

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

FINAL FLIGHT MISSION RULES

APOLLO 17 (AS-514/114/LM-12)

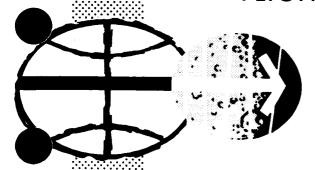
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SEPTEMBER 1, 1972

PREPARED FLIGHT CONTROL DIVISION



MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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APOLLO 17

FINAL FLIGHT MISSION RULES

PREFACE

THIS DOCUMENT CONTAINS THE FINAL FLIGHT MISSION RULES FOR APOLLO 17 AS OF SEPTEMBER 1, 1972. ALL SUBSEQUENT REVISIONS TO THIS DOCUMENT WILL BE PRINTED ON DIFFERENT COLORED PAGES FOR EASY RECOGNITION.

IT IS REQUESTED THAT ANY ORGANIZATION HAVING COMMENTS, QUESTIONS, OR SUGGESTIONS CONCERNING THESE MISSION RULES CONTACT MR. JOHN H. TEMPLE, FLIGHT OPERATIONS AND RECOVERY BRANCH, BUILDING 30, ROOM 2058, PHONE 713-483-4126.

ANY REQUESTS FOR ADDITIONAL COPIES OR CHANGES TO THE DISTRIBUTION LIST IN APPENDIX B OF THIS DOCUMENT MUST BE MADE IN WRITING TO MR. HOWARD W. TINDALL, JR., DIRECTOR OF FLIGHT OPERATIONS, MANNED SPACECRAFT CENTER, HOUSTON, TEXAS.

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MISSION RULES

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		A. THE "C	CONDITION/MALF	UNCTI	ON" COLUMN	DEFINES THE FAILURE	· <u>·</u>		
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MISSION RULES

I - GENERAL GUIDELINES

R ITEM					
		OMSF GENERAL RULES	- 		
I-1	MISSION RULES ARE EFFECTIVE DUR APPLICABLE. WHEN POST MISSION FLIGHT HARDWARE, AND LUNAR SAMP	QUARANTINE IS IMPOSED, RULES	WILL BE APPLICABLE		
I-2	DURING THE CONDUCT OF THE MISSI TO PRIMARY OBJECTIVES, MISSION				ATIONS THAT INVOLVE CHANGES
1-3	WITHIN THEIR RESPECTIVE AREAS O DOD MANAGER FOR MSF SUPPORT OPE OPTIMUM CONDUCT OF THE MISSION.	RATIONS, AND THE MISSION DIF			
I-4	THE SPACECRAFT COMMANDER, SPACE LAUNCH OPERATIONS MANAGER, LAUN MISSION DIRECTOR MAY REQUEST A	NCH DIRECTOR, FLIGHT DIRECTOR	R, DOD MANAGER FOR M	SF SUPPORT	OPERATIONS, OR THE
I-5	DURING THE COUNTDOWN, THE LAUNC WILL PROVIDE TECHNICAL ADVICE A LATTER TWO WILL KEEP THE MISSIO PHASE OF OPERATIONS, SIMILAR SU FLIGHT OPERATIONS. THE MISSION SOLUTIONS DURING THE APPLICABLE	AND SUPPORT DIRECTLY TO THE CONDINENTAL DIRECTOR FULLY INFORMED OF UPPORT AS REQUIRED WILL BE PAY DIRECTOR WILL BE KEPT FULL	LAUNCH OPERATIONS MA F PROBLEMS AND PROPO ROVIDED TO THE FLIGH	NAGER AND SED SOLUTI IT DIRECTOR	LAUNCH DIRECTOR. THE TONS. DURING THE FLIGHT R AND THE MSC DIRECTOR OF
I-6	WHEN TIME PERMITS, THE FAILURE THE LAUNCH DIRECTOR OR THE FLIC THE MALFUNCTION. SUBSEQUENTLY "PROCEED, HOLD, RECYCLE," OR "S	GHT DIRECTOR. THE INITIAL R , THE MISSION DIRECTOR WILL	EPORT WILL INCLUDE T BE INFORMED OF ESTIM	THE POSITIO	ON OR FACILITY THAT DETECTE
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MISSION RULES

I - GENERAL GUIDELINES - CONTINUED

1-7 1F A MANDATORY ITEM FAILS DURING THE COUNTDAWN, IT WILL SE CORRECTED PRIOR TO LAUNCH, HOLDING OR RECYCLING THE COUNTDAWN AS MICESSARY. IS A MANDATORY ITEM CANNOT BE CORRECTED TO RESULT LITTORY MITTINE PROPRIATE CORRECTION AND PROGRAM MANAGERS. GENEROLLY THE LOSS OF A MANDATORY ITEM WILL RESULT IN A SCRUB. 1-8 AS THE RESIDMATED REPRESENTATIVE OF THE PROGRAM DIRECTOR, ONLY THE MISSION DIRECTOR MAY SCRUB THE MISSION. FURTHER THE MISSION DIRECTOR MAY SCRUB THE MISSION. FURTHER THE MISSION DIRECTOR RETAINS THE PRIPARY AUTHORITY TO DOMINGABLE A MANDATORY CATEGORY. THIS AUTHORITY WILL BE EXPOSED AS INCLUDENCES DECIDATE AND AFTER APPROPRIATE RECOMPENDATIONS FROM THE DIRECTOR OF FLIGHT OPERATIONS, PROGRAM MANAGERS, JURINCH DIRECTOR, AND FLIGHT DIRECTOR. 1-9 CONSIDERATION WILL BE GIVEN TO THE REPAIR OF ANY HIGHLY RESIDRABLE ITEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED CITEMANNACES OLD. THE MISSION DIRECTOR WAY SCRUB THE MISSION AFTER COORDINATION WITH THE APPROPRIATE OPERATIONS AND PROGRAM MANAGERS. THE MISSION DIRECTOR WAY SCRUB THE MISSION AFTER COORDINATION WITH THE APPROPRIATE OPERATIONS AND PROGRAM MANAGERS. THE LAUNCH SITE AND MY SCRUB THE MISSION AFTER COORDINATION WITH THE APPROPRIATE OPERATIONS AND PROGRAM MANAGERS. 1-10 IF THE MCC LINES A PRAMAGER BUT THE LAUNCH SITE MS A WILD READOUT, THE MC WILL CONTINUE ON THE LAUNCH SITE READOUT. THIS IS TRUE EXCEPT FOR THOSE MANDATORY PARAMETERS ALL THE MISSION BULLS WITH A PROPRIATE OPERATIONS OF THE FLIGHT CREW AND SWIECEMENT RESULTING FROM A FAD ARBORT. 1-11 THE LAUNCH DIRECTOR WILL BE RESPONSIBLE FOR ALL ACTIONS IN THE EVENT OF LAUNCH SITE EMPRESACES EXCEPT FOR RECOVERY OPERATIONS MANAGER MAY SEND AN ABOUT REQUEST FROM THE TIME THE LAUNCH SITE PROBLEM. 1-12 THE LAUNCH DIRECTOR WILL BE RESPONSIBLE FOR ALL ACTIONS IN THE EVENT OF LAUNCH SITE EMPRESACES EXCEPT FOR RECOVERY OPERATIONS OF THE FLIGHT CREW AND SWIECEMENT FROM THE TIME THE LAUNCH ESCAPE SYSTEM IS ARROUNTED THE LAUNCH OPERATIONS. 1-1-10 MISSION REPORT OF THE PROPRIES OF THE MISSION BRANCES	. 1							
COMPTION AS RECESSARY. IF A MANDATORY LITEM CANNOT BE CORRECTED TO PERMIT LIFTOFF WITHIN THE LAUNCH WINDOW, THE MISSION DIRECTOR MY PROCERO WITH CUMING HERE APPROPRIATE OPERATIONS AND PROGRAM MANAGERS. GENERALLY THE LOSS OF A MANDATORY TIEM MILL RESULT IN A SCRIB. AS THE DESTONATED REPRESENTATIVE OF THE PROGRAM DIRECTOR, ONLY THE MISSION DIRECTOR MAY SCRIB THE MISSION. FURTHER PROGRAM MANAGERS. GENERALLY THE LOSS OF A MANDATORY CHECKER, AND SCRIBE THE MISSION DIRECTOR RETAINS THE PRIPMER AUTHORITY DI DOMINIARIAE, A MANDATORY CATEGORY. THIS AUTHORITY MILL BE EXECUTED AS CIRCUMSTANCES DICTAR AND PETROPHORATIONS FROM THE DIRECTOR OF PILIOTI OPERATIONS, PROGRAM MANAGERS, LAUNCH DIRECTOR, AND FILM FOR MORE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM. BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE SCRUBBED FOR ANY SINGLE HIGHLY DESIDABLE TIEM, BUT IN NO CASE WILL THE LAUNCH BE DIRECTOR OF THE MISSION DIRECTOR MY SCRUB THE MISSION BUT IN THE ASSOCIATION WITH THE APPROPRIATE OPERATIONS AND PROGRAM MANAGERS. 1-10 IF HE MEKEVER POSSIBLE, THE LAUNCH SITE AND HICE WILL VERIFY TELEMETRY READOUT DISCREPANCIES DICCURRING FRIOR TO LIFTOFF. HICE COUNTDOWN MILL CONTINUE, MEETE POSSIBLE, CONCURRENTLY WITH CORRECTION OF AN EXISTING PROBLEM. 1-11 THE LAUNCH DIRECTOR WILL BE RESPONSIBLE FOR ALL ACTIONS IN THE EVENT OF LAUNCH SITE EMERGENCIES EXCEPT FOR RECOVERY OPERATIONS OF THE FLIGHT CREW AND SPACECRAFT RESULTING FROM A PAO ABORT. 1-12 THE LAUNCH OPERATIONS MANAGER MAY SEND AN ABORT REQUEST FROM THE THE HEALTH CAUNCH ESCAPE SYSTEM IS ARMED UNTIL THE SPACE VEHICLE REACHES SUFFICIEN	R	ITEM						
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MISSION RULES

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_R ITEM								
I-14	RESPONSIBIL	ITY FOR SENDI	NG AN	ABORT REQU	E, THE LAUNCH OPERA JEST. THE CRITERIA SION RULES RESPECTI	FOR SENDING AN ABO	FLIGHT DIF RT REQUEST	ECTOR WILL HAVE CONCURRENT DURING THIS PERIOD WILL LE
I-15	WHERE POSSIE	BLE, ALL MANU/ OF THE FAILU	AL ABO	ORT COMMAND CREW ABORT	/REQUESTS FROM THE CACTION WILL NORMALL	GROUND DURING FLIG Y BE BASED UPON TW	HT WILL BE O CUES.	BASED ON TWO INDEPENDENT
I-16	THE LAUNCH (OPERATIONS MAN	NAGER ER BY	WILL INFOR STATING "C	M THE MCC WHEN THE : LEAR TOWER" OVER ON!	SPACE VEHICLE REACE OF THE LOOPS FOR	HES SUFFIC KSC TO MC	IENT ALTITUDE TO CLEAR THE C.
I-17	NOT REQUIRE	IMMEDIATE ACT	ΓΙΟΝ,	THE LAUNCH	EHICLE COLLISION WI OPERATIONS MANAGER DIRECTOR FOR ANY ACT	WILL CONTINUE TO	EVALUATE T	HER CONTINGENCIES WHICH DO HE EXTENT OF DAMAGE AND L TOWER CLEARANCE.
I-18					IZCLE PASSES FROM THE		TO THE FLI	GHT DIRECTOR WHEN THE SPACE
1-19					DYNAMICS OFFICER AND SENDING AN ABORT RE			ILL HAVE THE CAPABILITY TO N THE FLIGHT RULES.
1-20	THE SPACECRA	AFT COMMANDER	MAY I	NITIATE SU	CH INFLIGHT ACTION /	AS HE DEEMS ESSENT:	IAL FOR CR	EW SAFETY.
I-21	FLIGHT CREW	SAFETY SHALL	TAKE	PRECEDENCE	OVER THE ACCOMPLISE	MENT OF MISSION OF	BJECTIVES.	
I-22					EEN THE MANNED SPACE MISSION CONDUCT AS			CECRAFT, THE SPACECRAFT MISSION RULES.
I-23					Y COORDINATOR, WILL ME OF SPLASHDOWN.	PROVIDE THE DOD MA	Anager for	MANNED SPACE FLIGHT SUPPORT
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MISSION RULES

PART I - GENERAL GUIDELINES - CONTINUED

		PART I - GENERAL GUIDELINES - CONTINUED
R	ITEM	
	I-24	THE DOD MANAGER FOR MANNED SPACEFLIGHT SUPPORT OPERATIONS IS RESPONSIBLE FOR RECOVERY AND FOR COMMAND AND CONTROL OF DOD RECOVERY FORCES. RECOMMENDATIONS, GUIDELINES AND REQUIREMENTS - AS SET FORTH BY NASA - WILL BE CONSIDERED TO EFFECT SAFE AND EXPEDITIOUS RECOVERY OF THE FLIGHT CREW AND SPACECRAFT.
	1-25	IF THE LM DESCENT STAGE WITH A NUCLEAR POWER SOURCE ABOARD IS ABANDONED WHILE SUBJECT TO EARTH RETURN AND IF CREW SAFETY AND CONTROL SYSTEMS CONSIDERATIONS PERMIT, THE LM WILL BE TARGETED FOR AN OCEAN AREA REENTRY. THE PREDICTED IMPACT LOCATION WILL BE DETERMINED AND REPORTED TO THE APOLLO MISSION DIRECTOR.
	I-26	NO SPACE VEHICLE COMPONENT WILL BE DELIBERATELY TARGETED FOR A LUNAR IMPACT WITHOUT THE PRIOR APPROVAL OF THE APOLLO MISSION DIRECTOR.
		RULE NUMBERS I-27 THROUGH
		I-35 ARE RESERVED.
		,
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MISSION RULES

PART I - GENERAL GUIDELINES - CONTINUED

ΙT	TEM								
						DEFINITIONS			
I-	-36					MARY PURPOSE OF THE MODIFIED BUT MAY BE			ER CONTROL DOCUMENTATION,
I-	-37	AND EXPE	RIENCE FOR US PHOTOGRAPHIC	E IN I	DEVELOPMENT , THOUGH RE	F OF HARDWARE AND/OF	PROCEDURES FOR ALL D SPACE FLIGHT EX	PPLICATION	AT PROVIDES IMPORTANT DATA TO APOLLO MISSIONS. CSM BOARD, ARE NOT ASSIGNED AS
I-	-38					RTANCE ASSIGNED TO S SSION RULES ARE MAND			L SUPPORT ELEMENTS.
I-	-39	ACCOMPLI	SHMENT OF THE	MISS	ION, WHICH		FLIGHT, AND RECO	VERY OPERA	NT THAT IS ESSENTIAL FOR TIONS THAT ENSURE CREW BJECTIVES.
Ι-	-40	SUPPORTS							L SUPPORT ELEMENT THAT COMPLISHMENT OF THE
1-	-41	SPACE VEHICLE	ELEMENT - A	PART	OF ANY LAU	NCH VEHICLE OR SPACE	CCRAFT SYSTEM.		
I-	-42					NY SYSTEM OR ACTIVIT OSE ELEMENTS WHICH /			OUNTDOWN, LAUNCH, FLIGHT, CLE ITSELF.
I-	-43	SYSTEM,	AND COMPONENT	T PERF	ORMANCE AN		NE VALUES WILL BE	ESTABLISHE	SSARY TO IDENTIFY VEHICLE, D SUCH THAT FURTHER RIMARY OBJECTIVES.
I-	-44	UNIT TO		THE OP	ERATIONAL				THE FUNCTIONING OF A HE PRIMARY OBJECTIVES.
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MISSION RULES

PART I - GENERAL GUIDELINES - CONTINUED

R	ITEM								
	I-45	MEASUREMENT -	A MEASUREMEN	r is a	SPECIFIC	DATA CHANNEL OF INS	FRUMENTATION MONITO	ORING A SI	NGLE FUNCTION.
	I-46		ON OF SPACE VI			QUIPMENT THAT ACQUINTIONAL SUPPORT ITEM		D MONITORS	DATA FOR PERFORMANCE
	I- 4 7	TIME PRI	OR TO THIS PE	RIOD,	TASK ACCOM		RICTLY TIME-RELATE	D AND A HO	RING THE INTERVAL OF NLD IS A MEANINGLESS TERM. LLATION.
	I-48	PROCEED - CON	TINUE IN ACCO	RDANCE	WITH PRES	CRIBED COUNTDOWN PR	OCEDURES.		
	I-49					DOWN FOR ANY REASON DRY FOR LAUNCH OR FL		E WEATHER,	. REPAIR OF HARDWARE OR
	I-50	HOLD-POINT -	A PREDETERMIN	ED PO	INT WHERE T	FHE COUNTDOWN MAY BE	CONVENIENTLY INTE	RRUPTED.	
	1-51	SCRUB - THE L	AUNCH IS TERM	IINATEI	D TO BE RES	SCHEDULED.			
	I-52	<u>recycle</u> - The	: COUNTDOWN IS	STOP!	PED AND RE	TURNED TO A DESIGNAT	ED POINT OR AS SPE	CIFIED IN	THE LAUNCH MISSION RULES.
	I-53		<u>ime</u> – Turnarol Ig Recycle ani			TOTAL TIME REQUIRED	FROM A SCRUB TO TH	HE NEXT SC	HEDULED LIFTOFF TIME (T-O)
	I-5 4	<u>Cutoff</u> - The Sequence		MANUA	L COMMAND	TO STOP THE LAUNCH S	SEQUENCE AFTER INIT	TIATION OF	THE AUTOMATIC LAUNCH
	I-55		E EVENT DETERI US TIME COMME		BY THE INS	TRUMENTATION UNIT U	MBILICAL DISCONNECT	Γ SIGNAL.	IT IS THAT POINT IN TIME
	l.								
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	GENERAL GUIDELINES	OMSF GENERAL RULES	I-6	Tape 2.2

MISSION RULES

PART I - GENERAL GUIDELINES - CONCLUDED

					MEIONE GOIDEE					
R ITEM										
I-56		ION TERMINATION		UNSCHEDULE	D INTENTIONAL	_ SEPARATION	I OF THE SPACE	ECRAFT FROM	THE LAUNCH VE	HICLE PRIOR
I-57	EARLY MISSION	N TERMINATION	- UNS	CHEDULED I	NTENTIONAL MI	ISSION TERM!	NATION AT OR	AFTER ORBI	TAL INSERTION.	
I-58	MISSION PERIO FLIGHT (OCCURS	CREW, FLIGHT	N (LUN HARDWA	AR LANDING RE, OR REL	MISSION) - MEASE OF THE L	MISSION PER: LUNAR SAMPLE	OD TERMINATIO	ON OCCURS U	JPON THE RELEAS : INVESTIGATORS	E OF THE , WHICHEVER
				,						
							-			
 	<u> </u>	MISSION	REV	DATE	SECTION		GROUP	PAGE	T	
		APOLLO 17	FNL	9/1/72	GENERAL GUIDELINES	OMS RUL	F GENERAL ES	I-7		Tape 2.3

MISSION RULES

SECTION 1 - GENERAL RULES AND SOP'S

_					32011011	I - GENERAL RULES AF	JOF 3		
ì	ITEM								
						GENERAL			
	1-1		ON REQUIRED			NED DECISIONS DESIGN L SITUATIONS OCCUR [F REAL-TIME N, THE FLIGHT PHASE, AND
	1-2	SPACECRAFT AN	D GROUND TEL	.EMETR	Y READOUTS	ILL VERIFY ALL MALFU , THE SPACECRAFT REA ABLE SPACECRAFT COCH	ADOUTS ARE PRIME (ASSUMING T	
	1-3					IF KNOWN SPACECRAFT DETAILED OBJECTIVES			IMIT THE MISSION DURATION
	1-4	WHEN A CONFLI	CT OF FLIGHT	T PLAN	ACTIVITIE	S OCCURS, THE FLIGHT	DIRECTOR WILL DE	TERMINE TH	E PRIORITY OF ACTIVITIES.
	1-5		RULES. THE	SPEC					ONTAINED IN PART I OR FROM TIONS FROM THE GENERAL
	1-6	THE FLIGHT DI SUCCESSFUL CO				OF THE FLIGHT, CHOO	SE TO TAKE ANY NEC	ESSARY ACT	TION REQUIRED FOR THE
	1-7					TO BE INTERIM OR UN ONS UNTIL THE NUMBE			IDERLINED IN THIS ONSIBLE NASA AGENCY.
	1-8		BIASED TO COM			ARE THE ACTUAL VEH E DELAYS OR INSTRUM			ARE KNOWN AND UNDERSTOOD SPACECRAFT AND MSFN
	1-9	UNLESS STATED	· ·		TORY AND H	IIGHLY DESIRABLE INS	TRUMENTATION REQUI	REMENTS AF	RE SATISFIED BY EITHER
_			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	GENERAL RULES AND SOP'S	GENERAL	1-1	Tape 3.1
				L1	L	WOLLS WITH SOL 2	L	<u> </u>	1abe 3.

MISSION RULES

	175			JECTI	ION I - GEN	ERAL RULES AND SUP	3 - CONTINGED		
R	ITEM								
	1-10					FOR THE PURPOSES OF VAL RULE I-39):	FLIGHT MISSIO	ON RULES MUST BI	E IN ACCORD WITH THE
		B. REQUIRED C. REQUIRED	TO IMPLEMEN	T RULE	ES RESULTIN ES RESULTIN	Y IG IN LAUNCH ABORTS IG IN EARLY MISSION IE TO THE NEXT MISSI			
			BOVE CRITERIA OPRIATE MISSI			INSTRUMENTATION LIS	TINGS IN THIS	DOCUMENT WILL	BE CROSS-REFERENCED
	1-11		TION REQUIRED			KTATION AS HIGHLY DE TEMS MANAGEMENT OR R			N RULES IS ANY ECISIONS NOT IN THE
	1-12					THE SPACECRAFT OR LA	UNCH VEHICLE C	DURING THE LAUN	CH PHASE UNLESS SPECIFIC
	1-13		OPERATIONS MA ATING "CLEAR				OR WHEN THE SP	PACE VEHICLE HA	S CLEARED THE UMBILICAL
	1-14	THE COMMAND	PILOT MAY IN	TAITII	E SUCH INFI	LIGHT ACTION AS HE C	EEMS ESSENTIAL	L FOR CREW SAFE	тү.
	1-15					BETWEEN THE MSFN AND HIN THE FRAMEWORK OF			WILL ASSUME
		RULE NUMBER	S 1-16 THROUG	GH 1-2	3 ARE RESE	RVED.			
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	GENERAL RULES AND SOP'S	GENERAL	1-2	Tape 50.1
						<u> </u>	<u> </u>		

MISSION RULES

		SECTION 1 - GENERAL KOLES AND SON.2 - CONTINUED
R	ITEM	
		DEFINITIONS
	1-24	ASAP - AS SOON AS PRACTICABLE (I.E., AS SOON AS POSSIBLE AND REASONABLE).
	1-25	PTP - A PREFERRED TARGET POINT IS A STRATEGICALLY LOCATED SET OF COORDINATES FOR WHICH THE SPACECRAFT SHOULD BE TARGETED IF IT BECOMES NECESSARY TO LAND ON THAT REVOLUTION.
	1-26	ATP - AN ALTERNATE TARGET POINT IS A STRATEGICALLY LOCATED SET OF COORDINATES CHOSEN TO PROVIDE A SPACECRAFT TARGET POINT MIDWAY BETWEEN PTP'S.
	1-27	NEXT BEST PTP - A PREFERRED TARGET POINT WHICH CAN BE REACHED BY THE SPACECRAFT WITHIN THE CONSTRAINTS IMPOSED BY THE SPACECRAFT PROBLEM CAUSING AN EARLY MISSION TERMINATION AND ALLOWING THE BEST POSSIBLE REENTRY AND LANDING AREA CONDITIONS. THE MISSION WILL NOT PROCEED TO THE NEXT PHASE UNLESS SPECIFICALLY NOTED.
	1-28	REENTER ASAP - REENTER AS SOON AS PRACTICABLE (I.E., AS SOON AS POSSIBLE AND REASONABLE).
	1-29	TERMINATE ASAP - REENTER WITH THE MINIMUM TRIP TIME TO AN UNSPECIFIED LANDING AREA.
	1-30	CRITICAL MANEUVERS:
		A. ANY BURN REQUIRED TO EFFECT CREW RECOVERY WHEN THERE IS NO ALTERNATIVE METHOD FOR OBTAINING THE NECESSARY ΔV OR
		B. ANY REQUIRED BURN WHERE THE USE OF A DEGRADED SPS IS PREFERABLE TO THE USE OF ANY AVAILABLE ALTERNATIVE METHOD. THE MANEUVERS TABULATED ON MR 3-86 HAVING SPS LIMITS OF "NONE" OR "LOOSE" ARE GENERALLY CATEGORIZED AS CRITICAL BURNS WITH THE DEGREE OF CRITICALITY INDICATED BY THE ENGINE LIMITS AND CREW ACTIONS SPECIFIED IN THAT TABLE.
	1-31	NON-CRITICAL BURN - A NON-CRITICAL BURN IS ANY OTHER BURN AND INCLUDES THOSE CHARACTERIZED BY "TIGHT" LIMITS IN MR 3-86. BECAUSE OF TRAJECTORY CONSIDERATIONS OR OTHER REASONS A NON-CRITICAL BURN MAY, ONCE INITIATED, CHANGE CLASSIFICATION. ALSO. A BURN CONSIDERED AS NON-CRITICAL MAY BE RECLASSIFIED IF, IN THE
	1-32	EXISTING MISSION SITUATION, THE FLIGHT DIRECTOR JUDGES ITS VALUE TO BE COMMENSURATE WITH ANY INCREASED RISK. EARLY STAGING - UNSCHEDULED SEPARATION OF THE S-IVB STAGE FROM THE S-II STAGE.
		MISSION REV DATE SECTION GROUP DATE
		APOLLO 17 FNL 9/1/72 GENERAL RULES AND SOP'S 1-3 Tape 3.3
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MISSION RULES

			SECII	ON I - GEN	ERAL RULES AND SOP'	S - CONTINUED		
R ITEM	-							
1-3	ORBIT (H		N THE	EVENT OF A	S PROPULSIVE MANEUV IN SLV FAILURE OCCUR			
1-3					SENCY DESTRUCT PACKA I THE RANGE SAFETY R		HE RSO TRANSM:	ITTING A COMMAND
1-3	S-IVB SAFING	- A PASSIVAT	ION SE	EQUENCE IN	WHICH S-IVB LOX, LH	₂ , AND HIGH PRESS	SURE SPHERES /	ARE DEPLETED.
1-3	5 PRELAUNCH PHA	ASE (PRELN) -	THE T	FIME INTERV	AL FROM THE COMPLET	ION OF THE FLIGH	T READINESS RE	EVIEW TO LIFTOFF.
1-3		- THE INTERVIVIDED AS SHO			THROUGH SPLASHDOWN.	FOR MISSION RUL	LE PURPOSES TH	HE FLIGHT PHASE IS
	A. LAUNCH PE	HASE - FROM I	IFTOFF	THROUGH I	NSERTION (TB) THROU	GH TRA)		
					ROUGH S-IVB CUTOFF		NJECTION (TIT	}
					ON THROUGH LM EJECTI			,
					CUTOFF FOR TLI THROU			
ļ	ľ				RING WHICH THE LM AN			
					O UNDOCKING AND FRO		EI CUTOFF	
ŀ					SM CIRCULARIZATION			
		PHASE - FROM						
					FROM THE INITIATION	OF THE PDI MANEU	VER TO TOUCHDO	DWN
	1. <u>PDI</u> 1		-		TIME PERIOD, THE LM IN THE DESCENT STAGE			AND GET INTO ORBIT
-	2. <u>PDI</u>	+ 6:10 TO HIG	H GATE	THIS PE	RIOD ENDS WHEN THE	MANEUVER IS MADE	TO VISUALLY	AQUIRE THE LANDING STIE.
	3. <u>HIGH</u>	GATE TO TOUC	HDOWN	- LANDING	SITE VISABILITY TO	TOUCHDOWN.		
	J. LUNAR STA	AY PHASE - TH	E TIME	INTERVAL	FROM TOUCHDOWN UNTI	L LIFTOFF		
		E TIME INTERV 5 PSIA AND IN			SSURIZATION (3.5 PS	IA AND DECREASING	G) UNTIL LM RE	EPRESSURIZATION
	L. ASCENT PI	HASE - THE TI	ME INT	TERVAL FROM	1 LIFTOFF TO LM INSE	RTION INTO LUNAR	ORBIT	
		<u>JS</u> - THE TIME IL CSM/LM DOC		RVAL FROM 1	INSERTION INTO LUNAR	ORBIT AFTER ASCI	ENT OR AFTER A	AN ABORTED DESCENT
	N. TRANSEAR	TH COAST PHAS	<u>E - F</u>	ROM TEI CUT	TOFF TO CM/SM SEPARA	TION		
	O. ENTRY PH	ASE - FROM CM	I/SM SE	EPARATION 1	TO SPLASHDOWN			
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	:							
٠		MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	GENERAL	DEFINITIONS		
			Щ		RULES AND SOP'S		1-4	Tape 3.4

MISSION RULES

1-39 **RECUTRY PRASE - THE TIME INTERNAL FROM SPLASHOUNT TO DELIVERY OF THE FLIGHT CREW AND SPACECRAFT TO DESIGNATE LAND BASED INSTALLATIONS. **RECHTRY DEFINITIONS:** **A. AUTOMATIC - RECETTRY CONTROLLED BY THE CREW MANUALLY FLYING BANK ANGLE COMMAND TO THE RCS. **B. CLOSED LODG - RECETTRY CONTROLLED BY THE CREW MANUALLY FLYING BANK ANGLE MODULATION USING CMC DATRY PROGRAM OUTDUTS.** **C. OPEN LODP RECETTRY - RECETTRY CONTROLLED BY THE CREW USING SPACECRAFT DISPLAYS AND FLYING:** 1. BANK ANGLE (RR 0-90) AND RETRIB (RL 0-90). 2. CONSTANT BANK ANGLE - CORE STABLISHES AND MAINTAINS A CONSTANT BANK ANGLE. (CONSTANT BANK ANGLES GREATER THAN 90 DECREES HILL NOT BE FLOWN EXCEPT WHEN SKIP-OUT RULE IS VIOLATED.) 3. ROLLING RECHTRY - MAINTAIN CONSTANT IS DECREES PER SECOND ROLL RATE. 4. ENS RANGING - CONSTANT BANK ANGLE IS HELD TO 10. THEN THE RANGE-TO-DO DISPLAY AND THE RANGE POTENTIAL LIKES ARE COMPARED TO MODULATE THE BANK ANGLE. AT SERRE, THE PRESENT BANK ANGLE IS REVERSED. D. CONSTANT GENTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A CONSTANT SERRE, THE PRESENT BANK ANGLE IS REVERSED. C. EMES RECETTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A CONSTANT SETTLE OF LIVE LESS THAN 28,500 FPS. THE ENS IS THEN USED TO CONTROL BANKE BY NULLING THE DIFFERENCE BETWEEN THE BANGE-TO-GO COUNTER AND THE RANGE POTENTIAL GUIDELINES. ALL MANEUVERS ARE OVERFICIONED AS NECESSARY TO PREVENT AN ONSET OR OFFSET VIOLATION. 1-40 **OPERATIONAL PROTTERINT** - THE AREA THAT IS OPERATIONALLY ACCESSIBLE USING THE GAN, EMS, AND CONSTANT AG THE STORM FOR THE MAINTAIN ASSESSMENT OF THE MAINTAIN ASSESSMENT AND ASSESSM	ITEM								
A. AUTOMATIC - REENTRY CONTROLLED BY CMC WHICH OUTPUTS BANK ANGLE COMMAND TO THE RCS. B. CLOSED LOOP - REENTRY CONTROLLED BY THE CREM MANUALLY FLYING BANK ANGLE MODULATION USING CMC ENTRY PROGRAM OUTPUTS. C. OPEN LOOP REENTRY - REENTRY CONTROLLED BY THE CREM USING SPACECRAFT DISPLAYS AND FLYING: 1. BANK ANGLE (RR 0-90) AND RETRB (RL 0-90). 2. CONSTANT BANK ANGLE - CREME ESTABLISHES AND MAINTAINS A CONSTANT BANK ANGLE. (CONSTANT BANK ANGLES GREATER THAM 90 DEPREES WILL NOT BE FLOWN EXCEPT WHEN SKIP-OUT ROLE IS VIOLATED.) 3. ROLLING REENTRY - MAINTAIN CONSTANT 13 DEPREES PER SECOND ROLL BATE. 4. EMS RANGING - CONSTANT BANK ANGLE IS HELD TO 1G. THEN THE RANGE-TO-GO DISPLAY AND THE RANGE POTENTIAL LINES ARE COMPARED TO MODULATE HE BANK ANGLE AT RETRB, THE PRESENT BANK ANGLE IS REVERSED. D. CONSTANT GENTRY - CREM CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. EMS REINTRY - CREM CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED GLEVEL. E. EMS RECENTRY - CREM CONTROLS THE BANK ANGLE TO MAINTAIN A CONSTANT GUTTLE WELCTTY LESS THAM 25,500 FPS. THE END IS THEN USED TO CONTROL BANGE BY NULLING THE DIFFERENCE BETWEEN THE RANGE-TO-GO COUNTER AND THE RANGE POTENTIAL GUIDELINES. ALL MANELVERS ARE OVERRIDDEN AS NECESSARY TO PREVENT AN ONSET OR OFFSET VIOLATION. 1-40 DEPERATIONAL FOOTPRIETT - THE AREA THAT IS OPERATIONALLY ACCESSIBLE USING THE GAM, EMS, AND CONSTANT AG ENTRY MODES AND ALLOWING FOR THEIR ASSOCIATED DISPERSIONS. THE GAMP ORTHOR FROM ET AND TO ETTHERS SIDE OF THE GOONDY TRACK AND EXTENDED THE REASE AS THE AREA FROM 61 MM UPRANGE TO 91 MM DOWNRANGE AND 127 NM CROSSRANGE ABOUT THE CONSTANT AG TARGET POINTS. THE CONSTANT AG AREA IS THE AREA TO MM UPRANGE TO 140 NM DOWNRANGE AND 127 NM CROSSRANGE ABOUT THE CONSTANT AG TARGET POINTS. THE CONSTANT AG THE END OF THE MISSION. THE NOTING FOR MALFUNCTIONS INDICATES THAT THE MISSION MILL BE CONTINUED IN ACCORDANCE WITH PRESENT PLANS UNLESS OVERFIDING FACTORS ARE PRESENT WHICH MOULD CAUSE SELECTION OF AN ALTERNATE CHOICE. 1-43 EVASIVE MANUEUVER - US	1-38					SPLASHDOWN TO DELIV	ERY OF THE FLIGH	T CREW AND SPACEO	CRAFT TO DESIGNATED
B. CLOSED LOOP - REENTRY CONTROLLED BY THE CREW MANUALLY FLYING BANK ANGLE MODULATION USING CMC ENTRY PROGRAM OUTPUTS. C. OPEN LOOP REENTRY - REENTRY CONTROLLED BY THE CREW USING SPACECRAFT DISPLAYS AND FLYING: 1. BANK ANGLE (RR 0-90) AND RETRE (RL 0-90). 2. CONSTANT BANK ANGLE - CREW ESTABLISHES AND MAINTAINS A CONSTANT BANK ANGLE. (CONSTANT BANK ANGLES GREATER THAN 90 DEGREES WILL NOT BE FLOWN EXCEPT WHEN SKIP-OUT RULE IS VIOLATED.) 3. ROLLING RENTRY - MAINTAIN CONSTANT 18 DEGREES PER SECOND ROLL RATE. 4. EMS RANGING - CONSTANT BANK ANGLE IS NELD TO 16. THEN THE RANGE-TO-GO DISPLAY AND THE RANGE POTENTIAL LINES ARE COMPARED TO MODULATE THE BANK ANGLE. AT RETRE, THE PRESENT BANK ANGLE IS REVERSED. D. CONSTANT GENTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. SMS REEMTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. SMS REEMTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. SMS REEMTRY - CREW CONTROLS THE BANK ANGLE OF NULLING THE DIFFERENCE BETWEEN THE BANKE-TO-GO COUNTER AND THE RANGE OTTONITIAL QUIDELINES. ALL MANEUVERS ARE OVERRIDORN AS NECESSARY TO PREVENT AN ONSET OR OFFSET VIOLATION. 1-40 DEPARTIONAL FOOTPRINT - THE AREA THAT IS OPERATIONALLY ACCESSIBLE USING THE GAN, EMS, AND CONSTANT AG ENTRY MODES AND ALLOWING FOR THEIR ASSOCIATED DISPERSIONS. THE GAN POSTION IS AN AREA 370 AN TO ETITURE SIDE OF THE GROUD THE RANGE TO THE STANDING THE STANDAY AND THE PROPERTY OF THE MISSION THE LINE WHERE FURTHER MISSION OBJECTIVES ARE CONSTANTED BEFORE THE END OF THE MISSION. RULING FOR MALPUNCTIONS INDICATES THAT THE MISSION MILL BE CONTINUED IN ACCORDANCE WITH PRESENT PLANS UNLESS OVERFIDING FACTORS ARE PRESENT MICH MOULD CAUSE SELECTION OF AN ALTERNATE CHOICE. PLASTIC MANEURE - USE OF RESIDUAL S-IVE BAN	1-39	REENTRY DEFI	NITIONS:						
C. OPEN LOOP RENTITY - RESTITY CONTROLLED BY THE CREW USING SPACECRAFT DISPLAYS AND FLYING: 1. BANK ANGLE (R O -90) AND RETRB (RL O -90). 2. CONSTANT BANK ANGLE - CREW ESTABLISHES AND MAINTAINS A CONSTANT BANK ANGLE. (CONSTANT BANK ANGLES GREATER THAN 90 DEGREES WILL NOT BE FLOWN EXCEPT WHEN SKIP-OUT RULE IS VIOLATED.) 3. ROLLING RESHTRY - MAINTAIN CONSTANT IS DEGREES PER SECOND ROLL RATE. 4. EMS PRANGING - CONSTANT BANK ANGLE IS HELD TO IG. THEN THE RANGE-TO-GO DISPLAY AND THE RANGE POTENTIAL LINKES ARE COMPARED TO MODULATE THE BANK ANGLE. THEN THE PRESENT BANK ANGLE IS REVERSED. 0. CONSTANT G ENTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. BYS REKITRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. CHE RETRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A CONSTANT G WITH LYCLOITY LESS THAN 25,500 FPS. THE EMS IS THEN USED TO CONTROLS THE BANK ANGLE TO MAINTAIN A SPECIFIED G LEVEL. E. PLAY RECEIVE - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A CONSTANT AND THE LYCLOITY LESS THAN 25,500 FPS. THE EMS IS THEN USED TO CONTROL RANGE BY UNLING THE DIFFERENCE BETWEEN THE RANGE-TOO COUNTER AND THE RANGE POTENTIAL GUIDELINES. ALL MANEUVERS ARE OVERRIDDEN AS NECESSARY TO PREVENT AN OWSET OR OFFSET VIOLATION. 1-40 OPERATIONAL FOOTPRINT - THE AREA THAT IS OPERATIONALLY ACCESSIBLE USING THE GAN, EMS, AND CONSTANT AG ENTRY MOSET OR THE GROUND TRACK AND EXTENDING FROM 915 NM FROM EI TO 2000 NM FROM EI. THE EMS AREA IS THE AREA FROM 51 NM UPRANGE TO 91 NM DOWNRANGE AND +27 NM CROSSRANGE ABOUT THE CONSTANT AG TANGET POINTS. THE CONSTANT AG AREA IS THE AREA 110 NM UPRANGE TO 140 NM DOWNRANGE AND +27 NM CROSSRANGE ABOUT THE CONSTANT AG TANGET POINTS. THE CONSTANT AG AREA IS THE AREA 110 NM UPRANGE TO 140 NM DOWNRANGE AND +27 NM CROSSRANGE ABOUT THE CONSTANT AG TANGET POINTS. 1-41 ALTERNATE MISSION - THE CONTINUE MISSION RULING FOR MALFUNCTIONS INDICATES THAT THE MISSION WILL BE CONTINUED IN ACCORDANCE WITH PRESENT PLANS UNLESS OVERTIONING FACTORS ARE PRESENT WHICH WOULD CAUS		A. <u>AUTOMATI</u>	C - REENTRY	ONTRO	LLED BY CM	C WHICH OUTPUTS BAN	K ANGLE COMMAND	TO THE RCS.	
1. BANK ANGLE (RR 0-90) AND RETRB (RL 0-90). 2. CONSTANT BANK ANGLE - CREW ESTABLISHES AND MAINTAINS A CONSTANT BANK ANGLE. (CONSTANT BANK ANGLES GREATER THAN 90 DEGREES WILL NOT BE PLOWN EXCEPT WHEN SKIP-OUT RULE IS VIOLATED.) 3. ROLLING RECHTRY - MAINTAIN CONSTANT IS DEGREES PER SECOND ROLL RATE. 4. EMS RANGING - CONSTANT BANK ANGLE IS HELD TO IG. THEN THE BANK GATCH. AT RETRB, THE PRESENT BANK ANGLE IS REVERSED. D. CONSTANT GENTRY - CREW CONTROLS THE BANK ANGLE ON MAINTAIN A SPECIFIED G LEVEL. E. EMS RECHTRY - CREW CONTROLS THE BANK ANGLE ON MAINTAIN A SPECIFIED G LEVEL. E. EMS PERMITY - CREW CONTROLS THE BANK ANGLE ON MAINTAIN A SPECIFIED G LEVEL. THE RHS IS THEN USED TO CONTROL RANGE BY NULLING THE DIFFERENCE BETWEEN THE RANGE-TO-GO COUNTER AND THE RANGE POTENTIAL GUIDELINES. ALL MANEUVERS ARE OVERRIDDEN AS NECESSARY TO PREVENT AN OWNSET OR OFFSET VIOLATION. 10-40 OPERATIONAL FOOTPRINT - THE AREA THAT IS OPERATIONALLY ACCESSIBLE USING THE GAM, EMS, AND CONSTANT 4G ENTRY MODES AND ALLOUTING FOR THEIR ASSOCIATED DISPERSIONS. THE GAN PORTION IS AN AREA 170 MM TO EITHER SIDE OF THE ROLUMD TRACK AND EXTENDING FROM 915 NM FROM EL TO 2000 MM FROM EL. THE LENS AREA IS THE AREA FROM 61 NW LOWARDS TO 91 NM DOWNRANGE AND 1-27 NM CROSSRANGE ABOUT THE CONSTANT 4G GRADE TO 91 NM DOWNRANGE AND 1-27 NM CROSSRANGE ABOUT THE CONSTANT 4G BAREA IS THE AREA 110 NM UPRANGE TO 140 NM DOWNRANGE AND 1-27 NM CROSSRANGE ABOUT THE CONSTANT 4G THE BAREA IS THE AREA 110 NM UPRANGE TO 140 NM DOWNRANGE AND 1-27 NM CROSSRANGE ABOUT THE CONSTANT 4G THE BAREA IS THE AREA 110 NM UPRANGE TO 140 NM DOWNRANGE AND 1-27 NM CROSSRANGE ABOUT THE CONSTANT 4G TRACE AND OF THE MISSION RULING FOR MALFUNCTIONS INDICATES THAT THE MISSION OBJECTIVES ARE CONSTINUED IN ACCORDANCE WITH PRESENT PLANS UNLESS OVERRIDING FACTORS ARE PRESENT MICH WOULD CAUSE SELECTION OF AN ALTERNATE CHOICE. 1-43 EVASIVE MANEUVER - USE OF RESIDUAL S-IVB PROPELLANTS TO ACHIEVE THE FOLLOWING IN ORDER OF PRIORITY: 1. A REDUCTION IN THE PROBABILITY OF S-IVB BAND SPACECARFT IMPACT						THE CREW MANUALLY F	LYING BANK ANGLE	MODULATION USING	S CMC
2. CONSTANT BANK ANGLE - CREW ESTABLISHES AND MAINTAINS A CONSTANT BANK ANGLE. (CONSTANT BANK ANGLES GREATER THAM 90 DEGREES WILL NOT BE FLOWN EXCEPT WHEN SKIP-OUT RULE IS VIOLATED.) 3. ROLLING REENTRY - MAINTAIN CONSTANT IS DEGREES PER SECOND OLD NATE. 4. EMS RANGING - CONSTANT BANK ANGLE IS HELD TO 1G. THEN THE RANGE-TO-GO DISPLAY AND THE RANGE POTENTIAL LINES ARE COMPARED TO MODULATE THE BANK ANGLE. AT METRB, THE PRESENT BANK ANGLE IS REVERSED. D. CONSTANT G ENTRY - CREW CONTROLS THE BANK ANGLE TO MAINTAIN A CONSTANT G UNTIL VELOCITY LESS THAM 25,500 FPS. THE EMS IS THEN USED TO CONTROL RANGE BY NULLING THE DEFFERENCE BETWEEN THE RANGE-TO-GO COUNTER AND THE RANGE POTENTIAL GUIDELINES. ALL MANEUVERS ARE OVERRIDDEN AS NECESSARY TO PREVENT AN OMSET OR OFFSET VIOLATION. 1-40 DPERATIONAL FOOTPRINT - THE AREA THAT IS OPERATIONALLY ACCESSIBLE USING THE GBN, EMS, AND CONSTANT 4G ENTRY MODES AND ALLOWING FOR THEIR ASSOCIATED DISPERSIONS. THE GBN PORTION IS AN AREA -70 MM TO EITHER SIDE OF THE GROUND TRACK AND EXTENDIA FROM 915 MM FROM E1 TO 2000 NM FROM E1. TO 2000 NM FROM E1. THE EMS RAFE THE AREA FROM 61 MM UPRANGE TO 91 MM DOWNRANGE AND 152 MM IN CROSSRANGE ABOUT THE CONSTANT 4G TARGET POINTS. THE CONSTANT 4G TARGET POINTS. 1-41 ALTERNATE MISSION - ANY DEVIATION FROM THE NOMINAL MISSION TIMELINE WHERE FURTHER MISSION OBJECTIVES ARE CONSIDERED BEFORE THE END OF THE MISSION. 1-42 CONTINUE MISSION - THE CONTINUE MISSION RULING FOR MALFUNCTIONS INDICATES THAT THE MISSION MILL BE CONTINUED IN ACCORDANCE WITH PRESENT PLANS UNLESS OVERRIDING FACTORS ARE PRESENT WHICH WOULD CAUSE SELECTION OF AN ALTERNATE CHOICE. 1-43 EVASIVE MANEUVER - USE OF RESIDUAL S-7VB PROPELLANTS TO ACHIEVE THE FOLLOWING IN ORDER OF PRIORITY: 1. A REQUCTION IN THE PROBABILITY OF S-1VB AND SPACECRAFT RECONTACT 2. A REDUCTION IN THE PROBABILITY OF S-1VB EARTH IMPACT	- 1	C. OPEN LOC	DP REENTRY - F	REENTR	Y CONTROLL	ED BY THE CREW USIN	G SPACECRAFT DIS	PLAYS AND FLYING:	
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MISSION RULES

1-45	SATURN L/V TIME	RASES						
1 43	TIME BASE	DEFINITION		NOMINAL INITIA	TE TIME			
	ТВ1	LIFTOFF TO S-IC INBOARD		0:00				
	TB2	S-IC INBOARD ENGINE CUTOFF TO S-IC OUTBOARD ENGINE CUTOFF (S-IC/S- STAGING)		2:17				
	TB3	S-IC OUTBOARD ENGINES CUTOFF TO S-II CUTOFF (S-II/S-IVB STAGING)		2:40				
	TB4	S-II CUTOFF TO S-IVB FIRST BURN CUTOFF		9:17				
	TB5	S-IVB FIRST BURN CUTOF TO S-IVB RESTART PREPARATIONS (RESTART MINUS 9 MIN 38 SEC)	=	11:46				
	TB6	S-IVB RESTART MINUS 9 TO S-IVB SECOND BURN C		2:20:48				
	TB7	S-IVB SECOND CUTOFF TO START OF S-IVB EVASIVE MANEUVER BURN		2:36:22				
	ТВ8	START EVASIVE BURN TO END OF S-IVB/IC LIFETIME.		4:14:22 (BY GROUND	CMD)			
	RULE NUMBERS 1-	45 THROUGH 1-47 ARE RESERVE	D.					

MISSION RULES

ITEM			3201	1011 1 - 02	NERAL RULES AND SOP'	3 - CONTINUE	.U	 	
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						<u> P</u> F	CORITY	<u>, </u>	
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į		LE WEATHER C			ECOVERY OPERATIONS		2		
	CAPABILI	TY OF RECOVE	RY FO	RCES	•		3		
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	A GROUND	STATION FOR	POST	-DEORBIT B	SURN* TRACKING		6		
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		APOLLO 17	FNL	9/1/72	GENERAL RULES AND SOP'S	TARGET POIN		1-7	Tape 4.1

MISSION RULES

PRELABACH PULES 1-56 MANDATORY - THE COGNIZATT FLIGHT CONTROLLER WILL SEQUEST A WOLD OR A CUTOFF FROM THE FLIGHT DIRECTOR IN CASE OF A LOSS OR FAILURE OF A MANDATORY ITEM. PRIOR TO 1-1 MIN., FAILURES OF MANDATORY ITEM WITHOUT VERTICATION DUE TO THE LINETTO THE REVIANDAR. A T-2-0 SC., ALL MANDATORY STOR MANDATOR TOWN VERTICATION DUE TO THE LINETTO THE REVIANDAR. A T-2-0 SC., ALL MANDATORY STOR MANDATOR TITEM WITHOUT TOR SPECIFIC PROCEDURES. 1-57 HIGHLY DESIGNAGE - THE COGNIZANT FLIGHT CONTROLLER WILL NOTIFY THE FLIGHT DIRECTOR IN CASE OF A LOSS OR A FAILURE OF A HOMEY RESIDNALE ITEMS.). A HOLD HAVE BE CALLED BY THE FLIGHT DIRECTOR IN CASE OF A LOSS OR A FAILURE OF A HOMEY RESIDNALE ITEMS.). A HOLD HAVE BE CALLED BY THE FLIGHT DIRECTOR IN CASE OF A LOSS OR A FAILURE OF A HOMEY RESIDNALE ITEMS STRENGE THE CONTROLLERS WILL NOT CALL HOLDS FOR THE LOSS OF DESTRABLE ITEMS AS THEY ARE PLACED IN THIS CATCORY RECAUSE THEY ARE ITEMS OF SUPPRIT WHICH ARE OF MINOR PROVINCE TO FLIGHT OPERATIONS. 1-58 MANUAL CUTOFF WILL NOT BE ATTEMPTED FROM T-11 SECONDS (ENGINE IGNITION) TO 1-O. MISSION REV ARE TEMPTED FROM T-11 SECONDS (ENGINE IGNITION) TO 1-O. MISSION REV ARE TEMPTED FROM T-11 SECONDS (ENGINE IGNITION) TO 1-O. MISSION REV ARE TEMPTED FROM T-11 SECONDS (ENGINE IGNITION) TO 1-O.			SECTION I - GENERAL RULES AND SOP'S - CONTINUED
1-56 MANDATORY - THE COGNIZANT FLIGHT CONTROLLER WILL REQUEST A HOLD OR A CUTOFF FROM THE FLIGHT DIRECTOR IN CASE OF A LOSS OR FAILURG OF A MANDATORY LITER, PRIOR TO 1-1 HIN, FAILURES OF MANDATORY TITERS WILL BE COMERSHED PROFICE THE MANDATORY TO A CUTOFF, AFTER T—1 HIN, CUTOFF KILL BE REQUESTED RAY MANDATORY THE WITHOUT VERTIFICATION DUE TO THE LIMITED THAT REMAINING. AT T—20 SEC, ALL MANDATORY STEMS WILL REVIENT TO HIGHLY DESIGNABLE UNDES SPECIFICALLY DESIGNATED AS MANDATORY TO L/O. REFERENCE THE LAUNCH MISSION RULES DOCUMENT FOR SPECIFIC PROCEDURES. 1-57 HIGHLY DESIGNABLE — THE COGNIZANT FLIGHT CONTROLLER WILL NOTIFY THE FLIGHT DIRECTOR TO RETAR THIS STEMS. IN HIGHLY DESIGNABLE STEMS AS THEY ARE SISSUADE STEMS. A HOLD MAY BE CALLED BY THE PLOTH TO REFER OR A LOSS OR A FAILURE OF A SIGNATURE STREAM STEMS. A HOLD MAY BE CALLED BY THE PLOTH TO REFER THE SITE STEMS. ALL HIGHLY DESIGNABLE STEMS REVERT TO DESIGNABLE AFTER AUTO SEQUENCE START. 1-58 DESIGNABLE — FLIGHT CONTROLLERS WILL NOT CALL HOLDS FOR THE LOSS OF DESIGNABLE STEMS AS THEY ARE PLACED IN THIS CANTEGORY BECAUSE THEY ARE STEMS OF SUPPORT WHICH ARE OF MINOR IMPORTANCE TO FLIGHT OPERATIONS. 1-59 MANUAL CUTOFF WILL NOT BE ATTEMPTED FROM T—11 SECONDS (ENGINE LOSSITION) TO T—0. MISSION BEY DATE SECURIOR SECURITY OF THE LOSS OF DESIGNABLE SECONDS. MISSION BEY DATE SECURITY OF THE SECONDS (ENGINE LOSSITION) TO T—0.	R	ITEM	
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RULE NUMBERS 1-60 THROUGH 1-65 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 GENERAL LAUNCH		1-58	
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 GENERAL LAUNCH		1-59	MANUAL CUTOFF WILL NOT BE ATTEMPTED FROM T-11 SECONDS (ENGINE IGNITION) TO T-0.
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APOLLO 17 FNL 9/1/72 GENERAL LAUNCH	\vdash		MISCIAN DEV DATE SECTION COOLD PAGE
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	L		

MISSION RULES

	SECTION 1 - GENERA	ME KULLS AND SUF	3 - CONTINUED		
RITEM					
		LAUNCH ABORTS			
1 1					
1-66	ABORT REQUEST COMMANDS ARE COMMANDS TRANSMIT ON THE COMMAND PILOT'S PANEL. THE "ABORT LE THE CREW TO TAKE THE NECESSARY ACTION TO ABO TRANSMITTING "ABORT REQUEST." ADDITIONAL CO	IGHT" AND A VOICE ORT THE MISSION.	REPORT "ABORT" OF	VER A/G AR USE TWO IN	E CONSIDERED TWO CUES FOR DEPENDENT CUES PRIOR TO
1-67	ABORT ACTION CAN BE INITIATED ONLY BY THE C	REW OR THE EDS.			
1-68	WHENEVER POSSIBLE, ALL ABORTS AND EARLY MISS	SION TERMINATIONS	WILL BE TIMED FOR	R A WATER	LANDING.
1-69	THE FLIGHT DIRECTOR WILL INITIATE THE ABORT	REQUEST FOR SPAC	ECRAFT SYSTEM MALI	FUNCTIONS.	
1-70	THE FLIGHT DYNAMICS OFFICER WILL INITIATE TO VEHICLE EXCEEDS THE FLIGHT DYNAMICS ENVELOPED	•	COMMAND DURING TH	E FLIGHT P	HASE IF THE SPACE
1-71	THE BOOSTER SYSTEMS ENGINEER WILL INITIATE SYSTEMS MALFUNCTIONS THAT WOULD NOT ALLOW A	•			
1-72	THE ONLY KSC POSITION THAT WILL HAVE ABORT OPERATIONS MANAGER MAY SEND AN ABORT REQUES' VEHICLE REACHES SUFFICIENT ALTITUDE TO CLEAN TO THE FLIGHT DIRECTOR, THE LAUNCH OPERATION THE CRITERIA DEFINED IN THE LMRD. THESE IN A. MAJOR STRUCTURAL FAILURE OR EXPLOSION B. NEGATIVE VERTICAL MOTION C. UNCONTROLLABLE VEHICLE TILTING D. CATASTROPHIC FIRES PRIOR TO LIFTOFF	T FROM THE TIME T R THE TOP OF THE NS MANAGER WILL I	THE LAUNCH ESCAPE SUMBILICAL TOWER.	SYSTEM IS PRIOR TO	ARMED UNTIL THE SPACE TRANSFER OF CONTROL
	APOLLO 17 FNL 9/1/72 GE	ECTION NERAL	GROUP LAUNCH	PAGE	
		LES AND SOP'S	RULES	1-9	Tape 4.3

MISSION RULES

1-73	THE RSO CAN SHUT DOWN THE					•
	THE SPACECRAFT. THE MFCO INITIATES A 4.1-SEC TIMER IF TRANSMITTED. THE BRSO THE RSO WILL ALWAYS SAFE T IS NOT TO BE TRANSMITTED.	ON THE GROUND (INSERTS A TIME	CAPE RSO CONSOLE C DELAY MANUALLY. 1	ONLY), WHICH IN TURN THE RSO DESTRUCT COM	ENABLES I	DESTRUCT CAPABILITY THEN DESTROY THE SLV.
1-74	THE RSO WILL SAFE THE S-IV	R DESTRUCT SYST	FM AFTER CONFIRMAT	TION OF S-IVR C/O FRI	OM THE ELL	IGHT DYNAMICS OFFICER
	IF COMMUNICATIONS ARE LOST VERIFICATION OF S-IVB CUTC INITIATES MFCO, THE RSO WI	WITH THE FIDO.	THE S-IVB DESTRUC , THE S-IVB DESTRU	CT SYSTEM WILL BE SAI JCT SYSTEM CANNOT BE	FED, BASEI REINITIAT	ON THE RSO'S
1-75	EMERGENCY ENGINE SHUTDOWN	METHODS:				
	INITIATOR	METHOD	STAGE	TIME FRAME		
	ASTRONAUT	CCW ON THC	S-IC, S-II, S-IVB	T+30 SEC TO S- CUTOFF	IVB	
	ASTRONAUT	S-II/ S-IVB L/V STAGE SWITCH	S-II, S-IVB	T+2:43 TO S-IVI CUTOFF	В	
	RS0	RF CMD (MFCO)	S-IC, S-II, S-IVB	T-O TO S-IVB CUTOFF		
	EDS	2 OF 3 VOTING LOGIC	S-IC	T+30 SEC TO ED: AUTO OFF AT T+2:00 MIN	s	
				NOTE: EDS WILL INITIATE ABORT T-O TO T+30 SE HOWEVER, S-IC ENGINES WILL NO BE SHUT DOWN.	FROM C.	
1-76	THE AUTOMATIC EDS (TWO ENG T+02:00. DURING LAUNCH, N					
	THE EDS AUTO SWITCH WAIN BUS OR FOR CONFI	VILL BE TURNED (OFF WHENEVER ANY T	WO CSM ENTRY BATTERI		
	MISSION	REV DATE	SECTION	GROUP	PAGE	

MISSION RULES

R	ITEM							
	1-77	ABORT MODES						
		MODE I	BOUN	DARY OF APPLIC	ATION			
		IA		RT ENABLE (APP 61 SEC (22.1K				
		IB		SEC TO 100K FE PROX 1:50)	ET ALTITUDE			
		IC		ET ALTITUDE TO N (GET APPROX				
	1-78	MODE II	BOUN	DARY OF APPLIC	ATION	PROCE	DURES	
			UNTIL F	ETTISON (GET A ULL LIFT SPLAS I DOWNRANGE (GE	H POINT IS		OF 300K	
							DROGUE S FULL LIFT	
:								
I								
\vdash	<u></u>	<u> </u>	MISSION	REV DATE	SECTION	GROUP	PAGE	
				FNL 9/1/72	GENERAL RULES AND SOP'S	LAUNCH RULES	1-11	Tape 4.5

MISSION RULES

Τ-	_			SCOTION 1 - GEN	IERAL RULES AND SOP	3 - CONTE	IOED	
ITEN	_							
1-7	79	MODE III	<u>B0</u>	UNDARY OF APPLIC	CATION		<u>PROCEDURES</u>	
				N FULL LIFT SPLÆ TO 3200 NM AND 1		Α.	MCC PROVIDES: 1. GETI AS S-IVB CUTO 2. DELTA V FOR 3350 NO 3. BURN DURATION 4. GET OF 300K 5. PITCH AT .05G 6. GET DROGUE	
	Ì					В.	MANEUVER IS SCS AUTO.	
				,		C.	ENTRY IS ROLL LEFT 55	DEGREES.
				CALLE 55 - DE	NOTE III "NO BURN" WILL ID IF THE ROLL LEFT GENTRY RANGE IS LE			
1-8	80	MODE IV	<u>B0</u>	UNDARY OF APPLIC	CATION		PROCEDURES	
	-		CAPABI ON COI	GENCY ORBIT INSE LITY TO INSERTIO LINE ON GAMMA N AR NOMINAL ALTIT	ON (BASED /S V PLOT	Α.	MCC PROVIDES: 1. GETI AT S-IVB CUTON 2. DELTA V REQUIRED TO GREATER THAN OR EQN	D ACHIEVE PERIGEE
						В.	BURN DURATION PITCH AT GETI MANEUVER IS SCS AUTO	
1-8	81	MODE	<u>B0</u>	UNDARY OF APPLIC	CATION		PROCEDURES	
		APOGEE KICK	BOUNDA	OGEE CUTOFF, OUT RY, CORRECTABLE IONS BY A MANEUN	TO SAFE ORBITAL	Α.	MCC PROVIDES: 1. GETI FOR BURN AT AF 2. DELTA V REQUIRED TO GREATER THAN OR EQU 3. BURN DURATION 4. PITCH ATTITUDE	ACHIEVE PERIGEE
		RULE NUMBERS	1-82 THROUGH	ı		В.	MANEUVER IS SCS AUTO	
		1-86 ARE RESE						
		·	MISSION	REV DATE	SECTION	GROUP	PAGE	
	,		APOLLO 17	FNL 9/1/72	GENERAL RULES AND SOP'S	LAUNCH RULES	1-12	Tape 5.1
					<u> </u>			

MISSION RULES

		SECTION 1 - G	ENERAL RULES AND SO	P'S - CONTINUED		
R ITEM						
			CREW ABORT LIMITS	-		
			 	_		
1-87	MAX Q REGION			PROCEDURES		
	(00:50 TO 02:00) AOA GREATER THAN OR EQU PITCH, OR YAW ERROR GRE 5 DEGREES (NOT APPLICAB PRIOR TO 50 SEC)	ATER THAN OR EQU	D ROLL, THI AL TO	ORT MODE I (ACTION O RESHOLD)	NLY AFTER BOT	H HAVE REACHED
1-88	RATES AND ATTITUDE			PROCEDURES		
	A. PITCH AND YAW					
	1. L/O TO 2 MIN - 2. 2 MIN TO S-IVB 3. YAW DEVIATION G (S-II AND S-IVB (WITH ALL ENGINES O	CUTOFF - 10 DEG/ REATER THAN 20 D BURN ONLY)	SEC	SORT MODE I, MODE II	, MODE III, O	R MODE IV
	B. ROLL					
	L/O TO S-IVB CUTOFF	30 DEC/550	And	ORT MODE I, MODE II,		
1-89	EDS AUTOMATIC ABORT LIM	ITS (UNTIL MANUAL		O ENGINES OUT AUTO A	AND LV RATES A	AT 2:00 MIN)
	A. RATES					
	PITCH AND YAW ROLL	4.0 ± 0.5 DEG, 20.0 ± 0.5 DEG,				
	B. ANY TWO ENGINES OUT					
	C. CM TO IU BREAKUP					
			T			
	MISSION APOLLO 17	REV DATE FNL 9/1/72	SECTION GENERAL	CREW ABORT	PAGE	
		l	RULES AND SOP'S	LIMITS	1-13	Tape 5.2

MISSION RULES

				1011 1		3 CONCEODED			
R	ITEM								
	1-90	S-IVB TANK PRESSURE L	MITS						
		A. BULKHEAD ΔP (FIRST	S-IVB C	C/O TO S/C	L/V SEP)				
		FUEL GREATER THAN							
		OXID GREATER THAN							
		B. LOX TANK PRESS GRE	ATER THA	N OR EQUAL	TO 50 PSIA (L/O TO	S/C L/V SEP)			
	1-91	ENGINE FAILURES				ROCEDURES			
		LOSS OF THREE OR MORE PRIOR TO S-IVB TO COI			ABORT	MODE I OR MODE II			
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_		MISSION APOLLO 1	REV 7 FNL	DATE 9/1/72	SECTION GENERAL	GROUP CREW ABORT	PAGE		
L		AFULLU	, Lur	3,1,12	RULES AND SOP'S	LIMITS	1-14	L	Tape 5.3

MISSION RULES

SECTION 2 - FLIGHT OPERATIONS RULES

R	ITEM	
		GENERAL
		
	2-1	PRELAUNCH_
		A. LAUNCH AZIMUTH LIMITATIONS RESTRICT LAUNCHES TO OCCUR BETWEEN 72 DEGREES AND 100 DEGREES.
		B. THE FLIGHT DIRECTOR WILL EVALUATE WIND SIMULATIONS ALONG THE MODE I (TOWER) ABORT TRACK PRIOR TO THE START OF CRITICAL COUNTDOWN ACTIVITIES AND WILL ADVISE THE LAUNCH DIRECTOR OF ANY PREDICTED PERIODS OF LAND LANDING. IF THE FLIGHT DIRECTOR IS UNABLE TO PROVIDE THIS EVALUATION, A LAND LANDING WILL BE ASSUMED AND THE SPACECRAFT WIND CONSTRAINTS FOR LAND IP'S WILL BE APPLIED. THESE CONSTRAINTS REQUIRE THAT THE SPACECRAFT NOT BE LAUNCHED OR REMAIN IN A TOWER ABORT MODE IF A TOWER ABORT WOULD RESULT IN A LAND LANDING WITH A HORIZONTAL VELOCITY COMPONENT OF GREATER THAN 54 FEET PER SECOND AT IMPACT. IN ALL CASES, THE LAUNCH DIRECTOR WILL BE PRIME FOR CALLING HOLDS FOR LAND LANDING LAUNCH WIND VIOLATIONS.
		C. THE LAUNCH WILL NOT BE ATTEMPTED IF THE MINIMUM GROUND INSTRUMENTATION CAPABILITY IS COMPROMISED. CONTINUOUS TRACKING COVERAGE IS REQUIRED FROM LIFTOFF THROUGH LIFTOFF PLUS 10 MIN. CONTINUOUS TM AND VOICE ARE REQUIRED FROM LIFTOFF THROUGH INSERTION.
	2-2	<u>LAUNCH</u>
		IT IS PREFERABLE TO GO INTO ORBIT RATHER THAN PERFORM A LAUNCH ABORT. THEREFORE, THE LAUNCH WILL BE CONTINUED AS LONG AS THE CREW CONDITION IS SATISFACTORY, NO S/C OR SLV PROBLEMS EXIST WHICH JEOPARDIZE CREW SAFETY, AND SUFFICIENT CONSUMABLES, COOLANT, AND ELECTRICAL ENERGY REMAIN FOR AT LEAST ONE REVOLUTION PLUS ENTRY.
İ		
		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 FLIGHT OPS RULES GENERAL 2-1 Tape 11.1

MISSION RULES

				SECT	ION 2 - FL	IGHT OPERATIONS RUL	ES - CONTINUED		
R	ITEM								-
	2-3	EARTH ORBIT	- -						
			VILL BE MADE A ROLLABLE CONDI			PTP WHEN ONE MORE C	SM FAILURE WILL R	RESULT IN AM	ASAP ENTRY OR
	ŀ	B. ADEQUAT	E CONSUMABLES	WILL	BE MAINTAI	NED FOR ENTRY IN TH	E NEXT PTP, MAKIN	G ALLOWANCE	S FOR SETUP AND ENTRY.
		C. THE DEC	ORBIT CAPABILI	TIES R	EQUIRED FO	R EARTH ORBIT ARE:			
		1. TWO	METHODS OF D	EORBIT	ARE REQUI	RED.			
		2. IF	A SUBSEQUENT	SINGLE	FAILURE W	OULD PRECLUDE DEORB	IT BY EITHER METH	OD REMAININ	G, THE CSM WILL DEORBIT.
		3. SPS	IS THE PRIME	METHO	D OF DEORB	IT AND SUFFICIENT Δ'	WILL BE RESERVE	D FOR THIS	MANEUVER.
		4. SM- IND	RCS (4 QUAD) DIVIDUAL SM-RC	AND SM S QUAD	-CM/RCS HY AND GNCS	BRID WILL BE CONSIDI INTEGRITY IS MAINTA	ERED AS INDEPENDE INED AND SUFFICIE	NT DEORBIT NT RCS PROP	METHODS AS LONG AS ELLANT IS AVAILABLE.
		5. THE	LM PROPULSION	N SYST M/RCS	EM (DPS OR HYBRID DEO	RCS) MAY BE USED TO RBIT CAN BE CONDUCTE	PLACE THE CSM I	N AN ORBIT	(H _p \geq 80 NM) FROM WHICH
		6. UTI	LIZATION OF B	ACKUP	DEORBIT ME	THODS WILL BE BASED	ON THE FOLLOWING	PRIORITIES	:
		(B)	SM-RCS LM PROP PLU: SM-CM/RCS H' LM PROP PLU:	YBRID		īn.			
		RULE NUMBER 2-10 ARE RE	S 2-4 THROUGH SERVED.						
	<u> </u>	L	MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	FLIGHT OPS RULES	GENERAL	2-2	Tape 6.2

MISSION RULES

2-11 THANSLINAN INJECTION A. THE TILL HILD BE GO IF THE SYC AND L/V SATISFY THE FOLLOWING CRITERIA: 1. THERE NOWE BEEN NO FAILURES IN THE LAUNCH VEHICLE WHICH RESULT IN A CATASTROPHIC MAZABO, 2. A "SO FOR ILL" RECOMMENDATION WILL BE GIVEN IF ENDOUGH PROPELLANT IS AVAILABLE AND THE SIV HARDWARE STATUS IS DEFEND ADRIQUATE FOR A REACOMBALE PROBABILITY OF REACHING A 28 000 NM APOGEE. THE FINAL DECISION MESTS WITH THE FLIGHT DIRECTOR FOR DETERMINING A REASONABLE PROBABILITY. 3. THE COST MAS TOTAL SYSTEMS CAPABILITY WITH REDUNDANCY. RETURNANCY VERIFICATION IS SUBJECT TO THE MANGER AND TYPE OF REQUIRANT COMPONENT CHECKS MUTCH CAN BE PERFORMED IN SUBJECT TO THE MANGER REPORT OF EVALUATION. C. ILLI TRANSLIVER WILL BE SIGNE THAT A SAFE CIRCUMLINAR RETURN TO EARTH CAN BE MEL-ISTABLISHED WITHIN AN DOS CAPABILITY AS LATE AS RC + 2 MBS. THE CAMBILITY WILL EXIST TO ESTABLISH A SAFE CIRCUMLINAR RETURN TO EARTH WITH THE SM-RCS UNTIL TILL + 5 MBS. 2-12 TRANSPOSITION, DOCKING AND EXECTION (TOBS) A. THE NORMAL MINIMAL CABIN PRESSURE REQLINE OF 4.0 PSIA FOR TOWNERS. HATCH REDUNDAL FOR IMBILITIAL HOOKUP OR DOCKING INTERACT. INSPECTION. B. IF NORMAL IN EXECUTION IS NOT SUCCESSFUL, NO ATTEMPT WILL SE MADE TO MAN THE LM AND "STAGE" TO RECOVER THE ASSENT STAGE. MISSION BRY DATE SECTION SECTION (TOBS) APOULD TO THAT STAGE. MISSION BRY DATE SECTION (FIRST) APPLICATION OF ROLL SECTION 2 RECOVER THE ASSENT STAGE. MISSION BRY DATE SECTION (FIRST) APPLICATION OF ROLLS SECTION (FIRST) APPLICATION OF ROLLS SECTION (FIRST) APOLICA TO THE MISSION REV DATE SECTION (FIRST) APPLICATION OF ROLLS SECTION (FIRST) APPLICATION OF ROLLS SECTION (FIRST) APPLICATION OF ROLLS SECTION (FIRST) APPLICATION OF ROLLS SECTION (FIRST) APPLICATION OF THE MISSION OF THE MISSION OF THE MISSION RECOVER THE ASSESTITED OF THE MISSION RECOVER THE ASSESTITED OF THE MISSION RECOVER THE ASSESTITED OF THE MISSION RECOVER THE ASSESTITED OF THE MISSION RECOVER THE MISSION RECOVER THE MISSION RECOVER THE MISSION RECOVER THE MISSION RECOVER THE MISSION RECO	·	SECTION 2 - FLIGHT OPERATIONS RULES - CONTINUED										
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APOLLO 17 FNL 9/1/72 FLIGHT OPS RULES GENERAL 2-3 Tape 50.2	<u> </u>	MISSION REV DATE SECTION GROUP PAGE										
		APOLLO 17 FNL 9/1/72 FLIGHT OPS RULES GENERAL 2-3 Tape 50.2										

MISSION RULES

рΤ	TTE: 1	SECTION 2 - FLIGHT OPERATIONS RULES - CONTINUED									
	ITEM										
	2-13	TRANSLUNAR COAST									
		A. NO MCC WILL BE PERFORMED IF LOI CAN BE TARGETED WITHIN OPERATIONAL CONSTRAINTS.									
		B. TRANSLUNAR COAST WILL BE TERMINATED IF ADEQUATE CONSUMABLES (CSM AND/OR LM) ARE NOT AVAILABLE FOR A CIRCUMLUM EARTH RETURN + 12 HRS AND A TLC DIRECT ABORT PROVIDES AN EARLIER LANDING TIME.									
į		C. THE CREW WILL MAN THE LM FOR BACKUP COMMUNICATIONS (VOICE, TM, TRACK) IF CSM COMMUNICATIONS ARE LOST WITH THE MSFN. WITH LOSS OF CSM COMMUNICATIONS, A LUNAR ORBIT MISSION WILL BE FLOWN UTILIZING THE LM COMMUNICATIONS SYSTEMS.									
		D. MCC'S WILL BE DESIGNED TO MEET LOI TARGETING CONSTRAINTS WHILE RESERVING A CAPABILITY TO PERFORM A RETURN TO EARTH MANEUVER WITH DPS ENGINE AS LATE AS 2 HOURS AFTER PERILUNE ON THE CIRCUMLUNAR TRAJECTORY.									
		E. FOR A CSM SOLO MISSION, MCC'S WILL BE TARGETED SO A SAFE CIRCUMLUNAR RETURN TO EARTH CAN BE ESTABLISHED WITHIN RCS CAPABILITY.									
		F. SIM BAY EXPERIMENT OPERATION DURING TLC									
		 ALL CREWMEN WILL BE IN THE CSM FOR SIM BAY DOOR JETTISON. A NO-GO FOR LOI WILL NOT PRECLUDE SIM BAY DOOR JETTISON. 									
	2-14	<u>LUNAR ORBIT INSERTION</u>									
		A. LOI WILL BE INHIBITED AND A LUNAR FLYBY PERFORMED IF THE CSM DOES NOT SATISFY ANY OF THE FOLLOWING CONDITIONS:									
		 FULL CRITICAL SYSTEMS REDUNDANCY ADEQUATE CONSUMABLES FOR MINIMUM LUNAR ORBIT OPERATIONS WITH CAPABILITY TO SUSTAIN A CRYO TANK LOSS AND RETURN TO EARTH WITH AN AVERAGE POWER LEVEL OF 40 AMPS SPS PROPELLANT RESERVE CAPABILITY FOR TEI AND TRANSEARTH MCC'S RCS PROPELLANT RESERVE TO ACCOMPLISH TEI CONTROL, TRANSEARTH MCC CONTROL, PTC, MINIMUM TRANSEARTH AND LUNAR ORBIT OPERATIONS 									
		B. A DPS LOI MAY BE PERFORMED IF REQUIRED TO ACCOMPLISH A LUNAR ORBIT MISSION.									
		C. FOR A CSM SOLO MISSION, THE SIM BAY DOOR MUST BE JETTISONED (ALLOWING SIM BAY SCIENCE OPERATIONS) TO BE GO FOR LOI.									
		MISSION REV DATE SECTION GROUP PAGE									
		MISSION REV DATE SECTION GROUP PAGE									

MISSION RULES

ъ.	TTC+4	SECTION 2 - FLIGHT OPERATIONS RULES - CONTINUED
R	ITEM	
ļ	2-15	LUNAR ORBIT
		A. FOR LOI DISPERSIONS, IF A STABLE ORBIT HAS NOT BEEN ACHIEVED, A DPS 30-MINUTE ABORT OR A DPS 2-HOUR ABORT WILL BE EXECUTED FOLLOWED BY A SUBSEQUENT DPS (OR APS) MANEUVER IF REQUIRED.
		B. DESIGNED REDUNDANT CAPABILITY MUST BE MAINTAINED IN ALL CSM SYSTEMS CRITICAL FOR TEI AND LIFE SUPPORT.
		C. SUFFICIENT CONSUMABLES MUST REMAIN TO COMPLETE THE NEXT MISSION PHASE WITH CAPABILITY TO SUSTAIN A CRYO TANK LOSS DURING THE PHASE AND RETURN TO EARTH WITH AN AVERAGE POWER LEVEL OF 40 AMPS.
		D. THE CSM MUST MAINTAIN AN SPS FUEL RESERVE CAPABILITY FOR THE TEI MANEUVERS AND TRANSEARTH MCC'S.
		E. THE CSM MUST MAINTAIN RCS PROPELLANT RESERVE TO ACCOMPLISH TEI CONTROL, TEC MCC CONTROL, PTC, AND MINIMAL TRANSEARTH OPERATIONS.
		F. IF A LANDING MISSION IS NOT POSSIBLE, THE ALTERNATE MISSION WILL NOT BE SHORTENED SOLELY TO ALLOW DPS TEI CAPABILITY. IF THE DPS IS AVAILABLE AT THE TEI TIME, IT WILL BE USED FOR TEI.
		G. LUNAR ORBIT SCIENCE OPERATIONS
		1. NO EVA WILL BE PERFORMED FOR SYSTEMS TROUBLE SHOOTING ON AN INDIVIDUAL SIM BAY MALFUNCTION.
		 DURING LUNAR SOUNDERS OPERATIONS, IF EMI RESULTS IN DEGRADATION OR LOSS OF TM, THE LUNAR SOUNDER OPERATION MAY BE CONTINUED DEPENDING ON THE STATUS OF CSM SYSTEMS.
	1	MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 FLIGHT OPS RULES GENERAL 2-5 Tape 53.1

MISSION RULES

		SECTION 2 - FLIGHT OPERATIONS RULES - CONTINUED
R	ITEM	
	2-16	DESCENT ORBIT INSERTION (DOI)
		DOI NILL BE PERFORMED ONLY IF A LUNAR LANDING MISSION CAN BE ACCOMPLISHED, OTHERWISE AN LOI-2 MANEUVER WILL BE PERFORMED TO ATTAIN APPROXIMATELY A 60 NM CIRCULAR ORBIT.
	2-17	INTRAVEHICULAR TRANSFER ONE HARDSUIT IVT FROM THE CSM TO THE LM WILL BE ACCOMPLISHED IF A REASONABLE CHANCE EXISTS THAT CORRECTIVE ACTION CAN BE TAKEN FOR A LM/TUNNEL PRESSURIZATION.
	2-18	DOCKED LM OPERATIONS FOR AN IMPENDING HAZARDOUS SITUATION RESULTING FROM A DESCENT STAGE PROBLEM, THE STAGE WILL BE JETTISONED AND ASCENT STAGE OPERATIONS WILL CONTINUE AFTER THE VEHICLE HAS MOVED TO A SAFE DISTANCE.
		RULES NUMBERS 2-19 AND 2-20 ARE RESERVED.
	2-21	CSM/LM UNDOCKING AND SEPARATION
		A. A MANNED LM WILL NOT BE UNDOCKED FROM THE CSM WITHOUT INDEPENDENT MANEUVER CAPABILITY OF BOTH VEHICLES TO RENDEZVOUS.
ŀ		B. EVT CAPABILITY IS REQUIRED FOR MANNED UNDOCKING.
		C. VHF COMMUNICATIONS ARE MANDATORY FOR SEPARATION.
	2-22	CSM LUNAR ORBIT UNDOCKED
		A. UNDOCKING TO PDI
		 LOSS OF REDUNDANT CAPABILITY IN CRITICAL SYSTEMS WILL BE CAUSE TO TERMINATE THE LANDING MISSION. LM SYSTEMS MAY BE UTILIZED TO PROVIDE SYSTEMS REDUNDANCY FOR CONTINUATION OF AN ALTERNATE MISSION.
		 LOSS OF CSM RESCUE CAPABILITY WILL BE CAUSE FOR TERMINATING THE MISSION AND PERFORMING A LM ACTIVE RENDEZVOUS ASAP.
		B. PDI TO LANDING NO CSM FAILURES WILL BE CAUSE FOR ABORT DURING POWERED DESCENT EXCEPT THOSE CONFIRMED SPS FAILURES REQUIRING RETENTION OF LM PROPULSION CAPABILITY.
]	C. LUNAR STAY
		FAILURE TO MAINTAIN REDUNDANT CAPABILITY IN SYSTEMS REQUIRED FOR TEI OR LIFE SUPPORT WILL BE CAUSE FOR TERMINATION OF LUNAR STAY.
		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 FLIGHT OPS RULES GENERAL 2-6 Tape 50.3
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MISSION RULES

		SECTION 2 - FEIGHT OFFICE TOTAL VOLES - CONTINCES
R	ITEM	
	2-23	RESERVED
1		
1	2-24	LM PDI
1 '	1	FOR PDI, THE LM MUST MEET THE LUNAR STAY WITH EVA CRITERIA, AND MUST HAVE THE CAPABILITY TO LAND, ASCEND, AND
		RENDEZVOUS WITHOUT VIOLATING ANY SPECIFIC MISSION RULES OR REDLINES.
	1 1	
	2-25	LM POWERED DESCENT
		IF A SYSTEMS FAILURE OCCURS AND A CHOICE IS AVAILABLE -
	1	IF A SYSTEMS FAILURE OCCURS AND A CHOICE IS AVAILABLE -
		A. PDI TO HIGH GATE
	1 . !	REDUNDANT CAPABILITY OF CRITICAL LM SYSTEMS AND SYSTEMS NEEDED FOR AN EVA ARE REQUIRED TO HIGH GATE. EARLY IN
1		POWERED DESCENT, IF AN ABORT IS REQUIRED, IT IS PREFERABLE TO ABORT WHEN DPS TO ORBIT CAPABILITY (AND THE
		SHORTER RENDEZVOUS) ARE AVAILABLE.
	1 1	SHOWER MEDITIONS, AND THE STATE OF THE STATE
1		B. HIGH GATE TO TOUCHDOWN
	1	BECAUSE OF LIMITED TIME FOR PROBLEM VERIFICATION AND SYSTEM RECONFIGURATION, IT IS PREFERABLE TO LAND THAN
]	ABORT. IF THE INDICATED FAILURE WILL ALLOW A SAFE LANDING AND ASCENT INTO AN ACCEPTABLE ORBIT, A LANDING
-		WILL BE ACCOMPLISHED.
	2-26	LM LUNAR STAY
		A. ONLY THOSE TIME-CRITICAL SYSTEMS FAILURES OR TRENDS THAT INDICATE IMPENDING LOSS OF THE CAPABILITY TO ASCEND
Ì		AND ACHIEVE A SAFE ORBIT WILL BE CAUSE FOR AN IMMEDIATE ABORT (ANYTIME LIFTOFF) FROM THE LUNAR SURFACE.
		B. LOSS OF REDUNDANT CAPABILITY IN CRITICAL LM SYSTEMS IS CAUSE FOR ABORT AT THE NEXT BEST OPPORTUNITY.
1		
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<u> </u>		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 FLIGHT OPS RULES GENERAL 2-7 Tape 6.7
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MISSION RULES

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R T	T.Tru	1			SECTI	ON 2 - FLI	IGHT OPERATIONS RULES	S - CONTINUED				
K	ITEM											
	2-27	LUN	IAR SURFA	ACE EVA'S								
		Α.		E NOMINAL (TWO- STRONAUTS ARE F			. EMU LIFE SUPPORT S'	STEMS CAPABILITY	AND CRITIC	CAL INSTRUMENTATION FOR		
		В.	A ONE-M	MAN EVA MAY BE	INITA	TED.						
		C.	BEING P		LOWED	BY IMMEDIA				F THE SPECIFIC ACTIVITY GH OR LOW PURGE MODE WILL		
		D.	THE OPE	ERATIONAL EVA F	PLAN W	√ILL BE CON	NSTRAINED TO A MAXIMU	JM DURATION OF 7 H	OURS.			
		Ε.					ED ALLOWING ONE FAILU DRAGE IS 300 BTU'S.	JRE (LRV OR PLSS)	WITH THE C	CAPABILITY TO RETURN TO THE LM.		
1		F.	ALL PL#	ANNED EVA'S WI!	LL INC	LUDE A 30-	-MINUTE, POST-EVA RES	SERVE ON EMU CONSU	MABLES.			
				O-MAN EVA ERATIONAL LRV				,				
					ONS WI	ILL BE LIMI	ITED TO ALLOW PLSS WA	ALKBACK ASSUMING N	IO PLSS FA!	LURES.		
) EVA EXCURSION IN LOW PURGE	ONS WI	ILL BE LIMI W. WITH NO	ITED TO SUPPORT RIDEE	BACK WITH A FAILED ON OF HI AND LO PUR	PLSS, USI	ING BSLSS AND THE OPS WILL BE USED FOR RETURN AND		
		ŧ	NO	LRV AVAILABLE								
	<u> </u>		(A)) EVA EXCURSI	ONS WI	ILL BE LIMI	TED TO A BSLSS WALK!	BACK CAPABILITY US	ING THE OP	PS IN LOW PURGE FLOW.		
			(B)) WITH NO BSL!	SS, TH	IE EVA EXCU	JRSIONS WILL BE LIMI	TED, ALLOWING LM R	ETURN USIN	NG THE OPS IN HIGH PURGE FLOW.		
			2. ONE	E-MAN EVA						1		
	İ		<u>OPE</u>	ERATIONAL LRV						!		
			(A)) EVA EXCURSIO	ONS WI	LL BE LIMI	ITED TO PLSS WALKBACK	K CAPABILITY ASSUM	ING NO PLS	S FAILURES.		
			(B)				ITED, ALLOWING DRIVER DDED TO THE LO PURGE		SING THE O	OPS IN A COMBINATION OF LO AND		
				LRV AVAILABLE	_'					I		
			(A)) EVA EXCURSIO	ONS WI	.LL BE LIMI	ITED TO ALLOW WALKBAC	CK TO THE LM, USING	G THE OPS	IN HIGH PURGE FLOW.		
	ļ	G.	COMMUNI	ICATIONS						!		
				R THE NORMAL (1		,		DOWNLINK VOICE FRO	OM ONE CRE	WMAN (OR TV DOWNLINK) ARE		
			5 M	MINUTES. WITH	LCRU/	/ANTENNA PR		OMM DURING A TRAVE	RSE, THE S	SE FOR A PERIOD EXCEEDING SURFACE OPERATIONS WILL		
			3. WIT		TOTAL	L LCRU COMM	M CAPABILITY, THE CRE	CREW WILL RETURN TO THE VICINITY OF THE LM AND				
			4. WIT					CREW WILL EGRESS, ACTIVATE THE LCRU, AND CONTINUE NORMAL SURFACE				
			5. THE	IE LCRU MAY BE H			EXTEND THE ALLOWABLE	E TRAVERSE DISTANC	ES FROM TH	E LM OR THE LRV		
			(A)	S REQUIRED) TO	MAINI	AIN COMMUN	ICATIONS.			,		
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				APOLLO 17	FNL	9/1/72	FLIGHT OPS RULES	GENERAL	2-8	Tape 50.4		
					1 7	4	1	4	1	1		

MISSION RULES

	SECTION 2 - FLIGHT OPERATIONS RU	TE2 - CONTINUED		· · · · · · · · · · · · · · · · · · ·							
R ITEM											
2-27 CONT	H. A VACUUM TRANSFER WILL ONLY BE ATTEMPTED IN AN EMERGEN	CY.									
	I. THE LM WILL NOT BE PRESSURIZED WITH A CREWMAN ON THE L	UNAR SURFACE.									
	J. BOTH PLSS'S AND BOTH OPS WILL BE RETAINED UNTIL TWO LIFE SUPPORT UNITS (TWO OPS, TWO PLSS, OR ONE PLSS PLUS ONE OPS) HAVE BEEN VERIFIED TO HAVE SUFFICIENT CONSUMABLES TO SUPPORT CEVA.										
	K. FOR THE TWO-MAN EVA, THE CDR WILL ALWAYS EGRESS FIRST PURGE. THIS WILL INSURE THAT THE CDR IS IN THE LEFT F OPPORTUNITY TO DOFF THE EMU'S.										
2-28	ASCENT										
	IN THE EVENT OF PROCEDURAL ERRORS OR SYSTEMS PROBLEMS WHICH FOR RENDEZVOUS AND WHICH CAN BE CORRECTED IN ONE REV, IT IS SITUATION THAN IT IS TO LIFT OFF ON TIME.			- · · · · · · ·							
2-29	RENDEZVOUS										
	A. SELECTION OF THE ACTIVE VEHICLE FOR RENDEZVOUS AND DOG FLIGHT CREW BASED UPON CONSUMABLES AND SYSTEMS PERFORM ACCOMPLISHING THE RENDEZVOUS.										
	B. THE DIRECT RNDZ PROFILE WILL BE PERFORMED IF THE MANDAPLANE ERROR CAN BE CORRECTED WITH ASCENT YAW STEERING. WILL BE EXECUTED.										
2-30	RETENTION OF THE LM ASC STAGE										
	CONSIDERATION WILL BE GIVEN TO RETAINING THE LM ASC STAGE IF THE ASC STAGE MUST BE RETAINED FOR TEI, THE ΔV RESERVED FASTER EARTH RETURN TIME.										
<u> </u>	MISSION REV DATE SECTION	GROUP	PAGE								
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MISSION RULES

R ITEM	, 			·····	SECTI	UN 2 - FLI	GHT OPERATIONS RULES	- CONCEUDED	- -			
TIEM	<u> </u>											
2-31	1	TRANSEA	RTH CO	DAST								
		A. THE STEEP TARGET LINE WILL BE USED FOR ALL MCC'S EXCEPT WHEN BOTH THE VELOCITY AT ENTRY INTERFACE IS LESS THAN 31,000 FPS AND THE G&N IS "GO" - THEN THE SHALLOW TARGET LINE WILL BE USED.										
	j	B. MCC'S MAY BE USED FOR LANDING AREA CONTROL PRIOR TO ENTRY INTERFACE MINUS 24 HOURS FOR RECOVERY ACCESS VIOLATIONS, UNACCEPTABLE WEATHER, OR LAND MASSES IN ANY PART OF THE OPERATIONAL FOOTPRINT.										
		C. IF THE FLIGHTPATH ANGLE IS OUTSIDE THE ENTRY CORRIDOR, AN MCC WILL BE EXECUTED AS SOON AS PRACTICAL.										
ļ		D. MCC	C'S WII	LL BE ACCOMPL	.ISHED	BY THE SP	S IF NECESSARY TO MA	AINTAIN RCS REC	DLINES.			
2-32	2	TRANSEA	ARTH C	OAST EVA								
		A. THE	TEC	EVA WILL BE I	NITIA	TED ONLY F	OR RETRIEVAL OF FILM	1 FROM THE PAN	CAMERA, MAPPIN	G CAMERA, OR LUNAR SOUNDER.		
		B. THE	CSM	OXYGEN SUPPLY	, AND	CRITICAL	INSTRUMENTATION MUST	ALL BE GO FOR	R EVA.			
		C. ALL	RCS	THRUSTER FIRE	IN T	HE VICINIT	Y OF THE TRANSFER PA	ATH MUST BE INF	HIBITED.			
		D. SPACECRAFT ATTITUDE AND ATTITUDE RATES MUST BE WITHIN LIMITS THAT ALLOW SAFE EVA OPERATIONS WITH SUFFICIENT SUNLIGHT THROUGHOUT THE PLANNED EVA PERIOD.										
		E. A VACUUM TRANSFER WILL ONLY BE ATTEMPTED IN AN EMERGENCY.										
		F. ALL SIM BAY POWER WILL BE DISABLED FOR THE EVA.										
2-33	і3	ALTERNATE MISSION										
		A. EARTH ORBIT										
		 CSM ONLY - EO SCIENCE, SPS INCLINATION CHANGE. ORBIT FOR SCIENCE OPERATIONS WILL BE A TRADE-OFF TO PROVIDE MOST OPTIMUM SIM BAY PHOTOGRAPHY AND LUNAR SOUNDER CONDITIONS YET REMAIN WITHIN RCS DEORBIT CAPABILITY. 										
	 CSM/LM - EO SCIENCE, INCLINATION CHANGE, ESTABLISH ORBIT FOR OPTIMUM SIM BAY PHOTOGRAPHY AND CONDITIONS. 								TOGRAPHY AND LUNAR SOUNDER			
		B. LUNAR ORBIT										
		CSM ONLY - SIM BAY EXPERIMENTS. APPROXIMATELY 6-DAY STAY, LOI TARGETED FOR EASTERN NODAL LOCATION O NM CIRCULAR ORBIT.										
		2.				ABILITY) -	SIM BAY EXPERIMENTS	S. APPROXIMATE	ELY 6-DAY STAY,	60 NM CIRCULAR ORBIT.		
		C. IN ANY ALTERNATE MISSION WITHIN THE CONSTRAINTS OF PROPELLANT REMAINING AND OTHER OPERATIONAL CONSIDERATIONS SUCH AS CREW SAFETY AND SYSTEMS LIFETIME, THE COMBINED LM ASC/DES STAGES WILL BE DISPOSED OF IN THE FOLLOWING ORDER OF DESCENDING PRIORITY:										
		2.	OCEA	R IMPACT N IMPACT R ORBIT								
				MISSION	REV	DATE	SECTION	GROUP	PAGE			
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MISSION RULES

SECTION 3 - MISSION RULE SUMMARY

THIS SECTION IS A SUMMARY OF THE DATA PRIORITY GUIDELINES BY MISSION PHASE, SLY RULES BY MISSION PHASE, SHYSTONS GO/MO-GO CRITERIA ON CHANTS BY MISSION PHASE. THE SUMMARY BULES PLUS THE CHART ARE REQUISED TO ENCOMPASS EACH PHASE. THE CAPABILITY LISTED IN THE CHART ARE THE REQUISEMENTS FOR INSTITUTION OF CONTINUATION OF A MISSION PHASE SECURITY. MISSION EVENTS FROM UNDOCKING TO POLICITION REQUISE THAT THE YUNICLES MEET THE LUMAR STAY MITH EVA CRITERIA AND HAVE THE CAPABILITY TO LAND, ASCEND, AND RENDEZVOUS. A. SLY S-IC ADMICHIT HOUSES OUT (THE DEFENDENT) S-IC GOOD ARMS SERVANTON S-IC LOSS OF CONTROL (THE DEFENDENT) S-IL BOURDE FLAURES (THE OPERANDENT) S-IL BOURDE FLAURES (THE OPERANDENT) S-IL BOURDE FLAURES (THE OPERANDENT) S-IVE LOSS OF FORMALICE FULLO (PRIOR TO S-IVE DOUTTON) S-IVE LOSS OF FORMALICE FULLO (PRIOR TO S-IVE DOUTTON) S-IVE LOSS OF FORMALICE FULLO (PRIOR TO S-IVE DOUTTON) S-IVE LOSS OF FORMALICE FULLO (PRIOR TO S-IVE DOUTTON) S-IVE LOSS OF FORMALICE FULLO (PRIOR TO S-IVE DOUTTON) S-IVE LOSS OF CABIN PRESSURE AND SUIT STROUGHTON FURLY (S) FAILED OPEN (NEFT, NULE 6-5) B. CSM 1. ENVIRONMENTAL LOSS OF CABIN PRESSURE AND SUIT STROUGHTON FURLY SAY, OR LOSS OF CABIN PRESSURE AND SUIT STROUGHTON FURLY SAY, OR (A) THE EVALUATION FORMER SCURCES ARE REQUIRED TO CONTINUE LAUNCH: (A) ONE F/C OR ANK BAT PLUS ONE ENERY BAY, OR (B) THREE STRIP MATS UNCONTROLLABLE SHORTED MATE BUS DIR ENERY BAY, OR (B) THREE STRIP MATS UNCONTROLLABLE SHORTED MATE BUS SORE IN BOTH CH-RCS RINGS (MODE I ONLY) C. VIOLATION OF TRAJECTORY LIMIT LINES D. TEAM DISCRETION MILL BE USED FOR: 1. SUIT/ZABAN CONTAMENATION 2. MEDICAL PROBLEMS MISSION REVUL SAYS MISSION RINE MISSION REVUL SAYS MISSION RINE MISSION REVUL SAYS MISSION RINE MISSION REVUL SAYS MISSION RINE MISSION REVUL SAYS MISSION RINE MISSION REVUL LAUNCH PHASE		SECTION 3 - MISSION RULE SUMMARY
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(B) THREE ENTRY BATS UNCONTROLLABLE SHORTED MAIN BUS LOSS OF BOTH AC BUSES DURING MODE I OR MODE II 3. PROPULSION SUSTAINED LEAK OR LOSS OF HE MANIFOLD PRESSURE IN BOTH CM-RCS RINGS (MODE I ONLY) C. VIOLATION OF TRAJECTORY LIMIT LINES D. TEAM DISCRETION WILL BE USED FOR: 1. SUIT/CABIN CONTAMINATION 2. MEDICAL PROBLEMS MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		
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LOSS OF BOTH AC BUSES DURING MODE I OR MODE II 3. PROPULSION SUSTAINED LEAK OR LOSS OF He MANIFOLD PRESSURE IN BOTH CM-RCS RINGS (MODE I ONLY) C. VIOLATION OF TRAJECTORY LIMIT LINES D. TEAM DISCRETION WILL BE USED FOR: 1. SUIT/CABIN CONTAMINATION 2. MEDICAL PROBLEMS MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		
SUSTAINED LEAK OR LOSS OF He MANIFOLD PRESSURE IN BOTH CM-RCS RINGS (MODE I ONLY) C. VIOLATION OF TRAJECTORY LIMIT LINES D. TEAM DISCRETION WILL BE USED FOR: 1. SUIT/CABIN CONTAMINATION 2. MEDICAL PROBLEMS MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		
D. TEAM DISCRETION WILL BE USED FOR: 1. SUIT/CABIN CONTAMINATION 2. MEDICAL PROBLEMS MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		
1. SUIT/CABIN CONTAMINATION 2. MEDICAL PROBLEMS MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		C. VIOLATION OF TRAJECTORY LIMIT LINES
2. MEDICAL PROBLEMS MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		D. TEAM DISCRETION WILL BE USED FOR:
APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE		
APOLLO 17 FNL 9/1/72 MISSION RULE LAUNCH PHASE	1	MISSION REV DATE SECTION GROUP PAGE

MISSION RULES

_				SECTION 3 - MI	SSION RULE SUMMARY -	- CONTINUED		
F	R	ITEM						
		3-2	THE S-IVB EARLY STAGING WILL	L BE USED AFTE	R "S-IVB TO COI" CAE	SAPILITY FOR THE FO	OLLOWING:	
!			S-II GIMBAL ACTUATOR IN S-II LOSS OF CONTROL S-II ENGINE FAILURES S-IVB COLD HE SHUTOFF			TT)		
		į						
		3-3	SWITCHOVER TO CSM GUIDANCE 1	WILL BE PERFOR	MED FOR:			
			SATURN GUIDANCE REFERE	NCE FAILURE				
	l							
			RULE NUMBERS 3-4 THROUGH 3-10 ARE RESERVED.					
						•		
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}			MISSION	REV DATE	SECTION	GROUP	PAGE	
				FNL 9/1/72	MISSION RULE SUMMARY	LAUNCH PHASE	3-2	Tape 8.2

MISSION RULES

ITEM								
					EARTH ORBIT			
3-11					M EXTRACTION) WILL E			DLLOWING SLV CONDITIONS
	B. S-I C. LOS	VB LOX TANK PRES S OF ATTITUDE CO	S IS G NTROL	REATER THA DURING TB5	RSAL SYSTEM ARMS IN/ N 50 PSI* (REFERENCI (CREW DISCRETION) E EXCEEDS LIMITS*			AND PRIOR TO SAFING*
}	E. STA	RT BOTTLE GREATE *PERFORM SPS M						
3-12	CSM SEPA	RATION FROM THE	S-IVB	(WITH LM E	XTRACTION) WILL BE	PERFORMED FOR:		
		'B NO-GO FOR TLI NO-GO FOR TLI BL	IT GO F	OR EARTH O	RBIT MISSION			
3-13	TLI WILI	. BE INHIBITED FO	R:					
	B. S-1 C. LOS D. COM E. LOS F. MIS G. UNA	IVB ENGINE MAIN L SS OF ATTITUDE CO NFIRMED ACTUATOR SS OF ENGINE HYDF SALIGNMENT RATE I ACCEPTABLE DIFFER	OX VAL ONTROL HARDOV RAULIC BETWEEN RENCES	VE FAILS T /ER FLUID I THE IU AN BETWEEN CM	C ACHIEVING A 28K NM O CLOSE AT CUTOFF ID IMU IS OUTSIDE LII IC AND IU PLATFORM V EN AND IU ORBITAL DE	MITS ELOCITY COMPONENTS	S OR TOTAL	VELOCITY AT INSERTION
3-14	A. PITO B. ROLL C. PITO	- BE TERMINATED F CH OR YAW BODY RA - BODY RATE GREAT CH OR YAW ATTITUE RBURN WHERE T _{GO}	NTES GF TER THA DE DEVI	AN 20 DEG/S (ATIONS FRO	EC OM NOMINAL PROFILES	IN EXCESS OF 45 DE	E G	
					•			
	!							
		MISSION	REV	DATE	SECTION MISSION RULE	GROUP EARTH ORBIT	PAGE 3-3	Tape 55.5

