-36078.	
118	18	CSAC	CSA3		START PRELAUNCH PREPS PER V-36032.	
118	19	CSAC	CSA4		START PRELAUNCH PREPS PER V-36080.	
118	20	CSAC	CSA5		START PRELAUNCH PREPS PER V-36081.	
118	21	CSAC	CSA6		START PRELAUNCH PREPS PER V-36082.	
118	22	CSAC	CSA7		START PRELAUNCH PREPS PER V-36083.	
118	23	CSAC	CSA8		START PRELAUNCH PREPS PER V-36084.	
118	24	CSAC	CSA9		START PRELAUNCH PREPS PER V-36085.	
181	25	C1TC	CSPP		START RACK/CONSOLE VERIFICATION PER V-31045.	
-18 HRS 45' 0"						
121	1	CLGK	CLTC		FT-05 IS COMPLETE.	
121	2	CLTC	CLGK		POWER OFF LVDC/DA PER V-33033, SECT IV REPORT WHEN COMPLETE.	***
121	3	CLGK	CLTC		KAG1 IS TERMINATED	
-18 HRS 30' 0"						
171	1	U2SI	C2TC		S-II AFT DOOR IS SECURED	
171	2	C2TC	B2TM		VERIFY S-II STAGE RF & TM CLOSEOUT FOR LAUNCH COMPLETE PER V-28143 (M021)	
171	3	C2TC	U2SE		VERIFY OK TO REMOVE A7-38 ACCESS KIT AND A7-91 PROTECTIVE PADS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-16 HRS 30' 0"						
171		4	C2TC	U2SI	START REMOVAL OF A7-38 ACCESS KIT AND A7-91 PROTECTIVE PADS PER V-26008 (G042) EXCEPT THOSE SECTIONS NEEDED FOR PD CONTAINER 223 ACCESS.	
		4-1		U2SI	*** NOTE: DO NOT BEGIN REMOVAL OF A7-91 PROTECTIVE PADS UNTIL S-IVB AFT ACCESS KIT REMOVAL HAS STARTED.	
171		5	C2TC	U2AN U2QC	START PERFORMANCE OF V-30029 (M020) TASK 47 (NON-FLIGHT HARDWARE REMOVAL FROM FWD INTERSTAGE). REPORT WHEN COMPLETE.	N-120-117
171		6	C2TC	C2AE	START (QAMS) MAINSTAGE OK PRESSURE SWITCH (CALIPS) VERIFICATION PER V-34014 (E23, 2A) AFTER AFT DOOR IS SECURED. REPORT WHEN COMPLETE.	
181		7	C1TC	C1PE	VERIFY INSTALLATION OF BASE HEAT SHIELD ACCESS PANELS COMPLETE.	
121		8	C1TC	CLTC	REQUEST CTSC PROVIDE SUPPORT FOR REMOVAL OF S-IC STORAGE CABINETS AND FIN & FAIRING PLATFORMS.	
151		9	CUTC	PUPL	START LUT EQUIPMENT REMOVAL. LV-GAL PARTICIPATION REQUIRED.	
-16 HRS 15' 0"		1			DELETED	
121		2	CLTC	C4IP	PRELAUNCH CHECKOUT GROUP ON.	
121		3	CLTC	CLIK	ISSUE S-IVB ALL RACS RUN	
151		4	CUTC	CUIP	MEASUREMENT TRANSFER - AUTO S-II BURN TEST AND S-IVB COAST TEST-AUTO (60X-607A6-CCIS PANEL)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-18 HRS 15' 0"						
	151	5	CUTC	BGCC	VERIFY/MOUNT MT01 TAPE	
	111	6	CLTC	CVTS	L/V RF & TM SYSTEMS ARE OFF	TCPI
-18 HRS 0' 0"						
	181	1	C1TC	L1IC	VERIFY RACS LOADING SYSTEM CHECKS COMPLETE	
	121	2	C1TC	CLTC	S-IC READY FOR MT-01	
	151	3	CUTC	SUVM	VERIFY READY FOR S/A #7 AUX WATER METHANOL LINE REMOVAL.	#
	181	4	CUTC	C1TC	REQUEST REMOVAL OF AUX WATER METHANOL LINES FROM END OF S/A #7. REPORT WHEN COMPLETE.	#
	181	5	C1TC	CSAC	REMOVE AUX WATER METHANOL LINES FROM END OF S/A #7. REPORT WHEN COMPLETE.	#
	121	6	CLTC	C1IP	28 VOLT RACS, LOX & FUEL RACS AND 400 HZ POWER - ON.	
	121	7	CLTC	C2NP	RACS POWER ON	
	121	8	CLTC	CLIK	COMMAND RACS, SII-ALL-ALL-RUN	
	188	9	CLTC	ALL	ANNOUNCE: STAGE MEASUREMENTS WILL BE INTERRUPTED DURING MT-01 (MEAS SCAN)	
	121	10	CLTC	CLIK	REQUEST & EXECUTE MT-01 (MEAS SCAN VEHICLE OPTION)	
		11		CLIK	NOTE ----	
					SWITCH ACTION IN NEXT STEP TO BE ACCOMPLISHED JUST PRIOR TO S-IC PORTION OF MT-01 SCAN	
	121	11-1	CLIK	C1IP	HARDWIRE MEASUREMENT TRANSFER TO TELEMETER	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 45' 0"	151	8	CUTC	SUVM	INSTALL CHE ASSEMBLY	
-17 HRS 30' 0"	171	1	C2AE	C2TC	MAINSTAGE OK PRESSURE SWITCH VERIFICATION IS COMPLETE.	
	171	2	U2MU	C2TC	TASK #22 INITIAL UMBILICAL PREPS ARE COMPLETE.	
	151	3	CUTC	SUVM	VERIFY CHE ASSEMBLY IS INSTALLED	
	121	4	CUTC	CLTC	CHE INSTALLATION IS COMPLETE	
	121	5	CVTS	CLTC	LM SHE TOPOFF LINES HAVE BEEN DISCONNECTED, YOU ARE CLEARED TO REMOVE FDS FROM THE IU/S-IVB	TCPI
	121	6	CLTC	C4TC CUTC	COORDINATE DIRECTLY WITH LM PERSONNEL AND REMOVE FDS FROM THE IU/S-IVB	
	161	7	C4TC	S4MF	REMOVE FIRST LM ACCESS STEP PER V-30539, APPENDIX D. REPORT WHEN COMPLETE.	
-17 HRS 15' 0"	121	1	CLIK	CLTC	MT-01 (MEAS SCAN) COMPLETE.	
	121	2	CLTC	C1IP	HARDWIRE MEASUREMENT TO GROUND.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 15' 0"						
	121	3	CLTC	C1IP	28 VOLT RACS, LOX & FUEL RACS AND 400 HZ POWER - OFF.	
	121	4	CLTC	C2NP	RACS POWER OFF	
	151	5	CUTC	CUIP	MEAS TRANSFER - OFF S-II BURN TEST & S-IVB COAST TEST-OFF (60X-607A6-CISS PANEL)	
	121	6	CLTC	C4IP	PRELAUNCH CHECKOUT GROUP OFF	
	181	7	C1TC	C1PE CHDA CTS1	VERIFY READY FOR LOWERING LUT ZERO LEVEL PLATFORM	
	181	8	C1TC	C1PC	TURN ON LOW LOX DOME PURGE.	
	181	9	C1TC	C1HP	APPLY S-IC HYDRAULICS. REPORT WHEN COMPLETE.	
	181	10	C1TC	C1PC	LOW LOX DOME PURGE OFF AFTER HYDRAULICS IS APPLIED.	
	181	11	C1TC	CPDC	VERIFY LLP PREPS FOR LOWERING COMPLETE AND LOWER LLP PER V-36070. REPORT WHEN COMPLETE.	B-204-111
	188	12	C1TC	ALL	THE LUT LEVEL PLATFORM IS BEING LOWERED. THE FLAME WELL OF THE MOBILE LAUNCHER IS NOW AN UNPROTECTED PAD AREA	
	118	13	CSAC	CSA1 CSA2 CSA3 CSA4 CSA5 CSA6 CSA7 CSA8 CSA9	VERIFY PRELAUNCH TOWER PREPS COMPLETE	
	181	14	C1TC	CSAC	VERIFY LSE MECHANICAL PRELIMINARY PREPS COMPLETE.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 5' 0"						
181		1	CSAC	C1TC	REQUEST CLEARANCE TO PRESSURIZE S/A'S 1, 5 AND 6	
-17 HRS 0' 0"						
181		1	C1TC	CSAC	CLEAR TO PRESSURIZE S/A'S 1, 5 AND 6. REPORT WHEN COMPLETE.	
121		2	CVTS	CLTC	RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION. REPORT WHEN COMPLETE.	TCPI
121		3	CLTC	C1TC	RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION PER V-36084. REPORT WHEN COMPLETE.	
181		4	C1TC	CECS	ESTABLISH MINIMUM POSSIBLE FLOW FOR S/M DUCT AND JUMPER LIMIT SWITCH ON FLOW CONTROL VALVE IF REQUIRED.	
181		5	C1TC	CSAC	RECONFIGURE S/A 8 ECS DUCT TO LAUNCH CONFIGURATION. REPORT WHEN COMPLETE.	
118		6	CSAC	CSA8	RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION PER V-36084. REPORT WHEN COMPLETE.	
171		7	C2TC	C2LD	SECURE COMMON BULKHEAD EVACUATION AND VERIFY ALL LEAK DETECTION CIRCUITS ACTIVATED PER V-26276 (G058).	
171		8	C2LD	L257	REPORT WHEN COMMON BULKHEAD EVACUATION IS SECURED AND ALL LEAK DETECTION CIRCUITS ARE ACTIVATED.	
171		9	L257	C2LD C2TC	EVACUATION COMPLETE AND ALL CIRCUITS ACTIVATED.	
161		10	C4TC	S4MA	VERIFY AFT ACCESS KIT REMOVAL COMPLETED.	
181		11	C1TC	C1PE	VERIFY REMOVAL OF S-IC FORWARD ACCESS KIT EXCEPT AS REQ'D FOR S&A DEVICE CONNECTION.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 0' 0"	181	12	C1TC	C1NE	VERIFY PD PULSE SENSOR UNITS CONNECTED	
	161	13	C4TC	S4MA	INSTALL AFT INTERSTAGE ACCESS DOOR PER V-30539, SECT M.	
	161	14	C4TC	S4PC	REMOVE STAGE MONITOR HUT. REPORT WHEN COMPLETE.	
	181	15	C1TC	BRFS	VERIFY READY FOR RANGE SUPPORT OF DRSCS PREPS.	
	121	16	C1TC	CLTC	READY FOR RANGE TO SUPPORT DRSCS PREPS.	
	111	17	CLTC	CVTS	REQUEST RANGE SUPPORT DRSCS PREPS ON CHANNEL 137 PER V-38000.	TCPI
	118	18	CSAC	CSAD	START DRRS PREPS PER V-36086.	
	118	19	CSAC	CSA1	PRESSURIZE ARM #1 PER V-36077.	
	118	20	CSAC	CSA5	PRESSURIZE ARM #5 PER V-36081.	
	118	21	CSAC	CSA6	PRESSURIZE ARM #6 PER V-36082.	
-16 HRS 45' 0"	171	1	C2TC	C2DP	VERIFY PD PULSE SENSOR UNITS CONNECTED.	
	181	2	CHDA	C1TC	LLP LOWERING COMPLETE	
	181	3	C1TC	C1HP C1PC	APPLY LOW LOX DOME PURGE, TURN OFF S-IC HYDRAULICS, AND THEN TURN OFF LOW LOX DOME PURGE.	
-16 HRS 45' 0"	181	1	CSAC	C1TC	S/A'S 1, 5 & 6 PRESSURIZED. REQUEST CLEARANCE TO PRESSURIZE S/A'S 2, 4 & 7	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-16 HRS 30: 00						
181		1	CLTC	OSAC	CLEAR TO PRESSURIZE S/A'S 2, 4 & 7, REPORT WHEN COMPLETE,	
151		2	CUTC	SUVM	REMOVE SUBLIMATOR VENT COVERS PER V-51062, PART III, REPORT WHEN COMPLETE,	#
151		3	CUTC	SUVM	REMOVE CHE ASSEMBLY, REPORT WHEN COMPLETE,	
151		4	CUTC	SUVE	REMOVE SHE IU CABLE RACK COVER ASSEMBLY, REPORT WHEN COMPLETE,	
121		5	CLTC	ETMS BTMI	VERIFY CIP DATA TRANSMISSION LINK ON	
121		6	CLTC C2TC C4TC		INSTALL PD RSCR ENABLE JUMPERS FOR DRSCS TESTS AND REPORT COMPLETION	
181		7	CLTC	L1RS	INSTALL PD RSCR ENABLE JUMPER J5 ON PANEL X02-121A2,	
		7-1			VERIFICATION BY LV-QAL	
171		8	C2TC	L2RR	INSTALL PD RSCR ENABLE JUMPER J2 ON PANEL X02-220A2	
		8-1			VERIFICATION BY LV-QAL	
161		9	C4TC	L4JR	INSTALL PD RSCR ENABLE JUMPER E2 ON PANEL X02-423A2	
		9-1			VERIFICATION BY LV-QAL	
121		10	CLTC C2TC C4TC		VERIFY PD PULSE SENSOR UNITS CONNECTED	
161		11	C4TC	S4MA	VERIFY AFT ACCESS DOOR SECURED AND READY FOR AFT CARRIER MECH, CHECKS,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
146 HRS 30: 00						
110	12	CSAC	CSA2		PRESSURIZE ARM #2 PER V-36078	
110	13	CSAC	CSA4		PRESSURIZE ARM #4 PER V-36080	
110	14	CSAC	CSA7		PRESSURIZE ARM #7 PER V-36083	
110	15	CSAC	CSA6		START PRECLOSEOUT CHECKLIST	
151	16	CLTC	CUTC		THE G-BALL COVER WILL BE INSTALLED IN APPROXIMATELY 1 HOUR. IU PERSONNEL WILL BE REQUIRED ON STATION TO MONITOR THE OPERATION.	
146 HRS 19: 00						
111	1	CLTC	CVTS		ADVISE CPSS THAT PD ENABLE JUMPERS ARE INSTALLED.	TCPI
101	2	CLTC	S4ME		REMOVE FDS PLATFORM AND MOVE SECOND LM ACCESS STEP IN FRONT OF LM T91 PER V-30539, SECT O.	
146 HRS 5: 00						
101	1	CSAC	CLTC		S/A'S 2, 4 & 7 AND PRIMARY DAMPER PRESSURIZED. REQUEST CLEARANCE TO PRESSURIZE S/A'S 8 & 9	
146 HRS 0: 00						
101	1	CLTC	CSAC		CLEAR TO PRESSURIZE S/A'S 8 & 9. REPORT WHEN COMPLETE.	
110	2	CSAC	CSA4		START PRECLOSEOUT CHECKLIST	
101	3	CLTC	L1LS		START SECOND LUT WALKDOWN. REPORT WHEN COMPLETE.	
3-1					VERIFICATION BY LV-QAL	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-16 HRS 01 ON						
110		4	CSAC	CSAB	PRESSURIZE SERVICE ARM #8 PER V-36084,	
110		5	CSAC	CSA9	PRESSURIZE SERVICE ARM #9 PER V-36085,	
171		6	C2TC	U2MU	START ARM #4 FINAL UMBILICAL PREPS PER V-30029 (M020) TASK 25, REPORT WHEN COMPLETE,	
171		7	C2TC	C2SP	DELETED CDDT ONLY	
161		8	C4TC	S4MA	START FINAL MECHANICAL CLOSEOUT AFT PER V-30539, SECT N,	
181		9	C1TC	CCLH	START LH2 COMPONENT TEST PER V-35004	
121		10	CLTC	BRFS	VERIFY DRSCS/GSE READY TO SUPPORT DRSCR OPEN LOOP TEST	
111		11	CLTC	CVTS	VERIFY THE RANGE READY TO SUPPORT OPEN LOOP DRSCR TEST WITH TEST CODE PLUGS, REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN,	TCP!
111		12	CLTC	CVTS	REQUEST RANGE SAFETY COMMAND TRANSMITTER #1 - ON AND VERIFY,	TCP!
121		13	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS <u>DRSCR OPEN LOOP TEST (TEST CODE PLUGS)</u>	
121		14	CLTC	RLDE	DELETED CDDT ONLY	
100		15	CLTC	ALL	ALL PERSONNEL SUPPORTING L/V RSCR TEST MONITOR CHANNEL 121 & TC CHANNELS	
121		16	CLTC	C1DP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT: PD RSCR'S ENABLE - OFF SYSTEMS STATUS SWITCH - SAFE S & A SWITCH - SAFE	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
16 HRS 01 ON						
121		17	CLTC	C4DP	PULSE SENSOR POWER ON	
121		18	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE,	
		18-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON	
121		19	CLTC	RRSC	VERIFY DRSCS RECORDERS ON	
121		20	CLTC	BTMC	TM TAPE RECORDER - ON TO SUPPORT DRSCR TEST,	
111		21	CLTC	CVTS	REQUEST SRD SWITCH TO CHANNEL 121 TO SUPPORT DRSCR TEST,	TCP1
121		22	CLTC	C1DP C2DP C4DP	STATUS SYSTEM SAFE SWITCH - OFF,	
		23		C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE	
121		24	CLTC	C1DP C2DP C4DP	RSCRIS 1 & 2 - INTERNAL & VERIFY,	
		24-1		C1DP C2DP C4DP	*** NOTE EBWIS 1 & 2 OFF,	
		24-2		B1RF B2RF B4RF CRSS	*** NOTE ALL RSCR LIMITER VOLTAGES RECEIVED,	
110		25	CSAC	CSA1	START PRECLOSEOUT CHECKLIST	

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CD ONLY						
-15 HRS 53:00						
121		1	CLTC	RRSC	RECORDERS - FAST SPEED	
121		2	CLTC	SRO	ON YOUR MARK SEND TEST CUTOFF COMMAND CONTINUOUSLY	
121		3	SRO	ALL	3-2-1-MARK	
121		4	CLTC	BRFS	SET AUDIO SELECT SWITCH TO THE FOLLOWING POSITIONS ON YOUR MARK: S-1C - RSCR #1 S-1C - RSCR #2 S-11 - RSCR #1 S-11 - RSCR #2 S-1VB - RSCR #1 S-1VB - RSCR #2	
121		5	CLTC	SRO	REMOVE CUTOFF COMMAND	
121		6	CLTC	BRFS	AUDIO SELECT SWITCH - OFF	
121		7	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		8	CLTC	CRSS	VERIFY DRSCR GND RF LINK CHECK WAS ILLUMINATED FOR EACH SWITCH POSITION	
		8-1		BRFS	*** NOTE DRSCR GND RF LINK CHECK WAS ILLUMINATED FOR EACH SWITCH POSITION	
121		9	CLTC	C1DP C2DP C4DP	DELETED CDDT ONLY	
		9-1		CRSS BRFS	DELETED CDDT ONLY	
121		10	CLTC	C1DP C2DP C4DP	DELETED CDDT ONLY	
		10-1		CRSS	DELETED CDDT ONLY	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-15 HRS 53:00						
121		11	CLTC	C1DP C2DP C4DP	DELETED CDDT ONLY	
		11-1		CRSS	DELETED CDDT ONLY	
121		12	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 AND 2 CUTOFF NOT RECEIVED	
		12-1		CRSS BRFS	*** NOTE CUTOFF NOT RECEIVED	
121		13	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 AND 2 NOT CHARGED	
		13-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
-15 HRS 50:00						
121		1	CLTC	SRO	SWITCH TO RANGE SAFETY COMMAND TRANSMITTER #2	
		1-1		B1RF B2RF B4RF CRSS	*** NOTE ALL RSCR LIMITER VOLTAGES RECEIVED	
121		2	CLTC	RRSC	RECORDERS - FAST SPEED	
121		3	CLTC	SRO	ON YOUR MARK SEND TEST CUTOFF COMMAND CONTINUOUSLY	
121		4	SRO		3-2-1-MARK	
121		5	CLTC	BRFS	SET AUDIO SELECT SWITCH TO THE FOLLOWING POSITIONS ON YOUR MARK	
					S-1C - RSCR #1 S-1C - RSCR #2 S-1I - RSCR #1 S-1I - RSCR #2 S-1VB - RSCR #1 S-1VB - RSCR #2	

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					CD ONLY	
-15 HRS 50: 00						
121		6	CLTC	SRO	REMOVE CUTOFF COMMAND	
121		7	CLTC	BRFS	AUDIO SELECT SWITCH - OFF	
121		8	CLTC	RRSC	RECORDERS - SLOW	
121		9	CLTC	CRSS	VERIFY DRSCR GND RF LINK CHECK ILLUMINATED FOR EACH SWITCH POSITION;	
121		9-1		BRFS	*** NOTE DRSCR GND RF LINK CHECK ILLUMINATED FOR EACH SWITCH POSITION;	
121		10	CLTC	C1DP C2DP C4DP	DELETED CDDT ONLY	
		10-1		CRSS BRFS	DELETED CDDT ONLY	
121		11	CLTC	C1DP C2DP C4DP	DELETED CDDT ONLY	
		11-1		CRSS	DELETED CDDT ONLY	
121		12	CLTC	C1DP C2DP C4DP	DELETED CDDT ONLY	
		12-1		CRSS	DELETED CDDT ONLY	
121		13	CLTC	C1DP C2DP C4DP	VERIFY RSCRS 1 AND 2 CUTOFF NOT RECEIVED;	
		13-1		CRSS BRFS	*** NOTE CUTOFF NOT RECEIVED	

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CD ONLY						
-15 HRS 50: 00		121: 14	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 AND 2 NOT CHARGED	#
		14-1:	CRSS	***	NOTE ALL EBW'S NOT CHARGED	#
-15 HRS 25: 00		121: 1	CLTC	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO;	
		121: 2	CLTC	C1DP C2DP C4DP	VERIFY RSCR POWER OFF;	
		121: 3	CLTC	CLVN	DESTRUCT SYSTEM - OFF; DELIVER DESTRUCT SYSTEM KEY TO CPSS; REPORT WHEN COMPLETE;	
		121: 4	CLTC	BTMC	TELEMETRY TAPE RECORDER - OFF & RELOAD FOR DRSCR CLOSED LOOP TEST (APPROX 3 MIN FOR RELOAD);	
		111: 5	CLTC	CVTS	DRSCR OPEN LOOP TEST COMPLETE; REQUEST RANGE SAFETY COMMAND TRANSMITTERS - OFF; DESTRUCT SYSTEM KEY RETURNED TO CPSS;	TCPI
		111: 6	CLTC	CVTS	REQUEST SRO TO RECONFIGURE TO FLIGHT CODE PLUGS	# TCPI
		121: 7	CLTC	RLDE	DELETED CDDT ONLY	
		181: 8	CLTC	CPDC	VERIFY LLP LOWERED & SECURED AND PREP TRANSPORTER FOR MOVE TO SOUTH END OF PAD PER V-36070;	B-204-111
		181: 9	CLTC	CPDC	START SECURING LUT WINCHES PER V-36070	B-204-111
		181: 10	CLTC	S4MA	VERIFY AFT CARRIER PREPS COMPLETE AND READY TO RETRACT ARM #6 TIP;	

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-15 HRS 45' 0"						
181		11	C4TC	C1TC	READY FOR SERVICE ARM #6 TIP RETRACTION.	
181		12	C1TC	CSAC	VERIFY PRECLOSE OUT CHECK LIST COMPLETE AND RETRACT SERVICE ARM EXTENSION PLATFORM AND CLOSE SAFETY GATE FOR ARM #6. REPORT WHEN COMPLETE.	
118		13	CSAC	CSA6	START FINAL TOWER PREPS PER V-36082	
-15 HRS 35' 0"						
112		1	CLTC	CTSC	VERIFY HAMMERHEAD CRANE IS SECURED FOR LAUNCH AND ACCESS HATCH TO 380' LEVEL IS UNLOCKED	TOPI
121		2	CLTC	C1TC	HAMMERHEAD CRANE IS SECURED FOR LAUNCH AND ACCESS HATCH IS UNLOCKED	
181		3	CUTC	C1TC	IU PERSONNEL ARE ON STATION TO MONITOR Q-BALL COVER INSTALLATION.	
181		4	C1TC	CPDC	H/H CRANE IS SECURED FOR LAUNCH. PROCEED WITH Q-BALL COVER LAUNCH PREPS PER V-36112	
121		5	CLTC	C2TC C4TC	VERIFY READY TO ACTIVATE 6000 PSI GH2 SUPPLY	
112		6	CLTC	CTSC	ACTIVATE 6000 PSI GH2 SUPPLY.	TOPI
111		7	CLTC	CVTS	REQUEST SCO PERSONNEL ON CH. 223 FOR ABORT LIGHT VERIFICATION. REQUEST EDS POWER ON.	TOPI
161		8	C4TC	S4MF	REMOVE SECOND LEM ACCESS STEP PER V-30539 APPENDIX D (COORDINATE DIRECTLY WITH LM PAD LEADER). REPORT WHEN COMPLETE.	
181		9	CSAC	C1TC	S/A'S 8 & 9 PRESSURIZED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 30' 0"	188	1	CVTS	PA	ALL NON-ESSENTIAL PERSONNEL ARE TO CLEAR THE CONTROL AREA FOR ALSEP FCA INSTALLATION. RADIATION AREA CONTROL IS IN EFFECT	TOPI
		1-1			*****WARNING***** * * THE CONTROL AREA FOR * * ALSEP FCA INSTALLATION * * CONSISTS OF THE SLA, * * IU, S-IVB FWD, S/A 7 * * AND A 10 FT PATHWAY UP * * THE MSS TO PLATFORM 3A. * * *****	
	121	1-2	CVTS	CLTC	INCREASE SM ECS FLOW RATE TO 100 LB/MIN	TOPI
	121	1-3	CLTC	C1TC	INCREASE SM ECS FLOW RATE TO 100 LB/MIN	
	181	1-4	C1TC	CECS	INCREASE SM ECS FLOW RATE TO 100 LB/MIN	
	118	2	CSAC	CSAB	START PRECLOSEOUT CHECKLIST	
	181	3	CSAC	C1TC	STARTING S/A 8 CLOSEOUT	
	121	4	C1TC	CLTC	STARTING S/A 8 CLOSEOUT	
	111	5	CLTC	CVTS	ADVISE SC GC THAT LV IS STARTING S/A 8 CLOSEOUT	TOPI
	121	6	CVTS	CLTC	CLEAR TO REMOVE THE S/A 8 EMERGENCY EGRESS LADDER & DOOR ASSEMBLY.	TOPI
	121	7	CLTC	C1TC	REMOVE S/A 8 EMERGENCY EGRESS LADDER & DOOR ASSEMBLY	
	181	8	C1TC	CSAC	REMOVE S/A 8 EMERGENCY EGRESS LADDER & DOOR ASSEMBLY	
	118	9	CSAC	CSAB	REMOVE EMERGENCY EGRESS LADDER & DOOR ASSEMBLY	
	118	10	CSAC	CHCU	SECURE ONE PUMP AND VERIFY OTHER PUMP IS RUNNING	
	111	11	CLTC	CVTS	VERIFY THE RANGE READY FOR RANGE SAFETY COMMAND CLOSED LOOP CHECKS.	TOPI
	111	12	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP THE LOCAL UHF CMD CARRIER & RANGE READY TO SUPPORT DRSCR CLOSED LOOP TEST ON CH. 121. 450 MHZ OPEN LOOP PROTECTION IS REQUIRED	TOPI

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-15 HRS 30' 0"					DRSCR CLOSED LOOP TEST. -----	
	111	13	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN	TOPI
	121	14	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	
	188	15	CLTC	ALL	ALL PERSONNEL SUPPORTING L/V RS CMD CHECKS SWITCH TO CHANNEL 121 AND MONITOR "TC" CHANNEL.	
	121	16	CLTC	BTMC	TM TAPE RECORDING ON TO SUPPORT DRSCS CLOSED LOOP TEST.	
		16-1		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR CHECK.	
	121	17	CLTC	C1DP C2DP C4DP	VERIFY THE FOLLOWING SWITCH POSITIONS: PD RSCR ENABLE -- OFF STATUS SYSTEMS SWITCH -- OFF S AND A STATUS SWITCH -- SAFE	
	121	18	CLTC	RRSC	VERIFY DRSCS RECORDERS ON	
	121	19	CLTC	C4ET	ENGINE CONTROL POWER -- ON.	
	121	20	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE	
		20-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON.	
	121	21	CLTC	C1DP C2DP C4DP	EBW GROUND POWER -- ON VERIFY EBW'S 1 & 2 CHARGED	
		21-1		CRSS	*** NOTE ALL EBW'S CHARGED.	
	121	22	CLTC	BRFS	SIGNAL GENERATOR SELECTOR -- NO. 1 AND VERIFY REMOTE MONITOR HYBRID.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 30' 0"						
	121	23	CLTC	C1DP C2DP C4DP	RSCR GROUND POWER - ON	
		23-1		CRSS	*** NOTE ALL RSCR'S ON	
	121	24	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 CHARGING VOLTAGES DECREASE TO ZERO.	
		24-1		CRSS	*** NOTE EBW CHARGING VOLTAGES DECREASE TO ZERO.	
	121	25	CLTC	B1RF B2RF B4RF	VERIFY LIMITER VOLTAGES OK.	
		25-1		CRSS	*** NOTE ALL LIMITER VOLTAGE INDICATIONS RECEIVED.	
	121	26	CLTC	C1DP C2DP C4DP	EBW'S 1 & 2 GROUND POWER - OFF	
		26-1		C2NP	CYCLE MAIN/INSTR BATT BLEED SWITCHES TO MAINTAIN BATT VOLTAGES IN TOLERANCE.	
	121	27	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 TRANSFER - INTERNAL	
	121	28	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 POWER ON AND INTERNAL POWER ON.	
		28-1		CRSS	*** NOTE ALL RSCR'S ON INTERNAL POWER.	
	121	29	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 GROUND POWER - OFF.	
	121	30	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 REMAIN ON	

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-15 HRS 30' 0"		30-1		C4SS	***** NOTE ALL RSCR'S REMAIN ON	
	181	31	C1TC	CCRP	START FINAL RP-1 SYSTEM PREPS PER V-25389	
	181	32	C1TC	CECS	CONFIGURE ECS TO SUPPORT ALSEP. REPORT WHEN COMPLETE. (CONFIGURE REDUNDANT BLOWER FOR SUPPORT).	
	121	33	C1TC	CLTC	REQUEST ACCE (CCF GN2) REPORT TO CECS ON CH 142 FOR ECS SUPPORT	
	111	34	CLTC	CVTS	REQUEST ACCE REPORT TO CECS ON CH 142 FOR ECS SUPPORT	TCPI
-15 HRS 25' 0"						
	161	1	C4TC	S40R	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS AND CDF NOT CONNECTED TO S & A'S.	
	181	2	C1TC	C1NE	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS & CDF NOT CONNECTED TO S & A.	
	171	3	C2TC	U2H0	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS AND CDF NOT CONNECTED TO S&A	
	121	4	CLTC	C1TC C2TC C4TC	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS AND CDF NOT CONNECTED TO S & A'S	
-15 HRS 20' 0"						
	121	1	C1TC	CLTC	READY FOR CONNECTION OF Q-BALL COVER RETRACT CABLES.	
	111	2	CLTC	CVTS	MSS PLATFORM #5 IS AVAILABLE FOR OPENING IN CONJUNCTION WITH Q-BALL CABLE CONNECTION.	TCPI
	181	3	C1TC	CPDC	CONNECT Q-BALL COVER RETRACT CABLES IN CONJUNCTION WITH PLATFORM #5 MOVEMENT AND START RETRACT SYSTEM PREPS PER V-36112	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 20' 0"						
	121	4	CLTC	C1DP C2DP C4DP	SAFE & ARM TO ARM FOR 2 SECONDS THEN AUTO	
		4-1		C1FR	*** NOTE ORDNANCE PREPS COMPLETE	
		4-2		CRSS	*** NOTE ALL S & A'S ARMED	
	121	5	CLTC	C1DP C2DP C4DP	SAFE S & A DEVICE AND REPORT SAFED. LEAVE SWITCH IN SAFE POSITION.	
		5-1		CRSS	*** NOTE ALL S & A'S SAFE	
	121	6	CLTC	C1DP C2DP C4DP	PD RSCR ENABLE - ON	
		6-1		C1DP C2DP C4DP CRSS	*** NOTE PD BLOCKED INDICATIONS OFF	
	121	7	CLTC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO CUTOFF.	
	121	8	CLTC	C2AE	VERIFY ENGINE CUTOFF SAFE ON.	
	121	9	CLTC	RRSC	RECORDERS - FAST SPEED.	
	121	10	CLTC	SRO	ON YOUR MARK SIMULTANEOUSLY SEND CUTOFF AND PD ON CLOSED LOOP LINKS FOR 7 SECONDS.	
	121	11	SRO	ALL	3-2-1-MARK	
	121	12	CLTC	RRSC	RECORDERS - SLOW SPEED.	
	121	13	CLTC	CUEF	VERIFY ABORT REQUEST A & B ON.	
	121	14	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 CUTOFF RECEIVED IMMEDIATELY AND PD RECEIVED AFTER 4 SECONDS	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 20' 0"						
	223	15	CLTC	SCDR	VERIFY ABORT LIGHT ON.	TCPI
		15-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED IMMEDIATELY AND PD RECEIVED AFTER 4 SECONDS	
	121	16	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 ON INTERNAL AND CHARGED.	
		16-1		CRSS	*** NOTE ALL EBW'S CHARGED.	
		16-2		C1FR	*** NOTE ORDNANCE PREPS COMPLETE OFF	
	121	16-3	CLTC	C4ET	VERIFY ENGINE CONTROL POWER INDICATION OFF	
	121	17	CLTC	C2AE	VERIFY ENGINE CUTOFF SAFE OFF	
	121	18	CLTC	C1CS	VERIFY ENGINE CUTOFF.	
		19		C4ET	*** NOTE NON PROGRAM CUTOFF ON.	
		20		C4ET	*** NOTE ENGINE CUTOFF ON.	
	121	21	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 FIRED AFTER 4 SECONDS	
		21-1		CRSS	*** NOTE ALL EBW'S FIRED AFTER 4 SECONDS	
	121	22	CLTC	RRSC	VERIFY 4 SECOND DELAY BETWEEN INITIATION OF CUTOFF & PD COMMANDS.	NOTE: OK
	121	23	CLTC	C1DP C2DP C4DP	PULSE SENSORS - RESET THEN AUTO.	
	121	24	CLTC	C1DP C2DP C4DP	VERIFY EBW'S FIRED - OFF	
		24-1		CRSS	*** NOTE EBW'S FIRED - OFF	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 20' 0"						
	121	25	CLTC	C1DP C2DP C4DP	EBW'S #2 THEN #1 TRANSFER - EXTERNAL THEN AUTO AND VERIFY EBW'S NOT CHARGED.	
		25-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
	121	26	CLTC	C4ET	VERIFY ENGINE CONTROL POWER ON.	
	121	27	CLTC	CUEF	VERIFY ABORT REQUEST A & B OFF	
	223	28	CLTC	SCDR	VERIFY ABORT LIGHT OUT.	TOP1
	121	29	CLTC	C2AE	VERIFY ENGINE CUTOFF SAFE ON.	
	121	30	CLTC	C1CS C4ET	VERIFY ENGINE CUTOFF INDICATIONS OFF.	
	121	31	CLTC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO AUTO AND VERIFY ENGINE CUTOFF SAFE OFF.	
	121	32	CLTC	C4ET	ENGINE CONTROL POWER - OFF.	
-15 HRS 15' 0"						
	121	1	CLTC	C1DP C2DP C4DP	PD RSCR ENABLE - OFF	
		1-1		C1DP C2DP C4DP CRSS	*** NOTE PD BLOCKED INDICATIONS ON	
	121	2	CLTC	BRFS	SIGNAL GENERATOR SELECT SWITCH - POSITION 2.	
	121	3	CLTC	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
		3-1		CRSS	*** NOTE LIMITER VOLTAGE INDICATIONS	

-15 HRS
 15' 0"

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		4	CLTC	RRSC	RECORDERS - FAST SPEED.	
121		5	CLTC	SRO	ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS.	
121		6	SRO	ALL	3-2-1-MARK	
121		7	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		8	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 CUTOFF RECEIVED.	
		9		CRSS BRFS	*** NOTE CUTOFF RECEIVED.	
121		10	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 CHARGED AND ON INTERNAL POWER.	
		10-1		CRSS	*** NOTE ALL EBW'S CHARGED.	
121		11	CLTC	RRSC	RECORDERS - FAST SPEED.	
121		12	CLTC	SRO	ON YOUR MARK SEND PD ON CLOSED LOOP LINKS FOR 3 SECONDS.	
121		13	SRO	ALL	3-2-1-MARK	
121		14	CLTC	RRSC	RECORDER - SLOW SPEED.	
121		15	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED.	
		16		CRSS BRFS	*** NOTE PD INDICATIONS.	
121		17	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 REMAIN CHARGED.	
		17-1		CRSS	*** NOTE ALL EBW'S REMAIN CHARGED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 15' 0"						
	121	18	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 FIRED INDICATORS REMAIN OFF.	
		18-1		CRSS	*** NOTE ALL EBW'S FIRED INDICATORS REMAIN OFF.	
	121	19	CLTC	RRSC	RECORDERS - FAST SPEED.	
	121	20	CLTC	SRO	ON YOUR MARK SEND SAFE COMMAND ON CLOSED LOOP LINKS FOR 3 SEC.	
	121	21	SRO	ALL	3-2-1-MARK	
	121	22	CLTC	RRSC	RECORDERS - SLOW SPEED.	
	121	23	CLTC	C2DP C4DP	VERIFY RSCR'S 1 & 2 POWER OFF & EBW'S 1 & 2 DISCHARGED.	
		23-1		CRSS	*** NOTE S-II AND S-IVB RSCR'S OFF & EBW'S DISCHARGED.	
		23-2		B2RF CRSS B4RF	*** NOTE S-II & S-IVB LIMITER VOLTAGES ZERO.	
	121	24	CLTC	C1DP	VERIFY RSCR'S 1 & 2 REMAIN ON INTERNAL & S-IC EBW'S 1 & 2 REMAIN CHARGED	
		24-1		CRSS	*** NOTE S-IC RSCR'S REMAIN ON INTERNAL AND S-IC EBW'S REMAIN CHARGED	
	121	25	CLTC	C1DP C2DP C4DP	EBW'S 1 & 2 TRANSFER - EXTERNAL THEN AUTO AND VERIFY EBW'S NOT CHARGED	
		25-1		CRSS	*** NOTE S-IC EBW'S NOT CHARGED	
	121	26	CLTC	BRFS	SIG, GEN-SELECT #1.	
		26-1		CRSS BRFS	*** NOTE S-IC LIMITER VOLTAGES RECEIVED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
115 HRS 15:00						
121		27	CLTC	C2DP C4DP	RSCRIS 1 & 2 TRANSFER -- EXTERNAL THEN INTERNAL	
121		28	CLTC	B2RF B4RF	VERIFY S-11 AND S-1VB LIMITER VOLTAGES OK	
		28-1		CRSS	*** NOTE S-11 & S-1VB LIMITER VOLTAGES RECEIVED.	
121		29	CLTC	BTMC	TM TAPE RECORDING -- OFF AND RELOAD;	
		29-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	
181		30	C1TC	C1NE C1PE	VERIFY ACCESS TO 118 SECTION NO LONGER REQUIRED.	
181		31	C2TC	C1TC	YOU ARE CLEAR TO ATTACH S/A 4 UMBILICAL WITHDRAWAL LANYARDS	
		31-1		C2TC	*****WARNING***** * * VERIFY ALL S-11 WORK IN * * THE S/A 4 UMBILICAL * * AREAS IS COMPLETE * * EXCEPT SAFING PIN * * REMOVAL & A7-64 PURGE -- * * BAG CLOSEOUT. * *****WARNING*****	
181		32	C1TC	CSAC	VERIFY PRECLOSEOUT CHECKLIST COMPLETED AND RETRACT SERVICE ARM #1 EXTENSION PLATFORM AND CLOSE SAFETY GATE; REPORT WHEN COMPLETE;	
118		33	CSAC	CSA1	START FINAL TOWER PREPS PER V-36077;	
181		34	C1TC	CSAC	YOU ARE CLEARED TO COMPLETE ARM #4 FINAL UMBILICAL PREPS PER V-36080;	
118		35	CSAC	CSA4	COMPLETE S/A 4 FINAL UMBILICAL PREPS;	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 7' 00"						
121		1	CLTC	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO AND VERIFY RSCR'S OFF,	
		1-1		B1RF B2RF CRSS B4RF	*** NOTE RSCR LIMITER VOLTAGE INDICATIONS OFF,	
121		2	CLTC	CLVN	DESTRUCT SYSTEM - OFF & RETURN DESTRUCT SYSTEM KEY TO CPSS, REPORT WHEN COMPLETE,	
121		3	CLTC	C1DP C2DP C4DP	VERIFY SAFETY BUS OFF,	
121		4	CLTC	BRFS	SIGNAL GENERATOR SELECTOR - STANDBY,	
111		5	CLTC	CVTS	LOCAL COMMAND CARRIER IS OFF & DESTRUCT SYSTEMS KEY RETURNED TO CPSS,	TCP
111		6	CLTC	CVTS	RANGE SAFETY COMMAND CHECKS COMPLETE; SYNCHRONIZED POWER AND SCO PERSONNEL NO LONGER REQUIRED,	TCPI
121		7	CLTC	C1DP C2DP C4DP	STATUS SYSTEMS - SAFE,	
-15 HRS 0' 00"						
121		1	CLTC	C1TC C2TC C4TC	REMOVE PD ENABLE JUMPERS, REPORT WHEN COMPLETE,	
181		2	CLTC	L1RS	REMOVE PD ENABLE JUMPER J5 ON PANEL XD2-121A2	
		2-1			VERIFICATION BY LV-GAL	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
15 HRS 01 00							
171		3	CRTO	L2RR	REMOVE PD ENABLE JUMPER J2 ON PANEL XD2-220A2.		
		3-1			VERIFICATION BY LV-GAL		
181		4	CRTO	L4JR	REMOVE PD ENABLE JUMPER E2 ON PANEL XD2-423A2.		
		4-1			VERIFICATION BY LV-GAL		
121		5	CLTC	04DP	PULSE SENSOR POWER OFF.		
111		6	CLTC	0VTS	ADVISE CPSS THAT PD ENABLE JUMPERS HAVE BEEN REMOVED.	TCPI	
121		7	CLTC	CRSS	VERIFY RF OPEN-LOOP AND CLOSED-LOOP DRSGS CHECKS COMPLETED.		
188		8	CLTC	ALL	ALL PERSONNEL WHO SUPPORTED L/V RANGE SAFETY COMMAND CHECKS RETURN TO ASSIGNED CHANNELS.		
181		9	CLTC	OPDC	START PNEUMATIC DISTRIBUTION PREPS FOR LAUNCH PER V-36064.		
181		10	CLTC	0ECS	VERIFY ECS CONFIGURED TO SUPPORT GN2 STANDBY (HAND VALVES CLOSED)		
121		11	CLTC	CLTC	ECS IS CONFIGURED FOR GN2 STANDBY (HAND VALVES CLOSED)		
111		12	CLTC	0VTS	ECS IS CONFIGURED FOR GN2 STANDBY (HAND VALVES CLOSED)	TCPI	
		12-1			***** WARNING ***** * ECS IS TO BE CONFIGURED FOR GN2 * * STANDBY WITH HANDVALVES CLOSED * * WHILE THE ALSEP FUEL CAPSULE IS * * INSTALLED IN THE VEHICLE. FOR * * AN EMERGENCY INVOLVING THE FUEL * * CAPSULE, THE HANDVALVES WILL NOT * * BE OPENED UNTIL DIRECTED BY CVTS. * *****	TCPI	
-14 HRS 45' 0"		188	1	CVTS	PA	ALSEP FCA INSTALLATION COMPLETE. THE CONTROL AREA IS OPEN FOR NORMAL WORK. RADIATION AREA CONTROL IS STILL IN EFFECT.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-14 HRS 45: 00						
	151	2	GUTC	SUVM SUVE	START REMOVAL OF IU LIGHTS AND DIS PER IV-26178, REPORT WHEN COMPLETE.	
	181	3	CSAC	CLTC	S/A 6 CLOSEOUT COMPLETE.	
-14 HRS 45: 00						
	121	1	CLTC	CLTC	REQUEST POWER COORDINATOR HAVE 4160 VOLT BREAKERS TURNED ON AT LOX STORAGE AREA SUBSTATION, (924-1 AND 924-2)	
	118	2	CLTC	CTSC	HAVE 4160 V BREAKERS TURNED ON AT LOX STORAGE AREA SUBSTATION (924-1 & 924-2).	TCP!
-14 HRS 35: 00						
	181	1	CLTC	CLMS	VERIFY LOX/FUEL DAC POWER ON	
-14 HRS 30: 00						
	121	1	CLTC	C4TC CUTC	IU ECS AIR FLOW WILL BE INCREASED TO 200 LB/MIN AT THIS TIME	
	111	2	CLTC	CVTS	ECS FLOW RATE INTO THE IU WILL BE INCREASED TO 200 LB/MIN AT THIS TIME.	TCPI
	121	3	CLTC	C1TC	PROCEED WITH IU AIR FLOW INCREASE.	
	181	4	C1TC	CECS	INCREASE IU AIR FLOW TO 200 LB/MIN. REPORT WHEN COMPLETE.	
✓	111	5	CLTC	CVTS	VERIFY READY FOR SERVICE ARM 8 EXTENSION PLATFORM RETRACTION.	
	121	6	CLTC	C1TC	READY FOR SERVICE ARM 8 EXTENSION PLATFORM RETRACTION	
	181	7	C1TC	CSAC	VERIFY PRECLOSEOUT CHECKLIST COMPLETE, RETRACT S/A 8 EXTENSION PLATFORM AND CLOSE SAFETY GATE. REPORT WHEN COMPLETE.	
	118	8	CSAC	CSA8	START FINAL TOWER PREPS PER V-36084.	
	181	9	C1TC	CCLO	START PROPELLANT COMPONENT TEST PER V-25340.	
	171	10	U2SI	C2TC	REMOVAL OF THE FORWARD ACCESS KIT COMPLETE, EXCEPT AT ACCESS DOOR OF CONTAINER 223.	

