

TEST NUMBER V-20060
REVISION NO. 027
EFFECTIVITY AS-509 & SUBS
RELEASE DATE JANUARY 21, 1971



**JOHN F. KENNEDY
SPACE CENTER**



HEROICRELICS.ORG

**RELEASED
FOR AS 509**

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

**VOLUME II OF III
ASSEMBLED FOR CD**



**Prepared For
LAUNCH VEHICLE OPERATIONS**

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

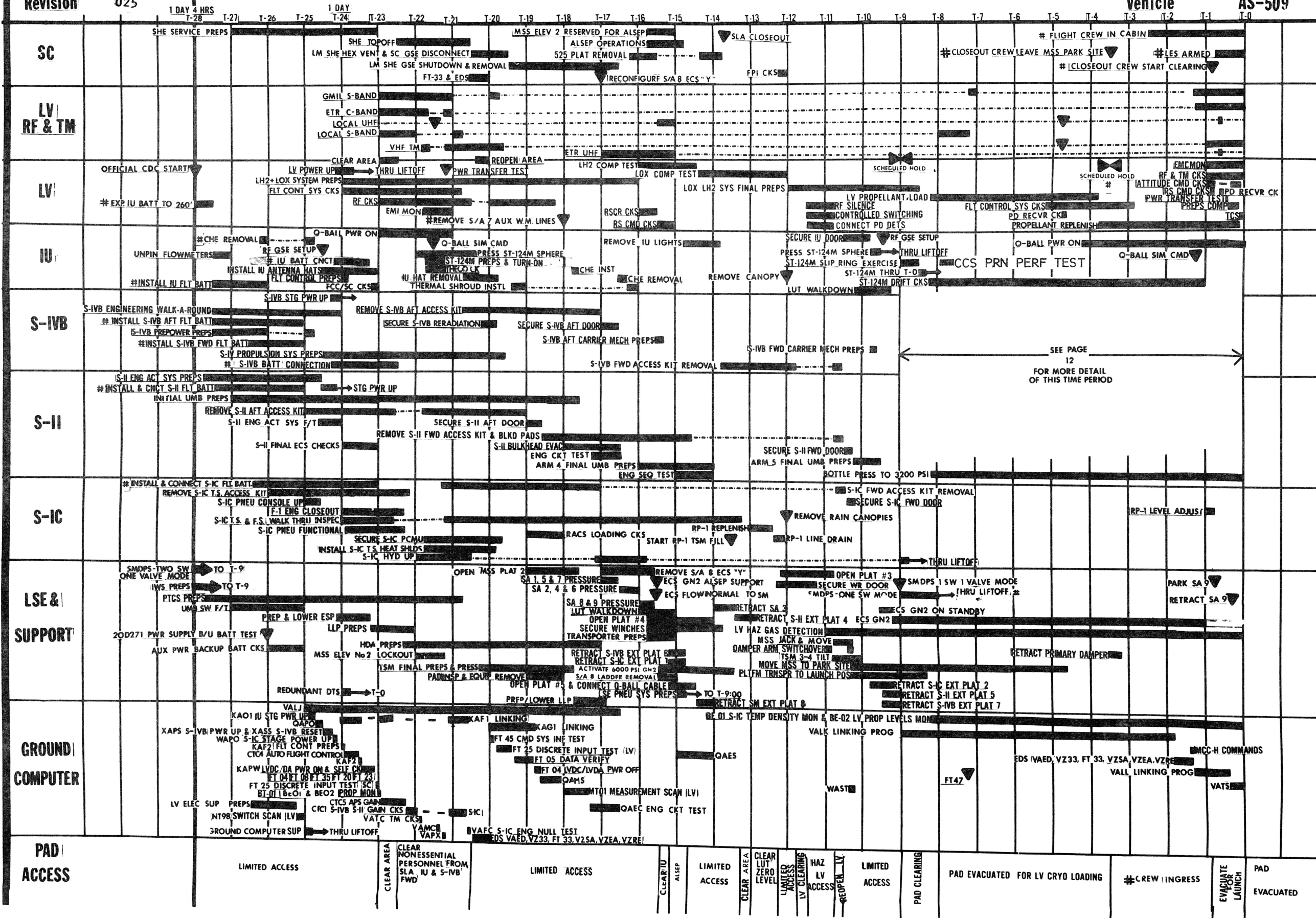
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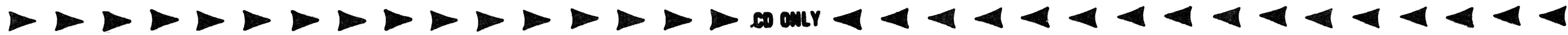
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LV COUNTDOWN

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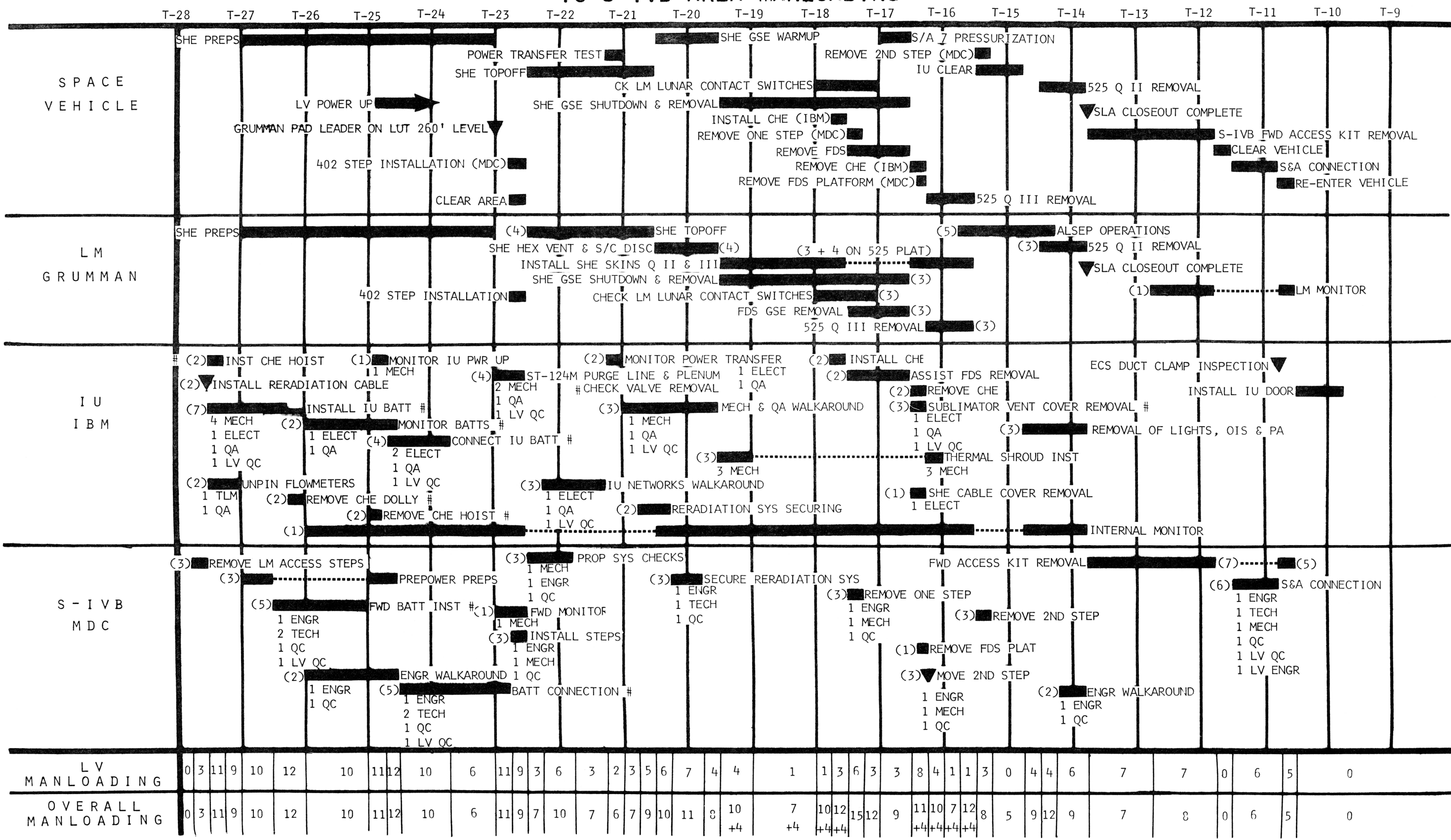
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APOLLO/SATURN
LAUNCH OPERATIONS