MISSION RULES

	1TEM 3-15	TLI WILL BE P								
3	3-15	TLI WILL BE P								
1 I			ERFORMED WITH	MANUA	IL BACKUP F	FOR:				
		A. A SATURN	GUIDANCE REFE	RENCE	FAILURE -	CSM TAKEOVER IN EA	RTH ORBIT OR DURIN	G TLI		
		B. SATURN ACT		AILURE	ES - IU COM	MPUTER CONTROL WITH	A MANUAL CUTOFF E	BASED ON TO	TAL INERTIAL VE	LOCITY
3	3-16	CSM SEPARATIO		C RCS	ASAP) FROM	M THE S-IVB WILL BE	DONE FOR LOSS OF	S-IVB ATTI	TUDE CONTROL.	
		RULE NUMBERS ARE RESERVED.		3-20						
			MISSION	REV	DATE	SECTION	GROUP	PAGE		
			APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	EARTH ORBIT	3-4		Tape 8.4

MISSION RULES

R	ITEM								
ļ						TD&E			
ļ	3-21	TD&E WILL NOT B	BE PERFORMED	FOR:					
		A. PILOT'S EVA	ALUATION OF 1	ATES	AND ATTITU	DES, AND SLA CONFIG	URATION NOT ACCEP	TABLE.	
		B. THE SLV IS	NO-GO FOR:						
		1. VIOLAT	TION OF S-IV	BULK	HEAD ΔP LI	MITS			4
		2. LOX TA	ANK PRESSURE	GREAT	ER THAN 50	PSI			
						•			
		RULE NUMBERS 3- 3-29 ARE RESER							
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	1								
			ě						
\vdash	J		MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	TD&E	3-5	Tape 8.5

MISSION RULES

_					SEC	TION 3 - M	ISSION RULE SUMMARY	- CONTINUED			
R	111	EM									
		- 1					TOANGLUNAD COAST				
		- 1				_	TRANSLUNAR COAST				
	1.	<u>,, </u>	THE OAN LITE	05 THE DOING	NDV NO	DE OF EVE	1177110 TRANSCIUME				
1	3-:	30	THE GAN WILL	BE THE PRIMA	ARY MU	DE OF EXEC	UTING TRANSLUNAR MCC	3.			
ı											
	1	ŀ		•							
ŀ	3-	31	MIDCOURSE CO	ORRECTION NOM:	INAL E	XECUTION P	OINTS WILL BE AT THE	FOLLOWING:			
	1	1									
			A. TLI C/O	+ 9 HOURS							
		- 1	B. TLI C/O							•	
ì			C. LOI - 22								
	1		D. LOI - 5	HOURS							
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<u> </u>				MISSION	REV	DATE	SECTION	GROUP	PAGE	· · ·	
				APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	TRANSLUNAR			
				I		l	SUMMARY	COAST	3-6	Tape 55.6	1

MISSION RULES

			SEC	110N 3 - MI	SSION RULE SUMMARY	- CONTINUED							
R	ITEM												
	3-32	DURING THE LOI BUR	RN, THE FLIGH	HT CREW WIL	L TAKE THE FOLLOWING	G ACTION:							
	Ì				LOI ABORT MODES								
		MODE	<u>T:</u>	<u>IME</u>	DELTA VM	TYPE	ABORT						
		I	0	TO 0:32	0 TO 207	DPS 2-HR DIRECT	ABORT						
			0:32	TO 0:53	207-TO 348	DPS 30-MIN DIREC	CT ABORT						
			0:53	10 1:31	348 TO 613	DPS TO DEPLETION	30-MIN DIRECT						
	Ì					ABORT FOLLOWED E 2 HOURS LATER	BY AN APS BURN						
		11	1:31	ΤΟ 2:03	613 TO 833	WITH APS BURN TO	ULSE CIRCUMLUNAR ABORT) SUPPLEMENT DPS BURN TO G SECOND IMPULSE (APS STER DPS BURN)						
	٠		2:03	TO 2:54	833 TO 1200	DPS 2-IMPULSE CI							
			2:54	TO 6:35	1200 ТО 2980		OR DPS) AT NEXT NITIATE ALTERNATE						
					PS IS REQUIRED TO SU E FROM 4:30 TO 6:35								
		A. ALL ABORT MANE	EUVERS ARE MO	ARE MCC TARGETED EXCEPT THE DPS 30-MIN ABORT WHICH IS TAKEN FROM THE CREW CHART.									
ı													
		B. CONTROL LIMITS APPLY AS FOLLOWS:											
		·	LOI DE	LTA T	LOI DELTA V	<u>LIMITS</u>							
ı			0 T(0:53	0 TO 348	TIGHT							
- 1			0:53 T		348 TO 1543	LOOSE							
ł			3:40 T	6:35	1543 TO 2980	TIGHT							
			GOOD (<u>NOTE</u> E CLOSES PREMATURELY PRIOR TO CUTOFF FOR								
-	ĺ				NOTE								
			REFERE	NCE RULE 3	-86 FOR DEFINITION (OF TIGHT AND							
				LIMITS.									
		RULE NUMBERS 3-33	THROUGH 3-37	7 ARE RESER	VED.								
		MISSI	ON REV	DATE	SECTION	GROUP P	AGE						
		APOLL		9/1/72	MISSION RULE		3-7						
				<u> </u>	SUMMARY	COAST	Tape 55.7						

MISSION RULES

LUNNS ORBIT 3-38 PRIOR TO UNDOOCKING, CSM MANELYERS WILL BE SCHEDULED WHEN REQUIRED TO CORRECT THE FOLLOWING SITUATIONS: A. MISS DISTANCE OVER THE LLS GREATER THAM 0.5 DEG OUT OF FLANE 9. DEVIATION IN APPROACH AZIMITH GREATER THAM 10 DEG FROM THE MOMIMAL. C. CUBRENT PERICYWITHON ALTITUDE LESS THAM 30,000 FT 3-39 DOLL DESIDUALS A. TRIM GAM X AXIS TO NITHIN 1 FPS. 1. FOR OVERBURNS GREATER THAM 2.2 FPS. BUT LISS THAM 10 FPS. PITCH 18D DEGREES AND TRIM TO 1 FPS UISHON 4% SR RCS THRUSTERS. 2. FOR OVERBURNS GREATER THAM 10 FPS WILL BE TRIMMED USING SPS. 8. IF THE GAM MAS OBVIOUSLY MALPUNCTIONED, THE REGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FILL 9/1/72 MISSION ROLE LUNAR ORBIT 3-8 Tage 55.	. 1		SECTION 3 - MISSION RULE SUMMARY - CONTINUED
PRIOR TO UNDOCKING, CSM MANEUVERS WILL BE SCHEDULED WHEN REQUIRED TO CORRECT THE FOLLOWING SITUATIONS: A. MISS DISTANCE OVER THE LLS GREATER THAN 10 DEG FROM THE MOMINAL C. CURRENT PERICYNTHION ALTITUDE LESS THAN 30,000 FT 3-39 DOL; RESIDONLS A. TRIM GOM X AXIS TO MITRIN 1 FPS. 1. FOR OVERBURRS LESS THAN 2.2 FPS, TRIM 10 -1 FPS WITH THE -X SM RCS TRRUSTERS. 2. FOR OVERBURRS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING SYS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SYS. 6. IF THE GOM HAS OBVIOUSLY MALFUNCTIONED, THE REGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION BRY DATE MISSION BRY DATE SECTION GROUP PAGE MISSION BRY DATE MISS	R	ITEM	
A. MISS DISTANCE OVER THE LLS GREATER THAN 0.5 DEG OUT OF PLANE B. DEVIATION IN APPROACH AZIMUTH GREATER THAN 10 DEG FROM THE NOMINAL C. CURRENT PERICYNTHION ALTITUDE LESS THAN 30,000 FT 3-39 DOI: RESIDUALS A. TRIM GBN X AXIS TO WITHIN 1 FPS. 1. FOR OVERBURNS LESS THAN 2.2 FPS, TRIM 10 -1 FPS WITH THE -X SM ACS THRUSTERS. 2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. B. IF THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. RESERVED MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE			LUNAR ORBIT
B. DEVIATION IN APPROACH AZIMUTH GREATER THAN 10 DEG FROM THE NOMINAL C. CURRENT PERICVATHION ALTITUDE LESS THAN 30,000 FT DOI, BESIDUALS A. TRIM GAM X AXIS TO NITHIN 1 FPS. 1. FOR OVERBURNS LESS THAN 2.2 FPS, TRIM TO -1 FPS WITH THE -X SM RCS THRUSTERS. 2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. 8. IF THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. RESERVED MISSION REV DATE SECTION GROUP PAGE AROUND 37 EM 92/1/72 MISSION BULE LUMAS ORBIT 3-8		3-38	PRIOR TO UNDOCKING, CSM MANEUVERS WILL BE SCHEDULED WHEN REQUIRED TO CORRECT THE FOLLOWING SITUATIONS:
C. CURRENT PERICYNTHION ALTITUDE LESS THAN 30,000 FT 3-39 DOI: RESIDUALS A. TRIM GAN X AXIS TO WITHIN 1 FPS. 1. FOR OVERBURNS LESS THAN 2.2 FPS, TRIM TO -1 FPS WITH THE -X SM RCS THRUSTERS. 2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. B. 1F THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE MEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE AROUND 37 FM 94/1/72 MISSION BULE LUMAS ORBIT 3-8			A. MISS DISTANCE OVER THE LLS GREATER THAN 0.5 DEG OUT OF PLANE
3-39 A. TRIM GAN X AXIS TO WITHIN 1 FPS. 1. FOR OVERBURNS LESS THAM 2.2 FPS, TRIM 10 -1 FPS WITH THE -X SM RCS THRUSTERS. 2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. 8. IF THE GAN MAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE APPLICATE FOR STATE OF THE SYSTEM OF THE SECTION BULL LUNAR ORBIT 3-8			B. DEVIATION IN APPROACH AZIMUTH GREATER THAN ±10 DEG FROM THE NOMINAL
A. TRIM GAN X AXIS TO WITHIN 1 FPS. 1. FOR OVERBURNS LESS THAN 2.2 FPS, TRIM TO -1 FPS WITH THE -X SM RCS THRUSTERS. 2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. B. IF THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE ABOULD 17 FM 19/1/77 MISSION BULE LUNAR ORBIT 3-8		i i	C. CURRENT PERICYNTHION ALTITUDE LESS THAN 30,000 FT
1. FOR OVERBURNS LESS THAN 2.2 FPS, TRIM TO -1 FPS WITH THE -X SM RCS THRUSTERS. 2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. 8. IF THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE 480110.17 FM 9/1/27 MISSION BULE LUMAR ORBIT 3-8		3-39	DOI ₁ RESIDUALS
2. FOR OVERBURNS GREATER THAN 2.2 FPS BUT LESS THAN 10 FPS, PITCH 180 DEGREES AND TRIM TO 1 FPS USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. 8. IF THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE 480110 17 FM 9/1/72 MISSION BULE LUNAR ORBIT 3-8			A. TRIM G&N X AXIS TO WITHIN 1 FPS.
USING +X SM RCS THRUSTERS. 3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS. B. IF THE GRN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE APPLIO 17 FNI 04/1/72 MISSION RULE LUVAR ORBIT 3-8			1. FOR OVERBURNS LESS THAN 2.2 FPS, TRIM TO -1 FPS WITH THE -X SM. RCS THRUSTERS.
B. IF THE GAN HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED. 3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE ABOULD 17 FM 9/1/72 MISSION RULE LUNAR ORBIT 3-8			
3-40 RESERVED MISSION REV DATE SECTION GROUP PAGE APPLIO 17 FM 9/1/72 MISSION RULE LUNAR ORBIT 3-8			3. RESIDUALS GREATER THAN 10 FPS WILL BE TRIMMED USING SPS.
MISSION REV DATE SECTION GROUP PAGE APPLIO 17 FM 9/1/72 MISSION RULE LUNAR ORBIT 3-8			B. IF THE G&N HAS OBVIOUSLY MALFUNCTIONED, THE NEGATIVE RESIDUAL INDICATED BY THE EMS WILL BE TRIMMED.
APOLLO 17 FNL 9/1/72 MISSION RULE LUNAR ORBIT 3-8		3-40	RESERVED
APOLLO 17 FNI 9/1/72 MISSION RULE LUNAR ORBIT 3-8	_		MISSION REV DATE SECTION GROUP PAGE
			APOLLO 17 FNL 9/1/72 MISSION RULE LUNAR ORBIT 3-8

MISSION RULES

C. ABORT DURING POWERED DESCENT WILL INSERT THE LM INTO ORBIT UTILIZING THE ONBOARD VARIABLE ABORT TARGETING. FOR ABORTS DURING THE FIRST 11 MIN, DOCKING SHOULD OCCUR WITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING WILL OCCUR WITHIN 5-1/4 HR. D. FOR COMPLETE LM FAILURES PRIOR TO PDI, THE CSM WILL EXECUTE A 5-IMPULSE RESCUE WITH DOCKING IN ABOUT 7-1/4 FROM PDI. RULE NUMBERS 3-44 THROUGH 3-48 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE													
TRAJECTORY MONITORING SOURCES. THESE SOURCES - GAN, EMS, AND MSFN - WILL BE EXAMINED WITH THE FOLLOWING CRITERIA A. IF MSFN RADAR DATA IS INVALID OR UNAVAILABLE, THE FOLLOWING CRITERIA APPLY: 1. IF THE GAN AND EMS ARE AVAILABLE, BOTH SOURCES MUST INDICATE STAY TO REMAIN IN THE LOW ORBIT. 2. IF ORLY ONE OF THE OMBOARD SOURCES (GAM, EMS) IS AVAILABLE, BOTH THAT SYSTEM AND BURN TIME MUST INDICATE STAY TO REMAIN IN THE LOW ORBIT. NOTES 1. THE EMS NOTE IS NO STAY IF THE EMS INDICATES A 10-FPS OVERSPEED AFTER THIMMING THE GAN. 2. THE MSEN NOTE IS NO STAY IF THE INCOMING PRADAR DATA INDICATES A CLOSEST APPROACH ALITITUDE OF EQUAL TO BE LESS THAN 1.0 NM ARBORT THE ALITHUL HUMAN TERRALS. THIS ALITHUDE CORRESPONDS TO PRECEDED AND A PRECIDENTIAL CHARM TERRALS. THIS ALITHUDE CORRESPONDS TO PRECIDE AND A PRECIDENT AND ALITHUDE OF 3,38 NM. THE CORRESPONDING DOPPLET RESIDUALS ARE APPROACHMATELY -100 CYCLES PER SEC. BUT THE ACTUAL INDRODUCE ORBESTIONS TO A PRECIDENT AND ALITHUDE OF 3,38 NM. THE CORRESPONDING DOPPLET RESIDUALS ARE APPROACHMATELY -100 CYCLES PER SEC. BUT THE ACTUAL INDRODUCE ORDER OF THE SECOND REAL TIME. 3. GURN TIME IS NO STAY IF AN OVERBURN OF 1,2 SECONDS IS INDICATED. 3.42 THE FOLLOWING CRITERION APPLY TO DOI?: A. WOICE CONFIDMATION OF CIRC IS REQUIRED FOR EXECUTION. B. DOI, WILL BE SOMEDULED AT LEAST 2 MIN AFTER CIRC. C. LIKE SOBBANT THE MILL BE 2.05 SECOND. THE FOLLOWING ENTIRE AT POI WILL BE NO LESS THAN A ON FT. 3-43 THE FOLLOWING ROBER FORM SEPARATION TO CIRCULARIZATION, THE NOMINAL RING: IS A P34 PROFILE WITH DOCKING OCCURRING A PRESENCE OF THE NORTH OF THE PART OF THE PAR	ITEM								-				
8. IF MSPN RADAR DATA IS INVALID OR UNAVAILABLE, THE FOLLOWING CRITERIA APPLY: 1. IF THE GAM AND EMS ARE AVAILABLE, BOTH SOURCES MUST INDICATE STAY TO REMAIN IN THE LOW ORBIT. 2. IF ONLY ONE OF THE OMBOARD SOURCES (GAM, EMS) IS AVAILABLE, BOTH THAT SYSTEM AND BURN TIME MUST INDICATE STAY TO REMAIN IN THE LOW ORBIT. ***ONDES*** 1. THE EMS NOTE IS NO STAY IF THE EMS INDICATES A 10-FPS OVERSPEED AFTER TRIMMING THE GAM. 2. THE MSPN VOTE IS NO STAY IF THE EMS INDICATES A 10-FPS OVERSPEED AFTER TRIMMING THE GAM. 2. THE MSPN VOTE IS NO STAY IF THE LINCOMING RADAR DATA INDICATES A CLOSEST APPROACH ALITIOUS CORRESPONDS TO A PERICINITION ALITIOUS OF 3,38 MM. THE CORRESPONDING DOPPLER RESIDUALS ARE APPROXIMATELY -106 CYCLES PER SEC. BUT THE ACTUAL NUMBER WILL BE DETERMINED REAL TIME. 3. BURN TIME SHO STAY IF AN OVERBURN OF 1.8 SECONDS IS INDICATED. 3-42 THE FOLLOWING CRITERION APPLY TO DO12: A. VOICE CONFISMATION OF CIRC IS REQUIRED FOR EXECUTION. B. DOI, WILL BE SCHEDULED AT LEAST 2 MIN AFTER CIRC. C. LM RCS BURN TIME WILL BE < 30 SEC. D. TARGETED PERILURE AT POIL WILL BE NO LESS THAN 40K FT. 3-43 THE FOLLOWING RADZ/RESCUE OPTIONS WILL BE UTILIZED AS NECESSARY FOR FAILURES REQUIRING TERMINATION OF LUMAR LANDING: A. FOR FAILURES FROM SEPARATION TO CIRCULARIZATION, THE NOMINAL RHOZ IS A P30 PROFILE WITH DOCKING OCCURRING 2 HAS AFTER SEP. B. FOR FAILURES FROM CIRCULARIZATION TO PD1, EXECUTE THE NO PD1 +12 ABORT SEQUENCE WITH DOCKING IN ABOUT 3-1/4 C. ABORT DURING THE FIRST IN MIN, DOCKING SHOULD OCCUR MITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING FOR ABORTS DURING THE FIRST IN MIN, DOCKING SHOULD OCCUR MITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING FOR ABORTS SEQUENCE WITH DOCKING IN ABOUT 7-1/4 FROM PD1. MISSION REY DATE SECURED.	3-41												
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B. DOI2 WILL BE SCHEDULED AT LEAST 2 MIN AFTER CIRC. C. LM RCS BURN TIME WILL BE 5 30 SEC. D. TARGETED PERILUNE AT PDI WILL BE NO LESS THAN 40K FT. 3-43 THE FOLLOWING RNDZ/RESCUE OPTIONS WILL BE UTILIZED AS NECESSARY FOR FAILURES REQUIRING TERMINATION OF LUNAR LANDING: A. FOR FAILURES FROM SEPARATION TO CIRCULARIZATION, THE NOMINAL RNDZ IS A P34 PROFILE WITH DOCKING OCCURRING 2 HRS AFTER SEP. B. FOR FAILURES FROM CIRCULARIZATION TO PDI, EXECUTE THE NO PDI +12 ABORT SEQUENCE WITH DOCKING IN ABOUT 3-1/4 C. ABORT DURING POWERED DESCENT WILL INSERT THE LM INTO ORBIT UTILIZING THE ONBOARD VARIABLE ABORT TARGETING. FOR ABORTS DURING THE FIRST 11 MIN, DOCKING SHOULD OCCUR WITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING WILL OCCUR WITHIN 5-1/4 HR. D. FOR COMPLETE LM FAILURES PRIOR TO PDI, THE CSM WILL EXECUTE A 5-IMPULSE RESCUE WITH DOCKING IN ABOUT 7-1/4 FROM PDI. RULE NUMBERS 3-44 THROUGH 3-48 ARE RESERVED.	3-42	THE FOLLOWING CRITERION APPLY TO DOI2:											
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2 HRS AFTER SEP. B. FOR FAILURES FROM CIRCULARIZATION TO PDI, EXECUTE THE NO PDI +12 ABORT SEQUENCE WITH DOCKING IN ABOUT 3-1/4 C. ABORT DURING POWERED DESCENT WILL INSERT THE LM INTO ORBIT UTILIZING THE ONBOARD VARIABLE ABORT TARGETING. FOR ABORTS DURING THE FIRST 11 MIN, DOCKING SHOULD OCCUR WITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING WILL OCCUR WITHIN 5-1/4 HR. D. FOR COMPLETE LM FAILURES PRIOR TO PDI, THE CSM WILL EXECUTE A 5-IMPULSE RESCUE WITH DOCKING IN ABOUT 7-1/4 FROM PDI. RULE NUMBERS 3-44 THROUGH 3-48 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE	3-43												
C. ABORT DURING POWERED DESCENT WILL INSERT THE LM INTO ORBIT UTILIZING THE ONBOARD VARIABLE ABORT TARGETING. FOR ABORTS DURING THE FIRST 11 MIN, DOCKING SHOULD OCCUR WITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING WILL OCCUR WITHIN 5-1/4 HR. D. FOR COMPLETE LM FAILURES PRIOR TO PDI, THE CSM WILL EXECUTE A 5-IMPULSE RESCUE WITH DOCKING IN ABOUT 7-1/4 FROM PDI. RULE NUMBERS 3-44 THROUGH 3-48 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE													
FOR ABORTS DURING THE FIRST 11 MIN, DOCKING SHOULD OCCUR WITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING WILL OCCUR WITHIN 5-1/4 HR. D. FOR COMPLETE LM FAILURES PRIOR TO PDI, THE CSM WILL EXECUTE A 5-IMPULSE RESCUE WITH DOCKING IN ABOUT 7-1/4 FROM PDI. RULE NUMBERS 3-44 THROUGH 3-48 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE		B. FOR FAILURES FROM CIRCULARIZATION TO PDI, EXECUTE THE NO PDI +12 ABORT SEQUENCE WITH DOCKING IN ABOUT 3-1/4 HR.											
RULE NUMBERS 3-44 THROUGH 3-48 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE		FOR ABORTS DURING THE FIRST 11 MIN, DOCKING SHOULD OCCUR WITHIN 3-1/4 HR. FOR ABORTS AFTER 11 MIN, DOCKING											
MISSION REV DATE SECTION GROUP PAGE			TE LM FAILU	RES PF	RIOR TO PD	I, THE CSM WILL EXEC	UTE A 5-IMPULSE I	RESCUE WITH	DOCKING IN ABOUT 7-1/4 HR				
MASSAGE RES		RULE NUMBERS 3	3-44 THROUGH	3-48	ARE RESERV	VED.							
MASSAGE RES	:												
APOLLO 17 FNL 9/1/72 MISSION RULE LUNAR ORBIT 3-9	<u> </u>		MISSION	REV	DATE	SECTION	GROUP	PAGE					
			APOLLO 17	FNL	9/1/72		LUNAR ORBIT	3-9	Tape 55.9				

MISSION RULES

R ITEM								
				POWER	RED DESCENT PHASE			
3-49	PDI IGNITION	1 - THE FOLLOW	ING ACTI	ON WILL F	BE TAKEN:			
1 1								
	A. AUTO ULL -IF NO A		FLIGHT C	REW PERFO	DRM MANUAL DPS IGN	ITTION		
					THE PERSON AND THE			
	B. NO AUTO	ULLAGE CREW BACK UP	THE 1011A	GE MANEUL	/FD			
		AUTO DPS IGN FI						
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		MISSION APOLLO 17	_	DATE 0/1/72	SECTION MISSION RULE	GROUP LUNAR ORBIT	PAGE 3-10	

MISSION RULES

	MISSION RULES SECTION 3 - MISSION RULE SUMMARY - CONTINUED
R ITEM	
3-50	LR DATA IS REQUIRED FOR LANDING
	A. LOCK ON
	1. LR DATA ACCEPTED AND CONVERGED CONTINUOUS TO P64 - CONTINUE MISSION IF LOSS OF LOCK OCCURS IN P64.
	 LR DATA ACCEPTED AND CONVERGED WITH SUBSEQUENT DROPOUT - CONTINUE INTO P64. (A) LANDING RADAR REGAINED IN P64 (1) DATA ACCEPTED BY LGC - CONTINUE MISSION (2) DATA NOT ACCEPTED BY LGC - ATTEMPT MANUAL LANDING IF LR/PGNS ΔH < 1500 FT (B) LANDING RADAR NOT REGAINED IN P64 - ABORT
	3. LATE LR LOCK-ON WITH DATA BEING INCORPORATED AND CONVERGING - <u>CONTINUE INTO P64</u> . (A) DATA ACCEPTED BY LGC - <u>CONTINUE MISSION</u> (B) DATA NOT ACCEPTED BY LGC - <u>ATTEMPT MANUAL LANDING</u>
	B. MINIMUM ALTITUDE WITHOUT LR ALTITUDE INCORPORATION
	1. PGNS ALTITUDE LESS THAN 22,000 FEET AND PGNS NAVIGATION ERRORS, CONFIRMED BY MSFN OR DOPPLER RESIDUALS, THAT CAUSE THE AGS-PGNS RADIAL VELOCITY DIFFERENCE (A) RADIAL N69 NOT INCORPORATED AND DIFFERENCE EXCEEDS -10 FPS - ABORT (B) RADIAL N69 INCORPORATED AND DIFFERENCE EXCEEDS -20 FPS - ABORT
	2. PGNS ALTITUDE LESS THAN 18,000 FEET AND PGNS NAVIGATION ERRORS, CONFIRMED BY DOPPLER BUT NOT BY AGS, THAT CAUSE THE MSFN-PGNS RADIAL VELOCITY DIFFERENCE TO EXCEED -20 FPS - ABORT
	3. PGNS ALTITUDE LESS THAN 10,000 FEET (A) RADIAL N69 NOT INCORPORATED - ABORT (B) LOSS OF WORKING PGNS (AS DEFINED BY RULE 5-91) - ABORT
	4. PGNS ALTITUDE LESS THAN 6,000 FEET - ABORT
	$\frac{\text{NOTE}}{\text{FOR FAILURES IN THE PGNS/LR INTERFACES, INCORPORATION MAY BE}} \\ \text{SATISFIED BY A PGNS/LR COMPARISON RESULTING IN A ΔH < 1500 FT.} \\$
	C. MINIMUM ALTITUDE WITHOUT LR VELOCITY INCORPORATION
	1. PGNS ALTITUDE LESS THAN 10,000 FEET WITH LANDMARK TRACKING OBTAINED AND PGNS NAVIGATION ERRORS CONFIRMED BY AGS OR DOPPLER THAT CAUSE MSFN - PGNS DOWNRANGE OR CROSSRANGE VELOCITY DIFFERENCES (A) NAV N69 INCORPORATED AND ΔX EXCEEDS +50 OR -35 FPS OR ΔY EXCEEDS +90 OR -70 FPS - ABORT (B) NAV N69 NOT INCORPORATED AND ΔX EXCEEDS ±20 FPS OR ΔY EXCEEDS +45 OR -25 FPS - ABORT
	 PGNS ALTITUDE LESS THAN 10,000 FEET WITHOUT LANDMARK TRACKING OBTAINED AND PGNS NAVIGATION ERRORS CONFIRME BY AGS OR DOPPLER THAT CAUSE MSFN - PGNS DOWNRANGE OR CROSSRANGE VELOCITY DIFFERENCES (A) NAV N69 INCORPORATED AND ΔX EXCEEDS ±35 FPS OR ΔY EXCEEDS +70 OR -25 FPS - ABORT (B) NAV N69 NOT INCORPORATED AND ΔX EXCEEDS ±15 FPS OR ΔY EXCEEDS +30 OR -10 FPS - ABORT.
	MISSION REV DATE SECTION GROUP PAGE

MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	LUNAR ORBIT DESCENT	3-11	Tape 55.11

MISSION RULES

	- 		SEC	CTION 3 - N	MISSION RULE SUMMARY	- CONTINUED		
R ITEM							-	
3-51	POWERED DES	CENT WILL BE	TERMI	NATED FOR 1	THE FOLLOWING:			
	A. PGNS NA DIFFERE		RS, CO	ONFIRMED BY	/ MSFN OR DOPPLER RE	SIDUALS, THAT RES	ULT IN THE	FOLLOWING AGS-PGNS VELOCITY
	ΔΫ	(DOWNRANGE) (CROSSRANGE) (RADIAL) GRE	GREAT	TER THAN ±9	90 FPS			
		VIGATION ERRO Y DIFFERENCES		ONFIRMED BY	Y DOPPLER RESIDUAL B	UT NOT BY AGS, TH	AT RESULT	IN THE FOLLOWING MSFN-PGNS
	_	(CROSSRANGE) (RADIAL) GRE						
	C. COMMAND	DED THRUST INC	REASI	NG PRIOR TO	O THROTTLE-DOWN OR P	63 TGO = 80 SEC		
	D. GTC GRE	ATER THAN 57	PERCE	NT BY P63/6	54 PROGRAM SWITCH PL	US 15 SEC		
	E. FAILURE	TO ACHIEVE F	TP (Al	JTO OR MANI	JAL) BY NOMINAL TIG	PLUS 31 SEĆ. (AB	ORT AT GTC	DIVERGENCE.)
		LOWING PGNS A	LARMS	: 20105, (00214, 20430, 20607,	21103, 20607, 21	103, 01107	, 21204, 21302, 21501,
	G. VIOLATI	ON OF THE TIM	E BIAS	SED DPS ABO	ORT BOUNDARY			
	H. NO THRO	OTTLE RECOVERY	(AUT	OR MANUAL	L) WITHIN 40 SEC AFT	ER GTC EQUALS 57 I	PERCENT	
3-52	AN ABORT WI	LL NOT BE PER	FORMEI	D FOR PGNS	FAILURE AFTER OBTAI	NING PITCHOVER IN	THE APPROA	ACH PHASE.
3-53		TARGET POINT SHIFT IS AS			D DOWNTRACK IF GTC I	NDICATES NO THROT	TLEDOWN BY	P63/64 PROGRAM SWITCH.
	A. 20,000	FT DOWNTRACK	IF VAI	LID LANDMAF	RK SIGHTINGS WERE OB	TAINED.		
	B. 10,000	FT DOWNTRACK	IF NO	VALID LANS	DMARK SIGHTINGS WERE	OBTAINED.		
	C. NO DOWN	ITRACK SHIFT W	ILL BI	E ALLOWED :	IF THE APPROACH AZIM	UTH IS BETWEEN 95	AND 100 DE	GREES.
		ONE M ABOVE			NOTE LL BE USED TO ALLOW	LANDING WITHIN TH	Ē	
3-54					NOT AVAILABLE FOR CO		S/AGS ERROF	RS, POWERED DESCENT WILL BE
		(> -35 FPS 2 > +60 OR -35	FPS					
		MISSION	REV	DATE	SECTION	GROUP	PAGE	
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MISSION RULES

	SECTION 3 - MISSION RULE SUMMARY - CONTINUED
R ITEM	
3-55	IN THE EVENT MSFN, DOPPLER, AND AGS NAV DATA ARE NOT AVAILABLE FOR MONITORING OF POWERED DESCENT, AN ABORT WILL BE PERFORMED IF LR DATA IS NOT INCORPORATED INTO THE PGNS BY PDI + 7 MIN.
	RULE NUMBERS 3-56 THROUGH 3-61 ARE RESERVED.
3 -	
	MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 MISSION RULE POWERED 3-13
	APOLLO 17 FNL 9717/2 MISSION ROLE POWERED 3-13 Tape 50.8

MISSION RULES

ITEM								
					JNAR SURFACE EVA PH	 ASE		
								
3-62	INITIATION	/TERMINATION/	CURTAI	LMENT				
		START OF A DR URN TO THE LM		TRAVERSE,	THE TIMELINE WILL	BE OPTIMIZED TO R	EMAIN WITHIN	THE LRV DRIVING CAPABIL
	B. IF LRV	MOBILITY IS I	DEGRAD	ED, THE FO	DLLOWING WILL BE EV	ALUATED TO ACCOMP	LISH MAXIMUM	SCIENTIFIC RETURN:
	2. TI	AVERSE DISTAN ME AT EACH STO LETION OF STO	OP 90					
	C. THE LR METABO	V WILL BE UTIN	LI ZED ITS SP	BECAUSE OF EED IS APP	ITS SCIENCE AND E	QUIPMENT PAYLOAD :	CAPABILITY A	ND ITS ABILITY TO REDUCE
	D. FOR EV.	A TERMINATION UPTION POINTS	OR OT	HER INTERR BE OBSERVE	CUPTIONS DURING ALS	EP DEPLOYMENT, THI CREW SAFETY CONSI	E FOLLOWING DERATION:	PREFERRED DEPLOYMENT
					CLOSE SEQ BAY DOO UN WITHIN ± 15°.	R. EMPLACE ALSEP	PACKAGES WI	TH HANDLES UP AND
	2. TI	LT FUEL CASK.	DOME	NOT REMOV	ED.			
,	3. TI	LT FUEL CASK.	REMO	VE DOME.	DO NOT DEFUEL.			
	EM							2. CARRY PACKAGE 1 TO 'AILABLE TO ERECT THE CS
	SU	NNECT HFE AND NSHIELD. MOUN WAY BACK TO D	NT ANT	CABLES TO ENNA MAST,	C/S. REMOVE LSP, I	.SG, AND LMS FROM IA. LEVEL AND AL	SUBPACKAGE I	. ALIGN C/S AND RAISE DEPRESS SHORTING PLUG
	6. TH	E HFE CAN BE	INTERR	UPTED AFTE	R COMPLETION OF TH	FIRST PROBE HOLE	Ξ.	
					MPLETE TASKS. A HO K TO LM (SEE CONTII			SK IS COMPLETED. DEPRES
	NECESSA	LANNING THE LE ARY TO KEEP TH AND 140° F ON	IE PRE	DICTED LRV	WEEN EVA'S, BATTER' BATTERY TEMPS BETI	THERMAL MANAGEME	ENT TECHNIQUE 5° F ON EVA	S WILL BE SCHEDULED AS
	· · · · · · · · · · · · · · · · · · ·	MISSION	REV	DATE	SECTION	GROUP	PAGE	
		112022011	1,72,1					L

MISSION RULES

	MISSION RULES								
T	SECTION 3 - MISSION RULE SUMMARY - CONTINUED								
ITEM									
3-63	PRECEDENCE/SCHEDULING GUIDELINES								
	A. FOR ANY MALFUNCTION ON A SURFACE TASK, A MAXIMUM OF 10 MINUTES WILL BE SPENT ON THE CONTINGENCY PROCEDURE BEFORE THE TASK IS ABANDONED, WITH THE FOLLOWING EXCEPTIONS:								
	1. RTG FUELING - UP TO 20 MINUTES WILL BE ALLOWED IN EXERCISING RTG FUELING CONTINGENCY PROCEDURES.								
	 ALSEP PACKAGE 1 TO PACKAGE 2 CABLE CONNECTIONS - UP TO 20 MINUTES WILL BE ALLOWED FOR MAKING THE CABLE CONNECTION. 								
	3. ALSEP ANTENNA - UP TO 30 MINUTES WILL BE ALLOWED FOR ANTENNA ERECTION AND ALIGNMENT.								
	 LRV ANOMALIES - UP TO 10 MINUTES WILL BE ALLOWED FOR ISOLATING MALFUNCTIONS. UP TO 30 MINUTES WILL BE ALLOWED TO RECOVER UTILIZATION OF THE VEHICLE. 								
	5. ALSEP DEPLOYMENT MAY BE CONTINUED ON A LATER EVA IF ADDITIONAL TIME TO SPEND ON CONTINGENCY PROCEDURES IS REQUIRED TO ATTAIN AN OPERATIONAL ALSEP.								
	B. IF A TASK IS NOT ABANDONED AND IS LEFT INCOMPLETE AT THE END OF AN EVA, IT WILL BE SCHEDULED DURING A SUBSEQUENT EVA CONSISTENT WITH ITS RANK WITHIN THE PRIORITIES DEFINED.								
	C. ALSEP DEPLOYMENT WILL NOT BE STARTED IF IT IS KNOWN THAT LESS THAN 1 HR 30 MIN IS AVAILABLE FOR ALSEP IN EVA 1.								
3-64.	LRV SYSTEMS/NAVIGATION								
	A. THERE ARE NO MINIMUM LRV SYSTEMS REQUIREMENTS WHICH WOULD CAUSE ABANDONMENT OF THE LRV IF THE CREW EVALUATES THE FOLLOWING AS ACCEPTABLE:								
	 MOBILITY AND CONTROL TRAVERSE RATE IS AT LEAST APPROXIMATELY EQUAL TO WALKING RATE REDUNDANT LIFE SUPPORT CAPABILITY FOR LM RETURN 								
	B. WITH A NONOPERATIONAL LRV NAVIGATION SYSTEM, ONE OF THE FOLLOWING RETURN TRAVERSE CAPABILITIES IS REQUIRED TO INITIATE OR CONTINUE A TRAVERSE:								
	 REASONABLE VISUAL ACCESS OF THE LM REASONABLE VISUAL ACCESS OF THE OUTBOUND TRAVERSE PATH SUN RELATIVE BEARING TO THE LM 								
	C. CONTINGENCY POWER/THERMAL MANAGEMENT AND/OR TRAVERSE ADJUSTMENT MUST BE EXERCISED TO KEEP THE LRV BATTERY TEMPERATURE BELOW 125° F ON EVA'S 1 AND 2 AND 140° F ON EVA 3. EXCEEDING THIS LIMIT WILL RESULT IN AN UNPREDICTABLE DEGRADATION OF BATTERY PERFORMANCE AND NAVIGATION ELECTRONICS.								
	D. THE LRV WILL NOT BE ABANDONED BECAUSE OF EXCESSIVE BATTERY TEMPERATURE(S).								
	WOODEN DEED DEED CONTINUE COOLID DAGS								
	MISSION REV DATE SECTION GROUP PAGE								
	APOLLO 17 FNL 9/1/72 MISSION RULE LUNAR SURFACE SUMMARY EVA PHASE 3-15 Tape 60.5								

MISSION RULES

				30	CITON 3 -	MISSION RULE SUMMAR	Y - CONTINUED			
ITEM	-		<u></u>							
3-65	CO	MUNICATI	ONS/TV							
į	Α.	THE FOL	LOWING COMM C	APABIL	.ITY IS REC	QUIRED TO START AND	CONTINUE A TRAVER	SE:		
		1. MSF	N VOICE UPLIN	к то с	ONE CREWMAN	, AND VOICE DOWNLIN	K FROM ONE CREWMA	N OR TV (FO	R MONITORING CREW RESPONSE).	
		2. MON	MONITOR STATUS OF EMU CRITICAL PARAMETERS (MSFN OR CREW).							
		3. LOS NEX	LOSS OF COMM WILL BE ACCEPTABLE DURING LRV MOVING OPERATIONS IF MINIMUM COMM REQUIREMENTS CAN BE MET AT THE NEXT STOP. THE MAXIMUM ALLOWABLE CONTINUOUS LOSS OF COMM WOULD BE APPROXIMATELY 30 MIN.							
	В.	IF LCRU	PROBLEMS OCC	UR, VO	ICE AND TH	HAVE PRIORITY OVER	TV.			
					GC IN	<u>NOTE</u> TA TV IS NOT AVAILA THE HAND-CARRY MOD	BLE E.			
,	c.	GCTA OP	ERATIONS							
		BE	POINTED NEAR T	THE SU	IN. HOWEVE	R, IF OBJECTIONABLE	HE SUN WILL BE IN FLARE OCCURS, TH	THE FIELD E GROUND WI	OF VIEW. THE CAMERA MAY LL REQUEST THE CAMERA BE	
		2. THE	GROUND WILL N	MONITO NS FRO	R THE TV P	TCTURE AND RECOMMEN	D OR COMMAND CAME	RA MOVEMENT	TO PREVENT IRREVERSIBLE	
		3. BET	BETWEEN EVA'S, THE TV CAMERA WILL BE LOCATED IN THE SUN AND WILL BE OFF TO MAINTAIN THERMAL BALANCE.							
		OR (COMMAND AN ALC	SWIT	CH SETTING	TO GET THE BEST PI	CTURE. THE ALC-PE	EAK WILL GI	VE THE BEST PICTURE OF THE	
	1									
	Ì									
	1									
			MISSION	REV	DATE	SECTION	GROUP	PAGE		
			APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	LUNAR SURFACE EVA PHASE	3-16	Tape 55.12	
		3-65 CO/A.	3-65 COMMUNICATI A. THE FOL 1. MSF 2. MON 3. LOS NEX B. IF LCRU C. GCTA OP 1. THE BE MOV 2. THE VID 3. BETT 4. WHEL OR 6	A. THE FOLLOWING COMM C 1. MSFN VOICE UPLIN 2. MONITOR STATUS O 3. LOSS OF COMM WILL NEXT STOP. THE S B. IF LCRU PROBLEMS OCCO C. GCTA OPERATIONS 1. THE COLOR TV CAMM BE POINTED NEAR MOVED OR WILL MOVE 2. THE GROUND WILL MOVE 3. BETWEEN EVA'S, TH 4. WHEN A BRIGHT OBLOR COMMAND AN ALCOR SRIGHT OBJECT, AN	A. THE FOLLOWING COMM CAPABIL 1. MSFN VOICE UPLINK TO CO 2. MONITOR STATUS OF EMU 3. LOSS OF COMM WILL BE A NEXT STOP. THE MAXIMU B. IF LCRU PROBLEMS OCCUR, VOICE OF THE MAXIMU C. GCTA OPERATIONS 1. THE COLOR TV CAMERA WI BE POINTED NEAR THE SU MOVED OR WILL MOVE THE 2. THE GROUND WILL MONITOR VIDICON TUBE BURNS FROM 3. BETWEEN EVA'S, THE TV 4. WHEN A BRIGHT OBJECT WOR COMMAND AN ALC SWITT BRIGHT OBJECT, AND THE	A. THE FOLLOWING COMM CAPABILITY IS REC. 1. MSFN VOICE UPLINK TO ONE CREMMAN 2. MONITOR STATUS OF EMU CRITICAL F. 3. LOSS OF COMM WILL BE ACCEPTABLE NEXT STOP. THE MAXIMUM ALLOWABLE B. IF LCRU PROBLEMS OCCUR, VOICE AND THE SE POINTED NEAR THE SUN. HOWEVE MOVED OR WILL MOVE THE CAMERA VILL. 2. THE GROUND WILL MONITOR THE TV P VIDICON TUBE BURNS FROM REFLECTI 3. BETWEEN EVA'S, THE TV CAMERA WILL. 4. WHEN A BRIGHT OBJECT WITH A CONS OR COMMAND AN ALC SWITCH SETTING BRIGHT OBJECT, AND THE ALC-AVERA	A. THE FOLLOWING COMM CAPABILITY IS REQUIRED TO START AND 1. MSFN VOICE UPLINK TO ONE CREWMAN, AND VOICE DOWNLIN 2. MONITOR STATUS OF EMU CRITICAL PARAMETERS (MSFN OR 3. LOSS OF COMM WILL BE ACCEPTABLE DURING LRY MOVING O NEXT STOP. THE MAXIMUM ALLOMABLE CONTINUOUS LOSS O B. IF LCRU PROBLEMS OCCUR, VOICE AND TM HAVE PRIORITY OVER GCTA TV IS NOT AVAILA IN THE HAND-CARRY MOD C. GCTA OPERATIONS 1. THE COLOR TV CAMERA WILL NOT BE POINTED SUCH THAT TO BE POINTED NEAR THE SUN. HOWEVER, IF OBJECTIONABLE MOVED OR WILL MOVE THE CAMERA VIA GROUND COMMANDS. 2. THE GROUND WILL MONITOR THE TV PICTURE AND RECOMMEN VIDICON TUBE BURNS FROM REFLECTIVE OBJECTS. 3. BETWEEN EVA'S, THE TV CAMERA WILL BE LOCATED IN THE 4. MHEN A BRIGHT OBJECT WITH A CONSTRASTING DARK BACKGOR COMMAND AN ALC SWITCH SETTING TO GET THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PIL BRIGHT OBJECT.	A. THE FOLLOWING COMM CAPABILITY IS REQUIRED TO START AND CONTINUE A TRAVER 1. MSFN VOICE UPLINK TO ONE CREWMAN, AND VOICE DOWNLINK FROM ONE CREWMAN 2. MONITOR STATUS OF EMU CRITICAL PARAMETERS (MSFN OR CREW). 3. LOSS OF COMM WILL BE ACCEPTABLE DURING LRY MOVING OPERATIONS IF MINI NEXT STOP. THE MAXIMUM ALLOWABLE CONTINUOUS LOSS OF COMM WOULD BE A 8. IF LCRU PROBLEMS OCCUR, VOICE AND TH HAVE PRIORITY OVER TV. NOTE GCTA TY IS NOT AVAILABLE IN THE MAND-CARRY MODE. C. GCTA OPERATIONS 1. THE COLOR TV CAMERA WILL NOT BE POINTED SUCH THAT THE SUN MILL BE IN BE POINTED HEAR THE SUN. HOWEVER, IF OBJECTIONABLE FLARE OCCURS, TH MOVED OR MILL MOVE THE CAMERA VIA GROUND COMMANDS. 2. THE GROUND WILL MONITOR THE TV PICTURE AND RECOMMEND OR COMMAND CAME VIDICON TUBE BURNS FROM REFLECTIVE CODECTS. 3. BETWEEN EVA'S, THE TV CAMERA WILL BE LOCATED IN THE SUN AND WILL BE IN GROUND AND ALC SWITCH SETTING TO GET THE BEST PICTURE. THE ALC-P BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT, AND THE ALC-AVERAGE WILL GIVE THE BEST PICTURE OF THE BRIGHT OBJECT.	A. THE FOLLOWING COMM CAPABILITY IS REQUIRED TO START AND CONTINUE A TRAVERSE: 1. MSFN VOICE UPLINK TO ONE CREMMAN, AND VOICE DOMNLINK FROM ONE CREMMAN OR TV (FE 2. MONITOR STATUS OF EMU CRITICAL PARAMETERS (MSFN OR CREM). 3. LOSS OF COMM WILL BE ACCEPTABLE DURING LRV MOVING OPERATIONS IF MINIMUM COMM RE NEXT STOP. THE MAXIMUM ALLOWABLE CONTINUOUS LOSS OF COMM MOULD BE APPROXIMATEL B. IF LCRU PROBLEMS OCCUR, VOICE AND TM HAVE PRIORITY OVER TV. MOTE GETA TV IS NOT AVAILABLE IN THE HAND-CARRY MODE. C. GCTA OPERATIONS 1. THE COLOR TV CAMERA WILL NOW BE POINTED SUCH THAT THE SUN WILL BE IN THE FIELD BE POINTED MEAR THE SUN. HOWEVER, I FORJECTIONABLE FLARE OCCURS, THE GROUND WILL MOVET THE CAMERA VIA GROUND COMMANDS. 2. THE GROUND WILL MONITOR THE TV PICTURE AND RECOMMEND OR COMMAND CAMERA MOVEMENT VIDICON TUBE BURNS FROM REFLECTIVE OBJECTS. 3. BETWEEN EVA'S, THE TV CAMERA WILL BE LOCATED IN THE SUN AND WILL BE OFF TO MAIN 4. MHEN A BRIGHT OBJECT WITH A CONSTRASTING DARK BACKGROUND IS IN THE FIELD OF VIEW OR COMMAND AN ALC SWITCH SETTING TO GET THE BEST PICTURE. THE ALC-PEAK WILL GIVE THE BEST PICTURE OF THE DARK BACKGROUND STAND WILL BE OFF TO MAIN OR COMMAND AND ALC SWITCH SETTING TO GET THE BEST PICTURE OF THE DARK BACKGROUND STAND AND ALC SWITCH SETTING TO GET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO GET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO GET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SET THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SETTING THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING TO SETTING THE BEST PICTURE OF THE DARK BACKGROUND AND ALC SWITCH SETTING THE SECTION BE ADMINISTRATED.	

MISSION RULES

RI	ITEM				52011		STON ROLE SUMMARY	CONTINUED				
	3-66	ALSE	ΞP									
				DTING PING S	WITCH	WILL BE AC	CTIVATED ASAP AFTER	CENTRAL STATION D	EDI OVMENT			
		в.		OUND 12 ONAR		OBIAIN DOM	WNLINK, THE GROUND N	VILL REQUEST THE A	STRONAUT TO) ROTATE THE RESET POWER		
		C. IF THE CREW MUST RETURN TO THE LM PRIOR TO COMPLETE ALSEP DEPLOYMENT, THE SHORTING PLUG SWITCH WAS ACTIVATED "ON" IF THE ANTENNA IS EMPLACED. IF THE ANTENNA IS NOT EMPLACED, THIS SWITCH WILL NOT ACTIVATED (PICK UP HERE ON EVA 2).										
		D.								TED FIRST. IF PROBLEMS		
		E. IF A HARD OBJECT IS ENCOUNTERED WHICH REDUCES DRILL RATE TO LESS THAN 5 INCHES PER MINUTE ON EITHER HI PROBE HOLE, THE FOLLOWING WILL BE ACCOMPLISHED:										
	,			E SECOND STE		TON IS NOIT	「ATTACHED, WITHDRAW	AND START AT A D	IFFERENT LO	CATION FOR MAXIMUM		
			2. IF SE ELAPS		ATTA	CHED, CONTI	INUE UNTIL <u>10</u> MINUTE	ES OF POWER "ON" T	IME FOR THE	DRILL STRING HAS		
		F.	IF UNABLE	TO DRILL NO	RMAL I	HFE BORE HO	DLES, THE FOLLOWING	SHOULD BE ACCOMPL	ISHED:			
		 F. IF UNABLE TO DRILL NORMAL HEE BORE HOLES, THE FOLLOWING SHOULD BE ACCOMPLISHED: 1. ATTEMPT TO INSERT PROBE INTO LUNAR SUBSURFACE USING HAND-AUGER, DOUBLE CORE TUBE HOLE, OR TRENCH IN THAT ORDER. 2. IF BORE HOLE IS AT LEAST 24 INCHES DEEP, PLACE PROBE IN HOLE AS FAR AS IT WILL GO. 										
		G. THE LSG WILL BE RECHECKED FOR LEVEL AND ALIGNMENT AND READINGS REPORTED BY THE ASTRONAUT AFTER EXPERIMENT UNCAGING. IF OUTSIDE ± 3° AZ, ± 3° LEVEL, THE LSG WILL BE RELEVELED AND REALIGNED.										
		H. THE LSP CHARGES WILL BE DEPLOYED WITHIN LINE-OF-SIGHT OF THE LSP TRANSMITTING ANTENNA AND IN AN AREA WHERE THE CHARGE WILL HAVE UNIFORM CONTACT WITH THE LUNAR SURFACE.										
-		L		MISSION	REV	DATE	SECTION	GROUP	PAGE			
		-		APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	LUNAR SURFACE EVA PHASE	3-17	Tape 51.1		

MISSION RULES

R	ITEM							ration .	
广									
	3-67	GEO	PHYSICS EXPERIMENTS						
		Α.	IF THE TRAVERSE GRAV READINGS WILL BE TAK SURFACE, THE PHASE L	KEN ON	THE SURFAC	CE. IF THE PHASE LO	ALARM WHILE A READ) OCK LOOP ALARM OCCI	ING IS TAK URS WHEN A	EN ON THE LRV, SUBSEQUENT READING IS TAKEN ON THE
		В.	IF THE TGE MEASUREME TEMPERATURES ARE OFF TRAVERSE, IT WILL BE	FSCALE	E. IF THE	TGE INTERMEDIATE OF	VEN READING ON EVA	S, READING 1 INDICAT	S WILL BE CONTINUED UNTIL THE ES A HOT ALARM PRIOR TO THE
		c.	IF THE VIBRATING STR	≀ING AM	MPLIFIER S:	IGNAL IS LOST THE TO	GE WILL BE ABANDONE	ED (REFERE	NCE MSN RULE 31-109, 110).
		D.	SEP EXPERIMENT THERM DUST FROM THE RADIAT 30 MINUTES, CR BY TU	TOR SUR	RFACES, AND	D TURNING THE DSEA	OPENING OR CLOSING TAPE CASSETTE OFF /	G OF THE R	ADIATOR COVERS, BRUSHING E STOPS GREATER THAN
		Ε.	SEP RADIATOR SURFACE	S WILL	. BE DUSTE	D:			
			1. PRIOR TO EACH CO 2. AT EACH TRAVERSE						
		F.	IF THE NEUTRON FLUX PENETRATING THE CORE 18 INCHES.	MONITO : HOLE,	OR DOES NOT	T HAVE THE DRILL COF E METHODS WILL BE U	RE HOLE AVAILABLE C SED TO IMPLACE THE	OR ENCOUNTE MONITOR TO	ERS DIFFICULTY IN D A MINIMUM DEPTH OF
			E NUMBERS 3-68 THROUG						
		L	MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	LUNAR SURFACE EVA PHASE	3-18	Tane 51 2

MISSION RULES

7754	SECTION 3 - MISSION RULE SUMMARY - CONTINUED								
ITEM									
	ASCENT								
	·								
3-80	ASCENT								
	A CHIDANCE SHITCHOVED TO ACCULATE DE DEDECOMES CON								
	A. GUIDANCE SWITCHOVER TO AGS WILL BE PERFORMED FOR:								
	1. THE FOLLOWING PGNS ALARMS: 20105, 00214, 20430, 20607, 21103, 01107, 21204, 21302, AND 21501.								
	CONFIRMED PGNS NAVIGATION ERRORS (DURING ASCENT OR FOLLOWING DESCENT ABORT) THAT RESULT IN ANY OF THE FOLLOWING CONDITIONS:								
	(A) AGS PREDICTED H _D AT INSERTION LESS THAN 40,000 FT								
	(B) AGS PREDICTED H _a AT INSERTION GREATER THAN TARGET VALUE PLUS 40 NM (C) AGS PREDICTED INSERTION WEDGE ANGLES GREATER THAN 1.0 DEG (DESCENT ABORT CASE OR COELLIPTIC								
	SEQ RNDZ) OR GREATER THAN 0.5 DEG (DIRECT RNDZ)								
	3. CONFIRMED PGNS NAVIGATION ERRORS THAT RESULT IN THE FOLLOWING MSFN PGNS VELOCITY DIFFERENCES:								
l .	(A) DELTA V _X (DOWN RANGE) GREATER THAN ±24 FPS								
	(B) DELTA V _Y (CROSS RANGE) GREATER THAN ±90 FPS (COELLIPTIC SEC RNDZ) OR GREATER THAN ±45 FPS (DIRECT RNDZ)								
	(C) DELTA V _Z (RADIAL) GREATER THAN ±37 FPS								
	B. THE GROUND WILL NOT REQUEST SWITCHOVER AFTER AGS TGO LESS THAN 30 SECONDS.								
	C. DURING ASCENT, THE AGS WILL BE DECLARED NO-GO IF CONFIRMED AGS NAVIGATION ERRORS RESULT IN:								
	 PGNS PREDICTED INSERTION H_p LESS THAN 30,000 FT PGNS PREDICTED INSERTION H_a GREATER THAN TARGET VALUE PLUS 40 NM 								
	 PGNS PREDICTED INSERTION WEDGE ANGLE GREATER THAN 1.0 DEG (COELLIPTIC SEQ RNDZ) OR GREATER THAN 0.5 DEG (DIRECT RNDZ) 								
2 01									
3-81	REQUIREMENTS TO COMMIT TO THE SHORT RNDZ								
	A. PRIOR TO L/O THE FOLLOWING IS REQUIRED:								
	1. ONE OPERATIONAL LM NAVIGATION SYSTEM								
	PREDICTED WEDGE ANGLE AT INSERTION EQUALS ZERO DEGREES. NO VIOLATION OF THE NAVIGATION REQUIREMENTS (REFERENCE MATRIX PAGE 3-20)								
	B. AT INSERTION (PRE-TWEAK) THE FOLLOWING IS REQUIRED:								
	1. TWEAK ΔV LESS THAN 60 FPS								
	2. POST-TWEAK H _D GREATER THAN 5 NM								
	3. NO VIOLATION OF THE NAVIGATION REQUIREMENTS (REFERENCE MATRIX PAGE 3-20)								
	NOTE WITH THE EXCEPTION OF LM COMPUTERS AND INERTIAL REFERENCES.								
	NO ONBOARD NAVIGATION SYSTEMS ARE VERIFIED AFTER LIFT-OFF.								
	WYSTON DEN STEE STOTION SOON TO SEE								
	MISSION REV DATE SECTION GROUP PAGE								
	SUMMARY EVA PHASE Tape 51.3								

MISSION RULES

		SECTION 3 - MISSION RULE SUMMARY - CONTINUED										
R	ITEM	-			_							
					REQI	UIRED G&N	1 SYSTEMS NE	EDED FOR	DIRECT RNDZ			
		,						<u></u>				
			NAVIG	RY RNDZ GATION		-			SYSTEM REQUIREME			
			TECHN	NIQUE C	COMPUTER	SENSO	OR/OPTICS	SENSOR/	COMPUTER INTERFA	CE SUPPLYING	TRACKER LIGHT	PLATFORM
			LGC/	/RR	LGC	RNDZ	RADAR	. RANGE TRUNI	, RANGE RATE, SH ION ANGLES	AFT AND		IMU
	1		AGS/	/RR	AEA		RADAR COAS		METER: RANGE AND	RANGE RATE	CSM	ASA
			CMC/	/SXT	СМС	USEAE	ABLE	SXT S	SHAFT AND TRUNNION	N ANGLES	LM	IMU
.												
	1 }								ECHNIQUES REMAINS			
	1 1		2.	LOSS OF ALL	THREE O)F THESE ?	TECHNIQUES	WILL RESU	LT IN EXECUTION	OF THE COELL	IPTIC SEQUENCE	RNDZ.
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				APOLLO 17	FNL	9/1/72	MISSION R SUMMARY		ASCENT EVA PHASE	3-20		Tape 10.3

MISSION RULES

TRANSCARTH COAST 3-82 TRANSCARTH HIC MOMINAL EXECUTION POINTS WILL BE AT THE FOLLOWING: A. TEI + 17 HOURS B. EI - 22 HOURS C. EI - 3 HOURS THANSCARTH MCC PHILOSOPHY: THE GAN IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUBE/RATES CONSTRAINTS: THE SUM LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PMI 315 DEGREES +5 DEGREES.	-	SECTION 3 - MISSION RULE SUMMARY - CONTINUED
TRANSEARTH MCC NOMINAL EXECUTION POINTS WILL BE AT THE FOLLOWING: A. TEI + 17 HOURS B. EI - 22 HOURS C. EI - 3 HOURS TRANSEARTH MCC PHILOSOPHY: THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. THE G&N EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.	R ITEM	
3-82 TRANSEARTH MCC NOMINAL EXECUTION POINTS WILL BE AT THE FOLLOWING: A. TEI + 17 HOURS B. EI - 22 HOURS C. EI - 3 HOURS 3-83 TRANSEARTH MCC PHILOSOPHY: THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		
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A. TEI + 17 HOURS B. EI - 22 HOURS C. EI - 3 HOURS TRANSEARTH MCC PHILOSOPHY: THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		
A. TEI + 17 HOURS B. EI - 22 HOURS C. EI - 3 HOURS 3-83 TRANSEARTH MCC PHILOSOPHY: THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.	3-82	TRANSEARTH MCC NOMINAL EXECUTION POINTS WILL BE AT THE FOLLOWING:
B. EI - 22 HOURS C. EI - 3 HOURS TRANSEARTH MCC PHILOSOPHY: THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.	1	
C. EI - 3 HOURS TRANSEARTH MCC PHILOSOPHY: THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		
THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		
THE G&M IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84		
THE G&N IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S. 3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		
3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.	3-83	TRANSEARTH MCC PHILOSOPHY:
3-84 CSM EVA ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.	1	THE GRN IS THE PRIMARY MODE OF EXECUTION FOR ALL TEC MCC'S
ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		THE THE STATE OF EXCESSION FOR ALL FEE PICE 5.
ATTITUDE/RATES CONSTRAINTS: THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		
THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.	3-84	CSM EVA
THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.		ATTITUDE (AATTS, CONSTANTED
		ATTITUDE/ KATES CONSTRAINTS:
		THE SUN LOOK ANGLES WILL BE MAINTAINED AT THETA 145 DEGREES, PHI 315 DEGREES ±5 DEGREES.
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MISSION RULES

_		SECTION 3 - MISSION RULE SUMMARY - CONTINUED									
R	ITEM										
		MANEUVERS									
	3-85	THE FOLLOWING GUIDELINES WILL APPLY TO LM MANEUVERS: A. TRIMMING									
		1. DESCENT ABORTS/ASCENTS									
		(A) WITH COMM - TRIM CONTROLLING SYSTEM UNLESS GROUND ADVISES DIFFERENTLY.									
		(B) WITHOUT COMM - TRIM CONTROLLING SYSTEM UNLESS PGNS/AGS v_{χ} DIFFERENCE IS GREATER THAN 10 FPS. IF SO, DETERMINE CORRECT SYSTEM USING RENDEZVOUS RADAR.									
		2. ALL RENDEZVOUS MANEUVERS WILL BE NULLED.									
		3. DOCKED DPS MANEUVERS WILL NOT BE TRIMMED.									
		B: ALTERNATE MISSION DOCKED DPS MANEUVERS WILL BE COMPLETED VIA AGS TAKEOVER FOR VIOLATION OF THE FOLLOWING LIMITS:									
		1. ATTITUDE RATES - 10 DEG/SEC									
		2. ATTITUDE ERRORS - 10 DEG 3. ATTITUDE EXCURSIONS - 10 DEG									
		C. ALTERNATE MISSION DOCKED DPS MANEUVERS WILL BE TERMINATED AFTER VIOLATION OF THESE OVERBURN CRITERIA:									
1											
İ	ļ ļ	 DPS LOI - 10 SEC AND △V AGS GREATER THAN 10 FPS DPS TEI - 10 SEC AND △V AGS GREATER THAN 2 FPS DPS LOI ABORTS - 10 SEC AND △V AGS GREATER THAN 2 FPS 									
		NOTE A CMC ΔV OF 2 FPS (OVERSPEED) AND 10-SEC OVERBURN IS ALSO A VALID CUE FOR SHUTDOWN.									
	3-86	THE TABLE ON THE NEXT PAGE, INCLUDING NOTES AND REFERENCES, SUMMARIZES THE TAKEOVER, RESTART, SHUTDOWN, AND TRIMMING REQUIREMENTS, AND SPS ENGINE LIMITS FOR ALL SPS MANEUVERS.									
		RULE NUMBERS 3-87 THROUGH 3-89 ARE RESERVED.									
		MISSION REV DATE SECTION GROUP PAGE									
		APOLLO 17 FNL 9/1/72 MISSION RULE MANEUVERS 3-22 Tape 10.5									
L											

MISSION RULES

SECTION 3 - MISSION RULE SUMMARY - CONTINUED

R	ITEM

MANICINED		E LIMITS	RATES/ER	RORS FOR	MANUAL	OVERBURN	EARLY C/O	RCS
MANEUVER	INHIBIT	TERMINATE	TAKEOVER	ACTION	START ACTION	SHUTDOWN CRITERIA	RESTART CRITERIA	TRIM GUIDELINES
MODE III	NONE	ERRATIC ENG	5/5	COMPLETE	START	g	Hp > 40	N/A
MODE IV	NONE	ERRATIC ENG	5/5	COMPLETE	START	g	Hp < 95 IF GAN GO ΔVTG > 60 OR C/O > 6 SEC EARLY	N/A
APOGEE KICK	NONE	ERRATIC FNG	5/5	COMPLETE	START	g	Hp < 95 IF G&N GO AVTG > 60 OR C/O > 6 SEC EARLY	N/A
TLC MCC	TIGHT [‡]	TIGHT i	10/10	TERMINATE	DELAY	1 SEC	NO	X = 0.2b
LOI	TIGHTh				START ¹			NO.
MODE I								
O TO O + 53		TIGHT	10/10	COMPLETE			YES	
0 + 53 TO 1 + 31		L00SE	10/10	COMPLETE			YES	-
MODE II								
1 + 31 TO 2 + 54		L00SE	10/10	COMPLETE			YES	,
MODE IIIC								
2 + 54 TO 3 + 40		LOOSE	10/10	COMPLETE			YES	
3 + 40 TO C/O		TIGHTh	10/10	COMPLETE		10 SEC	VGO > 50 AND G&N GO	
DOI	TIGHT	TIGHT	10/10	TERMINATE	DELAY	ВТ	NO NO	j
CIRC	TIGHT ¹	TIGHT	10/10	TERMINATE	STÅRT	1 SEC	ΔV TO GO > 20	ALL = 0.2
RESCUE	LOOSE	LOOSE	10/10	COMPLETE	START	1 SEC	ΔV TO GO > 12	ALL = 0.2
LOPC	TIGHT ¹	TIGHT	10/10	TERMINATE	DELAY	1 SEC	NO	Y = 0.2
TEI (G&N)	NONE	NONE	10/10	COMPLETE	DELAY	2 SEC AND $\Delta V_C = -40^{\circ}$	C/O > 3 SEC EARLY AND AVC > 50°	X AND Z = 0.2
TEI (SCS)	NONE	NONE	10/10	COMPLETE	START	2 SEC	ΔV _C > 50 OR C/O > 5 SEC EARLY	NO
TEC MCC								
CORRIDOR	L00SE	LOOSE	10/10	COMPLETE	DELAY	1 SEC AND	NO	X = 0.2
IP CONTROL ^b	TIGHT	TIGHT	10/10	TERMINATE	DELAY	1 SEC AND $\Delta V_C = 0$	NO	X AND Z = 0.2
TLC ABORT	TIGHT	LOOSE	10/10	COMPLETE	START	10 SEC AND 4VC = -70	C/O > 10 SEC EARLY AND AVC > 70	NO
EARTH DEOB	TIGHTd	LOOSE	10/10	COMPLETE	START	1 SEC AND $\Delta V_C = 0$	ΔV TO GO > 30 AND C/O > 3 SEC EARLY®	ALL = 0.2

TIGHT LIMITS: Fuel $0x \Delta P > 20$ and low P_C ; either prop tank press < 160 psi and low P_C ; $P_C < 80$ or decays 10 psi and V_M vs BT low; inhibit burn for any leak in He or prop tank. (Certain burns may be allowed with He tank leak if blowdown ΔV exceeds remaining mission requirements) f; GN_2 A or B < 400 psi (for LOI only, GN_2 A and B < 400 psi). LOOSE LIMITS: $P_C < 70$ psi and other cues; either prop tank < 115 psi and low P_C ; erratic engine (popping, vibration, etc.) f.

NOTES: a. Reserved.

- b. Trim all MCC (except MCC4) only if $X \le 2$ fps.
- c. See Rule 5-131.
- d. If SM RCS deorbit not available, use loose limits.
- e. See Rule 5-27.
- f. Some limits bay be downgraded if warranted by mission circumstance.
- g. See Rule 5-3.

- h. If indication of ball valve failure, start on good bank (with LM available). If thrusting, shut down good bank 10 sec prior to nominal cutoff to verify indication.
- If indication of ball valve failure, start on suspect bank. For dual bank burns, if indication of ball valve failure while thrusting, shut down good bank to verify failure. If thrusting continues, reenable good bank.
- j. See Rule 3-39.
- k. Reserved.
- 1. Ignition may be delayed up to but no more than 120 sec.

MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 17	FNL	9/1/72	MISSION RULE SUMMARY	MANEUVERS EVA PHASE	3-23	

SATURN LAUNCH VEHICLE GO/NO-GO CRITERIA 9/1/72

CONDITION			٩TE						RN ' + 15						1			1			M				
SATURN LANCE CONTION SOUTH CONTION SATURN LANCE CONTION		ORBIT	RESTART/TLI TERMINA					TLI TERMINATE	TLI TERM DURING BU CREW OPTION AFTER TB7						*						AE; SEP TO 7000 FT MINIMU				·
SATURN LAND WELL COMMITTON COAMO-GO		EARTH PARKING	RESTART/TL! INHIBIT						DURING TB6 TO TB6 + 9 MIN 20 SEC							INHIBIT TEL DURING TB5 AND TB6		INHIBIT RESTART	INHIBIT RESTART		-26 OR + 36 PSID (ANY TIM	SEP > 1800 PSIA	FOR LOX LEAD >20 SEC - INHIBIT	ANYTIME PRIOR TO IGN	
CONDITION ABORT SEPARATION S-1L/S-1VE	ICLE GO/NO-GO CRITERIA /72	*	GUIDANCE TAKEOVER						ATTEMPT S/C CONTROL TB5 AND TB7 TO TB7 + 15 MIN	LAUNCH, EPO TLI															
S-IC LOSS OF THRUST PRIOR TO TELL + 2:00	SATURN LAUNCH VEH		S-II/S-IVB EARLY STAGE						IF SMALL RATES UPSTAGE		AFTER S-IVB TO COL	AFTER S-IVB TO COI AND BEFORE S-II C/O MINUS 30 SEC					AFTER S-II IGN								
33 33 33		LAUNCH			BETWEEN TB1 +2:00 AND TB2 +0:08 SEC-MANUAL ABORT	MANUAL ABORT	AUTO ABORT TO 2 + 00		1 –		ABORT		BEFORE TB3 + 1 MIN 45 SEC - ABORT	ABORT	۱ ' ا					SEP TO 7000 FT MINIMUM				NO START	ABORT
		05-0N/05	CONDITION		LOSS OF THRUST 2 ADJ ENG		4°/SEC P AND Y, 20°/SEC R	10°/SEC P AND Y, 20°/SEC R		INERTIAL ATTITUDE REFERENCE FAIL	LOSS OF THRUST (3 OR MORE ENG) ABORT IF PRIOR TO S-IVB TO COI	ACTUATOR HARDOVER INBOARD	2ND PLANE SEPARATION FAIL	Y DEVIATION >20°		LOSS OF HYDRAULIC FLUID PRIOR TO START	COLD HE FAIL OPEN	INSUFFICIENT PROPELLANT	LOX VLV FAILS TO CLOSE AT 1ST C/0	DESTRUCT SYSTEM ARMS INADVERTANTLY	FU,OX BULKHEAD AP EXCEEDS LIMITS	START BOTTLE PRESS OUTSIDE RESTART LIMITS	LOX CHILLDOWN FAIL	S-IVB ACTUATOR HARDOVER	Y DEVIATION > 20°
3-24	REV			I I W			L		=1		 				Lou										

DISREGARD Q BALL FOR ENGINE OUT PRIOR TO 75 SEC.

Θ

	EART	RTH ORBIT	-		1.0			UNDOCK	CIRC/	POWERED		LUNAR STAY	STAY	LUNAR ORBIT	ORBIT	TEC
	CONT	CONT	TLI	TO & E	CONT	107	0/001	SEP	2 001	PDI	PDI TO T/D	PAST P	PAST T3 & SUBS	POST RNDZ	LM JETT	CSM EVA
ECS													1			
CABIN INTEGRITY	4) (⊙ ▼	←(7)-CABIN INTEGRITY-	GRITY		\ ↓	ĺ	CABIN INTEGRITY	EGRITY-		∱ ⊚		1	CABIN	- CABIN INTEGRITY		
NO FIRE OR SMOKE IN CABIN	NO'F OR S IN CAB-	C OR S IN	CAB-		+		NO F C	-NOFORSINCAB	1	∱ �			NO F	NO F OR S IN CAB	1	NO FOR SIN CAB
NO 02 MANIFOLD LEAKS	473₩0 02		MFLD LEAKS			NO 02 MFLD LEAKS-	LD LEAKS	Ì					Z	NO 02 MFLD LEAKS		NO 02 MFLD LEAKS
MAIN 02 REGULATORS	<u>↑</u> (7)-1 0F	1 2	1 0F 2	Ī	+	1 oF	or 2-							1 OF 2		вотн (8)
ECS COOLANT LOOPS	Ī	1 OF 2S		İ	◆ ①PRIMARY①▶	4RY(1)		(1)-PRIMARY-(1)-	4RY-①	†			PRI Û	PRIMARY (1)		PRIMARY
ECS RADIATORS	1	1 OF 2(S)	PRI (14)		★ ① PRIM.	<□ PRIMARY (1) + (1) + (1) - PRIMARY - (1) + (1) →	1	①-PRIM	ARY - 13-	A			PRI 🛈	PRIMARY (1)		
ECS GLYCOL EVAPS																
SUIT INTEGRITY	81 (2%)							Si								18
NO GLYCOL LEAK	1	★NO GLY	NO GLY LEAK				→NO GLÝ LEAK	LEAK		1			₽	-NO GLY LEAK		NO GLY LEAK
NO EXCESS HUMIDITY		A-NOE	XCESS*			-	NO EXCESS HUMID	S HUMID		♠				NO EXCESS HUMID	4	NO EXCESS HUMID
POTABLE & WASTE H20 TK																
SURGE TK/REPRESS PACKAGE	E															SURGE TK & ®
SUIT COMPRESSORS	★(7-)- 1 OF	2 (12)	1 OF 2		+0+	†	- Z 40 I-E)		Ť Ç	(12)		Ţ	+ (12) →	-1 0F 2 -(12)	(15)	ВОТН
SUIT CIRCUIT	(E) ¥	SUIT CIR	IT CIRCUIT +		+		-SUIT CIRCUIT -	#CUIT —		∱ ⊚		1	ins—	—Súit circuit —		SUIT CIRCUIT
OVBD DUMPS		1 0	-1 of 3		1 OF	m +							1	← 1 0F 3 ←		
CRYO																
0 ₂ TANKS		1 OF 3	ALL (O)			†	(10)- ALL	 例 1	† (i)			Ţ		- ALL (0-	2 OF 3	ALL ③
H2 TANKS		0F 3	۵) ۲۲			(a)	-(0)-	(0)	(a)	↑ (2)					1 OF 3	10F3
EPS																
FUEL CELLS	I	2 OF 3	2 OF 3		\downarrow		2 0F 3-	3		1				—2 OF 3	2 OF 3 (11)	10F3
AUX BATTERY	1 0															
ENTRY BATTERIES	+	2 OF 3	ALL (6)		 	100	-@−vṛr-@-	\vdash	9	1		1	 	-ALL-6-		
MAIN BUSES	1 OF 2	— вотн —	↑ ±					Ξ.		↑ ⊗		Ţ		- ВОТН		ВОТН
BATTERY BUSES	1 OF 2	₩ +	ВОТН ──				—— вотн-	1		∳		Ţ	\parallel	− ВОТН		
AC BUSES	1 0F 2@	← Вотн –	★				——вотн	±		∱ ⊚		1		- вотн		ВОТН
BAT RELAY BUS		◆ RELAY	RELAY BUS ➤		-BAT	RELAY BU	Bius			1		J	←—BAT	BAT RELAY BUS		
INVERTERS	1 0F 3⊕	4-2 OF 3-	F 3			+	2 OF 3	- 3		†		1	+	-2 OF 3	1	2 OF 3
AC ΦA (1 AND 2)		+ Вотн −	TH P				——вотн –	H.		↑ ⊘		1		—ВОТН		
DOCKING																
DOCKING LATCHES						9 OF 12										
GN2 BOTTLES																
SEQ																
SMJC		A SWA	ACT (A)		<u> </u>	دٍ1⊕										
SEQUENTIAL SYSTEMS		ВОТН	1		-HTOB	1										
1) BASED ON AMOUNT OF WATER AVAILABL	TER AVAILA	ABLE, CO	VSIDERAT	LE, CONSIDERATION WILL BE GIVEN	BE GIVEN	0	MUST HA	AVE CABIN	I INTEGRIT	WUST HAVE CABIN INTEGRITY OR SUIT LOOP CAPABLE OF SUPPORTING	LOOP CA	PABLE OF	SUPPOR	TING	LEGEND:	NO REQUIREMENTS
COURT THE DESIGNATION OF	201010101010101010101010101010101010101		5				;		,	1			,			

TLI MAY BE PERFORMED WITH 1 OF 2 PRIMARY RADIATOR PANELS AND THE SECONDARY LOOP (2)

(B) 1 OF 2 REQUIRED IF OPS AVAILABLE FOR USE BY LMP OR CDR
(9) MODE I AND II REGIONS ONLY, O THEREAFTER
(10) CONSIDERATION WILL BE GIVEN TO CONTINUING AFTER LOSS OF A
TANK

(B) BASED ON FAILURE MODE CONSIDERATION WILL BE GIVEN TO JETT LM WITH 1 REMAINING

(2) 1 OF 2 SUIT COMPRESSORS OR VACUUM CLEANER
(3) CONSIDERATION WILL BE GIVEN TO UNDOCKING IF MAIN REG FAILED CLOSED

6 CONSIDERATION WILL BE GIVEN TO CONTINUING WITH TWO REMAINING (4) NO REQUIREMENT IS SOURCE OF ACTIVATION CAN BE ISOLATED
S) MUST HAVE EITHER PRIMARY OR SECONDARY SYSTEM COMPOSED OF FUNCTIONING LOOP AND CORRESPONDING RADIATORS

(2) IF POSSIBLE LM DESCENT STAGE WILL BE RETAINED FOR TEI IF CONDITION NOT MET © CONSIDERATION WILL BE GIVEN TO PERFORMING EVA IF TKS 1 & 2 OR 1 & 3 REMAIN AND QUANTITY IN 2 OR 3 IS LESS THAN 60%

CSM GNC GO CRITERIA 9/1/72

REV

							5	9/1/72							941111	1300	
	3	EARTH ORBIT			TLC		LUNA!	LUNAR ORBIT (BEFORE UNDOCKING)	UNDOCK	CIRC/ DOI 2	POWERED DESCENT	DESCENT	LUNAR STAY		ORBIT (P RNOZ)	250 260 260	TEC
GO/NO-GO ITEM	CONT	CONT	12	TD&E	CONT	اق	CONT	CONT DOI			IQ.	PD1 T0 TD	PAST T1	PAST T3 & SUBS	CONT L. O.	LM JETT	CSM EVA
SDS/SDS							4										
DEORBIT CAPABILITY		SPS+B/U METHOD												1	SAVI C	2. AVIC	e
AUTO ATTITUDE CONTROL		4 3 AX	SI.	† @	3 AXIS	100		$\frac{1}{\sqrt{1}}$	2-AXIS-	XS				CIAKIS	SIVW-2	SIAA-C	9
RATE DAMPING		3 4	SI	Θ	3	3 AXIS			₹ <u>Ţ</u>	2-AXIS				51VY-2	2 4410	2 4416	96
DIRECT RCS		3 8	15	† @	, & —	AXIS			\prod	XS	1			5- AXIS	3-AA13	S-AAIS	0
BMAGS P, Y		1 OF 2	2			1 OF 2		R OPS	1 OF 2-	F 2	†			→ 1 0 F 2	7 7		
BMAGS R			1 0F 2			1 0F 2									1 OF 2		
FDAi		1 0F	2			1 0F 2		 	1 OF 2-	2 2					1 UF 2		
THC			—тнс—	1			_	↓ I	1 E						1 05 2		
RHC			-1 0F 2	^		1 OF 2		+	10	-1 or 2					1 OF 2		
EMS														5113	,	CMC	
смс			CMC			¥ 58 €		PPS GR	֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓֓	CMC					ו ו	1.	
15.5			15.5			ISS	_	+		-iss				- 22		155	
055								\		OSS OR VHF							
OPTICS DAC						0-DAC OR DPS		OR DPS	0-ľ	-0-DAC	\uparrow				JAC		
NO SOLENOID DR GND							-										
TVC SERVO LOOP		1 0F 2	9			Sau O	REFER A	A DPS	\prod	-вотн	\prod				BOTH		
DSKY			1 0F 2			OR DPS	3-86	OK OF 2	Ц	-1 OF 2	\prod			7 0 1 0 5	2	1 01 2	
SPS							<u>-</u>										C
FU/73X TANK (W/0 LEAK)		FU/0X-	↑ ×o			FU/0X		\ \ \	FU/0X	- FU/OX TANK				FU/OX TNK			9
GN2 TANK (W/O LEAK)		0F 2	1 0F 2 9			ANO DES		Sag OS	8 	-Вотн	$\prod_{i=1}^{n}$			3 3	- 80 TH		
BALL VALVE BANK		1 OF 2	1 OF 2			AND DPS	_	Sad ON		-вотн					-B01H		
FEEDLINE TEMP >40° F		>40°	• • • • • • • • • • • • • • • • • • •			>40.		 	À[->40°							
FU/0X AP < 20 PSI	_	Н	< 20						<u> </u>	\$ \$ \$ \$	\prod			102 > T	02		
Pc > 70 PSI		> 70				>70	-		1 01		\prod						
FLANGE TEMP <480°		<480				<480	-		\ \ \ \ \	<480							
HE TANK (W/0 LEAK)		(2)	HE TNK			HE TNK		R DPS	¥	F TWK							
SM RCS														,			
HE TANK (W/O LEAK)		3 OF 4	ALL			3 OF 4		\prod		3 OF 4				3 OF 4	2 OF 4	, 10,	C
NO LEAK BELOW ISO VLV		3 OF 4	ALL			3 OF 4		30F4	$\left \right $	ALL						4 6	9
PKG TEMP > 55°		0F 4	3 OF 4			3 0F 4		∐		- 3 0F 4				3 0F 4	4	3 01 4	+
THRUSTERS		AXES +X	3 OF 4 PY 6 OF 8 R	0		3 OF 4PY 6 OF 8 R		60F8		7 05 8	6 0F 8 R			6 OF 8 R	Э	ଚ	Ð
CM RCS		RANS								,				,			
HE TANK (W/O LEAK)	Ų.			(a)		1											Œ
MANIFOLD (W/O LEAK)	10F 3			—вотн—		\uparrow		¥	M	-вотн				★BOTH	★BOTH		9
NOT ARMED																Į.	
			L				+	_									

(1) REQUIRES 3 AXIS ATTITUDE CONTROL AND TRANSLATION 3 AXIS (ONE LATERAL AXIS MAY BE DEGRADED)

(2) MUST HAVE SUFFICIENT BLOWDOWN FOR DEORBIT

S AUTO OR MANUAL IN 3 AXIS

(4) REQUIRES CI OR D1, C2 OR D2, C3, C4, D3, D4 THRUSTERS

(5) 3 AXIS ATT. CONTROL AND ± X TRANSLATION

(6) 3 OF 4 TOTAL REQUIRED, ROLL 90" IF NECESSARY

TO KEEP REDUNDANCY IN YAW

1 T2 NO STAY CONDITIONS NONE

⊚ **©**

NEITHER TANK REQUIRED IF SUFFICIENT BLOWOOWN EXISTS IN EACH RING FOR ENTRY. ARMING SYSTEM WITH SOURCE PRESS >1250 PSI WILL PROVIDE >60 LBS BLOWOOWN IN EACH RING SINGLE POINT FAILURES WHICH CAN ONLY BE CONFIRMED BY BURNING ENGINE ⊚

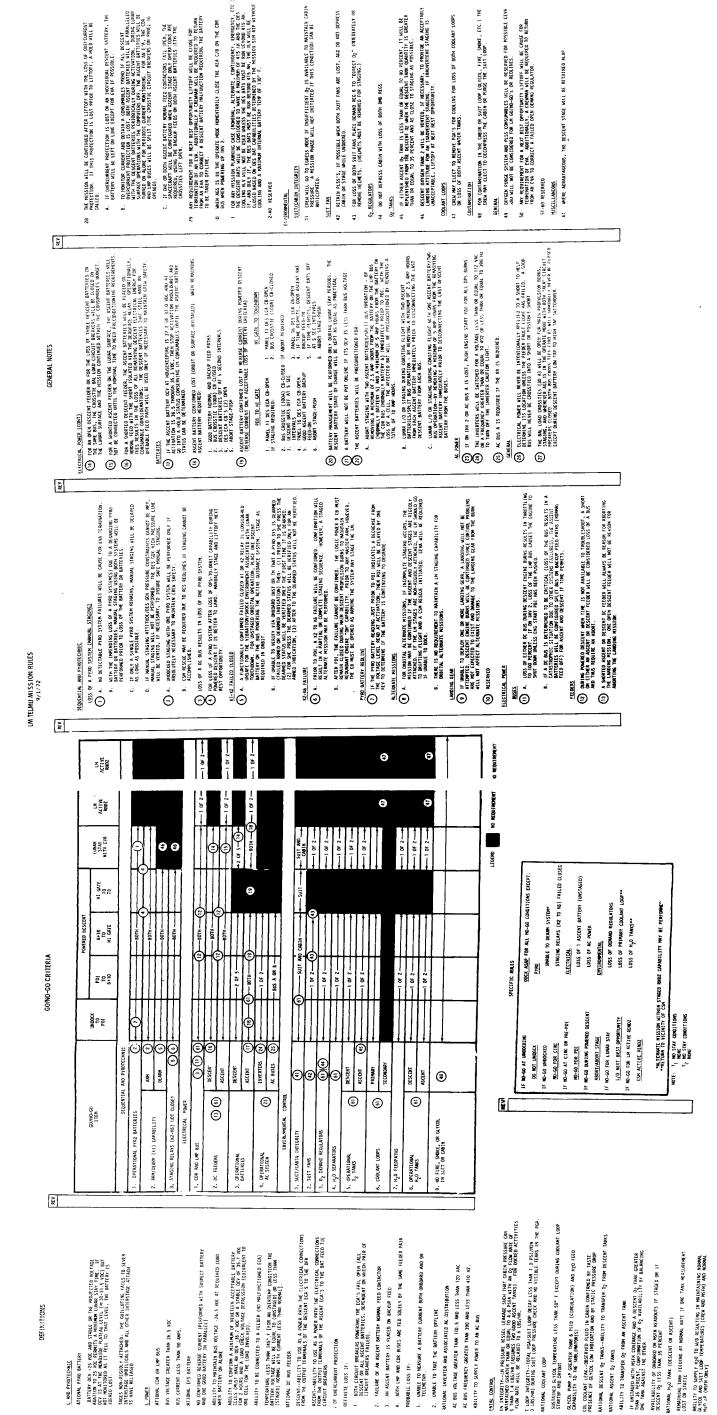
NO REQUIREMENT

LEGEND:

CONSIDERATION WILL BE GIVEN TO PERFORMING THE EVA WITH A PROPELLANT LEAK

CONSIDERATION WILL BE GIVEN TO COMPLETING THE LUNAR STAY PHASE

(2)



. OF OVERCURRENT PROTECTION

DEFIRETE LOSS 1F;

PROBABLE LOSS IF:

RATIONAL COOLANT LOOP

ENTAL CONTROL

WATIONAL DC BUS FEEDER

SATIONAL EPS DATTERY

ATIONAL PYRO BATTERY

AND PYROTECHNIC

LM CONTROL MISSION RULES

GO/NO-GO CRITERIA

MANAGEMENT RULES

GUIDANCE AND CONTROL

1. 3-AXIS ATITUDE CONTROL--THE ABILITY TO CHANGE THE EXISTING VEHICL ATTITUDE PLUS AND MINUS ABOUT EACH AXIS. TO HAVE, THIS CAPABILITY, THE LM REQUIRES AN OPERATIONAL MANUAL OR AUTOWATIC CONTROL SYSTEM. GUIDANCE AND CONTROL

DEFINITIONS

GUIDANCE STEERING—ABILITY TO CALCULATE AND STEER THE LM ALONG THE DESLIKED THRUST VECTOR DURING A POWERED MANEUVER. THIS CAPABILITY REQUIRES AN OPERATIONAL PGHS OR AGS INCLUDING A 3-AXIS ATTITUDE CONTROL SYSTEM. REDUNDANT 3-AXIS ATTITUDE CONTROL—"TWO AUTONOMOUS 3-AXIS ATTITUDE CONTROL SYSTEMS INDEPENDENT OF SECONDARY COILS, I.E., NO SINGLE FAILURE WILL CAUSE LOSS OF BOTH AUTONOMOUS SYSTEMS. ۳

۲;

DSKY OR CES FAILURE(S) OPERATIONAL PGNS--A PGNS WITHOUT AN LGC, ISS, PREVENTING PGNS 3-AXIS ATTITUDE CONTROL. 4.

5. OPERATIONAL AGS.-AN AGS WITHOUT AN AEA, ASA, DEDA OR CES FAILURE(S) PREVENTING AGS 3-AXIS ATTITUDE CONTROL.

3-AXIS TRANSLATION—ONE TTCA AND AN OPERATIONAL PGNS OR MANUAL (AGS MODE) TRANSLATION CAPABILITY.

DPS PROPULSION

OPERATIONAL DPS

PRIOR TO PUI IGNITION

- A. FUEL AND/OR OXID ENGINE INLET PRESSURE GREATER THAN 30 PSIA
- 8. FUEL AND UXID BULK TEMPERATURES GREATER THAN 50° F AND LESS THAN 90° F,
- 'n. C. △ TEMP BETWEEN FUEL AND OXID LESS THAN 10°

D. A PRESSURE (FUEL HIGH) LESS THAN 50 PSID.

E. PROPELLANT AND SUPERCRITICAL HELIUM ADEQUATE TO COMPLETE MISSION

AFTER PDI IGNITION

- A. FUEL AND/OR OXID ENGINE INLET PRESSURES GREATER THAW 150 PSIA (ULLAGE PRESSURES GREATER THAN 160 PSIA).
- B. THROAT AREA INCREASE LESS THAN 52 PERCENT.
- C. ADEQUATE PRUPELLANT AND SUPERCRITICAL HELIUM TO COMPLETE MISSION.
- DPS INSERTION CAPABILITY--THE ABILITY TO OBTAIN A SAFE INSERTION USING ONLY THE DPS. ۶.

APS PROPULSTON

OPERATIONAL APS

- PREPRESSURIZATION
- A. A PRESSURE BETWEEN APS FUEL AND OXID EMGINE INLET PRESSURES LESS THAN 90 PSID.
- THAN 10° F. B. A TEMP BETWEEN APS FUEL AND OXID LESS
- 50° F AND LESS C. APS FUEL AND/OR OXID TEMP GREATER THAN THAN 90° F.
- D. APS FUEL OR OXID INLET PRESSURE GREATER THAN 62 PSIA AND LESS THAM 220 PSIA.
- HELIUM TANK/LINE E. REDUNDANT PRESSURIZATION PATHS AND NO LEAKS.
- POST-PRESSURIZATION
- A. A PRESSURE BETWEEN FUEL AND OXID INLET PRESSURES LESS THAN OR EQUAL TO 15 PSID.
- FUEL AND/OR OXID INLET PRESSURES GREATER THAN 105 PSIA. (ULLAGE PRESSURE GREATER THAN 110 PSIA).
- C. ADEQUATE PROPELLANT AND SOURCE PRESSURE TO COMPLETE MISSION.

REACTION CONTROL

OPERATIONAL RCS

- SUPPLIED BY ITS STEM INDEPENDENT OF A. AN RCS CONTAINING 8 OPERATIONAL THRUSTERS OWN PRESSURIZATION AND PROPELLANT FEED SYS ASCENT FEED AND CROSSFEED.
 - B. FUEL AND/OR OXID MANIFOLD PRESSURES GREATER THAN OR EQUAL TO 100 PSIA.
 - C. FUEL TEMP GREATER THAN OR EQUAL TO 40° F AND LESS THAN OR EQUAL TO 100° F.
- D. QUAD TEMPS GREATER THAN 119° F.

	-		POWERED DESCENT			
GO/NO-GO ITEM	UNDOCK 10 PDI	PDI TO 10+10	6+10 TO HI GATE	HI GATE TO TD	LUNAR STAY W/EVA	LM ACTIVE RNDZ
GNC						
1. GUIDANCE UPERATIONAL PGHS					-	304 80
STEERING OPERATIONAL AGS		(-)			C Puris UK Aus	UK Alas
						PGNS
2. 3-AXIS OR PGNS AUTO ATT CONT		ВОТН		T (2)	N SOLIN	ASC ASC
					(10)	a constant
3. 3-AXIS TRANS (5)	+3 AXIS (17)					←(18) 1 AXIS -
4. FDAI-ATT/RATES/ERR		CREW OPTION	PTION-			
5. T/D 40 SEC OF 57 PERCENT GTC			*			
6. WHF RNG/CSM OPTICS	2 06 3					
7. RR	,					
8. A0T						
9. LR				•		
10. DPS AUTO ON (5)						
11. REDNT APS ON (6)				-		
12. P&R GDA TRIM		(7) NO IMPINGLATEN	NO IMPINGLMENT CONSTRAINTS			
13, HAN THTL (8) (1 TTCA)	,				********	
14. AUTO THTL			7			
pps						
1. OPERATIONAL DPS	(E)					
2. ADEQUATE PROP						
3. FTP BLOWNDOWN CAPABILITY			(1) 34% Podes	965		
APS						
1. OPERATIONAL APS						APS NOT
2. NO PROP LEAKS					1MMED 1./0	REQ
3. NO HE LEAKS/REDUNDANT PRESS PATH				4	(B)	FOR RNDZ
RCS						
1. OPERATIONAL RCS		A AND B		A OR B	A & B	- (18) A OR B
2. RCS LEAKS (14)		:0 LEAKS	(35)	A OR B	+ (15) - NO LKS +	
NO IMPINGEMENT)			
GENERAL NOTES	4.1.)3	i CCENS	TWENTED THE OPEN OFF
		Ç				מ שבלפו שם ביי
RDNT 3-AXIS ATT CONT EXISTS	ACCEPTABLE PROVIDED	9	(2) ABORI, THEN ABORI STAGE AT UPS DEPLETION IF	I SIAGE AI DPS DEPL	ELIUM IF:	
(2) LOSS OF PGHS OR AGS GUIDANCE STEERING IS ACCEPTABLE	RING IS ACCEPTABLE			MITIMS INSULTICIEN	A. LUM LEVEL CONFIRMS INSUFFICIENT PROFELLANT TO LAND	:
			B. A BETWEEN FU CENT	NEL AND OXIDIZEK QUA	∆ BETWEEN FUEL AND OXIDIZEK QUANIIIY IS GKEATEK IHAN IO PEK- CENT	IAN IO PER-
(3) FOR SINGLE CONTROL MODE, LANDING IS CREW OPTION	IS CREW OPTION		C POGS BEAUTING	2 PERCENT AND NO V	POSS READING 2 PERCENT AND NO VALID TIME ESTIMATE FROM LOW	FROM 1.0W
4 AGS RATE CMD MAY CONSIST OF 2 AXIS RATE CMD AND ONE DIRECT I F. ONE RATE CYROL FAILED	IS RATE CMD AND ONE					
A NO BUTTO HILL AGE DUING MO BUTTO START POIL NO GO	F-POI NO GO		D. DPS PROPELLA	NT MARGIN PREDICTED INTO PART (CONFIRMED	DPS PROPELLANT MARGIN PREDICTED LESS THAN MINUS 0.2 PERCENT AFTER ENTRY INTO P64 (CONFIRMED BY OTHER CUES)	2 PERCENT
	PON A MITO ON ACC ALITO	(Apc	THE LOT COMPLETE	ADE HELLIM CAUREE LEAV AFTER DRESSIRTZATION REQUIRES IMMEDIATE	MMEDIATE
	שוט אמוח חוש אמוח	9 (יב רבשי או ובע נערטטי	מודעוות שלמוער	
C) GDA WILL BE COMMANDED OFFABORT STAGE IF IMPINGEMENT LIMITS VIOLATED	STAGE IF IMPINGEMENT	3		SSURE LESS THAN 100 PROM GOOD SYSTEM	IF MANIFOLD PRESSURE LESS THAN 100 PSIA, AND LEAK UPSTREAM OF MAIN SOY, CROSSFEED FROM GOOD SYSTEM	FREAM OF MAIN
WORK-AROUND PROCEDURE EXISTS FOR MAXIMUM THRUST	MAXIMUM THRUST	(2)		ONLY IF RCS BLOWDO	CONTINUE MISSION ONLY IF RCS BLONDOWN CAPABILITY EXISTS TO MEET CONSIMABLE PEDITUES.	'S TO MEET
9 INHIBIT DPS BURNS		٣	ABORT STAGE AS	ABORT STAGE AS SOON AS POSSIBLE		
) (AFTER CIRC		
(11) ABORT STAGE PRIOR TO INLET PRESSURES REACHING 150 PSIA	URES REACHING 150 PSIA	<u>ا</u>		7 T T T T T T T T T T T T T T T T T T T		
		٣	(18) LOSS OF SOME TRA	ANSLATIONAL CAPABIL G DOCKING PHASE	LOSS OF SOME TRANSLATIONAL CAPABILITY REQUIRES HYBRID LM/CSM MANEUVERS DURING DOCKING PHASE	LM/CSM

IRIG BIAS UPDATES WILL BE ACCOMPLISHED WHEN GYRO DRIFT IS GREATER THAN THE TWO SIGHAN WHITH TRANSCHARGY AND UPON CONTROL/GUIDANCE CONCURRENCE. NO UPDATES WILL BE MADE FOR GYRO DRIFTS LESS THAN 0.075 UEG/HR (5 MERU). THE PENS WILL BE CONSIDERED NO GO WITH A GYRO URIFT GREATER THAN OR EQUAL TO ±1.5 DEG/HR (100 MERU). THE MAXIMUM ALLOWABLE VALUE WITHIN THE LGC IS ±1.93 DEG/HR (128 MERU). 1. NO BIAS UPDATES WILL BE ACCOMPLISHED PRIOR TO 30 MINUTES OF IMU OPERATION. 2. THE INITIAL BIAS UPDATE WILL NOT BE PERFORMED IF THE <u>a</u> BIAS IS LESS THAN ±0.03 CM/SEC/SEC. SUBSEQUENT UPDATES WILL ONLY BE PERFORMED IF THE <u>a</u> BIAS IS GREATER THAN ±0.1 CM/SEC/SEC. A. THE LR SHOULD NOT NORMALLY BE OPERATED AT AN ANTENNA TEMP LESS THAN +50° F, HOMEYER, THE LUNAR LANDING MISSION WILL BE ATTENTED IF THE ATTENNA TEMP IS ABOVE THE CRITICAL LIMIT OF -15° F (HARDWARE DAMAGE). D. IF LOSS OF IMU COOLING OCCURS, TURN-ON/OPERATION TIMES WILL BE DETERMINED BY REAL-TIME FLIGHT PLANNING REQUIREMENTS. THE RR AMTENNA WILL BE POSITIONED AFTER LUNAR T/D TO PRECLUDE REPOSITIONING DUE TO AMTENNA HEATING ON THE LUNAR SURFACE. PIPA BIAS UPDATES WILL BE ACCOMPLISHED AS FOLLOWS: RENDEZVOUS RADAR LANDING RADAR **ښ** 5

- THE AGS IS DECLARED NO GO DURING A GYRO AND ACCELEROMETER
 CALBRATION IF THE GYRO DURIT CHANGE IS GREATER THAN 2.00 DEG/HR
 AND IF THE ACCELEROMETER BIAS CHANGE IS GREATER THAN 0.039 FT/SEC/SEC
 FROM THE WALLE AT THE START OF THE CALIBRATION. B. LR ACTIVATION WILL BE DELAYED SO THAT THE PREDICTED LR TEMP WILL BE NO GREATER THAN 145° F AT HI-GATE. AGS 4
- IF LOSS OF ASA COOLING OCCURS, TURN ON/OPERATION TIMES WILL BE DETERMINED BY REAL-TIME FLIGHT PLANNING REQUIREMENTS.

LOSS OF INVERTER ONE/AC BUS A REQUIRES A MANUAL ENGINE ON SIGNAL TO MAINTAIN DPS ENGINE ELECTRICAL "ON" REDUNDANCY.

5. CES

- 1. FROM A SAFETY STANDPOINT, SUPERCRITICAL HELIUM BURST DISC RUPTURE DURING MANNED OPERATION IS AN ALLOWABLE EVENT.
- IF POWERED DESCENT IS ABORTED DURING DPS INSERTION CAPABILITY OR IF A DOCKED DPS CONTINGENCY IS REQUIRED AND PGGS LESS THAN 86 PERCENT, THE DES HELLUM REG I AND REG 2 VALVES SHOULD BE CLOSED TO SECONDS PRIOR TO ENGINE CUTOFF TO PREVENT POSSIBLE FUEL/HELLUM HEAT EXCHANGER FREEZING.
- THE DPS PRESSURIZATION SYSTEM MAY BE OPENED TO A START TANK LEAK. If DOWE, THE PRIMARY HELIUM REG SOV SHOULD BE CLOSED AFTER EACH BURN AND REOPENED PRIOR TO ANY SUBSEQUENT BURN.
 - THE START TANK SQUIBS WILL NOT BE BLOWN IF A LEAK EXISTS IN THE TANK PRIOR TO PRESSURIZATION UNLESS THE FUEL OR OXIDIZER ENGINE INLET PRESSURES ARE LESS THAN 30 PSIA.
 - 5. 91 SEC AFTER LOW LEVEL THE CREW WILL EVALUATE WHETHER TO LAND OR ABORT. (BINGO CALL WHEN 5 SEC AT FTP OR 20 SEC AT 27.5% APS PROPULSTON.

- 1. ASCENT FEED WILL NOT BE UTILIZED IF AN APS HELIUM/PROPELLANT LEAK OR MALID APS LO-LEVEL EXISTS DURING ANY PHASE OF THE HISSION.
- OPTIMIZATION OF APS HELIUM (ISOLATION OF LEAKING SOURCE, BLOW DOWN, ETC.) SHOULD BE ACCOMPLISHED IF POSSIBLE FOR HELIUM LEAKS.
 - ONE HELIUM BOTTLE IS CONSIDERED SUFFICIENT TO SUPPLY APS EV FOR NON-LANDING ALTERNATE MISSIONS.
- NITH AN APS PROPELLANT VALVE MISMATCH INDICATION DURING A BURN, FUTURE APS BURNS ARE POSSIBLE ONLY IF THE MISMATCH IS NOT PRESENT FOLLOWING THE BURN.