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CD ONLY						
-14 HRS 30' 00"						
171		7	C2SP	C2TC	DELETED CDDT ONLY	
181		8	C1TC	CPDC	VERIFY G-BALL COVER RETRACT CABLE CONNECTED.	
151		9	CUTC	PUPL	VERIFY LUT EQUIPMENT REMOVAL IS COMPLETE	
9-1					VERIFICATION BY LV-GAL	
-14 HRS 15' 00"						
181		1	CSAC	C1TC	S/A 1 CLOSEOUT COMPLETE.	
-14 HRS 0' 00"						
171		1	U2MU	C2TC	ARM #4 FINAL UMBILICAL PREPS ARE COMPLETE.	
171		2	C2TC	U2SE	VERIFY READY FOR ARM #3 RETRACTION & ARM #4 TIP RETRACTION.	
181		3	C2TC	C1TC	READY FOR SERVICE ARM #3 RETRACTION & ARM #4 TIP RETRACTION.	
181		4	C1TC	CSAC	YOU ARE CLEARED TO COMPLETE S/A 3 FINAL TOWER PREPS AND PREP AND RETRACT S/A 3 PER V-36032.	
118		5	CSAC	CSA4	START FINAL TOWER PREPS PER V-36080.	
118		6	CSAC	CSA3	START FINAL TOWER PREPS PER V-36032, CLOSE SAFETY GATE AND RETRACT ARM.	
151		7	CUTC	CUCP	DELETED CDDT ONLY	
171		8	C2TC	U2AM U2FM	START DISASSEMBLY AND REMOVAL OF MONITOR HUTS.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-14 HRS 01 07					CD ONLY	
		177	9	CLTC	CLOS	START/VERIFY START OF LV QC INSPECTION OF MSS PER TOP LV-QAL ICL-5 (MSS) FOR JACKING/MOVE.
		181	10	CLTC	CCRP	START RP-1 PANEL PREPS PER V-25389.
113 HRS 49 04		121	1	CVTS	CLTC	LM 525 PLATFORM IS COMPLETE, CLEAR TO START S-1VB FWD KIT REMOVAL, TCP1
		161	2	C4TC	S4PC	VERIFY WITH LM PAD LEADER THAT 525 PLATFORM REMOVAL IS COMPLETE.
		151	3	CUTC	SUVE	VERIFY IU LIGHTS AND OIS REMOVAL COMPLETE.
		161	4	C4TC	S4MF	START FINAL WALK-A-ROUND OF FWD SKIRT AREA.
		151	5	CUTC	UUVN SUVE	VERIFY IU READY FOR ACCESS KIT REMOVAL
		121	6	C4TC	CLTC	VERIFY IU AND S/C CLEAR FOR PARTIAL REMOVAL OF S-1VB FWD ACCESS KIT.
		161	7	C4TC	S4MF	START FORWARD ACCESS KIT REMOVAL PER V-30539, SECT P.
		121	8	CVTS	CLTC	CLEAR TO CLOSE AND LOCK EMERGENCY ACCESS GATE ON S/A 7, TCP1
		121	9	CLTC	CLTC	CLOSE AND LOCK EMERGENCY ACCESS GATE ON S/A 7.
		181	10	CLTC	CSAC	CLOSE AND LOCK EMERGENCY ACCESS GATE ON S/A 7.
		118	11	CSAC	CSA7	REMOVE PENETRABLE BARRIER AND CLOSE AND LOCK EMERGENCY EGRESS GATES.

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-13 HRS 30' 0"	121	1	CTSC	CLTC	6000 PSI GH2 SUPPLY ACTIVATED.	TCPI
	121	2	CLTC	C2TC C4TC	6000 PSI GH2 SUPPLY ACTIVATED.	
	171	3	C2TC	C2GP	START GH2 PREPS PER V-30029 (M020) TASK 27. REPORT WHEN COMPLETE.	
	161	4	C4TC	C4PS	START GH2 PREPS PER V-30539, SECT K.	
	161	5	C4TC	S4SY	STANDBY ON LUT 240 FT LEVEL TO PERFORM GH2 SNIFFER CHECKS	
	121	6	C1TC	CLTC	RP-1 REPLENISH WILL START IN 30 MINUTES. REQUEST PERMISSION TO PROCEED AT THAT TIME.	
	181	7	C1TC	CCRP	START FINAL PREPS FOR RP-1 REPLENISH INCLUDING TSM FILL PER V-25389.	
	111	8	CLTC	CVTS	RP-1 REPLENISH WILL START IN 30 MINUTES	TCPI
	121	9	CLTC	C1TC C2TC C4TC CUTC	IN 15 MINUTES, LUT ZERO LEVEL WILL BE CLEARED FOR 40 MINUTES FOR RP-1 REPLENISH. A PATHWAY TO THE ELEVATORS WILL BE PROVIDED FOR ACCESS.	
	171	10	C2TC	U2EO	REMOVE S-II PD EBW PULSE SENSORS PER V-30029 (M020) TASK 23. REPORT WHEN COMPLETE.	
	181	11	CSAC	C1TC	S/A 8 CLOSEOUT COMPLETE.	
-13 HRS 15' 0"	188	1	CVTS	PA	ALL NON-ESSENTIAL PERSONNEL ARE TO CLEAR THE CONTROL AREA FOR LV RP-1 REPLENISH OPERATIONS	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-13 HRS 15' 0"		1-1			*****WARNING***** * THE CONTROL AREA FOR LV * * RP-1 REPLENISH * * OPERATIONS CONSISTS OF * * THE ML ZERO LEVEL. A * * CONTROLLED WALKWAY WILL * * BE OPEN TO THE * * ELEVATORS. * *****	
-13 HRS 0' 0"						
	181	1	CSAC	C1TC	S/A 4 CLOSEOUT COMPLETE	
	121	2	CVTS	CLTC	CLEAR TO START RP-1 REPLENISH	TCPI
	121	3	CLTC	C1TC	CLEAR TO START RP-1 REPLENISH.	
	181	4	C1TC	CCRP	START RP-1 REPLENISH PER V-25389	
-12 HRS 30' 0"						
	121	1	CTSC	CLTC	6000 PSI HELIUM PAD/MSS BEING DISCONNECTED	TCPI
-12 HRS 20' 0"						
	121	1	C1TC	CLTC	VERIFY READY FOR WHITE ROOM MSS DOOR LOCK INSTALLATION.	
	111	2	CLTC	CVTS	VERIFY READY FOR WHITE ROOM MSS DOOR LOCK INSTALLATION.	TCPI
	181	3	C1TC	CSAC	INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK.	
	118	4	CSAC	CSA9	INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK PER V-36085.	
	181	5	C1TC	CCRP	VERIFY RP-1 REPLENISH COMPLETE AND LINE DRAIN IN PROGRESS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-12 HRS 20' 0"						
	121	6	C1TC	CLTC	RP-1 REPLENISH IS COMPLETE	
	111	7	CLTC	CVTS	RP-1 REPLENISH IS COMPLETE	TCPI
	188	8	CVTS	PA	LV RP-1 REPLENISHING OPERATIONS ARE COMPLETE. THE CONTROL AREA IS OPEN FOR NORMAL WORK.	TCPI
-12 HRS 15' 0"						
	121	1	CVTS	CLTC	VERIFY READY FOR MSS POWER TRANSFER	TCPI
	121	2	CLTC	V2MS V4MS	REPORT S-II AND S-IVB FUEL TANK PRESSURE READINGS TO MSTC ON CHANNEL 212. S-II D252-219 & D253-219 S-IVB D177-410 & D178-410	TCPI
	121	3	C1TC	CLTC	REQUEST CTSC PROVIDE SUPPORT FOR REMOVAL OF STAGE MONITOR SHACK AND S-IC STAGE SECURITY BARRIER.	
	112	4	CLTC	CTSC	REQUEST SUPPORT REMOVE THE S-IC STAGE MONITOR SHACK AND S-IC STAGE SECURITY BARRIER.	TCPI
-12 HRS 0' 0"						
	121	1	CTSC	CLTC	STAGE MONITOR SHACK AND S-IC STAGE SECURITY BARRIER BEING REMOVED.	TCPI
	121	2	CLTC	C1TC	STAGE MONITOR SHACK AND S-IC STAGE SECURITY BARRIER BEING REMOVED.	
	171	3	U2FM	C2TC	FWD AND AFT MONITOR HUTS ARE REMOVED	
	171	4	C2TC	C2DP	CONFIGURE ORDNANCE & PD PANEL FOR S&A CONNECTION PER V-30029 (M020) TASK 28. REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-12 HRS 0' 0"						
	171	5	C2BP	C2TC	ORDNANCE & PD PANELS ARE CONFIGURED FOR S&A CONNECTION.	
	171	6	U2EO	C2TC	PD EBW PULSE SENSOR REMOVAL COMPLETE.	
	171	7	C2TC	U2EO	PREP FOR PD EBW FIRING UNIT STRAY VOLTAGE CHECKS PER V-29050 (K010) (CDDT) V-29024 (K008) (CD). REPORT WHEN COMPLETE.	
	161	8	C4TC	C4SM	START CONTROL PANEL SETUPS AND INERT S&A REMOVAL PER V-30539, SECT R.	
	181	9	C1TC	CCLO	VERIFY COMPONENT TEST IS COMPLETE AND START LOX SYSTEM FINAL PREPS FOR LOADING PER V-25340.	
	181	10	C1TC	CCLH	VERIFY PROPELLANT COMPONENT TESTS COMPLETED PER V-35004.	
	181	11	C1TC	CCLH	START LH2 FINAL SYSTEMS PREPS FOR LOADING PER V-35004.	
	121	12	C1TC	CLTC	REQUEST CPSS RELEASE TCS KEY TO C1SP	
	111	13	CLTC	CVTS	REQUEST CPSS RELEASE TCS KEY TO C1SP FOR IGNITION SOURCE VOLTAGE CHECKS.	TCPI
	181	14	C1TC	C1EN	IGNITORS INSTALLED SWITCH TO ARM MOMENTARILY AND VERIFY ALL IGNITORS AND HYPERGOLS INSTALLED	
	181	15	C1TC	C1SP	VERIFY TCS POWER SUPPLY OFF	
	181	16	C1TC	C1NP	1D152 BUS ON	
	181	17	C1TC	C1SP	ARM TCS	
	181	18	C1TC	C1FR	VERIFY IGNITION SOURCE VOLTAGE OK	
	181	19	C1TC	C1SP	SAFE TCS AND RETURN TCS KEY TO CPSS	
	181	20	C1TC	C1NP	1D152 BUS OFF	
	121	21	C1TC	CLTC	TCS SAFE AND TCS KEY RETURNED TO CPSS	

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-12 HRS 0' 0"	111	22	CLTC	CVTS	IGNITION SOURCE VOLTAGE CHECKS COMPLETE. TCS HAS BEEN SAFED AND TCS KEY HAS BEEN RETURNED TO CPSS.	TOPI
	121	23	CLTC	CUTC C1TC	REMOVE ACCESS DOOR RAIN CANOPIES AND STORE.	
	151	24	CUTC	SUVM	REMOVE ACCESS DOOR RAIN CANOPY AND STORE. REPORT WHEN COMPLETE.	
	181	25	C1TC	C1PE	REMOVE ACCESS DOOR RAIN CANOPIES AND STORE.	
	171	26	C2TC	C2LD	START HE K-BOTTLE CHANGEOUT AND CALIBRATION PER V-30029 (M020) TASK 30, IN 07-55, WITHIN 3 HOURS PRIOR TO ACTUAL COUNT TIME OF T-8:59. VERIFY ALL LEAK DETECTION CIRCUITS ACTIVATED PER V-26276 (G058), PRIOR TO EVACUATING PAD. REPORT WHEN COMPLETE.	
	121	27	CVTS	CLTC	REQUEST MSS PLATFORM OBSERVERS TO REPORT TO PVTS AT MSS BASE LOW RISE ELEVATOR AT T-11:45 FOR OBSERVER BRIEFING.	TOPI
		27-1		CLTC	*** NOTE THE POSITION OF PLATFORM 1 WILL DETERMINE WHICH STAGE (S-IC OR S-II) PROVIDES OBSERVERS.	
	121	28	CLTC	C1TC C2TC C4TC CUTC	REQUEST MSS PLATFORM OBSERVERS TO REPORT TO PVTS AT MSS BASE LOW RISE ELEVATOR AT T-11:45 FOR OBSERVER BRIEFING	
-11 HRS 45' 0"						
	161	1	C4TC	S4MF	VERIFY FWD ACCESS KIT REMOVAL COMPLETE EXCEPT FOR PLATFORMS REQUIRED FOR S & A CONNECTION	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-11 HRS 45' 0"	188	2	CVTS	PA	ALL NON-ESSENTIAL PERSONNEL, EXCEPT PERSONNEL WORKING IN THE CSM, CLEAR THE CONTROL AREA FOR LV S & A ORDNANCE OPERATIONS.	TCPI
		2-1			*****WARNING***** * * THE CONTROL AREA FOR * * S & A CONNECTION IS THE * * SPACE VEHICLE INTERIOR * * EXCEPT FOR THE CSM AND * * S-IC BOATTAIL. * * *****	TCPI
	181	3	C1TC	CPDC	VERIFY LUT WINCHES SECURED	B-204-111
-11 HRS 30' 0"					S & A CONNECTIONS -----	
	121	1	CLTC	C1DP C2DP C4DP	VERIFY STATUS SYSTEMS SWITCH SAFE AND S & A SWITCH SAFE.	
	121	2	CLTC	C1DP C2DP C4DP	VERIFY S & A SAFE INDICATION	
	181	3	C1TC	C1NP	VERIFY/POSITION SWITCH SELECTOR INHIBIT TO ON.	
	181	4	C1TC	C1NP	RESET STAGE LOGIC AND VERIFY STAGE LOGIC ZERO ON.	
	181	5	C1TC	C1NE	VERIFY S-IC ORDNANCE AND PD PANELS CONFIGURED FOR CONTROLLED SWITCHING AND PD EBW CONNECTION PER V-21008.	
	121	6	CLTC	CUTC	PREPARE IU STAGE FOR RF SILENCE AND CONTROLLED SWITCHING PER V-31062, APPENDIX C.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-11 HRS 30' 0"						
121		7	CLTC	C1TC C2TC C4TC CUTC	VERIFY ORDNANCE AND PD PANELS IN CORRECT CONFIGURATION FOR S & A CONNECTION AND L/V READY FOR RF SILENCE & CONTROLLED SWITCHING PER TI 2-13	
111		8	CLTC	CVTS	REQUEST RF SILENCE ON. LV CONTROLLED SWITCHING AND CONTROLLED SWITCHING ACROSS LV/SC INTERFACE IS IN EFFECT.	TOPI
188		9	CVTS	PA	RF SILENCE IS NOW IN EFFECT ON THE SPACE VEHICLE. CONTROLLED SWITCHING IS NOW IN EFFECT ON THE LV AND ACROSS THE LV/SC INTERFACE.	TOPI
111		10	CLTC	CVTS	REQUEST CPSS VERIFY READY FOR PD DETONATOR & CDF CONNECTION	TCPI
121		11	CLTC	C1TC C2TC C4TC	CONNECT PD DETONATORS AND CDF	
161		12	C4TC	C4SM	START S & A CONNECTIONS PER V-30539, SECT R.	
181		13	C1TC	C1PE	CONNECT PDS CDF ASSEMBLIES PER V-29003.	
181		14	C1TC	C1NE	CONNECT S-IC PD DETONATORS PER V-21008. REPORT WHEN COMPLETE.	
171		15	C2TC	U2EO	CONDUCT PD STRAY VOLTAGE CHECKS PER V-29050 (K010) (CDDT) V-29024 (K008) (CD) REPORT WHEN COMPLETE.	
171		16	C2TC	U2HO	CONNECT PD DETONATORS AND CDF PER V-29050 (K010) (CDDT) V-29024 (K008) (CD)	
171		17	C2GP	C2TC	GH2 PREPS ARE COMPLETE.	
171		18	C2TC	C2GP	START FINAL GROUND PNEU SYS INSPECTION AND WALK AROUND PER V-30029 (M020) TASK 31. REPORT WHEN COMPLETE.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-11 HRS 30' 0"						
	121	19	CTSC	CLTC	OIS UNITS WILL BE REMOVED FROM THE PAD APRON AT THIS TIME (COUNTDOWN ONLY)	TCPI XB-149- 118
	181	20	CCRP	C1TC	RP-1 LINE DRAIN COMPLETED.	
-11 HRS 15' 0"	118	21	CSAC	CSA2 CSA5 CSA7	START PRECLOSEOUT CHECKLIST	B-208-115
	121	1	CLTC	C1TC C2TC C4TC CUTC	VERIFY L/V OBSERVERS ARE ON STATION FOR MSS MOVE	
	121	2	CTSC	CLTC	PAD/MSS 6000 PSI GN2 LINES ARE BEING DISCONNECTED	TCPI
-11 HRS 0' 0"		1			NOTE ----- FOR THE NEXT 15 MINUTES CSAD REQUIRES EXCLUSIVE CONTROL OF TV CAMERA 37.	
	111	2	CLTC	CVTS	VERIFY CLEAR TO DISCONNECT AUX. DAMPER	TCPI
	121	3	CLTC	C1TC	DISCONNECT AUX. DAMPER	
	181	4	C1TC	CSAC	DISCONNECT AUX. DAMPER. REPORT WHEN COMPLETE.	
	118	5	CSAC	CSAD	DISCONNECT AUX. DAMPER PER V-36086. REPORT WHEN COMPLETE.	
	171	6	U2HO	C2TC	PD DETONATORS & CDF CONNECTED	
	171	7	C2TC	U2HO	START CLOSEOUT OF PD CONTAINER PER V-30029 (M020) TASK 29. REPORT WHEN COMPLETE.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-11 HRS 0' 0"						
	121	8	C1TC	CLTC	REQUEST CTSC PROVIDE SUPPORT FOR ESP TRANSPORTER MOVE.	
	112	9	CLTC	CTSC	VERIFY READY TO SUPPORT ESP TRANSPORTER MOVE.	TCPI
		10		CLTC C1TC	NOTE ----- FOLLOWING STEPS TO BE PERFORMED NO EARLIER THEN 2 HOURS PRIOR TO FINAL PAD CLOSEOUT. IF COUNT IS HELD AT T-9 HRS, THESE STEPS WILL BE PERFORMED THE LAST 2 HOURS OF THE HOLD.	
	121	10-1	CLTC	C1TC	ARM HDA EXPLOSIVE RELEASE.	
	181	10-2	C1TC	LAS1	HOLDDOWN ARMS EXPLOSIVE RELEASE #1 AND #2 POWER MODULES TO ON AND VERIFY CIRCUIT BREAKERS ARE LOCKED ON.	
		10-3			VERIFICATION BY LV-QAL -----	
	181	10-4	C1TC	CHDA	VERIFY HOLDDOWN ARMS SECONDARY RELEASE SYSTEM READY FOR LAUNCH.	
	181	10-5	C1TC	CSAC	FIRING POWER BEING APPLIED MOMENTARILY.	
	181	10-6	C1TC	CSPP	CLOSE LSE OVERRIDE POWER MODULE CIRCUIT BREAKER PER V-31045. REPORT WHEN COMPLETE.	
	181	10-7	C1TC	CSPP	APPLY 43D100 AND 43D200 FIRING SYSTEM POWER PER V-21194. START BATTERY SWITCHOVER TEST. REPORT WHEN COMPLETE.	
	181	10-8	C1TC	CSAC	VERIFY LSE PREPS COMPLETE - ON.	
	181	10-9	C1TC	CSAC	VERIFY LSE READY FOR S/A #1 RETRACT - ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-11 HRS 0' 0"						
	181	10-10	C1TC	CSPP	START FINAL PREPARATIONS PER V-31045.	
-10 HRS 50' 0"						
	121	1	C1TC	CLTC	AUX DAMPER DISCONNECT COMPLETE.	
	121	2	CLTC	C1TC C2TC C4TC CUTC	VERIFY YOU ARE READY FOR MSS JACKING.	
	121	3	CLCS	CLTC	LV QC INSPECTION OF MSS PER TCP LV-QAL ICL-5 (MSS) IS COMPLETE	
	111	4	CLTC	CVTS	LV QC INSPECTION OF MSS PER TCP LV-QAL ICL-5 (MSS) IS COMPLETE, AUX DAMPER DISCONNECTED & L/V READY FOR MSS JACKING BUT NOT FOR MOVE.	TCPI
	181	5	C1TC	CTS1	START TSM 3-4 PROTECTIVE HOOD TOWER TILT-BACK PER V-36039 AFTER MSS JACKING HAS PROVIDED ADEQUATE CLEARANCE.	
-10 HRS 45' 0"						
		1			DELETED	B-208-115
	161	2	C4TC	C4SM	VERIFY COMPLETION OF S & A CONNECTIONS	
		3			DELETED	
		4			DELETED	
		5			DELETED	
		6			DELETED	

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-10 HRS 45' 0"						
171		7	U2HO	C2TC	PD CONTAINER CLOSEOUT COMPLETE.	
171		8	C2TC	U2SI	START FINAL REMOVAL OF A7-38 PER V-26008 (G042).	
121		9	CLTC	C1TC C2TC C4TC	VERIFY PD DETONATOR AND CDF CONNECTIONS COMPLETED.	
181		10	C1TC	C1PE C1NE	START FINAL REMOVAL OF S-IC FWD SKIRT PROTECTION, AUXILIARY LIGHTING AND INTERNAL WORK PLATFORM SEGMENTS PER V-29003 & V-21035.	
121		11	CLTC	C1TC C2TC C4TC CUTC	VERIFY LV READY TO REMOVE RF SILENCE & CONTROLLED SWITCHING.	
111		12	CLTC	CVTS	RF SILENCE AND CONTROLLED SWITCHING ARE NO LONGER REQUIRED. L/V ORDNANCE CONNECTION IS COMPLETE.	TCPI
188		13	CVTS	PA	LV PD DETONATOR CONNECTION IS COMPLETED. RF SILENCE AND CONTROLLED SWITCHING ARE NO LONGER IN EFFECT. THE CONTROL AREA IS OPEN FOR NORMAL WORK.	TCPI
121		14	C1TC	CLTC	FACILITY AIR STANDBY PANEL WILL BE ACTIVATED & FACILITY AIR SYSTEM WILL BE CHARGED WITH GN2.	
181		15	C1TC	CPDC	ACTIVATE FACILITY AIR STANDBY PANEL PER V-26222. REPORT WHEN COMPLETE.	
121		16	CVTS	CLTC	PLATFORM #3 IS OPEN AND SECURE.	TCPI
151		17	C4TC	CUTC	VERIFY IU CLEAR FOR FINAL REMOVAL OF S-IVB FORWARD ACCESS KIT.	
161		18	C4TC	S4MF	START FINAL REMOVAL OF S-IVB FWD. ACCESS KIT PER V-30539, SECT S.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 30' 0"						
181		1	C1TC	C1PE	VERIFY FWD SKIRT BULKHEAD PROTECTION & INTERNAL ACCESS EQUIPMENT REMOVED.	
181		2	C1TC	C1PE C1NE	VERIFY S-IC FWD SKIRT AREA WALK THROUGH COMPLETE AND AREA READY FOR FINAL CLOSURE.	
181		3	C1TC	C1PE	START INSTALLING AND SECURING S-IC FWD ACCESS DOOR PER V-24010.	
121		4	C1TC	CLTC	NOTIFY ALL STAGES THAT S-IC THRUST OK SIGNALS WILL BE CYCLED ON AND OFF. REQUEST CLEARANCE TO START THRUST OK PRESSURE SWITCH TEST (WAST)	
181		5	C1TC	C1PE	PREPARE FOR THRUST OK PRESSURE SWITCH TEST (WAST) PER V-24327. REPORT WHEN COMPLETE.	
181		6	C1TC	C1PK	CALL UP WAST PROGRAM UPON C1PE REQUEST AND NOTIFY C1TC PRIOR TO EXECUTION.	
171		7	C2TC	C2TV	VERIFY S-II OTV CAMERAS READY FOR PROPELLANT LOADING.	
161		8	C4TC	S4MF	VERIFY FWD ACCESS KIT REMOVAL COMPLETED AND READY TO INSTALL IU DOOR.	
161		9	CUTC	C4TC	VERIFY S-IVB FWD AREA CLEAR FOR IU ACCESS DOOR INSTALLATION.	
151		10	CUTC	SUNE	VERIFY READY TO INSTALL IU ACCESS DOOR.	
151		11	CUTC	UUVM	INSTALL AND SECURE IU ACCESS DOOR PER V-34046.	
181		12	C1TC	CWCP	START INDUSTRIAL WATER SYSTEM FINAL PREPS PER V-36113.	
171		13	U2SI	C2TC	FINAL REMOVAL OF A7-38 IS COMPLETE.	
171		14	C2TC	U2SE	VERIFY S-II FORWARD COMPARTMENT READY FOR CLOSEOUT.	

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-10 HRS 30' 0"						
	171	15	U20C	C2TC	VERIFY REMOVAL OF ALL NON-FLIGHT HARDWARE PER V-30029 (M020) TASK 47 AND THE INSPECTION PER ITI LS-008 FOR THE FORWARD INTERSTAGE COMPARTMENT IS COMPLETE.	
	171	16	C2TC	U2S1	SECURE S-II FORWARD ACCESS DOOR. REPORT WHEN COMPLETE.	
-10 HRS 20' 0"						
	181	1	CTS1	C1TC	TSM PROTECTIVE TOWER CLEAR FOR MSS MOVE.	
	121	2	C1TC	CLTC	TSM 3-4 TOWER CLEAR FOR MSS MOVE.	
	121	3	CLTC	C1TC C2TC C4TC CUTC	VERIFY YOU ARE READY FOR MSS MOVE.	
	111	4	CLTC	CVTS	LV CLEAR FOR MSS MOVE.	TCPI
	151	5	CUTC	LGCC	START LUT EVACUATION PROCEDURE PER V-22006. REPORT WHEN COMPLETE (VERIFY 28V #1 SWITCH ON 1504A1A6 DIST IS LEFT ON).	
-10 HRS 15' 0"						
	121	1	CVTS	CLTC	MSS IN MOTION.	TCPI
	181	2	C1PK	C1TC	WAST IS COMPLETE	
	121	3	C1TC	CLTC	WAST IS COMPLETE	
	181	4	C1TC	C1PE	VERIFY FWD SKIRT ACCESS DOOR SECURED	
	181	5	C1TC	C1PE	REMOVE BLOCKS FROM FWD UMBILICAL CARRIER. REPORT WHEN READY FOR S/A #2 TIP RETRACTION	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 15' 0"						
	181	6	C1TC	C1PE	SECURE FROM TOK PRESSURE SWITCH TEST PER V-24327. REPORT WHEN COMPLETE.	
	151	7	CUTC	PUPL	START LUT WALKDOWN. LV-QAL PARTICIPATION REQUIRED.	
	171	8	U2SI	C2TC	FWD ACCESS DOOR IS SECURED.	
	171	9	C2TC	C2SP	START ULLAGE PRESSURE SWITCH (CALIPS) VERIFICATION PER V-30029 (M020) TASK 86, AFTER FWD AND AFT ACCESS DOORS ARE SECURED. REPORT WHEN COMPLETE.	
	171	10	C2TC	U2MU	START ARM #5 FINAL UMBILICAL PREPS PER V-30029 (M020) TASK 33. REPORT WHEN COMPLETE.	
	181	11	C2TC	C1TC	YOU ARE CLEAR TO ATTACH S/A 5 UMBILICAL WITHDRAWAL LANYARDS	
		11-1	C2TC		*****WARNING***** * * VERIFY ALL S-II WORK IN * * THE S/A 5 UMBILICAL * * AREA IS COMPLETE EXCEPT * * SAFING PIN REMOVAL * * *****	
	181	12	C1TC	CSAC	VERIFY S/A 5 PRE-CLOSEOUT CHECKLIST COMPLETE AND START FINAL CLOSEOUT. COORDINATE WITH STAGE PERSONNEL TO RETRACT TIP AND CLOSE SAFETY GATE. REPORT WHEN COMPLETE.	
	118	13	CSAC	CSA5	COORDINATE WITH STAGE PERSONNEL ON ARM TO START FINAL CLOSEOUT PER V-36081.	
	181	14	CPDC	C1TC	FACILITY AIR STANDBY PANEL ACTIVATION COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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-10 HRS
10' 0"

1

NOTE

FOR THE NEXT 15 MINUTES CSAD
REQUIRES EXCLUSIVE CONTROL
OF TV CAMERAS 27 & AA3 OR
AA4.

121	2	CVTS	CLTC	READY FOR PRIMARY DAMPER CONNECTION	TOPI
121	3	CLTC	C1TC	CONNECT PRIMARY DAMPER	
181	4	C1TC	CSAC	CONNECT PRIMARY DAMPER. REPORT WHEN COMPLETE	
118	5	CSAC	CSAD	CONNECT PRIMARY DAMPER PER V-36086. REPORT WHEN COMPLETE.	
188	6	CSAD	PA	PRIMARY DAMPER WILL BE CONNECTED AT THIS TIME. VEHICLE MOTION AND GAS VENTING WILL OCCUR	
181	7	C1TC	CTS1	ERECT TSM 3-4 PROTECTIVE TOWER PER V-36039. REPORT WHEN COMPLETE.	
181	8	C1TC	CPDC	MOVE TRANSPORTER AND PLATFORMS TO LAUNCH POSITION ON HILL OF PAD AND SECURE FOR LAUNCH PER V-36070.	B-204-111
118	9	CSAC	CSA9	START FINAL CLOSEOUT OF S/A #9 LSE SYSTEMS.	

-10 HRS
5' 0"

121	1	C1TC	CLTC	PRIMARY DAMPER CONNECTED	
111	2	CLTC	CVTS	PRIMARY DAMPER ARM CONNECTION COMPLETE	TOPI
181	3	C1TC	CPDC	DEACTIVATE FACILITY AIR STANDBY PANEL PER V-26222. REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 0' 0"		1		CLTC C1TC	NOTE ----- IF A HOLD WILL OCCUR AT T-9 HRS, TSM SAFETY CABLE REMOVAL WILL BE ACCOMPLISHED 1 HOUR PRIOR TO RESUMING THE COUNT.	
188		1 - 1	CLTC	ALL	TAIL SERVICE MAST SAFETY CABLES WILL BE REMOVED AT THIS TIME. PERSONNEL USE EXTREME CAUTION IN AREA OF HOLDDOWN ARMS & TAIL SERVICE MASTS.	
121		1 - 2	CLTC	C1TC	REMOVE SAFETY CABLES AND START FINAL CLOSEOUT OF TAIL SERVICE MASTS.	
181		1 - 3	C1TC	CTS1	START TSM FINAL LAUNCHER PREPS PER V-36039.	
121		2	CLTC	LCDC L1PS	POWER DOWN 28V POWER SUPPLY (X02-1256A2) IN THE ML COUNTCLOCK. INSTALL AUTO START PLUG AND REAPPLY POWER. REPORT WHEN COMPLETE.	
171		3	C2TC	C2LD	VERIFY/TRANSFER LEAK DETECTION OPERATION TO REMOTE POWER AND PREPARE TO TRANSFER CONTROL FROM LOCAL TO REMOTE (LCC) PER V-26276 (G058)	
		4		C1TC C1PE	NOTE ----- THE FOLLOWING STEP WILL BE PERFORMED ONE HOUR PRIOR TO RESUMING THE COUNT SHOULD A HOLD OCCUR AT T-9 HRS	
181		4 - 1	C1TC	C1PE	APPLY HYDRAULICS TO THE F-1 ENGINES AND START PREFILL OPERATIONS PER V-34012	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 45' 0"						
181		1	C1PE	C1TC	FORWARD UMBILICAL CARRIER BLOCKS REMOVED. READY FOR ARM CLOSEOUT.	
181		2	C1TC	CSAC	VERIFY S/A 2 PRECLOSEOUT CHECKLIST COMPLETE AND START FINAL CLOSEOUT. RETRACT TIP AND CLOSE SAFETY GATE. REPORT WHEN COMPLETE.	
118		3	CSAC	CSA2	COORDINATE WITH STAGE PERSONNEL ON ARM TO START FINAL CLOSEOUT PER V-36078,	
151		4	CUTC	UUVN	VERIFY IU ACCESS DOOR IS INSTALLED.	
121		5	CUTC	CLTC	IU ACCESS DOOR IS SECURED. READY FOR S-IVB FWD MECH CHECKS.	
121		6	CLTC	C4TC	IU ACCESS DOOR IS SECURED. READY FOR S-IVB FWD MECH CHECKS.	
161		7	C4TC	S4MF	START FINAL MECHANICAL CLOSEOUT PER V-30539, SECT T.	
181		8	C1TC	CHGD	VERIFY HGD PREPS PER V-27087 COMPLETE, PERSONNEL CLEARING PAD AND HGD SYSTEM READY TO SUPPORT AIR TO GN2 SWITCHOVER.	
		9			NOTE ----- IF HOLD WILL OCCUR AT T-9 HRS, HGD WILL BE SUPPORTING 30 MIN PRIOR TO AIR TO GN2 SWITCHOVER.	
121		10	CLTC	C1TC C2TC C4TC CUTC	VERIFY ALL COMPARTMENTS CLOSED OUT AND READY TO SWITCH ECS FROM AIR TO GN2.	
111		11	CLTC	CVTS	REQUEST CPSS VERIFY ALL COMPARTMENTS CLEAR AND READY FOR ECS GN2 STANDBY.	TCP1

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 40' 0"						
	121	1	CUTC	CLTC	REQUEST CLEARANCE TO PRESSURIZE ST-124M SUPPLY SPHERE TO FLIGHT PRESSURE (3000 PSI)	
	151	2	CUTC	CUCP	PRESSURIZE ST-124M SUPPLY SPHERE TO 3000 PSI PER V-31062. (IF HOLD WILL OCCUR AT T-9 HRS, START PRESSURIZING THE ST-124M SUPPLY SPHERE 40 MINUTES PRIOR TO PICKING UP THE COUNT). REPORT WHEN SYSTEM STABILIZED.	
		2-1			*****CAUTION***** * * IU STAGE ST-124M SUPPLY * * SPHERE WILL BE * * PRESSURIZED TO 3000 PSI * * *****	
- 9 HRS 30' 0"						
	161	1	S4MF	C4TC	FINAL MECHANICAL CLOSEOUT IS COMPLETE.	
	181	2	C4TC	C1TC	FWD CARRIER MECH CHECKS ARE COMPLETE. READY FOR SERVICE ARM #7 TIP RETRACTION	
	181	3	C1TC	CSAC	VERIFY PRE-CLOSEOUT CHECKLIST COMPLETED AND START S/A #7 FINAL CLOSEOUT. RETRACT TIP AND CLOSE SAFETY GATE. REPORT WHEN COMPLETE.	
	121	4	C1TC	CLTC	STARTING S/A 7 FINAL CLOSEOUT	
	111	5	CLTC	CVTS	ADVISE SC QC THAT LV IS STARTING S/A 7 FINAL CLOSEOUT	TOPI
	118	6	CSAC	CSA7	COORDINATE WITH STAGE PERSONNEL ON ARM #7 TO START FINAL CLOSEOUT PER V-36083.	
	151	7	C4TC	CUTC CUCP	SERVICE ARM #7 UMBILICAL LOCKS ARE REMOVED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 30' 0"						
121		8	CLTC	C1TC	CONFIGURE ECS FOR STANDBY GN2	
181		9	C1TC	CECS	START ECS PREPS FOR LOADING PER V-36074 PART B.	
121		10	CVTS	CLTC	S/C CCS SWITCH IN BLOCK POSITION FOR FT-47 AT T-7:13 HRS	TCPI
181		11	C1TC	CPDC	VERIFY PNEUMATIC AND Q-BALL COVER RETRACT SYSTEM PREPS COMPLETED PER V-36064 AND V-36112 EXCEPT SMDPS IN 2 SWITCH 1 VALVE MODE AND FACILITY AIR STANDBY PANEL ACTIVATION.	
171		12	C2SP	C2TC	ULLAGE PRESSURE SWITCH (CALIPS) VERIFICATION IS COMPLETE	
171		13	C2TC	C2SP C2GP	START FINAL PANEL STATUS CHECKS PER V-30029 (M020) TASK 32. REPORT WHEN COMPLETE.	
171		14	C2GP	C2TC	FINAL GROUND PNEU SYS INSPECTION AND WALK AROUND COMPLETE.	
171		15	U2MU	C2TC	ARM #5 FINAL UMBILICAL PREPS ARE COMPLETE.	
171		16	C2TC	U2SE	VERIFY READY TO RETRACT SERVICE ARM #5 TIP.	
181		17	C2TC	C1TC	READY TO RETRACT SERVICE ARM #5 TIP.	
171		18	U2PE	C2TC	CLOSEOUT OF LUT LEVEL 180 PER V-30029 (M020) TASK 64 COMPLETE.	
171		19	C2TC	C2NP	VERIFY CALIPS POWER IS OFF.	
121		20	CLTC	VURF	START RF/GSE SETUP PER V-28069. (IF HOLD WILL OCCUR AT T-9 HRS, START RF/GSE SETUP 30 MINUTES PRIOR TO PICKING UP THE COUNT). REPORT WHEN COMPLETE.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 30' 0"	151	21	CUTC	BGCC	MASK THE FOLLOWING DISCRETES. REPORT WHEN COMPLETE. (IF A HOLD OCCURS AT T-9 HRS, START MASKING DISCRETES 30 MINUTES PRIOR TO PICKING UP THE COUNT) \$ FUNC SE 935-06 MMSK (MDI'S 0120-0143) \$ FUNC SE 937-02 MMSK (MDI'S 1536-1559) \$ FUNC SE 937-05 MMSK (MDI'S 1608-1631) \$ FUNC SE 937-01 MMSK (MDI'S 1512-1535) \$ FUNC SE 937-20 MMSK (MDI'S 1968-1991) \$ FUNC SE 937-45 MMSK (MDI'S 2568-2591)	
		21-1		ALL	*** NOTE THE ABOVE MASKED MDI/LDO'S WILL BE UPDATED EVERY 2 SECONDS UNTIL T-2:40 HRS.	
	111	22	CVTS	CLTC	OIS UNITS WILL BE REMOVED FROM 100 FT TO 0 FT LEVELS OF ML (COUNTDOWN ONLY).	TCPI
- 9 HRS 20' 0"	181	23	C1TC	C1PE	VERIFY PROPULSION PREPS COMPLETE EXCEPT PREFILL TOPPING PER V-34012.	
	121	1	CLTC	C1TC	SWITCH ECS TO GN2 PER V-36074 PART C (IF HOLD WILL OCCUR AT T-9:00 HRS, SWITCH TO GN2 20 MIN PRIOR TO PICKING UP THE COUNT)	
	181	2	C1TC	CECS	SWITCH ECS TO GN2 PER V-36074 PART C.	
- 9 HRS 15' 0"	161	1	C4TC	S4PC	VERIFY NON-FLIGHT HARDWARE TAG LOG IS COMPLETE.	
		1-1			VERIFICATION BY LV-QAL	
	181	2	C1TC	CSPP	TURN OFF CB #2 & #4 ON PANEL 14A, 200 FT LEVEL. REPORT WHEN COMPLETE.	
	151	3	CUTC	PUPL	VERIFY LUT WALKDOWN COMPLETE	
		3-1			VERIFICATION BY LV-QAL	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 10' 0"						
	121	1	CLTC	CLCP	REQUEST & EXECUTE NU-10. REPORT WHEN COMPLETE. (IF A HOLD WILL OCCUR AT T-9 HOURS, PERFORM THIS SEQUENCE 10 MINUTES PRIOR TO PICKING UP THE COUNT).	
- 9 HRS 0' 0"						
	121	1	C1TC	CLTC	ADVISE CVTS THAT SMDPS WILL BE PLACED IN A 1 SWITCH 1 VALVE MODE AT THIS TIME	
	111	1-1	CLTC	CVTS	THE SMDPS WILL BE PLACED IN A 1 SWITCH 1 VALVE MODE AT THIS TIME	TCPI
	181	1-2	C1TC	CPDC	TURN PANEL POWER ON. VERIFY SMDPS IS IN 1 SWITCH 1 VALVE MODE	
	121	2	CLTC	BPHO	VERIFY REGULAR CAMERAS OPERATIONAL AND SWITCH TO CH 181 TO SUPPORT PROPELLANT LOADING.	
	112	3	CLTC	CTSC	VERIFY TV CAMERAS ORIENTED FOR VEHICLE LOADING OPERATIONS.	TCPI
	181	4	C1TC	CWCP	VERIFY INDUSTRIAL WATER SYSTEM LAUNCH PREPS COMPLETED	
	181	5	C1TC	CSPP	VERIFY LUT WALKDOWN COMPLETE	
	181	6	C1TC	C1NE	VERIFY REMOVAL OF OFF-LUT CABLE ASSYS 5086W1, 5087W1 AND 5086CB1W1 PER V-21035.	
	181	7	C1TC	C1PE	VERIFY S-1C MECHANICAL PREPS COMPLETED AND PERSONNEL CLEARING PAD.	
	181	8	C1TC	C1NE	VERIFY S-1C ML ESE LAUNCH PREPS COMPLETE PER V-21035 AND PERSONNEL CLEARING PAD.	
	181	9	C1TC	CSPP	PLACE LSE POWER OVERRIDE SWITCH TO ON AND VERIFY.	
	181	10	C1TC	CSPP	PLACE 42D100 LOCKUP ENABLE SWITCH TO ON AND VERIFY.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 01 00						
	181	11	C1TC	CSPP	VERIFY LUT ELECTRICAL PREPS COMPLETE PER V-31045 AND PERSONNEL ARE CLEARING PAD.	
	121	12	C1TC	CLTC	S-IC ELECTRICAL LAUNCH PREPS COMPLETE.	
	181	13	C1TC	C1MS	VERIFY READY TO SUPPORT PROPELLANT LOADING.	
	181	14	C1TC	RPDC	VERIFY DTS/DEE PAD CLEARING COMPLETED PER V-25160.	
	181	15	C1TC	CTS1	VERIFY TSM FINAL PREPS ARE COMPLETE AND TSM PERSONNEL CLEAR OF PAD.	
	181	16	C1TC	CHDA	VERIFY HDA FINAL PREPARATIONS ARE COMPLETE AND HDA PERSONNEL CLEAR OF PAD	B-204-111
	181	17	C1TC	CSAC	VERIFY PAD MANUAL PREPS COMPLETE AND PERSONNEL CLEARING PAD	
	181	18	C1TC	CORP	VERIFY PAD RP-1 PREPS COMPLETED AND PERSONNEL CLEAR OF PAD.	
	181	19	C1TC	BRFS	VERIFY ML GSE OPERATION SATISFACTORY AND PERSONNEL CLEAR OF PAD.	
	171	20	C2SP	C2TC	FINAL PRESS PANEL STATUS CHECKS ARE COMPLETE.	
	171	21	C2GP	C2TC	FINAL GROUND PNEU PANEL STATUS CHECKS ARE COMPLETE.	
	171	22	C2TC	C2LD	VERIFY LEAK DETECTION SYSTEM CONTROL TRANSFER FROM LOCAL (ML) TO REMOTE (LCC) IS COMPLETE	
		22-1			NOTE ----- THIS TASK MAY REQUIRE PERSONNEL AT THE PAD DURING THE SCHEDULED HOLD.	
	171	23	C2LD	C2TC	LEAK DETECTION K-BOTTLE CHANGEOUT AND CALIBRATION COMPLETE.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 01 00						
	161	24	C4TC	C4PS	START FINAL PROPULSION PANEL VERIFICATION PER V-30539, SECT U.	
	171	25	C2TC	U2LN	VERIFY ELECTRICAL WALK AROUND COMPLETE PER V-21253 (G060)	
	181	26	C1TC	CPDC	ACTIVATE FACILITY AIR STANDBY PANEL PER V-26222 (IF HOLD WILL OCCUR AT T-9 HOURS, PERFORM THIS SEQUENCE 20 MINUTES PRIOR TO PICKING UP THE COUNT)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 9 HRS 0' 0"		1			NOTE ----- BUILT IN HOLD OF UP TO 6 HOURS WHICH WILL BE UTILIZED AS A NON- SCHEDULED WORK PERIOD. PREVIOUSLY ACCUMULATED HOLD TIMES MAY REDUCE THIS HOLD BY A CORRESPONDING PERIOD.	
		2			NOTE ----- ALL LV OPERATORS ARE REQUIRED TO CHECK THEIR PROCEDURES TO VERIFY THAT ALL PCR'S FROM THIS POINT THROUGH LV SAFING HAVE BEEN INCORPORATED.	
	121	3	CLTC	C1TC C2TC C4TC CUTC	VERIFY PCR VERIFICATION COMPLETE AND READY TO START PAD CLEARING OPERATIONS.	
	111	4	CLTC	CVTS	L/V READY TO START PAD CLEARING OPERATIONS. REQUEST SECURITY TO LOCK ROOM 1P4 AND DELIVER KEYS TO CLTC	TCPI
		5			NOTE ----- THE FOLLOWING SEQUENCES WILL OCCUR AT THE END OF THE BUILT-IN HOLD. (DELETE NEXT TWO SEQUENCES IF NO HOLD).	TCPI
	188	5-1	CVTS	PA	THE CLOCK WILL START ON MY MARK AT T-9 HRS 0 MIN 0 SEC.	TCPI
	188	5-2	CVTS	PA	5-4-3-2-1, MARK.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 8 HRS 59: 00						
121		1	CVTS	CLTC	CHANGE SMDPS FROM 1 SWITCH 1 VALVE MODE TO 1 SWITCH MODE; REPORT WHEN COMPLETE	TCP!
121		1-1	CLTC	C1TC	CHANGE SMDPS FROM 1 SWITCH 1 VALVE MODE TO 1 SWITCH MODE; REPORT WHEN COMPLETE	
181		1-2	C1TC	CPDC	CHANGE SMDPS FROM 1 SWITCH 1 VALVE MODE TO 1 SWITCH MODE; REPORT WHEN COMPLETE	
121		1-3	C1TC	CLTC	SMDPS IS IN ONE SWITCH MODE	
111		1-4	CLTC	CVTS	SMDPS IS IN ONE SWITCH MODE	TCP!
188		2	CVTS	PA	ALL PERSONNEL NOT POSSESSING T-9 HOUR HAZARDOUS BADGES ARE TO CLEAR THE BLAST DANGER AREA.	TCP!
121		3	CVTS	CLTC	DELETED CDDT ONLY	* TCP!
121		4	CLTC	C1PK	REQUEST AND EXECUTE VALK LINKING PROGRAM.	
		4-1			NOTE: ----- WHERE LINKING PROGRAMS ARE BEING UTILIZED, DO NOT PERFORM THOSE SEQUENCES WHICH ARE FOLLOWED BY THREE ASTERISKS IN THE REMARKS COLUMN. PROGRAMS WILL BE RUN BY THE CLOCK UNLESS C1PK IS NOTIFIED ON CH 121 PRIOR TO EXECUTION TIME. PREREQUISITES FOR AUTOMATIC PROGRAM EXECUTION ARE INDICATED IN THE REMARKS COLUMN AS PROGRAM CALLOUTS.	
121		5	CLTC	CLGK	POWER ON LVDC/DA PER V-33033, SECT I; REPORT WHEN COMPLETE (FT04, FT08, FT35, FT20 AND FT23)	***
171		6	C2TC	C2NP	PM POWER ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 8 HRS 59' 0"	171	7	C2TC	C2PM	START FINAL PANEL STATUS CHECKS PER V-30029 (M020) TASK 35, REPORT WHEN COMPLETE.	
	171	8	C2TC	C2HQ	VERIFY HAZARDOUS GAS DETECTION SYSTEM READY FOR PROPELLANT LOADING.	
	171	9	C2TC	ALL	START ROLL CALL TO VERIFY ALL CIP AND REDLINE OBSERVERS ARE ON STATION FOR PROPELLANT LOADING.	
	171	10	C2TC	R2DP	DELETED CDDT ONLY	
	161	11	C4TC	C4NP	VERIFY SW SEL INHIBIT OFF	
	161	12	C4TC	R4PU	PU STRIP CHARTS ON	
	161	13	C4TC	C4PU	PU POWER ON	
	161	14	C4TC	C4PU	PROPELLANT LOADING MEASURING ENABLE ON	
	161	15	C4TC	C4PS	START FINAL PREPS FOR LOADING PER V-30539, SECT U, REPORT WHEN COMPLETE.	
	151	16	CUTC	CUPC	START ST-124M SLIP RING EXERCISE PER V-23068.	
- 8 HRS 55' 0"	181	1	C1TC	CECS	VERIFY ECS OPERATIONS COMPLETE AND PERSONNEL ARE CLEARING PAD	
- 8 HRS 50' 0"	188	1	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE COMMUNICATION CODE NUMBERS, DIAL YOUR CODE AT THIS TIME FOR COMMUNICATION CHECK.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 50' 0"	171	2	C2TC	C2RP	START RECIRC BOTTLE PRESSURIZATION TO 3000 PSI PER V-30029 (M020), TASK 37	
- 8 HRS 45' 0"	171	1	C2RP	C2TC	RECIRC BOTTLE PRESSURIZATION IS COMPLETE	
	171	2	C2TC	C2AE	START ENGINE HELIUM BOTTLE PRESSURIZATION TO 3000 PSI PER V-30029 (M020), TASK 38	
- 8 HRS 40' 0"	121	1	CLTC	CUSW	VERIFY ESE/LVDA IN ESE POSITION.	(FT43)
	121	2	CLTC	C1NP C2NP	SWITCH SELECT INHIBIT TO ON TO SUPPORT FT-43.	(FT43)
	121	3	CLTC	CUNP	SWITCH SELECTOR INHIBIT OFF	(FT43)
	181	4	CCRP	C1TC	RP-1 PANEL POWER IS ON	
	171	5	C2PM	C2TC	FINAL PANEL STATUS CHECKS ARE COMPLETE.	
	181	6	C1TC	CPDC	VERIFY FACILITY AIR STANDBY PANEL HAS BEEN ACTIVATED AND PERSONNEL ARE CLEARING PAD	
- 8 HRS 39' 0"	121	1	CLGK	CLTC	LVDC/LVDA POWER ON IS COMPLETE.	
	121	2	CLTC	CLGK	REQUEST & EXECUTE FT-43 (COMPUTER INTERFACE)	***
		2-1		C4NP	*** NOTE FT-43 WILL ISSUE STAGE SELECT AND ADDRESS TO THE S-IVB STAGE WITH NO READ COMMANDS.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 35' 0"	171	1	C2AE	C2TC	ENGINE HELIUM BOTTLE PRESSURIZATION COMPLETE	
	161	2	C4TC	C4NP	4D411 POWER ON	
	161	3	C4TC	C4HY	MANUALLY CYCLE AUX HYD PUMP ON AND OFF TO MAINTAIN SYSTEM OIL TEMP ABOVE -10 DEG F. COORDINATE ALL SWITCH ACTIONS WITH C4TC PRIOR TO EXECUTION. TEMPERATURES MAY BE ALLOWED TO DECREASE BELOW THIS LIMIT IN THE EVENT OF INTERFERENCE WITH IU CONTROL COMPUTER FUNCTIONAL TEST.	
		3-1			*****CAUTION***** * * DO NOT ALLOW HYDRAULIC * * SYSTEM FLUID TEMPS TO * * DECREASE BELOW -25 * * DEG F. * * *****	
	151	4	CUPC	CUTC	ST-124M SLIP RING EXERCISE COMPLETE	
	151	5	CUTC	CUPC	TURN ON ST-124M SYSTEM AND START DRIFT CHECKS PER V-33011.	
- 8 HRS 32' 0"	121	1	CLGK	CLTC	FT43 COMPLETE	
	121	2	CLTC	C1NP C2NP	SWITCH SELECTOR INHIBIT TO OFF TO SUPPORT FT-03.	(FT03)
	121	3	CLTC	CUSW	LVDA/ESE SWITCH TO LVDA POSITION	(FT03)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 31' 0"						
181		1	C1TC	CCLH	VERIFY LH2 SYSTEMS FINAL PREPS FOR LOADING COMPLETE AND PERSONNEL CLEARING PAD.	
181		2	C1TC	CCLO	VERIFY LOX SYSTEM FINAL PREPS FOR LOADING PER V-25340 ARE COMPLETE AND PERSONNEL CLEARING PAD.	
181		3	C1TC	CHGD	VERIFY GN2 PURGE READY FOR PROPELLANT LOADING	
181		4	C1TC	CPDC	VERIFY PLATFORM TRANSPORTER IS AT LAUNCH POSITION AND SECURED AND ALL PERSONNEL CLEAR OF PAD.	B-204-111
171		5	C2TC	C2SP	SHROUD PURGE VALVE - OPEN	
171		6	C2TC	C2EV	VERIFY S-II READY FOR LOX & LH2 LOADING LIGHTS ON	
171		7	C2TC	C2PM	VERIFY READY FOR LOX & LH2 LOADING	
161		8	C4TC	C4PS C4ES C4HY	VERIFY READY FOR PROPELLANT LOADING.	
161		9	C4TC	S4PC	VERIFY ALL S-IVB PERSONNEL HAVE CLEARED THE PAD	
- 8 HRS 30' 0"						
121		1	CLTC	CLGK	REQUEST & EXECUTE FT-03 (LVDC/LVDA SWITCH SELECT INTERFACE TEST AUTOMATIC OPTION)	***
		1-1		C1NP C2NP C4NP CUNP	*** NOTE STAGES WILL BE TESTED IN THE FOLLOWING SEQUENCE - IU, S-IVB, S-II & S-IC	
				ADDR.	READ	
				----	----	
				000	NO	

