

15 pull-out charts



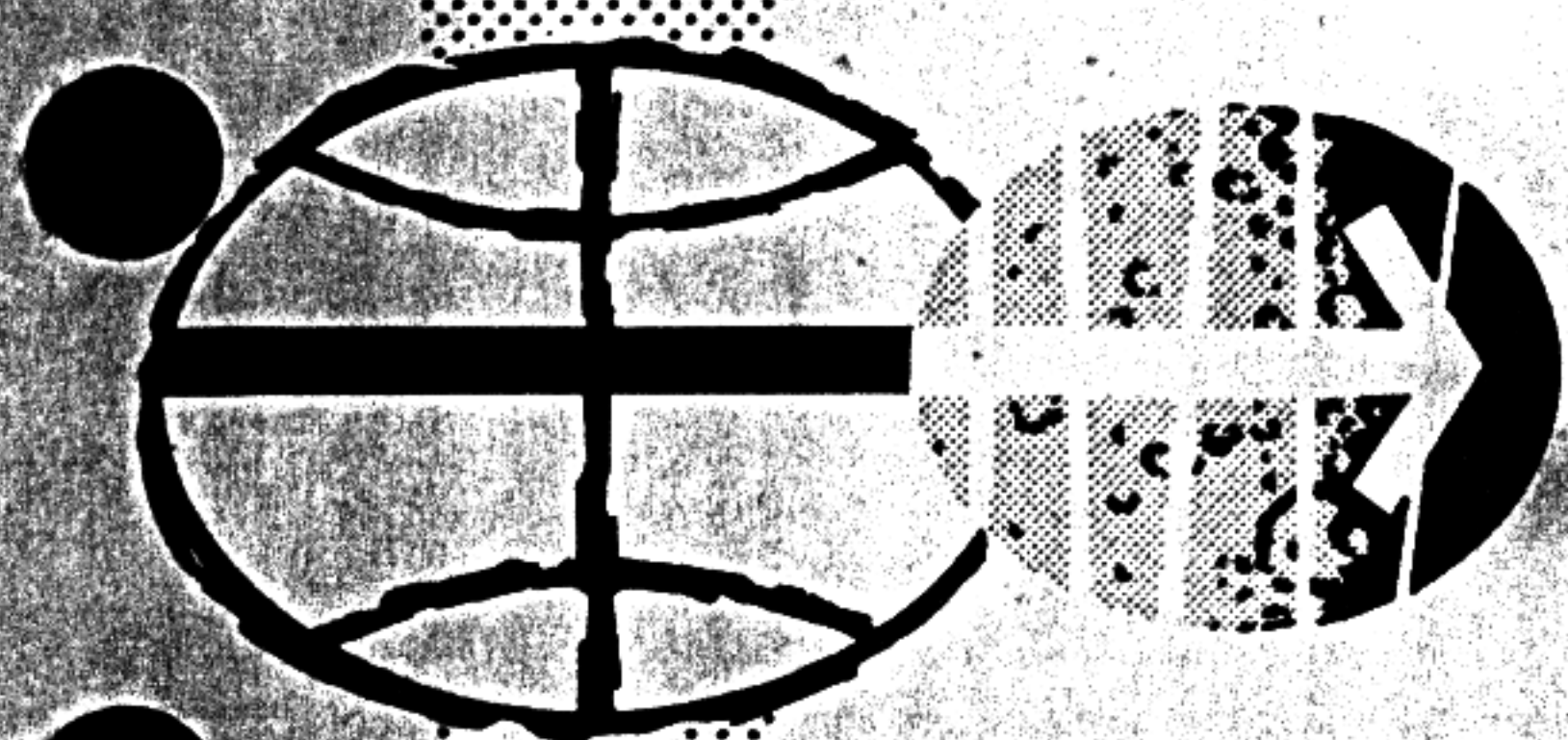
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
FINAL

APOLLO 12 FLIGHT PLAN

AS-507/CSM-108/LM-6

OCTOBER 15, 1969

FLIGHT PLANNING BRANCH
FLIGHT CREW SUPPORT DIVISION



MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

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SECTION I

SECTION II

SECTION III

SECTION IV

SECTION V

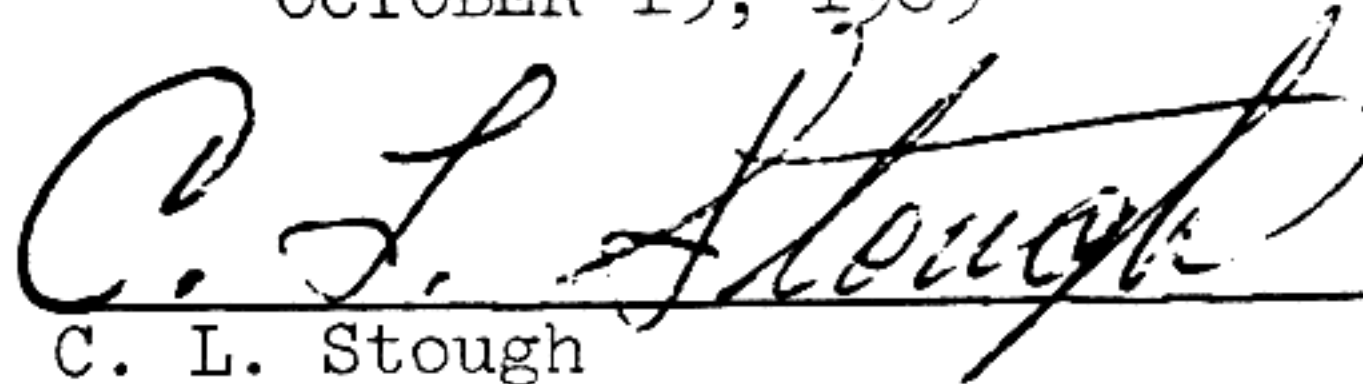
SECTION VI

APOLLO 12
APOLLO AS-507/CSM-108/LM-6

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Submitted by:

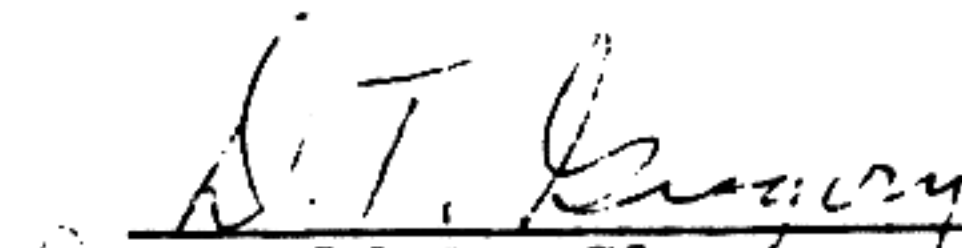

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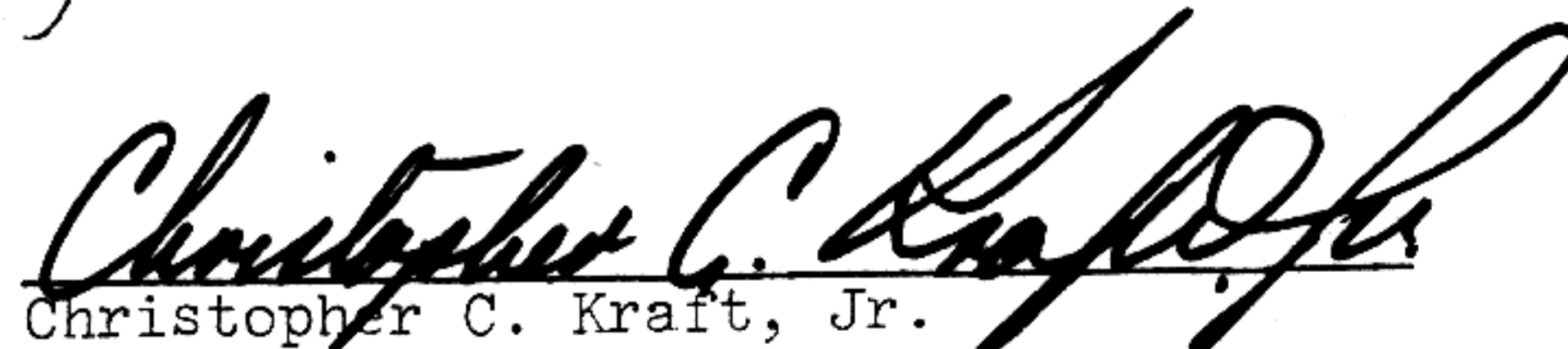

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TABLE OF CONTENTS

List of Charts and Graphs	iv
List of Tables	v
Introduction	vii
Acknowledgments	viii
Abbreviations	ix
Photographic Nomenclature	xviii
Symbol Nomenclature	xix

SECTION 1 - GENERAL

Flight Plan Notes	1-1
-------------------	-----

SECTION 2 - MISSION OBJECTIVES

Mission Objectives	2-1
--------------------	-----

SECTION 3 - DETAILED TIMELINE

1. Launch Phase	3-i
2. Translunar Injection	3-4
3. Translunar Coast Phase	
a. Transposition, Docking, and Ejection	3-5
b. Cislunar Navigation	3-8,3-16
c. LM Familiarization	3-45
d. Lunar Orbit Insertion	3-60

4. Lunar Orbit/Descent Phase	
a. Second LM Ingress	3-67
b. LM Activation and Checkout	3-79
c. Undocking	3-84
d. Touchdown	3-87
5. Lunar Surface Phase	
a. First EVA	3-93
b. Second EVA	3-108
c. LM Liftoff	3-122
6. Rendezvous/Lunar Orbit Phase	
a. Docking	3-125
b. LM Jettison	3-127
c. LM Impact	3-129
d. Candidate Landing Site Photography and Landmark Tracking	3-137,3-154
e. Trans Earth Injection	3-158
7. Trans Earth Coast Cislunar Navigation	3-169,3-173, 3-183,3-186, 3-188,3-198
8. Entry Interface	3-205

SECTION 4 - CONSUMABLES

This section will be added later as part of "Revision A" to the Final Flight Plan.

SECTION 5 - ABBREVIATED TIMELINE

Abbreviated Timeline

5-1

SECTION 6 - ALTERNATE MISSIONS

Alternate Mission 1 - CSM Only	6-1
Alternate Mission 2 - CSM/LM Lunar Orbit, DPS No/Go for Burn	6-2
Alternate Mission 3 - CSM/LM Lunar Orbit, No/Go for Undocking	6-3
Alternate Mission 4 - CSM Only, Earth Orbit	6-4
Alternate Timeline,-No MCC-4	6-5
Alternate Timeline,-LM Undocking Delayed One Rev.	6-10

CHARTS AND GRAPHS

FIG 1-1	LUNAR EXPLORATION COMM - ONE CREWMAN	1-8
FIG 1-2	LUNAR EXPLORATION COMM - BOTH CREWMAN	1-9
FIG 3-1	DOCKED LANDMARK TRACKING PROFILE	3-68,3-82
FIG 3-2	LUNAR ORBIT REST PERIOD ATTITUDE	3-71
FIG 3-3	CSM LANDMARK TRACKING PROFILE	3-89,3-92, 3-110,3-118a, 3-120,3-144, 3-148
FIG 3-4	HIGH RESOLUTION PHOTOGRAPHY	3-135,3-142
FIG 3-5	STEREO STRIP PHOTOGRAPHY	3-138,3-152

TABLES

TABLE 1-1	MSFN COVERAGE	1-10
1-2	TV SCHEDULE	1-13
1-3	FUEL CELL PURGE AND WATER DUMP SCHEDULE	1-14
1-4	LiOH CANNISTER CHANGE SCHEDULE	1-15
1-5	CSM BURN SCHEDULE	1-16
1-6	LM BURN SCHEDULE	1-17
1-7	BLOCK DATA	1-18
1-8	DSEA SCHEDULE	1-19
1-9	BATTERY CHARGE SCHEDULE	1-20
1-10	LANDMARK TRACKING	1-21
1-11	MISSION ACTIVITY SUMMARY	1-22
2-1	MISSION OBJECTIVE/ACTIVITY REFERENCE	2-2
3-1	TLI BURN TABLE	3-3
3-2	MCC-1 BURN TABLE	3-11
3-3	MCC-2 BURN TABLE	3-25
3-4	MCC-3 BURN TABLE	3-42
3-5	MCC-4 BURN TABLE	3-53
3-6	LOI-1 BURN TABLE	3-59
3-7	LOI-1 ABORT TABLE	3-59
3-8	LOI-2 BURN TABLE	3-64
3-9	CSM PLANE CHANGE #1 BURN TABLE	3-98
3-10	CSM PLANE CHANGE #2 BURN TABLE	3-136

TABLES (Cont'd)

3-11	TEI BURN TABLE	3-157
3-12	MCC-5 BURN TABLE	3-166
3-13	MCC-6 BURN TABLE	3-190
3-14	MCC-7 BURN TABLE	3-201

INTRODUCTION

This Flight Plan has been prepared by the Flight Planning Branch, Flight Crew Support Division, with technical support by TRW Systems.

This document schedules the AS-507/CSM-108/LM-6 operations and crew activities to fulfill, when possible, the test objectives defined in the Mission Requirements, H Type Mission Lunar Landing, Change B dated October 14, 1969.

The trajectory parameters used in this Flight Plan are for November 14, 1969 launch, with 72° launch azimuth and were supplied by Mission Planning and Analysis Division as defined by the Apollo Mission H-1 Spacecraft Operational Trajectory to be published.

The Apollo 12 Flight Plan is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes to this document that fall in the following categories should be submitted to the CPCB via a Crew Procedures Change Request:

1. Items that impose additional crew training or impact crew procedures.
2. Items that impact the accomplishment of Mission Objectives.
3. Items that result in a significant RCS or EPS budget change.
4. Items that result in moving major activities to a different activity day in the Flight Plan.
5. Items that require a change to the flight data file.

The Chief, Flight Planning Branch (FCSD) will determine what proposed changes fall in the above categories.

Mr. C. L. Stough will act as co-ordinator for all proposed changes to the Apollo 12 Flight Plan.

This Flight Plan is not to be reproduced without the written approval of the Chief, Flight Crew Support Division.

Any requests for additional copies or changes to the distribution lists of this document must be made in writing to Mr. W. J. North, Chief, Flight Crew Support Division, MSC, Houston, Texas.

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Views of the earth shown in the Flight Plan were taken from the document, "Views from the CM and LM during the Flight of Apollo 12 (Mission H-1)."

The CSM and LM attitude information was taken from the document, "Operational Lunar Orbit Attitude Sequence for Apollo 12 (Mission H-1)" to be published.

ABBREVIATIONS

ACCEL	Accelerometer
ACN	Ascension
ACT	Activation
ACQ	Acquisition or Acquire
AEA	Abort Electronics Assembly
AGS	Abort Guidance Subsystem
AH	Ampere Hours
ALSCC	Apollo Lunar Surface Close-up Camera
ALSEP	Apollo Lunar Surface Experiment Package
ALT	Altitude
AM	Amplitude Modulation
AMP or amp	Ampere
AMPL	Amplifier
ANG	Antigua
ANT	Antenna
AOH	Apollo Operations Handbook
AOS	Acquisition of Signal or Acquisition of Site
AOT	Alignment Optical Telescope
APS	Ascent Propulsion Subsystem
ARS	Atmosphere Revitalization System
ASC	Ascent
A/T	Alignment Technique
ATT	Attitude
AUX	Auxiliary
AZ	Azimuth
BAT	Battery
BD	Band
BDA	Bermuda
Bio	Bio-Medical Data on Voice Downlink
BP	Barber Pole
BRKT	Bracket
BT	Burn Time
BU	Backup
BW	Black & White (Film 3400)
BW1	Black & White (Film 3401)
CAP COM	Capsule Communicator
CAL \angle	Calibration Angle
CAM	Camera
CAN	CANISTER
CB	Circuit Breaker
CCIG	Cold Cathode Ion Gage
CDH	Constant Delta Altitude
CDR	Commander
CDU	Coupling Data Unit

CEX	Color External Photography
CIN	Color Internal Photography
CIRC	Circularization
CK	Check
C/L	Centerline or Checklist
CM	Command Module
CMC	Command Module Computer
CMD	Command
CMP	Command Module Pilot
CNTL	Control
C/O	Check out
COAS	Crew Optical Alignment Sight
COMM	Communications
CONFIG	Configuration
COMP	Compare
CONT	Continue and Contingency
CP	Control Point
CRO	Carnarvon, Australia
CRYO	Cryogenic
CSC	Contingency Sample Collection
CSC	Close-up Stereo Camera
CSI	Coelliptic Sequence Initiation
CSM	Command Service Module
C&WS	Caution and Warning System
CWEA	Caution and Warning Electronic Assembly
CYI	Grand Canary Island

DAC	Data Acquisition Camera
DAP	Digital Auto Pilot
DB	Deadband
DC	Direct Current
DCA	Digital Command Assembly
DEDA	Data Entry and Display Assembly
DEGS	Degrees
DEPL	Depletion
DES	Descent
DET	Digital Event Timer
DIFF	Difference
DIR	Direct
DK	Docked
DO	Detailed Objective
DOI	Descent Orbit Insertion
DPS	Descent Propulsion System
DS	Documented Sample
DSE	Data Storage Equipment
DSKY	Display and Keyboard
DTO	Detailed Test Objective
DUA	Digital Uplink Assembly
DWN	Down

E	Erasable or Enter
ECS	Environmental Control System
ED	Explosive Device
EDT	Eastern Daylight Time
EFH	Earth Far Horizon
EI	Earth (atmosphere) Interface and Entry Interface
EL	Electric Hasselblad Camera
ELEV	Elevation
EMER	Emergency
EMS	Entry Monitor System
EMU	Extravehicular Mobility Unit
ENH	Earth Near Horizon
EPO	Earth Parking Orbit
EPHEM	EPHEMERIS
EPS	Electrical Power Subsystem
EQUIP	Equipment
EST	Eastern Standard Time
ETB	Equipment Transfer Bag
EVA	Extravehicular Activity
EVAP	Evaporator
EVCS	Extravehicular Communications System
EVT	Extravehicular Transfer
EXT	External

f	F Stop
FC	Fuel Cell
FDAI	Flight Director Attitude Indicator
FLT	Flight
FM	Frequency Modulated
FOV	Field of View
FPS or fps	Feet per second
FT or ft	Feet
FTO	Flight Test Objective
FTP	Full Throttle Position
FWD	Forward

G.A.	Gas Analysis
GA	Gimbal Angle
GBI	Grand Bahama Islands
GBM	Grand Bahama (MSFN)
GDC	Gyro Display Coupler
GDS	Goldstone, California
GET	Ground Elapsed Time
GETI	Ground Elapsed Time of Ignition
GLY	Glycol
GMT	Greenwich Mean Time
G&N	Guidance and Navigation
GNCS	Guidance Navigation Control System
GWM	Guam
GYM	Guaymas, Mexico

H2	Hydrogen
HA	Apogee Altitude
HAW	Hawaii
HBR	High Bit Rate (TLM)
HD	Highly Desirable
HGA	High Gain Antenna
HI	High
H2O	Water
HP	Perigee Altitude
HSK	Honeysuckle (Canberra, Australia)
HTC	Hand Tool Carrier
HTR	Heater
HTV	USNS Huntsville
ICDU	Inertial Coupling Data Unit
ID	Identification
IGA	Inner Gimbal Angle
IGN	Ignition
IMU	Inertial Measurement Unit
IND	Indicator
INIT	Initialization
INT	Intervalometer
IP	Initial Point
ISA	Interim Stowage Assembly
IU	Instrumentation Unit
IVC	Intervehicular Communications
IVT	Intravehicular Transfer
JETT	Jettison
KM	Kilometer
kwh	Kilowatt Hour
LA	Launch Azimuth
LAT	Latitude
LBR	Low Bit Rate (TLM)
LBS or lbs	Pounds
LCG	Liquid Cooled Garment
L/D	Lift/Drag
LD	Lunar Day (TV Lens)
LDG	Landing
LDMK	Landmark
LEB	Lower Equipment Bay
LEC	Lunar Equipment Conveyor
LEL	Lunar Surface Electric Hasselblad Camera
LFH	Lunar Far Horizon
LGC	LM Guidance Computer
LH	Left-hand
L/H	Local Horizontal
LHEB	Left-hand Equipment Bay

LHFEB	Left-hand Forward Equipment Bay
LHSSC	Left Hand Side Storage Container
LiOH	Lithium Hydroxide
LLM	Lunar Landing Mission
LLOS	Landmark Line of Sight
LM	Lunar Module
LMP	Lunar Module Pilot
LNH	Lunar Near Horizon
L/O	LIFT OFF
LOI	Lunar Orbit Insertion
LONG	Longitude
LOS	Loss of Signal or Loss of Site
LPO	Lunar Parking Orbit
LR	Landing Radar
LRRR or LR3	Laser Ranging Retro-Reflector
LS	Landing Site or Lunar Surface
LSM	Lunar Surface Magnetometer
LT	Light
LTG	Lighting
LV	Launch Vehicle
L/V	Local Vertical
LVPD	Launch Vehicle Pressure Display
M	Mandatory
MAD	Madrid, Spain
MAG	Magazine (Camera)
MAN	Manual
MAX	Maximum
MAX Q	Maximum Dynamic Pressure
MCC	Midcourse Correction
MCC-H or MCC	Mission Control Center - Houston
MDC	Main Display Console
MEAS	Measurement
MER	USNS Mercury
MESA	Modular Experiment Stowage Assembly
MET	Mission Event Timer
MGA	Middle Gimbal Angle
M/I	Minimum Impulse
MIN	Minimum
MIR	Mirror
MLA	Merrit Island, Florida
mm	Millimeter
MNVR	Maneuver
MON	Monitor
MPL	Mid Pacific Landing
MPS	Main Propulsion System
MSFN	Manned Space Flight Network
MTVC	Manual Thrust Vector Control

N2	Nitrogen
NAV	Navigation
NM	Nautical Miles
NOM	Nominal
NXX	Noun XX
O2	Oxygen
OBS	Observation
O/F	Oxidizer to Fuel Ratio
OGA	Outer Gimbal Angle
OMNI	Omnidirectional Antenna
OPR	Operate
OPS	Oxygen Purge System
OPT	Option
ORB	Orbital
ORDEAL	Orbit Rate Display Earth and Lunar
ORIENT	Orientation
OVBD	Overboard
OVHD	Overhead
P	Pitch or Program
PAD	Voice Update
PCM	Pulse Code Modulation
PC	Plane Change or Chamber Pressure
PDI	Powered Descent Initiation
PER	Pericynthian
PGA	Pressure Garment Assembly
PGNS	Primary Guidance Navigation Control Section
PHOTO	PHOTOGRAPH
PIPA	Pulse Integrating Pendulous Accelerometer
PKG	Package
PLSS	Portable Life Support Systems
PM	Phase Modulated
POL	Polarity or Polarizing
PRE	Pretoria, South Africa
PREF	Preferred
PREP	Preparation
PRESS	Pressure
PRIM	Primary
PRN	Pseudo Random Noise
PROP	Proportional
PRPLNT	Propellant
PSE	Passive Seismic Experiment
PSIA	Pounds per Square Inch Absolute
PSID	Pounds per Square Inch Differential
PSIG	Pounds per Square Inch Gage
PT	Point
PTC	Passive Thermal Control
PU	Propellant Utilization
PUGS	Propellant Utilization and Gaging System
PWR	Power
PXX	Program XX
PYRO	Pyrotechnic

Qty	Quantity
QUAD	Quadrant
R	Roll or Range
R&B	Red & Blue
RAD	Radiator, or Radial, or Radiation
RCDR	Recorder
RCS	Reaction Control System
RCU	Remote Control Unit
RCV	Receiver
REACQ	Reacquire
RED	USNS Redstone
REFSMMAT	Reference Stable Member Matrix
REG	Regulator
REQD	Required
REV	Revolution
RH	Right-hand
RING	Ringsite
RLS	Radius of Landing Site
RNDZ	Rendezvous
RNG	Range/Ranging
RR	Rendezvous Radar
RSI	Roll Stability Indicator
RT	Real Time
RTC	Real Time Command
RTG	Radioisotope Thermoelectric Generator
RXX	Routine XX
SA	Shaft Angle
S/C	Spacecraft
SCE	Signal Conditioning Equipment
SCS	Stabilization Control System
SCT	Scanning Telescope
SEC	Secondary
SECO	S-IVB Engine Cut-off
SECS	Sequential Events Control System
SEL	Select
SEP	Separate
SEQ	Sequence
SIDE	Suprathermal Ion Detector Experiment
S-IVB	Saturn IV B(Third Stage)
SLA	Service Module LM Adapter
SLOS	Star Line-of-Sight
SM	Service Module
SPOT	Spot Meter
SPS	Service Propulsion System
SR	Sunrise
SRC	Sample Return Container
SRX	S-Band Receiver Mode No. X

SS	Sunset
STX	S-Band Transmit Mode No. X
S.V.	State Vector
Sw	Switch
SWC	Solar Wind Composition
SWE	Solar Wind Experiment
SXT	Sextant
SYS	System
T EPHEM	Time of Ephemeris Update
TA	Trunnion Angle
TAN	Tananarive, Madagascar
TB	Time Base
TCA	Time of Closest Approach
TD	Touchdown
TD&E	Transposition Docking & LM Ejection
TEC	Trans Earth Coast
TECH	Technique
TEI	Transearth Insertion
TEMP	Temperature
TERM	Terminate
TEX	Corpus Christi, Texas
TGT	Target
TIG	Time of Ignition
TLC	Trans Lunar Coast
TLI	Translunar Insertion
TLM or TM	Telemetry
TPF	Terminal Phase Final
TPI	Terminal Phase Initiation
TPM	Terminal Phase Midcourse
T/R	Transmitter/Receiver
TRANS	Translation
TRN	Trunion
TV	Television
TVC	Thrust Vector Control
TWR	Tower
ULL	Ullage
UMB	Umbilical
UNDK	Undock
US	United States
V	Velocity
VR	Resultant Velocity
VX	Velocity along the X-axis
VY	Velocity along the Y-axis
VZ	Velocity along the Z-axis

VAN	USNS Vanguard
VHF	Very High Frequency
VLV	Valve
VOX	Voice Keying
VXX	Verb XX
W/O	Without
WRT	With Respect to
WTN	USNS Watertown
X	Time of Closest Approach (Symbol)
X-DOT	Rate of Change along the X axis
XFER	Transfer
XMIT	Transmit or Transmitter
XPONDER	Transponder
Y	Yaw
YDOT	Rate of Change along the Y axis
ZDOT	Rate of Change along the Z axis
Δ Az	Azimuth Change (Difference)
Δ H	Altitude Change (Difference)
Δ P	Pressure Change (Difference)
Δ R	Position Change (Difference)
Δ V	Velocity Change (Difference)
Δ VC	Velocity Change at Engine Cutoff

Photographic Nomenclature

AAA/BBB/CCC/DDD - EEE, EEE, (GGG, HHH, III) JJJ

AAA - Location from which photography is to be accomplished

BBB - Camera

CCC - Lens

DDD - Film Type

EEE - Photography aids (i.e., brackets, intervalometer,
Mirror etc.)

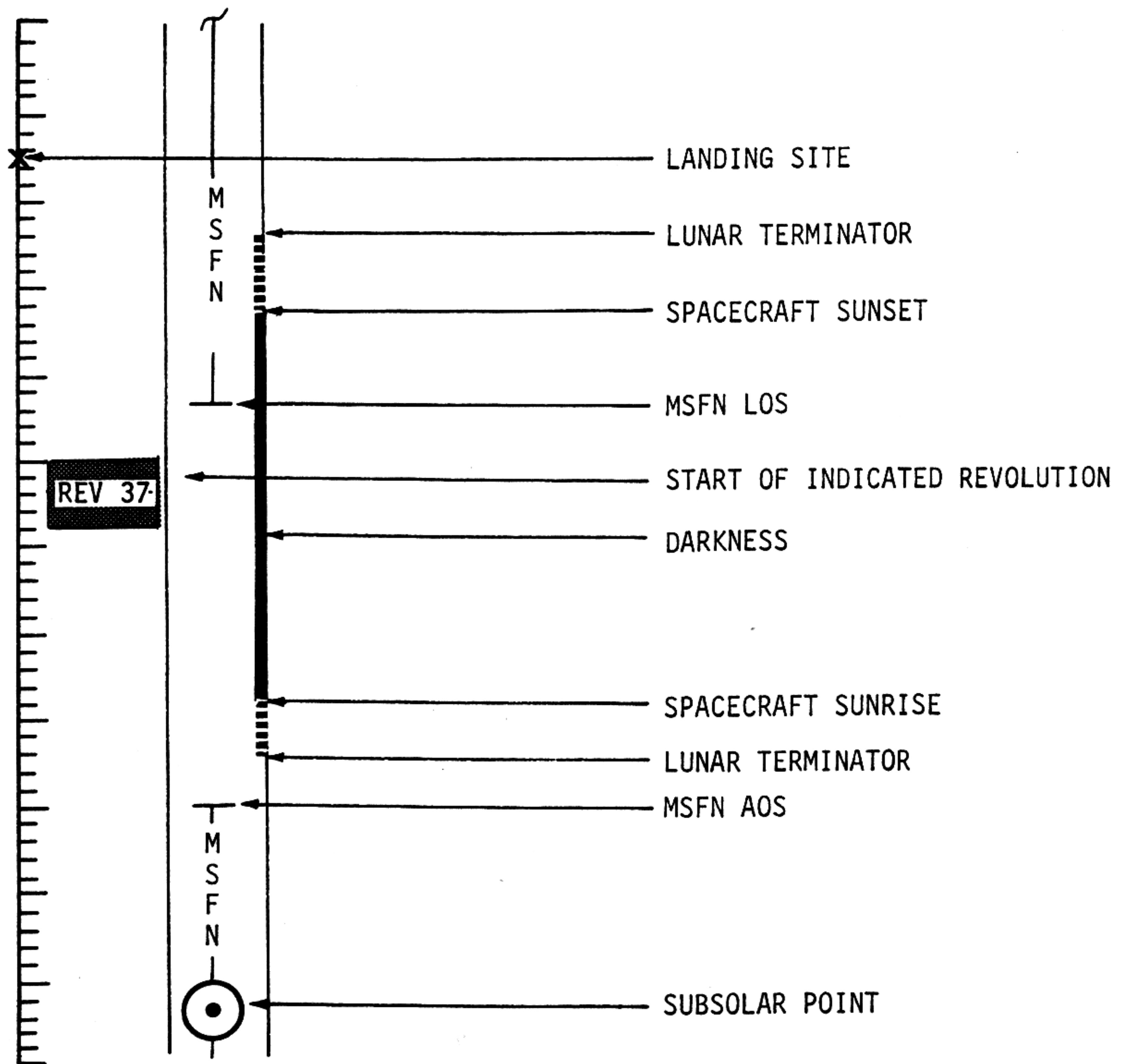
GGG - Lens Aperture Setting

HHH - Shutter Speed

III - Focus distance in feet

JJJ - Number of frames for EL & LEL cameras
Frame Rate
Magazine percent
T Time (minutes)
Operating time (minutes) for TV

SYMBOL NOMENCLATURE



SECTION I - GENERAL

FLIGHT PLAN NOTES

A. Crew

1. Crew designations are as follows:

<u>Designation</u>	<u>Prime</u>	<u>Backup</u>
Commander (CDR)	Conrad	Scott
Command Module Pilot (CMP)	Gordon	Worden
Lunar Module Pilot (LMP)	Bean	Irwin

2. The nominal CM couch positions are:

<u>Activity</u>	<u>Left</u>	<u>Center</u>	<u>Right</u>
Launch thru TLI	CDR	CMP	LMP
T&D thru Entry	CMP	CDR	LMP

3. The PGA's will be worn as follows:

ACTIVITY	PRESSURIZED HARD SUIT	SUITED (SOFT SUIT)	PARTIAL SUIT W/O HELMET & GLOVES	SHIRT SLEEVES
LAUNCH		ALL		
EARTH ORBIT			ALL	
TLI THROUGH SLINGSHOT MNVR			ALL	
TLC & TEC				ALL
LM ACTIVATION			ALL	
UNDOCKING		CDR & LMP	CMP	
SEPARATION			ALL	
PDI & TD		CDR & LMP	CMP	
LUNAR STAY EXCEPT EVA	VARIES ACCORDING TO CHECKLIST FOR CDR & LMP. CMP WILL BE PARTIALLY SUITED W/O HELMET & GLOVES			
SURFACE EVA	CDR & LMP		CMP	
LIFTOFF THRU DOCKING		CDR & LMP	CMP	
POST JETTISON THRU TEI				ALL
ENTRY				ALL

4. Crew status reports will be voiced to MCC-H before and after crew sleep periods. After waking the crew will report sleep obtained and radiation doses received during the last 24 hours and before going to sleep the crew will report medication used and any other pertinent information on activities performed.

5. Negative reporting will be used in reporting completion of each checklist.

All onboard gauge readings will be read directly from the
6. gauges with no calibration bias applied.

B. CSM Systems

1. Communications

- (a) The preferred S-Band communication modes are:
 - (1) Uplink Mode 6 (Voice, PRN, and Udata)
 - (2) Downlink Mode 2 (Voice, PRN, TLM-HBR)
- (b) OMNI B and VHF LEFT will be selected for liftoff. OMNI D will be selected by the crew during boost if the launch azimuth is less than 96° or OMNI C if the launch azimuth is greater than 96° . OMNI D will probably be the best antenna for earth orbit.
- (c) VHF Duplex B will be used for launch, and Simplex A for earth orbit operations.
- (d) During TLC and TEC, OMNI antennas will nominally be used. The CSM X-axis will be pitched up 90° (North) for TLC and pitched down 90° (South) for TEC with the Y-Z axes in the plane of the ecliptic. These attitudes permit high gain antenna coverage and simultaneous viewing of the earth and moon through side windows for TV coverage.
- (e) The CSM communications with the LM while the LM is on the lunar surface is via MSFN relay.
- (f) Table 1-1 is a summary of the MSFN coverage available for the CSM.
- (g) Table 1-2 contains a summary of the scheduled CSM TV transmissions.
- (h) During PTC the OMNI antennas will be switched via ground command. During periods of attitude control other than PTC the crew will manage antenna operations.
- (i) The CSM will be configured to relay LM communications prior to undocking.

2. DSE

- (a) The DSE will be normally operated via ground command except for special cases where the operation is time limited. In these cases the crew may be asked to rewind the tape.

- (b) During the earth orbit phase, the CSM LBR data will be recorded when the CSM is not within MSFN coverage. The DSE will be dumped during the pass over the US and over CRO prior to TLI if possible.
 - (c) During lunar orbit phase, the CSM LBR data will be recorded when the CSM is not within MSFN coverage. The DSE will normally be dumped at AOS.
 - (d) CSM LBR data will be recorded during all P22 landmark tracking and dumped at completion of tracking.
 - (e) CSM HBR and voice will be recorded during all CSM engine burns when MSFN coverage is not available.
 - (f) All Entry data will be recorded in HBR during the blackout.
3. Electrical Power
- (a) The CSM will normally remain powered up throughout the mission.
 - (b) Table 1-3 lists the Fuel Cell Purges and waste water dumps.
 - (c) Based on cryo purity and performance, fuel cell O₂ purges will be stretched to a maximum of 24 hours to coincide with water dump times. The O₂ purge at 11 hours will allow a judgment to be made on the defined purge schedule.
 - (d) The cryogenic heaters will be in AUTO during the mission and the fans will be operated manually. The O₂ & H₂ fans will be cycled for one minute before and after each sleep cycle and before each SPS burn. The O₂ & H₂ fans will also be cycled prior to CSM LM Ejection.
 - (e) Table 1-9 contains the battery charge schedule.

4. ECS and Water Management

- (a) Potable water will be chlorinated once a day after eat period prior to each sleep period.
- (b) Waste Water dumps and fuel cell purge criteria:
 - 1. During TLC and TEC water dumps and fuel cell purges will be scheduled after the sextant star check and prior to each midcourse maneuver.
 - 2. Waste water dumps and fuel cell purges will not be scheduled during the following periods:
 - a. Between MCC-3 and LOI-1 plus two hours.
 - b. Within three revolutions of pre-DOI undocking.
 - c. Between TEI and sextant star check prior to MCC-5.
 - d. Within one hour prior to optical navigation sightings.
 - e. Between MCC-6 and EI.
 - 3. During lunar orbit waste water dumps and fuel cell purges should be scheduled as close to the LOS midpoint as possible.
 - 4. All waste water dumps will be manual.
- (c) Only one CO₂ absorber filter (LiOH canister) is changed at a time. Table 1-4 list the LiOH canister change schedule. There are 20 filters onboard with 18 stowed at launch.
- (d) At lift-off the cabin will contain 60% O₂ and 40% N₂. The CM will be purged after launch. The purge is terminated prior to LM pressurization after TLI. After the LM is configured for ejection, it will be isolated and the CM will be purged for eight more hours.

5. Guidance and Navigation

- (a) During lunar orbit, the CSM and LM will utilize the same landing site and lift-off REFSMMATS such that the gimbal angles would be 0,0,0 with the LM sitting face forward on the landing site and the CSM over the landing site pitched up 90° from local horizontal "heads up."

- (b) The CSM tracking light will be on continuously from the undocking to landing and from LM lift-off to docking.
- (c) After each landmark tracking period, the CSM will reacquire MSFN so that N49 ($\Delta R, \Delta V$) is displayed on TLM for data retrieval.
- (d) The time tags on maneuvers in Section 3 indicate the completion time of the maneuver unless otherwise stated. All maneuver angles are the FDAI angles after the completed maneuver.
- (e) CSM/LM and CSM attitude maneuvers will normally be at a rate of $0.2^\circ/\text{sec}$ or $0.5^\circ/\text{sec}$ unless other rates are required.
- (f) Undocking will be done radially using the soft-undocking procedure. The probe will be extended its full length with the lm held on by the capture latches. When the rates are nulled, the CSM will then release the LM.

6. Propulsion Systems

- (a) The SPS engine will be used to "back-up" all LM rendezvous burns except CDH to conserve SM RCS. The nominal CDH burn magnitude is small thus it is backed up by the SM RCS. The SPS gimbal motors will not be turned on during the back-up maneuver preparation.
- (b) The SPS will always be started using a single bank, however, the other bank will be opened 2 to 5 seconds after ignition for burns longer than 6 seconds. Bank A will be used for the first engine ignition.
- (c) Table 1-5 lists the CSM propulsion burns.

C. LM Systems

1. Communications

- (a) The preferred S-Band communications are:
 - (1) Uplink Mode 7 (Voice, Udata)
 - (2) Downlink Mode 1 (Voice, TLM-HBR)
- (b) The LM voice recorder will be used to record LM voice during undocked operations. Table 1-8 is a schedule of LM voice recorder usage.
- (c) Figure 1-1 shows the communications mode for the first part of the EVA (CDR EVA only) and the one man contingency EVA. Figure 1-2 shows the nominal two-man EVA comm configuration.

2. ECS

- (a) The LM will contain ambient air at lift-off. During launch the pressure will bleed to zero. CSM 02 will be used to pressurize the LM after T&D. After T&D, the LM will be isolated and allowed to bleed down via leakage. For each entry into the LM before undocking the CSM 02 will be used to equalize LM pressure. After each entry, the LM will be isolated and allowed to leak down. This procedure insures a pure oxygen environment in the LM at the first EVA.
- (b) There are a total of six LM repressurizations, three docked and three on the lunar surface.

3. Guidance Systems

- (a) The LGC and CMC will use the same landing site and lift-off REFSMMATS.
- (b) The AGS will be placed in standby after the "GO" is given for lunar stay.
- (c) The RR and IMU will be powered down and the LGC placed in standby after TD plus two hours until lift-off preparation.
- (d) The rendezvous radar will be pointed away from the sun and will be turned off when no functional use is required to prevent overheating of the antenna. The LM tracking light will be on continuously between separation and touchdown and between launch and docking.

4. Propulsion Systems

(a) The APS/RCS interconnect will be used during the lunar lift-off and ascent only.

(b) Table 1-6 lists the LM propulsion burns.

D. Procedures

1. CSM

Crew procedures called out in the flight plan may be found in the following documents:

- (a) Apollo Operations Handbook - CSM-108 (AOH), Volume 2
- (b) Crew Checklists
- (c) CSM Rendezvous Procedures
- (d) Launch Abort Procedure
- (e) Reentry Procedures
- (f) Photographic Operations Plan
- (g) Lunar Landmark Tracking Attitude Studies
- (h) Lunar Orbit Attitude Sequence for Mission H

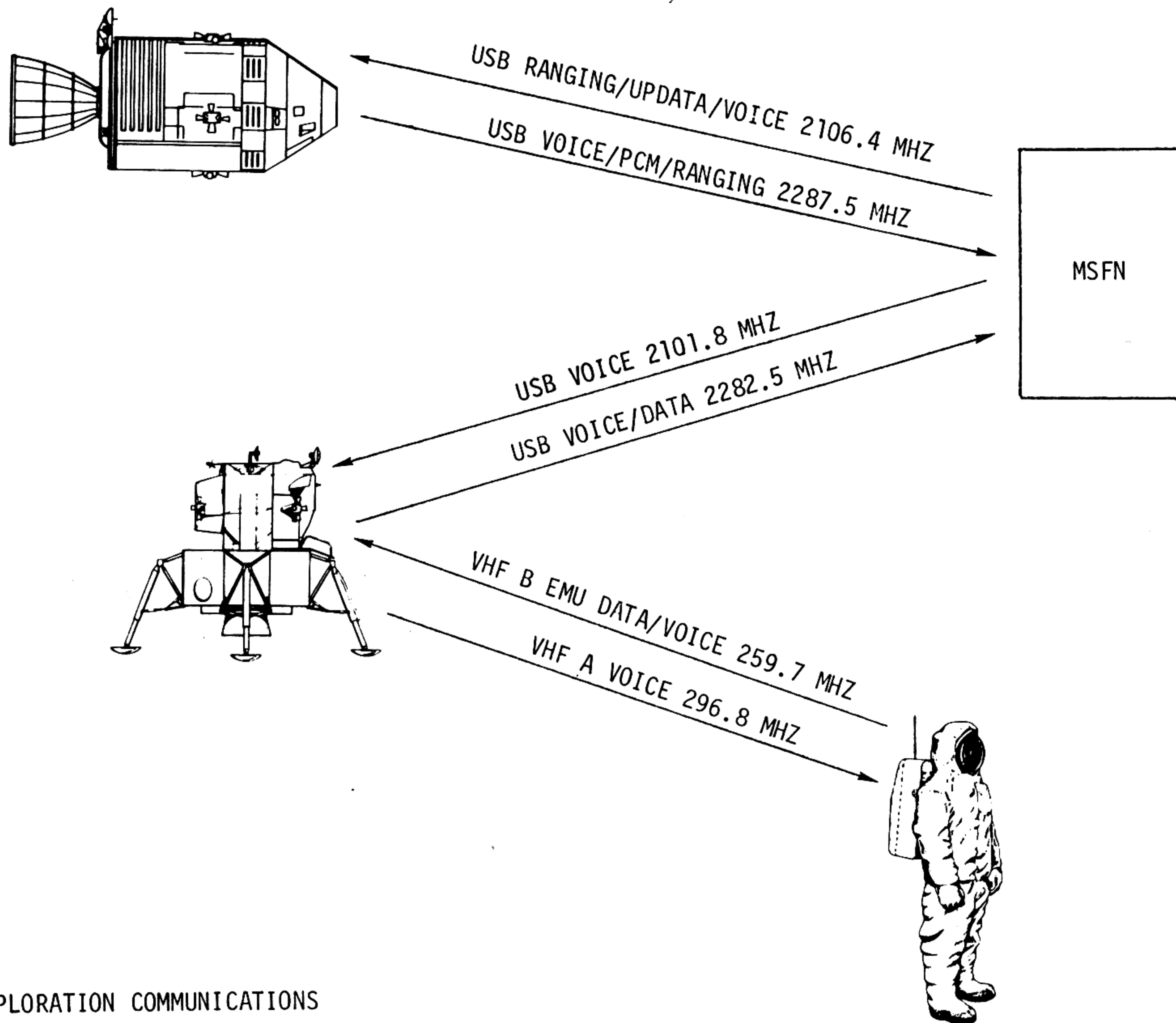
2. LM

Crew procedures called out in the flight plan may be found in the following documents:

- (a) Apollo Operations Handbook LM-6 Volume 2
- (b) Crew Checklists
- (c) LM Rendezvous Procedures
- (d) LM Descent/Ascent Procedures
- (e) Photographic Operations Plan
- (f) Orbital EVA Procedures
- (g) Lunar Surface Procedures

E. Summary

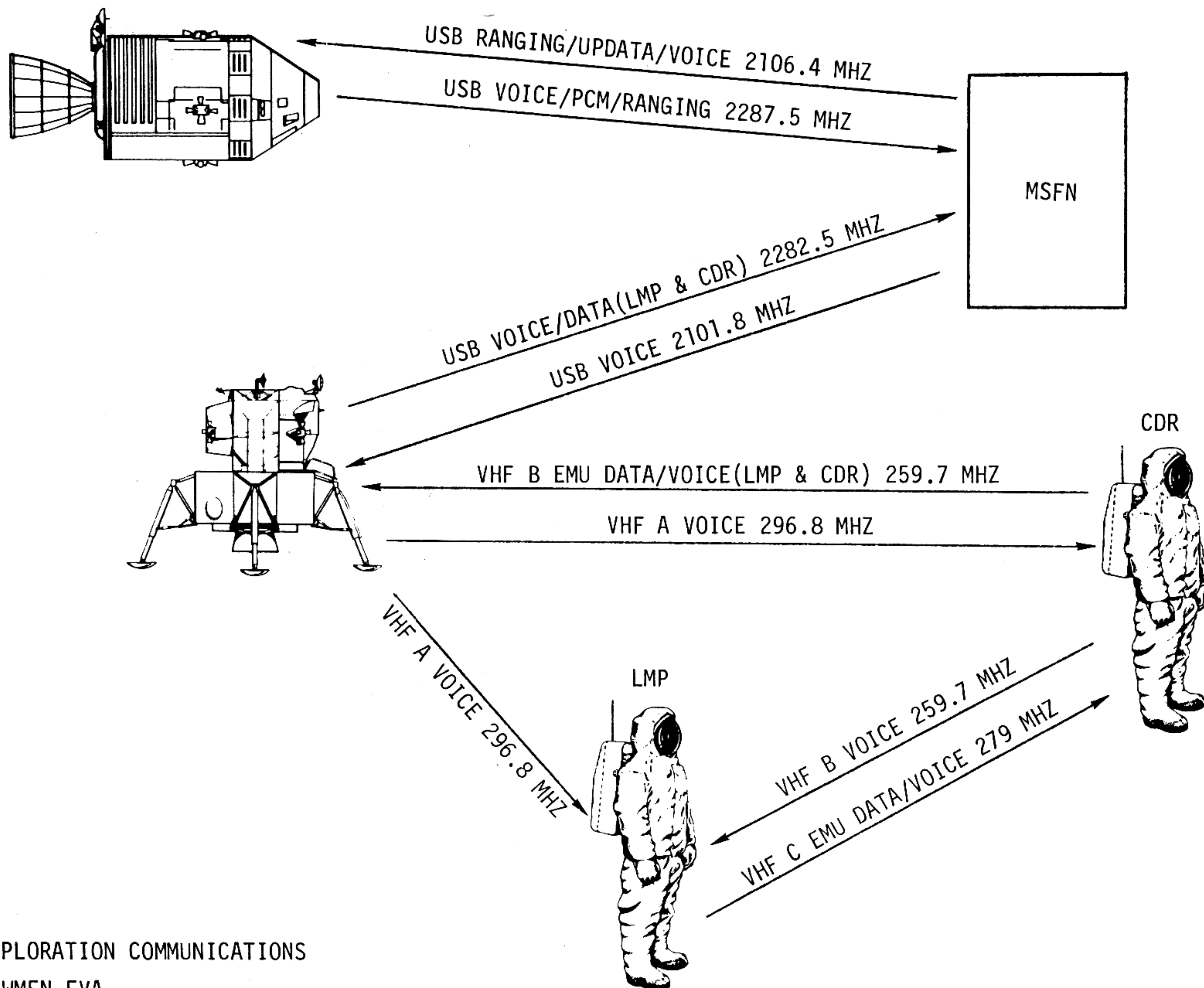
- 1. Table 1-7 contains a summary of the expected block data update times.
- 2. Table 1-10 the landmark tracking sites.
- 3. Table 1-11 is the mission activity summary.



LUNAR EXPLORATION COMMUNICATIONS
ONE CREWMAN EVA
PRIMARY MODE

Figure 1-1

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LUNAR EXPLORATION COMMUNICATIONS
 BOTH CREWMEN EVA
 EVCS DUAL MODE (RELAY)

Figure 1-2

TABLE 1-1
S/C COVERAGE BY MSFN STATIONS USING 85-FT/210-FT DISH/ANTENNA

	*GOLDSTONE (GDS)		*PARKS		HONEYSUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
EARTH ORBIT					0:59:38	1:05:41		
TRANSLUNAR COAST	1:29:04	1:33:44						
	2:55:31	16:00:18					3:17:35	8:00:23
			13:10:32	19:53:11	10:37:17	22:22:52		
							20:52:49	32:45:16
	28:04:35	40:20:40						
			37:18:16	44:31:12	34:49:51	46:55:10		
							45:21:13	56:51:14
	52:54:28	64:25:17						
			61:33:52	68:45:47	58:52:27	71:09:03		
							69:33:52	80:48:59
TRANSEARTH COAST	77:05:04	83:12:10						
					82:47:21	83:11:45		
							172:34:25	180:44:07
	174:41:50	188:06:30						
			185:25:52	190:05:03	182:33:22	192:51:23		
							191:06:11	204:50:33
	198:49:51	210:16:42						
			209:38:10	214:16:05	206:44:24	217:04:01		
							215:23:10	229:12:33
	223:13:44	236:55:11						
			234:28:27	239:05:44	231:22:48	244:17:39		
							242:02:02	242:37:25

*210 FT DISH ANTENNAS

TABLE 1-1 (Cont'd.)
S/C COVERAGE BY MSFN STATIONS USING 85-FT/210-FT DISH/ANTENNA

REV.	* GOLDSTONE (GDS)		* PARKS AUSTRALIA		HONEY SUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
1	83:44:40	85:09:07			83:44:12	85:08:41		
2	85:52:51	87:17:18	85:52:27	87:16:50	85:52:25	87:16:50		
3	88:01:53	88:32:43	88:01:27	89:13:03	88:01:26	89:13:02		
4			89:59:37	91:11:32	89:59:35	91:11:31		
5			91:58:10	93:00:56	91:58:09	93:09:52		
6					93:56:27	95:08:05	93:56:11	95:07:57
7							95:54:34	97:06:20
8							97:52:53	99:04:36
9							99:51:15	101:03:15
10	101:49:19	103:00:58					101:49:39	103:01:22
11	103:47:32	104:59:35					103:47:51	104:59:52
12	105:46:01	106:57:41						
13	107:44:13	108:56:00			107:47:55	108:55:34		
14	109:42:36	110:54:40	110:25:53	110:53:56	109:42:13	110:53:59		
15	111:41:04	112:52:42	111:40:30	112:52:12	111:40:29	112:52:13		
16			113:38:53	114:50:51	113:38:53	114:50:51		
17			115:37:21	116:48:58	115:37:20	116:48:58		
18					117:35:31	118:47:26	118:10:02	118:47:22
19					119:34:02	119:50:32	119:33:46	120:45:25
20							121:32:02	122:43:58
21							123:30:35	124:42:11
22	125:49:57	126:40:20					125:28:42	126:40:38
23	127:26:58	128:38:34					127:27:21	128:38:56
24	129:25:09	130:36:58					129:25:34	130:37:14

*210 FT DISH ANTENNAS

TABLE 1-1 (Cont'd.)
S/C COVERAGE BY MSFN STATIONS USING 85-FT/210-FT DISH/ANTENNA

REV	* GOLDSTONE (GDS)		* PARKS AUSTRALIA		HONEYSUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
25	131:23:41	132:35:24						
26	133:22:01	134:33:39			133:21:30	134:33:13		
27	135:20:22	136:32:13	135:34:08	136:31:31	135:19:55	136:31:33		
28	137:18:48	138:30:18	137:18:15	138:29:54	137:18:15	138:29:54		
29			139:16:36	140:28:29	139:16:37	140:28:30		
30			141:15:05	141:42:56	141:15:04	142:26:37		
31					143:13:18	144:17:27	143:13:06	144:24:59
32							145:11:30	146:23:07
33							147:09:41	148:21:32
34	150:17:19	150:19:32					149:08:13	150:19:44
35	151:06:00	152:17:51					151:06:26	152:18:08
36	153:04:30	154:15:59					153:04:50	154:16:26
37	155:02:40	156:14:23					155:03:05	156:04:42
38	157:01:05	158:12:44			157:59:50	158:12:14		
39	158:59:19	159:01:46			158:58:47	159:01:46		
40	159:02:04	160:10:45			159:02:04	160:10:17		
41	160:57:35	162:09:02	160:57:07	162:08:27	160:57:07	162:08:26		
42	162:55:46	163:47:51	162:55:13	164:06:42	162:55:14	164:06:43		
43			164:53:30	165:58:52	164:53:29	166:04:52		
44					166:51:42	168:03:04	166:56:03	168:02:52
45							168:49:36	170:00:54
46							170:47:39	171:03:59

*21 DISH ANTENNAS

TABLE 1 - 2

APOLLO 12 TV SCHEDULE

DAY	DATE	CST	GET	DURATION	ACTIVITY/SUBJECT	VEH	STA
FRIDAY	NOV. 14	1:50 PM	03:28	1 HR 02 MIN	TRANSPOSITION & DOCKING	CSM	GDS
SATURDAY	NOV. 15	4:47 PM	30:25	35 MIN	SPACECRAFT INTERIOR	CSM	GDS
MONDAY	NOV. 17	1:52 AM	63:30	50 MIN	INTERIOR & IVT TRANSFER	CSM	GDS
MONDAY	NOV. 17	7:52 PM	81:30	20 MIN	PRE LOI 1	CSM	GDS
MONDAY	NOV. 17	10:22 PM	84:00	30 MIN	PRE LOI 2	CSM	GDS
TUESDAY	NOV. 18	10:12 PM	107:50	40 MIN	UNDOCKING & FORMATION FLYING	CSM	GDS
WEDNESDAY	NOV. 19	5:02 AM	114:40	3 HR 25 MIN	LUNAR SURFACE ACTIVITIES	LM	PARKS/HSK
WEDNESDAY	NOV. 19	11:32 PM	133:10	6 HR 05 MIN	LUNAR SURFACE ACTIVITIES	LM	GDS
THURSDAY	NOV. 20	11:37 AM	145:15	30 MIN	DOCKING	CSM	MAD
FRIDAY	NOV. 21	3:17 PM	172:55	20 MIN	POST TEI - LUNAR SURFACE	CSM	MAD
SUNDAY	NOV. 23	5:37 PM	223:15	30 MIN	EARTH & INTERIOR	CSM	GDS

TABLE 1-3
FUEL CELL PURGE AND WATER DUMP SCHEDULE

<u>O₂ FUEL CELL PURGE AND WATER DUMP</u>			<u>H₂ FUEL CELL PURGE</u>		<u>REMARKS</u>
<u>GET</u>	<u>NUMBER</u>	<u>ΔTIME</u>	<u>NUMBER</u>	<u>ΔTIME</u>	
		11:30			
11:30	1			41:10	MCC 1
		19:00			
30:30	2				MCC 2
		10:10			
41:10	3	—————	1		Presleep
		19:50			
61:00	4			44:20	MCC 3
		24:30			
85:30	5	—————	2		LOI ₁ + 2 hrs
		16:00			
101:30	6				LOS Midpoint/ Post Sleep
		19:22			
120:52	7			55:30	LOS Midpoint/ Presleep
		20:08			
141:00	8	—————	3		LOS Midpoint
		23:15			
164:15	9				LOS Midpoint
				46:00	
		22:45			
187:00	10	—————	4		MCC 5
		21:00		35:00	
208:00	11				Post Sleep
		14:00			
222:00	12	—————	5		MCC 6

LiOH CANISTER CHANGE SCHEDULE

TABLE 1-4

CHG. NO.	APPROX. GET HRS	APPROX. Δ T HRS	INSTALL		REMOVE & STOW	
			CAN NO.	POSITION	CAN NO.	STOWAGE LOCATION
1	9:00	9	3	A	1	B5
2	18:00		4	B	2	B5
3	30:00	12	5	A	3	B5
4	41:00	11	6	B	4	B5
5	55:00	14	7	A	5	B6
6	66:00	11	8	B	6	B6
7	77:00	11	9	A	7	B6
8	88:00	11	10	B	8	B6
9	102:00	14	11	A	9	A3
10	121:00	19	12	B	10	A3
11	146:00	25	13	A	11	A3
12	159:00	13	14	B	12	A3
13	173:00	14	15	A	13	A4
14	185:00	12	16	B	14	A4
15	196:00	11	17	A	15	A4
16	208:00	12	18	B	16	A4
17	221:00	13	19	A	17	A6
18	235:00	14	20	B	18	A6

TABLE 1-5 CSM BURN SCHEDULE

BURN/ MNVR	GETI/ BURN TIME	ΔV_R (FPS)	ULLAGE/ ΔV (FPS)	REFSMMAT	REFSMMAT HA & HP(NM)	REMARKS
TLI	2:47:19.8 5Min.45.0Sec	--	--	--	--	S-IVB BURN
CM/LM EJECTION	4:07:19.8 3 Sec	0.4	NOT REQUIRED	PAD	--	RCS BURN
MCC-1	11:47:19.8	--	--	PTC	--	NOM. ZERO
MCC-2	30:52:43.7 10.0 Sec	68.8	NOT REQUIRED	PTC		SPS BURN
MCC-3	61:25:18.2	--	--	PTC	--	NOM. ZERO
MCC-4	78:25:18.2	--	--	LDG SITE		NOM. ZERO
LOI-1	83:25:18.2 5 Min.55.4 Sec	2889.9	NOT REQUIRED	LDG SITE	HA 168.9 HP 58.7	SPS BURN
LOI-2	87:44:10.0 17.6 Sec	169.6	2 JET 19.0 Sec	LDG SITE	HA 64.8 HP 53.0	SPS BURN
CSM/LM SEP	108:24:21.9 15.5 Sec	2.5	--	LDG SITE	HA 63.0 HP 54.5	RCS BURN
CSM P.C. #1	119:47:02.0 19.4 Sec	372.4	2JET 15.0 Sec	PLANE CHANGE	HA 61.5 HP 55.6	SPS BURN
CSM SEP MNVR	147:58:00.7 2.7 Sec	1.0	--	LIFT OFF	HA 59.7 HP 58.6	RCS BURN
CSM P.C. #2	159:01:46.0 18.0 Sec	360.0	4 JET 11 Sec	PLANE CHANGE	HA 58.6 HP 56.5	SPS BURN
TEI	172:21:14.7 2 Min 08.9 Sec	3035.9	4 JET 12 Sec	TEI	-- --	SPS BURN
MCC-5	187:21:14.7	--	--	PTC	--	NOM. ZERO
MCC-6	222:21:48	--	--	PTC	--	NOM. ZERO
MCC-7	241:21:48	--	--	ENTRY	--	NOM. ZERO

NOTE: HA & HP ARE CALCULATED FROM THE LANDING SITE ELEVATION

TABLE 1-6 LM BURN TABLE

BURN/ MNVR	GETI/ BURN TIME	Δ VR (FPS)	ULLAGE/ Δ V(FPS)	REFSMAT	REFSMAT HA & HP (NM)	REMARKS
DOI	109:23:00 BT- 28.2 sec	72.1	2 JET 7.5 Sec	LDG SITE	HA 59.3 HP 8.3	DPS
PDI	110:20:00 BT-11Min.18.5 SEC	6612.6	2 JET 7.5 Sec	LDG SITE	-- --	DPS
ASCENT	142:01:17.9 BT-7Min10.0 Sec	6046.2	None	LIFT OFF	HA 44.7 HP 8.3	APS
CSI	142:58:05.2 BT - 45.3 Sec	50.3	--	LIFT OFF	HA 45.6 HP 44.6	RCS BURN
PLANE CHANGE	143:26:27.5	0.0	--	LIFT OFF	HA 45.6 HP 44.6	RCS BURN NOM. ZERO
CDH	143:56:27.5	0.0	--	LIFT OFF	HA 45.6 HP 44.6	RCS BURN NOM. ZERO
TPI	144:36:25.7 BT 22.1 Sec	24.6	--	LIFT OFF	HA 61.9 HP 44.2	RCS BURN
MCC-1	144:51:25.7	--	--	LIFT OFF	HA 61.9 HP 44.2	RCS BURN NOM. ZERO
MCC-2	145:06:25.7	--	--	LIFT OFF	HA 61.9 HP 44.2	RCS BURN NOM. ZERO
LM DEORBIT	149:24:41.2 1 MIN 23.83 SEC	189.7	--	ASCENT	=	RCS BURN

NOTE: HA & HP ARE CALCULATED FROM THE LANDING SITE

TABLE 1-7

BLOCK DATA UPDATES

<u>TYPE DATA</u>			<u>GET</u>	<u>REV</u>
TLI	+ 90 Min	(P30)	01:30	
L/O	+ 8 Hrs	(P37)	01:30	
L/O	+ 15 Hrs	(P37) ¹	05:55	
L/O	+ 25 Hrs	(P37)	14:00	
L/O	+ 35 Hrs	(P37) ²	14:00	
L/O	+ 45 Hrs	(P37) ²	14:00	
L/O	+ 60 Hrs	(P37) ²	14:00	
LOI	- 5 Abort Pad	(P30)	35:00	
PC	+ 2	(P30)	77:30	
TEI	1	(P30) ^{3,4}	81:15	
TEI	4	(P30) ^{4,5}	81:15	
TEI	5	(P30) ^{3,6}	86:15	2
TEI	11	(P30) ⁵	91:00	4
TEI	34	(P30) ⁵	102:30	10
TEI	39	(P30) ^{5,7}	149:15	34
TEI	41	(P30) ³	158:00	38
TEI	43	(P30) ⁵	161:30	40
TEI	45	(P30) ⁵	165:00	42
TEI	45(Prelim.)	(P30)	169:00	44
TEI	45 (Nominal)	(P30 & TGT LOAD)	171:20	45
TEI	46	(P30)	171:20	45

(1) Assumes No MCC-1

(2) Assumes MCC-2

(3) Abbreviated P30 Pad: Includes - Purpose, Propulsion, Weight, Pitch & Yaw Trim, Time, ΔV_x , ΔV_y , ΔV_z , and Pitch

(4) Assumes No LOI-2

(5) Abbreviated P30 Pad: Includes - Purpose, Propulsion, Time, ΔV_x , ΔV_y , ΔV_z , and Pitch

(6) Assumes LOI-2 Accomplished

(7) Assumes No Plane Change

APOLLO 12/LM-6

DSEA SCHEDULE

TABLE 1-8

GET	DSEA MODE	Tape Time		Activity
		Activity	Total	
90 :40	ICS/PTT	*100%	00:15	S-Band/VHF Simplex Voice & TM Test
90 :55	OFF	00:15		
107:51	ICS/PTT	*100%	3:00	Prep for Undocking Post Lunar Touchdown
110:36	OFF	2:45		
113:52	VOX	*33%	4:26	PLSS Comm Act. (Pre-EVA1) Post EVA-1 Comm
118:11	OFF	1:26		
132:28	VOX	*33%	5:53	PLSS Comm Act. (Pre-EVA 2) Post EVA-2 Comm
136:50	OFF	1:27		
141:45	ICS/PTT	*100%	9:53	Liftoff Comm Post Docking
145:45	OFF	4:00		

*Estimated duty cycle in mode indicated

10 October 1969

TABLE 1-9
BATTERY CHARGE SCHEDULE

GET HR:MIN	BATTERY
04:30	B
11:30	A
62:00	B
76:30	A
88:10	B
131:30	A
137:25	B
186:00	B
193:15	A

LANDMARK TRACKING TABLE

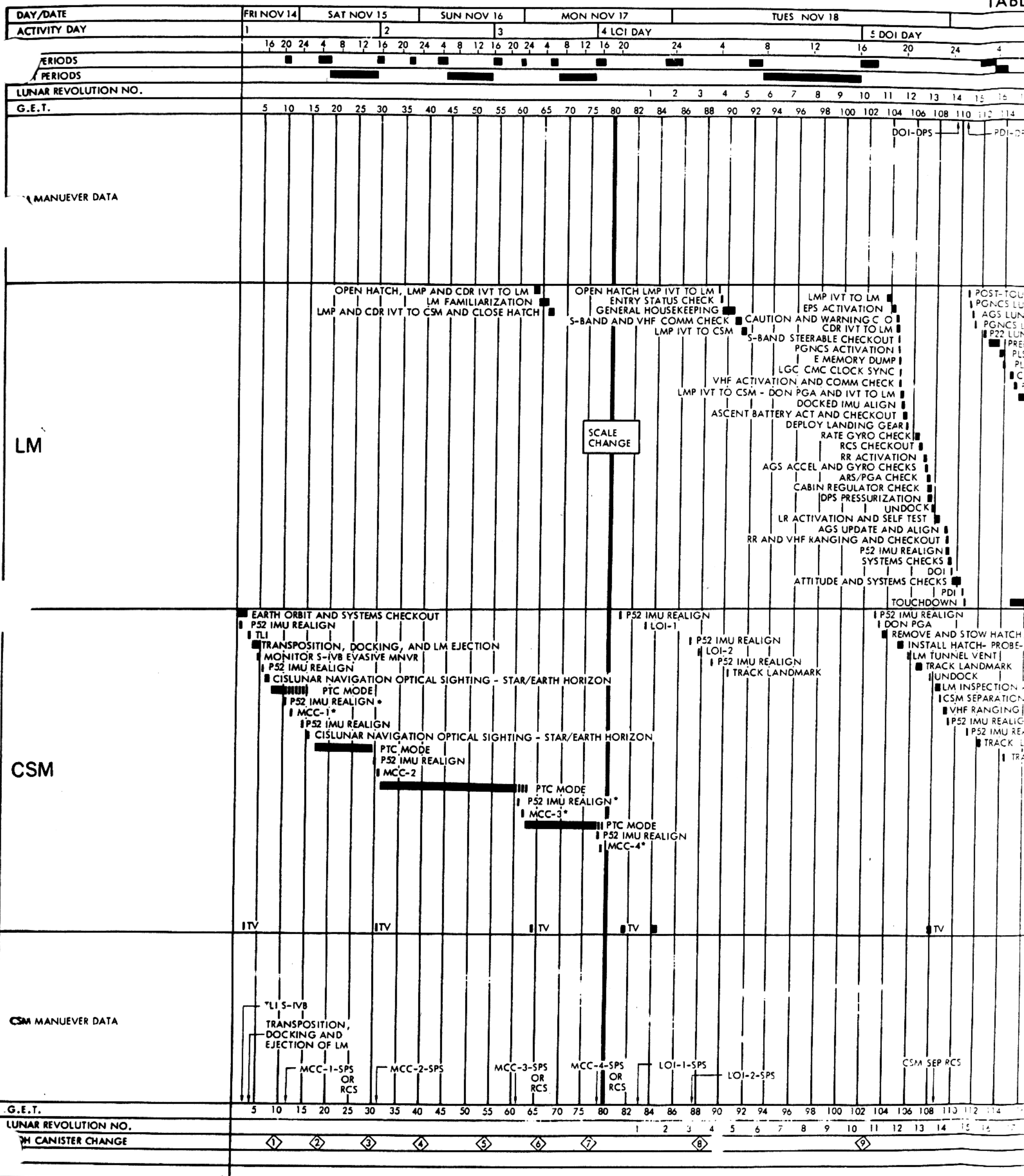
TABLE 1-10

<u>LANDMARKS</u>	<u>LATITUDE</u>	<u>LONGITUDES</u>	<u>ELEVATIONS (N.M.)</u>
H1*	1.517° S	15.250° W	-1.9438 n.m.
SITE 7*	2°58'56" S (2.9822°)	23°23'31" W (23.39194°)	-1.28164 n.m.
190	2.957° S	23.024° W	-1.23 n.m.
191	3.437° S	23.202° W	-1.36 n.m.
193*	3.437° S	23.229° W	-1.37 n.m.
194	3.009° S	23.573° W	-1.38 n.m.
195	3.377° S	24.008° W	-1.53 n.m.
Lalande Site **	4.783° S	8.667° W	-0.3239 n.m.
CP 1*	5.667° S	112.000° E	0.00 n.m.
CP 2*	10.250° S	56.183° E	-0.81 n.m.
Descartes Site **	8.858° S	15.517° E	-1.7 n.m.
DE 1*	8.883° S	15.550° E	-1.7 n.m.
DE 2	9.333° S	15.067° E	-1.7 n.m.
DE 3	8.767° S	14.983° E	-1.7 n.m.
Fra Mauro Site **	3.617° S	17.550° W	-1.8628 n.m.
FM 1*	3.228° S	17.3305° W	-1.5631 n.m.
FM 2	4.117° S	16.908° W	-1.8088 n.m.
FM 3	4.567° S	17.517° W	-1.7818 n.m.
Lansberg A *	0.150° N	31.150° W	-0.54 n.m.

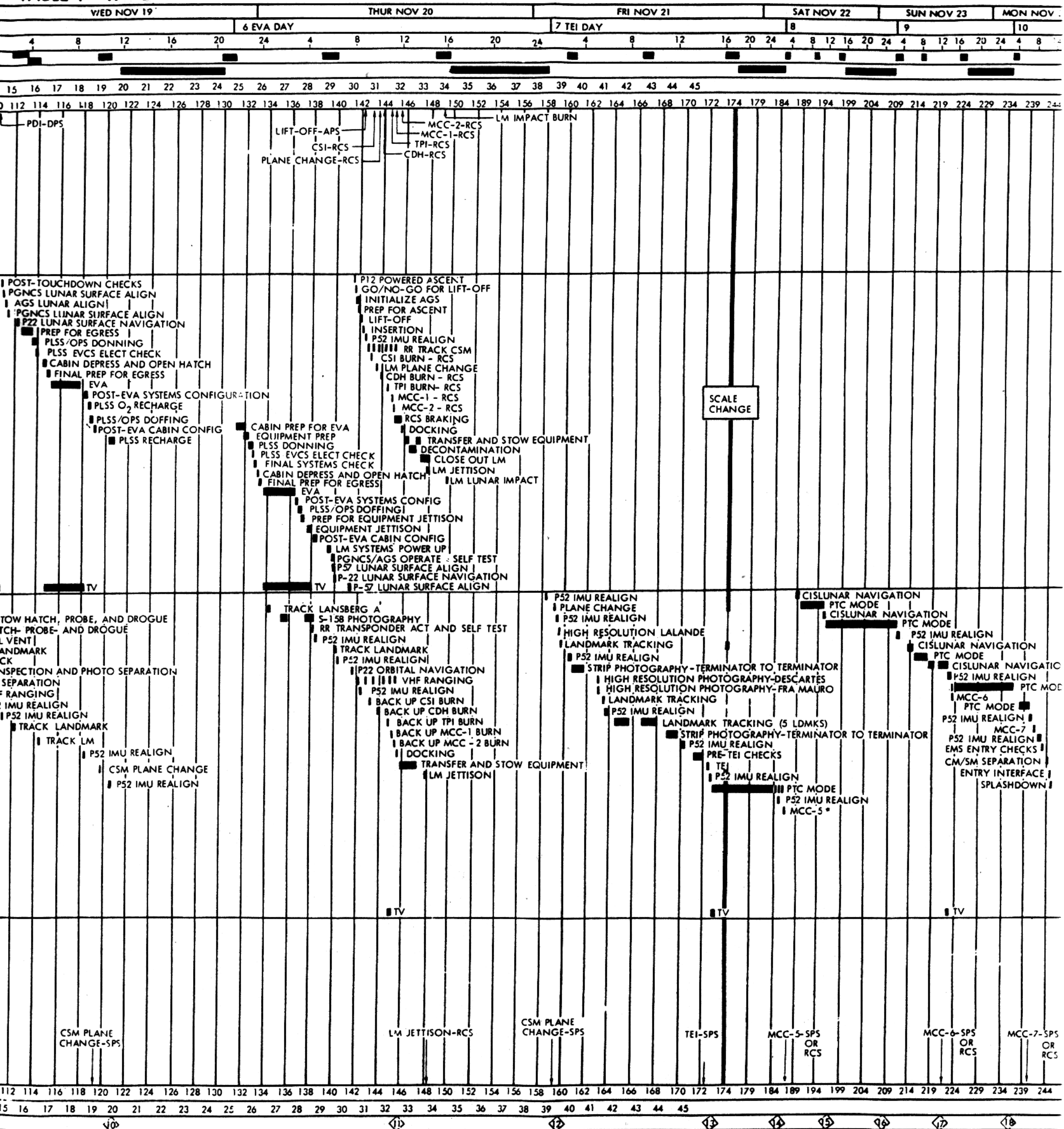
*Used in the nominal mission

**Future Landing Site

Note: Data was provided by the Mapping Sciences Laboratory.
Elevations are based on a mean lunar radius of
938.4449184 n m (1738.09 K M)



APOLLO 12 TABLE 1 - 11



*MAY NOT BE REQUIRED

SECTION 2 - MISSION OBJECTIVES

SECTION 2

MISSION OBJECTIVES

This section contains an activity summary, reflecting the objectives for Mission H as described in "Mission Requirements H-1 Type Mission". Table 2-1 provides a functional breakdown of the objectives and indicates the page in the timeline where the activity occurs. The alpha numeric listing presented in Table 2-1 is not intended to represent a priority or a sequential listing.

All of the test requirements have been implemented into the timeline. Details of the implemented test requirements are adequately covered in the Lunar Surface Operation Plan and the Photographic and TV Operations Plan.