REACTION CONTROL

L/O NEXT BEST OPPORTUNITY

IF NO-GO LUNAR STAY

IF NO-GO AT CIRC OR PRE-PDI SPECIFIC RULES

IF NO-GO AT UNDOCKING

T, WO STAY CONDITIONS:

NOTE

APS PROP LEAK

CSM ACTIVE RENDEZYOUS IF NO-GO RENDEZVOUS

IF NO-GO DURING POWERED DESCENT

ABORT

NO GO FOR CIRC/DUCK

IF NO-GO UNDOCKED DO NOT UNDOCK

> RCS PROP LEAK (BOTH SYS) T₂ NO STAY CONDITIONS:

> > 7

RCS LEAK (BOTH SYS) APS PROP LEAK

DPS CAPABILITY

1. ASCENT FEED WILL NOT BE UTLIZEU IF AN RCS PRUPELLANT LEAK EXISTS DOWNSTREAM OF THE MAIN SOV'S.

REV LUNAR SURFACE EVA (CONTINUED)	
교	
IAR SURFACE EVA	

FLOW A. ABLE TO PASS ETU PRESSURE INTEGRITY CHECK (HIGH 02 FLAG CLEARS AFTER INITIAL PRESSURIZATION).

EMU PRESSURE INTEGRITY

- B. PROPER PRESSURE REGULATION [LOST IF REGULATED PRESSURE LESS THAN 3.75 PSID (TM) AND DECREASING ON LUNAR SURFACE]. OPERATIONAL PRIMARY OXYGEN SUBSYSTEM (POS)
- A. SOURCE PRESSURE GREATER THAN 220 PSIA OR 5 PERCENT (INDICATOR).
 - B. ABLE TO SUPPLY OXYGEN TO OXYGEN VENTILATION LOOP.
- 5 PSID (TM) AND EASING]. C. PROPER PLSS PRESSURE REGULATION [NOT LESS THAN 3.75 DECREASING OR GREATER THAN 4.05 PSID (TM) AND INCRE
 - VDC AND STABLE A. PLSS BATTERY VOLTAGE GREATER THAN OR EQUAL TO 16.0 OPERATIONAL PLSS POWER SUPPLY
- B. PLSS BATTERY CURRENT DRAIN GREATER THAN 2.0 AMPS
 - PLSS & BSLSS THERMAL CONTROL CAPABILITY

LIQUID COOLED GARMENT/LIQUID TRANSPORT LOOP CIRCULATION

- PLSS THERMAL CONTROL CAPABILITY
- TEMPERATURE ITH DIVERTER A. LCG H20 INLET TEMPERATURE AND SUBLIMATOR 02 OUTLET LESS THAN 50° F AND LCG H20 3T GREATER THAN 5° F WI VALVE IN MAX POSITION.
- B. FEEDWATER RESERVOIR INTEGRITY AND THE ABILITY TO SUPPLY H2O TO SUBLIMATOR.

VENTILATION CAPABILITY--OPERATIONAL FAN (BAT CURRENT GREATER THAN 2.0 AMPS)

CONTAMINATION CONTROL CAPABILITY

- A. VENTILATION CAPABILITY
- B. PLSS CO2 PARTIAL PRESSURE LESS THAN 15.0 MM OF HG
- IN THE C. INSUFFICIENT CONTAMINATION (LIGH AND BY-PRODUCTS) VENTILATION LOOP TO RESULT IN CREWMAN DISCOMFORT

OPERATIONAL OXYGEN PURGE SYSTEM (OPS)

- A. 15 MINUTES HI PURGE CAPABILITY AT THE END OF A PLANNED EVA. OPS RESIDUALS ARE:
- GREATER THAN 240 PSIA AT HIGH PURGE GREATER THAN 90 PSIA AT LOW PURGE GREATER THAN 100 PSIA AT MAKEUP
- SS THAN 4.0 PSID, TO 5.0 PSID IN CEPTABLE FOR ESSURE EXCEEDS OPS 02 REGULATED PRESSURE GREATER THAN 3.4 AND LESS TOR OPS 02 REGULATED PRESSURE DOES NOT 60 FROM 4.0 TO LESS THAN 1 SEC. THE OPS WILL BE CONSIDERED UNACCEPT. MAKEUP MODE OPERATIONS IF THE OPS 02 REGULATED PRESSUR 4.0 PSID.
- PURGE VALVE (REDUNDANT LOCKING PIN NOT REQUIRED) ن.

- OPERATIONAL PGA
- MUST PASS EMU INTEGRITY CHECK AND HAVE ALL CONNECTORS LOCKED AND ALL RESTRAINTS CABLES EXCEPT GLOVE OR NECK CABLES INTACT. NOTE ONLY A SINGLE LOCKING MECHANISM IS REQUIRED FOR EACH CONHECTOR.
- TERMINATE EVA--THE CREW WILL BE ALLOWED SUFFICIENT TIME TO CLOSE OUT THE ACTIVITY IN WHICH THEY ARE ENGAGED (5 TO 10 MINUTES) AND WILL THEN RETURN TO THE LM AND EXPEDITIOUSLY COMPLETE CLOSEOUT ACTIVITIES AS REQUIRED.
- TERMINATE EVA IMMEDIATELY--THE CREW WILL CEASE THEIR SURFACE ACTIVITIES AND IMMEDIATELY RETURN TO THE LM, INGRESS, AND REPRESSURIZE. Ξ.
 - 12.

		, 0	n 5 ∑	3 OF 2	
	ONBOARD	CUFF GAGE	TONE	TONE	
	PAM F11/FM	000001010001010	1007010100h	GT8140C/GT8240C	
	MEAS DESCRIPTION	PGA PRESS GAGE	LOW PGA PRESS TONE	LOW VENT FLOW TONE PLSS BAT CURRENT	
:					

CMP EVA

- CMP EMU PRESSURE INTEGRITY
- ABLE TO MEET MAX 0.8 PSID/MIN DECAV CRITERIA DURING EMU PRESSURE INTEGRITY CHECK.
- NOT LESS THAN 3.70 PSID (CREWMAN) AND 4.0 PSID (CREWMAN) AND INCREASING CMP EMU REGULATED PRESSURE DECREASING OR GREATER THAN DURING CMP EVA.
- ADEQUATE 02 FLOW FROM SCU
- CMP EMU 0.2 FLOW INTO SUIT GREATER THAN 6.0 LBS/HR (60 TO 65 PSI UMBILICAL PRESS)

LEG PRESS GREATER THAN 4.05 PSID, CLOSE POS SHUTOFF VLV TIMATING OPS.

ACTIVATE OP : OPS

IF EMU REG AFTER'ACTUA

ACTIVATE BS

O O O O

ACTIVATE OP

OPERATIONAL PGA OPERATIONAL OPS

OPS: OPEN PGA PURGE VLV -- LOW FLOW BSLSS AND/OR OPS PURGE AS REQUIRED. TERMINATE FVA

TERMINATE EVA ACTIVATE OPS AS REQUIRED

LOW (FROM SCU) NUMENTATION

ADEQUATE 0, FLOW

CRITICAL INSTRUME

INTEGRITY

EMU PRESSURE INTE

1F NO-60

GO ITEM

60/N0-G0

CMP EVA

- IERMINATE CMP EVA--THE CREWMAN WILL CEASE PLANNED EVA ACTIVITIES, TRANSFER TO THE CM, INGRESS AND REPRESSURIZE.
 - CRITICAL INSTRUMENTATION

1 OF 2	1 OF 2
CUFF GAGE ONBOARD (CMP ONLY)	ONBOARD (CMP ONLY) }
PGA PRESS GAGE LOW PRESS WARNING SWITCH	LOW FLOW WARNING SWITCH CM PRESS GAGE

LUNAR SURFACE EVA

GO/NO-GO CRITERIA/SPECIFIC RULES

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EVA MISSION RULES

LUNAR SURFACE EVA

- THE BSLSS WILL BE CARRIED ON ALL TWO-MAN EVA TRAVERSES.
- IF ITS USE IS REQUIRED, THE TETHER WILL BE ATTACHED FOR ALL OPERATIONS EXCEPT GETTING ON AND OFF THE LRV AND INGRESSING LM. FOR THESE ACTIONS, THE BSLSS WILL BE DISCONNECTED FROM THE CREWMAN WITH THE FAILED PLSS.

NOTES

TERMINATE EVA

TERMINATE EVA IMMEDIATELY

ITEM

GO/NO-GO ITE

TION

PROPER VENTILATION

PLSS POWER

- INTERMITTENT OPS PURGING FOR DECONTAMINATION OR ADDITIONAL COOLING REQUIRES THE PRIMARY OS SHUTOFF WALVE BE TIRNED OFF FOLLOWING OPS ACTIVATION, BUT PRIOR TO PURGING, THE PURGE VALVE SHOULD BE CLOSED PRIOR TO REOPENING THE PRIMARY OS SHUTOFF VALVE AND DEACTIVATION OF THE OPS. ?
- CREMMAN MAY ATTEMPT A WET SUBLIMATOR RESTART IF BREAKTHROUGH OCCURS VACUUM TRANSFERS WILL BE USED ONLY IN SUPPORT OF:

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Θ 0

CONTROL

CONTAMINATION CONT EMU PRESS INTEGRIT

0 Θ

- A. CONTINGENCY INTRAVEHICULAR TRANSFERS OR CONTINGENCY EXTRAVEHICULAR ACTIVITIES
- B. A LM CABIN REPRESS FAILURE
- AN EMU/LW ECS HYBRID LIFE SUPPORT AND COMM CONFIGURATION IS ACCEPTABLE IF WITHIN SYSTEMS CAPABILITIES AND IF REQUIRED TO PRECLUDE TIMELINE IMPACT. 5.

(e)

0

<3.5 PSID

B. 3.4 <PRESS <3

THERMAL CONTROL

A. PRESS <3.4 PSII PSID

UMENTATION

PRIMARY O₂ SUPPLY CRITICAL INSTRUME

- BOTH PLSS'S AND OPS'S WILL BE RETAINED UNTIL TWO LIFE SUPPORT UNITS (2 OPS, 2 PLSS, OR 1 PLSS + 1 OPS) HAVE BEEN VERFIED TO HAVE SUFFICIENT CONSUMABLES TO SUPPORT CONTINGENCY EXTRAVEHICULAR ACTIVITIES. **.**
- THE LM WILL NOT BE PRESSURIZED WITH A CREWMAN ON THE LUNAR SURFACE.
 - FOR THE 2 MAN EVA, THE CDR WILL ALWAYS EGRESS FIRST AND INGRESS LAST UNLESS THE CDR HAS INITIATED AN OPS PURGE. THIS WILL ENSURE THAT THE CDR IS IN THE LEFT PILOT POSITION SHOULD ASCENT BE REQUIRED WITHOUT AN OPPORTUNITY TO DOFF THE EMU'S. 7. 8.

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FCD 5-69.25.58

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COMMUNICATIONS/IESTRUMENTATION GO CRITERIA

									•	- / - / /									
60/NO-G0	EARTH ORBIT	199		7.C	<u> </u>	(BETORE	LUNAR ORBIT (BE! ORE UNDOCKING)	MG)	UNDOCKING	CIRC/ DOI ₂	POWER	POWERED DESCENT		LUMAR STAY	TAY	SHUNESUNSO	LUNAR ORBIT POST REND	POST DOCK	TEC
TEM	CONT C	CONT E.O.	12	704E	COMT	 <u>5</u>	CONT LOI	COMT	NOMINAL		POI 109 109 109	PDI TO POI+6:10 HI PDI +6:10 TO HI POI +6:10 GATE	HI CATE 5	STAY 2-MAN 1-MAN W/0 EVA EVA	I 3-MAN EVA	LM ACTIVE	CONT L.O.	LM JETT	CSM EVA
USB 2-WAY VOICE COMM		O CSM	SM			35° 25° 25°	3		CSM & LM	CSM	CSIM AND		ບ <	0 § 0 §	(S) (S)		CSM	CSN	
VHF COMM LM/CSM								νY	BUPLEX OR	†									
VHF COMM LM (LCRU)/ EVA														SIMP	SIMP (6) SIMP (6)				
VHF COMM EVA/EVA																			
MSFN/EVA VOICE														©	@				
CRITICAL INSTRUMENTATION	*	← WSO ←	1			CSM	၁	D WS:	CSM (2) LM & CSM	AND CA	AND UM	> 	+	LM AND (— LIM AND CSM —		CSM		
LM TELEMETRY									BR OR HBR	LBR OR HBR	LBR OR HBR		†	-LBR OR HBR	T.				
CSM TELEMETRY	*	+HBR OR LBR+	1																
CSM SCE																			_

VHF IS ACCEPTABLE RESERVED

NO REQUIREMENT

LM RELAY TO CSM IS ACCEPTABLE
ADQUATE DATA TO MAKE FINAL GO/NO-GO
TO CONTINUE POWERED DESCENT (TM OR ONBOARD DISPLAY)
CSM AND LM COMM IS REQUIRED FOR DO!

IF LM PROBLEM IS DEFINED, CONTINUE EVA PREP AND ACTIVATE LCRU ASAP CSM AND LM CRITICAL INST REQUIRED FOR DOI VOICE UPLIMY TO EITHER CREWMAN, VOICE DOWNLINK FROM ONE CREWMAN OR TV VOICE CONFIRMATION OF CIRC MNVR IS MANDATORY FOR DOI 2

050 MISSION RULES - OPTIC: 1CS 9/1/72

SPECIFIC MISSION RULES

		1, FAIL							1. EXCI	2. GN ₂		
PANORAMIC CAMERA	TLC LUNAR ORBIT	TURN 64K BIT DATA SYSTEM ON AND APPLY POWER TO THE CAMERA		USABLE REALENS, GO TO COLD SOAK	TERMINATE PHOTO BASS	1	OPER CAMERA FOR 1 MIN	OPER CAMERA IN MOND MODE	CYCLE OPEN/STBY SWITCH TO STBY FOR 30 SEC THEN BACK TO OPERATE. REMAIN IN OPERATE FOR GROUND	CYCLE OPER/STBY SWITCH TO STBY FOR 30 SEC THEN BACK TO OPERATE. IF TB RETURNS TO TB - BP, GO TO STBY AND WAIT FOR GROUND MANLYSIS.	CONTINUE OPERATION	CONTINUE OPERATION
	CONDITION/MAL FUNCTION	1. SIM TEMP SL1211T () (2	2. FORWARD LENS <45° F TEMP (SL1040T) NONOPERATE > 120° F	.,,	UPERAIE > 105 F	3. CAPPING SHUTTER FAILS OPEN OR CLOSED	4. TEST CYCLE FAILS	5. STEREO MODE FAILS	6. TB REMAINS GREY AT TURM-ON	7. TB - BP DURING OPERATE S	8. FORWARD MOTION COMPENSATION FAILS	9- LOSS OF DOWNLINK DATA

MAPPING CAMERA	CONDITION/MALFUNCTION TLC LUMAR ORBIT	2177 TURN 64K BIT DATA SYSTEM ON 105° F AND APPLY POWER TO THE CAMERA	NONOBEDATE < 40° F	TURN CAMERA OFF	OPERATE >90° F	(6) CONFIGURE FOR STBY MODE AND WAIT FOR GROUND ANALYSIS	ION COMPENSATION CONTINUE OPERATION	MECHANISM (3) RETRACTED	EXTENDED INHIBIT SM RCS JETS A2, A4, B1, B4	NLINK DATA
	CONDITION/I	1. SIM TEMP SL1217T < 40° F OR > 105° F	2. FORWARD LENS	LEMP (SLIOBUL)		3, TB - BP	4. FORWARD MOTION COMPENSATION	5. DEPLOYMENT MECHANISM	r AIL 3	6. LOSS OF DOWNLINK DATA

	LUNAR ORBIT		LEAVE LASER ALTIMETER POWERED	POWER DOWN LASER	LIMT OPER TO NOMINAL CAMERA MODE SEQUENCES	LIMIT OPER TO NOMINAL AUTO MODE SEQUENCES	POWER DOWN LASER	LIMIT OPER TO NOMINAL
LASER ALTIMETER	140	SCHEDULE SIM BAY HOT/COLD SOAK AS REQUIRED						
	ALFUNCTION	0	<-10°F	>131° F AND INTER- MITTENT RANGE READOUT		DATA		٧
	CONDITION/MALFUNCTION	1. SIM TEMP SL1217T < -30° F OR > 150° F	2. CAVITY TEMP		3. LOSS OF AUTO MODE	4. LOSS OF VALID RANGE DATA IN CAMERA MODE	5. PFN VOLTAGE >2900V	6. LOSS OF DOWNLINK DATA
			_					

		9/1/12 MCRA POOB		
1 1	CONDITION/MALFUNCTION	MC/LA DOUR	TINGO OTMIT	
1	CLOSED		OPERATE CAMERA TO OBTAIN BASELINE ENCINEERING DATA	OBTAIN (9)
~	(LO) OPEN		MINIMIZER DOWN MINIMIZER AND DELEVA SELONG AS POSSIBLE AND VELVE DUMPS, 1920 DUMPS, PLEL CELL PURGES AND UNDESIRABLE THRUSTER ACTIVATIONS	LONG AS APS, H20 SES AND ACTIVATIONS
1		GN ₂		
1 2	CONDITION/MALFUNCTION	TLC	LUNAR ORBIT	
	MECHANICAL FAILURE ELECTRICAL FAILIDE		SCHEDULE PC OPERATION TO EXHAUST FILM PRIOR TO GN ₂ DEPLETION (I) RESTRICT PC OPERATION TO HIGHE 3T	TO EXHAUST ETION TO HIGHEST
1			OPER MAPPING CAMERA AND ATTEMPT OPER OF PAN CAMERA	N CAMERA (12)
		NOTES		
Θ	AFTER FILM ADVANCE AVERAGI 87 5° F	AFTER FILM ADVANCE AVERAGE EITHER 12017, 12041, OR 120 at 5° f	R 1206T WITH 1211T.	
	THIS RULE ONLY APPLICABLE PRE SIM DOOR JETT	PRE SIM DOOR JETT		
⊙ ⊙	SEE OPTICS MENT ROLE TO INSUFFICIENT DATA TO DIST A FAILED T/M POINT	SEE UPTICS MART RULE IT INSUFFICIENT DATA TO DISTINGUISH BETWEEN A FAILED CAPP A FAILED TAM POINT	D CAPPING SHUTTER AND	
	A NO-GO INDICATION WILL BE ARE SENSED:	A NO-GO INDICATION WILL BE RECEIVED IF ANY OF THE FOLL Are sensed:	E FOLLOWING CONDITIONS	
	A. STEREO WALFUNCTION B. FILM PATH FAILURE C. CAPPURE SUUTER NOT ACTIVATED D. LENS ROTATION SIGNAL LOST E. OUT OF FILM SIGNAL	CTIVATED LOST		
	A NO-GO INDICATION WILL BE PARANETERS IS IN THE IMPRO	A NO-60 INDICATION WILL BE RECEIVED IF ANY ONE OF THE PARAMETERS IS IN THE IMPROPER STATE.	JE THE FOLLOWING	
	A. MC FRONT LENS TEMP B. STELLAR CAMERA FRONT ELEMENT TEMP C. SUPPLY CASSETTE TEMP	ELEWENT TEMP		
	REFERENCE MALFUNCTION PROCEDURE X.X.	CEDURE X.X.		
	THIS RULE ALSO APPLICABLE TO THE TEC PHASE	TO THE TEC PHASE		
	CONSIDERATION WILL BE GIVE	CONSIDERATION WILL BE GIVEN TO OPENING THE DOOR DURING	DURING THE TEC EVA	
	REFERENCE MALFUNCTION PROCEDURE X.X. CUE:	CEDURE X.X.		
E . O	OR MECHANICAL FAILURE, SI S IN STBY. GN, WILL BE S AX FLOW RATE OF 1.55 LB/H OR ELECTRICAL FAILURE, SI URING PC OPERATION.	FOR MICHANICAL FAILURE, SLIDBJX READS "ON" CONTINUOUSI TIS STREY "GAP WILL BE TURNELED TO THE ATB BARS CONT WAX TOW ARTE OF 1.55 LB/MS. GMY, MOULD BE DEPLIED IN DURING PECENTICAL FAILURE, SLIDBJX READS "ON" CONTINUOUSI DURING PE OPERATION.	INIOUSIY EVEN WEEN PC AC CONTINUOUSIY AT A ETED IN 6.09 HOURS. HOUGUSLY BEIT ONLY	
(E)	CUE:			
	SL1031X READS "OFF" CONTIN JAM IF GN2 IS NOT SUPPLIED	SL1031X READS "OFF" CONTINUOUSLY DURING PC OPERATION. JAM IF GNZ IS NOT SUPPLIED TO AIR BARS	ATION. PC FILM MAY	
(2)	BA WILL BE ENABLED FOR TRA DURING LH DESCENT AND LM A ENTRY INTERFACE TO PROVIDE FIRING RCS THRUSTERS ARE R	B4 WILL BE EMBLED FOR TRANSLATION MANEUVERS, FOR RESC OURNE LA DESCENT AND LA ASCENT AND FROM 8 HOURS BEFOR ENTRY INTERFACE TO PROVIDE COUPLED ATTITUDE CONTROL W FIRING RCS THANSTERS ARE REQUIRED.	DR RESCUE CAPABILITY S BEFORE MCC-7 TO FROL WHEN FORMARD	

RE

THE FILM IN THE PANORANIC AND MAPPING CAMERAS OF CA AND MY INLL BE CYCLED AT INTERVALS OF 24 · 6 HOURS. THE CAMERAS AND SDS 5YSTEM MILL BE ACTIVATED TO MONITOR THESE FUNCTIONS. DURING ALL SPS POWERED FELGHT PHASES, THE PC WILL BE PLACED IN THE "BOOST" MODE AND THE MC IN THE "STANDBY" MODE WITH IMAGE MTM "GFF". THE PC LENS STOW POSITION WILL BE VERIFIED PRIOR TO SIN DOOR JETTISON AND PRIOR TO INITIATING THERMAL PRECONDITIONING OF THE PC. ADDITIONAL STOW VERFICATION WILL BE SCHEDULED AS REQUIRED.

A. THERMAL MONITORING AND THERMAL MANAGEMENT OF THE SIM BAY.

PERIODIC ADVANCENENT OF THE PANORAMIC AND MAPPING CAMERA FILM.

PRIOR TO SIM DOOR JETTISON THE SIM EXPERIMENTS AND SCIENTIFIC DATA SYSTEM (SOS) WILL BE POWERED AS REQUIRED TO SUPPORT THE FOLLOWING FUNCTIONS:

RESCHEDULING OF EXPERIMENT OPERATION IF REQUIRED DUE TO EXCESSIVE CONSUMBLES: SAGE (RCS, PM, ETC.) OR ADDIQUOUS EXPERIMENT OPERATION WILL BE ACCOMPLISHED WITHIN THE GUIDELINES OF THE EXPERIMENT PRIORITIES. LUNAR ORBIT SIN BAY EXPERIMENTS ARE LISTED BELOW IN THEIR ORDER OF PRIORITY.

B. SM ORBITAL PHOTOGRAPHIC TASKS C. IR SCANNING RADIOMETER (ISR) D. FAR UV SPECTROMETER (UVS)

A. LUNAR SOUNDER

4. A PC PHOTO SEQUENCE WILL NOT EXCEED 30 MINUTES THE MC WILL BE PLACED IN "STANDBY" PRIOR TO THE FIRST CAPERA DOFERTION TO ALLOW FOR THERMAL STABILIZATION. THE MC WILL REMAIN IN STBY BETWEEN PHOTO PASSES. THE PC HEATERS WILL BE ENABLED PRIOR TO THE FIRST COMERA DEPEATION TO ALLOW FOR THERMAL STABLIZATION. THE PC HEATERS WILL REWAIN ENABLED BETWEEN PHOTO PASSES.

IN THE EVENT OF EXCESSIVE GN2 USAGE, THE OPERATION OF ONE CAMERA WILL NOT BE TERMINATED TO SAVE GNZ FOR THE OTHER CAMERA. TOTAL FAILURE OF THE GN2 SYSTEM WILL NOT PRECLUDE ATTEMPTS TO OPERATE THE MC AND PC.

THE IMAGE NOTION RATE ON THE MC WILL BE ADJUSTED TO MINIMM ERROR FOR THE ORBIT OF OPERATION. IF CORONA IS DETECTED IN AN EXPERIMENT AND IS DEGRADING ONLY THAT EXPERIMENT, THAT EXPERIMENT'S OPERATION WILL NOT BE TERMINATED FOR THE MISSION BELL MAY BE RESCHEDILED TO WALFILZE THE SCIENTIFIC RETURN.

ALL EXPERIMENT COVERS WILL MORMALLY BE CLOSED FOR THE FOLLOWING CONDITIONS AFTER SIM DOOR JETTISON:

A. ACTIVATION OF SM RCS JETTS AZ, A4, B1, or B4 C. WATER AND URINE DUMPS* SPS BURNS

D. FUEL CELL PURGES*

VIOLATION OF THE SUN-AVOIDANCE CONSTRAINTS *N/A TO UVS COVER AFTER 2 DAYS IN CIRCULAR LUNAR ORBIT. CSM EVAPORATOR OR LM SUBLIMATOR OPERATION*

STOP DEG LONG.

START DEG LONG.

REV NO. 180

10. THE PC PHOTO SEQUENCES LISTED BELOW AND ALL PT PHOTOGRAPHY WITHIN 10° OF THE SUBSOLUEAR POINT WILL BE TERMINATED FOR A PC FAD LENS TEMP SEARCHES THAN 112° F, ALL OTHER PC PHOTO SEQUENCES WILL BE TERMINATED FOR A PC FAD LENS THEP GREATER THAN 105° F.

6. SM RCS THRUSTERS A2, A4, B1, AND B4 WILL BE DISABLED DURING ALL EXPERIMENT OPERATIONS.

A FAILURE OF ANY EXPERIMENT COVER OR EXTENSION MECHANISM WILL NOT PRECLUDE AN EVA FOR FILM RETRIEVAL 7. WATER AND URINE DUMPS WILL BE INHIBITED FROM 3 HOURS BEFORE UNTIL IMMEDIATELY AFTER PC AND MC OPERATIONS.

THERE ARE THREE ACCEPTABLE CUES ON ANTENNA POSITION.
THESS ARE THE APPROPEDIST TALRBACK THOUSTONG, VISUAL
VERFICKATION FROM AN UNDOOCKED U., AND THE ANTENNE SAFE
STORAL ON THEIREFIREY. ANY ANTENNA THACK AND THE
VERFIELS AS RETRACTED BY ONE OF THESE NEARS VILL BE
ASSUMED TO BE EXTENDED BE FOR THE SYS BURN LIMIT.

SIM BAY HARDWARE REDLINES WILL NOT BE VIOLATED IN THE PHRSUIT OF SCIENCE OATA UNESS THE DATA BEING COLLECTED IS JUDGED TO BE WORE IMPORTANT THAN ALL SUBSEQUENT DATA. 10.

A "NO-GO" FOR LOI WILL NOT PRECLUDE SIM BAY DOOR JETTISON.

12. AN ATTITUDE DEADBAND OF 0.5 DEGREES WILL BE USED DURING THE FOLLOWING OPERATIONS: A ALL CAMEDA ADEDATIONS

B. MANDATORY LASER ALTIMETER OPERATION

C. HF AND VHF ACTIVE SOUNDING MODES

D. UVS INERTIAL ATTITUDE HOLD TARGETS

A DEADBAND OF 3.0 DEGREES MAXIMUM WILL BE USED FOR ALL OTHER EXPERIMENT OPERATION.

(4) PRIOR TO SIM DOOR JET, THE UPPER NONOPERATING LIMIT IS | IMIT IS 100° F.

1). LA OPERATION WILL NOT BE ATTEMPTED WITH THE MC/LA DOOR CLOSEO. 12. IF EXCESSIVE TRAVEL TIMES ARE DETECTED DURING MC/LA POSITIONING, SUBSEQUENT CYCLES FOR CONTAMINATION PROTECTION WILL BE DELETED.

13. IF THE LASER ALTHETR LIFETIME IS JUDGED TO BE ROWER THAT THE REMAINEM MISSION REQUIREMENT, THE LA OPERATING POPTILE MILL BE REDACED TO INSUME COVERAGE OF PRIORITY QUBECTIVES.

REV

	FA	FAR ULTRAVIOLET SPECTROMETER	
CONDITION / MALFUNCTION	NO	TLC	LUNAR ORBIT/TEC
1. SIM TEMP	<180° F	APPLY POWER TO SPECTROMETER	
SL12xx	> TBD° F	GO TO COLD SOAK ATTITUDE	
2. SPECTROMETER TEMPS	< 35° F	LEAVE SPECTRO	LEAVE SPECTROMETER POWERED
SL1101T OR SL1102T	>180° F	POWER DOWN S	POWER DOWN SPECTROMETER (2)
3. CORONA IN THE UVS		TURN OFF SPECTROMETER	ENHANCE OPERATING ENVIRONMENT
4. SUN APPROACHING FIELD-0F-VIEW	,		CLOSE SPECTROMETER COVER
2 A T G T.C.C.C.	CLOSED		OPERATE TO OBTAIN ENGINEERING DATA
S. COVER FAILS	OPEN		MINIMIZE DUMPS, PURGES,

			INFRARED SCANNING RADIOMETER	
CONDITION/MALFUNCTION	FUNCTION		TLC	LUNAR ORBIT/TEC
1. SIM TEMP	(<t80° f<="" td=""><td>APPLY POWER TO RADIOMETER</td><td></td></t80°>	APPLY POWER TO RADIOMETER	
SLXXXXT	9	> 780° F	GO TO COLD SOAK ATTITUDE	
2. PRIMARY MIRROR TEMP		<15°F	LEAVE RADIOMETER POWERED	TER POWERED (
SL1129T		>122°F	POWER DOWN	POWER DOWN RADIOMETER (3)
3. SUN APPROACHING FIELD-OF-VIEW	OF-VIEW			CLOSE RADIOMETER COVER
A CONTRACTOR OF		CLOSED		OPERATE TO OBTAIN ENGINEERING DATA
4. COVER PRIES		OPEN		MINIMIZE DUMPS, PURGES, AND JET FIRINGS

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	LUNAR ORBIT/TEC			ENABLE OPTICAL RECORDER HTRS	REMOVE PWR FROM OPTICAL (4) RECORDER HTRS	APPLY STBY PWR TO CSAR	REMOVE PWR FROM CSAR	TERMINATE ACTIVE SOUNDER OPERATIONS (5)	TERMINATE SOUNDER OPERATION IN THE HF MODE	TERMINATE SOUNDER OPERATION IN THE VHF MODE	TERMINATE ACTIVE SOUNDER OPERATION (5)	TERMINATE ACTIVE SOUNDER OPERATION (5)	TERMINATE ACTIVE SOUNDER OPERATION (5)	TERMINATE SOUNDER OPERATION IN HF MODE	TERMINATE SOUNDER OFERATION IN VHF MODE	RESCHEDULE VHF OPERATIONS	PERFORM FLIGHT PLAN ON LBR		LUNAR ORBIT/TEC	OPERATE IN DEGRADED MODE
LUNAR SOUNDER	TLC	APPLY STBY PWR TO CSAR AND OPTICAL RECORDER	GO TO COLD SOAK ATTITUDE	ENABLE OPTICA	GO TO COLD SOAK ATTITUDE	APPLY STB	GO TO COLD SOAK ATTITUDE											HF ANTENNAS	71.0	OPERATE IN DI
		<tb0° f<="" td=""><td>> TB0° F</td><td>< TBD* F</td><td>>180°F</td><td><tbd* f<="" td=""><td>>180°F</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>нся</td><td>HBR TM</td><td></td><td></td><td></td></tbd*></td></tb0°>	> TB0° F	< TBD* F	>180°F	<tbd* f<="" td=""><td>>180°F</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>нся</td><td>HBR TM</td><td></td><td></td><td></td></tbd*>	>180°F									нся	HBR TM			
	CONDITION/MALFUNCTION	1. SIM TEMP (1)	341206	111100 VO 11 110 C	TEMP SL1275T	3. CSAR INTERNAL	TEMP 5L1256T	4. FILM MOTION FAILURE	5. LOSS OF PRF-1 AND PRF-2	6. LOSS OF PRF-3	7. CLOCK FAILURE	8. LOSS OF OSC FREQ LOCK	9. LOSS OF VIDEO	10, HF RF PWR OUTPUT < TBD	11. VIII RE PWR CUTFUT <tod< td=""><td>12 FM (NTO I S (SO) ATED TO</td><td></td><td></td><td>CONDITION/MALFUNCTION</td><td>1. FAILURE TO FULLY EXTEND</td></tod<>	12 FM (NTO I S (SO) ATED TO			CONDITION/MALFUNCTION	1. FAILURE TO FULLY EXTEND

JETTISON PRIOR TO NEXT SPS BURN

2. FAILURE TO RETRACT SAFE DISTANCE

NOTES

THIS RULE ONLY APPLIES TO PRE SIM DOOR JETTISON PHASE

THE SPECTROMETER WILL BE POWERED DOWN IF THE TEMPS GET ABOVE 125° F AND VALID DATA IS NOT BEING COLLECTED. THE MADIONEYER WILL BE POWERED DOWN IF THE TEMPS GET ABOVE 100° F AND VALID DATA IS NOT BEING COLLECTED. <u>-00 0 00</u>

IF TEMP CONTINUES TO INCREASE, COLD SOAK WILL BE REQUIRED. OPERATING MODE WILL BE LIMITED TO RECEIVE-ONLY MODE.

REV

PRIOR TO SIM DOOR JETTISOH THE SIM EMPERIMENTS AND SCIENTIFIC DATA SYSTEM (SOS) WILL BE POWENED AS REQUIRED TO SUPPORT THE FOLLOWING FUNCTIONS:

A. THERNAL MONITORING AND THERMAL MANAGEMENT OF THE SIM BAY.

RESCHEDULING OF EXPERIENT OPERATION IF REQUIRED DUE TO EXCESSIVE CONSYMBALES STAGE (FIGS. 1979, ETC.) OR ANOMALOUS EXPERIENT TO PEDATION WILL BE ACCOMPLISHED WITHIN THE QUIDILINES OF THE EXPERIENT PROPRETIES.

2.

8. PERIODIC ADVANCEMENT OF THE PANORAMIC AND MAPPING CAMERA FILM.

LUNAR ORBIT SIM BAY EZPERIMENTS ARE LÍSTED BELOM IN THEIR ORDER Of priority.

SM ORBITAL PHOTOGRAPHIC TASKS C. IR SCANNING RADIOMETER (ISR) D. FAR UV SPECTR METER (UVS)

A. LUNAR SOUNDER

LUNAR SOUNDER

- SIM BAY JET COMFIGURATION WILL BE INITIATED A MINIMUM OF 30 MINUTES PRIOR TO OPTICAL RECORDER OPERATION. 2.
- ALL OTHER SIM BAY EXPERINENTS AND THE SDS WILL BE POWERED DOWN DURING SOUNDER OPERATIONS.
- THE LS TRANSMITTERS WILL HOT BE OPERATED HITHIN 100 FEET OF AN UNSTAGED L/M.
- A CSM CONFIGURATION WILL BE ESTABLISHED FOR THE ENI TEST AND LS DEPERATION. WO CONFIGURATION CHANGES WILL BE MADE TO BESOLVE HILL REPAGE TIEL COMMUNICATIONS SYSTEMS.

THERE ARE THREE ACCEPTABLE CUES ON ANTENNA POSITION. THE SE ARE THE APPROPARET FINEMENT INTOLLINEN WYSHE WISHERSTON FROM AN UNDOISED LAN AND THE MATERNA SAFE SIGNAL ON WISHERINEN ANT ANTENNA THAI CAMEN OF VERTICAL ON SEFFACIED TO NEW OF THISE PRAYS WILL BE ASSUMED TO BE EXTENDED BEYOND THE SYS DURM LIMIT.

SM RCS THRUSTERS A2, A4, B1, AND B4 WILL BE DISABLED DURING ALL EXPERIMENT OPERATIONS.

*N/A TO UVS COVER AFTER 2 DAYS IN CIRCULAR LUMAR ORBIT.

E. VIOLATION OF THE SUN-AVOIDANCE CONSTRAIRTS F. CSM EVAPORATOR OR LM SUBLIMATOR OPERATION*

C. MATER AND URINE DUMPS*

SPS BURNS

D. FUEL CELL PURGES*

WATER AND URINE DUMPS WILL BE THHIBITED FROM 3 HOURS BEFORE UNTIL IMMEDIATELY AFTER PC AND MC OPERATIONS.

A FAILURE OF ANY EXPERIMENT COVER OR EXTENSION MECHANISM WILL NOT PRECLUDE AN EVA FOR FILM RETRIEVAL.

SIM BAY HARDWARE REDLINES WILL NOT BE VIDLATED III THE PURSUIT OF SCIENCE DATA UNICESS THE DATA GEING COLLECTED IS JUDGED TO BE MORE IMPORTANT THAN ALL SHUSSEQUENT DATA.

10.

AN ATTITUDE DEADBAND OF 0.5" WILL BE USED DURING THE FOLLOWING OPERATIONS:

MANDATORY LASER ALTIMETER OPERATION D. UVS INERTIAL ATTITUDE HOLD TARGETS HE AND WHE ACTIVE SOUNDING MODES

A. ALL CAMERA OFERATIONS

1). A "NO-GO" FOR LOI WILL NOT PRECLUDE SIM BAY DOOR JETTISON. 12. AM AITITUDE DEADEAND OF O.S" WILL BE USED DURING THE FOLION

A DEADBAND OF 3.0 DEGREES MAXIMIN WILL BE USED FOR ALL OTHER EXPERIMENT OPERATION.

GENERAL

REV

THE EXPERIMENT COVER WILL REMAIN CLOSED FOR <u>TBO</u> MINUTES FOLLOWING A DUMP OF PURGE. INFARED SCANNING RADIOMETER

THE EAR THENT COVER WILL BE CLOSED FOR THE ACTIVATION OF RES JETS AZ, AA, BI AND BA OR WHENEVER THE SUN ENTERS THE SPECTBONETER FOX.

UNTIL THE CUMPLETION OF THE DAYS IN CLECILLAR GRBIT, THE EXPERIENT COVER WILL BE CLOSED FOR TOURYS AND PURGES. DIMPS AND PURGES AND PURGES MILL NOT BE SCHEDULED WITHIN 15 MINUTES OF THE START OF A DATA TAKE.

THE ISR SCAN DRIVE MOTOR WILL BE POWERED FOR SIM DOOR JETT.

A MINIMUM OF 2 MINUTES OF HBR/HF MODE DATA WILL BE COLLECTED BEFORE AND AFTER THE 2 REV HF ACTIVE MODE.

THE SQUINDER ROR AND OPTICAL RCDR WILL BE THERMALLY PRECONDITIONED PRIOR TO DATA COLLECTION. m;

THE HGA WILL BE POWERED DOWN DURING THE HF AND RECEIVE ONLY MODES

ALL EXPERIMENT COVERS WILL HORMALLY BE CLOSED FOR THE FOLLOWING CONDITIONS AFTER SIM DOOR JETTISOM:

A. ACTIVATION OF SM RCS JETS A2, A4, B1, OR B4

IF CORONA IS DETECTED IN AN EXPERIMENT AND IS DEGRADING ONLY DAY EXPERIENT'S OPERATION WILL NOT BE TEXHINGS ON THE HISSION BUT MAY BE RESCHEDULED TO MAKHIZE THE SCHEMITTE OF THE HISSION BUT MAY BE RESCHEDULED TO MAKHIZE THE SCHEMITTE RETURN.

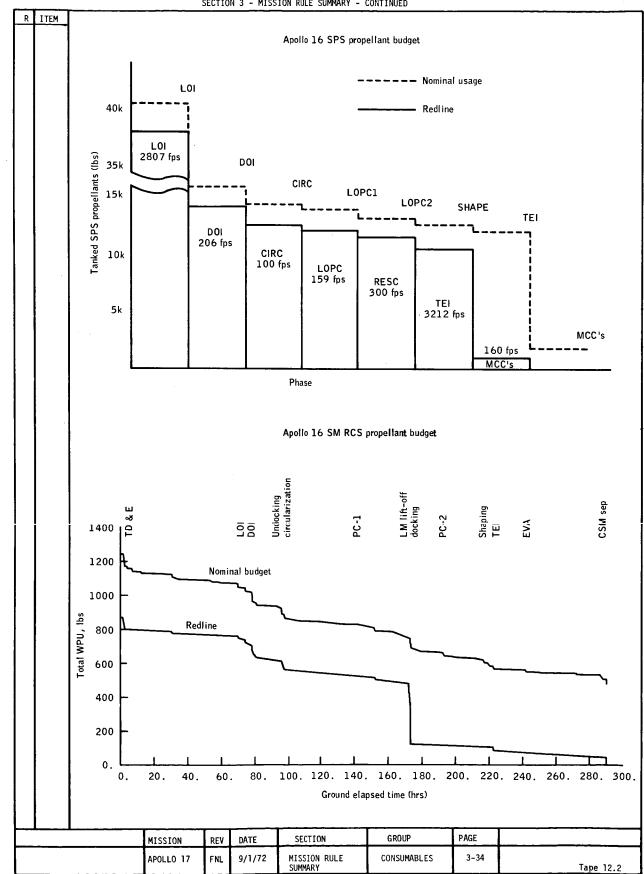
FAILURE OF THE HF ANTERNAS TO FULLY EXTEND WILL NOT PRECLUDE SOUNDER OPERATION IN THE HF AND LISTEM MODES.

THE OPTICAL RECORDER FILM WILL HOT BE TRANSPORTED WITH LESS THAN NO FEET OF FILM REMAINING.

MISSION RULES

_				SEC	TION 3 - M	IISSION RULE SUMMAR	- CONTINUED							
R	ITEM													
						CONSUMABLES			•					
	l					CONSUMBLES								
	3-90	SPS (APOLLO) 16 DATA)											
		<u> </u>	•											
									BIT, LANDING, LM RESCUE AND A					
				H. VI	OLATION OF	THE SPS REDLINE W	LL REQUIRE MNVR TE	RADE-OFFS A	S SHOWN IN FMR 5-34. THE SPS					
		REDLINE	INCLUDES:											
		LO			184 LBS	2807 FPS	•							
		DC			522 LBS	206 FPS								
			IRC		370 LBS	100 FPS								
			OPC 1 Escue		576 LBS 108 LBS	159 FPS								
		TE			542 LBS	300 FPS 3212 FPS	(NOMINAL RETURN,	cz unc)						
			C MCC		415 LBS	160 FPS	(3 SIGMA SCS C/O							
			NUSABLE		400 LBS	0 FPS	,= ====, 505 0/0	/ /						
		B. THE MIN	IMUM SPS RENI	JIREME	NTS FOR A		I ARE RASED ON A MI	NTMHM COLO	MISSION. THE SEQUENCE OF					
į		MANEUVE	ERS WOULD BE I	.0I 1	(60 X 170)	. LOI 2 (60 X 60).	TEL AND TEMO'S I	HE FOLLOWI	NG NUMBERS REPRESENT MINIMUMS					
		WITHOUT	RESPECT TO	ΓRAJEC	TORIES OR	OTHER VARIABLES AN	SHOULD BE USED AS	BASELINE	DATA ONLY.					
)I 1		267 LBS	2775 FPS								
)I 2		539 LBS	150 FPS								
		TE	I .		108 LBS	2650 FPS								
		TE	EMC'S	1	318 LBS	500 FPS								
		UN	IUSABLE		400 LBS	0 FPS								
		SM RCS (APOLLO 16 DATA) A. THE SM RCS REDLINE INCLUDES: 1. NOMINAL USAGE FROM LAUNCH THRU TD&E (75 LBS) 2. POST TD&E TO MCC-2. INCLUDES ALLOWANCE FOR ONE PTC, MANEUVER, TRIM & DAMPING FOR MCC-2. (26 LBS)												
j	i	2. POS	ST TD&E TO MC	C-2.	INCLUDES A	LLOWANCE FOR ONE P	C, MANEUVER, TRIM	& DAMPING	FOR MCC-2. (26 LBS)					
١		3. MCC	C-2 TO MCC-4.	INCL	UDES ALLOW	ANCE FOR TWO PTC'S	MANEUVER, TRIM AN	D DAMPING	FOR MCC-4. (25 LBS)					
ļ						USAGE (174 LBS)								
ı									AND TRIMS FOR CIRC AND PC-1.					
ļ	- 1						HAT REQUIRES ADDIT ALSO INCLUDED A		SECOND 4 JET ULLAGES, 1 FPS					
١	İ					M JETTISION AND SE		10011 10	SECOND 4 GET GEENGES, 1 173					
		7. TWO	REVS ATTITUD	E HOLI	D PLUS TEI	. INCLUDES ALLOWA	CE FOR ONE P52, UL	LAGE AND DA	AMPING (30 LBS)					
-	- 1					CUTOFF) (22 LBS)								
			CALLOWANCE (2		•	CM CED (20 100)								
						SM SEP (39 LBS)								
- [1								UNAR ORBIT AND PROVIDE A					
			TRANSEARTH FILES. THE LO				II KENLINE WILL RE	SULT IN TE	RMINATION OF LUNAR ORBIT					
Į							MTNAL TEC							
1						AGE AND DAMPING, NO A G&N TEI CUTOFF)	MINAL IEC BUDGET.							
			LDJ 20 	15.0 14	(3 31UM	n dan iti CUIUFF)								
		17	'4 LBS TOT	AL										
	İ													
		RULE NUMBER	S 3-92 THROUG	H 3-10	OO ARE RES	ERVED.								
			MISSION	REV	DATE	SECTION	GROUP	PAGE						
			APOLLO 17	FNL	9/1/72	MISSION RULE	CONSUMABLES	3-33						
			L.	L	L	SUMMARY			Tape 51.4					

MISSION RULES



MISSION RULES

SECTION 3 - MISSION RULE SUMMARY - CONTINUED

R	ITEM	
-		CSM BATTERY ENERGY AND CRYOGENIC O $_2$ AND H $_2$ (APOLLO 16 DATA)

THE FOLLOWING MINIMUM USABLE ENERGY/QUANTITIES MUST BE AVAILABLE TO INITIATE THE SPECIFIC PHASES.

		LAUNCH	LOI	UNDOCK	LO	PC	SHAPE MNVR	
					1	2		
BAT AMP-HOURS	3 BAT	90.8 ①	80.8	72.7	68.4	64.6	58.2	
REMAINING	2 BAT	56.1	47.1	43.4	42.2	41.0	38.1	
0 ₂ TOTAL LBS	3 TANKS	782	631	584	477	398	352	
H ₂ TOTAL LBS	3 TANKS	64.9	50.3	45.7	33.4	24.5	18.9	

ENERGY REQUIREMENT TO PERFORM NOMINAL MISSION WITHOUT CHARGER. REDLINE DOES NOT ALLOW PRE-LOI GIMBAL DRIVE CHECK OR BACKUP SPS BURN PREPS AND REQUIRES POWER DOWN OF ECS RADIATOR HEATERS OVERLOAD SENSING.

NOTES

- (A) PRELAUNCH BATTERY REDLINES ARE BASED ON FAILURE OF THE BATTERY CHARGER BEFORE ACCOMPLISHING ANY CHARGING.
- (B) THE TWO BATTERY REDLINES REFLECT THE ENERGY REQUIRED IN THE TWO LOWEST BATTERIES TO PROVIDE CAPABILITY FOR A SAFE RETURN FROM ANY POINT IN THE MISSION. THE REDLINES ARE BASED ON LOSS OF THE HIGHEST BATTERY SUBSEQUENT TO LOSS OF THE BATTERY CHARGER WITH A TWO-BATTERY ENTRY (WITH G&N) AND 12 HOURS OF POSTLANDING TIME.
- (C) IF RESCUE IS REQUIRED, THE THREE-BATTERY ENERGY REQUIREMENTS WILL BE RECOVERED BY POWERING DOWN TO A TWO-BATTERY G&N ENTRY.
- (D) AUX BAT ENERGY IS NOT INCLUDED IN BAT REDLINES.
- (E) CONSIDERATION WILL BE GIVEN TO PERFORMING SPS BURNS WITHOUT BATTERY SUPPLEMENT IF REDLINE NOT MET.
- (F) CRYOGENIC REDLINES ARE BASED ON CAPABILITY TO PERFORM NOMINAL MISSION WITH CAPABILITY TO RETURN TO EARTH AT A 40 AMP AVERAGE POWER LEVEL AFTER LOSS OF ANY CRYO TANK AT THE WORST CASE TIME FOR FAILURE.
- (G) THREE-TANK CRYOGENIC REDLINE IS BASED ON THE TOTAL QUANTITY REQUIRED TO PERFORM NOMINAL LENGTH MISSION.

RULE NUMBERS 3-102 THROUGH 3-110 ARE RESERVED.

<u> </u>						
MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO	17 FNL	9/1/72	MISSION RULE SUMMARY	CONSUMABLES	3-35	Tape 51.5

LM CONSUMABLE REQUIREMENTS / MANAGEMENT TELMU

9/1/72

B. REDLINES

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NOMINAL AND ALTERNATE ENA'S--PLSS AMP-HOURS, $\mathbf{0_2}$, LIOH, AND $\mathbf{H_2O}$ REQUIRED FOR 30 MIMUTES OF POST EVA RESERVE.

C. EXCURSION CONSTRAINTS

FROM UNDOCKING TO TOUCHDOMN, THE MINIMUM REQUIREMENTS ARE BASED ON THE TIME TO COMPLETE A LANDING, A 24.5-MR STAY WITH ONE EYA, ASCENT, AND A 2.0-HR RENDEZYOUS THROUGH CREW TRANSFER, A 2-HR ORBITAL CONTINGENCY, AND REDWINMAT ASCENT EPS SOURCES FOR THE RENDEZYOUS.

EPS AND ECS MINIMUM CONSUMABLE REQUIREMENTS

..:

REV

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THE TIME TO COMPLETE A LANDING AND THE 24.5-HR LUMAR STAY MAY BE SUPPORTED BY ANY COMBINATION OF DESCENT AND ASCENT CONSUMBBLES. IN ADDITION, EACH ASCENT BATTEN, ONE H₂O TAMK AND ONE ASCENT O₂ TAMK (THE LH CABIN IS CONSIDERED A REDUNDANT O₂ SOURCE) MASI CONTAIN THE CONSUMBBLES REQUIRED FOR LIFTOFF AND A 2.0-HR REMEZONUS THROUGH CREW TRANSFER. THE 2-HR CONCERNED, IS CONSIDERED TO BE SATISFIED BY THE REDUNDANCY REQUIREMENT. SHOULD THAN ASCENT H₂O TAMES BE AMAILABLE, THE REQUIREMENT FOR LIFTOFF THROUGH CREM TRANSFER CAPABILITY IN EACH TAMK MILL SATISFY THE 2-HR OBBITAL CONTINGENCY. IF ONLY ONE TAMK IS AVAILABLE, IT MIST ALSO INCLUDE THE 2-HR CONTINGENCY.

PLSS, USING BSLSS AND OPS IN LOW PURGE FLOW. 8

THE WALKBACK RETURN TRAVERSE CAPABILITY REPRESENTS A PARTICULAR CONSUMBLE CONSIDERING A WALKBACK RETURN RATE OF 3.6 KM/HB FOR DISTANCES -3.6 KM MO. 2.7 W/HB FOR DISTANCES -3.6 KM. THE SSLSS RIDERACK RETURN TRAVESSE CAPABILITY REPRESENTS 5 HIN FOR BSLSS ACTIVATION AND AN LRY RATE OF 7.3 KM/HB.

Ξ

FOR THE REMAINDER OF THE LUMAR STAY, THE MINIMM DESCENT STAGE REQUIREMENTS
ARE BASED ON THOSE CONSUMBLES REQUIRED FOR THE SCHEDULED ACTIVITIES
DURING EACH DEFINED PHASE, AN ASCENT PREPARATION, AND A 2-HR SUBFACE
RESERVE. THE LAST 4 HOURS OF THIS REQUIREMENT FOR EPS MUST BE SPLIT-BUS
OPERATION. ASCENT STAGE MINIMM REQUIREMENTS ARE AS STATED ABOVE.

FOR A TWO-MAN WALKING TRAVERSE THE FOLLOWING WILL APPLY:

5

FOR THE RENDEZVOUS, THE MINIMUM REQUIREMENTS ARE THOSE CONSUMBRES SHOULD NECESSARY TO SUPPORT A LH-ACTIVE RENDEZVOUS THROUGH CREN TRANSFER. SHOULD THESE MINIMUM REQUIREMENTS BE VIOLATED, THE LM MILL BE POWERD DOWN MHILE THE CAS RECOMES THE ACTIVE VEHICLE. HOMEVER, THE LM MILL BE POMERED UP TO PERFORM BRAKING MITH SUFFICIENT CONSUMBLES BEING RETAINED FOR THIS PURPOSE

ن

(A) EVA EXCURSIONS WILL BE LIMITED TO A BSLSS WALKBACK CAPABILITY USING THE OPS IN LOW PURGE FLOW. WITH NO BSLSS, THE EVA EXCURSIONS WILL BE LIMITED, ALLOWING LM RETURN USING THE OPS IN HIGH PURGE FLON. (8)

e,

THO POUNDS OF DXYGEN CONTAINED IN THE LM CABIN AT 5.3 PS.IA WILL BE CONSIDERED AMAILABLE IN CALCULATING MINIMUM O₂ REQUIREMENTS. THE CABIN CAN BE CONSIDERED, WHEN DISCUSSING FUNCTIONAL PRESSURE YESSEL REQUIREMENTS, AS A BACKUP TO THE ASCENT O₂ TAMKS.

ASSUMING NO PLSS FAILURES.

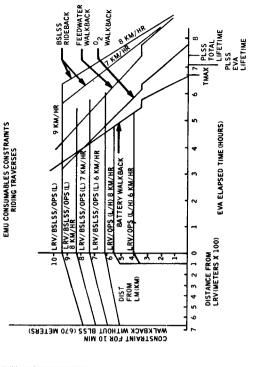
FOR A ONE-MAN WALKING TRAVERSE THE FOLLOWING WILL APPLY:

EVA EXCURSIONS WILL BE LIMITED TO ALLON WALKBACK TO THE LM, UTILIZING THE OPS IN HIGH PURGE FLOM.

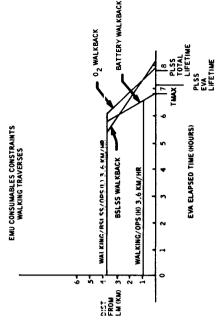
E SUPPORT UNITS
RIFIED TO HAVE
15 MIN LIFETIME;

BOTH PLSS'S AND OPS WILL BE RETAINED UNTIL THO LIFE (2 OPS, 2 PLSS'S OR 1 PLSS AND 1 OPS) HAVE BEEN VERI SUFFICIENT CONSUMABLES TO SUPPORT CEVA (MINIMAM OF 1

OPS IN HI FLOW)







(2) THE WALKING/OPS (H) RETURN TRAVERSE CAPABILITY REPRESENTS AN OPS HIGH PURGE FLON RATE OF <u>7.8</u> LBS/HR FOR THE TIME REQUIRED FOR THE WALKING RETURN TRAVERSE.

(1) THE WALKING/BSLSS/OPS (L) RETURN TRAVERSE CAPABILLITY REPRESENTS AN OPS LOW PURGE FLOW RATE OF 4_O LB/HH, 5 MIN FOR BSLSS ACTIVATION, AND THE TIME REQUIRED FOR THE WALKING RETURN TRAVERS.

PARTICULAR CONSUMBLE USED AT A CONTINGENCY RATE AT THE 3.6 INVINE RETURN WALKING RATE.

THE PRENTSSION ESTIMATES USED IN DEFINING THE OPERATIONAL ENVELOPE, BSLSS RIDGENCK AND NOOWAL RIDGENCK LINITS, WILL BE UPDATED AS NECESSARY DIRING THE TRAVERSE BASED ON A REAL-TIME ASSESSMENT OF MOBILITY AND CONSUMABLES. PLSS TOTAL LIFETIME. - THE MAXIMUM PLSS LIFETIME ANALIABLE AS AFFORDED BY THE MOST CONSTRAINING CONSUMBBLE. IT IS DETERMINED BY DIVIDING THE CONSUMBBLE USE RATE,

PLSS EVA LIFETIME - THE MAXIMUM POSSIBLE EVA TIME AS AFFORDED BY THE MOST CONSTRAINING PLSS CONSUMBLE. IT IS DETERMINED BY SUBTRACTING 30 MINUTES (POST-EVA RESERVE) FROM THE TOTAL PLSS LIFETIME. TMAX - THE EYA TIME AT MAICH THE CREMANN MUST BE AT THE LM AS LIMITED BY THE MOST CONSTRAINING PLSS CONSUMBLE. FOR A RIDING TRAVERSE, IT IS DETEMINED BY SUBTRACTING TO MINUTES (LAY EQUIPMENT ASSEMBLY TIME)
AND 13 MINUTES (LM INGRESS TIME) FROM THE PLSS EVA LIFETINE. FOR A
MALKING TRAVERSE, IT IS DETERMINED BY SUBTRACTING 13 MINUTES (LM
INGRESS TIME) AND 5 MINUTES (BSLSS HOOKUP TIME) FROM THE PLSS EYA

REV

(A) RIDING TRAVERSES Ê

THE LRV/BSLSS/OPS (1) RETURN TRAVERSE CAPABILITY REPRESENTS AN OPS LOW PURGE FLOW RATE OF 4.0 LBS/HR. THE REQUIRED FOR MALKBACK TO THE LRY AT 4.0 RV/HR. 5 MINUTES FOR BSLSS ACTIVATION. AND THE TIME REQUIRED FOR LRY RETURN TRAVERSE AT 7.3 RV/HR.

THE LRV/OPS (L/H) RETURN 'RAVERSE CAPABILITY REPRESENTS AN OPS

(2)

LO PUNGE FLOM RATE OF 4.0 LBS/MR FOR WALKBACK TO THE LRY (< 100 METERS) AT 4.0 KN/HR, AND THE LRY RETURN TRAVERSE AT 7.3 KN/HR, AND AN OPS HI PUNGE FLOW RATE OF 7.8 LBS/HR FOR

AN ARBITRARY 10 MIN PAD WILL BE IMPOSED DURING

THE LOW PURGE FLOW PHASE.

(3)

EVA EXCURSION LIMITATIONS ARE A FUNCTION OF TRAVERSE WODES (RIDING OR MALKING), NUMBER OF EVA CREMMAN, EVA EQUIPMENTS AVAILABLE, AND PLSS CONSUMABLES REMAINING.

FOR A TWO-MAN RIDING TRAVERSE THE FOLLOWING WILL APPLY:

(A) EVA EXCURSIONS WILL BE LIMITED TO ALLOW WALKBACK FROM A FAILED LRY ASSUMING NO PLSS FAILURES.

EVA EXCURSIONS WILL BE LIMITED TO ALLOW RIDEBACK WITH A FAILED

EVA EXCURSIONS WITHOUT THE BSLSS (OR IF THE BSLSS IS BEING USED) WILL BE LINITED ALLOWING WALKBACK TO THE LRY (< 100 METERS) AND RIDING ON LRY USING OPS LOW PURGE FLOW AMO ALLOWING 13 MIN AT HIGH PURGE FLOM FOR INGRESS. AN ARBITRARY 10 MIN FAD WILL BE INFOSED FOR THE LOW PURGE FLOW PHASE.

(B) WALKING TRAVERSES

FOR A ONE-MAN RIDING TRAVERSE THE FOLLOWING WILL APPLY:

(A) EVA EXCURSIONS WILL BE LIMITED TO WALKBACK FROM A FAILED LRY

EIM EXCLUSIONS WILL BE LIMITED TO MILINA MAURAMENT TO LINY (\$ 100 MITERS) AND RIDING ON THE LAY USING OPS LOW PURSE FLOW AND ALLOWING 13 MIN AT HI PURGE FLOW FOR THIGRESS. AN ARBITRARY 10 MIN PAD WILL BE IMPOSED FOR THE LO PURGE FLOW PUACE.

AMP-HRS, 0₂, LIOH AMD H₂O QUANTITIES REQUIRED TO COMPLETE EVA PREP, EVA, PLUS THE VALUES REQUIRED FOR 3O MINUTES OF POST EVA RESERVE.

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1. NOMINAL AND ALTERNATE EVA'S

EMU CONSUMABLE REQUIREMENTS

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ALL EMERGENCY RETURNS ARE CONSTRAINED BY THE 300 BTU MAXIMAM CREMAN HEAT STORAGE AND THE 13 MINUTES REQUIRED FOR TERMINATION AND INGRESS. ALL RIDING AND MALKING RATES ARE UNCORRECTED MAP RATES.

LM CONSUMABLE REQUIREMENTS/ MANAGEMENT CONTROL

9/1/72

REV

- I. RCS CONSUMABLE REQUIREMENTS
 - A. GO/NO-GO'S

THE GO/NO-GO FOR EACH MISSION PHASE IS DEFINED AT THE QUANTITY REQUIRED FOR COMPLETION OF THE NOMINAL MISSION TO DOCKING PLUS OPS RESERVE. ALL GO/NO-GO'S ARE THE AVERAGE OF SYSTEM A AND B.

B. REDLINES (AN "X" INDICATES THAT PROPELLANT IS REQUIRED FOR THE FUNCTION LISTED)

REDLINES	DOCKING	LONGEST ABORT RNDZ (DPS)	STAGING	BRAKING	ASCENT	LONGEST LOS FOR CSM RESCUE	TWEAK	1 REV CSM RNDZ	OPS RESERVE
UNDOCKING TO CIR	Х								X
CIRC TO PDI	х	Х	х	Х					Х
PDI TO T/D	Х			Х	х	Х			х
LUNAR STAY	Х			Х	х	Х			х
ASC TO TWEAK	Х		-		х		Х	X	Х
TWEAK TO TPF	Х				1			Х	Х
TPF TO DOCKING			······································						х

ALL REDLINES REQUIRE A PERCENT READING ON EACH INDIVIDUAL SYSTEMS GAGE (OR AN EQUIVALENT OF PROPELLANT IF THE GAGE HAS FAILED) EQUAL TO OR GREATER THAN THE REDLINE VALUE.

C. OPS RESERVE

- AFTER COMMITTING TO A RENDEZVOUS BUT PRIOR TO TPF, THE OPS RESERVE IS THAT QUANTITY OF RCS PROPELLANT REQUIRED FOR ONE REV OF LOS TRACKING OF THE CSM (LM STAGED) OR 2.5 PERCENT.
- 2. AFTER TPF, THE OPS RESERVE IS THAT QUANTITY OF RCS PROPELLANT REQUIRED FOR A CSM ACTIVE DOCKING OR 1.0 PERCENT.
- II. PROPULSION PROPELLANT GAGING
 - A. DPS
 - 1. PRIME METHOD--PQGS TM AND ONBOARD (1.3 PERCENT).
 - 2. BACKUP METHOD--GROUND MASS CALCULATION (3 PERCENT)
 - B. APS
 - 1. PRIME METHOD--APS QUANTITY FROM LGC MASS CALCULATION (3 PERCENT)
 - 2. BACKUP METHOD-- FLOW RATE TIMES ELAPSED TIME (5 PERCENT)
 - C. RCS
 - 1. PRIME METHOD--GROUND RCS PROGRAM (6 PERCENT)
 - 2. BACKUP METHOD--PQMD (ONBOARD READOUT 13 PERCENT, GROUND READOUT 10 PERCENT)
- III. CONSUMABLES MANAGEMENT
 - A. RCS

THE RCS SYSTEM SHOULD BE CROSSFED WHEN NECESSARY TO INSURE NEITHER SYSTEM EXCEEDS ITS RCS CONSUMABLE REDLINE.

MISSION RULES

SECTION 4 - GROUND INSTRUMENTATION REQUIREMENTS

R	ITEM								
						GENERAL			
	4-1	GENERAL							
	<u>.</u>					DEFINE THE MCC/MSFN FICER REQUIREMENTS			MET BEFORE A "GO" IS
		SOFTWARE		UIRED	TO PROVIDE	THE MANDATORY FUNC			EM, THE HARDWARE AND/OR OR OPERATIONAL
		C. WHERE RED	DUNDANCY EXIST	'S FOR	MANDATORY	ITEMS, A BACKUP CAP	PABILITY IS CONSID	ERED HIGHL	desirable.
	1					NOTE			
						OUS EQUIPMENT LISTIN			
1						ARE TO BE UTILIZED A 「 IS MANDATORY, PRIC			
						G THE MISSION TO LA			
					ABLE TO:		•		
					A. RECEI	IVE AND DISPLAY TELE	METRY AND		
						KING DATA	,		
1						TAIN VOICE COMMUNICA	ATIONS WITH		
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			APOLLO 17	FNL	9/1/72	GROUND INSTR REQUIREMENTS	GENERAL	4-1	Tape 13.1

MISSION RULES

	T							
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
i					MCC			
	i							
	4-2	TELEMETRY						
		A. CONSOLE DISPLAY	PRELAUNCH	MANI	DATORY		A. FOR DISPLAY (OF MANDATORY S/V PARAMETERS
		(D/TV, EVENTS, ANALOGS)						
		B. PCM GROUND STATIONS (4)	PRELAUNCH	2 OI DES	F <mark>4 M</mark> ANDATORY, 2 HIG IRABLE	SHLY	B. FOR DISPLAY (DF MANDATORY S/V EVENTS AND
		C. RECORDING AND	PRELAUNCH		IRABLE			
		PLAYBACK 1. ALDS						
		2. MSFN						
	.							
	4-3	COMMAND			•			
		A. MOCR TOGGLE SWITCHES	PRELAUNCH	HIG	HLY DESIRABLE		A. FOR LAUNCH P	HASE ABORT REQUEST
		(BOTH A AND B) 1. BSE ABORT REQUEST						
		2. FIDO ABORT REQUEST 3. FD ABORT REQUEST						
		B. COMMAND PANELS:	PRELAUNCH	HI G	HLY DESIRABLE			
		INCO, GUIDO, BSE, CCATS						
		C. MOCR CONSOLE/SITE SELECT CAPABILITY	PRELAUNCH	HIG	HLY DESIRABLE			
		1. RTC CONSOLE (CCATS)						
		2. CCATS CMD CONSOLE MED						
	i	D. FC/M&O SWITCHING	PRELAUNCH	HIG	HLY DESIRABLE			
	 	CAPABILITY 1. CCATS		 				
		2. CCATS CMD MED						
	Ì	E. ABORT/CCATS TEST SWITCHING CAPABILITY	PRELAUNCH	HIG	HLY DESIRABLE			
		1. FD CONSOLE 2. CCATS CMD MED						•
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		APOLLO 17	7 FNL 9/	1/72	GROUND INSTR REQUIREMENTS	MCC	4-2	Tape 13.2
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MISSION RULES

R RULE CONDITION/MALFUNC		7							
RULE	CONDITION/MALFUNCTION	PHASE	<u> </u>	RULING		CUES/NOTES/COMMENTS			
4-4	TRAJECTORY								
	A. TRAJECTORY DATA PROCESSING					A. THE TRAJECTORY DATA SOURCES ARE UTILIZ AS FOLLOWS:			
	1. AVAILABILITY OF ONE INDEPENDENT	PRELAUNC	או או	IANDATORY		1. (A) INDEPENDENT VERIFICATION OF L/V NAVIGATION			
	TRACKING SOURCE (IPR, USB) FROM LIFTOFF TO T+10 MINUTES					(B) PROTECTION AGAINST VIOLATION OF LAUNCH ENVELOPE			
	2. IU AND CMC TM VECTORS FROM LIFTOFF TO INSERTION	PRELAUNC	н вот	TH MANDATORY		A. 2. REQUIRED FOR ORBIT GO/NO-GO			
	B. RTCC - DATA SELECT CAPABILITY	PRELAUNC	H MAN	IDATORY .		B. TO SELECT BEST AVAILABLE DATA SOURCE			
4-5	COMMUNICATIONS								
	A. MOCR:					A. FOR MISSION CONTROL			
	AFD CONF LOOP FD LOOP	PRELAUNC	H 1 C	DF 2 MANDATORY					
	MOCR DYN MOCR SYS 1 & 2 A/G 1 LOOP A/G 2 LOOP	PRELAUNC	H ALL	. HIGHLY DESIRABLE					
	B. MCC/LAUNCH COMPLEX:	PRELAUNC	н 1 с	OF 3 MANDATORY		B. FOR TERMINAL COUNT COORDINATION OF MCC-PAD ACTIVITIES			
	121 CLTC 111 CVTS 212 MSTC					MCC-PAD ACTIVITIES			
	C. MCC/RSO:	H 1 C	OF 3 MANDATORY		C. FOR TRAJECTORY VERIFICATION AND BOOSTE SAFING				
	FD LINE TO RSO RSO PRIVATE LINE CAPE 111 RSO LOOP								
	D. MCC/REMOTED SITES:	PRELAUNC	H MAN	NDATORY		D. USED FOR COMMUNICATION WITH CREW			
	ONE A/G PATH								
4-6	COMPUTER								
	A. MOC (IBM 360/75)	PRELAUNC	H MAI	NDATORY		TO PROCESS MANDATORY S/V PARAMETERS AND TRAJECTORY DATA			
	B. DSC (IBM 360/75)	PRELAUNC	н нто	GHLY DESIRABLE		AN SSC (IBM 360/75) IS AVAILABLE AS BACKU TO THE MOC OR DSC.			
	C. CCATS (UNIVAC 494)- ONLINE	PRELAUNC		MANDATORY AND 1 HIGH SIRABLE	_Y	TO THROUGH PROCESS MANDATORY S/V PARAMETERS TO MOC			
	CCATS (UNIVAC 494)- STANDBY								
4-7	TIMING								
	MITE (2)	PRELAUNCH 1 MANDATORY			MCC TIMING STANDARD TO SUPPORT MANDATORY RTCC/CCATS COMPUTERS				
<u> </u>		<u> </u>							
	MISSION		TE	SECTION	GROUP	PAGE			
	APOLLO 1	7 FNL	3/1/72	GROUND INSTR REQUIREMENTS	MCC	4-3 Tape 1			

MISSION RULES

SECTION 4 -	GROUND	INSTRUMENTATION	RECHITREMENTS -	CONTINUED

R	RULE	CONDITION/MALEUNCTION	PHASE	\neg		RULING		CHEC /M	TES /COMME	NTC		
^	RULE	CONDITION/MALFUNCTION	PHASE	\dashv		KULING		COF2/NO	OTES/COMME	C 1 M		
	4-8	MCC POWER										
		A. BUS A1	PRELAU	NCH	MANDA	ATORY		A. UNIN	TERRUPTABI	LE POWER FOR D/TV		
		B. BUS A2	PRELAU	NCH	HIGHI	LY DESIRABLE		ŀ		O VSM ON A2.		
		C. BUS Bī	PRELAU	NCH	HIGH	LY DESIRABLE				ERRUPTABLE POWER FOR THE		
		·						- ON	E-HALF MOO	HLY DESIRABLE ITEMS: CR CONSOLE POWER		
									CC CONSOLE	CONSOLES AND PLOTBOARDS ES (EXCEPT COMP SUP)		
		D. BUS B2	PRELAU	NCH	MANDA	ATORY		ONE-	HALF OF TH	TERRUPTABLE POWER FOR HE MOCR CONSOLE POWER, ALL OWER, AND ALL MOC DDD'S		
	4-9	DISPLAY				•						
		A. MOCR D/TV CHANNELS NO. OF POSITION CHANNELS	PRELAU	NCH	7 OF	40 MANDATORY		A. FOR IF D LOST	ISPLAY SWI	MANDATORY S/V PARAMETERS TCHING CAPABILITY IS ALSO		
		RETRO 1 FIDO 1 GUIDO 1						V:	IDO WILL F S V AND GA OARDS	REQUIRE 2 CHANNELS AND GAMM MMA (EI) VS V (EI) ON PLOT		
	!	EECOM 1 GNC 1 RTCC 1 BOOSTER 1						2. B	SE WILL RE	QUIRE 3 CHANNELS		
		B. TRAJECTORY DISPLAY										
		1. FDO LAUNCH DIGITALS	PRELAU	NCH	MANDA	ATORY ON D/TV		B. 1. F	OR CONTING ANEUVER DA	GENCY ORBIT INSERTION TA AND T _{FF} LIMITS		
		2. GAMMA VS V	PRELAU	NCH	MAND	ATORY ON 1 OF 4:				TED TRACKING DATA SOURCE		
	:				(B) 1 (C) 1	10 X 20 SCRIBER PLO D/TV RTCC PLOTBOARD SSR PLOTBOARD	TTER					
		3. RFO LAUNCH DIGITALS	PRELAUNCH MANDATORY ON D/TV						ONITOR FOR ANEUVER DA	R MODES III AND IB NTA		
		4. GAMMA(EI) VS V(EI)	PRELAU	NCH	MAND	ATORY ON 1 OF 2:		4. M	ONITOR FOR	R G-LIMIT VIOLATION		
					(A) I	D/TV SSR PLOTBOARD						
		5. PHI VS LAMBDA	PRELAU	NCH	` '	Y DESIRABLE ON 1 O	F 2:	5. M	ONITOR FOR	CROSS-RANGE LIMITS		
					RTCC PLOTBOARD SSR PLOTBOARD							
		6. T _{FF} VS R _{IP}	PRELAU	NCH		LY DESIRABLE ON 1 O	F 2:		ONITOR FOR	R ABORT MODES II, III,		
			(A) D/TV (B) SRR PLOTBOARD				(A) D/TV					
		7. H VS D					X 20					
		8. GAMMA(I) VS V(I) (CMC DYNAMIC STATUS)	PRELAU	NCH		LY DESIRABLE ON 10 . BER PLOTTER	X 10	 MONITOR FOR L/V AND S/C NAVIGATION PERFORMANCE (GUIDANCE SYSTEM ANALYSIS - COMPARES CMC WITH TRACKING) 				
		9. WEDGE ANGLE MONITOR	PRELAU	AUNCH HIGHLY DESIRABLE ON D/TV			V	9. MONITOR FOR L/V AND S/C NAVIGATION PERFORMANCE				
_		MISSION		DATE		SECTION	GROUP		PAGE			
		APOLLO 17	FNL	9/1/	/72	GROUND INSTR REQUIREMENTS	MCC		4-4	Tape 13.4		

MISSION RULES

R RULE CONDITION/MALFUNCTION PHASE RULING 4-9 10. GUIDO ANALOG CHART PRELAUNCH HIGHLY DESIRABLE ON TV THO THO	CUES/NOTES/COMMENTS
(CONT) RECORDERS ONE AND	
11. INSERTION/INJECTION PRELAUNCH MANDATORY ON D/TV DIGITALS	11. FOR G&N GO/NO-GO
C. ADEG CHANNELS 90-93 PRELAUNCH HIGHLY DESIRABLE	C. FOR DSC DISPLAYS
D. VSM PRELAUNCH MANDATORY	D. FOR D/TV. IF MANDATORY CHANNELS CAN BE DISPLAYED, THE VSM IS HD FOR LAUNCH PRO-
E. AUX VSM PRELAUNCH HIGHLY DESIRABLE	VIDED THE ETO IS LESS THAN 1 HOUR
F. EIDOPHORS (3) PRELAUNCH 2 HIGHLY DESIRABLE	
NOTE: INDIVIDUAL FLIGHT CONTROLLERS WILL BE RESPONSIBLE FOR REPORT- ING LOSS OF DISPLAY CAPABILITY OF MANDATORY PARAMETERS TO THE FLIGHT DIRECTOR.	
MISSION REV DATE SECTION GROUP	PAGE
APOLLO 17 FNL 9/1/72 GROUND INSTR REQUIREMENTS MCC	4-5 Tape 13.5

MISSION RULES

	GSFC A. GSFC UNIVAC-494 (2) COMMUNICATIONS PROCESSOR B. WBD (50.0 KBPS) LINES (2) BETWEEN MCC AND GSFC C. TTY CIRCUITS BETWEEN MCC AND GSFC	PRELAUNCE	GSFC/KSC/MSFN 1 MANDATORY	A. ONE UNIVAC-494 CAN PERFORM ALL NECESSAR
	A. GSFC UNIVAC-494 (2) COMMUNICATIONS PROCESSOR B. WBD (50.0 KBPS) LINES (2) BETWEEN MCC AND GSFC C. TTY CIRCUITS BETWEEN			A. ONE UNIVAR-494 CAN PEDENDM ALL MECECCARD
	A. GSFC UNIVAC-494 (2) COMMUNICATIONS PROCESSOR B. WBD (50.0 KBPS) LINES (2) BETWEEN MCC AND GSFC C. TTY CIRCUITS BETWEEN		1 MANDATORY	A. ONE UNIVAC-494 CAN DEDECOM ALL MECCCCADO
	A. GSFC UNIVAC-494 (2) COMMUNICATIONS PROCESSOR B. WBD (50.0 KBPS) LINES (2) BETWEEN MCC AND GSFC C. TTY CIRCUITS BETWEEN		1 MANDATORY	A. ONE UNIVAC-494 CAN PEDECODM ALL NECESCAR
	COMMUNICATIONS PROCESSOR B. WBD (50.0 KBPS) LINES (2) BETWEEN MCC AND GSFC C. TTY CIRCUITS BETWEEN		1 MANDATORY	A. ONE UNIVAC-494 CAN PEDECOM ALL MECECCAR
	LINES (2) BETWEEN MCC AND GSFC C. TTY CIRCUITS BETWEEN	PRELAUNCH	i e	FUNCTIONS, THE SECOND ONE IS BACKUP.
	C. TTY CIRCUITS BETWEEN MCC AND GSFC		1 MANDATORY	B. EITHER LINE CAN BE SWITCHED TO EITHER UNIVAC-494.
				C. VFTG PROVIDES TWO REDUNDANT 16 CIRCUIT TTY CHANNELS.
	1. OUTGOING	PRELAUNCH	1 OF 32 CIRCUITS HIGHLY DESIRABLE	1. FOR ACQ MSG, LS CMD
	2. INCOMING (JJ)	PRELAUNCH	1 OF 32 CIRCUITS MANDATO	DRY 2. FOR RECEPTION OF LOWSPEED RADAR DATA
4-11	KSC			
1 1	TELEMETRY:			
	A. VHF TM FROM THE FOLLOWING FOR S-II, S-IVB, AND IU:			A. THESE ANTENNAS CAN BE SWITCHED TO MILA CIF FACILITIES
	1. CIF ANTENNA 2. MILA VHF ANTENNA	PRELAUNCH	1 HIGHLY DESIRABLE	
	B. USB TM FROM THE FOLLOWING:			B. USB IS THE CSM'S ONLY SOURCE OF DATA.
	1. MILA USB 2. CIF USB	PRELAUNCH	1 MANDATORY	
	COMMAND:			
	THIS CAPABILITY IS DEFINED UNDER GSFC/ KSC/MSFN COMMAND RULE 4-12 FOR LAUNCH COVERAGE.			
.	TRACKING:			
	THAT CAPABILITY REQUIRED TO SATISFY RULE 4-4 (TRAJECTORY) IS MANDATORY.			
	VOICE COMMUNICATIONS:			
-	THIS KSC CAPABILITY IS DEFINED UNDER MCC RULE 4-5			
'	(COMMUNICATIONS).			
	MICCION	REV DATI	I CECATON:	
	MISSION APOLLO 17	1 1 1 1		GROUP PAGE SFC/KSC/MSFN

MISSION RULES

	4-12 LAURCH COVERAGE KSCAMSIN SITES (SITES NOT LISTED DUE TO VARIBLE LAURCH OF VARIBLE LAURCH STEP OF PRECISION AND PRECISION A	4-12 LAUNCH COVERAGE KSC/MSRN SITES (SITES HOT LISTED DUE TO VARIABLE LAUNCH AZIMUTH) MUST PROVIDE THE FOLLOWING CAPABILITIES ROW LIFTOFF THROUGH S-IVE CUTOFF. REFER TO DECISION MATRIX (RULE 4-17) TO DETERMINE CAPABILITY A. CMD CCS B. TELEMETRY S-IC (VHF) PRELAUNCH HIGHLY DESIRABLE S-IC DATA IS ONLY HIGHLY DESIRABLE S-IC MALFUNCTIONS. S-II (VHF) PRELAUNCH HIGHLY DESIRABLE FROM LIFTOFF TO S-IC CUTOFF (APPROX 9:17 SEC) S-IVB UHF (CP-1) PRELAUNCH IU CCS (DP-1B) IU VHF (DP-1) CSM (USB) PRELAUNCH AMODATORY FROM LIFTOFF THROUGH S-IVB CUTOFF C. TRACKING THAT CAPABILITY REQUIRED TO SATISFY RULE 4-4 (TRAJECTORY) IS MANDATORY D. A/G COMMUNICATIONS 1. MILA WISH VHF PRELAUNCH 1 OF 2 MANDATORY D. A/G COMMUNICATIONS 1. MILA WISH VHF PRELAUNCH 1 OF 2 MANDATORY USB 2. MSNN PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY USB 2. MSNN PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY VHF PRELAUNCH 1 OF 2 MANDATORY		LAUNCH COVERAGE KSC/MSFN SITES (SITES NOT LISTED DUE TO VARIABLE LAUNCH	PHASE	RULING	CUES/NOTES/COMMENTS
KSC/MSFN SITES (SITES NOT LISTED DUE TO VARIABLE LAUNCH AZIMUTH) MUST PROVIDE THE FOLLOWING CAPABILITIES FROM LIFTOFF THROUGH S. TUB CUTOFF. REFER TO DECISION MATRIX (RULE 4-17) TO DETERMINE CAPABILITY A. CMD CCS B. TELEMETRY S-IC (VHF) PRELAUNCH HIGHLY DESIRABLE S-IC DATA IS ONLY HIGHLY DESIRABLE SINCE T MCC IS NOT PRIME FOR REQUESTING AN ABORT F TO S-II CUTOFF (APPROX 9-17) SEC MALFUNCTIONS. S-IVB VHF (CP-1) PRELAUNCH HIGHLY DESIRABLE FROM LIFTOFF TO S-II CUTOFF (APPROX 9-17) SEC MALFUNCTIONS. S-IVB VHF (CP-1) PRELAUNCH HIGHLY DESIRABLE FOR ABORT CUES FROM MCC TO S-I UCH FOR ABORT CUES FROM MCC FOR ABORT CUES FROM MCC FOR ABORT CUES FROM MCC FOR ABORT CUES FROM MCC THAT CAPABILITY REQUIRED TO SATISFY RULE 4-4 (TRADECTORY) S-IVB CUTOFF D. A/G COMMUNICATIONS AMADATORY PROM LIFTOFF THROUGH S-IVB CUTOFF D. A/G COMMUNICATIONS AMADATORY PROM LIFTOFF THROUGH S-IVB CUTOFF D. A/G COMMUNICATIONS MEN PRELAUNCH PRELAUNCH 1 OF 2 MANDATORY D. A/G COMMUNICATIONS AMADATORY PRELAUNCH 1 OF 2 MANDATORY WIFF PRELAUNCH 1 OF 2 MANDATORY PRELAUNCH 1 OF 2 MANDATORY PRELAUNCH PRELAUNCH 1 OF 2 MANDATORY PRELAUNCH PRELAUNCH 1 OF 2 MANDATORY	RECEMBER SITES (SITES WARRABLE LAUNCH AZISHIN) MIST PROUDE THE TOLLOWING CAPA- WARRABLE LAUNCH AZISHIN) MIST PROUDE THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE CAPABILITY TO STILL THE TOLLOWING CAPA- THE TOLLOWING CAPA- THE	RESTANCE FILTER (SITES OF THE PROTOE THE PRECIAINCH AZTRUTIS) MIST PROTOE THE PROTOE THE PRECIAINCH CAPACITY AZTRUTIS) MIST PROTOE CAPACITY AZTRUTIS) MIST PROTOE CAPACITY AZTRUTIS) MIST PROTOE CAPACITY AZTRUTIS MIST PROTOE CAPACITY AZTRUTIS MIST PROTOE CAPACITY AZTRUTIS MIST PROTOE FIRE PRECIAINCH HIGHLY DESIRABLE MIC TO SET AND PRECIAINCH MIGHLY DESIRABLE MIC TO SET AT THE PRECIAINCH MIGHLY DESIRABLE FROM LIFTOFF ADDRESS AND PRECIAINCH MIGHLY DESIRABLE FROM MIC TO SET AUTOMOTORY FOR ABORT CUES FROM MIC SET ABOUT CUES FROM MIC MIGHLY DESIRABLE FROM MIC TO SET AUTOMOTORY MIGHLY DESIRABLE FROM MIC TO SET AUTOMOTORY FOR ABORT CUES FROM MIC SET ABOUT CUES FROM MIC MIGHLY DESIRABLE FROM MIC MIGHLY DESIRABLE FROM MIC MIGHLY DESIRABLE FROM MIC MIGHLY DESIRABLE FROM MIC SET AUTOMOTORY FOR ABORT CUES FROM MIC MIGHLY DESIRABLE FROM MIC MIGHLY DESIRABLE FROM MIC MIGHLY DESIRABLE FROM MIC MIGHLY DESIRABLE FROM MIC MIC MIGHLY DESIRABLE FROM MIC MIC MIC MIC MIC MIC MIC MIC MIC MI	4-12	KSC/MSFN SITES (SITES NOT LISTED DUE TO VARIABLE LAUNCH			
				THE FOLLOWING CAPABILITIES FROM LIFTOFF THROUGH S-TVB CUTOFF. REFER TO DECISION MATRIX (RULE 4-17) TO DETERMINE CAPABILITY A. CMD CCS B. TELEMETRY S-IC (VHF) S-IVB VHF (CP-1) IU CCS (DP-1B) IU VHF (DP-1) CSM (USB) C. TRACKING THAT CAPABILITY REQUIRED TO SATISFY RULE 4-4 (TRAJECTORY) IS MANDATORY D. A/G COMMUNICATIONS 1. MILA VHF USB 2. MSFN VHF	PRELAUNCH PRELAUNCH PRELAUNCH PRELAUNCH	HIGHLY DESIRABLE HIGHLY DESIRABLE FROM LIFTOFF TO S-II CUTOFF (APPROX 9:17 SEC) HIGHLY DESIRABLE 1 OF 2 MANDATORY MANDATORY FROM LIFTOFF THROUGH S-IVB CUTOFF	FOR ABORT CUES FROM MCC FOR ABORT CUES FROM MCC

MISSION RULES

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R	RULE	CONDITION/MALFUNCTION	PHASE	<u> </u>	RULING		CUES/NC	TES/COMME	NTS
	4-13	GENERAL ORBITAL COVERAGE IT IS REQUIRED THE MSFN HAVE THE CAPABILITY OF PROVIDING THE MCC THE MINIMUM MISSION CONTROL SUPPORT LISTED BELOW OF TWO MSFN USB SITES PER REVOLUTION THROUGH REVOLUTION 3.							
		A. CMD							
]		CCS	PRELAUNCH		LY DESIRABLE				
		CSM USB B. TELEMETRY	PRELAUNCH	нтин	LY DESIRABLE				
l		S-IVB VHF (CP-1)	PRELAUNCH	нтен	LY DESIRABLE				
			PRELAUNCH	1	2 MANDATORY		DOWNLIN	KS REOUIRE	D TO RECOVER S-IVB DATA.
		IU CCS (DP-1B) IU VHF (DP-1)							
ļ		CSM USB	PRELAUNCH	MAND	ATORY				
		C-BAND	PRELAUNCH	нтсн	LY DESIRABLE				
		USB	PRELAUNCH	1	ATORY				
		D. A/G COMMUNICATIONS			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
		VHF USB	PRELAUNCH	1 0F	2 MANDATORY		USB MAN TLI TO CAPABIL	CONFIRM ON	LEAST ONE STATION PRIOR TO BOARD CSM USB A/G
	4-14	POST S/C SEPARATION IT IS MANDATORY THAT 1 SITE PROVIDE THE FOLLOWING CAPABILITIES:							
		A. TLM - CCS	PRELAUNCH	MANE	DATORY		A. TO P	ROVIDE TM	FOR DETERMINING S-IVB STATUS
		B. CMD - CCS	PRELAUNCH	MANE	DATORY		B. TO P	ROVIDE COR	RECTIVE COMMAND CAPABILITY
									HEAD DELTA PROBLEMS.
									OVE ARE REQUIRED TO INSURE D LM EXTRACTION.
		<u> </u>	<u> </u>						
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MISSION RULES

R	RULE	CONDITION/MAL	The state of the s	PHASE		RULING		CUES/NOTES/COM	MENTS
	4-15	HSK, GDS, MAD IT IS MANDATOR OF THESE SITES THE FOLLOWING	Y 2 OF 3 PROVIDE						
ı		CAPABILITIES:							
		A. TM USB	ı	PRELAU	- 1	ATORY		A. TO COVER TR	ANSLUNAR COAST AND LPO
-		B. TRACK USB		PRELAU!	1	DATORY			
1		C. VOICE USB	i	PRELAU		ATORY			
		ט. טייט טייט טיי	'	PRELAU	NCH HIGH	ILY DESIRABLE			
	4-16	RIOMETER NETWO	ORK SITES	PRELAU	NCH				
ĺ		GWM.IMA			HIG	LY DESIRABLE			
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			APOLLO 17	FNL	9/1/72	GROUND INSTR	GSFC/KSC/	/MSFN	
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MISSION RULES

R	ITEM	
	4-17	INTRODUCTION TO SITE FAILURE DECISION MATRIX
		FOR PRELAUNCH FAILURES OF LAUNCH PHASE SITE CAPABILITY, THE FOLLOWING DECISION MATRIX APPLIES THE LAUNCH PHASE GROUND INSTRUMENTATION REQUIREMENTS TO THE RESULTING DEGRADED COVERAGE.
		THIS MATRIX POINTS OUT THE LOSS OF CONTINUOUS COVERAGE BETWEEN LIFTOFF AND INSERTION PLUS 60 SECONDS FOR VARIOUS SITE FAILURES. IF SITE FAILURES OCCUR PRIOR TO LAUNCH, THE MATRIX WILL BE USED TO DETERMINE WHETHER MANDATORY CONTINUOUS COVERAGE HAS BEEN LOST.
		(NOMINAL INSERTION IS 11:55)
		TO USE THE MATRIX:
		A. LOOK FOR AN X UNDER THE COLUMN FOR SITE WHERE THE FAILURE OCCURRED.
		B. GO ACROSS TO THE COLUMN FOR THE CAPABILITY THAT WAS LOST AND READ THE DECISION.
		C. THE COVERAGE THAT WAS LOST IS IN THE COLUMN LABELED "APPROXIMATE MANDATORY COVERAGE LOST."
		D. MORE THAN ONE X IN A ROW SPECIFIES A FAILURE OF THE SAME CAPABILITY AT MORE THAN ONE SITE.
	,	
		MISSION REV DATE SECTION GROUP PAGE
		MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 GROUND INSTR REQUIREMENTS GSFC/KSC/MSFN 4-10 Tape 14.5
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MISSION RULES

SECTION 4 - GROUND INSTRUMENTATION REQUIREMENTS - CONCLUDED

			SITES	FAILED		APPROXIMATE	C.F	APABILIT	Y LOST			
		ALDS TM	MIL/ CAPE	BDA	VAN	MANDATORY COVERAGE LOST FOR	тм	CMD	TRACK	A/G		
		00:00 T0 08:49	00:00 T0 08:49	04:10 T0 12;40	09;10 T0 16:05	NO-GO ITEMS FOR ALL LAUNCH AZIMUTHS	USB OR CCS AND VHF	USB AND CCS	BOTH S AND C BAND	USB AND VHF		
	S I N G	х				NONE SEE NOTE 1	G0	N/A	N/A	N/A		
	L E S I T		Х			00:00 TO 04:10 SEE NOTE 2	GO	GO	NO-GO	NO-GO		
;	F A I			Х		08:49 TO 09:10 SEE NOTE 3	GO	GO	GO	GO		
	L U R E				Х	NONE	GÖ	GO	GO	GO		
	м	х	х			00:00 T0 04:10	NO-GO	GO	NO-GO	NO-GO		
	U L T I		x	Х		00:00 T0 09:10 SEE NOTE 2	GO	GO	NO-GO	NO-GO		
	E S I	L E S	L E S		х		Х	00:00 T0 04:10 SEE NOTE 2	G0	GO	NO-GO	NO-GC
	F A			Х	Х	08:49 TO 16:05	NO-GO	GO	NO-GO	NO-GC		
	I L U R E	х		Х		08:49 TO 09:10 SEE NOTE 3	G0	GO	GO	GO		
	S	X			х	NONE	GO	GO	GO	GO		
		х	Х	х		00:00 T0 09:10	NO-GO	G0	NO-G0	NO-GO		

NOTES: 1. LOSS OF ALDS RESULTS IN LOSS OF S-IC TM. HOWEVER, IT IS NOT MANDATORY FOR LAUNCH.

- 2. GO ON TM BECAUSE OF ALDS DATA UNTIL 08:49.
- 3. LOSS OF COVERAGE IS NOT SEVERE ENOUGH FOR A NO-GO CONDITION.

MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 17	FNL	9/1/72	GROUND INSTR REQUIREMENTS	GSFC/KSC/MSFN	4-11	

ITEM

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE

					SECTION 5	- TRAJECTORY AND G	UIDANCE		
R	ITEM								

						AUNCH/TRANSEARTH			
	٠, ١	THE LAUNCH	DUACE UTLL DE	TE DM	NATED FOR	ANY OF THE COLLOWS	0. COMPTTONO		
	5-1	THE LAUNCH	PHASE WILL BE	I E RM	INATED FOR	ANY OF THE FOLLOWIN	G CONDITIONS:		
1		Δ ΥΙΟΙΔΤΙΙ	ON OF THE VEH	TOLE E	SDEAVIID I TN	ıF			
ŀ			:40 AND DECRE						
ı			ON OF ENTRY "						
	1	D. V _S INCR							
			ED CONDITIONS	AT IN	NSERTION				
			ON OF EXIT HE						
	1 1	G. IF H <	75 NM AND DEC	REASIN	NG BEFORE A	ACHIEVING MODE IV CA	PABILITY		
	li								
1	ļ (
	5-2	THE LEG WILL	I NOT DE 1ETT	TCONE	NINTI MOC	NE TT CADADTITE TO	ECTADI TOUED DY T	. 1.20 41	ID THEREACTNO
1	3-2	THE CES WILL	L NOT BE SETT	TSUNE	O ONLIE MOL	DE II CAPABILITY IS	ESTABLISHED BY I	F = 1:20 AF	INCREASING.
							•		
1	5-3	MODE II, II	I, IV, AND AP	OGEE I	KICK				
									. THE CREW USING THE G&N,
	1	WILL BE	PRIME FOR MO	DE IV	, APOGEE KI	ICK MANEUVERS, AND D	ETERMINATION OF S	-IVB OVERSE	PEED CONDITIONS.
		B MODE 11							
ı		B. MODE II	I MANEUVERS W	ILLE R	: INTERRUPT	TED WHEN T _{FF} = 1:00	AND DECREASING.		
		C. MODE IV	MANFILVERS AN	n Apno	SEE KICK MA	ANEUVERS WILL BE INT	FRRHIPTEN WHEN T	= 1.40 AND	D DECDEASING
1]	3, 1,022 1,	14412012110 141		JEE KIOK III	WEGVERS WILE DE INT	FF	- 1.40 AIII	DECKEASING.
1		D. MODE IV	MANEUVERS WI	LL BE	INTERRUPTE	ED IF THE CURRENT AL	TITUDE IS 70 NM,	DECREASING,	, AND Hp < 300K FT.
		E. IF ENTE	RING, UTILIZE	LIFT	TO AVOID L	LAND. UNAVOIDABLE L	AND LANDING USE F	L 90 DEG.	
	<u> </u>	F 75 NO 0							
	1 1	F. IF NU S	LA SEP OR IF	252 F	41L5:				
		1 Hn	< 40 - EXECUT	F CM/	SM SEP RV 1	Γ = 1· Δ Ω			
			10 EXECUT	L 0/1/	SIT SEI DI	'FF '''			
	i I	2. 40	< Hp < 70 - G	ROUND	WILL DECI	DE TO USE CM RCS ASA	P OR AT APOGEE TO	REDUCE Hp	TO 40 NM
1									
	5-4	MODE III AB	ORTS						
		A DDEDICT	בח ד אבדכיי	CDC C	/0 ~1.00				
		A. PREDICT	ED T _{FF} AFTER	SPS C,	/0 <1.00.				
	Ì	l. FUL	L LIFT IP ON	WATER	- DO NOT t	JBURN.			
						- BURN TO T _{FF} = 1:0	0, RL 90 DEG.		
		3. G&N	NO-GO AND FL	LL LI	FT IP ON LA	AND - BURN A REDUCED	Λ ΤΟ MAINTAIN Τ	FF AFTER C	O AND RL 90 DEG.
1									
	l i	B. IF ∆TB	≤ 2 SEC, DO N	IOT BUI	RN.				
		C *F *C	TION OCCUPE A	CTEN :	CETI : 10 :	CEC DUDN UNTIL COM		/TE 110-22	NIE TO BURN IN T
ļ				IFIER (GE (1 + 10 :	SEC, BURN UNTIL G&N	AK = U, KL 55 DEG	. (IF UNA	SLE TO BURN AR = 0,
		RL 90 D	.Lu. /						
—				PE	DATE	CECTION	CDOID	DACE	
-			MISSION 27	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	LAUNCH TRANSEARTH	5-1·	Tape 51.6
						<u> </u>			I

MISSION RULES

	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED									
R ITEM										
5-5	THE S/C CMC WILL BE NO-GO FOR ABORT MANEUVER DETERMINATION AND MONITORING FOR ANY OF THE FOLLOWING:									
	A. CMC PROGRAM ALARMS:									
	SINGLE OCCURRENCE - 00214, 00777, 01107, 01407, 04777, 07777, 10777, 13777, 14777, 00205									
	CONTINUOUS OCCURRENCE - 20430, 20607, 20610, 21204, 21206, 21210, 21302, 21501, 21502, 21521, 31104, 31201, 31202, 31203, 31211 B. RTCC AND CMC T _{FF} DIFFERENCE OF > 40 SEC.									
	C. CONFIRMED ERROR IN S/C PLATFORM VELOCITY COMPONENTS OF > 50 FPS IN X OR 100 FPS IN Z.									
	D. CMC TRAJECTORY SOURCE INDICATES "GO" OR "NO-GO" INCONSISTENT WITH BEST TRAJECTORY SOURCE(S) INDICATION.									
5-6	THE ORBIT IS "GO" IF Hp > 70 NM.									
5-7	ELIMINATION OF CM RCS PROPELLANTS DURING MODE I ABORTS									
	A. THE CREW WILL BE ADVISED TO BURN OFF THE CM RCS PROPELLANTS IN THE EVENT OF A MODE I ABORT IF THE PREDICTED LANDING POINT IS ON LAND.									
	B. FOR LOSS OF COMM WITH MCC AND MODE I ABORT BETWEEN 61 SEC GET AND 120 SEC GET THE CM RCS PROPELLANT WILL BE BURNED OFF.									
	RULES 5-8 THROUGH 5-19 ARE RESERVED.									
	MISSION REV DATE SECTION GROUP PAGE									
	APOLLO 17 FNL 9/1/72 TRAJECTORY LAUNCH AND GUIDANCE TRANSEARTH 5-2 Tape 51.7									
	MIN GUIDMING INMINISEMENT 3-2 Tâpe 51./									

MISSION RULES

	т т	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED
R	ITEM	
		EARTH ORBIT AND TLI
	5-20	EARTH ORBITAL ALTITUDE CONSTRAINTS:
		A. REAL-TIME MISSION PLANNING
		PERIGEE - 85 NM MINIMUM. MAXIMUM Hp IS DETERMINED BY SM RCS AVAILABLE FOR HYBRID DEORBIT.
-		B. CONTINGENCY
		PERIGEE - 70 NM MINIMUM (VIOLATIONS WILL BE CORRECTED ASAP) IF Hp < 70 NM AND MANEUVER TO RAISE Hp IS NOT POSSIBLE:
	·	 40 < Hp < 70 - EXECUTE SPS RETROGRADE ASAP UNTIL Hp < 40. IF NO SPS, LSE SM-RCS. Hp < 40 - CM/SM SEP - RETRO WILL RECOMMEND ENTRY PROFILE.
	5-21	RESERVED
	5-22	S/C L/O TIME (GRR) WILL BE UPDATED WITH SRC L/U TIME IF THE TWO ARE DIFFERENT BY 10 SEC.
	5-23	TIME BETWEEN EPO RETROFIRE GETI AND 400K MUST BE >9 MIN. IF NOT, RETARGET FOR NEXT PTP.
	5-24	RESERVED
	5-25	PLANNED G&N AND SCS RETROFIRE MANEUVERS WILL BE UPDATED IF:
		A. THE COMPUTED RETROFIRE POSITION CHANGES BY >0.5° LONGITUDE PRIOR TO GETI - 30 MIN.
		B. THE COMPUTED RETROFIRE POSITION CHANGES >2° LONGITUDE AFTER GETI - 30 MIN.
	5-26	RESERVED
┞╌┦		
 		MISSION REV DATE SECTION GROUP PAGE
		AND GUIDANCE AND TLI 5-3 Tape 16.3

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED

			SE	ECTION	15 - TRAJE	CTORY AND GUIDANCE	- CONTINUED				
R	ITEM										
	5-27	IF SPS FAILS AFTER	R EPO RETRO	OFIRE	IGNITION (OR NO SLA SEP:					
		A. Hp > 70 NM -	RETARGET F	FOR NE	EXT BEST P	TP USING RCS.					
		B. 40 < Hp < 70 - PITCH UP TO LOCAL HORIZONTAL ATTITUDE AND BURN SM RCS USING FOLLOWING PRIORITIES:									
		1. BURN Hp 1	TO PAD VALU	UE							
		2. BURN MAXI	IMUM SM RCS	S AV A	AVAILABLE						
			RCS TO Hp = G AT T _{FF} =			CS AV NOT SUFFICIENT	TO OBTAIN Hp = 4	10 NM. IF I	dp < 40 nm, TERMINATE ALL		
		C. Hp < 40 NM -	REMAIN IN	RETRO	ATTITUDE	AND BURN SM RCS USI	NG THE FOLLOWING	PRIORITY:			
		1. BURN ∆V F	RESIDUALS.								
		2. BURN MAXI	IMUM SM ΔV	AVAII	.ABLE.						
						NOTE					
						LOX DUMP CAPABILITY					
						SHAPE THE ORBIT FO					
						MANEUVER OR TO REDU WEIGHT TO OBTAIN MO					
					SM RCS AV.		NL				
	5-28	THE G&N IS NO-GO F	EOD ENTDY	TC.							
	3-20										
									CREW B. V AND VTY.		
		B. V AND GAMMA A	AT 400K ARI	E OUIS	SIDE THE CO	ORRIDOR. GROUND WIL	L PROVIDE ENTRY P	PROFILE.			
	5-29	BOOSTER NAVIGATION	N AND TARGE	ET UPI	DATES FOR 1	ſLI:					
		A. AN IU NAVIGAT TO TB6 INITIA					D TO INSURE INCOR	RPORĀTION OV	ER A MSFN STATION PRIOR		
		1. WHERE AN	IU ACCELER	ROMETE	ER FAIL OCC	CURRED PRIOR TO EART	H ORBIT INSERTION	ı .			
		2. FOR A FIR	RST OR SECO	OND TI	_I OPPORTUM	NITY WHERE MSFN VERS	US IU DIFFERENCE	VIOLATES AN	Y OF THE FOLLOWING:		
		AT GET =				ON <u>></u> 33,101 FT					
					MAJOR <u>></u> 1.1 RANGE VELOO	I NM CITY (MAXIMUM) <u>></u> 9 F	PS				
		AT GET =	1 HR 45 M	IN: [DOWNRANGE F	POSITION > 56,894 FT					
						AXIS > 1.21 NM VELOCITY (MAXIMUM)	> 9 FPS				
		B. THERE WILL BE	E NO IU TAF			R EITHER TLI OPPORTU	_				
						,	,				
			SSION	REV	DATE	SECTION	GROUP	PAGE			
		AP	POLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	EARTH ORBIT AND TLI	5-4	Tape 11A.2		

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED

	1250	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED									
R	1TEM 5-30	DECEDATO									
	5-30	RESERVED									
	5-31	RESERVED									
}	3-31	RESERVED									
	5-32	THE MAXIMUM ALLOWABLE MISALIGNMENT RATES BETWEEN THE IU AND IMU ARE 0.6 DEG/HR (IU) AND 1.5 DEG/HR (IMU).									
		THE CHARLESON ALLOWABLE MISALIGNMENT KATES BETWEEN THE TU AND IMU ARE 0.6 DEG/HR (IU) AND 1.5 DEG/HR (IMU).									
	5-33	RESERVED									
	5-34	TLI UNDERBURNS									
		A. FOR APOGEE ALTITUDES ABOVE 100K NM, A LUNAR LANDING MISSION IS AVAILABLE. THE TRADEOFFS THAT WILL BE MADE TO ACHIEVE THIS MISSION ARE, IN ORDER OF PRIORITY: (ITEMS ARE ADDITIVE)									
		1. PROVIDE ADDITIONAL ΔV FOR MCC BY FOREGOINT ANY NOMINAL CONSTRAINTS ON TEC RETURN INCLINATION.									
		2. EXECUTE MCC 1 AT TLI + 3 HRS									
		3. PROVIDE ADDITIONAL AV FOR MCC 1 BY:									
		(A) UTILIZE THE LM YAW STEERING BUDGET DURING ASCENT (B) GIVE UP LOPC 2									
		(C) ADD 24 HRS TO TEC (D) REOPTIMIZE THE DESCENT APPROACH AZ									
		4. EXECUTE MCC 1 AT TLI + 1 HR									
		5. PROVIDE ADDITIONAL AV FOR MCC 1 BY:									
		(A) REOPTIMIZE TLC (INCREASE DESCENT SEA)									
		(B) SCHEDULE TEI SHORTLY AFTER RNDZ (C) ADD 24 HRS TO TEC (MAINTAIN MISSION DURATION <300 HRS)									
		(D) SHORTEN THE PLANNED LUNAR STAY TIME TO ELIMINATE LOPC 1.									
		<u>NOTE</u> THE ADDITIONAL CAPABILITY ACHIEVED BY EACH ITEM IS HIGHLY MISSION DEPENDENT.									
		B. FOR APOGEE ALTITUDES BETWEEN 100K NM AND 28,000 NM, A LUNAR ORBIT ALTERNATE MISSION IS AVAILABLE. THE NOMINAL									
		PLAN FOR THIS MISSION IS:									
		1. EXECUTE MCC 1 ASAP (BETWEEN TLI + 1 AND TLI + 3 HRS)									
		2. EXECUTE A DPS LOI									
		3. EXECUTE ALL REMAINING MANEUVERS (CIRC, LOPC, TEI) WITH THE SPS									
Ш		C. FOR APOGEE ALTITUDES BELOW 28,000 NM, AN EARTH ORBIT ALTERNATE MISSION WILL BE PERFORMED.									
<u> </u>		MISSION REV DATE SECTION GROUP PAGE									
		APOLLO 17 FNL 9/1/72 TRAJECTORY EARTH ORBIT AND GUIDANCE AND TLI 5-5 Tape 51.8									
TCC	2014										

MISSION RULES

R	ITEM							·	<u> </u>
	5-35	DIFFERENCE	IN CMC AND IU P	PLATFO	RM VELOCIT	Y COMPONENTS OR TOTA	AL VELOCITY AT IN:	SERTION:	
		A. VIOLAT	ION OF ANY OF TH	IE FOL	LOWING MEA	NS TLI IS NO-GO:			
		Δ X > ±	38 FPS						
		Δ Ϋ > ±							
		Δ Ž > ±							
		Δ ^V T >	±34 FPS						
		B. VIOLAT	ION OF ANY OF TH	IE FOLI	LOWING MEAN	NS TLI IS TEMPORARIL	Y NO-GO:		
l		±7.5 <	ΔΧ̈́ < ±38 FPS						
1	1		Δ Ý < ± 73 FPS						
1			∆ Ž < ±87 FPS						
		±14 <	ΔV_T < ±34 FPS						
						NOTE			
	1				TLI IS NO-	-GO UNTIL PARTS C AN	ID 5-36		
					ARE DETERM	MINED (ORBITAL PARAM	IETER		
					DECISIONS).			
			ION OF ANY OF TH			TAL DECISION PARAME	TERS AT GET = 1 F	HR 45 MIN ME	ANS TLI IS NO-GO.
			# 10D #W70						
			AJOR AXIS > ±3.2 ANGE VELOCITY IS		2 FPS				
	5-36	DIFFERENCE	IN MSFN AND IU	DOWNR#	ANGE POSITI	ON ΔRV > ±105,100 F	T AT GET = 56 MIN	I MEANS TLI	IS NO-GO.
	5-37					CCELEROMETER FAIL DU			
		A NIFFFD	ENCE IN DOWNDANC	F D051	TTION - 153	35,900 FEET AT GET =	EE MIN		
						IM AT GET = 1 HR 45			
						8.7 FPS AT GET = 1			
l									
		RULES 5-38	THROUGH 5-45						
		ARE RESERVI	ED.						
İ									
	l l								
]								
	<u></u>		MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	TRAJECTORY	EARTH ORBIT	1	
1			1	Į.	I	AND GUIDANCE	AND TLI	5-6	Tape 11A.4

MISSION RULES

ITEM		25,011	ON 5 TRAJECTO	KY AND GUIDANC	E - CONTINUED		
1 1 L(*)							
ŀ					_		
			MA	NEUVERS/COAST	_		
E 46	TUE 0140 05 4 55 1151						
5-46	THE CMC OR LGC WILL	BE TEMPORA	RILY NO-GO FO	R MANEUVER CON	TROL FOR ANY OF T	HE FOLLOWING:	
	A. COMPUTER PROGRA	M ALARMS:					
	SINGLE OCCURREN	CE - 00205,	00214, 00777	, 01107, 01407	, 03777, 04777, 0	7777, 10/77,	13777, 14777
	CONTINUOUS OCCU 31201, 31202, 3	RRENCE - 20 1203, 31211	430, 20607, 2	0610, 21204, 2	1206, 21210, 2130	2, 21501, 215	02, 21521, 31104,
	B. CMC/IMU ALIGNME	NT DISCREPA	NCY (FOR MANE	UVER EXECUTION	, MONITORING, AND	ORBIT DETERM	INATION):
		R CHECK - A	UTO OPTICS POS	SITIONING DOES	NOT PLACE SELECT		ELD OF VISION OF SXT.
	C. LGC/IMU ALIGNME	NT DISCREPA	NCY INDICATE I	BY >2 DEG FROM	PREDICTED COAS C	OORDINATES.	
	D. DIFFERENCE BETW						
	1. LATITUDE > 6 2. LONGITUDE > 3. H > 0.2 NM	0.02°			·		
- 47	CDACEODAET TIME						
5-47	SPACECRAFT TIMING M	JST BE MAIN	TAINED WITHIN	THE FOLLOWING	LIMITS:		
5-47	SPACECRAFT TIMING M	UST BE MAIN			LIMITS:		
5-47	SPACECRAFT TIMING ME				LIMITS:		
5-47		CMC (SEC)			LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI	2 2 2 2			LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S	2 2 2 2 2	LGC (SEC)		LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOR	2 2 2 2 2 2 2 2 2	LGC (SEC) 2		LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOW	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	LGC (SEC) 2 2	AGS (SEC)	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	LGC (SEC) 2 2 0.3	AGS (SEC) 0.3	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT	CMC (SEC) 2 2 2 2 2 2 2 0.5 0.5	LGC (SEC) 2 2 0.3 0.3	AGS (SEC) 0.3 0.3	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT	2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	LGC (SEC) 2 2 0.3	AGS (SEC) 0.3	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 2 0.5 0.5 0.5 0.5	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:		
5-47	A. RETROFIRE B. ENTRY C. TLI D. MCC'S E. LOI/DOI/CIRC/LOF F. TEI G. DESCENT H. ASCENT I. RENDEZVOUS J. SXT TRACKING	CMC (SEC) 2 2 2 2 0.5 0.5 0.5 0.5 6-55 ARE RES	LGC (SEC) 2 2 0.3 0.3 0.5	AGS (SEC) 0.3 0.3 0.5	LIMITS:	PAGE	

MISSION RULES

R	ITEM	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED	
	5-56	RESERVED	
	5-57	TRANSLUNAR MCC EXECUTION CRITERIA	
		A. MCC'S 2 AND 4 ARE PREFERRED EXECUTION POINTS. THE FIRST MIDCOURSE WILL BE DELAYED UNTIL MCC2 IF THE COST IS NOT PROHIBATIVE.	
		B. MIDCOURSE CORRECTIONS WILL BE COMPUTED TO UTILIZE THE PREFERRED PROPULSION SYSTEM. THIS MAY INCLUDE NON-FREE RETURN MANEUVERS OFF OF A NOMINAL FREE RETURN TRAJECTORY.	
	5-58	RESERVED	
	5-59	LOI SHALL BE TARGETED WITHIN THESE CONSTRAINTS:	
		A. THE PERICYNTHION OF THE APPROACH HYPERBOLA WILL BE MAINTAINED WITHIN ±10 NM OF Hp TARGET.	
		B. THE ALTITUDE OF THE NODE (BETWEEN THE APPROACH HYPERBOLA AND THE DESIRED LPO) WILL BE MAINTAINED BETWEEN -10 AND +15 NM OF Hp TARGET.	
	5-60	A "GO" FOR LOI REQUIRES THE FOLLOWING:	
		A. COMMITMENT TO AT LEAST 4 HRS IN LPO (PROVIDES ONE REV OF TRACK AFTER LOI FOR CALCULATION OF TEI).	
		B. ADEQUATE FUEL REMAINING FOR SUBSEQUENT LUNAR ORBIT OPERATIONS (MINIMUM IS TEI AND TEC MCC'S)	
	!		
Ш		MISSION REV DATE SECTION GROUP PAGE	
		APOLLO 17 FNL 9/1/72 TRAJECTORY AND GUIDANCE COAST 5-8 Tape 17.	\neg

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED

1TEM 5-61

PREMATURE LOI SHUTDOWN FOR SPS PROBLEMS (LOI ABORT MODES)

A. SHUTDOWN IN MODE 1 REGION -

EXECUTE A DPS 2-HR DIRECT ABORT FOR: LOI BURN TIME FROM 0 TO 0:32 LOI $\Delta V_{\rm M}$ FROM 0 TO 207

EXECUTE A DPS 30-MIN DIRECT ABORT FOR: LOI BURN TIME FROM 0:32 TO 0:53 LOI $\Delta V_{\rm M}$ FROM 207 TO 3 + 48

EXECUTE A DPS TO DEPLETION 30-MIN DIRECT ABORT FOLLOWED BY A SUPPLEMENTARY APS BURN 2 HRS LATER: LOI BURN TIME FROM 0:53 TO 1:31 LOI ΔV_{M} FROM 348 TO 613

B. SHUTDOWN IN MODE II REGION -

EXECUTE A DPS + APS 2-IMPULSE CIRCUMLUNAR ABORT WITH APS BURN TO SUPPLEMENT DPS BURN TO DEPLETION DURING SECOND IMPULSE (APS BURN IS TWO HOURS AFTER DPS BURN) FOR:

LOI BURN TIME FROM 1:31 TO 2:03

LOI BURN TIME FROM 1:31 TO 2:03 LOI AV_M FROM 613 TO 833

EXECUTE A DPS 2-IMPULSE CIRCUMLUNAR ORBIT: LOI BURN TIME FROM 2:03 TO 2:54 LOI ΔV_{M} FROM 833 TO 1200

C. SHUTDOWN IN MODE III REGION -

EXECUTE TEI (SPS OR DPS) AT NEXT OPPORTUNITY OR INITIATE AN ALTERNATE MISSION: LOI BURN TIME FROM 2:54 TO 6:35 LOI ΔV_{M} FROM 1200 TO 2980 (FOR APOLLO 17 APS IS REQUIRED TO SUPPLEMENT DPS FOR LOI BURN TIME FROM 4:30 TO 6:35)

<u>NOTES</u>

- ALL ABORT MANEUVERS ARE MCC-H TARGETED EXCEPT FOR THE DPS 30-MIN ABORT WHICH IS TAKEN FROM THE CREW CHART
- 2. CONTROL LIMITS APPLY AS FOLLOWS:

LOI BURN TIME LOI DELTA VM LIMITS

RULES 5-62 THROUGH 5-75 ARE RESERVED.

MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	MANEUVERS COAST	5-9	Tape 17.2

MISSION RULES

			35011	10N 3 - 1RA	AJECTORY AND GUIDA	NCE - CONTINUED		
R ITEM								
					LUNAR ORBIT			
5-76	THE DOI ₁ MAN	NEUVER WILL B	BE TARG	GETED TO OF	PTIMIZE THE GROUND	TRACK FOR LUNAR	LANDING.	
					NOTE			
				THE TARGE	ETED Hp IN REV 12	IS 80K FT.		
5-77	A "GO" FOR I	DOI REQUIRES	COMMIT	TMENT TO AT	T LEAST 4 HRS IN L	UNAR ORBIT.		
					<u>NOTE</u> DES ONE FULL REV O LCULATION OF TEI	F TRACK AFTER		
5-78					THE BAILOUT ABORT UDE OF EQUAL TO OR			F INCOMING MSFN RADAR NAR TERRAIN.
					NOTES			
					RICYNTHION ALTITUD NM CLOSEST APPROA		DS	
			:	WHICH (LUE OF DOPPLER RES CORRESPONDS TO THI ROXIMATELY <u>-106</u> CY E ACTUAL VALUE WIL L TIME.	S PERICYNTHION CLES PER SEC		
5-79	A. MISS DI: B. DEVIATI	STANCE OVER 1 ON IN APPROAC	THE LLS	S GREATER '	BE SCHEDULED ASAP THAN 0.5 DEG OUT O ER THAN ±10 DEG FR THAN 30,000 FT	F PLANE	LLOWING SITUA	TIONS:
لــــــــــــــــــــــــــــــــــــــ		MICCION	REV	DATE	SECTION	GROUP	PAGE	
		MISSION APOLLO 17	FNL	9/1/72	TRAJECTORY	LUNAR ORBIT		

MISSION RULES

		SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED
R	ITEM	
	5-80	RESERVED
:	5-81	RESERVED
	5-82	THE FOLLOWING CRITERION APPLY TO DOI ₂ : A. VOICE CONFIRMATION OF CIRC IS REQUIRED FOR EXECUTION. B. DOI ₂ WILL BE SCHEDULED AT LEAST 2 MIN AFTER CIRC. C. LM RCS BURN TIME WILL BE < 30 SEC. D. TARGETED PERILUNE AT PDI WILL BE NO LESS THAN 40K FT.
	5-83	AN UPDATE TO THE LLS WILL BE PROVIDED THE CREW DURING PDI TO CORRECT ANY DOWNRANGE ERRORS THAT HAVE ACCUMULATED IN THE LGC ESTIMATE OF POSITION PROVIDING THIS UPDATE IS NO LESS THAN 1000 FT NOR MORE THAN 35,000 FT.
	5-84	THE CIRCULARIZATION MANEUVER WILL BE TARGETED TO ACHIEVE A CIRCULAR ORBIT AT RENDEZVOUS AND AN ORBITAL PERIOD THAT MAINTAINS THE CSM SOLO TIMELINE.
Ш		
<u> </u>		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 TRAJECTORY LUNAR ORBIT 5-11 Tape 57.3
700		

MISSION RULES

A. THE LIS LANDMARK SIGNITINGS WILL BE CONSIDERED ACCEPTABLE IF THE PREMISSION LLS POSITION IS CHANGED BY LESS THAN: * \$ 7,900 FT (CROSSTRACK LIMIT MAY BE UPDATED IN FLIGHT BASED ON QUALITY OF TRACKING DATA.) * \$ 3,900 FT * \$ 4,300 FT * 8. POWERED DESCENT WILL NOT BE SLIPPED TO ACHIEVE AN ACCEPTABLE SET OF LANDMARK SIGNITINGS. ** ** ** ** ** ** ** ** **				SECI	10N 5 - II	RAJECTORY AND GUIDA	NCE - CONTINUED		
BY LESS THAN: 1 2 7,900 FT (CROSSTRACK LIMIT MAY BE UPDATED IN FLIGHT BASED ON QUALITY OF TRACKING DATA.) 2 3,900 FT R 4,330 FT B. POWERED DESCENT WILL NOT BE SLIPPED TO ACHIEVE AN ACCEPTABLE SET OF LANDMARK SIGNTINGS. 5-86 ALLOMABLE MISALIGNMENT AT PDI IS 0.6 DES ABOUT THE Y AXIS. IF THE SECOND PS2 ALIGNMENT DETECTS DRIFT RATES INDICATIVE OF GREATER MISALIGNMENT, PDI WILL BE SLIPPED ONE REV IF NEW COMPENSATION CANNOT BE IMMEDIATELY APPLIED RULES 5-87 THROUGH 5-89 ARE RESERVED. MISSION BEV DATE SECTION GROUP PAGE MISSION BEV DATE SECTION GROUP PAGE MISSION BEV DATE SECTION GROUP PAGE	R ITEM								
A _ 3,800 FT B. POWERED DESCENT WILL NOT BE SLIPPED TO ACHIEVE AN ACCEPTABLE SET OF LANDMARK SIGNTINGS. 3-86 ALLOWABLE MISALIGAMENT AT PDI IS 0.6 DEG ABOUT THE Y AXIS. IF THE SECOND PS2 ALIGAMENT DETECTS DRIFT RATES INDICATIVE OF GREATER MISALIGHMENT, PDI WILL BE SLIPPED ONE REV IF NEW COMPENSATION CANNOT BE IMMEDIATELY APPLIED RULES 5-87 THROUGH 5-89 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FML 971/72 TARJECTORY LUMAS DRBIT	5-85	A. THE LLS L BY LESS T	ANDMARK SI	GHTING	SS WILL BE	CONSIDERED ACCEPTA	BLE IF THE PREMISS	ION LLS POS	SITION IS CHANGED
5-86 ALLOWABLE MISALIGNMENT AT PDI IS 0.6 DEG ABOUT THE Y AXIS. IF THE SECOND PS2 ALIGNMENT DETECTS DRIFT RATES INDICATIVE OF GREATER MISALIGNMENT, PDI WILL BE SLIPPED ONE REV IF NEW COMPENSATION CANNOT BE IMMEDIATELY APPLIED RULES 5-87 THROUGH 5-89 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FM 9/1/72 TRAJECTORY LUMAR ORBIT		λ <u><</u> 3,800	FT	SSTRAC	CK LIMIT MA	AY BE UPDATED IN FL	IGHT BASED ON QUAL	ITY OF TRAC	KING DATA.)
INDICATIVE OF GREATER MISALIGNMENT, POI WILL BE SLIPPED ONE REV IF NEW COMPENSATION CANNOT BE IMMEDIATELY APPLIED RULES 5-87 THROUGH 5-89 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 TRAJECTORY LUMAR DRBIT		B. POWERED D	ESCENT WIL	L NOT	BE SLIPPE	TO ACHIEVE AN ACC	EPTABLE SET OF LAN	DMARK SIGHT	INGS.
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 TRAJECTORY LUMAR ORBIT	5-86	ALLOWABLE MISO	ALIGNMENT A	AT PDI ISALIG	IS 0.6 DE	G ABOUT THE Y AXIS WILL BE SLIPPED ON	. IF THE SECOND P	52 ALIGNMEN ENSATION CA	T DETECTS DRIFT RATES NNOT BE IMMEDIATELY APPLIED
APOLLO 17 FNL 9/1/72 TRAJECTORY LUNAR ORBIT		RULES 5-87 THI	ROUGH 5-89	ARE R	ESERVED.				
APOLLO 17 FNL 9/1/72 TRAJECTORY LUNAR ORBIT									
APOLLO 17 FNL 9/1/72 TRAJECTORY LUNAR ORBIT		·							
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APOLLO 17 FNL 9/1/72 TRAJECTORY LUNAR ORBIT							1	T	
		- M	MO1221	DEV	DATE	SECTION	GRUID	DAGE	

MISSION RULES

		MISSION RULES
R	ITEM	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED
	1121	RULES 5-85 THROUGH 5-89 ARE RESERVED.
	5-90	LR DATA IS REQUIRED FOR LANDING.
:		A. LOCK-ON
		1. LR DATA ACCEPTED AND CONVERGED CONTINUOUS TO P64 - CONTINUE MISSION IF LOSS OF LOCK OCCURS IN P64.
İ		2. LR DATA ACCEPTED AND CONVERGED WITH SUBSEQUENT DROPOUT - CONTINUE TO P64.
		(A) LANDING RADAR REGAINED IN P64. (1) DATA ACCEPTED BY LGC - <u>CONTINUE MISSION</u> (2) DATA NOT ACCEPTED BY LGC - <u>ATTEMPT MANUAL LANDING IF LR/PGNS AH <1500 FT</u>
		(B) LANDING RADAR NOT REGAINED AT P64 - <u>ABORT</u>
		3. LATE LR LOCK-ON WITH DATA BEING INCORPORATED AND CONVERGING - CONTINUE TO P64
		(A) DATA ACCEPTED BY LGC - <u>CONTINUE MISSION</u> (B) DATA NOT ACCEPTED BY LGC - <u>ATTEMPT MANUAL LANDING</u>
		B. MINIMUM ALTITUDE WITHOUT LR ALTITUDE INCORPORATION
		 PGNS ALTITUDE LESS THAN 22,000 FEET AND PGNS NAVIGATION ERRORS, CONFIRMED BY MSFN OR DOPPLER RESIDUALS, THAT CAUSE AN AGS-PGNS RADIAL VELOCITY DIFFERENCE (A) RADIAL N69 NOT INCORPORATED AND DIFFERENCE EXCEEDS 10 FPS - ABORT (B) RADIAL N69 INCORPORATED AND DIFFERENCE EXCEEDS 20 FPS - ABORT
		 PGNS ALTITUDE LESS THAN 18,000 FEET AND PGNS NAVIGATION ERRORS, CONFIRMED BY DOPPLER BUT NOT BY AGS, CAUSE THE MSFN-PGNS RADIAL VELOCITY DIFFERENCE TO EXCEED -20 FPS - ABORT
		3. PGNS ALTITUDE LESS THAN 10,000 FT
		(A) RADIAL N69 NOT INCORPORATED - <u>ABORT</u> (B) LOSS OF WORKING PGNS (AS DEFINED BY RULE 5-91) - <u>ABORT</u>
		4. PGNS ALTITUDE LESS THAN 6000 FT - ABORT
		<u>NOTE</u>
		FOR FAILURES IN THE PGNS/LR INTERFACES, INCORPORATION MAY BE SATISFIED BY A PGNS/LR COMPARISON RESULTING IN ΔH < 1500 FT.
		C. MINIMUM ALTITUDE WITHOUT LR VELOCITY INCORPORATION
		1. PGNS ALTITUDE LESS THAN 10,000 FEET WITH LANDMARK TRACKING OBTAINED AND PGNS NAVIGATION ERRORS CONFIRMED
		BY AGS OR DOPPLER THAT CAUSE MSFN - PGNS DOWNRANGE OR CROSSRANGE VELOCITY DIFFERENCES (A) NAV N69 INCORPORATED AND AX EXCEEDS +50 OR -35 FPS OR AY EXCEEDS +90 OR -70 FPS - ABORT
		(B) NAV N69 NOT INCORPORATED AND ΔΧ EXCEEDS ±20 FPS OR ΔΥ EXCEEDS +45 OR -25 FPS - ABORT
		2. PGNS ALTITUDE LESS THAN 10,000 FEET WITHOUT LANDMARK TRACKING OBTAINED AND PGNS NAVIGATION ERRORS CONFIRMED BY AGS OR DOPPLER THAT CAUSE MSFN - PGNS DOWNRANGE OR CROSSRANGE VELOCITY DIFFERENCES (A) NAV N69 INCORPORATED AND ΔX EXCEEDS ±35 FPS OR ΔY EXCEEDS +70 OR -25 FPS - ABORT
		(B) NAV N69 NOT INCORPORATED AND ΔX EXCEEDS ±15 FPS OR ΔY EXCEEDS ±30 OR −10 FPS - ABORT.
		MISSION REV DATE SECTION GROUP PAGE

APOLLO 17

9/1/72

TRAJECTORY AND GUIDANCE

Tape 11D.3

5-13

LUNAR ORBIT

MISSION RULES

T T	SECTION 5 - TRAJECTURY AND GUIDANCE - CONTINUED									
R ITEM										
5-91	POWERED DESCENT WILL BE TERMINATED FOR THE FOLLOWING:									
	A. PGNS NAVIGATION ERRORS, CONFIRMED BY MSFN OR DOPPLER RESIDUALS, THAT RESULT IN THE FOLLOWING AGS-PGNS DIFFERENCES:									
	$\Delta \hat{X}$ (DOWNRANGE) > +90 OR -35 FPS $\Delta \hat{Y}$ (CROSSRANGE) > ±90 FPS $\Delta \hat{Z}$ (RADIAL) > +60 OR -35 FPS									
	B. PGNS NAVIGATION ERRORS, CONFIRMED BY DOPPLER RESIDUAL BUT NOT BY AGS, THAT RESULT IN THE FOLLOWING MSFN-PGNS VELOCITY DIFFERENCES:									
	$\Delta \dot{Y}$ (CROSSRANGE) > ± 200 FPS $\Delta \dot{Z}$ (RADIAL) > ± 45 OR -35 FPS									
	C. COMMANDED THRUST INCREASING PRIOR TO THROTTLEDOWN OR P63 T_{GO} = 80 SECONDS									
	D. GTC GREATER THAN 57 PERCENT BY P63/P64 PROGRAM SWITCH PLUS 15 SECONDS									
	E. FAILURE TO ACHIEVE FTP (AUTO OR MANUAL) BY NOMINAL T $_{ m IG}$ + 31 SECONDS (ABORT AT GTC DIVERGENCE)									
	F. THE FOLLOWING PGNS ALARMS: 20105, 00214, 20430, 20607, 21103, 01107, 21204, 21302, 21501, 00402 (CONTINUING)									
	G. CONSIDERATION WILL BE GIVEN TO ABORTING FOR VIOLATION OF THE TIME BAISED DPS ABORT BOUNDARY.									
5-92	THE DESCENT TARGET POINT WILL BE SHIFTED DOWNTRACK IF GTC INDICATES NO THROTTLEDOWN BY P63/64 PROGRAM SWITCH - THE MAXIMUM SHIFT IS AS FOLLOWS:									
	A. 20,000 FT DOWNTRACK IF VALID LANDMARK SIGHTINGS WERE OBTAINED. B. 10,000 FT DOWNTRACK IF NO VALID LAND C. NO DOWNTRACK SHIFT WILL BE ALLOWED IF THE APPROACH AZIMUTH IS BETWEEN 95 AND 100 DEG									
	NOTE ONE MINUTE OF RCS WILL BE USED TO ALLOW LANDING									
	WITHIN THE ABOVE LIMITS.									
5-93	AN ABORT WILL NOT BE REQUESTED FOR A PGNS FAILURE AFTER PITCHOVER IN THE APPROACH PHASE.									
5-94	IN THE EVENT MSFN AND DOPPLER DATA ARE NOT AVAILABLE FOR CONFIRMATION OF PGNS/AGS ERRORS, POWERED DESCENT WILL BE TERMINATED FOR THE FOLLOWING AGS-PGNS VELOCITY DIFFERENCES:									
	$\Delta\dot{X}$ > -35 FPS $\Delta\dot{Z}$ > +60 FPS OR -35 FPS									
	MISSION REV DATE SECTION GROUP PAGE									
	APOLLO 17 FNL 9/1/72 TRAJECTORY LUNAR ORBIT 5-14 Tape 52.4									

MISSION RULES

T		JEGT	011 3 - 110	AJECTORY AND G	OTDANCE -	CONTINUED			
ITEM									
5-95	IN THE EVENT MSFN, DOPF BE PERFORMED IF LR DATA	PLER, AM	ID AGS NAV	DATA ARE NOT ATED INTO THE	AVAILABLE PGNS BY 7	FOR MONITORI	NG OF POWERE	D DESCENT, A	N ABORT WILL
	RULES 5-96 THROUGH 5-10	OO ARE F	RESERVED.						
					•				
	MISSION	REV	DATE	SECTION		GROUP	PAGE		
	APOLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	LU	NAR ORBIT	5-15		Tape 52.5

MISSION RULES

			S	ECTIO	1 5 - TRAJE	ECTORY AND GUIDANCE	- CONTINUED					
R	ITEM		·									
						ASCENT						
:	5-101	LM LIFTOFF WILI	L BE DELAYED	one ri	EVOLUTION (RATHER THAN ACCEPTI	NG A SLIP IN NO	OMINAL LIFTOFF T	TIME GREATER THAN			
		A. 10 SECONDS B. 90 SECONDS										
	5-102	FOLLOWING A DES	SCENT ABORT,	GU I DA	NCE SWITCH	OVER TO AGS WILL BE	PERFORMED FOR	·				
١		A. THE FOLLOW	ING PGNS ALAR	MS:	20105, 002	14, 20430, 20607, 2	1103, 01107, 21	1204, 21302, AND	21501			
		B. PGNS NAVIG	ATION ERRORS	THAT	RESULT IN:							
	į	2. AGS PR		TION	Ha GREATER	D FEET. THAN TARGET VALUE E GREATER THAN 1.0		AL MILES.				
	5-103	DURING ASCENT, GUIDANCE SWITCHOVER TO #3S WILL BE PERFORMED FOR A. THE FOLLOWING PGNS ALARMS: 20105, 00214, 20430, 21607, 21103, 01107, 21204, 21302, AND 21501										
		A. THE FOLLOWING PGNS ALARMS: 20105, 00214, 20430, 23607, 23103, 01107, 23204, 23302, AND 21501										
l		B. PGNS NAVIGATION ERRORS, CONFIRMED BY AGS RESIDUALS, THAT RESULT IN THE FOLLOWING MSFN-PGNS VELOCITY DIFFERENCES:										
		ΔΧ (DOWNRANGE) > ±24 FPS ΔΫ́ (CROSSRANGE) > ±90 FPS (COELLIPTIC SEO ENCE RENDEZVOUS), > ±45 FPS (DIRECT RENDEZVOUS) ΔΖ˙ (RADIAL) > ±37 FPS										
		C. PGNS NAVIG	ATION ERRORS	THAT	RESULT IN							
		 AGS PREDICTED INSERTION Hp < 40,000 FEET. AGS PREDICTED INSERTION Ha GREATER THAN TARGET VALUE PLUS 40 NAUTICAL MILES. AGS PREDICTED INSERTION WEDGE ANGLES GREATER THAN 1.0 DEGREE (COELLIPTIC SEQUENCE RENDEZVOUS), GREATER THAN 0.5 DEG (DIRECT RENDEZVOUS) 										
		D. IF MSFN NO	T VALID DURIN	IG ASC	ENT THE FOI	LLOWING DOPPLER RES	IDUALS WILL BE	USED TO CONFIRM	1 SWITCHOVER:			
		1.(A). AGS-PGNS ΔΫ (CROSSRANGE) > ±45 FPS AND DOPPLER-PGNS RESIDUAL > ±8.0 FPS FOR THE DIRECT RNDZ (B). AGS-PGNS ΔΫ (CROSSRANGE) > ±90 FPS AND DOPPLER-PGNS RESIDUAL > ±16.0 FPS FOR THE COELLIPTIC RNDZ										
		2. AGS-PG	ins ∆Ž (RADIAL	.) > ±	37 FPS AND	DOPPLER-PGNS RESID	UAL > ±32.0 FPS	5				
١												
			T			r						
			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION TRAJECTORY	GROUP ASCENT	PAGE	 			
					i .	AND GUIDANCE	1	5-16	Tape 11D.4			

MISSION RULES

R	ITEM	
	5-104	DURING ASCENT, THE AGS WILL BE DECLARED NO-GO FOR CONFIRMED AGS NAVIGATION ERRORS THAT RESULT IN
		A. PGNS PREDICTED INSERTION Hp < 30,000 FT.
		B. PGNS PREDICTED INSERTION HA GREATER THAN TARGET VALUE PLUS 40 NM
		C. PGNS PREDICTED INSERTION WEDGE ANGLE GREATER THAN 1.0 DEGREE (COELLIPTIC SEQUENCE RENDEZVOUS), GREATER THAN 0.5 DEG (DIRECT RENDEZVOUS)
		TIME OLD DEG (DIRECT REHIDEZTOOD)
1	5-105	THE GROUND WILL NOT REQUEST SWITCHOVER AFTER AGS T_{60} < 30 SEC.
		RULE NUMBERS 5-106 THROUGH
		5-110 ARE RESERVED
	1	
1		
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	1	
		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 TRAJECTORY ASCENT 5-17 Tape 18.2
		I I I AND GUIDANCE I 3-1/ I Tabé 18.2

MISSION RULES

1750			SECTI	UN 5 - TRA	JECTORY AND GUIDANO	E - CONTINUED					
ITEM											
					RENDEZVOUS						
5-111	COMPUTATION/	EXECUTION WITH	THE	AGS AS BAC	NDZ (TPI ONLY) OR T KUP UTILIZING THE A GNS, AGS, CMC, AND	CCEPTED SOLUTION	QUENCE (CSI,CDH	, AND TPI) MANEUVER E SOLUTIONS FOR THESE			
	A. THE FOLLS	OWING VOTING L	_OGIC	WILL BE OB	SERVED FOR ALL MANE	UVERS:					
					OF 3 SOURCES AND EX L BE UTILIZED TO IS						
	B. AGREEMEN	T BETWEEN SOUR	RCES I	S DEFINED	AS ·						
	1. DIREC	CT RNDZ - TIP									
	(A)	3 FPS IN ΔV_{χ}									
	(B)	7 FPS IN AV									
	(C)	9 FPS IN AVZ				•					
	,				NOTE						
			LM	BIASES OF	1 FPS IN AV AND -2	FPS IN AV.					
	WILL BE APPLIED TO THE LM SOLUTION FOR COMPARISON WITH THE CSM SOLUTION										
	2. COELL	2. COELLIPTIC SEQUENCE RNDZ - ALL MANEUVERS									
	(A) 3 FPS IN ΔV_{χ}										
	(B) 7 FPS IN △V _Y										
	(C)	9 FPS IN AVZ									
	C. THE CMC S	SOLUTION FOR T	HE PL	ANE CHANGE	MANEUVER WILL ALWA	YS BE EXECUTED I	F GREATER THAN 5	5 FPS.			
5-112	I TETOPE WITE	DE COURTES =			NI OUVIE ASSIST						
0-114			U SAT	12F1 THE FC	OLLOWING CONSTRAINT	> :					
	A. DIRECT RN	NDZ									
	1. THE A	∆H AT TPI WILL	BE 15	5 NM.							
	1	∆⊖ AT TPI WILL									
					BE ZERO DEGREES.						
	4. TPI W	4. TPI WILL OCCUR 45 MIN AFTER INSERTION.									
	B. COELLIPTI	IC SEQUENCE RN	DZ								
	1		n=	- 4744							
		∆H AT TPI WILL WOMINAL FLEVAT			DEG) WILL OCCUR 16	MIN PRIOR TO SU	NRISE				
		ODH MANEUVER W				10 30					
					•						
i		MISSION	REV	DATE	SECTION	GROUP	PAGE				
		APOLLO 17	FNL	9/1/72	TRAJECTORY	RENDEZVOUS					
		1	I		AND GUIDANCE	1	5-18	Tape 11			

MISSION RULES

		31	CUITON	1 3 - IKAUI	ECTURY AND GUIDANCE	- CONTINUED						
ITEM												
5-113	COELLIPTIC SEQU	JENCE RNDZ EX	ECUTIO	ON SHALL, I	WHERE POSSIBLE, OBS	ERVE THE FOLLOWI	NG CONSTRAINTS:					
	A THE ACTUS	ALL MAY DE CO		. F MM . CD.O.	4 3 F NW							
	A. THE ACTUAL											
	B. TPI MAY OCC											
	C. THE AT BETT	MEEN CUH AND	IPI MU	151 BE GKE	ATER THAN 30 MIN							
5-114	THE "BAILOUT" MANEUVER TO TRANSFER FROM THE DIRECT RNDZ TECHNIQUE TO THE COELLIPTIC SEQUENCE RNDZ WILL BE EXECUTED IF:											
	A. THE ΔV _G OF	THE TWEAK MAI	NEUVER	R BECOMES	GREATER THAN 60 FPS							
					A LM PERILUNE OF L							
	C. LOSS OF ANY	Y SYSTEM DURI	NG ASC	CENT RESUL	TING IN VIOLATION O	F THE RNDZ NAVIG	ATION MATRIX					
5-115		Y RNDZ NAVIGA TECHNIQUES A		FECHNIQUE	IS REQUIRED TO COMM	IT TO THE DIRECT	RNDZ. THE PRIMAF	RY RNDZ				
	1. LGC AN	D RNDZ RADAR				•						
		D RNDZ RADAR										
	3. CMC, SI	EXTANT, AND L	M LIGH	łT								
					ES, WHICH MAY YIELD ER COMPUTATION SOUR							
	1. AEA, VHF EMS, LM COAS, AND CSM LIGHT											
	2. AEA, VHF CMC, LM COAS, AND CSM LIGHT											
1	3. CMC, VHF CMC, SEXTANT, AND REFLECTED SUNLIGHT											
		HF CMC, CSM C										
	5. CMC, V	HF CMC, CSM C	OAS, A	AND REFLEC	TED SUNLIGHT							
	RULES 5-116 TH	ROUGH 5-120										
	ARE RESERVED.											
	:											
<u>.</u>		MICCION	DEV.	DATE	SECTION	GROUP	PAGE					
		MISSION	REV	DATE 9/1/72	TRAJECTORY	RENDEZVOUS	IAGE					
		APOLLO 17	FNL	3/1//6	AND GUIDANCE	VEHNETAON2	5-19	Tape 18.4				

MISSION RULES

				SECT	ION 5 - TRA	AJECTORY AND GUIDANG	E - CONTINUED		
R	ITEM							_	
1						TRANSEARTH ENTRY			
	5-121	TRANSEARTH	MCC WILL BE T	ARGETI	ED TO ACHIE	EVE ENTRY CONDITIONS	AS FOLLOWS:		
		A. IF V _{EI}	> 31000 FPS 0	R G&N	NO-GO, USE	STEEP TARGET LINE.			
		B. IF VEI	< 31000 FPS A	ND GAI	N GU, USE :	SHALLOW TARGET LINE.			
	5-122	TRANSEARTH	MCC PHILOSOPH	Y					
		A. TEC MCC	WILL NOT USE	LAND:	ING POINT (CONTROL UNLESS THE L	ANDING POINT IS	UNACCEPTABLE	
		B. IF GAMM	A EI IS OUTSI	DE TH	E ENTRY COF	RRIDOR.			
			OR TO GET OF ER MCC 5 - EX			EXECUTE MCC ASAP IF	PREDICTED AV AT	「MCC 5 IS > :	20 FPS
		C. MCC GRE	ATER THAN MIN	IMUM	IMPULSE CAF	PABILITY WILL USE TH	E SPS IF PRACTIO	CAL.	
	l·								
	5-123	TEC MCC FOR	LANDING AREA	CONTI	ROL				
		A. PRIOR T	O EI MINUS 24	HRS -	- WILL BE E	EXECUTED FOR RECOVER	Y ACCESS VIOLATI	ONS, UNACCEP	TABLE WEATHER AT IP, OR IF
		THERE I	S ANY LAND MA	SS IN	THE GAN EN	MS, OR CONSTANT G LA	NDING AREAS OR I	F A SIGNIFIC	ANT LAND MASS IS IN
		ANT UIT	ER PORTION OF	IHE (JPE KATI UNAL	_ FOUIPRINI.			
		B. AFTER E	I MINUS 24 HR	S - W	ILL NOT BE	EXECUTED.			
	5-124	RESERVED							
ĺ									
	5-125	BACKUP ENTR	Y IS CONSTRAI	NED AS	FOLLOWS:				
		A. THE CON	STANT G ENTRY	MUST	FALL BETWE	EN 3 AND 5 G'S.			
		B. EMS RAN	GING WILL NOT	BE A	TTEMPTED UN	NTIL V IS LESS THAN	25500 FPS.		
	5-126	WEATHER AVO	IDANCE WITH A	ER O DYI	NAMIC LIFT	WILL NOT BE ATTEMPT	ED UNLESS THE G&	N IS OPERATIO	DNAL, OR EMS-INDICATED
			LESS THAN 25						
	5-127	PREDICTED E	NIBA CUBBIUUD	VIOL	ATION AFTER	R THE LAST MCC OPPOR	TUNITY		
]								
						SE CREW TO FLY FULL SE CREW TO FLY NEGAT			, THEN FLY G&N. / 4-G CONSTANT ENTRY.
		= 110110		Ji					
	L		MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	TRANSEARTH ENTRY	5-20	Tape 57.5
<u> </u>			<u></u>	L	<u> </u>	L	L		14pc 37.3

MISSION RULES

				2FC11(JN 5 - TRAC	ECTORY AND GUIDANO	E - CONTINUED			
R	ITEM					- 2	. – —			
	5-128	RESERVED								
	5-129	RESERVED								
	5-130	B. P65 VALUE	OF VL DIFFER	S FROM	1 THE GROUN	ID COMPUTED LIMITS ID COMPUTED LIMITS IT LIMITS (SKIP) ON	EMS SCROOL			
		D. CAUSES TRA E. THE G&N TA F. THE G&N TA	JECTORY TO V IM ATTITUDES IM ATTITUDES	IOLATE AT CM AT .0	E THE ONSET 1/SM SEP DI 05 G DIFFER	LIMITS (GN ON EMS FFER FROM THE HORI FROM THE GROUND V P64 AT RET .05 G ±	SCROLL ZON MONITOR ATTIT ALUES BY GREATER	UDE BY GREA THAN 5 DEG	TER THAN 5 DEG	
										4
		-		,			T		···	
-			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION TRAJECTORY	GROUP TRANSEARTH	PAGE		
			L			AND GUIDANCE	EARTH	5-21		Tape 18.6

MISSION RULES

	, .	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED											
R	ITEM												
	5-131	TEI ABORTS AND RESIDUAL TRIMMING PHILOSOPHY											
		A. IN GENERAL, ONCE THE SPS HAS BEEN IGNITED, THE MANEUVER WILL BE COMPLETED WITH THE SPS ENGINE. THIS IMPLIES THAT THERE WILL BE NO MANUAL SHUTDOWNS AND AS MANY RESTARTS AS NECESSARY TO COMPLETE THE TEI MANEUVER. QUANTITIES FOR THE ΔV RULES LISTED BELOW FOR PREMATURE SHUTDOWNS ARE GUIDELINES FOR USE OF RCS PROPELLANT.											
:		1. NO SPS IGNITION - DO NOT ATTEMPT A MANUAL RESTART. SLIP 1 REV AND DO MALFUNCTION PROCEDURES.											
		2. AFTER SPS IGNITION, THERE WILL BE NO MANUAL SPS SHUTDOWN.											
		3. FOR PREMATURE SHUTDOWN:											
		(A) TEI AV REMAINING GREATER THAN THE RCS AV CAPABILITY MINUS 20 FPS - RESTART SPS AND COMPLETE THE TARGETED BURN. NO TRIM.											
	,	(B) TEI ΔV REMAINING LESS THAN THE RCS ΔV CAPABILITY MINUS 20 FPS, BUT GREATER THAN 5 FPS - RCS +X OR SPS MAY BE USED TO COMPLETE THE TARGETED BURN BASED UPON CREW JUDGEMENT. NO TRIM.											
		(C) RESIDUAL LESS THAN 5 FPS - TRIM X AND Z.											
		NOTE THIS RULE ALSO APPLIES FOR A DPS TEI WITH NO OPERATIONAL SPS FOR BACKUP.											
		B. PREMATURE DPS TEI SHUTDOWN WITH AN OPERATIONAL SPS AS BACKUP											
ļ		1. NO DPS IGNITION - SLIP 1 REV AND DO MALFUNCTION PROCEDURES AND RETARGET USING DPS OR SPS.											
		2. FOR A PREMATURE SHUTDOWN IN THE MODE III REGION (ACHIEVED TEI ΔV < 1700 FPS/PRE-ABORT PERIOD LESS THAN 15 HR) - TARGET THE SPS FOR THE NEXT TEI.											
		3. FOR A PREMATURE SHUTDOWN IN THE MODE I REGION (ACHIEVED TEI ΔV > 1700 FPS) - TARGET THE SPS AT TEI +2 HR.											
		RULES 5-132 THROUGH 5-139 ARE RESERVED.											
		·											
<u>_</u>	<u>L</u>												
\vdash		MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 TRAJECTORY TRANSEARTH											
		AND GUIDANCE ENTRY 5-22 Tape 18.7											

MISSION RULES

ITEM		- 1						
			_					
			_	RANGE SAF	ETY RULES AND AGRE	EMENTS		
					GENERAL			
5-140					CIFIED IN AFETR MAI C AFETR/NASA INTER			
5-141	IGNITION AND I	NASA IS UNABL T FROM THE NA	E TO A SA LAU	ACCOMPLISH INCH VEHICL	CUTOFF. THE RSO W	ILL SEND "ARM/MFCC CLTC). THE CLTC W	ONLY IN F	L NOT LIFT OFF AFTER RESPONSE TO A CODED RE RSO ON THE CLTC-RSO A LIFTOFF INDICATION.
5-142	PROCEDURE WILI	L BE EXECUTED THRUST HAVE F	IF RA AILED.	NGE SAFETY THE REQU	ORT IN RESPONSE TO A FLIGHT TERMINATION WEST FROM RSO TO FD CKUP.	I CRITERIA HAVE BE	EN VIOLATED	AND RSO EFFORTS
5-143	DYNAMICS OFFI	CER (FIDO). CCESSFUL. TH	THIS P E REQU	PROCEDURE W JEST FROM F		ABORT LIMITS HAVE	BEEN EXCEE	OR (FD) OR THE FLIGHT DED AND ABORT ACTION O LOOP (CAPE 111)
5-144	"NO. 4 OUT" Of	N THE RSO LOO	P (CAP	PE 111) AND	O. 3 OR NO. 4 ENGIN VOR ACTIVATE THE EN HIGHLY DESIRABLE.			RSO, NO. 3 OUT" OR NSOLE. THE NO. 3
5-145					D, THE RSO WILL SEN			
5-146	IF AN ESTABLIS	SHED IMPACT P	REDICT	ION (IP) P	OINT IS ON THE CAPE	KENNEDY LAND ARE	A, "DESTRUC	T/PD" WILL BE
		TO TERMINATE		T BY "ARM/	MFCO" IS UNSUCCESSE	UL WHILE THE IP I	S ON THE CA	PE KENNEDY LAND AREA,
5-147	DESTRUCT/PU	WILL DE SENT						
5-147	DESTRUCTIVE	T	Γ	1	T 222	T	Lace	
5-147	DESTRUCTIVE	MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION TRAJECTORY	GROUP RANGE SAFETY	PAGE	

MISSION RULES

				SEUII	UN 3 - IRA	JECTORY AND GUIDANG	CE - CONTINUED				
R	ITEM				_						
	5-148	WHEN THE IP HABORT. THE "SEPARATION, A	DESTRUCT/PD"	FUNCT	ION WILL B	E SENT ONLY AFTER F	ON WILL BE LIMITED FD/FIDO CONFIRMATIO	TO "ARM/M ON OF SATI	FCO" OR CREW INITIATED SFACTORY SPACECRAFT		
	5-149	IF AN IP POIN BE SENT UPON					INECESSARY, THE RS(O WILL NOT	IFY FD/FIDO, "SAFE WILL		
	5-150	FD/FIDO WILL THE RSO WILL	DECLARE TO THE	HE RSO	WHEN THER	E IS NO POSSIBILITY O BE OVERFLOWN.	OF INSERTING THE	SPACECRAF	T INTO AN ORBIT, AND		
5-151 AN ETR RANGE SAFETY OFFICER (BRSO) IS REQUIRED AT BERMUDA TO MONITOR PRESENT POSITION AND IMPACT PREDIC CHARTS, TO OBSERVE TELEMETRY DISPLAYS, AND TO TRANSMIT THE RANGE SAFETY FUNCTIONS WHEN COMMANDED TO DO THE RSO. FOR FLIGHT AZIMUTHS LESS THAN 090 DEGREES, THE BRSO WILL ASSUME PRIMARY RANGE SAFETY RESPONSION THE EVENT OF LOSS OF COMMUNICATIONS BETWEEN THE BRSO AND THE RSO.											
	5-152	SAFING BY THE RSO WILL BE TRANSMITTED AFTER GATE PENETRATION AND FIRST S-IVB CUTOFF WHEN THE FD/FIDO REQUESTS, "RSO SEND SAFE." WHEN SAFING IS CONFIRMED, THE RSO WILL STATE "SAFING CONFIRMED." IN THE EVENT OF LOSS OF COMM WITH FD/FIDO, THE RSO WILL SEND SAFE ONLY IF HE CAN CONFIRM S-IVB CUTOFF.									
5-153 IF SAFING CANNOT BE CONFIRMED BY THE RSO, ANOTHER SAFING ATTEMPT WILL BE MADE BY THE RSO ON TH PASS OVER THE CAPE. COORDINATION WILL BE EFFECTED WITH THE SUPERINTENDENT OF RANGE OPERATIONS FIDO TO ENSURE COMMAND COVERAGE AND TELEMETRY DISPLAY AVAILABILITY. AT THE AGREED TIME, FIDO "RSO SEND SAFE." UPON CONFIRMATION, THE RSO WILL STATE, "SAFING CONFIRMED".											
	5-154 THE FD/FIDO WILL INFORM THE RSO IMMEDIATELY UPON DETERMINATION OF A SPACECRAFT SEPARATION. THIS NOTIFICATION WILL BE TRANSMITTED ON THE RSO LOOP (CAPE 111) WITH THE FIDO-RSO PRIVATE LINE AS BACKUP.										
				-							
			MISSION	REV	DATE	SECTION	GROUP	PAGE			
			APOLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	RANGE SAFETY	5-24	Tape 19.2		
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MISSION RULES

	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED											
R	ITEM											
		TRACKING SOURCES										
	5-155 AT LEAST TWO (2) VEHICLE POSITION DATA SOURCES ARE MANDATORY TO L/O FOR EACH PHASE OF POWERED FLIGHT PRIOR TO THE AFRICAN GATE TO ENABLE THE RANGE SAFETY OFFICER TO DETERMINE IF THE VEHICLE IS NORMAL OR VIOLATES ESTABLISH INFLIGHT SAFETY CRITERIA.											
	5-156	DATA FROM TWO (2) OF THE FOLLOWING THREE (3) RADARS ARE MANDATORY TO L/O (OTHER HIGHLY DESIRABLE): BERMUDA FPS-16, BERMUDA FPQ-6, AND GRAND TURK TPQ-18.										
	5-157 PRESENT POSITION AND IP PLCTS AT BERMUDA (BDA) USING INPUTS FROM EITHER THE BDA FPS-16 OR BDA FPQ-6 RADAR ARE HIGHLY DESIRABLE FOR LAUNCH.											
						•						
		MISSION APOLLO 17	REV	DATE	SECTION TRAJECTORY	GROUP RANGE SAFETY	PAGE					
L		APOLLO 17	FNL	9/1/72	AND GUIDANCE	NAME SAFEII	5-25	Tape 19.	.3			

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED

	SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED									
R	ITEM									
]									
					-	**************************************	_			
					_	AIRBORNE SYSTEMS				
•	5-158						LAUNCH VEHICLE ST			
		MANDATORY TO	L/O. THE RAI	NGE SA	FETY SUPER	VISOR (CRSS) AT T	HE LAUNCH CONTROL	CENTER WILL	DETERMINE IF	THE
		RECEIVERS ARE	OPERATING P	ROPERL	Υ.					
- 1	1									
1										
	5-159	IU C-BAND BEA	CON NO. 1 OR	NO. 2	IS HIGHLY	DESIRABLE FOR LA	UNCH.			
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1			APOLLO 17	FNL	9/1/72	TRAJECTORY	RANGE SAFETY	5 66		7
L			L	<u> </u>	L	AND GUIDANCE	<u> 1</u>	5-26	<u> </u>	Tape 19.4

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED

	,			ECITO	N 5 - IKAJ	ECTORY AND GUIDANCE	- CONTINUED			
R	ITEM									
	l									
						COMMAND/CONTROL				
1						- S. A WHID/ CONTINUE				
	5-160	NASA BERMUDA D	ORS COMMAND/CO	NTROI	CAPARII IT	V IS MANDATODY TO !	/O FOR FLIGHT AZIM	TUE LECC	THAN OO DECREE	
		Wilder Bernieder E	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	MINOL	CAPABILIT	1 13 MANDATORT TO E	/O FOR FLIGHT AZIMI	NIH2 LESS	THAN 90 DEGREES	•
	5-161	A 4-SECOND TIM	IE DELAY BETWE	EN "A	RM/MFCC" A	ND "DESTRUCT/PD" WI	LL BE PROVIDED BY	TIMERS IN	THE RSO CONSOLE	IN THE
1		RCC.								<u>-</u>
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			MISSION	REV	DATE	SECTION	GROUP	PAGE		
			APOLLO 17	FNL	9/1/72		RANGE SAFETY	<u> </u>		
			710550 17	1 144	3,1,76	TRAJECTORY AND GUIDANCE	IVANUE SAFEIT	5-27		Tape 19.5
TSG										

MISSION RULES

SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED

		SECTION 5 - TRAJECTORY AND GUIDANCE - CONTINUED
R	ITEM	
	1	COMMUNICATIONS
	5-162	ONE (1) OF TWO (2) PRIVATE, INDEPENDENT, GEOGRAPHICALLY DIVERSIFIED COMMUNICATIONS LINKS BETWEEN THE RSO AND BRSO IS MANDATORY AND THE OTHER IS HIGHLY DESIRABLE.
	5-163	ONE (1) OF THE FOLLOWING THREE (3) COMMUNICATIONS LINKS IS MANDATORY BETWEEN THE RSO AND FD/FIDO AND THE OTHERS ARE HIGHLY DESIRABLE.
		A. RSO LOOP (CAPE 111) B. RSO PRIVATE LINE
		C. FLIGHT DIRECTOR LOOP
	5-164	A COMMUNICATIONS LINK BETWEEN THE RSO AND THE RANGE SAFETY SUPERVISOR (CRSS) AT THE LAUNCH CONTROL CENTER IS MANDATORY FOR T-40 MINUTE DESTRUCT CHECKS.
	5-165	A DIRECT LINE COMMUNICATIONS LINK BETWEEN THE RSO AND THE LAUNCH VEHICLE TEST CONDUCTOR (CLTC) IS HIGHLY DESIRABLE.
<u> </u>		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 TRAJECTORY RANGE SAFETY AND GUIDANCE 5-28 Tape 19.6
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MISSION RULES

Т				SECTIO	N 5 - TRAJ	ECTORY AND GUIDANC	E - CONTINUED		
4	ITEM								
١						TELEMETRY			
ı									
į	5-166	IU TELEMETRY I			NCE PARAME	TERS) TO THE RTCS	ARE HIGHLY DESIRAB	LE UNTIL S	-IVB CUTOFF FOR IP
	5-167	TELEMETRY REQU	JIREMENTS TO I	BE DIS	PLAYED FOR	R THE RSO AND THE E	RSO ARE HIGHLY DES	IRABLE.	
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			APOLLO 17	FNL	9/1/72	TRAJECTORY AND GUIDANCE	RANGE SAFETY	5-29	Tape 19.7
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MISSION RULES

				32011	011 3 - 170-1	JECTORY AND GUIDAN	CE - CONCLUDED			
R	ITEM					_				
	1 1				DANCE CAL	TOTAL OF STORE STORE				
					KANGE SAI	FETY WEATHER RESTR	ICTIONS			
	5 ,60									
	5-168	WIND RESTRICT	IONS							
		AN ANNUAL PRO	FILE WIND RES	TRICT	ION OF 1.2	5 SIGMA (11 PERCEN	T) WILL BE IN EFFE	CT FOR LAUI	NCH.	
	5-169	CEILING AND V	ISIBILITY RES	TRICT	IONS					
		NO CEILING OR	VISIBILITY F	ESTRI	CTIONS WILI	L BE IMPOSED PROVI	DING CNV FPS-16 AN	D MILA TPQ-	-18 RADARS AND	
		BEACON NO. 1				•				
	·									
_			*		 		T	Т	I	
-			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION TRAJECTORY	GROUP RANGE SAFETY	PAGE		
1			AFOLEO 17	l '''-	-, -, -,	AND GUIDANCE		5-30	ĺ	Tape 19.8

MISSION RULES

SECTION 6 - SLV - TB1 THROUGH TB4/TB4A

. 1					SECTION 6 -	- SLV - TB1 THROUGH	184/184A		
R	ITEM								
1					CIMALA				
1					SUMMAF	RY OF LAUNCH PHASE F	RULES		
	İ								
1									
			LOSS OF THRUST						
		6-2 LOSS (OF ATTITUDE CO	NTROL					
1	1	6-3 INERT	IAL PLATFORM F	AILURE	E - ACCELER	ROMETER			
		6-4 SLV II	NERTIAL PLATFO	RM FA	LURE				
		6-5 S-IVB	CRYO REPRESS	VALVES	S FAIL OPEN	N			
l						DR YAW DURING S-II E	HIRN		
			LOSS OF THRUST						
			GIMBAL SYSTEM		DE.				
			SECOND PLANE S						
			LOSS OF HYDRA		LLUID				
	1		LOSS OF THRUS						
		9-15 2-1AB	COLD HELIUM S	HUTOFI	F VALVE(S)	FAIL OPEN			
		_							
	'		G MISSION RULE	S ALSO	APPLY TO	THIS SECTION:			
		NONE							
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			MISSION	REV	DATE	SECTION	GROUP	PAGE	
-			APOLLO 17	FNL	9/1/72	SLV - TB1			
					<u></u>	THRU TB4/TB4A		6-1	Tape 53.4

MISSION RULES

SECTION 6 - SLV - TB1 THROUGH TB4/TB4A - CONTINUED

R ITEM

- A. BSE GENERALIZED SWITCH SELECTOR COMMAND CAPABILITY EXISTS:
 - 1. WHEN CREW ENABLES IU COMMAND SYSTEM (EXCEPT AS NOTED BELOW IN ITEM D)
 - 2. AFTER TB7 + 20 MIN
 - AFTER SPACECRAFT SEPARATION
- B. BSE MANEUVER UPDATE AND INHIBIT CAPABILITY EXISTS FOR TB7 MANEUVERS ONLY.
- C. BSE HAS NAVIGATION UPDATE CAPABILITY (FMR 6-3) AND TARGET UPDATE CAPABILITY (NO REQUIREMENT).
- D. BSE HAS NO COMMAND CAPABILITY DURING POWERED BURN PHASES.
- E. A SAFE DISTANCE BETWEEN THE SPACECRAFT AND S-IVB/IU IS DEFINED AS 7000 FT.
- F. BSE WILL RECOMMEND NO S-IVB RESTART FOR ANY CONFIRMED CONDITION/MALFUNCTION IN THE LAUNCH VEHICLE WHICH RESULTS IN:
 - A CATASTROPHIC HAZARD
 - 2. ACHIEVEMENT OF AN S-IVB ENGINE MAINSTAGE BURN WITH EXPECTED CUTOFF OR SHUTDOWN CONDITIONS DEFINITELY PRECLUDING AN ACCEPTABLE LUNAR MISSION. IN APPLYING THIS CRITERIA TO SPECIFIC MISSION RULES, A GO/NO GO RECOMMENDATION WILL BE REQUIRED IF INSUFFICIENT S-IVB CONSUMABLES OR PROPULSION PERFORMANCE IS AVAILABLE TO ASSURE ANY FINITE PROBABILITY OF ACHIEVING A CUTOFF ORBIT WITH 28K NM APOGEE ALTITUDE (FMR 7-1).
- G. IN THE EVENT OF NO S-IVB IGNITION AT RESTART OR AN EARLY S-IVB SECOND BURN CUTOFF, THE SPACECRAFT SHOULD REMAIN ATTACHED TO THE S-IVB/IU AND MONITOR LH₂ AND LOX ULLAGE PRESSURES UNTIL THE STAGE STATUS CAN BE ASSESSED BY GROUND. IF EMERGENCY SEPARATION IS REQUIRED IMMEDIATELY AFTER S-IVB CUTOFF, THE SPACECRAFT SHOULD IMMEDIATELY GO TO A SAFE DISTANCE (7000 FT) FROM THE S-IVB/IU.
- H. ABORT OR SPACECRAFT SEPARATION DURING LAUNCH PHASE WILL BE RECOMMENDED FOR THE FOLLOWING:
 - 6-1 S-IC LOSS OF THRUST
 - 6-5 S-IVB LOX CRYO REPRESS VALVE(S) FAIL OPEN
 - 6-6 EXCESSIVE ATTITUDE ERRORS IN PITCH OR YAW DURING S-II BURN
 - **6-7 S-II LOSS OF THRUST
 - **6-8 S-II ANY SINGLE ACTUATOR HARDOVER INBOARD
 - 6-9 S-II SECOND PLANE SEPARATION FAILS TO OCCUR AT TB3 + 31 SEC
 - 6-10 S-IVB LOSS OF ENGINE HYDRAULIC FLUID PRIOR TO FIRST S-IVB BURN
 - 6-11 S-IVB STAGE LOSS OF THRUST
 - 6-12 S-IVB COLD HELIUM SHUTOFF VALVE(S) FAILS OPEN
- I. SPACECRAFT GUIDANCE TAKEOVER WILL BE RECOMMENDED FOR THE FOLLOWING:
 - 6-4 LAUNCH VEHICLE INERTIAL PLATFORM FAILURE-ATTITUDE REFERENCE
 - 7-8 LOSS OF ATTITUDE CONTROL DURING TB5, TB7
- J. S-II/S-IVB EARLY STAGING WILL BE RECOMMENDED FOR THE FOLLOWING:
 - 6-5 S-IVB LOX CRYO REPRESS VALVE(S) FAIL OPEN
 - **6-6 EXCESSIVE ATTITUDE ERROR IN PITCH OR YAW DURING S-II BURN
 - **6-7 S-II LOSS OF THRUST
 - **6-8 S-II ANY SINGLE ACTUATOR HARDOVER INBOARD
 - **6-12 S-IVB COLD HELIUM SHUTOFF VALV(S) FAILS OPEN
 - ** TIME DEPENDENT

MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 1	7 FNL	9/1/72	SLV - TB1 THRU TB4/TB4A		6-2	Tape 11A.8

MISSION RULES

					101 111100011 101710			
R ITEM								
	K. TLI INH	IBIT PRIOR TO	RESTA	RT OR SPACE	CRAFT SEPARATION W	ILL BE RECOMMEN	IDED FOR THE FO	LLOWING:
	71 1	NCHEETCIENT DE	ODELL	ANTS DEMATA	I FOR ACHIEVEMENT (E ACCEDTABLE AL	TERNATE MICCIO	IAI C
					AFTER INSERTION	F ACCEPTABLE AL	. TEKNAJE MISSIC	142.
		OSS OF ATTITUE						
	7-22 5	-IVB CONFIRMED	LOSS	OF HYDRAUL	IC FLUID			
	8-6 9	-IVB ACTUATOR	CONFI	RMED HARDON	ER PRIOR TO IGNITI	ON		
	8-8 L	OSS OF ATTITUE	DE CON	TROL DURING	G S-IVB SECOND BURN			
	L. SPACECF FOLLOWI		N OR T	LI INHIBIT	WILL BE RECOMMENDE	D UNLESS COMMAN	ND ACTION IS SU	ICCESSFUL FOR THE
	7-4)-2 ENGINE MAIN	N OXID	IZER VALVE	FAILS TO CLOSE AT	FIRST S-IVB CUT	OFF	
1 1	*7-6	S-IVB COLD HELD	IUM SH	UTOFF VALVE	ES FAIL TO CLOSE			
	7-12	J-2 ENGINE MAIN	N FUEL	VALVE OR N	MAIN OXIDIZER VALVE	LEAKAGE		
					_TA PRESSURE REACHE		36 OR -26 PSID	
1	7-20	J-2 ENGINE STAI	RT BOT	TLE PRESSU	RE OUTSIDE RESTART	LIMITS		
	,	EMERGENCY SEP	ARATIO	N REQUIRED		,		
	M. BSE WII	L INHIBIT T86	IN TH	E EVENT A	TLI NO-GO DECISION	IS MADE IN TB5.		
	N. THERE	MUST BE AT LEAS	ST AN	80 MIN COA	ST PERIOD BETWEEN S	-IVB FIRST AND	SECOND BURNS.	
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	I	MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	SLV - TB1			
		1 5225	1		THRU TB4/TB4A		6-3	Tape 20.3

MISSION RULES

	SECTION 6 - S	SLV -	TB1	THROUGH	TB4/TB4A	-	CONTINUED
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_		r	SECTION	6 - SLV -	- TB1 THROUGH TB4/TB4	A - CONTI	INUED
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
	6-1	S-IC STAGE LOSS OF THRUST A. ANY SINGLE ENGINE PRIOR TO TB3 B. ANY TWO OR MORE ENGINES PRIOR TO DEACTIVATION OF ENGINE AUTO ABORT C. LOSS OF TWO ADJACENT CONTROL ENGINES AFTER DEACTIVATION OF AUTO ABORT AND BEFORE TB2 + 8 SEC D. LOSS OF TWO ADJACENT CONTROL ENGINES AFTER TB2 + 8 SEC E. LOSS OF THRUST - ENGINE 3 OR 4 (THIS RULE APPLIES ONLY FOR THE UNIQUE CASE OF ENGINE 3 OR 4 THRUST LOSS BETWEEN O TO 45 SEC) 1. VOICE COMM WITH RSO MISSION	LAUNCH	A. <u>C</u> B. <u>A</u> C. <u>A</u> E C. <u>A</u> E E C. <u>C</u> E	CONTINUE MISSION BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND MIT ABORT REQUEST. BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND CONTINUE MISSION BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND CONTINUE MISSION BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND BSE INFORM FLIGHT AND CONTINUE MISSION BSE INFORM FLIGHT AND BSE INFORM FLIGHT BSE INFORM	O TRANS- O TRANS- N ALL O FIDO. ENGINE RSO MALIES ITION ITIO	CUES A&B. 1. THRUST OK SWITCHES - OFF (K33-115 THROUGH K47-115) 2. THRUST CHAMBER PRESSURE (D8-101 THROUGH D8-105) 3. LONGITUDINAL ACCELERATION (A2-603) 4. FINAL THRUST OK CUTOFF - ON (K52-115 THROUGH K56-115) NOTES A&B. 1. CREW MAY DEACTIVATE AUTOMATIC ABORT AFTER TB1 120 SEC. C. 1. FOR LOSS OF TWO ADJACENT CONTROL ENGINES BEFORE CECO (TB2 + 0), ALL ENGINES WILL CUT OFF AT CECO, FOR LC OF TWO ADJACENT CONTROL ENGINES AFTE CECO. ALL ENGINES WILL CUT OFF AT CECO, FOR LC OF TWO ADJACENT CONTROL ENGINES AFTE CECO. ALL ENGINES WILL CUT OFF IMMEDIATELY. D. 1. ALL ENGINES WILL SHUT DOWN IMMEDIATELY. S-IC/S-II STAGING IS ENABLED AT TB2 + 16.9 SEC. CUES E. 1. THRUST CHAMBER PRESSURE (D8-103 AND D8-104) 2. ENGINE 3 OR ENGINE 4 THRUST OK SWITCHES OFF (K39-115 THROUGH K44-11 3. ENGINE 3 OR 4 FNL THRUST OK CUTOFF (K54-115 THROUGH K55-115) NOTES E. 1. RSO PL OR FD LOOP BACKUP TO RSO LOOF 2. CONFIRMATION OF NO OTHER KNOWN ANOMALIES WILL BE BASED ON: (A) ENGINE CHAMBER PRESSURE NOT DECREASING, AND (B) THRUST OK SWITCHES - ON
		APOLLO 17		9/1/72	SLV - TB1	5.1001	
ı			1		THRU TB4/TB4A		6-4 Tape 54.7

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	6-2	LOSS OF ATTITUDE CONTROL A. PRIOR TO DEACTIVATION OF EDS AUTO ABORT	LAUNCH	A. <u>ABORT</u>	CUES A.1. ANGULAR RATES - PITCH (R4-602) OR YAW (R5-602) GREATER THAN 2 DEG/SEC AND NOT DECREASING. ROLL (R6-602)
				BSE TRANSMIT ABORT REQ	GREATER THAN 5 DEG/SEC AND NOT DECREASING. 2. ANGULAR RATES - PITCH (R13-602) OR YAW (R8-602) GREATER THAN 2 DEG/SEC AND NOT DECREASING. ROLL (R12-602) GREATER THAN 5 DEG/SEC AND NOT DECREASING (SEE NOTE A.2)
					3. LOSS OF ATTITUDE CONTROL ALERT (SEE NOTE A.2.) NOTES
	!				A.1. THESE CUES ARE VALID IF RATE CHANNEL SWITCHOVER HAS NOT OCCURRED.
		B. BETWEEN DEACTIVATION OF EDS AUTO ABORT AND TB5 INITIATE	LAUNCH	B. <u>ABORT</u> BSE TRANSMIT ABORT REC	DUEST B.1. ANGULAR RATES - PITCH (R4-602), YAW (R5-602), GREATER THAN OR EQUAL TO 10 DEG/SEC, ROLL (R34-602) GREATER THAN OR EQUAL TO 20 DEG/SEC.
					2. ANGULAR RATES - PITCH (R13-602), YAW (R8-602), GREATER THAN OR EQUAL TO 10 DEG/SEC.
					3. EDS OVERRATE - PITCH OR YAW (K84-602), ROLL (K83-602).
					NOTES B.1. R13-602 AND R8-602 ARE VALID IF RATE CHANNEL SWITCHOVER HAS NOT OCCURRED.
					2. LOSS OF ATTITUDE CONTROL ALERT WILL BE GIVEN FOR THE FOLLOWING CONDITIONS:
					(A) LVDC/LVDA COMPUTATIONAL FAILURE. (B) ATTITUDE ERROR SIGNALS: TB1 + 120 SEC THRU S-II BURN - PITCH, YAW, ROLL, 5 DEG. S-IVB BURN - PITCH AND YAW, 5 DEG; ROLL, 3.5 DEG.
					(C) FAILURE TO INITIATE PROPER GUIDANCE SEQUENCE
	i				(D) S-IVB ENGINE ACTUATOR HARDOVER GREATER THAN ±5 DEG (S-II BURN ONLY)
					(E) FAILURE OF S-IVB ENGINE HYDRAULICS (S-IVB BURN ONLY)
					3. ROLL ATTITUDE ERRORS >3.5 DEG. DURING S-IVB BURN MAY BE A RESULT OF LOSS OF BOTH APS MODULES. THE CREW SHOULD ATTEMPT TO CONTROL ROLL WITH RCS.
_			I pry I		COOLIN DAGS
	_	MISSION APOLLO 17	FNL 9/	SECTION 1/72 SLV - TB1 THRU TB4/TB4A	GROUP PAGE 6-5 Tape 54.5

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMM	ENTC
		on or rolly inter one roll			KOLING		COES/NOTES/COMP	EM 3
	6-3	INERTIAL PLATFORM FAILURE - ACCELEROMETER	LAUNO COAST	·	ONTINUE MISSION	:	CUES	
		(ONE OR MORE AXIS)	RESTA	ART BS	SE INFORM FLIGHT, FID UIDO	O, AND	1. GUIDANCE STA (H60-603)	TUS WORD (MODE CODE 24)
				CA	APCOM ADVISE CREW		BITS D26 AND	D25 FOR Z ACCEL SET TO "ONE"
				ĺ			BITS D24 AND	D23 FOR X ACCEL SET TO "ONE"
							BITS D22 AND	D21 FOR Y ACCEL SET TO "ONE"
İ							INDICATE IN	R PICKOFFS (X, Y, OR Z) EXCESS OF 3 DEG AND NOT (H10-603, H11-603, H12-603)
							NOTES	
		:					1. NO EFFECT ON S-IC STAGE B	VEHICLE TRAJECTORY DURING URN.
							UTILIZES A P FAILED AXIS S-IVB BURNS.	S TO A BACKUP MODE AND RECOMPUTED F/M PROFILE FOR DURING THE S-IC, S-II, AND THE IU STATE VECTOR THERE- T REFLECT THE ACTUAL FLIGHT
							UNLESS REAL-	UPDATE WILL BE REQUIRED TIME ANALYSIS INDICATES A PDATE IS NOT REQUIRED 9).
							4. CREW WILL IN OVERSPEED CO	ITIATE MANUAL CUTOFF FOR AN NDITION.
							FOR THE FAIL	URN PRECOMPUTED F/M PROFILE ED AXIS ASSUMES NOMINAL ERFORMANCE AND NOMINAL MASS
	6-4	LAUNCH VEHICLE INERTIAL PLATFORM FAILURE -	ALL	<u>co</u>	ONTINUE MISSION		CUES	
		ATTITUDE REFERENCE		ME.	SE INFORM FLIGHT AND I END SPACECRAFT GUIDAN AKEOVER		1. GUIDANCE REF GUID MODE WO TO ONE (H60-	ERENCE FAILURE (DO4 OR DO6) RD 2 (MODE WORD 26) BIT 8 SET 503)
							2. GUIDANCE STA (H60-603)	TUS WORD (MODE CODE 24)
						Í	BITS D20 AND	D19 FOR Z GIMBAL SET TO "ONE"
							BITS D18 AND	D17 FOR X GIMBAL SET TO "ONE"
ŀ								D15 FOR Y GIMBAL SET TO "ONE"
	ļ						3. LADDER OUTPU (H54-603, H5	TS CONSTANT FOR FAILED AXES 5-603, H56-603)
								DR CONSTANT FOR FAILED AXES D-602, H71-602)
							NOTES	, ··-,
								THIS FAILURE PRIOR TO TB6, AVE TO INITIATE TB6, AND ISSUED BY CMC.
				1		ļ		
		MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	SLV - TB1 THRU TB4/TB4A		6-6	Tape 11B.1
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MISSION RULES

R	RULE	CONDITION/MALFUNCTIO	N	PHASE			RULING		CUES/N	OTES/COMME	NTS
	RULE	CONDITION/MALFUNCTION S-IVB LOX CRYO REPRESS VALVE(S) FAILS OPEN A. PRIOR TO S-II CUTON 1. DURING S-IC BURN B. IN TB5	E E	PHASE		8B. CO SP 8S 1. IF PR OFF FR RE	RULING RULING RITINUE MISSION/EARLORT CONTINUE MISSION/EARLY STAGE/ABORT BEE INFORM FLIGHT RECOMMEND CREW HOLITOWER. AT TB3 + 3: SECONDS, BSE RECOMING EARLY STAGE. IF S-IVB DOES NOT: BSE TRANSMIT ABORT IF S-IVB DOES NOTINUE MISSION/EARLY STAGE BSE INFORM FLIGHT RECOMMEND CARLY STAGE BSE INFORM FLIGHT RECOMMEND EARLY STAGE BSE INFORM FLIGHT AND TRANSMIT ABORT REQUITED TO REPART TO RECOMMEND TRANSMIT ABORT REQUITED TO REPART TO RECOMMEND CORPESS VALVE INTINUE MISSION/EMER PACECRAFT SEPARATION CYCLE AND CLOSE LO REPRESS VALVE I IS UNSUCCESSFUL, VENT LOX TANK OPEN LH2 CRYO REPRESS VALVE THE LOX TANK ULLAGE SESSURE IS AT 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS VALVE THE LOX TANK ULLAGE SESSURE IS AT 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS VALVE THE LOX TANK ULLAGE SESSURE IS AT 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE HIGH, BSE I SET 50 PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN CLOSE LH2 CRYO REPRESS TALE TO PSI TERMINATE LOX VENT AFTER 8 MIN TERMINATE LOX VENT AFTER 8 MIN TERMINATE LOX VENT AFTER 8 MIN TERMINATE LOX VENT AFTER 8 MIN TERMINATE LOX VENT	AND D START, REQUEST SE TISON AND AGE LAGE PSIA BSE UEST. GENCY X CRYO ESS VLV ASAP RESS O MIN E A OR NFORM	B.1. COID B.1. COID A. BUIL BEI A. COID BEI A. COID BEI A. COID NOTES A. ACTIC A. BUIL BEI A. COID NOTES A. CIIC A. COID NOTES TANK DELT A. IF IT THE DATE S. THIS RESII	X TANK ULL. 1-44 PSIA) BO-406) LD HELIUM MAINS LESS LD HELIUM MAINS LESS LD HELIUM MAINS LESS K TANK ULL. 179-406, D RNER LOX R RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R RNER LOX R LOW -100° LD HELIUM MAINS LESS X TANK ULL. 179-406, D RNER LOX R R RNER LOX R R RNER LOX R R RNER LOX R R RNER LOX R R R R R R R R R R R R R	AGE PRESSURE AT RELIEF AND RELIEVING (D179-406, REGULATOR DISCHARGE PRESSURE THAN 50 PSIA (D105-403). BOTTLE PRESSURE DECAYING 263-403). EPRESS COIL TEMPERATURE F (C378-403). AGE PRESSURE INCREASING 180-406). EPRESS COIL TEMPERATURE F (C378-403). BOTTLE PRESSURE DECAYING 263-403). D. TO AVOID EXCEEDING LOX SURE OR BULKHEAD POSITIVE LIMITS (FMR 7-14). OR RESTART CRITERIA FOR UALIFIED PROSPORTANT. OR RESTART CRITERIA FOR UALIFIED PROSPORTANT. OR RESTART CRITERIA FOR CON REPRESS TO OPEND, ECTOR WILL BE IN ERROR SINCE STORED PROGRAM. A NAV UP-
		MISSI APOLLO		REV FNL	DATE 9/1,		SECTION SLV - TB1 THRU TB/4/TB4A	GROUP		PAGE 6-7	Tape 54.6

MISSION RULES

				T	<u>-</u>	TANC CUES MOTES (COMMENTS			
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS		
	6-6	EXCESSIVE ATTITUDE ERROR IN PITCH OR YAW DURING S-II BURN	LAUNCI		PRT/EARLY STAGE		CUES 1. GUIDANCE CHI MINUS (H60-603) GREATER	THETA GIMBAL ANGLE THAN 85 DEG PITCH.	
		A. PRIOR TO S-IVB TO COI CAPABILITY			ABORT BSE INFORM FLIGHT AI TRANSMIT ABORT REQUI		45 DEG YAW AND DIV	ERGING. ONDING (G8-201 THRU 204.	
		B. BETWEEN S-IVB TO COI AND S-II CUTOFF			EARLY STAGE BSE INFORM FLIGHT AI AND RECOMMEND EARLY		3. VERIFIED TRAJECTOR	PLY FOR OTHER IDENTIFIED	
	6-7	S-II LOSS OF THRUST	LAUNC	1		·	CUES		
		A. ANY SINGLE ENGINE FAILURE TO ATTAIN THRUST OR LOSS OF THRUST PRIOR TO NOMINAL S-II CUTOFF		l	CONTINUE MISSION BSE INFORM FLIGHT AN	ND FIDO.	A.1. THRUST OK SWITCH 205, K232-201 THI 2. THRUST CHAMBER PA THRU 205)	ES-OFF (K231-201 THRU RU 205). RESSURE- ZERO (D13-201	
		B. ANY TWO ENGINES FAILURE TO ATTAIN THRUST OR LOSS OF THRUST		-	CONTINUE MISSION CREW WILL ABORT ON (LIMITS.	DNBOARD	3. LONGITUDINAL ACCE B.1. THRUST OK SWITCHE 205, K232-201 THE 2. THRUST CHAMBER PETHRU 205)	ES OFF (K231-201 THRU	
		C. THREE OR MORE ENGINES OUT		İ	ABORT/EARLY STAGE/ CONTINUE MISSION		3. LONGITUDINAL ACCE C.1. THRUST OK SWITCHE 205, K232-201 THE	ES OFF (K231-201 THRU RU 205)	
		1. PRIOR TO S-IVB TO COI CAPABILITY			1. ABORT BSE INFORM FLIGHT TRANSMIT ABORT RE		THRU 205) 3. LONGITUDINAL ACCE	RESSURE ZERO (D13-201 ELERATION (A2-603)	
		2. AFTER S-IVB TO COI CAPABILITY BUT PRIOR TO LOW LEVEL SENSE ARM			2. EARLY STAGE BSE INFORM FLIGHT RECOMMEND EARLY S		C. <u>NOTE</u> AFTER PROGRAMED S-II (ENGINES OUT REFERS ONL		
		3. AFTER LOW LEVEL SENSE ARM (A) 3 CONTROL ENGINES OUT			3. EARLY STAGE/ CONTINUE MISSION (A) EARLY STAGE				
		(B) ALL ENGINES OUT			BSE INFORM FL RECOMMEND EAF (B) CONTINUE MISS BSE INFORM FL	SION			
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6-8 6-8 6-10 6-10 6-10 6-10 6-10 6-10 6-10 6-10	R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		T	OTES/COMM	ENTS	
SEPARATION FAILS TO OCCUR AT TB3 + 31.7 SEC BES INFORM FLIGHT AND TRANSHIT ABORT REQUEST. CREW ABORT PRIOR TO TB3 + 1 MIN 45 SEC. BES INFORM FLIGHT AND TRANSHIT ABORT REQUEST. CREW ABORT PRIOR TO TB3 + 1 MIN 45 SEC. S. GUIDANCE MODE WORD CODE CODE 25 BIT OIS REMAINS ZERO (M60-603). J. IGNITION BUS VOLTAGE REMAINS AT APPROXIMATELY 56 VOLTS (M125-207). 4. RECIRCULATION BUS VOLTAGE REMAINS AT APPROXIMATELY 56 VOLTS (M11-207). NOTES THE CREW SHOULD ABORT AS SOON AS POSSIBLE AFTER MALFUNCTION OCCURS TO PRECLUDE EXCESSIFIED AND START. BSE TRANSHIT ABORT REQUEST AT S-11 CUTOFF. BES INFORM FLIGHT AND FIOD AND RECOMMEND NO S-1VB START. BSE TRANSHIT ABORT REQUEST AT S-11 CUTOFF. CUES 1. HYDRAULIC RESERVOIR OIL LEVEL APPROX ZERO PETAL GRAPH AND FIOD AND RECOMMEND NO S-1VB START. BSE TRANSHIT ABORT REQUEST AT S-11 CUTOFF. 1. IF L7-403 IS FUNCTIONING PROPERLY, IT IS REQUIRED FOR IMPLEMENTATION OF THIS RULE. 2. SPACECRAFT SHOULD HAVE COI CAPIBILITY AT S-11 CUTOFF. MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE		6-8	ACTUATOR HARDOVER INBOARD A. PRIOR TO S-IVB TO COI CAPABILITY B. BETWEEN S-IVB TO COI CAPABILITY AND 30 SEC PRIOR TO S-II CUTOFF C. AFTER S-II CUTOFF	LAUNCH	A. <u>A</u> B. <u>B</u> C. <u>C</u>	SION ABORT BSE INFORM FLIGHT AN FRANSMIT ABORT REQUE EARLY STAGE BSE INFORM FLIGHT AN RECOMMEND EARLY STAGE CONTINUE MISSION) ST	1. YAW (G8-) 2. PITC (G9-) 3. ADJA PLAN MEAS NOTES THE CREI AS POSS PRECLUDI	201 THRU 2 H ACTUATOR 201 THRU 2 CENT CONTR E MOVES 4- UREMENTS A W SHOULD A IBLE AFTER E EXCESSIV	R POSITION EXCEEDS R POSITION EXCEEDS RO4, G31-201 THRU 2 ROL ENGINE ACTUATOR ROL ENGINE ACTUATOR ROLES 1 AND 2) RORT OR EARLY STAGE MALFUNCTION OCCUR	+6 DEG +6 DEG :04) R IN SAME SAME
FLUID PRIOR TO FIRST S-IVB BURN BSE INFORM FLIGHT AND FIDO AND RECOMMEND NO S-IVB START. BSE TRANSMIT ABORT REQUEST AT S-II CUTOFF. BSE INFORM FLIGHT AND FIDO AND RECOMMEND NO S-IVB START. BSE TRANSMIT ABORT REQUEST AT S-II CUTOFF. 3. HYDRAULIC RESERVOIR PRESSURE LESS THAN 1700 PSIA (042-403). NOTES 1. IF L7-403 IS FUNCTIONING PROPERLY, IT IS REQUIRED FOR IMPLEMENTATION OF THIS RULE. 2. SPACECRAFT SHOULD HAVE COI CAPIBILITY AT S-II CUTOFF, THE CREW SHOULD INHIBIT THE S-IVB START WITH THE TRANSLATION HANDCONTROLLER. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 SLV - TB1		6-9	SEPARATION FAILS TO OCCUR AT TB3 + 31.7 SEC	LAUNCH	BSE ABOR	 INFORM FLIGHT AND TI RT REQUEST. CREW ABO	ORT	1. SECOI NO SI 2. GUIDD D15 I 3. IGNIT APPRO 4. RECII APPRO NOTES THE CREI	EPARATION ANCE MODE REMAINS ZE FION BUS V DXIMATELY RCULATION DXIMATELY N SHOULD A ALFUNCTION	(M86-206, M87-206) WORD 1 MODE CODE 2 RO (H60-603). OLTAGE REMAINS AT 28 VOLTS (M125-207 BUS VOLTAGE REMAIN 56 VOLTS (M111-207	5 BIT). S AT).
APOLLO 17 FNL 9/1/72 SLV - TB1		6-10	FLUID PRIOR TO FIRST	LAUNCH	BSE RECO TRAN	— INFORM FLIGHT AND FI DMMEND NO S-IVB STARI KSMIT ABORT REQUEST A	r. BSE	1. HYDRAPERCE 2. HYDRAPSIA NOTES 1. IF L7 REQUI 2. SPACE S-II 3. AT S- THE S	ENT (L7-40 AULIC SYST PSIA (D41 AULIC RESE (D42-403) Y-403 IS F RED FOR I ECRAFT SHO CUTOFF LI CUTOFF	3). EM PRESSURE LESS T-403). RVOIR PRESSURE APP. UNCTIONING PROPERL MPLEMENTATION OF TULD HAVE COI CAPIB THE CREW SHOULD TWITH THE TRANSLA	HAN ROX ZERO Y, IT IS HIS RULE. ILLITY AT INHIBIT
APOLLO 17 FNL 9/1/72 SLV - TB1			MICCION	RFV	DATE	SECTION	GRUID		PAGE		
1 1 1						SLV - TB1	under		, AGE		

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SECTION D .	- 2LV -	181	HKUUGH	184/184A	 CONCLUDED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
Γ				<u> </u>			
	6-11	S-IVB STAGE LOSS OF THRUST A. FAILS TO ATTAIN THRUST OR PREMATURE SHUTDOWN PRIOR TO OBTAINING PARKING	LAUNCH	A. <u>AE</u> BS	<u>BORT</u> SE TRANSMIT ABORT RE	QUEST.	CUES 1. THRUST CHAMBER PRESSURE - ZERO (D1-401). 2. THRUST OK SWITCHES - OFF (K14-401, K157-401).
		ORBIT B. SHUTDOWN PRIOR TO ACHIEVING MINIMUM REQUIRED APOGEE ALTITUDE AND ENTRY INTO TB7 FOR REASONS OTHER THAN A PROPELLANT DEPLETION	TLI	BS CC CC TH AT MC UI SE SE	ONTINUE MISSION SE INFORM FLIGHT AND MMAND TO EARTH ORBI ONFIGURATION HE SPACECRAFT SHOULD ITACHED TO THE S-IVB ONITOR LH2 AND LOX T LLAGE PRESSURES. IF PARATION IS REQUIRE PACECRAFT SHOULD IMM IELY GO TO A SAFE DI 7000 FT) FROM THE S-	REMAIN /IU AND ANK D, THE EDI- STANCE	3. LONGITUDINAL ACCELERATION - ZERO (A2-603). 4. TB5 IS INITIATED. GUID MODE WORD 1 (MODE CODE 25); BIT D2 SET TO ONE (H60-603). 5. TB7 IS INITIATED. GUID MODE WORD 2 (MODE CODE 26); BIT D20 SET TO ONE (H60-603). NOTES 1. SEPARATION WILL BE REQUIRED FOR VIOLATION OF FMR 7-6 OR FMR 7-14. 2. FOR A FAILURE OF THE S-IVB TO RESTART, THE ONBOARD PROGRAM WILL RECYCLE TO TB5 THROUGH TB6C FOR A SECOND RESTART OPPORTUNITY.
	6-12	S-IVB COLD HELIUM SHUTOFF VALVES FAIL OPEN A. PRIOR TO S-II ENGINE START. B. BETWEEN S-II ENGINE START AND 30 SEC PRIOR TO S-II CUTOFF C. AFTER S-II CUTOFF MINUS 30 SEC	LAUNCH	B. <u>E/</u> BS. <u>CC</u> IP TO SH	BORT SE INFORM FLIGHT AND IT ABORT REQUEST ARLY STAGE SE INFORM FLIGHT AND OMMEND EARLY STAGING WHED JATELY. IF PRIO OWER JETTISON, THE C HOULD HOLD THE TOWER FTER S-IVB START ONTINUE MISSION SE INFORM FLIGHT	RE- R TO REW	CUES 1. COLD HELIUM REG DISCHARGE PRESSURE REMAINS GREATER THAN 200 PSIA (D105-403) 2. LOX ULLAGE PRESSURE AT RELIEF SETTING (41-44 PSIA) AND RELIEVING (D179-406, D180-406) 3. COLD HELIUM BOTTLE PRESSURE DECAYING (D261-403, D263-403).
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L		AFOLLO 17			THRU TB4/TB-A		6-10 Tape 54.9

MISSION RULES

SECTION 7 - SLV - TB5 AND TB7

n treu		JEGI1	ON 7 - SLV - TB5 AND	18/						
R ITEM	4									
		Summa	RY OF COAST PHASE RU	LES						
ļ										
1	7-1 INSUFFICIENT PROPELL	ANT								
	7-2 LOSS OF ONE APS MODU	LE								
	7-3 MAIN FUEL VALVE FAIL	S TO CLOSE								
	7-4 MAIN OXIDIZER VALVE	FAILS TO CLOSE								
	7-5 RANGE SAFETY SYSTEM	NOT SAFED AFTER	INSERTION							
	7-6 COLD HELIUM SHUTOFF	VALVE FAILS OPEN								
	7-7 AUXILIARY HYDRAULIC									
-	7-8 LOSS OF ATTITUDE CON									
	7-9 CONTINUOUS VENT REGU		PEN							
1	7-10 APS ULLAGE ENGINE FA	ILS ON								
1	7-11 RESERVED	VALUE OF MATH OV	**************************************							
	7-12 J2 ENGINE MAIN FUEL			IN TB5						
-	7-13 IU ENVIRONMENTAL CON 7-14 COMMON BULKHEAD AP	INUL SYSTEM FAIL	5							
	7-15 LOSS OF S-IVB STAGE PNEUMATICS									
	7-16 RESERVED	I HEURINI 163								
	7-17 LH ₂ TANK VENT FAILUR	E OR LEAK								
	7-18 LOW COLD HELIUM SUPP			•						
	7-19 LOX TANK ULLAGE PRES		N 31 PSTA							
	7-20 J-2 ENGINE START BOT									
	7-21 PU VALVE FAILURE									
İ	7-22 S-IVB CONFIRMED LOSS	OF HYDRAULIC FL	UID							
	7-23 RESERVED									
	7-24 RESERVED									
	7-25 LOX NON-PROPULSIVE V	ENT FAILS TO OPE	N							
ŀ	7-26 LH ₂ LATCHING VENT VA	LVE FAILS TO OPE	N							
ŀ	7-27 GH ₂ START BOTTLE DUM									
	7-28 COLD HELIUM DUMP FAI	LS TO OCCUR								
	7-29 RESERVED	•								
İ	7-30 RESERVED			٠						
ļ	1									
1										
	THE FOLLOWING MISSION RULE	S ALSO APPLY TO	THIS SECTION:							
-	6-3 INERTIAL PLATFORM FAI	LURE - ACCELEROM	ETER							
	6-4 LAUNCH VEHICLE INERTI	AL PLATFORM FAIL	URE - ATTITUDE REFER	ENCE						
	6-5 SIV B LOX CRYO REPRES	S VALVE FAILS OP	EN.							
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	MISSION	REV DATE	SECTION	GROUP	PAGE					
	APOLLO 17	FNL 9/1/72	SLV - TB5							
		1 1	AND TB7		7-1	Tape 57.6				

MISSION RULES

	T		350	110N / - 51	LV - TB5 AND TB7 - C	ONLINGED		
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
	7-1	PRIOR TO S-IVB RESTART, PROPELLANT QUANTITIES PRECLUDE ACHIEVEMENT OF AN ACCEPTABLE LUNAR MISSION AND:	EARTH ORBIT	NO S- MISS)	-IVB RESTART/CONTINU ION	<u>JE</u>	CUES 1. PROPELLANT REMANDURING R/T EVAL	AINING AS ASCERTAINED LUATIONS.
		A. NO FAILURES HAVE BEEN IDENTIFIED WHICH RESULTED IN AN EXCESSIVE PROPELLANT IMBALANCE, AND INSUFFICIENT PROPELLANT REMAINS FOR ACHIEVEMENT OF AN ACCEPTABLE ALT MISSION		BS	O S-IVB RESTART SE INFORM FLT OF PRE APABILITY	DICTED	REMAINING ARE I 6-12, 7-3, 7-4 7-19, 7-21, 7-2	RING EVALUATION OF PROPELLANT DEFINED BY FMR'S 6-5, 6-7, , 7-6, 7-9, 7-12, 7-17, 7-18, 24, 7-30, 8-4. RESULT IN A LOX DUMP RE-
		B. FAILURES HAVE BEEN IDENTIFIED WHICH RESULTED IN AN EXCESSIVE IMBALANCE OF PROPELLANTS			ONTINUE MISSION/NO S ESTART	S-IVB	(FMR 6-5). S-IVB FIRST	EPRESS VALVES FAIL OPEN OTBV FAILS OPEN DURING T BURN (FMR 7-30) M SHUTOFF VALVES FAIL OPEN
		1. LOX DUMP WOULD SIGNIFICANTLY IMPROVE THE PROBABILITY OF A MINIMUM LUNAR LANDING OR A MINIMUM LO MISSION. 2. LOX DUMP WOULD NOT SIGNIFICANTLY IMPROVE THE PROBABILITY OF A			BSE INFORM FLT AND LOX DUMP TO MAXIMI ACCEPTABLE LUNAR M CAPABILITY. IF COMMENT OF THE ACCEPTABLE THAN 3200 R, OR COMMENT OF THE ACCEPTABLE OF THAN 160° R AT ENCISTART, BSE CMD (A) MAINSTAGE ENABLE OF THE ACCEPTABLE OF THE ACCE	IZE 11SSION 199-401 COLDER 100-401 COLDER SINE	(C) LOW LOX TAY 7-19) (D) J-2 ENGINE CLOSE (FMR MFV IS OPEN (E) MRCV FAILS (F) LOX BLEED N (G) OTBV FAILS 3. IMPLEMENTATION A STATE VECTOR 4. FAILURE MUST BE LOS. 5. CORRECTIVE ACT: ITEMS 2(A), 2(TO 4.5 POSITION (FMR 7-24) VLV FAILS OPEN (FMR 7-21) OPEN (FMR 7-30) OF A LOX DUMP MAY REQUIRE
		MINIMUM LO MISSION.						
\vdash	<u> </u>	MICCION	REV	DATE	SECTION	GROUP	PAGE	
 	MISSION APOLLO 17			9/1/72	SLV - TB5	GROOP	I FAUE	
			FNL		AND TB7		7-2	Tape 46.6

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHAS	E	RULING		CUES/NOTES/COMMENTS
	7-2	LOSS OF ONE APS MODULE A. TB5 TO TB6+9 MIN 20 SEC	EARTH ORBIT		CONTINUE MISSION 1. BSE INFORM FLIGH COMMAND - S-IVB MODE ON		CUES 1. MANIFOLD PRESSURE MOD. 1 BELOW 100 PSIA (D70-414), (D71-414) 2. MANIFOLD PRESSURE MOD. 2 BELOW 100 PSIA (D72-415), (D73-415)
		B. TB7 TO TB7+15 MIN	; 	В.	2. CREW WILL STABIL VEHICLE WITH CSM	IZE THE I RCS	
					BSE INFORM FLIGH COMMAND - FCC PO CREW WILL STABIL	WER OFF	
		C. TB7+15 MIN TO LM EJECTION	:	c.	VEHICLE WITH CSM CONTINUE MISSION	RCS	
					BSE INFORM FLIGH COMMAND - FCC PO CREW DISCRETION DOCKING	WER OFF	
		D. LM EJECTION TO YAW MANEUVER COMPLETE		D.	CONTINUE MISSION 1. BSE INFORM FLIGH COMMAND - FCC PO		
					2. SPACECRAFT WILL EVASIVE MANEUVER		
					3. DO NOT INITIATE	TB8	
	,				4. BSE PERFORM NON- PROPULSIVE S-IVB BY GROUND COMMAN	SAFING D	
		E. AFTER YAW ATTITUDE MANEUVER COMPLETE		E.	CONTINUE MISSION		NOTES
					BSE INFORM FLIGHT A		1. LIMITS IN FMR 7-8 CONDITION/MALFUNCTION DO NOT APPLY TO THE FAILURE IN 7-2
					1. CMD TB8 ASAP CON WITH MISSION CON		CONDITION/MALFUNCTION E.
					2. AFTER EVASIVE BU ULLAGE MOTOR ON (SHORT LOX DUMPS) MODE ON AND ATT ! LIMITS OF ±15.3° MANEUVER VEHICLE ALTERNATE LOX DUI	OR CMD WITH BURN ERROR , TO TO THE	CVS PROP VENTING SHOULD BE INHIBITED TO PRECLUDE UNDESIRABLE TORQUE ON THE STAGE DURING ULLAGE MOTOR MANUEVERING.
					3. ACCOMPLISH LOX DI BURN MODE ON	JMP WITH	
					4. AFTER COMPLETION DUMP, INITIATE SO HEATING AVOIDANCE MANUEVER	DLAR	
					IF RULING E.2. IS UP	ISUCCESS-	
					5. CMD ATT ERROR LIN	MITS OF	
					6. PERFORM LOX DUMP SIMULTANEOUSLY WI MANUEVER TO ALT L ATT WITH BURN MOD	OX DUMP	
					7. PERFORM RULING E.	4. ABOVE	
		7.77 - T. 17 1	<u> </u>				
<u></u>		MISSION	REV	DATE	SECTION	GROUP	PAGE
		APOLLO 1	FNL	9/1/72	SLV - TB5 AND TB7		7-3 Tape 45.9