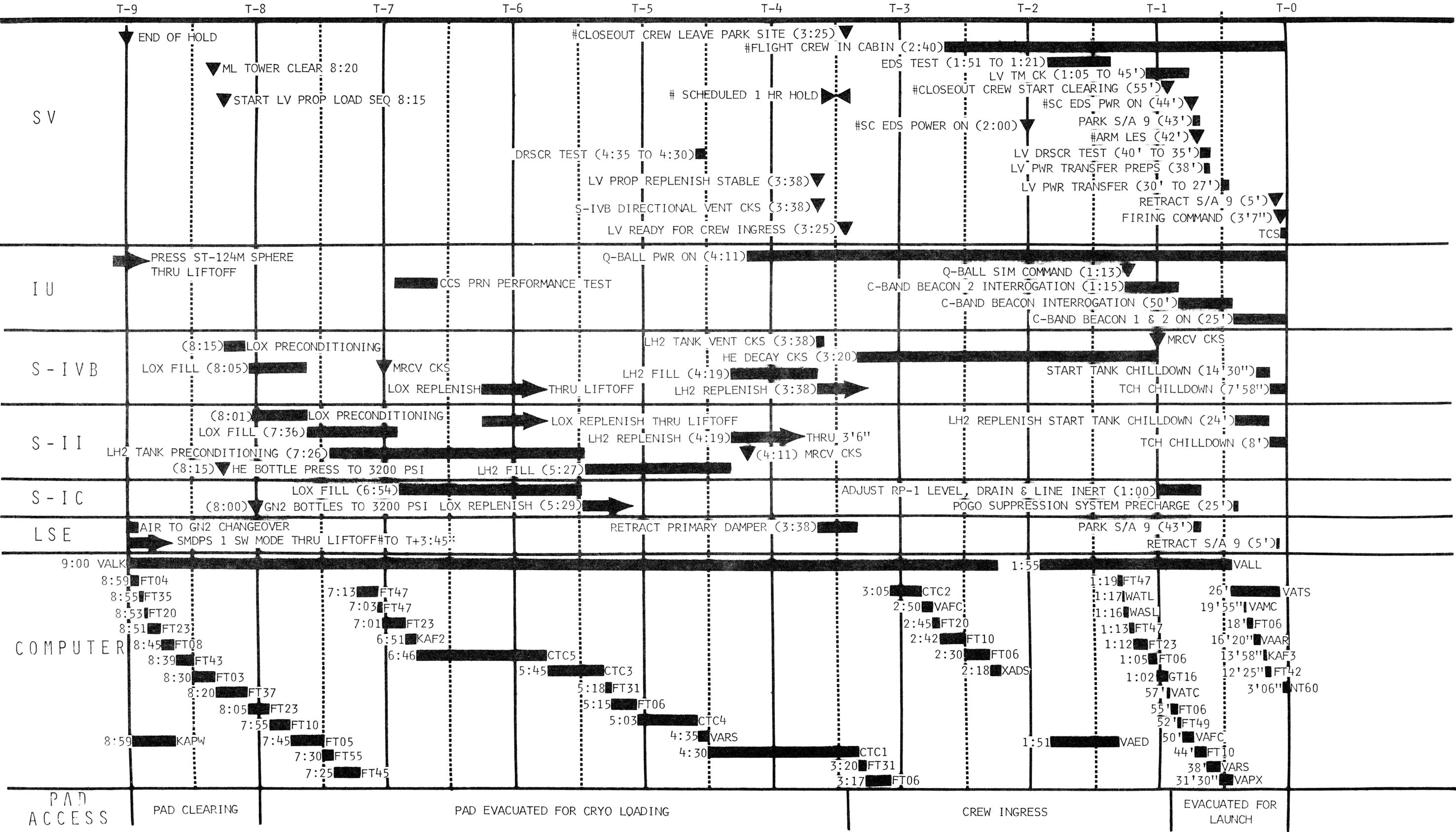
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IU S-IVB AREA MANLOADING