TABLE 2-1
MISSION OBJECTIVE/ACTIVITY
REFERENCE

NUMBER	OBJECTIVE	ACTIVITY	PAGE NO.
A A-1	Contingency Sample Collection Provide a contingency sample for postflight scientific investigations	EVA-1	3-93
B B-1 B-2 B-3 B-4	Lunar Surface EVA Operations Evaluate walking pace on typical terrain Evaluate the capability of the crew to lift and maneuver large packages Evaluate the capability of the crew to unstow and deploy the erectable S-band antenna Evaluate the adequacy of the preflight estimates of time required to perform specific EVA activities	EVA-1, EVA2 } EVA 1 EVA-1 EVA-1, EVA-2	3-93 3-94 3-109 3-94 3-93 3-109
C C-1	PLSS Recharge Demonstrate the capability to recharge the PLSS while in the LM on the lunar surface	POST EVA-1	3-97 3-100
F F-1 F-2 F-3	Selected Sample Collection Collect rock samples and fine-grained fragmental material Collect one large rock Collect a core tube sample	EVA-1 EVA-1 EVA-1	3-96 3-96 3-96

TABLE 2-1 (CONT'D)
MISSION OBJECTIVE/ACTIVITY
REFERENCE

NUMBER	OBJECTIVE	ACTIVITY	PAGE NO.
G	Photographs of Candidate Exploration Sites		
G-1	Obtain stereoscopic photographs of selected lunar sites	POST LM JETTISON	3-137
G-2	Obtain high resolution photographs of selected lunar sites	POST LM JETTISON	3-139 3-141 3-153
H	Lunar Surface Characteristics		
H-1	Obtain data on the mechanical behavior and terrain characteristics of the lunar surface	EVA-1, EVA-2	3-93 3-109
H-2	Determine the LM landing gear stroking, footpad lunar surface interaction, LM attitude and ground clearance after landing	TOUCHDOWN, EVA-1	3-87 3-94
H-3	Determine the extent of lunar surface erosion and the effects of surface ejecta on the LM resulting from DPS exhaust impingement during landing	EVA-1	
I	Lunar Environment Visibility		
I-1	Deleted		
I-2	Obtain data on the ability to perform visual tasks while on the lunar surface	EVA-1	3-93 3-109
I-3	Obtain data on the ability to observe contrast in the lunar shadow and on the lunar terrain	EVA-2	3-109
J	Landed LM Location		
J-1	Determine the position of the landed LM in real time	DOI THROUGH TOUCHDOWN	3-88
J-2	Obtain data to permit a postflight determination of the landed LM location	DOI THROUGH TOUCHDOWN	3-90

TABLE 2-1 (CONT'D)
MISSION OBJECTIVE/ACTIVITY
REFERENCE

NUMBER	OBJECTIVE	ACTIVITY	PAGE NO
L	Photographic Coverage		
L-1	Obtain photographs of the lunar surface during LM descent	PDI THROUGH TOUCHDOWN	3-87
L-2	Obtain photographs of the lunar surface after touch-down and prior to cabin depressurization	POST TOUCHDOWN	3-88
L-3	Obtain photographs of the landed LM, of various EVA evaluation tasks and of operations related to geologic inspection and sampling	EVA-1, EVA-2	3-93 3-109
M	Television Coverage		
M-1	Provide TV camera coverage of an astronaut descending to the lunar surface	EVA-1, EVA 2	3-93 3-109
M-2	Provide TV camera coverage of an external view of the landed LM	EVA-1	3-94
M-3	Provide TV camera coverage of the lunar surface in the general vicinity of the LM	EVA-1	3-94
M-4	Provide TV camera panoramic coverage of distant terrain features	EVA-1	3-94
M-5	Provide TV camera coverage of an astronaut during lunar surface activities	EVA-1, EVA 2	3-93 3-109
N	Surveyor III Investigation		
N-1	Obtain photographs of lunar material in vicinity of Surveyor III	EVA-2	3-113
N-2	Obtain samples of lunar material in the crater containing the Surveyor III	EVA-2	3-113
N-3	Obtain photographs of Surveyor III	EVA-2	3-113
N-4	Obtain parts of the Surveyor III	EVA-2	3-113
N-5	Obtain data on the extent of mirror debonding on Surveyor III	EVA-2	3-113

TABLE 2-1 (CONT'D)
MISSION OBJECTIVE/ACTIVITY
REFERENCE

NUMBER	OBJECTIVE	ACTIVITY	PAGE NO.
0 0-1	Selenodetic Reference Point Update Obtain lunar landmark tracking data to permit an update of the selenodetic coordinates of a selected lunar reference point	CSM SOLO-REV 26	3-111
ALSEP	Apollo Lunar Surface Experiments Package		
ALSEP-1	Deploy the Lunar Passive Seismic Experiment (S-031)	EVA-1	3-95
ALSEP-2	Deploy the Lunar Surface Magnetometer Experiment (S-034)	EVA-1	3-95
ALSEP-3	Deploy the Solar Wind Spectrometer Experiment (S-035)	EVA-1	3-95
ALSEP-4	Deploy the Suprathermal Ion Detector Experiment (S-036) and the Cold Cathode Ion Gauge Experiment (S-058)	EVA-1	3-95
S-059	Lunar Field Geology		
S-059-1	Deleted		
S-059-2	Examine, describe, photograph and collect lunar geologic samples for return to earth	EVA-2	3-109
S-159-3	Collect a lunar environment sample of lunar surface material	EVA-2	3-109
S-059-4	Collect a gas analysis sample of lunar surface material	EVA-2	3-109
S-059-5	Obtain core samples of lunar material	EVA-2	3-109
S-059-6	Study and describe field relationships (such as shape, size, range, patterns of alignment or distribution) of all accessible types of lunar topographic features	EVA-2	3-109

TABLE 2-1 (CONT'D)

MISSION OBJECTIVE/ACTIVITY
REFERENCE

NUMBER	OBJECTIVE	ACTIVITY	PAGE NO.
S-080 S-080-1	Solar Wind Composition Conduct the Solar Wind Composition Experiment (S-080)	EVA-1, EVA-2	3-94 3-113
S-158	Multispectral photography	CSM SOLO	3-113 3-116
T-029	Pilot Describing Function Experiment (No crew activity required)	Post Mission Debriefing & Analysis	-----
M-515	Lunar Dust Detector Experiment (no crew activity required)	EVA-1	3-95

FLIGHT PLAN

TIME	EVENT	REMARKS
-00:09	LCC: <u>REPORT</u> IGNITION	CREW POSITIONS @ L/O CDR - LH COUCH CMP - CENTER COUCH LMP - RH COUCH
00:00	LCC: CDR: <u>REPORT</u> LIFT-OFF	
00:02	CDR: <u>REPORT</u> YAW MNVR	
00:11	CDR: <u>REPORT</u> ROLL AND PITCH PROGRAM	LIFTOFF 1022 CST NOVEMBER 14, 1969, 72.1° L.A. TARGETED FOR LANDING SITE 7.
00:30	CDR: <u>REPORT</u> ROLL COMPLETE	
00:42	MCC: <u>REPORT</u> MARK MODE IB	
00:50	LMP: <u>REPORT</u> CABIN PRESS DECREASING	PROP DUMP TO RCS CMD
01:24	MAX Q	ALTITUDE 14,000 ft
01:57	MCC: <u>REPORT</u> MARK MODE IC	ALTITUDE 100,000 ft
02:00	MCC: CDR: <u>REPORT</u> GO/NO-GO FOR STAGING	
02:16	CDR: <u>REPORT</u> INBOARD ENGINES CUTOFF	
02:42	CDR: <u>REPORT</u> OUTBOARD ENGINES CUTOFF	
02:43	CDR: <u>REPORT</u> STAGING	
02:44	CDR: <u>REPORT</u> S-II IGNITION	
03:13	CDR: <u>REPORT</u> S-II SEP LT OUT	
03:18	CMP: <u>REPORT</u> TOWER JETT	
	MCC: <u>REPORT</u> MODE II	
	CDR: <u>REPORT</u> S/C GO/NO-GO	
MISSION APOLLO 12		EDITION FINAL (NOV 14)
		DATE OCTOBER 15, 1969
		PAGE 3-1

FLIGHT PLAN

TIME	EVENT	REMARKS
03:23	CDR: <u>REPORT</u> GUIDANCE INITIATE	
03:53	MCC: <u>REPORT</u> TRAJECTORY GO/NO-GO	
04:00	CMP: <u>REPORT</u> S/C GO/NO-GO	
05:00	LMP: <u>REPORT</u> S/C GO/NO-GO	
05:25	MCC: <u>REPORT</u> S-IVB TO COI CAPABILITY	
06:00	CDR: <u>REPORT</u> S/C GO/NO-GO	
06:25	MCC: <u>REPORT</u> S/C GO/NO-GO	
	MCC: <u>REPORT</u> TIME OF LEVEL SENSE ARM AND S-II CUTOFF	
07:00	CDR: <u>REPORT</u> S/C GO/NO-GO	
08:00	CDR: <u>REPORT</u> S/C GO/NO-GO	
08:30	MCC & CDR: <u>REPORT</u> S/C GO/NO-GO FOR STAGING	
09:00	MCC: <u>REPORT</u> MARK MODE IV	
09:11	CDR: <u>REPORT</u> S-II CUTOFF	
09:14	CDR: <u>REPORT</u> S-II S-IVB STAGING	
09:17	CDR: <u>REPORT</u> S-IVB IGNITION	
10:00	MCC & CDR: REPORT GO/NO-GO FOR ORBIT	
	MCC: <u>REPORT</u> PREDICTED SECO	

MISSION

APOLLO 12

EDITION

FINAL (NOV 14)

DATE

OCTOBER 15, 1969

PAGE

3-ii

FLIGHT PLAN

TIME	EVENT	REMARKS
11:00	CDR: <u>REPORT</u> S/C GO/NO-GO	INSERTION
11:29	CDR: <u>REPORT</u> SECO $TB_5 = 0$ S-IVB MAINTAINS COMMANDED CUTOFF INERTIAL ATTITUDE	
SECO +10 SEC	MCC: <u>REPORT</u> ORBITAL GO/NO-GO	
SECO +20 SEC	S-IVB MANEUVERS TO LH AND INITIATES ORB RATE (HEADS DOWN)	
SECO +59 SEC	S-IVB INITIATES CONTINUOUS LH_2 VENTING (TERMINATES AT $TB_6 + 42.2$ SEC GET = 2:38:24)	
	V66-TRANSFER CSM STATE VECTOR TO LM SLOT	
	V45-RESET LUNAR SURFACE FLAG	
12:50	BDA LOS INSERTION CHECKLIST	
16:04	VAN LOS	
16:37	CYI AOS <u>MCC UPDATE:</u> Z TORQUING ANGLE	
23:44	CYI LOS SYSTEM MONITORING & CHECKING POST INSERTION ECS CONFIGURATION	
MISSION APOLLO 12		EDITION FINAL (NOV 14)
		DATE OCTOBER 15, 1969
		PAGE 3-iii

FLIGHT PLAN

TIME	EVENT	REMARKS
31:31	CONFIGURE CAMERA FOR T&D AND S-IVB PHOTO [CM2/DAC/18/CEX-BRKT, MIR (f8,250,7) 6fps, 0.3 MAG (5 MIN) CM2/EL/80/CEX (f8,250,30) 10] UNSTOW TV CAMERA PRE-TLI SYSTEM VERIFICATION AND MONITORING CDR INSTALL COAS CMP JETTISON OPTICS COVERS P52 IMU REALIGN Option 3-REFSMMAT REPORT GYRO TORQUING ANGLES	LMP HOLDS CAMERA REALIGNS TO PAD ORIENTATION
52:20	CRO AOS DUMP DSE GDC ALIGN TO IMU	
58:11	CRO LOS	<div style="border: 1px solid black; padding: 5px;"> IMU REALIGN P52 N71: _____, N05: _____ N93: _____ X _____ Y _____ Z _____ GET _____:_____:_____ _____:_____:_____ </div>
<div> <div>MISSION</div> <div>APOLLO 12</div> <div>EDITION</div> <div>FINAL (NOV 14)</div> <div>DATE</div> <div>OCTOBER 15, 1969</div> <div>PAGE</div> <div>3-iv</div> </div>		

MCC-H

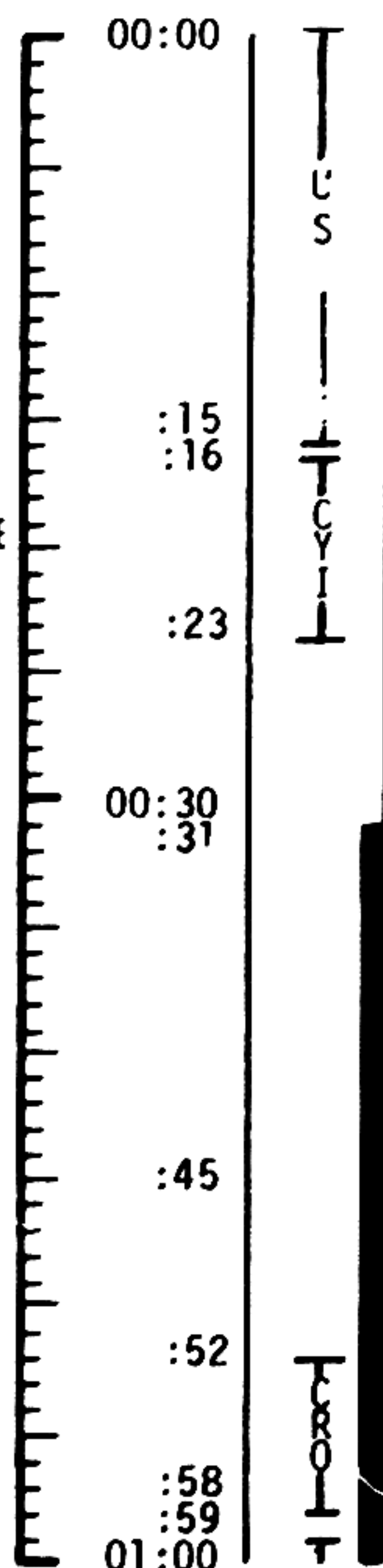
1022 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
Z TORQUING ANGLE

DUMP DSE



LIFTOFF 14 NOV 1969

SECO

INSERTION CK LIST

SYSTEMS MONITORING & CHECKING

PRE-TLI SYSTEM VERIFICATION
AND MONITORING

SETUP CAMERA EQUIPMENT

IMU REALIGN - P52
(OPTION 3 - REFSMMAT)REPORT GYRO TORQUING ANGLES
GDC ALIGN TO IMU

LIFTOFF CREW POSITIONS
LEFT COUCH - CDR
CENTER COUCH - CMP
RIGHT COUCH - LMP
AT SECO+20 SEC, SIV-B
MNVRS TO LH AND
INITIALIZES ORB RATE
(HEADS DOWN)

COOLANT CONTROL ATTEN-
UATION PANEL NOT
OPENED

P52 (PAD ORIENT)

N71: _ _ _ ' _ _ _

N05: _ _ _ ' _ _ _

N93: _ _ _ ' _ _ _

Y _ _ _ ' _ _ _

Y _ _ _ ' _ _ _

Z _ _ _ ' _ _ _

GET _ _ _ ' _ _ _

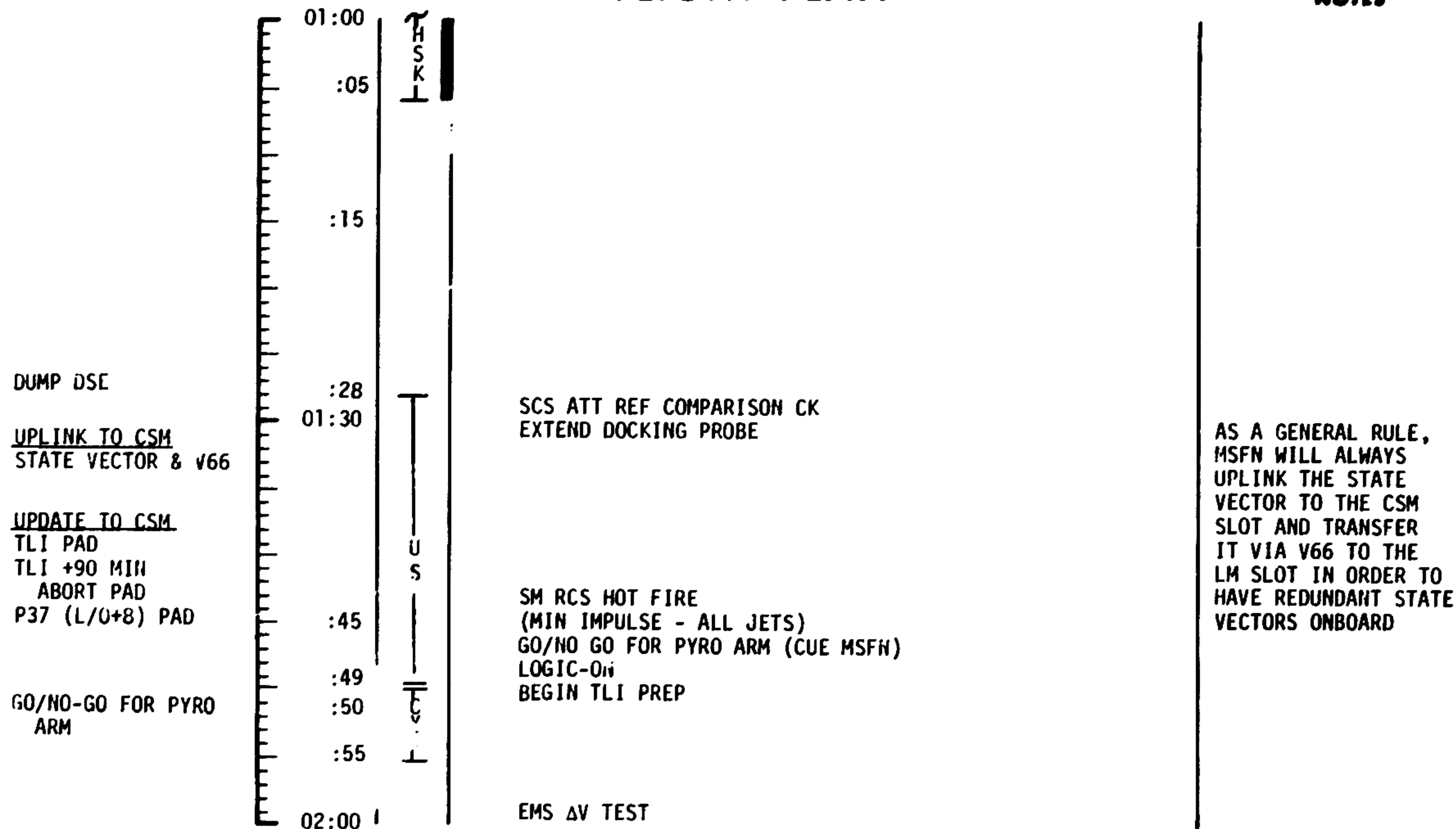
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	00:00 - 01:00	1/1	3-1

MCC-H

1122 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	01:00 - 02:00	1/1-2	3-2

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

FLIGHT PLAN

TLI
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC SHUTDOWN	+45° SHUTDOWN	BT + 6 SEC & V _f = PAD VALUE	NO TRIM

TABLE 3-1
3-3

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1222 CST

FLIGHT PLAN

NOTES

GO/NO GO

02:00

PYRO ARM

GDC ALIGN TO IMU

:15

SET ORDEAL

:25

GO/NO GO FOR TLI

02:30

: 31

: 33

TB-6 (02:37:41.8)

:45

P47 - THRUST MONITOR

TLI

TIG: 02:47:19.8

BT: 5:45.0

ΔV : 10,510 FPS

:52

P00 - CMC IDLING

V66 - TRANS CSM SV TO LM SLOT

TLI BURN STATUS REPORT

CDR - TRANS TO CENTER COUCH, CMP - LEFT COUCH

LMP - RIGHT COUCH

03:00

AT SECO: SIVB INERTIAL
AT SECO+20 SEC: SIVB
TO LOCAL HORIZONTAL
ORB RATE, HEADS DOWN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	02:00 - 03:00	1/TLC	3-4

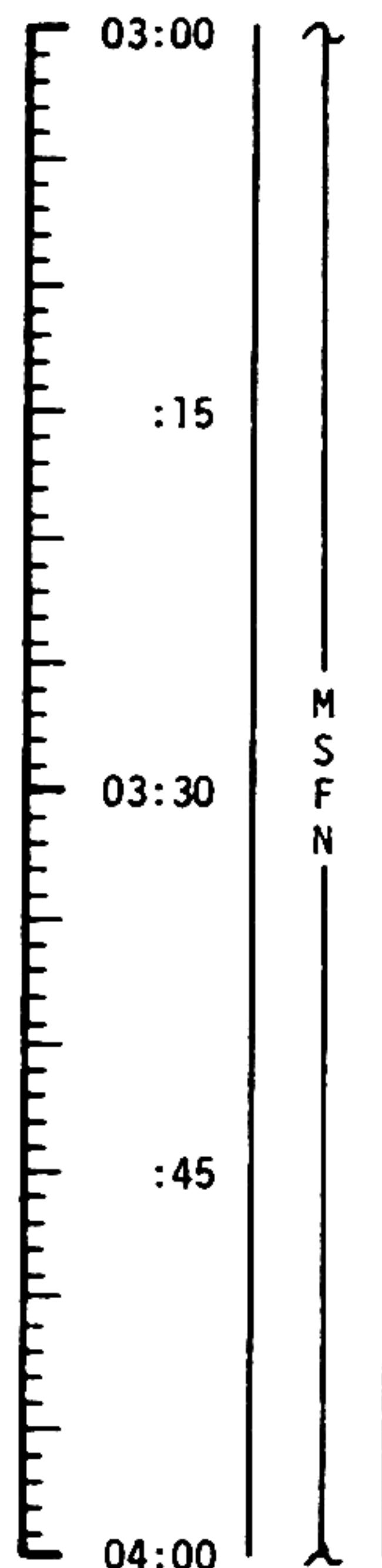
MCC-H

1322 CST

FLIGHT PLAN

NOTES

GO/NO GO FOR T&D



WASTE STOWAGE VENT - CLOSED
 DIRECT O₂ VLV-OPEN UNTIL CAB ~ 5.7 PSI, THEN CLOSE
 GDC ALIGN TO IMU
 SIVB MNVRS TO CSM/SIVB SEP ATT BY 03:11
 S-BAND ANT - OMNI
 S-BAND ANT OMNI - B
 ACTIVATE AND LOAD DAP (11102, 01111)

R 356
 P 92
 Y 332

LOAD DOCKING GIMBAL ANGLES

CSM SEP PREPARATION

R 304 HGA
 P 272 P-20
 Y 28 Y290

CSM/SIVB SEP GET: 03:23

CSM MNVR TO DOCK ATT BY 03:28

HGA TRACK - REACQ

HGA BEAM - WIDE

TV (GDS) 03:28 TO 04:30 CM4-IN, BRKT (f22)

VISUALLY INSPECT AND PHOTOGRAPH SIVB AND LM

DOCK GET: 03:33

BEGIN CSM/LM CABIN PRESSURE EQUALIZATION

CDR: CONFIGURE FOR LM EJECTION

TUNNEL PRESSURE INTEGRITY CHECK

WASTE STOWAGE VENT VALVE - VENT

REMOVE AND TEMPORARILY STOW TUNNEL HATCH

CHECK DOCKING LATCHES

VENT DOCKING PROBE

LM UMBILICAL CONNECTION

REINSTALL TUNNEL HATCH

LM TUNNEL VENT VLV - LM/CM ΔP

LEAVE TUNNEL EQUALIZATION VALVE CLOSED

CYCLE O₂ & H₂ FANS

SWITCH TO OMNI C
 DURING THE MNVR
 TO THE DOCKING
 ATTITUDE

T & D MNVR
 +X 0.8 FPS, AFTER
 15 SEC -X 0.3 FPS.
 V49 AUTO MNVR TO DOCKING
 ATT. NULL TRANSLATION
 AND RATES, +X TO CLOSE
 AT 0.25 TO 0.5 FPS.

CAMERA SETTINGS FOR
 LM EJECTION:

CM 2/DAC/18/CEX - BRKT,
 MIR (f8,250,7) 12 fps,
 0.7 MAG (6MIN)

CM 4/EL/80/ CEX-
 (f8,250,30)5

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	03:00 - 04:00	1/TLC	3-5

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

REVISION A

MCC-H

1422 CST

FLIGHT PLAN

NOTES

GO/NO GO FOR
PYRO ARM AND
CSM/LM EJECTION(TLI CUTOFF +
1 HR 20 MIN)UPDATE TO CSM
S-IVB EVASIVE
MNVR GO/NO GO

DUMP DSE

(TLI CUTOFF +
1 HR 53 MIN)

04:00

:15

04:30

:45

05:00

M
S
F
NGO/NO-GO PYRO ARM (CUE MSFN)
LOGIC ON
LOAD DAP (21101, 11111)
PYRO ARM
P47 - THRUST MONITOR
PHOTOGRAPH LM EJECTION

CSM/LM EJECTION

MNVR TO ACQUIRE S-IVB IN HATCH
WINDOW BY 04:18R 96
P 277
Y 344OMNI D

TIG: 04:13:19.8

BT: 3 SEC

 ΔV : 0.4 FPS

S-IVB APS EVASIVE MNVR GET = 04:25

 $\Delta V \approx 9.6$ FPS

BATTERY CHARGE, BATTERY B

CONTINUE TO MONITOR S-IVB THROUGH
WINDOW UNTIL COMPLETION OF SLINGSHOT
MANEUVER

S-IVB SLINGSHOT MNVR

GET = 04:46

SPRING ACTUATOR
 $\Delta V \approx 0.8$ FPS. 4 JET
RCS -X TRANSLATION
0.4 FPS FOR A TOTAL
 $\Delta V \approx 1.2$ FPS.
5 SEC AFTER EJECTION
THERE IS AN RCS -X
TRANSLATION FOR 3 SEC.SLINGSHOT ΔV
= 68.7 FPS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	04:00 - 05:00	1/TLC	3-6

MCC-H

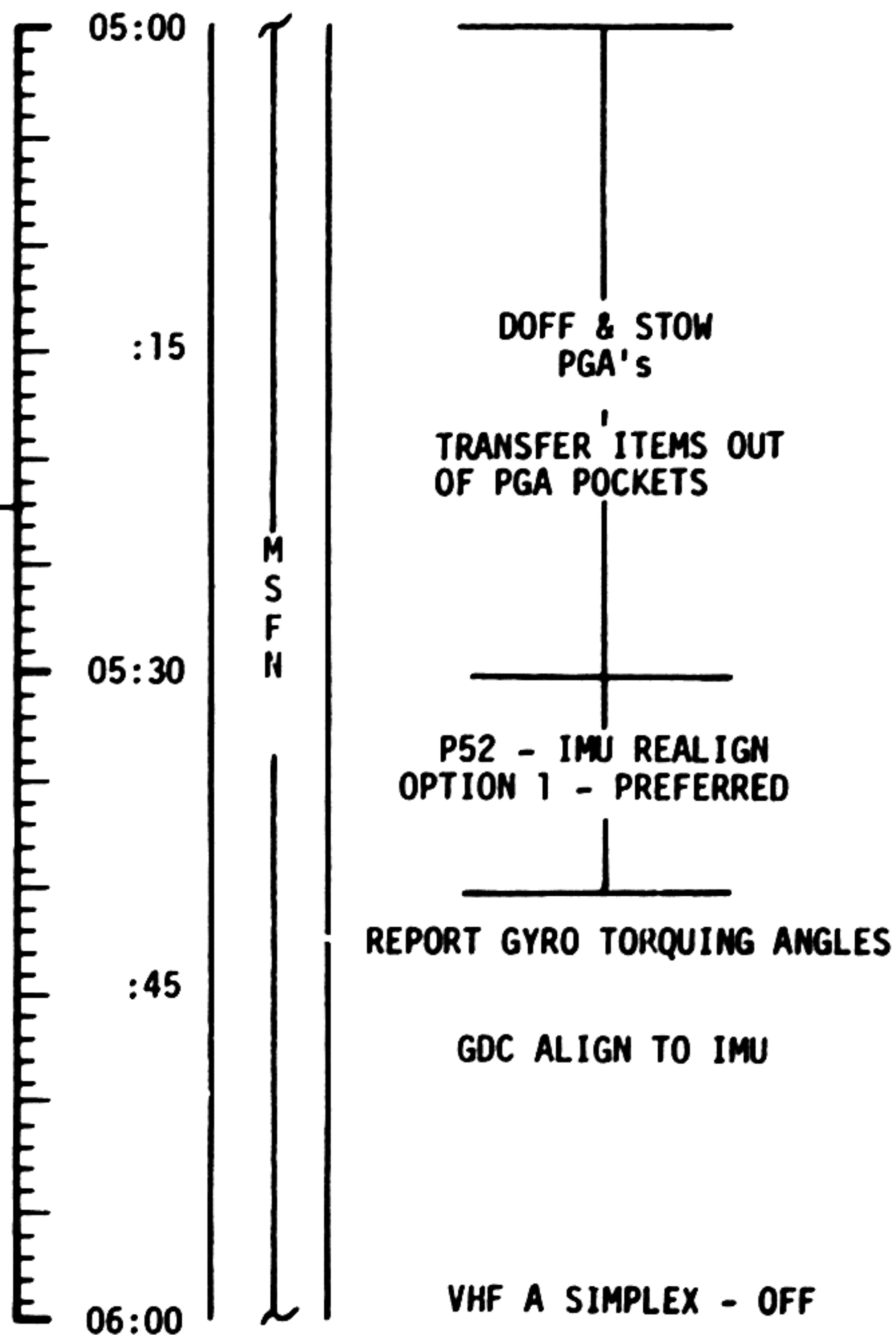
1522 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
DESIRED ORIENTATION
(PTC)
ZERO TRUNION BIAS

UPDATE TO CSM
P37 PAD (L/O+15)



P52 (PTC ORIENT)

N71: — — — —

N05: — — — —

N93:

X — — — —

Y — — — —

Z — — — —

GET — — — —: — — — —: — — — —

P 37 PAD ASSUMES
NO MCC-1

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	05:00 - 06:00	1/TLC	3-7

MSC Form 29 (May 69)

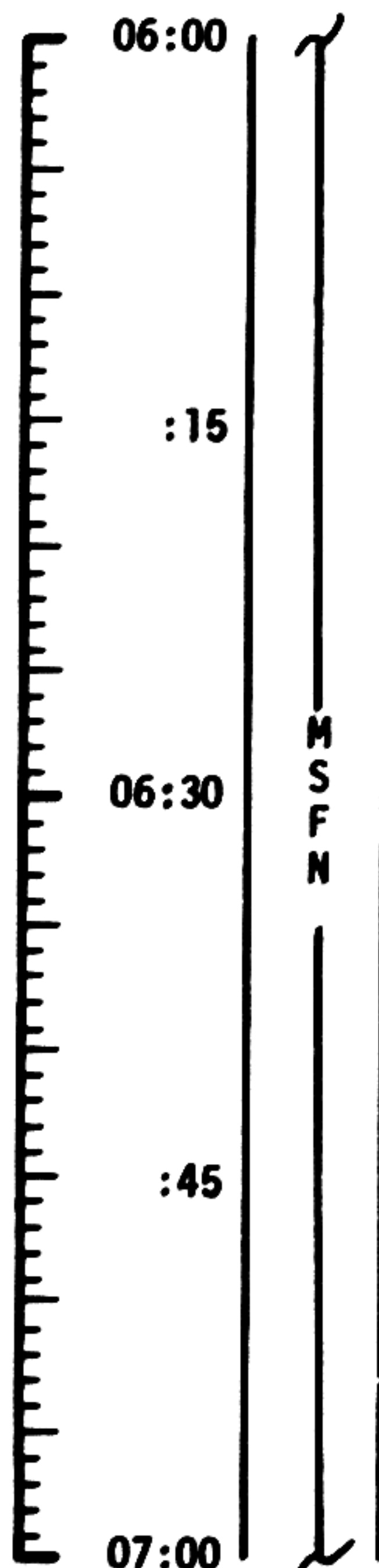
FLIGHT PLANNING BRANCH

MCC-H

1622 CST

FLIGHT PLAN

NOTES



MNVR TO OPTICS CALIBRATION ATT
 P23 - CISELUNAR NAVIGATION
 OPTICS CALIBRATION
 STAR 1 5

R 204
 P 262
 Y 0

P00
 V49 - MNVR TO SIGHTING ATT
 STAR/EARTH HORIZON

R 159
 P 282
 Y 0

P23 - CISELUNAR NAVIGATION

LOAD W MATRIX (R1 + 8 0 0 0 0) (R2 + 0 0 0 7 0)
 1. STAR 2 3 E N H (R3 = 0 0 1 1 0)

3 MARKS ON EACH STAR

INCORPORATE P23
 MARK DATA AND
 UPDATE ONBOARD
 STATE VECTOR

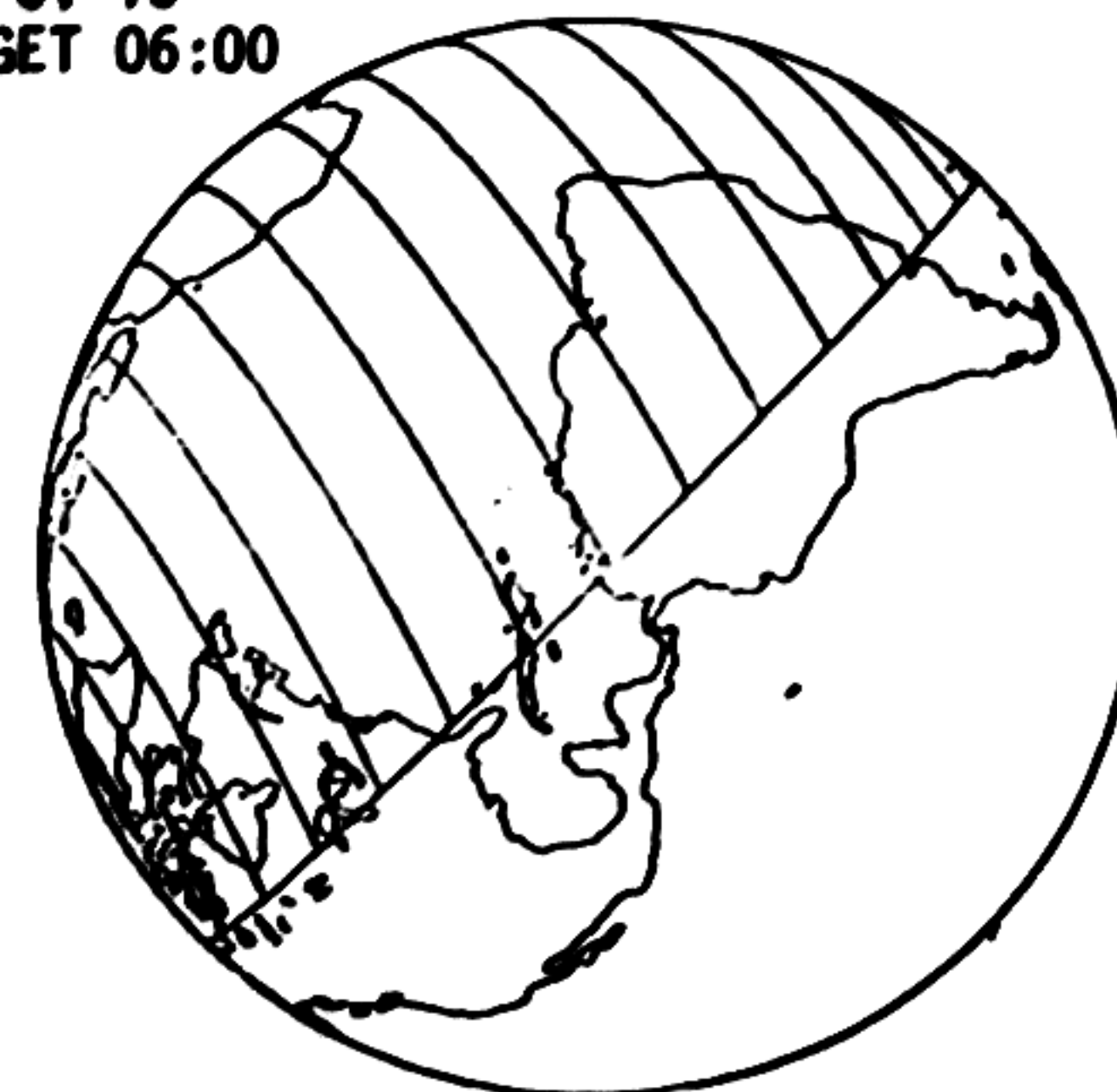
2. STAR 1 5 E F H (R3 = 0 0 1 2 0)

3. STAR 2 4 E N H (R3 = 0 0 1 1 0)

4. STAR 2 4 E N H (R3 = 0 0 1 1 0)

5 STAR 1 6 E F H (R3 = 0 0 1 2 0)

FOV 16°
 GET 06:00



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	06:00 - 07:00	1/TLC	3-8

MCC-H

1722 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)

07:00

MNVR TO PTC ATTITUDE

P 90
Y 0

ESTABLISH PTC

MANEUVER TO PTC
ATTITUDE-DISABLE TWO
ADJACENT QUADS-NUL
RATES IN $+5^\circ$ DB FOR
20 MINUTES-WIDEN DEAD
BAND TO $+30^\circ$, ENABLE
ALL JETS AND ROLL VE-
HICLE AT 0.3° /SEC,
DISABLE JETS

:30

DEACTIVATE PRIMARY EVAPORATOR
GLY EVAP H₂O FLOW - OFF ~~(GRT)~~ (CTR)
GLY EVAP STM PRESS AUTO - MAN
GLY EVAP STM PRESS INCR - INCR FOR 1 MIN

SELECT NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF

08:00

M
S
F
N

PTC

P 90 Y 0

:30

L10H CANISTER CHANGE NO. 1
(3 INTO A, STOW 1 IN B5)

09:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	07:00 - 09:00	1/TLC	3-9

MSC Form 29 (May 69)

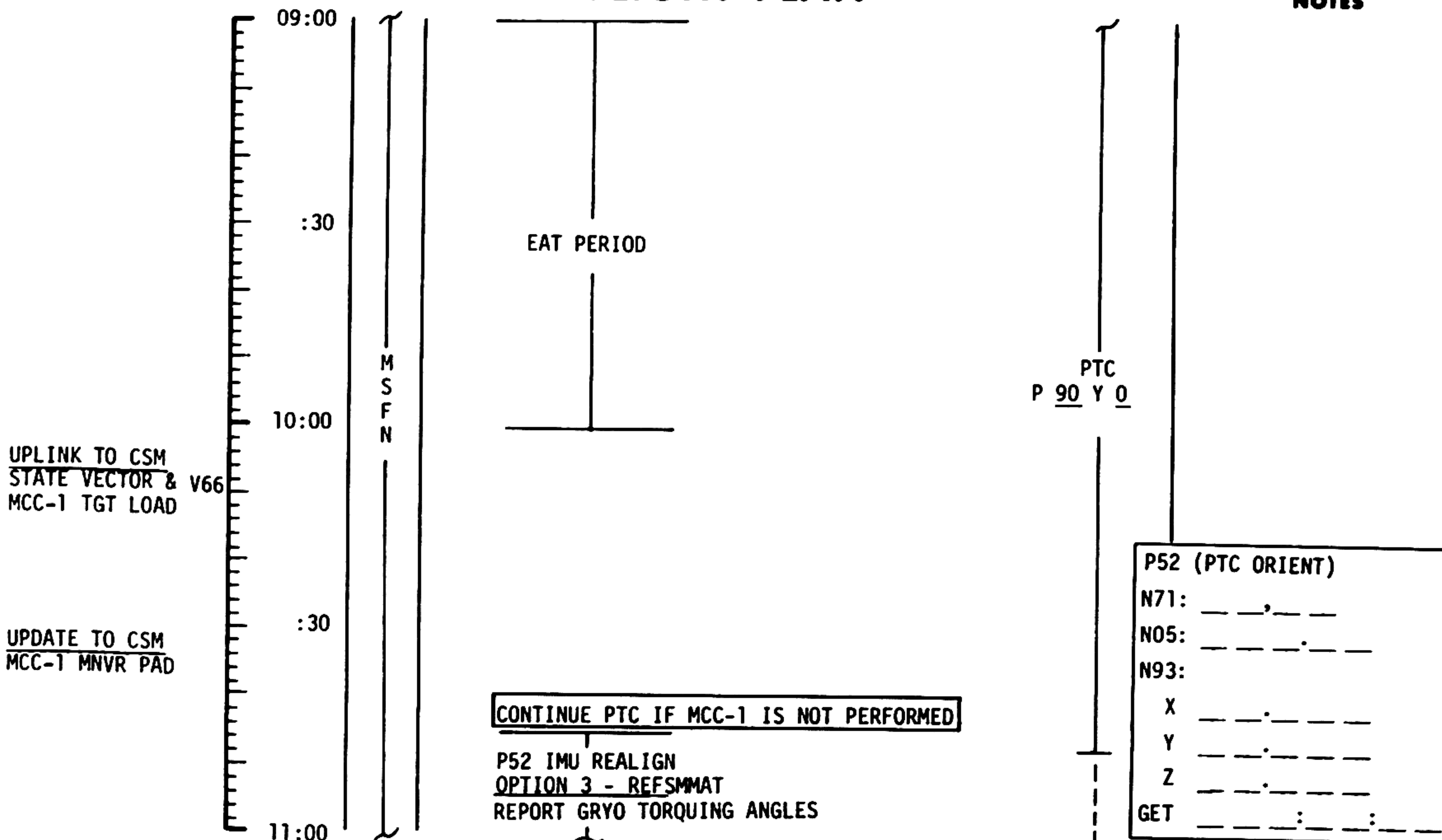
FLIGHT PLANNING BRANCH

MCC-H

1922 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	09:00 - 11:00	1/TLC	3-10

FLIGHT PLAN

MCC-1
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	IF<2FPS, TRIM X AXIS TO 0.2FPS IF>2FPS, NO TRIM

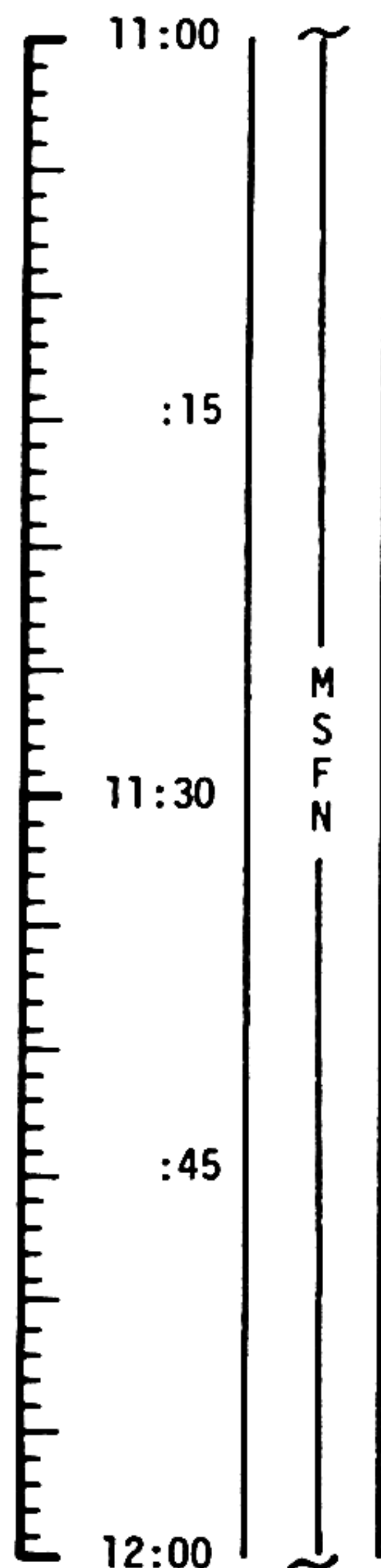
TABLE 3-2
3-11

MCC-H

2122 CST

FLIGHT PLAN

NOTES

P30 - EXTERNAL ΔV

V49 - MNVR TO BURN ATT

SXT STAR CHECK
 BATTERY CHARGE, BATTERY A
 O₂ FUEL CELL PURGE
 WASTE WATER DUMP
 P40/P41 - SPS/RCS THRUST

GDC ALIGN TO IMU

MCC-1

V66 - TRANSFER CSM SV TO LM SLOT
 MCC-1 BURN STATUS REPORT

TIG: 11:47:19.8
 ΔV : NOMINALLY ZERO

PTC

BURN STATUS REPORT					
X	X		•		ΔTIG
X	X		•		BT
			•		V_{gx}
TRIM					
X	X	X			R
X	X	X			P
X	X	X			Y
			•		V_{gx}
			•		V_{gy}
			•		V_{gz}
			•		ΔV_c *
X	X	X			FUEL *
X	X	X			OX *
X	X	X			UNBAL

* ITEMS TO BE
 REPORTED IN MSFN

MCC-1 WILL BE
 DELAYED TO MCC-2
 IF PROPELLANT COST
 IS NOT PROHIBITIVE
 TLI + 9 HRS

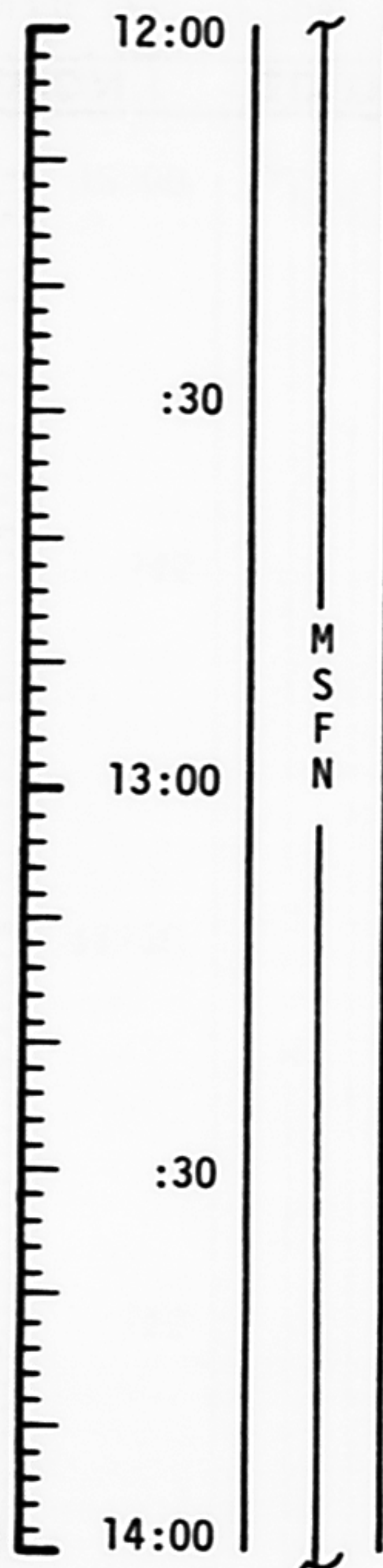
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	11:00 - 12:00	1/TLC	3-12

MCC-H

2222 CST

FLIGHT PLAN

 NOTES
 YES

 UPDATE TO CSM
 P37 PADS (L/O +
 25, 35, 45 & 60)

 REPORT: LM/CM ΔP
 WASTE STOWAGE VENT VLV - CLOSE
 VENT BATTS UNTIL SYSTEM TEST METER (4A) = 0

 MNVR TO PTC ATT P 90
 Y 0

 PTC
 P 90 Y 0

 DECISION TO
 CABIN PURGE REINITIATE
 WILL BE MADE
 REAL TIME APPROX
 3 HRS GET

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	12:00 - 14:00	1/TL	-13

MSC Form 29 (May 69)

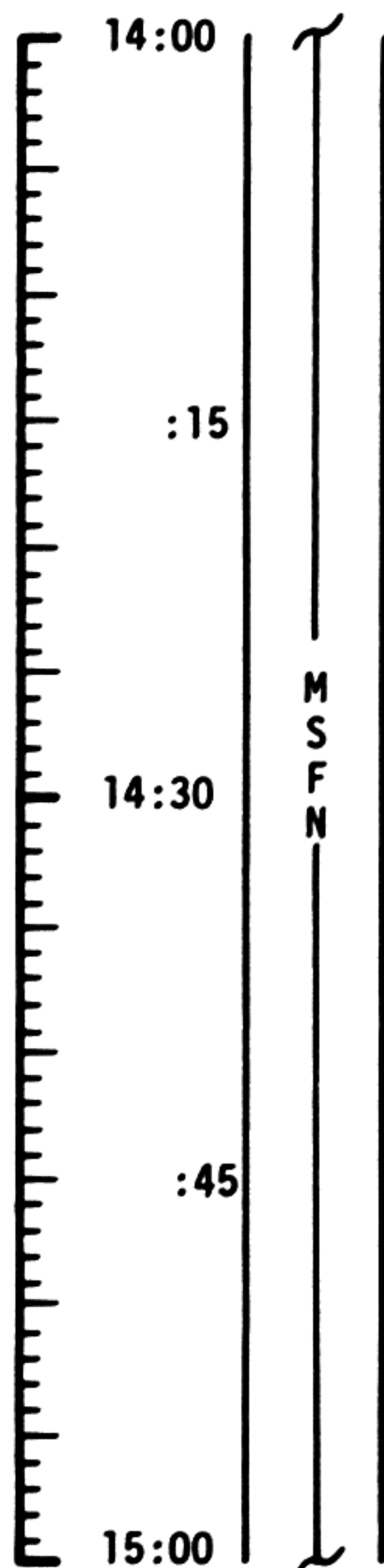
FLIGHT PLANNING BRANCH

MCC-H

0022 CST

FLIGHT PLAN

NOTES



P52 IMU REALIGN
OPTION 3 REFSMMAT
(OPTIONAL)

PTC
P 90 Y 0

P52 (PTC ORIENT)

N71: _ _ _ , _ _ _

N05: _ _ _ . _ _ _

N93:

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

Z _ _ _ . _ _ _

GET _ _ _ : _ _ _ : _ _ _

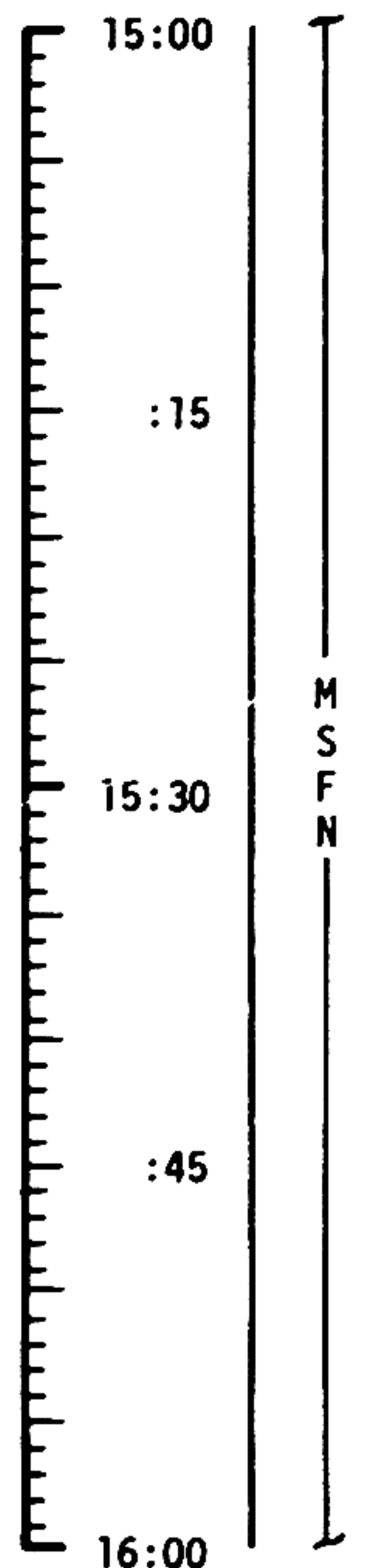
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	14:00 - 15:00	1/TLC	3-14

MCC-H

0122 CST

FLIGHT PLAN

NOTES



REPORT GYRO TORQUING ANGLES
GDC ALIGN TO IMU

MNVR TO OPTICS CALIBRATION ATT

P23 - CISELUNAR NAVIGATION

OPTICS CALIBRATION

STAR 1 5

P00

R 204

P 262

Y 0

V49 - MNVR TO SIGHTING ATT R 145

STAR/EARTH HORIZON P 293

P23 - CISELUNAR NAVIGATION Y 0

LOAD W MATRIX (R1 + 1 4 0 0 0) (R2 + 0 0 0 0 2)

1. STAR 2 4 ENH (R3 = 0 0 1 1 0)

2. STAR 1 6 EFH (R3 = 0 0 1 2 0)

3. STAR 2 6 ENH (R3 = 0 0 1 1 0)

3 MARKS EACH STAR

INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	15:00 - 16:00	1/TLC	3-15

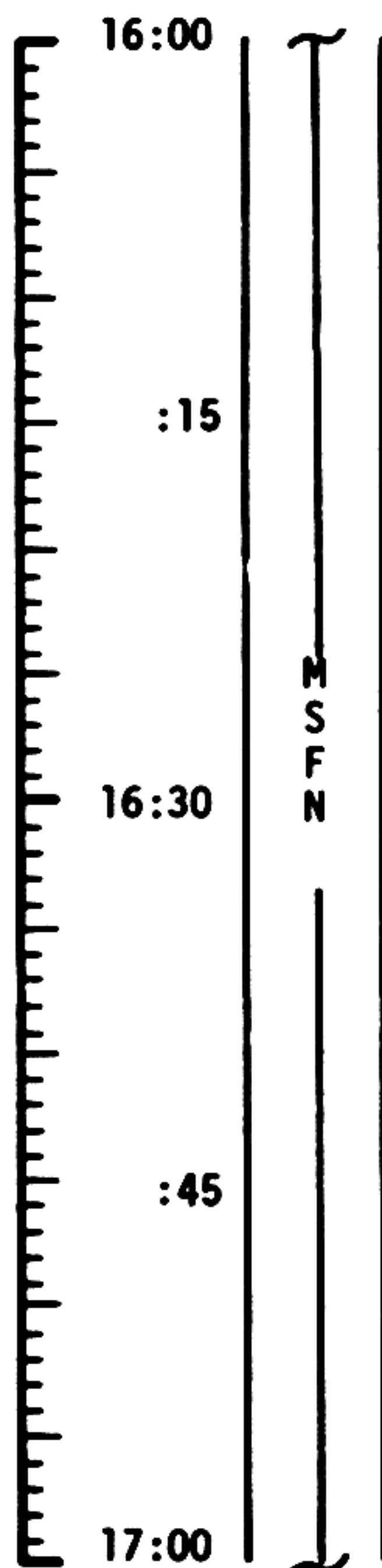
MCC-H

0222 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)



4. STAR 2 1 E F H (R3 = 0 0 1 2 0)

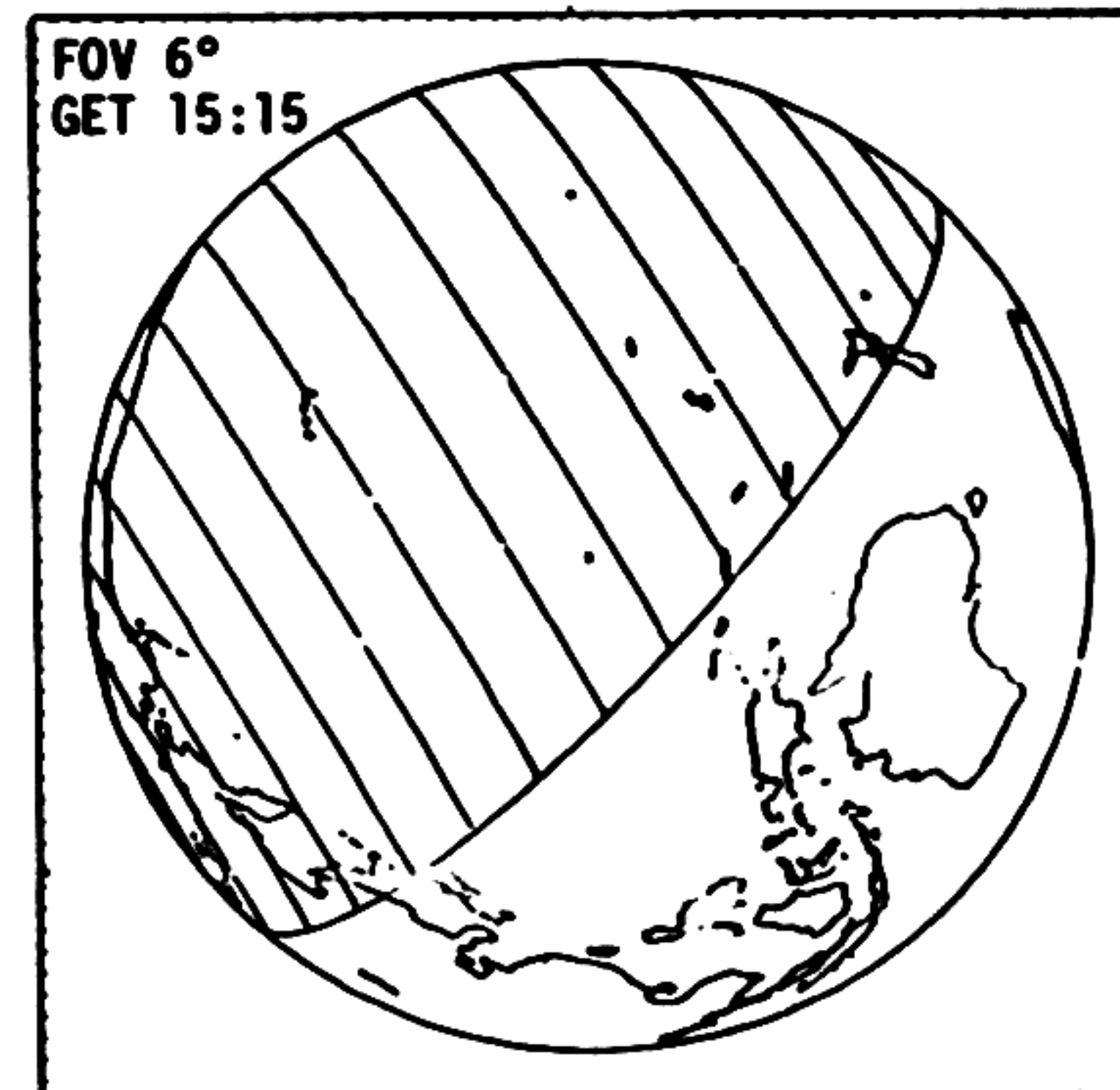
5. STAR 2 3 E N H (R3 = 0 0 1 1 0)

MNVR TO PTC ATTITUDE P 90
START PTC Y 0

EAT PERIOD

PTC

P 90 Y 0



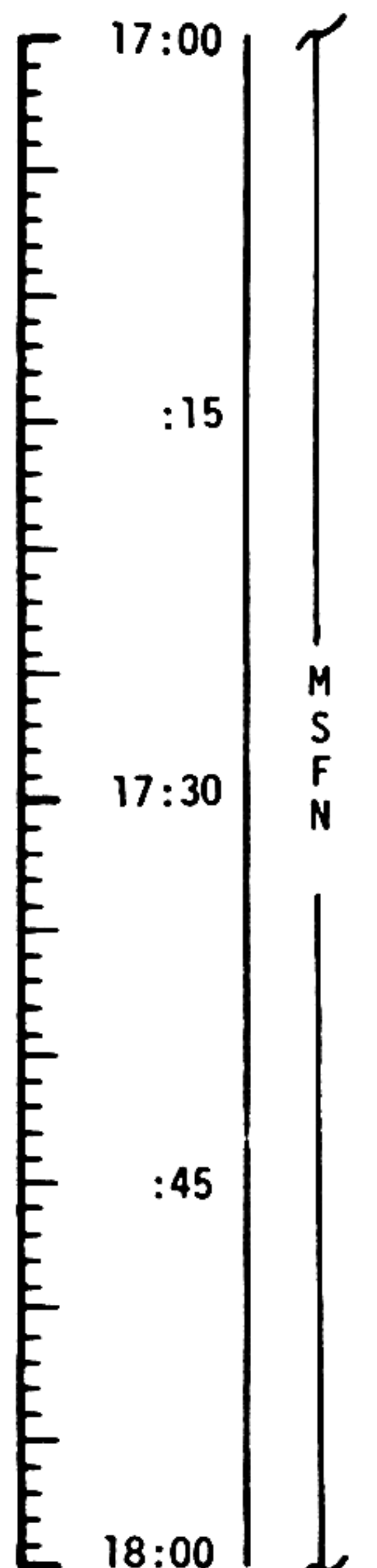
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	16:00 - 17:00	1/TLC	3-16

MCC-H

0322 CST

FLIGHT PLAN

NOTES



EAT PERIOD

LiOH CANISTER CHANGE NO.2
(4 INTO B, STOW 2 IN B5)

PRESLEEP CHECKLIST:
 CREW STATUS REPORT (MED)
 ONBOARD READOUTS
 CYCLE O2 & H2 FANS
 CHLORINATE POTABLE WATER
 VERIFY:
 WASTE MNGT OVBD DRAIN - OFF
 WASTE STOW VENT VLV - CLOSED
 EMER CABIN PRESS VLV - BOTH
 SURGE TK O2 VLV - ON
 REPRESS O2 VLV - OFF
 LM TUNNEL VENT - LM/CM ΔP
 "E" MEMORY DUMP
NORMAL LUNAR COMM EXCEPT:
 S-BD NORMAL MODE VOICE - OFF
 S-BD SQUELCH - ENABLE
 S-BD AUX TAPE - OFF
 S-BD ANT - OMNI
 S-BD ANT OMNI - B
 TAPE RCDR FWD - OFF

ONBOARD READOUT

BAT C _____
 PYRO BAT A _____
 PYRO BAT B _____
 RCS A _____
 B _____
 C _____
 D _____
 DC IND SEL - MNA OR B

PTC
P 90 Y 0

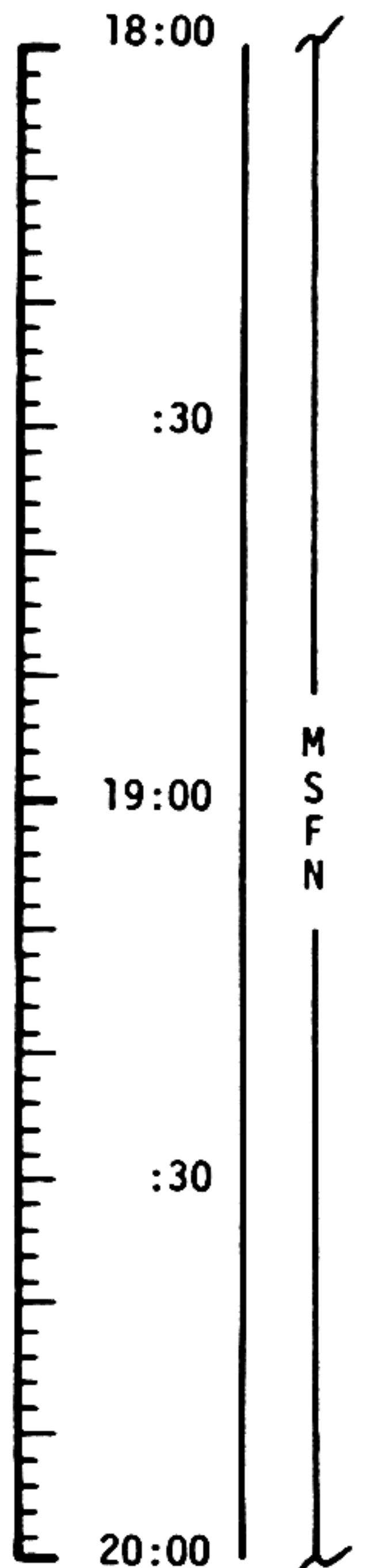
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	17:00 - 18:00	1/TLC	3-17

MCC-H

0422 CST

FLIGHT PLAN

NOTES



M
S
F
N

REST PERIOD
(10 HOURS)

PTC
P 90 Y 0

DURING REST PERIOD
TWO CREWMEN IN
COUCHES AND ONE
IN REST STATION

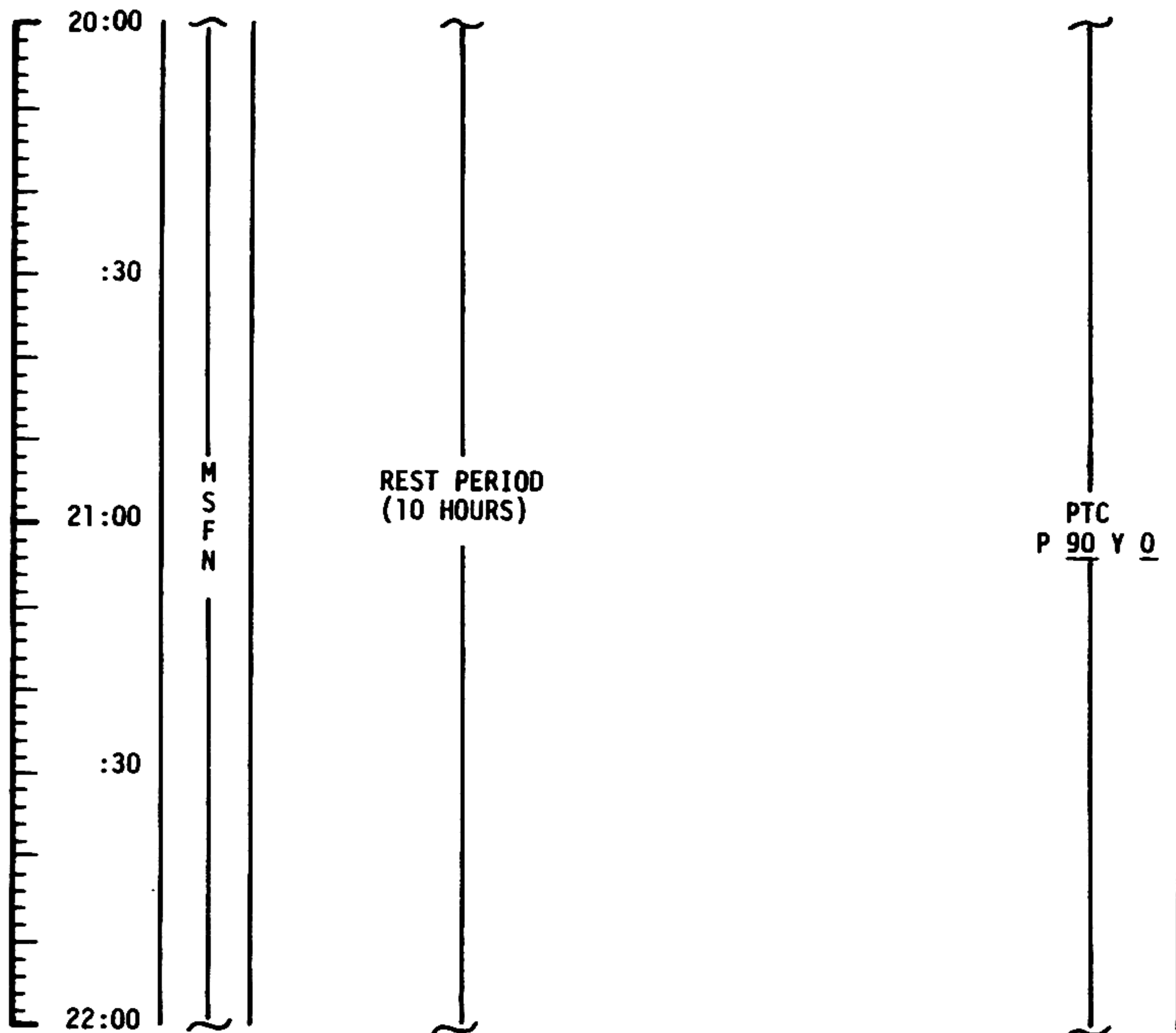
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	18:00 - 20:00	1/TLC	3-18

MCC-H

0622 CST

FLIGHT PLAN

NOTES



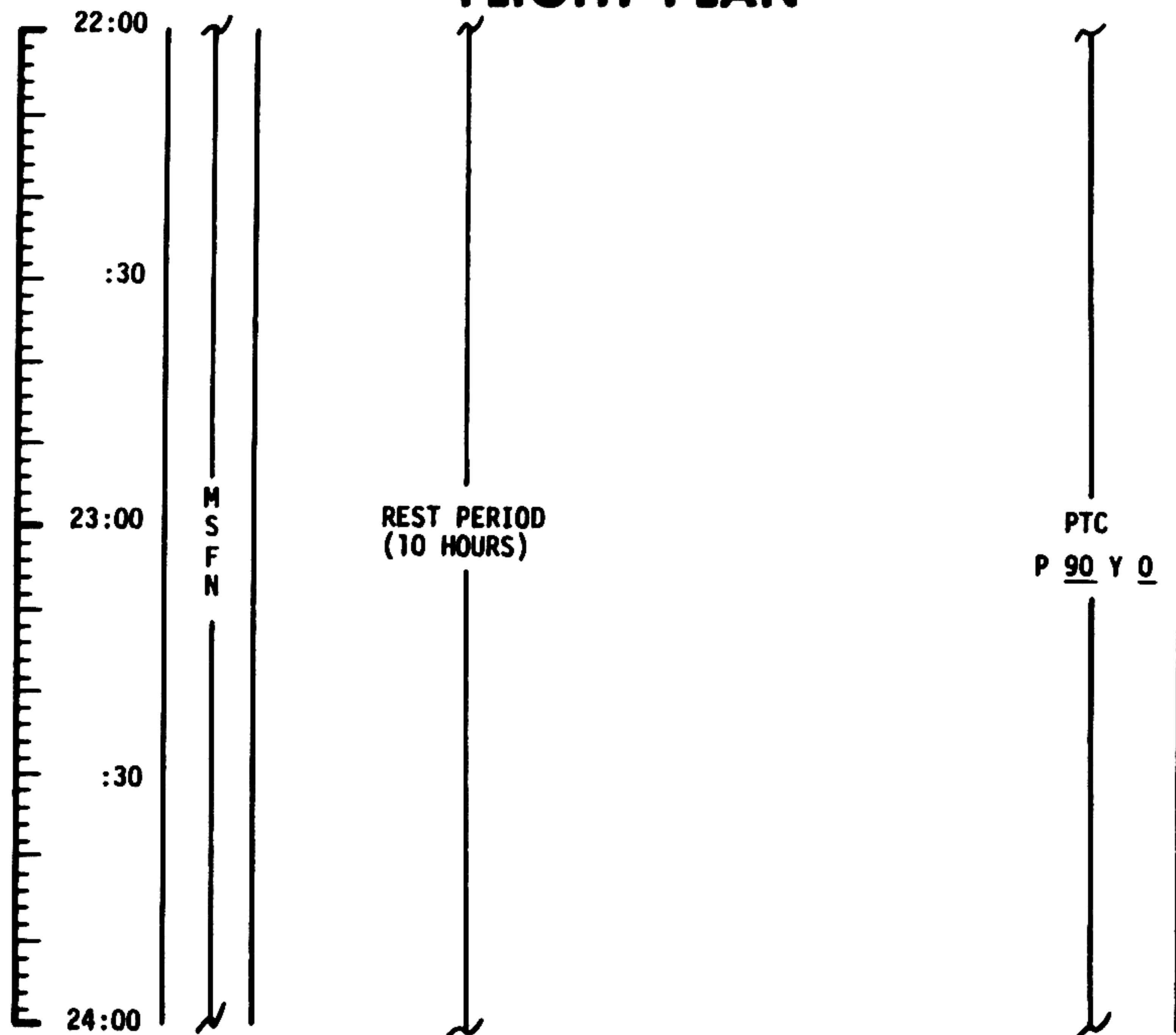
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	20:00 - 22:00	1/TLC	3-19

MCC-H

0822 CST

FLIGHT PLAN

NOTES



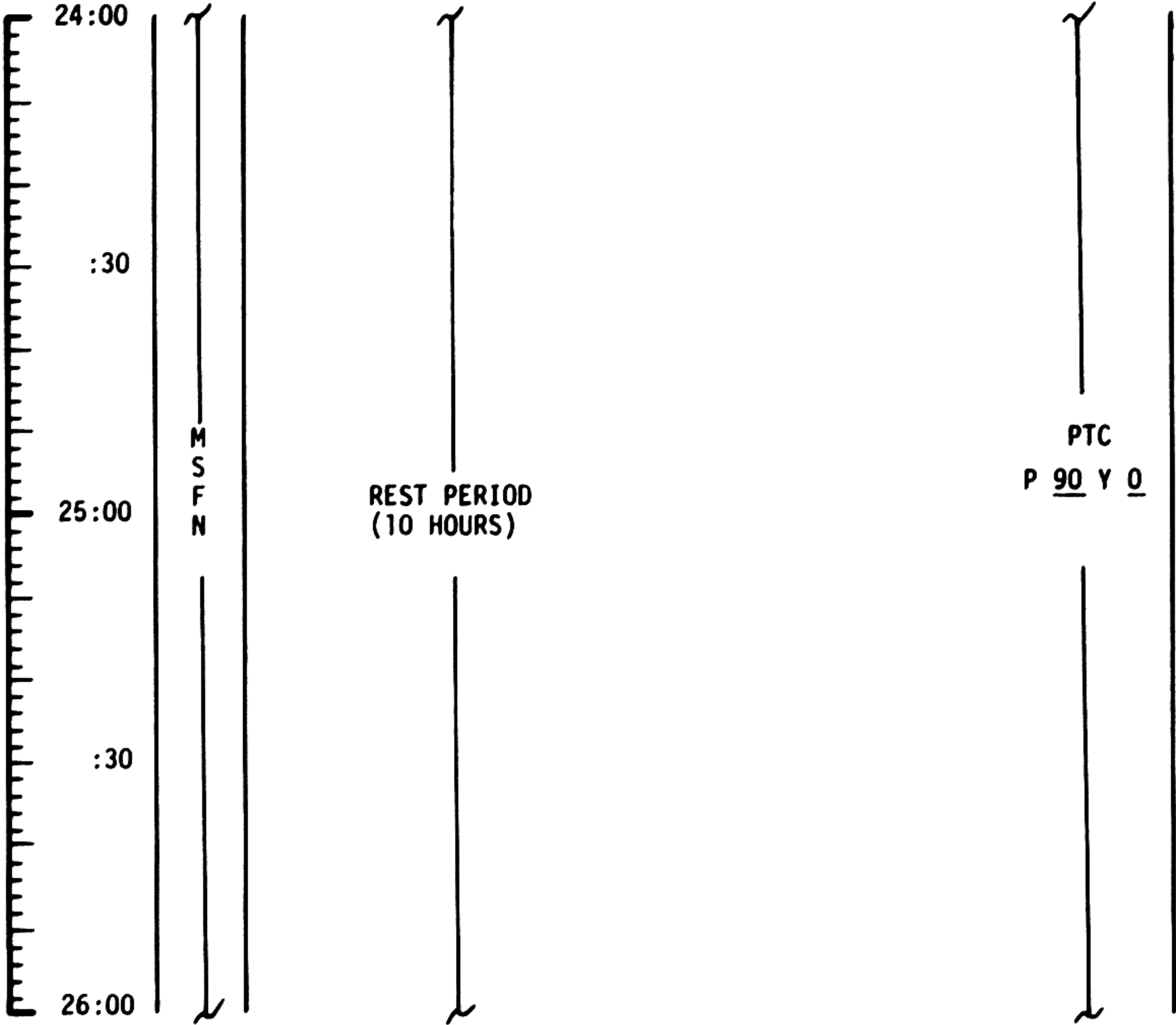
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	22:00 - 24:00	1/TLC	3-20

MCC-H

1022 CST

FLIGHT PLAN

NOTES



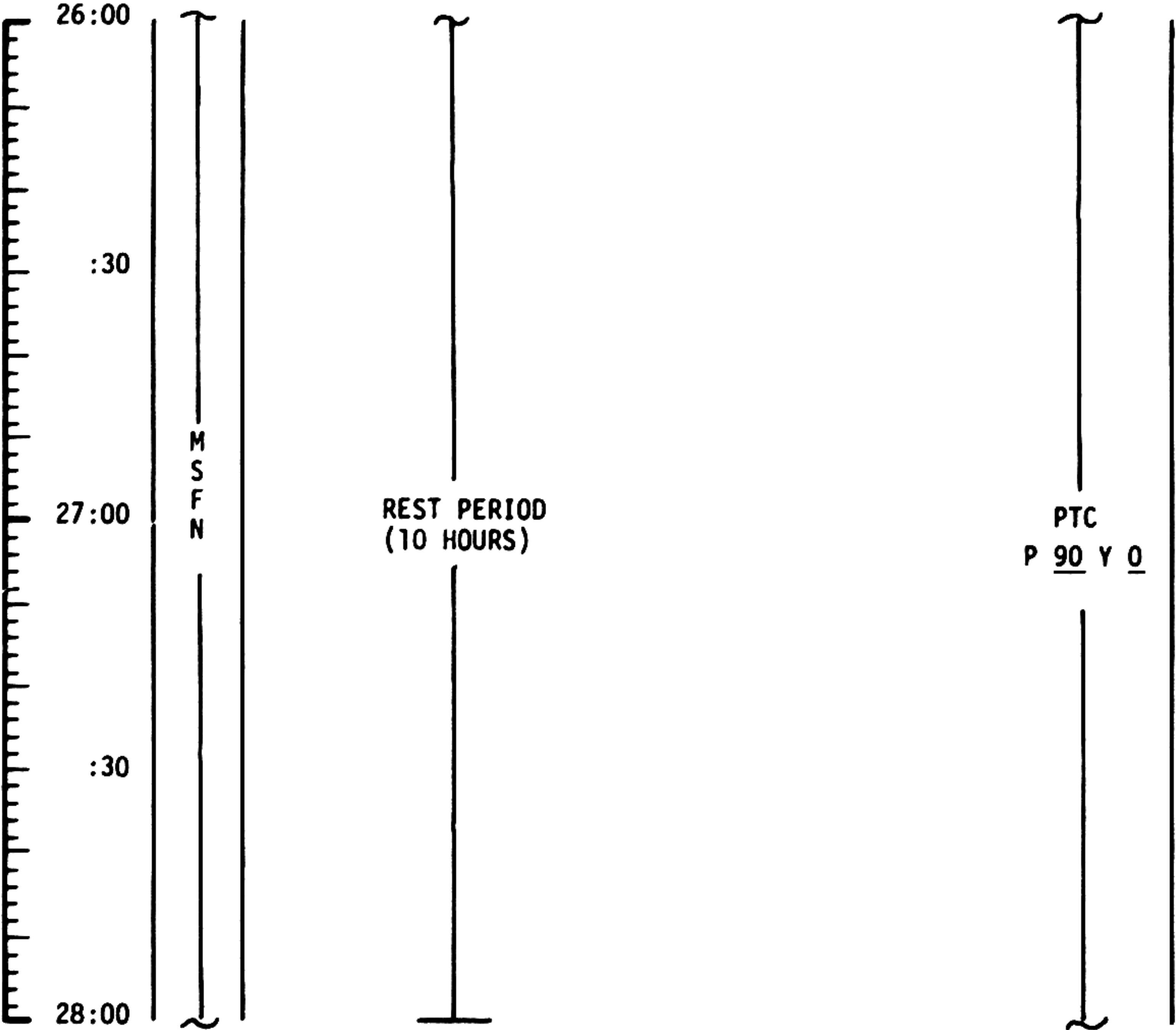
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	24:00 - 26:00	1/TLC	3-21

MCC-H

1222 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	26:00 - 28:00	1/TLC	3-22

MCC-H

1422 CST

FLIGHT PLAN

NOTES

28:00

:15

28:30

:45

29:00

M
S
F
N

EAT PERIOD

POSTSLEEP CHECKLIST:
 CREW STATUS REPORT
 CONSUMABLES UPDATE
 CYCLE H2 & O2 FANS
 FLIGHT PLAN UPDATE
 NORMAL LUNAR COMM EXCEPT:
 S-BD AUX TAPE - OFF
 TAPE RCDR FWD - OFF
 S-BD ANT - OMNI
 S-BD ANT OMNI - B

CSM CONSUMABLES UPDATE
 GET: ____ : ____
 RCS TOTAL ____ %
 QUAD A ____ % B ____ %
 C ____ % D ____ %
 H₂ TOTAL ____ %
 O₂ TOTAL ____ %

CREW STATUS REPORT
 CDR CMP LMP
 SLEEP ____
 PRD ____

PTC
 P 90 Y 0

UPDATE TO CSM
 CONSUMABLES
 FLIGHT PLAN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	28:00 - 29:00	2/TLC	3-23

NSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

LOG SHEET FOR LIGHT FLASHES & RADIO SIGNALS BEHIND MOON

G.E.T.

