

#5

TEST NUMBER	V-20060
REVISION NO.	031
EFFECTIVITY	AS-510 & SUBS
RELEASE DATE	JULY 15, 1971



**JOHN F. KENNEDY  
SPACE CENTER**

**RELEASED  
FOR AS 510**

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

**VOLUME II OF IV**

**ASSEMBLED FOR CD**

Prepared For  
**LAUNCH VEHICLE OPERATIONS**

Prepared By  
**THE BOEING COMPANY  
ATLANTIC TEST CENTER  
SATURN V-LAUNCH OPERATIONS**

**THIS TCP CONTAINS  
HAZARDOUS OPERATIONS**

TCP NO V-20060, Vol II

REVISION 031

DATE JULY 15, 1971

NO OF PAGES 417

EFFECTIVITY AS-510 & subs

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

VOLUME II OF IV

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HAZARDOUS OPERATIONS**

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TABLE OF CONTENTS

SUBJECT -----	PAGE -----
APPROVAL PAGE . . . . .	2
INTRODUCTION AND PROCEDURE EXPLANATION. . . . .	4
TEST CATALOG SHEET. . . . . (SEE VOL I, PAGE 7)	
TEST OUTLINE. . . . . (SEE VOL I, PAGE 9)	
SAFETY & TCPI STATEMENTS. . . . .	7
LIST OF EFFECTIVE PAGES . . . . .	8
REVISION RECORD . . . . .	9
TV CAMERA LOCATIONS . . . . .	11
LV COUNTDOWN BAR CHARTS	
LV COUNT T-28 TO T-0. . . . .	12
MANLOADING T-28 TO T-8. . . . .	13
LV COUNT T-9 TO T-0. . . . .	14
SPECIAL CDDT TESTS. . . . .	15*
LV SUPPORT T-28 TO T+4. . . . .	16
DRAIN T+0 TO T+5. . . . .	17
DRY CDDY T+0 TO T+11 . . . . .	18*
REFERENCED TEST AND CHECKOUT PROCEDURES . . . . .	19
AUTOMATED PROGRAM INDEX . . . . .	20
LAUNCH OPERATIONS COMMUNICATIONS. . . . .	21
CALL STATIONS . . . . .	23
OIS COMMUNICATIONS MATRIX . . . . .	24
LAUNCH VEHICLE TM & RF FREQUENCIES. . . . .	25
CDDT & CD OPERATIONAL DIFFERENCES . . . . .	26
LAUNCH COMPLEX 39 PAD ACCESS CONTROL & AREA MAPS. . . . .	27
ML/SV REFERENCE SKETCH. . . . .	31
LV PROPELLANT LOADING SCHEDULE. . . . .	32
VOLUME II, COUNT. . . . .	33
APPENDIX A: LV SAFING PROCEDURES	
PART 1: PRIOR TO T-3:07 MIN: COMP SUPPORTING. . . . .	292
PART 2: PRIOR TO T-3:07 MIN: COMP DOWN. . . . .	301
PART 3: T-3:06 MIN TO T+0: COMP SUPPORTING. . . . .	309
PART 4: T-3:06 MIN TO T+0: COMP DOWN. . . . .	325
APPENDIX B: LV HOLD AND RECYCLE PROCEDURES . . . . .	335
PART 1: HOLD OPTION 1 (T-22' TO T-3'7"). . . . .	340
PART 2: HOLD OPTION 2 (T-12'25" TO T-3'7"). . . . .	343
PART 3: HOLD OPTION 3 (T-22' TO T-3'7"). . . . .	352
PART 4: RECYCLE TO T-22 MINUTES. . . . .	369
PART 5: DRSCR RETEST . . . . .	378
APPENDIX C: LV DRAIN OPERATIONS	
PART 1: LV PREPS FOR DRAIN . . . . .	384
PART 2: LV DRAIN . . . . .	389
PART 3: S-II PREPS FOR DRAIN . . . . .	400
PART 4: LV PREPS FOR COMPUTER DOWN DRAIN . . . . .	402
APPENDIX D: CONTINGENCY PROCEDURES	
PART 1: T-32' MANUAL POWER TRANSFER. . . . .	408
APPENDIX E: PAD ACCESS DURING HAZARDOUS OPERATIONS . . . . .	418

#### A. INTRODUCTION

1. 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.
2. 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:
  - (A) SPACECRAFT COUNTDOWN PROCEDURE K-0007
  - (B) LUNAR MODULE COUNTDOWN PROCEDURE KL-0007
  - (C) SPACE VEHICLE COUNTDOWN PROCEDURE (INCLUDES INFORMATION TO DIRECT INTERFACE OPERATIONS AMONG LV, SC, SUPPORT & RANGE)  
V-40310 (CDDT ONLY)      V-40300 (CD ONLY)
  - (D) APOLLO/SATURN V LAUNCH MISSION RULES AS-510 K-V-05.10/10  
XB-331-62
3. IN ADDITION, UNDER EMERGENCY CONDITIONS SPECIFIED THEREIN, THE SATURN V LAUNCH VEHICLE EMERGENCY PROCEDURE, V-20050, WILL BE USED.

#### H. CDDT & COUNTDOWN PROCEDURE EXPLANATION

1. THE CDDT/CD WILL BE TREATED AS ONE PROCEDURE BUT WILL BE PUBLISHED SEPARATELY AS FOLLOWS:
  - (A) IN THE ISSUE RELEASED FOR CDDT, THE PAGES IN THE PROCEDURE HAVING A STEP UNIQUE TO CDDT WILL BE MARKED "CDDT ONLY". SUCH PAGES WILL HAVE A COUNTERPART PAGE CONTAINED IN APPENDIX G MARKED "CD ONLY". THIS ISSUE OF THE PROCEDURE WILL BE PROMINENTLY MARKED ON THE FRONT COVER "ASSEMBLED FOR CDDT".
    - (1) PAGES WITH BLACK BARS ARE TO BE USED ONLY DURING THE COUNTDOWN DEMONSTRATION TEST.
    - (B) FOLLOWING CDDT, THE "CDDT ONLY" PAGES WILL BE REPLACED BY THE "CD ONLY" PAGES. DRY CDDT PAGES (APPENDIX F) WILL BE REMOVED, ALL APPROVED PERMANENT PROCEDURE CHANGES WILL BE INCORPORATED, THE PROCEDURE REVISION NUMBER WILL BE INCREASED, THE FRONT COVER WILL BE PROMINENTLY MARKED "ASSEMBLED FOR CD" AND THE PROCEDURE WILL BE REPUBLISHED AND REDISTRIBUTED.
      - (1) PAGES WITH BLACK DIAMONDS ARE TO BE USED ONLY DURING THE LAUNCH COUNTDOWN.
    - (C) THE "ASSEMBLED FOR CD" VERSION WILL NOT BE DISTRIBUTED UNTIL ABOUT 4 CALENDAR DAYS PRIOR TO THE START OF CD TO AVOID THE RISK OF HAVING THE TWO PROCEDURES CONFUSED.

#### G. CODES IN THE REMARKS COLUMN

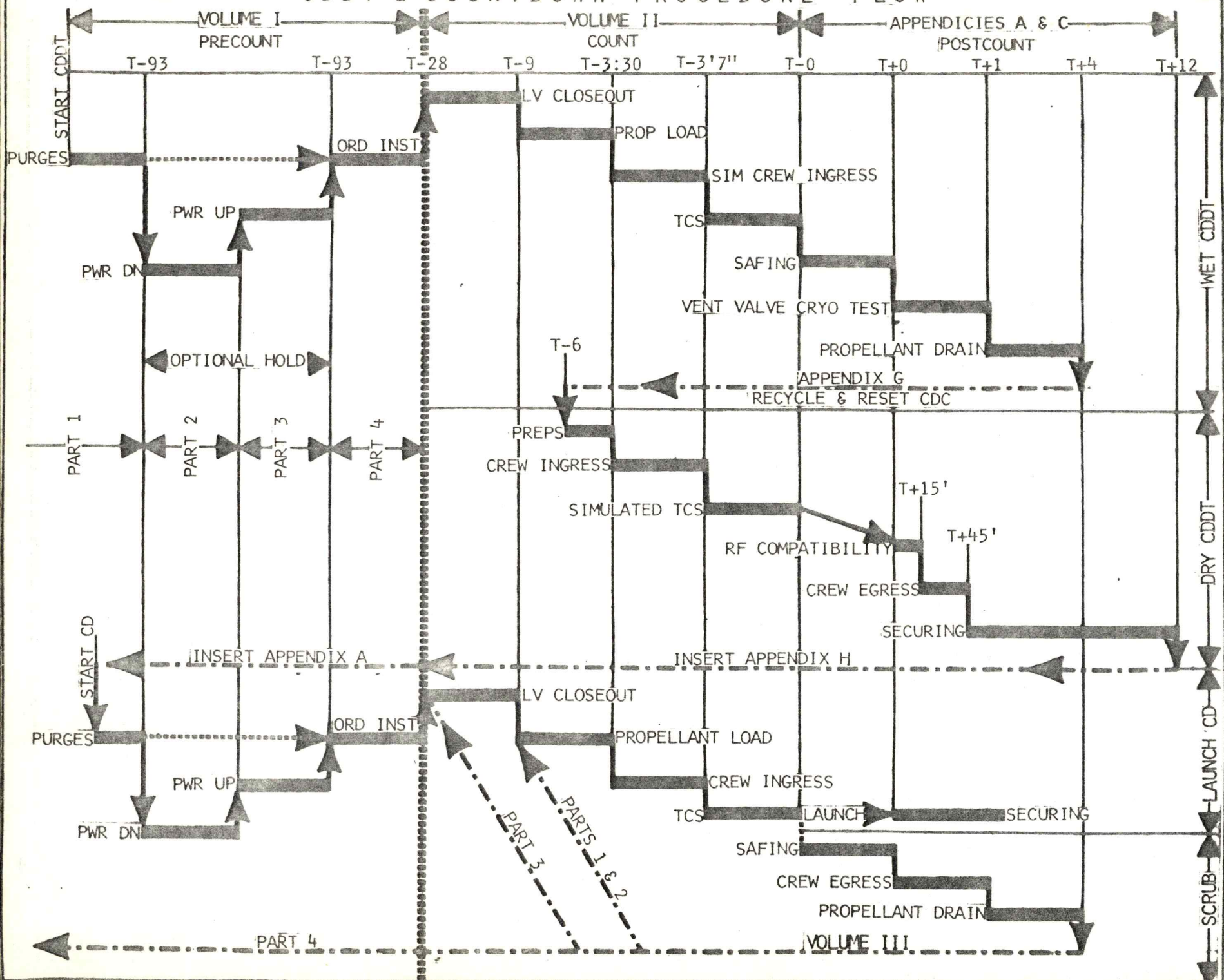
1. \* INDICATES INFORMATION UNIQUE TO CDDT
2. # INDICATES INFORMATION UNIQUE TO LAUNCH CD
3. + INDICATES START OR COMPLETION OF BARCHART BAR
4. A INDICATES INFORMATION FOR AS-510 ONLY
5. \*\*\* INDICATES A SEQUENCE NORMALLY PERFORMED BY A LINKING PROGRAM
6. (XXXX) INDICATES A SEQUENCE WHICH MUST BE COMPLETE BEFORE THE IVAR (WITHIN PARENTHESES) EXECUTES
7. TCPI (SEE PARAGRAPH D.1 FOLLOWING)

# CDDT & COUNTDOWN PROCEDURE FLOW

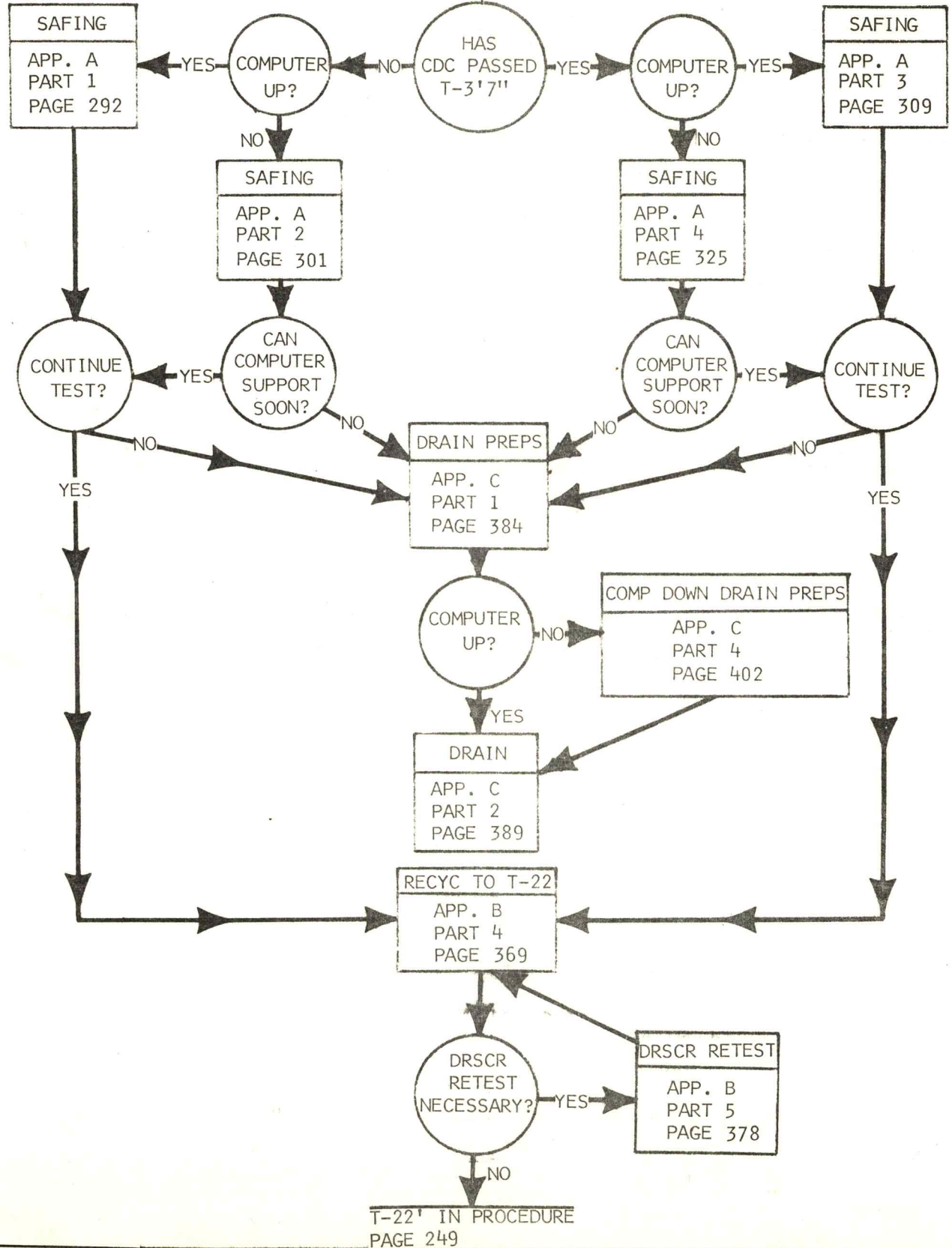
LV CDDT & CD, VOL II  
 DATE: MAY 18, 1971  
 REVISION 029

APOLLO/SATURN

PAGE 5251,60  
 TEST NO 20060, VOL II  
 VEHICLE AS-510  
 5



LV SAFING IS REQUIRED



D. INTEGRATED TCP INTERFACE  
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1. SPECIFIC SEQUENCES IDENTIFIED IN THIS TCP WITH THE SYMBOL TCPI (TEST & CHECKOUT PROCEDURE INTERFACE) HAVE BEEN COORDINATED WITH OTHER ORGANIZATIONS WHOSE CORRESPONDING TCP'S ARE USED DURING THIS TEST. IT IS THE RESPONSIBILITY OF THE ORGANIZATION INITIATING A CHANGE TO A TCPI SEQUENCE TO INSURE THAT COORDINATION WITH AFFECTED ORGANIZATIONS IS ACCOMPLISHED THROUGH THE INTEGRATION SUPPORT CONTRACTOR. PROBLEMS RESULTING FROM THE COORDINATION WILL BE RESOLVED BY LV-OMO-3 PRIOR TO THE DLO PRE-TEST BRIEFING, AND LV-OMO-3 FROM THE TIME OF DLO PRE-TEST BRIEFING THROUGH COMPLETION OF THE TEST.

E. SAFETY  
-----

1. THE LAUNCH VEHICLE COUNTDOWN DEMONSTRATION AND COUNTDOWN OPERATIONS ARE CONSIDERED TO BE HAZARDOUS FOR THE FOLLOWING REASONS:
  - (A) SPACECRAFT HYPERGOLICS WILL BE ON BOARD.
  - (B) RP-1 WILL BE ON BOARD.
  - (C) SPACE VEHICLE ORDNANCE WILL BE INSTALLED AND CONNECTED.
  - (D) SPACE VEHICLE PROPELLANT TANKS AND GAS STORAGE SPHERES WILL BE PRESSURIZED.
  - (E) HAZARDOUS ENVIRONMENTAL CONDITIONS MAY BE ENCOUNTERED (INERT ATMOSPHERES, WORK AT HEIGHTS, RADIATION AND ENGINE GIMBALLING).
  - (F) HEAVY EQUIPMENT MOVEMENTS WILL BE REQUIRED.
  - (G) SPACE VEHICLE CRYOGENIC LIQUIDS (LOX, LH2 & SHE) WILL BE LOADED.
  - (H) THE FLIGHT CREW WILL INGRESS AND THE HATCH WILL BE CLOSED.
  - (I) THE SPACE VEHICLE WILL BE LAUNCHED (CD ONLY).

LIST OF EFFECTIVE PAGES		Date	Effectivity	Test Number	Revision	Page	
		7/14/71	AS-510	V-20060, II	031	8	
Page No.	Rev.	Page No.	Rev.	Page No.	Rev.	Page No.	Rev.
COVER (1)	031	102	030	237	031		
2 THRU 4	031	103 - 106	029	G238 & G239	029		
5 THRU 7	029	G107	029	240 - 244	029		
8 & 9	031	108	029	G245	029		
10 & 11	029	G109 - G111	029	246 - 248	029		
12	031	112	029	G249	029		
G13	031	G113 - G116	029	250 - 257	029		
14	029	117 - 131	029	G258	029		
15	DELETED	G132	031	259 - 265	029		
G16	029	G133	029	266	031		
17	029	134 - 142	029	267 - 271	029		
18	DELETED	G143	029	G272	029		
19 & 20	031	144 - 151	029	273 & 274	029		
21 - 27	029	G152	029	G275-G288	029		
G28	029	153	031	G289	031		
29 - 32	029	154 & 155	029	G290	029		
G33	029	G156	029	291 - 299	029		
G34	031	157	029	300	031		
G35	029	158	031	301 - 309	029		
36	030	159	029	G310-G312	DELETED		
G37 - G39	029	G160	029	313 - 315	029		
40 & 41	029	161	029	G316	029		
G42 - G46	029	G162	031	317 & 318	029		
47 & 48	029	163 - 165	029	G319	029		
G49	029	G166	029	320 - 350	029		
50	029	167	031	350-1	031		
G51	029	G168	029	350-2	031		
52 & 53	029	169 - 172	029	351 - 377	029		
G54	029	G173	029	G378	029		
55 & 56	029	174 - 179	029	379 - 383	029		
G57	029	G180	029	G384-G387	029		
58 & 59	029	181 - 185	029	388	029		
G60	029	G186 & G187	029	G389	029		
61 & 62	029	188 & 189	029	390 - 396	029		
G63	029	G190 & G191	029	G397 & G398	029		
64 & 65	029	192 - 195	029	399	029		
G66	029	G196	030	400 & 401	031		
67 - 70	029	197	029	402 - 410	029		
G71	029	G198 & G199	029	G411	029		
72 - 74	029	200	029	412 & 413	029		
G75	029	G201 & G202	029	414	031		
G76	031	203	029	415 - 420	029		
G77	029	G204-G210	029				
78	029	G211	031				
G79	029	G212-G219	029				
80	029	220 - 223	029				
G81 - G85	029	G224	029				
86 - 90	029	225 - 229	029				
G91	029	G230	030				
92 - 95	029	G231	029				
G96 & G97	029	G232	031				
98 - 100	029	G233-G235	029				
G101	029	236	029				



REVISION RECORD PAGE (CURRENT VEHICLE)

PAGES AFFECTED

REV.	REVISED	ADDED	DELETED	REASON/SUPPORTING DOCUMENT
028	ALL			<p>DERIVED FROM REV 027 BY:</p> <p>INCORPORATING AS-509 CDDT PERMANENT PCR'S XB-247-107, XB-249-109, I-173-113, D-86-122, D-88-125, XB-253-128, N-217-130 &amp; XB-251-132 WHICH WERE NOT COMPLETELY INCORPORATED IN PRIOR REVISIONS.</p> <p>INCORPORATING AS-509 CD PERMANENT PCR'S N-224-139, N-221-140, D-90-141, XB-257-142, B-321-143, B-322-144, B-323-145 &amp; D-92-146 WHICH WERE NOT INCORPORATED IN PRIOR REVISIONS.</p> <p>INCORPORATING AS-510 PCR'S XB-303-1, B-325-2, XB-301-3, XB-304-4, XB-308-5, XB-306-6, XB-309-7, I-191-8, I-192-9, I-193-10, I-194-11, I-195-12, I-196-13, N-228-14, N-229-15, N-230-16 AND B-326-17.</p> <p>PRERELEASE FOR AS-510 DATED APRIL 22, 1971.</p>
029	ALL			<p>INCORPORATED AS-510 PCR'S:          B-331-18, XB-316-19, B-332-20,          B-333-21, B-334-22, B-336-23,          B-338-24, B-339-25, B-340-26,          Q-10-27, B-337-28 XB-311-29,          XB-320-30, XB-321-31, N-237-32,          D-94-33, T-15-34, I-202-35,          I-203-36, I-204-37, I-205-38,          I-206-39, I-207-40, XB-322-41,          I-212-42, B-341-43, B-343-44, XB-324-45,          N-239-47, B-344-48 &amp; I-213-49.</p> <p>RELEASED FOR AS-510 CDDT          JUNE 1, 1971.</p>
030	COVER, 2, 8, 9, 36, 44, 102, 162, 196, 208, 230, 310, 311, 312, 400, 430, 438, 491, 507, G196 & G230	NONE	NONE	<p>INCORPORATES AS-510 PCR'S:          I-214-50, N-244-51, N-245-52, N-246-53,          N-247-54, N-248-55 &amp; XB-332-56.</p> <p>PARTIAL REVISION FOR AS-510 CDDT          JUNE 29, 1971.</p>
031	COVER, 2, 3, 4, 8, 9, 12, G13, 19, 20, G34, G76, G132, 153, G158, G162, 167, G211, G232, 237, 266, G289, 300, 400, 401 & 414	350-1 350-2	15, 18, ALL CDDT ONLY PAGES, APPENDIX F, G310, G311, G312.	<p>INCORPORATES AS-510 PCR'S:          N-252-57, B-351-58, I-217-59, D-97-60, N-251-61,          XB-331-62, N-253-64, D-98-65, B-353-67, N-254-68          &amp; XB-344-71.</p> <p>RELEASED FOR AS-510 LAUNCH CD          JULY 15, 1971.</p>

LV CDDT & CD, VOL II  
DATE: MAY 18, 1971  
REVISION 029

APOLLO/SATURN

5251.60  
PAGE 10  
TEST NO-20060, VOL II  
VEHICLE AS-510

REVISION RECORD PAGE (PRIOR REVISIONS)

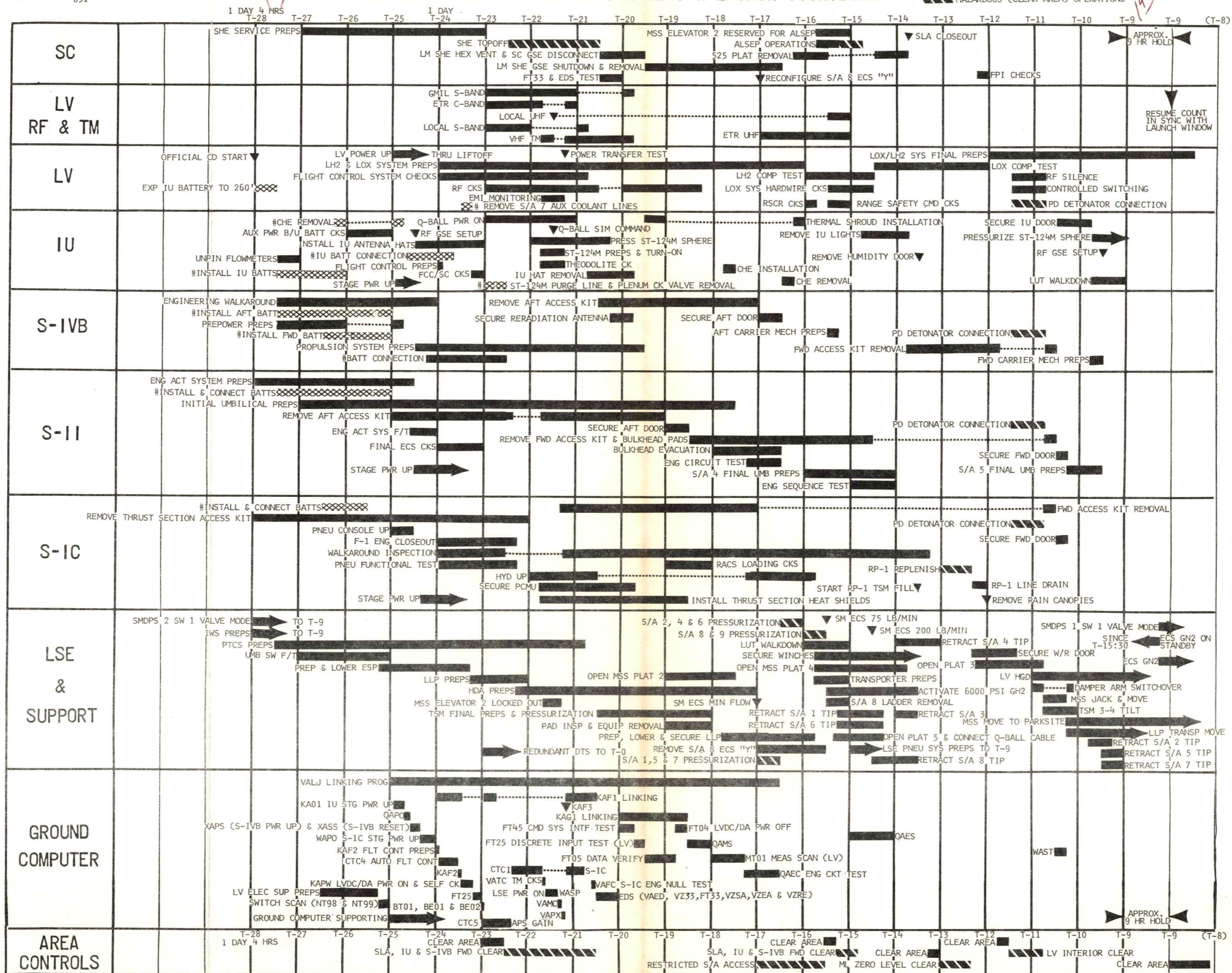
REV.	REASON
BASIC	INITIAL RELEASE FOR AS-504 1/17/69 (CDDT)
001	PARTIAL REVISION FOR AS-504 2/3/69 (CDDT)
002	SECOND RELEASE FOR AS-504 2/19/69 (CD)
003	PRERELEASE FOR AS-505 3/3/69
004	INITIAL RELEASE FOR AS-505 3/29/69 (CDDT)
005	PARTIAL REVISION FOR AS-505 4/18/69 (CDDT)
006	SECOND RELEASE FOR AS-505 5/7/69 (CD)
007	PRERELEASE FOR AS-506 4/24/69
008	INITIAL RELEASE FOR AS-506 5/26/69 (CDDT)
009	PARTIAL REVISION FOR AS-506 6/17/69 (CDDT)
010	SECOND RELEASE FOR AS-506 7/3/69 (CD)
011	PRERELEASE FOR AS-507 8/15/69
012	INITIAL RELEASE FOR AS-507 9/19/69 (CDDT)
013	PARTIAL REVISION FOR AS-507 10/16/69 (CDDT)
014	SECOND PARTIAL REVISION FOR AS-507 10/23/69 (CDDT)
015	SECOND RELEASE FOR AS-507 10/29/69 (CD)
016	PRERELEASE FOR AS-508 1/19/70
017	INITIAL RELEASE FOR AS-508 2/13/70 (CDDT)
018	PARTIAL REVISION FOR AS-508 3/12/70 (CDDT)
019	SECOND RELEASE FOR AS-508 3/26/70 (CD)
020	PARTIAL REVISION FOR AS-508 4/2/70 (CD)
021	SECOND PARTIAL REVISION FOR AS-508 4/6/70 (CD)
022	CONTINGENCY CD FOR AS-508 (NOT RELEASED)
023	PRERELEASE FOR AS-509 11/04/70
024	INITIAL RELEASE FOR AS-509 12/09/70 (CDDT)
025	PARTIAL REVISION FOR AS-509 1/06/71 (CDDT)
026	SECOND PARTIAL REVISION FOR AS-509 1/11/71 (CDDT)
027	SECOND RELEASE FOR AS-509 1/18/71 (CD)
028	PRERELEASE FOR AS-510 4/22/71

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 ASTRONICS EQUIPMENT
5, 6 & 7	ML 0' LEVEL	TSM 1-2, 3-2, 3-4, & S-IC LOX VENT VALVE
9	ML 180' LEVEL	S-II GSE AND STAGE INSULATION
10	ML 30' LEVEL	LOX VALVE COMPLEX
11	ML 60' LEVEL	ML DECK
12	ML 100' LEVEL	S-IC INTERTANK AREA & CARRIER ASSEMBLY
13	ML 120' LEVEL	LH2 VALVE COMPLEX
14	ML 120' LEVEL	LOX VALVE COMPLEX
15	ML 130' LEVEL	S/A 4 & RETRACTION S-II UMB DRAIN
16	ML 180' LEVEL	S/A 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 PNEU CONSOLE
20	ML 220' LEVEL	S/A 6, 7, 1U
21	ML 240' LEVEL	S/A 6 & LH2 UMBILICAL
22	ML 240' LEVEL	S/A 5 S-IVB APS MODULE
23	ML 240' LEVEL	S-IVB HEAT EXCHANGER & VALVE PANEL
24	ML 260' LEVEL	S/A 7 AND S-IVB UMB & S-II H2 VENT VALVE
25	ML 300' LEVEL	WHITE ROOM, SC INTERIOR
26	ML 320' LEVEL	S/A 8, LES & S/A 9
27	ML 340' LEVEL	S/A 9, CM, SW, W/R, G-BALL COVER & DAMPER
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	S/V, 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 & LINES
34	PAD APRON SW CORNER	VEHICLE, LOX VENT VALVE AT 120' LEVEL
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	LH2 TANKER GAUGES
38	MSS S. LEG 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	LM FUELING FUNCTIONS
53	PLATFORM 3 SOUTH	FUEL LINES, OXIDIZER AND FUEL FILL PORTS, UMB DISCONNECTS, RCS
54	PLATFORM 4A	FUEL LINES, OXIDIZER AND FUEL FILL PORTS, UMB DISCONNECTS, RCS
55	PLATFORM 4A	FUEL LINES, OXIDIZER AND FUEL FILL PORTS, UMB DISCONNECTS, RCS
56	MSS 310' LEVEL	UMB DISCONNECT, FLUID LINES AND GSE INTERFACE
57	PLATFORM 4C	UMB DISCONNECT, FLUID LINES AND GSE INTERFACE
57	MSS 310' LEVEL	UMB DISCONNECT, FLUID LINES AND GSE INTERFACE
57	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	UGS #17	LV VERTICAL MOTION

LV COUNTDOWN DEMONSTRATION TEST & LAUNCH COUNTDOWN

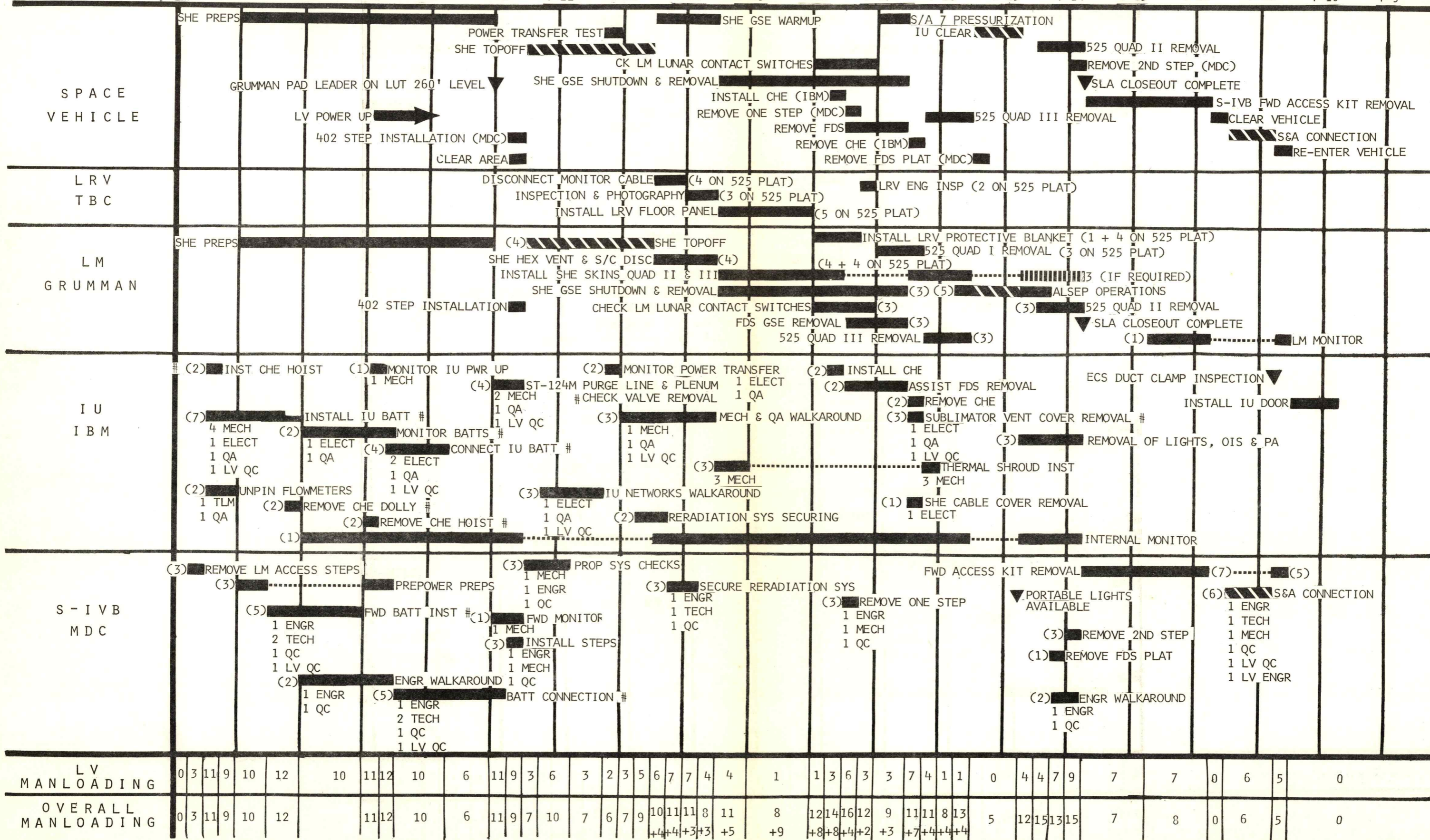
CD ONLY  
HAZARDOUS (CLEAR AREA) OPERATIONS



IU S-IVB AREA MANLOADING

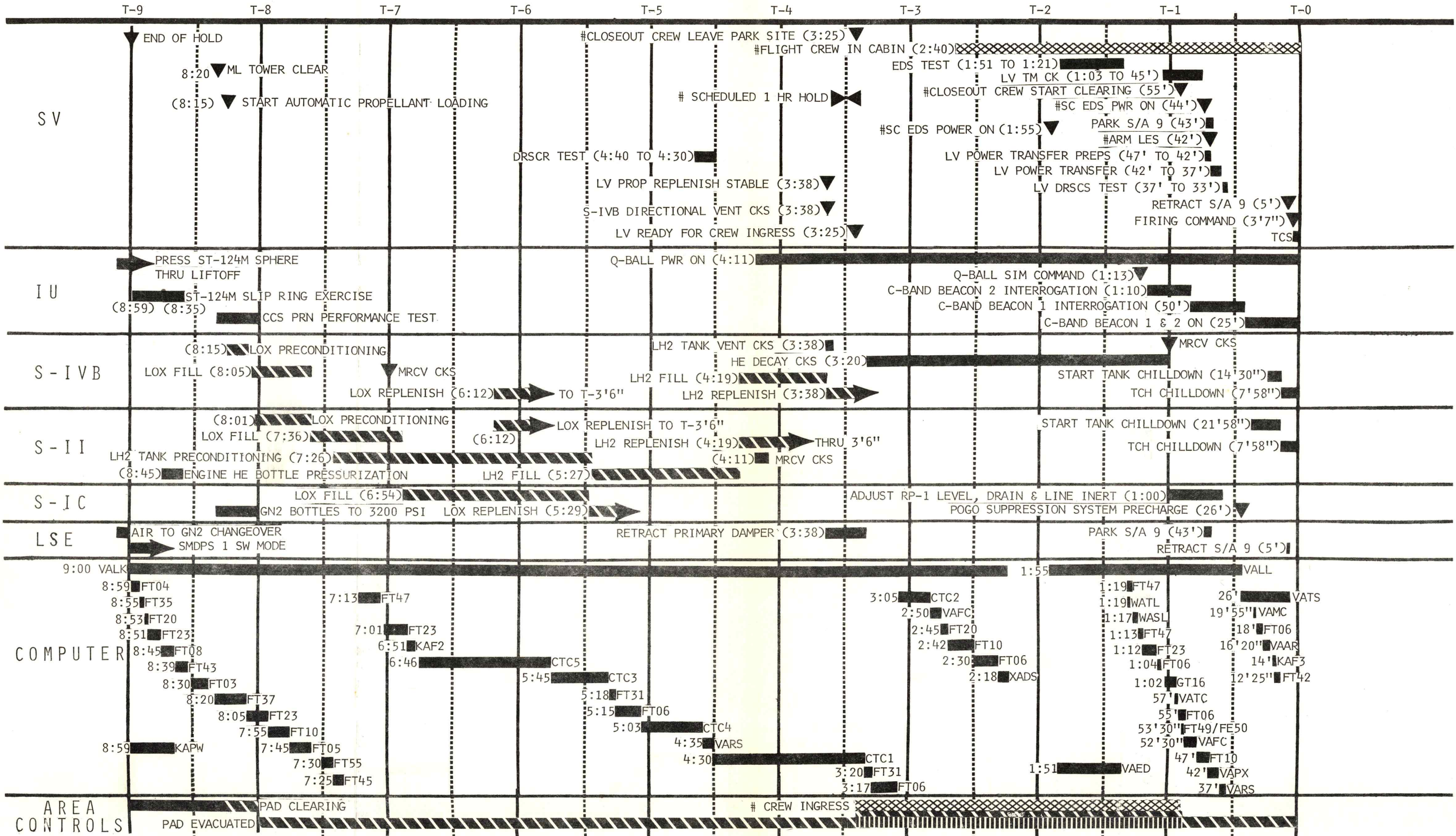
# CD ONLY  
 CONTINGENCY TIME  
 HAZARDOUS (CLEAR AREA) OPERATIONS

T-28 T-27 T-26 T-25 T-24 T-23 T-22 T-21 T-20 T-19 T-18 T-17 T-16 T-15 T-14 T-13 T-12 T-11 T-10 T-9



# LV CDDT & CD AFTER T-9 HR HOLD

▨ CDDT ONLY  
 ⊞ CD ONLY  
 ▩ HAZARDOUS (CLEAR AREA) OPERATIONS

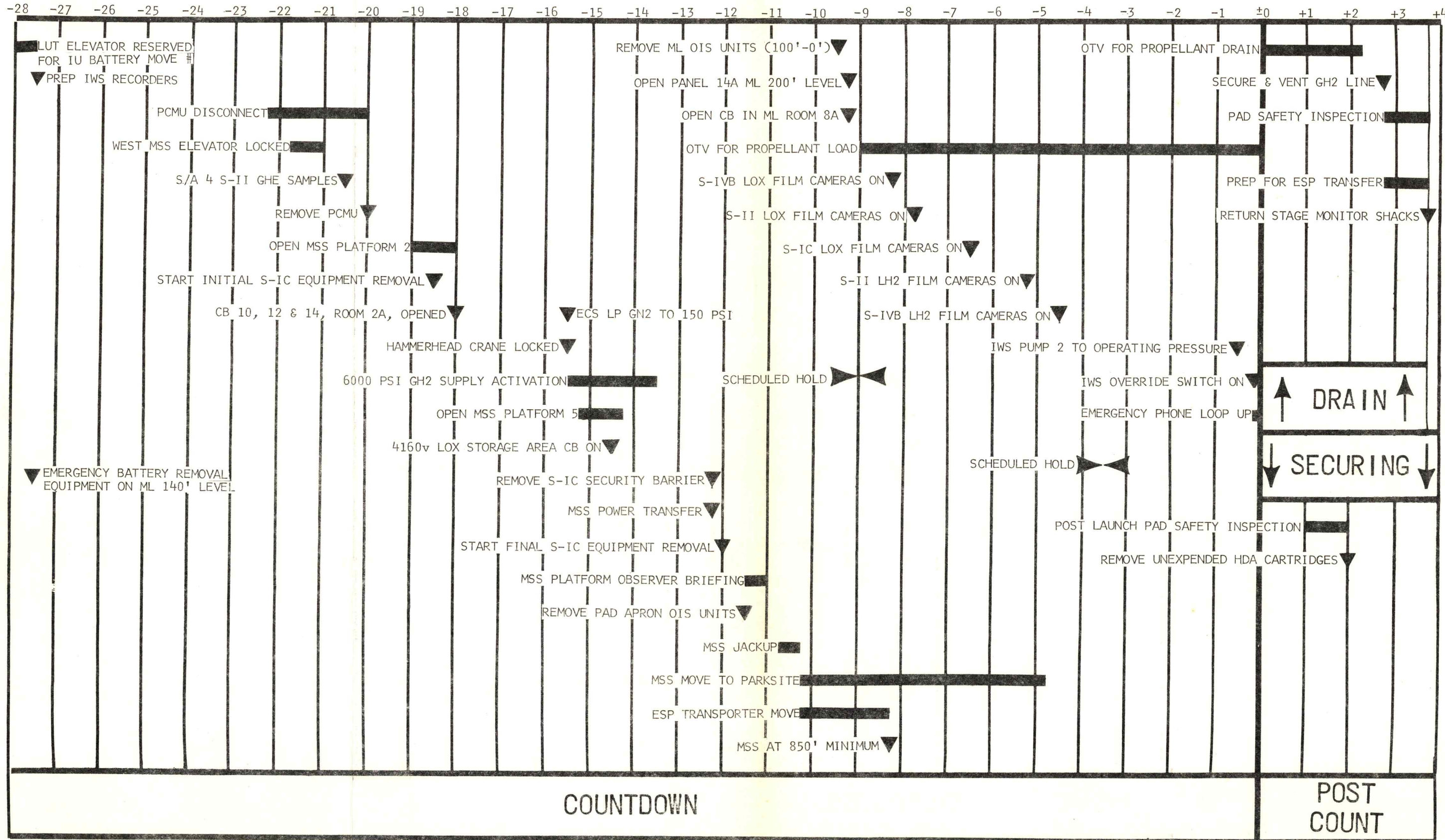


LV CDOT - CD, VOL II  
 DATE: MAY 30, 1971  
 REVISION 029

APOLLO/SATURN  
 LAUNCH OPERATIONS

PAGE G16  
 TEST NO. V-20060, VOL II  
 VEHICLE AS-510

## LV CD SUPPORT REQUIREMENTS

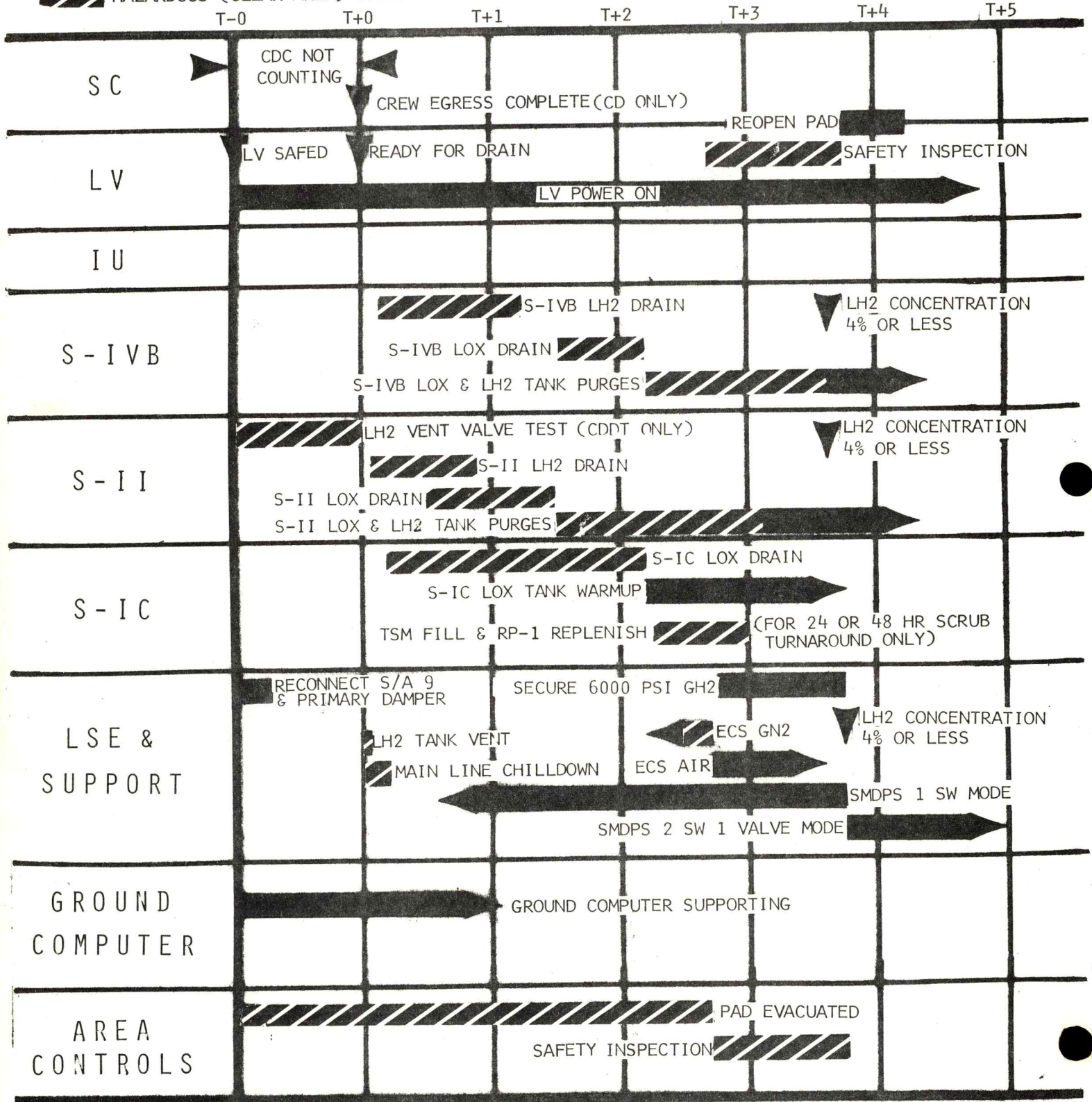


COUNTDOWN

POST  
COUNT

# LV DRAIN OPERATIONS

 HAZARDOUS (CLEAR AREA) OPERATIONS





REFERENCED TEST AND CHECKOUT PROCEDURES

THE TEST AND CHECKOUT PROCEDURES REFERENCED IN THIS DOCUMENT ARE PARALATED BELOW. THE REVISION LEVEL SHOWN IS THE ONE TO BE USED DURING THE LAUNCH VEHICLE COUNTDOWN DEMONSTRATION AND COUNTDOWN. CORRECTIONS AND CHANGES MUST BE PROCESSED IN ACCORDANCE WITH TI-2-1.

S-IC STAGE & GSE TEST AND CHECKOUT PROCEDURES

TCP NO.	REV.	TITLE	
V-21008	008	ELEC CONNECTION OF S-IC PAD EBW DETS	(HAZARDOUS)
V-21009	008	ELEC CONNECTION OF S-IC PD S&A UNIT	(HAZARDOUS)
V-21010	007	S&A DEVICE CHECKOUT	(HAZARDOUS)
V-21012	008	ELEC CONNECTION OF S-IC RR EBW DETS	(HAZARDOUS)
V-21013	008	ELEC CK OUT OF S-IC EBW DETS	(HAZARDOUS)
V-21014	008	ELEC INSTL/REMOVAL OF HV IGNITERS	(HAZARDOUS)
V-21018	009	FLT BATT ACTIVATION & CHECKOUT	(HAZARDOUS)
V-21032	006	LCC/ML ELEC CABLE VERIFICATION	
V-21035	008	PREPS OF S-IC ESE TO SUPPORT LAUNCH CD	
V-21036	006	S-IC STAGE ESE POST LAUNCH CHECK LIST	
V-21038	010	S-IC POWER ON	
V-21097	005	S-IC POWER OFF	
V-21194	008	LSE POWER ON & OFF REMOTE CONTROL (LCC)	
V-21204	007	INSTALLATION OF S-IC FLIGHT BATTERIES	(HAZARDOUS)
V-21321	006	ELEC INSTALLATION OF S-IC HDA ORD	(HAZARDOUS)
V-21439	003	EMERG BACKUP BATT OPERATIONAL TEST	
V-24010	007	S-IC INTERNAL WORK PLATFORM REMOVAL	(HAZARDOUS)
V-24011	005	BULKHEAD PROTECTION EQUIP REMOVAL	(HAZARDOUS)
V-24320	004	S-IC FORWARD UMBILICAL RECONNECTION	
V-24327	008	S-IC PNEU SYS CDDT AND LAUNCH PREPS	(HAZARDOUS)
V-25003	002	RP-1 STANDBY	
V-25159	009	PTCS PREPS FOR PROP LOAD OPS	
V-25160	004	DTS/DEE SYSTEM PAD SECURING	
V-25340	007	LOX PREPS FOR VEHICLE LOADING/PAD A	(HAZARDOUS)
V-25342	003	LOX SYS SECURING AFTER LOX LOAD/DRAIN	(HAZARDOUS)
V-25344	004	TOTAL LOX SYS DEWPOINT/PAD A	
V-25345	004	LOX SYS SECURING AFTER LAUNCH/PAD A	(HAZARDOUS)
V-25389	008	RP-1 AUTO LEVEL ADJUST/LINE INERT	(HAZARDOUS)
V-26222	006	SOP FOR THE PNEU DIST SYS	(HAZARDOUS)
V-26247	006	ECS DAILY OPS/LC-39A	(HAZARDOUS)
V-27187	003	HGD SYSTEM OPERATING PROCEDURE	(HAZARDOUS)
V-27093	007	LOX & FUEL LIQUID LEVEL & LOAD ELECTRONICS TESTS	
V-27098	009	VEH MEAS GSE STA TEST SUPPORT PREPS	
V-27153	010	S-IC STAGE MEASURING SCAN TEST MTO1	
V-27175	008	LCC MEAS STA OPS, CAL & MAINT	
V-28016	007	TM CONFIGURATION CHECKS	
V-28186	004	S-IC AND GSE TM SUPPORT	
V-29003	006	S-IC STAGE ORD INST AT PAD	(HAZARDOUS)
V-29005	006	F-1 ENGINE ORDNANCE INSTALLATION	(HAZARDOUS)
V-31031	004	IWS ELECTRICAL POWER PREPARATION	
V-31032	004	ECS NETWORKS PREOPERATIONAL CHECKOUT	
V-31045	008	SA/TSM/LA-ELEC SUPPORT FOR CDDT & LAUNCH	
V-31047	004	S-IC UMB CABLE CONNECT/DISCONNECT PROC	
V-33030	006	S-IC FLT CONTROL SYS PREPS	(HAZARDOUS)
V-34012	007	S-IC PROPULSION SYS PREPS	
V-35004	006	LH2 SYSTEM PREP FOR VEHICLE LOADING	(HAZARDOUS)
V-36032	003	S-II AFT S/A LOCAL CONTROL OPERATION	(HAZARDOUS)
V-36039	006	TSM SYS PREP & OPS FOR CDDT AND CD	(HAZARDOUS)
V-36063	007	SMDPS LAUNCH CONFIGURATION PREPS	(HAZARDOUS)
V-36064	005	PNEU DIST SYS LAUNCH CONFIGURATION PREPS	(HAZARDOUS)
V-36069	005	HDA & S/A CONTROL SW SUPPORT OPS	(HAZARDOUS)
V-36070	005	PLATFORMS & TRANSPORTER LAUNCH PREPS	(HAZARDOUS)
V-36071	004	S-IC INTERTANK S/A EXT & CARRIER RECONNECT	(HAZARDOUS)
V-36074	006	ECS PROP LOAD OPS/LC-39A & B	(HAZARDOUS)
V-36077	006	S-IC INTERTANK S/A SUPPORT CDDT & CD	(HAZARDOUS)
V-36078	005	S-IC FWD S/A SUPPORT CDDT & CD	(HAZARDOUS)
V-36079	005	HYD DISTRIBUTION SYS PREPS FOR CD	(HAZARDOUS)
V-36080	006	S-II INTERMEDIATE S/A SUP CDDT & CD	(HAZARDOUS)
V-36081	005	S-II FWD S/A SUPPORT CDDT & CD	(HAZARDOUS)
V-36082	005	S-IVB AFT S/A SUPPORT CDDT & CD	(HAZARDOUS)
V-36083	006	S-IVB FWD S/A SUPPORT CDDT & CD	(HAZARDOUS)
V-36084	005	SM S/A SUPPORT OPS CDDT & CD	(HAZARDOUS)
V-36085	006	CM ACCESS ARM SUPPORT CDDT & CD	(HAZARDOUS)
V-36086	006	DRRS SUPPORT CDDT & CD	(HAZARDOUS)
V-36087	004	LSE MECH OPS	
V-36112	004	Q-HALL COVER REMOVAL SYSTEM PREPS/ML	(HAZARDOUS)
V-36113	004	INDUSTRIAL WATER SYSTEM LAUNCH PREPS	(HAZARDOUS)
V-37038	004	HGD SYSTEM MAINTENANCE	(HAZARDOUS)
V-38000	009	DRSCS PAD ST-GE AND VEHICLE SUPPORT	

S-II STAGE TEST AND CHECKOUT PROCEDURES

TCP NO.	REV.	TITLE	
V-21103	010	H011 S-II STAGE POWER APPLICATION	
V-21111	006	H013 S-II BATTERY INSTALLATION	
V-21249	006	H016 S-II BATTERY REMOVAL (CDDT ONLY)	
V-21253	011	G040 S-II FINAL ELECTRICAL CHECKS	
V-21438	003	B022 FINAL STAGE ELECTRICAL CHECKS (CDDT ONLY)	
V-21452	001	G141 S-II FINAL LUT ELECTRICAL CHECKS	
V-24116	006	J001 PROPELLANT LINES VACUUM CHECK (CD ONLY)	
V-24411	HA5	Q003 S-II STAGE AND LUT INSPECTION	
V-25311	007	L009 PURGE & VACUUM SYSTEM SECURING	(HAZARDOUS)
V-26276	009	G058 S-II PURGE SYS OPS FOR PROP LOADING	(HAZARDOUS)
V-26507	HA5	G147 S-II STG ACCESS EQUIPMENT INSTL/REMOVAL	(HAZARDOUS)
V-27154	004	G031 LCC RECORDER, FUNCT SETUP & VERIFICATION	
V-27183	003	G032 MEASUREMENT STATION CHECKOUT/TEST	
V-27208	005	X044 S-II FINAL AIRBORNE MEASUREMENTS CLOSEOUT	
V-27218	002	G137 GSE ENG WALKDOWN OF ML INSTR	
V-28135	002	G050 S-II TM C/O EQUIP TEST (STAGE MODULE EQUIP)	
V-28143	008	M021 S-II STAGE RF & TM CLOSEOUT FOR LAUNCH	
V-28144	007	R025 S-II TM OPERATIONAL READINESS CHECK	
V-28181	002	G125 FM/FM TM C/O EQUIP TEST (STAGE MODULE)	
V-29024	016	K008 S&A DEVICE INSTL & C/O (CD ONLY)	(HAZARDOUS)
V-29038	006	S009 PULSE SENSOR REMOVAL	
V-29050	007	K010 INERT S&A DEVICE INSTALLATION (CDDT ONLY)	(HAZARDOUS)
V-30029	012	M020 STAGE & GSE PREPS FOR CDDT & CD	(HAZARDOUS)
V-30575	001	Z037 MISS EQUIP SECURING	(HAZARDOUS)
V-34014	008	E023 PROPULSION SYS TEST OPERATIONS	(HAZARDOUS)

S-IVB STAGE TEST AND CHECKOUT PROCEDURES

TCP NO.	REV.	TITLE	
V-21413	004	VEHICLE BATTERY MONITORING (CD ONLY)	
V-30539	008	S-IVB SUPPORT & PREPS FOR CDDT & CD	(HAZARDOUS)

INSTRUMENT UNIT TEST AND CHECKOUT PROCEDURES

TCP NO.	REV.	TITLE	
V-21222	011	AUXILIARY DAILY POWER ON PROCEDURE	
V-21223	019	IU POWER APPLICATION/REMOVAL	
V-21243	011	PRIMARY LAUNCH VEHICLE SUPPORT	
V-21479	ORIG	IU BATT ACT, MON & DISCHARGE TCP	(HAZARDOUS)
V-22006	009	GROUND COMPUTER DAILY/TEST OPERATIONS	
V-23068	012	ST-124M SLIP RING EXERCISE	
V-24443	ORIG	IU PREPS FOR HYPERGL LGADING	
V-26178	010	IU EQUIPMENT PRESSURIZATION	(HAZARDOUS)
V-28069	018	IU RF SYSTEM SUPPORT	
V-28072	006	IU STAGE MODULE TCE POWER UP SEQUENCE	
V-31008	005	ML/DCE REMOTE OPERATING PROCEDURE	
V-31062	013	IBM SUPPLEMENTAL TO S/V CDDT AND CD	(HAZARDOUS)
V-33011	009	ST-124M SYSTEM OPERATIONS	
V-33033	006	FLT COMPUTER SYS TEST CDDT & LAUNCH	
V-34017	006	IU/S-IVB ECS OPERATION	
V-34046	006	IU ACCESS DOOR INSTALLATION AND REMOVAL	
V-34047	013	IU HEAVY COMPONENT INSTL & REMOVAL	
V-36038	008	IU PNEUMATIC CONSOLE SET UP	

INTEGRATED TEST AND CHECKOUT PROCEDURES

TCP NO.	REV.	TITLE	
V-20056	013	SATURN V LAUNCH VEH EMERG PROCEDURE	(HAZARDOUS)
V-21096	ORIG	EDS OVERALL AND COUNTDOWN TEST	
V-35014	015	LV LOX/LH2 LOAD & DRAIN OPS	(HAZARDOUS)
V-35015	014	LV LOX/LH2 SYS PURGE VOL I	(HAZARDOUS)
V-35015	003	LV LOX/LH2 SYS PURGE VOL II	(HAZARDOUS)

LV TEST AND CHECKOUT PROCEDURES

TCP NO.	REV.	TITLE	
V-28070	005	S-IC TELEMETRY, MOBILE LAUNCHER GSE READINESS	
V-28009	007	TM CHECKOUT EQUIPMENT DAILY READINESS TEST	

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 AUTOMATED PROGRAMS INDEX  
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THE AUTOMATED PROGRAMS (IVAR'S) EXECUTED DURING THE COURSE OF THIS TEST AND CHECKOUT PROCEDURE ARE TABULATED BELOW. THE REVISION LEVEL SHOWN IS THE ONE TO BE USED DURING THE LAUNCH VEHICLE COUNTDOWN DEMONSTRATION AND COUNTDOWN. CORRECTIONS AND CHANGES MUST BE PROCESSED IN ACCORDANCE WITH TI-2-17.

XB-331-62

IVAR	REV	TITLE	REMARKS	IVAR	REV	TITLE	REMARKS
BE01	0010	S-IC PROPELLANT TEMPERATURE MONITOR		MT01	0019	MEASUREMENTS CALIBRATION TEST	
BE02	0008	S-IC PROPELLANT LEVEL MONITOR		NT98	0017	DISCRETE INITIALIZATION/REINITIALIZATION	
BT01	0000	PROPELLANT MONITOR UPDATE TEST PROGRAM		NT99	0005	DISCRETE EXECUTIVE ACTION TABLE MODIFY	
CS80	0026	DDAS INTERFACE ROUTINE		QAEC	0001	S-II ENGINE CIRCUITRY TEST	
CTC1	0048	GAIN TEST		QAES	0003	S-II ENGINE SEQUENCE TEST	
CTC2	0034	CONTROL COMPUTER RELAY REDUNDANCY TEST		QAMS	0000	S-II MAINSTAGE CALIPS TEST	
CTC3	0023	CONTROL COMPUTER COMPARATOR TEST		QAPO	0003	S-II STAGE POWER ON	
CTC4	0043	EDS CONTROL RATE GYRO TEST		VAAR	0000	FINAL ATTITUDE RATE COMMANDS	
CTC5	0036	APS GAIN TEST		VAED	0003	EDS TEST	
FE50	0007	ACCELEROMETER MONITOR TEST		VAFc	0001	FLIGHT CONTROL UTILITY PROGRAM	
FT03	0009	LVDC/LVDA SWITCH SELECTOR INTERFACE TEST		VALJ	0002	T-25 HR LINKING PROGRAM	
FT04	0031	LVDC POWER ON/OFF AND/OR REDUNDANCY TEST		VALK	0000	T-9 HR LINKING PROGRAM	
FT05	0015	LVDC DATA LOAD AND/OR VERIFY TEST		VALL	0001	T-1:51 HR LINKING PROGRAM	
FT06	0009	LVDC GIMBAL ANGLE READ & PLATFORM DRIFT TEST		VAMC	0000	MEASURING SYSTEM RAPID CALIBRATION	
FT08	0006	LVDC CORE MAP LOAD AND/OR PRINT TEST		VAPX	0001	LAUNCH VEHICLE POWER TRANSFER	
FT10	0012	LVDC LADDER OUTPUT TEST		VARS	0000	LAUNCH VEHICLE DRSCR TEST	
FT20	0006	LVDC/LVDA SELF TEST		VARY	0001	LAUNCH VEHICLE RECYCLE TO T-22 MINUTES	
FT23	0010	LVDC SECTOR SUMCHECK TEST		VATC	0000	LAUNCH VEHICLE TELEMETRY CALIBRATION	
FT25	0023	LVDC/LVDA DISCRETE INPUT TEST		VATS	0002	TERMINAL SEQUENCE PROGRAM	
FT31	0002	LVDC ACCELEROMETER PULSE COUNT TEST		VZEA	0003	ENGINE OUT ABORT TEST	
FT33	0008	LVDC/LVDA DISCRETE OUTPUT TEST		VAEC	0003	ENGINE SEQUENCE TEST	
FT35	0003	LVDC/LVDA DDAS TEST		VZRE	0003	RATE EXCESSIVE ABORT TEST	
FT37	0026	SIMULATED FLIGHT INITIALIZE TEST		VZSA	0003	SPACE VEHICLE ABORT TEST	
FT42	0028	PREPARE TO LAUNCH TEST		VZ33	0003	LVDA/LVDC DISCRETE OUTPUT TEST	
FT43	0010	LVDC COMPUTER INTERFACE UNIT TEST		WAPO	0002	S-IC DAILY POWER ON	
FT45	0011	LVDC COMMAND SYSTEM TEST		WASL	0000	S/A PRESSURE LEVEL TEST	
FT47	0007	PREFLIGHT COMMAND TEST		WASP	0004	LSE POWER ON	
FT49	0009	ACCELEROMETER MONITOR DISPLAY CONTROL		WAST	0000	S-IC CALIPS CHECKOUT	
FT55	0019	LVDC TELEMETRY TEST		WASV	0001	S-IC STAGE SYSTEMS VERIFICATION TEST	
GE01	0029	AZIMUTH LAYING AND PLOT MONITOR		WATL	0000	TSM PRESSURE LEVEL TEST	
GT16	0028	AZIMUTH LAYING PROGRAM		XATC	0000	S-IVB INITIAL SWITCH SCAN	
KAF1	0000	F/C T-24 HR LINKING PROGRAM		XADS	0017	S-IVB COUNTDOWN DISCRETE SCAN	
KAF2	0000	F/C OAT PREPS		XAPS	0004	S-IVB STAGE & GROUND POWER APPLICATION	
KAF3	0000	F/C THRUST VECTOR READ		XASS	0001	S-IVB SWITCH SELECTOR RESET	
KAG1	0000	LVDC/LVDA T-2 HR LINKING PROGRAM					
KAPW	0000	LVDC/LVDA POWER ON					
KA01	0015	IU STAGE POWER APPLICATION					
ME01	0019	RACS RAPID CONTROL ROUTINE					

LV CDDT & CD, VOL 11  
 DATE: JULY 14, 1971  
 REVISION 031  
 APOLLO/SATURN  
 PAGE 5-51.00  
 TEST NG-2:060 VOL 11  
 VEHICLE AS-510  
 20

LAUNCH OPERATIONS COMMUNICATIONS

COMPLEX 39 RA SYSTEM:  
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TO BE UTILIZED FOR ADMINISTRATIVE PHONE CALL ANNOUNCEMENTS, "T" COUNT ANNOUNCEMENTS, PAGING SPECIFIC PERSONNEL TO AN OIS CHANNEL, OPERATIONAL & EMERGENCY ANNOUNCEMENTS, AND FOR RAD ACCESS ANNOUNCEMENTS.

INTERCOMMUNICATIONS:  
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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 (TBC)	C1TC	181	121
S-II TEST CONDUCTOR (NR)	C2TC	171	121
S-IVB TEST CONDUCTOR (MDC)	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	CTSC	112	

LV EMERGENCY COMMUNICATIONS  
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IN THE EVENT OF AN OIS FAILURE, THE YELLOW POINT TO POINT PHONE SYSTEM WILL BE UTILIZED FOR EMERGENCY COMMUNICATIONS. THE STATIONS LISTED BELOW HAVE THE YELLOW PHONES ON OR NEAR THEIR CONSOLE AND ARE TO BECOME ACTIVE ON THIS NETWORK. PRIOR TO CRYOGENIC LOADING A COMMUNICATIONS CHECK WILL BE PERFORMED BY CLTC WITH THE STATIONS LISTED.

LVO:

CLTC (LV TEST CONDUCTOR)  
CLES (LV ELEC ENGINEER)  
CLMS (LV MECH ENGINEER)  
CIAR (LV CHIEF ENGINEER)  
CLBC (G.F. CORN)  
CLPS (LV PROP SYS ENGINEER)

S-IVB:

C4TC (S-IVB TEST CONDUCTOR)  
C4ES (S-IVB ELECTRONIC SYS)  
C4PS (S-IVB PROPUL SYS)  
R4PS (PROP STRIP CHARTS)  
R4SC (ELECT STRIP CHARTS)  
R4EI (S-IVB VOLTAGE &  
CURRENT RECORDERS)

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 (S/A CONTROL COOR.)  
CHDA (HOLD DOWN ARM CONTROL)  
CECS (ECS CONTROL)  
CCRP (RP-1 CONTROL)  
CCLO (LOX CONTROL)  
CCLH (LH2 CONTROL)  
RPDC (PROP DC PWR NETS)

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)  
BGCC (GROUND COMP.)

