



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

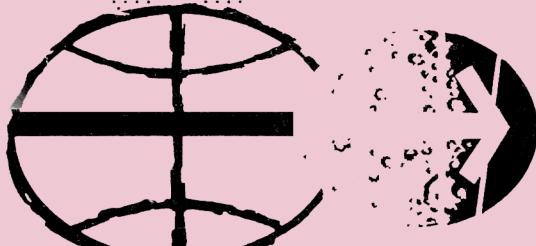
REVISION A

Apollo 13 Flight Plan

AS-508/CSM-109/LM-7

MARCH 27, 1970

FLIGHT PLANNING BRANCH
FLIGHT CREW SUPPORT DIVISION



MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

UNITED STATES GOVERNMENT

Memorandum

TO : Distribution

DATE: MAR 23 1970

FROM : CF/Chief, Flight Crew Support Division

In reply refer to:
CF62-70M-089

SUBJECT: Revision A to the Apollo 13 Final Flight Plan

Enclosed is Revision A to the Apollo 13 Final Flight Plan. Revision A includes:

- a. Pen and ink changes to be made on indicated pages
- b. Pages to be inserted in place of original pages
- c. Attitude illustration pages to be inserted in section 3

297100
Warren J. North

Enclosure

CF62:TRLindsey:avg 3-24-70



5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

APOLLO FLIGHT DATA FILE

ORIGINAL 3/16/70

REVISION A 3/27/70

LIST OF EFFECTIVE PAGES

* INDICATES CURRENT CHANGES

PAGE NUMBER	ISSUE
i thru xx	Original
1-1 thru 1-25	Original
2-1 thru 2-4	Original
3i thru 3-54A	Original
*3-54B	Revision A
3-55 thru 3-56	Original
*3-56A	Revision A
3-57 thru 3-57A	Original
*3-57B	Revision A
3-58	Original
*3-58A	Revision A
3-59 thru 3-60	Original
*3-60A thru 3-60B	Revision A
3-61 thru 3-69	Original
*3-69A thru 3-69B	Revision A
3-70 thru 3-72	Original
*3-72A thru 3-72B	Revision A
3-73 thru 3-74A	Original
*3-74B	Revision A
3-75 thru 3-76	Original
*3-76A thru 3-76C	Revision A
3-77 thru 3-78A	Original
*3-78B	Revision A
3-79 thru 3-80B	Original
*3-80C	Revision A
3-81 thru 3-82B	Original
*3-82C	Revision A
3-83 thru 3-84A	Original
*3-84B	Revision A
3-85 thru 3-86	Original
*3-86AA	Revision A
3-86A thru 3-88	Original
*3-88A	Revision A
3-89 thru 3-95A	Original
*3-95B	Revision A
3-96 thru 3-97A	Original
*3-97B	Revision A
3-98 thru 3-99	Original
*3-99A	Revision A

3-100 thru 3-102A	Original
*3-102B	Revision A
3-103 thru 3-103A	Original
*3-104 thru 3-105	Revision A
3-106 thru 3-107	Original
*3-107A thru 3-107B	Revision A
3-108 thru 3-109	Original
*3-109A thru 3-109B	Revision A
3-110 thru 3-111	Original
*3-111A	Revision A
3-112 thru 3-113	Original
*3-113A	Revision A
3-114 thru 3-117	Original
*3-117A	Revision A
3-118 thru 3-119	Original
*3-119B	Revision A
3-120 thru 3-122	Original
*3-122A thru 3-122B	Revision A
3-123 thru 3-126	Original
*3-126AA	Revision A
3-126A	Original
*3-126B	Revision A
3-127 thru 3-128A	Original
*3-128B	Revision A
3-129 thru 3-130	Original
*3-130A	Revision A
3-131 thru 3-192	Original
4-1 thru 4-32	Original
5-1 thru 5-10	Original
6-1 thru 6-3	Original

Make the following pen and ink changes to the Final Apollo 13 Flight Plan dated March 16, 1970.

- Pg. 1-5 Paragraph 6, line 7 as reads "pitched up 20°" change to read "pitched up 90°".
- Pg. 1-14 Add on first blank line of TV schedule:
"Saturday, Apr. 11, 2:49 pm, 01:36, 05 min, EARTH SURFACE,
CSM/S-IVB, MILA". Change Note at bottom of page to read
"**Approval received for Satellite time".
- Pg. 1-17 Line 6, change MCC-4 Refsmmat to "PTC".
- Pg. 1-22 Line 3, change 13-1 Altitude to -00.279; at bottom of page, change Mean Lunar Radius to "1738.09 KM".
- Pg. 1-24 In set TLC-1 (06:00), change 3rd Star (76) to read "125/EFH EPSILON SCORPII". In set TLC-2 (31:00), change 3rd Star (42) to read "212/EFH DELTA SAGITTARI". In set TLC-2 (31:00), change 4th Star (45) to read "44/ENH ENIF".
- Pg. 3-2 At 01:35, add "TV (MILA) 01:36 to 01:41".
- Pg. 3-3 At 02:45, MCC-H Column, add "DUMP DSE". At 02:55, fill in "OMNI C".
- Pg. 3-4 At 03:00, change DAP LOAD to read (11103, 11111).
- Pg. 3-4 At 03:10, fill in "HGA P -5, Y 297".
- Pg. 3-5 At 04:05, fill in "OMNI D".
At 04:25, add HGA P -10, Y 350.
At 04:35, delete "SECURE HGA . . .".
- Pg. 3-6 At 05:55, add "SECURE HGA, HGA TRACK-MAN, HGA Pitch -52, HGA Yaw 270".
- Pg. 3-7 At 06:00, fill in "OMNI B".
At 06:10, delete "OMNI ".
At 06:33, change 3rd Star (76) to read:
"3. STAR 125 EFH (R3 00120) EPSILON SCORPII
N88: (R1 -12736)(R2 -39323)(R3 -28133)".
- Pg. 3-9 Earth Field of VIEW, change GET to "10" hrs and F.O.V. to "10°".
- Pg. 3-10 Earth Field of VIEW, change GET to "8" hrs and F.O.V. to "11°".
- Pg. 3-25 At 31:00, add OMNI B, at 31:28 change 3rd Star (42, PEACOCK) to read:
"3. STAR 212 EFH (R3 00120) DELTA SAGITTARI
N88: (R1 +03605)(R2 -43220)(R3 -24881)".

At 31:33, change 4th STAR (45) to read:
"4. STAR 44 ENH (R3 00110) ENIF".

- Pg. 3-40 At 58:00, Fill in "Roll 285, HGA P 21, Y 270".
- Pg. 3-52 At 74:20, Change Moon View ATT to "R 359, P 111, Y 320,
HGA P -43, Y 283".
- Pg. 3-55 At 77:52, in notes column, change S-IVB LUNAR IMPACT NOTE to
read "(GET 77:44) LAT 3.0°S, LONG 30.0°W".
- Pg. 3-60 At 82:00, in notes column add "NOTE" IF AUTO ACQ W/HGA
unsuccessful, acquire in Manual Mode, Wide Beamwidth. If
no comm use Omni A. At 82:04, center column, add "REPORT
DOI ATTITUDE DEVIATIONS TO MSFN".
- Pg. 3-63 At 85:12, change "Tunnel Vent Valve - LM Press" to read
"Tunnel Vent Valve - LM/CM ΔP".
- Pg. 3-73 At 99:43, CMP column, change "25 sec between marks" to read
"10 sec between marks".
- Pg. 3-74 At 100:56, CMP column, change MNVR complete time to "(101:05)".
- Pg. 3-74A Change altitude of LANDMARK 13-1 as reads -000.18 to read
"-000.28".
- Pg. 3-75 At 101:23, MCC-H column, after "UPLINK TO LM . . . DESCENT TARGET" add "LPD BIAS (IF REQ'D)". At 101:30, LMP column,
fill in "Steerable ANT P 132, Y -36".
- Pg. 3-75, 3-76 Add S/C darkness strip to LM MSFN column from 101:47:00 to
102:35:45. Terminator passage occurs at 101:42 and 102:41.
- Pg. 3-76 At 102:58, CMP column, delete "REACQUIRE MSFN V64" and add
"OMNI B".
- Pg. 3-77 At 103:54, LMP column, delete "Biomed SW-RT"; at 103:57,
MCC-H column, delete "Disable S-BD Relay"; at 103:00, MCC-H
column, delete "DUMP DSE". At 103:22, MCC-H column add
"DUMP DSE".
- Pg. 3-78 At 104:55, MCC-H column, add "Update to LM, P 22 ACQ TIME
28° ELEV". At 104:56, CMP column, add "ORBITAL SCIENCE"
and at 104:59 add "PHOTO TGT 14".
- Pg. 3-78A 13-1 P22 LDMK TRACKING PAD, delete DAC shutter speed "(1/60)".
Change 13-1 altitude as reads "-000.18" to read "-000.28".
- Pg. 3-79 At 105:00, CMP column, delete "ORBITAL SCIENCE, PHOTO TGT 14".
At 105:23, MCC-H column, delete "P22 ACQ time 28° EL". At 105:59,
CMP column, add "HGA P -6, Y 181; in MCC-H column add "DUMP DSE".
- Pg. 3-80 LM columns, delete line now showing "EQUIPMENT PREP" beginning
at 106:30, draw in new line at 106:15.

- Pg. 3-81 At 107:19, CMP column, change TOPO Attitude to "R 358, P 123, Y 359".
- Pg. 3-82 At 108:02, CMP column, after "P 018" add "OMNI D".
- Pg. 3-85 At 111:36, CMP column, after "DAC OFF . . ." add "LOAD DAP (10102) (11111)".
- Pg. 3-87 At 113:52, CMP column, change MNVR COMPLETE TIME TO "(113:54)".
At 113:56, CMP column, delete "OMNI B" add HGA P -44, Y 225.
- Pg. 3-88 LM columns, delete line now showing "PLSS RECHARGE" beginning at 114:09. Draw in new line a 114:00. Delete "EAT PERIOD" in CDR and LMP columns at 114:04. At 114:54, change "SC CONT-CMC/FREE . . ." to read "SC CONT-CMC/AUTO . . .". At 115:00, delete "SC CONT CMC/AUTO".
- Pg. 3-94 At 124:24, LM column, change "LGC PUMP CB-CLOSE" to "LCG PUMP CB-CLOSE".
- Pg. 3-97 At 127:10, MCC-H column, add "MSFN record CMP voice on DSE". At 127:12, CMP column, add "OMNI A".
- Pg. 3-98 At 128:18, across LM column, add "PERFORM THERMAL DEGRADATION TEST".
At 128:35, CMP column, change "OMNI D" to "OMNI C".
- Pg. 3-99 At 129:22, CMP column, delete "V64 ACQ MSFN".
- Pg. 3-100 At 130:33, CMP column, change "OMNI C" to "OMNI D". At 130:41, CMP column, add "OMNI A". At 130:46, CMP column, add "V64 ACQ MSFN".
- Pg. 3-101 At 131:14, CMP column, fill in R 012, P 116.8, Y 008. At 131:25, CMP column, change "OMNI C" to "OMNI A".
- Pg. 3-103A 13-1 P22 LDMK Tracking Pad, delete DAC shutter speed "(1/60)". Change 13-1 altitude as reads "-000.18" to read "-000.28".
- Pg. 3-104 At 134:30, CMP column, change "OMNI C" to "OMNI D".
- Pg. 3-106 CMP column, at 136:30, change "STOW JETTISON ITEMS" to "PACK JETTISON ITEMS".
- Pg. 3-114 At 144:21, change "OMNI D" to "OMNI C". At 144:57, add "Presleep checklist". At 144:57, add "CABIN FANS (2)-OFF; remove and stow (on A-13) Cabin Fan Lunar Dust Filter".
- Pg. 3-115 At 145:18, delete "(10111, 11111), V21N01, 3255E, 1616E".
Add V79
$$\begin{pmatrix} -0.0000 \\ +010.00 \\ +11111 \end{pmatrix}$$
- Pg. 3-119 At 153:08, delete "MNVR TO P52 ATT (153:15), R 098, P 274, Y 315".
At 153:14, change HGA to "P -5, Y 250". At 153:43, delete "OMNI A".
- Pg. 3-120 At 154:55, change P52 ATT to "R 180, P 0, Y 320, OMNI A".

- Pg. 3-121 At 155:46, as reads "MNVR TO PHOTO ATT BY", delete "BY".
- Pg. 3-122 At 156:19, delete "V64 Acquire MSFN". At 156:48, add "V64 Acquire MSFN". At 156:53, change "VISUAL TGT 16, N . . ." to read "VISUAL TGT 15, N . . .".
- Pg. 3-124 At 158:32, add "V64 Acquire MSFN". At 158:47, delete "V64 Acquire MSFN". At 158:52, change f stop for TGT 63 from "f4" to "f5.6".
- Pg. 3-126 At 160:16, add "V64 Acquire MSFN". At 160:21, MCC-H column, after "Record PCM . . . ON DSE" add "(IF NO HGA)". At 160:35, delete "V64 Acquire MSFN". At 160:50, change f stop for TGT 66 from "f4" to "f5.6".
- Pg. 3-131 At 165:50, change TV Attitude Yaw to "Y 352".
- Pg. 3-136 At 170:03, add "OMNI D".
- Pg. 3-144 At 183:00, change Optics Cal Attitude to "R 075, P 063, Y 0" and add HGA P -79, Y 290. At 183:06, change Optics Cal Star to "STAR 4 4".
- Pg. 3-145 At 184:00, after "START PTC" add "S-BD ANT-OMNI B ON MCC CUE, SECURE HGA".
- Pg. 3-148 At 187:00, add "OMNI D".
- Pg. 3-152 At 191:00, add "OMNI B".
- Pg. 3-156 At 195:00, add "OMNI D".
- Pg. 3-164 At 208:00, add "OMNI B".
- Pg. 3-168 At 212:00, add "OMNI B".
- Pg. 3-173 At 217:00, add "OMNI B".
- Pg. 3-174 At 218:22, delete "R __, P __, Y __".
- Pg. 3-176 At 220:00, add "OMNI B". At 220:54, fill in R 340, P 270, Y 0, HGA P 20, Y 270".
- Pg. 3-178 At 222:03, after "START PTC", add "S-BD ANT-OMNI B ON MCC CUE, SECURE HGA".
- Pg. 3-184 At 232:00, add "OMNI B".
- Pg. 3-187 At 235:50, fill in "R 075, P 063, Y 0, OMNI B OPTICS CAL STAR 4 4".
- Pg. 3-188 At 236:00, fill in "R 090, P 171, Y 345".
- Pg. 3-190 At 238:52, fill in "R 0, P 156, Y 0, OMNI B, VHF ANT RT".
- Pg. 3-192 At 240:35, fill in "R 0, P 156, Y 0".

CSM GNC GO CRITERIASPS

- o FU/OX TANK (W/O LEAK) - FU/OX GN₂ TANK (W/O LEAK) - 1 OF 2 (CANT CONFIRM)
- o BALL VALVE BANK - BOTH FEEDLINE TEMP >40° F
- o FU/OX ΔP<20 PSI PC>70 PSI
- o ULLAGE CAPABILITY - 1 OF 2
- o HE TANK (W/O LEAK)

SM RCS

- o HE TANK (W/O LEAK) - ALL NO LEAK BELOW ISO VLV - ALL
- o PKG TEMP > 55° - ALL
- o THRUSTERS - 3 OF 4 P & Y, 6 OF 8 R

CM RCS

- o HE TANK (W/O LEAK) - BOTH MANIFOLD (W/O LEAK) - BOTH NOT ARMED

SYSTEMS MANAGEMENT

- o START BURN ON BANK B OPEN BANK A TIG + 2-5 SECONDS

LOI INHIBIT CRITERIA

- | | |
|------------|--|
| <u>SPS</u> | o FULL CRITICAL SYSTEMS REDUNDANCY |
| | o ADEQUATE CONSUMABLES FOR MIN LO OPS, CAPABILITY TO SUSTAIN TANK LOSS AND RETURN TO EARTH WITH AVG POWER LEVEL OF 40 AMPS |
| | o SPS PRPLNT RESERVE FOR TEI AND TEC MCC'S |
| | o RCS PRPLNT RESERVE FOR TEI AND TEC CONTROL, PTC, AND MIN LUNAR ORBIT OPERATIONS |
| | o DPS LOI IF REQUIRED TO ACCOMPLISH A LUNAR ORBIT OPERATION |

CSM GNC GO CRITERIA
GNCSS/SCS

- | | |
|---|--------------------------------|
| o | 3 - AXIS AUTO ATTITUDE CONTROL |
| o | 3 - AXIS RATE DAMPING |
| o | 3 - AXIS DIRECT RCS |
| o | BMAGS P, Y -- 1 OF 2 |
| o | BMAGS R -- 1 OF 2 |
| o | FDAI -- 1 OF 2 |
| o | CMC, ISS, OSS, OPTICS DAC |
| o | TVC SERVO LOOP -- BOTH |
| o | DSKY -- 1 OF 2 |

FLIGHT PLAN

LOI BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 10 SEC	DO NOT TRIM

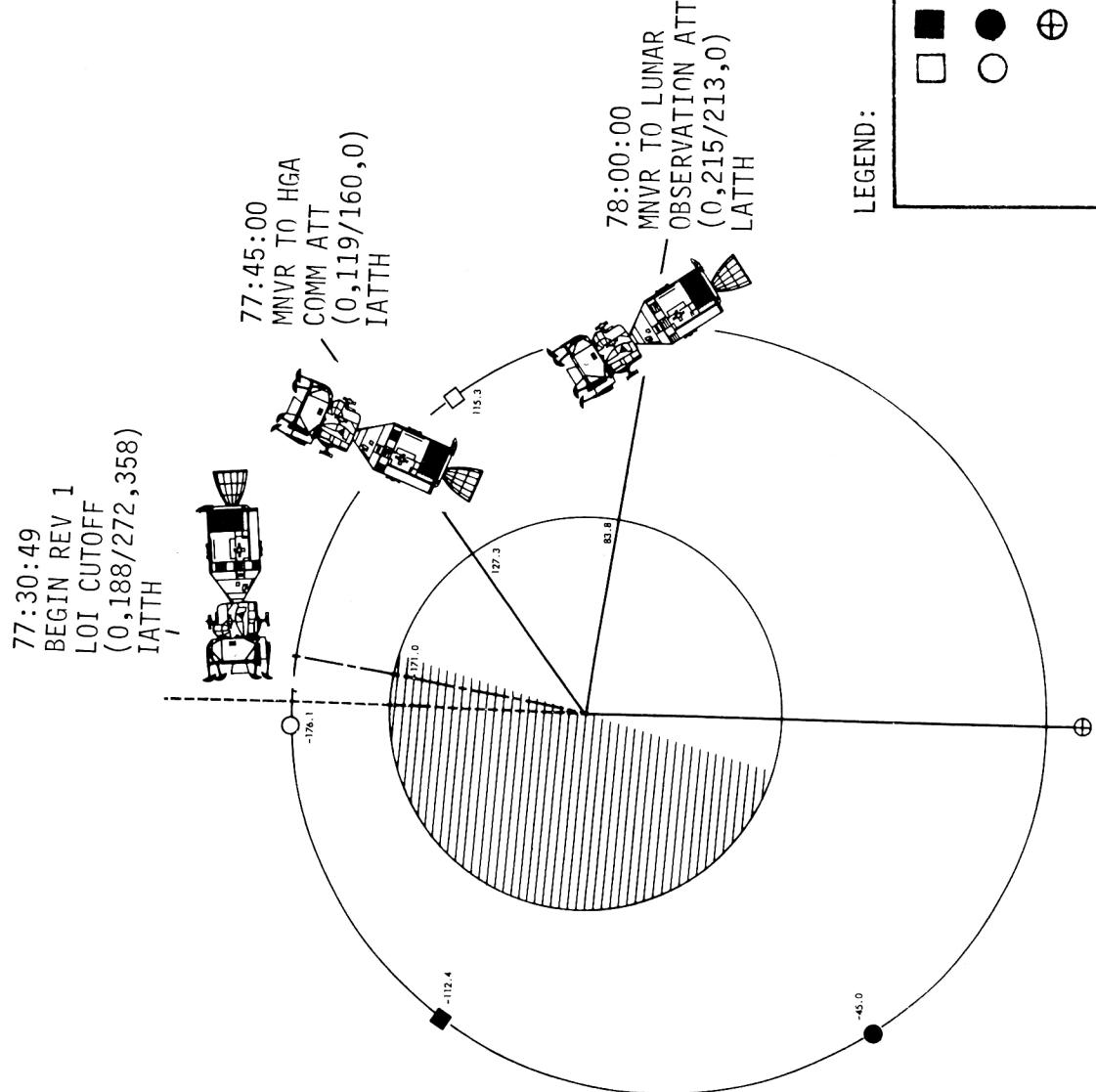
TABLE 3-6
LOI ABORT TABLE

MODE I (DPS ONLY)	MODE II (DPS ONLY)	MODE III (DPS ONLY)	TIGHT SPS LIMITS FUEL - OXID DELTA P GREATER THAN 20 PSI CONFIRMED BY LOW PC PROP TANK PRESS LESS THAN 160 PSI CONFIRMED BY LOW PC PC LESS THAN 80 PSI OR DECAYS 10 PSI DURING THE BURN ANY BALL VALVE FAILS TO OPERATE, OR CLOSES PREMATURELY, SHUT DOWN THE GOOD BANK AND (A) IF THRUST CEASES- ABORT (B) IF THRUST CONTINUES- REENABLE BOTH BANKS AND CONTINUE
0-1 MIN 45 SEC ΔV_m 0-750 (TIGHT)	1 MIN 45 SEC TO 2 MIN 50 SEC ΔV_m 750-1245 (LOOSE)	2 MIN 50 SEC TO 3 MIN 50 SEC ΔV_m 1245-1700 (LOOSE)	NOTE: IF THE FIRST BANK SELECTED FAILS TO OPERATE UNDER G & N CONTROL, ATTEMPT TO START THAT BANK UNDER SCS CONTROL. IF THE BANK STARTS UNDER SCS CONTROL, CONTINUE THE BURN AND EVALUATE G & N STEERING. IF THE BANK FAILS TO START UNDER SCS CONTROL, INHIBIT LOI.
LOI + 2 HR. MCC-H TARGET OR CREW CHART (NO COMM)	DPS ₁ @ LOI + 2 HR DPS ₂ @ LOI + 1 REV MCC-H TARGET	DPS @ LOI + 1 REV MCC-H TARGET	LOOSE SPS LIMITS PC LESS THAN 70 PSI CONFIRMED BY OTHER CUES PROP TANK PRESS LESS THAN 115 PSI CONFIRMED BY LOW PC