REMARKS

FLIGHT PLAN

DATE 10/5/69

LIGHT FLASH
 2. Firing LG6

**LOG SHEET
FOR
LIGHT FLASHES & RADIO SIGNALS BEHIND MOON**

G.E.T.**REMARKS**

FLIGHT PLAN

DATE 10/5/69

LIGHT FLASH
& RADIO LOG

MCC-H

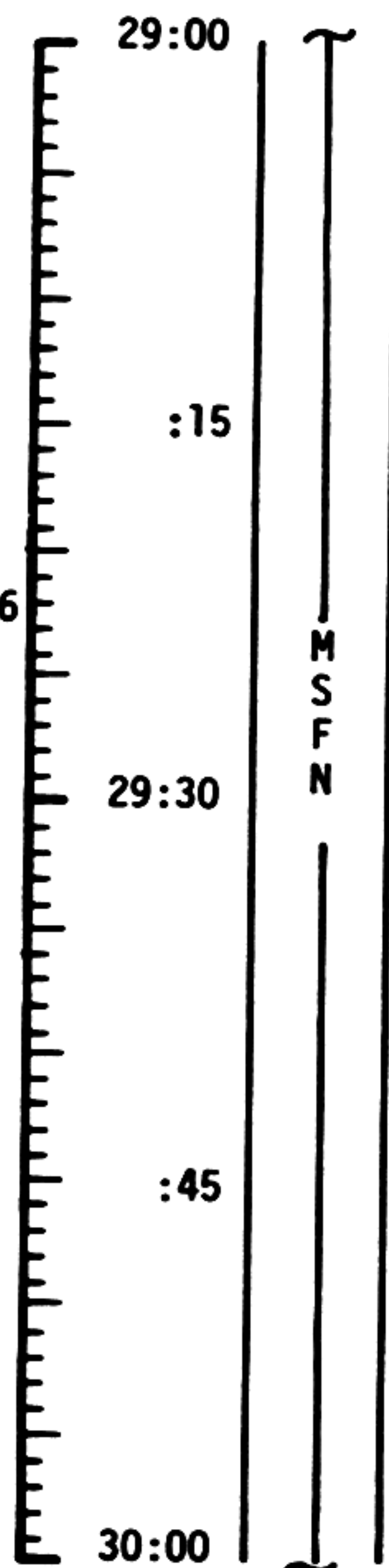
1522 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
STATE VECTOR & V66
MCC-2 TGT LOAD

UPDATE TO CSM
GO/NO-GO MCC-2
MCC-2 MNVR PAD



EAT PERIOD

REPORT LM/CM ΔP

P52 - IMU REALIGN
OPTION 3 - REFSMMAT

REPORT GYRO TORQUING ANGLES

LIOH CANISTER CHANGE NO 3
(5 INTO A, STOW 3 IN B5)

PTC
P 90 Y 0

P52 (PTC ORIENT)

N71: — — — —

N05: — — — —

N93: — — — —

X — — — —

Y — — — —

Z — — — —

GET — — — —

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	29:00 - 30:00	2/TLC	3-24

FLIGHT PLAN

MCC-2
BURN TABLE

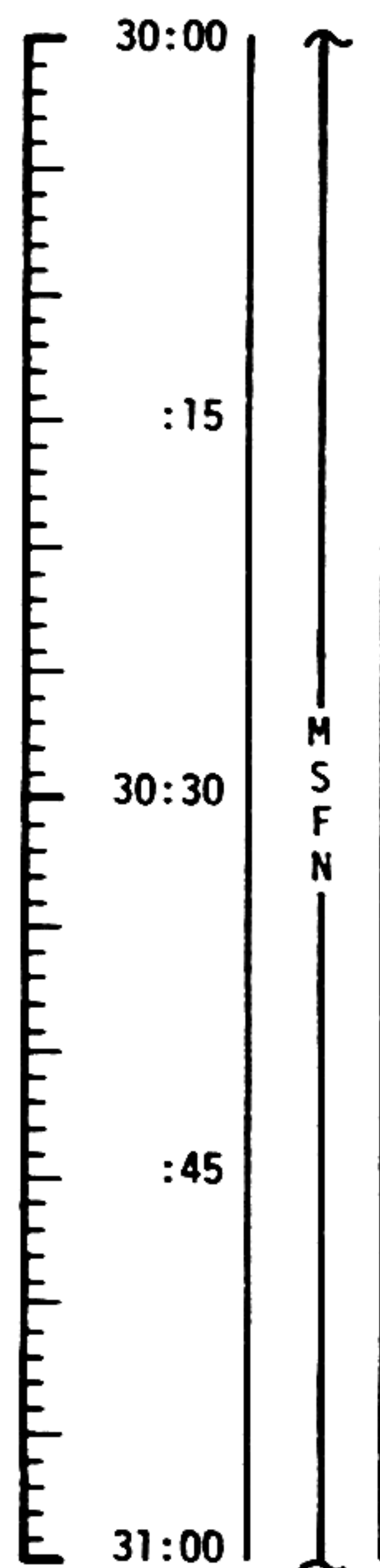
P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	IF<2FPS, TRIM X AXIS TO 0.2FPS IF>2FPS, NO TRIM

TABLE 3-3
3-25

MCC-H

1622 CST

FLIGHT PLAN

P30 EXTERNAL ΔV

V49 - MNVR TO BURN ATT

SXT STAR CHECK

TV (GDS) 30:25 TO 31:00
CM4/TV-IN (f5.6)O₂ FUEL CELL PURGE
WASTE WATER DUMP

P40 - SPS THRUST

GDC ALIGN TO IMU

MCC-2

V66 - TRANSFER CSM SV TO LM SLOT
MCC-2 BURN STATUS REPORT

R _____ HGA

P _____ P _____

Y _____ Y _____

BURN STATUS REPORT

X	X	<input type="checkbox"/>	•	ΔTIG
X	X		•	BT
<input type="checkbox"/>			•	V _{gx}
TRIM				
X	X	X		R
X	X	X		P
X	X	X		Y
<input type="checkbox"/>			•	V _{gx}
<input type="checkbox"/>			•	V _{gy}
<input type="checkbox"/>			•	V _{gz}
<input type="checkbox"/>			•	ΔV_c^*
X	X	X		FUEL*
X	X	X		OX*
X	X	X		UNBAL

*ITEMS TO BE
REPORTED TO MSFN

TIG: 30:52:43.7

BT: 10.0SEC

ΔV : 68.8 FPS

ULLAGE - NONE

ATTITUDE FOR MCC-2
BURN IS CONSTRAINED
IN ROLL FOR HGA
ACQUISITION FOR TV
AND BY SXT STAR CHECK

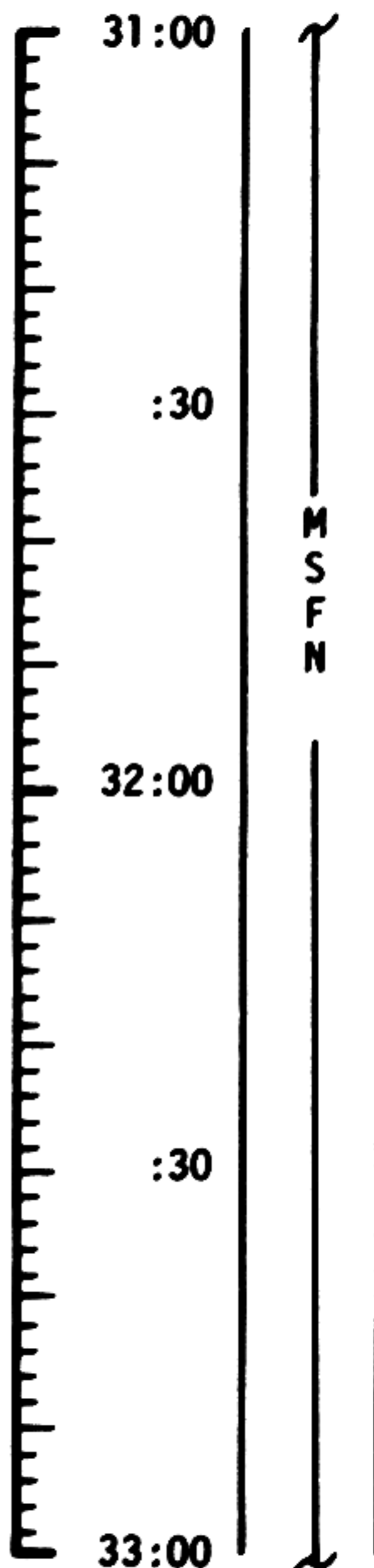
TLI + 28 HRS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	30:00 - 31:00	2/TLC	3-26

MCC-H

1722 CST

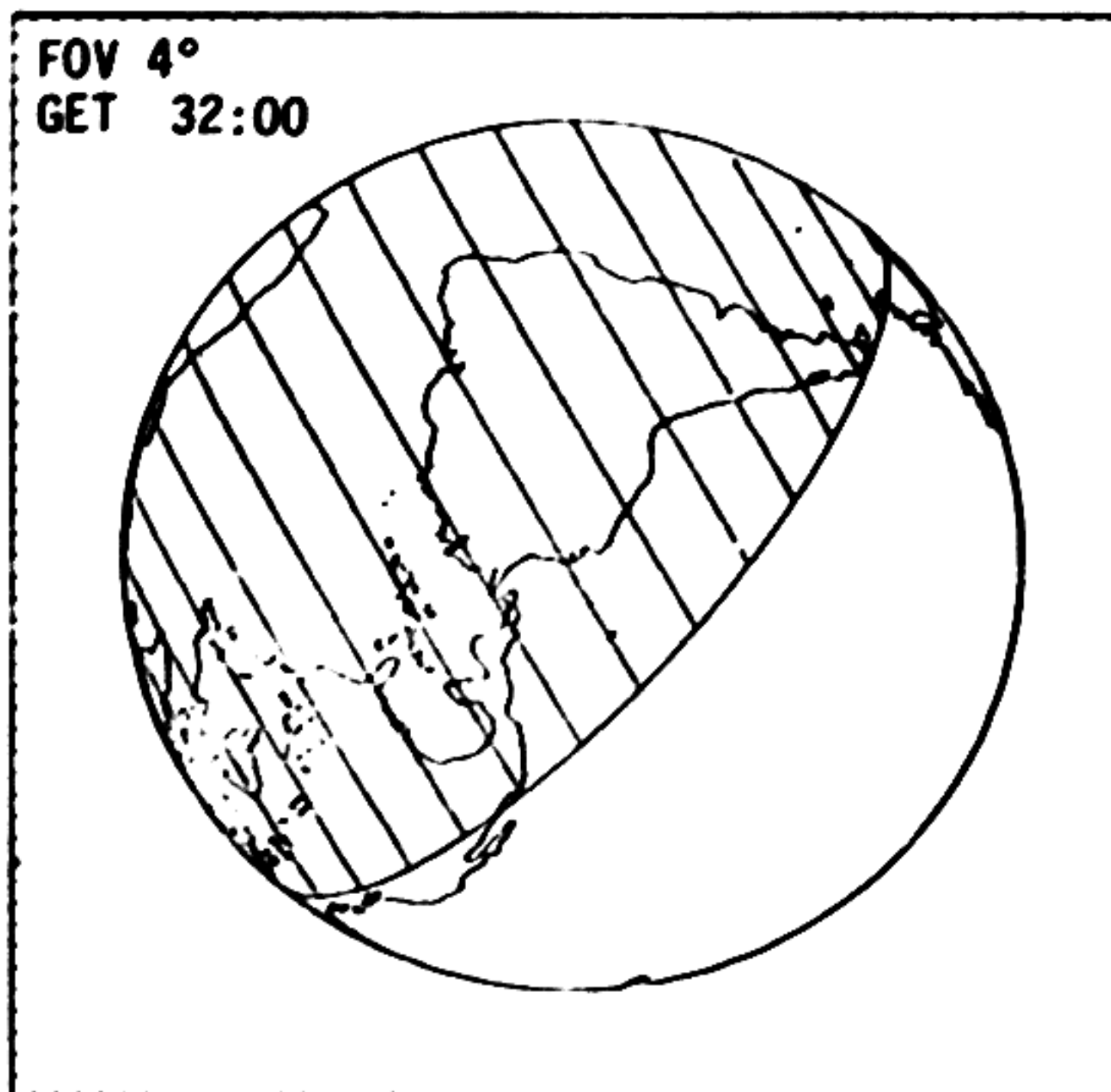
UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)



FLIGHT PLAN

NOTES

MANEUVER TO PTC ATTITUDE P 90
START PTC Y 0
S-BAND ANT - OMNI
SECURE HGA
HGA TRACK - MAN
HGA PITCH -52°
HGA YAW 270°
CHECK BAT VENT (TEST METER 4A)



PTC
P 90 Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	31:00 - 33:00	2/TLC	3-27

NSC Form 28 (May 68)

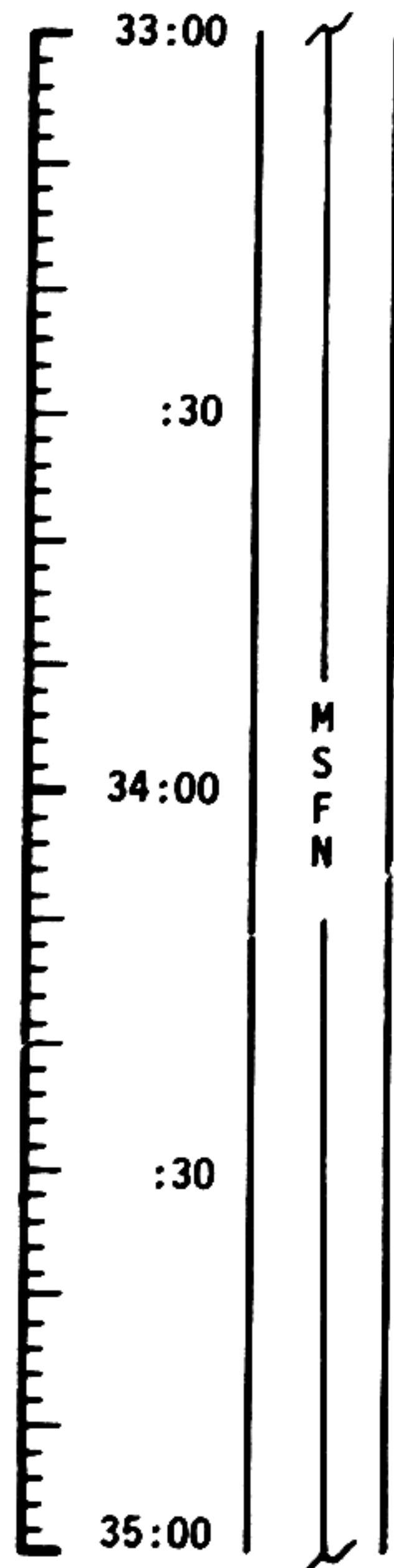
FLIGHT PLANNING BRANCH

MCC-H

1922 CST

FLIGHT PLAN

NOTES



PTC
P 90 Y 0

LOI-1 MINUS 5 HR
ABORT IS
CIRCUMLUNAR
TRAJECTORY TO THE
PRI MPL AND
WITH A PERILUNE
BETWEEN 60 AND
1500 NM.

UPDATE TO CSM
LOI-1 MINUS 5 HR
ABORT PAD

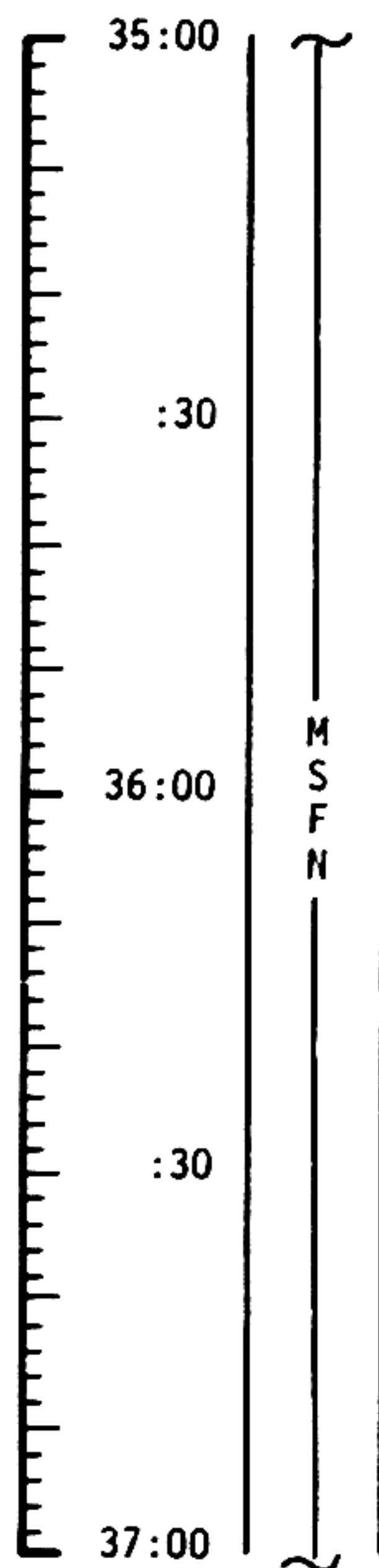
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	33:00 - 35:00	2/TLC	3-28

MCC-H

2142 CST

FLIGHT PLAN

NOTES



EAT PERIOD

 REINITIATE CSM PURGE
(IF REQUIRED)

 PTC
P 90 Y 0

THE LENGTH OF THE
SECOND CSM CABIN
PURGE WILL BE
DETERMINED REAL TIME
BASED ON THE LM LEAK
RATE INSURING LM O₂
PURITY REQUIREMENTS
ON THE LUNAR SURFACE

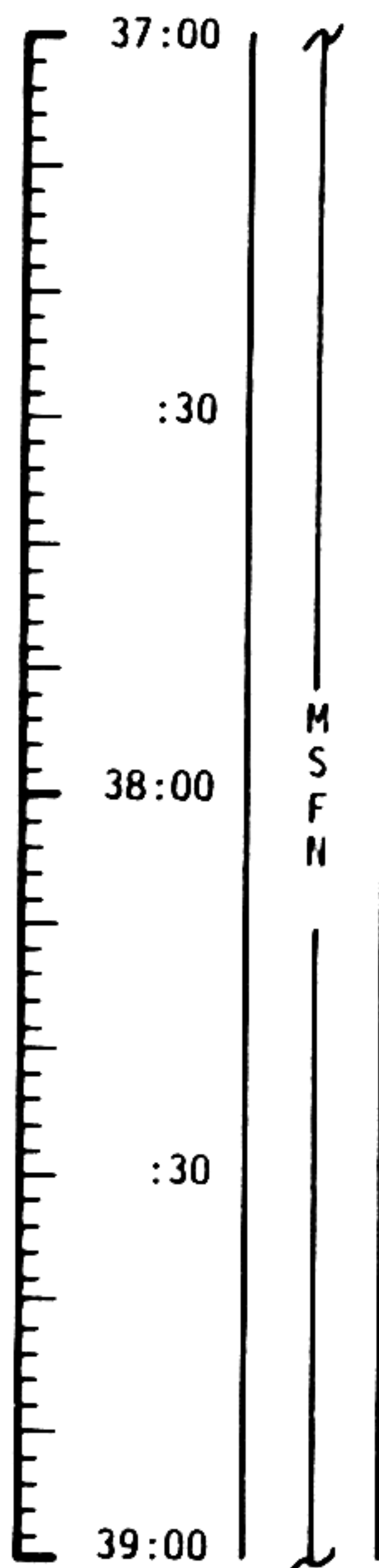
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	35:00 - 37:00	2/TLC	3-29

MCC-H

2322 CST

FLIGHT PLAN

NOTES



PTC
P 90 Y 0

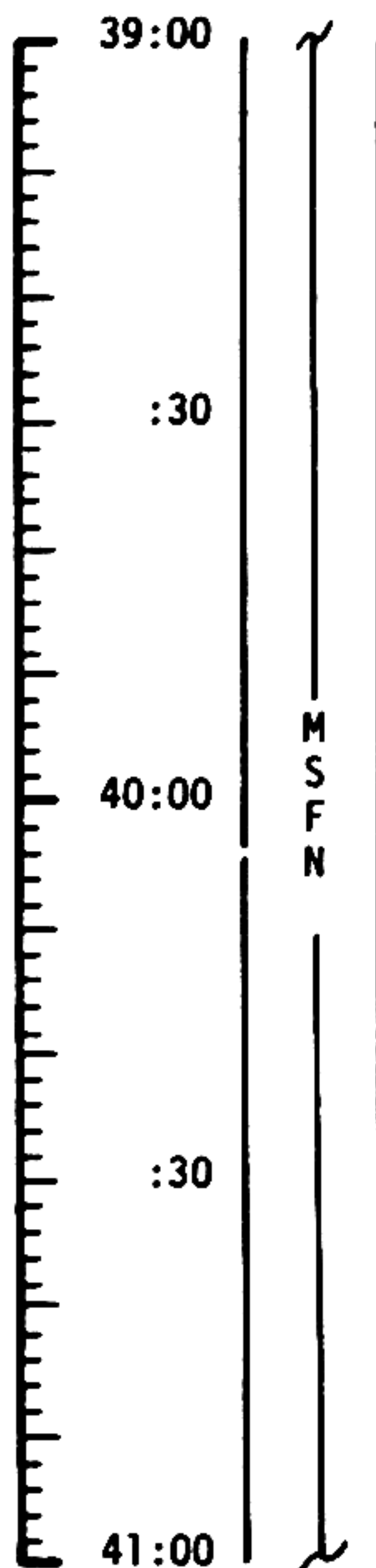
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	37:00 - 39:00	2/TLC	3-30

MCC-H

0122 CST

FLIGHT PLAN

NOTES



M
S
F
N

REPORT LM/CM ΔP

H₂ PURGE LINE HTRS - ON

PTC
P 90 Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	39:00 - 41:00	2/TLC	3-31

MCC-H

0322 CST

FLIGHT PLAN

NOTES

WASTE WATER DUMP
 H₂ & O₂ FUEL CELL PURGE
 LiOH CANISTER CHANGE NO. 4
 (6 INTO B, STOW 4 IN B5)

EAT PERIOD

PRESLEEP CHECKLIST:
 CREW STATUS REPORT (MED)
 ONBOARD READOUTS
 CYCLE O₂ & H₂ FANS
 CHLORINATE POTABLE WATER
 VERIFY:
 WASTE MNGT OVBD DRAIN - OFF
 WASTE STOW VENT VLV - CLOSED
 EMER CABIN PRESS VLV - BOTH
 SURGE TK O₂ VLV - ON
 REPRESS O₂ VLV - OFF
 LM TUNNEL VENT - LM/CM ΔP
 "E" MEMORY DUMP
 NORMAL LUNAR COMM EXCEPT:
 S-BD NORMAL MODE VOICE - OFF
 S-BD SQUELCH - ENABLE
 S-BD AUX TAPE - OFF
 S-BD ANT - OMNI
 S-BD ANT OMNI - B
 TAPE RCDR FWD - OFF

ONBOARD READOUT

BAT C _____
 PYRO BAT A _____
 PYRO BAT B _____
 RCS A _____
 B _____
 C _____
 D _____
 DC IND SEL - MNA OR B

PTC
 P 90 Y 0

UPLINK TO CSM
 STATE VECTOR & V66

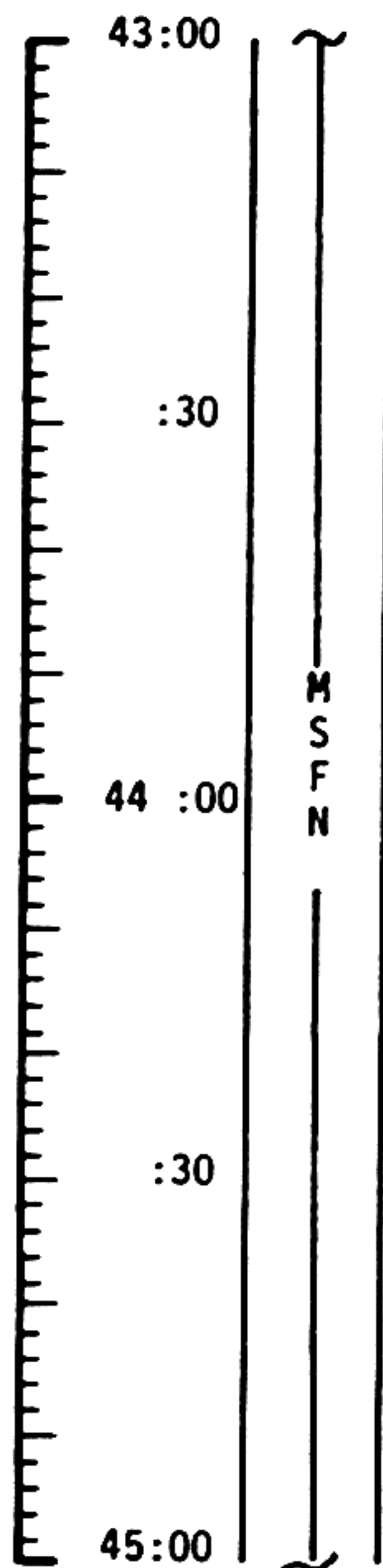
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	41:00 - 43:00	2/TLC	3-32

MCC-H

0522 CST

FLIGHT PLAN

NOTES



M
S
F
N

REST PERIOD
(10 HOURS)

PTC
P 90 Y 0

DURING REST PERIOD
TWO CREWMEN IN
COUCHES AND ONE
IN REST STATION

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	43:00 - 45:00	2/TLC	3-33

MSC Form 29 (May 69)

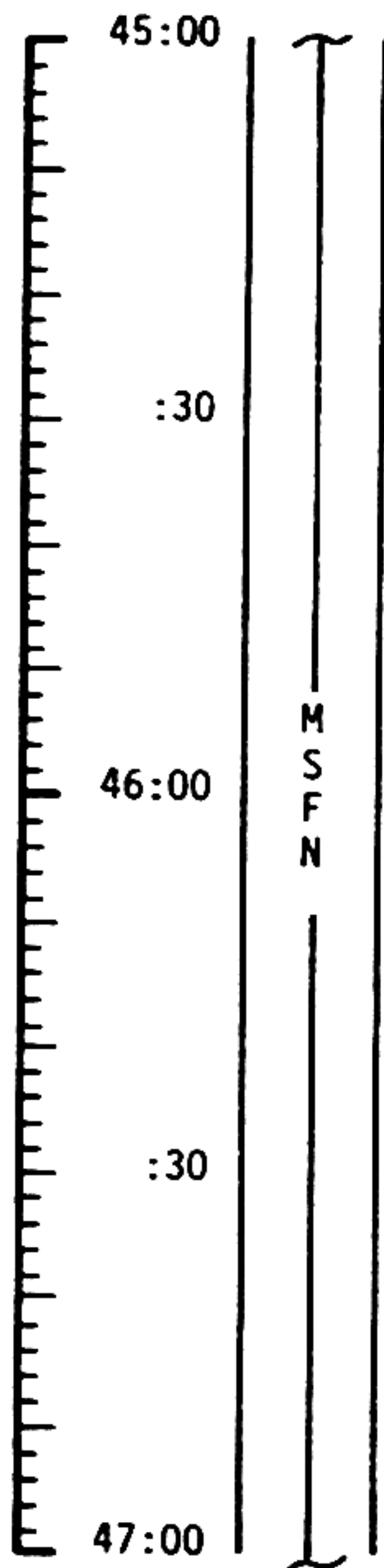
FLIGHT PLANNING BRANCH

MCC-H

0722 CST

FLIGHT PLAN

NOTES



REST PERIOD
(10 HOURS)

PTC
P 90 Y 0

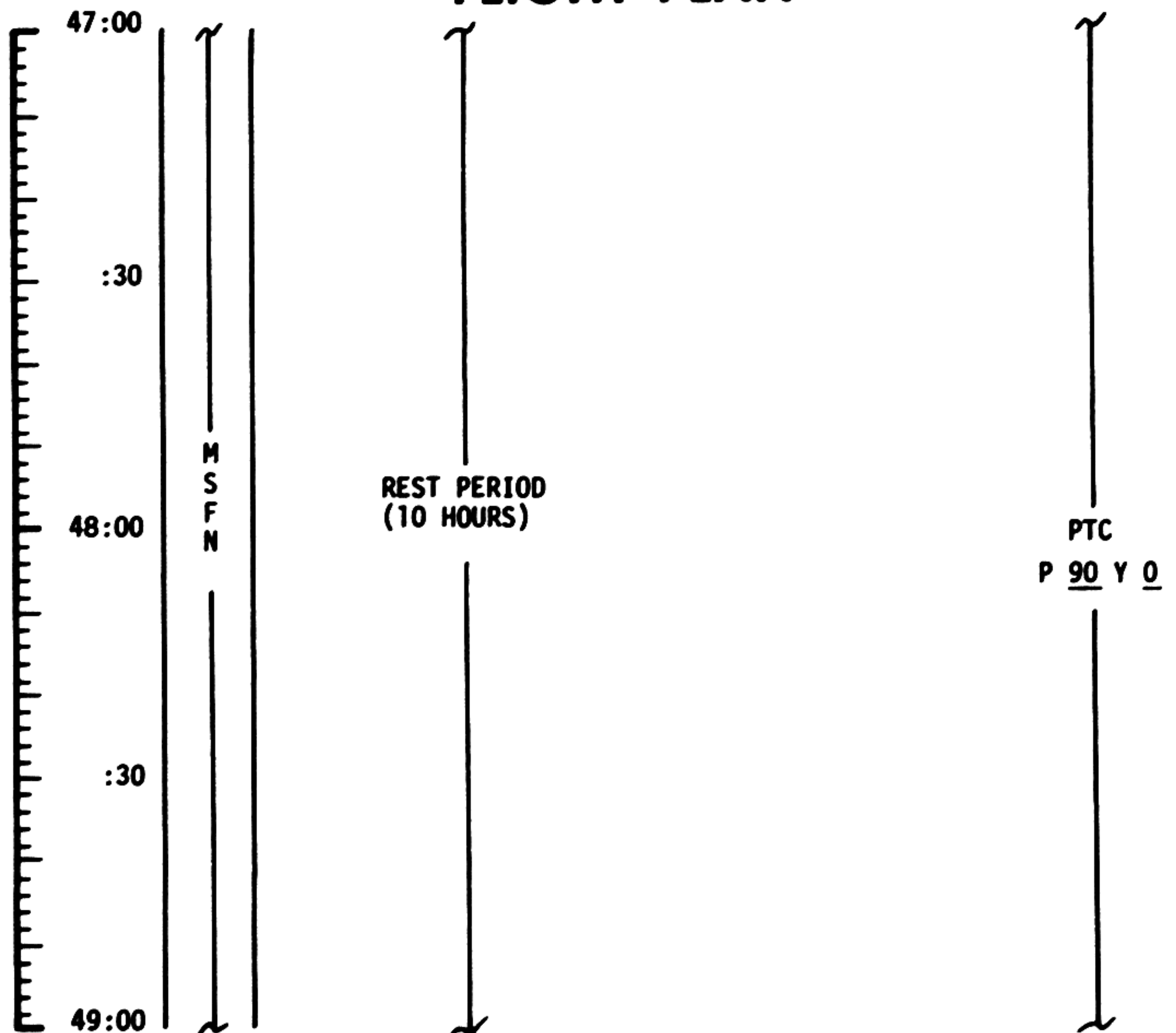
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	45:00 - 47:00	2/TLC	3-34

MCC-H

0922 CST

FLIGHT PLAN

NOTES



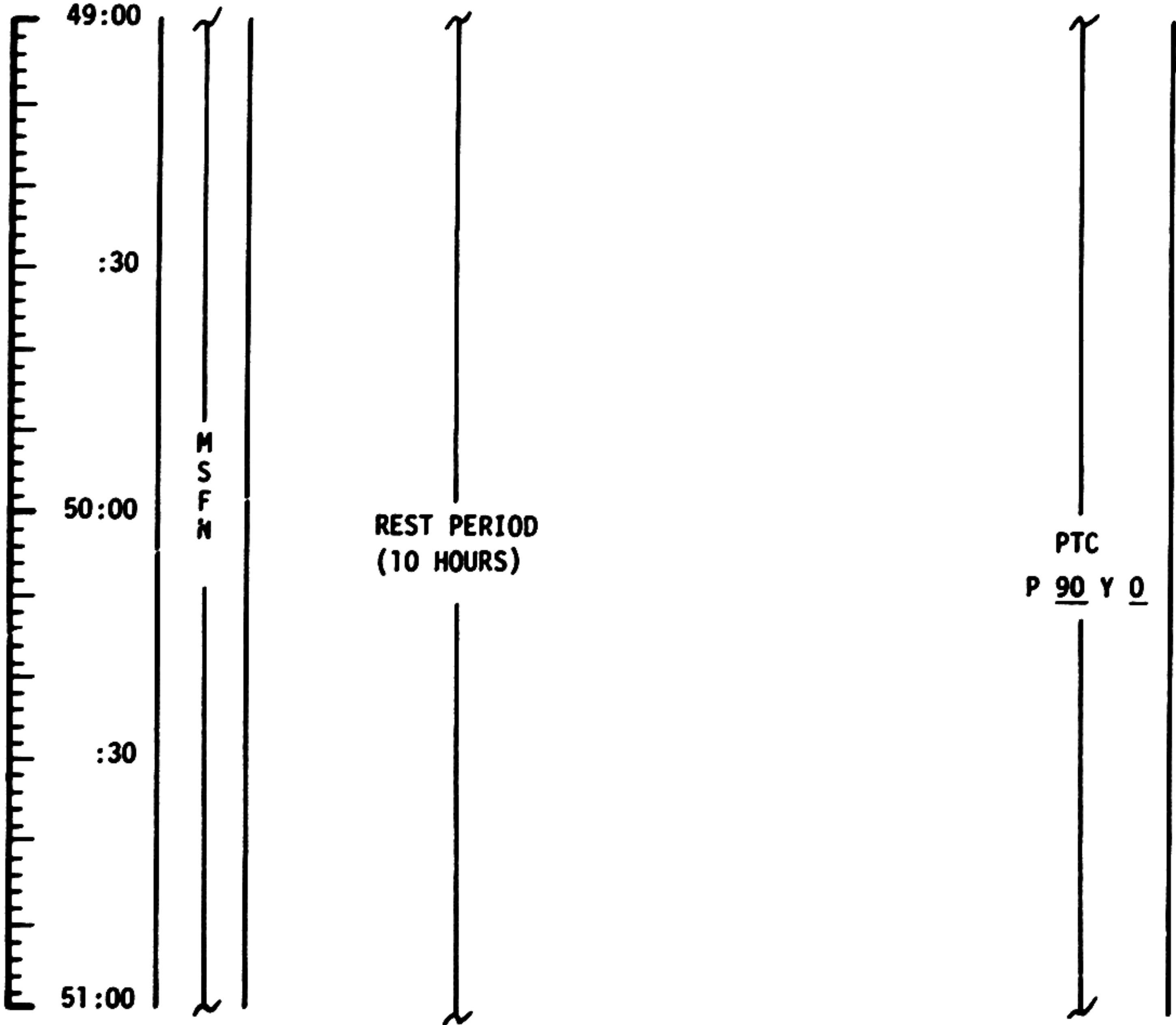
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	47:00 - 49:00	2/TLC	3-35

MCC-H

1122 CST

FLIGHT PLAN

NOTES



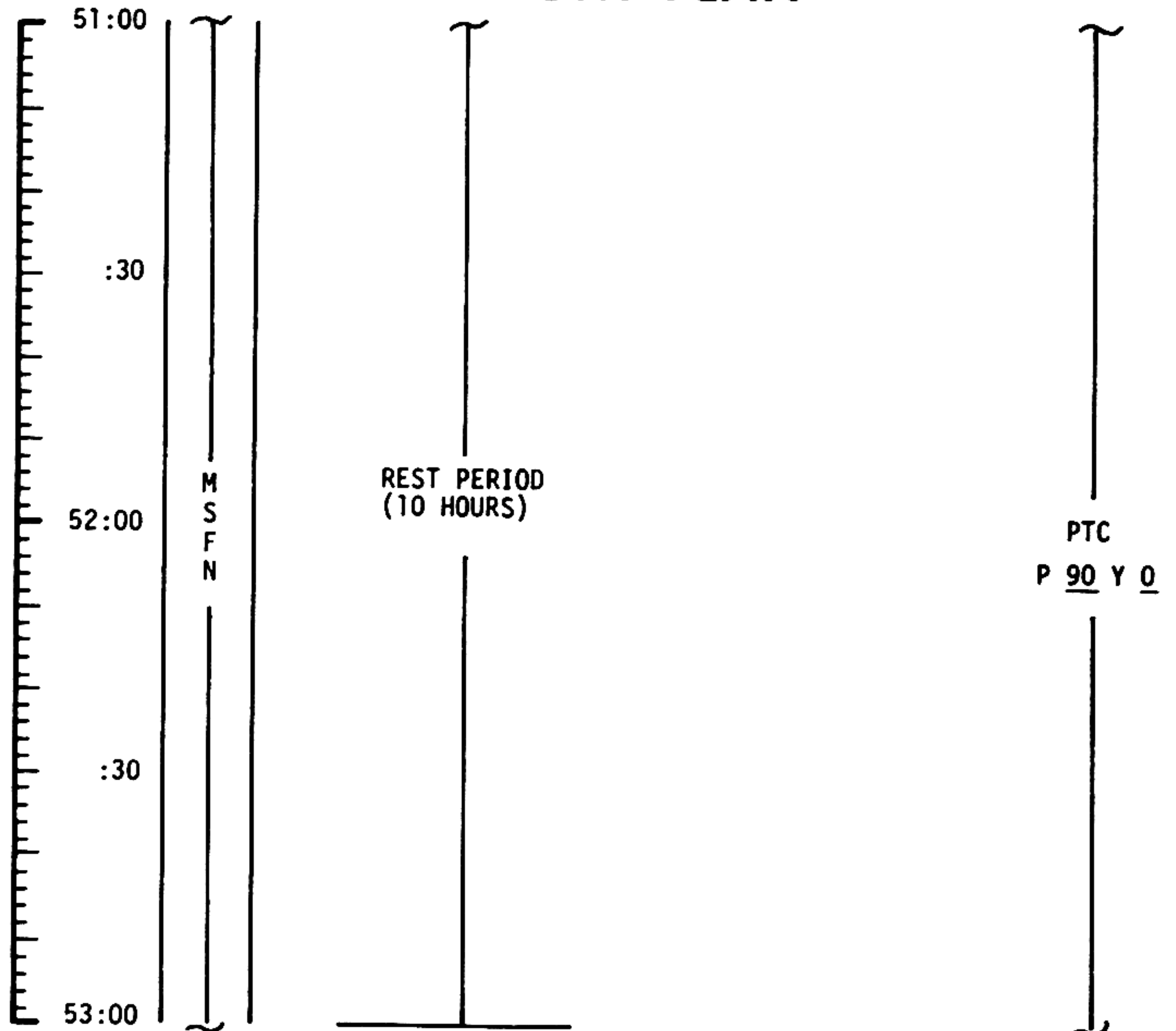
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	49:00 - 51:00	2/TLC	3-36

MCC-H

1322 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	51:00 - 53:00	2/TLC	3-37

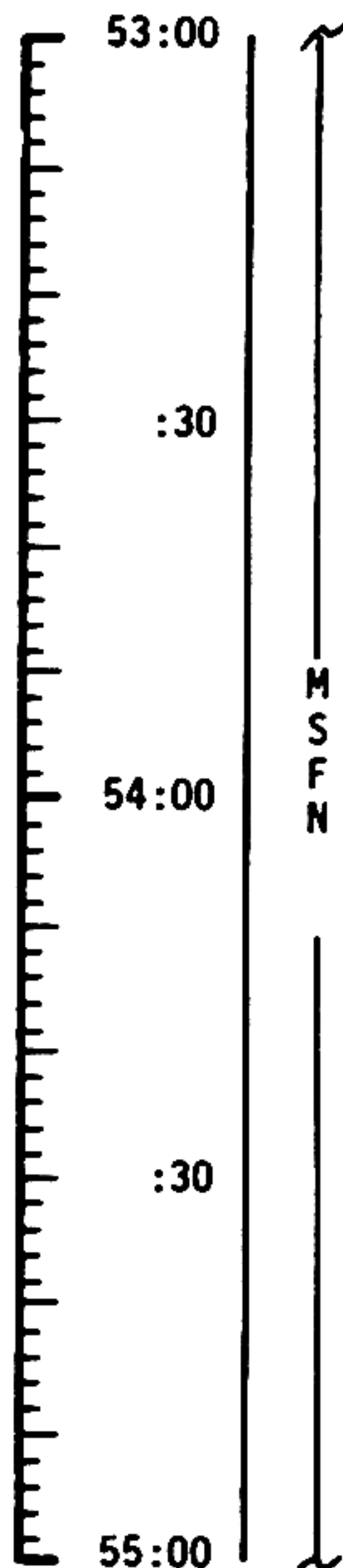
MCC-H

1522 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN



EAT PERIOD

L10H CANISTER CHANGE
NO. 5 (7 INTO A, STOW
5 IN B6)

REPORT LM/CM ΔP

POSTSLEEP CHECKLIST:
CREW STATUS REPORT
CONSUMABLES UPDATE
CYCLE H2 & O2 FANS
FLIGHT PLAN UPDATE
NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B

CSM CONSUMABLES UPDATE

GET: ____ : ____

RCS TOTAL ____ %

QUAD A ____ % B ____ %

C ____ % D ____ %

H₂ TOTAL ____ %

O₂ TOTAL ____ %

CREW STATUS REPORT

	CDR	CMP	LMP
SLEEP	_____	_____	_____
PRD	_____	_____	_____

PTC
P 90 Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	53:00 - 55:00	3/TLC	3-38

MCC-H

1722 CST

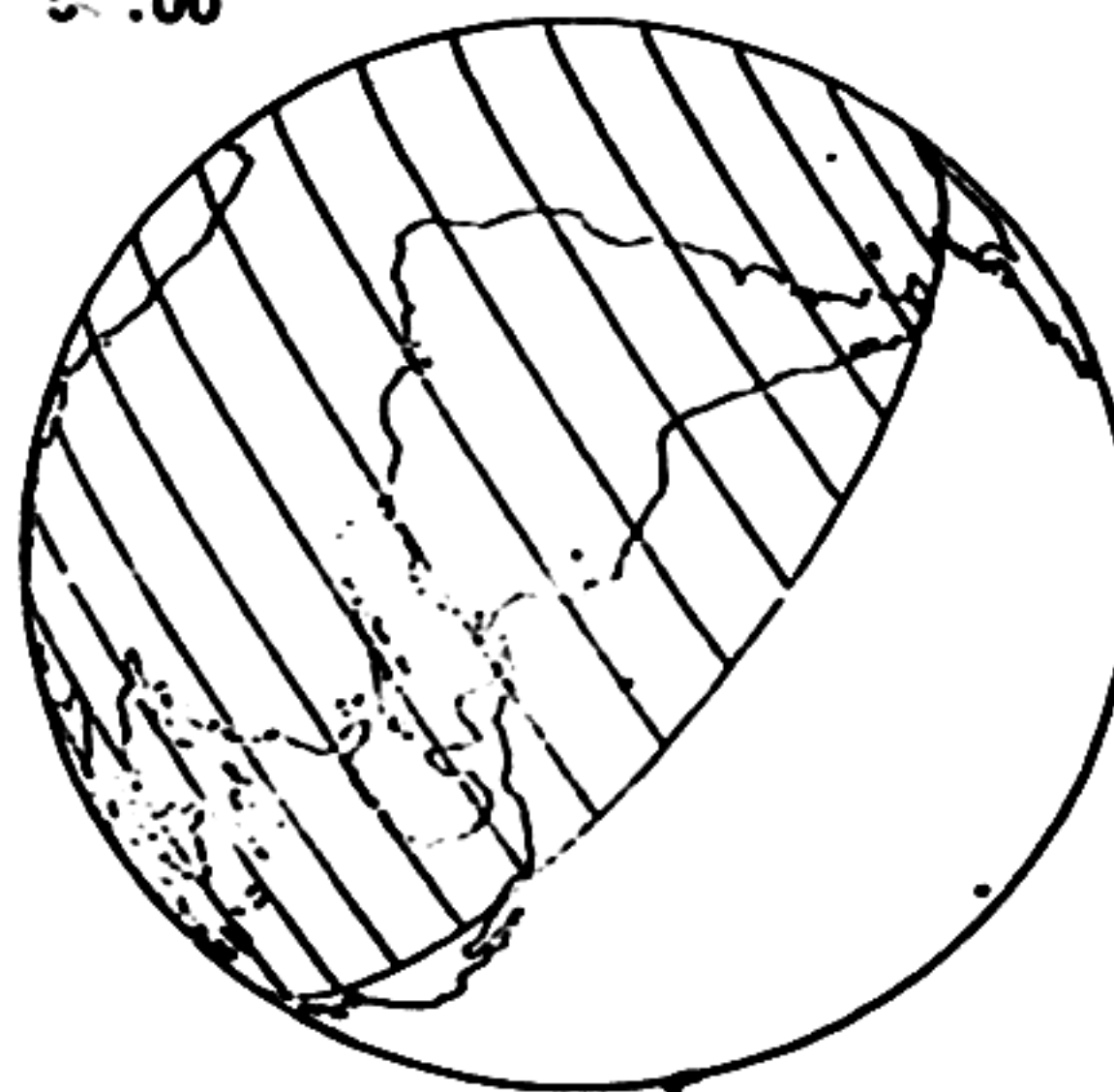
FLIGHT PLAN

NOTES

P52 IMU REALIGN
OPTION 3 REFSMMAT
(OPTIONAL)

REPORT GYRO TORQUING ANGLES

FOV 3°
GET 55:00



P52 (PTC ORIENT)

N71: _____

N05: _____

N93: _____

X _____

Y _____

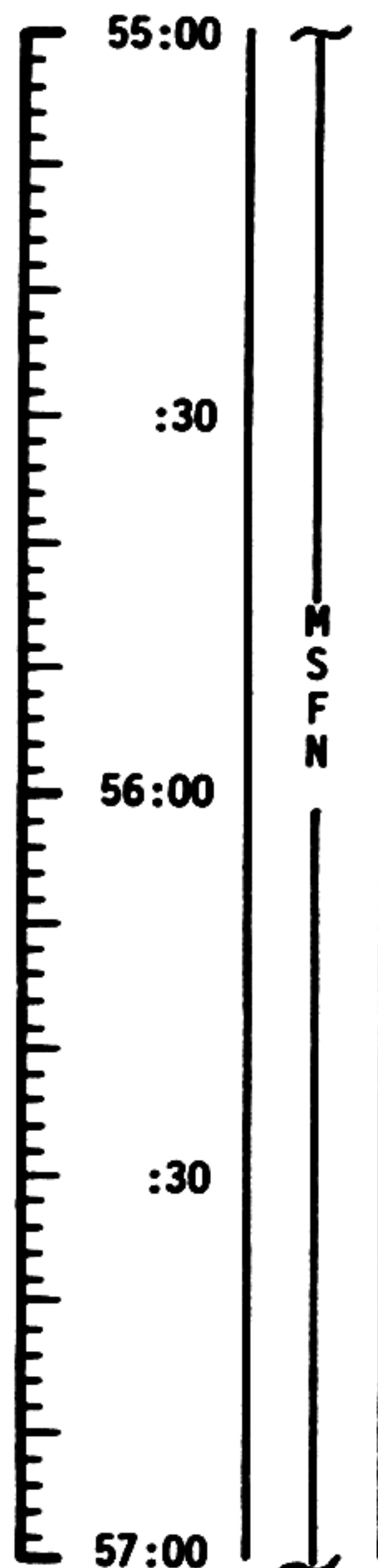
Z _____

GET _____:_____:_____

ΔH DETERMINED
FROM STAR/EARTH
HORIZON SIGHTINGS
WILL BE UPLINKED
IF IT DIFFERS FROM
 ΔH IN E-MEMORY
BY MORE THAN 5.0 KM

PTC
P 90 Y 0

UPLINK TO CSM
 ΔH (IF REQUIRED)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	55:00 - 57:00	3/TLC	3-39

NSC Form 20 (May 69)

FLIGHT PLANNING BRANCH

MCC-H

1922 CST

FLIGHT PLAN

NOTES

57:00

:30

58:00

:30

59:00

M
S
F
N

PTC

P 90 Y 0

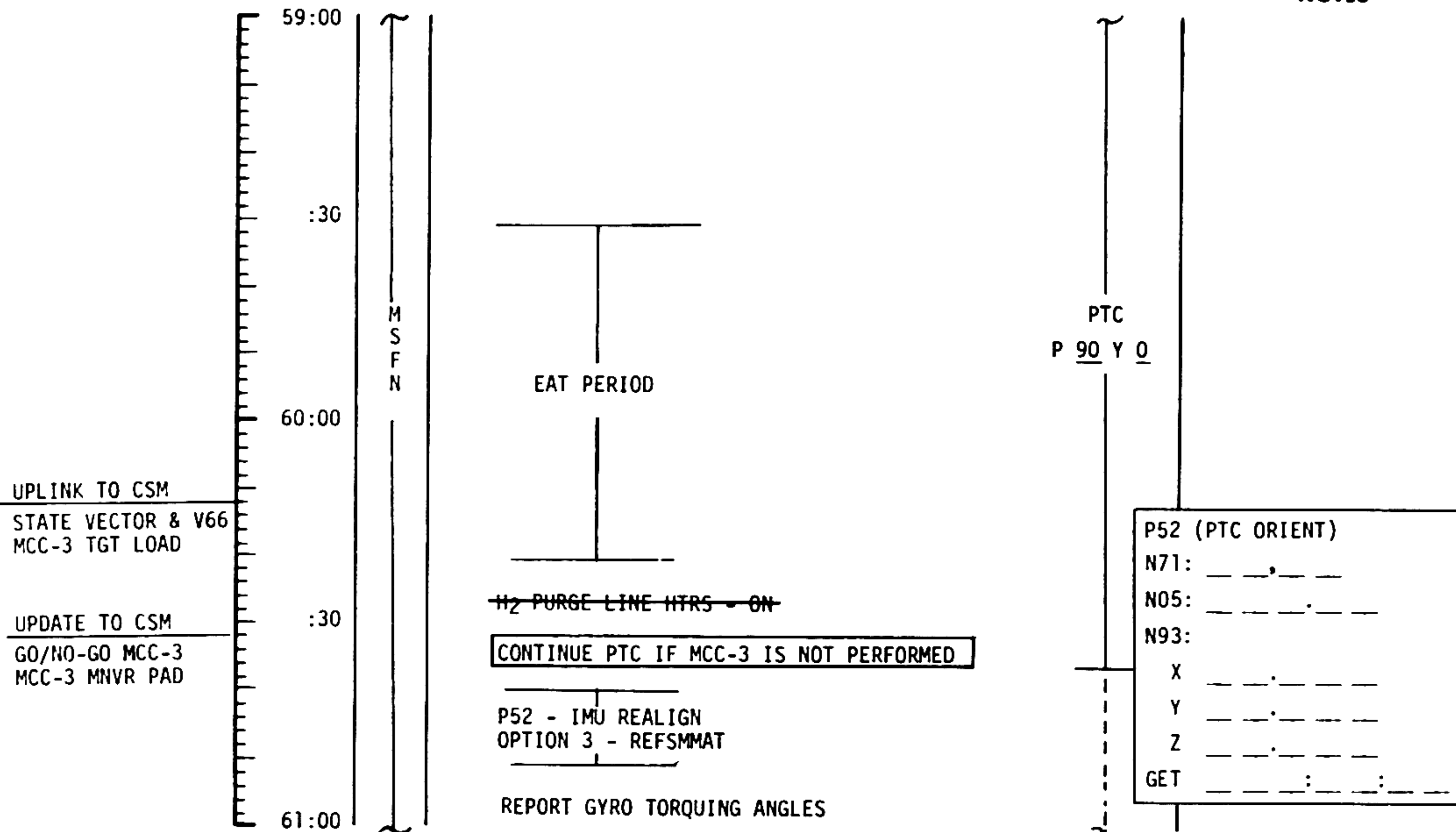
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	57:00 - 59:00	3/TLC	3-40

MCC-M

2122 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	59:00 - 61:00	3/TLC	3-41

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FLIGHT PLAN

MCC-3
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	IF <2FPS, TRIM X AXIS TO 0.2FPS IF >2FPS, NO TRIM

TABLE 3-4
3-42

2322 CST

MCC-H

FLIGHT PLAN

NOTES

61:00

P30 - EXTERNAL ΔV

V49 - MNVR TO BURN ATT

SXT STAR CHECK
 O2 FUEL CELL PURGE
 WASTE WATER DUMP
 P40/P41 - SPS/RCS THRUST

:15

M
S
F
N

GDC ALIGN TO IMU

MCC-3

TIG: 61:25:18.2
 ΔV : NOMINALLY
 ZERO

61:30

V66 - TRANSFER CSM SV TO LM SLOT
 MCC-3 BURN STATUS REPORT

MNVR TO PTC ATTITUDE

P 90
 Y 0

START PTC

:45

62:00

MCC-3 WILL BE
 DELAYED TO MCC-4
 IF PROPELLANT
 COST IS NOT
 PROHIBITIVE

BURN STATUS REPORT

X	X		•		Δ TIG
X	X		•		BT
			•		V _{gx}
TRIM					
X	X	X			R
X	X	X			P
X	X	X			Y
			•		V _{gx}
			•		V _{gy}
			•		V _{gz}
			•		ΔV_c *
X	X	X			FUEL *
X	X	X			OX *
X	X	X			UNBAL

* ITEMS TO BE
 REPORTED TO MSFN

(LOI₁ - 22 HRS)

UPDATE TO CSM
 QUADS TO DISABLE
 FOR PTC (LOWEST)
 QUANTITY PRPLNT)

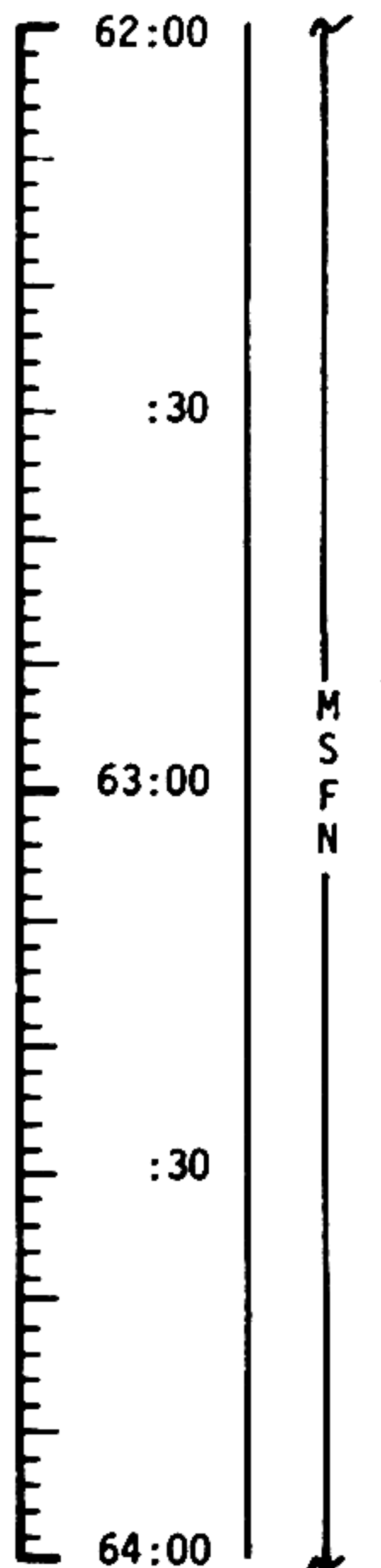
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	61:00 - 62:00	3/TLC	3-43

MCC-H

0022 CST

FLIGHT PLAN

NOTES



BATTERY CHARGE, BATTERY B

PRESSURIZE CSM TO 5.7 PSIA THEN:
PRESSURIZE LM

STOP PTC AT TV ATTITUDE

R _____
HGA: P _____ Y _____

TV(GDS) 63:30 to 64:20
CM4/TV - IN(f5.6)

PTC
P 90 Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	62:00 - 64:00	3/TLC	3-44

FLIGHT PLAN

CSM

0222 CST

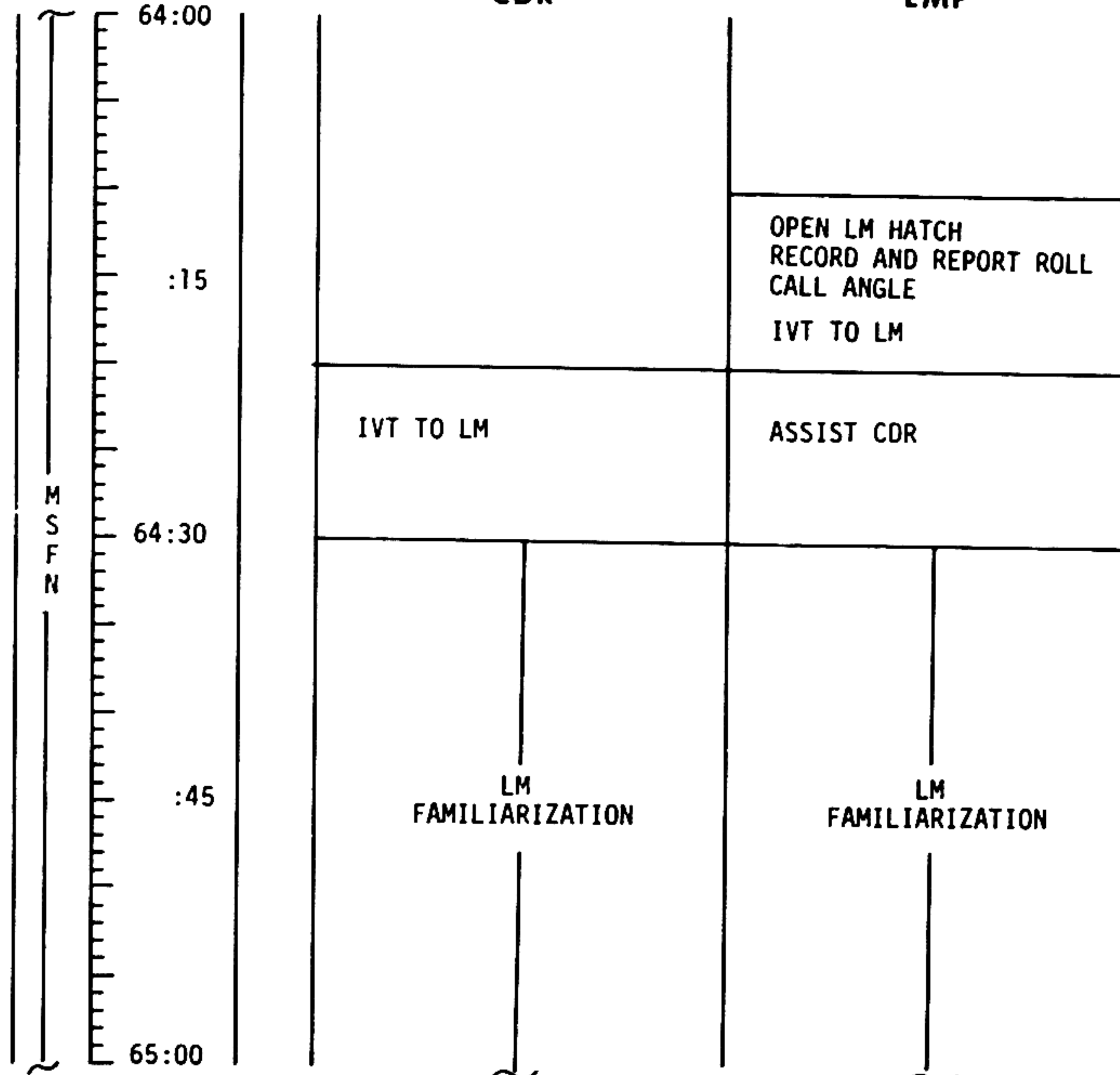
LM

MCC-H

CMP

CLEAR TUNNEL OF
CM HATCH
INSPECT TUNNEL &
DOCKING LATCHES
REMOVE PROBE & DROGUE

TEMPORARILY STOW
PROBE & DROGUE



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	64:00 - 65:00	3/TLC	3-45

FLIGHT PLANNING BRANCH

CMP

0322 CST

LM

MCC-H

START PTC

PTC
P 90 Y 0

MSFN

65:00

:15

65:30

:45

66:00

CDR

LM FAMILIARIZATION

LMP

LM
FAMILIARIZATION

IVT TO CSM

IVT TO CSM

CLOSE LM HATCH

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	65:00 - 66:00	3/TLC	3-46

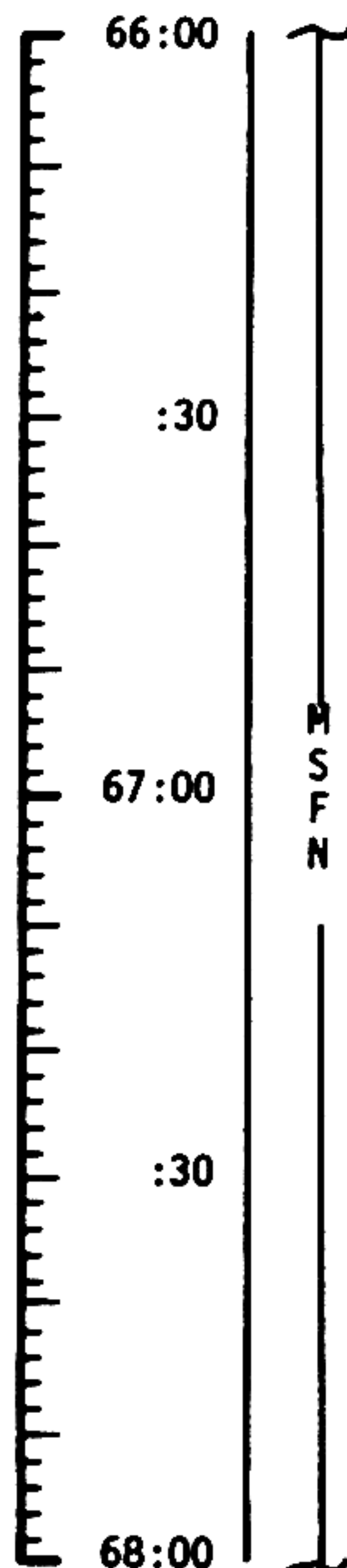
FLIGHT PLANNING BRANCH

MCC-M

0422 CST

FLIGHT PLAN

NOTES



CMP: INSTALL PROBE AND DROGUE
INSTALL CM HATCH
LM TUNNEL VENT VALVE - LM/CM ΔP

L10H CANISTER CHANGE
NO. 6 (8 INTO B, STOW
6 IN B6)

EAT PERIOD

PRESLEEP CHECKLIST:
CREW STATUS REPORT (MED)
ONBOARD READOUTS
CYCLE O2 & H2 FANS
CHLORINATE POTABLE WATER
VERIFY:
WASTE MNGT OVBD DRAIN - OFF
WASTE STOW VENT VLV - CLOSED
EMERG CABIN PRESS VLV - BOTH
SURGE TK O2 VLV - ON
REPRESS O2 VLV - OFF
LM TUNNEL VENT - LM/CM ΔP
"E" MEMORY DUMP
NORMAL LUNAR COMM EXCEPT:
S-BD NORMAL MODE VOICE - OFF
S-BD SQUELCH - ENABLE
S-BD AUX TAPE - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B
TAPE RCDR FWD - OFF

ONBOARD READOUT

BAT C _____
PYRO BAT A _____
PYRO BAT B _____
RCS A _____
B _____
C _____
D _____
DC IND SEL - MNA OR B

PTC
P 90 Y Q

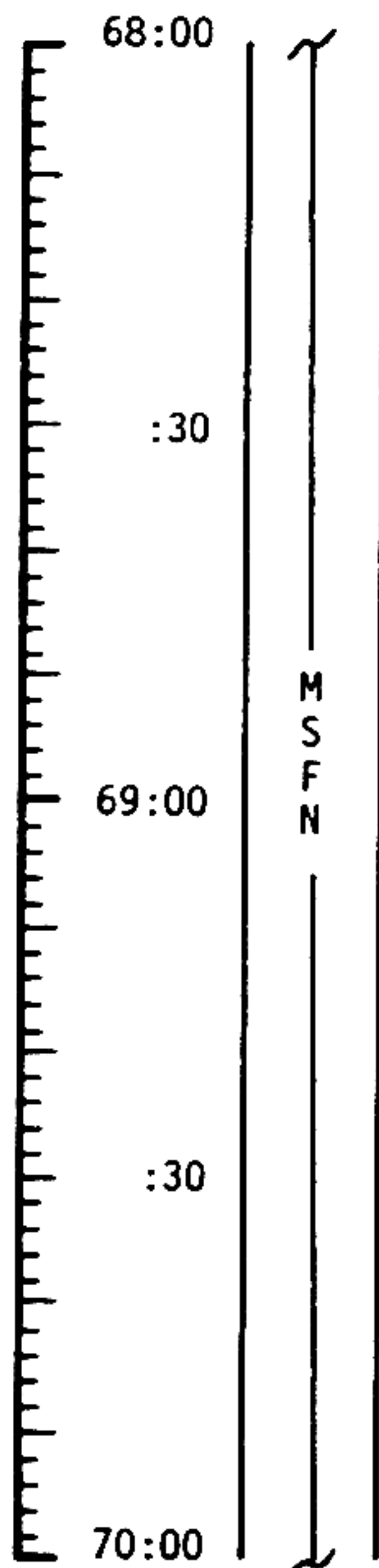
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	66:00 - 68:00	3/TLC	3-47

MCC-H

0622 CST

FLIGHT PLAN

NOTES



REST PERIOD
(8 HOURS)

PTC
P 90 Y 0

DURING REST PERIOD
TWO CREWMEN IN
COUCHES AND ONE
IN REST STATION

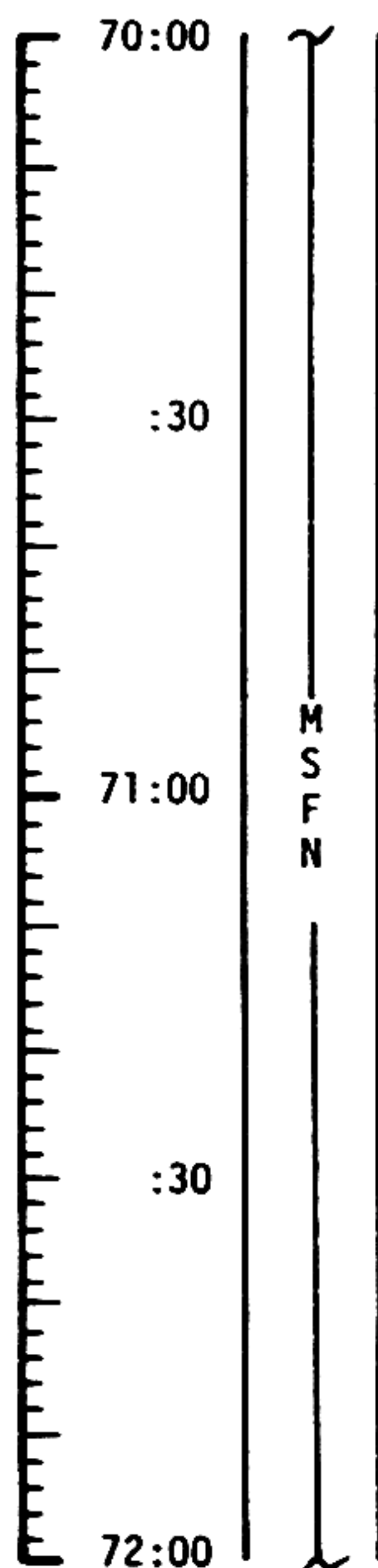
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	68:00 - 70:00	3/TLC	3-48

MCC-H

0822 CST

FLIGHT PLAN

NOTES



REST PERIOD
(8 HOURS)

PTC
P 90 Y 0

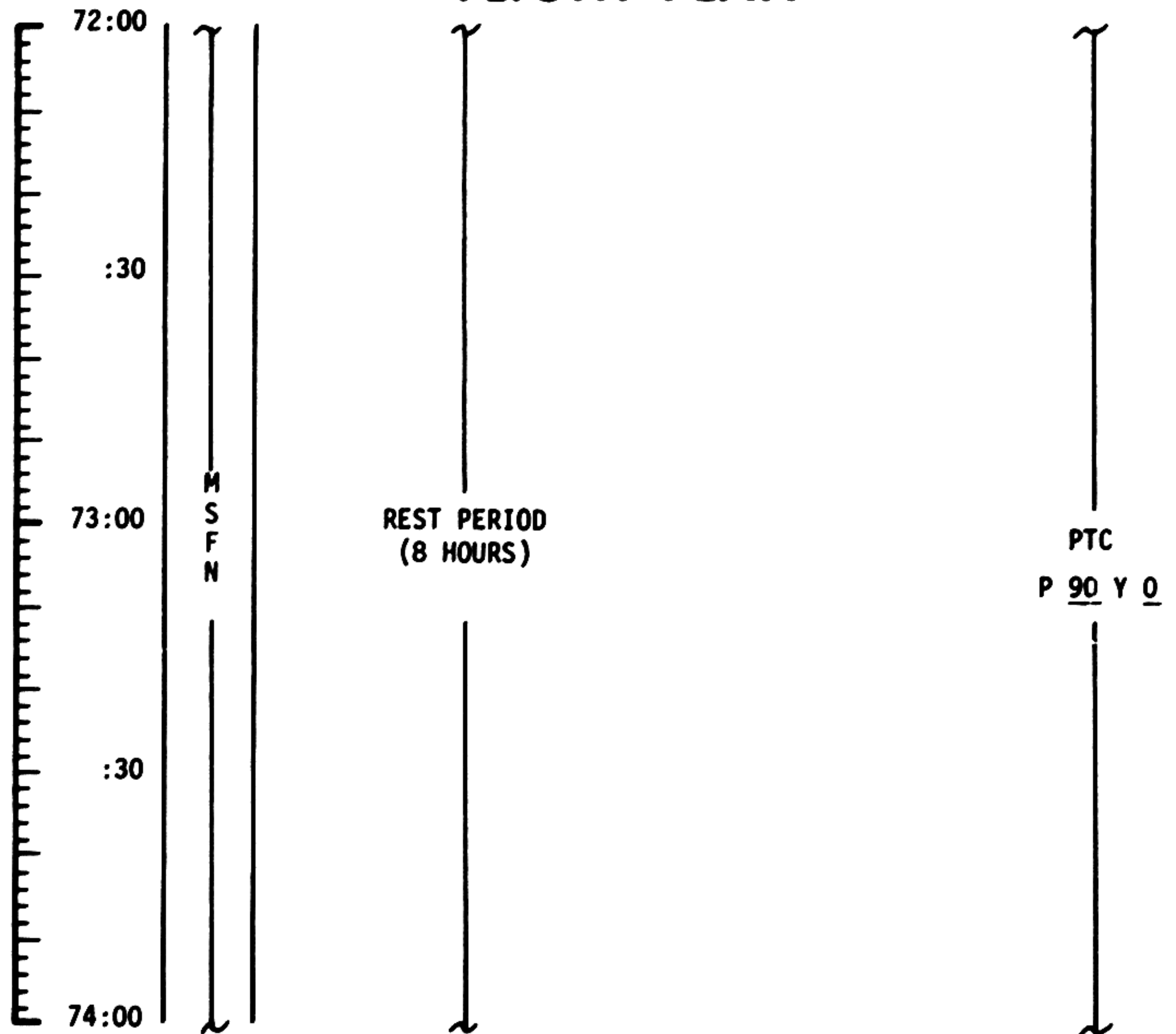
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	70:00 - 72:00	3/TLC	3-49

MCC-H

1022 CST

FLIGHT PLAN

NOTES



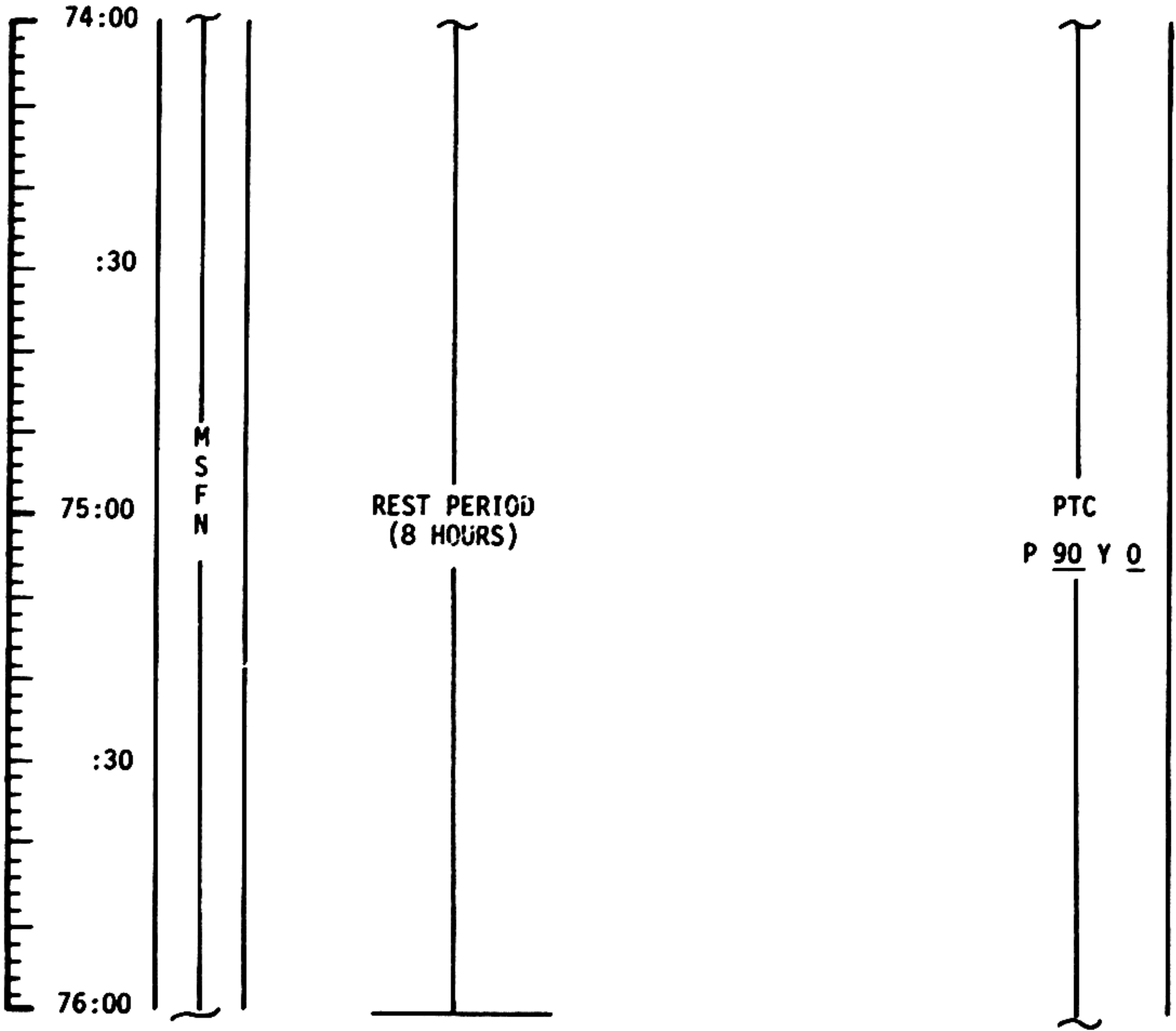
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	72:00 - 74:00	3/TLC	3-50

MCC-H

1222 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	74:00 - 76:00	3/TLC	3-51

MCC-H

1422 CST

FLIGHT PLAN

NOTES

IF MCC-4 IS NOT
PERFORMED SEE:
NO MCC-4 ALTERNATE
TIMELINE

POSTSLEEP CHECKLIST:
CREW STATUS REPORT
CONSUMABLES UPDATE
CYCLE H2 & O2 FANS
FLIGHT PLAN UPDATE
NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B

BATTERY CHARGE,
BATTERY A

EAT PERIOD

CSM CONSUMABLES UPDATE

GET: _____:_____

RCS TOTAL _____%

QUAD A _____% B _____%

C _____% D _____%

H₂ TOTAL _____%

O₂ TOTAL _____%

L10H CANISTER CHANGE
NO. 7 (9 INTO A, STOW
7 IN B6)

P52 IMU REALIGN
OPTION 1 - PREFERRED
REPORT GYRO TORQUING ANGLES

CREW STATUS REPORT

CDR CMP LMP

SLEEP _____

PRD _____

P30 - EXTERNAL ΔV

PTC
P 90 Y 0

PERICYNTHION + 2
ABORT PAD
TARGETED FOR A
FAST RETURN TO MPL

P52 (LDG SITE ORIENT)
OPTION 1 - PREFERRED

N71: _____

N05: _____

N93: _____

X _____

Y _____

Z _____

GET _____:_____

UPLINK TO CSM
STATE VECTOR &
MCC-4 TGT LOAD
DESIRED ORIENT
(LDG SITE)

V66

UPDATE TO CSM
MCC-4 MNVR PAD
CONSUMABLES
FLIGHT PLAN
PERICYNTHION +2
ABORT PAD

76:00

:30

77:00

:30

78:00

M
S
F
N

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	76:00 - 78:00	A/TLC	3-52

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

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FLIGHT PLAN

MCC-4
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	TRIM X AXIS ONLY TO 1.0 FPS

TABLE 3-5
3-53

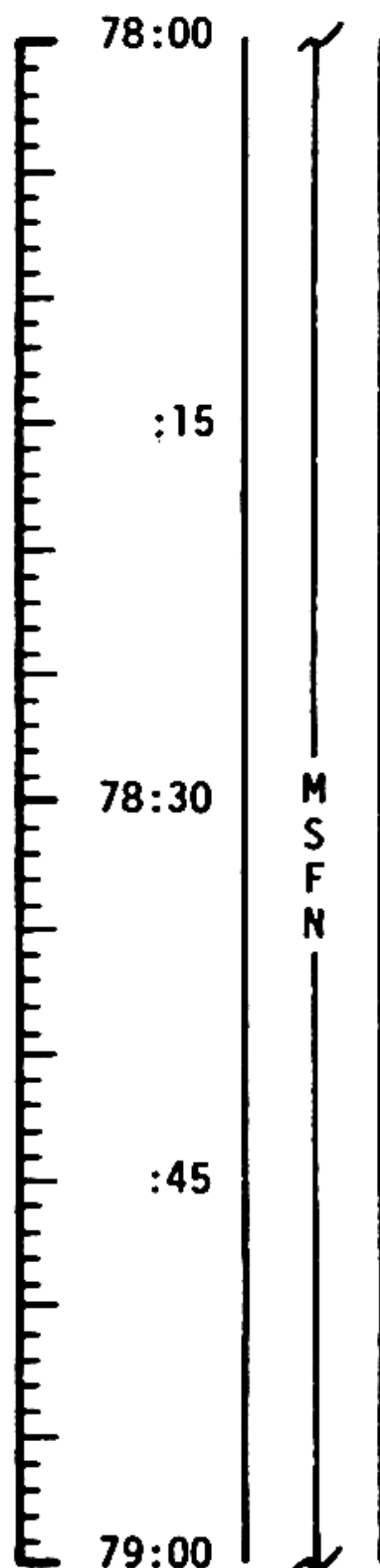
MCC-H

1622 CST

FLIGHT PLAN

NOTES

(LOI-1 - 5 HRS)



V49 - MNVR TO BURN ATT

SXT STAR CHECK

P40/P41 - SPS/RCS THRUST

GDC ALIGN TO IMU

MCC-4

V66 - TRANSFER CSM SV TO LM SLOT

MCC-4 BURN STATUS REPORT

REPORT LM/CM ΔP

TIG: 78:25:18.2
 ΔV : NOMINALLY
 ZERO

MCC-4 WILL BE
 EXECUTED WITH
 THE SPS IF THE
 BURN TIME >3 SEC

BURN STATUS REPORT									
X	X			•					ΔTIG
X	X			•					BT
								•	V_{gx}
TRIM									
X	X	X							R
X	X	X							P
X	X	X							Y
								•	V_{gx}
								•	V_{gy}
								•	V_{gz}
								•	ΔV_c *
X	X	X							FUEL *
X	X	X							OX *
X	X	X							UNBAL

* ITEMS TO BE
 REPORTED TO MSFN

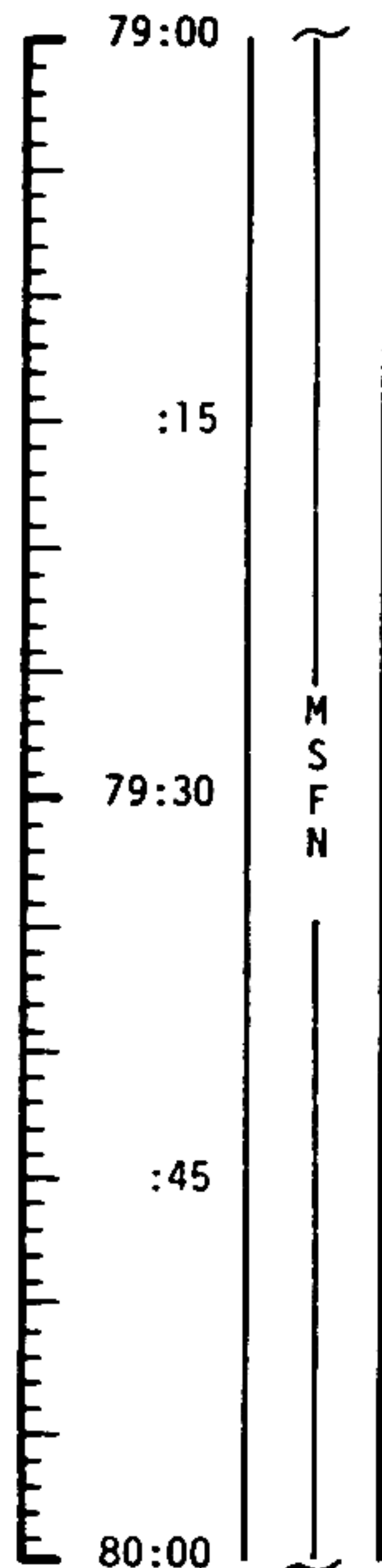
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	78:00 - 79:00	4/TLC	3-54