DLO:

CVTS (TEST SUPERVISOR)

SUPPORT:

BCFM (LCC MEAS.)  
BCWC (FIREX CONTROL)

S-II:

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

CALL STATIONS

ACDF CDF TEST CONDUCTOR  
BCXN BENDIX SUPPORT SUPERVISOR  
BCFM FACILITY MEASUREMENTS  
BCPN CCC PNEUMATICS CONSOLE  
BCRL RCA/LTV SUPPORT SUPERVISOR  
BCSC VEHICLE SUPPORT CONTROLLER  
BCWC WATER CONTROL (CCC-CONSOLES)  
BD05 LCC DATA DISPLAY STATION  
BDTS DATA TRANSMISSION (2P12) INFORMATION SYSTEM  
BEWZ HAZARDOUS MONITORING - INFORMATION SYSTEMS  
BELT LIGHTNING WARNING  
BGCC GROUND COMPUTER COMPLEX FIRING ROOM  
BLTH LVO TM ENGINEER  
BOSC SUPPORT CONTROLLER, OPS/VEHICLE RM 1P9  
BRTV DTV SYSTEM CENTER  
BWD PHOTOGRAPHY (TECHNICOLOR)  
BRFS RF GROUND STATION LCC, RF-DRSCS GND STATION - 2P10A  
BT15 INSTALLATION SUPPORT CONTROLLER  
BTMC TM C/O EQUIPMENT, COMMON MODULE - ROOM 2P10  
BTM1 TM C/O EQUIPMENT C/F INTERFACE MODULE - RM 2P10  
RUM TM CHECKOUT EQUIPMENT  
SRTF RF CHECKOUT STATION  
BLTM TM CHECKOUT EQUIPMENT  
R2RF RANGE SAFETY ENGINEER  
R27M TM CHECKOUT EQUIPMENT, S-II MODULE - ROOM 2P10  
B4IE S-1VB INSTRUMENTATION ENGINEER  
BARF LCC RF STATIONS  
R47M S-1VB TM CHECKOUT EQUIPMENT  
CARE GROUND NETWORKS ENGINEER  
CCAP AUXILIARY POWER CONSOLE  
CCLM LVO CHECKOUT CONSOLE  
CCLD LVO CONTROL CONSOLE  
CCPM NETWORKS POWER MONITOR  
CCPQ LVO CONTROL CONSOLE  
CCTC TEST SUPPORT CONTROLLER (SOP)  
CECS EDS CONTROL CONSOLE  
CE4K CRT KEYBOARD - EDS OPERATOR  
CICG INSTRUMENTATION CONTROLLER  
CNDU HYDRAULIC CHARGING UNIT CONTROL CONSOLE  
CNDM HOLDDOWN ARMS CONTROL SYSTEM  
CWD0 HAZARDOUS GAS DETECTION SYSTEM - LCC  
CHG2 ADRPT MON HAZ GAS CUE PANEL CONSOLE BE-11  
CHG2 L. A. RIGELL  
G. F. COEN  
CLCD LVO GROUND COMPUTER SYSTEM ENGINEER  
CLCE LVO CHIEF ENGINEER  
CLCP LVO COMPUTER AUTOMATION PROGRAMMING ENGR  
CLDE LUT SYSTEMS DEE PRINTER  
CLE6 LVO CHIEF LV ELECTRICAL GAC SYSTEM  
CLE1 LVO INTEGRATION EQUIP ELEC SYS ENGR  
CLEL LVO LAUNCH EQUIP ELEC SYST ENGR  
CLEP LVO PROPELLANTS ELEC SYST ENGR  
CLE5 ELECTRICAL S/C OPERATIONS ENGINEER  
CLEU ELEC NETKS SYST ENGR IU  
CLEM LVO WATER SYST ELEC SYST ENGR  
CLE1 ELEC NETKS SYST ENGR S-II  
CLE2 ELEC NETKS SYST ENGR S-II  
CLE4 ELEC NETKS SYST ENGR S-1VB  
C4E1 CRT KEYBOARD - LIGHT CONTROL  
C4F5 LVO FLIGHT CONTROL SYSTEM ENGINEER  
C4G2 CRT KEYBOARD - GUIDANCE  
C4G3 LVO GYRO AND STABILIZER SYSTEM ENGINEER  
C4L1 L/V CRT KEYBOARD - MEASURING  
C4L2 LVO INSTRUMENTATION SYSTEM ENGINEER  
C4L3 L/V MECHANICAL SYSTEMS ENGINEER  
C4M4 S-1VB MECHANICAL SYSTEMS ENGINEER  
C4M5 LVO FLIGHT COMPUTER SYSTEMS ENGR  
C4M6 LVO OPERATIONS MANAGER  
C4P5 LVO PROPELLANT SYSTEMS ENGINEER  
C4Q1 LVO GROUND COMPUTER SYSTEMS ENGR  
C4Q2 LSE & ECS CRT  
C4Q3 LAUNCH VEHICLE TEST CONDUCTOR  
CLVN VEHICLE NETWORKS PANEL  
CNDP PNEUMATIC DISTRIBUTION SYSTEM CONTROL CONSOLE  
CPH1 LMP COMPONENTS PANEL #1  
CPH2 LMP COMPONENTS PANEL #2  
CPD1 LMX COMPONENTS PANEL #1  
CPD2 LMX COMPONENTS PANEL #2  
CPD3 LMX COMPONENTS PANEL #3  
CPRK PROPELLANTS DISPLAY COMPUTER CONSOLE  
CPRP RP-1 COMPONENTS PANEL  
CPS5 SYSTEMS SAFETY  
CPS8 RANGE SAFETY SUPERVISOR PANEL  
CS42 SERVICE ARMS CONTROL CONSOLE  
CS4D DRSS CONSOLE  
CSAM SERVICE ARMS MEASUREMENTS PANEL  
CSA1 SERVICE ARM #1 CONTROL CONSOLE (S-1C INTER TANK)  
CSA2 SERVICE ARM #2 CONTROL CONSOLE (S-1C FORWARD)  
CSA3 SERVICE ARM #3 CONTROL CONSOLE (S-1I AFT)  
CSA4 SERVICE ARM #4 CONTROL CONSOLE (S-1I INTERMEDIATE)  
CSA5 SERVICE ARM #5 CONTROL CONSOLE (S-1I FORWARD)  
CSA6 SERVICE ARM #6 CONTROL CONSOLE (S-1VB AFT)  
CSA7 SERVICE ARM #7 CONTROL CONSOLE (S-1VB FORWARD)  
CSA8 SERVICE ARM #8 CONTROL CONSOLE (SERVICE MODULE)  
CSA9 SERVICE ARM #9 CONTROL CONSOLE (COMMAND MODULE)  
CSPR SERVICE ARMS POWER PANEL  
CTSC TEST SUPPORT CONTROLLER  
CTS1 TAIL SERVICE MAST - 2 FIRING AND MONITOR TEST CONSOLE  
CTS2 TAIL SERVICE MAST - 1 FIRING AND MONITOR TEST CONSOLE  
CTS3 TAIL SERVICE MAST - 4 FIRING AND MONITOR TEST CONSOLE  
CUCP IU COOLING CONTROL CONSOLE  
CUCR IU FLIGHT CONTROL RECORDER PANEL  
CUCS AIRBORNE COMMAND SIMULATOR  
CUD0 DIGITAL EVENTS EVALUATOR PRINTER  
CUEF EDS FLIGHT MONITOR  
CUES EDS PREPARATION  
CUEV EVENTS DISPLAY  
CUCF IU FLIGHT CONTROL PANEL  
CUCG IU FLIGHT CONTROL SYSTEMS ENGINEER  
CUCS FLIGHT CONTROL SYSTEMS INTEGRATOR  
CUGA IU FLIGHT CONTROL EDS RATE GYRO/CONTROL  
CUIE INTERGRATION/AUX POWER SYSTEM ENGINEER  
CUIP IU INSTRUMENTATION PANEL  
CUNP IU GROUND NETWORKS ENGINEER  
CUNK IU CRT KEYBOARD - NETWORKS  
CUNW IU NETWORKS PANEL  
CUCP ST-124M SYSTEM ENGINEER  
CUPP IU AC & DC POWER  
CUPF FLT CONT COMP INPUT SUBSTITUTE PANEL  
CUSH SWITCH SELECTOR PANEL  
CUTC IU TEST CONDUCTOR  
CVTS SPACE VEHICLE TEST SUPERVISOR

INDUSTRIAL WATER CONTROL PANEL  
C1C5 CUTOFF SENSORS PANEL  
C1D0 DEE PRINTER  
C1D1 PROPELLANT DISPERSION AND ORDNANCE (DESTRUCT) PANEL  
C1E1 ENGINE HEATERS PANEL  
C1E2 S-1C ENGINE PANEL  
C1E3 EVENT DISPLAY DISCRETE READOUT PANEL  
C1F0 S-1C ENGINE DEFLECTION PANEL  
C1FE FLIGHT CONTROL SYSTEM ENGINEER  
C1FR FIRING PANEL  
C1HP HYDRAULICS PANEL  
C1JP MEASURING PANEL  
C1J0 S-1C LOX CONSOLE  
C1MS MEASURING SYSTEM TEST OPERATIONS  
C1NK CRT KEYBOARD - NETWORKS  
C1NP NETWORKS PANEL  
C1NE GROUND ELECTRICAL ENGINEER  
C1O0 LOX TANKING COMPUTER  
C1C0 CONTROL AND PURGE PANEL (STAGE PNEUMATICS CONTROL)  
C1PE PROPELLATION AND MECHANICAL SYSTEMS ENGINEER  
C1PK CRT KEYBOARD - PROPELLION  
C1PP DC POWER PANEL  
C1PS GROUND POWER POWER SUPPLY ENGINEER  
C1PU S-1C PREFILL PANEL  
C1P1 RP-1 SYSTEM PANEL  
C1RU RP-1 TANKING COMPUTER PANEL  
C1SN S-1C STAGE NETWORKS ENGINEER  
C1SP SEQUENCER PANEL  
C1TC S-1C STAGE TEST CONDUCTOR  
C2AE ALL ENGINE PANEL  
C2E1 S-1I ALERT INDICATOR DISPLAY CONSOLE  
C2DP PD AND EHW AND ORDNANCE PANELS  
C2EC ENGINE COMPONENTS PANEL  
C2EM EVENTS DISPLAY PANEL  
C2FC HYDRAULICS PANEL  
C2FE ENGINE DEFLECTION PANEL  
C2G0 GROUND PNEUMATICS PANEL  
C2HG HAZARDOUS GAS DETECTION ENGINEER  
C2HU LMP TANKING COMPUTER  
C2IP MEASURING AND RF PANEL  
C2LA S-1I PROPELLANT LOADING ELECTRICAL ADVISOR  
C2NK CRT KEYBOARD - NETWORKS  
C2NP NETWORKS PANEL  
C2O0 LOX TANKING COMPUTER  
C2PA PRESSURIZATION ADVISOR, MECHANICAL  
C2PC DC POWER CONTROL PANEL #1  
C2PK CRT KEYBOARD - PROPELLION  
C2PM PROPELLANT MONITOR PANEL  
C2PU PROPELLANT UTILIZATION AND DEPLETION PANELS  
C2PV PURGE AND VACUUM PANEL  
C2PR RECIRCULATION PANEL  
C2RR RELAY RACKS (#1 AND #2)  
C2RI S-1I ACCESS STRUCTURES PANEL  
C2RP PRESSURIZATION PANEL  
C2S0 S-1I STAGE TEST CONDUCTOR  
C2V1 S-1I TM CONTROLLER  
C4AL APS LAUNCH A MONITOR PANEL  
C4D0 DIGITAL EVENTS EVALUATOR PRINTER  
C4D1 PROPELLANT DISPERSION AND ORDNANCE PANEL  
C4E0 ENGINE PREPARATION PANEL  
C4E5 S-1VB ELECTRONICS SYSTEM ENGINEER  
C4ET ENGINE TEST PANEL  
C4EV S-1VB EVENTS DISPLAY PANEL  
C4FC S-1VB FLIGHT CONTROL PANEL  
C4FS S-1VB FLIGHT CONTROL SYSTEM ENGINEER  
C4HC S-1VB HE CONTROL PANEL  
C4MN S-1VB GMP/GNP CONTROL PANEL  
C4M2 LMP TANKING COMPUTER  
C4HY HYDRAULIC PANEL  
C4IP S-1VB MEASURING PANEL  
C4K CRT KEYBOARD - NETWORKS  
C4NP S-1VB NETWORK PANEL  
C4N2 CRT DISPLAY CONSOLE - NETWORKS OPERATIONAL MON SYS  
C4N3 S-1VB NETWORKS CRT DISPLAY CONSOLE - CIF DATA  
C4O0 O2/H2 BURNER PANEL  
C4O1 LOX TANKING COMPUTER  
C4P1 S-1VB PROPELLANTS #1 BOARD  
C4P2 S-1VB DC POWER SUPPLY PANELS  
C4P3 S-1VB PROPELLANT STATUS PANEL  
C4P4 S-1VB PROPELLION SYSTEM ENGINEER  
C4P5 S-1VB PROPELLANT UTILIZATION SYSTEMS PANEL  
C4P2 CRT DISPLAY CONSOLE - PROP OPERATIONAL MON SYS  
C4P3 S-1VB PROPELLION CRT DISPLAY CONSOLE - CIF DATA  
C4Q0 S-1VB QUALITY CONTROL  
C4SM S-1VB MECH/STRUCTURES SYSTEM ENGINEER  
C4SP S-1VB STAGE PRESSURE PANEL  
C4TC S-1VB STAGE TEST CONDUCTOR  
E4SM CIF ANTENNA SITE  
ECOP CIF COMPUTER  
EDDS CIF DATA DISPLAY ROOM (307)  
EDTS DATA TRANSMISSION STATION  
ETMS TELEMETRY GROUND STATION (CIF)  
ETOM GUIDANCE TM OUTPUT MONITOR (CIF)  
E27M CIF S-1I TM ENGR MONITOR  
E4FC CIF S-1VB FLIGHT CONTROL ENGR MONITOR  
E47M TELEMETRY MONITOR  
G41L UNIFIED S BAND GROUND STATION  
H41L HOUSTON FLIGHT DIRECTOR  
K4TC SPACECRAFT TEST CONDUCTOR  
L4SE LSE ELEC ENGR, LUT BASE  
L4S1 LSS POWER SUPPLY AND DIST, RACKS  
LD4S DDAS (ML)  
LEBS EMERGENCY BACKUP BATTERIES (ML)  
LESP ENGINE SERVICE PLATFORM  
L4CC GROUND COMPUTER COMPLEX (ML)  
L4DA HOLDDOWN ARMS  
L4HD HAZARDOUS GAS DETECTION SYSTEM RM 15H  
L4DE DIGITAL EVENT EVALUATOR (ML) DEE-A  
L4RS DIGITAL RANGE SAFETY COMMAND SYSTEM GSE  
L4M LAUNCH OPERATIONS MANAGER  
L4PC PNEUMATIC DISTRIBUTION COMPLEX  
L4PL PROPELLANT LOADING COMPUTERS  
L4PB POWER SUPPLY SYSTEM RACKS, AREA 7/B  
L4PR INTEGRATION NETWORK (ML)  
L4SC LUT SIGNAL CONDITIONING TEST PANELS  
L4U1 ML QUALITY INSPECTION  
L4SM LUT TAIL SERVICE MAST ENGINEER  
L4UNW IU NETWORKS  
L4LIEP S-1C ENGINE AREA  
L4LHC S-1C GROUND HYDRAULICS SUPPLY & CHECKOUT  
L4LHC MOTOR CONTROL CENTER S-1C GRND WVD SUPPLY & C/O  
L4LIC S-1C INSTRUMENTATION ENGINEER (ML)  
L4LIS LUT SUPERVISOR  
L4LINE LUT NETWORKS ENGR (S-1C STAGE)  
L4LOE S-1C ORDNANCE ENGINEER

GROUND POWER POWER SUPPLY ENGINEER  
S-1C PREFILL UNIT  
L1R5 RELAY RACKS AND SEQUENCER RACK  
L1SM STAGE MONITOR/OPERATIONS COORDINATOR  
L1TH HANDLING & ORDNANCE ENGINEER, THRUST STRUCTURE, S-1C  
L1T1 TM & RF THRUST STRUCTURE  
L2PD POWER DISTRIBUTION RACKS (ROOM 8B)  
L2RR S-1I RELAY RACKS ( THROUGH 5) (ROOM 7A)  
L4CE CONTROL ELECTRONIC ENGINEER  
L4JR JUNCTION RACKS  
L4PR S-1VB POWER RACKS (ROOM 7B)  
M4NR GUID & NAV RIGHT SIDE UNIT 4, SC  
M4NS GUID & NAV UNIT 14, SC  
M4SC NASA S/C TEST CONDUCTOR  
M4TE TEST PROJECT ENGINEER  
M4HE ENVIRONMENTAL HEALTH ENGINEER  
M4SE ENGINE SERVICE PLATFORM TRANSPORTER  
M4GE PAD HP GAS ENGINEER  
M4FD LV-DAL-31 BSE 4 ML  
M4LO LV-DAL-34 IU  
M4L1 LV-DAL-31 S-1C  
M4L2 LV-DAL-32 S-1I  
M4L3 LV-DAL-33 S-1VB  
M4F1 EMC MONITOR INFORMATION SYSTEM  
M4PL IU PAD LEADER  
M4SD IUW PAD SAFETY  
M4US TEST SUPERVISOR, PAD  
M4ES S-1C GROUND LEVEL ENGINE SERVICING  
M4S1 LSE FIRING ROOM NETWORKS ENGR  
M4DC COUNTDOWN (LCC)  
M4DS DCS RATE ENGINEER  
M4E3 DEE-3 SYSTEM ENGINEER  
M4TS DATA TRANSMISSION SYSTEM ENGINEER  
M4SM LV E 3 RECORDERS  
M4RE EDS STRIP CHARTS  
M4SC LMP STRIP CHARTS  
M4LCC LCC STRIP CHARTS  
M4LR LMX NETWORKS ENGINEER  
M4RS TSM & SVA RECORDERS  
M4RP S-1I ENGINES DCS POWER - LCC  
M4SC RP-1 STRIP CHARTS  
M4RS RANGE SAFETY OFFICER STRIP CHARTS  
M4UB IU STRIP CHARTS  
M4XS LCC STRIP CHARTS  
M4JR LCC RACKS PATCH DIST.  
M4NE IU MEASURING STRIP CHARTS  
M4SC S-1C STRIP CHARTS  
M4SD S-1I DIGITAL PRINTER  
M4RP S-1I ENGINES REDLINE ENGINEER  
M4SC STRIP CHARTS  
M4RE S-1VB GROUND BUSS E & I RECORDERS  
M4M4 S-1VB HYDRAULIC STRIP CHARTS  
M4PS S-1VB PROPELLION STRIP CHARTS  
M4PU S-1VB PU STRIP CHARTS  
M4SC STRIP CHART RECORDERS  
M4CR S/C COMMANDER  
M4RO SUPERINTENDENT OF RANGE OPERATIONS  
M4UF IU RF STRUCTURE  
M4UTM TM IU STRUCTURE  
M4UVE IU VEHICLE NETWORKS  
M4VM IU VEHICLE MECHANICAL  
M4SCE S-1VB CONTROL ELECTRONICS ENGINEER  
M4SFC S-1VB FLIGHT CONTROL ENGINEER  
M4SIT S-1VB HYDRAULICS ENGINEER  
M4SIE INSTRUMENTATION ENGINEER  
M4S4M APT STRUCTURAL/MECH ENGR  
M4S4M FWD STRUCTURAL/MECH ENGR  
M4S4M S-1VB MOBIL LAUNCHER STRUCTURAL/MECHANICAL ENGINEER  
M4S4M S-1VB SERVICE STRUCTURE STRUCTURAL/MECH ENGR  
M4S4M STRUCTURE MEASURING STATION  
M4OR ORDNANCE ENGINEER  
M4PC S-1VB PAD CONTROL  
M4PE S-1VB PROPELLION ENGINEER  
M4P4 S-1VB SAFETY ENGINEER  
M4TM S-1VB STRUCTURE TM ENGINEER  
M4SE LSE ELEC ENGR - TOWER  
M4S4S SERVICE ARM #8 SYSTEM  
M4UCU GROUND SUPPORT COOLING UNIT  
M4UCP IU PNEUMATIC CONSOLE  
M4UVM IU MECHANICAL, UMBILICAL TOWER  
M4U1FN FORWARD SKIRT ELECTRICAL NETWORKS  
M4U1FT S-1C FORWARD SKIRT TM & RF  
M4ZAM S-1I AFT MONITOR  
M4ZAN AIRBORNE SYSTEMS ENGINEER  
M4Z1 S-1I AIRBORNE NETWORKS FWD  
M4Z2 S-1I AIRBORNE NETWORKS AFT  
M4UEC ENVIRONMENTAL CONTROL ENGINEER  
M4U2E S-1I ELECTRICAL ORDNANCE ENGINEER  
M4U2F S-1I FLIGHT CONTROL  
M4U2F S-1I FWD MONITOR  
M4ZM0 HANDLING AND ORDNANCE ENGINEER  
M4U1S S-1I INSULATION ENGINEER  
M4U2J ENGINE SYSTEMS ENGINEER  
M4U1F FLIGHT CONTROL LEADMAN  
M4U1L S-1I HYDRAULIC LEADMAN  
M4U2LN S-1I LUT NETWORKS ENGINEER  
M4U2LP S-1I PRESSURIZATION LEADMAN  
M4U2M MECHANICAL AND HYDRAULICS ENGINEER  
M4U2MO S-1I MECHANICAL ORDNANCE ENGINEER  
M4U2M MECH/UMBILICAL ENGINEER  
M4U2P PROPELLANT/PRESSURIZATION ENGINEER  
M4U2F PROPELLANT FILL ENGINEER  
M4UPM PROPELLANT MANAGEMENT ENGINEER  
M4UPV ML PURGE & VACUUM ENGINEER  
M4U2C ML QUALITY CONTROL REP  
M4U2E S-1I PAD LEADER  
M4U2S STRUCTURES AND INSULATION ENGINEER  
M4U2T SAFETY ENGINEER  
M4U2M TM ENGINEER  
M4U4A PNEUMATIC CONSOLE, S7-45A  
M4U4B INSULATION PURGE PNEUMATIC CONSOLE, S7-45  
M4U4G S-1VB AFT MONITOR  
M4U4J S-1VB FORWARD MONITOR  
M4U4E PROPELLION ENGINEER  
M4U4S IU MEASURING STATION  
M4U4R RF, MCH BAND RADAR & CCS CHECKOUT  
M4VMS MEASURING GSE STATION  
M4VMS MEASURING GSE STATION  
M4VMS S-1VB MEASURING STATION  
M4Z4S ADRPT MON VISUAL OBSERVER (CX 70, UC4 OR UC5)  
M4Z4S ADRPT MON VISUAL OBSERVER (CX 14, UC16)  
M4Z3 ADRPT MON VISUAL OBSERVER (CX 17, UC17 OR UC9)

# OIS-RF CHANNELIZATION LC-39

## AS-508 & SUBS

LV CDDT & CD, VOL 11  
 DATE: MAY 18, 1971  
 REVISION 029

APOLLO/SATURN

PAGE 5051.60  
 TEST NO-2 060, VOL 11  
 VEHICLE AS-510

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

R = AVAILABLE TO ETR  
 U = AVAILABLE TO USB - MILA  
 SA = FOR TEMPORARY USE DURING SERVICE ARM OPERATIONS  
 C = AVAILABLE TO CRAWLER TRANSPORTER/MOBILE LAUNCHER BY MICROWAVE DURING TRANSFER OPERATIONS

APPROVED *A. J. Siffert Jr.* 1/22/70  
 LO-PLN

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
IU	DF-1	250.7
	DP-1	245.3

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

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

BARCHARTS MANLOADING & SUPPORT RIGHTS DIFFERENT FOR CDDT & CD  
PAD ACCESS RADIATION AREA CONTROL ENDS AT T-8 HRS DURING CDDT BUT CONTINUES FOR CD.  
PAD ACCESS CONTROL AREA REOPENING TIMES DIFFERENT AFTER CDDT AND CD.  
PAD ACCESS CONDITIONS FOR RECONFIGURATION APPLICABLE TO DRY CDDT ONLY.

- 1D 4H 0' 0" BATTERIES MOVED DURING CD ONLY
- 1D 3H 45' 0" ACCESS STEP REMOVED DURING CD
- 1D 4H 0' 0" BATTERY REMOVAL WOULD ONLY OCCUR DURING CD
- 1D 3H 30' 0" CHE HOIST DOLLY & BATTS INSTALLED DURING CD
- 1D 3H 30' 0" JUMPER INSTALLED FOR CDDT
- 1D 3H 0' 0" Q-BALL PORT PLUGS REMOVED DURING CD
- 1D 2H 30' 0" BATTERIES INSTALLED DURING CD ONLY
- 1D 2H 30' 0" BATTERY BYPASS INSTALLED FOR CDDT
- 1D 2H 10' 0" CHE DOLLY REMOVED DURING CD
- 1D 2H 0' 0" BATTERIES INSTALLED DURING CD ONLY
- 1D 2H 0' 0" CHE DOLLY REMOVED DURING CD
- 1D 1H 0' 0" BATTERIES INSTALLED DURING CD ONLY
- 1D 1H 0' 0" BATTERY ACCESS PLATFORMS REMOVED DURING CDDT
- 1D 1H 0' 0" CHE HOIST REMOVED DURING CD
- 24H 40' 0" BATTERIES CONNECTED DURING CD ONLY
- 24H 40' 0" OAT & SIM FLT POWER USED DURING CDDT
- 24H 35' 0" CHE HOIST REMOVED DURING CD
- 24H 20' 0" BATTERIES CONNECTED DURING CD ONLY
- 24H 0' 0" BATTERIES CONNECTED DURING CD ONLY
- 23H 40' 0" BATTERIES CONNECTED DURING CD ONLY
- 23H 15' 0" AUX COOLANT LINES REMOVED DURING CD
- 23H 0' 0" ST-124M PURGE LINE & CHECK VALVE REMOVED DURING CD
- 22H 45' 0" ACCESS STEP REINSTALLED DURING CD
- 22H 30' 0" ST-124M PURGE LINE & CHECK VALVE REMOVED DURING CD
- 22H 15' 0" BATTERY ACCESS PLATFORMS REMOVED DURING CDDT
- 22H 0' 0" ST-124M PURGE SUPPLY VALVE CLOSED DURING CDDT
- 21H 40' 0" BATTERY ACCESS PLATFORMS REQUIRED FOR CD
- 21H 40' 0" PROTECTIVE COVERS REMOVED DURING CDDT
- 21H 15' 0" SIM LAUNCH ON DURING CDDT
- 21H 15' 0" IGN BATT BLEED ON FOR CD
- 21H 15' 0" SIM FLT POWER ENABLED FOR CDDT
- 21H 15' 0" SIM OAT SWITCH ON FOR CDDT
- 21H 15' 0" SIM LAUNCH POWER ON DURING CDDT
- 21H 14' 30" SIM LAUNCH POWER OFF DURING CDDT
- 21H 14' 30" IGN BATT BLEED OFF FOR CD
- 21H 14' 15" SIM FLIGHT POWER TO DISABLE FOR CDDT
- 21H 12' 0" SIM OAT SWITCH OFF FOR CDDT
- 21H 12' 0" BATTERY ACCESS PLATFORMS REMOVED DURING CD
- 20H 15' 0" ST-124M SYSTEM PURGED DURING CDDT
- 19H 0' 0" BATTERY SUBSTITUTE BOXES NOT USED DURING CD
- 19H 0' 0" BATTERY SUBSTITUTE BOXES USED DURING CDDT
- 19H 0' 0" LUT STORAGE CABINETS BANDED DURING CD
- 19H 0' 0" FLIGHT CODE PLUG INSTALLED DURING CD ONLY
- 18H 0' 0" AUX COOLANT LINES REMOVED DURING CD
- 18H 0' 0" LH2 VENT VALVE CHECKOUT DURING CDDT
- 18H 0' 0" CRD'S TORQUED DURING CD ONLY
- 16H 35' 0" S/A 1 SAFE ANGLE SWITCH ACTIVATED DURING CDDT
- 16H 15' 0" SUBLIMATOR VENT COVERS REMOVED DURING CD
- 16H 30' 0" SUBLIMATOR VENT COVERS REMOVED DURING CD
- 16H 5' 0" S/A 2 SAFE ANGLE SWITCH ACTIVATED DURING CDDT
- 16H 0' 0" S-11 LH2 VENT VALVE CRYO TEST RUN DURING CDDT ONLY
- 16H 0' 0" DEE 6 DISCRETES MASKED DURING CDDT
- 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
- 14H 30' 0" LH2 VENT VALVE CRYO TEST RUN DURING CDDT ONLY

- 14H 0' 0" ST-124M SYSTEM PURGED DURING CDDT
- 11H 25' 0" LH2 VENT VALVE CRYO TEST RUN DURING CDDT ONLY
- 10H 0' 0" LH2 VENT VALVE CRYO TEST RUN DURING CDDT ONLY
- 9H HOLDING OFF-LUT CABLE ASSEMBLIES REMOVED DURING CD
- 9H HOLDING READY FOR IGNITION INDICATIONS DURING CDDT
- 9H HOLDING LH2 VENT VALVE CRYO TEST RUN DURING CDDT ONLY
- 8H 59' 0" SC EDS POWER TURNED ON DURING CDDT
- 8H 59' 0" LH2 VENT VALVE INST VERIFICATION DURING CDDT
- 8H 55' 0" SIM FLT ENABLED FOR CDDT ONLY
- 8H 20' 0" BATT HEATER SHUT OFF DURING CDDT
- 7H 30' 0" S-1VB APS PRESSURIZED DURING CD
- 6H 0' 0" PROPELLANT SYS CRYO TEST RUN DURING CDDT ONLY
- 4H 40' 0" DRSCS FLIGHT CODE PLUGS INSTALLED DURING CD
- 4H 40' 0" DRSCS TEST CODE PLUGS INSTALLED DURING CDDT
- 4H 0' 0" LOX HE INJ TEST RUN DURING CD
- 3H 50' 0" S-11 LH2 OVERFILL SENSOR TEST RUN DURING CDDT
- 3H 45' 0" LOX HE INJ TEST RUN DURING CD
- 3H 45' 0" PROP SYS CRYO TEST RUN DURING CDDT ONLY
- 3H 40' 0" S-11 LOX HE BLOWDOWN TEST RUN DURING CDDT
- 3H 30' 0" PROP SYS BOTTLE DECAY TEST RUN DURING CD
- 3H 20' 0" SWITCHES POSITIONED TO COUNT CONFIG DURING CD
- 3H 20' 0" EAS MANUAL THERMAL CONTROL ESTABLISHED FOR CD
- 3H 20' 0" S-1VB HE SUPPLY PRESSURE DECREASED DURING CDDT
- 3H 20' 0" S-1C HE BOTTLE PRESSURE TEST RUN DURING CDDT
- 3H 8' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 3H 5' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 3H 0' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 55' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 48' 7" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 45' 30" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 45' 0" PROP SYS BOTTLE DECAY TEST RUN DURING CD
- 2H 42' 15" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 42' 14" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 42' 13" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 42' 17" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 42' 9" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 41' 15" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 35' 45" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 35' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 33' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 30' 0" PROP SYS BOTTLE DECAY TEST RUN DURING CDDT
- 2H 8' 0" PROPELLANT SYS CRYO TESTS RUN DURING CDDT ONLY
- 2H 0' 0" SC EDS POWER TURNED ON DURING CD
- 1H 52' 0" CCS ENABLED BY CDDR DURING CD
- 1H 51' 0" PROGRAM VZSA IN EDS TEST RUN DURING CD
- 1H 45' 0" PROP SYS BOTTLE DECAY TEST RUN DURING CDDT
- 1H 27' 0" CCS BLOCK EXERCISED DURING CD ONLY
- 1H 21' 0" EDS POWER OFF, DSM READY FOR Q-BALL CAL AND CCS ENABLED DURING CD
- 1H 21' 0" IL COMMAND SYSTEM ENABLED DURING CDDT
- 1H 19' 0" CCS BLOCK EXERCISED DURING CD
- 1H 19' 0" IL SWITCH ACTION (IN PLACE OF MSTC) DURING CDDT
- 1H 0' 0" HE SUPPLY PRESSURE INCREASED DURING CDDT
- 1H 0' 0" HELIUM SUPPLY OPENED DURING CD
- 45' 0" DIGITAL PRINTER POWER ON DURING CDDT
- 44' 0" SC EDS POWER IS ON DURING CD
- 40' 0" DRSCS TEST CODE PLUGS INSTALLED DURING CDDT
- 40' 0" DRSCS FLIGHT CODE PLUGS INSTALLED DURING CD ONLY
- 38' 0" SIM LAUNCH ON FOR CDDT
- 38' 0" SIM OAT SWITCH ON FOR CDDT
- 38' 0" SIM FLT POWER SWITCH ENABLED FOR CDDT
- 30' 0" SIM LAUNCH POWER ON FOR CDDT
- 33' 0" COUNTERCLOCK RESET OPTION AVAILABLE FOR CDDT ONLY
- 29' 30" SIM LAUNCH POWER OFF FOR CDDT
- 7' 58" S/A 1 ARMED FOR RETRACTION DURING CD
- 0' 30" S/A 1 RETRACTED DURING CD
- 16.2' TO +2H 30" DIFFERENT TCS AND PLUS TIMES FOR CD AND CDDT
- APP A3 START TANK RECHILL TEST RUN DURING CDDT ONLY
- APP B5 DRSCS TEST CODE PLUGS INSTALLED DURING CDDT
- APP B5 DRSCS FLIGHT CODE PLUGS INSTALLED DURING CD ONLY
- APP C1 SIM OAT SWITCH OFF FOR CDDT
- APP C1 CREW INVOLVED FOR CD ONLY
- APP C1 S-11 LH2 VENT VALVE TEST RUN DURING CDDT DRAIN ONLY
- APP C1 S/C EDS POWER TURNED OFF DURING CD SCRUB
- APP C1 DRSCS FLIGHT CODE PLUG SECURED DURING CD SCRUB ONLY
- APP C2 S-11 LH2 VENT VALVE TEST RUN DURING CDDT DRAIN ONLY
- APP D SIM OAT SWITCH ON FOR CDDT
- APP G APPLICABLE TO CDDT ONLY
- APP H APPLICABLE TO CD ONLY



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.

WARNING LIGHTS:  
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RED PAD CLOSED CONDITION 1

THIS CONDITION EXISTS DURING EXTREMELY HAZARDOUS OPERATIONS. ACCESS TO THE PAD AREA DURING THIS PERIOD OF TIME SHALL BE PROHIBITED OR SHALL BE RIGIDLY CONTROLLED BY CVTS AND CPSS. ACCESS SHALL BE BY SPECIAL PERMISSION ONLY.

FLASHING HAZARDOUS ACCESS CONDITION 2  
AMBER

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

AMBER LIMITED ACCESS CONDITION 3

THIS CONDITION EXISTS DURING HAZARDOUS OPERATIONS IN THE PAD AREA WHEN ONLY ACCESS TO THE IMMEDIATE AREA MUST BE CONTROLLED. PERSONNEL ENTERING THE 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.

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.

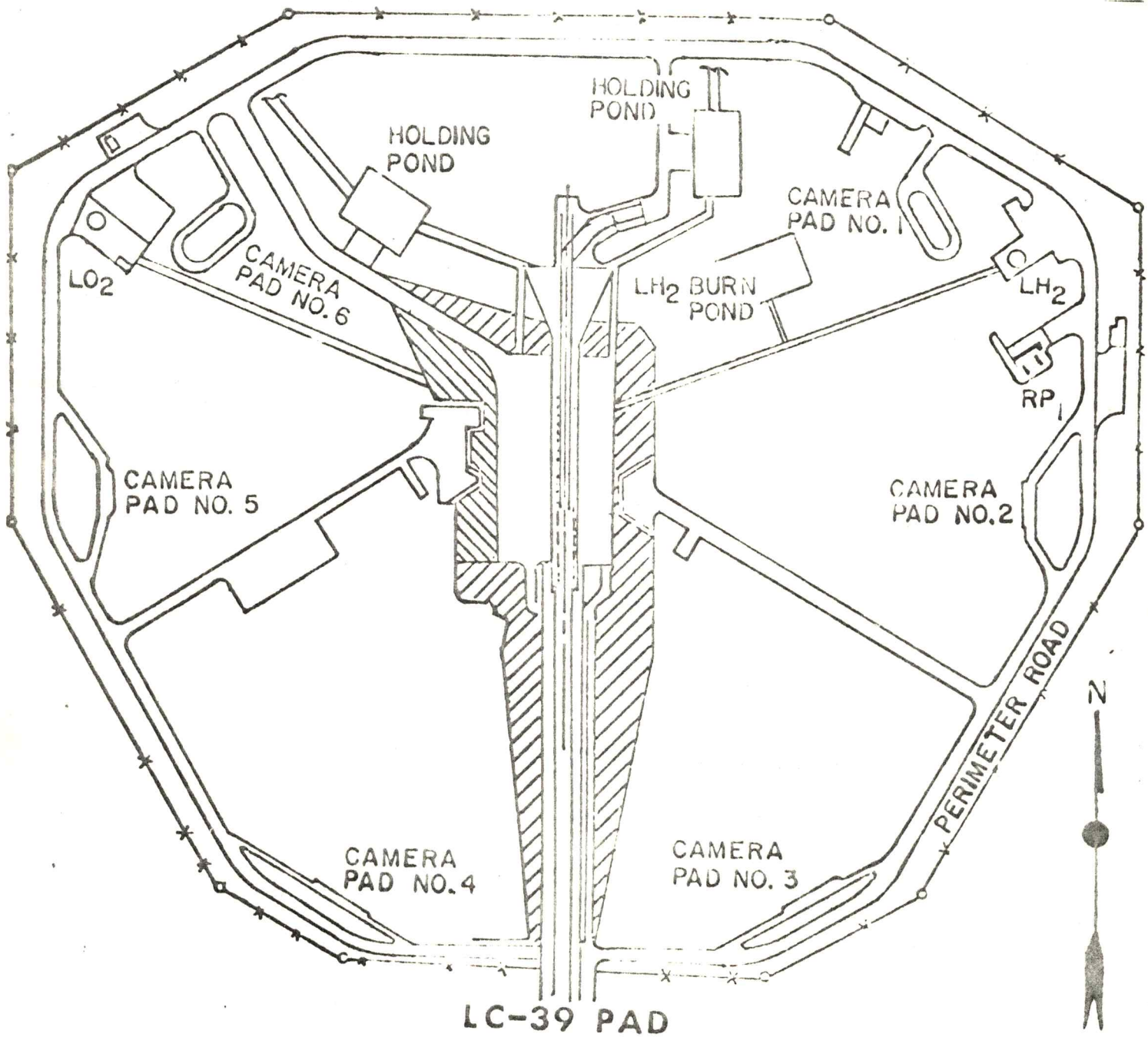


RESTRICTED ACCESS CONDITIONS (WET CDDT AND COUNTDOWN)

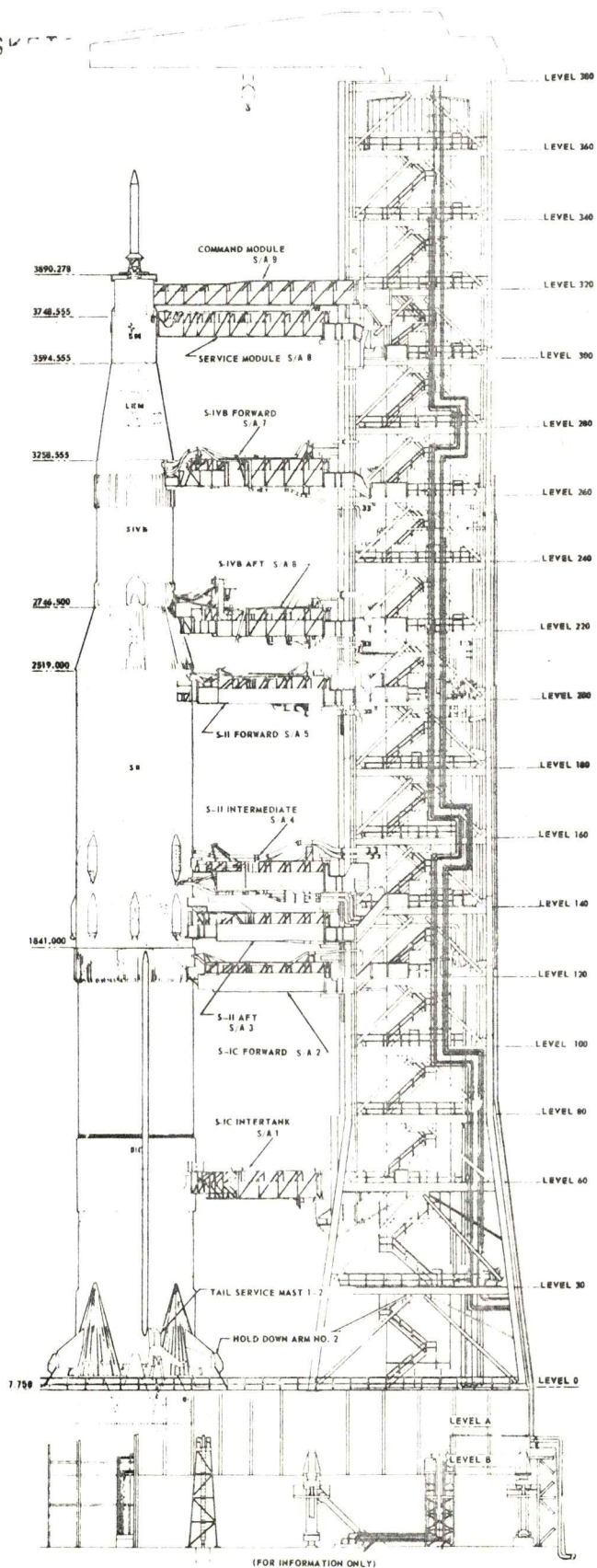
1. T-22:30 HRS TO T-20:30 HRS: THE LM DESCENT AREA INTERNAL TO SLA, IU & S-IVB FORWARD AREA WILL BE CLEARED FOR LM SHE TOPOFF.
2. T-16 HRS TO T-10:45 HRS: MSS PLATFORM OPENINGS WILL REQUIRE LOCAL CLEARING WHICH WILL BE CONTROLLED BY S/V TEST SUPERVISOR.
3. T-15:15 HRS TO T-14:45 HRS: THE SLA, IU, S-IVB 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 LIFTOFF (OR T+18 HRS IF SCRUBBED FOR THIS MONTH). #
4. T-13 HRS TO T-11:30 HRS: LUT 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.
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 EVACUATED.
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 DECLARES THE SPECIAL CONTROL AREA OPEN AT T+2 HRS AFTER LAUNCH. #

EMERGENCY AND PAD CREWS WILL BE STATIONED IN VAR HIGH BAY NO. 3 WITH REQUIRED EQUIPMENT AND VEHICLES.





ML/SV REFERENCE SKETCH



(FOR INFORMATION ONLY)

LV PROPELLANT LOADING SCHEDULE:

LOADING SEQUENCE -----	TIME -----	REQUIRED MSS DISTANCE FROM LV -----
START REPLENISH LINE CHILLDOWN	T-8:15	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-II LH2 PRECONDITIONING	T-7:26	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-5:27	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 -----						
<div style="position: absolute; left: 100px; top: 200px; color: blue; font-size: 24px;">1900E</div> <div style="position: absolute; left: 50px; top: 260px;">                         T-28:00                          - 1 DAY                          4 HRS                          0' 0"                     </div>						
111		1	CLTC	CVTS	VERIFY ML ELEVATOR 1 RESERVED FOR 30 MINUTES FOR LV BATTERY MOVE	# TCP
171		2	C2TC	C2FC	START S-II ENGINE ACTUATION SYSTEM PREPS PER V-30029 (M020) TASK 13. REPORT WHEN COMPLETE.	
261		3	C2TC	BOSC	S-II WILL NEED 4 SCOTT AIR PACKS (LVN-15) AT ML 140 FT LEVEL IN 30 MINUTES TO SUPPORT EMERGENCY BATTERY REMOVAL CREW.	# TCP
171		4	C2TC	U2SE	PICK UP 4 PROXIMITY FIRE SUITS (LVN-26) AT LC39 FIRE STATION AND DELIVER TO ML 140 FT LEVEL IN 30 MINUTES TO SUPPORT EMERGENCY BATTERY REMOVAL CREW.	#
181		5	C1TC	L1IC	START THRUST STRUCTURE AND HEAT SHIELD INSTRUMENTATION PROTECTIVE COVERS REMOVAL PER V-27195. REPORT WHEN COMPLETE.	
		6			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
181		7	C1TC	C1PE	START REMOVAL OF THRUST STRUCTURE INTERNAL ACCESS EQUIPMENT PER V-24010	
<div style="position: absolute; left: 50px; top: 820px;">                         T-27:45                          - 1 DAY                          3 HRS                          45' 0"                     </div>						
161		1	C4TC	L4CE	START BURNER RECORDER SETUP PER V-30539, SECT J. REPORT WHEN COMPLETE.	
161		2	C4TC	S4MF	REMOVE LM ACCESS STEPS PER V-30539, APPENDIX D. REPORT WHEN COMPLETE, (COORDINATE DIRECTLY WITH GRUMMAN PAD LEADER)	#







TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
T-27:30 1 DAY 3 HRS 30' 0"						
	161	25	C4TC	C4ES	START S-IVB PREPOWER PREPS PER V-30539, APPENDIX A	
	171	26	C4TC	C2TC	INSTALL S-II/S-IVB SEPARATION SIMULATION JUMPER FOR ENGINE SEQUENCE (X02-220 A2J7). REMOVE WHEN ENGINE SEQUENCE IS COMPLETE.	
	171	27	C2TC	L2RR	INSTALL JUMPER J7 IN X02-220A2 FOR S-IVB ENGINE SEQUENCE TEST. REMOVE JUMPER UPON C2TC REQUEST.	
		27-1			VERIFICATION BY LV-QAL:  INSTALLED ----- REMOVED -----	
T-27:00 1 DAY 3 HRS 0' 0"						
	121	1	CLTC	C1TC C2TC C4TC	START UMBILICAL RELEASE SENSOR CHECK PER V-31045 AND V-30539, REPORT WHEN COMPLETE.	
	181	2	C1TC	CSPP	START UMBILICAL RELEASE SENSOR CHECKS PER V-31045.	
	171	3	C2TC	U2MU U2PF	GO TO CH 181 AND SUPPORT UMBILICAL RELEASE SENSOR CHECKS PER V-31045.  WHEN COMPLETE, REINSTALL RELEASE SENSORS PER V-30029(M020) TASK 24, AND THEN START S-II 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.	







TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
T-25:15						
- 1 DAY						
1 HRS						
15' 0"						
121		2	CLTC	C2TC C4TC	APPLY SWITCH POWER, REPORT WHEN COMPLETE	
121		3	CLTC	CUTC	SWITCH POWER IS ON - INITIALIZE DISCRETES	
151		4	CUTC	BGCC	INITIALIZE DISCRETES PER V-22006 (PROGRAMS NT99 & NT98), REPORT WHEN SWITCH SCAN IS BEING DISPLAYED.	
181		5	C1TC	CPDC	PREP ESP FOR LOWERING PER V-36070, REPORT WHEN READY TO LOWER.	
T-25:05						
- 1 DAY						
1 HRS						
5' 0"						
121		1	CUTC	CLTC	SWITCH SCAN IS BEING DISPLAYED FOR VERIFICATION.	
121		2	CLTC	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	START REDUNDANT POWER SUPPLY PER V-21222, REPORT WHEN COMPLETE.	
121		6	CLTC	CUTC	SWITCH SCAN IS SATISFACTORY - BRING UP COMPUTER.	
T-25:02						
- 1 DAY						
1 HRS						
2' 0"						
151		1	CUTC	CUIP CUCP CUNP	VERIFY PANEL SWITCHES ARE CONFIGURED PER V-21223 TO SUPPORT KA01 (IU POWER APPLICATION)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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T-25:00  
 - 1 DAY  
 1 HRS  
 0' 0"

2200 E

151		1	CUTC	BGCC	ENTER SGO AND REPORT WHEN COMPUTER SUPPORTING.	
121		2	CUTC	CLTC	GROUND COMPUTER IS SUPPORTING	
188		3	CLTC	ALL	GROUND COMPUTER IS SUPPORTING	

3-1

\*\*\* NOTE ALL DISPLAY CONSOLE OPERATORS, PRIOR TO SELECTING ANY COMPUTER PROGRAM, ACCOMPLISH THE FOLLOWING (NOT REQUIRED DURING LINKING PROGRAMS):

1. MOMENTARILY DEPRESS TV TRANSMIT
2. TYPE "1"
3. MOMENTARILY DEPRESS EXECUTE
4. MOMENTARILY DEPRESS CLEAR

4


NOTE

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WHEN LINKING PROGRAMS ARE UTILIZED, SEQUENCES WITH THREE ASTERISKS IN THE COMMAND STA AND REMARKS COLUMNS WILL BE DONE AUTOMATICALLY BY THE LINKING PROGRAM. IF THE LINKING PROGRAM IS NOT UTILIZED, THE TEST CONDUCTOR FOR THE INDICATED COMM CH WILL, AT THE APPROPRIATE TIME, REQUEST THE OPERATORS TO DO THESE FUNCTIONS MANUALLY. PROGRAMS WILL NORMALLY BE DONE AT THE TIME SHOWN BUT MAY, AFTER COORDINATION ON CH 121, BE CALLED EARLY BY CLES (VALJ) OR DELAYED BY CLFK (KAF1)/CLGK (KAPW, KAG1)/ C1PK (VALJ)





TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
						
T-25:00					<i>CD ONLY</i>	
1 DAY					<i>2200E</i>	
1 HRS						
0' 0"						
	181	19	C1TC	C1PE	CONFIGURE S-IC PNEUMATIC CONSOLES PER V-24327 PREPOWER ON	
	151	20	CUTC	SUVM	REMOVE CHE HOIST	#
	151	21	CUNE	CUTC CUES	VERIFY LIFTOFF LIGHT ON PRIOR TO IU STAGE POWER APPLICATION (HARDWIRE CHECKS).	
-24 HRS						
55' 0"						
	151	1	***	CUNP	REQUEST & EXECUTE KA01 (IU POWER UP). REPORT WHEN COMPLETE.	***
-24 HRS						
50' 0"						
	121	1	CLTC	BTMC	START TCE PREPS PER V-28009. REPORT WHEN COMPLETE.	
	181	2	C1TC	V1MS	START S-IC VEHICLE MEASURING STATION PREPS PER V-27098	
	151	3	BUTM	CUTC	TCE STATION SETUP IS COMPLETE.	
	171	4	R2SC	C2TC	LCC MEASURING STATION SETUP IS COMPLETE.	
	171	5	V2MS	C2TC	VAB MEASURING STATION SETUP IS COMPLETE.	
-24 HRS						
45' 0"						
	121	1	CUTC	CLTC	ALTERNATE FIRING ROOM IS SUPPORTING.	
	151	2	C2TC	CUTC	CLOSE S-II 400 HZ CIRCUIT BREAKER	
	171	3	C2TC	R2SC	VERIFY READY FOR S-II STAGE AND ESE POWER	

*Rise*

*RDSC 2 ON STATION*

*2215*







TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 20: 0"	161	7	G4ES	C4NP	BATTERY MONITOR TO AUTO AFTER BATTERY VOLTAGES ARE RECORDED.	
	161	8	G4ES	C4TC	FLIGHT BATTERY CONNECTION AND LOADING COMPLETE.	
	161	9	G4TC	C4PS	START PROPULSION FINAL CHECKS PER V-30539, SECT K.	
	121	10	BTMC	CLTC	TCE PREPS COMPLETE PER V-28009	
	121	11	CLTC	ETMS BTMI	VERIFY CIF DATA TRANSMISSION LINK ON	
-24 HRS 15: 0"	121	1	CLTC	C1TC C2TC C4TC CUTC	VERIFY STAGE AND GROUND POWER APPLIED	
	111	2	CLTC	CVTS	LV POWER IS ON.	YCPI
-24 HRS 10: 0"	181	1	G1TC	C1NE	VERIFY CIRCUIT BREAKER LOCKS HAVE BEEN INSTALLED PER V-21035	
	181	2	G1TC	C1NP	POSITION 1D181 BUS TO ON, VERIFY INDICATION	
	181	3	G1TC	V1MS	VERIFY S-IC VEHICLE MEASURING STATION PREPS COMPLETED PER V-27098.	
	181	4	G1TC	B1TM	START S-IC TM DDAS CHECKS PER V-28186.	
	181	5	G1TC	C1EN	PLACE IGNITORS INSTALLED TO ARM MOMENTARILY THEN AUTO AND VERIFY ALL IGNITOR AND HYPERGOL INSTALLED INDICATIONS ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 10' 0"		6			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	7	C1TC	C1PE	START PROPULSION SYSTEM FUNCTIONAL TEST PER V-34012. REPORT WHEN COMPLETE.	
	181	8	C1TC	C1PE C1NE	VERIFY READY TO LOWER ENGINE SERVICE PLATFORM.	
	181	9	C1TC	CPDC	START LOWERING ENGINE SERVICE PLATFORM PER V-36070.	
-24 HRS 5' 0"						
	121	1	CLTC	CUFS	START FLIGHT CONTROL SYSTEM PREPS ON CH 123.	(KAF2)
	123	2	CUFS	CUSP CUGA	PLACE ALL FCC, CCIS AND EDS/CRG PANEL SWITCHES TO AUTO	(KAF2)
	151	3	CUFS	CUES	VERIFY EDS AUTO ABORT BUS DEENERGIZED AND WILL REMAIN OFF UNTIL COMPLETION OF CTC4.	(KAF2)
	151	4	CLFK	BGCC	MOUNT CTC4/CSBD SCALE FACTOR TAPE ON IODC 1-3.— REPORT WHEN COMPLETE.	
-24 HRS 0' 0"						
	181	1	C1TC	CCLO	START LOX SYSTEM PREPS FOR LOADING PER V-25340.	
	181	2	C1TC	CCLH	START LH2 SYSTEM PREPS FOR LOADING PER V-35004.	



LV CDDT & CD, VOL II

DATE: MAY 18, 1971

APOLLO/SATURN LAUNCH OPERATIONS

REVISION 029

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-24 HRS 01 00"						
	181	13	C1TC	CPDC	REMOVE GIMBAL PLATFORMS FROM AROUND ENGINES PER V-36070 AS REQUIRED BY PROPULSION SYSTEM ENGINEER. USE TAG LINE TO KEEP SECTION FROM FALLING.	
	151	14	CUTC	CCAP LRPR	INSTALL AUXILIARY POWER CIRCUIT BREAKER LOCKING PINS PER V-31062, APPENDIX E. REPORT WHEN COMPLETE.	
	181	15	C1TC	CECS	START ECS PREPS PER V-36074, PART A	
	171	16	C2TC	U2EC	START S-II FINAL ECS CHECKS PER V-30029 (M020) TASK 17. REPORT WHEN COMPLETE	
	171	17	C2TC	U2MH	START FINAL ENGINEERING WALKDOWN OF ENGINE ACTUATION, ENGINE COMPARTMENT CONDITIONING AND THERMAL CONTROL SYSTEMS. REPORT WHEN COMPLETE.	
	171	18	C2TC	C2EC	PERFORM FINAL "G" SWITCH CHECKOUT AND SECURING PER V-30029 (M020) TASK 53. REPORT WHEN COMPLETE.	
-23 HRS 55 00"						
	121	1	CUFS	CLTC	KAF2 COMPLETE. STARTING CTC4.	
	123	2	***	CLFK	REQUEST AND EXECUTE CTC4 NORM OPTION (CRG CALIB TEST; P, Y, R AXES; POS & NEG; B1-LEVEL PKG; COMPARATOR TEST AND RATE EXCESSIVE TEST). REPORT WHEN COMPLETE.	***
		3			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	4	C1TC	C1PE	START S-IC PNEUMATIC SYSTEM FUNCTIONAL TEST PER V-24327.	

2305E

Rise



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
23 HRS 50' 0"						
	121	1	C4TC	CLTC	APS ENGINE VALVE POWER OFF AND WILL REMAIN OFF UNTIL T-9'58", SAFETY LOCK IS INSTALLED,	
	181	2	C1TC	B1TM	VERIFY S-IC TM DDAS CHECKS COMPLETED PER V-28186	
	181	3	C1TC	C1NE	VERIFY TCS FUNCTIONAL TEST IS COMPLETE	
23 HRS 40' 0"						
	151	1	CUTC	CUNE	VERIFY IU BATTERY CONNECTIONS ARE COMPLETE	#
23 HRS 30' 0"						
	121	1	CUFS	CLTC	CTC4 COMPLETE. STARTING KAF2 (FCC PREPS)	
	123	2	***	CLFK	REQUEST & EXECUTE KAF2 (FLT CONTROL PREPS) WITH THE FOLLOWING OPTIONS:  PRIMARY OPTION 2 (FCC PREPS) SECONDARY OPTION 1 (COMPARATORS RESET)	***
	123	3	CUFS	CUSP	FLIGHT CONTROL COMPUTER SYSTEM POWER SWITCH - ON,	
	151	4	CLFK	BGCC	REMOVE CTC4/CSBO SCALE FACTOR TAPE FROM IODC 1-3.	
	151	5	CUTC	SUVM	REMOVE S/A 7 AUX COOLANT LINES PER V-31062. REPORT WHEN COMPLETE.	#
23 HRS 25' 0"						
	121	1	CUFS	CLTC	KAF2 AND KAF1 COMPLETE.	
	121	2	***	CLGK	REQUEST & EXECUTE KAPW (LVDC/LVDA POWER ON) PER V-33033, SECT I, (FT04, FT35, FT20, FT23 AND FT08)	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-23 HRS 16' 0"		181	1	C1TC	CSPP	VERIFY RELEASE SENSOR CHECKS ARE COMPLETE PER V-31045.	
		181	2	C1TC	CSPP	START <u>43D100</u> & <u>43D200</u> BUS CHECKS PER V-21194	
		181	3	C1TC	CPDC	VERIFY ENGINE SERVICE PLATFORM IS REMOVED AND CONNECT WINCH CABLES TO LLP PER V-36070.	
		121	4	C1TC	CLTC	REQUEST CLOSED LOOP CLEARANCE FOR 450 MHZ FOR <u>DRSCS PREPS</u> (PROTECTION NOT REQUIRED)	
		111	5	CLTC	CVTS	REQUEST CLOSED LOOP CLEARANCE FOR 450 MHZ FOR DRSCS PREPS (PROTECTION NOT REQUIRED)	TCPI *
		121	6	CLTC	BGCC	VERIFY DATA INPUT TAPE FOR BT01 MOUNTED ON IODC 1 STA 3.	(BT01)
-23 HRS 15' 0"		121	1	CVTS	CLTC	SPACECRAFT IS READY FOR SC CONTROL OF SATURN ATTITUDE COMMAND CHECKS ON CH 212	TCPI
		121	2	CLTC	ALL	FOLLOWING PERSONNEL GO TO CHANNEL 212 TO SUPPORT SC CONTROL OF SATURN ATTITUDE COMMAND CHECKS: CUPS, CUSP, CUFE, CUCR, CUSW, C4FC, C4FS	TCPI
		212	3	MSTC	CUSP CUCR CUSW C4FC	VERIFY READY FOR SC CONTROL OF SATURN COMMAND TEST	TCPI
		212	4	MSTC	CUSW	ISSUE IU OCTAL 031 (SC CONTROL OF SATURN ENABLE)	TCPI
		212	5	MSTC	SCDR	LV GUID SW - CMC	TCPI
		212	6	MGNR		SC CONTROL OF SAT LIGHT ON/SAT TAKEOVER ENABLE LIGHT ON	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 15' 0"						
		212	MSTC	CUSP	VERIFY SC CONTROL INDICATION ON	TCPI
		212	MSTC	SCDR	RHC2 ARMED	TCPI
		212	MSTC	CUSP	S-IVB COAST MODE SWITCH TO ON	TCPI
		212	MSTC	SCDR	RHC2 - (+) ROLL SOFT STOP	TCPI
		212	MSTC	CUCR C4FC	VERIFY PLUS ROLL COMMAND, I-IV AND III-II APS FIRING	TCPI
		212	MSTC	SCDR	RHC2 - (-) ROLL SOFT STOP	TCPI
		212	MSTC	CUCR C4FC	VERIFY MINUS ROLL COMMAND, I-II AND III-IV APS FIRING	TCPI
		212	MSTC	SCDR	RHC2 - (+) PITCH SOFT STOP	TCPI
		212	MSTC	CUCR C4FC	VERIFY PLUS PITCH COMMAND, I-P APS FIRING	TCPI
		212	MSTC	SCDR	RHC2 - (-) PITCH SOFT STOP	TCPI
		212	MSTC	CUCR C4FC	VERIFY MINUS PITCH COMMAND, III-P APS FIRING	TCPI
		212	MSTC	SCDR	RHC2 - (+) YAW SOFT STOP	TCPI
		212	MSTC	CUCR C4FC	VERIFY PLUS YAW COMMAND, I-II AND III-II APS FIRING	TCPI
		212	MSTC	SCDR	RHC2 - (-) YAW SOFT STOP	TCPI
		212	MSTC	C4FC CUCR	VERIFY MINUS YAW COMMAND, I-IV AND III-IV APS FIRING	TCPI
		212	MSTC	SCDR	RHC2 - NEUTRAL THEN LOCK	TCPI
		212	MSTC	CUSW	ISSUE IU OCTAL 051 (SC CONTROL OF SATURN DISABLE)	TCPI



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 10: 0"		8-1		CLGK	*** NOTE VERIFY DIN 4 ON & DIN 9 OFF	
223		9	CLGK	CLGK	TERMINATE FT25	
223		10	***	CLGK	REQUEST & EXECUTE FT33 (ISSUE D04 ON) AND VERIFY.	***
223		11	***	CLGK	TERMINATE FT33.	***
223		12	***	CLGK	REQUEST & EXECUTE FT25.	***
		12-1		CLGK	*** NOTE VERIFY DIN 4 AND DIN 9 ON.	
223		13	***	CLGK	TERMINATE FT25.	***
223		14	***	CLGK	REQUEST & EXECUTE FT33 (ISSUE D04 OFF AND D06 ON) AND VERIFY.	***
223		15	***	CLGK	TERMINATE FT33.	***
223		16	***	CUSW	ISSUE IU OCTAL 051 (SC CONTROL OF SATURN DISABLE).	***
223		17	***	CLGK	REQUEST & EXECUTE FT25.	***
		17-1		CLGK	*** NOTE VERIFY DIN 4, 9 ON.	
223		18	***	CLGK	TERMINATE FT25.	***
223		19	***	CLGK	REQUEST & EXECUTE FT33 (ISSUE D06 OFF) AND VERIFY.	***
223		20	***	CLGK	TERMINATE FT33.	***
223		21	***	CUSW	ISSUE IU OCTAL 051 (S/C CONTROL OF SATURN DISABLE).	***
223		22	***	CLGK	REQUEST & EXECUTE FT25.	***
		22-1		CLGK	*** NOTE DIN 4 ON AND DIN 9 OFF.	
223		23	***	CLGK	TERMINATE FT25.	***
223		24	***	CUSW	ISSUE IU OCTAL 031 (S/C CONTROL OF SATURN ENABLE).	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 10: 0"						
	223	25	***	CLGK	REQUEST & EXECUTE FT25.	***
		25-1		CLGK	*** NOTE VERIFY DIN 4 AND DIN 9 ON.	
	223	26	CLGK	MGNS	TURN ON SATURN INJECTION SEQUENCE START	TCPI
	223	27	CLGK	SCDR	PANEL 2, LV TRANSLUNAR SWITCH TO SAFE.	TCPI
		27-1		CLGK	*** NOTE DIN 20 ON & DIN 6 OFF.	
	223	28	CLGK	MGNS	TURN OFF SATURN INJECTION SEQUENCE START	TCPI
		28-1		CLGK	*** NOTE VERIFY DIN 20 OFF & DIN 6 ON.	
	223	29	CLGK	SCDR	PANEL 2, LV TRANSLUNAR SWITCH TO INJECT.	TCPI
		29-1		CLGK	*** NOTE VERIFY DIN 6 OFF	
	223	30	CLGK	MGNS	TURN SATURN CUTOFF ON.	TCPI
		30-1		CLGK	*** NOTE VERIFY DIN 23 AND INT 7 ON.	
	223	31	CLGK	MGNS	TURN SATURN CUTOFF OFF.	TCPI
		31-1		CLGK	*** NOTE VERIFY DIN 23 OFF AND INT 7 OFF.	
	223	32	CLGK	SCDR	PANEL 2, LV GUIDANCE SWITCH TO IU.	TCPI
		32-1		CLGK	*** NOTE VERIFY DIN 4, 6, 9, 20, 22 & 23 OFF AND INT 2 & 7 OFF.	
	223	33	CLGK	CLGK	TERMINATE FT25	
	223	34	***	CUSW	ISSUE IU OCTAL 051 (SC CONTROL OF SATURN DISABLE).	***
	223	35	CLGK	SCDR MGNS	SUPPORT NO LONGER REQUIRED.	TCPI



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 01 0"						
121	10	CLTC	QUIP		Q-BALL POWER ON Q-BALL HEATER POWER - ON	TCPI +
171	11	C2TC	C2NP		START ONE POINT CAL PER V-30029 (M020) TASK 18. REPORT WHEN COMPLETE.	
121	12	***	CPRK		REQUEST AND EXECUTE BT01 (PROPELLANT MONITOR UPDATE) AND BE01 AND BE02 (PROPELLANT MONITOR PROGRAMS).	*** +
		12-1	CPRK		*** NOTE VERIFY BE01 & BE02 OPERATION IS NORMAL AFTER BT01 TERMINATION, THEN TERMINATE BE01 & BE02.	
		12-2	CPRK		*** NOTE IF RCA 110A COMPUTER SUPPORT IS LOST AFTER T-23 HRS, THE FOLLOWING SEQUENCES ARE TO BE ACCOMPLISHED WHEN THE COMPUTER IS AGAIN SUPPORTING:  1. VERIFY THAT PROGRAMS BE01 AND BE02 MEMORY IN ML COMPUTER IS LOST.  2. REQUEST BGCC TO MOUNT BT01 2. REQUEST BGCC TO MOUNT BT01 PARAMETER TAPE ON STA 1-3. CPRK REINITIATE BT01 TEST PROGRAM.  3. IF T - TIME IS PAST T-8:20 HRS WHEN RCA-110A COMPUTER SUPPORT IS LOST, RE-INITIATE THE BE01 AND BE02 PROGRAMS WITH APPLICABLE OPTIONS AND SCAN RATES. (REFERENCE: V-35014 OR V-25389).	
121	13	CLTC	ALL		FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO SUPPORT APS GAIN TEST CTC5:  CLFK      CUCR      CUGA      C4FC CLGK      CUFE      CUSP      C4FS	(CTC5)
123	14	CUFS	C4FC C4HY		VERIFY PREPS COMPLETE AND S-IVB HYDRAULICS OFF	(CT



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-23 HRS 01 00"						
	123	15	CUFS	CLGK	VERIFY READY TO SUPPORT CTC5 & CTC1	(CTC5)
	151	16	CUFS	BGCC	MASK THE FOLLOWING DISCRETES: SFUNC SE935-38 MMSK (MDI'S 0888-0911)	(CTC5)
	171	17	U2EC	C2TC	S-II FINAL ECS INSPECTION COMPLETE AND SYSTEM IN FLIGHT CONFIGURATION.	
	171	18	U2MH	C2TC	EAS/ENGINE COMPARTMENT CONDITIONING SYSTEM FINAL ENGINEERING WALKDOWN COMPLETE.	
		19			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS; * * *****	
	181	20	C1TC	C1PE	PREPARE S-IC <u>HYDRAULIC UNIT</u> PER V-34012. REPORT WHEN COMPLETE.	
	181	21	C1TC	BRFS	<u>TURN ON ML AND LCC GSE POWER</u>	
	181	22	C1TC	RDTS	<u>VERIFY BACKUP FIRING ROOM DTS IS SUPPORTING</u>	RDSC 2
	171	23	C2TC	U2PF	START PROPELLANT FILL AND HAZARDOUS GAS DETECTION SYSTEMS INSPECTIONS PER V-30029 (M020) TASK 21.	
-22 HRS 59 00"						
	121	1	CPRK	CLTC	BT01 COMPLETE	
	121	2	***	CLFK	REQUEST AND EXECUTE KAF1 OPTION 2 (CTC5 & CTC1)	***
	123	3	***	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.	***

2400

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
22 HRS 59' 0"		3-1	CLFK		*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE	
		3-2	CUNP		*** NOTE GROUP 1 RESET WILL BE ISSUED PERIODICALLY DURING THIS PROGRAM	
22 HRS 45' 0"	161	1	C4TC	S4MF	INSTALL LM ACCESS STEPS PER V-30539 APPENDIX D, REPORT WHEN COMPLETE.	#
22 HRS 30' 0"	151	1	CUTC	SUVM	VERIFY ST-124M PURGE LINE AND PLENUM CHECK VALVE REMOVED,	#
	171	2	L2PD	C2TC	CIRCUIT BREAKERS LOCK INSTALLATION IS COMPLETE.	
	121	3	CLTC	VURF	ENABLE LOCAL CCS CARRIER AND VERIFY.	
	121	4	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	5	CLTC	VURF	VERIFY CCS IN LOCK, START CCS CHECKS PER V-28069.	
	111	6	CLTC	CVTS	LV COMMAND DECODER COMING ON	TCPI
	121	7	CLTC	CUIP	COMMAND DECODER POWER - ON.	
	161	8	C4TC	S4CE	VERIFY FINAL ENGINEERING WALKAROUND FORWARD COMPLETE	
	161	9	C4TC	C4ES	VERIFY S-IVB FLIGHT BATTERIES CONNECTED	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22 HRS 25: 0"	111	1	CLTC	CVTS	REQUEST RANGE INTERROGATE C-BAND BEACON #2. REPORT RANGE READOUTS TO VURF ON CHANNEL 137.	TCPI
	121	2	CLTC	C4TC	VERIFY S-IVB ENGINE SEQUENCE TEST COMPLETE OR WILL NOT BE RUN PRIOR TO COMPLETION OF CTC1.	(CTC1)
	121	3	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO SUPPORT S-IVB, S-II FLIGHT CONTROL SYSTEM GAIN TEST (CTC1):	(CTC1)
					CLGK CUSP CUNP R4HY CUFE CUCR S4HY CUGA CLFK U2MH C2FC C2FE U2LH V2MS U2FE U2LF R2SC C4FS C4FC C4HY C4NP	
		3-1		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.	
		3-2		CUNP	*** NOTE GROUP 2 RESET WILL BE ISSUED PERIODICALLY DURING THIS PROGRAM.	
	123	4	CUFS	S4HY	VERIFY ENGINE AREA CLEAR FOR HYDRAULIC OPERATION	(CTC1)
	171	5	C2TC	C2IP	VERIFY GROUND POWER TO ON	(CTC1)
	123	6	CUFS	C4NP	4D411 POWER ON OR VERIFY ON	(CTC1)
	123	7	CUFS	C4HY	AUXILIARY PUMP POWER SWITCH TO AUTO	(CTC1)
-22 HRS 20: 0"	123	1	CUFS	CUGA	PLACE EDS/CONTROL RATE GYRO SYSTEM POWER SWITCH TO ON	(CTC1)
	151	2	CUFS	BGCC	UNMASK THE FOLLOWING DISCRETES:  SFUNC SE 935-38 MREL (MDI'S 0888-0911)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22 HRS 20' 0"	121	3	CUPS	CLTC	CTC5 COMPLETE. STARTING CTC1.	
		3-1		C4HY	*****CAUTION***** * * MONITOR HYDRAULIC * * SYSTEM TEMPERATURE, DO * * NOT EXCEED 190 DEG F. * * NOTIFY CUPS WHEN * * TEMPERATURE EXCEEDS 180 * * DEG F, * * *****	
		3-2			*****WARNING***** * * THE FOLLOWING SEQUENCES * * ARE HAZARDOUS FOR THE * * S-IVB ENGINE GIMBAL * * ENVELOPE * * *****	
		4	***	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS AB, C, G, IJ, MN (AO, A1, S-IVB PRIMARY, P & Y, SW, PT, ZERO, SW, PT, 5). REPORT WHEN COMPLETE.	***
-22 HRS 15' 0"	121	4-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE.	
		1	CUTC	SUVE	START IU ELECTRICAL WALKAROUND. LV-GAL PARTICIPATION REQUIRED.	
		2	CLTC	GMIL	VERIFY GROUND STATION IN LOCK FROM CCS PCM SOURCE.	TCPI
		3	C1TC	CHDA	START HDA PRELAUNCH PREPS PER V-36069	
		4	C1TC	CPDC	VERIFY REQUIRED LLP GIMBAL PLATFORM SECTIONS REMOVED AND WINCH CABLES CONNECTED TO LLP.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
22 HRS 10: 0"						
	123	4	***	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS AB, C, F, IJK, M (AO, A1, S-II GAIN, P, Y, R, SW PT ZERO), REPORT WHEN COMPLETE.	***
		4-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON THE SANDERS CONSOLE	
	121	5	C1TC	CLTC	REQUEST BOSC PROVIDE SUPPORT FOR PCMU DISCONNECT	
	261	6	CLTC	BOSC	REQUEST SUPPORT FOR PCMU DISCONNECT, TM SWITCH POSITIONING -----	TCPI
	121	7	CLTC	C1TC C2TC C4TC CUTC	POSITION TM CAL CONTROLS FOR VATC/VALJ AND REPORT WHEN READY	
	181	8	C1TC	C1IP	TM MODE SELECT - AUTO.	(VATC)
	181	9	C1TC	C1IP	TM CALIBRATOR - AUTO	(VATC)
	181	10	C1TC	C1IP	TM CAL MODE - AUTO	(VATC)
	181	11	C1TC	C1IP	PREFLT LEVELS - AUTO	(VATC)
	181	12	C1TC	C1IP	F1 AND P1 RF TRANSMITTER - AUTO	(VALJ)
	181	13	C1TC	C1IP	LOX AND FUEL RACS POWER - AUTO	
	181	14	C1TC	C1IP	28 VDC RACS POWER - AUTO	(VAMC)
	181	15	C1TC	C1IP	400 HZ CAL POWER - AUTO	(VAMC)
	121	16	C1TC	CLTC	S-IC READY FOR VALJ/VATC	
	171	17	C2TC	C2IP	GROUND POWER - ON	(VATC)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22 HRS 10: 0"						
	171	18	C2TC	C2IP	RF COUPLER - AUTO	(VATC)
	171	19	C2TC	C2IP	TM CAL MODE - AUTO	(VATC)
	171	20	C2TC	C2IP	PREFLT LEVELS - AUTO	(VATC)
	171	21	C2TC	C2IP	FM/FM INFLT - AUTO	(VATC)
	171	22	C2TC	C2IP	PCM MODE - AUTO	(VATC)
	171	23	C2TC	C2IP	F1, F2 AND P1 RF TRANSMITTER - AUTO	(VALJ)
	171	24	C2TC	C2NP	RACS POWER - AUTO	(VAMC)
	171	25	C2TC	C2IP	FREQ MEAS CAL - AUTO	(VAMC)
	121	26	C2TC	CLTC	S-II READY FOR VALJ/VATC	
	161	27	C4TC	C4IP	TM MODE SELECT - AUTO	(VALJ)
	161	28	C4TC	C4IP	TM CALIBRATE - AUTO	(VATC)
	161	29	C4TC	C4IP	P1 TRANSMITTER - AUTO	(VALJ)
	161	30	C4TC	C4IP	PRELAUNCH CHECKOUT GROUP - AUTO	(VALJ/ VAMC)
	121	31	C4TC	CLTC	S-IVB READY FOR VALJ/VATC	
	151	32	CUTC	CUIP	RF DUMMY LOAD - AUTO	(VALJ)
	151	33	CUTC	CUIP	F1 TM - AUTO	(VATC)
	151	34	CUTC	CUIP	TM CAL MODE TO INFLT THEN AUTO	(VATC)
	151	35	CUTC	CUIP	TM CALIBRATOR - AUTO	(VATC)
	151	36	CUTC	CUIP	PREFLT LEVELS - AUTO	(VATC)
	151	37	CUTC	CUIP	F1 AND P1 RF TRANSMITTER - AUTO	(VALJ)
	121	38	CUTC	CLTC	IU READY FOR VALJ/VATC	






TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-22 HRS 01 00"						
	151	6	CUTC	LUNW	ST-124M HEATERS FROM STANDBY TO NORMAL.	
	181	7	C1TC	C1PE C1NE	VERIFY THRUST SECTION FINAL WALK THROUGH IS COMPLETE AND AREA IS READY FOR FINAL CLOSEOUT	
	188	8	CLTC	ALL	FOLLOWING STATIONS SWITCH TO CH 123 TO SUPPORT S-IC FLIGHT CONTROL SYSTEM GAIN TEST: C1FE      C1PC      C1HP      C1FC      L1EP	(CTC1)
		9			*****WARNING***** * * THE FOLLOWING THREE * * SEQUENCES ARE * * HAZARDOUS * * *****	
	123	10	CUFS	C1PC	<u>LOW LOX DOME PURGE ON</u>	(CTC1)
	123	11	CUFS	L1EP	VERIFY S-IC ENGINE AREA CLEAR FOR GIMBALING	(CTC1)
	123	12	CUFS	C1HP	<u>APPLY S-IC HYDRAULICS.</u> REPORT WHEN COMPLETE.	(CTC1)
	171	13	U2PF	C2TC	PROPELLANT FILL AND HAZARDOUS GAS DETECTION SYSTEMS WALK AROUND INSPECTIONS ARE COMPLETE.	
-21 HRS 55 00"						
	123	1	***	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS B, C, E, IJK, M (A1, S-IC GAIN, P, Y, R, SW PT ZERO), REPORT WHEN COMPLETE.	***
		1-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE	
	123	2	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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
21 HRS 55: 0"						
	123	3	CUFS	R2SC	RECORDERS TO SLOW SPEED	
	123	4	CUFS	V2MS	RECORDERS TO OFF	
	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	
21 HRS 50: 0"						
	181	1	C1TC	CSPP	VERIFY 43D100 & 43D200 BUS CHECKS COMPLETE PER V-21194	
		2			*****WARNING***** * THE FOLLOWING SEQ IS * * HAZARDOUS, * *****	
21 HRS 47: 0"	181	3	C1TC	C1PE	DISCONNECT & SECURE FUSU (OR PCMU) PER V-24327.	
	121	1	CLTC	BTMS BTMC	TM TAPE RECORDING - ON.	
21 HRS 45: 0"						
	123	1	CUFS	CUSP	VERIFY/ACCOMPLISH NO MODE LIGHTS ILLUMINATED	
	123	2	CUFS	C1PC	LOW LOX DOME PURGE OFF.	
	123	3	CUFS	ALL	ALL PERSONNEL CONCERNED WITH FLIGHT CONTROL CHECKS RETURN TO CHANNEL 121	
	121	4	CUFS	CLTC	FLIGHT CONTROL SYSTEMS GAIN TEST (CTC1) AND KAF1 COMPLETE.	
	111	5	CLTC	CVTS	VERIFY C-BAND INTERROGATION COMPLETE. STANDBY TO MONITOR POWER TRANSFER AT T-21115.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 45: 0"						
	121	6	CLTC	CUIP	G-BAND BEACON #1 INHIBIT ON G-BAND BEACON #1 AND #2 INHIBITS OFF	
		6-1		CUIP	*** NOTE BOTH BEACONS ON	
	121	7	CLTC	ETMS	VERIFY CIF READY TO SUPPORT TM CHECKS.	
	121	8	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT TEST	
	121	9	CLTC	CGIC	REQUEST ELECTROMAGNETIC COMPATIBILITY MONITORING  (ALLOW FIVE MINUTES TO OPERATING STEPS)	TCPI *
		10			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	11	C1TC	C1PE	START FINAL INSTALLATION OF BASE HEAT SHIELD ACCESS PANELS PER V-29003	*
	121	12	***	C1IP C2IP C4IP CUIP	VERIFY RF SILENCE OFF	***
	121	13	CLTC	C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT OFF	
		14			DELETED	
	121	15	***	C2IP	VERIFY GROUND POWER ON (CAL POWER)	***
	121	16	***	C1IP	TM MODE SELECT SWITCH - ANTENNA.	***
	121	17	***	C2IP	RF COUPLER TO ANTENNA	***
	121	18	***	C4IP	TM MODE SELECT SWITCH TO COAX,	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 45:00"						
	121	19	***	CUIP	RF DUMMY LOAD - ON.	***
	121	20	***	CUIP	F1 TM - ON.	***
	121	21	***	CUIP	TM CAL MODE TO INFLIGHT THEN AUTO.	***
	121	22	***	C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS ON IN SEQUENCE LISTED AND MARKED OVER CHANNEL 121.	***
	121	23	***	C1IP	F1 & P1 RF - ON.	***
	121	24	***	C2IP	F1, F2, & P1 RF - ON.	***
	121	25	***	C4IP	P1 - ON THEN AUTO	***
	121	26	***	CUIP	F1 AND P1 RF - ON	***
	121	27	***	C1IP CUIP	TM CALIBRATOR POWER - ON.	***
	121	28	***	C1IP C2IP CUIP	TM CAL MODE - PREFLIGHT & PREFLIGHT LEVELS - 50%	***
	121	29	C1PK	CLTC	TM SYSTEM PREPS FOR PARAMETER CHECK COMPLETE	
	121	30	CLTC	ETMS	START TM PARAMETERS CHECK  (DELAY 5 MINUTES MINIMUM FOR TM TRANSMITTER WARM UP)	
+21 HRS 40:30"	121	11	CLTC	ALL	VATC WILL START EXECUTING IN 30 SECONDS. FLUCTUATING MEASUREMENTS MAY OCCUR DURING NEXT 3 MINUTES.	
		11-1		BGCC	*** NOTE LCC GENERAL MESSAGE NO. 0510 "NO S/S OUTPUT - S-IVB" MAY OCCUR DURING NEXT 3 MINUTES.	
-21 HRS 40:00"	111	1	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 *

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
						
21 HRS 40: 0"					<b>CD ONLY</b>	
	121	2	CLTC	CUPC	TURN ON ST-124M SYSTEM PER V-33011.	
	121	3	CLTC	GMIL	VERIFY READY FOR CCS LOW GAIN	TCP1
	121	4	CLTC	CUSW	ISSUE IU OCTAL 052 (CCS LOW GAIN)	
	171	5	U2MH	C2TC	HYDRAULIC PERSONNEL HAVE COMPLETED REMOVAL OF NON-FLIGHT EQUIPMENT.	
	171	6	C2TC	U2SE	VERIFY OK TO REMOVE STA 30 AND HEAT SHIELD A7-84 ACCESS PLATFORMS.	
	171	7	C2TC	U2SI	START COMPLETE REMOVAL OF STATION 30/A7-84 PLATFORMS (S-II AFT ACCESS PLATFORMS) PER V-26507 (G147) TASKS 10 & 18 EXCEPT THOSE SECTIONS NEEDED FOR ACCESS TO FLIGHT BATTERIES.	#
	171	8	C2TC	U2SI	<b>CDDT ONLY</b>	
	171	9	C2TC	U2SI	START REMOVAL OF A7-84 HEAT SHIELD COVER PER V-26507 (G147) TASKS 12 & 20.	
	171	10	C2TC	U2SI	<b>CDDT ONLY</b>	
		11			DELETED	
		11-1			DELETED	
	121	12	***	CLIK	REQUEST & EXECUTE VATC (TM PREFLIGHT CALIBRATION), REPORT WHEN COMPLETE.	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 37' 0"	121	1	CLIK	CLTC	VATC COMPLETE.	
	121	2	***	CLSK	REQUEST & EXECUTE WASP (43D100 & 43D200 POWERUP AND BATTERY SWITCHOVER). REPORT WHEN COMPLETE.	***
-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 MTPC MONITOR CHANNEL 121 FOR Q-BALL SIM COMMAND IN 5 MINUTES AND PROVIDE READINGS TO VUMS ON CH 148.	TCPI
-21 HRS 30' 0"		1		CLTC CUIP	*** NOTE VATC MUST BE COMPLETE PRIOR TO ISSUING Q-BALL SIM COMMAND.	
	121	1-1	CLTC	CUIP	Q-BALL SIM COMMAND ON FOR 10 SECONDS	TCPI
	121	1-2	CUIP	ALL	3-2-1, MARK	TCPI
	121	2	CLTC	GMIL	VERIFY READY FOR CCS HIGH GAIN.	TCPI
	121	3	CLTC	CUSW	ISSUE IU OCTAL 072 (CCS HIGH GAIN).	
	161	4	C4TC	S4MA	START FINAL CLOSEOUT OF FLAME IMPINGEMENT CURTAIN.	
-21 HRS 25' 0"	121	1	CLSK	CLTC	WASP COMPLETE.	
	188	2	CLTC	ALL	DDAS MEASUREMENTS MAY BE INTERRUPTED DURING THE ONE MINUTE CIF-DRS CHECKS.	
	121	3	CLTC	RDAS	BACKUP FIRING ROOM TAPE RECORDER ON.	
	121	4	CLTC	RDAS	ESE DRS SYNCHRONIZER TO POSITION 3.	
	121	5	CLTC	RDAS	PCM/PCM/FM CONTROL SWITCH TO SWITCHED AND VERIFY ALL STAGE DRS SYNC TO CIF DATA.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 25' 0"						
	121	6	CLTC	RDAS	PCM/PCM/FM CONTROL SWITCH TO NORMAL.	
	121	7	CLTC	RDAS	ESE DRS SYNCHRONIZER TO POSITION 2 AND VERIFY ALL DRS SYNC TO UMBILICAL DATA.	
	121	8	CLTC	RDAS	BACKUP FIRING ROOM TAPE RECORDER OFF.	
-21 HRS 20' 0"						
	121	1	***	C1IP	LOX AND FUEL RACS POWER - ON	***
	121	2	***	C1IP	28 VDC RACS POWER ON	***
	121	3	***	CLIK	REQUEST & EXECUTE VAMC (MEAS SYS RAPID CAL) ALL STAGES. REPORT WHEN COMPLETE.	***
		3-1		ALL	*** NOTE STAGE MEASUREMENTS WILL BE INTERRUPTED DURING VAMC	
		3-2		C1IP	*** NOTE 28 VDC RACS AND 400 HZ POWER - ON	
	181	4	C1TC	CSPP	VERIFY FIRING SYSTEM BATTERY SWITCHOVER TEST COMPLETE AND REMOVE 43D100 AND 43D200 POWER	
-21 HRS 17' 0"						
	121	1	CLIK	CLTC	VAMC COMPLETE	
		1-1		C1IP	*** NOTE 28 VDC RACS AND 400 HZ POWER - OFF	
	121	2	***	C1IP	LOX & FUEL RACS POWER - OFF	***
	181	3	C1TC	BRFS	VERIFY DRSCS/GSE READY TO SUPPORT LV POWER TRANSFER TEST	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
21 HRS 17: 0"						
	111	4	CLTC	CVTS	REQUEST GMIL VERIFY CCS INTERROGATION COMPLETE, STANDBY TO MONITOR CCS DURING POWER TRANSFER, COMMAND DECODER ON, IU COMMAND SYSTEM IS DISABLED.	TCPI
	111	5	CLTC	CVTS	LV 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
		5-1			*** NOTE BOTH C-BAND BEACONS ON	
	121	6	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS.  POWER TRANSFER TEST PREPS -----	(VAPX)
	111	7	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP LOCAL UHF COMMAND CARRIER (PROTECTION REQUIRED)	TCPI (VAPX)
	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	(VAPX)
	121	10	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE.	(VAPX)
		10-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON	
	121	11	CLTC	RRSC	VERIFY DRSCS RECORDERS ON	(VAPX)
		12		C2NP	ACTIVATE BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE. (CD ONLY)	
	188	13	CLTC	ALL	ALL PERSONNEL SUPPORTING POWER TRANSFER TEST MONITOR CHANNEL 121 AND SWITCH TO INDIVIDUAL "STAGE TC" ACTIVE CHANNELS TO PREPARE FOR POWER TRANSFER.	