CONTINUED

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 30' 0"					337 NO 200 NO 100 NO 040 NO 020 NO 010 NO 004 NO 002 NO 001 NO 377 NO 377 YES	
					MULTIPLE STAGE SELECTION WILL BE AS FOLLOWS: IU & S-IVB IU & S-II IU & S-IC S-IVB & S-II S-IVB & S-IC S-II & S-IC AN ADDRESS OF 377 WILL BE ISSUED WITH EACH MULTIPLE STAGE SELECT. ANY ANOMALIES NOTED REPORT TO CLTC.	
	121	2	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY TO START PROPELLANT LOADING	
	112	3	CLTC	CTSC	VERIFY READY TO SUPPORT PROPELLANT LOADING AND HAVE BCFM SWITCH TO CH 133 FOR LOX COMMUNICATIONS CHECKS	TCPI
	188	4	CLTC	ALL	ALL PERSONNEL REQUIRED FOR LV PROPELLANT LOADING REPORT FOR COMMUNICATIONS CHECKS ON CH 133 FOR LOX AND CH 143 FOR LH2	
- 8 HRS 27' 0"	171	1	C2TC	C2AE	BEGIN START TANK PURGE PER V-30029 (M020), TASK 88	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 27' 0"						
	171	2	C2TC	C2RP	LH2 PREVALVES TO CLOSE THEN INHIBIT. VERIFY LH2 PREVALVES CLOSED - ON	
	171	3	C2TC	C2RP	LH2 PUMP AND RETURN LINE VALVES TO CLOSE VERIFY RETURN LINE VALVES OPEN - OFF	
	171	4	C2TC	C2RP	LOX OVERRIDE TO OPEN.	
	171	5	C2TC	C2RP	ALL PREVALVES LOX RETURN VALVES TO CLOSE VERIFY LOX PREVALVES CLOSED - ON. VERIFY LOX RETURN LINE VALVES OPEN REMAINS ON.	
- 8 HRS 25' 0"						
	171	1	C2TC	C2SP	HIGH LEVEL PURGE VALVE TO OPEN AND VERIFY OPEN LIGHT ON	
- 8 HRS 23' 0"						
	121	1	CLGK	CLTC	FT03 COMPLETED	
	121	2	CLTC	C1NP C2NP CUNP	SWITCH SELECTOR INHIBIT ON TO SUPPORT FT-37	(FT37)
	121	3	CLTC	CUSW	LVDA/ESE SWITCH TO ESE	(FT37)
	121	4	CLTC	ETMS	TM RECORDERS ON	(FT37)
	121	5	CLTC	ECOP	VERIFY CIF IS READY TO SUPPORT FT-37 (PREPARE TO LAUNCH - REPEATABLE SIM FLT OPTION)	(FT37)
	121	6	CLTC	ECOP	INITIATE GUIDANCE REAL TIME REDUCTION PROGRAM	(FT37)
	171	7	C2TC	C2AE	START LOX DOME AND GG INJECTOR PURGE PER V-30029 (M020) TASK 40.	
	171	8	C2TC	C2SP	HIGH LEVEL PURGE VALVE TO CLOSE. VERIFY OPEN LIGHT OFF.	
	171	9	C2TC	C2SP	LOW LEVEL PURGE VALVE TO OPEN. VERIFY OPEN LIGHT ON.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 22' 0"						
	161	1	C4TC	C4PS	VERIFY READY FOR ENGINE PURGES.	
	161	2	C4TC	C4SP	OPEN CONTROL AND REPRESS SUPPLY.	
	161	3	C4TC	E4IM	MONITOR D-18 AND D-50.	
	161	4	C4TC	C4ET	CT HELIUM CONTROL SOLENOID ON.	
	161	5	C4TC	C4EP	ENGINE PUMP PURGE TO ENABLE.	
	161	6	C4TC	C4EP	CLOSE CHILLDOWN VALVES	
	121	7	C4TC	CLTC	READY TO INHIBIT SWITCH SELECTOR	(FT37)
- 8 HRS 20' 0"	121	8	CLTC	C4NP	SWITCH SELECTOR INHIBIT ON TO SUPPORT FT-37	(FT37)
	111	1	CLTC	CVTS	LV READY TO START CROSS COUNTRY LINE CHILLDOWN. VERIFY ML UMBILICAL TOWER IS CLEAR OF NON-ESSENTIAL PERSONNEL AND MSS IS REQUIRED DISTANCE FROM S/V (850 FT).	TOPI
		1-1		ALL	*** NOTE 10 MINUTES AFTER LOX FILL COMMAND, S-IVB SLOW FILL WILL START AUTOMATICALLY	
	121	2	CLTC	CLGK	REQUEST & EXECUTE FT-37 (PREPARE TO LAUNCH TEST -- REPEATABLE SIM FLIGHT OPTION)	***
	181	3	C1TC	CECS	VERIFY ECS GN2 FLOW FOR 1 HOUR	
	181	4	C1TC	C1NP	HEATER POWER - ON	
	181	5	C1TC	C1EH	HEATER POWER TO ENABLE	
		5-1		C1EH	*** NOTE HEATERS CYCLING	
		5-2		C1DE	*** NOTE DEE 2033 ON (S-IC READY FOR LOX LOADING)	
	181	6	C1TC	CWCP	VERIFY IWS MANUAL ARMING BUS - ON	
	181	7	C1TC	C1PC	PRESSURIZE S-IC GN2 CONTROL & PURGE BOTTLES TO 3200 PSI PER V-24327. REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 20' 0"						
	171	8	C2TC	C2NP	HEATER POWER AND BATTERY HEATERS ON	
	171	9	C2TC	C2FC	MANUALLY CYCLE INDIVIDUAL AUX HYDRAULIC PUMPS ON AND OFF TO MAINTAIN SYSTEM OIL TEMP WITHIN 0 TO 65 DEG F ENVELOPE PER V-30029 (M020) TASK 36. COORDINATE ALL SWITCH ACTIONS WITH C2TC AND CUPS PRIOR TO EXECUTION.	
- 8 HRS 18' 0"						
	171	1	C2TC	C2AE	START TURBOPUMP PURGE PER V-30029 (M020) TASK 41.	
	171	2	C2TC	C2RP	START LOX HE INJECTION PURGE PER V-30029 (M020), TASK 39	
- 8 HRS 15' 0"						
	121	1	CLTC	C1TC	YOU HAVE CLEARANCE TO START CROSS COUNTRY LINE CHILLDOWN.	
		1-1			NOTE ----	
					FROM NOW THRU T +0 THE FOLLOWING STATIONS REQUIRE ACCESS TO THE NOTED TV CAMERAS	
					CSA4 - CAMERAS 15, 16, 36	
					CSA5 - CAMERAS 15, 20, 21, 36	
					CSA6/7 - CAMERAS 20, 21, 22, 24, 36	
	121	2	C1TC	CLTC	LOX FILL COMMAND HAS BEEN GIVEN (AUTOMATIC PROPELLANT LOADING INITIATED)	
	121	3	CLGK	CLTC	FT-37 COMPLETED, AND REPEATABLE SIM FLIGHT IS IN PROCESS.	

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- 8 HRS 15' 0"						
	171	4	C2AE	C2TC	START TANK PURGE IS COMPLETE	
- 8 HRS 10' 0"						
	121	1	C1TC	CLTC	STARTING S-II LH2 PRECONDITIONING	
- 8 HRS 5' 0"						
	121	1	CLGK	CLTC	REPEATABLE SIM FLIGHT COMPLETE	(FT23)
	121	2	CLTC	CLGK	REQUEST & EXECUTE FT-23 (LVDC SECTOR SUM CHECK)	***
	121	3	CLTC	ECOP	STOP REAL TIME REDUCTION PROGRAM	
	121	4	CLTC	ETMS	TM RECORDERS OFF	
	121	5	CLTC	C4NP		
	121	6	C1TC	CUNP	SWITCH SELECTOR INHIBIT OFF	
			CLTC	CLTC	STARTING S-IVB SLOW FILL (FAST FILL WILL NOT START UNTIL CLEARANCE RECEIVED)	
	121	7	CVTS	CLTC	PAD CLEARING OPERATIONS HAVE BEEN COMPLETED. CLEAR TO START S-IVB FAST FILL.	TCPI
	121	8	CLTC	C1TC	PAD IS CLEAR FOR S-IVB LOX FAST FILL	
- 8 HRS 1' 0"						
	121	1	C1TC	CLTC	STARTING LOX MAINLINE CHILLDOWN AT S-IVB 5%.	
	171	2	C2PM	C2TC	LOX MAINLINE CHILLDOWN ON.	
	171	3	C2TC	C2AE C2EC C2RP	START THRUST CHAMBER JACKET PURGE PER V-30029 (M020) TASK 42 AND SECURE LOX DOME, GG, HE INJ AND TURBO PUMP PURGES.	

TIME	COMM. CH	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 0' 0"	181	1	C1TC	C1NE	START S-IC LCC ESE CLOSEOUT PER V-21035. REPORT WHEN COMPLETE.	
- 7 HRS 55' 0"	121	1	CLGK	CLTC	FT-23 COMPLETED.	
	121	2	CLTC	CLGK	REQUEST & EXECUTE FT-10 (LADDER OUTPUT TEST FULL RANGE OPTION).	***
	111	3	CLTC	CVTS	VERIFY CLEARANCE FOR IU CCS RF SYSTEM.	TCPI
	111	4	CLTC	CVTS	REQUEST GMIL VERIFY CCS CARRIER IS OFF.	TCPI
	121	5	CLTC	VURF	ENABLE LOCAL CCS CARRIER & VERIFY.	
	121	6	CLTC	CUIP	CCS TRANSPONDER POWER-ON.	
	121	7	CLTC	VURF	VERIFY CCS IN LOCK.	
	121	8	CLTC	CUNP	VERIFY SWITCH SELECTOR INHIBIT OFF	
	121	9	CLTC	CUSW	ISSUE IU OCTAL 072 (OMNI XMT)	
	121	10	CLTC	CUIP	COMMAND DECODER POWER-ON.	
	111	11	CLTC	CVTS	LOCAL CCS CARRIER IS ON. CCS TRANSPONDER AND COMMAND DECODER ARE ON. (IU COMMAND SYSTEM IS DISABLED)	TCPI
	121	12	CLTC	VURF	START CCS RF CHECKS PER V-28069.	
- 7 HRS 46' 0"	171	1	C2AE	C2TC	S-II ENGINE PURGES COMPLETED	
- 7 HRS 45' 0"	121	1	CLGK	CLTC	FT-10 IS COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 7 HRS 45' 0"	121	2	CLTC	CLGK	REQUEST & EXECUTE FT-05 (VLA DATA LOAD)	***
- 7 HRS 39' 0"	171	1	C1TC	C2TC	STARTING S-II LOX LOADING. ALL SUPPORT PERSONNEL SWITCH TO CH 133.	
- 7 HRS 36' 0"	121	1	C1TC	CLTC	S-IVB LOX LOADING TO 99% IS COMPLETED. STARTING S-II LOX LOADING.	
	111	2	CLTC	CVTS	STARTING S-II LOX LOADING.	TCPI
	171	3	C2TC	C2PU	REPORT WHEN LOX DEPLETION SENSORS ARE COVERED. (LOX 1/2% TO 1% MASS)	
		3-1		C2PU	*** NOTE SENSORS REGISTER INTERMITTENT WET/DRY SIGNALS DURING INITIAL LOADING PHASE.	
	171	4	C2PU	C2TC	ALL LOX DEPLETION SENSORS ARE WET	
	171	5	C2TC	C2RP	VERIFY ENGINE PURGES ARE COMPLETE. ALL PREVALVES LOX RETURN LINE VALVES TO OPEN. VERIFY LOX PREVALVES OPEN - ON.	
	171	6	C2TC	C2RP	LOX OVERRIDE TO CLOSE.	
	161	7	C4TC	C4PS	START LOX CHILLDOWN PUMP CHECKS AND LOX VENT CHECKS PER V-35014.	
- 7 HRS 35' 0"	121	1	CLGK	CLTC	FT-05 IS COMPLETE (GIVE DATE OF VLA DATA LOADED).	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
- 7 HRS 30' 0"						
121		1	CLTC	ETMS	TM RECORDERS ON	(FT55)
121		2	CLTC	ECOP	START REAL TIME REDUCTION PROGRAM	(FT55)
121		3	CLTC	RLDE	GIVE CDC/GMT TIME CORRELATION ON EVERY HALF HOUR UNTIL T-0 AND UPON ENTERING AND TERMINATION OF HOLDS.	
121		4	CLTC	CLGK	REQUEST & EXECUTE FT-55 (LVDA TM TEST)	***
121		5	CLTC	VURF	VERIFY READY TO SUPPORT FT-45.	(FT45)
121		6	CLTC	CUSW	ISSUE IU OCTAL 026 (CMD SYS ENABLE)	(FT45)
121		7	CLTC	CUCS	VERIFY ACS IN COMP/COMP MODE.	(FT45)
161		8	C4TC	C4PS E4IM	PROCEED WITH AMBIENT SPHERE PRESSURIZATION	
161		9	C4PS	C4SP	CLOSE COLD HE SUPPLY	
161		10	C4PS	C4HC	INCREASE HE SUPPLY PRESSURE TO 3100 +/- 100 PSIA.	
		10-1		C4HC	*** NOTE PRESSURE TO BE MAINTAINED FOR 1 HOUR MINIMUM	
161		11	C4PS	E4IM	REPORT WHEN AMBIENT SPHERES ARE STABILIZED	
161		12	C4PS	C4AL	OPEN 3000 PSI SUPPLY	#
161		13	C4PS	R4PS	MONITOR APS SYSTEMS FOR STABILIZATION	#
- 7 HRS 25' 0"						
121		1	CLGK	CLTC	FT-55 IS COMPLETE	
121		2	CLTC	CLGK	REQUEST & EXECUTE FT-45 (CMD SYS - INTERFACE)	***

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CD ONLY						
- 7 HRS 20' 0"						
121		1	CLGK	CLTC	FT-45 COMPLETED	
121		2	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	(FT47)
121		3	CLTC	CUSW	ISSUE IU OCTAL 072 (OMNI XMT)	(FT47)
111		4	CLTC	CVTS	REQUEST USB CCS CARRIER ON AND VERIFY	(FT47) TCPI
121		5	CLTC	VURF	DISABLE LOCAL CCS CARRIER & VERIFY	(FT47)
111		6	CLTC	CVTS	LOCAL CCS CARRIER IS DISABLED. REQUEST GMIL VERIFY S-BAND CCS IS IN LOCK.	TCPI (FT47)
121		7	CVTS	CLTC	USB/CCS TRANSPONDER IN LOCK AND CLEAR TO ENABLE IU COMMAND SYSTEM	(FT47) TCPI
111		8	CLTC	CVTS	REQUEST GMIL MONITOR CH 121 AND REPORT WHEN READY TO SUPPORT FT-47.	(FT47) TCPI
- 7 HRS 13' 0"						
121		1	CLTC	CLGK	REQUEST & EXECUTE FT-47, (PREFLIGHT COMMAND SYS TEST HOUSTON). (OPTIONSP1)	***
121		2	CLGK	CLTC	FLIGHT COMPUTER READY FOR COMMANDS	
111		3	CLTC	CVTS	L/V READY FOR HOUSTON PREFLIGHT COMMANDS REQUEST HFLT REPORT ON CH. 121	TCPI
121		4	HFLT	ALL	TERMINATE COMMAND ON MY MARK	
121		5	HFLT	ALL	3, 2, 1, MARK	
121		6	CLTC	ETOM	VERIFY AVP ONLY.	
121		7	CLTC	CUSW	ISSUE IU OCTAL 026 (COMMAND SYS ENABLE)	
121		8	HFLT	ALL	COMMAND -- ON MY MARK (GENERAL LOAD 1)	
121		9	HFLT	ALL	3 -- 2 -- 1, MARK SINGLE WORD DUMP, LOCATIONS 200 THROUGH 206	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 7 HRS 13' 0"						
	121	10	CLTC	ETOM	VERIFY AVP, CRP AND SINGLE WORD DUMP	
	121	11	HFLT	ALL	COMMAND -- ON MY MARK (GENERAL LOAD 2)	
	121	12	HFLT	ALL	3 - 2 - 1, MARK SECTOR DUMP FOR OTU	
	121	13	CLTC	ETOM	VERIFY AVP, CRP AND SECTOR DUMP	
	121	14	HFLT	ALL	COMMAND -- ON MY MARK (GENERAL LOAD 3)	
	121	15	HFLT	ALL	3 - 2 - 1, MARK SECTOR DUMP FOR NAV UPDATE	
	121	16	CLTC	ETOM	VERIFY AVP, CRP AND SECTOR DUMP	
	121	17	CLTC	HFLT	VERIFY HOUSTON COMMANDS COMPLETE.	TOPI
7 HRS 5' 0"						
	181	1	C1TC	C1PC	OPERATE ENGINE THERMAL CONDITIONING PURGE AS REQUIRED TO MAINTAIN ENGINE TEMP	
	171	2	C2TC	C2PM	VERIFY LH2 TANK PRE-CONDITIONED TO MINUS 50 DEG. F PRIOR TO 40% LOX MASS ON BOARD	
- 7 HRS 3' 0"						
	121	1	CLTC	CLGK	REQUEST AND EXECUTE FT-47 (PREFLIGHT CMD SYS TEST -- HOUSTON) (OPTIONSP3)	***
	121	2	CLGK	CLTC	FT-47 COMPLETE	
	121	3	CLTC	ECOP	TERMINATE REAL TIME REDUCTION PROGRAM.	
	121	4	CLTC	ETMS	TM RECORDERS OFF	
	121	5	CLTC	CUIP	COMMAND DECODER POWER OFF CCS TRANSPONDER POWER OFF	
	121	6	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 7 HRS 3' 0"	111	7	CLTC	CVTS	IU CCS RF SYSTEM IS OFF. CLEAR TO BRING DOWN GMIL CCS CARRIER. REQUEST GMIL REPORT IU CCS GO/NO-GO TO VURF ON CH 137.	TCPI
	111	8	CLTC	CVTS	HOUSTON PREFLIGHT COMMAND SYSTEM TEST IS COMPLETE.	TCPI
- 7 HRS 1' 0"	121	1	CLTC	CLGK	REQUEST & EXECUTE FT-23 (LVDC SECTOR SUM CHECKS).	***
	181	2	C1TC	ALL	PERSONNEL SUPPORTING LOX LOADING GO TO CH 133 ACTIVE.	
- 6 HRS 55' 0"	121	1	CLTC	CUFS	PLACE ALL FCC, CCIS AND EDS/CRG PANEL SWITCHES TO AUTO.	
- 6 HRS 54' 0"	181	1	C1TC	C1PC	LOW LOX DOME PURGE SWITCH TO AUTO	
	181	2	C1TC	C1CS	POSITION LOX LEVEL SIMULATE SWITCHES TO WET WHEN FIRST INDICATION OF SENSORS WET IS NOTED. WHEN C1LO HAS TERMINATED LOX BUBBLING, POSITION LOX LEVEL SIMULATE SWITCHES TO AUTO AND VERIFY LOX LEVEL DRY INDICATIONS ARE OFF.	
	121	3	C1TC	CLTC	S-II LOX LOADING TO 99% IS COMPLETED AND STARTING S-IC LOX LOADING.	
	111	4	CLTC	CVTS	STARTING S-IC LOX LOADING.	TCPI
		4-1			NOTE ----- FOR THE NEXT 1 HR AND 25 MIN, CSA1 REQUIRES ACCESS TO TV CAMERAS 7, 11 & 12.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 6 HRS 54' 0"						
- 6 HRS 51' 0"						
	121	1	CLGK	CLTC	FT-23 IS COMPLETE.	
	121	2	CLTC	C1PC	LOW LOX DOME PURGE ON FOR FLIGHT CONTROL SYSTEM CHECKS	*** (CTC5)
	121	3	CLTC	CUPS	REQUEST & EXECUTE KAOS (FLT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 1 (FCC & GYRO PREPS) SECONDARY OPTION 1 (COMPARATORS RESET)	*** (CTC5)
	121	4	CLTC	CUSP	FLIGHT CONTROL COMPUTER SYSTEM POWER - ON	(CTC5)
- 6 HRS 47' 0"						
	121	1	CLFK	CLTC	KAOS COMPLETE.	(CTC5)
	121	2	CLTC	ALL	THE FOLLOWING STATION SWITCH TO CHANNEL 123 TO PREPARE FOR CTC5 CLGK CLFK CUGA CUCR E4IM CUFE C4FC CUSP C4FS C4NP	(CTC5)
	121	3	CLTC	CUPS	REQUEST & EXECUTE APS GAIN TEST (CTC5) ON CHANNEL 123. REPORT WHEN COMPLETE.	***
	123	4	CUPS	CLGK	VERIFY READY TO SUPPORT CTC5.	
- 6 HRS 45' 0"						
	121	1	CLTC	C1TC C2TC C4TC CUTC	DISPLAY DISCRIPTIONS (FORMAT SELECTS) MUST BE COORDINATED WITH CLTC PRIOR TO EXECUTION UNTIL COMPLETION OF VALK.	

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- 6 HRS 45' 0"	123	2	CUFS	CLFK	REQUEST & EXECUTE CTC5 NORM OPTION (LVDC & CRG INPUTS; BURN & COAST MODES; P, Y AND R AXES; SPARE & ACTIVE) APS POWER OFF).	***
		2-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE.	
- 6 HRS 10' 0"	161	1	C4PS	C4HC	DECREASE HE SUPPLY TO 1500 +/- 100 PSIA	
	161	2	C4PS	C4SP	OPEN COLD HE SUPPLY	
- 5 HRS 48' 0"	123	1	CLFK	CUFS	CTC5 COMPLETE	
	121	2	CUFS	CLTC	APS GAIN TEST (CTC5) COMPLETE	
	121	3	CLTC	CUFS	REQUEST & EXECUTE CONTROL COMPUTER COMPARATOR TEST (CTC3) WITH LVDC INTERFACE ON CHANNEL 123. REPORT WHEN COMPLETE.	***
	123	4	CUFS	CLFK	REQUEST AND EXECUTE CTC3, OPTIONS A, CD, EF (LVDC, INPUTS; BURN AND COAST MODE; P, Y, AXES). REPORT WHEN COMPLETE.	***
- 5 HRS 32' 0"	171	1	C2PM	C2TC	PRE-CONDITIONING TEMP MINUS 160 DEG. F. ON SWITCH IS ON. J-RING TEMP IS BELOW MINUS 160 DEG. F. READY FOR LH2 LOADING.	
	171	2	C1TC	C2TC	READY TO START LH2 LOADING. ALL SUPPORT PERSONNEL GO TO CH 143.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 5 HRS 29' 0"						
	121	1	C1TC	CLTC	S-IC LOX LOADING IS COMPLETED AND ALL STAGE LOX REPLENISH HAS BEEN INITIATED. REQUEST CLEARANCE TO START LH2 LOAD.	
	181	2	C1TC	C1LD	CYCLE LOX VENTS CLOSED THEN AUTO AS REQD TO MAINTAIN ULLAGE PRESS AND VENT VALVE OPERATION	
	181	3	C1TC	C1RP	PRESSURIZE HE BOTTLES TO 3200 PSI PER V-24327. REPORT WHEN COMPLETE.	
	161	4	C4TC	C4PS	VERIFY READY FOR HEAT EXCHANGER LH2 LOAD	
	171	5	C2TC	C2EV	VERIFY READY FOR LH2 LOADING ON	
- 5 HRS 18' 0"						
	123	1	CLFK	CUFS	CTC3 COMPLETE	
	121	2	CUFS	CLTC	CONTROL COMPUTER COMPARATOR TEST (CTC3) COMPLETE	
	121	3	CLTC	C1PC	LOW LOX DOME PURGE OFF	***
	121	4	CLTC	CUPC	REQUEST & EXECUTE FT-06 (DRIFT CHECKS OPTION)	***
- 5 HRS 15' 0"						
	121	1	C2TC	CLTC	PRECONDITIONING TO MINUS 160 DEG. F. IS COMPLETED, READY FOR LH2 LOADING.	
	121	2	CLTC	C1TC	START S-II LH2 LOADING	
	111	3	CLTC	CVTS	STARTING S-II LH2 LOADING.	TOPI
	181	4	C4TC	C1TC	READY FOR LH2 LOADING.	
		5			NOTE ----- C2TV REQUIRES CONTROL OF OTV CAMERAS 9, 16, 34 & 35 DURING LH2 LOADING OF S-II STAGE. VIDEO TAPE REQUIRED AS DIRECTED BY C2TV	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 5 HRS 8' 0"						
	121	1	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO PREPARE FOR FLIGHT CONTROL SYSTEM GAIN TEST (CTC1)	
					CLGK CUCR C2FC C4HY CUSP CLFK CUFE C1FE V2MS R4HY C2FE CUFS CUGA R2SC E2FC C4FS C4FC	
	123	2	CUFS	C1FE	VERIFY READY TO SUPPORT CTC1	(CTC4)
	123	3	CUFS	C2FC	ALL CONTROL SWITCH TO AUTO POSITION EXCEPT AUX PUMPS SWITCH IN ENABLE POSITION. THERMAL CONTROL SWITCH IN OFF POSITION AND MAIN PUMP CASE BYPASS VALVE SWITCH IN CLOSED POSITION.	(CTC4)
		3-1		CLFK	*** NOTE ADVISE C2FC PRIOR TO S-II PROGRAM EVENTS SO R2SC AND V2MS CAN BE COMMANDED TO SWITCH TO FAST SPEED ON RECORDERS.	
	123	4	CUFS	C2FE	VERIFY READY TO SUPPORT CTC1	(CTC4)
	123	5	CUFS	C4HY	AUX HYDRAULIC PUMP POWER SWITCH TO AUTO.	(CTC4)
	123	6	CUFS	C4FC	VERIFY READY TO SUPPORT CTC1	(CTC4)
	151	7	CUFS	CUES	VERIFY EDS AUTO ABORT BUS DE-ENERGIZED AND WILL REMAIN OFF UNTIL COMPLETION OF CTC4	(CTC4)
	123	8	CUFS	CUGA	CONTROL EDS RATE GYRO SYSTEM POWER ON.	(CTC4)
- 5 HRS 5' 0"						
	171	1	C2TC	C2PM	VERIFY RECIRC ENABLE ON. (LH2 10% MASS).	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5 HRS 5' 0"						
	171	2	C2TC	C2RP	RECIRC RESET TO RESET THEN INHIBIT	
	171	3	C2TC	C2RP	VERIFY LH2 PREVALVES OPEN - ON AND RECIRC. RESET - ON.	
5 HRS 3' 0"						
	121	1	CUPC	CLTC	FT-06 DRIFT CHECKS COMPLETE	
	121	2	CLTC	CUFS	REQUEST & EXECUTE CONTROL EDS RATE GYRO SUBSYSTEM TEST (CTC4) ON CHANNEL 123. REPORT WHEN COMPLETE.	***
	123	3	CUFS	CLFK	REQUEST & EXECUTE CTC4 NORM OPTIONS (CRG CALIB TEST) P, Y & R AXES; POS & NEG; BI-LEVEL PKG; COMPARATOR TEST & RATE EXCESSIVE TEST). REPORT WHEN COMPLETE.	***
	181	4	C1TC	V1MS	CALL OUT MEASUREMENTS C300-117, C301-117 & C302-117 IN DEGREES F TO CORP OR CPRK ON CH 133 EVERY HALF HOUR (GMT) UNTIL T-1 HOUR 30 MIN THEN EVERY 10 MINUTES UNTIL T-10 MIN.	
4 HRS 35' 0"						
	123	1	CLFK	CUFS	CTC4 COMPLETE	
	121	2	CLTC	C1PC	LOW LOX DOME PURGE ON	*** (CTC1)
	121	3	CUFS	CLTC	CONTROL EDS RATE GYRO SUBSYSTEM TEST (CTC4) COMPLETE.	
	121	4	CLTC	CUFS	REQUEST & EXECUTE FLIGHT CONTROL SYSTEM GAIN TEST (CTC1) ON CH 123, REPORT WHEN COMPLETE.	***
	123	5	CUFS	CLFK	REQUEST & EXECUTE CTC1 WITH THE FOLLOWING OPTIONS AB, C, EF, IJ, O-AB, C, GH, IJ, NO-B, D, GH, IJ, NO-AB, C, EF, K, M. (S-IC & S-II, AO & A1, P & Y, SWITCH POINT 2) S-IVB PRIM & SPARE, AO & A1, P & Y SWITCH POINT 5 & 6; S-IC & S-II, AO & A1, ROLL, SWITCH POINT ZERO; WITH CANT)	***

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 4 HRS 35' 0"		5-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE.	
- 4 HRS 22' 0"	161	1	C1TC	C4TC	READY FOR LH2 LOADING. ALL SUPPORT PERSONNEL GO TO CH 143.	
- 4 HRS 19' 0"	121	1	C1TC	CLTC	S-II LH2 LOADING IS COMPLETED AND S-IVB LH2 LOADING IN PROGRESS.	
	171	2	C2TC	C2RP	LH2 PUMP DISCHARGE AND RETURN LINE VALVES TO OPEN.	
	171	3	C2TC	C2RP	START LH RECIRC PUMP TEST PER V-30029 (M020) TASK 61. REPORT WHEN COMPLETE.	
- 4 HRS 11' 0"	121	1	CLTC	CQAA	Q-BALL POWER ON Q-BALL HEATER POWER - ON	TOPI
		1-1			NOTE ----- Q-BALL POWER SWITCH WILL BE LEFT IN ON POSITION UNTIL T-13 MIN	
	171	2	C2RP	C2TC	LH RECIRC PUMP TEST COMPLETE.	
	171	3	C2TC	C2AE C2RP	START PROPULSION SYSTEM BOTTLE DECAY TESTS PER V-30029 (M020) TASK 34.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 3 HRS 50' 00"	171	1	02AE	02TC	PROPULSION SYSTEM BOTTLE DECAY TEST COMPLETE.	
- 3 HRS 45' 00"					DRSCR CLOSED LOOP TEST	
	111	1	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP LOCAL COMMAND CARRIER (PROTECTION REQUIRED)	TCP!
	111	2	CLTC	CVTS	REQUEST SRQ SWITCH TO CHANNEL 121 TO SUPPORT DRSCR CLOSED LOOP TEST USING FLIGHT CODE PLUGS	TCP! #
	111	3	CLTC	CVTS	DELETED CDDT ONLY	TCP! #
	111	4	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN	TCP!
	121	5	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	
	121	6	CLTC	C1DP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT: PD RSCR'S ENABLE - OFF SYSTEM STATUS SW - SAFE S & A SWITCH - SAFE	
	121	7	CLTC	C1DP C2DP C4DP	VERIFY S & A SAFE AND RSCR'S 1 & 2 PD BLOCKED - ON	
	121	8	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE,	
		8-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 3 HRS 451 ON						
121:		9	CLTC	BTMC	TM TAPE RECORDER ON	
		9-1:		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR TESTS.	
121:		10	CLTC	RRSC	VERIFY DRSCS RECORDERS ON.	
111:		11	CLTC	CVTS	LOCAL CMD CARRIER COMING ON.	TCP!
121:		12	CLTC	BRFS	SIG. GEN. SELECTOR ON AND VERIFY REMOTE MONITOR TO HYBRID	
121:		13	CLTC	C1DP C2DP C4DP	SYSTEM STATUS SWITCH - OFF	
		14		C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE.	
121:		15	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL AND VERIFY	
121:		16	CLTC	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
		16-1:		CRSS	*** NOTE LIMITER VOLTAGES RECEIVED.	
121:		17	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		17-1:		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121:		18	CLTC	C1DP C2DP C4DP	AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF, SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO	
121:		19	CLTC	RRSC	RECORDERS - FAST SPEED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3 HRS 45' 0"						
121		20	CLTC	SRO	ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS	
121		21	SRO		3-2-1 - MARK	
		22		C1DP C2DP C4DP	SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF	
121		23	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		24	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 WERE INTERNAL & CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON	
		24-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED	
		24-2		CRSS	*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON	
121		25	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		25-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		26	CLTC	C1DP C2DP C4DP	VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED	
121		27	CLTC	RRSC	RECORDERS - FAST SPEED	
121		28	CLTC	SRO	ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
121		29	SRO		3-2-1 - MARK	
121		30	CLTC	RRSC	RECORDERS - SLOW SPEED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3 HRS 45' 0"						
121		31	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		31-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED	
121		32	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	
		32-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		33	CLTC	BTMC	TM TAPE RECORDER OFF AND RELOAD	
		33-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	
121		34	CLTC	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO AND VERIFY RSCR'S OFF.	
		34-1		B1RF B2RF B4RF CRSS	*** NOTE RSCR LIMITER VOLTAGE INDICATIONS OFF.	
121		35	CLTC	CLVN	DESTRUCT SYSTEM - OFF AND RETURN DESTRUCT SYSTEM KEY TO CRSS. REPORT WHEN COMPLETE.	
121		36	CLTC	C1DP C2DP C4DP	VERIFY SAFETY BUS - OFF.	
121		37	CLTC	C1DP C2DP C4DP	STATUS SYSTEMS - SAFE	
121		38	CLTC	BRFS	SIGNAL GENERATOR SELECTOR - STANDBY	
161		39	C4TC	C4PS	WHEN LH2 LOADING REACHES 100% START CHILLDOWN PUMP CHECKS PER V-35014.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3 HRS 40' 0"						
	111	1	CLTC	CVTS	RANGE SAFETY COMMAND CHECKS COMPLETE. LOCAL COMMAND CARRIER IS OFF AND DESTRUCT SYSTEM KEY RETURNED TO CPSS	TOPI
	171	2	C2TC	C2LD	START COMMON BULKHEAD EVACUATION	
- 3 HRS 38' 0"						
	121	1	C1TC	CLTC	S-IVB LH2 LOADING IS COMPLETED AND REPLENISH INITIATED. LOX & LH2 STABLE AT 100%.	
	121	2	CLTC	C4TC	START LH DIRECTIONAL VENT TEST. REPORT WHEN COMPLETE.	
	111	3	CLTC	CVTS	LV CRYO LOADING IS COMPLETE AND NORMAL REPLENISH HAS BEEN ESTABLISHED.	TOPI
		4			NOTE ----- FOR THE NEXT 5 MINUTES, CSAD REQUIRES EXCLUSIVE CONTROL OF TV CAMERAS 27 & AA3 OR AA4.	
	121	5	CLTC	C1TC	RETRACT PRIMARY DAMPER	
	181	6	C1TC	CSAC	RETRACT PRIMARY DAMPER. REPORT WHEN COMPLETE	
	118	7	CSAC	CSAD	RETRACT PRIMARY DAMPER PER V-36086.	
		8		C4PS	NOTE THE FOLLOWING SEQUENCES TO BE PERFORMED APPROX 8 MINUTES AFTER L/R IS OPENED.	
	143	9	C4PS	C4HU	POSITION S-IVB REPLENISH VALVE OVERRIDE CLOSE SWITCH TO CLOSE	
	161	10	C4PS	C4PR	VERIFY LH2 REPLENISH VALVE CLOSED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3 HRS 38' 0"						
143		11	C4PS	C4HU	VERIFY S-IVB AUTO REVERT INHIBIT SWITCH ON	
143		12	C4PS	RHDR	VERIFY AUTO REVERT INHIBIT ILLUMINATED	
161		13	C4PS	C4SP	LH L/R OPEN ON THEN OFF	
161		14	C4PS	C4SP	VERIFY CLOSED IND ON AND LH VENT BOOST CLOSE AND L/R LATCH RESET COMMANDS IND ON.	
161		15	C4PS	C4SP	VERIFY LH TANK VENT CLOSED.	
161		16	C4PS	C4SP	DIR VENT TO FLIGHT THEN AUTO, VERIFY FLIGHT POSITION.	
161		17	C4PS	C4SP	DIR VENT TO GROUND THEN AUTO, VERIFY GROUND POSITION.	
161		18	C4PS	C4SP	OPEN LH TANK VENT.	
143		19	C4PS	C4HU	POSITION S-IVB REPLENISH VALVE OVERRIDE SWITCH TO NORMAL. VERIFY NORMAL REPLENISH HAS BEEN ESTABLISHED.	
161		20	C4PS	C4SP	CLOSE LOX TANK VENT THEN OPEN	
161		21	C4PS	C4SP	LOX TANK NPV OPEN, LATCH, CLOSE, THEN UNLATCH.	
161		22	C4PS	C4SP	VERIFY VALVE IN AN INTERMEDIATE POSITION	
161		23	C4PS	C4SP	LOX TANK NPV OPEN THEN CLOSE	
161		24	C4PS	C4SP	VERIFY FULL CLOSED IND ON, AND LOX VENT/NPV BOOST CLOSE AND NPV LATCH COMMAND RELAYS RESET IND. ON.	
		25			DELETED	
121		26	C4TC	CLTC	S-IVB VENT TESTS COMPLETE. READY FOR CREW INGRESS	
161		27	C4PS	C4PU	PU MIXTURE RATIO 5.5 ON 5 SECONDS THEN OFF	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3 HRS 38' 0"		27-1		C4PU	*** NOTE PU OPEN LOOP CONTROLS RELAYS RESET OFF THEN ON	
161	28	C4PS	R4PU		VERIFY PU VALVE TO 5.5/1 (BELOW 10%) POSITION AND RETURN TO NULL.	
161	29	C4PS	C4PU		PU MIXTURE RATIO 4.5 - ON 5.0 SECONDS THEN OFF	
		29-1		C4PU	*** NOTE PU OPEN LOOP CONTROL RELAYS RESET OFF THEN ON	
161	30	C4PS	R4PU		VERIFY PU VALVE IN 4.5/1 (ABOVE 90%) POSITION AND RETURN TO NULL.	
171	31	C2TC	C2NP		VERIFY STAGE SELECT TO OFF	
171	32	C2TC	C2PU		START PU TEST	
	33		C2PU		OPEN LOOP ARM - ON THEN AUTO AND WAIT FOR STABILIZATION OF PU VALVES	
171	34	C2PU	C2NK		ISSUE SW SELECTOR CH 59 (ENTER SMSII059)	
171	35	C2PU	R2SC		WHEN PU VALVES STABILIZE, VERIFY PU VALVES ARE 0.3 VOLTS OR LESS.	
171	36	C2PU	C2NK		ISSUE SW SELECTOR CH 58 AND CH 56 (ENTER SMSII 058 AND SMSII 056)	
171	37	C2PU	R2SC		WHEN PU VALVES STABILIZE, VERIFY PU VALVES ARE 4.6 VOLTS DC OR MORE	
	38		C2PU		PLACE PU RESET TO ON, THEN AUTO	
171	39	C2PU	R2SC		VERIFY PU VALVES RETURN TO NULL	
	40		C2PU		VERIFY PU RESET AND AUX RESET - ON	
171	41	C2PU	C2NP		STAGE SELECT TO INHIBIT	
171	42	C2PU	C2TC		PU TEST COMPLETE	
121	43	C2TC	CLTC		S-II PU TEST COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3 HRS 30' 0"						
123		1	CLFK	CUFS	CTC1 COMPLETE	
123		2	CUFS	C4HY	AUXILIARY PUMP POWER SWITCH TO OFF	
123		3	CUFS	C2FC	RETURN PANEL CONTROL SWITCHES TO COUNT CONFIGURATION.	
		3-1		C2FC	ALL FUNCTIONAL SWITCHES TO OFF OR DOWN POSITION, EXCEPT ALL ACCUMULATOR CONTROL IN AUTO AND AUX PUMPS IN ENABLE	
171		4	C2FE	C2TC	FLIGHT CONTROL TEST CTC1 IS COMPLETE.	
171		5	C2FC	C2TC	REQUEST PERMISSION TO ESTABLISH EAS AUTOMATIC TEMPERATURE CONTROL MODE.	
		6		C2FC	VERIFY ACCUMULATORS UNLOCKED	
171		7	C2FC	R2SC V2MS	HYDRAULIC RECORDERS ON.	
		8		C2FC	S-II AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 - ON. ALLOW SYSTEM PRESSURES TO STABILIZE.	
		9		C2FC	OPEN MAIN PUMP BYPASS VALVE AND ALLOW MAIN PUMP FLUID TEMPS TO STABILIZE WITH RESERVOIR FLUID TEMPS.	
		9-1		C2FC	CLOSE MAIN PUMP BYPASS VALVE.	
		10		C2FC	ALL ACCUMULATOR CONTROL - LOCK, THEN AUTO	
		11		C2FC	S-II AUXILIARY HYDRAULIC PUMPS ENGINES 1, 2, 3 & 4 - OFF. NOTE NORMAL SHUTDOWN	
		12		C2FC	THERMAL CONTROL - ON	
		12-1		C2FC	*** NOTE MAIN PUMP BYPASS VALVE OPEN DURING AUXILIARY PUMP OPERATION. (THERMAL CONTROL CYCLE)	
		13		C2FC	VERIFY INDIVIDUAL ACCUMULATOR LOCKUP LIGHTS ON AND ALL ACCUMULATORS LOCK COMMAND LIGHT OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 3 HRS 30' 00"						
	171	14	C2FC	V2MS	HYDRAULIC RECORDERS OFF	
	171	15	C2FC	C2TC	EAS AUTOMATIC THERMAL CONTROL MODE HAS BEEN ESTABLISHED	
	125	16	CUPS	ALL	ALL S-1C, S-11 & S-1VB PERSONNEL CONCERNED WITH FLIGHT CONTROL CHECKS RETURN TO CHANNEL 121	
	121	17	CUPS	CLTC	FLIGHT CONTROL SYSTEMS GAIN TEST (CTC1) COMPLETE	
	121	18	CLTC	CUPC	REQUEST & EXECUTE FT-06 (DRIFT CKS OPTION)	***
	171	19	C2TC	C2RP	DELETED GDDT ONLY	*
- 3 HRS 25' 00"						
	111	1	CLTC	CVTS	LV READY FOR CREW INGRESS	TCPI
		2	CLTC		*** NOTE TIME FOR S/C GROUND CLOSEOUT CREW TO LEAVE MSS PARKSITE,	
- 3 HRS 20' 00"						
	161	1	C4PS	C4ET	ENGINE CONTROL POWER ON,	
		1-1			*****CAUTION***** * * C4ET ENGINE CONTROL * * POWER OFF UPON ANY * * CHANGE OF STATE OF THE * * ENGINE * * *****	
	161	2	C4PS	C4ET	VERIFY IGNITION DETECTED ON,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 3 HRS 20' ON						
161		3	C4PS	C4ET	SWITCH SELECTOR CUTOFF ON THEN OFF	
161		4	C4PS	C4ET	LIQUID LEVEL SENSOR CUTOFF TO ARM	
161		5	C4PS	C4ET	MONITOR FOR ANY ENGINE CUTOFF	
161		6	C4PS	C4OH	VOTING CIRCUIT ENABLE ON	
161		7	C4PS	C4OH	NOTE REPRESS SYS RELAYS RESET IND, OFF	
161		8	C4PS	C4OH	MONITOR FOR A BURNER MALFUNCTION	
161		9	CSAC	CLTC	PRIMARY DAMPER IS RETRACTED & LATCHED	
121		10	CLTC	CLTC	PRIMARY DAMPER IS RETRACTED & LATCHED	
111		11	CLTC	CVTS	PRIMARY DAMPER IS RETRACTED & LATCHED	TCPI
161		12	C4TC	C4PS	CONDUCT HELIUM DECAY CHECKS ON CH 161	
161		13	C4PS	RAPS E4IM	VERIFY HELIUM HAS STABILIZED AND READY FOR DECAY CHECKS	
161		14	C4PS	C48P	CLOSE COLD HELIUM SUPPLY VALVE	
161		15	C4PS	C48P	OPEN COLD HELIUM LINE VENT FOR 15 MINUTES THEN CLOSE	
161		16	C4PS	C4HC	DELETED CDDT ONLY	*
161		17	C4PS	C4OH	VOTING CKT TEMP SIM #1 TO LOW AND #2 TO HIGH, VERIFY NO MALFUNCTION	
161		18	C4PS	C4OH	VOTING CKT TEMP SIM #2 TO AUTO AND #3 TO HIGH, VERIFY NO MALFUNCTION	
161		19	C4PS	C4OH	VOTING CKT TEMP SIM #1 TO HIGH AND #3 TO LOW, VERIFY NO MALFUNCTION	
161		20	C4PS	C4OH	VOTING CKT TEMP SIM #1 TO AUTO	
171		21	C2RP	C2TC	DELETED CDDT ONLY	*

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					CD ONLY	
- 3 HRS 151 04						
121		1	CUPC	CLTC	FT-06 COMPLETE	
121		2	CLTC	CUPS	REQUEST & EXECUTE CONTROL COMPUTER REDUNDANCY TEST (CTC2) WITH LVDC INTERFACE ON CH 123, REPORT WHEN COMPLETE.	***
125		3	CUPS	CLBK	VERIFY READY TO SUPPORT	
125		4	CUPS	CLFK	REQUEST & EXECUTE CTC2 NORM OPTION, REPORT WHEN COMPLETE, (LVDC, CRG S/C INPUTS; BURN & COAST MODE) P, Y, R)	***
121		5	CLTC	ALL	DELETED CDDT ONLY	A*
171		6	C2TC	C2RP	DELETED CDDT ONLY	A*
175		7	C2RP	R2SC	DELETED CDDT ONLY	A*
175		8	C2RP	E2AE	DELETED CDDT ONLY	A*
175		9	C2RP	C2PK	DELETED CDDT ONLY	A*

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
3 HRS 15:04						
175		10	C2RP	CECS	DELETED CDDT ONLY	A*
		10-1		CECS	DELETED CDDT ONLY	A*
175		11	C2RP	BCFM	DELETED CDDT ONLY	A*
175		12	C2RP	CCLO	DELETED CDDT ONLY	A*
		12-1		CCLO	DELETED CDDT ONLY	A*
175		13		C2RP	DELETED CDDT ONLY	A*
		13-1		ALL	DELETED CDDT ONLY	A*
3 HRS 01:04						
161		1	C4PS	C40H	VOTING CKT TEMP SIM #3 TO AUTO AND #2 TO LOW	
123		2	CLPK	CUPS	CTC2 COMPLETE	

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CD ONLY						
3 HRS 01 ON						
121		3	CUPS	CLTC	CTC2 COMPLETE	
121		4	CLTC	C1PC	LOW LOX DOME PURGE OFF	***
121		5	CLTC	CUPS	PERFORM CONTROL COMPUTER S/C INPUT TEST ON CHANNEL 123; REPORT WHEN COMPLETE.	
125		6	CUPS	CUSP	SELECT FOLLOWING SWITCHES: S-1VB COAST PITCH AXIS S-1VB COAST TEST TEST RAMP A & B SPACE CRAFT CONTROL ST-124M SUB	
125		7	CUPS	CUSP	RAMP POSITIVE TO THRESHOLD (APPROX 0.3 VDC) ON I-P	
125		8	CUPS	CUCR	VERIFY APPROX +1.0 DEG PSI PITCH	
125		9	CUPS	CUSP	RAMP NEGATIVE TO THRESHOLD (APPROX -0.3 VDC) ON III-P	
125		10	CUPS	CUCR	VERIFY APPROX -1.0 DEG PSI PITCH	
125		11	CUPS	CUSP	ZERO RAMP	
125		12	CUPS	CUSP	DESELECT PITCH AXIS; SELECT YAW AXIS.	
125		13	CUPS	CUSP	RAMP POSITIVE TO THRESHOLD (APPROX 0.3 VDC) ON I-II & III-II,	
125		14	CUPS	CUCR	VERIFY APPROX +1.0 DEG PSI YAW	
125		15	CUPS	CUSP	RAMP NEGATIVE TO THRESHOLD (APPROX -0.3 VDC) ON I-IV & III-IV,	
125		16	CUPS	CUCR	VERIFY APPROX -1.0 DEG PSI YAW	
125		17	CUPS	CUSP	ZERO RAMP	
125		18	CUPS	CUSP	DESELECT YAW AXIS; SELECT ROLL AXIS,	
125		19	CUPS	CUSP	RAMP POSITIVE TO THRESHOLD (APPROX 0.3 VDC) ON I-III & III-IV,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 3 HRS 01' 00"						
125		20	CUPB	CUCR	VERIFY APPROX +1.0 DEG PSI ROLL	
125		21	CUPB	CUSP	RAMP NEGATIVE TO THRESHOLD (APPROX -0.3 VDC) ON I-IV & III-III	
125		22	CUPB	CUCR	VERIFY APPROX -1.0 DEG PSI ROLL	
125		23	CUPB	CUSP	ZERO RAMP	
125		24	CUPB	CUSP	POSITION ALL CC15 PANEL SWITCHES TO OFF	
175		25	C2RP	DECS	DELETED CDDT ONLY	A*
- 2 HRS 55' 00"						
121		1	CUPB	CLTC	CONTROL COMPUTER S/C INPUT TEST COMPLETE	(FT20)
121		2	CLTC	CLGK	REQUEST & EXECUTE FT-20 (LVDC SELF TEST)	***
- 2 HRS 50' 00"						
121		1	CLGK	CLTC	FT-20 COMPLETE	
121		2	CLTC	CLGK	REQUEST & EXECUTE FT-10 (LADDER OUTPUT TEST - FULL RANGE OPTION)	***
- 2 HRS 40' 00"						
		1		CLTC	*** NOTE TIME FOR START OF FLIGHT CREW INGRESS	
151		2	C4PS	C4OH	VOTING CKT TEMP SIM #2 TO AUTO AND #1 TO LOW	
121		3	CLGK	CLTC	FT-10 COMPLETE	
151		4	CUTC	BGCC	UNMASK THE FOLLOWING DISCRETES, REPORT WHEN COMPLETE	
					S FUNC SE 935-06 MREL	
					S FUNC SE 937-02 MREL	
					S FUNC SE 937-05 MREL	
					S FUNC SE 937-01 MREL	
					S FUNC SE 937-20 MREL	
					S FUNC SE 937-45 MREL	

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PAGES G 181 THROUGH G 184 HAVE BEEN INTENTIONALLY
LEFT BLANK. ALL OMITTED SEQUENCES PERTAIN TO
A CDDT ONLY TEST.