MCC-H

1722 CST

FLIGHT PLAN

NOTES



PRE LOI SEC LOOP CHECK
 ECS IND SW - SEC
 SEC GLY TO RAD VLV - NORM
 SEC COOL LOOP PUMP - AC 1
 GLY DISCHARGE SEC PRESS-39-51 PSIA
 ACCUM SEC QTY IND-30-55%
 SEC EVAP TEMP OUT - DECREASE
 (VERIFY FLOW)
 SEC COOL LOOP PUMP - OFF (CTR)
 SEC GLY TO RAD VLV - BYPASS
 ECS IND SW - PRIMARY

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	79:00 - 80:00	4/TLC	3-55

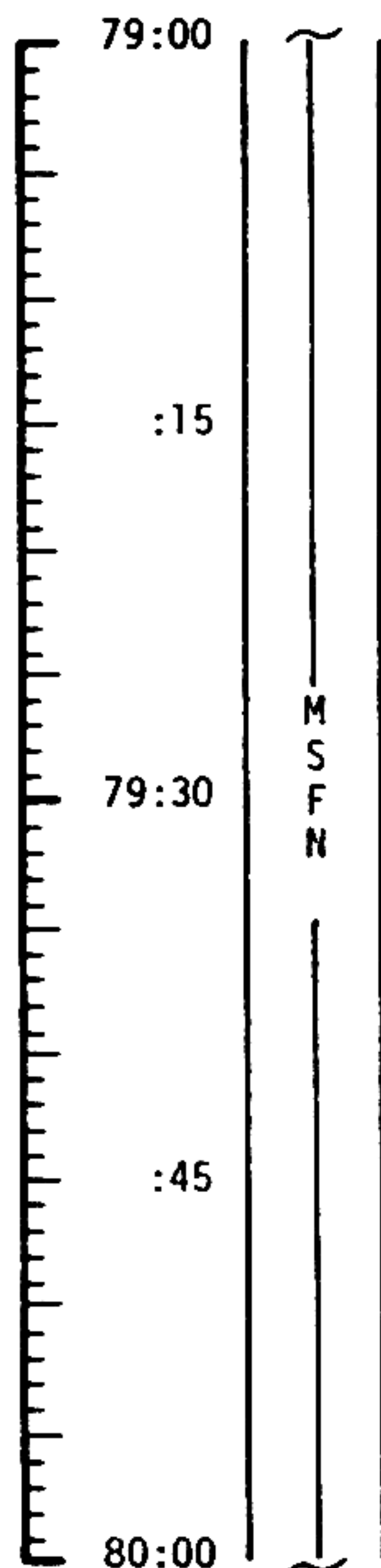
NSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

1722 CST

FLIGHT PLAN

NOTES



PRE LOI SEC LOOP CHECK
 ECS IND SW - SEC
 SEC GLY TO RAD VLV - NORM
 SEC COOL LOOP PUMP - AC 1
 GLY DISCHARGE SEC PRESS-39-51 PSIA
 ACCUM SEC QTY IND-30-55%
 SEC EVAP TEMP OUT - DECREASE
 (VERIFY FLOW)
 SEC COOL LOOP PUMP - OFF (CTR)
 SEC GLY TO RAD VLV - BYPASS
 ECS IND SW - PRIMARY

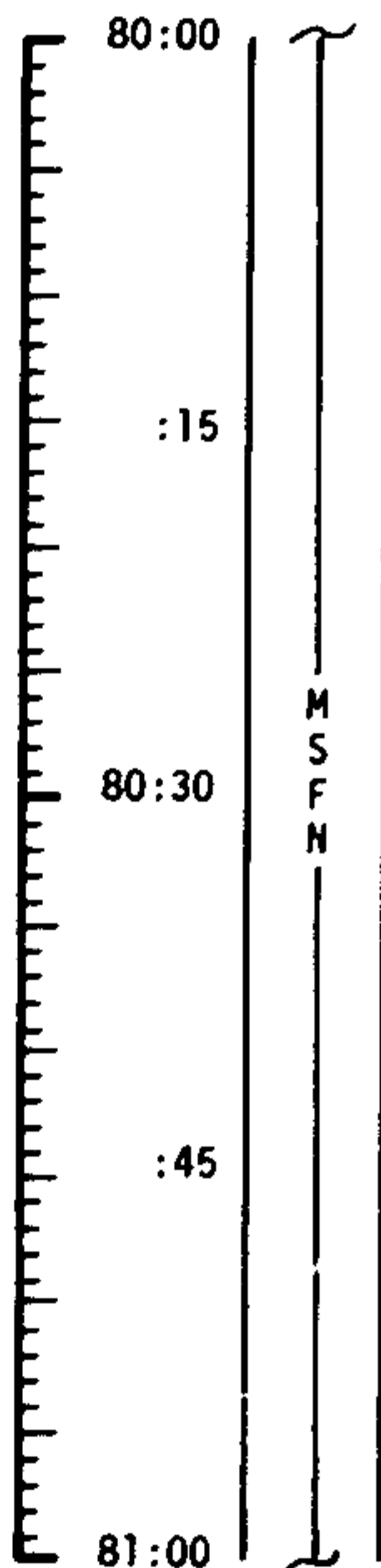
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	79:00 - 80:00	4/TLC	3-55

MCC-H

1822 CST

FLIGHT PLAN

NOTES



PRESSURIZE CSM TO 5.4 PSIA THEN:
PRESSURIZE LM
(IN CASE OF LOI ABORT)

LM TUNNEL VENT VLV - CM/LM ΔP

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	80:00 - 81:00	4/TLC	3-56

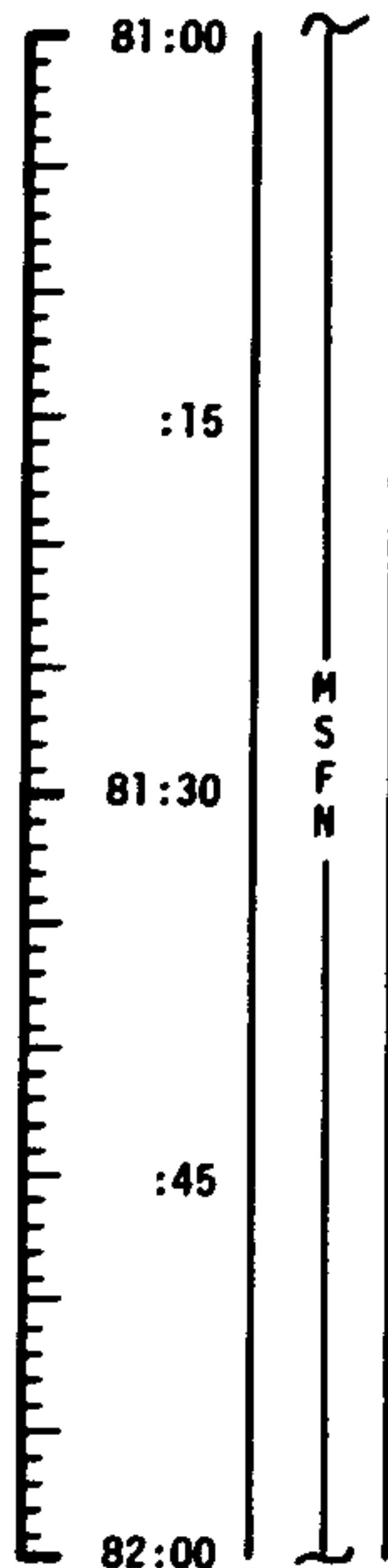
MCC-N

1922 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
STATE VECTOR & V66
(PRELIMINARY)
LOI-1 TGT LOAD
(PRELIMINARY)
UPDATE TO CSM
LOI-1 MNVR PAD
(PRELIMINARY)
TEI 1 & 4 PAD



MNVR TO MOON VIEW ATT BY 81:10
AND GO INERTIAL R 187 HGA
P 186 P 4
Y 20 Y 207

P52 - IMU REALIGN
OPTION 3 - REFSMMAT

REPORT GYRO TORQUING ANGLES

TV (GDS) 81:30 TO 81:50
CM4/TV-IN (f22)

MNVR TO BURN ATT BY 81:55
EXCEPT FOR ROLL R 124 HGA
P 261 P -18
Y 19 Y 251

P52 (LDG SITE ORIENT)

N71: — — — — —

N05: — — — — —

N93: — — — — —

X — — — — —

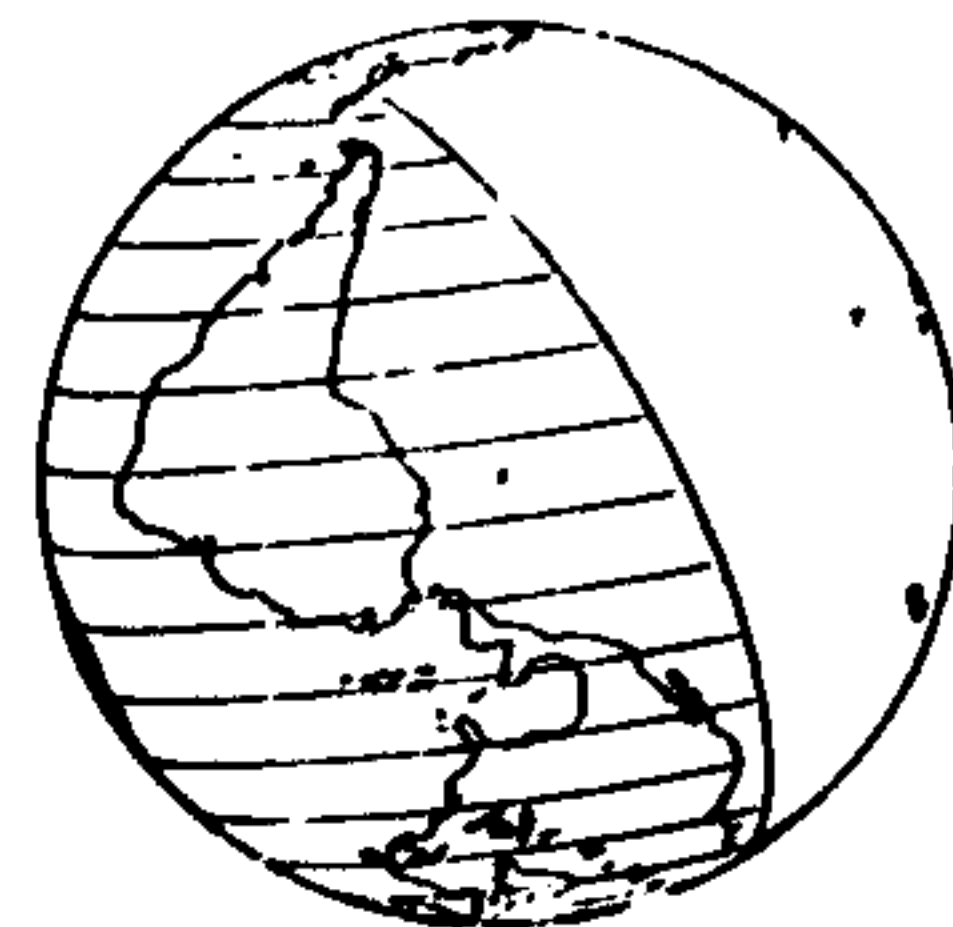
Y — — — — —

Z — — — — —

GET — — — — —

TEI 1 & 4 PADS
ASSUME NO LOI-2

FOV 3°
GET 81:10



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	81:00 - 82:00	4/TLC	3-57

MSC Form 29 (May 68)

FLIGHT PLANNING BRANCH

REVISION A

NO MCC-4 ALTERNATE TIMELINE

The guidelines used for developing a "No MCC-4" alternate timeline are as follows:

- The crew rest period is extended two more hours making a total of ten hours for rest.
- A P52 IMU Realign to REFSMMAT to the PTC orientation is performed just after wake up for a drift check.
- A second P52 IMU Realign is performed to the landing site orientation and is used for the LOI₁ burn.

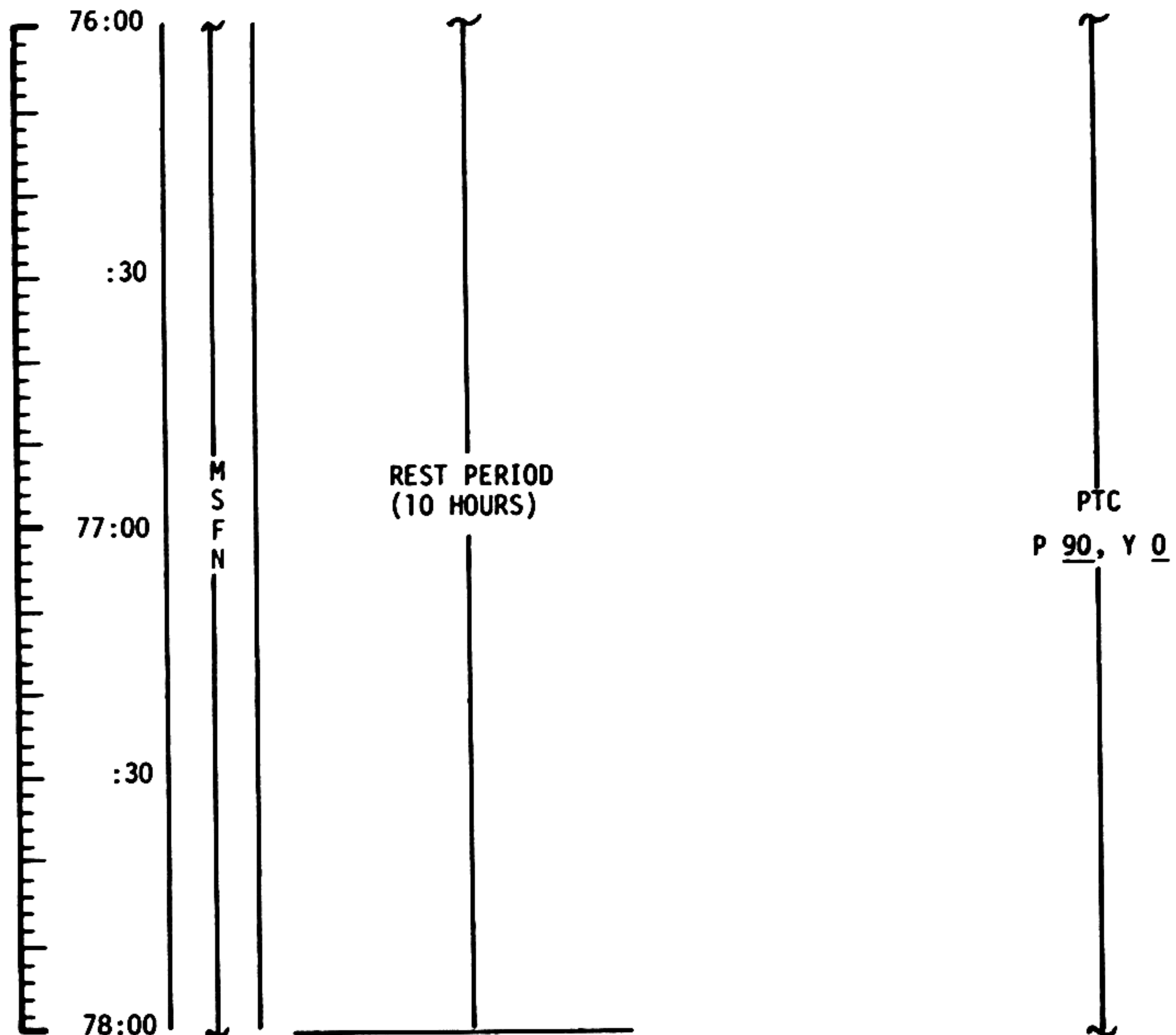
TLC WITHOUT
MCC 4

MCC-H

1422 CST

FLIGHT PLAN

NOTES



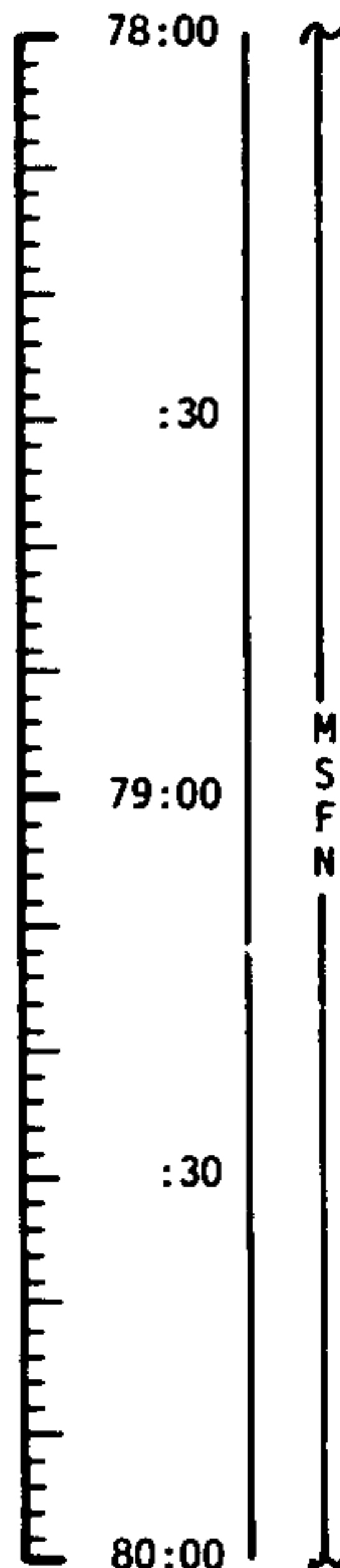
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	76:00 - 78:00	4/TLC	6-6

MCC-H

1622 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
STATE VECTOR & V66UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN
PERICYNTHION +2
ABORT PAD

STOP PTC

26/1/270

P52 IMU REALIGN
OPTION 3 REFSMMATREPORT GYRO TORQUING
ANGLESBATTERY CHARGE
BATTERY A

EAT PERIOD

POSTSLEEP CHECKLIST:
CREW STATUS REPORT
CONSUMABLES UPDATE
CYCLE H2 & O2 FANS
FLIGHT PLAN UPDATE
NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B

CSM CONSUMABLES UPDATE

GET: _____:

RCS TOTAL _____ %

QUAD A _____ % B _____ %

C _____ % D _____ %

H₂ TOTAL _____ %

O₂ TOTAL _____ %

CREW STATUS REPORT

	CDR	CMP	LMP
SLEEP	_____	_____	_____
PRD	_____	_____	_____

P52 (PTC ORIENT)
OPTION 3 - REFSMMAT

N71: _____

N05: _____

N93: _____

X _____

Y _____

Z _____

GET _____:_____:

PERICYNTHION +2 ABORT
PAD TARGETED FOR A
FAST RETURN TO MPL

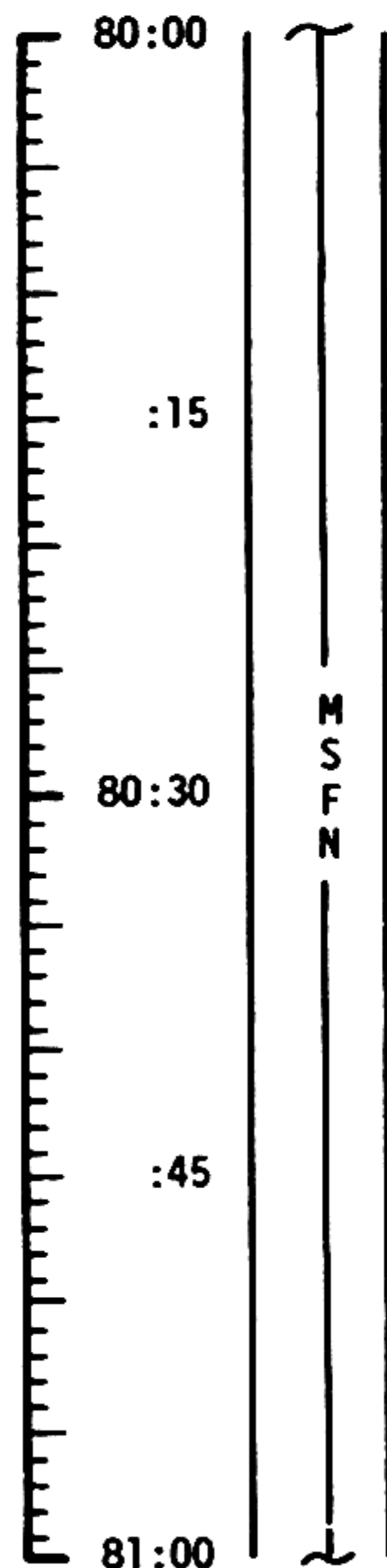
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	78:00 - 80:00	4/TLC	6-7

MCC-H

1822 CST

FLIGHT PLAN

NOTES



LiOH CANISTER CHANGE NO.7 (9 INTO A,
STOW 7 INTO B6)

PRESSURIZE CSM TO 5.4 PSIA THEN:
PRESSURIZE LM
(IN CASE OF LOI ABORT)

PRE LOI SEC LOOP CHECK
ECS IND SW - SEC
SEC GLY TO RAD VLV - NORM
SEC COOL LOOP PUMP - AC 1
GLY DISCHARGE SEC PRESS-39-51 PSIA
ACCUM SEC QTY IND-30-55%
SEC EVAP TEMP OUT - DECREASE
(VERIFY FLOW)
SEC COOL LOOP PUMP - OFF (CTR)
SEC GLY TO RAD VLV - BYPASS
ECS IND SW - PRIMARY

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	80:00 - 81:00	4/TLC	6-8

MCC-N

1922 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
STATE VECTOR & V66
(PRELIMINARY)
LOI₁ TGT LOAD
(PRELIMINARY)
DESIRED ORIENT
(LDG SITE)
UPDATE TO CSM
LOI₁ MNVR PAD
(PRELIMINARY)
TEI 1 & 4 PAD

81:00

:15

81:30

:45

82:00

M
S
F
N

MNVR TO MOON VIEW ATT BY 81:10
AND GO INERTIAL R 300 HGA

P 154 P 4Y 20 Y 207

P52 - IMU REALIGN
OPTION 1 - PREFERRED

REPORT GYRO TORQUING ANGLES

TV (GDS) 81:30 TO 81:50

MNVR TO BURN ATT BY 81:55
EXCEPT FOR ROLL R 124 HGA

P 261 P -18Y 19 Y 251

P52 (LDG SITE ORIENT)

N71: — — — —

N05: — — — —

N93:

X — — — —

Y — — — —

Z — — — —

GET — — — —

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	81:00 - 82:00	4/TLC	6-9

MCC-H

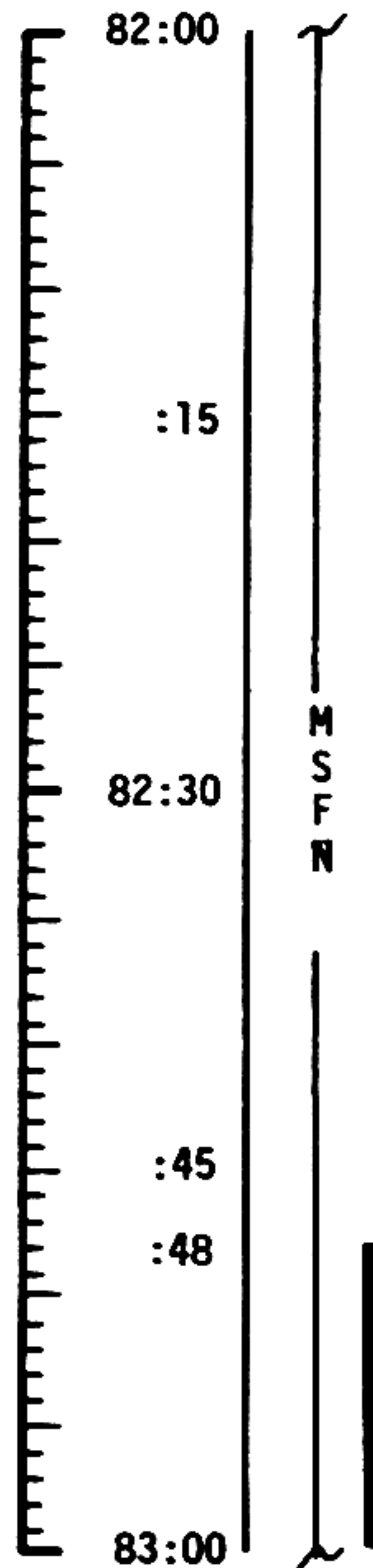
2022 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV 1
LOI-1 MNVR PAD

UPLINK TO CSM
STATE VECTOR & V66
LOI-1 TGT LOAD

MAP UPDATE REV 1

LOS

180°

AOS WITH LOI

AOS WITHOUT LOI

PRE LOI-1 SYSTEMS CHECKS:

C&W CHECK

CM RCS CHECK

SM RCS CHECK

SPS PERIODIC MONITOR

ECS PERIODIC MONITOR

P30 - EXTERNAL ΔV

P40 - SPS THRUST

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	82:00 - 83:00	4/TLC	3-58

FLIGHT PLAN

LOI-1
BURN TABLE
TABLE 3-6

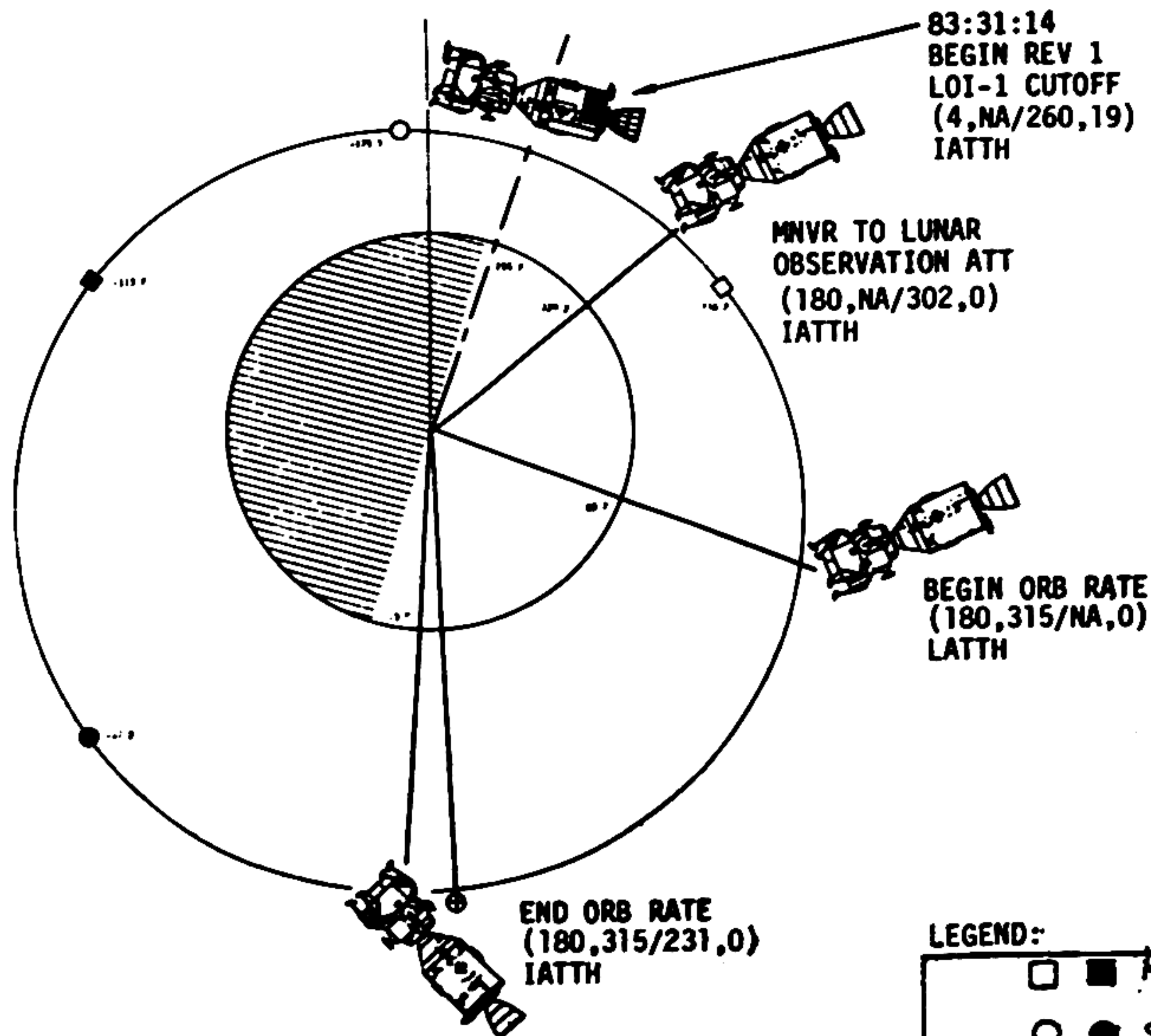
P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 10 SEC	DO NOT TRIM

LOI-1 ABORT TABLE
TABLE 3-7

MODE I (DPS ONLY)	MODE IA (DPS+APS)	MODE IIA (DPS APS)	MODE II (DPS ONLY)	MODE III (DPS ONLY)	
0-20 SEC. BT ΔV_m 0-135 (Tight) LOI + 2HR. MCC-H TGT.	20-40 SEC. BT ΔV_m 135- ²⁹⁰ 280 (Tight) LOI + 0.5HR. CREW CHART TGT	40SEC-1MIN 30 SEC ΔV_m ²⁹⁰ 280 -650 (Tight) DPS ? LOI+1/2HR. CREW CHART TGT *APS @ LOI+ 2 1/2 HR. MCC-H TGT *SPS BACKUP	1MIN 30SEC-2MIN 24SEC ΔV_m 650- ¹⁰⁶⁰ 750 (Loose) DPS ₁ @ LOI + 2HR DPS ₂ @ LOI + 1REV MCC-H TGT. APS ASAP AFTER DPS ₂ MCC-H TGT (CONT. OF DPS ₂)	2MIN 24SEC - 2MIN 50SEC ΔV_m ¹⁰⁶⁰⁻¹²⁷⁰ 750-1250 (Loose) DPS ₁ @ LOI + 2HR DPS ₂ @ LOI + 1REV MCC-H TGT.	2MIN 50SEC - END OF BURN ΔV_m ¹²⁷⁰ 1250 -1600 (Loose) ΔV_m 1600-Cutoff (Tight) DPS @ LOI + 1REV. MCC-H TGT

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REV 1



3-59A

LEGEND:

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

REVISION B

MCC-M

2122 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
GO/NO-GO LOI-1

83:00

M
S
F
NROLL TO BURN ATT R 4
P 261OMNI DSXT STAR CHECK Y 19
VERIFY DSE MOTION AT LOS

:15

:18

:25

83:30

REV 1

GDC ALIGN TO IMU

LOI-1

TIG: 83:25:18.2
 BT: 5 MIN 55.4 SEC
 ΔV_R : 2889.9 FPS
 ULLAGE: NONE
 ORBIT: 58.7 x 168.9 NM

V66 - TRANSFER CSM STATE VECTOR TO LM SLOT

MNVR TO COMM ATT AND
GO INERTIAL BY 83:40

R 180 HGA:
 P 302 P -68
 Y 0 Y 339

ACQUIRE MSFN

:44
:45M
S
F
N

LOI-1 BURN STATUS REPORT

LUNAR SURFACE OBSERVATION ATTITUDE
 (HATCH WINDOW) - HEADS DOWN
 GO ORB RATE BY 84:00

:58

84:00



BURN STATUS REPORT

X	X		•	Δ TIG **
X	X		•	BT **
			•	V _{gx}
TRIM				
X	X	X		R
X	X	X		P
X	X	X		Y
			•	V _{gx} ***
			•	V _{gy} ***
			•	V _{gz} ***
			•	ΔV_C *
X	X	X		FUEL *
X	X	X		OX *
X	X	X		UNBAL

* ITEMS TO BE
 REPORTED TO MSFN
 ** REPORT IF OFF
 MORE THAN ONE SECOND
 *** REPORT IF >0.2 FPS
 LOI-1 WILL BE
 STARTED WITH THE
 SPS PU VALVE IN
 INCREASE

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	83:00 - 84:00	4/1	3-60

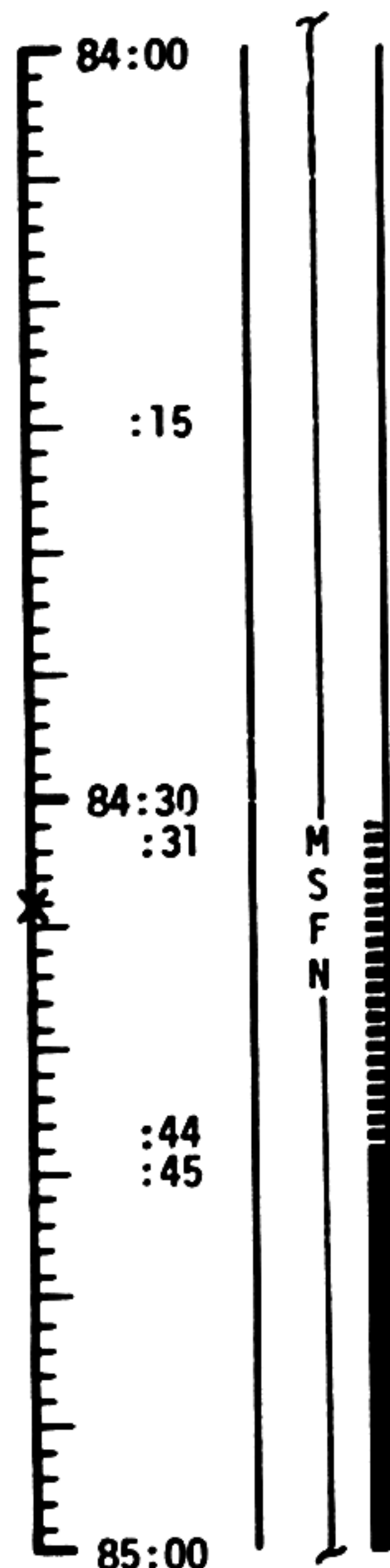
MCC-H

2222 CST

FLIGHT PLAN

NOTES

TV (GDS) 84:00 TO 84:30
CM 4/TV - IN(f22)



STOP ORB RATE PITCH AT 231 AND GO INERTIAL
BY 84:27

R 180 HGA
P 231 P -38
Y 0 Y 189

EAT PERIOD

MAP UPDATE REV <u>2</u>		
LOS	:	_____
180°	:	_____
AOS	:	_____

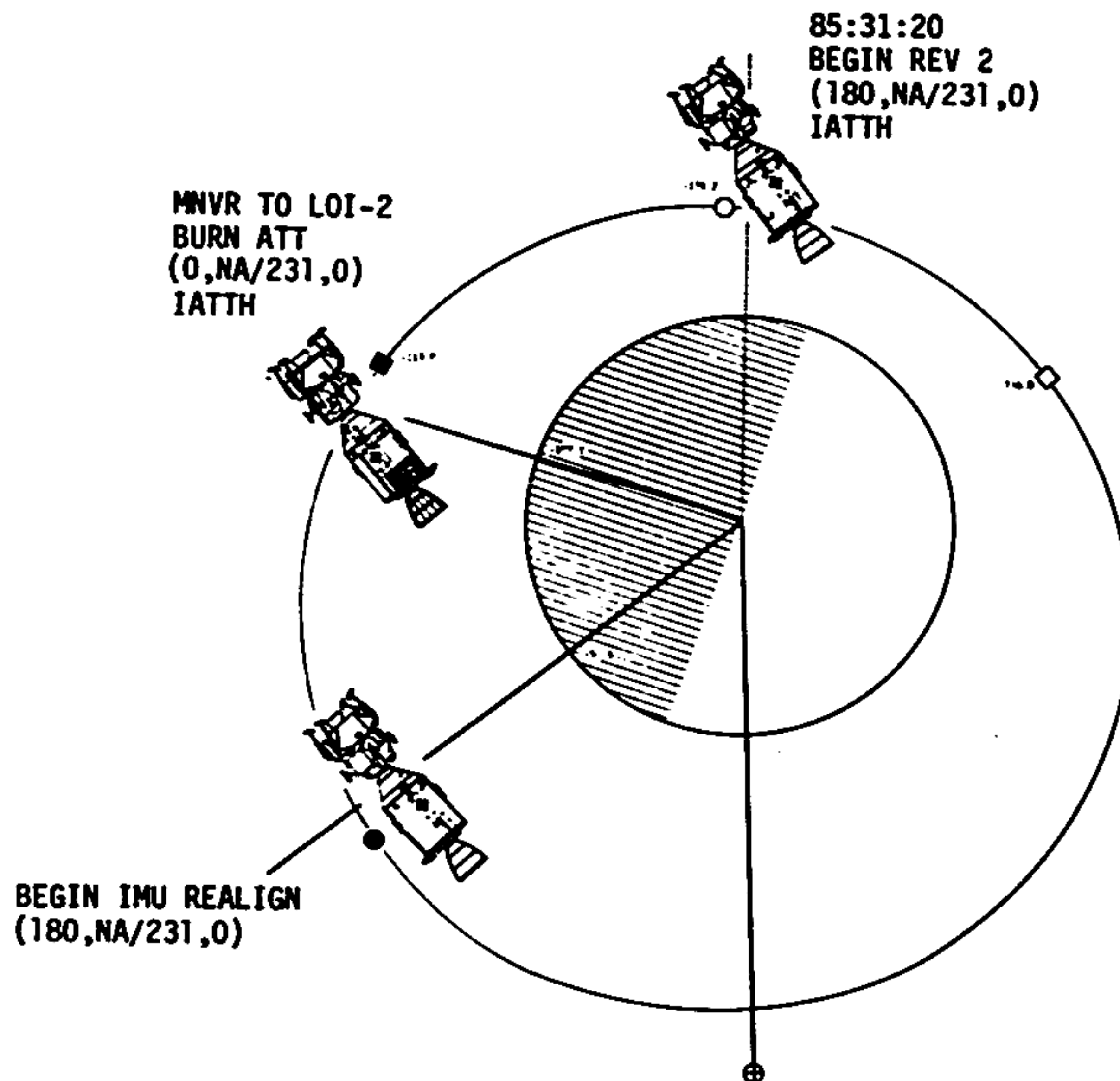
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
Apollo 12	FINAL (NOV 14)	OCTOBER 15, 1969	84:00 - 85:00	4/1	3-61

MSC Form 29 OT (Mar. 69)

FLIGHT PLANNING BRANCH

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REV 2



LEGEND:

- ■ MSFN ACS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-61A

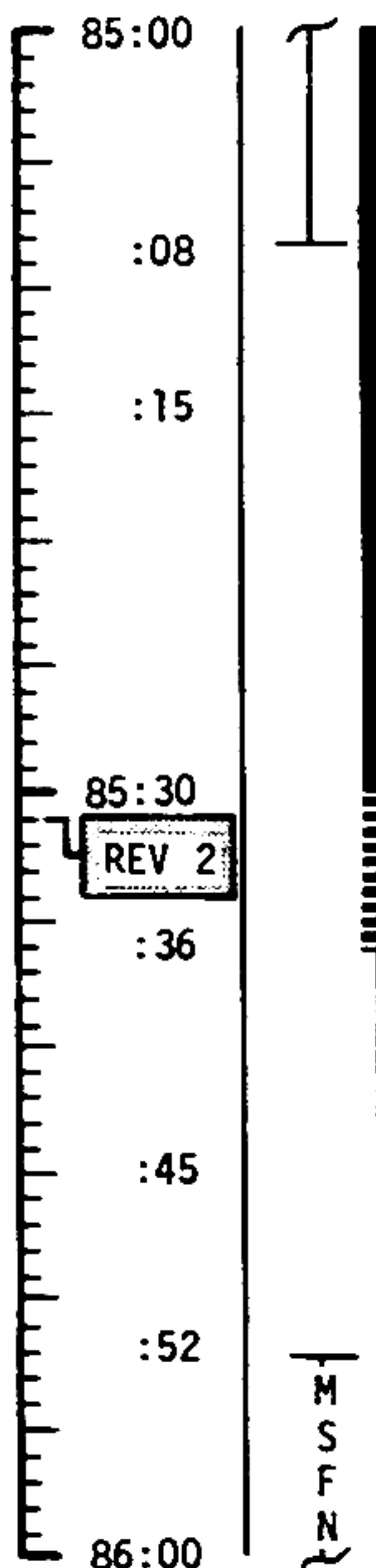
REVISION B

MCC-H

FLIGHT PLAN

NOTES

2322 CST



H₂ PURGE LINE HTRS - ON

VERIFY DSE MOTION AT LOS
EAT PERIOD

H₂ AND O₂ FUEL CELL PURGE
WASTE WATER DUMP

REACQUIRE MSFN
HGA P -38 Y 189

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	85:00 - 86:00	4/1	3-62

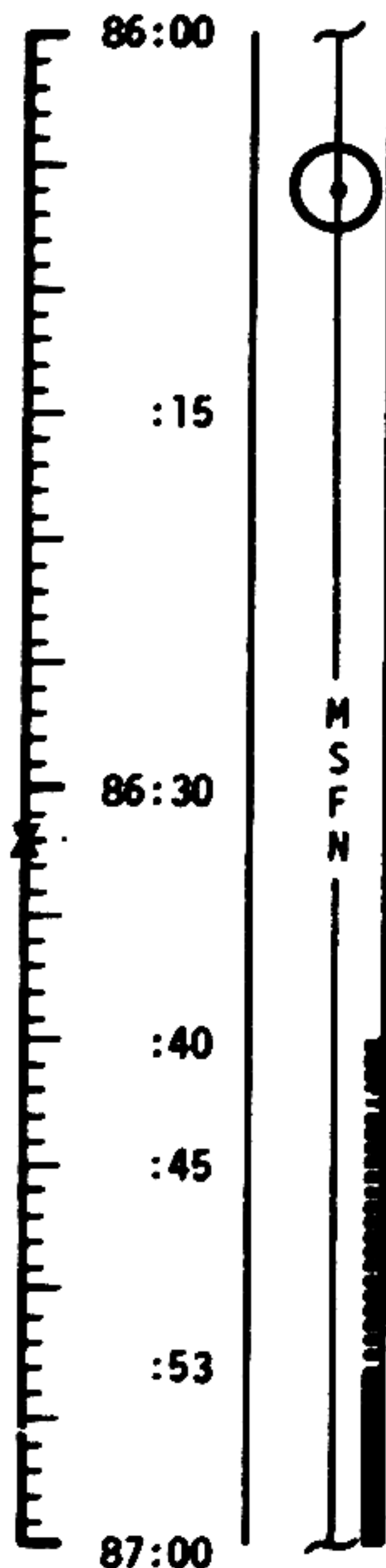
MCC-H

0022 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
CSM STATE VECTOR
& V66
LOI-2 TARGET LOAD
UPDATE TO CSM
LOI-2 MNR PAD
TEI 5 PAD
MAP UPDATE REV 3



CMP - PRE LOI -2 SYSTEMS CHECKS
C&W CHECK
CM RCS CHECK
SPS PERIODIC MONITOR CHECK
ECS PERIODIC MONITOR CHECK

P52 IMU REALIGN
OPTION 3 REFSMAT

TEI 5 BLOCK DATA
ASSUMES LOI-1 & LOI-2
ACCOMPLISHED

MAP UPDATE REV 3
LOS : _____ : _____ : _____
180° : _____ : _____ : _____
AOS : _____ : _____ : _____

P52 (LDG SITE ORIENT)

N71: _____
N05: _____
N93: _____
X _____
Y _____
Z _____
GET _____ : _____ : _____

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	86:00 - 87:00	4/2	3-63

NSC Form 28 (May 68)

FLIGHT PLANNING BRANCH

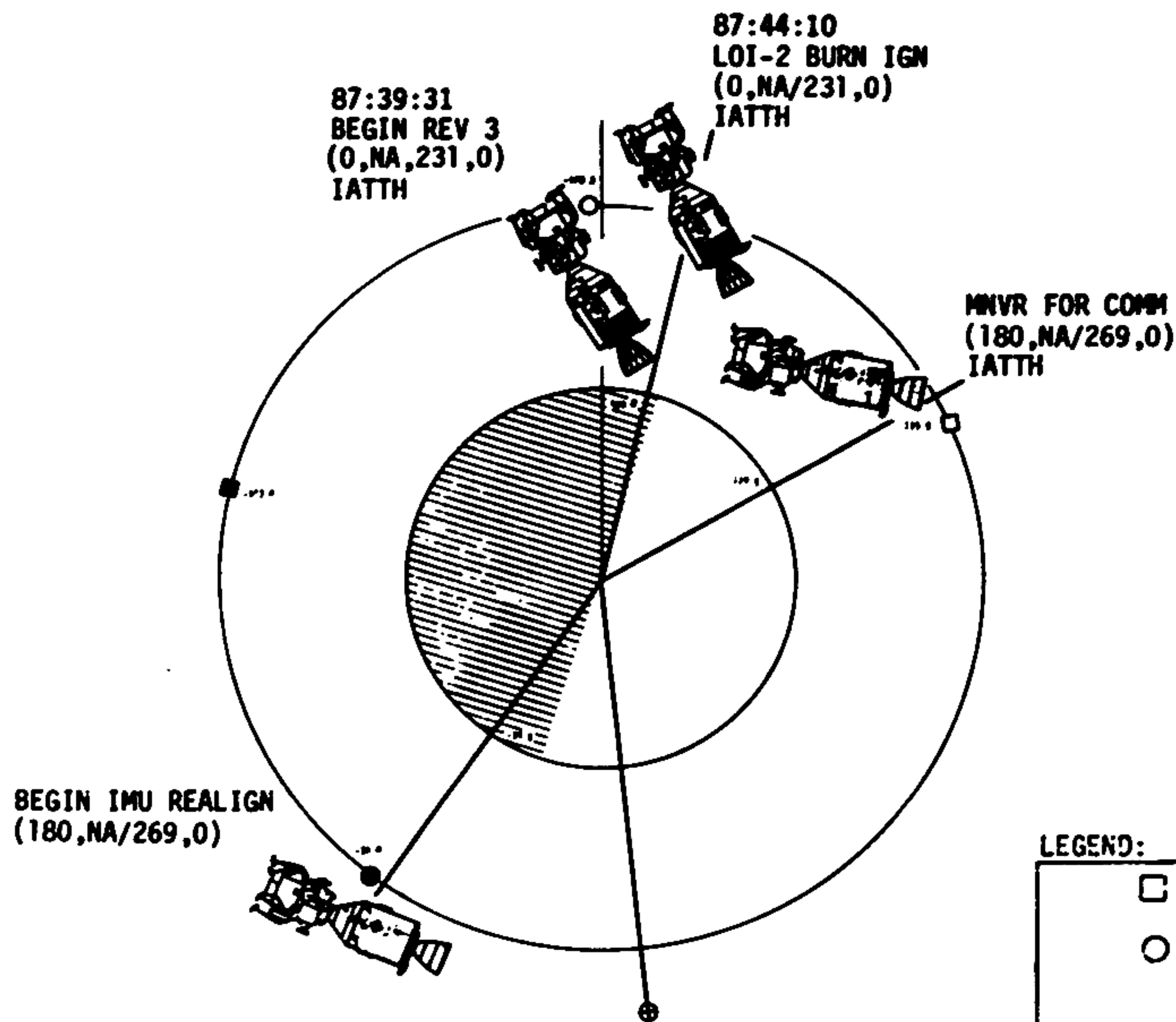
REVISION A

FLIGHT PLAN

LOI-2
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	TRIM X AXIS TO 1 FPS

TABLE 3-8
3-64



LEGEND:

- ■ MSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-64A

REVISION B

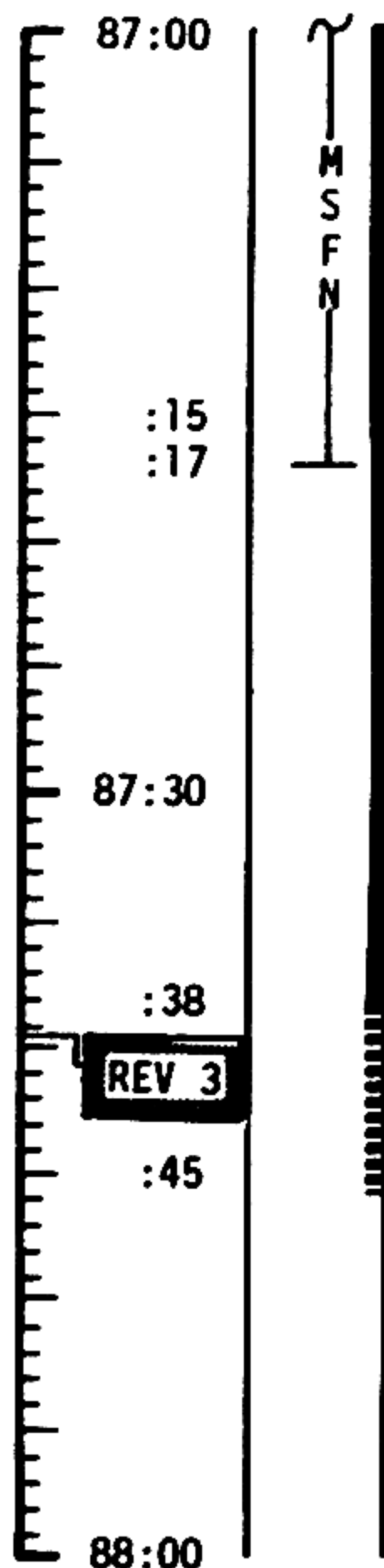
MCC-M

0122 CST

FLIGHT PLAN

NOTES

PIPA BIAS CHECK

GO/NO GO FOR
LOI-2

DRIFT CHECK

REPORT GYRO TORQUING ANGLES

P30 EXTERNAL ΔV

LOAD DAP FOR 2 JET ULLAGE (20101) (11111)

V49 MNVR TO LOI-2 BURN ATT BY 87:15

SXT STAR CHECK

R 0

OMNI 0

P40 - SPS THRUST

P 231

VERIFY DSE MOTION AT LOS

V 0

TIG: 87:44:10.0

BT: 17.6 SEC

 ΔVR : 169.6 FPS

ULLAGE: 2 JET 19.0 SEC

RETROGRADE

ORBIT: 64.9X53.0

TRIM X AXIS TO 1 FPS

GDC ALIGN TO IMU

LOI-2

V66 TRANSFER CSM STATE VECTOR TO LM SLOT

P52 (LDG SITE ORIENT)

N71: _ _ _ , _ _ _

N05: _ _ _ . _ _ _

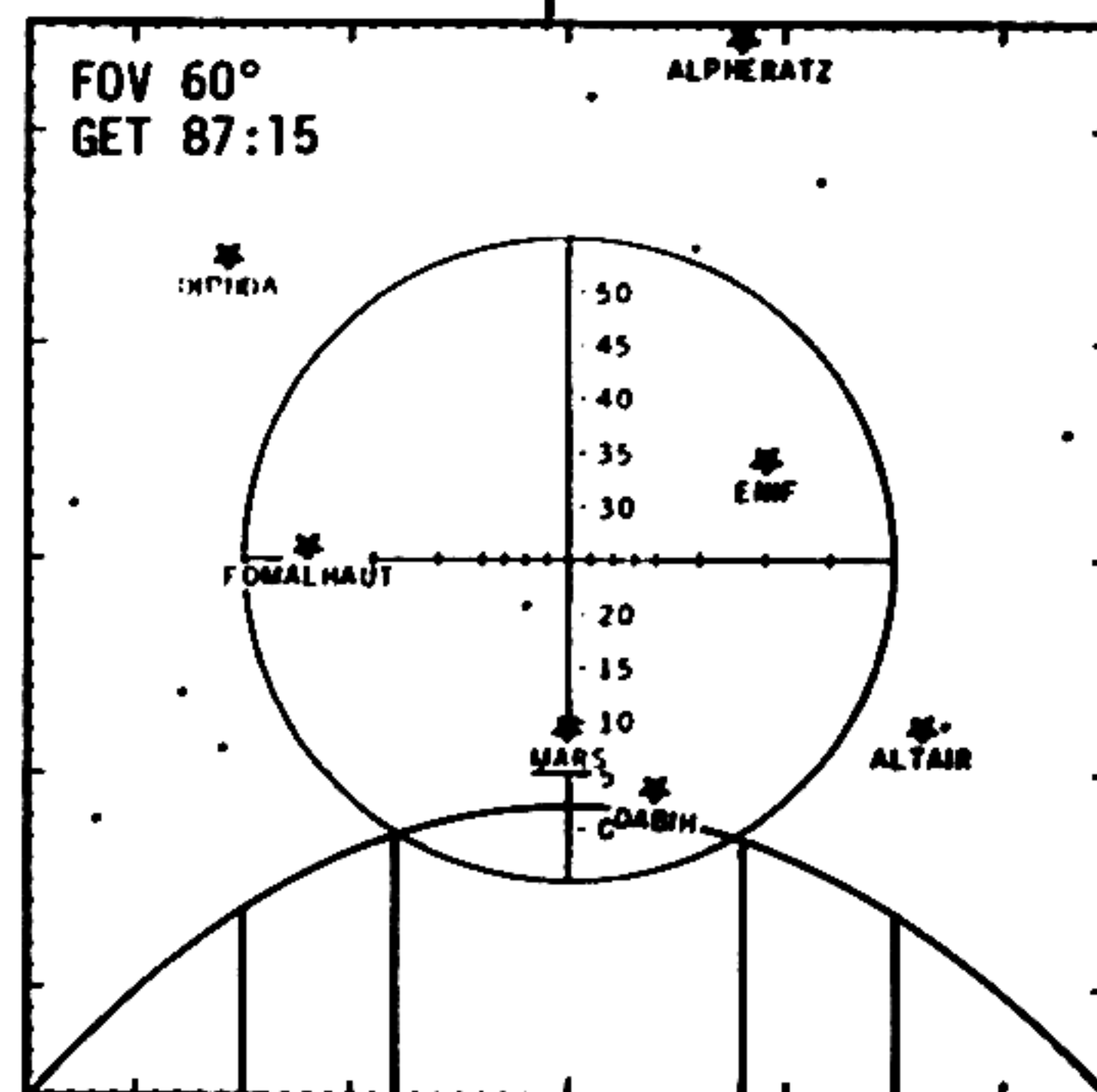
N93:

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

Z _ _ _ . _ _ _

GET _ _ _ : _ _ _ : _ _ _



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	87:00 - 88:00	4/2-3	3-65

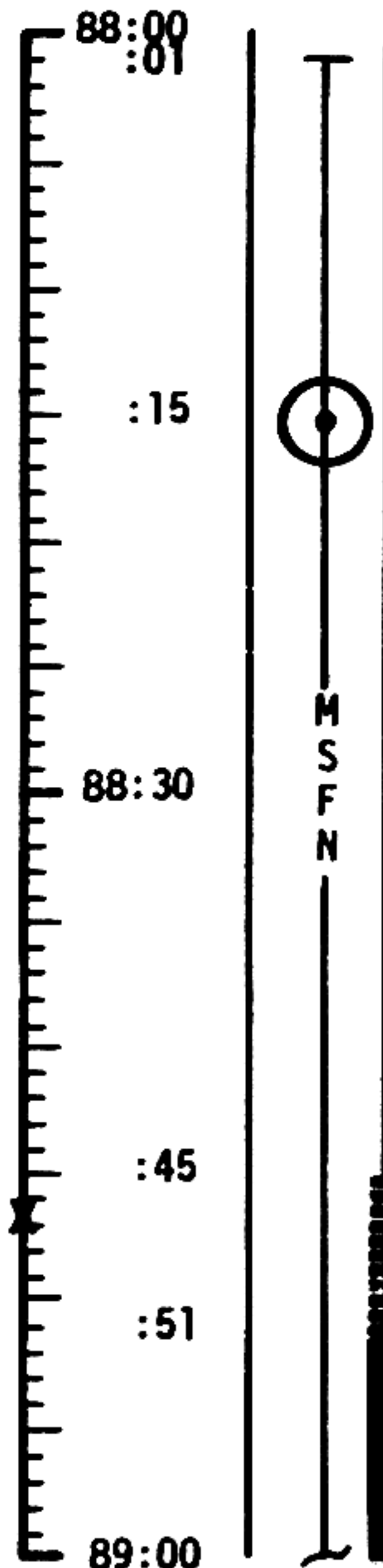
MCC-H

0222 CST

FLIGHT PLAN

NOTES

DUMP DSE

UPDATE TO CSM
LDMK TRACK PAD
MAP UPDATE REV 4

MNVR TO COMM ATTITUDE AND
GO INERTIAL R 180 HGA
BY 88:00 P 269 P -71
Y 0 Y 206

BATTERY CHARGE, BATTERY B

LOI -2 BURN STATUS REPORT

EQUALIZE CM/LM PRESSURE
TUNNEL VENT VALVE - LM PRESS

LiOH CANISTER CHANGE NO. 8
10 INTO B, STOW 8 IN B6

P52 IMU REALIGN
OPTION 3 REFSMMAT

P52 (LDG SITE ORIENT)

N71: _____
N05: _____
N93: _____
X _____
Y _____
Z _____
GET _____:_____:_____

BURN STATUS REPORT

X	X		•	ΔTIG**
X	X		•	BT**
			•	V _{gx}
TRIM				
X	X	X		R
X	X	X		P
X	X	X		Y
			•	V _{gx} ***
			•	V _{gy} ***
			•	V _{gz} ***
			•	ΔV _c *
X	X	X		FUEL*
X	X	X		OX*
X	X	X		UNBAL

MAP UPDATE REV 4

LOS : _____:_____:_____

180° : _____:_____:_____

AOS : _____:_____:_____

*ITEMS TO BE REPORTED
TO MSFN

**REPORT IF OFF MORE
THAN 1 SEC

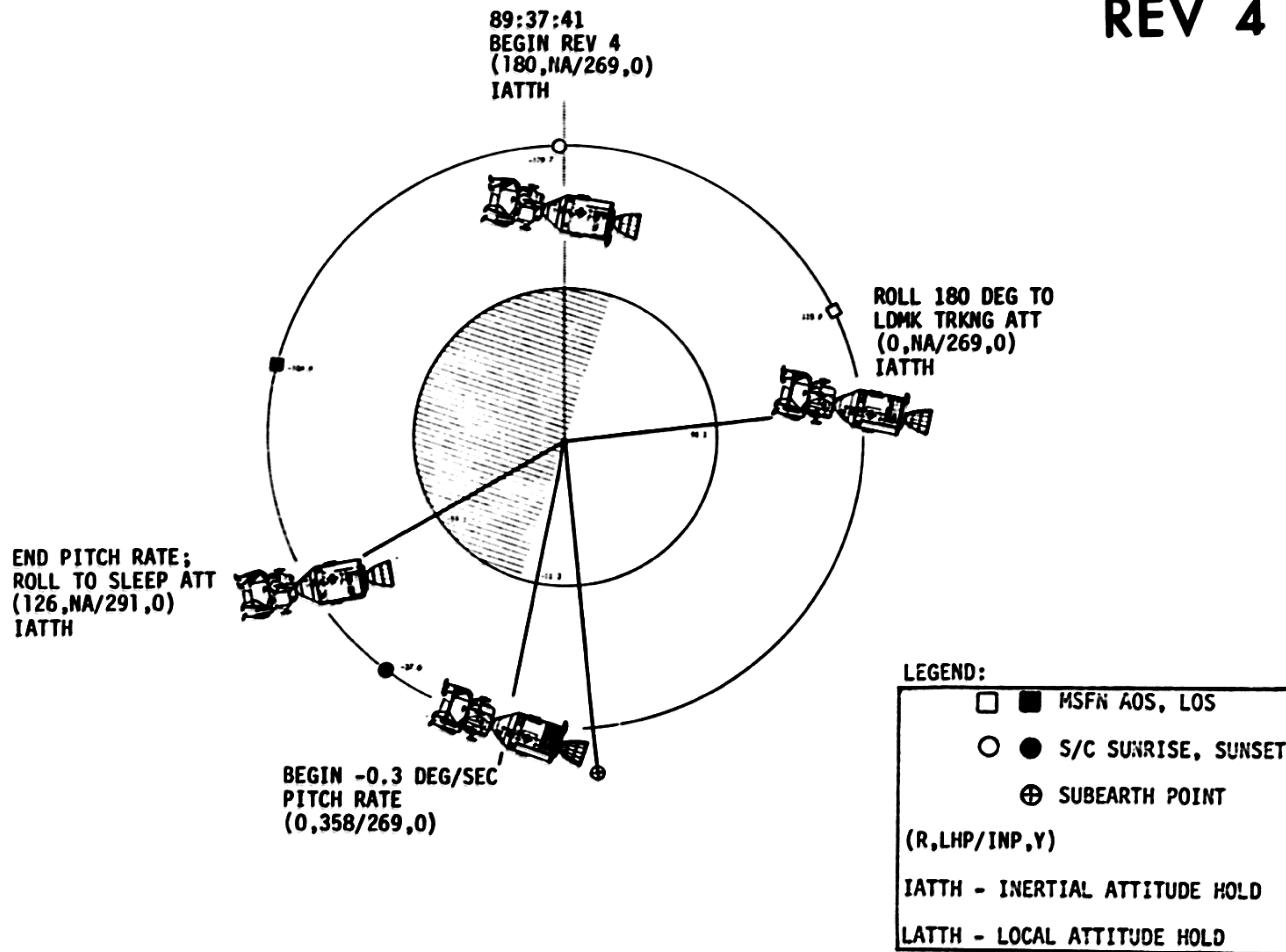
***REPORT IF >0.2 FPS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	88:00 - 89:00	4/3	3-66

MSC Form 28 (May 68)

FLIGHT PLANNING BRANCH

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3-66A

REVISION B

FLIGHT PLAN

CSM

LM

M. C-H

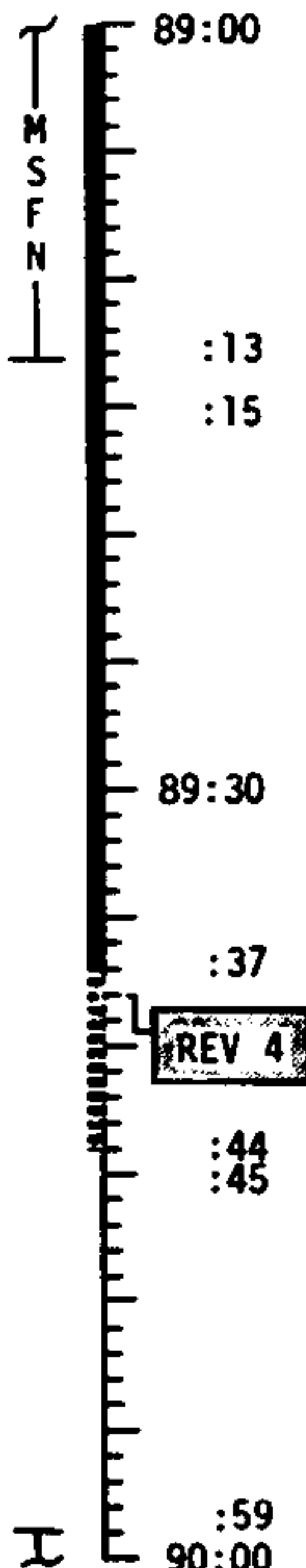
CMP

CDR

LMP

0322 CST

REPORT GYRO TORQUING ANGLES
GDC ALIGN TO IMU
PREPARE FOR LM INGRESS
VERIFY TUNNEL PRESS
REMOVE HATCH & STOW
INSPECT DOCKING LATCHES
REMOVE & STOW PROBE AND
DROGUE
VERIFY DOCKING ANGLE
VERIFY DSE MOTION AT LOS



		OPEN LM HATCH IVT TO LM	
IVT TO LM		LM ENTRY STATUS CHECKS	
		PERFORM HOUSEKEEPING CHORES 1. STOW HELMET STOWAGE BAGS. UNSNAP BOTH HSB'S 2. UNSTOW 70MM & 16MM FILM BAGS 3. PUT UP SNAP STRAPS	
AID LMP AS REQUIRED			

REACQUIRE MSFN
HGA P -71 Y 206

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	89:00 - 90:00	4/3-4	3-67

FLIGHT PLANNING BRANCH

REVISION B

2 DEG PITCH DOWN FROM
LOCAL HORIZONTAL BEGIN
0.3 DEG/SEC PITCH DOWN
AT AOS.

DOCKED LANDMARK TRACKING PROFILE

T1 GET AT 0° ELEVATION
T2 GET AT 35° ELEVATION

HORIZON

HORIZON

LANDMARK

RADIUS OF MOON

CENTER OF MOON

$\Delta T_1 = 300 \text{ SEC}$
 $\Delta T_2 = 40 \text{ SEC}$
 $\Delta T_3 = 25 \text{ SEC}$
 $\Delta T_4 = 25 \text{ SEC}$
AOS to LOS = 3 MIN

P22	AUTO	ACQ	P dn 2°	RO°	YO°
T ₁	---	•	---	---	H-I
T ₂	---	•	---	---	
R	---	°P	---	°Y	---
N or S	NM	---	SA	---	TA
CP	---	---	N89	---	---
LAT	-1.517°	---	---	---	---
LONG/2	-7.625°	---	---	---	---
ALT	-1.94 N MI	---	---	---	---

FIGURE 3-1
3-68

FLIGHT PLAN

CSM

CMP

ROLL 180 DEG TO
LDMK TRACK
ATTITUDE BY 90:06

R 0
P 269
Y 0

GO INERTIAL
SELECT OMNI D

P22 ORBITAL NAV
ESTABLISH 0.3°/SEC
PITCH DOWN @ T2

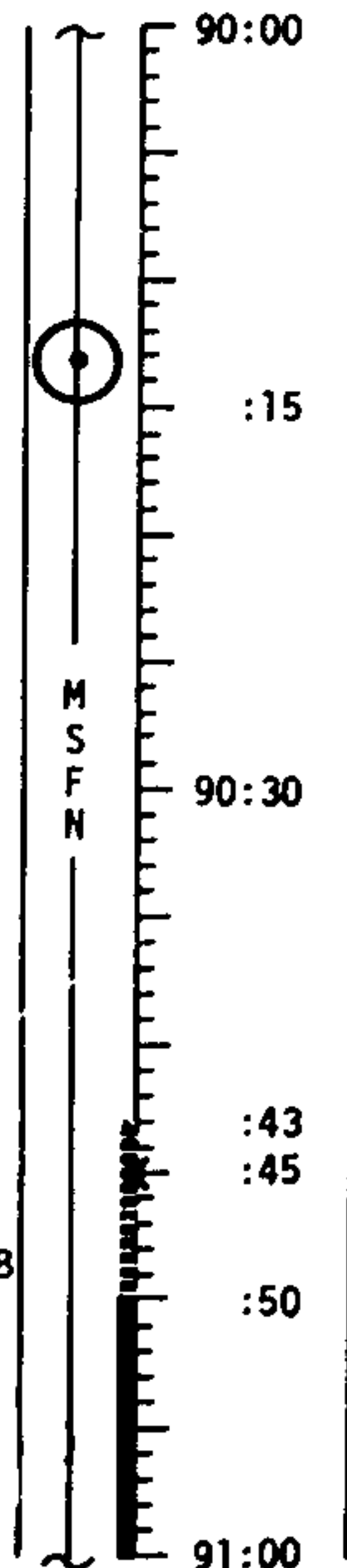
TRACK LDMK H-1
DO NOT PRO ON
FINAL N89,
25 SEC BETWEEN MARKS
5 MARKS

STOP PITCH RATE
ROLL TO REST ATT BY 90:58

R 126 HGA
P 291 P -29
Y 0 Y 275

GO INERTIAL

0422 CST



CDR

AID LMP AS REQUIRED

LM

LMP

MCC-H

TRANSFER TO LMP POWER

COMM ACTIVATION

S-BAND/VHF SIMPLEX

VOICE & TM TEST

REPORT OPS SOURCE
PRESSURE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	90:00 - 91:00	4/4	3-69

LUNAR ORBIT REST PERIOD ATTITUDE

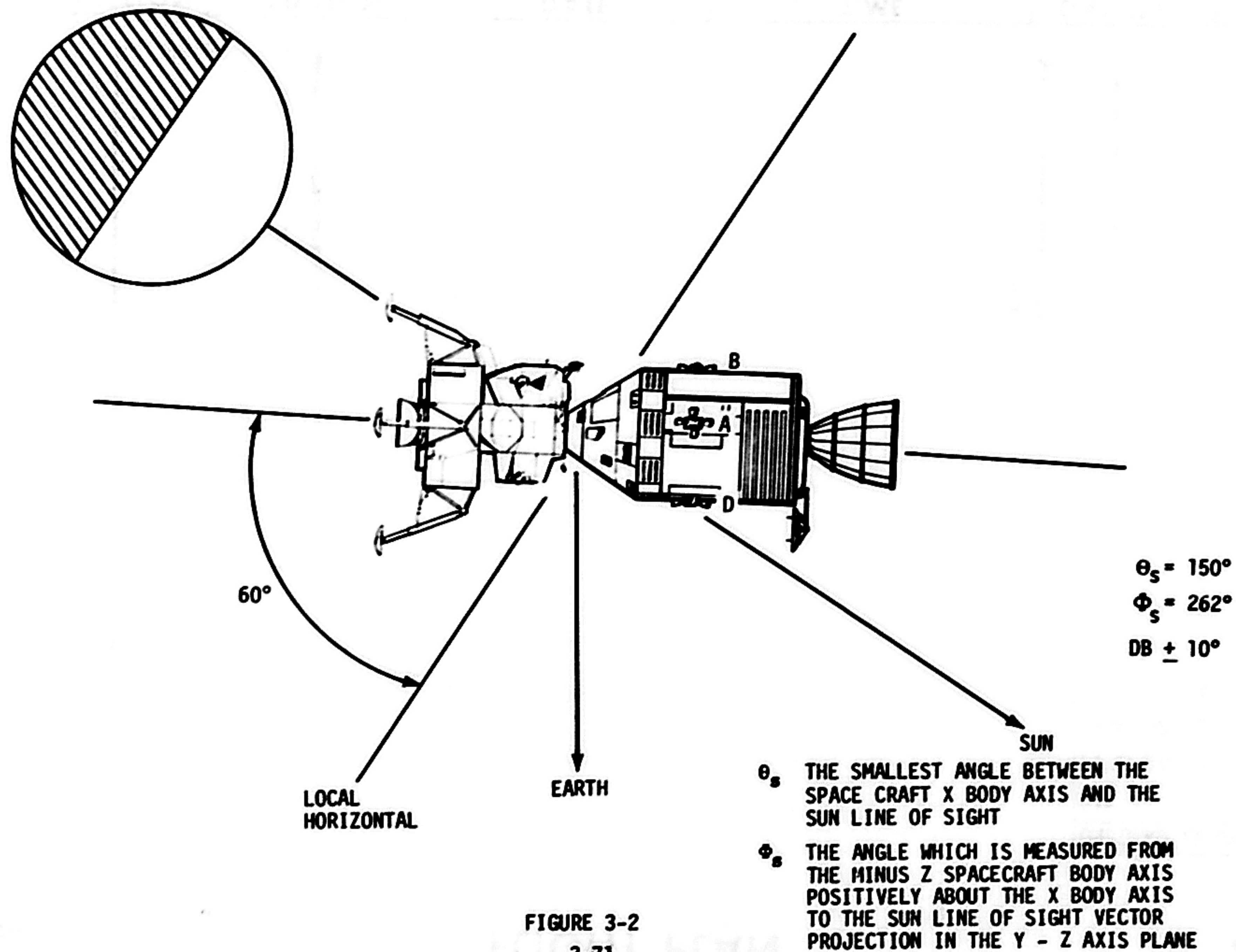


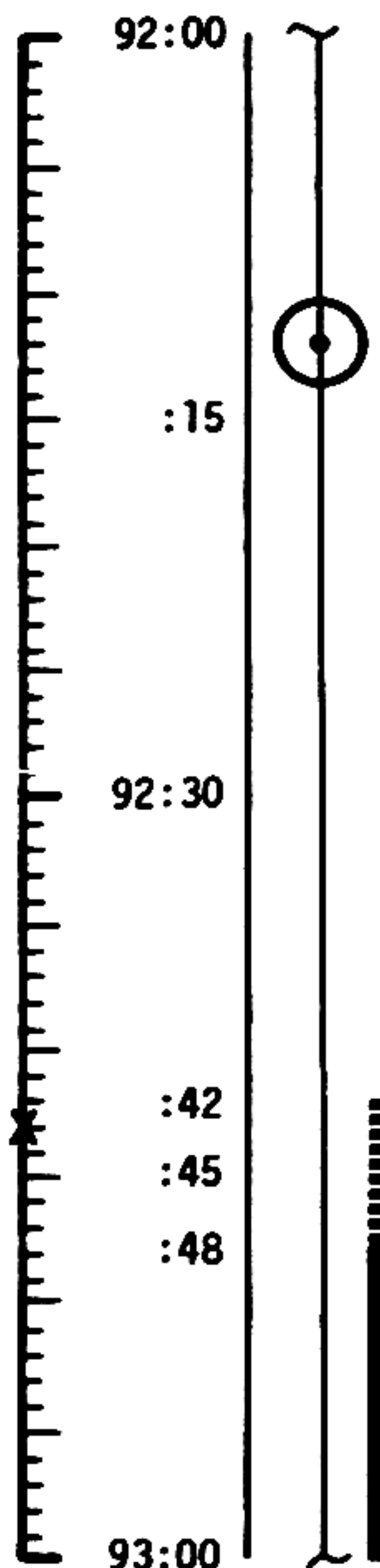
FIGURE 3-2
3-71

MCC-H
DUMP DSE

0622 CST

FLIGHT PLAN

NOTES



EAT PERIOD

REST PERIOD
(8.5 HOURS)

REST
ATT

ONBOARD READOUT	
BAT C	_____
PYRO BAT A	_____
PYRO BAT B	_____
RCS A	_____
B	_____
C	_____
D	_____
DC IND SEL - MNA OR B	

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	92:00 - 93:00	4/5	3-72

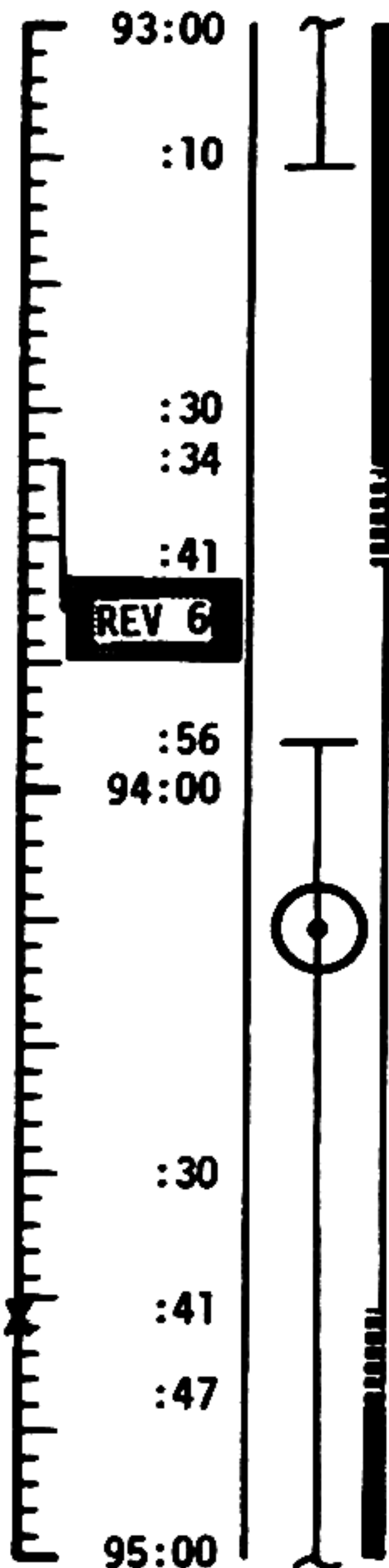
MCC-H

0722 CST

FLIGHT PLAN

NOTES

DUMP DSE



REST PERIOD
(8.5 HOURS)

REST
ATT

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	93:00-95:00	4/5-6	3-73

MCC-M

FLIGHT PLAN

NOTES

0922 CST
95:00
REV 7
:30
:33
:40
:54
96:00
:30
:39
:45
97:00

DUMP DSE



REST PERIOD
(8.5 HOURS)

REST
ATT

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	95:00 - 97:00	4/6-7	3-74

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

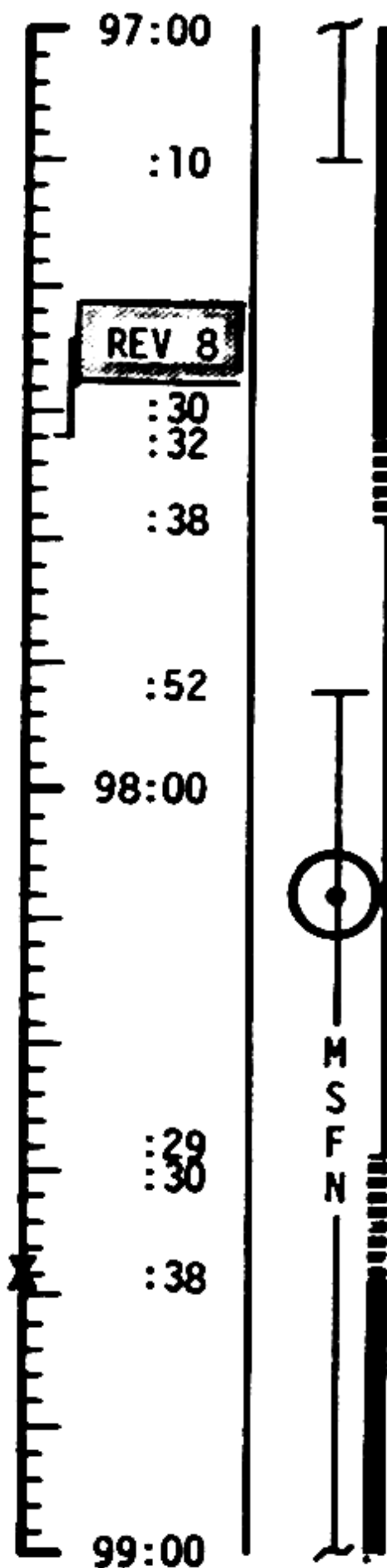
MCC-H

1122 CST

FLIGHT PLAN

NOTES

DUMP DSE



REST PERIOD
(8.5 HOURS)