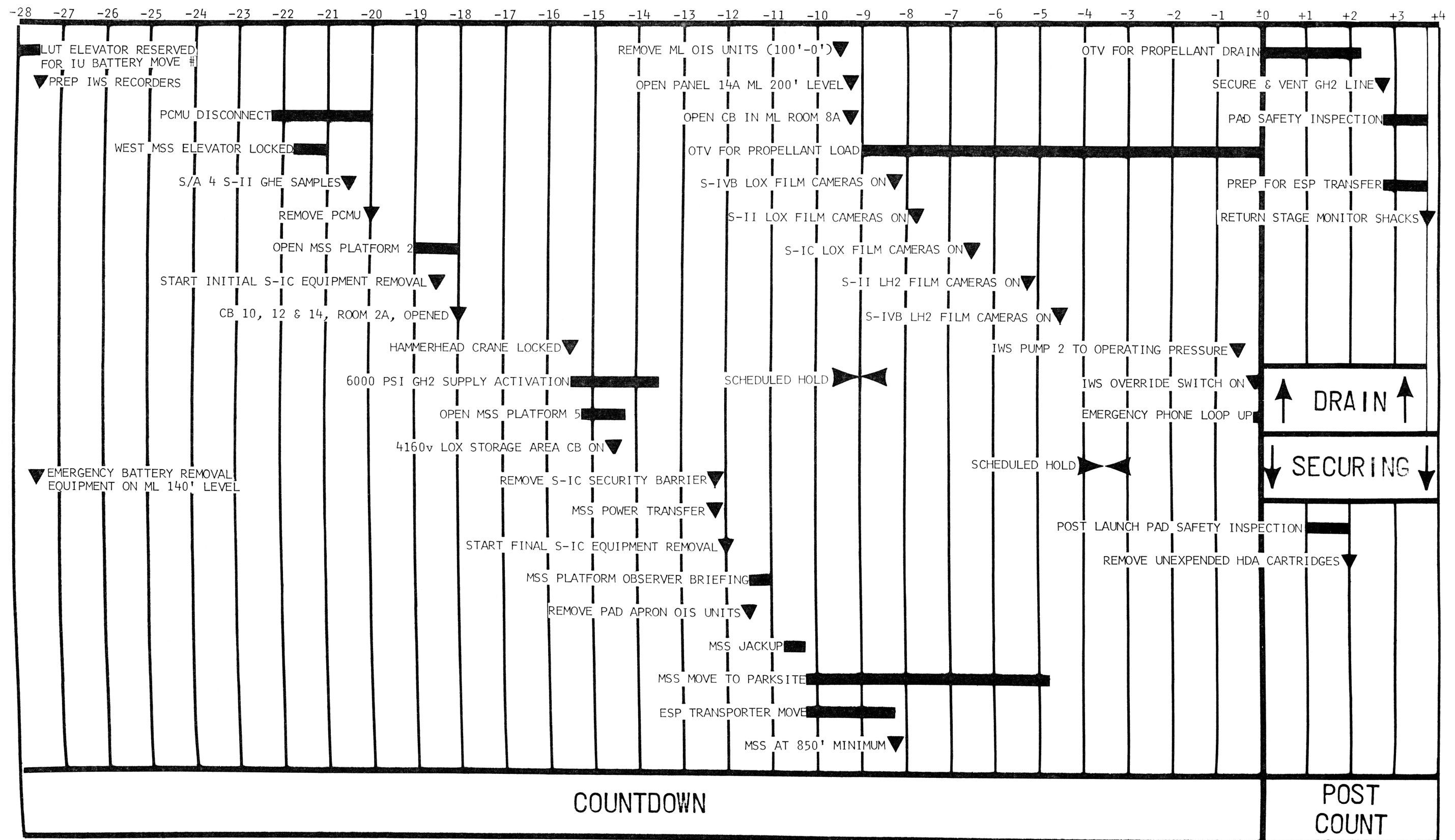


LV CDDT & CD AFTER T-9 HR HOLD

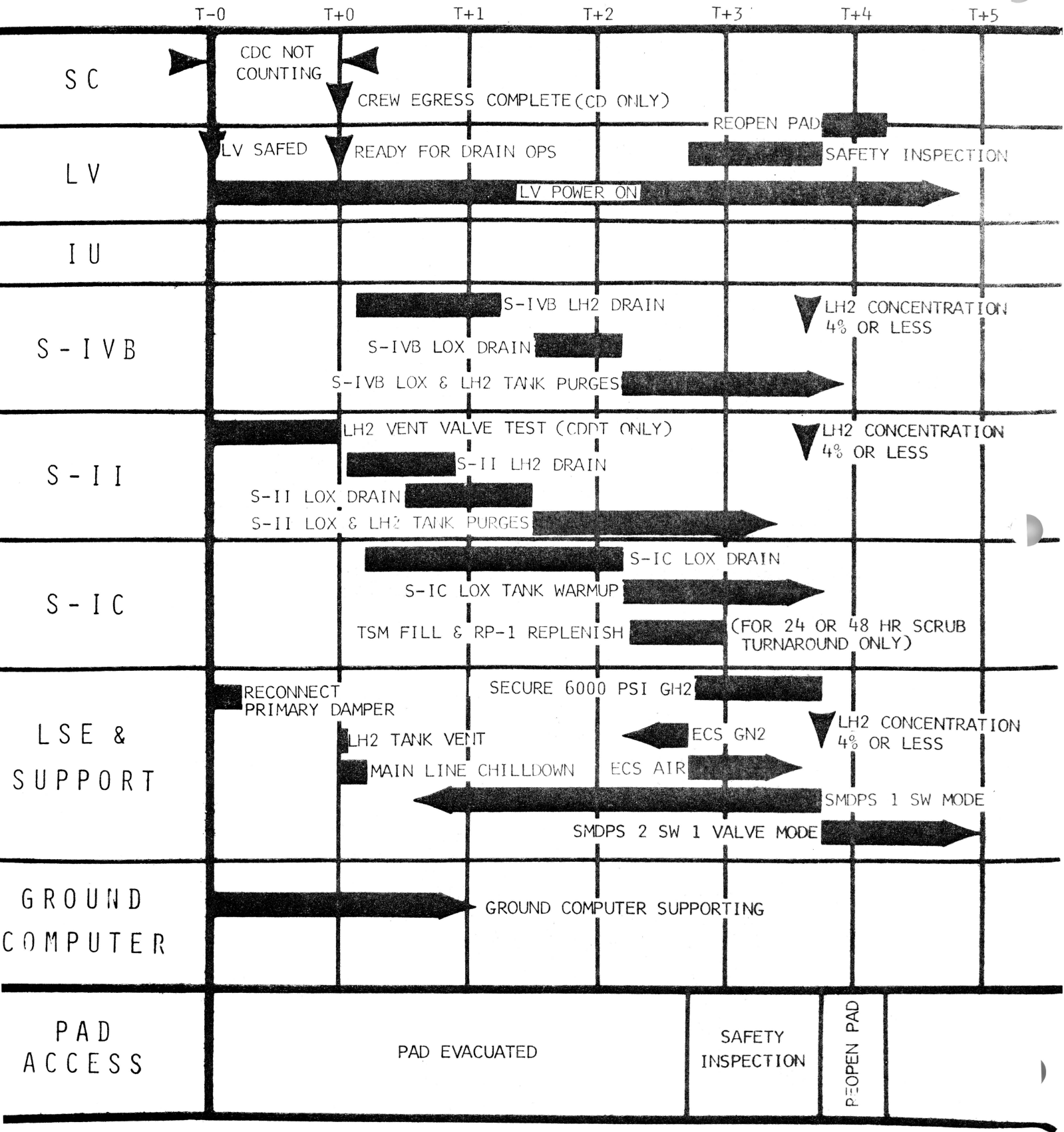


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LV CD SUPPORT REQUIREMENTS



LV DRAIN OPERATIONS



LAUNCH OPERATIONS COMMUNICATIONS

COMPLEX 39 PA SYSTEM: -----

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

INTERCOMMUNICATIONS: -----

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

		ACTIVE -----	MONITOR -----
S-IC TEST CONDUCTOR (TBC)	C1TC	181	121
S-II TEST CONDUCTOR (NR)	C2TC	171	121
S-IVR TEST CONDUCTOR (MDC)	C4TC	161	121
IO 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

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)
ELSR (LV CIF 307 COOR)

S-1C:

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

S-II:

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

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)

S-IU:

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

DLO:

CVTS (TEST SUPERVISOR)

SUPPORT:

BCFM (LCC MEAS.)
BCWC (FIREX CONTROL)

L10C S-C GROUND HYDRAULICS SUPPLY & CHECKOUT
L11HC MOTOR CONTROL CENTER S-C GND WYD SUPPLY & C/O
L11C S-C INSTRUMENTATION ENGINEER (INTL)
L11J NALINDING ORDNANCE ENGINEER, MULTITANK, S-C
L11L LTR SUPERVISOR
L12C LTR NETWORKS ENGR (S-C STAGE)
L13C S-C ORDNANCE ENGINEER
L13S GROUND POWER POWER SUPPLY ENGINEER
L13U S-C REFILL UNIT
L13S RELAY AND/OR SEQUENCE RACK
L15H STAGE MOTOR/OPERATIONS COORDINATOR
L15H WANDERING ORDNANCE ENGINEER, THRUST STRUCTURE, S-C
L15H S-C THRUST STRUCTURE
L15H POWER DISTRIBUTION RACKS (ROOM 8B)
L20R S-C 1 RELAY RACKS 11 THROUGH 31 (ROOM 8B)
L4C LTR CONTROL ELECTRONIC ENGINEER
L4R JUNCTION RACKS
L4R S-C 1V POWER RACKS (ROOM 7B)
M0R GUID & NAV RIGHT SIDE UNIT 4, SC
M0S GUID & NAV UNIT 34, SC
M5TC NASA S-C TEST CONDUCTOR
N7PE TEST PROJECT ENGINEER
P0ME ENVIRONMENTAL HEALTH ENGINEER
P0ST ENGINE SERVICE PLATFORM TRANSPORTER
P0ME PAD W/AS ENG. ENGINEER
P0S LVO-433 OSE & M
P10U LVO-434 S-C
P10I LVO-434 S-C
P10C LVO-434 S-C
P10A LVO-433 S-1V
P0F1 EHC MONITOR INFORMATION SYSTEM
P0U1 FU PAD LEADER
P0VS ISM PAD SAFETY
P0TS TEST SUPERVISOR, PAD
P10S S-C GROUND LEV. ENGINE SERVICING
R4S1 LSC FIRING ROOM NETWORKS ENGR
R4C2 COUNTDOWN (LCC)
R4S OYAS OSE RACKS
R0R3 DES-3 SYSTEM ENGINEER
R0TS DATA TRANSMISSION SYSTEM ENGINEER
R0SC L/V & E RECORDERS
R0C2 S/C STRIP CHARTS
R0SC LSC STRIP CHARTS
R0E DES-3 RECORDERS
R0R LOR LSC NETWORKS ENGINEER
R0SC TSM & SVA RECORDERS
R0TC PROPELLANT D.C. POWER - LCC
R0S RWS S/C STRIP CHARTS
R0SC RANGE SAFETY OFFICER STRIP CHARTS
R0U1 1U STRIP CHARTS
R0SC S-C STRIP CHARTS
R11R LCC RACKS PATCH DIST.
R1NE S-C 1V STRIP CHARTS
R0C S-C STRIP CHARTS
R0P S-C 1 DIGITAL PRINTER
R0M1 S-C 1V ENGINE HEADLINE ENGINEER
R0SC STRIP CHARTS
R4E1 S-1V GROUND BUSS E & I RECORDERS
R4N1 S-1V HYDRAULIC INSTRUMENTATION
R4P1 S-1V PROPELLANT STRIP CHARTS
R4U S-1V PU STRIP CHARTS
R4SC STRIP CHART MEMBERS
SCD S/C COMMANDER
S0O SUPERINTENDENT OF RANGE OPERATIONS
S0I S-C INSTRUMENTATION INSPECTOR
SURF 1U RF STRUCTURE
S0TH 1U TH STRUCTURE
S0VE 1U VEHICLE MECHANICAL
S0VUM 1U VEHICLE MECHANICAL
S4C S-1V CONTROL ELECTRONICS ENGINEER
S4FC S-1V FUEL CONTROL ENGINEER
S4H S-1V HYDRAULICS ENGINEER
S4IE INSTRUMENTATION ENGINEER
S4M1 APT STRUCTURAL/MECH ENGR
S4M2 F4U STRUCTURAL/MECH ENGR
S4M S-1V MOBILE LAUNCHER STRUCTURAL/MECHANICAL ENGINEER
S4C S-1V DES-3 STRUCTURE STRUCTURAL/MECH ENGR
S4SC STRUCTURE MEASURING STATION
S4S S-1V ORDNANCE ENGINEER
S4PC S-1V PAD CODE
S4P S-1V PROPELLENT ENGINEER
S4S S-1V SAFETY ENGINEER
S4C S-1V STRUCTURE TH ENGINEER
U4B LSE ELECT ENG - TOWEL
U4B SERVICE ARM #8 SYSTEM
U0U GROUND SUPPORT COOLING UNIT
U4C PNEUMATIC CONSOLE
U0VM 1U MECHANICAL, UNLOADING TOWER
U1N FORWARD SKIPT ELECTRICAL NETWORKS
U1T 1U FORWARD SKIPT TOW & RF
U1M S-11 AFT MONITOR
U1R AIRBORNE SYSTEMS ENGINEER
U2A1 S-11 AIRBORNE NETWORKS PAD
U2A2 S-11 AIRBORNE NETWORKS AFT
U2EC ENVIRONMENTAL CONTROL ENGINEER
U2F S-11 ELECTRICAL CONTROL ENGINEER
U2FE S-11 FLIGHT CONTROL
U2FH S-11 FWD MONITOR
U2HC ORDNANCE ENGINEER
U2IE S-11 INSULATION ENGINEER
U2J ENGINE SYSTEMS ENGINEER
U1F FLIGHT CONTROL COORDINATOR
U4M S-11 HYDRAULIC LEADMAN
U4L S-11 LTR NETWORKS ENGINEER
U2I PREPRESSURIZATION COORDINATOR
U2H MECHANICAL AND HYDRAULICS ENGINEER
U2NO S-11 MECHANICAL ORDNANCE ENGINEER
U2NU MECHANICAL/HYDRAULIC ENGINEER
P0E PROPELLANT/PRESSURIZATION ENGINEER
U2P PROPELLANT FILL ENGINEER
U2P PROPELLANT MANAGEMENT ENGINEER
U2M PURGE & VACUUM ENGINEER
U2OC M/L QUALITY CONTROL REP
U2S1 S-C PAD LEADER
U2S1 STRUCTURES AND INSULATION ENGINEER
U2S SAFETY ENGINEER
U2TH TH ENGINEER
U2A4 PNEUMATIC CONSOLE, ST-49A
U4A6 INSULATION PURGE PNEUMATIC CONSOLE, ST-49A
U4A8 S-1V AFT MONITOR
U4A7 S-1V FORWARD MONITOR
U4E PROPELLSION ENGINEER
V0M S-11 MEASURING STATION
V0TF RF CHAND RADAR & CCS CHECKOUT
V1M MEASURING OSE STATION
V1S MEASURING OSE STATION
V1S S-1V MEASURING STATION
Z1 ABOARD MON VISUAL OBSERVER (CX 20, UCA OR UCS)
Z2 ABOARD MON VISUAL OBSERVER (CX 34, UC16)
Z3 ABOARD MON VISUAL OBSERVER (CX 37, UC16 OR UCS)