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
2 HRS 27' 0"		1			NOTE ----- C2TV REQUIRES VIDEO TAPE TV SCAN OF S-11 SIDEWALL INSULATION UTILIZING CAMERAS 9, 16, 34 & 35	
2 HRS 20' 0"						
161		1	C4PS	C4OH	VOTING CKT TEM SIM #1 TO AUTO	
161		2	C4PS	C4ET	LIQUID LEVEL SENSOR CUTOFF TO DISARM.	
161		3	C4PS	C4ET	ENGINE READY BYPASS ON THEN OFF AND VERIFY ENGINE CUTOFF LOCKIN OFF	
161		4	C4PS	C4ET	ENGINE CONTROL POWER OFF,	
161		5	C4PS	C4OH	VOTING CIRCUIT ENABLE OFF,	
161		6	C4PS	C4OH	VERIFY REPRESS SYS RELAYS RESET IND ON,	
2 HRS 15' 0"						
		1		CLTC	NOTE ----- LOM ABORT ADVISORY SYSTEM COMMUNICATIONS CHECKS WILL TAKE PLACE AT THIS TIME STARTING ON CH 111, STATIONS INVOLVED ARE: E160 E1CP BOSC CHQ2 CLPS Z1 22 Z3	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 2 HRS 11: 07						
	121	1	CLTC	C4NK	REQUEST AND EXECUTE XADS (S-1VB COUNTDOWN DISCRETE SCAN); REPORT WHEN COMPLETE.	***
- 2 HRS 6: 07						
	121	1	C4NK	CLTC	XADS (S-1VB COUNTDOWN DISCRETE SCAN) COMPLETE	
	121	2	CLTC	CUPC	REQUEST & EXECUTE FT-06 (DRIFT CKS OPTION)	***
- 2 HRS 5: 07						
	121	1	CVTS	CLTC	SVC EDS POWER IS COMING ON AT T-2 HOURS	# TCPI
- 1 HRS 56: 07						
	121	1	CLTC	C1TC C2TC C4TC CUTC	START PREPS FOR EDS TEST PER V-21096; REPORT WHEN READY TO SUPPORT EDS TEST;	
	121	2	CLTC	ALL	FOLLOWING PERSONNEL SWITCH TO CHANNEL 223 TO SUPPORT EDS TEST AFTER COMPLETING PREPS: RLDE C2AE CUES C4ET CLGK C2EC QUNP C4NP OUEF C2NP OUDE C1NE	
	171	3	C2TC	C2AE C2EC C2NP	PREP FOR EDS TEST; REPORT WHEN COMPLETE.	
	181	4	C1TC	C1NE	VERIFY READY TO SUPPORT EDS TEST.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
- 1 HRS 51, 00						
121		1	CUPC	CLTC	FR-06 (DRIFT CHECKS COMPLETE),	
121		2	C1PK	CLTC	VALK IS COMPLETE,	
111		3	CLTC	CVTS	LV READY FOR EDS TEST, REQUEST SCO PERSONNEL SWITCH TO CH, 223,	TCPI
121		4	CVTS	CLTC	SCO PERSONNEL STANDING BY TO SUPPORT EDS TEST,	TCPI
121		5	CLTC	GEDK	PERFORM EDS TEST PER V-21096 (PROGRAMS VZ33, FT-83, VAED, VZEA, VZRE, VZSA), REPORT WHEN PROGRAMS HAVE TERMINATED,	#
121		6	CLTC	GEDK	DELETED CDDT ONLY	*
		7		C1FR	NOTE ----- CRSS WILL CONDUCT HOLDFIRE CHECKS WITH RSO & SRO DURING THE NEXT 30 MINUTES. THE RANGE SAFE INDICATION ON THE C1FR PANEL WILL CYCLE ON AND OFF DURING THESE CHECKS,	
- 1 HRS 29, 00						
111		1	CLTC	CVTS	G-BALL SIM COMMANDS & CCS BLOCK WILL BE EXERCISED AT THE COMPLETION OF EDS TEST, REQUEST SCDR & MYPE MONITOR 121,	TCPI #
111		2	CLTC	CVTS	DELETED CDDT ONLY	TCPI *
111		3	CLTC	CVTS	VERIFY RANGE CLEARANCE FOR ALL L/V RF AND TM, C1F & USB STATION READY TO SUPPORT,	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 1 HRS 27' 0"						
121:		4	CLTC	CUIP	VERIFY RF SILENCE OFF,	(FT47)
121:		5	CLTC	CUIP	CCS TRANSPONDER ON, VERIFY COMMAND DECODER IS OFF,	(FT47)
118		6	CSAC	CHCU	START SECOND PUMP SYSTEM AND VERIFY BOTH PUMP SYSTEMS 1 & 2 RUNNING,	(WATL WASL)
121:		7	CLTC	CLPC	LOW LOX DOME PURGE ON	
121:		8	CLTC	CUSP	SELECT S-IC BURN MODE ON THEN OFF	
- 1 HRS 21' 0"						
121:		1	CEDK	CLTC	EDS PROGRAMS HAVE TERMINATED,	(VALL)
121:		2	CEDK	CLTC	EDS TEST COMPLETE,	
171:		3	C2TC	C2AE C2EC C2NP	SECURE FROM EDS TEST, REPORT WHEN COMPLETE,	
111:		4	CLTC	CVTS	EDS TEST COMPLETE, REQUEST MFLT REPORT ON CH 121 FOR HOUSTON PREFLIGHT COMMANDS,	TCPI
121:		5	CVTS	CLTC	EDS POWER IS OFF, CSM READY FOR Q-BALL CALL, CCS IS ENABLED,	# TCPI (VALL)
121:		6	CLTC	CLPK	REQUEST AND EXECUTE VALL (LINKING PROGRAM FOR OVERALL TESTS)	(FT47)
6-1:					NOTE ----- WHEN VALL LINKING PROGRAM IS BEING EXECUTED, OMIT STEPS WITH 3 ASTERISKS TO THE RIGHT OF THE STEP,	
181:		7	CLTC	CSAC	VERIFY S/A'S READY FOR WASL,	(WASL)

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CD ONLY						
- 1 HRS 21: 00						
181		8	CLTC	CTS1	VERIFY TSM'S READY FOR WATL,	(WATL)
121		9	CLTC	CLTC	S/A'S AND TSM'S READY FOR WATL & WASL,	(WATL WASL)
111		10	CLTC	CVTS	REQUEST CCS S-BAND CARRIER ON - COMMAND DECODER IS OFF,	(FT47) TCP!
121		11	CVTS	CLTC	USB/CCS TRANSPONDER IN LOCK, CLEAR TO TURN ON COMMAND DECODER,	(FT47) TCP!
121		12	CLTC	CUIP	COMMAND DECODER ON,	(FT47)
121		13	CLTC	CUNP	VERIFY SWITCH SELECTOR INHIBIT OFF,	(FT47)
121		14	CLTC	CUSW	ISSUE IU OCTAL 072 (CCS OMNI),	(FT47)
121		15	CLTC	CUSW	DELETED CDDT ONLY	*((FT47)
		15-1		CUES	DELETED CDDT ONLY	*
121		16	CLTC	ECOP	START REAL TIME REDUCTION PROGRAM,	(FT47)
- 1 HRS 19: 00						
121		1	CLTC	CLGK	REQUEST & EXECUTE FT-47 (PREFLIGHT COMMAND SYSTEM TEST - HOUSTON) (OPTION SP1),	***
121		2	CLGK	CLTC	FLIGHT COMPUTER READY FOR COMMANDS,	
121		3	CLTC	CLSK	REQUEST AND EXECUTE WATL,	***
121		4	HFLT	ALL	COMMAND ON MY MARK (GENERAL LOAD 1),	
121		5	HFLT	ALL	3-2-1 MARK, SINGLE WORD DUMP, LOCATIONS 200 THROUGH 206	
121		6	CLTC	ETOM	VERIFY AVPI, CRP AND SINGLE WORD DUMP,	
121		7	HFLT	ALL	COMMAND - ON MY MARK (GENERAL LOAD 2),	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
121	8	HFLT	ALL	3-2-1	MARK, SECTOR DUMP FOR OTU,	
121	9	CLTC	ETOM		VERIFY AVP, CRP AND SECTOR DUMP,	
121	10	HFLT	ALL		COMMAND - ON MY MARK (GENERAL LOAD 3),	
121	11	HFLT	ALL	3-2-1	MARK, SECTOR DUMP FOR NAV UPDATE,	
121	12	CLTC	ETOM		VERIFY AVP, CRP AND SECTOR DUMP,	
212	13	CLTC	MSTC		READY FOR CCS BLOCK - VERIFY BLOCK,	# TCPI (FT47)
121	14	CLTC	CUNP		DELETED CDDT ONLY	*(FT47)
	14-1		CUES		DELETED CDDT ONLY	*
	14-2		CUNP		DELETED CDDT ONLY	*
	14-3		GMIL		DELETED CDDT ONLY	*(FT47)
121	15	CLTC	CUSH		DELETED CDDT ONLY	*(FT47)
121	16	HFLT	ALL		TERMINATE COMMAND ON MY MARK,	(FT47)
121	17	HFLT	ALL	3, 2, 1	MARK,	(FT47)
121	18	CLTC	ETOM		VERIFY AVP ONLY,	(FT47)
121	19	CLTC	HFLT		VERIFY HOUSTON COMMANDS COMPLETE,	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1 HRS 17' 0"						
	121	1	CLSK	CLTC	WATL COMPLETE.	
	121	2	CLTC	CLSK	REQUEST AND EXECUTE WASL.	***
- 1 HRS 15' 0"						
	121	1	CLTC	CUIP	C-BAND NO. 1 AND NO. 2 ON. C-BAND NO. 1 AND NO. 2 INHIBITS ON. C-BAND NO. 1 AND NO. 2 INHIBITS OFF. C-BAND NO. 1 INHIBIT ON.	
- 1 HRS 14' 0"						
	121	1	CLSK	CLTC	WASL COMPLETE.	
- 1 HRS 13' 0"						
	121	1	CLTC	CLGK	REQUEST AND EXECUTE FT-47 (PREFLIGHT COMMAND SYSTEM TEST -- HOUSTON) (OPTION SP3).	***
	121	2	CLGK	CLTC	FT-47 COMPLETE.	
	121	3	CLTC	ECOP	TERMINATE REAL TIME REDUCTION PROGRAM.	
	111	4	CLTC	CVTS	HOUSTON PREFLIGHT COMMAND SYSTEM TEST COMPLETE. REQUEST GMIL REPORT IU CCS GO/NO-GO TO VURF ON CH. 137.	TCPI
	121	5	CLTC	MTPE	VERIFY READY FOR Q-BALL SIM COMMAND.	TCPI
	121	6	CLTC	CQAA	GIVE Q-BALL SIM COMMAND FOR 10 SECONDS ON YOUR MARK.	TCPI
	121	7	CQAA		3, 2, 1, MARK.	TCPI
	111	8	CLTC	CVTS	REQUEST MTPE SUPPLY Q-BALL SIM COMMAND READING TO VUMS ON CH. 148.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1 HRS 12' 0"	121	1	CLTC	CLGK	REQUEST AND EXECUTE FT-23 (LVDC SECTOR SUM CHECK).	***
- 1 HRS 10' 0"	121	1	CLTC	VURF	VERIFY C-BAND BEACON #2 READY FOR INTERROGATION.	
	111	2	CLTC	CVTS	READY TO START C-BAND BEACON #2 CHECKS. REPORT GO/NO-GO AND RANGE READOUT TO VURF ON CH. 137.	TCPI
- 1 HRS 5' 0"	121	1	CLTC	CUPC	VERIFY ST-124M PREPS COMPLETE. READY FOR FT-06.	(FT06)
	111	2	CLTC	CVTS	REQUEST GMIL REMOVE CCS S-BAND CARRIER AND MEASURE UNLOCKED FREQUENCY, "IU COMMAND SYSTEM IS DISABLED".	TCPI
	121	3	CLGK	CLTC	FT-23 COMPLETED.	
	121	4	CLTC	CUPC	REQUEST AND EXECUTE FT-06 (GIMBAL ANGLE READ).	***
	121	5	CLTC	ETMS	VERIFY CIF READY TO SUPPORT TM CHECKS.	
	121	6	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT TEST.	
	121	7	CLTC	ETMS BTMI	VERIFY CIF DATA TRANSMISSION LINK - ON.	
	111	8	CLTC	CVTS	REQUEST ELECTROMAGNETIC COMPATIBILITY MONITORING AND VERIFY CCS CARRIER ON FOR LAUNCH.	TCPI
	121	9	CLTC	RLDE	ENTER/VERIFY CDC MODE.	
	121	10	CLTC	CLTC	REQUEST CSA9 SWITCH TO CHANNEL 111 ACTIVE AND REPORT TO CVTS FOR S/A #9 OPERATIONS.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 5' 0"		10-1			NOTE ----- FROM NOW UNTIL LIFTOFF, CSA9 WILL RESPOND ONLY TO CVTS ON CH. 111.	
181	11	C1TC	CSAC		REQUEST CSA9 SWITCH TO CHANNEL 111 ACTIVE AND REPORT TO CVTS TO OPERATE S/A #9 AS DIRECTED.	
111	12	CLTC	CVTS		CSA9 WILL REPORT ON CHANNEL 111. CONFIRM WHEN COMMUNICATIONS HAVE BEEN SATISFACTORILY ESTABLISHED.	TCPI
	13				DELETED OPERATING STEPS FOR LV TM CHECKS -----	
121	14	CLTC	C1IP C2IP C4IP CUIP		VERIFY RF SILENCE OFF.	
121	15	CLTC	C2NP C4NP		SWITCH SELECTOR INHIBIT OFF.	
121	16	CLTC	C1IP		VERIFY TM MODE SELECT SWITCH -- ANTENNA.	
121	17	CLTC	C2IP		VERIFY RF COUPLER TO ANTENNA.	
121	18	CLTC	C4IP		VERIFY TM MODE SELECT SWITCH TO ANTENNA.	
121	19	CLTC	CUIP		VERIFY RF DUMMY LOAD OFF.	
121	20	CLTC	ETMS BTMC		TM TAPE RECORDING ON.	
121	21	CLTC	CUIP		F1 TM ON.	
121	22	CLTC	C1IP C2IP C4IP CUIP		ALL TM TRANSMITTERS ON IN SEQUENCE LISTED AND MARKED ON CH. 121.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1 HRS 5' 0"		22-1		C1IP	F1 & P1 RF ON.	
		22-2		C2IP	F1, F2 & P1 RF ON.	
		22-3		C4IP	P1 - ON AND SSB TO ENABLE.	
		22-4		CUIP	F1 & P1 RF - ON.	
121		23	CLTC	C1IP CUIP	TM CALIBRATOR ON.	
121		24	CLTC	C2IP	VERIFY GROUND POWER ON (CAL. POWER).	
121		25	CLTC	C1IP C2IP CUIP	TM CAL MODE TO PREFLIGHT AND PREFLIGHT LEVELS TO 50 PERCENT.	
121		26	CLTC	C4IP	TM CAL MODE TO PREFLIGHT	
121		27	CLTC	BTIM	ALLOW 5 MIN. WARM-UP THEN CONDUCT L/V TM CHECK ON CH. 127. REPORT WHEN COMPLETE.	
188		28	CLTC	ALL	ALL PERSONNEL SUPPORTING L/V TM CHECKS, GO TO CHANNEL 127 ACTIVE AND MONITOR STAGE "TC" CHANNEL. (DELAY 5 MINUTES MINIMUM FOR TM TRANSMITTER WARM-UP).	
171		29	C2TC	C2NP	PLACE/VERIFY STAGE SELECT TO OFF.	
171		30	C2TC	C2PU	START PU REVERIFICATION CHECK.	
		31		C2PU	OPEN LOOP ARM TO ON THEN AUTO AND WAIT FOR STABILIZATION OF PU VALVES.	
		32		C2NK	ISSUE SW SEL CH. 59 (ENTER SMSII059)	
171		33	C2PU	R29C	VERIFY PU VALVES (G006-201 THRU 205) SLEW TO A MINIMUM OF 0.3 VOLTS.	
171		34	C2PU	C2NK	ISSUE SWITCH SELECTOR CH 58 (ISSUE SMSII058)	

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SD ONLY						
- 1 HRS 5: 00						
	171	35	02PU	R2SC	VERIFY PU VALVES RETURN TO NULL;	
	171	36		02PU	VERIFY PU AUX RESET LIGHT - OFF;	
	171	37	02PU	02TC	PU REVERIFICATION CHECK COMPLETE;	
- 1 HRS 2: 00						
	121	1	CUPC	CLTC	FT-06 COMPLETE;	
	121	2	CLTC	CUPC	REQUEST AND EXECUTE GT-16 (AZIMUTH LAYING PROGRAM);	***
		2-1		CUPC	*** NOTE IF CUMULATIVE HOLDS OCCUR PRIOR TO EXECUTION OF FT-42 THAT WOULD CAUSE A FLIGHT AZIMUTH CHANGE IN EXCESS OF 5 DEG, PERFORM THE FOLLOWING SEQUENCE: 1. CUPC ENTER SFUNG01/005 AND THE AZIMUTH UPDATE;	
- 1 HRS 0: 00	161	0	CLTC	CCRP	START RP-1 LEVEL ADJUST AND LINE INERTING PER V-25389.	
	161	1	C4PS	C4TC	HELIUM DECAY CHECK IS COMPLETE AND READY TO RE-ESTABLISH FLOW. START FINAL PROPULSION CHECKS;	
	161	2	C4PS	C4HC	DELETE CDD1 ONLY	
	161	3	C4PS	C4SP	OPEN LOX PREPRESS VALVE FOR 20 SECONDS THEN AUTO;	
	161	4	C4PS	C4SP	OPEN COLD HELIUM LINE VENT;	
	161	5	C4PS	C4SP	OPEN COLD HELIUM SUPPLY;	
	161	6	C4PS	C4SP	CLOSE COLD HELIUM LINE VENT;	
	161	7	C4PS	C4AL	OPEN 3000 PSI HE SUPPLY IF REQUIRED;	#

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
- 1 HRS 01 ON						
161		8	C4TC	C4PS	START PU CHECK; REPORT WHEN COMPLETE;	
161		9	C4PS	C4PU	FUEL BOILOFF BIAS - ON;	
161		10	C4PS	C4PU	PU MIXTURE RATIO 5:5 ON 5 SECONDS THEN AUTO;	
		10-1		C4PU	*** NOTE PU OPEN LOOP CONTROL RELAYS RESET OFF THEN ON;	
161		11	C4PS	R4PU	VERIFY PU VALVE TO 5:5/1 (BELOW 10X) POSITION AND RETURN TO NULL;	
161		12	C4PS	C4PU	PU MIXTURE RATIO 4:5 - ON 5 SECONDS THEN AUTO;	
		12-1		C4PU	*** NOTE PU OPEN LOOP CONTROL RELAYS RESET OFF THEN ON;	
161		13	C4PS	R4PU	VERIFY PU VALVE IN 4:5/1 (ABOVE 90X) POSITION AND RETURN TO NULL;	
161		14	C4TC	C4PS	START FINAL PROPULSION CHECKS;	
161		15	C4PS	C4ET	ENGINE CONTROL POWER ON;	
161		16	C4PS	C4ET	VERIFY IGNITION DETECTED IND ON;	
161		17	C4PS	C4ET	SW SELECTOR CUTOFF - ON THEN AUTO;	
161		18	C4PS	C4ET	VERIFY THE FOLLOWING: 1, ENGINE CUTOFF ON; 2, NON-PROGRAMMED CUTOFF OFF; 3, ENGINE CUTOFF LOCKIN ON;	
161		19	C4PS	C4ET	ENGINE IGNITION POWER - ON;	
161		20	C4PS	C4ET	VERIFY ENGINE READY ON AND ENGINE CUTOFF LOCKIN OFF;	
161		21	C4PS	C4HN	LOX UMBILICAL PURGE SUPPLY - AUTO;	
161		22	C4PS	C4HN	HEAT EXCHANGER CIRCUIT #1 VENT OPEN FOR 20 SECONDS; THEN CLOSE;	

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- 1 HRS 01 00						
161		23	C4PS	C4SP	VERIFY DIRECTIONAL VENT IN AUTO.	
161		24	C4PS	C4EP	LOX AND LH2 CHILLDOWN PUMPS TO AUTO.	
161		25	C4PS	C4EP	LOX AND LH2 PREVALVES TO AUTO	
161		26	C4PS	C4TC	FINAL PROPULSION CHECKS ARE COMPLETE.	
127		27	BTTM	ETMS	START TM PARAMETERS QUICK SCAN CHECK. (DELAY NEXT STEP 2 MIN).	
127		28	BTTM	C1IP C2IP CUIP	PREFLIGHT LEVELS TO 0 PERCENT (IU TO AUTO).	
127		29	BTTM	C4IP	SSB CAL COMMAND ON THEN OFF. (DELAY NEXT STEP 1 MIN).	
127		30	BTTM	C1IP C2IP CUIP	PREFLIGHT LEVELS TO 100 PERCENT. (DELAY NEXT STEP 1 MIN).	
127		31	BTTM	C1IP C2IP CUIP	PREFLIGHT LEVELS TO AUTO.	
127		32	BTTM	C1IP C2IP C4IP CUIP	TM CAL MODE TO INFLIGHT.	
188		33	BTTM	ALL	ANNOUNCE: TM INFLIGHT CAL WILL INTERRUPT DDAS MEASUREMENTS MOMENTARILY.	
127		34	BTTM	C1IP	TM CAL CMD ON FOR 5 SEC.	
127		35	BTTM	C2IP	FM/FM INFLIGHT ON FOR 5 SEC., THEN OFF.	
127		36	BTTM	C4IP	TM CAL ON FOR 5 SEC., THEN OFF.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 0' 0"						
	127	37	BTTM	CUIP	TM CAL CMD ON FOR 5 SEC.	
	127	38	BTTM	C4IP	REG CAL COMMAND ON FOR 5 SECONDS.	
	127	39	BTTM	ETMS	REPORT ANY OUT OF TOLERANCE PARAMETERS TO BLTM ON CH. 127 WHEN ANALYSIS IS COMPLETE.	
	127	40	BTTM	ALL	L/V TM CHECKS ARE COMPLETED. ALL PERSONNEL CONNECTED WITH TM CHECKS SWITCH TO CHANNEL 121.	
	121	41	BTTM	CLTC	L/V TM CHECKS ARE COMPLETED.	
-52' 0"						
	121	1	CUPC	CLTC	GT-16 COMPLETE.	
		2			NOTE ----- FT-06 AND FT-49 WILL BE CALLED UP SEQUENTIALLY BY VALK. START AND COMPLETION TIMES MAY NOT CORRESPOND TO THOSE NOTED.	
	121	3	CLTC	CUPC	REQUEST AND EXECUTE FT-06 (GIMBAL ANGLE READ).	***
	188	4	CLTC	ALL	FOLLOWING PERSONNEL SWITCH TO CHANNEL 123 FOR FLIGHT CONTROL SYSTEM NULL TEST: CUFE CUFFS C1FE C4FC CUCR R2SC CUGA C1FC C4FS E2FC C2FE V2MS C4HY CUSP C2FC CLFK E4IM	2
	123	5	CUFFS	CUSP	FLIGHT CONTROL COMPUTER TO S-II BURN MODE.	
	123	6	CUFFS	C2FC	MAIN PUMP BYPASS VALVE CLOSED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-52' 0"						
123		7	CUFS	C2FC	THERMAL CONTROL - OFF.	
123		8	CUFS	C2FC	VERIFY ACCUMULATORS UNLOCKED.	
123		9	CUFS	C2FC	S-II AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 - ON AND VERIFY SYSTEM PRESSURES HAVE STABILIZED.	
123		10	CUFS	CUQR C2FE	VERIFY SERVOVALVE CURRENTS (IV) & ENGINE BETA POSITION SIGNAL NULLS IN TOLERANCE.	
		11		C2FC	OPEN MAIN PUMP BYPASS VALVE AND ALLOW MAIN PUMP FLUID TEMPS TO STABILIZE WITH RESERVOIR FLUID TEMPS.	
		11-1		C2FC	CLOSE MAIN PUMP BYPASS VALVE.	
123		12	CUFS	C2FC	ALL ACCUMULATOR CONTROL - LOCK, THEN AUTO.	
123		13	CUFS	C2FC	S-II AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 - OFF. NOTE NORMAL SHUTDOWN.	
123		14	CUFS	C2FC	THERMAL CONTROL - ON.	
		14-1		C2FC	*** NOTE MAIN PUMP BYPASS VALVE OPEN DURING AUXILIARY PUMP OPERATION.	
123		15	CUFS	C2FC	VERIFY INDIVIDUAL ACCUMULATOR LOCKUP LIGHTS ON AND ALL ACCUMULATORS LOCK COMMAND LIGHT OFF.	
123		16	CUFS	CUSP	FLIGHT CONTROL COMPUTER TO S-IVB BURN MODE.	
123		17	CUFS	C4HY	FLIGHT MODE - ON THEN AUTO.	
123		18	CUFS	C4HY	VERIFY HYDRAULIC SYSTEM STABILIZED.	
123		19	CUFS	CUQR C4FC	VERIFY SERVOVALVE CURRENT (IU) AND BETA POSITION SIGNAL NULLS IN TOLERANCE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-52' 0"	123	20	CUSF	CUSP	CONTROL COMPUTER TO S-IC BURN MODE (ON THEN OFF).	
	123	21	CUSF	CUCR C1FE	VERIFY SERVOVALVE CURRENT AND BETA POSITION SIGNAL NULLS IN TOLERANCE.	
-51' 25"	181	1	C1TC	C1PC	VERIFY THERMAL CONDITIONING PURGE ON AND MAINTAIN FOR THE REMAINDER OF THE COUNT.	
-50' 0"	111	1	CLTC	CVTS	VERIFY C-BAND BEACON #2 READOUTS COMPLETE AND READY FOR C-BAND BEACON #1.	TOPI
	121	2	CLTC	CUIP	C-BAND #2 INHIBIT ON THEN OFF. C-BAND #1 INHIBIT OFF. C-BAND #2 INHIBIT ON.	
	111	3	CLTC	CVTS	REQUEST RANGE READOUT OF C-BAND BEACON #1. REPORT READOUTS TO VURF ON CHANNEL 137.	TOPI
-49' 0"	121	1	CUPC	CLTC	FT-06 COMPLETE.	
	121	2	CLTC	CLGK	REQUEST AND EXECUTE FT-49/FE-50 (ACCEL MON PROGRAM).	***
-47' 0"	121	1	CLGK	CLTC	FT-49 COMPLETE. FE-50 MONITOR PROGRAM IN PROGRESS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
-45: 00	171	1	CRTO	R2DP	DELETED CDDT ONLY	
-44: 00	121	1	CVTS	CLTC	S/C BDS POWER IS ON	# TCP1
-43: 00		1			NOTE ----- FOR THE NEXT 40 MINUTES, CSA9 REQUIRES EXCLUSIVE CONTROL OF CAMERA 26 & 27	
	111	2	CVTS	CSA9	ON YOUR MARK, RETRACT S/A #9 TO 12 DEGREE PARK POSITION PER V-36085, REPORT WHEN COMPLETE.	TCP1
-42: 00		1		CLTC	*** NOTE TIME FOR ARMING LES	
	121	2	CLTC	CUPS	START ATTITUDE COMMAND TEST ON CH 123, REPORT WHEN COMPLETE.	(FT10)
	121	3	CLTC	CLGK	GO TO CH 123 TO SUPPORT ATTITUDE COMMAND TEST	(FT10)
	123	4	CUPS	CLGK	REQUEST FT-10 LADDER OUTPUT TEST, AUTO OPTION.	***
		4-1			*** NOTE THE FT-10 AUTO OPTION WILL DRIVE THE GUIDANCE LADDERS TO +/- 2 DEG PITCH, +/- 2 DEG YAW AND +/- 5 DEG ROLL	
	123	5	CUPS	CUOR	VERIFY VALVE CURRENTS AND BETA RESPONSE ON ALL ENGINES	
	123	6	CUPS	CLGK	TERMINATE FT-10	***
	123	7	CUPS	ALL	ATTITUDE COMMAND TEST COMPLETE, RETURN TO CHANNEL 121.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
-42: 00	111	8	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN AND TCS ARM KEY TO CLSP	TCPI
	121	9	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	
	121	10	CLTC	CLSP	OBTAIN TCS ARM KEY FROM CPSS	
-40: 00	121	1	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT DRSCR CLOSED LOOP TEST	
	111	2	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP LOCAL COMMAND CARRIER (PROTECTION REQUIRED)	TCPI
	111	3	CLTC	CVTS	DELETED CDDT ONLY	TCPI
	111	4	CLTC	CVTS	REQUEST SRD SWITCH TO CHANNEL 121 TO SUPPORT DRSCR CLOSED LOOP TEST USING FLIGHT CODE PLUGS	TCPI
					<u>DRSCR CLOSED LOOP TEST</u>	
		5	CLTC		*** NOTE DO NOT PROCEED UNTIL S/A #9 RETRACTION HAS STARTED (OTV)	
	121	6	CLTC	CLDP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT PD RSCR'S ENABLE - OFF SYSTEM STATUS SW - SAFE S & A SWITCH - SAFE	
	121	7	CLTC	CLDP C2DP C4DP	VERIFY S & A SAFE AND RSCR'S 1 & 2 PD BLOCKED - ON	
	121	8	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-40' 0"		8-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON.	
121		9	CLTC	BTMC	TM TAPE RECORDER ON FOR DRSCS TEST	
		9-1		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR TESTS.	
121		10	CLTC	RRSC	VERIFY DRSCS RECORDERS ON	
111		11	CLTC	CVTS	LOCAL CMD CARRIER COMING ON.	TOP!
121		12	CLTC	BRFS	SIG. GEN. ON AND VERIFY REMOTE MONITOR TO HYBRID.	
121		13	CLTC	C1DP C2DP C4DP	SYSTEM STATUS SWITCH - OFF	
121		14	CLTC	C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE.	
121		15	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL AND VERIFY	
121		16	CLTC	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
		16-1		CRSS	*** NOTE LIMITER VOLTAGES RECEIVED.	
121		17	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		17-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		18	CLTC	C1DP C2DP C4DP	AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF, SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-40' 0"						
121	19	CLTC	RRSC		RECORDERS - FAST SPEED	
121	20	CLTC	SRO		ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS	
121	21	SRO			3-2-1 - MARK	
	22		C1DP C2DP C4DP		SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF	
121	23	CLTC	RRSC		RECORDERS - SLOW SPEED	
121	24	CLTC	C1DP C2DP C4DP		VERIFY EBW'S 1 & 2 WERE INTERNAL & CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON	
	24-1		CRSS BRFS		*** NOTE CUTOFF RECEIVED	
	24-2		CRSS		*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON	
121	25	CLTC	C1DP C2DP C4DP		VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
	25-1		CRSS		*** NOTE ALL EBW'S NOT CHARGED	
121	26	CLTC	C1DP C2DP C4DP		VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED	
121	27	CLTC	RRSC		RECORDERS - FAST SPEED	
121	28	CLTC	SRO		ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
121	29	SRO			3-2-1 - MARK	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-40' 0"						
121		30	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		31	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		31-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED	
121		32	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	
		32-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		33	CLTC	BTMC	TM TAPE RECORDER OFF AND RELOAD	
		33-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	
111		34	CLTC	CVTS	REQUEST RANGE SAFETY COMMAND TRANSMITTER #1 CARRIER ON. REPORT WHEN TURNED ON.	TCPI
		34-1		CLTC	*** NOTE - DO NOT PROCEED UNTIL TRANSMITTER IS REPORTED ON	
121		35	CLTC	BRFS	SIG GEN SELECTOR - STANDBY	
		35-1		B1RF B2RF B4RF CRSS	*** NOTE ALL LIMITER VOLTAGES RECEIVED.	
111		36	CLTC	CVTS	DRSCR TEST IS COMPLETE. LOCAL CMD CARRIER IS OFF.	TCPI
-36' 0"						
121		1	CLGK	CLTC	FT-10 COMPLETE	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-35' 0"	181	1	CCRP	C1TC	RP-1 LEVEL ADJUST AND LINE INERTING ARE COMPLETED PER V-25389	
-33' 30"		1		C2RP	VERIFY LOX HE INJ RECVR PRESS METER AT APPROXIMATELY 3000 PSIA.	
		2		C2RP	LOX HE INJ TO START	
		3		C2RP	*** NOTE HE INJ ORIFICE OUT PRESS METER INDICATES PRESS RISE TO APPROX 240 PSIA	
171		4	C2RP	C2TC	LOX HE INJECT IN PROGRESS <u>PREPS FOR POWER TRANSFER TEST</u>	
188		5	CLTC	ALL	ALL PERSONNEL SUPPORTING POWER TRANSFER TEST SWITCH TO INDIVIDUAL "STAGE TC" ACTIVE CHANNELS TO PREPARE FOR POWER TRANSFER.	
181		6	C1TC	C1NP	VERIFY INTERNAL AND EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
181		7	C1TC	C1NP	BATTERY INSTALLED ENABLE TO ON - THEN AUTO	
		7-1		C1NP	*** NOTE S-IC READY FOR POWER TRANSFER ON THEN OFF	
181		8	C1TC	C1NP	VERIFY POWER TRANSFER SWITCH - AUTO.	
181		9	C1TC	C1NE R1SC	VERIFY READY FOR POWER TRANSFER	
121		10	C1TC	CLTC	S-IC READY FOR POWER TRANSFER PROGRAM REQUEST	
		10-1		C2RP	*** NOTE OK TO OPERATE PUMPS LIGHT ON	
171		11	C2TC	C2RP	LH2 RECIRC PUMPS TO START, THEN INHIBIT (AT 2 SECOND INTERVALS)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-33'30"		11-1		C2PC	*** NOTE RECIRC BUS CURRENT INCREASES WITH EACH RECIRC PUMP START	
171		12	C2TC	C2RP	LH2 PREVALVES TO CLOSE, THEN INHIBIT	
		12-1		C2RP	*** NOTE LH2 PREVALVES CLOSED - ON	
171		13	C2TC	C2NP	BATTERY INSTALLED TO AUTO	
171		14	C2TC	C2NP	VERIFY MAIN, INSTR AND RECIRC POWER TRANSFER SWITCHES IN AUTO	
171		15	C2TC	C2NP R2SC	VERIFY READY FOR POWER TRANSFER	
121		16	C2TC	CLTC	S-11 READY FOR POWER TRANSFER PROGRAM REQUEST	
161		17	C4TC	C4EP	VERIFY LOX AND LH2 READY TO START INDICATION ON	
161		18	C4TC	C4IP	PRELAUNCH CHECKOUT GROUP TO AUTO	
161		19	C4TC	C4NP	EMERGENCY POWER TRANSFER - OFF	
161		20	C4TC	C4NP	BATTERY MONITOR TO AUTO.	
161		21	C4TC	C4HY	VERIFY FLIGHT MODE IN AUTO OR POSITION TO AUTO.	
161		22	C4TC	C4NP C4PP	VERIFY INTERNAL AND EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER.	
161		23	C4TC	R4E1 R4SC	STRIP CHARTS TO FAST	
161		24	C4TC	C4NP	POWER TRANSFER SWITCH TO AUTO	
161		25	C4TC	C4NP C4PS R4E1 R4SC	VERIFY READY FOR POWER TRANSFER	
121		26	C4TC	CLTC	S-1VB READY FOR POWER TRANSFER PROGRAM REQUEST	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-33'30"						
151	27	CUTC	CUNP		VERIFY INTERNAL AND EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER	
151	28	CUTC	CUNP RUBM		VERIFY READY FOR POWER TRANSFER	
151	29	CUTC	CUNP		POWER TRANSFER TEST TO AUTO	
151	30	CUTC	CUNP		IU TO REMAIN ON INTERNAL FOR 3 MINUTES	
121	31	CUTC	CLTC		IU READY FOR POWER TRANSFER PROGRAM REQUEST	
-32' 0"						
111	1	CLTC	CVTS		REQUEST RANGE MONITOR C-BAND AND GMIL MONITOR IU CCS DURING POWER TRANSFER TEST	TOPI
121	2	CLTC	RLDE		START AND STOP SEQUENCE COMPARE AS DIRECTED BY CARE	
123	3	CUFS	CUGA		ATTITUDE RATE COMMANDS (PLUS 10 DEG/SEC ROLL). HOLD UNTIL POWER TRANSFER IS COMPLETE.	
121	4	CUFS	CLTC		FLIGHT CONTROL READY FOR POWER TRANSFER	
121	5	CLTC	C1NK C2NK C4NK CUNK		MONITOR CONSOLE #12 DURING VAPX	
121	6	CLTC	C1TC C2TC C4TC CUTC		AFTER TRANSFER TO INTERNAL SECURE STAGES FROM POWER TRANSFER ON "STAGE TC" CHANNELS.	
	6-1	ALL			*** NOTE S-IC, S-II AND S-IVB STAGES STAY INTERNAL FOR 30 SECONDS MINIMUM IU STAY ON INTERNAL POWER FOR 3 MINUTES MINIMUM. REPORT BATTERY VOLTAGES AND CURRENTS TO CLES ON CH 125.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-31'30"	121	1	CLTC	C1PK	REQUEST & EXECUTE VAPX (POWER TRANSFER) (CDDT/CD OPTION).	
-30' 0"					POWER TRANSFER TEST -----	
	121	1	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3".	
	121	2	C1PK	ALL	VAPX WILL TRANSFER STAGES INTERNAL IN 5 SEC.	
	121	2-1	C1PK	ALL	5-4-3-2-1, MARK	
		2-2		C1NP C2NP C4NP CUNP	*** NOTE ON INTERNAL POWER	
		2-3		CUDE	*** NOTE 0777 & 0779 ON, 0781 OFF	
	121	3	C1PK	CLTC	ALL STAGES INTERNAL FOR 30 SECONDS. TRANSFER EXTERNAL INDIVIDUALLY USING STAGE SWITCHES	
		3-1		C1NP	*** NOTE POWER TRANSFER EXTERNAL OFF	
		3-2		C1NP	*** NOTE POWER TRANSFER INTERNAL ON	
	181	4	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) -- ON	
		4-1		C1NP	*** NOTE BUS +1D121 OFF	
		4-2		C1NP	*** NOTE BUS +1D111 OFF	
		4-3		C1NP	*** NOTE BUS +1D211 OFF	
		4-4		R1SC	*** NOTE RECORD VOLTAGE FOR STAGE BUSSES 1D11 AND 1D21, RECORD VOLTAGE AND CURRENT FOR BUSSES 1D10 & 1D20.	
	181	5	C1TC	C1NP	POWER TRANSFER SWITCH EXTERNAL THEN AUTO.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-30' 0"						
		5-1		C1NP	*** NOTE S-IC POWER TRANSFER COMPLETE OFF	
		5-2		C1NP	*** NOTE POWER TRANSFER INTERNAL OFF	
181	6	C1TC		C1NP	VERIFY POWER TRANSFER EXTERNAL ON	
181	7	C1TC		C1NP	BATTERY INSTALLED ENABLE SWITCH TO AUTO	
		7-1		C1NP	*** NOTE BUS +1D121 ON	
		7-2		C1NP	*** NOTE BUS +1D211 ON	
		7-3		C1NP	*** NOTE BUS +1D111 ON	
181	8	C1TC		R1SC	READOUT 1D11 & 1D21 VOLTAGE & 1D10, 1D20 VOLTAGE AND CURRENT DURING INTERNAL, THEN REPORT TO CLES ON CH 125.	
181	9	C1TC		ALL	ALL STATIONS RETURN TO CH 121	
121	10	C1TC		CLTC	S-IC POWER TRANSFER TEST IS COMPLETE	
		10-1		C2NP	*** NOTE POWER TRANSFER COMPLETE ON	
		10-2		R2SC	*** NOTE RECORD THE FOLLOWING: MAIN BATT CURRENT (XM0021-207) ----- MAIN DC BUS VOLTAGE 2D11 (XM0020-207) ----- INSTR BATT CURRENT (XM0024-207) ----- INSTR DC BUS VOLTAGE 2D21 (XM0023-207) ----- RECIRC BUS CURRENT (XM0114-207) ----- RECIRC DC BUS VOLTAGE 2D51 (XM0111-207) ----- IGN DC BUS VOLTAGE 2D61 (XM0125-207) -----	

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-30' 0"						
171		11	C2TC	C2NP	TRANSFER MAIN, INSTR. & RECIRC TO EXTERNAL AFTER 30 SECONDS MINIMUM ON INTERNAL.	
		11-1		C2NP	*** NOTE MAIN, INST & RECIR BUSES EXTERNAL ON	
		11-2		C2NP	*** NOTE POWER TRANSFER COMPLETE OFF	
171		12	C2TC	C2RP	RECIRC. RESET TO RESET, THEN INHIBIT	
		12-1		C2PC	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS	
171		13	C2TC	C2RP	LOX HE INJECTION TO AUTO	
		13-1		C2RP	*** NOTE LOX HE INJ OFF -- OFF LH2 PREVALVES OPEN ON, PUMP INLET PRESSURE DECAY.	
171		14	C2TC	ALL	ALL STATIONS RETURN TO CH121	
121		15	C2TC	CLTC	S-II POWER TRANSFER TEST IS COMPLETE	
171		16	C2TC	R2SC	READOUT RECORDED BUS VOLTAGES TO CLES ON CH 125.	
161		17	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE	
161		18	C4TC	C4NP	VERIFY STAGE ON INTERNAL POWER	
161		19	C4TC	R4SC	VERIFY BUS VOLTAGE AND CURRENT WITHIN LIMITS	
161		20	C4TC	C4NP	VERIFY READY FOR TRANSFER TO EXTERNAL	
161		21	C4TC	C4NP	POWER TRANSFER SWITCH -- EXTERNAL THEN AUTO	
161		22	C4TC	C4NP	VERIFY STAGE ON EXTERNAL POWER	
161		23	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-30' ON						
161		24	C4TC	R4PS	VERIFY CHILLDOWN PUMP DATA SATISFACTORY AND READY TO TURN PUMPS OFF	
161		25	C4TC	C4EP	OPEN LOX & LH2 PREVALVES.	
161		26	C4TC	C4EP	LOX CHILLDOWN PUMP - OFF	
161		27	C4TC	C4EP	LH2 CHILLDOWN PUMP - OFF	
161		28	C4TC	C4HY	FLIGHT MODE - OFF THEN AUTO	
161		29	C4TC	R4SC	TRANSMIT POWER TRANSFER DATA TO GDC-28 ON CH 125	
161		30	C4TC	C4DE	TRANSMIT THE FOLLOWING DEE TIMES TO C4PS: S/SEL CH 83 READ COMMAND ON 2647 AND 2648 OFF 1710 AND 1711 ON	
161		31	C4TC	ALL	ALL STATIONS RETURN TO CH 121	
121		32	C4TC	CLTC	S-IVB POWER TRANSFER TEST COMPLETE	
		32-1	CUTC		*** NOTE DELAY NEXT STEP FOR 3 MINUTES	
151		33	CUTC	CUNP	POWER TRANSFER TO EXTERNAL ON YOUR MARK	
151		34	CUNP		3-2-1, MARK	
		34-1	CUNP		*** NOTE IU GROUND POWER ON AND POWER TRANSFER COMPLETE OFF (0777 & 0779 OFF, 0781 ON)	
151		35	CUTC	CUNE	VERIFY POWER TRANSFER SATISFACTORY	
151		36	CUTC	RUBM	READOUT VOLTAGES AND CURRENTS TO CLES ON CH 125	
151		37	CUTC	ALL	ALL STATIONS RETURN TO CH 121	
121		38	CUTC	CLTC	IU POWER TRANSFER TEST IS COMPLETE	
121		39	CLTC	ALL	RECORDERS SUPPORTING POWER TRANSFER TO SLOW	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-30' 0"						
	121	40	CLTC	CUFS	POWER TRANSFER TEST COMPLETE	
	123	41	CUFS	CUOR CUGA	VERIFY ATTITUDE RATE COMMAND UNDISTURBED DURING POWER TRANSFER	
	123	42	CUFS	CUGA	REMOVE PLUS ROLL ATTITUDE RATE COMMAND	
	123	43	CUFS	ALL	ALL FLIGHT CONTROL PERSONNEL RETURN TO CH 121	
	121	44	CUFS	CLTC	FLIGHT CONTROL SYSTEM TEST IS COMPLETE	
	153	45	RLDE		ESTABLISH COMMUNICATION WITH HOUSTON VIA CH193 AND GIVE HOUSTON CDC/GMT TIME CORRELATION.	
		45-1			*** NOTE IF ANY HOLD IS GREATER THAN 10 MIN. GIVE ANOTHER CDC/GMT TIME CORRELATION TO HOUSTON	
	181	46	C1TC	CECS	START S-IC FWD COMPARTMENT TEMPERATURE INCREASE PER V-36074.	
-27' 0"						
	121	1	C1PK	CLTC	VAPX IS COMPLETE.	
-26' 0"						
		1		RRSC	*** NOTE DRSCS MEASUREMENTS OK DURING PWR TRANSFER	
	181	2	C1TC	C1CS	POSITION LOX LEVEL SIMULATE WET SWITCHES TO SIMULATE	
	181	3	C1TC	C1PE	PRECHARGE POGO SUPPRESSION SYSTEM.	
	181	4	C1TC	V1MS R1SC	GO TO CHANNEL 182 ACTIVE TO SUPPORT POGO SUPPRESSION SYSTEM PRECHARGE.	
	182	5	C1PE	C1LO	LOX BUBBLING TO DUCTS 1 AND 3. VERIFY PROPER LIGHT INDICATION. TWO DUCT BUBBLING SHALL REMAIN ON DURING REMAINDER OF COUNT.	

