

SECTION II

SECTION II

1. The first part of the report is a summary of the work done during the year.

LIFT-OFF SWITCH POSITIONS

Remarks

- B - 1. ✓ Drogue Pins - STOWED
2. ✓ Stowage Boxes - SECURE
3. ✓ Stowage Vents - OPEN
4. ✓ Splash Curtains - SECURE
5. ✓ Ditch Handle - LOCKED
6. ✓ Hatch Handle - SECURED
7. ✓ "D" Ring - UNSTOW
8. ✓ Arm Restraints - UP
9. ✓ Shoulder Restraints - LOCKED

- C - 10. Left SECONDARY O₂ BOTTLE
SHUTOFF Handle - OPEN

11. ABORT Handle - NORMAL
12. GUIDANCE Switch - OFF
13. AUX RECP Switch - OFF
14. Left Utility Light - STOWED
15. All left C/B's - CLOSED
16. BOOST-INSERT Switch - ARM
17. RETRO PWR Switch - SAFE
18. RETRO JETT Switch - SAFE
19. LANDING Switch - SAFE
20. RETRO ROCKET SQUIBS Switches (4) - ARM
21. SEQ LIGHTS TEST Switch - OFF
22. SEQ LIGHTS Switch - BRIGHT
23. ATT IND Switch - WITH FDI
24. Maneuver Controller - OFF
25. Maneuver Controller - STOWED
26. EMERG PRE MAIN Switch - GUARDED
27. Altimeter - SET
28. IVI - ZERO
29. Flight Director REF Switch - COMP
30. Flight Director MODE Switch - RATE
31. FDI SCALE RANGE Switch - LO
32. EVENT TIMER - STBY and ZEROED
33. Left Mirror - STOWED

15. Except T_R-256 C/B - OPEN

- P - 34. ✓ All Overhead C/B's - CLOSED
35. ✓ T/M AC Switch - ON
36. ✓ DC-DC CONV Switch - PRI
37. ✓ Center Light - BRIGHT
38. ✓ ACME BIAS PWR - PRI
39. ✓ ROLL JETTS Switch - YAW
39a. ✓ OAMS RESV - SAFE
40. ✓ ATTITUDE DRIVERS Switch - PRI
41. ✓ ACME LOGIC Switches (3) - PRI
42. ✓ Twizzle Stick - STOWED

34. ✓ Except OAMS HTRS &
✓ H₂O HTRSC/B'S - OPEN
✓ ELSS PWR C/B - OPEN

- C - 43. ✓ CABIN AIR RECIRC Handle - UP (Open)

45°

Remarks

- P - ~~44.~~ INLET SNORKEL Handle - UP (Closed)
~~45.~~ CABIN VENT Handle - UP (Closed)
~~46.~~ WATER SEAL Handle - UP (Open)
~~47.~~ O₂ HIGH RATE RECOCK Handle - UP
~~48.~~ SUIT FAN Switch - NO. 1 & NO. 2
~~49.~~ PRIMARY PUMP A Switch - ON
~~50.~~ PRIMARY PUMP B Switch - OFF
~~51.~~ RAD Switch - BY-PASS
~~52.~~ EVAP Heat Switch - OFF
~~53.~~ EVAP Switch - MAX FLOW
~~54.~~ SECONDARY PUMP A Switch - ON
~~55.~~ SECONDARY PUMP B Switch - OFF
~~56.~~ O₂ HI RATE Switch - OFF

- B - ~~57.~~ ALL Light Dimmers - Open as required

- P - ~~58.~~ Sequential Telelights - LOCKED
~~59.~~ H₂ TANK VAC - SAFE
~~60.~~ CLK LT Dimmer - Full Bright
~~61.~~ Digital Timer - START
~~62.~~ TDA RIGID CONTROL Switch - OFF
~~63.~~ TDA UNDOCK CONTROL Switch - OFF

- ~~64.~~ CRY QTY Switch - O
2

- ~~65.~~ O HEATER Switch - Auto
~~66.~~ H₂ HEATER Switch - Auto
~~67.~~ OAMS REG Switch - GUARDED
~~68.~~ PROP Indicator Switch - O
~~69.~~ UHF T/R Switch - NO. 1
~~70.~~ HF T/R Switch - OFF
~~71.~~ SILENCE Switch - OFF
~~72.~~ KEYING Switch - CONT INT/PTT
~~73.~~ NO. 2 AUDIO Switch - UHF
~~74.~~ RECORD - CONT
~~75.~~ RESC BEACON CONTROL Switch - OFF
~~76.~~ C-ADAPT BEACON CONTROL Switch - CMD
~~77.~~ C-RNTY BEACON CONTROL Switch - CONT
~~78.~~ T/M CALIB Switch - OFF
~~79.~~ T/M Control STBY T/M Switch - OFF
~~80.~~ T/M CONTROL T/M Switch - R/T & ACQ
~~81.~~ TAPE PLYBK Switch - CMD
~~82.~~ ANT SEL Switch - RNTY
~~83.~~ HF ANT Switch - OFF (Center)

- C - ~~84.~~ NO. 1 AUDIO Switch - UHF
~~85.~~ RADAR Switch - OFF
~~86.~~ PLATFORM Mode Switch - FREE
~~87.~~ SCANNER Switch - PRI
~~88.~~ RATE BYROS Switches (3) - PRI
~~89.~~ COMPUTER Power Switch - ON
~~90.~~ COMPUTER Mode Switch - ASC

Remarks

- 91. ATTITUDE CONTROL Mode Switch - RATE CMD
- 92. OAMS PROP MOTOR VALVE Switch - OPEN
- 93. RCS A & B PROP MOTOR VALVE Switches - OPEN
- 94. OAMS CNTL POWER Switch - OFF
- 95. RCS A & B CNTL POWER Switches - OFF
- 96. REPRESS Knob - CLOSED
- 97. MANUAL O₂ HIGH RATE Handle - Down (Closed)
- P - 98. Right Mirror - STOWED
- 99. AUX TAPE PWR - OFF
- 100. AUX TAPE SELECTOR Switch - STBY
- 101. X-RAY - OFF
- 102. BETA - W MAG
- 103. COLLECTOR DOOR - CLOSED
- 104. DOOR LOCK - GUARDED
- 105. ION SENSOR SEQ Switch - Center
- 106. ION SENSOR MODE - SAFE
- 107. X-OVER - OFF
- 108. SECTION 1 PURGE - OFF
- 109. SECTION 1 POWER - ON
- 110. SECTION 2 POWER - ON
- 111. SECTION 2 PURGE - OFF
- 112. 1A, 1B, 1C, 2A, 2B, & 2C Switches - ON
- 113. FCΔP SELECTOR Switch - OFF
- 114. Voltmeter Selector Switch - C
- 115. MDU PWR Switch - ON
- 116. MDU - 72: _ _ _ _ _
- 117. FDI SCALE RANGE Switch - LO
- 118. Flight Director REF Switch - COMP
- 119. Flight Director MODE Switch - ATT
- 120. ALL Right C/B's - CLOSED
- 121. Maneuver Controller - OFF
- 122. ATT IND Switch - WITH FDI
- 123. AC POWER Switch - IGS
- 124. BIO-MED RCDR 1 Switch - CONT
- 125. BIO-MED RCDR 2 Switch - CONT
- 126. RCS HTRS Switch - OFF
- 127. BUS TIE Switches 1 & 2 - OFF
- 128. MAIN BATTERIES Switches (4) - ON
- 129. SQUIB BATTERIES Switches (3) - ON
- 130. ENCDR - OFF
- 131. EXT LTS - OFF
- 132. INDEX - OFF
- 133. ENGINE - STOP
- 134. Agena BUS ARM - SAFE
- 135. AUX RECP Switch - OFF
- 136. Right Utility Light - STOWED
- 137. Right SECONDARY O₂ BOTTLE SHUTOFF Handle - OPEN
- 138. Drinking Nozzle - ²STOWED
- 139. CNDSATE VALVE Switch - NORM
- 140. H₂O TANK VALVE Switch - NORM
- 141. URINE Valve - OFF
- 142. Urine HTR Switch - OFF

Remarks

- B -143. Hatches - LOCKED
144. Hatch Pawls (2) - Neutral
145. Clip PTT Buttons (2) to "D" Rings
146. SUIT TEMP CONTROL - As Required
147. CABIN VENT PLUG - Removed
148. SUIT FLOW - As Required
149. Harness Secure and Locked

TIME HR:MIN	COMP PRE LN	PLAT SET	CNTL MODE PLAN	ACTION		MISSION	EDITION FINAL	DATE JUNE 22, 1966	STATION	AOS	LOS	TOTAL	REV	PAGE	
				COMMAND PILOT	PILOT										
				INSERTION CHECKLIST A - UNSTOW NAV CHECKLIST STOW "D" RING & SAFETY BOOSTER-INSERT - SAFE RETROCKET SQUIBS (4) - SAFE MANEUVER CONTROLLER - OFF MANEUVER CONTROLLER - STOW SEQ LIGHTS TEST - RED & GREEN/AMBER LEFT SEC O₂ BOTTLE SHUTOFF - CLOSED ARM RESTRAINTS - STOW RETICLE - UNSTOW, INSTALL & CONNECT LEFT LT - DIM CENTER LT - DIM WINDOW COVER - JETT A - STOW "D" RING & SAFETY ARM RESTRAINTS - STOW OAMS HTRS C/B - CLOSED H₂O HTRS C/B'S - CLOSED ANT SEL - ADPT CRY QTY - OFF CABIN VENT PLUG - INSTALL RECORD - OFF VOLTMETER - BT INDIVIDUALLY PLACE EACH MAIN BATTERY TO TEST CHECK EACH AMP AND VOLT READING.											5

FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION				
				COMMAND PILOT	PILOT			
	PRE LN	SEF	PLAT		PLACE BATTERIES TO "OFF" COMPLETE ELECTRICAL CHECK VOLTMETER - C X-RAY - ON BETA - W MAG WINDOW COVER - JETT HARNESS & BELT - UNFASTEN DROGUE PINS (R & L) - INSTALL REMOVE & STOW HELMET & GLOVES UNSTOW & INSTALL LIGHT WT HEAD SET UNSTOW & CALIBRATE SEXTANT UNSTOW & HAND FLIGHT PLAN BOOK TO CMD PILOT MCC - UPDATE TIME AND APOGEE/ PERIGEE ALTITUDE UPDATE 1-4 REENTRY INFOR- MATION AS FOLLOWS, IF REQUIRED. 1. GETRC 2. RET 400K 3. RETRB A - COPY UPDATE INFORMATION			
				A - <u>REPORT CHECKLIST COMPLETE.</u> ETR LOS - 00:11:16 SUNSET - 00:12:53				
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT
				COMMAND	PILOT	
68:40	PRE LN	BEF	PLAT	<u>PRERETRO CHECKLIST</u> A - VERIFY ALL EQUIPMENT-STOWED ACCORDING TO REENTRY STOWAGE CHART. DROGUE PINS - OUT & STOW INSERT NEW VOICE TAPE. SURVIVAL LANYARD - INSTALL CONNECT SHOULDER HARDNESS & LAP BELT SEQ LIGHTS - BRIGHT SEQ LIGHTS TEST - AMBER/RED & GREEN. VERIFY LEFT C/B'S - CLOSED TP-256 C/B'S - CLOSED VERIFY ATT IND - WITH FDI'S RETRO PWR - ARM CHECK RCS PRESSURE RCS - PUSH CHECK RCS PRESSURE RETRO PWR - SAFE OAMS CNTL POWER - OFF ATTITUDE CONTROL - RATE CMD PLATFORM - ORB RATE RCS A CNTL PWR - ACME CHECK OPERATION A - VERIFY ALL EQUIPMENT STOWED ACCORDING TO REENTRY STOWAGE CHART. DROGUE PINS - OUT & STOW SURVIVAL LANYARD - INSTALL CONNECT SHOULDER HARNESS & LAP BELT. A - MONITOR RCS PRESSURE MOUNT 16 MM CAMERA		
MISSION	EDITION	DATE	STATION	AOS	LOS	TOTAL
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION						
				COMMAND PILOT	PILOT					
	PRE LN	ORB RATE	RATE CMD DIR	A - RCS A CNTL POWER - DIRECT CHECK OPERATION RCS A CNTL POWER - OFF RCS B CNTL POWER - ACME CHECK OPERATION RCS B CNTL POWER - DIRECT CHECK OPERATION RCS B CNTL POWER - OFF OAMS CNTL POWER - ON CHECK RCS PRESSURE PLATFORM - BEF ATTITUDE CONTROL - PLAT EVENT TIMER - STBY SET EVENT TIMER TO 22:00 FACEPLATE - CLOSED LEFT SEC O₂ BOTTLE - OPEN						
		BEF	OFF RATE CMD PLAT		CYI AOS - 68:42:40 <u>NOTE:</u> DO NOT SWITCH FROM BEF TO ORB RATE WHILE IN PLATFORM CONTROL MODE. A - VERIFY OVERHEAD C/B'S (ALL) - CLOSED, ACCEPT: ELSS PWR C/B - OPEN OASS HTR C/B - OPEN H₂O HTR C/B - OPEN CTR LIGHT - BRIGHT SUIT FAN - NO. 1 & NO. 2					
MISSION	EDITION			DATE	STATION	AOS	LOS	TOTAL	REV	PAGE
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION			PILOT			
				COMMAND	PILOT					
	PRE LN	BEF	PLAT	A - KEYING - CONT INTER - PTT C - RNTY - CONT T/M - R/T AND ACQ. ANT SEL - RNTY ELECTRICAL CHECK VOLTMEETER - BT MAIN BATTERIES (4) - TEST/OFF VOLTMEETER - C X - RAY - OFF BETA - OFF ION SENSOR MODE - SAFE VERIFY ATT IND - WITH FDI VERIFY RIGHT C/B'S (ALL) - CLOSED EXCEPT: CALIB C/B - OPEN AGENA FWR C/B - OPEN AGENA CNIL C/B - OPEN VERIFY AUX TAPE - OFF AUX TAPE C/B - OPEN EXT LTS - OFF ENGINE - STOP VERIFY RT SEC O₂ BOTTLE - OPEN FACEPLATE - CLOSED						
				KNO AOS - 68:49:20 CYI LOS - 68:50:19 SUNSET - 68:53:49 KNO LOS - 68:58:12 TAN AOS - 69:01:44 TAN LOS - 69:11:48 CRO AOS - 69:17:58 A - REPORT PRERETRO CHECKLIST COMPLETE						
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FLIGHT PLAN

TIME		COMP	PLAT	CNTL MODE	ACTION						
HR:MIN	COMMAND				PILOT						
69:24:05	PRE	LN	BEF	PLAT	CRO - BACKUP MAG REENTRY UPDATES GIVE S/C A GET TIME HACK	A - CHECK ACCURACY OF THE DIGITAL CLOCK					
					CRO - AT T _R - 22 MIN, GIVE MARK TO START EVENT TIMER COUNTING DOWN						
					A - AT CRO MARK, EVENT TIMER - DOWN CONTINUE ALIGNING PLATFORM	A - CHECK T _R (ADDRESS 0.) COMPUTER - RNTY					
					CRO LOS - 69:28:32 CNT AOS - 69:38:55 SUNRISE (69:30:00)						
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT		
				COMMAND	PILOT			
T _R - 4:16 (69:39:49)	RNTY	BEF	PLAT	T _R - 256 (SEC) CHECKLIST				
				SEQUENCE LIGHTS - AMBER EVENT TIMER READS 4:16 MIN A - WHEN SEQUENCE LIGHTS GO AMBER VERIFY COMPUTER - RNTY VERIFY SQUIB BATTERIES (3) - ON MAIN BATTERIES - ON VERIFY RCS PROP MOTOR VALVES A AND B - OPEN PROP GAGE - RCS A RECORD - CONT VERIFY CYRO QTY - OFF VERIFY ANT SELECT - RNTY				
		ORB RATE	PUL	A - ATTITUDE CONTROL - PULSE PLATFORM - ORB RATE FDR - PLAT FDM - RATE FDI SCALE RANGE - HI ATTITUDE CONTROL - RATE CMD VERIFY RATE GRYS (3) - PRI				
		RATE CMD						
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT		
				COMMAND	PILOT			
	RNTY	ORB RATE		A - OAMS CNTL POWER - OFF OAMS PROP MOTOR VALVES - CLOSED RCS A & B CNTL POWER - ACME CONTROL S/C ATTITUDE TO & HOLD RETROATTITUDE (20° PITCH DOWN) (CHECK CONTROL MODE OPERATION IN ALL AXES) RETRO PWR - ARM A - IND RETRO ATT - PUSH FDR - PLAT FDM - ATT FDI SCALE RANGE - HI VERIFY HF T/R - OFF				
				A - REPORT T_R - 256 SEC CHECK- LIST COMPLETE				
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION			PILOT
				COMMAND	PILOT		
T _R -1 (69:43:05)	RNTY	ORB RATE	RATE CMD	T _R -1 (MIN) (EVENT TIMER READS 1:00)	CHECKLIST		
				A - HOLD RETROAATTITUDE (20° PITCH DOWN)		A - SEP OAMS LINE - PUSH SEP ELECT - PUSH SEP ADAPT - PUSH	
				A - AT T _R -30 SEC: RETRO ROCKET SQUIBS (4) - ARM		A - AT T _R -5 SEC: ARM AUTO RETRO - PUSH	
T _R -0 (69:44:05)				CTN - COUNTDOWN TO T _R	RETROFIRE (EVENT TIMER READS 00:00)		
						A - CHECK START COMP LITE START GET CLOCK	
MISSION		EDITION		DATE	STATION	AOS	LOS
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							TOTAL
							REV
							PAGE

FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT		
				COMMAND	PILOT			
	RNTY	ORB RATE FREE	RATE CMD			A - T _R + 1 SEC START COMP - PUSH MAN FIRE RETRO - PUSH		
T _R +30				A - REPORT TO CTN 1. NO. OF RETROS FIRED 2. IVI READINGS 3. ESTIMATED ATTITUDE DURING RETROFIRE 4. AUTO OR MANUAL RETROFIRE		A - PLATFORM - FREE		
T _R +45				RETRO JETT LIGHT - AMBER				
				A - RETRO JETT - ARM JETT RETRO - PUSH REPORT RETRO JETT HAW AOS - 59:47:20 CTN LOS - 68:48:50				
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT		
				COMMAND	PILOT			
	RNTY	FREE	RATE CMD	POSTRETRO JETT CHECKLIST				
				A - RETRO PWR - SAFE RETRO JETT - SAFE RETRO ROCKET SQUIBS (4) - SAFE FDR - COMP FDM - RATE FDI SCALE RANGE - LO RCS CNTL PWR B - OFF ATTITUDE CONTROL - PULSE BOOST INSERT CNTL 1 AND 2 C/B - OPEN RETRO SEQ CNTL 1 AND 2 C/B - OPEN SCANNER - OFF TIGHTEN AND LOCK RESTRAINT HARNESS CHECK HATCH PAWLS - NEUTRAL				
				HAW LOS - 69:53:20 A - CRYO O ₂ & H ₂ HTR C/B - OPEN OAMS CNTL PROP C/B - OPEN FUEL CELL CNTL 1 & 2 C/B - OPEN TAPE RCDR CNTL C/B - OPEN CRYO O ₂ & H ₂ HTRS - OFF SECT NGU 1 & 2 PWR - OFF 1A, 1B, 1C, 2A, 2B, 2C - OFF CABIN AIR RECIRC VALVE - 45° FDR - COMP FDM - RATE				
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION				
				COMMAND	PILOT			
T _R 14:30	RNTY	FREE	PUL	A - REPORT CHECKLIST COMPLETE A - SYNC EVENT TIME TO PLUS TIME GYM AOS - 69:58:20	A - TIGHTEN AND LOCK RESTRAINT HARNES CHECK HATCH PAWLS - NEUTRAL			
	GYM-REPORT THE FOLLOWING REENTRY PARAMETERS: 1. RET 400K 2. RETRE 3. ROLL ANGLES (L AND R) 4. RETBBO 5. RETEBO 6. RET DROGUE 7. RET MAIN 8. (R _N - R _P) I							
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FLIGHT PLAN

TIME		COMP	PLAT	CNTL MODE	ACTION		PILOT
HR:MIN	COMMAND				PILOT		
		RNTY	FREE	PUL	A - CONTROL S/C ATTITUDES TO: 180° YAW 170° ROLL HORIZON AT TOP OF WINDOW <u>400K FEET</u> A - AFTER ROLL NEEDLE DEFLECTION CONTROL S/C ATT TO BACKUP BANK ANGLE AND DAMP PITCH AND YAW RATES ATTITUDE CONTROL - RATE CMD (RE-ENT) <u>BEGIN BLACKOUT</u> <u>GUIDANCE INITIATE</u> A - MAINTAIN BACKUP BANK ANGLE UNTIL IT IS ESTABLISHED THAT INITIAL DOWN RANGE NEEDLE DEFLECTION FALLS WITHIN ACCEPTABLE RANGE (± 50 NAUTICAL MILES FROM PREDICTED INITIAL DEFLECTION). THEN NULL ROLL ERROR FDI NEEDLE THROUGHOUT REMAINDER OF GUIDANCE PHASE TO NULL CROSS RANGE AND DOWN RANGE ERRORS. <u>END BLACKOUT</u>	A - COPY THE ABOVE RE-ENTRY PARAMETERS	
	T _R +18:59						
	T _R +21:07						
	T _R +21:14						
	T _R +26:01						
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FLIGHT PLAN

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				COMMAND PILOT	PILOT			
	RNTY	FREE	DATE CMD RNTY	<u>35K CHECKLIST</u> A - "D" RING - UNCOVER & UNSAFETY ARM RESTRAINTS - UNSTOW HARNES - LOCKED RCS A & B PROP MOTOR VALVES - CLOSED BLIP THRUSTER TO RELIEVE PRESSURE MONITOR CABIN PRESSURE	A - "D" RING - UNCOVER & UNSAFETY ARM RESTRAINTS - UNSTOW HARNES - LOCKED MONITOR CABIN PRESSURE O₂ HIGH RATE - ON (27K)			
T _R +29:18	RNTY	FREE		MCC - MARK 10.6K A - PARA - PUSH LDG ATT - PUSH (DO NOT PUSH LDG ATT UNTIL MAIN CHUTE HAS DEREEFED.) A - <u>REPORT</u> MAIN CHUTE DEPLOY - MENT.	A - MARK POINT OF MAIN CHUTE DEPLOY, MAIN CHUTE DEREEF AND SINGLE POINT RELEASE ON VOICE TAPE RECORDER.			
				<u>10.6K FEET</u>				
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION				
				COMMAND	PILOT			
	RNTY	FREE		POSTMAIN CHECKLIST A - ATT IND CNTL C/B'S - OPEN CALL RECOVERY FORCES SET BAROMETRIC PRESSURE A - RESC BEACON - W/O LT ACME BIAS PWR - OFF RCS HTRS - OFF SCAN HTR C/B - OPEN COMPUTER - PRE LN COMPUTER PWR - OFF PLATFORM - OFF RATE GYROS (3) - OFF AC POWER - OFF RCS C/B'S - OPEN RCS CNTL PWR - OFF ACME CNTL NO. 1 C/B - OPEN ACME CNTL NO. 2 C/B - OPEN				
	OFF	OFF		2K CHECKLIST A - "D" RING COVER & SAFETY A - "D" RING COVER & SAFETY				
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT			
				COMMAND	PILOT				
T _R +33:18				A - PARA JETT - PUSH LANDING - SAFE HELMET - OFF & STOW ARM RESTRAINTS - STOW LAP BELT - RELEASE & STOW SHOULDER FITTINGS - STOW DROGUE MORTAR PINS (2) - INSTALL HATCH PAWLS - UNLOCK REPORT LANDING COORDINATES ON UHF	<u>LANDING</u> <u>POSTLANDING CHECKLIST</u> A - HF ANT - EXT/OFF (30 SEC) NOTE: MUST BE DONE WITH LANDING SWITCH ARMED.				
				A - HELMET - OFF & STOW ARM RESTRAINTS - STOW LAP BELT - RELEASE & STOW SHOULDER FITTINGS - STOW DROGUE MORTAR PINS (2) - INSTALL					
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT		
				COMMAND	PILOT			
				A - ALL SWITCHES OFF EXCEPT: UHF - NO. 1 NO. 1 AUDIO MODE SWITCH - UHF LEFT C/B PANEL CONFIGURED AS FOLLOWS: TOP ROW - ALL C/B'S OPEN EXCEPT: AUDIO AND UHF T/R C/B - CLOSED UHF RELAY C/B - CLOSED TONE VOX C/B - CLOSED HF T/R C/B - CLOSED HF WHIP ANT C/B - CLOSED SECOND ROW - ALL C/B'S OPEN EXCEPT: ELECT TIMER C/B - CLOSED IND LT TEST C/B - CLOSED SEQ LIGHTS CNTL C/B - CLOSED THIRD ROW ALL C/B'S OPEN	A - HATCH PAWLS - UNLOCK HF T/R - RNTY CALL RECOVERY REPORT LANDING COORDINATES ON HF NO. 2 AUDIO - HF-DF (AS REQ)			
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION		PILOT		
				COMMAND	PILOT			
						A - ALL SWITCHES OFF EXCEPT: RIGHT SWITCH PANEL - BIO-MED RCDS 1 AND 2 - CONT MAIN BATTERIES (4) - ON SQUIB BATTERY NO. 2 - ON OVERHEAD SWITCH PANEL - DC - DC CONVERTER - PKI CENTER PANEL - SUIT FAN - NO. 1 OR NO. 1 AND NO. 2 RESC BEACON CONTROL - W/O LT HF T/R SWITCH - RNTY CONFIGURE C/B'S AS FOLLOWS: OVERHEAD PANEL 1ST ROW: RCS A & RCS B L/B'S - OPEN 2ND ROW: ATTITUDE THRUSTER C/B'S OPEN 3RD ROW: MANEUVER THRUSTER C/B'S - OPEN 4TH ROW: ACME, OAMS CNTL, RCS SQUIB C/B'S - OPEN 5TH ROW: ALL C/B'S OPEN EXCEPT CARIN LTS C/B - CLOSED		
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FLIGHT PLAN