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
CD ONLY						
8 HRS 20' 0"		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)	***
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	CDDT ONLY	*
		10		C2NP	CDDT ONLY	*
171		11	C2TC	C2FC	MANUALLY CYCLE INDIVIDUAL AUX HYDRAULIC PUMPS ON AND OFF TO MAINTAIN SYSTEM OIL TEMP WITHIN 0 TO 65 DEG F ENVELOPE PER V-30029 (M020) TASK 36. COORDINATE ALL SWITCH ACTIONS WITH C2TC AND CUF5 PRIOR TO EXECUTION.	
181		12	C1TC	CPRK	RECALL BE02 AT A 10 SECOND SCAN RATE AND ALL STAGES OPTION.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 18' 0"	171	1	C2TC	C2AE	START TURBOPUMP PURGE PER V-30029 (M020) TASK 41,	
		2			DELETED	N-219-136
8 HRS 15' 0"	121	1	CLTC	C1TC	YOU HAVE CLEARANCE TO START CROSS COUNTRY LINE CHILLDOWN,	
		1-1			NOTE ----- FROM NOW THRU T +0 THE FOLLOWING STATIONS REQUIRE ACCESS TO THE NOTED TV CAMERAS CSA4 - CAMERAS 15, 16, 36 CSA5 - CAMERAS 15, 20, 21, 36 CSA6/7 - CAMERAS 20, 21, 22, 24, 36	
	121	2	C1TC	CLTC	LOX FILL COMMAND HAS BEEN GIVEN (AUTOMATIC PROPELLANT LOADING INITIATED)	
	121	3	CLGK	CLTC	FT37 COMPLETE, REPEATABLE SIM FLIGHT IS IN PROCESS,	
	261	4	CLM4	BOSC	REQUEST PRESENT GH2 BATTERY PRESSURE	TCPI
8 HRS 10' 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	

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APOLLO/SATURN LAUNCH OPERATIONS

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
8 HRS 10' 0"						
	171	2	C2RP	C2TC	ACCUMULATOR FILL SYSTEM PURGE COMPLETED,	N-219-136
	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 * * *****	
	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.	

APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 51' 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	CLTC	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	TOPI
	121	7	CLTC	C1TC	PAD IS CLEAR FOR S-IVB LOX FAST FILL	
	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 0' 0"						
	181	1	C1TC	C1NE	START S-IC LCC ESE CLOSEOUT PER V-21035. REPORT WHEN COMPLETE.	
	111	2	CLTC	CVTS	ALERT MSTC THAT THE PRN MODULATION OF CSM S-BAND UP-LINK WILL BE DISABLED FOR CCS CHECKS IN 5 MINUTES FOR APPROX. 20 MINUTES.	TCPI
7 HRS 55' 0"						
	151	3	CUTC	BGCC	VERIFY/MOUNT VLA DATA LOAD TAPE ON IODC 1-3. REPORT WHEN COMPLETE.	FT05
	121	1	CLGK	CLTC	FT23 COMPLETE	
	121	2	***	CLGK	REQUEST & EXECUTE FT10 (LADDER OUTPUT TEST FULL RANGE OPTION),	***
	111	3	CLTC	CVTS	VERIFY CLEARANCE FOR IU CCS RF SYSTEM,	TOPI

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 7 HRS 55' 0"	111	4	CLTC	CVTS	REQUEST GMIL VERIFY CCS CARRIER IS OFF,	TCPI
	121	5	CLTC	VURF	ENABLE LOCAL CCS CARRIER & VERIFY,	
	121	6	CLTC	CUIP	CCS TRANSPONDER POWER-ON,	
	121	7	CLTC	VURF	VERIFY CCS IN LOCK,	
	121	8	CLTC	CUNP	VERIFY SWITCH SELECTOR INHIBIT OFF	
	121	9	CLTC	CUSW	ISSUE IU OCTAL 007 (OMNI XMT)	
	121	10	CLTC	CUIP	COMMAND DECODER POWER-ON,	
	111	11	CLTC	CVTS	LOCAL CCS CARRIER IS ON, CCS TRANSPONDER AND COMMAND DECODER ARE ON, (IU COMMAND SYSTEM IS DISABLED)	TCPI
	121	12	CLTC	VURF	START CCS RF CHECKS PER V-20069,	
	111	13	CLTC	CVTS	REQUEST GMIL DISABLE CSM S-BAND UP-LINK PRN MODULATION, AND VERIFY. (FOR APPROX 20 MIN)	TCPI
- 7 HRS 54' 0"	171	1	C2PM	C2TC	S-11 LOX TANK CHILLDOWN IN PROGRESS	
	171	2	C2TC	C2AE C2EC C2RP	START THRUST CHAMBER JACKET PURGE PER V-30029 (M020) TASK 42 AND SECURE LOX DOME, GG, HE INJ AND TURBO PUMP PURGES,	
		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)	***

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APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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,	
	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),	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<div style="text-align: center;"> ▶ ▶ ▶ ▶ ▶ ▶ CD ONLY ◀ ◀ ◀ ◀ ◀ ◀ </div>						
7 HRS 35' 0"						
	121	2	CLTC	ETMS BTMC	TM RECORDERS ON	(FT55)
	121	3	CLTC	ECOP	START REAL TIME REDUCTION PROGRAM	(FT55)
	121	4	CLTC	VURF	VERIFY READY FOR CSM UP-LINK PRN MODULATION.	
	111	5	CLTC	CVTS	REQUEST GMIL BRING UP PRN MODULATION ON CSM S-BAND UP-LINK.	TCPI
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	
	161	8	C4PS	C4SP	CLOSE COLD HE SUPPLY	
	161	9	C4PS	C4HC	INCREASE HE SUPPLY PRESSURE TO 3100 +/- 100 PSIA,	
		9-1		C4HC	*** NOTE PRESSURE TO BE MAINTAINED FOR 1 HOUR MINIMUM	
	161	10	C4PS	R4PS	REPORT WHEN AMBIENT SPHERES ARE STABILIZED	
	161	11	C4PS	C4AL	OPEN 3000 PSI SUPPLY	#
	161	12	C4PS	R4PS	MONITOR APS SYSTEMS FOR STABILIZATION	#

