

C. H. B.

Measuring and Telemetry  
Information Summary for  
CDDT and LCD



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CDDT and LAUNCH ASSIGNMENTS

T - 14 to T - 9

Firing Room

CUIP - Nielsen  
CLIK - Cook  
RUBM - Gustafson  
RUBM - Theobald  
RUBM - Toback

First Floor (TM-GSE)

BUTM - Bell  
BUTM - Schneider  
BUTM - Moors

Structure

SUMS - Hutson  
SUMS - Bowser

T - 9 to T - 8

Firing Room

CUIP - Nielsen  
CLIK - Cook  
RUBM - Gustafson  
RUBM - Theobald  
RUBM - Toback

Structure

SUMS - Hutson  
SUMS - Bowser

SUTM - Bell  
SUTM - Schneider  
SUTM - Moors

T - 8 to T - 3.5  
(T - 0 + 5 hrs.)

Firing Room

CUIP - Hoenstine  
RUBM - Theofrastou

CIF

T - 3.5 to 5 hrs.  
(Arrive T-0 + 5 hrs.)

Firing Room

CUIP - Nielsen  
CLIK - Cook  
RUBM - Gustafson  
RUBM - Theofrastou  
RUBM - Toback

First Floor (TM-GSE)

BUTM - Bell  
BUTM - Schneider  
BUTM - Moors

Room 307 - Vozzola  
Tele. Sta. - Wong

Fallback Crew (Hangar U)

Hoenstine  
Hutson  
Bowser



CDD AND LAUNCH  
"HOLD" OR "CUT-OFF" MATRIX

PREPARED BY  
IBM TEST OPERATIONS

REVISION A

TIME	ACTION TO	OIS CHANNEL	STATEMENT	IBM TEST CONDUCTOR ACTION TO	OIS CHANNEL
START OF OPERATING STEPS TO T-2 MIN 43 SEC (163 SEC) AUTO SEQUENCE START	CUTC IBM TEST CONDUCTOR	RED 3	"CUTC", THIS IS (NOTE 1). REQUEST A "HOLD" DUE TO (NOTE 2).	CLTC LAUNCH VEHICLE TEST CONDUCTOR. RELAY "HOLD" REQUEST	BLACK 1
T-2 MIN 43 SEC (163 SEC) TO T-45 SEC (NOTE 3)	CUTC IBM TEST CONDUCTOR	RED 3	"CUTC, THIS IS (NOTE 1). REQUEST A "CUT-OFF."  FOLLOW UP WITH REASON. (NOTE 2)	CLTC LAUNCH VEHICLE TEST CONDUCTOR. RELAY "CUT-OFF" REQUEST	BLACK 1
T-45 SEC TO T-5 SEC	CINP FIRING CONSOLE	BLACK 1	"CINP GIVE CUT-OFF"  FOLLOW UP WITH REASON TO CUTC AND CLTC (NOTE 2)	N/A	BLACK 1
T-5 SEC TO LIFTOFF	NONE -- NO MANUAL CUT-OFF CAPABILITY				

- NOTES: 1. This will be the (4) character "Call Sign" assigned to the station requesting the action (i. e., CUNP, CGCC, etc.)
2. Reason should be a clear, concise statement as to the cause for the "Hold" or "Cut-Off". If a Launch Mission Rule is violated, give the following data also:

Item Number  
Description  
Measurement Number  
Page Number

EXAMPLE

2-626  
ST-124M Air Bearing Inlet Pressure  
XD11-603  
2-54

3. If an EMERGENCY condition is noted from T-2 min 43 sec (163 sec) to T-45 sec., the "Cut-Off" request should be addressed directly to CINP as from T-45 sec to T-5 sec.



## Criteria to Determine Impact

The impact and the course of action Launch Mission Rules items have is dependent on primarily two different things: (1) whether the item is mandatory, highly desirable, or desirable, and (2) when in the count the item fails. The following criteria under Space Vehicle Functional Sequence is used.



# NASA/KENNEDY SPACE CENTER LAUNCH MISSION RULES

ITEM	DESCRIPTION				
	<p><u>SPACE VEHICLE FUNCTIONAL SEQUENCE:</u></p> <p>THE SPACE VEHICLE SEQUENCE DETAILS ACTIONS TO BE FOLLOWED IN THE EVENT PROBLEMS ARE ENCOUNTERED IN THE COUNTDOWN.</p>				
	<u>TIME PERIOD</u>	<u>CONDITION</u>	<u>ACTION/COMMENT</u>		
1-601	T-11 HRS 20 MIN (L/V POWER UP) TO T-5 HRS 55 MIN (L/V SAFE AND ARM CONNECTION).	MALFUNCTION OF ANY REPAIRABLE SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT.	CORRECT MALFUNCTION IN PARALLEL WITH OTHER OPERATIONS. HOLD AT T-5 HRS 55 MIN FOR <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> ITEMS IF REPAIR CANNOT BE COMPLETED IN PARALLEL WITH OR AFTER L/V SAFE AND ARM CONNECTION.		
1-602	T-5 HRS 55 MIN (L/V SAFE AND ARM CONNECTION) TO T-5 HRS (CLOSE IU DOOR).	MALFUNCTION OF ANY REPAIRABLE SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT.	CORRECT MALFUNCTION IN PARALLEL WITH OTHER OPERATIONS. HOLD AT T-5 HRS FOR <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> ITEMS IN THE IU.		
1-603	T-5 HRS (CLOSE IU DOOR) TO T-3 HRS 10 MIN (SERVICE STRUCTURE REMOVAL).	MALFUNCTION OF ANY REPAIRABLE SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT.	CORRECT MALFUNCTION IN PARALLEL WITH OTHER OPERATIONS. HOLD AT T-3 HRS 10 MIN FOR <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> ITEMS IF SERVICE STRUCTURE IS REQUIRED FOR REPAIR.		
1-604	T-3 HRS 10 MIN (SERVICE STRUCTURE REMOVAL) TO T-2 HRS 45 MIN (L/V DUAL LOX LOADING).	MALFUNCTION OF ANY REPAIRABLE SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT.	CORRECT MALFUNCTION IN PARALLEL WITH OTHER OPERATIONS. HOLD AT T-2 HRS 45 MIN FOR <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> ITEMS IF REPAIR CANNOT BE COMPLETED IN PARALLEL WITH OR AFTER CRYOGENIC LOADING.		
1-605	T-2 HRS 45 MIN (START L/V DUAL LOX LOADING) TO T-1 HRS 55 MIN (START S-IVB LH <sub>2</sub> LOADING).	MALFUNCTION OF ANY REPAIRABLE SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT.	PROCEED IF CORRECTION CAN BE ACCOMPLISHED IN PARALLEL WITH NORMAL FUNCTIONS; OTHERWISE HOLD FOR <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> ITEMS. IF REPAIR IS NOT POSSIBLE, REVIEW CRITICALITY, EVALUATE PERFORMANCE DEGRADATION; MAKE THE DECISION TO PROCEED, HOLD, OR SCRUB. (2 HRS 30 MIN ARE REQUIRED TO DRAIN L/V LOX AND RETURN SERVICE STRUCTURE IF NEEDED FOR REPAIR).		
MISSION	SECTION	STAGE/SUBSECTION	SYSTEM	REV	DATE
SA-204/LM-1	SPACE VEHICLE	FUNCTIONAL SEQUENCE			
				PAGE	1-24



# NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	DESCRIPTION						
	<u>SPACE VEHICLE FUNCTIONAL SEQUENCE (CONTINUED):</u>						
	<u>TIME PERIOD</u>	<u>CONDITION</u>	<u>ACTION/COMMENT</u>				
1-606	T-1 HRS 55 MIN (START S-IVB LH <sub>2</sub> LOADING) TO T-15 MIN (S-IVB THRUST CHAMBER CHILLDOWN).	MALFUNCTION OF ANY REPAIRABLE SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT.	<p>PROCEED IF CORRECTION CAN BE ACCOMPLISHED IN PARALLEL WITH NORMAL FUNCTIONS; OTHERWISE HOLD FOR <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> ITEMS. IF REPAIR IS NOT POSSIBLE, REVIEW CRITICALITY, EVALUATE PERFORMANCE DEGRADATION; MAKE THE DECISION TO PROCEED, HOLD, OR SCRUB. (4 HRS. ARE REQUIRED TO DRAIN L/V LOX AND LH<sub>2</sub> AND RETURN SERVICE STRUCTURE IF NEEDED FOR REPAIR).</p> <p>NOTE 1: AFTER THE COMPLETION OF LH<sub>2</sub> LOADING (T-45 MINUTES) AN ACCUMULATED HOLD OF APPROXIMATELY 4 HRS IS POSSIBLE WITHOUT REPLENISHING THE LH<sub>2</sub> STORAGE TANK. (THIS 4 HOURS DOES NOT INCLUDE THE NORMAL COUNT FROM T-45 MINUTES TO T-0). DURING THE HOLD, STORAGE TANK REPLENISHMENT TO MEET OPERATIONAL NEEDS WILL BE ACCOMPLISHED IF REQUIRED AND WILL ALLOW EXTENSION OF THE 4 HOUR HOLD CAPABILITY. LOX STORAGE TANK REPLENISHMENT WILL BE REQUIRED AFTER AN ACCUMULATED HOLD OF APPROXIMATELY 9 HOURS.</p>				
1-607	T-15 MIN (S-IVB THRUST CHAMBER CHILLDOWN) TO T-2 MIN 43 SEC (AUTOMATIC SEQUENCE START).	MALFUNCTION OF ANY <u>MANDATORY</u> OR <u>HIGHLY DESIRABLE</u> SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT APPLICABLE TO THIS TIME PERIOD.	<p>HOLD. A HOLD OF 5 MIN MAXIMUM CAN BE TOLERATED WITHOUT RECYCLING TO T-15 MIN PROVIDED S-IVB CHILLDOWN OPERATIONS CONTINUE. THIS LIMITATION IS DICTATED BY S-IVB THRUST CHAMBER CHILLDOWN. IF THE HOLD EXCEEDS 5 MIN RECYCLE TO T-15 MIN. A WARMUP PERIOD OF 10 MIN IS REQUIRED PRIOR TO INITIATING CHILLDOWN SEQUENCE AFTER RECYCLING TO T-15 MIN. A HOLD IN EXCESS OF ONE HOUR AT T-15 MIN WILL REQUIRE A RECYCLE TO T-30 MIN.</p> <p>NOTE 1: THE AMOUNT OF RECYCLES TO T-15 MIN IS LIMITED BY THE CAPABILITY OF THE GASEOUS HYDROGEN STORAGE FACILITY. THIS CAPABILITY WILL ALLOW A MAXIMUM OF 4 COMPLETE CHARGES OF THE S-IVB START BOTTLE BEFORE DEPLETION. 6 TO 8 HOURS ARE REQUIRED TO RECHARGE THE STORAGE FACILITY.</p>				
MISSION		SECTION	STAGE/SUBSECTION	SYSTEM	REV	DATE	PAGE
SA-204/LM-1		SPACE VEHICLE	FUNCTIONAL SEQUENCE				1-25



# NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	DESCRIPTION				
	<u>SPACE VEHICLE FUNCTIONAL SEQUENCE (CONTINUED):</u>				
	<u>TIME PERIOD</u>	<u>CONDITION</u>	<u>ACTION/COMMENT</u>		
1-608	T-2 MIN 43 SEC (AUTOMATIC SEQUENCE START) TO T-5 SEC (2 SEC PRIOR TO IGNITION).	MALFUNCTION OF ANY <u>MANDATORY</u> SPACE VEHICLE ELEMENT OR OPERATIONAL SUPPORT ELEMENT APPLICABLE TO THIS TIME PERIOD.	CUTOFF. RECYCLE TO T-15 MIN. MAKE THE DECISION TO HOLD AND REPAIR OR TO SCRUB. A WARMUP PERIOD OF 10 MIN IS REQUIRED BEFORE INITIATING A S-IVB CHILLDOWN SEQUENCE AFTER RECYCLING TO T-15 MIN.  NOTE 1: THE AMOUNT OF RECYCLES TO T-15 MIN IS LIMITED BY THE CAPABILITY OF THE GASEOUS HYDROGEN STORAGE FACILITY. THIS CAPABILITY WILL ALLOW A MAXIMUM OF 4 COMPLETE CHARGES OF THE S-IVB START BOTTLE BEFORE DEPLETION. 6 TO 8 HOURS ARE REQUIRED TO RECHARGE THE STORAGE FACILITY.		
1-609	T-5 SEC (2 SEC PRIOR TO IGNITION COMMAND) TO T-0 (LIFTOFF).	NOT APPLICABLE.	NONE. NO HOLDS WILL BE CALLED. NO MANUAL CUTOFF WILL BE GIVEN. AFTER T-3 SECONDS AN AUTOMATIC CUTOFF WILL RESULT IN A SCRUB.		
MISSION	SECTION	STAGE/SUBSECTION	SYSTEM	REV	DATE
SA-204/LM-1	SPACE VEHICLE	FUNCTIONAL SEQUENCE			PAGE 1-26



# Mission Rule Measurements Not in LCC

The following measurements are not monitored in the LCC. It is suggested that SUMS, EUDK, and RUBM, and CLIK look at these measurements periodically.

A2-603	Accel., Longt.
C11-601	Temp. Sub. Inlet M/W
C64-601	Batt. #1 Int.
C65-601	Batt. #2 Int.
C66-601	Batt. #3 Int.
C68-601	Batt. #4 Int.
F1-601	Flow Rate Sub. Inlet H2O
F2-601	Flow Rate Sub. Bypass M/W
G6-601	Open Pos. H2O Cont. valve
H60-603	(need GE 635 to evaluate) Guid. Comp. Operation
K141-900	SM-SLA Phys. Mon A
K142-900	"
K145-900	LEM-SLA Sep. Rel. Close A
K146-900	" Close B
K147-900	SLA Panel Dep. Rel. Close A
K148-900	" Close B
K149-900	SLA Deployment Phy. Monitor
M12-601	6D11 Bus Voltage



Measurement On During Flight Only

During pre-flight checkout measurements are questioned because the wrong measurement is being looked at. The following will be seen when the measurement transfer relay is in the flight position only:

C6-601	Temp., Sublimator Inlet Water
C9-601	Temp., IU Inlet Meth/Water
C10-601	Temp., IU Exit Meth/Water
C11-601	Temp., Sublimator Inlet Meth/Water
C12-601	Temp., Sublimator Exit Meth/Water
C18-602	Temp., Cold Plate Inlet Coolant
C51-603	Temp., Azusa Internal
C69-602	Temp., Control Computer
J30-602	RF Refl. Pwr. Pl TM
M6-603	Volt. 250 VA Inv. Phase A, B.
M8-603	Volt. 205 VA Inv. Phase C, A.
M12-601	6D11 Bus Volt
M13-601	6D21 Bus Volt
M14-601	6D31 Bus Volt