TIME HR:MIN	COMP	PLAT	CNTL MODE	ACTION				
				COMMAND PILOT	PILOT			
					6TH ROW: ALL C/B'S OPEN EXCEPT: SUIT FANS 1 & 2 C/B - CLOSED 7TH ROW: ALL C/B'S OPEN EXCEPT: RESC BEACONS C/B, AND DC-DC CONV C/B - CLOSED <u>RIGHT HAND PANEL</u> TOP ROW: ALL C/B'S OPEN EXCEPT: BIO MED INST C/B - CLOSED 2ND ROW: ALL C/B'S OPEN EXCEPT: TAPE RCDR FWR C/B - CLOSED WHEN RCS FUMES AND/OR OTHER ARE NO LONGER PRESENT: CABIN VENT - DWN (OPEN) WATER SEAL - DWN (CLOSED) INLET SNORKEL - DWN (OPEN)			
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GEMINI X	FINAL	JUNE 22, 1966						24

FLIGHT PLAN

POWER DOWN CHECKLIST

CMD PILOT

1. LF AUX RECP - OFF
2. ATT IND - OFF
3. Event Timer - STOP
4. RADAR - OFF
5. PLATFORM - OFF
6. COMPUTER PWR - OFF (PRE LN)
7. SCANNER - OFF
8. OAMS CNTL POWER - OFF
9. RATE GYROS (3) - OFF
10. ATTITUDE CONTROL - RATE CMD
11. Left Cabin LT - OFF

PILOT

1. ACME BIAS POWER - OFF
2. PRI & SEC PUMP A - OFF
3. PRI & SEC PUMP B - ON
4. ATT IND LT C/B - OPEN
5. NO. 1 & NO. 2 AUDIO - INT
6. HF T/R - OFF
7. C-ADAPT - CMD
8. C-RNTY - CMD
9. T/M - CMD
10. ATT IND - OFF
11. AC POWER - OFF
12. RT AUX RECP - OFF
13. RCS HTRS - ON (During Sleep Period)
14. SUIT FAN - NO. 1
15. CENTER LT - OFF
16. RT CABIN LT - OFF

COMMUNICATIONS PROCEDURES

1. Negative reporting will be used in most air-ground transmissions to eliminate unnecessary contacts. UHF will be the normal mode for station communications.
2. Unless initially contacted by the crew, the ground stations will not attempt voice contact until after T/M lock-on and inspection of the data.
3. The general voice communications procedure for station passes will consist of the following:
 - a. Ground Station - Report T/M lock-on and status of T/M readouts.
 - b. Ground Station request pilot's report on:
 - (1) T/M values not reliably received on the ground.
 - (2) T/M values near unacceptable limits or changing at excessive rates.
 - (3) Other values or conditions specifically requested by MCC.
 - c. Crew gives status report (GO/NO GO).

NOTE: A GO report will be given if all S/C readouts are nominal and there are no known problem areas affecting the continuation of the mission.
 - d. Ground Station - Advise crew of current or impending problems, of known errors in cockpit gage readings, of other information specifically requested by the pilot such as T/M values monitored only on the ground.
4. If ground stations do not establish contact at first attempts, the Cap Com will transmit in the blind within two minutes of T/M contact or at point of closest approach and report appropriate information under a, and d of item 3 before again attempting to establish voice contact.
5. Each station should insure their air/ground transmissions do not interfere with the onboard activities of the crew except where required by an emergency condition of the S/C.
6. T/M, Tape Playback and C-Band Beacon Procedures

In general, all control of the T/M, Tape Dump and C-Band Beacons will be by Real-Time Commands (RTC). The onboard switches will be in the Cmd position for the entire flight except for launch thru rndz when the TM will be in "R/T & ACQ" and one C-band Switch in "CONT" and, after the Pre-Retro Checklist when the T/M will be in "R/T & ACQ" and the C-Rnty Beacon will be in "CONT." During EVA the T/M will be in "R/T-& ACQ" position.

Tape Dump: The D/T Tape will be played back by DCS approximately once per revolution at the best ground station available for that purpose. The appropriate stations will be selected real time.

7. T/M Calibrations

T/M Calibration Commands will be command on once per day. Additional calibrations will be scheduled as required. The S/C will be notified prior to a calibration command being sent.

8. The flight crew will report completion of each checklist to the appropriate ground station. The checklist will not be read by the flight crew or the ground station over air/ground during the conduct of the checklist.

10. During communications the spacecraft will be referred to by name: (i.e., Gemini X and the ground will be referred to by station name (i.e., Hawaii). The individual crew members will be referred to as follows:

- a. Left Seat - Command Pilot (CMD)
- b. Right Seat - Pilot (Pilot)

11. Onboard Gage Readouts

All onboard gage readings reported to the network will be read directly from the S/C gages and not corrected by the appropriate factors.

12. Flight Plan Reports

Once per day following the activities over the United States, the flight crew will make a report to the ground containing the following flight plan information:

- a. Particular flight plan items accomplished, including the revolution (or approximate time) of accomplishment.
- b. Changes from nominal operational or experimental procedures due to S/C anomalies or experiment equipment malfunctions.
- c. Quantity and type of photographic film used.

Negative reporting will be used in all other cases.

13. GO/NO GO Procedures

A GO/NO GO check will be conducted once per day by both the ground and the flight crew to verify the ability of the S/C to proceed with the mission to the next GO/NO GO area. The following sequence of events will be followed:

- a. No more than one revolution prior to the GO/NO GO station, the flight crew will accomplish the following:
 - (1) Battery Test each (4) Main Battery
Report anomalies (voltage 22.5 volts)
 - (2) Verify systems required for GO/NO GO are operational
- b. Over GO/NO GO site, the flight crew will report stack currents and GO/NO GO and the ground reports the GO/NO GO.
- c. The 45-1 Preretro Cmd Load and T_R will be loaded prelaunch and updated as required.

The following is the nominal schedule for the GO/NO GO areas:

GO/NO GO STATIONS

<u>Area</u>	<u>Station</u>	<u>Rev</u>
*16-1	CRO	1
30-1	CRO	12
45-1	MCC	26

*NOTE - Under certain liftoff times (later than nominal) & weather conditions this will be changed realtime to 15-1.

14. PLA Updates

The flight crew will be updated by voice with the retro-sequence information for the Planned Landing Area (PLA) in each revolution. This updating will be accomplished by blocks with one ground station relaying the information for a block. Each block will contain approximately 7 PLA's. The PLA update is as follows:

- a. Area _____
 - b. GET RC _____
 - c. RET 400K _____
 - d. RET RB _____
- } If the same update only one

PLA UPDATE STATIONS

<u>Block</u>	<u>Station</u>	<u>Rev</u>
1	Prelaunch	

<u>Block</u>	<u>Station</u>	<u>Rev</u>	<u>Time</u>
2	CSQ	6	08:54
3	CYI	12	18:05
4	CSQ	19	30:13
5	CYI	25	39:25
6	HAW	33	53:30
7	CYI	40	63:54

15. As required, the flight crew will be updated for forthcoming translations. The following format will be observed:

A. UNDOCKED S/C TRANSLATION

- a. Purpose of translation
- b. GET of translation initiation (hr:min:sec)
- c. Duration of burn (min:sec)
- d. Computer load
 - 25:XXXXX
 - 26:XXXXX
 - 27:XXXXX
 Do not update cores that are zeros
- e. NORTH/SOUTH (If out-of-plane burn)
- f. THRUSTERS (If other than aft)

B. DOCKED AGENA TRANSLATIONS

- a. Purpose
- b. GET of translation initiation (Time START cmd is transmitted)
- c. DURATION of BURN (Actual burn time of the SPS or PPS)
- d. Computer load
 - 25:XXXXX
 - 26:XXXXX
 - 27:XXXXX
 Do not update cores that are zeros
- e. THRUSTERS (SPS or PPS)
- f. Direction (Posigrade, NORTH, etc)

16. During the EVA's the crew will report the following information after each EVA sequence:

a. Pilot
Status

b. Cmd Pilot
Status
Next sequence to accomplish.

17. Agena operation

a. The SPC's will normally be disabled during docked operations unless required for operational use.

b. The encoder will remain on continuously during the docked phase of the mission unless the crew is requested to turn it off to allow the ground to transmit commands to the Agena. Once these commands have been transmitted, the ground will notify the crew so they can turn the encoder back on.

18. In the event of unscheduled undocking, the crew will send the following cmds to the Agena prior to undocking, if possible

030 - RECORDER & T/M OFF	}	IF RECORDER IS ON
021 - T/M ON		
071 - L BAND BEACON ON		
231 - UHF ENABLE		

CREW STATUS REPORT

Purpose

To provide the necessary medical monitoring of the flight crews during the mission to insure crew safety.

Procedure

Two crew status reports per 24 hours will be scheduled for both crewmen over designated ground stations. Each crew status report will consist of:

- a. Food report (if other than Normal)
- b. Water report (if other than Normal)

NOTES:

1. Each crewmember will report if he did not eat the normal amount of food during the previous day.
2. The water report will be made if the gun counter reading is less than 400 counts over the previous day's counter reading.

GEMINI X ESTIMATED OAMS PROPELLANT USAGE

The following is Spacecraft No. 10 usable OAMS propellant:

Fuel	450.5 lbs.
Oxidizer	*490.1
Total	940.6 lbs.

Notes: The usable propellant can vary depending upon how much attitude control versus translation is done in the actual mission. The above usable propellant is based on a mission mixture ratio of 1.088.

*Includes 23.6 lbs. usable in the auxiliary tank.

The following estimated propellant usage represents the nominal propellant usage and does not reflect any dispersions.

NOMINAL PROPELLANT REQUIREMENTS

	<u>Fuel</u>	<u>Prop</u>
1. Rendezvous	132.5	277.0
2. Dual Rendezvous	112.6	240.6
3. Operational requirements	43.4	84.3
4. Experiments	44.8	77.9
5. Retrofire preparation	3.5	6.0
Total	336.8	685.8

DISPERSED PROPELLANT REQUIREMENTS

	<u>Fuel</u>	<u>Prop</u>
1. Rendezvous	161.5	337.7
2. Dual Rendezvous	188.9	406.6
3. Operational requirements	43.4	84.3
4. Experiments	44.8	77.9
5. Retrofire Preparation	3.5	6.0
6. Gage inaccuracy contingency	12.8	27.0
Total	454.9	940.5

NOMINAL RENDEZVOUS PROPELLANT REQUIREMENTS

<u>Purpose</u>	<u>ΔV</u>	<u>Fuel</u>	<u>Prop</u>
1. Insertion	10.0 Fwd	4.8	10.2
2. Phase Adjust	54.7 Fwd	26.3	56.3
3. Circularization	51.2 Fwd	24.6	52.7
4. Terminal Phase Initiation	33.0 Fwd	15.8	33.7
5. 82° Correction	1.0 Fwd	0.8	1.0
	4.0 Up	2.2	4.8
6. 34° Correction	3.0 Up	1.4	3.1
7. Velocity Match	23.0 Up	11.4	24.6
	35.2 Aft	24.5	53.5
	1.9 Right	1.9	2.1
8. LOS Control	----	7.0	15.0
9. Attitude Control	----	11.8	20.0
Total		132.5	277.0

DISPERSED RENDEZVOUS PROPELLANT REQUIREMENTS

	<u>ΔV</u>	<u>Fuel</u>	<u>Prop</u>
1. Nominal requirements	---	133.2	277.0
2. Inplane insertion	10.0	4.8	10.2
3. Out-of-plane dispersion	25.0	11.9	25.5
4. Terminal phase dispersions	---	11.6	25.0
Total		161.5	337.7

NOMINAL DUAL RENDEZVOUS PROPELLANT REQUIREMENTS

<u>Purpose</u>	<u>ΔV</u>	<u>Fuel</u>	<u>Prop</u>
1. Platform Alignments (4)	---	1.2	2.0
*2. Catch-up Adjust	0	0	0
*3. Height Adjust (40:15)	0	0	0
*4. Catch-up Adjust (41:00)	0	0	0
*5. Corrective Combination (45:00)	0	0	0
*6. N _{SR} (45:30)	0	0	0
7. Tracking of passive Agena	---	3.5	6.0
8. Terminal Phase Initiation	23.1 Fwd	8.6	18.5
	10.3 Down	5.1	11.0
9. 1st Midcourse Correction	0	0	0
10. 2nd Midcourse Correction	0	0	0
11. Velocity Match	46.3 Aft	24.8	54.1
	1.9 Up	0.9	2.0
12. LOS Control	---	23.2	50.0
13. Height Adjust (to 161 x 215)	95.0	45.3	97.0
Total		112.6	240.6

DISPERSED DUAL RENDEZVOUS PROPELLANT REQUIREMENTS

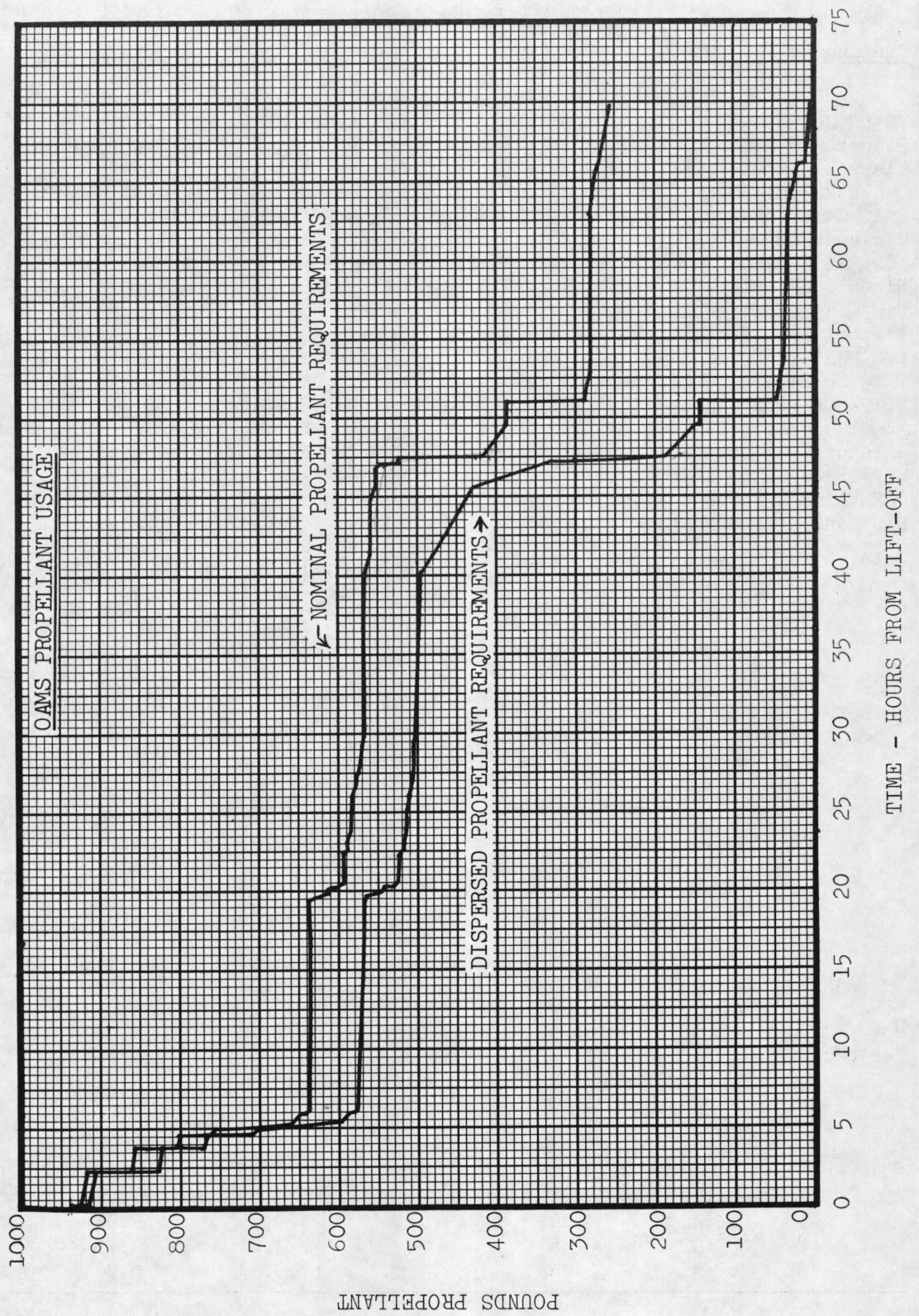
	<u>ΔV</u>	<u>Fuel</u>	<u>Prop</u>
1. Nominal requirements	---	112.0	240.6
*2. Tweak translations	50.0	25.7	56.0
3. Terminal phase dispersions	---	51.2	110.0
Total		188.9	406.6

NOMINAL OPERATIONAL CHECKS PROPELLANT REQUIREMENTS

<u>Purpose</u>	<u>Fuel</u>	<u>Prop</u>
1. Formation Flying (05:20 to 06:00)	6.2	12.0
*2. Dockings and Undockings (3)	18.5	36.0
3. Bending Check	1.8	3.0
4. Umbilical EVA		
**a. Formation Flying (47:30 to 49:30)	15.4	30.0
b. Separate from passive Agena	<u>1.5</u>	<u>3.3</u>
Subtotal	43.4	84.3

NOMINAL EXPERIMENTS PROPELLANT REQUIREMENTS

<u>Purpose</u>	<u>Fuel</u>	<u>Prop</u>
1. D-5 Experiment	5.3	9.0
2. D-10 Experiment	10.6	16.0
3. S-1 Experiment	2.1	3.5
4. S-5 Experiment	2.9	5.0
5. S-6 Experiment	2.9	5.0
*6. S-13 Experiment	2.6	4.5
7. S-26 Experiment	14.9	29.0
8. MSC-8 Experiment	0.3	0.5
9. MSC-12 Experiment	3.2	5.4
Total	<u>44.8</u>	<u>77.9</u>



GEMINI X ELECTRICAL LOAD ANALYSIS

<u>Continuous Power Down Load</u>	<u>Amps</u>	<u>Intermittent Loads</u>	<u>Amps</u>	<u>Hrs.</u>	<u>Amp Hrs.</u>
	27V				
DC-DC Converter	1.72	Clock Light	.14	69.73	9.76
Electronic Timer	.23	Lighting	.42	48.00	20.16
Elapsed Time Digital		H ₂ Heater	.60	5.46	3.28
Clocks and Light	.27	O ₂ Heater Auto	.40	46.50	18.60
Suit Compressor (1)	3.30	O ₂ Heater - Manual	11.60	2.61	30.25
Cooland Pumps-B (2)	3.44	H ₂ O Evap. Heater	3.32	0.25	.83
ACQ. Aid Beacon	.20	UHF T/R (Xmtr $\frac{1}{2}$ time,			
Bio-med systems	.34	RCVR $\frac{1}{2}$ time)	1.00	20.00	20.00
Bio-med recorder (2)	.10	R/T - T/M Xmtr			
Digital Cmd. System	.40	(25 min. / orbit)	.75	18.35	13.75
RCS Heaters	.42	D/T - T/M Xmtr			
Time Correlation Buffer	.09	(6 min. / orbit)	.75	4.40	3.30
Voice Control Center-W/O		Urine Dump Heaters			
Tone Generator & Audio		(3 min. / orbit)	2.24	2.20	4.94
Inputs	.11	C-Adapt Beacon			
UHF T/R - INT & REC	.10	(10 min. / orbit)	1.00	7.33	7.33
OAMS Line & Valve Heaters	2.06	Cry Qty Gage			
H ₂ O Tank & Line Heaters	1.22	(5 mins. / day)	.43	.25	.11
Total @ 27V	14.00	Voice Tape Recorder			
		(14 spools)	.08	14.00	1.12
		Exp MSC -3, 6, 7	.40	69.73	27.89
		Exp D-10	.50	5.334	2.67
		Oxidizer Tank Htr.			
		(V/W tank)	.75	53.00	39.70
		Total @ 27V			203.69

MISSION SUMMARY

	<u>Purpose</u>	<u>Amps</u>	<u>Hours</u>	<u>Amp-Hours</u>
	Power down	14.00	69.73	976.22
	Intermittent Load	---	---	203.69
	Prelaunch	---	---	160.00
	Lift-off - 00:40:00	35.80	.667	23.89
	00:40:00 - 03:00:00	32.79	2.334	76.43
	3:00 - 6:00	36.30	3.00	108.92
	6:00 - 8:30	30.81	2.50	77.05
Power	18:10 - 19:00	Above	22.00	.834
Up	19:00 - 19:30	Power	27.49	.50
Periods	19:30 - 20:55	Down	31.10	1.417
	20:55 - 22:20	Load	27.65	1.417
	22:20 - 24:20		20.30	2.00
	25:35 - 31:00		.48	5.417
	39:30 - 41:00		26.75	1.50
	41:00 - 44:00		.48	3.00
	44:00 - 44:45		24.22	.75
	44:45 - 53:40		29.25	8.917
	62:00 - 62:45		24.22	.75
	62:45 - 69:44		28.30	6.984
Total				2,320.95

H₂ Fuel Cell Loading (assuming no venting)

Total assumes 136% H₂ 7.9000 #

Purge allowance, 12 purges .084

7.816

Residual .24

Usable for power production 7.576 #

O₂ Loading (assuming no venting)

Total assumes 100% O₂ - 106.0 #

Purge allowance, 12 purges 1.41 #
104.59 #

Residual 8.67 #

Usable 95.92 #

F.C. Usage (2,320.95 amp hours) - 54.70 #

Crew Usage - 34.53 #

Remaining 6.69 #

Cryogenic Flow Rates:

H₂ Rate = 0.002972 #/amp-hr

O₂ Rate = 0.02357 #/amp-hr

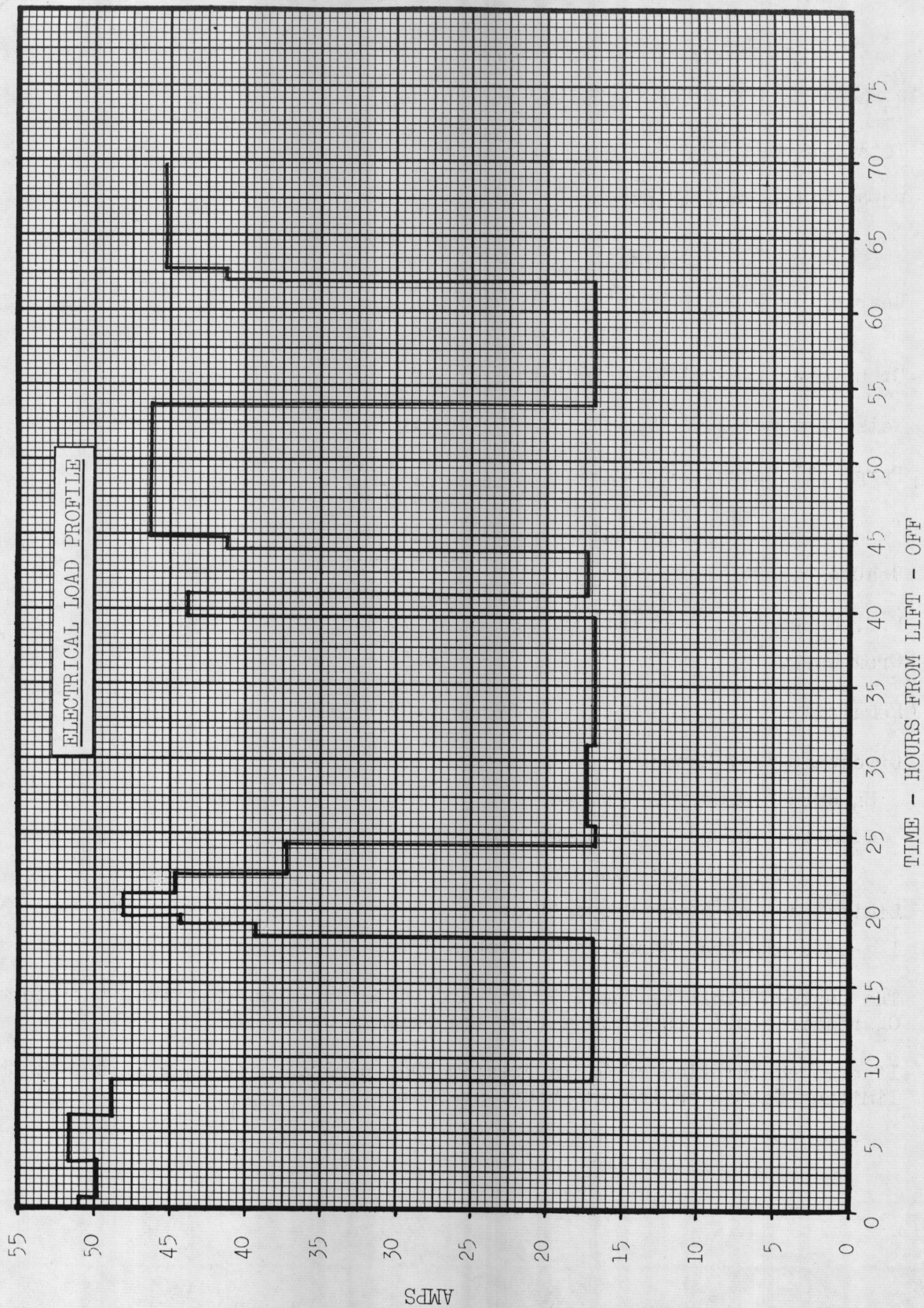
H₂O Rate = 0.02384 #/amp-hr

Limitations on Power Production:

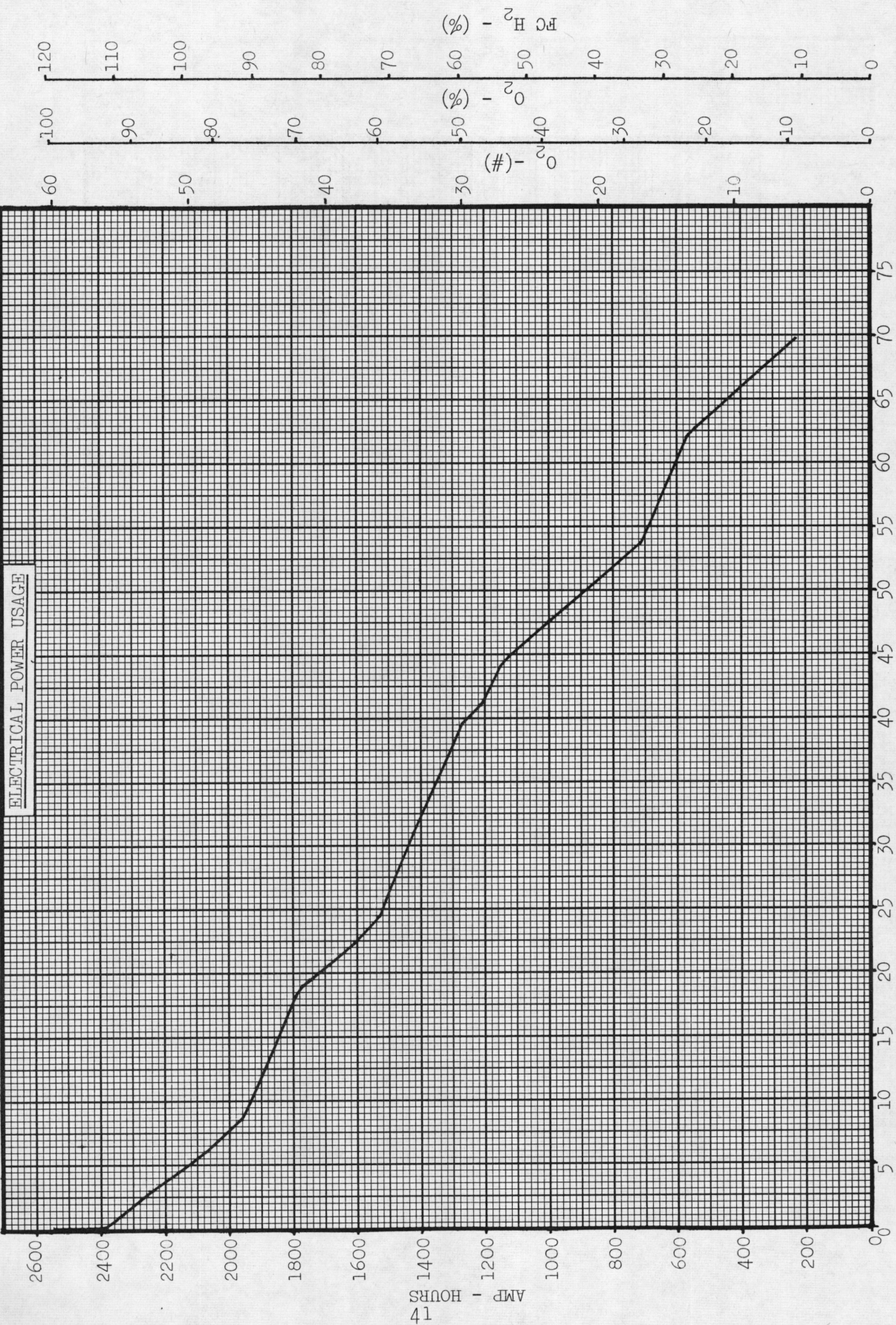
1. 2550 amp-hrs. based on available H₂.

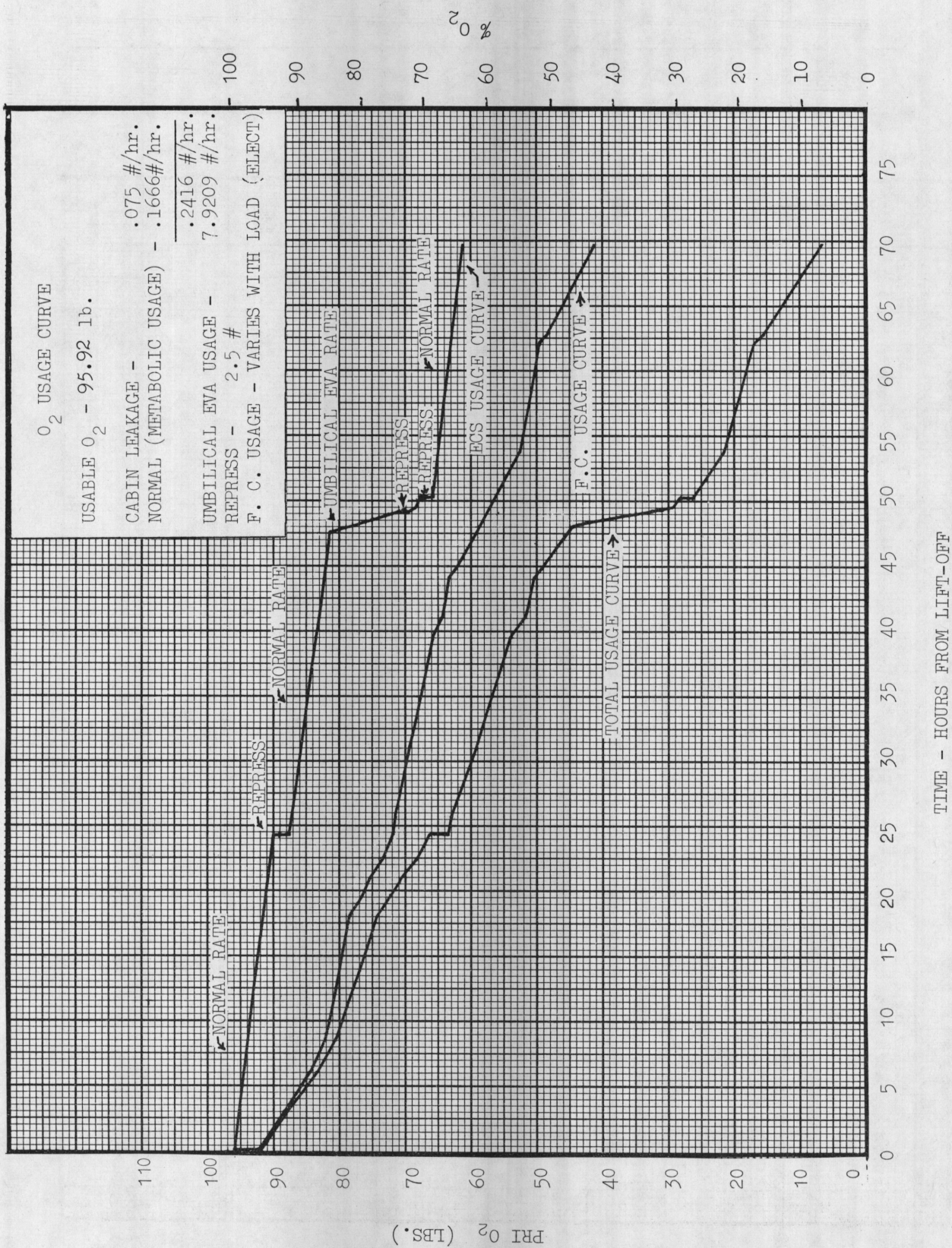
The desired limit is the 2550 amp-hrs based on H₂ consumption, therefore, O₂ required will be 60.10 # from the Primary O₂ tank.

If crew consumption of O₂ is greater than nominal, the O₂ will become the limiting factor on the amp-hours available.



TIME - HOURS FROM LIFT - OFF





DOCKING PRACTICES

Purpose

1. To provide crew training for both crewmen in actual dockings.
2. To evaluate docking techniques under various configurations of the spacecraft and Agena.

NOTE: A total of three dockings will be accomplished.

Spacecraft Systems Configuration

1. PLATFORM - ORB RATE
2. RATE GYROS (3) - PRI
3. COMPUTER - As required

Time of Dockings

- ~~1. First - 06:30~~
- ~~2. Second - 07:50~~
3. Third - 19:50
- ~~4. Fourth - 20:40~~

1. $m = 4$

2.

3rd 20:45

First Docking Configuration

1. Agena at 0° , -90° , 0° yaw (TDA North) (S/C - 0° , 90° , 0°)
2. Agena Flight Control Mode 6
3. Performed by Command Pilot

Second Docking Configuration

1. Agena at 0° , 0° , 0° (TDA Fwd) (S/C - 0° , 180° , 0°)
2. Agena Flight Control Mode 1
3. Performed by Command Pilot

Third Docking Configuration

1. Agena at 0° , 0° , 0° (TDA Fwd) (S/C - 0° , 180° , 0°)
2. Agena Flight Control Mode 1
3. Performed by Pilot

Procedures

1. Prior to undocking, perform the following:
 - a. COMPUTER - NAV (CTCH-UP)
Load the computer as follows:

25:00000
26:00000
27:00000
START COMP - PUSH
 - b. RDR - STBY
 - c. MANEUVER CONTROLLER - UNSTOW
MANEUVER CONTROLLER - ON
 - d. Send the following commands to the Agena:

141 - APPROACH LIGHTS ON
201 - SDP BRIGHT
071 - L BAND BEACON ON
041 - RECORD DATA
220 - UNRIGIDIZE (or TDA CONTROL - UNDOCK)
2. Start 16mm camera at 6 frames/second.
3. OAMS ATTITUDE CONTROL POWER - ON
4. ATTITUDE CONTROL - RATE CMD or DIRECT
5. Undock and translate to 3 feet at $\frac{1}{2}$ foot/second.
6. ATTITUDE CONTROL - PULSE
7. RDR - ON

8. Change 16mm camera speed to one frame/second.
9. Proceed with S-26 Experiment (See S-26 Experiment).
10. Translate to 60 feet from the Agena.
11. If Agena recording time is available,
Send Cmd 041 (RECORD DATA) to the Agena.
12. RDR - STBY
13. Start 16mm camera at one frame/second.
14. Translate toward the Agena at $\frac{1}{2}$ foot/second.
15. At a range of 25 feet, start the 16mm camera at 6 frames/second.
16. ATTITUDE CONTROL - RATE CMD or DIRECT
17. DOCK
18. When the RIGID LT comes on:
 - a. RIGID STOP - STOP
 - b. OAMS CNTL POWER - OFF
 - c. ATTITUDE CONTROL - PULSE
 - d. ENGINE - ARM
 - e. Check SDP ARMED LT illuminated.
 - f. ENGINE - STOP
 - g. Check SDP ARMED LT extinguished.
 - h. RDR - OFF
 - i. COMPUTER - PRE LN
19. Stop 16mm camera.
20. Send the following commands to the Agena:
O30 - T/M OFF
O21 - T/M ON
O40 - APPROACH LTS OFF
O70 - L BAND BEACON OFF
21. MANEUVER CONTROLLER - OFF
22. Configure Agena SDP as desired.

Propellant Requirements

Docking 6.0

Undocking 6.0

Dockings (3) 18.0

Undockings (3) 18.0

36.0 lbs.

GEMINI-AGENA BENDING MODE CHECK

Purpose

To obtain damping, frequency, and elastic coupling data of the Gemini-Agena 1st Bending Mode.

Flight Systems Configuration

1. S/C PLATFORM - ORB RATE
2. S/C RATE GYROS (3) - PRI
- 3 S/C COMPUTER - CTCH-UP

NOTE - This test must be conducted over a T/M site, since the data desired is only on R/T T/M.

Procedures

1. ATTITUDE CONTROL - DIRECT
OAMS ATT CNTL POWER - ON
2. Send the following Cmds to the Agena:
 041 - RECORD DATA
 300 - H/S - OFF
 350 - GEO RATE - OFF
 400 - ACS - OFF
3. Apply a 3-second pitch down thrust immediately followed by a 3-second pitch up.
4. Allow the Gemini-Agena to stabilize for 2 minutes.
5. Apply a 3-second yaw left thrust immediately followed by a 3-second yaw right thrust.
6. Allow the Gemini-Agena to stabilize for 10 seconds.
7. Send the following Agena Cmds:
 030 - T/M & RECORDER - OFF
 021 - T/M - ON
8. Maneuver S/C to next heading and set up for gyrocompass.

Propellant Requirements - 3.0#/check = 3.0#

ELECTRIC CHARGE MONITOR TEST

Purpose

To study the amount of charge that is exchanged between the Gemini and Agena as the TDA probe contacts the Agena.

Spacecraft Systems Configuration

1. S/C undocked from Agena.
2. S/C flying formation with Agena at 60 ft.

Time

Prior to first docking.

Procedures

1. Send the following Agena Cmds:
 - a. 041 - RECORD DATA
 - b. 151 - BOOM ANTENNA EXTEND (Calibrates the monitoring device)
Wait 30 seconds.
 - c. 271 - PWR RELAY RESET (Removes the calibration voltage)
 - d. 220 - TDA UNRIGIDIZE
 - e. 220 - TDA UNRIGIDIZE

} INITIALIZES MONITOR
2. RDR - STBY
3. DOCK (See docking procedures)
4. Send the following Agena Cmds:
 - 030 - T/M & RECORDER OFF
 - 021 - T/M ON
 - 040 - APPROACH LTS OFF
 - 070 - L BAND BEACON OFF

NOTE - See docking procedures for other post docking procedures.

STANDUP EXTRAVEHICULAR ACTIVITY

Purpose

To perform the experiments MSC-5, S-13, MSC-8, S-5, and S-6.

NOTE: Experiment MSC-5 will be performed only if the moon is greater than quarter full.

Systems Configuration

1. S/C - Agena Docked
2. Agena at 0°, 0°, 0° (S/C - 0°, 180°, 0°)
3. Agena in Flight Control Mode 6
4. S/C powered up.

Procedures

PRELIMINARY STANDUP EVA PREPARATION (21:35)

1. Configure the cockpit as follows:

a. ECS System

PRI PUMP A - ON
SEC PUMP A - ON
BOTH SUIT FLOW - PILOTS OPTION
CRY QTY GAGE - O₂
O₂ HTR - AUTO
H₂ HTR - AUTO
SUIT FAN - No. 1
CABIN AIR RECIRCU - UP (OPEN)
INLET SNORKEL - UP (CLOSED)
CABIN VENT - UP (CLOSED)
WATER SEAL - UP (OPEN)
O₂ HIGH RATE RECOCK - UP
LT SEC O₂ BOTTLE - CLOSED
RT SEC O₂ BOTTLE - OPEN
CONDENSATE - NORMAL
H₂O TANK VALVE - NORMAL
WASTE - OFF

b. GNC System

AC POWER - IGS
ACME BIAS PWR - PRI
Both FDR - PLAT
Both FDM - RATE
Both ATT IND - WITH FDI'S
OAMS CNTL PWR - ON
OAMS PROP MOTOR VALVE - OPEN
PROP GAGE - 0
RCS HTRS - ON
ATTITUDE CONTROL - AS REQ
RATE GYROS (3) - PRI
RDR - OFF
COMPUTER - ON/NAV. (CTCH UP)
PLATFORM - ORB RATE

c. Electrical System

VOLT METER - M
ALL CABIN LTS - Red or Off
ATT IND LT C/B - CLOSED
CLOCK LIGHT - BRIGHT
ALL AGENA CONTROL C/B's - CLOSED
ELSS PWR C/B - OPEN

d. Communications

No. 1 and No. 2 AUDIO - UHF
UHF - No. 1
HF - OFF
KEYING - CONT INTER/PTT
ANT SEL - ADAPT
T/M - CMD
C-BAND Beacons - CMD

e. Agena

Flight Control MODE 6

2. Both Pilots verify or perform the following:
 - a. Life Vests stowed.
 - b. Lap restraint harness stowed
 - c. Optical sight installed
 - d. Shoulder and leg restraints - Stowed
3. Pilot remove from Right hand Food Box and install as follows:
 - a. 18 inch & 24 inch EVA hoses with attached interconnects
 - 1) Disconnect the inlet ECS hose and insert the 18 inch inlet extension hose and interconnect.
 - 2) Disconnect the outlet ECS hose and insert the 24 inch outlet extension hose and interconnect.
 - b. Urine sample bags and defecation devices - place in Footwell pouch.
 - c.
 - 1) Standup tether - attach between suit and spacecraft.
 - 2) Standup electrical extension - Install as follows:

BIOMED INSTRU C/B - OPEN
INSTALL ELECTRICAL EXTENSION

NOTE - Communications will be lost with pilot while the standup electrical extension is disconnected.

BIOMED INSTRU C/B - CLOSED
Verify normal communications regained.
 - d. 70 mm Maurer Camera with UV film magazine (S-13 and MSC-5) and temporarily stow in a convenient place.
 - e. Pressure thermal gloves - stow temporarily.
 - f. S-10 pouch - stow in convenient place

4. Pilot unstow remaining S-13 and MSC-5 equipment and assemble:
 - a. UV Lens and grating
 - b. Extended timer
 - c. S-13 bracket (orbital pouch)
5. Cmd Pilot unstow camera box and remove:
 - a. 70 mm Maurer with MSC-8 designated magazine
6. Restow Camera box
7. Cmd Pilot unstow color patch plate (MSC-8) and Pilot unstow MSC-8 Rod and give to Cmd pilot.
8. Cmd Pilot assemble MSC-8 experiment.
9. Pilot remove and attach hatch closing device.
10. Insert voice tape (Record - off)
11. Prepare dry waste Jettison package
12. Move food packages from hatch pouches and stow in Rt. hand AFT food box and close vent.
13. Continue with Flt Plan Activities.

FINAL STANDUP EVA PREPARATION
(22:25:00)

1. S/C systems will be reconfigured as follows:

- a. ECS Systems

SEC Pump A - OFF
SEC Pump B - ON
O₂ Pressure - Maximum (800 psi)
CABIN AIR RECIRCU - DWN (CLOSED)

- b. GNC Systems

Maneuver Thruster C/B's - OPEN
ATTITUDE CONTROL - PULSE
COMPUTER - PRE LN/OFF
SCANNER - PRI

- c. Electrical System

EVENT TIMER TO 00:00 and Standby

- d. Agena

S/C undocked from Agena and separated from it.

2. Platform BEF and aligning.
3. Both pilots transfer T-17 experiment package to command pilots footwell and stow or secure any loose items.
4. Cmd pilot perform the following:
 - a. Don pressure gloves and helmet.
 - b. Check all fittings. Position helmet tiedown.
 - c. Zippers closed and checked.
5. Cmd pilot perform suit integrity check as follows:
 - a. Close visor
 - b. Position mirror to see suit outlet fitting
 - c. LEFT HAND SUIT FLOW - OFF

- d. Disconnect suit outlet hose
 - e. Actuate Electrical O₂ HI Rate
 - f. Monitor suit pressure
 - g. Recock O₂ high rate when suit pressure reads 3.7 psi above cabin press.
 - h. Verify that suit pressure is stable and read.
 - i. Allow 30 seconds pressure decay and read suit pressure. (.5 psi/30 sec max.; .15-.35 psi is nominal)
 - j. Reinstall suit outlet hose
 - k. Suit flow - Full increase
6. Pilot perform the following:
- a. Don helmet and pressure thermal gloves
 - b. Check security and operation of EVA visor on helmet.
 - c. Check helmet restraint.
 - d. Zippers closed and checked.
7. Pilot perform suit integrity check as follows:
- a. Close visor
 - b. Position mirror to see suit outlet fitting
 - c. RIGHT HAND SUIT FLOW - OFF
 - d. Disconnect suit outlet hose
 - e. Actuate Electrical O₂ HI Rate
 - f. Monitor suit pressure
 - g. Recock O₂ high rate when suit pressure reads 3.7 psia above cabin press.
 - h. Verify that suit pressure is stable and read.
 - i. Allow 30 seconds pressure decay and read suit pressure. (.5 psi/30 sec max.; .15-.35 psi is nominal)

- ✓
- j. Reinstall suit outlet hose
 - k. Suit flow - full increase
8. Both pilots make final check of all fittings.
9. Both pilots verify:
- a. Visors locked
 - b. EVA VISOR in place
 - c. Helmets locked
 - d. Gloves locked
 - e. All gas connectors locked.
 - f. MSC-8 rigged and accessible.
 - g. S-13 Camera Bracket ready and accessible.
 - h. Zippers closed
 - i. C/B'S & Switches in correct positions
 - j. All Cabin Lights - Dimmed
10. Pilot position hatch gain and drive selector to the "U" (Unlock) position.
- 115

SPACECRAFT DEPRESSURIZATION AND EGRESS
(22:55)

1. Cmd pilot perform or verify the following:
 - a. VOICE TAPE - RECORD - CONT
 - b. CABIN AIR RECIRC DOWN (CLOSED)
 - c. Cabin vent check valve - OPEN
 - d. Slowly open cabin vent to depressurize cabin to 3.0 psia.
Verify systems integrity while holding cabin at 3.0 psia.
 - e. CABIN VENT - OPEN (Complete depressurization of cabin)
 - f. Hold hatch closing device to prevent hatch inadvertent opening
2. Pilot perform the following:
 - a. Open S/C hatch (in sunlight)
 - b. Position hatch gain and drive to "L" (lock) position,
open sawtooth
 - c. Ensure hatch STRIKER PLATE LEVER is fully outboard.
 - d. Jettison Dry Waste Bag
 - e. Install Sun Shade on Command Pilot's window
3. Cmd pilot hand S-13 Camera/Bracket to pilot
4. Pilot set up 70 mm Maurer for S-13
5. Command Pilot perform the following:

Attitude Control - pulse

Platform - ORB RATE

EVA ACTIVITIES (00:00)

Cmd pilot at sunset start event timer counting up.

Pilot at sunset start watch counting up.

Sequence 1 00:00 - 36:14

Pilot perform experiment S-13 (Cmd pilot track designated star fields) (See S-13 exp for details)

	S/C - BEF	YAW	PITCH
a.	00:00 SPICA	120° S	60° U
b.	10:00 BETA CRUX	100° S	20° U
c.	20:00 SHAULA	130° S	60° U
d.	30:00 GAMMA VELORUM	90° S	10° U

NOTE - Unless it takes less time for each star field, the last star field will not be completed. Sunrise (36:14)

Sequence 2 36:14 - 40:00

Pilot dismount Maurer and bracket and hand to Cmd pilot and receive MSC-8 Maurer assembly.