REST
ATT

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	97:00 - 99:00	4/7-8	3-75

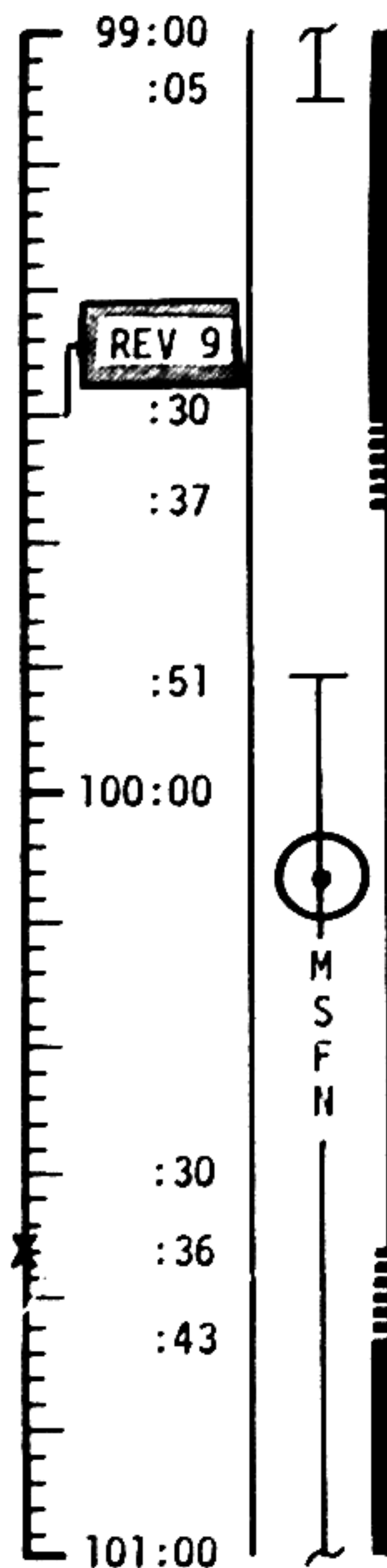
MCC-H

1322 CST

FLIGHT PLAN

NOTES

DUMP DSE



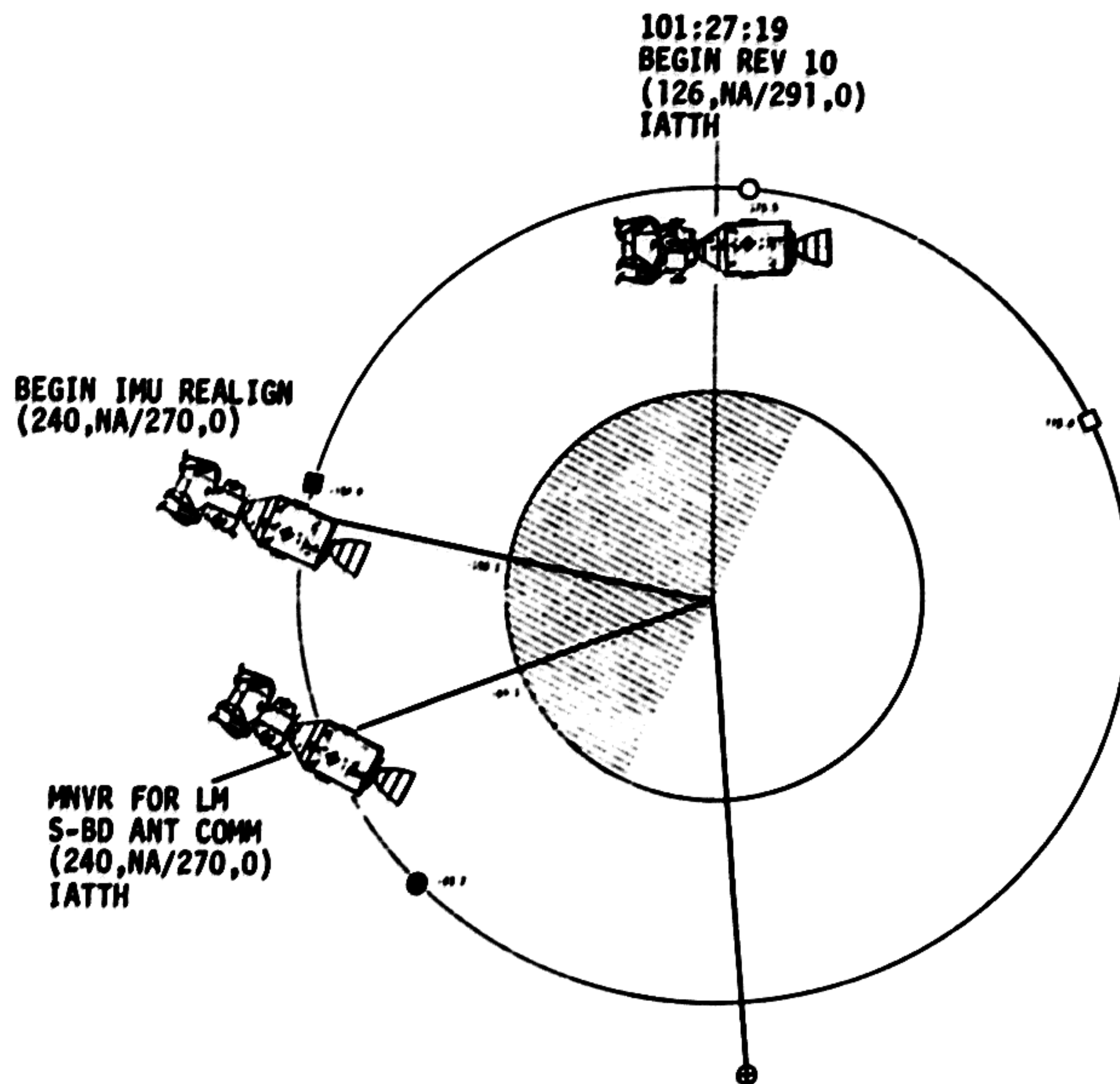
REST PERIOD
(8.5 HOURS)

REST
ATT

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	99:00 - 101:00	4/8-9	3-76

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REV 10



LEGEND:

- ■ MSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-76A

REVISION B

MCC-M

FLIGHT PLAN

NOTES

1522 CST

101:00

:03

:15

REV 10

:29
101:30

:35

:45

:49

102:00

VERIFY DSE MOTION AT LOS

WASTE WATER DUMP
O₂ FUEL CELL PURGE
EAT PERIOD

POSTSLEEP CHECKLIST

CREW STATUS REPORT
CONSUMABLES UPDATE
FLIGHT PLAN UPDATE
CYCLE H₂, O₂ FANS
~~POT H₂O HTR ON~~
NORMAL LUNAR COMM EXCEPT:
S BD ANT - HI GAIN
CREW MANAGES ANT OPS

CSM CONSUMABLES UPDATE

GET: _____ : _____
RCS TOTAL _____ %
QUAD A _____ % B _____ %
C _____ % D _____ %
H₂ TOTAL _____ %
O₂ TOTAL _____ %

CREW STATUS REPORT

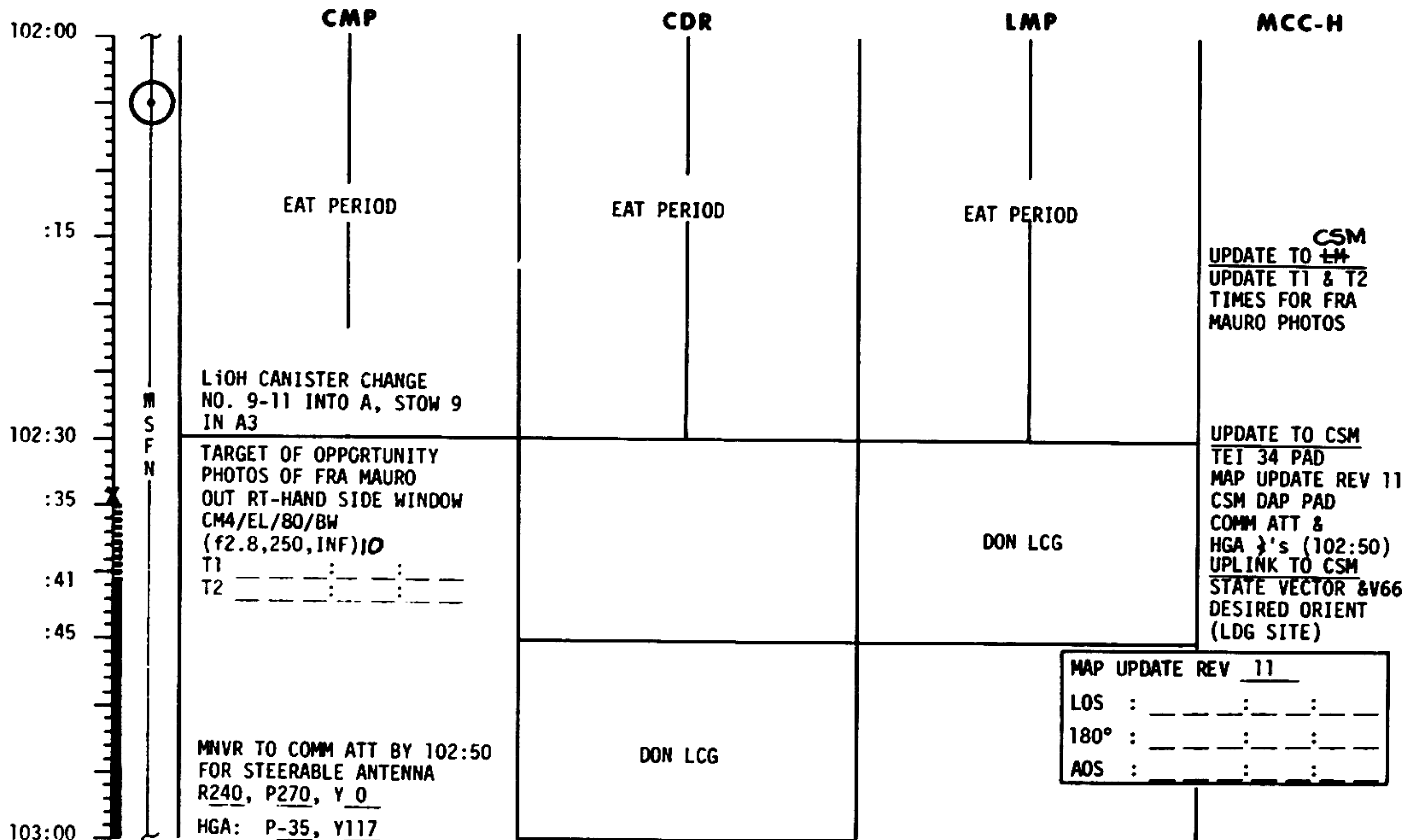
	CDR	CMP	LMP
SLEEP	_____	_____	_____
PRD	_____	_____	_____

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	101:00 - 102:00	5/9-10	3-77

1622 CST

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	102:00 - 103:00	5/10	3-78

1722 CST

FLIGHT PLAN

103:00
:01

CMP

CDR

LMP

MCC-H

P52 - IMU REALIGN

OPTION 1 - (PREFERRED)

:15

DON PGA
W/O HELMET & GLOVES

REV 11

:27

103:30

:34

EQUALIZE CM/LM PRESSURE

:45

:47

OPEN & STOW CM HATCH
REMOVE & STOW PROBE & DROGUE
CHECK LATCHES
REACQUIRE MSFN
HGA: P-35, Y117

REPORT DOCKING TUNNEL
INDEX ANGLE

104:00

MSFN

VERIFY DSE MOTION AT LOS

P52 (LDG SITE ORIENT)

N71: _____

N05: _____

N93: _____

X _____

Y _____

Z _____

GET _____:_____:_____

MAP UPDATE REV 12

LOS : _____:_____:_____

180° : _____:_____:_____

AOS : _____:_____:_____

VERIFY DOCKING TUNNEL
INDEX ANGLE

DUMP DSE

DON PGA W/O HELMET & GLOVES

OPEN LM HATCH

IVT TO LM

UPDATE TO CSM
MAP UPDATE REV 12

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	103:00 - 104:00	5/10-11	3-79

1822 CST

FLIGHT PLAN

104:00

CMP

CSM POWER TO LM
OFF AT LMP'S REQUEST

CDR

DON PGA
W/O HELMET & GLOVES

LMP

TRANSFER TO LM POWER

LM FAMILIARIZATION &
HOUSEKEEPING
(IF NECESSARY)

MCC-H

:15

EPS ACTIVATION
S-BAND ACTIVATION
MISSION TIMER ACTIVATION
PRIMARY GLYCOL LOOP ACT

UPDATE TO CSM
P22 LDMK
TRACKING PAD

CONFIGURE CAMERAS FOR
UNDocking
CM2/DAC/18/CEX-BRKT-MIR
(f8,250,7) 6fps, 16 MIN
CM4/TV-IN BRKT (f22)

DISCONNECT & STOW
LM POWER UMBILICAL

CAUTION/WARNING C/O

CB ACTIVATION

TB VERIFICATION

104:30

CM2/EL/80/CEX
(f8,250, 50) 10

IVT TO LM
TRANSFER HELMET & GLOVES

SEC S-BAND T/R &
POWER AMPL CHECK

UPDATE TO LM
STEERABLE ANT }'s
BY 104:30
(IF REQ'D)

:33

~~INHIBIT 838C4 CSM THRUSTERS~~

ECS ACTIVATION & C/O
CONNECT TO LM ECS

S-BAND STEERABLE ANTENNA
ACT: P 68, Y 19

:40

LM CLOCK SYNC: V06N65
T EPHEM: V05NOTE 1706E

PGNCS TURN-ON & SELF TEST

SUIT FAN/H₂O SEP CHECK

UPDATE TO LM
STEERABLE ANT }'s
(105:49)
(IF REQ'D)

:45

LM VHF CHECKOUT:
VHF AM(B)-SIMPLEX
VHF RCV ONLY-B DATA
VHF AM(B)-OFF
VHF AM(A)-SIMPLEX
V06N20E

LGC/CMC CLOCK SYNC
T EPHEM UPDATE
E MEMORY DUMP

GLYCOL PUMP CHECK

VHF CHECKOUT

(ON CDR'S MARK)
MIN DB FOR LM ALIGN
VERIFY DSE MOTION AT LOS
RECORD LM PCM DATA

DOCKED IMU COARSE ALIGN
REPORT GIMBAL ANGLES
& TIME TO MSFN

IVT TO CSM

:59

105:00

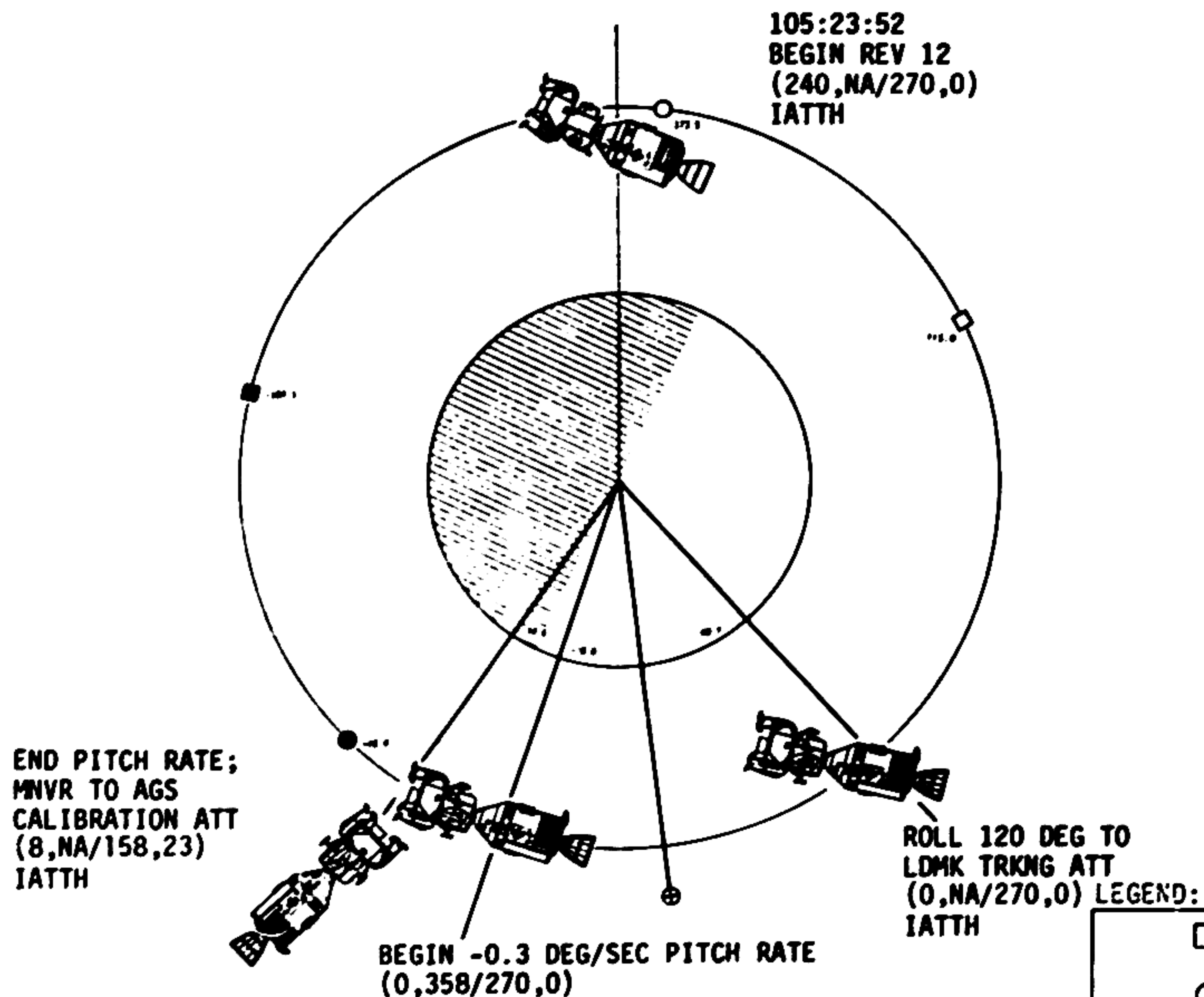
FWD OMNI - LBR
SLEW STEERABLE ANT:
P 68, Y 19

DON PGA

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	104:00 - 105:00	5/11	3-80

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REV 12



LEGEND:

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

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-80A

REVISION B

FLIGHT PLAN

CSM

1922 CST

LM

MCC-H

CMP

CDR

LMP

DON HELMET & GLOVES
PGA PRESSURE INTEGRITY
CHECK

105:00

:15

REV 12

:26

105:30

:32

INHIBIT ROLL COMMANDS
UNTIL LM/CM $\Delta P > 3.5$ PSID
INSTALL DROGUE & PROBE
PRELOAD PROBE
COCK LATCHES (12)
INSTALL HATCH
VENT TUNNEL
HATCH INTEGRITY
CHECK
CONFIGURE PANEL 10
FOR CSM RELAY

REACQUIRE MSFN
HGA: P-35, Y 117

VO6N20E
DOFF HELMET & GLOVES

M
S
F
N

M
S
F
N

:45

106:00

VERIFY DROGUE
& PROBE
INSTALLATION

CLOSE AND SECURE
HATCH

DEPLOY LANDING GEAR

POO & DATA FOR UPLINK
DOCKED IMU FINE ALIGN
VO6 N20E ON MARK

DON PGA
IN CSM

IVT TO LM
TRANSFER HELMET & GLOVES

CONNECT TO LM ECS
& COMM

ASCENT BATTERY
ACTIVATION
AND C/O

RECORD ED BAT
VOLTS

AGS ACT & SELF TEST

STEERABLE ANTENNA:
P 68, Y 19

BIOMED SW - LEFT

V47-AGS INITIALIZATION

DUMP DSE

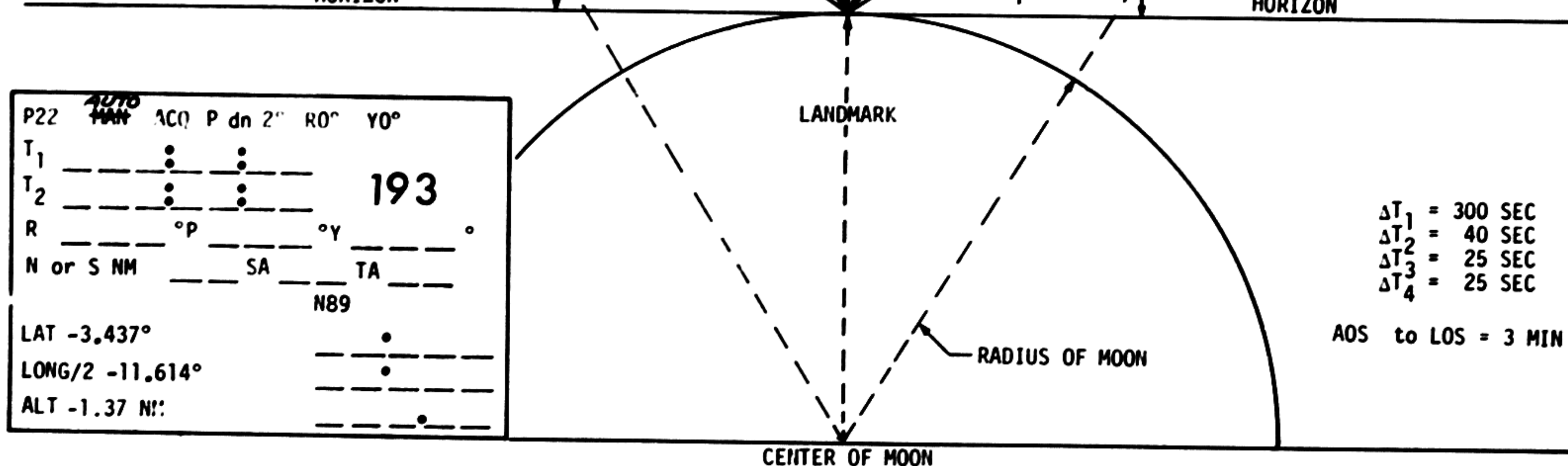
UPLINK TO CSM
CSM STATE VECTOR & V66
UPDATE TO LM
DAP DATA
GYRO TORQUING $\frac{1}{2}$'s

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	105:00 - 106:00	5/11-12	3-81

DOCKED LANDMARK TRACKING PROFILE

2 DEG PITCH DOWN FROM
LOCAL HORIZONTAL BEGIN
0.3 DEG/SEC PITCH DOWN
AT AOS.

T1 GET AT 0° ELEVATION
T2 GET AT 35° ELEVATION



$\Delta T_1 = 300 \text{ SEC}$
 $\Delta T_2 = 40 \text{ SEC}$
 $\Delta T_3 = 25 \text{ SEC}$
 $\Delta T_4 = 25 \text{ SEC}$

AOS to LOS = 3 MIN

CENTER OF MOON

FIGURE 3-1

3-82

P22	4070 MAN	ACQ	P dn 2"	R0°	Y0°
T ₁	---	---	---	---	---
T ₂	---	---	---	---	193
R	---	°P	---	°Y	---
N or S	NM	---	SA	---	TA
				N89	---
LAT -3.437°				---	---
LONG/2 -11.614°				---	---
ALT -1.37 N!				---	---

FLIGHT PLAN

CSM

2022 CST

LM

MCC-H

CMP

106:00

CDR

LMP

SELECT OMNI D
ROLL 120° TO TRACKING
ATT AT 106:10
R O , P270, Y O

V06N20E
VERIFY DSE MOTION
P22-ORBITAL NAVIGATION
ESTABLISH 0.3°/SEC
PITCH RATE AT LDMK AOS

TRACK LDG SITE LDMK 193
DO NOT PROCEED ON N89
25 SEC BETWEEN MARKS,
5 MARKS

STOP AGS CAL PITCH@P158
BY 106:35 HGA: P-47, Y168
V06 H20E
MNVR TO AGS CAL
ATT BY 106:45
R 8 , P 158 , Y 23
HGA: P-41 , Y 139

V06N20E
SC CONTROL-SCS
~~MIN/MAX DB, LOW/HIGH~~
→ RATE (AT CDR'S REQUEST)
CMC FREE FOR RCS
HOT FIRE
VERIFY DSE MOTION AT LOS
RECORD LM PCM DATA
INHIBIT THRUSTER B3
FOR LM RR SELF TEST

MSFN

106:30

• 32

: 38

: 45

:57

107:00

MSFN

DAP SET - GIMBAL &
THROTTLE TEST
LOAD DAP - 32022

RATE GYRO
TEST
V06N20 ON MARK

RCS PRESSURIZATION

V06 N20E ON MARK

V06N20E ON MARK

RCS CHECKOUT

LOAD AGS PAD

SELECT OMNI-FWD

SLEW STEERABLE ANT:
P 104, Y 01
FOR AGS CAL PITCH ATT
RCS PRESSURIZATION

RCS CHECKOUT

FWD OMNI-LBR
SLEW STEERABLE S-BD
ANT: P 132, Y 24

UPLINK TO LM
 LS REFSMMAT
 LM SV & V66
 LGC/CMC CLOCK SYNC
 PIPA BIAS
 LGC ABORT CONSTANT
 E-MEMORY UPDATE
 (IF REQ'D)
UPDATE TO CSM
 SEP TIME &
 UNDOCK TIME
UPDATE TO LM
 AGS K FACTOR
 AGS ABORT
 CONSTANTS
 STEERABLE ANT }'s
 (IF REQ'D)
UPDATE TO CSM
MAP UPDATE REV 13

MAP UPDATE REV 13

L0S : : :
180° : : :
AOS : : :

UPDATE TO LM
STEERABLE ANT }'s
(107:47)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	106:00 - 107:00	5/12	3-83

FLIGHT PLANNING BRANCH

REVISION A

CSM

2122 CST

LM

MCC-H

CMP

RATE <0.1°/SEC
 DISABLE THRUSTERS FOR
 32 SEC(AT LMP'S REQUEST)
 ENABLE THRUSTERS &
 MAINTAIN RATE <0.1°/SEC
 FOR 6 MIN
 RE-ENABLE B3
 VERIFY TUNNEL VENT
 VALVE - OFF

RR TRANSPONDER ACT
 & SELF TEST

P30/P41 TO MANEUVER
 TO UNDOCKING ATT
 BY 107:40

R 180, P 285, Y 0
 HGA: P -76, Y 218

GDC ALIGN TO IMU
 START CAMERAS

TV(GDS) 107:50 - 108:30

GO/NO-GO

LOAD DAP-CSM ONLY

R1=11102, R2=11111

S/C CONTROL - CMC

SOFT UNDOCK

S/C CONTROL - CMC
 STATION KEEP @ 40'

~~RE-ENABLE B3&C4 JETS~~

107:00

:15

REV 13

:24

107:30

:31

:43

:45

108:00

T
M
S
F
NT
M
S
F
N

CDR

RR ACT & SELF
 TEST

DON HELMET & GLOVES

ARS/PGA PRESSURE INTEGRITY CHECK

CABIN REGULATOR
 CHECK

DPS PRESS & C/O

GO/NO-GO
 PREPARE FOR
 UNDOCKING
 P47-THRUST MONITOR

YAW LEFT 60°
 PITCH UP 90°
 R 180, P 195, Y 0

LMP

AGS ACCELEROMETER
 & GYRO CALIBRATION

DON HELMET & GLOVES

CABIN REGULATOR
 CHECK

V47-AGS UPDATE & ALIGN

STEERABLE ANT:
 P 132, Y 24
 REACQUIRE MSFN
 PCM-HI

PREPARE FOR UNDOCKING

STEERABLE ANT:
 P 71, Y -52

DUMP DSE
 GO/NO-GO FOR
 UNDOCKING

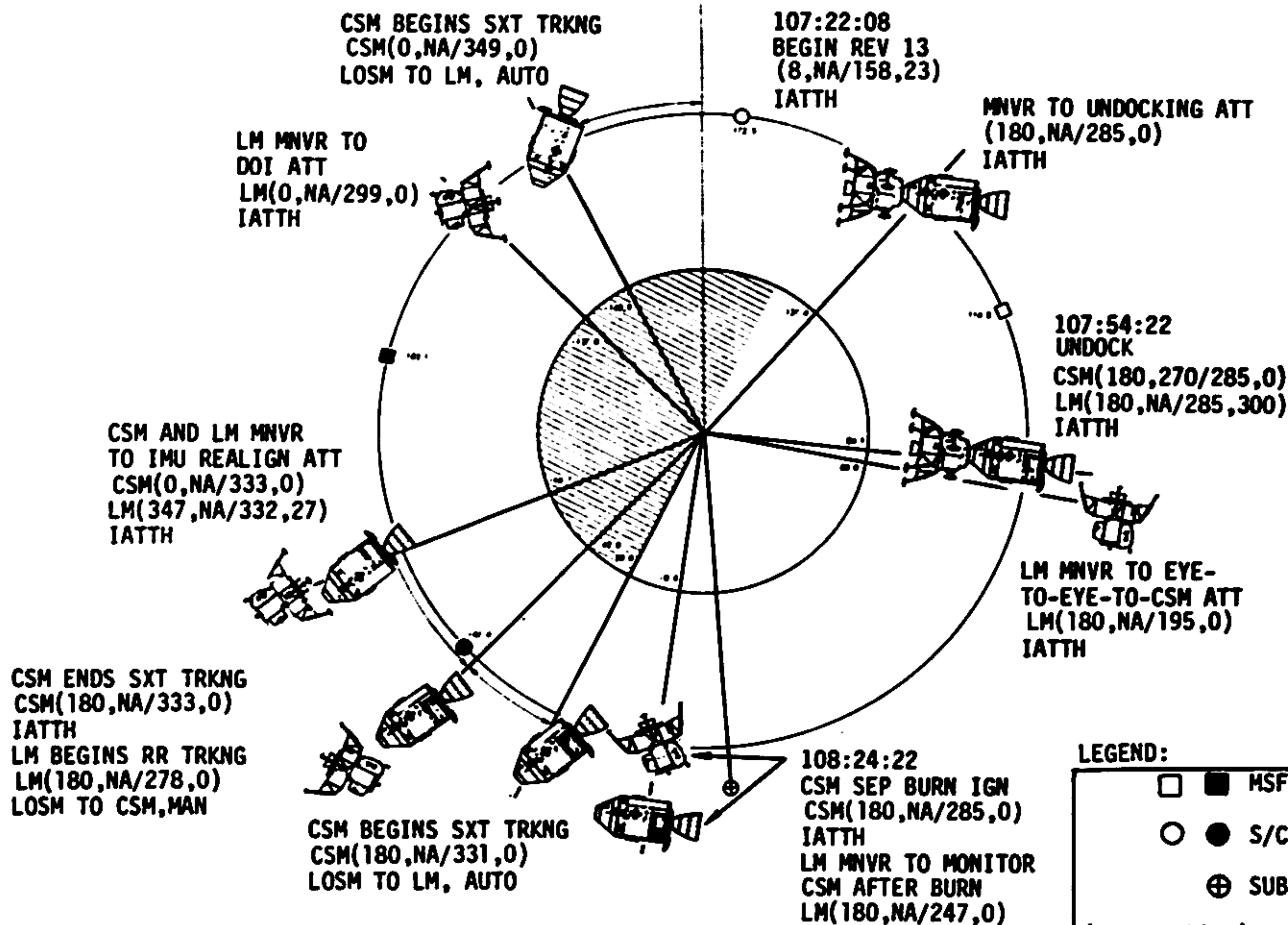
SOFT UNDOCK 107:54:22

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	107:00 - 108:00	5/12-13	3-84

FLIGHT PLANNING BRANCH

REVISION A

REV 13



LEGEND:

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

3-84A

REVISION B

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FLIGHT PLAN

CSM

CMP

SEQ CAMERA - OFF

P30/P41

CSM SEPARATION
TIG: 108:24:22
BT: 15.8 SEC
 ΔV_T : 2.5 fps
+Z THRUSTERS
ORBIT: 63.6X55.1

P20-RNDZ NAVIGATION
MNR TO TRACK ATT
SXT TRACKING &
VHF RANGING
ROLL TO 0° BY 108:44

MAP UPDATE REV 14

LOS : _ _ _ : _ _ : _ _
180° : _ _ _ : _ _ : _ _
AOS : _ _ _ : _ _ : _ _

P52-IMU REALIGN
OPT3-REFSMAT
(LDG SITE ORIENT)

VHF A-SIMPLEX/DATA
VERIFY DSE MOTION AT LOS

2222 CST

108:00

:15

108:30

:37

:45

:55

109:00

MSFN

MSFN

LM

CDR

V83 - SET ORDEAL

LR ACTIVATION
& SELF TEST

DOFF HELMETS & GLOVES

SEPARATION

P00 & DATA

P30-EXT ΔV
P40-DPS THRUST
(UNTIL MSFN GO)
RR & VHF RANGING
AND CHECKOUT

P52-IMU ALIGN
OPT 3 - REFSMMAT
(LDG SITE ORIENT)
LPD CALIBRATION
GO/NO-GO FOR DOI

LMP

BIOMED SW - RIGHT

V47-AGS UPDATE & ALIGN
LOAD AGS EXT ΔV

DESIGNATE RR TO
CLEAR AOT IF REQ'D

P52-OBSERVE THRU AOT
SLEW STEERABLE
ANT: P 12, Y 0
OMNI FWD-PCM LBR
VHF A VOICE, B DATA

MCC-H

UPLINK TO LM
LM STATE VECTOR
(DOI-10)
DOI TARGET LOAD
PIPA BIAS
DESCENT TARGET
UPDATE TO LM
DOI PAD
NO PDI + 12 PAD
PDI PAD
PDI ABORT <10 MIN
PDI ABORT >10 MIN
T2 & T3 PADS
P22 ACQ TIME 28° EL
GYRO TORQUING }'s

UPDATE TO CSM
MAP UPDATE REV 14
UPLINK TO LM
CSM STATE VECTOR
(DOI-10)
UPLINK TO CSM
CSM STATE VECTOR
(DOI-10)
LM STATE VECTOR
(DOI-10)
PIPA BIAS
UPDATE TO LM
STEERABLE ANT }'s
FOR PDI ATTITUDE
(IF REQ'D)
GO/NO-GO

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	108:00 - 109:00	5/13	3-85

FLIGHT PLAN

CSM

CMP

GDC ALIGN TO IMU
V83-VERIFY ORDEAL

P20-AUTO MNVR TO
SXT TRACK ATT

CONFIRM DOI
P76-LOAD TARGET ΔV'S

P20-AUTO MNVR
SXT & VHF
TRACKING OF LM

V64-ACQUIRE MSFN

2322 CST
109:00

REV 14

:15

:23

:29
109:30

:41

:43

:45

110:00

LM

CDR

LMP

SYSTEMS CHECKS

P40-DPS THRUST
MNVR TO BURN ATT
R 0, P 299, Y 0

RR-ON
P20-MAN LOCK-ON
V63-COMPARE RR & CSM
VHF RANGE
RR-OFF

P30-EXT ΔV
LOAD PDI+12 ABORT

MNVR TO PDI ATT BY 109:38
R 0, P 109, Y 0
VERIFY COMM
DOI POST BURN REPORT
COAS TO OVHD WINDOW
P63-CHECK TIG

RR-ON
P20-MODE II LOCK-ON

SYSTEMS CHECKS

V47-AGS UPDATE & ALIGN

VHF A - VOICE/RNG
VHF B - OFF

SET CAMERA
LM/UAC/HCEX(4,500,INF)6FPS

SLEW STEERABLE ANT
P 12, Y 0
S-BD RANGING-RANGE
BIOMED SW-LEFT

DON HELMETS & GLOVES
BATTERY 5&6 - ON
SYSTEMS CHECK: DPS, APS,
RCS, EPS, CWEA
S-BD RANGING-OFF/RESET

MCC-H

TIG: 109:23:00
BT: 28.2 SEC
ΔV: 72.1 FPS
ULL: 2JETS, 7.5 SEC
ORBIT: 59.3X8.3

ENABLE MSFN RELAY

DUMP USE

UPDATE TO CSM
MAP UPDATE REV 15

MSFN

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	109:00 - 110:00	5/13-14	3-86

FLIGHT PLANNING BRANCH

FLIGHT PLAN

CSM

CMP

SEXTANT TRACKING

P00, TRACK MANUALLY
GO/NO-GO

CONFIRM STAY/NO-STAY
V44-SET LS FLAG

CONFIRM STAY/NO-STAY

STOP PITCH: R 0, P79, Y 0
HGA: P-51, Y 13

VHF RANGING-OFF

P52-IMU REALIGN
OPT 3 - REFSMMAT
LDG SITE ORIENT

VERIFY DSE MOTION AT LOS
GDC ALIGN TO IMU

2422 CST
110:00

M
S
F
N

M
S
F
N

:15

:29
110:30

:35

:45

:54

111:00

CDR

P00 (FOR UPLINK)

P63-AUTO MNVR TO PDI ATT

LR-ON

GO/NO-GO FOR PDI
FINAL TRIM
ULL: 2 JET, 7.5 SEC

RR-OFF

EVALUATE MANUAL CONTROL
PITCH OVER AT P64
P66

DPS VENT
P68, P12

LR-OFF

P57-IMU ALIGN
OPT 3 - REFSMMAT
A/T 1 - GRAVITY

LM

LMP

PDI 110:20:00

TOUCHDOWN 110:31:19

PERFORM LUNAR CONTACT CHECKLIST

STAY/NO-STAY AT PDI + 15

STAY/NO-STAY AT PDI +19

DOFF HELMETS & GLOVES

CONFIGURE EGRESS MODE
CHECK SYS CONFIGURATION

V47-INITIALIZE AGS
TARGET AGS FOR ABORT

START 16mm CAMERA
SYSTEMS MONITOR
UPDATE AGS ALT @ 6000'

UPDATE & ALIGN AGS

STOP 16mm CAMERA
ASCENT BATTERIES OFF
REPORT DEDA 047.053

AGS LUNAR SURFACE
GYRO CALIBRATION
LOAD AGS ASCENT TARGET

BIOMED SW - RIGHT

MCC-H

UPLINK TO LM
LM STATE VECTOR
RLS

UPDATE TO LM
ΔRLS

STAY/NO-STAY

STAY/NO-STAY

COPY AGS AZIMUTH

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	110:00 - 111:00	5/14	3-87

FLIGHT PLANNING BRANCH

REVISION A

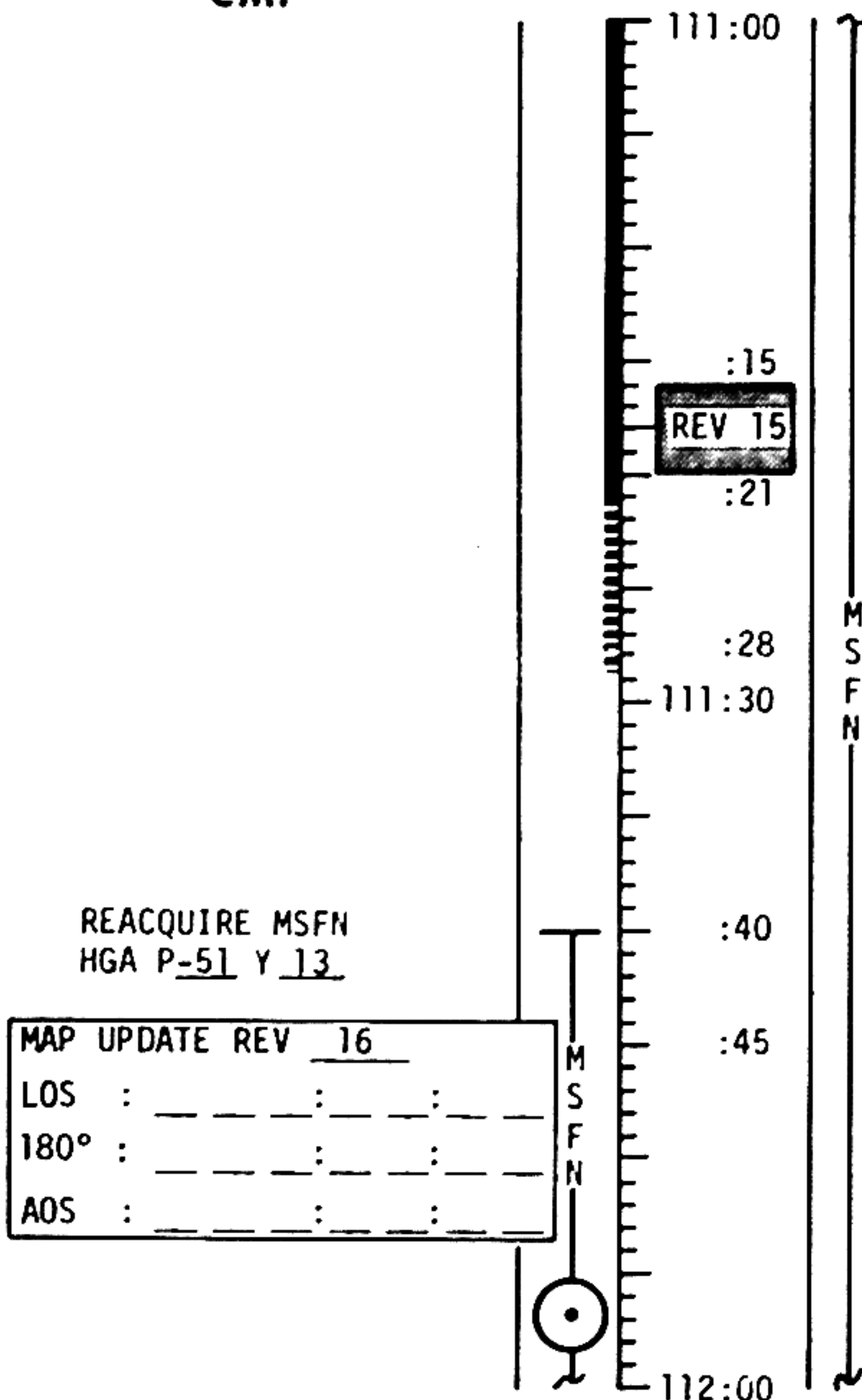
CSM

CMP

0122 CST

LM

MCC-H

CDR
INSTALL WINDOW SHADESP57 - IMU ALIGN
OPT 3 - REFSMMAT
A/T 2 - TWO CELESTIAL
BODIESP57 - IMU ALIGN
OPT 3 - REFSMMAT
A/T 2 - TWO CELESTIAL
BODIES

STOW WINDOW SHADES

CONFIGURE FOR PARTIAL POWER DOWN

DESCRIBE & PHOTOGRAPH LUNAR SURFACE
REPORT FEATURES SEEN DURING DESCENT
AND DETERMINE LM LOCATION WITH MSFN
REPORT ANGLE OF +Z WRT WEST

EAT PERIOD

LMP
TERMINATE AGS
GYRO CALIBRATION

P57 - OBSERVE THRU AOT

P57 - OBSERVE THRU AOT

ALIGN AGS TO PGNC

UPLINK TO LM

RLS

CSM STATE VECTOR

STAY/NO-STAY FOR
POWER DOWN

UPLINK TO CSM

CSM STATE VECTOR

DUMP DSE

UPDATE TO CSM

P22 - TRACKING PAD

MAP UPDATE REV 16

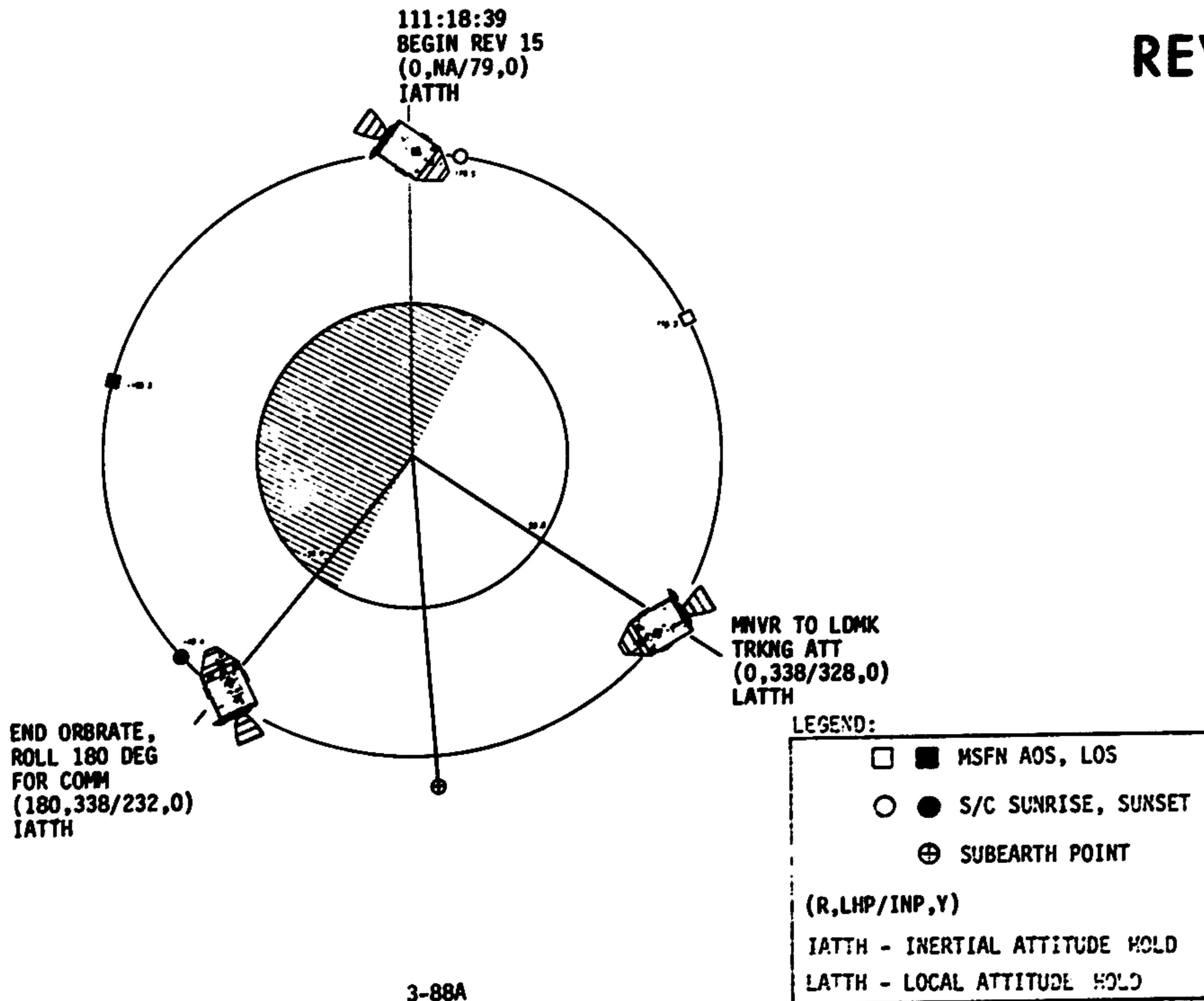
UPDATE TO LM

LM CONSUMABLES

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	111:00 - 112:00	5/14-15	3-88

FLIGHT PLANNING BRANCH

REV 15



3-88A

REVISION B

22 DEG PITCH DOWN FROM
LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING



3-89

FLIGHT PLAN

CSM

CMP

MNVR TO TRACKING
ATTITUDE BY 112:00
R 0, P338/N/A, Y 0
GO ORB RATE
SELECT OMNI D
P22 ORBITAL NAVIGATION
VERIFY DSE MOTION

TRACK LDG SITE LDMK 193
DO NOT PRO ON FINAL N89
25 SEC BETWEEN MARKS
5 MARKS

RR TRANSPONDER - OFF
STOP ORB RATE@P232, MNVR
TO ACQ MSFN, GO INERTIAL
R 180, P232, Y 0
HGA P-23, Y 189

EAT PERIOD

VERIFY DSE MOTION @ LOS

0222 CST
112:00

M
S
F
N

:15

:28

112:30

:34

:45

:52

113:00

M
S
F
N

CDR

RR-ON

P22 - LUNAR SURFACE NAVIGATION

TERMINATE P22 - LUNAR SURFACE NAVIGATION
DESIGNATE THEN PWR DWN RR
E MEMORY DUMP

POWER DOWN IMU
LGC TO STANDBY

CREW STATUS REPORT (DOSIMETER, MEDICATION)

CABIN PREP FOR EVA

STOW ALL LOOSE ITEMS NOT REQUIRED FOR EVA
UNSTOW EVA 1 PREP & POST CARD
REMOVE CB EVA CONFIG & ONE MAN EVA PAGE & INSTALL

STOW LUNAR CHECKLIST

EAT PERIOD

LM

LMP

MCC-H

UPDATE TO LM
DAP LOAD
LIFT OFF TIME FOR
REV 16 THRU 19

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	112:00 - 113:00	5/15	3-90

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

EAT PERIOD

CABIN PREP FOR EVA (CONT)

0322 CST
113:00

:15

REV 16

:20

:27

113:30

MSFN

REACQUIRE MSFN

HGA P -23 , Y 189

:38

:45

MSFN



114:00

EQUIPMENT PREP

SET DET FOR CABIN DEPRESS
UNSTOW LMP'S PLSS FROM LM FLOOR
PREPARE SEQ CAMERA
DEPLOY EVA ANTENNA
UNSTOW & DON LUNAR BOOTS (BOTH)
UNSTOW & CHECK BOTH OPS'S

-1:20

-1:10

-1:00

PLSS DONNING

CONFIGURE LMP'S PLSS/OPS FOR DONNING
UNSTOW RCU'S
LMP DON PLSS/OPS
CONFIGURE CDR'S PLSS/OPS FOR DONNING
CDR DON PLSS/OPS
VERIFY RCU CONTROLS AND CONNECT
TO PLSS/PGA

DUMP USE

-:50

UPDATE TO CSM
P22 - TRACKING PAD
MAP UPDATE REV 17

-:40

PLSS COMM CHECK

AUDIO SWITCHES CK, ACTIVATE PLSS COMM SYSTEMS&C/U
(TV CB - CLOSE THEN OPEN)

FINAL SYSTEMS PREP

-:30

MAP UPDATE REV 17

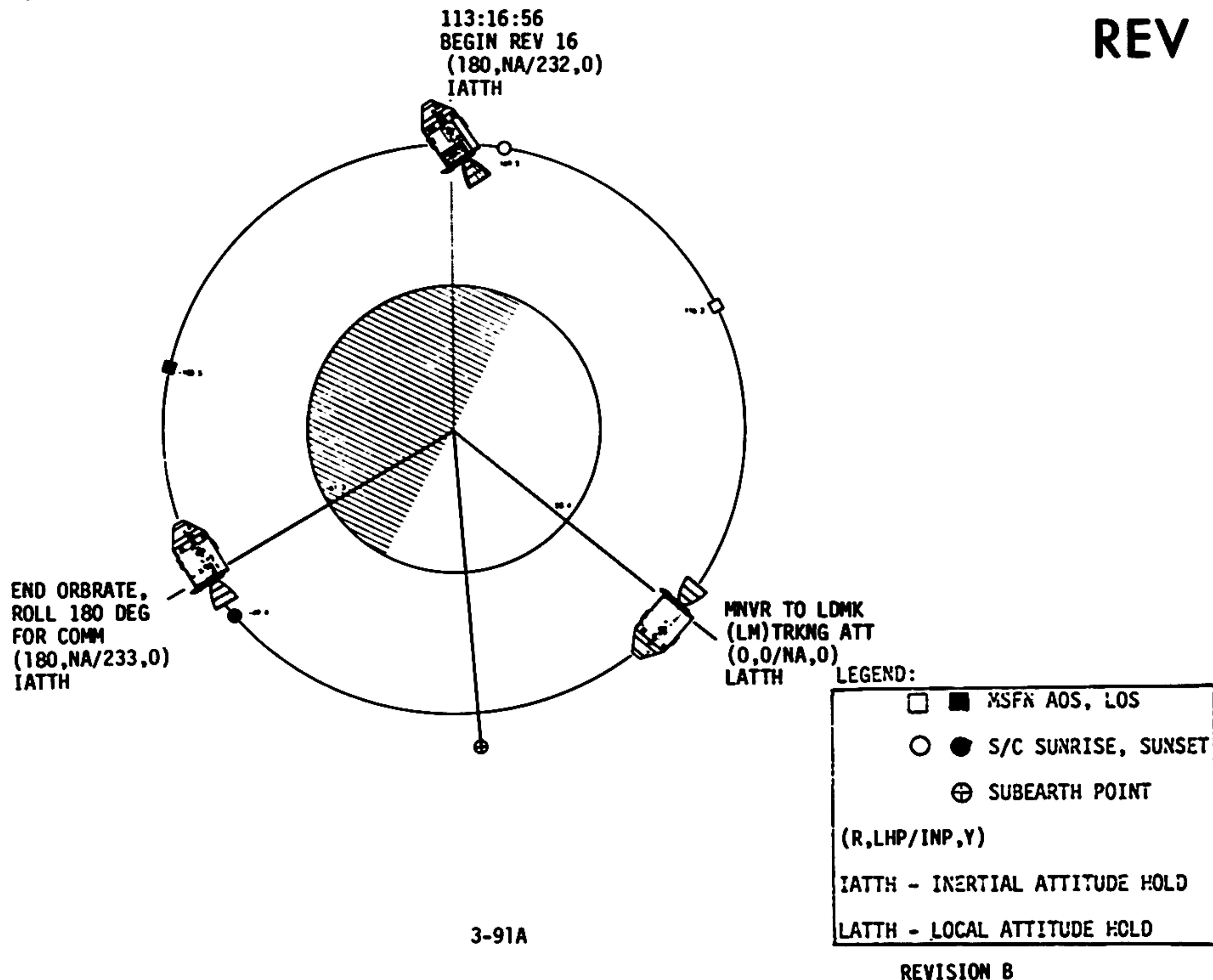
LOS : _ _ _ : _ _ _

180°W: _ _ _ : _ _ _

AOS : _ _ _ : _ _ _

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	113:00 - 114:00	5/15-16	3-91

REV 16

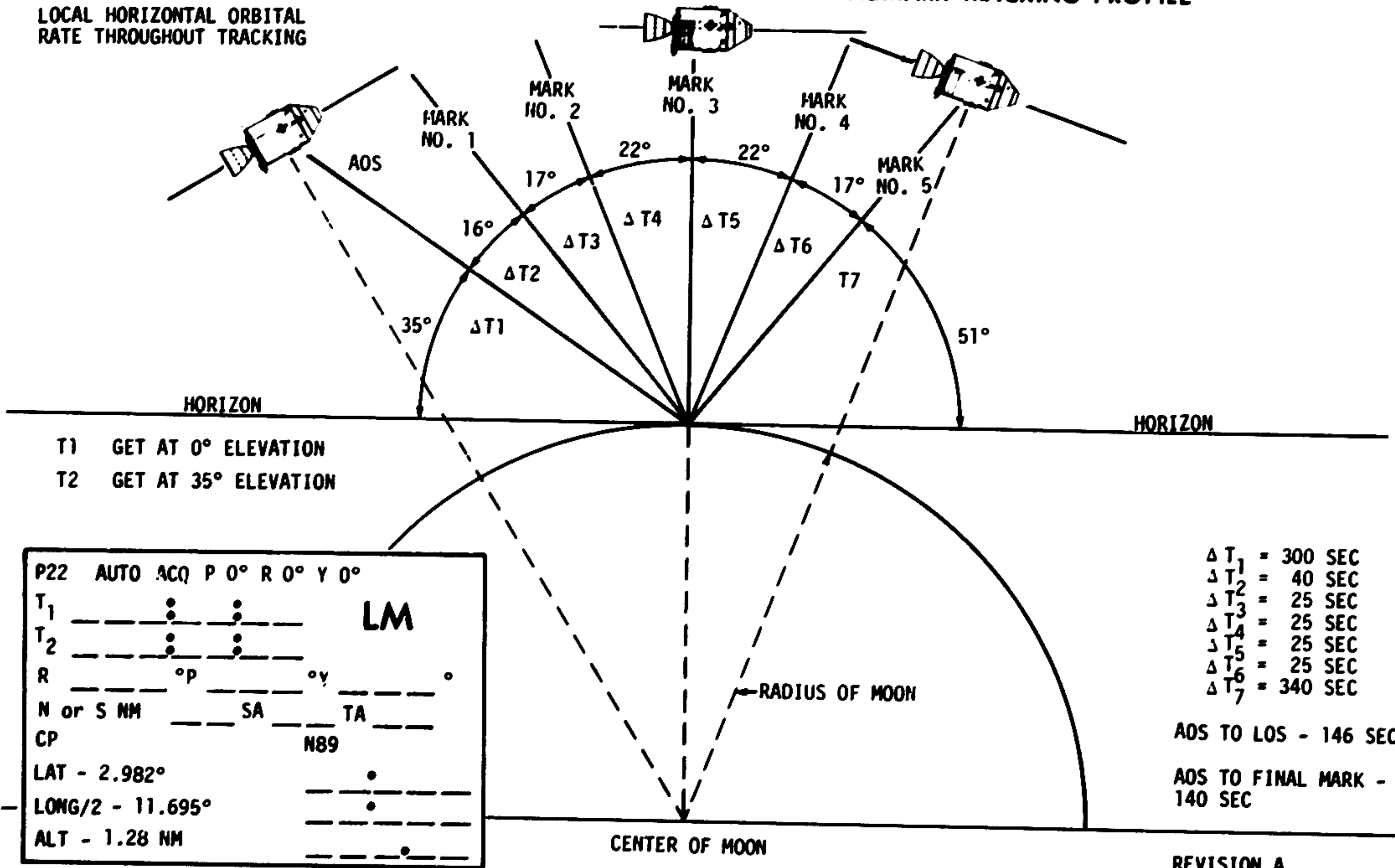


3-91A

REVISION B

LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING

CSM LANDMARK TRACKING PROFILE



CENTER OF MOON

FIGURE 3-3
3-92

REVISION A

FLIGHT PLAN

CSM

CMP

MNVR TO TRACKING
ATTITUDE BY 114:00

R 0, P 0 /N/A, Y 0
GO ORB RATE
SELECT OMNI D
P22 ORBITAL NAVIGATION

VERIFY DSE MOTION

TRACK LM
DO NOT PRO ON FINAL N89
25 SEC BETWEEN MARKS
5 MARKS

STOP ORB RATE @ P233, MNVR
TO ACQ MSFN, GO INERTIAL
R 180, P 233, Y 0
HGA P -23, Y 190

VERIFY DSE MOTION @ LOS

0422 CST
114:00

MSFN

:15

:26

114:30

:33

:45

:50

115:00

MSFN

LM

CDR

LMP

CONNECT OPS O₂ HOSES
DON HELMETS
CONNECT PLSS H₂O HOSES
LCG PUMP CB-OPEN
DON GLOVES

VERIFY CB & VALVE CONFIGURATION

PRESSURE INTEGRITY CHECK
PLSS O₂ ON

CABIN DEPRESS
CONFIRM "GO" FOR EVA
DEPRESS CABIN TO 3.5 PSIA

SET ~~DET~~ CHRONOMETER
FWD DUMP VALVE - OPEN
OPEN FWD HATCH

FINAL PREP FOR EGRESS
PLSS H₂O ON, FINAL SYSTEMS CHECK,
TURN TV ON, VERIFY CB CONFIGURATION

CDR EGRESS
MOVE THROUGH HATCH
DEPLOY LEC & MESA
DESCEND TO SURFACE

ENVIRONMENTAL FAM
CK BALANCE, CK LM STABILITY

CONT. SAMPLE COLLECTION
COLLECT & STOW SAMPLE

ETB TRANSFER
DEPLOY MESA & ETB

ASSIST & MONITOR CDR

ACTIVATE 16MM SEQ CAMERA

MONITOR & PHOTO CDR
WITH 70 MM CAMERA

PERFORM FINAL LM & EMU CK

CONFIRM "GO" FOR EVA

MCC-H

:30

:20

:10

START EVA
0:00

0:10

0:20

0:30

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	114:00 - 115:00	5/16	3-93

CSM

CMP

LM

MCC-H

0522 CST

115:00

CDR

LMP

EVA GO

0:30

REV 17

:15

:19

:25

115:30

:36

:45

116:00

M
S
F
N

STOW PLSS BATTS & LiOH CAN,
& CONT SAMPLE IN ETB
TRANSFER ETB TO LM
REST
TRANSFER ETB TO SURFACE

LMP AND CONT PHOTOS
PHOTOGRAPH LMP EGRESS
TAKE CONTINGENCY PHOTOS
PHOTOGRAPH COLOR CHART

S-BD ERECT. ANT DEPLOYMENT
UNSTOW S-BAND ANT
CARRY ANT TO DEPLOY SITE
ERECT ANTENNA
CONNECT ANTENNA CABLE
ALIGN ANTENNA

FLAG DEPLOY

PANORAMA & CLOSE-UP PHOTOS
UNSTOW ALSCC & PLACE IN SUN
TAKE PANORAMA & SURFACE
CLOSE-UP PHOTO'S

ALSEP OFFLOAD
OFFLOAD ALSEP PKG #1
POSITION PKG #1 CLEAR OF
SEQ BAY

REMOVE SIDE SUBPALLET
FROM PKG #2

ASSIST CDR WITH ETB
TRANSFER

LMP EGRESS
MOVE THROUGH HATCH
DESCEND TO SURFACE

ENVIRONMENTAL FAM
CHECK BALANCE & STABILITY

TV DEPLOYMENT
DEPLOY TRIPOD & TV CAMR
TV PANORAMA, POSITION TV
TO VIEW S-BD ERECT./MESA

SWC DEPLOYMENT
DEPLOY SWC IN SUN
PHOTO SWC & LM/EARTH

FLAG DEPLOY

LM INSPECTION/PHOTO
POSITION TV FOR SEQ BAY
INSPECT & PHOTO LM PADS/
SURFACE

ALSEP OFFLOAD
OPEN SEQ BAY DOORS
OFFLOAD ALSEP PKG #2
DEPLOY HTC

DEPLOY FUEL CASK
EXTRACT FUEL ELEMENT
FUEL RTG

0:40

0:50

1:00

1:10

DUMP DSE

1:20

1:30

REACQUIRE MSFN
HGA P -23, Y 190

M
S
F
N

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	115:00 - 116:00	5/16-17	3-94

MSC Form 1674 (OT)(June 69)

FLIGHT PLANNING BRANCH

REVISION A

FLIGHT PLAN

CSM
CMP

LM

MCC-H

0622 CST
116:00

CDR

LMP

MAP UPDATE REV 18			
LOS	:	:	:
180°	:	:	:
AOS	:	:	:

M
S
F
N

:15

:25

116:30
:31

:45

:49

117:00

M
S
F
N

CLOSE SEQ BAY DOORS
CARRY HTC TO MESA
PICK UP TONGS

ALSEP TRAVERSE

CARRY SUBPALLET TO TV
ORIENT TV FOR ALSEP
CARRY SUBPALLET TO
DEPLOYMENT SITE

ALSEP SYSTEM INTERCONNECT

UNSTOW SIDE FROM SUBPALLET
CONNECT TO CENTRAL STATION
UNSTOW & POSITION PSE STOOL

SWE DEPLOYMENT
DEPLOY SWE, ALIGN & PHOTOGRAPH

LSM OFFLOAD

UNSTOW LSM

SUNSHIELD DEPLOYMENT

RELEASE PERIMETER, ANT,
CABLE, & INNER BOLTS, RAISE
SUNSHIELD, & CK. CURTAINS

ANTENNA INSTALLATION

INSTALL ANT MAST
INSTALL ANT ON MAST
SET AZIMUTH & ELEVATION
OFFSETS
LEVEL & ALIGN ANTENNA

ALSEP ACTIVATION

VERIFY EXPERIMENTS DEPLOYED
ACTIVATE ALSEP

CONNECT PKG #2 TO CARRY
BAR

ALSEP TRAVERSE

CARRY ALSEP PKG's TO
DEPLOYMENT SITE
REST ENROUTE

ALSEP SYSTEM INTERCONNECT POSITION PKGS

UNSTOW RTG CABLE AND
CONNECT TO CENTRAL STATION

PSE DEPLOYMENT
UNSTOW PSE & PLACE ON PSE
STOOL, DEPLOY THERMAL SKIRT
LEVEL & PHOTOGRAPH PSE

LSM DEPLOYMENT

CARRY LSM TO DEPLOY SITE
DEPLOY LSM, & LEVEL &
ALIGN
PHOTOGRAPH LSM

SIDE DEPLOYMENT

CARRY SIDE TO DEPLOY SITE
DEPLOY GROUND SCREEN
DEPLOY CCIG
LEVEL & ALIGN SIDE
PHOTOGRAPH SIDE

ALSEP SITE PHOTOGRAPHY
PHOTO DEPLOYMENT SITE

1:30

1:40

1:50
UPDATE TO CSM
MAP UPDATE REV 18

2:00

2:10

2:20

2:30

VERIFY DSE MOTION @ LOS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	116:00 - 117:00	5/17	3-95

CSM

CMP

LM

MCC-H

0722 CST

117:00

CDR

LMP

2:30

GO/NO GO FOR
EVA EXTENSION
2:40

2:50

3:00

DUMP DSE

3:10

UPDATE TO CSM
MAP UPDATE REV 19

3:20

3:30

REV 18

:15

:17

:24

117:30

:35

:45

118:00

M
S
F
NM
S
F
N

EAT PERIOD

REACQUIRE MSFN
HGA P -23, Y 190

MAP UPDATE REV 19

 LOS : _ _ _ : _ _ : _ _
 180°W: _ _ _ : _ _ : _ _
 AOS : _ _ _ : _ _ : _ _

 RETURN TRAVERSE
 TRAVERSE TO LM COLLECTING
 SAMPLES
 REST ENROUTE

 RETURN TRAVERSE
 TRAVERSE TO LM COLLECT-
 ING SAMPLES
 REST ENROUTE
 RETURN TV TO LM AREA
 & POSITION TO VIEW MESA/
 LADDER
 PHOTOGRAPH ALSEP SITE

SRC #1 PACKING

 STOW 70 MM CAM IN ETB
 STOW TOOLS
 UNSTOW & UNPACK SRC #1
 SEAL ORGANIC CONTROL SAMPLE
 REMOVE LMP SADDLE BAG &
 FINISH FILLING
 PACK SAMPLES IN SRC & SEAL

 CORE TUBE SAMPLE COLLECTION
 COLLECT CORE & STOW IN SRC
 REMOVE CDR SADDLE BAG

EVA TERMINATION

 STOW 70MM CAM IN ETB
 CLEAN EMU & CHECK CDR
 INGRESS
 CHECK EMU & LM SYSTEMS
 S-BD ANT-LUNAR STAY
 ASSIST CDR
 REMOVE ETB FROM LEC & STOW

 LEC TRANSFERS
 STOW 70MM CAM IN ETB,
 CLOSE ETB & TRANSFER
 INTO LM
 REST/CHECK EMU

 ATTACH LEC TO SRC
 TRANSFER SRC INTO LM

ASSIST CDR

 EVA TERMINATION
 PLACE SRC #2 ON +Y PAD
 CLEAN EMU
 ASCEND TO PLATFORM
 STOW LEC & INGRESS

 REMOVE SRC FROM LEC
 STOW SRC ON ENG COVER

PASS LEC TO CDR

 JETTISON EQUIPMENT & CLOSE HATCH
 REPRESS CABIN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	117:00 - 118:00	5/17-18	3-96

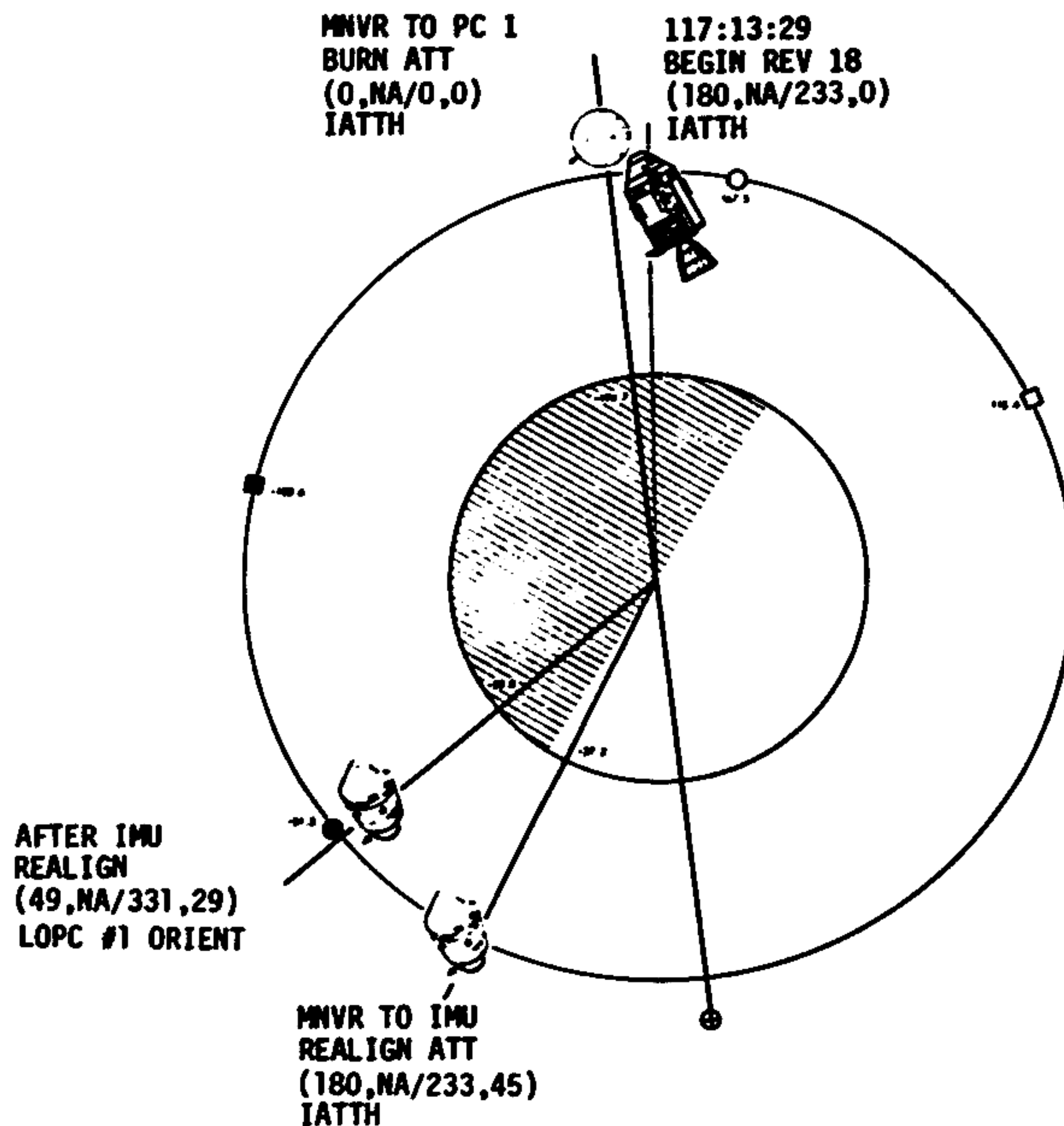
MSC Form 1674 (OT) (June 69)

FLIGHT PLANNING BRANCH

REVISION B

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REV 18



3-96A

LEGEND:

- ■ KSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION B

FLIGHT PLAN

CSM

LM

MC-H

CMP

0822 CST

CDR

LMP

3:30

EAT PERIOD

MNVR TO P52 ATT BY 118:22

R 180, P 233, Y 45
HGA P -22, Y 234

P52 - IMU REALIGN
OPTION 1 - PREFERRED
(PLANE CHANGE ORIENT)

GDC ALIGN TO IMU

VERIFY DSE MOTION @ LOS

118:00

:15

:24

118:30

:45

:47

119:00

M
S
F
N

M
S
F
N

POST EVA SYSTEMS CONFIGURATION
CONFIGURE VALVES AND CIRCUIT BREAKERS

TV-OFF

DOFF HELMETS & GLOVES

DISCONNECT OPS O2 & PLSS H₂O HOSES & CONNECT LM O2 &
H₂O HOSES, LCG PUMP CB-CLOSE
SWITCH TO LM COMM SYSTEM, BIO MED-LEFT

UPDATE TO CSM
MNVR PAD
(PLANE CHANGE)

PLSS O2 RECHARGE

CONNECT LMP'S PLSS TO LM O2 SUPPLY & FILL (2 MIN))
CONNECT CDR'S PLSS TO LM O2 SUPPLY & FILL (2 MIN))

UPLINK TO CSM
CSM STATE VECTOR
PLANE CHANGE TGT
LOAD
DESIRED ORIENT
(PLANE CHANGE)

PLSS/OPS DOFFING

REMOVE RCU'S, DOFF PLSS/OPS
REPLACE CDR'S PLSS BATT & LiOH CARTRIDGE
REMOVE OPS & STOW ON ENG COVER
STOW PLSS (RECHARGE STATION)
REPLACE LMP'S PLSS BATT & LiOH CARTRIDGE
REMOVE OPS & STOW PLSS (FLOOR)
OPS CHECK (BOTH)
STOW LMP OPS ON FLOOR

POST EVA CABIN CONFIGURATION

STOW SRC IN LOWER & CDR OPS IN TOP OPS COMPARTMENT
CONFIGURE SEQ CAMERA
VERIFY CB CONFIGURATION

LCG PUMP CB - OPEN
UNSTOW LUNAR SURFACE CHECKLIST
STOW EVA1 PREP & POSTCARD

EAT PERIOD

EAT PERIOD

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	118:00 - 119:00	5/18	3-97

FLIGHT PLAN

CSM PLANE CHANGE #1
BURN TABLE

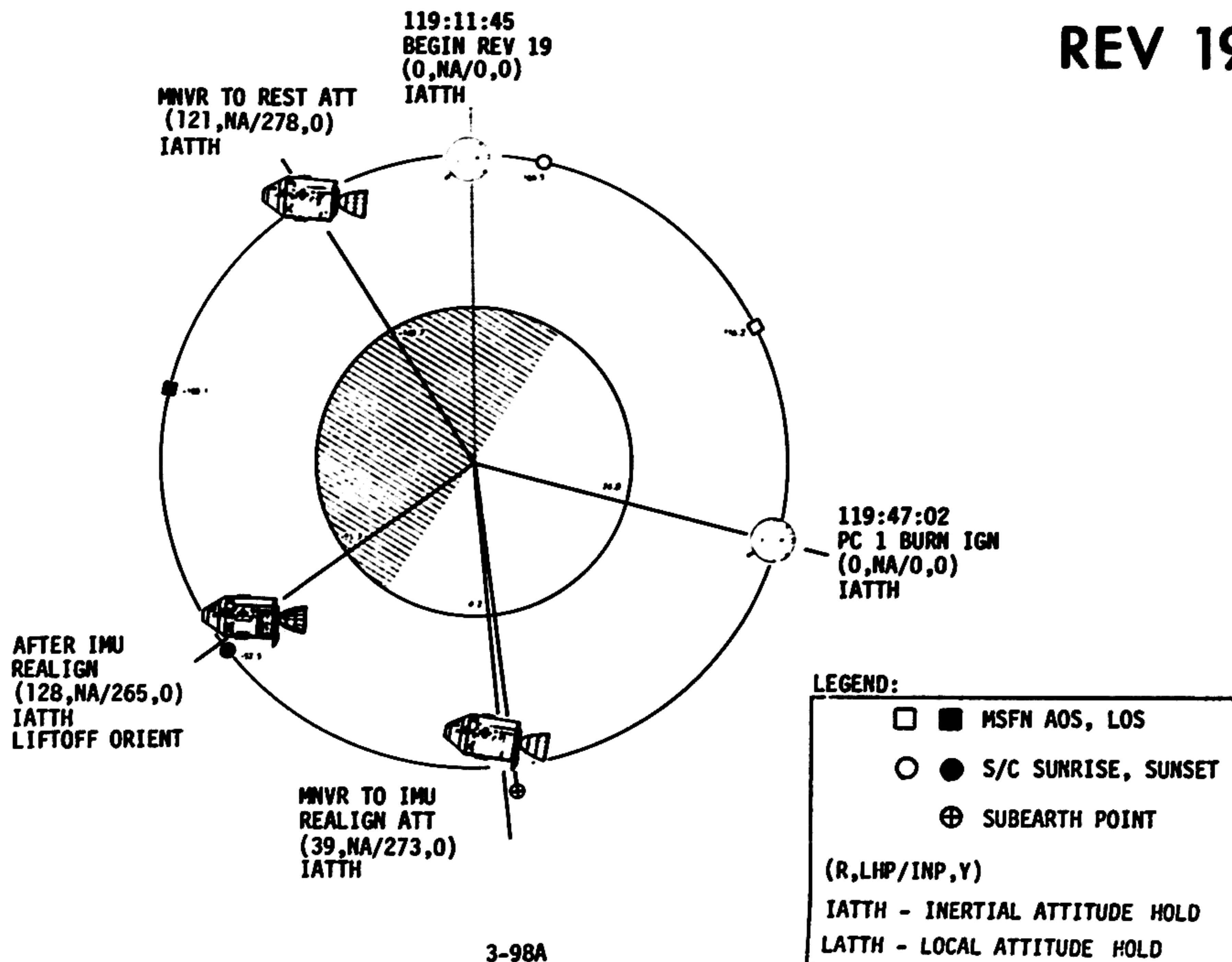
P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	NO TRIM