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APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 26' 0"	121	1	CLTC	CLTC	STARTING S-II LH2 PRECONDITIONING	
7 HRS 25' 0"	121	1	CLGK	CLTC	FT55 COMPLETE	
	121	2	***	CLGK	REQUEST & EXECUTE FT45 (CMD SYS - INTERFACE)	***
7 HRS 20' 0"	121	1	CLGK	CLTC	FT45 COMPLETED	
	121	2	CLTC	CUNP	ISSUE IU STAGE LOGIC RESET	(FT47)
	111	3	CLTC	CVTS	IU COMMAND SYSTEM IS DISABLED, REQUEST USB CCS CARRIER ON AND VERIFY	(FT47) TCPI
	121	4	CLTC	VURF	DISABLE LOCAL CCS CARRIER & VERIFY	(FT47)
	111	5	CLTC	CVTS	LOCAL CCS CARRIER IS DISABLED, REQUEST GMIL VERIFY S-BAND CCS IS IN LOCK,	TCPI (FT47)
	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
		8			2 SEQUENCES DELETED	N-219-136
	171	10	C2TC	C2RP	LH2 PREVALVES TO CLOSE, HOLD, PLACE RECIRC RESET TO RESET, THEN INHIBIT. RELEASE AND PLACE LH2 PREVALVES TO INHIBIT.	N-219-136
	171	10-1		C2RP	*** NOTE ACCUMULATOR BLEED VALVE OPEN - ON	
		11			DELETED	N-219-136

APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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)	
	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,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 51' 0"	181	1	C1TC	C1PC	OPERATE ENGINE THERMAL CONDITIONING PURGE AS REQUIRED TO MAINTAIN ENGINE TEMPERATURE	
7 HRS 31' 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	BTMS 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
	111	8	CLTC	CVTS	HOUSTON PREFLIGHT COMMAND SYSTEM TEST IS COMPLETE,	TCPI
7 HRS 11' 0"	121	1	***	CLGK	REQUEST & EXECUTE FT23 (LVDC SECTOR SUM CHECKS).	***
	181	2	C1TC	ALL	PERSONNEL SUPPORTING LOX LOADING GO TO CH 133 ACTIVE,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
7 HRS 01 00"						
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 AND VERIFY RELAYS RESET IND OFF AND MRCV OPEN CMD ON IND ON,	
161		5	C4PS	C4PU	MRCV CMD NO, 2 OPEN,	
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,	
		8-1		C4PU	*** NOTE MRCV OPEN CMD ON IND OFF,	
161		9	C4PS	C4PU	MRCV CMD NO, 2 CLOSE,	
		9-1		C4PU	*** NOTE RELAYS RESET IND ON,	
161		10	C4PS	R4PS	VERIFY MRCV CLOSES,	
161		11	C4PS	C4PU	MRCV CMD NO, 1 OPEN THEN NO, 2 OPEN, DELAY 5 SECONDS, THEN MRCV CMD NO, 1 AND NO, 2 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,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
6 HRS 55' 0"	121	1	CLTC	CDFS	START FLIGHT CONTROL SYSTEM PREPS ON CH 123	(KAF2)
	123	2	CDFS	CUSP CUGA	PLACE ALL FCC, CCIS AND EDS/CRG PANEL SWITCHES TO AUTO,	(KAF2)
6 HRS 54' 0"	181	1	C1TC	C1PC	LOW LOX DOME PURGE SWITCH TO AUTO	(KAF2)
	181	2	C1TC	C1CS	POSITION LOX LEVEL SIMULATE SWITCHES TO WET WHEN FIRST INDICATION OF SENSORS WET IS NOTED, WHEN C1LO HAS TERMINATED LOX BUBBLING, POSITION LOX LEVEL SIMULATE SWITCHES TO AUTO AND VERIFY LOX LEVEL DRY INDICATIONS ARE OFF,	
	121	3	C1TC	CLTC	S-11 LOX LOADING TO 99% IS COMPLETED AND STARTING S-1C LOX LOADING,	
	111	4	CLTC	CVTS	STARTING S-1C LOX LOADING,	TCPI
		4-1			NOTE ----- FOR THE NEXT 1 HR AND 25 MIN, CSA1 REQUIRES ACCESS TO TV CAMERAS 7, 11 & 12.	
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)	***

APOLLO/SATURN LAUNCH OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
6 HRS 51' 0"	123	4	CDFS	CUSP	FLIGHT CONTROL COMPUTER SYSTEM POWER - ON	
6 HRS 47' 0"	121	1	CDFS	CLTC	KAF2 COMPLETE,	
	121	2	CLTC	ALL	THE FOLLOWING STATIONS SWITCH TO CHANNEL 123 TO PREPARE FOR CTC5; CLGK CLFK CUGA CUCR E4FC CUFE C4FC CUSP C4FS C4NP	(CTC5)
	123	3	CDFS	CLGK	VERIFY READY TO SUPPORT CTC5,	(CTC5)
	151	4	CDFS	BGCC	MASK THE FOLLOWING DISCRETES: \$FUNC SE 935-38 MMSK (MDI'S 0888 THRU 0911)	(CTC5) I-167- 108
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,	
	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,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 6 HRS 30' 0"					CD ONLY	
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	
- 5 HRS 55' 0"						
121		1	CLTC	C1TC C2TC	CDDT ONLY	*A
181		2	C1TC	CCL0	CDDT ONLY	*A
171		3	C2TC	C2PM	CDDT ONLY	*A
- 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 THRU 0911)	I-167- 108

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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	
	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	C1TC	C1TC	START S-II LH2 LOADING	
	111	4	C1TC	CVTS	STARTING S-II LH2 LOADING,	TOPI
		5			NOTE ----	
					C2TV REQUIRES CONTROL OF OTV CAMERAS 9, 16, 34 & 35 DURING LH2 LOADING OF S-II STAGE, VIDEO TAPE REQUIRED AS DIRECTED BY C2TV	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5 HRS 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)	***
5 HRS 15' 0"						
	121	1	CLGK	CLTC	FT31 COMPLETE	
	121	2	***	CUPC	REQUEST & EXECUTE FT06 (DRIFT CHECKS OPTION)	***
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 CRFC C4HY CUSP CLFK CUFE C1FE V2MS R4HY CRFE CUPS CUGA R2SC C4FS C4FC	(CTC
	123	2	CUPS	C1FE	VERIFY READY TO SUPPORT CTC1	(CTC4)
	123	3	CUPS	CRFC	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 CRFC PRIOR TO S-11 PROGRAM EVENTS SO R2SC AND V2MS CAN BE COMMANDED TO SWITCH TO FAST SPEED ON RECORDERS.	
	123	4	CUPS	CRFE	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)

LV CDDT & CD, VOL II
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APOLLO/SATURN LAUNCH OPERATIONS

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 TEST NO. V-20060, VOL II
 VEHICLE AS-509

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
5 HRS 51 00						
	151	7	CUES	CUES	VERIFY EDS AUTO ABORT BUS DE-ENERGIZED AND WILL REMAIN OFF UNTIL COMPLETION OF CTC4	(CTC4)
	123	8	CUES	CUGA	CONTROL EDS RATE GYRO SYSTEM POWER ON,	(CTC4)
5 HRS 51 00						
	171	1	C2PM	C2TC	RECIRC ENABLE ON, (LH2 10% MASS),	
	171	2	C2TC	C2RP	RECIRC RESET TO RESET THEN INHIBIT	
	171	3	C2TC	C2RP	VERIFY LH2 PREVALVES OPEN - ON AND RECIRC, RESET - ON,	
		3-1		C2RP	*** NOTE RECORD LH PREVALVE CRYO OPENING TIME IN APPENDIX OF V-30029 (M020) MAXIMUM ALLOWABLE IS 1 SEC,	
	171	4	C2TC	U2SE	S-II LH2 FILL HAS STARTED, RELEASE STAGE ENTRY ONLY RED CREW MEMBERS AND LIFE SUPPORT,	
	261	5	C2TC	BOSC	S-II LH2 FILL HAS STARTED, BENDIX LIFE SUPPORT FOR S-II STAGE ENTRY IS NO LONGER REQUIRED, (LVR-2 & LVR-7),	TOPI
		6			DELETED	N-219-136
		7			DELETED	N-129-136
5 HRS 31 00						
	121	1	CUPC	CLTC	FT06 COMPLETE	
	123	2	***	CLFK	REQUEST & EXECUTE CTC4 NORM OPTIONS (CRG CALIB TEST; P, Y & R AXES; POS & NEG; BI-LEVEL PKG; COMPARATOR TEST & RATE EXCESSIVE TEST), REPORT WHEN COMPLETE,	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 5 HRS 0' 0"					CD ONLY	
		1			DELETED	N-219-136
	121	2	CLTC	BRFS	VERIFY RF SELECT TO STANDBY AND REMOTE MONITOR TO SIG GEN 1.	(VARS)
	181	3	C1TC	CCLO	CDDT ONLY	*A
	121	4	C1TC	CLTC	CDDT ONLY	*A
- 4 HRS 40' 0"					DRSCR CLOSED LOOP TEST -----	
	111	1	CLTC	CVTS	VERIFY CLEARANCE TO BRING UP LOCAL COMMAND CARRIER (PROTECTION REQUIRED)	TCPI
	111	2	CLTC	CVTS	REQUEST SRO SWITCH TO CHANNEL 121 TO SUPPORT DRSCR CLOSED LOOP TEST USING FLIGHT CODE PLUGS	TCPI #
	111	3	CLTC	CVTS	CDDT ONLY	TCPI *
	111	4	CLTC	CVTS	REQUEST CPSS RELEASE DESTRUCT SYSTEM KEY TO CLVN	TCPI
	121	5	CLTC	CLVN	OBTAIN DESTRUCT SYSTEM KEY FROM CPSS	
	121	6	CLTC	C1DP C2DP C4DP	VERIFY ALL SWITCHES IN AUTO POSITION EXCEPT: PD RSCR'S ENABLE - OFF SYSTEM STATUS SW - SAFE S & A SWITCH - SAFE	(VARS)
	121	7	CLTC	BTMC	TM TAPE RECORDER ON	(VARS)
		7-1		BTMC	*** NOTE RELOAD AT COMPLETION OF DRSCR TESTS.	