Set up MSC-8 Maurer assembly. (different camera from S-13 camera)

(Cmd pilot orient S/C so that sun is within 30° of perpendicular to color patch plate.)

Sequence 3 40:00 - 45:00

Pilot take MSC-8 photographs

NOTE - Cmd pilot maintain proper sun angle. Hand MSC-8 color plate back to Cmd pilot, jettison MSC-8 rod

Sequence 4 45:00 - 55:00

Pilot take S-5 and S-6 photographs with remainder of Maurer Film.

Hand Maurer to Cmd pilot

TERMINATE "STANDUP EVA"

PROCEDURES FOR INGRESS (01:00)

1. Pilot check hatch holding device (sawtooth) - open
2. Pilot check hatch pawls to lock.
3. Pilot check hatch seal for proper seating and debris.
4. Both pilots close hatch tight by pulling on hatch closing device.
5. Pilot raise EV Visor.
6. Pilot complete hatch locking.
7. Both pilots perform the following:
 - a. CABIN VENT - CLOSED
 - b. CABIN VENT CHECK VALVE - CLOSED
 - c. VERIFY SEC O₂ (LT AND RT BOTTLES) - CLOSED
 - d. RAD - BYPASS
 - e. CABIN REPRESS - OPEN
8. Both pilots monitor cabin pressure and when it reaches 4.5 psia, gradually open visors to depressurize suit.
9. Cmd pilot perform the following:
 - a. CABIN REPRESS - SHUT
 - b. RAD - FLOW
10. Pilot perform the following:
 - a. SEC O₂ (RT. HD. BOTTLE) - OPEN
 - b. Position hatch gain and drive select to "N" (Neutral)
11. Pilot stow hatch closing device.
12. Cmd pilot CABIN AIR RECIRC - UP (OPEN)

13. Both pilots power down spacecraft as follows:

- a. RADAR - OFF
- b. PLATFORM - OFF
- c. RATE GYROS (3) - OFF
- d. EVENT TIMER - STOP
- e. CRYO QTY GAGE - OFF
- f. AC POWER - OFF
- g. ACME BIAS PWR - OFF
- h. COOLANT PUMPS - As desired
- i. T/M - CMD
- j. MANEUVER THRUSTER C/B's - CLOSED

14. Pilot performs the following:

- a. BIOMED INSTRU C/B - OPEN
- b. Remove electrical extension and reconnect spacecraft connector to suit.

NOTE - Communications will be lost with pilot while the standup electrical extension is disconnected.

- c. BIOMED INSTRU C/B - CLOSED
- d. Verify normal communications regained

15. Stow all EV Gear except what is needed during the umbilical EVA in permanent stowage. The following EVA gear needed later is stowed in accessible places with Velcro, et cetera.

- a. Standup electrical extension
- b. 18 in EV standup hose with interconnect
- c. 24 in EV standup hose with interconnect
- d. Pressure thermal gloves
- e. Standup tether
- f. 70 mm Maurer Magazines
- g. S-10 Pouch

UMBILICAL EXTRAVEHICULAR ACTIVITY

Purpose

1. To evaluate the operation of the Extravehicular Life Support System (ELSS).
2. To evaluate the Handheld Maneuvering Unit (HHMU) for maneuvering in space with 75 ft/sec ΔV .
3. To perform the S-12, T-17 and S-10 experiments.

Systems Configuration

1. S/C - (S/C10 Agena) - Undocked
2. S/C powered-up

Procedures

Preliminary Egress Preparation (42:30)

1. Configure the cockpit as follows:

a. ECS System

PRI PUMP B - ON

SEC PUMP B - ON

Both SUIT FLOW - Full Increase

CRY QTY Gage - OFF

O₂ HTR - AUTO

H₂ HTR - AUTO

SUIT FAN - No. 1 or No. 1 and No. 2

CABIN AIR RECIRCU - UP (OPEN)

INLET SNORKEL - UP (CLOSED)

CABIN VENT - UP (CLOSED)

WATER SEAL - UP (OPEN)

O₂ HIGH RATE RECOCK - UP (cycle to recock)

LT SEC O₂ BOTTLE - CLOSED
RT SEC O₂ BOTTLE - OPEN
CONDENSATE - NORMAL
H₂O TANK VALVE - NORMAL
WASTE - OFF

b. GNC System

AC POWER - OFF
ACME BIAS PWR - OFF
Both FDR - PLAT
Both FDM - RATE
Both ATT IND - WITH FDI's
OAMS CNTL PWR - ON
OAMS PROP MOTOR VALVE - OPEN
Prop gage - 0
RCS HTRS - ON
ATTITUDE CONTROL - PULSE
RATE GYROS (3) - OFF
RDR - OFF
COMPUTER - OFF
PLATFORM - OFF

c. Electrical System

VOLT METER - M
ALL CABIN LTS - Pilot's option
ATT IND LT C/B - CLOSED
CLOCK LIGHT - BRIGHT

All Agena CONTROL C/B's - CLOSED

ELSS PWR C/B - OPEN

d. Communications

HF ANT - RET/OFF (1 min)
No. 1 and No. 2 AUDIO - UHF
UHF - No. 1
HF - OFF
Keying - CONT INTER/PTT
ANT SEL - ADAPT
T/M - R/T and ACQ
C-Bands - Cmd

- ✓
2. Verify the following items are unstowed and in accessible places:
 - a. Standup electrical extension
 - b. 18 in EVA hose with interconnect
 - c. 24 in EVA hose with interconnect
 - d. Pressure thermal gloves

 3. Verify the following items:
 - a. Gloves doffed
 - b. Helmets doffed
 - c. Life vests stowed
 - d. Shoulder and leg restraints stowed
 - e. Zippers closed and checked
 - f. Restraint harness released and stowed
 4. Cmd pilot unstow EVA Gear from left food box:
 - a. Dual "Y" connectors (2)
ELSS restraint assembly (2)
 - b. (1) adapter assembly (EVA Movie Camera)
 - c. Handheld maneuvering unit.
 - d. Stowage Duffle Bag
 5. Pilot attach ELSS restraints
 6. Cmd Pilot check that both connector ports of "Y" connectors are in the open position. Hand to the pilot on his request.
 7. Pilot perform the following:
 - a. Disconnect the outlet ECS hose from the suit and connect to the bottom of "Y" connector.
 - b. Connect "Y" connector to suit outlet fitting.

- c. Disconnect S/C inlet hose from suit and connect to bottom of second "Y" connector.
 - d. Connect "Y" connector to suit inlet fitting.
8. Cmd Pilot unstow C/B and light assembly (if not already done)
9. Cmd Pilot remove camera box and unstow:
- a. (2) 16mm cameras with magazines - check footage of film in magazines.
 - b. (1) Extra 16mm magazine stow in lt. hd. v/w pouch
 - c. 70mm Hasselblad with SO-217 film pack
 - d. 16mm camera lenses:
 - 5mm lens for EVA camera
 - 18mm lens for Cmd Pilot's camera
 - e. 16mm camera mirror
10. Cmd Pilot restow camera box.
11. Cmd Pilot verify that two voice tape cartridges are accessible (place in v/w pouch)
12. Cmd Pilot perform the following:
- a. Install 16mm camera bracket
 - b. Install 16mm camera and connect C/B and light assembly. Check operation.
13. Pilot assemble EVA camera and C/B and light assembly and check operation. Stow on rt. hd. sidewall.
14. Pilot remove and attach closing device.
15. Place umbilical bag in Pilot's footwell and T-17 in Cmd Pilot's footwell.

16. Prepare both ends of umbilical for connection to pilot and S/C
17. Pilot connect S/C end of umbilical as follows:
 - a. Biomed Instru C/B - OPEN
 - b. Disconnect S/C electrical connector from suit.

NOTE: Communications will be lost with pilot while the electrical connectors are disconnected.

- c. Pilot connects S/C electrical connector to S/C end of umbilical electrical cable.
 - d. Cabin repress - OPEN (for 10 seconds - purges filter in valves).
 - e. Pilot connect O₂ Quick Disconnect to Quick Disconnect on S/C repress valve.
 - f. Pilot attach umbilical S/C tether hook to ingress bar.
18. Cmd pilot and pilot connect suit end of 50 ft umbilical as follows:
 - a. Connect electrical connector to suit
 - b. Biomed Instru. C/B - Closed
 - c. Verify normal communications are regained.
 - d. Attach HHMU to umbilical
 - e. Cmd Pilot attach umbilical man tether hook to pilot's harness.
19. Cmd Pilot perform the following:
 - a. Install optical sight (if not already done)
20. Continue with dual rendezvous

21. S/C systems will be configured as follows @ end of dual rendz.

a. ECS Systems

PRI PUMP A - ON
SEC PUMP A - ON
BOTH SUIT FLOW - FULL INCREASE (PILOT'S OPTION)
CRY QTY GAGE - OFF
O₂ HTR - AUTO
H₂ HTR - AUTO
SUIT FAN - NO. 1 or NO. 1 and NO. 2.
CABIN AIR RECIRCU - UP (OPEN)
INLET SNORKEL - UP (CLOSED)
CABIN VENT - UP (CLOSED)
WATER SEAL - UP (OPEN)
O₂ HIGH RATE RECOCK - UP
LT SEC O₂ BOTTLE - CLOSED
RT SEC O₂ BOTTLE - OPEN
CONDENSATE - NORMAL
H₂O TANK VALVE - NORMAL
WASTE - OFF

b. GNC System

AC POWER - IGS
ACME BIAS PWR - PRI
Both FDR - PLAT } PILOT'S OPTION
Both FDM - RATE }
Both ATT IND - with FDI's
OAMS ATT CNTL PWR - ON
OAMS PROP MOTOR VALVE - OPEN
PROP GAGE - 0
RCS HTRS - OFF
ATTITUDE CONTROL - PULSE
RATE GYROS (3) - PRI
SCANNER - PRI
RDR - OFF
PLATFORM - ON
COMPUTER - ON/NAV (CATCH UP)

c. Electrical System

VOLTMETER - M
ALL CABIN LTS - Pilot's option
ATT IND LT C/B - Closed
Clock Light - Bright

All Agena Control C/B's - Closed
EVENT TIMER - Counting up
ELSS PWR C/B - OPEN

d. Communications

HF ANT - RET/OFF (1 MIN)
No. 1 and No. 2 AUDIO - UHF
UHF - No. 1
HF - OFF
KEYING - CONT INTER/PTT
ANT SEL - ADAPT
T/M - CMD
C - ADAPT - CMD

FINAL EVA PREPARATION

(After Dual Rendezvous)

(47:35)

1. a. Cmd Pilot fly formation on passive Agena
- b. Both pilots perform post rendezvous checklist
 - SEC Pump A - OFF
 - SEC Pump B - ON
 - CRYO QTY GAGE - O₂
 - O₂ HTR - AUTO VERIFY
 - H₂ HTR - AUTO
 - Cabin Air Recircu - DWN (Closed)
 - RCS HTRS - ON
 - EXT LTS - Dock
 - EVENT TIMER TO 00:00 and Standby
 - O₂ Pressure - MAXIMUM (800 psi)
 - ELSS C/B - OPEN
2. Pilot put helmet on and verify zipper is closed.
3. Both pilots perform the following:
 - a. Cmd Pilot unstow camera box.
 - b. Pilot unstow the ELSS
 - c. Cmd Pilot stow camera box
4. Pilot verify the following:
 - a. ELSS O₂ Selector - off
 - b. ELSS BYPASS - NORMAL
5. Pilot connect ELSS end of 50 ft. umbilical electrical connector to ELSS.
6. Pilot connect O₂ umbilical to top plug of ELSS.
7. Pilot remove inlet and outlet plugs of ELSS and stow temporarily.
8. Pilot purge ELSS lines by opening repress valve for 10 sec.
9. Pilot connect inlet (18") and outlet (24") standup hoses to ELSS.

10. Cmd Pilot perform the following:

- a. Don pressure gloves
- b. Check all fittings and position helmet tiedown
- c. Stow all loose items

11. Cmd Pilot perform suit integrity check as follows:

- a. Close visor
- b. Position left cabin mirror to see suit outlet hose and fitting.
- c. LH Suit Flow - OFF
- d. Disconnect suit outlet hose
- e. Actuate electrical O₂ Hi Rate
- f. Monitor suit pressure
- g. Recock O₂ high rate when suit pressure reads 3.7 psi above cabin press.
- h. Verify that suit pressure is stable and read.
- i. Allow 30 seconds pressure decay and read suit pressure. (.5 psi/30 sec max., .15-.35 psi is nominal)
- j. Reinstall suit outlet hose.
- k. Suit flow - full increase

12. Cmd Pilot open cabin repress valve.

NOTE: Flow through ELSS is required to prevent line heater over-temp during subsequent ELSS checkout.

13. Pilot perform the following:

- a. ELSS O₂ flow select - HI
- b. ELSS Battery - ON
- c. Verify ELSS suit pressure light and audio tone is "ON".
Reset Audio Tone
- d. ELSS TEST/DIM/BRIGHT SWITCH - DIM/BRIGHT (Verify operation)

- e. ELSS TEST/DIM/BRIGHT SWITCH - TEST (VERIFY "SUIT PRESS" AND "EMERG O₂" LTS ON).
 - f. When Test/Dim/Bright Switch is back to DIM, Verify Audio Tone-OFF, Emergency O₂ Light - OFF, Suit pressure light - ON
 - g. ELSS BATTERY - OFF
 - h. ELSS O₂ FLOW SELECT - OFF
 - i. ELSS C/B - ON (Verify Peanut light - ON)
 - j. Connect inlet standup hose to top of inlet "Y" connector.
 - k. Connect outlet standup hose to top of outlet "Y" connector.
 - l. R. H. suit flow valve-off
14. Both pilots disconnect pilot's ECS inlet and outlet hoses from "Y" connectors.
15. Cmd pilot connect pilot's hoses with an interconnect.
16. Pilot insert ELSS plugs into open "Y" connector ports
17. Pilot connect Hasselblad to ELSS bracket.
18. Pilot performs the following:
- a. Don thermal pressure gloves
 - b. Check security and operation of EV visor on helmet.
19. Both pilots make final check of all fittings
20. Pilot check helmet restraint. Check in mirror for proper locking. Stow mirror.
21. Pilot position hatch gain and drive selector to the "U" (unlock) position.
22. Pilot perform the following:
- a. Don ELSS by attaching restraint straps.
 - b. Attach Hasselblad lanyard to top of ELSS
 - c. Attach HHMU to front of ELSS with Velcro.
23. Cmd pilot check all gear

24. Pilot perform suit integrity check as follows:

- a. Slowly close visor to pressurize suit.
- b. When suit pressure reaches $3.3 \pm .1$ psi above cabin, ELSS O₂ Selector - MED

NOTE: This will increase suit press. to $3.7 \pm .2$ psi.

- c. Monitor suit pressure.
- d. Cmd Pilot check cabin repress - closed
- e. Ten seconds after cabin repress - closed, read suit pressure (3.5 psi above cabin pressure)
- f. Monitor suit pressure for 30 seconds. ($.5$ decay; max. allowable is 1.0)
- g. Cmd Pilot check cabin repress - open
- h. ELSS O₂ Flow select - HI
- i. Activate ELSS EMERGENCY O₂ Supply ($1 \frac{3}{4}$ turns C.C.W.)
- j. Turn battery back on
- k. Verify suit pressure, Emergency O₂ Light and Audio Tone - OFF.
- l. Monitor suit pressure to approximately 3.7 psia above cabin press.

25. Cmd Pilot cabin repress - closed

26. Pilot verify Emergency O₂ Light and Audio Tone - ON

27. Cmd Pilot cabin repress - open, pilot press audio reset.

28. Pilot verify Emergency O₂ Light and Audio Tone - Off

29. Pilot turn ELSS Evaporator - ON (90° C.C.W.)

30. Both pilots verify:

- a. Visors locked
- b. Helmets locked
- c. Gloves locked
- d. All gas connectors locked.

- e. Hasselblad ready
 - f. EVA camera ready
 - g. Record - cont
 - h. Loose items stowed or secured.
 - i. C/B's & Switches in correct position 70
31. Both Pilots perform the following.
- a. COMPUTER - PRE LN/NAV (CATCH UP)
 - b. INSERT ALL ZERO'S IN ADDRESSES 25, 26, & 27
 - c. START COMP - PUSH

SPACECRAFT DEPRESSURIZATION AND EGRESS

(48:08)

1. Cmd Pilot perform the following:
 - a. Start event timer - Up (At sunrise)
 - b. Verify cabin air recircu - closed (down)
 - c. Cabin vent - check valve - open
 - d. Slowly open cabin vent to depressurize cabin to 3.0 psia. Verify systems integrity while holding cabin at 3.0 psia. (Pilot's suit 3.7 psi above cabin, Cmd Pilot 4 psi above cabin)
 - e. Cabin vent - open (complete depressurization of cabin)
 - f. Hold hatch closing device to preclude hatch inadvertently opening
2. Pilot perform the following:
 - a. Unlatch spacecraft hatch
 - b. Rotate EV Visor into position
 - c. Open the hatch
 - d. Position hatch gain and drive select to "L" (Lock) Position, Sawtooth - OPEN
 - e. Stow hatch handle
 - f. Ensure hatch striker plate lever is fully outboard
3. Both pilots make final check of all fittings
4. Pilot stand in seat
5. Both pilots feed umbilical and out of hatch.

EVA ACTIVITY ON UMBILICAL

Note: Station keeping thruster firing will be coordinated between Cmd Pilot and Pilot to prevent firing vertical thruster No. 16 while Pilot is working in the nozzle area.

Sequence 1 00:00 - 05:00

Pilot:

- ✓ a. Activate handrail raising mechanism.
- ✓ b. Move to N₂ fitting
- ✓ c. Position nitrogen line back to nitrogen fitting in adapter.
- ✓ d. Insert HHMU nitrogen line fitting into fitting on adapter.
- ✓ e. Open N₂ shut-off valve.
- ✓ f. Move to cabin area

Sequence 2 05:00 - 10:00

Pilot:

- ✓ a. Collect S-12 and hand to Cmd Pilot.
- x b. Pick up EVA camera from cabin and install on adapter.
- x c. Turn EVA camera on 1 frame/sec.
- ✓ d. Fire HHMU to check flow

Sequence 3 10:00 - 30:00

Pilot perform the following:

- ✓ a. Translate to Agena
- x b. Activate T-17
- ✓ c. Remove S-10
- ✓ d. Translate to S/C and hand S-10 to Command Pilot.

Sequence 4 30:00 - 40:00

Pilot perform HHMU EVALUATION:

- a. Pilot translate with HHMU to 30 feet from the S/C and null rates and remain stabilized.
- b. Translate along line of sight of the Agena.

Sequence 5 40:00 - 45:00

EVA Pilot pickup:

- a. Command pilot translate to pilot.

Sequence 6 45:00 - 55:00

Pilot perform umbilical evaluation

Pilot evaluates the umbilical's dynamics by using the umbilical to pull himself to the spacecraft.

Sequence 7 55:00

- a. Remove sunshade
- b. Terminate extravehicular activity.

INGRESS PREPARATION

1. Pilot move to adapter and perform the following:
 - a. Turn off " N_2 " shut-off valve
 - b. Bleed off propellant in HHMU with short thrusts while holding on to the adapter handrails
 - c. Unplug the HHMU propellant fitting
2. Pilot move to spacecraft hatch and stand in seat.
3. Pilot retrieve EV camera
Turn off 16 mm EVA camera
4. Both pilots pull in umbilical and stow temporarily in the left footwell.

INGRESS

1. Pilot open hatch holding device (sawtooth).
2. Pilot check hatch pawls to lock.
3. Pilot check hatch seal for proper seating and debris.
4. Pilot partially ingress cabin.
5. Pilot rotate EV VISOR open.
6. Pilot release ELSS restraints and hand ELSS to Cmd Pilot.
7. Pilot complete ingress
8. Both pilots close hatch tight by pulling on hatch closing device.
9. Pilot complete hatch locking
10. Cmd Pilot perform the following:
 - a. CABIN Vent-Closed
 - b. CABIN Vent Checkvalve-Closed
 - c. ELSS BYPASS - NORMAL
 - d. ELSS O₂ Flow Selector-HI
 - e. ELSS EVAPORATE-OFF
11. Both pilots monitor cabin pressure, when cabin pressure reaches 2.0 psia, go to bypass on ELSS & close Repress Valve. If cabin cannot be repressurized, use emergency procedures.

✓

Note: ELSS Battery-OFF @ 1000 psi emergency O₂ Supply. Turn off EMERGENCY O₂ Supply @ 100 psi remaining and turn repress valve - ON if pilot still connected to ELSS.

12. Pilot open visor to depress suit at 3.7 psia.
13. Pilot position hatch gain and drive select to "N" (neutral)
14. Pilot stow sawtooth
15. Cmd Pilot translate aft (4 sec retrograde) to separate from Agena.
16. Cmd Pilot remove umbilical tether bracket from Pilot's suit.
17. Pilot remove interconnect from ECS hoses, and place in umbilical bag.
18. Pilot perform the following:
 - a. Disconnect inlet "Y" connector from suit and connect inlet ECS hose
 - b. Suit Flow - Full open
 - c. Disconnect outlet "Y" connector from suit and connect outlet ECS hose
19. Cmd Pilot perform the following:
 - a. ELSS Battery - off
 - b. Deactivate ELSS emergency O₂ supply. If done earlier due to shortage of EMER O₂ turn off repress valve.
20. Pilot perform the following:
 - a. Biomed Instru. C/B - open
 - b. ELSS PWR C/B - open
 - c. Disconnect umbilical electrical cable and connect long length jumper cable.

Note: Communications will be lost with pilot while the electrical connectors are disconnected.

- d. Biomed instru. C/B - closed
 - e. Verify normal communications regained
21. Pilot perform suit integrity check as follows:
- a. Close visor
 - b. Position mirror to see outlet hose.
 - c. Right hand suit flow - off
 - d. Disconnect suit outlet hose
 - e. Actuate electrical O₂ HI Rate
 - f. Monitor suit pressure
 - g. Recock O₂ high rate when suit pressure reads 3.7 psi above cabin press.
 - h. Verify that suit pressure is stable and read.
 - i. Allow 30 seconds pressure decay and read suit pressure.
(.5 psi /30 sec max.; .15 - .35 psi is nominal)
 - j. Reinstall suit outlet hose
 - k. Suit Flow - Full increase.
22. Both pilots make up a bundle of items to jettison and put in bag. The following items will be jettisoned:
- a. Umbilical bag
 - b. 50-foot umbilical
 - c. HHMU
 - d. ELSS
 - e. ELSS restraint straps (2)
 - f. Standup hoses (18" and 24")
 - g. (2) "Y" connectors and (1) interconnector
 - h. EVA VISOR

- i. EVA CAMERA BRACKET
 - j. EVA Camera C/B and light assembly (long)
 - k. Dry waste container.
23. Pilot position hatch pawls to "U" (Unlock)
24. Cmd Pilot perform the following:
- a. AIR RECIRC VALVE - CLOSED (down)
 - b. Cabin vent check valve - open
 - c. Slowly open cabin vent to depressurize cabin to 3.0 psia. Verify systems integrity while holding cabin at 3.0
 - d. Cabin vent open (complete cabin depress).
 - e. Hold hatch closing device to prevent hatch inadvertently opening.
25. Pilot perform the following:
- a. Open spacecraft hatch
 - b. Position hatch Gain and Drive to "L" (Lock) position.
 - c. Open sawtooth
 - d. Ensure hatch striker plate lever is fully outboard.
 - e. Jettison bundle
26. Both pilots perform the following:
- a. Close hatch by pulling on the hatch closing device.
 - b. Complete hatch locking
27. Both pilots perform the following:
- a. Cabin vent - close
 - b. Vent check valve - Closed
 - c. Rad - Bypass

- d. Sec O₂ (Lt and Rt Bottles) - Closed
 - e. Cabin repress - open
28. Both pilots monitor cabin pressure and at 4.5 psia open visors to depress suit.
29. Both pilots perform the following:
- a. Cabin repress - closed
 - b. Rad - Flow
 - c. Sec O₂ (Rt Bottle) - open
30. Cmd Pilot perform the following:
- a. Unstow camera box and stow gear
 - b. Stow camera box
31. Pilot remove and stow hatch closing device; close sawtooth
32. CMD Pilot stow miscellaneous EVA gear. S-10 and S-12 stow in permanent stowage.
33. Pilot report any items not on previously established jettison list.
34. Pilot perform the following:
- a. Biomed instrument C/B - open
 - b. Remove electrical jumper cable and connect spacecraft electrical connector to suit.
- Note: Communications with the pilot will be lost while electrical connectors or disconnected.
- c. Biomed instrument C/B - closed
 - d. Verify normal communications are regained.
35. Both pilots complete stowage of unneeded gear.
36. Proceed with next event.