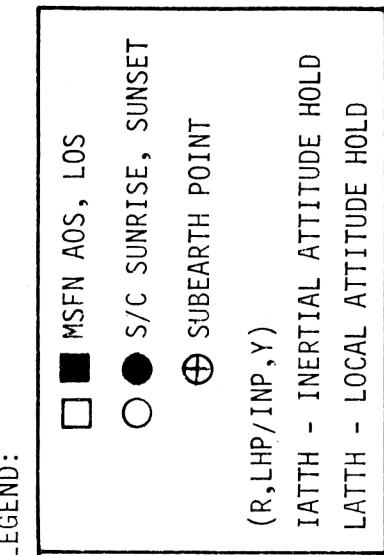
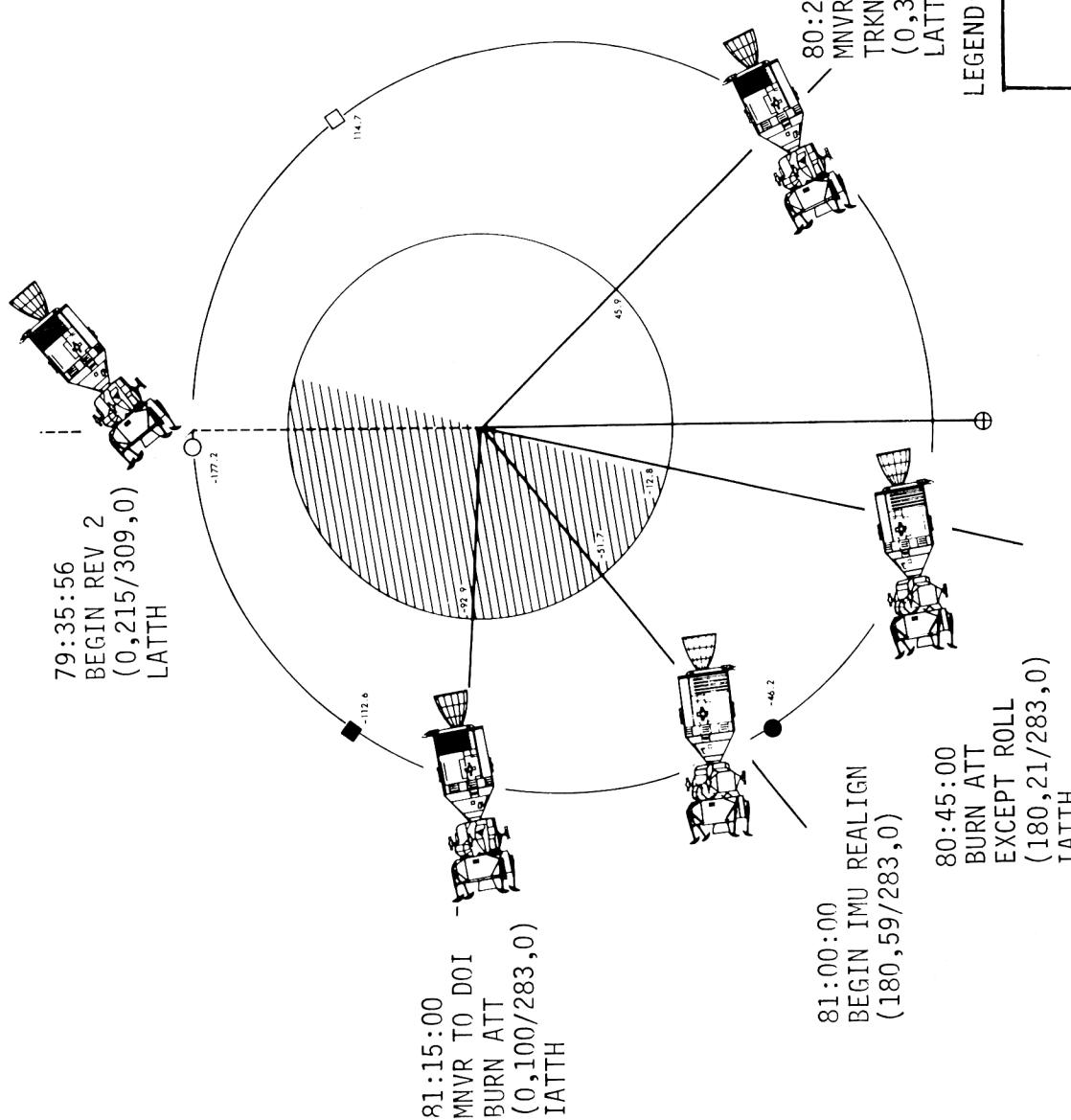
TABLE 3-7

TIGHT SPS LIMITS FUEL - OXID DELTA P GREATER THAN 20 PSI CONFIRMED BY LOW PC PROP TANK PRESS LESS THAN 160 PSI CONFIRMED BY LOW PC PC LESS THAN 80 PSI OR DECAYS 10 PSI DURING THE BURN ANY BALL VALVE FAILS TO OPERATE, OR CLOSES PREMATURELY, SHUT DOWN THE GOOD BANK AND (A) IF THRUST CEASES- ABORT (B) IF THRUST CONTINUES- REENABLE BOTH BANKS AND CONTINUE	PHYSIOLOGICAL INDICATIONS OF ERRATIC ENGINE PERFORMANCE (VIBRATION, POPPING, ETC.)
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REV 1



REV 2

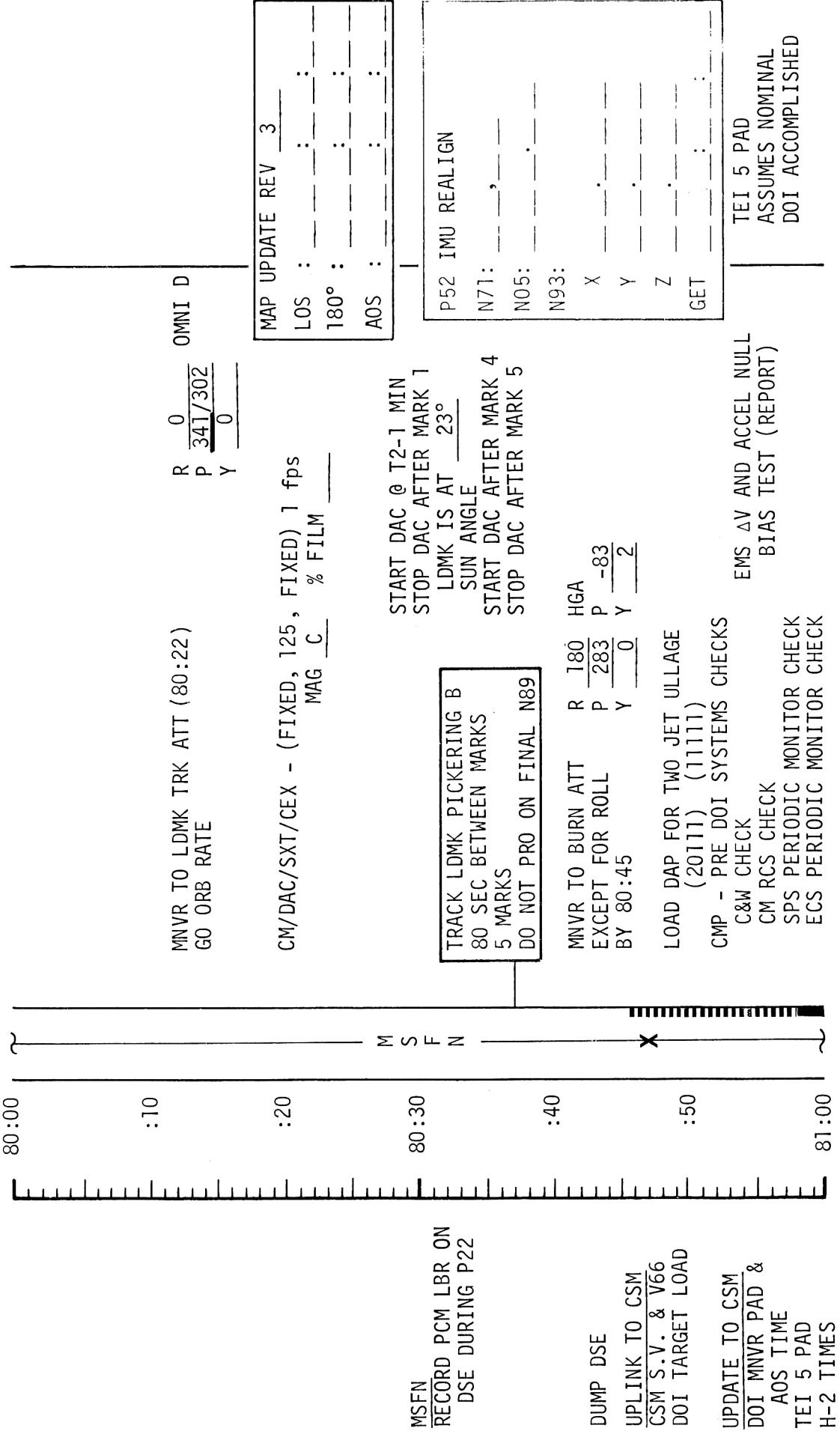


3-57B

REVISION A

MCC-H**FLIGHT PLAN**

2113 CST

NOTES

FLIGHT PLAN

DOI
BURN TABLE

P OR Y RATES	ATT DEVIATIONS	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+ 10° TAKEOVER	BT + 1 SEC	TRIM X TO WITHIN 1 FPS * DO NOT TRIM Y & Z

*IF OVERBURN IS >2.2 FPS PITCH 180 AND TRIM RCS IF <10 , SPS IF ≥ 10 .

AT AOS AFTER DOI, THE REQUIREMENT FOR THE BAILOUT MANEUVER WILL BE DETERMINED BY EVALUATION OF THE THREE TRAJECTORY MONITORING SOURCES. THESE SOURCES--PGNS, EMS, AND MSFN--WILL BE EXAMINED WITH THE FOLLOWING CRITERIA:

1. IF MSFN RADAR DATA IS VALID AND REASONABLE, A STAY VOTE FROM MSFN IS REQUIRED TO REMAIN IN THE LOW ORBIT.

2. IF MSFN RADAR DATA IS INVALID OR UNAVAILABLE, THE FOLLOWING CRITERIA APPLIES:

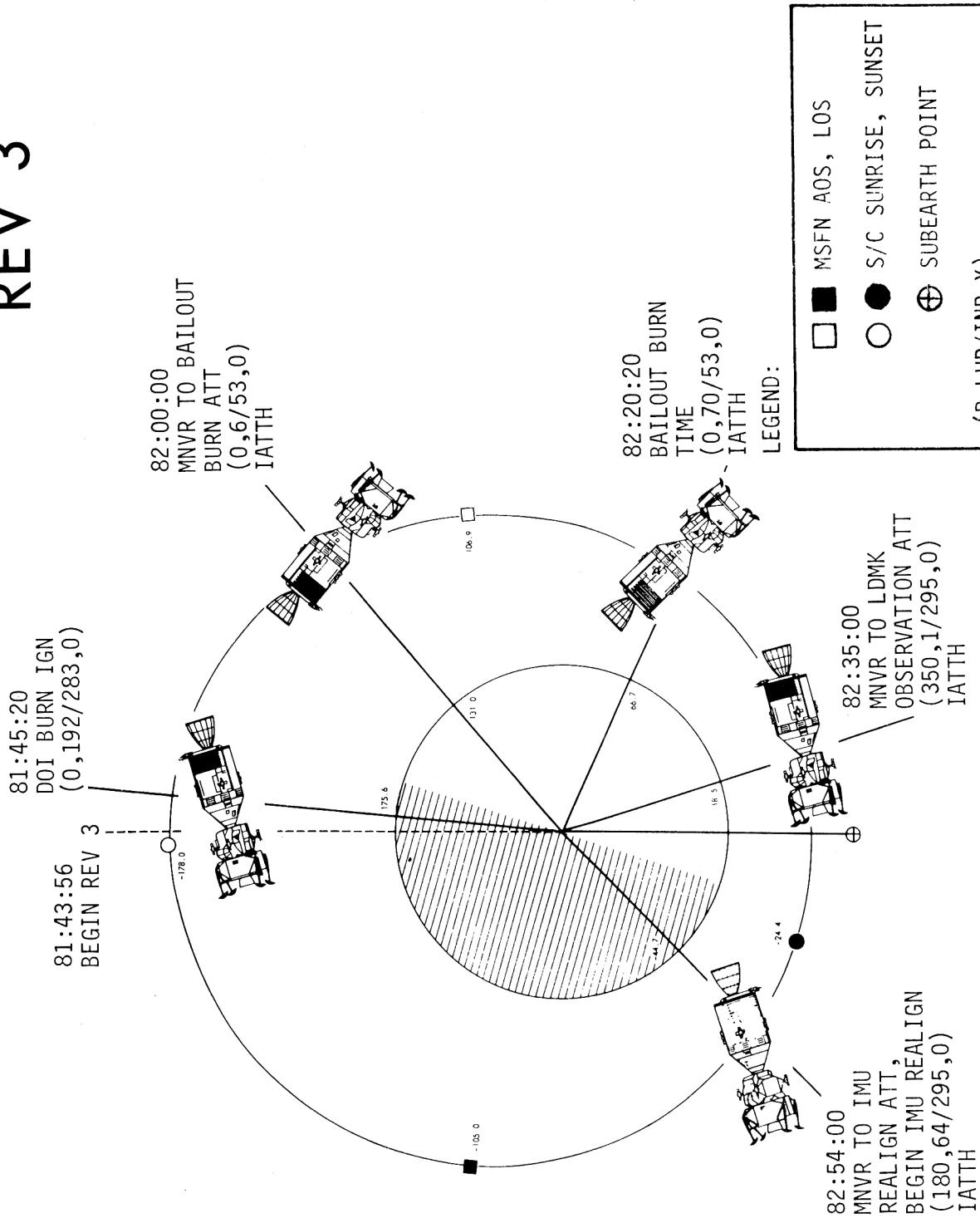
- A. 2 OUT OF 2 STAY VOTES REQUIRED TO REMAIN IN THE LOW ORBIT.
- B. 1 OF 1 STAY VOTE REQUIRED TO REMAIN IN THE LOW ORBIT.

- (1) THE EMS VOTE IS NO STAY IF THE EMS INDICATES A 12FPS OVERTSPEED AFTER TRIMMING THE PGNS.
- (2) THE MSFN VOTE IS NO STAY IF THE INCOMING RADAR DATA INDICATES CLOSEST APPROACH ALTITUDE OF EQUAL TO OR LESS THAN 1.0 N MI ABOVE THE LUNAR TERRAIN. THIS ALTITUDE CORRESPONDS TO A PERICYCNYTHION ALTITUDE OF 3.6 N MI AND DOPPLER RESIDUALS AT AOS OF -32 CYCLES PER SECOND.

TABLE 3-8
3-58A

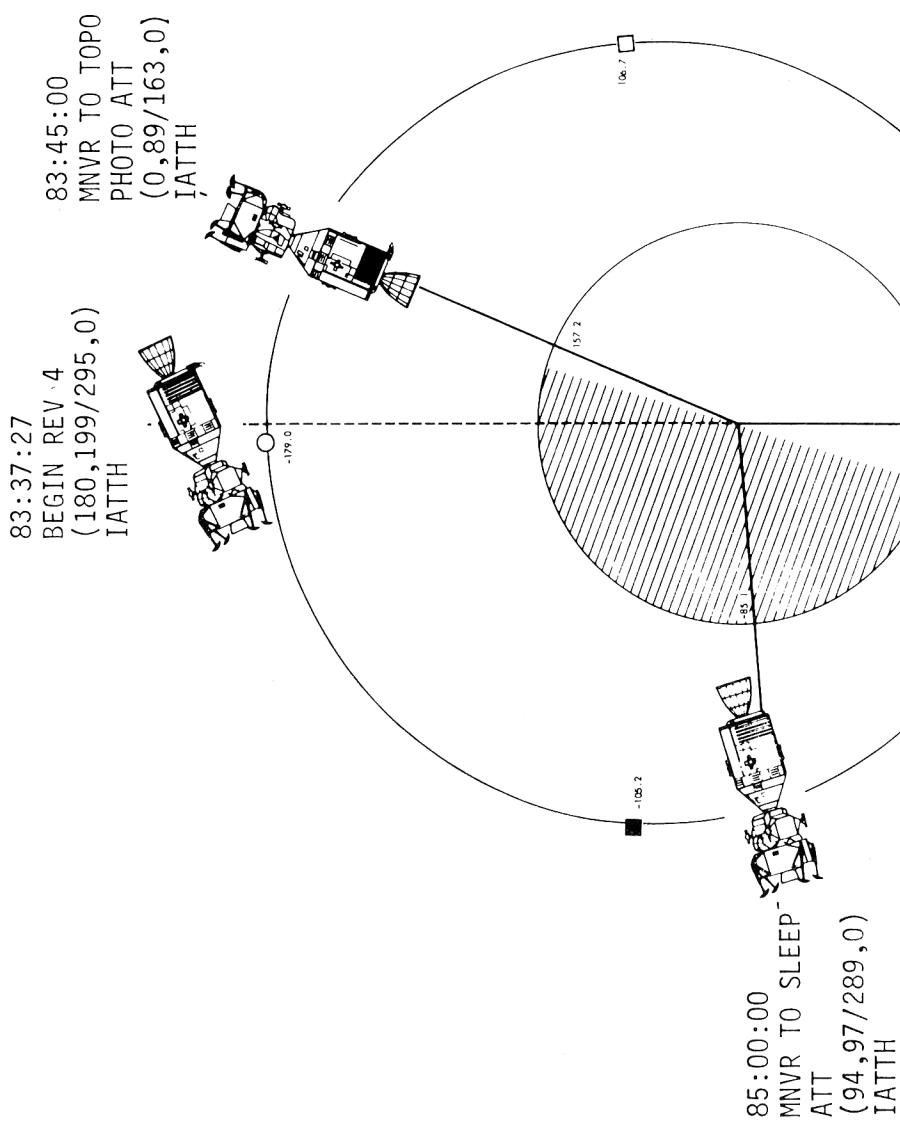
REVISION A

REV 3

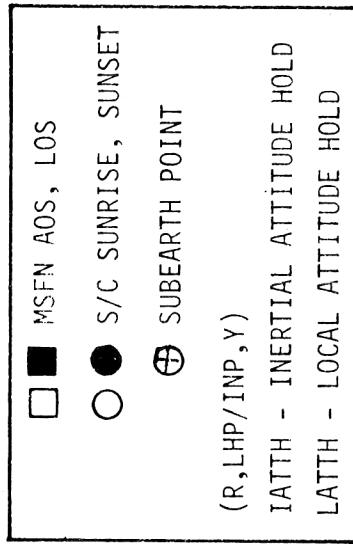


REVISION A

REV 4



LEGEND:



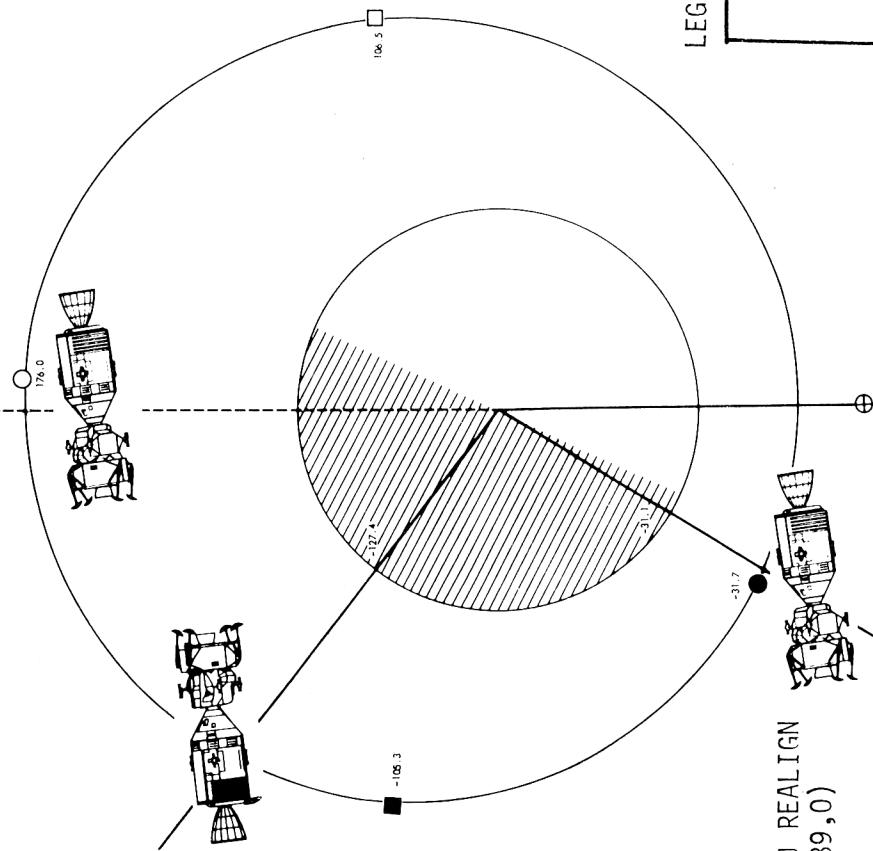
3-60B

REVISION A

REV 10

94:58:56
BEGIN REV 10
(94,187/289,0)
IATTH

96:35:00
MNVR TO AGS
CALIBRATION ATT
(8,316/113,23)
IATTH



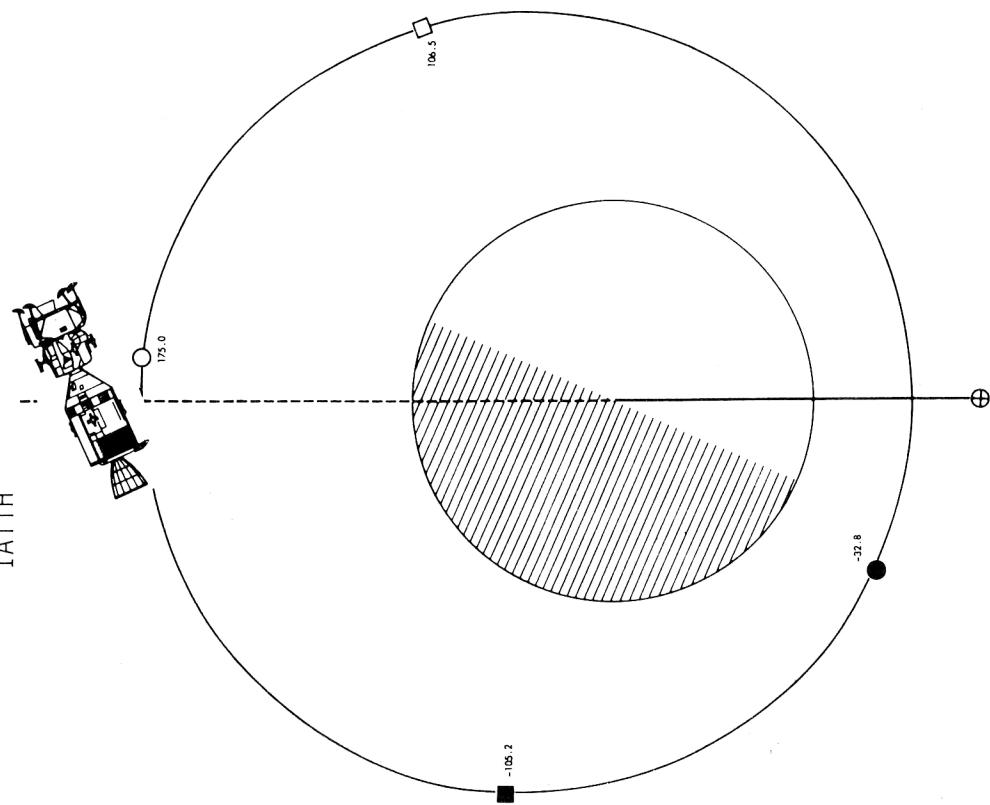
96:05:00
BEGIN IMU REALIGN
(94,37/289,0)

LEGEND:

- | | |
|--------------------------------------|----------------------------------|
| □ | MSFN AOS, LOS |
| ○ | S/C SUNRISE, SUNSET |
| ⊕ | SUBEARTH POINT
(R,LHP/IMP,Y). |
| IATTH - INERTIAL ATTITUDE HOLD | |
| LATTH - LOCAL ATTITUDE HOLD | |

96:52:30
BEGIN REV 11
(8,9/113,23)
IATTH

REV 11



LEGEND:

□ ■	MSFN AOS, LOS
○ ●	S/C SUNRISE, SUNSET
⊕	SUBEARTH POINT
(R,LHP/INP,Y)	
IATTH - INERTIAL ATTITUDE HOLD	
LATTH - LOCAL ATTITUDE HOLD	

3-69B

REVISION A

FLIGHT PLAN

CSM

CMP

1513 CST

INHIBIT ROLL COMMANDS
UNTIL LM/CM $\Delta P > 3.5$ PSID
REMOVE & STOW
CSM/LM UMBILICAL
INSTALL DROGUE & PROBE
PRELOAD PROBE
COCK LATCHES (12)
INSTALL HATCH
VENT TUNNEL
HATCH INTEGRITY
CHECK
CMC - FREE/AUTO
VERIFY DSE MOTION AT LOS
RECORD LM PCM DATA
DOFF HELMET & GLOVES
LIOH CANISTER CHANGE
10 INTO B, STOW 8 IN B6
RR TRANSPONDER ACT
& SELF TEST

98:00
:10
:20
98:30
:40
REV 12
:50
99:00

DOCKED IMU FINE ALIGN
VERIFY DROGUE
& PROBE
INSTALLATION
CLOSE AND SECURE
HATCH
DON HELMET & GLOVES
ARS/PGA PRESSURE INTEGRITY CHECK
CABIN REGULATOR CHECK
DOFF HELMETS & GLOVES (CREW OPTION)
DRIFT CHECK
V06 N20E ON MARK
RR ACT & SELF TEST
LOAD DAP
R=21101, R2=111111
V06N20E
INHIBIT B3
THRUSTER FOR
RR ACT & SELF TEST
CMC FREE FOR AGS CAL
P30/P41 TO MANEUVER
TO UNDOCKING ATT
(99:10)
R 0, P 102, Y 0

LM

CDR

DOCKED IMU FINE ALIGN
VERIFY DROGUE
& PROBE
INSTALLATION
CLOSE AND SECURE
HATCH
DON HELMET & GLOVES

LMP

COPY UPDATES
AGS ACTIVATION & SELF
TEST
AGS TIME INITIALIZATION
LOAD AGS PAD
STEERABLE ANT
P 131, Y 41
VHF B XMTR - DATA
DON HELMET & GLOVES

UPDATE TO LM
GYRO TORQUING 'S
AGS ABORT CONSTANTS
DAP DATA
UPLINK TO LM
LS REFSMMAT
LM S.V. & V66
LGC/CMC CLOCK SYNC
LGC ABORT CONSTANTS
E MEMORY UPDATE
(IF REQ'D)
UPDATE TO LM
AGS K FACTOR

MAP UPDATE REV 12

LOS : _____

180° : _____

AOS : _____

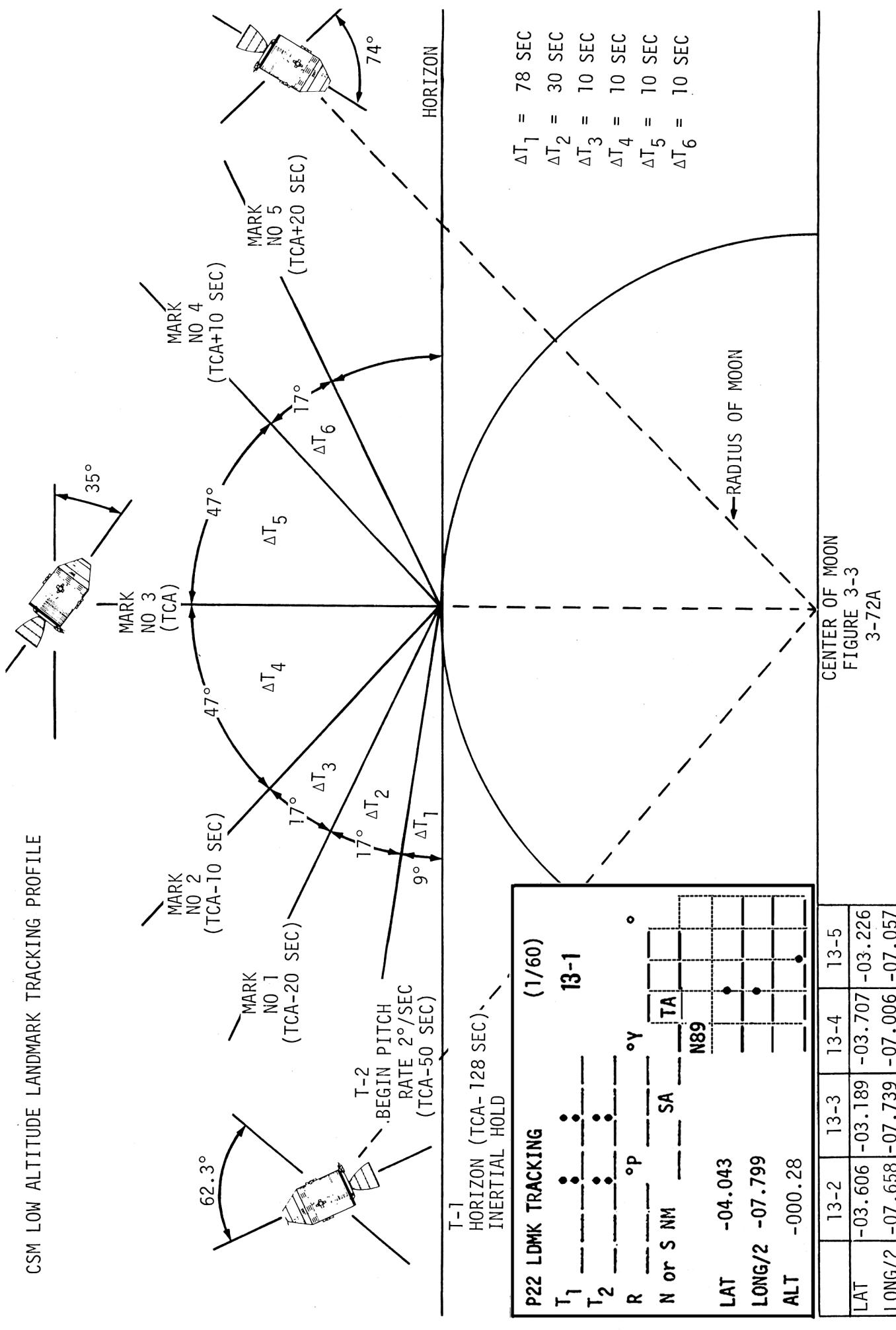
MAP UPDATE REV 12
LOS : _____
180° : _____
AOS : _____

V47-AGS UPDATE & ALIGN
DOCKED AGS
CALIBRATION

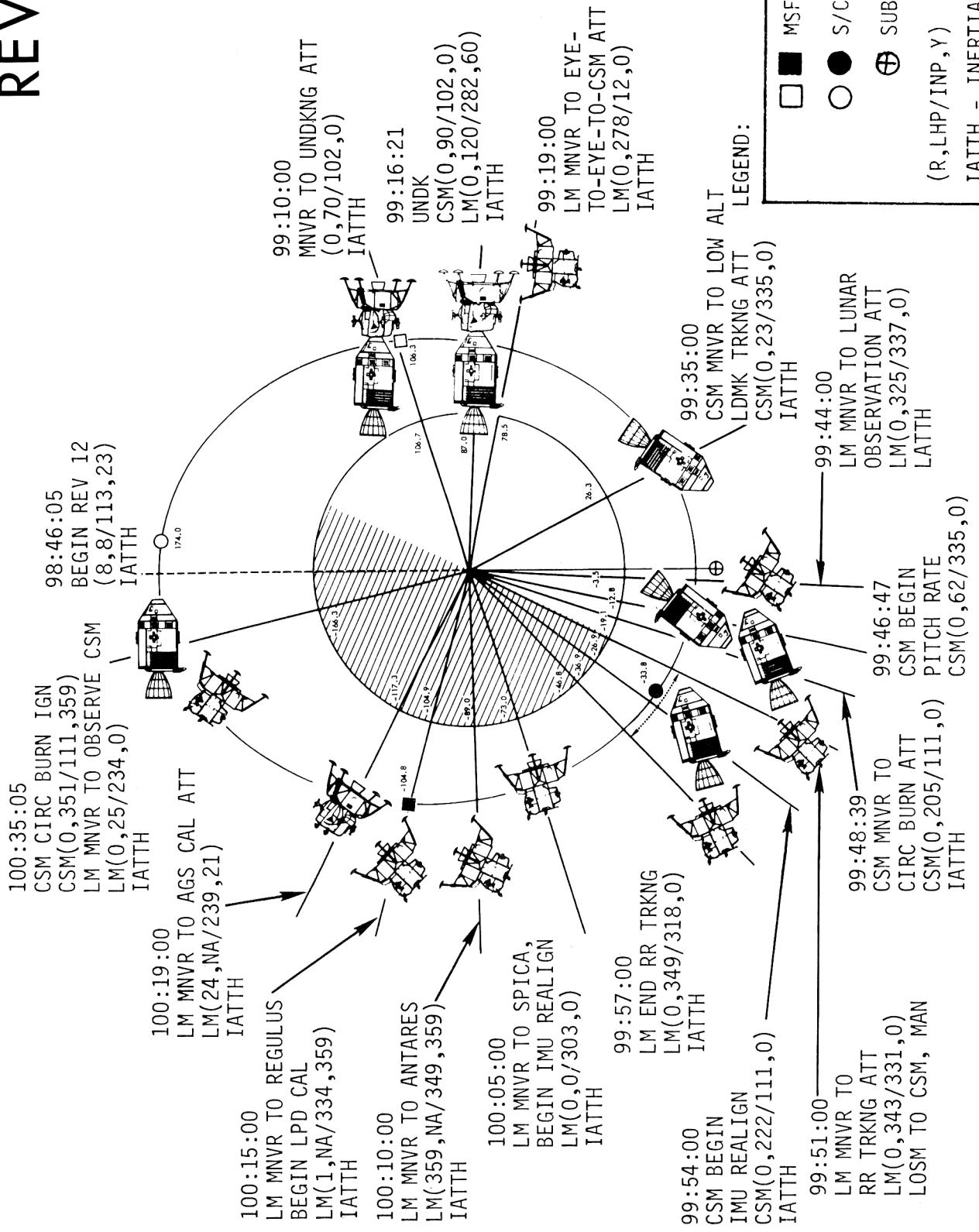
MCC-H

MISSION	EDITION	DATE	TIME	DAY / REV	PAGE
APOLLO 13	FINAL (APRIL)	MARCH 16, 1970	98:00 - 99:00	5/11-12	3-72

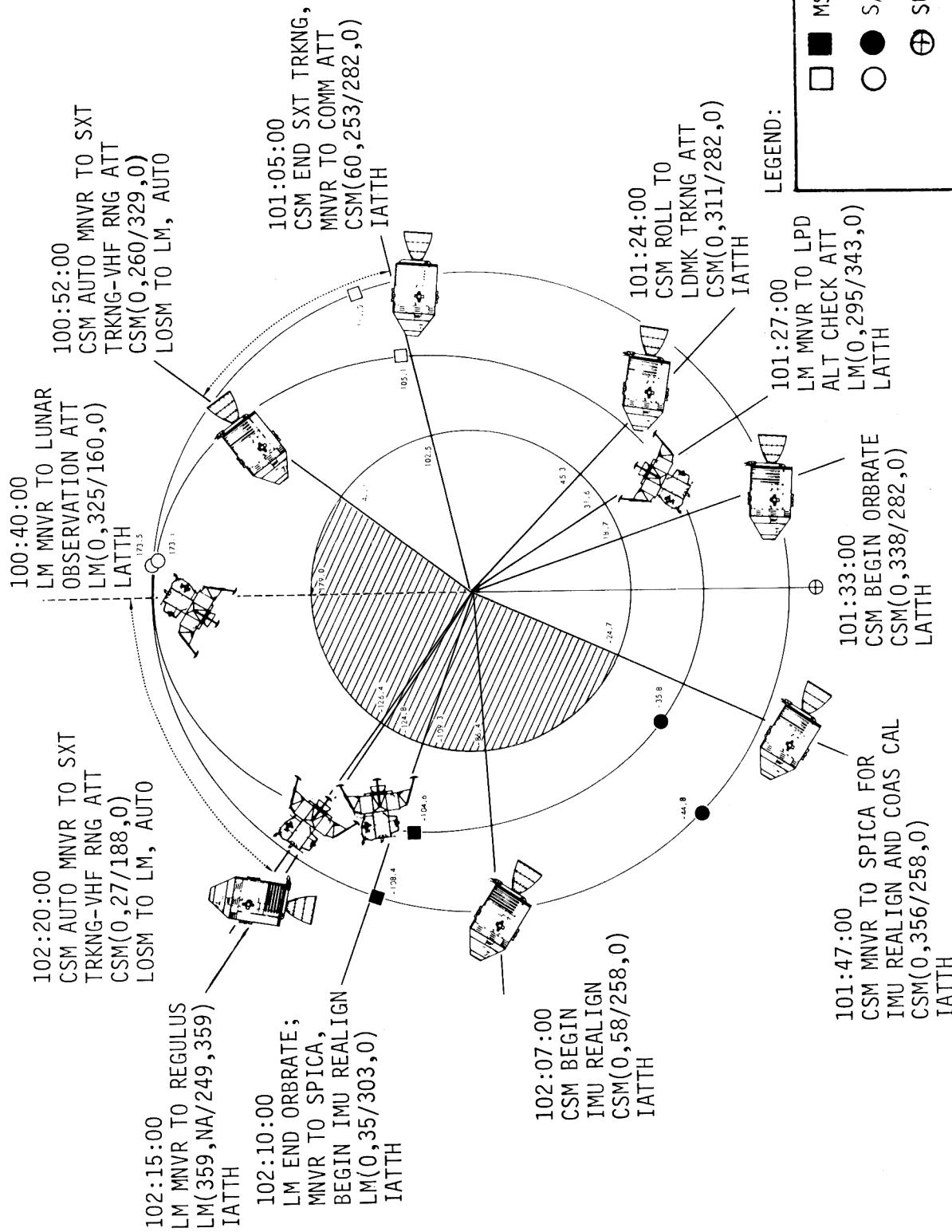
CSM LOW ALTITUDE LANDMARK TRACKING PROFILE