TABLE 3-9
3-98

REVISION B

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REV 19



3-98A

REVISION B

FLIGHT PLAN

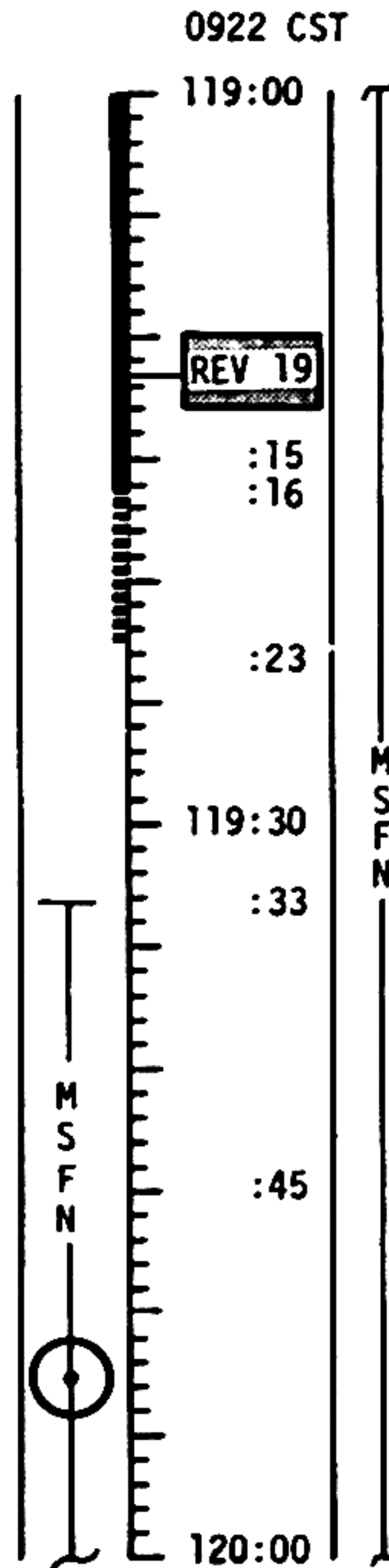
CSM

CMP

P30 - EXT ΔV
V49 - MNVR TO BURN
ATTITUDE BY 119:10
R 0, P 0, Y 0
HGA P 20, Y 276
SEXTANT STAR CHECK

P40 - SPS THRUSTING
REACQUIRE MSFN

GDC ALIGN TO IMU
SPS PLANE CHANGE #1
TIG: 119:47:01.9
BT: 19.4 SEC
 ΔVR : 372.4 FPS
ULLAGE: 2 JETS, 15 SEC
ORBIT: 61.5 X 55.6



LM

CDR

EAT PERIOD

LMP

EAT PERIOD

MCC-H

BURN STATUS REPORT			
X	X	<input type="checkbox"/>	•
X	X	<input type="checkbox"/>	•
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•
TRIM			
X	X	X	
X	X	X	
X	X	X	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	•
X	X	X	
X	X	X	
X	X	X	

ΔTIG
BT
 V_{gx}
R
P
Y
 V_{gx}
 V_{gy}
 V_{gz}
 ΔV_c *
FUEL *
OX *
UNBAL

*ITEMS TO BE REPORTED TO MSFN

UPDATE TO LM
LIFT OFF TIME FOR
REV 20 THRU 24
(ASSUMES NOM PLANE
CHANGE)

DUMP DSE

PLSS RECHARGE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	119:00 - 120:00	5/18-19	3-99

CSM

CMP

MNVR TO P52 ATT BY 120:10

R 39, P 273, Y 0HGA P 30, Y 245MAP UPDATE REV 20

LOS : _ _ _ : _ _ _

180°W: _ _ _ : _ _ _

AOS : _ _ _ : _ _ _

P52 - IMU REALIGN
OPTION 1 - PREFERRED
(LIFT OFF ORIENT)

GDC ALIGN TO IMU

VERIFY DSE MOTION @ LOS

L10H CANISTER CHANGE NO. 10
12 INTO B, STOW 10 IN A3O₂ FUEL CELL PURGE
WASTE WATER DUMP

1022 CST

120:00

:15

:23

:29
120:30

:45

121:00

M
S
F
NM
S
F
N

LM

CDR

LMP

PLSS FEEDWATER COLLECTION (BOTH)

REPORT PLSS FEEDWATER QUANTITIES

CONNECT LM O₂ SUPPLY TO PLSS & FILL (10 MIN)CONNECT LM H₂O SUPPLY TO PLSS & FILL (3 MIN)CONNECT LM O₂ SUPPLY TO 2ND PLSS & FILL (10 MIN)CONNECT LM H₂O SUPPLY TO 2ND PLSS & FILL (3 MIN)EVA DEBRIEFING
VOICE - DN VOICE BU, S-BD PWR AMPL - OFF
CREW STATUS (RADIATION, MEDICATION)

CONFIGURE SLEEP STATIONS

REST PERIOD
9 HOURSREST PERIOD
9 HOURSUPLINK TO CSM
DESIRED ORIENT
(LIFT OFF)UPDATE TO CSM
REV 20 MAP UPDATE

P52 (LIFT-OFF ORIENT)

N71: _ _ _ ' _ _ _

N05: _ _ _ ' _ _ _

N93: _ _ _ ' _ _ _

X _ _ _ ' _ _ _

Y _ _ _ ' _ _ _

Z _ _ _ ' _ _ _

GET _ _ _ : _ _ _

GO/NO-GO FOR
SECOND EVA
EXTENSION

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	120:00 - 121:00	5/19	3-100

MSC Form 1674 (OT) (June 69)

FLIGHT PLANNING BRANCH

REVISION A

FLIGHT PLAN

CSM

CMP

MNVR TO REST ATT BY 121:00
R 121, P 278, Y 0
HGA P-25, Y 261
GO INERTIAL
LOAD DAP (11110) (11111)
V21 NOTE, 3255E, 1616E

ONBOARD READOUT

BAT C _____
PYRO BAT A _____
PYRO BAT B _____
RCS A _____
B _____
C _____
D _____
DC IND SEL - MNA OR B

1122 CST

121:00

REV 20

:15

:22

121:30
:32

:45

122:00

M
S
F
N



CDR

REST PERIOD
9 HOURS

LM

LMP

REST PERIOD
9 HOURS

MCC-H

CSM PRESLEEP CHECKLIST

E-MEMORY DUMP
CREW STATUS REPORT
(medication)
ONBOARD READOUTS to MSFN
CYCLE H2, O2, FANS
CHLORINATE WATER
VERIFY:
WASTE MNGT OVBD DRAIN -
OFF
WASTE STOW VENT vlv -
CLOSED
EMER CABIN PRESS vlv -
BOTH
SURGE TK O2 vlv - ON
REPRESS O2 vlv - OFF
LM TUNNEL VENT vlv -
OFF
NORMAL LUNAR COMM EXCEPT:
S BD SQUELCH - ENABLE
HI GAIN ANTENNA TRACK -
REACQ
HI GAIN ANTENNA BEAM -
NARROW
S BD ANT - HI GAIN
VHF AM B - DUPLEX
DSE DUMP

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969.	121:00 - 122:00	5/19-20	3-101

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

REST PERIOD
9 1/2 HOURS

REST PERIOD
9 HOURS

REST PERIOD
9 HOURS

DUMP DSE

1222 CST
122:00

123:00

124:00

REV 21

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	122:00 - 124:00	5/20-21	3-102

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

REST PERIOD
9 1/2 HOURS

REST PERIOD
9 HOURS

REST PERIOD
9 HOURS

DUMP DSE

1422 CST
124:00

125:00

REV 22

:12

:19

:28

:30

126:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	124:00 - 126:00	5/21-22	3-103

FLIGHT PLAN

CSM
CMP

LM

MCC-H

CDR

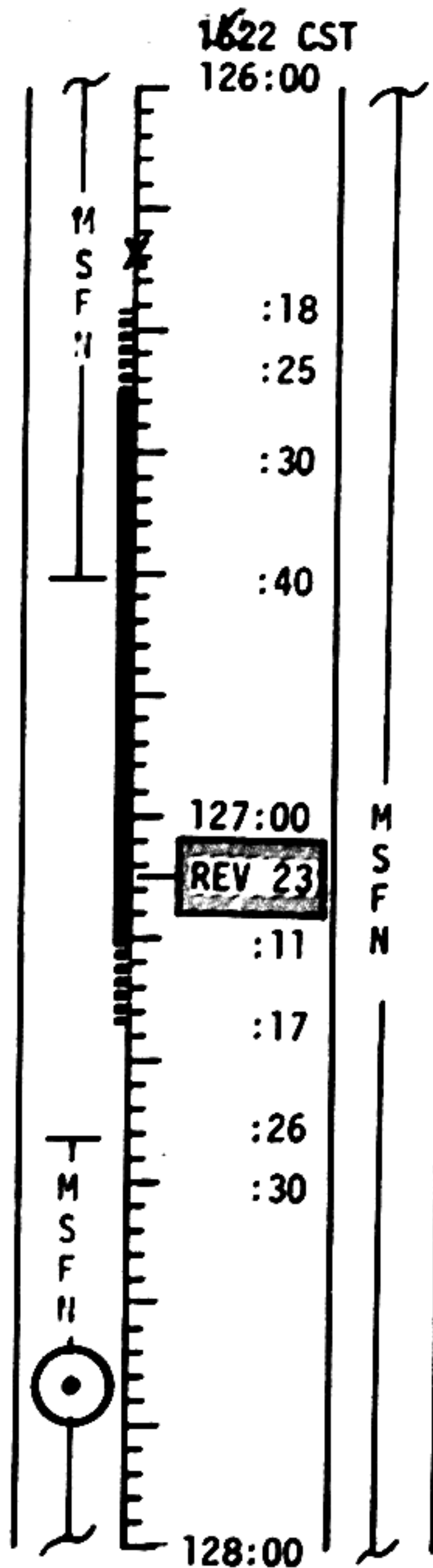
LMP

REST PERIOD
9 1/2 HOURS

REST PERIOD
9 HOURS

REST PERIOD
9 HOURS

DUMP DSE

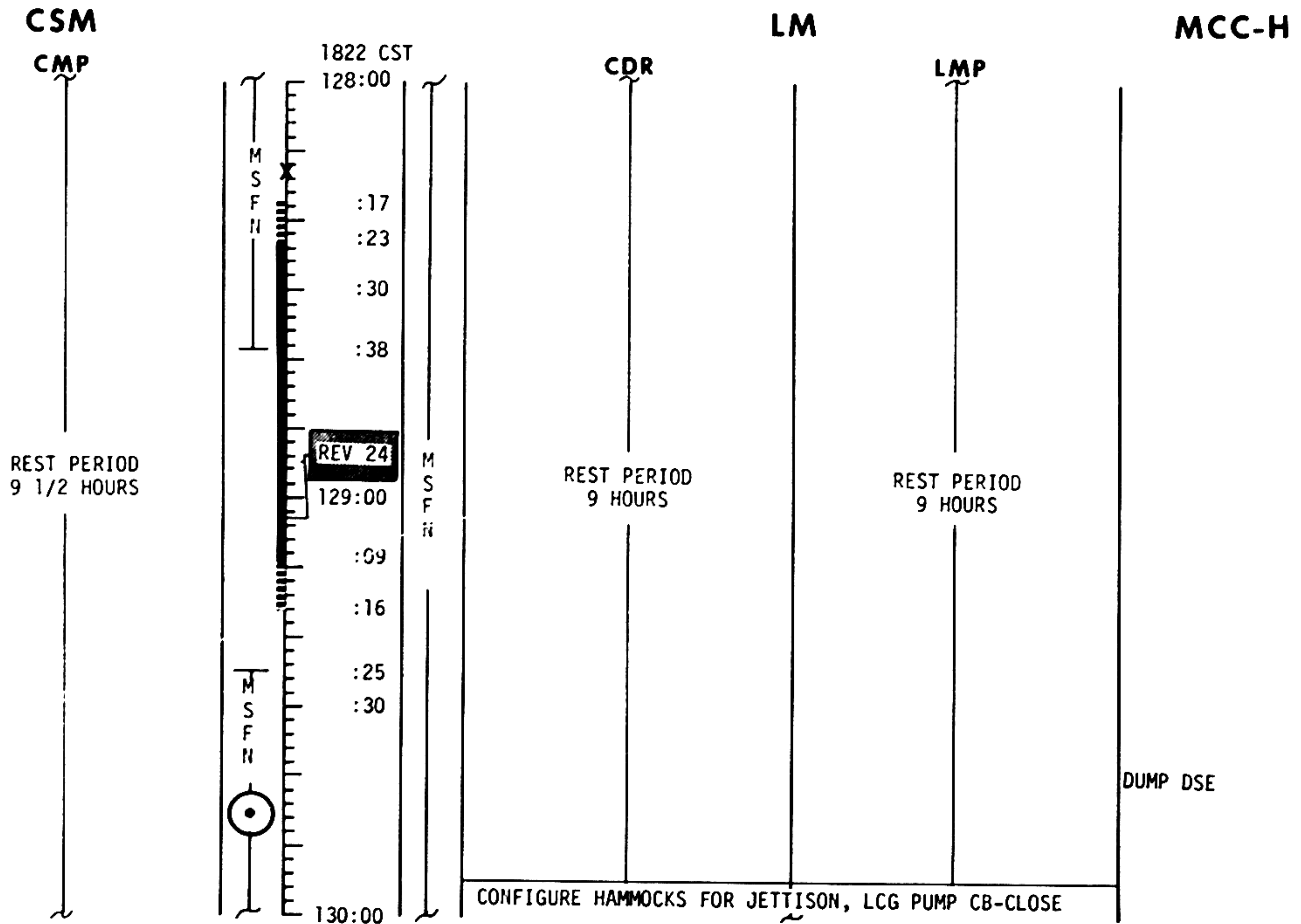


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	126:00 - 128:00	5/22-23	3-104

Form 1674 (OT) (June 69)

FLIGHT PLAN BRANCH

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	128:00 - 130:00	5/23-24	3-105

CSM

LM

MCC-H

CMP

2022 CST

130:00

CDR

LMP

S-BD PWR AMPL - PRIM, VOICE - VOICE
 CHANGE LM L10H CARTRIDGE, LGC TO OPERATE TO
 UPDATE LGC CLOCK THEN BACK TO STANDBY

M
S
F
N

:15

:22

130:30

:37

:45

M
S
F
N

131:00

REST PERIOD
 9 1/2 HOURS

STAY/NO STAY FOR EVA PREP
 CREW STATUS REPORT (SLEEP, DOSIMETER)

EAT PERIOD

EAT PERIOD

UPDATE LM
 LM CONSUMABLES
 LIFT OFF TIME FOR
 REV 25 THRU 28
 STAY/NO STAY

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	130:00 - 131:00	6/24	3-106

MSC Form 1674 (OT) (June 69)

FLIGHT PLANNING BRANCH

REVISION B

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

REST PERIOD
9 1/2 HOURS

2122 CST
131:00

REV 25

:08

:15

:23

131:30

:45

132:00

BATTERY CHARGE, BATTERY A
HGA P-24, Y254

POSTSLEEP CHECKLIST

CREW STATUS REPORT
CONSUMABLES UPDATE
FLIGHT PLAN UPDATE
CYCLE H2, O2 FANS

NORMAL LUNAR COMM EXCEPT:
S BD ANT - HI GAIN
CREW MANAGES ANT OPS

VHF AM B - DUPLEX

M
S
F
N

M
S
F
N

EAT PERIOD

EAT PERIOD

EVA PLANNING PERIOD

CABIN PREP FOR EVA

STOW ALL LOOSE ITEMS NOT REQ'D FOR EVA
UNSTOW EVA 2 PREP & POST CARD
STOW LUNAR SURFACE CHECKLIST

DUMP DSE

CREW STATUS REPORT

CMP

SLEEP? _____

PRD _____

UPDATE TO CSM
CONSUMABLES

CSM CONSUMABLES UPDATE

GET: _____:_____

RCS TOTAL _____%

QUAD A _____% B _____%

C _____% D _____%

H₂ TOTAL _____%

O₂ TOTAL _____%

EQUIPMENT PREP

SET DET FOR CABIN DEPRESS

PREPARE CAMERAS
COLLECT ITEMS FOR JETTISON
UNSTOW AND CHECK BOTH OPS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	131:00 - 132:00	6/24-25	3-107

CSM

CMP

MAP UPDATE REV 26

LOS : _ _ _ : _ _ _

180° : _ _ _ : _ _ _

AOS : _ _ _ : _ _ _

EAT PERIOD

VERIFY DSE MOTION @ LOS

P52 - IMU REALIGN
OPTION 3 - REFSMMAT
(LIFT OFF ORIENTATION)M
S
F
N2222 CST
132:00

:14

:15

:21

132:30

:35

:45

133:00

M
S
F
N

LM

CDR

LMP

EQUIPMENT PREP (CONT)

PLSS DONNING

CONFIGURE LMP'S PLSS/OPS FOR DONNING

UNSTOW RCU'S

LMP DON PLSS/OPS

UNSTOW CDRS PLSS/OPS FOR DONNING

CDR DON PLSS/OPS

VERIFY RCU CONTROLS AND CONNECT
TO PLSS/PGAPLSS COMM CHECKAUDIO SWITCHES CHECK, ACTIVATE PLSS COMM SYSTEMS
S-BD PWR AMPL-PRIM (TV CB - CLOSE THEN OPEN)FINAL SYSTEMS PREPCONNECT OPS O₂ HOSES

DON HELMETS

CONNECT PLSS H₂O HOSES

LCG PUMP CB-OPEN

DON GLOVES

VERIFY ITEMS PREPARED FOR JETTISON

VERIFY EVA CB CONFIGURATION

PRESSURE INTEGRITY CHECKPLSS O₂ ON

CABIN DEPRESS

CONFIRM "GO" FOR EVA
DEPRESS CABIN TO 3.5 PSIA

MCC-H

UPLINK TO CSM
CSM STATE VECTOR

-1:00

UPDATE TO CSM
MAP UPDATE REV 26

-:50

-:40

P52 (LIFT-OFF ORIENT)

N71: _ _ _ , _ _ _

N05: _ _ _ . _ _ _

N93: _ _ _ . _ _ _

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

Z _ _ _ . _ _ _

GET _ _ _ : _ _ _

-:10

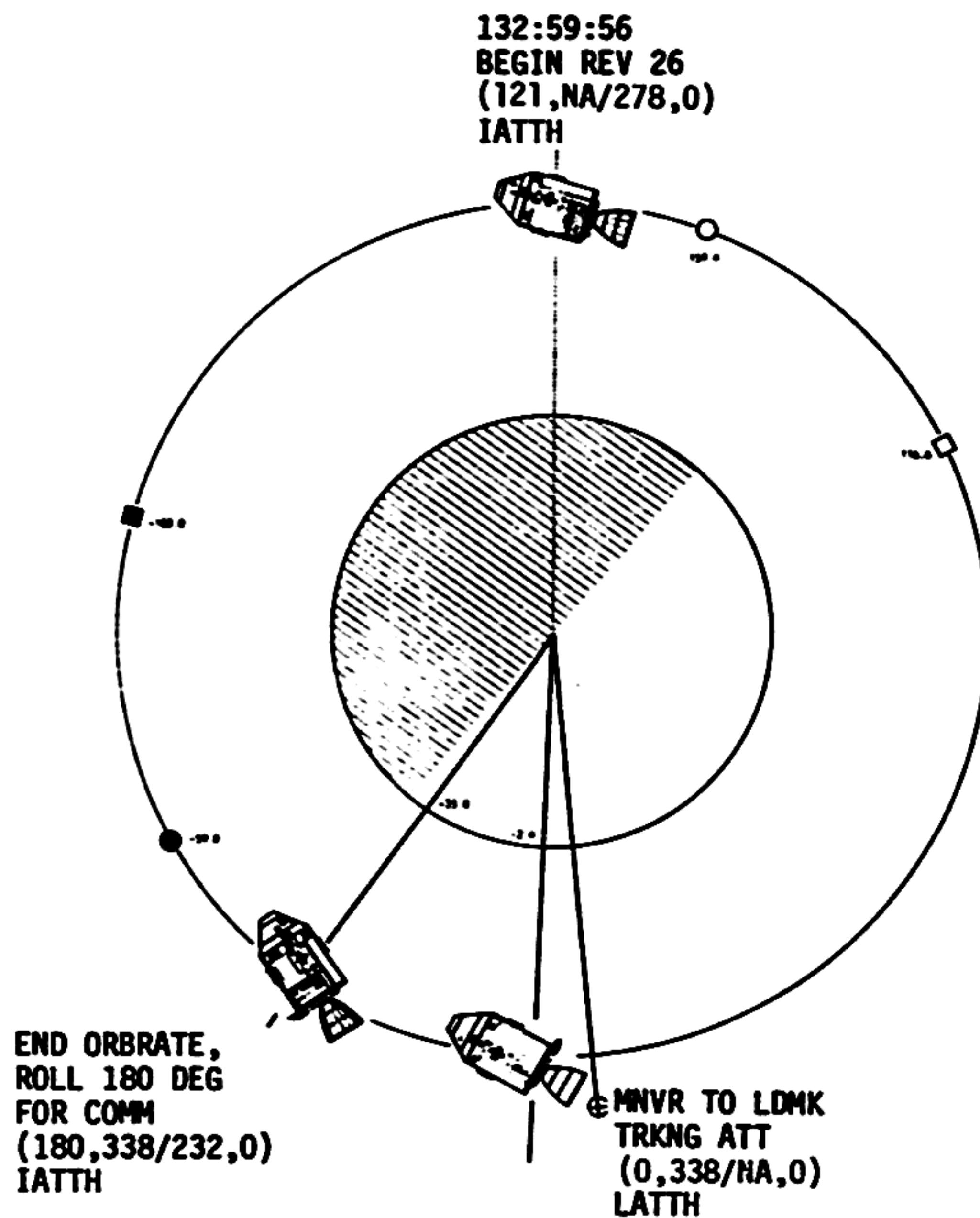
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	132:00 - 133:00	6/25	3-108

MSC Form 1674 (OT)(June 69)

FLIGHT PLANNING BRANCH

REVISION A

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LEGEND:

- ■ KSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-108A

REVISION B

FLIGHT PLAN

CSM

CMP

P52 - IMU REALIGN (CONT)

UNSTOW S-158

REACQUIRE MSFN

HGA P -24, Y 254

SET UP DAC FOR LDMK
TRACKING PHOTOS THRU SXT

CM/DAC/SXT/CEX, (SEE LDMK
TRACK PAD) 1FPS (5MIN)

MAP UPDATE REV 27

LOS : _____ : _____ : _____

180° : _____ : _____ : _____

AOS : _____ : _____ : _____

VERIFY DSE MOTION

MNVR TO TRACK ATT

BY 134:00

R 0, P 338N/A, Y 0

OMNI D

GO ORB RATE

2322 CST

133:00

REV 26

:07

:13

:15

:21

133:30

M
S
F
N

:45

134:00

M
S
F
N

CDR

LM

LMP

SET ~~DET~~ & CHRONOMETER
FWD DUMP VALVE - OPEN

OPEN FWD HATCH

FINAL PREP FOR EGRESS

PLSS H₂O ON, FINAL SYSTEMS CHECK, TURN TV ON
VERIFY CB CONFIGURATION, JETTISON BAG & LHSSC

CDR EGRESS

ETB TRANSFER

TRANSFER ETB TO SURFACE

ASSIST CDR

GEOLOGY TRAVERSE PREP

STOW TOOLS & EQUIP ON HTC

RETRIEVE & OPEN SRC #2

ATTACH SADDLE BAG TO LMP

UNSTOW SRC #2

SEAL ORGANIC CONT SAMPLE

LMP EGRESS

DESCEND TO SURFACE

ATTACH PARTS BAG TO CDR

~~PUT COLOR MAG IN SADDLE BAG~~

CONTRAST CHART PHOTOS

POSITION TV FOR GEOLOGY

TRAVERSE

GEOLOGY TRAVERSE

COLLECT DOCUMENTED SAMPLES
NOTE: 1ST DOCUMENTED SAMPLE POLARIZED
COLLECT CORE TUBE SAMPLES
TRENCH SITE SAMPLING
COLLECT GAS ANALYSIS SAMPLES
MAKE GENERAL OBSERVATIONS

START EVA
0:00

0:10

DUMP DSE
0:20

0:30

UPDATE TO CSM
MAP UPDATE REV 27

P22 TRACKING PAD

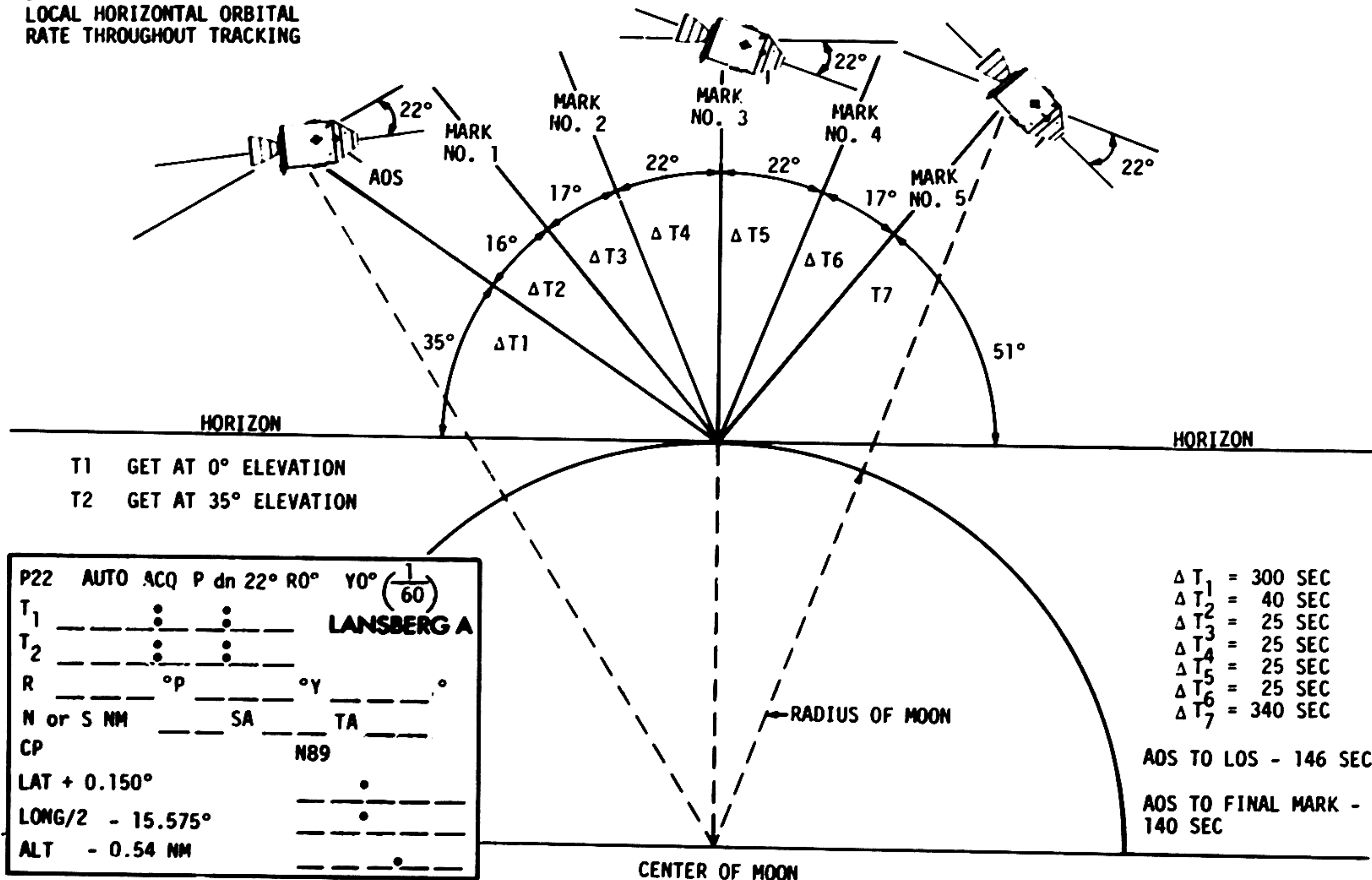
0:40

0:50

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV.14)	OCTOBER 15, 1969	133:00 - 134:00	6/26	3-109

22 DEG PITCH DOWN FROM
LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING

CSM LANDMARK TRACKING PROFILE



CENTER OF MOON

FIGURE 3-3
3-110

FLIGHT PLAN

CSM

CMP

0022 CST

LM

MCC-H

CDR

LMP

START DAC T2(-) 1 MIN

TRACK LANSBERG A
DO NOT PRO ON FINAL N89
25 SEC BETWEEN MARKS
5 MARKS

STOP DAC AFTER MARK 5

STOP ORB RATE @ P 232
MNVR TO ACO MSFN,
GO INERTIAL

R 180, P 232, Y 0
HGA P -26 Y 186

VERIFY DSE MOTION @ LOS

MSFN

134:00

:12

:15

:19

134:30

:33

:45

REV 27

135:00

MSFN

COLLECT DOCUMENTED SAMPLES
COLLECT CORE TUBE SAMPLES
TRENCH SITE SAMPLING
COLLECT GAS ANALYSIS SAMPLES
MAKE GENERAL OBSERVATIONS

1:00

UPDATE TO CSM
S-158 PAD (REV 27)

1:10

1:20

1:30

1:40

1:50

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	134:00 - 135:00	6/26-27	3-111

S-158 REV 27

BLUE, GREEN, BLACK - (f5.6) _____, RED (f4.0) _____

T₁ START BLUE, GREEN & RED CAMERAS @ 135:19:00 (_____:_____:_____)
START BLACK CAMERA @ T₁ + 5 MIN

T₂ STOP ALL CAMERAS @ 135:30:00 (_____:_____:_____)

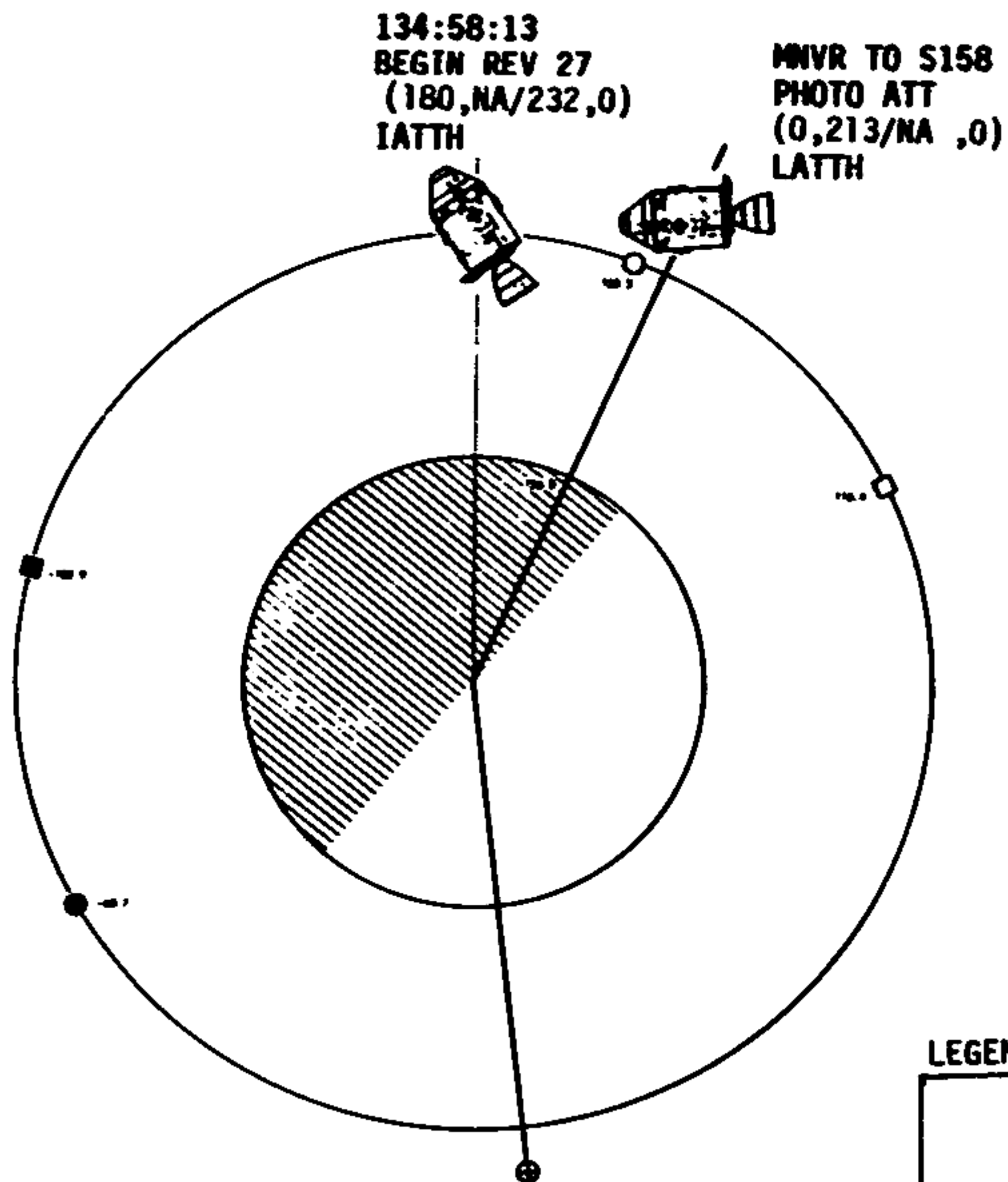
T₃ START BLUE, GREEN & RED CAMERAS @ 135:40:00 (_____:_____:_____)
START BLACK CAMERA @ T₃ + 7 MIN

T₄ STOP ALL 4 CAMERAS @ 136:02:00 (_____:_____:_____)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	135:00 - 136:00	6/27	3-112

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REV 27



LEGEND:

- ■ MSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

3-112A

REVISION B

FLIG'T PLAN

CSM

CMP

MIVR TO S158 ATT
BY 135:06
R 0, P 213/N/A, Y 0
OMNI D
GO ORB RATE

START BLU, GRN&RED CAMERAS

S-158 PHOTOGRAPHY

START BLK CAMERA

STOP ALL CAMERAS

SW TO OMNI A
@ 135:36

START BLU, GRN&RED CAMERAS

ACQUIRE MSFN @ 135:42
HGA P -13, Y 174

START BLK CAMERA

S-158 PHOTOGRAPHY

0122
0222 CST
135:00

:05

:11

:15

:19

135:30

:45

136:00

MSFN

MSFN

LM

CDR

LMP

SURVEYOR SITE ACTIVITIES

PHOTOGRAPH AND COLLECT SAMPLES
PHOTOGRAPH SURVEYOR
COLLECT GLASS SAMPLES

COLLECT WITH LMP ASSISTANCE:

STERILE CABLE SAMPLE
ALUMINUM TUBE SAMPLE
TV CAMERA

GEOLOGY RETURN TRAVERSE

GEOLOGY RETURN TRAVERSE

SRC 2 PACKING
PLACE 70MM CAM IN ETB
RETRIEVE SWC FOIL
PACK SAMPLES IN SRC

POSITION TV TO VIEW LM
PLACE SURVEYOR PARTS
IN +Z PAD
RETRIEVE ALSSC&TAKE PHOTOS
OF SURFACE
PUT ALSSC FILM IN ETB

2:00

2:10

2:20

2:30

DUMP DSE

2:40

2:50

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	135:00 - 136:00	6/27	3-113

FLIGHT PLAN

CSM

LM

MCC-H

CMP

STOP ALL CAMERAS
CONTINUE ORB RATE

0222 CST

CDR

LMP

136:00

CHECK & CLEAN LMP EMU
CLOSE & SEAL SRC

EVA TERMINATION
STOW 70MM CAMERA IN ETB
CLEAN EMU
ASCEND TO PLATFORM, INGRESS
CHECK EMU & LM SYSTEMS

3:00

UPDATE TO CSM
MAP UPDATE REV 28
S-158 PAD (REV 28)

:12

LEC TRANSFERS
CHECK 70MM(2) IN ETB
CLOSE & TRANSFER ETB
REST/CHECK EMU
ATTACH LEC TO SRC
TRANSFER SRC INTO LM
REST/CHECK EMU

ASSIST CDR WITH TRANSFERS

3:10

:15

:18

TRANSFER SURVEYOR PARTS BAG

DISCARD LEC

3:20

EVA TERMINATION
CLEAN EMU, ASCEND TO
PLATFORM
INGRESS

136:30

:32

CLOSE HATCH & REPRESS CABIN

3:30

POST EVA SYSTEMS CONFIGURATION
CONFIGURE VALVES AND CIRCUIT BREAKERS

DOFF GLOVES

DISCONNECT OPS O2 HOSES & CONNECT LM O2 HOSES
DISCONNECT PLSS H2O HOSES & CONNECT LM H2O HOSES
LCG PUMP CB-CLOSE
SWITCH TO LM COMM SYSTEM

:45

PLSS/OPS DOFFING

REMOVE RCU'S DISCONNECT PLSS O2 HOSES

DOFF PLSS/OPS
REMOVE OPS & CHECKOUT

REV 28

137:00

VERIFY DSE MOTION @ LOS

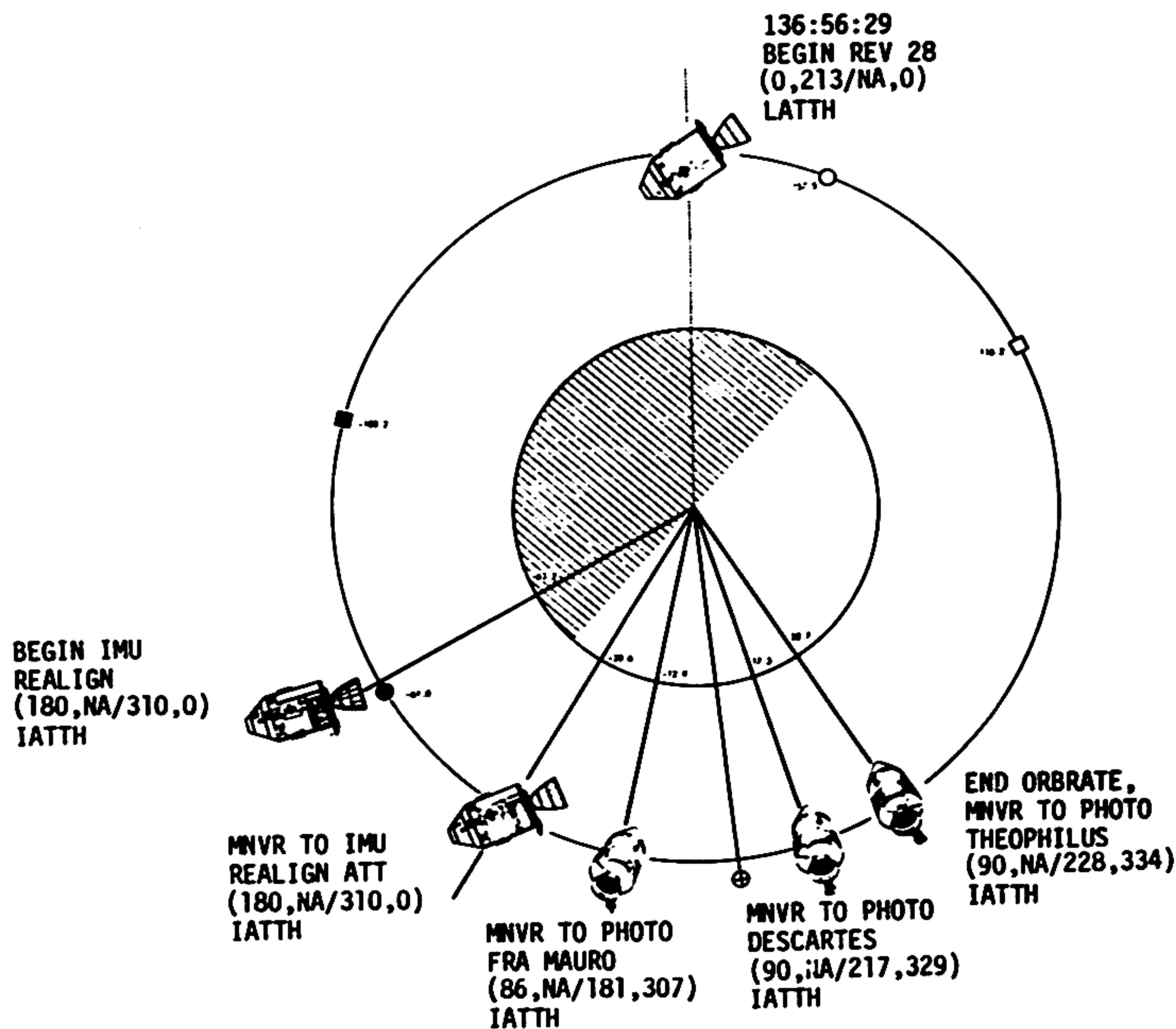
M
S
F
N

M
S
F
N

MAP UPDATE REV 28			
LOS	:	---	:
180°	:	---	:
AOS	:	---	:

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	136:00 - 137:00	6/27-28	3-114

REV 28



LEGEND:

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

3-114A

REVISION B

S-158 REV 28

BLUE, GREEN, BLACK (f8.0) _____, RED (f5.6) _____

T1 START ALL CAMERAS @ 137:27:00 (____:____:____)

T2 STOP ALL CAMERAS @ 137:40:00 (_____:_____:_____)

SELECTED TARGETS

NORTH WALL OF THEOPHILUS

R____, P____, Y____

BLUE, GREEN, BLACK (f5.6) _____, RED(f4.0) _____

T1 START ALL CAMERAS @ 137:47:00 (_____:_____:_____)

T₂ STOP ALL CAMERAS AFTER 2 PHOTOS (20 SEC)

DESCARTES

R____, **P**____, **Y**_____

NO CHANGE IN f STOPS

T1 START ALL CAMERAS @ 137:51:00 (_____:_____:_____)

T₂ STOP ALL CAMERAS AFTER 2 PHOTOS (20 SEC)

FRA MAURO

R _____, P _____, Y _____

ALL CAMERAS (f2.8) _____

T1 START ALL CAMERAS @ 138:01:00 (____:____:____)

T₂ STOP ALL CAMERAS AFTER 2 PHOTOS (20 SEC)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	137:00 - 138:00	6/28	3-115

FLIGHT PLAN

CSM

LM

MCC-H

CMP

VERIFY ORB RATE
R 0, P 213/N/A, Y 0
OMNI D

0322 CST

CDR

LMP

BATTERY CHARGE, BATTERY B

START ALL CAMERAS

S-158 PHOTOGRAPHY

STOP ALL CAMERAS
STOP ORB RATE, V49-MNVR
BY 137:45

R 90, P 228, Y 334

S-158 THEOPHILUS

V49-MNVR BY 137:50

R 90, P 217, Y 329

S-158 DESCARTES

V49-MNVR BY 138:00

R 86, P 181, Y 307

137:00

:04

:10

:15

:18

137:30

:45

138:00

STOW OPS ON ENGINE COVER
STOW BOTH PLSS ON FLOOR
VERIFY CB CONFIGURATION
RR OPR HTR - ON
DOFF LUNAR BOOTS

PREP FOR EQUIPMENT JETTISON
UNSTOW 70MM CAM FROM ETB
PHOTO LUNAR SURFACE
CONFIGURE 16MM SEQ CAMERA
STOW EQUIPMENT IN LHSCC
PLSS FEEDWATER COLLECTION (BOTH)
REPORT PLSS FEEDWATER QUANTITIES
POSITION LHSCC, JETT BAG, AND PLSS'S FOR JETTISON
DON EV GLOVES

UPDATE TO CSM
MAP UPDATE REV 29

PRESSURE INTEGRITY CHECK
CHECK VALVE POSITIONS
VERIFY GAGE READINGS

CABIN DEPRESS
OPEN DUMP VALVE

HATCH OPENING
OPEN HATCH
JETTISON EQUIPMENT

MAP UPDATE REV 29

LOS : _ _ _ : _ _ _ : _ _ _
180° : _ _ _ : _ _ _ : _ _ _
AOS : _ _ _ : _ _ _ : _ _ _

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	137:00 - 138:00	6/28	3-116

CSM

LM

MCC-H

CMP

0422 CST

CDR

LMP

S-158 FRA MAURO
MNVR TO P52 ATT BY 138:06

R180, P310, Y 0
HGA P-74, Y337
GO INERTIAL
RR TRANSPONDER ACTIVATION
AND SELF TEST

P52 - IMU REALIGN
OPTION 3 - REFSMMAT
(LIFT-OFF ORIENT)

VERIFY DSE MOTION @ LOS

STOW S-158

EAT PERIOD

M
S
F
N

138:00

:10

:15

:16

138:30

:45

REV 29

139:00

M
S
F
N

CABIN REPRESS
DUMP VALVES - AUTO, REPRESS CABIN
VERIFY MASTER ALARM & WARNING LIGHTS ON
DOFF GLOVES, HELMETS, & VISORS

POST EVA CLEAN UP
SECURE OPS'S ON FLOOR
STOW EQUIPMENT
STOW SRC #2
STOW SURVEYOR BAG
STOW ALL EVA ON BOARD DATA
IN FLT DATA FILE

EVA DEBRIEFING

CREW STATUS REPORT (MEDICATION, DOSIMETER)

EAT PERIOD

EAT PERIOD

DUMP DSE

P52 (LIFT OFF-ORIENT)

N71: _____

N05: _____

N93: _____

X _____

Y _____

Z _____

GET _____:_____:_____

UPDATE TO LM
LIFTOFF TIME FOR
REV 29 & 30
P22 ACQ TIME 28° EL
LM CONSUMABLE PAD

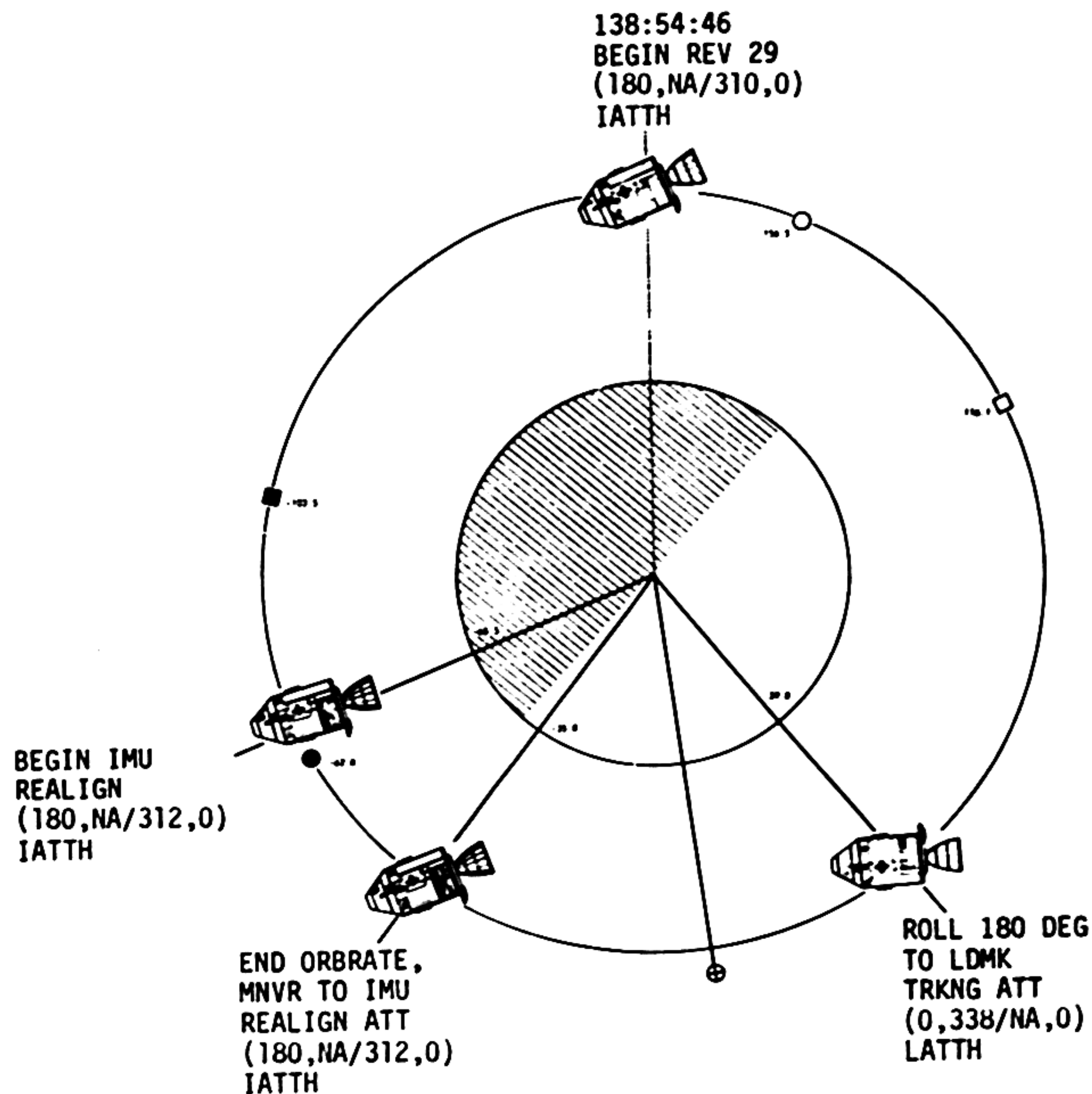
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	138:00 - 139:00	6/28-29	3-117

MSC Form 1674 (OT)(June 69)

FLIGHT PLANNING BRANCH

REVISION A

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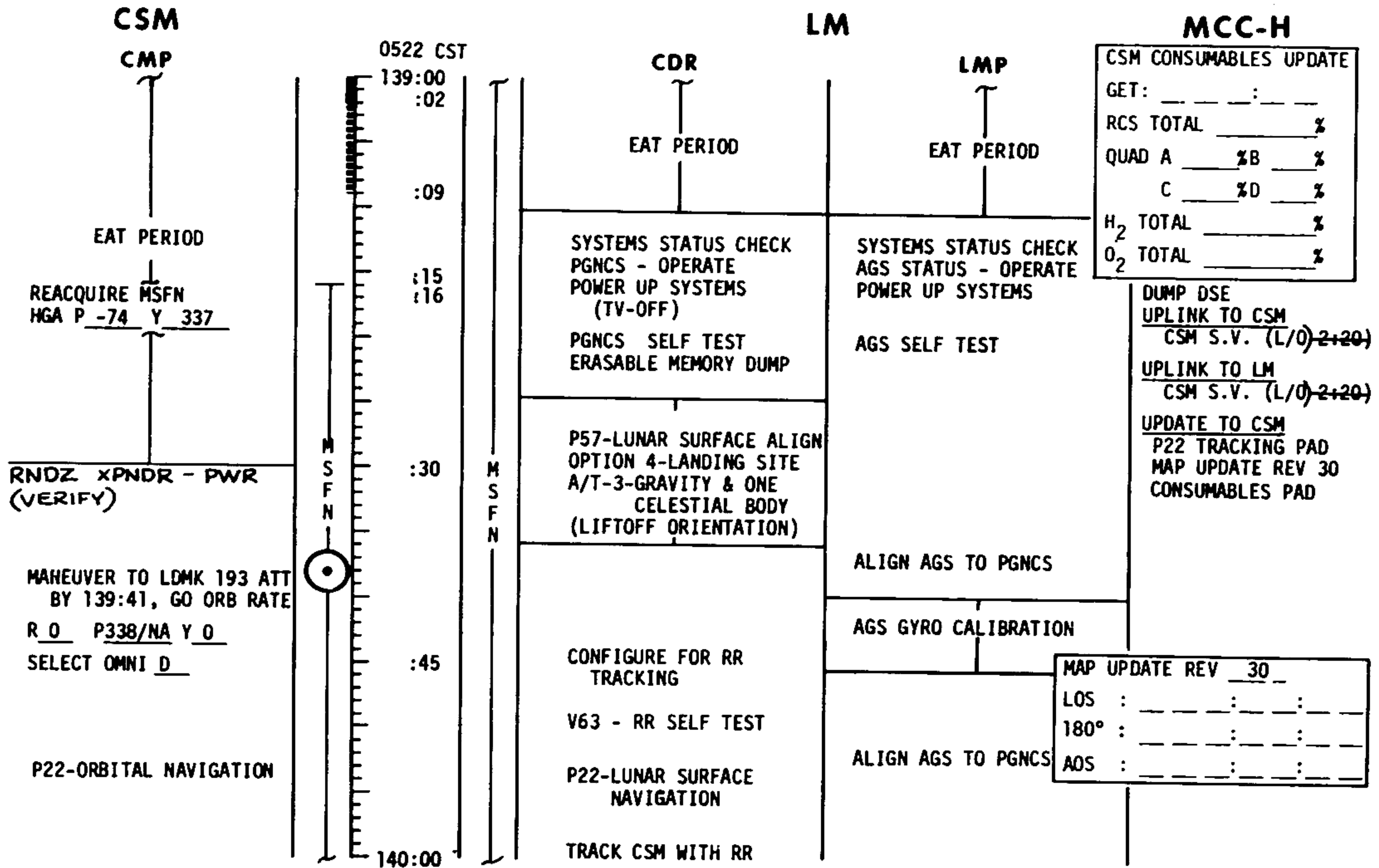
LEGEND:

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

3-117A

REVISION B

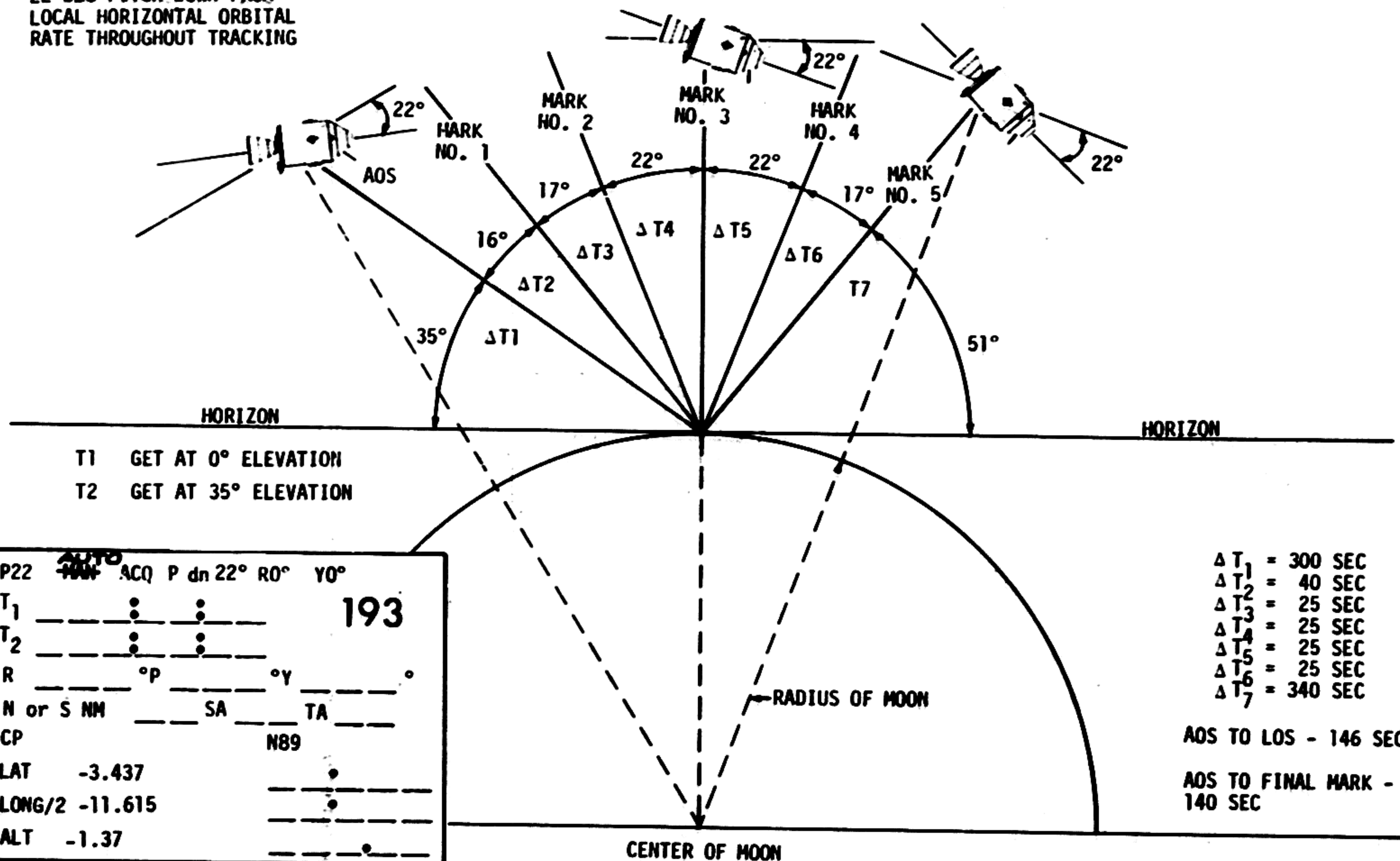
FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	139:00 - 140:00	6/29	3-118

CSM LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM
LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING



CENTER OF MOON

FIGURE 3-3

3-118a

FLIGHT LAN

CSM

LM

MCC-H

CMP

0622 CST

CDR

LMP

TRACK LANDMARK 193
DO NOT PRO ON FINAL N89
25 SEC BETWEEN MARKS
5 MARKS

STOP PITCH AND MANEUVER
TO P52 ATTITUDE BY
140:06

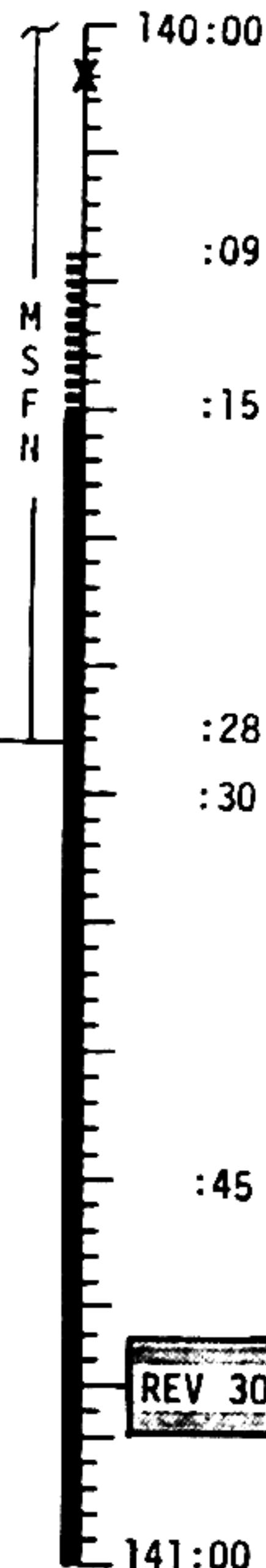
R 180 P 312 Y 0
HGA P -73 Y 338

P52 - IMU REALIGN
OPTION 3- REFSMMAT
(LIFTOFF ORIENTATION)

REPORT GYRO TORQUE ANGLES
GDC ALIGN TO IMU
VERIFY DSE MOTION
AT LOS

H₂ PURGE LINE HTR-ON

O₂ & H₂ FUEL CELL PURGE
WASTE WATER DUMP



TRACK CSM WITH RR

RATE GYRO CHECK

RCS CHECKOUT

V47-AGS INITIALIZATION

LOAD AGS ASCENT TGT:
H = 60,000 FT
H DOT = 9 FT/SEC

UPLINK TO CSM
RESET SURFACE FLAG
LM S.V. (INS + 18)

UPLINK TO LM
LGC GYRO COMPENSATION
UPDATE TO LM
ASCENT PAD
CSI PAD
AGS K FACTOR
LM & CSM DAP WEIGHTS

P52 (LIFT-OFF ORIENT)

N71: _ _ _ _

N05: _ _ _ _

N93: _ _ _ _

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

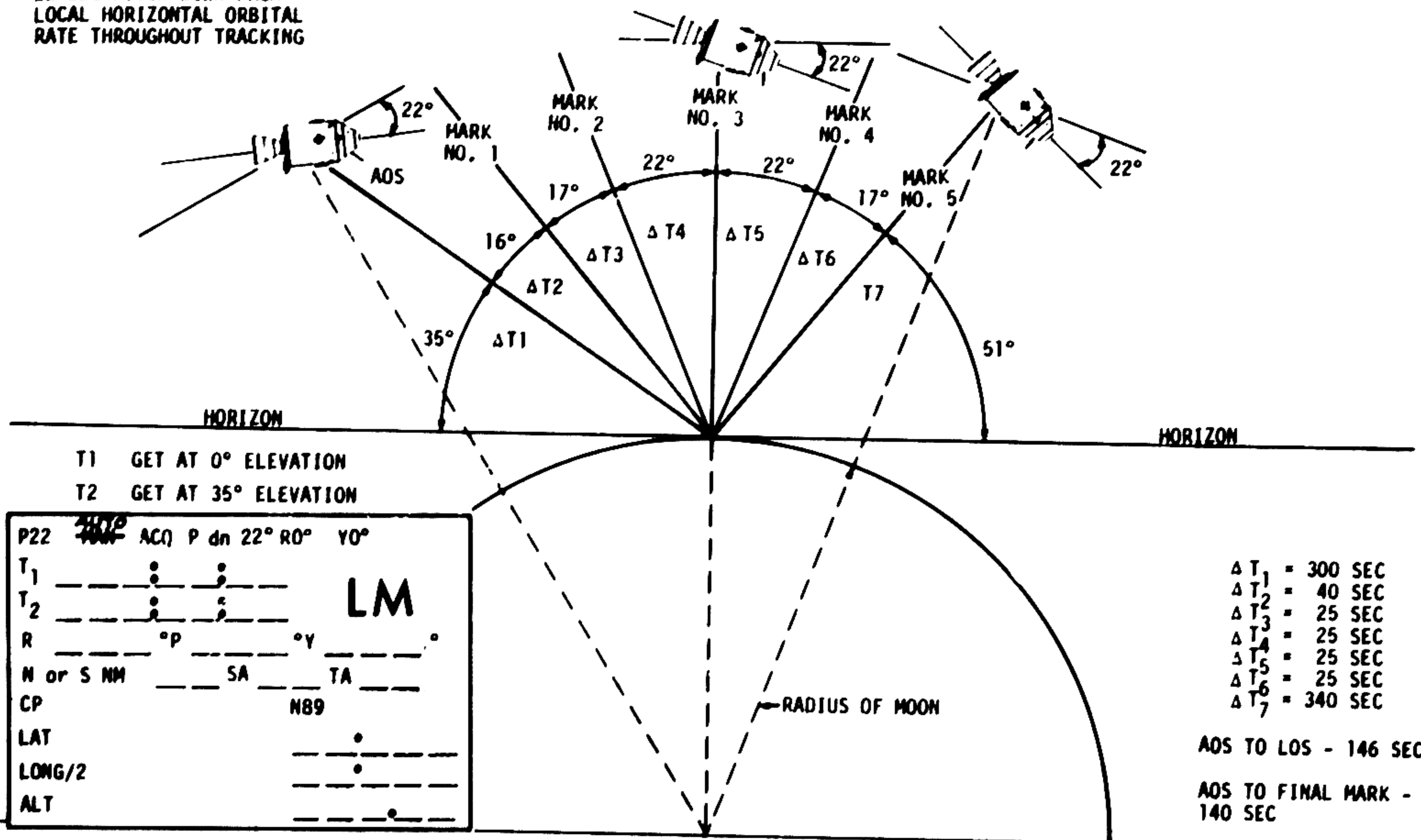
Z _ _ _ . _ _ _

GET _ _ _ : _ _ _

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	140:00 - 141:00	6/29-30	3-119

CSM LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM
LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING



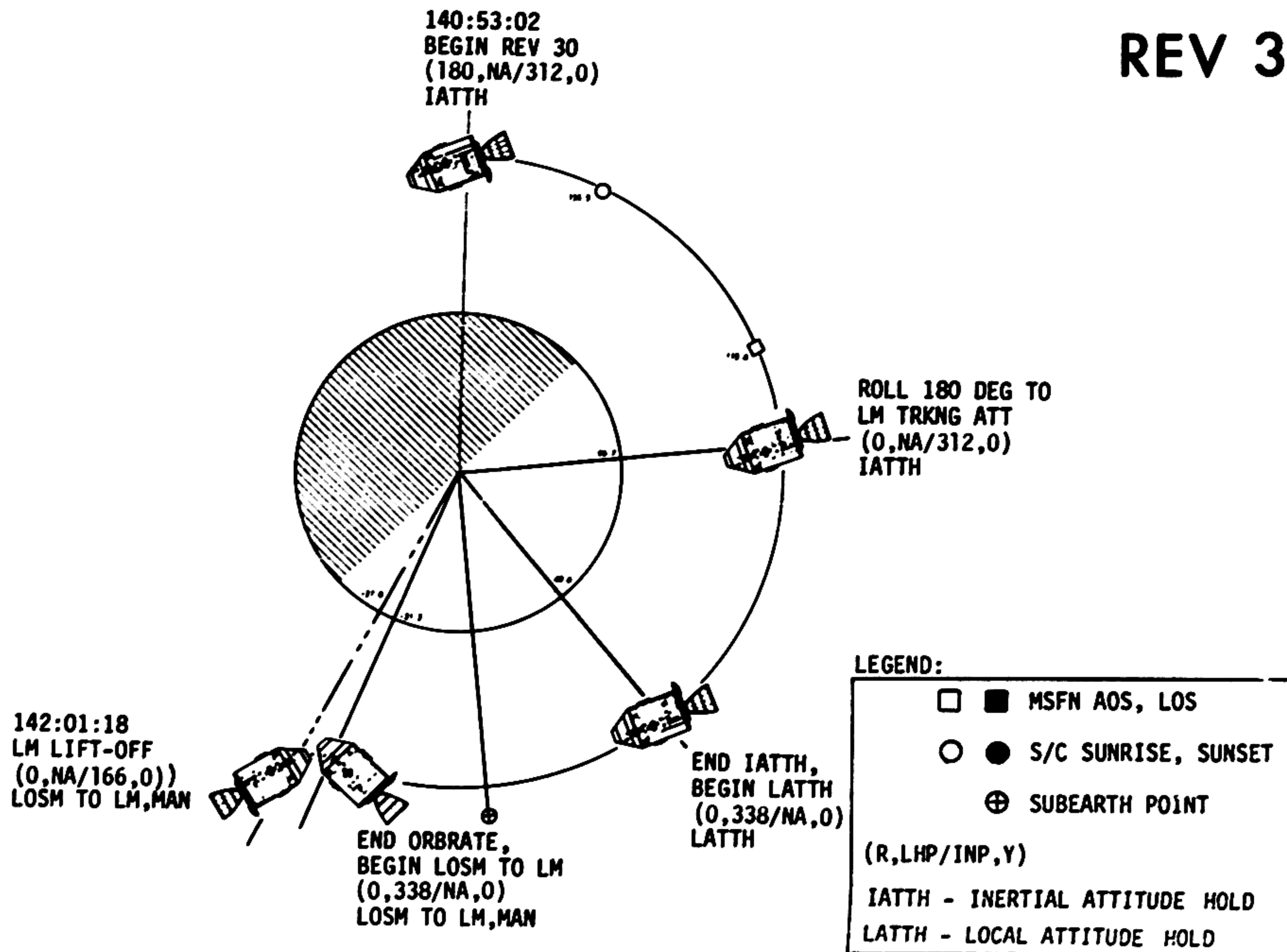
NOTE: Coordinates of LM to be updated
Real time

CENTER OF MOON

FIGURE 3-3

3-120

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3-120A

REVISION B

FLIGHT PLAN

CSM

CMP

SET UP CAMERAS FOR DOCKING
CM2/DAC/18/CEX-

BRKT, MIR(f8,250,7)
6 FPS, 1 MAG, 16 MIN

CM2/EL/80/CEX
(f8,250,FOCUS), 10
CM4/TV-IN BRKT (f22)

REACQUIRE MSFN

HGA: P -73, Y 338

V49-MNVR TO LM TRACK
ATT BY 141:21

R 0 P 312 Y 0

OMNI D

P22-ORBITAL NAVIGATION

GO ORB RATE @ 141:39

R 0 P 338/NA Y 0

TRACK LM @ AOS

0722 CST

141:00
:01

:08

:14
:15

:30

:45

142:00

M
S
F
N

M
S
F
N

CDR

LM

LMP

MCC-1.