STAR OCCULTATION NAVIGATION

PURPOSE

Evaluate photoelectric occultation telescope and pilot procedures to develop a simple, accurate, self-contained orbital navigation system.

SPACECRAFT SYSTEMS CONFIGURATION

1. Undocked
2. AUX RECP - OFF
3. Photometer unstowed and connected to Aux Recp and TM jack.

NOTE: Keep sensor covered before sunset.

4. Filter - stowed position
5. Gain wheel - left (down)
6. Spacecraft reticle - installed
7. Day-night switch - NIGHT
8. Attitude control - PULSE
9. Cabin lights - Dim

PROCEDURES

MODE A

1. Align spacecraft BEF
2. Acquire bright star about to be occulted.
3. AUX RECP - ON.
4. Point photometer at star, align star with instrument reticle circle.
5. Depress calibrate button.
6. Turn gain wheel up until reticle light color changes (red to green fluctuating).
7. Release calibration button.

8. Continue to track star until it disappears from sight.
9. Acquire next star to be occulted and repeat steps 4 thru 8.
10. Voice record or enter in log the time of the experiment, variations from suggested sequence, and comments.

MODE B

Same as Mode A, except: After calibration on star, point photometer so that the star is outside the instrument reticle circle to the side. Continue to track star until it is occulted. Note: reticle light will remain red.

MODE C

Same as Mode A, except: Depress calibration button briefly when the star is at the top and bottom of the airglow and as the star vanishes from view.

SEQUENCES - Suggested stars and acquisition order.

SEQ 01 Stars	Time before next star sets	Acquisition pointing directions
Alphard	4 min.	BEF, left of track
Regulus	6 min.	BEF, left of track
Denebola	4 min.	BEF, left of track
Alkaid	4 min.	BEF, right of track
Arcturus	3 min.	BEF, on track
Alphecca	6 min.	BEF, right of track
Unuk	---	BEF, on track

PROPELLANT REQUIREMENTS

4 night passes at 2.25 lb per run - 9.0 lb

EXPERIMENT D-10

ION SENSING ATTITUDE CONTROL

PURPOSE

To determine the feasibility of orbital pitch and yaw determination by ion sensing.

SPACECRAFT SYSTEMS CONFIGURATION

1. Undocked
2. Agena power C/B - Closed
3. Other systems are dependent on particular sequences.

NOTE: The experiment must be completed during a continuous period of time involving no firing of the vertical and lateral thrusters. Firing of these thrusters will severely degrade the sensors once their covers are released. Firing of any other thrusters should not affect the sensors.

PROCEDURES

MODE A - Equipment extension and activation

1. Bus Arm Switch - EXP
2. Ion sensor seq. switch - SEQ. 1
3. Wait 1 to 2 minutes for booms to fully extend.

NOTE: Opening of the sensor covers prior to full boom extension may cause the booms to jam inside the retro adapter section.

4. Ion Sensor mode switch - ON. (Must remain ON or FDI until completion of exp)
5. Ion sensor seq. switch - SEQ. 2.
6. Bus Arm switch - SAFE.

MODE B - Ambient data accumulation

1. Platform - ORB Rate and aligned.
2. Computer - PRE LN
3. Attitude Control - PLAT
4. ION Sensor mode switch - FDI.
5. FDI Scales - HI.
6. Hold spacecraft attitude at zero in all axes for 10 minutes.

NOTE: Mode B should be done three times, once for each at the northern and most orbital latitude, the southernmost orbital latitude, and at an equatorial crossing.

MODE C - Roll attitude study

1. Platform - ORB RATE and aligned.
2. COMPUTER - PRE LN.
3. Attitude control - PULSE.
4. Ion Sensor mode switch - FDI
5. FDI Scales - HI.

6. Roll 720 degrees at about 3 deg. per second, holding pitch and yaw to zero.
7. Voice record crew commentary about FDI needle movements.

NOTE: Mode C should be done twice; once in daylight, once in darkness.

MODE D - Pitch attitude study

1. Platform - ORB RATE and aligned.
2. Computer - PRE LN.
3. Attitude control - PULSE.
4. Ion Sensor mode switch - FDI.
5. FDI scales - HI.
6. Holding both yaw and roll to zero degrees, pitch from 20 deg. down to 40 deg. up at ≈ 0.1 deg. per second.
7. Holding yaw at 5 deg. left and roll to zero, pitch from 40 deg. up to 20 deg. down at ≈ 0.1 deg. per second.
8. Holding yaw at 5 deg. right and roll to zero, pitch from 20 deg. down to 20 deg. up at ≈ 0.1 deg. per second.
9. Voice record crew commentary about FDI needle movements.

NOTE: Mode D should be done three times.

MODE E - Yaw attitude study

1. Platform - ORB RATE and aligned.
2. Computer - PRE LN.
3. Attitude control - PULSE
4. Ion Sensor mode switch - FDI.
5. FDI scales - HI.
6. Holding both pitch and roll to zero degrees, yaw from 20 deg. right to 40 deg left at ≈ 0.1 deg. per second.
7. Holding pitch at 5 deg. down and roll to zero, yaw from 40 deg. left to 20 deg. right at ≈ 0.1 deg. per second.
8. Holding pitch at 5 deg. up and roll to zero, yaw from 20 deg. left to 20 deg. right at ≈ 0.1 deg. per second.

9. Voice record crew commentary about FDI needle movements.

NOTE: Mode E should be done three times.

MODE F - Photo emission effects

1. Platform - ORB RATE and aligned.
2. Computer - PRE LN.
3. Attitude control - PLAT.
4. Ion Sensor mode switch - FDI.
5. FDI Scales - HI.
6. Hold spacecraft attitude at zero about all three axes from 5 min. before Sunrise to 15 min. after Sunrise.
7. Voice record crew commentary on FDI needle movements.

NOTE: Mode F should be done twice.

MODE G - Random data accumulation

1. Ion Sensor mode switch - ON.
2. At least 6 hours of data acquisition is requested. Drifting flight is preferred.

MODE H - Translation thruster effects

1. Platform - ORB RATE and aligned.
2. Computer - NAV (CTCH-UP)
3. Enter the following into the computer:
25:00000
26:00000
27:00000
4. Attitude control - PULSE
5. Ion sensor mode switch - FDI.
6. FDI scales - HI.
7. Control S/C attitudes to 0°, 0°, 0°
8. START COMP - PUSH
9. Holding 0°, 0°, 0°, Fire the UP/DWN and LEFT/RIGHT translation thrusters briefly.
10. Read address 80 from the computer
11. Translate aft to null address 80
12. Voice record crew commentary on FDI needle movements.

NOTE: The thruster firings in this sequence will probably destroy the sensing system. Hence, this mode will be the last performed.

PROPELLANT REQUIREMENTS

Mode B (3) - 1.5
Mode C (2) - 1.5
Mode D (3) - 4.0
Mode E (2) - 3.0
Mode F (2) - 1.5
Mode H (1) - 3.5
Plat Align(2) 1.0

Total 16.0 #

EXPERIMENT MSC-3

TRI-AXIS MAGNETOMETER

PURPOSE

To monitor the direction and amplitude of the earth's magnetic field.

SPACECRAFT SYSTEMS CONFIGURATION

1. BETA - With Mag. in insertion checklist.
2. BETA - OFF in preretro checklist.

FUEL REQUIREMENTS

None

EXPERIMENT MSC-5

LUNAR UV SPECTRAL REFLECTANCE

PURPOSE

To determine the ultraviolet spectral reflectance of the lunar surface in a range of wave lengths from 2000 to 3200 Angstroms.

SPACECRAFT SYSTEMS CONFIGURATION

1. Pilot EVA
2. Right hatch - open
3. Unstowed - Maurer 70 mm camera
 - UV lens
 - UV film magazine
 - UV diffraction grating
 - Extended timer
 - Bracket
4. Attitude control - PULSE
5. S/C reticle in left window.=

PROCEDURES

1. Assemble camera, lens, bracket, etc.
2. Mount on spacecraft prior to darkness.
3. Acquire moon in spacecraft reticle at 5 deg. up and zero yaw, and damp rates.
4. Take spectrograms, cycling up then down through the settings on the extended timer. (1, 2, 5, 10, 20, 40, 75, 150, 75 -- , 2, 1 sec.)

NOTE: No thruster firing during exposures of 10 sec. or less, minimum firing on other exposures.

PROPELLANT REQUIREMENT

1 run at 2.0 lbs. per run - 2.0 lbs.

NOTE: MSC-5 experiment requires greater than a quarter moon to conduct. Therefore, with the present launch date it will not be conducted.

EXPERIMENT MSC-6

BETA SPECTROMETER

PURPOSE

To experimentally verify the ability to predict the radiation hazards in the space environment, and to determine the gross interaction of the spacecraft with the environment.

SPACECRAFT SYSTEMS CONFIGURATION

1. BETA - With Mag. in insertion checklist.
2. Platform - ORB RATE and aligned if in Modes A or B.
3. BETA - OFF in preretro checklist.

PROCEDURES

MODE A: Controlled Attitude

1. Attitude control - PULSE
2. Hold yaw at zero degrees, pitch at zero degrees, and roll at 42 ° left plus or minus 2°. Attitude to be held through the South Atlantic anomaly region.

MODE B: Controlled Roll Rate

1. Attitude control - PULSE
2. During a pass through the South Atlantic anomaly hold pitch and yaw at zero degrees, and roll at about 6 degrees per second.

NOTE: - In the nominal Flight Plan no Mode A's or Mode B's are scheduled.

PROPELLANT REQUIREMENTS

2 controlled passes at 1.0 lb per pass 2.0 #

EXPERIMENT MSC-7

BREMSSTRAHLUNG SPECTROMETER

PURPOSE

To determine the gamma flux and energy spectra induced inside the spacecraft by exterior electron flow patterns.

SPACECRAFT SYSTEMS CONFIGURATION

1. X-RAY - ON in insertion checklist.
2. X-RAY - OFF in preretro checklist.

FUEL REQUIREMENTS

None

EXPERIMENT MSC-8

COLOR PATCH PHOTOGRAPHY

PURPOSE

To determine the color correction filters required during film processing to produce a good color fidelity in cislunar and lunar photography.

SPACECRAFT SYSTEMS CONFIGURATION

1. Pilot EVA
2. Right hatch open
3. Attitude control - PULSE
4. Unstowed - MSC-8 Maurer 70 mm Camera
 - f2.8 Lens
 - Color slate
 - Extension rod
 - MSC-8 film magazine

PROCEDURES

1. Assemble rod
2. Attach camera and slate to rod.
3. Maneuver to get sun normal to color slate (within 20 degrees of normal required).
4. Take 3 exposures at f.8.0, 1/250 second.
5. Take 3 exposures at f.11, 1/250 second.
6. Take 3 exposures at f.16, 1/250 second.
7. Dismantle rod and slate.
8. Dispose of rod.
9. Stow slate for postflight evaluation.

PROPELLANT REQUIREMENTS

1 sequence at 1.0 lb per sequence 1.0 lb.

EXPERIMENT MSC-12

LANDMARK CONTRAST

PURPOSE

To acquire reference data for the Apollo guidance and navigation system by measuring the contrast of selected land-sea boundaries.

SPACECRAFT SYSTEMS CONFIGURATION

1. Undocked.
2. Photometer unstowed and connected to AUX RECP and TM jack.
3. Photometer day-night switch - DAY.
4. Filter - in place.
5. Gain wheel - left (down).
6. Spacecraft reticle - installed.
7. Attitude control - PULSE.
8. Sequence camera with 75 mm lens in right window bracket.

CONDITIONS REQUIRED

1. Sun angle at least 30 degrees above horizon.
2. Area scanned directly on spacecraft ground track.
3. Spacecraft right window shaded from sun glare.

NOTE: Do not expose photomultiplier to direct sunlight.

PROCEDURES

MODE A:- Boundary observations.

1. Roll to heads down position.
2. Align spacecraft on land-sea interface on ground track.
3. Actuate 16mm camera at 1 frame per second.
4. Calibration:
 - A. Align photometer on land.
 - B. Depress calibration button.

C. Rotate gain wheel until reticle color changes (red to green fluctuating).

D. Release calibration button.

5. Brightness measurement:

Align photometer on land side of interface for 4 seconds, then on water side for 2 seconds.

6. Polarization check:

A. Depress calibration button for 1 second.

B. Rotate photometer 90 degrees about optical axis.

C. Align photometer on land for 4 seconds, then on water for 2 seconds.

7. Continue with as many brightness measurements as possible.

8. After task:

A. 16mm Camera - OFF

B. Cover objective for 10 sec. to get "dark" reading with settings unchanged.

Voice record time, area, and comments on visual contrast, landmark coloration, prominent landmark features, cloud cover, window glare, etc.

MODE B:- Daylight Lunar Calibration

1. Photometer settings left same as on preceding ground observation.

2. Align spacecraft and photometer on moon for about 30 seconds of measurements.

MODE C:- Night Lunar Calibration

Same procedure as for Mode B.

MODE D:- Planetary Calibration

Same procedure as for Mode B, except: Stow day filter and calibrate on a planet such as Venus.

MODE E:- Cloud Deck Calibration

Same as Mode B, but use a cloud deck as the calibration source.

NOTE: A maximum of two calibrations are required.

SEQUENCES - to be used for ground updates.

01. Baja California coast
02. Texas coast
03. West coast of Florida
04. East coast of Florida
05. West coast of South America
06. Northeast coast of South America
07. West coast of Africa
08. Mediterranean coast of Africa
09. Red Sea coast of Africa
10. Persian Gulf Arabian coast
11. South coast of Hawaii Island.

PROPELLANT REQUIREMENTS

4 ground observations at 0.9 lb per pass
2 calibrations @ 0.9 lb per cal

3.6 #
1.8 #
5.4

EXPERIMENT S-1

ZODIACAL LIGHT PHOTOGRAPHY

PURPOSE

To obtain infra-red photographs of the zodiacal light near the sun at sunset, and to obtain infra-red photographs of the airglow, covering the entire horizon during the night.

SPACECRAFT SYSTEMS CONFIGURATION

1. Undocked.
2. S/C Reticle mounted in left window
3. 35 mm zodiacal light camera mounted in right window.
4. Rate gyros - PRI or SEC
5. FDI scale range - LO
6. Attitude control - PULSE
7. All cabin lighting - OFF

NOTE: If lighting is required, momentary actuation of fingertip lights should be used when the camera shutter is closed - indicated by the red camera light being on.

PROCEDURES

Zodiacal Light Exposures:

1. Maneuver to BEF, yaw 15 deg. right, pitch up 58 deg. roll counter clockwise. (Center reticle on Alpha Canes Venatici)
2. Take 7 exposures, starting at sunset plus 1 min.

NOTE: Make attitude and rate corrections only when camera light is on, or camera is shut off.

3. Camera - OFF, acquire attitude for airglow photography.

AIRGLOW EXPOSURES:

1. Maneuver BEF to yaw zero, pitch up 25 deg, and roll 140 deg, clockwise.
2. Damp rates.
3. Take 11 airglow exposures holding this attitude. Start at about 10 min. after sunset.

NOTE: Make attitude and rate corrections only when camera light is on, or camera is shut off.

PROPELLANT REQUIREMENTS

1 sequence at 3.5 lbs. per sequence-3.5#

EXPERIMENT S-5

SYNOPTIC TERRAIN PHOTOGRAPHY

PURPOSE

To improve and extend the techniques of synoptic geologic and topographic aerial photography.

SPACECRAFT SYSTEMS CONFIGURATION

1. Attitude control - PULSE
2. Unstow - 70 mm Maurer Camera
Ring sight
Film magazine
80 mm lens

PROCEDURES

1. Assemble and prepare camera and accessories for photography.
2. Record time, sequence or subject, mode, magazine number and frame number on the onboard voice recorder and/or log book.
3. Pitch spacecraft straight down, if possible, to obtain photographs of selected terrain.
4. Control roll as required to keep sun glare from spacecraft window.

MODE A - Strip photos - one frame every 5 sec.

<u>SEQ</u>	<u>LOCATION</u>
01	Red Sea-Arabian Peninsula
02	Mexico
03	West Pakistan
04	Sahara
05	Northern So. America

MODE B - 2 or 3 frames

06	Mississippi Delta
07	Ganges Delta
08	Bahamas-Tongue of the ocean
09	Philippines
10	Mekong alluvium

EXPERIMENT S-6

SYNOPTIC WEATHER PHOTOGRAPHY

PURPOSE

To obtain selective, high quality, color cloud photographs to study the fine structure of the earth's weather system.

CONDITIONS

Between 9:00 AM and 3:00 PM local solar time.

SPACECRAFT SYSTEMS CONFIGURATION

1. Attitude control - PULSE
2. Unstow - 70 mm Maurer camera
Ring sight
UV filter
Film magazine
80 mm lens

PROCEDURES

1. Assemble and prepare camera and accessories for photography.
2. Control spacecraft attitudes as required to obtain photographs of selected cloud formations.
3. Voice record comments on each photograph - time, location, and significant observations.

- NOTE:
- A. Control roll as required to keep sun glare off window through which photographs are taken.
 - B. Photograph the same formation on successive passes, if possible.
 - C. Clouds over land are desirable in order to provide identification of cloud location.

SEQUENCES - to be used for ground updates.

01. Cloud eddies near islands and costal prominences
02. Diurnal cloud variation in costal and island areas.
03. Cumulus cloud "streets".
04. Sunlint in Gulf of Mex., Bahamas, Bermuda area.

05. Severe thunderstorms
06. Thunderstorms with strong wind shear
07. Tropical and extratropical cyclones.
08. Cirrus bands emanating from tropical convergence zone.
09. Areas of interest to oceanographers.
10. Pictures near meteorological sounding stations.

- | | |
|-----------------|----------------|
| A. Guam | H. Eniwetok |
| B. Midway | I. Kwajalein |
| C. Wake | J. Key West |
| D. Marcus Is. | K. Swan Island |
| E. Johnston Is. | L. Ascension |
| F. Kauai | M. West Indies |
| G. Hawaii | |

EXPERIMENT S-10

MICROMETEORITE CRATER COLLECTION

PURPOSE

To collect craters of micrometeorite impacts on specially prepared and polished surfaces that can be recovered for study and analysis.

SPACECRAFT SYSTEMS CONFIGURATION

1. Spacecraft station-keeping with passive Agena.
2. Pilot EVA.

PROCEDURES

Recovery of collector.

1. With handle, slide unit forward until the cover is free to close.
2. Close cover.
3. Remove unit from passive Agena.
4. Attach unit to Velcro on chest pack until return to spacecraft.
5. After return to spacecraft, lock handle and insert unit in its stowage bag.

EXPERIMENT S-12

MICROMETEORITE COLLECTION

PURPOSE

To study particle environment at orbital altitude, and to study the effects of space environment on certain biological materials.

SPACECRAFT SYSTEMS CONFIGURATION

1. Pilot EVA to retrieve collector.
2. Collector surface should not be exposed if "snowflake" particles are present; or during thruster firings, fuel cell purges or overboard dumps of liquids.

PROCEDURES

OPENING:

1. COLLECTOR DOOR - OPEN
2. Mark time of opening in log.

CLOSING:

1. COLLECTOR DOOR - CLOSED
2. Mark time not open or time of final closure in log.

NOTE: Close and open as required. Do not re-open for 2 minutes following thruster fire, etc.

RETRIEVAL

1. COLLECTOR DOOR - CLOSED prior to EVA.
2. Wait 2 minutes for door to close.
3. COLLECTOR DOOR - DOOR LOCKED prior to EVA.
4. Pilot EVA.
5. Remove lead fairing, retrieve experiment unit.
6. Stow unit on latch structure of EVA chest pack after pack is stowed.

TIME REQUIREMENTS

A minimum exposure time of 8 hours is required.

EXPERIMENT S-13

UV ASTRONOMICAL CAMERA

PURPOSE

To test the techniques of ultraviolet photography and spectrometry under vacuum conditions, and to obtain spectrograms of selected star fields.

SPACECRAFT SYSTEMS CONFIGURATION

1. Pilot EVA
2. Right hatch - open
3. Unstowed - S-13 Maurer 70 mm camera
 - UV lens
 - UV film magazine
 - UV diffraction grating
 - 10 degree prism
 - Extended timer
 - Bracket
4. Attitude Control - PULSE

PROCEDURES

MODE A - Diffraction grating exposures

1. 5 exposures at 10 seconds.
2. 1 exposure at 10 seconds with a 0.10/sec yaw rate incorporated.
3. 2 exposures at 75 seconds.

MODE B - Prism exposures

1. 5 exposures at 5 seconds.
2. 1 exposure at 5 seconds with a 0.10/sec yaw rate incorporated.
3. 2 exposures at 75 seconds.

SEQUENCE OF OPERATIONS

1. Assemble camera and attachments as required by mode number.
2. Mount camera and bracket on spacecraft.
3. Enter darkness BEF.
4. Acquire star field, damp rates.
5. Take spectrograms as per mode designated.
6. Acquire next star field, repeat steps 4 and 5.

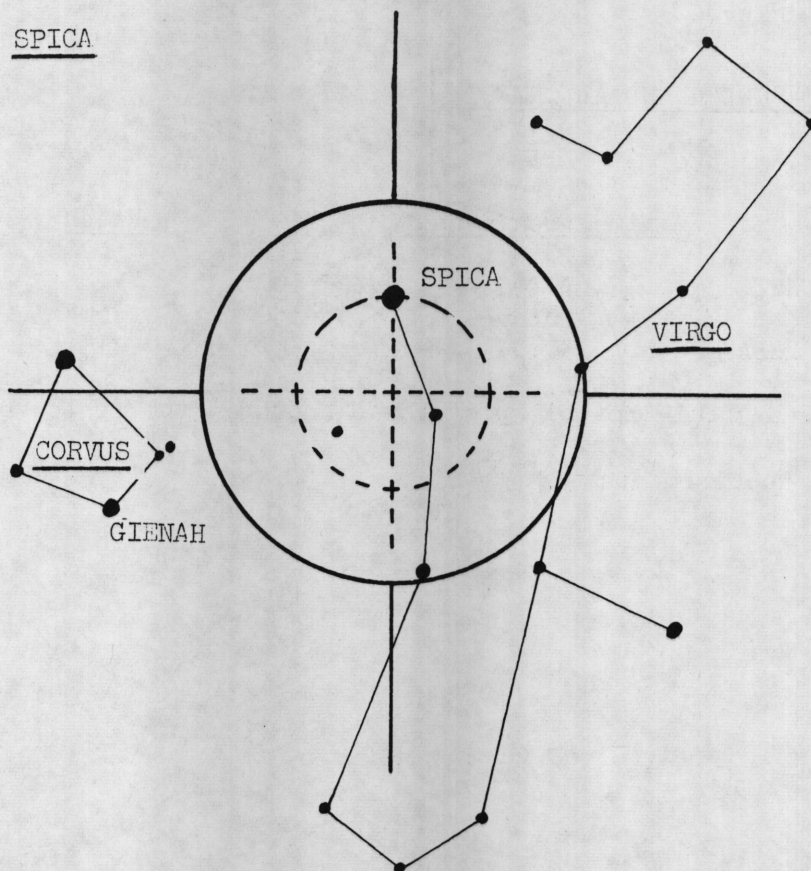
ACQUISITION ORDER AND ALIGNMENT

<u>Star</u>	<u>Time from Sunset</u>	<u>Yaw</u>	<u>Pitch</u>
1. SPICA	00:00	-120°	60°
2. BETA CRUX	10:00	-100°	20°
3. SHUALA	20:00	-130°	60°
4. GAMMA VELA	30:00	-30°	5°

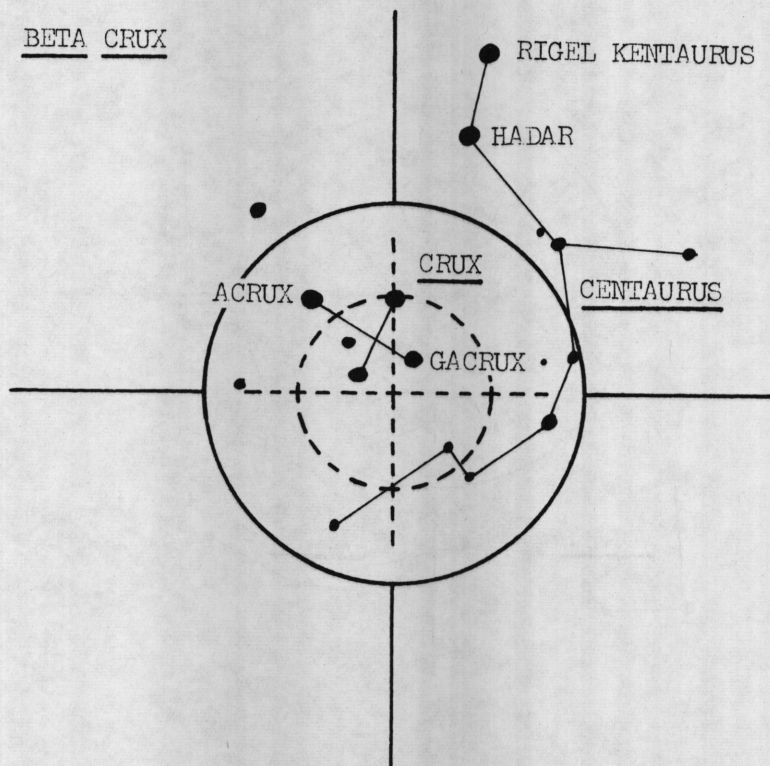
Align S/C to obtain reticle picture as shown in the following figures.