REV 12



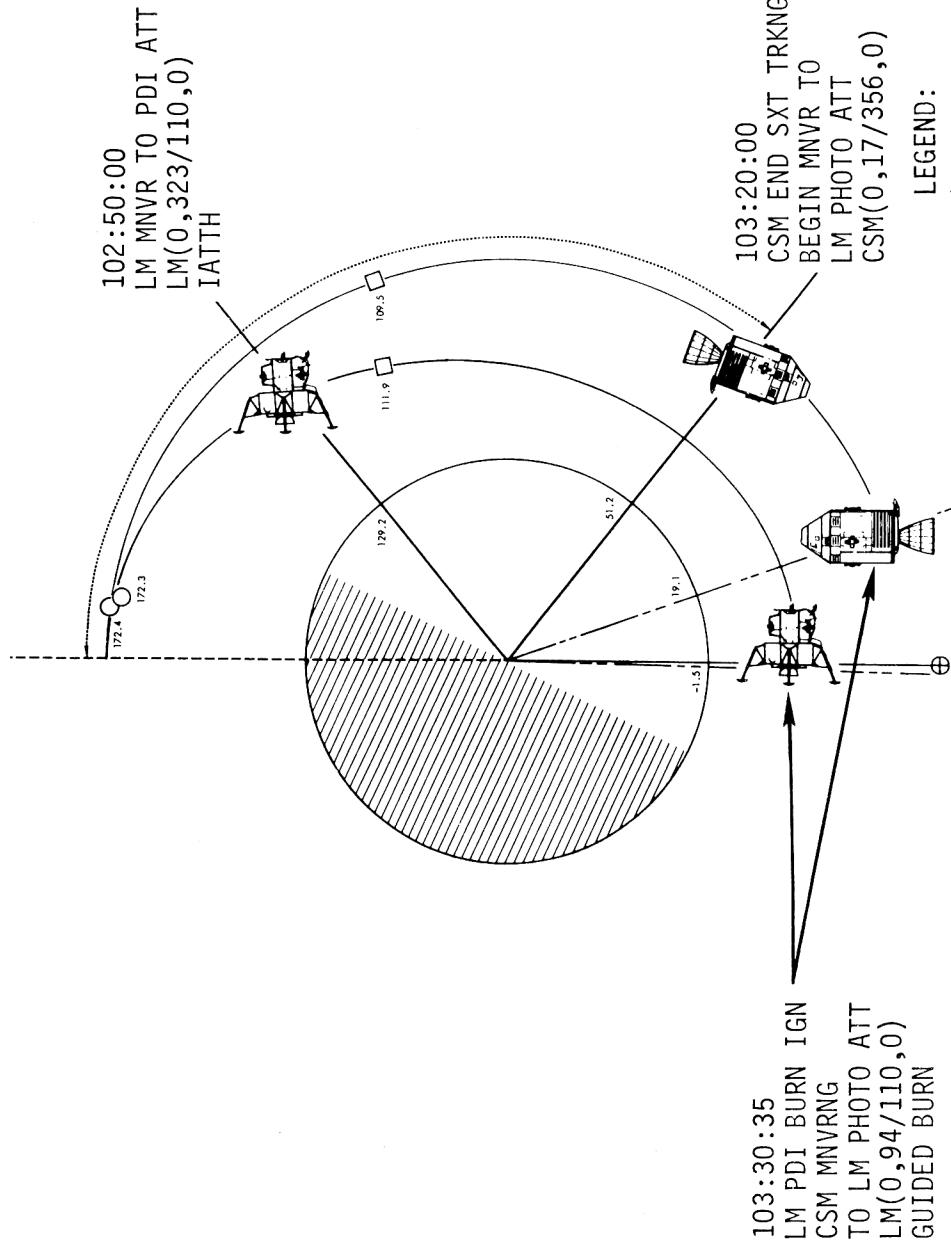
REV 13



3-74B

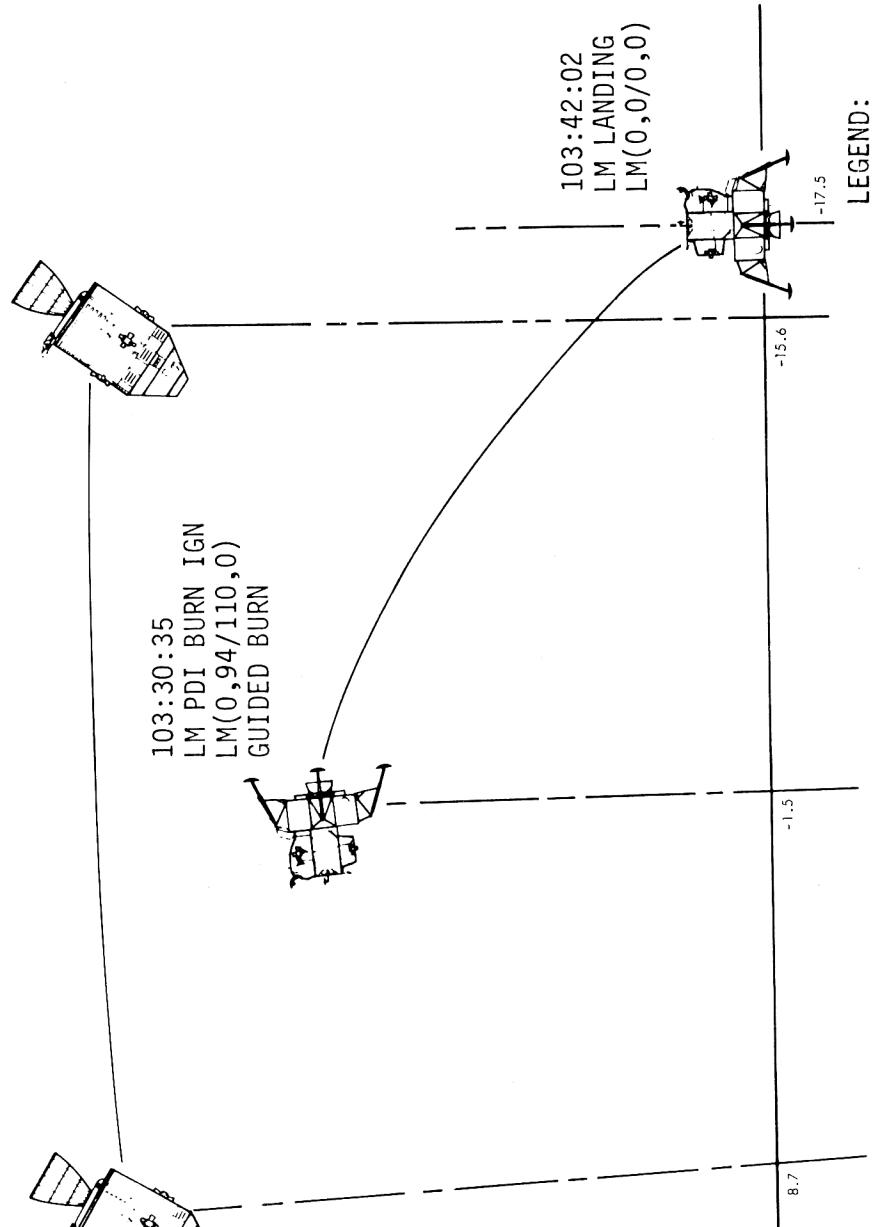
REVISION A

REV 14

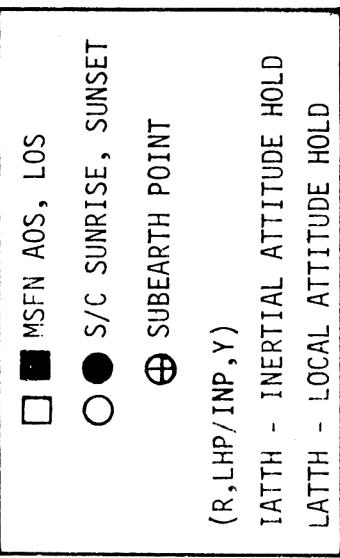


103:34:00
CSM MNVR TO
LM PHOTO ATT
 $CSM(0,217/153,0)$
IATTH

103:42:02
LM LANDING
 $CSM(0,241/153,0)$
IATTH



LEGEND:

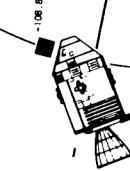


3-76B

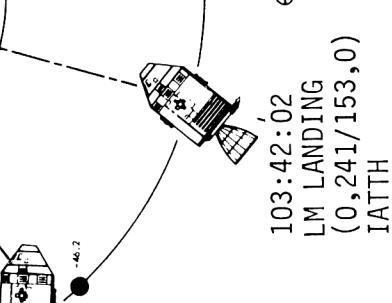
REVISION A

REV 14

104:10:00
MNVR TO SC CONTAMINATION
PHOTO ATT
(320, 307/133, 348)
IATTH



103:54:00
MNVR FOR IMU REALIGN;
BEGIN IMU REALIGN
(0, 225/100, 0)
IATTH



LEGEND:

□ ■ MSFN AOS, LOS
○ ● S/C SUNRISE, SUNSET
⊕ SUBEARTH POINT
(R, LHP/INP, Y)
IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

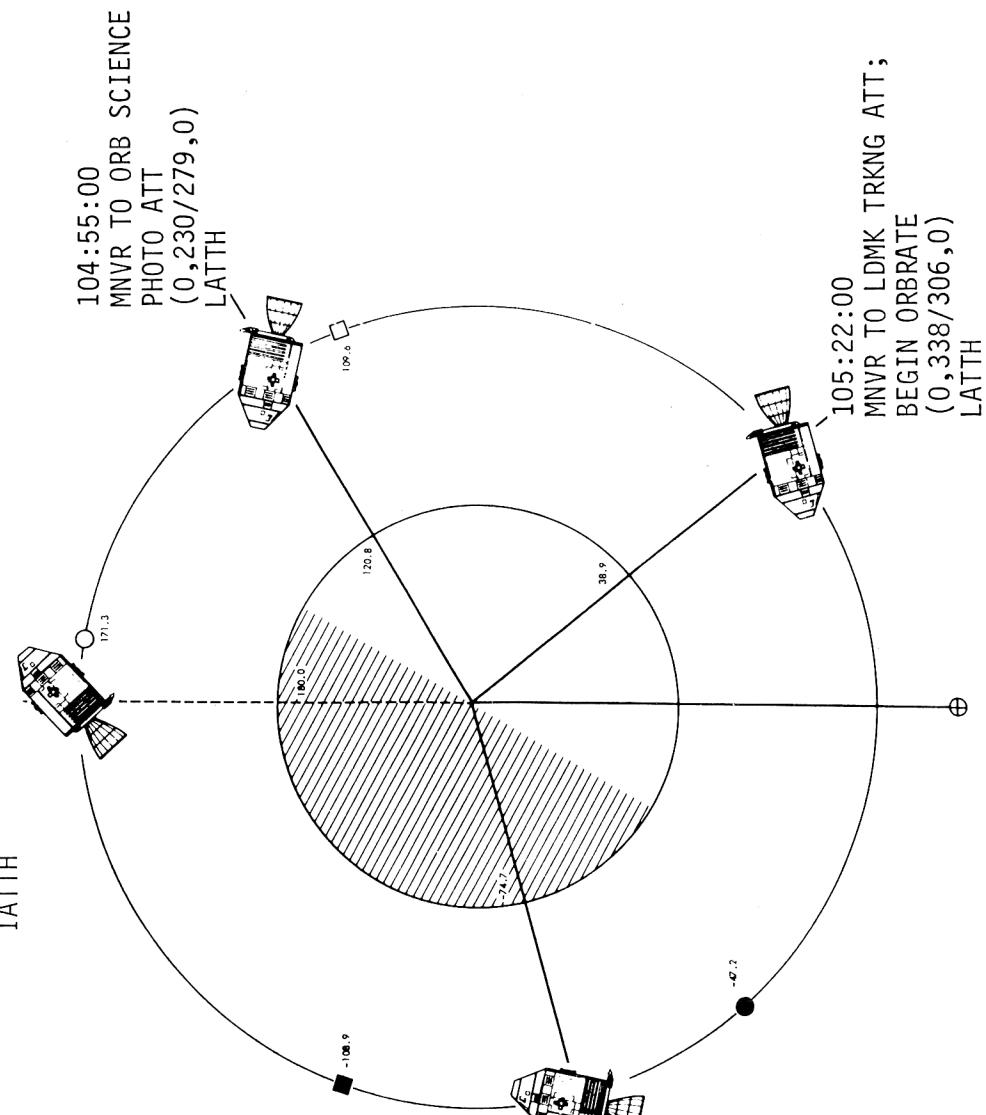
3-76C

REVISION _____

A

REV 15

104:35:33
BEGIN REV 15
(320,25/133,348)
IATTH



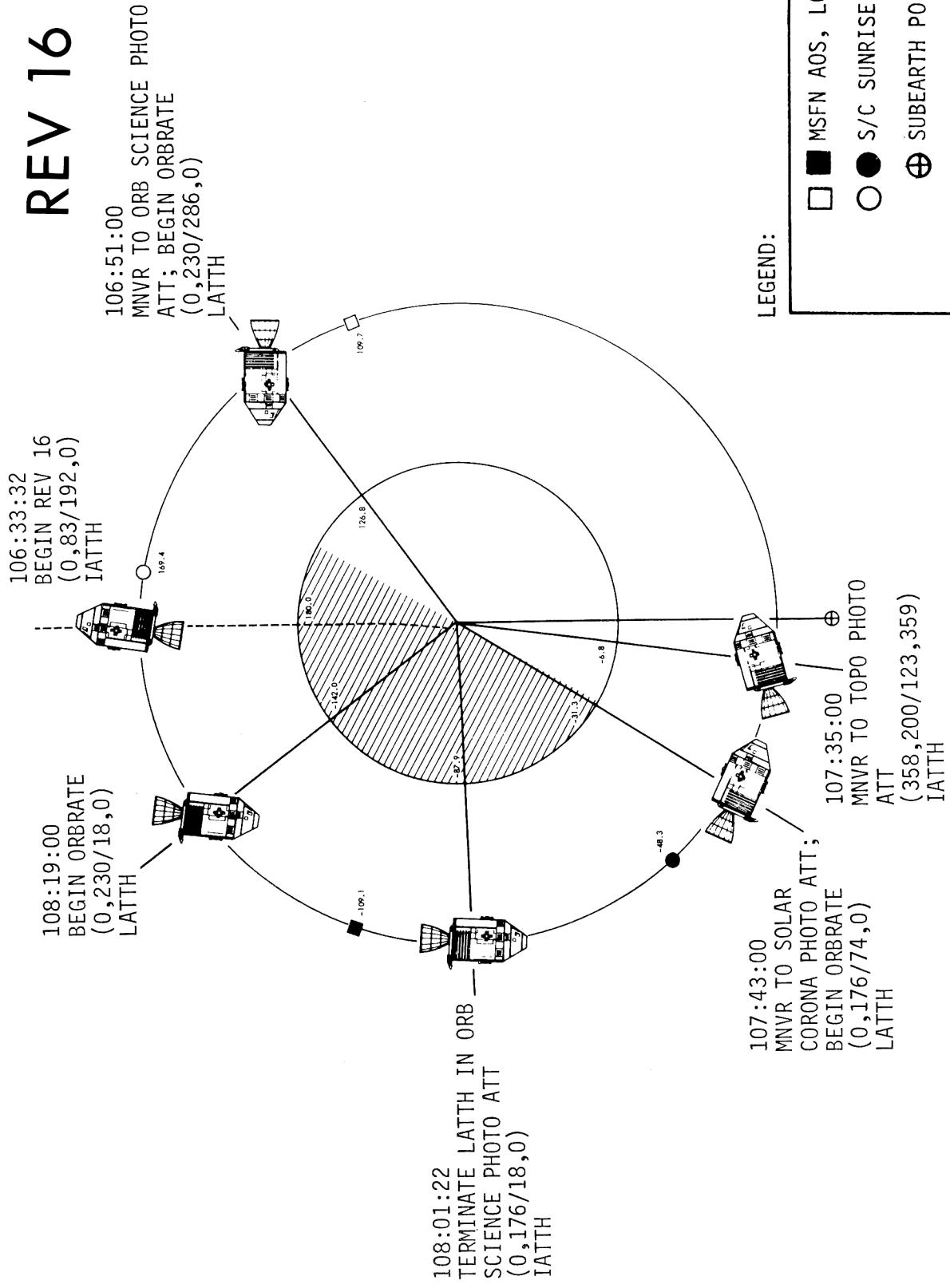
LEGEND:

<input type="checkbox"/>	MSFN AOS, LOS
<input type="circle"/>	S/C SUNRISE, SUNSET
<input type="oplus"/>	SUBEARTH POINT
(R,LHP/INP,Y)	
IATTH - INERTIAL ATTITUDE HOLD	
LATTH - LOCAL ATTITUDE HOLD	

3-78B

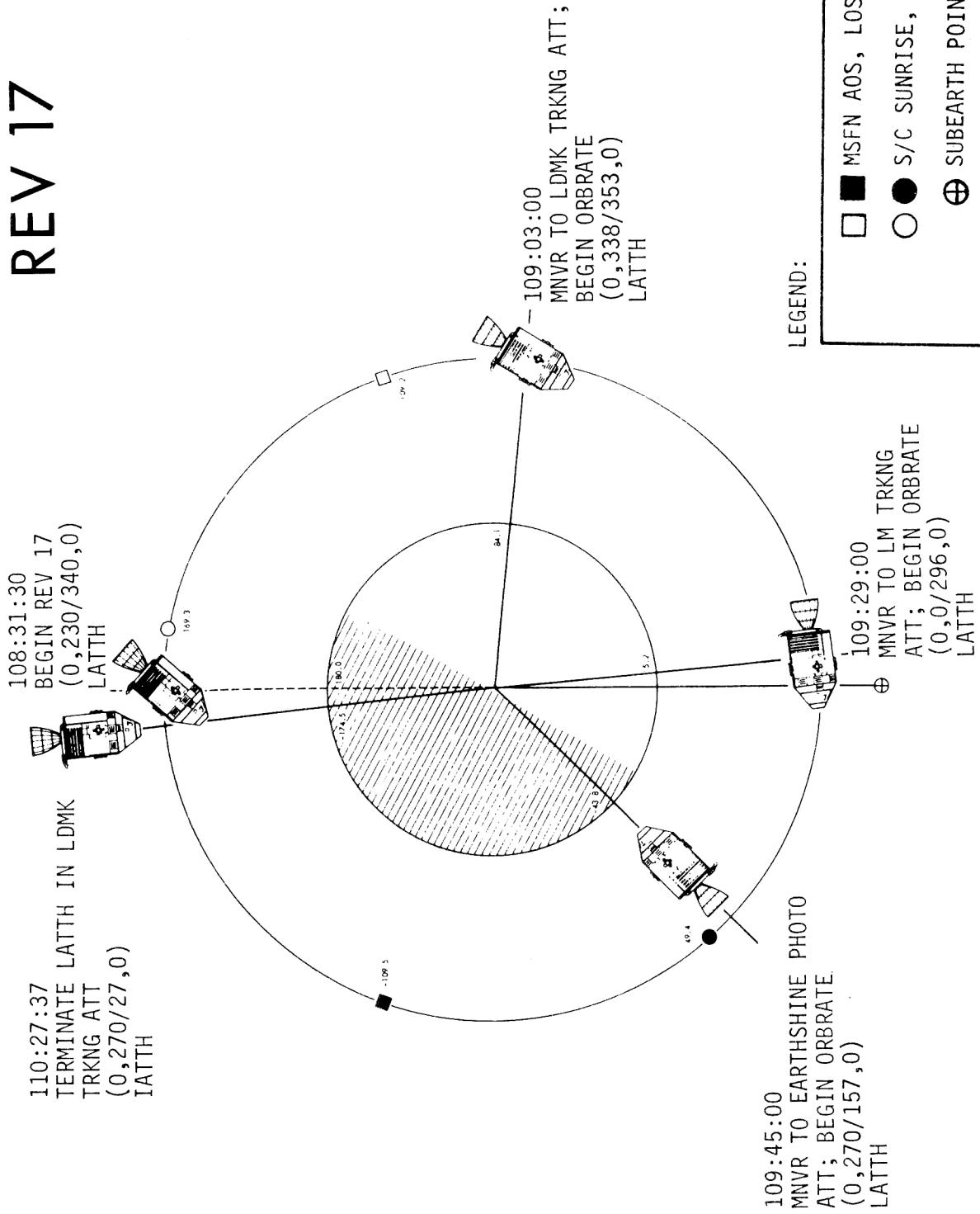
REVISION A

REV 16



REV 17

110:27:37
TERMINATE LATTH IN LDMK
TRKNG ATT
(0, 270/27, 0)
LATTH



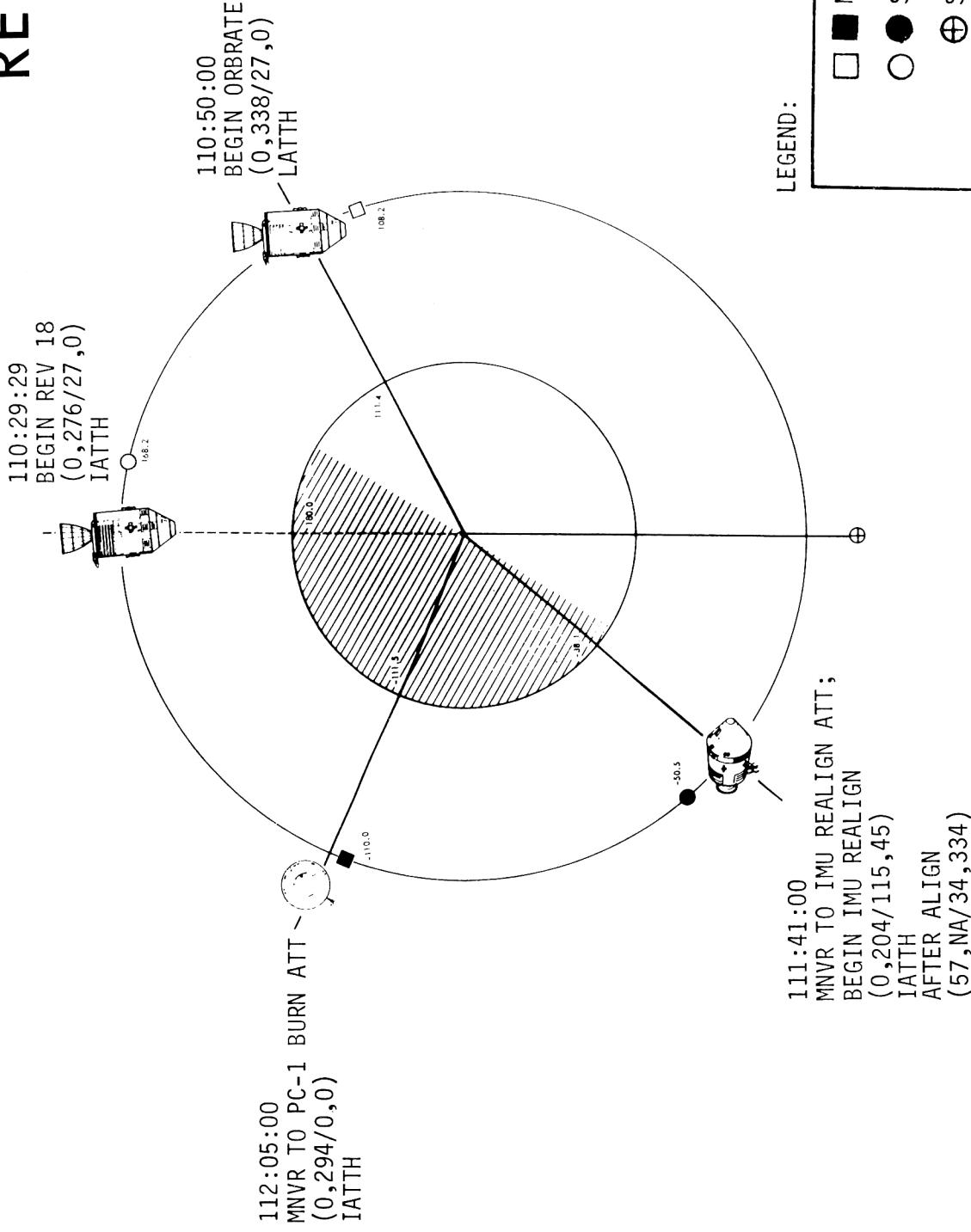
(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION A