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-500		LINK, DP-1	<del>M</del>				CHECK TO T-5 SECONDS		
2-501		LINK, DF-1	HD						
2-502		LINK, DF-2	HD						
2-503		LINK, DS-1 (IU STAGE) LINK, CS-1 (S-IVB STAGE) LINK, GS-1 (S-IB STAGE)	2 OF 3 M				FAILURE OF 1 SINGLE SIDE BAND PACKAGE PRIOR TO AUTOMATIC SEQUENCE START WILL RESULT IN A REAL TIME DECISION TO HOLD AND REPAIR OR WAIVE THIS REQUIREMENT IN THE EVENT OF ANOTHER SINGLE SIDE BAND PACKAGE FAILURE DURING THE AUTOMATIC SEQUENCE PRIOR TO T-5 SECONDS		
2-504		TAPE RECORDER	<del>HD</del>				CHECK FROM SYSTEM ACTIVATION TO T-15 MINUTES		
2-505		IU COMMAND	M				CHECK TO T-5 SECONDS		
2-506		C-BAND TRANSPONDER 603A653 C-BAND TRANSPONDER 602A619 AZUSA TRANSPONDER	1 OF 3 M				CHECK TO T-5 SECONDS		
2-506 A		A0 MULTIPLEXER	M				CHECK TO T-5 SECONDS		
2-506 B		REMOTE DIGITAL SUB-MULTIPLEXER (RDSM)	HD						
2-506 C		B0 MULTIPLEXER	<del>HD</del>						
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		STAGE SYSTEMS				2-26



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-507	VA2-603	ACCELERATION, LONGITUDINAL	*				*PCM DATA ONLY SEE ITEM 2-318		
2-508	VA4-601	ACCELERATION, PITCH CONTROL		M	-0.5 M/SEC <sup>2</sup>	+0.5 M/SEC <sup>2</sup>	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-509	VA5-603	ACCELERATION, YAW CONTROL		M	-0.5 M/SEC <sup>2</sup>	+0.5 M/SEC <sup>2</sup>	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-510	C11-601	TEMPERATURE, SUBLIMATOR INLET METHANOL/WATER	HD						
2-511	VXC15-601	TEMPERATURE, METHANOL/WATER CONTROL	HD	M	57°F 13.9° C 517° R	61°F 16.1° C 521° R	CHECK FROM SYSTEM STABILIZATION TO START OF AUTOMATIC SEQUENCE		
2-512	XC31-603	TEMPERATURE, ST-124M AIR BEARING INLET	HD						
2-513	VC34-603	TEMPERATURE, ST-124M INERTIAL GIMBAL		M	104° F 40° C 564° R	118.40° F 48° C 578.4° R	CHECK FROM T-3 HOURS TO START OF AUTOMATIC SEQUENCE		
2-513A	XC36-601	TEMPERATURE, IU AMBIENT		M	54.8° F 12.7° C 514.8° R	80° F 26.7° C 540° R	CHECK FROM SYSTEM STABILIZATION TO START OF AUTOMATIC SEQUENCE		
2-514	VC54-603	TEMPERATURE, GUIDANCE COMPUTER (MEMORY)		M	50° F 10° C 510° R	116.6° F 47° C 576.6° R	CHECK FROM L/V POWER UP TO START OF AUTOMATIC SEQUENCE		
2-515	VC55-603	TEMPERATURE, DATA ADAPTER (2A10A5)		M	32° F 0° C 492° R	167° F 75° C 627° R	CHECK FROM L/V POWER UP TO START OF AUTOMATIC SEQUENCE		
2-516	C64-601	TEMPERATURE, BATTERY NO. 1 INTERNAL		HD					
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS				2-27



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	WEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES	
				CATEGORY	MIN. VALUE	MAX. VALUE		
2-517	C65-601	TEMPERATURE, BATTERY NO. 2 INTERNAL		HD				
2-518	C66-601	TEMPERATURE, BATTERY NO. 3 INTERNAL		HD				
2-519	C68-601	TEMPERATURE, BATTERY NO. 4 INTERNAL		HD				
2-520		DELETED						
2-521	XD10-603	PRESSURE, GN <sub>2</sub> REGULATOR INLET		M	2800 PSIA	3200 PSIA	CHECK FROM SPHERE PRESSURIZATION TO 3000 PSIA TO T-5 SECONDS	
2-522	XD11-603	PRESSURE, ST-124M AIR BEARING INLET		M	13.0 PSID	17.0 PSID	CHECK FROM TIME OF SPHERE PRESSURIZATION TO START OF AUTOMATIC SEQUENCE	
2-523	VD12-603	PRESSURE, INTERNAL AMBIENT ST-124M		M	16.0 PSIA	22.5 PSIA	CHECK FROM TIME OF SPHERE PRESSURIZATION TO START OF AUTOMATIC SEQUENCE	
2-524	XD17-601	PRESSURE, COOLANT MANIFOLD INLET	HD	M	40 PSIA	NONE	CHECK FROM SYSTEM STABILIZATION TO T-5 SECONDS	
2-525	VXD24-601	INLET PRESSURE, COOLANT PUMP METHANOL/WATER		M	15.2 PSIA	20 PSIA	CHECK FROM SYSTEM STABILIZATION TO T-5 SECONDS	
2-526	XD25-601	PRESSURE, GN <sub>2</sub> REGULATOR INLET	HD	M	2800 PSIA	3200 PSIA	CHECK FROM SPHERE PRESSURIZATION TO 3000 PSIA TO T-5 SECONDS	
2-527	F1-601	FLOW RATE, SUBLIMATOR INLET WATER	HD					
2-528	F2-601	FLOW RATE, SUBLIMATOR BYPASS METHANOL/WATER	HD					
MISSION SA-204/LM1		SECTION LAUNCH VEHICLE	STAGE/SUBSECTION IU		SYSTEM REDLINE & INFLIGHT MEASUREMENTS		REV DATE	PAGE 2-28



# NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

NASA/KENNEDY SPACE CENTER			STAGE 1						
ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-529	VF9-602	FLOW RATE, IU EXIT COOLANT	HD						
2-530	VF10-601	FLOW RATE, S-IVB INLET COOLANT	HD						
2-531	VG3-601	POSITION, METHANOL/WATER CONTROL VALVE	HD						
2-532	VG5-601	CLOSED POSITION, WATER CONTROL VALVE		M	*	*	*INDICATION MUST BE "CLOSED". CHECK FROM WATER/METHANOL SYSTEM TEMPERATURE STABILIZATION TO T-28 SECONDS		
2-533	G6-601	OPEN POSITION, WATER CONTROL VALVE	HD						
2-534	VH10-603	Z ACCELEROMETER PICKUP, ST-124M		HD					
2-535	VH11-603	X ACCELEROMETER PICKUP, ST-124M		HD					
2-536	VH12-603	Y ACCELEROMETER PICKUP, ST-124M		HD					
2-537	VH40-603	Z GYRO PICKUP, ST-124M		HD					
2-538	VH41-603	X GYRO PICKUP, ST-124M		HD					
2-539	VH42-603	Y GYRO PICKUP, ST-124M		HD					
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	E	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS				2-29



# NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

NASA KENNEDY SPACE CENTER			PRELAUNCH			TIME PERIOD/ACTION/NOTES			
ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	CATEGORY	MIN. VALUE		MAX. VALUE		
2-540	VH54-603	ATTITUDE PITCH LADDER OUTPUT (GUIDANCE COMPUTER)	M**	M	-0.5°	+0.5°	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-541	VH55-603	ATTITUDE YAW LADDER OUTPUT (GUIDANCE COMPUTER)		M	-0.5°	+0.5°	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-542	VH56-603	ATTITUDE ROLL LADDER OUTPUT (GUIDANCE COMPUTER)		M	-0.5°	+0.5°	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-543	H60-603	GUIDANCE COMPUTER OPERATION DELTA X, PCM/657 P10/675 DELTA Y, PCM/657 P10/675 DELTA Z, PCM/657 P10/675  ERROR MESSAGE WORD PCM/736 P10/371 ERROR MONITOR REGISTER PCM/760 P10/701		M	-0.015% -0.02% -0.02%  * *	+0.015% +0.02% +0.02%  * *	**CHECK TO T-5 SECONDS CHECK FROM T-2 HOURS TO T-10 SECONDS NOTE: AMP III DATA STARTS WHEN FUNCTION EXECUTOR FT49/FT50 IS INITIATED  ERROR MESSAGE WORDS AND ERROR MONITOR REGISTER TRANSMISSIONS THAT OCCUR DURING CHECKOUT WILL BE EVALUATED IN REAL TIME TO DETERMINE THEIR SIGNIFICANCE		
2-544		DELETED	1 OF 2 M				CHECK TO T-5 SECONDS		
2-545		DELETED							
2-546		DELETED							
2-547	VH69-602 VR9-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION ROLL ANGULAR VELOCITY, ROLL EDS GROUP 1 (COMMAND)	1 OF 2 M				CHECK TO T-5 SECONDS		
2-548	VH70-602 VR11-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION YAW ANGULAR VELOCITY, YAW EDS GROUP 2 (SPARE)							
MISSION SA-204/LM1		SECTION LAUNCH VEHICLE	STAGE/SUBSECTION IU		SYSTEM REDLINE & INFLIGHT MEASUREMENTS		REV	DATE	PAGE 2-30



# NASA KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD ACTION NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-549	VH71-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION PITCH	1 OF 2 M				CHECK TO T-5 SECONDS		
	VR10-602	ANGULAR VELOCITY, PITCH EDS GROUP 2 (COMMAND)							
2-550	VJ71-603	COMPUTER RESET PULSE NO. 1 (GUIDANCE DECODER)	1 OF 2 M				CHECK TO T-5 SECONDS		
	VJ72-603	COMPUTER RESET PULSE NO. 2 (GUIDANCE DECODER)							
2-551	K20-602	S-IVB BURN	HD						
2-552	VK22-602	SERVO AMPLIFIER COMPARATOR, PITCH		M	*	*	} **INDICATION MUST BE "OFF" CHECK FROM SYSTEM ACTIVATION TO T-5 SECONDS		
2-553	VK23-602	SERVO AMPLIFIER COMPARATOR YAW		M	*	*			
2-554	VK24-602	SPATIAL AMPLIFIER COMPARATOR ROLL-YAW I		M	*	*			
2-555	VK25-602	SPATIAL AMPLIFIER COMPARATOR, PITCH		M	*	*			
2-556	VK26-602	SPATIAL AMPLIFIER COMPARATOR, ROLL-YAW II		M	*	*			
2-557	VK32-601	CONTROL ACCELEROMETERS, "ON" INDICATION		M	*	*	} **INDICATION MUST BE "ON". CHECK FROM SYSTEM ACTIVATION TO T-5 SECONDS		
2-558	VK33-603	CONTROL COMPUTER, "ON" INDICATION BUS 6D11		M	*	*			
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS				2-31



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-559	VK34-603	CONTROL COMPUTER, "ON" INDICATION BUS 6D31		M	∞	∞	INDICATION MUST BE "ON". CHECK FROM SYSTEM ACTIVATION TO T-5 SECONDS		
2-560	VK35-603	CONTROL COMPUTER, "ON" INDICATION BUS 6D41		M	∞	∞			
2-561	VK36-602	CONTROL SIGNAL PROCESSOR, "ON" INDICATION		M	∞	∞			
2-562	VK140-602	INVERTER DETECTOR MONITOR		M	∞	∞			
2-563	K141-900 K142-900	SM-SLA PHY MONITOR A SM-SLA PHY MONITOR B	1 OF 2 M				CHECK TO T-5 SECONDS		
2-564	K145-900 K146-900	LEM SLA SEPARATION RELAY CLOSE A LEM SLA SEPARATION RELAY CLOSE B	1 OF 2 HD				CHECK TO T-5 SECONDS		
2-565	K147-900 K148-900	SLA PANELS DEPLOY RELAY CLOSE A SLA PANELS DEPLOY RELAY CLOSE B	1 OF 2 HD						
2-566	K149-900	SLA DEPLOYMENT PHYS MONITOR	M						
2-567	VXM1-602	MEASURING VOLTAGE	HD						
2-568	M12-601	VOLTAGE, 6D11 BUS	HD						
2-569	XM16-601	CURRENT, 6D10 BATTERY		HD					
2-570	XM17-601	CURRENT, 6D20 BATTERY		HD					
2-571	XM18-601	CURRENT, 6D30 BATTERY		HD					
2-572	XM20-601	CURRENT, 6D40 BATTERY		HD					
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS				2-32



# NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-573		DELETED							
2-574		DELETED							
2-575		DELETED							
2-576		DELETED							
2-577		DELETED							
2-578		DELETED							
2-579	XM62-307	VOLTAGE, 6D10 BATTERY		M	*	*	CHECK FROM BATTERY INSTALLATION TO FINAL POWER TRANSFER (T-28 SECONDS) MINIMUM AND MAXIMUM LIMITS OF BATTERY VOLTAGES WILL BE DETERMINED DURING BATTERY ACTIVATION TESTS. THESE LIMITS WILL BE FURNISHED TO THE MSFC PROGRAM MANAGER OR HIS REPRESENTATIVE AND KSC OPERATIONS PERSONNEL BY KSC LV-GDC2		
2-580	XM63-307	VOLTAGE, 6D20 BATTERY		M	*	*			
2-581	XM64-307	VOLTAGE, 6D21 BUS		M	26.5 VDC	29.5 VDC	WHILE BUSES ARE ENERGIZED BY GROUND OR INTERNAL ELECTRICAL POWER TO T-5 SECONDS. TRANSIENTS THAT OCCUR DURING POWER TRANSFER AND LOAD SWITCHING ARE NOT CONSIDERED AS DEVIATIONS FROM LIMITS		
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS				2-33



# NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-582	XM72-307	VOLTAGE, 6D30 BATTERY		M	<del>26.5</del>	<del>29.5</del>	CHECK FROM BATTERY INSTALLATION TO FINAL POWER TRANSFER (T-28 SECONDS) *MINIMUM AND MAXIMUM LIMITS OF BATTERY VOLTAGES WILL BE DETERMINED DURING BATTERY ACTIVATION TESTS. THESE LIMITS WILL BE FURNISHED TO THE MSFC PROGRAM MANAGER OR HIS REPRESENTATIVE AND KSC OPERATIONS PERSONNEL BY KSC LV-GDC2		
2-583	XM73-307	VOLTAGE, 6D40 BATTERY		M	<del>26.5</del>	*			
2-584	XM74-307	VOLTAGE, 6D41 BUS		M	26.5 VDC	29.5	WHILE BUSES ARE ENERGIZED BY GROUND OR INTERNAL ELECTRICAL POWER TO T-5 SECONDS. TRANSIENTS THAT OCCUR DURING POWER TRANSFER AND LOAD SWITCHING ARE NOT CONSIDERED AS DEVIATIONS FROM LIMITS		
2-585	VX175-307	VOLTAGE, 6D31 BUS		M	26.5 VDC	29.5 VDC			
2-586	VX176-307	VOLTAGE, 6D11 BUS		M	26.5 VDC	29.5 VDC			
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS				2-34