Propellant Requirements - 4.5 #

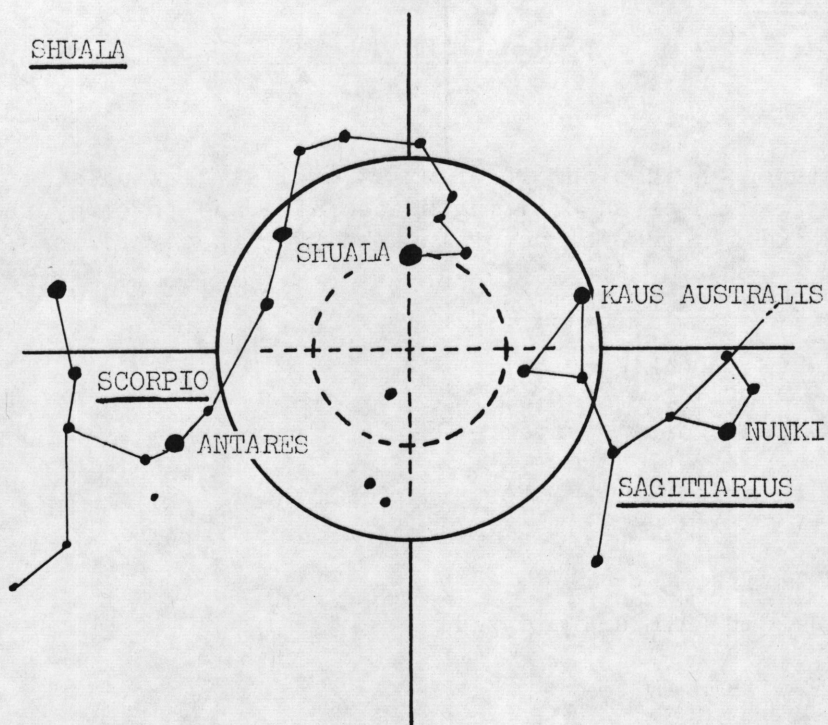
SPICA



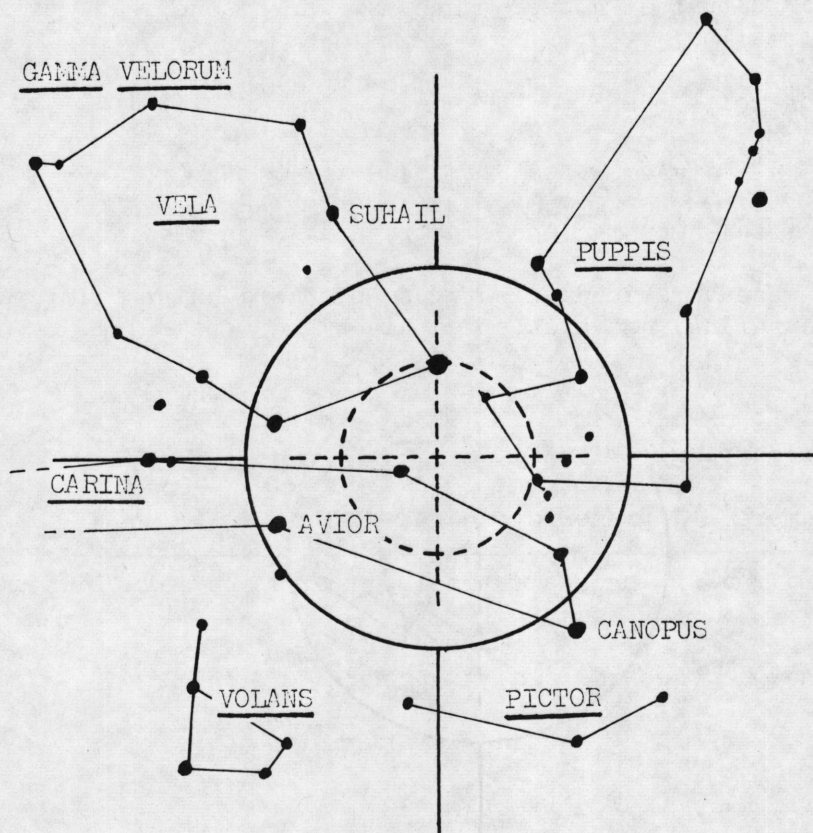
BETA CRUX



SHUALA



GAMMA VELORUM



EXPERIMENT S-26

ION WAKE MEASUREMENT

PURPOSE

To obtain data on the ambient ion flux at orbital altitudes, to investigate the ionospheric wake of an orbiting spacecraft, and to study the changes in the ion flux and ion wake structure caused by thruster firings.

SPACECRAFT SYSTEMS CONFIGURATION

Agena Systems (See Docking Practice)

1. Stabilization control system - ON
2. Agena orientation - TDA - forward or south.

GEMINI SYSTEMS

1. Platform - ORB RATE and aligned.
2. RDR - OFF within 20 feet

NOTE: Radar output at closer range may cause sensors to present false information.

3. Attitude control - PULSE
4. Triaxis magnetometer - ON
5. Sequence camera - mounted and electrically connected.

NOTE: For maneuvers in daylight, use standard color film; for darkness maneuvering, use high speed black and white film.

PROCEDURES

MODE A - Linear mapping.

1. Sequence camera - 1 frame per second - ON.
2. Voice record and/or log start time of camera and magazine number
3. Send command 041 (Record Data) to Agena
4. Voice record and/or log recorder start time.

- D. Translate aft 30 ft. and down 30 ft. to point C. Rate should be about 0.2 ft./sec.
- E. At an estimated 20 to 25 ft. separation turn Radar ON. Voice record and/or log radar on time.
- F. Translate aft 130 ft. and up 30 ft. to point D. Rate should be about 0.5 ft./sec.
- G. Translate down and aft to 250 ft. separation. Rate should be about 1.0 ft./sec.
- 6. Send command 030 (Recorder & T/M) to Agena. Voice record and/or log OFF time of PCM.
- 7. Send command 021 (T/M - ON) to Agena.
- 8. Sequence camera - OFF. Voice record and/or log OFF time of camera.
- 9. Continue with docking practice.
- 10. Ground playback Agena recorder over station.

NOTE: Agena recorder is limited to 20 min. record time. It must be shut off at 20 min. for subsequent dump.

SEQUENCES - Areas of interest for full mappings.

SEQ 01 - Daylight portion of orbit with the earth's magnetic field lines perpendicular to the velocity vector.

SEQ 02 - Darkness portion of orbit with the earth's magnetic field lines perpendicular to the velocity vector.

SEQ 03 - Darkness portion of orbit through the South Atlantic Anomaly area.

PROPELLANT REQUIREMENTS

1. Linear mapping	3.0
2. Transverse mappings (3)	26.0
Total	29.0 lb.

EXPERIMENT M-5

BIOASSAYS OF BODY FLUIDS

PURPOSE

To analyze body fluids to determine the physiological stress resulting from space flight.

SPACECRAFT SYSTEMS CONFIGURATION

Urine receiver connected.
Sample bag unstowed.

PROCEDURES

Mark sample bag C or P and GET.
Collect sample.
Stow sample bag.

NOTE: Log if tracer pump is passed more than once per sample.
Never turn selector valve counterclockwise except to get
UCD sample.

EXPERIMENT T-17

METEROROID EROSION

PURPOSE

To measure the cratering flux of meteoroids at satellite altitudes, to verify previously gathered data, to determine the meteoroid erosion effects on the optical properties of glass, and to determine meteoroid composition by analysis of impacts.

SPACECRAFT SYSTEMS CONFIGURATION

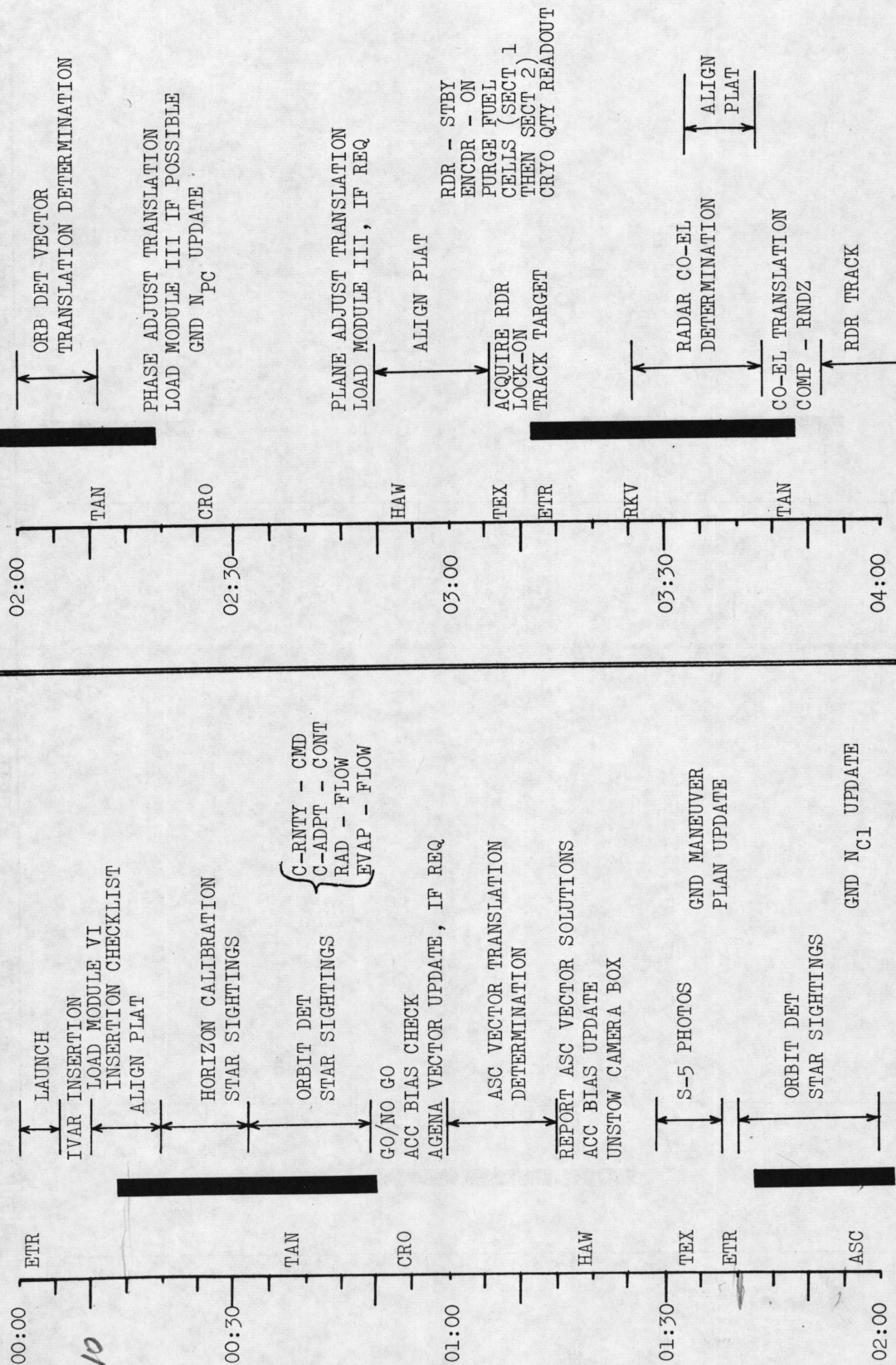
1. Gemini stationkeeping with Passive (Gemini 8) Agena
2. Pilot EVA to deploy T-17 package.

PROCEDURES

1. Pull Velcro (R) to release package.
2. Grasp handle and deploy unit along or around TDA.

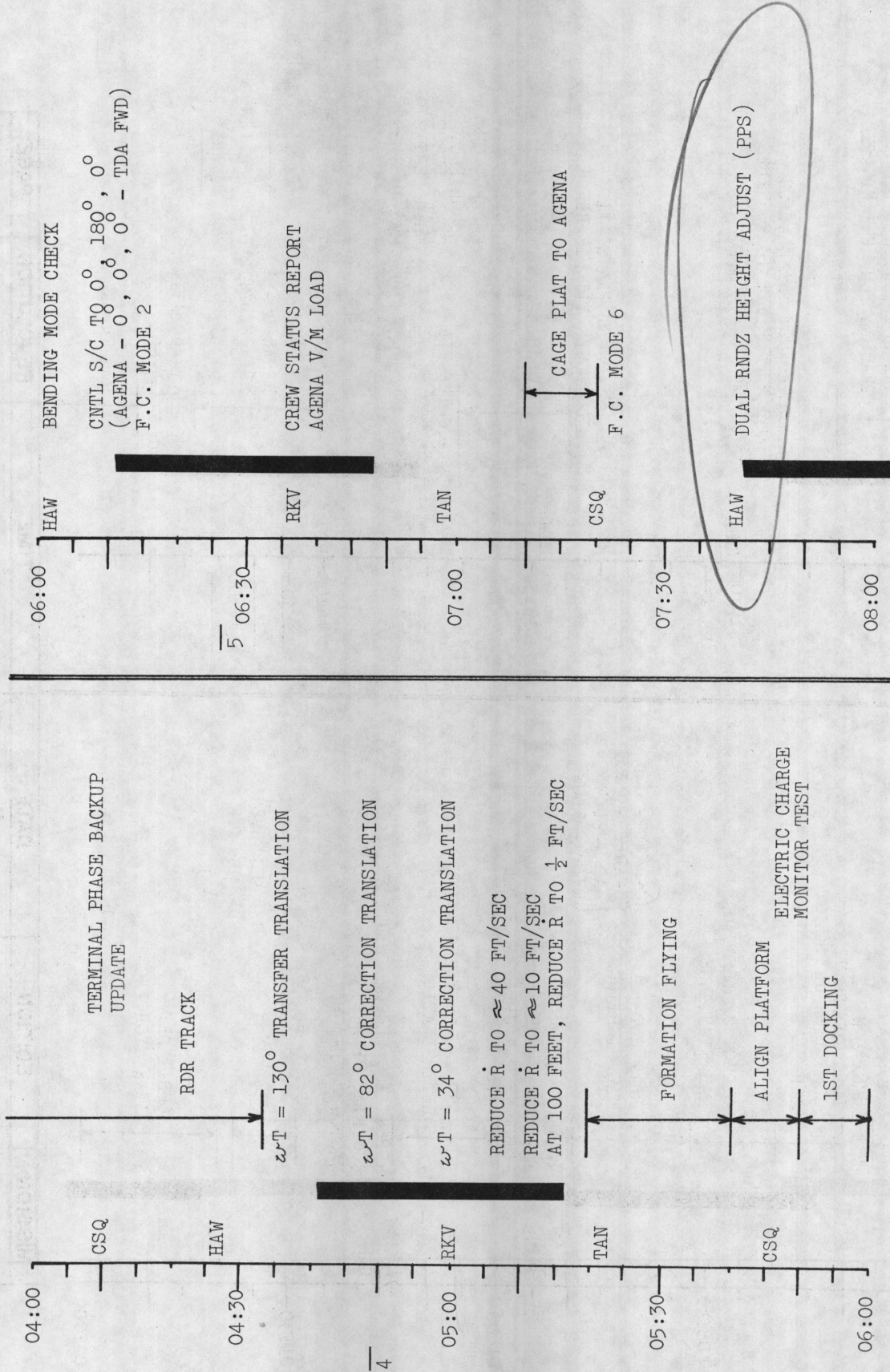
SECTION III

FLIGHT PLAN



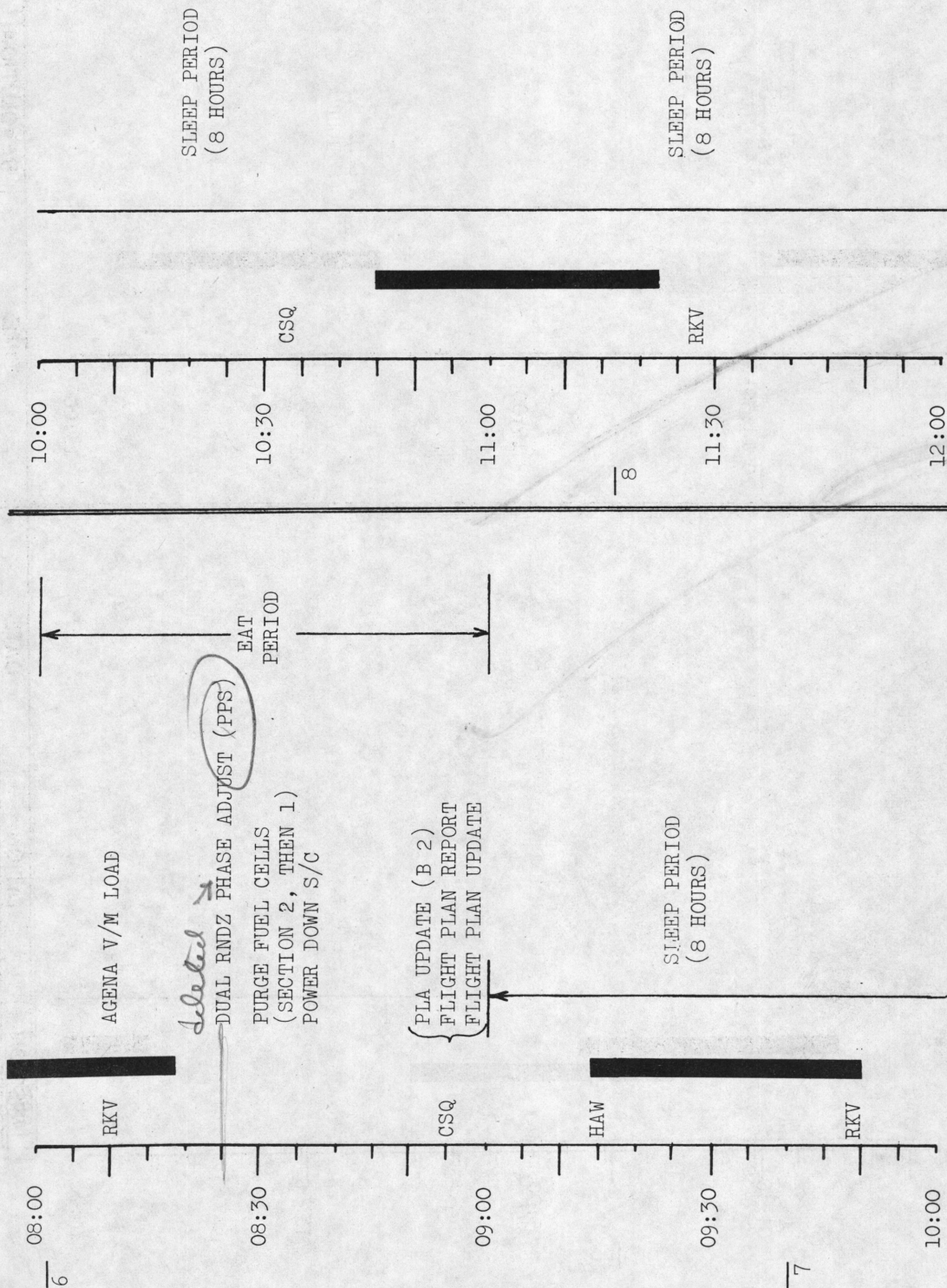
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	00:00 to 04:00	1 - 2	1

FLIGHT PLAN



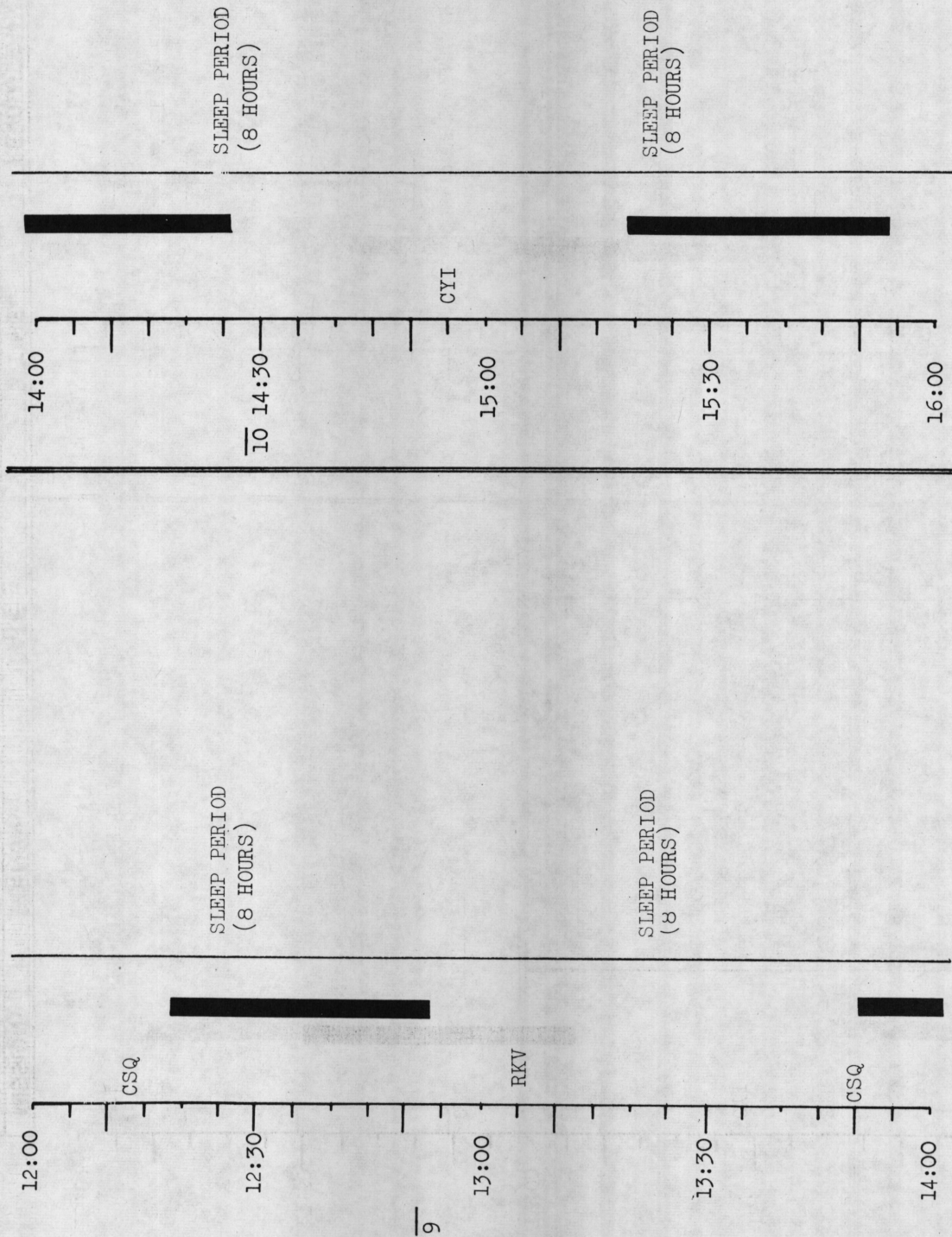
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	04:00 to 08:00	4 - 5	2A