*OK 3 E*



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
21 HRS 17: 00		14			*****WARNING***** * THE FOLLOWING SEQ'S ARE * * HAZARDOUS FOR THE S-IC * * ENGINE GIMBAL ENVELOPE, * *****	
	121	15	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO SUPPORT FLIGHT CONTROL SYSTEM PREPS FOR POWER TRANSFER: CUPS CUCR C1FE L1EP CUSP C1PC CUGA	(VAPX)
	121	16	CLTC	CUPS	PREPARE FLIGHT CONTROL FOR POWER TRANSFER	(VAPX)
	123	17	CUPS	C1PC	LOW LOX DOME PURGE ON	(VAPX)
	123	18	CUPS	L1EP	VERIFY S-IC ENGINE SECTION CLEAR FOR ENGINE GIMBALLING	(VAPX)
	121	19	CUPS	CLTC	FLIGHT CONTROL READY FOR POWER TRANSFER.	(VAPX)
	181	20	C1TC	C1NP	VERIFY INTERNAL AND EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER.	(VAPX)
	181	21	C1TC	C1NP	POWER TRANSFER TO AUTO	(VAPX)
	181	22	C1TC	C1NP	<b>CDDT ONLY</b>	(VAPX)
	181	23	C1TC	C1NP	BATTERY INSTALLED ENABLE SWITCH TO ON THEN AUTO	(VAPX)
		23-1		C1NP	*** NOTE S-IC READY FOR POWER TRANSFER ON THEN OFF	
	181	24	C1TC	C1NE R1SC	VERIFY READY FOR POWER TRANSFER.	(VAPX)
	121	25	C1TC	CLTC	S-IC READY FOR POWER TRANSFER PROGRAM REQUEST	(VAPX)
	171	26	C2TC	C2NP	BATTERY INSTALLED TO AUTO.	(VAPX)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<div style="display: flex; justify-content: space-around;"> <span>▶</span><span>▶</span><span>▶</span><span>▶</span><span>▶</span><span>▶</span><span>CD ONLY</span><span>◀</span><span>◀</span><span>◀</span><span>◀</span><span>◀</span><span>◀</span> </div>						
021 RS 17:00						
171	27	C2TC	C2NP		IGN BATT BLEED TO ON	# (VAPX)
171	28	C2TC	C2NP		VERIFY MAIN, INSTR & RECIRC POWER TRANSFER SWITCHES IN AUTO.	(VAPX)
171	29	C2TC	C2NP		APPLY PM POWER	(VAPX)
171	30	C2TC	C2NP R2SC		VERIFY READY FOR POWER TRANSFER.	(VAPX)
121	31	C2TC	CLTC		S-II READY FOR POWER TRANSFER PROGRAM REQUEST.	(VAPX)
161	32	C4TC	C4NP		EMERGENCY POWER TRANSFER SWITCH OFF.	(VAPX)
161	33	C4TC	C4NP		BATTERY MONITOR TO AUTO	(VAPX)
161	34	C4TC	C4NP		VERIFY 4D411 POWER ON.	(VAPX)
161	35	C4TC	C4NP		<b>CDDT ONLY</b>	(VAPX)
161	36	C4TC	S4HY		VERIFY S-IVB ENGINE SECTION AREA CLEAR, FOR HYDRAULICS.	(VAPX)
161	37	C4TC	C4HY		VERIFY FLIGHT MODE IS IN AUTO OR POSITION TO AUTO.	(VAPX)
161	38	C4TC	R4EI R4HY R4SC		RECORDERS FAST.	(VAPX)
161	39	C4TC	C4IP		PRELAUNCH CHECKOUT GROUP TO AUTO	(VAPX)
161	40	C4TC	C4EP		VERIFY CHILLDOWN PUMP SWITCHES ARE OFF	(VAPX)
161	41	C4TC	C4EP		CLOSE LOX AND LH2 CHILLDOWN VALVES.	(VAPX)
161	42	C4TC	C4PU		PU POWER ON THEN AUTO	(VAPX)
161	43	C4TC	C4NP C4PP		VERIFY INTERNAL & EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER.	(VAPX)
	43-1				CDDT ONLY	* D-97-60

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
021 HRS 17: 00						
	161	44	C4TC	C4NP C4NK R4EI C4HY R4SC	VERIFY READY FOR POWER TRANSFER,	(VAPX)
	161	45	C4TC	C4NP	POWER TRANSFER SWITCH TO AUTO	(VAPX)
	121	46	C4TC	CLTC	S-IVB READY FOR POWER TRANSFER PROGRAM REQUEST,	(VAPX)
	151	47	CUTC	CUNP	VERIFY INTERNAL & EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER,	(VAPX)
	151	48	CUTC	CUNP	<b>CDDT ONLY</b>	(VAPX)
	151	49	CUTC	CUNP RUBM	VERIFY READY FOR POWER TRANSFER,	(VAPX)
		49-1	CUTC CUNP		*** NOTE IU TO REMAIN ON INTERNAL POWER FOR 3 MINUTES	
	151	50	CUTC	CUNP	POWER TRANSFER TEST TO AUTO	(VAPX)
	121	51	CUTC	CLTC	IU READY FOR POWER TRANSFER PROGRAM REQUEST,	(VAPX)
	121	52	CLTC	C1NK C2NK C4NK CUNK	MONITOR CONSOLE 12 DURING VAPX	
	121	53	CLTC	C1TC C2TC C4TC CUTC	AFTER TRANSFER TO INTERNAL/EXTERNAL SECURE STAGES FROM POWER TRANSFER ON STAGE TC CHANNELS,	
		53-1	ALL		*** NOTE S-IC & S-II ON INTERNAL POWER FOR 30 SEC; S-IVB FOR 45 SEC; IU FOR 3 MINUTES. REPORT BATTERY VOLTAGES AND CURRENTS TO CLES ON CH 125.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 17: 0"		53-2	CUCR CUGA		*** NOTE VAPX WILL TORQUE THE ROLL GYROS TO +9 DEG/SEC CAUSING THE S-IC ENGINES TO GIMBAL	
		54			NOTE ----- IF A TEST IS TO BE PERFORMED MANUALLY, THE SEQUENCES WITH THE AUTO PROGRAM IVAR IN THE COMMAND STATION COLUMN WILL BE COMMANDED BY THE TEST CONDUCTOR ASSOCIATED WITH THE OIS COMM CH SHOWN.	
-21 HRS 15: 0"					POWER TRANSFER TEST -----	
121		1	CLTC	C1PK	REQUEST & EXECUTE VAPX (T-21 HOUR OPTION)	
121		2	VAPX	BRFS	DRSCS RF CARRIER ON AND VERIFY	
161		3	VAPX	C4NP	BATTERY MONITOR ENABLE	
121		4	VAPX	C1DP C2DP C4DP	RSCR'S 1 & 2 INTERNAL AND VERIFY	
		4-1		C1DP C2DP C4DP	*** NOTE EBW'S 1 & 2 OFF.	
		4-2		B1RF B2RF B4RF CRSS	*** NOTE ALL RSCR LIMITER VOLTAGES RECEIVED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
21 HRS 15: 0"		5		C4HY	<p>*****CAUTION*****</p> <p>* * MONITOR HYDRAULIC * * SYSTEM TEMPERATURE, DO * * NOT EXCEED 190 DEG F, * * NOTIFY C4TC WHEN * * TEMPERATURE EXCEEDS 180 * * DEG F. * *</p> <p>*****</p>	
		6			<p>*****WARNING*****</p> <p>* * THE FOLLOWING SEQUENCES * * ARE HAZARDOUS FOR THE * * S-IVB ENGINE GIMBAL * * ENVELOPE. * *</p> <p>*****</p>	
161		7	VAPX	C4HY	FLIGHT MODE ON THEN AUTO.	
121		8	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3".	
121		9	C1PK	ALL	VAPX WILL TRANSFER STAGES INTERNAL IN 5 SEC, 5-4-3-2-1 MARK	
121		10	VAPX	C1NP C2NP C4NP CUNP	TRANSFER TO INTERNAL POWER	
		10-1		CUDE	*** NOTE 0777 & 0779 ON, 0781 OFF	
		10-2		C1NP	*** NOTE POWER TRANSFER EXTERNAL OFF	
		10-3		C1NP	*** NOTE POWER TRANSFER INTERNAL ON	
		10-4		C1NP	<b>CDDT ONLY</b>	
181		11	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) - ON	

21 HRS  
15:00"

21 HRS  
14:30"

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		11-1		R1SC	*** NOTE VOLTAGE FOR STAGE BUSES 1D11 & 1D21 AND VOLTAGE AND CURRENT FOR BUSES 1D10 & 1D20.	
		11-2		C1NP	*** NOTE +1D111, +1D211, +1D121 BUS INDICATIONS OFF	
		11-3		R2SC	*** NOTE RECORD THE FOLLOWING WHILE ON INTERNAL  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) -----	
	121	1	C1PK	ALL	S-IC & S-II TRANSFERED EXTERNAL DISPLAYED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
*21 HRS 14:30"	181	2	C1TC	C1NP	VERIFY POWER TRANSFER EXTERNAL ON	
		2-1		C1NP	*** NOTE S-1C POWER TRANSFER COMPLETE OFF	
		2-2		C1NP	*** NOTE POWER TRANSFER INTERNAL OFF	
		2-3		C1NP	*** NOTE BUS 1D121 ON	
		2-4		C1NP	*** NOTE BUS 1D211 ON	
		2-5		C1NP	*** NOTE BUS 1D111 ON	
		2-6		C1NP	<b>CDDT ONLY</b>	
	181	3	C1TC	R1SC	READOUT 1D11 & 1D21 VOLTAGE AND 1D10 & 1D20 VOLTAGE AND CURRENT DURING INTERNAL THEN REPORT TO CLES ON CH 125.	
	181	4	C1TC	ALL	ALL STATIONS RETURN TO CH 121	
	121	5	C1TC	CLTC	S-1C POWER TRANSFER TEST IS COMPLETE	
		5-1		C2NP	*** NOTE MAIN BUS EXTERNAL ON	
		5-2		C2NP	*** NOTE INST. BUS EXTERNAL ON	
		5-3		C2NP	*** NOTE RECIRC. BUS EXTERNAL ON	
		5-4		C2NP	*** NOTE POWER TRANSFER COMPLETE OFF	
	171	6	C2NP	C2TC	S-1I POWER TRANSFER TEST IS COMPLETE.	
	171	7	C2TC	C2NP	REMOVE PM POWER	
	171	8	C2TC	C2NP	IGN BATT BLEED TO OFF	#
	171	9	C2TC	C2NP	VERIFY STAGE ON EXTERNAL POWER	
	121	10	C2TC	CLTC	S-1I POWER TRANSFER IS COMPLETE	
	171	11	C2TC	R2SC	READOUT RECORDED BUS VOLTAGES TO CLES ON CH 125	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
21 HRS 14:15"		1		C4NP	*** NOTE AFTER 45 SECONDS ON INTERNAL, THE FOLLOWING WILL OCCUR.	
	161	1-1	VAPX	C4NP	POWER TRANSFER EXTERNAL THEN AUTO.	
	161	1-2	VAPX	C4NP	BATTERY MONITOR DISABLE THEN AUTO.	
	161	2	C4TC	C4NP C4NK	VERIFY POWER TRANSFER INTERNAL/EXTERNAL COMPLETE.	
		3		C4HY	*** NOTE 30 SECONDS AFTER POWER TRANSFER EXTERNAL THE FOLLOWING WILL OCCUR.	
	161	3-1	VAPX	C4HY	FLIGHT MODE OFF THEN AUTO.	
		4			*****WARNING***** * * RESUME PREVIOUS HAZARD * * LEVEL - END OF WARNING * * FOR S-IVB ENGINE GIMBAL * * ENVELOPE, * * *****	
	161	5	C4TC	C4NP	EMERGENCY POWER TRANSFER TO EXTERNAL	
	161	6	C4TC	C4NP	<b>CDDT ONLY</b>	*
	161	7	C4TC	C4NP	4D411 POWER OFF	
	161	8	C4TC	C4NK	TRANSMIT POWER TRANSFER DATA TO CLES ON CH 125	
	161	9	C4TC	C4EP	OPEN LOX AND LH2 CHILLDOWN VALVES	
	161	10	C4TC	C4PU	PU POWER OFF THEN AUTO.	
	161	11	C4TC	ALL	ALL STATIONS MONITOR CH 121.	
	121	12	C4TC	CLTC	S-IVB POWER TRANSFER TEST COMPLETE AND ACCEPTABLE.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS																		
21 HRS 12: 0"	151	1	CUTC	CUNP	VERIFY IU GROUND POWER ON AND POWER TRANSFER COMPLETE OFF,																			
		1-1		CUDE	*** NOTE 0777 & 0779 OFF, 0781 ON																			
	151	2	CUTC	CUNP	POWER TRANSFER TO EXTERNAL																			
	151	3	CUTC	CUNP	<b>CDDT ONLY</b>																			
	151	4	CUTC	CUNE	VERIFY POWER TRANSFER SATISFACTORY																			
	151	5	CUTC	RUBM	READOUT VOLTAGE AND CURRENTS TO CLES ON CH 125																			
					<table border="0"> <tr> <td>BUS</td> <td>VOLTAGE</td> <td>CURRENT</td> </tr> <tr> <td>-----</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>6D10</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>6D20</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>6D30</td> <td>-----</td> <td>-----</td> </tr> <tr> <td>6D40</td> <td>-----</td> <td>-----</td> </tr> </table>	BUS	VOLTAGE	CURRENT	-----	-----	-----	6D10	-----	-----	6D20	-----	-----	6D30	-----	-----	6D40	-----	-----	
BUS	VOLTAGE	CURRENT																						
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6D10	-----	-----																						
6D20	-----	-----																						
6D30	-----	-----																						
6D40	-----	-----																						
	151	6	CUTC	ALL	ALL STATIONS RETURN TO CH 121																			
	121	7	CUTC	CLTC	IU POWER TRANSFER TEST IS COMPLETE																			
	121	8	VAPX	C1DP C2DP C4DP	VERIFY EBW'S EXTERNAL AND NOT CHARGED																			
		8-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED,																			
		8-2		RRSC	*** NOTE PROPER DRSCS INDICATIONS DURING POWER TRANSFER (DRSCS RECORDER)																			
	121	9	VAPX	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO AND VERIFY RSCR POWER OFF																			
	121	10	VAPX	BRFS	DRSCS RF CARRIER - OFF																			





21 HRS  
12: 00

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
	121	39	CLTC	ETMS BTMC	TM TAPE RECORDING OFF		
	121	40	CLTC	ETMS	REPORT OUT OF TOLERANCE PARAMETERS TO BLTM ON CHANNEL 127 WHEN ANALYSIS IS COMPLETE.		
	121	41	CLTC	CUIP	C-BAND BEACON 1 - OFF C-BAND BEACON 2 - OFF		
	188	42	CLTC	ALL	THE FOLLOWING STATIONS ARE TO SWITCH TO CHANNEL 123 TO SUPPORT IU/S-IC FLIGHT CONTROL SYSTEM GAIN TEST (CTC1) AND S-IC ENGINE NOT ZERO GAIN TEST (VAFC):	(CTC1)	
					CLGK      CUSP      C1FE      L1EP CUFE      CUCR      C1FC      C1PC CUGA      CLFK      C1HP      CUNP		
	123	43	CUFS	CLGK	VERIFY READY TO SUPPORT CTC1 & VAFC	(CTC1)	
	123	44	CUFS	CUSP	VERIFY ALL CCIS PANEL SWITCHES IN AUTO	(CTC1)	
	123	45	CUFS	CUGA	VERIFY ALL EDS/CONTROL RATE GYRO PANEL SWITCHES IN AUTO POSITION EXCEPT SYSTEM POWER	(CTC1)	
		45-1		CUNP	*** NOTE GROUP 2 RESET WILL BE ISSUED PERIODICALLY THROUGHOUT THIS PROGRAM		
	123	46	CUFS	C1HP	VERIFY <u>S-IC HYDRAULICS SUPPORTING</u>	(CTC1)	
	123	47	CUFS	L1EP	VERIFY S-IC ENGINE AREA CLEAR FOR GIMBALING	(CTC1)	
	123	48	CUFS	C1PC	VERIFY/ACCOMPLISH LOW LOX DOME PURGE ON	(CTC1)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 10' 0"	123	1	***	CLFK	REQUEST & EXECUTE KAF1 LINKING PROGRAM OPTION 3 (KAF3, CTC1 & VAFC)	***
		1-1		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.	
	123	2	***	CLFK	REQUEST & EXECUTE KAF3 (THRUST VECTOR READ), REPORT WHEN COMPLETE.	***
-21 HRS 9' 0"	121	1	CUFS	CLTC	KAF3 COMPLETE, STARTING CTC1	
	123	2	***	CLFK	REQUEST AND EXECUTE CTC1, OPTIONS A, C, E, IJK, M (AO, S-IC GAIN, P, Y, R, SW PT ZERO), REPORT WHEN COMPLETE.	***
		2-1		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	CLTC	CUIP	Q-BALL POWER OFF Q-BALL HEATER POWER OFF	TCPI
	151	2	CUTC	LUGI SUVN	START IU MECHANICAL WALKAROUND PER V-31062, PART III.	
	121	3	CLTC	ETMS	VERIFY OUT OF TOLERANCE PARAMETERS REPORTED TO BLTN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-21 HRS 0' 0"	181	4	C1TC	CSPP	HAVE USAE AND LASE START LUT WALKDOWN	
	161	5	C4TC	S4MA	START AFT INTERSTAGE FINAL WALKAROUND	
	181	6	C1TC	CHCU	PREP HCU PER V-36079, REPORT WHEN COMPLETE	
	261	7	C2TC	BOSC	S-11 WILL BE READY FOR PURGE AND VACUUM DEW POINT GHE SAMPLES (2 EACH) ON S/A 4 IN 30 MINUTES. (LVN-4 & LVN-5).	TCPI
-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.	TCPI
	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	TCPI
	121	4	CLTC	CUSW	ISSUE IU OCTAL 007 (CCS OMNI)	
-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 C-BAND ANTENNA COUPLERS PER V-28069	
	181	4	C1TC	LPLX	VERIFY PTCS PREPS COMPLETED PER V-25159	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-20 HRS 35: 0"						
	121	1	CUPS	CLTC	CTC1 COMPLETE. STARTING VAFC	
	123	2	***	CLFK	REQUEST & EXECUTE VAFC (FLIGHT CONTROL UTILITY PROGRAM) PRIMARY OPTION 2 (S-IC ENGINE NOT ZERO TEST). REPORT WHEN COMPLETE.	***
	181	3	C1TC	C1NE	VERIFY READY TO SUPPORT EDS TEST.	
	121	4	CLTC	C1TC C2TC C4TC CUTC	START PREPS FOR EDS TEST PER V-21096. REPORT WHEN READY TO SUPPORT EDS TEST.	(VAED)
	171	5	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.	TCPI
	123	2	CUPS	ALL	ALL STATIONS CONCERNED WITH S-IC ALL ENGINES NULL TEST RETURN TO CHANNEL 121.	
	121	3	CUPS	CLTC	VAFC & KAF1 ARE COMPLETE.	(VAED)
	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	CUPS	PLACE ALL CCIS AND EDS/CRG PANEL SWITCHES - OFF	
	121	8	CLTC	C1HP	TURN OFF S-IC HYDRAULIC UNIT	
		9			*****WARNING***** * * RESUME PREVIOUS HAZARD * * LEVEL -- END OF WARNING * * FOR S-IC ENGINE GIMBAL * * ENVELOPE. * * *****	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
20 HRS 30: 0"						
	121	10	CLTC	C1PC	AFTER S-IC HYDRAULIC UNIT IS OFF, TURN LOW LOX DOME PURGE OFF.	*
	121	11	CLTC	CVTS	LV READY FOR EDS TEST, REQUEST SCO PERSONNEL SWITCH TO CHANNEL 223.	TCP1
	121	12	CVTS	CLTC	SCO PERSONNEL STANDING BY TO SUPPORT EDS TEST	TCP1
	121	13	CLTC	ALL	ALL LV PERSONNEL SUPPORTING EDS TEST GO TO CH 223 ACTIVE AND MONITOR CH 121	
	121	14	***	CEDK	PERFORM EDS TEST PER V-21096 (PROGRAM VZ33, FT33, VAED, VZEA, VZRE, VZSA), (SPR1 OPTION), REPORT WHEN COMPLETE.	***
	161	15	C4TC	S4MA	VERIFY FLAME IMPINGEMENT CURTAIN CLOSEOUT COMPLETE.	
	161	16	C4TC	S4MA S4PC	START REMOVAL OF AFT ACCESS KIT PER V-30539, SECT M.	*
	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	
	171	19	C2TC	C2PV	SAMPLE PURGE SYSTEMS PER V-26276 (G058), REPORT WHEN COMPLETE.	
20 HRS 20: 0"	121	1	CLTC	CUTC	VERIFY TM RADIATION SYSTEM IN FLIGHT CONFIGURATION	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
▶▶▶▶▶▶▶▶▶▶ <b>CD ONLY</b> ▶▶▶▶▶▶▶▶▶▶						
20 HRS 20: 0"						
	121	2	CLTC	CUIP	RF DUMMY LOAD OFF	
	121	3	CLTC	BTMC	TM TAPE RECORDING - ON	
	121	4	CLTC	CUIP	P1 - RF ON	
20 HRS 15: 0"						
	151	1	CUTC	CUCP	<b>CDDT ONLY</b>	* *
	151	2	CUTC	CUCP	SECURE ST-124M AIR BEARING SYSTEM PER V-34017.	# *
	151	3	CUTC	CUCP	SETUP HIGH PRESSURE REGULATOR PER V-36038. REPORT WHEN COMPLETE.	
	161	4	C4TC	S4CE	DISCONNECT S-IVB RERADIATION SYSTEM PER V-30539, SECT L.	♦
	121	5	C4TC	CLTC	VERIFY OPEN LOOP CLEARANCE ON 258.5 MHZ FOR VEHICLE ANTENNA CHECKS.	
20 HRS 0: 0"						
	121	1	CEBK	CLTC	EDS TEST IS COMPLETE	
	111	2	CLTC	CVTS	EDS TEST IS COMPLETE	TCPI *
	121	3	CLTC	CUNP	SWITCH SELECTOR INHIBIT OFF.	
	121	4	CLTC	CUSW	ISSUE IU OCTAL 026 (CMD SYS ENABLE)	(FT45)
	111	5	CLTC	CVTS	IU COMMAND SYSTEM IS ENABLED	TCPI
	121	6	CLTC	VURF	VERIFY READY TO SUPPORT FT45	(FT45)
	121	7	CLTC	CUCS	VERIFY ACS IN COMP/COMP MODE	(FT45)
	121	8	***	CLGK	REQUEST & EXECUTE KAG1 (LINKING PROGRAM)	*** *

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-20 HRS 01 00"						
121		9	***	CLGK	REQUEST & EXECUTE FT45 (COMMAND SYSTEM INTERFACE TEST)	***
121		10	CLTC	ETMS	VERIFY RECEPTION OF TM LINK DP1	
121		11	CLTC	CUIP	P1 RF - OFF	
121		12	C4TC	CLTC	REQUEST ETMS TO MONITOR CH 127 FOR S-IVB TM VEHICLE ANTENNA SIGNAL RECEPTION TEST.	
181		13	C1PE	C1TC	PCMU IS CLEAR FOR MOVE TO FALLBACK AREA	
121		14	C1TC	CLTC	REQUEST BOSC SUPPORT REMOVAL OF PCMU.	
261		15	CLTC	BOSC	REMOVE PCMU FROM ZERO LEVEL.	TCP1
121		16	CLTC	RLDE	LOAD CDDT WET OR COUNTDOWN SEQUENCE COMPARE TABLE AND START AND STOP SEQUENCE COMPARE ROUTINE PER CARE INSTRUCTIONS	
171		17	C2GP	C2TC	S-II GROUND PNEUMATICS ACTIVATED	
181		18	C1TC	CSPP	START HARDWARE FUNCTIONAL CHECKS PER V-31045. REPORT WHEN COMPLETE.	
151		19	CUTC	SUVE	VERIFY CABLE 6281W201 (CABLE FROM LRV BATT MON BOX TO X-OVER) IS DISCONNECTED FROM LRV BATT MON BOX, CAPPED AND SECURED FOR LAUNCH.	
121		20	CLTC	C1TC	START HARDWARE CHECKS PER V-21035. REPORT WHEN COMPLETE.	
181		21	C1TC	C1NE	START HARDWARE CHECKS PER V-21035. REPORT WHEN COMPLETE.	
-19 HRS 59 00"						
121		1	C2TC	CLTC	STARTING S-II HARDWARE FUNCTIONAL TEST.	
171		2	C2TC	O2NP	PERFORM S-II HARDWARE FUNCTIONAL TEST PER V-30029 (M020) TASK 99.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-19 HRS 55: 0"						
	121	1	CLGK	CLTC	FT45 COMPLETE	*
	121	2	CLTC	BTMC	TM TAPE RECORDING OFF	
	121	3	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	
	121	4	CLTC	CUIP	COMMAND DECODER - OFF CCS TRANSPONDER - OFF	
	111	5	CLTC	CVTS	IU COMMAND SYSTEM IS DISABLED.	TCPI
	121	6	CLTC	SURF	START FINAL CCS ANTENNA COUPLER REMOVAL PER V-28069	
	121	7	CLTC	VURF	POWER DOWN RF GSE PER V-28069	
	121	8	C2TC	CLTC	S-II HARDWIRE FUNCTIONAL TEST COMPLETE.	
-19 HRS 45: 0"						
	161	1	C4TC	S4CE	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 FT25 (LV DISCRETE INPUT TEST). REPORT WHEN READY TO SUPPORT.	(FT25)
	171	4	C2TC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO AUTO	(FT25)
	171	5	C2TC	C2NP	STAGE SELECT TO OFF	(FT25)
	171	6	C2TC	C2AE	ENGINE SS CUTOFF TO OFF THEN AUTO.	(FT25)
	171	7	C2TC	C2EC	MAINSTAGE OK SWITCHES TO AUTO	(FT25)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
-19 HRS 45: 0"						
	171	8	C2TC	C2EC	ENGINE CUTOFF TO AUTO	(FT25)
	171	9	C2TC	C2NP	PM POWER TO AUTO	(FT25)
	171	10	C2TC	C2NP	SIM LAUNCH TO AUTO	(FT25)
	171	11	C2TC	C2PU	ALL SWITCHES TO AUTO	(FT25)
	161	12	C4TC	C4ET	ENGINE CONTROL POWER TO AUTO	(FT25)
	161	13	C4TC	C4ET	MAINSTAGE CK SIM TO AUTO	(FT25)
	161	14	C4TC	C4ET	ENGINE COMPONENT TEST POWER ON	(FT25)
	161	15	C4TC	C40H	VOTING CIRCUIT ENABLE TO AUTO	(FT25)
	161	16	C4TC	C40H	VOTER CIRCUIT TEMP #1 SIM TO AUTO	(FT25)
	161	17	C4TC	C40H	VOTER CIRCUIT TEMP #2 SIM TO AUTO	(FT25)
	161	18	C4TC	C40H	VOTER CIRCUIT TEMP #3 SIM TO AUTO	(FT25)
	161	19	C4TC	C4SP	MODE SELECT TO BURNER THEN AUTO.	(FT25)
	151	20	CUTC	CUES	MODE SWITCH TO TEST AND VERIFY 1D199 BUS ON	(FT25)
	151	21	CUTC	BGCC	LOAD FT25 DECK IN CARD READER. REPORT WHEN COMPLETE.	(FT25)
	151	22	CUTC	BGCC	VERIFY/MOUNT LVDC FLIGHT PROGRAM ON IODC 1-3. REPORT WHEN COMPLETE.	(FT05)
-19 HRS 42: 0"						
	121	1	CLTC	C1NP C4NP CUNP	SWITCH SELECTOR INHIBIT OFF	(FT25)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-19 HRS 40' 0"						
	121	1	***	CLGK	REQUEST AND EXECUTE FT25 (LV DISCRETE INPUT TEST). REPORT WHEN READY FOR INTERSTAGE OPTION.	***
	121	2	***	CLGK	ENTER SP3 AND SP1 TO CONTINUE	***
-19 HRS 30' 0"						
	151	1	CUTC	LUOI SUVN	VERIFY IU MECHANICAL WALK AROUND COMPLETE AND SATISFACTORY.	
	151	2	CUTC	SUVN	START PARTIAL THERMAL ISOLATION SHROUD INSTALLATION PER V-31062, PART III. REPORT WHEN COMPLETE.	
	121	3	CLGK	CLTC	LV DISCRETE INPUT TEST (FT25) IS COMPLETE	
	121	4	CLTC	C1TC C2TC C4TC CUTC	SECURE FROM LV DISCRETE INPUT TEST. REPORT WHEN COMPLETE.	
	171	5	C2TC	C2AE	ALL ENG EMER CUTOFF TO CUTOFF	
	171	6	C2TC	C2EC	CUTOFF TO OFF (ENG 201 THRU 205).	
	171	7	C2TC	C2EC	MAINSTAGE OK PRESSURE SWITCH TO AUTO (ENG 201 THRU 205)	
	171	8	C2TC	C2NP	SWITCH SELECTOR INHIBIT TO ON.	
	161	9	C4TC	C40H	LOX SHUT DOWN VALVE (SW-SEL) TO CLOSE THEN AUTO	
	161	10	C4TC	C40H	LH PROPELLANT VALVE (SW-SEL) TO CLOSE THEN AUTO	
	161	11	C4TC	C4SP	MODE SELECT TO AMBIENT.	
	161	12	C4TC	C40H	VERIFY BURNER SYSTEM RELAY RESET ON AND REPRESS SYSTEM LAUNCH MODE IND ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
*19 HRS 30' 0"	161	13	C4TC	C40H	VOTING CIRCUIT ENABLE OFF	
	161	14	C4TC	C4ET	ENGINE CONTROL POWER OFF	
	161	15	C4TC	C4ET	MAINSTAGE OK SIM OFF	
	161	16	C4TC	C4ET	ENGINE COMPONENT TEST POWER OFF	
	151	17	CUTC	CUES	EDS MODE SWITCH TO MONITOR	
	181	18	C1TC	C1NP	SWITCH SELECTOR INHIBIT -- ON	
	181	19	CWCP	C1TC	INDUSTRIAL WATER SYSTEM INITIAL PREPS ARE COMPLETE PER V-36113	
	171	20	C2TC	U2AN U2QC	START FWD INTERSTAGE NON-FLIGHT HARDWARE REMOVAL AND INSPECTION PER V-30029 (M020) TASK 47.	
*19 HRS 25' 0"	121	1	***	CLGK	REQUEST & EXECUTE FT05 (DATA VERIFY)	***
*19 HRS 0' 0"	171	1	U2PF	C2TC	PROPELLANT FILL SYSTEM WALK AROUND INSPECTION IS COMPLETE.	
	171	2	C2TC	U2SE	VERIFY S-II AFT COMPARTMENT READY FOR CLOSE OUT	
	181	3	C2TC	C1TC	REMOVAL OF S-II AFT ACCESS KIT IS COMPLETE.	
	171	4	U2GC	C2TC	REMOVAL OF ALL NON-FLIGHT HARDWARE PER V-30029 (M020) TASK 47 AND THE INSPECTION PER V-24411 (0003) FOR THE AFT INTERSTAGE COMPARTMENT IS COMPLETE.	
	171	5	U2GC	C2TC	<b>CDDT ONLY</b>	

LV CDDT & CD, VOL II  
 DATE: MAY 18, 1971  
 REVISION 029

APOLLO/SATURN LAUNCH OPERATIONS

5131.00

PAGE

G97

V-20050, VOL II  
 VEHICLE AS-510

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<div style="display: flex; justify-content: space-between;"> <div style="font-size: 2em;">▶▶▶▶▶▶▶▶▶▶</div> <div>CD ONLY</div> <div style="font-size: 2em;">◀◀◀◀◀◀◀◀◀◀</div> </div>						
-19 HRS 01 07						
171		6	C2TC	U2SI	SECURE THE AFT INTERSTAGE ACCESS DOOR. REPORT WHEN COMPLETE.	•
171		7	C2TC	U2SI	START BANDING OF S-II LUT STORAGE CABINETS PER V-26507 (G147) TASK 23.	#
161		8	C4TC	C4PS	VERIFY PROPULSION FINAL PREPS PARTS 1 THROUGH 4 ARE COMPLETE AND READY FOR MSS PLAT 2 OPENING	
161		9	C4TC	S4MM	VERIFY MSS PLAT 2 READY FOR OPENING	
121		10	C4TC	CLTC	MSS PLAT 2 READY FOR OPENING	
111		11	CLTC	CVTS	YOU ARE CLEARED TO OPEN MSS PLAT 2	TCPI
181		12	C1TC	BRFS	VERIFY DRSCS FLIGHT CODE PLUG INSTALLED IN LCC DECODER PER V-38000 SECT 14.	#
<u>0400E</u> 181		13	C1TC	V1ME	START RACS LOADING SYSTEM CHECKS PER <u>V-27093.</u> REPORT WHEN COMPLETE.	
121		14	CLTC	ALL	FOLLOWING STATIONS SWITCH TO CH 116 TO SUPPORT RACS LOADING SYSTEM CHECKS: V1ME              C10U <u>R1SC.</u> CLIK              C1RU <u>C1IP</u>	
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	CSA4	START PRELAUNCH PREPS PER V-36080.	
118		19	CSAC	CSA5	START PRELAUNCH PREPS PER V-36081.	
118		20	CSAC	CSA6	START PRELAUNCH PREPS PER V-36082.	
118		21	CSAC	CSA7	START PRELAUNCH PREPS PER V-36083.	
118		22	CSAC	CSA8	START PRELAUNCH PREPS PER V-36084.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
19 HRS 01 00"						
	118	23	CSAC	CSA9	START PRELAUNCH PREPS PER V-36089.	
	181	24	CLTC	CSPP	START RACK/CONSOLE VERIFICATION PER V-31045.	
	121	25	CLTC	SURF	VERIFY IU ANTENNA COUPLERS HAVE BEEN REMOVED.	
	171	26	C2TC	C2AE	START PREPS FOR QAMS (MAINSTAGE OK PRESSURE SWITCH CHECKOUT) PER V-34014 (E023, SEC 2A)	
	151	27	CUTC	SUVM	VERIFY PARTIAL THERMAL ISOLATION BOTTOM SHROUD INSTALLATION IS COMPLETE.	
18 HRS 45 00"						
	121	1	CLGK	CLTC	FT05 COMPLETE.	
	121	2	***	CLGK	POWER OFF LVDC/DA PER V-33033, SECT IV REPORT WHEN COMPLETE.	***
	121	3	CLGK	CLTC	KAG1 IS TERMINATED	
		4		C2AE C2PK	NOTE ----	
					VERIFICATION OF S-II INTERSTAGE DOOR CLOSE OUT WILL BE REQUIRED BEFORE QAMS CAN BE EXECUTED. VALJ WILL CALL QAMS AT 7-18 HR 3010".	
	121	5	CLTC	CLTC	VERIFY READY TO START HARDWARE FUNCTIONAL CHECKS	
	121	6	CLTC	CUES	EDS MODE SWITCH TO LAUNCH	
	121	7	CLTC	RLDE	VERIFY DEE 4319 ON (EDS READY)	
	121	8	CLTC	CUES	EDS MODE SWITCH TO MONITOR	
	121	9	CLTC	RLDE	VERIFY DEE 4319 OFF	
	111	10	CLTC	CVTS	REQUEST SC READY SWITCH ON THEN OFF FROM CSAT PANEL. REPORT WHEN COMPLETE.	TCPI
	121	11	CLTC	RLDE	VERIFY DEE 2149 ON THEN OFF (S-IC READY FOR LAUNCH)	
	121	12	CLTC	CRSS	PLACE BYPASS SWITCH ON THEN OFF. REPORT WHEN COMPLETE.	
	121	13	CLTC	RLDE	VERIFY DEE 0163 ON THEN OFF (RANGE SAFE)	
18 HRS 30 00"						
	171	1	U2SI	C2TC	S-II APT DOOR IS SECURED	
	171	2	C2TC	U2SE	VERIFY OK TO REMOVE A7-38 ACCESS KIT AND A7-91 PROTECTIVE PADS.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-18 HRS 30' 0"						
	171	3	C2TC	U2SI	START REMOVAL OF A7-38 ACCESS KIT AND A7-91 PROTECTIVE PADS PER V-26507 (G147) TASKS 9, 14, 17 & 21, EXCEPT THOSE SECTIONS NEEDED FOR PD CONTAINER 223 ACCESS.	
		3-1		U2SI	*** NOTE DO NOT BEGIN REMOVAL OF A7-91 PROTECTIVE PADS UNTIL S-IVB AFT ACCESS KIT REMOVAL HAS STARTED.	
		4	C2TC	U2AN	START STAGE LIGHT, OIS AND EMERGENCY LIGHT REMOVAL FROM FWD INTERSTAGE PER V-30575 (Z037). REPORT WHEN COMPLETE.	
	121	5	C2TC	CLTC	S-II READY TO EXECUTE GAMS (MAINSTAGE CALIPS TEST)	
	171	6	***	C2AE	EXECUTE GAMS (MAINSTAGE CALIPS TEST) PER V-34014 (E023, 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 BOSC PROVIDE SUPPORT FOR INITIAL REMOVAL OF S-IC STORAGE CABINETS AND FIN & FAIRING PLATFORMS.	
	261	9	CLTC	BOSC	START INITIAL REMOVAL OF S-IC STORAGE CABINETS AND FIN & FAIRING PLATFORMS. COORDINATE INITIAL REMOVAL NOW AND ADDITIONAL REMOVAL AT T-12 HRS WITH BOEING PERSONNEL.	TCPI
	151	10	CUTC	PUPL	START LUT EQUIPMENT REMOVAL. LV-GAL PARTICIPATION REQUIRED.	
	171	11	C2PV	C2TC	PURGE SYSTEMS SAMPLING IS COMPLETE	
-18 HRS 15' 0"						
	151	1	CUTC	CUIP	MEASUREMENT TRANSFER - AUTO S-II BURN TEST AND S-IVB COAST TEST-AUTO (60X-607A6-CCIS PANEL)	(MT01)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
18 HRS 15' 0"	121	2	CLTC	ALL	DISPLAY OPERATORS DO NOT CALL DISPLAY DESCRIPTIONS (FORMAT SELECT) UNTIL MT01 IS COMPLETE.	
	151	3	CUTC	BGCC	REMOVE DISPLAY DESCRIPTION TAPE FROM IODC 2-6	
	151	4	CUTC	BGCC	VERIFY/MOUNT MT01 DATA TAPE ON 2-9 AND SCRATCH TAPE ON 1-3	(MT01)
	111	5	CLTC	CVTS	LV RF & TM SYSTEMS ARE OFF	TCPI
18 HRS 2' 0"	181	1	C1TC	V1ME	VERIFY RACS <u>LOADING</u> SYSTEM CHECKS COMPLETE	(MT01)
	121	2	C1TC	CLTC	S-IC READY FOR MT01	
	171	3	C2AE	C2TC	QAMS (MAINSTAGE OK PRESSURE SWITCH VERIFICATION) COMPLETE.	
	121	4	C2TC	CLTC	QAMS COMPLETE.	
	121	5	***	C4IP	PRELAUNCH CHECKOUT GROUP ON.	*** (MT01)
	121	6	***	CLIK	ISSUE S-IVB ALL RACS RUN	*** (MT01)
	121	7	***	C1IP	28 VOLT RACS, LOX & FUEL RACS AND 400 HZ POWER - ON.	***
	121	8	***	C2NP	RACS POWER ON	***
	121	9	***	CLIK	COMMAND RACS, SII-ALL-ALL-RUN	***
	121	10	C2TC	CLTC	S-II READY FOR MT01	
	188	11	CLTC	ALL	STAGE MEASUREMENTS WILL BE INTERRUPTED DURING MT01 (MEAS SCAN).	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
18 HRS 01 00"						
	121	1	***	CLIK	REQUEST & EXECUTE <u>MT01</u> (MEAS SCAN VEHICLE OPTION)	***
		2		CLIK	NOTE ----- SWITCH ACTION IN NEXT STEP TO BE ACCOMPLISHED JUST PRIOR TO S-IC PORTION OF MT01 SCAN	(MT01)
	121	2-1	CLIK	C1IP	HARDWIRE MEASUREMENT TRANSFER TO TELEMETER,	
	171	3	C2TC	R2DP	<b>CDDT ONLY</b>	*
	181	4	C1TC	CHDA	VERIFY THAT CRD READINGS ARE WITHIN TOLERANCE	#
	181	5	C1TC	BRFS	START DRSCS FINAL CHECKS PER <u>V-38000</u> , SECT 14	
	181	6	CPDC	C1TC	REQUEST BOSC HAVE CIRCUIT BREAKERS CB 10, 12 & 14 IN PANEL L-22 ROOM 2A OPENED	
	121	7	C1TC	CLTC	REQUEST BOSC HAVE CIRCUIT BREAKERS CB 10, 12 & 14 IN PANEL L-22 ROOM 2A OPENED.	
	261	8	CLTC	BOSC	HAVE CIRCUIT BREAKERS CB 10, 12 & 14 IN PANEL L-22 ROOM 2A OPENED.	TCPI
	181	9	C1TC	CTS1	VERIFY PRESSURIZATION COMPLETE AND REMOVE TSM SERVICE PLATFORMS	
	171	10	C2TC	C2PV	START COMMON BULKHEAD EVACUATION PER V-26276 (G058); REPORT WHEN COMPLETE.	

*0500E*

DATE: JUNE 28, 1971  
REVISION 030

APOLLO/SATURN LAUNCH OPERATIONS

V-20080, VOL II  
VEHICLE AS-510

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 45: 0"						
	121	1	C1TC	CLTC	PROCEEDING WITH HDA SAFETY PIN REMOVAL	
	188	2	CLTC	ALL	HOLDDOWN ARM SAFETY PINS WILL BE REMOVED AT THIS TIME. PERSONNEL USE CAUTION IN THE HOLDDOWN ARM AREA	
	181	3	C1TC	CHDA	REMOVE SAFETY PINS PER V-36069	
	181	4	C1TC	C1PE	VERIFY READY FOR REMOVAL OF LUT LEVEL ZERO PLATFORM SECTIONS	
	181	5	C1TC	CPDC	PREPARE LLP FOR LOWERING.	
	151	6	CUTC	SUVM	INSTALL CHE ASSEMBLY	
-17 HRS 30: 0"						
	171	1	U2MU U2PF	C2TC	TASK 24 SENSOR REINSTALLATION AND TASK 22 INITIAL UMBILICAL PREPS ARE COMPLETE.	
	151	2	CUTC	SUVM	VERIFY CHE ASSEMBLY IS INSTALLED	
	121	3	CUTC	CLTC	CHE INSTALLATION IS COMPLETE	
	121	4	CVTS	CLTC	LM SHE TOPOFF LINES HAVE BEEN DISCONNECTED. YOU ARE CLEARED TO REMOVE FDS FROM THE IU/S-IVB	TCPI
	121	5	CLTC CUTC	C4TC CUTC	COORDINATE DIRECTLY WITH LM PERSONNEL AND REMOVE FDS FROM THE IU/S-IVB	
	161	6	C4TC	S4MF	REMOVE FIRST LM ACCESS STEP PER V-30539, APPENDIX D. REPORT WHEN COMPLETE.	
	121	7	O2TC	C1TC	INSTALL JUMPER J4 IN X02-121A2 (S-II ENG START BYPASS ENABLE)	
	181	8	C1TC	C1NE	VERIFY/INSTALL JUMPER J4 IN X02-121A2 (S-II ENG START BYPASS ENABLE)	(QAEC)
		8-1			VERIFICATION BY LV-QAL	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 30: 0"	171	9	C2TC	C2AE	ALL SWITCHES TO AUTO EXCEPT COMPONENT TEST POWER TO OFF	(QAEC)
	171	10	C2TC	C2EC C2RP	ALL SWITCHES TO AUTO	(QAEC)
	171	11	C2TC	L2RR	INSTALL/VERIFY INSTALLED JUMPER J4 IN X02-220A2 (ENG COMP TEST POWER ENABLE)	(QAEC)
		11-1			VERIFICATION BY LV-QAL	
	171	12	C2TC	C2AE	VERIFY START VENT CONTROL PRESS ON LIGHT ON	(QAEC)
	171	13	C2TC	C2NP	STAGE SELECT TO OFF	(QAEC)
	171	14	C2TC	C2EC C2PK	VERIFY READY TO SUPPORT QAEC	
-17 HRS 15: 0"	121	1	CLIK	CLTC	MT01 COMPLETE.	
	151	2	CUTC	BGCC	REMOVE MT01 TAPE FROM IODC 2-9 AND LOAD DISPLAY DESCRIPTION TAPE ON IODC 2-6.	
	121	3	CLTC	ALL	MT01 IS COMPLETE, DISPLAY DESCRIPTIONS (FORMAT SELECT) CAN NOW BE CALLED.	
	121	4	CLTC	C1IP	HARDWIRE MEASUREMENT TO GROUND.	
	121	5	***	C1IP	28 VOLT RACS, LOX & FUEL RACS AND 400 HZ POWER - OFF.	***
	121	6	***	C2NP	RACS POWER OFF.	***
	171	7	C2NP	C2TC	RACS POWER OFF.	
	181	8	C1TC	C1IP	FUEL AND LOX RACS POWER SWITCH TO OFF AND VERIFY	
	151	9	CUTC	CUIP	MEAS TRANSFER - OFF. S-II BURN TEST & S-IVB COAST TEST-OFF (60X-607A6-CISS PANEL)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
17 HRS 15: 0"						
		121	10	***	C4IP PRELAUNCH CHECKOUT GROUP OFF THEN AUTO	***
		111	11	CLTC	CVTS S/A 7 WILL BE PRESSURIZED IN 15 MINUTES. LOCAL CLEARING WILL BE CONTROLLED BY S/A PERSONNEL.	TCPI
		181	12	C1TC	C1PE CHDA CTS1	
					VERIFY READY FOR LOWERING LUT ZERO LEVEL PLATFORM	
		13			*****WARNING***** * * THE FOLLOWING SEQUENCES * * ARE HAZARDOUS FOR THE * * S-IC ENGINE GINBAL * * ENVELOPE, * * *****	
		181	14	C1TC	C1PC	TURN ON <u>LOW LOX DOME PURGE</u> .
		181	15	C1TC	C1HP	APPLY <u>S-IC HYDRAULICS</u> REPORT WHEN COMPLETE.
		181	16	C1TC	C1PC	AFTER HYDRAULICS IS APPLIED TURN LOW LOX DOME PURGE OFF.
		181	17	C1TC	CPDC	VERIFY LLP PREPS FOR LOWERING COMPLETE AND LOWER LLP PER V-38070. REPORT WHEN COMPLETE.
		188	18	C1TC	ALL	THE LUT LEVEL PLATFORM IS BEING LOWERED. THE FLAME WELL OF THE LUT IS NOW AN UNPROTECTED PAD AREA.
		118	19	CSAC	CSA1 CSA2 CSA4 CSA5 CSA6 CSA7 CSA8 CSA9	VERIFY PRELAUNCH TOWER PREPS COMPLETE

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 15' 0"	181	20	C1TC	CSAC	VERIFY LSE MECHANICAL PRELIMINARY PREPS COMPLETE.	
	121	21	C2TC	CLTC	S-II READY TO EXECUTE GAEC (S-II ENGINE CIRCUITRY CHECKOUT)	
	121	22	***	C2PK C2EC	REQUEST & EXECUTE GAEC (S-II ENGINE CIRCUITRY CHECKOUT)	***
-17 HRS 5' 0"	181	1	CSAC	C1TC	REQUEST CLEARANCE TO PRESSURIZE S/A'S 1, 5 AND 7	
HRS 0' 0"	121	1	CVTS	CLTC	REDUCE S/A 8 ECS FLOWRATE TO MINIMUM, REPORT WHEN COMPLETE.	TCPI
	121	2	CLTC	C1TC	REDUCE S/A 8 ECS FLOWRATE TO MINIMUM, REPORT WHEN COMPLETE.	
	181	3	C1TC	CECS	ESTABLISH MINIMUM POSSIBLE FLOW FOR SM DUCT AND JUMPER LIMIT SWITCH ON FLOW CONTROL VALVE IF REQUIRED. REPORT WHEN COMPLETE.	
	181	4	C1TC	CSAC	CLEAR TO PRESSURIZE S/A'S 1, 5 AND 7, REPORT WHEN COMPLETE.	
	121	5	CVTS	CLTC	RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION, REPORT WHEN COMPLETE.	TCPI
	121	6	CLTC	C1TC	RECONFIGURE S/A 8 ECS "Y" DUCT TO FLIGHT CONFIGURATION PER V-36084, REPORT WHEN COMPLETE.	
	181	7	C1TC	CSAC	RECONFIGURE S/A 8 ECS DUCT TO LAUNCH CONFIGURATION, REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-17 HRS 01 00	118	8	CSAC	CSA8	RECONFIGURE S/A 8 ECS "YM" DUCT TO FLIGHT CONFIGURATION PER V-36084. REPORT WHEN COMPLETE.	
	161	9	C4TC	S4MA	VERIFY AFT ACCESS KIT REMOVAL COMPLETED.	
	181	10	C1TC	C1PE	VERIFY REMOVAL OF S-IC FORWARD ACCESS KIT EXCEPT AS REQ'D FOR S&A DEVICE CONNECTION.	
	181	11	C1TC	C1NE	VERIFY PD PULSE SENSOR UNITS CONNECTED	
	161	12	C4TC	S4MA	INSTALL AFT INTERSTAGE ACCESS DOOR PER V-30539, SECT M.	
	161	13	C4TC	S4PC	REMOVE STAGE MONITOR HUT. REPORT WHEN COMPLETE.	
	181	14	C1TC	BRFS	VERIFY READY FOR RANGE SUPPORT OF DRSCS PREPS.	
	121	15	C1TC	CLTC	READY FOR RANGE TO SUPPORT DRSCS PREPS.	
	111	16	CLTC	CVTS	REQUEST RANGE SUPPORT DRSCS PREPS ON CHANNEL 137 PER V-38000, SECT 14.	TCPI
	118	17	CSAC	CSAD	START DRRS PREPS PER V-36086.	
	118	18	CSAC	CSA1	PRESSURIZE S/A 1 PER V-36077.	
	118	19	CSAC	CSA5	PRESSURIZE S/A 5 PER V-36081.	
	118	20	CSAC	CSA7	PRESSURIZE S/A 7 PER V-36083.	
-16 HRS 45 00	171	1	C2TC	C2DP	VERIFY PD PULSE SENSOR UNITS CONNECTED.	
	181	2	CPDC	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.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
-16 HRS 45: 0"		4			*****WARNING***** * RESUME PREVIOUS HAZARD * * LEVEL... END OF S-IC * * ENGINE GIMBAL ENVELOPE * * HAZARD, * *****	
	161	5	C4TC	S4CE	VERIFY PD PULSE SENSOR UNITS CONNECTED.	
-16 HRS 35: 0"		1	CSAC	C1TC	S/AIS 1, 5 & 7 PRESSURIZED, REQUEST CLEARANCE TO PRESSURIZE S/AIS 2, 4 & 6.	
	181	2	C1TC	CSA1 CSAC	<b>CDDT ONLY</b>	
-16 HRS 30: 0"		1	C1TC	CSAC	CLEAR TO PRESSURIZE S/AIS 2, 4 & 6, REPORT WHEN COMPLETE.	
	151	2	CUTC	SUVM	REMOVE SUBLIMATOR VENT COVERS PER V-31062, 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 CIF DATA TRANSMISSION LINK ON	
	121	6	CLTC	C1TC C2TC C4TC	INSTALL PD RSCR ENABLE JUMPERS FOR DRSCS TESTS AND REPORT COMPLETION	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-16 HRS 30' 0"						
181		7	C1TC	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	C1TC C2TC C4TC	VERIFY PD PULSE SENSOR UNITS CONNECTED	
161		11	C4TC	S4MA	VERIFY AFT ACCESS DOOR INSTALLED AND READY FOR FINAL S/A 6 CARRIER PREPARATION.	
171		12	C2TC	C2IP	START S-II GSE LUT WALKDOWN PER V-27218 (G137). REPORT WHEN COMPLETE.	
118		13	CSAC	CSA2	PRESSURIZE S/A 2 PER V-36078	
118		14	CSAC	CSA4	PRESSURIZE S/A 4 PER V-36080	
118		15	CSAC	CSA6	PRESSURIZE S/A 6 PER V-36082	
151		16	C1TC	CUTC	THE Q-BALL COVER WILL BE INSTALLED IN APPROXIMATELY 1 HOUR. IU PERSONNEL WILL BE REQUIRED ON STATION TO MONITOR THE OPERATION.	
171		17	C2PV	C2TC	COMMON BULKHEAD EVACUATION COMPLETED. ALL PURGE CIRCUITS ACTIVATED.	
		18	***	C2EC	QAEC (ENGINE CIRCUITRY CHECKOUT) COMPLETE.	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
*16 HRS 30' 0"						
	171	19	C2EC	C2TC	QAEC (ENGINE CIRCUITRY CHECKOUT) COMPLETE,	
	121	20	C2TC	CLTC	QAEC COMPLETE,	
	121	21	C1PK	CLTC	VALJ HAS TERMINATED,	
	171	22	C2TC	V2MS	QAEC IS COMPLETE, PREP FOR DRSCR TESTS, REPORT WHEN READY,	
*16 HRS 15' 0"						
	111	1	CLTC	CVTS	S/AIS 8 & 9 WILL BE PRESSURIZED IN 15 MINUTES, LOCAL CLEARING WILL BE CONTROLLED BY S/A PERSONNEL,	TCPI
	111	2	CLTC	CVTS	ADVISE CPSS THAT PD ENABLE JUMPERS ARE INSTALLED,	TCPI
	151	3	CUTC	SUVM	VERIFY SUBLIMATOR VENT COVER REMOVAL IS COMPLETE,	#
	151	4	CUTC	SUVM	VERIFY CHE REMOVAL COMPLETE,	
	151	5	CUTC	SUVE	VERIFY SMC CABLE RACK COVER REMOVAL COMPLETE,	
	151	6	CUTC	SUVM	INSTALL FINAL THERMAL ISOLATION SHROUD PER V-31062, PART III, REPORT WHEN COMPLETE,	
*16 HRS 5' 0"						
	181	1	CSAC	C1TC	S/AIS 2, 4 & 6 AND PRIMARY DAMPER PRESSURIZED, REQUEST CLEARANCE TO PRESSURIZE S/AIS 8 & 9	
	181	2	C1TC CSA2 CSAC		<b>CDDT ONLY</b>	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
▶ ▶ ▶ ▶ ▶ CD ONLY ◀ ◀ ◀ ◀ ◀ ◀ ◀ ◀ ◀						
-16 HRS 01 00						
	151	1	CUTC	SUVM	VERIFY FINAL THERMAL ISOLATION SHROUD INSTALLATION IS COMPLETE.	
	181	2	C1TC	CSAC	CLEAR TO PRESSURIZE S/AIS 8 & 9. REPORT WHEN COMPLETE.	
	118	3	CSAC	CSA1 CSA4 CSA6	START PRECLOSEOUT CHECKLIST	
	181	4	C1TC	L1LS	START SECOND LUT WALKDOWN, VERIFY NO EQUIPMENT REMAINS ON PAD APRON. REPORT WHEN COMPLETE.	
		4-1			VERIFICATION BY LV-QAL	
	118	5	CSAC	CSA8	PRESSURIZE S/A 8 PER V-36084.	
	118	6	CSAC	CSA9	PRESSURIZE S/A 9 PER V-36085.	
	171	7	C2TC	U2MU U2PF	START S/A 4 FINAL UMBILICAL PREPS PER V-30029 (M020) TASK 25. REPORT WHEN COMPLETE.	
	171	8	C2TC	C2SP	CDDT ONLY	
	181	9	C1TC	CCLH	START LH2 COMPONENT TEST PER V-35004	
	161	10	C4TC	S4OR	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS AND CDF NOT CONNECTED TO S&AIS.	
	121	11	CLTC	BRFS	VERIFY DRSCS/GSE READY TO SUPPORT DRSCR OPEN LOOP TEST	
	111	12	CLTC	CVTS	VERIFY THE RANGE READY TO SUPPORT OPEN LOOP DRSCR TEST WITH TEST CODE PLUGS. REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN.	TCPI
	111	13	CLTC	CVTS	REQUEST RANGE SAFETY COMMAND TRANSMITTER 1 - ON AND VERIFY.	TCPI



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-16 HRS 01 00"	121	25	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL & VERIFY.	
		25-1		C1DP C2DP C4DP	*** NOTE EBW'S 1 & 2 OFF.	
		25-2		B1RF B2RF B4RF CRSS	*** NOTE ALL RSCR LIMITER VOLTAGES RECEIVED.	
-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-IC - RSCR 1 S-IC - RSCR 2 S-II - RSCR 1 S-II - RSCR 2 S-IVB - RSCR 1 S-IVB - 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.	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
					CD ONLY		
-15 HRS 53: 0"	121	9	CLTC	C1DP C2DP C4DP	CDDT ONLY	*	
		9-1		CRSS BRFS	CDDT ONLY	*	
	121	10	CLTC	C1DP C2DP C4DP	CDDT ONLY	*	
		10-1		CRSS	CDDT ONLY	*	
	121	11	CLTC	C1DP C2DP C4DP	CDDT ONLY	*	
		11-1		CRSS	CDDT ONLY	*	
	121	12	CLTC	C1DP C2DP C4DP	VERIFY RSCRIS 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: 0"	121	1	CLTC	SRO	SWITCH TO RANGE SAFETY COMMAND TRANSMITTER #2.	
			1-1		B1RF B2RF B4RF CRSS	*** NOTE ALL RSCR LIMITER VOLTAGES RECEIVED.	





TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
-15 HRS 50: 0"		11-1		CRSS	CDDT ONLY	*
	121	12	CLTC	C1DP C2DP C4DP	CDDT ONLY	*
		12-1		CRSS	CDDT ONLY	*
	121	13	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 AND 2 CUTOFF NOT RECEIVED.	#
		13-1		CRSS BRFS	*** NOTE CUTOFF NOT RECEIVED	#
	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 45: 0"						
	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 *

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 45' 0"		6		C1FR QUEV	NOTE -----  CRSS WILL CONDUCT HOLDFIRE CHECKS WITH RSO & SRO DURING THE NEXT 30 MINUTES. THE RANGE SAFE INDICATION ON THE C1FR PANEL AND BOTH SRO/RSO PROCEED INDICATIONS ON IU EVENTS DISPLAY PANEL WILL CYCLE ON AND OFF DURING THESE CHECKS.	
	111	7	CLTC	CVTS	REQUEST SRO TO RECONFIGURE TO FLIGHT CODE PLUGS	# TCPI
	121	8	CLTC	RLDE	CDDT ONLY	*
	121	9	BOSC	CLTC	REQUEST S-II & S-IVB PERSONNEL REPORT TO PGHE ON CH 264 FOR GH2 CROSS COUNTRY LINE LEAK CHECKS.	TCPI
	121	10	CLTC	C2TC C4TC	HAVE YOUR PERSONNEL REPORT TO PGHE ON CH 264 FOR GH2 CROSS COUNTRY LINE LEAK CHECKS.	
	181	11	C1TC	CPDC	VERIFY LLP LOWERED & SECURED AND PREP TRANSPORTER FOR MOVE TO SOUTH END OF PAD PER V-36070.	
	181	12	C1TC	CPDC	START SECURING LUT WINCHES PER V-36070	
-15 HRS 35' 0"						
	261	1	CLTC	BOSC	VERIFY HAMMERHEAD CRANE IS SECURED FOR LAUNCH AND ACCESS HATCH TO 380' LEVEL IS UNLOCKED	TCPI
	121	2	CLTC	C1TC	HAMMERHEAD CRANE IS SECURED FOR LAUNCH AND ACCESS HATCH IS UNLOCKED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 35' 0"						
	181	3	CUTC	C1TC	IU PERSONNEL ARE ON STATION TO MONITOR Q-BALL COVER INSTALLATION.	
	181	4	C1TC	CSAC	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	
	261	6	CLTC	BOSC	ACTIVATE 6000 PSI GH2 SUPPLY.	TCPI *
	111	7	CLTC	CVTS	REQUEST SCO PERSONNEL ON CH, 223 FOR ABORT LIGHT VERIFICATION, REQUEST EDS POWER ON,	TCPI
	181	8	CSAC	C1TC	S/A'S 8 & 9 PRESSURIZED	*
-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	TCPI *
		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. * * *****	TCPI *
	121	2	CVTS	CLTC	INCREASE SM ECS FLOW RATE TO 75 +/- 5 LB/MIN	TCPI *
	121	3	CLTC	C1TC	INCREASE SM ECS FLOW RATE TO 75 +/- 5 LB/MIN	

LV ODDT-3 CD, VOL II

DATE: MAY 18, 1971

REVISION 029

## APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 30' 0"						
181		4	C1TC	CECS	INCREASE SM ECS FLOW RATE TO 75 +/- 5 LB/MIN	
181		5	C4TC	S4MA	START FINAL S/A 8 CARRIER PREPARATION PER V-30539, SECT N.	
118		6	CSAC	CSA8	START PRECLOSEOUT CHECKLIST	
181		7	CSAC	C1TC	STARTING S/A 8 CLOSEOUT	
121		8	C1TC	CLTC	STARTING S/A 8 CLOSEOUT	
111		9	CLTC	CVTS	ADVISE SC GC THAT LV IS STARTING S/A 8 CLOSEOUT	TCPI
121		10	CVTS	CLTC	CLEAR TO REMOVE THE S/A 8 EMERGENCY EGRESS LADDER & DOOR ASSEMBLY,	TCPI
121		11	CLTC	C1TC	REMOVE S/A 8 EMERGENCY EGRESS LADDER & DOOR ASSEMBLY,	
181		12	C1TC	CSAC	REMOVE S/A 8 EMERGENCY EGRESS LADDER & DOOR ASSEMBLY,	
118		13	CSAC	CSA8	REMOVE EMERGENCY EGRESS LADDER & DOOR ASSEMBLY,	
118		14	CSAC	CHCU	SECURE ONE PUMP AND VERIFY OTHER PUMP IS RUNNING	
111		15	CLTC	CVTS	VERIFY THE RANGE READY FOR RANGE SAFETY COMMAND CLOSED LOOP CHECKS.	TCPI
111		16	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	TCPI
					DRSCR CLOSED LOOP TEST -----	
111		17	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN	TCPI
121		18	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
15 HRS 30: 00						
	188	19	CLTC	ALL	ALL PERSONNEL SUPPORTING LV RS CMD CHECKS SWITCH TO CHANNEL 121 AND MONITOR STAGE TC CHANNEL.	
	121	20	CLTC	BTMC	TM TAPE RECORDING ON TO SUPPORT DRSCS CLOSED LOOP TEST.	
		20-1		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR CHECK.	
	121	21	CLTC	C1DP C2DP C4DP	VERIFY THE FOLLOWING SWITCH POSITIONS: PD RSCR ENABLE - OFF SYSTEMS STATUS SWITCH - OFF S&A STATUS SWITCH - SAFE	
	121	22	CLTC	RRSC	VERIFY DRSCS RECORDERS ON	
	121	23	CLTC	C4ET	ENGINE CONTROL POWER - ON.	
	121	24	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE	
		24-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON.	
	121	25	CLTC	C1DP C2DP C4DP	EBW GROUND POWER - ON VERIFY EBW'S 1 & 2 CHARGED	
		25-1		CRSS	*** NOTE ALL EBW'S CHARGED.	
	121	26	CLTC	BRFS	SIGNAL GENERATOR SELECTOR - NO. 1 AND VERIFY REMOTE MONITOR HYBRID.	
		26-1		C2NP	CYCLE MAIN/INSTR BATT BLEED SWITCHES TO MAINTAIN BATT VOLTAGES IN TOLERANCE (CD ONLY).	
	121	27	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 TRANSFER - INTERNAL	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
15 HRS 30' 0"						
	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	VERIFY EBW'S 1 & 2 CHARGING VOLTAGES DECREASE TO ZERO,	
		29-1		CRSS	*** NOTE EBW CHARGING VOLTAGES DECREASE TO ZERO,	
	121	30	CLTC	B1RF B2RF B4RF	VERIFY LIMITER VOLTAGES OK.	
		30-1		CRSS	*** NOTE ALL LIMITER VOLTAGE INDICATIONS RECEIVED,	
	121	31	CLTC	C1DP C2DP C4DP	EBW'S 1 & 2 GROUND POWER - OFF	
	181	32	C1TC	CCRP	START FINAL <u>RP-1</u> SYSTEM PREPS PER <u>V-25389</u>	
	181	33	C1TC	CECS	CONFIGURE ECS TO SUPPORT ALSEP, REPORT WHEN COMPLETE, (CONFIGURE REDUNDANT BLOWER FOR SUPPORT),	
	121	34	C1TC	CLTC	REQUEST ACCF (CCF GN2) REPORT TO CECS ON CH 142 FOR ECS SUPPORT,	
	261	35	CLTC	BOSC	REQUEST ACCF REPORT TO CECS ON CH 142 FOR ECS SUPPORT,	TCPI
		35-1		CLTC	*** NOTE CCF GN2 BACKUP SUPPORT FOR ALSEP FCA PRIMARY COOLING WILL BE SIMULATED DURING CDDT, HOWEVER THE LP GN2 LINE WILL BE PRESSURIZED TO 150 PSIG,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 30: 0"						
	171	36	C2IP	C2TC	S-II GSE LUT WALKDOWN IS COMPLETE.	
	181	37	C1TC	CCLO	START LOX SYSTEM HARDWIRE CHECKS PER V-25340.	
-15 HRS 25: 0"						
	181	1	C1TC	C1NE C1PE	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS & CDF NOT CONNECTED TO S&A	
	171	2	C2TC	C2DP	VERIFY SHORTING PLUGS INSTALLED ON PD DETONATORS AND CDF NOT CONNECTED TO S&A	
	121	3	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 CABLE.	
	111	2	CLTC	CVTS	MSS PLATFORM 5 IS AVAILABLE FOR OPENING IN CONJUNCTION WITH Q-BALL CABLE CONNECTION.	TCPI *
	181	3	C1TC	CSAC	CONNECT Q-BALL COVER RETRACT CABLE IN CONJUNCTION WITH PLATFORM 5 MOVEMENT.	
	121	4	CLTC	C1DP C2DP C4DP	SAFE & ARM TO ARM FOR 2 SECONDS THEN AUTO	
		4-1		C1FR	*** NOTE ORDNANCE PREPS COMPLETE ON	
		4-2		CRSS	*** NOTE ALL S&A'S ARMED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 20' 0"						
	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	
		5-2		C1FR	*** NOTE ORDNANCE PREPS COMPLETE OFF	
	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	
	223	15	CLTC	SCDR	VERIFY ABORT LIGHT ON,	TOPI
		15-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED IMMEDIATELY AND PD RECEIVED AFTER 4 SECONDS	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 20' 0"						
	121	16	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 ON INTERNAL AND CHARGED.	
		16-1		CRSS	*** NOTE ALL EBW'S CHARGED.	
	121	17	CLTC	C4ET	VERIFY ENGINE CONTROL POWER INDICATION OFF	
	121	18	CLTC	C2AE	VERIFY ENGINE CUTOFF SAFE OFF	
	121	19	CLTC	C1CS	VERIFY ENGINE CUTOFF.	
		19-1		C4ET	*** NOTE NON PROGRAM CUTOFF ON.	
		19-2		C4ET	*** NOTE ENGINE CUTOFF ON.	
	121	20	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 FIRED AFTER 4 SECONDS	
		20-1		CRSS	*** NOTE ALL EBW'S FIRED AFTER 4 SECONDS	
	121	21	CLTC	RRSC	VERIFY 4 SECOND DELAY BETWEEN INITIATION OF CUTOFF & PD COMMANDS.	
	121	22	CLTC	C1DP C2DP C4DP	PULSE SENSORS -- RESET THEN AUTO.	
	121	23	CLTC	C1DP C2DP C4DP	VERIFY EBW'S FIRED -- OFF	
		23-1		CRSS	*** NOTE EBW'S FIRED -- OFF	
	121	24	CLTC	C1DP C2DP C4DP	EBW'S #2 THEN #1 TRANSFER -- EXTERNAL THEN AUTO AND VERIFY EBW'S NOT CHARGED.	
		24-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 20: 0"						
	121	25	CLTC	C4ET	VERIFY ENGINE CONTROL POWER ON,	
	121	26	CLTC	CUEF	VERIFY ABORT REQUEST A & B OFF	
	223	27	CLTC	SCDR	VERIFY ABORT LIGHT OUT,	TCP!
	121	28	CLTC	C2AE	VERIFY ENGINE CUTOFF SAFE ON,	
	121	29	CLTC	C1CS C4ET	VERIFY ENGINE CUTOFF INDICATIONS OFF,	
	121	30	CLTC	C2AE	ALL ENGINE EMERGENCY CUTOFF TO AUTO AND VERIFY ENGINE CUTOFF SAFE OFF,	
	121	31	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	
	111	2	CLTC	CVTS	ABORT LIGHT CHECK COMPLETE, LV NO LONGER REQUIRES EDS POWER,	TCP!
	121	3	CLTC	BRFS	SIGNAL GENERATOR SELECT SWITCH - POSITION 2.	
	121	4	CLTC	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
		4-1		CRSS	*** NOTE LIMITER VOLTAGE INDICATIONS	
	121	5	CLTC	RRSC	RECORDERS - FAST SPEED,	
	121	6	CLTC	SRO	ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 15: 0"						
121		7	SRO	ALL	3-2-1-MARK	
121		8	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		9	CLTC	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 CUTOFF RECEIVED.	
		9-1		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.	
		15-1		CRSS BRFS	*** NOTE PD INDICATIONS.	
121		16	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 REMAIN CHARGED.	
		16-1		CRSS	*** NOTE ALL EBW'S REMAIN CHARGED.	
121		17	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 FIRED INDICATORS REMAIN OFF.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 15:00		17-1		CRSS	*** NOTE ALL EBW'S FIRED INDICATORS REMAIN OFF.	
121		18	CLTC	RRSC	RECORDERS - FAST SPEED.	
121		19	CLTC	SRO	ON YOUR MARK SEND SAFE COMMAND ON CLOSED LOOP LINKS FOR 3 SEC.	
121		20	SRO	ALL	3-2-1-MARK	
121		21	CLTC	RRSC	RECORDERS - SLOW SPEED.	
121		22	CLTC	C2DP C4DP	VERIFY RSCR'S 1 & 2 POWER OFF & EBW'S 1 & 2 DISCHARGED.	
		22-1		CRSS	*** NOTE S-II AND S-IVB RSCR'S OFF & EBW'S DISCHARGED.	
		22-2		B2RF CRSS B4RF	*** NOTE S-II & S-IVB LIMITER VOLTAGES ZERO.	
121		23	CLTC	C1DP	VERIFY RSCR'S 1 & 2 REMAIN ON INTERNAL & S-IC EBW'S 1 & 2 REMAIN CHARGED	
		23-1		CRSS	*** NOTE S-IC RSCR'S REMAIN ON INTERNAL AND S-IC EBW'S REMAIN CHARGED	
121		24	CLTC	C1DP C2DP C4DP	EBW'S 1 & 2 TRANSFER - EXTERNAL THEN AUTO AND VERIFY EBW'S NOT CHARGED	
		24-1		CRSS	*** NOTE S-IC EBW'S NOT CHARGED	
121		25	CLTC	BRFS	SIG GEN-SELECT #1.	
		25-1		CRSS BRFS	*** NOTE S-IC LIMITER VOLTAGES RECEIVED.	
121		26	CLTC	C2DP C4DP	RSCR'S 1 & 2 TRANSFER - EXTERNAL THEN INTERNAL	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 15: 0"						
	121	27	CLTC	B2RF B4RF	VERIFY S-II AND S-IVB LIMITER VOLTAGES OK	
		27-1		CRSS	*** NOTE S-II & S-IVB LIMITER VOLTAGES RECEIVED.	
	121	28	CLTC	BTMC	TM TAPE RECORDING -- OFF AND RELOAD.	
		28-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	
	181	29	C1TC	C1NE C1PE	VERIFY ACCESS TO 118 SECTION NO LONGER REQUIRED.	
	181	30	C2TC	C1TC	YOU ARE CLEAR TO ATTACH S/A 4 UMBILICAL WITHDRAWAL LANYARDS	
		30-1		C2TC	*****WARNING***** * * VERIFY ALL S-II WORK IN * * THE S/A 4 UMBILICAL * * AREAS IS COMPLETE * * EXCEPT SAFING PIN * * REMOVAL & A7-64 PURGE * * BAG CLOSEOUT. * * *****	
	181	31	C1TC	CSAC	VERIFY PRECLOSEOUT CHECKLIST COMPLETED AND RETRACT S/A 1 EXTENSION PLATFORM AND CLOSE SAFETY GATE. REPORT WHEN COMPLETE.	
	118	32	CSAC	CSA1	START FINAL TOWER PREPS PER V-36077.	
	181	33	C1TC	CSAC	YOU ARE CLEARED TO COMPLETE S/A 4 FINAL UMBILICAL PREPS PER V-36080.	
	118	34	CSAC	CSA4	COMPLETE S/A 4 FINAL UMBILICAL PREPS.	
	161	35	C4TC	S4MA	VERIFY AFT CARRIER PREPS COMPLETE AND READY TO RETRACT S/A 6 TIP.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 15: 0"						
	181	36	C4TC	C1TC	READY FOR S/A 6 TIP RETRACTION.	
	181	37	C1TC	CSAC	VERIFY PRECLOSE OUT CHECK LIST COMPLETE, RETRACT SERVICE ARM EXTENSION PLATFORM AND CLOSE SAFETY GATE FOR S/A 6. REPORT WHEN COMPLETE.	
	118	38	CSAC	CSA6	START FINAL TOWER PREPS PER V-36002	
-15 HRS 7: 0"						
	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	RANGE SAFETY COMMAND CHECKS COMPLETE.	TCPI
	111	6	CLTC	CVTS	LOCAL COMMAND CARRIER IS OFF & DESTRUCT SYSTEMS KEY RETURNED TO CPSS.	TCPI
	121	7	CLTC	C1DP C2DP C4DP	STATUS SYSTEMS - SAFE.	
	171	8	C2TC	V2MS	DRSCR TESTS ARE COMPLETE, PREP FOR GAES, REPORT WHEN READY.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
15 HRS 01 00						
	121	1	CLTC	C1TC C2TC C4TC	REMOVE PD ENABLE JUMPERS, REPORT WHEN COMPLETE.	
	181	2	C1TC	L1RS	REMOVE PD ENABLE JUMPER J5 ON PANEL X02-121A2	
		2-1			VERIFICATION BY LV-QAL	
	171	3	C2TC	L2RR	REMOVE PD ENABLE JUMPER J2 ON PANEL X02-220A2.	
		3-1			VERIFICATION BY LV-QAL	
	161	4	C4TC	L4JR	REMOVE PD ENABLE JUMPER E2 ON PANEL X02-423A2	
		4-1			VERIFICATION BY LV-QAL	
	121	5	CLTC	C4DP	PULSE SENSOR POWER OFF.	
	111	6	CLTC	CVTS	ADVISE CPSS THAT PD ENABLE JUMPERS HAVE BEEN REMOVED,	TCPI
	121	7	CLTC	CRSS	VERIFY RF OPEN-LOOP AND CLOSED-LOOP DRSCS CHECKS COMPLETED.	
	188	8	CLTC	ALL	ALL PERSONNEL WHO SUPPORTED LV RANGE SAFETY COMMAND CHECKS RETURN TO ASSIGNED CHANNELS	
	121	9	C2TC	CLTC	S-11 READY TO EXECUTE QAES (ENGINE SEQUENCE TEST).	
	171	10	C2TC	C2AE	START ENGINE SEQUENCE TEST (QAES) PER V-34014 (E023). REPORT WHEN COMPLETE.	
	181	11	C1TC	CPDC	START PNEUMATIC DISTRIBUTION PREPS FOR LAUNCH PER V-36064	
	181	12	C1TC	CECS	VERIFY ECS CONFIGURED TO SUPPORT GN2 STANDBY (HAND VALVES CLOSED)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15 HRS 01 00"						
		121	C1TC	CLTC	ECS IS CONFIGURED FOR GN2 STANDBY (HAND VALVES CLOSED)	
		111	CLTC	CVTS	ECS IS CONFIGURED FOR GN2 STANDBY (HAND VALVES CLOSED)	TCPI
		14-1			*****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
		171	O2TC	U2EO	REMOVE S-II PD EBW PULSE SENSORS PER V-30029 (M020) TASK 23. REPORT WHEN COMPLETE.	
-14 HRS 45 00"						
		188	CVTS	PA	ALSEP FCA INSTALLATION COMPLETE. THE CONTROL AREA IS OPEN FOR NORMAL WORK. RADIATION AREA CONTROL IS STILL IN EFFECT.	TCPI
		151	CUTC	SUVM SUVE	START REMOVAL OF IU LIGHTS & OIS AND SECURE LIGHT SYSTEM GN2 PURGE PER IV-26178. REPORT WHEN COMPLETE.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-14 HRS 43: 0"						
	121	1	C1TC	CLTC	REQUEST POWER COORDINATOR HAVE 4160 VOLT BREAKERS TURNED ON AT LOX STORAGE AREA SUBSTATION. (924-1 AND 924-2)	
	262	2	CLTC	BTIS	HAVE 4160 V BREAKERS TURNED ON AT LOX STORAGE AREA SUBSTATION (924-1 & 924-2).	TCP!
-14 HRS 35: 0"						
	181	1	C1TC	C1MS	VERIFY LOX/FUEL DAC POWER ON	
-14 HRS 30: 0"						
	121	1	CVTS	CLTC	INCREASE IU ECS FLOW TO MAXIMUM	TCP!
	121	2	CLTC	C4TC CUTC	IU ECS AIR FLOW WILL BE INCREASED TO 200 LB/MIN AT THIS TIME.	
	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 S/A 8 EXTENSION PLATFORM RETRACTION.	TCP!
	121	6	CLTC	C1TC	READY FOR S/A 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	CSAB	START FINAL TOWER PREPS PER V-36084.	
	181	9	C1TC	CCLO	VERIFY LOX SYSTEM CHECKS COMPLETE AND START PROPELLANT COMPONENT TEST PER V-25340.	

ORSE

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-14 HRS 30' 0"	171	10	U2SI	C2TC	REMOVAL OF THE FORWARD ACCESS KIT COMPLETE, EXCEPT AT ACCESS DOOR OF CONTAINER 223.	
	171	11	C2SP	C2TC	CDDT ONLY	
	181	12	C1TC	CSAC	VERIFY G-BALL COVER RETRACT CABLE CONNECTED.	
-14 HRS 15' 0"	181	1	CSAC	C1TC	S/A 1 & 6 CLOSEOUT COMPLETE.	
	161	2	C4TC	S4MF	REMOVE FDS PLATFORM PER V-30539, SECT P (COORDINATE DIRECTLY WITH LM PAD LEADER), REPORT WHEN COMPLETE.	D-97-60
	161	3	C4TC	S4MF	START WALKAROUND OF FORWARD SKIRT AREA.	
-14 HRS 0' 0"	171	1	U2MU U2PF	C2TC	S/A 4 FINAL UMBILICAL PREPS ARE COMPLETE.	
	171	2	C2TC	U2SE	VERIFY READY FOR S/A 3 RETRACTION & S/A 4 TIP RETRACTION.	
	181	3	C2TC	C1TC	READY FOR S/A 3 RETRACTION & S/A 4 TIP RETRACTION.	
	181	4	C1TC	CSAC	YOU ARE CLEARED TO COMPLETE S/A 4 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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+14 HRS 0:00"						
	151	7	CUTC	CUCP	CDDT ONLY	*
	171	8	C2TC	U2AM U2FM	START DISASSEMBLY AND REMOVAL OF MONITOR HUTS	
	177	9	CLTC	CLQS	START/VERIFY START OF LV-QAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-QAL-QCP-11 FOR MSS MOVE.	
	181	10	C1TC	CCRP	START RP-1 PANEL PREPS PER <u>V-25389.</u>	
	121	11	C4TC	CLTC	KSC SYSTEMS SAFETY SUPPORT WILL BE REQUIRED IN 30 MINUTES ON LUT LEVEL 240 FOR GH2 SNIFFER CHECKS	
	111	12	CLTC	CVTS	KSC SYSTEMS SAFETY SUPPORT WILL BE REQUIRED IN 30 MINUTES ON LUT LEVEL 240 FOR GH2 SNIFFER CHECKS	TCPI
	121	13	C2TC	CLTC	KSC SYSTEMS SAFETY SUPPORT WILL BE REQUIRED IN 30 MINUTES ON THE LUT 180 FT LEVEL TO PERFORM GH2 SNIFFER CHECKS OF S7-41 "D" UNIT.	
	111	14	CLTC	CVTS	KSC SYSTEMS SAFETY SUPPORT WILL BE REQUIRED IN 30 MINUTES ON THE LUT 180 FT LEVEL TO PERFORM GH2 SNIFFER CHECKS OF S7-41 "D" UNIT.	TCPI
	171	15	C2AE	C2TC	ENGINE SEQUENCE TEST (QAES) COMPLETE.	
	171	16	C2TC	C2NP	STAGE SELECT TO INHIBIT	
	121	17	C2TC	CLTC	QAES (ENGINE SEQUENCE TEST) COMPLETE	
	121	18	C2TC	C1TC	JUMPER J4 IN X02-121A2 (S-II ENG START BYPASS) IS NO LONGER REQUIRED.	
	171	19	C2TC	L2RR	REMOVE JUMPER J4 IN X02-220A2 (ENG COMP TEST POWER).	
		19-1			VERIFICATION BY LV-QAL	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
14 HRS 01 0"	181	20	C1TC	C1NE	REMOVE JUMPER J4 IN X02-121A2 (S-II ENG START BYPASS).	
		20-1			VERIFICATION BY LV-QAL -----	
	171	21	U2EO	C2TC	PD EBW PULSE SENSOR REMOVAL COMPLETE.	
	171	22	C2TC	C2AE C2EC C2RP	START ENGINE/RECIRC PANEL STATUS CHECKS PER V-30029 (M020) TASK 19. REPORT WHEN COMPLETE.	
	161	23	C4TC	S4MF	REMOVE SECOND LM ACCESS STEP PER V-30539, APPENDIX O (COORDINATE DIRECTLY WITH LM PAD LEADER). REPORT WHEN COMPLETE.	
13 HRS 55 0"	171	1	C2AE	C2TC	ENGINE/RECIRC PANEL STATUS CHECKS COMPLETED.	
13 HRS 45 0"	121	1	CVTS	CLTC	LM 525 PLATFORM REMOVAL IS COMPLETE. CLEAR TO START S-IVB FWD KIT REMOVAL.	TCP1
	161	2	C4TC	S4MF	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	VERIFY FINAL WALKAROUND OF FWD SKIRT AREA IS COMPLETE	
	151	5	CUTC	UJVM SUVE	VERIFY IU READY FOR ACCESS KIT REMOVAL	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-13 HRS 45: 0"							
		121	6	C4TC	CLTC	VERIFY IU AND S/C CLEAR FOR PARTIAL REMOVAL OF S-IVB 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. (COMPLETION REQUIRED FOR MSS PLAT 3 OPENING)	TCPI
		121	9	CLTC	C1TC	CLOSE AND LOCK EMERGENCY ACCESS GATE ON S/A 7. REPORT WHEN COMPLETE.	
		181	10	C1TC	CSAC	CLOSE AND LOCK EMERGENCY ACCESS GATE ON S/A 7. REPORT WHEN COMPLETE.	
		118	11	CSAC	CSA7	REMOVE PENETRABLE BARRIER AND CLOSE AND LOCK EMERGENCY EGRESS GATES. REPORT WHEN COMPLETE.	
-13 HRS 30: 0"							
		121	1	BOSC	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

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-13 HRS 30' 0"	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.	
	181	10	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 *
		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. * * *****	TCPI *
-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	
	181	5	C1TC	V1ME	MONITOR CH 143 TO SUPPORT RP-1 REPLENISH	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
-12 HRS 20: 00							
		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 AND S/A 9 HANGER REMOVAL (S/A 9 LOAD LIMITED TO 5 PEOPLE WITH HANGERS REMOVED)	TCPI *
		181	3	C1TC	CSAC	INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK AND REMOVE S/A 9 HANGERS.	
		118	4	CSAC	CSA9	INSTALL WHITE ROOM MSS DOOR POSITIVE LOCK, POST LOAD LIMIT WARNING SIGN AND REMOVE S/A 9 HANGERS PER V-36085 SECT. J. REPORT WHEN COMPLETE.	
		181	5	C1TC	CCRP	VERIFY RP-1 REPLENISH COMPLETE AND LINE DRAIN IN PROGRESS.	
		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 *
		121	9	C1TC	CLTC	S/A 7 EMERGENCY ACCESS GATE IS CLOSED AND LOCKED. READY FOR MSS PLAT 3 OPENING.	*
		121	10	BOSC	CLTC	VERIFY THE EMERGENCY ACCESS GATE ON S/A 7 IS CLOSED AND LOCKED FOR MSS PLATFORM 3 OPENING.	TCPI
		181	11	C1TC	V1MS	SECURE VEHICLE MEASURING GSE PER V-27098. REPORT WHEN COMPLETE.	
		181	12	C1TC	U1FN	DISCONNECT PD PULSE SENSORS AND REMOVE PER V-21008.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-12 HRS 15' 0"	121	1	MSTC	CLTC	VERIFY READY FOR FPI CALS, SEND V2MS & V4MS TO CH 212;	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 SUPPORT TO REMOVE STAGE MONITOR SHACK AND S-IC STAGE SECURITY BARRIER,	
	261	4	CLTC	BOSC	REMOVE THE S-IC STAGE MONITOR SHACK, AND THE S-IC STAGE SECURITY BARRIER,	TCPI
	121	5	CVTS	CLTC	MSS PLATFORM OBSERVERS ARE TO REPORT TO PVTS AT THE BASE OF THE MSS LOW RISE ELEVATOR FOR BRIEFING IN 45 MINUTES,	TCPI
		5-1		CLTC	*** NOTE THE POSITION OF PLATFORM 1 WILL DETERMINE WHICH STAGE (S-IC OR S-II) PROVIDES OBSERVERS,	
	121	6	CLTC	C1TC C2TC C4TC CUTC	MSS PLATFORM OBSERVERS ARE TO REPORT TO PVTS AT THE BASE OF THE MSS LOW RISE ELEVATOR FOR BRIEFING IN 45 MINUTES,	
-12 HRS 5' 0"	261	1	C2TC	BOSC	VERIFY MSS PLAT 1 IS LOCATED AT AND WILL REMAIN AT STA 1800.	TCPI
-12 HRS 0' 0"	171	1	U2FM	C2TC	FWD AND AFT MONITOR HUTS ARE REMOVED	
	171	2	C2TC	C2DP	CONFIGURE ORDNANCE & PD PANEL FOR S&A CONNECTION PER V-30029 (M020) TASK 26. REPORT WHEN COMPLETE;	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
12 HRS 01 00						
171		3	C2DP	C2TC	ORDNANCE & PD PANELS ARE CONFIGURED FOR S&A CONNECTION.	
171		4	C2TC	U2E0	PREP FOR PD EBW FIRING UNIT STRAY VOLTAGE CHECKS PER V-29050 (K010) (CDDT) V-29024 (K008) (CD). REPORT WHEN COMPLETE.	
161		5	C4TC	C4SM	START CONTROL PANEL SETUPS AND INERT S&A REMOVAL PER V-30539, SECT G.	
181		6	C1TC	CCLO	VERIFY COMPONENT TEST IS COMPLETE AND START LOX SYSTEM FINAL PREPS FOR LOADING PER V-25340.	
181		7	C1TC	CCLH	VERIFY PROPELLANT COMPONENT TESTS COMPLETED PER V-35004.	
181		8	C1TC	CCLH	START LH2 FINAL SYSTEMS PREPS FOR LOADING PER V-35004.	
121		9	C1TC	CLTC	REQUEST CPSS RELEASE TCS KEY TO C1SP	
111		10	CLTC	CVTS	REQUEST CPSS RELEASE TCS KEY TO C1SP FOR IGNITION SOURCE VOLTAGE CHECKS.	TCP1
181		11	C1TC	C1EN	IGNITORS INSTALLED SWITCH TO ARM MOMENTARILY AND VERIFY ALL IGNITORS AND HYPERGOLS INSTALLED	
181		12	C1TC	C1SP	VERIFY TCS POWER SUPPLY OFF	
181		13	C1TC	C1NP	1D152 BUS ON	
181		14	C1TC	C1SP	ARM TCS	
181		15	C1TC	C1FR	VERIFY IGNITION SOURCE VOLTAGE OK	
181		16	C1TC	C1SP	SAFE TCS AND RETURN TCS KEY TO CPSS	
181		17	C1TC	C1NP	1D152 BUS OFF	
121		18	C1TC	CLTC	TCS SAFE AND TCS KEY RETURNED TO CPSS	
111		19	CLTC	CVTS	IGNITION SOURCE VOLTAGE CHECKS COMPLETE. TCS HAS BEEN SAFED AND TCS KEY HAS BEEN RETURNED TO CPSS.	TCP1

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-12 HRS 01 00"						
					<i>1100E</i>	
		121	20	CLTC C1TC	CUTC C1TC REMOVE ACCESS DOOR RAIN CANOPIES AND STORE,	
		151	21	CUTC	SUVM REMOVE ACCESS HUMIDITY DOOR AND STORE, REPORT WHEN COMPLETE,	
		181	22	C1TC	C1PE REMOVE ACCESS DOOR RAIN CANOPIES AND STORE,	
		181	23	CCRP	C1TC RP-1 LINE DRAIN COMPLETED.	
-11 HRS 45 00"						
		161	1	C4TC	S4MF VERIFY FWD ACCESS KIT REMOVAL COMPLETE EXCEPT FOR PLATFORMS REQUIRED FOR S&A CONNECTION	
		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	
		121	4	CVTS	CLTC STARTING MSS OIS TRANSFER FROM PAD HARDLINE TO UHF. CRAWLER TRANSPORTER OIS CHANNEL ASSIGNMENTS ARE IN EFFECT.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
11 HRS 30: 0"					S&A DEVICE 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.	
121		7	CLTC	C1TC C2TC C4TC CUTC	VERIFY ORDNANCE AND PD PANELS IN CORRECT CONFIGURATION FOR S&A CONNECTION AND LV 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.	TCPI
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.	TCPI
121		10	CLTC	CUDE	VERIFY DEE 755 (RF SILENCE) ON	
111		11	CLTC	CVTS	REQUEST CPSS VERIFY READY FOR PD DETONATOR & CDF CONNECTION	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
11 HRS 30' 0"						
	121	12	CLTC	C1TC C2TC C4TC	CONNECT PD DETONATORS AND CDF	
	161	13	C4TC	C4SM	START S&A CONNECTIONS PER V-30539, SECT Q.	
	181	14	C1TC	C1NE	CONNECT S-IC PD DETONATORS PER V-21008. REPORT WHEN COMPLETE.	
		15			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS, * * *****	
	181	16	C1TC	C1PE	CONNECT PDS CDF ASSEMBLIES PER V-29003.	
	171	17	C2TC	U2E0	CONDUCT PD STRAY VOLTAGE CHECKS PER V-29050 (K010) (CDDT) V-29024 (K008) (CD) REPORT WHEN COMPLETE.	
	171	18	C2TC	U2H0	CONNECT PD DETONATORS AND CDF PER V-29050 (K010) (CDDT) V-29024 (K008) (CD)	
	171	19	C2GP	C2TC	GH2 PREPS ARE COMPLETE.	
	121	20	CGIC	CLTC	OIS UNITS WILL BE REMOVED FROM THE PAD APRON AT THIS TIME (COUNTDOWN ONLY).	TCP1
	118	21	CSAC	CSA2 CSA5 CSA7	START PRECLOSEOUT CHECKLIST	
	121	22	CVTS	CLTC	MSS OIS TRANSFER FROM PAD TO CRAWLER TRANSPORTER IS COMPLETE.	TCP1

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
-11 HRS 25: 0"	261	1	C2TC	BOSC	<b>CDDT ONLY</b>	• TCPI
-11 HRS 15: 0"	121	1	CVTS	CLTC	VERIFY READY FOR MSS POWER TRANSFER FROM PAD TO CRAWLER TRANSPORTER	TCPI
-11 HRS 0: 0"	121	1	CVTS	CLTC	A HOLD OF - HOURS -- MINUTES WILL START AT T-9 HRS.	TCPI
		1-1		CLTC	*** NOTE CVTS WILL NOTIFY CLTC OF CHANGES IN HOLD TIME IN EXCESS OF 15 MINUTES DURATION.	TCPI
	121	2	CLTC	C1TC C2TC C4TC CUTC	A HOLD OF - HRS --- MINUTES WILL START AT T-9 HRS.	
	121	3	CLTC	C1TC C2TC CUTC C4TC	VERIFY PURGE BOX VALIDATION.	
	121	4	CVTS	CLTC	REQUEST PURGE BOX VALIDATION STATUS	TCPI
		5			NOTE ----	
					FOR THE NEXT 15 MINUTES CSAD REQUIRES EXCLUSIVE CONTROL OF TV CAMERA 27 & AA3 OR AA4.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
11 HRS 01 00						
	111	6	CLTC	CVTS	VERIFY PREVAILING WINDS DO NOT EXCEED REDLINE VALUES FOR FREE STANDING S/V.	TCPI
		7			NOTE -----  REDLINE WINDSPEED IS 39 KNOTS PEAK WINDS AT 530 FT ABOVE GROUND LEVEL. IF HIGHER WINDS ARE PREDICTED, DAMPER SWITCHOVER MAY PROCEED ONLY IF BENDING MOMENT ASSESSMENT INDICATES SATISFACTORY CONDITIONS, (LO DIRECTOR'S CONCURRENCE WITH ASSESSMENT IS REQUIRED)	TCPI
	121	8	CVTS	CLTC	CLEAR TO DISCONNECT AUX DAMPER	TCPI
	121	9	CLTC	C1TC	DISCONNECT AUX DAMPER	
	181	10	C1TC	CSAC	DISCONNECT AUX DAMPER. REPORT WHEN COMPLETE.	
	118	11	CSAC	CSAD	DISCONNECT AUX DAMPER PER V-36086, REPORT WHEN COMPLETE.	
	171	12	U2HO	C2TC	PD DETONATORS & CDF CONNECTED	
	171	13	C2TC	U2HO	START CLOSEOUT OF PD CONTAINER PER V-30029 (M020) TASK 29. REPORT WHEN COMPLETE.	
	121	14	C1TC	CLTC	TSM PERSONNEL ON STATION FOR MSS MOVE. REQUEST BOSC PROVIDE SUPPORT FOR ESP TRANSPORTER MOVE.	
	261	15	CLTC	BOSC	TSM PERSONNEL ARE ON STATION FOR MSS MOVE. VERIFY READY TO SUPPORT ESP TRANSPORTER MOVE.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 50' 0"						
	121	1	C1TC	CLTC	AUX DAMPER DISCONNECT COMPLETE AND S/A 9 HANGERS HAVE BEEN REMOVED.	
	121	2	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY FOR MSS JACKING.	
	121	3	CLGS	CLTC	LV-QAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-QAL-QCR-11 IS COMPLETE.	
	111	4	CLTC	CVTS	LV-QAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-QAL-QCR-11 IS COMPLETE, AUX DAMPER DISCONNECTED & LV 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"						
	161	1	C4TC	C4SM	VERIFY COMPLETION OF S&A CONNECTIONS	
	171	2	U2HO	C2TC	PD CONTAINER CLOSEOUT COMPLETE.	
	171	3	C2TC	U2SI	START FINAL REMOVAL OF A7-38 PER V-26507 (G147) TASK 9.	
	121	4	CLTC	C1TC C2TC C4TC	VERIFY PD DETONATOR AND CDF CONNECTIONS COMPLETED.	
		5			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	6	C1TC	C1PE C1NE	START FINAL REMOVAL OF S-IC FWD SKIRT PROTECTION, AUXILIARY LIGHTING AND INTERNAL WORK PLATFORM SEGMENTS PER V-29003 & V-21035.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
10 HRS 45' 0"						
	121	7	CLTC	C1TC C2TC C4TC CUTC	VERIFY LV READY TO REMOVE RF SILENCE & CONTROLLED SWITCHING.	
	111	8	CLTC	CVTS	RF SILENCE AND CONTROLLED SWITCHING ARE NO LONGER REQUIRED. LV ORDNANCE CONNECTION IS COMPLETE.	TCPI
	188	9	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	10	C1TC	CLTC	FACILITY AIR STANDBY PANEL WILL BE ACTIVATED & FACILITY AIR SYSTEM WILL BE CHARGED WITH GN2.	
		11			*****WARNING***** * * THE FACILITY AIR SYSTEM * * WILL BE CHARGED WITH * * GN2. PERSONNEL SHOULD * * AVOID USE OF AIR TOOLS * * INSIDE ENCLOSED AREAS. * * *****	
	181	12	C1TC	CPDC	ACTIVATE FACILITY AIR STANDBY PANEL PER V-26222. REPORT WHEN COMPLETE.	
	121	13	CVTS	CLTC	PLATFORM 3 IS OPEN AND SECURE.	TCPI
	151	14	C4TC	CUTC	VERIFY IU CLEAR FOR FINAL REMOVAL OF S-IVB FORWARD ACCESS KIT.	
	161	15	C4TC	S4MF	START FINAL REMOVAL OF S-IVB FWD ACCESS KIT PER V-30539, SECT R.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
10 HRS 35' 0"	121	1	CVTS	CLTC	GMIL BRINGING UP CCS S-BAND & VHF CARRIERS FOR GMIL TESTING	TCPI
		1-1		CLTC	*** NOTE RF CLEARANCE WILL BE IN EFFECT FOR LV FREQUENCIES 2101.8 (CCS), 2282.5 (CCS), 245.3 (DP-1) & 258.5 (CP-1) MHZ;	TCPI
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.	
		3			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	4	C1TC	C1PE	START INSTALLING AND SECURING S-IC FWD ACCESS DOOR PER V-24010.	
	121	5	C1TC	CLTC	NOTIFY S-II, S-IVB, IU, EDS & SC THAT S-IC THRUST OK SIGNALS WILL BE CYCLED ON AND OFF, REQUEST CLEARANCE TO START THRUST OK PRESSURE SWITCH TEST (WAST).	
	121	6	CLTC	C2TC C4TC CUTC	S-IC THRUST OK SIGNALS WILL BE CYCLED ON AND OFF DURING THE NEXT 15 MINUTES.	
	111	7	CLTC	CVTS	ADVISE SCO PERSONNEL THAT S-IC THRUST OK SIGNALS WILL BE CYCLED ON AND OFF DURING THE NEXT 15 MINUTES.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 30' 0"		8			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS, * * *****	
181		9	C1TC	C1PE	PREPARE FOR THRUST OK PRESSURE SWITCH TEST (WAST) PER V-24327, REPORT WHEN COMPLETE.	
181		10	C1TC	C1PK	CALL UP WAST PROGRAM UPON C1PE REQUEST AND NOTIFY C1TC PRIOR TO EXECUTION.	
161		11	C4TC	S4MF	VERIFY FWD ACCESS KIT REMOVAL COMPLETED AND READY TO INSTALL IU DOOR.	
161		12	CUTC	C4TC	VERIFY S-IVB FWD AREA CLEAR FOR IU ACCESS DOOR INSTALLATION.	
151		13	CUTC	SUVE	VERIFY READY TO INSTALL IU ACCESS DOOR.	
151		14	CUTC	UUVN	INSTALL AND SECURE IU ACCESS DOOR PER IV-34046.	
181		15	C1TC	CWCP	START INDUSTRIAL WATER SYSTEM FINAL PREPS PER V-36113.	
171		16	U2SI	C2TC	FINAL REMOVAL OF A7-38 IS COMPLETE.	
171		17	C2TC	U2SE	VERIFY S-II FORWARD COMPARTMENT READY FOR CLOSEOUT.	
171		18	U2OC	C2TC	VERIFY REMOVAL OF ALL NON-FLIGHT HARDWARE PER V-30029 (M020) TASK 47 AND THE INSPECTION PER V-24411 (0003) FOR THE FORWARD INTERSTAGE COMPARTMENT IS COMPLETE.	
171		19	C2TC	U2SI	SECURE S-II FORWARD ACCESS DOOR, REPORT WHEN COMPLETE.	
161		20	C4TC	S4ML	START FINAL LUT WALKAROUND.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 20' 00"						
	121	1	CVTS	CLTC	MSS JACKING IS COMPLETE	TCPI
	181	2	CTS1	C1TC	TSM PROTECTIVE TOWER CLEAR FOR MSS MOVE.	
	121	3	C1TC	CLTC	TSM 3-4 TOWER CLEAR FOR MSS MOVE.	
	121	4	CLTC	C1TC C2TC C4TC CUTC	VERIFY YOU ARE READY FOR MSS MOVE.	
	111	5	CLTC	CVTS	LV CLEAR FOR MSS MOVE.	TCPI
	151	6	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' 00"						
	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	
		5			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	6	C1TC	C1PE	SECURE FROM TOK PRESSURE SWITCH TEST PER V-24327. REPORT WHEN COMPLETE.	
	171	7	U2SI	C2TC	FWD ACCESS DOOR IS SECURED.	
	171	8	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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 15: 0"						
	171	9	O2TC	U2MU	START ARM 5 FINAL UMBILICAL PREPS PER V-30029 (M020) TASK 33. REPORT WHEN COMPLETE.	
	181	10	O2TC	C1TC	YOU ARE CLEAR TO ATTACH S/A 5 UMBILICAL WITHDRAWAL LANYARDS	
		10-1	O2TC		*****WARNING***** * * VERIFY ALL S-II WORK IN * * THE S/A 5 UMBILICAL * * AREA IS COMPLETE EXCEPT * * SAFING PIN REMOVAL * * *****	
	181	11	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	12	CSAC	CSA5	COORDINATE WITH STAGE PERSONNEL ON ARM TO START FINAL CLOSEOUT PER V-36081.	
	181	13	CPDC	C1TC	FACILITY AIR STANDBY PANEL ACTIVATION COMPLETE.	
-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	TCPI
	121	3	CLTC	C1TC	CONNECT PRIMARY DAMPER	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-10 HRS 10' 0"						
	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.	
	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	TCPI
	181	3	C1TC	CPDC	DEACTIVATE FACILITY AIR STANDBY PANEL PER V-26222. REPORT WHEN COMPLETE.	
		4			*****WARNING***** * * THE FACILITY AIR SYSTEM * * HAS BEEN PURGED OF GN2 * * AND IS BACK IN ITS * * NORMAL CONFIGURATION. * * *****	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
+ 10 HRS 01 00"	171	1	C2TC	C2PV	CDDT ONLY	
+ 9 HRS 45 00"	181	1	C1TC	CSAC	VERIFY S/A 2 PRECLOSEOUT CHECKLIST COMPLETE AND START FINAL CLOSEOUT, RETRACT TIP AND CLOSE SAFETY GATE, REPORT WHEN COMPLETE.	
	118	2	CSAC	CSA2	COORDINATE WITH STAGE PERSONNEL ON ARM TO START FINAL CLOSEOUT PER V-36078,	
		3			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	181	4	C1TC	C1PE	REMOVE BLOCKS FROM FORWARD UMBILICAL CARRIER.	
	151	5	CUTC	UUVN	VERIFY IU ACCESS DOOR IS INSTALLED.	
	121	6	CUTC	CLTC C4TC	IU ACCESS DOOR IS SECURED. READY FOR S-IVB FINAL S/A 7 CARRIER PREPARATION.	
	151	7	CUTC	PUPL	START LUT WALKDOWN. LV-0AL PARTICIPATION REQUIRED.	
	161	8	C4TC	S4MF	START FINAL S/A 7 CARRIER PREPARATION PER V-30539, SECT S.	
+ 9 HRS 30 00"	121	1	CVTS	CLTC	GMIL TESTING IS COMPLETE. GMIL CCS S-BAND CARRIER IS OFF.	TCPI
	161	2	S4MF	C4TC	FINAL S/A 7 CARRIER PREPARATION IS COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
9 HRS 30: 0"						
181		3	C4TC	C1TC	READY FOR S/A 7 TIP RETRACTION.	
181		4	C1TC	CSAC	VERIFY PRE-CLOSEOUT CHECKLIST COMPLETED AND START S/A 7 FINAL CLOSEOUT. RETRACT TIP AND CLOSE SAFETY GATE. REPORT WHEN COMPLETE.	
121		5	C1TC	CLTC	STARTING S/A 7 FINAL CLOSEOUT	
111		6	CLTC	CVTS	ADVISE SC GC THAT LV IS STARTING S/A 7 FINAL CLOSEOUT	TCP I
118		7	CSAC	CSA7	COORDINATE WITH STAGE PERSONNEL ON S/A 7 TO START FINAL CLOSEOUT PER V-36083.	
151		8	C4TC	CUTC CUCP	S/A 7 UMBILICAL LOCK IS REMOVED.	
121		9	CVTS	CLTC	SC CCS SWITCH IN BLOCK POSITION FOR FT-47 AT T-7113 HRS	TCP I
181		10	C1TC	CPDC	VERIFY PNEUMATIC DISTRIBUTION SYSTEM PREPS COMPLETED PER V-36064 EXCEPT SMDPS IN 2 SWITCH 1 VALVE MODE AND FACILITY AIR STANDBY PANEL ACTIVATION.	
171		11	C2SP	C2TC	ULLAGE PRESSURE SWITCH (CALIPS) VERIFICATION IS COMPLETE	
171		11-1	C2TC	C2SP	VERIFY CHECK VALVE INSTALLED IN LINE P303 PER TPS	N-252-57
171		12	U2MU	C2TC	S/A 5 FINAL UMBILICAL PREPS ARE COMPLETE.	
171		13	C2TC	U2SE	VERIFY READY TO RETRACT S/A 5 TIP.	
181		14	C2TC	C1TC	READY TO RETRACT S/A 5 TIP.	
171		15	C2TC	C2NP	VERIFY CALIPS POWER IS OFF.	
121		16	CGIC	CLTC	OIS UNITS WILL BE REMOVED FROM 100 FT TO 0 FT LEVELS OF ML (COUNTDOWN ONLY).	TCP I
181		17	C1TC	C1PE	VERIFY PROPULSION PREPS COMPLETE EXCEPT PREFILL TOPPING PER V-34012.	
181		18	C1TC	CSAC	VERIFY Q-BALL COVER RETRACT SYSTEM PREPS COMPLETED PER V-36112.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
9 HRS 15' 0"						
		1	C4TC	C4QC	VERIFY NON-FLIGHT HARDWARE TAG LOG IS COMPLETE.	
		1-1			VERIFICATION BY LV-QAL	
		2	C1TC	CLTC	REQUEST BOSC TO REPORT TO LASE IN ML ROOM 8A TO SUPPORT THE OPENING OF CIRCUIT BREAKERS PER V-31045.	
		3	CLTC	BOSC	REPORT TO LASE IN ML ROOM 8A TO SUPPORT THE OPENING OF CIRCUIT BREAKERS IN PANEL L-14A (200 FT LEVEL) AND PANELS L-21, L-22, P-16 & P-19 (IN ML BASE)	TCPI
		4	C1TC	CSPP	TURN OFF EMERGENCY LIGHTING AND HDA FACILITY AC CIRCUIT BREAKERS PER V-31045.	
		5	C1TC	V1MS	REPORT STATUS OF THE FOLLOWING HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS:	
				RULE NO.	MEAS NO.	MEASUREMENT DESCRIPTION
				2-131	D8-101	PRESS, COMBUSTION CHAMBER
				2-132	D8-102	PRESS, COMBUSTION CHAMBER
				2-133	D8-103	PRESS, COMBUSTION CHAMBER
				2-134	D8-104	PRESS, COMBUSTION CHAMBER
				2-135	D8-105	PRESS, COMBUSTION CHAMBER
				2-147	VK39-115	TOK PRESS SW 1 ENG 3
				2-148	VK42-115	TOK PRESS SW 1 ENG 4
				2-151	VK54-115	FINAL TOK C/O ENG 3
				2-152	VK55-115	FINAL TOK C/O ENG 4
		6	C2TC	V2MS	REPORT STATUS AS OF T-21:45 OF THE FOLLOWING HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS:	
				RULE NO.	MEAS NO.	MEASUREMENT DESCRIPTION
				2-344	D13-201	PRESS, THRUST CHAMBER, ENG 1
				2-345	D13-202	PRESS, THRUST CHAMBER, ENG 2
				2-346	D13-203	PRESS, THRUST CHAMBER, ENG 3
				2-347	D13-204	PRESS, THRUST CHAMBER, ENG 4
				2-348	D13-205	PRESS, THRUST CHAMBER, ENG 5
				2-420	VK231-203	PRESS, MNSTG OK SW A, ENG 3
				2-423	K285-203	DEPRESS MNSTG OK SW A, ENG 3
				2-433	VK421-207	EDS ALL ENGINES CUTOFF 2



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
9 HRS 15' 0"		161	7	C4TC	C4N3 V4MS C4ET C4LE NO, NO, MEASUREMENT DESCRIPTION ----- 2-518 DL-401 PRESS, THRUST CHAMBER 2-561 VK14-401 MNSTG OK PRESS SW 1 2-562 VK157-401 MNSTG OK PRESS SW 2 2-563 X158-401 MNSTG OK PRESS SW 1 DEPRESS 2-564 X159-401 MNSTG OK PRESS SW 2 DEPRESS		
		151	8	CUTC	CUEF REPORT STATUS OF THE FOLLOWING HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS: RULE MEAS NO, NO, MEASUREMENT DESCRIPTION ----- 2-754 VK75-602 SC EDS/MAN C/O OF LV ENGS 2-755 VK84-602 EDS PITCH/YAW RATE EXCESSIVE		
9 HRS 10' 0"		121	1	CLTC	C1TC C2TC C4TC CUTC VERIFY ALL HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS ARE GO AND READY TO TRANSFER LMR MONITOR RESPONSIBILITY TO THE EASTERN TEST RANGE,		
9 HRS 5' 0"		121	1	CLTC	SRO ALL HIGHLY DESIRABLE LMR RANGE SAFETY MEASUREMENTS ARE GO, VERIFY EASTERN TEST RANGE ASSUMES MONITORING RESPONSIBILITY AT THIS TIME.		
		171	2	C2TC	U2LN VERIFY ELECTRICAL WALK AROUND COMPLETE PER V-21253 (G060)		

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
HOLDING 9 HRS 01 00					----- STARTING SCHEDULED HOLD -----	
121		1	CLTC	CGIC	VERIFY TV CAMERAS READY FOR VEHICLE LOADING OPERATIONS.	TCPI
181		2	C1TC	CSPP	VERIFY LUT WALKDOWN COMPLETE	
181		3	C1TC	C1NE	VERIFY REMOVAL OF OFF-LUT CABLE ASSYS 5086W1, 5087W1 AND 5086CB1W1 PER V-21035.	#
181		4	C1TC	C1NE	VERIFY S-IC LUT ESE LAUNCH PREPS COMPLETE PER V-21035 AND PERSONNEL CLEARING PAD.	
181		5	C1TC	C1MS	VERIFY READY TO SUPPORT PROPELLANT LOADING.	
181		6	C1TC	CHDA	VERIFY HDA FINAL PREPS ARE COMPLETE AND HDA PERSONNEL CLEAR OF PAD.	
181		7	C1TC	CSAC	VERIFY PAD MANUAL PREPS COMPLETE AND PERSONNEL CLEARING PAD	
181		8	C1TC	BRFS	VERIFY LUT GSE OPERATION SATISFACTORY AND PERSONNEL CLEAR OF PAD.	
161		9	C4TC	C4PS	START FINAL PROPULSION PANEL VERIFICATION PER V-30539, SECT T.	
151		10	CUTC	PUPL	VERIFY LUT WALKDOWN AND LUT EQUIPMENT REMOVAL IS COMPLETE	
		10-1			VERIFICATION BY LV-GAL	
		11			NOTE ----- ALL LV OPERATORS ARE REQUIRED TO CHECK THEIR PROCEDURES DURING THE HOLD TO VERIFY THAT PCRS FROM T-8 HRS 59' THROUGH APPENDIX E (LISTED BELOW) HAVE BEEN INCORPORATED.	

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

PCR

PAGE TIME STATIONS AFFECTED

THIS INFORMATION TO BE PROVIDED IN A MEMO TO BE DISTRIBUTED AT THIS TIME BY THE INTEGRATED TEST & CHECKOUT PROCEDURES TEST MONITOR.

HOLDING  
 - 9 HRS  
 (240' 0")

---4:00 HOURS PRIOR TO RESUMING COUNT---

171	1	C2TC	C2GP	START FINAL GROUND PNEU SYS INSPECTION AND WALK AROUND PER V-30029 (M020) TASK 31. REPORT WHEN COMPLETE.
-----	---	------	------	--

HOLDING  
 - 9 HRS  
 (120' 0")

---2:00 HOURS PRIOR TO RESUMING COUNT---

121	1	CLTC	C1TC	ARM HDA EXPLOSIVE RELEASE
181	2	C1TC	LAS1	HOLDDOWN ARMS EXPLOSIVE RELEASE #1 AND #2 POWER MODULES TO ON AND VERIFY CIRCUIT BREAKERS ARE LOCKED ON.
	2-1			VERIFICATION BY LV-QAL
181	3	C1TC	CHDA	VERIFY HOLDDOWN ARMS SECONDARY RELEASE SYSTEM READY FOR LAUNCH
181	4	C1TC	CSAC	FIRING POWER BEING APPLIED MOMENTARILY
181	5	C1TC	CSPP	CLOSE LSE OVERRIDE POWER MODULE CIRCUIT BREAKER PER V-31045. REPORT WHEN COMPLETE. [DEE-6 (4174) ON]

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
▶▶▶▶▶▶▶▶▶▶ CD ONLY ▶▶▶▶▶▶▶▶▶▶						
HOLDING T-9 HRS (120' 0")						
121		6	CLTC	C1TC	CLEAR TO REQUEST & EXECUTE WASP (LSE POWER ON)	
161		7	C1TC	CLSK	CALL UP WASP PROGRAM UPON CSPP REQUEST AND NOTIFY C1TC PRIOR TO EXECUTION, REPORT WHEN COMPLETE.	
181		8	C1TC	CSAC	VERIFY THE FOLLOWING INDICATIONS ON:  T-187 LSE PREPS COMPLETE LSE READY FOR S/A 1 RETRACT T-16.2 LSE READY FOR S/A 2 RETRACT T-8.9 READY LESS S/A 1, 2 SAFE ANGLE	
181		9	C1TC	CLDE	VERIFY DEE-6 (4229, 4052, 4219, 4233) ON	
181		10	C1TC	CSAC	CDDT ONLY	*
181		11	C1TC	CLDE	CDDT ONLY	*
181		12	C1TC	C1FR	VERIFY THE FOLLOWING INDICATIONS ON:  LAUNCH SUPPORT PREPS COMPLETE LSE READY FOR S/A 1 RETRACT READY TO RETRACT S-IC FWD UMB	B-351-58
181		13	C1TC	C1FR	CDDT ONLY	*
181		14	C1TC	CSPP	START FINAL PREPARATIONS PER V-31045	
171		15	C2TC	C2SP C2GP	START FINAL PANEL STATUS CHECKS PER V-30029 (M020) TASK 32. REPORT WHEN COMPLETE.	
171		16	C2TC	C2PV	START FINAL PANEL STATUS CHECKS PER V-26276 (G05B). REPORT WHEN COMPLETE.	
121		17	CLTC	C1TC C2TC C4TC CUTC	VERIFY PCR VERIFICATION COMPLETE	
181		18	CSPP	C1TC	43D100 & 43D200 POWER APPLIED AND SWITCHOVER TEST COMPLETED. WASP COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
HOLDING - 9 HRS (120' 0")						
121		19	C1TC	CLTC	WASP COMPLETE	
HOLDING - 9 HRS (90' 0")						
---1130 HOURS PRIOR TO RESUMING COUNT---						
171		1	C2GP	C2TC	FINAL GROUND PNEU SYS INSPECTION AND WALK AROUND COMPLETE,	
171		2	C2SP	C2TC	FINAL PRESS PANEL STATUS CHECKS ARE COMPLETE,	
171		3	C2GP	C2TC	FINAL GROUND PNEU PANEL STATUS CHECKS ARE COMPLETE,	
171		4	C2PV	C2TC	FINAL PURGE AND VACUUM PANEL STATUS CHECKS ARE COMPLETE,	
HOLDING - 9 HRS (75' 0")						
---1115 HOURS PRIOR TO RESUMING COUNT---						
171		1	U2PE U2PV	C2TC	CLOSEOUT OF LUT LEVEL 180 PER V-30029 (M020) TASK 64 COMPLETE,	
HOLDING - 9 HRS (60' 0")						
---1100 HOUR PRIOR TO RESUMING COUNT---						
188		1	CVTS	PA	ML WILL BE PRESSURIZED AT THIS TIME	TCP1
188		2	CLTC	ALL	TAIL SERVICE MAST SAFETY CABLES WILL BE REMOVED AT THIS TIME, PERSONNEL USE EXTREME CAUTION IN AREA OF HOLDDOWN ARMS AND TAIL SERVICE MASTS,	
121		3	CLTC	C1TC	REMOVE SAFETY CABLES AND START FINAL CLOSEOUT OF TAIL SERVICE MASTS	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					▶ ▶ ▶ ▶ ▶ CD ONLY ◀ ◀ ◀ ◀ ◀ ◀ ◀	
HOLDING 9 HRS (60' 0")						
	181	4	C1TC	CTS1	START TSM FINAL LAUNCHER PREPS PER V-36039,	
	181	5	C1TC	CECS	VERIFY RESC READY TO RECORD ECS MEASUREMENTS:	
		6			*****WARNING***** * * THE FOLLOWING SEQ IS * * HAZARDOUS, * * *****	
	181	7	C1TC	C1PE	APPLY HYDRAULICS TO THE F-1 ENGINES AND START PREFILL OPERATIONS PER V-34012	
	171	8	C2TC	C2PV	CDDT ONLY	
	121	9	C1TC	CLTC	REQUEST ACCF (CCF GN2) TO REPORT TO CECS ON CH 142 FOR ECS SUPPORT	
	261	10	CLTC	BOSC	REQUEST ACCF TO REPORT TO CECS ON CH 142 FOR ECS SUPPORT	TCPI
HOLDING 9 HRS (45' 0")						
---45 MINUTES PRIOR TO RESUMING COUNT---						
	121	1	CLTC	C1TC C2TC C4TC CUTC	VERIFY ALL COMPARTMENTS CLOSED OUT AND READY TO SWITCH ECS FROM AIR TO GN2,	
	111	2	CLTC	CVTS	ALL LV COMPARTMENTS CLOSED OUT AND READY TO SWITCH ECS FROM AIR TO GN2,	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
HOLDING - 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. REPORT WHEN SYSTEM STABILIZED.	
		2-1			*****CAUTION***** * IU STAGE ST-124M SUPPLY * * SPHERE WILL BE * * PRESSURIZED TO 3000 PSI * *****	
HOLDING - 9 HRS (30' 0")						
	111	1	CLTC	CVTS	REQUEST CPSS VERIFY CLEARANCE TO SWITCH ECS TO GN2.	TCP1
	121	2	CLTC	VURF	START RF/GSE SETUP PER V-28069. REPORT WHEN COMPLETE.	
	121	3	CLTC	C1TC	CONFIGURE ECS FOR STANDBY GN2	
		4			*****WARNING***** * AN INERT ATMOSPHERE * * HAZARD EXISTS IN THE * * ECS ROOM AND ALL S/Y * * COMPARTMENTS, EXCEPT * * THE CM WHILE THE ECS * * PURGE GN2 HAND VALVE IS * * OPEN, * *****	
	181	5	C1TC	CECS	START ECS PREPS FOR LOADING PER V-36074 PART B	





TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
HOLDING - 9 HRS (20' 0")						
181		4	C1TC	CPDC	ACTIVATE FACILITY AIR STANDBY PANEL PER V-26222.	
171		5	C2TC	U2SE	LV ECS IS SWITCHING TO GN2. VERIFY S-II RED CREW IS READY TO SUPPORT PER V-30029 (M020) PARAGRAPH C.6.	
261		6	C2TC	BOSC	VERIFY TWO EACH BENDIX LIFE SUPPORT PERSONNEL ON STATION READY TO SUPPORT S-II STAGE ENTRY RED CREW WITH THE FOLLOWING EQUIPMENT IN A SCAPE VAN:  4 K BOTTLES BREATHING AIR  2 100 FT HARDLINES  1 2X4 HARDLINE MANIFOLD  4 50 FT HARDLINES WITH OIS CABLES  4 HARDLINE BREATHING MASKS WITH OIS HARNESS AND FULLY CHARGED MINI BOTTLES BREATHING AIR (LVR-2 & LVR-7)	TCPI
HOLDING - 9 HRS (15' 0")						
---15 MINUTES PRIOR TO RESUMING COUNT---						
121		1	CVTS	CLTC	CHANGE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 1 SWITCH MODE, REPORT WHEN COMPLETE	TCPI
121		2	CLTC	C1TC	CHANGE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 1 SWITCH MODE, REPORT WHEN COMPLETE	
181		3	C1TC	CPDC	CHANGE SMDPS FROM 2 SWITCH 1 VALVE MODE TO 1 SWITCH MODE, REPORT WHEN COMPLETE	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
HOLDING 9 HRS (10' 0")						
---10 MINUTES PRIOR TO RESUMING COUNT---						
181	1	C1TC	CTS1		VERIFY TSM FINAL PREPS ARE COMPLETE AND TSM PERSONNEL CLEAR OF PAD	
181	2	C1TC	CWCP		VERIFY INDUSTRIAL WATER SYSTEM LAUNCH PREPS COMPLETED.	
181	3	C1TC	C1PE		VERIFY S-IC MECHANICAL PREPS COMPLETED AND PERSONNEL CLEARING PAD	
181	4	C1TC	CCLH		VERIFY LH2 SYSTEMS FINAL PREPS FOR LOADING COMPLETE AND PERSONNEL CLEARING PAD.	
181	5	C1TC	CCRP		VERIFY RP-1 PREPS COMPLETE.	
181	6	C1TC	CSPP		PLACE LSE POWER OVERRIDE SWITCH TO ON AND VERIFY	
181	7	C1TC	CSPP		VERIFY LUT ELECTRICAL PREPS COMPLETE PER V-31045 AND PERSONNEL ARE CLEARING PAD	
121	8	C1TC	CLTC		S-IC ELECTRICAL LAUNCH PREPS COMPLETE	
181	9	C1TC	RPDC		VERIFY DTS/DEE PAD CLEARING COMPLETED PER V-25160	
262	10	CLTC	BTIS		VERIFY REGULAR CAMERAS OPERATIONAL AND HAVE BPHO SWITCH TO CH 181 TO SUPPORT PROPELLANT LOADING.	TCPI
HOLDING 9 HRS (0' 0")						
--- JUST PRIOR TO RESUMING COUNT ---						
121	1	CLTC	C1TC C2TC C4TC CUTC		VERIFY READY TO START PAD CLEARING OPERATIONS.	
111	2	CLTC	CVTS		LV READY TO START PAD CLEARING OPERATIONS. REQUEST SECURITY TO LOCK ROOM 1P4 AND DELIVER KEYS TO CLTC	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
HOLDING - 9 HRS (0' 0")						
	188	3	CVTS	PA	THE CLOCK WILL START ON MY MARK AT T-9 HRS 0 MIN 0 SEC.	TCPI
	188	4	CVTS	PA	5-4-3-2-1, MARK.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 59: 0"						
	188	1	CVTS	PA	ALL PERSONNEL NOT POSSESSING T-9 HOUR HAZARDOUS BADGES ARE TO CLEAR THE BLAST DANGER AREA.	TCP1
	121	2	CVTS	CLTC	CDDT ONLY	* TCP1
	121	3	CLTC	C1PK	REQUEST AND EXECUTE VALK LINKING PROGRAM.	
		3-1			NOTE ----- WHEN LINKING PROGRAMS ARE UTILIZED, SEQUENCES WITH THREE ASTERISKS IN THE COMMAND STA AND REMARKS COLUMNS WILL BE DONE AUTOMATICALLY BY THE LINKING PROGRAM. IF THE LINKING PROGRAM IS NOT UTILIZED, THE TEST CONDUCTOR FOR THE INDICATED COMM CH WILL, AT THE APPROPRIATE TIME, REQUEST THE OPERATIONS TO DO THESE FUNCTIONS MANUALLY. PROGRAMS WILL NORMALLY BE DONE AT THE TIME SHOWN BUT MAY, AFTER COORDINATION ON CH 121, BE CALLED EARLY BY CLES OR DELAYED BY C1PK.	
	121	4	***	CLGK	POWER ON LVDC/DA PER V-33033, SECT I. REPORT WHEN COMPLETE (KAPW, FT04, FT35, FT20, AND FT23 AND FT08)	***
	171	5	C2TC	C2NP	PM POWER ON	
	171	6	C2TC	C2PM	VERIFY HAZARDOUS GAS DETECTION SYSTEM READY FOR PROPELLANT LOADING AND START FINAL STATUS CHECKS PER V-30029 (M020) TASK 35. REPORT WHEN COMPLETE.	
	171	7	C2TC	R2DP	CDDT ONLY	*
	161	8	C4TC	C4NP	VERIFY SW SEL INHIBIT OFF	
	161	9	C4TC	R4PU	PU STRIP CHARTS ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 59' 0"						
	161	10	C4TC	C4PU	PU POWER ON THEN AUTO.	
		11			DELETED	D-98-65
	161	12	C4TC	C4PS	START FINAL PREPS FOR LOADING PER V-30539, SECT T, REPORT WHEN COMPLETE.	
	151	13	CUTC	CUPC	START ST-124M SLIP RING EXERCISE PER V-23068.	
	181	14	C1TC	RDTS	TURN ON THE ALT FR PTCS TANKING COMPUTER 28 VDC SWITCHES ON PANEL 5341 AND 5333.	
	181	15	C1TC	RDTS	TURN ON ALL ALT FR TANKING COMPUTER AUTO AND MANUAL POWER SWITCHES	
	181	16	C1TC	CPDC	VERIFY FACILITY AIR STANDBY PANEL HAS BEEN ACTIVATED AND PERSONNEL ARE CLEARING PAD	
- 8 HRS 55' 0"						
	121	1	CVTS	CLTC	GMIL BRINGING UP CCS S-BAND CARRIER FOR MCC COMMAND VALIDATION TEST, VERIFY COMMAND DECODERS ARE OFF.	TCPI
	181	2	C1TC	CECS	VERIFY ECS OPERATIONS COMPLETE AND PERSONNEL ARE CLEARING PAD	
- 8 HRS 50' 0"						
	188	1	CLTC	ALL	ALL PERSONNEL ASSIGNED YELLOW POINT TO POINT PHONES GO ACTIVE ON THE PHONE NET FOR COMMUNICATIONS CHECK.	
	171	2	C2TC	C2RP	START RECIRC BOTTLE PRESSURIZATION TO 3000 PSI PER V-30029 (M020), TASK 37	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 45' 0"	171	1	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 FT43.	(FT43)
	121	3	CLTC	CUNP	SWITCH SELECTOR INHIBIT OFF	(FT43)
	171	4	C2PM	C2TC	FINAL PANEL STATUS CHECKS ARE COMPLETE.	
8 HRS 39' 0"	121	1	CLGK	CLTC	LVDC/LVDA POWER ON IS COMPLETE.	
	121	2	***	CLGK	REQUEST & EXECUTE FT43 (COMPUTER INTERFACE)	***
		2-1		C4NP	*** NOTE FT43 WILL ISSUE STAGE SELECT AND ADDRESS TO THE S-IVB STAGE WITH NO READ COMMANDS.	
8 HRS 35' 0"	171	1	C2AE	C2TC	ENGINE HELIUM BOTTLE PRESSURIZATION COMPLETE	
	161	2	C4TC	C4NP	4D411 POWER ON	
	161	3	C4TC	C4NP	<b>CDDT ONLY</b>	
	161	4	C4TC	C4HY	MANUALLY CYCLE AUX HYD PUMP ON AND OFF TO MAINTAIN SYSTEM OIL TEMPERATURE 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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 8 HRS 35' 0"		4-1			*****CAUTION***** * DO NOT ALLOW HYDRAULIC * * SYSTEM FLUID TEMPS TO * * DECREASE BELOW -25 * * DEG F. * *****	
	151	5	CUPC	CUTC	ST-124M SLIP RING EXERCISE COMPLETE	
	151	6	CUTC	CUPC	TURN ON ST-124M SYSTEM AND START DRIFT CHECKS PER V-33011.	
	171	7	C2RP	C2TC	RECIRC BOTTLE PRESSURIZATION IS COMPLETE	
- 8 HRS 32' 0"						
	121	1	CLGK	CLTC	FT43 COMPLETE	
	121	2	CLTC	C1NP C2NP	SWITCH SELECTOR INHIBIT TO OFF TO SUPPORT FT03.	(FT03)
	121	3	CLTC	CUSW	LVDA/ESE SWITCH TO LVDA POSITION	(FT03)
- 8 HRS 31' 0"						
	181	1	C1TC	CCLO	VERIFY LOX SYSTEM FINAL PREPS FOR LOADING PER V-25340 ARE COMPLETE.	
	181	2	C1TC	CHGD	VERIFY GN2 PURGE READY FOR PROPELLANT LOADING	
	181	3	C1TC	CPDC	VERIFY PLATFORM TRANSPORTER IS AT LAUNCH POSITION AND SECURED AND ALL PERSONNEL CLEAR OF PAD.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS																												
8 HRS 31' 0"																																		
	171	4	C2TC	C2SP	VERIFY SHROUD PURGE VALVE - OPEN																													
	171	5	C2TC	C2EV	VERIFY S-II READY FOR LOX & LH2 LOADING LIGHTS ON																													
	171	6	C2TC	C2PM	VERIFY READY FOR LOX & LH2 LOADING																													
	161	7	C4TC	C4PS C4ES C4HY	VERIFY READY FOR PROPELLANT LOADING.																													
	161	8	C4TC	S4PC	VERIFY ALL S-IVB PERSONNEL HAVE CLEARED THE PAD																													
8 HRS 30' 0"																																		
	121	1	CVTS	CLTC	MCC COMMAND VALIDATION TEST IS COMPLETE. GMIL CCS S-BAND CARRIERS ARE OFF.	TCPI																												
	121	2	***	CLGK	REQUEST & EXECUTE FT03 (LVDC/LVDA SWITCH SELECT INTERFACE TEST AUTOMATIC OPTION)	***																												
		2-1		C1NP C2NP C4NP CUNP	*** NOTE STAGES WILL BE TESTED IN THE FOLLOWING SEQUENCE - IU, S-IVB, S-II & S-IC																													
					<table> <thead> <tr> <th>ADDR.</th> <th>READ</th> </tr> <tr> <th>----</th> <th>----</th> </tr> </thead> <tbody> <tr><td>000</td><td>NO</td></tr> <tr><td>337</td><td>NO</td></tr> <tr><td>200</td><td>NO</td></tr> <tr><td>100</td><td>NO</td></tr> <tr><td>040</td><td>NO</td></tr> <tr><td>020</td><td>NO</td></tr> <tr><td>010</td><td>NO</td></tr> <tr><td>004</td><td>NO</td></tr> <tr><td>002</td><td>NO</td></tr> <tr><td>001</td><td>NO</td></tr> <tr><td>377</td><td>NO</td></tr> <tr><td>377</td><td>YES</td></tr> </tbody> </table>	ADDR.	READ	----	----	000	NO	337	NO	200	NO	100	NO	040	NO	020	NO	010	NO	004	NO	002	NO	001	NO	377	NO	377	YES	
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(CONTINUED)