P57-LUNAR SURFACE ALIGN
OPTION 4-LANDING SITE
A/T-3-GRAVITY & ONE
CELESTIAL BODY
(LIFTOFF ORIENTATION)

DON HELMET & GLOVES
LOAD DAP N46-12002
PI2-POWERED ASCENT
GO/NO-GO FOR LIFTOFF

PRELAUNCH SWITCH CHECKS
VENT DPS & SHe

VERIFY CB STATUS
CHECK APS BURN CARD

CHECK APS,RCS,EPS,ECS

ALIGN AGS TO PGNCs
DON HELMET & GLOVES
SET CAMERA FOR ASCENT:
LM3/DAC/10/CEX(f2.8,500,30)
12 FPS, 1 MAG, 8 MIN
ASCENT BATS-ON,DES 1&3-OFF
ENTER AGS LUNAR ALIGN
PRELAUNCH SWITCH CHECKS

V47-AGS INITIALIZATION
LIFTOFF COMM
DES BATS 2&4 - OFF
DEADFACE DES BATS
VERIFY CB STATUS
CHECK APS BURN CARD

CHECK APS, RCS, EPS, ECS

SEQ CAMERA - ON

MAP UPDATE REV 31

LOS : _ _ _ _ : _ _ _

180° : _ _ _ _ : _ _ _

AOS : _ _ _ _ : _ _ _

UPDATE TO CSM

LM TRACKING PAD

~~MAP UPDATE REV 31~~

UPLINK TO CSM(IF REQ)

LM S.V. (INS + 18)

CSM S.V. (INS + 18)

UPLINK TO LM (IF REQ)

CSM S.V. (INS + 18)

RLS

GO/NO-GO FOR LIFTOFF
FOR REV 30

L/O - 6 MINUTES:
DISABLE MSFN RELAY

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	141:00 - 142:00	6/30	3-121

FLIGHT PLANNING BRANCH

REVISION A

CSM

LM

MCC-H

CMP

0822 CST

CDR

LMP

CMC FREE @ TRUN ANGLE=22°
NULL LM LOS RATES WITH
MINIMUM IMPULSE CONTROL

CONFIRM INSERTION
V64 ACQUIRE MSFN
VHF RANGING

P52-IMU REALIGN
OPTION 3-REFSMAT
(LIFTOFF ORIENTATION)
REPORT GYRO TORQUE ANGLES
VERIFY DSE MOTION @ LOS
P20 - RNDZ NAVIGATION
P32-TARGET CSI
SXT & VHF TRACKING

FINAL CSI COMP

P40-SPS THRUSTING
SPS CHECKLIST

BACKUP CSI
CONFIRM LM CSI

M
S
F
N

142:00
:07
:12
:14
:15
:26
:27
:30
:45
143:00

REV 31

M
S
F
N

ABORT STAGE
YAW RIGHT 20° FOR COMM

APS LIFTOFF

INSERTION

NULL RESIDUALS
LOAD DAP, N46-11002

P52-IMU REALIGN
OPTION 3 - REFSMMAT
(LIFTOFF ORIENTATION)

V48-LOAD DAP, N46 - 11012
P32 - TARGET CSI
RNDZ RADAR TRACKING

FINAL CSI COMPUTATION
P41-RCS THRUSTING

NULL RESIDUALS

STOP 16 MM CAMERA
ECS CHECK

RR-ON
P20-RENDEZVOUS NAVIGATION
PCM-LO, OMNI - AFT
BIOMED - OFF

CHECK RCS, EPS, ECS

LOAD AGS CSI EXT ΔV

RCS

CSI

TIG: 142:01:17.9
BT: 7:10
ΔVR: 6046.2 FT/SEC
ORBIT: 44.7x8.3
GET: 142:08:27.9

DUMP DSE
UPLINK TO CSM
LM STATE VECTOR

TIG: 142:58:05.2
BT: 45.3 SEC
ΔVR: 50.3 FT/SEC
ORBIT: 45.6x44.6

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	142:00 - 143:00	6/30-31	3-122

FLIGHT PLANNING BRANCH

REVISION B

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

0922 CST
143:00

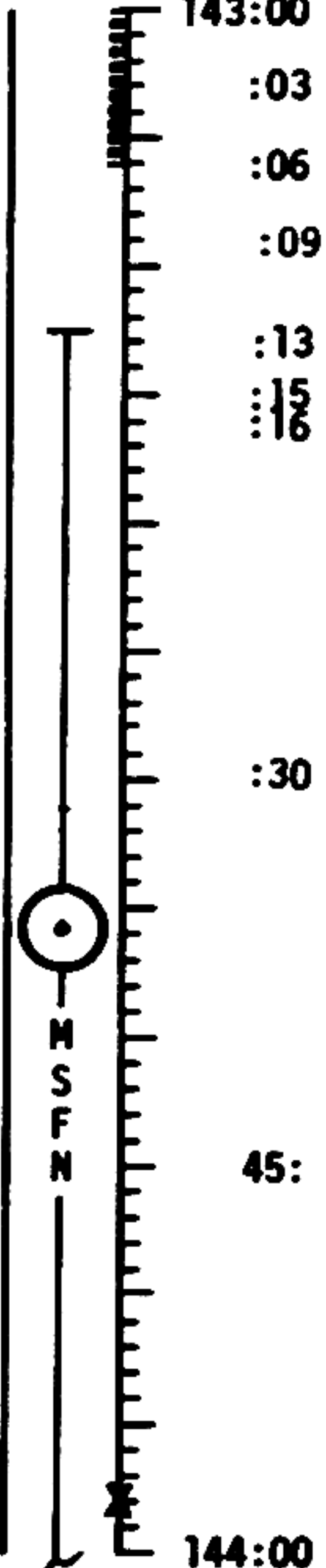
P20 AUTO MNVR TO
TRACK ATTITUDE
SXT & VHF TRACKING

OMNI D

CONFIRM LM PC
P33 - TARGET CDH
SXT & VHF TRACKING

FINAL CDH COMP
P41 - RCS THRUSTING
RCS CHECKLIST

CDH BACKUP
CONFIRM LM CDH
P20-AUTO MNVR TO TRACK ATT



P33-TARGET CDH
RNDZ RADAR TRACKING

P30-TARGET PLANE CHANGE
(IF PLANE CHANGE NOT REQUIRED, CONTINUE TRACKING FOR CDH)

OMNI-FWD, BIOMED-RIGHT
PCM-H1
LOAD AGS PC EXT ΔV
CSI BURN STATUS
REPORT

P41-RCS THRUSTING

RCS PLANE CHANGE

GET: 143:26:27.5
 ΔV_R : NOM ZERO

P33 TARGET CDH
RNDZ RADAR TRACKING

CHECK RCS, EPS, ECS

FINAL CDH COMPUTATION
(IF CDH NOT REQUIRED, TERMINATE TRACKING AND P33)

P41-RCS THRUSTING

LOAD AGS CDH EXT ΔV

RCS

CDH

GET: 143:56:27.5
 ΔV_R : NOM ZERO

NULL RESIDUALS
P34-TARGET TPI

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	143:00 - 144:00	6/31	3-123

FLIGHT PLANNING BRANCH

REVISION A

CSM

1022 CST

LM

MCC-H

CMP

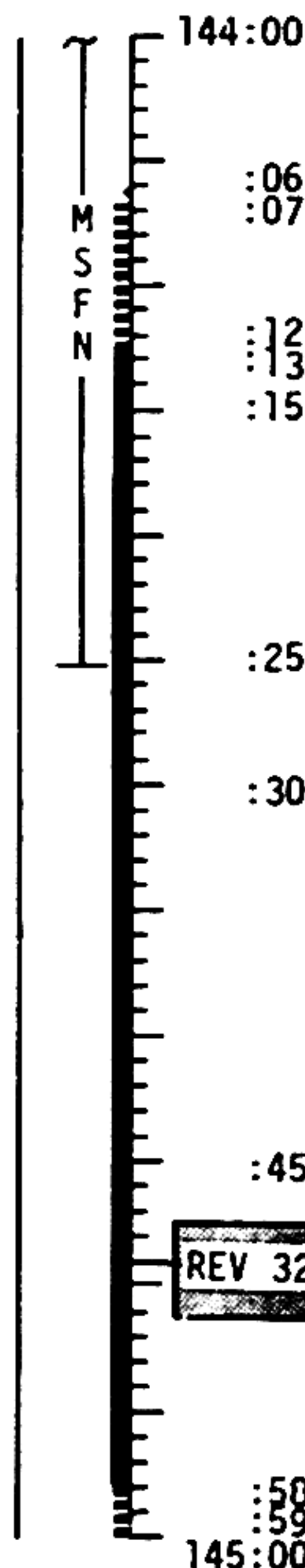
P34-TARGET TPI
SXT & VHF TRACKING

FINAL TPI COMP
VERIFY DSE MOTION @ LOS
P40-SPS THRUSTING
SPS CHECKLIST

TPI BACKUP
CONFIRM LM TPI
P35-TARGET MCC-1
SXT & VHF TRACKING

FINAL MCC-1 COMP
P41-RCS THRUSTING
MCC-1 BACKUP
CONFIRM LM MCC-1

P35-TARGET MCC-2
SXT & VHF TRACKING



CDR
RNDZ RADAR TRACKING

FINAL TPI COMPUTATION

P41-RCS THRUSTING

NULL RESIDUALS
P35-TPM TARGETING(MCC-1)
RNDZ RADAR TRACKING

P41-RCS THRUSTING

NULL RESIDUALS
P35-TPM TARGETING(MCC-2)
RNDZ RADAR TRACKING

LMP

CHECK RCS, EPS, ECS

OMNI-AFT, BIOMED-OFF
PCM-LO

LOAD AGS TPI EXT ΔV

LOAD AGS MCC-1 EXT ΔV

TIG: 144:36:25.7
BT: 22.1 SEC
 ΔV_R : 24.6 FT/SEC
ORBIT: 61.9x44.2

GET: 144:51:25.7

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	144:00 - 145:00	6/31-32	3-124

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144:36:50
TPI BURN IGN
CSM(0,NA/4,0)
IATTH
LM(0,NA/273,0)
LOSM TO CSM

145:17:39
FIRST LM BRAKING
BURN
CSM(60,NA/9,0)
LOSM TO LM
LM(0,NA/238,0)
LOSM TO CSM






145:21:51
FINAL LM BRAKING
BURN
CSM(0,NA/334,0)
LOSM TO LM ALONG
X-AXIS
LM(0,NA/244,0)
LOSM TO CSM

CSM AND LM BEGIN
VHF RNG AND RR TRKNG,
RESPECTIVELY
CSM(0,NA/129,0)
LOSM TO LM
LM(0,NA/4,0)
LOSM TO CSM

CSM AND LM END
VHF RNG AND RR TRKNG,
RESPECTIVELY
CSM(0,NA/161,0)
IATTH
LM(0,NA/36,0)
IATTH

145:40:00
CSM/LM DKNQ
CSM(180,NA/336,0)
IATTH
LM(180,NA/336,300)
IATTH

LEGEND:

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

3-124A

REVISION B

FLIGHT PLAN

CSM

LM

MCC-H

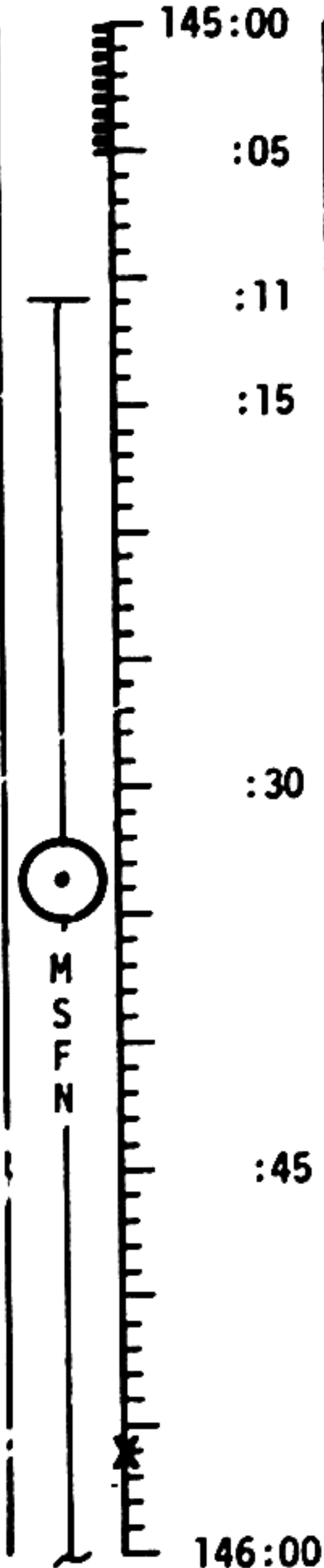
CMP

1122 CST

CDR

LMP

FINAL MCC-1 COMP
P41 - RCS THRUSTING
CONFIRM LM MCC-2
POO (TERMINATE P20)
V64 - ACQUIRE MSFN
TV (MAD) 145:15 TO 145:45
CONFIGURE FOR DOCKING
GO/NO-GO FOR PYRO ARM
(CUE MSFN)
LOGIC-ON
START 16MM CAMERA
(16 MINUTES)
DOCKING ATTITUDE
R 180 P 336 Y 0
HGA P -51 Y 350
PYRO ARM
CSM ACTIVE DOCKING
POST DOCKING CHECKLIST
V48-LOAD DAP, R1(61102)
R2(11111)
PRESSURIZE CM TO 5.5PSIA
ADJUST O₂ FLOW TO 0.6#/HR
PRESS TUNNEL TO 3 PSID
FOR LEAK CHECK, THEN
EQUALIZE CM/LM ΔP
REMOVE AND STOW HATCH
VERIFY LATCHES
COLLAPSE PROBE AND
PASS TO CDR



P41 - RCS THRUSTING

LOAD AGS MCC-2 EXT ΔV

RCS MCC-2

TIG: 145:06:25.7

NULL RESIDUALS
POO (TERMINATE P20)
V48 - LOAD DAP, N46-11002
V63 - RR SELF TEST
RR-OFF

OMNI-AFT, BIOMED-~~LEFT~~ ^{RIGHT}
PCM-HI
V64-ACQUIRE MSFN
SET UP CAMERA FOR DOCKING
LM/DC/60/HCEX
(f11,250,FOCUS) 5

DOCKING ATTITUDE
R 180 P 336 Y 300

STEERABLE ANGLES
P 181
Y 61

GO/NO GO FOR PYRO
ARM

DOCKING

GET: 145:40

CONFIGURE PGNCs & AGS
V48 LOAD DAP, N46-12021
PREP FOR TRANSFER

DOFF HELMET & GLOVES
OPEN HATCH
REMOVE & STOW DROGUE
RECEIVE & STOW PROBE

DOFF HELMET & GLOVES
ASSIST CDR

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	145:00 - 146:00	6/32	3-125

FLIGHT PLANNING BRANCH

REVISION A

CMP

VERIFY DSE MOTION @ LOS

TRANSFER B5 AND B6
CONTAINERS TO LM
MANEUVER TO LM JETTISON
ATTITUDE BY 146:51
R 219 P 358 Y 342
HGA P -41 Y +5

1222 CST

- 146:00

MSFN

:04

:11

:15

:23

: 30

:45

REV 33

:57

147:00

CDR

RECEIVE B5 & B6 FROM
CMP AND STOW
LM JETTISON ATTITUDE
R 63 P 240 Y 290
STEERABLE ANGLES
P 201 Y 73

LM

LMP

ASSIST CUR
(DECONTAMINATION)

MCC-H

UPDATE TO CSM
MAP UPDATE REV33
SEP BURN PAD
LM JETT ATT
LM JETT TIME
UPLINK TO CSM
CSM S.V. (TIG-10)*
LM S.V. (TIG-10)*
UPLINK TO LM
LM S.V. (TIG-10)*
P30 TARGET LOAD
UPDATE TO LM
DEORBIT BURN PAD

*TIG OF LM
DEORBIT BURN

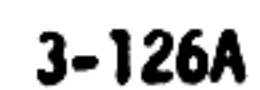
MAP UPDATE REV 33

LOS : : :
180°W: : :
AOS : : :

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	146:00 - 147:00	6/32-33	3-126

FLIGHT PLANNING BRANCH

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LEGEND:

☐ ☒ MSFN AOS, LOS

☐ ☒ S/C SUNRISE, SUNSET

☒ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

FLIGHT PLAN

CSM

LM

MCC-H

CMP

CDR

LMP

1322 CST

REACQUIRE MSFN
HGA P-41 Y 5

UNSTOW & INSTALL HATCH
HATCH INTEGRITY CHECK
GO/NO-GO FOR PYRO ARM
(CUE MSFN)
LOGIC-ON

DEPRESS TUNNEL

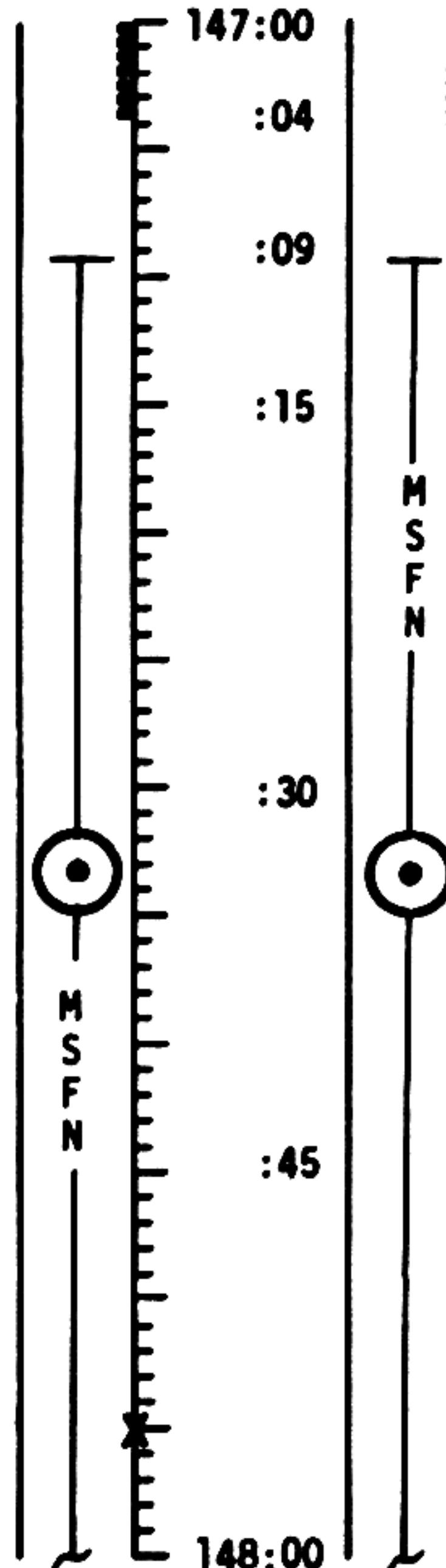
CONFIGURE CSM FOR JETT
SET UP CAMERA FOR JETT
CM4/DAC/18/CEX-BRKT,
MIR(f8,250,7)12FPS,
0.5 MAG, 4 MIN

PYRO ARM
V48-LOAD DAP,N46-
R1(11102)
R2(01111)

P47-THRUST MONITOR

LM JETTISON

SET ORDEAL



DISCONNECT FROM LM
IVT TO CM

CONFIGURE S-BAND
VERIFY COMM
ALIGN AGS TO PGNC
V47-AGS INITIALIZATION
P30-TARGET PGNC
TARGET AGS ΔV
CONFIGURE FOR LM JETT
CLOSE HATCH, IVT TO CM

DUMP DSE
UPDATE TO CSM
P76 PAD
MAP UPDATE REV 34

GO/NO-GO FOR LM
JETT & PYRO ARM

MAP UPDATE REV 34		
LOS	:	---
180°W:	:	---
AOS	:	---

LM JETTISON
GET: 147:57:00
ΔV: 0.5 FT/SEC
ORBIT: 59.9x59.1

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	147:00 - 148:00	6/33	3-127

FLIGHT PLANNING BRANCH

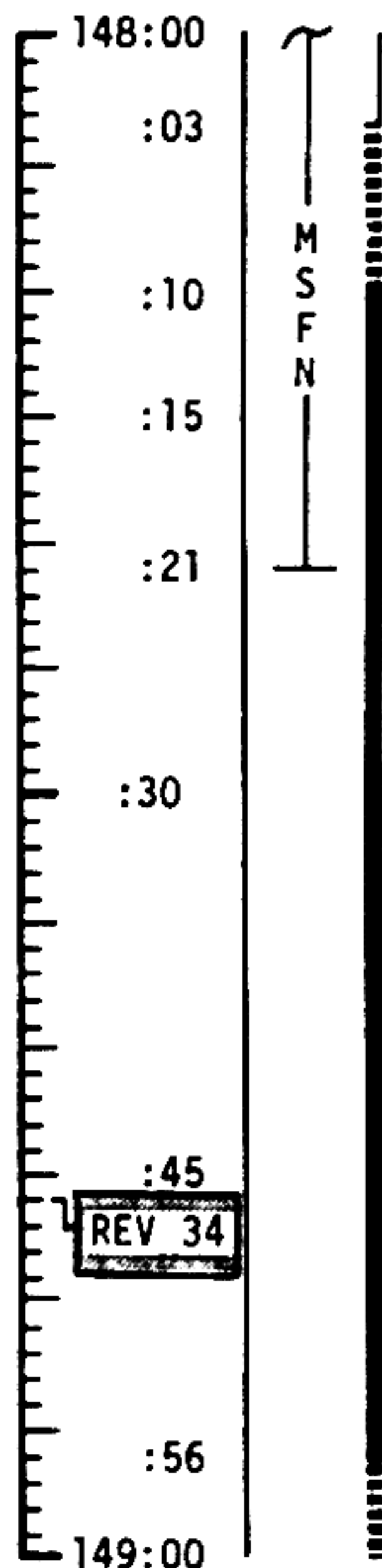
REVISION A

MCC-M

1422 CST

FLIGHT PLAN

NOTES

UPLINK TO LM
P42-APS THRUSTING

CSM SEPARATION

CSM SEP ATTITUDE

R180 P90/NA Y 0

HGA P-36 Y352

SET ORDEAL

P20-RENDEZVOUS NAVIGATION

AUTO MNVR TO LM TRACK ATT

SET UP CAMERA FOR LM IMPACT

CM/DAC/SXT/CEX

(FIXED, 250, FIXED) 1 FPS, 0.5MAG, 46 MIN

TRACK LM AND PHOTOGRAPH THROUGH SEXTANT

VERIFY DSE MOTION @ LOS

VACUUM, DOFF, BAG, AND STOW PGA'S

EAT PERIOD

PRESLEEP CHECKLIST

E-MEMORY DUMP

CREW STATUS REPORT (medication)

ONBOARD READOUTS to MSFN

CYCLE H2, O2 FANS

CHLORINATE WATER

VERIFY

WASTE MNGT OVBD DRAIN vlv - OFF

WASTE STOW VENT vlv - CLOSED

EMER CABIN PRESS vlv - BOTH

SURGE TK O2 vlv - ON

REPRESS O2 vlv - OFF

LM TUNNEL VENT vlv - OFF

NORMAL LUNAR COMM EXCEPT

S BD SQUELCH - ENABLE

HI GAIN ANTENNA TRACK - REACQ

HI GAIN ANTENNA BEAM - NARROW

S BD ANT - HI GAIN

CSM SEPARATION

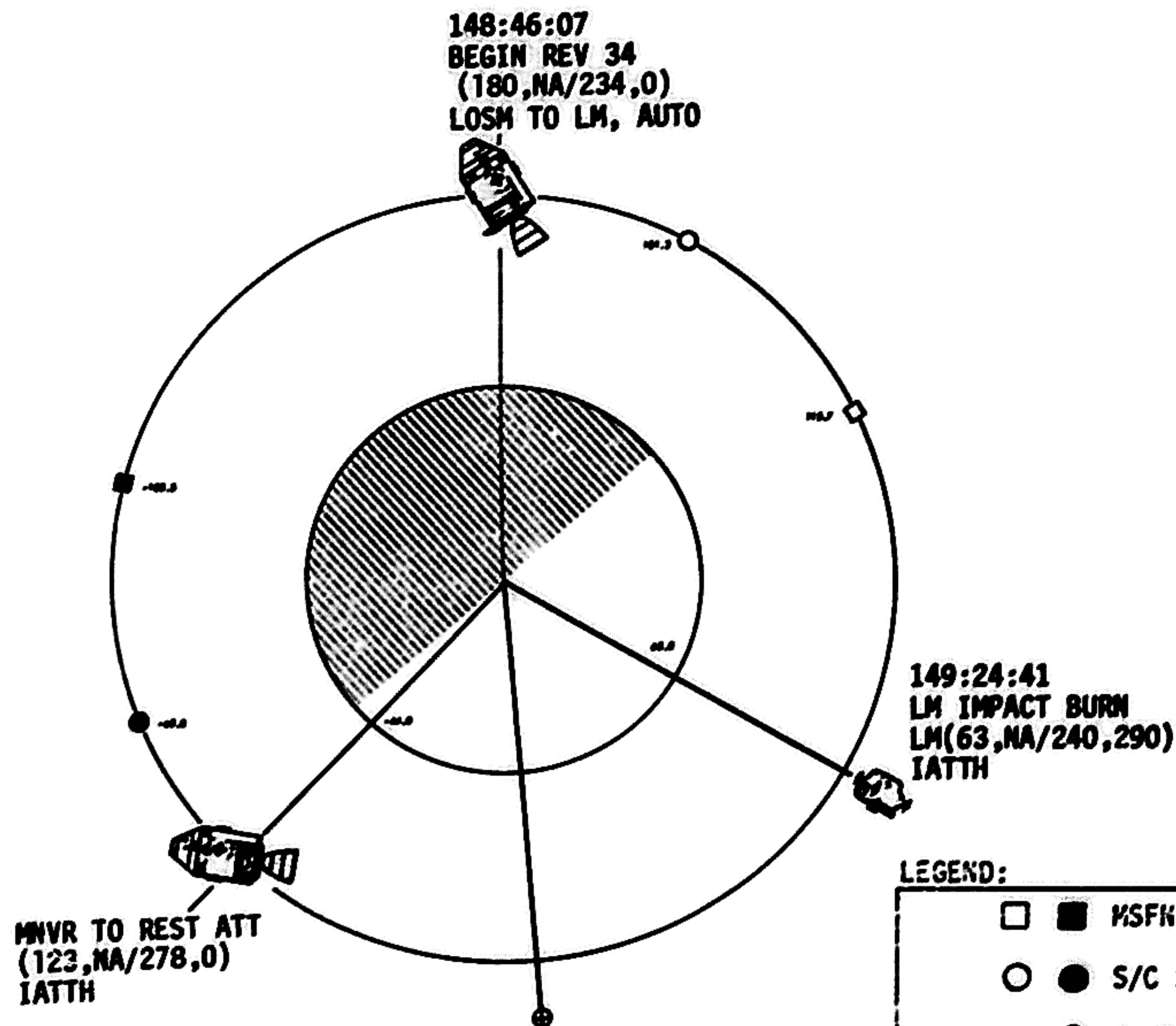
BT: ~~2.7~~ SEC 5.5 SEC ΔV_R : 1.0 FT/SEC

ORBIT: 59.7x58.6

SM RCS Z-AXIS BURN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	148:00 - 149:00	6/33-34	3-128

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LEGEND:

- ■ MSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

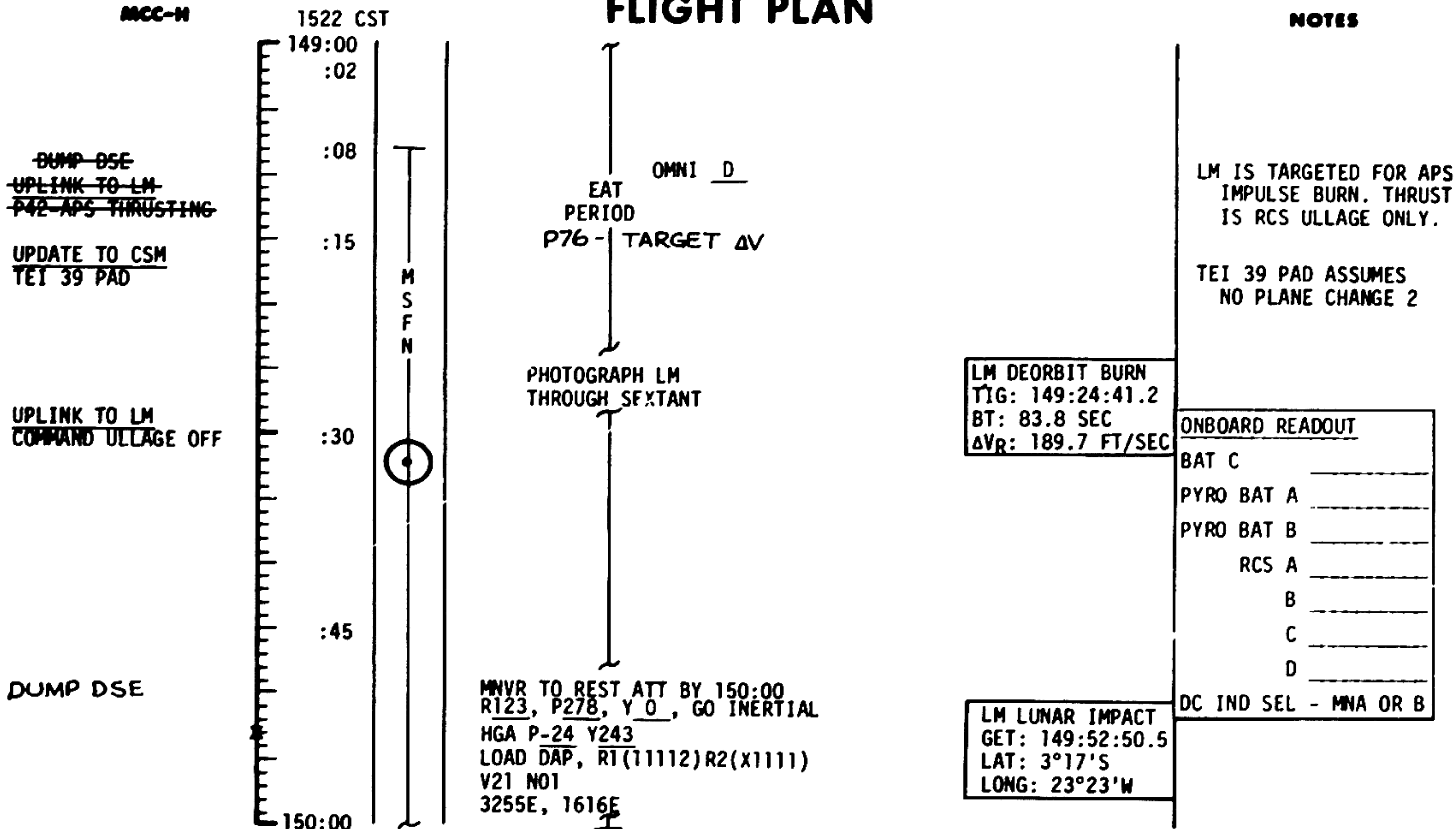
3-128A

REVISION B

MCC-H

FLIGHT PLAN

NOTES



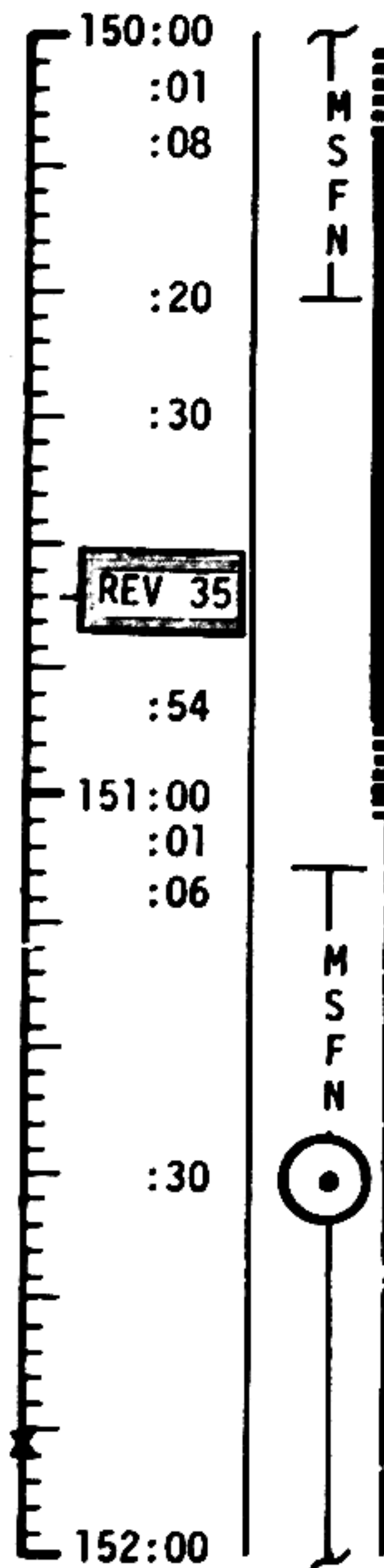
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	149:00 - 150:00	6/34	3-129

MCC-H

1622 CST

FLIGHT PLAN

NOTES



REST PERIOD
(7.5 HOURS)

REST
ATT

DUMP DSE

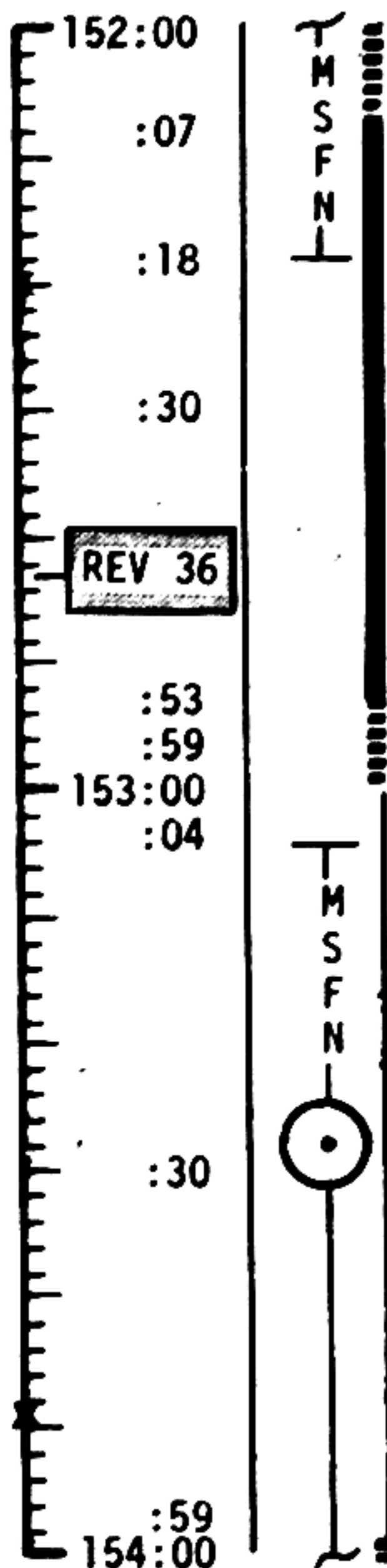
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	150:00 - 152:00	6/34-35	3-130

MCC-H

1822 CST

FLIGHT PLAN

NOTES



DUMP DSE

REST PERIOD
(7.5 HOURS)

REST
ATT

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	152:00 - 154:00	6/35-36	3-131

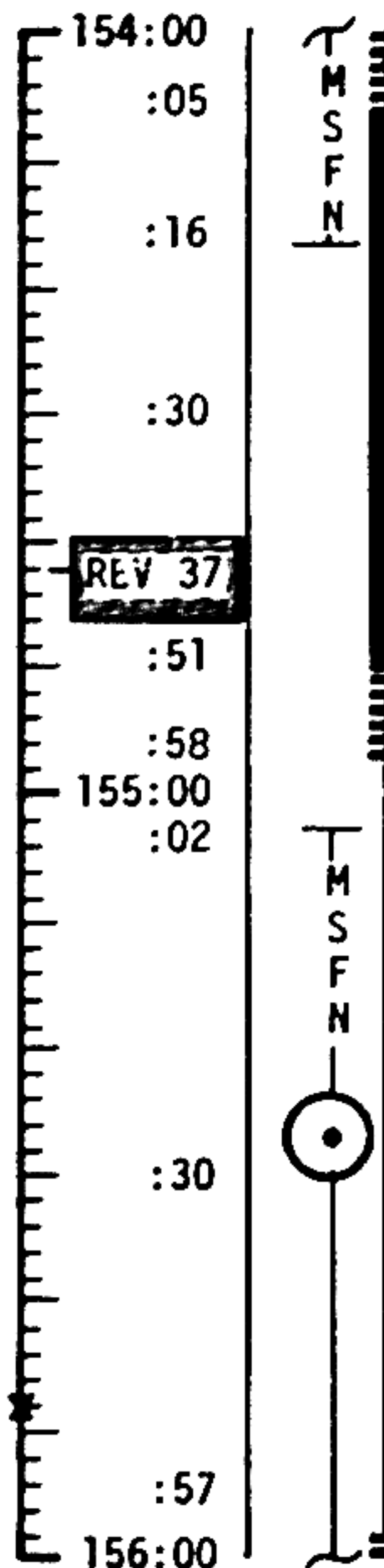
MCC-M

2022 CST

FLIGHT PLAN

NOTES

DUMP DSE



REST PERIOD
(7.5 HOURS)

REST
ATT

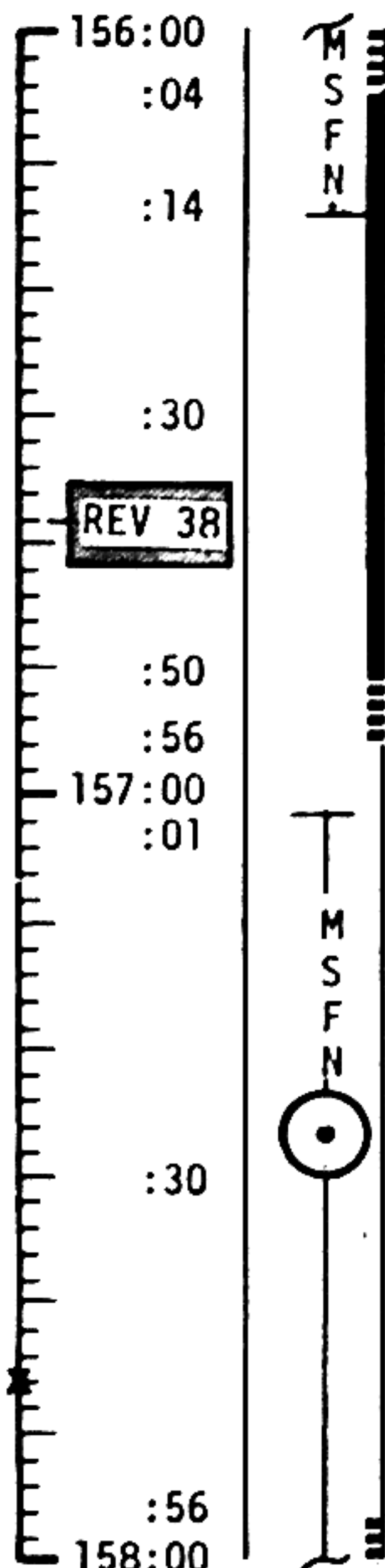
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	154:00 - 156:00	6/36-37	3-132

MCC-H

2222 CST

FLIGHT PLAN

NOTES



REST PERIOD
(7.5 HOURS)

REST
ATT

HGA P-22 Y239

DUMP DSE

UPDATE TO CSM
PLANE CHANGE MNR
CONSUMABLES
FLIGHT PLAN
MAP UPDATE REV 39
TE1 41 PAD
UPLINK TO CSM
STATE VECTOR & V66
PC TARGET LOAD
DESIRED ORIENT (PC)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	156:00 - 158:00	6/37-38	3-133

0022 CST

FLIGHT PLAN

NOTES

158:00
:02
:12
:15
158:30
REV 39
:45
:48
:54
:59
159:00

M
S
F
N

MNVR TO P52 ATT BY 158:06
R 180 HGA
P 278 P -60
Y 45 Y 239

VERIFY DSE MOTION AT LOS

P52 IMU REALIGN
OPTION 1 PREFERRED

P30 - EXTERNAL ZV

V49 - MNVR TO BURN
ATT BY 158:35 R 0 HGA
P 0 P -10
Y 0 Y 274

SXT STAR CHECK
P 40 - SPS THRUST
SETUP DAC IN LH RNDZ WINDOW
(OBLIQUE PHOTOGRAPHY)
CM2/DAC/18/BW-BRKT. & MIR,
(f8,125,∞), 6FPS (0.5 MAG, 8 MIN)
SETUP EL CAMERA IN RH RNDZ
WINDOW
(HI RESOLUTION PHOTOGRAPHY)
CM4/EL/500/BW-BRKT, CONT,
(f8,125,∞), 20-40
GDC TO IMU ALIGN

POSTSLEEP CHECKLIST

CREW STATUS REPORT
CONSUMABLES UPDATE
FLIGHT PLAN UPDATE
CYCLE H2, O2 FANS
~~POT H2O HTR ON~~
NORMAL LUNAR COMM EXCEPT:
S BD ANT - HI GAIN
CREW MANAGES ANT OPS

MAP UPDATE REV 39

LOS : : :
180° : : :
AOS : : :

TEI 41 ASSUMES
PLANE CHANGE 2

CSM CONSUMABLES UPDATE

GET: :
RCS TOTAL %
QUAD A %B %
C %D %
H₂ TOTAL %
O₂ TOTAL %

P52 (PLANE CHANGE ORIENT)

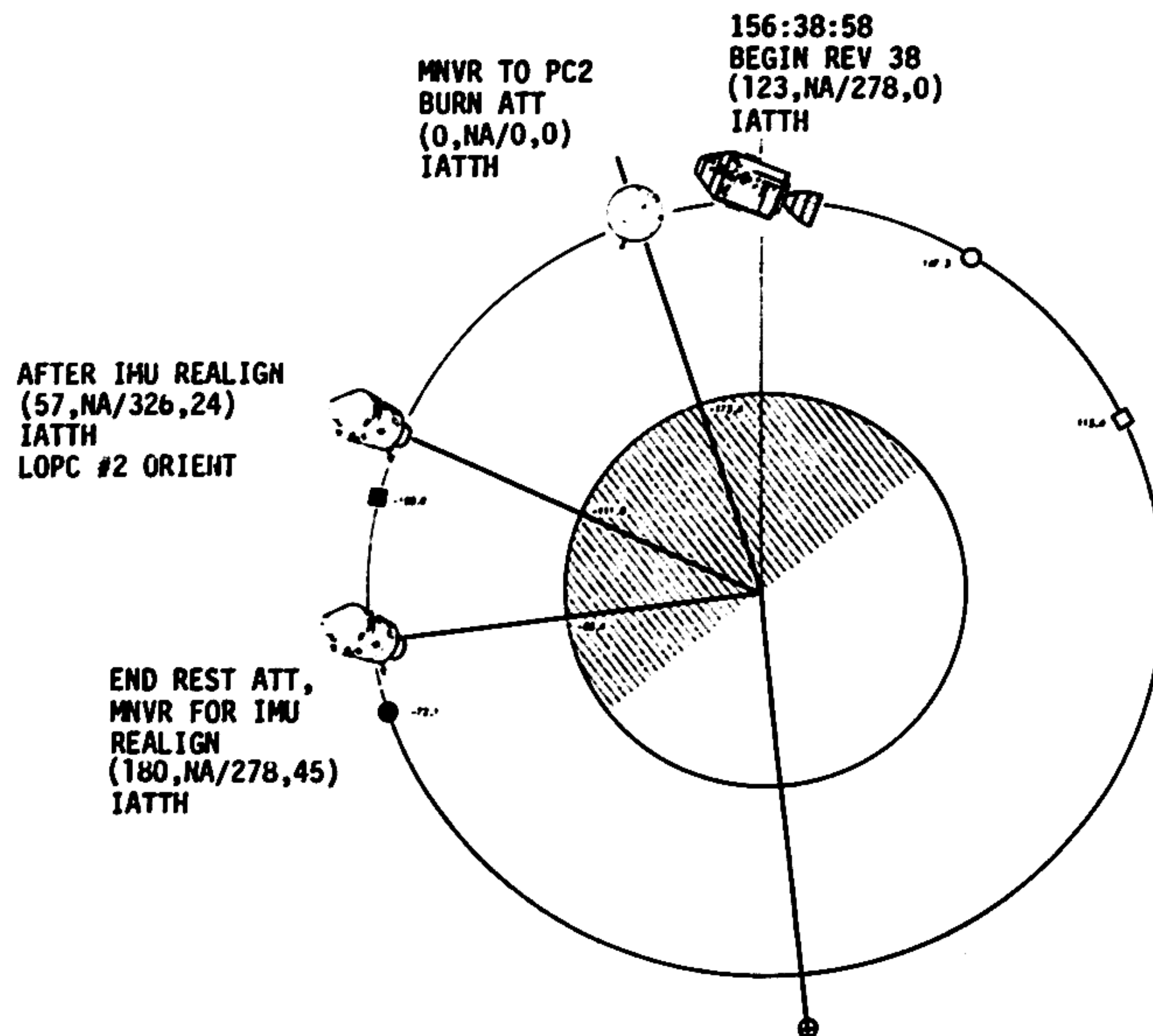
N71: :
N05: :
N93: :
X :
Y :
Z :
GET : :

CREW STATUS REPORT

CDR CMP LMP
SLEEP : :
PRD : :

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	158:00 - 159:00	7/38-39	3-134

REV 38



LEGEND:

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

3-134A

REVISION B

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HIGH RESOLUTION PHOTOGRAPHY
REV 39

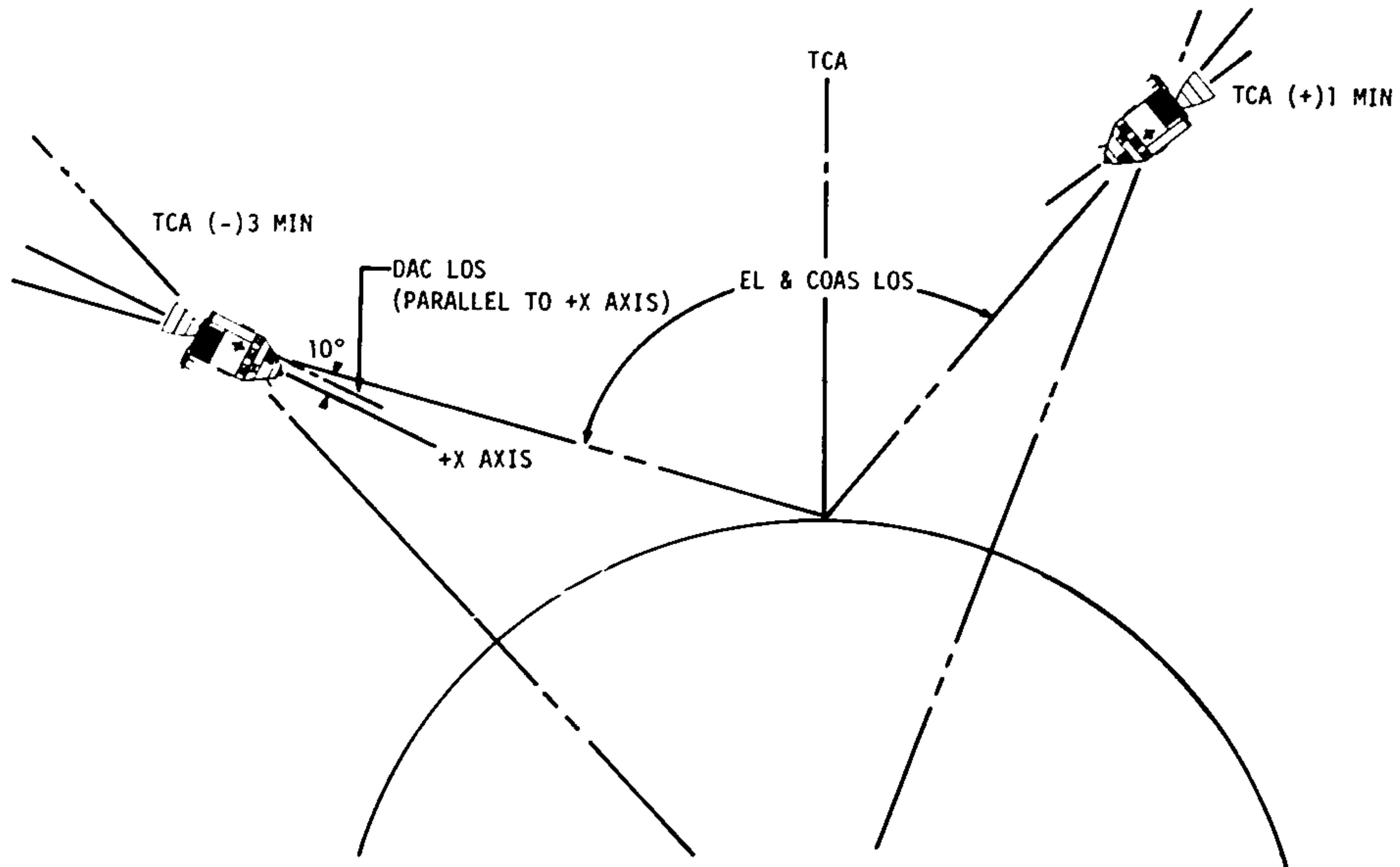


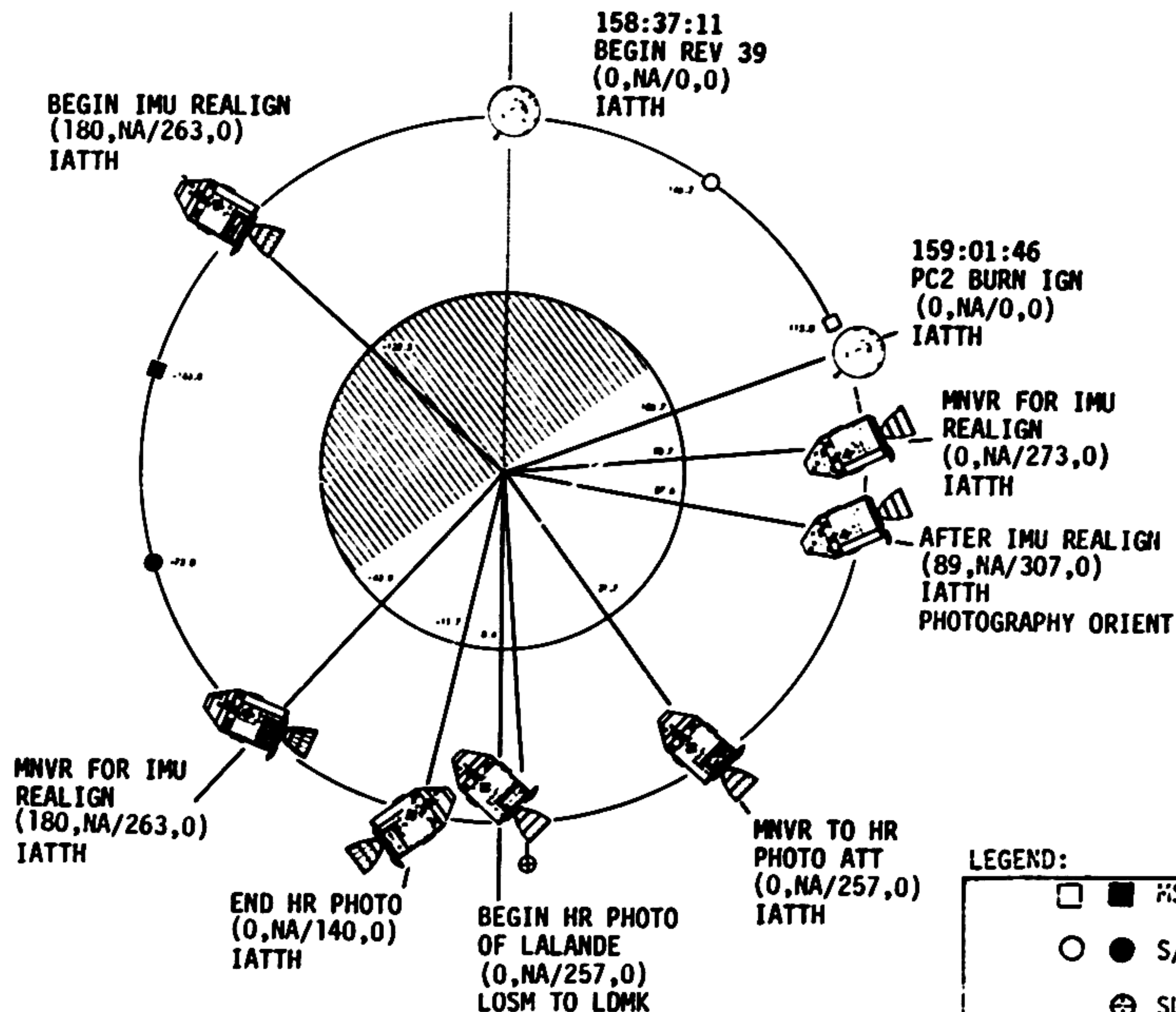
FIGURE 3-4
3-135

FLIGHT PLAN

CSM PLANE CHANGE #2
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	NO TRIM

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3-136A

REVISION B

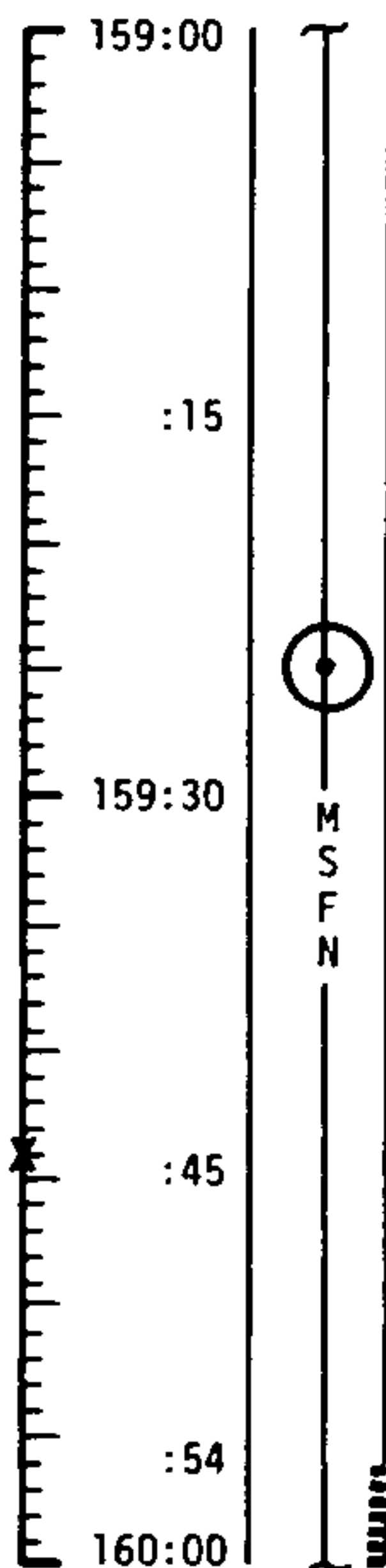
MCC-H

0122 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
DESIRED ORIENT
(PHOTOGRAPHY)
DUMP DSE
UPDATE TO CSM
TIME-HI RESOLUTION
PHOTO



CSM PLANE CHANGE #2

MNVR TO P52 ATT BY 159:07

P52 IMU REALIGN

OPTION 1 PREFERRED

GYRO TORQUE

BURN STATUS REPORT

REPORT GYRO TORQUING ANGLES (P52 @158:15)

V66 TRANSFER CSM TO LM SLOT

SET COAS FOR (+) 10 DEG LOS

LiOH CANISTER CHANGE NO 12

14 INTO B, STOW 12 IN A3

START EAT PERIOD

MNVR TO ATT FOR LALANDE PHOTOGRAPHY

BY 159:26 (FOR T1) R 0

OMNI D

P257

Y 0

TRACK LALANDE THRU COAS AND START
CAMERAS AT T1. STOP CAMERAS AT T2

MNVR TO P52 ATT BY 159:51

R180

P263

Y 0

HGA

P -56

Y 186

TIG: 159:01:46.0

BT : 18.0 SEC

 ΔV_R : 360.0 FPS

ULLAGE: 4 JET 11 SEC

ORBIT: 58.6 X 56.5 NM

HGA P 3, Y 281

T1 IS 3 MINUTES

PRIOR TO TCA

T2 IS 1 MINUTE

AFTER TCA

EL CAM TO BE MANUALLY
ACTUATED AT APPROX.

20 SECOND INTERVALS

HI RESOLUTION PHOTO
LALANDE

T1 _____ : _____ : _____
T2 _____ : _____ : _____
R _____, P _____, Y _____

BURN STATUS REPORT

X	X		•	Δ TIG
X	X		•	BT
			•	V_{gx}
TRIM				
X	X	X		R
X	X	X		P
X	X	X		Y
			•	V_{gx}
			•	V_{gy}
			•	V_{gz}
			•	ΔV_C^*
X	X	X		FUEL*
X	X	X		OX*
X	X	X		UNBAL

*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (REV 14)	OCTOBER 15, 1969	159:00 - 160:00	7/39	3-137

STEREO STRIP PHOTOGRAPHY
REV 40

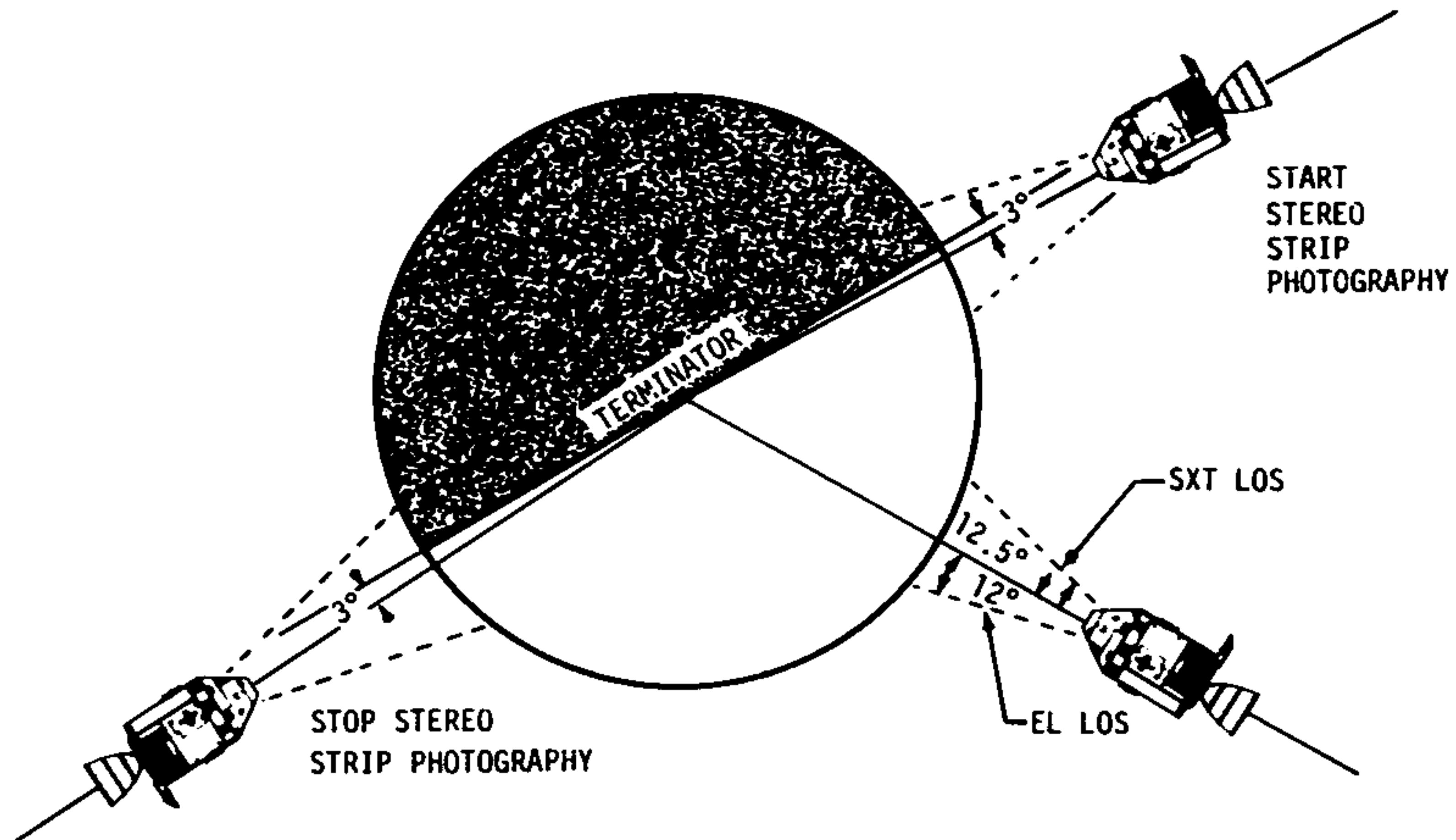


FIGURE 3-5
3-138

MCC-H

0222 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
STEREO PHOTO TIME
MAP UPDATE REV 40

160:00	T
:01	M
	S
	F
	N
:10	L
:15	
160:30	
REV 40	
:45	
:47	
:53	
:57	
161:00	I

SETUP EL CAMERA FOR STEREOSCOPIC STRIP
PHOTOGRAPHY (RH RNDZ WINDOW)
CM4/EL/80/BW-BRKT, INTR, (f4,250,∞),180
VERIFY DSE AT LOS

SET UP DAC FOR SXT/DAC PHOTOGRAPHY
CM/DAC/SXT/CEX, (FIXED,60, FIXED), 1FPS(1MAG=93MIN)

P52 IMU REALIGN
OPTION 3 REFSMMAT

GDC ALIGN TO IMU

ZERO OPTICS & MANUALLY SET SA=0°, TR=45°

V83E ALIGN FDAI #1
ORDEAL R 0, P270/ NA, Y 0
V79E R1 = -0.0507
R2 = +000.50
R3 = +11111

SELECT OMNI D
V06N65 AT GROUND TERMINATOR
BEGIN PHOTOGRAPHY AT GROUND TERMINATOR (+) 1 MIN(T1)
RECORD START TIME _____:_____:_____. GET
V16N91 AT GROUND TERMINATOR (+) 2 MINUTES

STEREO PHOTO

T1 _____:_____:_____
T2 _____:_____:_____

MAP UPDATE REV 40

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

P52 (PHOTOGRAPHY ORIENT)

N71: _____:_____:_____
N05: _____:_____:_____
N93: _____:_____:_____
X _____:_____:_____
Y _____:_____:_____
Z _____:_____:_____
GET _____:_____:_____

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	160:00 - 161:00	7/39-40	3-139

MCC-H

0322 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV41
TEI 43 PAD

DUMP DSE

161:00
:15
161:30
:45
:53
:59
162:00

MSFN

DAC SHUTTER SPEED 125 GET 161:06
(GET _ _ _ : _ _)

DAC SHUTTER SPEED 250 GET 161:16
(GET _ _ _ : _ _)

STEREO STRIP
PHOTOGRAPHY

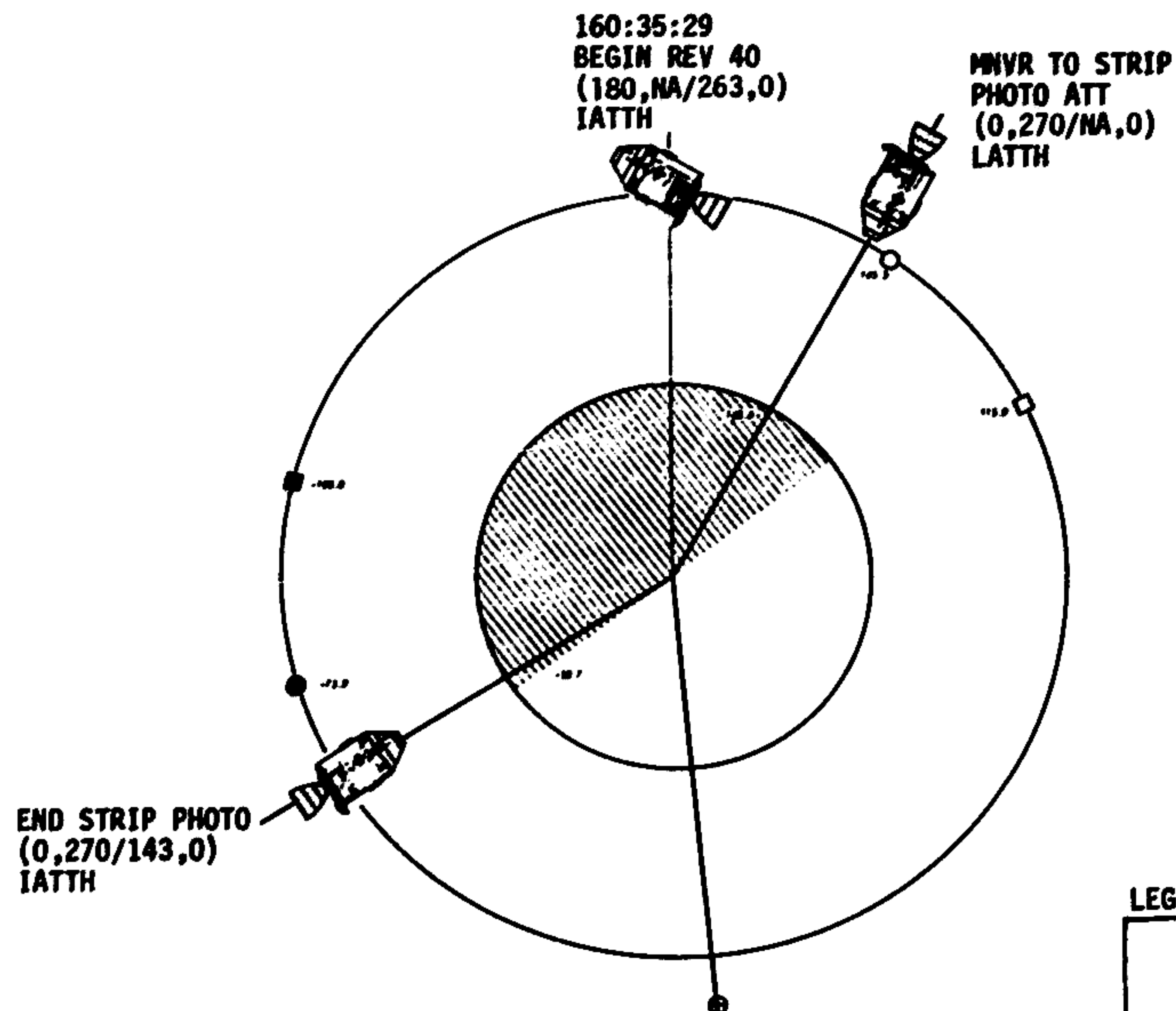
DAC SHUTTER SPEED 125 GET 161:34 OMNI B
(GET _ _ _ : _ _)
DAC SHUTTER SPEED 60 GET 161:38
(GET _ _ _ : _ _)

V06N65 AT GROUND TERMINATOR (-) 90 SECONDS
END STRIP PHOTOGRAPHY AT GROUND TERMINATOR(-) 1 MINUTE (T2)
GO INERTIAL R 0, P 143, Y 0
HGA P -64, Y 173
RECORD STOP TIME _ _ _ : _ _ _ : _ _ _ . _ _ _ GET

MAP UPDATE REV 41
LOS : _ _ _ : _ _ _ : _ _ _
180° : _ _ _ : _ _ _ : _ _ _
AOS : _ _ _ : _ _ _ : _ _ _

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	161:00 - 162:00	7/40	3-140

REV 40



LEGEND:

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

3-140A

REVISION B

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MCC-N

0422 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
TIME - HIGH
RESOLUTION PHOTOS

162:00

T
H
S
F
N

REPORT GYRO TORQUING ANGLES

:09

VERIFY DSE MOTION AT LOS

:15

162:30

REV 41

SETUP DAC IN LH RNDZ WINDOW (OBLIQUE PHOTOGRAPHY)
CM2/DAC/18/BW-BRKT,MIR,(f8, 125, ∞),6FPS
(1.5 MAG-24 MIN.)

SETUP COAS (LH RNDZ WINDOW) FOR (+) 10 DEGREES

SETUP EL CAMERA IN RH RNDZ WINDOW
(HIGH RESOLUTION PHOTOGRAPHY)
CM4/EL/500/BW-BRKT,CONT,(f8,125, ∞),150-120

:45

:52

:55

REACQUIRE MSFN
HGA P -64, Y 173

163:00

HI RESOLUTION PHOTO
DESCARTES

T1 _____ : _____ : _____
T2 _____ : _____ : _____
R _____, P _____, Y _____

HI RESOLUTION PHOTO
FRA MAURO

T1 _____ : _____ : _____
T2 _____ : _____ : _____
R _____, P _____, Y _____

T1 IS 3 MINUTES
BEFORE TCA

T2 IS 1 MINUTE
AFTER TCA

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	162:00 - 163:00	7/40-41	3-141

HIGH RESOLUTION PHOTOGRAPHY
REV 41

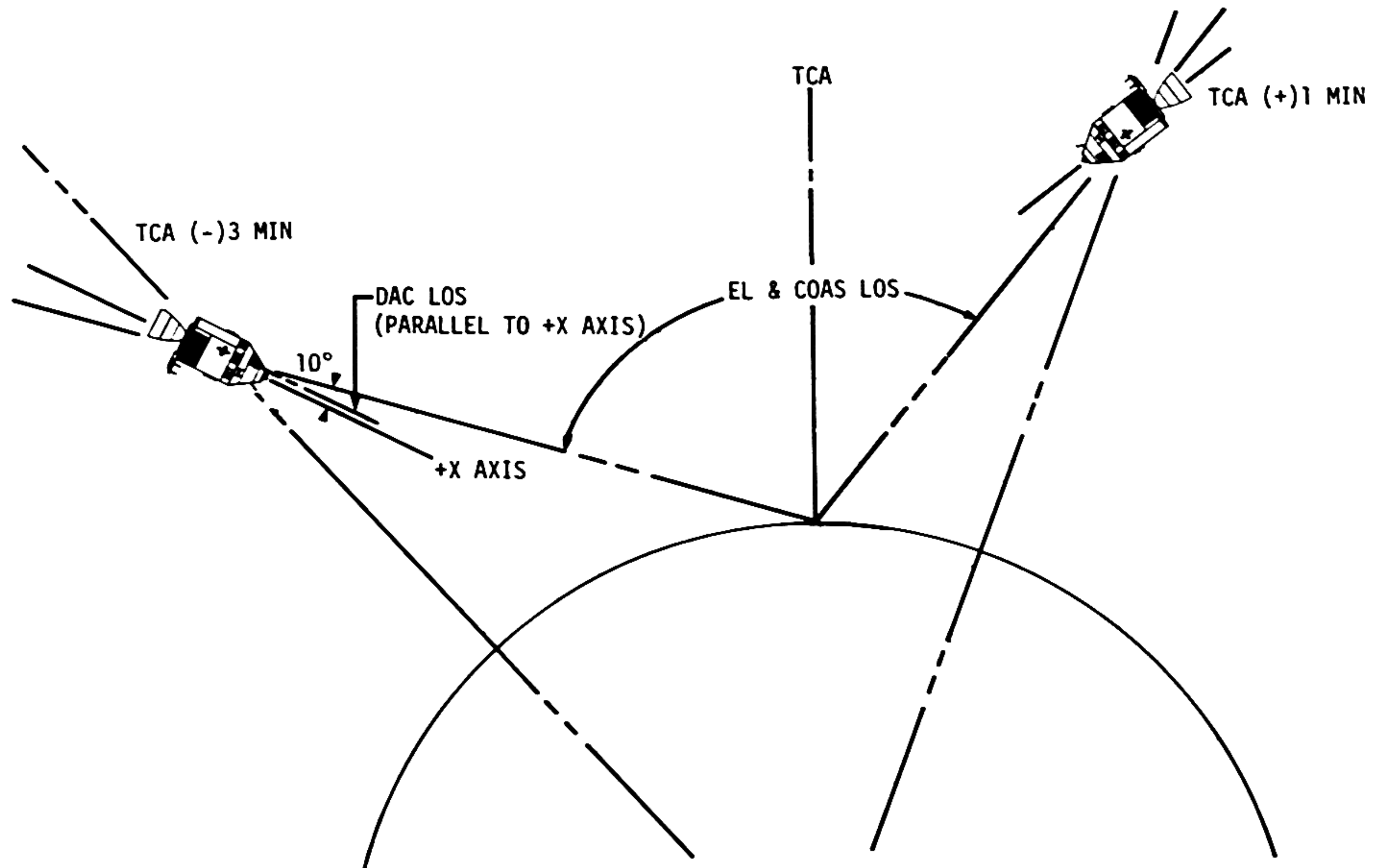
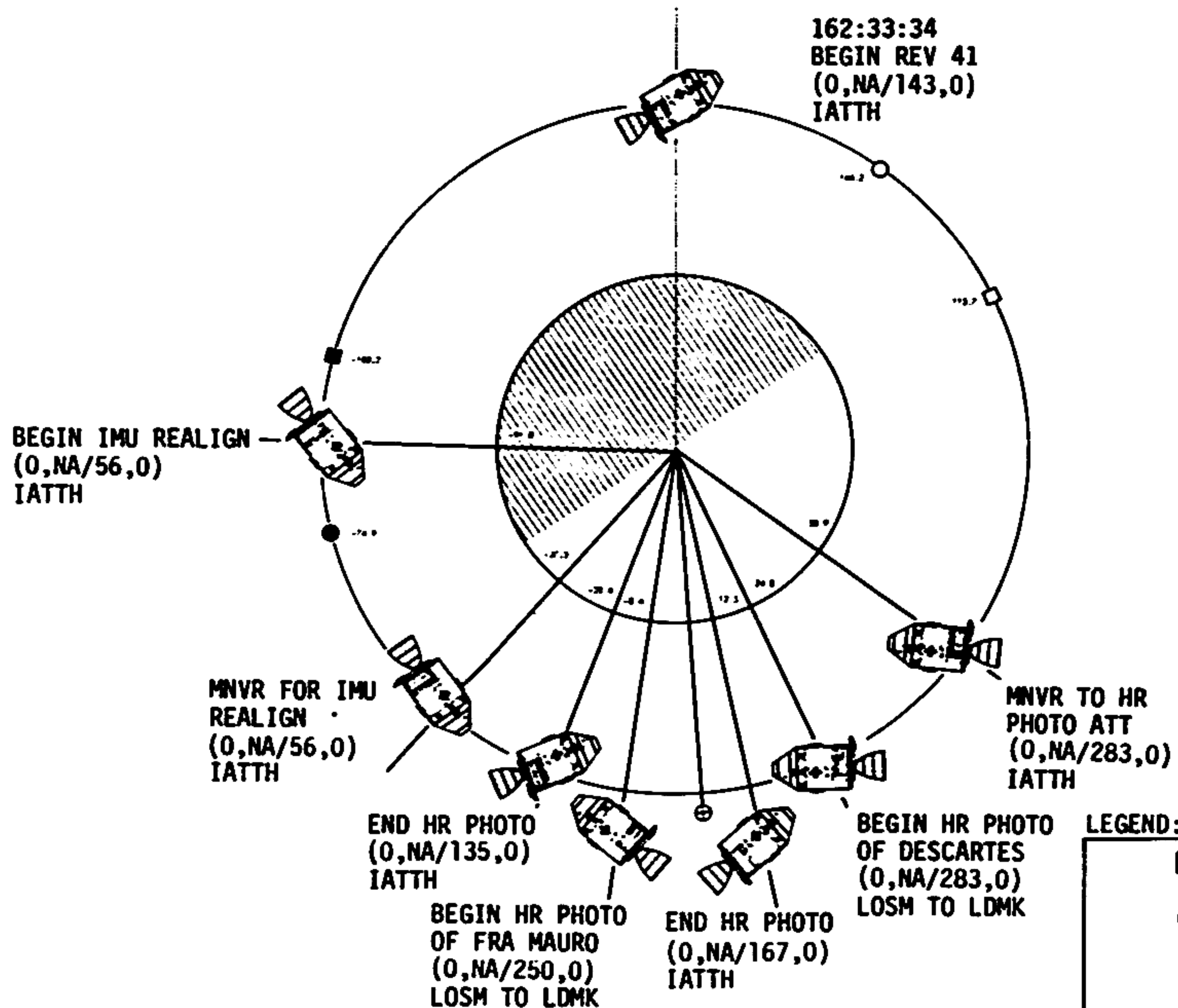


FIGURE 3-4
3-142

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LEGEND:

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

3-142A

REVISION 8

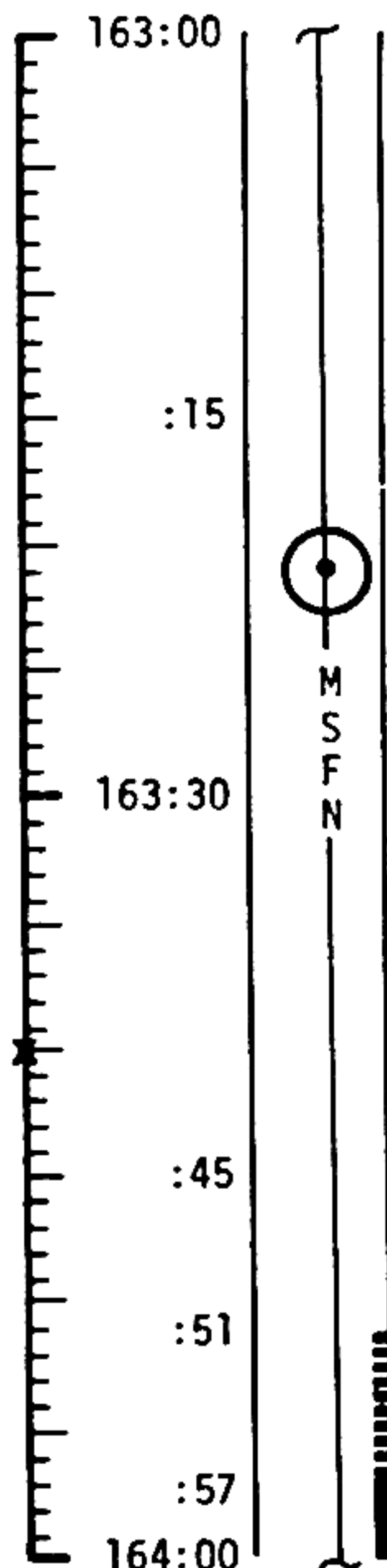
MCC-H

0522 CST

FLIGHT PLAN

NOTES

DUMP DSE

UPDATE TO CSM
MAP UPDATE REV 42~~PCM-LBR~~UPDATE TO CSM
LDMK TRACK PADUPLINK TO CSM
CSM STATE VECTOR
& V66

MNVR-TO ATT FOR DESCARTES PHOTOGRAPHY BY 163:16

OMNI	<u>D</u>	R	<u>0</u>
		P	<u>283</u>
		Y	<u>0</u>

TRACK DESCARTES THRU COAS AND START
CAMERA AT T1, STOP CAMERAS AT T2
MNVR TO ATTITUDE FOR FRA MAURO PHOTO BY 163:33

R	<u>0</u>	P	<u>250</u>	Y	<u>0</u>	OMNI	<u>D</u>
---	----------	---	------------	---	----------	------	----------

TRACK FRA MAURO THRU COAS AND
START CAMERA AT T1, STOP CAMERA
AT T2

V64 ACQUIRE MSFN @ PITCH = 135°
MNVR TO P52 ATT BY 163:45

R	<u>0</u>
P	<u>56</u>
Y	<u>0</u>

MAP UPDATE REV 42

LOS : _____:_____:_____

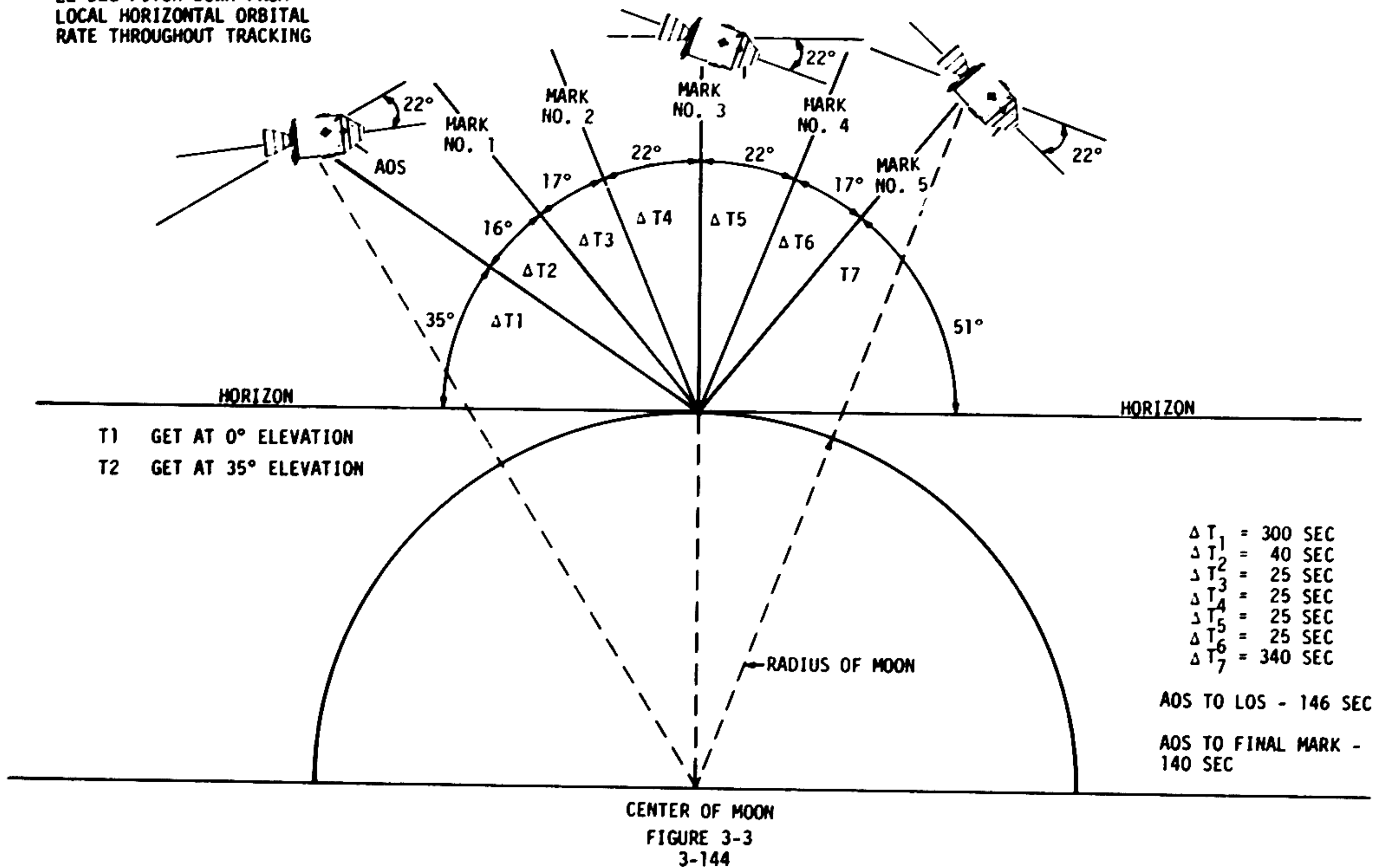
180° : _____:_____:_____

AOS : _____:_____:_____

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	163:00 - 164:00	7/41	3-143

CSM LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM
LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING



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P22 ~~AUTO~~ ~~MAN~~ ACQ P dn 22° RO° YO° ($\frac{1}{60}$)

T₁ _____ : _____ : _____

T₂ _____ : _____ : _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -5.667° _____ .

LONG/2 +56.000° _____ .

ALT +0.00 NM _____ .

CP-1

P22 ~~AUTO~~ ~~MAN~~ ACQ P dn 22° RO° YO° ($\frac{1}{125}$)

T₁ _____ : _____ : _____

T₂ _____ : _____ : _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -10.250° _____ .

LONG/2 +28.091° _____ .

ALT -0.81NM _____ .

CP-2

P22 ~~AUTO~~ ~~MAN~~ ACQ P dn 22° RO° YO° ($\frac{1}{250}$)

T₁ _____ : _____ : _____

T₂ _____ : _____ : _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -8.883° _____ .

LONG/2 +7.775° _____ .

ALT -1.70NM _____ .

DE-1

P22 ~~AUTO~~ ~~MAN~~ ACQ P dn 22° RO° YO° ($\frac{1}{60}$)

T₁ _____ : _____ : _____

T₂ _____ : _____ : _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -3.228° _____ .

LONG/2 -8.665° _____ .

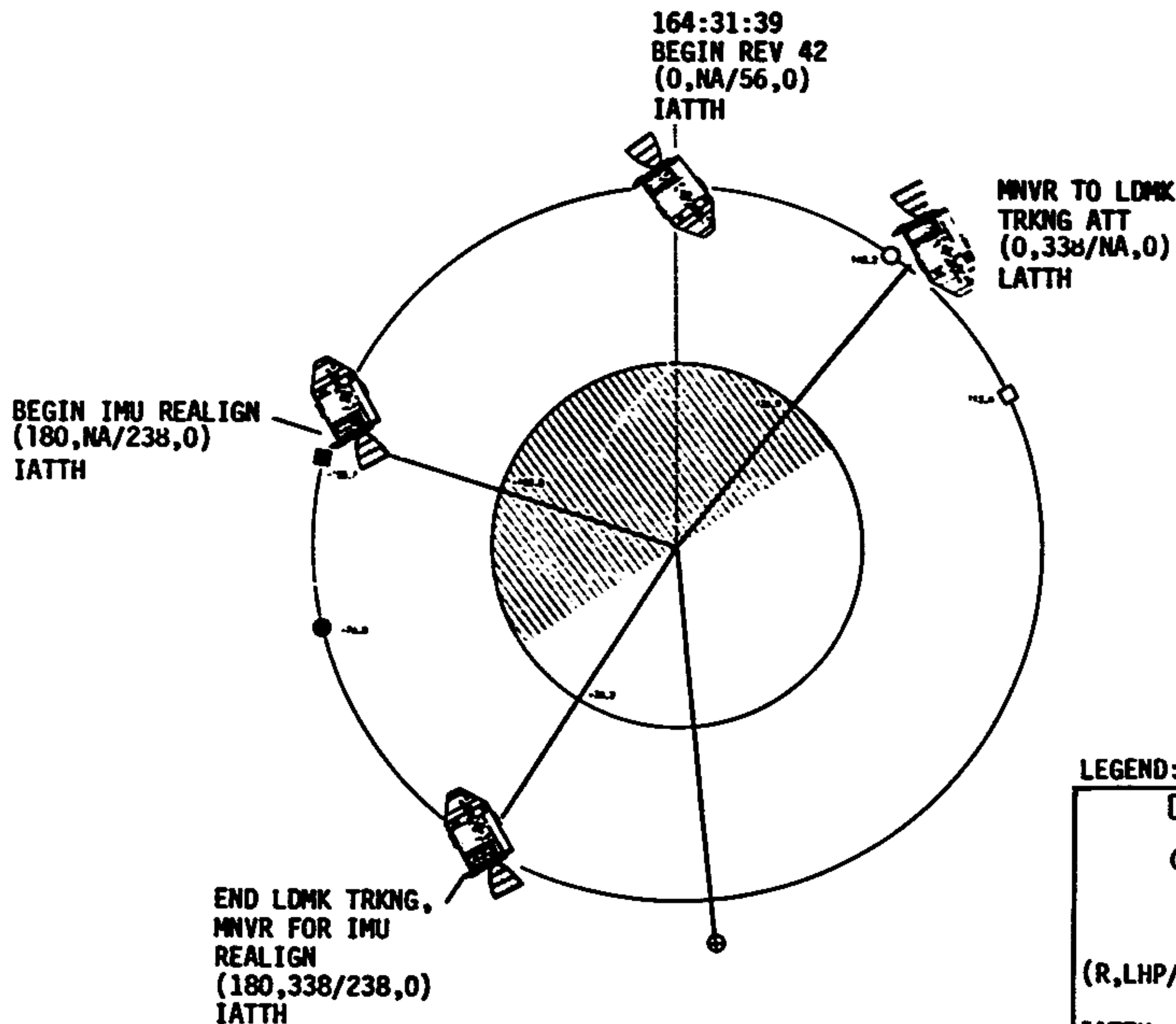
ALT -1.56NM _____ .