NOTE: OK

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-26' 0"						
182		6	C1PE	V1MS R1SC	STAND-BY TO MONITOR MEASUREMENTS C326-115 THRU C345-115.	
182		7	C1PE	C1RP	VERIFY LOX BUBBLING HAS BEEN ON FOR MINIMUM OF ONE MINUTE THEN POSITION POGO SUPPLY VALVES NO. 1 AND NO. 2 TO OPEN FOR ONE MINUTE AND THEN TO CLOSE. VERIFY PROPER LIGHT INDICATIONS.	
182		8	C1PE	R1SC	VERIFY POGO MEASUREMENTS SHOWED INCREASE IN TEMPERATURE	
182		9	C1PE	V1MS R1SC	VERIFY MEASUREMENTS BELOW SHOW INCREASE IN TEMPERATURE.	
					ENGINE 1 ----- C334-115 C335-115	ENGINE 2 ----- C326-115 C327-115
					ENGINE 3 ----- C338-115 C339-115	ENGINE 4 ----- C330-115 C331-115
					FORMAT 331	
182		10	C1PE	V1MS R1SC	POGO SUPPRESSION SYSTEM PRECHARGE COMPLETE. RETURN TO CHANNEL 121.	
181		11	C1PE	C1TC	POGO SUPPRESSION SYSTEM PRECHARGE COMPLETE.	
-25' 0"						
121		1	CLTC	C1TP C2TP C4TP CU1P	PLACE TM CAL CONTROLS - AUTO. REPORT WHEN COMPLETE.	(VATC

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-25' 0"						
		1-1		C1IP	VERIFY TM CALIBRATOR - ON	(VATC)
		1-2		C1IP	TM CAL MODE -- AUTO	(VATC)
		1-3		C1IP	RACS POWER -- AUTO	(VATC)
					NOTE ----- LOX AND FUEL RACS OFF	
		1-4		C1IP	400 HZ CAL POWER -- AUTO	(VATC)
		1-5		C1IP	PREFLIGHT LEVELS -- AUTO	(VATC)
		1-6		C2IP	FM/FM INFLT -- AUTO	(VATC)
		1-7		C2IP	TM CAL MODE -- AUTO	(VATC)
		1-8		C2IP	FREQ MEAS CAL -- AUTO	(VATC)
		1-9		C2IP	PREFLIGHT LEVELS -- AUTO	(VATC)
		1-10		C2IP	PCM MODE -- AUTO	(VATC)
		1-11		C2NP	RACS POWER -- AUTO	(VATC)
		1-12		CUIP	TM CAL MODE -- AUTO	(VATC)
		1-13		CUIP	VERIFY TM CALIBRATOR - ON	(VATC)
		1-14		CUIP	PREFLT LEVELS -- AUTO	(VATC)
		1-15		C4IP	TM CAL COMMAND -- AUTO	(VATC)
		1-16		C4IP	PRELAUNCH CHECKOUT GROUP -- AUTO	(VATC)
		1-17		C4IP	TM CAL MODE -- AUTO	(VATC)
		1-18		C4IP	REGULAR CAL COMMAND -- AUTO	(VATC)
121		2	CLTC	C1PK	REQUEST & EXECUTE VATS (TERMINAL SEQ PROG PR2/PR4)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-25' 0"		2-1		CLTC	NOTE ----- WHEN VATS TERMINAL LINKING PROGRAM IS BEING EXECUTED, OMIT STEPS WITH THREE ASTERISKS TO THE RIGHT OF THE STEP.	
121		3	CVTS	CLTC	RANGE INTERROGATION OF C-BAND BEACON #1 IS COMPLETE. VERIFY C-BAND BEACON #2 IS COMING ON.	TOPI
121		4	CLTC	CUIP	C-BAND BEACON #1 INHIBIT - ON C-BAND BEACON #1 & #2 INHIBIT - OFF	
121		5	CLTC	CRSS	VERIFY PROCEED ON & BYPASS IS OFF	
121		6	CLTC	C1FR	VERIFY RANGE SAFE - ON	
121		7	CLTC	C4PP	PLUG SUPERVISION POWER OFF	
121		8	CLTC	RLDE	GIVE A DEMAND PRINTOUT ON ALL STAGE PRINTERS. REPORT WHEN COMPLETE.	
-24' 0"		1	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE LOOP CODE NUMBER DIAL YOUR CODE NUMBERS AND KEEP RECEIVERS OFF THE HOOK UNTIL T-0	
171		2	C2TC	C2AE	START ENGINE CHILLDOWN BY THE CLOCK AT T-22 MINUTES	
171		3	C2TC	C2NP	VERIFY STAGE SELECT OFF	
		3-1		C2AE	ENGINE SW SEL CUTOFF TO ON THEN AUTO	
		3-2		C2AE	ALL ENG EMERG CUTOFF TO AUTO	
		3-3		C2AE	START TANK ALL VENT TO ALL VENT	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22'30"	188	1	CLTC	ALL	VATC WILL START EXECUTING AT T-21'55" MINUTES. FLUCTUATING MEASUREMENTS MAY OCCUR DURING NEXT 3 MINUTES.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22' 0"					***** * NOTE * * ---- * * IF RECYCLE IS NECESSARY, * * THE COUNTDOWN WILL BE * * PICKED UP AT THIS POINT. * * *****	
		1		C2AE	START TANK SUPPLY VALVE TO PRESSURIZE	
		1-1		C2AE	*** NOTE ALL START TANK PRESS METERS INDIATE PRESS RISE AND TEMP METERS INDICATE TEMP DROP	
		1-2		R2SC	*** NOTE XY PLOTTER TEMP AXIS DEFLECTION	
171		2	C2AE	C2TC	START TANK CHILLDOWN IN PROGRESS	
121		3	C2TC	CLTC	S-11 START TANK CHILLDOWN IS IN PROGRESS	
121		4	CLTC	C4TC	FOLLOWING STATIONS SWITCH TO 161 FOR CHILLDOWN TEST (CHILLDOWN FUNCTIONS TO BE PERFORMED BY CLOCK AND MARKED BY C4PS ON CH 161)	
					C4AL C4ET C4PS C4NP C4SP C4EP C4HN C4NP C4ES R4PS	
181		5	C1TC	CWCP	START FINAL INDUSTRIAL WATER PREPS PER V-36113.	
-21'55"						
121		1	CLTC	CLIK	REQUEST & EXECUTE VATC (TM PREFLT CAL).	***
-20'30"						
121		1	CLIK	CLTC	VATC COMPLETE	
121		2	CLTC	CLIK	REQUEST & EXECUTE VAMC (MEAS SYSTEM RAPID CALIBRATION) (NOT TO BE PERFORMED IF A RECYCLE TO T-22' HAS OCCURRED)	***

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-20' 0"		1		04EP	OPEN START TANK VENT.	
		2		04EP	OPEN START TANK PURGE.	
101		3	CLTC	CLPE	VERIFY S-IC GN2 & HELIUM SYSTEM PRESSURIZED TO FLIGHT PRESSURE	
101		4	CLTC	CLPC	VERIFY/ACCOMPLISH LOW LOX DOME PURGE ON.	
101		5	CLTC	CT51	OPEN PRESSURE SUPPLY VALVE #3.	
-19' 0"		1	CLTC	CLTC	VANC COMPLETE	
		1-1		04IP	*** NOTE TM READY	
-18' 0"		1	CLTC	ECOP	VERIFY CIF READY TO SUPPORT GUIDANCE REAL TIME PROGRAM.	
112		2	CLTC	CTSC	BRING INDUSTRIAL WATER SYSTEM SECOND PUMP TO OPERATIONAL PRESSURE OF 165 PLUS OR MINUS 10 PSIG.	TOP!
101		3	C4TC	R4HY	RECORDERS TO FAST	
101		4	C4TC	04HY	FLIGHT MODE -- ON THEN AUTO	
101		5	C4TC	R4HY	REPORT WHEN HYDRAULIC SYSTEM IS STABILIZED	
-17' 0"		1	RLDE		ESTABLISH BLACK PHONE COMM WITH HOUSTON ON 9-713-HU-3-XXXX.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-16' 0"	181	1	C1TC	C1SP	CUTOFF RESET - ON MOMENTARILY.	
	181	2	C1TC	C1EN	ARM IGNITORS INSTALLED - ON THEN AUTO, VERIFY HYPERGOL AND IGNITORS INSTALLED INDICATIONS REMAIN ON.	
-15' 0"	161	1	C4TC	C4AL	REMOVE SAFETY LOCKS FROM APS VALVE POWER SWITCH	
-14' 30"		1		C4ET	CT HELIUM CONT SOL ON AND OFF AT C4PS COMMAND.	
		2		C4EP	CLOSE START TANK PURGE SUPPLY VALVE.	
		3		C4EP	OPEN START TANK SUPPLY VALVE.	
	161	4	C4PS	C4TC	START TANK CHILLDOWN IS IN PROGRESS	
	121	5	C4TC	CLTC	S-IVB START TANK CHILLDOWN IS IN PROGRESS	
-14' 0"	181	1	C1TC	C1LO	LOX FLIGHT VENTS TO CLOSE THEN AUTO	
		1-1		C1LO	*** NOTE LOX FLIGHT VENTS OPEN	
-13' 0"	121	1	CLTC	CLGK	REQUEST & EXECUTE FT-06 (GIMBAL ANGLE READ)	***
		2		C2AE	TCH PURGE TO ON	
	171	3	C2AE	C2TC	TCH JACKET PURGE IN PROGRESS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-13' 0"		3-1		C2SP	CYCLE LOX AND LH VENT VALVES INDIVIDUALLY CLOSED THEN OPEN, A MINIMUM OF FOUR TIMES EACH, TO VERIFY PROPER VENT VALVE MICRO SWITCH OPERATION.	
	151	4	CUTC	CQAA	Q-BALL POWER - AUTO	
		4-1		CQAA	*** NOTE Q-BALL POWER ON	
		5		C4EP	OPEN THRUST CHAMBER PURGE SUPPLY	
-12' 30"		1		C4HN	OPEN HEAT EXCHANGER CIRCUIT #1 VENT.	
		1-1		C4EP C4HN	*** NOTE STANDBY TO CYCLE HEAT EXCHANGER CIRCUIT NO. 1 VENT AND START TANK SUPPLY VENT IF REQUESTED BY R4PS.	
	171	2	C2TC	C2EC	VERIFY IGNITION DETECTED ON, ENGINES 1 THRU 5	
-12' 0"		1	CLTC	CUSP	VERIFY CONTROL COMPUTER IN S-IC BURN MODE.	
	121	2	CLTC	CUGA	ATTITUDE RATE COMMANDS - (PLUS 1.5 DEGREES PITCH AND YAW).	
	121	3	CUGA	CLTC	ATTITUDE RATE COMMANDS COMPLETE	
		4	RLDE		SELECT EST AND ENTER, THEN CDC & ENTER	
		4-1	RLDE		*** NOTE IF HOLD OCCURS, GIVE ANOTHER CDC/GMT TIME CORRELATION TO HOUSTON	
	153	5	RLDE	HFLT	T- _____ OCCURRED AT GMT _____	
	153	6		HFLT	VERIFY RECEIPT OF TIME CHECK	
	171	7	C2TC	C2NP	VERIFY RESET FOR FIRING COMMAND ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-12' 0"		8		C4SP	CLOSE LOX TANK VENT. VERIFY VALVE CLOSSES IMMEDIATELY	
		9		C4SP	LOX TANK VENT OPEN THEN AUTO	
		10		C4SP	CLOSE LH TANK VENT. VERIFY VALVE CLOSSES IMMEDIATELY	
		11		C4SP	LH2 TANK VENT OPEN THEN AUTO.	
	121	12	CLTC	ECOP	START GUIDANCE REDUCTION PROGRAM.	
-11' 0"						
	181	1	C1TC	C1PU	START S-IC FUEL JACKET TOPPING PER V-34012	
	181	2	C1TC	C1NP	STAGE LOGIC - RESET	
		2-1		C1NP	*** NOTE STAGE LOGIC ZERO.	
	121	3	CLTC	C1SP	SEQUENCER POWER ON. ✓	
		3-1		C1SP	*** NOTE ALL VOLTAGES NORMAL.	
		3-2		C1SP	*** NOTE SEQUENCER RESET.	
	181	4	CWBP	C1TC	FINAL INDUSTRIAL WATER SYSTEM PREPS ARE COMPLETE.	
	112	5	CLTC	CTSC	WATER SYSTEM DIESEL ENGINE OVERRIDE SWITCH - ON	TCPI
-10' 45"						
	181	1	C1TC	R1SC	STANDBY TO REPORT ANY CHANGES IN POGO MEASUREMENTS (C335-115, C327-115, C339-115 & C331-115)	
	181	2	C1TC	C1LO	VERIFY S-IC LOX BUBBLING TO DUCTS 1 & 3.	
	181	3	C1TC	C1RP	VERIFY LOX BUBBLING HAS BEEN ON A MINIMUM OF ONE MINUTE, THEN OPEN POGO SUPPLY VALVES 1 & 2 FOR ONE MINUTE THEN CLOSE POGO SUPPLY VALVES 1 & 2.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10'30"	171	1		C2FC	MAIN PUMP BYPASS VALVE CLOSED.	
	171	2		C2FC	THERMAL CONTROL - OFF.	
	171	3	C2TC	C2FC	VERIFY ACCUMULATORS UNLOCKED.	
-10' 0"		1			DELETED	
	121	2	CLGK	CLTC	FT-06 COMPLETE	
	121	3	CLTC	CLGK	REQUEST AND EXECUTE FT-42 (PREPARE TO LAUNCH)	***
		3-1		CVTS	*** NOTE IF A HOLD IS CALLED AFTER FT-42 HAS BEEN EXECUTED, DEPRESS HOLD BUTTON ONLY. DO NOT PRESET NEW COUNTDOWN TIME. AT TERMINATION OF A HOLD, DEPRESS COUNTDOWN BUTTON ONLY.	TCPI
	121	4	CLTC	CLGK	READOUT LV FIRING AZIMUTH ON CH 111 WHEN READY	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10' 0"						
	171	5	C2TC	C2RP	START RECIRC ACTIVATION	
		6		C2RP	*** NOTE OK TO OPERATE PUMPS - ON	
		7		C2RP	LH2 PUMPS NO. 1 THRU 5 TO START THEN INHIBIT AT 2 SEC INTERVALS (MINIMUM)	
		7-1		C2PC	*** NOTE RECIRC BUS CURRENT INCREASES WITH EACH PUMP START.	
		8		C2RP	WAIT 5 SEC (MINIMUM) THEN PLACE LH2 PREVALVES TO CLOSE THEN INHIBIT	
		8-1		C2RP	*** NOTE ALL ENG INLET LH2 PRESS METERS INDICATE PRESS RISE	
	171	9	C2RP	C2TC	RECIRC ACTIVATION COMPLETE	
		10		C2EV	*** NOTE RECIRC READY FOR LAUNCH IS ON	
		10-1		C2PU	*** NOTE PU AUX RESET LIGHT IS OFF	
	171	11	C2TC	R2SC	VERIFY ENGINE PU VALVES IN NULL POSITION AND MONITOR FOR OUT OF TOLERANCE READINGS.	
		12		C2FC	S-II AUXILIARY HYDRAULIC PUMPS ENGINES 1, 2, 3 & 4 - ON. NOTE CORRECT PRESSURES.	
		13		C2FC	MAIN PUMP BYPASS VALVE - OPEN	
	171	14	C2FC	C2TC	HYDRAULICS ACTIVATED IN SUPPORT OF TCH CHILLDOWN.	
		14-1		C2FC	*** NOTE: IF HOLD IS CALLED BETWEEN T-10' AND T-8', AND EXCEEDS 4 MINUTES: SELECT MAIN PUMP BYPASS VALVES CLOSED, THERMAL CONTROL ON, AND AUX PUMPS OFF. ADVISE C2TC OF SWITCH ACTION AND SYSTEM CONFIGURATION. WHEN COUNT RESUMES, SELECT THERMAL CONTROL OFF, AUX PUMPS ON, AND MAIN PUMP BYPASS VALVES OPEN.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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-10' 0"

161

15

C4TC

C4AL APS ENGINE VALVE POWER ON

- 8' 0"

1

*****NOTICE*****

* IF A HOLD IS CALLED BETWEEN T-8' AND
 * T-6', THE FOLLOWING STEPS SHALL BE
 * PERFORMED IMMEDIATELY.

* C4EP CLOSE TCH CHILLDOWN
 * VALVE

* C2AE TCH CHILLDOWN TO
 * OFF

* 111
 * 121 CVTS ALL THE CLOCK WILL BE
 * RESTARTED IN
 * EXACTLY MIN
 * SEC FROM MY MARK.

* C2AE ON MARK FROM CVTS, TURN
 * TCH CHILLDOWN TO ON

* C4EP ON MARK FROM CVTS,
 * OPEN TCH CHILLDOWN
 * VALVE

* 111
 * 121 CVTS ALL 5, 4, 3, 2, 1 -
 * MARK

TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-8' 0"	161 121	1		C4EP	CLOSE THRUST CHAMBER PURGE SUPPLY	
		2		C4EP	OPEN THRUST CHAMBER CHILLDOWN VALVE	
		3	C4PS	C4TC	THRUST CHAMBER CHILLDOWN IS IN PROGRESS	
		4	C4TC	CLTC	S-IVB TCH CHILLDOWN IS IN PROGRESS	
		4-1			***** CAUTION ***** * S-IVB THRUST CHAMBER CHILLDOWN SHALL NOT * * EXCEED 20 MINUTES ACCUMULATED AND SHALL * * BE ON FOR AT LEAST 8 MINUTES CONTINUOUSLY * * PRIOR TO T-0. * *****	
	121	5	CLTC	C4IP	PRELAUNCH C/O GROUP PWR OFF	
		5-1		C4IP	*** NOTE TM READY REMAINS ON	
		6		C2AE	TCH CHILLDOWN TO ON	
		7		C2AE	TCH PURGE TO OFF	
		7-1		C2AE	*** NOTE ALL TCH JACKET TEMP METERS INDICATE TEMP DROP	
	171	8	C2AE	C2TC	THRUST CHAMBER JACKET PURGE IS COMPLETED, AND TCH CHILLDOWN IN PROGRESS.	
		8-1			*****CAUTION***** * * S-II THRUST CHAMBER * * CHILLDOWN SHALL NOT * * EXCEED 10 MINUTES * * ACCUMULATED AND SHALL * * BE ON FOR AT LEAST * * 8 MINUTES CONTINUOUSLY * * PRIOR TO T-0 * * *****	
	121	9	C2TC	CLTC	S-II TCH CHILLDOWN IN PROGRESS.	
		9-1		C2AE	*** NOTE ADVISE C2TC HOLD TIME REMAINING BEFORE SAFING IS REQUIRED.	
		10		C1FC	*** NOTE ENGINES IN NULL POSITION.	
		11		C1HP	*** NOTE HYDRAULIC PRESSURE 1590 +/- 80 PSIA	
118	12		CSAC	CHCU	START CIRCUIT BYPASS TO BYPASS & VERIFY.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
7:00	118	10	CSAC	CSA1	LOWER LOX LINE PURGE VALVE SWITCH TO OPEN & VERIFY,	
	118	11	CSAC	CSA1	UPPER LOX LINE PURGE VALVE SWITCH TO OPEN & VERIFY,	
	118	12	CSAC	CSA1	DELETED CDDT ONLY	
	118	13	CSAC	CSA1	CARRIER CONNECT & RETRACT ARMING SWITCH TO ARM	
181	14	CLTC	CLRP	S-IC FUEL FLIGHT VENT TO AUTO,		
	14-1		CLRP	*** NOTE FUEL FLIGHT VENT CLOSED,		
181	15	CLTC	CLRP	PRESSURIZE S-IC FUEL TANK TO APPROX. 2 PSIG, REPORT WHEN COMPLETE,		
7:30	121	1	C1PK	CLTC	VATS COMPLETE	(NT60)
	121	2	CLTC	CLVN	COMPUTER TEST SWITCH OFF,	
	2-1		ALL	*** NOTE DISREGARD COMPUTER TEST DISCRETE LIGHT CHANGES,		
121	3	CLTC	CLCP	REQUEST & EXECUTE NT-60 (REDLINE MONITOR PROGRAM)		
111	4	CLCK	CVTS HFLT SRO	LV FIRING AZIMUTH IS	DEG MIN	TCPI
				SEC		
	4-1		CLCK	*** NOTE READOUT NEW FIRING AZIMUTH FOLLOWING ANY HOLDS		
7:00	181	1	CSAC	CLTC	LSE MECH READY FOR LAUNCH,	
	181	2	CLTC	CLFR	VERIFY LAUNCH SUPPORT PREPS COMPLETE,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					GO ONLY	
- 7: 0"	121	3	CLTC	CLTC	LAUNCH SUPPORT PREPS COMPLETE,	
- 6:30"	121	1	CLTC	CUES	EDS MODE - LAUNCH,	
		1-1		CLFR CUES	*** NOTE EDS READY,	
	121	2	CLBK	CLTC	LVDC IN PREPARE TO LAUNCH MODE,	
	121	3	CLTC	C1NP C2NP CUNP	INHIBIT SWITCH SELECTOR AND RESET COUNTERS,	
- 6: 0"		1			*****NOTICE***** * IF A HOLD IS CALLED * * BETWEEN T-6: AND T-3:17" * * ALL CHILDDOWNS SHALL * * CONTINUE * *****	
	181	2	CLTC	CLPU	VERIFY F-1 ENGINE THRUST CHAMBER PREFILL TOPPING COMPLETE,	
	151	3	CUTC	CUCP	PUMP PRESSURE SWITCH ACTIVATE ON	
		3-1		CUCP	*** NOTE PUMP PRESSURE ACTIVATE INDICATION ON	
	151	4	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - ON (SENSE CONTROL PANEL BITS 21 & 22)	
	151	5	CUTC	CGAA	G-BALL HEATER POWER - OFF	
	121	6	CLTC	CLTC	PROPULSION PREPS COMPLETE	

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- 5:30"						
	121	1	CLTC	ETOM	VERIFY GUIDANCE TM SATISFACTORY	
		2		C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT.	
		3		C4EP	CLOSE START TANK VENT.	
		4		R4PS	MONITOR START TANK PRESSURE STABILIZATION	
	121	5	CLTC	CWCP	VERIFY IWS AUTO/ARM BUS - ON	
	121	6	CLTC	C1DP C2DP C4DP	SAFE & ARM TO ARM FOR 2 SECONDS THEN AUTO	
		6-1		CRSS	*** NOTE ALL S & A ARM INDICATORS ON.	
		6-2		C1FR	*** NOTE ORDNANCE PREP COMPLETE.	
		6-3		C2TC	*** NOTE PD SYSTEM READY.	
		6-4		C4TC	*** NOTE PD SYSTEM READY.	
		6-5		C1NP	*** NOTE READY FOR LAUNCH POWER	
	121	7	CLTC	CSPP C1RP C4PP	COMMIT POWER SUPPLY & VERIFY.	
	121	8	CLTC	C1NP	POWER FUNCTION SELECTOR - LAUNCH AND VERIFY ALL STAGES READY FOR POWER TRANSFER ON.	
		8-1		C1NP	*** NOTE LAUNCH BUS 1D161 ON AND PRELAUNCH BUS 1D151 OFF	
		8-2		C1NP	*** NOTE BATT #1 & #2 ON.	
		8-3		C1FR	*** NOTE HYPERGOLS INSTALLED - ON.	
		8-4		C1FR	*** NOTE IU AND S/C READY FOR LAUNCH.	
		8-5		C1RP	*** NOTE POGO SUPPLY VALVES 1 & 2 OPEN COMMAND OFF	

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5:30"	181	9	C1TC	C1CS	LOX LEVEL SIMULATE SWITCHES TO AUTO	
5: 7"		1		C2SP	LOX DISCONNECT PRESSURE - ON	
		2		C2SP	LOX SUPPLY VALVE - OPEN	
		3		C2SP	*** NOTE LH2 LOW PRESS VENT MODE - ON.	
5: 0"		1			NOTE ----	
					FOR THE NEXT 5 MIN, CSA1 REQUIRES EXCLUSIVE CONTROL OF CAMERA 11.	
		2		C4EP	LH2 CHILLDOWN PUMP - ON THEN AUTO	
		3		C4EP	CLOSE START TANK SUPPLY VALVE.	
		4		C4EP	OPEN START TANK SUPPLY VENT.	
		5		R4PS	REPORT INDICATION OF START TANK PRESSURE INCREASE TO C4PS	
	111	6	CVTS	CSA9	RETRACT S/A #9. REPORT WHEN RETRACTED	TCPI
		6-1			NOTE ----	
					CSA9 REQUIRES EXCLUSIVE USE OF CAMERA 36 UNTIL S/A #9 IS RETRACTED.	
4:50"		1		C4EP	LOX CHILLDOWN PUMP - ON THEN AUTO	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 4'45"		1		C4EP	PREVALVES CLOSE THEN AUTO.	
		1-1		C4EV C4TC	*** NOTE PREPS COMPLETE ON. (DEE-1947)	
161		2	C4PS	C4TC	S-IVB CHILLDOWN SEQUENCE COMPLETE.	
121		3	C4TC	CLTC	S-IVB CHILLDOWN IS COMPLETE	
161		4	C4TC	C4NP	SWITCH SELECTOR - INHIBIT	
161		5	C4TC	C4HN	CLOSE COLD HE CROSSOVER VALVE	
161		6	C4TC	ALL	ALL S-IVB PERSONNEL RETURN TO CH. 121.	
- 4'37"		1		C2AE	START TANK ALL VENT TO OFF	
		2		C2AE	HELIUM BOTTLE SUPPLY VALVE TO OFF	
		3		C2AE	HELIUM BOTTLE SUPPLY LINE VENT TO VENT	
171		4	C2AE	C2TC	START TANK PRESSURIZATION IN PROGRESS.	
171		5	C2TC	ALL	ALL S-II PERSONNEL RETURN TO CH. 121.	
151		6	CUTC	ALL	ALL IBM PERSONNEL RETURN TO CH 121	
181		7	C1TC	ALL	ALL S-IC PERSONNEL GO TO CHANNEL 121	
- 4'30"		1	CLTC	C1SP	ARM TCS.	
		1-1		C1FR	*** NOTE TCS READY.	
		1-2		C1FR	*** NOTE IGNITION SOURCE VOLTAGE OK.	
		2	CLTC		*****CAUTION***** * * S-IVB CHILLDOWN MUST BE * * COMPLETE PRIOR TO NEXT * * STEP * * *****CAUTION*****	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4'30"	121	2-1	CLTC	CUSW	LVDA/ESE TO LVDA.	
		3		C2FC	PREPARE FOR LAUNCH - LAUNCH	
4'10"	121	1	CLTC	CUES	THRUST OK INHIBIT A & B SWITCHES TO AUTO	TCPI
4' 0"	121	1	CVTS	CLTC	CLEARED FOR LAUNCH.	TCPI
		1-1		C2FC	*** NOTE ACCUMULATOR LOCKUP INDICATIONS - ON.	
		1-2		C2FC	*** NOTE AUXILIARY PUMPS POWER ON INDICATIONS - OFF.	
		1-3		C2FC	*** NOTE READY FOR LAUNCH INDICATION ON	
		1-4		C2TC C2EV	*** NOTE S-II PREP COMPLETE ON.	
		1-5		C2FC	*** NOTE ACCUMULATOR FLUID/GAS PRESSURES, ENGINES 1, 2, 3 & 4, 3500 - 3900 PSI	
		2		C2FC	S-II AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 - OFF	
		3		C2FC	MAIN PUMP BYPASS VALVE CLOSED	
	121	4	CLTC	C1FR	VERIFY PREPARATIONS COMPLETE ON.	
		5		ALL	*** NOTE DISPLAY OPERATORS. DO NOT CALL UP DISPLAY DESCRIPTIONS AFTER TCS START.	

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Recorder, TO FAST.						
- 2' 0"	111 121	6	CVTS	ALL	***** COUNT TIME ANNOUNCEMENTS ----- -3'30" TO -0'40" EVERY 10 SECONDS -0'40" TO -0'15" EVERY 5 SECONDS -0'11" TO L/O EVERY 1 SECOND *****	TCPI
- 3'20"		1			*****CAUTION***** * * ALL L/V STATIONS * MONITOR CHANNEL 121 * DURING TERMINAL * SEQUENCE. * *****CAUTION*****	
		2	C2SP		LOX SUPPLY VALVE - CLOSE	
		3	C2AE		START BOTTLE SUPPLY VALVE TO OFF	
		4	C2AE		START TANK SUPPLY LINE VENT TO VENT	
- 3'10"	121	1	C1FR		INITIATE FIRING COMMAND AND VERIFY (DO NOT RELEASE UNTIL TCS STARTS OR SAFING PROCEDURE INITIATED)	
		1-1	C1FR		*** NOTE FIRING COMMAND ENABLED (C) DEE 0128.	
- 3' 6"	121	1	C1FR		VERIFY FIRING COMMAND IS ON (H) DEE 3171	
		1-1	C1FR		*** NOTE TCS READY OFF (C) DEE 0099	
		1-2	C1SP		*** NOTE TCS RESET OFF (C) DEE 3175	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3' 6"						
		1-3		C1SP	*** NOTE TCS OUTPUT ON AND PULSE OK ON (C) DEE 0055 (H) DEE 3176 (MASKED & OMITTED)	
		1-4		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF. (DEE 1190)	
		1-5		C2AE	*** NOTE START TANK SUPPLY LINE VENT OPEN - ON. (DEE 1188)	
		2			S-II LOX PRESS SEQUENCE ON -----	
		2-1		C2SP	*** NOTE LOX SUPPLY VALVE OPEN (DEE 1094)	
		2-2		C2SP	*** NOTE LOX TANK VENTS CLOSED ON AND BOOST CLOSED ON FOR 5 SECONDS. (DEE 1101, 1109, 2540, 2542)	
		3			S-II LOX REPLENISH TERMINATE -----	
		3-1		C20U	*** NOTE FLIGHT MASS ON	
		3-2		C2PM CCLO	*** NOTE S-II REPLENISH COMPLETED ON	
		3-3		C2PM CP02	*** NOTE S-II LOX DEBRIS VALVE CLOSED (DEE 1122)	
		3-4		C20U	*** NOTE REPLENISH VALVE ENABLED OFF	
		3-5		CP02	*** NOTE S-II REPLENISH CLOSED.	
		3-6		CP02 C2PM	*** NOTE S-II LOX FILL & DRAIN CLOSED (DEE 1124)	
		3-7		CP02 C2PM	*** NOTE S-II UMB. VENT VALVE OPEN	
		3-8		C2PM	*** NOTE LOX UMB. PURGE VALVE OPEN (DEE 1125)	

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3' 6"						
		3-9		C2EV	*** NOTE LOX PROP READY FOR LAUNCH ON	
		3-10		CCLO	*** NOTE S-II UMB. PURGE - ON.	
		4			S-IVB LOX REPLENISH TERMINATION -----	
		4-1		C40U	*** NOTE FLIGHT MASS ON.	
		4-2		CCLO C4PR	*** NOTE S-IVB REPLENISH COMPLETED (H)	
		4-3		C40U	*** NOTE REPLENISH VALVE ENABLED OFF.	
		4-4		CP02 C4PR	*** NOTE S-IVB REPLENISH CLOSED (H)	
		4-5		CP02 C4PR	*** NOTE S-IVB LOX FILL & DRAIN CLOSED (H)	
		4-6		CP02 C4PR	*** NOTE S-IVB UMB. VENT OPEN.	
		4-7		CCLO	*** NOTE S-IVB UMB. PURGE ON.	
		4-8		R4PS	*** NOTE DEMAND ON D-14	
		5			S-II LH2 REPLENISH TERMINATION -----	
		5-1		C2HU	*** NOTE S-II 100% FLIGHT MASS ON	
		5-2		C2PM CCLH	*** NOTE S-II REPLENISH COMPLETED ON	
		5-3		C2PM CPH1	*** NOTE S-II REPLENISH VALVE (A3310) CLOSED.	
		5-4		C2PM CPH1	*** NOTE LH2 S-II FILL & DRAIN VALVE (C128) CLOSED. (DEE 1129)	
		5-5		C2PM CPH1	*** NOTE S-II UMB. LINE DRAIN VALVE (A3316) OPEN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 3' 6"						
		5-6		CPH1	*** NOTE S-II UMB LINE PURGE VALVE (A9147) OPEN.	
		5-7		C2PM	*** NOTE LH2 UMB PURGE VALVE OPEN. (DEE 1131)	
		5-8		CCLH	*** NOTE S-II UMB. LINE DRAIN ON	
		6			S-IVB LH2 REPLENISH TERMINATION -----	
		6-1		C4HU	*** NOTE S-IVB 100% FLIGHT MASS ON	
		6-2		CCLH C4PR	*** NOTE S-IVB REPLENISH COMPLETED ON	
		6-3		CPH1	*** NOTE S-IVB REPLENISH VALVE (A3311) CLOSED	
		6-4		CPH1 C4PR	*** NOTE S-IVB FILL & DRAIN VALVE (D104) CLOSED (H)	
		6-5		CPH1	*** NOTE S-IVB UMB. LINE DRAIN VALVE (A3317) OPEN	
		6-6		CPH1	*** NOTE S-IVB UMB. LINE PURGE VALVE (A11773) OPEN.	
		6-7		CCLH	*** NOTE S-IVB UMB. LINE DRAIN ON	
		7			S-IC LOX REPLENISH TERMINATE -----	
		7-1		C10U	*** NOTE FLIGHT MASS ON	
		7-2		C10U	*** NOTE REPLENISH VALVE ENABLE OFF	
		7-3		CP02	*** NOTE S-IC REPLENISH CLOSED	
		7-4		CP02	*** NOTE S-IC FILL & DRAIN (B239) CLOSED	
		7-5		CP02	*** NOTE S-IC UMB. VENT (A213) OPEN	
		7-6		CP01	*** NOTE REPLENISH LINE FLOW REMAINS AT 800 GPM.	

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3' 6"		7-7	CCLO		C1LO *** NOTE S-1C LOX REPLENISH COMPLETE	
		7-8	CCLO		*** NOTE S-1C UMB PURGE ON	
2' 47"		1			S-1VB LOX TANK PREPRESS SEQUENCE -----	
		1-1	C4SP		*** NOTE LOX TANK PRESSURIZING (H)	
		1-2	C4SP		*** NOTE S-1VB LOX VENT CLOSES IMMEDIATELY (H)	
		1-3	C4EV		*** NOTE S-1VB LOX PRESSURIZATION COMMAND ON (C) DEE 1940	
		1-4	E4IM R4PS		*** NOTE COLD HE REG OPERATION (D-105)	
2' 32"		1			ML COMPUTER INHIBIT ON -----	
		1-1	BGCC		*** NOTE COMPUTER TO IDLE MODE (DEE 3072)	
		1-2	BGCC		*** NOTE IF COMPUTER IDLE MODE CANNOT BE VERIFIED, HAVE CLVN PLACE ML/DCE IN MANUAL MODE	
2' 0"		1	C2SP		*** NOTE LOX ULLAGE PRESS SW. #1 AND/OR #2 ON (DEE 1098, 1099)	
		1-1	C2SP		*** NOTE LOX PRESS SYS READY FOR LAUNCH. (DEE 1102)	
	153	2	RLDE		COMM. CHECK WITH HOUSTON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1'42"		1			S-IC HYDRAULICS COMMIT AND CHECK +1D161 -----	
		1-1	C1HP		*** NOTE HYDRAULIC UNIT COMMITTED ON (DDAS) DEE 3245	
- 1'37"		1			S-IC, S-II & S-IVB FUEL PREPRESS -----	
		1-1	C1RP		*** NOTE PREPRESS VALVE OPEN (C) DEE 0278.	
		1-2	C1RP		*** NOTE S-IC FUEL TANK IS PRESSURIZING	
		1-3	C2SP		*** NOTE LH2 PRESS SUPPLY VALVE OPEN (DEE 1110)	
		1-4	C2SP		*** NOTE LH2 DISCONNECT PRESS ON (DEE 1570)	
		1-5	C2SP		*** NOTE LH2 VENTS CLOSED ON AND BOOST CLOSED ON FOR 5 SECONDS. (DEE 1116, 1097, 2548, 2550)	
		1-6	C4SP		*** NOTE S-IVB LH2 PREPRESS SUPPLY OPENS (C) DEE 1954 ON THEN OFF, DEE 1716 TO OFF THEN ON	
		1-7	C4EV		*** NOTE S-IVB FUEL TANK PRESSURIZATION COMMAND ON (C) DEE 1938 ON	
		1-8	C4SP		*** NOTE S-IVB LH2 VENT CLOSES IMMEDIATELY (H)	
		1-9	CPH1		*** NOTE S-II/S-IVB VENT LINE PURGE (A2984) OPEN.	
- 1'22"		1			S-II LH2 PRESS +15 -----	

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- 1' 22"		1-1		C2SP	*** NOTE LH2 23 PSIA ULLAGE PRESS LIGHT ON (DEE 1118)	
		1-2		C2SP	*** NOTE LOW LEVEL PURGE VALVE CLOSED. (DEE 1108)	
- 1' 12"		1			S-IC TIME FOR LOX PREPRESS -----	
		1-1		C1LO	*** NOTE S-IC FLIGHT VENTS CLOSED (C) DEE 0014, 0017.	
		1-2		C1LO	*** NOTE LOX BUBBLING STOPPED (C) DEE 0007.	
		1-3		C1LO	*** NOTE PREPRESS VALVE OPEN (C) DEE 0022.	
		1-4		C1LO	*** NOTE S-IC LOX TANK IS PRESSURIZING	
		2		CPH1	*** NOTE S-II/S-IVB SERVICE ARM PURGE VALVE (A2983) OPEN	
- 1' 0"		1			INHIBIT S-IC INTERTANK SERVICE ARM AUTO ----- EXTEND, VALVES RESET, AUTO CHARGING & ----- PAD WATER ON -----	
		1-1		CWCP	*** NOTE FLAME DEFLECTOR COOLING VALVE OPENS	
		1-2		C2SP	*** NOTE LH2 ULLAGE PRESS SW #1 AND/OR #2 ON (DEE 1114, 1115)	
		1-3		C2EV	*** NOTE LH2 PROP. READY FOR LAUNCH ON (DEE 1130)	
		1-4		C2SP	*** NOTE LH2 PRESS SYS READY FOR LAUNCH. (DEE 1117)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 1' 0"		1-5		C2TC	*** NOTE S-II READY FOR LAUNCH - ON (DEE 1555)	
- 0'50"		1			POWER TRANSFER INTERNAL & S-IC LOX DOME ----- AND GG INJECTOR PURGE ON -----	
	121	2	C1FR		VERIFY POWER TRANSFER COMPLETE (C) DEE 0172.	
		2-1		C1NP C2NP C4NP CUNP	*** NOTE POWER TRANSFER COMPLETE (DEE 3363) (S-1VB DEE 1843 ON)	
		2-2		C1PC	*** NOTE S-IC HIGH LOX DOME PURGE ON (DDAS) DEE 3277.	
		2-3		CUDE	*** NOTE DEE 0779 AND 0777 ON, 0781 OFF.	
		2-4		CUCP	*** NOTE PUMP PRESSURE SWITCH ACTIVATE INDICATION OFF (DEE 0655 OFF)	
- 0'48"		1		C1LO	*** NOTE S-IC LOX PREPRESS IS OK (C) DEE 0015.	
		2		CIRP	*** NOTE FUEL PREPRESS AND FLIGHT PRESS OK (C) DEE 0270.	
- 0'47"		1		CUCP	*** NOTE PUMP PRESSURE SWITCH ACTIVATE INDICATION ON (DEE 0655 ON)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
0'40"		1			DISABLE S-IC FUEL & LOX FILL AND DRAIN ----- VALVES AND ENABLE S-IC PROPELLANTS ----- PRESSURIZED -----	
		1-1	CWCP		*** NOTE FLAME DEFLECTOR COOLING WATER ON. IF NO FLOW INDICATIONS, OPERATE FLAME DEFLECTOR QUENCH VALVE SWITCH TO OPEN POSITION AT T-14 SEC BY THE CLOCK	
		1-2	C1FR		*** NOTE S-IC PROPELLANTS PRESSURIZED (C) DEE 0171.	
		2			S-IVB TIME FOR DIRECTIONAL VENT TO ----- FLIGHT POSITION -----	
		2-1	C4SP		*** NOTE S-IVB DIRECTIONAL VENT TO FLIGHT POSITION (C) DEE 1714 ON	
		2-2	C4TC		*** NOTE S-IVB READY FOR LAUNCH (C) DEE 1966 ON	
0'30"		1			S-IC ENG HYD CHECKOUT VALVES TO STAGE ----- POSITION. RETRACT S-IC INTERTANK ----- SERVICE ARM. INHIBIT S-IC ----- FWD & INFLIGHT SERVICE ARMS AUTO EXTEND ----- & VALVES RESET. INHIBIT S-IC FWD ----- SERVICE ARM AUTO CHARGING, -----	#
		1-1	CSA1		DELETED CDDT ONLY	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
0'30"						
		1-2	CSA1	***	NOTE ALL SUPPLY AND RETURN VALVES OPEN (DDAS) DEE 3841 OFF, 3843 ON.	#
		1-3	C1EN	***	NOTE S-IC ENGINE (1-5) CHECKOUT VALVES TO STAGE POSITION (C) DEE 0112.	
		1-4	C2SP	***	NOTE LOX & LH2 SUPPLY VALVES CLOSED. (DEE 1095, 1111)	
		1-5	C2SP	***	NOTE LOX & LH2 SUPPLY LINE VENTS OPEN. (DEE 1017, 1404)	
		1-6	C2SP	***	NOTE LOX & LH2 DISC PRESS OFF (DEE 1569, 1570)	
		1-7	C2SP	***	NOTE LOX AND LH2 ACT PRESS VENTING (DEE 1105, 1551)	
		1-8	C2RP	***	NOTE PNEUM RECVR DISC ACT PRESS OFF - ON (DEE 1066)	
		1-9	C2RP	***	NOTE PNEUM RECVR SUPPLY VALVE OPEN-OFF. (DEE 1067)	
		1-10	C2GP	***	NOTE PNEUM. RECVR LINE VENT OPEN. (DEE 1068)	
		1-11	C2AE	***	NOTE HE BOTTLES SUPPLY LINE VENT OPEN - ON. (DEE 1195)	
		1-12	C2AE	***	NOTE START TANK VENT CONTROL PRESS ON - OFF. (DEE 1191)	
		1-13	C2AE	***	NOTE HE BOTTLES SUPPLY VALVE OPEN - OFF. (DEE 1194)	
		1-14	C2LD	***	NOTE COMMON BULKHEAD VAC OFF	
		1-15	R2SC	***	VERIFY 1C11 AND 3C21 WITHIN LIMITS.	