MISSION RULES

R	RULE	CONDITION/MALF	UNCTION	PHASE	7	RULING	331.102	CUES/NOTES/COMMENTS	
٣			,					· · · · · · · · · · · · · · · · · · ·	
	7-3	J-2 ENGINE MAIN VALVE (MFV) FAI CLOSE AT:						CUES 1. MAIN FUEL VALVE POSITION (C	64-401).
		A. FIRST S-IVB		ARTH	A. <u>C</u>	ONTINUE MISSION		2. MAIN FUEL VALVE OPEN (K118-	401).
		:				SE INFORM FLIGHT AND OMMAND (ASAP)		3. FUEL FLOWMETER FLOWRATE (F2	-401).
					1	. PREVALVES AND RECT SHUTOFF VALVES CLC (SEE NOTE 1)		NOTES	
					2	. ATTEMPT TO CYCLE A	IND	 IF THE MFV IS OPEN, THE LH2 PRESSURE WILL GO TO ZERO AF ACTION (A.1). 	PUMP INLET TER COMMAND
					I	F SUCCESSFUL, BSE CO	MMAND	2. THIS FAILURE WILL REQUIRE E LH2 RESIDUALS TO DETERMINE	VALUATION OF
			1		3	. PREVALVE AND RECIP SHUTOFF VALVES OPE	RC In	TLI VELOCITY CUTOFF (REF FM	IR 7-1).
					C	F UNSUCCESSFUL AND NONFIRMED FULLY OPEN,		 A FAILURE FOLLOWING SECOND WILL REQUIRE A RE-EVALUATIO IMPACT VELOCITY DESIRED. 	BURN CUTOFF N OF LUNAR
						- MAINSTAGE ENABLE NO. 2 - ON		4. IMPLEMENTATION OF PART A4 A IN AN EXTENDED FUEL LEAD JU IGN, AND THERE WILL BE NO L	ST PRIOR TO TLI
	ŀ				5	. BURN MODE A - ON		RECIRCULATION. ENGINE M/S W 7 SECONDS EARLY.	ILL OCCUR
		B. SECOND S-IVB	CUTOFF 1	rlc		ONTINUE MISSION SE INFORM FLIGHT AND		5. IF THE MFV DOES NOT CLOSE, NOT BE IMPLEMENTED SINCE IT A SIMULTANEOUS LOX AND LH2	WILL RESULT IN
					1	. ATTEMPT TO CLOSE M IF UNSUCCESSFUL, E ASAP IN TB 8.		6. FUEL DUMP WILL INITIATE 3.2 THAN NOMINAL LOX DUMP TIME.	
					2	. ENGINE PUMP PURGE	OFF.	 THIS FAILURE WILL REQUIRE R ASSESSMENT BY THE LUNAR IMP 	
	,				3	. EDS CUTOFF NO 2 EN PROCEED WITH LH2 E AT NOMINAL LOX DUM	IUMP		
						TIME (SEE NOTE 6) SE TERMINATE LH2 DUM	10		
	j				A	FTER 200 SECONDS BY	ı.		
					4	PREVALUES AND RECT VALVES CLOSED	RC		
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	<u> </u>	<u> </u>	MISSION	REV	DATE	SECTION	GROUP	PAGE	
 i			APOLLO 17		9/1/72	SLV - TB5			
					L	AND TB7		7-4	TAPE 59.1

MISSION RULES

R F	RULE	CONDITION/MALF	UNCTION	PHASE		RULING	·	CUES/NOTES/COMM	ENTS	
7-		J-2 ENGINE MAIN OXIDIZER VALVE FAILS TO CLOSE A. FIRST S-IVB B. SECOND S-IVB	(MOV) AT: CUTOFF	PHASE EARTH ORBIT	A	CONTINUE MISSION/ NO S-IVB RESTART BSE INFORM FLIGHT AN COMMAND (ASAP) 1. PREVALVES AND REC SHUTOFF VALVES CL 2. ATTEMPT TO CLOSE IF A.2 IS SUCCESSFUL INFORM FLIGHT AND CC 3. PREVALVES AND REC SHUTOFF VALVES OP IF A.2 IS UNSUCCESSFORM INFORM FLIGHT AN RECOMMEND NO S-IVB RECONTINUE MISSION BSE INFORM FLIGHT AN RECOMMEND NO S-IVB RECONTINUE MISSION	IRC OSED MOV , BSE MMAND IRC EN UL, D ESTART	CUES 1. MAIN OXIDIZER INDICATES NOT 2. MAIN OXIDIZER 3. LOX FLOWMETER FLOW. 4. LOX INJECTOR NOTES 1. IF THE MOV IS PRESSURE WILL (A.1). 2. THIS FAILURE IN RESIDUALS TO INVELOCITY CUTOOL OPERATIONS. 3. LOX DUMP WILL 4. THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THIS FAILURE IN THE TAILUR	VALVE POSITION (G3-401)	TING ET ND OF
		C. AT END OF LOY DUMP	x		c.	1. ATTEMPT TO CLOSE IF UNSUCCESSFUL, CMD ASAP IN TB 8 2. ENGINE PUMP PURGE BSE TERMINATE LOX DU 120 SEC AFTER GAS IN OBSERVED BY COMMANDI (SEE NOTE 3) 3. PREVALVES AND REVALVES CLOSED CONTINUE MISSION BSE FLIGHT AND TERMINATE DUMP 120 SEC AFTER GINGESTION OBSERVED B COMMANDING: 1. PREVALVES AND RECVALVES CLOSED 2. ATTEMPT TO CLOSE	MOV BSE OFF MP GESTION NG: CIRC INFORM LOX AS Y			
						IF C.2. IS SUCCESSFU 3. CLOSE PREVALVES A RECIRC VALVES				
			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION SLV - TB5	GROUP	PAGE		

MISSION RULES

			T	7 101 7	3LV - 103 AND 107 -	CONTINCE	
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
	7-5	RANGE SAFETY SYSTEM NOT SAFED AFTER INSERTION A. PROPELLANT DISPERSION SYSTEM NOT ARMED B. PROPELLANT DISPERSION SYSTEM ARMED AND RSO HAS NOT SENT MFCO	EARTH	В.	CONTINUE MISSION BSE INFORM FLIGHT AND COMMEND RSO SEND SAFE COMMAND EMERGENCY SPACECRAFT SEPARATION BSE INFORM FLIGHT AND RECOMMEND EMERGENCY SPACECRAFT SEPARATION WHEN SPACECRAFT HAS REACHED A SAFE DISTAN (7,000 FT) RECOMMEND RSO SEND SAFE COMMAND	D N.	CUES 1. FIRING UNIT 1 RS EBW GREATER THAN OR EQUAL TO 1.6 VOLTS (M30-411). 2. FIRING UNIT 2 RS EBW GREATER THAN OR EQUAL TO 1.6 VOLTS (M31-411). 3. RANGE SAFETY RECEIVER NO. 1 ENABLE (N57-411) BETWEEN 2.4 AND 4.5 VOLTS. 4. RANGE SAFETY RECEIVER NO. 2 ENABLE (N62-411) BETWEEN 2.4 AND 4.5 VOLTS. 5. RSO DISPLAY AND COMMAND SYSTEM STATUS. NOTES 1. RSO SHOULD NOT ATTEMPT TO SAFE THE RANGE SAFETY RECEIVERS UNTIL IT IS CONFIRMED THAT THE PROPELLANT DISPERSION SYSTEM IS NOT ARMED (CONDITION A ONLY). 2. EITHER CUE 1 OR CUE 2 IS SUFFICIENT FOR IMPLEMENTING RULE B. 3. CUES 3 AND 4 ARE VALID ONLY WHEN THE VEHICLE IS RECEIVING 450 MHZ RADIATION.
	7-6	S-IVB STAGE COLD HELIUM SHUTOFF VALVES FAIL OPEN IN A. TB5	EARTH ORBIT		CONTINUE MISSION/ EMERGENCY SPACE- CRAFT SEPARATION BSE INFORM FLIGHT AND 1. VENT LOX TANK 2. ATTEMPT TO CLOSE T STAGE COLD HELIUM IF 2 IS SUCCESSFUL 3. TERMINATE LOX VENT IF 2 IS UNSUCCESSFUL 4. OPEN LH2 CRYO REPRIVEY. 5. TERMINATE LOX VENT AFTER 8 MIN.	HE VALVES - RESS	CUES 1. COLD HELIUM REGULATOR DISCHARGE PRESSURE GREATER THAN 200 PSIA (D0105-403). 2. LOX TANK ULLAGE PRESSURES (D0179-406, D0180-406). 3. COLD HELIUM BOTTLE PRESSURE DECAYING (D261-403, D0263-403). NOTES 1. ACTION REQUIRED TO AVOID EXCEEDING LOX TK OVER PRESS OR BULKHEAD POSITIVE DELTA PRESS LIMITS (FMR 7-14) 2. SEE FMR 7-18 FOR RESTART CRITERIA FOR OFF-NOMINAL COLD HELIUM PRESSURE. 3. IF LOX NPV VALVE FAILS TO OPEN, THE LOX VENT VALVE CAN BE OPENED AS BACKUP. 4. THIS FAILURE WILL REQUIRE EVALUATION OF RESIDUALS TO DETERMINE ADEQUACY FOR TLI VELOCITY CUTOFF AND LUNAR IMPACT
		B. TB7	TLC	В.	6. LH2 CRYO REPRESS V CLOSE ASAP AFTER 4 IF LOX ULLAGE PRESSUR 50 PSIA OR SATURATED, INFORM FLIGHT AND TRA ABORT REQUEST AND REC EMERGENCY S/C SEPARAT CONTINUE MISSION AFTER TB7 + 2 MIN 30 BSE INFORM FLIGHT AND 1. VENT LOX TANK FOR 30 SEC VENTING SHOULD BE TER PRIOR TO S/C SEPARATI	O MIN. E AT BSE NSMIT COMMEND ION. SEC 12 MIN MINATED ON	OPERATIONS (FMR 7-1)
-				DATE	SECTION	GROUP	PAGE
L		APOLLO 17	FNL	9/1/72	SLV - TB5 AND TB7		7-6 Tape 59.3

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		ES /NOTES /COMME	T T T T T T T T T T T T T T T T T T T
<u> </u>	RULE	CONDITION/MALFONCTION	FRASE		RULING		ES/NOTES/COMME	N12
	7-7	S-IVB AUXILIARY HYDRAULIC PUMP FAILS A. TO TURN OFF AS SEQUENCED B. TO TURN ON	EARTH ORBIT	E	CONTINUE MISSION BSE INFORM FLIGHT AN ATTEMPT TO TURN OFF LARY HYDRAULIC PUMP AS POSSIBLE CONTINUE MISSION	AUXIL- AS SOON NO	1. SYSTEM PRES 2. RESERVOIR L 3. AFT BATTERY 4. HYDRAULIC R (D42-403). TES FAILURE TO TU PLETES AFT NO 90 MIN AND OV APPROXIMATELY	NO. 2 CURRENT (M22-404). ESERVOIR OIL PRESSURE RN OFF HYDRAULIC PUMP DE 2 BATTERY IN APPROXIMATELY ERHEATS HYDRAULIC SYSTEM IN
		1. AS SEQUENCED AND THE RESERVIOR OIL TEMP IS BELOW OR PREDICTED TO BE BELOW 35° F BE- FORE NEXT STATION AOS 2. AT TB6 + 3 MIN 39 SEC	TLI	1	SSE INFORM FLIGHT AN I. ATTEMPT TO TURN A IARY HYDRAULIC PU SSE INFORM FLIGHT AN	MP ON	2. RESERVOIR O 3. AFT BAT NO. 4. RESERVOIR P	SURE (D41-403). IL LEVEL (L7-403). 2 CURRENT (M22-404). RESSURE (D42-403). UMP INLET OIL TEMP (C50-401).
		C. TO TURN ON FOR LOX DUMP (J-2 ENGINE NOT CENTERED IN PITCH PLANE PRIOR TO LOX DUMP)	TLC	c. c	2. COMMAND AUXILIARY HYDRAULIC PUMP OF CONTINUE MISSION	C	1. ACTUATOR PO: 2. SYSTEM PRES:	IL TEMP (C51-403). SITION (G1-403) SURE (D41-403) HETA GREATER THAN 10 DEGREES
		1. ENGINE GIMBAL ANGLE LESS THAN ±3 DEGREES 2. ENGINE GIMBAL ANGLE GREATER THAN ±3 DEGREES 3. ATTITUDE ERROR		2	BSE INFORM FLIGHT CONTINUE MISSION BSE INFORM FLIGHT INHIBIT LOX DUMP CONTINUE MISSION	1.	±3 DEGREES IS FOLLOWING CON	COMMAND SIGNAL
		GREATER THAN 10 DEGREES DURING DUMP			BSE INFORM FLIGHT TERMINATE LOX DUM	IP	ATTITUDE CONTI ATTITUDE CONTI MAINTAINED FOI CONDITION. IF APS PROPELI EITHER CONDIT DUMP, CONSIDEI DUCTING A CYCI REQUIRED AV FO	ENGINES ARE AVAILABLE FOR ROL IN THE YAW PLANE, ROL IN THIS PLANE WILL BE R AN ACTUATOR IN A HARDOVER LANT IS INSUFFICIENT AND ION C.2. OR C.3. PRECLUES LOX RATION WILL BE GIVEN TO CONLECT LOX DUMP TO ATTAIN THE DR LUNAR IMPACT BASED ON ISION OF LUNAR IMPACT TEAM.
						4.		HYDRAULIC OIL TEMP (C51-403) 5° F, THE AUX HYDRAULIC PUMP LED.
	_	MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	SLV - TB5 AND TB7		7-7	Tape 22.5

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	1	RULING	cu	ES/NOTES/COMMEN	TS
	7-8	LOSS OF ATTITUDE CO- TROL DURING A. TB5	EARTH ORBIT/TLO	T.	PACECRAFT GUIDANCE AKEOVER/SPACECRAFT EPARATION SE INFORM FLIGHT AND OMMEND SPACECRAFT GL AKEOVER. F UNSUCCESSFUL, BSE OMMEND SPACECRAFT SE	RE- IDANCE RE- PARA-	1. ANGULAR RATE (R5-602) GRE NOT DECREASI R12-602), GR NOT DECREASI 2. ANGULAR RAGE (R8-602) GRE NOT DECREASI GREATER THAN CREASING (SE	- PITCH (R13-602) OR YAW ATER THAN 0.3 DEG/SEC AND NG, OR ROLL (R12-602) 0.5 DEG/SEC AND NOT DE-
		B. TB6 TO TB6 + 9 MIN 20 SEC	TLI	В	LI INHIBIT SE INFORM FLIGHT AND COMMEND TLI INHIBIT	RE-	1. SAME AS A.1. 2. SAME AS A.2. 3. LOSS OF ATTINOTES 2 AND	ABOVE TUDE CONTROL ALERT (SEE
		C. TB7	TLC	B 1	REW DISCRETION SE INFORM FLIGHT AND MANEUVER DO NOT START EVASION MANEUVER DO NOT INITIATE TO BE PERFORM NON-PROPULSIVE S-IVB BY GROUND COMMAND	D FIDO VE 8 SAFING	1. SAME AS A.1 2. SAME AS A.2.	ABOVE ABOVE TUDE CONTROL ALERT (SEE
		D. TB8	TLC	E # # # # # # # # # # # # # # # # # # #	CONTINUE MISSION 3SE INFORM FLIGHT AND AND TERMINATE 1. LOX DUMP 2. ULLAGE ENGINE BURN 3. LH2 CVS	o FIDO	NOTES 2 AND OTES IMMEDIATELY AF RETURN OF CONT PROGRAMED MANE ARE NOT APPLIC LOSS OF ATTITE GIVEN FOR THE (A) LVDC/LVDA (B) ABNORMAL A (C) FAILURE TO SEQUENCE THESE CUES ARE SWITCHOVER HAS LOSS OF ATTITE	TUDE CONTROL ALERT (SEE 4) FTER S-IVB CUTOFF, S/C IROL TO SATURN, OR DURING UVERS THE ABOVE RATE LIMITS CABLE. JUDE CONTROL ALERT WILL BE FOLLOWING CONDITIONS: COMPUTATIONAL FAILURE ATTITUDE ERROR SIGNALS D INITIATE PROPER GUIDANCE E VALID IF RATE CHANNEL S NOT OCCURRED. JUDE CONTROL ALERT IS SUFFI- LEMENTING THIS RULE EXCEPT
		MISSION	REV D	TE	SECTION	GROUP	PAGE	
		APOLLO	17 FNL	9/1/72	SLV - TB5 AND TB7		7-8	Tape 22.6

MISSION RULES

			,		- 100 AND 107 - COM		
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
	7-9	CONTINUOUS VENT SYSTEM (CVS) REGULATOR FAILS TO OPEN IN TB5 (TB5 + 59 SEC)	EARTH ORBIT/ TLI	BSE 1. A 0 IF U 2. V V Q IF T TO T 3. U AFTE 4. U ULLA PRIC IZAT IF E	INUE MISSION INFORM FLIGHT AND ITEMPT TO OPEN CVS F VERRIDE SHUTOFF VALV NSUCCESSFUL, BSE ENT THE LH2 TANK PR: B6 + 8 MIN 40 SEC TO ALUE BELOW THE PRESS INTERED FOR S-1VB REST HE LH2 BLOWDOWN IS O ED WITHIN 30 MINUTES B6 INITIATE, COMMANI ILLAGE ENGINES R 90 SEC OF ULLAGE, ILLAGE ENGINES OFF AGING SHOULD BE COMPI NOT TO THE AMBIENT REI ION.	IOR TO) A SURE RE- FART. COM- S PRIOR) SEND PRESSUR- IS	CUES 1. CVS NOZZLE PRESSURE (D181-409, D182-409). 2. CVS REGULATOR CLOSED (K154-411). 3. LH2 ULLAGE PRESSURE (D177-408, D178-408). NOTES 1. IF THE CVS REGULATOR FAILS TO OPEN, THE LH2 SATURATION TEMPERATURE WILL INCREASE ABOVE NOMINAL RESTART LIMITS. 2. COMMAND ACTION WILL REQUIRE EVALUATION OF LH2 RESIDUALS TO DETERMINE ADEQUACY FOR TLI VELOCITY CUTOFF. 3. IF THE CVS REGULATOR IS CLOSED DURING ORBIT, THE IU STATE VECTOR WILL BE IN ERROR SINCE THE IU USES A STORED PROGRAM FOR THIS THRUST. A NAVIGATION UPDATE MAY BE REQUIRED (REF FMR 7-11).
	7-10	APS ULLAGE ENGINE(S) THRUST FAILS TO TER- MINATE AT SEQUENCED TIMES	EARTH ORBIT/ TLI/TL	C BSE TO T THRU	INFORM FLIGHT AND A' TERMINATE ULLAGE ENG JST. UNSUCCESSFUL, BSE IN SHT OF IMPENDING LOS. ITUDE CONTROL CAPABI	INE FORM S OF	CUES 1. ULLAGE ENGINE THRUST CHAMBER PRESSURE (D220-414, D221-415). 2. APS HELIUM SPHERE PRESSURE DECREASING (D35-414, D36-415, D250-414, D251-415).
-	<u> </u>	<u> </u>	1		T	anerra	Tana T
-		MISSION	REV	DATE	SECTION	GROUP	PAGE
		APOLLO	17 FNL	9/1/72	SLV - TB5 AND TB7		7-9 Tape 22.7

MISSION RULES

R	RULE	CONDITION/MALFUN	ICTION	PHASE		RULING		CUES/NOTES/COM	MENTS
						· · · · · · · · · · · · · · · · · · ·			
	7-11	IU STATE VECTOR I ERROR WHEN COMPAR		LAUNCH	CONT	INUE MISSION		CUES	
		MSFN STATE VECTOR SOME COMPONENT OF PLATFORM AND/OR C	I (I.E.,			XMIT IU NAV UPDATE E O RECOMMENDATION PER 5-29		IF IU AND MSFN THE FOLLOWING /	ΔA, ΔRV, AND ΔŴ MAX DIFFER BY MOUNTS:
		HAS FAILED OR EXH A LARGE ERROR)						1. AT T + 56 M	N
		,,	İ					(A) △A = 1.	NM
Ì			ŀ					(B) ΔRV = 30	,101 FT
								(C) ΔŴ MAX =	9.0 FPS WHEN AW = 2307 FT
								2. AT T + 1 HOL	R 45 MIN
		٠						(A) ∆A = 1.2	1 NM
								(B) ∆RV = 56	,894 FT
							·	(C) AŴ MAX =	9.0 FPS WHEN ∆W = 3857 FT
								NOTES	
								AS CVS FAILU	FAILURE OR MALFUNCTION, SUCH RE, OR ACCELEROMETER FAILURE TO PERFORM A NAVIGATION
		·						2. THERE ARE TO VECTOR COMPA CORRESPOND 1 + 56 MIN AND 1 HR 45 MIN	O TIMES DURING EPO THAT THESE RISONS ARE MADE. THESE TIMES O A VECTOR TIME TAGGED AT TL A VECTOR TIME TAGGED AT TL + THE VECTOR COMPARISONS WILL HE FOLLOWING PARAMETERS:
									ICALLY, THE DELTA SEMIMAJOR
	,		į						E LOCAL DELTA DOWNRANGE
								(C) ∆Ŵ MAX - THIS IS AS W CH/	THE LOCAL CROSSRANGE VELOCIT A FUNCTION OF W AND CHANGES NGES.
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			APOLLO 17	+	ATE 9/1/72	SECTION SLV - TB5	GROUP	PAGE	
			0220 17			AND TB7		7-10	Tape 11D.6

MISSION RULES

MISSION RULES

R RULE	CONDITION/MAL	FUNCTION	PHASI			RULING		CUES/NOTES/COMM	ENTS	· · · · · · · · · · · · · · · · · · ·
7-12 (CONT)	C. MOV LEAKING TB7	IN	TLC		E C C C C C C C C C C C C C C C C C C C	CONTINUE MISSION SE INFORM FLIGHT AN COMMAND IN TBB. ENGINE PUMP PURGE OFF SE REINITIATE LOX E STEER SEQUENCED DUMP COMMANDING: MAIN LOX VALVE OF SECURE SYSTEM 120 SE TERMINATE DUMP A SECURE SYSTEM 120 SE TERMINATE DUMP AND COMMANDINGSERVED BY COMMANDINGSERVED B	DUMP PEN IND C NG:			
	D. MFV LEAKING IN TB7				D. <u>C</u> B A A A T C C 5	ONTINUE MISSION SE INFORM FLIGHT AN ISAP IN TB 8: ENGINE PUMP PURGE EDS CUTOFF NO. 2 ENABLE SE INITIATE LH2 DUM OMINAL LOX DUMP TER IME BY COMMANDING: EDS CUTOFF NO. 2 DISABLE MAIN FUEL VALVE OF FREE 200 SEC., BSE ERMINATE LH2 DUMP BOMMANDING: MAIN FUEL VALVE CO. PREVALVES AND REC VALVES CLOSED.	OFF PAFTER MINATION (SEE PEN Y			
		MISSION	REV	DATE		SECTION	GROUP	PAGE		
		APOLLO 17	FNL	9/1/	72	SLV - TB5 AND TB7		7-12	Ţ	ape 59.5

MISSION RULES

SECTION 7 - SLV - TB7 - CONTINUED

R RULE CONDITION/MALFUNCTION PHASE RULING CUES/NOTES/COMMENTS 7-13 IU ECS WATER VALVE FAILS TO CYCLE OPEN OR CLOSE A. WATER VALVE CLOSED AND COOLANT INLET CONTROL TEMPERATURE IS 64° FOR HIGHER, AND THE INERTIAL GIMBAL TEMPERATURE IS 117° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP SI 115° F OR HIGHER, OR THE LVDA MEMORY TEMP (C11-60) BUSINESS RULING CUES/NOTES/COMMENTS CUES LVDS CUES LVDS LVDS LVDS CUES 1. WATER VALVE CLOSED/OPEN (G5-6 G6-601) 2. WATER VALVE OPEN 3. ST-124 INERTIAL GIMBAL TEMP (C11-60) 4. SUBLIMATOR INLET TEMP (C11-60) 5. LVDC MEMORY TEMP (C54-603)
FAILS TO CYCLE OPEN OR CLOSE A. WATER VALVE CLOSED AND COOLANT INLET CONTROL TEMPERATURE IS 64° FOR HIGHER, AND THE INERTIAL GIMBAL TEMPERATURE IS 117° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP NO. 1 OR NO. 2 IS 147° F OR HIGHER, OR THE LVDA MEMORY TEMP (C51-602)
HIGHER, OR THE LYDC LOGIC TEMP IS 142° F OR HIGHER, OR OF HIGHER, OR OF HIGHER, OR OF HIGHER, OR OF HIGHER, OR OF HIGHER, OR OF HIGHER, OR OF HIGHER, OR AND COOLART INHE INHERITAL GIBBAL TEMP IS 149° F OR HIGHER, OR THE LYDR TEMP NO. 1 OR NO. 2 IS OF THE LYDR CHAPBOWY TEMP NO. 1 OR NO. 2 IS OF THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR CHAPBOWY TEMP IS 119° F OR HIGHER, OR THE LYDR TEMP NO. 1 C. CONTINUE MISSION BSE INFORM FLT AND SEND: OR HIGHER, OR CLOSED WHEN THE LYDR TEMP NO. 1 C. CONTINUE MISSION BSE INFORM FLT AND SEND: OR HIGHER, OR CLOSED HAS BEEN INHIBITED MITH THE WI
APOLLO 17 FNL 9/1/72 SLV - TB5
AND TB7 7-13 Tape

MISSION RULES

SECTION 7 - SLV - TB7 - CONTINUED

PAGE COMPITION/PAGE/ENCITION PAGE BULING CUES/MOTES/COMPICTS 7-14 SURFACE COMPAN SURFACE OF THE SURFACE STATE OF THE SURFACE STATE OF THE SURFACE SURFACE STATE OF THE SURFAC			1	1			i	
SUMMER ADMITS PRES- SIME REACHES OR EXCERGS: A. MINUS 20 PSID OR PLUS 30 PSID OR PLUS 30 PSID OR B. MINUS 26 PSID OR PLUS 36 PSID OR PLUS 36 PSID OR PLUS 36 PSID OR PLUS 37 PSID OR PLUS 37 PSID OR PLUS 38 PSID OR PLUS 38 PSID OR PLUS 38 PSID OR PLUS 39 PSID OR PLUS 39 PSID OR PLUS 30 PSID OR PLUS 40 PSID OR PLUS 4	R RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COM	MENTS
MISSION REV DATE SECTION GROUP PAGE	7-14	BULKHEAD DELTA PRES- SURE REACHES OR EXCEEDS: A. MINUS 20 PSID OR PLUS 30 PSID B. MINUS 26 PSID OR	ORBIT	B. E	BSE INFORM FLIGHT AND HAND LH2 AND/OR LOX VENT DPEN OR CLOSED TO PRI REACHING SEPARATION EMERGENCY SPACECRAFT SEPARATION BSE TRANSMIT ABORT RI AND REQUEST EMERGENCY	VALVES ECLUDE LIMITS	CUES 1. LH2 TANK ULL, D178-408). 2. LOX TANK ULL, D179-406) 3. LH2 PUMP INLI 4. LOX PUMP INLI NOTES 1. MINUS DELTA PER TANK ULLAGE FUEL TANK ULLAGE FUEL TANK ULL 3. THE MINIMUM FOR THE S-IVB AND THE S-IVB AND THE ULTIMATE	AGE PRESSURE (K177-408, AGE PRESSURE (D180-406, ET PRESSURE (D2-403). ET PRESSURE (D3-403). PRESSURE IS DEFINED AS A LAGE PRESSURE GREATER THAN ULLAGE PRESSURE. RESSURE IS DEFINED AS A LOX PRESSURE GREATER THAN THE LAGE PRESSURE. RECOMMENDED DISTANCE BETWEEN D THE SPACECRAFT IS 7,000 FT. WILL STRUCTURALLY FALL AT
MISSION REV DATE SECTION GROUP PAGE		L	Ц,,,,		· · · · · · · · · · · · · · · · · · ·		, , , , , , , , , , , , , , , , , , , 	7.7
· · · · · · · · · · · · · · · · · · ·		MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 17 FNL 9/1/72 SLV - TB5 AND TB7 7-14 Tape 59.6		APOLLO	17 FNL	9/1/72				

MISSION RULES

_				1011 / 3	ET - 105 AND 107 - (
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
١	7-15	S-IVB STAGE PNEUMATIC		A. <u>c</u>	ONTINUE MISSION		CUES	
		SUPPLY PRESSURE DECAY EXCESSIVE IN:		В	SE INFORM FLIGHT ANI)	1. ENGINE PUMP PO	URGE PRESSURE (D50-403)
		A. TB5	EARTH ORBIT	1	. ATTEMPT TO TERMINA PURGE AND/OR CLOSE HELIUM SUPPLY SHUT	AMBIENT	(D236-403, D25	•
				2	VALVE. . RE-OPEN AMBIENT HE SUPPLY SHUTOFF VAL		3. LOX REPRESS SI D254-403).	JPPLY PRESSURE (D88-403,
				İ	WHEN PNEUMATICS RI			JMATIC SUPPLY PRESSURE DECAY
		В. ТВ7	TLC		ONTINUE MISSION SE INFORM FLIGHT AND	,	IS ONE WHICH WILL	RESULT IN DEPLETION OF PRIOR TO COMPLETION OF TB8
				l	. OPEN PREVALVES AND CHILLDOWN SHUTOFF)	, 61107, 6110.	
					F EXCESSIVE PRESSURI			
					CLOSE AMBIENT HELE SUPPLY SHUTOFF VAI			
				3	B. REOPEN AMBIENT HEL SUPPLY SHUTOFF VAI	.VES		
					WHEN PNEUMATICS R	QUIKED.	,	
	7-16	CONTROL SIGNAL PROCESSOR	TLC	CONT	INUE MISSION		CUES:	
		NULL SHIFT IN TB7 OR TB8			INFORM FLIGHT AND CO DER LIMITS TO 12.0 DI		1. PRIME RATE GYP GREATER THAN (RO MINUS REFERENCE RATE GYRO 0.3 DEG/SEC (PITCH, R4-602, R5-602, R8-602; ROLL, R6-60
,	,							MINUS THETA GIMBAL ANGLE NTER THAN 10 DEG AND NOT
								GREATER THAN 1.6 DEG(H54-60 03) EXCEPT DURING PROGRAMED
							NOTES	
							1. IF BOTH RATE (CUE 1 MUST BE	SYRO MEASUREMENTS ARE VALID, USED.
							PRIOR TO TB6 -	Y, IF A NULL SHIFT OCCURS 9 SECONDS, A DCS CMD TO OF
							SENT AFTER TBO	5 - 9 SECONDS TO PREVENT THE CHING BACK TO THE LOWER
	<u> </u>	l uzcaza:	REV	DATE	CCCTION C	CROUP	BAGE	
		MISSION APOLLO 17	FNL	DATE 9/1/72	SECTION SLV - TB5	GROUP	PAGE	
			لــــــــــــــــــــــــــــــــــــــ	,	AND TB7	L	7-15	Tape 11D.7

MISSION RULES

R	RULE	CONDITION/MALF	UNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
	7-17	LH2 TANK ULLAGE PRESSURE LESS TH 17 PSIA IN TB5	HAN I	EARTH ORBIT/ TLI	BS 1. IF CC AM AV	CONTINUE MISSION SE INFORM FLIGHT AND COLOSE ON AND OFF AND CVS REGULATOR CLOSED (ORIFICE OPEN) (NOTE THE CONDITION CANNOT BRECTED AND SUFFICIEN MAILABLE, BSE INHIBIT 02/H2 BURNER	BOOST /OR 1). BE T	3. LH2 VENT CLOSE K210-410). NOTES 1. IF THE ULLAGE PSIA AFTER THE THE REGULATOR TAIN A 17 TO 2 LH2 TANK. 2. IF LH2 TANK ULTO BE LESS THE RESULTING PROFINCLUDED IN THE	PRESSURE (D177-408, PRESSURE (D2-403). D DISCRETES (K1-410, PRESSURE RISES ABOVE 21 REGULATOR HAS BEEN CLOSED, SHOULD BE CYCLED TO MAIN- PSIA ULLAGE PRESSURE IN LAGE PRESSURE IS EXPECTED N 19.5 PSIA AT TB6 INITIATE, ELLANT LOSSES SHOULD BE E EVALUATION OF CAPABILITY EPTABLE ALTERNATE MISSION
_			MISSION	-	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	SLV - TB5	1		

MISSION RULES

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R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUES/NOTES/COMMENTS
	7-18	LOW COLD HELIUM SUPPLY PRESSURE A. PRIOR TO BURNER START B. DURING BURNER OPERATION	EARTH ORBIT	B. <u>C</u>	ONTINUE MISSION SE INFORM FLIGHT ANI AND FROM LAST STATIO RIOR TO TB6 URNER LOX SHUTDOWN V LOSE ON ONTINUE MISSION SE INFORM FLIGHT ANI H2 AND LOX REPRESS V LOSED.	1. AN EXCESSIVE COLD HELIUM SUPPLY PRESSURE DECAY IS ONE WHICH WILL RESULT IN A COLD HELIUM BOTTLE PRESSURE OF LESS THAN 1000 PSIA AT T86 INITIATE OR LESS THAN 450 PS AT COMPLETION OF CRYOGENIC REPRESSURIZATION. ND CMD 2. THIS FAILURE WILL REQUIRE EVALUATION OF RESIDUALS TO DETERMINE ADEQUACY FOR TLI
	7-19	A. LOX TANK ULLAGE PRESSURE LESS THAN 31 PSIA DURING ORBITAL COAST OR EXPECTED TO BE LESS THAN 31 PSIA BY TB6 INITIATE	EARTH	BSE 1. L C IF L NOT REQUE COMM 2. L V P Q 3. D IF L GREA REQUE IF T SURE FLIG SETT 4. B C 5. A	INUE MISSION INFORM FLIGHT AND CO OX TANK VENT VALVE E LOSE MORE THAN 9 PSI BELG IRED ULLAGE PRESSURE AND OX TANK REPRESS CONT ALVE OPEN ON UNTIL 7 RESSURE GREATER THAN UIRED, THEN OFF ELETED OX TANK ULLAGE PRESS ITER THAN 9 PSI BELOW IRED ULLAGE F IS GREATER THAN THE TER THAN THAN THAN THAN HE ROUIRED ULLAGE F IS GREATER THAN THAN HT CONTROL PRESSURE ING, BSE COMMAND URNER LOX SHUTDOWN N LOSE S CLOSE AS POSSIBLE B6 + 7 MIN 30 SEC, L MBIENT REPRESS ON	BOOST D180-406) 2. LOX PUMP INLET PRESSURE (D3-403) SSURE IS DW THE RE, OR PRESSURE PRESSER E SWITCH VALVE E TO
Г		MISSION	REV	DATE	SECTION	GROUP PAGE
		APOLLO 17	FNL	9/1/72	SLV - TB5	
L					AND TB7	7-17 Tape 11C.2

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	.0110	. , -	SLV - TB5 AND TB7 -	CONTINU	Γ	OTES/COMME	NTS
۲	7-20	J-2 ENGINE START BOTTLE	EARTH						. 25, 001111	
	7-20	PRESSURE OUTSIDE RE- START LIMITS	ORBIT					CUES START B	OTTLE PRES	SURE (D17-401, D241-401)
		A. ABOVE 1450 PSIA			A. <u>cc</u>	ONTINUE MISSION		NOTES		50.12 (51.7 1 01.7 521.1 101.7
	ļ	DURING ORBITAL COAST FOR FIRST OPPORTUNITY RESTART OR ABOVE			BS	SE INFORM FLIGHT AND	SENT			T BOTTLE DECAY DURING IS DEFINED AS A PRESSURE
		1500 PSIA FOR SECOND OPPORTUNITY RESTART				START BOTTLE VENT FOR 3 SEC	OPEN	DECA' PRES	Y WHICH WI SURE BELOW	LL RESULT IN A START BOTTLE 800 PSIA AT SECOND BURN OMMAND (TB6 + 9 MIN 30 SEC).
					2.	REPEAT COMMAND AS NECESSARY TO INSUP PRESSURE OF LESS T 1450 PSIA FOR FIRS OPPORTUNITY RESTAR 1500 PSIA FOR SECCOPPORTUNITY RESTAR	THAN ST RT OR DND	MAXII		PRESSURE OF 300 PSIA OWABLE AT START BOTTLE ND.
		B. ABOVE 1800 PSIA PRIOR TO RESTART				MERGENCY SPACECRAFT PARATION		!		
					AN.	SE TRANSMIT ABORT RE ND RECOMMEND EMERGEN PACECRAFT SEPARATION	ICY			
		C. BELOW 800 PSIA (SEE NOTE)			c. <u>cc</u>	ONTINUE MISSION				
		, , ,				SE INFORM FLIGHT AND OMMAND ASAP)	<i>.</i>		
					1.	. START TANK RECHARG ARM ON	iE			
					2.	. START TANK VENT OF UNTIL TANK PRESSUR LESS THAN 300 PSIA THEN CLOSE	RE			
	7-21	LOX BLEED VLV FAILS OPEN	LAUNCH		CONT	INUE MISSION		CUES:		
		DURING S-IVB FIRST BURN		-		INFORM FLT ASAP AFTE FF, BSE:	:R			VLV CLOSED OFF (K126-401) IRST BURN.
					1.	YCLE LOX BLEED VLV; . IS UNSUCCESSFUL, E B6 + 7 MIN 30 SEC AN	BETWEEN	2. REDU	CED ENGINE PERFORMAN	PERFORMANCE (REFER TO REAL- CE RESULTS)
					TE	B6 + 9 MIN 30 SEC, E	BSE:	NOTES:		
					2. CL	LOSE MRCV (5.0 POSIT	TION)	IMBA! RESI	LANCE AND DUALS TO D	ILL RESULT IN PROPELLANT WILL REQUIRE EVALUATION OF ETERMINE ADEQUACY FOR TLI F (REF FMR 7-1)
	7-22	S-IVB CONFIRMED LOSS OF HYDRAULIC FLUID	EARTH ORBIT/ TLI			-IVB RESTART (TB5)/I BIT (TB6)	<u>[L]</u>	CUES 1 HVDD	AUU TO DECE	DVOID OIL LEVEL ADDROV TERM
			1.51			INFORM FLIGHT AND RE	ECOM-	PERC	ENT (L7-40	•
					MEND	NO S-IVB RESTART			AULIC SYST PSIA (D41	EM PRESSURE LESS THAN -403).
								3. HYDRA ZERO	AULIC RESE PSIA (D42	RVOIR PRESSURE APPROXIMATELY -403).
								NOTES		
										TIONING PROPERLY, IT IS EMENTATION OF THIS RULE.
					-]			T	
-		MISSION	+	DATE	72	SECTION	GROUP		PAGE	
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MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	1	SLV - TB5 AND TB7 -		CUES/NOTES/COMME	ers
Ť	KOLL	CONDITION/PRACTORETION	11110	_	NOETHO			
	7-23	LOSS OF ECS COOLANT CIRCULATION	EO TLI TLC	BSE COOL	INUE MISSION INFORM FLT AND SEND: ANT PUMP NO. I ON AN SURE SWITCH DEACTIVA	ID D	APPROXIMATELY 2. FLOW RATE S-IV APPROXIMATELY 3. COOLANT MANIFO APPROXIMATELY 4. COOLANT PUMP N +28 VDC	(B INLET COOLANT (F10-601) 1.5 GPM. PLD INLET PRESS. (D17-601) 16 PSIA. 10. 2 POWER ON (K161-601) ENLET PRESS (D24-601)
	7-24	MIXTURE RATIO CONTROL VLV (MRCV) FAILS OPEN (4.5 POSITION) DURING S-IVB FIRST BURN	LAUNCH	BSE FIRS	INUE MISSION INFORM FLT ASAP AFTE T ENGINE CUTOFF, BSE E MRCV		(G17-401) DOES 2. MRCV OPEN ON (3. FAILURE VERIFI (REFER TO REAL RESULTS). NOTES: THIS FAILURE WILL IMBALANCE AND WILL	CONTROL VLV POSITION TO TINDICATE 5.0 POSITION. (K219-404) (4.5 POSITION). ED BY ENGINE PERFORMANCE -TIME ENGINE PERFORMANCE RESULT IN PROPELLANT L REQUIRE EVALUATION OF RMINE ADEQUACY FOR TLI REF FMR 7-1)
					Language	2202	Tana-	
 	_	MISSION		DATE	SECTION	GROUP	PAGE	
		APOLLO	17 FNL	9/1/72	SLV - TB5 AND TB7		7-19	Tape 45.7

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
	7-25	S-IVB STAGE LOX NON- PROPULSIVE VENT (NPV) FAILS A. TO OPEN AT TB7 + 0.7 SEC	TLC	B	<u>Ontinue Mission</u> Se inform flight and He Lox Tank To 18-20 Rior To TB7 + 15 Min	VENT PSIA	CUES 1. LOX NPV NOZZLE PRESSURES (D243-404, D244-404). 2. LOX TANK ULLAGE PRESSURE (D180-406, D179-406). 3. LOX NPV OPEN DISCRETES (K198-424, K199-424).
		B. TO LATCH OPEN AT TBB + 28 MIN 10 SEC	TLC	1 I M 1:	ONTINUE MISSION SE INFORM FLIGHT AND ATTEMPT TO LATCH OF THE LOX VENT F UNSUCCESSFUL, BSE AND AT TB8 +26 MIN 5 SEC LH2 LATCHING VENT CLOSED	PEN COM-	(135-424).
	7-26	LH2 LATCHING VENT VALVE FAILS TO LATCH OPEN AS PROGRAMED A. IN TB7	TLC	В	<u>ONTINUE MISSION</u> SE INFORM FLIGHT AND		CUES 1. LH2 NPV NOZZLE PRESSURE (D183-409, D184-409). 2. LH2 ULLAGE PRESSURE (D177-408, D178-408).
				I C 2	. ATTEMPT TO OPEN TH LATCHING VENT VALV F UNSUCCESSFUL, BSE OMMAND 1. LH2 LATCHING VENT CLOSED 1. LH2 VENT VALVE OPE	E 4	3. LH2 LATCHING VENT VALVE DISCRETES (K210-410, K211-410). 4. LH2 PUMP INLET PRESSURE (D2-403)
				1 4	T TB7 + 15 MIN OR TE HR 15 MIN COMMAND . LH2 VENT VALVE CLC		
		B. IN TB8		B	ONTINUE MISSION SE INFORM FLIGHT AND THE LH2 LATCHING VALVE F UNSUCCESSFUL, BSE IAND (ASAP) LOX NPV UNLATCHED CLOSED	PEN ENT COM-	
_			l nov	2775	CECTION	CBOUR	PAGE
	-	MISSION APOLLO 1		DATE 9/1/72	SECTION SLV - TB5 AND TB7	GROUP	7-20 Tape 23.7

MISSION RULES

SECTION	7	-	SLV	-	TB5	AND	TB7	-	CONTINUED

	R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/N	OTES/COMME	NTS	
		7-27	ENGINE START BOTTLE DUMP FAILS TO INITIATE	TLC	BSE TO 0	INUE MISSION INFORM FLIGHT AND AT PEN THE START BOTTLE FOR A MINIMUM OF 4 NDS	VENT	D241-40 NOTES THE MAX REACHIN	1). IMUM SAFE	ROOF PRESSU	17-401, MIT TO PRECLUDE RE PRIOR TO
		7-28	S-IVB STAGE COLD HELIUM DUMP FAILS TO INITIATE	TLC	BSE 1. A C L F F M IF U FF LIG OPEN 2. L	INUE MISSION INFORM FLIGHT AND ATTEMPT TO INITIATE 1 COLD HELIUM DUMP THRO CH2 COIL ON 02/H2 BUF OOR A MINIMUM OF 45 INUTES INSUCCESSFUL, BSE INF CH1 AND, AFTER LOX NF I IN TB8, COMMAND OX PRESSURIZATION SH TALVES OPEN FOR A MIN OF 30 MINUTES	OUGH RNER FORM PV	D263-40 NOTE THE MAX REACHIN	3). IMUM SAFE	ROOF PRESSU	(D261-403, MIT TO PRECLUDE RE PRIOR TO
		7-29	ENG HELIUM CONTROL VLV LEAKING AFTER FIRST ENGINE CUTOFF	EO	BSE 1. C	INUE MISSION INFORM FLT AND: EYCLE ENG HELIUM CONTILV (NOTE 1) EITHER BLEED VALVE IS ER TO FMR 8-3 OR 8-4		2. ENG 2 D242 3. FUEL (D20 4. BLEE: 1. RULII BSE 2. RULII LOS 3	TER CONTROL HE -401) DECR TK HELIUM -403, D249 D VLVS CLO NG 1 MAY B IN AN EFFO NGS 1 THRO AFTER FIRS	LIUM PRESS EASING REPRESS SPI-403) SED (K126-4) E REPEATED A RT TO TERMIN UGH 4 MUST H T ENGINE CU	HERE PRESS O1, K127-401) AT DISCRETION OF NATE LEAKAGE. BE TAKEN PRIOR TO
þ			MISSION	REV	DATE	SECTION	GROUP		PAGE	_	
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MISSION RULES

SECTION 7 - SLV - TB5 AND TB7 - CONCLUDED

_			<u>1</u>	SEC	TION 7 - S	SLV - TB5 AND TB7 -	ONCLUDED			_
R	RULE	CONDITION/MALFU	INCTION	PHASE		RULING		CUES/NOTES/COMME	NTS	
R	7-30	CONDITION/MALFU OXIDIZER TURBINE VLV (OTBY) FAILS DURING S-IVB FIR: LOW APS HELIUM S SUPPLY PRESSURE	BYPASS OPEN ST BURN		CONTI BSE I POSSI OFF, 1. CL VA 2. DR 3. DR (S 4. CY 5. RE IF CY AND 1 6. CL CONTI IF AF IS SO F GROUF FLIGH BOTTI	RULING NUE MISSION NFORM FLT AS SOON A BLE AFTER FIRST BUR	S CUT- ECIRC (S PURGE AL CCESS- 30 SEC 3SE: ION) SSURE KT RM HELIUM	CUES: 1. OTBV POSITION DURING S-IVB F FIRST BURN. 2. OTBV CLOSED OF FIRST BURN. 3. REDUCED ENG PE ENGINE PERFORM NOTES: 1. THIS FAILURE WIMBALANCE AND RESIDUALS TO DVEL. CUTOFF (R COU	(G8-401) INDICATES OPEN TERST BURN. F (K125-401) DURING S-IVB REFORMANCE (REFER TO R/T MANCE RESULTS). WILL RESULT IN PROPELLANT WILL REQUIRE EVALUATION OF ETERMINE ADEQUACY FOR TLI REF FMR 7-1) BE IMPLEMENTED AS SOON AS	то
卜		'	MISSION	REV	DATE	SECTION	GROUP	PAGE		
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MISSION RULES

SECTION 8 - SLV - TB6

					SE	CTION 8 - SLV - TB6					
R	ITEM										
					SUMMARY	OF RESTART PHASE F	UFFS				
					3011111111	OF ALSTANT THASE I	IOLES				
		8-1	RESERVED								
		8-2	02/H2 BURNER LH2 VAL	VE FA	AILS						
		8-3	LH, CHILLDOWN SYSTEM								
		8-4	LOX CHILLDOWN SYSTEM								
		8-5	RESERVED								
		8-6	S-IVB ACTUATOR HARDO	VER							
- 1		8-7	CONTINUOUS VENT REGU	LATOF	R FAILS TO	CLOSE					
		8-8	LOSS OF ATTITUDE CON	TROL	DURING SE	COND BURN					
	THE FOLLOWING MISSION RULES ALSO APPLY TO THIS SECTION: 6-3 INERTIAL PLATFORM FAILURE - ACCELEROMETER										
		6-4	LAUNCH VEHICLE INERT	IAL F	PLATFORM F	AILURE ATTITUDE REF	ERENCE				
			S-IVB STAGE LOSS OF		ST						
		7-2	LOSS OF ONE APS MODU								
		1	S-IVB AUXILIARY HYDR								
	1	7-8	LOSS OF ATTITUDE CON				SEC (CREW IMPLEM	ENTATION)			
		7-9	CONTINUOUS VENT REGU								
		i i	IU ECS WATER VALVE F				EVOCEDO CO TOTA	AD : 27 =	In Japan sure		
		7-14			AD DELTA I	*KESSURE REACHES OF	LXCEEDS -20 PSID	OR +36 PS1	D (CREW IMPLEMENTATION)		
		7 17	OR +30 PSID, -26 PSI		LEAV DUDTI	UC ODDITAL COACT					
	7-17 LH ₂ TANK VENT FAILURE OR LEAK DURING ORBITAL COAST										
	7-18 LOW COLD HELIUM SUPPLY PRESSURE 7-19 LOX TANK ULLAGE PRESSURE LOW (CREW IMPLEMENTATION) 7-20 J-2 ENGINE START BOTTLE PRESSURE OUTSIDE RESTART LIMITS										
	l		S-IVB LOSS OF ENGINE								
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MISSION RULES

SECTION 8 - SLV - TB6 - CONTINUED

R	pi i e	CONDITION MAN TOWNS	B		1	8 - SLV - TB6 - COI	MITMOED	T		
<u> </u>	RULE	CONDITION/MALFUNCTION	PHAS	E	┼	RULING		CUES/	NOTES/COMM	ENTS
	8-1	RESERVED						1		
	8-2	S-IVB STAGE 02/H2 BURNER FUEL PROPELLANT VALVE FAILS CLOSED A. PRIOR TO TB6 + 341 SEC B. AFTER TB6 + 341 SEC	TLI		В.	CONTINUE MISSION BSE INFORM FLIGHT A COMMAND 1. BURNER SHUTDOWN 2. CONTINUOUS VENT ORIFICE OPEN 3. LH2 REPRESSURIZA CONTROL VALVE CL 4. LOX REPRESSURIZA CONTROL VALVE CL CONTINUE MISSION BSE INFORM FLIGHT A COMMAND 1. BURNER SHUTDOWN 2. APSULLAGE ENGINE 3. LH2 REPRESSURIZA CONTROL VALVE CL 4. LOX REPRESSURIZA CONTROL VALVE CL	SYSTEM ATION OSE ATION OSE ND S ON TION OSE TION	2. BUI (K) 3. AME (K) NOTE THE 02 DETECT OR BUF	RNER CHAMB 2034-403, RNER PROPE 180-404, K BIENT REPR 195-404). 2/H2 BURNE F FAILURE G RNER FLAME	ER DOME TEMPERATURE C382-403). LLANT VALVE POSITIONS 192-403, K181-404) ESSURIZATION MODE SELECT R VOTING CIRCUIT WILL NOT OF THE BURNER TO IGNITE -OUT IN THE EVENT THE FUEL E FAILS CLOSED.
	8-3	LH2 CHILLDOWN SYSTEM FAILS DURING RESTART PREPARATIONS	TLI		BSE 1.	TINUE MISSION INFORM FLIGHT AND ATTEMPT TO CORRECT SITUATION SPECIFIED NOTE A, B, D UNSUCCESSFUL, BSE ORM FLIGHT	IN	2. LH2 3. LH2 K11 4. LH2 5. LH2 6. LH2 ΔP NOTE LH2 CH A. PRE' B. REC' C. BLEI	PRECIRC FL PREVALVE 2-404). BLEED VAL RECIRC VA ULLAGE PR (D177-408; ILLDOWN WI VALVE IS O IRCULATION ED VALVE I	VALVE IS CLOSED
		MISSION	REV	DATE		SECTION	GROUP		PAGE	
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MISSION RULES

SECTION 8 - SLV - TB6 - CONTINUED

FAILS DURING RESTART PREPARATIONS 1. ATTEMPT TO CORRECT SITUATION SPECIFIED IN NOTES 1.A, 1.B, 1.D IF 1 IS UNSUCCESSFUL, BSE INFORM FLIGHT AND BETWEEN TB6 + 4 MIN 10 SEC AND TB6 + 7 MIN 37.8 SEC COMMAND 2. ALTERNATE SEQUENCE 6D 1. LOX CH PRESSU (C4-40 (C4-40 TB6 + 7 MIN 37.8 SEC COMMAND 5. LOX BL	EVALVE DISCRETES (K109-403,
20 SEC, BSE INFORM FLIGHT AND 3. RECOMMEND TLI INHIBIT 20 SEC, BSE INFORM FLIGHT AND CLOSED 2. MOV OP 3. LOX FLI 4. LOX IN MOTES 1. LOX CH (A) PRI (B) REI (C) BLI (O) CH 2. ALTERN ONBOAR BEGINV VELOCIT OPERAT: 8-5 RESERVED MISSION REV DATE SECTION GROUP PAC APOLLO 17 FRIL 9/1/72 SLV - TB6	ιξ
	-3 Tape 27.3

MISSION RULES

SECTION 8 - SLV - TB6 - CONTINUED

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R R	RULE	CONDITION/MALFUN	CTION	PHASE	_	RULING		CUES/N	OTES/COMME	NTS	
8-4	-6	S-IVB ACTUATOR CONFIRMED HARDOVE PRIOR TO TLI IGN AUXILIARY HYDRAUL PUMP IS OPERATING	R AND .IC	TLI	INH A.	TINUE MISSION/TLI IBIT/CUTOFF CONTINUE MISSION IF TIME PERMITS, SET FOR THE CREW TO ATTE GIMBAL THE ENGINE WI ROTATIONAL HAND CONT IF THERE IS NOT TIME UNSUCCESSFUL, TLI INHIBIT/CUTOFF BSE INFORM FLIGHT AN RECOMMEND TLI INHIBI CUTOFF AND IMPLEMENT ABOVE PROCEDURE	MPT TO TH THE ROLLER , OR IF	MOTE BOTH IN POSITIO	O, G1-403, IDIVIDUAL I ON INDICATE	NS ±5 DEG OR GREATER G2-400, G2-403). PITCH/YAW ACTUATOR ORS MUST CONFIRM R TO IMPLEMENTATION OF	₹ THE
8-	-7	S-IVB STAGE CONTINUOUS VENT MODULE A. REGULATOR FAIL CLOSE DURING R SEQUENCE B. REGULATOR FAIL CLOSE OR ORIFI SHUTOFF VALVE TO CLOSE AT TB	S TO ESTART S TO CE FAILS	TLI	B. <u>1</u>	CONTINUE MISSION BSE INFORM FLIGHT AN 1. ATTEMPT TO CLOSE CVS REGULATOR IF 1 IS UNSUCCESSFUL BSE INFORM FLIGHT AN COMMAND 2. 02/H2 BURNER SHUT CONTINUE MISSION BSE INFORM FLIGHT AN	THE D DOWN	2. CV 3. LH D1 B.1. LH	IAN 3 PSIA IS REGULATO IZ TANK ULI 78-408). IZ TANK COI	PRESSURE REMAINS GREAT (D181-409 THROUGH D18 DR CLOSED (K154-411). AGE PRESSURE (D177-40 NTINUOUS VENT ORIFICE VE CLOSED (K0155-411). PRESSURE DOES NOT DECR	32-409).
		2 MIN 30.9 SEC (SEE NOTE)				1. ATTEMPT TO CLOSE CVS REGULATOR OR CVS ORIFICE SHUTO VALVE IF 1 IS UNSUCCESSFUL BSE COMMAND AT TB7 + 15 MIN AND TB7 + 1 H 15 MIN 2. LH2 LATCHING VENT VALVE OPEN AND LA	THE FF •	TO (D <u>NOTE</u> THIS FA	0 PSIA AT 0181-409, 	TTB7 + 2 MIN 30.9 SEC D0182-409). - REQUIRE RE-EVALUATIO UNAR IMPACT.	:
			ISSION POLLO 17	REV FNL 1	DATE 9/1/72	SECTION SLV - TB6	GROUP		PAGE 8-4	Tape 27,	4

MISSION RULES

SECTION 8 - SLV - TB6 - CONCLUDED

CONTINUE DISTRICT STATE OF THE CONTINUE MISSION SET INFORM PLICIAIT AND FIDO CERW WILL TAKE ACTION ON LIMITS (NOTE 1) 1. AMBILLAR RATES - PITCH (R34-602), YAM (R5-602), OR ROLL (R6-602) GREATER THAN (R5-602), OR ROLL (R6-602) GREATER THAN (R5-602), OR ROLL (R6-602) GREATER THAN (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) GREATER (R5-602), OR ROLL (R6-602) (R6-60	R RULE CONDITION/MA	LFUNCTION PHAS		RULING		S/NOTES/COMMENTS	
	8-8 LOSS OF ATTI	TUDE TLI	E <u>CON</u> BSE CRE	RULING NTINUE MISSION E INFORM FLIGHT AND EW WILL TAKE ACTION (CUE FIDO 1 ON 2 3 NOT: 1 2 4 4	ANGULAR RATES - PITCH ((R5-602), OR ROLL (R6-6 5 DEG/SEC AND NOT DECRE. ANGULAR RATES - PITCH ((R8-602), OR ROLL (R12- THAN 5 DEG/SEC AND NOT (SEE NOTE 3). LOSS OF ATTITUDE CONTROL NOTE 2). ES TLI BURN WILL BE TERMIN. (A) PITCH OR YAW BODY R. ±10 DEG/SEC (B) ROLL BODY RATE GREA: DEG/SEC (C) PITCH OR YAW ATTITUE NOMINAL PROFILES GRI LOSS OF ATTITUDE CONTROL GIVEN FOR THE FOLLOWING (A) LVDC/LVDA COMPUTATIO (B) ATTITUDE ERROR SIGN. THAN ±3.5 DEG. PITCH THAN ±5 DEG. (C) FAILURE TO INITIATE SEQUENCE. (D) FAILURE OF S-IVB ENC THE CUES ARE VALID IF RASWITCHOVER HAS NOT OCCUP ROLL ATTITUDE ERRORS >3. RESULT OF LOSS OF BOTH A CREW SHOULD ATTEMPT ROLL	O2) GREATER THAN ASING. R13-602), YAW 602) GREATER DECREASING L ALERT (SEE ATED FOR ATES GREATER THAN TER THAN ±20 DE DEVIATION FROM EATER THAN 45 DEG L ALERT WILL BE CONDITIONS: ONAL FAILURE. ALS-ROLL GREATER H AND YAW GREATER PROPER GUIDANCE GINE HYDRAULICS. ATE CHANNEL RRED5 DEG. MAY BE A APS MODULES. THE
1							, <u>.</u>
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MISSION RULES

SECTION 9 - SLV - TB8

						SE	CTION 9 - SLV - TB	8				
R	ITEM											
						SIMMAIS OF	SAFING AND SLINGS	HOT DIVES				
						JOHNAKI O	SAI THE AND SETTINGS	UOI KULES				
		9-1		NEUMATIC DUM	FAIL	S						
			LOX DUM									
		9-3	RESERVE	CONTROL BOTTI	LE DUM	PFAILS						
İ		9-5										
1												
		THE I	OLLOWING	REFERENCED F	LIGHT	MISSION R	ULES ARE ALSO APPI	TCARLE DURING	TIME RASE FIGHT	(TR8).		
	THE FOLLOWING REFERENCED FLIGHT MISSION RULES ARE ALSO APPLICABLE DURING TIME BASE EIGHT (TB8): 7-3 J-2 ENGINE MAIN FUEL VALVE (MFV) FAILS TO CLOSE AT FIRST S-IVB CUTOFF, SECOND S-IVB CUTOFF											
		7-4	J-2 ENG	INE MAIN OXII	DIZER '	VALVE FAIL	S TO CLOSE AT FIRS	KSI S-IVB CUTOFF	JFF, SECOND S-11 F SECOND RURN (/B CUTOFF		
		7-8	LOSS OF	ATTITUDE COM	ITROL	DURING TB5	AND TB7 TO SPACEC	RAFT SEPARATIO	ON, TB6 TO TB6	- 9 min 20 SEC AFTER		
			SPACECRA	AFT SEPARATIO	N, AF	TER TB8 IN	ITIATE					
				VALVE FAILS 1								
		7-14	2-1AR 2	TAGE COMMUNE TAGE LOY NON-	PRODU	AU DELTA P ISTVE VENT	(NDV) FAILS TO OR	EXCEEDS -20 F	SID OR +30 PSII), -26 PSID OR +36 PSID		
		7-26	LH ₂ LAT	CHING VENT VA	LVE F	AILS TO LA	(NPV) FAILS TO OP TCH OPEN AS PROGRA	-n Ai 187 + 0. MED -	. / SEC, TO LATCH	OPEN AT TB8 +17 MIN 3 SEC		
		7-28	S-IVB S	TAGE COLD HEL	IUM D	UMP FAILS	TO INITIATE					
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MISSION RULES

SECTION 9 - SLV - TB8 - CONTINUED

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R	RULE	CONDITION/MALF	UNCTION	PHASE	\dashv		RULING		CUES/NC	TES/COMME	VIS	
	9-1	S-IVB STAGE PNE DUMP FAILS TO 1		TLC		BSE	INUE MISSION INFORM FLIGHT AND MPT TO OPEN THE ENG PURGE CONTROL VALV		2. AMB1 D256 NOTES THE ST/ LIFTOFI	TENT HELIU 5-403). AGE PNEUMA	URGE PRESSURE M SUPPLY PRESS TIC BOTTLE WIL NOT REACH PRO	URE (D236-403
	9-2	S-IVB LOX DUMP TO INITIATE	FAILS	TLC		BSE ATTE	TINUE MISSION INFORM FLIGHT AND EMPT TO INITIATE THE REQUIRED LOX DUMP		2. MAII (K1: 3. LOX 4. LOX 5. LOX 6. LOX NOTES 1. LOX (A) (B) 2. IF	N OXIDIZER 20-401). PUMP INLE FLOW RATE PREVALVE PREVALVE DUMP WILL THE MOV R THE LOX F A LOX DUMF	VALVE POSITIO VALVE OPEN DI T TEMPERATURE (F1-401). OPEN DISCRETE CLOSE DISCRETE FAIL TO INITI EMAINS CLOSED REVALVE REMAIN IS UNSUCCESSE OF THE LUNAR RED.	(C4-403). (K109-403). (K110-403). ATE IF IS CLOSED
	9-3	ENGINE CONTROL DUMP FAILS TO RULES 9-4 AND ARE RESERVED.	INITIATE	TLC		BSE.	TINUE MISSION INFORM FLIGHT AND EMPT TO OPEN THE ENI IUM CONTROL VALVE	GINE	2. ENG (D1 NOTES THE MA REACHI	INE CONTRO 9-401, D24 XIMUM SAFE NG BOTTLE	PL REG PRESS (I PL HELIUM SPHEF 2-401). PRESSURE LIMI PROOF PRESSURE 2300 PSIA.	RE PRESSURE
	<u> </u>		1	1	\perp				-	I :	· · · · · · · · · · · · · · · · · · ·	
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			0220 17	''''	-' ''		3230			9-2		Tape 27.7

MISSION RULES

SECTION 9 - SLV - TB8 - CONCLUDED

		PRELAUNCH	INSTRUMENTATI	ON			
	STAGE COMMUNICATIONS	SYSTEM AND FL	IGHT CONTROL	MEASUREMENT CAT	EGORIZATION		
	MEASUREMENT DESCRIPTION	MEAS NUMBER	ONBOARD	TRANSDUCERS	CATEGORY	EFFEC- TIVITY	MISSION RULE RE
	STAGE COMMUNICATIONS SYSTEM						
	S-II STAGE						
	LINK BP1 MUX BP1AO MUX BP1BO MUX CP1AO				HD HD HD		
	S-IVB STAGE						
	LINK CP1 MUX DP1BO (YIA IU) MUX CP1BO				HD M HD		
	INSTRUMENT UNIT						
	LINK DP1 LINK DP1B MUX CP1AO (VIA S-IVB) MUX DP1AO			·	HD M HD HD		
	EMERGENCY DETECTION SYSTEM (EDS)				м		
	COMMAND COMMUNICATIONS SYSTEM (CCS) UPLINK				м		
	FLIGHT CONTROL MEASUREMENTS						
	S-IVB STAGE						
	PRESS, FUEL PUMP INLET PRESS, FUEL TANK ULLAGE EDS 1 PRESS, FUEL TANK ULLAGE EDS 2 PRESS, OXID PUMP INLET	D2-403 D177-408 D178-408 D3-403	METER* METER*	COMMON COMMON	2 OF 3 M		7-14 7-14 7-14/19
	PRESS, OXID TANK ULLAGE EDS 1 PRESS, OXID TANK ULLAGE EDS 2	D179-406 D180-406	METER*	COMMON COMMON	2 OF 3 M		7-14/19,8- 7-14/19,8-
1	INSTRUMENT UNIT						
1	GUIDANCE COMPUTER OPERATION	H60-603			M		6-1/4/7/9, 7-8/11,8-1
	COMPUTER RESET PULSE NO. 1-GUIDANCE DECODER	J71-603					REQUIRED T
	COMPUTER RESET PULSE NO. 2-GUIDANCE DECODER	J72-603			1 OF 2 M		MULTIPLE W GROUND COMMANDS
	*ONBOARD DISPLAY MANDATORY						
1							
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MISSION RULES

SECTION 10 - CSM ENVIRONMENTAL CONTROL SYSTEM

D	TTEM	 			and an analysis of			
R	ITEM							
ĺ								
į					GENERAL			
	10-1	LAUNCH						
	10-1	LAUNCH						
		LAUNCH WILL BE CONTIN	NUED AS LON TO 2-1. TH	G AS THE SU ERE ARE NO	IT CIRCUIT AND O ₂ S COOLANT FAILURES FO	SUPPLY WILL SUPPO OR WHICH LAUNCH/I	ORT FLIGHT C	REW DEMANDS FOR AT LEAST ASE WILL BE TERMINATED.
		TLC & TEC						
		WATER EVAPORATION WII	LL BE LIMIT	ED TO COMPO	NENT TESTING.			
		POWERED DESCENT						
		THERE ARE NO CSM ENVI	IRONMENTAL	CONTROL SYS	TEMS FAILURES FOR W	WHICH POWERED DES	CENT WILL B	E TERMINATED.
		ALL PHASES						
		A. BACKUP SYSTEMS AF FOR MISSION CONT	ND BACKUP CO	OMPONENTS W	IILL NORMALLY BE USE	D FOR THE MOST R	APID PRACTIO	CAL RETURN TO EARTH, NOT
		B. LM SYSTEMS WILL E STAGE WILL BE RE	BE USED AS I	REQUIRED FO E POSSIBLE.	R CSM SYSTEMS BACKU	JP. IF CSM SYSTE	MS REQUIRE I	LM BACKUP, THE DESCENT
		C. TO CONTINUE, WATE	ER QUANTITY	PREDICTION	S MUST REFLECT ADEQ	QUATE QUANTITIES	TO MEET NORM	MAL MISSION REQUIREMENTS.
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L				<u> </u>	CONTROL SYSTEM		10-1	Tape 33.1

MISSION RULES

			SECTION	10 -	CSPI ENVIR	ONMENTAL CONTROL SY	STEM - CONTINUED						
R I	ITEM												
h (0-2	DEFINITIONS											
			M PRESSURE V			UCH THAT CABIN PRES EGULATORS (1.2 LB/H		INTAINED GR	EATER THAN OR EQUAL TO				
	:	•	PGA CHECK W TOTAL LOOP STABILIZATI	ITH L	EAKAGE GRE WHICH RES	EATER THAN 0.5 PSI/M BULTS IN ECS 0 ₂ FLOW CIRCUIT INTEGRITY C	> 0.9 LB/HR AFTE		PRESSURE				
				THE S	UIT CIRCUI	T TO MAINTAIN ADEQU	ATE CREW COMFORT /	AND/OR CO ₂	REMOVAL WITHOUT USING				
				D OR	REGULATOR	FAILURE WITH WHICH	THE SUIT CIRCUIT (O ₂ DEMANDS	CANNOT BE SUPPLIED FOR				
				LOW,			ED, OR COMBINED FA	AILURES SUC	H THAT RADIATORS AND				
				LOW,			ED, OR COMBINED F	AILURES SUC	H THAT RADIATORS AND				
		LOSS OF COLLANT LOOP RADIATORS: RADIATOR LEAK, BLOCKAGE OF ALL FLOW THROUGH RADIATORS, OR RADIATOR DEGRADATION SUCH THAT TOTAL LONG-TERM USAGE OF WATER IS MORE THAN IS BEING PRODUCED.											
-		LOSS OF ALL COOL		Ry an	D SECONDAR	Y LOOP COOLING.							
			· ·	PRESS	PACK, OR		LE PLUMBING FAILU	RES WHICH R	EQUIRE ISOLATION OF THE				
		RULE NUMBERS 10	-3 THROUGH 1	0-9 A	RE RESERVE	D.							
oxdot		T.	1,000.00	1		I	anaun						
			MISSION APOLLO 17	REV FNL	9/1/72	SECTION CSM ENVIRONMENT CONTROL SYSTEM	GROUP GENERAL	PAGE 10-2	Tape 33.2				
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MISSION RULES

1	SEC	TION 10	- CSM ENV	I RONMENTAL CONTROL	SYSTEM - CONTINUE	D	
ITEM							
ì				SYSTEMS MANAGEMENT			
10-10	0 ₂ SYSTEM						
	A. SUIT FLOW RELIEF VALVE	WTII F	REMAIN CLOS	SED FOR DURATION OF	FI IGHT		
					, Erani .		
	B. NORMAL CM REPRESSURIZA						
	C. THE REPRESS PACK VALVE PRESSURIZATION AND REC		BE IN OFF F	POSITION FOR ALL PHA	SES EXCEPT LAUNCH	H, CSM EVA,	ENTRY, AND TUNNEL/LM
	D. THE SUIT CIRCUIT MUST AND THE SUIT CIRCUIT I			IMULATED H ₂ ONCE EVE	RY 6 HOURS FOR 1	MINUTE WHEN	ALL CREWMEN ARE SUITED
	E. THE SURGE TANK AND REP	RESS PA	ACK WILL NO	DRMALLY BE RECHARGED	SIMULTANEOUSLY.		
	F. CM CABIN PRESSURE WILL	NOT BE	E ALLOWED 1	TO DROP BELOW 4.0 PS	IA DURING NORMAL	LM PRESSUR	ZATION EXCEPT DURING TD&E
	G. THE CM ECS WILL NORMAL	LY SUPF	PLY ALL 02	FOR CONSUMPTION AND	LEAKAGE DURING 1	IVT PHASES.	
	H. THE FLIGHT CREW WILL D	ON SUI	TS FOR THE	FOLLOWING:			
	1. INABILITY TO MAINT	AIN CA	BIN PRESSUR	RE ABOVE 4.5 PSIA			
	2. TD&E 3. GLYCOL LEAKS IN CO	mmand i	MODULE				
	4. FIRE, SMOKE, AND/O 5. LM JETT	R CONT	AMINATION 1	IN CABIN			
ŀ	6. CSM EVA						
	I. THE FLIGHT CREW WILL I	OFF SU	ITS (TIME #	AND CONDITIONS PERMI	TTING) FOR THE FO	DLLOWING:	
	LOSS OF SUIT CIRCU CONFIRMED LEAK OF		IN SUIT CI	IRCUIT			
	COOLANT MANAGEMENT						
	A. FOR SIMULTANEOUS PRIMA	RY AND	SECONDARY	LOOP OPERATION, EIT	HER THE PRIMARY (OR SECONDARY	/ LOOP RADIATOR WILL
	B. GLYCOL RESERVOIR WILL	BE ON I	LINE AND RA	ADIATORS WILL BE BYP	ASSED FOR LAUNCH.		
	C. INDICATED GLYCOL ACCUM	ULATOR	QUANTITY V	VILL BE MAINTAINED B	ETWEEN 30 AND 70	PERCENT.	
	D. SECONDARY COOLANT WILL		•				
	E. ADDITIONAL POWER LOADS				EMDT TO MATHTAIN	DDIMARY PAT	NIATOR OUTLET TEMPERATURE
	GREATER THAN -20 DEG.	MILL I	DE MODED W	S PEROTUEN IN WH WIL	COLUMN TATALAN	FINITIART KAL	DIATOR GOTLES TEMPERATURE
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	APOLLO 17	FNL	9/1/72	CSM ENVIRONMENT	MANAGEMENT	i i	

MISSION RULES

	 	SECII	UN IU	- CSM ENV	TRONMENTAL CONTROL	AZIEM - CONTINUE	υ 		
ITEM								-	
10-10	WATER SYSTEM								
(CONT)	WATER STSTEM								
1 1	WASTE WATER W	ILL NORMALL	Y BE	DUMPED TO		R, IF WASTE WATER	QUANTITY I	TY LESS THAN 85-90 PERCENT NSTRUMENTATION (CF0009) IS EASE.	
	B. WATER DUMPS W	VILL BE MANA	GED S	O THAT:					
					GREATER THAN 75 PEI NK WILL BE FULL AND		ILL BE 90 P	ERCENT FULL	
	C. WATER DUMPS A	AND FUEL CEL	L PUR	GES WILL N	ORMALLY BE SCHEDULE	TO OCCUR:			
	THAN 1 HO	OUR BEFORE A	N OPT	ICAL SIGHT			ISLUNAR NAV	IGATION - OR NO LATER	
							L CELL PURG	ES WILL NOT BE SCHEDULED:	
	1. TEN HOURS						E GEEE FORG	ES WILL NOT BE SCHEDULED.	
	2. DURING MS 3. TEN HOURS	FN TRACKING	PERI	ODS					
					E DUMPS WILL BE INH:	BITED.			
	,			, ,,,,,	E DOING WILE DE IMI				
	 THREE HOURS BEFORE AND UNTIL IMMEDIATELY AFTER PAN CAMERA AND MAPPING CAMERA OPERATIONS FIFTEEN MIN BEFORE AND UNTIL IMMEDIATELY AFTER FAR UV SPECTROMETER OPERATION (ONLY EFFECTIVE FOR FIRST TWO DAYS AFTER CIRCUMLUNAR ORBIT). 								
	3. BEFORE AND UNTIL IMMEDIATELY AFTER IR OPERATION.								
	SYSTEM BACKUP								
	LM SYSTEMS WILL B POSSIBLE.	BE USED AS R	EQUIR	ED FOR CSM	SYSTEMS BACKUP. DE	SCENT AND/OR ASC	ENT STAGE W	ILL BE RETAINED IF	
	RULE NUMBERS 10-1	11 THROUGH 1	0-19	ARE RESERV	ED.				
ŀ									
1									
1	LT _M	IISSION	REV	DATE	SECTION	GROUP	PAGE		
		APOLLO 17	FNL	9/1/72	CSM ENVIRONMENT CONTROL SYSTEM	MANAGEMENT	10-4	Tape 57.9	
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MISSION RULES

	T 7					· · · · · · · · · · · · · · · · · · ·	
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
					SPECIFIC		
	10-20	CABIN PRESSURE CANNOT BE RELIEVED	LAUNCH	CON .	TINUE MISSION		NORMAL RELIEF STARTS AT 50 SECONDS
	10-21	CABIN PRESSURE DECREAS- ING AND/OR LESS THAN 4.5 PSIA AND:					CREW OPTION TO USE LM ENVIRONMENT FOR EARTH RETURN IN LIEU OF SUITED RETURN.
		A. SUIT PRESSURE GREATER THAN 3.5 PSIA	LAUNCH	1 A.1	. CONTINUE MISSION		
			PRE-PI	DI 2	. ENTER NEXT BEST P NO-GO FOR PDI. RI DESCENT STAGE FOR POSSIBLE	ETAIN	
			POWERS DET		. CONTINUE MISSION NO-GO FOR LUNAR ST . ENTER NEXT BEST P		
	,		ALL		CABIN PRESS NOT RI GREATER THAN 4.5 I	ESTORED	
		B. SUIT PRESSURE LESS THAN 3.5 PSI	LAUNC) ALL	- 1	- ABORT ASAP - ENTER ASAP		
	.1	C. LOSS OF SUIT CIRCULATION	LAUNCI	d C.1	. ABORT ASAP OPEN DIRECT 02 45	DEG	C.1. CORRESPONDS TO 12.6 LB/HR (APPROX 3 CFM/CREWMAN)
			ALL	2	FROM LAUNCH SETTI	NG.	
				!			
L		<u> </u>	, ,			<u> </u>	L
L		MISSION		DATE	SECTION COM ENT	GROUP	PAGE
		APOLLO 17	FNL	9/1/72	CSM ENVIRONMENT CONTROL SYSTEM	SUIT/CA	10-5 Tape 33.5

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUES/NOTES/COMMENTS
Г						
	10-22	LOSS OF SUIT CIRCUIT, CABIN STABLE AND GREATER THAN 4.5 PSIA				LM SYSTEMS (IF AVAILABLE) WILL BE USED FOR CO2 AND H2O REMOVAL.
			LAUNCH	Α.	CONTINUE MISSION	A. CORRESPONDS TO 12.6 LB/HR (APPROX 3 CFM/CREWMAN)
					OPEN DIRECT O2 VALVE FROM LAUNCH SETTING	
			PRE-PD	в.	ENTER NEXT BEST PTP	
				ļ	NO-GO FOR PDI. RETA DESCENT STAGE FOR TE POSSIBLE	
			POWERE DESCEN		CONTINUE MISSION	
Ì			DESCEN		NO-GO FOR LUNAR STAY	,
			ALL	ı	ENTER NEXT BEST PTP	
					 DOFF SUITS OPEN WASTE OVERBO 	DARD D.2. WASTE OVERBOARD BLEED = 1.0 LB 02/HR
		l			DRAIN VALVE TO OB CABIN BLEED FLOW	
		l			3. DON FACE MASKS AF	TER 1 HR 3. TIME REQUIRED FOR CM CO2 PARTIAL PRESSURE TO INCREASE TO 7.6 mm HG:
					4. IF VACUUM CLEANER TIONAL AND TIME F	R FUNC- PERMITS, 1 CREWMAN - 4 HR
					USE LIOH CANISTER ASSEMBLY SHOWN IN	3 CREWMAN - 80 MIN
					CONTINGENCY CHECK C/2-26(5).	KC151
	10-23	LOSS OF SURGE TANK OR REPRESS PACK	TEC	Α.	NO-GO FOR CSM EVA UM OPS AVAILABLE FOR US	
					CDR AND LMP CONTINUE MISSION	
			ALL	- B-	CONTINUE PISSION	
1	10-24	LOSS OF SURGE TANK AND REPRESS PACK	LAUNCH	ı A.	CONTINUE MISSION	
		NET KESS THOK	ALL	В.	CONTINUE MISSION	B. OPS 02 QTY - 4 LB/OPS (TWO OPS AVAILABLE)
					PLAN TO RESTORE ENTI STORING OPS IN CM A' LM EGRESS.	
ŀ			TEC	c.	CONTINUE MISSION	
			ļ		DOFF SUITS FOR ENTR	γ.
					NO-GO FOR CSM EVA	
			1			
<u> </u>		<u> </u>	1		CEOTIC:	L choup Laser L
-		MISSION APOLLO		DATE 9/1/72	SECTION CSM ENVIRONMENT	GROUP PAGE SUIT/CABIN
1		1			CONTROL SYSTEM	10-6 Tape 33.6

MISSION RULES

	T				TROUBLETTAL CONTROL 3	131211 - 6011	711000	
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	(CUES/NOTES/COMMEI	(TS
	10-25	FIRE OR SMOKE IN COMMAND MODULE	LAUNCH	-	ABORT I. DECOMPRESS CABIN			
				2	 TROUBLESHOOT ELEC SYSTEM PER FLIGHT CHECKLIST BOOST F PROCEDURES. 	CREW		
			PRE-PE		ENTER NEXT BEST PTP NO-GO FOR PDI. RETA DESCENT STAGE FOR TE	IN LM		
			POWERE	D C. 9	CONTINUE MISSION NO-GO FOR LUNAR STAY			
			TEC	D. 1	NO-GO FOR CSM EVA			
			ALL	E.1.	TROUBLESHOOT/COMBA PER FLIGHT CREW CH EMERGENCY PROCEDUR	ECKLIST		
				2.	ASSESS DAMAGE AND POWER FROM AFFECTE SYSTEMS			
				3.	ENTER NEXT BEST PT	<u>P</u>		
		•			RETAIN LM, IF POSS	IBLE.		
	10-26	CONTAMINATION IN CABIN	ALL	CREN	N MAY ELECT TO DECOM	PRESS I	IF UNABLE TO CLE/ MAY BE TERMINATED	AR CONTAMINATION, MISSION DEARLY.
	10-27	LOSS OF SUIT INTEGRITY	LAUNCH	ı A. <u>(</u>	CONTINUE MISSION			
			ALL	В. с	CONTINUE MISSION			
				'	NO-GO FOR UNDOCK			
			TEC	c. <u>i</u>	NO-GO FOR CSM EVA			
<u> </u>	<u> </u>	<u> </u>	Ļ.,		y			
-	-	MISSION	_	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	CSM ENVIRONMENT CONTROL SYSTEM	SUIT/CABIN	N 10-7	Tape 33.7

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
	10-28	LOSS OF 02 MANIFOLD A. 02 MANIFOLD LEAKS GREATER THAN 4 LB/HR AND CABIN PRESSURE GREATER THAN 4.5 PSIA	LAUNCH UNDOCKED PRE-PDI POWERED DESCENT/ LUNAR STAY	A.1. <u>Continue Mission</u> 2. <u>Continue Mission</u>	LM 02 (IF AVAILABLE) MAY BE USED TO SUPPLE- MENT CSM SUPPLY.
			ALL	3. ENTER NEXT BEST PTP (A) VERIFY SURGE TANK AND REPRESS PACK ISOLATED UNTIL ENTRY (B) RETRIEVE OPS FROM LM, IF DOCKED	A.3. APPROXIMATELY 5 HOURS ARE REQUIRED TO DEPLETE CABIN 02 FROM 4.8 TO 3.5 PSIA, WITH 0.456 LB/HR USAGE RATE (CREW + CABIN LEAK + TANK PRESS BLEED). A.3.(B) CREW OPTION TO USE LM ENVIRONMENT FO EARTH RETURN IN LIEU OF MANUAL CABIN PRESSURE REGULATION.
		B. 02 MANIFOLD LEAKS GREATER THAN 4 LB/HR AND CABIN PRESSURE LESS THAN 4.5 PSIA	LAUNCH ALL	(C) NO-GO FRO CSM EVA B.1. ABORT ASAP 2. ENTER ASAP USE OPS IN SUITED MODE FOR ENTRY IF PRACTICAL	
	10-29	LOSS OF ONE MAIN REGULATOR			
		A. FAILED CLOSED	TEC/E0	A.1. NO-GO FOR CSM EVA UNLESS OPS AVAILABLE FOR USE BY CDR AND LMP 2. CONSIDERATION WILL BE GIVEN TO UNDOCKING	
		B. FAILED OPEN	ALL	3. <u>CONTINUE MISSION</u> B. <u>CONTINUE MISSION</u>	
	10-30	BOTH MAIN REGULATORS FAILED CLOSED	LAUNCH LO UNDOCKED/ PRE-PDI POWERED DESCENT/ LUNAR	A. CONTINUE MISSION B. NO-GO FOR UNDOCKING C. CONTINUE MISSION	LM SYSTEMS (IF AVAILABLE) MAY BE USED IN LIEU OF CSM SYSTEMS.
			ALL	D. <u>ENTER NEXT BEST PTP</u> NO-GO FOR CSM EVA	D. SUIT LOOP PRESSURE WILL DROP FROM 3.75 PS TO 2.5 PSIA IN APPROXIMATELY 9 MINUTES.
		MISSION	REV DATE		PAGE
		APOLLO 17	FNL 9/1	CSM ENVIRONMENT SUIT/CA	NBIN 10-8 Tape 34.1

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NO	TES/COMME	VTS		
			<u> </u>	 							_
	10-31	LOSS OF ONE SUIT COM-	ALL	Α. <u>α</u>	CONTINUE MISSION						
		PRESSOR	TEC	В. <u>М</u>	10-GO FOR CSM EVA						
	1										
	10-32	LOSS OF TWO SUIT COM- PRESSORS	LAUNCH	Α. <u>(</u>	CONTINUE MISSION		VACUUM BUT WI	CLEANER M	AY BE CONNEC	CTED TO SUIT LOONTEGRITY. CON-	P
		THEOGRA	<u> </u>	(DPEN DIRECT O2 45 DE LAUNCH SETTING	G FROM				RETAINING LM.	
			EO		CONTINUE MISSION						
l				1 -	NO-GO FOR TLI						
			LO	C. 1	NO-GO FOR UNDOCKING						
			ALL	D. (CONTINUE MISSION						
				1	NO-GO FOR CSM EVA						
			ļ								
		RULE NUMBERS 10-33					,				
		THROUGH 10-39 ARE REŞERVED.									
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	4	MISSION	REV [ATE	SECTION	GROUP		PAGE			
		APOLLO 1	7 FNL	9/1/72	CSM ENVIRONMENT CONTROL SYSTEM	SUIT/	CABIN	10-9		Tape 34.2	
L_					CONTROL STSTEM	L		<u> </u>	L	Tape ST.2	

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE			RULING			TES/COMME	NTS
H	ROLL	CONDITION/MALTONCTION	FIIASL			KOLINU		0013/110	TEST COMME	****
	10-40	PRIMARY COOLANT LOOP MALFUNCTIONS								
1		A. LOSS OF EVAPORATOR	LAUNCH		A.1.	CONTINUE MISSION				
			ALL		2.	CONTINUE MISSION		A.2.(A)	MAINTAIN THAN -20°	PRI RAD OUT TEMP GREATER
						ACTIVATE SECONDARY COOLANT LOOP WITH RADIATORS IN BYPASS REQUIRED TO MAINTAI PRIMARY EVAPORATOR TEMP LESS THAN 90° AS REQUIRED FOR CRECOMFORT.	N OUT F OR	(B)	WATER MAN TION AND LOOP TO M	AGEMENT MAY DICTATE ACTIVA DEACTIVATION OF SECONDARY NAINTAIN PRIMARY RAD OUT EEN 45° AND 90° F.
		B. LOSS OF EITHER RADIATOR PANEL	LAUNCH		B.1.	CONTINUE MISSION		B.I. AL	TERNATE MI	SSION MAY BE PERFORMED
			ALL		2.	BASED ON WATER AVAI FOR EVAPORATIVE COO THE MISSION WILL BE CONTINUED USING SEC RADIATORS SUPPLEMEN PRIMARY LOOP EVAPOR	LING ONDARY TED BY			
		C. TOTAL LOSS OF LOOP	LAUNCH		c.1.	CONTINUE MISSION				
						ACTIVATE SECONDARY	LOOP	•		
	,		E0		2.	CONTINUE MISSION		C.2. AL	TERNATE MI	SSION MAY BE PERFORMED.
						NO-GO FOR TLI. ACT SECONDARY LOOP	IVATE			
			POWERE		3.	CONTINUE MISSION				
			DESCEN LUNAR STAY	''/		ACTIVATE SECONDARY	LOOP.			
	·		TEC		4.	NO-GO FOR CSM EVA				
			ALL		5.	BASED ON AMOUNT OF AVAILABLE, CONSIDER WILL BE GIVEN TO CO ING MISSION ON SECO LOOP.	ATION NTINU-			
		D. LOSS OF BOTH PRIMARY RADIATOR PANELS	LAUNCH	1	D.1.	CONTINUE MISSION AC SECONDARY LOOP	TIVATE			
			EO		2.	CONTINUE MISSION NO FOR TLI, ACTIVATE SECONDARY LOOP	GO GO			
			ALL		3.	BASED ON AMOUNT OF AVAILABLE CONSIDERA WILL BE GIVEN TO CO ING MISSION ON SECO LOOP.	TION NTINU-			
	10-41	SECONDARY LOOP MALFUNCTIONS								
		A. LOSS OF EVAPORATOR	ALL		A. <u>C</u>	ONTINUE MISSION				
		B. LOSS OF RADIATORS	E0		в. <u>с</u>	ONTINUE MISSION		B. LOOP MODE		OPERATIONAL IN EVAPORATIVE
		C. TOTAL LOSS OF LOOP	ALL		c. <u>c</u>	ONTINUE MISSION		. 1006		
	10-42	LOSS OF PRIMARY AND SECONDARY EVAPORATORS	ALL		CONT	INUE MISSION				
-		MISSION	REV	DATE		SECTION	GROUP		PAGE	
		APOLLO 1	7 FNL	9/1	/72	CSM ENVIRONMENT CONTROL SYSTEM	COOLAN	Т	10-10	Tape 110.5
			<u> </u>	<u> </u>		SONTINUE STOTEM			10-10	Tabe 110.0

MISSION RULES

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R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
	10-43	LOSS OF ALL COOLING, PRIMARY AND SECONDARY					LM SYSTEMS (IF AV SUPPLEMENT CSM OP	AILABLE) WILL BE USED TO ERATIONS.
			LAUNCH	A. <u>C</u>	ONTINUE MISSION			
			E0	B. <u>E</u> I	NTER NEXT BEST ATP (R PTP	B. LOSS OF TWO FU	EL CELLS, POWER DOWN.
				EI Ei	AXIMUM ORBIT TIME: MERGENCY POWER DOWN D BY 1.5 HOURS OF PO OR ENTRY.	FOLLOW-		
			POWERED DESCENT	c. <u>c</u>	ONTINUE MISSION			
			ALL	D. <u>E</u>	NTER ASAP			
	10-44	CONFIRMED LEAK OF GYLCOL COOLANT					LM ENVIRONMENT (I EARTH RETURN IN L	F AVAILABLE) MAY BE USED FOR IEU OF CSM.
		A. IN COMMAND MODULE	LAUNCH	A.1.	CONTINUE MISSION			
	•		E0	2.	ENTER NEXT BEST PTF	<u>.</u>		
					DON SUITS. PURGE S LOOP WITH DIRECT OF		,	
			POWERED DESCENT	3.	CONTINUE MISSION			
			DESCENT		NO-GO FOR LUNAR STA	۱Y		
	İ		TEC	4.	NO-GO FOR CSM EVA			
			ALL	5.	ENTER NEXT BEST PTF	-		
		B. IN SUIT CIRCUIT	LAUNCH	B.1.	CONTINUE MISSION			
	,		E0	2.	ENTER NEXT BEST PTE	-		
					DOFF SUITS AND USE MASKS IF REQUIRED.	FACE		
			POWERED. DESCENT	3.	CONTINUE MISSION			
					NO-GO FOR LUNAR STA	lΥ		
			TEC	- 1	NO-GO FOR CSM EVA			
			ALL	5.	ENTER NEXT BEST PTE	'		
		RULE NUMBERS 10-45						
		THROUGH 10-49 ARE RESERVED.		ļ				
		1						
-	<u> </u>	MISSION	REV [ATE	SECTION	GROUP	PAGE	
	· - · ·	APOLLO 1	_	9/1/72	CSM ENVIRONMENT CONTROL SYSTEM	COOLAN	10-11	Tape 34.4
L			بلبسل		CONTROL STATEM		10-11	1ape 34.4

MISSION RULES

R	RULE	CONDITION/MALF	UNCTION	PHASE		RULING		CUES/NO	TES/COMMEN	NTS	
	10-50	LOSS OF ALL OVE	′	EO TLC		ENTER NEXT BEST PT NO-GO FOR TLI NO-GO FOR LOI CONTINUE MISSION	<u>P</u>	MANA CABI 2. IF P ALON WILL OR C	GEMENT OVI N. OTABLE ANI EE) BECOME BE NECES! YCLIC ACC! FLUID STO! CAPABILI	ERBOARD DRA D WASTE TAN FULL, FORC SARY TO ALL JMULATOR OP RAGE BAGS A	THROUGH WASTE IN VALVE INTO KS (OR WASTE TAR ED WATER BOILING OW FUEL CELL AND ERATION. ND LM URINE STO- LABLE) WILL BE
	10-51	UNCONTROLLABLE HUMIDITY		LAUNCH PRE-PD:	B. <u>E</u>	CONTINUE MISSION ENTER NEXT BEST PTP HO-GO FOR PDI. RETAI DESCENT STAGE FOR TE		LM SYST	EMS MAY BI	E USED FOR	HUMIDITY CONTROI
				TEC ALL	1 .d	NO-GO FOR LUNAR STAY NO-GO FOR CSM EVA ENTER NEXT BEST PTP		•			
	10-52	WASTE WATER TAI OR LOSS OF WAS STORAGE CAPABI	TE WATER	ALL	<u>CON</u>	FINUE MISSION		SUPF 2. WHEN PLUS (A)	PLEMENT CSI I POTABLE I I FUEL CELI TEMPORARY DUMPING PP BOARD USI HOSES TO RELIEVING RELIEVING	M. WATER TANK L WATER WIL STORAGE IN OTABLE WATE NG URINE TR ENHANCE TRA THROUGH OV LVES.	BECOMES FULL, SI L BE ELIMINATED CSM FLUID BAGS R DIRECTLY OVER: ANSFER/WATER GUI CKING PERIODS
	10-53	CONFIRMED LEAK POTABLE WATER UNABLE TO TRAN FUEL CELL WATE POTABLE TANK RULE NUMBERS 1 THROUGH 10-59	TANK OR SFER R TO	LAUNCH ALL	· ·	CONTINUE MISSION CONTINUE MISSION		LM SYST SUPPLEM	TEMS (IF A' MENT CSM. STORAGE BA		IAY BE USED TO
		RESERVED	MISSION	REV	DATE	SECTION	GROUP		PAGE		
Г			APOLLO 17	FNL	9/1/72	CSM ENVIRONMENT CONTROL SYSTEM	WATER AN		10-12		Tape 34.5

MISSION RULES

		INSTR	UMENTATION REQUIREME	NTS		
10-60	MEAS DESCRIPTION	РСМ	ONBOARD	TRANSDUCER	CATEGORY	MSN RULE REFERENCE
	CABIN PRESS SUIT PRESS TANK BLADDER PRESS	CF0001P CF0012P CF0120P	METER METER	COMMON COMMON	1 OF 3 M	10-20
	SURGE TANK PRESS OXYGEN REPRESS PRESS	CF0006P	METER METER	COMMON	1 OF 2 M	10-28
	PRIM ACCUM QTY PRIM PUMP OUT PRESS	CF0019Q CF0016P	METER METER	COMMON COMMON	1 OF 2 M	10-40, 10-44
	POTABLE H2O QTY WASTE H2O QTY	CF0010Q CF0009Q	METER METER	COMMON COMMON	HD HD	10-53, 10-52
	SEC STEAM PRESS SEC EVAP OUT TEMP	CF0073P CF0071T	METER METER	COMMON COMMON	HD HD	10-41
1	SEC ACCUM QTY	CF0072Q	METER	COMMON	HD	
	SEC PUMP OUT PRESS	CF0070P	METER	COMMON	ДН	
	PRIM EVAP OUT TEMP	CF0018T	METER	COMMON	ДН	
	PRIM STEAM PRESS	CF0034	METER	COMMON	DH	
	ECS 02 FLOW	CF0035R	METER	COMMON	HD	
	02 MANIFOLD PRESS	CF0036P			HD	
	SUIT COMP PRESS	CF0015P	METER	COMMON	HD	
	PRIM RAD OUT TEMP	CF0020T	METER	COMMON	HD	
	PRIM EVAP INLET TEMP	CF0181T			но	
	STEAM DUCT TEMP	CF0017T			HD	
	SEC RAD OUT TEMP	SF0263T	METER		дн	

MISSION RULES

SECTION 11 - CSM CRYOGENICS

		SECTION 11 - CSM CRYOGENICS
R	ITEM	· · · · · · · · · · · · · · · · · · ·
	-	
		GENE RAL
	11-1	LAUNCH
	''-'	<u>LAGITOR</u>
		THERE ARE NO CRYO FAILURES FOR WHICH THE LAUNCH/INSERTION PHASE WILL BE TERMINATED. FOR COMPLETE LOSS OF THE SYSTEM RESULTING IN THREE FUEL CELL FAILURES, ENTRY WILL BE PLANNED INTO PTP 3-1. THREE ENTRY BATTERIES AND THE AUX LAT ARE CAPABLE OF SUPPORTING THE LAUNCH AS LONG AS THREE REVS POWERED DOWN TO 50 AMPS AND ENTRY.
	11-2	ALL PHASES
		THE CRYOGENICS SYSTEM IS REQUIRED UNTIL CM/SM SEP SO THAT THE ENTRY AND LANDING PHASES WILL BE ENTERED INTO WITH FULL CONSUMABLES POTENTIAL, THAT IS, FULLY CHARGED ENTRY BATTERIES AND ENTRY 0_2 TANKS. IF THIS CAPABILITY IS POTENTIALLY JEOPARDIZED BY CRYO SYSTEMS DEPLETION OR MALFUNCTION, MISSION TERMINATION PROCEDURES WILL BE ENACTED IN WHATEVER TIMEFRAME IS APPROPRIATE OR AVAILABLE. ANY ENTRY BATTERY OR ENTRY 0_2 USAGE AFTER LOSS OF RECHARGE CAPABILITY FROM THE CRYO SYSTEM WILL REDUCE SUPPLY AVAILABLE FOR ENTRY, LANDING, AND POSTLANDING.
	ŀ	
	, ,	DOUGHED DESCRIPT
	11-3	POWERED DESCENT
1		THERE ARE NO CRYO SYSTEM FAILURES FOR WHICH POWERED DESCENT WILL BE TERMINATED.
	11-4	LOSS OF CRYOGENIC TANK IS DEFINED AS:
		A. PRESSURE CANNOT BE MAINTAINED ABOVE 150 PSIA FOR 02 AND 100 PSIA FOR H2.
		B. A LEAK WHICH, COMBINED WITH A 40-AMP LOAD FLOW FROM THE TANK, WILL DEPLETE THE TANK BEFORE CM/SM SEP.
		C. LOSS OF ALL HEATERS IN AN 02 TANK, LOSS OF 2 HEATERS AND ONE FAN IN H2 TANKS 1 AND 2, OR LOSS OF BOTH FANS IN H2 TANK 3.
	11-5	THE LUNAR MISSION WILL BE CONTINUED IF THE ${ m H_2}$ and ${ m O_2}$ tanks meet redline criteria and the lowest two tanks are capable of supporting an Earth Return from any point with at least an average power level of 40 amps.
	11-6	EARTH ORBIT MISSION WILL BE CONTINUED AS LONG AS ENOUGH TOTAL CRYO (02, H2) IS AVAILABLE TO PERFORM AN ENTRY INTO THE NEXT DAILY GO/NO-GO AREA.
		RULE NUMBERS 11-7 THROUGH 11-9 ARE RESERVED.
\vdash		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 CSM CRYOGENICS GENERAL 11-1 Tape 35.1

MISSION RULES

SECTION 11 - CSM CRYOGENICS - CONTINUED

			SE	CTION 11 -	CSM CRYOGENICS - C	ONTINUED		
R ITE	М			_				
				SY	STEMS MANAGEMENT			
11-1	O <u>CRYO MANAGEME</u>	<u>NT</u>						
		TANK PRESSURE UTILIZE FANS		L BE MAINT	AINED BY USE OF TAN	K HEATERS IN "AUT	ro" Mode Wit	H THE EXCEPTION OF H ₂ TANK 3
	B. MANUAL PRE	SSURE CONTROL	WILL	NORMALLY	BE USED AS REQUIRED	TO MAINTAIN:		
	1. TANK P	RESSURES GREA	TER T	HAN 750 PS	IA O ₂ AND 200 PSIA	FOR H ₂ .		
					TWO TANKS IN EACH S AMPS AND AS REQUIF			TURN FROM ANY POINT WITH AT
	C. ONE FUEL C	CELL MAY BE PU	IRGED +	OR THE SPA	CECRAFT ELECTRICAL	LOADS MAY BE INCE	REASED TO PR	ECLUDE CRYO TANK VENTING.
	D. H ₂ TANKS 1	AND 2 FANS W	ILL N	OT BE OPER	ATED IN THE AUTO MC	DE. H2 TANK 3 FA	ANS MAY BE O	PERATED IN THE AUTO MODE.
		ISOLATION VAL				IT WILL BE CLOSED) IF LOSS OF	TANKS 1 OR 2 AFFECTS TANK :
11-1	1 <u>CRYO GAGING</u>							
					RIME. ACCURACY IS AY BE DEGRADED FROM			±0.72 LB H ₂) PER TANK. F TANK FANS.
	B. MCC CALCUL	ATED QUANTITY	Y USIN	G PRESSURE	VERSUS TEMPERATURE	IS BACKUP.		
	RULE NUMBERS	11-12 THROUGH	ł 11-1	9 ARE RESE	RVED.			
		•						
		MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	CSM CRYOGENICS	MANAGEMENT	11-2	Tape 35.2

MISSION RULES

SECTION 11 - CSM CRYOGENICS - CONTINUED

R	RULE	CONDITION/MAL	FUNCTION	PHASE			RULING	CONTINUED	CUES/N	OTES/COMMI	INTS	
						SPE	CIFIC MISSION RULES					
	11-20	LOSS OF ONE O	2 TANK	LAUNC	н	Α.	CONTINUE MISSION		LM, PL	SS, AND OF	S 02 WILL BI	USED AS REQUIRED
				ALL			CONSIDERATION WILL ! TO CONTINUING THE M AFTER LOSS OF A TANK	ISSION	TO SUP	PLEMENT C	SM 02.	
				POST	DOCK	c.	JETTISON LM					
				TEC			CONSIDERATION WILL I TO PERFORMING CSM ET TANKS 1 AND 2 OR 1 A REMAIN AND QUANTITY OR 3 IS LESS THAN 60	VA IF AND 3 IN 2				
	11-21	LOSS OF TWO O		LAUNC	H	Α.	CONTINUE MISSION					
		AND/OR TWO H2	TANKS	EO			CONTINUE MISSION					
					1		NO-GO FOR TLI		•			
				POWER DESCE			CONTINUE MISSION	,				
				ALL			NO-GO FOR LUNAR STAY ENTER NEXT BEST PTP					
							RETAIN LM IF POSSIB	LE				
	11-22	LOSS OF ONE H	2 TANK	LAUNC	н	Δ	CONTINUE MISSION	,				
		2000 0. 02		ALL		В.	CONSIDERATION WILL I GIVEN TO CONTINUING MISSION AFTER LOSS (TANK	THE				
				POST	DOCK	с.	ENTER NEXT BEST PTP JETTISON LM					
	11-23	LOSS OF THREE	O2 TANKS	LAUNC	ม	Δ	CONTINUE MISSION		ALIY DA	TTEDV WILL	. POWER SMJC'	c
		AND/OR THREE					ISOLATE SURGE TANK I	BEFORE	DA	#166	OHEN SHOU	~.
				TLC			800 PSIA ENTER NEXT BEST PTP					
							NO-GO FOR LOI					
				POWER DESCE			CONTINUE MISSION					
				ALL			NO-GO FOR LUNAR STAY ENTER NEXT BEST PTP	(
				ALL			RETAIN LM IF POSSIB	LE				
			ļ									
		RULE NUMBERS THROUGH 11-49 RESERVED.										
H	<u></u>	<u> </u>	MISSION	REV	DATE		SECTION	GROUP		PAGE		
			APOLLO 17	FNL		/72	CSM CRYOGENICS	SPECIFI	ıc	11-3		Tape 35.3
L			<u> </u>	ــــــــــــــــــــــــــــــــــــــ	L		L			l		