CONTINGENCY A
FLIGHT PLAN



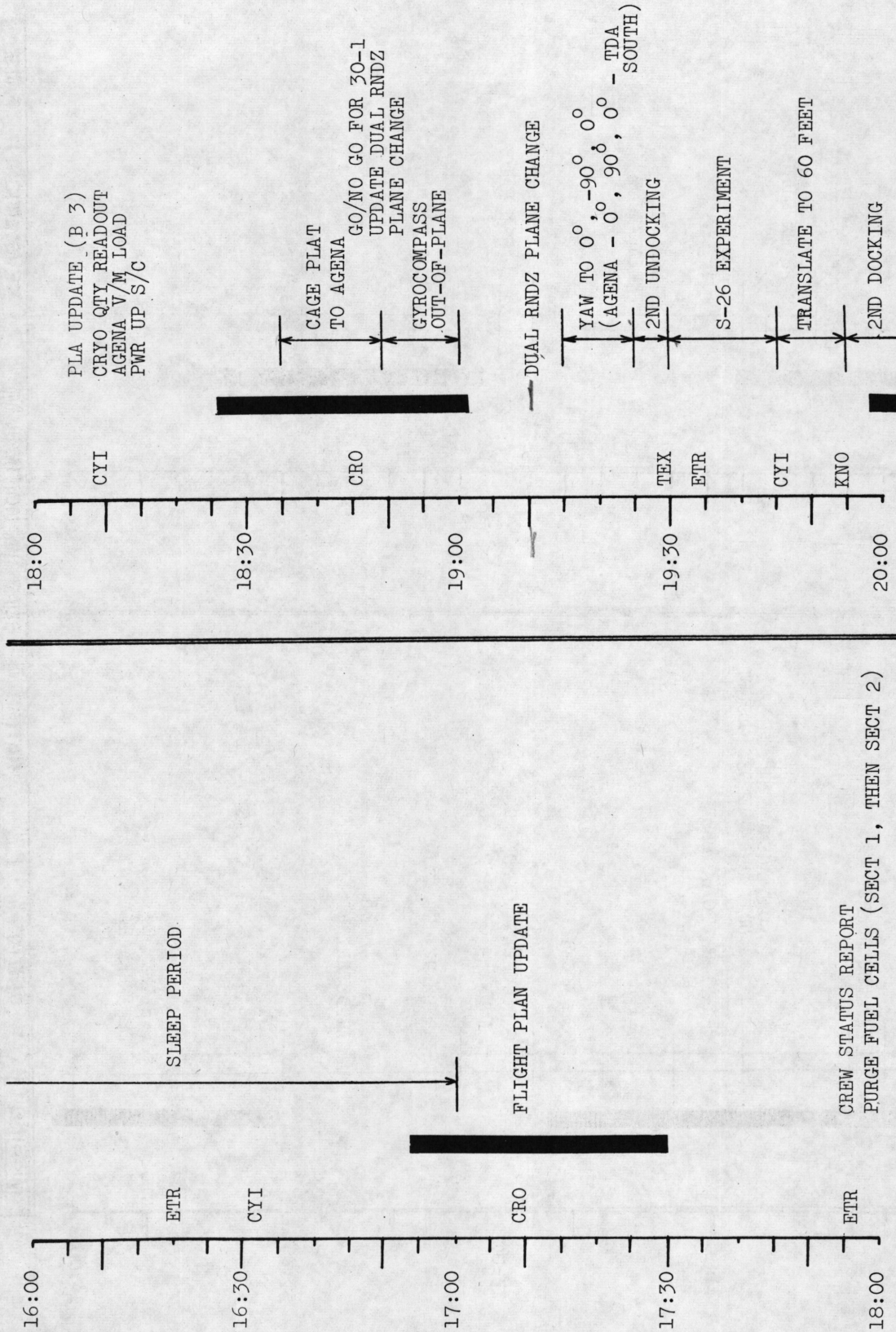
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	08:00 to 12:00	6 - 8	3A

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	12:00 to 16:00	9 - 10	4

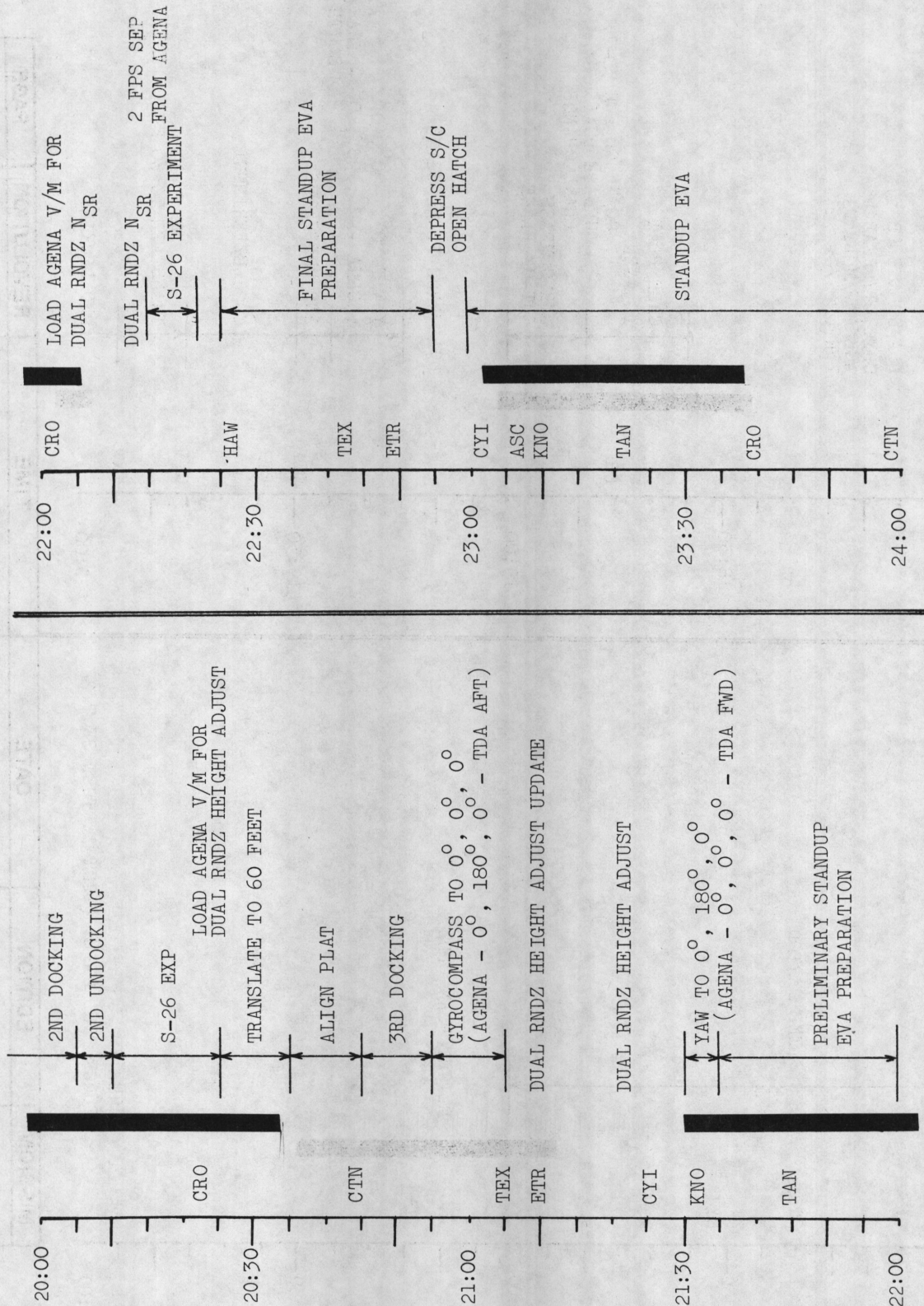
FLIGHT PLAN



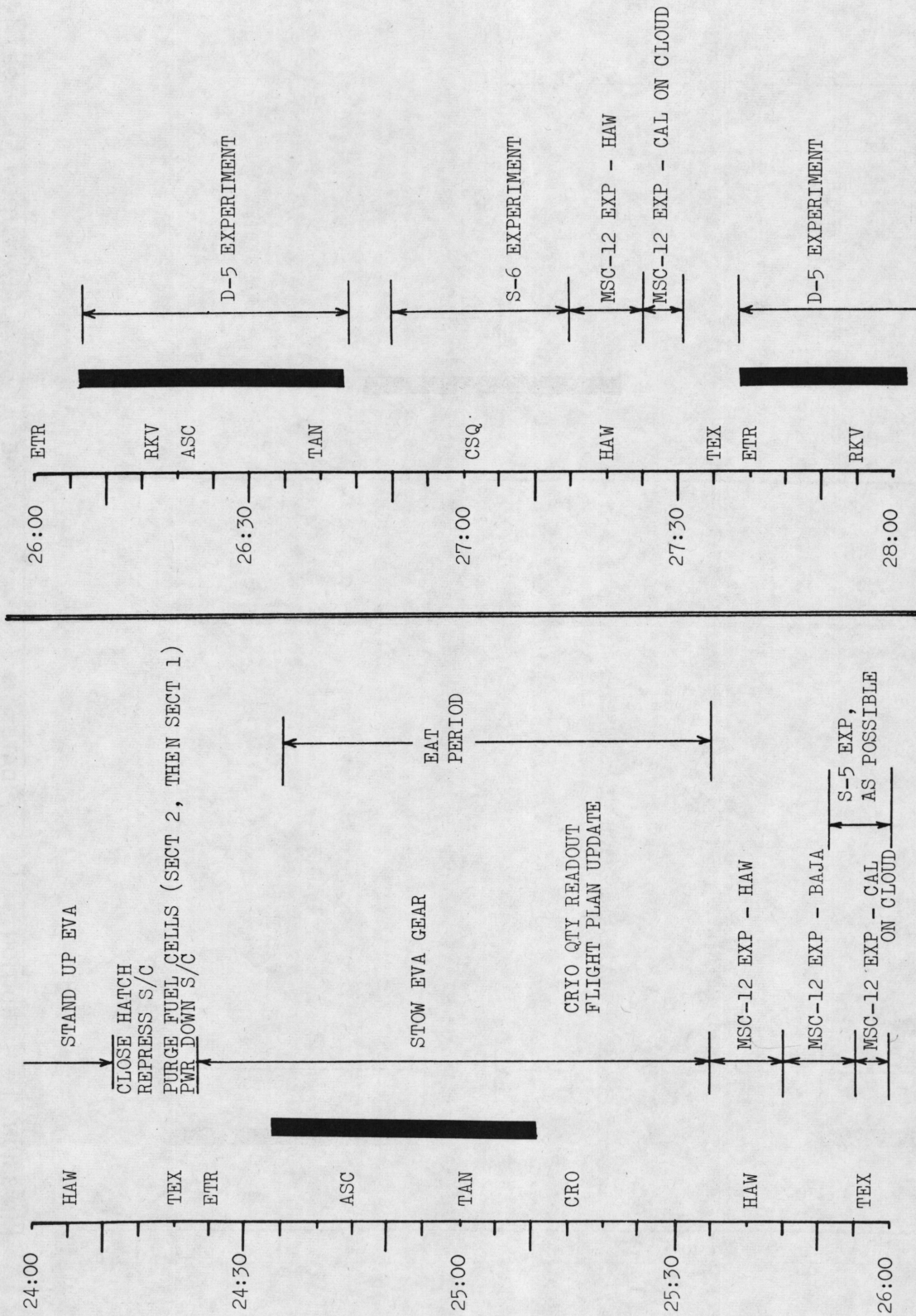
CREW STATUS REPORT
PURGE FUEL CELLS (SECT 1, THEN SECT 2)

MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	16:00 to 20:00		5

FLIGHT PLAN

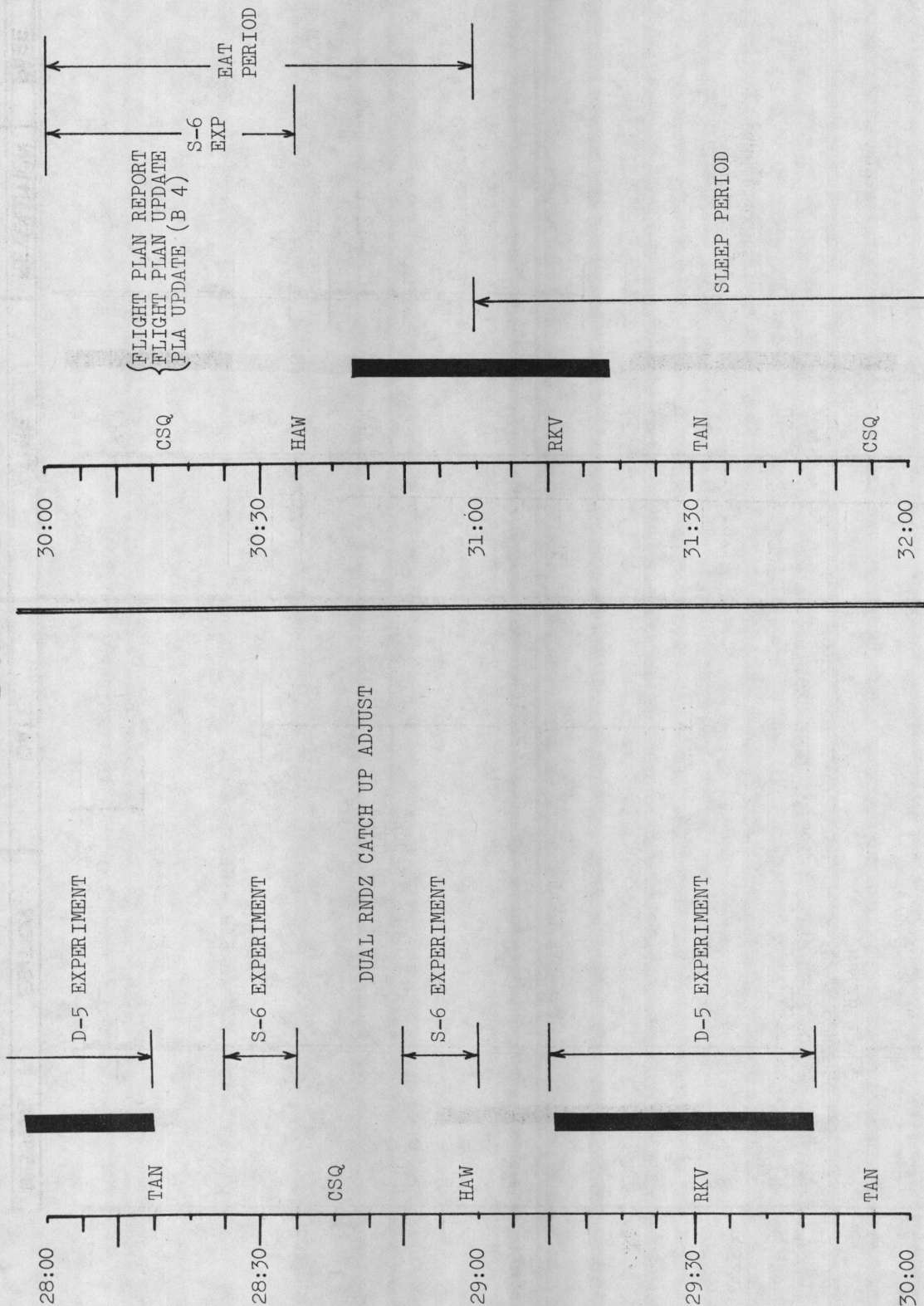


FLIGHT PLAN



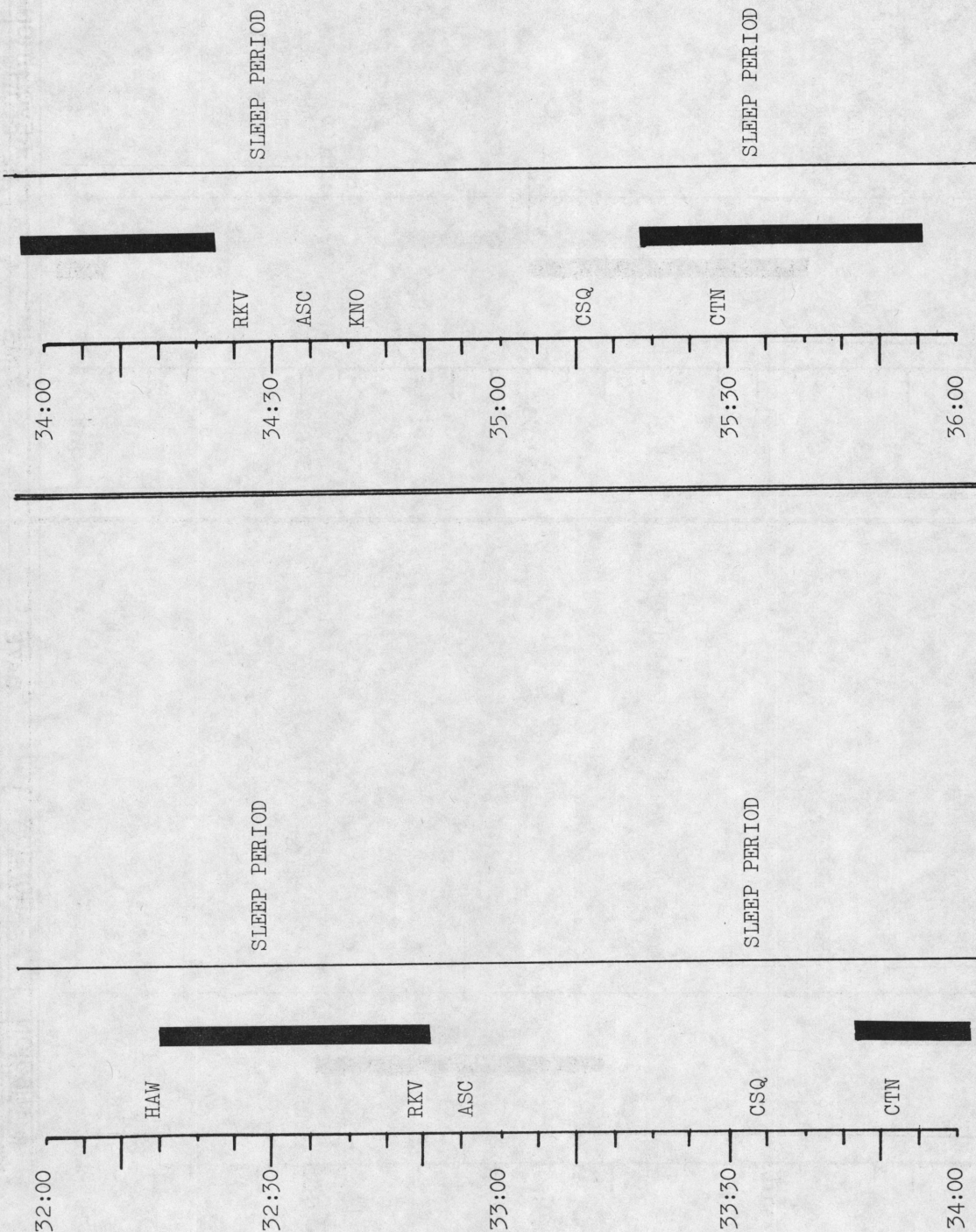
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	24:00 to 28:00		7

FLIGHT PLAN



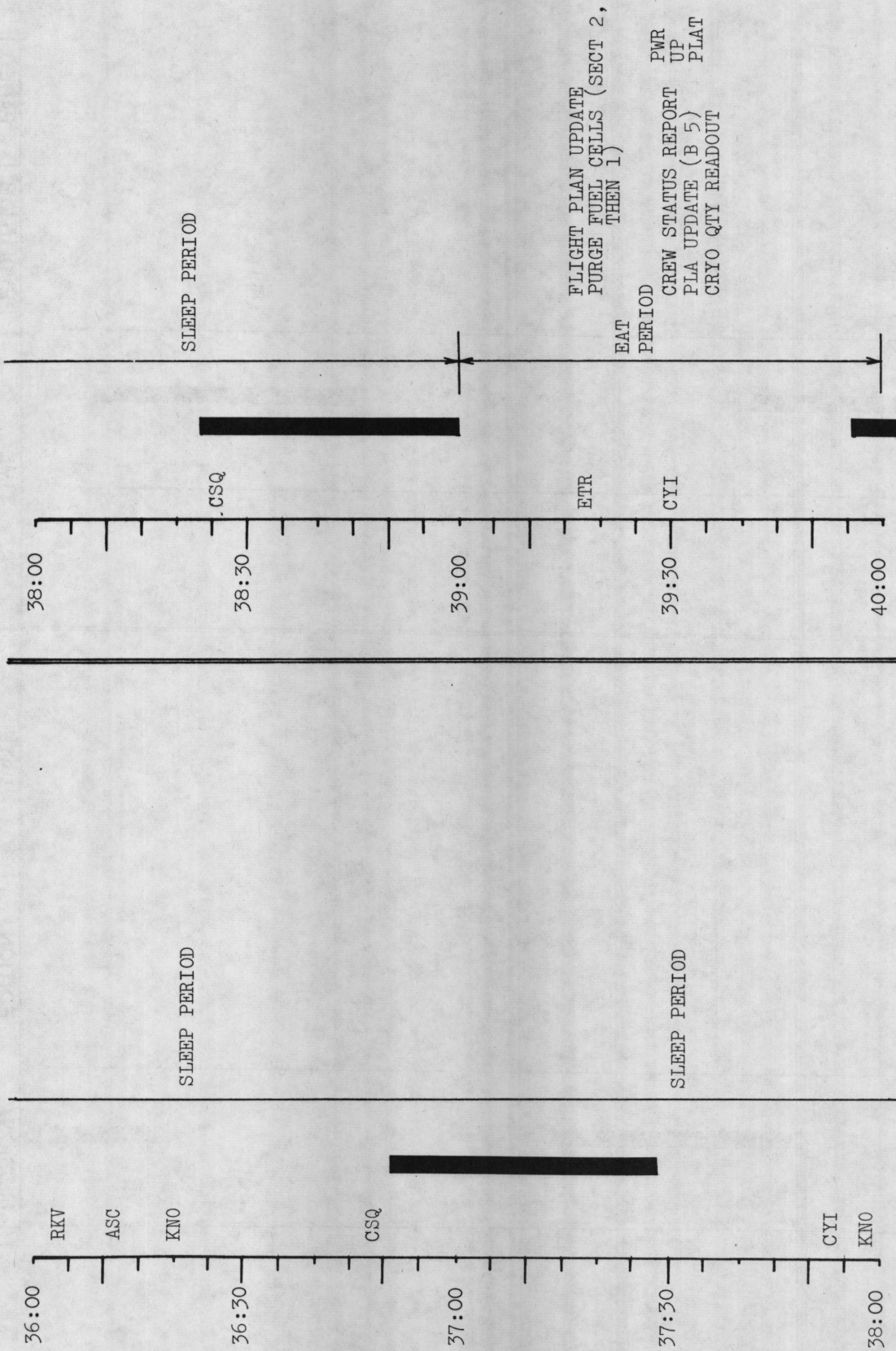
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	28:00 to 32:00		8

FLIGHT PLAN



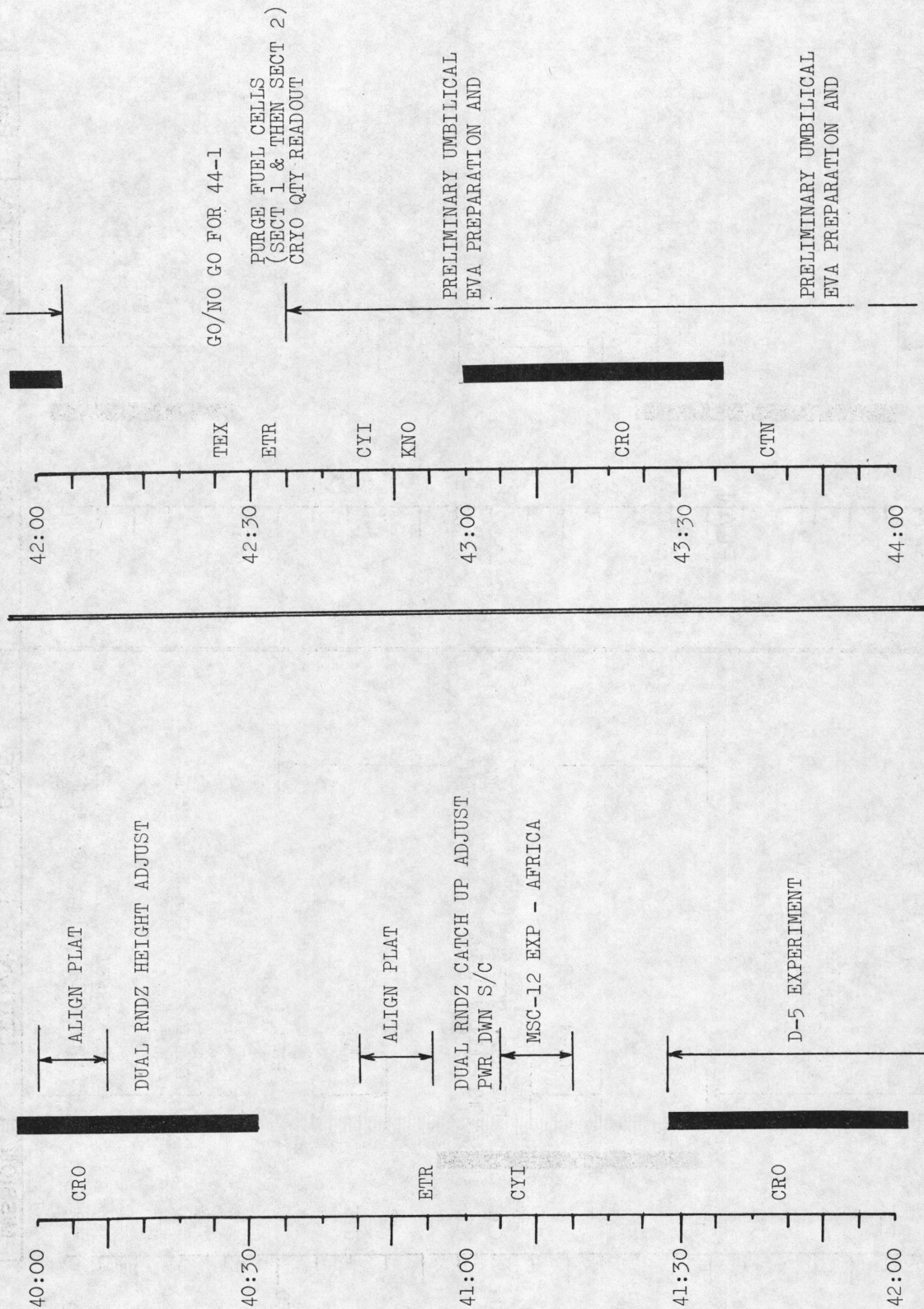
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	32:00 to 36:00		9

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	36:00 to 40:00		10

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	40:00 to 44:00		11

FLIGHT PLAN

44:00
TEX
ETR
CYI
KNO
TAN
CRO
CTN
45:00
TEX
ETR
CYI
46:00

PWR UP PLAT

PRELIMINARY UMBILICAL
EVA PREPARATION AND

ALIGN PLAT
DUAL RNDZ CORRECTIVE
COMBINATION ADJUST
EAT
PERIOD

ALIGN PLAT

DUAL RNDZ N SR

TRACK @ 7° PITCH & OBSERVE
FOR TARGET

WHEN TARGET IS ACQUIRED, READOUT
PITCH ANGLE EVERY 60 SECONDS.