LV CDDT & CD, VOL II
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APOLLO/SATURN LAUNCH OPERATIONS

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 TEST NO. V-20060, VOL II
 VEHICLE AS-509

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 40' 0"						
	121	8	CLTC	RRSC	VERIFY DRSCS RECORDERS ON,	(VAR)
	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,	N-219-136
	171	12	C2TC	C2RP	START LH2 RECIRC PUMP TEST PER V-30029 (M020) TASK 61. REPORT WHEN COMPLETE,	N-219-136
4 HRS 36' 0"						
	121	1	***	C1PC	LOW LOX DOME PURGE ON	*** (CTC1)
4 HRS 35' 0"						
	121	1	C1FS	CLTC	CTC4 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	***	C1PK	REQUEST & EXECUTE VARS (DRSCR TEST) (T-3 HR OPTION).	***
	121	4	VAR	C1DP C2DP C4DP	VERIFY S&A SAFE AND RSCR'S 1 & 2 PD BLOCKED - ON	
	121	5	C1PK	CLVN	DESTRUCT SYSTEM TO ENABLE,	
		5-1		C1DP C2DP C4DP	*** NOTE SAFETY BUS ON,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 35' 0"						
	121	6	C1PK	C1DP C2DP C4DP	SYSTEM STATUS SWITCH - OFF	
	121	7	VAR5	BRFS	SIG GEN SELECTOR ON AND VERIFY REMOTE MONITOR TO HYBRID	
	121	8	VAR5	C1DP C2DP C4DP	RSCR'S 1 & 2 - INTERNAL AND VERIFY	
	121	9	VAR5	B1RF B2RF B4RF	VERIFY RSCR LIMITER VOLTAGES OK	
		9-1		CRSS	*** NOTE LIMITER VOLTAGES RECEIVED,	
	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	AS SOON AS RSCR'S 1 & 2 CUTOFF INDICATIONS GO OFF, SIMULTANEOUSLY SWITCH EBW'S 1 & 2 TO EXTERNAL THEN AUTO	
	121	12	C1PK	CLTC	READY FOR SRO CUTOFF COMMAND	
	121	13	CLTC	RRSC	RECORDERS - FAST SPEED	
	121	14	CLTC	SRO	ON YOUR MARK SEND CUTOFF ON CLOSED LOOP LINKS FOR 3 SECONDS	
	121	15	SRO	ALL	3-2-1 - MARK	
		16	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
4 HRS 35' 0"						
121		17	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		18	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 WERE INTERNAL & CHARGED WHILE RSCR'S 1 & 2 CUTOFF INDICATIONS WERE ON	
		18-1		CRSS BRFS	*** NOTE CUTOFF RECEIVED	
		18-2		CRSS	*** NOTE ALL EBW'S WERE CHARGED WHILE CUTOFF WAS ON	
121		19	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 EXTERNAL & NOT CHARGED	
		19-1		CRSS	*** NOTE ALL EBW'S NOT CHARGED	
121		20	VAR5	C1DP C2DP C4DP	VERIFY S&A DEVICE SAFE AND RSCR'S 1 & 2 PD BLOCKED	
121		21	C1PK	CLTC	READY FOR SRO PD COMMAND	
121		22	CLTC	RRSC	RECORDERS - FAST SPEED	
121		23	CLTC	SRO	ON YOUR MARK SEND PD COMMAND ON CLOSED LOOP LINKS FOR 1 SECOND	
121		24	SRO	ALL	3-2-1 - MARK	
121		25	CLTC	RRSC	RECORDERS - SLOW SPEED	
121		26	VAR5	C1DP C2DP C4DP	VERIFY RSCR'S 1 & 2 PD RECEIVED	
		26-1		CRSS BRFS	*** NOTE PD INDICATIONS RECEIVED	
121		27	VAR5	C1DP C2DP C4DP	VERIFY EBW'S 1 & 2 DID NOT CHARGE	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 4 HRS 35' 0"					CO ONLY	
		27-1		CRSS	*** NOTE ALL EBW'S DID NOT CHARGE	
121		28	VARS	C1DP C2DP C4DP	RSCR'S TRANSFER - EXTERNAL THEN AUTO AND VERIFY RSCR'S OFF.	
		28-1		B1RF B2RF B4RF CRSS	*** NOTE RSCR LIMITER VOLTAGE INDICATIONS OFF.	
121		29	C1PK	C1DP C2DP C4DP	STATUS SYSTEMS - SAFE	
121		30	C1PK	CLVN	DESTRUCT SYSTEM - OFF AND RETURN DESTRUCT SYSTEM KEY TO CPSS, REPORT WHEN COMPLETE.	
121		31	VARS	C1DP C2DP C4DP	VERIFY SAFETY BUS - OFF.	
121		32	VARS	BRFS	SIGNAL GENERATOR SELECTOR TO STANDBY AND HYBRID TO SELECT MONITOR NO. 1	
121		33	C1PK	CLTC	VARS COMPLETE.	
171		34	C2PM	C2TC	CDDT ONLY	*A
121		35	C2TC	CLTC	CDDT ONLY	*A
171		36	C2RP	C2TC	LH2 RECIRC PUMP TEST COMPLETE	N-219-136
- 4 HRS 30' 0"						
121		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)	***

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 4 HRS 30' 0"					CD ONLY	
		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	
		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
	181	5	CCLO	C1TC		*A
- 4 HRS 22' 0"	121	6	C1TC	CLTC	CDDT ONLY CDDT ONLY	*A
	161	1	C1TC	C4TC	READY FOR LH2 LOADING, ALL SUPPORT PERSONNEL GO TO CH 143.	
- 4 HRS 19' 0"						
	121	1	C1TC	CLTC	S-II LH2 LOADING IS COMPLETED AND S-IVB LH2 LOADING IN PROGRESS.	
	171	2	C2TC	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.	
- 4 HRS 16' 0"						
	111	1	CLTC	CVTS	ADVISE SCO PERSONNEL THAT Q-BALL POWER IS COMING ON IN APPROXIMATELY 5 MINUTES	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
4 HRS 11' 0"						
121		1	CLTC	CUIP	Q-BALL POWER ON Q-BALL HEATER POWER - ON	TCPI
		1-1		CUIP	*** NOTE Q-BALL POWER SWITCH WILL BE LEFT IN ON POSITION UNTIL T-38 MIN	
121		2	C2TC	CLTC	STARTING MRCV TEST	
171		3	C2TC	C2PU	START MRCV TEST, REPORT WHEN COMPLETE.	
171		4	C2TC	C2NP	SWITCH SELECTOR INHIBIT OFF	
171		5	C2TC	C2AE	VERIFY ENGINE 201 THRU 205 HELIUM BOTTLE PRESSURE IS 1400 PSIA OR GREATER	
171		6	C2TC	V2MS	VERIFY READY TO SUPPORT MRCV TIMING (MEASUREMENTS K6-201, K125-201 AND G006-201 THRU 205)	
171		7	C2TC	R2SC	G006-201 THRU 205 RECORDERS TO FAST	
171		8	C2TC	C2AE	ALL HELIUM SOL SW TO ON	
171		9	C2TC	C2AE	ALL HELIUM CONT SOL ON LIGHT - ON	
171		10	C2TC	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	C2TC	R2SC	VERIFY G006-201 THRU 205 INCREASED 1.3 TO 1.8 VDC,	
171		12	C2TC	C2PK	VERIFY ENGINE REG OUT PRESS D012-201 THRU 205 IS 415 +/- 25 PSIA.	
171		13	C2TC	C2PU	MRCV COMMAND NO. 1 SW - HIGH EMR.	
171		14	C2TC	C2PU	RESET LIGHT - OFF	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ CO ONLY ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶						
4 HRS 11' 0"						
	171	15	C2TC	C2PU	CHECKOUT RESET LIGHT - OFF,	
	171	16	C2TC	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,	
	171	17	C2TC	R2SC	VERIFY G006-201 THRU 205 DECREASED 1,3 TO 1,8 VDC,	
	171	18	C2TC	C2PU	MRCV COMMAND NO, 2 SW - LOW EMR,	
	171	19	C2TC	C2PU	CHECKOUT RESET LIGHT - ON	
	171	20	C2TC	C2EV	ENG 201 THRU 205 MRCV SOL CMD ON LIGHT - ON	
	171	21	C2TC	R2SC	VERIFY G006-201 THRU 205 INCREASED 1,3 TO 1,8 VDC,	
	171	22	C2TC	C2PU	MRCV COMMAND NO. 1 SW - LOW EMR.	
	171	23	C2TC	C2PU	RESET LIGHT - ON	
	171	24	C2TC	C2AE	ALL HELIUM SOL TO OFF	
	171	25	C2TC	C2AE	ALL HELIUM CONT SOL ON LIGHT - OFF	
	171	26	C2TC	R2SC	VERIFY G006-201 THRU 205 DECREASED 1,3 TO 1,8 VDC,	
4 HRS 5' 0"						
	171	1	C2PU	C2TC	MRCV TEST IS COMPLETE	
	121	2	C2TC	CL7C	MRCV TEST IS COMPLETE	
4 HRS 0' 0"						
	171	1	C2TC	C2RP	START LOX HE INJ/ACCUMULATOR TEST PER V-30029 (M020) TASK 45, REPORT WHEN COMPLETE,	#