MISSION RULES

SECTION 11 - CSM CRYOGENICS - CONCLUDED

			INSTRUMEN	TATION REQUIREMEN	TS		
				<u> </u>			
11-50	<u> </u>	AS DESCRIPTION	<u>PCM</u>	ONBOARD	TRANSDUCERS	CATEGORY	MSN RULE REFERENCE
	02 TAN 02 TAN 02 TAN		SC0032Q SC0033Q SC0051Q	METER METER METER	COMMON COMMON COMMON	1 OF 3 MANDATORY	11-20,21,22
	02 TAN 02 TAN 02 TAN	(1 TEMP (2 TEMP (3 TEMP	SC0041T SC0042T SC0055T			HIGHLY DESIRABLE	11-20,21,22
	H2 TAN H2 TAN H2 TAN	(2 QTY	SC0030Q SC0031Q SC0050Q	METER METER METER	COMMON COMMON COMMON	1 OF 3 MANDATORY	11-21,22
	H2 TAN	(1 TEMP (2 TEMP (3 TEMP	SC0043T SC0044T SC0054T			HIGHLY DESIRABLE	11-21,22
	02 TAN	C 1 PRESS C 2 PRESS C 3 PRESS	SC0037P SC0038P SC0053P	METER METER METER	COMMON COMMON COMMON	1 OF 3 MANDATORY	11-20,21,22 11-20,21,22
	H2 TAN	C 1 PRESS C 2 PRESS C 3 PRESS	SC0039P SC0040P SC0052P	METER METER METER	COMMON COMMON COMMON	1 OF 3 MANDATORY	11-21,22 11-21,22
İ	02 TAN	(2 AND 3 MAN. PR	ESS SCOO69P	C&W	COMMON	HD	
	O2 TAN	() HTR TEMP	SC0070T	METER	COMMON	HD	11-23
	02 TAN	(2 HTR TEMP	SC0071T	METER	COMMON	HD	11-23
	02 TAN	3 HTR TEMP	SC0072T	METER	COMMON	HD	11-23

MISSION RULES

SECTION 12 - CSM ELECTRICAL POWER SYSTEM

_						COM ELECTRICAL PUNE	.N 3131211		
R	ITEM								
						CENERAL			
						GENERAL			
	12-1	LAUNCH							
	12-1								
		A. LAUNCH WI PTP 2-1. TO CONTIN	THERE MUST E	JED AS BE AT	LONG AS SI LEAST ONE I	UFFICIENT ENERGY IS MAIN BUS AND ONE AC	AVAILABLE TO F BUS (THROUGH N	PERFORM AN ENTE MODE I AND II E	Y INTO AT LEAST EGIONS) OPERATIONAL
		B. THE LAUNC OR ONE EN	H PHASE WILL TRY BATTERY A	NOT B	E TERMINATI E SM POWER	ED AS LONG AS THREE SOURCE REMAIN.	ENTRY BATTERIE	ES REMAIN TO SU	PPLY MAIN BUS LOADS
	12-2	POWERED DESCE	NT_			•			
		THERE ARE NO	EPS FAILURES	FOR WI	HICH POWER	ED DESCENT WILL BE T	ERMINATED.		
	12-3	ALL PHASES					•		
		THE MISSION W SUPPORTING MI GOOD ENTRY BA	SSION REQUIRE	MENTS	S LONG AS T OF 75 TO S	THE REQUIRED NUMBER DO AMPS (WITHOUT BAT	OF FUEL CELLS TERY SUPPLEMEN	ARE AVAILABLE	AND ARE CAPABLE OF G SPS ΔV'S) AND THREE
	12-4	BATTERY IS CO	NSIDERED FAIL	ED IF:	:				
		A. LAUNCH -	A BATTERY BUS	VOLTA	AGE IS 0.5	VOLTS LESS THAN THE	CORRESPONDING	MAIN BUS.	
	-					SS THAN 3 AMPS WHEN MANEUVERS IS 20 ±		MAIN BUS DURI	NG SPS MANEUVERS
		C. SUSTAINED	BATTERY CHAR	GER OL	JTPUT TO AN	I ENTRY BATTERY IS G	REATER THAN 2.	O AMPS AND ALL	LOADS REMOVED.
		D. THE AUX B	ATTERY CANNOT	SUPPO	ORT REQUIRE	D MAIN BUS LOADS.			
	12-5	AN AC BUS IS	CONSIDERED FA	ILED I	F ANY TWO	PHASES CANNOT BE MA	INTAINED GREAT	ER THAN 95 VOL	rs.
	12-6	AN INVERTER IS	S CONSIDERED	FAILED) IF:				
		A. OUTPUT VOI	LTAGE ON ANY I	PHASE	IS GREATER	THAN 130 VAC.			
						SS THAN 95 VAC. ODICALLY BASED ON TR	EMP.		
\sqcup			1			<u> </u>		· 	
-	· · - · · · · · · · · · · · · · · · · ·		MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION CSM ELECTRICAL	GROUP GENERAL	PAGE	
					37.772	POWER SYSTEM	VIL	12-1	Tape 43.1

MISSION RULES

SECTION 12 - CSM ELECTRICAL POWER SYSTEM

TITIES TUEL CELL IS CONSIDERED FAILED FOR MISSION PLANNING IF: A. FUEL CELL AND T SUPPLY SUPPLICITAT PAWER TO MEET ITS OWN PAGASITIC LOADS (S AMPS PLUS DILINE MEATER POWER AS REQUIRED). B. FUEL CELL H ₂ LOGP IS CONTAMINATED WITH MON. C. REQUIATED H ₂ PRESSURE IS LESS THAN 36.7 PSIA (CORRESPONDS TO N ₂ PRESSURE SHIFT DOWN TO 28.2 PSIA FOR CHITICAL DYNATION - LOWER N ₂ PRESSURE CAN BE MANAGED BY TURNING OFF H ₂ O TAWN PRESSURE). D. EITHER THE H ₂ OR GLYCOL PUMP HAS FAILED. 12-8 TLI MINIMUM PURGE CAMABILITY IS BOTH DAYGEN AND HYDROGEN ON ONE FUEL CELL AND AT LEAST DAYGEN ON ONE OTHER FREL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED. MISSION REV DAYE MISSION REV DAYE SECTION GROUP PAGE APOLLO 17 FRL 9/1/7/2 CSP LECTRICAL GCHERAL TAPP 31			SECTION 12 - CSM ELECTRICAL POWER SYSTEM
A. FUEL CELL CANNOT SUPPLY SUFFICIENT POWER TO MEET ITS OWN PARASITIC LONGS (5 AMPS PLUS INLINE MEATER POWER AS REQUIRED). B. FUEL CELL Ng LOOP IS CONTAMINATED WITH KSM. C. REGULATED Ng PRESSURE IS LESS THAN 36.7 PSIA (CORRESPONDS TO Ng PRESSURE SMIFT DOWN TO 28.2 PSIA FOR CRITICAL OPERATION - LOWER Ng PRESSURE CAN BE MANAGED BY TURNING OFF NgO TANK PRESSURE). D. EITHER THE Ng OR GLYCOL PUMP HAS FAILED. 12-8 TLI MINIMUM PURGE CAPABILITY IS BOTH DAYGEN AND HYDROGEN ON ONE FUEL CELL AND AT LEAST DAYGEN ON ORE OTHER FUEL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED.	R	ITEM	
POWER AS EXCUSED). B. FUEL CELL H ₂ LOOP IS CONTAMINATED WITH KON. C. REQULATED H ₂ PRESSURE IS LESS THAN 36.7 PSIA (CORRESPONDS TO N ₂ PRESSURE SMIFT DOWN TO 28.2 PSIA FOR CRITTOLL OPENATION - LOWER N ₂ PRESSURE CAN BE MANAGED BY TURNING OFF H ₂ O TANK PRESSURE). D. EITHER THE H ₂ OR GLYCOL PUMP HAS FAILED. 12-8 TIJ MINIMUM PURGE CAPABILITY IS BOTH OXYGEN AND HYDROGEN ON ONE FUEL CELL AND AT LEAST OXYGEN ON ONE OTHER FUEL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FRL. 9/1/72 CSM ELECTRICAL GENERAL	1	2-7	FUEL CELL IS CONSIDERED FAILED FOR MISSION PLANNING IF:
C. REGULATED H ₂ PRESSURE IS LESS THAN 36.7 PSIA (CORRESPONDS TO N ₂ PRESSURE SHIFT DOWN TO 28.2 PSIA FOR CRITICAL OPERATION - LOWER N ₂ PRESSURE CAN BE MANAGED BY TURNING OFF H ₂ O TANK PRESSURE). D. EITHER THE H ₂ OR GLYCOL PUMP HAS FAILED. TILI MINIMUM PURGE CAPABILITY IS BOTH OXYGEN AND HYDROGEN ON ONE FUEL CELL AND AT LEAST OXYGEN ON ONE OTHER FUEL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FRU 97/1772 CSM ELECTRICAL GENERAL			
D. EITHER THE H ₂ OR GLYCOL PUMP HAS FAILED. TLI MINIMUM PURGE CAPABILITY IS BOTH DXYGEN AND HYDROGEN ON ONE FUEL CELL AND AT LEAST DXYGEN ON ONE OTHER FUEL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED. MISSION REY DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL GENERAL			B. FUEL CELL H ₂ LOOP IS CONTAMINATED WITH KOH.
D. EITHER THE H ₂ OR GLYCOL PUMP HAS FAILED. TLI MINIMUM PURGE CAPABILITY IS BOTH OXYGEN AND HYDROGEN ON ONE FUEL CELL AND AT LEAST OXYGEN ON ONE OTHER FUEL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED. MISSION REY DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL GENERAL			C. REGULATED H ₂ PRESSURE IS LESS THAN 36.7 PSIA (CORRESPONDS TO N ₂ PRESSURE SHIFT DOWN TO 28.2 PSIA FOR CRITICAL OPERATION - LOWER N ₂ PRESSURE CAN BE MANAGED BY TURNING OFF H ₂ O TANK PRESSURE).
FUEL CELL. RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FHL 9/1/72 CSM ELECTRICAL GEMERAL			
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL GENERAL	1	12-8	
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL GENERAL			RULE NUMBERS 12-9 THROUGH 12-19 ARE RESERVED.
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL GENERAL			
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL GENERAL			
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MISSION RULES

Τ.	TEN 1		320	. 1011	_	LCTRICAL POWER 3131	LIT - CONTINUED					
十	TEM											
					SY	STEMS MANAGEMENT						
12	2-20	BUS MANAGEMEN	<u>rr</u>									
		A MATH RUSE	INMOON LITTE 2	IV DE	VEDT ICOLA	TED. BUT WHEN REQU	TOED ONE AND ON	NIV ONE EUE	CELL HALL BE THEN			
ı	- 1		AIN BUSES.	LT DE	MEPT ISULA	IED. BUI WHEN KEQU	IKED, UNE AND UN	NLY UNE FUEL	CELL MIET BE LIED			
Ì		D 1111507500										
		B. INVERTERS	WILL BE CONF	IGURED	SUCH THAT	MAIN BUS A WILL SU	IPPLY AC BUS 1 AM	ND MAIN BUS E	WILL SUPPLY AC BUS 2.			
	ł						AND LESS THAN 3	31 VDC. ONE	FUEL CELL MAY BE OPEN			
		CIRCUITED	FOR OPTIMUM	VOLTAG	E AND POWE	R MANAGEMENT.						
		D. THE BATTE	RY CHARGER WI	LL BE	USED TO CH	ECK OUT A SUSPECTED	SHORTED BUS (E)	XCEPT MAIN BU	SES) AFTER ALL			
		EQUIPMENT	AND POWER SO	URCES	HAVE BEEN	REMOVED FROM BUS.						
		E. MINIMUM M	MAIN BUS VOLTA	GE WIL	L BE MAINT	AINED TO BE COMPATI	BLE WITH ONLINE	OPERATION EO	UIPMENT:			
	j											
		1. SPS 2. PGNS	24 25									
		3. AUTO										
		4. AUTO 5. DIREC										
	ŀ	6. DIREC										
		7. INVER	RTERS 19	.0								
1.												
'	2-21	BATTERY MANAG	<u>IEMEN I</u>									
		A. BATTERIES	A AND B WILL	BE US	ED TO SUPP	LEMENT MAIN BUS LOA	DS FROM T-75 SEC	CONDS TO INSE	RTION.			
	ŀ	B. BATTERIES	A AND B WILL	BE US	ED TO SUPP	LEMENT MAIN BUS LOA	DS FOR SPS MANFU	JVFRS. BATTE	RY C WILL BE ROTATED			
						NT THE BATTERY CHAR			W C WILL DE NOTHED			
		C. BATTERY O	CHARGING WILL	RF TFR	MINATED FO	R ONE OF THE FOLLOW	ING. WHICHEVER (OCCURS FIRST.				
		or billion o	WINGING WILL	DE 121		N ONE OF THE POLLOW	Ind, millione tex (occons That.				
	ŀ	1. INTEG	GRATED AMP-HOU	RS INT	O BATTERY	BY CHARGER EQUALS I	NTEGRATED AMP-HO	OURS OUT OF B	ATTERY BY LOADS			
	ļ	2. WHEN	BATTERY CHARG	ER CUR	RENT DECRE	ASES TO 0.62 AMPS (CORRESPONDS TO 3	39.8 VDC AT T	HE BATTERY BUS)			
		D TUDES DAT	TEDIEC UTLL 5	C TIC.) TO THE 148	THE DUCKE FOR DECERT	T MANIFELIZED AND -	THEOL				
		D. INKEL BAI	CENTES MITT R	c sitt	, IO INE MA	IN BUSES FOR DEORBI	I MANEUVEK AND E	LNIKT.				
		E. BATTERIES	ARE CONSIDER	ED TO	HAVE 40 AM	P-HR CAPABILITY INF	LIGHT AND 45 AMP	P-HR CAPABILI	TY FOR POSTLANDING.			
		F. A SINGLE	BATTERY THAT	CANNOT	BE RECHAR	GED WILL NOT BE USE	D EXCEPT DURING	DEORBIT, ENT	RY, AND POSTLANDING.			
			BATTERY VENT VALVE WILL REMAIN CLOSED UNLESS MANIFOLD PRESSURE IS GREATER THAN 6 PSIA. VENTING OPERATION WILL BE ALLOWED TO TROUBLESHOOT A SUSPECTED FROZEN DUMP. VENTING WILL BE CONSTRAINED TO HAVE A MINIMUM									
ĺ			SIM DATA.			•						
		H. THE AUX B	BATTERY WILL N	OT BE	USED FOR N	ORMAL MISSION OPERA	TIONS.					
	- 1					or Elvi						
			T	т —		1 * *	T					
			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION CSM ELECTRICAL	GROUP MANAGEMENT	PAGE				

MISSION RULES

BUEL CELL MANAGEMENT A. FUEL CELL MILL BE "SHUT DOWN" FOR THE FOLLOWING: 1. SUSTAINED CURRENT CUTPUT LESS THAN 5 AWS 2. FUEL CELL M2 LOOP IS CONTAMINATED WITH KOH 3. REACTANT LEARNED CORRESTION MISSION DURATION 8. FUEL CELL M3 BE "OPEN CIRCUITED" FOR THE FOLLOWING: 1. SKIN TEMP GREATER THAN 475" F. 2. TOE TEMP GREATER THAN 425" F. 3. FAILURE OF M2 PUMP OR LYCOL PUMP 4. VOLTAGE MANAGEMENT 5. FUEL CELL CANNOT BE PUREES AND TIME TO BO IS GREATER THAN PREDICTED FUEL CELL LIFETIME 6. CRYO LEAN ISOLATION C. FUEL CELL QAND M2 PUREES WILL NORMALLY BE PERFORMED AT 24 AND 48 HOUR INTERVALS, RESPECTIVELY. HOWEVER, THE INTERVALS WILL BE FLEXIBLE TO COINCIDE WITH WATER DUMPS (REF. MR 10-10, WATER SYSTEM, "C" AND "D"). 0. ADDITIONAL PURBES WILL BE INITIATED AS OPERATIONAL CONDITIONS DICTATE. E. FUEL CELLS WILL NOT BE PURBED FOR COMPEMBED HIGH PH INDICATION. F. EACH M3 PURBES WILL NORMALLY BE PRECEDED BY 20 MINUTES OF M2 VERY MEATER OPERATION FOLLOWED BY 10 MINUTES OF M2 VERY MEATER OPERATION AFTER PURBE COMPLETION. G. FUEL CELL INLINE HEATERS WILL NORMALLY OFFINE IN "AUTO" CONTINUOUSLY. H. REACTANT VALVES MUST REMAIN OPEN AT ALL TIMES WITH THE FOLLOWING EXCEPTIONS: 1. IF THE FUEL CELL IS DECLARED FAILED, OR 2. FOR CRYO LEAK ISOLATION, THE FULL CILL MIST BE "OPEN CIRCUITED" PRIOR TO REACTANT VALVE CLOSURE, THE FREATH VALVES MUST BE REDEVELD PRIOR TO MINITIAN FOR DUT TEMP GREATER THAN "40". IF CRYO BUSINEST HORMADIZED OR RAD OUT TEMPS NOT MAINTAINED GREATER THAN "40", FC RAD WILL BE FLACED IN EMPRESMOY BYASS. 3. ONE FUEL CELL MAY BE PURGED TO PRECLUDE VENTING OF CRYO TRANS OR FOR CRYO PRESSURE MANAGEMENT. K. IF IT RECORDS OPERATIONALLY NECESSARY TO SHUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL 2 WILL BE SELECTED. L. LOSS OF EITHER FUMP IN A FIVEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE M2 PURGES WILL NORMALLY MOT BE FERFORMED FOR THE PURPOSE OF COOLING RANJOR MATER REMOVAL.			SEC	CTION		LECTRICAL POWER SYS	TEM - CONTINUED		
A. FUEL CELL MILL BE "SHIT DOWN" FOR THE FOLLOWING: 1. SUSTAINED CURRENT CUTPUT LESS THAIN S AMPS 2. FUEL CELL My LOOP IS CONTAMINATED WITH KON 3. REACTAINT LEARNER STORMED STAIN SISSION DURATION B. FUEL CELL MAY BE "OPEN CREATER THAIN 475" F. 2. TOE THEM GREATER THAIN 475" F. 2. TOE THEM GREATER THAIN 475" F. 3. FAILURE OF H, DIMPO OR ALYCOL PUMP 4. VOLTAGE MANAGEMENT 5. FUEL CELL CANNOT BE PURGED AND TIME TO GO IS GREATER THAIN PREDICTED FUEL CELL LIFETIME 6. CAYRO LEAN ISOLATION C. FUEL CELL CANNOT BE PURGES MILL MORMALLY BE PERFORMED AT 24 AND 48 HOUR INTERVALS, RESPECTIVELY. HOWEVER, THE INTERVALS WILL BE FLEXIBLE TO COINCIDE WITH WATER DUMPS (MEE, NR 10-10, WATER SYSTEM, "C" AND "D"). D. ADDITIONAL PURGES WILL BE INITIATED AS OPERATIONAL CONDITIONS DICTATE. E. FUEL CELLS WILL NOT BE PURGED FOR CONTINUED HIGH PH IDOICATION. F. EACH H, PURGE WILL NORMALLY BE PRECEDED BY 20 MINUTES OF H ₂ VENT HEATER OPERATION FOLLOWED BY 10 MINUTES OF HEATER OPERATION AFTER PURGE COMPLETION. G. FUEL CELL INLINE MEATERS WILL NORMALLY OPERATE IN "AUTO" CONTINUOUSLY. H. REACTANT VALVES MUST REMAIN OFEN AT ALL TIMES WITH THE FOLLOWING EXCEPTIONS: 1. If THE FUEL CELL IS RECLARED FAILED, OR 2. FOR CRYO LEAN ISOLATION. THE FUEL CELL MYST BE "OPEN CIRCUITED" PRIOR TO REACTANT VALVE CLOSURE. THE REACTANT VALVES MUST BE RECIPIED FROM TO AUTO THALINE HEATER AUTOVATION TO PRECLUDE FUEL CELL FAILURES THAN "-40", FC RAD WILL BE PLACED IN EMFRENCY BYPASS. J. ONE FUEL CELL MAY BE PURGED TO PRECLUDE VENTING OF CRYO TANNS OR FOR CRYO PRESSURE MANAGEMENT. K. IF IT BECOMES OPERATIONALLY RECESSARY TO SHUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL 2 WILL BE SELECTED. L. LOSS OF EITHER PUMP IN A FUEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE H ₂ PURGES WILL NORMALLY NOT BE PURFORMED FOR THE PURPOSE OF COOLING AND/OR MATER REMOVAL. MISSION THE PURPOSE OF THE PURPOSE OF COOLING AND/OR MATER REMOVAL.	ITEM								
1. SUSTAINED CURRENT OUTPUT LESS THAN S AMPS 2. FUEL CELL N ₂ LOOP IS CONTAMINATED WITH KON 3. REACTANT LEARAGE JECORADIZING MISSION DUBATION B. FUEL CELL N ₂ POPEN CIRCUITED" FOR THE FOLLOWING: 1. SKIN TEMP GREATER THAN 475" F. 2. TOE TEMP GREATER THAN 475" F. 3. FAILURE OF N ₂ PUMPO OR GLYCOL PROP 4. VOLTAGE MANAGEMENT 5. FUEL CELL CANNOT BE PUMPED AND TIME TO GO IS GREATER THAN PREDICTED FUEL CELL LIFETIME 6. CRYO LEAK ISOLATION C. FUEL CELL Q AND N ₂ PUMPED WILL NORMALLY BE PERFORMED AT 24 AND 48 HOUR INTERVALS, RESPECTIVELY. HOWEVER, THE INTERVALS WILL BE INITIATED AS OPERATIONAL CONDITIONS DICTATE. 6. FUEL CELLS WILL NOT BE PURBED FOR CONFIRMED HIGH PH INDICATION. F. EACH N ₂ PURBE WILL NORMALLY BE PRECEDED BY 20 MINUTES OF N ₂ EVENT HEATER OPERATION FOLLOWED BY 10 MINUTES OF HEATER OPERATION AFTER PURBE COMPLETION. G. FUEL CELL INLINE SKATERS WILL NORMALLY OPERATE IN "AUTO" CONTINUOUSLY. H. REACTANT VALVES MUST REMAIN OPEN AT ALL TIMES WITH THE FOLLOWING EXCEPTIONS: 1. If THE FUEL CELL IS DECLARED FAILED, OR 2. FOR CRYO LEAK ISOLATION. THE FUEL CELL MUST BE "OPEN CIRCUITED" PRIOR TO REACTANT YALVE CLOSURE. THE REACTANT VALVES MUST BE RECORDED FOR TO AUTO THIN THE HEATER ACTIVATION TO PRECUDE FUEL CELL FAILURE 11. ADDITIONAL POWER LOADS WILL BE ADDED AS REQUISED TO MEINTAIN FE RAD OUT TEMP GREATER THAN "-40". IF CRYO BUDGET JEOPARDIZED OR RAD OUT TEMPS NOT MAINTAINED GREATER THAN "-40", FC RAD WILL BE PLACED IN EMERGENCY BYPASS. J. ONE FUEL CELL MAY BE PURBED TO PRECLUBE VENTING OF CRYO TANKS OR FOR CRYO PRESSURE MANAGEMENT. K. IF IT BECOMES OPERATIONALLY NECESSARY TO SMUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL Z WILL BE SECTION. MISSION REV DATE. SECTION BROUP PAGE MISSION REV DATE. SECTION GROUP PAGE MISSION REV DATE. MISSION REV DATE. SECTION GROUP PAGE MISSION REV DATE. MASSION REV DATE. MASSION REV DATE. MASSION REV DATE. MASSION REV DATE. MASSION REV DATE. MASSION REVER DATE. MASSION REVER DATE. MASSION REVER DATE. MASSION REVER DATE. MASSION REVER DATE.	12-22	FUEL CELL MA	NAGEMENT						
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F. EACH H ₂ PURGE WILL NORMALLY BE PRECEDED BY 20 MINUTES OF H ₂ VENT HEATER OPERATION FOLLOWED BY 10 MINUTES OF HEATER OPERATION AFTER PURGE COMPLETION. G. FUEL CELL INLINE HEATERS WILL NORMALLY OPERATE IN "AUTO" CONTINUOUSLY. H. REACTANT VALVES MUST REMAIN OPEN AT ALL TIMES WITH THE FOLLOWING EXCEPTIONS: 1. IF THE FUEL CELL IS DECLARED FAILED, OR 2. FOR CRYO LEAK ISOLATION. THE FUEL CELL MUST BE "OPEN CIRCUITED" PRIOR TO REACTANT VALVE CLOSURE. THE REACTANT VALVES MUST BE REOPENED PRIOR TO AUTO INLINE HEATER ACTIVATION TO PRECLUDE FUEL CELL FAILURE I. ADDITIONAL POWER LOADS WILL BE ADDED AS REQUIRED TO MAINTAIN FC RAD OUT TEMP GREATER THAN -40°. IF CRYO BUGGET JEOPARDIZED OR RAD OUT TEMPS NOT MAINTAINED GREATER THAN -40°, FC RAD WILL BE PLACED IN EMERGENCY BYPASS. J. ONE FUEL CELL MAY BE PURGED TO PRECLUDE VENTING OF CRYO TANKS OR FOR CRYO PRESSURE MANAGEMENT. K. IF IT BECOMES OPERATIONALLY NECESSARY TO SHUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL 2 WILL BE SELECTED. L. LOSS OF EITHER PUMP IN A FUEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE H ₂ PURGES WILL NORMALLY NOT BE PERFORMED FOR THE PURPOSE OF COOLING AND/OR WATER REMOVAL. MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE		D. ADDITION	AL PURGES WILL	BE IN	ITIATED AS	OPERATIONAL CONDIT	IONS DICTATE.		
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H. REACTANT VALVES MUST REMAIN OPEN AT ALL TIMES WITH THE FOLLOWING EXCEPTIONS: 1. IF THE FUEL CELL IS DECLARED FAILED, OR 2. FOR CRYO LEAK ISOLATION. THE FUEL CELL MUST BE "OPEN CIRCUITED" PRIOR TO REACTANT VALVE CLOSURE. THE REACTANT VALVES MUST BE REOPENED PRIOR TO AUTO INLINE HEATER ACTIVATION TO PRECLUDE FUEL CELL FAILURE I. ADDITIONAL POWER LOADS WILL BE ADDED AS REQUIRED TO MAINTAIN FC RAD OUT TEMP GREATER THAN -40°. IF CRYO BUDGET JEOPARDIZED OR RAD OUT TEMPS NOT MAINTAINED GREATER THAN -40°, FC RAD WILL BE PLACED IN EMERGENCY BYPASS. J. ONE FUEL CELL MAY BE PURGED TO PRECLUDE VENTING OF CRYO TANKS OR FOR CRYO PRESSURE MANAGEMENT. K. IF IT BECOMES OPERATIONALLY NECESSARY TO SHUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL 2 WILL BE SELECTED. L. LOSS OF EITHER PUMP IN A FUEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE H ₂ PURGES WILL NORMALLY NOT BE PERFORMED FOR THE PURPOSE OF COOLING AND/OR WATER REMOVAL. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FRL 9/1/72 CSM ELECTRICAL MANAGEMENT							H ₂ VENT HEATER OPE	RATION FOL	LOWED BY 10 MINUTES
1. IF THE FUEL CELL IS DECLARED FAILED, OR 2. FOR CRYO LEAK ISOLATION. THE FUEL CELL MUST BE "OPEN CIRCUITED" PRIOR TO REACTANT VALVE CLOSURE. THE REACTANT VALVES MUST BE REOPENED PRIOR TO AUTO INLINE HEATER ACTIVATION TO PRECLUDE FUEL CELL FAILURE I. ADDITIONAL POWER LOADS WILL BE ADDED AS REQUIRED TO MAINTAIN FC RAD OUT TEMP GREATER THAN -40°. IF CRYO BUGGET JEOPARDIZED OR RAD OUT TEMPS NOT MAINTAINED GREATER THAN -40°, FC RAD WILL BE PLACED IN EMERGENCY BYPASS. J. ONE FUEL CELL MAY BE PURGED TO PRECLUDE VENTING OF CRYO TANKS OR FOR CRYO PRESSURE MANAGEMENT. K. IF IT BECOMES OPERATIONALLY NECESSARY TO SHUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL 2 WILL BE SELECTED. L. LOSS OF EITHER PUMP IN A FUEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE H ₂ PURGES WILL NORMALLY NOT BE PERFORMED FOR THE PURPOSE OF COOLING AND/OR WATER REMOVAL. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FRIL 9/1/72 CSM ELECTRICAL MANAGEMENT		G. FUEL CEL	L INLINE HEATE	RS WIL	L NORMALLY	OPERATE IN "AUTO"	CONTINUOUSLY.		
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K. IF IT BECOMES OPERATIONALLY NECESSARY TO SHUT DOWN OR OPEN-CIRCUIT A FUEL CELL, THEN FUEL CELL 2 WILL BE SELECTED. L. LOSS OF EITHER PUMP IN A FUEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE H ₂ PURGES WILL NORMALLY NOT BE PERFORMED FOR THE PURPOSE OF COOLING AND/OR WATER REMOVAL. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL MANAGEMENT		BUDGET J							
SELECTED. L. LOSS OF EITHER PUMP IN A FUEL CELL WILL BE CONSIDERED LOSS OF BOTH PUMPS, AND EXTENSIVE H ₂ PURGES WILL NORMALLY NOT BE PERFORMED FOR THE PURPOSE OF COOLING AND/OR WATER REMOVAL. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL MANAGEMENT		J. ONE FUEL	. CELL MAY BE P	URGED	TO PRECLUD	E VENTING OF CRYO T	ANKS OR FOR CRYO P	RESSURE MA	NAGEMENT.
NORMALLY NOT BE PERFORMED FOR THE PURPOSE OF COOLING AND/OR WATER REMOVAL. MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 CSM ELECTRICAL MANAGEMENT				NALLY	NECESSARY	TO SHUT DOWN OR OPE	N-CIRCUIT A FUEL C	ELL, THEN	FUEL CELL 2 WILL BE
APOLLO 17 FNL 9/1/72 CSM ELECTRICAL MANAGEMENT								ND EXTENSI	VE H ₂ PURGES WILL
APOLLO 17 FNL 9/1/72 CSM ELECTRICAL MANAGEMENT									
APOLLO 17 FNL 9/1/72 CSM ELECTRICAL MANAGEMENT									
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
E DIGIED CACIEM E 1704 E 1744 31	_ · _		APOLLO 17	FNL	9/1/72	CSM ELECTRICAL POWER SYSTEM	MANAGEMENT	12-4	Tape 31.4

MISSION RULES

	<u>.</u>	SECTION 12 - CSM ELECTRICAL POWER SYSTEM - CONTINUED												
R	ITEM													
	12-23	INVERTER MANAGE	MENT											
		INVERTERS MAY E	BE REMOVED FRO	M LIN	E FOR ANY	OF THE FOLLOWING REA	ASONS:							
		A. INVERTER TE	MP GREATER TH	IAN 19	0° F									
		B. SPACECRAFT												
		C. ANY PHASE \	ANY PHASE VOLTAGE OUTSIDE 115 ± 5 VAC											
	•													
		RULE NUMBERS 12	O OA TUDOUCU 1	12 20	ADE DECEDA	ED.								
		KULE NUMBERS 14	2-24 INKOOGN	14-49	ARE RESERV	EU								
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			MISSION	REV	DATE	SECTION	GROUP	PAGE						
			APOLLO 17	FNL	9/1/72	CSM ELECTRICAL POWER SYSTEM	MANAGEMENT	12-5	Ta	ape 31.5				
			i			<u> </u>			<u> </u>					

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING			OTES/COMME	INTS	
				SPI	ECIFIC MISSION RULES					
	12-30	LOSS OF ONE FUEL CELL (OUTPUT LESS THAN 5 AMPS)	LAUNCH	Α.	CONTINUE MISSION IF LOSS IS FC 3, OP CIRCUIT AND CONFIGUTO MAIN BUS B ONLY.	RE FC 2	LOADS SUBSEC	DURING SP DUENT FUEL	S BURNS TO BA	S. BAT C MAY
	:		ALL	В.	CONTINUE MISSION 1. OPEN CIRCUIT FUE 2. IF LOSS IS FC 3 CONFIGURE FC 2 T BUS B ONLY.					
	•				3. IF FUEL CELL CAN RESTORED, PERFOR SHUTDOWN.	NOT BE M				
	12-31	LOSS OF TWO FUEL CELLS (OUTPUT LESS THAN 5 AMPS EACH)	LAUNCH	Α.	CONTINUE MISSION AFTER 2:00 GET PERF 1. EDS AUTO/OFF TO		LM SYS POWER		BE USED TO SU	UPPLEMENT CSN:
			POWERED Descent	В.	2. TIE BAT C TO BOT BUSES CONTINUE MISSION NO-GO FOR LUNAR STA			AUX BATTER BAT C.	Y MAY BE USED) IN LIEU OF
			POST DOCK		NO-GO FOR LUNAR STA RETAIN LM IF POSSIB GO FOR CSM EVA	_ [
			ALL		ENTER NEXT BEST PTP 1. CONNECT REMAININ CELL TO BOTH MAI	G FUEL	SUI	E ENTRY BA PPLEMENT R LOR TO DEC	T OR AUX MAY EMAINING FC F RBIT.	BE USED TO FOR G&N ALIGNMENT
					2. PERFORM POWERDOW MAINTAIN MAIN BU GREATER THAN 24.	S VOLTS	E.2 RI	EF CREW EM	ERGENCY POWER	RDOWN PROCEDURE.
							***		***************************************	
-		MISSION APOLLO 17	REV DATE	/72	SECTION CSM ELECTRICAL	GROUP FUEL CEL	LS	PAGE		
		AFOLEO 17			POWER SYSTEM		-	12-6		Tape 31.5

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	·	RULING	3000	CUES/NOTES/COMMENTS	
	12-32	LOSS OF THREE FUEL CELLS (OUTPUT LESS THAN 10 AMPS EACH)	POWER DESCE	ED B.	CONTINUE MISSION 1. TIE AUX BAT TO M 2. AFTER 2:00 EDS A TO OFF. TIE BAT BOTH MAIN BUSES 3. POWER DOWN TO SO AND ENTER NEXT B WITHIN 5 HRS IF CELLS CANNOT BE CONTINUE MISSION NO-GO FOR LUNAR STA ENTER NEXT BEST PTP	UTO/OFF C TO AMPS EST PTP FUEL RESTORED	LM SYSTEMS (IF AVAILAB SUPPLEMENT FUEL CELL PO A.1 4.75 HOURS LEFT IN	OWÉR. ORBIT BEFORE TIE AUX BAT TO BOTH
	12-33	LOSS OF ALL SM POWER PLUS ONE ENTRY BATTERY CURRENT LESS THAN 50 PERCENT OF LOAD ON EITHER REMAINING BATTERY	LAUNC EO POWER DESCE	B. ED C.	ABORT ENTER NEXT BEST ATP PERFORM EMERGENCY P DOWN CONTINUE MISSION NO-GO FOR LUNAR STA ENTER NEXT BEST PTP PERFORM EMERGENCY P DOWN	OWER Y	USE LM SYSTEMS IF AVAIL BATTERIES FOR ENTRY. A. ASSUMES ALL THREE FI LESS THAN OR EQUAL T BATTERY C TIED TO BO B. 2.4 HOURS LEFT IN OR IGNITION.	JEL CELL CURRENTS FO 5 AMPS AND DTH MAINS.
	12-34	DEGRADED FUEL CELLS (UNABLE TO SUPPORT NORMAL DRIFTING FLIGHT LOADS - SCS AND G&N POWERED DOWN - AND MAINTAIN MN BUS VOLTAGE GREATER THAN 26.5 VDC) RULE NUMBERS 12-35 THROUGH 12-39 ARE RESERVED.	LAUNC POWER DESCE ALL	ED B.	CONTINUE MISSION CONTINUE MISSION NO-GO FOR LUNAR STA ENTER NEXT BEST PTP	1		
-		MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOŁLO 17	FNL	9/1/72	CSM ELECTRICAL POWER SYSTEM	FUEL CEL	_S 12-7	Tape 31.6

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	30 2.	RULING	211 0011		ES/COMMEN	TS
	12-40	LOSS OF ONE ENTRY BATTERY (OUTPUT LESS THAN 3 AMPS WHEN TIED TO MAIN BUS)	LAUNCH		CONTINUE MISSION 1. EDS AUTO/OFF TO 0 2. IF LOSS OF BAT A, BAT C TO MAIN A. 3. IF LOSS OF BAT B,	TIE	- 1 1		
			ALL		BAT C TO MAIN B. BASED ON FAILURE MOD CONSIDERATION WILL B GIVEN TO CONTINUING NOMINAL MISSION.			OST DURING	G SPS MANEUVER, CONTINUE BATTERY.
	12-41	LOSS OF TWO ENTRY BATTERIES (OUTPUT LESS THAN 3 AMPS EACH WHEN CONNECTED TO MAIN BUS)	LAUNCH		CONTINUE MISSION AS AS ONE SM POWER SOUR REMAINS 1. EDS AUTO/OFF TO C	CE OFF			
			PRE-PDI		2. ENTER NEXT BEST F	TP .			
			POWERED DESCENT ALL	C.	NO-GO FOR PDI CONTINUE MISSION NO-GO FOR LUNAR STAY ENTER NEXT BEST PTP USE ONE BATTERY ENTF PROCEDURE.				G SPS MANEUVER, ATTEMPT TO BOTH MAINS.
	12-42	LOSS OF BATTERY CHARGER	E0		CONTINUE MISSION ROTATE BATTERY C FOR TO MAINTAIN BALANCES BATTERIES				
	1		TLC	1	NO-GO FOR LOI IF SUNTWO LOWEST ENTRY BAT LESS THAN 45.7 AMP-1	TTERIES			
			LO		NO-GO FOR UNDOCK IF OF TWO LOWEST ENTRY BATTERIES LESS THAN 41.1 AMP-HRS.	SUM			
	12-43	LOSS OF AUX BAT	ALL	COM	ITINUE MISSION				
		MISSION	REV DA		SECTION	GROUP		PAGE	
		APOLLO 1	7 FNL 9	/1/72	CSM ELECTRICAL POWER SYSTEM	BATTER I CHARGER	IES/ }	12-8	Tape 31.7

MISSION RULES

	R	RULE	CONDITION/MALFUNCT	ION I	PHASE		RULING		CUES/NO	TES/COMME	NTS	
		12-44	LOSS OF AUX BAT GR TO RESISTOR NETWOR	OUND K	ALL	CONT	INUE MISSION		FOLLOW	ING PCM ME	ASUREMENTS:	N LOSS OF THE
										R FC2 H2 1 K ALPHA C1	LOW RATE CHAN 3	
											3 IN MR 14-31	
	۱		RULE NUMBERS 12-45									
			THROUGH 12-49 ARE RESERVED.									
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t			MIS	SION	REV	DATE	SECTION	GROUP	·	PAGE	<u> </u>	
L			APO	OLLO 17	FNL	9/1/72	CSM ELECTRICAL POWER SYSTEM	BATTERI CHARGER	ES/	12-9		Tape 31.8

MISSION RULES

	7		1		ELECTRICAL POWER SYS	IEM - CONIIN	NOED		
R	RULE	CONDITION/MALFUNCTION	PHAS		RULING		CUES/NOTES/COMME	NTS	
	12-50	MAIN BUS TIE MOTOR SWITCH FAILURES A. ONE MOTOR SWITCH FAILS OPEN B. ONE OR BOTH MOTOR SW FAILED CLOSED	LAUN	В.	1. CONTINUE MISSION (A) IF MOTOR SW A BAT C TO MAIN (B) IF MOTOR SW B BAT C TO MAIN 2. CONTINUE MISSION CLOSE ALTERNATE M AND USE MAIN BUS AS MOTOR SWITCHES CONTINUE MISSION 1. IF MOTOR SW A/C, WILL BE TIED TO A VIA THE B/C MO 2. IF MOTOR SW B/C, WILL BE TIED TO BUS B VIA THE A/MOTOR SW.	BUS A. /C, TIE BUS B. OTOR SW TIE CB'S MAIN BUS TOR SW. BAT B MAIN B	MOTOR SW. CHARGING. B. IF BOTH MOTOR	NUST BE CHARGED THROU LEAVE BAT RLY CB CLO SWITCHES FAIL CLOSE NOT BE CHARGED.	SED FOR
		MISSIO		DATE	SECTION	GROUP	PAGE		
		APOLLO	17 FNL	9/1/72	CSM ELECTRICAL POWER SYSTEM	DC DISTRIBUTI	ION 12-10	Ta	pe 31.9

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NO	TES/COMMEN	its
	12-51	A. MAIN BUS A SHORTED GREATER THAN 25 AMPS	LAUNCH	A.1.	CONTINUE MISSION				
	İ				(A) EDS AUTO/OFF				
١					(B) FC 2 TO MAIN	1			
l					(C) BAT C TO MAIN				
					(D) INVERTER 3 TO MAIN B	AC 1,			
					(E) POWER DOWN MA	IN A			
					(F) TVC GIMBAL DR (P, Y) - 2	IVE			•
					(G) GIMBAL MOTOR CONTROL (YAW PITCH 2) BAT AFTER GIMBAL TURN ON	2, B - OPEN			
			PRE-PDI	A.2.	. ENTER NEXT BEST P	<u>TP</u>			
					NO-GO FOR PDI. R LM DESCENT STAGE				
			POWERED	A.3	CONTINUE MISSION				
			DESCENT	ļ	NO-GO FOR LUNAR S	TAY			
			ALL	A.4	. ENTER NEXT BEST P POWER DOWN MAIN A	TP.			
		B. MAIN BUS B SHORTED GREATER THAN 25 AMPS	LAUNCH	B.1	. CONTINUE MISSION				
		GREATER THAN 25 APTES			(A) EDS AUTO/OFF	- OFF			
					(B) BAT C TO MAIN	I A	!		
					(C) INVERTER 3 TO MAIN A	AC 2,			
					(D) POWER DOWN MA	IN B			
			PRE-PDI	B.2	. ENTER NEXT BEST F	<u>TP</u>			
					NO-GO FOR PDI. RE LM DESCENT STAGE				
			POWERED	В.3	. CONTINUE MISSION				
			DESCENT		NO-GO FOR LUNAR S	STAY			
			ALL	B.4	. ENTER NEXT BEST F POWER DOWN MAIN E				
		C. MAIN BUS SHORTED GREATER THAN 25 AMPS AND FUEL CELL(S) CANNOT BE DIS- CONNECTED FROM SHORTED BUS	LAUNCH	C.1	. ABORT		F	ROM SHORTE	MOTOR SWITCH TO DISCONNECT ED BUS INDICATED BY FC 5 T/B GRAY.
			PRE-PDI	C.2	. ENTER NEXT BEST I MAIN BUS NOT RES NO-GO FOR PDI. RI LM DESCENT STAGE	TORED. ETAIN			
			POWERED	c.3	. CONTINUE MISSION				
			DESCENT		NO-GO FOR LUNAR	STAY			
			ALL	C.4	. ENTER NEXT BEST	PTP			L FEED CIRCUITRY SHORTED, EACTANT VALVES.
		MISSION	REV DAT		SECTION	GROUP		PAGE	
Γ-		APOLLO 17	7 FNL 9/	1/72	CSM ELECTRICAL POWER SYSTEM	DC DISTRIE	BUTION	12-11	Tape 31.10

MISSION RULES

RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUES/N	IOTES/COMMENTS
12-52	BATTERY BUS SHORTED A. SHORT	LAUNCH	1 A.1	(A) PLACE EDS AUT	į	GREATER THAN 18 AMPS WILL CAUSE BATTERY BUS VOLTAGE TO BE LESS THAN OR EQUAL TO MAIN BUS VOLTAGE.
				TO OFF (B) TIE BAT C TO ASSOCIATED MA		,
		PRE~PE)I 2	2. ENTER NEXT BEST P		
				NO-GO FOR PDI. RE DESCENT STAGE FOR		
		POWERE DESCEN		B. CONTINUE MISSION		
		ALL	4	NO-GO FOR LUNAR S' 1. ENTER NEXT BEST P' BUS NOT RESTORED	TP IF A.4. F	REMOVE POWER FROM BUS, IF SHORTED LESS THAN OR EQUAL TO 10 AMPS. POWE
						BUS JUST PRIOR TO ENTRY TO MAINTAIN SECS REDUNDANCY.
	B. SHORT LESS THAN 5 AMPS	ALL	В.	CONTINUE MISSION REMOVE POWER FROM BI EXCEPT FOR MANEUVER:	C AND	
				ENTRY	,	
12-53	BATTERY RELAY BUS SHORTED					
	A. SHORT GREATER THAN 2.0 AMPS	LAUNC		1. CONTINUE MISSION		
		POWERI DESCEI		2. <u>CONTINUE MISSION</u> NO-GO FOR LUNAR S	гау	
		ALL		3. ENTER NEXT BEST P	_	
				OPEN BATTERY BUS BATTERY RELAY BUS		
	B. SHORT LESS THAN 2.0 AMPS	ALL	В.	CONTINUE MISSION	POV CON	ARGE BAT B CONTINUOUSLY WITH BAT B WER ENTRY AND POSTLANDING CB OPEN. NSIDER BATTERY CHARGER LOST FOR SSION PLANNING.
		į.				
	MISSION	REV	DATE	SECTION	GROUP	PAGE
	APOLLO 1	7 FNL	9/1/72	CSM ELECTRICAL POWER SYSTEM	DC DISTRIBUTION	12-12 Tape 32.

MISSION RULES

L	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NO	TES/COMME	NTS	
	12-54	A. LOSS OF BAT RELAY BUS OR ONE BATTERY BUS, (UNABLE TO POWER BUS) B. LOSS OF ONE MAIN BUS (UNABLE TO POWER BUS) RULE NUMBERS 12-55 THROUGH 12-59 ARE RESERVED.	PRE-PDI POWERED DESCENT ALL LAUNCH PRE-PDI POWERED DESCENT TEC ALL	3 4 B.1 2	2. CONTINUE MISSION 2. ENTER NEXT BEST P NO-GO FOR PDI. RE DESCENT STAGE FOR 3. CONTINUE MISSION NO-GO FOR LUNAR S 4. ENTER NEXT BEST P NO-GO FOR PDI. R DESCENT STAGE FOR 3. CONTINUE MISSION NO-GO FOR LUNAR S 4. NO-GO FOR CSM EVA 5. ENTER NEXT BEST P RETAIN LM, IF POS	TAIN LM TEI TAY TP EMAIN LM TEI TAY				
	12-60		LAUNCH PRE-PDI POWERED DESCENT TEC ALL LAUNCH PRE-PDI POWERED DESCENT	B. C. D. E. A. B.	CONTINUE MISSION ENTER NEXT BEST PTP NO-GO FOR PDI. RETA DESCENT STAGE FOR TO CONTINUE MISSION NO-GO FOR LUNAR STA NO-GO FOR CSM EVA ENTER NEXT BEST PTP RETAIN LM CONTINUE MISSION ENTER NEXT BEST PTP NO-GO FOR PDI. RETA DESCENT STAGE FOR TO POSSIBLE CONTINUE MISSION NO-GO FOR LUNAR STA	IN LM	PLACE	REMAINING	INVERTER ON	BOTH AC BUSES.
		MISSION APOLLO 17	REV DAT		ENTER NEXT BEST PTF RETAIN LM SECTION CSM ELECTRICAL POWER SYSTEM	GROUP AC DISTRIBU	TION	PAGE 12-13		Tape 32.2

MISSION RULES

R	RULE	CONDITION/MALF		PHASE		RULING		CUES/NOTES/COMM	ENTS	
	12-62	LOSS OF BOTH #	AC BUSES	POWER DESCE	RED B.	ABORT MODE I OR MO 1. OPEN DIRECT O2 VENTILATION 2. IF AFTER MODE I PTP 2-1 CONTINUE MISSION ENTER NEXT BEST PT RETAIN LM. IF SUIT REMOVE HELMET AND IF TIME PERMITS, R SUITS. IF CABIN DE SURIZED, USE DIREC UNTIL CABIN IS REP	FOR SUIT I, ENTER P OR ATP ED, GLOVES. EMOVE PROSE TO 02	A.2. INITIATE (COOLING. C. FOR CSM ONLY	CONTINUOUS FC H2 PU , ENTER WITHIN 1-1 ITINUOUS FC H2 PURG	/2 HOURS.
		RULE NUMBERS 1 THROUGH 12-69 RESERVED.					·			
-			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION CSM ELECTRICAL POWER SYSTEM	GROUP AC DISTRIBUT	PAGE ION 12-14		Tape 32.3

MISSION RULES

			INSTRUMENTATIO	ON REQUIREM	ENTS		
12-70	MEAS DESCRIPTION	PCM	<u>onboari</u>	<u> </u>	TRANSDUCERS	CATEGORY	MSN RULE REFERENCE
	AC BUS 1 PHASE A VAC AC BUS 1 PHASE B VAC AC BUS 1 PHASE C VAC	CC0200V	METER METER METER	COMMON	SEPARATE	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-5,6,61
	AC BUS 2 PHASE A VAC AC BUS 2 PHASE B VAC AC BUS 2 PHASE C VAC	CC0203V	METER METER METER	METER	SEPARATE	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-5,6,61
	MAIN BUS A VDC MAIN BUS B VDC BAT BUS A VDC BAT BUS B VDC BAT RELAY BUS VDC	CC0206V CC0207V CC0210V CC0211V CC0232V	METER METER METER METER METER		SEPARATE SEPARATE SEPARATE SEPARATE SEPARATE	1 OF 2 MANDATORY HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-200,32,52 12-22
	BAT A CURRENT BAT B CURRENT BAT C CURRENT	CC0222C CC0223C CC0224C	METER METER METER		COMMON COMMON COMMON	2 OF 3 MANDATORY	12-4,33,40,41
	FC 1 CURRENT FC 1 02 FLO FC 1 H2 FLO	SC2113C SC2142R SC2139R	METER Meter Meter		COMMON COMMON COMMON	1 OF 3 MANDATORY	12-7,31,32,33, 22A
	FC 2 CURRENT* FC 2 02 FLO FC 2 H2 FLO	SC2114C SC2143R SC2140R	METER METER METER	•	COMMON COMMON COMMON	1 OF 3 MANDATORY	12-7,31,32,33, 22A
	FC 3 CURRENT FC 3 02 FLO FC 3 H2 FLO	SC2115C SC2144R SC2141R	METER METER METER		COMMON COMMON COMMON	1 OF 3 MANDATORY	12-7,31,32,33, 22A
	BAT CHARGER CURRENT	CC0215C	METER		COMMON	HIGHLY DESIRABLE	
	FC 1 SKIN TEMP FC 2 SKIN TEMP FC 3 SKIN TEMP	SC2084T SC2085T SC2086T	METER METER METER		COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-22B
	FC 1 COND TEMP FC 2 COND TEMP FC 3 COND TEMP	SC2081T SC2082T SC2083T	METER METER METER		COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-22B
	FC 1 RAD OUT TEMP FC 2 RAD OUT TEMP FC 3 RAD OUT TEMP	SC2087T SC2088T SC2089T	METER METER METER		COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-22 I
	BAT MANIFOLD PRESS		METER			HIGHLY DESIRABLE	
	INV 1 TEMP INV 2 TEMP INV 3 TEMP	CC0175T CC0176T CC0177T	MCWS MCWS MCWS		COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	
	FC 1 PH FC 2 PH FC 3 PH	SC2160X SC2161X SC2162X	TALKBAC TALKBAC TALKBAC	CK	COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	12-22E
	AUX BAT (SM BAT)	SC0230V		- -		HIGHLY DESIRABLE	
	NOTE: USE BAT C IN LIEU * COMMON SHUNT FOR			•			

MISSION RULES

SECTION 13 - DOCKING AND UMBILICAL

_					SECTION 1:	3 - DOCKING AND UMB	ILICAL		
R	ITEM								
Ì						CENEDAL			
-	 					GENERAL			
	1								
	,,,	TUDEE COOR BOOK							
1	13-1	THREE GOOD DOCK!	ING RING L	ATCHES	5 120 DEG /	APART ARE REQUIRED F	FOR AN IVT.		
1									
	13-2	DOCKED SPS OF DE	OC RHIDNIC D	CONTR	AT LEACT	NINE GOOD DOCKING F	77NO 1 870NF0		
		DOUNED SI'S ON DI	3 DOMIS K	LQUIN	MI LENSI	MINE GOOD DOCKING F	ING LAICHES.		
ŀ									
	13-3	MANNED UNDOCKING	OPERATIO	NS WIL	L BE TERMI	NATED FOR ANY FATEL	RE OF A DOCKING DI	ING LATCH :	TO RELEASE. NO ATTEMPT WILL
	1	BE MADE TO DISAS	SSEMBLE A	DOCKIN	NG RING LAT	rch.	or in booking it	ING EATON	TO RELEASE. NO ATTEMPT WILL
	13-4	WITH FAILURE OF	THE CSM F	ORWARI	HATCH PRI	MARY LOCK/UNLOCK ME	CHANISM, THE NOMIN	IAL MISSION	WILL BE PERFORMED USING THE
		SECONDARY LOCK/U	JNLOCK MEC	HANISM	1.				
	ŀ						•		
	13-5	LOSS OF VICUAL P	OCUTNO AT	DC / CC					
	13-3	LOSS OF VISUAL D	OUNTING AL	טט (ננ	NAS AND IAH	RGETS) WILL NOT INHI	BIT DOCKING AND UN	DOCKING.	
	i								
	İ								
	13-6	IF THE DOCKING P	ROBE FAILS	S TO I	NDICATE EX	TENSION OR IF BOTH	TALKBACK INDICATOR	S* ARE RAD	RBER POLE, TD&E WILL BE
	ŀ	ATTEMPTED.					THE TOTAL THE TOTAL OF	S ANL DAN	TOLK FOLE, IDAE WILL BE
		*NOTE: THE	ONLY DOCK	ING PR	OBE INSTRU	MENTATION CONSISTS	OF TWO TALKBACK IN	DICATORS I	N THE CSM
İ									
		DIN E NUMBERO 10							
		RULE NUMBERS 13-	/ I HRUUGH	13-10	ARE RESER	VED.			
-									
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
-	·		POLLO 17	FNL	9/1/72	DOCKING AND	GENERAL	PAGE	
1		^'	JEEU 17	,	-, 1, 16	UMBILICAL	GENERAL	13-1	Tape 35.5

MISSION RULES

SECTION 13 - DOCKING AND UMBILICAL - CONTINUED

ITEM		350110	N 13 - DUC	KING AND UMBILICAL	- CONTINUED					
TIEM										
				MANAGEMENT						
13-11	FOR MISFIRE OF A DOCKING OF DOCKING. TWO NITROGEN FAILURE MODE, CONSIDERATI	BOTTL	ES REMAINI	NG ARE NORMALLY REC	UIRED TO ALLOW UN	DOCKING. H	OWEVER, BASED ON THE			
13-12	THE CM FORWARD AND LM UPF	PER HAT	CH NORMALL	Y WILL BE INSTALLED	FOR ANY TYPE OF	MANEUVER OR	DOCKING.			
13-13	DURING OPERATIONS WHEN CO				PROBE PRELOAD ONL	Y (DOCKING	LATCHES COCKED) CM/LM			
	TUNNEL PRESSURE, PS	<u>. A</u>		COMBINED CM/	LM ACTIVE THRUSTE	<u>RS</u>				
	GREATER THAN 1.5 PS: BETWEEN 0 AND 1.5 PS O PSIA			INHIBIT ALL NO MORE THAN		'AW CONTROL				
13-14 LOW PROBE TEMPERATURE WILL NOT INHIBIT DOCKING ATTEMPTS. RULE NUMBERS 13-15 THROUGH 13-19 ARE RESERVED.										
	-									
:										
<u> </u>	MISSION	REV	DATE	SECTION	GROUP	PAGE				
	APOLLO 17	FNL	9/1/72	DOCKING AND UMBILICAL	MANAGEMENT	13-2	Tape 35.6			

MISSION RULES

SECTION 13 - DOCKING AND UMBILICAL - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING			OTES/COMME	NTS
				SPI	ECIFIC MISSION RULES	<u> </u>			
	13-20	FAILURE TO ACHIEVE OR MAINTAIN POWER TO X-LUNAR BUS LOADS FROM CSM	DOCKED	Α.	OPEN CB (11) LTG: ANUN/DOCK/COMP EPS: DES ECA OPEN CB (26) LTG: FLOOD EPS: DES ECA ALTERNATE USE OF BA 1,2,3, AND 4 UNTIL ACTIVATION		9 H THE TRO 2. NON LCA WIL 3. OVE	IRS AFTER EMAL CONS DL ASSEMBL MINAL MISS L, ECA, AN L NOT BE	ION MAY BE PERFORMED BECAUSE D BATTERY THERMAL CONSTRAINTS VIOLATED. PROTECTION IS LOST UNTIL A
	13-21	FAILURE TO ACHIEVE S-IVB/LM SEPARATION OR FAILURE TO MATE LM UMBILICALS (P23 AND P24)	TD&E	PEF	RFORM CSM/LM FINAL S	EΡ.	MATING POWER	AT LEAST	NNOT BE ACHIEVED WITHOUT ONE UMBILICAL. ITCHED AND MAINTAINED WITH
	13-22	FAILURE TO ACHIEVE CSM/LM FINAL SEPARATION	DOCKED	Α.	RETRIEVE PROBE AND AND INSTALL AFTER UNDOCKING, DE CSM AND JETTISON PR OVERBOARD	DROGUE PRESS			
	13-23	FAILURE TO INDICATE DOCKING PROBE EXTEND OR BOTH TALKBACK INDICATORS ARE BARBER POLE	TD&E UNDOCKED	В.	CONTINUE MISSION ATTEMPT TD&E CONTINUE MISSION ATTEMPT DOCKING		OCCUR	G RING TUI TO THE EX' T BE MAIN'	NNEL STRUCTURE DAMAGE ∷AY TENT THAT TUNNEL PRESSURE TAINED.
	13-24	CANNOT REMOVE CSM FORWARD HATCH	TD&E DOCKED	В.	PERFORM CSM/LM FINA PERFORM CSM/LM FINA IF LM MANNED, PERFO. TO CSM.	L SEP			
		MISSION	REV DAT	<u> </u>	SECTION	GROUP		PAGE	
-		APOLLO 17	FNL 9/	1/72	DOCKING AND UMBILICAL	SPECIFI	C	13-3	Tape 35.7

MISSION RULES

SECTION 13 - DOCKING AND UMBILICAL - CONCLUDED

R RULE CONDITION/MALPUNCTION PHASE RULING CUES/MOTES/COMMENTS 13-25 CANNOT REMOVE DOCKING PRINCE, IN INDIGE, MAYOR LAW UPER HATCH. 13-26 FAILURE TO RELEASE DOCKED REDOCK 13-27 PRIMARY FORMARD HATCH LOCK/UNICOCYNECHANISM MODERATIVE 13-28 FAILURE TO LOCK CSM TOME TORRAND HATCH LOCK/UNICOCYNECHANISM MODERATIVE 13-29 FAILURE TO LOCK CSM TOME DOCKED CONTINUE MISSION DOCKED 13-29 FAILURE TO REINSTALL PROBE AND MOTE PRINCE CONTINUE MISSION DOCKED WITH CABIN PRESSURE. 13-29 FAILURE TO LOCK CSM LOCKED DOCKED OCKED IN UNIVERSITY OF HATCH CABIN PRESSURE. 13-30 LOSS OF PRIMARY AND SECONDARY ORCHING SYSTEM ALL CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION ALL CONTINUE MISSION CONTINUE MISSION		т т					00.102002.		
PROBE, LM DROGUE, AND/OR LM UPPER HATCH. 13-26 FAILURE TO RELEASE CAPTURE LATCHES 13-27 PRIMARY FORWARD HATCH LOCK/UNLOCK MECHANISM INOPERATIVE 13-28 FAILURE TO LOCK CSM FORWARD HATCH LOCK/PUNLOCK MECHANISM ENTER IN SUITS 13-29 FAILURE TO REINSTALL PROBE AND/OR DROGUE OR FAILURE TO CLOSE LM UPPER HATCH 13-30 LOSS OF PRIMARY AND SECUNDARY DOCKING 13-30 LOSS OF PRIMARY AND SECUNDARY DOCKING PERFORM EVT IF LM MANNED PERFORM EVT IF LM MANNED REDOCK CONTINUE MISSION ENTER IN SUITS REF SCP A15 I.A: ASSUMES HATCH CAN BE SEALE NO UNDOCKING	R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMEN	TS
13-27 PRIMARY FORWARD HATCH LOCK/UNLOCK MECHANISM INOPERATIVE 13-28 FAILURE TO LOCK CSM FORWARD HATCH DOCKED 13-29 FAILURE TO REINSTALL PROBE AND/OR DROGUE OR FAILURE TO CLOSE LM UPPER HATCH 13-30 LOSS OF PRIMARY AND SECONDARY DOCKING ALL CONTINUE MISSION ENTER IN SUITS REF SCP A15 I.A: ASSUMES HATCH CAN BE SEALE CONTINUE MISSION ENTER IN SUITS NO UNDOCKING		13-25	PROBE, LM DROGUE,	DOCKED	-		1	SPS AND SM RCS MA	NEUVERS MAY BE PERFORMED.
13-28 FAILURE TO LOCK CSM FORWARD HATCH 13-29 FAILURE TO REINSTALL PROBE AND/OR DROGUE OR FAILURE TO CLOSE LM UPPER HATCH 13-30 LOSS OF PRIMARY AND SECONDARY DOCKING TD&E CONTINUE MISSION ENTER IN SUITS CONTINUE MISSION ENTER IN SUITS REF SCP A15 I.A: ASSUMES HATCH CAN BE SEALE AND SECURED WITH CABIN PRESSURE. NO UNDOCKING		13-26	FAILURE TO RELEASE CAPTURE LATCHES	DOCKED	REDO	<u>ock</u>			
13-28 FAILURE TO LOCK CSM FORWARD HATCH 13-29 FAILURE TO REINSTALL PROBE AND/OR DROGUE OR FAILURE TO CLOSE LM UPPER HATCH 13-30 LOSS OF PRIMARY AND SECONDARY DOCKING 13-30 LOSS OF PRIMARY AND SECONDARY DOCKING CONTINUE MISSION REF SCP A15 I.A: ASSUMES HATCH CAN BE SEALE AND SECURED WITH CABIN PRESSURE. NO UNDOCKING CONTINUE MISSION ENTER IN SUITS REF SCP A15 I.A: ASSUMES HATCH CAN BE SEALE AND SECURED WITH CABIN PRESSURE.		13-27	LOCK/UNLOCK MECHANISM	ALL	<u>CON.</u>	FINUE MISSION			
PROBE AND/OR DROGUE OR FAILURE TO CLOSE LM UPPER HATCH 13-30 LOSS OF PRIMARY AND SECONDARY DOCKING CONTINUE MISSION SECONDARY DOCKING		13-28	FAILURE TO LOCK CSM FORWARD HATCH		CON	TINUE MISSION		REF SCP A15 I.A: AND SECURED WITH	ASSUMES HATCH CAN BE SEALER CABIN PRESSURE.
13-30 LOSS OF PRIMARY AND ALL <u>CONTINUE MISSION</u> SECONDARY DOCKING		13-29	PROBE AND/OR DROGUE OR FAILURE TO CLOSE	DOCKED	NO.	<u>UNDOCKING</u>	·		
		13-30	LOSS OF PRIMARY AND SECONDARY DOCKING	ALL	<u>CON</u>	TINUE MISSION			
MISSION REV DATE SECTION GROUP PAGE			MICSTON	REV	DATE	SECTION	GROUP	PAGE	
	-		APOLLO 17		9/1/72	DOCKING AND	SPECIFIC		

MISSION RULES

SECTION 14 - CSM SEQUENTIAL

_					SECTION	1 14 - CSM SEQUENTI	AL .		- 			
R	ITEM											
						GENERAL						
	14-1	LAUNCH THERE ARE NO.S	FOUFNTIAL MA	1 FUNCT	TTONS FOR W	MICH LAUNCH WILL B	F TERMINATED					
		1112112 11112 110 0		21 0110		WITCH ENGINEER WILL DI	resortingles.					
	14-2	IF AN ENTRY BA	TTERY IS LOS	T, THE	EDS WILL	BE FLOWN OPEN LOOP	•					
	14-3	ALL MISSION PH	ASES (EXCEPT	LUNAF	ORBIT)							
		I TO CONTINUE TH	E MISSION, B	отн Р	rro Buses A	ND BOTH LOGIC BUSES	S ARE REQUIRED.					
	14-4	POWERED DESCEN	<u>T</u>				•					
		THERE ARE NO C	SM SEQUENTIA	L SYST	TEM FAILURE	S FOR WHICH POWERE	DESCENT WILL	BE TERMINATED.				
	14-5	4-5 SEQUENTIAL LOGIC BUS IS CONSIDERED FAILED IF: A. VOLTAGE IS LESS THAN 22 VDC AND UNABLE TO ACTIVATE RCS ENABLE AND/OR SLA SEP RELAYS (CD0170X AND/OR CD0123X SYSTEM A, CD0171X AND/OR CD0124X SYSTEM B).										
		B. LOGIC BUS S	HORTED GREAT	ER THA	AN 10 AMPS.							
	14-6	PYRO BUS IS CO	NSIDERED FAI	LED IF	·:							
		A. SHORTED GRE	ATER THAN 10	AMPS								
		D CATLUDE TO	DEDECOM ANY	CENTER	ITTAL CUMOT	TON HITH CUSTECTED	EATLED BYDO CY	/CTFM				
		B. FAILURE TO	PERFORM ANT	SEQUE	IIIAL FUNCI	TION WITH SUSPECTED	FAILED PIRO ST	121EM				
		RULE NUMBERS 1	4-7 THROUGH	14-9 /	ARE RESERVE	D.						
	<u> </u>											
_			MISSION	REV	DATE	SECTION	GROUP	PAGE				
			APOLLO 17	FNL	9/1/72	CSM SEQUENTIAL	GENERAL	14-1	Tape 36.1			

MISSION RULES

_					ECITON 14	- CSM SEQUENTIAL	- CONTINUED		
R	ITEM								
					-				
					-	MANAGEMENT			
:	14-10	ARMING OF THE WILL ARM THE	SEQUENTIAL S LOGIC BUSES A	SYSTEM IND ST	WILL BE PE AND BY FOR	ERFORMED WHILE IN A GO FROM THE GR	CONTACT WITH A COUND TO PROCEED W	GROUND TELEMET WITH ARMING TH	RY SITE. THE FLIGHT CREW E PYRO BUSES.
		RULE NUMBERS	14-11 THROUGH	1 14-1	9 ARE RESER	RVED.			
						•			
			•						
1		·							
				<u> </u>		<u> </u>			
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
-			APOLLO 17	FNL	9/1/72	CSM SEQUENTIAL	MANAGEMENT	14-2	Tape 36.2

MISSION RULES

SECTION 14 - CSM SEQUENTIAL - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NO	OTES/COMME	NTS
	14-20	SEQUENTIAL LOGIC BUS A OR B LESS THAN OR EQUAL TO 22 VDC AND UNABLE TO ACTIVATE RCS ENABLE AND/OR SLA SEP RELAYS	LAUNCH EO TLC	A. B.	CONTINUE MISSION RULES CONTINUE MISSION ENTER 3-1 IF BUS NOT RESTORED TERMINATE OPERATIONS ENTER NEXT BEST PTP NOT RESTORED	<u>5</u>	CD0170: AND/OR	X AND/OR C CDO124X S	DO123X SYSTEM A, CDO171X YSTEM B
			LUNAR ORBIT/ LUNAR STAY	C.	CONTINUE MISSION				
	14-21	PYRO BUS A OR B LESS THAN OR EQUAL TO 35 VDC							
		A. SHORTED GREATER THAN 10 AMPS	LAUNCH EO TLC		. CONTINUE MISSION TERMINATE OPERATION ENTER NEXT BEST P			SE BATTERY FFECTED BU	TIE FOR PYRO POWER TO S.
			LUNAR ORBIT/ LUNAR STAY	3	3. CONTINUE MISSION				
ĺ		B. SHORTED LESS THAN 10 AMPS	ALL	В.	CONTINUE MISSION			BATTERY 1 ECTED BUS.	TE FOR PYRO POWER TO
		C. PYRO BUS TM READS O VDC AND PYRO BAT ONBOARD GREATER THAN 35 VDC	LAUNCH ALL	i	CONTINUE MISSION ATTEMPT FUNCTION IS SUSPECTED FAILED IN ONLY: (A) IF FUNCTION IN CONTINUE MISS (B) IF FUNCTION DOWNER NORMALLY NEXT BEST PTP	ORMAL, ION DES NOT	3: U: B:	5 VDC PRIC SED IN LIE) BAT VERIFIED GREATER THAN OR TO ARMING. IF ENTRY BAT U OF PYRO BAT, VOLTAGE SHOULD NATELY EQUAL TO BAT BUS
	14-22	TELEMETRY INDICATES AN EDS VOTE INPUT 1, 2, OR 3	LAUNCH	Α.	ITINUE MISSION IF ANY ENTRY BATTER THAN 22 VDC, EDS AU SWITCH TO OFF ALL ENTRY BATTERIES GREATER THAN 22 VDC CHECK CORRESPONDING CB'S 1, 2, OR 3 CLO	TO/OFF : EDS	RESPEC A. BAT	TIVELY.	ED0132X, CD0133X, AND CD0134X CAN ONLY BE MONITORED
-	<u> </u>	MISSION	REV [DATE	SECTION	GROUP		PAGE	
-		APOLLO 17	FNL	9/1/72	CSM SEQUENTIAL	SPECIFI	C	14-3	Tape 36.3

MISSION RULES

SECTION 14 - CSM SEQUENTIAL - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	_	CUES/NOTES/C	OMMENTS
	14-23	LET JETTISON MOTOR DOES NOT FIRE	LAUNCH	ATTE	<u>TINUE MISSION</u> MPT JETTISON PER CR KLIST EMERGENCY PRO			
	14-24	SMJC ACTIVATES PREMATURELY	EO TLC	OF AND	FINUE MISSION IF SOU ACTIVATION CAN BE DE ISOLATED. ER NEXT BEST PTP IF ACTIVATION CAN NOT B	TERMINED SOURCE		
			ALL	l l	LATED TINUE MISSION	:		
	14-25	ACTIVATED CM RCS PRESS LOGIC RELAYS	ALL	A.	TINUE MISSION PRIOR TO CM RCS PRES NOT ARM RESPECTIVE P (FOR BOTH INDICATION FORM SLA SEP WITH SE CB'S OPEN.) AT CM RCS PRESS: AR RESPECTIVE PYRO BUS	YRO BUS IS PER- ICS ARM	CD0173X AND,	/OR CD0174X
	14-26	ACTIVATED SLA DEPLOY LOGIC RELAYS	ALL	A. 8.	TINUE MISSION PRIOR TO SLA SEP: [ARM RESPECTIVE PYRO FOR SLA SEP: ARM RE PYRO BUS FIRST	BUS	CDO123X AND,	/OR CD0124X
	14-27	UNABLE TO PERFORM SLA SEPARATION	TLC	ENT	ER NEXT BEST PTP			
	14-28	ACTIVATED APEX JETTI- SON LOGIC RELAYS	LUNAR ORBIT/ LUNAR STAY		CONTINUE MISSION DO NOT ARM PYRO BUSI MALFUNCTION HAS BEEI ISOLATED ENTER NEXT BEST PTP DO NOT ARM PYRO BUSI MALFUNCTION HAS BEEI ISOLATED	N ES UNTIL	DETECTED AT	SECS POWER UP (CD0230X AND
-		MISSION	REV DA		SECTION	GROUP	PAGE	
-		APOLLO 17	- 1 - 1 -	/1/72	CSM SEQUENTIAL	SPECIFIC		

MISSION RULES

SECTION 14 - CSM SEQUENTIAL - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMM	ENTS
	14-29	ACTIVATED DROGUE CHUTE DEPLOY LOGIC RELAY	LUNAR ORBIT, LUNAR STAY	B. <u>1</u>	CONTINUE MISSION DO NOT ARM PYRO BUSE MALFUNCTION HAS BEEN ISOLATED ENTER NEXT BEST PTP DO NOT ARM PYRO BUSE MALFUNCTION HAS BEEN ISOLATED	S UNTIL	MAY BE DETECTED CEOOOZX)	AT ANY TIME (CEOOO1X AND/OR
	14-30	ACTIVATED PILOT CHUTE DEPLOY LOGIC RELAY	LUNAR ORBIT, LUNAR STAY	B. 1	CONTINUE MISSION DO NOT ARM PYRO BUSE MALFUNCTION HAS BEEN ISOLATED ENTER NEXT BEST PTP DO NOT ARM PYRO BUSE MALFUNCTION HAS BEEN ISOLATED	S UNTIL		S POWER UP PRIOR TO ENTRY CEOOO4X) WITH EDS BAT A(B)
	14-31	LOST GROUND TO RESISTOR NETWORK FOR LOGIC OR PYRO BUS VOLTS MEASUREMENTS	LAUNCH EO TD&E ALL	ARM CON DO 1 UNT	FINUE MISSION BOTH SYSTEMS FINUE MISSION NOT ARM AFFECTED SYS IL SEQUENTIAL GO/NO- OR TO ENTRY UNLESS OF THE FAILS	GO	ARMING AFFECTED OF FOLLOWING PCA LOGIC A SC2142R FC 1 02 SP0930P FU SM/EN SL1206T SIM THEF LOGIC B SC2140R FC 2 H2 ST0832K ALPHA CT SC0230V AUX BAT PYRO A SC2143R FC 2 02 CT0018V SCE 10 V PYRO B SC2139R FC 1 H2 ST0831K ALPHA CT	FLOW IG INTERFACE P MAL LOC 6 TEMP FLOW RATE CHAN 3 VOLTS FLOW JDC
		RULE NUMBERS 14-32 THROUGH 14-49 ARE RESERVED.						
-	<u> </u>	MISSION	REV	DATE	SECTION	GROUP	PAGE	<u> </u>
		APOLLO 17	_	9/1/72	CSM SEQUENTIAL	SPECIFI		Tape 36.5

MISSION RULES

SECTION 14 - CSM SEQUENTIAL - CONCLUDED

I							
			INSTRUM	MENTATION REQUIREMEN	NTS		
	14-50	MEAS DESCRIPTION	<u> PCM</u>	<u>onboard</u>	TRANSDUCERS	CATEGORY	MSN RULE REFERENCE
		PYRO BUS A VOLTS PYRO BUS B VOLTS	CD0005\ CD0006\			1 OF 2 M	14-21 14-21
		SEQ LOGIC BUS A VOLTS SEQ LOGIC BUS B VOLTS	CD0200\ CD0201\			HD HD	14-20 14-20
		APEX JET A APEX JET B	CD0230) CD0231)			HD HD	14-29 14-29
		DROGUE DEPLOY A DROGUE DEPLOY B	CE0001)			HD HD	14-30 14-30
		PILOT CHUTE DEPLOY A PILOT CHUTE DEPLOY B	CE0003) CE0004)	(HD HD	14-31 14-31
		SLA SEP RELAY A RCS/SCS ACTIVATE A	CD0123)	(HD HD	14-26
		SLA SEP RELAY B RCS/SCS ACTIVATE B	CD0124) CD0171)	(HD HD	14-26
		CM RCS PRESS SIG A CM RCS PRESS SIG B	CD01737 CD01747	(HD HD	14-25 14-25
		CM-SM SEP RELAY A CM-SM SEP RELAY B	CD0023) CD0024)	(·	HD HD	
		CREW ABORT A CREW ABORT B	CD01307 CD01317	(HD HD	
		EDS ABORT VOTE 1 EDS ABORT VOTE 2	CD01322 CD01332	((HD HD	14-22 14-22
		EDS ABORT VOTE 3	CD0134	(нр нр	14-22
	} !	EDS ABORT B MAIN CHUTE DISC A MAIN CHUTE DISC B	CE03212 CE03222	κ		HD HD HD	
		EDS ABORT REQ A EDS ABORT REQ B	BS00801	x		HD HD	
		DOCKING PROBE TEMP	CS0220			HD	
		CSM-LM LOCK RING SEP RELAY A	CD1154	χ		HD	13-22
	٠	CSM-LM LOCK RING SEP RELAY B LM CURRENT	CD1155		COMMON	HD HD	13-22
		21 COMEN	502502	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	OUTTON		
l							
L		MISSION RE	V DATE	SECTION	GROUP	PAGE	
_		APOLLO 17 FNI		CSM SEQUENTIAL	INSTR REQ	14-6	Tape 36.6

MISSION RULES

SECTION 15 - GUIDANCE AND CONTROL

						5 - GOLDANCE AND CO								
R	ITEM													
						GENERAL								
	15-1	LAUNCH												
	13-1													
		THERE ARE NO F	FAILURES OF TH	HE CSM	I GUIDANCE	AND CONTROL SYSTEM	WHICH ARE CAUSE	E FOR ABORT.						
	15-2	EARTH ORBIT PH	HASE											
		A. IN ORDER TO CONTINUE THE MISSION PAST THE NEXT BEST PTP, THE GUIDANCE AND CONTROL SYSTEMS MUST PROVIDE SPS CRITICAL BURN CAPABILITY AND ONE BACKUP DEORBIT METHOD (SM OR HYBRID). THE FOLLOWING MINIMUM CAPABILITIES MUST BE AVAILABLE:												
	·	1. ATTITU	UDE CONTROL:	DIREC	T RCS, AUT	O ATTITUDE CONTROL	AND RATE DAMPIN	NG IN EACH AXI	s.					
		2. TVC ((CRITICAL BURNS	s): 0	NE TVC SER	VO LOOP IN EACH AXIS	S AND ONE TYC C	CONTROL MODE (ACCEL CMD EXCLUDED).					
		PROVII	DE THAT CAPABI	LITY.	IF SM DE	PROPELLANT IS AVAID ORBIT IS NOT POSSIB ILITY FOR A HYBRID (LE DUE TO LACK	1 DEORBIT, THE OF PROPELLANT	G&C SYSTEMS MUST OR A SYSTEMS FAILURE,					
		(A) S	SM DEORBIT REC	QUIREM	ENTS:									
		((1) TRANSLATION CAPABILITY (2) ONE OPERATIONAL FDAI (3) RATE DAMPING IN ALL THREE AXES, DAP OR SCS											
		(B) H	HYBRID DEORBIT	r requ	IREMENTS:									
		((1) ALL SM DE (2) OPERATION (3) TWO OPERA	NAL IM	U, CMC, AN	NTS (RATE DAMPING MU D MAIN DSKY	JST BE SCS)							
						N AFTER THE STORAGE ER BY EITHER CMC AUT			STEMS MUST PROVIDE THE IRECT ULLAGE.					
						OAST PHASE, THE GUII NIMUM CAPABILITIES N			ST PROVIDE REDUNDANT FOR TLI:					
		1. ATTITU	JDE CONTROL:	DIREC	T RCS, AUT	O ATT CONTROL AND RA	ATE DAMPING IN	EACH AXIS.						
		2. TVC:	3 OF 4 SERVO	LOOPS	AND TWO T	VC CONTROL MODES (AC	CCEL. CMD EXCLU	DED).						
		3. G&N:				OPERATIONAL AND OPT	TICS OR COAS CA	PABLE OF ALIG	NING PLATFORM.					
		P40 ATTITUDE ERROR DISPLAY REQUIRED.												
		4. DISPLA	AYS: ONE OPER	RATION	AL FDAI.									
		5. ATTITU	JDE REFERENCE:	RED	UNDANT ATT	ITUDE SOURCES ARE RE	QUIRED FOR HIG	H-SPEED ENTRY						
\vdash	L		T	- F: /	DATE	CECTAO:	CROUP	T Decr						
\vdash			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION GUIDANCE AND	GROUP GENERAL	PAGE	Tape 43B.8					
					3, 1, 7,	CONTROL	GENERAL	15-1	1ape 438.8					

MISSION RULES

SECTION 15 - GUIDANCE AND CONTROL

-,					SECTION	15 - GUIDANCE AND C	ONTROL		
4	ITEM								
	15-3	TRANSLUNAR COA	<u>st</u>					•	
		IN ORDER TO CO			PAST THE N	EXT BEST PTP, THE G	UIDANCE AND COM	NTROL SYSTEMS MU	JST PROVIDE THE
		A. ATTITUDE C	ONTROL: DIRE	CT RCS	, AUTO ATT	CONTROL AND RATE D	AMPING IN EACH	AXIS.	
		B. RCS TRANSL	ATION: X-AXI	S VIA	AUTO COILS	OR DIRECT ULLAGE P	USHBUTTON.		
	15-4	LOI							
	i	IN ORDER TO CO	MMIT TO LOI,	THE FO	LLOWING MI	NIMUM CAPABILITIES	MUST BE AVAILAE	BLE:	
I		A. ATTITUDE C	ONTROL: DIRE	CT RCS	S, AUTO ATT	CONTROL AND RATE D	AMPING IN EACH	AXIS	
			SERVO LOOPS NTROL MODES (A			ONE IN PITCH (IF D	PS IS AVAILABLE	FOR ABORTS AND	FOR TEI), AND TWO
		C. DELETED					~.*		
		D. SPS: NON-	CRITICAL BURN	CAPAE	BILITY IS R	EQUIRED.			
	15-5	LUNAR ORBIT	T WILL DE TEDI	MINATE	D FARLY IF	FITUED DEDUNDANT A	TTITUDE CONTROL	OR NON CRITTICA	
l						D IF LM DPS IS NOT			L SPS CAPABILITY IS
			O PERFORM A NO				UST BE ABLE TO	PROVIDE AN ULLA	GE MANEUVER BY EITHER
	15-6	UNDOCKED							
		CAPABILITY. T	HE G&C SYSTEMS	S MUST	PROVIDE D	NATED IF THE G&C SY IRECT RCS AND TRANS ADDITION, THE FOLLO	LATION CAPABILI	TY IN EACH AXIS	, AND RATE DAMPING
		A. OPERATIONAL B. ONE DSKY C. TRANSLATION				D COAS			
۱		D. RATE DAMPI	NG IN TWO AXES		m nais				
		F. ONE OPERATIONAL	IONAL RHC						
İ		G. ONE OPERAT: H. DIRECT RCS	IN ALL THREE						
		I. NON-CRITICA	AL SPS BURN CA	AP A BIL	ITY				
							,		
_			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION GUIDANCE AND	GROUP GENERAL	PAGE	
					l * ' ' ' *	CONTROL.		15-2	Tape 57.10

Tape 57.10

15-2

MISSION RULES

_				SECT	ION 15 - GI	JIDANCE AND CONTROL	- CONTINUED			
R	ITEM							<u> </u>		
	15-7	ASCENT, DESCE	<u>NT</u>							
		THERE ARE NO	GUIDANCE AND	CONTR	OL SYSTEM I	FAILURES THAT AFFECT	THE ASCENT OR D	DESCENT PHASE	ïs.	
	15-8	LUNAR STAY PH	ASE_							
		LUNAR STAY WI	LL BE TERMINA	TED EA	ARLY IF RFI	DUNDANT SPS CONTROL	CAPARTLITY IS LO	TN ADD	TION THE FOLLOWS	· NC
		MINIMUM CONTR	OL CAPABILITI	ES MUS	ST BE AVAIL	ABLE FOR THE ACCOMP	LISHMENT OF TEI:	31. IN ADDI	IIION, INE FULLUWI	NG
		A. ATTITUDE	CONTROL: DIR	ECT RO	S IN THREE	AXES AND RATE DAMP	ING IN TWO AXES			
		B. TVC: BOTA	H SERVO LOOPS	AND 1	TWO TVC CON	ITROL MODES (ACCEL C	MD EXCLUDED)			
		C. G&N: THE	G&N MUST BE	FULLY	OPERATIONA	L WITH THE EXCEPTIO	N OF OPTICS AND	EITHER DSKY		
	,									
	15-9	CSM EVA								
		CSM EVA WILL I	BE NO-GO/TERM	INATEI	FOR LOSS	OF THREE-AXIS ATTIT	UDE CONTROL (REF	MR 17-5)		
Ш										
-			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION GUIDANCE AND	GROUP GENERAL	PAGE		
1			1 0220 17		-, 1, 1, 1	CONTROL		15-3	Та	pe 37.3

MISSION RULES

	· · · · · · · · · · · · · · · · · · ·	SECTION 15 - GUIDANCE AND CONTROL - CONTINUED												
R	ITEM													
		SYSTEMS MANAGEMENT												
	15-10	ATTITUDE CONTROL												
		CSM IN ACTIVE RCS CONTROL - LM WILL NOT BE IN ACTIVE ATTITUDE HOLD. LM IN ACTIVE RCS CONTROL - CSM WILL NOT BE IN ACTIVE ATTITUDE HOLD. FOR DOCKING ACTIVITIES AFTER OPENING THE APS INTERCONNECT (BOTH VEHICLES IN ACTIVE RCS CONTROL), THE CSM MUST BE IN A TIGHTER DEADBAND THAN THE LM.												
	15-11	PIPA BIAS WILL BE UPDATED WHEN ACTUAL BIAS DIFFERS FROM THE VALUE IN CMC ERASABLE BY ± 0.003 FT/Sec ² . THE FAILURE LIMIT ON THE CSM ACCELEROMETER IS ± 0.164 FT/Sec ² . THE FIRST GYRO BIAS DRIFT WILL BE UPDATED IF THE DRIFT IS ± 1 MERU (0.015 DEG/HR). THEREAFTER, ± 3 MERU (± 0.045 DEG/HR) WILL BE THE UPDATE CRITERIA. THE FAILURE LIMIT ON THE CSM GYRO IS ± 100 MERU (± 1.5 DEG/HR).												
	15-12	∆V COUNTER DRIFT												
		A. FOR SPS BURNS, THE ΔV COUNTER SHOULD BE APPROPRIATELY BIASED FOR DRIFTS OF GREATER THAN 0.015 FT/SEC 2 .												
		 A. FOR SPS BURNS, THE ΔV COUNTER SHOULD BE APPROPRIATELY BIASED FOR DRIFTS OF GREATER THAN 0.015 FT/SEC². B. FOR RCS BURNS, THE ΔV COUNTER WILL BE BIASED FOR DRIFTS GREATER THAN OR EQUAL TO 0.01 FT/SEC². SHOULD TH DRIFT BE GREATER THAN 0.1 FT/SEC², THE EMS WILL BE CONSIDERED FAILED. 												
	15-13	DAP INITIALIZATION												
		A. GIMBAL TRIMS: WILL BE UPDATED FOR EVERY SPS MANEUVER BASED ON FINAL TRIM POSITIONS OF THE PREVIOUS MANEUVER AS MONITORED ON TELEMETRY, IF THE PREVIOUS MANEUVER WAS SCS CONTROLLED. IF THE PREVIOUS MANEUVER WAS G&N CONTROLLED, THE CMC STORED VALUES WILL BE USED. TRIMS WILL BE REINITIALIZED FROM THE GROUND AFTER EACH VEHICLE CONFIGURATION CHANGE AND AFTER EACH WEIGHT UPDATE. TRIMS MUST BE UPDATED WHEN GROUND COMPUTED VALUES DIFFER FROM CMC STORED VALUES BY 0.5 DEGREE.												
		B. CSM, LM WEIGHT: SHOULD BE UPDATED WHEN GROUND COMPUTED VALUES DIFFER FROM CMC STORED VALUES BY 1.0 PERCENT. WEIGHTS MUST BE UPDATED WHEN GROUND VALUES DIFFER FROM CMC VALUES BY 10.0 PERCENT.												
	15-14	SPS THRUST CONSTRAINTS												
		A. ET DECAY WILL BE UPDATED WHEN ACTUAL VALUE DIFFERS FROM LOADED BY ±0.05 SECONDS.												
B. EFIMP16 WILL BE UPDATED WHEN ACTUAL VALUE DIFFERS FROM LOADED BY 400 LB THRUST. RULE NUMBERS 15-15 THROUGH 15-19 ARE RESERVED.														
										\vdash	<u></u>	MISSION REV DATE SECTION GROUP PAGE		
		APOLLO 17 FNL 9/1/72 GUIDANCE AND SYSTEMS CONTROL MANAGEMENT 15-4 Tape 52.6												

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
				SPEC	CIFIC MISSION RULES	-	
	15.00	LOCC OF EXTUEN NAC	ALL	CONT	INUE MISSION		1. REF MALF PROC:
	15-20	LOSS OF EITHER BMAG 1 OR 2 IN EITHER PITCH OR YAW CHANNEL	ALL	00111	THOE MISSION		G&C-1, 3, 4, AND 8
							SEC-1, 3, 3A, AND 6
							2. NO SCS AUTO TVC
							3. IF IN YAW CHANNEL, AFTER .05G RSI IS UNABLE IF REMAINING GYRO IS SELECTED FOR RATE. RSI MUST BE REALIGNED, IN ADDITION TO THE ABOVE, FOR YAW FAILURE AFTER .05G.
	15-21	LOSS OF BOTH BMAG 1 AND 2 IN EITHER PITCH OR YAW CHANNEL	LAUNCH	A. <u>C</u>	ONTINUE MISSION		A. MTVC ACCEL CMD IS ONLY MODE III OR MODE IV SPS CONTROL MODE.
			TLC	B. <u>N</u>	O-GO FOR LOI		•
		· .	L0	-	O-GO FOR UNDOCKING		C. PLAN DPS TEI
					NTER NEXT BEST PTP I PS NOT AVAILABLE FOR		
	İ		DESCENT	D. <u>C</u>	ONTINUE MISSION		
			CSM EVA	i -	ONTINUE MISSION	NTCD	F. IN EARTH ORBIT, LOSS OF PITCH CHANNEL
			ALL OTHERS	' <u>N</u>	ERMINATE PHASE AND E	<u>.w.c.</u>	RESULTS IN ALL THREE DEORBIT METHODS BEING SUBJECTED TO SINGLE FAILURES IN THE G&N SYSTEM. THE YAW LOSS PRECLUDES HYBRID DEORBIT AND SUBJECTS BOTH REMAINING DEORBIT METHODS TO SINGLE FAILURES IN THE G&N SYSTEM
			ENTRY	G. <u>C</u>	CONTINUE MISSION		G. RSI AND SCS FDAI ROLL UNUSABLE WITH YAW CHANNEL FAILURES.
	15-22	LOSS OF ROLL BMAG					
		A. NUMBER ONE	ALL	A. <u>C</u>	CONTINUE MISSION		A.]. MANUAL ROLL ATTITUDE CONTROL REQUIRED IN
							2. FOR ENTRY, NO SCS FDAI ROLL. RSI VALID.
		B. NUMBER TWO	ALL	В. <u>С</u>	CONTINUE MISSION		B.1. USE OF ATT 1/RATE 2 AND LIM CYCLE MAY PROVIDE RATE DAMPED ATTITUDE HOLD WHEN RCS DAP IS NOT USED. GYRO PACKAGE 2 MUST BE POWERED DOWN TO EFFECT ATTITUDE HOLD IF FAILURE IS HARDOVER.
							SELECTION OF RATE 1 WILL PROVIDE BOTH RSI AND SCS FDAI ROLL FOR ENTRY. RSI MUST BE REALIGNED FOR ROLL FAILURE AFTE .05G.
			<u> </u>		<u> </u>		<u> </u>
-		MISSION APOLLO		9/1/72	SECTION GUIDANCE AND	GROUP SCS	PAGE
1		APOLLO	, I'IL	21.7.6	CONTROL		15-5 Tape 37.5

MISSION RULES

	RULE	CONDITION/MALFUNCT	ION	PHASE			RULING		CUES/N	OTES/COMME	ENTS
ŀ	5-23	LOSS OF BOTH ROLL BMAG'S		_AUNCH		_	ONTINUE MISSION				
١				0		1	NO-GO FOR TLI ENTER NEXT BEST PT				
l			-	TLC		C. <u>N</u>	DEORBIT NOT AVAILA 10-GO FOR LOI	BLE			LL OR RSI AVAILABLE FOR
l			Į,	POST RI	NDZ	D. E	NTER NEXT BEST PTP		ENTR	<i>1</i> .	
				ALL OTHERS		E. <u>C</u>	ONTINUE MISSION				
ļ	5-24	LOSS OF EITHER TVC									UAD/AXIS FOR HARDOVER
l		SERVO LOOP IN EITHER PITCH OR YAW AXIS								OOVER RECO	CKED AND TBD LBS/QUAD/AXIS VERY FOR DOCKED SPS
l	,]:	LAUNCH,	/E0	Α. <u>(</u>	CONTINUE MISSION				
						[ELECT 1 OR 2 ON TVC PRIVE SWITCH IN APPR IXIS				
		· .		TLC		(O FOR LOI IF REDUND AN BE MAINTAINED IN NERTIAL YAW AXIS				
			},	LO		c. <u>r</u>	O-GO FOR UNDOCKING		C. IN LU	JNAR ORBIT	, PLAN DPS TEI.
١							NTER NEXT BEST PTP PPS NOT AVAILABLE FO				
		:	1	DESCEN	T	D. <u>C</u>	CONTINUE MISSION				
١				ALL OTHERS		E. <u>1</u>	ERMINATE PHASE AND				
						<u> </u>	NTER NEXT BEST PTP				
ŀ	15-25	LOSS OF BOTH TVC SEF	vo	LAUNCH		Α. <u>α</u>	CONTINUE MISSION		A.1. REF	- MALF PRO	C G&C-1, G&N-4, SCS-A1
		Lours							LAN	MODE III NDING POIN FH SM-RCS.	OR IV CAPABILITY. LIMITED T CONTROL IN MODE III OR IV
l				EO		В. <u>Е</u>	NTER NEXT BEST PTP				
l						F	CS DEORBIT				
				TLC	_		IO-GO FOR LOI				
l			i	DESCEN ALL	T	-	CONTINUE MISSION ERMINATE PHASE AND		E TN 11	INAD ODDIT	, DO DPS TEI.
١				OTHERS		1 -	NTER NEXT BEST PTP			JAAN UNDII	, bu br3 ici.
	15-26	LOSS OF PROPORTIONAL CONTROL FROM:									
		A. EITHER RHC		ALL		A. <u>(</u>	CONTINUE MISSION				
						ļ	JSE REMAINING RHC				
		B. BOTH RHC'S	- 1	ALL		i -	CONTINUE MISSION USE DIRECT RCS OR AC	CFI	B. NO MT	IVC RATE 0	R MTVC ACCEL CMD CAPABILITY
		·					CMD FOR MANUAL MANEU				
1		MISS	ION	REV	DATE	L	SECTION	GROUP	Ļ	PAGE	<u> </u>

MISSION RULES

RULE CONDITION/MALPUNCTION 15-27 LOSS OF DIRECT RCS CONTROL FROM: A. ELTER RHC, AM OR ALL AKS B. BOTH RNC'S, SAME LAUNCH CSH EVA 3. CONTINUE MISSION ALL ALS SERVER RHC, AND OR ALL AKS CSH EVA 3. CONTINUE MISSION ALL ALS SERVER RHS REST PTP C. BOTH RNC'S, TWO AXES LUMAR STAY C. BOTH RNC'S, TWO AXES LUMAR STAY C. CONTINUE MISSION B. CONTROL IS REGAINED BY OPENING INS CP'S B. CONTROL IS REGAINED BY OPENING INS CP'S B. CONTROL IS REGAINED BY OPENING INS CP'S B. CONTROL IS REGAINED BY DEALING SUY CONTROL IS NOT RESTAINED C. CONTROL IS NOT RESTAI					
A. ETHER PIC. ANY OR ALL AKES B. BOTH RHC'S, SAME LAUNCH DESCENT CSM EVA A. CONTINUE MISSION CSM EVA A. CONTINUE MISSION CSM EVA A. TERMINATE PIMSE AND ENTER REXT BEST PTP CSM/EVA CSM/EVA CSM/EVA CSM/EVA CSM/EVA A. TERMINATE PIMSE AND ENTER REXT BEST PTP CSM/EVA	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
ALL AKES B. BOTH RRC'S, SAME ANTS CSM EVA ALL CSM EVA ALL CONTINUE MISSION C. BOTH RRC'S, TWO AKES LUNAR STAY C. BOTH RRC'S, TWO AKES LUNAR STAY C. BOTH RRC'S, TWO AKES LUNAR STAY C. BOTH RRC'S, TWO AKES LUNAR STAY C. DON'THUE MISSION ENTER NEXT BEST PTP CSM/EVA A. CONTRUL IS REGAINED BY OPENING ENS B. CONTRUL IS REGAINED BY PLACING S/C CONTRUL IS REGAINED BY PLACING S/C CONTRUL IS REGAINED BY PLACING S/C CONTRUC SIS DOT C. C. CONTRUC IS NOT REGAINED C. C. CONTRUC IS NOT REGAINED C. C. C. CONTRUC IS NOT REGAINED C. C. C. C. C. C. C. C. C. C. C. C. C. C	15-27				REF MALF PROC SCS 5
B. BOTH RIC'S, SAME ANIS CSM VAVA AL OTHERS C. BOTH RIC'S, TWO AXES LUMAR STAY C. BOTH RIC'S, TWO AXES LUMAR STAY C. BOTH RIC'S, TWO AXES LUMAR STAY C. BOTH RIC'S, TWO AXES LUMAR STAY C. BOTH RIC'S, TWO AXES LUMAR STAY C. CONTINUE MISSION 4. TERMINATE PHASE AND ENTER MEXT BEST PTP C. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION B. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION B. CONTINUE MISSION C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS NOT REGAINED C. CONTROL IS RECAINED BY PURLING YOU. C. CONTROL IS NOT REGAINED C. CONTROL IS NOT REGAINED DESCENT C. CONTINUE MISSION A. LONG YOU. A. CONTINUE MISSION A. ONE BY PURLING YOU. A. CONTINUE MISSION A. ONE BY PURLING YOU. A. CONTINUE MISSION A. ONE BY PURLING YOU. A. CONTINUE MISSION A. ONE BY PURLING YOU. A. CONTINUE MISSION A. ONE BY PURLING YOU. A. CONTINUE MISSION A. ONE BY PURL RICK BEST PTP USE DIRECT VULAGE AND DIRECT WAY. A. CONTINUE MISSION A. ONE BY PURL RICK BEST PTP USE DIRECT VULAGE AND DIRECT WAY. A. CONTINUE MISSION A. ONE BY PURL RICK BEST PTP USE DIRECT VULAGE AND DIRECT WAY. A. CONTINUE MISSION A. ONE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE VIOLATES DIRECT RCS REQUIREMENTS. B. S. FAILURE YOU. A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION A. CONTINUE MISSION			ALL	A. CONTINUE MISSION	
ALL OTHERS C. BOTH RHC'S, TWO AXES LUNAR STAY C. CONTINUE MISSION 15-28 COMPLETE LOSS OF AUTO ATTITUDE CONTROL IN PAIR CHARGES B. COMPLETE LOSS OF AUTO ATTITUDE CONTROL IN PAIR CHARGES B. CONTROL IS REGAINED BY OPENING ENG CO'S OF AUTO CONTROL SWITCH TO COMPLETE SOLUTION B. CONTROL IS REGAINED BY PEACING SC'C CONTROL SWITCH TO COMPLETE SOLUTION C. CONTROL IS NOT COMPLET		B. BOTH RHC'S, SAME	DESCENT	2. CONTINUE MISSION	
ATTITUDE CONTROL IN PITCH AND YAM CHANNELS A. CONTROL IS REGAINED BY OPENING EMS CB'S B. CONTROL IS REGAINED BY PLACING S/C CONTROL SHITCH TO CMC. C. CONTROL IS NOT REGAINED BY PLACING S/C CONTROL SHITCH TO CMC. C. CONTROL IS NOT REGAINED B. CONTROL IS NOT REGAINED B. CONTROL IS NOT REGAINED B. CONTINUE MISSION CSM/EVA ALL OTHERS B. CONTINUE MISSION CSM/EVA ALL OTHERS C.1. CONTINUE MISSION C.2. CONTINUE MISSION C.3. FAILURE VIOLATES RATE DAMPING REQUIREMENTS. C.3. FAILURE VIOLATES RATE DAMPING REQUIREMENTS. REF MALF PROC GAC-1,2,3,4,5, AND 6 A. CONTINUE MISSION DESCENT LUNAR STAV CSM EVA ALL A. CONTINUE MISSION C.3. FAILURE VIOLATES RATE DAMPING C.3. FAILURE VIOLATES RATE DAMPING REGUIREMENTS. REF MALF PROC GAC-1,2,3,4,5, AND 6 A. CONTINUE MISSION LUNAR STAV CSM EVA ALL ALC OTHERS CSM EVA ALL OTHERS CSM EVA ALL OTHERS CSM EVA ALL OTHERS CONTINUE MISSION CSM EVA ALL CSM EVA ALL OTHERS CSM EVA ALL OTHERS CMTINUE MISSION CSM EVA ALL CSM EVA ALL OTHERS CMTINUE MISSION ENTER NEXT BEST PTP CSM EVA ALL OTHERS CMTINUE MISSION CSM EVA ALL OTHERS CMTINUE MISSION CSM EVA CSM EVA ALL OTHERS CMTINUE MISSION CSM EVA CSM EVA ALL OTHERS CMTINUE MISSION CSM EVA CMTINUE MISSION CSM EVA CMTINUE MISSION CSM EVA CMTINUE MISSION CSM EVA CMTINUE MISSION CMTINUE		C. BOTH RHC'S, TWO AXES	ALL OTHERS LUNAR STAY	4. TERMINATE PHASE AND ENTER NEXT BEST PTP C.1. TERMINATE PHASE AND ENTER NEXT BEST PTP	B.5. FAILURE VIOLATES DIRECT RCS REQUIREMEN
A. CONTROL IS REGAINED BY OPENING EMS CB'S B. CONTROL IS REGAINED BY PLACING 5/C CONTROL IS NOT C. CONTROL MISSION 2. CONTINUE MISSION ENTER NEXT BEST PTP USE DIRECT ULLAGE AND DIRECT RCS. C. CONTINUE MISSION T. C. 2. NO-GO FOR LOI 3. CONTINUE MISSION T. C. 2. NO-GO FOR LOI 3. CONTINUE MISSION 4. CONTINUE MISSION LUNAR STAY C. SM EVA ALL OTHERS 6. CONTINUE MISSION 6. TERMINATE PHASE AND ENTER NEXT BEST PTP B. S. IN LUNAR ORBIT, DO DPS TEI. ENTER NEXT BEST PTP	15-28	ATTITUDE CONTROL IN			SÚSPECTED FAILURE WOULD BE AUTO INHIBIT
BY PLACING SYTCH CONTROL SWITCH TO CMC. C. CONTROL IS NOT REGAINED ALL OTHERS ALL OTHERS A. ONE B. BOTH LAUNCH B. BOTH LAUNCH			ALL	AFTER SM JETTISON EMS MAY BE REENABLED WITHOUT LOSS	CIRCUIIRT.
CSM/EVA ALL OTHERS 2. CONTINUE MISSION 3. TERMINATE PHASE AND ENTER NEXT BEST PTP USE DIRECT ULLAGE AND DIRECT RCS. REF MALF PROC G&C-1,2,3,4,5, AND 6 REF MALF PROC G&C-1,		BY PLACING S/C CONTROL SWITCH TO	ALL	B. CONTINUE MISSION	B. NO SCS ATTITUDE CONTROL
A. ONE A. ONE B. BOTH LAUNCH LAUNCH LAUNCH LUC LUC LUNAR STAY CSM EVA ALL OTHERS A. CONTINUE MISSION CONTINUE MISSION CONTINUE MISSION ALL CONTINUE MISSION B. 5. IN LUNAR ORBIT, DO DPS TEI. ALL OTHERS OTHERS ALL OTHE			CSM/EVA	CONTINUE MISSION TERMINATE PHASE AND ENTER NEXT BEST PTP USE DIRECT ULLAGE AND	C.3. FAILURE VIOLATES RATE DAMPING REQUIREMENTS.
B. BOTH LAUNCH TLC 2. NO-GO FOR LOI DESCENT 3. CONTINUE MISSION LUNAR STAY CSM EVA ALL OTHERS 6. TERMINATE PHASE AND ENTER NEXT BEST PTP ENTER NEXT BEST PTP	15-29	ATTITUDE INDICATORS			REF MALF PROC G&C-1,2,3,4,5, AND 6
OTHERS ENTER NEXT BEST PTP		i	LAUNCH TLC DESCENT LUNAR STAY	B. 1. CONTINUE MISSION 2. NO-GO FOR LOI 3. CONTINUE MISSION 4. CONTINUE MISSION	B.5. IN LUNAR ORBIT, DO DPS TEI.
MISSION REV DATE SECTION GROUP PAGE			ALL OTHERS		
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MISSION RULES

R	RULE	CONDITION/MALFU	NCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
	15-30	LOSS OF ACT PHAS	E A					1. LOSS OF AC1 PH	HASE A RESULTS IN THE LOSS O
								(A) REDUNDANT SERVO LOOF SAME BUS.	SERVO LOOP POWER. BOTH PS MUST BE POWERED BY THE
								(B) PROPORTION BOTH RHC'S FROM RHC N	VAL ATTITUDE CONTROL FROM S. ALL PROPORTIONAL CONTROL NO. 1.
			·					(C) FDAI NO. 1	
								(D) GYRO ASSEM	MBLY NO. 1
								(E) SCS TOTAL	ATTITUDE ERROR
								(F) SCS TOTAL	ATTITUDE
	,							(G) SCS AUTO 1	
						•			IM IMPULSE CAPABILITY
									JDE CONTROL RATE DAMPING
								, ,	
l								(J) GPI P AND	
								. HYBRID DEORBI1	T, LOSS OF ACT PRECLUDES T AND SUBJECTS BOTH REMAINING OS TO A SINGLE FAILURE (AC2
				LAUNCH	A	. CONTINUE MISSION		•	
l				TLC		. NO-GO FOR LOI	·		
ŀ			1	DESCENT	- 1	. CONTINUE MISSION			
ļ			1	CSM EVA		. CONTINUE_MISSION			
				ALL OTH	- 1	. TERMINATE PHASE AND		E. IN LUNAR ORBIT	DO DOS TEI
			'			ENTER NEXT BEST PTP		E. IN EGIVIN GREIT	DO DI 3 121.
		!				ENTER HEAT DEST FIT			
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MISSION RULES

			7-	GOTDANCE AND CONTROL		T	
R RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
15-31	LOSS OF AC2 PHASE A	LAUNCH TLC DESCEN CSM EV ALL OT	B. T C. A D. HERS E.	CONTINUE MISSION NO-GO FOR LOI CONTINUE MISSION CONTINUE MISSION TERMINATE PHASE AND ENTER NEXT BEST PTP		LOSS OF: (A) REDUNDANT (B) ALL PROPO (C) FDAI NO. (D) GYRO ASSE (E) SCS PITCH (F) ALL SCS T AND ACCEL (G) RSI (H) GPI P AND 2. IN EARTH ORBI ALL THREE DEO	MBLY NO. 2 AND YAW TOTAL ATTITUDE VC CAPABILITY (AUTO, RATE CMD) Y DRIVE NO. 2 T, LOSS OF AC2 RESULTS IN RBIT METHODS BEING SUBJECTE AILURE (AC1 PHASE A).
15-32°	LOSS OF ORBIT RATE DISPLAY (ORDEAL) EARTH AND LUNAR	ALL	CON	ITINUE MISSION		REF MALF PROC G&	C-4 AND 5
15-33	LOSS OF ENTRY MONITOR SYSTEM	ALL	CON	ITINUE MISSION		REF MALF PROC EM	S-1
15-34	GROUND AT EITHER SPS SOL DRIVER OUTPUT AND UNABLE TO REMOVE	ALL	l	ITINUE MISSION N SPS PILOT VALVE CE	3'S	REF MALF PROC G&	C-1
		1		T		<u> </u>	· · · · · · · · · · · · · · · · · · ·
	MISSION APOLLO 17	REV	9/1/72	SECTION GUIDANCE AND	GROUP SCS	PAGE	
	APULLU 17	1'''	- 1116	CONTROL	303	15-9	Tape 38.