46:00
KNO
TAN
CRO
CTN
HAW
TEX
ETR
47:30
TAN
48:00

DUAL RNDZ UPDATE

ORBIT RATE COMPENSATION VECTOR
BACKUP DUAL RNDZ UPDATE
PURGE FUEL CELLS (SECT 1, THEN 2)
CRYO QTY READOUT

ALIGN PLAT

ACQUIRE TARGET

DUAL RNDZ TPI

1ST MIDCOURSE CORRECTION

2ND MIDCOURSE CORRECTION

FLY FORMATION @ 60 FEET

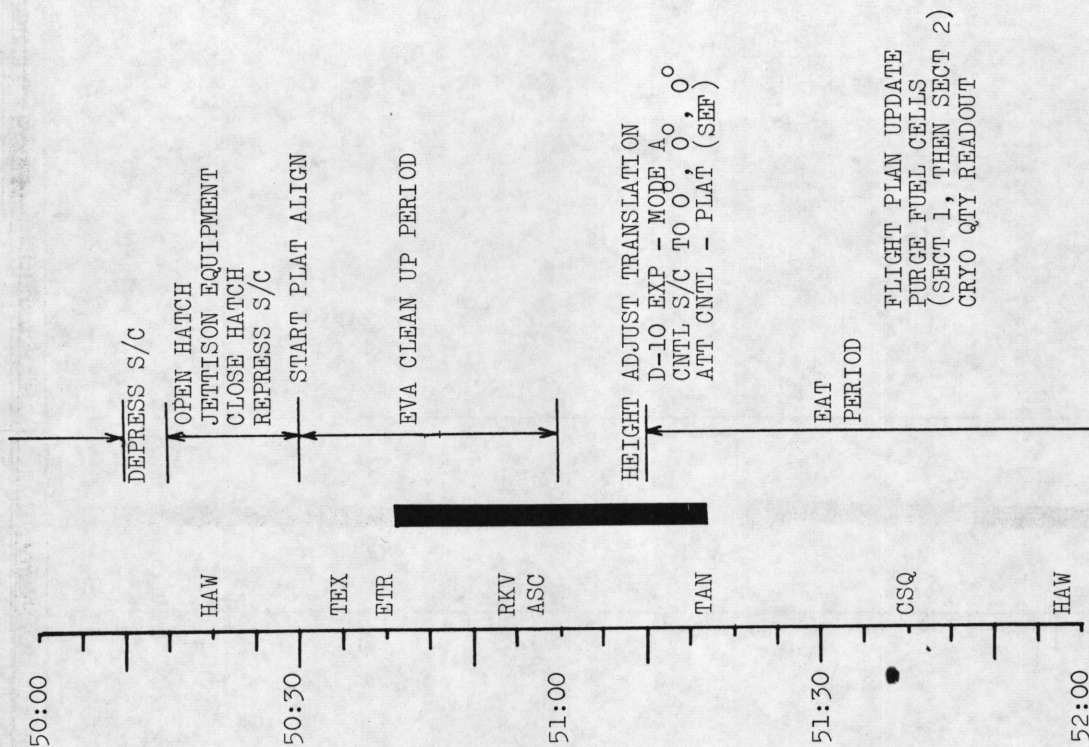
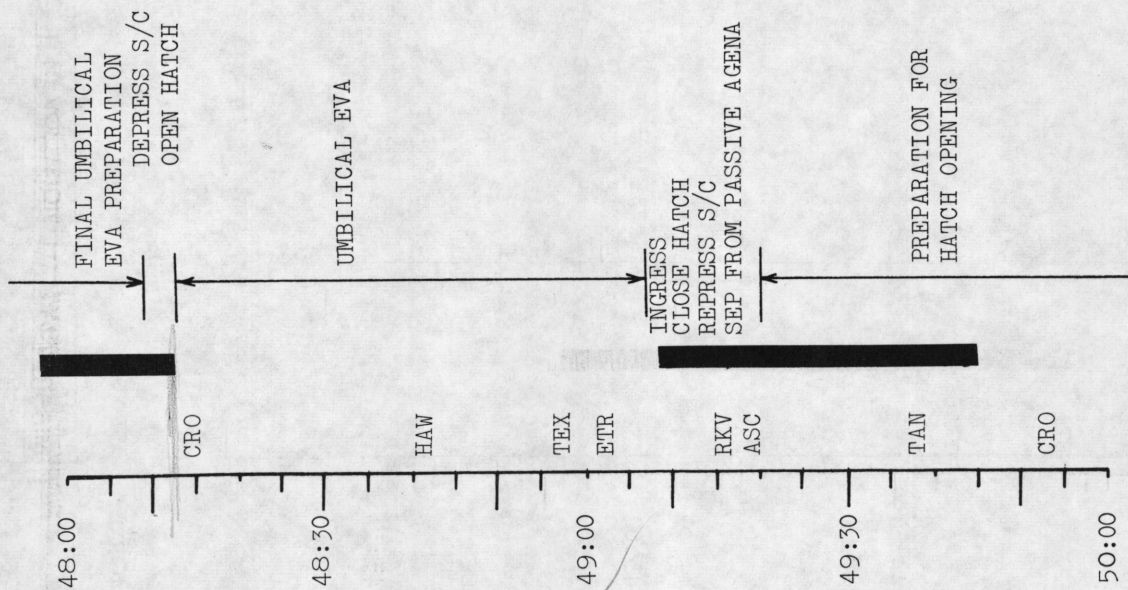
FINAL UMBILICAL
EVA PREPARATION

MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	44:00 to 48:00		12

55-
48:13
47:36
37

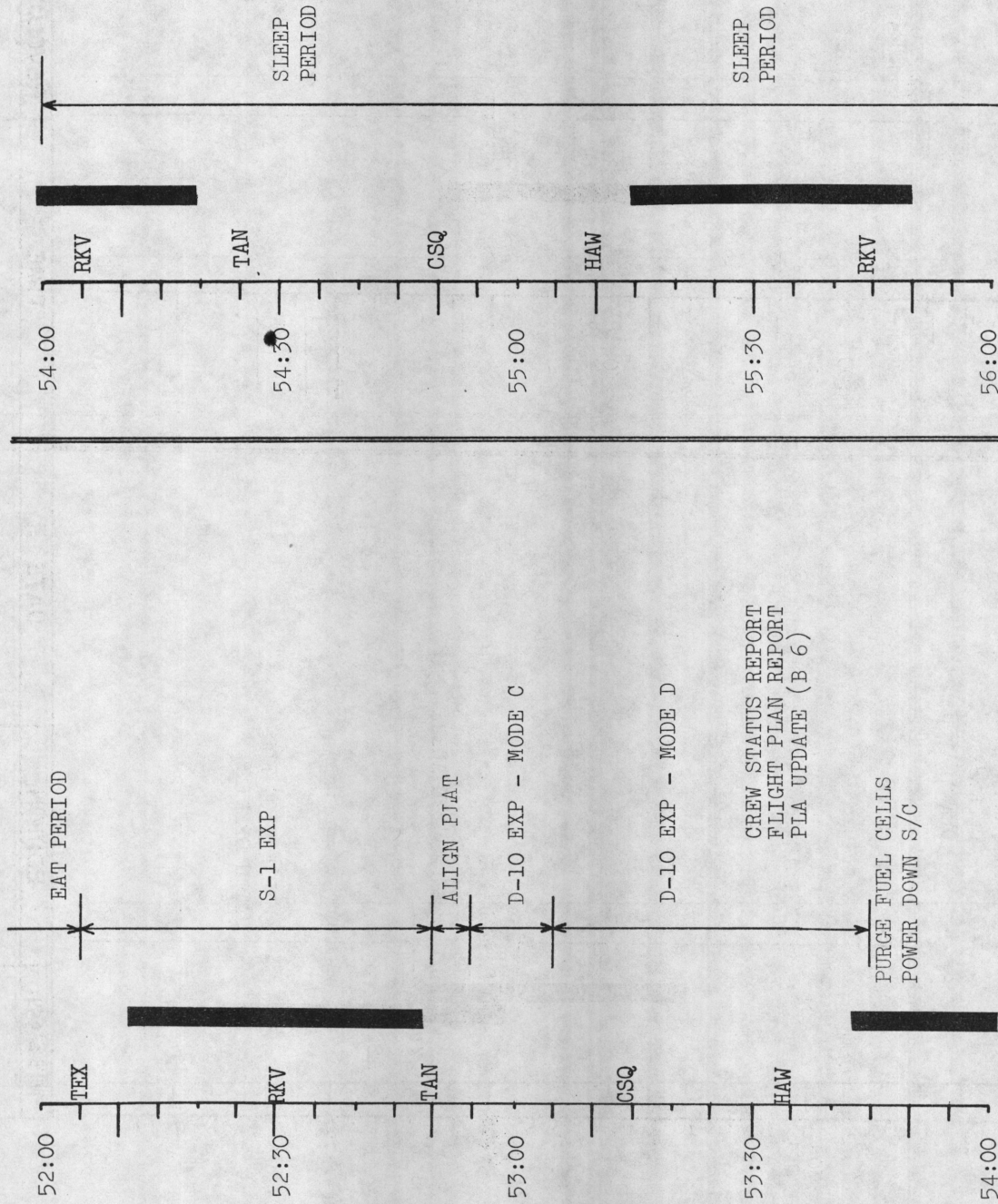
47:57
Stationary

FLIGHT PLAN



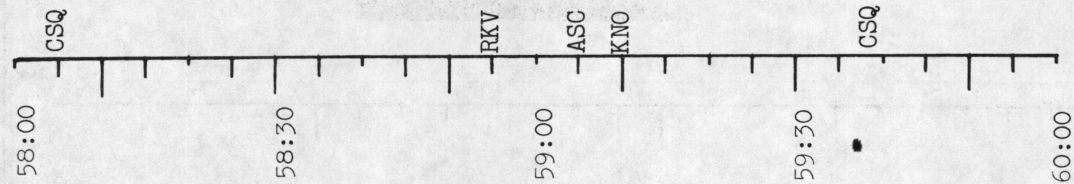
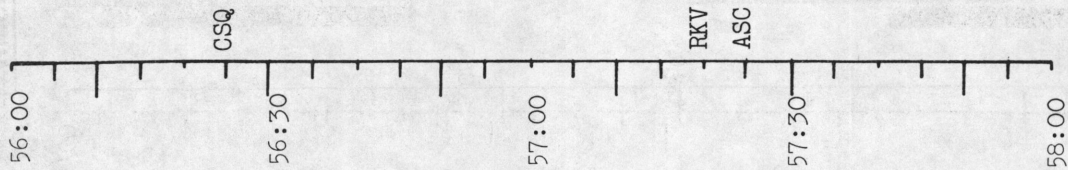
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	48:00 to 52:00		13

FLIGHT PLAN



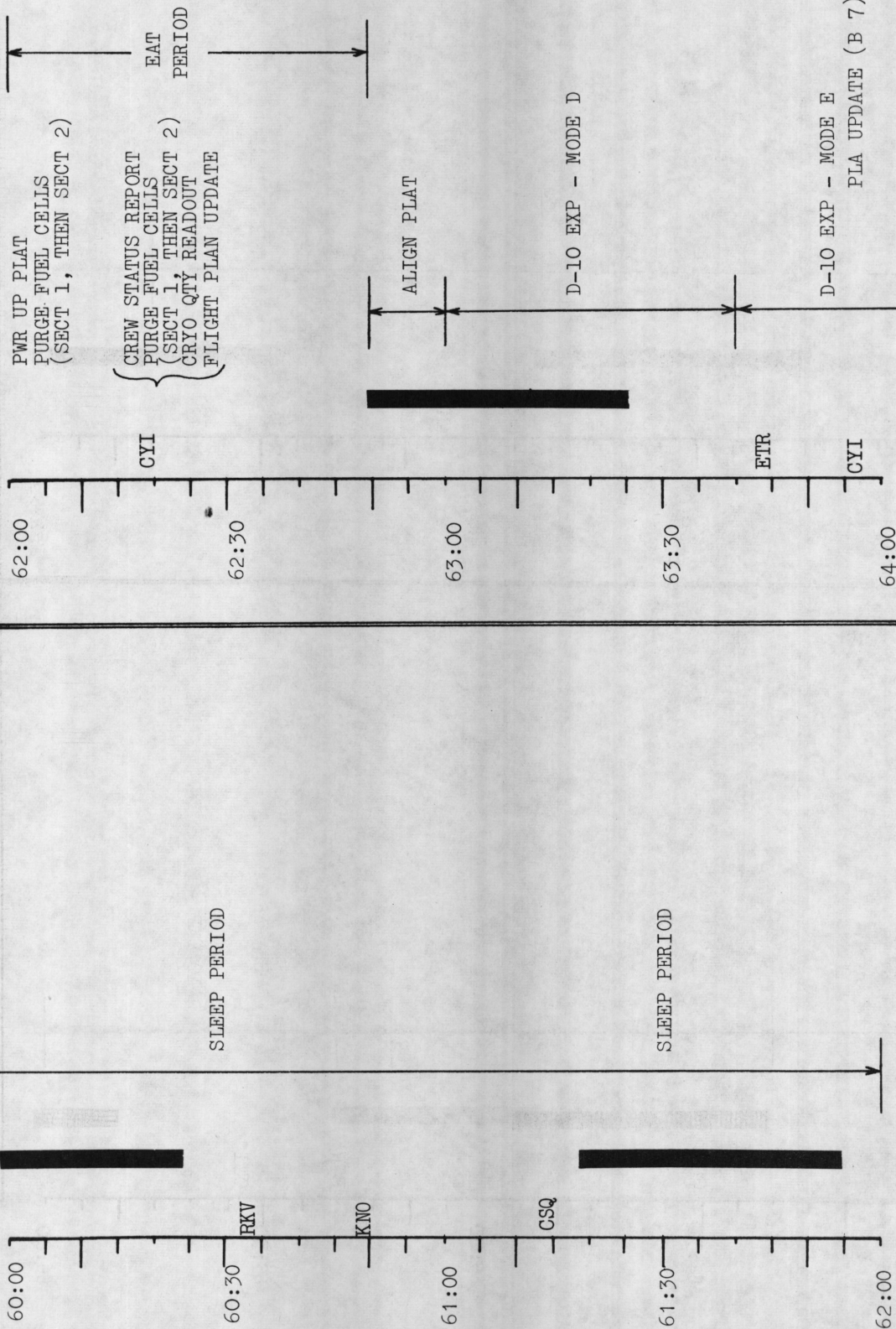
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	52:00 to 56:00		14

FLIGHT PLAN



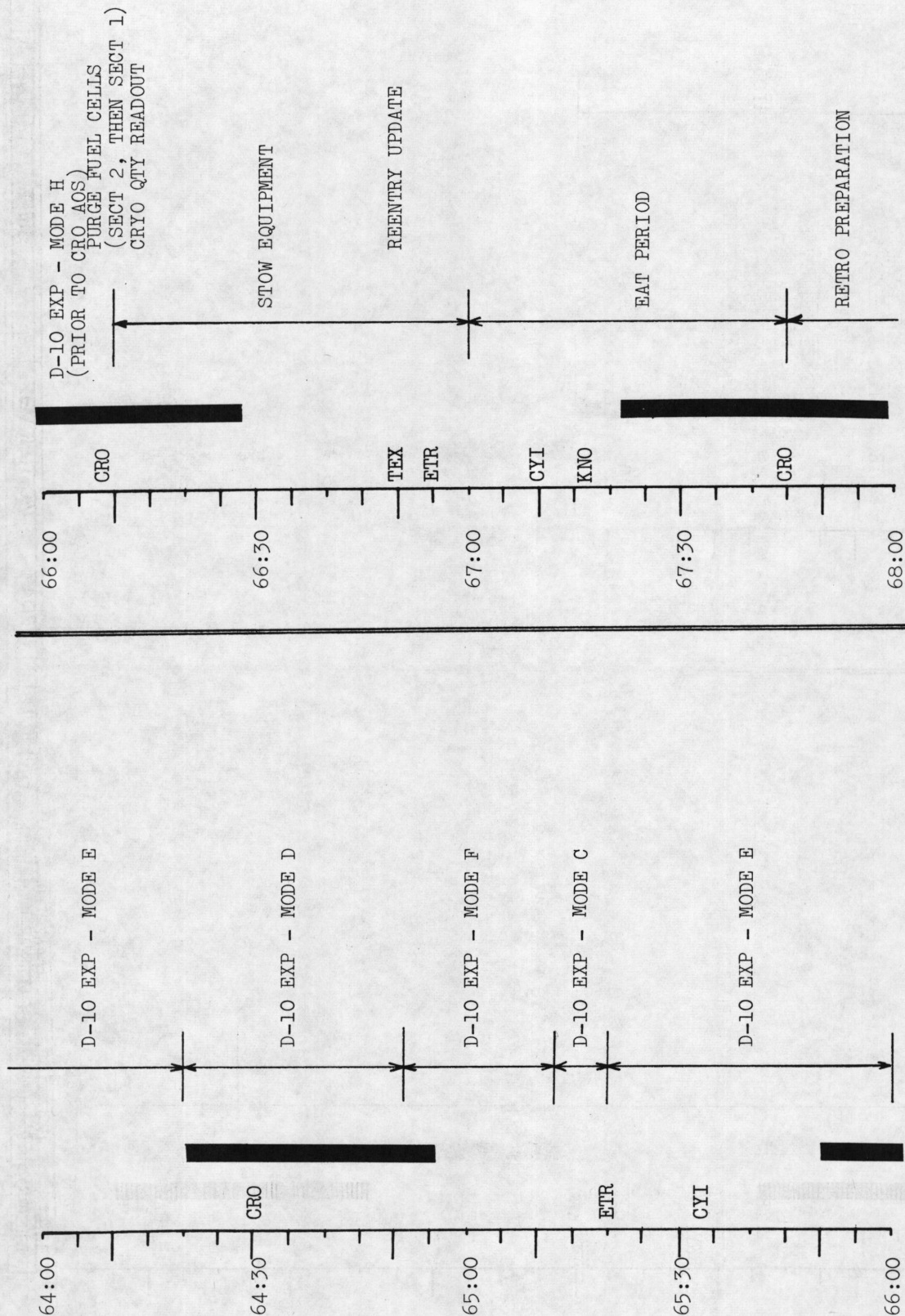
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	56:00 to 60:00		15

FLIGHT PLAN



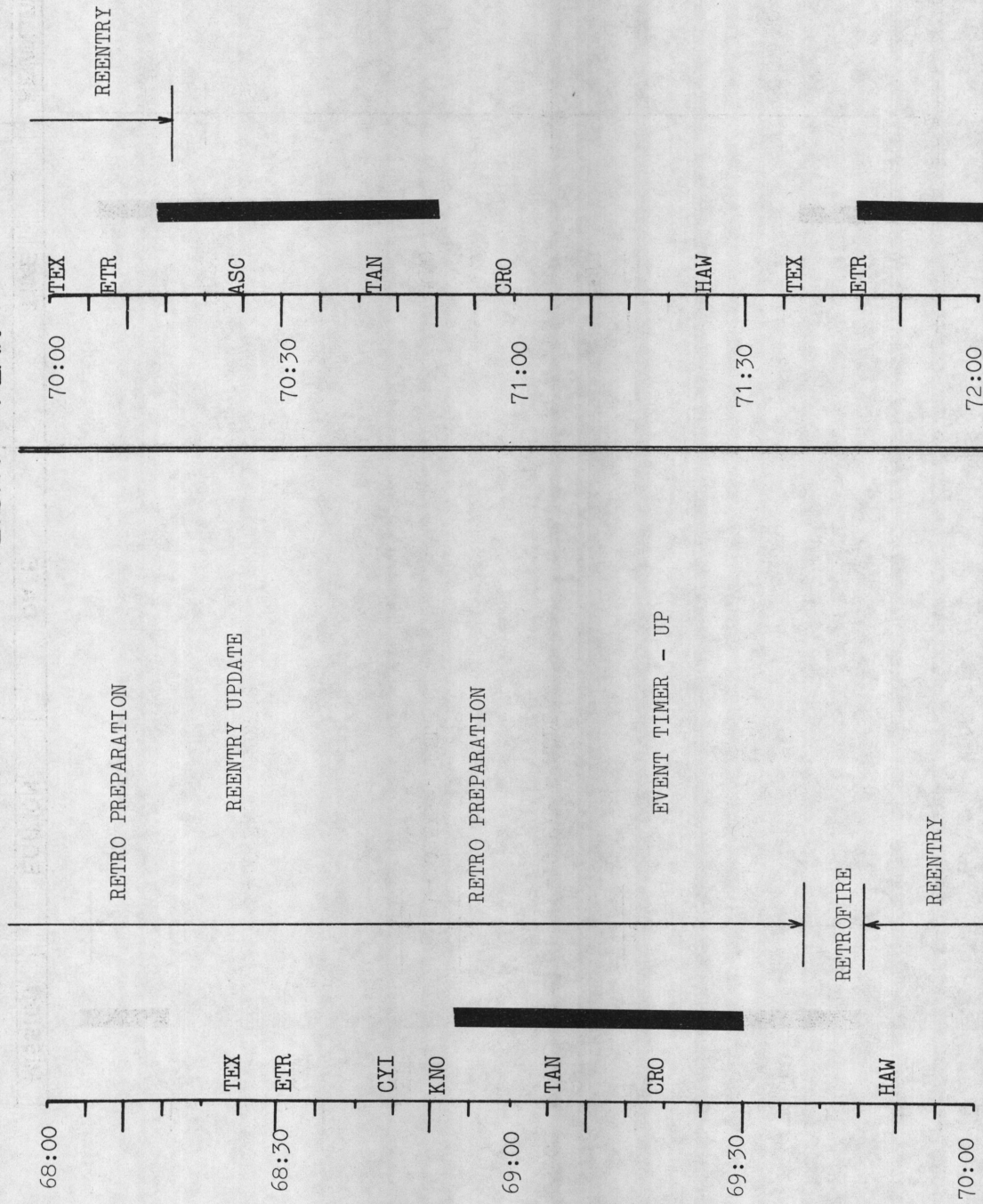
MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	60:00 to 64:00		16

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	64:00 to 68:00		17

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	REVOLUTION	PAGE
Gemini X	Final	June 22, 1966	68:00 to 72:00		18