REV 18



3-84B

REVISION A

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

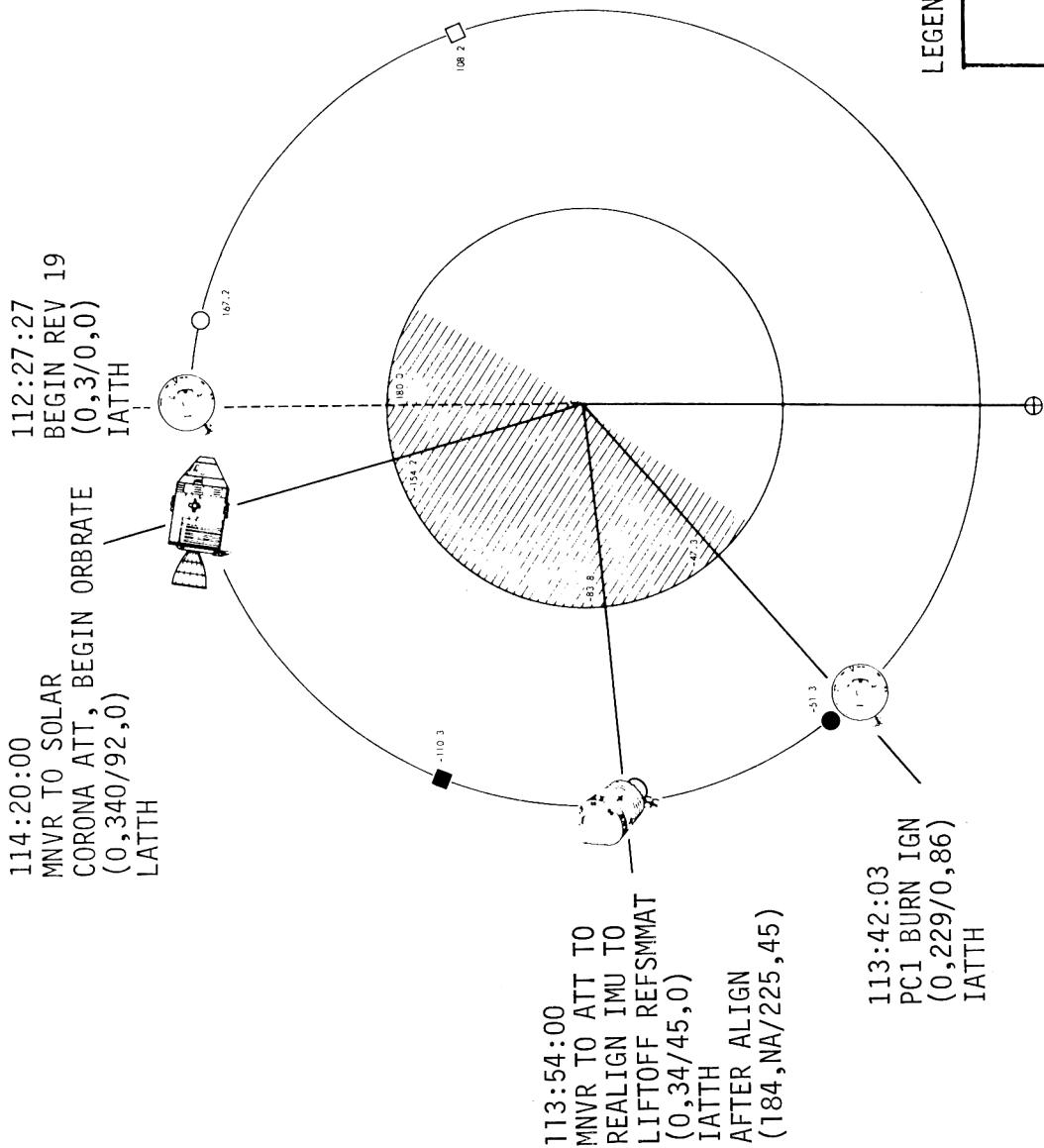
(R, LHP/INP, Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

A

REV 19



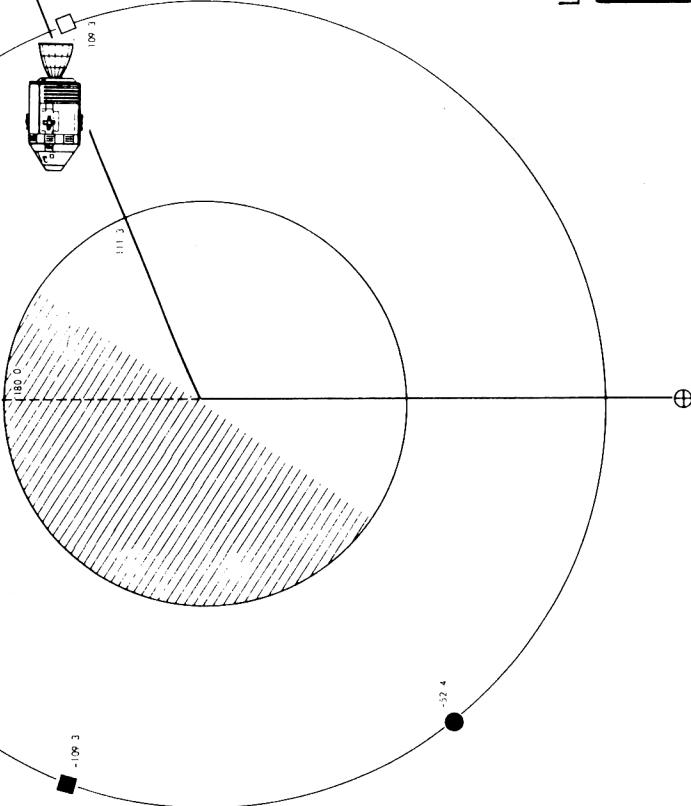
REVISION A

REV 20

114:25:28
BEGIN REV 20
(0,340/75,0)
LATTH



114:48:00
MNVR TO REST ATT
(98,246/272,0)
IATTH



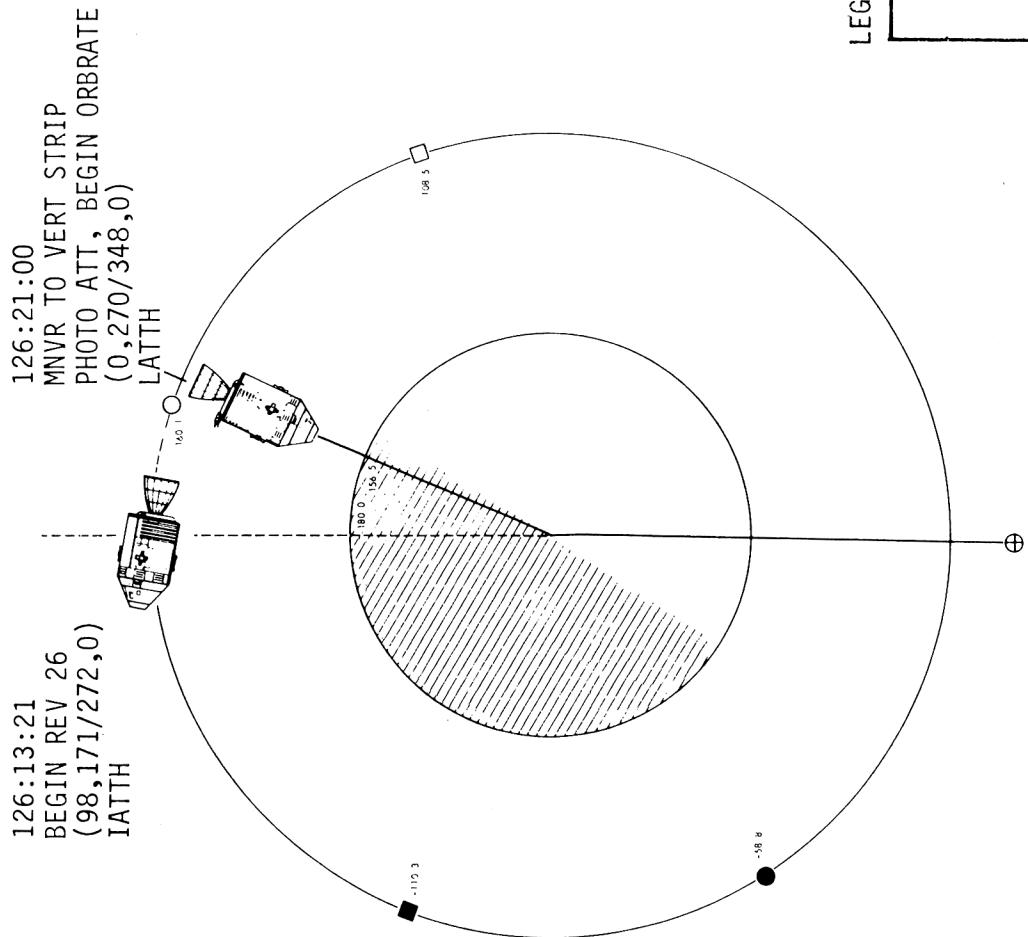
LEGEND:

■	MSFN AOS, LOS
●	S/C SUNRISE, SUNSET
	SUBEARTH POINT
$(R, LHP/INP, Y)$	
	IATTH - INERTIAL ATTITUDE HOLD
	LATTH - LOCAL ATTITUDE HOLD

3-88A

A

REV 26



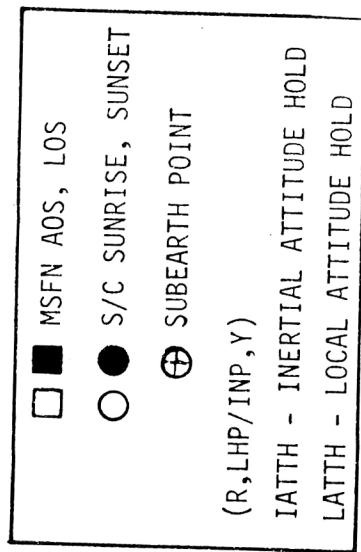
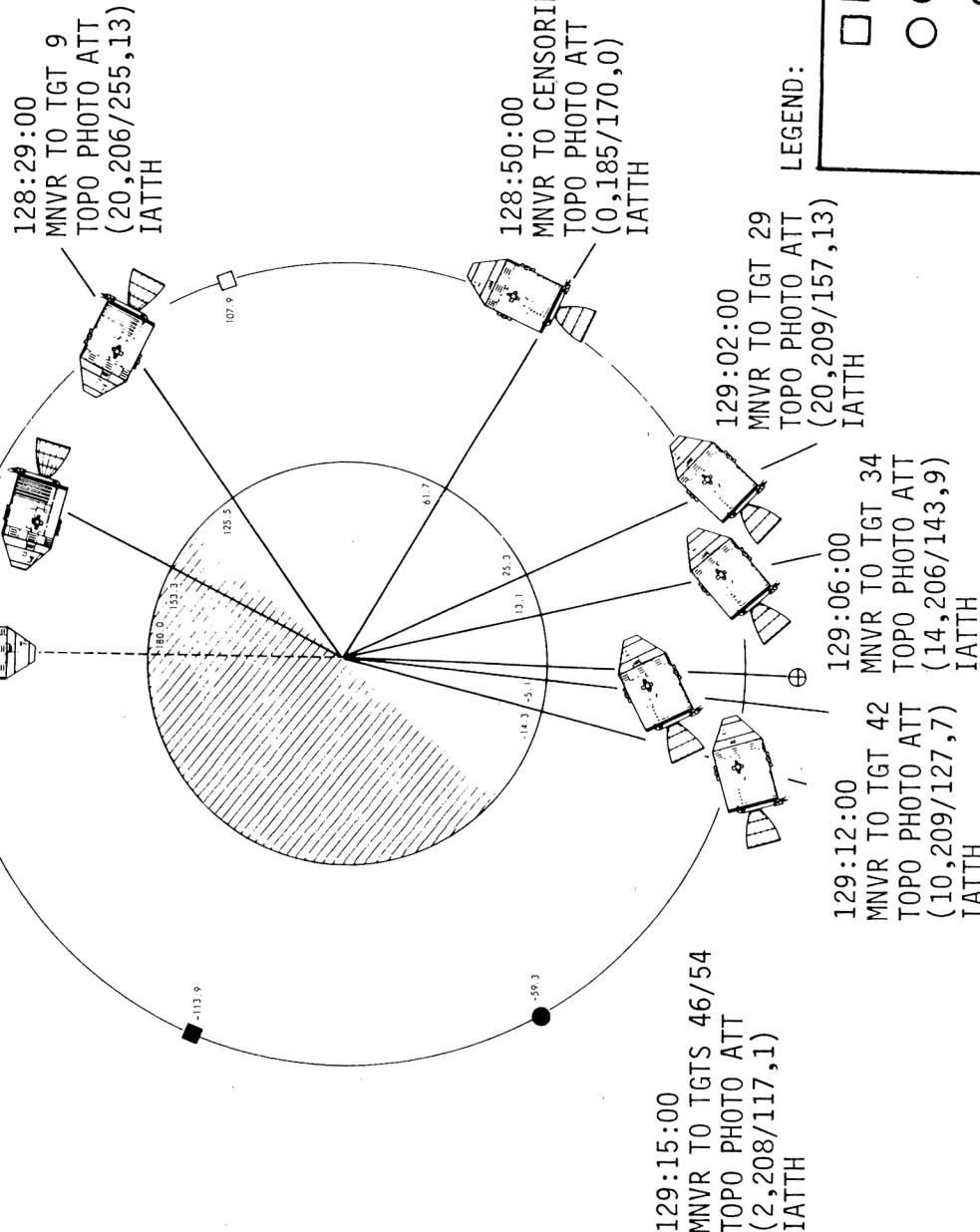
3-95B

REVISION A

REV 27

128:11:20
BEGIN REV 27
(0,270/12,0)
LATTH

128:20:00
MNVR TO TGT 6
TOPO PHOTO ATT
(349,192/268,353)
LATTH



(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION A

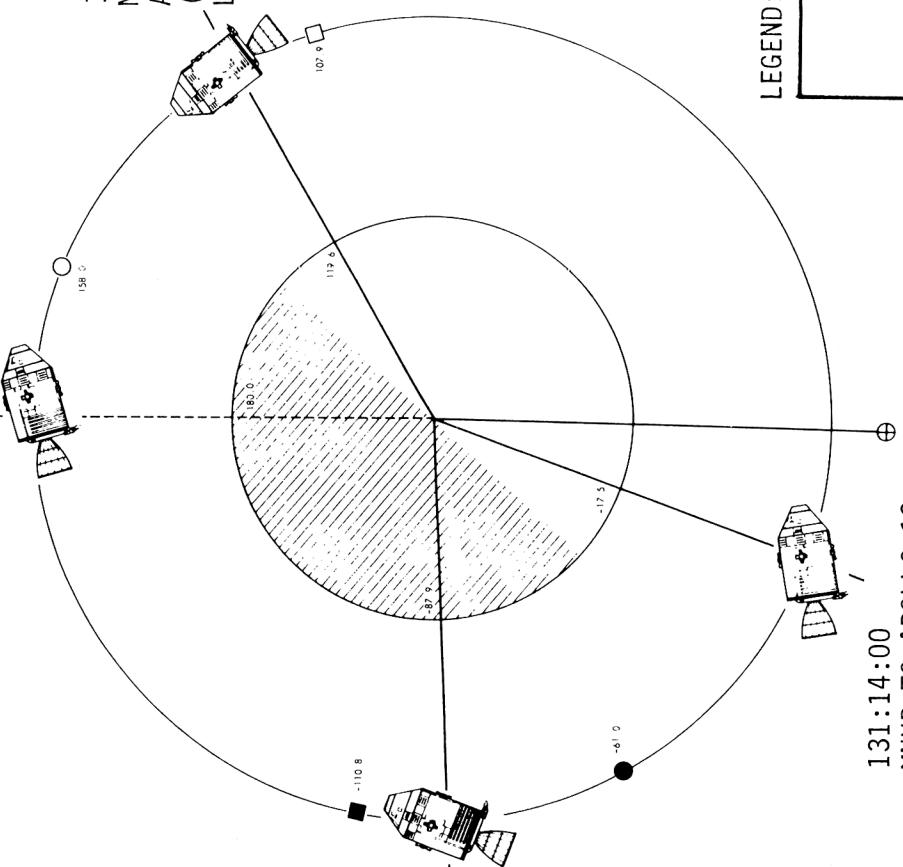
3-97B

REV 28

130:09:19
BEGIN REV 28
(2,14/117,1)
IATTH

130:29:00
MNVR TO OBL STEREO PHOTO
ATT, BEGIN ORBRATE
(0,183/227,0)
LATTH

131:37:00
MNVR TO ZODIACAL LIGHT
PHOTO ATT, BEGIN ORBRATE
(0,346/183,0)
LATTH



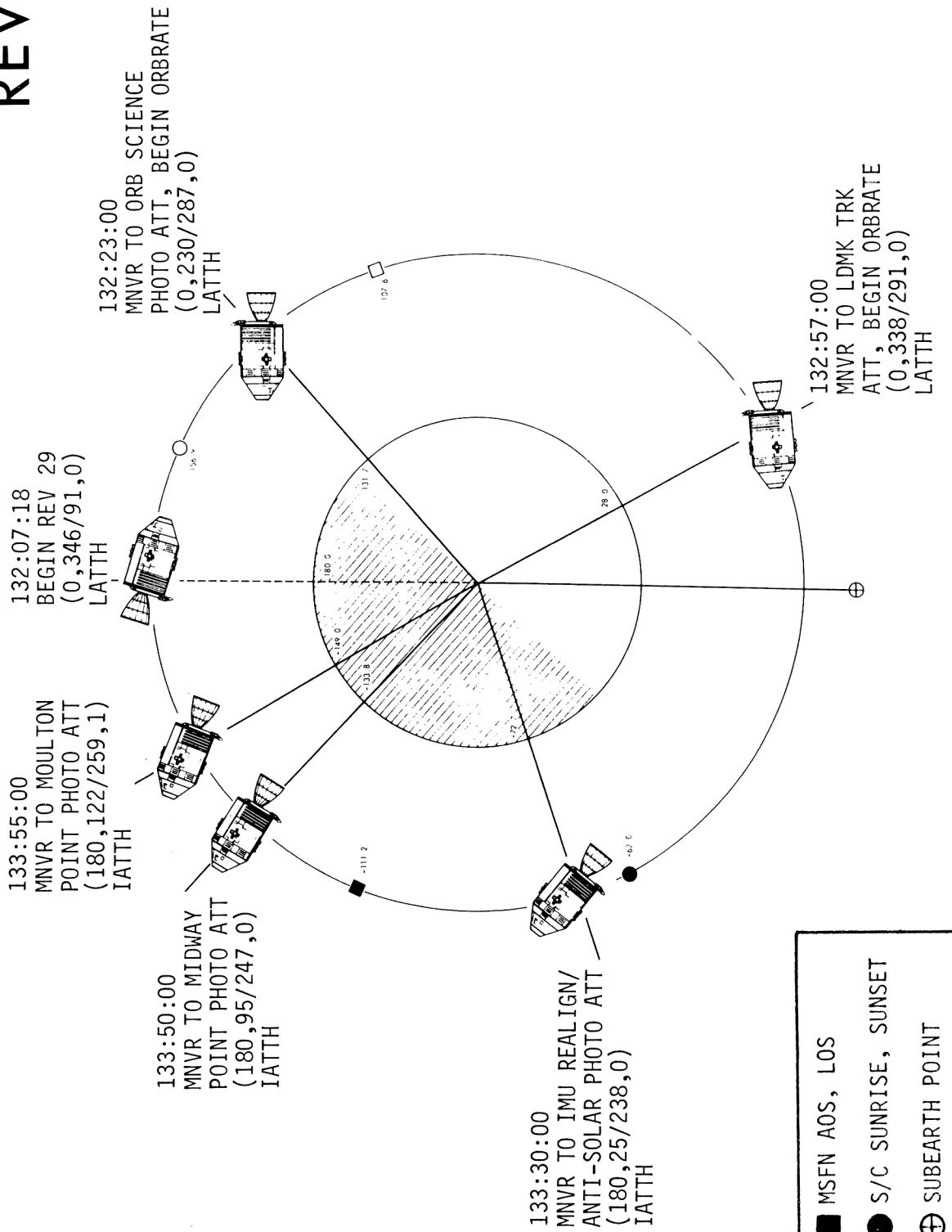
LEGEND :