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 30: 0"					<p>MULTIPLE STAGE SELECTION WILL BE AS FOLLOWS:</p> <p>IU &amp; S-IVB                      IU &amp; S-II                      IU &amp; S-IC                      S-IVB &amp; S-II                      S-IVB &amp; S-IC                      S-II &amp; S-IC</p> <p>AN ADDRESS OF 377 WILL BE ISSUED WITH EACH MULTIPLE STAGE SELECT. REPORT ANY ANOMALIES TO CLTC.</p>	
	171	3	C2TC	C2TV	VERIFY S-II OTV CAMERAS READY FOR PROPELLANT LOADING	
	121	4	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY TO START PROPELLANT LOADING	
	121	5	CLTC	CGIC	VERIFY READY TO SUPPORT PROPELLANT LOADING AND HAVE BCFM SWITCH TO CH 133 FOR LOX COMMUNICATIONS CHECKS	TCP!
	188 121	6	CLTC	ALL	ALL PERSONNEL REQUIRED FOR LV LOX PROPELLANT LOADING REPORT FOR COMMUNICATIONS CHECKS ON CH 133.	
8 HRS 27: 0"						
	171	1	C2TC	C2AE	BEGIN START TANK PURGE PER V-30029 (M020), TASK 88	
8 HRS 25: 0"						
	111	1	CLTC	CVTS	ALERT MSTC THAT THE PRN MODULATION OF CSM S-BAND UP-LINK WILL BE DISABLED IN 5 MINUTES FOR APPROXIMATELY 20 MINUTES.	TCP!
	171	2	C2TC	C2SP	VERIFY LOW LEVEL PURGE VALVE OPEN AND OPEN LIGHT ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 23' 0"						
	121	1	CLGK	CLTC	FT03 COMPLETE	
	121	2	CLTC	CUSW	LVDA/ESE SWITCH TO ESE	(FT37)
	121	3	CLTC	ETMS	TM RECORDERS ON	(FT37)
	121	4	CLTC	ECOP	VERIFY CIF IS READY TO SUPPORT FT37 (PREPARE TO LAUNCH - REPEATABLE SIM FLT OPTION)	(FT37)
	121	5	CLTC	ECOP	INITIATE GUIDANCE REAL TIME REDUCTION PROGRAM	(FT37)
	171	6	C2TC	C2AE	START LOX DOME AND GG INJECTOR PURGE PER V-30029 (M020) TASK 40.	
		6-1		C2PU R2SC	*** NOTE MEASUREMENTS G006-201 THROUGH 205 WILL BE ACTIVE DURING LOX DOME AND GG INJECTOR PURGE PER V-30029 (M020) TASK 40	
	171	7	C2TC	C2RP	START ACCUMULATOR FILL SYSTEM PURGE PER V-30029 (M020) TASK 30. (IF FT43, FT03 NOT COMPLETE, DELAY THIS STEP).	
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	C4P2	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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<b>CD ONLY</b>						
8 HRS 20: 0"						
	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).	TCPI
		1-1		ALL	*** NOTE 10 MINUTES AFTER LOX FILL COMMAND, S-IVB SLOW FILL WILL START AUTOMATICALLY	
	121	2	***	CLGK	REQUEST & EXECUTE FT37 (PREPARE TO LAUNCH TEST - REPEATABLE SIM FLIGHT OPTION)	***
		2-1		CLGK	*** NOTE NOTIFY VURF (CH 151) WHEN SYNC RESET ACTION IS COMPLETE.	
	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.	
	171	8	C2TC	C2NP	HEATER POWER AND BATTERY HEATERS ON	
	171	9	C2NP	C2NK	<b>CDDT ONLY</b>	
		10		C2NP	<b>CDDT ONLY</b>	
	171	11	C2TC	C2FC	MANUALLY CYCLE INDIVIDUAL AUX HYDRAULIC PUMPS ON AND OFF TO MAINTAIN SYSTEM OIL TEMP WITHIN +20 TO +120 DEG F ENVELOPE PER V-30029 (MO20) TASK 36. COORDINATE ALL SWITCH ACTIONS WITH C2TC AND CUPS PRIOR TO EXECUTION.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK	
8 HRS 20' 0"							
		181	12	C1TC	CPRK	RECALL BE02 AT A 10 SECOND SCAN RATE AND ALL STAGES OPTION.	
		111	13	CLTC	CVTS	VERIFY CLEARANCE FOR IU CCS RF SYSTEM.	TCP1
		111	14	CLTC	CVTS	REQUEST GMIL DISABLE CSM S-BAND UP-LINK PRN MODULATION (FOR APPROXIMATELY 20 MINUTES) AND VERIFY.	TCP1
		111	15	CLTC	CVTS	REQUEST GMIL VERIFY CCS CARRIER IS OFF.	TCP1
		121	16	CLTC	VURF	ENABLE LOCAL CCS CARRIER & VERIFY.	
		121	17	CLTC	CUIP	CCS TRANSPONDER POWER-ON.	
		121	18	CLTC	VURF	VERIFY CCS IN LOCK.	
		121	19	CLTC	CUNP	VERIFY SWITCH SELECTOR INHIBIT OFF	
		121	20	CLTC	CUSW	ISSUE IU OCTAL 007 (OMNI XMT)	
		121	21	CLTC	CUIP	COMMAND DECODER POWER-ON.	
		111	22	CLTC	CVTS	LOCAL CCS CARRIER IS ON, CCS TRANSPONDER AND COMMAND DECODER ARE ON, (IU COMMAND SYSTEM IS DISABLED)	TCP1
		121	23	CLTC	VURF	START CCS RF CHECKS PER V-28069.	
8 HRS 18' 0"							
		171	1	C2TC	C2AE	START TURBOPUMP PURGE PER V-30029 (M020) TASK 41.	
8 HRS 15' 0"							
		121	1	CLTC	C1TC	YOU HAVE CLEARANCE TO START CROSS COUNTRY LINE CHILLDOWN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
		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		
8 HRS 15: 0"							
		121	2	C1TC	CLTC	LOX FILL COMMAND HAS BEEN GIVEN (AUTOMATIC PROPELLANT LOADING INITIATED)	
		121	3	CLGK	CLTC	FT37 COMPLETE. REPEATABLE SIM FLIGHT IS IN PROCESS.	
		261	4	CLM4	BOSC	REQUEST PRESENT GH2 BATTERY PRESSURE	TCPI
8 HRS 20: 0"							
		171	1	C2TC	C2PV	START COMMON BULKHEAD EVACUATION	
			1-1		C2PV	*** NOTE IF THE COMMON BULKHEAD VACUUM DEFINED BY THE LMR CANNOT BE ATTAINED BY T-1 HR, USE THE J-RING EVACUATION. CYCLE VALVES AS NECESSARY TO MAINTAIN THE PURGE AND VACUUM CIRCUITS OPERATION	
		171	2	C2RP	C2TC	ACCUMULATOR FILL SYSTEM PURGE COMPLETED.	
		171	3	C2TC	C2RP	LH2 PREVALVES TO CLOSE THEN INHIBIT, VERIFY LH2 PREVALVES CLOSED - ON	
			3-1		C2RP	*****CAUTION***** * * MONITOR LH FEED DUCT * * PRESS (D092-201/205) * * DURING PROPELLANT TANK * * CHILLDOWN, IF PRESSURE * * EXCEEDS 35 PSIA! * * * 1. PLACE RECIRC RESET * * TO RESET THEN * * INHIBIT * * * 2. ALL PREVALVES LOX * * RETURN VALVES TO * * OPEN * * * 3. REPEAT SEQ 3, 6 & 7 *	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 10: 0"						
	171	4	C2TC	C2RP	LH2 PUMP AND RETURN LINE VALVES TO CLOSE VERIFY RETURN LINE VALVES OPEN - OFF	
	171	5	C2TC	C2RP	LOX OVERRIDE TO OPEN.	
	171	6	C2TC	C2RP	ALL PREVALVES LOX RETURN VALVES TO CLOSE VERIFY LOX PREVALVES CLOSED - ON, VERIFY LOX RETURN LINE VALVES OPEN REMAINS ON.	
	171	7	C2TC	C2RP	ACCUMULATOR BLEED VALVE TO CLOSE THEN INHIBIT.	
	171	8	C2TC	C2RP	START LOX HE INJECTION PURGE PER V-30029 (M020), TASK 39	
8 HRS 5: 0"						
	121	1	CLGK	CLTC	REPEATABLE SIM FLIGHT COMPLETE	(FT23)
	121	2	***	CLGK	REQUEST & EXECUTE FT23 (LVDC SECTOR SUM CHECK)	***
	121	3	CLTC	ECOP	STOP REAL TIME REDUCTION PROGRAM	
	121	4	CLTC	ETMS	TM RECORDERS OFF	
	121	5	C1TC	CLTC	STARTING S-IVB SLOW FILL (FAST FILL WILL NOT START UNTIL CLEARANCE RECEIVED).	
	121	6	CVTS	CLTC	PAD CLEARING OPERATIONS HAVE BEEN COMPLETED, CLEAR TO START S-IVB LOX FAST FILL	TCPI
	121	7	CLTC	C1TC	PAD IS CLEAR FOR S-IVB LOX FAST FILL	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 51 0"	171	8	C2AE	C2TC	START TANK PURGE IS COMPLETE	
8 HRS 11 0"	121	1	C1TC	CLTC	STARTING LOX MAINLINE CHILLDOWN AT S-IVB 5%.	
8 HRS 01 0"	181	1	C1TC	C1NE	START S-IC LCC ESE CLOSEOUT PER V-21035, REPORT WHEN COMPLETE.	
	151	2	CUTC	BGCC	VERIFY/MOUNT VLA DATA LOAD TAPE ON IODC 1-3, REPORT WHEN COMPLETE.	
	121	3	CLTC	VURF	VERIFY READY FOR CSM UP-LINK PRN MODULATION.	
	111	4	CLTC	CVTS	REQUEST GMIL BRING UP PRN MODULATION ON CSM UP-LINK.	TCP1
7 HRS 55 0"	121	1	CLGK	CLTC	FT23 COMPLETE	†
	121	2	***	CLGK	REQUEST & EXECUTE FT10 (LADDER OUTPUT TEST FULL RANGE OPTION).	*** †
7 HRS 54 0"	171	1	C2PM	C2TC	S-II LOX TANK CHILLDOWN IN PROGRESS	
	171	2	C2TC	C2AE 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
7 HRS 54' 0"		2-1		C2PU R2SC	*** NOTE MEASUREMENTS G006-201 THROUGH 205 WILL BE ACTIVE DURING SECURING OF LOX DOME AND GG INJECTOR PURGES	
7 HRS 45' 0"						
	121	1	CLGK	CLTC	FT10 COMPLETE.	
	121	2	***	CLGK	REQUEST & EXECUTE FT05 (VLA DATA LOAD)	***
7 HRS 39' 0"						
	171	1	C1TC	C2TC	STARTING S-II LOX LOADING. ALL SUPPORT PERSONNEL SWITCH TO CH 133.	
	171	2	C2AE	C2TC	S-II ENGINE PURGES COMPLETED	
7 HRS 36' 0"						
	121	1	C1TC	CLTC	S-IVB LOX LOADING TO 99% IS COMPLETED. STARTING S-II LOX LOADING. HAVE ALL PERSONNEL REQUIRED FOR S-II LH2 PRECONDITIONING REPORT FOR COMM CHECKS ON CH 143.	
	188	2	CLTC	ALL	ALL PERSONNEL REQUIRED FOR S-II LH2 PRECONDITIONING REPORT FOR COMM CHECK ON CH 143.	
	111	3	CLTC	CVTS	STARTING S-II LOX LOADING.	TCPI
	171	4	C2TC	C2PU	REPORT WHEN LOX DEPLETION SENSORS ARE COVERED, (LOX 1/2% TO 1% MASS)	
		4-1		C2PU	*** NOTE SENSORS REGISTER INTERMITTENT WET/DRY SIGNALS DURING INITIAL LOADING PHASE.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 7 HRS 36: 0"						
	171	5	C2PU	C2TC	ALL LOX DEPLETION SENSORS ARE WET	
	171	6	C2TC	C2RP	VERIFY ENGINE PURGES ARE COMPLETE. ALL PREVALVES LOX RETURN LINE VALVES TO OPEN, VERIFY LOX PREVALVES OPEN - ON,	
	171	7	C2TC	C2RP	LOX OVERRIDE TO CLOSE.	
	161	8	C4TC	C4PS	START LOX CHILLDOWN PUMP CHECKS AND LOX VENT CHECKS PER V-35014.	
- 7 HRS 35: 0"						
	121	1	CLGK	CLTC	FT05 COMPLETE (GIVE DATE OF VLA DATA LOADED).	
	151	2	CUTC	BGCC	REMOVE VLA TAPE FROM IODC 1-3	
	121	3	CLTC	ETMS BTMC	TM RECORDERS ON	(FT55)
	121	4	CLTC	ECOP	START REAL TIME REDUCTION PROGRAM	(FT55)
- 7 HRS 30: 0"						
	121	1	CLTC	RLDE	GIVE CDC/GMT TIME CORRELATION ON EVERY HALF HOUR UNTIL T-0 AND UPON ENTERING AND TERMINATION OF HOLDS.	
	121	2	***	CLGK	REQUEST & EXECUTE FT55 (LVDA TM TEST)	***
	121	3	CLTC	VURF	VERIFY READY TO SUPPORT FT45.	(FT45)
	121	4	CLTC	CUSW	ISSUE IU OCTAL 026 (CMD SYS ENABLE)	(FT45)
	111	5	CLTC	CVTS	IU COMMAND SYSTEM IS ENABLED	TCPI
	121	6	CLTC	CUCS	VERIFY ACS IN COMP/COMP MODE.	(FT45)
	161	7	C4TC	C4PS	PROCEED WITH AMBIENT SPHERE PRESSURIZATION	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 7 HRS 20' 0"						
	121	6	CVTS	CLTC	USB/CCS TRANSPONDER IN LOCK AND CLEAR TO ENABLE IU COMMAND SYSTEM	(FT47) TCPI
	111	7	CLTC	CVTS	REQUEST GMIL MONITOR CH 121 AND REPORT WHEN READY TO SUPPORT FT47.	(FT47) TCPI
	171	8	C2TC	C2RP	LH2 PREVALVES TO CLOSE, HOLD, PLACE RECIRC RESET TO RESET, THEN INHIBIT, RELEASE AND PLACE LH PREVALVES TO INHIBIT.	
		8-1		C2RP	*** NOTE ACCUMULATOR BLEED VALVE OPEN - ON	
- 7 HRS 13' 0"						
	121	1	***	CLGK	REQUEST & EXECUTE FT47, (PREFLIGHT COMMAND SYS TEST) (HOUSTON). (OPTION SP1)	***
	121	2	CLGK	CLTC	FLIGHT COMPUTER READY FOR COMMANDS	
	111	3	CLTC	CVTS	LV 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	
	121	10	CLTC	ETOM	VERIFY AVP, CRP AND SINGLE WORD DUMP	
	121	11	HFLT	ALL	COMMAND - ON MY MARK (GENERAL LOAD 2)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 13' 0"	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.	
7 HRS 5' 0"	181	1	C1TC	C1PC	OPERATE ENGINE THERMAL CONDITIONING PURGE AS REQUIRED TO MAINTAIN ENGINE TEMPERATURE	
7 HRS 3' 0"	121	1	***	CLGK	REQUEST AND EXECUTE FT47 (PREFLIGHT CMD SYS TEST) (HOUSTON) (OPTION SP3)	***
	121	2	CLGK	CLTC	FT47 COMPLETE	
	121	3	CLTC	ECOP	TERMINATE REAL TIME REDUCTION PROGRAM.	
	121	4	CLTC	ETMS BTMC	TM RECORDERS OFF	
	121	5	CLTC	CUIP	COMMAND DECODER POWER OFF CCS TRANSPONDER POWER OFF	
	121	6	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	
	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

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 3' 0"	111	8	CLTC	CVTS	HOUSTON PREFLIGHT COMMAND SYSTEM TEST IS COMPLETE.	TCPI
7 HRS 1' 0"	121	1	***	CLGK	REQUEST & EXECUTE FT23 (LVDC SECTOR SUM CHECKS).	***
	181	2	C1TC	ALL	PERSONNEL SUPPORTING LOX LOADING GO TO CH 133 ACTIVE.	
7 HRS 0' 0"	161	1	C4TC	C4PS	START MIXTURE RATIO CONTROL VALVE (MRCV) CHECKS ON CH 161. REPORT WHEN COMPLETE.	
	161	2	C4PS	V4MS	VERIFY READY TO RECORD K7, K219, D18 & G17.	
	161	3	C4PS	C4ET C4PU R4PS	VERIFY READY FOR MRCV CHECKS.	
	161	4	C4PS	C4PU	MRCV CMD NO. 1 OPEN (OCTAL 002) AND VERIFY RELAYS RESET IND OFF AND MRCV OPEN CMD ON IND ON.	
	161	5	C4PS	C4PU	MRCV CMD NO. 2 OPEN (OCTAL 117).	
	161	6	C4PS	C4ET	CT HELIUM CONTROL SOLENOID ON.	
		6-1		C4ET	*** NOTE LOX AND LH BLEED VALVES CLOSE.	
	161	7	C4PS	R4PS	VERIFY MRCV OPENS.	
	161	8	C4PS	C4PU	MRCV CMD NO. 1 CLOSE (OCTAL 055).	
		8-1		C4PU	*** NOTE MRCV OPEN CMD ON IND OFF.	
	161	9	C4PS	C4PU	MRCV CMD NO. 2 CLOSE (OCTAL 036).	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 01' 0"		9-1	C4PU	C4PU	*** NOTE RELAYS RESET IND ON.	
	161	10	C4PS	R4PS	VERIFY MRCV CLOSES.	
	161	11	C4PS	C4PU	MRCV CMD NO. 2 OPEN THEN NO. 1 OPEN, DELAY 5 SECONDS, THEN MRCV CMD NO. 2 AND NO. 1 CLOSE.	
	161	12	C4PS	R4PS	VERIFY MRCV OPENS THEN CLOSES.	
	161	13	C4PS	C4ET	CT HELIUM CONTROL SOL OFF.	
	161	14	C4PS	V4MS	REPORT MRCV VALVE MOTION TIMES AND VOLTAGE CHANGE TO C4PS.	
6 HRS 55' 0"		121	CLTC	CUFS	START FLIGHT CONTROL SYSTEM PREPS ON CH 123	(KAF2)
		123	CUFS	CUSP CUGA	PLACE ALL FCC, CCIS AND EDS/CRG PANEL SWITCHES TO AUTO.	(KAF2)
6 HRS 54' 0"		181	C1TC	C1PC	LOW LOX DOME PURGE SWITCH TO AUTO	(KAF2)
		181	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	C1TC	CLTC	S-II LOX LOADING TO 99% IS COMPLETED AND STARTING S-IC LOX LOADING.	
		111	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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
6 HRS 51' 0"						
	121	1	CLGK	CLTC	FT23 COMPLETE	
	121	2	***	C1PC	LOW LOX DOME PURGE ON FOR FLIGHT CONTROL SYSTEM CHECKS	*** (KAF2)
	123	3	***	CLFK	REQUEST & EXECUTE KAF2 (FLT CONTROL PREPS) WITH THE FOLLOWING OPTIONS: PRIMARY OPTION 1 (FCC & GYRO PREPS) SECONDARY OPTION 1 (COMPARATORS RESET)	***
	123	4	CUFS	CUSP	FLIGHT CONTROL COMPUTER SYSTEM POWER - ON	
6 HRS 47' 0"						
	121	1	CUFS	CLTC	KAF2 COMPLETE.	
	121	2	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO PREPARE FOR CTC5; CLGK CLFK CUGA CUCR CUFE C4FC CUSP C4FS C4NP	(CTC5)
	123	3	CUFS	CLGK	VERIFY READY TO SUPPORT CTC5.	(CTC5)
	151	4	CUFS	BGCC	MASK THE FOLLOWING DISCRETES: SFUNC SE 935-38 MMSK (MDI'S 0888-0911)	(CTC5)
6 HRS 46' 0"						
	121	1	CLTC	C1TC C2TC C4TC CUTC	DISPLAY DESCRIPTIONS (FORMAT SELECTS) MUST BE COORDINATED WITH CLTC PRIOR TO EXECUTION UNTIL COMPLETION OF VALK.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<b>CD ONLY</b>						
6 HRS 46' 0"	171	2	C2TC	C2NK C2PK	DISPLAY DESCRIPTIONS (FORMAT SELECTS) MUST BE COORDINATED WITH C2TC PRIOR TO EXECUTION UNTIL COMPLETION OF VALK,	
	121	3	***	C1PC	LOW LOX DOME PURGE ON FOR CTC5	***
	123	4	***	CLFK	REQUEST & EXECUTE CTC5 NORM OPTION (LVDC & CRG INPUTS; BURN & COAST MODES; P, Y AND R AXES; SPARE & ACTIVE; APS POWER OFF).	***
		4-1		CLFK	*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE,	
6 HRS 30' 0"	161	1	C4PS	C4HC	DECREASE HE SUPPLY TO 1500 +/- 100 PSIA	
	161	2	C4PS	C4SP	OPEN COLD HE SUPPLY	
		2-1		C4SP	*** NOTE RAPID CYCLING OF LOX AND LH2 REPRESS VENTS REQUIRED FOR NEXT TWO SEQUENCES TO PREVENT EXCESSIVE PRESSURE DROP	
	161	3	C4PS	C4SP	DECREASE LOX REPRESS PRESSURE 100-150 PSI BELOW ENGINE BOTTLE PRESSURE	
	161	4	C4PS	C4SP	DECREASE LH2 REPRESS PRESSURE 100-150 PSI BELOW LOX REPRESS BOTTLE PRESSURE	
	161	5	C4PS	R4PS	VERIFY DELTA P'S ARE SATISFACTORY	
6 HRS 0' 0"	171	1	CLTC	C1TC C2TC	<b>CDDT ONLY</b>	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
6 HRS 01' 0"	181	2	C1TC	CCL0	CDDT ONLY	*
	171	3	C2TC	C2PM C2RP R2PM R2SC	CDDT ONLY	*
5 HRS 45' 0"	121	1	CUFS	CLTC	CTC5 COMPLETE. STARTING CTC3.	
	121	2	***	C1PC	LOW LOX DOME PURGE ON FOR CTC3	***
	123	3	***	CLFK	REQUEST AND EXECUTE CTC3, OPTIONS A, CD, EF (LVDC, INPUTS; BURN AND COAST MODE; P, Y, AXES). REPORT WHEN COMPLETE.	***
	151	4	CUFS	BGCC	UNMASK THE FOLLOWING DISCRETES: \$FUNC SE 935-38 MREL (MDI'S 0888-0911)	
5 HRS 32' 0"	171	1	C2PM	C2TC	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.	
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	C1LO	CYCLE LOX VENTS CLOSED THEN AUTO AS REQUIRED TO MAINTAIN ULLAGE PRESSURE AND VENT VALVE OPERATION	

LV CDDT &amp; CD, VOL II

DATE: MAY 18, 1971

## APOLLO/SATURN LAUNCH OPERATIONS

REVISION 029

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5 HRS 29' 0"						
	181	3	C1TC	C1RP	PRESSURIZE HE BOTTLES TO 3200 PSI PER V-24327, REPORT WHEN COMPLETE.	
	161	4	C4TC	C4PS	VERIFY READY FOR LH2 LOAD.	
	171	5	C2TC	C2EV	VERIFY READY FOR LH2 LOADING ON	
5 HRS 27' 0"						
	121	1	C2TC	CLTC	PRECONDITIONING TO MINUS 160 DEG F IS COMPLETE. READY FOR LH2 LOADING.	
	121	2	C4TC	CLTC	READY FOR LH2 LOADING.	
	121	3	CLTC	C1TC	START S-II LH2 LOADING	
	111	4	CLTC	CVTS	STARTING S-II LH2 LOADING.	TCPI
		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	
5 HRS 18' 0"						
	121	1	CUPS	CLTC	CTC3 COMPLETE	
	121	2	***	C1PC	LOW LOX DOME PURGE OFF	***
	121	3	***	CLGK	REQUEST & EXECUTE FT31 (ACCELEROMETER PULSE COUNT)	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5 HRS 15: 0"						
	121	1	CLGK	CLTC	FT31 COMPLETE	
	121	2	***	CUPC	REQUEST & EXECUTE FT06 (DRIFT CHECKS OPTION)	***
	151	3	CLFK	BGCC	MOUNT CTC4/CSBO SCALE FACTOR TAPE ON IODC 1-3. REPORT WHEN COMPLETE.	
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 CUF E C1FE V2MS R4HY C2FE CUPS CUGA R2SC C4FS C4FC	(CTC4)
	123	2	CUPS	C1FE	VERIFY READY TO SUPPORT CTC1	(CTC4)
	123	3	CUPS	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.	(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	CUPS	C2FE	VERIFY READY TO SUPPORT CTC1	(CTC4)
	123	5	CUPS	C4HY	AUX HYDRAULIC PUMP POWER SWITCH TO AUTO.	(CTC4)
	123	6	CUPS	C4FC	VERIFY READY TO SUPPORT CTC1	(CTC4)
	151	7	CUPS	CUES	VERIFY EDS AUTO ABORT BUS DE-ENERGIZED AND WILL REMAIN OFF UNTIL COMPLETION OF CTC4	(CTC4)
	123	8	CUPS	CUGA	CONTROL EDS RATE GYRO SYSTEM POWER ON.	(CTC4)



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
4 HRS 40: 00						
	111	2	CLTC	CVTS	REQUEST SRD SWITCH TO CHANNEL 121 TO SUPPORT DRSCR CLOSED LOOP TEST USING FLIGHT CODE PLUGS	TCPI (VARS) #
	111	3	CLTC	CVTS	<b>CDDT ONLY</b>	TCPI (VARS) *
	111	4	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN	TCPI (VARS)
	121	5	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	(VARS)
	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	(VARS)
	121	7	CLTC	BTMC	TM TAPE RECORDER ON	(VARS)
		7-1		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR TESTS.	
	121	8	CLTC	RRSC	VERIFY DRSCS RECORDERS ON.	(VARS)
	111	9	CLTC	CVTS	LOCAL CMD CARRIER COMING ON.	TCPI
		10		C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE (CD ONLY).	
	171	11	C2TC	C2RP	LH2 PUMP DISCHARGE AND RETURN LINE VALVES TO OPEN.	
	171	12	C2TC	C2RP	START LH2 RECIRC PUMP TEST PER V-30029 (M020) TASK 61. REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 36' 0"	121	1	***	C1PC	LOW LOX DOME PURGE ON	*** (CTC1)
4 HRS 35' 0"	121	1	CUFS	CLTC	CTC4 COMPLETE	
	151	2	CLFK	BGCC	REMOVE CTC4/CSBO SCALE FACTOR TAPE FROM IODC 1-3	
		3			NOTE ----- IF A TEST IS TO BE PERFORMED MANUALLY, THE SEQUENCES WITH THE AUTO PROGRAM IVAR IN THE COMMAND STATION COLUMN WILL BE COMMANDED BY THE TEST CONDUCTOR ASSOCIATED WITH THE OIS COMM CH SHOWN.	
	121	4	***	C1PK	REQUEST & EXECUTE VARS (DRSCR TEST) (T-4 HR OPTION).	***
	121	5	VARS	C1DP C2DP C4DP	VERIFY S&A SAFE AND RSCR'S 1 & 2 PD BLOCKED - ON	
	121	6	C1PK	CLVN	DESTRUCT SYSTEM TO ENABLE.	
		6-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON.	
	121	7	C1PK	C1DP C2DP C4DP	SYSTEM STATUS SWITCH - OFF	
	121	8	VARS	BRFS	SIG GEN SELECTOR ON AND VERIFY REMOTE MONITOR TO HYBRID	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 35: 0"						
121		9	VAR S	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL AND VERIFY	
121		10	VAR S	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
		10-1		CRSS	*** NOTE LIMITER VOLTAGES RECEIVED.	
121		11	VAR S	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		11-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		12	VAR S	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		13	C1PK	CLTC	READY FOR SRO CUTOFF COMMAND	
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	
		17	VAR S	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	VAR S	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 WERE INTERNAL & CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 35: 0"		19-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED	
		19-2		CRSS	*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON	
121		20	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		20-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		21	VAR5	C1DP C2DP C4DP	VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED	
121		22	C1PK	CLTC	READY FOR SRO PD COMMAND	
121		23	CLTC	RRSC	RECORDERS - FAST SPEED	
121		24	CLTC	SRO	ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
121		25	SRO	ALL	3-2-1 - MARK	
121		26	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		27	VAR5	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		27-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED	
121		28	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	
		28-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		29	VAR5	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO AND VERIFY RSCR'S OFF.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 35: 0"		29-1		B1RF B2RF B4RF CRSS	*** NOTE RSCR LIMITER VOLTAGE INDICATIONS OFF.	
121	30	C1PK	C1DP C2DP C4DP		STATUS SYSTEMS - SAFE	
121	31	C1PK	CLVN		DESTRUCT SYSTEM - OFF AND RETURN DESTRUCT SYSTEM KEY TO CPSS, REPORT WHEN COMPLETE.	
121	32	VARS	C1DP C2DP C4DP		VERIFY SAFETY BUS - OFF.	
121	33	VARS	BRFS		SIGNAL GENERATOR SELECTOR TO STANDBY AND HYBRID TO SELECT MONITOR NO. 1	
121	34	C1PK	CLTC		VARS COMPLETE.	
171	35	C2RP	C2TC		LH2 RECIRC PUMP TEST COMPLETE.	
4 HRS 30: 0"		1	***	C1PC	LOW LOX DOME PURGE ON FOR CTC1	***
123	2	***	CLFK		REQUEST & EXECUTE CTC1 WITH THE FOLLOWING OPTIONS AB, C, GH, IJ, M-B, D, GH, IJ, N-AB, C, EF, IJ, O-AB, C, EF, K, M (S-IVB, AO, A1, SPO, PRIM & SPARE, PITCH & YAW - S-IVB, A1, SP6, PRIM & SPARE, PITCH & YAW - S-IC S-II, AO, A1, SP2, PITCH & YAW - S-IC S-II, AO, A1, ROLL AXIS, SPO)	***
	2-1		CLFK		*** NOTE ADVISE ALL PERSONNEL OF MAJOR PROGRAM EVENTS BEING DISPLAYED ON SANDERS CONSOLE.	
121	3	CLTC	BTMC		TM TAPE RECORDER OFF AND RELOAD	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 30' 0"		3-1	BTMC		*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	
	111	4	CLTC	CVTS	RANGE SAFETY COMMAND CHECKS COMPLETE. LOCAL COMMAND CARRIER IS OFF AND DESTRUCT SYSTEM KEY RETURNED TO CPSS	TCPI
		5-7			<b>CDDT ONLY</b>	*
4 HRS 22' 0"		1	C1TC	C4TC	READY FOR LH2 LOADING. ALL SUPPORT PERSONNEL GO TO CH 143.	
	161					
4 HRS 19' 0"		1	C1TC	CLTC	S-II LH2 LOADING IS COMPLETED AND S-IVB LH2 LOADING IN PROGRESS.	
	121					
	171	2	C2TC	C2SP	CYCLE THE LH2 VALVES CLOSED THEN OPEN AT LEAST EVERY TWO HOURS. IF THE VALVES SHOULD INADVERTENTLY NOT BE CYCLED AS SPECIFIED, THEY SHOULD BE CYCLED A MINIMUM OF 5 TIMES TO ASSURE NORMAL OPERATION. THE FIRST THREE CYCLES SHALL UTILIZE THE OVERRIDE CLOSE ASSIST.	
	173	3	C2TC	C2GP	PERIODICALLY CYCLE THE START TANK LINE VENT OPEN (10 SECONDS MINIMUM) UNTIL THE PRESSURE HAS STABILIZED THEN CLOSE, UP TO THE INITIATION OF START TANK CHILLDOWN. VERIFY THE A7-71 LH2 LIQUID LEVEL IS CONSTANT PRIOR TO EACH CYCLE OF THE START TANK LINE VENT.	
4 HRS 16' 0"		1	CLTC	CVTS	ADVISE SCO PERSONNEL THAT Q-BALL POWER IS COMING ON IN APPROXIMATELY 5 MINUTES	TCPI
	111					
4 HRS 11' 0"		1	CLTC	CUIP	Q-BALL POWER ON Q-BALL HEATER POWER - ON	TCPI
	121					
		1-1	CUIP		*** NOTE Q-BALL POWER SWITCH WILL BE LEFT IN ON POSITION UNTIL T-47 MIN	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 11' 0"						
		121	2	C2TC	CLTC	STARTING MRCV TEST
		171	3	C2TC	C2PU	START MRCV TEST. REPORT WHEN COMPLETE.
			3-1	C2PU	*** NOTE ALLOW 2 SECONDS DELAY MINIMUM BETWEEN COMMANDS TO MRCV'S.	
		171	4	C2PU	C2NP	SWITCH SELECTOR INHIBIT OFF
		171	5	C2PU	C2AE	VERIFY ENGINE 201 THRU 205 HELIUM BOTTLE PRESSURE IS 1400 PSIA OR GREATER
		171	6	C2PU	V2MS	VERIFY READY TO SUPPORT MRCV TIMING (MEASUREMENTS K6-201, K125-201 AND G006-201 THRU 205)
		171	7	C2PU	R2SC	G006-201 THRU 205 RECORDERS TO FAST
		171	8	C2PU	C2AE	ALL HELIUM SOL SW TO ON
		171	9	C2PU	C2AE	ALL HELIUM CONT SOL ON LIGHT - ON
		171	10	C2PU	V2MS	MEASURE TIME FROM K6-201 ON TO WHEN G006-201 THRU 205 REACHES LOW ENGINE MIXTURE RATIO (EMR) POSITION AND VERIFY THE TIME IS LESS THAN ONE SECOND FOR EACH VALVE.
		171	11	C2PU	R2SC	VERIFY G006-201 THRU 205 INCREASED 1.3 TO 1.8 VDC.
		171	12	C2PU	C2PK	VERIFY ENGINE REG OUT PRESS D012-201 THRU 205 IS 415 +/- 25 PSIA.
			13	C2PU		MRCV COMMAND NO. 1 SW - HIGH EMR.
			14	C2PU		RESET LIGHT - OFF
			15	C2PU		CHECKOUT RESET LIGHT - OFF.
		171	16	C2PU	C2EV	ENG 201 THRU 205 MRCV SOL CMD ON LIGHT OFF
		171	17	C2PU	V2MS	MEASURE TIME FROM K125-201 OFF TO WHEN G006-201 THRU 205 REACHES HIGH EMR POSITION AND VERIFY THE TIME IS LESS THAN 1.2 SECOND FOR EACH VALVE.



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
3 HRS 50' 0"						
	121	1	CLTC	C1TC C2TC	CDDT ONLY	*
	181	2	C1TC	CCLH	CDDT ONLY	*
	171	3	C2TC	C2PM R2PM R2SC	CDDT ONLY	*
3 HRS 45' 0"						
	161	1	C4TC	C4PS	WHEN LH2 LOADING REACHES 100% START CHILLDOWN PUMP CHECKS PER V-35014.	
	123	2	CUFS	C4HY	AUXILIARY PUMP POWER SWITCH TO OFF	
	171	3	C2RP	C2TC	LOX HE INJ/ACCUMULATOR TEST COMPLETED	#
	181	4	CCLO	C1TC	CDDT ONLY	*
	121	5	C1TC	CLTC C2TC	CDDT ONLY	*
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 LH2 DIRECTIONAL VENT CHECK, REPORT WHEN COMPLETE,	*
	111	3	CLTC	CVTS	LV CRYO LOADING IS COMPLETE AND NORMAL REPLENISH HAS BEEN ESTABLISHED.	TCPI *

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3 HRS 38' 0"		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.	
	161	8	C4TC	C4PS	START LH2 DIRECTIONAL VENT CHECK, AND LH2 AND LOX TANK VENT CHECKS ON CH 161.	
	143	9	C4PS	C4HU	POSITION S-IVB REPLENISH VALVE OVERRIDE CLOSE SWITCH TO CLOSE	
	161	10	C4PS	C4PR	VERIFY LH2 REPLENISH VALVE CLOSED	
	161	11	C4PS	C4SP	LH2 L/R OPEN ON THEN OFF	
	161	12	C4PS	C4SP	VERIFY CLOSED IND ON AND LH2 VENT BOOST CLOSE AND L/R LATCH RESET COMMANDS IND ON.	
	161	13	C4PS	C4SP	VERIFY LH2 TANK VENT CLOSED.	
	161	14	C4PS	C4SP	DIR VENT TO FLIGHT THEN AUTO. VERIFY FLIGHT POSITION.	
	161	15	C4PS	C4SP	DIR VENT TO GROUND THEN AUTO. VERIFY GROUND POSITION.	
	161	16	C4PS	C4SP	OPEN LH2 TANK VENT.	
	143	17	C4PS	C4HU	POSITION S-IVB REPLENISH VALVE OVERRIDE SWITCH TO NORMAL. VERIFY NORMAL REPLENISH HAS BEEN ESTABLISHED.	
	161	18	C4PS	C4SP	CLOSE LOX TANK VENT THEN OPEN	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CD ONLY						
3 HRS 38: 0"						
	161	19	C4PS	C4SP	LOX TANK NPV OPEN, LATCH, CLOSE, THEN UNLATCH.	
	161	20	C4PS	C4SP	VERIFY VALVE IN AN INTERMEDIATE POSITION	
	161	21	C4PS	C4SP	LOX TANK NPV OPEN THEN CLOSE	
	161	22	C4PS	C4SP	VERIFY FULL CLOSED IND ON, AND LOX VENT/NPV BOOST CLOSE AND NPV LATCH COMMAND RELAYS RESET IND, ON.	
	121	23	C4TC	CLTC	S-IVB VENT CHECKS COMPLETE. READY FOR CREW INGRESS	
3 HRS 30: 0"						
	171	1	C2TC	C2AE C2RP	START PROPULSION SYSTEM BOTTLE DECAY TEST PER V-30029 (M020) TASK 34	#
3 HRS 25: 0"						
	111	1	CLTC	CVTS	LV READY FOR CREW INGRESS	TCPI
		2	CLTC		*** NOTE TIME FOR SC GROUND CLOSEOUT CREW TO LEAVE MSS PARKSITE.	
3 HRS 20: 0"						
	123	1	CUFS	C2FC	RETURN PANEL CONTROL SWITCHES TO COUNT CONFIGURATION.	#
		1-1		C2FC	ALL FUNCTIONAL SWITCHES TO OFF OR DOWN POSITION, EXCEPT ALL ACCUMULATOR CONTROL IN AUTO AND AUX PUMPS IN ENABLE	#
	171	2	C2FE	C2TC	FLIGHT CONTROL TEST CTC1 IS COMPLETE.	
	171	2-1	C2FC	C2TC	REQUEST PERMISSION TO ESTABLISH EAS MANUAL TEMPERATURE CONTROL MODE.	





TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3 HRS 20: 0"						
	121	15	***	CLGK	REQUEST & EXECUTE FT31 (ACCELEROMETER PULSE COUNT)	***
	161	16	C4PS	C4ET	ENGINE CONTROL POWER ON	
		16-1			*****CAUTION***** * * C4ET ENGINE CONTROL * * POWER OFF UPON ANY * * CHANGE OF STATE OF THE * * ENGINE * * *****	
	161	17	C4PS	C4ET	VERIFY IGNITION DETECTED ON	
	161	18	C4PS	C4ET	SWITCH SELECTOR CUTOFF NO. 1 ON THEN OFF	
	161	19	C4PS	C4ET	SW SELECTOR CUTOFF NO. 2 AUTO THEN OFF	
	161	20	C4PS	C4ET	LIQUID LEVEL SENSOR CUTOFF TO ARM	
	161	21	C4PS	C4ET	MONITOR FOR ANY ENGINE CUTOFF	
	161	22	C4PS	C4SP	MODE SELECT TO BURNER THEN AUTO	
	161	23	C4PS	C4OH	VOTING CIRCUIT ENABLE ON	
	161	24	C4PS	C4OH	VERIFY REPRESS SYS LAUNCH MODE IND OFF	
	161	25	C4PS	C4OH	MONITOR FOR A BURNER MALFUNCTION.	
	181	26	CSAC	C1TC	PRIMARY DAMPER IS RETRACTED & LATCHED	
	121	27	C1TC	CLTC	PRIMARY DAMPER IS RETRACTED & LATCHED	
	111	28	CLTC	CVTS	PRIMARY DAMPER IS RETRACTED & LATCHED	TCP1
	161	29	C4TC	C4PS	CONDUCT HELIUM DECAY CHECKS ON CH 161.	
	161	30	C4PS	R4PS C4P2	VERIFY HELIUM HAS STABILIZED AND READY FOR DECAY CHECKS,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<b>CD ONLY</b>						
3 HRS 20' 0"						
	161	31	C4PS	C4SP	CLOSE COLD HELIUM SUPPLY VALVE	
	161	32	C4PS	C4SP	OPEN COLD HELIUM LINE VENT FOR 15 MINUTES THEN CLOSE	
	161	33	C4PS	C4HC	<b>CDDT ONLY</b>	*
	161	34	C4PS	C4OH	VOTING CKT TEMP SIM #1 TO LOW AND #2 TO HIGH, VERIFY NO MALFUNCTION.	
	161	35	C4PS	C4OH	VOTING CKT TEMP SIM #2 TO AUTO AND #3 TO HIGH, VERIFY NO MALFUNCTION.	
	161	36	C4PS	C4OH	VOTING CKT TEMP SIM #1 TO HIGH AND #3 TO LOW, VERIFY NO MALFUNCTION.	
	161	37	C4PS	C4OH	VOTING CKT TEMP SIM #1 TO AUTO.	
	181	38	C1TC	C1PE	<b>CDDT ONLY</b>	*
		39-41			<b>CDDT ONLY</b>	**
3 HRS 17' 0"						
	121	1	CLGK	CLTC	FT31 COMPLETE	
	121	2	***	CUPC	REQUEST & EXECUTE FT06 (DRIFT CKS OPTION)	***
3 HRS 9' 0"						
	181	1	CCLH	C1TC	<b>CDDT ONLY</b>	*
	121	2	C1TC	CLTC C2TC	<b>CDDT ONLY</b>	*

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3 HRS 8: 0"						
	121	1	CLTC	C1TC C4TC	CDDT ONLY	*
	181	2	C1TC	CCLH	CDDT ONLY	*
3 HRS 5: 0"						
	121	1	CUPC	CLTC	FT06 COMPLETE	*
	123	2	CUFS	CLGK	VERIFY READY TO SUPPORT CONTROL COMPUTER REDUNDANCY TEST (CTC2).	(C2TC)
	121	3	***	C1PC	LOW LOX DOME PURGE ON FOR CTC2.	***
	123	4	***	CLFK	REQUEST & EXECUTE CTC2 NORM OPTION. REPORT WHEN COMPLETE; (LVDC, CRG S/C INPUTS; BURN & COAST MODE; P, Y, R)	***
	121	5	CLTC	C1TC C2TC	CDDT ONLY	*
	171	6	C2TC	C2RP C2SP C2GP R2SC V2MS R2RL	CDDT ONLY	*
		6-1			CDDT ONLY	*
	171	7	C2TC	C2NP	CDDT ONLY	*

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
3 HRS 01 00"						
	161	1	C4PS	C4OH	VOTING CKT TEMP SIM #3 TO AUTO AND #2 TO LOW	
	171	2	C2TC	C2RP	CDDT ONLY	*
		2-1		C2RP	CDDT ONLY	*
2 HRS 55 00"						
	191	1	C1TC	CCL0	CDDT ONLY	*
		2		CCL0	CDDT ONLY	*
	133	3	CCL0	C20U CP02	CDDT ONLY	*
	133	4	CCL0	C20U	CDDT ONLY	*
	133	5	CCL0	C20U	CDDT ONLY	*
	133	6	CCL0	CP02	CDDT ONLY	*
	133	7	CCL0	CP02	CDDT ONLY	*
	133	8	CCL0	RLDR	CDDT ONLY	*
	181	9	CCL0	C1TC	CDDT ONLY	*
	121	10	C1TC	CLTC C2TC	CDDT ONLY	*



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 42'15"		1		C2RP	CDDT ONLY	*
2 HRS 42'14"		1		C2RP	CDDT ONLY	*
2 HRS 42'13"		1		C2EC	CDDT ONLY	*
2 HRS 42'10"		1		C2RP	CDDT ONLY	*
2 HRS 42' 9"		1		C2RP	CDDT ONLY	*
		2		C2RP	CDDT ONLY	*
		2-1		C2RP	CDDT ONLY	*
		3			CDDT ONLY	*



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
2 HRS 35' 0"	171	1	C2RP	C2GP	CDDT ONLY	*
		2		C2RP	CDDT ONLY	*
	171	3	C2RP	C2TC	CDDT ONLY	*
	171	4	C2TC	C2SP	CDDT ONLY	*
		5		C2SP	CDDT ONLY	*
		6		C2SP	CDDT ONLY	*
		7		C2SP	CDDT ONLY	*
		8-10			CDDT ONLY	*
2 HRS 33' 0"	181	1	C1TC	CCL0	CDDT ONLY	*
	133	2	CCL0	C20U	CDDT ONLY	*
	133	3	CCL0	CP02	CDDT ONLY	*
	133	4	CCL0	CP02	CDDT ONLY	*
	133	5	CCL0	C20U	CDDT ONLY	*
	133	6	CCL0	RLDR	CDDT ONLY	*
		7		CCL0	CDDT ONLY	*
	181	8	CCL0	C1TC	CDDT ONLY	*
	121	9	C1TC	CLTC C2TC	CDDT ONLY	*
	121	10	C2TC	CLTC	CDDT ONLY	*



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
2 HRS 30 0"						
	121	1	CLGK	CLTC	FT10 COMPLETE	
	121	2	***	CUPC	REQUEST & EXECUTE FT06 (DRIFT CHECKS)	***
	151	3	CUTC	BGCC	UNMASK THE FOLLOWING DISCRETES, REPORT WHEN COMPLETE,	
					DELETED	
					\$ FUNC SE 937-02 MREL	B-353-67
					\$ FUNC SE 937-05 MREL	#
					\$ FUNC SE 937-01 MREL	
					\$ FUNC SE 937-20 MREL	
					\$ FUNC SE 937-45 MREL	
	171	4	C2TC	C2NP	STAGE SELECT TO INHIBIT	
	171	5	C2TC	C2AE C2RP	CDDT ONLY	
2 HRS 27 0"						
		1			NOTE	
					-----	
					C2TV REQUIRES VIDEO TAPE TV SCAN OF S-II SIDEWALL INSULATION UTILIZING CAMERAS 9, 16, 34 & 35	
2 HRS 25 0"						
	161	1	C4PS	C4ET	CUTOFF SENSOR POWER OFF	
	161	2	C4PS	C4ET	VERIFY NONPROGRAMMED CUTOFF ON	
	161	3	C4PS	C4ET	VERIFY WET INDICATION OFF	
	161	4	C4PS	C4ET	LIQUID LEVEL SENSOR CUTOFF TO DISARM	
	161	5	C4PS	C4ET	VERIFY NONPROGRAMMED CUTOFF INDICATION OFF	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 51 00"	111	1	CLTC	CVTS	VERIFY RANGE CLEARANCE FOR ALL LV RF AND TM AND USB STATION READY TO SUPPORT.	TCPI
		1-1		C1IP C2IP C4IP CUIP	GDDT ONLY	*
2 HRS 01 00"	121	1	CVTS	CLTC	SC EDS POWER IS COMING ON AT T-1 HR 55' 00"	# TCPI
	121	2	CLTC	C1TC C2TC C4TC CUTC	PREPARE FOR VALL AND START PREPS FOR EDS TEST PER V-21096, REPORT WHEN READY TO SUPPORT EDS TEST.	
	171	3	C2TC	C2AE C2EC C2NP	PREP FOR EDS TEST, REPORT WHEN COMPLETE.	
	181	4	C1TC	C1NE	VERIFY READY TO SUPPORT EDS TEST.	
	181	5	C1TC	C1IP	TM MODE SELECT - AUTO	(VALL)
	181	6	C1TC	C1IP	TM CALIBRATOR - AUTO	(VALL)
	181	7	C1TC	C1IP	TM CAL MODE - AUTO	(VALL)
	181	8	C1TC	C1IP	PREFLT LEVELS - AUTO	(VALL)
	181	9	C1TC	C1IP	F1 AND P1 RF TRANSMITTER - AUTO	(VALL)
	181	10	C1TC	C1PC	LOW LOX DOME PURGE - AUTO	(VALL)
	121	11	C1TC	CLTC	S-IC READY FOR VALL	

APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
2 HRS 01 00"		12	C2TC	C2IP	GROUND POWER - ON	(VALL)
		13	C2TC	C2IP	RF COUPLER - AUTO	(VALL)
		14	C2TC	C2IP	TM CAL MODE - AUTO	(VALL)
		15	C2TC	C2IP	PREFLT LEVELS - AUTO	(VALL)
		16	C2TC	C2IP	FM/FM INFLT - AUTO	(VALL)
		17	C2TC	C2IP	PCM MODE - AUTO	(VALL)
		18	C2TC	C2IP	F1, F2 AND P1 RF TRANSMITTER - AUTO	(VALL)
		19	C2TC	CLTC	S-1I READY FOR VALL	
		20	C4TC	C4IP	TM MODE SELECT - AUTO	(VALL)
		21	C4TC	C4IP	TM CALIBRATE - AUTO	(VALL)
		22	C4TC	C4IP	P1 TRANSMITTER - AUTO	(VALL)
		23	C4TC	CLTC	S-1VB READY FOR VALL	
		24	CUTC	CUIP	RF DUMMY LOAD - AUTO	(VALL)
		25	CUTC	CUIP	F1 TM - AUTO	(VALL)
		26	CUTC	CUIP	TM CAL MODE TO INFLT THEN AUTO	(VALL)
		27	CUTC	CUIP	TM CALIBRATOR - AUTO	(VALL)
		28	CUTC	CUIP	PREFLT LEVELS - AUTO	(VALL)
		29	CUTC	CUIP	F1 & P1 RF TRANSMITTER - AUTO	(VALL)
		30	CUTC	CLTC	IU READY FOR VALL	
		31	CUTC	BGCC	<b>GDDT ONLY</b>	
1 HRS 55 00"		1	CLTC	C1PK	REQUEST AND EXECUTE VALL (LINKING PROGRAM)	(VAED)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 55: 0"		1-1			<p>NOTE                      ----</p> <p>WHEN LINKING PROGRAMS ARE UTILIZED, SEQUENCES WITH THREE ASTERISKS IN THE COMMAND STA AND REMARKS COLUMNS WILL BE DONE AUTOMATICALLY BY THE LINKING PROGRAM. IF THE LINKING PROGRAM IS NOT UTILIZED, THE TEST CONDUCTOR FOR THE INDICATED COMM CH WILL, AT THE APPROPRIATE TIME, REQUEST THE OPERATORS TO DO THESE FUNCTIONS MANUALLY. PROGRAMS WILL NORMALLY BE DONE AT THE TIME SHOWN BUT MAY, AFTER COORDINATION ON CH 121, BE CALLED EARLY BY CLES OR DELAYED BY C1PK.</p>	
	121	2	CLTC	ALL	ALL LV PERSONNEL SUPPORTING EDS TEST GO TO CH 223 ACTIVE AND MONITOR CH 121	
	111	3	CLTC	CVTS	LV READY FOR EDS TEST, REQUEST SCO PERSONNEL SWITCH TO CH. 223.	TCPI
	121	4	CLTC	CEDK	GO TO CH 223 AND PERFORM EDS TEST WHEN READY.	
1 HRS 52: 0"						
	111	1	CLTC	CVTS	REQUEST IU CCS ENABLE. REPORT WHEN COMPLETE, (SCDR, PANEL 2, IU UP TLM TO ACCEPT)	# TCPI (FT47)
	121	2	CVTS	CLTC	SCO PERSONNEL STANDING BY TO SUPPORT EDS TEST, CCS IS ENABLED.	# TCPI
	121	3	CVTS	CLTC	CDDT ONLY	* TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 51' 0"	121	1	***	CEDK	REQUEST & EXECUTE VAED (EDS TEST) PER V-21096 (PROGRAMS VAED, VZ33, FT33, VZSA, VZEA, VZRE). (SPR1 OPTION). REPORT WHEN PROGRAMS HAVE TERMINATED.	# ***
	121	2	***	CEDK	CDDT ONLY	* ***
		3		C1FR CUEV	NOTE -----  CRSS WILL CONDUCT HOLDFIRE CHECKS WITH RSO & SRO DURING THE NEXT 30 MINUTES. THE RANGE SAFE INDICATION ON THE C1FR PANEL AND BOTH SRO/RSO PROCEED INDICATIONS ON IU EVENTS DISPLAY PANEL WILL CYCLE ON AND OFF DURING THESE CHECKS.	
1 HRS 45' 0"	171	1	C2AE	C2TC	CDDT ONLY	*
1 HRS 30' 0"	171	1	C2TC	R2SC	START LH2 INLET TEMPERATURE CORRECTION PER V-30029 (M020) TASK 71. REPORT WHEN COMPLETE.	
1 HRS 27' 0"	111	1	CLTC	CVTS	Q-BALL SIM COMMANDS & CCS BLOCK WILL BE EXERCISED AT THE COMPLETION OF EDS TEST. REQUEST SCDR & MTPE MONITOR 121.	TCPY #

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
1 HRS 27: 0"						
	111	2	CLTC	CVTS	GDDT ONLY	TCP!
	111	3	CLTC	CVTS	REQUEST GMIL REPORT ON CH121 TO SUPPORT FT47	TCP!
	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)
		7			*****CAUTION***** * * THE FOLLOWING SEQ IS * * HAZARDOUS, * * *****	
	121	8	CLTC	C1PC	LOW LOX DOME PURGE ON	
	121	9	CLTC	CUSP	SELECT S-IC BURN MODE ON THEN OFF	
	111	10	CLTC	CVTS	REQUEST CCS S-BAND CARRIER ON - COMMAND DECODER IS OFF,	TCP! (FT47)
1 HRS 21: 0"						
	121	1	CEBK	CLTC	EDS PROGRAM COMPLETE,	(FT47)
	121	2	CEBK	CLTC	EDS TEST COMPLETE.	
	111	3	CLTC	CVTS	EDS TEST COMPLETE. REQUEST HFLT REPORT ON CH 121 FOR HOUSTON PREFLIGHT COMMANDS.	TCP!
	121	4	CLTC	RLDE	LOAD SEQUENCE COMPARE QW69 FOR WATL/WASL AND START GROUP 1.	(WATL/ WASL)







TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 1 HRS 17' 0"	121	1	CLSK	CLTC	WATL COMPLETE.	
	121	2	***	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.	
	261	2	CLM4	BOSC	REQUEST PRESENT GH2 BATTERY PRESSURE	TCPI
+ 1 HRS 14' 0"	121	1	CLSK	CLTC	WASL COMPLETE.	
+ 1 HRS 13' 0"	121	1	***	CLGK	REQUEST AND EXECUTE FT47 (PREFLIGHT COMMAND SYSTEM TEST) (HOUSTON) (OPTION SP3).	***
	121	2	CLGK	CLTC	FT47 COMPLETE.	
	121	3	CLTC	BTMC	TM TAPE RECORDING OFF.	
	121	4	CLTC	ECOP	TERMINATE REAL TIME REDUCTION PROGRAM.	
	111	5	CLTC	CVTS	HOUSTON PREFLIGHT COMMAND SYSTEM TEST COMPLETE. REQUEST GMIL REPORT IU CCS GO/NO-GO TO VURF ON CH 137.	TCPI
	121	6	CLTC	MTPE	VERIFY READY FOR Q-BALL SIM COMMAND.	TCPI
	121	7	CLTC	CUIP	GIVE Q-BALL SIM COMMAND FOR 10 SECONDS ON YOUR MARK.	TCPI
	121	8	CUIP	ALL	3, 2, 1, MARK.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 1 HRS 13' 0"	111	9	CLTC	CVTS	REQUEST MTPE SUPPLY Q-BALL SIM COMMAND READING TO VUMS ON CH 148.	TCPI
+ 1 HRS 12' 0"	121	1	***	CLGK	REQUEST AND EXECUTE FT23 (LVDC SECTOR SUM CHECK).	***
+ 1 HRS 10' 0"	121	1	CLTC	VURF	VERIFY C-BAND BEACON NO. 2 READY FOR INTERROGATION.	
	111	2	CLTC	CVTS	READY TO START C-BAND BEACON NO. 2 CHECKS. REPORT GO/NO-GO AND RANGE READOUT TO VURF ON CH. 137.	TCPI
+ 1 HRS 6' 0"	121	1	CLTC	BTMC ETMS	TM TAPE RECORDING ON	
+ 1 HRS 5' 0"	121	1	CLTC	CUPC	VERIFY ST-124M PREPS COMPLETE. READY FOR FT06.	(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	FT23 COMPLETE  TELEMETRY TURN ON ----- (FOLLOWS FT23 IMMEDIATELY)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 51 00"						
121		4	***	C1IP C2IP C4IP CUIP	ALL TM TRANSMITTERS ON IN SEQUENCE LISTED AND MARKED OVER CH 121.	***
121		5	***	C1IP	TM MODE SELECT SWITCH TO ANTENNA.	***
121		6	***	C1IP	F1 & P1 RF ON	***
121		7	***	C1IP	TM CALIBRATOR ON	***
121		8	***	C1IP	TM CAL MODE TO PREFLIGHT AND PREFLIGHT LEVELS TO 50 PERCENT.	***
121		9	***	C2IP	RF COUPLER TO ANTENNA	***
121		10	***	C2IP	VERIFY GROUND POWER ON (CAL POWER).	***
121		11	***	C2IP	F1, F2 & P1 RF ON	***
121		12	***	C2IP	TM CAL MODE TO PREFLIGHT AND PREFLIGHT LEVELS TO 50 PERCENT.	***
121		13	***	C4IP	TM MODE SELECT SWITCH TO ANTENNA.	***
		14	***	C4IP	P1, ON THEN AUTO.	***
121		15	***	CUIP	RF DUMMY LOAD OFF.	***
121		16	***	CUIP	F1 TM ON	***
		17	***	CUIP	F1 AND P1 RF ON	***
121		18	***	CUIP	TM CALIBRATOR ON	***
121		19	***	CUIP	TM CAL MODE TO PREFLIGHT AND PREFLIGHT LEVELS TO 50 PERCENT.	***
121		20	C1PK	CLTC	TELEMETRY TRANSMITTER TURN-ON COMPLETE  (DELAY 5 MINUTES MINIMUM FOR TM TRANSMITTER WARM UP)	
121		21	CLTC	ETMS	START TM PARAMETERS QUICK SCAN CHECK	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 51 00"						
	121	22	CLTC	ETMS	VERIFY CIF READY TO SUPPORT TM CHECKS.	
	121	23	CLTC	C2IP CUIP	VERIFY PREFLIGHT/INFLIGHT CAL MODE AND PREFLIGHT LEVELS TO AUTO	(VATC)
	121	24	CLTC	C4IP	VERIFY TM CALIBRATE TO AUTO	(VATC)
	121	25	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT TEST.	
	121	26	CLTC	ETMS BTMI	VERIFY CIF DATA TRANSMISSION LINK - ON.	
	111	27	CLTC	CVTS	VERIFY CCS CARRIER ON FOR LAUNCH.	TCPI
	121	28	CLTC	CGIC	START ELECTROMAGNETIC COMPATIBILITY MONITORING.	TCPI
	121	29	CLTC	RLDE	ENTER/VERIFY CDC MODE.	
	121	30	CLTC	C1TC	REQUEST CSA9 SWITCH TO CHANNEL 111 ACTIVE AND REPORT TO CVTS FOR S/A 9 OPERATIONS.	
		30-1			NOTE ----- FROM NOW UNTIL LIFTOFF, CSA9 WILL RESPOND ONLY TO CVTS ON CH 111.	
	181	31	C1TC	CSAC	REQUEST CSA9 SWITCH TO CHANNEL 111 ACTIVE AND REPORT TO CVTS TO OPERATE S/A 9 AS DIRECTED.	
	111	32	CLTC	CVTS	CSA9 WILL REPORT ON CHANNEL 111. CONFIRM WHEN COMMUNICATIONS HAVE BEEN SATISFACTORILY ESTABLISHED.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 4' 0"	121	1	***	CUPC	REQUEST AND EXECUTE FT06 (GIMBAL ANGLE READ),	***
1 HRS 2' 0"	121	1	CUPC	CLTC	FT06 COMPLETE	(GT16)
	121	2	***	CUPC	REQUEST AND EXECUTE GT16 (AZIMUTH LAYING PROGRAM),	***
1 HRS 0' 0"	181	1	C1TC	CCRP	START RP-1 LEVEL ADJUST AND LINE INERTING PER V-25389,	
	161	2	C4PS	C4TC	HELIUM DECAY CHECK IS COMPLETE AND READY TO RE-ESTABLISH FLOW AND START FINAL PROPULSION CHECKS,	
	161	3	C4PS	C4HC	<b>CDDT ONLY</b>	
	161	4	C4PS	C4SP	OPEN LOX PREPRESS VALVE FOR 20 SECONDS THEN AUTO,	
	161	5	C4PS	C4SP	OPEN COLD HELIUM LINE VENT,	
	161	6	C4PS	C4SP	OPEN COLD HELIUM SUPPLY,	
	161	7	C4PS	C4SP	CLOSE COLD HELIUM LINE VENT,	
	161	8	C4PS	C4AL	OPEN 3000 PSI HE SUPPLY IF REQUIRED,	#
	161	9	C4PS	C4ET C4PU R4PS V4MS	VERIFY READY FOR MRCV CHECKS	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 01 00"						
	161	10	C4PS	C4PU	MRCV COMMAND NO. 1 & NO. 2 OPEN	
		10-1		C4PU	*** NOTE RELAYS RESET INDICATION OFF AND MRCV OPEN COMMAND INDICATION ON	
	161	11	C4PS	C4ET	CT HELIUM CONTROL SOLENOID ON	
		11-1		C4ET	*** NOTE LOX & LH2 BLEED VALVES CLOSED	
		12	C4PS		DELAY 5 SECONDS -----	
	161	12-1	C4PS	C4PU	MRCV COMMAND NO. 1 & NO. 2 CLOSE	
		13	C4PS		DELAY 5 SECONDS -----	
	161	13-1	C4PS	C4PU	MRCV COMMAND NO. 1 & NO. 2 OPEN	
		14	C4PS		DELAY 5 SECONDS -----	
	161	14-1	C4PS	C4PU	MRCV COMMAND NO. 1 & NO. 2 CLOSE	
	161	15	C4PS	C4ET	CT HELIUM CONTROL SOLENOID OFF.	
	161	16	C4PS	R4PS	VERIFY MRCV OPERATION SATISFACTORY	
	161	17	C4PS	V4MS	REPORT MRCV VALVE MOTION TIMES AND VOLTAGE CHANGE TO C4PS	
	161	18	C4PS	C4ET	ENGINE CONTROL POWER ON.	
	161	19	C4PS	C4ET	VERIFY IGNITION DETECTED IND ON.	
	161	20	C4PS	C4ET	SW SELECTOR CUTOFF NO. 1 - ON	
	161	21	C4PS	C4ET	VERIFY THE FOLLOWING:  1. ENGINE CUTOFF ON, 2. NON-PROGRAMMED CUTOFF OFF, 3. ENGINE CUTOFF LOCKIN ON.	
	161	22	C4PS	C4ET	ENGINE IGNITION POWER - ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 01 00"						
	161	23	C4PS	C4ET	VERIFY ENGINE READY ON AND ENGINE CUTOFF LOCKIN OFF.	
	161	24	C4PS	C4HN	LOX UMBILICAL PURGE SUPPLY - AUTO.	
	161	25	C4PS	C4HN	HEAT EXCHANGER CIRCUIT #1 VENT OPEN FOR 20 SECONDS, THEN AUTO	(VATS)
	161	26	C4PS	C4SP	LOX VENT CLOSE THEN OPEN	
	161	27	C4PS	C4SP	LH2 VENT CLOSE THEN OPEN	
	161	28	C4PS	C4SP	VERIFY DIRECTIONAL VENT IN AUTO.	
	161	29	C4PS	C4EP	LOX AND LH2 CHILLDOWN PUMPS TO AUTO.	(VAPX/ VATS)
	161	30	C4PS	C4EP	LOX AND LH2 PREVALVES TO AUTO	(VAPX/ VATS)
	161	31	C4PS	C4EP	OPEN START TANK PURGE	
	161	32	C4PS	C4EP	OPEN START TANK VENT	
	161	33	C4PS	C4EP	DELAY 5 MINUTES THEN CLOSE START TANK PURGE AND START TANK VENT.	
	161	34	C4PS	C4EP	START TANK VENT - AUTO	(VATS)
	161	35	C4PS	C4EP	START TANK SUPPLY VENT - AUTO	(VATS)
	161	36	C4PS	C4EP	START TANK SUPPLY VALVE - AUTO	(VATS)
	161	37	C4PS	C4EP	THRUST CHAMBER PURGE SUPPLY - AUTO	(VATS)
	161	38	C4PS	C4EP	THRUST CHAMBER CHILLDOWN SUPPLY - AUTO	(VATS)
	161	39	C4PS	C4TC	FINAL PROPULSION CHECKS ARE COMPLETE.	
59 00"						
	121	1	CLTC	CUFS	PREPARE FOR AND START FLIGHT CONTROL SYSTEM TEST ON CH 123. MONITOR CH 121. REPORT WHEN COMPLETE.	(VAFC)



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+59:00"	188	2	CLTC	ALL	FOLLOWING STATIONS SWITCH TO CHANNEL 123 FOR FLIGHT CONTROL SYSTEM NULL TEST: CUF E CUF S C1FE C4FC CUCR R2SC CUGA C1FC C4FS CLFK C2FE V2MS C4HY CUSP C2FC	(VAFC)
	123	3	CUFS	C2FC	ALL CONTROL SWITCHES TO AUTO POSITION EXCEPT AUX PUMP SWITCH IN ENABLE	(VAFC)
	123	4	CUFS	V2MS	HYDRAULIC RECORDERS ON AT 2 MM/SEC.	(VAFC)
	123	5	CUFS	C4HY	FLIGHT MODE TO AUTO.	(VAFC/VAPX)
+57:30"	188	1	CLTC	ALL	VATC WILL START EXECUTING IN 30 SECONDS, FLUCTUATING MEASUREMENTS MAY OCCUR DURING THE NEXT 2 MINUTES.	
		1-1	BGCC		*** NOTE LCC GENERAL MESSAGE NO. 0510 "NO S/S OUTPUT S-IVB" MAY OCCUR DURING NEXT 2 MINUTES.	
+57:00"	121	1	CUPC	CLTC	GT16 AND AZIMUTH LAYING COMPLETE.	
	121	2	***	CLIK	REQUEST & EXECUTE VATC (LV TM CAL CKS)	***
+55:00"	121	1	CLIK	CLTC	VATC COMPLETE	
		2			NOTE ----- FT06, FT49, VAFC & FT10 WILL BE EXECUTED CONSECUTIVELY AND NOT NECESSARILY AT THE CDC TIMES SHOWN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+55:00"	121	3	***	CUPC	REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ)	***
	121	4	CLTC	ETMS	REPORT OUT OF TOLERANCE PARAMETERS TO BLTM ON CH 127 WHEN ANALYSIS IS COMPLETE	
+53:30"	121	1	CUPC	CLTC	FT06 COMPLETE	
	121	2	***	CLGK	REQUEST & EXECUTE FT49/FE50 (ACCEL MONITOR PROG)	***
+52:30"	121	1	CLGK	CLTC	FT49 COMPLETE, FE50 MONITOR PROGRAM IN PROGRESS	
	121	2	***	C1PC	LOW LOX DOME PURGE ON FOR VAFC.	***
	123	3	***	CLFK	REQUEST & EXECUTE VAFC (FLIGHT CONTROL UTILITY PROGRAM) PRIMARY OPTION 1 (NULL TEST) SECONDARY OPTION 1 (S-II STAGE) SECONDARY OPTION 2 (S-IVB STAGE) SECONDARY OPTION 3 (S-IC STAGE) REPORT WHEN COMPLETE.	***
+51:25"	181	1	CLTC	C1PC	VERIFY THERMAL CONDITIONING PURGE ON AND MAINTAIN FOR THE REMAINDER OF THE COUNT.	
+50:00"	111	1	CLTC	CVTS	VERIFY C-BAND BEACON 2 READOUTS COMPLETE AND READY FOR C BAND BEACON 1.	TCPI
	121	2	CLTC	CUIP	C-BAND 2 INHIBIT ON THEN OFF. C-BAND 1 INHIBIT OFF. C-BAND 2 INHIBIT ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-50' 0"	111	3	CLTC	CVTS	REQUEST RANGE READOUT OF C-BAND BEACON 1. REPORT READOUTS TO VURF ON CHANNEL 137.	TCPI
	111	4	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN AND TCS ARM KEY TO C1SP	TCPI (VAPX)
	121	5	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	(VAPX)
	121	6	CLTC	C1SP	OBTAIN TCS ARM KEY FROM CPSS	
-47' 0"	121	1	CUFS	CLTC	VAFC COMPLETE	
		1-1		C2FC	*** NOTE ENGINES 1, 2, 3 & 4 ACCUMULATOR LOCKUP ON LIGHTS - ON	
	123	2	CUFS	V2MS	HYDRAULIC RECORDERS OFF	
	121	3	CLTC	CUFS	START ATTITUDE COMMAND TEST ON CH 123. REPORT WHEN COMPLETE.	(FT10)
	121	4	CLTC	CLGK	GO TO CH 123 TO SUPPORT ATTITUDE COMMAND TEST	(FT10)
	121	5	***	C1PC	VERIFY LOW LOX DOME PURGE ON FOR FT10.	***
	123	6	***	CLGK	REQUEST FT10 LADDER OUTPUT TEST, AUTO OPTION.	***
		6-1			*** NOTE THE FT10 AUTO OPTION WILL DRIVE THE GUIDANCE LADDERS TO +/- 2 DEG PITCH, +/- 2 DEG YAW AND +/- 5 DEG ROLL	
	123	7	CUFS	CUCR	VERIFY VALVE CURRENTS AND BETA RESPONSE ON ALL ENGINES	
					VAPX PREPS -----	
	121	8	CLTC	BRFS	VERIFY RF SELECT TO STANDBY AND REMOTE MONITOR TO SIG GEN 1.	(VAPX)





TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
147: 0"						
	171	29	C2RP	LH PREVALVES TO CLOSE THEN AUTO		(VAPX)
		29-1	C2PK	*** NOTE K396-207 THRU K400-207 ON (LH PRE-VALVE CLOSE COMMAND)		
		29-2	C2NP	*** NOTE VERIFY 2D511 BUS IS APPROXIMATELY 54 VDC AND 2D511 CURRENT IS LESS THAN 105 AMPS.		
	171	30	C2TC C2NP	R2SC VERIFY READY FOR VAPX PROGRAM REQUEST		(VAPX)
	121	31	C2TC	CLTC VAPX PREPS COMPLETE,		
	161	32	C4TC C4PP	C4NP VERIFY INTERNAL AND EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER,		(VAPX)
	161	32-1 33	C4TC C4NP	CDDT ONLY BATTERY MONITOR TO AUTO		D-97-60 (VAPX)
	161	34	C4TC C4NP	<b>CDDT ONLY</b>		(VAPX)
	161	35	C4TC C4NP	EMERGENCY POWER TRANSFER OFF		(VAPX)
	161	36	C4TC C4NP	POWER TRANSFER SWITCH TO AUTO		(VAPX)
	161	37	C4TC C4IP	PRELAUNCH CHECKOUT GROUP TO AUTO.		(VAPX/ VATS)
		37-1	C4IP	*** NOTE TM READY		
	161	38	C4TC C4HY	VERIFY OR POSITION FLT MODE SW IN AUTO.		(VAPX/ VATS)
	161	39	C4TC C4EP	VERIFY LOX AND LH2 READY TO START INDICATION ON		(VAPX)
	161	40	C4TC C4NK C4NP C4HY C4PS R4EI R4SC	VERIFY READY FOR POWER TRANSFER TEST,		(VAPX)
	121	41	C4TC	CLTC VAPX PREPS COMPLETE,		

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
+47: 0"						
	151	42	CUTC	CUNP	VERIFY INTERNAL & EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER	(VAPX)
	151	43	CUTC	CUNP	<b>CDDT ONLY</b>	(VAPX) *
	151	44	CUTC	CUNP RUBM	VERIFY READY FOR POWER TRANSFER	(VAPX)
	151	45	CUTC	CUNP	POWER TRANSFER TEST TO AUTO	(VAPX)
		45-1	CUTC CUNP		*** NOTE IU TO REMAIN ON INTERNAL POWER FOR 3 MINUTES	
	121	46	CUTC	CLTC	VAPX PREPS COMPLETE.  VATS PREPS -----	
	181	47	C1TC	C1SP	SEQUENCER POWER AUTO	(VATS)
	181	48	C1TC	C1NP	STAGE LOGIC TO AUTO	(VATS)
	181	49	C1TC	C1CS	LOX AND FUEL LEVEL SENSORS TO AUTO	(VATS)
	181	50	C1TC	C1IP	28 VDC RACS POWER AND 400 HZ POWER TO AUTO.	(VATS)
	181	51	C1TC	CSPP C1PP	POWER SUPPLY COMMIT TO AUTO	(VATS)
	121	52	C1TC	CLTC	S-IC READY FOR VATS.	
	171	53	C2TC	C2NP	STAGE SELECT TO OFF	(VATS)
	171	54	C2TC	C2AE C2EC C2IP C2NP C2RP C2PU C2FC C2SP	START VATS PREPS, REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
-47: 0"		55		C2IP	FREQUENCY MEASURING CAL TO AUTO	(VATS)
171		56		C2NP	<b>CDDT ONLY</b>	*(VATS)
171		57		C2RP	LH PUMPS 1 THROUGH 5 TO AUTO.	(VATS)
171		58		C2RP	LH PREVALVES TO AUTO.	(VATS)
171		59		C2AE	HE BOTTLE SUPPLY VALVE TO AUTO.	(VATS)
171		60		C2AE	HE BOTTLE SUPPLY LINE VENT TO AUTO.	(VATS)
171		61		C2AE	START TANK SUPPLY VALVE TO AUTO.	(VATS)
171		62		C2AE	START TANK SUPPLY LINE VENT TO AUTO.	(VATS)
171		63		C2AE	START TANK ALL VENT TO AUTO.	(VATS)
171		64		C2AE	TCH PURGE TO AUTO.	(VATS)
171		65		C2AE	TCH CHILLDOWN TO AUTO.	(VATS)
171		66		C2PU	VERIFY ALL WET SIMS TO AUTO	(VATS)
171		67		C2EC	MAINSTAGE OK'S TO AUTO FOR ALL ENGINES.	(VATS)
171		68		C2SP	LOX DISCONNECT PRESS SW TO AUTO.	(VATS)
171		69		C2SP	LOX SUPPLY VALVE SW TO AUTO.	(VATS)
171		70		C2NP	RACS POWER TO AUTO	(VATS)
171		71		C2FC	VERIFY INDIVIDUAL ACCUMULATOR LOCKUP LIGHTS ON AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF.	(VATS)
121		72	C2TC	CLTC	S-II READY FOR VATS.	
161		73	C4TC	C4PP	POWER SUPPLY COMMIT TO AUTO	(VATS)
161		74	C4TC	C4PP	PLUG SUPERVISION POWER TO AUTO	(VATS)
161		75	C4TC	C4SP	LOX & LH2 VENT SWITCHES TO AUTO	(VATS)
151		76	CUTC	CUCP	VERIFY PUMP PRESSURE SWITCH ACTIVATE - AUTO	(VATS)



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<b>CD ONLY</b>						
+47: 0"	151	77	CUTC	CUIP	Q-BALL POWER TO AUTO Q-BALL HEATER POWER TO AUTO	(VATS)
		77-1		CUIP	*** NOTE Q-BALL POWER ON	
	151	78	CUTC	CUES	THRUST OK INHIBIT A & B SWITCHES TO AUTO	(VATS)
	151	79	CUTC	ALL	ALL PERSONNEL INVOLVED IN POWER TRANSFER AND VATS PREPS RETURN TO CH 121	
	121	80	CUTC	CLTC	IU READY FOR VATS.	
	111	81	CLTC	CVTS	REQUEST RANGE MONITOR C-BAND AND GMIL MONITOR IU CCS DURING POWER TRANSFER TEST	TCPI
+45: 0"	171	1	C2TC	R2DP	<b>GDDT ONLY</b>	*
+44: 0"	121	1	CVTS	CLTC	SC EDS POWER IS ON	# TCPI
	181	2	C1TC	CWCP	START FINAL IWS PREPS PER V-36113	
+43: 0"		1			NOTE ----- FOR THE NEXT 40 MINUTES, CSA9 REQUIRES EXCLUSIVE CONTROL OF CAMERA 26 & 27	
	161	2	C4TC	R4EI R4HY R4SC	STRIP CHARTS TO FAST	(VAPX)
		3		C1NK C2NK C4NK CUNK	MONITOR CONSOLE 12 DURING VAPX	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+43' 0"	121	4	CLTC	C1TC C2TC C4TC CUTC	AFTER TRANSFER TO INTERNAL/EXTERNAL SECURE STAGES FROM POWER TRANSFER ON STAGE TC CHANNELS.	(VAPX)
		4-1	ALL	***	NOTE S-IC & S-II STAGES ON INTERNAL POWER FOR 30 SECONDS; S-IVB FOR 45 SECONDS; IU FOR 3 MINUTES. REPORT BATTERY VOLTAGES AND CURRENTS TO CLES ON CH 125.	
	111	5	CVTS	CSA9	ON YOUR MARK, RETRACT S/A 9 TO 12 DEGREE PARK POSITION PER V-36085. REPORT WHEN COMPLETE.	TCPI
+42' 0"		1	CLTC	***	NOTE TIME FOR ARMING LES	
	123	2	***	CLGK	TERMINATE FT10. REPORT WHEN COMPLETE.	***
	121	3	CUPS	CLTC	FT10 COMPLETE	
		4			NOTE -----  IF A TEST IS TO BE PERFORMED MANUALLY, THE SEQUENCES WITH THE AUTO PROGRAM IVAR IN THE COMMAND STATION COLUMN WILL BE COMMANDED BY THE TEST CONDUCTOR ASSOCIATED WITH THE OIS COMM CH SHOWN	
	121	5	CLTC	C1PK	REQUEST & EXECUTE VAPX (POWER TRANSFER TEST) (T-30 MIN OPTION)	***
	121	6	VAPX	BRFS	SIG GEN ON AND VERIFY REMOTE MONITOR TO HYBRID	
	121	7	VAPX	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL AND NOT CHARGED	