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0'17"	153	4	HFLT		VERIFY RECEIPT OF GRR TIME	
		4-1		C1DP C2DP C4DP	*** NOTE RSCR'S 1 & 2 PD BLOCKED OFF. (DEE 1012, 1013) (C) DEE 0038, 0039. DEE 1673, 1674	
		4-2		C4ET	*** NOTE NON PROGRAMMED CUTOFF NOT ON DEE 1948 NOT ON	

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CD ONLY						
0' 16.2 "		1			S-IC FORWARD SERVICE ARM RETRACT -----	
		1-1		CSA2	*** NOTE ALL SUPPLY & RETURN VALVES OPEN (DDAS) DEE 3882 ON	#
		1-2		C1NP	*** NOTE UPPER PLUGS CONNECTED OFF	#
0'11"		1-3		CSAC CSA2	*** NOTE S-IC FWD AT SAFE ANGLE (DDAS) DEE 3874 ON	#
		1-4		CSAC C1FR	*** NOTE LAUNCH SUPPORT READY FOR IGNITION. (DDAS) DEE 4006 ON	#
		1-5		CSAC CSA1	*** NOTE S-IC INTERTANK AT SAFE ANGLE (DDAS) DEE 3851 ON	#
	121	2		C1FR	READY FOR IGNITION IS ON (C) DEE 0160	#
0' 8.9 "		1			S-IC TIME FOR IGNITION -----	#
	121	2		C1FR	IGNITION SEQUENCE IS STARTED.	#
		2-1		C1NP	*** NOTE POWER TRANSFER MOTOR BUS - OFF (C) DEE 0011	#
		2-2		C1FR	*** NOTE TIME FOR IGNITION ON (C) DEE 0165	#
		2-3		C4SP	*** NOTE S-IVB COLD HELIUM SUPPLY CLOSES	#
		2-4		C4SP	*** NOTE S-IVB COLD HELIUM SUPPLY VENT OPENS	#

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0' 8.9 "		2-5		C2AE	*** NOTE TCH CHILLDOWN - OFF (DEE 1193)	#
		2-6		C4SP	*** NOTE S-IVB GROUND PREPRESS SUPPLY VENT OPENS	#
		2-7		C4SP	*** NOTE S-IVB CONTROL & REPRESS SUPPLY CLOSES	#
		2-8		C4EP	*** NOTE S-IVB TCH CHILLDOWN SUPPLY CLOSES.	#
		2-9		C4EP	*** NOTE S-IVB CONTROL BOTTLE SUPPLY VENT OPENS.	#
		2-10		C2PM	*** NOTE LOX UMB PURGE VALVE OPEN - OFF.	#
		2-11		CTS1	*** NOTE PURGE VALVES #1 & #2 OPEN. (COMP) DEE 1617 & 1618 ON	#
		2-12		CPDC	*** NOTE RETRACT VALVE OPEN. (COMP) DEE 1597 ON	#
0' 8.8 "		1			START S-IC IGNITER NO. 1 -----	#
0' 8.7 "		1			START S-IC IGNITER NO. 2 -----	#
0' 6.7 "		1			TIME FOR S-IC LINKS BURNED -----	#
121		2	C1FR		S-IC LINKS ARE BURNED (C) DEE 0102, 0103	#

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01 6.7 "		2-1		C1FR	*** NOTE ENGINES ARMED ON (C) DEE 0174	#
01 6.52 "		1			START S-IC ENG 105 -----	#
		1-1		C1FR	*** NOTE ENG 105 START ON (C) DEE 0222	#
01 6.23 "		1			START S-IC ENG 101 -----	#
		1-1		C1FR	*** NOTE ENG 101 START ON (C) DEE 0230	#
01 6.07 "		1			START S-IC ENG 103 -----	#
		1-1		C1FR	*** NOTE ENG 103 START ON (C) DEE 0228	#
01 5.97 "		1			START S-IC ENG 104 -----	#
		1-1		C1FR	*** NOTE ENG 104 START ON (C) DEE 0224	#
01 5.95 "		1			START S-IC ENG 102 -----	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
0' 5.95"		1-1	C1FR		*** NOTE ENG 102 START ON (C) DEE 0226	#
0' 5"		1			S-IC ENG START SOLENOIDS OFF; GROUND ----- CAMERA CONTROL ARM -----	#
		1-1	C1FR		*** NOTE ENG 1-5 START - OFF.	#
		2	VPHO		*** NOTE GROUND CAMERA CONTROL ON.	#
0' 4.70"		1			S-IC LOX SECONDARY PREPRESS ON -----	#
		1-1	C1LO		*** NOTE LOX SECONDARY PREPRESS VALVE OPEN ON (C) DEE 0267	#
0' 2.75"		1			S-IC FUEL AUX, PREPRESS ON -----	#
		1-1	C1RP		*** NOTE S-IC FUEL AUX PREPRESS ON. (C) DEE 0108, 0109	#
0' 1.92"	121	1	C1FR		ALL ENGINES RUNNING (C) DEE 0120	#

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
0' 0.05"		1			TIME FOR THRUST CHECKS -----	#
0' 0"		1			S-IC TIME FOR COMMIT AND S-II ELEC ----- DEADFACE COMPLETION -----	#
	121	1-1		C1FR	*** NOTE TIME FOR COMMIT (C) DEE 0117	#
		2	C1FR		COMMIT.	#
		2-1		C1FR	*** NOTE ALL HOLDDOWN ARMS RELEASED. (C) DEE 2143	#
		2-2		CHDA	*** NOTE CONTROL SWITCHES ARMED (COMP) DEE 1620 & 1622 ON	#
		2-3		CHDA	*** NOTE ARMING RELAYS OK (DDAS) DEE 4204 & 4205 ON	#
		2-4		CHDA	*** NOTE HDA RELEASE VALVES 1 AND 2 OPEN (COMP) DEE 1611 & 1615 ON	#
		2-5		CHDA	*** NOTE ARMS 1, 2, 3, 4 LANYARD PLUG IN - OFF. (DDAS) DEE 4020, 4021, 4022 & 4023 OFF	#
		2-6		CHDA	*** NOTE ALL ARMS HOLDING OFF (COMP) DEE 1613 OFF	#
		2-7		C1EH	*** NOTE S-IC ENG 101-105 HEATER POWER OFF.	#
		2-8		C1HP	*** NOTE S-IC HYDRAULIC UNIT SHUTDOWN SEQUENCE IN PROGRESS.	#
		2-9		C2NP	*** NOTE COMMIT BUS +2D131 ZERO.	#
		2-10		C2NP	*** NOTE IND BUS 2D119 ZERO.	#
		2-11		C2EV	*** NOTE COMMIT BUS +2D131 OFF.	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
0' 0"		2-12		C2EV	*** NOTE IND. BUS 2D119 OFF.	#
		2-13		C2EV	*** NOTE S-IC COMMIT.	#
0' 0"		1		C2EV	*** NOTE FWD & AFT UMBILICAL PLUG CONN OFF.	#
121		2	CLTC		LIFTOFF (PANEL LIGHT AND OTV)	#
		2-1		CUEV	*** NOTE LIFTOFF.	#
		2-2		C1FR	*** NOTE LIFTOFF (C) DEE 0092	#
		2-3		C4PR	*** NOTE S-IVB LH2 DEBRIS VALVE CLOSED.	#
		2-4		C4PR	*** NOTE S-IVB LOX DEBRIS VALVE CLOSED.	#
		2-5		CHDA	*** NOTE PRIMARY AND SECONDARY CONTROL SWITCHES CLOSED (DDAS) DEE 4198, 4199, 4201 & 4202 ON	#
		2-6		CSA4 CSA5 CSA6 CSA7 CSA8	*** NOTE ALL SUPPLY & RETURN VALVES OPEN (DDAS) DEE 3898, 3925, 3951, 3978 & 4046 ON	#
		2-7		CTS1 CTS2 CTS3	*** NOTE HYD RETURN VALVES #1 & #2 CLOSE LIGHT AND UMBILICAL PLATE MATED LIGHT OFF (DDAS) DEE 4081, 4083, 4110, 4112, 4139, 4141, 4237, 4238 & 4239 ON	#
		2-8		CWCP	*** NOTE LUT SERVICE ARM QUENCH ON (7500 GPM).	#
		2-9		CWCP	MANUALLY OPERATE LUT DECK FLUSH VALVE TO OPEN POSITION AT LIFT-OFF COMMAND, OVER OIS, PLUS OPERATOR COUNT OF 2 SEC'S.	#

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CD ONLY						
+ 0' 2"		1		C2PM CPH1	*** NOTE S-II LH2 DEBRIS VALVE CLOSED.	#
		1-1		CWCP	*** NOTE FLAME DEFLECTOR QUENCH ON (20,000 GPM).	#
		1-2		CWCP	*** NOTE LUT DECK FLUSH AND QUENCH ON (50,000 GPM).	#
+ 0' 5"	181	1	C1TC	CSPP	PLACE LSE POWER OVERRIDE SWITCH TO OFF AND VERIFY.	#
+ 0' 8"		1		CHCU	SECURE PUMPS #1 & #2. SET SYSTEM POWER SWITCH TO OFF.	#
		2		CUCP	GSCU'S OFF	#
+ 0' 32"		1		CWCP	*** NOTE FLAME DEFLECTOR QUENCH OFF	#
		1-1		CWCP	*** NOTE LUT DECK FLUSH ON (20,000 GPM)	#
+ 0' 55"	121	1	CLTC	C1TC C2TC C4TC CUTC	TAKE YOUR PERSONNEL TO STAGE TC CHANNELS FOR IMMEDIATE SECURING OPERATIONS. REPORT WHEN COMPLETE.	#
+ 1' 0"		1	RLDE		BREAK HOUSTON PHONE HOOKUP	#
	151	2	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	#

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
181		3	C1TC	C1PE C1NE	START S-IC PANEL SECURING PER V-21036 (POST LAUNCH CHECKLIST)	#
181		4	C1TC	CSAC	SECURE SYSTEMS POWER ON CH 118.	#
118		5	CSAC	CSA1 CSA2 CSA4 CSA5 CSA6 CSA7 CSA8 CSA9 CSAD CHDA	SYSTEM POWER SWITCHES - OFF	#
118		6	CSAC	CTS1	SAFE TSM'S PER V-36039.	#
161		7	C4TC	C4SP	CLOSE COLD HELIUM SUPPLY	#
161		8	C4TC	C4SP	CLOSE LOX PREPRESS VALVE	#
161		9	C4TC	C4SP	CLOSE CONTROL & REPRESS SUPPLY	#
161		10	C4TC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN SUPPLY	#
161		11	C4TC	C4AL	CLOSE 3000 PSI SUPPLY	#
171		12	C2TC	C2AE	TCH CHILLDOWN TO OFF	#
171		13	C2TC	C2SP	LOW LEVEL PURGE VALVE TO CLOSE	#
171		14	C2TC	C2SP	SHROUD PURGE VALVE TO CLOSE	#
171		15	C2TC	C2GP	GH SUPPLY VALVE TO CLOSE	#
		15-1		C2TC	*** NOTE FOR COMPUTER DOWN CONDITION, REQUEST CLVN TO ISSUE THE FOLLOWING MDO'S: 1111 OFF (LOW LEVEL PURGE VALVE CLOSE) 1072 OFF (SHROUD PURGE VALVE CLOSE)	#

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
GD ONLY						
+ 1' 0"						
	171	16	C2TC	C2AE	START TANK SUPPLY VALVE TO OFF	#
	171	17	C2TC	C2GP	START TANK LINE VENT OPEN FOR APPROX 10 SECONDS, THEN TO CLOSE.	#
	171	18	C2TC	C2AE	HE BOTTLES SUPPLY VALVE TO OFF	#
	171	19	C2TC	C2AE	START TANK VENT CONT PRESS TO OFF	#
	171	20	C2TC	C2RP	PNEUM RECEIVER SUPPLY VALVE TO OFF	#
	171	21	C2TC	C2RP	RECEIVER ACT DISC TO OFF	#
	171	22	C2TC	C2SP	LOX AND LH ACT PRESS SW'S TO OFF	#
	171	23	C2TC	C2SP	LOX AND LH VENT VALVE SW'S TO CLOSE	#
	171	24	C2TC	C2SP	LOX DISCONNECT PRESS SW TO CLOSE	#
	171	25	C2TC	C2SP	SHROUD PURGE VALVE SW TO CLOSE	#
	171	26	C2TC	C2GP	HE PRESS SEL SW TO 1000 PSIG.	#
	171	27	C2TC	C2LD	MONITOR STATUS OF GSE UNTIL PAD ACCESS TIME	#
	171	28	C2TC	C2NP	STAGE POWER SWITCH TO OFF.	#
	171	29	C2TC	C2NP	SECURE ALL GROUND ESE POWER SUPPLIES EXCEPT 2D100 PER V-21103 (8011), 2D100 POWER TO STAY ON UNTIL GROUND PNEUMATICS IS SECURED.	#
+ 2' 0"						
	181	1	C1TC	CCLO	SECURE LOX PUMPS AND VENT STORAGE TANK	#
	181	2	C1TC	CCLH	VERIFY STORAGE TANK VENT AND AUTO LAUNCH SECURING IN PROGRESS PER V-35014.	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
+ 2'30"						
	171	1	C2TC	C2PM	VERIFY LOX AND LH2 DEBRIS VALVES CLOSED	#
	171	2	C2TC	C2PM	VERIFY LOX AND LH2 UMBILICAL PURGE VALVES CLOSED	#
	181	3	C1TC	RRSC	RECORDERS OFF	#
+ 5' 0"						
	181	1	C1TC	CWCP	START INDUSTRIAL WATER SYSTEM SHUTDOWN PER V-36113.	#
	181	2	C1TC	CSPP	POWER SUPPLY COMMIT OFF	#
	181	3	C1TC	CSPP	PLACE 42D100 LOCKUP ENABLE SWITCH TO OFF AND VERIFY.	#
	181	4	C1TC	CSPP	REMOVE LSE 42D100, 43D100 & 43D200 POWER PER V-21194.	#
+ 5'30"						
	121	1	CLTC	C1TC C2TC C4TC CUTC	VERIFY IMMEDIATE SECURING OPERATIONS COMPLETE.	#
					POST LAUNCH SECURING OPERATIONS -----	#
+ 6' 0"						
	121	1	CLTC	C1TC C2TC C4TC CUTC	CONTINUE SECURING OPERATIONS.	#
	111	2	CLTC	CVTS	LVV STARTING FINAL SECURING OPERATIONS.	# TCPI
	121	3	CVTS	CLTC	VERIFY LH2 SYSTEM INERTING HAS BEGUN.	# TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					GD ONLY	
+ 6' 0"						
151		4	CUTC	CUNP	SECURE IU GROUND POWER PER V-21223. REPORT WHEN COMPLETE. (LEAVE SWITCH POWER ON)	#
151		5		CUTC	TERMINATE ALTERNATE FIRING ROOM SUPPORT	#
181		6	C1TC	BRFS	SECURE DRSCS GSE PER V-38000 (IF COMPUTER NOT SUPPORTING, C1TC REQUEST MDO 0449 BE ISSUED OFF)	#
181		7	C1TC	CHGD	SECURE HGD SYS PER V-37038.	#
181		8	C1TC	CCLO	SECURE LOX SYSTEM PER V-25345.	#
181		9	C1TC	CCLH	SECURE LH2 SYSTEM PER V-35005.	#
161		10	C4TC	C4HN	SUPPORT LH2 SYSTEM SECURING PER V-35005 ON CH 143	#
171		11	C2TC	C2PM	SUPPORT LH2 SYSTEM SECURING PER V-35005 ON CH 143	#
181		12	C1TC	CCRP	SECURE RP-1 SYSTEM PER V-25003.	#
181		13	C1TC	RPDC	SECURE PTCs, DEE-3, DTS AND PROPELLANT POWER PER V-25159, V-25077 AND V-25078. (AFTER COMPLETION OF PROPELLANT MECH AND ECS SECURING PROCEDURES).	#
121		14	CLTC	BTMC	SECURE TM TAPE RECORDING AFTER LOSS OF TM SIGNAL	#
121		15	CLTC	CUTC	CHILLED WATER SUPPLY TO THE ML 110A IS OFF. PROCEED WITH SECURING THE ML 110A.	#
151		16	CUTC	CLVN	ML DCE TO MANUAL MODE	#
151		17	CUTC	BGCC	DC POWER OFF THE ML 110A	#
151		18	CUTC	CCPM	237500 OUTPUT POWER OFF (DO NOT TRANSFER TO FACILITY POWER)	#
151		19	CUTC	ALL	POST LAUNCH OPERATIONS WILL BE PERFORMED PER V-31062, PART VII	#

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
+20' 0"	151	1	CUTC	RLDE	TERMINATE MAG TAPE AND POWER OFF THE DEE-6 COMPUTER	
+ 1 HRS 0' 0"		1			NOTE A SAFETY INSPECTION OF THE LAUNCH PAD WILL BE CONDUCTED BY SAFETY AND CONTRACTOR PERSONNEL FROM T +1 HR TO T +2 HRS. LAUNCH VEHICLE PERSONNEL WILL NOT BE GIVEN ACCESS TO THE AREA UNTIL THE SAFETY INSPECTION IS COMPLETE.	
	111	2	CLTC	CVTS	REQUEST CPSS TO CLEAR APPROVED BENDIX PERSONNEL INTO FACILITY HIGH PRESSURE HG2 AREA TO SECURE AND VENT 6000 PSI GH2 TRANSFER LINE.	# TOPI
+ 2 HRS 0' 0"	111	1	CLTC	CVTS	VERIFY SAFETY INSPECTION COMPLETE AND SPECIAL CONTROL AREA OPEN FOR LIMITED ACCESS	# TOPI
	188	2	CVTS	ALL	SPECIAL CONTROL AREA OPEN FOR LIMITED ACCESS	# TOPI
	121	3	CLTC	C1TC C2TC C4TC CUTC	THE SPECIAL CONTROL AREA IS OPEN FOR LIMITED ACCESS	#
	121	4	CVTS	CLTC	6000 PSI GH2 TRANSFER LINE SECURED AND VENTED.	# TOPI

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GD ONLY						
2 HRS 01 00						
121		5	CLTC	C2TC C4TC	6000 PSI GH2 TRANSFER LINE VENTED. START GH2 SYSTEM PURGES.	#
161		6	C2TC	C4TC	VERIFY GHE PURGE SUPPLY AVAILABLE FOR GH2 SYSTEM PURGE.	#
171		7	C2TC	C2GP	START POST LAUNCH GH2 CIRCUIT PURGE PER V-30029 (M020) TASK 46.	#
161		8	C4TC	C4PS	START GH2 SYSTEM PURGE PER V-30539, SECT V.	#
181		9	C1TC	C1PE	SECURE HYDRAULIC UNIT PER V-34012 AFTER LAUNCH AREA IS OPEN.	#
181		10	C1TC	C1PE	SECURE INERT PREFILL UNIT PER V-34012 AFTER LAUNCH AREA IS OPEN.	#
181		11	C1TC	C1PE	SECURE PNEUMATIC CONSOLES PER V-21036 (POST LAUNCH CHECKLIST) AFTER LAUNCH AREA IS OPEN.	#
181		12	C1TC	CLTC	REQUEST BENDIX ORDNANCE PERSONNEL REMOVE HOLDDOWN ARM UNEXPENDED POWER CARTRIDGES PER V-36069. OBTAIN CLEARANCE THROUGH GUARD STATIONS TO ML ZERO LEVEL.	#
112		13	CLTC	CTSC	REQUEST BENDIX ORDNANCE PERSONNEL REMOVE HDA UNEXPENDED POWER CARTRIDGES PER V-36069.	TCPI
181		14	C1TC	C1NE	SECURE S-IC ESE PER V-21036. REPORT WHEN COMPLETE.	#
181		15	C1TC	CSAC	SECURE SYSTEMS ON CHANNEL 118	#
118		16	CSAC	CSA1	SECURE ARM #1 PER V-36077.	#
118		17	CSAC	CSA2	SECURE ARM #2 PER V-36078.	#
118		18	CSAC	CSA3	SECURE ARM #3 PER V-36032.	#
118		19	CSAC	CSA4	SECURE ARM #4 PER V-36080.	#

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
2 HRS 0' 0"						
118		20	CSAC	CSA5	SECURE ARM #5 PER V-36081.	#
118		21	CSAC	CSA6	SECURE ARM #6 PER V-36082.	#
118		22	CSAC	CSA7	SECURE ARM #7 PER V-36083.	#
118		23	CSAC	CSA8	SECURE ARM #8 PER V-36084.	#
118		24	CSAC	CSA9	SECURE ARM #9 PER V-36085.	#
118		25	CSAC	CSAD	SECURE DRRS PER V-36086.	#
118		26	CSAC	CTS1	SECURE TSM'S PER V-36039	#
118		27	CSAC	CHDA	SECURE HDS/SACS PER V-36069.	#
118		28	CSAC	CHCU	SECURE HCU PER V-36079	#
171		29	C2TC	U2SE U2MU U2SI U2PE U2LD U2AN	INSPECT S-II LUT EQUIPMENT FOR POST LAUNCH STATUS. REPORT RESULTS TO C2TC ON CHANNEL 171.	#
171		30	C2TC	U2AN	START CIRCUIT BREAKER LOCK REMOVAL PER V-30029 (M020) TASK 48. REPORT WHEN COMPLETE.	#
171		31	C2TC	C2GP	START POST LAUNCH GROUND PNEU SECURING PER V-30029 (M020) TASK 49. REPORT WHEN COMPLETE.	#
171		32	C2TC	U2LD	START POST LAUNCH LEAK DETECTION SECURING PER V-30029 (M020) TASK 50. REPORT WHEN COMPLETE.	#
181		33	C1TC	CECS	SECURE PAD ECS PER V-36074	#
181		34	C1TC	CPDC	SECURE PNEU DIST SYSTEM PER V-36064	#
181		35	C1TC	CPDC	SECURE Q-BALL COVER PNEUMATIC RETRACT SYSTEM PER V-36112 AND SMDPP PER V-36063	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
2 HRS 01' 0"						
	121	36	CLTC	LCDC L1PS	POWER DOWN ML COUNT CLOCK 28V POWER SUPPLY, REMOVE AUTOSTART PLUG & REAPPLY POWER. REPORT WHEN COMPLETE.	#
	171	37	C2TC	C2NP	POWER DOWN ESE PER V-21103 (B011) WHEN C2GP REPORTS GROUND PNEUMATICS ARE SECURED.	#
	171	38	C2TC	U2AN	OPEN CIRCUIT BREAKERS PER V-21103 (B011) REPORT WHEN COMPLETE.	#
2 HRS 30' 0"						
	121	1	CLTC	C1TC C2TC C4TC CUTC	REPORT WHEN COMPUTER SUPPORT IS NO LONGER REQUIRED.	#
		2		CUTC	COUNTCLOCK MAY BE SECURED AFTER S-IVB TLI (TLI OCCURS BETWEEN T+2:45 AND T+4:30)	
	121	3	CLTC	CUTC	SECURE L/V ELECTRICAL SUPPORT EQUIPMENT PER PROCEDURE V-31062, APPENDIX A. REPORT WHEN COMPLETE	#
	161	4	C4TC	C4PS C4ES	CONTINUE POST LAUNCH SECURING PER V-30539, SECT V. REPORT WHEN COMPLETE.	#

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SAFING PROCEDURES

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APPENDIX A - L/V SAFING PROCEDURE PART 1 PRIOR TO T-3:07 MIN (COMPUTER ----- SUPPORTING). ----- CONDITIONS: * FIRING COMMAND NOT ISSUED * TCS FUNCTIONS NOT INITIATED * HOLD COUNT SOURCE NOT CUTOFF * HOLD CALLED BETWEEN T-24 MIN AND TCS (T-00:03:07) * ALL PERSONNEL MONITORING CH 121						
		1		C2AE	TCH CHILLDOWN TO OFF	
		2		C2AE	START TANK SUPPLY VALVE TO OFF	
		3		C2AE	START TANK ALL VENT TO ALL VENT	
		3-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT.	
		4		C2SP	LOX SUPPLY VALVE TO CLOSE	
121		5	CLTC	C1NP	POWER CONTROL FUNCTION SELECTOR TO PRELAUNCH	
121		6	CLTC	C1SP	CUTOFF RESET	
121		6-1		BGCC	*** NOTE COMPUTER IN GO MODE.	
121		7	CLTC	C4AL	APS ENGINE VALVE POWER OFF.	
121		8	CLTC	C1SP	TCS - SAFE AND SEQUENCER POWER OFF	
121		9	CLTC	C1DP C2DP C4DP	SAFE & ARM DEVICE - SAFE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		10	CLTC	CUSW	LVDA/ESE SWITCH TO ESE.	
121		11	CLTC	CUSP	CONTROL COMPUTER TO S-IVB COAST TEST MODE.	
121		12	CLTC	CUFC	VERIFY FLIGHT CONTROL SYSTEM IN A SAFE CONFIGURATION FOR LADDER DRIFT.	
121		13	CLTC	CLIK, C1PK, CLCP CLGK	TERMINATE PROGRAM BEING EXECUTED.	
		13-1		CLGK	*** NOTE TERMINATE FE-50	
		13-2		CLGK	*** NOTE TERMINATE GE-01 IF FT-42 HAS BEEN PREVIOUSLY EXECUTED	
		13-3		C1PK	***NOTE TERMINATE VATS IF EXECUTING	
		13-4		CLPC	***NOTE TERMINATE NT-60 IF EXECUTING	
121		14	CLTC	CHCU	START CKT BYPASS SWITCHES OFF	
		15	RLDE		*** NOTE ENTER EST MODE.	
121		16	CLTC	CLVN	COMP TEST SW ON & VERIFY DISCRETE CYCLING	
121		17	CLTC	C1TC C2TC C4TC CUTC	SAFE YOUR STAGES & GSE. ESTABLISH HOLD CONDITION. REPORT WHEN COMPLETE.	
121		18	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF	
121		19	CLTC	ECOP	TERMINATE REAL TIME GUIDANCE REDUCTION	
121		20	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE LOOP CODE NUMBERS HANG UP YOUR RECEIVERS.	
111		21	CLTC	CVTS	L/V IS SAFED, HOLD CONDITION ESTABLISHED	TCPI
121		22	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR DRAIN PROCEDURE)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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PART 1 PRIOR TO T-3:07 MIN

 (COMPUTER SUPPORTING)

S-IC SAFING

181	1	C1TC	CCRP		EVALUATE S-IC STAGE FUEL LOAD FOR POSSIBLE REPLENISH AND/OR FUEL LEVEL ADJUST REQUIREMENTS.	
181	2	C1TC	CPRK		REINITIALIZE BE01 WITH THE "I" OPTION & THEN THE "Z" OPTION AT A 10 SEC SCAN RATE	
181	3	C1TC	CPRK		AFTER 35 TO 45 MIN REVERIFY S-IC, RP-1 MAX F WITH CCRP & S-IC, LOX MAX L WITH CCLO	
181	4	C1TC	C1PC		CONTINUE THERMAL CONDITIONING PURGE OPERATION.	
181	5	C1TC	C1LO		LOX BUBBLING TO AUTO	
181	6	C1TC	CCLO		CONTINUE LOX REPLENISH TO ALL STAGES.	
181	7	C1TC	CCLH		CONTINUE LH2 REPLENISH TO S-II & S-IVB STAGES.	
181	8	C1TC	C1PC		LOW LOX DOME PURGE TO OFF	
181	9	C1TC	CTS1		VERIFY AND/OR OPERATE PSV #3 SWITCH TO DOWN	
121	10	C1TC	CLTC		S-IC SAFED. HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 1 PRIOR TO T-3:07 MIN ----- (COMPUTER SUPPORTING)	
					S-II SAFING -----	
171		1	C2TC	C2NP	SWITCH SELECTOR INHIBIT - OFF	
171		2	C2TC	C2AE	VERIFY TCH CHILLDOWN IN OFF.	
171		3	C2TC	C2AE	VERIFY START TANK ALL VENT IN ALL VENT	
171		4	C2TC	C2AE	VERIFY START TANK SUPPLY VALVE IN OFF.	
171		5	C2TC	C2AE	START TANK SUPPLY LINE VENT TO VENT	
171		6	C2TC	C2AE	HE BOTTLE SUPPLY VALVE TO OFF	
171		7	C2TC	C2AE	HE BOTTLE SUPPLY LINE VENT TO VENT.	
		8		C2AE	USE ALL HE SOLENOID SWITCHES TO KEEP HE BOTTLE PRESSURES BELOW 3465 PSIA.	
171		9	C2TC	C2AE	VERIFY/PLACE TCH PURGE TO OFF	
171		10	C2TC	C2LD	MAINTAIN LEAK DETECTION AND PURGE SYSTEM OPERATIONS.	
171		11	C2TC	C2FC	PREP FOR LAUNCH TO INHIBIT.	
171		12	C2TC	C2FC	MAIN PUMP BYPASS VALVE TO CLOSE.	
171		13	C2TC	C2FC	THERMAL CONTROL TO ON.	
		13-1		C2FC	*** NOTE INDIVIDUAL ACCUMULATOR LOCKUP LIGHTS ON AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF.	
		13-2		C2FC	*** NOTE OPEN MAIN PUMP BYPASS VALVE DURING AUXILIARY PUMP OPERATION. (THERMAL CONTROL CYCLE)	
		14		C2FC	AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 AND 4 - OFF.	
171		15	C2FC	C2TC	HYDRAULICS SAFED AND IN HOLD CONDITION.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
171		16	C2TC	C2AE	PREVALVE LOCKOUT TO ON.	
171		17	C2TC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO CUTOFF.	
171		18	C2TC	C2NP	STAGE LOGIC TO RESET THEN OFF.	
		18-1		C2NP	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS.	
171		19	C2TC	C2AE	PREVALVE LOCKOUT TO AUTO	
		19-1		C2AE	*** NOTE ENGINE C/O SAFE - ON	
		19-2		C2AE	*** NOTE PREVALVE LOCKOUT ON - ON	
		19-3		C2RP	*** NOTE LH PREVALVES OPEN - ON	
		19-4		C2RP	*** NOTE RECIRC RESET AND RECIRC STOP RESET - ON	
		19-5		C2RP	*** NOTE LH PUMP AND RETURN LINE VALVES OPEN - ON.	
171		20	C2TC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51.	
171		21	C2TC	C2RP	PNEUMATIC SUPPLY VALVE TO OFF	
171		22	C2TC	C2GP	RECEIVER LINE VENT TO OPEN	
		23		C2RP	USE RECIRC ACT SYST VENT COMMAND TO MAINTAIN RECIRC RECVR PRESSURE BELOW 3465 PSIA.	
		24		C2RP	USE LOX HE INJ START COMMAND TO MAINTAIN LOX HE INJ RECVR PRESSURE BELOW 3465 PSIA.	
171		25	C2RP	C2TC	RECIRC SYSTEM SAFED AND IN HOLD CONDITION.	
171		26	C2TC	C2SP	LOX DISCONNECT PRESS - CLOSE.	
		26-1		C2SP	*** NOTE LOX & LH VENT VALVES OPEN.	
		26-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED.	
		26-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		26-4		C2SP	*** NOTE LOX & LH ACT PRESSURE ON.	
		26-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN.	
		26-6		C2SP	*** NOTE SHROUD PURGE VALVE OPEN.	
		26-7		C2GP	*** NOTE GN SUPPLY ON.	
		26-8		C2GP	*** NOTE GH PRESSURE ON.	
		26-9		C2GP	*** NOTE 3000 PSIG HE PRESS ON.	
		26-10		C2GP	*** NOTE 3000 PSIG EMERG HE PRESS ON.	
		26-11		C2GP	*** NOTE SECONDARY HE PRESS ON.	
		26-12		C2GP	*** NOTE HE F & D LINE INERT ON.	
		26-13		C2GP	*** NOTE HE ACT PNEU PRESS ON.	
		26-14		C2GP	*** NOTE HE TURBO START GH VENT ON.	
		26-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON.	
		26-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON.	
		26-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON.	
		26-18		C2GP	*** NOTE AMB HE TCH PURGE ON.	
		26-19		C2GP	*** NOTE RECEIVER LINE VENT OPEN.	
171		27	C2SP	C2TC	PRESSURIZATION SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
171		28	C2GP	C2TC	GROUND PNEUMATICS SAFED AND IN HOLD CONDITION.	
171		29	C2PM	C2TC	PROPELLANT MONITOR SAFED AND IN HOLD CONDITION.	
171		30	C2AE	C2TC	ENGINE SYSTEM SAFED, PURGES ARE ON, AND HOLD CONDITION ESTABLISHED.	
171		31	C2LD	C2TC	LEAK DETECTION AND PURGE SYSTEM IN HOLD CONDITION.	
121		32	C2TC	CLTC	S-II SAFED, HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
PART 1 PRIOR TO T-3:07 MIN ----- (COMPUTER SUPPORTING) S-IVB SAFING -----						
161		1	C4TC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE.	
161		2	C4TC	C4EP	CLOSE START TANK SUPPLY VALVE.	
161		3	C4TC	C4EP	OPEN START TANK VENT ON C4PS COMMAND.	
161		4	C4TC	C4ET	VENT ENGINE CONTROL BOTTLE AS REQUIRED TO MAINTAIN PRESSURE BELOW 3200 PSIA MAX BY CYCLING C.T. HELIUM CONTROL.	
161		5	C4TC	C4NP	SWITCH SELECTOR INHIBIT - OFF	
161		6	C4TC	C4EP	LOX & LH2 PREVALVES - OPEN	
161		7	C4TC	C4EP	LOX & LH2 CHILLDOWN PUMPS - OFF	
161		8	C4TC	C4HY	FLIGHT MODE OFF THEN AUTO.	
161		9	C4TC	C4HN	CLOSE HEAT EXCHANGER VENT CKT 1	
161		10	C4TC	C4EP	CLOSE START TANK PURGE VALVE	
161		11	C4TC	C4EP	CLOSE THRUST CHAMBER PURGE VALVE	
161		12	C4TC	C4SP	LOX VENT SWITCH TO OPEN	
161		13	C4TC	C4SP	LH2 VENT SWITCH TO OPEN	
161		14	C4TC	C4PP	PLUG SUPERVISION POWER ON	
121		15	C4TC	CLTC	S-IVB SAFED. HOLD CONDITION ESTABLISHED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 1 PRIOR TO T-3:07 MIN ----- (COMPUTER SUPPORTING)	
					I.U. SAFING -----	
151		1	CUTC	CUES	EDS MODE SWITCH TO MONITOR THRUST OK SWITCH A & B TO INHIBIT.	
151		2	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
151		3	CUTC	CLGK	REQUEST & EXECUTE FT20 IF LVDC IS NOT IN MODE SORT.	
151		4	CUTC	CUNP	SWITCH SELECTOR INHIBIT - ON	
121		5	CUTC	CLTC	IU SAFED. HOLD CONDITION ESTABLISHED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					APPENDIX A - LV SAFING PROCEDURE PART 2 - PRIOR TO T-3:07 MIN ----- (COMPUTER DOWN CONDITION) * FIRING COMMAND NOT ISSUED * TCS FUNCTIONS NOT INITIATED * HOLD COUNT SOURCE NOT CUTOFF * HOLD CALLED BETWEEN T-24 MIN & TCS (T-00:03:07)	
188		1	CLTC	ALL	A HOLD CONDITION EXISTS, THE COMPUTER IS NOT SUPPORTING. ALL PERSONNEL MONITOR CHANNEL 121.	
		2		C2SP	LOX SUPPLY VALVE TO CLOSE	
		3		C2AE	TCH CHILLDOWN TO OFF.	
121		4	CLTC	C1NP	POWER CONTROL FUNCTION SELECTOR TO PRELAUNCH	
121		5	CLTC	C1SP	CUTOFF RESET, TCS TO SAFE AND SEQUENCER POWER OFF	
121		6	CLTC	C1DP C2DP C4DP	SAFE & ARM TO SAFE	
121		7	CLTC	CLVN	ML/DCE TO MANUAL MODE	
121		8	CLTC	CUSW	LVDA/ESE TO ESE	
121		9	CLTC	C2NP C4NP	SWITCH SELECTOR INHIBIT TO OFF	
121		10	CLTC	C4AL	APS ENGINE VALVE POWER OFF	
121		11	CLTC	CLVN	ISSUE THE FOLLOWING MDO'S ON OR OFF SIMULTANEOUSLY BY SETTING UP THE DCE BIT PATTERN DEFINED FOR EACH GROUP, (ANNOUNCE OVER OIS CH 121 AS EACH GROUP IS ISSUED) PER V-31008:	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		11-1		ALL	*** NOTE ALL PANEL OPERATORS POSITION SWITCHES TO POSITION INDICATED IN PARENTHESES AFTER EACH GROUP IS ISSUED.	
121		11-2	CLVN	GRP 1 - MUX 21, 22: ADDRESS 12: DATA BIT 5 DN. 1805 ON (CUSP - S-II BURN TEST MODE ON).		
		11-3	CUSP	*** NOTE FLIGHT CONTROL IN SAFE CONFIGURATION FOR LADDER DRIFT		
121		11-4	CLVN	GRP 2 - MUX 21, 22: ADDRESS 16: DATA BIT 17 DN, 18 DN. 1913 ON (CUES-TOK INHIBIT A SWITCH TO INHIBIT) 1914 ON (CUES-TOK INHIBIT B SWITCH TO INHIBIT)		
121		11-5	CLVN	GRP 3 - MUX 22: ADDRESS 6: DATA BIT 1 UP, 16 UP, 18 UP, 19 DN. 1153 OFF (C2AE-START TANK SUPPLY VALVE TO OFF) 1168 OFF (C2AE-TCH PURGE TO OFF) 1170 OFF (C2AE - HE BOTTLE SUPPLY VLV TO OFF) 1171 ON (C2AE - HE BOTTLE SUPPLY LINE VENT TO VENT)		
121		11-6	CLVN	GRP 4 - MUX 22: ADDRESS 10: DATA BIT 5 DN, 6 DN, 8 UP. 1253 ON (C2FC - THERMAL CONTROL TO ON) 1254 ON (C2FC - MAIN PUMP BYPASS VALVE TO OPEN) 1256 OFF (C2FC - PREP FOR LAUNCH TO INHIBIT)		
121		11-7	CLVN	GRP 5 - MUX 22: ADDRESS 3: DATA BIT 23 UP. 1103 OFF (C2SP - LOX DISC PRESS TO CLOSE)		
121		11-8	CLVN	GRP 6 - MUX 22: ADDRESS 5: DATA BIT 4 UP, 5 DN, 23 DN. 1132 OFF (C2RP - RECIRC RECVR SUPPLY VLV TO OFF) 1133 ON (C2GP - RECIRC RECVR LINE VENT TO OPEN) 1151 ON (C2AE - START TANKS SUPPLY LINE TO VENT)		

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		11-9		CLVN	GRP 7 - MUX NONE: ADDRESS 13: DATA BIT 22 DN. 0334 ON (C2AE - PREVALVE LOCKOUT TO ON)	
121		11-10	21	CLVN	GRP 8 - MUX 22: ADDRESS 9: DATA BIT 21 UP, 23 UP. 1245 OFF (C2FC - AUX HYD PUMP 1 TO OFF) 1247 OFF (C2FC - AUX HYD PUMP 2 TO OFF)	
121		12		CLVN	GRP 9 - MUX 22: ADDRESS 10: DATA BIT 1 UP, 3 UP. 1249 OFF (C2FC - AUX HYD PUMP 3 TO OFF) 1251 OFF (C2FC - AUX HYD PUMP 4 TO OFF)	
121		12-1		CLVN	GRP 10 - MUX 21, 22: ADDRESS 2: DATA BIT 11 UP, 12 UP. 1571 OFF (C4EP-TCH PURGE SUPPLY CLOSE) 1572 OFF (C4EP-TCH CHILLDOWN CLOSE)	
121		12-2		CLVN	GRP 11 - MUX 21, 22: ADDRESS 8: DATA BIT 13 UP, 15 UP. 1717 OFF (C4EP-START TANK PURGE SUPPLY CLOSE) 1719 OFF (C4EP-START TANK SUPPLY CLOSE)	
121		12-3		CLVN	GRP 12 - MUX 21, 22: ADDRESS 6: DATA BIT 21 UP. 1677 OFF (C4HN-HEAT EXCHANGER CIR #1 VENT CLOSE)	
121		12-4		CLVN	GRP 13 - MUX NONE: ADDRESS 10: DATA BIT 13 UP, 15 UP 0253 OFF (CTS1 - TSM 1-2 PSV #3 CLOSE) 0255 OFF (CTS1 - TSM 3-2 PSV #3 CLOSE)	
121		12-5		CLVN	GRP 14 - MUX NONE: ADDRESS 14: DATA BIT 14 UP 0350 OFF (CTS1 - TSM 3-4 PSV #3 CLOSE)	
121		13	CLTC	CUSW	ISSUE THE FOLLOWING OCTALS. REPORT WHEN COMPLETE. S-IVB 151 (LOX & LH PREVALVES OPEN) S-IVB 042 (LOX CHILLDOWN PUMP OFF) S-IVB 153 (LH2 CHILLDOWN PUMP OFF) S-IVB 074 (FLIGHT MODE OFF)	
121		14	CLTC	C1LO	LOX BUBBLING TO AUTO	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		15	CLTC	C2AE	START TANK ALL VENT TO ALL VENT	
		15-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT.	
		16		C2AE	USE ALL HE SOLENOID SW TO KEEP HE BOTTLE PRESSURES BELOW 3465 PSIA.	
121		17	CLTC	C2AE	ALL ENG EMERGENCY CUTOFF TO CUTOFF	
		18	CLTC		NOTE ----- CLVN MUST COMPLETE ISSUANCE OF THE ABOVE S-II MDO'S PRIOR TO PERFORMING THE FOLLOWING S-II STEPS	
121		19	CLTC	C2NP	STAGE LOGIC TO RESET	
		19-1		C2NP	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS	
		19-2		C2RP	*** NOTE LH PREVALVES OPEN -- ON	
		19-3		C2RP	*** NOTE LH PUMP & RETURN LINE VALVES OPEN-ON	
		19-4		C2AE	*** NOTE LH PREVALVE LOCKOUT ON-ON	
		19-5		C2AE	*** NOTE ENG CUTOFF SAFE -- ON	
		20		C2RP	USE RECIRC ACT SYS VENT CMD TO MAINTAIN RECIRC RECVR PRESSURE BELOW 3465 PSIA.	
		21		C2RP	TO MAINTAIN LOX HE INJ RECVR PRESSURE BELOW 3465 PSIA, NOTIFY C2TC TO REQUEST CLVN ISSUE MDO 0568 ON/OFF (S-II LOX HE INJ START/STOP) (MUX 21, ADDRESS 2, DATA BIT 16 DN/UP)	
		22		C4EP	OPEN START TANK VENT ON C4PS COMMAND	
		23		C4ET	USE HE CONTROL SOLENOID TO MAINTAIN ENGINE CONTROL BOTTLE PRESSURE BELOW 3200 PSIA MAX	
		24		C4HN	CLOSE 6000 GH2 INLET AT C4PS COMMAND	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		25		C4SP	LOX & LH2 VENT OPEN SWITCHES TO OPEN	
	121	26	CLTC	CHCU	START CKT BYPASS SWITCHES TO OFF	
		27			DELETED	
		28		CLTC	*** NOTE CUSW MUST BE COMPLETE PRIOR TO NEXT STEP	
		29		C4NP	SWITCH SELECTOR INHIBIT TO ON	
		30		C4PP	PLUG SUPERVISION POWER ON	
	121	31	CLTC	CCRP	EVALUATE FUEL LOAD FOR POSSIBLE REPLENISH AND/OR FUEL LEVEL ADJUST	
	121	32	CLTC	CCLO	MAINTAIN ALL STAGE LOX REPLENISH AT 100% PER V-35014	
	121	33	CLTC	CCLH	MAINTAIN S-II AND S-IVB LH2 REPLENISH AT 100% PER V-35014	
	121	34	CLTC	CUSP	VERIFY FLIGHT CONTROL IS IN A SAFE CONFIGURATION FOR LADDER DRIFT	
	121	35	CLTC	CLGK	OFF AUTO ON SWITCH TO OFF	
	121	36	CLTC	CUDE	VERIFY 728 (HALT) AND 730 (MEMORY RELEASE) ARE ON.	
	121	37	CLTC	C1PC	LOW LOX DOME PURGE TO OFF	
	121	38	CLTC	ECOP	STOP GUIDANCE REDUCTION PROGRAM	
	121	39	CLTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
		40	RLDE		*** NOTE ENTER EST MODE	
	121	41	CLTC	CUES	EDS MODE SW TO MONITOR	
	121	42	CLTC	C1TC C2TC C4TC CUTC	VERIFY STAGES SAFED AND HOLD CONDITION ESTABLISHED AND AWAITING COMPUTER SUPPORT.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		43	CLTC	CUTC	REINITIALIZE GROUND COMPUTER PER V-31062, APPENDIX F. REPORT WHEN COMPLETE.	
121		44	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE LOOP CODE NUMBERS HANG UP YOUR RECEIVERS.	
111		45	CLTC	CVTS	LAUNCH VEHICLE SAFE. HOLD CONDITION ESTABLISHED AND AWAITING COMPUTER SUPPORT.	TCPI
121		46	CUTC	CLTC	COMPUTER SUPPORTING	
121		47	CLTC	CLGK	POWER ON LVDC/LVDA PER V-33033 SECTION I. REPORT WHEN COMPLETE (APPROX. 20 MIN.) (NOT REQUIRED IF PROCEEDING TO SCRUB).	
121		48	CLTC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51	
		48-1		C2FC	MAIN PUMP BYPASS VALVE CLOSED	
		48-2		C2SP	*** NOTE LOX & LH VENT VALVES OPEN	
		48-3		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED	
		48-4		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED	
		48-5		C2SP	*** NOTE LOX & LH ACT PRESSURE ON	
		48-6		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN	
		48-7		C2GP	*** NOTE GN SUPPLY ON	
		48-8		C2GP	*** NOTE GH PRESSURE ON	
		48-9		C2GP	*** NOTE 3000 PSIG HE PRESS ON	
		48-10		C2GP	*** NOTE 3000 PSIG EMERG HE PRESS ON	
		48-11		C2GP	*** NOTE SECONDARY HE PRESS ON	
		48-12		C2SP	*** NOTE SHROUD PURGE VALVE OPEN	
		48-13		C2GP	*** NOTE HE F & D LINE INERT ON.	

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		48-14		C2GP	*** NOTE HE ACT PNEU PRESS ON.	
		48-15		C2GP	*** NOTE HE TURBO START GH VENT ON.	
		48-16		C2GP	*** NOTE LOX & LH HE TANK PRESS ON.	
		48-17		C2GP	*** NOTE HE TURBO PUMP PURGE ON.	
		48-18		C2GP	*** NOTE ENG TCH CHILLDOWN ON.	
		48-19		C2GP	*** NOTE AMB HE TCH PURGE ON.	
121		49	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY TO START RECYCLE OR SCRUB.	
121		50	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF	
111		51	CLTC	CVTS	COMPUTER SUPPORT REESTABLISHED, LAUNCH VEHICLE READY TO START RECYCLE OR SCRUB	TCPI
121		52	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR DRAIN PROCEDURE)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					APPENDIX A LV SAFING PROCEDURE ----- PART 3 T-3:06 MIN TO T+0 ----- (COMPUTER SUPPORTING) CONDITIONS: * AUTOMATIC OR MANUAL CUTOFF ISSUED. * ALL PERSONNEL MONITORING CHANNEL 121	
		1			*****CAUTION***** * IF CAUSE FOR CUTOFF IS * NO LIFTOFF AND NO * AUTOMATIC CUTOFF (AT * IGNITION PLUS 17 * SECONDS), PERFORM NEXT * 2 SEQUENCES PRIOR TO * PROCEEDING WITH SAFING. *****	
121		1-1	C1PE	C1FR	GIVE CUTOFF COMMAND (HOLD FOR 3 SEC AND RELEASE)	
121		1-2	C1PE	CLTC	CUTOFF RECEIVED AND ENGINES OUT	
		2		C1NE	REPORT CAUSE OF CUTOFF WHEN DETERMINED	
		2-1		C1FR	*** NOTE (IF CUTOFF IS AFTER IGN) CUTOFF COMPLETE ON	
		2-2		C1EN	*** NOTE ALL MAIN VALVES CLOSED	
		2-3		C1EN	*** NOTE ALL CHECKOUT VALVES IN GROUND POSITION	
		3		C2AE	TCH CHILLDOWN TO OFF.	
		4		C2AE	START TANK ALL VENT TO ALL VENT	
		4-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		5	CLTC	C4AL	APS ENGINE VALVE POWER - OFF.	
		5-1		C1NP C2NP C4NP CUNP	*** NOTE STAGE POWER ON EXTERNAL.	
		5-2		CUDE	*** NOTE 0777 (PWR XFER COMPLETE) & 0779 (IU STAGE POWER) OFF, 0781 (IU GND POWER) ON	
121		6	CLTC	CLVN	ML BLOCK INHIBIT ON	
		6-1		BGCC	*** NOTE COMPUTER IN GO MODE	
121		7	CLTC	C1SP	TCS - SAFE AND SEQUENCER POWER - OFF.	
		7-1		C1FR	*** NOTE CUTOFF ON	
121		8	CLTC	C1DP C2DP C4DP	SAFE AND ARM - SAFE	
		8-1		C1FR	*** NOTE FIRING COMMAND OFF	
121		9	CLTC	CUSW	LVDA/ESE TO ESE	
121		10	CLTC	CSA1	IF S/A 1 IS RETRACTED, AUTO EXTEND ARMING SWITCH OFF	
121		11	CLTC	CSA2	IF S/A 2 IS RETRACTED, AUTO EXTEND ARMING SWITCH OFF AND SAFE ALL YOUR CHARGING SYSTEMS	
121		12	CLTC	C1LO	LOX FLIGHT VENTS TO OPEN	
121		13	CLTC	C1NP	POWER FUNCTION SELECTOR - PRELAUNCH	
		14		C1LO	*** NOTE IF INTERCONNECTS HAVE BEEN CLOSED FOR MORE THAN 5 MINUTES, OR IF PREVALVE CLOSED FOR MORE THAN; 5 MINUTES - IF ENGINES HAVE NOT STARTED 3 MINUTES - IF ENGINES HAVE STARTED 0 MINUTES - IF THRUST STRUCTURE FIRE OCCURS PERFORM THE FOLLOWING 4 STEPS:	
		14-1		C1LO	LOX INTERCONNECT VALVES #1, #3, & #4 TO CLOSE.	