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
- 3 HRS 49' 0"						
	121	1	CLTC	C1TC C2TC	GDDT ONLY	*A
	143	2	C1TC	CCLH	GDDT ONLY	*A
	171	3	C2TC	C2PM	GDDT ONLY	*A
- 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	#
- 3 HRS 40' 0"						
	121	1	CLTC	C1TC C2TC	GDDT ONLY	*A

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
- 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
		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.	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
3 HRS 38' 0"						
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	
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	
171		24	C2TC	C2RP	CDDT ONLY	*A
		24-1		C2RP	CDDT ONLY	*A

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
3 HRS 35' 0"	181	1	CITC	CECS	DDDT ONLY	*A
		1-1		CECS	DDDT ONLY	*A
		2			DELETED	
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,	
		3		C2FC	VERIFY ACCUMULATORS UNLOCKED	
	171	4	C2FC	R2SC V2MS	HYDRAULIC RECORDERS ON,	
		5		C2FC	S-II AUXILIARY HYDRAULIC PUMPS, ENGINES 1, 2, 3 & 4 - ON, ALLOW SYSTEM PRESSURES TO STABILIZE,	
		6		C2FC	OPEN MAIN PUMP BYPASS VALVE AND ALLOW MAIN PUMP FLUID TEMPS TO STABILIZE WITH RESERVOIR FLUID TEMPS,	

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APPENDIX C

LV DRAIN OPERATIONS

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
<div>CD ONLY</div> <div>APPENDIX C</div> <div>-----</div> <div>LV DRAIN OPERATIONS</div> <div>-----</div> <div>PART 1</div> <div>-----</div> <div>LV PREPS FOR DRAIN</div> <div>-----</div>						
121		1	CLTC	C1DP C2DP C4DP	SYSTEMS STATUS SWITCH TO SAFE	
		1-1		C1DP C2DP C4DP	*** NOTE RSCR EXTERNAL AND OFF	
121		2	CLTC	CLVN	DESTRUCT SYSTEM OFF	
121		3	CLTC	CUPC	POWER DOWN ST-124M PER V-33011	
151		3-1	CUTC	CUNP	CDDT ONLY	
121		4	CLTC	CUSP	FLIGHT CONTROL COMPUTER POWER SWITCH - OFF,	
121		5	CLTC	CUGA	CONTROL EDS RATE GYRO POWER SWITCH - OFF	
121		6	CLTC	CLGK	REQUEST & EXECUTE FT04 PER V-33033, SECTION IV (POWER OFF LVDC/LVDA)	
121		7	CLTC	CUPC	TERMINATE GE01 IF EXECUTING	
121		7-1	CLTC	CUES	THRUST OK SWITCH A&B TO INHIBIT	
121		8	CLTC	CWCP	RECONFIGURE THE IWS TO AN EGRESS CONFIGURATION PER V-36113,	
121		9	CLTC	CSPP	REMOVE LSE 43D100 & 43D200 FIRING POWER PER V-21194 & REMOVE LSE POWER OVERRIDE REPORT WHEN COMPLETE,	
121		10	CLTC	C1TC C2TC C4TC CUTC	VERIFY SYSTEMS SAFED & READY FOR CREW EGRESS,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
111		11	CLTC	CVTS	LV READY FOR CREW EGRESS.	TCPI
188		12	CLTC	ALL	ALL LV SYSTEMS WILL BE HELD AT THIS POINT UNTIL FLIGHT CREW EGRESS IS COMPLETE.	
111		13	CVTS	CSA9	RECONNECT SERVICE ARM 9 PER V-36085 (IF NOT ALREADY CONNECTED)	TCPI
111		14	CSA9	CVTS	S/A 9 RECONNECTED.	TCPI
111		15	CVTS	CSA9	RETURN TO CHANNEL 118.	TCPI
118		16	CSA9	CSAC	S/A 9 HAS BEEN RECONNECTED, CSA9 IS NOW ACTIVE ON CHANNEL 118.	
181		17	CSAC	C1TC	S/A 9 IS RECONNECTED.	
118		18	CSAC	CHCU	PLACE ONE PUMP IN STANDBY AND VERIFY OTHER PUMP IS RUNNING.	
181		19	C1TC	CSPP	PLACE 42D100 LOCKUP ENABLE SWITCH TO OFF AND VERIFY	
		20			NOTE ----- IF FLIGHT CREW IS ABOARD, IT WILL BE APPROXIMATELY ONE HOUR BEFORE ALL PERSONNEL WILL BE CLEAR OF THE CONTROL AREA FOR DRAIN OPERATIONS.	
121		1	CVTS	CLTC	CREW EGRESS IS COMPLETE, ALL PERSONNEL ARE CLEAR OF THE CONTROL AREA, LV DRAIN OPERATIONS MAY START.	TCPI
		2			NOTE ----- FOR THE NEXT 15 MIN. CSAD REQUIRES EXCLUSIVE CONTROL OF TV CAMERAS 27 AND AA3 OR AA4	
121		3	CLTC	C1TC	RECONNECT PRIMARY DAMPER	XB-247-107

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY	
121		19	CLTC	C1IP	28 VOLT RACS AND 400 HERTZ POWER - OFF.	
121		20	CLTC	ETMS BTMC	TM TAPE RECORDING OFF,	
121		21	CLTC	C1IP CUIP	TM CALIBRATOR - OFF.	
121		22	CLTC	CUNP	SWITCH SELECTOR INHIBIT OFF.	
121		23	CLTC	CUIP	C-BAND BEACON #1 - OFF C-BAND BEACON #2 - OFF CCS TRANSPONDER - OFF COMMAND/DECODER - OFF O-BAND INHIBIT #1 & #2 - OFF	
121		24	CLTC	CUIP	Q-BALL POWER - OFF Q-BALL HEATER POWER - OFF.	TCPI
121		25	CLTC	CUCP	HIGH PRESSURE REGULATOR SWITCH TO LOW,	
121		26	CVTS	CLTC	SC EDS POWER IS OFF	# TCP
111		27	CLTC	CVTS	COMMAND DECODER IS OFF.	TCPI
111		28	CLTC	CVTS	ALL LV RF SYSTEMS ARE OFF.	TCPI
121		29	CLTC	CUNP	SWITCH SELECTOR INHIBIT ON.	
121		30	CLTC	BRFS	SECURE GSE FLIGHT CODE PLUG	#
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,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
	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,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					CD ONLY PART 2 ----- LV DRAIN -----	
181		1	C1TC	CCRP	SECURE RP-1 PANEL POWER	
181		2	C1TC	CCLO	START AUTO SIMULTANEOUS LOX DRAIN PREPS PER V-35014 ADDENDUM B-1. REPORT WHEN READY TO START DRAIN.	
171		3	C2SP	C2TC	CDDT ONLY	*
121		4	C2TC	CLTC	CDDT ONLY	*
121		5	CLTC	C2TC	CDDT ONLY	*
181		6	CCLO	C1TC	LOX DRAIN PREPS COMPLETED.	
121		7	CLTC	C1TC C2TC C4TC	VERIFY READY TO START SIMULTANEOUS PROPELLANT DRAIN	
111		8	CLTC	CVTS	RESET CDC TO T+0 AND START COUNT UP	TCPI
121		1	CLTC	C1TC	CLEARED TO START SIMULTANEOUS DRAIN OPERATIONS.	
181		2	C1TC	CCLH	START AUTO SIMULTANEOUS LH2 DRAIN OPERATIONS PER V-35014 ADDENDUM B-1. REPORT WHEN COMPLETE.	
181		3	C1TC	CCLO	START AUTO SIMULTANEOUS LOX DRAIN OPERATIONS PER V-35014 ADDENDUM B-1. REPORT WHEN COMPLETE.	