DATE: JULY 14, 1971

REVISION 031

## APOLLO/SATURN LAUNCH OPERATIONS

5251.60

PAGE


237

VEHICLE V-20060, VOL II

VEHICLE

AS-510

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+42' 0"	121	8	VAPX	C1DP C2DP C4DP	VERIFY S&A SAFE AND RSCR'S 1 & 2 PD BLOCKED - ON	
	121	9	VAPX	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL AND VERIFY	
	121	10	VAPX	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	XB-331-62
		10-1		CRSS	*** NOTE LIMITER VOLTAGES RECEIVED.	
	121	11	VAPX	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	XB-331-62
		11-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
		11-2		CUCR CUGA	*** NOTE VAPX WILL TORQUE ROLL GYROS TO +9 DEG/SEC CAUSING THE S-IC ENGINES TO GIMBAL	
	123	12	VAPX	CUGA	S-IC ATTITUDE RATE COMMAND +9 DEG/SEC ROLL AND HOLD DURING POWER TRANSFER.	
	161	13	VAPX	C4NP	BATTERY MONITOR ENABLE	
	161	14	VAPX	C4HY	FLIGHT MODE ON THEN AUTO	
	161	15	VAPX	C4EP	DELAY (FOR HYD SYS STABILIZATION) THEN LH2 CHILLDOWN PUMP ON THEN AUTO	
	161	16	VAPX	C4EP	DELAY 8 SECONDS (FROM LH2 CHILLDOWN PUMP ON) THEN LOX CHILLDOWN PUMP ON THEN AUTO.	
	161	17	VAPX	C4EP	DELAY 5 SECONDS (FROM LOX CHILLDOWN PUMP ON) THEN LOX AND LH2 PREVALVES CLOSED THEN AUTO.	
	121	18	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3".	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
 <b>CD ONLY</b>						
+42' 0"						
	121	19	C1PK	ALL	VAPX WILL TRANSFER STAGES INTERNAL IN 5 SEC.	
	121	20	C1PK	ALL	5-4-3-2-1, MARK	
	121	21	VAPX	C1NP C2NP C4NP CUNP	TRANSFER TO INTERNAL POWER.	
		21-1		CUDE	*** NOTE 0777 & 0779 ON, 0781 OFF	
		21-2		C1NP	*** NOTE POWER TRANSFER EXTERNAL OFF	
		21-3		C1NP	*** NOTE POWER TRANSFER INTERNAL ON	
		21-4		C1NP	<b>CDDT ONLY</b>	
	181	22	C1TC	C1FR	VERIFY POWER TRANSFER COMPLETE (ALL STAGES) - ON	
		22-1		C1NP	*** NOTE BUS +1D121 OFF	
		22-2		C1NP	*** NOTE BUS +1D111 OFF	
		22-3		C1NP	*** NOTE BUS +1D211 OFF	
		22-4		R1SC	*** NOTE RECORD VOLTAGE FOR STAGE BUSES 1D11 AND 1D21, RECORD VOLTAGE AND CURRENT FOR BUSES 1D10 & 1D20.	
	153	23	RLDE		ESTABLISH COMMUNICATION WITH HOUSTON VIA CH 153 AND GIVE HOUSTON CDC/GMT TIME CORRELATION.	
		23-1		RLDE	*** NOTE IF ANY HOLD IS GREATER THAN 10 MIN, GIVE ANOTHER CDC/GMT TIME CORRELATION TO HOUSTON	
+41' 30"						
	121	1	C1PK	ALL	S-IC & S-II TRANSFERED EXTERNAL DISPLAYED	
	181	2	C1TC	C1NP	VERIFY POWER TRANSFER EXTERNAL ON	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+41'30"					RECIRC DC BUS VOLTAGE 2D51 (XM0111-207) -----	
					IGN DC BUS VOLTAGE 2D61 (XM0125-207) -----	
	171	8	C2TC	C2RP	RECIRC RESET TO RESET, THEN INHIBIT	
		8-1		C2PC	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS	
		8-2		C2RP	*** NOTE LH2 PREVALVES OPEN ON, LH2 PUMP INLET PRESSURE DECAY.	
121		9	C2TC	CLTC	S-II POWER TRANSFER TEST IS COMPLETE	
171		10	C2TC	R2SC	READOUT RECORDED BUS VOLTAGES TO CLES ON CH 125.	
+41'15"		1		C4NP	*** NOTE AFTER 45 SECONDS ON INTERNAL THE FOLLOWING WILL OCCUR;	
	161	1-1	VAPX	C4NP	POWER TRANSFER EXTERNAL THEN AUTO.	
	161	1-2	VAPX	C4NP	BATTERY MONITOR DISABLE THEN AUTO	
	161	2	C4TC	C4NK C4NP	VERIFY POWER TRANSFER INTERNAL/EXTERNAL COMPLETE.	
	+40'45"		1		C4EP C4HY	*** NOTE 30 SECONDS AFTER POWER TRANSFER EXTERNAL THE FOLLOWING WILL OCCUR;
161		1-1	VAPX	C4EP	LOX & LH2 PREVALVES OPEN THEN AUTO	
161		1-2	VAPX	C4EP	LOX & LH2 CHILLDOWN PUMPS OFF THEN AUTO	
161		1-3	VAPX	C4HY	FLIGHT MODE OFF THEN AUTO (VERIFY CHILLDOWN PUMPS OFF BEFORE TURNING OFF HYD PUMP)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
+40:45"							
	161	2	C4TC	C4NK	TRANSMIT POWER TRANSFER DATA TO CLES ON CH 125		
	161	3	C4TC	C4DE	TRANSMIT THE FOLLOWING DEE TIMES TO C4PS: S/S OCTAL 151 READ COMMAND ON 2647 AND 2648 OFF 1710 AND 1711 ON		
	121	4	C4TC	CLTC	S-IVB POWER TRANSFER TEST COMPLETE AND ACCEPTABLE.		
+39:00"							
	151	1	CUTC	CUNP	VERIFY IU GROUND POWER ON AND POWER TRANSFER COMPLETE OFF.		
		1-1		CUDE	*** NOTE 0777 & 0779 OFF, 0781 ON		
	151	2	CUTC	CUNP	POWER TRANSFER SWITCH TO EXTERNAL.		
	151	3	CUTC	CUNE	VERIFY POWER TRANSFER SATISFACTORY		
	151	4	CUTC	RUBM	READOUT VOLTAGES AND CURRENTS TO CLES ON CH 125		
					BUS	VOLTAGE	CURRENT
					-----	-----	-----
					6D10	-----	-----
					6D20	-----	-----
					6D30	-----	-----
					6D40	-----	-----
	121	5	CUTC	CLTC	IU POWER TRANSFER TEST IS COMPLETE.		
	121	6	C1PK	CLTC	VAPX COMPLETE		
	121	7	CLTC	ALL	RECORDERS SUPPORTING POWER TRANSFER TO SLOW		
	123	8	CUFS	CUCR CUGA	VERIFY ATTITUDE RATE COMMAND UNDISTURBED DURING POWER TRANSFER		

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-39' 0"	123	9	CUFS	ALL	ALL FLIGHT CONTROL PERSONNEL RETURN TO CH 121	
		10		RRSC	*** NOTE DRSCS MEASUREMENTS OK DURING PWR TRANSFER	
	111	11	CLTC	CVTS	REQUEST CLEARANCE TO PROCEED WITH DRSCR TEST WITH SRO ON CH 121.	TCPI
-37' 0"	121	1	CLTC	C1PK	REQUEST & EXECUTE VARS (DRSCR TEST) (T-40 MINUTE FRT/CDDT/CD OPTION)	
	121	2	VARS	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	3	C1PK	CLTC	READY FOR SRO CUTOFF COMMAND	
	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	VARS	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	8	CLTC	RRSC	RECORDERS - SLOW SPEED	
	121	9	VARS	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 WERE INTERNAL & CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON	
		9-1	CRSS BRFS		*** NOTE CUTOFF RECEIVED	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-37: 0"		9-2		CRSS	*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON	
121		10	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		10-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		11	VAR5	C1DP C2DP C4DP	VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED	
121		12	C1PK	CLTC	READY FOR SRO PD COMMAND	
121		13	CLTC	RRSC	RECORDERS - FAST SPEED	
121		14	CLTC	SRO	ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
121		15	SRO	ALL	3-2-1 - MARK	
121		16	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		17	VAR5	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		17-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED	
121		18	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	
		18-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		19	C1PK	CLTC	READY FOR RANGE TRANSMITTER ON. REPORT WHEN TURNED ON.	
111		20	CLTC	CVTS	REQUEST RANGE SAFETY COMMAND TRANSMITTER #1 CARRIER ON. REPORT WHEN TURNED ON.	TCPI
		20-1		CLTC C1PK	*** NOTE - DO NOT PROCEED UNTIL TRANSMITTER IS REPORTED ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-37: 0"	121	21	CLTC	C1PK	RANGE TRANSMITTERS ON, ENTER SPR1 TO CONTINUE.	
	121	22	VARS	BRFS	SIG GEN SELECTOR - STANDBY	
		22-1		B1RF B2RF B4RF CRSS	*** NOTE ALL LIMITER VOLTAGES RECEIVED.	
-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 THEN AUTO	
		2-1		C2RP	*** NOTE HE INJ ORIFICE OUT PRESS METER INDICATES PRESS RISE TO APPROX 240 PSIA	
	171	3	C2RP	C2TC	LOX HE INJECT IN PROGRESS	
-33: 0"	121	1	C1PK	CLTC	VARS COMPLETE	
	181	2	***	C1CS	POSITION LOX LEVEL SIMULATE WET SWITCHES TO SIMULATE	***
	111	3	CLTC	CVTS	DRSCR TEST IS COMPLETE. LOGAL COMMAND CARRIER IS OFF.	TCPI
	121	4	CLTC	BTMC	TM TAPE RECORDER OFF AND RELOAD	
		4-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (COUNTDOWN ONLY)	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-32' 0"						
	121	1	CLTC	RLDE	GIVE A DEMAND PRINTOUT ON ALL STAGE PRINTERS. REPORT WHEN COMPLETE.	
	181	2	CWCP	C1TC	FINAL IWS PREPS ARE COMPLETE.	
-30' 0"						
	181	1	C1TC	CECS	START S-IC FWD COMPARTMENT TEMPERATURE INCREASE PER V-36074.	
	181	2	C1TC	CPRK	REDUCE BE01 SCAN RATE TO 1 MINUTE INTERVALS	
-27' 0"						
		1		CLFK C4PK C4NK C2PK C2NK	TERMINATE DISPLAY DESCRIPTIONS ON CONSOLE PAGE A. DO NOT RECALL WHILE VATS IS EXECUTING.	(VATS)
	161	2	C4TC	C4AL	REMOVE SWITCH LOCKS FROM APS VALVE POWER SWITCH AND POSITION SWITCH TO AUTO	(VATS)
	121	3	C4TC	CLTC	S-IVB READY FOR VATS.	
	121	4	CLTC	CRSS	VERIFY PROCEED ON & BYPASS IS OFF	(VATS)
		4-1		C1FR	*** NOTE RANGE SAFE - ON	
		4-2		CUEV	*** NOTE BOTH SRO/RSO PROCEED INDICATIONS ON	
		5		CUPC	NOTE -----	
		6		CUPC	EXECUTE GE01 TO AGREE WITH PLOT AZIMUTH.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-27' 0"		6-1		CUPC	*** NOTE IF CUMULATIVE HOLDS OCCUR PRIOR TO EXECUTION OF FT42 THAT WOULD CAUSE A FLIGHT AZIMUTH CHANGE IN EXCESS OF 5 DEG, CUPC ENTER SFUNCGE01/005 AND THE AZIMUTH UPDATE.	
-26' 0"	121	1	CLTC	C1PK	REQUEST & EXECUTE VATS (TERMINAL SEQUENCE PROG PR2/PR4)	
		1-1		ALL	NOTE -----	
					WHEN LINKING PROGRAMS ARE UTILIZED, SEQUENCES WITH THREE ASTERISKS IN THE COMMAND STA AND REMARKS COLUMNS WILL BE DONE AUTOMATICALLY BY THE LINKING PROGRAM. IF THE LINKING PROGRAM IS NOT UTILIZED, THE TEST CONDUCTOR FOR THE INDICATED COMM CH WILL, AT THE APPROPRIATE TIME, REQUEST THE OPERATORS TO DO THE FUNCTIONS MANUALLY.	
					DURING VATS, IF A TIME CRITICAL EVENT DOES NOT OCCUR WITHIN 10 SECONDS AFTER THE EXPECTED TIME, THE OPERATORS INDICATED WILL DO THE FUNCTIONS MANUALLY AND REPORT THIS ACTION ON THE INDICATED COMM CH.	
		2			DELETED	
	181	3	C1TC	C1PE	PRECHARGE POGO SUPPRESSION SYSTEM.	
	181	4	C1TC	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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
26: 0"	182	6	C1PE	R1SC	STAND-BY TO MONITOR POGO TEMPERATURE MEASUREMENTS C335-115, C327-115, C339-115 & C331-115	
		7			*****CAUTION***** * * THE FOLLOWING SEQ IS * * HAZARDOUS. * * *****	
	182	8	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	9	C1PE	R1SC	VERIFY ONE OF FOUR POGO MEASUREMENTS GO FROM ON SCALE TO OFF SCALE HIGH.	
	181	10	C1PE	R1SC	POGO SUPPRESSION SYSTEM PRECHARGE COMPLETE. RETURN TO CHANNEL 121.	
	181	11	C1PE	C1TC	POGO SUPPRESSION SYSTEM PRECHARGE COMPLETE.	
	161	12	***	C4PP	PLUG SUPERVISION POWER OFF THEN AUTO	***
25: 0"	121	1	CVTS	CLTC	RANGE INTERROGATION OF C-BAND BEACON 1 IS COMPLETE, VERIFY C-BAND BEACON 2 IS COMING ON.	TCPI
	121	2	CLTC	CUIP	C-BAND BEACON 1 INHIBIT - ON C-BAND BEACON 1 & 2 INHIBIT - OFF	
24: 0"	171	1	C2TC	C2AE	MONITOR ENGINE CHILLDOWN BY THE CLOCK AT T-22 MINUTES	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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CD ONLY

T-22' 0"

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*****
*                                     *
*                               NOTE   *
*                               ----   *
*                                     *
* IF RECYCLE IS                    *
* NECESSARY, THE                    *
* COUNTDOWN WILL BE                 *
* PICKED UP AT THIS                  *
* POINT.                             *
*                                     *
* IN THE EVENT OF A HOLD            *
* BETWEEN T-22' AND                 *
* T-3'7" TURN TO APPENDIX          *
* B FOR DESCRIPTION OF              *
* OPTIONS AVAILABLE AND             *
* SEQUENCES TO BE                  *
* PERFORMED.                        *
*                                     *
*****
    
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T-21'58"

171		1	***	C2AE	START TANK ALL VENT TO ALL VENT	***
		2	***	C2AE	START TANK SUPPLY VALVE TO PRESSURIZE	***
		2-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - ON	
171		3	C2AE	C2TC	START TANK CHILLDOWN IN PROGRESS	
121		4	C2TC	CLTC	S-II START TANK CHILLDOWN IS IN PROGRESS	
		4-1			CDDT ONLY	*

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
20'30"	121	1	CLTC	ALL	VAMC WILL START EXECUTING AT 19' 55". FLUCTUATING MEASUREMENTS MAY OCCUR DURING NEXT 2 MINUTES.	
20' 0"	181	1	C1TC	C1PE	VERIFY S-IC GN2 & HELIUM SYSTEM PRESSURIZED TO FLIGHT PRESSURE	
	181	2	C1TC	C1PC	VERIFY/ACCOMPLISH LOW LOX DOME PURGE ON.	
	181	3	C1TC	CTS1	OPEN PRESSURE SUPPLY VALVE 3.	
	161	4	C4TC	R4HY	RECORDERS TO FAST	
	161	5	C4TC	C4PS	MONITOR/START CHILLDOWN BY THE CLOCK	
19'55"	121	1	***	CLIK	REQUEST & EXECUTE VAMC (MEAS SYSTEM RAPID CALIBRATION).	***
19' 0"	121	1	CLIK	CLTC	VAMC COMPLETE	
		1-1		C4IP	*** NOTE TM READY	
	181	2	C1TC	C1CS	VERIFY PROPER RESPONSE (DRY) OF LOX & FUEL LEVEL CUTOFF SENSORS TO VAMC.	
18'45"		1	***	C4HY	FLIGHT MODE - ON THEN AUTO	***
	161	2	C4TC	R4HY	REPORT WHEN HYDRAULIC SYSTEM IS STABILIZED	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+18' 0"	121	1	CLTC	ECOP	VERIFY CIF READY TO SUPPORT GUIDANCE REAL TIME PROGRAM.	
	121	2	***	CLGK	REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ), REPORT WHEN COMPLETE.	***
	261	3	CLTC	BOSC	BRING INDUSTRIAL WATER SYSTEM SECOND PUMP TO OPERATIONAL PRESSURE OF 165 PLUS OR MINUS 10 PSIG, REPORT WHEN COMPLETE.	TCPI
+16' 20"	121	1	CLGK	CLTC	FT06 COMPLETE	
		2			NOTE ----	
					IF A TEST IS TO BE PERFORMED MANUALLY, THE SEQUENCES WITH THE AUTO PROGRAM IVAR IN THE COMMAND STATION COLUMN WILL BE COMMANDED BY THE TEST CONDUCTOR ASSOCIATED WITH THE OIS COMM CH SHOWN.	
	121	3	***	CLFK	REQUEST & EXECUTE VAAR (S-IC ATTITUDE RATE COMMAND TEST)	***
	121	4	VAAR	CUSP	VERIFY CONTROL COMPUTER IN S-IC BURN MODE	
	121	5	VAAR	CUGA	ATTITUDE RATE COMMANDS - (PLUS 1.5 DEG/SEC PITCH AND YAW, AND PLUS 7 DEG/SEC ROLL)	
+16' 0"	181	1	C1TC	C1SP	CUTOFF RESET - ON MOMENTARILY.	
		1-1		C1FR	*** NOTE PROPELLANT DEPLETED FAILURE INDICATION OFF	
	181	2	C1TC	C1EN	ARM IGNITORS INSTALLED - ON THEN AUTO, VERIFY HYPERGOL AND IGNITORS INSTALLED INDICATIONS REMAIN ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-15' 0"	121	1	CLFK	CLTC	VAAR COMPLETE	
-14' 30"		1		C4ET	CT HELIUM CONT SOL ON AND OFF AT C4PS COMMAND.	
		2	***	C4EP	OPEN START TANK VENT	***
		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' 25"		1	***	C4SP	LOX TANK VENT CLOSED FOR 3 SECONDS THEN OPEN THEN AUTO.	***
		2	***	C4SP	LH TANK VENT CLOSED FOR 3 SECONDS THEN OPEN THEN AUTO.	***
-14' 0"		1			*****CAUTION***** * * THE FOLLOWING SEQUENCE * * IS HAZARDOUS * * *****	
	181	2	C1TC	C1LO	LOX FLIGHT VENTS TO CLOSE THEN AUTO	
		2-1		C1LO	*** NOTE LOX FLIGHT VENTS OPEN	
	121	3	CLTC	ECOP	START GUIDANCE REAL TIME REDUCTION PROGRAM	(FT42)
	181	4	***	C1NP	STAGE LOGIC RESET	***
		4-1		C1NP	*** NOTE STAGE LOGIC ZERO	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS	
+14' 0"	121	5	***	C1SP	SEQUENCER POWER ON	***	
		5-1		C1SP	*** NOTE ALL VOLTAGES NORMAL		
		5-2		C1SP	*** NOTE SEQUENCER RESET		
	171	6	***	C2RP	VERIFY OK TO OPERATE RECIRC PUMPS ON	***	
	121	7	***	CLFK	REQUEST & EXECUTE KAF3 (THRUST VECTOR READ)	***	
	+12'58"	121	1	CLFK	CLTC	KAF3 COMPLETE	
			2	***	C2AE	TCH PURGE TO ON	***
		2-1		C2AE	*** NOTE TCH PURGE ON		
171		3	C2AE	C2TC	TCH JACKET PURGE IN PROGRESS.		
		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.		
		4	***	C4EP	OPEN THRUST CHAMBER PURGE SUPPLY	***	
171		5	***	C2FC	MAIN PUMP BYPASS VALVE - CLOSE THEN AUTO	***	
171		6	***	C2FC	THERMAL CONTROL - ON THEN AUTO	***	
171		7	***	C2FC	ENGINES 1, 2, 3 & 4 ACCUMULATOR CONTROL OFF THEN AUTO	***	
+12'53"		171	1	***	C2FC	MAIN PUMP BYPASS VALVE - OPEN THEN AUTO	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-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.	
		1-2		C2EC	*** NOTE IGNITION DETECTED ON, ENGINES 1 THRU 5	
-12'25"	121	1	***	CLGK	REQUEST & EXECUTE FT42 (PREPARE TO LAUNCH)	***
	121	2	CLTC	CLGK	READOUT LV FIRING AZIMUTH ON CH 111 WHEN READY	
-12' 0"		1	RLDE		SELECT EST AND ENTER, THEN CDC & ENTER	
		1-1	RLDE		*** NOTE IF HOLD OCCURS, GIVE ANOTHER CDC/GMT TIME CORRELATION TO HOUSTON	
	153	2	RLDE	HFLT	T- _____ OCCURRED AT GMT _____	
	153	3		HFLT	VERIFY RECEIPT OF TIME CHECK	
		3-1		C2NP	*** NOTE RESET FOR FIRING COMMAND ON.	
-11' 0"	181	1	C1TC	C1PU	START S-1C FUEL JACKET TOPPING PER V-34012	
	261	2	CLTC	BOSC	PLACE INDUSTRIAL WATER SAFETY OVERRIDE SWITCH TO OVERRIDE	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
-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.	
		3			*****CAUTION***** * * THE FOLLOWING SEQ IS * * HAZARDOUS, * * *****	
	181	4	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.	
10:00"	121	1	CLGK	CLTC	FT42 COMPLETE AND LVDC IN PREPARE TO LAUNCH MODE	
	111	2	CLGK	CVTS HFLT SRO	LV FIRING AZIMUTH IS    DEG    MIN    SEC	TCPI
		2-1	CLGK		*** NOTE READOUT NEW FIRING AZIMUTH FOLLOWING ANY HOLDS.	
9:58"	161	1	***	C4AL	APS ENGINE VALVE POWER ON	***
9:55"		1	***	C2RP	LH2 PUMPS NO. 1 THRU 5 TO START THEN INHIBIT AT 2 SEC INTERVALS (MINIMUM)	***
	171	2		C2PC	VERIFY AS RECIRC BUS CURRENT INCREASES WITH EACH PUMP START.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
9:55"		3	***	C2RP	WAIT 5 SEC (MINIMUM) THEN PLACE LH2 PREVALVES TO CLOSE THEN INHIBIT	***
		3-1		C2RP	*** NOTE ALL ENG INLET LH2 PRESS METERS INDICATE PRESS RISE	
	171	4	C2RP	C2TC	RECIRC ACTIVATION COMPLETE	
		5		C2EV	*** NOTE RECIRC READY FOR LAUNCH IS ON	
7:58"		1	***	C4EP	OPEN THRUST CHAMBER CHILLDOWN VALVE	***
		2	***	C4EP	CLOSE THRUST CHAMBER PURGE SUPPLY	***
	161	3	C4PS	C4TC	THRUST CHAMBER CHILLDOWN IS IN PROGRESS	
	121	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 * * 7' 40" CONTINUOUSLY * * PRIOR TO S-IC IGNITION * * COMMAND * * *****	
		5	***	C2AE	TCH CHILLDOWN TO ON	***
		5-1		C2AE	*** NOTE TCH CHILLDOWN ON	
		6	***	C2AE	TCH PURGE TO OFF	***
		6-1		C2AE	*** NOTE TCH PURGE OFF	
		6-2		C2AE	*** NOTE ALL TCH JACKET TEMP METERS INDICATE TEMP DROP	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7:58"	171	7	C2AE	C2TC	THRUST CHAMBER JACKET PURGE IS COMPLETED, AND TCH CHILLDOWN IN PROGRESS.	
		7-1			*****CAUTION***** * S-II THRUST CHAMBER * * CHILLDOWN SHALL NOT * * EXCEED 13 MINUTES * * ACCUMULATED AND SHALL * * BE ON FOR AT LEAST * * 7' 40" CONTINUOUSLY * * PRIOR TO S-IC IGNITION * * COMMAND. * *****	
		7-2			*****NOTICE***** * IF A HOLD IS CALLED * * BETWEEN T-7' 58" AND * * T-3' 7" ALL CHILLDOWNS * * SHALL CONTINUE UNLESS * * HOLD OPTION 2 OR 3 IS * * ANNOUNCED * *****	
	121	8	C2TC	CLTC	S-II TCH CHILLDOWN IN PROGRESS	
		8-1	C2AE		*** NOTE ADVISE C2TC HOLD TIME REMAINING BEFORE SAFING IS REQUIRED	
		9	C1FC		*** NOTE ENGINES IN NULL POSITION	
		10	C1HP		*** NOTE HYDRAULIC PRESSURE 1590 +/- 80 PSIA	
	118	11	CSAC	CHCU	START CIRCUIT BYPASS TO BYPASS AND VERIFY	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
7:58"						
	118	12	CSAC	CSA1	LOWER LOX LINE PURGE VALVE SWITCH TO OPEN & VERIFY	
	118	13	CSAC	CSA1	UPPER LOX LINE PURGE VALVE SWITCH TO OPEN & VERIFY	
	118	14	CSAC	CSA1	<b>CDDT ONLY</b>	*
	118	15	CSAC	CSA1	CARRIER CONNECT & RETRACT ARMING SWITCH TO ARM	#
	181	16	C1TC	C1RP	S-IC FUEL FLIGHT VENT TO AUTO	
		16-1		C1RP	*** NOTE FUEL FLIGHT VENT CLOSED	
	181	17	C1TC	C1RP	PRESSURIZE S-IC FUEL TANK TO APPROX 2 PSIG. REPORT WHEN COMPLETE.	
	121	18	CLTC	ETOM	VERIFY GUIDANCE TM SATISFACTORY	
7:50"						
	171	1	***	C2FC	S-II AUXILIARY HYDRAULIC PUMPS ENGINES 1, 2, 3 & 4 - ON THEN AUTO	***
	171	2	***	C2FC	THERMAL CONTROL - OFF THEN AUTO	***
7:00"						
	181	1	CTS1	C1TC	TSM'S READY FOR LAUNCH.	
	181	2	CSAC	C1TC	SERVICE ARMS READY FOR LAUNCH.	
		2-1		C1FR	*** NOTE LAUNCH SUPPORT PREPS COMPLETE.	
		2-2		CLDE	*** NOTE DEE-6 (0168) ON	
6:30"						
	121	1	CLTC	CUES	EDS MODE TO LAUNCH.	
		1-1		C1FR CUES	*** NOTE EDS READY.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
6:30"	121	2	CLTC	C1NP C2NP CUNP	INHIBIT SWITCH SELECTOR AND RESET COUNTERS.	
6:15"	151	1	***	CUCP	PUMP PRESSURE SWITCH ACTIVATE ON	***
		1-1		CUCP	*** NOTE PUMP PRESSURE ACTIVATE INDICATION ON	
	151	2	***	CUIP	G-BALL HEATER POWER - OFF	***
6:00"	181	1	C1TC	C1PU	VERIFY F-1 ENGINE THRUST CHAMBER PREFILL TOPPING COMPLETE.	
	151	2	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - ON (SENSE CONTROL PANEL BITS 21 & 22)	
	121	3	C1TC	CLTC	PROPULSION PREPS COMPLETE	
	121	4	CLTC	BPHO	START S-IC, S-II & S-IVB LOX AND LH2 FILM CAMERAS	
		4-1		BPHO	*** NOTE LOX & LH2 CAMERAS MAY BE STOPPED UPON COMPLETION OF TCS PLUS ONE MINUTE	
5:30"		1	***	C4EP	CLOSE START TANK VENT.	***
		2	***	C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT.	***
		2-1		R4PS	*** NOTE MONITOR START TANK PRESSURE STABILIZATION	
	121	3	CLTC	CWCP	VERIFY IWS AUTO/ARM BUS - ON	
	121	4	CLTC	C1DP C2DP C4DP	SAFE & ARM TO ARM FOR 2 SECONDS THEN AUTO.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5:30"		4-1		CRSS	*** NOTE ALL S&A ARM INDICATORS ON.	
		4-2		C1FR	*** NOTE ORDNANCE PREP COMPLETE.	
		4-3		C2TC	*** NOTE PD SYSTEM READY.	
		4-4		C4TC	*** NOTE PD SYSTEM READY.	
		4-5		C1NP	*** NOTE READY FOR LAUNCH POWER	
	121	5	CLTC	C1NP	POWER FUNCTION SELECTOR - LAUNCH AND VERIFY ALL STAGES READY FOR POWER TRANSFER ON.	
		5-1		C1NP	*** NOTE LAUNCH BUS 1D161 ON AND PRELAUNCH BUS 1D151 OFF	
		5-2		C1NP	*** NOTE BATT #1 & #2 ON.	
		5-3		C1FR	*** NOTE HYPERGOLS INSTALLED - ON.	
		5-4		C1FR	*** NOTE IU AND SC READY FOR LAUNCH.	
5:25"	121	1	***	CSPP C1PP C4PP	COMMIT POWER SUPPLY AND VERIFY	***
		1-1		CLDE	*** NOTE DEE-6 (3637) ON	
5:7"		1	***	C2SP	LOX DISCONNECT PRESSURE - ON	***
		2	***	C2SP	LOX SUPPLY VALVE - OPEN	***
		2-1		C2SP	*** NOTE LH2 LOW PRESS VENT MODE - ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5' 0"		1			NOTE ----- FOR THE NEXT 5 MIN CSA1 REQUIRES EXCLUSIVE CONTROL OF CAMERA 11.	
		2	***	C4EP	CLOSE START TANK SUPPLY VALVE.	***
		3	***	C4EP	OPEN START TANK SUPPLY VENT.	***
		4		R4PS	REPORT INDICATION OF START TANK AND ENGINE BOTTLE PRESSURE INCREASE TO C4PS.	
	111	5	CVTS	CSA9	RETRACT S/A 9, REPORT WHEN RETRACTED	TCPI *
		5-1			NOTE ----- CSA9 REQUIRES EXCLUSIVE USE OF CAMERA 36 UNTIL S/A 9 IS RETRACTED.	
4' 58"		1	***	C4EP	LH2 CHILLDOWN PUMP - ON THEN AUTO	***
4' 50"		1	***	C4EP	LOX CHILLDOWN PUMP - ON THEN AUTO.	***
		1-1		C4EV C4TC	*** NOTE PREPS COMPLETE ON. (DEE-1947)	
4' 45"		1	***	C4EP	LOX & LH2 PREVALVES CLOSE THEN AUTO.	***
	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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4:45"	161	5	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	***
		2-1		C2AE	*** NOTE HE BOTTLE SUPPLY VALVE OPEN - OFF	
		3	***	C2AE	HELIUM BOTTLE SUPPLY LINE VENT TO VENT	***
		3-1		C2AE	*** NOTE HE BOTTLE SUPPLY LINE VENT OPEN - ON	
	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"	121	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*****	
	121	2-1	CLTC	CUSW	LVDA/ESE TO LVDA.	
		3		RDAS	*** NOTE REPORT ALL DRS STATION SYNC ERRORS ON CH 121 UNTIL T-19 SECS AS THEY OCCUR	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4:10"	121	1	***	CUES	THRUST OK INHIBIT A & B SWITCHES TO OFF	***
		1-1		SCDR	*** NOTE LV ENGINE 1 THROUGH 5 LIGHTS ON IN SC (CD ONLY)	TCP I
4:00"	121	1	CVTS	CLTC	CLEARED FOR LAUNCH.	TCP I
		1-1		ALL	*** NOTE DISPLAY OPERATORS, DO NOT CALL UP DISPLAY DESCRIPTIONS AFTER TCS START.	
					*****	
	111 121	2	CVTS	ALL	COUNT TIME ANNOUNCEMENTS -----	TCP I
					-3:30" TO -0:40" EVERY 10 SECONDS -0:40" TO -0:15" EVERY 5 SECONDS -0:11" TO L/O EVERY 1 SECOND *****	
3:55"		1	***	C2FC	MAIN PUMP BYPASS VALVE CLOSED THEN AUTO	***
3:50"		1	***	C2FC	ALL ACCUMULATOR CONTROL - LOCK THEN AUTO	***
		1-1		C2FC	*** NOTE ACCUMULATOR LOCKUP INDICATIONS - ON	
		2	***	C2FC	S-II AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4, OFF THEN AUTO	***
		2-1		C2FC	*** NOTE AUXILIARY PUMPS POWER ON INDICATIONS -- OFF	
		2-2		C2FC	*** NOTE READY FOR LAUNCH INDICATION ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3:50"		2-3		C2TC		
				C2EV	*** NOTE S-II PREP COMPLETE ON.	
		2-4		C1FR	*** NOTE IF MANUAL CUTOFF IS REQUESTED AND THE MANUAL CUTOFF HARDWIRE SWITCH FAILS TO GIVE CUTOFF, THEN C1SP WILL CYCLE THE TCS POWER SWITCH TO OFF THEN BACK TO ON TO GIVE CUTOFF	
3:40"	121	1	C1FR	CLTC	PREPARATIONS COMPLETE ON.	
3:20"		1			*****CAUTION***** * * ALL LV STATIONS MONITOR * * CHANNEL 121 DURING * * TERMINAL SEQUENCE. * * *****CAUTION*****	
		2	***	C2SP	LOX SUPPLY VALVE - CLOSE	***
		3	***	C2AE	START BOTTLE SUPPLY VALVE TO OFF	***
		3-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF	
		4	***	C2AE	START TANK SUPPLY LINE VENT TO VENT	***
		4-1		C2AE	*** NOTE START TANK SUPPLY LINE VENT OPEN - ON	
3:10"	121	1		C1FR	INITIATE FIRING COMMAND AND VERIFY (DO NOT RELEASE UNTIL TCS STARTS, AN OPTION 2 OR 3 HOLD IS ANNOUNCED OR SAFING PROCEDURE INITIATED)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3:10"		1-1		C1FR	*** NOTE FIRING COMMAND ENABLED (C) DEE 0128.	
3: 6"		1	CLVN		COMPUTER TEST SWITCH OFF AND VERIFY	
	121	2	C1FR		VERIFY FIRING COMMAND IS ON (H) DEE 3171	
		2-1		C1FR	*** NOTE TCS READY OFF (C) DEE 0099	
		2-2		C1SP	*** NOTE TCS RESET OFF (C) DEE 0131	
		2-3		C1SP	*** NOTE TCS OUTPUT ON AND PULSE OK BLINKING ONCE PER SECOND (C) DEE 0055.	
		2-4		CSAC	*** NOTE T-186 TCS STARTED -- ON (DEE-6 (4005) ON)	
		3	TCS		S-II LOX PRESS SEQUENCE ON -----	
		3-1		C2SP	*** NOTE LOX SUPPLY VALVE OPEN (DEE 1094)	
		3-2		C2SP	*** NOTE LOX TANK VENTS CLOSED ON (DEE 2540, 2542)	
		4	TCS		S-II LOX REPLENISH TERMINATE -----	
		4-1		C2OU	*** NOTE FLIGHT MASS ON	
		4-2		C2PM C2LO	*** NOTE S-II REPLENISH COMPLETED ON	
		4-3		C2PM CPO2	*** NOTE S-II LOX DEBRIS VALVE CLOSED (DEE 1122)	
		4-4		C2OU	*** NOTE REPLENISH VALVE ENABLED OFF	
		4-5		CPO2	*** NOTE S-II REPLENISH CLOSED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3: 6"						
		4-6		CP02 C2PM	*** NOTE S-II LOX FILL & DRAIN CLOSED (DEE 1124)	
		4-7		CP02 C2PM	*** NOTE S-II UMB, VENT VALVE OPEN	
		4-8		C2PM	*** NOTE LOX UMB, PURGE VALVE OPEN (DEE 1126)	
		4-9		C2EV	*** NOTE LOX PROP READY FOR LAUNCH ON	
		4-10		CCL0	*** NOTE S-II UMB, PURGE - ON,	
		5	TCS		S-IVB LOX REPLENISH TERMINATION -----	
		5-1		C40U	*** NOTE FLIGHT MASS ON.	
		5-2		CCL0 C4PR	*** NOTE S-IVB REPLENISH COMPLETED (H)	
		5-3		C40U	*** NOTE REPLENISH VALVE ENABLED OFF.	
		5-4		CP02 C4PR	*** NOTE S-IVB REPLENISH CLOSED (H)	
		5-5		CP02 C4PR	*** NOTE S-IVB LOX FILL & DRAIN CLOSED (H)	
		5-6		CP02 C4PR	*** NOTE S-IVB UMB, VENT OPEN.	
		5-7		CCL0	*** NOTE S-IVB UMB, PURGE ON.	
		5-8		R4PS	*** NOTE DEMAND ON D-14	
		6	TCS		S-II LH2 REPLENISH TERMINATION -----	
		6-1		C2PM CCLH	*** NOTE S-II REPLENISH COMPLETED ON	
		-2		C2PM CPH1	*** NOTE S-II REPLENISH VALVE (A3310) CLOSED.	

N-251-61



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
31 6"						
		6-3		C2PM CPH1	*** NOTE LH2 S-II FILL & DRAIN VALVE (C128) CLOSED. (DEE 1129)	
		6-4		C2PM CPH1	*** NOTE S-II UMB, LINE DRAIN VALVE (A3316) OPEN.	
		6-5		CPH1	*** NOTE S-II UMB LINE PURGE VALVE (A9147) OPEN,	
		6-6		C2PM	*** NOTE LH2 UMB PURGE VALVE OPEN. (DEE 1131)	
		6-7		CCLH	*** NOTE S-II UMB, LINE DRAIN ON	
		7	TCS		S-IVB LH2 REPLENISH TERMINATION -----	
		7-1		CCLH C4PR	*** NOTE S-IVB REPLENISH COMPLETED ON	
		7-2		CPH1	*** NOTE S-IVB REPLENISH VALVE (A3311) CLOSED	
		7-3		CPH1 C4PR	*** NOTE S-IVB FILL & DRAIN VALVE (D104) CLOSED (H)	
		7-4		CPH1	*** NOTE S-IVB UMB, LINE DRAIN VALVE (A3317) OPEN	
		7-5		CPH1	*** NOTE S-IVB UMB, LINE PURGE VALVE (A11773) OPEN.	
		7-6		CCLH	*** NOTE S-IVB UMB, LINE DRAIN ON	
		8	TCS		S-IC LOX REPLENISH TERMINATE -----	
		8-1		C10U	*** NOTE FLIGHT MASS ON	
		8-2		C10U	*** NOTE REPLENISH VALVE ENABLE OFF	
		8-3		CPO2	*** NOTE S-IC REPLENISH CLOSED	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3:06"		8-4		CP02	*** NOTE S-IC FILL & DRAIN (B239) CLOSED	
		8-5		CP02	*** NOTE S-IC UMB. VENT (A213) OPEN	
		8-6		CP01	*** NOTE REPLENISH LINE FLOW REMAINS AT 800 GPM,	
		8-7		CCLO C1LO	*** NOTE S-IC LOX REPLENISH COMPLETE	
		8-8		CCLO	*** NOTE S-IC UMB PURGE ON	
2:47"		1	TCS		S-IVB LOX TANK PREPRESS SEQUENCE -----	
		1-1		C4SP	*** NOTE LOX TANK PRESSURIZING (H)	
		1-2		C4SP	*** NOTE S-IVB LOX VENT CLOSES IMMEDIATELY (H)	
		1-3		C4EV	*** NOTE S-IVB LOX PRESSURIZATION COMMAND ON (C) DEE 1940	
		1-4		C4P2 R4PS	*** NOTE COLD HE REG OPERATION (D-105)	
2:32"		1	TCS		LUT 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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 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.	
+ 1'42"		1	TCS		S-IC HYDRAULICS COMMIT AND CHECK +1D161 -----	
		1-1		C1HP	*** NOTE HYDRAULIC UNIT COMMITTED ON (DDAS) DEE 3245	
+ 1'37"		1	TCS		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 (DEE 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)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1:37"		1-9		CPH1	*** NOTE S-II/S-IVB VENT LINE PURGE (A2984) OPEN.	
1:12"		1	TCS		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	
1:00"		1	TCS		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)	
		1-5		C2TC	*** NOTE S-II READY FOR LAUNCH - ON (DEE 1555)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1' 0"		1-6			CSAC *** NOTE T-60 S/A 1 INHIBITS - ON (DEE-6 (3927) ON)	
0'50"		1	TCS		POWER TRANSFER INTERNAL -----	
	121	2	C1FR		VERIFY POWER TRANSFER COMPLETE (C) DEE 0172.	
		2-1		C1NP C2NP C4NP CUNP	*** NOTE POWER TRANSFER COMPLETE (S-II DEE 3363) (S-IVB DEE 1843 ON)	
		2-2		CUDE	*** NOTE DEE 0779 AND 0777 ON, 0781 OFF.	
		2-3		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)	
0'40"		1	TCS		DISABLE S-IC FUEL & LOX FILL AND DRAIN VALVES AND ENABLE S-IC PROPELLANTS PRESSURIZED ----- -----	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
0140"		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	TCS		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	
0130"		1	TCS		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	<b>GDDT ONLY</b>	#
		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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
0130"		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 START TANK VENT CONTROL PRESS ON - OFF, (DEE 1191)	
		1-12		C2PV	*** NOTE COMMON BULKHEAD VAC OFF	
		1-13		R2SC	*** VERIFY C050-327 & D072-327 WITHIN LIMITS	
		1-14		C2SP	*** NOTE LOW LEVEL PURGE VALVE CLOSED, (DEE 1108)	
		1-15		CSAC	*** NOTE T-30 S/A 1 RETRACT AND LSE INHIBITS - ON (DEE-6 (3959) ON)	
0122"		1	TCS		GUIDANCE REF ALERT AND INSTRUMENT ----- HEATER POWER DISABLE -----	
	121	2	CUEV		VERIFY GUIDANCE ALERT. (DEE 0870 ON)	
		2-1		C1FR	*** NOTE IU READY FOR LAUNCH - OFF.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
0'22"		2-2		C1FR	*** NOTE PREPS COMPLETE - OFF (C) DEE 0159.	
		2-3		C1NP	*** NOTE HEATER POWER LIGHT OFF	
0'20"		1	TCS		CLOSE S-IC LOX INTERCONNECT VALVES -----	
		1-1		C1LO C1FR	*** NOTE LOX INTERCONNECT VALVES CLOSED, (C) DEE 2027, 2029, 2031.	
0'17"		1	TCS		GUIDANCE REF RELEASE -----	
		2	TCS		PD RSCR ENABLE -----	
121		3	CUEV		VERIFY GUIDANCE RELEASE (DEE 0869 ON).	
		3-1		C1FR	*** NOTE IU READY FOR LAUNCH - ON.	
		3-2		C1FR	*** NOTE PREPS COMPLETE - ON (C) DEE 0159.	
153		4	RLDE		GRR OCCURRED AT _____ SEC _____ MS	
153		5	HFLT		VERIFY RECEIPT OF GRR TIME	
		5-1		C1DP C2DP C4DP	*** NOTE RSCR'S 1 & 2 PD BLOCKED OFF, (DEE 1012, 1013) (C) DEE 0038, 0039. DEE 1673, 1674	
		5-2		C4ET	*** NOTE NON PROGRAMMED CUTOFF NOT ON DEE 1948 NOT ON	





TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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CD ONLY

0'  
8.9 "

		2-4	C4SP	***	NOTE S-IVB COLD HELIUM SUPPLY VENT OPENS	#
		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 Q-BALL COVER RETRACT VALVE OPEN (COMP) DEE 1597 ON	#
		2-13	CSAC	***	NOTE T-8,9 IGNITION COMMAND - ON (DEE-6 (4007) ON)	#

0'  
8.8 "

1	TCS	START S-IC IGNITER NO. 1 -----	#
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0'  
8.7 "

1	TCS	START S-IC IGNITER NO. 2 -----	#
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
0' 6.7"		1	TCS		TIME FOR S-IC LINKS BURNED -----	#
	121	2	C1FR		S-IC LINKS ARE BURNED (C) DEE 0102, 0103	#
		2-1		C1FR	*** NOTE ENGINES ARMED ON (C) DEE 0174	#
0' 6.54"		1	TCS		START S-IC ENG 105 -----	#
		1-1		C1FR	*** NOTE ENG 105 START ON (C) DEE 0222	#
0' 6.39"		1	TCS		START S-IC ENG 103 -----	#
		1-1		C1FR	*** NOTE ENG 103 START ON (C) DEE 0228	#
0' 6.28"		1	TCS		START S-IC ENG 102 -----	#
		1-1		C1FR	*** NOTE ENG 102 START ON (C) DEE 0226	#
0' 6.11"		1	TCS		START S-IC ENG 104 -----	#
		1-1		C1FR	*** NOTE ENG 104 START ON (C) DEE 0224	#



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
0' 0.05"		1	TCS		TIME FOR THRUST CHECKS -----	#
0' 0"		1	TCS		S-IC TIME FOR COMMIT AND S-II ELEC ----- DEADFACE COMPLETION -----	#
		1-1		C1FR	*** NOTE TIME FOR COMMIT (C) DEE 0117	#
	121	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
					<b>CD ONLY</b>	
01 00		2-12		C2EV	*** NOTE IND BUS 2D119 OFF.	#
		2-13		C2EV	*** NOTE S-IC COMMIT.	#
		2-14		CSAC	*** NOTE COMMIT - ON	#
01 00		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 AS LIFTOFF ANNOUNCED OVER OIS, PLUS OPERATOR COUNT OF 2 SECONDS.	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
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		CHCW	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,	#
	181	2	C1TC	CPDC	SECURE PNEUMATIC SYSTEM PANEL POWER	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CO ONLY</b>	
1' 0"						
151		1	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	#
181		2	C1TC	C1PE C1NE	START S-IC PANEL SECURING PER V-21036 (POST LAUNCH CHECKLIST)	#
181		3	C1TC	CSAC	SECURE SYSTEMS POWER ON CH 118.	#
118		4	CSAC	CSA1 CSA2 CSA4 CSA5 CSA6 CSA7 CSA8 CSA9 CSAD CHDA	SYSTEM POWER SWITCHES - OFF	#
181		5	C1TC	CTS1	SAFE TSM'S PER V-36039.	#
181		6	C1TC	CECS	START ECS SECURING PER V-36074	#
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	C4HN	CLOSE COLD HELIUM CROSSOVER VALVE	#
161		12	C4TC	C4AL	CLOSE 3000 PSI SUPPLY	#
171		13	C2TC	C2AE	TCH CHILLDOWN TO OFF	#
171		14	C2TC	C2SP	LOW LEVEL PURGE VALVE TO CLOSE	#
171		15	C2TC	C2SP	SHROUD PURGE VALVE TO CLOSE	#
171		16	C2TC	C2GP	GH SUPPLY VALVE TO CLOSE	#



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		16-1		C2TC	*** NOTE FOR COMPUTER DOWN CONDITION, REQUEST CLVN TO ISSUE THE FOLLOWING MDOIS:  MUX 22, ADDRESS 4, DATA BIT 7 UP 1111 OFF (LOW LEVEL PURGE VALVE CLOSE)  MUX 22, ADDRESS 2, DATA BIT 16 UP 1072 OFF (SHROUD PURGE VALVE CLOSE)	#
171		17	C2TC	C2AE	START TANK SUPPLY VALVE TO OFF	#
171		18	C2TC	C2GP	START TANK LINE VENT OPEN FOR APPROX 10 SECONDS, THEN TO CLOSE.	#
171		19	C2TC	C2AE	HE BOTTLES SUPPLY VALVE TO OFF	#
171		20	C2TC	C2AE	START TANK VENT CONT PRESS TO OFF	#
171		21	C2TC	C2RP	PNEUM RECEIVER SUPPLY VALVE TO OFF	#
171		22	C2TC	C2RP	RECEIVER ACT DISC TO OFF	#
171		23	C2TC	C2SP	LOX AND LH ACT PRESS SW'S TO OFF	#
171		24	C2TC	C2SP	LOX AND LH VENT VALVE SW'S TO CLOSE	#
171		25	C2TC	C2SP	LOX DISCONNECT PRESS SW TO CLOSE	#
171		26	C2TC	C2GP	HE PRESS SEL SW TO 1000 PSIG.	#
171		27	C2TC	C2PV	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 (B011). 2D100 POWER TO STAY ON UNTIL GROUND PNEUMATICS IS SECURED.	#
181		1	C1TC	CCLO	SECURE LOX PUMPS AND VENT STORAGE TANK	#
181		2	C1TC	CCLH	VERIFY AUTO LAUNCH SECURING IN PROGRESS PER V-35014.	#

CD ONLY

17 0"

21 0"



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
61 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) (MUX NONE. ADDRESS 18. DATA BIT 17 UP)	#
	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-35015, VOL II	#
	161	10	C4TC	C4HN	SUPPORT LH2 SYSTEM SECURING PER V-35015, VOL II ON CH 143	#
	171	11	C2TC	C2PM	SUPPORT LH2 SYSTEM SECURING PER V-35015, VOL II ON CH 143	#
	181	12	C1TC	CCRP	SECURE RP-1 SYSTEM PER V-25003.	#
	181	13	C1TC	RPDC RDTS RDE3	SECURE DEE-3, DTS AND PROPELLANT POWER, AFTER COMPLETION OF PROPELLANT MECH AND ECS SECURING PROCEDURES.	#
	181	14	C1TC	RDTS RPDC	SECURE ALTERNATE FIRING ROOM DTS AND PROPELLANT POWER	#
	121	15	CLTC	BTMC	SECURE TM TAPE RECORDING AFTER LOSS OF TM SIGNAL	#
	121	16	CLTC	CUTC	CHILLED WATER SUPPLY TO THE ML 110A IS OFF. PROCEED WITH SECURING THE LUT 110A	#
	151	17	CUTC	CLVN	ML DCE TO MANUAL MODE	#
	151	18	CUTC	BGCC	DC POWER OFF THE ML 110A	#
	151	19	CUTC	COPM	23T500 OUTPUT POWER OFF (DO NOT TRANSFER TO FACILITY POWER)	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 01 00	151	20	CUTC	ALL	POST LAUNCH OPERATIONS WILL BE PERFORMED PER V-31062, PART VII	#
	181	21	C1TC	V1ME	SECURE VEHICLE MEASURING GSE PER V-27098.	#
	181	22	C1TC	B1TM	SECURE TCE PER V-28186.	#
+20 00	151	1	CUTC	RLDE	TERMINATE MAG TAPE AND POWER OFF THE DEE-6 COMPUTER	#
+ 1 HRS 00 00		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 AND SAMPLES OF THE LH2 SKID FILTERS AND TRANSFER LINE INDICATE LESS THAN 4% GH2.	#
	111	2	CLTC	CVTS	REQUEST CPSS TO CLEAR APPROVED BENDIX PERSONNEL INTO FACILITY HIGH PRESSURE GH2 AREA TO SECURE AND VENT 6000 PSI GH2 TRANSFER LINE.	# TCPI
	121	3	BOSC	CLTC	VERIFY S-II & S-IVB PERSONNEL ARE READY TO SUPPORT GH2 CROSS COUNTRY LINE SECURING WITH GHE.	# TCPI











LV CDDT & CD, VOL II  
DATE: MAY 18, 1971  
REVISION 029

APOLLO/SATURN

5251.60  
PAGE 291  
TEST NO -20060, APP A1  
VEHICLE AS-510

APPENDIX A  
SAFING PROCEDURES

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 LV					APPENDIX A - LV 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-22 MIN AND TCS (T-00:03:07)  * ALL PERSONNEL MONITORING CH 121	
		1		C2AE	TCH CHILLDOWN TO OFF THEN AUTO	
		2		C4EP	TCH CHILLDOWN VALVE CLOSE THEN AUTO.	
		3		C2AE	START TANK SUPPLY VALVE TO OFF THEN AUTO	
		4		C2AE	START TANK ALL VENT TO ALL VENT	
		4-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT. NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY WHEN EMERGENCY VENT IS USED.	
		5		C2SP	LOX SUPPLY VALVE TO CLOSE THEN AUTO	
	121	6	CLTC	C1NP	POWER CONTROL FUNCTION SELECTOR TO PRELAUNCH	
	121	7	CLTC	C1SP	CUTOFF RESET	
	121	7-1		BGCC	*** NOTE COMPUTER IN GO MODE.	
	121	8	CLTC	C4AL	APS ENGINE VALVE POWER OFF.	
	121	9	CLTC	C1SP	TCS - SAFE AND SEQUENCER POWER OFF THEN AUTO	
	121	10	CLTC	CSA1	POSITION AND/OR VERIFY CARRIER CONNECT AND RETRACT ARMING SWITCH TO OFF.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 LV						
121		11	CLTC	C1DP C2DP C4DP	SAFE & ARM DEVICE - SAFE.	
121		12	CLTC	CUSW	LVDA/ESE SWITCH TO ESE.	
121		13	CLTC	CUSP	CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO ON.	
121		14	CLTC	CUFC	VERIFY FLIGHT CONTROL SYSTEM IN A SAFE CONFIGURATION FOR LADDER DRIFT.	
121		15	CLTC	CLIK CLGK C1PK CLOP	TERMINATE PROGRAM BEING EXECUTED.	
		15-1		CLGK	*** NOTE TERMINATE FE50	
		15-2		CLGK	*** NOTE TERMINATE GE01 IF FT42 HAS BEEN PREVIOUSLY EXECUTED	
		15-3		C1PK	*** NOTE TERMINATE VATS IF EXECUTING	
121		16	CLTC	CHCU	START CKT BYPASS SWITCHES OFF	
		16-1		CLDE	*** NOTE DEE-6 (1482, 1485, 4221, 4222) OFF	
		17		RLDE	*** NOTE ENTER EST MODE.	
121		18	CLTC	C1TC C2TC C4TC CUTC	SAFE YOUR STAGES & GSE, ESTABLISH HOLD CONDITION. REPORT WHEN COMPLETE.	
121		19	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF THEN AUTO	
		19-1		CLDE	*** NOTE DEE-6 (3637) OFF	
121		20	CLTC	ECOP	TERMINATE REAL TIME GUIDANCE REDUCTION	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 LV	111	21	CLTC	CVTS	LV IS SAFED, HOLD CONDITION ESTABLISHED	TCPI
	121	22	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B4 FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR DRAIN PROCEDURE)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1	S-IC				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	CYS1	VERIFY AND/OR OPERATE PSV #3 SWITCH TO DOWN	
		8-1			*** NOTE DEE-6 (1493, 1505 & 1517) OFF AND (4094, 4123 & 4152) ON	
181		9	C1TC	CSA1	POSITION AND/OR VERIFY LOWER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
181		10	C1TC	CSA1	POSITION AND/OR VERIFY UPPER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
121		11	C1TC	CLTC	S-IC SAFED. HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1	S-II				PART 1 PRIOR TO T-3:07 MIN ----- (COMPUTER SUPPORTING)	
					S-II SAFING -----	
171		1	C2TC	C2AE	VERIFY TCH CHILLDOWN IN AUTO.	
		1-1		C2AE	*** NOTE TCH CHILLDOWN OFF	
171		2	C2TC	C2AE	VERIFY START TANK ALL VENT IN ALL VENT	
171		3	C2TC	C2AE	VERIFY START TANK SUPPLY VALVE IN AUTO.	
		3-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF	
171		4	C2TC	C2AE	START TANK SUPPLY LINE VENT TO VENT THEN AUTO.	
171		5	C2TC	C2AE	HE BOTTLE SUPPLY VALVE TO OFF THEN AUTO.	
171		6	C2TC	C2AE	HE BOTTLE SUPPLY LINE VENT TO VENT.	
		7		C2AE	USE ALL HE SOLENOID SWITCH TO KEEP HE BOTTLE PRESSURES BELOW 3000 PSIA.	
171		8	C2TC	C2AE	VERIFY/PLACE TCH PURGE TO OFF THEN AUTO.	
171		9	C2TC	C2PV	MAINTAIN PURGE AND VACUUM SYSTEM OPERATIONS.	
171		10	C2TC	C2FC	MAIN PUMP BYPASS VALVE TO CLOSE THEN AUTO.	
171		11	C2TC	C2FC	ENGINES 1, 2, 3 & 4 ACCUMULATOR CONTROL - ON THEN AUTO.	
171		12	C2TC	C2FC	ALL ACCUMULATOR CONTROL - UNLOCK THEN AUTO.	
		12-1		C2FC	*** NOTE INDIVIDUAL ACCUMULATOR LOCKUP LIGHTS ON AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF.	
171		13	C2TC	C2FC	AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 AND 4 - OFF THEN AUTO.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 S-II						
	171	14	C2FC	C2TC	HYDRAULICS SAFED AND IN HOLD CONDITION.	
	171	15	C2TC	C2RP	RECIRC RESET TO RESET THEN INHIBIT.	
		15-1		C2NP	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS.	
		15-2		C2RP	*** NOTE LH PREVALVES OPEN - ON	
		15-3		C2RP	*** NOTE RECIRC RESET AND RECIRC STOP RESET - ON	
	171	16	C2TC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51.	
	171	17	C2TC	C2SP	LOX DISCONNECT PRESS - CLOSE THEN AUTO	
		17-1		C2SP	*** NOTE LOX & LH VENT VALVES OPEN.	
		17-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED.	
		17-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED.	
		17-4		C2SP	*** NOTE LOX & LH ACT PRESSURE ON.	
		17-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN.	
		17-6		C2SP	*** NOTE SHROUD PURGE VALVE OPEN.	
		17-7		C2GP	*** NOTE GN SUPPLY ON.	
		17-8		C2GP	*** NOTE GH PRESSURE ON.	
		17-9		C2GP	*** NOTE 3000 PSIG HE PRESS ON.	
		17-10		C2GP	*** NOTE 3000 PSIG EMERG HE PRESS ON.	
		17-11		C2GP	*** NOTE SECONDARY HE PRESS ON.	
		17-12		C2GP	*** NOTE HE F & D LINE INERT ON.	
		17-13		C2GP	*** NOTE HE ACT PNEU PRESS ON.	
		17-14		C2GP	*** NOTE HE TURBO START GH VENT ON.	
		17-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 S-II						
		17-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON.	
		17-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON.	
		17-18		C2GP	*** NOTE AMB HE TCH PURGE ON.	
171		18	C2SP	C2TC	PRESSURIZATION SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
171		19	C2GP	C2TC	GROUND PNEUMATICS SAFED AND IN HOLD CONDITION.	
171		20	C2PM	C2TC	PROPELLANT MONITOR SAFED AND IN HOLD CONDITION.	
171		21	C2AE	C2TC	ENGINE PURGES ARE COMPLETE AND HOLD CONDITION ESTABLISHED.	
171		22	C2PV	C2TC	PURGE AND VACUUM SYSTEM IN HOLD CONDITION.	
121		23	C2TC	CLTC	S-II SAFED, HOLD CONDITION ESTABLISHED.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 S-IV						
PART 1 PRIOR TO T-3:07 MIN						
-----						
(COMPUTER SUPPORTING)						
S-IVB SAFING						
-----						
161		1	C4TC	C4EP	START TANK SUPPLY VALVE CLOSE THEN AUTO.	
161		2	C4TC	C4EP	ON C4PS COMMAND OPEN START TANK VENT.	
161		3	C4TC	C4ET	VENT ENGINE CONTROL BOTTLE AS REQUIRED TO MAINTAIN PRESSURE BELOW 3200 PSIA MAX BY CYCLING C.T. HELIUM CONTROL.	
161		4	C4TC	C4NP	SWITCH SELECTOR INHIBIT - OFF	
161		5	C4TC	C4EP	LOX & LH2 PREVALVES - OPEN THEN AUTO	
161		6	C4TC	C4EP	LOX & LH2 CHILLDOWN PUMPS - OFF THEN AUTO	
161		7	C4TC	C4HY	FLIGHT MODE OFF THEN AUTO.	
161		8	C4TC	C4HN	HEAT EXCHANGER CKT 1 VENT CLOSE THEN AUTO.	
161		9	C4TC	C4EP	THRUST CHAMBER PURGE SUPPLY CLOSE THEN AUTO.	
161		10	C4TC	C4SP	LOX VENT SWITCH TO OPEN	
161		11	C4TC	C4SP	LH2 VENT SWITCH TO OPEN	
161		12	C4TC	C4PP	PLUG SUPERVISION POWER ON THEN AUTO.	
121		13	C4TC	CLTC	S-IVB SAFED, HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A1 IU					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 THEN AUTO	
151		2	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
151		3	CUTC	CLGK	REQUEST & EXECUTE FT20 (LVDC SELF CHECK) IF LVDC IS NOT IN MODE SORT,	
151		4	CUTC	CUNP	SWITCH SELECTOR INHIBIT - ON	
121		5	CUTC	CLTC	IU SAFED. HOLD CONDITION ESTABLISHED.	XB-331-62

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV					APPENDIX A - LV SAFING PROCEDURE ----- PART 2 PRIOR TO T-3:07 MIN ----- (COMPUTER DOWN)  CONDITIONS:  * FIRING COMMAND NOT ISSUED  * TCS FUNCTIONS NOT INITIATED  * HOLD COUNT SOURCE NOT CUTOFF  * HOLD CALLED BETWEEN T-22 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 THEN AUTO	
		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	C4NP	SWITCH SELECTOR INHIBIT TO OFF	
121		10	CLTC	C4NP	EMERGENCY POWER TRANSFER SWITCH - EXTERNAL	
121		11	CLTC	C4AL	APS ENGINE VALVE POWER OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV						
	121	12	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:	
		12-1		ALL	*** NOTE ALL PANEL OPERATORS POSITION SWITCHES TO POSITION INDICATED IN PARENTHESES AFTER EACH GROUP IS ISSUED.	
	121	12-2		CLVN	GRP 1 - MUX 21, 22. ADDRESS 12. DATA BIT 5 DN. 1805 ON (CUSP - S-II BURN TEST MODE ON).	
		12-3		CUSP	*** NOTE FLIGHT CONTROL IN SAFE CONFIGURATION FOR LADDER DRIFT	
	121	12-4		CLVN	GRP 2 - MUX 21, 22. ADDRESS 16. DATA BIT 17 DN, 18 DN. 1913 ON (CUES-TOK INHIBIT A SW TO AUTO) 1914 ON (CUES-TOK INHIBIT B SW TO AUTO)	
	121	12-5		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 THEN AUTO) 1168 OFF (C2AE-TCH PURGE TO OFF THEN AUTO) 1170 OFF (C2AE - HE BOTTLE SUPPLY VALVE TO OFF THEN AUTO) 1171 ON (C2AE - HE BOTTLE SUPPLY LINE VENT TO VENT)	
	121	12-6		CLVN	GRP 4 - MUX 22. ADDRESS 10. DATA BIT 6 UP 1254 OFF (C2FC - MAIN PUMP BYPASS VALVES CLOSE THEN AUTO)	
	121	12-7		CLVN	GRP 5 - MUX 22. ADDRESS 3. DATA BIT 23 UP. 1103 OFF (C2SP - LOX DISC PRESS TO CLOSE THEN AUTO)	
	121	12-8		CLVN	GRP 6 - MUX 22. ADDRESS 9. DATA BIT 22 DN. 1246 ON (C2FC - ENG 1 ACCUM CONTROL - ON THEN AUTO)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV						
	121	12-9	CLVN	GRP 7 - MUX 22. ADDRESS 10. DATA BIT 0 DN, 2 DN, 4 DN. 1248 ON (C2FC - ENG 2 ACCUM CONTROL - ON THEN AUTO) 1250 ON (C2FC - ENG 3 ACCUM CONTROL - ON THEN AUTO) 1252 ON (C2FC - ENG 4 ACCUM CONTROL - ON THEN AUTO)		
	121	12-10	CLVN	GRP 8 - MUX 21. ADDRESS 1. DATA BIT 21 DOWN THEN REISSUE WITH DATA BIT 21 UP. 0549 ON/OFF (C2FC - ALL ACCUM CONTROL TO UNLOCK THEN AUTO)		
	121	12-11	CLVN	GRP 9 - MUX 22. ADDRESS 5. DATA BIT 23 DN. 1151 ON (C2AE - START TANKS SUPPLY LINE TO VENT THEN AUTO)		
	121	12-12	CLVN	GRP 10 - MUX 22. ADDRESS 9. DATA BIT 21 UP, 23 UP. 1245 OFF (C2FC - AUX HYD PUMP 1 TO OFF THEN AUTO) 1247 OFF (C2FC - AUX HYD PUMP 2 TO OFF THEN AUTO)		
	121	12-13	CLVN	GRP 11 - MUX 22. ADDRESS 10. DATA BIT 1 UP, 3 UP. 1249 OFF (C2FC - AUX HYD PUMP 3 TO OFF THEN AUTO) 1251 OFF (C2FC - AUX HYD PUMP 4 TO OFF THEN AUTO)		
	121	12-14	CLVN	GRP 12 - MUX 21, 22. ADDRESS 2. DATA BIT 11 UP, 12 UP. 1571 OFF (C4EP - TCH PURGE SUPPLY CLOSE THEN AUTO) 1572 OFF (C4EP - TCH CHILLDOWN CLOSE THEN AUTO)		
	121	12-15	CLVN	GRP 13 - MUX 21, 22. ADDRESS 8. DATA BIT 15 UP. 1719 OFF (C4EP - START TANK SUPPLY CLOSE THEN AUTO)		
	121	12-16	CLVN	GRP 14 - MUX 21, 22. ADDRESS 6. DATA BIT 21 UP. 1677 OFF (C4HN - HEX CIR #1 VENT CLOSE THEN AUTO)		

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV						
121		12-17		CLVN	GRP 15 - 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		12-18		CLVN	GRP 16 - MUX NONE, ADDRESS 14. DATA BIT 14 UP. 0350 OFF (CTS1 - TSM 3-4 PSV #3 CLOSE)	
121		12-19		CLVN	GRP 17 - MUX 22, ADDRESS 5. DATA BIT 10 DN THEN REISSUE WITH DATA BIT 10 UP. 1138 ON THEN OFF (C2RP - RECIRC RESET TO RESET THEN INHIBIT)	
121		12-20		C2NP	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS.	
121		13	CLTC	CUSW	ISSUE THE FOLLOWING OCTALS. REPORT WHEN COMPLETE.  S-IVB 151 (C4EP - LOX & LH PREVALVES OPEN THEN AUTO) S-IVB 042 (C4EP - LOX CHILLDOWN PUMP OFF THEN AUTO) S-IVB 153 (C4EP - LH2 CHILLDOWN PUMP OFF THEN AUTO) S-IVB 074 (C4HY - FLIGHT MODE OFF THEN AUTO)	
121		14		CLVN	GRP 18 - MUX NONE, ADDRESS BIT 11. DATA BIT 12 UP, 0276 OFF (C1LO - LOX BUBBLING TO AUTO).	
121		15	CLTC	C2AE	START TANK ALL VENT TO ALL VENT	
		15-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT, NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY WHEN EMERGENCY VENT IS USED.	
		16		C2AE	USE ALL HE SOLENOID SW TO KEEP HE BOTTLE PRESSURES BELOW 3000 PSIA.	
		17		C4EP	ON C4PS COMMAND OPEN START TANK VENT.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2-LV		18		C4ET	USE HE CONTROL SOLENOID TO MAINTAIN ENGINE CONTROL BOTTLE PRESSURE BELOW 3200 PSIA MAX	
		19		C4HN	AT C4PS COMMAND CLOSE 6000 GH2 INLET.	
		20		C4SP	LOX & LH2 VENT SWITCHES TO OPEN	
	121	21	CLTC	CHCU	START CKT BYPASS SWITCHES TO OFF	
	121	22	CLTC	CSA1	POSITION AND/OR VERIFY CARRIER CONNECT AND RETRACT ARMING SWITCH TO OFF.	
	121	23	CLTC	CSA1	POSITION AND/OR VERIFY LOWER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
	121	24	CLTC	CSA1	POSITION AND/OR VERIFY UPPER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
		25		CLTC	*** NOTE CUSW MUST BE COMPLETE PRIOR TO NEXT STEP	
	121	26	CLTC	C4NP	SWITCH SELECTOR INHIBIT TO ON	
	121	27	CLTC	CCRP	EVALUATE FUEL LOAD FOR POSSIBLE REPLENISH AND/OR FUEL LEVEL ADJUST IN SUPPORT OF A RECYCLE.	
		27-1			NOTE ----- PROPELLANT PROGRAMS BT01, BE01 & BE02 MAY HAVE TO BE REINITIATED.	
	121	28	CLTC	CCLO	MAINTAIN ALL STAGE LOX REPLENISH AT 100% PER V-35014	
	121	29	CLTC	CCLH	MAINTAIN S-II AND S-IVB LH2 REPLENISH AT 100% PER V-35014	
	121	30	CLTC	CUSP	VERIFY FLIGHT CONTROL IS IN A SAFE CONFIGURATION FOR LADDER DRIFT	
	121	31	CLTC	CLGK	OFF AUTO ON SWITCH TO OFF	
	121	32	CLTC	CUDE	VERIFY 728 (HALT) AND 730 (MEMORY RELEASE) ARE ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV						
	121	33	CLTC	ECOP	STOP GUIDANCE REDUCTION PROGRAM	
	121	34	CLTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
		35	RLDE		*** NOTE ENTER EST MODE	
	121	36	CLTC	CUES	EDS MODE SW TO MONITOR	
	121	37	CLTC	C1TC C2TC C4TC CUTC	VERIFY STAGES SAFED AND HOLD CONDITION ESTABLISHED & AWAITING COMP SUPPORT.	
	121	38	CLTC	CUTC	REINITIALIZE GROUND COMPUTER PER V-31062, APP F; REPORT WHEN COMPLETE.	
	111	39	CLTC	CVTS	LAUNCH VEHICLE SAFE. HOLD CONDITION ESTABLISHED AND AWAITING COMPUTER SUPPORT.	TCPI



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV					HOLDING FOR COMPUTER SUPPORT -----	
	121	1	CUTC	CLTC	COMPUTER SUPPORTING	
	121	2	CLTC	CLGK	POWER ON LVDC/LVDA PER V-33033 SECTION I. REPORT WHEN COMPLETE (APPROX. 20 MIN.) (NOT REQUIRED IF PROCEEDING TO SCRUB).	
	121	3	CLTC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51	
		3-1		C2SP	*** NOTE LOX & LH VENT VALVES OPEN	
		3-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED	
		3-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED	
		3-4		C2SP	*** NOTE LOX & LH ACT PRESSURE ON	
		3-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN	
		3-6		C2GP	*** NOTE GN SUPPLY ON	
		3-7		C2GP	*** NOTE GH PRESSURE ON	
		3-8		C2GP	*** NOTE 3000 PSIG HE PRESS ON	
		3-9		C2GP	*** NOTE 3000 PSIG EMERG HE PRESS ON	
		3-10		C2GP	*** NOTE SECONDARY HE PRESS ON	
		3-11		C2SP	*** NOTE SHROUD PURGE VALVE OPEN	
		3-12		C2GP	*** NOTE HE F & D LINE INERT ON.	
		3-13		C2GP	*** NOTE HE ACT PNEU PRESS ON.	
		3-14		C2GP	*** NOTE HE TURBO START GH VENT ON.	
		3-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON.	
		3-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON.	
		3-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A2 LV		3-18		C2GP	*** NOTE AMB HE TCH PURGE ON.	
121		4	CLTC	C4PP	PLUG SUPERVISION POWER ON THEN AUTO.	
121		5	CLTC	C4HN	VERIFY OPEN OR OPEN 6000 PSI GH2 INLET	
121		6	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF THEN AUTO	
171		7	C2AE	C2TC	ENGINE PURGES ARE COMPLETE	
121		8	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY TO START RECYCLE OR SCRUB.	
111		9	CLTC	CVTS	COMPUTER SUPPORT REESTABLISHED, LAUNCH VEHICLE READY TO START RECYCLE OR SCRUB	TCPI
121		10	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B4 FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR DRAIN PROCEDURE)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 LV					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	
	121	1	C1PE	C1FR	*****CAUTION***** * * IF CAUSE FOR CUTOFF IS * * NO LIFTOFF AND NO * * AUTOMATIC CUTOFF (AT * * IGNITION PLUS 17 * * SECONDS) GIVE CUTOFF * * COMMAND (HOLD FOR 3 SEC * * AND RELEASE) AND ADVISE * * 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	C4EP		TCH CHILLDOWN VALVE CLOSE THEN AUTO.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3	LV					
		22		C2AE	START TANK ALL VENT TO ALL VENT	
		22-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT. NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY WHEN EMERGENCY VENT IS USED.	
	121	23	CLTC	C4AL	APS ENGINE VALVE POWER - OFF.	
		23-1		C1NP C2NP C4NP CUNP	*** NOTE STAGE POWER ON EXTERNAL.	
		23-2		CUDE	*** NOTE 0777 (PWR XFER COMPLETE) & 0779 (IU STAGE POWER) OFF, 0781 (IU GND POWER) ON	
	121	24	CLTC	CLVN	ML BLOCK INHIBIT ON	
		24-1		BGCC	*** NOTE COMPUTER IN GO MODE	
	121	25	CLTC	C1SP	TCS - SAFE AND SEQUENCER POWER - OFF THEN AUTO	
		25-1		C1FR	*** NOTE CUTOFF ON	
	121	26	CLTC	C1DP C2DP C4DP	SAFE AND ARM - SAFE	
		26-1		C1FR	*** NOTE FIRING COMMAND OFF	
	121	27	CLTC	CUSW	LVDA/ESE TO ESE	
	121	28	CLTC	CUSP	CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO ON.	
	121	29	CLTC	CUSP	VERIFY FLIGHT CONTROL SYSTEM IN SAFE CONFIGURATION FOR LADDER DRIFT.	
	121	30	CLTC	CSA1	POSITION AND/OR VERIFY CARRIER CONNECT AND RETRACT ARMING SWITCH TO OFF.	
	121	31	CLTC	CSA1	IF S/A 1 IS RETRACTED, AUTO EXTEND ARMING SWITCH OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3	LV					
121		32	CLTC	CSA2	IF S/A 2 IS RETRACTED, AUTO EXTEND ARMING SWITCH OFF AND SAFE ALL YOUR CHARGING SYSTEMS	
		33			*****CAUTION***** * * THE FOLLOWING SEQUENCES * * ARE HAZARDOUS. * * *****	
121		34	CLTC	C1LO	LOX FLIGHT VENTS TO OPEN	
121		35	CLTC	C1NP	POWER FUNCTION SELECTOR - PRELAUNCH	
		36	CLTC		*****CAUTION***** * * IF CUTOFF BETWEEN T-20 * * SEC AND T-8,9 SEC (IGN * * COMMAND), ACCOMPLISH * * THE FOLLOWING SUBSTEPS: * * *****	
121		36-1	CLTC	C1LO	VERIFY LOX INTERCONNECT VALVES 1, 3 & 4 OPEN & 2 CLOSED.	
121		36-2	CLTC	C1LO	VERIFY LOX BUBBLING DUCTS 1 & 3 ON. CONTINUE 2 DUCT BUBBLING FOR 10 MINUTES TO ESTABLISH THERMAL PUMPING.	
		37	CLTC		*****CAUTION***** * * IF CUTOFF AFTER T-8,9 * * (IGN COMMAND) & CUTOFF * * RESET CANNOT BE GIVEN * * WITHIN 3 MINUTES FROM * * INTERCONNECT CLOSURE * * (T-20 SEC), ACCOMPLISH * * THE FOLLOWING SUBSTEPS: * * *****	
121		37-1	CLTC	C1LO	VERIFY MANUAL ACTION IS BEING TAKEN TO ESTABLISH S-IC THERMAL PUMPING.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3	LV					
		37-2		C1LO	NOTE LOX BUBBLING SWITCH TO DUCTS 1 & 3.	
		37-3		C1LO	LOX INTERCONNECT VALVES 1, 3 & 4 SWITCHES TO CLOSE.	
		37-4		C1LO	LOCK UP COMMAND DISABLE TO ON.	
	121	37-5	C1LO	C1EN	PREVALVE EMERGENCY SWITCH TO OPEN. VERIFY ALL LOX PREVALVES OPEN.	
		37-6		C1LO	LOX INTERCONNECT VALVES 1, 3 & 4 TO OPEN. NOTE OPEN INDICATION.	
		37-7		C1LO	NOTE BUBBLING DUCTS 1 & 3 ON. CONTINUE 2 DUCT BUBBLING FOR 10 MINUTES TO ESTABLISH THERMAL PUMPING.	
	121	38	CLTC	C1PC	VERIFY LOX DOME PURGE ON	
	121	39	CLTC	C1PE	VERIFY ALL LOX DUCT CONDITIONS SATISFACTORY & READY TO RESET CUTOFF.	
	121	40	CLTC	C1SP	CUTOFF - RESET.	
	121	41	CLTC	C1FR	VERIFY CUTOFF - OFF	
		41-1		C1LO	*** NOTE LOX PREVALVES OPEN.	
		41-2		C1LO	*** NOTE INTERCONNECT VALVES 1, 3 & 4 OPEN AND 2 CLOSED.	
		41-3		C1LO	*** NOTE BUBBLING DUCTS 1 & 3 ON.	
		42			*****CAUTION***** * * RESUME PREVIOUS HAZARD * * LEVEL - END OF CAUTION * * *****	
	121	43	CLTC	CLVN	ML COMPUTER INHIBIT TO AUTO.	
		43-1		BGCC	*** NOTE COMPUTER IN GO MODE.	
	121	44	CLTC	CWCP	FLAME DEFLECTOR COOLING OFF.	
		45		C4SP	*** NOTE DIRECTIONAL VENT IN GROUND POSITION AND LH2 VENT OPEN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<b>CD ONLY</b>						
A3	LV					
		46		C4SP	AT C4PS COMMAND, LOX TANK VENT OPEN	
		46-1		C1PK	*** NOTE TERMINATE VATS IF EXECUTING	
	121	47	CLTC	C1TC C2TC C4TC CUTC	SAFE YOUR STAGES AND GSE, ESTABLISH A HOLD CONDITION. REPORT WHEN COMPLETE.	
	121	48	CLTC	ECOP	TERMINATE GUIDANCE REDUCTION PROGRAM.	
		48-1		CLTC C2TC	<b>CDDT ONLY</b>	
	121	49	CLTC	CSPP C1PP C4PP	POWER SUPPLY COMMIT OFF THEN AUTO	
	111	50	CLTC	CVTS	LV IS SAFED, HOLD CONDITION ESTABLISHED	TCPI
		51	RLDE		*** NOTE ENTER EST MODE.	
		52			NOTE ---	
	121	53 <del>54</del> 55	CLTC	ALL	IF S/A 2 IS RETRACTED, THERE WILL BE NO INDICATION IN THE HGD SYSTEM FOR S-IC FWD/S-II AFT <b>CDDT ONLY</b> ALL PERSONNEL TURN TO: (APPENDIX B4 FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR LV DRAIN)	*