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		14-2		C1LO	LOX BUBBLING TO ALL DUCTS	
		14-3		C1LO	*** NOTE LOX BUBBLING ALL DUCTS ILLUMINATED.	
		14-4		C1EN	IF S-IC PREVALVES HAVE CLOSED, PLACE PREVALVE EMERGENCY SWITCH TO CLOSE.	
121		15	CLTC	C1PC	VERIFY LOX DOME PURGE ON	
		15-1		C1PC	*** NOTE IF IGNITION HAS OCCURED, HIGH LOX DOME PURGE TO ON AND LEAVE ON FOR 2 MINUTES MINIMUM THEN LOW LOX DOME PURGE ON (15 MINUTES MINIMUM)	
		15-2		C1PC	*** NOTE IF IGNITION HAS NOT OCCURED, LOW LOX DOME PURGE TO OFF WHEN FLIGHT CONTROL COMPUTER GOES OUT OF S-IC BURN MODE AND FLAME DEFLECTOR WATER IS OFF.	
121		16	CLTC	C1PE	VERIFY ALL LOX DUCT CONDITIONS SATISFACTORY & READY TO RESET CUTOFF.	
121		17	CLTC	C1SP	CUTOFF - RESET.	
121		18	CLTC	C1FR	VERIFY CUTOFF - OFF	
121		19	CLTC	CLVN	ML COMPUTER INHIBIT TO AUTO	
121		20	CLTC	CWCP	FLAME DEFLECTOR COOLING OFF.	
		21		C4SP	NOTE DIRECTIONAL VENT IN GROUND POSITION AND LH2 VENT OPEN	
		22		C4SP	VENT LOX TANK AT C4PS COMMAND.	
121		23	CLTC	C1TC C2TC C4TC CUTC	SAFE YOUR STAGES AND GSE, ESTABLISH A HOLD CONDITION. REPORT WHEN COMPLETE.	
121		24	CLTC	ECOP	TERMINATE GUIDANCE REDUCTION PROGRAM.	
121		25	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
121		26	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE LOOP CODE NUMBERS HANG UP YOUR RECEIVERS.	
111		27	CLTC	CVTS	LV IS SAFED, HOLD CONDITION ESTABLISHED	TOPI
		28	RLDE		*** NOTE ENTER EST MODE.	
		29			NOTE ----- IF S/A 2 IS RETRACTED, THERE WILL BE NO INDICATION IN THE HGD SYSTEM FOR S-IC FWD/S-II AFT	
121		30	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR LV DRAIN)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 3 T-3:06 MIN TO T+0 ----- COMPUTER SUPPORTING ----- S-IC SAFING -----	
181		1	C1TC	CSA1	VERIFY S/A #1 CONNECTED OR EXTEND & RECONNECT PER V-36071	
181		2	C1TC	C1RP	ADJUST FUEL TANK PRESSURE TO 18-20 PSIA	
181		3		C1LO C1EN R1SC	**** NOTE IF INTERCONNECTS HAVE BEEN CLOSED MORE THAN FIVE MINUTES, PERFORM THE FOLLOWING SUBSEQUENCES: ***** CAUTION ***** * IF PREVALVES HAVE BEEN CLOSED FOR MORE * * THAN: * * 5 MINUTES-IF ENGINES HAVE NOT STARTED * * 3 MINUTES-IF ENGINES HAVE STARTED * * 0 MINUTES-IF THRUST STRUCTURE FIRE HAS * * OCCURRED. * * DISREGARD FOLLOWING SUBSEQUENCES AND * * DRAIN LOX PER V-35014 ADDENDUM B.6, * * S-IC GRAVITY DRAIN. * * * *****	
		3-1				
		3-2		C1LO	LOX FLIGHT VENTS TO CLOSE	
182		3-3	C1LO	R1SC	MONITOR S-IC LOX TANK ULLAGE PRESSURE (D94-115). NOTIFY C1LO IF PRESSURE EXCEEDS 27.0 PSIA.	
		3-4		C1LO	LOX PRESSURE DRAIN VALVE TO OPEN.	
		3-5		C1LO	WHEN LOX TANK PRESSURE REACHES APPROX 25 PSIA, PLACE LOX PRESSURE DRAIN VALVE TO CLOSE.	
		3-6			DELETED	
		3-7		C1LO	OPEN LOX INTERCONNECT VALVES 1, 3 & 4.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		3-8		C1LO	*** NOTE INTERCONNECT VALVE 2 CLOSED	
		3-9		C1LO	START BUBBLING DUCTS 1 & 3 AND MAINTAIN FOR 10 MINUTES TO ESTABLISH THERMAL PUMPING.	
		3-10		C1LO	WHEN 10 MINUTE BUBBLING PERIOD IS COMPLETE (WITH LOX TANK PRESSURIZED), OPEN S-IC LOX TANK VENTS. CONTINUE BUBBLING DUCTS 1 & 3 FOR AN ADDITIONAL 10 MINUTES, THEN PLACE LOX BUBBLING SWITCH TO AUTO.	
181		3-11	C1TC	C1EN	VERIFY LOX & FUEL PREVALVES OPEN.	
181		4	C1TC	C1PC	CONTINUE THERMAL CONDITIONING PURGE.	
		4-1		C1EN	*** NOTE ALL ENG VALVES CLOSED	
		4-2		C1EH	*** NOTE HEATER POWER ON.	
		4-3		C1PC	*** NOTE LOX DOME & GG INJECTION PURGE VENT VALVES CLOSED.	
		4-4		C1PC	*** NOTE PURGE FILL AND DRAIN VALVE OPEN	
		4-5		C1PC	*** NOTE CONTROL PRESS FILL + DRAIN VALVE OPEN.	
		4-6		C1PC	*** NOTE GN2 BOTTLE GROUND VENT CLOSED.	
		4-7		C1PC	*** NOTE GN2 BOTTLE LOW + HIGH FILL VALVES OPEN.	
		4-8		C1HP	*** NOTE HYDRAULIC UNIT COMMITTED OFF.	
		4-9		C1HP	*** NOTE HYDRAULIC PRESSURE OK	
		4-10		C1RP	*** NOTE HE GND ISOLATION VALVE OPEN.	
		4-11		C1RP	*** NOTE HE BOTTLE HIGH FILL VALVES OPEN.	
		4-12		C1RP	*** NOTE HE BOTTLE GROUND VENT CLOSED.	
		4-13		C1RP	*** NOTE ALL PREPRESS VALVES CLOSED.	
		4-14		C1LO	*** NOTE ALL PREPRESS VALVES CLOSED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
181		5	C1TC	CHCU	START CKT BYPASS SWITCHES - OFF	
181		6	C1TC	C1NP	VERIFY UPPER PLUGS CONNECTED LIGHT ON	
181		7	C1TC	C1NP	IF UPPER UMBILICAL SUPERVISION LIGHT IS OFF, HEATER POWER - OFF	
181		8	C1TC	CCLO	REVERT LOX SYSTEM	
181		9	C1TC	CCLH	REVERT LH2 SYSTEM	
181		10	C1TC	CSA2	IF S/A 2 IS RETRACTED, VALVES RESET SWITCH TO RESET THEN OFF AND VERIFY ***** CAUTION *****	
		11			* IF PREVALVES HAVE BEEN CLOSED FOR MORE THAN: * 5 MINUTES-IF ENGINES HAVE NOT STARTED * 3 MINUTES-IF ENGINE HAVE STARTED * 0 MINUTES-IF THRUST STRUCTURE FIRE HAS * OCCURRED, DISREGARD FOLLOWING SUBSEQUENCES * AND DRAIN LOX PER V-35014 ADDENDUM B.6, * S-IC GRAVITY DRAIN. *****	
181		11-1	C1TC	C1LO	VERIFY THERMAL PUMPING HAS BEEN ESTABLISHED.	
181		11-2	C1TC	C1LO	VERIFY LOX PRESSURE DRAIN VALVE CLOSED.	
181		11-3	C1TC	C1LO	LOX TANK VENTS TO OPEN.	
181		11-4	C1TC	C1LO	LOX BUBBLING TO AUTO.	
181		12	C1TC	CSA1	VERIFY SERVICE ARM #1 RECONNECTED AND READY TO REINITIATE LOX REPLENISH	
181		13	C1TC	CTS1	OPERATE PSV #3 SWITCH TO DOWN AND VERIFY	
181		14		C1TC C1IP R1TM	NOTE ----- IF UPPER UMBILICAL SUPERVISION LIGHT IS OFF ON THE S-IC NETWORKS PANEL (C1NP), TRANSMITTERS MUST BE TURNED OFF AT OR BEFORE CUTOFF PLUS 60 MINUTES.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
	121	15	C1TC	CLTC	S-IC SAFED AND HOLD CONDITION ESTABLISHED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 3 T-3106 MIN TO T+0 ----- (COMPUTER SUPPORTING) ----- S-11 SAFING -----	
171		1	C2TC	C2NP	SWITCH SELECTOR INHIBIT - OFF	
171		2	C2TC	C2AE	VERIFY TCH CHILLDOWN IN OFF	
171		3	C2TC	C2AE	VERIFY START TANK ALL VENT IN ALL VENT.	
171		4	C2TC	C2AE	VERIFY START TANK SUPPLY VALVE IN OFF.	
171		5	C2TC	C2AE	VERIFY START TANK SUPPLY LINE VENT IN VENT.	
171		6	C2TC	C2AE	VERIFY HE BOTTLE SUPPLY VALVE IN OFF.	
171		7	C2TC	C2AE	VERIFY HE BOTTLE SUPPLY LINE VENT IN VENT.	
		8		C2AE	USE ALL HE SOLENOID SWITCHES TO KEEP HE BOTTLE PRESSURES BELOW 3465 PSIA.	
171		9	C2TC	C2LD	MAINTAIN LEAK DETECTION AND PURGE SYSTEM OPERATIONS.	
171		10	C2TC	C2FC	PREP FOR LAUNCH TO INHIBIT.	
171		11	C2TC	C2FC	VERIFY MAIN PUMP BYPASS VALVES CLOSED.	
171		12	C2TC	C2FC	THERMAL CONTROL TO ON.	
		12-1		C2FC	*** INDIVIDUAL ACCUMULATOR LOCK LIGHTS ON AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF.	
		12-2		C2FC	*** NOTE OPEN MAIN PUMP BYPASS VALVE DURING AUXILIARY PUMP OPERATION (THERMAL CONTROL CYCLE)	
171		13	C2FC	C2TC	HYDRAULICS SAFED AND HOLD CONDITION ESTABLISHED.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
171		14	C2TC	C2AE	PREVALVE LOCKOUT TO ON.	
171		15	C2TC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO CUTOFF.	
171		16	C2TC	C2NP	STAGE LOGIC TO RESET, THEN AUTO.	
		16-1		C2NP	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS	
171		17	C2TC	C2AE	PREVALVE LOCKOUT TO AUTO.	
		17-1		C2AE	*** NOTE PREVALVE LOCKOUT ON - ON.	
		17-2		C2AE	*** NOTE ENG C/O SAFE - ON	
		17-3		C2RP	*** NOTE LH PREVALVES OPEN - ON	
		17-4		C2RP	*** NOTE RECIRC RESET AND RECIRC STOP RESET - ON.	
		17-5		C2RP	*** NOTE LH PUMP AND RETURN LINE VALVES OPEN - ON	
171		18	C2TC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51. REPORT WHEN COMPLETE.	
171		19	C2TC	C2RP	PNEU SUPPLY VALVE TO OFF.	
171		20	C2TC	C2GP	RECEIVER LINE VENT TO OPEN.	
		21		C2RP	USE RECIRC ACT SYS VENT COMMAND TO MAINTAIN RECIRC RECVR PRESS BELOW 3465 PSIA.	
		22		C2RP	USE LOX HE INJ START COMMAND TO MAINTAIN LOX HE INJ RECVR PRESSURE BELOW 3465 PSIA.	
171		23	C2RP	C2TC	RECIRC SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
171		24	C2TC	C2SP	LOX DISCONNECT PRESS TO CLOSE	
		24-1		C2SP	*** NOTE LOX & LH VENT VALVES OPEN	
		24-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED	
		24-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED	

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		24-4		C2SP	*** NOTE LOX & LH ACT PRESS ON	
		24-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN	
		24-6		C2GP	*** NOTE GN SUPPLY ON	
		24-7		C2GP	*** NOTE GH PRESSURE ON	
		24-8		C2GP	*** NOTE 3000 PSIG HE PRESS ON	
		24-9		C2GP	*** NOTE 3000 PSIG EMERGENCY HE PRESS ON	
		24-10		C2GP	*** NOTE SECONDARY HE PRESS ON	
		24-11		C2SP	*** NOTE SHROUD PURGE VALVE OPEN	
		24-12		C2GP	*** NOTE HE F & D LINE INERT ON	
		24-13		C2GP	*** NOTE HE ACT PNEU PRESS ON	
		24-14		C2GP	*** NOTE HE TURBO START GH VENT ON	
		24-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON	
		24-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON	
		24-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON	
		24-18		C2GP	*** NOTE AMB HE TCH PURGE ON	
171		25	C2SP	C2TC	PRESSURIZATION SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
171		26	C2GP	C2TC	GROUND PNEUMATICS SAFED AND HOLD CONDITION ESTABLISHED.	
171		27	C2PM	C2TC	PROPELLANT MONITOR SAFED AND HOLD CONDITION ESTABLISHED.	
171		28	C2AE	C2TC	ENGINE SYSTEM SAFED, PURGES ARE ON AND HOLD CONDITION ESTABLISHED.	
171		29	C2LD	C2TC	LEAK DETECTION AND PURGE SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
121		30	C2TC	CLTC	S-II SAFED HOLD CONDITION ESTABLISHED.	

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					PART 3 T-3106 MIN TO T+0 ----- (COMPUTER SUPPORTING) ----- S-IVB SAFING -----	
161		1	C4TC	C4NP	SWITCH SELECTOR INHIBIT - OFF	
161		2	C4TC	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE	
161		3	C4TC	C4EP	OPEN START TANK VENT/EMERGENCY DUMP AT C4PS COMMAND	
161		4	C4TC	C4ET	VENT ENGINE CONTROL BOTTLE AS REQUIRED TO MAINTAIN PRESSURE BELOW 3200 PSIA BY CYCLING C.T. HELIUM CONTROL	
161		5	C4TC	C4EP	OPEN LOX AND LH2 PREVALVES	
161		6	C4TC	C4EP	LOX CHILLDOWN PUMP OFF	
161		7	C4TC	C4EP	LH2 CHILLDOWN PUMP OFF	
161		8	C4TC	C4HY	FLIGHT MODE OFF, THEN AUTO	
161		9	C4TC	C4SP	LH2 VENT SWITCH TO OPEN	
161		10	C4TC	C4PP	PLUG SUPERVISION POWER ON	
121		11	C4TC	CLTC	S-IVB SAFED AND HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 3 T-3106 MIN TO T+0 ----- (COMPUTER SUPPORTING) ----- IU SAFING -----	
151		1	CUTC	CUEV	VERIFY GRR & GRR REMOVED.	
151		2	CUTC	CUSP	CONTROL COMPUTER TO S-IVB COAST TEST MODE.	
151		3	CUTC	CUSP	VERIFY FLIGHT CONTROL SYSTEM IN SAFE CONFIGURATION FOR LADDER DRIFT	
151		4	CUTC	CLGK	TERMINATE GE-01 IF GRR HAS NOT OCCURRED	
151		5	CUTC	CLGK	TERMINATE FE-50 IF GRR HAS NOT OCCURRED OR IF FE-50 DID NOT TERMINATE AFTER GRR	
151		6	CUTC	CUES	EDS MODE SWITCH TO MONITOR THRUST OK SWITCH A & B TO INHIBIT LIFT-OFF RESET ON THEN OFF	
151		7	CUTC	CLCP	TERMINATE NT-60 (REDLINE MONITOR PROGRAM)	
151		8	CUTC	CLGK	REQUEST AND EXECUTE FT-20 (LVDC SELF CHECK). REPORT WHEN COMPLETE. (APPROX 4 MINUTES)	
151		9	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
151		10	CUTC	CLVN	COMP TEST SW ON. VERIFY DISCRETE CYCLING.	
121		11	CUTC	CLTC	IU SAFED AND HOLD CONDITION ESTABLISHED	
		12		CUTC	*** NOTE PERFORM FOLLOWING TWO SEQUENCES IF CUTOFF OCCURS PRIOR TO GRR (T-17 SECONDS)	
151		12-1	CUTC	CLGK	REQUEST & EXECUTE FT-23 (SECTOR SUM CHECKS). REPORT WHEN COMPLETE. (APPROX 6 MINUTES)	
151		12-2	CUTC	CLTC	FT-23 (SECTOR SUM CHECKS) IN PROGRESS	
		13		CUTC	*** NOTE PERFORM FOLLOWING SUBSEQUENCES IF CUTOFF OCCURS AFTER GRR (T-17 SECONDS)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
	121	13-1	CUTC	CLTC	REQUEST SWITCH SELECTOR INHIBITS BE TURNED ON AFTER S-IVB SAFING ACCOMPLISHED	I-100-113 XB-149-
	151	13-2	CUTC	CLGK	REQUEST & EXECUTE FT-37 (REPEATABLE SIM FLT) AND FT-23 (SECTOR SUM CHECKS) (APPROX 18 MINUTES). REPORT WHEN COMPLETE.	118
	121	13-3	CUTC	CLTC	FT-37 AND FT-23 COMPLETE. SWITCH SELECTOR INHIBIT RESTRICTION MAY BE RELEASED.	I-100-113

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APPENDIX A LV SAFING PROCEDURE ----- PART 4 T-3:06 MIN TO T+0 ----- (COMPUTER DOWN) CONDITIONS * AUTOMATIC OR MANUAL CUTOFF ISSUED						
		1			*****CAUTION***** * * IF CAUSE FOR CUTOFF IS * * NO LIFTOFF AND NO * * AUTOMATIC CUTOFF (AT * * IGNITION PLUS 17 * * SECONDS), PERFORM NEXT * * 2 SEQUENCES PRIOR TO * * PROCEEDING WITH SAFING. * * *****	
121		1-1	C1PE	C1FR	GIVE CUTOFF COMMAND (HOLD FOR 3 SEC AND RELEASE)	
121		1-2	C1PE	CLTC	CUTOFF RECEIVED AND ENGINES OUT	
188		2	CLTC	ALL	CUTOFF OBSERVED. THE COMPUTER IS NOT SUPPORTING. ALL PERSONNEL MONITOR CHANNEL 121	
		3		C1NE	REPORT CAUSE OF CUTOFF WHEN DETERMINED	
		4		C2AE	TCH CHILLDOWN TO OFF.	
		5		C1NP C2NP C4NP CUNP	*** NOTE STAGE POWER EXTERNAL (HARDLINE INDICATIONS)	
		5-1		CUDE	*** NOTE 0777 (PWR XFER COMPLETE) AND 0779 (IU STAGE POWER) OFF, 0781 (IU GND POWER) ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
	121	6	CLTC	CLVN	ML/DOE TO MANUAL MODE	
	121	7	CLTC	C1SP	TCS TO SAFE AND SEQ POWER OFF	
	121	8	CLTC	C1DP C2DP C4DP	SAFE & ARM TO SAFE	
	121	9	CLTC	CUSW	LVDA/ESE TO ESE	
	121	10	CLTC	C2NP C4NP	SWITCH SELECTOR INHIBIT TO OFF	
	121	11	CLTC	C4AL	APS ENGINE VALVE POWER TO OFF	
	121	12	CLTC	CLVN	ISSUE GRP 1 - MUX 21, 22 : ADDRESS 12: DATA BIT 5 DN. REPORT WHEN COMPLETE. 1805 ON (CUSP - S-II BURN TEST MODE - ON)	
	121	13	CLTC	CUSP	VERIFY FLIGHT CONTROL IN SAFE CONFIGURATION FOR LADDER DRIFT.	
	121	14	CLTC	C1NP	POWER CONTROL FUNCTION SELECTOR PRELAUNCH	
		14-1		C1NP	*** NOTE LAUNCH BUS 1D161 OFF.	
		14-2		C1NP	*** NOTE PRELAUNCH BUS 1D151 ON.	
	121	15	CLTC	C1LO	LOX FLIGHT VENTS TO OPEN	
		16		C1LO C1EN	**** NOTE IF INTERCONNECTS HAVE BEEN CLOSED FOR MORE THAN 5 MINUTES, OR PREVALVE CLOSED FOR MORE THAN: 5 MINUTES-IF ENGINES HAVE NOT STARTED 3 MINUTES-IF ENGINES HAVE STARTED 0 MINUTES-IF THRUST STRUCTURE FIRE HAS OCCURRED, PERFORM THE FOLLOWING SUBSEQUENCES:	
		16-1		C1LO	LOX INTERCONNECT VALVES 1, 3 & 4 TO CLOSE.	
		16-2		C1LO	LOX BUBBLING TO ALL DUCTS.	
		16-3		C1EN	IF S-IC PREVALVES HAVE CLOSED, PLACE PREVALVE EMERGENCY SWITCH TO CLOSE.	
		16-4		C1PC	*** NOTE LOX DOME PURGE ON	
		16-5		C1PC	IF IGNITION HAS OCCURRED, OPERATE LOW LOX DOME PURGE ON (15 MINUTES MINIMUM)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		16-6		C1PC	IF IGNITION HAS NOT OCCURED, LOW LOX DOME PURGE TO OFF WHEN FLIGHT CONTROL COMPUTER GOES OUT OF S-IC BURN MODE & FLAME DEFLECTOR WATER IS OFF.	
121		17	CLTC	CLGK	ON AUTO OFF SWITCH TO OFF	
		17-1		CUDE	**** NOTE 728 (HALT) AND 730 (MEMORY RELEASE) ARE ON	XB-150-114
121		18	CLTC	C1PE	VERIFY LOX DUCT CONDITIONS SATISFACTORY FOR CUTOFF RESET	
121		19	CLTC	C1SP	RESET CUTOFF	
		19-1		C1FR	*** NOTE CUTOFF - OFF	
		19-2		C1PC	*** NOTE HIGH LOX DOME PURGE OFF	
121		20	CLTC	CUES	MODE SWITCH TO MONITOR. LIFT-OFF RESET ON THEN OFF	
		21		C1LO C1EN R1SC	**** NOTE IF INTERCONNECTS HAVE BEEN CLOSED FOR MORE THAN 5 MINUTES, PERFORM THE FOLLOWING SUBSEQUENCES: * * * * * CAUTION * * * * * * IF PREVALVES HAVE BEEN CLOSED FOR MORE * * THAN: * * 5 MINUTES-IF ENGINES HAVE NOT STARTED * * 3 MINUTES-IF ENGINES HAVE STARTED * * 0 MINUTES-IF THRUST STRUCTURE FIRE HAS * * OCCURRED * * DISREGARD FOLLOWING SUBSEQUENCES AND * * DRAIN LOX PER V-35014 ADDENDUM B.6, * * S-IC GRAVITY DRAIN. * * * * * *	
		21-1				
		21-2		C1LO	CLOSE S-IC LOX TANK VENT VALVES.	
182		21-3	C1LO	R1SC	READ UP S-IC LOX TANK ULLAGE PRESSURE (D94-119). NOTIFY C1LO IF PRESSURE EXCEEDS 27.0 PSIA.	
		21-4		C1LO	LOX PRESSURE DRAIN LINE TO OPEN.	
		21-5		C1LO	WHEN LOX TANK ULLAGE PRESS REACHES APPROX 25 PSIA, LOX PRESSURE DRAIN LINE TO CLOSE.	
		21-6			DELETED	
		21-7		C1LO	LOX INTERCONNECT VALVES #1, #3 & #4 TO OPEN. VERIFY CLOSED LIGHT OFF	
		21-8		C1LO	START BUBBLING DUCTS 1 & 3 - MAINTAIN FOR 10 MINUTES TO ESTABLISH THERMAL PUMPING.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		21-9		C1LO	WHEN 10 MINUTE BUBBLING PERIOD IS COMPLETE (WITH LOX TANK PRESSURIZED), OPEN S-IC LOX TANK VENTS. CONTINUE BUBBLING DUCTS 1 & 3 FOR AN ADDITIONAL 10 MINUTES, THEN PLACE BUBBLING SWITCH TO AUTO.	
121	22	CLTC	CSA1		EXTEND AND RECONNECT S-IC INTERTANK ARM PER V-36071, IF ARM HAS BEEN RETRACTED	
121	23	CLTC	C1RP		ADJUST S-IC FUEL TANK PRESSURE TO 18-20 PSIA.	
121	24	CLTC	CWCP		FLAME DEFLECTOR COOLING OFF	
121	25	CLTC	CLVN		ISSUE THE FOLLOWING MDOS ON OR OFF SIMULTANEOUSLY BY SETTING UP THE DCE BIT PATTERN DEFINED FOR EACH GROUP. (ANNOUNCE OVER OIS CH. 121 AS EACH GROUP IS ISSUED) PER V-31008:	
		25-1			*** NOTE ALL PANEL OPERATORS PLACE SWITCHES TO POSITION INDICATED IN PARENTHESES AFTER EACH GROUP IS ISSUED	
121	25-2		CLVN		GRP 2 - MUX 21, 22: ADDRESS 16: DATA BIT 17 DN, 18 DN. 1913 ON (CUES-TOK INHIBIT A SWITCH TO INHIBIT) 1914 ON (CUES-TOK INHIBIT B SWITCH TO INHIBIT)	
121	25-3		CLVN		GRP 3 - MUX 22: ADDRESS 10: DATA BIT 5 DN, 6 DN, 8 UP 1253 ON (C2FC - THERMAL CONTROL TO ON) 1254 ON (C2FC - MAIN PUMP BY-PASS VALVE TO OPEN) 1256 OFF (C2FC - PREP FOR LAUNCH TO INHIBIT)	
121	25-4		CLVN		GRP 4 - MUX 22: ADDRESS 3: DATA BIT 23 UP 1103 OFF (C2SP - LOX DISC PRESS TO CLOSE)	
121	25-5		CLVN		GRP 5 - MUX 22: ADDRESS 5: DATA BIT 4 UP, 5 DN 1132 OFF (C2RP - RECIRC RECVR SUPPLY VALVE TO OFF) 1133 ON (C2GP - RECIRC RECVR LINE VENT TO OPEN)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		25-6		CLVN	GRP 6 - MUX NONE: ADDRESS 13: DATA BIT 22 DN. 0334 ON (C2AE - PREVALVE LOCKOUT TO ON)	
121		25-7		CLVN	GRP 7 - MUX 21, 22: ADDRESS 2: DATA BIT 12 UP 1572 OFF (C4EP - TCH CHILLDOWN CLOSED)	
121		25-8		CLVN	GRP 8 - MUX NONE: ADDRESS 10: DATA BIT 13 UP, 15 UP. 0253 OFF (CTS1 - TSM 1-2 PSV #3 CLOSE) 0255 OFF (CTS1 - TSM 3-2 PSV #3 CLOSE)	
121		25-9		CLVN	GRP 9 - MUX NONE: ADDRESS 14: DATA BIT 14 UP. 0350 OFF (CTS1 - TSM 3-4 PSV #3 CLOSE)	
121		26	CLTC	CUSW	ISSUE THE OCTALS IN SEQUENCE NOTED. REPORT WHEN COMPLETE. S-IVB 151 (LOX & LH PREVALVES OPEN) S-IVB 042 (LOX CHILLDOWN PUMP OFF) S-IVB 133 (LH2 CHILLDOWN PUMP OFF) S-IVB 074 (FLIGHT PUMP MODE OFF)	
121		27	CLTC	C2AE	START TANKS ALL VENT TO ALL VENT	
		27-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT	
		28		C2AE	USE ALL HE SOLENOID SW TO KEEP HE BOTTLE PRESSURES BELOW 3465 PSIA	
121		29	CLTC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO CUTOFF	
		30		CLTC	NOTE CLVN MUST COMPLETE ISSUANCE OF THE ABOVE S-II MDO'S PRIOR TO PERFORMING THE FOLLOWING S-II STEPS	
121		31	CLTC	C2NP	STAGE LOGIC TO RESET	
		31-1		C2NP	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS.	
		31-2		C2RP	*** NOTE LH PREVALVES OPEN - ON.	
		31-3		C2RP	*** NOTE LH PUMP & RETURN LINE VALVES OPEN - ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		31 -4		C2AE	*** NOTE PREVALVE LOCKOUT ON - ON.	
		31 -5		C2AE	*** NOTE ENG CUTOFF SAFE - ON.	
		32		C2RP	USE RECIRC ACT SYS VENT CMD TO MAINTAIN RECIRC RECVR PRESSURE BELOW 3465 PSIA	
		33		C2RP	TO MAINTAIN LOX HE INJ RECVR PRESS BELOW 3465 PSIA, NOTIFY C2TC TO REQUEST CLVN. ISSUE MDO 0568 ON/OFF (S-II LOX HE INJ START/STOP) (MUX 21, ADDRESS 2, DATA BIT 16 DN/UP)	
		34		C4EP	OPEN START TANK VENT/EMERGENCY DUMP ON C4PS COMMAND	
		35		C4ET	USE HE CONTROL SOLENOID TO MAINTAIN ENGINE CONTROL BOTTLE PRESSURE BELOW 3200 PSIA MAX	
		36		C4SP	*** NOTE LH2 TANK VENT OPEN	
		37		C4SP	VENT LOX TANK AT C4PS COMMAND	
121		38	CLTC	CCLO	REVERT LOX SYSTEM	
121		39	CLTC	CCLH	REVERT LH2 SYSTEM IF REPLENISH COMPLETE	
121		40	CLTC	CHCU	START CKT BYPASS SWITCHES - OFF	
121		41	CLTC	CSA2	IF S/A 2 IS RETRACTED, AUTO EXTEND ARMING SWITCH OFF AND SAFE ALL YOUR CHARGING SYSTEMS	
		42		CLTC	*** NOTE CUBW MUST BE COMPLETE PRIOR TO NEXT STEP	
121		43	CLTC	C4NP	INHIBIT SWITCH SELECTOR	
121		44	CLTC	C4PP	PLUG SUPERVISION POWER ON	
121		45	CLTC	RLDE	GIVE DEMAND PRINTOUT TO ALL STAGE PRINTERS. REPORT WHEN COMPLETE.	
121		46	CLTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
121		47	CLTC	ECOP	TERMINATE REAL TIME GUIDANCE REDUCTION	
		48	RLDE		*** NOTE ENTER EST MODE	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		49	CLTC	C1TC C2TC C4TC CUTC	VERIFY STAGE SAFED AND HOLD CONDITION ESTABLISHED.	
121		50	CLTC	CUTC	REINITIALIZE GROUND COMPUTER PER V-31062 APPENDIX F. REPORT WHEN COMPLETE.	
121		51	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE LOOP CODE NUMBERS HANG UP YOUR RECEIVERS	
111		52	CLTC	CVTS	LAUNCH VEHICLE SAFED. HOLD CONDITION ESTABLISHED AND AWAITING COMPUTER SUPPORT.	TCPI
					<u>HOLDING FOR COMPUTER SUPPORT</u> -----	
121		0	CUTC	CLTC	COMPUTER SUPPORTING	
121		1	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF	
181		2	C1TC	C1IP B1TM	IF UPPER UMBILICAL SUPERVISION LIGHT IS OFF ON THE S-IC NETWORKS PANEL (C1NP), TRANSMITTERS MUST BE TURNED OFF AT OR BEFORE CUTOFF PLUS 60 MINUTES.	
121		3	CLTC	CSA2	IF S/A 2 IS RETRACTED, VALVES RESET SWITCH TO RESET THEN OFF AND VERIFY.	
121		3-1	CLTC	C1TC C2TC C4TC CUTC	VERIFY SWITCH SELECTOR INHIBITS ARE ON AT THIS TIME AND REMAIN ON UNTIL COMPLETION OF FT-37 AND FT-23 (DO NOT PERFORM THIS STEP IF CUTOFF OCCURS BEFORE GRR OR IF PROCEEDING TO SCRUB)	I-100-113
121		4	CLTC	CLGK	POWER ON LVDC-LVDA PER V-33033 SECTION I. REQUEST & EXECUTE FT-37 (REPEATABLE SIM FLT) AND FT-23 (SECTOR SUM CHECKS) ONLY IF CUTOFF OCCURS AFTER GRR REPORT WHEN COMPLETE. (NOT REQUIRED IF PROCEEDING TO SCRUB) (APPROX. 40 MIN)	

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121		4-1	CLGK	CLTC	FT-37 AND FT-23 COMPLETE (DO NOT PERFORM THIS STEP IF CUTOFF OCCURS BEFORE GRR OR IF PROCEEDING TO SCRUB)	I-100-113
121		5	CLTC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51	
171		5-1		C2SP	*** NOTE LOX & LH VENT VALVES OPEN	
171		5-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED	
171		5-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED	
171		5-4		C2SP	*** NOTE LOX & LH ACT PRESSURE ON	
171		5-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN	
		5-6		C2GP	*** NOTE GN SUPPLY ON	
		5-7		C2GP	*** NOTE GH PRESSURE ON	
171		5-8		C2GP	*** NOTE 3000 PSIG HE PRESS ON	
171		5-9		C2GP	*** NOTE 3000 PSIG EMERG HE PRESS ON	
171		5-10		C2GP	*** NOTE SECONDARY HE PRESS ON	
171		5-11		C2SP	*** NOTE SHROUD PURGE VALVE OPEN	
		5-12		C2GP	*** NOTE HE F & D LINE INERT ON	
		5-13		C2GP	*** NOTE HE ACT PNEU PRESS ON	
		5-14		C2GP	*** NOTE HE TURBO START GH VENT ON	
		5-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON	
		5-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON	
		5-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		5-18		C2GP	*** NOTE AMB HE TCH PURGE ON	
121		6	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY FOR RECYCLE OR SCRUB	
111		7	CLTC	CVTS	COMPUTER SUPPORT REESTABLISHED. LAUNCH VEHICLE READY TO START RECYCLE OR DRAIN OPERATIONS.	TCPI
		8			NOTE ----- IF S/A 2 IS RETRACTED, THERE WILL BE NO INDICATION IN THE HGD SYSTEM FOR S-1C FWD/S-11 AFT.	
121		9	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR DRAIN PROCEDURE)	

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LV RECYCLE PROCEDURE

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APPENDIX B - L/V RECYCLE PROCEDURE ----- PART 1 RECYCLE TO T-22 MINUTES ----- CONDITIONS ----- * COMPUTER SUPPORTING * LAUNCH VEHICLE IN ESTABLISHED HOLD CONDITION						
188		1	CLTC	ALL	PROCEEDING TO RECYCLE, ALL PERSONNEL ACTIVE ON CHANNEL 121	
121		2	CLTC	CSA2	IF S/A 2 IS RETRACTED, SET RETRACT ARMING SWITCH TO ARM	
121		3	CLTC	CSAC	IF S/A 2 IS RETRACTED, VERIFY LSE READY FOR IGNITION ON	
121		4	CLTC	CSAC	START PRESSURE AND LEVEL CHECKS PER V-36039 & V-36087. REPORT WHEN COMPLETE.	
121		5	CLTC	CWCP	START IWS RECYCLE OPERATIONS PER V-36113	
121		6	CLTC	C1PC	LOW LOX DOME PURGE ON.	
121		7	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	
121		8	CLTC	CUSP	SELECT S-IC BURN MODE SWITCH ON THEN AUTO.	
121		9	CLTC	CUFS	START ATTITUDE COMMAND TEST ON CH 123. REPORT WHEN COMPLETE.	
121		10	CLTC	CLGK	GO TO CH 123 TO SUPPORT ATTITUDE COMMAND TEST.	
123		11	CUFS	CLGK	REQUEST FT-10 LADDER OUTPUT TEST, AUTO OPTION.	
		11-1			NOTE ----- THE FT-10 AUTO OPTION WILL DRIVE THE GUIDANCE LADDER TO +/- 2 DEG. PITCH, +/- 2 DEG. YAW AND +/- 5 DEG. ROLL	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
123		12	CUFS	CUCR	VERIFY VALVE CURRENTS AND BETA RESPONSE ON ALL ENGINES	
123		13	CUFS	CLGK	TERMINATE FT-10	
123		14	CUFS	ALL	ATTITUDE COMMAND TEST COMPLETE. RETURN TO CH 121.	
121		15	CUFS	CLTC	ATTITUDE COMMAND TEST COMPLETE.	
121		16	CLTC	C2TC	FOLLOWING STATIONS SWITCH TO CHANNEL 171 FOR S-II RECYCLE:	
					C2AE C2EC C2LD C2FC R2SC C2RP C2PM C2SP C2GP C2PU E2FC V2MS	
171		17	C2TC	C2GP	RECEIVER LINE VENT TO CLOSE.	
171		18	C2TC	C2AE	PREVALVE LOCKOUT TO AUTO.	
171		19	C2TC	C2AE	START ENGINE HE BOTTLE PRESSURIZATION TO 3000 PSI PER V-30029 (M020) TASK 38	
171		20	C2TC	C2RP	START RECIRC BOTTLE PRESSURIZATION TO 3000 PSI PER V-30029 (M020) TASK 37.	
171		21	C2TC	C2RP	AFTER RECIRC BOTTLE SUPPLY VALVE IS OPEN PLACE LOX HE INJ. TO START THEN AUTO	
171		22	C2TC	C2FC	START EAS RECYCLE OPERATIONS	
171		23	C2FC	V2MS	HYDRAULIC RECORDERS ON	
		24		C2FC	MAIN PUMP BYPASS VALVE CLOSE	
		25		C2FC	THERMAL CONTROL TO OFF.	
		26		C2FC	VERIFY ACCUMULATORS UNLOCKED	
		27		C2FC	AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 TO ON. ALLOW SYSTEM PRESSURES TO STABILIZE	
		28		C2FC	OPEN MAIN PUMP BYPASS VALVE AND ALLOW MAIN PUMP FLUID TEMPS TO STABILIZE WITH RESERVOIR FLUID TEMPS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		28-1		C2FC	CLOSE MAIN PUMP BYPASS VALVE	
		29		C2FC	ACCUMULATOR CONTROL TO LOCK, THEN TO AUTO.	
		30		C2FC	AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 TO OFF. VERIFY NORMAL SHUTDOWN.	
171		31	C2FC	V2MS	HYDRAULIC RECORDERS OFF	
		32		C2FC	THERMAL CONTROL TO ON.	
		32-1		C2FC	*** NOTE INDIVIDUAL ACCUMULATOR LOCK LIGHTS ON AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF	
		32-2		C2FC	*** NOTE OPEN MAIN PUMP BYPASS VALVE DURING AUXILIARY PUMP OPERATIONS (THERMAL CONTROL CYCLE)	
171		33	C2AE	C2TC	ENG. HE BOTTLE PRESSURIZATION TO 3000 PSI COMPLETE.	
171		34	C2TC	C2AE	START TANK SUPPLY LINE VENT TO OFF.	
171		35	C2TC	C2NP	STAGE SELECT OFF.	
171		36	C2TC	C2PU	PLACE OPEN LOOP ARM TO ON THEN AUTO AND VERIFY PU AUX RESET - OFF	
171		37	C2FC	C2TC	EAS RECYCLE OPERATIONS COMPLETE	
171		38	C2TC	C2AE	ENGINE SW. SEL. CUTOFF TO ON THEN AUTO.	
171		39	C2TC	C2AE	ALL ENG EMERG CUTOFF TO AUTO.	
171		40	C2TC	C2AE	START TANK ALL VENT TO ALL VENT.	
171		41	C2RP	C2TC	RECIRC. BOTTLE PRESSURIZATION TO 3000 PSI COMPLETE.	
171		42	C2RP	C2TC	LOX HE INJ IN PROGRESS.	
171		43	C2TC	R2SC C2AE C2EC C2FC C2GP C2LD C2PM C2PU C2RP C2SP	VERIFY READY TO PICK UP THE COUNT AT T-22 MINUTES	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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171 44 C2TC ALL ALL S-II PERSONNEL RETURN TO CH 121

121 45 C2TC CLTC S-II RECYCLE COMPLETE.

121 46 CLTC CCLH RE-ESTABLISH/VERIFY LH2 REPLENISH

121 47 CLTC CSA1 VERIFY S/A #1 CONNECTED AND READY TO
REINITIATE LOX REPLENISH

121 48 CLTC CCLO RE-ESTABLISH/VERIFY LOX REPLENISH

121 49 CLTC C1NP
CUNP
C4NP SWITCH SELECTOR INHIBIT - OFF

121 50 CLTC C1DP
C2DP
C4DP VERIFY S & A SAFE AND PD BLOCKED

121 51 CLTC RRSC VERIFY RECORDERS ON

52 C2NP
R2SC CYCLE MAIN/INSTR BATT BLEED SWITCHES TO
MAINTAIN BATT VOLTAGES IN TOLERANCE

121 53 CLTC C1DP
C2DP
C4DP VERIFY EBW'S 1 & 2 EXTERNAL AND NOT
CHARGED

53-1 CRSS *** NOTE ALL EBW'S NOT CHARGED

121 54 CLTC CRSS HOLD FIRE TO PROCEED & BYPASS - OFF

121 55 CLTC C1FR VERIFY RANGE SAFE ON

121 56 CLTC CUSW ISSUE IU OCTAL 072 (CCS OMNI)

121 57 CLTC CQAA Q-BALL POWER ON.
Q-BALL HEATER POWER - ON

57-1 NOTE

Q-BALL POWER SWITCH WILL BE
LEFT IN ON POSITION UNTIL
T-13 MIN.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		58	CLTC	CUCP	PUMP PRESSURE SWITCH ACTIVATE - OFF	
121		59	CLTC	CLGK	REQUEST & EXECUTE FT49/FE50 (ACCEL MON. PROG)	
		60		CLTC	*** NOTE IF HOLD TIME HAS EXCEEDED 30 MINUTES, PERFORM DRSCR RETEST PER APP. B, PART 2, PAGE 310. ----	
121		61	CLTC	CTS1	VERIFY OR OPERATE PSV #3 SWITCH TO DOWN	
161		62	C4TC	C4EP	CLOSE START TANK SUPPLY VENT	
161		63	C4TC	C4HN	OPEN 6000 PSI GH2 OR VERIFY OPEN	
161		64	C4TC	C4HN	OPEN COLD HELIUM CROSSOVER VALVE	
161		65	C4TC	C4EP	CLOSE START TANK VENT	
161		66	C4TC	C4EP	CLOSE START TANK EMERGENCY DUMP	
161		67	C4TC	C4PP	PLUG SUPERVISION POWER OFF	
		68		CLTC C1IP	PERFORM THE FOLLOWING TWO SEQUENCES ONLY IF THERE HAS BEEN A S/A 2 DISCONNECT AND TRANSMITTERS ARE NOT ON.	
121		68-1	CLTC	C1IP	ALL TRANSMITTERS ON IN SEQUENCE LISTED AND MARKED ON CH 121.	
121		68-2		C1IP	F1, ON P1, ON	
121		69	CLTC	C1IP C2IP C4IP CUIP	PLACE TM CAL CONTROLS -- AUTO. REPORT WHEN COMPLETE.	
		69-1		C1IP	TM CALIBRATOR - ON	
		69-2		C1IP	TM CAL MODE -- AUTO	
		69-3		C1IP	RACS POWER - AUTO	
		69-4		C1IP	400 HZ CAL POWER - AUTO. NOTE LOX AND FUEL RACS POWER OFF.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		69-5		C1IP	PREFLIGHT LEVELS - AUTO	
		69-6		C2IP	FM/FM INFLT - AUTO	
		69-7		C2IP	TM CAL MODE - AUTO	
		69-8		C2IP	FREQ MEAS CAL - AUTO	
		69-9		C2IP	PREFLIGHT LEVELS - AUTO	
		69-10		C2IP	PCM MODE - AUTO	
		69-11		C2NP	RACS POWER - AUTO	
		69-12		CUIP	TM CAL MODE - AUTO	
		69-13		CUIP	VERIFY TM CALIBRATOR ON	
		69-14		CUIP	PREFLT LEVELS - AUTO	
		69-15		C4IP	TM CAL COMMAND - AUTO	
		69-16		C4IP	PRELAUNCH CHECKOUT GROUP - AUTO	
		69-17		C4IP	TM CAL MODE - AUTO	
		69-18		C4IP	REGULAR CAL COMMAND - AUTO	
111		70	CLTC	CVTS	SET COUNT CLOCK AT T-22 MINUTES.	
121		71	CLTC	CLIK	REQUEST & EXECUTE VAMC (MEAS SYS RAPID CALIBRATION). REPORT WHEN COMPLETE.	
121		72	CLTC	CUPC	REQUEST & EXECUTE FT-06 & GT-16 (OPTION B) IF FT-42 WAS PREVIOUSLY EXECUTED	
121		73	CLTC	C1PK	REQUEST & EXECUTE VATS (TERMINAL SEQUENCE LINKING PROGRAM, PR2/PR4). DO NOT PERFORM VAMC DURING COUNT AT T-20 30".	
		73-1			NOTE ----- WHEN VATS TERMINAL LINKING PROGRAM IS BEING EXECUTED OMIT STEPS FOLLOWED BY THREE ASTERISKS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
	188	74	CLTC	ALL	ALL PERSONNEL ASSIGNED EMERGENCY PHONE LOOP CODE NUMBER DIAL YOUR CODE NUMBERS AND KEEP RECEIVERS OFF THE HOOK UNTIL T-0	
	121	75	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY TO RESUME COUNT	
	121	76	CLTC	RLDE	ENTER/VERIFY CDC MODE	
	121	77	CLTC	ALL	RETURN TO ASSIGNED CHANNELS TO RESUME THE COUNT AT SEQUENCE 1, T-22'0" PAGE 218. THE COUNT CLOCK WILL BE RESTARTED ON A MARK FROM CVTS.	
	111	78	CLTC	CVTS	LAUNCH VEHICLE READY TO RESUME COUNT. REQUEST A TIME COUNT AND MARK START OF COUNTDOWN CLOCK.	TCPI
		78-1		CVTS	*** NOTE USE A 5 COUNT FOR COUNT CLOCK START ON THE "ALL CALL" SYSTEM.	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APPENDIX B - LV RECYCLE PROCEDURE ----- PART 2 - DRSCR RETEST -----						
		1			NOTE ----- THIS RETEST TO BE ACCOMPLISHED AS PART OF RECYCLE TO T-22 MINUTES IF REQUIRED.	
		2			NOTE ----- S-IC CLOSED LOOP TEST NOT POSSIBLE IF S/A 2 HAS DISCONNECTED.	
111		3	CLTC	CVTS	VERIFY CLEARANCE TO REMOVE THE RANGE CMD CARRIER & REQUEST SRO TO COME TO CH. 121.	TCPI
111		4	CLTC	CVTS	LOCAL COMMAND CARRIER COMING ON	TOPI
121		5	CLTC	C1DP C2DP C4DP	SYSTEM STATUS SWITCH - OFF	
121		6	CLTC	CLVN	DESTRUCT SYSTEM - ENABLE	
		6-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON	
		6-2		C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE	
121		7	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 TO INTERNAL & VERIFY	
		7-1		CRSS	*** NOTE ALL RSCR'S ON INTERNAL POWER	
		7-2		B1RF B2RF B4RF CRSS	*** NOTE LIMITER VOLTAGES RECEIVED	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		8	CLTC	RRSC	VERIFY RECORDERS - ON	
121		9	CLTC	BRFS	SIG GEN ON AND VERIFY REMOTE MONITOR TO HYBRID.	
121		10	CLTC	SRO	RANGE CARRIER OFF - VERIFY READY FOR DRSCR CHECKS - CLOSED LOOP	
		10-1		B1RF B2RF B4RF CRSS	*** NOTE LIMITER VOLTAGES RECEIVED.	
121		11	CLTC	C1DP C2DP C4DP	VERIFY DRSCR #1 & #2 GROUND POWER SWITCH IN AUTO	
121		12	CLTC	BTMC	TM TAPE RECORDER - ON FOR DRSCS TEST	
		12-1		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR TESTS.	
121		13	CLTC	C1DP C2DP C4DP	AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF, SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO	
121		14	CLTC	RRSC	RECORDERS - FAST SPEED	
121		15	CLTC	SRO	ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS.	
121		16	SRO	ALL	3-2-1 MARK	
121		17	CLTC	C1DP C2DP C4DP	SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF	
121		18	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		19	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 WERE INTERNAL AND CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		19-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED	
		19-2		CRSS	*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON.	
121		20	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL AND NOT CHARGED.	
		20-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		21	CLTC	C1DP C2DP C4DP	VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED.	
121		22	CLTC	RRSC	RECORDERS - FAST SPEED	
121		23	CLTC	SRO	ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
121		24	SRO	ALL	3-2-1 MARK	
121		25	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		26	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		26-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED.	
121		27	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	
		27-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		28	CLTC	BTMC	TM TAPE RECORDER OFF AND RELOAD	
		28-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	
111		29	CLTC	CVTS	REQUEST RANGE SAFETY COMMAND TRANSMITTER #1 CARRIER ON. REPORT WHEN TURNED ON.	TOPI
		29-1		CLTC	*** NOTE DO NOT PROCEED UNTIL TRANSMITTERS ARE ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
121		30	CLTC	BRFS	SIG GEN SELECTOR - STANDBY	
121		30-1		B1RF B2RF B4RF CRSS	*** NOTE ALL LIMITER VOLTAGES RECEIVED	
111		31	CLTC	CVTS	DRSCS TEST COMPLETE. LOCAL COMMAND CARRIER IS OFF	TCPI
121		32	CLTC	ALL	ALL PERSONNEL TURN TO APP B1, PAGE 306 , SEQ 61 -----	