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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	CQLO	C1TC	S-IC LOX DRAIN STARTED	
32' 0"	181	1	CQLO	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,	
1 HRS 30' 0"	181	1	CQLO	C1TC	S-II LOX DRAIN IS COMPLETE, STARTING	
	121	2	CLTC	C1TC C2TC C4TC	S-IVB LOX DRAIN, 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,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
1 HRS 30' 0"	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	C0LO	C1TC	S-IVB LOX DRAIN COMPLETE	
	121	2	C1TC	CLTC	S-IVB LOX DRAIN COMPLETE,	
	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	C0LO	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		C0LO C0LH	*** NOTE PROPELLANTS SUPPORT WILL BE REQUIRED UNTIL COMPLETION OF S-II & S-IVB PURGES (APPROX T+7130 HRS)	
	111	9	CLTC	CVTS	LV PROPELLANT DRAIN IS COMPLETE AND TANK PURGES ARE IN PROGRESS,	TCPI

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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
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-11 LH2 PROPELLANT TANK PURGED FOR MINIMUM OF 30 MINUTES, READY FOR SAFETY INSPECTION TEAM TO ENTER THE PAD, (POST TANKING PURGE IS CONTINUING)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 40' 0"						
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,	
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-IC 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,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 40: 0"	121	13	CLTC	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>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 & 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"> 1. THE S-II & S-IVB LH2 TANKS CONTAIN LESS THAN 4% GH2 BY SNIFFING PURGE GASES AT SAMPLE PORTS AT THE FILTERS ON FILL LINES, 2. THE LH2 TRANSFER LINE CONTAINS LESS THAN 4% GH2 BY SNIFFING PURGE GASES AT SAMPLE PORTS AT THE INLET TO VALVE SKIDS, 3. THE GN2 HANDVALVES HAVE BEEN CLOSED IN THE ECS ROOM, <p>THE LOX & 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

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 40' 0"	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,	
	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,	TOPI
	121	18	BOSC	CLTC	VERIFY S-IVB & S-II PERSONNEL ARE READY TO SUPPORT GH2 CROSS COUNTRY LINE SECURING WITH GHE,	TOPI
	151	19		CUTC	TERMINATE ALTERNATE FIRING ROOM SUPPORT	
	161	20	CLTC	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 * * *****	
	161	5	CLTC	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,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
2 HRS 45' 0"	181	6	C1TC	C1PE	SECURE APPLICABLE PORTIONS OF S-IC PNEUMATICS SYS PER V-24327, REPORT WHEN COMPLETE.	
	121	7	C1TC	CLTC	ECS SWITCH OVER 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 (G056),	
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	ECS GN2 HANDVALVES HAVE BEEN CLOSED * * * * * WARNING * * * * * * * END ECS INERT ATMOSPHERE HAZARD * * - RESUME PREVIOUS HAZARD LEVEL * * * * * * *	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
• 3 HRS 40' 0"						
	121	3	CLTC	CLTC	ECS GN2 HANDVALVES ARE CLOSED AND LH2 SYSTEM INERTING ON THE LUT ACCEPTABLE FOR AREA OPENING	
	111	4	CLTC	CVTS	ECS GN2 HANDVALVES ARE CLOSED, LH2 SYSTEM INERTING ON THE LUT IS ACCEPTABLE FOR AREA OPENING,	TOP!
• 3 HRS 45' 0"						
	121	1	CVTS	CLTC	SAFETY INSPECTION IS COMPLETE, SPECIAL CONTROL AREA IS OPEN FOR REQUIRED PERSONNEL,	TOP!
	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	BUSC	CLTC	25 TON FORKLIFTS & CABLES AT PAD GATE FOR MOVE OF ESP TO ML,	TOP!
	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-11 PREPARATIONS FOR PROPELLANT DRAIN -----	
171		1	C2TC	C2SP	GN PURGE VALVE TO AUTO,	
171		2	C2TC	C2SP	LH SUPPLY VALVE TO AUTO,	
171		3	C2TC	C2GP	GH SUPPLY VALVE TO CLOSE,	
171		4	C2TC	C2GP	START TANK LINE VENT TO OPEN FOR APPROX 10 SECONDS THEN CLOSE,	
171		5	C2TC	C2GP	GH REG VENTS TO OPEN,	
171		6	C2TC	C2GP	HE PRESS SEL SW TO 1000 PSIG,	
171		7	C2TC	C2AE	VERIFY ENGINE PURGES COMPLETE,	
171		8	C2TC	C2AE	USE ALL HE SOLENOID SWITCH TO VENT ENG HE BOTTLES BELOW 25 PSIA,	
		8-1		C2PU R2SC	*** NOTE MESAUREMENTS G006-201 THROUGH 205 WILL BE ACTIVE,	
171		9	C2TC	C2RP	PNEU SUPPLY VALVE TO OFF,	
171		10	C2TC	C2RP	LOX HE INJECTION TO START, THEN AUTO, WHEN RECEIVER PRESS APPROX, 1465 PSIA, HE INJECTION TO STOP, THEN AUTO,	
		10-1		C2SP	*** NOTE LOX HE INJECTION RECEIVER BEING VENTED INTO LOX TANK,	
171		11	C2TC	C2RP	USE RECIRC ACT SYSTEM VENT SWITCH TO VENT RECIRC RECEIVER TO APPROX, 1465 PSIA,	
171		12	C2TC	C2AE	START TANK SUPPLY LINE VENT TO OFF,	
171		13	C2TC	C2AE	VERIFY HE BOTTLE PRESSURES BELOW 25 PSIA,	
171		14	C2TC	C2AE	VERIFY START TANK PRESSURES BELOW 25 PSIA,	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
171		15	C2TC	C2AE	ALL ENG EMERGENCY CUTOFF TO AUTO.	
171		16	C2TC	C2RP	VERIFY LOX HE INJECTION RECEIVER PRESSURE APPROX, 1465 PSIA,	
171		17	C2TC	C2RP	VERIFY RECIRC RECVR PRESS APPROX, 1465 PSIA,	
171		18	C2TC	C2RP	PNEUM, SUPPLY VALVE TO PRESSURIZE,	
171		19	C2TC	C2GP C2PV C2PM C2SP	VERIFY READY FOR PROPELLANT DRAIN,	
171		20	C2TC	C2PV	MAINTAIN COMMON BULKHEAD VACUUM FOR PROPELLANT DRAIN,	
121		21	C2TC	CLTC	S-11 READY FOR PROPELLANT DRAIN,	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					PART 4 ----- LV PREPS FOR COMPUTER DOWN DRAIN -----	
121		1	CLTC	CUNP	ISSUE STAGE LOGIC RESET,	
121		2	CLTC	CLVN	VERIFY/PLACE ML DCE TO MANUAL MODE	
121		3	CLTC	CLVN	ISSUE THE FOLLOWING MDOS ON OR OFF SIMULTANEOUSLY BY SETTING UP THE DCE BIT PATTERN DEFINED FOR EACH GROUP (ANNOUNCE OVER 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 F1-RF OFF) 1486 OFF (S-IC P1-RF OFF)	
121		3-3	CLVN		GRP 2 - MUX 22, ADDRESS 20, DATA BIT 2 UP, 1490 OFF (S-IC 28V RACS POWER OFF)	
121		3-4	CLVN		GRP 3 - MUX NONE, ADDRESS 9, DATA BIT 0 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 (C2RP-RECIRC RECEIVER SUPPLY VALVE TO OFF)	
121		3-6	CLVN		GRP 5 - MUX 22, ADDRESS 2, DATA BIT 17 UP, 1073 OFF (C2GP-HE SELECT TO 1000 PSI)	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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	CUNP	SWITCH SELECTOR INHIBIT OFF,	
121		6	CLTC	CUSW	ISSUE IU OCTAL 054 (C-BAND INHIBIT #1 & #2 OFF)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
	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 379	

TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
					S-IVB DRAIN PREPS - COMPUTER DOWN -----	
121		1	CLTC	C4TC	IDENTIFY THE FOLLOWING STEPS REQUIRED FOR DRAIN PREPS:	
121		2	CLTC	CLVN	ISSUE THE FOLLOWING MDOIS 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)	

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TIME	COMM. CH.	SEQUENCE	COMMAND STA.	RESPONSE STA.	DESCRIPTION	REMARKS
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,	