- | | | |
|---|---|---------------------------------|
| □ | ■ | MSEN AOS, LOS |
| ○ | ● | S/C SUNRISE, SUNSET |
| ⊕ | | SUBEARTH POINT
(R,LHP/INP,Y) |
- IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

3-99A

REVISION A

REV 29



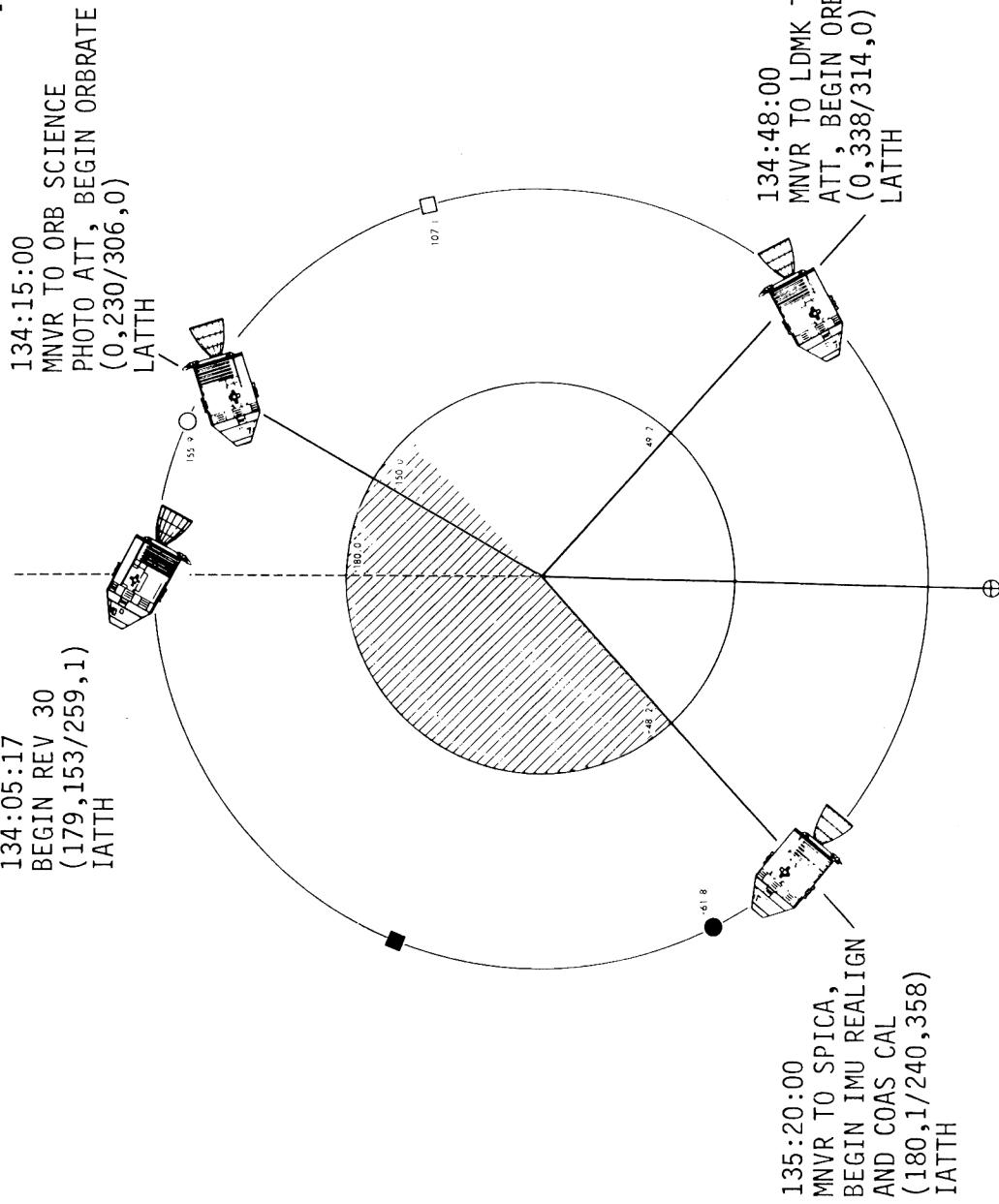
LEGEND:

- | |
|--------------------------------|
| □ ■ MSFN AOS, LOS |
| ○ ● S/C SUNRISE, SUNSET |
| ⊕ SUBEARTH POINT |
| (R,LHP/INP,Y) |
| IATTH - INERTIAL ATTITUDE HOLD |
| LATTH - LOCAL ATTITUDE HOLD |

3-102B

REVISION A

REV 30

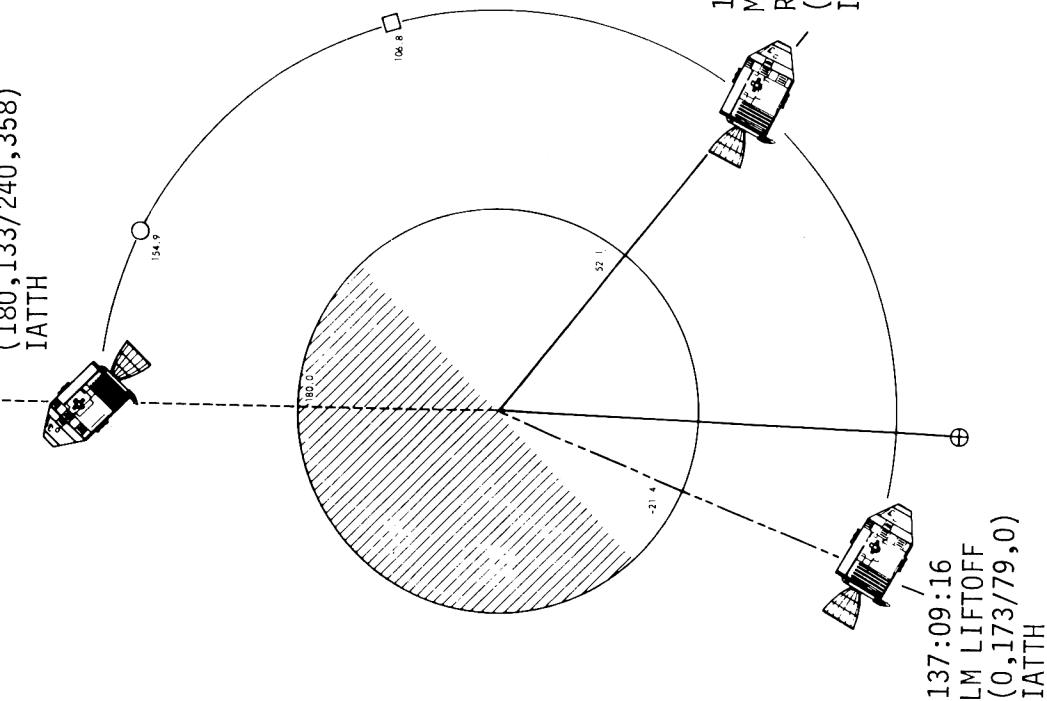


3-103B

REVISION A

REV 31

136:03:16
BEGIN REV 31
(180,133/240,358)
IATT_H

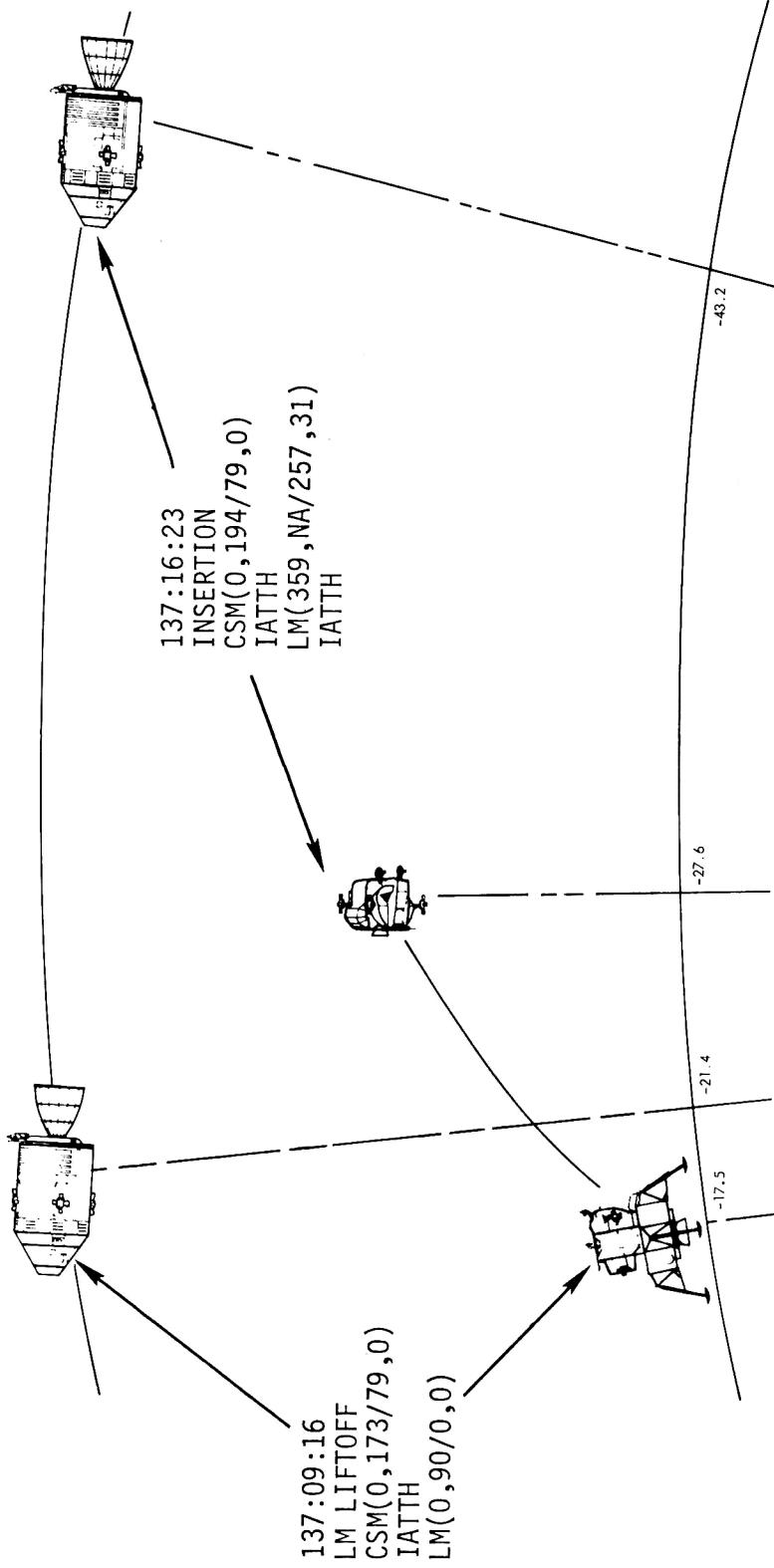


LEGEND:

- | | |
|---|------------------------------------|
| □ | ■ MSFN AOS, LOS |
| ○ | ● S/C SUNRISE, SUNSET |
| ⊕ | ⊕ SUBEARTH POINT
(R,LHP/INP,Y). |
- IATT_H - INERTIAL ATTITUDE HOLD
LAT_H - LOCAL ATTITUDE HOLD

3-105A

REVISION A



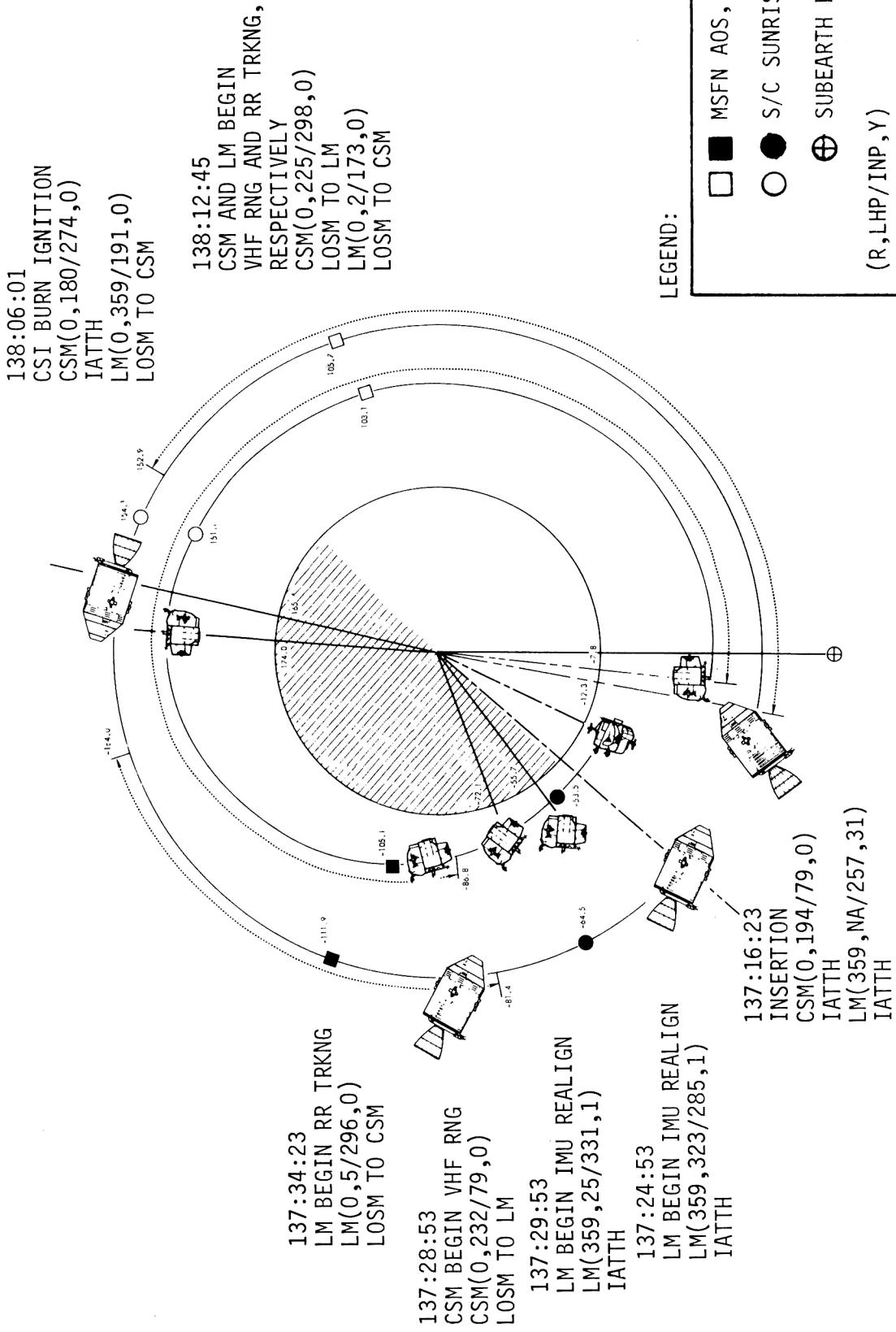
LEGEND:

<input type="checkbox"/>	MSFN AOS, LOS
<input checked="" type="circle"/>	S/C SUNRISE, SUNSET
<input checked="" type="circle"/>	SUBEARTH POINT
(R,LHP/INF,Y)	
IATTH	- INERTIAL ATTITUDE HOLD
LATTH	- LOCAL ATTITUDE HOLD

3-107A

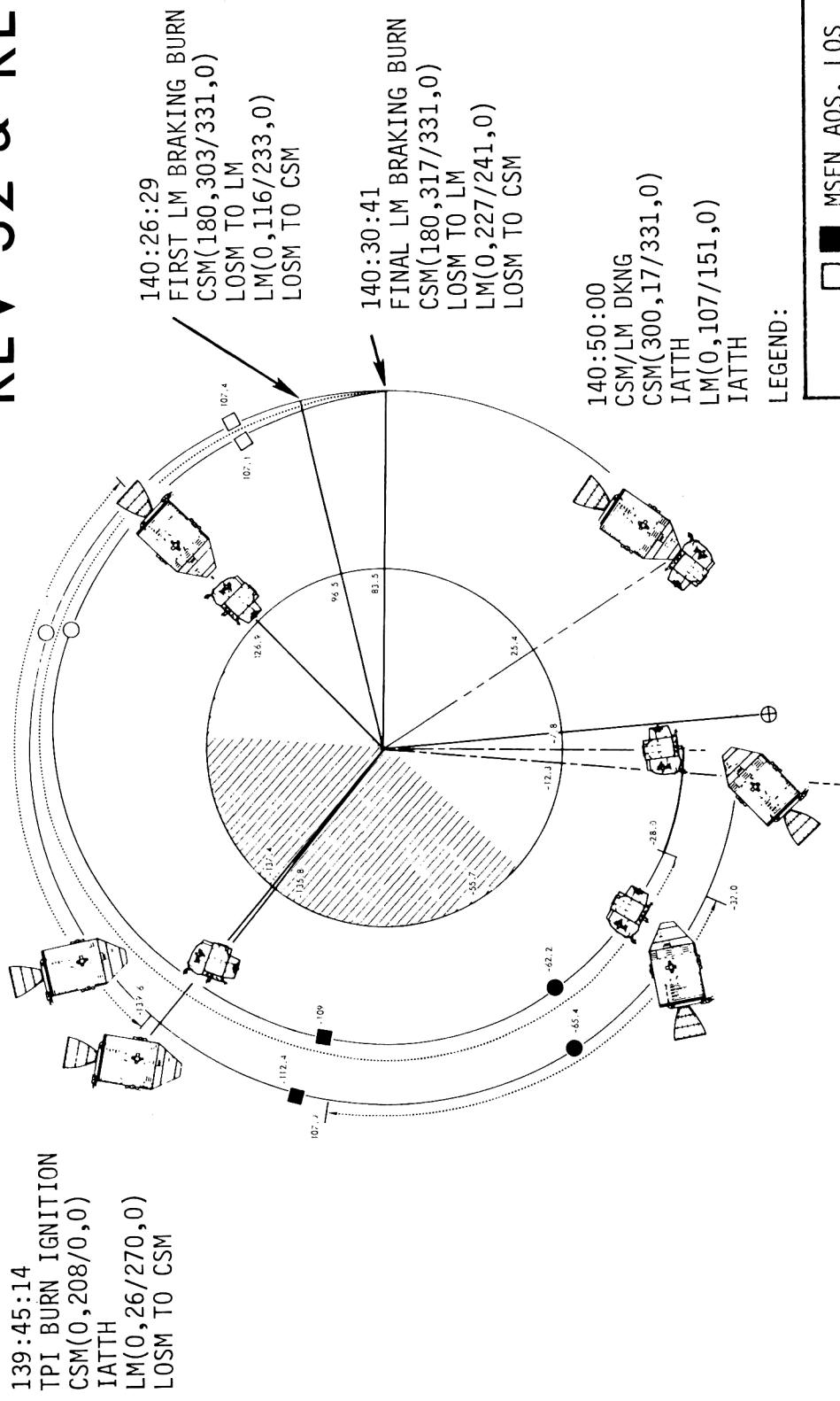
REVISION A

REV 31 & REV 32



REVISION A

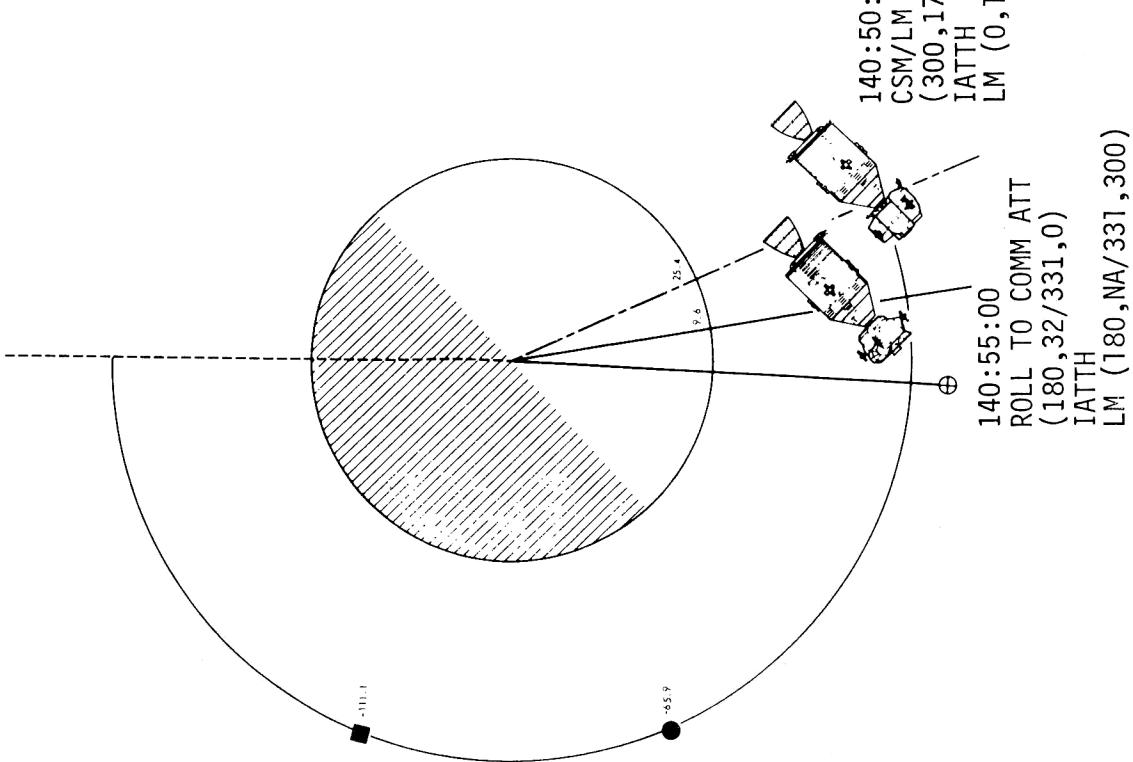
REV 32 & REV 33



REVISION A

3-109A

REV 33



LEGEND:	
□	■ MSFN AOS , LOS
○	● S/C SUNRISE , SUNSET
⊕	⊕ SUBEARTH POINT

140:50:00
CSM/LM DKNG
(300,17/331,0)
IATTH
LM (0,107/151,0)