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APPENDIX C

LV DRAIN OPERATIONS

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					APPENDIX C ----- LV DRAIN OPERATIONS ----- PART 1 ----- LV PREPS FOR DRAIN -----	
121		1	CLTC	C1DP C2DP C4DP	SYSTEMS STATUS SWITCH TO SAFE	
		1-1		C1DP C2DP C4DP	*** NOTE RSCR EXTERNAL AND OFF	
121		2	CLTC	CLVN	DESTRUCT SYSTEM OFF	
121		3	CLTC	CUPC	POWER DOWN ST-124M PER V-33011	
121		4	CLTC	CUSP	FLIGHT CONTROL COMPUTER POWER SWITCH - OFF.	
121		5	CLTC	CUGA	CONTROL EDS RATE GYRO POWER SWITCH - OFF	
121		6	CLTC	CLGK	REQUEST & EXECUTE FT-04 PER V-33033, SECTION IV (POWER OFF LVDC/LVDA)	
121		7	CLTC	CUPC	TERMINATE GE-01 IF EXECUTING	
121		8	CLTC	CWCP	RECONFIGURE THE IWS TO AN EGRESS CONFIGURATION PER V-36113.	
121		9	CLTC	CSPP	REMOVE LSE 43D100 & 43D200 FIRING POWER PER V-21194 & REMOVE LSE POWER OVERRIDE REPORT WHEN COMPLETE.	
121		10	CLTC	C1TC C2TC C4TC CUTC	VERIFY SYSTEMS SAFED & READY FOR CREW EGRESS.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
	111	11	CLTC	CVTS	LV READY FOR CREW EGRESS.	TCPI
	188	12	CLTC	ALL	ALL LV SYSTEMS WILL BE HELD AT THIS POINT UNTIL FLIGHT CREW EGRESS IS COMPLETE.	
	111	13	CVTS	CSA9	RECONNECT SERVICE ARM 9 PER V-36085 (IF NOT ALREADY CONNECTED)	TCPI
	111	14	CSA9	CVTS	S/A #9 RECONNECTED.	TCPI
	111	15	CVTS	CSA9	RETURN TO CHANNEL 118.	TCPI
	118	16	CSA9	CSAC	S/A #9 HAS BEEN RECONNECTED. CSA9 IS NOW ACTIVE ON CHANNEL 118.	
	181	17	CSAC	C1TC	S/A #9 IS RECONNECTED.	
	181	18	C1TC	CSPP	PLACE 42D100 LOCKUP ENABLE SWITCH TO OFF AND VERIFY	
		19			NOTE ----- IF FLIGHT CREW IS ABOARD, IT WILL BE APPROXIMATELY ONE HOUR BEFORE ALL PERSONNEL WILL BE CLEAR OF THE CONTROL AREA FOR DRAIN OPERATIONS.	
	121	1	CVTS	CLTC	CREW EGRESS IS COMPLETE. ALL PERSONNEL ARE CLEAR OF THE CONTROL AREA. LV DRAIN OPERATIONS MAY START.	TCPI
		2			NOTE ----- FOR THE NEXT 15 MIN. CSAD REQUIRES EXCLUSIVE CONTROL OF TV CAMERAS 37 & 39.	
	121	3	CLTC	C1TC	RECONNECT PRIMARY DAMPER	
	181	4	C1TC	CSAC	RECONNECT PRIMARY DAMPER	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
118		5	CSAC	CSAD	RECONNECT PRIMARY DAMPER PER V-36086;	
181		6	CLTC	CTS1	DISARM UMBILICAL SWITCH AND CLOSE UMBILICAL RELEASE SIMULATE VALVE	
		7	CLTC		NOTE ----- IF COMPUTER IS NOT SUPPORTING, ALL PERSONNEL TURN TO APPENDIX C, PART 4, PAGE 331 -----	
121		8	CLTC	G2TC	TURN TO PART 3 AND START S-11 PREPARATIONS FOR PROPELLANT DRAIN ON CHANNEL 171; REPORT WHEN READY FOR LH2 DRAIN	#
121		9	CLTC	G1TC	DELETED GDDT ONLY	*
121		10	CLTC	G2TC	DELETED CDDT ONLY	*
171		11	G2TC	G2SP	DELETED GDDT ONLY	*
121		12	CLTC	G4TC	START S-1VB PROPELLANT DRAIN PREPS PER V-30539 SECT W;	
121		13	CLTC	G1IP G2IP G4IP G1UP	ALL TM RF ASSY'S - OFF AND MARK;	
121		14		G1IP	F1 & P1 TRANSMITTERS OFF	
121		15		G2IP	F1, F2, & P1 TRANSMITTERS OFF	
121		16		G1UP	F1 & P1 RF OFF	
121		17		G4IP	P1 OFF AND SSB TO DISABLE	
121		18	CLTC	G1UP	F1 TM ASSY OFF	
121		19	CLTC	G1IP	28 VOLT RACS AND 400 HERTZ POWER - OFF;	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					GD ONLY	
121		20	CLTC	ETMS BTMC	TM TAPE RECORDING OFF,	
121		21	CLTC	C1IP CUIP	TM CALIBRATOR - OFF,	
121		22	CLTC	CUNP	SWITCH SELECTOR INHIBIT OFF,	
121		23	CLTC	CUIP	G-BAND BEACON #1 - OFF G-BAND BEACON #2 - OFF CCS TRANSPONDER - OFF COMMAND/DECODER - OFF G-BAND INHIBIT #1 & #2 - OFF	
121		24	CLTC	CQAA	Q-BALL POWER - OFF Q-BALL HEATER POWER - OFF,	TCP!
121		25	CLTC	CUCP	HIGH PRESSURE REGULATOR SWITCH TO LOW,	
121		26	CVTS	CLTC	S/C EDS POWER IS OFF	# TCP!
111		27	CLTC	CVTS	COMMAND DECODER IS OFF,	TCP!
111		28	CLTC	CVTS	ALL LV RF SYSTEMS ARE OFF,	TCP!
121		29	CLTC	CUNP	SWITCH SELECTOR INHIBIT ON,	
161		30	CATC	CANP	BATTERY MONITOR TO AUTO	
121		31	CLTC	BRFS	SECURE GSE FLIGHT CODE PLUG	#
181		32	C1TC	BRFS	SECURE DRSCS GSE PER V-38000 SCRUB/ RECYCLE PROCEDURE	
121		33	C1TC	CLTC	PRIMARY DAMPER AND S/A #1 ARE CONNECTED,	
111		34	CLTC	CVTS	PRIMARY DAMPER IS CONNECTED,	TCP!
181		35	C1TC	C1PE	CONTINUE THERMAL CONDITIONING PURGE AND ENGINE HEATER OPERATIONS UNTIL RESIDUAL LOX HAS BOILED OFF,	
121		36	CLTC	C1SP	RETURN TCS KEY TO CPSS	
121		37	CLTC	CLVN	RETURN DESTRUCT SYSTEM ENABLE KEY TO CPSS	
111		38	CLTC	CVTS	TCS AND DESTRUCT SYSTEM ENABLE KEYS HAVE BEEN RETURNED TO CPSS	TCP!
		39			NOTE	

NOTE:
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PART 2.

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					CD ONLY	
					PART 2 -----	
					LV DRAIN -----	
181		1	C1TC	CCLH	START MANUAL LH2 DRAIN PREPS PER V-35014 ADDENDUM D-13, REPORT WHEN READY TO START S-11 DRAIN,	
181		1-1	C1TC	CCRP	SECURE RP-1 PANEL POWER	B-212-119
181		2	C1TC	CCLO	START MANUAL LOX DRAIN PREPS PER V-35014 ADDENDUM B-3, REPORT WHEN READY TO START DRAIN,	
171		3	C2SP	C2TC	DELETED CDDT ONLY	*
121		4	C2TC	CLTC	DELETED CDDT ONLY	*
121		5	CLTC	C2TC	DELETED CDDT ONLY	*
181		6	CCLH	C1TC	MANUAL LH2 DRAIN PREPS COMPLETED, READY TO START S-11 LH2 DRAIN,	
181		7	CCLO	C1TC	MANUAL LOX DRAIN PREPS COMPLETED,	
181		8	CLTC	C1TC C2TC C4TC	VERIFY READY TO START SIMULTANEOUS PROPELLANT DRAIN	
111		9	CLTC	CVTS	RESET CDC TO T+0 AND START COUNT UP	
121		1	CLTC	C1TC	CLEARED TO START SIMULTANEOUS DRAIN OPERATIONS,	
181		2	C1TC	CCLH	START MANUAL LH2 DRAIN OPERATIONS PER V-35014 ADDENDUM D-13, REPORT WHEN COMPLETE,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
+ 0' 0"						
	181	3	C1TC	CCLO	START MANUAL LOX DRAIN OPERATIONS PER V-85014 ADDENDUM B-3, REPORT WHEN COMPLETE;	
+ 5' 0"	181	1	CCLH	C1TC	S-II LH2 DRAIN IN PROCESS	
+ 8' 0"	181	1	CCLH	C1TC	S-IVB LH2 DRAIN IN PROCESS	
+ 10' 0"	181	1	CCLO	C1TC	S-IC LOX DRAIN STARTED	
+ 32' 0"	181	1	CCLO	C1TC	S-II LOX DRAIN STARTED (S-II LH2 APPROXIMATELY 50%)	
+ 1 HRS 0' 0"	181	1	CCLH	C1TC	S-II LH2 DRAIN IS COMPLETE	
+ 1 HRS 14' 0"	181	1	CCLH	C1TC	S-IVB LH2 DRAIN IS COMPLETE;	
+ 1 HRS 28' 0"	181	1	CCLO	C1TC	S-II LOX DRAIN IS COMPLETE; STARTING S-IVB LOX DRAIN;	
	181	2	C1TC	CCLH	START LH2 SYSTEM PURGE (S-II ONLY)	
	121	3	C1TC	C2TC	START S-II POST TANKING PURGE	
	171	4	C2TC	C2NP	REMOVE PM POWER	
	171	5	C2TC	C2SP C2RP	START POST TANKING PURGE PER V-24259 (L011)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 1 HRS 28' 0"						
	171	6	C2TC	C2SP	LOW LEVEL PURGE OFF WHEN NOT REQUIRED.	
	171	7	C2TC	C2GP	START GH2 CIRCUIT SCRUB PURGE PER V-30029 (M020) TASK 54.	
	171	8	C2TC	C2LD	START STAGE LH2 TANK SAMPLING PER V-25311 (L009) WHEN REQUIRED PER V-24259 (L011)	
+ 2 HRS 0' 0"						
	181	1	CCLO	C1TC	S-IVB LOX DRAIN COMPLETE	
	121	2	CLTC	C1TC	CLEAR TO PROCEED WITH S-IVB LH2 INERTING PURGE	
	181	3	C1TC	CCLH	CLEAR TO START S-IVB PURGE	
	161	4	C4TC	C4PU	PU POWER OFF	
	161	5	C4TC	C4PU	LOADING MEASUREMENT ENABLE - OFF	
	181	6	CCLO	C1TC	S-IC LOX DRAIN COMPLETE	
	121	7	C1TC	CLTC	LOX DRAIN IS COMPLETE	
	171	8	C2TC	C2FC	START EAS POST DRAIN PROCEDURE PER V-30029 (M020) TASK 55.	
		8-1	CCLO CCLH		*** NOTE PROPELLANTS SUPPORT WILL BE REQUIRED UNTIL COMPLETION OF S-IVB PURGES	
+ 2 HRS 30' 0"						
	171	1	C2TC	C2SP	VERIFY POST TANKING PURGE PARTIALLY COMPLETE AND READY FOR INSPECTION TEAM	
	121	2	C2TC	CLTC	S-II LH2 PROPELLANT TANK PURGE IN PROCESS. READY FOR INSPECTION TEAM.	
	121	3	C4TC	CLTC	S-IVB LH2 PROPELLANT TANK PURGE IN PROCESS. READY FOR INSPECTION TEAM.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
+ 2 HRS 30' 0"						
	181	4	CCLH	C1TC	VEHICLE LH2 TANKS AND GSE PURGING IS IN PROCESS. READY FOR INSPECTION TEAM TO VERIFY LESS THAN 4% GH2 IN TRANSFER LINE	
	121	5	C1TC	CLTC	VEHICLE LH2 TANKS AND GSE PURGING IS IN PROCESS. READY FOR INSPECTION TEAM TO VERIFY LESS THAN 4% GH2 IN TRANSFER LINE	
	171	6	C2TC	C2SP	SHROUD PURGE TO CLOSE	
	181	7	C1TC	CCLO	PURGE INERT AND SECURE LOX SYSTEM PER V-25342	
	181	8	C1TC	CECS	SWITCH ECS FROM GN2 TO AIR PER V-36074 PART D.	
	181	9	C1TC	CHGD	SECURE HGD SYS PER V-37037	
	181	10	C1TC	C1PE	VENT S-IC GN2 BOTTLES TO 1500 PSI PER V-24327.	
	181	11	C1TC	C1NP	HEATER POWER SWITCH TO OFF	
	121	12	CLTC	C1TC C2TC C4TC	VERIFY ALL SYSTEMS READY FOR POST DRAIN SAFETY INSPECTION.	
	111	13	CLTC	CVTS	LV PROPELLANT DRAIN OPERATIONS ARE COMPLETE & LV IS READY FOR SAFETY INSPECTION.	TCPI
		14			NOTE ----- A SAFETY INSPECTION OF THE LAUNCH PAD WILL BE CONDUCTED FOR THE NEXT HOUR. LAUNCH VEHICLE PERSONNEL WILL NOT BE GIVEN ACCESS TO THE AREA UNTIL SAFETY PERSONNEL COMPLETE THEIR INSPECTION.	TCPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 2 HRS 30' 0"	111	15	CLTC	CVTS	REQUEST CPSS TO CLEAR BENDIX PERSONNEL TO FACILITY HIGH PRESSURE GH2 AREA TO SECURE AND VENT 6000 PSI GH2 TRANSFER LINE	TOPI
	121	16	C1TC	CLTC	REQUEST SUPPORT PREPARE TO HAVE 2 PRIME MOVERS AND CABLES FOR ESP TRANSPORTER MOVE. PRIME MOVERS SHOULD BE AT THE MSS ROAD BLOCK AT T+ 2 HRS 45 MIN AND READY TO PULL THE ESP TRANSPORTER AT THE START OF PAD OPENING.	
	111	17	CLTC	CVTS	REQUEST SUPPORT PREPARE TO HAVE 2 PRIME MOVERS AND CABLES FOR ESP TRANSPORTER MOVE. PRIME MOVERS SHOULD BE AT THE MSS ROAD BLOCK AT T+ 2 HRS 45 MIN AND READY TO PULL THE ESP TRANSPORTER AT THE BEGINNING OF PAD OPENING.	TOPI
	121	18	CVTS	CLTC	VERIFY S-IVB & S-II PERSONNEL ARE READY TO SUPPORT GH2 CROSS COUNTRY LINE SECURING WITH GHE.	TOPI
	151	19		CUTC	TERMINATE ALTERNATE FIRING ROOM SUPPORT	
+ 2 HRS 45' 0"	171	1	C2FC	C2TC	EAS POST DRAIN PROCEDURES ARE COMPLETE	
	171	2	C26P	C2TC	GH2 CIRCUIT SCRUB PURGE COMPLETE.	
	181	3	C1TC	C1PE	AFTER RESIDUAL LOX HAS BOILED OFF AS INDICATED BY MEASUREMENTS C242-101 THRU -105 & HEATERS CYCLING, TURN OFF ENG. HEATERS, THERMAL CONDITIONING PURGE & HEATER POWER.	
	181	4	C1TC	C1PE	SECURE APPLICABLE PORTIONS OF S-IC PNEUMATICS SYS PER V-24327. REPORT WHEN COMPLETE.	
	121	5	C1TC	CLTC	ECS SWITCH OVER FROM GN2 TO AIR IS COMPLETE. ECS GN2 IS IN STANDBY CONFIGURATION	XB-150-114

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 3 HRS 0' 0"						
	171	1	C2SP	C2TC	LH2 TANK PURGE COMPLETE PER V-24259 (L011)	
	171	2	C2LD	C2TC	LH2 TANK SAMPLING COMPLETED PER V-25311 (L009). LEAK DETECTION OPERATION TO BE SECURED TO STANDBY OPERATION PER SECTION E.3 OF V-25311 (L009).	
		2 -1			NOTE ----- IF REQUIRED, OPERATION WILL CONTINUE PER APPLICABLE SECTIONS OF V-26276 (G058).	
	121	3	CVTS	CLTC	CLEAR TO START RP-1 REPLENISH (IF RECYCLING TO T-9 HRS)	TCPI
	121	4	CLTC	C1TC	START RP-1 REPLENISH (IF RECYCLING TO T-9 HRS)	
	181	5	C1TC	CCRP	APPLY RP-1 PANEL POWER AND START REPLENISH PER V-25389 (IF RECYCLING TO T-9 HRS)	
	121	6	CLTC	C1TC	SEND TSM PERSONNEL TO ZERO LEVEL FOR TSM 3-4 TILT BACK (IF MSS IS TO BE RETURNED TO PAD)	
	181	7	C1TC	CTS1	SEND TSM PERSONNEL TO ZERO LEVEL FOR INSTALLING TSM SAFETY CABLES, RIGGING TSM 3-4 FOR TILT TILT BACK AND SECURING TSM SYSTEMS (IF MSS IS TO BE RETURNED TO PAD)	
+ 3 HRS 30' 0"	121	1	CVTS	CLTC	SAFETY INSPECTION IS COMPLETE. SPECIAL CONTROL AREA IS OPEN FOR REQUIRED PERSONNEL IF RP-1 REPLENISH NOT IN PROCESS.	TCPI
		2			DELETED	XB-150- 114
	151	3	CUTC	CUCP	VENT ST-124M AIR BEARING SYSTEM PER V-34006. REPORT WHEN COMPLETE.	
	121	4	CLTC	C1TC C2TC C4TC CUTC	SPECIAL CONTROL AREA IS OPEN FOR REQUIRED PERSONNEL IF RP-1 REPLENISH NOT IN PROCESS.	

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3 HRS 30' 0"	188	5	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX F FOR DRY ODDT OPERATIONS) (VOLUME III FOR LAUNCH VEHICLE SCRUB TO LAUNCH TURNAROUND OPERATIONS)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
					PART 3 -----	
					S-II PREPARATIONS FOR PROPELLANT DRAIN -----	
171		1	C2TC	C2SP	GN PURGE VALVE TO AUTO.	
171		2	C2TC	C2SP	LH SUPPLY VALVE TO AUTO.	
171		3	C2TC	C2GP	GH SUPPLY VALVE TO CLOSE.	
171		4	C2TC	C2GP	START TANK LINE VENT TO OPEN FOR APPROX 10 SECONDS THEN CLOSE.	
171		5	C2TC	C2GP	GH REG VENTS TO OPEN.	
171		6	C2TC	C2GP	RECEIVER LINE VENT TO CLOSE.	
171		7	C2TC	C2GP	HE PRESS SEL SW TO 1000 PSIG.	
171		8	C2TC	C2AE	VERIFY ENGINE PURGES COMPLETE.	
171		9	C2TC	C2AE	USE ALL HE SOLENOID SWITCH TO VENT ENG. HE BOTTLES BELOW 25 PSIA. ALLOW BOTTLES TO VENT UNTIL PROPELLANT TANK PURGE IS COMPLETE.	
171		10	C2TC	C2RP	LOX HE INJECTION TO START, THEN AUTO, WHEN RECEIVER PRESS APPROX. 1465 PSIA, HE INJECTION TO STOP, THEN AUTO.	
		10-1		C2SP	*** NOTE LOX HE INJECTION RECEIVER BEING VENTED INTO LOX TANK.	
171		11	C2TC	C2RP	USE RECIRC ACT SYSTEM VENT SWITCH TO VENT RECIRC RECEIVER TO APPROX. 1465 PSIA.	
171		12	C2TC	C2AE	START TANK SUPPLY LINE VENT TO OFF.	
171		13	C2TC	C2AE	VERIFY HE BOTTLE PRESSURES BELOW 25 PSIA.	
171		14	C2TC	C2AE	VERIFY START TANK PRESSURES BELOW 25 PSIA.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
171		15	C2TC	C2AE	ALL ENG. EMERGENCY CUTOFF TO AUTO.	
171		16	C2TC	C2RP	VERIFY LOX HE INJECTION RECEIVER PRESSURE APPROX. 1465 PSIA.	
171		17	C2TC	C2RP	VERIFY RECIRC RECVR PRESS APPROX. 1465 PSIA.	
171		18	C2TC	C2RP	PNEUM. SUPPLY VALVE TO PRESSURIZE.	
171		19	C2TC	C2GP C2LD C2PM C2SP	VERIFY READY FOR PROPELLANT DRAIN.	
171		20	C2TC	C2LD	START COMMON BULKHEAD EVACUATION AS REQUIRED FOR PROPELLANT DRAIN.	
121		21	C2TC	CLTC	S-II READY FOR PROPELLANT DRAIN.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 4 ----- LV PREPS FOR COMPUTER DOWN DRAIN -----	
121		1	CLTC	CUNP	ISSUE STAGE LOGIC RESET.	
121		2	CLTC	CLVN	VERIFY/PLACE ML DCE TO MANUAL MODE	
121		3	CLTC	CLVN	ISSUE THE FOLLOWING MDOS ON OR OFF SIMULTANEOUSLY BY SETTING UP THE DCE BIT PATTERN DEFINED FOR EACH GROUP (ANNOUNCE OVER DIS CH 121 AS EACH GROUP IS ISSUED) PER V-31008.	
		3-1	ALL		*** NOTE ALL PANEL OPERATORS POSITION SWITCHES TO POSITION INDICATED IN PARENTHESIS AFTER THE GROUP IS ISSUED	
121		3-2	CLVN		GRP 1 - MUX 22: ADDRESS 19: DATA BIT 3 UP, 4 UP, 19 UP, 22 UP. 1467 OFF (S-IC TM CAL POWER OFF) 1468 OFF (S-IC 400 HZ POWER OFF) 1483 OFF (S-IC F1-RF OFF) 1486 OFF (S-IC P1-RF OFF)	
121		3-3	CLVN		GRP 2 - MUX 22: ADDRESS 20: DATA BIT 2 UP. 1490 OFF (S-IC 28V RACS POWER OFF)	
121		3-4	CLVN		GRP 3 - MUX NONE: ADDRESS 9: DATA BIT 0 ON, 10 DN, 20 DN. 0216 ON (TSM 1-2 UMB RELEASE SIM VALVE CLOSE) 0226 ON (TSM 3-2 UMB RELEASE SIM VALVE CLOSE) 0236 ON (TSM 3-4 UMB RELEASE SIM VALVE CLOSE)	
121		3-5	CLVN		GRP 4 - MUX 22: ADDRESS 5: DATA BIT 5 UP. 1133 OFF (C2GP-RECVR LINE VENT CLOSE)	
121		3-6	CLVN		GRP 5 - MUX 22: ADDRESS 2: DATA BIT 17 UP. 1073 OFF (C2GP-HE SELECT TO 1000 PSI)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
121		3-7		CLVN	GRP 6 -- MUX 21: ADDRESS 2: DATA BIT 10 DN; 0568 ON (C2RP LOX HE INJ START)	
121		3-8		CLVN	GRP 7 -- MUX 22: ADDRESS 10: DATA BIT 9 UP, 11 UP, 14 UP, 6 DN 1262 OFF (C2IP F1-RF OFF) 1259 OFF (C2IP F2-RF OFF) 1257 OFF (C2IP P1-RF OFF) 1254 ON (C2FC MAIN PUMP BYPASS VALVE OPEN)	
121		3-9		CLVN	GRP 8 -- MUX 21: ADDRESS 7: DATA BIT 19 DN; 0691 ON (CCS TRANSPONDER OFF)	
121		3-10		CLVN	GRP 9 -- MUX 21, 22: ADDRESS 13: DATA BIT 18 UP, 19 UP, 22 UP, 23 UP; 1842 OFF (IU TM CAL POWER OFF) 1843 OFF (IU F1-RF OFF) 1846 OFF (IU P1-RF OFF) 1847 OFF (IU F1-TM OFF)	
121		3-11		CLVN	GRP 10 -- MUX 21, 22: ADDRESS 14: DATA BIT 4 UP, 6 UP 1852 OFF (G-BAND BEACON #1 OFF) 1854 OFF (COMMAND DECODER OFF)	
121		3-12		CLVN	GRP 11 -- MUX 21, 22: ADDRESS 16: DATA BIT 12 UP, 16 UP; 1908 OFF (G-BALL HEATERS OFF) 1912 OFF (G-BAND BEACON #2 OFF)	
121		3-13		CLVN	GRP 12 -- MUX NONE: ADDRESS 18: DATA BIT 17 UP; 0449 OFF (ML/DRSCS/GSE POWER OFF)	#
121		4	CLTC	C2AE	ALL HELIUM SOLENOID SWITCH -- ON	
121		5	CLTC	CUNP CANP	SWITCH SELECTOR INHIBIT OFF,	
121		6	CLTC	CUSH	ISSUE IU OCTAL 034 (G-BAND INHIBIT #1 & #2 OFF)	
121		7	CLTC	CUSH	ISSUE S-1VB OCTAL 157 (SSB TO DISABLE)	

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111:		8	CLTC	CVTS	ALL LV RF SYSTEMS ARE OFF EXCEPT S-1VB P1 258.5 MHZ LINK	TCP!
121:		9	CLTC	BRFS	LCC GSE POWER OFF	
121:		10	CLTC	CUNP	SWITCH SELECTOR INHIBIT ON	
121:		11	CLTC	CUPC	POWER DOWN ST-124M PER V-33011	
121:		12	CLTC	CUSP	FLIGHT CONTROL COMPUTER POWER SWITCH - OFF	
121:		13	CLTC	CUGA	CONTROL EDS RATE GYRO POWER SWITCH - OFF	
121:		14	CLTC	CLGK	ON-AUTO-OFF SWITCH TO OFF	
121:		15	CLTC	CUDE	VERIFY HALT (728) AND MEMORY RELEASE (730) ARE ON	
121:		16	CLTC	CTS1	DISARM UMBILICAL SWITCH	
121:		17	CLTC	C2GP	GH SUPPLY VALVE TO CLOSE	
121:		18	CLTC	C2GP	START TANK LINE VENT TO OPEN	
121:		19	CLTC	C2RP	USE RECIRC ACT SYSTEM VENT SWITCH TO VENT PNEUMATIC RECEIVER TO 1465 PSIA	
		19-1		C2AE	*** NOTE HE BOTTLE PRESSURES BELOW 25 PSIA	
		19-2		C2AE	*** NOTE START TANK PRESSURES BELOW 25 PSIA	
		19-3		C2RP	*** NOTE HE INJ RECVR PRESS APPROX 0 PSIA	
		19-4		C2RP	*** NOTE RECIRC RECVR PRESS APPROX 1465 PSIA	
121:		20	CLTC	C2LD	INITIATE COMMON BULKHEAD EVACUATION AS REQUIRED FOR PROPELLANT DRAIN	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					S-IVB DRAIN PREPS - COMPUTER DOWN -----	
121		1	CLTC	C4TC	IDENTIFY THE FOLLOWING STEPS REQUIRED FOR DRAIN PREPS:	
121		2	CLTC	CLVN	ISSUE THE FOLLOWING MDO'S ON OR OFF SIMULTANEOUSLY BY SETTING UP THE DCE BIT PATTERN DEFINED FOR EACH GROUP (ANNOUNCE OVER OIS CH 121 AS EACH GROUP IS ISSUED) PER V-31008.	
121		2-1		CLVN	GRP 1 - MUX 21: ADDRESS 3: DATA BIT 3 UP, 7 UP, 579 OFF (LH TANK VENT OPEN OFF) 583 OFF (LOX TANK VENT OPEN OFF)	
121		2-2		CLVN	GRP 2 - MUX 21, 22: ADDRESS 1: DATA BIT 15 UP. 1551 OFF (CIRCUIT NO. 2 SUPPLY OPEN OFF)	
121		2-3		CLVN	GRP 3 - MUX 21, 22: ADDRESS 3: DATA BIT 14 UP, 19 UP. 1598 OFF (CONT & REPRESS SUPPLY OPEN OFF) 1603 OFF (COLD HELIUM SUPPLY OPEN OFF)	
121		2-4		CLVN	GRP 4 - MUX 21, 22: ADDRESS 5: DATA BIT 20 UP. 1652 OFF (APS ENG VALVE POWER OFF)	
121		2-5		CLVN	GRP 5 - MUX 21, 22: ADDRESS 6: DATA BIT 5 UP, 14 UP, 15 UP, 16 UP. 1661 OFF (APS 3000 HELIUM SUPPLY OPEN OFF) 1670 OFF (DOME CROSSOVER OPEN OFF) 1671 OFF (CIRCUIT NO. 3 SUPPLY OPEN OFF) 1672 OFF (750 HELIUM SUPPLY OPEN OFF)	
121		2-6		CLVN	GRP 6 - MUX 21, 22: ADDRESS 8: DATA BIT 7 UP, 8 UP, 12 UP, 14 UP. 1711 OFF (ENGINE CONTROL POWER OFF) 1712 OFF (ENGINE IGNITION POWER OFF) 1716 OFF (START TANK VENT OPEN OFF) 1718 OFF (START TANK SUPPLY VENT OPEN OFF)	

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121		2-7		CLVN	GRP 7 - MUX 21, 22: ADDRESS 10: DATA BIT 16 UP. 1768 OFF (START TANK EMERGENCY VENT OPEN OFF)	
121		2-8		CLVN	GRP 8 - MUX 21, 22: ADDRESS 3: DATA BIT 21 DN. 1605 ON (COLD HELIUM CROSSOVER OPEN)	
121		3	CLTC	CUSW	ISSUE S-IVB OCTAL 162 (S/SEL CUTOFF OFF).	
121		4	CLTC	C4DE	VERIFY DEE 1930 ON (LH LATCHING RELIEF CLOSED).	
121		4-1	CLTC	CLVN	IF NOT ON ----- ISSUE GRP 9 - MUX 21, 22: ADDRESS 8: DATA BIT 16 DN 1720 ON (LH LATCH RELIEF VALVE OPEN ON).	
121		5	CLTC	CLVN	ISSUE GRP 10 - MUX 21, 22: ADDRESS 8: DATA BIT 16 UP. 1720 OFF (LH LATCH RELIEF VALVE OPEN OFF)	
		5-1		C4DE	VERIFY DEE 1930 ON.	
121		6	CLTC	C4DE	VERIFY DEE 1676 ON (LOX NPV FULL CLOSE).	
121		6-1	CLTC	CUSW	IF NOT ON ----- ISSUE S-IVB OCTAL 114 (LOX TANK NPV OPEN ON). ISSUE S-IVB OCTAL 165 (LOX TANK NPV OPEN OFF).	
		7		C4DE	VERIFY DEE 1676 ON.	
121		8	CLTC	C4TC	CONTINUE S-IVB DRAIN PREPS PER V-30539.	
121		9	CLTC	C1TC C2TC C4TC	VERIFY READY TO START PROPELLANT DRAIN.	
121		10	CLTC	C1TC	START PROPELLANT DRAIN, PER APPENDIX C, PART 2, PAGE 322. -----	

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121		1	CLTC	BTMC	TM TAPE RECORDING - ON	
188		2	CLTC	ALL	ALL PERSONNEL SUPPORTING POWER TRANSFER TEST SWITCH TO INDIVIDUAL "STAGE TC" ACTIVE CHANNELS TO PREPARE FOR POWER TRANSFER.	
123		3	CUFS	CUGA	ATTITUDE RATE COMMANDS (PLUS 10 DEG/SEC ROLL). HOLD UNTIL POWER TRANSFER IS COMPLETE.	
121		4	CUFS	CLTC	FLIGHT CONTROL READY FOR POWER TRANSFER.	
181		5	C1TC	C1NP	VERIFY INTERNAL AND EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
181		6	C1TC	C1NP	BATTERY INSTALLED ENABLE TO ON	
		6-1		C1NP	*** NOTE S-IC READY FOR POWER TRANSFER.	
181		7	C1TC	C1NE R1SC	VERIFY READY FOR POWER TRANSFER.	
181		8	C1TC	C1NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
121		9	C1TC	CLTC	S-IC READY FOR POWER TRANSFER.	
		9-1		C2RP	*** NOTE OK TO OPERATE PUMPS LIGHT ON.	
171		10	C2TC	C2RP	LH2 RECIRC PUMPS TO START, THEN INHIBIT (AT 2 SECOND INTERVALS).	
		10-1		C2PC	*** NOTE RECIRC BUS CURRENT INCREASES WITH EACH RECIRC PUMP START	

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171		11	C2TC	C2RP	LH2 PREVALVES TO CLOSE, THEN INHIBIT	
		11-1		C2RP	*** NOTE LH2 PREVALVES CLOSED - ON	
171		12	C2TC	C2NP	BATTERY INSTALLED TO ENABLE	
		12-1		C2NP	*** NOTE MAIN, INST AND RECIRC BATTERY CONNECTED - ON	
171		13	C2TC	C2NP R2SC	VERIFY READY FOR POWER TRANSFER.	
171		14	C2TC	C2NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
121		15	C2TC	CLTC	S-II READY FOR POWER TRANSFER.	
161		16	C4TC	R4HY	HYD STRIP CHARTS TO FAST	
161		17	C4TC	C4HY	FLIGHT MODE ON THEN AUTO, (VERIFY WHEN SYSTEM IS STABILIZED).	
161		18	C4TC	C4EP	VERIFY LOX AND LH2 READY TO START INDICATION ON.	
161		19	C4TC	C4EP	LH2 CHILLDOWN PUMP - ON (WAIT 10 SECONDS BEFORE NEXT STEP).	
161		20	C4TC	C4EP	LOX CHILLDOWN PUMP - ON (WAIT 5 SECONDS BEFORE NEXT STEP).	
161		21	C4TC	C4EP	CLOSE LOX AND LH2 PREVALVES.	
161		22	C4TC	C4NP	EMERGENCY POWER TRANSFER - OFF.	
161		23	C4TC	C4NP	STAGE BATTERY MONITOR TO ENABLE	
161		24	C4TC	C4IP	VERIFY PRELAUNCH CHECKOUT GROUP OFF	
161		25	C4TC	C4NP C4PP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
161		26	C4TC	C4NP R4EI R4SC	VERIFY READY FOR POWER TRANSFER.	
161		27	C4TC	C4NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
121		28	C4TC	CLTC	S-IVB READY FOR POWER TRANSFER.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
151		29	CUTC	CUNP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
151		30	CUTC	CUNP RUBM	VERIFY READY FOR POWER TRANSFER.	
151		31	CUTC	CUNP	IU TO REMAIN ON INTERNAL FOR 3 MINUTES	
151		32	CUTC	CUNP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
121		33	CUTC	CLTC	IU READY FOR POWER TRANSFER.	
					<u>POWER TRANSFER TEST</u> -----	
121		1	CLTC	C1TC C2TC C4TC CUTC	AFTER TRANSFER TO INTERNAL SECURE STAGES FROM POWER TRANSFER ON STAGE "TC" CHANNELS	
		1-1		ALL	*** NOTE S-1C, S-1I & S-IVB STAGES STAY INTERNAL FOR 30 SECONDS MINIMUM. IU STAY ON INTERNAL POWER FOR 3 MINUTES MINIMUM. REPORT BATTERY VOLTAGES AND CURRENTS TO CLES ON CH 125.	
121		2	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3".	
121		3	CLTC	C1NP C2NP C4NP CUNP	ON MY MARK TRANSFER TO INTERNAL POWER SIMULTANEOUSLY.	
121		4	CLTC		5-4-3-2-1 "MARK"	
		4-1		CUDE	*** NOTE 0777 & 0779 ON, 0781 OFF	
		4-2		C1NP	*** NOTE POWER TRANSFER EXTERNAL OFF	
		4-3		C1NP	*** NOTE POWER TRANSFER INTERNAL ON	
181		5	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) -- ON	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
181		6	C1TC	C1NP	VERIFY S-IC POWER TRANSFER COMPLETE ON	
		6-1		C1NP	*** NOTE BUS +1D121 OFF	
		6-2		C1NP	*** NOTE BUS +1D111 OFF	
		6-3		C1NP	*** NOTE BUS +1D211 OFF	
		6-4		R1SC	*** NOTE RECORD VOLTAGE FOR STAGE BUSES 1D11 AND 1D21, RECORD VOLTAGE AND CURRENT FOR BUSES 1D10 & 1D20.	
181		7	C1TC	C1NP	POWER TRANSFER SWITCH EXTERNAL THEN AUTO.	
		7-1		C1NP	*** NOTE S-IC POWER TRANSFER COMPLETE OFF	
		7-2		C1NP	*** NOTE POWER TRANSFER INTERNAL OFF	
181		8	C1TC	C1NP	VERIFY POWER TRANSFER EXTERNAL ON	
181		9	C1TC	C1NP	BATTERY INSTALLED ENABLE SWITCH TO AUTO	
		9-1		C1NP	*** NOTE BUS +1D121 ON	
		9-2		C1NP	*** NOTE BUS +1D211 ON	
		9-3		C1NP	*** NOTE BUS +1D111 ON	
181		10	C1TC	R1SC	READOUT 1D11 & 1D21 VOLTAGE & 1D10, 1D20 VOLTAGE AND CURRENT DURING INTERNAL, THEN TO CLES ON CH 125.	
181		11	C1TC	ALL	ALL STATIONS RETURN TO CH 121	
121		12	C1TC	CLTC	S-IC POWER TRANSFER TEST IS COMPLETE	
		12-1		C2NP	*** NOTE POWER TRANSFER COMPLETE ON	
		12-2		R2SC	*** NOTE RECORD THE FOLLOWING: MAIN BATT CURRENT (XM0021-207) ----- MAIN DC BUS VOLTAGE 2D11 (XM0020-207) ----- INSTR BATT CURRENT (XM0024-207) -----	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					INSTR DC BUS VOLTAGE 2D21 (XM0023-207) -----	
					RECIRC BUS CURRENT (XM0114-207) -----	
					RECIRC DC BUS VOLTAGE 2D51 (XM0111-207) -----	
					IGN DC BUS VOLTAGE 2D61 (XM0125-207) -----	
171		13	C2TC	C2NP	TRANSFER MAIN, INSTR. & RECIRC TO EXTERNAL AFTER 30 SECONDS MINIMUM ON INTERNAL.	
		13-1		C2NP	*** NOTE MAIN, INST & RECIRC BUSES EXTERNAL ON	
		13-2		C2NP	*** NOTE POWER TRANSFER COMPLETE OFF	
171		14	C2TC	C2RP	RECIRC, RESET TO RESET, THEN INHIBIT	
		14-1		C2PC	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS	
171		15	C2TC	C2RP	LOX HE INJECTION TO AUTO	
		15-1		C2RP	*** NOTE LOX HE INJ OFF - OFF LH2 PREVALVES OPEN ON. PUMP INLET PRESSURE DECAY.	
171		16	C2TC	C2NP	BATTERY INSTALLED ENABLE TO AUTO	
171		17	C2TC	ALL	ALL STATIONS RETURN TO CH 121	
121		18	C2TC	CLTC	S-II POWER TRANSFER TEST IS COMPLETE	
171		19	C2TC	R2SC	READOUT RECORDED BUS VOLTAGES TO CLES ON CH 125.	
161		20	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE	
161		21	C4TC	C4NP	VERIFY STAGE ON INTERNAL POWER	
161		22	C4TC	R4SC	VERIFY BUS VOLTAGE AND CURRENT WITHIN LIMITS	

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161		23	C4TC	C4NP	POWER TRANSFER SWITCH - EXTERNAL THEN AUTO	
161		24	C4TC	C4NP	VERIFY STAGE ON EXTERNAL POWER	
161		25	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE OFF	
161		26	C4TC	R4PS	VERIFY CHILLDOWN PUMP DATA SATISFACTORY AND READY TO TURN PUMPS OFF	
161		27	C4TC	C4EP	OPEN LOX & LH2 PREVALVES.	
161		28	C4TC	C4EP	LOX CHILLDOWN PUMP - OFF	
161		29	C4TC	C4EP	LH2 CHILLDOWN PUMP - OFF	
161		30	C4TC	C4HY	FLIGHT MODE - OFF THEN AUTO	
161		31	C4TC	R4HY	RECORDERS - SLOW AFTER PRESSURE DECAYS	
161		32	C4TC	C4NP	STAGE BATTERY MONITOR TO AUTO	
161		33	C4TC	R4SC	TRANSMIT POWER TRANSFER DATA TO GDC-28 ON CH 125	
161		34	C4TC	C4DE	TRANSMIT THE FOLLOWING DEE TIMES TO C4PS: S/SEL CH 83 READ COMMAND ON 2647 AND 2648 OFF 1710 AND 1711 ON	
161		35	C4TC	ALL	ALL STATIONS RETURN TO CH 121	
121		36	C4TC	CLTC	SLIVB POWER TRANSFER TEST COMPLETE	
151		37	CUTC	CUNP	VERIFY POWER TRANSFER COMPLETE & IU STAGE POWER ON	
151		38	CUTC	RUBM	VERIFY BUS VOLTAGE AND CURRENT WITHIN LIMITS, READOUT VOLTAGES AND CURRENTS TO CLES ON CH 125	
		38-1		CUTC	*** NOTE DELAY NEXT STEP FOR 3 MINUTES	
151		39	CUTC	CUNP	POWER TRANSFER TO EXTERNAL ON YOUR MARK	

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151		40	CUNP		3-2-1, MARK	
151		41	CUTC	CUNP	VERIFY IU GROUND POWER ON AND POWER TRANSFER COMPLETE OFF (0777 & 0779 OFF, 0781 ON)	
151		42	CUTC	CUNE	VERIFY POWER TRANSFER SATISFACTORY	
151		43	CUTC	ALL	ALL STATIONS RETURN TO CH 121	
121		44	CUTC	CLTC	IU POWER TRANSFER TEST IS COMPLETE	
121		45	CLTC	BTMC	TM TAPE RECORDERS - OFF & RELOAD	
121		46	CLTC	CUFS	POWER TRANSFER TEST COMPLETE	
123		47	CUFS	CUCR CUGA	VERIFY ATTITUDE RATE COMMAND UNDISTURBED DURING POWER TRANSFER	
123		48	CUFS	CUGA	REMOVE PLUS ROLL ATTITUDE RATE COMMAND	
123		49	CUFS	ALL	ALL FLIGHT CONTROL PERSONNEL RETURN TO CH 121	
121		50	CUFS	CLTC	FLIGHT CONTROL SYSTEM TEST IS COMPLETE	

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APPENDIX E

PAD ACCESS DURING HAZARDOUS OPERATIONS

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APOLLO/SATURN
LAUNCH OPERATIONS

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TEST NO. V-20060, APP E
VEHICLE AS-507

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APPENDIX E ----- PAD ACCESS DURING HAZARDOUS OPERATIONS -----						
121		1	CLTC	C1DP C2DP C4DP	VERIFY S & A SAFE AND SYSTEM STATUS SAFE SWITCH TO SAFE	
121		2	CLTC	C1TC	VERIFY PROPELLANT SYSTEMS IN SAFE CONDITION	
181		3	C1TC	CWCP	INS MANUAL ARMING TO OFF AND VERIFY	
121		4	CLTC	C1TC	VERIFY INS MANUAL ARMING IS OFF	
121		5	CLTC	C1TC C2TC C4TC CUTC	GO TO YOUR STAGE #TC# CHANNELS AND ASSESS YOUR PNEUMATIC SYSTEMS FOR STABLE CONDITIONS.	
151		6	CUTC	ALL	PREPARE FOR RF SILENCE & CONTROLLED SWITCHING AND PAD ACCESS DURING HAZARDOUS OPERATIONS PER V-31062, APPENDIX I.	
171		7	C2TC	C2FC	PREPARE ENGINE ACTUATION SYSTEMS FOR CONTROLLED SWITCHING PER V-30029 (M020) TASK 53 IF AUTO THERMAL CONTROL MODE IS IN EFFECT, REPORT WHEN READY FOR CONTROLLED SWITCHING.	
121		8	CLTC	C1TC C2TC C4TC CUTC	DO NOT INITIATE ANY STAGE TEST PROGRAMS UNTIL FURTHER NOTICE	
121		9	CLTC	C1TC C2TC C4TC CUTC	VERIFY ALL PNEUMATIC SYSTEMS ARE STABLE AND READY FOR CONTROLLED SWITCHING	

LV GDDT & CD, VOL II
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
188		10	CLTC	ALL	CONTROLLED SWITCHING IS IN EFFECT	
121		11	CLTC	C1NE C2EV C4ES CUNE CSPP	REPORT TO CLES ON CH 125 TO ASSESS DEE-6 ACTIVITY.	
121		12	CLTC	RLDE	MONITOR DEE-6 ACTIVITIES ON MASTER DEE PRINTER. REPORT ANY DEE-6 DISCRETE ACTION TO CLES ON CHANNEL 125.	
121		13	CLTC	CVTS	LV IS IN A SAFE CONFIGURATION FOR CREW ENTRY TO PAD AREA	TOPI
121		14	CLTC	C1TC C2TC C4TC CUTC	CREW ENTERING PAD WILL ESTABLISH COMMUNICATIONS WITH CLTC AND MAINTAIN COMMUNICATIONS WHILE ON THE PAD	
		14-1		ALL	*** NOTE WHEN CREW HAS CLEARED THE PAD, CONTROLLED SWITCHING WILL BE ENDED, INITIATION OF STAGE TEST PROGRAMS ALLOWED AND DEE-6 ACTIVITY ASSESSMENT ON CH 125 WILL BE DISCONTINUED.	
171		15	C2TC	C2FC	RE-ESTABLISH COUNT CONFIGURATION PER V-30029 (M020) TASK 53. REPORT WHEN COMPLETE.	

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