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-587	VR4-602	ANGULAR VELOCITY, PITCH CONTROL		M	-.75°/SEC	+.75°/SEC	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-588	VR5-602	ANGULAR VELOCITY YAW CONTROL		M	-.75°/SEC	+.75°/SEC	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-589	VR6-602	ANGULAR VELOCITY, ROLL CONTROL		M	-.75°/SEC	+.75°/SEC	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-590	VR9-602	ANGULAR VELOCITY, ROLL EDS GROUP 1 (COMMAND)	*				**SEE ITEM 2-547		
2-591	VR10-602	ANGULAR VELOCITY, PITCH EDS GROUP 2 (COMMAND)	*				**SEE ITEM 2-549		
2-592	VR11-602	ANGULAR VELOCITY, YAW EDS GROUP 2 (SPARE)	*				**SEE ITEM 2-548		
2-593	VR25-602	EDS COMPARATOR RELAY MONITOR 1 (ROLL)		M	*	*	] **INDICATION MUST BE "OFF". CHECK FROM SYSTEM ACTIVATION TO T-5 SECONDS		
2-594	VR26-602	EDS COMPARATOR RELAY MONITOR 2 (YAW)		M	*	*			
2-595	VR27-602	EDS COMPARATOR RELAY MONITOR 3 (PITCH)		M	*	*			
2-596	VR28-602	EDS WHEEL SPEED GROUP 1 (ROLL)		M	*	*	] **INDICATION MUST BE "ON". CHECK FROM SYSTEM ACTIVATION TO T-5 SECONDS EXCEPT DURING THOSE PERIODS WHEN TORQUING ACTION CAUSES AN "OFF" INDICATION		
2-597	VR29-602	EDS WHEEL SPEED GROUP 2 (YAW)		M	*	*			
2-598	VR30-602	EDS WHEEL SPEED GROUP 3 (PITCH)		M	*	*			
MISSION SA-204/LM1		SECTION LAUNCH VEHICLE	STAGE/SUBSECTION IU		SYSTEM REDLINE & INFLIGHT MEASUREMENTS		REV	DATE	PAGE 2-35



# RED LINES TO MISSION RULES

## IU 204L

2-506		C-BAND TRANSPONDER 603A653 C-BAND TRANSPONDER 602A619 AZUSA TRANSPONDER	1 OF 3 M **				CHECK TO T-5 SECONDS **SEE ITEM 1-407 FOR HIGHER CATEGORY
2-513	VC34-603	TEMPERATURE, ST-124M INERTIAL GIMBAL		M	96.8° F 36° C 556.8° R	118.40° F 48° C 578.4° R	CHECK FROM T-3 HOURS TO START OF AUTOMATIC SEQUENCE
2-513A	XC36-601	TEMPERATURE, IU AMBIENT		M	64.9° F 18.3° C 524.9° R	80° F 26.7° C 540° R	CHECK FROM SYSTEM STABILIZATION TO T-14 MINUTES *THIS LIMIT MAY BE CHANGED TO 12.7° C AFTER NOTIFICATION OF MSFC. SEE ITEM 2-009.
2-566	K149-900	SLA DEPLOYMENT PHYS MONITOR	M **				CHECK TO T-5 SECONDS **SEE ITEM 2-010
2-581	XM64-307	VOLTAGE, 6D21 BUS		M	25.5 VDC	29.5 VDC	WHILE BUSES ARE ENERGIZED BY GROUND OR INTERNAL ELECTRICAL POWER TO T-5 SECONDS. TRANSIENTS THAT OCCUR DURING POWER TRANSFER AND LOAD SWITCHING ARE NOT CONSIDERED AS DEVIATIONS FROM LIMITS
2-584	XM74-307	VOLTAGE, 6D41 BUS		M	26.5 VDC	29.5 VDC	WHILE BUSES ARE ENERGIZED BY GROUND OR INTERNAL ELECTRICAL POWER TO T-5 SECONDS. TRANSIENTS THAT OCCUR DURING POWER TRANSFER AND LOAD SWITCHING ARE NOT CONSIDERED AS DEVIATIONS FROM LIMITS
2-585	VXM75-307	VOLTAGE, 6D31 BUS		M	25.5 VDC	29.5 VDC	
2-586	VXM76-307	VOLTAGE, 6D11 BUS		M	25.5 VDC	29.5 VDC	



ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-500		LINK, DP-1	J29-602, DP1A0M14-03, P1 RF OUTPUT CIF MONITOR
2-501		LINK, DF-1	J25-602, CP1B01501, F1 RF OUTPUT CIF MONITOR
2-502		LINK, DF-2	J27-602, CP1B01503, F2 RF OUTPUT CIF MONITOR
2-503		LINK, DS-1 (IU STAGE)	J31-602, CP1B01910, S1 RF OUTPUT CIF MONITOR
2-504		TAPE RECORDER	NO ALT. SOURCE
2-506A		AO MULTIPLEXER	CHECK DP1A0-28-10 5v.
2-506B		REMOTE DIGITAL SUB-MULTIPLEXER (RDSM)	PANEL LIGHTS - CUIP
2-506C		BO MULTIPLEXER	CHECK CP1B0-28-10 5v. CHECK DF2B0-28-10 5v.
2-507	VA2-603	ACCELERATION, LONGITUDINAL	NONE. SHOULD BE 1 g AT ALL TIMES.
2-508	VA4-601	ACCELERATION, PITCH CONTROL	NONE. SHOULD BE 2.5 v, EXCEPT DURING F/C CHECKS.
2-509	VA5-603	ACCELERATION, YAW CONTROL	NONE. SHOULD BE 2.5 v, EXCEPT DURING F/C CHECKS.
2-510	C11-601	TEMPERATURE, SUBLIMATOR INLET METHANOL/WATER	CHECK C36. SHOULD BE AMBIENT TEMP. ON GROUND.
2-511	VXC15-601	TEMPERATURE, METHANOL/WATER CONTROL	CHECK C16-603.
2-512	XC31-603	TEMPERATURE, ST-124M AIR BEARING INLET	NONE
2-513	VC34-603	TEMPERATURE, ST-124M INERTIAL GIMBAL	NONE



ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-513 A	XC36-601	TEMPERATURE, IU AMBIENT	CHECK XC136-601
2-514	VC54-603	TEMPERATURE, GUIDANCE COMPUTER (MEMORY)	CHECK VC53-603
2-515	VC55-603	TEMPERATURE, DATA ADAPTER (2A10A5)	CHECK VC56-603
2-516	C64-601	TEMPERATURE, BATTERY NO. 1 INTERNAL	CHECK CORRESPONDING CURRENT M16-601
2-517	C65-601	TEMPERATURE, BATTERY NO. 2 INTERNAL	CHECK CORRESPONDING CURRENT M17-601
2-518	C66-601	TEMPERATURE, BATTERY NO. 3 INTERNAL	CHECK CORRESPONDING CURRENT M18-601
2-519	C68-601	TEMPERATURE, BATTERY NO. 4 INTERNAL	CHECK CORRESPONDING CURRENT M20-601
2-521	XD10-603	PRESSURE, GN <sub>2</sub> REGULATOR INLET	CHECK FOR CHANGE IN XD11-603
2-522	XD11-603	PRESSURE, ST-124M AIR BEARING INLET	CHECK XD10-603 (THIS MEAS. IS NEEDED TO INSURE AIR BEARING OPERATIONS)
2-253	VD12-603	PRESSURE, INTERNAL AMBIENT ST-124 M	CHECK XD11-603
2-524	XD17-601	PRESSURE, COOLANT MANIFOLD INLET	CHECK F2-601, VXD24-601
2-525	VXD24-601	INLET PRESSURE, COOLANT PUMP METHANOL/WATER	CHECK XD17-601
2-526	XD25-601	PRESSURE, GN <sub>2</sub> REGULATOR INLET	CHECK VXD24-601, XD17-601
2-257	F1-601	FLOWRATE, SUBLIMATOR INLET WATER	INACTIVE DURING PREFLIGHT. SHOULD BE 2.5 v.
2-258	F2-601	FLOWRATE, SUBLIMATOR BYPASS METHANOL/WATER	CHECK G3-601
2-529	VF9-602	FLOWRATE, IU EXIT COOLANT	CHECK F10-601 AND OTHER FLOWS.
2-530	VF10-601	FLOWRATE, SIVB INLET COOLANT	CHECK F9-601 AND OTHER FLOWS.
2-531	VG3-601	POSITION, METHANOL/WATER CONTROL VALVE	CHECK F2-601



ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-532	VG5-601	CLOSED POSITION, WATER CONTROL VALVE	CHECK G6-601
2-533	G6-601	OPEN POSITION, WATER CONTROL VALVE	CHECK VG5-601
2-534	VH10-603	Z ACCELEROMETER PICKUP, ST-124 M	CHECK HL3-603
2-535	VH11-603	X ACCELEROMETER PICKUP, ST-124 M	CHECK HL4-603
2-536	VH12-603	Y ACCELEROMETER PICKUP, ST-124 M	CHECK HL5-603
2-537	VH40-603	Z GYRO PICKUP, ST-124M	CHECK H44-603
2-538	VH41-603	X GYRO PICKUP, ST-124M	CHECK H45-603
2-539	VH42-603	Y GYRO PICKUP, ST-124M	CHECK H46-603
2-540	VH54-603	ATTITUDE PITCH LADDER OUTPUT (GUIDANCE COMPUTER)	CHECK VH71-602
2-541	VH55-603	ATTITUDE YAW LADDER OUTPUT (GUIDANCE COMPUTER)	CHECK VH70-602
2-542	VH56-603	ATTITUDE ROLL LADDER OUTPUT (GUIDANCE COMPUTER)	CHECK VH69-602
2-543	H60-603	GUIDANCE COMPUTER OPERATION DELTA X, PCM/657 P10/675 DELTA Y, PCM/657 P10/675 DELTA Z, PCM/657 P10/675  ERROR MESSAGE WORD PCM/736 P10/371 ERROR MONITOR REGISTER PCM/760 P10/701	OPERATION IS BEING MONITORED BY FLT. COMP. PEOPLE IN CIF.



ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-547	VH69-602 VR9-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION ROLL ANGULAR VELOCITY, ROLL EDS GROUP 1 (COMMAND)	CHECK VH56-603 CHECK VR6-602
2-548	VH70-602 VR11-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION YAW ANGULAR VELOCITY, YAW EDS GROUP 3 (SPARE)	CHECK VH55-603 CHECK VR5-602
2-549	VH71-602 VR10-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION PITCH ANGULAR VELOCITY, PITCH EDS GROUP 2 (COMMAND)	CHECK VH54-603 CHECK VR4-602
2-550	VJ71-603 VJ72-603	COMPUTER RESET PULSE NO. 1 (GUIDANCE DECODER) COMPUTER RESET PULSE NO. 2 (GUIDANCE DECODER)	CHECK VJ71-603 & VJ72-603 which are redundant. CHECK VJ71-603 & VJ72-603 which are redundant.
2-551	VK-20-602	SIVB BURN	INACTIVE DURING PREFLIGHT EXCEPT DURING FC CHECKS.
2-552	VK22-602	SERVO AMPLIFIER COMPARATOR, PITCH	CHECK WITH FC, COMES ON WHEN REDUNDANT SYSTEM DOES NOT COMPARE.
2-553	VK24-602	SERVO AMPLIFIER COMPARATOR, YAW	"
2-554	VK24-602	SPATIAL AMPLIFIER COMPARATOR ROLL-YAW I	"
2-555	VK25-602	SPATIAL AMPLIFIER COMPARATOR, PITCH	"
2-556	VK26-602	SPATIAL AMPLIFIER COMPARATOR, ROLL-YAW II	"
2-557	VK32-601	CONTROL ACCELEROMETERS, "ON" INDICATION	CHECK WITH FLIGHT CONTROL
2-558	VK33-603	CONTROL COMPUTER, "ON" INDICATION BUS 6D11	CHECK WITH FLIGHT CONTROL
2-559	VK34-603	CONTROL COMPUTER, "ON" INDICATION BUS 6D31	CHECK WITH FLIGHT CONTROL
2-560	VK35-603	CONTROL COMPUTER, "ON" INDICATION BUS 6D41	CHECK WITH FLIGHT CONTROL
2-561	VK36-602	CONTROL SIGNAL PROCESSOR, "ON" INDICATION	CHECK WITH FLIGHT CONT



ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-562	VK140-602	INVERTER DETECTOR MONITOR	CHECK WITH FLIGHT CONTROL
2-563	K141-900	SM-SLA PHY MONITOR A	INACTIVE DURING PREFLIGHT, K141-900 and K142-900 ARE REDUNDANT.
	K142-900	SM-SLA PHY MONITOR B	
2-564	K145-900	LEM SLA SEPARATION RELAY CLOSE A	INACTIVE DURING PREFLIGHT, K145-900 & K146-900 ARE REDUNDANT.
2-565	K147-900	SLA PANELS DEPLOY RELAY CLOSE A	INACTIVE DURING PREFLIGHT
	K148-900	SLA PANELS DEPLOY RELAY CLOSE B	INACTIVE DURING PREFLIGHT
2-566	K149-900	SLA DEPLOYMENT PHYS MONITOR	NONE
2-567	VXM1-602	MEASURING VOLTAGE	CHECK CHANNEL A0-28-10 5v REF.
2-568	M12-601	VOLTAGE, 6D11 BUS	CHECK XM76-307
2-569	XM16-601	CURRENT, 6D10 BATTERY	CHECK VXM76-307 or M12-601, CORRESPONDING VOLTAGE INTERNAL POWER ONLY.
2-570	XM17-601	CURRENT, 6D20 BATTERY	CHECK VXM64-307, CORRESPONDING VOLTAGE
2-571	XM18-601	CURRENT, 6D30 BATTERY	CHECK VXM75-307, CORRESPONDING VOLTAGE
2-572	XM20-601	CURRENT, 6D40 BATTERY	CHECK VXM76-307, CORRESPONDING VOLTAGE
2-573 - 2-578		DELETED	
2-579	XM62-307	VOLTAGE, 6D10 BATTERY	CHECK XM16-601 IF INTERNAL, C64-601 IF EXTERNAL
2-580	XM63-307	VOLTAGE, 6D20 BATTERY	CHECK XM17-601 IF INTERNAL, C65-601 IF EXTERNAL
2-581	XM64-307	VOLTAGE, 6D21 BUS	CHECK CORRESPONDING CURRENT XM17-601 IF INTERNAL, XM77-307 IF EXTERNAL



ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-582	XM72-307	VOLTAGE, 6D30 BATTERY	CHECK XM18-601 IF INTERNAL, C66-601 IF EXTERNAL
2-583	XM73-307	VOLTAGE, 6D40 BATTERY	CHECK XM20-601 IF INTERNAL, C68-601 IF EXTERNAL
2-584	XM74-307	VOLTAGE, 6D41 BUS	CHECK CORRESPONDING CURRENT, XM20-601 IF INTERNAL XM30-307 IF EXTERNAL
2-585	VXM75-307	VOLTAGE, 6D31 BUS	CHECK CORRESPONDING CURRENT XM18-601 IF INTERNAL XM18-601 IF EXTERNAL
2-586	VXM76-307	VOLTAGE, 6D11 BUS	CHECK CORRESPONDING CURRENT XM16-601 IF INTERNAL XM22-307 IF EXTERNAL
2-587	VR4-602	ANGULAR VELOCITY, PITCH CONTROL	CHECK VR10-602
2-2588	VR5-602	ANGULAR VELOCITY YAW CONTROL	CHECK VR14-602
2-589	VR6-602	ANGULAR VELOCITY, ROLL CONTROL	CHECK VR9-602
2-590	VR9-602	ANGULAR VELOCITY, ROLL EDS GROUP 1 (COMMAND)	CHECK VR6-602
2-591	VR10-602	ANGULAR VELOCITY, PITCH EDS GROUP 2 (COMMAND)	CHECK VR4-602
2-592	VR11-602	ANGULAR VELOCITY, YAW EDS GROUP 2 (SPARE)	CHECK VR5-602
2-593	VR25-602	EDS COMPARATOR RELAY MONITOR 1 (ROLL)	COMPARE VR4-602 WITH VR12-602
2-594	VR26-602	EDS COMPARATOR RELAY MONITOR 2 (YAW)	COMPARE VR14-602 WITH VR8-602
2-595	VR27-602	EDS COMPARATOR RELAY MONITOR 3 (PITCH)	COMPARE VR9-602 WITH VR 13-602
2-596	VR28-602	EDS WHEEL SPEED GROUP 1 (ROLL)	CHECK WITH F/C
2-597	VR29-602	EDS WHEEL SPEED GROUP (YAW)	CHECK WITH F/C




ITEM	MEAS./TM #	DESCRIPTION	ALTERNATE SOURCE
2-598	VR30-602	EDS WHEEL SPEED GROUP 3 (PITCH)	CHECK WITH F/C.



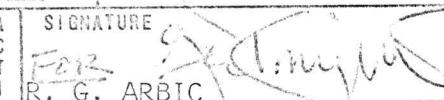
# LAUNCH MISSION RULES INPUT AND CHANGE FORM

1. TO BE FILLED OUT BY ORGANIZATION  
RESPONSIBLE FOR PREPARATION OF LMRD SECTION

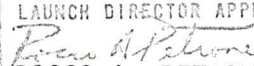
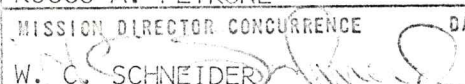
DATE	MISSION
JANUARY 18, 1968	SA-204/LM1
TRANSACTION	
204-LV-3	
REQUESTER	
LV-TOM1	
LMRD SECTION NO.	DEVELOPMENT CENTER CONCURRENCE
2	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A

REMARKS
P R E P A R E D B Y SIGNATURE  MAIL CODE SYMBOL LV-TOM1

3. TEST PLANNING OFFICE APPRAISAL

APPROVED	REMARKS
<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
A C T I O N B Y SIGNATURE  R. G. ARBIC MAIL CODE SYMBOL LO-PLN-2 DATE JAN 18, 1968	

4. SHORT-CYCLE CHANGES

LAUNCH DIRECTOR APPROVAL	DATE
 ROCCO A. PETRONE	19 Jan 68
MISSION DIRECTOR CONCURRENCE	DATE
 W. C. SCHNEIDER	

2. INPUT /CHANGE (3)

REVISED PAGE 2-10A, REVISED ITEM 2-172A

NOTES COLUMN READS AS FOLLOWS:

CHECK TO T-5 SECONDS. \*RANGE SAFETY REQUIREMENT. IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY PERFORMING AN RF SENSITIVITY CHECK.

REVISED ITEM 2-172B;

NOTES COLUMN READS AS FOLLOWS:

CHECK TO T-5 SECONDS

\*RANGE SAFETY REQUIREMENT. IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY MEASUREMENT NO. M506-13, COMMAND RECEIVER NO. 2 HIGH LEVEL FIELD OR BY PERFORMING AN RF SENSITIVITY CHECK.

REVISED PAGE 2-22, REVISED ITEM 2-380;

NOTES COLUMN READS AS FOLLOWS:

CHECK TO T-5 SECONDS

\*RANGE SAFETY REQUIREMENT IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY PERFORMING AN RF SENSITIVITY CHECK.

REVISED PAGE 2-22, REVISED ITEM 2-381;

NOTES COLUMN READS AS FOLLOWS:

CHECK TO T-5 SECONDS

\*RANGE SAFETY REQUIREMENT IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY MEASUREMENT N56-411, SECURE RANGE SAFETY RECEIVER HIGH LEVEL SIGNAL STRENGTH, OR BY PERFORMING AN RF SENSITIVITY CHECK.

ADDED PAGE 2-22A, NO ITEM CHANGES;

ITEM 2-382 AND 2-383 ARE ON THIS PAGE TO ALLOW ROOM FOR CHANGES TO ITEMS 2-380 AND 2-381.

REVISED PAGE 2-30, REVISED ITEM 2-543

MINIMUM VALUE COLUMN READS AS FOLLOWS:

-0.015%

-0.02 °

-0.02 °



# LAUNCH MISSION RULES INPUT AND CHANGE FORM

1. TO BE FILLED OUT BY ORGANIZATION  
RESPONSIBLE FOR PREPARATION OF LMRD SECTION

DATE	MISSION
TRANSACTION	
REQUESTER	
LMRD SECTION NO.	DEVELOPMENT CENTER CONCURRENCE YES <input type="checkbox"/> NO <input type="checkbox"/> N/A <input type="checkbox"/>
REMARKS	
P R E P A R E D B Y	SIGNATURE
	MAIL CODE SYMBOL

3. TEST PLANNING OFFICE APPRAISAL

APPROVED	REMARKS
<input type="checkbox"/> YES	
<input type="checkbox"/> NO	
A C T I O N B Y	SIGNATURE
	MAIL CODE SYMBOL      DATE

4. SHORT-CYCLE CHANGES

LAUNCH DIRECTOR APPROVAL	DATE
MISSION DIRECTOR CONCURRENCE	DATE

2. INPUT /CHANGE (3)

MAXIMUM VALUE COLUMN READS AS FOLLOWS:

+0.015%

+0.02 °

+0.02 °

NOTES COLUMN READS AS FOLLOWS:

\*CHECK TO T-5 SECONDS. ERRORS IN LVDC TELEMETRY DATA SHALL NOT EXCEED 1%.

ANY LVDC TELEMETRY WORDS WITH VALIDITY BIT SET SHALL NOT BE COUNTED. IN  
PREPARE TO LAUNCH THE FOLLOWING BIT PATTERNS ARE TELEMETERED ALTERNATELY:

P10 061 TAG 614 PATTERN 2525, P10 714 TAG 763 PATTERN 5252

CHECK FROM T-2 HOURS TO T-10 SECONDS

NOTE: AMP III DATA STARTS WHEN FUNCTION EXECUTOR FT49/FT50 IS INITIATED.