140:55:00
ROLL TO COMM ATT
(180,32/331,0)
IATTH
LM (180,NA/331,300)

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION A

3-109B

FLIGHT PLAN

CSM

1013 CST

UPDATE TO LM
DEORBIT BURN PAD
DAP WEIGHTS
UPDATE TO CSM

LM JETT ATT & TIME
CSM SEP BURN PAD
DAP LOAD
UPLINK TO CSM
CSM S.V. (TIG*-10)
LM S.V. (TIG*-10)

*TIG OF LM
DEORBIT BURN

141:00
X
:10
M
S
F
N
:20
141:30
:40
:50
142:00

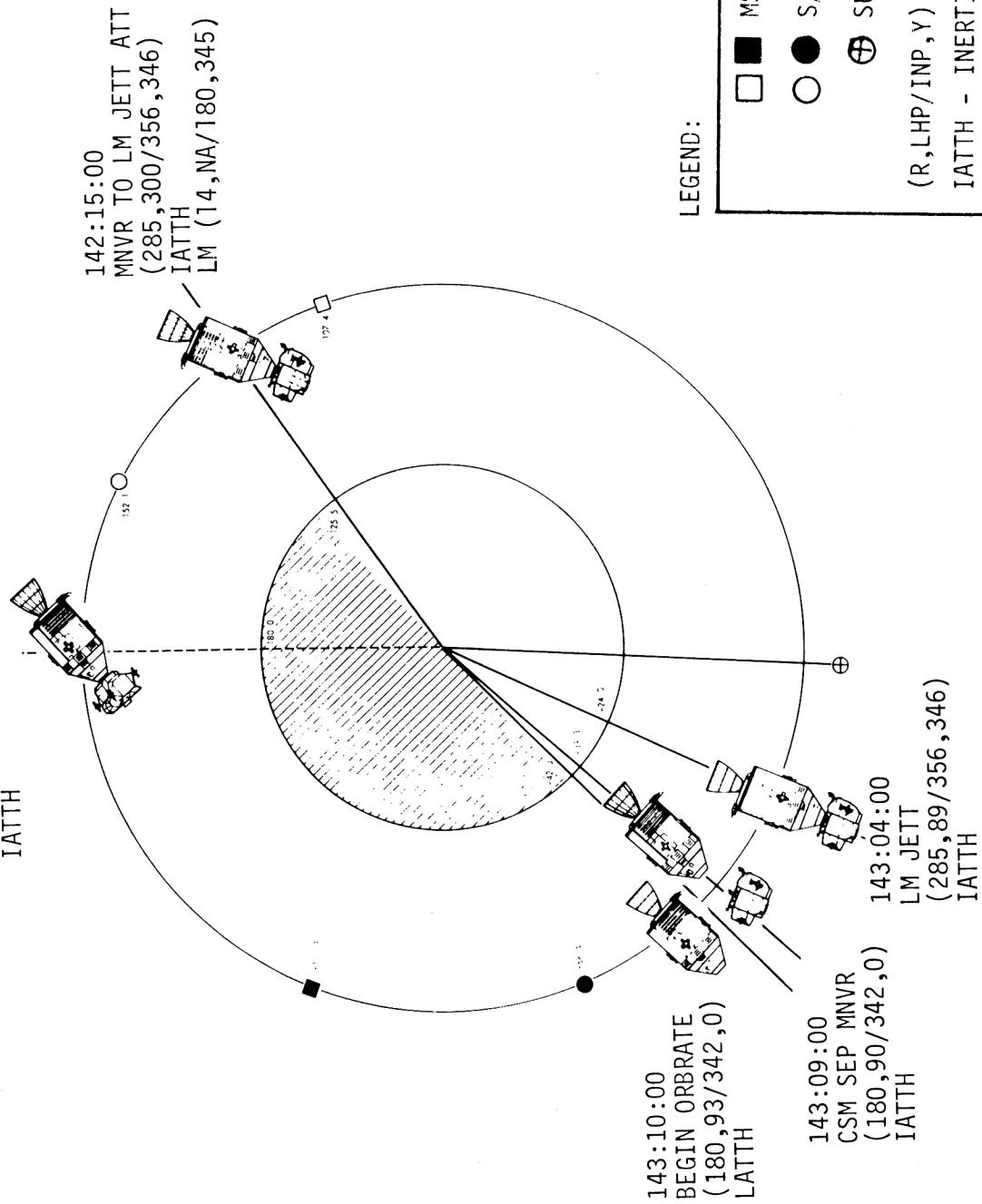
VERIFY CRYO 02 PRESS
REPRESS PKG VLV-OFF
PRESSURIZE CABIN TO 5.5 PSIA
ADJUST 02 FLOW <0.5 LB/HR
ADJUST 02 FLOW TO 0.6 LB/HR
PRESSURIZE TUNNEL TO 3 PSID
VERIFY ΔP STABLE FOR 3 MINUTES
VERIFY LM FWD DUMP VALVE-AUTO
CABIN FAN (2)-ON (UP)
EQUALIZE TUNNEL PRESSURE
LiOH CANISTER CHANGE
12 INTO B, STOW 10 IN A3
STOW OPTICS
REMOVE HATCH AND STOW
VERIFY DOCKING LATCHES (>3)
REMOVE PROBE AND DROGUE
STOW TV CAMERA
PASS TO CDR AT HIS REQUEST:
PROBE
DROGUE
HELMET/GLOVE BAGS
DECONTAMINATION BAGS (A8 & U1)
RECEIVE FROM LM AND STOW:
TOP A1 → (1) DC BAG ← (1) DC BAG
UPPER EQUIP BAY → (2) HSB's ← (2) DC BAGS
B5, B6 → (2) DC BAGS ← (2) DC BAGS
TOP A7, A11 → (1) DC BAG ← (1) DC BAG
RECEIVE FROM CSM
BAG AND TRANSFER TO CMP:
1 ISA W/ TOTE BAG & WEIGH BAG
2 HELMETS (GLOVES INSIDE)
2 SRC'S FROM SRC RACKS
1 TOTE BAG W/DUST COVER CONTAINING
LENS BRUSH
5 70 MM MAGS IN BAGS (3+2)
6 16 MM MAGS IN BAG
1 70 MM CAMERA
1 CSC CASSETTE
1 CLSRC
2 16 MM MAGS IN BAG

MCC VERIFY DSE
MOTION BEFORE
LOS

MISSION	EDITION	DATE	TIME	DAY / REV	PAGE
APOLLO 13	FINAL (APRIL)	MARCH 27, 1970	141:00 - 142:00	6/33-34	3-111

REV 34

141:57:12
BEGIN REV 34
(180,221/331,0)
IATTH



3-111A

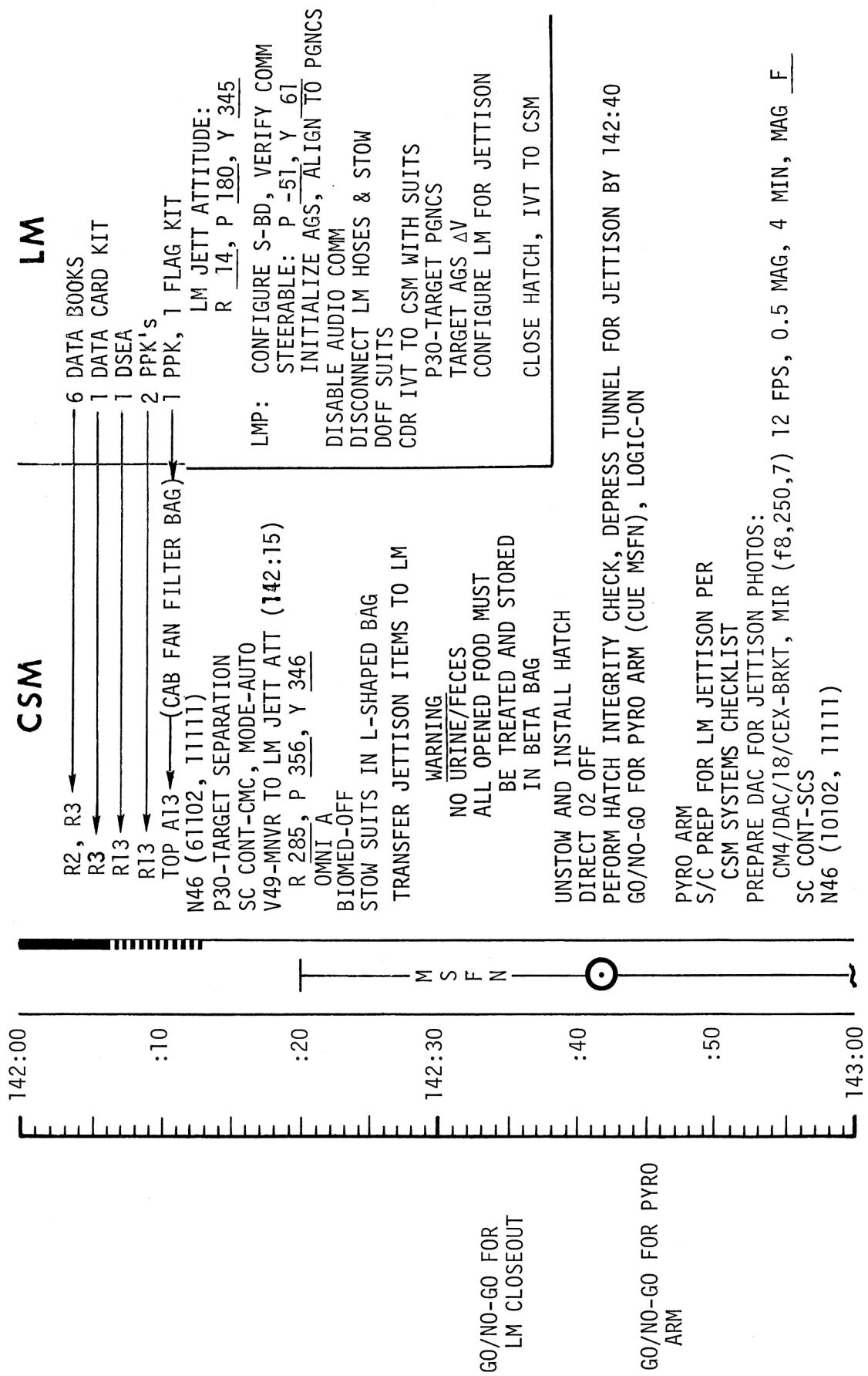
REVISION A

MCC-H

FLIGHT PLAN

CSM

LM



MISSION	EDITION	DATE	TIME	DAY / REV	PAGE
APOLLO 13	FINAL (APRIL)	MARCH 27, 1970	142:00 - 143:00	6/34	3-112

FLIGHT PLAN

MCC-H

1213 CST

:00 DUMP DSE
UPLINK TO LM
V48-LOAD DAP
R1-12011
P42-APS THRUSTING
UPDATE TO CSM
TOPO PHOTO PAD REV 35

143:00 DAC ON
P47-THRUST MONITOR
LN JETTISON 143:04
P41-RCS THRUSTING
MNVR TO SEP ATT, (143:08) R 180, P 341.6, Y 0
OMNI B

CSM SEPARATION 143:09
GO ORB RATE (143:10) P 093/342, V64-ACQ MSFN
PREPARE DAC FOR LM DEORBIT BURN PHOTOGRAPHY
CM/DAC/SXT/CX (FIXED, 250, FIXED) 12 FPS, 0.5 MAG, 4 MIN
MAG F

S/C CLEANUP

CMP DOFF PGA
CONFIGURE FOR BI-STATIC RADAR TEST
VERIFY VHF AM B - DUPLEX
VHF RANGING-RANGING
VHF ANTENNA-LEFT
VHF AM SQUELCH A-MAX
VHF AM T/R OFF

VERIFY DSE MOTION @ LOS (3 AUDIO PANELS)
THIS VHF CONFIGURATION WILL BE
MAINTAINED UNTIL 166:10

143:09 TIG: 143:09
BT: 6.12 SEC
AVR: 1.0 FT/SEC
ULLAGE: N/A
ORBIT: 57.7 x 55.3

LM IS TARGETTED FOR
APS IMPULSE BURN.
THRUST IS RCS
ULLAGE ONLY.

ONBOARD READOUT

BAT C _____
PYRO BAT A _____
RCS A _____
B _____
C _____
D _____

DC IND SEL - MMA OR B

MAP UPDATE REV 35

EAT PERIOD R P Y
T START: _____ : _____ : _____
T STOP : _____ : _____ : _____
RNG _____ NM.

DC IND SEL - MMA OR B

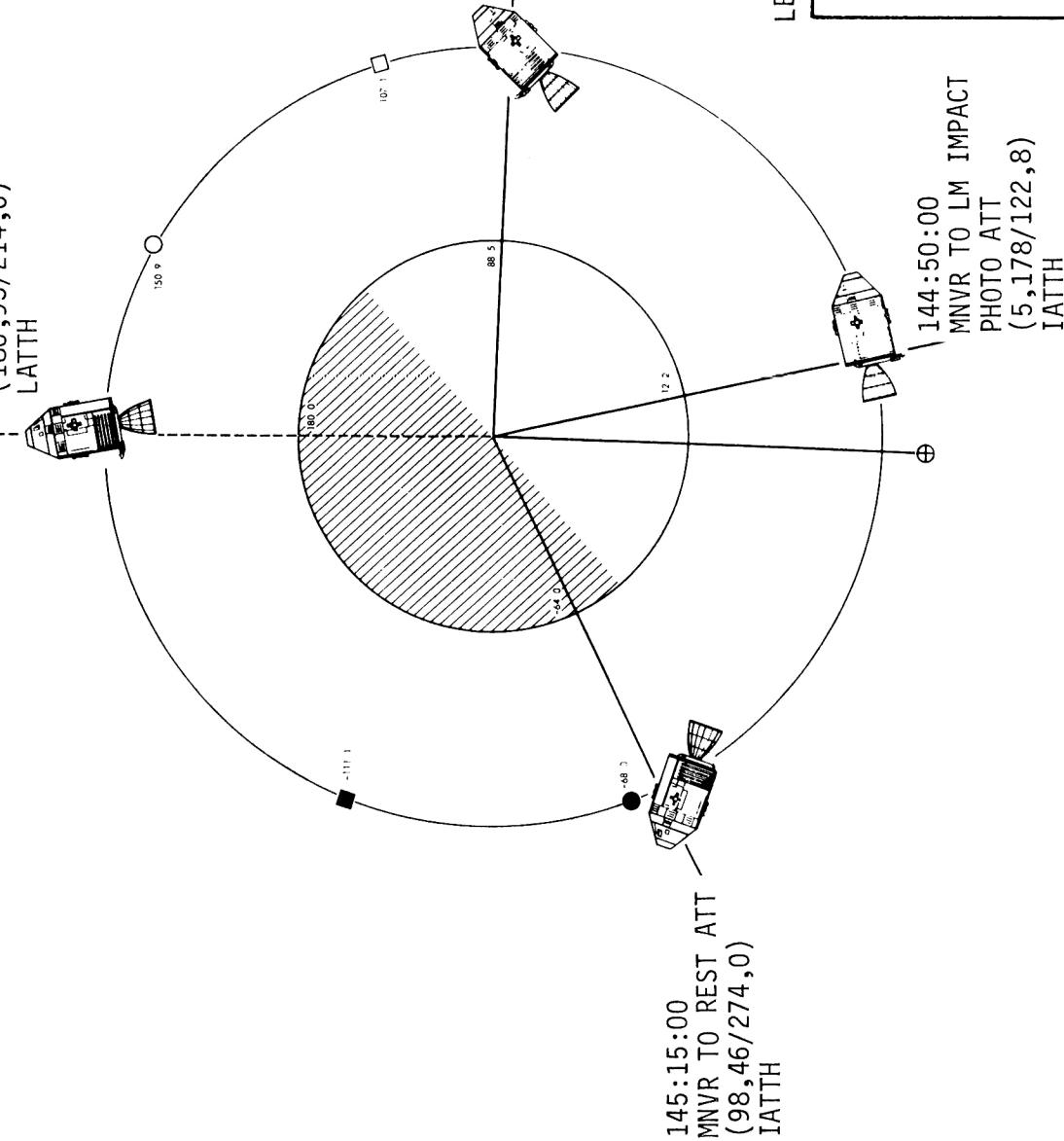
MAP UPDATE REV 35

LOS : _____ : _____ : _____
180° : _____ : _____ : _____
AOS : _____ : _____ : _____

MISSION	EDITION	DATE	TIME	DAY / REV	PAGE
APOLLO 13	FINAL (APRIL)	MARCH 27, 1970	143:00 - 144:00	6/34-35	3-113

REV 35

143:55:10
BEGIN REV 35
(180,93/214,0)
LATTH



3-113A

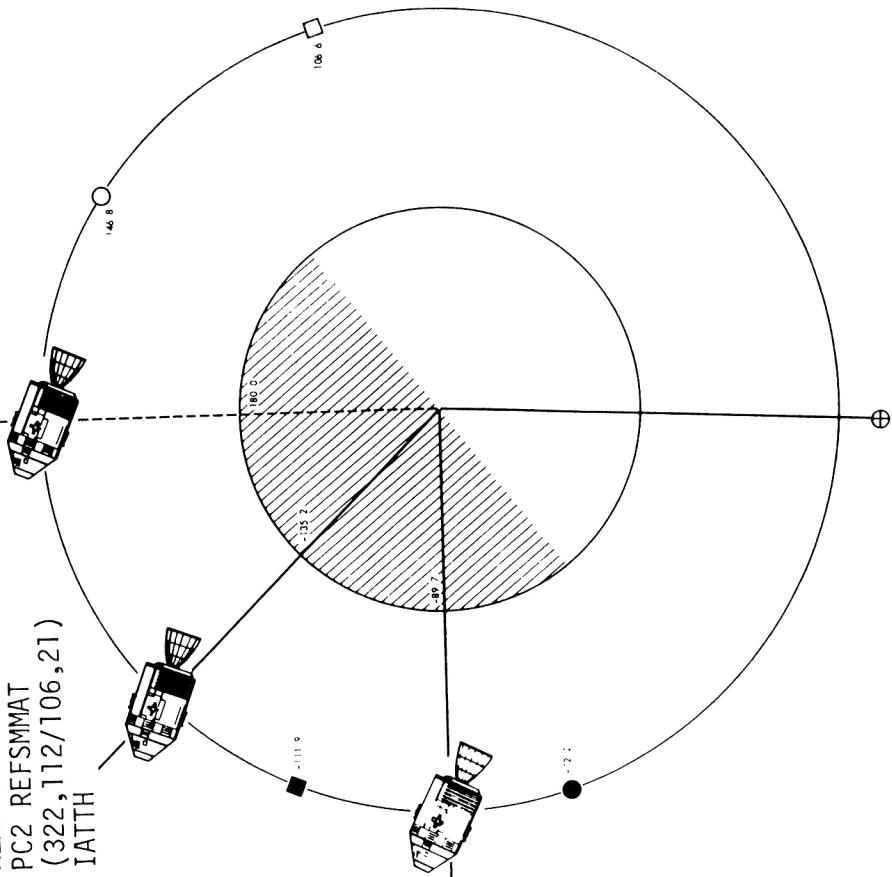
REVISION A

REV 39

151:46:50
BEGIN REV 39
(98,158/274,0)
IATTH

153:30:00
REALIGN IMU TO
PC2 REFSMMAT
(322,112/106,21)
IATTH

153:15:00
END REST PERIOD
BEGIN IMU REALIGN
(98,67/274,0)
IATTH



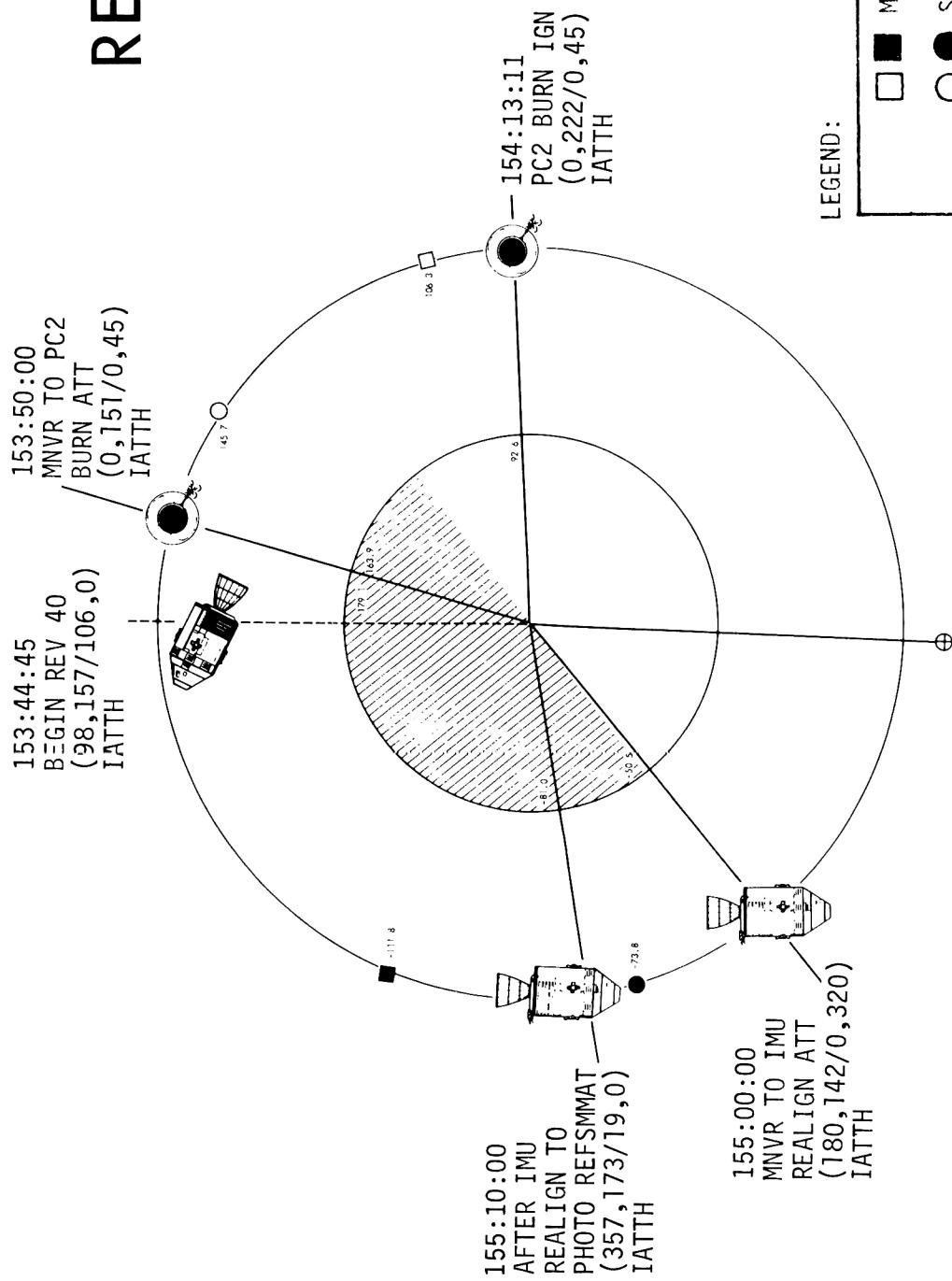
LEGEND:

□	MSFN AOS , LOS
○	S/C SUNRISE , SUNSET
⊕	SUBEARTH POINT
(R,LHP/INP,Y)	
IATTH	- INERTIAL ATTITUDE HOLD
LATTH	- LOCAL ATTITUDE HOLD

3-117A

REVISION _____ A

REV 40



LEGEND:

	MISFN AOS, LOS
	S/C SUNRISE, SUNSET
	SUBEARTH POINT

(R,LHP/INP,Y)

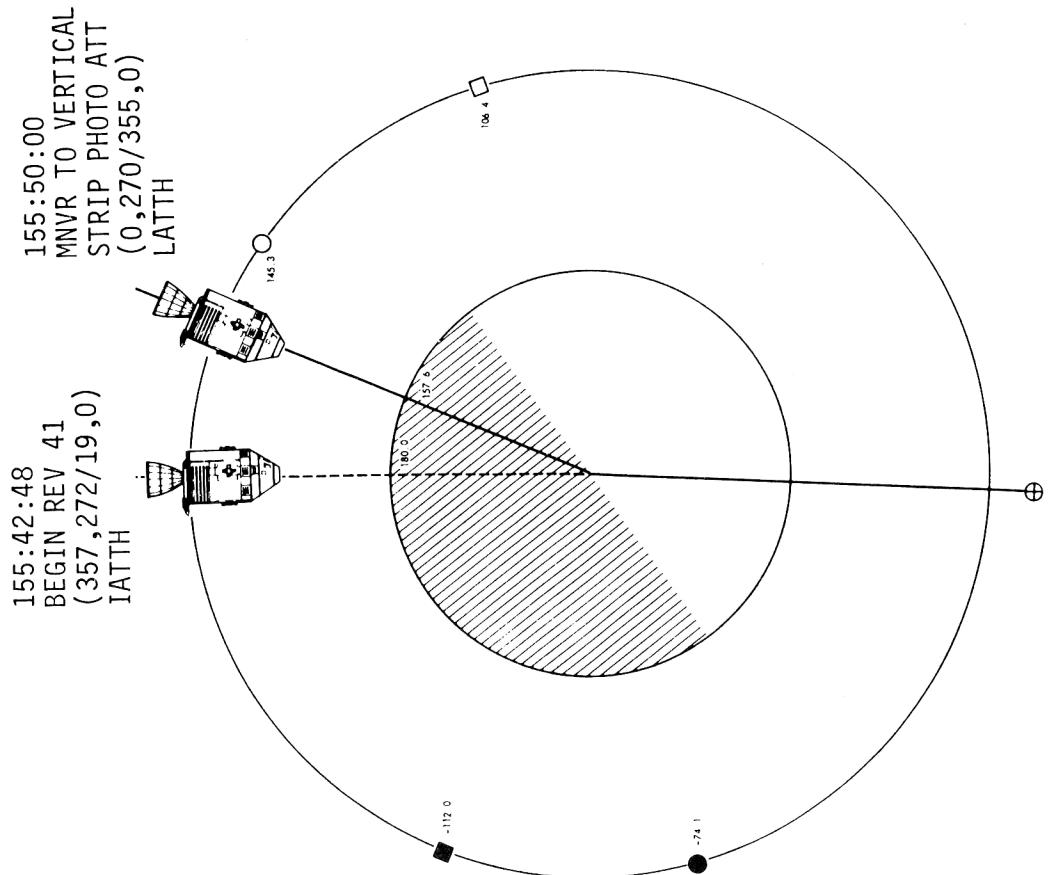
IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-119B

REVISION A

REV 41

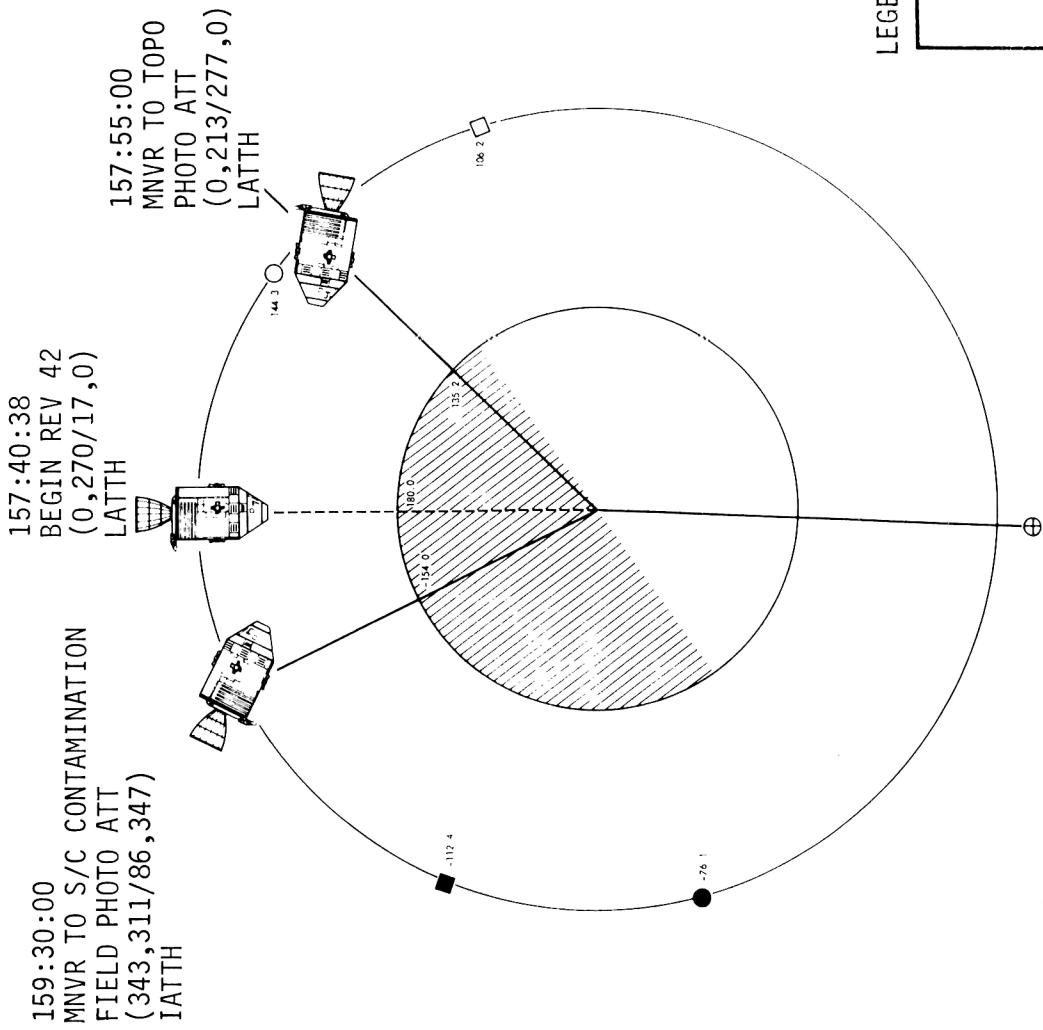


LEGEND:

□ ■	MSFN AOS, LOS
○ ●	S/C SUNRISE, SUNSET
⊕	SUBEARTH POINT
(R, LHP/INP, Y)	
IATHH - INERTIAL ATTITUDE HOLD	
LATTH - LOCAL ATTITUDE HOLD	

REVISION A

REV 42



LEGEND:

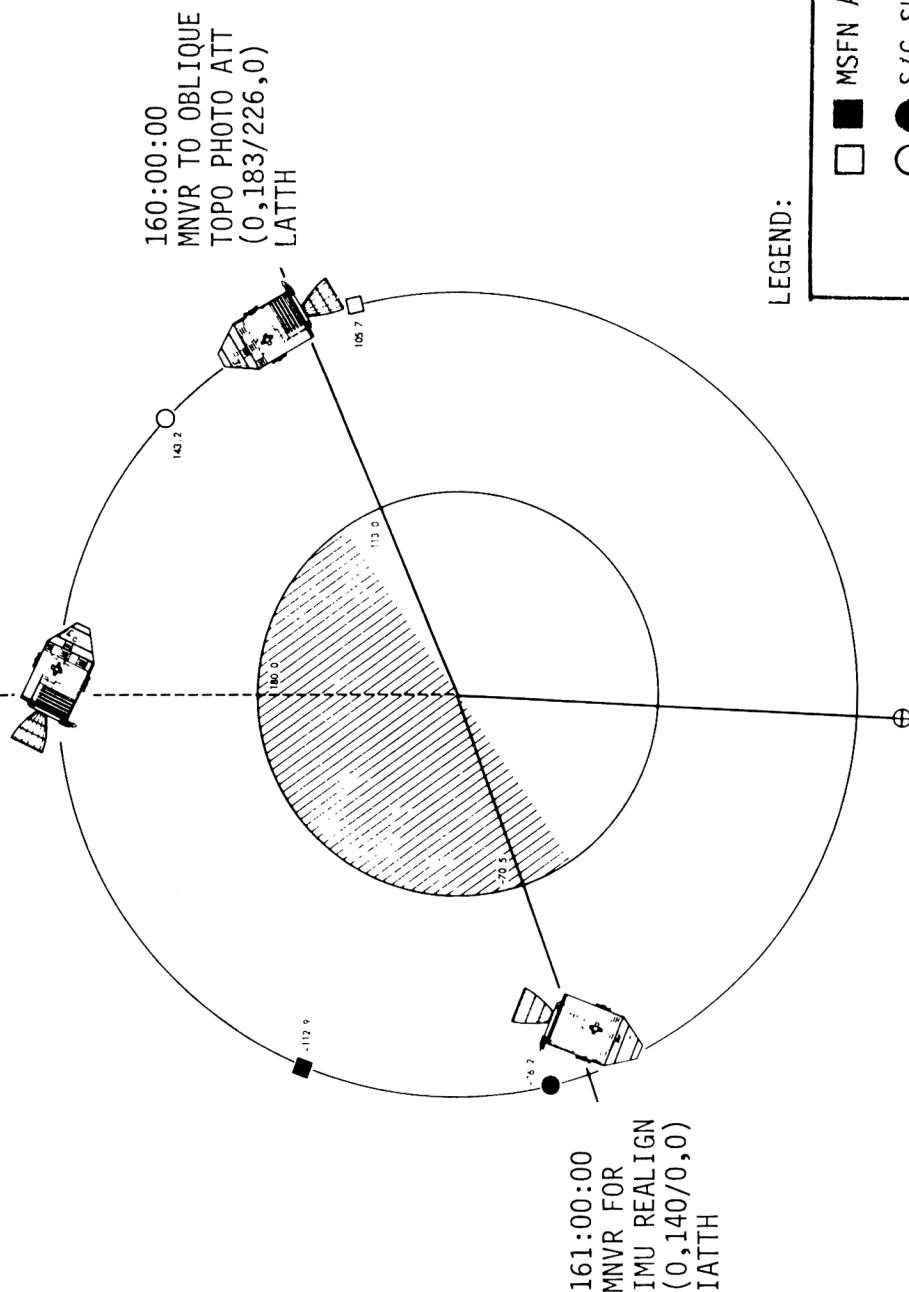
□ ■	MSFN AOS, LOS
○ ●	S/C SUNRISE, SUNSET
⊕	SUBEARTH POINT
(R, LHP/INP, Y)	
IATT _H	- INERTIAL ATTITUDE HOLD
LATT _H	- LOCAL ATTITUDE HOLD

3-122B

REVISION A

159:38:28
BEGIN REV 43
(343,337/86,347)
IATTH

REV 43



$(R, LHP/INP, Y)$.

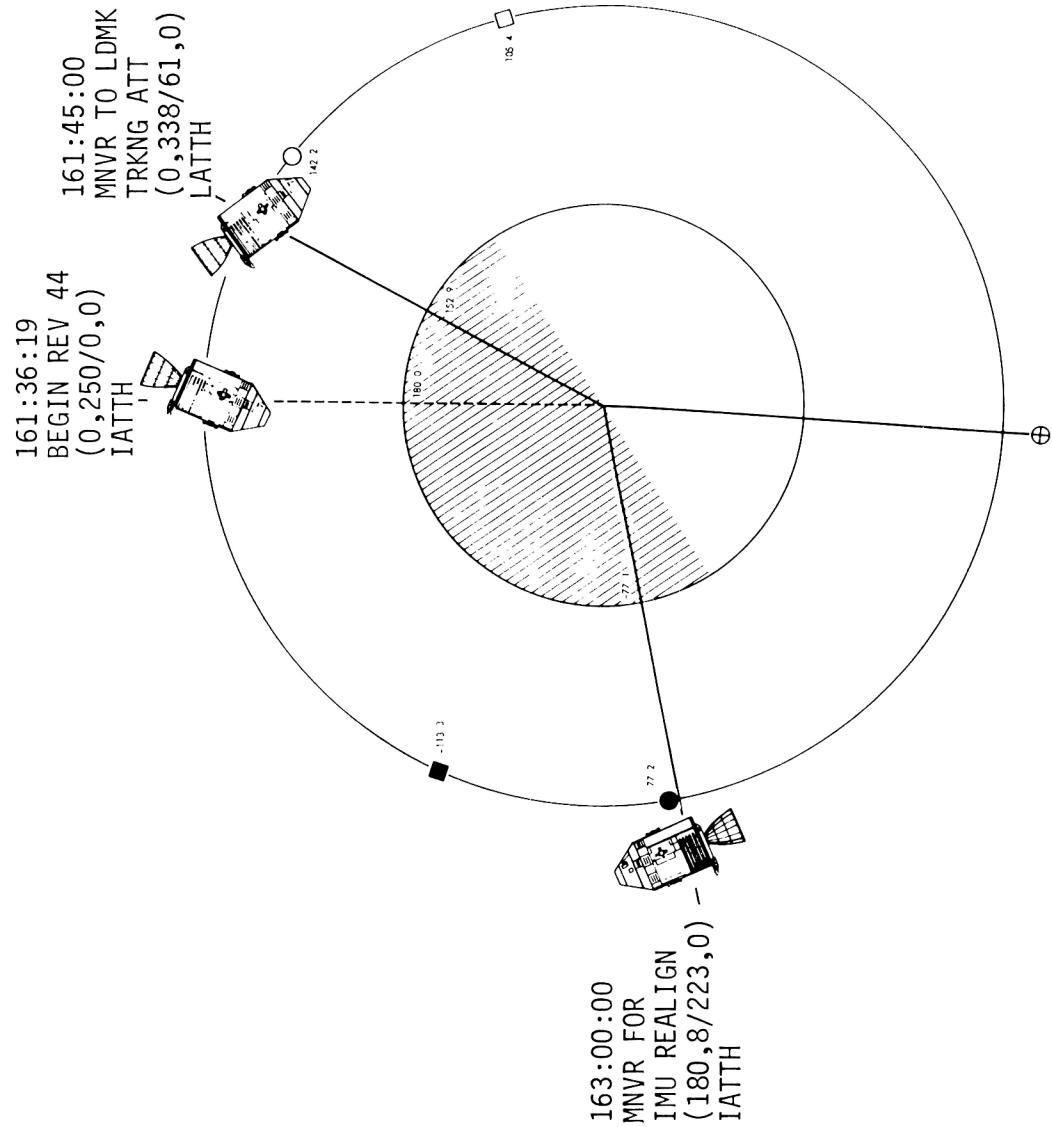
IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-126AA

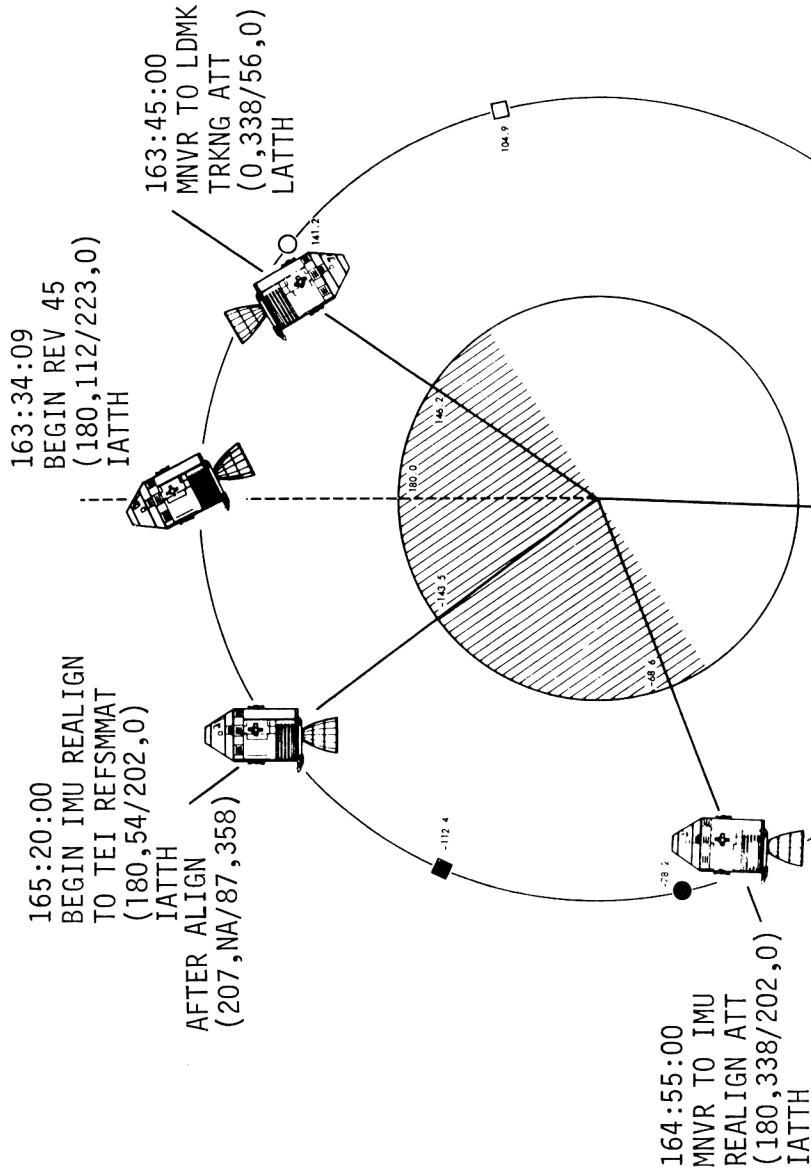
REVISION A

REV 44



3-126B

REV 45



3-128B

REVISION A

REV 46