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 S-IC					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	C1TC	C1LO	WHEN 10 MINUTE BUBBLING PERIOD IS COMPLETE (IF REQUIRED) PLACE LOX BUBBLING SWITCH TO AUTO,	
181		4	C1TC	C1EN	VERIFY LOX & FUEL PREVALVES OPEN,	
181		5	C1TC	C1PC	CONTINUE THERMAL CONDITIONING PURGE.	
		5-1		C1EN	*** NOTE ALL ENG VALVES CLOSED	
		5-2		C1EH	*** NOTE HEATER POWER ON,	
		5-3		C1PC	*** NOTE LOX DOME & GG INJECTION PURGE VENT VALVES CLOSED,	
		5-4		C1PC	*** NOTE PURGE FILL AND DRAIN VALVE OPEN	
		5-5		C1PC	*** NOTE CONTROL PRESS FILL & DRAIN VALVE OPEN,	
		5-6		C1PC	*** NOTE GN2 BOTTLE GROUND VENT CLOSED,	
		5-7		C1PC	*** NOTE GN2 BOTTLE LOW & HIGH FILL VALVES OPEN,	
		5-8		C1HP	*** NOTE HYDRAULIC UNIT COMMITTED OFF,	
		5-9		C1HP	*** NOTE HYDRAULIC PRESSURE OK	
		5-10		C1RP	*** NOTE HE GND ISOLATION VALVE OPEN,	
		5-11		C1RP	*** NOTE HE BOTTLE HIGH FILL VALVES OPEN,	
		5-12		C1RP	*** NOTE HE BOTTLE GROUND VENT CLOSED,	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 S-IC						
		5-13		C1RP	*** NOTE ALL PREPRESS VALVES CLOSED.	
		5-14		C1LO	*** NOTE ALL PREPRESS VALVES CLOSED.	
181		6	C1TC	CHCU	START CKT BYPASS SWITCHES - OFF	
181		7	C1TC	C1NP	VERIFY UPPER PLUGS CONNECTED LIGHT ON	
181		8	C1TC	C1NP	IF UPPER UMBILICAL SUPERVISION LIGHT IS OFF, HEATER POWER - OFF	
181		9	C1TC	CCLO	REVERT LOX SYSTEM	
181		10	C1TC	CSA1	POSITION AND/OR VERIFY LOWER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
181		11	C1TC	CSA1	POSITION AND/OR VERIFY UPPER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
181		12	C1TC	CCLH	REVERT LH2 SYSTEM	
181		13	C1TC	CSA2	IF S/A 2 IS RETRACTED, VALVES RESET SWITCH TO RESET THEN OFF AND VERIFY	
181		14	C1TC	C1LO	VERIFY THERMAL PUMPING HAS BEEN ESTABLISHED.	
181		15	C1TC	CSA1	VERIFY S/A 1 RECONNECTED AND READY TO REINITIATE LOX REPLENISH	
181		16	C1TC	CTS1	OPERATE PSV #3 SWITCH TO DOWN AND VERIFY	
181		17	C1TC	C1IP	IF S/A 2 IS RETRACTED, ACCOMPLISH FOLLOWING SUBSEQUENCES	
181		17-1	C1TC	C1IP	P-1 & F-1 TRANSMITTERS OFF THEN AUTO ON YOUR MARK	
181		17-2	C1IP		P-1 OFF, MARK (THEN AUTO) F-1 OFF, MARK (THEN AUTO)	
121		18	C1TC	CLTC	S-IC SAFED AND HOLD CONDITION ESTABLISHED.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 S-I						
		10-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED	
		10-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED	
		10-4		C2SP	*** NOTE LOX & LH ACT PRESS ON	
		10-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN	
		10-6		C2GP	*** NOTE GN SUPPLY ON	
		10-7		C2GP	*** NOTE GH PRESSURE ON	
		10-8		C2GP	*** NOTE 3000 PSIG HE PRESS ON	
		10-9		C2GP	*** NOTE 3000 PSIG EMERGENCY HE PRESS ON	
		10-10		C2GP	*** NOTE SECONDARY HE PRESS ON	
		10-11		C2SP	*** NOTE SHROUD PURGE VALVE OPEN	
		10-12		C2GP	*** NOTE HE F & D LINE INERT ON	
		10-13		C2GP	*** NOTE HE ACT PNEU PRESS ON	
		10-14		C2GP	*** NOTE HE TURBO START GH VENT ON	
		10-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON	
		10-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON	
		10-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON	
		10-18		C2GP	*** NOTE AMB HE TCH PURGE ON	
	171	11	C2SP	C2TC	PRESSURIZATION SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
	171	12	C2GP	C2TC	GROUND PNEUMATICS SAFED AND HOLD CONDITION ESTABLISHED.	
	171	13	C2PM	C2TC	PROPELLANT MONITOR SAFED AND HOLD CONDITION ESTABLISHED.	
	171	14	C2AE	C2TC	ENGINE PURGES ARE COMPLETE AND HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 S-II	171	15	C2PV	C2TC	PURGE SYSTEM SAFED AND HOLD CONDITION ESTABLISHED.	
	121	16	C2TC	CLTC	S-II SAFED HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 S-IV					PART 3 T-3:06 MIN TO T+0 ----- (COMPUTER SUPPORTING) -----  S-IVB SAFING -----	
161		1	C4TC	C4NP	SWITCH SELECTOR INHIBIT - OFF	
161		2	C4TC	C4EP	AT C4PS COMMAND OPEN START TANK VENT/EMERGENCY DUMP	
161		3	C4TC	C4ET	VENT ENGINE CONTROL BOTTLE AS REQUIRED TO MAINTAIN PRESSURE BELOW 3200 PSIA BY CYCLING CT HELIUM CONTROL	
161		4	C4TC	C4EP	LOX AND LH2 PREVALVES OPEN THEN AUTO	
161		5	C4TC	C4EP	LOX CHILLDOWN PUMP OFF THEN AUTO	
161		6	C4TC	C4EP	LH2 CHILLDOWN PUMP OFF THEN AUTO	
161		7	C4TC	C4HY	FLIGHT MODE OFF, THEN AUTO	
161		8	C4TC	C4SP	LH2 VENT SWITCH TO OPEN	
161		9	C4TC	C4PP	PLUG SUPERVISION POWER ON THEN AUTO.	
121		10	C4TC	CLTC	S-IVB SAFED AND HOLD CONDITION ESTABLISHED.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 IU					PART 3 T-3:06 MIN TO T+0 ----- (COMPUTER SUPPORTING) -----  IU SAFING -----	
151		1	CUTC	CUSP	VERIFY FLIGHT CONTROL SYSTEM IN SAFE CONFIGURATION FOR LADDER DRIFT	
151		2	CUTC	CLGK	TERMINATE GE01 IF GRR HAS NOT OCCURRED	
151		3	CUTC	CLGK	TERMINATE FE50 IF GRR HAS NOT OCCURRED OR IF FE50 DID NOT TERMINATE AFTER GRR	
151		4	CUTC	CUES	EDS MODE SWITCH TO MONITOR TOK SWITCH A & B TO INHIBIT THEN AUTO DEPRESS LIFTOFF RESET	
151		5	CUTC	CUEV	VERIFY GRR A & GRR REMOVED.	
151		6	CUTC	CLGK	REQUEST AND EXECUTE FT20 (LVDC SELF CHECK), REPORT WHEN COMPLETE, (APPROX 4 MINUTES)	
151		7	CUTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
151		8	CUTC	CLVN	COMPUTER TEST SWITCH ON, VERIFY DISCRETE CYCLING	
121		9	CUTC	CLTC	IU SAFED AND HOLD CONDITION ESTABLISHED	
		10	CUTC		*** NOTE PERFORM FOLLOWING SUBSEQUENCES IF CUTOFF OCCURS PRIOR TO GRR (T-17 SECONDS)	
151		10-1	CUTC	CLGK	REQUEST & EXECUTE FT23 (SECTOR SUM CHECKS), REPORT WHEN COMPLETE, (APPROX 6 MINUTES)	
151		10-2	CUTC	CLTC	FT23 (SECTOR SUM CHECKS) IN PROGRESS	
		11	CUTC		*** NOTE PERFORM FOLLOWING SUBSEQUENCES IF CUTOFF OCCURS AFTER GRR (T-17 SECONDS)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A3 IU	151	11-1	CUTC	CLGK	REQUEST & EXECUTE FT37 (REPEATABLE SIM FLIGHT) AND FT23 (SECTOR SUM CHECKS) (APPROX 18 MINUTES), REPORT WHEN COMPLETE	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV					<p>APPENDIX A LV SAFING PROCEDURE</p> <p>-----</p> <p>PART 4 T-3:06 MIN TO T+0</p> <p>-----</p> <p>(COMPUTER DOWN)</p> <p>CONDITIONS:</p> <p>* AUTOMATIC OR MANUAL CUTOFF ISSUED</p>	
121		1	C1PE	C1FR	<p>*****CAUTION*****</p> <p>* IF CAUSE FOR CUTOFF IS *            * NO LIFTOFF AND NO *            * AUTOMATIC CUTOFF (AT *            * IGNITION PLUS 17 *            * SECONDS), GIVE CUTOFF *            * COMMAND (HOLD FOR 3 SEC *            * AND RELEASE) AND ADVISE *            * CLTC CUTOFF RECEIVED *            * AND ENGINES OUT, *            * *            *****</p>	
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	
121		6	CLTC	CLVN	ML/DCE TO MANUAL MODE	
121		7	CLTC	C1SP	TCS TO SAFE AND SEQ POWER OFF THEN AUTO	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV						
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	C1NP	POWER CONTROL FUNCTION SELECTOR PRELAUNCH	
		12-1		C1NP	*** NOTE LAUNCH BUS 1D161 OFF.	
		12-2		C1NP	*** NOTE PRELAUNCH BUS 1D151 ON.	
121		13	CLTC	C4NP	EMERGENCY POWER TRANSFER SWITCH - EXTERNAL	
		14			*****CAUTION***** * * THE FOLLOWING SEQUENCES * * ARE HAZARDOUS, * * *****	
121		15	CLTC	C1LO	LOX FLIGHT VENTS TO OPEN	
		16		CLTC C1LO	*****CAUTION***** * * IF CUTOFF BETWEEN T-20 * * SEC & T-8,9 SEC (IGN * * COMMAND) ACCOMPLISH THE * * FOLLOWING SUBSTEPS, * * *****	
121		16-1	CLTC	C1LO	VERIFY LOX INTERCONNECT VALVES 1, 3, & 4 OPEN & 2 CLOSED.	
121		16-2	CLTC	C1LO	VERIFY SWITCH LOX BUBBLING DUCTS 1 & 3 ON, CONTINUE 2 DUCT BUBBLING FOR 10 MINUTES TO ESTABLISH THERMAL PUMPING.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV		17		CLTC C1LO C1PC	*****CAUTION***** * IF CUTOFF AFTER T-8.9 * * SEC (IGN COMMAND) & * * CUTOFF RESET CANNOT BE * * GIVEN WITHIN 3 MINUTES * * FROM INTERCONNECT * * CLOSURE (T-20 SEC) * * ACCOMPLISH THE * * FOLLOWING SUBSTEPS, * * * *****	
121		17-1	CLTC	C1LO	VERIFY MANUAL ACTION IS BEING TAKEN TO ESTABLISH S-IC THERMAL PUMPING.	
		17-2		C1LO	*** NOTE LOX BUBBLING SWITCH TO DUCTS 1 & 3.	
		17-3		C1LO	LOX INTERCONNECT VALVES 1, 3 & 4 SWITCHES TO CLOSE.	
		17-4		C1LO	LOCK UP COMMAND DISABLE TO ON.	
121		17-5	C1LO	C1EN	PREVALVE EMERGENCY SWITCH TO OPEN.	
		17-6		C1LO	LOX INTERCONNECT VALVES 1, 3 & 4 TO OPEN. NOTE CLOSED INDICATIONS EXTINGUISHED.	
		17-7		C1LO	CONTINUE 2 DUCT BUBBLING FOR 10 MINUTES TO ESTABLISH THERMAL PUMPING.	
121		17-8	CLTC	C1PC	VERIFY LOX DOME PURGE ON.	
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 LOX DOME PURGE OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV		19-3		C1LO	*** NOTE INTERCONNECT VALVES 1, 3 & 4 CLOSED LIGHTS EXTINGUISHED.	
121		20	CLTC	CUES	MODE SWITCH TO MONITOR, DEPRESS LIPTOFF RESET	
121		21	CLTC	CSA1	POSITION AND/OR VERIFY CARRIER CONNECT AND RETRACT ARMING SWITCH TO OFF,	
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.	
		24			*****WARNING***** * * RESUME PREVIOUS HAZARD * * LEVEL - END OF CAUTION * * *****	
121		25	CLTC	CWCP	FLAME DEFLECTOR COOLING OFF	
121		26	CLTC	CLVN	ISSUE THE FOLLOWING MDDS 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:	
		26-1			*** NOTE ALL PANEL OPERATORS PLACE SWITCHES TO POSITION INDICATED IN PARENTHESES AFTER EACH GROUP IS ISSUED	
121		26-2		CLVN	GRP 1 - MUX 21, 22, ADDRESS 12. DATA BIT 5 DN, 1805 ON (CUSP - S-II BURN TEST MODE - ON)	
		26-3		CUSP	*** NOTE FLIGHT CONTROL IN SAFE CONFIGURATION FOR LADDER DRIFT,	
121		26-4		CLVN	GRP 2 - MUX 21, 22, ADDRESS 16. DATA BIT 17 DN, 18 DN, 1913 ON (CUES-TOK INHIBIT A SW TO AUTO) 1914 ON (CUES-TOK INHIBIT B SW TO AUTO)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV						
121		26-5		CLVN	GRP 3 - MUX 22; ADDRESS 9. DATA BIT 22 DN. 1246 ON (C2FC - ENG 1 ACCUM CONTROL ON THEN AUTO)	
121		26-6		CLVN	GRP 4 - MUX 22; ADDRESS 10. DATA BITS 0 DN, 2 DN, 4 DN. 1248 ON (C2FC - ENG 2 ACCUM CONTROL ON THEN AUTO) 1250 ON (C2FC - ENG 3 ACCUM CONTROL ON THEN AUTO) 1252 ON (C2FC - ENG 4 ACCUM CONTROL ON THEN AUTO)	
121		26-7		CLVN	GRP 5 - MUX 21; ADDRESS 1. DATA BIT 21 DN THEN REISSUE WITH DATA BIT 21 UP. 0549 ON/OFF (C2FC - ALL ACCUM CONTROL TO UNLOCK THEN AUTO)	
121		26-8		CLVN	GRP 6 - MUX 22; ADDRESS 3. DATA BIT 23 UP. 1103 OFF (C2SP - LOX DISC PRESS TO CLOSE THEN AUTO)	
121		26-9		CLVN	GRP 7 - MUX 21; 22. ADDRESS 2. DATA BIT 12 UP. 1572 OFF (C4EP - TCH CHILLDOWN CLOSED THEN AUTO)	
121		26-10		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		26-11		CLVN	GRP 9 - MUX NONE. ADDRESS 14. DATA BIT 14 UP. 0350 OFF (CTS1 - TSM 3-4 PSV 3 CLOSE)	
121		26-12		CLVN	GRP 10 - MUX 22. ADDRESS 5. DATA BIT 10 DN THEN REISSUE WITH DATA BIT 10 UP. 1138 ON/OFF (C2RP - RECIRC RESET TO RESET THEN INHIBIT)	
121		27	CLTC	CUSW	ISSUE THE OCTALS IN SEQUENCE NOTED. REPORT WHEN COMPLETE.  S-IVB 151 (C4EP - LOX & LH PREVALVES)	

(CONTINUED)

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV					OPEN THEN AUTO) S-IVB 042 (C4EP - LOX CHILLDOWN PUMP OFF THEN AUTO) S-IVB 153 (C4EP - LH2 CHILLDOWN PUMP OFF THEN AUTO) S-IVB 074 (C4HY - FLIGHT PUMP MODE OFF THEN AUTO)	
	121	28	CLTC	C2AE	START TANKS ALL VENT TO ALL VENT	
		28-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT. NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY WHEN EMERGENCY VENT IS USED.	
		29		C2AE	USE ALL HE SOLENOID SW TO KEEP HE BOTTLE PRESSURES BELOW 3000 PSIA	
		30		C4EP	ON C4PS COMMAND OPEN START TANK VENT/EMERGENCY DUMP	
		31		C4ET	USE HE CONTROL SOLENOID TO MAINTAIN ENGINE CONTROL BOTTLE PRESSURE BELOW 3200 PSIA MAX	
		32		C4SP	*** NOTE LH2 TANK VENT OPEN	
		33		C4SP	AT C4PS COMMAND, LOX VENT OPEN.	
	121	34	CLTC	CCLO	REVERT LOX SYSTEM	
	121	35	CLTC	CCLH	REVERT LH2 SYSTEM IF REPLENISH COMPLETE	
	121	36	CLTC	CCRP	EVALUATE FUEL LOAD FOR POSSIBLE REPLENISH AND/OR FUEL LEVEL ADJUST IN SUPPORT OF A RECYCLE;	
		36-1			NOTE -----  PROPELLANT PROGRAMS BT01, BE01 & BE02 MAY HAVE TO BE REINITIATED.	
	121	37	CLTC	CHCU	START CKT BYPASS SWITCHES - OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV						
121		38	CLTC	CSA2	IF S/A 2 IS RETRACTED, AUTO EXTEND ARMING SWITCH OFF AND SAFE ALL YOUR CHARGING SYSTEMS	
		39		CLTC	*** NOTE CUSW MUST BE COMPLETE PRIOR TO NEXT STEP	
121		40	CLTC	C4NP	INHIBIT SWITCH SELECTOR	
121		41	CLTC	RLDE	GIVE DEMAND PRINTOUT TO ALL STAGE PRINTERS, REPORT WHEN COMPLETE.	
121		42	CLTC	BGCC	THERMAL OVERRIDE SWITCHES - OFF (SENSE CONTROL PANEL BITS 21 & 22)	
121		43	CLTC	CUSP	VERIFY FLIGHT CONTROL IN SAFE CONFIGURATION FOR LADDER DRIFT.	
121		44	CLTC	CLGK	ON AUTO OFF SWITCH TO OFF	
		44-1		CUDE	*** NOTE 728 (HALT) AND 730 (MEMORY RELEASE) ARE ON	
121		45	CLTC	ECOP	TERMINATE REAL TIME GUIDANCE REDUCTION PROGRAM,	
		46		RLDE	*** NOTE ENTER EST MODE	
121		47	CLTC	C1TC C2TC C4TC CUTC	VERIFY STAGE SAFED AND HOLD CONDITION ESTABLISHED,	
121		48	CLTC	CUTC	REINITIALIZE GROUND COMPUTER PER V-31062 APPENDIX F, REPORT WHEN COMPLETE,	
111		49	CLTC	CVTS	LAUNCH VEHICLE SAFED, HOLD CONDITION ESTABLISHED AND AWAITING COMPUTER SUPPORT,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV					HOLDING FOR COMPUTER SUPPORT -----	
121		1	CUTC	CLTC	COMPUTER SUPPORTING	
121		2	CLTC	CSP C1PP C4PP	POWER SUPPLY COMMIT OFF THEN AUTO	
121		3	CLTC	C4PP	PLUG SUPERVISION POWER ON THEN AUTO.	
181		4	C1TC	C1IP B1TM	IF S/A 2 IS RETRACTED, ACCOMPLISH FOLLOWING SUBSEQUENCES	
181		4-1	C1TC	C1IP	P-1 & F-1 TRANSMITTERS OFF THEN AUTO ON YOUR MARK.	
181		4-2	C1IP		P-1 OFF, MARK F-1 OFF, MARK	
121		5	CLTC	CSA2	IF S/A 2 IS RETRACTED, VALVES RESET SWITCH TO RESET THEN OFF AND VERIFY.	
121		6	CLTC	CSA1	POSITION AND/OR VERIFY LOWER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
121		7	CLTC	CSA1	POSITION AND/OR VERIFY UPPER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
121		8	CLTC	CLGK	POWER ON LVDC-LVDA PER V-33033 SECTION I, IF CUTOFF OCCURED AFTER GRR, REQUEST & EXECUTE FT37 (REPEATABLE SIM FLT) AND FT23 (SECTOR SUM CHECKS). REPORT WHEN COMPLETE, (NOT REQUIRED IF PROCEEDING TO SCRUB) (APPROXIMATELY 40 MIN)	
121		9	CLTC	C2AE	START ENGINE PURGES PER V-30029 (M020) TASK 51	
171		9-1		C2SP	*** NOTE LOX & LH VENT VALVES OPEN	
171		9-2		C2SP	*** NOTE LOX & LH SUPPLY VALVES CLOSED	
171		9-3		C2SP	*** NOTE LOX & LH SUPPLY LINE VENTS CLOSED	
171		9-4		C2SP	*** NOTE LOX & LH ACT PRESSURE ON	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV						
171		9-5		C2SP	*** NOTE LOW LEVEL PURGE VALVE OPEN	
		9-6		C2GP	*** NOTE GN SUPPLY ON	
		9-7		C2GP	*** NOTE GH PRESSURE ON	
171		9-8		C2GP	*** NOTE 3000 PSIG HE PRESS ON	
171		9-9		C2GP	*** NOTE 3000 PSIG EMERG HE PRESS ON	
171		9-10		C2GP	*** NOTE SECONDARY HE PRESS ON	
171		9-11		C2SP	*** NOTE SHROUD PURGE VALVE OPEN	
		9-12		C2GP	*** NOTE HE F & D LINE INERT ON	
		9-13		C2GP	*** NOTE HE ACT PNEU PRESS ON	
		9-14		C2GP	*** NOTE HE TURBO START GH VENT ON	
		9-15		C2GP	*** NOTE LOX & LH HE TANK PRESS ON	
		9-16		C2GP	*** NOTE HE TURBO PUMP PURGE ON	
		9-17		C2GP	*** NOTE ENG TCH CHILLDOWN ON	
		9-18		C2GP	*** NOTE AMB HE TCH PURGE ON	
171		10	C2AE	C2TC	ENGINE PURGES ARE COMPLETE	
121		11	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY FOR RECYCLE OR SCRUB	
111		12	CLTC	CVTS	COMPUTER SUPPORT REESTABLISHED. LAUNCH VEHICLE READY TO START RECYCLE OR DRAIN OPERATIONS.	TCPI
		13			NOTE -----  IF S/A 2 IS RETRACTED, THERE WILL BE NO INDICATION IN THE HGD SYSTEM FOR S-IC FWD/S-II AFT.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
A4 LV	121	14	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX B4 FOR RECYCLE TO T-22 MIN) (APPENDIX C FOR DRAIN PROCEDURE)	

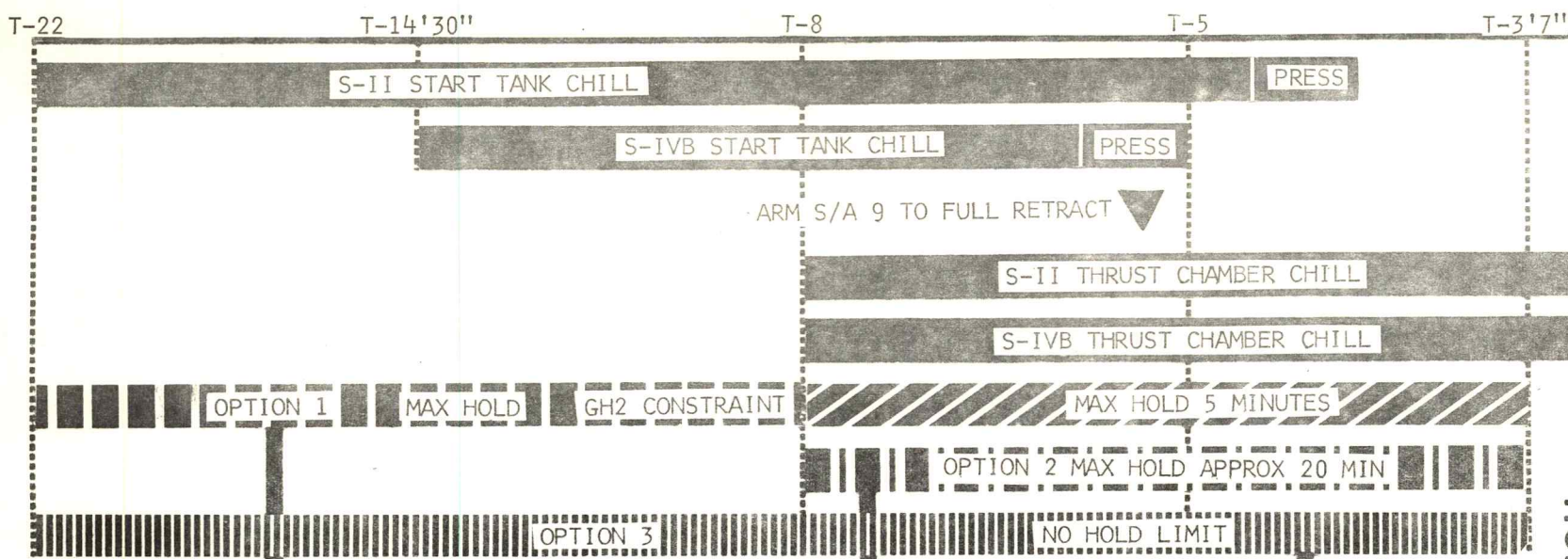
LV CDDT & CD, VOL II  
DATE: MAY 18, 1971  
VISION 029

APOLLO/SATURN

PAGE 5251.60 335  
TEST NO. V-20060, APP B  
VEHICLE AS-510

APPENDIX B

LV HOLD AND RECYCLE PROCEDURES



HOLD OPTIONS

CLOCK HOLDS AT T TIME

1. COMPUTER WILL SELECT OPT 1 PRIOR TO T-8'. AFTER T-8', OPT 1 DECISION MUST BE ANNOUNCED ON CH 121 PRIOR TO CLOCK STOP.
2. AFTER CLOCK IS STOPPED, TWO GMT VALUES ARE DISPLAYED:
  - (A) GMT AFTER WHICH OPT 2 IS NOT AVAILABLE WITHOUT WARMUP.
  - (B) GMT AFTER WHICH PICKUP NOT ALLOWED.
3. AFTER CVTS IS TOLD TO PICKUP, ABOUT 30 SECONDS WILL ELAPSE PRIOR TO CLOCK START IF HOLD AFTER T-4'.

CLOCK RESET TO T-8'

1. GO INTO OPT 2 FROM OPT 1 OR DIRECTLY. COMPUTER WILL SELECT OPT 2 FOR ANY HOLD AFTER ABOUT T-8', UNLESS MANUALLY OVERRIDDEN.
2. ABOUT 10 MINUTES IS REQUIRED TO TURNAROUND TO SAME T TIME FOR HOLDS AFTER T-8'.
3. START TANKS WILL BE PRESSURIZED. HOLD TIME LIMITED BY S-II START TANK WARMUP.
4. AFTER PICKUP AT T-8', OPT 2 HOLD REPEAT NOT POSSIBLE AFTER DISPLAYED T TIME UNLESS WARMUP TIME IS MET DURING REPEAT HOLD. OPT 1 HOLD LIMITED TO DISPLAYED TIME.

CLOCK RESET TO T-22'

1. GO INTO OPT 3 FROM OPT 1 OR OPT 2.
2. ABOUT 15 MINUTES BEFORE READY TO RESUME COUNT AT T-22'.
3. AFTER CLOCK RESET TO T-22', NO HOLD LIMIT.

APPENDIX B  
-----

T-22' TO T-3'7" HOLD OPTIONS  
-----

SELECTION OF OPTION  
-----

A. T-22' TO T-7'58". HOLD AND EXERCISE OPTIONS 1, 2 (IF AVAILABLE) OR 3.

1. OPTION 1  
-----

- (A) CONTINUE START TANK CHILLDOWNS.
- (B) HOLD LIMITED BY GH2 CAPACITY.
- (C) COUNT CAN BE RESUMED MOMENTARILY.
- (D) CAN SUBSEQUENTLY SELECT OPTION 2 (IF AVAILABLE) OR 3 BY KEYBOARD ENTRY TO CONSERVE GH2.
- (E) CAN SAFE FOR SCRUB OR RECYCLE PER APPENDIX A1 (OR A2 IF COMPUTER DOWN).
- (F) VATS AUTOMATICALLY SELECTS OPTION 1 UNTIL T-7'58"

2. OPTION 2 (AFTER FT42 INITIATED: T-12'25")  
-----

- (A) CONTINUE START TANK CHILLDOWN TO PROVIDE CONTINUOUS CHILL OF 17'23" (S-II) & 9'0" (S-IVB) ENDING WITH PRESSURIZATION.
- (B) HOLD LIMITED BY START TANK WARMUP LIMITS.
- (C) CAN SUBSEQUENTLY SELECT OPTION 3 BY KEYBOARD ENTRY, OR SAFE FOR SCRUB OR RECYCLE PER APPENDIX A1 (OR A2 IF COMPUTER IS DOWN).
- (D) SELECT OPTION 2 BY KEYBOARD ENTRY AFTER VATS AUTOMATICALLY SELECTS OPTION 1.
- (E) VATS PROGRAM WILL RESUME WITH CDC PICK UP.

(CONTINUED)

A. T-22' TO T-7'58". HOLD AND EXERCISE OPTIONS 1, 2 (IF AVAILABLE) OR 3.

3. OPTION 3  
-----

- (A) TERMINATE START TANK CHILLDOWNS.
- (B) HOLD LIMITED BY LAUNCH WINDOW.
- (C) COUNTDOWN CLOCK WILL BE RECYCLED TO T-22 MINUTES.
- (D) CAN SAFE FOR SCRUB OR RECYCLE PER APPENDIX A1 (OR A2 IF COMPUTER DOWN).
- (E) SELECT OPTION 3 BY KEYBOARD ENTRY

H. T-7'58" TO T-3'7". HOLD IMMEDIATELY & EXERCISE OPT 1, 2 OR 3.

1. OPTION 1 (ONLY FOR HOLD LESS THAN 5 MINUTES)  
-----

- (A) CONTINUE ALL CHILLDOWNS.
- (B) TOTAL ACCUMULATED OPTION 1 HOLDS LIMITED TO 5 MINUTES.
- (C) COUNT CAN BE RESUMED MOMENTARILY.
- (D) CAN SUBSEQUENTLY SELECT OPTION 2 OR 3 (SUBJECT TO LMR LIMITS) BY KEYBOARD ENTRY.
- (E) IF HOLD EXCEEDS 5 MINUTES. MUST SELECT OPTION 2 OR 3 OR SAFE LV PER APPENDIX A1 (OR A2 IF COMPUTER DOWN) AND RECYCLE TO T-22' PER APPENDIX B4 OR DRAIN PER APPENDIX C.
- (F) SELECT OPTION 1 BY CLES DEPRESSING COMPUTER MANUAL PROCEED (CMP) SWITCH PRIOR TO HOLD OR SELECTED AUTOMATICALLY BY VATS IF OPTION 2 IS NOT AVAILABLE WITHOUT WARMUP.

(CONTINUED)

B. T-7'58" TO T-3'7". HOLD IMMEDIATELY & EXERCISE OPT 1, 2 OR 3.

2. OPTION 2  
-----

- (A) TERMINATE TCH CHILLDOWNS.
- (B) HOLD LIMITED BY START TANK WARMUP LIMITS
- (C) COUNTDOWN CLOCK WILL BE RECYCLED TO T-8 MINUTES.
- (D) CONTINUE START TANK CHILLDOWN TO PROVIDE CONTINUOUS CHILL OF 17'23" (S-II) & 9'0" (S-IVB) ENDING WITH PRESSURIZATION UNLESS OPTION TO BYPASS PRESSURIZATION IS SELECTED.
- (E) CAN SUBSEQUENTLY SELECT OPTION 3 OR SAFE FOR SCRUB OR RECYCLE PER APPENDIX A1 (OR A2 IF COMPUTER DOWN).
- (F) VATS AUTOMATICALLY SELECTS OPTION 2 (IF AVAILABLE), UNLESS CLES DEPRESSES CMP SWITCH PRIOR TO HOLD.

3. OPTION 3  
-----

- (A) TERMINATE TCH AND START TANK CHILLDOWNS (VENT START TANK IF REQUIRED).
- (B) HOLD LIMITED BY LAUNCH WINDOW.
- (C) COUNTDOWN CLOCK WILL BE RECYCLED TO T-22 MINUTES.
- (D) CAN SAFE FOR SCRUB OR RECYCLE PER APP A1 (OR A2 IF COMPUTER DOWN).
- (E) SELECT OPTION 3 BY KEYBOARD ENTRY.

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					HOLD OPTION 1 ----- T-22' TO T-3'7" -----	
OPT 1 - 22' 0"						
TO - 3' 7"						
	121	1	C1PK	CLTC	OPTION 1 SELECTED	
	121 111	2	CLTC	ALL	THE COUNT IS HOLDING AT ----- MINUTES ----- SECONDS IN OPTION 1. CONTINUE CHILLDOWNS IN PROGRESS.	
		2-1		CLM4	*** NOTE COORDINATE WITH BOSC ON CH 261 FOR GH2 BATTERY PRESSURE.  ---IF HOLD BETWEEN T-4'37" & T-3'20"--- -----	TCPI
		3		C2AE	1'17" AFTER T-4'37", START TANK SUPPLY VALVE TO OFF AND START TANK SUPPLY LINE VENT TO VENT,	
		3-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF,	
		3-2		C2AE	*** NOTE START TANK SUPPLY LINE VENT OPEN - ON,	
	171	4	C2AE	C2TC	START TANK PRESSURIZATION COMPLETE,  ---- IF HOLD IS AFTER T-4'37" ---- -----	
		5		C2AE	USE HE BOTTLE EMERGENCY VENT SWITCH TO KEEP HE BOTTLE PRESS BETWEEN 2800 & 3100 PSIA.	
		6		C2AE	USE START TANK EMERG VENT SW TO KEEP START TANK PRESS IN START BOX COORDINATE WITH R2SC #1,	
		6-1			NOTE -----  NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 1 + 22: 0"						
TO + 3: 7"						
					--- IF HOLD IS AFTER T-3:55" --- -----	
		7	***	C2FC	AUX PUMPS 1 THRU 4 ON THEN AUTO.	***
		8	***	C2FC	ALL ACCUMULATORS UNLOCK THEN AUTO.	***
		9	***	C2FC	DELAY 4 SEC, THEN PROCEED	***
		10	***	C2FC	MAIN PUMP BYPASS VALVE OPEN THEN AUTO	***
					--- IF HOLD IS AFTER T-7:58" --- -----	
		11		C1PK	*** NOTE S-II TCH CHILL HOLD CAPABILITY WILL BE EXCEEDED AT _____ GMT,	
		12		C1PK	*** NOTE WITHOUT WARMUP, OPTION 2 IS NOT AVAILABLE AFTER _____ GMT,  ADVISE CLTC WHEN TIME IS WITHIN ONE MINUTE.	
		13		CLTC	*** NOTE IF OPTION 1 TIME EXPIRES, OPTION 2 OR 3 OR CDC PICKUP SHOULD BE EXECUTED IMMEDIATELY.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 1 - 22' 0"						
TO - 3' 55"					IF CDC BEFORE T-3'55" ----- --- JUST BEFORE COUNT RESUMES --- -----	
	121	1	CLTC	ALL	ALL PERSONNEL RETURN TO THE MAIN PROCEDURE, PAGE ----, --- MIN --- SEC.	
	111	2	CLTC	CVTS	LV IS READY TO RESUME COUNT ON YOUR MARK	TCPI
	111 121	3	CVTS	ALL	THE CLOCK WILL BE RESTARTED ON MY MARK, 5, 4, 3, 2, 1 - MARK;	TCPI
OPT 1 - 3' 55"						
TO 3' 7"					IF CDC AFTER T-3'55" ----- --- JUST BEFORE COUNT RESUMES --- -----	
	121	1	CLTC	C2FC	SECURE AUX HYDRAULICS ON CVTS MARK	
	121	2	CLTC	ALL	ALL PERSONNEL RETURN TO THE MAIN PROCEDURE, PAGE ----, --- MIN --- SEC	
	111	3	CLTC	CVTS	LV IS READY TO RESUME THE COUNT 20 SECONDS FROM YOUR MARK.	TCPI
	111 121	4	CVTS	ALL	THE CLOCK WILL BE RESTARTED EXACTLY 20 SECONDS FROM MY MARK, 5 - 4 - 3 - 2 - 1 - MARK	TCPI
		4-1		C2FC	MAIN PUMP BYPASS VALVES - CLOSE THEN AUTO.	
		4-2		C2FC	ALL ACCUM CONTROL - LOCK, THEN AUTO.	
		4-3		C2FC	AUX PUMPS 1-4 OFF, THEN AUTO.	
		4-4		C2FC	*** NOTE READY FOR LAUNCH - ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					HOLD OPTION 2 ----- T-12:25" TO T-3:7" -----	
OPT 2 -12:25"						
TO - 3: 7"						
	121	1	C1PK	CLTC	OPTION 2 SELECTED	
	121	2	CLTC	ALL	THE COUNT IS HOLDING AT ----- MINUTES ----- SECONDS IN OPTION 2.	
		2-1	CLTC C1PK C2AE C4PS		*** NOTE CONTINUE TIMED START TANK CHILLDOWNS THROUGH PRESSURIZATION. (MAY BE BYPASSED FROM KEYBOARD AFTER T-7: 58")  ---IF AFTER T-7:58"--- -----	
	121	3	CLTC	CUSW	LVDA/ESE TO ESE (PERFORM OR VERIFY).	
	121	4	CLTC	C4NP	SWITCH SELECTOR INHIBIT -- OFF (PERFORM OR VERIFY).	
	121	5	CLTC	C1DP C2DP C4DP	SAFE & ARM TO SAFE (PERFORM OR VERIFY).	
		6	***	C2AE	TCH CHILLDOWN TO OFF	***
		6-1		C2AE	*** NOTE TCH CHILLDOWN OFF	
		7	***	C2AE	TCH PURGE TO ON	***
		7-1		C2AE	*** NOTE TCH PURGE ON	
	171	8	C2AE	C2TC	TCH CHILLDOWNS HAVE BEEN TERMINATED. TCH JACKET PURGE IS ON.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 12:25"						
TO 3: 7"						
					---IF AFTER T-7:58"---	CONT'D
		8-1		C2SP	IF HOLD TIME PLUS REMAINING COUNT TIME IS APPROXIMATELY 30 MINUTES OR MORE, CYCLE EACH LOX & LH2 VENT VALVE INDIVIDUALLY FROM OPEN TO CLOSE TO OPEN FOR 4 CYCLES TO VERIFY VENT VALVE SOLENOID OPERATION. AFTER COMPLETION OF CYCLING, ALL VENT VALVES ARE TO BE IN OPEN POSITION.	
		9	***	C4EP	CLOSE TCH CHILLDOWN VALVE	***
		9-1		C4EP	*** NOTE TCH CHILLDOWN SUPPLY CLOSED	
		10	***	C4EP	OPEN TCH PURGE SUPPLY	***
		10-1		C4EP	*** NOTE TCH PURGE SUPPLY ON	
161		11	C4PS	C4TC	TCH CHILLDOWN HAS BEEN TERMINATED.	
		11-1		C1PK	*** NOTE TO RESTORE S-II TCH CHILL TO 8 MIN, WARMUP UNTIL _____ GMT.	
		11-2		C1PK	*** NOTE TO RESTORE S-II TCH CHILL TO 13 MIN, WARMUP UNTIL _____ GMT.	
		11-3		C1PK	*** NOTE PRIOR TO THIS TIME UNUSED DELTA CHILL TIME IS _____ MINS _____ SECS.	
		12	***	C2FC	THERMAL CONTROL ON THEN AUTO.	***
					---IF AFTER T-3:55"---	
		13	***	C2FC	ALL ACCUMULATOR CONTROL TO UNLOCK THEN AUTO.	***
		14	***	C2FC	MAIN PUMP BYPASS VALVE OPEN THEN AUTO	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 - 12:25"						
TO - 3: 7"						
					---- IF AFTER T-7:58" ---- -----	
		15	***	C2FC	AUX PUMPS 1 THRU 4 OFF THEN AUTO	***
		15-1		C2FC	*** NOTE THERMAL CONTROL MAINTAINS FLUID TEMPS BETWEEN 80 DEG F & 120 DEG F, ADVISE C2TC OF CYCLIC ACTION.	
		15-2			NOTE ---- S-II PREPS COMPLETE LIGHT WILL CYCLE OFF DURING HOLD OPTION 2 OPERATIONS.	
					---- IF AFTER T-6:15" ---- -----	
	151	16	***	CUIP	Q-BALL HEATER POWER ON THEN AUTO	***
					---- IF AFTER T-5:17" ---- -----	
		17	***	C2SP	LOX SUPPLY VALVE -- CLOSE, THEN AUTO	***
					---- IF AFTER T-4:10" ---- -----	
	121	18	***	CUES	TOK SWITCH A & B TO INHIBIT THEN AUTO	*** TCP!
					---- IF AFTER T-4:45" ---- -----	
	161	19	***	C4EP	LOX & LH2 PREVALVES -- OPEN THEN AUTO	***
					---- IF AFTER T-4:50" ---- -----	
	161	20	***	C4EP	LOX CHILLDOWN PUMP -- OFF THEN AUTO	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 - 12'25"						
TO - 3' 7"						
					--- IF AFTER T-4'58" --- -----	
	161	21	***	C4EP	LH2 CHILLDOWN PUMP - OFF THEN AUTO	***
					--- IF AFTER T-12'25" --- -----	
		22		ALL	*** NOTE IF CDC BETWEEN T-12'25" & T-7'58", CDC MAY BE RESUMED MOMENTARILY.	
		22-1		CLTC C2AE C4PS C1PK	*** NOTE IF AFTER T-7'58", START TANK PRESSURIZATION CAN BE BYPASSED WITH KEYBOARD ENTRY.	
		23		C2AE C4PS C4HN C4EP	NOTE ----- AT COMPLETION OF REQUIRED START TANK CHILLDOWNS OF 17'23" (S-II) & 9'0" (S-IVB), PERFORM THE FOLLOWING SUBSEQUENCES:	***
		23-1	***	C4HN	CLOSE HEX CIRCUIT #1 VENT.	***
		23-2	***	C4EP	CLOSE START TANK VENT, AFTER 30 SECONDS, CLOSE START TANK SUPPLY VALVE AND OPEN START TANK SUPPLY VENT.	***
	161	23-3	C4PS	C4TC	START TANK PRESSURIZATION COMPLETE.	
		23-4	***	C2AE	START TANK ALL VENT TO OFF. AFTER 1'17", START TANK SUPPLY VALVE TO OFF AND START TANK SUPPLY LINE VENT TO VENT.	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
CPT 2 12:25"						
TO 3: 7"						
					--- IF AFTER 7:12:25" --- -----	CONT'D -----
		23-5	***	C2AE	HE BOTTLE SUPPLY VALVE TO OFF,	***
		23-6		C2AE	*** NOTE HE BOTTLE SUPPLY VALVE OPEN -- OFF	
		23-7	***	C2AE	HE BOTTLE SUPPLY LINE VENT TO VENT,	***
		23-8		C2AE	*** NOTE HE BOTTLE SUPPLY LINE VENT OPEN - ON	
		23-9		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN -- OFF	
		23-10		C2AE	*** NOTE START TANK SUPPLY LINE VENT OPEN - ON	
	171	23-11	C2AE	C2TC	START TANK PRESSURIZATION COMPLETE.	
		23-12		C2AE	USE HE BOTTLE EMERGENCY VENT SWITCHES TO KEEP HE BOTTLE PRESSURES BETWEEN 2800 & 3100 PSIA.	
		23-13		C2AE	USE START TANK EMERGENCY VENT SWITCHES TO KEEP START TANK PRESSURE IN START BOX, COORDINATE WITH R2SC #1.	
		23-14		C2AE	NOTE -----  NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY	
		23-15		C4ET	VENT ENGINE CONTROL BOTTLE ON C4PS COMMAND TO MAINTAIN PRESSURE BELOW 3200 PSIA	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 -12:25"						
TO • 3: 7"						
					--- IF AFTER T-7:58" --- -----	
	121	24	***	CLGK	TERMINATE GE01 (AZIMUTH LAYING) AND VERIFY,	***
	121	25	***	CUPC	VERIFY PLATFORM STOPPED	***
		26		CLTC	IF VATS NOT EXECUTING, IMMEDIATELY PERFORM FOLLOWING TIME CRITICAL STEP,	
	121	26-1	***	CEDK	ISSUE MDO 980 ON/OFF (GUID INTERRUPT 3)	***
	121	27	C1PK	CLTC	VATS IN SEMI AWAITING CDC RESET	
	121	28	CLTC	CVTS	RESET CDC TO T-8 MIN PER SPECIAL PROCEDURE;  DIAL IN T-8 MIN 5 SEC, DEPRESS PRESET, DEPRESS COUNTDOWN, ALLOW COUNTDOWN TO REACH T-8 MIN THEN DEPRESS HOLD, TO RESUME COUNT DEPRESS COUNTDOWN ONLY.	TCP
		29		C1PK	RESTART VATS AFTER CDC RESET	
	121	30	***	CLGK	REQUEST & EXECUTE FT42 (PREP TO LAUNCH). REPORT WHEN LVDC IN PREP TO LAUNCH MODE.	***
		31		C1PK	*** NOTE TO RESTORE S-II TCH CHILL TO 8 MIN, WARMUP UNTIL ----- GMT,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 12:25"						
TO 3: 7"						
					--- IF AFTER T-7:58M --- -----	CONT'D -----
		32		C1PK	*** NOTE TO RESTORE S-II TCH CHILL TO 13 MIN, WARMUP UNTIL ----- GMT.	
		33		C1PK	*** NOTE PRIOR TO THIS TIME, UNUSED DELTA CHILL TIME IS -- MINS -- SECS & WITHOUT WARMUP; OPTION 2 WILL NOT BE AVAILABLE AFTER ----- CDC TIME.	
121		34	C1PK	CLTC	OPTION 2 SECURING COMPLETE.	
121		34-1		C1TC C2TC C4TC CUTC	*** NOTE IF SECURING NOT COMPLETE, REPORT TO CLTC.	
		35		C4PS	NOTE -----  PERFORM THE FOLLOWING SUBSEQUENCES IF START TANK REDLINES ARE EXPECTED TO BE EXCEEDED.	
		35-1		C4ET	CT HELIUM CONTROL SOLENOID ON AND OFF AT C4PS COMMAND.	
161		35-2	C4PS	C4EP	OPEN START TANK SUPPLY.	
161		35-3	C4PS	C4EP	CLOSE START TANK SUPPLY VENT.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 - 12:25"						
TO - 3: 7"						
					--- IF AFTER T-7:58" --- -----	CONT'D -----
	161	35-4	C4PS	C4EP	OPEN START TANK VENT.	
		35-5		C4HN C4EP	STANDBY TO CYCLE HEX CKT 1 VENT AND START TANK SUPPLY VENT AT C4PS COMMAND.	
	161	35-6	C4PS	R4PS	REPORT WHEN START TANK TEMP IS ADEQUATE.	
	161	35-7	C4PS	C4EP	CLOSE START TANK VENT.	
	161	35-8	C4PS	C4EP	DELAY 30 SECONDS THEN CLOSE START TANK SUPPLY AND OPEN START TANK SUPPLY VENT.	

REVISION 031

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 -12'25"					--- IF HOLD AFTER T-12'25" --- -----	
T0 - 3' 7"					--- 6 MINUTES BEFORE T-8' & COUNTING --- ----- (IF S-II RECHILL REQUIRED)	N-253-64
		1		CLTC C2AE R2AE	NOTE -----  IF START TANK RECHILL REQUIRED LIMITS ARE EXPECTED TO BE EXCEEDED, PERFORM THE FOLLOWING S-II START TANK RECHILL 6 MINUTES PRIOR TO T-8 MINUTES AND COUNTING	
	121	2	C2AE	CLTC	START TANK RECHILL REQUIRED. ADVANCE WARNING OF COUNT PICKUP IS REQUIRED.	
		2-1		CLTC C2AE	NOTE -----  SIX MINUTES (5'10" MINIMUM) BEFORE T-8 MINUTES AND COUNTING, PERFORM S-II START TANK RECHILL AS FOLLOWS:	
	121	3	CLTC	C2AE	PROCEED WITH START TANK RECHILL	
		4		C2AE	HE BOTTLE SUPPLY LINE VENT TO OFF	
		5		C2AE	HE BOTTLE SUPPLY VALVE TO PRESSURIZE	
		6		C2AE	START TANK SUPPLY LINE VENT TO OFF	
		7		C2AE	START TANK SUPPLY VALVE TO PRESSURIZE	
		8		C2AE	START TANK ALL VENT TO TALL VENT	
		8-1		C2AE R2AE	*****NOTE CONTINUE START TANK CHILLDOWN FOR 5 MINUTES OR UNTIL WARMEST START TANK TEMPERATURE REACHES -245 DEG F, THEN REPRESSURIZE START TANKS	
		9		C2AE	START TANK ALL VENT TO OFF THEN AUTO (MUST BE ACCOMPLISHED BEFORE T-7'58")	
	121	10	C2AE	CLTC	START TANK RECHILL COMPLETE	
		11		C2AE	HE BOTTLE SUPPLY VALVE TO OFF THEN AUTO	

REVISION 031

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 -12'25"						N-253-64
TO - 3' 7"					---IF HOLD AFTER T-12'25"--- ----- ---6 MINUTES BEFORE COUNT RESUMES--- ----- (IF S-II RECHILL REQUIRED)	CONT'D ----- CONT'D ----- CONT'D
		12		C2AE	HE BOTTLE SUPPLY LINE VENT TO VENT	
		13		C2AE	1'17" AFTER START TANK ALL VENT TO OFF THEN AUTO, PLACE START TANK SUPPLY VALVE TO OFF THEN AUTO AND START TANK SUPPLY LINE VENT TO VENT THEN AUTO	
	171	14	C2AE	C2TC	START TANK PRESSURIZATION COMPLETE	
		15		C2AE	USE HE BOTTLE EMERGENCY VENT SWITCHES TO KEEP HE BOTTLE PRESSURES BETWEEN 2800-3100 PSIA.	
		16		C2AE	USE START TANK EMERGENCY VENT SWITCHES TO KEEP START TANK PRESSURE IN START BOX. COORDINATE WITH R2SC #1.	
		16-1		C2AE	***** NOTE NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 2 -12:25"						
TO - 7:58"					---- IF HOLD BETWEEN -12:25" & -7:58" ---- ----- ---- JUST BEFORE COUNT RESUMES ---- -----	
	121	1	CLTC	ALL	RETURN TO PAGE --- SEQUENCE -----,	
	121 111	2	CLTC	CVTS	LV READY FOR CDC PICKUP ON YOUR MARK	TCPI
	111 121	3	CVTS	ALL	THE COUNT WILL RESUME AT T- 1 " ON MY MARK 5 - 4 - 3 - 2 - 1 - MARK	TCPI
OPT 2 - 7:58"						
TO - 3: 7"					---- IF HOLD IS AFTER T-7:58" ---- ----- ---- JUST BEFORE COUNT RESUMES ---- -----	
	121	1	C1PK	CLTC	VATS AT T-8 MIN AWAITING CDC PICKUP,	
	121	2	CLTC	ALL	RETURN TO T-7:58" PAGE 256 SEQUENCE 1 ---	
	111 121	3	CLTC	CVTS	LV READY TO PICKUP AT T-8 ON YOUR MARK.	TCPI
	111 121	4	CVTS	ALL	THE COUNT WILL RESUME AT T-8 MIN ON MY MARK. 5 - 4 - 3 - 2 - 1 - MARK	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					HOLD OPTION 3 ----- T-22:00 TO T-3:07" -----	
OPT 3 + 22:00"						
TO + 3:07"						
	121	1	CLTC	ALL	THE COUNT IS HOLDING AT ----- MINUTES ----- SECONDS IN OPTION 3.	
	121	2	CLTC	CUSW	LVDA/ESE TO ESE (PERFORM OR VERIFY)	
	121	3	CLTC	C4NP	SWITCH SELECTOR INHIBIT - OFF (PERFORM OR VERIFY)	
	121	4	CLTC	C1DP C2DP C4DP	SAFE & ARM TO SAFE (PERFORM OR VERIFY)	
	121	5	CLTC	C1NP	FUNCTION SELECTOR TO PRELAUNCH (PERFORM OR VERIFY)	
	121	6	CLTC	C1SP	TCS TO SAFE AND SEQUENCER POWER TO OFF THEN AUTO	
	121	7	CLTC	CTS1	VERIFY OR CLOSE PRESSURE SUPPLY VALVE 3	
	121	8	CLTC	C1PK	COMMAND VATS TO OPTION 3	
					GO TO ONE OF THE FOLLOWING PAGES FOR THE APPROPRIATE HOLD TIME.	
					T-21:58" TO T-14:30" --- PAGE 353	
					T-14:30" TO T-12:25" --- PAGE 354	
					T-12:25" TO T-7:58" --- PAGE 356	
					T- 7:58" TO T-3:07" --- PAGE 359	
					IF ENTERING HOLD OPTION 3 AFTER/FROM HOLD OPTION 2	
					T- 7:58" TO T-3:07" --- PAGE 363	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 +21'58"						
TO +14'30"						
					---IF HOLD BETWEEN -21'58" & -14'30"---	
					-----	
171		1	***	C2AE	START TANK ALL VENT TO VENT	***
171		2	***	C2AE	START TANK SUPPLY VALVE TO OFF	***
		2-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF	
171		3	C2AE	C2TC	START TANK CHILLDOWN HAS BEEN TERMINATED	
					--- IF AFTER T-18'50" ---	
					-----	
161		4	***	C4HY	FLIGHT MODE OFF THEN AUTO	***
					--- IF AFTER T-21'58" ---	
					-----	
121		5	***	CSPP C1PP C4PP	COMMIT POWER SUPPLY OFF, THEN AUTO (PERFORM OR VERIFY)	***
171		6	***	C2FC	MAIN PUMP BYPASS VALVE CLOSE, THEN AUTO (PERFORM OR VERIFY)	***
171		7	***	C2FC	INDIVIDUAL ACCUM CONTROL ON, THEN AUTO	***
171		8	***	C2FC	ALL ACCUMULATORS CONTROL UNLOCK, THEN AUTO (PERFORM OR VERIFY)	***
171		9	***	C2FC	HYD THERMAL CONTROL OFF, THEN AUTO (PERFORM OR VERIFY)	***
171		10	***	C2FC	AUX PUMPS 1, 2, 3, & 4 OFF, THEN AUTO (PERFORM OR VERIFY)	***
					COMPLETE FINAL SECURING STEPS ON PAGE 367	
					---	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 -14'30"						
TO -12'25"						
					--- IF HOLD BETWEEN -14'30" & -12'25" --- -----	
					--- IF AFTER T-12'58" --- -----	
161		1	***	C4EP	TCH PURGE SUPPLY TO OFF, THEN AUTO	***
171		2	***	C2AE	TCH PURGE TO OFF	***
		2-1		C2AE	*** NOTE TCH PURGE ON - OFF	
171		3	C2AE	C2TC	TCH PURGE TERMINATED	
					--- IF AFTER T-14'30" --- -----	
161		4	***	C4EP	CLOSE START TANK VENT	***
161		5	***	C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT	***
161		6	***	C4EP	CLOSE START TANK SUPPLY VALVE	***
161		7	***	C4EP	OPEN START TANK SUPPLY LINE VENT FOR 15 SECONDS THEN CLOSE	***
161		8	C4PS	C4TC	START TANK CHILLDOWN TERMINATED	
171		9	***	C2AE	START TANK ALL VENT TO VENT	***
171		10	***	C2AE	START TANK SUPPLY VALVE TO OFF	***
		10-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF	
171		11	C2AE	C2TC	START TANK CHILLDOWN HAS BEEN TERMINATED	
161		12	***	C4HY	FLIGHT MODE OFF THEN AUTO	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 -14:30"						
TO -12:25"						
					---IF HOLD BETWEEN -14:30" & -12:25"---	CONT'D
		121	13	***	CSPP C1PP C4PP COMMIT POWER SUPPLY OFF, THEN AUTO (PERFORM OR VERIFY)	***
		171	14	***	C2FC MAIN PUMP BYPASS VALVE CLOSE, THEN AUTO (PERFORM OR VERIFY)	***
		171	15	***	C2FC INDIVIDUAL ACCUM CONTROL ON, THEN AUTO	***
		171	16	***	C2FC ALL ACCUMULATORS CONTROL UNLOCK, THEN AUTO (PERFORM OR VERIFY)	***
		171	17	***	C2FC HYD THERMAL CONTROL OFF, THEN AUTO (PERFORM OR VERIFY)	***
		171	18	***	C2FC AUX PUMPS 1, 2, 3 & 4 OFF, THEN AUTO (PERFORM OR VERIFY)	***
					COMPLETE FINAL SECURING STEPS ON PAGE 367.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 -12'25"						
TO - 7'58"						
					---IF HOLD BETWEEN -12'25" & -7'58"---	
					-----	
	161	1	***	C4EP	TCH PURGE SUPPLY TO OFF, THEN AUTO	***
	171	2	***	C2AE	TCH PURGE TO OFF	***
		2-1		C2AE	*** NOTE TCH PURGE ON - OFF	
	171	3	C2AE	C2TC	TCH JACKET PURGE HAS BEEN TERMINATED	
	161	4	***	C4EP	CLOSE START TANK VENT	***
	161	5	***	C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT	***
	161	6	***	C4EP	CLOSE START TANK SUPPLY VALVE	***
	161	7	***	C4EP	OPEN START TANK SUPPLY LINE VENT FOR 15 SECONDS THEN CLOSE	***
	161	8	C4PS	C4TC	START TANK CHILLDOWN AND TCH PURGE TERMINATED	
	171	9	***	C2AE	START TANK ALL VENT TO VENT	***
	171	10	***	C2AE	START TANK SUPPLY VALVE TO OFF	***
		10-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF	
	171	11	C2AE	C2TC	START TANK CHILLDOWN HAS BEEN TERMINATED.	
	161	12	***	C4HY	FLIGHT MODE OFF THEN AUTO	***
	121	13	***	CSPP C1PP C4PP	COMMIT POWER SUPPLY OFF, THEN AUTO (PERFORM OR VERIFY)	***
	171	14	***	C2FC	MAIN PUMP BYPASS VALVE CLOSE, THEN AUTO (PERFORM OR VERIFY)	***
	171	15	***	C2FC	INDIVIDUAL ACCUM CONTROL ON, THEN AUTO	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 -12:25"						
TO -7:58"						
					---IF HOLD BETWEEN -12:25" & -7:58"---	CONT'D
					-----	-----
	171	16	***	C2FC	ALL ACCUMULATORS CONTROL UNLOCKED, THEN AUTO (PERFORM OR VERIFY)	***
	171	17	***	C2FC	HYD THERMAL CONTROL OFF, THEN AUTO (PERFORM OR VERIFY)	***
	171	18	***	C2FC	AUX PUMPS 1, 2, 3 & 4 OFF, THEN AUTO (PERFORM OR VERIFY)	***
	121	19	***	CLGK	TERMINATE GEO1 AND VERIFY	***
	121	20	***	CLGK	TERMINATE FE50 AND VERIFY	***
	121	21	***	CUPC	VERIFY PLATFORM HAS STOPPED	***
		22		CLTC	IF VATS NOT EXECUTING, IMMEDIATELY PERFORM FOLLOWING TIME CRITICAL STEP	
	121	22-1	***	CEDK	ISSUE MDO 980 ON/OFF (GUID INTERRUPT 3)	***
	121	23	***	C4AL	APS ENGINE VALVE POWER OFF, THEN AUTO (PERFORM OR VERIFY)	***
	121	24	***	C1PC	VERIFY LOW LOX DOME PURGE ON	***
	121	25	***	CUSP	CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO ON	***
	121	26	***	CLGK	REQUEST & EXECUTE FT20 (LVDC SELF CHECK). REPORT WHEN COMPLETE,	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 12125"						
TO 7158"					---IF HOLD BETWEEN 12125" & 7158"---	CONT'D
	121	27	***	CUSP	CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO OFF	***
	121	28	***	CUSP	VERIFY FCC IN S-IC BURN MODE	***
	121	29	***	C1PC	VERIFY LOW LOX DOME PURGE ON	***
	121	30	***	CLGK	REQUEST & EXECUTE FT10 (LADDER OUTPUT TEST), REPORT WHEN COMPLETE,	***
	121	31	***	CUPC	REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ), REPORT WHEN COMPLETE,	***
	121	32	***	CLGK	REQUEST & EXECUTE FT49/FE50, REPORT WHEN COMPLETE,	***
					COMPLETE FINAL SECURING STEPS ON PAGE 367	--

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 + 7:58"						
TO + 3: 7"						
					--- IF HOLD BETWEEN -7:58" & -3:17" --- -----	
	171	1	***	C2AE	TCH CHILLDOWN TO OFF	***
		1-1		C2AE	*** NOTE TCH CHILLDOWN ON OFF	
	161	2	***	C4EP	CLOSE THRUST CHAMBER CHILLDOWN VALVE	***
		2-1		C4EP	*** NOTE TCH CHILLDOWN SUPPLY CLOSED	
	161	3	***	C4EP	CLOSE START TANK VENT	***
	161	4	***	C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT	***
	161	5	***	C4EP	CLOSE START TANK SUPPLY VALVE	***
	161	6	***	C4EP	OPEN START TANK SUPPLY LINE VENT FOR 15 SECONDS THEN CLOSE	***
	161	7	C4PS	C4TC	START TANK/TCH CHILLDOWN TERMINATED	
	171	8	***	C2AE	START TANK ALL VENT TO VENT	***
	171	9	***	C2AE	START TANK SUPPLY VALVE TO OFF	***
		9-1		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT, NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY WHEN EMERGENCY VENT IS USED.	
	171	10	C2AE	C2TC	START TANK AND TCH CHILLDOWN TERMINATED.	
					--- IF AFTER T-6:15" --- -----	
	151	11	***	CUIP	Q-BALL HEATER POWER ON THEN AUTO	***
					--- IF BETWEEN T-5:17" & T-3:20" --- -----	
	171	12	***	C2SP	LOX SUPPLY VALVE - CLOSE, THEN AUTO	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 7:58"					---	
TO 3: 7"					IF HOLD BETWEEN -7:58" & -3:7" --- ----- IF AFTER T-4:10" --- -----	CONT'D -----
	121	13	***	CUES	THRUST OK SWITCH A & B TO INHIBIT THEN AUTO	*** TCPI
					---	
					IF AFTER T-4:45" --- -----	
	161	14	***	C4EP	LOX & LH2 PREVALVES - OPEN, THEN AUTO	***
					---	
					IF AFTER T-4:50" --- -----	
	161	15	***	C4EP	LOX CHILLDOWN PUMP - OFF, THEN AUTO	***
					---	
					IF AFTER T-4:58" --- -----	
	161	16	***	C4EP	LH CHILLDOWN PUMP - OFF, THEN AUTO	***
					---	
					IF AFTER T-7:58" --- -----	
	161	17	***	C4HY	FLIGHT MODE OFF THEN AUTO	***
	121	18	***	CSPP C1PP C4PP	COMMIT POWER SUPPLY OFF, THEN AUTO (PERFORM OR VERIFY)	***
	171	19	***	C2FC	MAIN PUMP BYPASS VALVE CLOSE, THEN AUTO (PERFORM OR VERIFY)	***
	171	20	***	C2FC	INDIVIDUAL ACCUM CONTROL ON, THEN AUTO	***
	171	21	***	C2FC	ALL ACCUMULATORS CONTROL UNLOCKED, THEN AUTO (PERFORM OR VERIFY)	***
	171	22	***	C2FC	HYD THERMAL CONTROL OFF, THEN AUTO (PERFORM OR VERIFY)	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 7:58"						
TO 3: 7"						
					--- IF HOLD BETWEEN -7:58" & -3:7" ---	CONT'D
					-----	
					--- IF AFTER T-7:58" ---	CONT'D
					-----	
171		23	***	G2FC	AUX PUMPS OFF, THEN AUTO (PERFORM OR VERIFY)	***
121		24	***	CLGK	TERMINATE GE01 AND VERIFY	***
121		25	***	CLGK	TERMINATE FE50 AND VERIFY	***
121		26	***	CUPC	VERIFY PLATFORM STOPPED	***
		27		CLTC	IF VATS NOT EXECUTING, IMMEDIATELY PERFORM FOLLOWING TIME CRITICAL STEP	
121		27-1	***	CEDK	ISSUE MDO 980 ON/OFF (GUID INTERRUPT 3)	***
121		28	***	C4AL	APS ENGINE VALVE POWER OFF THEN AUTO (PERFORM OR VERIFY)	***
121		29	***	C1PC	VERIFY LOW LOX DOME PURGE ON	***
121		30	***	CUSP	CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO ON	***
121		31	***	CLGK	REQUEST & EXECUTE FT20 (LVDC SELF CHECK), REPORT WHEN COMPLETE.	***
121		32	***	CUSP	CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO OFF	***
121		33	***	CUSP	VERIFY FCC IN S-IC BURN MODE	***
121		34	***	CLPC	VERIFY LOW LOX DOME PURGE ON	***
121		35	***	CLGK	REQUEST & EXECUTE FT10 (LADDER OUTPUT TEST), REPORT WHEN COMPLETE.	***
121		36	***	CUPC	REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ), REPORT WHEN COMPLETE.	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 - 7:58"						
TO - 3: 7"						
					--- IF HOLD BETWEEN -7:58" & -3:7" --- ----- --- IF AFTER T-7:58" --- -----	CONT'D CONT'D
	121	37	***	CLGK	REQUEST & EXECUTE FT49/FE50 (ACCEL MONITOR PROGRAM), REPORT WHEN COMPLETE.	***
	121	38	CLTC	CHCU	PLACE START CIRCUIT BYPASS TO NORMAL	
	181	39	C1TC	CSA1	POSITION CARRIER CONNECT AND RETRACT ARMING SWITCH TO OFF,	
	181	40	C1TC	CSA1	POSITION LOWER LOX LINE PURGE VALVE SWITCH TO CLOSED,	
	181	41	C1TC	CSA1	POSITION UPPER LOX LINE PURGE VALVE SWITCH TO CLOSED,	
					COMPLETE FINAL SECURING STEPS ON PAGE 367 -----	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 7:58"						
TO 3:7"						
					IF ENTERING OPTION 3 AFTER/FROM OPTION 2 ----- ---IF HOLD BETWEEN T-7:58" & T-3:7"--- -----	
161		1	***	C4EP	TCH PURGE SUPPLY TO OFF, THEN AUTO	***
171		2	***	C2AE	TCH PURGE TO OFF	***
		2-1		C2AE	*** NOTE TCH PURGE ON - OFF	
161		3	***	C4EP	CLOSE START TANK VENT	***
161		4	***	C4HN	CLOSE HEAT EXCHANGER CIRCUIT #1 VENT	***
161		5	***	C4EP	CLOSE START TANK SUPPLY VALVE	***
161		6	***	C4EP	OPEN START TANK SUPPLY LINE VENT FOR 15 SECONDS THEN CLOSE.	***
171		7	***	C2AE	START TANK ALL VENT TO VENT	***
171		8	***	C2AE	START TANK SUPPLY VALVE TO OFF	***
		8-1		C2AE	*** NOTE START TANK SUPPLY VALVE OPEN - OFF	
		8-2		C2AE	*** NOTE IF START TANKS FAIL TO VENT, USE EMERGENCY VENT. NO MORE THAN TWO START TANKS MAY BE VENTED SIMULTANEOUSLY WHEN EMERGENCY VENT IS USED.	
171		9	C2AE	C2TC	START TANK CHILLDOWN TERMINATED.	
161		10	***	C4HY	FLIGHT MODE OFF THEN AUTO	***