ERROR MESSAGE WORDS AND ERROR MONITOR REGISTER TRANSMISSION THAT OCCUR DURING  
CHECKOUT WILL BE EVALUATED IN REAL TIME TO DETERMINE THEIR SIGNIFICANCE.  
SEE ITEM 2-010.

ADDED PAGE 2-30A, NO ITEM CHANGES;

ITEM 2-544 THRU 2-548 ARE ON THIS PAGE TO ALLOW ROOM FOR CHANGES TO ITEM 2-543.



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES
				CATEGORY	MIN. VALUE	MAX. VALUE	
2-172A	VM505-13	COMMAND RECEIVER NO. 1 LOW LEVEL FIELD		M*			CHECK TO T-5 SECONDS * RANGE SAFETY REQUIREMENT IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY PERFORMING AN RF SENSITIVITY CHECK
2-172B	VM508-13	COMMAND RECEIVER NO. 2 LOW LEVEL FEILD		M*			CHECK TO T-5 SECONDS * RANGE SAFETY REQUIREMENT IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECIEVER OPERATION WILL BE VERIFIED BY MEASUREMENT NO. M506-13, COMMAND RECEIVER NO. 2 HIGH LEVEL FIELD OR BY PERFORMING AN RF SENSITIVITY CHECK

MISSION SA-204/LM1	SECTION LAUNCH VEHICLE	STAGE/SUBSECTION S-IB	SYSTEM REDLINE & INFLIGHT MEASUREMENTS	REV	DATE SHORT CYCLE 204-LV-3	PAGE 2-10A
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## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-374		DELETED							
2-375		DELETED							
2-376	VXN37-414	QUANTITY, OXID TANK MOD 1 (APS)	HD						
2-377	VXN38-415	QUANTITY, OXID TANK MOD 2 (APS)	HD						
2-378	VXN39-414	QUANTITY, FUEL TANK MOD 1 (APS)	HD						
2-379	VXN40-415	QUANTITY, FUEL TANK MOD 2 (APS)	HD						
2-380	VN57-411	SECURE RANGE SAFETY RECEIVER 1 LOW LEVEL SIGNAL STRENGTH		M*			CHECK TO T-5 SECONDS *RANGE SAFETY REQUIREMENT IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY PERFORMING AN RF SENSITIVITY CHECK		
2-381	VN62-411	SECURE RANGE SAFETY RECEIVER 2 LOW LEVEL SIGNAL STRENGTH		M*			CHECK TO T-5 SECONDS *RANGE SAFETY REQUIREMENT IN THE EVENT OF FAILURE OF THIS MEASUREMENT, COMMAND RECEIVER OPERATION WILL BE VERIFIED BY MEASUREMENT N56-411, SECURE RANGE SAFETY RECEIVER HIGH LEVEL SIGNAL STRENGTH, OR BY PERFORM- ING AN RF SENSITIVITY CHECK.		
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	S-IVB		REDLINE & INFLIGHT MEASUREMENT			SHORT-CYCLE 204-LV-3	2-22



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-382		LOX CUTOFF SENSOR NO. 1 - WET LOX CUTOFF SENSOR NO. 2 - WET LOX CUTOFF SENSOR NO. 3 - WET (INDICATIONS DS 38, DS 39 AND DS 40 PANEL 1484)		2 OF 3 M	✖	✖	✖2 OF 3 INDICATIONS MUST BE "DRY" FROM LV POWER UP TO START OF S-IVB LOX LOADING 2 OF 3 INDICATIONS MUST BE "WET" FROM START OF S-IVB LOX LOADING TO START OF AUTOMATIC SEQUENCE.		
2-383		LH <sub>2</sub> CUTOFF SENSOR NO. 1 - WET LH <sub>2</sub> CUTOFF SENSOR NO. 2 - WET LH <sub>2</sub> CUTOFF SENSOR NO. 3 - WET (INDICATIONS DS 83, DS 84 AND DS 85 PANEL 1484)		2 OF 3 M	✖	✖	✖2 OF 3 INDICATIONS MUST BE "DRY" FROM LV POWER UP TO START OF S-IVB LH <sub>2</sub> LOADING 2 OF 3 INDICATIONS MUST BE "WET" FROM START OF S-IVB LH <sub>2</sub> LOADING TO START OF AUTOMATIC SEQUENCE.		
MISSION SA-204/LM1		SECTION LAUNCH VEHICLE	STAGE/SUBSECTION S-IVB		SYSTEM REDLINE & INFLIGHT MEASUREMENTS		REV	DATE SHORT CYCLE 204-LV-3	PAGE 2-22A



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES		
				CATEGORY	MIN. VALUE	MAX. VALUE			
2-540	VH54-603	ATTITUDE PITCH LADDER OUTPUT (GUIDANCE COMPUTER)		M	-0.5°	+0.5°	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-541	VH55-603	ATTITUDE YAW LADDER OUTPUT (GUIDANCE COMPUTER)		M	-0.5°	+0.5°	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-542	VH56-603	ATTITUDE ROLL LADDER OUTPUT (GUIDANCE COMPUTER)		M	-0.5°	+0.5°	CHECK FROM T-2 HOURS TO T-5 SECONDS		
2-543	H60-603	GUIDANCE COMPUTER OPERATION	M*	M			*CHECK TO T-5 SECONDS		
		DELTA $\dot{X}$ , PCM/657 P10/675 DELTA $\dot{Y}$ , PCM/657 P10/675 DELTA $\dot{Z}$ , PCM/657 P10/675			-0.015% -0.02° -0.02°	+0.015% +0.02° +0.02°	CHECK FROM T-2 HOURS TO T-10 SECONDS NOTE: AMP III DATA STARTS WHEN FUNCTION EXECUTOR FT49/FT50 IS INITIATED		
		ERROR MESSAGE WORD PCM/736 P10/371 ERROR MONITOR REGISTER PCM/760 P10/701			* *	* *	ERROR MESSAGE WORDS AND ERROR MONITOR REGISTER TRANSMISSIONS THAT OCCUR DURING CHECKOUT WILL BE EVALUATED IN REAL TIME TO DETERMINE THEIR SIGNIFICANCE SEE ITEM 2-010.		
MISSION		SECTION	STAGE/SUBSECTION		SYSTEM		REV	DATE	PAGE
SA-204/LM1		LAUNCH VEHICLE	IU		REDLINE & INFLIGHT MEASUREMENTS			SHORT CYCLE 204-LV-3	2-30



## NASA/KENNEDY SPACE CENTER - LAUNCH MISSION RULES

ITEM	MEAS/TM NO.	DESCRIPTION	FLIGHT CATEGORY	PRELAUNCH			TIME PERIOD/ACTION/NOTES
				CATEGORY	MIN. VALUE	MAX. VALUE	
2-544		DELETED					
2-545		DELETED					
2-546		DELETED					
2-547	VH69-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION ROLL	1 OF 2				CHECK TO T-5 SECONDS
	VR9-602	ANGULAR VELOCITY, ROLL EDS GROUP 1 (COMMAND)	M				
2-548	VH70-602	ATTITUDE ERROR SIGNAL, ANGULAR POSITION YAW	1 OF 2				CHECK TO T-5 SECONDS
	VR11-602	ANGULAR VELOCITY, YAW EDS GROUP 2 (SPARE)	M				