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	↓	RULING		CUES/NOTES	COMMEN	rs 	
	15-35	LOSS OF TRANSLATION	LAUNCH	A. <u>c</u> o	NTINUE MISSION					
		HAND CONTROLLER	EARTH ORBIT	1	TER NEXT BEST PTP		B. VIOLATE MINIMUM	S BOTH S REQUIRE	M AND HYBRID MENTS.	DEORBIT
1			TLC	c. <u>co</u>	NTINUE MISSION					
١			LO	D. <u>NO</u>	-GO FOR UNDOCKING		D. VIOLATE	S LM RES	CUE MINIMUM	REQUIREMENTS.
			UNDOCKED	E. <u>DO</u>	<u>ck</u>					
		·	ALL OTHER	s F. <u>co</u>	NTINUE MISSION					
	15-36	COMPLETE LOSS OF RHC								
	15-36	A. ONE RHC	ALL	A. CC	ONTINUE MISSION					
		B. BOTH RHC'S	LAUNCH		CONTINUE MISSION					
		b. Both Allo 3	TLC	1	NO-GO FOR LOI					
			DESCENT	1	CONTINUE MISSION					
			LUNAR		CONTINUE MISSION					
			STAY CSM EVA	5.	CONTINUE MISSION					
			ALL OTHER	S 6.	ENTER NEXT BEST PTP					
		·								
		RULE NUMBERS 15-37 THROUGH 15-49 ARE RESERVED.								
	<u> </u> - -									
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		MISSIO		TE 0.41.470	SECTION SECTION	GROUP SCS		AGE		
-		APOLLO	17 FNL	9/1/72	GUIDANCE AND CONTROL	JUJ		15-10		Tape 38.3

MISSION RULES

RU	ILE	CONDITION/MALFUNCTION	PHASE			RULING		[TES/COMME	YTS
15-5	50	LOSS OF COMMAND MODULE						REF MALF	PROC G&N-	5
	ļ	COMPUTER	LAUNCH		Δ CO	NTINUE MISSION				
			EO		B. CO	NTINUE ALTERNATE EO SSION IF BOTH SPS AF ORBIT CAPABILITY AV			TES HYBRIC REMENTS	DEORBIT MINIMUM
			TLC		c. co	NTINUE MISSION IF LA S AVAILABLE				
			LO		EN	-GO FOR UNDOCKING TER NEXT BEST PTP II		D. IN LUI	NAR ORBIT,	, PLANS DPS TEI
			UNDOCKE		DP E. <u>DO</u>	S NOT AVAILABLE FOR CK	TEI	E. VIOLAT	TES LM RES	CUE MINIMUM REQUIREMENTS
			POST DO			NTINUE MISSION TAIN LM ASCENT STG		G. USE LI	M FOR COMM	1 B/U
			CSM EVA			NTINUE MISSION RFORM BACKUP ENTRY				
			ALL OTH	ERS		RMINATE PHASE AND			DERATION W UNAR STAY	VILL BE GIVEN TO COMPLETING PHASE
15-	51	LOSS OF DSKY					•	REF MALF	PROC G&N-	-5
		A. EITHER MDC OR LEB DSKY	ALL		A. <u>CC</u>	NTINUE MISSION				
		B. BOTH MDC AND LEB	LAUNCH		в.1.	CONTINUE MISSION				
		55.11	EO			CONTINUE ALTERNATE MISSION IF BOTH SPS SM DEORBIT CAPABILI AVAILABLE	AND		LATES HYBF UIREMENTS	RID DEORBIT MINIMUM
			TLC		3.	CONTINUE MISSION IF	LM			
	i		LO		4.	NO-GO FOR UNDOCKING ENTER NEXT BEST PTP	IF LM	4. PLA	N DPS TEI	
			UNDOCK			DPS NOT AVAILABLE F	OR TEI	5. VIO	LATES LM I	RESCUE MINIMUM REQUIREMENTS
			POST D			CONTINUE MISSION RETAIN LM ASCENT ST	<u>G</u>	7. USE	LM FOR CO	OMM B/U
			ENTRY ALL OT	HERS		PERFORM BACKUP ENTR	_		SIDERATION LUNAR STA	N WILL BE GIVEN TO COMPLETING
						ENTER NEXT BEST PTP	-		Edital 311	11 111/32
						,				
		MISSION		DATE		SECTION	GROUP		PAGE	
		APOLLO	17 FNL	9/1	112	GUIDANCE AND CONTROL	G&N		15-11	Tape 65.7

MISSION RULES

₹	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
	15-52	LOSS OF INERTIAL					REF MALF PROC G&N-	6
١	10 02	SUBSYSTEM					NET MALE PROC GAM-	o
		!	LAUNCH	_	ONTINUE MISSION			
			EO	MI	ONTINUE ALTERNATE EO ISSION IF BOTH SPS A CORBIT CAPABILITY AV	ND SM	B. VIOLATES HYBRIG REQUIREMENTS	DEORBIT MINIMUM
ļ			TLC	C. NO	O-GO FOR LOI		-	
İ			LO	-	NTER NEXT BEST PTP		D. IN LUNAR ORBIT,	DO DPS TEI
ı			UNDOCKED	E. <u>DC</u>			E. VIOLATES LM RES	CUE REQUIREMENTS
			DESCENT	-	ONTINUE MISSION			
-			POST DOCK		ETAIN LM ASCENT STG		G. USE LM G&N TO M	IUNITOR BURNS
			ENTRY		ERFORM BACKUP ENTRY			
١			1		ERMINATE PHASE AND E	NTER	J. VIOLATES LM RES	CUE MINIMUM REQUIREMENTS
					EXT BEST PTP			
	15-53	LOSS OF OPTICS SUBSYSTEM	ALL	CONT	INUE MISSION		REF MALF PROC G&N-	5
				USE E	BACKUP ALIGNMENT PRO S)	CEDURE	:	
	15-54	LOSS OF OPTICS SUBSYSTEM COUPLING					REF MALF PROC G&C-	1
		DATA UNIT DIGITAL-TO- ANALOG CONVERTER					CONSTITUTES LOSS O	F TVC DAP
			LAUNCH	A. <u>CC</u>	ONTINUE MISSION			
			E0	в. сс	ONTINUE MISSION			
			TLC	c. <u>cc</u>	ONTINUE MISSION			
			LO	D. <u>N</u> C	O-GO FOR UNDOCKING		D. IN LUNAR ORBIT,	PLAN DPS TEI.
				E.N DF	NTER NEXT BEST PTP I PS NOT AVAILABLE FOR	F LM Tei		
			UNDOCKED	E. <u>D</u> (оск			
			DESCENT	F. <u>cc</u>	ONTINUE MISSION			
			CSM EVA	G. <u>CC</u>	ONTINUE MISSION			
			ALL OTHERS	н. т	ERMINATE PHASE AND E	NTER		
				NE	EXT BEST PTP			
						·		
j		RULE NUMBERS 15-55						
		THROUGH 15-59 ARE RESERVED.						
	<u></u>							
		MISSION	REV DAT		SECTION	GROUP	PAGE	
		APOLLO 13	7 FNL 9/	1/72	GUIDANCE AND	G&N	1	

MISSION RULES

		INST	RUMENTATION REG	QUIREMENTS		
15-60	MEAS DESCRIPTION	<u>PCM</u>	ONBOARD	TRANSDUCERS	CATEGORY	MSN RULE <u>REFERENCE</u>
	CMC DIGITAL DATA	CG0001 V	-	-	MANDATORY	15-50
ļ	SPS SOL DRIVER 1 SPS SOL DRIVER 2	CH3604X CH3605X	EMS-SPS-ON EMS-SPS-ON	SEPARATE SEPARATE	HIGHLY DESIRABLE HIGHLY DESIRABLE	15-34 15-34
	PITCH GIMBAL POS 1 & 2	СН3517Н	GPI	COMMON	1 OF 2 MANDATORY	15-24,25
	YAW GIMBAL POS 1 & 2	СН3518Н	GPI	COMMON	ONBOARD/HD-PCM 1 OF 2 MANDATORY ONBOARD/HD-PCM	15-24,25
	TM BIAS 2.5 VDC PIPA TEMP IMU HTR +28 VDC CMC OPERATE +28 VDC OPTX OPERATE +28 VAC	CG1110V CG2300T CH1513X CG1523X CG1533X	- - - -	·	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	15-52,53,54 15-52 15-52 15-50 15-54
	IG 1X RSVR OUT SIN IG 1X RSVR OUT COS MG 1X RSVR OUT SIN MG 1X RSVR OUT COS OG 1X RSVR OUT SIN OG 1X RSVR OUT COS	CG2112V CG2113V CG2142V CG2143V CG2172V CG2173V	FDAI FDAI FDAI FDAI FDAI FDAI	COMMON COMMON COMMON COMMON COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	15-52 15-52 15-52 15-52 15-52 15-52
	SHAFT CDU DAC OUT TRUNNION CDU DAC OUT	CG3721V CG3722V	<u>-</u>	-	HIGHLY DESIRABLE HIGHLY DESIRABLE	15-54 15-54
	CMC WARNING	CG5040X	C&W	COMMON	HIGHLY DESIRABLE	15-50
ŕ	PITCH ATT ERROR YAW ATT ERROR ROLL ATT ERROR	CH3500H CH3501H CH3502H	FDAI FDAI FDAI	COMMON COMMON COMMON	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	15-20,21,22,23 15-20,21,22,23 15-20,21,22,23
-	SCS PITCH BODY RATE SCS YAW BODY RATE SCS ROLL BODY RATE SCS TVC PITCH AUTO CMD SCS TVC YAW AUTO CMD MTVC PITCH CMD MTVC YAW CMD	CH3503R CH3504R CH3505R CH3582V CH3583V CH3585H CH3586H	FDAI FDAI FDAI - - - -	COMMON COMMON COMMON - - - -	HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE HIGHLY DESIRABLE	15-20,21,22,23 15-20,21,22,23 15-20,21,22,23 15-24,25 15-24,25 15-24,25 15-24,25
	FDAI ERROR 5, RATE 5 FDAI ERROR 50/15,	CH3592X CH3593X	-	-	HIGHLY DESIRABLE HIGHLY DESIRABLE	15-20,21,22,23 15-20,21,22,23
	RATE 50/10 PITCH DIFF CLUTCH CUR YAW DIFF CLUTCH CUR	CH3666C CH3667C	- -	- -	HIGHLY DESIRABLE HIGHLY DESIRABLE	15-24,25 15-24,25

MISSION RULES

	SECTION 16 - CSM SPS
ITEM	
	GENERAL
	
16-1	A. <u>CATEGORIES OF FAILURES</u>
	FAILURES AFFECTING THE SPS FALL INTO ONE OF THREE CATEGORIES:
	1. FAILURES WHICH CAUSE THE SPS TO BE UNSAFE: THESE FAILURES RESULT IN MISSION TERMINATION ASAP.
	2. FAILURES WHICH CAUSE THE SPS TO BE INOPERABLE OR HAZARDOUS TO OPERATE: THESE FAILURES RESULT IN ALTERATION OF THE MISSION TO MINIMIZE USAGE OF THE SPS.
	 FAILURES SUCH THAT CONTINUED OPERATION WILL RESULT IN SUBSEQUENT DEGRADATION: THESE FAILURES ALLOW PERFORMANCE OF CRITICAL BURNS ONLY.
	B. <u>ULLAGE REQUIREMENTS</u>
	SUBSEQUENT TO THE DEPLETION OF STORAGE TANK PROPELLANTS, AN ULLAGE MANEUVER WILL NORMALLY BE PERFORMED PRIOR TO ANY BURN. HOWEVER, INABILITY TO PERFORM AN ULLAGE WILL NOT PRECLUDE A CRITICAL BURN.
	C. PREMATURE TERMINATION OF BURNS
	CRITICAL BURNS WILL NOT BE TERMINATED BECAUSE OF ANOMALIES. NON-CRITICAL BURNS WILL BE TERMINATED UNDER VARIOUS CONDITIONS AS SPECIFIED IN RULE 3-86 AND THE SPECIFIC RULES OF THIS SECTION.
	N <u>OTE</u> A CRITICAL BURN IS DEFINED AS AN SPS BURN THAT IS REQUIRED FOR THE SAFE RETURN OF THE CREW.
16-2	LAUNCH PHASE
	THERE ARE NO SPS FAILURES WHICH REQUIRE A LAUNCH ABORT.
16-3	RESERVED
	MISSION REV DATE SECTION GROUP PAGE
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MISSION RULES

. 1					SECTION	16 - CSM SPS - CONTI	INUED		
R	ITEM								
	16-4	EARTH ORBIT PHA	<u>ISE</u>						
			IRNS, THE MISS			/, APOGEE KICK AND I MINATED BY ENTRY INT			PABLE OF PERFORMING M-RCS OR HYBRID
						ON-CRITICAL BURNS, T THE SPS MAY BE USED			SUITABLE EARTH ORBIT
			PROVIDE THE ORBIT SHAPIN		CAPABILIT	Y TO DEORBIT FROM AN	NY POINT IN THIS PI	HASE, THE	LM DPS AND LM RCS MAY
	16-5	TRANSLUNAR COAS	ST PHASE						
		A. CRITICAL BU OR LAND IMP		PHASE	ARE TIME-C	RITICAL ABORTS, BURN	NS TO ASSURE FREE I	RETURN, OR	BURNS TO AVOID LUNAR
	; ;	B. CERTAIN ABO	DRT BURNS, BUF	RNS TO	ASSURE FRI	EE RETURN OR BURNS 1	TO AVOID LÚNAR OR I	AND IMPAC	T MAY USE THE LM DPS AND
	16-6	LUNAR ORBIT PHA	ASE_						
		A. TEI IS THE	ONLY CRITICAL	BURN	IN THIS P	HASE.			
		B. LM DPS MAY	BE USED FOR T	TEI IF	THE CAPAB	ILITY EXISTS.			
		C. TERMINATE F	PHASE FOR LOSS	S OF S	PS REDUNDAI	NCY WHEN DPS IS NOT	AVAILABLE FOR TEI		
	16-7	DESCENT PHASE							
		THE LM POWERED	DESCENT WILL	BE AB	ORTED FOR	SPS PROPELLANT LEAKS	5.		
	16-8	UNDOCKED AND LL	JNAR STAY PHAS	SES.					
		A. THE LUNAR O	ORBIT PLANE CH	HANGE	IS A CRITIO	CAL BURN IF OUTSIDE	TOTAL LM CAPABILIT	ΓΥ.	
		B. THESE PHASE	ES WILL BE TER	RMINAT	ED FOR CON	FIRMED LOSS OF SPS F	REDUNDANCY.		
		C. LUNAR STAY	WILL BE ABORT	TED AT	T1 FOR SP	S PROPELLANT LEAKS.			
	<u></u>		MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	CSM SPS	GENERAL	16-2	Tape 57.11

MISSION RULES

R	ITEM								
	16-9	ASCENT PHASE							
ļ		LM RESCUE BURNS	MAY BE REQUI	RED, A	AND THEY AR	RE CRITICAL.			
	16 10	TRANSCAPTU COAC	r Duace						
	16-10	A. CRITICAL BUI		HASE /	ARE MIDCOUF	RSE CORRECTIONS TO A	TTAIN THE PROPER E	NTRY CORRI	DOR WHICH ARE OUTSIDE
		SM-SCS CAPAI		VEN T	DEDECOM*	IO TUE COM EVA FOR C	DC DDODELLANT LEAK	c curt i	IND CARAN CONTANTIATION
		1				WILL BE EVALUATED I		5. 5011 /	ND CABIN CONTAMINATION
	16-11	CONSIDERATION W	ILL BE GIVEN	TO RE	TAINING THE	E LM ASCENT STAGE TO	GAIN ADDITIONAL A	V FOR CERT	TAIN SPS FAILURES
				,,,,,,					ALL S. S. WILLIAMS
		:							
	!								
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	CSM SPS	GENERAL	16-3	Tape 58.1

MISSION RULES

		SECTION 16 - CSM SPS - CONTINUED
R	ITEM	
		SYSTEMS MANAGEMENT
	16-12	PROPELLANT GAGING
		A. FOR BURNS LESS THAN 25 SECONDS DURATION:
		1. PRIME METHOD: IMU AV OBTAINED 2. BACKUP METHOD: FLOW RATE X BURN TIME
		B. FOR BURNS GREATER THAN 25 SECONDS DURATION:
		1. PRIME METHOD: IMU AV OBTAINED
		2. BACKUP METHOD: ONBOARD GAGING SYSTEM
	16-13	THE PU VALVE WILL BE USED TO MAINTAIN THE UNBALANCE READING:
		A. PRIOR TO CROSSOVER: WITHIN ±50 LBS OF THE STABLE VALUE OCCURRING APPROXIMATELY 25 SEC AFTER LOI IGNITION.
		B. AFTER CROSSOVER: WITH ±100 LBS OF ZERO UNBALANCE.
	16-14	DUAL BANK VS SINGLE BANK OPERATION
		THE SPS WILL ALWAYS BE STARTED USING A SINGLE BANK. HOWEVER, THE OTHER BANK WILL BE OPENED 2 TO 5 SECONDS AFTER IGNITION FOR BURNS PLANNED TO BE LONGER THAN 10 SECONDS.
		The second secon
	16-15	PROPELLANT MANAGEMENT
		DELETED
_		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 CSM SPS MANAGEMENT 16-4 Tape 52.7

MISSION RULES

_					ECTION 10	- CSM SPS - CONTI	NOED		
17	TEM								
16	-16	PROPELLANT FE	EDLINE TEMPERA	TURE M	IANAGEMENT				
			ERS WILL BE MAI TURE ABOVE 45°		CYCLED TO	MAINTAIN FEEDLIN	E TEMPERATURES BET	WEEN 45° F A	AND 75° F AND ENGINE
		RULE NUMBERS	16-17 THROUGH	16-19	ARE RESERV	ED.			
:									
						•			
		· .							
					•				
	,								
									
			MISSION	REV	DATE	SECTION	GROUP	PAGE	

MISSION RULES

+	RULE	CONDITION/MALFUNCTION	PHASE	RULING	CUES/NOTES/COMMENTS
				SPECIFIC MISSION RULES	
	16-20	SUSTAINED PRESSURE			MALF PROC SPS 1B
		EITHER THE FUEL OR OXIDIZER TANK (COULD BE			REF MR 3-86 MANEUVER TABLE
İ		HELIUM OR FUEL OR OXIDIZER)			MANUAL PRESSURIZATION OF THE TANKS SHOULD E CONSIDERED PRIOR TO ANY REQUIRED SPS BURN.
١			LAUNCH	CONTINUE MISSION	NOTE:
				PLAN RCS DEORBIT AT NEXT	BEST SUSTAINED PRESSURE DECAY IS DEFINED AS A DECREASE OF AT LEAST 4 PSI, NOT ATTRIBUTABLE
				IF LAND IMPACT IS IMMINED AFTER ABORTING, REPRESS MANUALLY AND PERFORM BURN AVOID LAND.	TO HELIUM ABSORPTION AND/OR THERMAL EFFECTS
			EO	ENTER NEXT BEST PTP	
	ĺ			RCS DEORBIT	
ı		•	TLC	NO-GO FOR LOI-	
				INHIBIT NON-CRITICAL SPS	BURNS
			ro	ENTER NEXT BEST PTP	
			UNDOCKED	USE DPS IF CAPABILITY EX	
			DESCENT	DOCK ASAP ABORT	DO NOT STAGE LM
			LUNAR	RETURN TO CSM ASAP	
			TEC	CONTINUE MISSION	
				INHIBIT NON-CRITICAL BURN	ıs
			CSM EVA	CONTINUE MISSION	CONSIDERATION WILL BE GIVEN TO CONTINUING
ŀ		A. DURING NON-CRITICAL BURN (PRESS LESS THAN OR EQUAL TO	ALL	A. <u>TERMINATE BURN</u>	BASED ON AMOUNT OF CONTAMINANTS
١		160 PSIA) B. DURING CRITICAL BURN	ALL	B. CONTINUE BURN	
۱					
			:		
١	16-21	LOSS OF ONE GN2 TANK PRESSURE (LESS THAN 400 PSI)			MALF PROC SPS 9 TRANSDUCER INDICATION CANNOT BE VERIFIED
١		,,			WITHOUT ENGINE OPERATION.
			EO	A. CONTINUE MISSION	eue l
١			ALL OTHERS	B.1. VERIFY OPERATION OF ON SUSPECT BANK	202-
				2. IF LOSS CONFIRMED B ENGINE OPERATION, RI MR 16-22.	
		MISSION	REV DATE	SECTION	GROUP PAGE
		APOLLO 17	FNL 9/1,		SPECIFIC 16-6 Tape 65.10

MISSION RULES

_			•						
R	RULE	CONDITION/MALFUNCTION	PHASE	<u> </u>	RULING		CUES/NOT	ES/COMME	NTS
1	ŀ								
ין	16-22	LOSS OF ONE BANK OF BALL VALVES					MALF PROC	SPS-9	
ı			LAUNCH/ E0	A. <u>C</u>	NOISSIM BUNITHO				
1	ŀ		TLC	B. C	ONTINUE MISSION				
١					F DPS AVAILABLE				
			L0	C. <u>N</u>	D-GO FOR UNDOCKING		C. PLAN D	PS TEI	
l	:				NTER NEXT BEST PTP I PS NOT AVAILABLE FOR				
			UNDOCKED/ DESCENT	D. N,	/A				
			LUNAR STAY	Ε. <u>Ε</u> Ι	NTER NEXT BEST PTP				
	16-23	LOSS OF BOTH GN2 TANK					MALF PROC	SPS 9	
		PRESSURE (LESS THAN 400 PSIA)					WITHOUT E		TION CANNOT BE VERIFIED ERATION.
	1		LAUNCH	A. <u>C</u>	ONTINUE MISSION		•		
١			EO	Β. <u>ε</u>	NTER NEXT BEST PTP				
١				R	CS DEORBIT				
١			TLC	C. <u>N</u>	O-GO FOR LOI				
ı			LO	D. <u>E</u>	NTER NEXT BEST PTP		D. DO DPS	TEI.	
ļ			UNDOCKED	E. <u>D</u>	OCK ASAP		E. DO NOT	STAGE L	M
			DESCENT	-	ONTINUE MISSION				
١			LUNAR STAY		ETURN TO CSM AND PER ET ASAP	RFORM			
			TEC	н. <u>с</u>	ONTINUE MISSION				
١									
١	16-24	FUEL FEEDLINE AND/OR OXIDIZER FEEDLINE TEMP					MALF PROC		
١		LESS THAN 40° F AND UNABLE TO INCREASE.					LIMITATIO	N FOR CR	ITICAL BURNS IS 25° F.
١			LAUNCH	-	ONTINUE MISSION				
-			EO		NTER NEXT BEST PTP				
١				i	CS DEORBIT				
			TLC	-	O-GO FOR LOI/DOI		D DA BBG	. TET	
			F0	1 ~	NTER NEXT BEST PTP		D. DO DPS	ti.	
			DESCENT	1 -	OCK ASAP		F. DO NOT	T STAGE !	м
			LUNAR	1	CONTINUE MISSION RETURN TO CSM ASAP	İ	1. 50 1101	JINGE E	
			STAY	" 5	L. Chi To OSH NORE				
			TEC	н. <u>с</u>	CONTINUE MISSION				
j									
					T	I			
		MISSION APOLLO 1	7 FNL 9	TE /1/72	SECTION CSM SPS	GROUP SPECIFI		PAGE 16-7	Tape 65.5

MISSION RULES

_	·			-	0 - CSM SFS - CONTI				
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES	COMMEN	TS
	16-25	ENGINE FLANGE TEMP GOES HIGHER THAN 480° F DURING AN SPS BURN A. DURING NON-CRITICAL BURN B. DURING CRITICAL BURN	LAUNCH EO TLC LO	ENTE RCS NO-G ENTE USE A. T B B. C	APPLICABLE R NEXT BEST PTP DEORBIT O FOR LOI/DOI/PDI R NEXT BEST PTP DPS IF AVAILABLE ERMINATE BURN NHIBIT FURTHER NON-IURNS				
	16-26	THRUST CHAMBER PRESSURE LESS THAN 70 PSI CONFIRMED BY OTHER INSTRUMENTATION	LAUNCH EO	A. N	NHIBIT FURTHER NON- URNS OT APPLICABLE	CRITICAL	MALF PROC CONFIRMING PC METER, INTERFACE AND OX TAI	INSTRU CREW, D PRESSUR	MENTATION INCLUDES ONBOARD BEGRADED THRUST, FU AND OX BES, F/O VALVE POSITIONS, FU BURES.
			TLC LO UNDOCKI ALL OTHERS	C. <u>N</u> D. <u>E</u> F. <u>C</u>	CCS DEORBIT NO-GO FOR LOI/DOI/PD ENTER NEXT BEST PTP DOCK CONTINUE MISSION	<u>I</u>	D. DO DPS		AVAILABLE.
		A. DURING NON-CRITICAL BURN B. DURING CRITICAL BURN		<u>CC</u>	ERMINATE BURN NHIBIT FURTHER NON-C URNS ONTINUE BURN NHIBIT FURTHER NON-C				
					JRNS .	A VIII			
卜		MISSION	REV	DATE	SECTION	GROUP	P.	AGE	
		APOLLO 1	-	9/1/72	CSM SPS	SPECII		6-8	Tape 39.8
L						L			

MISSION RULES

SECTION 16 - CSM SPS - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RUL I NG	CL	JES/NOTES/COMMENTS	
	16-27	RESERVED						
	16-28	ΔP BETWEEN FUEL AND OX TANK PRESSURES GREATER THAN 20 PSI AND UNABLE TO DECREASE	LAUNCH EO TLC LO UNDOCKED	B. <u>EN</u> RC C. <u>NO</u> D. <u>EN</u>	INTINUE MISSION ITER NEXT BEST PTP IS DEORBIT I-GO FOR LOI ITER NEXT BEST PTP ICK ASAP		F PROC SPS 1C	•
		A. DURING NON-CRITICAL BURN	ALL OTHERS	<u>TER</u>	INTINUE MISSION IMINATE BURN IIBIT FURTHER NON-CRI INS	TICAL		
		B. DURING CRITICAL BURN			ITINUE BURN IIBIT FURTHER NON-CRI INS	TICAL		
		MISSION	REV [DATE	SECTION	GROUP	PAGE	
_		APOLLO 17		9/1/72	CSM SPS	SPECIFIC	16-9	Tape 65.6

MISSION RULES

SECTION 16 - CSM SPS - CONTINUED

R	RULE	CONDITION/MALFUNCT	TION P	PHASE	T	RULING		CUES/NOTES/COMME	NTS	
Ë	NOLL	CONDITION				NOETHG		COEST NOTEST CONTE		
	16-29	LEAK OR COMPLETE LO OF HELIUM SUPPLY PRESSURE OR BOTH HELIUM VALVES FAIL CLOSED						BLOWDOWN AV REMAI ULLAGE VOLUME AT MALF PROC SPS 7 A		
				AUNCH	1	ONTINUE MISSION				
			EC	0		D-GO FOR TLI				
					SI	ONTINUE MISSION IN E JFFICIENT ULLAGE BLC DWN ∆V CAPABILITY EX	W-			
			TL	LC		D-GO FOR LOI				
			LC)		D-GO FOR UNDOCKING		D. PLAN DPS TEI		
						NTER NEXT BEST PTP I PS NOT AVAILABLE FOR				
			UN	NDOCKE	D E. <u>D</u>	OCK ASAP				
			AL OT	LL Thers	F. <u>CC</u>	ONTINUE MISSION	j			
					I!	NHIBIT NON-CRITICAL	BURNS			
		RULE NUMBERS 16-30					İ			
		THROUGH 16-49 ARE RESERVED.								
			İ							
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-	1	MI	SSION	REV	DATE	SECTION	GROUP	PAGE		
-				FNL	9/1/72	CSM SPS	SPECIFI		Tape	39.10
								1		

MISSION RULES

SECTION 16 - CSM SPS - CONCLUDED

		TNCTDI	MENTATION DECISIONENT	c		
			MENTATION REQUIREMENT	·		
16-50	MEAS DESCRIPTION	PCM	<u>onboard</u>	TRANSDUCERS	CATEGORY	MSN RULE Reference
	OX TK PRESS OX TK PRESS OX SM/ENG INTERFACE P	SP0003P SP0033P SP0931P	METER/C&W METER/C&W	COMMON]	1 OF 2 M O/B	16-20,28 16-20,28 16-20,29
	FU TK PRESS FU TK PRESS FU SM/ENG INTERFACE P	SP0006P SP0066P SP0930P	METER/C&W METER/C&W	COMMON COMMON	1 OF 2 M O/B HD	16-20,28 16-20,28 16-20,28
	SPS VLV ACT PRESS-PRI SPS VLV ACT PRESS-SEC	SP0600P SP0601P	METER METER	COMMON COMMON	M O/B OR PCM M O/B OR PCM	16-21,22 16-21,22
	SPS FU FEEDLINE TEMP SPS OX FEEDLINE TEMP	SP0048T SP0049T	METER SYS TEST	COMMON COMMON	HD HD	16-24
1	ENG CHAMBER PRESS	SP0661P	METER	COMMON	M 0/B	16-26
	He TK PRESS	SP0001P	METER	SEPARATE	1 OF 2 M	16-29
	FU/OX VLV 1 POS FU/OX VLV 2 POS	SP0022H SP0023H	DISPLAY DISPLAY	SEPARATE SEPARATE	1 OF 2 M 1 OF 2 M	16-21,26 16-21,26
	FU/OX VLV 3 POS FU/OX VLV 4 POS	SP 0024 H SP0025H	DISPLAY DISPLAY	SEPARATE SEPARATE	1 OF 2 M 1 OF 2 M	16-21,26 16-21,26
	OX TK 1 QTY - TOTAL AUX OX TK 2 QTY FU TK 1 QTY - TOTAL AUX FU TK 2 QTY	SP0655Q SP0656Q SP0657Q SP0658Q	DISPLAY DISPLAY DISPLAY DISPLAY	COMMON COMMON COMMON COMMON	HD HD HD	16-10,11,13 16-10,11,13 16-10,11,13 16-10,11,13
	ENG INJ FLANGE TEMP	SP0062T	-	-	HD	16-25

MISSION RULES

SECTION 17 - CSM SM-RCS

ITEM								
				-	GENERAL			
17-1	THE LOSS OF ONE TION OF FAILURES CONSIDERED CAUSE	WHICH LEAD ON	NUSE FO	R ABORT AN LOSS OF MU	D THERE ARE NO SI LTIPLE QUADS. TH	NGLE FAILURES NOR HERE ARE, THEREFOR	R ANY REASONABLE REA RE, NO SM-RCS FAILUF	ALISTIC COMBINA- RES WHICH ARE
17-2	EARTH ORBIT PHAS	<u>E</u>						our CUIDELINE IS
	THAT AS LONG	AS THE SPACE	CRAFT	S OF ONE O	HAD WILL REQUIRE	EARLY TERMINATION AND THE SPS CAN B TLI BE INHIBITED DEORBIT WILL BE AF	OF THE MISSION. T BE BURNED THE MISSIO AND MAY LEAD TO EAF FECTED.	ON NEED NOT BE
1	B. LOSS OF TWO	OR MORE QUADS	s is c	AUSE FOR EN	TRY INTO THE NEX	T BEST PTP.		LL BEOLITEE
1					AN THE CARABILIT	V TO PERFORM ULLA	GE MANEUVERS AND WI ECLUDES SM OR HYBRI	D DEORBIT.
	2. LOSS OF	TWO OPPOSITE	QUADS	WILL DEST	ROY THE CAPABILIT	Y TO PERFORM PREC	ISE THREE-AXIS ATTI	TUDE CONTROL
17-3		AD TO NOT CALL	SE FOR CONTRO	TLC TERMI	NATION OR LOI INH EE-AXIS TRANSLATI	IBIT. TD&E WILL (CONTINUE AS LONG AS	THE SM RCS CAN
17-4	LOSS OF ONE Q BE NO-GO BECA ORBIT OR LUNA	UAD IS NOT, IN USE LOSS OF ON R STAY PHASES OR ATTITUDE CO	NE QUAL , AND 1	S ALSO CAL	OR EARLY TERMINA CSM ACTIVE DOCK ISE FOR PERFORMIN	TION OF LUNAR ORBI ING. LOSS OF TWO G TEI WITH THE LM	IT OR LUNAR STAY PHA QUADS IS CAUSE FOR DPS OR RETAINING TI	ASES. UNDOCKING WIL TERMINATING LUNAR HE LM ASCENT STAGE
17-						WATER FOR THE FOL	IOWING FAILURES:	
	THE CSM EVA	WILL BE NO-GO	OR, IF	IN PROGRE	SS, WILL BE TERM.	NATED FOR THE FOL	LONING	
	A. DELETED B. LOSS OF	ANY ONE OF THI	RUSTERS	S C2 AND D2	2, C3, C4, C1 AND	D1, D3, D4 IF LM	RCS CANNOT BE USED	FOR ATTITUDE CONTRO
	RULE NUMBERS	S 17-6 THROUGH	17-14	ARE RESER	VED			
							PAGE	
			T '	DATE	SECTION	GROUP	PAGE	
 		MISSION	REV	DATE	CSM SM-RCS	GENERAL	17-1	Tape 47

MISSION RULES

SECTION 17 - CSM SM-RCS - CONTINUED

T.zzu T		S	SECTION 1	7 - CSM SM-RCS - CO	NTINUED	T	
ITEM							
				YSTEMS MANAGEMENT	.		
				•	-		
17-15	PROPELLANT GAGING						
	A. PRIME METHOD: RTCC	EQUATION	(5 PERC	ENT)			
	B. BACKUP METHOD: HEL	IUM PRESS	SURE/TEMP	ERATURE (11 PERCENT) (ONBOARD)		
17-16	QUAD PROPELLANT BALANCE						
	PROP ISOLATION VALVES WE SELECTING TWO-JET +X AN						
	ATTITUDE CONTROL. PROPI						
17-17	SECONDARY PROPELLANT FU	EL PRESSU	JRE VALVE	<u>.</u>			
	THE RCS SECONDARY FUEL	PRESSURIZ	ZATION VA	LVE WILL BE OPENED	WHEN THE FUEL M	MANIFOLD PRESSUR	E REACHES 150 PSIA OR
	RTCC SHOWS 115 LBS WILL	BE EXCEE	EDED DURI	NG A TRANSLATION MA	NEUVER.		
	RULE NUMBERS 17-18 THRO	UGH 17-19	ARE RES	ERVED.			
				,			
	MISSION	REV	DATE	SECTION	GROUP	PAGE	
	112002011	-	9/1/72	OEO (TOM	4,100		Tape 52.8

MISSION RULES

SECTION 17 - CSM SM-RCS - CONTINUED

		T			- C3H 3H-RC3 - CUN		T		
RULE	CONDITION/MALFUNCTION	PHASE			RULING		CUES/N	OTES/COMME	ENTS
			S	PECI	FIC MISSION RULES	-			
17-20	SUSTAINED LEAK IN HELIUM TANK						QUAD WI	OC RCS 2 LL REMAIN E REACHES	USABLE UNTIL He MANIFOLD
	A. ONE OR MORE QUADS	LAUNCH	A	. co	NTINUE MISSION		PRESSUR	E REMUNES	75 P31.
•	B. ONE QUAD (ALL OTHER	E0	- 1		NO-GO FOR TLI				
	QUADS NORMAL)	ALL OTHERS		2. 9	CONTINUE MISSION				
	C. MORE THAN ONE QUAD	E0	С	.1. 9	CONTINUE MISSION				
				i	ENTER PRIOR TO LOSS HYBRID DEORBIT CAPA	S OF ABILITY			
		TLC		2.(A) NO-GO FOR LOI				
				(1	B) CONTINUE MISSION IF SUFFICIENT BLOWDOWN CAPABIN EXISTS		,		
		DESCEN	т	3. !	CONTINUE MISSION				
		ALL OTHERS		4.	TERMINATE PHASE AN	<u>)</u>	C.4.(A)	IN LUNAR	ORBIT, DO DPS TEI.
				-	ENTER NEXT BEST PTI	<u>-</u>	(B)		M ASCENT STAGE THROUGH TEI G UPON LM RCS PROPELLANT G.
17-21	SUSTAINED LEAK BELOW He ISOLATION VALVE (COULD BE HELIUM OR FUEL OR OXIDIZER)		-				QUAD WI	OC RCS IC LL REMAIN E REACHES	USABLE UNTIL He MANIFOLD
	A. ONE OR MORE QUADS	LAUNCH	A	. co	NTINUE MISSION		I KESSOK	L KENGIES	73 731.
	B. ONE QUAD (ALL OTHER QUADS NORMAL)	EO	В	.1.	NO-GO FOR TLI				
	QUADS NORMAL)	TLC		2.(A) CONTINUE MISSION	N	i.		
		LO			NO-GO FOR DOI OR U	NDOCKING	B.3. RE	TAIN LM AS LM APS/RO	SCENT STAGE FOR TEI DEPENDI CS PROPELLANT REMAINING.
		UNDOCK			DOCK ASAP				
		DESCEN LUNAR	'		CONTINUE MISSION CONTINUE MISSION				
		STAY		•					
		CSM EV	A	7.	CONTINUE MISSION		CO		ON WILL BE GIVEN TO THE MISSION BASED ON AMOUNT ANTS
	C. MORE THAN ONE QUAD	DESCEN	т С	.1.	CONTINUE MISSION				
		ALL OTHER		2.	TERMINATE PHASE AN	2	C.2. IN	LUNAR ORE	BIT DO DPS TEI.
				•	ENTER NEXT BEST PT	-			
	MISSION	REV	DATE	\Box	SECTION	GROUP	•	PAGE	
	APOLLO 1	7 FNL	9/1/72		CSM SM-RCS	SPECIFI	c	17-3	Tape 47.2

MISSION RULES

SECTION 17 - CSM SM-RCS - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE	T	RULING		IOTES/COMME	NTS
$\stackrel{\circ}{\vdash}$	KOLL	CONDITION/FIAET ONC TON	THASE	- 	KUEING		10123/ 00/11/12	
	17-22	PACKAGE TEMP LESS THAN 55° F AND UNABLE TO INCREASE	LAUNCH	NOT A	PPLICABLE	MALF P	ROC RCS 1A	
		A. ONE QUAD (ALL OTHER QUADS NORMAL)	ALL	A. <u>CO</u>	NTINUE MISSION			
		B. MORE THAN ONE QUAD	TLC		CONTINUE MISSION			
			DESCENT		NO-GO LOI CONTINUE MISSION			
			ALL	3.	TERMINATE PHASE AND	B.3.(A) IN LUNAR	ORBIT DO DPS TEI.
			OTHER		ENTER NEXT BEST PTP	. (В) RETAIN LM DEPENDING	ASCENT STAGE FOR TEI UPON LM APS/RCS PROPELLANT.
	17-23	LOSS OF INDIVIDUAL THRUSTERS OR THRUSTER COMBINATIONS AS A RESULT OF CLOGGING, FREEZING, BURNOUT, OR CONTROL SYSTEM MALFUNCTION	LAUNCH	NOT A	APPLICABLE	OF AUT	L SYSTEM MA D COILS OF ARE STILL A	ILFUNCTION WILL CAUSE LOSS THRUSTER ALTHOUGH DIRECT VAILABLE.
		A. LOSS OF ANY ROLL THRUSTER	ALL	A. <u>C</u>	ONTINUE MISSION	į		
		B. LOSS OF FOLLOWING THRUSTER COMBINA- TIONS:	EO	B.1.	CONTINUE ALTERNATE EO MISSION IF BOTH AND SM RCS DEORBIT CAPABILITY AND ALL			
		TWO PITCH OR TWO YAW			ATTITUDE CONTROL AV			
		ONE PITCH AND ONE YAW		2.	NO-GO FOR LOI			
		PITCH AND TWO ROLL IN SAME DIRECTION	TLC		PLAN TEI FOR NEXT OPPORTUNITY			
		ONE YAW AND TWO ROLL IN SAME DIRECTION	TLC/ UNDOCKED		DOCK ASAP			
		THREE ROLL IN SAME DIRECTION	DESCENT	4.	CONTINUE MISSION	0		CENT STAGE FOR TEI IF LOSS STERS IN ONE DIRECTION IN
			LUNAR STAY	5.	ENTER NEXT BEST PTF	-		
		C. LOSS OF +X THRUSTERS ON ADJACENT QUADS	EO ALL	- 1	ENTER NEXT BEST PTE	" I CAP	SPS RULE 1 ABILITY	6-27, LACK OF ULLAGE
		D. LOSS OF ANY ONE OF C2 AND D2, C3, C4, C1 AND D1, D3, D4	CSM EVA	D. <u>N</u>	O-GO/TERMINATE		LM RCS FOF ILABLE.	R ATTITUDE CONTROL IF
		RULE 17-24 THROUGH 17-49 ARE RESERVED.						
	I .		' 				T	T
		MISSION	REV D	ATE	SECTION	GROUP	PAGE	

MISSION RULES

SECTION 17 - CSM SM-RCS - CONCLUDED

		INSTR	UMENTATION REQUIREMENT	S		
17-50	MEAS DESCRIPTION	<u> PCM</u>	<u>onboard</u>	TRANSDUCERS	CATEGORY	MSN RULE Reference
	SM He TK A PRESS QTY SM-RCS PROP SYS A	SR5001P SR5025Q		COMMON)	1 M O/B OR PCM	17-20,21 17-20,21
	SM He TK B PRESS QTY SM-RCS PROP SYS B	SR5002P SR5026Q		COMMON }	1 M O/B OR PCM	17-20,21 17-20,21
	SM He TK C PRESS QTY SM-RCS PROP SYS C	SR5003P SR5027Q		COMMON }	1 M O/B OR PCM	17-20,21 17-20,21
	SM He TK D PRESS QTY SM-RCS PROP SYS D	SR5004P SR5028Q		COMMON }	1 M O/B OR PCM	17-20,21 17-20,21
	SM ENG PKG A TEMP SM ENG PKG B TEMP SM ENG PKG C TEMP SM ENG PKG D TEMP	SR5065T SR5066T SR5067T SR5068T	METER/C&W METER/C&W	COMMON COMMON COMMON COMMON	HD HD HD	17-22 17-22 17-22 17-22
	SM He TK A TEMP SM He TK B TEMP SM He TK C TEMP SM He TK D TEMP	SR50137 SR50147 SR50157 SR50167	METER METER	COMMON COMMON COMMON COMMON	HD HD HD HD	17-20,21 17-20,21 17-20,21 17-20,21
	SM He MAN A PRESS SM He MAN B PRESS SM He MAN C PRESS SM He MAN D PRESS	SR5729F SR5776F SR5817F SR5830F		 	HD HD HD HD	17-20,21 17-20,21 17-20,21 17-20,21
	SM FU MAN A PRESS SM FU MAN B PRESS SM FU MAN C PRESS SM FU MAN D PRESS	SR5737F SR5784F SR5822F SR5823F	METER/C&W METER/C&W	COMMON COMMON COMMON COMMON	НD НD НD НD	17-12,21 17-12,21 17-12,21 17-12,21
	SM OX MAN A PRESS SM OX MAN B PRESS SM OX MAN C PRESS SM OX MAN D PRESS	SR5733F SR5780F SR5820F SR5821F		 	HD HD HD HD	17-21 17-21 17-21 17-21
		1-1-	T		Lavas	
	MISSION	REV DATE	SECTION	GROUP INSTR REQ	PAGE	Tape 58.3

MISSION RULES

SECTION 18 - CSM CM-RCS

R ITE	M								
!									
						GENERAL			
18-1	,	LAUNCH							
	İ								
		CAUSE FO	R ABORT SINCE	THE R	EMAINING R		ORT OR ENTRY ATT		E IN ONE CM RCS RING IS NOT OL. THIS FAILURE WILL
		JUSTIFIC PRESSURI IT IS NO REV STIL OPERATIO CM RCS C	ATION FOR A MC ZED TO NOMINAL OT CAUSE FOR AB AL EXISTS BY US ONALLY PREFERAB CONTROL IS REQU	DDE I A PRESS BORT SS BING TI BLE TO DIRED I	ABORT. THI SURES, WHIC INCE THE AI HE CONTINGI PERFORMING FOR ABORTS	E HELIUM SUPPLY PRES CH WOULD PROVIDE SUF BILITY TO PERFORM A ENCY SM RCS SPINUP F G AN ABORT AND PRESE	SURE IS NOT REQUESTICIENT BLOWDOWN SAFE ENTRY INTO PRIOR TO CM/SM SE INTS LESS POTENTI MODE III REGIONS	FIRED FOR MO IN EACH RI THE ATLANTI P. THIS ME AL HAZARD T IN AND TO AB	OR TO TOWER JETTISON IS DE I IF THE SYSTEM CAN BE NG. AFTER TOWER JETTISON, C AT THE END OF THE FIRST THOD OF ENTRY IS CONSIDERED O CREW RECOVERY. FURTHERMORE, DRT THE LAUNCH IN THESE FE ENVIRONMENT.
18-2			LINAD CTAV D	Mere.					
10-2	۱ ٔ	LUNAK UKBIT,	LUNAR STAY PH	ASES					
		B. THESE PH	ASES WILL BE O	ONTINO	JED IF THE	ATED FOR LOSS OR IMP CM RCS IS ARMED. INTO THE NEXT BEST		NE CM RCS S	YSTEM.
	•								
18-3		LM DESCENT P	MVCE						
		LIV DESCENT Y	TIAGE .						
'		THERE ARE NO	CM RCS FAILUR	ES TH	AT ARE CAUS	SE FOR TERMINATING T	HE DESCENT PHASE		
18-4	.	ALL OTHER PH	IACEC						
		ALL OTHER TH	MOLS.						
	ı					ANIFOLD PRESSURE (CO			
	ı								STEM AND REDUCES THE AV SSURE IN BOTH CM RCS RINGS
	ı	DELETES	ALL ENTRY ATTI	TUDE (CONTROL CAP	ABILITY REQUIRING C	ONTINGENCY SM RC	S SPINUP PR	OR TO CM/SM SEP. THE LOSS
		OF UNE U	K BOTH CM KCS	KINGS	IS CAUSE F	OR TERMINATING THE	PHASE AND MISSIO	N BY ENTRY :	NTO THE NEXT BEST PTP.
		B. DELETED							
		C. DELETED							
	- 1								
	L		MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	CSM CM-RCS	GENERAL	18-1	Tape 43A.3

MISSION RULES

SECTION 18 - CSM SM-RCS - CONTINUED

7.7	rru T	SECTION TO COMPANY CONTINUED
R IT	TEM .	
18	8-5	ALL PHASES
1	l	
1		SUSTAINED DECREASE IN (OR LOSS OF) HELIUM TANK PRESSURES IN EITHER RING REQUIRES THAT THE CM RCS BE PRESSURIZED ASAP. 1250 PSI HELIUM TANK PRESSURE IS REQUIRED TO PROVIDE A FULLY PRESSURIZED SYSTEM.
		ASAF. 1250 PSI RELIGIO TANA PAGSSURE IS REQUIRED TO PROVIDE A FULLY PRESSURIZED SYSTEM.
	i	
		RULE NUMBERS 18-6 THROUGH 18-9 ARE RESERVED.
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		APOLLO 17 FNL 9/1/72 CSM CM-RCS GENERAL 18-2 Tape 52.9
C 20		

MISSION RULES

SECTION 18 - CSM CM-RCS - CONTINUED

				SECTION 18	- CSM CM-RCS - CON	TINUED		
R	ITEM							
				SY	STEMS MANAGEMENT			
	18-10	THRUSTER TEMP CONTROL						
		CM RCS THRUSTERS MAY BE WHICHEVER COMES FIRST. RESULTS OF CM RCS CHECK	IF THRU	JSTER(S) HE	ATER FUNCTION FAILS	OR UNTIL THE LOWE , CM RCS IS STILL	ST INDICAT	TED TEMPERATURE IS 28° F, D OPERATIONAL PENDING
		MALF PROC RCS 5.						
	18-11	HELIUM INTERCONNECT						
			INTER					IS DEPLETED IN THE OTHER ROL. ONCE INTERCONNECTED,
		MALF PROC RCS 4.						
		RULE NUMBERS 18-12 THRO	JGH 18-1	19 ARE RESE	RVED.			
			-					
								i e
		MT0070**	DE!!	DATE	SECTION	CROUR	DACE	T
-		MISSION APOLLO 1	REV FNL	DATE 9/1/72	SECTION CSM CM-RCS	GROUP MANAGEMENT	PAGE 18-3	Tape 40.8
1		1 5220 1.	I	1	I	l	1	1

MISSION RULES

SECTION 18 - CSM SM-RCS - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
				SPE	CIFIC MISSION RULES	- ;	
	18-20	SUSTAINED LEAK IN OR COMPLETE LOSS OF HELIUM SUPPLY PRESSURE ONE OR BOTH RINGS	ALL		ITINUE MISSION IN SUI WDOWN IS AVAILABLE :		
					G FOR ENTRY		
	18-21	SUSTAINED LEAK IN OR COMPLETE LOSS OF HELIUM MANIFOLD PRESSURE (COULD BE EITHER FUEL OR OXIDIZER)			, ·		
		A. ONE RING	LAUNCH	A.1	. CONTINUE MISSION	_	
			DESCENT		ENTER NEXT BEST PT	<u>TP</u>	
r			EVA		CONTINUE MISSION CONTINUE MISSION		A.3. CONSIDERATION WILL BE GIVEN TO
							CONTINUING BASED ON AMOUNT OF CONTAMINANTS.
			ALL OTHERS	4	ENTER NEXT BEST P	_	
		B. BOTH RINGS	LAUNCH	B.1	. CONTINUE MISSION / ENTER NEXT BEST P UNLESS PRIOR TO TO JETTISON. IF PRIO TOWER JETTISON, AI	TP OWER OR TO	
	-		DESCENT	2	. CONTINUE MISSION		
			EVA	3	. CONTINUE MISSION		B.3. CONSIDERATION WILL BE GIVEN TO CONTINUING BASED ON AMOUNT OF CONTAMINANTS.
			ALL OTHER	4	ENTER NEXT BEST P		B.4. CM SPIN-UP REQUIRED PRIOR TO ENTRY.
		i					
ш		MISSION	REV [ATE	SECTION	GROUP	PAGE
		APOLLO 17		9/1/72	CSM CM-RCS	SPECIFIC	

MISSION RULES

SECTION 18 - CSM CM-RCS - CONTINUED

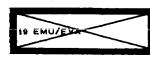
R	RULE	CONDITION/MAL	FUNCTION	PHASE		RULING		CUES/N	OTES/COMME	NTS	
	18-22	CM RCS IS ARM ANY REASON	ED FOR	ALL	<u>cc</u>	ONTINUE MISSION					·
		RULE NUMBERS THROUGH 18-49 RESERVED.	18-23 ARE								
									•		
	:							•			
		· · · · · · · · · · · · · · · · · · ·							·	· · · · · · · · · · · · · · · · · · ·	
			MISSION	REV	DATE	SECTION	GROUP		PAGE		****
			APOLLO 17	FNL	9/1/72	CSM CM-RCS	SPECIFIC		18-5		Tape 43A.4

MISSION RULES

SECTION 18 - CSM CM-RCS - CONCLUDED

					INSTRUM	MENTATION REQUIREMEN	ITS	4	
									
	18-50	MEAS DE	SCRIPTION -		PCM	ONBOARD	TRANSDUCERS	CATEGORY	MSN RULE REFERENCE
		CM He TK CM He TK	A PRESS B PRESS		CR0001P CR0002P	METER METER	COMMON COMMON	M O/B OR PCM M O/B OR PCM	18-20 18-20
		CM TK A	TEMP TEMP		CR0003P CR0004P	METER METER	COMMON COMMON	HD HD	18-20 18-20
		CM He MN	FLD A PRESS		CR0035P	C&W METER	SEPARATE	1 OF 2 M	18-21
		CM He MN	FLD B PRESS		CR0036P	C&W METER	SEPARATE	1 OF 2	
						METER		М	18-21
							•		
							,		
									,
					•				
_			MISSION	REV	DATE	SECTION	GROUP	PAGE	
_	·		APOLLO 17	FNL	9/1/72	CSM CM-RCS	INSTR REQ	18-6	Tape 40.11

THIS SECTION HAS BEEN DELETED. REFERENCE EVA MISSION RULES IN SECTION 3 OF THIS DOCUMENT.



MISSION RULES

SECTION 20 - COMMUNICATIONS AND INSTRUMENTATION

R ITEM				JL0	100 20 - (OMMUNICATIONS AND I	NSTRUMENTALION		
						GENERAL			
20-1	Α.	BASELIN	E REQUIREMENT	S (ALI	. PHASES EX	CEPT LAUNCH)			
		2. TWO-	-WAY VOICE CO -WAY VOICE CO N DURING UNDO	MM BET	WEEN CSM O		G ALL DOCKED ACTIV	VITIES AND	BETWEEN CSM, LM/LCRU AND
	В.	LAUNCH							
		THERE A	RE NO COMMUNI	CATION	is FAILURES	FOR WHICH THE LAUN	CH/INSERTION PHASE	WILL BE 1	FERMINATED.
	С.	LUNAR ST	TAY ADDITIONAL	L REQU	IREMENTS				
						WEEN MSFN AND ONE E WEEN MSFN AND LM/LC		ı	
						NOTE	•		
	-					NLY VOICE IS ACCEPT. MONITOR CREW.	ABLE IF TV IS		
	D.	THE LM V	WILL BE RETAIN	NED FO	R TEC COMM	IN EVENT OF LOSS O	F ALL COMM BETWEEN	THE CSM A	IND THE GROUND.
	Ε.		OF VOICE OR			OR FAILURE OF TWO-W	AY VOICE COMMUNICA	ATIONS TO T	HE CMP, OR BOTH, WILL NOT
20-2	VHF	EVA COMP	MUNICATIONS PI	RIORIT	IES ARE:				
	Α.	TWO-MAN	EVA						
						MODE ALLOWS DUPLEX PLUS THE RECEPTION (E TRANSMISSION OF VOICE AND
		BETW	WEEN EVA'S PLU	JS THE	TRANSMISS		OTH THE EVA'S TO T	HE LM/LCRU	TION ALLOWS DUPLEX VOICE PLUS THE TRANSMISSION OF
	В.	ONE-MAN	EVA						
			ME: EVA-1A OF M EVA TO LM/LO		2A (ALLOWS	DUPLEX VOICE BETWEE	EN EVA AND THE LM/	LCRU PLUS	THE TRANSMISSION OF DATA
		2. BACK	KUP: EVA-1B (OR EVA	-2B (ALLOW	S DUPLEX VOICE BETWE	EEN EVA AND LM)		
						NOTE			
				NO	VOICE CAPA	BILITY VIA LCRU IN 1	THIS MODE.		
	RULE	S 20-3 T	THROUGH 20-6 A	ARE RE	SERVED.				
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	COMM AND INST	FUNCTIONAL COMM-GENERAL	20-1	Tape 24.1

MISSION RULES

			SECTION	20 -	COMMUNICAT	TIONS AND INSTRUMENT	TATION - CONTINUED)	
R	ITEM								
					-	MANAGEMENT			
					•				
	20-7	VOICE CONFIGURA	ATION						
		A. LM/CSM/MSFN							
						MITTED/RECEIVED SIMI IVED SIMULTANEOUSLY			GH CY1, REV 1. VHF SIMPLEX REV 1 LOS.
			SIMPLEX 296.8 A (LM) WILL			DICE COMM BETWEEN VI	EHICLES EXCEPT DUR	RING RANGIN	IG WHEN DUPLEX B (CSM) AND
		3. VHF B S	SIMPLEX 259.7	MHZ	IS BACKUP	TO VHF A SIMPLEX 29	5.8 MHZ		
		4. USB IS	PRIME VOICE	COMM I	BETWEEN MS	FN AND CSM, LM, OR	LCRU.		
		5. USB/VHI	F RELAY IS VO	ICE C	OMM BACKUP	TO USB BETWEEN MSF	N AND MALFUNCTIONS	D S/C.	
		l '				NEOUS MSFN UPLINK TO MSFN/LM, AND MSFN/			F REQUIREMENT SHOULD EXIST,
		SIMPLE		MODE	IS PRECLU				RIME VHF MODE IS VHF A "AY PHASE, THE PRIME
		8. THE CSI	M AND LM WILL	. TRAN	SMIT SIMUL	TANEOUSLY ON VHF AN	D USB DURING ALL I	_M POWERED	UP PHASES IN LUNAR ORBIT.
		Į.	EVENT OF A C Y RELAY AND R				CATIONS WITH MSFN	, THE LM WI	LL BE CONFIGURED FOR LM
		B. LM/EVA/MSF	N						
		LM/LCRU TW	O-WAY RELAY W	VITH T	WO-MAN EVA	IS THE PRIME MODE	PLANNED FOR EVA OF	PERATION.	
	20-8	CSM VHF/USB MAI	NAGEMENT						
	<u> </u>	A. FOR CREW R	EST PERIODS,	CSM S	-BAND ANTE	NNAS WILL BE SELECT	ED BY GROUND COMM/	ANDS.	
		l.	TROL OF THE S			L BE BY GROUND COMM	AND. CSM COMMUNIC	CATIONS SWI	TCH POSITION WILL REFLECT
\vdash		1	MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	COMM AND INST	FUNCTIONAL COMM-MGT	20-2	. Tape 24.2

MISSION RULES

		SECTIO	ON 20 -	COMMUNIC	ATIONS AND INSTRUME	NTATION - CONTIN	UED	
R ITEM	-{							
20-9	LM STEE	RABLE ANTENNA MANA	AGEMENT					
		UPLINK MODES 2 AND THE AUTO TRACK MOD		ALL PRN	UPLINKS WILL BE AVO	IDED IF POSSIBLE	WHEN THE ST	EERABLE ANTENNA IS OPERATING
	1	STEERABLE ANTENNA 195° F DURING CRI				I -65° F AND 150°	F. THE STE	ERABLE ANTENNA MAY BE OPERAT
20-10	GCTA MA	NAGEMENT						
	POI		. HOWE	VER, IF O	BJECTIONABLE FLARE			TIEW. THE CAMERA MAY BE TEST THE CAMERA TO BE MOVED
					RE AND RECOMMEND CA		R MOVE THE C	AMERA VIA COMMANDS) TO PREVE
	C. BET	WEEN EVA'S THE TV	CAMERA	WILL BE	LOCATED IN THE SUN	AND OFF TO MAINT	AIN THERMAL	BALANCE.
	D. RES	SERVED						
	СОМ	MAND AN ALC SWITC	H SETTI	NG TO GET		THE ALC-PEAK WI	LL GIVE THE	HE GROUND WILL RECOMMEND OR BEST PICTURE OF THE D.
	1	GROUND WILL NEVE	R INITI	ATE GCTA	COMMANDS THAT WOULD	CAUSE MORE THAN	TWO DRIVE M	OTORS TO OPERATE
	G. THE	GCTA WILL BE POS	ITIONED	VIA GROU	ND COMMAND AS NECES	SARY TO PROVIDE	THERMAL MANA	GEMENT.
	н. тне	E TV CAMERA AND TH	E TV COI	NTROL UNI	T WILL BE DUSTED AT	EACH STOP.		
20-1	LCRU MA	NAGEMENT						
	A. THE	THERMAL BLANKETS	ON THE	LCRU WIL	L BE POSITIONED AS	REQUIRED TO MAIN	TAIN THERMAL	MANAGEMENT.
	мои	MINAL MODE OF OPER MINAL MODE OF OPER CKUP MODE OF OPERA	ATION FO	OR FIXED	BASE IS FM/TV.			
	THE		ILL BE (UTILIZED		,	THIS MODE AL	LOWS THE GROUND TO COMMAND
ļ	1	THERMAL BLANKETS THERMAL BLANKET				ERCENT FOR EITHE	R HANDCARRY	MODE. THE CREW SHOULD RETAI
	D. THE	E LCRU BATTERY WIL	L BE CH	ANGED WHE	N THE VOLTAGE IS 27	.5 V IF STOPPED	OR, IF MOVIN	G, AT THE NEXT STOP.
	E. THE	E LCRU WILL BE DUS	TED AT E	EACH STOP				
Щ.		<u> </u>		-		T	Tres	Г
		MISSION APOLLO 17		DATE 9/1/72	SECTION COMMAND INST	GROUP FUNCTIONAL	PAGE	
			LLL		<u> </u>	COMM-MGT	20-3	Tape 52.10

MISSION RULES

				35011	UII EU	0011101111	ATTUNS AND INSTRUM	ENTATION - CONTIN	JED_	
R	ITEM									
	20-12	SDS	MANAGEME	ENT						
	'-	900	7 (2 11) (42)							
		Α.	THE CSM	PCM WILL BE	OPERAT	TED IN HBR	DURING ALL SCIENTI	FIC OPERATIONS, E	CEPT FOR PO	ORTIONS OF LUNAR SOUNDER
			OPERATIO	ONS.						
			THE CONT	FDOL OF THE B	CE 1171	L DE VIA C	DOUBLE COMMAND THE			
		в.								CREW MAY BE REQUESTED TO XXIMUM AMOUNT OF SCIENTIFIC
			DATA.	THE DOE AT C	EKIKI	111123 001		IO ASSISI IN UBIA	INTINÒ THE MY	WILLIAM WHOOM! OF SCIENTIFIC
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				MISSION	REV	DATE	SECTION	GROUP	PAGE	
				APOLLO 17	FNL	9/1/72	COMM AND INST	FUNCTIONAL COMM-MGT		
1				l	I	I		COMM-MGT	20-4	Tape 52.11

MISSION RULES

20-13 LOSS OF TWO-MAY WIFE WIGGE COMMINE RESIDENT WOLCE COMMINE RETAINS OF TWO MAY WIFE WIGGE COMMINE RESIDENT WOLCE COMMINE RETAIN WITH RESIDENT WOLCE COMMINE RESIDENT WOLCE RESIDENT RESIDENT WOLCE RESIDENT RESID	R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	1		OTES/COMME	ENTS
WOLCE COMM BETWEEN CSM AND LIN ON-OF FOR SEP NAVR UNDOCKED DOCK ASSP NO-OF FOR CSM CIRC AND DOT2 CONTINUE MISSION PRE-PDI LINAR STAY 20-14 LOSS OF THO-NAY VOICE COMM MITH MSFI A. CSM ONLY LAUNCH A. CSM ONLY LAUNCH A. CSM INTLE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION DOT A. CONTINUE MISSION NO-OF RESP MANEUVER STAY DOT B. LIN ONLY DOCKED PRE-PDI PRE-PDI PRE-PDI PRE-PDI POCKED PRE-PDI POCKED P						SPECIFIC				
COMM WITH MSEN A. CSM ONLY LAUNCH EARTH ORBIT TLC 3. CONTINUE MISSION DDI 4. CONTINUE MISSION NN-GO FOR SEP MANEUVER UNDOCKED DESCENT LUMAR STAY B. LM ONLY DOCKED UNDOCKED UNDOCKED B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER UNDOCKED B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER UNDOCKED B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER UNDOCKED UNDOCKED B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER UNDOCKED UNDOCKED UNDOCKED B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER UNDOCKED		20-13	VOICE COMM BETWEEN CSM	PRE-PDI POWEREI DESCENT	NO-CON	GO FOR SEP MNVR K ASAP GO FOR CSM CIRC AND TINUE MISSION TINUE MISSION	ю 1 ₂	REF CSI COMM W	ITH CSM M MAL PROC ITH LM	EDURE COMM 5 - LOSS OF VHF
ORBIT TLC 3. CONTINUE MISSION DDI 4. CONTINUE MISSION NO-GO FOR SEP MANEUVER 5. CONTINUE MISSION LUNDOCKÉD/ POBERED DESCENT LUNAR STAY B. LM ONLY DOCKED UNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT LUNDOCKED PRE-PDI POBERED DESCENT ROCKED		20-14	COMM WITH MSFN	ŀ			20.70	REF CSI CSM VO	M MAL PROC ICE COMM	EDURES 7 AND 8 - LOSS OF
NO-GO FOR SEP MANEUVER UNDOCKED/ POWERED DESCENT LUMAR STAY DOCKED B. LM ONLY DOCKED UNDOCKED PRE-PDI POWERED DESCENT LUMAR STAY DOCKED POWERED DESCENT LUMAR STAY A. 6. UTILIZE VHF OF VHF RELAY FROM LM. IF UNABLE, TERMINATE LUMAR STAY AND PERFORM A DOCKED TEIL. NOTE: RETAIN LM FOR COMM DURING TEC. REF LM MAL PROC COMM 4 - LOSS OF S-BAND VOICE COMM VOICE COMM REF LM AL PROC COMM 4 - LOSS OF S-BAND REF LM MAL PROC COMM 4 - LOSS OF S-BAND REF LM MAL PROC COMM 4 - LOSS OF S-BAND B. 4. COMM VIA LCRU IS ACCEPTABLE. MISSION REV DATE MISSION REV DATE SECTION GROUP PAGE				ORBIT		POINT	<u> </u>	COM VO:	MM WITH MS ICE, AND C	FN. LM COMM WILL BE USED FOR SM TM USED FOR SIM BAY
LUNAR STAY 6. CONTINUE MISSION DOCKED B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER UNDOCKED PRE-PDI POWERED DESCENT LUNAR STAY MISSION MISSION MISSION REV DATE A. 6 UTILIZE VHF OF VHF RELAY FROM LM. IF UNABLE, TERMINATE LUNAR STAY AND PERFORM A DOCKED TEI. NOTE: RETAIN LM FOR COMM DURING TEC. REF LM MAL PROC COMM 4 - LOSS OF S-BAND VOICE COMM VOICE COMM A. 6 UTILIZE VHF OF VHF RELAY FROM LM. IF UNABLE, TERMINATE LUNAR STAY AND PERFORM A DOCKED TEI. NOTE: RETAIN LM FOR COMM 4 - LOSS OF S-BAND VOICE COMM WISSION B. 1. CONTINUE MISSION REV DATE SECTION GROUP PAGE A. 6 UTILIZE VHF OF VHF RELAY FROM LM. IF UNABLE, TERMINATE LUNAR STAY AND PERFORM A DOCKED TEI. NOTE: RETAIN LM FOR COMM 4 - LOSS OF S-BAND VOICE COMM VIA LCRU IS ACCEPTABLE.				UNDOCKE Powerei	D/ 5	NO-GO FOR SEP MANE	EUVER			
B. LM ONLY DOCKED DOCKED NO-GO FOR SEP MANEUVER UNDOCKED PRE-PDI POWERED DESCENT LUNAR STAY MISSION REV DATE B. 1. CONTINUE MISSION NO-GO FOR SEP MANEUVER 2. RETURN TO VICINITY OF CSM NO-GO FOR PDI 3. PDI TO TOUCHDOWN - CONTINUE MISSION B. 4. COMM VIA LCRU IS ACCEPTABLE. REF LM MAL PROC COMM 4 - LOSS OF S-BAND VOICE COMM REF LM MAL PROC COMM 4 - LOSS OF S-BAND VOICE COMM NO-GO FOR PDI B. 4. COMM VIA LCRU IS ACCEPTABLE.				LUNAR		. CONTINUE MISSION		UN/ A E	ABLE, TERM DOCKED TEI	INATE LUNAR STAY AND PERFORM .
POWERED DESCENT LUNAR STAY 4. LM LIFTOFF NEXT ASCENT OPPORTUNITY B.4 COMM VIA LCRU IS ACCEPTABLE. MISSION REV DATE SECTION GROUP PAGE			B. LM ONLY	UNDOCKE	.D 2	NO-GO FOR SEP MANE	ł	REF LM	MAL PROC	
				DESCENT Lunar	•	. PDI TO TOUCHDOWN - CONTINUE MISSION . LM LIFTOFF NEXT AS		B.4 COM	₩ VIA LCR	U IS ACCEPTABLE.
	_			TT		Ī.				
APOLLO 17 FAL 3717/2 COMM AND INST FONCTIONAL COMM-SPECIFIC 20-5 Tape 24.5			MISSION APOLLO 17	FNL FNL	9/1/72	SECTION COMM AND INST	FUNCTION			Tano 24 5

MISSION RULES

R	RULE	CONDITION/MAL		PHASE		_	RULING		Г	NOTES/COMM	ENTS
	20-15	LOSS OF TWO	COM AUDIO	500							
	20-13	CENTERS	SSM AUDIO	EP0			TINUE MISSION -GO FOR TLI		İ		
ı				TLC			NTINUE MISSION				
				DOCKE	ED	COL	VTINUE MISSION				
		:		UNDOC	SVED.		-GO FOR DOI OR UNDOO	CKING			
			j	PRE-F	1		-GO FOR CIRC				
				DESCE LUNAR STAY							
				POST	DOCK	RET	TAIN ASCENT STAGE				
	20-16			LUNAR	,	CON	ITINUE MISSION				
		RELAY. NO TW VOICE WITH EI CREWMAN.		STAY		PRO	OCEED WITH EVA AND A	ACTIVATE			
						,,,,	LUNG NON				
		* .									
	20-17	LOSS OF VOICE EVA-2 TO EVA-		DUAL EVA			ITINUE MISSION			()	
			. [LVF	N-2 GO TO POSITION "	'В"	EVA-1 EVC-2	(CDR) HAS IF ON L	EVC-1, EVA-2 (LMP) HAS CRU:
								į	•		COMMUNICATE WITH MSFN.
										TM FROM E	va-2. ROCEDURALLY TIME-SHARE ALL
									VO:	CE TRANSM	ISSIONS WITH MSFN.
									4. MOI	NITOR PLSS	E SWITCHED EVERY 45 MIN TO DATA ON BOTH CREWMEN.
1	20-18	LOSS OF VOICE EVA-1 TO EVA-		DUAL EVA		CON	TINUE MISSION				
		TAV-1 10 EAV-	•	EVA		Α.	EVA-2 GO TO POSITIO	N "A"			•
						В.	EVA-1 GO TO POSITIO	N "B"	IF ON		
			9.						B.1. F	IO TM.	OT COMMUNICATE WITH MSFN AND
									2. E	VA-1 MUST OICE TRANS	PROCEDURALLY TIME-SHARE ALL SMISSIONS WITH MSFN.
									۲	INUTES TO	BE SWITCHED EVERY 45 MONITOR PLSS DATA ON BOTH
									C	REWMEN.	
					İ						
								İ			
\vdash	<u> </u>		MISSION	REV	DATE	_	SECTION	GROUP		PAGE	
			APOLLO 17	FNL	9/1/	72 -	COMM AND INST	FUNCTION			Tane 24 6
						72				20-6	Tape 24.6

MISSION RULES

<u>.</u>	RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUE	S/NOTES/COMMEN	TS
	20-19	LOSS OF DUPLEX VOICE BETWEEN EVA-1 AND EVA-2	DUAL EVA	B. I	INUE EVA OTH CREWMEN WILL GO OSITION"A" F STILL NO COMM, SEL OSITION "B" F STILL NO COMM, COM VA IF ONE CREWMAN CA ECEIVE MSFN VOICE. BLE TO RECEIVE MSFN ETURN TO VHF RANGE (ECT B. ITINUE IN IF NOT VOICE,	OPERATION VI DATA WILL ON TRANSMITTER	LY BE TRANSMITTED WHEN THE
	20-20	LOSS OF TWO-WAY VOICE BETWEEN MSFN AND EVA A. LCRU	DUAL EVA	FOR RESP A. <u>C</u> 1 2 3 B. <u>C</u>	E UPLINK WITH TV AVA MSFN MONITORING OF G ONSES IS ACCEPTABLE ONTINUE EVA . EVA-2 GO TO POSIT: "A" EVA-1 GO TO PO "B" 2. IF SUCCESSFUL, COM EVA. 3. IF UNSUCCESSFUL, TO VHF RANGE OF LI CONTINUE EVA 1. IF LCRU AVAILABLE ACTIVATE ASAP AND CONTINUE EVA.	ION A. SITION NTINUE RETURN	I. EVCS MODE-B LCRU.	WILL NOT COMMUNICATE WITH
	20-21	LOSS OF TWO-WAY VOICE BETWEEN MSFN AND EVA	ALT EVA	VOIO ABLE	2. IF LCRU NOT AVAIL EVA 2 RETURN TO LI RECONFIGURE COMM. CONTINUE EVA WITH RANGE OF LM. CE UPLINK WITH TV AVE FOR MSFN MONITORIN	M AND THEN IN VHF		
		A. LCRU B. LM	(ONE-MA	A.1 2. 3 B.1	A RESPONSES IS ACCEP ATTEMPT TO RECONFIEVCS. IF SUCCESSFUL, CONEVA. IF NOT SUCCESSFUL, TURN TO VHE RANGE AND CONTINUE EVA. IF LCRU AVAILABLE, ACTIVATE ASAP AND TINUE EVA IF LCRU NOT AVAILA	GURE TINUE RE- OF LM CON-		
		MISSION		ATE	RETURN TO LM AND F FIGURE COMM. THEN CONTINUE EVA WITHI RANGE OF LM	ECON- N VHF GROUP	PAGE	
		APOLLO	17 FNL	9/1/72	COMM AND INST	FUNCTIONAL	1C 20-7	Tape 24.7

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE			RULING		CUES/NOTES/COMMENTS		
	20-22	LOSS OF LCRU	EVA	-	ETUR	<u>NUE EVA</u> N TO WITHIN VHF RAN	GE OF			
	20-23	LOSS OF LCRU HGA	EVA	"	ONTI	<u>nue eva</u> Ga		BY SWITC TV AVAIL	CHING ANTE	NNA CONNECTIONS ON LCRU, 10 FT SITE.
	20-24	LOSS OF LCRU LGA	EVA	I	F LO	NUE EVA ST DURING MOVING MO NUE TO NEXT STOP AN N COMM VIA HGA.		HGA CANN	OT BE USE	D FOR MOVING COMM.
	20-25	LOSS OF LCRU BATTERY	EVA	Ā	BA EV B. DU LF	NUE EVA RIOR TO TRAVERSE-INS RITERY ASSIGNED TO N A. RING TRAVERSE-SWITC RIV POWER UNTIL NEXT REN INSTALL BATTERY REVIOUS EVA.	H TO STOP,	BASEI B. LCRU	O ON LRV P	RAVERSE WILL BE PLANNED OWER AVAILABLE. ROM PREVIOUS EVA WILL BE LRV.
	20-26	LOSS OF LCRU MOVING COMM MODE	EVA	.	WHEN SWIT(INUE EVA NEXT STOP IS REACHE H ANTENNA CONNECTIO JSE FM/TV OR TV REMO)NS	MOVING 1 PRI - PI B/U - PI CONT -	M1/WB M1/NB	
	20-27	LOSS OF PM1 TRANSMITTER OR RECEIVER	EVA		A. MC HC B. S'	INUE EVA DVING COMM-SWITCH LI GA CONNECTION PORT. TOPPED COMM 210 FT SITE AVAIL RETAIN SWITCHED CI FIGURATION . 210 FT SITE NOT AVAILABLE, RETURN NORMAL CONFIGURAT	ABLE, ON-		AVAILABLE	E TO 210 FT SITE ON LGA E VIA HGA
	20-28	LOSS OF TRANSMITTER 2	EVA		SWIT	<u>INUE EVA</u> CH TO PM1 TRANSMITT IN VOICE AND TM	ER TO	TV AND	COMMAND C	APABILITY IS LOST.
 		MISSION	REV	DATE		SECTION	GROUP		PAGE	
		APOLLO 1	7 FNL	9/1/7	2	COMM AND INST	FUNCTION COMM-SPI		20-8	Tape 25.1

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE	E		RULING		CUES/NOTES/COMMENTS
	20-29	LOSS OF RECEIVER 2	EVA		LOS	NTINUE EVA SS OF COMMAND AND UP DURING GEOLOGICAL S REMAIN IN FM/TV OR	TOP.	A. CREW CAN MANUALLY POSITION CAMERA.
					В.	DURING WALKING PART STOP, SELECT PMI/WB		B. TV AND COMMAND CAPABILITY IS LOST
	20-30	LOSS OF LCRU VHF RECEIVER	EVA		UTI CRE	ITINUE EVA LIZE TV VISUAL RESP W AS CUE TO RECEIPT INKS.	ONSES OF OF MCC	
	20-31	LOSS OF LCRU VHF TRANSMISSION	EVA			ITINUE EVA 'URN TO VHF RANGE OF	LM	
177.00	20-32	LOSS OF LCRU TV (GCTA)	EVA		А.	BYPASS TCU BY RECAB LOSS OF COMMAND CON RESULT IF STILL NO TV, SEL PM1/WB AND CONTINUE TV.	TROL WILL	A. CREW CAN MANUALLY CONTROL CAMERA
	20-33	LOSS OF COMMAND TO LCRU TV (GCTA)	EVA			TINUE EVA W MANUALLY CONTROL	гv.	
	20-34	LOSS OF LCRU/GCTA TM	LUNAR STAY		<u>CON</u>	TINUE MISSION		ONBOARD CREW READOUTS WILL BE REQUIRED.
	20-35	LCRU TEMP MORE THAN 120 DEG F	LUNAR STAY			TINUE MISSION IN DUTY CYCLE OPERA	TIONS	DUTY CYCLE: 5 MIN ON AND 10 MIN OFF
	20-36	GCTA TEMP MORE THAN 122 DEG F	LUNAR STAY			TINUE MISSION OSITION CAMERA		MANUAL OR BY GROUND COMMAND
		RULE NUMBERS 20-37 THROUGH 20-40 ARE RESERVED.						
<u></u>		MISSION	REV	DATE		SECTION	GROUP	PAGE
		APOLLO 1	7 FNL	9/1	/72	COMM AND INST	FUNCTI COMM-S	ONAL SPECIFIC 20-9 Tape 25.2

MISSION RULES

							TIONS AND INSTRUME	THE CONTINC	,	
R	ITEM									
1						-				
							CSM - GENERAL			
	20-41	Δ	RASELINE R	EQUIREMENT (A	ALI DH	ASES EYCED	T LAUNCH)			
	10 41	Α.	DASELINE N	LEGOTILEMENT (F	NLL FI	ASES EXCEP	1 LAUNCH)			
				NSTRUMENTATIO	ON - C	RITICAL IN	STRUMENTATION IS T	HAT INSTRUMENȚATI	ON REQUIRED	TO VERIFY MISSION GO/NO-GO
		1	CRITERIA.	•						
		В.	LAUNCH							
			THERE ARE	NO CSM INSTRU	IMENTA	TION FAILU	RES FOR WHICH THE I	_AUNCH/INSERTION	PHASE WILL	BE TERMINATED.
	i	С.	POWERED DE	SCENT ADDITIO	NAL R	EQUIREMENT	s .			
			THERE ARE	NO CSM INSTRU	JMENTA	TION SYSTE	MS FAILURES FOR WH	CH LM POWERED DE	SCENT WILL	BE TERMINATED.
	,									
	20-42	THE	MICCION 11T	II DE CONTY	ירט ייי	TIL TUE ! CO	C OF THE			
	20-42	IME	LITOSION MI	LL BE CONTINU	ich Mī	in THE FOR	S UP IHE:	•		
		Α.	CSM UPDATA	LINK						
			CSM CAUTIO CSM DSE	N AND WARNING	SYST	EM		•		
				AIN ANTENNA						
			CSM FM DOW							
				NGING (PRN)						
	•	G. H.	VHF RANGIN	IG						
		п.	202							
						-			,	
		DITT	UT CA OC 2	IROUGH 20-45 F	10E DE	CEDVED				
İ		KULE	3 20 -43 in	IKUUGH 20-45 F	ARE RE	SERVED				
ı										
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	1									
	1									
	1									
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	Ī	1								
				MISSION	REV	DATE	SECTION	GROUP	PAGE	
					FNL	9/1/72	COMM AND INST	CSM INST		
				l		L	L	GENERAL	20-10	Tape_25.3

MISSION RULES

			SECTION	N 20 -	COMMUNICAT	TIONS AND INSTRUMEN	TATION - CONTINUED)	
R	ITEM							•	
					C	SM ~ MANAGEMENT			
	20-46	DSE MANAGEMEN	т						
	20-40	DSE PHINGEREN	<u>L</u>						
		EXCEPT DU DURING PE	RING PERIODS (RIODS OF VHF (OF ORB	ITAL SCIENO G WHEN NO I	CE OPERATIONS WHEN	CSM HBR WILL BE RE	CORDED WIT	ITH GROUND TELEMETRY SITES H THE EXPERIMENT DATA AND E TELEMETRY WILL BE NORMALLY
		B. CM HIGH-B	IT-RATE DSE RI	ECORDI	NGS WILL BE	MADE DURING THE FO	OLLOWING OPERATION	ıs:	
	1	1. LAUN	СН						
		2. TLI							
]		B/CSM SEPARAT	ION					
		4. TD&E 5. ALL	SPS MANEUVERS	AND M	TUCUIDEE C	ADDECTIONS			
			ING AND UNDOC		IDCOOKSE C	DKKEC! TON2			
			M SEPARATION		TRY		•		
	i		REQUIREMENTS						
		9. LM F		DFDATY	ONE				
		IU. UKBI	TAL SCIENCE OF	PEKATI	UNS				
		C. DURING SL	EEP PERIODS						
		HETNE HTE	U CAIN ANTENN	AC DC	E DECORDIN	G AND DUMPING WILL	DE MANACED DED HAN	ADOUT	
	20-47	BE CORRECT	BE CONFIGURED	PLETIO DRIFT	N OF POWER	ED FLIGHT. FORE BEING UPDATED			-15 MINUTES, CTE WILL NOT
			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	COMM AND INST	CSM INST MANAGEMENT	20-11	Tape 25.4

MISSION RULES

R R	RULE	CONDITION/MALFUNCTION	PHASE		RUL I NG		CUES/NOTES/COM	MENTS	
					SM - SPECIFIC				
20)-51	LOSS OF CSM TM A. HBR OR LBR	ALL	_	NTINUE MISSION		REF CSM MAL PRO LOSS OF REAL-TI FOR TM IF AVAIL	CEDURE COMM 10 - MSFN REPO ME PCM. DSE MAY BE UTILIZ ABLE.	ORTS ZED
		B. ALL TM	EO ALL	2. 1	CONTINUE MISSION ENTER NEXT BEST PTP CONTINUE MISSION				
20	0-52	LOSS OF CRITICAL INSTRUMENTATION	LAUNCH EO	ENTER	NUE MISSION NEXT BEST PTP				
3			TLC	CONTI NO-GO	FOR TLI NUE MISSION FOR LOI FOR LUNAR OPERATION	<u>√S</u>			
20	0-53	LOSS OF ONE CSM PMP POWER SUPPLY	ALL	CONTI	<u>NUE MISSION</u>				
20	0-54	LOSS OF BOTH CSM POWER AMPLIFIERS	EPO ALL SCIENCE	CONTI ANT I	O FOR TLI NUE MISSION IF HIGH IS AVAILABLE (NUE MISSION BASED O NT OF SCIENCE DATA T SE OBTAINED	N			
2	0-55	LOSS OF THE SCE	ALL	CONT	INUE MISSION				
2	20-56	COMPLETE OR PARTIAL LOSS OF SCIENTIFIC TM	ALL SCIENCE	CONT	INUE MISSION INUE MISSION O ON AMOUNT OF SCIEN THAT CAN BE OBTAINE	CE D.			
						•			
		MISSION	REV DA	TE	SECTION	GROUP	PAGE	1	
		APOLLO 1	7 FNL 9	/1/72	COMM AND INST	CSM INS MANAGE		Tape 65	5.1

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		/NOTES/COMME	NTS
	20-57	LOSS OF FM TRANSMITTER	ALL		INUE MISSION			
			SCIENCE	AMOUN	INUE MISSION BASED O NT OF SCIENTIFIC DAT CAN BE OBTAINED	N A		
	20-58	LOSS OF HGA	ALL	CONT	INUE MISSION INUE MISSION			
				BASE	ON AMOUNT OF SCIEN THAT CAN BE OBTAINE	TIFIC D		
	20-59	LOSS OF DSE	ALL SCIENCE		INUE MISSION	·		
				ONLY	REAL-TIME DATA WILL ABLE	ВЕ		
		RULE NUMBERS 20-60 THROUGH 20-65 ARE RESERVED.						
							,	
						:		
							<u> </u>	
<u>_</u>		MISSION APOLLO		DATE	SECTION TAIST	GROUP	PAGE	
		APOLLO	17 FNL	9/1/72	COMM AND INST	CSM INST MANAGEMENT	20-13	Tape 65.2

MISSION RULES

. I	ITEM	
1		
		LM - GENERAL
	20-66	A. BASELINE REQUIREMENT
		CRITICAL INSTRUMENTATION - CRITICAL INSTRUMENTATION IS THAT INSTRUMENTATION, ONBOARD OR TM DURING MSFN AOS, OR
		ONBOARD ONLY DURING MSFN LOS, REQUIRED TO VERIFY MISSION GO/NO-GO CRITERIA.
i		B. LUNAR STAY ADDITIONAL REQUIREMENTS
		LM LBR OR HBR TM IS REQUIRED. IF LM TM DATA IS LOST DURING AN EVA, THAT EVA WILL BE CONTINUED.
	20-67	THE MISSION WILL BE CONTINUED WITH THE LOSS OF THE:
		A. LM UPDATA LINK
		B. LM CAUTION AND WARNING SYSTEM C. LM DSEA
		D. EVA TELEMETRY
		E. LM FM DOWNLINK
		F. LM USB RANGING (PRN) G. VHF RANGING
		H. GCTA
]	I. LCRU
_		MISSION REV DATE SECTION GROUP PAGE
		APOLLO 17 FNL 9/1/72 COMM AND INST LM INST- GENERAL 20-14 Tape 25.7

MISSION RULES

R	ITEM								
					LM	- MANAGEMENT			
	20-71	STAY, THE POW	POWERED-UP ER AMPLIFIER	R WILI	L BE TURNE	D OFF. LBR TM, PLS	SS AND VOICE CIRCU	IT MARGINS TE WILL BE	LL BE USED. DURING LUNAR ARE ADEQUATE. SWITCHED FROM HBR TO LBR AL VOICE COMMUNICATIONS.
	20-72	SYSTEM MONITORING DURING SLEEP PERI	-	WMEN	WILL SLEEP	WITH HEADSETS TO	MONITOR FOR MASTER	ALARMS OR	GROUND COMMUNICATIONS.
		RULE NUMBERS 20-7	73 THROUGH 2	0-75	ARE RESERV	ED.	•		
							·		
							4		
								,	
		ì							
F			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION COMM AND INST	GROUP LM INST- MANAGEMENT	PAGE 20-15	Tape 26.1

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUES/	NOTES/COMMENT	rs
					M - SPECIFIC			
	20-76	LOSS OF LM TM		A CO	NTINUE MISSION	REF	LM MAL PROC	COMM 6
	1	A. LOSS OF LBR ONLY	ALL	-	NTINUE MISSION	MSEN	REPORTS LOS	S OF PCM
		B. LOSS OF HBR ONLY	ALL	B. <u>co</u>	MITMUE MISSION	l l		MAKE FINAL GO/NO-GO TO
						CONT	INUE POWERED	DESCENT.
İ		C. LOSS OF ALL TM	DOCKED	C.1.	CONTINUE MISSION			
					NO-GO FOR UNDOCKING			
			PRE PDI	2.	RETURN TO VICINITY	F CSM		
			POWERED DESCENT	3.	CONTINUE MISSION IF			
			DESCENT		ADEQUATE DATA IS AV ABLE TO MAKE FINAL GO/NO-GO DECISION (ONBOARD DISPLAY)			
		. ,	LUNAR	4.	NO-GO FOR NORMAL ST	<u>y</u>		
			STAY		TIME AND TWO MAN EV ONE MAN EVA ACCEPTA IF O/B MONITORING I	LE		
				1	AVAILABLE.			
]		DUAL	5.	CONTINUE EVA			
			EVA		ATTEMPT TO RE-ESTAB TM AFTER EVA.	.ISH		
							,	
	20-77	LOSS OF CRITICAL	DOCKED	DO N	OT UNDOCK			
		INSTRUMENTION	UNDOCKED	DOCK	ASAP			
			LUNAR	LIFT	OFF NEXT BEST OPPOR	<u> </u>		
			STAY	}				
	İ	RULE NUMBERS 20-78 THROUGH 20-80 ARE						
1		RESERVED.						
		}		İ		Ì		
	1							
L			1		CECTION .	CROUP	PAGE	
\vdash		MISSION		NTE 9/1/72	SECTION COMM AND INST	GROUP LM INST-	PAGE	
-		APOLLO	1/ I'NL	3/1/16	COLLEG THE THE	SPECIFIC	20-16	Tape 26.2

MISSION RULES

		CSM - INST	RUMENTATION REQUIRE	MENTS		
20-81	MEAS DESCRIPTION	PCM	ONBOARD	TRANSDUCERS	CATEGORY	MISSION RULE R
	UDL VALIDITY SIGNAL	CT0262	v -	-	HD	20-42
	USB RECEIVER AGC	CT06201	E METER	COMMON	HD	20-42,20-7A(9) 20-88
	USB RECEIVER ERROR	CT0604	F -	-	HD	
	DSE TAPE MOTION	CT0012	х тв	-	НД	20-42,20-46
1	CTE TIME	CT0145	F -	-	HD	20-47
	SCE 10 VDC	CT0018	v -	-	HD	
	SCE 5 VDC	CT0017	v -	-	HD	
	SCE 20 VDC	CT0015	v -	-	HD	
	SCE -20 VDC	CT0016	v -	-	HD	
	PCM HI REF 85 PERCENT	CT0125	v -	-	HD	
	PCM HI REF 15 PERCENT	CT0126	v -	-	ан	
	HI GAIN ANT POS-PITCH	ST0152	н -	-	HD	
	HI GAIN ANT POS-YAW	ST0153	Н -	-	HD	
	HGA BEAM WIDTH SW POS - NA	R CT0161	x -	-	р	
	HGA BEAM WIDTH SW POS - ME	D CT0162	x -	-	HD	
	HGA TRACK SW POS - AUTO	CT0163	x -	-	но	
	HGA TRACK SW POS - REACQ	CT0164	x -	-	HD	
·	MASTER UNIT TEMP	ST0562	Т		HD	20-56
	SLAVE UNIT TEMP	ST0563	Т		HD	20-56
		LM - INSTRI	UMENTATION REQUIREM	IFNTS	,	
20-82	MEAS DESCRIPTION	<u>PCM</u>	ONBOARD	TRANSDUCERS	CATEGORY	MISSION RULE RE
	PCM OSC FAIL 2	GL0422		-	1 OF 2	
	PCM OSC FAIL 3	GL0423		-	HD	
	CAL 85 PCT	GL0401		-	НО	
]	CAL 15 PCT	GL0402		-	HD	
	MET	GL05011		-	HD	
	C AND W FAIL	GL4054		-	HD	
1	MASTER ALARM	GL4069		-	HD	
	DUA STATUS	GT0441		-	HD	20-67
	S-BND ST PH ERR	GT09921		-	HD	20.67
	S-BND RCVR SIG	GT0994	V METER /CAUTION	-	HD	20-67
	STEERABLE ANT TEMP	GT0454	METER /CAUTION	-	HD	20-98,20-71
	XMTR PO	GT0993	-	-	HD	20-67,20-76
	LCRU RADIATOR TEMP	RT8001	T METER	REDUNDANT	HD	20-34
	LCRU SUBSYSTEMS VOLTAGE	RT8003	T METER	-	HD	20-34
<u> </u>	MISSION R	EV DATE	SECTION	GROUP	PAGE	



NOTE

SECTION 21 NOW COVERS LM/EMU INSTRUMENTATION.

FORMER LM SECTIONS 21
THROUGH 27 HAVE BEEN
DELETED TO ELIMINATE
DUPLICATION BETWEEN
THEM AND THE LM TELMU
AND CONTROL SUMMARY
RULES IN SECTION 3.