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 - 7:58"						
TO - 3: 7"						
					IF ENTERING OPTION 3 AFTER/FROM OPTION 2 ----- ---IF HOLD BETWEEN T-7:58" & T-3:7"--- -----	CONT'D CONT'D
	121	1	***	CSP C1PP C4PP	COMMIT POWER SUPPLY OFF, THEN AUTO (PERFORM OR VERIFY)	***
	171	2	***	C2FC	MAIN PUMP BYPASS VALVE CLOSE, THEN AUTO (PERFORM OR VERIFY)	***
	171	3	***	C2FC	INDIVIDUAL ACCUM CONTROL ON, THEN AUTO	***
	171	4	***	C2FC	ALL ACCUMULATORS CONTROL UNLOCK, THEN AUTO (PERFORM OR VERIFY)	***
	171	5	***	C2FC	HYD THERMAL CONTROL OFF, THEN AUTO (PERFORM OR VERIFY)	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 + 7:58"						
TO + 3: 7"						
					IF ENTERING OPTION 3 AFTER/FROM OPTION 2	CONT'D
					----- IF HOLD BETWEEN T-7:58" & T-3:7" -----	CONT'D
		171	6	***	C2FC AUX PUMPS 1, 2, 3, & 4 OFF, THEN AUTO (PERFORM OR VERIFY)	***
		121	7	***	CLGK TERMINATE GEO1 AND VERIFY	***
		121	8	***	CLGK TERMINATE FE50 AND VERIFY	***
		121	9	***	CUPC VERIFY PLATFORM HAS STOPPED	***
			10		CLTC IF VATS NOT EXECUTING, IMMEDIATELY PERFORM FOLLOWING TIME CRITICAL STEP	
		121	10-1	***	CEDK ISSUE MDO 980 ON/OFF (GUID INTERRUPT 3)	***
		121	11	***	C4AL APS ENGINE VALVE POWER OFF THEN AUTO (PERFORM OR VERIFY)	***
		121	12	***	C1PC VERIFY LOW LOX DOME PURGE ON	***
		121	13	***	CUSP CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO ON	***
		121	14	***	CLGK REQUEST & EXECUTE FT20 (LVDC SELF CHECK), REPORT WHEN COMPLETE,	***
		121	15	***	CUSP CONTROL COMPUTER S-IVB COAST TEST MODE SWITCH TO OFF	***
		121	16	***	CUSP VERIFY FCC IN S-IC BURN MODE	***
		121	17	***	C1PC VERIFY LOW LOX DOME PURGE ON.	***
		121	18	***	CLGK REQUEST & EXECUTE FT10 (LADDER OUTPUT TEST), REPORT WHEN COMPLETE.	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 - 7:58"						
TO - 3:17"						
					IF ENTERING OPTION 3 AFTER/FROM OPTION 2	CONT'D
					----- IF HOLD BETWEEN T-7:58" & T-3:17" -----	CONT'D
					-----	
		121	19	***	CUPC REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ), REPORT WHEN COMPLETE.	***
		121	20	***	CLGK REQUEST & EXECUTE FT49/FE50, REPORT WHEN COMPLETE.	***
		121	21	CLTC	CHOU PLACE START CIRCUIT BYPASS TO NORMAL.	
		181	22	C1TC	CSA1 POSITION CARRIER CONNECT AND RETRACT ARMING SWITCH TO OFF.	
		181	23	C1TC	CSA1 POSITION LOWER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
		181	24	C1TC	CSA1 POSITION UPPER LOX LINE PURGE VALVE SWITCH TO CLOSED.	
					COMPLETE FINAL SECURING STEPS ON PAGE 367	
					-----	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 -22:00"						
TO -3:07"						
					FINAL SECURING -----	
121		1	C1PK	CLTC	OPT 3 SECURING IS COMPLETE	
121		2	CLTC	CUES	EDS MODE SWITCH TO MONITOR	
121		3	CLTC	C1TC C2TC C4TC CUTC	VERIFY OPT 3 SECURING IS COMPLETE.	
111		4	CLTC	CVTS	OPTION 3 SECURING IS COMPLETE. RESET THE COUNTCLOCK TO -22:00".	TCPI
121		5	CLTC	CUPC	(IF HOLD WAS AFTER T-12:25") REQUEST & EXECUTE GE01 (AZIMUTH LAYING & PLOT MONITOR). THE FIRING AZIMUTH MAY BE PERIODICALLY UPDATED.	
		5-1		C2AE	USE HE BOTTLE EMERGENCY VENT SWITCHES TO KEEP HE BOTTLE PRESSURES BETWEEN 2800 & 3100 PSIA.	
		5-2		C2SP	IF HOLD TIME PLUS REMAINING COUNT TIME IS APPROXIMATELY 30 MINUTES OR MORE, CYCLE EACH LOX & LH2 VENT VALVE INDIVIDUALLY FROM OPEN TO CLOSE TO OPEN FOR 4 CYCLES TO VERIFY VENT VALVE SOLENOID OPERATION. AFTER COMPLETION OF CYCLING, ALL VENT VALVES ARE TO BE IN OPEN POSITION.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
OPT 3 - 22: 0"						
TO - 3: 7"						
					FINAL SECURING ----- --- JUST BEFORE COUNT RESUMES --- -----	CONT'D -----
	121	1	CLTC	C1PK	RESTART VATS	
	171	2	***	C2AE	HE BOTTLE SUPPLY LINE VENT TO OFF	***
		2-1		C2AE	*** NOTE HE BOTTLE SUPPLY LINE VENT OPEN - OFF	
	171	3	***	C2AE	START TANK SUPPLY LINE VENT TO OFF	***
		3-1		C2AE	*** NOTE START TANK SUPPLY LINE VENT OPEN - OFF	
	171	4	***	C2AE	HE BOTTLE SUPPLY VALVE TO PRESSURIZE	***
		4-1		C2AE	*** NOTE HE BOTTLE SUPPLY VALVE OPEN - ON	
	121	5	C1PK	CLTC	VATS IS AT T-22 AWAITING CDC TO PICKUP	
	121	6	CLTC	ALL	ALL PERSONNEL RETURN TO T-22, PAGE 249 ----	
	111 121	7	CLTC	CVTS	LV READY TO PICKUP AT T-22 MIN ON YOUR MARK	TCPI
	111 121	8	CVTS	ALL	THE COUNT WILL RESUME AT T-22 MIN ON MY MARK.  5 - 4 - 3 - 2 - 1 - MARK	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4					APPENDIX B ----- PART 4 - 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	C1TC C2TC C4TC CUTC	PREPARE FOR VARY, REPORT WHEN COMPLETE.	
181		3	C1TC	CSAC	PREP FOR WATL AND WASL, REPORT WHEN COMPLETE.	
181		4	C1TC	C1SP	SEQUENCER POWER AUTO.	
181		5	C1TC	C1NP	STAGE LOGIC AUTO.	
181		6	C1TC	C1CS	LOX AND FUEL LEVEL SENSORS TO AUTO.	
181		7	C1TC	C1IP	TM CALIBRATOR - AUTO	
181		8	C1TC	C1IP	TM CAL MODE AUTO.	
181		9	C1TC	C1IP	PREFLIGHT LEVELS AUTO.	
181		10	C1TC	C1IP	28 VDC RACS POWER AND 400 HZ POWER TO AUTO.	
181		11	C1TC	CSPP C1PP	POWER SUPPLY COMMIT TO AUTO.	
121		12	CLTC	C2TC	FOLLOWING STATIONS SWITCH TO CHANNEL 171 FOR S-II RE-CYCLE,  C2EC C2GP C2SP C2FC C2PV V2MS C2AE C2RP C2PU R2SC C2PM	
171		13	C2TC	C2RP	LOX HE INJECTION TO START, THEN AUTO.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP 84						
171		14	C2TC	C2AE	START TANK ALL VENT TO AUTO.	
171		15	C2TC	C2AE	HE BOTTLE SUPPLY LINE VENT TO AUTO.	
171		16	C2TC	C2AE	TCH CHILLDOWN TO AUTO.	
171		17	C2TC	C2PU	VERIFY ALL WET SIMS IN AUTO.	
171		18	C2TC	C2SP	LOX DISCONNECT PRESS SW TO AUTO.	
171		19	C2TC	C2SP	LOX SUPPLY VALVE SW TO AUTO.	
171		20	C2TC	C2NP	RACS POWER TO AUTO.	
171		21	C2TC	C2FC	ALL CONTROL SWITCHES TO AUTO EXCEPT AUX PUMP SWITCH TO ENABLE.	
171		22	C2TC	C2FC	VERIFY INDIVIDUAL ACCUMULATOR LOCKUP LIGHTS ON, AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF.	
171		23	C2FC	V2MS	HYDRAULIC RECORDERS ON AT 2 MM/SEC.	
121		24	C2TC	CLTC	S-II READY FOR VARY.	
161		25	C4TC	C4NP	EMERGENCY POWER TRANSFER SWITCH OFF	(VATS)
161		26	C4TC	C4PP	PLUG SUPERVISION POWER - AUTO.	(VATS)
161		27	C4TC	C4EP	START TANK VENT CLOSE THEN AUTO.	(VATS)
161		28	C4TC	C4EP	CLOSE START TANK EMERGENCY DUMP.	
161		29	C4TC	C4SP	LOX & LH2 VENT SWITCHES TO AUTO.	(VATS)
161		30	C4TC	C4PP	POWER SUPPLY COMMIT TO AUTO.	(VATS)
161		31	C4TC	C4IP	TM CALIBRATE - AUTO	(VATS)
161		32	C4TC	C4AL	APS ENGINE POWER TO AUTO.	(VATS)
121		33	CLTC	CUSP	(IF LV SAFED PER APPENDIX A1 OR A3) S-IVB COAST TEST MODE SWITCH TO AUTO	
121		34	CLTC	CUSP	(IF LV SAFED PER APPENDIX A2 OR A4) S-II BURN TEST MODE SWITCH TO AUTO	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4						
121		35	CLTC	ECOP	TERMINATE GUIDANCE REDUCTION.	
121		36	CLTC	CUIP	TM CAL MODE TO AUTO.	(VATC)
121		37	CLTC	C1NP C2NP C4NP CUNP	SWITCH SELECTOR INHIBIT - OFF	
121		38	CLTC	CWCP	START IWS RECYCLE OPERATIONS PER V-36113	
121		39	CLTC	CLGK	GO TO CH 123 TO SUPPORT ATTITUDE COMMAND TEST,	
121		40	CLTC	CCLH	RE-ESTABLISH OR VERIFY LH2 REPLENISH PER V-35014	
121		41	CLTC	CSA1	VERIFY S/A 1 CONNECTED AND READY TO REINITIATE LOX REPLENISH	
121		42	CLTC	CCLO	RE-ESTABLISH/VERIFY LOX REPLENISH	
121		43	CLTC	CRSS	HOLD FIRE TO PROCEED & BYPASS - OFF	
121		44	CLTC	C1PK	REQUEST & EXECUTE VARY (CDDT WET OR CD OPTION) (AUTO RECYCLE).	
121		45	C1PK	CLTC	DISPLAYING S/A 2 AND GT16 OPTIONS.  IF S/A 2 IS RETRACTED & GT16 IS REQUIRED ENTER SPR1  IF S/A 2 IS NOT RETRACTED & GT16 IS REQUIRED, ENTER SPR2  IF S/A 2 IS NOT RETRACTED & GT16 IS NOT REQUIRED, ENTER SPR3  IF S/A 2 IS RETRACTED & GT16 IS NOT REQUIRED, ENTER SPR4  FOR UNRESTRICTED SEMI, ENTER SPR5.	
121		46	***	CTS1	VERIFY OR OPERATE PSV #3 SWITCH TO DOWN.	***
121		47	***	C1FR	VERIFY RANGE SAFE ON;	***



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4						
	121	48	***	C1DP C2DP C4DP	VERIFY S&A SAFE & PD BLOCKED.	***
	121	49	***	C1DP C2DP C4DP	VERIFY EBW'S EXTERNAL & DISCHARGED.	***
		50		CLTC	NOTE -----  SUBSEQUENCES TO BE PERFORMED ONLY IF S/A 2 HAS RETRACTED.	
	121	50-1	***	BGCC	ISSUE MDO 0016 ON (S-IC FWD LEVEL & PSI OK) AND VERIFY	***
	121	50-2	***	C1IP	ALL TRANSMITTERS ON IN SEQUENCE LISTED AND MARKED ON CH 121.	***
	121	50-3	***	C1IP	F1, ON P1, ON	***
	121	51	***	CSAC	VERIFY FOLLOWING INDICATIONS ON:  T-187 LSE PREPS COMPLETE LSE READY FOR S/A 1 RETRACT T-16.2 LSE READY FOR S/A 2 RETRACT T-8.9 READY LESS S/A 1, 2 SAFE ANGLE	***
		52	***	C1NP	VERIFY STAGE LOGIC ZERO	***
	121	53	C1PK	CLTC	VARY DISPLAYING WATL & WASL OPTIONS AS FOLLOWS:  1. RUN WATL & WASL 2. RUN WASL ONLY 3. RUN WATL ONLY 4. OMIT OR RUN MANUALLY	
		53-1		CLTC	*** NOTE IF MANUAL OPTION IS SELECTED, COMMAND CSAC (CH 121) TO START PRESSURE AND LEVEL CHECKS PER V-36039 & V-36087 AND TO REPORT WHEN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP 84						
	121	54	***	C1PC	LOW LOX DOME PURGE ON.	***
	121	55	***	CUNP	ISSUE IU STAGE LOGIC RESET (EDS GRP 1 & 2)	***
	121	56	***	CUSP	SELECT S-IC BURN MODE SWITCH ON THEN AUTO.	***
	121	57	CLTC	CUFS	START ATTITUDE COMMAND TEST ON CH 123. REPORT WHEN COMPLETE.	
	123	58	***	CLGK	REQUEST FT10 LADDER OUTPUT TEST, AUTO OPTION.	***
		58-1			NOTE -----  THE FT10 AUTO OPTION WILL DRIVE THE GUIDANCE LADDER TO +/- 2 DEG PITCH, +/- 2 DEG YAW AND +/- 5 DEG ROLL.	
	123	59	CUFS	CUCR	VERIFY VALVE CURRENTS AND BETA RESPONSE ON ALL ENGINES	
	123	60	***	CLGK	TERMINATE FT10	***
	123	61	CUFS	ALL	ATTITUDE COMMAND TEST COMPLETE. RETURN TO CH 121.	
	121	62	CUFS	CLTC	ATTITUDE COMMAND TEST COMPLETE.	
		63	***	C2AE	HELIUM BOTTLE LINE VENT OFF.	***
		63-1		C2AE	*** NOTE HELIUM BOTTLE SUPPLY LINE VENT OPEN - OFF	
		64	***	C2AE	ALL HELIUM CONTROL SOLENOIDS TO OFF.	***
		64-1		C2AE	*** NOTE ALL HE SOL - OFF	
		65	***	C2AE	HELIUM BOTTLE VENT 1-5 TO OFF.	***
		66	***	C2EC	HELIUM CONTROL SOLENOID 201 THRU 205 OFF	***
		66-1		C2EC	*** NOTE HE CONTROL SOLENOID 201 THRU 205 - OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4		67	***	C2AE	HE BOTTLE SUPPLY VALVE TO PRESSURIZE	***
		67-1		C2AE	*** NOTE HE BOTTLE SUPPLY VALVE OPEN - ON	
171		68	C2TC	C2FC	START EAS RECYCLE OPERATIONS	
171		69	***	C2FC	MAIN PUMP BYPASS VALVE - CLOSE, THEN AUTO	***
171		70	***	C2FC	ENGINES 1, 2, 3 & 4 ACCUMULATOR CONTROL OFF, THEN AUTO.	***
171		71	***	C2FC	VERIFY ACCUMULATORS UNLOCKED.	***
171		72	***	C2FC	AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 TO ON, ALLOW SYSTEM PRESSURES TO STABILIZE	***
171		73	***	C2FC	OPEN MAIN PUMP BYPASS VALVE AND ALLOW MAIN PUMP FLUID TEMPS TO STABILIZE WITH RESERVOIR FLUID TEMPS.	***
171		74	***	C2AE	START TANK SUPPLY LINE VENT TO OFF.	***
		74-1		C2AE	*** NOTE START TANK SUPPLY LINE VENT OPEN - OFF	
171		75	***	C2FC	MAIN PUMP BYPASS VALVE - CLOSE, THEN AUTO	***
171		76	***	C2FC	ENGINES 1, 2, 3 & 4 ACCUMULATOR CONTROL - ON, THEN AUTO.	***
171		77	***	C2FC	AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 TO OFF THEN AUTO. VERIFY NORMAL SHUTDOWN.	***
171		78	C2FC	V2MS	HYDRAULIC RECORDERS OFF	
		78-1		C2FC	*** NOTE INDIVIDUAL ACCUMULATOR LOCK LIGHTS ON AND ALL ACCUMULATOR LOCK COMMAND LIGHT OFF	
		78-2		C2FC	*** NOTE OPEN MAIN PUMP BYPASS VALVE DURING AUXILIARY PUMP OPERATIONS	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4						
	171	79	C2AE	C2TC	ENG HE BOTTLE PRESSURIZATION TO 3000 PSI COMPLETE.	
	171	80	C2TC	R2SC C2AE C2EC C2FC C2GP C2PV C2PM C2PU C2RP C2SP	VERIFY READY TO PICK UP THE COUNT AT T-22 MINUTES	
	121	81	C2TC	CLTC	S-II RECYCLE COMPLETE.	
	121	82	CLTC	BTMC ETMS	VERIFY TM TAPE RECORDING ON	
		83		C2NP R2SC	CYCLE MAIN/INSTR BATT BLEED SWITCHES TO MAINTAIN BATT VOLTAGES IN TOLERANCE (CD ONLY)	
	121	84	***	CUIP	G-BALL POWER ON THEN AUTO, G-BALL HEATER POWER ON THEN AUTO.	***
	121	85	***	CUCP	PUMP PRESSURE SWITCH ACTIVATE - OFF THEN AUTO.	***
	121	86	***	CLGK	REQUEST & EXECUTE FT49/FE50 (ACCEL MON PROG)	***
	121	87	***	CLIK	REQUEST & EXECUTE VATC (TM PREFLIGHT CAL), REPORT WHEN COMPLETE.	***
	161	88	***	C4EP	CLOSE START TANK SUPPLY VENT THEN AUTO	***
	161	89	***	C4HN	VERIFY 6000 PSI GH2 OPEN.	***
	121	90	CLTC	RLDE	GIVE A DEMAND PRINTOUT ON ALL STAGE PRINTERS, REPORT WHEN COMPLETE.	
	121	91	***	C4NK	REQUEST & EXECUTE XADS, REPORT WHEN COMPLETE.	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4						
	121	92	C1PK	CLTC	VARY DISPLAYING VARS RUN OPTION.	
		92-1		CLTC	*** NOTE IF DRSCR RETEST IS REQUIRED, TURN TO APPENDIX B, PART 5, PAGE 378.	
	121	93	C1PK	CLTC	VARY READY FOR CDC RESET TO T-22 MINUTES	(VATS)
	111	94	CLTC	CVTS	SET COUNT CLOCK AT T-22 MINUTES.	TCPI (VATS)
	121	95	***	CUPC	REQUEST & EXECUTE FT06 (GIMBAL ANGLE READ), IF THE GROUND COMPUTER HAS NOT BEEN IN CONTINUOUS SUPPORT, REQUEST & EXECUTE GT16 (AZIMUTH LAYING), REPORT WHEN COMPLETE.	***
		95-1	CLTC	CUPC	(IF HOLD WAS AFTER T-12:25") REQUEST & EXECUTE GE01 (AZIMUTH LAYING & PLOT MONITOR).	
	261	96	CLM4	BOSC	REQUEST PRESENT GH2 BATTERY PRESSURE	TCPI
	121	97	***	C1PK	REQUEST & EXECUTE VATS (TERMINAL SEQUENCE LINKING PROGRAM, PR2/PR4).	***
		97-1			NOTE -----  WHEN LINKING PROGRAMS ARE UTILIZED, SEQUENCES WITH THREE ASTERISKS IN THE COMMAND STA AND REMARKS COLUMNS WILL BE DONE AUTOMATICALLY BY THE LINKING PROGRAM. IF THE LINKING PROGRAM IS NOT UTILIZED, THE TEST CONDUCTOR FOR THE INDICATED COMM CH WILL, AT THE APPROPRIATE TIME, REQUEST THE OPERATORS TO DO THE FUNCTIONS MANUALLY. PROGRAMS WILL NORMALLY BE DONE AT THE TIME SHOWN.  ***** DURING VATS, IF A TIME CRITICAL EVENT DOES NOT OCCUR WITHIN 10 SECONDS AFTER THE EXPECTED TIME, THE OPERATORS INDICATED WILL DO THE FUNCTIONS MANUALLY AND REPORT THIS ACTION ON THE INDICATED COMM CH. *****	

DATE: MAY 18, 1971

REVISION 029

## APOLLO/SATURN LAUNCH OPERATIONS

5251.60

PAGE

377

V-20080, APP B4

VEHICLE

AS-510

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B4						
	121	98	***	C4PP	PLUG SUPERVISION POWER OFF THEN AUTO	***
	121	99	CLTC	C1TC C2TC C4TC CUTC	VERIFY READY TO RESUME COUNT	
	121	100	C1PK	CLTC	VATS AT T-22 MINUTES AWAITING CDC PICKUP	
	121	101	CLTC	RLDE	ENTER/VERIFY CDC MODE	
	121	102	CLTC	ALL	RETURN TO ASSIGNED CHANNELS TO RESUME THE COUNT AT T-22:10" PAGE 249. THE COUNT CLOCK WILL BE RESTARTED ON A MARK FROM CVTS.	
	111	103	CLTC	CVTS	LAUNCH VEHICLE READY TO RESUME COUNT. REQUEST A TIME COUNT AND MARK START OF COUNTDOWN CLOCK.	TCPI
		103-1		CVTS	*** NOTE USE A 5 COUNT FOR COUNT CLOCK START ON THE "ALL CALL" SYSTEM.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<p>CD ONLY</p> <p>APPENDIX B</p> <p>-----</p> <p>PART 5 - DRSCR RETEST</p> <p>-----</p>						
APP B5		1			NOTE -----  THIS RETEST TO BE ACCOMPLISHED AS PART OF RECYCLE TO T-22 MINUTES IF REQUIRED.	
		2			NOTE -----  S-1C CLOSED LOOP TEST NOT POSSIBLE IF S/A 2 HAS DISCONNECTED. PERFORM S-1I & S-1VB RETEST MANUALLY.	
121		3	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT DRSCR CLOSED LOOP TEST.	
111		4	CLTC	CVTS	<b>CDDT ONLY</b>	* TCP
111		5	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP LOCAL COMMAND CARRIER (PROTECTION REQUIRED) AND REQUEST SRO SWITCH TO CH 121 TO SUPPORT DRSCR CLOSED LOOP TEST USING FLIGHT CODE PLUGS. DO NOT BRING DOWN RANGE CARRIER UNTIL REQUESTED.	# TCP
		6		C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE (CD ONLY).	
121		7	CLTC	BRFS	VERIFY RF SELECT TO STANDBY AND REMOTE MONITOR TO SIG GEN 1	
111		8	CLTC	CVTS	LOCAL COMMAND CARRIER COMING ON.	TCP I

TIME	COM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B5						
121		9	CLTC	RRSC	VERIFY DRSCS RECORDERS ON.	
121		10	CLTC	C1DP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT: PD RSCR'S ENABLE - OFF SYSTEM STATUS SW - OFF S&A SWITCH - SAFE	
121		11	CLTC	C1PK	IF S/A 2 IS CONNECTED, COMMAND VARY TO RUN VARS (FRT/CDDT/CD RECYCLE OPTION)	
121		12	***	C1PK	REQUEST & EXECUTE VARS (DRSCR TEST) (FRT/CDDT/CD RECYCLE OPTION)	***
		12-1			NOTE -----  IF THE DRSCR TEST IS TO BE PERFORMED MANUALLY, THE SEQUENCES WITH THE AUTO PROGRAM IVAR IN THE COMMAND STATION COLUMN WILL BE COMMANDED BY THE TEST CONDUCTOR ASSOCIATED WITH THE OIS COM CH SHOWN.	
121		13	VARS	C1DP C2DP C4DP	VERIFY S&A SAFE AND RSCR'S 1 & 2 PD BLOCKED - ON	
121		14	C1PK	CLVN	DESTRUCT SYSTEM TO ENABLE (PERFORM OR VERIFY)	
		14-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON.	
121		15	C1PK	C1DP C2DP C4DP	SYSTEM STATUS SWITCH - OFF (PERFORM OR VERIFY)	
121		16	VARS	BRFS	SIG GEN ON AND VERIFY REMOTE MONITOR TO HYBRID.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B5						
121		17	C1PK	CLTC	READY FOR RANGE COMMAND TRANSMITTER OFF	
111		18	CLTC	CVTS	REQUEST RANGE CARRIER OFF & VERIFY	TCPI
121		19	VAR5	C1DP C2DP C4DP	EBWIS 1 & 2 EXTERNAL THEN AUTO	
121		20	VAR5	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL (PERFORM OR VERIFY)	
		20-1		CRSS	*** NOTE ALL RSCR'S ON INTERNAL POWER	
121		21	VAR5	B1RF B2RF B4RF CRSS	VERIFY RSCR LIMITER VOLTAGES OK.	
121		22	VAR5	C1DP C2DP C4DP	VERIFY EBW'S #1 & #2 EXTERNAL AND NOT CHARGED.	
		22-1		CRSS	*** NOTE ALL EBWS NOT CHARGED.	
121		23	VAR5	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		24	C1PK	CLTC	READY FOR SRO CUTOFF COMMAND.	
121		25	CLTC	RRSC	RECORDERS - FAST SPEED	
121		26	CLTC	SRO	ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS.	
121		27	SRO	ALL	3-2-1 MARK	
121		28	VAR5	C1DP C2DP C4DP	SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B5						
	121	29	CLTC	RRSC	RECORDERS - SLOW SPEED	
	121	30	VAR	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 WERE INTERNAL AND CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON,	
		30-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED	
		30-2		CRSS	*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON,	
	121	31	VAR	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL AND NOT CHARGED,	
		31-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
	121	32	VAR	C1DP C2DP C4DP	VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED,	
	121	33	C1PK	CLTC	READY FOR SRO PD COMMAND,	
	121	34	CLTC	RRSC	RECORDERS - FAST SPEED	
	121	35	CLTC	SRO	ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
	121	36	SRO	ALL	3-2-1 MARK	
	121	37	CLTC	RRSC	RECORDERS - SLOW SPEED	
	121	38	VAR	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		38-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED,	
	121	39	VAR	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP B5		39-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		40	C1PK	CLTC	READY FOR RANGE TRANSMITTER ON - VERIFY	
111		41	CLTC	CVTS	REQUEST RANGE SAFETY COMMAND TRANSMITTER #1 CARRIER ON, REPORT WHEN TURNED ON,	TCPI
		41-1		CLTC	*** NOTE DO NOT PROCEED UNTIL TRANSMITTERS ARE ON	
121		42	VARS	BRFS	SIG GEN SELECTOR - STANDBY	
121		42-1	VARS	B1RF B2RF B4RF CRSS	VERIFY RSCR LIMITER VOLTAGES OK,	
121		43	C1PK	CLTC	VARS COMPLETE	
121		44	CLTC	BTMC	TM TAPE RECORDER OFF AND RELOAD	
		44-1		BTMC	*** NOTE DELIVER TAPE TO SECURITY OFFICER (CD ONLY)	
111		45	CLTC	CVTS	DRSCS TEST COMPLETE, LOCAL COMMAND CARRIER IS OFF	TCPI
121		46	CLTC	ALL	ALL PERSONNEL TURN TO RECYCLE, APP B4, PAGE 376 , SEQ 93 -----	

LV CDDT & CD, VOL II  
DATE: MAY 18, 1971  
REVISION 029

APOLLO/SATURN

PAGE 5251.60 383  
TEST NO. -20060, APP C1  
VEHICLE AS-510

APPENDIX C  
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LV DRAIN OPERATIONS  
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<p>CD ONLY</p> <p>APPENDIX C</p> <p>-----</p> <p>LV DRAIN OPERATIONS</p> <p>-----</p> <p>PART 1</p> <p>-----</p> <p>LV PREPS FOR DRAIN</p> <p>-----</p>						
APP C1 0' 0"						
121		1	CLTC	C1DP C2DR C4DP	SYSTEMS STATUS SWITCH TO SAFE	
		1-1		C1DP C2DR C4DR	*** NOTE RSCR EXTERNAL AND OFF	
121		2	CLTC	CLVN	DESTRUCT SYSTEM OFF	
121		3	CLTC	CUPC	POWER DOWN ST-124M PER V-33011	
151		4	CUTC	CUNP	<b>GDDT ONLY</b>	
121		5	CLTC	CUSP	FCC POWER SWITCH - OFF	
121		6	CLTC	CUGA	CONTROL EDS RATE GYRO POWER SWITCH - OFF	
121		7	CLTC	CLGK	REQUEST & EXECUTE FT04 PER V-33033, SECTION IV (POWER OFF LVDC/LVDA)	
121		8	CLTC	CUPC	TERMINATE GE01 IF EXECUTING	
121		9	CLTC	CUES	THRUST OK SWITCHES A & B TO INHIBIT.	
121		10	CLTC	CWCP	RECONFIGURE THE IWS TO AN EGRESS CONFIGURATION PER V-36113.	
121		11	CLTC	CSPR	REMOVE LSE 43D100 & 43D200 FIRING POWER PER V-21194 & REMOVE LSE POWER OVERRIDE REPORT WHEN COMPLETE.	
121		12	CLTC	C1TC C2TC C4TC CUTC	VERIFY SYSTEMS SAFED & READY FOR CREW EGRESS.	#

LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP C1 0' 0"						
	121	13	CLTC	C1TC C2TC C4 C CUTC	CDDT ONLY	*
	111	14	CLTC	CVTS	LV READY FOR CREW EGRESS.	# TCP
	188	15	CLTC	ALL	ALL LV SYSTEMS WILL BE HELD AT THIS POINT UNTIL FLIGHT CREW EGRESS IS COMPLETE.	#
	111	16	CVTS	CSA9	RECONNECT SERVICE ARM 9 PER V-36085 (IF NOT ALREADY CONNECTED)	TCPI
	111	17	CSA9	CVTS	S/A 9 RECONNECTED.	TCPI
	111	18	CVTS	CSA9	RETURN TO CHANNEL 118.	TCPI
	121	19	CVTS	CLTC	SC EDS POWER IS OFF	# TCP
	118	20	CSA9	CSAC	S/A 9 HAS BEEN RECONNECTED. CSA9 IS NOW ACTIVE ON CHANNEL 118.	
	181	21	CSAC	C1TC	S/A 9 IS RECONNECTED.	
	118	22	CSAC	CHCU	PLACE ONE PUMP IN STANDBY AND VERIFY OTHER PUMP IS RUNNING.	
		23			NOTE -*-  WITH FLIGHT CREW ABOARD, IT WILL BE APPROXIMATELY ONE HOUR BEFORE ALL PERSONNEL WILL BE CLEAR OF THE CONTROL AREA FOR DRAIN OPERATIONS.	#
APP C1 0' 0"	121	1	CVTS	CLTC	CREW EGRESS IS COMPLETE. ALL PERSONNEL ARE CLEAR OF THE CONTROL AREA. LV DRAIN OPERATIONS MAY START.	# TCP







TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP C1 01 0"						
181		31	C1TC	BRFS	SECURE DRSCS GSE PER V-38000 SCRUB/ RECYCLE PROCEDURE	
121		32	C1TC	CLTC	PRIMARY DAMPER AND S/A 1 ARE CONNECTED.	
111		33	CLTC	CVTS	PRIMARY DAMPER IS CONNECTED.	TCPI
		34			*****CAUTION***** * * THE FOLLOWING SEQ IS * * HAZARDOUS * * *****	
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	TCPI
		39			NOTE -----  CONTINUED IN APPENDIX C, PART 2.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
+ 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	
+15: 0"	181	2	C1TC	C1CS	POSITION LOX LEVEL SIMULATE SWITCHES TO OFF THEN AUTO	
		1		CLTC	NOTE -----	
	177	1-1	CLTC	CLGS	FOLLOWING SUBSEQUENCE IS TO BE PERFORMED ONLY IF MSS IS RETURNING TO THE PAD. START/VERIFY START OF LV-GAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-GAL-GCP-11 FOR MSS MOVE.	
+32: 0"	181	1	CCLO	C1TC	S-II LOX DRAIN STARTED (S-II LH2 APPROXIMATELY 50%)	
+54: 0"	181	1	CCLH	C1TC	S-II LH2 DRAIN IS COMPLETE	
+ 1 HRS 15: 0"	181	1	CCLH	C1TC	S-IVB LH2 DRAIN IS COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
		2		CLTC CLOS	NOTE ----	
1 HRS 15' 0"					FOLLOWING SUBSEQUENCES ARE TO BE PERFORMED ONLY IF MSS IS RETURNING TO PAD.	
	121	2-1	CLOS	CLTC	LV-QAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-QAL-QCP-11 IS COMPLETE.	
	111	2-2	CLTC	CVTS	LV-QAL INSPECTION OF MSS PLATFORMS 1 & 2 PER LV-QAL-QCP-11 IS COMPLETE.	TCPI
1 HRS 30' 0"						
	181	1	CCLO	C1TC	S-II LOX DRAIN IS COMPLETE. STARTING S-IVB LOX DRAIN.	
	121	2	CLTC	C1TC C2TC C4TC	START LH2 POST TANKING PURGE PER V-35015, VOL II.	
	181	3	C1TC	CCLH	START LH2 SYSTEM PURGE PER V-35015, VOL II.	
	171	4	C2TC	C2NP	REMOVE PM POWER	
	171	5	C2TC	C2SP C2RP	START POST TANKING PURGE PER V-35015, VOL II. NOTIFY C2TC WHEN TANK PURGE HAS BEEN IN PROGRESS FOR 30 MINUTES.	
	171	6	C2TC	C2PM	SUPPORT LH2 SYSTEM SECURING PER V-35015, VOL II ON CH 143.	
	171	7	C2TC	C2SP	LOW LEVEL PURGE OFF WHEN NOT REQUIRED.	
	171	8	C2TC	C2GP	START GH2 CIRCUIT SCRUB PURGE PER V-30029 (M020) TASK 54.	
	171	9	C2TC	U2SE	S-II PROPELLANT DRAIN IS COMPLETE, RELEASE S-II RED CREW FROM STANDBY.	
2 HRS 10' 0"						
	181	1	CCLO	C1TC	S-IVB LOX DRAIN COMPLETE	
	121	2	C1TC	CLTC	S-IVB LOX DRAIN COMPLETE.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 10: 0"	161	3	C4TC	C4HN	SUPPORT LH2 SYSTEM SECURING PER V-35015, VOL II ON CH 143.	
	161	4	C4TC	C4PU	PU POWER OFF THEN AUTO	
	161	5	C4TC	C4PU	LOADING MEASUREMENT ENABLE - OFF	
	181	6	CCL0	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	CCL0 CCLH		*** NOTE PROPELLANTS SUPPORT WILL BE REQUIRED UNTIL COMPLETION OF S-II & S-IVB PURGES (APPROX T+7:30 HRS)	
	111	9	CLTC	CVTS	LV PROPELLANT DRAIN IS COMPLETE AND TANK PURGES ARE IN PROGRESS.	TCPI
2 HRS 15: 0"	121	1	CVTS	CLTC	CLEAR TO START RP-1 REPLENISH (IF RECYCLING TO T-9 HRS)	TCPI
	121	2	CLTC	C1TC	START RP-1 REPLENISH (IF RECYCLING TO T-9 HRS)	
	181	3	C1TC	CCRP	APPLY RP-1 PANEL POWER AND START REPLENISH PER V-25389 (IF RECYCLING TO T-9 HRS)	
		4			NOTE -----  FOLLOWING SUBSEQUENCES ARE TO BE PERFORMED ONLY IF MSS IS RETURNING TO PAD.	
	121	4-1	CVTS	CLTC	MSS OBSERVERS ARE TO REPORT TO PVTS AT LAUNCH OPERATION TRAILER 179 AT THE PAD MAIN GATE FOR BRIEFING IN 45 MINUTES.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 15' 0"						
	121	4-2	CLTC	C1TC C2TC C4TC CUTC	MSS OBSERVERS ARE TO REPORT TO PVTS AT LAUNCH OPERATION TRAILER 179 AT THE PAD MAIN GATE FOR BRIEFING IN 45 MINUTES.	
	171	4-3	C2TC	C2PV	MSS PLATFORM OBSERVERS WITH HEADSETS REPORT TO PVTS AT PAD MAIN GATE (TRAILER 179) FOR BRIEFING IN 45 MINUTES.	
2 HRS 40' 0"						
	171	1	C2TC	C2SP	VERIFY POST TANKING PURGE IN PROGRESS FOR MINIMUM OF 30 MINUTES AND READY FOR SAFETY INSPECTION TEAM TO ENTER PAD, CONTINUE POST TANKING PURGE AND SUPPORT TBC ON 4% GH2 SNIFFER CHECKS.	
	121	2	C2TC	CLTC	S-II LH2 PROPELLANT TANK PURGED FOR MINIMUM OF 30 MINUTES, READY FOR SAFETY INSPECTION TEAM TO ENTER THE PAD, (POST TANKING PURGE IS CONTINUING)	
	121	3	C4TC	CLTC	S-IVB LH2 PROPELLANT TANK HAS BEEN PURGED FOR MINIMUM OF 30 MINUTES AND READY FOR SAFETY INSPECTION TEAM TO ENTER PAD, (POST TANKING PURGE IS CONTINUING)	
	181	4	C1TC	CCLH	S-II & S-IVB TANKS HAVE BEEN PURGED FOR MINIMUM OF 30 MINUTES, VERIFY GSE READY FOR SAFETY INSPECTION TEAM TO ENTER PAD AND VERIFY LESS THAN 4% GH2 IN STAGE TANKS AND TRANSFER LINE BY SNIFFING AT SAMPLE PORTS ON VALVE SKIDS, VERIFY INITIAL SYSTEM SECURING CREW AT ROAD BLOCK TO FOLLOW SAFETY INSPECTION TEAM TO THE LUT AND TO THE LH2 STORAGE AREA, S-II & S-IVB TANK PURGES WILL CONTINUE.	
	181	5	C1TC	CCLO	VERIFY INITIAL SYSTEM SECURING CREW AT ROAD BLOCK TO FOLLOW SAFETY INSPECTION TEAM TO THE LUT AND TO THE LOX STORAGE AREA, PURGE, INERT AND SECURE LOX SYSTEM PER V-25342.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 40' 0"						
	171	6	C2TC	C2SP	SHROUD PURGE TO CLOSE	
	171	7	C2TC	U2IE U2SE	VERIFY S-II INSULATION PERSONNEL ARE AT ROADBLOCK TO ACCOMPANY SAFETY INSPECTION TEAM TO PAD APRON AND 140 FT LEVEL	
	181	8	C1TC	CECS	SWITCH ECS FROM GN2 TO AIR PER V-36074 PART D. VERIFY HANDVALVE SECURING CREW AT ROADBLOCK TO FOLLOW SAFETY INSPECTION TEAM TO ECS ROOM.	
	181	9	C1TC	CHGD	SECURE HGD SYS PER V-37038	
	181	10	C1TC	C1PE	VENT S-1C GN2 BOTTLES TO 1500 PSI PER V-24327.	
	181	11	C1TC	C1NP	HEATER POWER SWITCH TO OFF	
	121	12	C2TC	CLTC	S-II INSULATION PERSONNEL ARE AT ROADBLOCK TO ACCOMPANY SAFETY INSPECTION TEAMS TO PAD APRON AND 140 FT LEVEL.	
	121	13	C1TC	CLTC	ALL SYSTEMS ARE READY FOR SAFETY INSPECTION TEAMS TO ENTER THE PAD. LOX, LH2 AND ECS INITIAL SYSTEM SECURING CREWS ARE AT ROADBLOCK TO ACCOMPANY SAFETY INSPECTION TEAMS TO LUT, LOX & LH2 STORAGE AREAS AND ECS ROOM.	
	111	14	CLTC	CVTS	LV PROPELLANT DRAIN OPERATIONS ARE COMPLETE. LV IS READY FOR SAFETY INSPECTION TEAMS, INITIAL SYSTEM SECURING CREWS AND S-II INSULATION PERSONNEL TO ENTER THE PAD.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 40: 0"					<p style="text-align: center;">NOTE ----</p> <p>A SAFETY INSPECTION OF THE LAUNCH PAD AND INITIAL SYSTEM SECURING OF HAZARDOUS SYSTEMS WILL BE CONDUCTED AT THIS TIME. DESIGNATED LAUNCH VEHICLE PERSONNEL WILL ACCOMPANY THE SAFETY INSPECTION TEAMS TO THE LUT, LOX &amp; LH2 STORAGE AREAS AND ECS ROOM BUT WILL BE PRECEDED BY THEM.</p> <p>THE LUT AND PTCR MAY BE OPENED FOR STAGE ACCESS CREW ENTRY UPON CPSS VERIFICATION THAT:</p> <ol style="list-style-type: none"> <li>1. THE S-II &amp; S-IVB LH2 TANKS CONTAIN LESS THAN 4% GH2 BY SNIFFING PURGE GASES AT SAMPLE PORTS AT THE FILTERS ON FILL LINES.</li> <li>2. THE LH2 TRANSFER LINE CONTAINS LESS THAN 4% GH2 BY SNIFFING PURGE GASES AT SAMPLE PORTS AT THE INLET TO VALVE SKIDS.</li> <li>3. THE GN2 HANDVALVES HAVE BEEN CLOSED IN THE ECS ROOM.</li> </ol> <p>THE LOX &amp; LH2 STORAGE AREAS MAY BE OPENED FOR ACCESS WHEN CPSS INSPECTION OF EACH AREA IS COMPLETE.</p>	TCPI
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	TCPI
121		16	CLTC	CLTC	REQUEST SUPPORT PREPARE TO HAVE TWO 25 TON FORKLIFTS AND CABLES FOR ESP TRANSPORTER MOVE. FORKLIFTS 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.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 40' 0"						
	261	17	CLTC	BOSC	REQUEST TWO 25 TON FORKLIFTS AND CABLES FOR ESP TRANSPORTER MOVE. FORKLIFTS 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.	TCPI
	121	18	BOSC	CLTC	VERIFY S-IVB & S-II PERSONNEL ARE READY TO SUPPORT GH2 CROSS COUNTRY LINE SECURING WITH GHE.	TCPI
	151	19		CUTC	TERMINATE ALTERNATE FIRING ROOM SUPPORT	
	181	20	C1TC	CCLH	VERIFY WHEN SYSTEM INERTING TO LESS THAN 4% GH2 IS SATISFACTORY BY COORDINATING WITH SECURING CREW ON LUT WITH SAFETY INSPECTION TEAM	
2 HRS 45' 0"						
	171	1	C2FC	C2TC	EAS POST DRAIN PROCEDURES ARE COMPLETE	
	171	2	C2TC	C2IP	GROUND POWER TO OFF.	
	171	3	C2GP	C2TC	GH2 CIRCUIT SCRUB PURGE COMPLETE.	
		4			*****CAUTION***** * * THE FOLLOWING TWO * * SEQUENCES ARE HAZARDOUS * * *****	
	181	5	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	6	C1TC	C1PE	SECURE APPLICABLE PORTIONS OF S-IC PNEUMATICS SYS PER V-24327. REPORT WHEN COMPLETE.	

LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 45' 0"	121	7	C1TC	CLTC	ECS SWITCHOVER FROM GN2 TO AIR IS COMPLETE. ECS GN2 IS IN STANDBY CONFIGURATION.	
3 HRS 0' 0"	171	1	C2TC	C2PV	SECURE PURGE AND VACUUM SYSTEM PER V-25311 (L009).	
		1-1			NOTE - - -  IF REQUIRED, OPERATION WILL CONTINUE PER APPLICABLE SECTIONS OF V-26276 (G058).	
3 HRS 30' 0"	121	1	CLTC	C1TC	SEND TSM PERSONNEL TO ZERO LEVEL FOR TSM 3-4 TILT BACK (IF MSS IS TO BE RETURNED TO PAD).	
	181	2	C1TC	CTS1	SEND TSM PERSONNEL TO ZERO LEVEL FOR INSTALLING TSM SAFETY CABLES, RIGGING TSM 3-4 FOR TILT BACK AND SECURING TSM SYSTEMS (IF MSS IS TO BE RETURNED TO PAD).	
3 HRS 40' 0"	181	1	CCLH	C1TC	SYSTEM INERTING HAS BEEN VERIFIED SATISFACTORILY ON THE LUT	
	181	2	CECS	C1TC	<b>DDT ONLY</b>	#
	181	3	CECS	C1TC	ECS IS CONFIGURED FOR GN2 STANDBY (HAND VALVES CLOSED)	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					<b>CD ONLY</b>	
		3-1			*****WARNING***** * * ECS IS TO BE CONFIGURED * * FOR GN2 STANDBY WITH * * HANDVALVES CLOSED WHILE * * ALSEP IS INSTALLED IN * * VEHICLE, FOR FCA * * EMERGENCY, THE HAND * * VALVES WILL NOT BE * * OPENED UNTIL DIRECTED * * BY CVTS. * * *****	#
3 HRS 40' 0"		4			*****WARNING***** * * END ECS INERT * * ATMOSPHERE HAZARD - * * RESUME PREVIOUS HAZARD * * LEVEL. * * *****	
	121	5	C1TC	CLTC	<b>CDDT ONLY</b>	*
	111	6	CLTC	CVTS	<b>CDDT ONLY</b>	* TCP
	121	7	C1TC	CLTC	ECS IS CONFIGURED FOR GN2 STANDBY (HANDVALVES CLOSED), LH2 SYSTEM INERTING ON THE LUT IS ACCEPTABLE FOR AREA OPENING,	#
	111	8	CLTC	CVTS	ECS IS CONFIGURED FOR GN2 STANDBY (HANDVALVES CLOSED), LH2 SYSTEM INERTING ON THE LUT IS ACCEPTABLE FOR AREA OPENING,	# TCP
3 HRS 45' 0"	121	1	CVTS	CLTC	SAFETY INSPECTION IS COMPLETE, SPECIAL CONTROL AREA IS OPEN FOR REQUIRED PERSONNEL.	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3 HRS 45: 0"						
151		2	CUTC	CUCP	VENT ST-124M AIR BEARING SYSTEM PER V-34017. REPORT WHEN COMPLETE.	
151		3	CUTC	CUCP	PUMP PRESSURE SWITCH ACTIVATE OFF THEN AUTO	
121		4	CLTC	C1TC C2TC C4TC CUTC	SPECIAL CONTROL AREA IS OPEN FOR REQUIRED PERSONNEL.	
121		5	BOSC	CLTC	25 TON FORKLIFTS & CABLES AT PAD GATE FOR MOVE OF BSP TO ML.	TCPI
188		6	CLTC	ALL	ALL PERSONNEL TURN TO: (APPENDIX F FOR DRY CDDT OPERATIONS) (VOLUME III FOR LAUNCH VEHICLE SCRUB TO LAUNCH TURNAROUND OPERATIONS)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
PART 3 -----						
S-II PREPARATIONS FOR PROPELLANT DRAIN -----						
C3 S-II						
171		1	C2TC	C2SP	GN2 PURGE VALVE TO AUTO.	
171		2	C2TC	C2SP	LH2 SUPPLY VALVE TO AUTO.	
171		3	C2TC	C2GP	LH2 DISCONNECT PRESS SW TO AUTO	
171		4	C2TC	C2GP	LOX DISCONNECT PRESS SW TO AUTO	
171		5	C2TC	C2GP	GH2 SUPPLY VALVE TO CLOSE.	
171		6	C2TC	C2GP	START TANK LINE VENT OPEN UNTIL D079-327 INDICATES APPROX ZERO PSIG.	
		6-1	C2TC	C2AE	START TANK ALL VENT TO ALL VENT.	N-254-68
		6-2	C2TC	C2AE	START TANK SUPPLY LINE VENT TO VENT.	N-254-68
		6-3	C2TC	C2AE	START TANK SUPPLY VALVE TO PRESSURIZE.	N-254-68
171		7	C2TC	C2GP	AFTER D079-327 INDICATES APPROX ZERO PSIG PUT GH REG VENTS TO OPEN.	
		7-1	C2TC	C2AE	START TANK SUPPLY VALVE TO OFF.	N-254-68
		7-2	C2TC	C2AE	START TANK SUPPLY LINE VENT TO OFF.	N-254-68
		7-3	C2TC	C2AE	HE BOTTLE AND START TANK PURGE SW TO ON. MAINTAIN PURGE FOR 10 MINUTES, THEN PLACE HE BOTTLE AND START TANK PURGE SW TO OFF.	N-254-68
		7-4	C2TC	R2SC	VERIFY START TANK PRESSURE (D016-201/205) AT ZERO.	N-254-68
		7-5	C2TC	C2AE	START TANK ALL VENT TO OFF	N-254-68

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARK
C3 S-II						
171		8	C2TC	C2GP	HE PRESS SEL SW TO 1000 PSIG.	
171		9	C2TC	C2AE	VERIFY ENGINE PURGES COMPLETE.	
171		10	C2TC	C2AE	USE ALL HE SOLENOID SWITCH TO VENT ENG HE BOTTLES BELOW 25 PSIA.	
		10-1		C2PU R2SC	*** NOTE MESAUREMENTS 0006-201 THROUGH 205 WILL BE ACTIVE.	
171		11	C2TC	C2RP	PNEU SUPPLY VALVE TO OFF.	
171		12	C2TC	C2RP	LOX HE INJECTION TO START, THEN AUTO, WHEN RECEIVER PRESS APPROX. 1465 PSIA, HE INJECTION TO STOP, THEN AUTO.	
		12-1		C2SP	*** NOTE LOX HE INJECTION RECEIVER BEING VENTED INTO LOX TANK.	
171		13	C2TC	C2RP	USE RECIRC ACT SYSTEM VENT SWITCH TO VENT RECIRC RECEIVER TO APPROX. 1465 PSIA.	
171		14	C2TC	C2AE	START TANK SUPPLY LINE VENT TO OFF.	
171		15	C2TC	C2AE	VERIFY HE BOTTLE PRESSURES BELOW 25 PSIA.	
171		16	C2TC	C2AE	VERIFY START TANK PRESSURES BELOW 25 PSIA.	
171		17	C2TC	C2AE	ALL ENG EMERGENCY CUTOFF TO AUTO.	
171		18	C2TC	C2RP	VERIFY LOX HE INJECTION RECEIVER PRESSURE APPROX. 1465 PSIA.	
171		19	C2TC	C2RP	VERIFY RECIRC RECVR PRESS APPROX. 1465 PSIA.	
171		20	C2TC	C2RP	PNEUM SUPPLY VALVE TO PRESSURIZE.	
171		21	C2TC	C2GP C2PV C2PM C2SP	VERIFY READY FOR PROPELLANT DRAIN.	
171		22	C2TC	C2PV	MAINTAIN COMMON BULKHEAD VAGUUM FOR PROPELLANT DRAIN.	
121		23	C2TC	CLTC	S-II READY FOR PROPELLANT DRAIN.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 4 ----- LV PREPS FOR COMPUTER DOWN DRAIN -----	
C4 LV						
	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 OIS 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 P1-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 DN, 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 4 UP, 1132 OFF (C2RR-RECIRC RECEIVER SUPPLY VALVE TO OFF)	
	121	3-6	CLVN		GRP 5 - MUX 22, ADDRESS 2, DATA BIT 17 UP, 1073 OFF (C2GR-HE SELECT TO 1000 PSI)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
C4 LV						
121		3-7		CLVN	GRP 6 - MUX 21; ADDRESS 2. DATA BIT 16 DN. 0568 ON (C2RP LOX HE INJ START)	
121		3-8		CLVN	GRP 7 - MUX 22; ADDRESS 10. DATA BIT 14 UP, 11 UP, 9 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 (C-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 (Q-BALL HEATERS OFF) 1912 OFF (C-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	USE ALL HELIUM SOLENOID SWITCH TO VENT ENG HE BOTTLES BELOW 25 PSIA.	
		4-1		C2PU R2SC	*** NOTE MEASUREMENTS G006-20- THROUGH 205 WILL BE ACTIVE.	
121		5	CLTC	GUNP	SWITCH SELECTOR INHIBIT OFF.	
121		6	CLTC	CUSW	ISSUE IU OCTAL 054 (C-BAND INHIBIT #1 & #2 OFF)	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
C4 LV						
111		7	CLTC	CVTS	ALL LV RF SYSTEMS ARE OFF EXCEPT S-IVB P1 258.5 MHZ LINK.	TCPI
121		8	CLTC	BRFS	LCC GSE POWER OFF AND SECURE PER V-38000 SCRUB/RECYCLE PROCEDURE.	
121		9	CLTC	CUNP	SWITCH SELECTOR INHIBIT ON	
121		10	CLTC	CUPC	POWER DOWN ST-124M PER V-33011	
121		11	CLTC	CUSP	FLIGHT CONTROL COMPUTER POWER SWITCH - OFF.	
121		12	CLTC	CUGA	CONTROL EDS RATE GYRO POWER SWITCH - OFF	
121		13	CLTC	CLGK	ON-AUTO-OFF SWITCH TO OFF	
121		14	CLTC	CUDE	VERIFY HALT (728) AND MEMORY RELEASE (730) ARE ON	
121		15	CLTC	CTS1	DISARM UMBILICAL SWITCH	
121		16	CLTC	C2GP	GH SUPPLY VALVE TO CLOSE	
121		17	CLTC	C2GP	START TANK LINE VENT TO OPEN	
121		18	CLTC	C2RP	USE RECIRC ACTUATION SYSTEM VENT SWITCH TO VENT PNEUMATIC RECEIVER TO 1465 PSIA.	
		18-1		C2AE	*** NOTE HE BOTTLE PRESS BELOW 25 PSIA	
		18-2		C2AE	*** NOTE START TANK PRESS BELOW 25 PSIA	
		18-3		C2RP	*** NOTE HE INJ RECVR PRESS APPROX 0 PSIA	
		18-4		C2RP	*** NOTE RECIRC RECVR PRESS APPROX 1465 PSIA	
121		19	CLTC	C2PV	MAINTAIN COMMON BULKHEAD VACUUM FOR PROPELLANT DRAIN	
121		20	CLTC	C1TC C2TC C4TC	VERIFY READY TO START PROPELLANT DRAIN.	
121		21	CLTC	C1TC	START PROPELLANT DRAIN, PER APPENDIX C, PART 2, PAGE 389	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
C4 S-IV					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 HE 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)	
121		2-7		CLVN	GRP 7 - MUX 21; 22, ADDRESS 10, DATA BIT 16 UP, 1768 OFF (START TANK EMERGENCY VENT OPEN OFF)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
C4 S-IV						
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/S 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.	

LV CDDT & CD, VOL II  
DATE: MAY 18, 1971  
REVISION 029

APOLLO/SATURN

PAGE 5251.60 407  
TEST NO. V-20060, APP D  
VEHICLE AS-510

APPENDIX D  
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CONTINGENCY PROCEDURES  
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1					APPENDIX D ----- CONTINGENCY PROCEDURES ----- PART 11 T-421 MANUAL POWER TRANSFER ----- PREPS FOR POWER TRANSFER TEST -----	
111		1	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN	TCPI
121		2	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	
121		3	CLTC	BRFS	VERIFY RF SELECT TO STANDBY AND REMOTE MONITOR TO SIG GEN 1	
121		4	CLTC	BTMC	VERIFY LCC/TM CHECKOUT EQUIPMENT READY TO SUPPORT POWER TRANSFER TEST	
121		5	CLTC	BTMC	TM TAPE RECORDER ON	
121		6	CLTC	RRSC	DRSCS RECORDERS ON (PERFORM OR VERIFY)	
111		7	CLTC	CVTS	LOCAL COMMAND CARRIER COMING ON	TCPI
		8		C2NP	CYCLE MAIN/INSTR BATTERY BLEED SWITCHES TO MAINTAIN BATTERY VOLTAGES IN TOLERANCE (CD ONLY)	
121		9	CLTC	C1DP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT: PD RSCR'S ENABLE - OFF SYSTEM STATUS SW - OFF S&A SWITCH - SAFE	
121		10	CLTC	CLVN	DESTRUCT SYSTEM TO ENABLE	
121		11	CLTC	C1DP C2DP C4DP	VERIFY S&A SAFE AND RSCR'S 1 & 2 PD BLOCKED ON	

APP	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	121	12	CLTC	BRFS	SIG GEN ON AND VERIFY REMOTE MONITOR TO HYBRID	
	121	13	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL AND NOT CHARGED	
	121	14	CLTC	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL AND VERIFY	
	121	15	CLTC	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
	121	16	CLTC	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL AND NOT CHARGED	
	121	17	CLTC	BTMC	TM TAPE RECORDING - ON	
	188	18	CLTC	ALL	ALL PERSONNEL SUPPORTING POWER TRANSFER TEST SWITCH TO INDIVIDUAL STAGE TC ACTIVE CHANNELS TO PREPARE FOR POWER TRANSFER.	
	123	19	CUPS	CUGA	ATTITUDE RATE COMMANDS (PLUS 10 DEG/SEC ROLL), HOLD UNTIL POWER TRANSFER IS COMPLETE.	
	121	20	CUPS	CLTC	FLIGHT CONTROL READY FOR POWER TRANSFER.	
	181	21	C1TC	C1NP	VERIFY INTERNAL AND EXTERNAL BUSES ARE CORRECT FOR POWER TRANSFER.	
	181	22	C1TC	C1NP	BATTERY INSTALLED ENABLE TO ON	
		22-1		C1NP	*** NOTE S-IC READY FOR POWER TRANSFER.	
	181	23	C1TC	C1NE R1SC	VERIFY READY FOR POWER TRANSFER.	
	181	24	C1TC	C1NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
	121	25	C1TC	CLTC	S-IC READY FOR POWER TRANSFER.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1		25-1		C2RP	*** NOTE OK TO OPERATE PUMPS LIGHT ON.	
171		26	C2TC	C2RP	LH2 RECIRC PUMPS TO START, THEN INHIBIT (AT 2 SECOND INTERVALS).	
		26-1		C2PC	*** NOTE RECIRC BUS CURRENT INCREASES WITH EACH RECIRC PUMP START	
171		27	C2TC	C2RP	LH2 PREVALVES TO CLOSE, THEN INHIBIT	
		27-1		C2RP	*** NOTE LH2 PREVALVES CLOSED -- ON	
171		28	C2TC	C2NP	BATTERY INSTALLED TO ENABLE	
		28-1		C2NP	*** NOTE MAIN, INST AND RECIRC BATTERY CONNECTED - ON	
171		29	C2TC	C2NP	VERIFY SIM FLT BATT ENABLED (CDDT ONLY)	
171		30	C2TC	C2NP R2SC	VERIFY READY FOR POWER TRANSFER,	
171		31	C2TC	C2NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
121		32	C2TC	CLTC	S-II READY FOR POWER TRANSFER,	
161		33	C4TC	R4HY	HYD STRIP CHARTS TO FAST	
161		34	C4TC	C4HY	FLIGHT MODE ON THEN AUTO, (VERIFY WHEN SYSTEM IS STABILIZED).	
161		35	C4TC	C4EP	VERIFY LOX AND LH2 READY TO START INDICATION ON.	
161		36	C4TC	C4EP	LH2 CHILLDOWN PUMP - ON (WAIT 8 SECONDS BEFORE NEXT STEP).	
161		37	C4TC	C4EP	LOX CHILLDOWN PUMP - ON (WAIT 5 SECONDS BEFORE NEXT STEP).	
161		38	C4TC	C4EP	CLOSE LOX AND LH2 PREVALVES.	
161		39	C4TC	C4NP	EMERGENCY POWER TRANSFER - OFF.	
161		40	C4TC	C4NP	STAGE BATTERY MONITOR TO ENABLE	
161		41	C4TC	C4NP	SIM FLIGHT POWER SWITCH ENABLE (CDDT ONLY)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	161	42	C4TC	C4IP	PRELAUNCH CHECKOUT GROUP OFF THEN AUTO	
	161	43	C4TC	C4NP C4PR	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
	161	44	C4TC	C4NP R4EI R4SC	VERIFY READY FOR POWER TRANSFER.	
	161	45	C4TC	C4NP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
	121	46	C4TC	CLTC	S-IVB READY FOR POWER TRANSFER.	
	151	47	CUTC	CUNP	VERIFY INTERNAL & EXTERNAL BUSSES ARE CORRECT FOR POWER TRANSFER.	
	151	48	CUTC	CUNP	<b>CDDT ONLY</b>	*
	151	49	CUTC	CUNP RUBM	VERIFY READY FOR POWER TRANSFER.	
	151	50	CUTC	CUNP	IU TO REMAIN ON INTERNAL FOR 3 MINUTES	
	151	51	CUTC	CUNP	ON MARK FROM CLTC TRANSFER TO INTERNAL.	
	121	52	CUTC	CLTC	IU READY FOR POWER TRANSFER.	
APP D1					POWER TRANSFER TEST -----	
	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-IC, S-II & S-IVB STAGES STAY INTERNAL FOR 30 SECONDS MINIMUM. IU STAY ON INTERNAL POWER FOR 3 MINUTES MINIMUM. RERORT BATTERY VOLTAGES AND CURRENTS TO CLES ON CH 125.	
	121	2	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO FAST AT COUNT "3".	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	121	3	CLTC	C1NP C2NP C4NP CUNP	ON MY MARK TRANSFER TO INTERNAL POWER SIMULTANEOUSLY.	
	121	4	CLTC	ALL	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	
	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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	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 WHILE ON INTERNAL:  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) -----	
	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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	171	14	C2TC	C2RP	RECIRC, RESET TO RESET, THEN INHIBIT	
		14-1		C2PC	*** NOTE RECIRC BUS CURRENT DECREASES TO LESS THAN 5 AMPS	
		14-2		C2RP	*** NOTE LH2 PREVALVES OPEN ON, PUMP INLET PRESSURE DECAY.	
	171	15	C2TC	C2NP	BATTERY INSTALLED ENABLE TO AUTO	
	171	16	C2TC	ALL	ALL STATIONS RETURN TO CH 121	
	121	17	C2TC	CLTC	S-II POWER TRANSFER TEST IS COMPLETE	
	171	18	C2TC	R2SC	READOUT RECORDED BUS VOLTAGES TO CLES ON CH 125.	
	161	19	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE	
	161	20	C4TC	C4NP	VERIFY STAGE ON INTERNAL POWER	
	161	21	C4TC	R4SC	VERIFY BUS VOLTAGE AND CURRENT WITHIN LIMITS	
	161	22	C4TC	C4NP	POWER TRANSFER SWITCH - EXTERNAL THEN AUTO	
	161	23	C4TC	C4NP	VERIFY STAGE ON EXTERNAL POWER	
	161	24	C4TC	C4NP	VERIFY POWER TRANSFER COMPLETE OFF	
	161	25	C4TC	R4PS	VERIFY CHILLDOWN PUMP DATA SATISFACTORY AND READY TO TURN PUMPS OFF	
	161	26	C4TC	C4EP	OPEN LOX & LH2 PREVALVES THEN AUTO	D-97-60
	161	27	C4TC	C4EP	LOX CHILLDOWN PUMP - OFF THEN AUTO	
	161	28	C4TC	C4EP	LH2 CHILLDOWN PUMP - OFF THEN AUTO	
	161	29	C4TC	C4HY	FLIGHT MODE - OFF THEN AUTO	
	161	30	C4TC	R4HY	RECORDERS - SLOW AFTER PRESSURE DECAYS	
	161	31	C4TC	C4NP	STAGE BATTERY MONITOR TO AUTO	
	161	32	C4TC	R4SC	TRANSMIT POWER TRANSFER DATA TO CLES ON CH 125	

DATE: MAY 18, 1971  
REVISION 029

## APOLLO/SATURN LAUNCH OPERATIONS

5251.60

PAGE

415

TEST NO. V-20060, APP D  
VEHICLE AS-510

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	161	33	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	34	C4TC	ALL	ALL STATIONS RETURN TO CH 121	
	121	35	C4TC	CLTC	S-IVB POWER TRANSFER TEST COMPLETE	
	151	36	CUTC	CUNP	VERIFY POWER TRANSFER COMPLETE & IU STAGE POWER ON	
	151	37	CUTC	RUBM	VERIFY BUS VOLTAGE AND CURRENT WITHIN LIMITS, READOUT VOLTAGES AND CURRENTS TO CLES ON CH 125	
		37-1		CUTC	*** NOTE DELAY NEXT STEP FOR 3 MINUTES	
	151	38	CUTC	CUNP	POWER TRANSFER TO EXTERNAL ON YOUR MARK	
	151	39	CUNP	ALL	3-2-1, MARK	
	151	40	CUTC	CUNP	VERIFY IU GROUND POWER ON AND POWER TRANSFER COMPLETE OFF,	
		40-1		CUDE	*** NOTE 0777 & 0779 OFF, 0781 ON	
	151	41	CUTC	CUNE	VERIFY POWER TRANSFER SATISFACTORY	
	151	42	CUTC	ALL	ALL STATIONS RETURN TO CH 121	
	121	43	CUTC	CLTC	IU POWER TRANSFER TEST IS COMPLETE	
	121	44	CLTC	ALL	ALL RECORDERS SUPPORTING POWER TRANSFER GO TO SLOW	
	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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP D1						
	123	49	CUFS	ALL	ALL FLIGHT CONTROL PERSONNEL RETURN TO CH 121	
	121	50	CUFS	CLTC	FLIGHT CONTROL SYSTEM TEST IS COMPLETE	

LV CDDT & CD, VOL II  
DATE: MAY 18, 1971  
REVISION 029

APOLLO/SATURN

PAGE 5251.60 417  
TEST NO. V-20060, APP E  
VEHICLE AS-510

APPENDIX E  
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PAD ACCESS DURING HAZARDOUS OPERATIONS  
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP E					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	IWS MANUAL ARMING TO OFF AND VERIFY	
		3-1		CWCP	*** NOTE BE PREPARED TO OPERATE P-1 BOOSTER PUMP ON AND LUT RISER SUPPLY VALVE OPEN IF PERSONNEL REQUIRE ACCESS TO ML TOWER,	
121		4	CLTC	C1TC	VERIFY IWS MANUAL ARMING IS OFF AND READY TO OPERATE IWS P-1 BOOSTER PUMP ON AND LUT RISER SUPPLY VALVE TO OPEN IF PERSONNEL ACCESS TO ML TOWER REQUIRED,	
121		5	CLTC	C1TC C2TC C4TC CUTC	GO TO YOUR STAGE TO CHANNELS AND ASSESS YOUR PNEU SYSTEMS FOR STABLE CONDITIONS,	
151		6	CUTC	ALL	PREPARE FOR RF SILENCE & CONTROLLED SWITCHING AND PAD ACCESS DURING HAZARDOUS OPERATIONS PER V-31062, APP I,	
171		7	C2TC	C2FC	PREPARE ENGINE ACTUATION SYSTEMS FOR CONTROLLED SWITCHING PER V-30029 (M020) TASK 62 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	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP E						
	121	9	CLTC	C1TC C2TC C4TC CUTC	VERIFY ALL PNEUMATIC SYSTEMS ARE STABLE & READY FOR CONTROLLED SWITCHING	
	188	10	CLTC	ALL	CONTROLLED SWITCHING IS IN EFFECT	
	121	11	CLTC	C1NE C2EV C4ES CUNE CSPF	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	TCF
		14			*****WARNING***** * THE FOLLOWING * * OPERATIONS WILL BE * * PERFORMED PRIOR TO * * CLEARING PERSONNEL ON * * TO ML TOWER BUT ONLY IF * * PERSONNEL REQUIRE * * ACCESS TO ML TOWER. * *****	
	181	14-1	C1TC	CWCP	P-1 BOOSTER PUMP ON AND LUT RISER SUPPLY VALVE OPEN.	



TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
APP E						
	121	15	CLTC	C1TC C2TC C4TC CUTC	CREW ENTERING PAD WILL ESTABLISH COMMUNICATIONS WITH CLTC AND MAINTAIN COMMUNICATIONS WHILE ON THE PAD	
		16			*****CAUTION***** * * THE FOLLOWING * * OPERATIONS WILL BE * * PERFORMED ONLY IF * * PERSONNEL HAVE BEEN ON * * AND ARE NOW CLEAR OF ML * * TOWER, * * *****	
	181	16-1	C1TC	CWCP	P-1 BOOSTER PUMP OFF AND LUT RISER SUPPLY VALVE CLOSE.	
		17		ALL	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	18	C2TC	C2FC	RE-ESTABLISH COUNT CONFIGURATION PER V-30029 (M020) TASK 62. REPORT WHEN COMPLETE.	
					*****END OF V-20060*****	

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HAYNES, B.	LV=GDC=4	5
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JONES, D. R.	LV=GDC=23	3
CLAY, R. P.	LV=GDC=24	4
DAVIS, L. R.	LV=GDC=25	3
SUMNER, K. W.	LV=GDC=26	2
MC CREARY, M. E.	LV=GDC=27	5
WHEELER, W. P.	LV=GDC=28	5
REGISTER, B. J.	LV=GDC=31	4
PERKINSON, J. A.	LV=GDC=32	3
ELY, G. W.	LV=GDC=33	5
EDWARDS, M. D.	LV=INS	1
CONWAY, J. D.	LV=INS=A	4
HUFFMAN, B.	LV=INS=1	1
FITZGERALD, J. J.	LV=INS=2	1
BIZZELL, J. S.	LV=INS=11	4
BLANCHARD, L. C.	LV=INS=12	2
WATT, J. D.	LV=INS=13	2
GRUNENFELDER, A. C.	LV=INS=14	2
RALEY, E. O.	LV=INS=21	13
JOROLAN, A. E.	LV=INS=22	5
FANNIN, L. E.	LV=MEC	3
SCOVILLE, D. A.	LV=MEC=1	1
HUMPHREY, J. T.	LV=MEC=2	13
CORN, G. F.	LV=MEC=3	15
DELA ROSA, H. J.	LV=MEC=11	6
ROBINSON, G. H.	LV=MEC=12	6
O'HARA, A.	LV=OMO	1
OGLESBY, T. L.	LV=OMO=1	1
YOUNG, R. E.	LV=OMO=3	5
WILLIAMS, M. C.	LV=PLN=1	1
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KING, J.	PA=P1B, KSC M7 657	1
WILLIAMS, F. E.	PM=KM=L	8
KIMERY, D.	PM=MO=E, MSFC	1
KEYES, P.	PM=SAT=A, MSFC	1
RANGE OPERATIONS	RCC, MU 5050	2
SELLS, H. R.	S&E=ASTN=50	4
JONES, B.	S&E=ASTR=51	5
SMITH, R.	S&E=CSE=L	5
MC GOUGH, J. T.	SF=OPN	1
HIGGINS, G.	SO=ENG=2	1
MOSES, C. S.	SO=OPN	1
PYLES, H. R.	SO=OPN=1	1
BRANTLEY, R. A.	SO=OPN=2	1
COOK, J. P.	SO=TS=402	1
PENLAND, D. T.	TS=NTS=2	3
BARFUS, J. N.	TS=TSM=5	2

RELEASED PROCEDURE DISTRIBUTION

RECEIVER	ADDRESS	COPIES OF VOLUME II
SUPPORT CONTRACTORS		
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AMES, M. H.	BEN 2100 (BENDIX)	3
ANDERSON, B. C.	VAB 3N9 (ROCKETDYNE)	7
COMPTON, H.	BEN=2350 (BENDIX)	5
CONRAD, H.	LCC 2P23 (CCSU)	5
DABLADO, L. A.	VAB 2N7 (ROCKETDYNE)	3
HARRIS, B. J.	TWA 2222, LCC 1P25	3
JANES, L. B.	VAB 3A8 (TECH)	2
LUCKETT, A. W.	LCC 1R14B (FEC)	2
O'DELL, H.	VAB 2585 (CCSD)	2
REED, B.	BEN 2500 (BENDIX)	1
SMITH, R. K.	VAB 10E7 (GE)	8
STAGE CONTRACTORS		
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CLYOD, L.	ZK=49 (NR)	2
FISCHER, G.	VAB 3M8 (NR)	135
BROWN, D.	VK=23, VAB 3L4 (MDC)	130
ROSS, J. C.	VAB 2D5 (IBM)	125
BOEING		
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YANCEY, J. L.	LCC 2P26, BOFO=41	10
ADAMS, R. H.	VAB 6D17, BOFL=21	10
BAGGETT, J. A.	VAB 6B15, BOFO=49	16
BROWN, W. C.	VAB 2D9, BOFM=05	1
CALVETTO, R. S.	VAB 6D15, BOFO=04	7
CATER, R. B.	VAB 2E7, BOFM=27	3
CHANDLER, J. W.	VAB 2L8, BOFL=10	3
DREYER, W. F.	VAB 2E7, BOFM=27	2
ECKHOFF, J. L.	VAB 2E7, BOFM=27	4
FRIEND, C.	VAB 2D9, BOFM=05	1
GEORGE, J. A.	VAB 2E9, BOFM=29	20
HARDCASTLE, H. S.	VAB 6R20, BOFO=11	1
HAWK, G. A.	VAB 3E8, BOFM=42	6
HENDERSON, H. H.	VAB 6R13, BOFO=13	14
HOLLAND, R. E.	LCC 2P15, BOFL=52	6
HOLMES, W. C.	VAB 2L2, BOFM=34	2
LOONEY, J. H.	VAB 6R21, BOFO=21	6
LUNDY, J. H.	VAB 6D16, BOFN=49	1
LYONS, B. P.	VAB 2E6, BOFN=55	18
MC CRANEY, J. L.	VAB 6R23, BOFM=02	7
MC INNIS, F. W.	VAB 7H13, BOFL=93	2
NEAL, E. T.	VAB 2L10, BOFM=39	20
O'NEIL, J.	VAB 2L9, BOFM=38	3
SACK, A.	VAB 6D18, BOFM=04	8
SAUBER, P. T.	VAB 3E9, BOFM=43	1
SCOTT, N. H.	VAB 3E9, BOFM=43	2
STEPHENS, C. H.	VAB 6D21, BOFM=66	5
TAYLOR, D.	VAB 3L15, BOFM=19A	2
WEBB, D. L.	VAB 2E12, BOFM=32	6
ZYZAK, E. E.	VAB 2L1, BOFM=33	1
YANCEY, J. T.	VAB 6D7, BOFM=60	9
BURKET, B. B.	K6=1045 RM 126	1
DAVIS, J.R.	JD=49 (HUNTSVILLE)	1
EDWARDS,	LS=03 MICHOU	3
FOSTER, E. T.	TA=01 MTF	1
GERHARDT, E. D.	HTVL JD=83	2
SIDES, C. A.	MICHOU LT=54	2
KIRBY, J. H.	MOBA FP=53	2
KUYKENDALL, M.	VAB 3L15C, BOFM=19C	1
LARSON, C.	O&C 2023, BOFN=96	1
CHAMBLEE, B.	HOSC, HA=04	1
OWENS, J. D.	VAB 2L3, BOFM=35	10
SCHINDLER, D. H.	HTVL AG=80	1
TRC FILE	VAB 3N1, BOFM=49	5
WFINGER, D. B.	O&C 2130, BOFN=96	1
SUBTOTAL		
15% EXTRA		1060
TOTAL		159
		1219

NOTE

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 TO ARRANGE CORRECTIONS,  
 CHANGES, ADDITIONS OR  
 DELETIONS, PLEASE SUBMIT AN  
 AVO TO LV=OMO=1, LCC 2R17.

DELIVER ALL EXTRAS TO LV=OMO=1,  
 DELIVER ORIGINALS TO BOFM=35 (J.C. REED)

LIST REVISED 06/23/71