21 LM/EMU INSTRUMENTATION I LM SEQUENTIAL AND PYROTECHNIC 22 LIELECTRICAL POWER 23 LM ENVIRONMENTAL 24 LM GUIDANCE AND CONTROL 25 LM D 5 26 LM APS 2 LM REACTION CONTROL SYSTEM 28 SPACE ENVIRONMENT 29 RECOVERY 30 AEROMEDICAL 31 LUNAR SURFACE OPERATIONS 32 ALSEP 33 LUNAR ORBIT EXPERIMENTS APPENDICES A ACRONYMS AND SYMBOLS B DISTRIBUTION LIST C CHANGE CONTROL

MISSION RULES

SECTION 21 - LM/EMU INSTRUMENTATION

SYSTEM MEAS DESCRIPTION PCM OMBOARD SEQUENTIAL/ PYROTECHNIC ED RLY B K1-K6 GY0201X SYS A STAGING LIGHT COMMON CAUTION CLIGHT ED RLY B K1-K6 GY0221X ED RLY B K7-K15 GY0232X ED RLY B K7-K15 GY023X ED RLY B K7-K15 GY02	
SEQUENTIAL/ PYROTECHNIC ED RLY A K1-K6 GY0201X SYS A STAGING LIGHT COMMON CAUTION LIGHT ED RLY B K1-K6 ED RLY B K7-K15	
PYROTECHNIC COMMON CAUTION LIGHT ED RLY B K1-K6 GY0202X SYS B STAGING LIGHT ED RLY A K7-K15 GY0231X	CATEGORY
ED RLY B KT-K6 ED RLY A KT-K15 ED RLY B KT-K15	HD HD
POWER AC BUS VOLTS BAT 1 CUR BAT 2 CUR BAT 2 CUR BAT 3 CUR BAT 3 CUR BAT 4 CUR BAT 4 CUR BAT 1 VOLTS BAT 1 VOLTS BAT 1 VOLTS BAT 1 VOLTS BAT 2 VOLTS BAT 3 VOLTS BAT 2 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 4 VOLTS BAT 6 CO202V BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 1 MAL BAT 2 VOLTS BAT 3 VLTS BAT 3 VLTS BAT 3 VLTS BAT 4 VOLTS BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 1 MAL BAT 2 VL MAL BAT 3 VL MAL BAT 3 VL MAL BAT 4 MAL BAT 5 MAL BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 7 MAL BAT 1 LOW TAP BAT 3 BAT 6 NORM COR BAT 6 NOR BAT 6 NOR BAT 6 NOR BAT 6 NOR BAT 6 NOR BAT 6 NOR BAT 6 NOR BAT	HD HD HD HD
BAT 2 CUR BAT 1 CUR BAT 3 CUR BAT 3 CUR BAT 4 CUR BAT 4 CUR BAT 4 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 1 VOLTS BAT 1 VOLTS BAT 1 VOLTS BAT 1 VOLTS BAT 5 VOLTS BAT 5 VOLTS BAT 5 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 3 VOLTS BAT 4 CUR BAT 3 VOLTS BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 6 CUR BAT 7 MAL BAT 6 CUR BAT 1 MAL BAT 1 MAL BAT 1 MAL BAT 1 MAL BAT 1 MAL BAT 2/L MAL BAT 2/L MAL BAT 3 CAUT, COMP BAT 3 MAL BAT 4 MAL BAT 6 CO9964U BAT 3 CAUT, COMP BAT 3 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 7 MAL BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 5 BAU CDR BAT 5 BAU CDR BAT 5 BAU CDR BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 7 MAL BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 5 BAU CDR BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 7 MAL BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 5 BAU CDR BAT 6 MAL BAT 5 BAU CDR BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 6 MAL BAT 7 MAL BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 1 LOW TAP BAT 5 BAL CAUT, COMP BAT 6 MAL BAT 6 M	1 OF 2
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BAT 2/L MAL GC9962U CAUT, COMP BAT 3/L MAL GC9963U CAUT, COMP BAT 4 MAL GC9964U CAUT, COMP BAT 5 MAL GC9965U CAUT, COMP BAT 6 MAL GC9966U CAUT, COMP BAT 6 MAL GC9966U CAUT, COMP BATTERY MAL GL4047X COMP BAT 1 LOW TAP GC4362X FLAG BAT 4 LOW TAP GC4368X FLAG BAT 5 B/U CDR GC4368X FLAG BAT 6 NORM CDR GC4372X FLAG BAT 6 NORM CDR GC4372X FLAG BAT 6 SEVERAL HD MEASUREMENTS WILL CAUSE SEVERAL HD MEASUREMENTS	1 OF 2 M PCM
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MISSION RULES

SYSTEM						
ENVIRONMENTAL SULT PRESS GARIN PRESS UAR RICE PRESS GASSIP MITTER LOF 3 DES 2 02 PRESS GASSIP MITTER DES 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER ASC 1 02 PRESS GASSIP MITTER GALVOL PUMP PRESS GASSIP MITTER GALVOL PUMP PRESS GASSIP MITTER GALVOL PUMP PRESS GASSIP MITTER GALVOL PUMP PRESS GASSIP MITTER GALVOL M	ITEM		SECTION 21 - LM/EMU	INSTRUMENTATION -	CONTINUED	<u> </u>
CASTROL CABIN PRESS UTH REF PRESS UTH REF PRESS UP STORY F/H REF PRESS UP STORY F/H REF PRESS UP STORY F/H REF PRESS UP STORY F/H REF PRESS UP STORY F/H REF PRESS UP STORY F/H REF PRESS UP STORY UNH REF PRESS UP STORY RETER, CAUT 1 0F 2 RETER, CAUT 1 10F 2 RETER, CAUT		SYSTEM	MEAS DESCRIPTION	PCM	ONBOARD	CATEGORY
CABIN PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF PRESS UP RIF UP RIF RIF RIF RIF RIF RIF RIF RIF RIF RIF			SUIT PRESS	GF1301P		
DES 10 PRESS GF358AP METER, CAUT M of 2 ASC 10 PRESS GF358AP METER, CAUT M of 2 ASC 20 PRESS GF358AP METER, CAUT M of 2 GLYCOL PUMP DELTA P SEC GF292IP			U/H RLF PRESS	GF3591P	METER }	1 OF 3
GLYCOL PUMP PRESS GF999FU			DES 1 02 PRESS ASC 1 02 PRESS	GF3584P GF3582P	METER, CAUT∫ METER, CAUT)	M 1 OF 2
GLYCOL TEMP GF9998U METER, CAUT GLYCOL THEFT TEMP GF2581T METER 1 OF 2 GLYCOL THET TEMP GF2581T METER 1 OF 2 GLYCOL THET TEMP GF2531T METER 1 OF 2 DES 2 RAD PRESS GF0500P METER 1 OF 2 ASC 1 ROU QTY GF4502P METER 1 OF 2 ASC 2 ROU QTY GF4502P METER 1 OF 2 AS			GLYCOL PUMP DELTA P SEC GLYCOL PUMP PRESS GLYCOL PUMP PRESS	GF2021P GF2921P GF9997U	} } METER \	
DES 2 H20 PRESS GF-0500P METER \ 1 OF 2 DES 1 H20 PRESS GF-4500P METER \ 1 OF 2 ASC 1 H20 DTY GF-3502P METER \ 1 OF 2 ASC 1 H20 DTY GF-3502P METER \ 1 OF 2 ASC 2 H20 DTY GF-3502P METER \ 1 OF 2 ASC 2 H20 DTY GF-3502P METER \ 1 OF 2 ASC 2 H20 DTY GF-3502P METER \ 1 OF 2 ASC 2 H20 DTY GF-3502P METER \ 1 OF 2 REPR ELEC OPEN GF-3572X WARNING HD CO2 PART PRESS GF-1521P METER, CAUT, COMP HD SUIT DIV EGRESS GF-1221X			GLYCOL TEMP GLYCOL OUTLET TEMP SUIT TEMP	GF9998U GF2581T GF1281T	METER, CAUT	
PRI H20 REG DELTA P GF4101P HD REPR ELEC OPEN GF3572X WARNING HD C02 PART PRESS GF1521P WETER, CAUT, COMP HID REPR ELEC OPEN GF3572X CAUT, COMP HID REPR ELEC OPEN GF3572X CAUT, COMP HID SUIT DIV EGRESS GF1221X			DES 2 H2O PRESS DES 1 H2O PRESS ASC 1 H2O QTY	GF0500P GF4500P GF4502P	METER } METER } METER }	1 OF 2 M 1 OF 2
CO2 PART PRESS GF1521P METER, CAUT, COMP HD H20 SEP PARTE GF9999U CAUT, COMP HD SUIT DIV EGRESS GF1221X		•				HD
LOSS OF SEVERAL HO MEASUREMENTS WILL CAUSE SEVERELY DEGRADED MISSION MONITORING CAPABILITY. MISSION MONITORING CAPABILITY. MISSION REV DATE SECTION GROUP PAGE			CO2 PART PRESS H2O SEP RATE	GF1521P GF9999U	METER, CAUT, COMP CAUT, COMP	HD HD
MISSION KEY DATE OFFICE			WILL CAUSE SE	RAL HD MEASUREMENTS EVERELY DEGRADED	i ,	
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SECTION 21 - LM/EMU INSTRUMENTATION - CONTINUED

SYSTEM MEAS DESCRIPTION PAYER ON ON OR ORDER CHUYEVA FEED MED PRESS GIBINOPYGTB210P IND FLAG HD D FLOW HEED HOW PRESS HOW FLOW HE FLAG HD D FLOW HEED FLOW HEED FLOW HEED FLOW HEED FLOW HEED FLOW HEED FLOW HEED FLOW HOW HOW FLOW HEED FLO			J.	CITON ZI	- LM/Er	MU INSTRUMENTATION -	CONTINUED		
EMU/EVA FEED H2D PRESS LOW FEED H2D PRESS LOW FEED H2D PRESS LOW FOR FLOW PLSS SAT CUR PLSS SAT CUR FLSS SAT VULT LICE H2D TEMP GRIB141/GR824T GRAPHESS GRAPHESS LOW PARTS LOW PARTS LOW PARTS LOW FOR A PRESS LOW PARTS SUBL 02 QUT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP GR81/59/GR825P PLSS 02 QTT TEMP HD HD HC HC HC HC HC HC HC HC HC HC HC HC HC	R ITEM	-							
LOW FEED HZD PRESS LOW FATH FLOR PLSS BAT CUR PLS BAT CUR		SYSTEM	MEAS	DESCRIP	TION	FM/FM PA	<u>\M</u>	ONBOARD	CATEGORY
PLSS BAT VOLT ICE NOD TEMP FOR PRESS PLAN FOR PRESS BLOW PAR PRESS SUBL 02 PUT TEMP PLSS 02 PRESS PLS 02 PRESS PLS 0		EMU/EVA	LOW	FEED H20	PRESS	GT8110P/GT8		TONE-FLAG TONE-FLAG	НD
SUBL CO QUIT TEMP PLESS CAPES GRISTON/GREATSP PLESS CAPESS GRISTON/GREATSP PLESS CAPESS PLESS CAPESS PLESS CAPESS PLESS CAPESS GRISTON/GREATSP HIGH C2 FLOW LCG R/20 A T GT8196T/GT8296T HIGH C2 FLOW COPS RECE PRESS CAGE GRISTON/GT8201V HIGH C2 FLOW EVC CAL 0 VDC GT8102V/GT8201V HIGH C3 FLOW EVC CAL 5 VDC GT8102V/GT8202V HID NOTE LOSS OF SEVERAL HD MEASUREMENTS MILL CAUSE SEVERELY DEGRADED MISSION MONITORING CAPABILITY.			PLSS LCG PGA PGA	BAT VOL H2O TEMP PRESS PRESS	T	GT8141V/GT8 GT8154T/GT8	3241V 3254T		HD HD 1 OF 3
OPS PRESS GAGE OPS REG PRESS GAGE EVC CAL S VICE OFS REG PRESS GAGE O			SUBL PLSS PLSS PLSS HIGH	02 OUT 5-CO2 PP 5 O2 PRES 5 O2 QTY 1 O2 FLOW	TEMP S IND	GT8175P/GT8 GT8182P/GT8	3275P 3282P	METER	HD HD HD HD
LOSS OF SEVERAL HD MEASUREMENTS MILL CAUSE SEVERELY DEGRADED MISSION MONITORING CAPABILITY.			OPS OPS EVC	PRESS GA REG PRES CAL O VD	S GAGE	GT8101V/GT8	3201V		HD HD HD
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SECTION 21 - LM/EMU INSTRUMENTATION - CONTINUED

1					INSTRUME	NTATION REQUIREMENTS	5		
		SYSTEM	MEAS DISC	RIPTION	1	PCM	ONBOARD		CATEGORY
1		GUIDANCE	LGC DOWN	NLINK	_	GG0001 X	-		
		AND	PLS TORC	REF		GG1040V	-		HD
		CONTROL	2.5 VDC	TM BIAS	5	GG1110V	-		HD
1			IMU 28 \			GG1201V	-		HD
-			IRIG SUS		KC C	GG1331V	-		HD
-			IMU STBY	ſ		GG1513X	-		HD
1			LGC OPR X PIPA (אז דוור	DH a ce	GG1523X GG2001V	-		HD HD
ļ			Y PIPA (Z PIPA (OUT IN F	PHASE PHASE	GG2021V GG2041V	-		HD HD
1			IG SVO E IG 1X RS			GG2101V GG2112V	- FDAI		HD HD
	. 1		IG 1X R			GG2113V	FDAI		HD
1			MG SVO E			GG2137V GG2142V	+ FD4.1		HD
ļ	ļ		MG 1X RS			GG2143V	FDAI FDAI		HD HD
			OG SVO I OG RSVR OG RSVR	OUT SIM	N	GG2167V GG2172V GG2173V	FDAI FDAI		HD HD HD
			PITCH A			GG2219V	FDAI		HD-PCM
ŀ			YAW ATT ROLL AT			GG2249V GG2279V	. FDAI FDAI		HD-PCM HD-PCM
1			PIPA TE			GG2300T*	C&W		HD-PCM
1			RR SHIF			GG3304V	FDAI		HD-PCM
			RR SHIF RR TRUN RR TRUN	SIN		GG3305V GG3324V GG3325V	FDAI FDAI FDAI		HD-PCM HD-PCM HD-PCM
			LGC WAR			GG9001 X	C&W		HD-PCM
	ł		ISS WAR			GG9002X	C&W		HD-PCM
	l		LR ANT			GN7563T GN7621X	TEMP MONITOR C&W		HD-PCM HD-PCM
			RR ANT			GN7723T	TEMP MONITOR		HD-PCM
			LR RNG I LR VEL	BAD		GN7521X GN7557X	C&W C&W		HD HD
			YAW ERR PITCH E Roll Er	RR CMD		GH1247V GH1248V GH1249V	- - -		HD HD HD
	1		JD A4D RCS TCP			GH1419V GR5023X	-		HD HD
ı			JD B3D	OUTPUT		GH1423V	-		HD
	1		JD A2D RCS TCP			GH1427V GR5040X	-		HD HD
	1		JD B1D RCS TCP	OUTPUT		GH1431V GR5044X	-		HD HD
ŀ	1		JD B4U			GH1418V	_		HD
			JD B4F JD A4R	OUTPUT		GH1420V GH1421V	-		HD HD
	ł		JD A3U	OUTPUT		GH1422V	-		HD
			JD B3A JD A3R			GH1424V GH1425V	-		HD HD
ĺ	1		JD B2U JD A2A	OUTPUT		GH1426V GH1428V	-		HD HD
ļ.	- 1		JD B2L	OUTPUT		GH1429V	-		НD
	1		JD Alu JD Alf			GH1430V GH1432V	-		HD HD
]	İ	+ 10010877	JD B1L		06 11650 5	GH1433V	-		HD
		~ INDICATE	S SEPARAIL IR	MUZDUCE	K2 U\$ED F	FOR ONBOARD AND PCM			
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SECTION 21 - LM/EMU INSTRUMENTATION - CONTINUED

R ITEM							
	SYSTEM	MEAS DE	SCRIPTION	PCM	ONBOARD)	CATEGORY
ł	GUIDANCE	RCS TO		GR5031X	-	_	HD
i '	AND CONTROL	RCS TO RCS TO		GR5033X GR5034X	-		HD HD
	(CONTINUED)	RCS TO	P A3U	GR5035X	_		HD
İ		RCS TO RCS TO		GR5037X GR5038X	-		HD HD
		RCS TO	P B2U	GR5039X	_		HD
		RCS TO RCS TO		GR5041X GR5042X	-		HD HD
		RCS TO		GR5043X	-		HD
1		RCS TO RCS TO		GR5045X GR5046X	-		HD HD
1		YAW AT		GH1455V	FDAI		HD
-	1		ATT ERR ITT ERR	GH1456V GH1457V	FDAI FDAI		HD HD
l l			W RATE	GH1461V	FDAI		HD
İ		RGA PI	TCH RATE	GH1462V	FDAI		HD
-			ILL RATE	GH1463V	FDAI		HD
		AGS SE		GH1621X	-		HD
1			PLS/DIR PLS/DIR	GH1628X GH1629X	-		HD HD
,		YAW PI		GH1630X	-		HD
	1	AUTO (GH1214X	-		HD
1	1	APS AF		GH1230X	-		HD
	1		RE OVRD	GH1286X	· _		HD
			IRUST CMD	GH1311V	METER		HD
			GDA POS BDA POS	GH1313V GH1314V			HD HD
		P TRM		GH1323X	C&W		HD
		R TRM		GH1330X	C&W		HD
		DPS AF	HRUST CMD	GH1331V GH1348X	METER		HD HD
		DPS V		GQ6806H			HD
			PWR FAIL	GL4026X	C&W		HD
	ļ		PWR FAIL	GL4027X	C&W		HD
ŀ		AGS DO	WNLINK MD	GI0001X GI3301T	-		HD
1			ing IR FAIL	GL4028X	C&W		HD HD
		AUTO (GH1217X	-		HD
		AGS AI		GH1641X	_		HD
			T HOLD	GH1642X	-		НД
		PGNS / PGNS /	NUTO NTT HOLD	GH1643X GH1644X	-		HD HD
	DESCENT	START	TNK PRESS	GQ3015P	HE MON	I	НД
ŀ	PROPULSION		PRESS	GQ3018P	C&W		HD
			PRESS	GQ3025P		7	HD
	}	HE PRI HE PRI	.55 :SS	GQ3435P GQ3436P	PRESS	Ţ	1 OF 2 M
		FU TNI	(1 QTY (2 QTY	GQ3603Q GQ3604Q	ΥΤ Ω ΥΤ Ω	1	1 OF 4 M
		OX TNI	C 1 QTY	GQ4103Q	QTY		SEE NOTE 2
	1	FU 1	C 2 QTY	GQ4104Q GQ3718T	QTY	I I	UD
1		FU 2		GQ37181 GQ3719T	TEMP MO TEMP MO	ON .	HD HD
		0X 1 1		GQ4218T	TEMP MO		HD
		0X 2 °		GQ4219T GQ3611P	TEMP MO	אנ ר	HD
		FU PRI Ox Pri		GQ3611P GQ4111P		Ļ	2 OF 3 M
		TCP		GQ6510P	THRUST	.	
		LOW LI	EVEL	GQ4455X	DPS LO	_	HD SEE
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	<u></u>		<u> </u>	THOTROMENTATION	LM CONTROL	£1=0	Tape 61.1

MISSION RULES

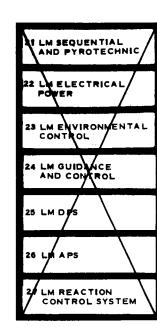
SECTION 21 - LM/EMU INSTRUMENTATION - CONCLUDED

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		2. FOR APPR LOSS RESU	THE LOSS OF E OXIMATE 20 SE OF BOTH SYST LTS. OF LO-LEVEL	C HOVER TIME PEN EMS, A PENALTY OI RESULTS IN AN APP	DX MEASUREMENTS, AN ALTY IS REALIZED. FO F 60 SEC HOVER TIME PROXIMATE 28 SEC HOVE	ER TIME	
					ASC F ILL CAUSE SEVERELY		
			D OXID "B" OF		ASC F SYS B AS	UEL	HD
			D FUEL "A" OF D FUEL "B" OF		SYS A AS ASC SYS B AS	FUEL	HD HD
			D OXID "A" OF		SYS A AS ASC	FUEL	но
		QUAD 1 QUAD 2 QUAD 3 QUAD 4	TEMP TEMP TEMP	GR6004T GR6003T GR6002T GR6001T	TEMP MON TEMP MON TEMP MON TEMP MON		HD HD HD
		RCS MAI	N "B" CLSD Ed open	GR9610U GR9613P	MAIN SOV CRSFD		HD HD
		RCS MAI	20 TEMP N "A" CLSD	GR4585T GR9609U	MAIN SOV		HD HD
		RCS "B"	20 TEMP FUEL TEMP	GR4586T GR2122T	TEMP MON		HD HD
		RCS "A"	He PRESS FUEL TEMP	GR1102P GR2121T	PRESS MO TEMP MO		HD
		RCS "B" RCS "B"	FUEL MFLD PF REG PRESS PROP QTY	GR1202P GR1095Q	PRESS MO PRESS MO QUANTIT	N _ N C&W Y	2 OF 3 M 1 OF 2 M
		RCS "A" RCS "A" RCS "B"	OX MFLD PRES	RESS GR2201P SS GR3201P SS GR3202P	PRESS MO PRESS MO PRESS MO	N	1 OF 2 M
	CONTROL	RCS "A" RCS "A"	He PRESS REG PRESS	GR1101P GR1201P	PRESS MO	N C&W }) 2 OF 3 M
	REACTION	VLVS B APS TCP	DELTA POS DELTA POS PROP QTY	GP2997U GP2998U GP2010P GR1085Q	QUANTI	TY)	HD HD HD 1 OF 2 M
		APS OXI APS OXI	D PRESS	GP1503P	GP1001P	}	1 OF 2 M
		APS FUE APS OXI APS OXI APS FUE APS FUE	D TEMP D LOW L PRESS	GP0908X GP1218T GP1408X GP1501P	C&W TEMP C&W GP0501P	}	HD HD HD 1 OF 2 M
		APS He	2R PRESS REG PRESS REG PRESS	GP0002P GP0042P GP0018P GP0025P GP0713T	HEL MON C&W TEMP	C&W } }	1 OF 2 M PCM 1 OF 2 M - PCM HD
	ASCENT PROPULSION	APS He APS He	1 PRESS LR PRESS	GP0001P GP0041P	HEL MON	C&W }	1 OF 2 M PCM
1 1	ASCENT	ADC U.	1 DDECC	CD00010	LICI MAN	Cen)	1 05 0 **

SECTIONS 21 THROUGH 27 ARE DELETED. REFERENCE TELMU AND CONTROL MISSION RULES IN SECTION 3 OF THIS DOCUMENT.

THE LM DETAILED RULES WERE DELETED TO ELIMINATE DUPLICATION BETWEEN THEM AND THE SUMMARY RULES IN SECTION 3.

IN SOME CASES, THE SUMMARY RULES HAVE BEEN EXPANDED TO INCLUDE DATA PREVIOUSLY COVERED ONLY IN THE DETAILED RULES.



MISSION RULES

						SECTION	28 - SPACE ENVIRON	MENT					
<u>`</u>	ITEM												
							GENERAL						
Ì													
	28-1	ALL	DECISIONS	WILL BE BASE	D ON	CONFIRMED	MEASUREMENTS AND/OR	EVENTS AND PROJEC	CTIONS BAS	ED ON CONFIRMED EVENTS.			
	28-2	<u>DEF</u> 1	NITIONS										
						ION DOSE TO WHICH TESTINAL) DOSE OF		YOULD BE SUBJECTED					
	B. THE PLANNING OPERATIONAL DOSE (POD) IS THE MAXIMUM RADIATION DOSE TO THE CREW FOR WHICH ANY MISSION WOUL BE DESIGNED DURING THE PLANNING PERIOD BASED ON AN ASSUMED SKIN DOSE OF 250 RAD AND/OR A DEPTH DOSE OF 25 RAD.												
	•		THESE DOS		THE C	UTOFF POIN	T WHERE A DECISION	MUST BE MADE WHETH	HER TO CON	INUE OR TERMINATE			
			THE RADIA OF 100 ER		DOSE	(RAD) IS	A UNIT OF ABSORBED	DOSE WHICH IS EQUA	AL TO AN EI	NERGY DEPOSITION			
		Ε.	E. THE RELATIVE BIOLOGICAL EFFECTIVENESS (RBE) EXPRESSES THE EFFECTIVENESS OF PARTICULAR TYPES OF RADIATION IN PRODUCING THE SAME BIOLOGICAL RESPONSE.										
			THE AVERAGE RBE THAT WILL BE USED FOR SOLAR PARTICLE EVENT RADIATION FROM PROTONS IS 1.2. F. THE ROGENTGEN EQUIVALENT MAN (REM) IS THE PRODUCT OF THE RAD AND THE RBE (REM = RAD X RBE).										
		F.	THE ROGEN	TGEN EQUIVALE	NT MA	N (REM) IS	THE PRODUCT OF THE	RAD AND THE RBE (REM = RAD	X RBE).			
		G.	A CONFIRM	ED EVENT IS	EFINE	D-AS AN EV	ENT THAT HAS BEEN M	EASURED BY TWO OR	MORE INDEF	ENDENT SOURCES.			
				CANT INCREASE AND ACCURACY			L BE DEFINED BY THE THE TIME.	FLIGHT SURGEON IN	I REAL TIME	BASED ON THE			
	:												
		i											
				MISSION	REV	DATE	SECTION	GROUP	PAGE				
_				APOLLO 17	FNL	9/1/72	SPACE ENVIRONMENT	GENERAL	28-1	Tape 28.1			

MISSION RULES

SECTION 28 - SPACE ENVIRONMENT - CONTINUED

RITEM	
	MANAGEMENT
28-3	THE EXISTING AND PROJECTED RADIATION ENVIRONMENT WILL BE A PART OF THE GO/NO-GO DECISION PROCESS.
28-4	PRIORITY OF DATA
	A. NATURAL (SOLAR PARTICLE EVENT)
	1. PRELAUNCH AND EPO (A) SOLAR PARTICLE ALERT NETWORK (SPAN) (B) VELA NATURAL RADIATION SATELLITE (C) PIONEER RADIATION SATELLITE (D) EXPLORER RADIATION SATELLITE (E) SOLAR PARTICLE MONITORING SYSTEM (SPMS)
	2. ALL OTHER PHASES (A) S/C INSTRUMENTATION (1) VAN ALLEN BELT DOSIMETER (VABD) (2) PERSONAL RADIATION DOSIMETER (PRD) (3) NUCLEAR PARTICLE DETECTION SYSTEM (NPDS) (B) SOLAR PARTICLE ALERT NETWORK (SPAN) (C) VELA NATURAL RADIATION SATELLITE (D) PIONEER RADIATION SATELLITE (E) EXPLORER RADIATION SATELLITE (F) SOLAR PARTICLE MONITORING SYSTEM (SPMS)
	B. ARTIFICIAL
	1. ALL PHASES EXCEPT EPO (A) JAEIC (B) RIOMETER
	2. EPO (A) JAEIC (B) RIOMETER (C) PRD
	3. EARTH ORBITAL MISSION (A) PRD (B) JAEIC (C) RIOMETER
	RULE NUMBERS 28-5 THROUGH 28-9 ARE RESERVED.
	MISSION REV DATE SECTION GROUP PAGE
	APOLLO 17 FNL 9/1/72 SPACE MANAGEMENT 28-2 Tape 28

MISSION RULES

SECTION 28 - SPACE ENVIRONMENT - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUES/NOTES/COMMENTS	
				SPE	CIFIC MISSION RULES	_	
	28-10	ANY SOURCE REPORTS A POSSIBLE ARTIFICIAL EVENT	ALL		CEED UNTIL VERIFICAT M ALL OTHER SOURCES.		
	28-11	DEFINITE ARTIFICIAL EVENT CONFIRMED BY REPORTING SOURCES	PRELAUI		HOLD UNTIL INFORMATI FROM REPORTING SOURC INDICATES THE MOD WI BE EXCEEDED.	CES	
			EPO	- 1	CONTINUE MISSION UNLESS DATA ANALYS INDICATES THAT THE PROJECTED THROUGH WILL EXCEED THE MC SIGNIFICIANT AMOUN THE MOD WILL BE EXECUTED BY A SIGNIFICANT AFORBIT ALTERNATE MI	E DOSE TLI TLI OD BY A NT. IF XCEEDED AMOUNT, TH	ER
				2	POR DOSES APPROACE THE MOD CONTINUE N WITH CONTINUOUS P MONITORING AND CRE ASSESSMENT. CONSII WILL BE GIVEN TO THE TRAJECTORY TO EARTH ORBIT OR REE ASAP BASED ON ACTU	MISSION RD EW DERATION CHANGING A LOW ENTERING	
			ALL OTHER	c.	CONTINUE MISSION		
	28-12	RADIATION CONFIRMED BY PRD READOUTS OR ONBOARD TM AND PROJECTED TO EXCEED THE MOD	ALL	REE	NTER NEXT BEST PTP	ALSO APPLIES TO ALTERNATE EARTH ORBIT MISSION.	
	28-13	MAJOR SOLAR FLARE PREDICTED	ALL	CON	ITINUE MISSION		
	ļ						
		MISSION	REV	DATE	SECTION	GROUP PAGE	
_							

MISSION RULES

SECTION 28 - SPACE ENVIRONMENT - CONTINUED

		T		
R RULE CONDITION/MALFUNCTION	ON PHASE	RULING	CUES/NOTES/COMM	ENTS
28-14 MAJOR SOLAR FLARE HAS OCCURRED		A CONTINUE ASSOCIATION		
A. UNCONFIRMED PARTICLE EVENT	ALL	A. CONTINUE MISSION		
B. CONFIRMED PARTICL EVENT AND SOLAR PARTICLE ALERT NETWORK/RTACF	E PRELAUNCH	B.1. HOLD UNTIL DATA AN INDICATES THAT THE WILL NOT BE EXCEED	MOD	
ANALYSIS INDICATE THE MOD WILL BE	S EPO	2. CONTINUE MISSION	·	
EXCEEDED DURING T MISSION	HE	IF DATA ANALYSIS I THAT THE MOD WILL EXCEEDED BY A SIGN AMOUNT PRIOR TO MI COMPLETION, TLI IS	BE NIFICIANT SSION	
	ALL OTHERS	3. CONTINUE MISSION		
	OTHERS	CONSIDERATION WILL GIVEN TO EARLY (OR EXTENDED) TEI AND INHIBITING CREW TR TO LM.		
C. CONFIRMED PARTICL EVENT AND S/C TM	E TLC	C.1. <u>CONTINUE MISSION</u>		D BEGIN PERSONAL DOSIMETER ION SURVEY METER READOUTS
PRD READOUT PROJECTIONS INDIC THE MOD WILL BE EXCEEDED DURING 1 MISSION	ATE	CONSIDERATION SHOW GIVEN TO ENTERING BEST PTP IF THE TO DOSE CAN BE REDUCE SIGNIFICANTLY WITH INCREASING THE TOT RISK TO THE CREW.	JLD BE PER FCOH S NEXT ITAL ID IOUT	
	LO	2. CONTINUE MISSION	2.(A) HATCH-DOW	N ATTITUDE MAY BE USED TO E TOTAL DOSE.
		CONSIDER EXTENDING ORBIT STAY TIME IF TOTAL DOSE TO THE WOULD BE REDUCED SIGNIFICANTLY BY L SHIELDING.	LUNAR THE (B) IF A PART CREW CREW WILL CSM ASAP.	ICLE EVENT IS CONFIRMED, THE TRANSFER FROM THE LM TO THE
	LUNAR STAY	3. CONSIDER REDUCING LUNAR STAY TIME AN EVA IF THE TOTAL C THE CREW CAN BE RE SIGNIFICANTLY WITH INCREASING THE TOT TO THE CREW.	ID/OR DOSE TO EDUCED IOUT	
	ALL OTHER PHASES	4. <u>CONTINUE MISSION</u>		
	ON REV DAT	I CENTROLL	COROUR TOACE	T
MISS: APOLL		/1/72 SPACE	GROUP PAGE SPECIFIC	
		ENVIRONMENT	28-4	Tape 28.4

MISSION RULES

SECTION 28 - SPACE ENVIRONMENT - CONCLUDED

28-15	MEAS DESCRIPTION RADIATION DOSIMETER 1	THOTICAL		QUIREMENTS	_		
28-15							
	RADIATION DOSIMETER 1		<u>PCM</u>	ONBOARD	TRANSDUCERS	CATEGORY	MSN RULE RE
	(CM DEPTH DOSE RATE)	C	CK1051K	-	-	HD	28-12
		ABD					
	RADIATION DOSIMETER 2 (CM SKIN DOSE RATE)	C	CK1052K	-	-	но	28-12
1	DOSIMETER RATE CHANGE	C	CK1053R		-	HD	28-12
	NE	PDS					
	PROTON COUNT RATE CHAN 1	S	ST0820K	-	-	но	28-14
	PROTON COUNT RATE CHAN 2	S	ST0821K	-	-	HD	28-14
	PROTON COUNT RATE CHAN 3	5	ST0822K	-	-	HD	28-14
1 1	PROTON COUNT RATE CHAN 4	\$	ST0823K	-	-	HD	28-14
	ALPHA COUNT RATE CHAN 1		ST0830K	-	-	HD	28-14
	ALPHA COUNT RATE CHAN 2		ST0831K	-		HD	28-14
	ALPHA COUNT RATE CHAN 3		ST0832K	-	-	HD	28-14
	PROTON INTEGER COUNT RATE		ST0838K	-	-	HD	28-14
1	TEMP NUCLEAR PART, DET		ST0840T	-	-	HD	28-14
1 1	TEMP NUCLEAR PART. ANAL		ST0841T	2 0400400	-	HD	28-14
	PERSONAL RADIATION DOSIMETER	(PRD)	-	3 ONBOARD		MANDATORY TO BE ONBOARD	28-14
	RATE SURVEY METER (RSM)		-	1 ONBOARD		MANDATORY TO BE ONBOARD	28-14

MISSION RULES

SECTION 29 - RECOVERY

	R	RULE	CONDITION/MALE	FUNCTION	PHASE		RULING		CUES/N	OTES/COMME	NTS	
							SPECIFIC					
)		29-1	ACCEPTABLE WEA CONDITIONS AND CAPABILITY* IN LAUNCH SITE AR	RECOVERY THE	PRELAU	NCH MANI	DATORY			. •		
		29-2	ACCEPTABLE WEA CONDITIONS AND CAPABILITY* IN LAUNCH ABORT A 1000 NM DOWNRA IN THE MIDPACI RECOVERY ZONE	RECOVERY THE REA TO NGE AND	PRELAUI	NCH HIGH	HLY DESIRABLE					
		29-3	MINIMUM OF 71 OF CM POSTLAND AVAILABLE AT L	ING POWER		HIG	HLY DESIRABLE			/IDE 40 HO NE UPRIGHT		TLANDING POWER
		29-4	MINIMUM OF 35 OF CM POSTLAND AVAILABLE AT L	ING POWER		MANI	DATORY			/IDE 18 HO NE UPRIGHT		TLANDING POWER
		29-5	UNTIL ENTRY MI HOURS, RETAIN CAPABILITY TO ENTRY POINT ±5	∆V MOVE		HIG	HLY DESTRABLE		TO PROV	/IDE WEATH	ER AVOIDANCE (CAPABILITY.
									UPON THE EVALUAT RECOVER THE TIM CAPABIL CAPABIL CAPABIL CAPABIL RE-EVAL	HE LOCAL RION OF HIR YEY OPERATI ME OF CM L ITY AND S HE FOLLOWI TE WHEN IT LUATE: CE WINDS HE HE HE HE HE HE HE HE HE H	ECOVERY UNIT (S CAPABILITY ON. WEATHER (TO PERFORM THE CONDITIONS AT BOTH RECOVERY EGRITY OF THE ARE USED TO
					,		<u></u>				<u> </u>	
				MISSION	1	DATE	SECTION	GROUP		PAGE		
l				APOLLO 17	FNL	9/1/72	RECOVERY	SPECIFI	Ü	29-1	L	Tape 29.3

MISSION RULES

SECTION 29 - RECOVERY - CONCLUDED

R	RULE	CONDITION/MALFUNCTION	PHASE	RULING		CUES/NOTES/COMMENT	'S
	29-6	AN ELLIPSE 163 NM UP- RANGE, 152 NM DOWNRANGE AND 50 NM TO EITHER SIDE 0F 55 DEG/55 DEG TARGET POINT, AND AN ELLIPSE 105 NM UPRANGE AND DOWNRANGE AND 40 NM TO EITHER SIDE 0F THE ROLL RIGHT 90 DEG (DELAYED) TARGET POINT WILL BE CLEAR OF ALL LAND.	EARTH ORBITAL	MANDATORY			
	29-7	REMAINDER OF MANEUVER FOOTPRINT AND AN ELLIPSE 139 NM UPRANGE AND DOWNRANGE AND 40 NM TO EITHER SIDE OF 90 DEG/90 DEG TARGET POINT, AND AN ELLIPSE 105 NM UPRANGE AND DOWNRANGE AND 40 NM TO EITHER SIDE OF ROLL RIGHT 90 DEG TARGET POINT WILL BE CLEAR OF LARGE LAND MASSES.	EARTH ORBITAL	HIGHLY DESIRABLE			
	29-8	A 5 NM RADIUS CIRCLE CENTERED ON THE GNCS TARGET POINT AND AN ELLIPSE 26 NM UPRANGE, 26 NM DOWNRANGE AND 52 NM EITHER SIDE OF THE EMS TARGET POINT WILL BE CLEAR OF ALL LAND.	POST-TLI	MANDATORY			
	29-9	REMAINDER OF OPERATIONAL FOOTPRINT (SEE RULE 1-40) WILL BE CLEAR OF LARGE LAND MASSES	POST-TLI	HIGHLY DESTRABLE			
-		Luvara	REV DATI	SECTION	GROUP	PAGE	
\vdash		MISSION APOLLO 1		SECTION 1/72 RECOVERY	SPECIFIC		Tape 29.4
L		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,					

MISSION RULES

SECTION 30 - AEROMEDICAL

					SECTI	ON 30 - AEROMEDICAL			
R	ITEM								
						GENERAL			
	30-1	PRELAUNCH							
		PRIOR TO COMMI	TTING TO LAU	NCH, T	THE FOLLOWI	NG CONDITIONS MUST	BE MET:		
			M CABIN OXYG	EN CON	CENTRATION	. STATUS. I FOR LAUNCH IS 60 F FOR LAUNCH IS 95 PE			
	30-2					SST 2 INCHES OF WATE			PRESSURE. SUIT LOOP PURGE S.
	30-3	THE POTABLE WA	TER PH MUST	BE WIT	THIN 6.0 TO	8.0 AT SERVICING A	WD FINAL SAMPLI	NG.	
	30-4	THE MAXIMUM AL	LOWABLE CONC	ENTRAT	TION OF PCC	0 ₂ 1S 5 MM OF Hg.			
	30-5	<u>LAUNCH</u>							
		THERE ARE NO M TO THE CREW.	EDICAL REASO	NS FOR	R ABORTING	DURING THE LAUNCH P	PHASE OTHER THAN	THOSE CONDI	TIONS INTOLERABLE
	30-6	EARTH ORBIT AN	D DEEP SPACE	OPERA	ATIONS				
		EARLY MISSION	TERMINATION	FOR ME	DICAL REAS	ONS FALLS INTO TWO	CATEGORIES:		
						FECT CREW SAFETY, C			
	30-7	WATER PALATABI	LITY						
		CREW EVALUATION OF THE DRINKING WATER TASTE WILL BE THE BASIS FOR DETERMINING WATER PALATABILITY, EVEN FOR KOH CONTAMINATION.							
		RULE NUMBERS 3	0-8 THROUGH	30-14	ARE RESERV	ED.			
	<u> </u>		MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	AEROMEDICAL	GENERAL	30-1	Tape 29.5

MISSION RULES

SECTION 30 - AEROMEDICAL - CONTINUED

R	RULE	CONDITION/MALFUNCTION		PHASE			RULING		CUES/NO	TES/COMMEN	its
+	KOLL	CONDITION/PIACIONCITON	+	111102	十		NOLTHO			20, 00, 112.	
					-	CDECI	LETC MACCION DINEC				
١					-	SPECI	IFIC MISSION RULES				
	30-15	LOSS OF OR UNREADABLE		ALL SUACEC		A. <u>C</u>	ONTINUE MISSION				CIPATED DURING LAUNCH. M
Ì		EKG	'	PHASES	ļ				RECO!	MEND EARL	VALUATE THE PROBLEM AND MU Y MISSION TERMINATION IF YON IS NOT EFFECTIVE,
			1	EVA	ŀ	B. <u>C</u>	ONTINUE MISSION				LL EVALUATE PROBLEM AND
											A MAY BE RECOMMENDED.
	30-16	ABONORMAL HEART RATE, RHYTHM, OR EKG	1	LAUNCH		A. <u>C</u>	ONTINUE MISSION				EVALUATE THE PROBLEM AND
1	-	MITTING ON LING		EP0		B. <u>N</u>	O-GO FOR TLI				I IS NOT EFFECTIVE.
		•	- 1	TLC	- 1		O-GO FOR LOI				
			i	LO EVA	1		NTER NEXT BEST PTP ERMINATE EVA		•		
		•		TEC	- 1		NTER NEXT BEST PTP			•	
									: I		
	30-17	ABNORMAL RESPIRATORY		LAUNCH		A (1)	ONTINUE MISSION		THE ARM	ORMAI PATE	S WILL BE EVALUATED BY TH
-	~~- <i>'</i> ',	RATE		EPO	ł		0-GO FOR TLI		MCC SUR	GEON AND E RECOMMENDE	EARLY MISSION TERMINATION TO IF CORRECTIVE ACTION IS
				TLC	- 1		0-G0 FOR LOI		NOT EFF		
	ļ			L0		D. <u>E</u>	NTER NEXT BEST PTP				
				TEC		E. <u>E</u>	NTER NEXT BEST PTP				
	30-18	ONSET OF SERIOUS		LAUNCH		A. ∩	ONTINUE MISSION		MCC SUR	GEON WILL	EVALUATE THE PROBLEM AND
		MEDICAL PROBLEM				C C	REW MAY ELECT TO ABO NTOLERABLE	ORT IF	MAY REC	OMMEND EAR	RLY MISSION TERMINATION IF I IS NOT EFFECTIVE.
				EP0			NTER NEXT BEST PTP				
				TLC		C. <u>E</u>	NTER NEXT BEST PTP				
				LO		D. <u>E</u>	NTER NEXT BEST PTP				
			1	EVA		_	ERMINATE EVA				
				TEC		F. <u>E</u>	NTER NEXT BEST PTP				
								-			
		MISSI		REV	DATE		SECTION	GROUP		PAGE	
		APOLL	17	FNL	9/1/	/72	AEROMEDICAL	SPECIFI PHYSIOL		30-2	Tape 29.6

MISSION RULES

SECTION 30 - AEROMEDICAL - CONTINUED

30-19 DYSBARISM IN ANY CREWMAN LAUNCH ALL B. TEMMINATE PHASE ENTER NEXT BEST PTP B. IF RESULTANT FROM THEMPAL OVERLOAD B. IF RESULTANT THE RESULT THE SUBSTITUTES OF THE ANY THE SUBSTITUTES OF THE ANY THE SUBSTITUTE OF THE ANY THE ANY THE ANY THE SUBSTITUTE OF THE ANY THE ANY THE ANY THE	R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMI	ENTS
DESPITE CORRECTIVE A. IF DUE TO ILLNESS LAUNCH A.1. NOT APPLICABLE 2. TERMINATE PHASE ENTER NEXT BEST PTP B. IF RESULTANT FROM THERMAL OVERLOAD B. IF RESULTANT FROM THERMAL OVERLOAD EVA A. IF AMBER LINE IS EXCEEDED: DECREASE ACTIVITY. A. AMBER LINE LIMIT IS WORK SUSTAINED AT A RATE GREATER THAN 2500 BTU/HR FOR A PER LONGER THAN 5 MINUTES. AS DETERMINED BY PREFLIGHT ERGOMETRY CALIBRATIONS. THE SURGEON WILL EVALUATE AND MAY RECOMMEND DECREASED CREW ACTIVITY. B. IF RED LINE IS EXCEEDED: STOP ACTIVITY AND REST. B. RED LINE LIMIT IS WORK SUSTAINED AT A RATE GREATER THAN 2500 BTU/HR FOR A PER LONGER THAN 5 MINUTES. AS DETERMINED BY PREFLIGHT ERGOMETRY CALIBRATIONS. THE SURGEON WILL EVALUATE AND MAY RECOMMEND DECREASED CREW ACTIVITY. B. RED LINE LIMIT IS WORK SUSTAINED AT A RATE GREATER THAN 3000 BTU/HR FOR A PER LONGER THAN 2 MINUTES. AS DETERMINED BY PREFLIGHT ERGOMETRY CALIBRATIONS. MC SURGEON WILL EVALUATE AND MAY RECOMMEND THAN THE CREW STOP ACTIVITY AND REST. RULE NUMBERS 30-22 THROUGH 30-24 ARE		30-19	DYSBARISM IN ANY CREWMAN		B. <u>1</u>	CREW MAY ELECT TO AE CONDITION IS INTOLER FERMINATE PHASE		2. IF CONDITIO OVER-PRESSU REG TO PRES B. MCC SURGEON W EARLY MISSION	INS PERMIT, CREW MAY ELECT TO IRIZE BY SELECTING SUIT DEMAN IS POSITION. IILL EVALUATE AND MAY RECOMME TERMINATION IF CORRECTIVE
DECREASE ACTIVITY. RATE GREATER THAN 2500 BTU/HR FOR A PER LONGER THAN 5 MINUTES, AS DETERMINED BY PREFLIGHT ERGOMETRY CALIBRATIONS. THE SURGEON WILL EVALUATE AND MAY RECOMMEND DECREASED CREW ACTIVITY. B. IF RED LINE IS EXCEEDED: STOP ACTIVITY AND REST. B. RED LINE LIMIT IS WORK SUSTAINED AT A RATE GREATER THAN 3000 BTU/HR FOR A PER LONGER THAN 2 MINUTES, AS DETERMINED BY PREFLIGHT ERGOMETRY CALIBRATIONS. MCC SURGEON WILL EVALUATE AND MAY RECOMMEND THAT THE CREW STOP ACTIVITY AND REST. RULE NUMBERS 30-22 THROUGH 30-24 ARE		30-20	DESPITE CORRECTIVE A. IF DUE TO ILLNESS B. IF RESULTANT FROM THERMAL OVERLOAD	ALL	B.1.	TERMINATE PHASE ENTER NEXT BEST PT NOT APPLICABLE TERMINATE PHASE		MCC SURGEON MAY MINATION IF TREA	RECOMMEND EARLY MISSION TER- TMENT IS UNSUCCESSFUL.
			RULE NUMBERS 30-22 THROUGH 30-24 ARE	EVA	B. 1	DECREASE ACTIVITY. IF RED LINE IS EXCEE	DED:	RATE GREATER LONGER THAN 5 PREFLIGHT ERG SURGEON WILL DECREASED CRE B. RED LINE LIMI RATE GREATER LONGER THAN 2 PREFLIGHT ERG SURGEON WILL	THAN 2500 BTU/HR FOR A PERIC MINITES, AS DETERMINED BY METRY CALIBRATIONS. THE MC EVALUATE AND MAY RECOMMEND W ACTIVITY. T IS WORK SUSTAINED AT A THAN 3000 BTU/HR FOR A PERIC MINUTES, AS DETERMINED BY OMETRY CALIBRATIONS. MCC EVALUATE AND MAY RECOMMEND
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 AEROMEDICAL SPECIFIC				+		f ————————			

MISSION RULES

SECTION 30 - AEROMEDICAL - CONTINUED

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING	C	UES/NOTES/COMMENTS
	20.05						
	30-25	INCREASE IN PCO2 A. IS GREATER THAN OR EQUAL TO 7.6 MM Hg	LAUNCH	ŀ	. CONTINUE MISSION	Α.	PCO2 SHOULD DECREASE BELOW 2 MM Hg WITHIN 30 MINUTES.
		B. GREATER THAN OR EQUAL TO 7.6 MM Hg AND UNABLE TO DECREASE	LAUNCH ALL	B.1	CHANGE LIOH CANIS CONTINUE MISSION CONTINUE MISSION (A) OPEN SUITS ANIFROM CABIN (B) CHANGE SECOND CANISTER (C) TEST PC02 SENS	B.: D BREATHE	2. LiOH CANISTERS MAY BE CHANGED IN AN UNPRESSURIZED CABIN. 2. (C) PCO2 SENSOR TEST: PURGE PCO2 SENSOR WITH DIRECT O2 VALVE OPEN FOR 10 SEC (REF ECS
		C. GREATER THAN OR EQUAL TO 10 MM Hg	LAUNCH ALL	į.	. <u>CONTINUE MISSION</u> . <u>TERMINATE PHASE</u> ENTER NEXT BEST PT		MALF NO. 12). IF ABOVE PROCEDURE RESULTS IN A PC02 READING NEAR ZERO, THE PC02 SENSOR IS OPERATING PROPERLY. 2. PLSS ACCEPTABLE C02 LEVEL IS 15 MM Hg (REFERENCE EVA MISSION RULES CHART)
	30-26.	PCO2 INSTRUMENTATION FAILURE	ALL	CONT	FINUE MISSION		
		RULE NUMBERS 30-27 THROUGH 30-34 ARE RESERVED.					
	<u>_</u>	MISSION	REV	DATE	SECTION	GROUP	PAGE
		APOLLO 17	FNL	9/1/72	AEROMEDICAL	SPECIFIC EQUIPMENT	30-4 Tape 44.7

MISSION RULES

SECTION 30 - AEROMEDICAL - CONCLUDED

		INSTRUME	NTATION REQUIREMENTS	_		
30-35	MEAS DESCRIPTION	PCM	ONBOARD	TRANSDUCERS	CATEGORY	MSN RULE REFERENCE
	<u>CSM</u>	6100601				
	ELECTROCARDIOGRAM	CJ0060J	NOT DISPLAYED		M*	30-15,16
	ELECTROCARDIOGRAM ELECTROCARDIOGRAM	CJ0061J	NOT DISPLAYED		M*	30-15,16
		CJ0062J	NOT DISPLAYED		M*	30-15,16
	CO2 PARTIAL PRESSURE	CF0005P	MÉTER	COMMON	HD	30-2,27,28
	SUIT CABIN DELTA PRESS ORAL TEMPERATURE	CF0003P	NOT DISPLAYED CLINICAL THERMOMETER		HD M	30-3,19 30-20
	PNEUMOGRAM	CJ0200P	NOT DISPLAYED		HD	30-17
	PNEUMOGRAM	CJ0201P	NOT DISPLAYED	•	нр	30-17
	PNEUMOGRAM	CJ0202P	NOT DISPLAYED		но	30-17
	<u>LM</u>					30 77
	CO2 PARTIAL PRESSURE	GF1521P	METER		HD	
	ELECTROCARDIOGRAM	GT9999	NOT DISPLAYED		M**	30-15,16
	PNEUMOGRAM		NOT DISPLAYED		HD	30-17
	PLSS					00 17
	PLSS ELECTROCARDIOGRAM	GT8124J			M**	30-15,16
		GT8224J			M**	30-15,16
	*MANDATORY UNTIL SUI	F ROOM DEPARTU	RE.			
	**MANDATORY UNTIL LM (CLOSEOUT.				
	MISSION F	REV DATE	SECTION	GROUP	PAGE	

MISSION RULES

SECTION 33 - ILINAR SHREACE OPERATIONS

			JL	- 16 MOTIO	LUNAR SURFACE UP	EKATIONS		
R ITEM								
				CONSTR	AINTS AND OPTIONS			
31-1		NVELOPE AND R	EASSES	SING THE T	RAVERSE PLAN. TH			INTAINING THE EFFECTIVE TED UPWARD OR DOWNWARD
	A. TERRAIN DI	IFFERENCES						
	B. LOSSES IN	DRIVING TIME	ATTRI	BUTABLE TO	SURFACE OBSERVAT	TIONS		
	C. UNSCHEDULE	ED STOPS						
	RULE NUMBERS 3	ol o Tupoucu	21 20	ADE DECEDU	ED			
	ROLE NUMBERS S	or-z inkoodn	31-30	AKE KESEKY	EU			
						,		
	<u> </u>					•		
							•	
								•
							•	
		MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 17	FNL	9/1/72	LUNAR	CONSTRAINTS	21_1	Tano 424 0

MISSION RULES

	ļ						
	į		PRECE	DENCE/SCHE DUL IN	 G		
							
31-31	MODIFIED AS	NECESSARY TO AC RFACE HARDWARE	COMMODATE THE A	CTUAL LANDING P	DINT, RADIUS O	F OPERATIONS, TI	H WILL BE USED AS BASELINES MELINE AND MOBILITY CONSTR MUM TIME REQUIRED FOR EACH
	A 50H	TH MASSIF	TBD	MIN	IMUM TIME		
	1	TH MASSIF	TBD		IMUM TIME		
ļ	C. DAR	K MANTLE	TBD	MIN	IMUM TIME		
	D. LIG	HT MANTLE	TBD	MIN	IMUM TIME		
31-32		INS WHERE ALL SU ON/TASK TRADE-C		INOT BE ACCOMPLI	SHED, THE FOLL	OWING ORDER OF F	PRECEDENCE WILL BE USED IN
1		EVA	_	EVA	_	. EVA	
1		STATION	PRIORITY		PRIORITY	STATION	PRIORITY
	Ì	ALSEP	1	2	1	6 }	1
	İ	1	2	3 4	3	7 ∫ 8	2
		•		5	4	10	3
						9	4
	B. AHE	EAD OF TIMELINE GRADATION OF TH	BY MORE THAN 15 E LRV TO SUCH AN		MIMIMUM OF 4 I		EED CANNOT BE MAINTAINED OR
31-34			•			REDUCTIONS, THE E	REVISION WILL NORMALLY BE POINTS.
	1						
31-35				2 WILL BE LIMIT FOR STATION 3 A			FROM STATION 2 WILL BE LIM
31-35	TO 2 HOURS		AINTAIN MARGINS				FROM STATION 2 WILL BE LIM
31-35	TO 2 HOURS	AND 50 MIN TO M	AINTAIN MARGINS				FROM STATION 2 WILL BE LIM
31-35	TO 2 HOURS	AND 50 MIN TO M	AINTAIN MARGINS	FOR STATION 3 A	IND 4 WALKBACK		FROM STATION 2 WILL BE LIM
31-35	TO 2 HOURS	AND 50 MIN TO M	AINTAIN MARGINS			PAGE	FROM STATION 2 WILL BE LIM

MISSION RULES

SYSTEMS MANAGEMENT THE LRV RADIATOR COVERS WILL BE DUSTED BEFORE OPENING. THE RADIATOR SURFACES WILL BE I COVERS ARE OPENED WITH RADIATORS IN THE SUN. THE AUXILIARY PWR BYPASS SWITCH WILL BE PUT IN THE ON POSITION ONLY AFTER EVA 3.	DUSTED EACH TIME THE
31-51 THE LRV RADIATOR COVERS WILL BE DUSTED BEFORE OPENING. THE RADIATOR SURFACES WILL BE I COVERS ARE OPENED WITH RADIATORS IN THE SUN.	DUSTED EACH TIME THE
31-51 THE LRV RADIATOR COVERS WILL BE DUSTED BEFORE OPENING. THE RADIATOR SURFACES WILL BE I COVERS ARE OPENED WITH RADIATORS IN THE SUN.	DUSTED EACH TIME THE
COVERS ARE OPENED WITH RADIATORS IN THE SUN.	DUSTED EACH TIME THE
COVERS ARE OPENED WITH RADIATORS IN THE SUN.	DUSTED EACH TIME THE
31-52 THE AUXILIARY PWR BYPASS SWITCH WILL BE PUT IN THE ON POSITION ONLY AFTER EVA 3.	
31-52 THE AUXILIARY PWR BYPASS SWITCH WILL BE PUT IN THE ON POSITION ONLY AFTER EVA 3.	
• • • • • • • • • • • • • • • • • • • •	
31-53 THE DRIVE ENABLE SWITCHES WILL NOT BE OPERATED AFTER INITIAL CONFIGURATION EXCEPT AS RI	EQUIRED FOR FAILURES OR
31-54 LRV PARKING CONSTRAINTS FOR LRV AND PAYLOAD THERMAL CONSIDERATIONS ARE AS FOLLOWS:	
A. THE LRV WILL BE PARKED A MINIMUM OF <u>20</u> FT FROM THE NEAREST LM SIDE.	
B. <u>PARKING DURATION</u> <u>REQ</u> UIRED SUN AZIMUTH CRÍTICAL ITEM	
B. PARKING DURATION REQUIRED SUN AZIMUTH CRITICAL ITEM	
LESS THAN: 6 HRS IN SUN ANY N/A	
2 HRS IN SHADE ANY N/A	
MORE THAN:	
6 HRS IN SUN 80°-110° CCW FROM UPSUN* LCRU, C&D CONSOLE	
2 HRS IN SHADE NOT RECOMMENDED C&D CONSOLE LRV NAVIGATION	
LCRU	
*FOR BETWEEN EVA'S PARKING, THE LRV NAVIGATION HEADING WILL BE USED TO PARK THE LRV 85	° CCW FROM UPSUN.
HEADING WILL BE SPECIFIED BY MCC BASED ON SUN AZIMUTH.	
31-55 LRV BATTERY POWER/THERMAL MANAGEMENT WILL BE ACCOMPLISHED THROUGH CONFIGURATION OF THE	DATTERY LOADS A THITTING HOS
OF NON-CRITICAL SYSTEMS AND BY OPENING THE BATTERY COVERS WHILE PARKING UPSUN AT TRAVES	
30 MIN. THE CONDITIONS TO BE MAINTAINED THROUGH THIS MANAGEMENT IN ORDER OF PRIORITY	ARE:
A. BATTERIES SHALL BE MAINTAINED IN TEMPERATURE RANGE OF:	
1. 40° F - 125° F FOR EVA 1 AND 2 2. 40° F - 140° F FOR EVA 3	
C. 40 1 - 140 1 10K EVA 3	
B. RELATIVE STATE-OF-CHARGE BETWEEN BATTERIES BALANCED TO WITHIN 20 AMP-HOURS	
B. RELATIVE STATE-OF-CHARGE BETWEEN BATTERIES BALANCED TO WITHIN 20 AMP-HOURS	
B. RELATIVE STATE-OF-CHARGE BETWEEN BATTERIES BALANCED TO WITHIN 20 AMP-HOURS	
B. RELATIVE STATE-OF-CHARGE BETWEEN BATTERIES BALANCED TO WITHIN 20 AMP-HOURS	
B. RELATIVE STATE-OF-CHARGE BETWEEN BATTERIES BALANCED TO WITHIN 20 AMP-HOURS	
B. RELATIVE STATE-OF-CHARGE BETWEEN BATTERIES BALANCED TO WITHIN 20 AMP-HOURS MISSION REV DATE SECTION GROUP PAGE	

MISSION RULES

_	SECTI	<u> </u>	R SURFACE OPERATIONS	S - CONTINUED		
R ITEM						
31-56	LRV BATTERY COVERS WILL BE OF	PENED DURING	EVA/LRV CLOSEOUT AT	THE LM.		
31-57	DELETED					
31-58	THE LRV MUST REMAIN STATIONAL GYRO UNIT (DGU) TO ATTAIN OPE OPERATED. USE OF THE SYSTEM	ERATING SPEED	. DURING THIS WARM	-UP PERIOD THE GYP		
31-59	THE LRY DGU WILL BE ALIGNED ON THE TRAVERSE. IT WILL BE				WILL BE (CHECKED AT DESIGNATED POINTS
				·		
· ·						
					T	
	MISSION RE		SECTION	GROUP	PAGE	
	APOLLO 17 FN	L 9/1/72	LUNAR SURFACE OPS	LRV MANAGEMENT	31-4	Tape 52.13
			L		•	

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		AR SURFACE OPERATIONS RULING		NOTES/COMMENTS	
					SPECIFIC			
	31-60	RESERVED						
	31-61	FORWARD OR REAR STEER- ING UNIT FAILS TO RESPOND TO HAND- CONTROLLER COMMAND		ELE STE	CCTRICALLY DISABLE THE ERING UNIT.	FAILED MAY EY STEER!	YENTUALLY REQUIR ING WANDERS EXCE	E PINNING IF UNPOWERED SSIVELY.
	31-62	FORWARD OR REAR STEER- ING UNIT DRIVE HARDOVER WITH HAND CONTROLLER IN NEAR CENTER POSITION		ME (ECTRICALLY DISABLE AND CHANICALLY DECOUPLE AN IT AND LOCK AFFECTED N STRAIGHT AHEAD POSIT	FECTED ARE I	NICAL DECOUPLING RREVERSIBLE FOR	AND STEERING LOCKING THE FRONT WHEELS.
	31-63	BOTH STEERING UNITS DRIVE HARDOVER CONTRARY TO STEERING COMMAND OR FAIL TO RESPOND TO HAND CONTROLLER	1	ANI DII RIC	ECTRICALLY DISABLE, D D LOCK STEERING. CRE RECTIONAL CONTROL USI GHT DRIVE POWER TO DE AVERSE LIMITS.	N ASSESS NG LEFT/		
L	<u> </u>	<u> </u>			T		Inter I	
-		MISSION APOLLO 1	REV 7 FNL	DATE 9/1/72	LUNAR SURFACE OPS	GROUP LRV MOBILITY	PAGE 31-5	Tape 41.6

MISSION RULES

7			SECTION 31		TOURNEL OF EIGHTON	J - CONTI	1			
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/N	OTES/COMME	NTS	
	31-64	DELETED								
	31-65	TRACTION DRIVE MOTOR TEMP EXCEEDS 400°F OR PREDICTED TO EXCEED 450°F								
		A. MOTOR IS NOT NEEDED TO MAINTAIN LRV MOBILITY		EI	EMOVE MOTOR FROM SEI LECTRICALLY. DECOUI ECHANICALLY AT NEXT	PLE	A. MOTOF 400 I	R IS REUS <i>A</i> DEG F. DU	BLE AFTER COOLDO	OWN TO BELOW BELP COOLDOWN
		B. MOTOR IS REQUIRED TO MAINTAIN ACCEPT- ABLE LRV MOBILITY		V A El	OTOR WILL BE KEPT IN ICE. TRAVERSE WILL JUSTED TO BE WITHIN WYELOPE BEFORE TDS I 50°F.	BE WALKING	1. DF	RIVING AT VOIDING PE	COOLDOWN WHILE I LEAST 4 KM/HR COLONGED UPSLOPES CUMULATED DUST	
	31-66	INSUFFICIENT POWER TO COMPLETE THE NOMINAL MISSION			ACTION IN THE FOLLOR AS REQUIRED:	OWING				
					EMOVE THE LCRU FROM OWER	LRV				
		·] -	W	URTAIL THE TRAVERSE ITHIN THE LRV POWER VAILABLE	то .				
	31-67	BRAKE WILL NOT RELEASE ON ONE WHEEL								
		A. TRACTION DRIVE IS NOT REQUIRED FOR LRV MOBILITY		W:	EMOVE POWER AND DEC HEEL BEFORE CONTINU ISSION.		AFTEI	R EACH STO	ORTH TIME TO CHEC OP AS WORKING VIE MECHANISM,	CK THE WHEEL BRATION AND
		B. TRACTION DRIVE IS REQUIRED FOR LRV MOBILITY		B. A B. L C A	TTEMPT TO FREE BRAK! ACKING/FORWARD MOTI- EFT AND RIGHT STEER OMMANDS, AND INDUCE ND VIBRATION. IF ALLS, USE TRACTION O ACHIEVE LRV MOBIL	ON, ING D SHOCKS LL DRIVE	B. IT IS COME	S DUBIOUS BRAKE, BU	IF TRACTION DRIV IT ALL EFFORTS S IE ABANDONING LRV	IOULD BE
	31-68	ABNORMAL AMPERE UN- BALANCE BETWEEN BATTERY 1 AND BATTERY 2		BATT DEFI (LOS TRAC TRAC AT N	STRIBUTE LOADS TO M. ERY REDUNDANCY. IF NITE MOTOR SHORT EX S OF POMER OUTPUT O TION DRIVE), SHUT D TION DRIVE AND DECO EXT STOP IF EXCESSI ANICAL DRAG IS SUSPI	A ISTS F OWN UPLE VE				
	31-69	RESERVED								
		MISSION	REV DATE		SECTION	GROUP		PAGE		
		APOLLO 17	FNL 9/	/72	LUNAR SURFACE OPS	LRV ELECTRI	CAL	31-6		Tape 46.8
						<u> </u>			L	

MISSION RULES

R	RULE	CONDITION (MAIL CONCITION	Τ		AR SURFACE OPERATION	1		urc
K	KULE	CONDITION/MALFUNCTION	PHASE		RULING	- CI	UES/NOTES/COMME	NIS .
	31-70	TRACTION DRIVE MOTOR POWER CIRCUITRY:						
		A. FAILS ON			REMOVE POWER FROM AF FRACTION DRIVE. USE NECESSARY TO ACHIEVE ABLE MOBILITY.	AS	. DRIVE POWER CE WHILE BRAKE IS BYPASSED.	B WILL POP IF FAILURE OCCURS S SET. CURRENT LIMITING IS
		B. FAILS OFF			REMOVE POWER FROM AF FRACTION DRIVE	FECTED B	. NO "JACKRABBIT AFFECTED TRAC	" MODE CAPABILITY WITH FION DRIVE.
	31-71	TRACTION DRIVE MOTOR CONTROL CIRCUITRY:						
		A. FAILS ON			USE AFFECTED TRACTIC AS DESIRED TO ACHIEV MOBILITY. POWER DOW MOTOR IS UNMANAGEABL FOR STOPS.	E MAX N IF	. USE DRIVE POWI MOTOR ON OR O	ER SWITCH TO TURN AFFECTED FF.
		B. FAILS OFF		В. 1	POWER DOWN AFFECTED DRIVE. DECOUPLE IF IVE WHEEL DRAG IS SU	EXCESS- SPECTED.		
		RULE NUMBERS 31-72 THROUGH 31-100 ARE RESERVED.	i			·		
:								
		MISSION	REV	DATE	SECTION	GROUP	PAGE	
-		APOLLO 17	FNL	9/1/72	LUNAR Surface ops	LRV DRIVE	31-7	Tape 41.8
Щ								

MISSION RULES

R	ITEM								
				-	SURFACE E	XPLORATION SYSTEMS	-		-
	31-101	THE FILM-REMAI FILM FOR TASKS FOLLOWING SEQU	REMAINING ON	THE E	MM FILM WI	LL BE TRACKED VIA P ILM-LIMITED SITUATI	ERIODIC CREW READ- ONS, PHOTO DOCUMEN	OUTS TO EN	ISURE RETENTION OF ADEQUATE
	i	A. ELIMI	NATE HIGHLY D	ESIRAE	BLE PHOTOGR	APHY BEGINNING WITH	LOWEST PRIORITY T	ASKS.	
		B. ELIMI	NATE MANDATOR	Y PHO1	TOGRAPHY WH	ERE TV COVERAGE CAN	ADEQUATELY FULFIL	L THE PHOT	O DOCUMENTATION REQUIREMENT.
						GINNING WITH LOWEST			
		C. ELIMI	NATE MANDATOR	i riio	IOGRAFIII BL	dimind with concor	TRIORIT TRIORI		
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	1								
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-	<u> </u>	<u>L. </u>	MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	FNL	9/1/72	LUNAR SURFACE OPS	SURFACE EXPLOR SYS	31-8	Tape 56.2

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
		:		1	TRAVERSE GRAVIMETER	-		
	31-102	TGE MEASUREMENT MADE WHILE MOUNTED TO THE LRV INDICATES A PHASE LOCKED LOOP RATE ALARM		WITH LUNAF MEASL	MEASUREMENT WILL BE THE TGE PLACED ON T R SURFACE. ALL FUTU REMENTS WILL BE MAD GE PLACED ON THE LU ACE.	HE RE E WITH	A PHASE LOCKED LO BY THE THREE MOST DISPLAY BEING ZER	OP RATE ALARM IS INDICATED SIGNIFICANT DIGITS OF THE).
	31-103	TGE MEASUREMENT MADE WHILE PLACED ON LUNAR SURFACE INDICATES A PHASE LOCKED LOOP RATE ALARM		WILL MEASU	LOCK LOOP BYPASS M BE USED TO REPEAT T IREMENT AND FOR ALL IREMENTS.	ΉE	BY THE THREE IN THE DISPLAY BE COCKED IN BY DEPRESSING SWITCHES SIMULE. 3. ALL MEASUREMEL BYPASS MODE HE	LOOP BYPASS MODE IS INITIATE BOTH "GRAV" AND "READ"
	31-104	INTERMEDIATE OVEN HOT ALARM IS EXPERIENCED PRIOR TO DEPARTURE ON EVA-1.		RADIA	E TGE IN LM SHADE WI NTOR COVER OPENED PR RTING ON EVA TRAVERS	IOR TO	BY A 6 OR 7 II DIGIT OF THE	OVEN HOT ALARM IS INDICATED N THE EIGHTH MOST SIGNIFICAN DISPLAY. SED ON EVA'S II AND III.
	31-105	PRECISION OVEN TEMP REACHES MAXIMUM POSITIVE DEVIATION		TAKEN THE C TGE N SHADO SURFA	JRTHER MEASUREMENTS N DURING THE REMAIND CURRENT TRAVERSE. VILL BE PLACED IN TH W WITH THE RADIATOR ACE EXPOSED AT THE E ENIENCE.	ER OF	ODD NUMBER IN THE	DEVIATION IS INDICATED BY AP EIGHTH MOST SIGNIFICANT LAY AND A "7" IN THE NINTH NT DIGIT.
:	31-106	RESERVED						
			1		Torano:		1_,	
		MISSION APOLLO 17	_	DATE 9/1/72	SECTION LUNAR	GROUP SURFACE	PAGE	
		7, 000 17	1'''* l	-, -,	SURFACE OPS	EXPLOR		Tape 66.1

MISSION RULES

R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMMENTS
	31-107	TGE PHASE LOCK LOOP FAILS TO ACQUIRE LOCK DURING A NORMAL GRAVITY MEASUREMENT		WILL MEASU	LOCK LOOP BYPASS MO BE USED TO REPEAT TH REMENT AND FOR ALL F REMENTS	1E	1. FAILURE OF PHASE LOCK LOOP TO ACQUIRE LOCK IS INDICATED BY A "9" IN THE MOST SIGNIFICANT DIGIT OF THE DISPLAY. 2. PHASE LOCKED LOOP BYPASS MODE IS INITIATED BY DEPRESSING BOTH "GRAV" AND "READ" SWITCHES SIMULTANEOUSLY. 3. ALL MEASUREMENTS MADE IN THE PHASE LOCKED LOOP BYPASS MODE HAVE A ZERO IN THE MOST SIGNIFICANT DIGIT OF THE DISPLAY.
	31-108	TGE IS OPERATED IN PHASE LOCKED LOOP BYPASS MODE.		SURFA	ILL BE PLACED ON LUI ICE FOR ALL MEASUREM I IN THE PLL BYPASS I	ENTS	PLL BYPASS MODE HAS NO FILTERING REQUIRED FOR LRV MOUNTED MEASUREMENTS.
	31-109	TGE MEASUREMENT IN PHASE LOCKED LOOP BYPASS MODE INDICATES ZEROS IN THE SEVEN MOST SIGNIFICANT DIGITS OF THE DISPLAY			OON THE TRAVERSE GRA	VIMETER	LOSS OF VIBRATING STRING SIGNAL ACCELEROMETER
	31-110	BIAS MEASUREMENT LIGHT FAILS TO EXTINGUISH AFTER 5 MINUTES OF MEASUREMENT TIME.			OON TRAVERSE GRAVIME RIMENT	TER	LOSS OF VIBRATING STRING ACCELEROMETER OUTPUT
-	ــــــــــــــــــــــــــــــــــــــ	MISSION	REV I	ATE	SECTION	GROUP	PAGE
		APOLLO 1		9/1/72	LUNAR SURFACE OPS	SURFACE EXPLOR	

MISSION RULES

					NAR SURFACE OPERATIO	NS - CUNTIN		
R	RULE	CONDITION/MALFUNCTION	PHASE		RULING		CUES/NOTES/COMME	NTS
				SURI	FACE ELECTRICAL PROP	ERTIES		
	31-111	SEP RECEIVER TEMP AT INITIAL DEPLOYMENT IS > TBD° F		OPEN DURII	RADIATOR COVERS-100 NG EVA 1.		I. SEP IS NOT USE 2. COVERS NORMALI EVA 1.	ED DURING EVA 1.
	31-112	SEP RECEIVER TEMP PRIOR TO A TRAVERSE IS:						
		A. > <u>TBD</u> ° F		A. (OPEN RADIATOR COVERS DURING THE EVA	100%		
		B. < 20° F		В.	CLOSE RADIATOR COVER DURING THE EVA	:s		
					PLACE THE RECEIVER I MODE PRIOR TO THE TR			
	31-113	SEP RADIATORS ARE EXPOSED			THE RADIATOR SURFACE BE DUSTED AFTER OPEN COVERS AT THE END OF TRAVERSE	S WILL		
					THE RADIATOR SURFACE BE DUSTED AT THE BEG OF EACH STOP DURING THE COVERS WILL BE (SINNING WHICH		
	31-114	RESERVED						
	31-115	BETWEEN EVA SEP CONFIGURATION		BE 0	ATOR COVERS WILL NO PENED 20% FOR BETWE TDOWN.	RMALLY EN EVA		
				OR 1 THER	WILL BE ADJUSTED TO OO% DEPENDING ON RE MAL CONDITIONS AT TO HE EVA.	AL-TIME		
\vdash	<u></u>	MISSION	REV	DATE	SECTION	GROUP	PAGE	
		APOLLO 1	_	9/1/72	LUNAR SURFACE OPS	SURFACE EXPLOR SY	rs 31-11	Tape 66.3
L					<u> </u>	L		

MISSION RULES

SECTION 32 - ALSEP

	r				JEC	TION 32 - ALSEP	 		
R	ITEM								
						GENERAL			
		(ALSEP) WHILE	THE CREW IS	ON THE	LUNAR SUF	RFACE. THESE RÚ	LES ARE EXCERPTED FR	OM THE EMRD	CE EXPERIMENT PACKAGE FOR APOLLO 17, AND MISSING ND IN THAT DOCUMENT.
					ALSEP OF	PERATIONAL GUIDE	LINES		
	32-1	GENERAL							
		A. THESE ALSE	P GENERAL OPE	RATIO	NAL GUIDELI	INES ARE BASED O	N OBJECTIVES IN THE	FOLLOWING P	RIORITIES:
		1. HFE							
		2. LSF							
		3. LSG							
		4. LMS							
		5. LEAM					•		
						NOTE			
					RIPPL	_E-OFF SEQUENCE	IS:		
							•		
						1. PDR 1 (7			
						2. PDR 2 (14	W)		
						 LMS LEAM 			
						5. HFE			
		В.							
		THROUGH -	REFER	RENCE	EMRD FOR A	POLLO 17			
		"'							
		I. THE ALSEP	SHORTING PLU	IG SWI	TCH WILL BE	E ACTIVATED ASAP	AFTER CENTRAL STATE	ON DEPLOYME	NT.
			OUND IS UNABL			NLINK, THE GROUN	D WILL REQUEST THE A	STRONAUT TO	ROTATE THE RESET
		K. REFERENCE	APOLLO 17 EM	IRD .					
		1 Детмент	COMMAND CAPET	ED UT) DE MATHE	TAINED ON AND TH	THE CAPED CONFICURA	TION EVOCET	TO CEND COMMANDS ***
		REMOTE SI		FROM 1	DEPLOYMENT	INITIATION UNTI			TO SEND COMMANDS AND ADDITIONAL PROTECTION
							CODE STEM THE UPS	DODE HOLES	JILL DE ATTEMPTED COOF
			MS ARE ENCOUN						WILL BE ATTEMPTED FIRST. DF 20 MINUTES ACCUMULATED
	<u> </u>		<u> </u>	1		T		1	T
-			MISSION	REV	DATE	SECTION	GROUP	PAGE	
			APOLLO 17	I FNI	9/1/72	ALSEP	GENERAL	32-1	Tane 26 4

MISSION RULES SECTION 32 - ALSEP - CONTINUED R ITEM 32-1 N. IF A HARD OBJECT IS ENCOUNTERED WHICH REDUCES DRILL RATE TO LESS THAN 5 INCHES PER MINUTE ON EITHER HFE PROBE (CONT) HOLE, THE FOLLOWING WILL BE ACCOMPLISHED: 1. IF THE SECOND STEM SECTION IS NOT ATTACHED, WITHDRAW AND START AT A NEW LOCATION FOR A MAXIMUM OF TWO WITHDRAWALS. 2. IF THE SECOND STEM SECTION IS ATTACHED, CONTINUE UNTIL 10 MINUTES OF POWER ON TIME FOR DRILL STRING HAS O. REFERENCE APOLLO 17 EMRD P. IF THE CREW MUST RETURN TO THE LM PRIOR TO COMPLETE ALSEP DEPLOYMENT, THE SHORTING PLUG SWITCH WILL BE ACTIVATED "ON" IF THE ANTENNA IS EMPLACED. IF THE ANTENNA IS NOT EMPLACED, THIS SWITCH WILL NOT BE ACTIVATED (PICK UP HERE ON EVA 2) Q. THROUGH R. REFERENCE APOLLO 17 EMRD S. FOR ANY MALFUNCTION DURING A SURFACE TASK, A MAXIMUM OF 10 MIN WILL BE SPENT ON THE CONTINGENCY PROCEDURE BEFORE THE TASK IS ABANDONED, WITH THE FOLLOWING EXCEPTIONS: 1. RTG FUELING - UP TO 20 MIN WILL BE ALLOWED IN EXERCISING RTG FUELING CONTINGENCY PROCEDURES. 2. ALSEP PACKAGE 1 TO PACKAGE 2 CABLE CONNECTIONS - UP TO 20 MIN WILL BE ALLOWED FOR MAKING THE CABLE CONNECTION. 3. ALSEP ANTENNA - UP TO 30 MIN WILL BE ALLOWED FOR ANTENNA ERECTION AND ALIGNMENT. 4. ALSEP DEPLOYMENT MAY BE CONTINUED ON A LATER EVA IF ADDITIONAL TIME TO SPEND ON CONTINGENCY PROCEDURES IS REQUIRED TO ATTAIN AN OPERATIONAL ALSEP. T. FOR EVA TERMINATION OR OTHER INTERRUPTIONS DURING ALSEP DEPLOYMENT, THE FOLLOWING DEPLOYMENT INTERRUPTION POINTS WILL BE OBSERVED IF PERMITTED BY CREW SAFETY CONSIDERATION: 1. REMOVE ALSEP PACKAGES 1 AND 2. CLOSE SEQ. BAY DOOR. REPLACE ALSEP PACKAGES WITH HANDLES UP AND WITH EXPERIMENTS FACING THE SUN WITHIN ±15°. 2. TILT FUEL CASK (DOME NOT REMOVED). 3. TILT FUEL CASK. REMOVE DOME. DO NOT DEFUEL. 4. FUEL RTG. THEN CARRY ALSEP TO DEPLOYMENT SITE. REMOVE ALL COMPONENTS FROM PACKAGE 2. CARRY PACKAGE 1 TO EMPLACEMENT SITE. DO NOT CONNECT RTG CABLE TO CS UNLESS SUFFICIENT TIME IS AVAILABLE TO ERECT THE CS SUNSHIELD. 5. CONNECT HFE CABLE TO CS. REMOVE PSE, ASE, AND LSM FROM SUBPACKAGE 1. ALIGN CS AND RAISE SUNSHIELD. MOUNT ANTENNA MAST, GIMBAL, AND ANTENNA. LEVEL AND ALIGN ANTENNA, DEPRESS SHORTING PLUG ON WAY BACK TO IM. 6. DEPLOY ALSEP EXPERIMENTS AND COMPLETE TASKS. A HOLD POINT EXISTS AFTER EACH TASK IS COMPLETED. DEPRESS SHORT-ING PLUG SWITCH AND ROTATE ASTRO SWITCH 1 CLOCKWISE ON WAY BACK TO LM (SEE CONTINGENCY PROCEDURES FOR HOLD POINTS).

MISSION	REV	DATE	SECTION	GROUP	PAGE	
APOLLO 17	FNL	9/1/72	ALSEP	GENERAL	32-2	Tape 45.2

MISSION RULES

					SECTI	ON 32 - ALSEP - CO	NTINUED					
ITEM	<u>M</u>											
32-1 (CONT			OTS ON TEMP LA				ER FUELING RTG, C	REW MUST NOT	T TOUCH SHORTING PLUG UNTIL IT			
		V. ALSEP DEP	LOYMENT WILL I	OT BE	STARTED I	F IT IS KNOWN THAT	LESS THAN 1 HR 30	O MIN IS AVA	AILABLE FOR ALSEP IN EVA 1.			
						,	·					
32-2 AND 32-3		REFERENCE AP	OLLO 17 EMRD									
32-4	,	A. REFERENC	E APOLLO 17 EM	1RD								
		B. THE CREW	WILL REPORT RE	CHECK	OF THE LS	G LEVEL AND ALIGN	ENT AFTER EXPERIME	ENT UNCAGING	i.			
32-5	5	A. REFERENCE	APOLLO 17 EMP	RD								
	I AREA WHERE THE CHARGE WILL											
		C. THROUGH D	REFERENCE APO	LLO 1	7 EMRD							
		E. DEPLOYMENT OF THE LSP EXPLOSIVE PACKAGE (EP) WILL BE TERMINATED ANY TIME ONLY ONE SAFETY FEATURE REMAINS. THE FOLLOWING CONDITIONS MUST BE MET BEFORE THE EP CAN DETONATE:										
		1. ASTRO	SW #2 ROTATE	то с	W (ENABLE)	POSITION. ENABLE	S 29 V TO THE LSP	CENTRAL ELE	CTRONICS.			
	l	2. LSP "	OPERATE" CMD (OCTAL	055) RECE	IVED BY LSP CENTRA	L ELECTRONICS.					
		3. LSP T	RANSMITTER PUL	.SES E	NABLE CMD	(OCTAL 156) RECEIN	ED BY LSP CENTRAL	ELECTRONICS				
		4. LSP FORMAT ON CMD (OCTAL 003) RECEIVED BY THE ALSEP CENTRAL STATION DDP.										
		5. TIME-	OUT OF SAFE/AF	RM SLI	DE TIMER T	D THE ARM CONDITIO	N.					
	ı	6. TIME-	OUT OF THERMAL	. BATT	ERY TIMER.							
ŀ		STATUS OF	EACH OF THESE	SAFE	TY FEATURE	S DURING NORMAL CF	EW HANDLING IS AS	FOLLOWS:				
			1 81555) DEDI	OVMENT	-	EATURES SAFED		MBER SAFED			
			 ALSEF CHARG 				2, 3, 4, 5, 6 3, 4, 5, 6		6 5			
			3. LSP F	PASSIV	E LISTENIN	3,	5,6		3			
32-6 THRU 32-8	,	REFERENCE APO	OLLO 17 EMRD									
<u></u>			MISSION	REV	DATE	SECTION	GROUP	PAGE				
			APOLLO 17	FNL	9/1/72	ALSEP	GENERAL	32-3	Tape 60.1			
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MISSION RULES

SECTION 32 - ALSEP - CONCLUDED

22-81 UNABLE TO DRILL NORMAL PROCESS ALL FERENCES HOLDS SUSSIBLE AT LEAST TO DRILL SIGNAL PROCESS OF PROBLES O	•				3201101	32 - ALSEP - CONCLUD			
A. I. FAND-AUBER DOPE STEWS INTO SUBSURABLE AT LESS DEEP AND DRILL IS ORD PARD DRILL IS STILL ORD PARD DRILL	1	RULE	CONDITION/MALFUNCTION	PHASE		RULING	CUES,	NOTES/COMME	NTS
LESS THAN 24 LICKERS DREP PARD DRILL IS REPERABLE INFORMATION OF PROBE I		32-81	HFE EMPLACEMENT HOLES						
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22-82 HICHES, DIG TRENCH APPROX. A FILLOR, SUPEND TO APPROX. 10 ENCIRC MEET AT OTHER ERO. PLACE PROBE IN TRENCH HITH CABLE AT SHALOM SHE ON. COVER PROBE MITH AS MUCH SOIL AS. 8. NEITHER HOLE IS 24 INCHES DEEP AND DORLL IS STILL OPERABLE C. IF HOLE IS NOT MOMINAL DEPTH 32-82 BAVE CHOICE OF DRILLING SECOND HE MOLE OR CORE SMMULE HOLE 32-83 DRILL RATE REDUCED TO LESS THAN 5 INCHES PER HINDTE 32-84 DRILL RATE REDUCED TO LESS THAN 5 INCHES PER HINDTE A. IF LESS THAN TWO STEM SECTIONS ARE ATTACHED TO THE PROBE SECTION ARE ATTACHED TO THE PROBE SECTION OF THE PROBE MITH AS MUCH STRING ARE ATTACHED TO THE PROBE SECTION ARE ATTACHED TO THE PROBE SECTION OF THE PROBE SECTION OF THE PROBE SECTION OF THE PROBE SECTION OF THE PROBE SECTION OF THE PROBE SECTION OF THE PROBE SECTION OF THE PROBE SECTIONS ARE ATTACHED TO THE PROBE SECTION OF THE SECTION ARE SECTION OF THE PROBE SECTION OF THE SECTION ARE SECTION OF THE SECTION ARE SECTION OF THE SECTION ARE SECTION OF THE SECTION ARE SECTION OF THE SECTION ARE SECTION OF THE SECTION OF THE SECTION ARE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF THE SECTION OF						PROBE INTO HOLE MAD DOUBLE CORE TUBE.	E BY A		
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SECOND HEE HOLE OR CORE SAMPLE HOLE A. 1F LESS THAN TWO STEM SECTIONS ARE ATTACHED TO LESS THAN 5 INCHES PER MINUTE A. 1F LESS THAN TWO STEM SECTIONS ARE ATTACHED TO THE POWER HEAD, WITHORAW AND START AT NEW LOCATION FOR MAXINUM OF TWO WITH- DRAWALS. B. 1F TWO OR MORE STEM SECTIONS ARE ATTACHED TO THE POWER HEAD, CONTINUE UNTIL 10 MINUTES OF POWER ON TIME FOR THE DRILL STRING HAS ELAPSED. 32-84 THRU 32-110 MISSION REV DATE SECTION GROUP PAGE					C.	AS IT WILL GO. EMP LOWER RADATION SHIE THE TOP OF THE PROB	LACE LD ON E		
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SECTION 33 IS DELETED.
REFERENCE LUNAR ORBIT
EXPERIMENT MISSION
RULES IN SECTION 3 OF
THIS DOCUMENT.

THIS SECTION WAS DELETED TO ELIMINATE DUPLICATION OF RULES IN SECTION 3 OF THIS DOCUMENT.



MISSION RULES

APPENDIX A - ACRONYMS AND SYMBOLS

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		1		L	SYMBOLS	<u> </u>	A-1	Tape 30.2

MISSION RULES

APPENDIX A - ACRONYMS AND SYMBOLS - CONTINUED

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MISSION RULES

APPENDIX A - ACRONYMS AND SYMBOLS - CONTINUED

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MISSION RULES

APPENDIX A - ACRONYMS AND SYMBOLS - CONTINUED

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MISSION RULES

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1			1		SYMBOLS		A-5	Tape 53.9

MISSION RULES

APPENDIX A - ACRONYMS AND SYMBOLS - CONCLUDED

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MISSION RULES

APPENDIX B - DISTRIBUTION LIST

		1	DISTRIBUTION LIST	-			
DIRECTOR							
AA/KRAFT, C. AB/SJOBERG, S AC/ABBEY, G.		.					
DIRECTOR OF F	LIGHT	OPERATION	<u>s</u>				
FA/TINDALL, H ROSE, R. G	. W.		_				
FLIGHT CONTRO	L DIVI	SION					
FC/KRANZ, E. GRIFFIN, G. FRANK, M. ROACH, J. BROOKS, M. FC2/HARLAN, C. F63/LOE, T. F63/BLAIR, L.	. D. P. W. F. . S.	'n					
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TRM TECHNICAL INFORMATION CENTER, HOUSTON OPERATIONS (5) HZ/2064-MITCHELL, R. A. MORTH AMERICAN ROCKWELL HOUSTON SMIM, R. (2) GODDARD SPACE FLIGHT CENTER KNOX, C. B. (9) CODE 221.1 MANNED FLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEC/ASTRO OFFICE (6) LO/KAPYRAN, W. J. LO-PH-Z-/XNIGHT, G. W. LV-OMD-1/MARILL, C. G. LV-OMD-1/MARILL, C. G. LV-OMD-1/MARILL, S. E. LV-INS/FOURANDS, M. D. LS-NILITANS, J. J. LS-ENG-7/GASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (4) LS-ENG-7/MASKINS, R. B. (2) HMC, SMI/SMERTER, R. (2) HMC, SMI/SMERTER, R. (2) HMC, SMI/SMERTER, R. (2) HMC, SMI/SMERTER, R. (2) HMC, SMI/SMERTER, R. (3) SO/GORMAN, R. E. PSC/MORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSC/MORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSC/MORE, A. H. MASSHALL SPACE FLIGHT CENTER MASSHALL SPACE FLIGHT CENTER MISSION REV DATE SECTION GROUP PAGE MISSION REV DATE SECTION GROUP PAGE		, a, b13/10/15 / 1						
H2/2064-MITCHELL, R. A. NORTH AMERICAN ROCKWELL HOUSTON SMIM, R. (2) GODDARD SPACE FLIGHT CENTER KNOX, C. B. (9) COME S21.1 MANNED FLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEY/ASTROD OFFICE (6) LO/KAPYRAN, W. J. LO-PLN-2/MIGHT, G. N. LV/GRUENE, H. LV-BR/GELL, I. A. LV-OMO-1/VARGEL, C. G. LV-OMO-3/YOURMANS, R. E. LLV-HIS/EDMARDS, N. D. LS/MILLIANS, J. J. LS-ENG-7/ASKINS, R. B. (4) LS-ENG-7/ASKINS, R. B. (4) LS-ENG-7/ASKINS, R. B. (2) MR. 3M1/FISCHERS, R. (2) MR. 3M1/FISCHERS, R. (2) MR. 3M1/FISCHERS, R. (2) MR. 3M1/FISCHERS, R. (2) MR. 3M1/FISCHERS, R. (3) SO/GORMAN, R. E. PSYMMORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSYMMORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSYMMORE, A. H. MSSION REV DATE SECTION GROUP PAGE MARSHALL SPACE FLIGHT CENTER MAFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40)								
SWIM, R. (2) GODDARD SPACE FLIGHT CENTER KNOX, C. B. (9) CODE 821.1 MANNED FLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEK/ASTRO OFFICE (6) LD/KAPYRAN, N. J. LU-PLN-2/KNIGHT, G. W. LU/SMIGHT, H. LV-B/RIGELL, I. A. LU-OMO-3/YOUMANS, R. E. LU-OMO-3/YOUMANS, R. E. LU-OMO-3/YOUMANS, R. E. LU-FUNC/ELAIMAN, R. E. LU-FUN					NTER, HOUSTON OPERA	TIONS (5)		
SWIM, R. (2) GOODARD SPACE FLIGHT CENTER KNOX, C. B. (9) CODE 821.1 MANNED FLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEK/ASTRO OFFICE (6) LD/KAPYRAN, N. J. LD-PLN-2/KNIGHT, G. W. LV/SRUENE, H. LV-B/RIGELL, I. A. LV-OMO-3/YOUMANS, R. E. LV-OMO-3/YOUMANS, R. E. LV-OMO-3/YOUMANS, R. E. LV-MILLEMON, N. J. LS-ENG-9/MARS, C. B. (4) TEC. VAB ZLI/YIZIAK, E. E. (2) NR, 3H/TSICHER, G. R. (2) MCC, 3KI/SMAFRE, J. R. (2) TSC/LARK, R. L. (2) RMC, 3KI/SMAFRE, J. R. (2) TSC/LARK, R. L. (2) RMC, 3KI/SMAFRE, J. R. (2) TSC/LARK, R. L. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, 3KI/SMAFRE, J. R. (2) RMC, MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40)		NODTH AMEDIC	AN DOC	NALLI HOUS	TON			
GODDARD SPACE FLIGHT CENTER KNOX, C. B. (9) CODE 821.1 MANNED PLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEK/ASTRO OFFICE (6) LO/KAPYRAN, M. J. LO-PLN-2/KRIGHT, G. M. LV-GROUER, H. LV-BRIEGEL, I. A. LV-OMO-1/MAGEL, C. G. LV-OMO-1/MAGEL, S. R. LS-WILLIAMS, J. J. LS-ENG-7/GASKINS, R. B. (4) LS-ENG-7/GASKINS, R. B. (4) TBC, VAB 2L1/ZYZAK, E. E. (2) MDC, 3K1/SHAFFER, J. R. (2) MDC, 3K1/SHAFFER, J. R. (2) MDC, 3K1/SHAFFER, J. R. (2) TS/CLARK, R. L. (2) RS/MORE, A. R. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-G-MATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE				KWEEL HOUS	TON			
KNOX, C. B. (9) CODE 821.1 MANNED FLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEK/ASTRO OFFICE (6) LO/ARPYRAN, H. J. J. DPLN-Z/KNIGHT, G. W. LV-BK/RIGELL, I. A. LV-DMO-1/NAGEL, C. G. LV-DMO-3/YOUMANS, R. E. LV-MOS-ZYVOUMANS, R. E. LV-INS/EDWARDS, M. D. LS-MILLIAMS, J. J. LS-ENS-J/GASKINS, R. B. (4) IS-ENS-J/GASKINS, R. B. (4) IS-ENS-GMARG, C. B. (4) ISC-ENS-J/GASKINS, R. B. (2) MOS, 301/SMOFTER, G. R. (2) MOS, 301/SMOFTER, G. R. (2) MOS, 301/SMOFTER, G. R. (2) TS/MODGE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-G/MATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FN. 971/72 APPENDIX B -		J. 1. (2)						
CODE 821.1 MANNED FLIGHT OPERATIONS DIVISION, REQUIREMENTS SECTION JOHN F. KENNEDY SPACE CENTER NASA - MSOB AA-AVO/SMITH, A. G. (4) CEK/ASTRO OFFICE (6) LO/KAPYRAN, M. J. LO-PLN-2/KINGEHT, G. W. LV/GRUENE, H. LV-BRIGELL, I. A. LV-OMD-1/NAGEL, C. G. LV-OMD-1/NAGEL, C. G. LV-OMD-1/NAGEL, C. G. LV-SDC/LEALMAN, R. E. LV-HINS/EDWARDS, M. D. LS/WILLIAMS, J. J. LS-ENG-F/GASKINS, R. B. (4) LS-ENG-F/GASKINS, R. B. (4) LS-ENG-F/GASKINS, R. B. (2) TISK, VMB 2L1/Z/ZAK, E. E. (2) NR, SMI/FISCHER, G. R. (2) NR, SMI/FISCHER, G. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (2) TISK, JAMFRER, J. R. (3) SO/GDMAN, R. E. PSK/MORGE, A. E. RSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/MATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FN. 9/1/72 APPENDIX B -				HT CENTER				
AA-AVO/SMITH, A. G. (4) CEK/ASTRO OFFICE (6) LO/KAPYRAN, W. J. LO-PLN-2/KNIGHT, G. W. LV-GRUERL, H. LV-B/FICELL, I. A. LV-OMD-1/MAGEL, C. G. LV-OMD-3/YOUMANS, R. E. LV-INS/EDWARDS, M. D. LS/WILLIAWS, J. J. LS-ENG-7/GASKINS, R. B. (4) LS-ENG-7/GASKINS, B. (4) TBC, VAB ZLI/YYZAK, E. E. (2) NR, 3M1/FISCHER, G. R. (2) MDC, 3K1/SHAFFER, J. R. (2) IBM, 3N1/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		CODE 821.1		ERATIONS D	IVISION, REQUIREMEN	rs section		
AA-AVO/SMITH, A. G. (4) CEX/ASTRO OFFICE (6) LO/KAPYRAM, M. J. LO-PLN-Z/KNIGHT, G. W. LV-GRUENE, H. LV-B/RIGELL, I. A. LV-OMO-1/MAGEL, C. G. LV-OMO-3/YOUMANS, R. E. LV-GOZ/LEALMAN, R. E. LV-INS/EDMARDS, M. D. LS/WILLIAMS, J. D. LS-WILLIAMS, J. B. (4) LS-ENG-7/GASKINS, R. B. (4) TBC, VAB ZLI/ZYZAK, E. E. (2) NR, 3M1/FISCHER, G. R. (2) MDC, 3K1/SMFFER, J. R. (2) IBM, 3N1/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		JOHN F. KENN	EDY SP	ACE CENTER	NASA - MSOB			
LO/KAPYRAN, W. J. LO-PLN-Z/KNIGHT, G. M. LV/GRUENE, H. LV-BYRIEGEL, I. A. LV-0MO-1/NAGEL, C. G. LV-0MO-3/YOUNAMS, R. E. LV-GDC/LEALMAN, R. E. LV-INS/EDMARDS, M. D. LS-ENG-AMARS, C. B. (4) LS-ENG-AMARS, C. B. (4) TBC, VAB 2L1/ZYZAK, E. E. (2) MC, 3K1/SHAFFER, J. R. (2) MC, 3K1/SHAFFER, J. R. (2) IDM, 3N1/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MODRE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/MATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		AA-AVO/SMITH	, A. G	. (4)				
LV-B/RIGELL, I. A. LV-DMO-1/MAGEL, C. G. LV-OMO-3/YOUMANS, R. E. LV-GDC/LEALMAN, R. E. LV-INS/EDWARDS, M. D. LS/MILLIAMS, J. J. LS-ENG-7/GASKINS, R. B. (4) LS-ENG-8/MARS, C. B. (4) TBC, VAB 2L1/ZYZAK, E. E. (2) MDC, 3K1/SIAFFER, J. R. (2) IBM, 3N1/SROFTER, J. R. (2) IBM, 3N1/SROFTER, J. R. (2) ISS/CLARK, R. L. (2) RS/MORG, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/MATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FRL 9/1/72 APPENDIX B -		LO/KAPYRAN.	W. J.					
LV-OMO-JYOUMANS, R. E. LV-GDC/LEALMAN, R. E. LV-INS/EDMARDS, M. D. LS-MILLIAMS, J. J. LS-ENG-JYGASKINS, R. B. (4) LS-ENG-JYGASKINS, R. B. (4) TSC, VAB 2LI/ZYZAK, E. E. (2) NR, 3MI/SIAFER, J. R. (2) MDC, 3KI/SHAFER, J. R. (2) IBM, 3NI/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		LV/GRUENE, H		. w.				
LV-INS/EDMARDS, M. D. LS/WILLIAMS, J. J. LS-ENG-7/GASKINS, R. B. (4) LS-ENG-6/MARS, C. B. (4) TBC, VAB 2L1/ZYZAK, E. E. (2) NR, SMI/FISCHER, G. R. (2) MDC, 3K1/SHAFFER, J. R. (2) IBM, 3N1/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		LV-OMO-1/NAG	EL, C.	G. R. E.				
LS-ENG-7/MARS, C. B. (4) LS-ENG-8/MARS, C. B. (4) TBC, VAB 2L1/ZYZAK, E. E. (2) NRC, 3M1/FISCHER, G. R. (2) MDC, 3X1/SHAFFER, J. R. (2) IBM, 3N1/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		LV-GDC/LEALM	AN, R.	E.				
TBC, VAB 2L1/ZYZAK, E. E. (2) NR, 3M1/FISCHER, G. R. (2) MDC, SK1/SHAFFER, J. R. (2) IBM, SN1/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		LS/WILLIAMS, LS-ENG-7/GAS	J. J. KINS,	R. B. (4)				
MDC, 3RI/SHAFFER, J. R. (2) IBM, 3NI/GROVIER, P. M. (2) TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		TBC, VAB 2L1	/ZYZAK	, E. E. (2)			
TS/CLARK, R. L. (2) RS/MOORE, A. H. IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		MDC, 3K1/SHA	FFER,	J. R. (2)				
IN/SENDLER, K. (3) SO/GORMAN, R. E. PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		TS/CLARK, R.	L. (2					
PSK/MORSE, A. E. KSC MISSION DIRECTOR'S OFFICE, R3121, MSO BLDG. GAC, M/S 300-6/WATSON, J. K. (6) MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		IN/SENDLER,	K. (3)					
MARSHALL SPACE FLIGHT CENTER MSFC/P-MO-MGR, MISSION OPERATIONS OFFICE (40) MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		PSK/MORSE. A	. E.	OR'S OFFIC	E, R3121, MSO BLDG.			
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -								
MISSION REV DATE SECTION GROUP PAGE APOLLO 17 FNL 9/1/72 APPENDIX B -		MARSHALL SPA	CE FLI	GHT CENTER				
APOLLO 17 FNL 9/1/72 APPENDIX B -		MSFC/P-MO-MG	R, MIS	SION OPERA	TIONS OFFICE (40)			
APOLLO 17 FNL 9/1/72 APPENDIX B -								
APOLLO 17 FNL 9/1/72 APPENDIX B -								
APOLLO 17 FNL 9/1/72 APPENDIX B -								
APOLLO 17 FNL 9/1/72 APPENDIX B -	<u> </u>	MTSSTON	REV	DATE	SECTION	GROUP	PAGE	
DISTR LIST B-3 Tape 21.6			1		APPENDIX B -		B-3	Tape 21.6

MISSION RULES

APPENDIX B - DISTRIBUTION LIST - CONCLUDED

				APPE	NDIX B - C	DISTRIBUTION LIST	- CONCLUDED						
R	ITEM												
			OFFICE MANNE	D SPAC	EFLIGHT								
			M/MYERS, D. MA/PETRONE, I MA/LEE, C. M. MAO/LAND, E. TC/DRAPER, C.	W. (2	0)								
			MAE/ALLMAN, .	J.									
			DDMS-M DDMS-N/DEARM/ ETOOP-2 PAFB	AN. J.	, MAJ.	, FLA							
			MIT INST. LA		RIES CAMBR	RIDGE, MASS.							
			NEVINS, J. (4 COPPS, S. (2 LARSON, R. (2 FELLMAN, P. () 2)									
			GRUMMAN AIRCE	RAFT E	NGINEERING	CORP., BETHPAGE,	NEW YORK						
			PRATT, R. (35	5)									
		NASA, DAYTONA BEACH OPER, P. O. BOX 2500, DAYTONA BEACH, FLA. 32015											
			MA-2D/CAHALAN, P. F.										
			GENERAL ELECTRIC, 1830 NASA BLVD, HOUSTON, TEXAS 77058										
		ı	GE/753/NELSON	۱, G.	С.								
			BENDIX										
			TDX/MILEY, R.	. R. (2)								
			BOEING CORPOR	RATION									
			HAO4/DATA MAN	NAGEME	NT (4)								
			WEATHER										
			SANDERSON, AL	LAN N.									
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-			MISSION APOLLO 17	REV FNL	DATE 9/1/72	SECTION APPENDIX B -	GROUP	PAGE					
L			L		. ,	DISTR LIST		B-4	Tape 21.7				

MISSION RULES

APPENDIX C - CHANGE CONTROL

	,				AFFLIND	IX C - CHANGE CONTR	JL		
R	ITEM								
						CHANCE CONTROL			
						CHANGE CONTROL			
		1.0 INTRODUC	TION						
		1.1 PURPOSE							
		INS FOR	URE THE PROPER	COOR	DINATION O	F CHANGES, PROVIDE	A RECORD OF PR	ROPOSED CHANGES	MISSION RULES. THIS WILL (INCLUDING THE RATIONALE ATES BETWEEN REVISIONS
		1.2 EFFECTIV	ITY						
		SEP	TEMBER 1, 1972	2					
	·	2.0 <u>CHANGE P</u>	ROCEDURES						
	; ;	2.1 SUBMISSI	ON OF CHANGES						
į		ORI (AF	GINATING OUTS D). CHANGES (IDE TH ORIGIN	E FLIGHT C ATING WITH		SUBMITTED DIR OL TEAM WILL B	RECTLY TO THE A	ID INPUT. CHANGES SSISTANT FLIGHT DIRECTOR THE AFD VIA THE PRIME
		2.1.1 FORMAT							
		(F0	RM MUST BE TYP	PED).	ADDITIONA		IF THE SPACE		M SHOWN IN FIGURE C-1 T ADEQUATE. THE COMPLETED
						COMPLETENESS AND P E ADVISED OF ANY SU		RULE FORMAT, A	ND MAKE CORRECTIONS AS
		2.2 APPROVAL							
		2.2.1 COORDI	NATION						
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MISSION RULES

APPENDIX C - CHANGE CONTROL - CONCLUDED

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