FM-1

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	164:00 - 165:00	7/41-42	3-145

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REV 42



LEGEND:

- MSFN AOS, LOS
- ● S/C SUNRISE, SUNSET
- ⊕ SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD

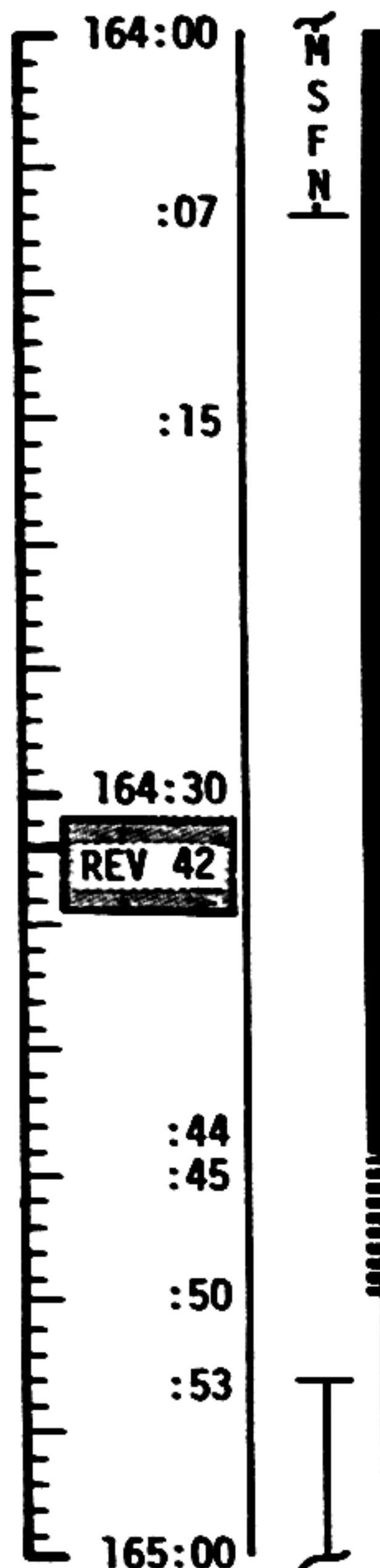
LATTH - LOCAL ATTITUDE HOLD

MCC-H

0622 CST

FLIGHT PLAN

NOTES



P52 IMU REALIGN
OPTION 3 REFSMMAT

VERIFY DSE MOTION AT LOS

GDC ALIGN TO IMU
02 FUEL CELL PURGE

WASTE WATER DUMP

SET UP DAC FOR LDMK TRACKING PHOTOS THRU SXT
CM/DAC/SXT/CEX, (SEE LDMK TRACK PAD) 1 FPS (IMAG-88MIN)

P52 (PHOTOGRAPHY ORIENT)

N71: _ _ _ , _ _ _

N05: _ _ _ . _ _ _

N93: _ _ _ . _ _ _

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

Z _ _ _ . _ _ _

GET _ _ _ : _ _ _ : _ _ _

SELECT OMNI D

MNVR TO LDMK TRACK ATT BY 164:46
GO ORB RATE-

R 0
P 338/NA
Y 0

TRACK LDMK CP-1
DO NOT PRO ON FINAL
N39
25 SECONDS BETWEEN MARKS
5 MARKS

START DAC @ T2 (-) 1 MIN

LDMK IS AT ~14.5°
SUN ANGLE
STOP DAC AFTER MARK 5

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	164:00 - 165:00	7/41-42	3-146

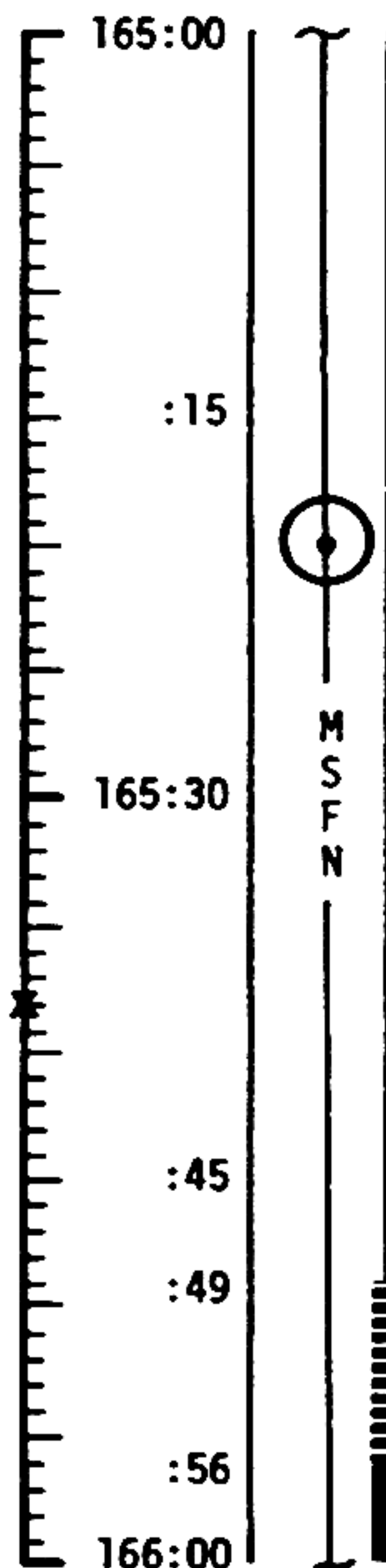
MCC-M

0722 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV 43
TEI 45 PAD



TRACK LDMK CP-2
DO NOT PRO ON FINAL
N89,
25 SEC BETWEEN MARKS
5 MARKS

START DAC @ T2(-)1 MIN

CP-2 LDMK IS
AT ~66° SUN ANGLE
STOP DAC AFTER MARK 5

TRACK LDMK DE-1
DO NOT PRO ON FINAL
N89,
25 SEC BETWEEN MARKS
5 MARKS

START DAC @ T2(-)1 MIN

DESCARTES LDMK IS
AT ~71.5° SUN ANGLE
STOP DAC AFTER MARK 5

TRACK LDMK FM-1
DO NOT PRO ON FINAL
N89,
25 SEC BETWEEN MARKS
5 MARKS

START DAC @ T2(-)1 MIN

FRA MAURO LDMK
IS AT ~39.5 SUN ANGLE
STOP DAC AFTER MARK 5

STOP PITCH
MNVR TO P52 ATT RY 165:42

R 180 HGA
P 238 P -27
Y 0 Y 183

MAP UPDATE REV 43

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

DUMP DSE
UPDATE TO CSM
CREW DEBRIEFING-
LDMK TRACKING
TECHNIQUES
LDMK TRACK PAD

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	165:00 - 166:00	7/42	3-147

CSM LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM
LOCAL HORIZONTAL ORBITAL
RATE THROUGHOUT TRACKING

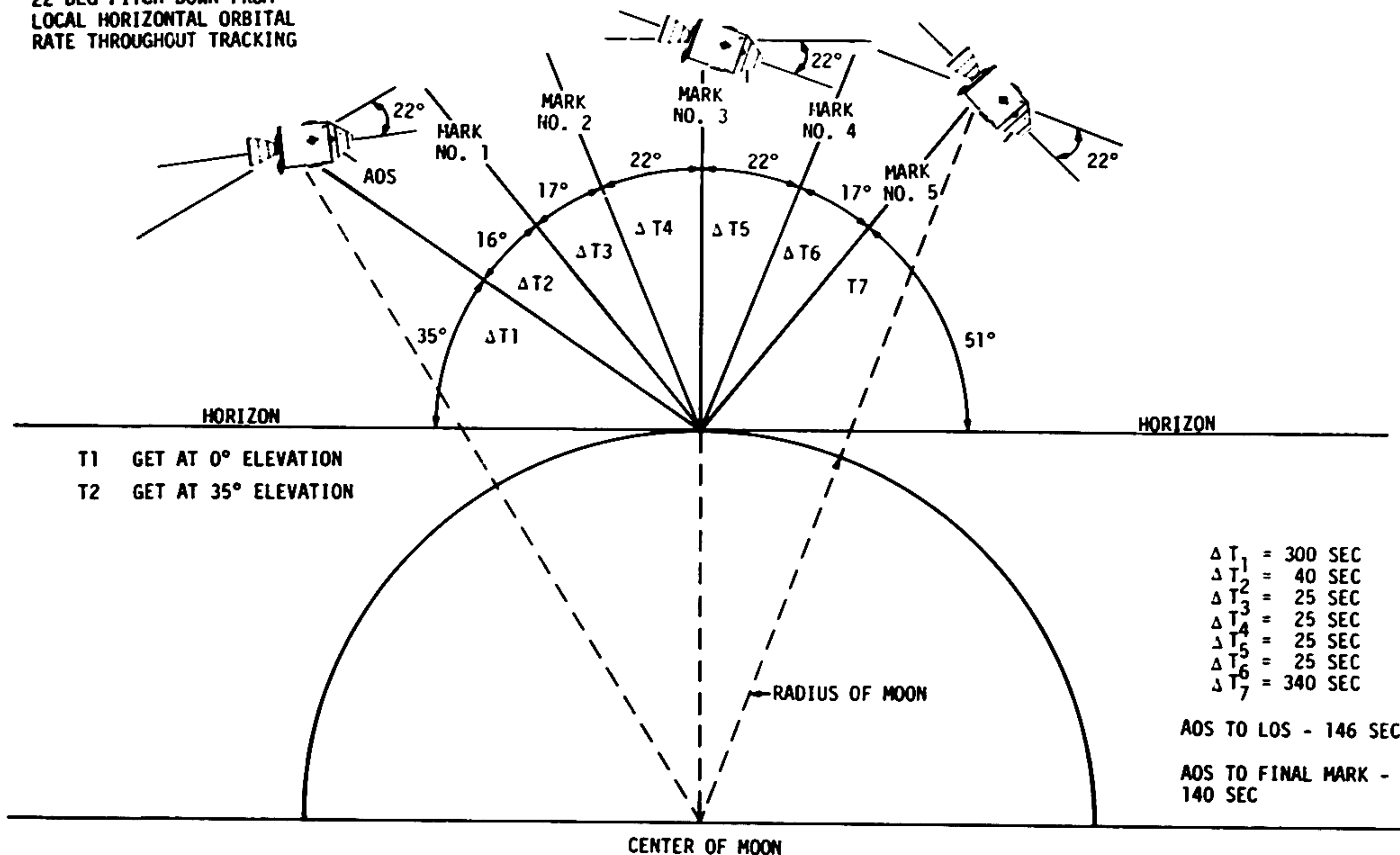


FIGURE 3-3

P22 ~~MAN~~ ⁴⁰⁷⁰ ACQ P dn 22° R0° Y0° ($\frac{1}{60}$)

T₁ _____

T₂ _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -5.667°

LONG/2 +56.000°

ALT +0.00 NM

CP-1

P22 ~~MAN~~ ³⁴⁷⁰ ACQ P dn 22° R0° Y0° ($\frac{1}{125}$)

T₁ _____

T₂ _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -10.250°

LONG/2 +28.091°

ALT -0.81NM

CP-2

P22 ~~MAN~~ ⁴⁰⁷⁰ ACQ P dn 22° R0° Y0° ($\frac{1}{250}$)

T₁ _____

T₂ _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -8.883°

LONG/2 +7.775°

ALT -1.70NM

DE-1

P22 ~~MAN~~ ⁴⁰⁷⁰ ACQ P dn 22° R0° Y0° ($\frac{1}{60}$)

T₁ _____

T₂ _____

R _____ °P _____ °Y _____ °

N or S NM _____ SA _____ TA _____

CP _____ N89

LAT -3.228°

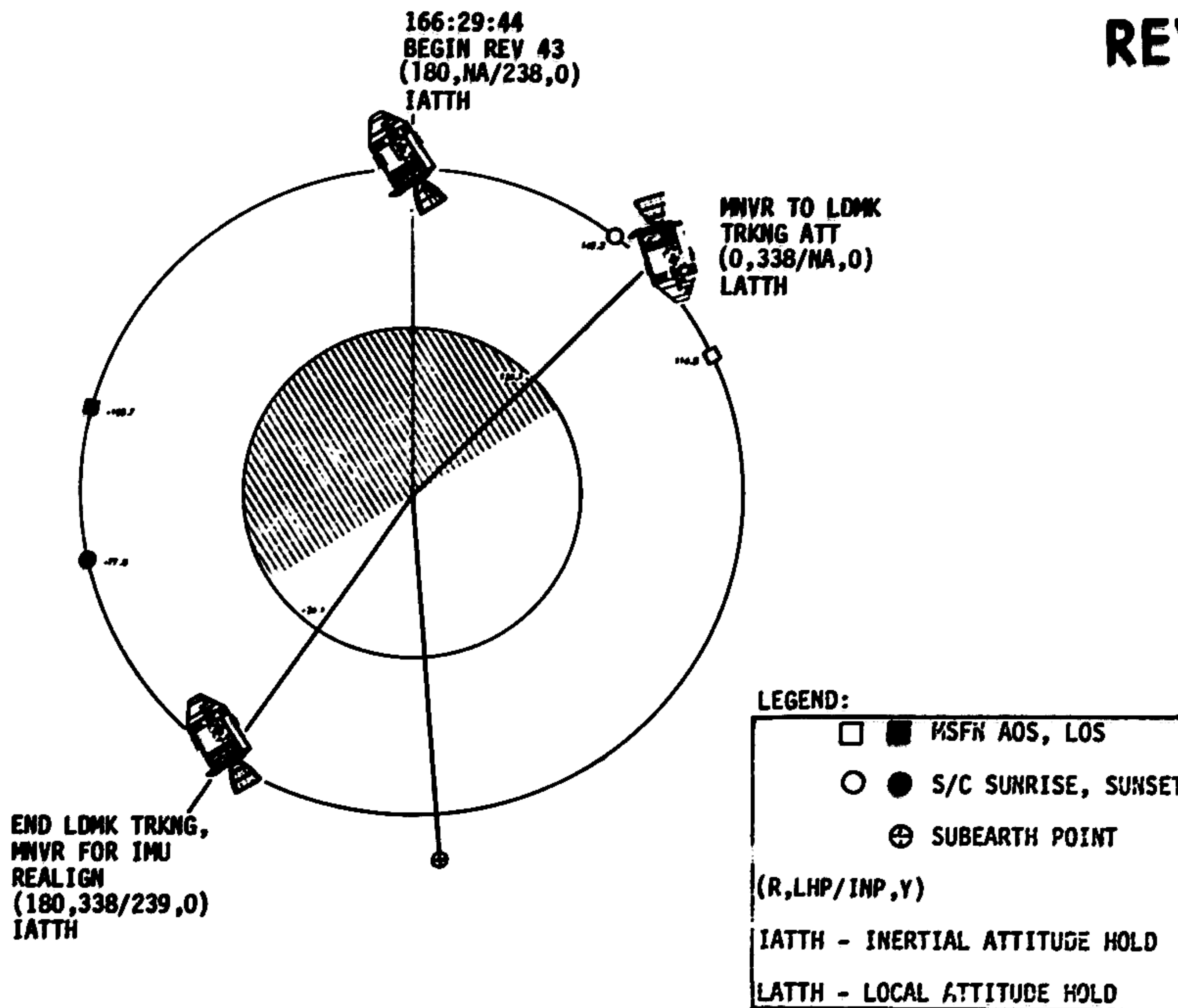
LONG/2 -8.665°

ALT -1.56NM

FM-1

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1989	166:00 - 167:00	7/42-43	3-149

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3-149A

REVISION B

MCC-H

0822 CST

FLIGHT PLAN

NOTES

UPLINK CSM
STATE VECTOR
& V66

166:00
:05
:15
166:30
REV 43
:42
:45
:48
:51
167:00

I

VERIFY DSE MOTION AT LOS

P52 IMU REALIGN
OPTION 3 REFSMMAT

GDC ALIGN TO IMU

EAT PERIOD

SEXT UP DAC FOR LDMK TRACKING PHOTO'S THRU SXT
CM/DAC/SXT/CEX (SEE LDMK TRACK PAD) 1FPSSELECT OMNI DMNVR TO LDMK TRACK ATT BY 166:45
GO ORB RATER 0
P 338/NA
Y 0

TRACK LDMK CP-1
DO NOT PRO ON FINAL
N89, 25 SEC BETWEEN
MARKS
5 MARKS

START DAC @ T2 (-) 1 MIN

CP1 LDMK IS
AT ~ 15.5° SUN ANGLE
STOP DAC AFTER MARK 5

P52 (LDG SITE ORIENT)

N71: _____

N05: _____

N93: _____

X _____

Y _____

Z _____

GET _____

M
S
F
N

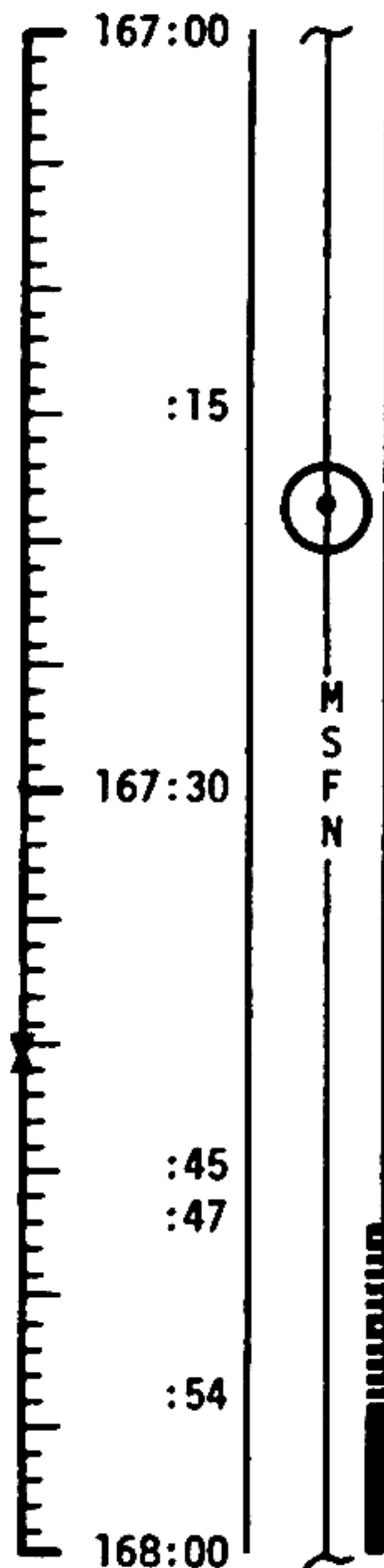
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	166:00 - 167:00	7/42-43	3-150

MCC-H

0922 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV 44

REPORT GYRO TORQUING ANGLES

TRACK LDMK CP-2
DO NOT PRO ON FINAL
N89
25 SEC BETWEEN MARKS
5 MARKS

START DAC @ T2(-)1 MIN

CP 2 LDMK IS
AT ~67° SUN ANGLE

STOP DAC AFTER MARK 5

TRACK LDMK DE-1
DO NOT PRO ON FINAL
N89
25 SEC BETWEEN MARKS
5 MARKS

START DAC @ T2(-)1 MIN

DESCARTES LDMK
AT ~72.5 SUN ANGLE

STOP DAC AFTER MARK 5

TRACK LDMK FM-1
DO NOT PRO ON FINAL
N89
25 SEC BETWEEN MARKS
5 MARKS

START DAC @ T2(-)1 MIN

FR. MAURO LDMK
AT ~40.5 SUN ANGLE

STOP DAC AFTER MARK 5

STOP PITCH AND MNVR TO ACQUIRE MSFN BY 167:40

R 180
P 239
Y 0

HGA:
P -29
Y 184

MAP UPDATE REV 44

LOS : _ _ _ : _ _ _

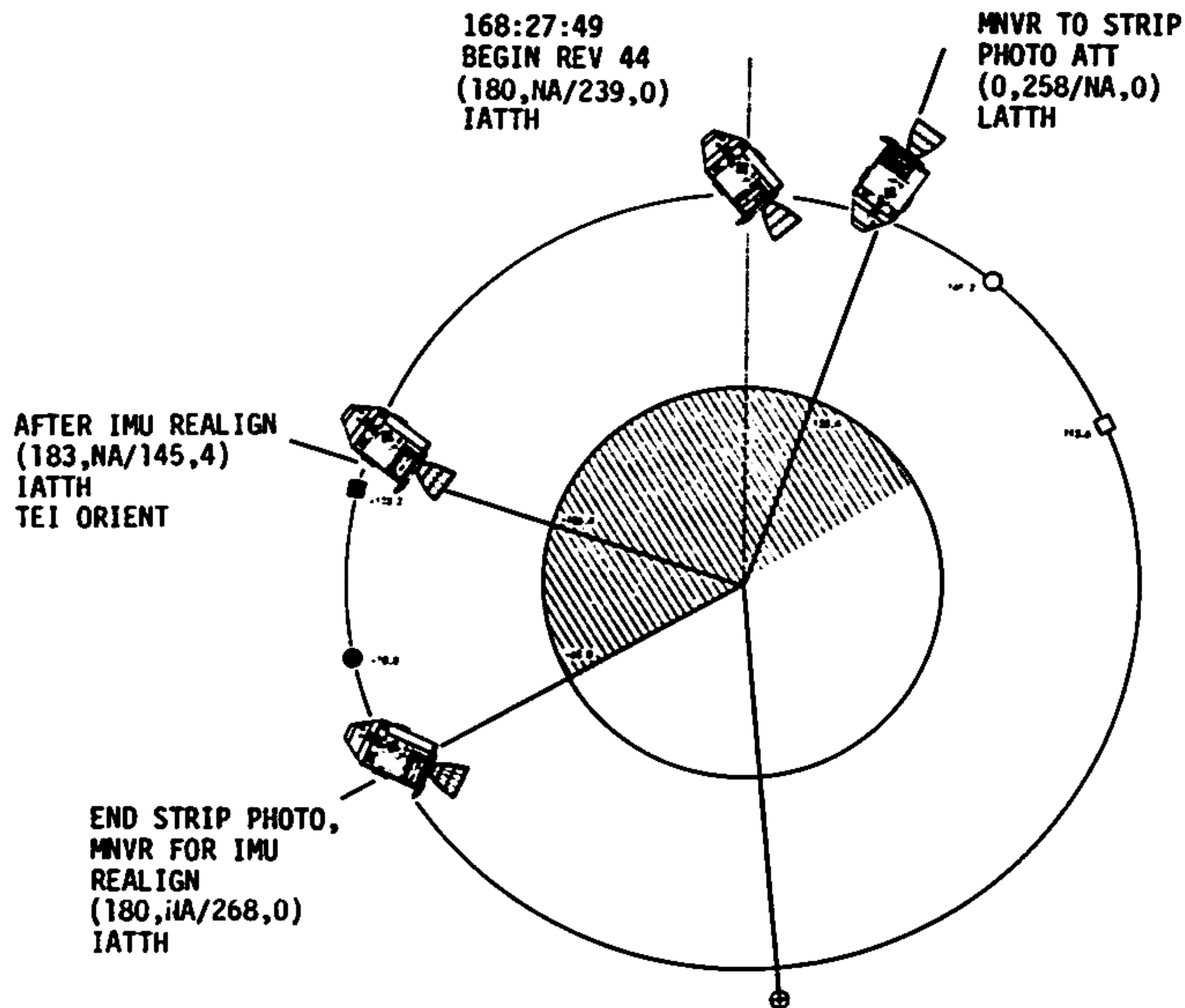
180° : _ _ _ : _ _ _

AOS : _ _ _ : _ _ _

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	167:00 - 168:00	7/43	3-151

REV 44



LEGEND:

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

3-151A

REVISION B

STEREO STRIP PHOTOGRAPHY

REV 44

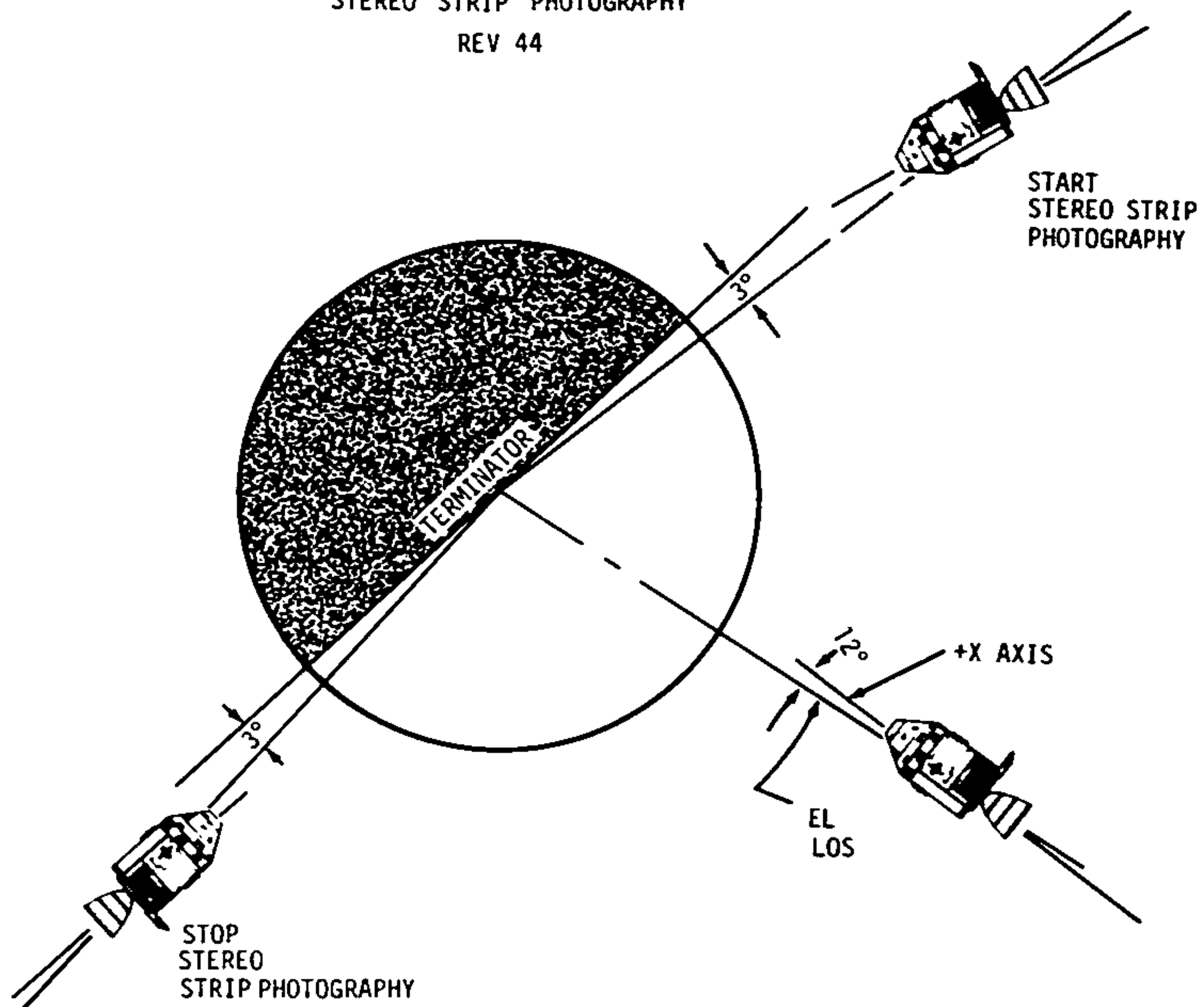


FIGURE 3-5
3-152

MCC-H

1022 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
STEREO PHOTO TIME
~~PCM-LBR~~

168:00	I
:03	
:15	
:30	
REV 44	
168:30	
:41	
:45	
:47	
:49	
169:00	

VERIFY DSE MOTION AT LOS

SETUP EL CAMERA FOR STEREO STRIP
PHOTOGRAPHY (RH RNDZ WINDOW)
CM4/EL/80/BW-BRKT,INTR(f4,250, ∞),180

MNVR TO PHOTOGRAPHIC ATTITUDE BY 168:36

R 0
P 258/NA
Y 0

V83E
ALIGN FDAI #1
ESTABLISH ORB RATE
V79E R1 = -0.0507
R2 = +000.50
R3 = +11111

SELECT OMNI D

V06N65 AT GROUND TERMINATOR
BEGIN PHOTOGRAPHY AT GROUND TERMINATOR (+) 1 MIN T1

RECORD START TIME _____:_____:____ GET

STEREO PHOTO

T1: _____:_____:____ GET
T2: _____:_____:____ GET

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	168:00 - 169:00	7/43-44	3-153

MCC-H

1122 CST

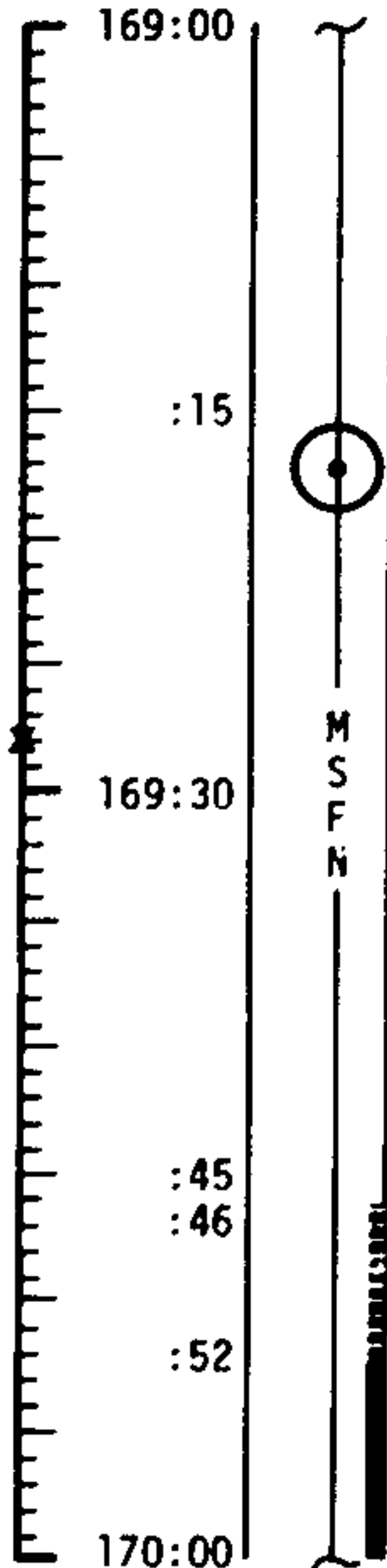
FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV 45
TEI 45 PAD
(PRELIMINARY)

DUMP DSE

UPLINK TO ^{CSM}~~LM~~
TEI DESIRED
ORIENT



STEREO STRIP
PHOTOGRAPHY

N65 AT GROUND TERMINATOR (-)90 SEC
END STEREO STRIP PHOTOGRAPHY AT GROUND TERMINATOR
(-)1 MINUTE-T2

RECORD STOP TIME _____:_____:_____ GET

STOP PITCH

MNVR TO P52 ATT BY 169:47

R 180

HGA

P 268

P -55

Y 0

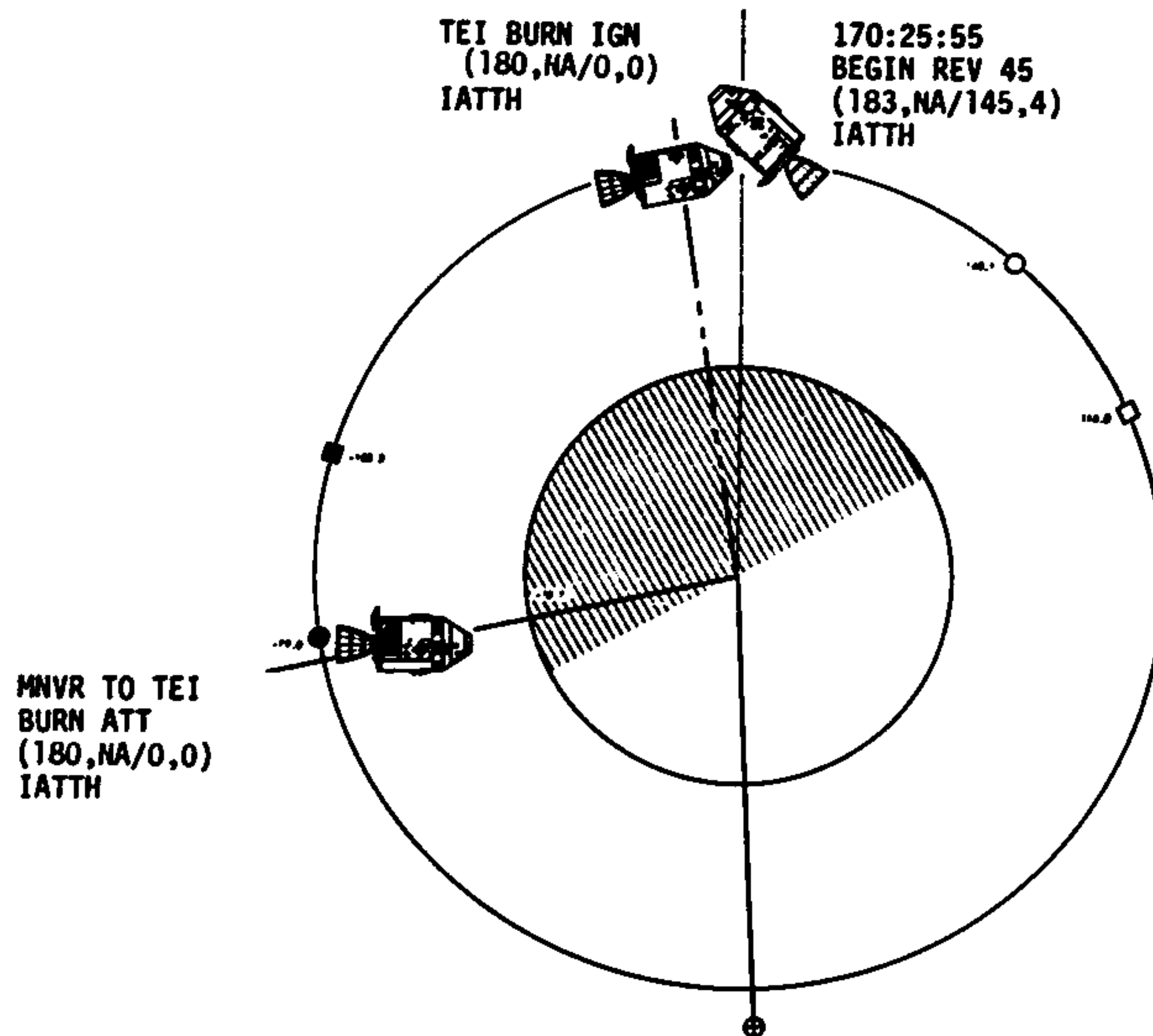
Y 186

MAP UPDATE REV 45		
LOS	:	_____
180°	:	_____
AOS	:	_____

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	169:00 - 170:00	7/44	3-154

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REV 45



LEGEND:

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

3-154A

REVISION B

MCC-H

1222 CST

FLIGHT PLAN

NOTES

170:00
:01
:15
:39
:45
:46
:48
171:00

REV 45

I

VERIFY DSE MOTION AT LOS

P52 IMU REALIGN
OPTION 1 PREFERRED

GDC ALIGN TO IMU

T

M
S
F
N
L

REACQUIRE MSFN

HGA: P -55 Y 186

REPORT GYRO TORQUING ANGLES

P52 (TEI ORIENT)

N71: _ _ , _ _

N05: _ _ _ _ . _ _

N93:

X _ _ . _ _ _ _

Y _ _ . _ _ _ _

Z _ _ . _ _ _ _

GET _ _ _ _ : _ _ _ _

DUMP DSE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	170:00 - 171:00	7/44-45	3-155

MCC-H

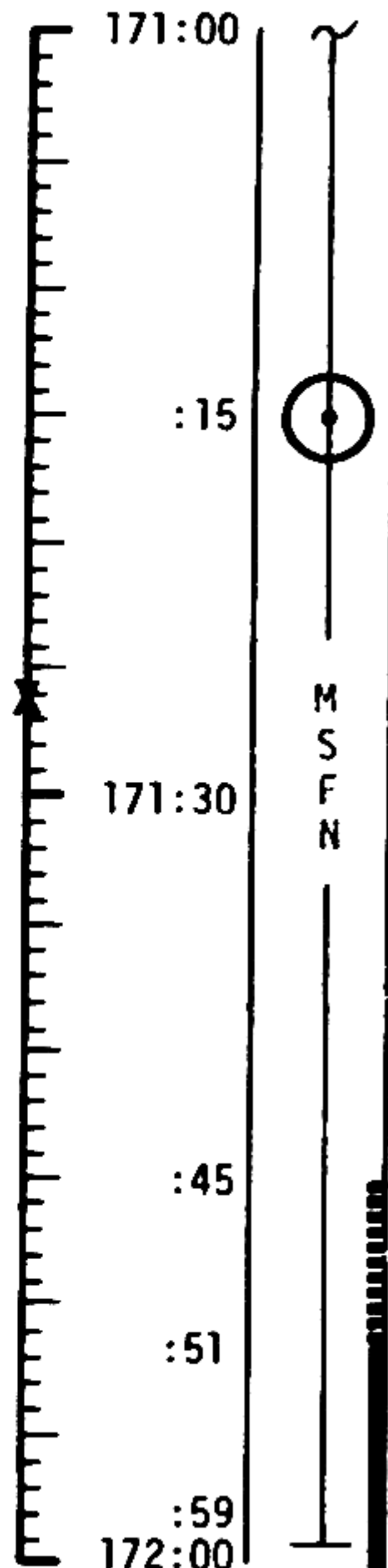
1322 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV 46
TEI 45 MNVR PAD
(NOMINAL)
TEI 46 MNVR PAD

UPLINK TO CSM
STATE VECTOR & V66
TEI 45 TARGET LOAD



PRE TEI SYSTEMS CHECKS
C & W CHECK
CM RCS MONITOR CHECK
SM RCS MONITOR CHECK
ECS MONITOR CHECK

P30-EXTERNAL ΔV

V49-MNVR TO BURN ATT BY 171:51

R 180
P 0
Y 0

OMNI C

SXT STAR CHECK

P40-SPS THRUST
VERIFY DSE MOTION AT LOS

MAP UPDATE REV 46

LOS

180°

AOS WITH TEI

AOS WITHOUT TEI

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	171:00 - 172:00	7/45	3-156

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

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FLIGHT PLAN

TEI BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME		RESIDUALS
		UNDERBURN	OVERBURN	
10°/SEC TAKEOVER	+10° TAKEOVER	FOR G&N C/O >3 SEC EARLY & ΔVC >+50 FPS SWITCH TO SCS AUTO & RESTART SPS	BT + 2 SEC & ΔVC = -40 FPS	TRIM X AND Z AXIS TO 0.2 FPS

TABLE 3-11
3-157

REVISION B

MCC-H

1422 CST

FLIGHT PLAN

NOTES

172:00

:03

GDC ALIGN TO IMU

:15

TIG: 172:21:14.7

BT: 02:08.9 SEC

 ΔV_R : 3035.9 FPS

ULLAGE: 4 JETS, 12 SEC

TEI

V66 TRANSFER CSM SV TO LM SLOT

172:30

:34

UPLINK TO CSM
DESIRED ORIENT
(PTC)M
S
F
N

173:00

MNVR TO TV ATT BY 172:46
 TV (MAD) 172:55 TO 173:15
 CMA/TV-IN (f22)
 (RH RNDZ WINDOW, HEADS DOWN)
 TEI BURN STATUS REPORT
 L10H CANISTER CHANGE NO. 13
 (15 INTO A, STOW 13 IN A4)

R 187
 P 200
 P 4

HGA
 P -71
 Y 11

BURN STATUS REPORT

X	X		•	Δ TIG**
X	X		•	BT**
			•	V_{gx}
TRIM				
X	X	X		R
X	X	X		P
X	X	X		Y
			•	V_{gx} ***
			•	V_{gy} ***
			•	V_{gz} ***
			•	ΔV_c *
X	X	X		FUEL*
X	X	X		OX*
X	X	X		UNBAL

* ITEMS TO BE REPORTED
 TO MSFN
 ** REPORT IF OFF MORE
 THAN ONE SECOND
 *** REPORT IF > 0.2 FPS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	172:00 - 173:00	7/45-TEC	3-158

MCC-H

1522 CST

FLIGHT PLAN

NOTES

173:00

:15

173:30

:45

174:00

M
S
F
H

WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREA
CONTAMINATION CONTROL

P52 - IMU REALIGN
GYRO TORQUE

REPORT GYRO TORQUING ANGLES

MNVR TO PTC ATTITUDE
START PTC

P270
Y 0

EAT PERIOD

PTC
P 270 Y 0

P52 (PTC ORIENT)

N71: _ _ ' _ _

N05: _ _ _ ' _ _

N93:

X _ _ ' _ _

Y _ _ ' _ _

Z _ _ ' _ _

GET _ _ : _ _ : _ _

DUMP DSE

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	173:00 - 174:00	7/TEC	3-159

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

MCC-H

1622 CST

FLIGHT PLAN

NOTES

174:00 :30 175:00 :30 176:00	M S F N	EAT PERIOD	PTC P 270 Y 0
		REST PERIOD (10 HOURS)	<div> PRESLEEP CHECKLIST: CREW STATUS REPORT ONBOARD READOUTS CYCLE O2 & H2 FANS CHLORINATE POTABLE WATER VERIFY: WASTE MNGT OVBD DRAIN - OFF WASTE STOW VENT VLV - CLOSED EMERG CABIN PRESS VLV - BOTH SURGE TK O2 VLV - ON REPRESS O2 VLV - OFF LM TUNNEL VENT - OFF "E" MEMORY DUMP NORMAL LUNAR COMM EXCEPT: S-BD NORMAL MODE VOICE - OFF S-BD SQUELCH - ENABLE S-BD AUX TAPE - OFF S-BD ANT - OMNI S-BD ANT OMNI - B TAPE RCDR FWD - OFF </div>
		<div> ONBOARD READOUT BAT C _____ PYRO BAT A _____ PYRO BAT B _____ RC: A _____ B _____ C _____ D _____ DC IND SEL - MIA OR B </div>	

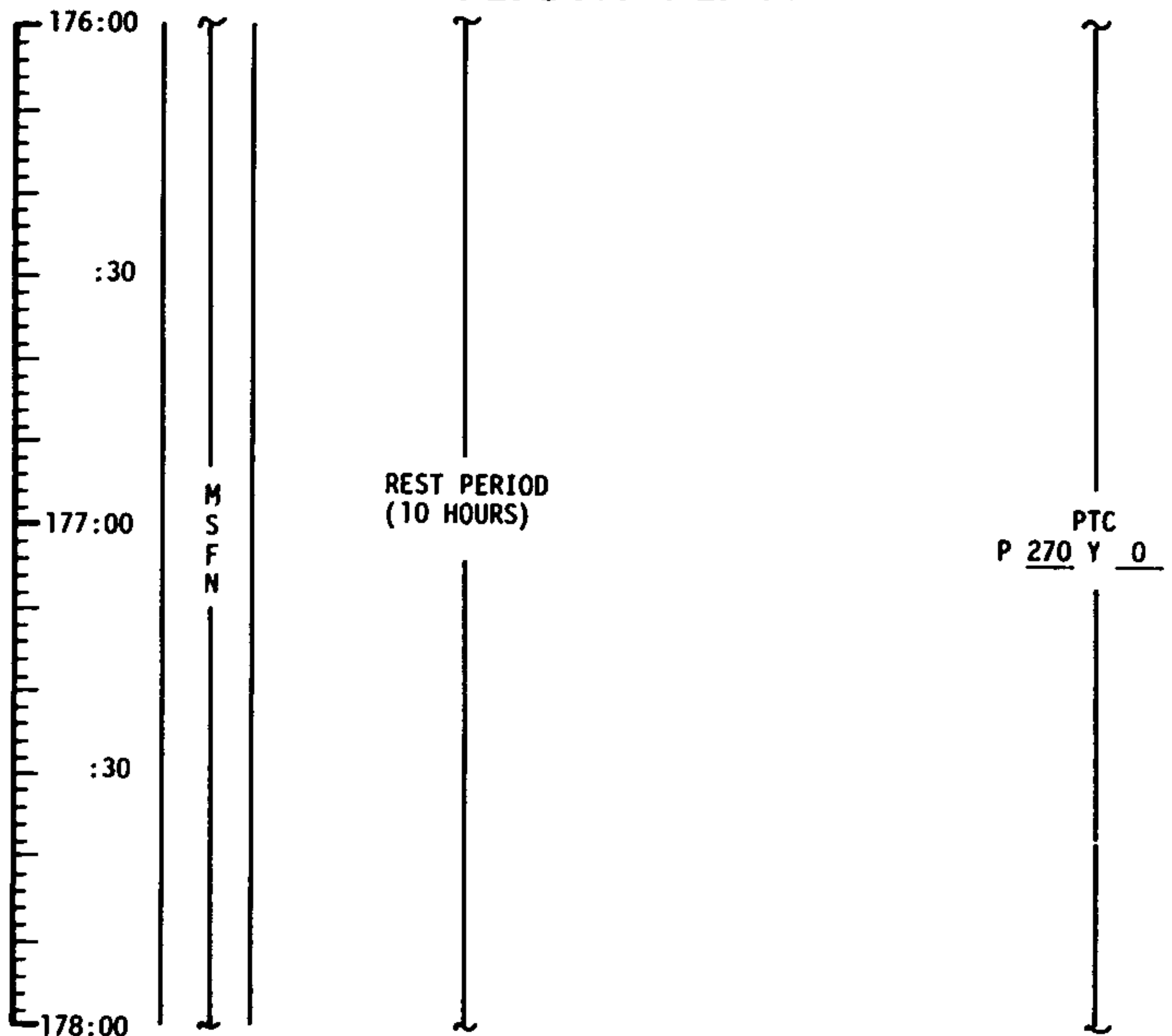
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	174:00 - 176:00	7/TEC	3-160

MCC-H

1822 CST

FLIGHT PLAN

NOTES



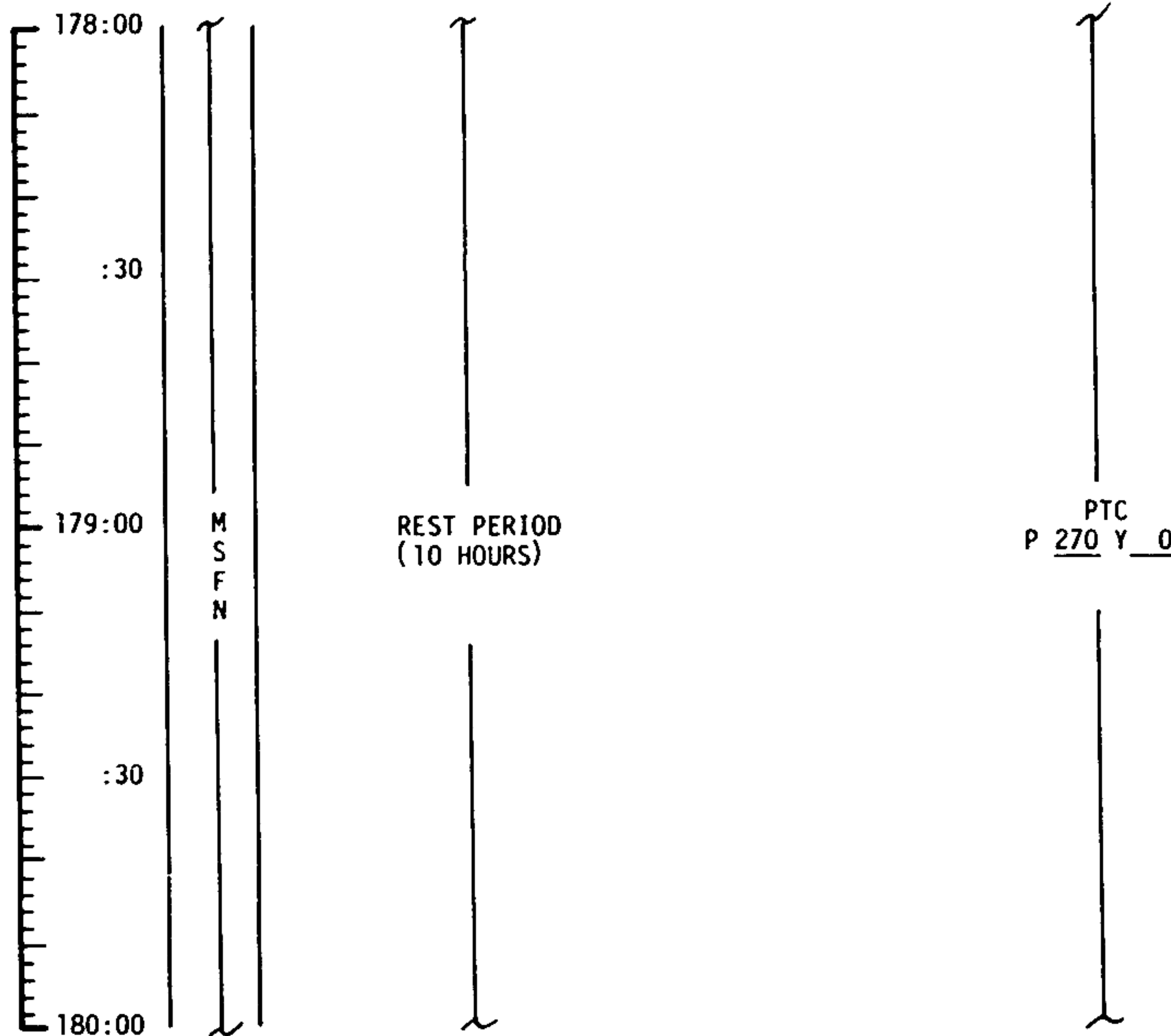
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	176:00 - 178:00	7/TEC	3-161

MCC-H

2022 CST

FLIGHT PLAN

NOTES



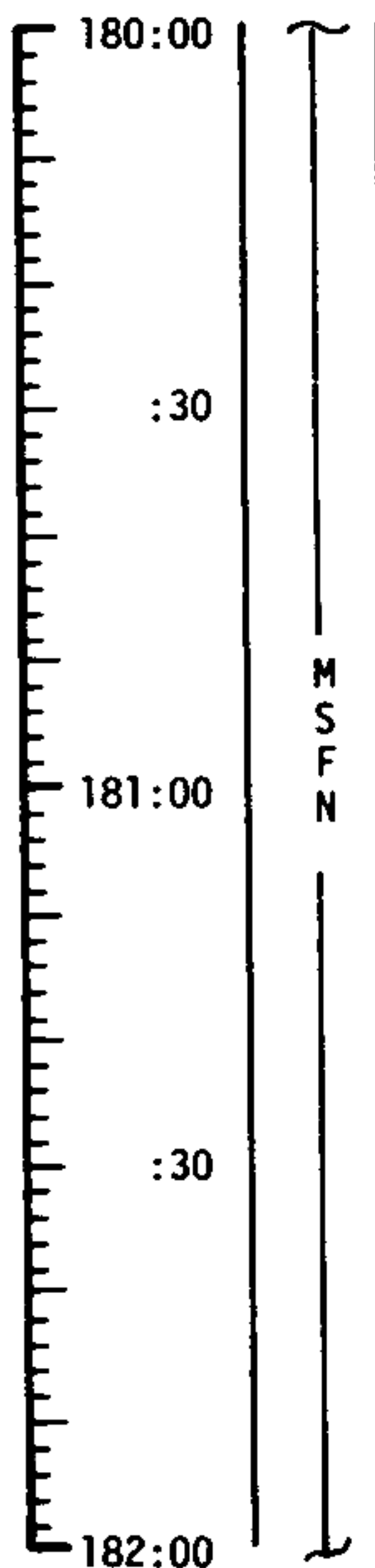
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	178:00 - 180:00	7/TEC	3-162

MCC-H

2222 CST

FLIGHT PLAN

NOTES



M
S
F
N

REST PERIOD
(10 HOURS)

PTC
P 270, Y 0

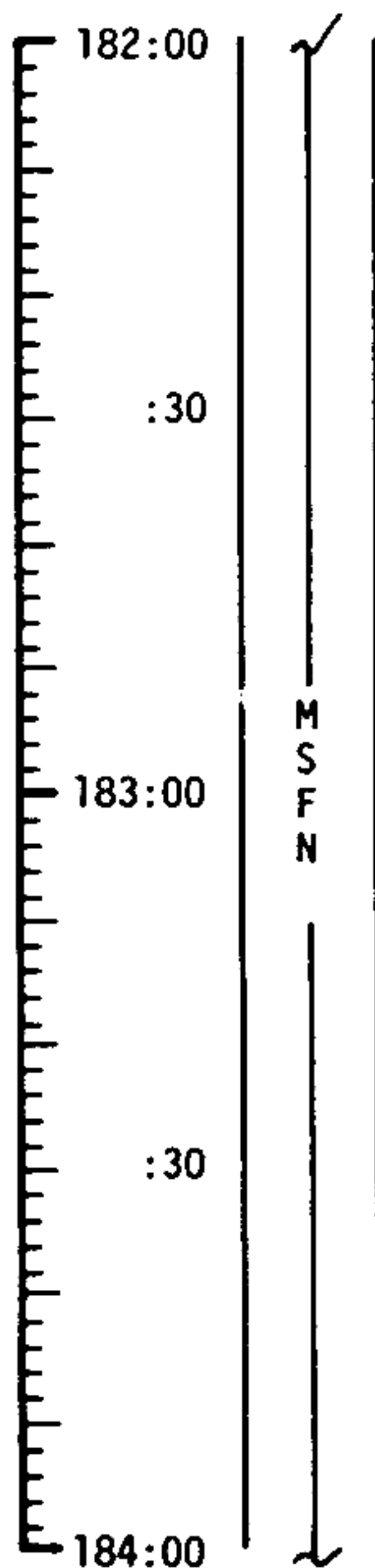
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	180:00 - 182:00	7/TEC	3-163

MCC-H

0022 CST

FLIGHT PLAN

NOTES



REST PERIOD
(10 HOURS)

PTC
P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	182:00 - 184:00	7/TEC	3-164

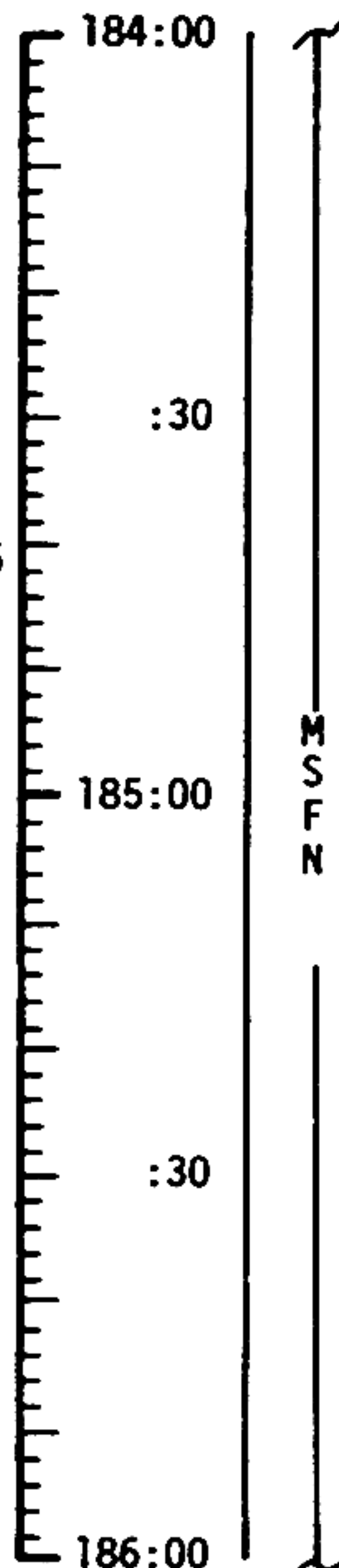
MCC-H

0222 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
CONSUMABLES
MCC-5 MNVR PAD
FLIGHT PLAN
UPLINK TO CSM
STATE VECTOR & V66
MCC-5 TGT LOAD



EAT PERIOD

WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREA

LiOH CANISTER CHANGE NO. 14
(16 INTO B, STOW 14 IN A4)

CONTINUE PTC IF MCC-5 IS NOT PERFORMED

P52 - IMU REALIGN
OPTION 3 - REFSMMAT
REPORT GYRO TORQUING ANGLES

POSTSLEEP CHECKLIST:
CREW STATUS REPORT
CONSUMABLES UPDATE
CYCLE H2 & O2 FANS
FLIGHT PLAN UPDATE
NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF
OMNI OPS
S-BD ANT - OMNI
S-BD ANT OMNI - B
HGA OPS
S-BD ANT-HI GAIN
CREW MANAGES ANT
OPS

CREW STATUS REPORT

	CDR	CMP	LMP
SLEEP	_____	_____	_____
PRD	_____	_____	_____

CSM CONSUMABLES UPDATE

GET: _____ : _____ : _____
RCS TOTAL _____ %
QUAD A _____ % B _____ %
C _____ % D _____ %
H₂ TOTAL _____ %
O₂ TOTAL _____ %

P52 (PTC ORIENT)

N71: _____ : _____ : _____
N05: _____ : _____ : _____
N93: _____ : _____ : _____
X _____ : _____ : _____
Y _____ : _____ : _____
Z _____ : _____ : _____
GET _____ : _____ : _____

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	184:00 - 186:00	8/TEC	3-165

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

Flight Med. not like this

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FLIGHT PLAN

MCC-5 BURN TABLE

P. OP. Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	±10° TAKEOVER	BI + 1 SEC	TRIM X AXIS ONLY TO 0.2 FPS

TABLE 3-12
3-106

MCC-H

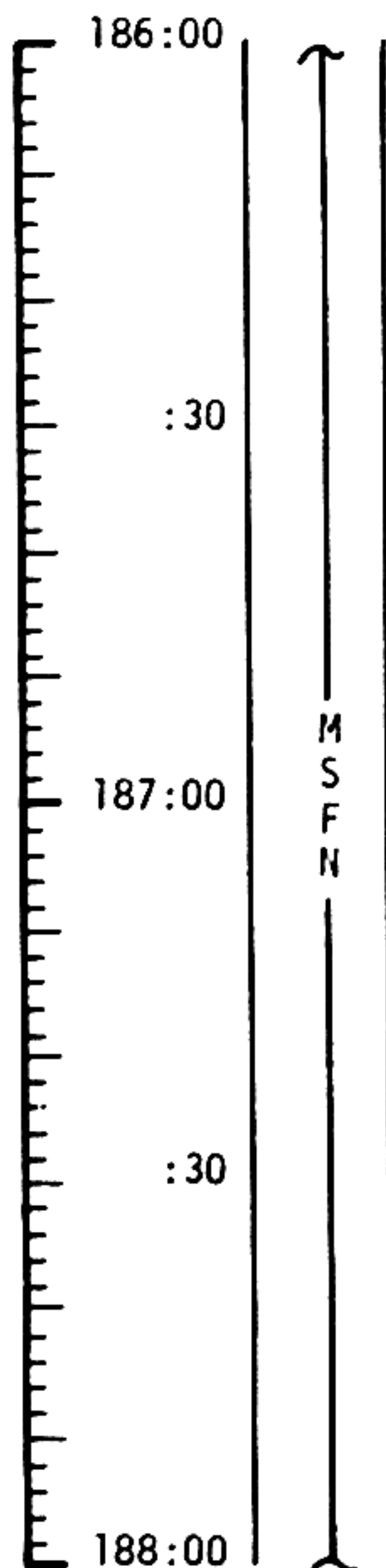
0422 CST

FLIGHT PLAN

NOTES

BATTERY CHARGE, BATTERY B

(TEI + 15 HRS)



H₂ PURGE LINE HTRS - ON
 P30 - EXTERNAL ΔV
 V49 - MNVR TO BURN ATT
 SXT STAR CHECK
 H2 & O2 FUEL CELL PURGE
 WASTE WATER DUMP
 P40/41 - SPS/RCS THRUST
 GDC ALIGN TO IMU

MCC-5

V66 TRANSFER CSM SV TO LM SLOT
 MCC-5 BURN STATUS REPORT

TIG: 187:21:14.7
 ΔV: NOMINALLY ZERO

PTC
 P 270, Y 0

BURN STATUS REPORT

X	X		•	ΔTIG
X	X		•	BT
			•	V _{gx}
TRIM				
X	X	X		R
X	X	X		F
X	X	X		Y
			•	V _{gx}
			•	V _{gy}
			•	V _{gz}
			•	ΔV _c *
X	X	X		FUEL *
X	X	X		OX *
X	X	X		UNBAL

* ITEMS TO BE
 REPORTED TO MSFN

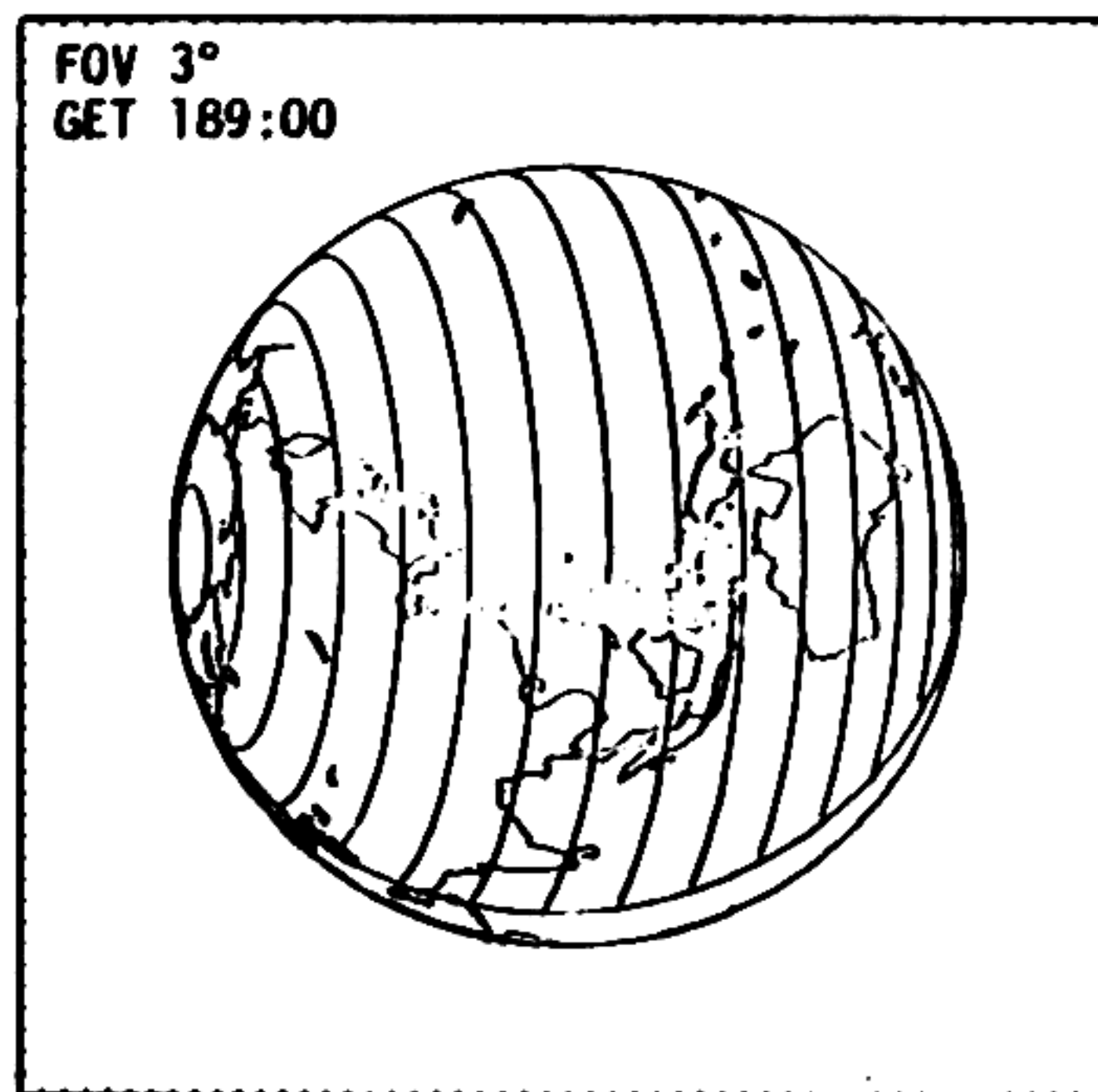
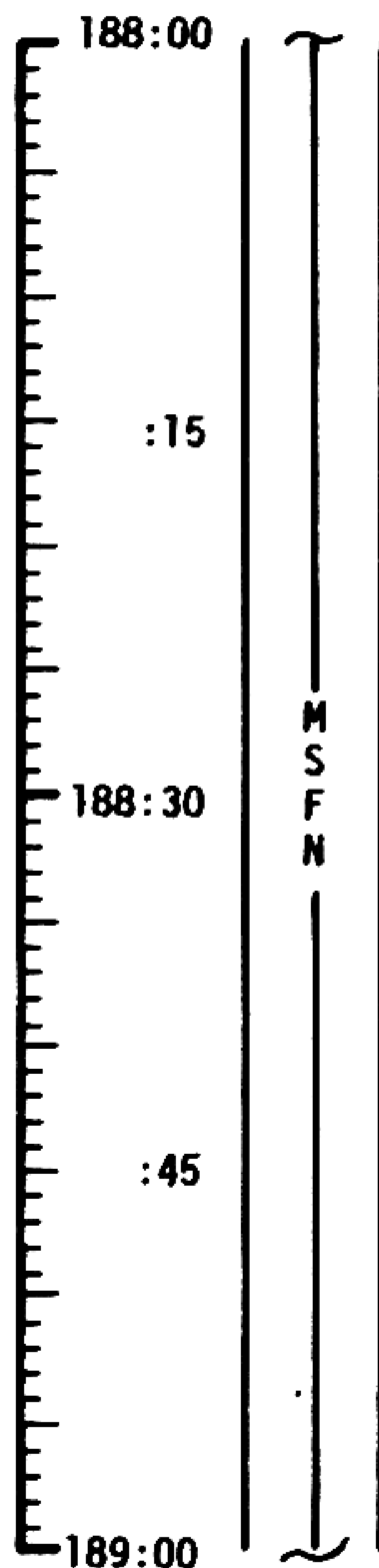
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	186:00 - 188:00	8/TEC	3-167

MCC-H

0622 CST

FLIGHT PLAN

NOTES



PTC
P 270, Y 0

STOP PTC AT ROLL 235°

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	188:00 - 189:00	8/TEC	3-168

MCC-N

0722 CST

FLIGHT PLAN

NOTES

189:00

MNVR TO OPTICS CALIBRATION ATT

R 235

P23 - CISELUNAR NAVIGATION

P 272

OPTICS CALIBRATION

Y 0

STAR 1 2

P00

V49 - MNVR TO SIGHTING ATT

R 90

STAR/EARTH HORIZON

P 339 341

P23 - CISELUNAR NAVIGATION

Y 332 333

LOAD W MATRIX (R1 +4 5 0 0 0)(R2 +0 0 0 0 6)

1. STAR 2 3 2 EFH (R3 = 0 0 1 2 0)

N88: (R1 = -6 3 5 0 5)(R2 = -0 1 8 8 3)(R3 = -7 7 2 2 4)

:15

M
S
F
N

189:30

2. STAR 1 7 4 ENH (R3 = 0 0 1 1 0)

N88: (R1 = -5 5 9 9 2)(R2 = -8 2 0 7 3)(R3 = +1 1 3 5 3)

3. STAR 1 7 2 ENH (R3 = 0 0 1 1 0)

N88: (R1 = -6 4 9 4 7)(R2 = -7 4 3 1 2)(R3 = -1 6 1 1 4)

:45

4. STAR 2 4 EFH (R3 = 0 0 1 2 0)

5. STAR 2 6 EFH (R3 = 0 0 1 2 0)

190:00

3 MARKS ON EACH STAR

INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	189:00 - 190:00	8/TEC	3-169

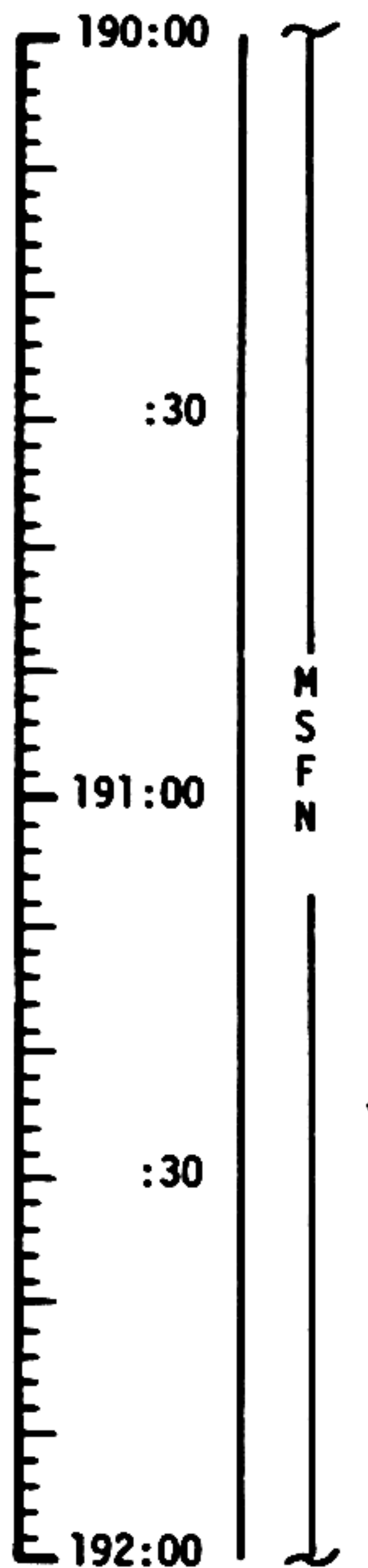
MCC-H

0822 CST

FLIGHT PLAN

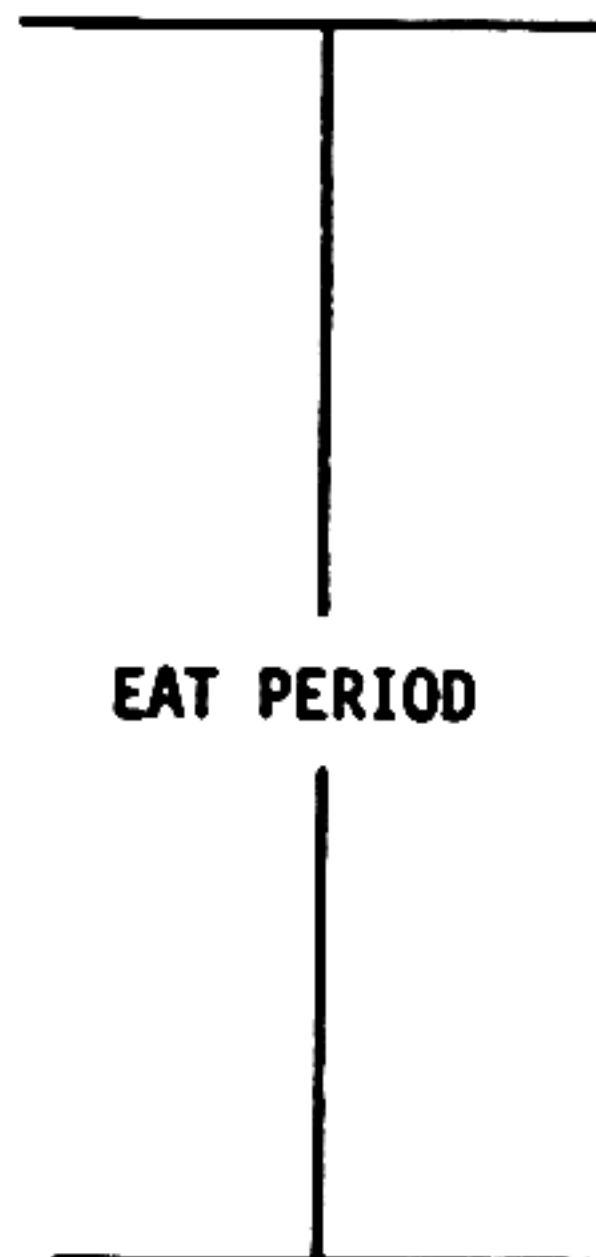
NOTES

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)



M
S
F
N

START PTC



PTC
P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	190:00 - 192:00	8/TEC	3-170

1022 CST

FLIGHT PLAN

10115

192:00

:30

193:00

:30

194:00

M
S
F
H

PTC
P 270, 1 0

BATTERY CHARGE, BATTERY A

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
FIELD 12	FINAL (NOV 14)	OCTOBER 15, 1969	192:00 - 194:00	07-EC	3-171

10115-03 (Nov 69)

FLIGHT PLANNING BRANCH

FLIGHT PLAN

197.00

: 1'

104:30

:45

100

**M
S
F
L**

FOV 3°
GET 195:00

[illegible]

P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
AV-10 12	12 (10/15)	OCTOBER 15, 1969	194:00 - 195:00	8/TEC	3-147

FLIGHT PLANNING SECTION

MCC-H

1322 CST

FLIGHT PLAN

NOTES

195:00		MNVR TO OPTICS CALIBRATION ATT	R 235
		P23 - CISELUNAR NAVIGATION	P 272
		OPTICS CALIBRATION	Y 0
		STAR 1 2	
		P00	
		V49 - MNVR TO SIGHTING ATT	R 90
		STAR/EARTH HORIZON	P 329
		P23 - CISELUNAR NAVIGATION	Y 332
:15		1. VENUS ENH (R3 = 0 0 1 1 0)	
		N88: (R1 = -7 0 4 9 6)(R2 = -6 5 8 7 4)(R3 = -2 6 2 9 2)	
		DO NOT PROCEED ON F 06 49	
		2. STAR 2 6 EFH (R3 = 0 0 1 2 0)	
195:30		3. STAR 1 6 0 EFH (R3 = 0 0 1 2 0)	
		N88: (R1 = -9 4 7 0 3)(R2 = -2 5 6 7 8)(R3 = +1 9 2 8 6)	
		4. STAR 1 7 1 ENH (R3 = 0 0 1 1 0)	
		N88: (R1 = -5 2 4 7 3)(R2 = -5 0 9 2 0)(R3 = -6 8 2 1 8)	
		5. STAR 1 6 3 EFH (R3 = 0 0 1 2 0)	
:45		N88: (R1 = -8 3 4 6 4)(R2 = -4 4 9 6 6)(R3 = +3 1 8 0 9)	
		6. STAR 2 0 4 ENH (R3 = 0 0 1 1 0)	
		N88: (R1 = -2 1 3 8 9)(R2 = -9 3 8 6 8)(R3 = -2 7 0 4 2)	
196:00			

3 MARKS ON EACH STAR

INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	195:00 - 196:00	8/TEC	3-173

MCC-H

1422 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)

196:00
:30
197:00
:30
198:00

M
S
F
N

START PTC

WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREA
CONTAMINATION CONTROL
L10H CANISTER CHANGE NO. 15
(17 INTO A, STOW 15 IN A4)

EAT PERIOD

PRESLEEP CHECKLIST:
CREW STATUS REPORT (MED)
ONBOARD READOUTS
CYCLE O2 & H2 FANS
CHLORINATE POTABLE WATER
VERIFY:
WASTE MNGT OVBD DRAIN - OFF
WASTE STOW VENT VLV - CLOSED
EMERG CABIN PRESS VLV - BOTH
SURGE TK O2 VLV - ON
REPRESS O2 VLV - OFF
LM TUNNEL VENT - OFF
"E" MEMORY DUMP
NORMAL LUNAR COMM EXCEPT:
S-BD NORMAL MODE VOICE - OFF
S-BD SQUELCH - ENABLE
S-BD AUX TAPE - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B
TAPE RCDR FWD - OFF

PTC
P 270, Y 0

ONBOARD READOUT

BAT C _____
PYRO BAT A _____
PYRO BAT B _____
RCS A _____
B _____
C _____
D _____
DC IND SEL - MNA OR B

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	196:00 - 198:00	8/TEC	3-174

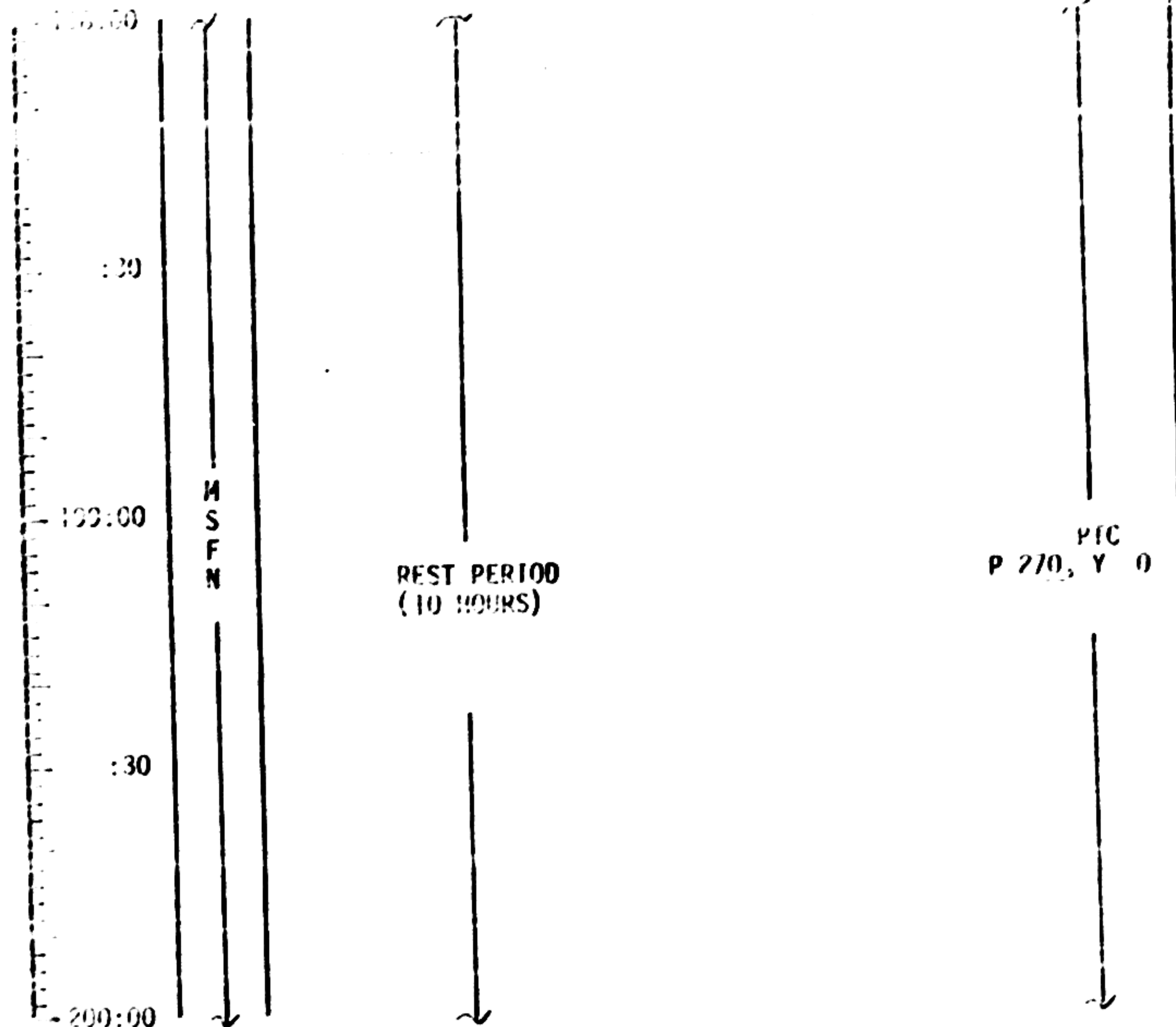
NSC Form 20 (May 69)

FLIGHT PLANNING BRANCH

1872 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
0110 12	FINAL (NOV 14)	OCTOBER 15, 1969	198:00 - 200:00	8/11C	3-175

MACC-11

1627 (51)

FLIGHT PLAN

NOTES

200:00

201:00

202:00

203:00

204:00

205:00

206:00

207:00

208:00

209:00

210:00

211:00

212:00

213:00

214:00

215:00

216:00

217:00

218:00

219:00

220:00

221:00

222:00

223:00

224:00

225:00

226:00

227:00

228:00

229:00

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287:00

288:00

289:00

290:00

291:00

292:00

293:00

294:00

295:00

296:00

297:00

298:00

299:00

300:00

REST PERIOD
(10 HOURS)

PIC
P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
MACC-11	1627 (51)	OCTOBER 15, 1969	200:00 - 202:00	8/TEC	3-10

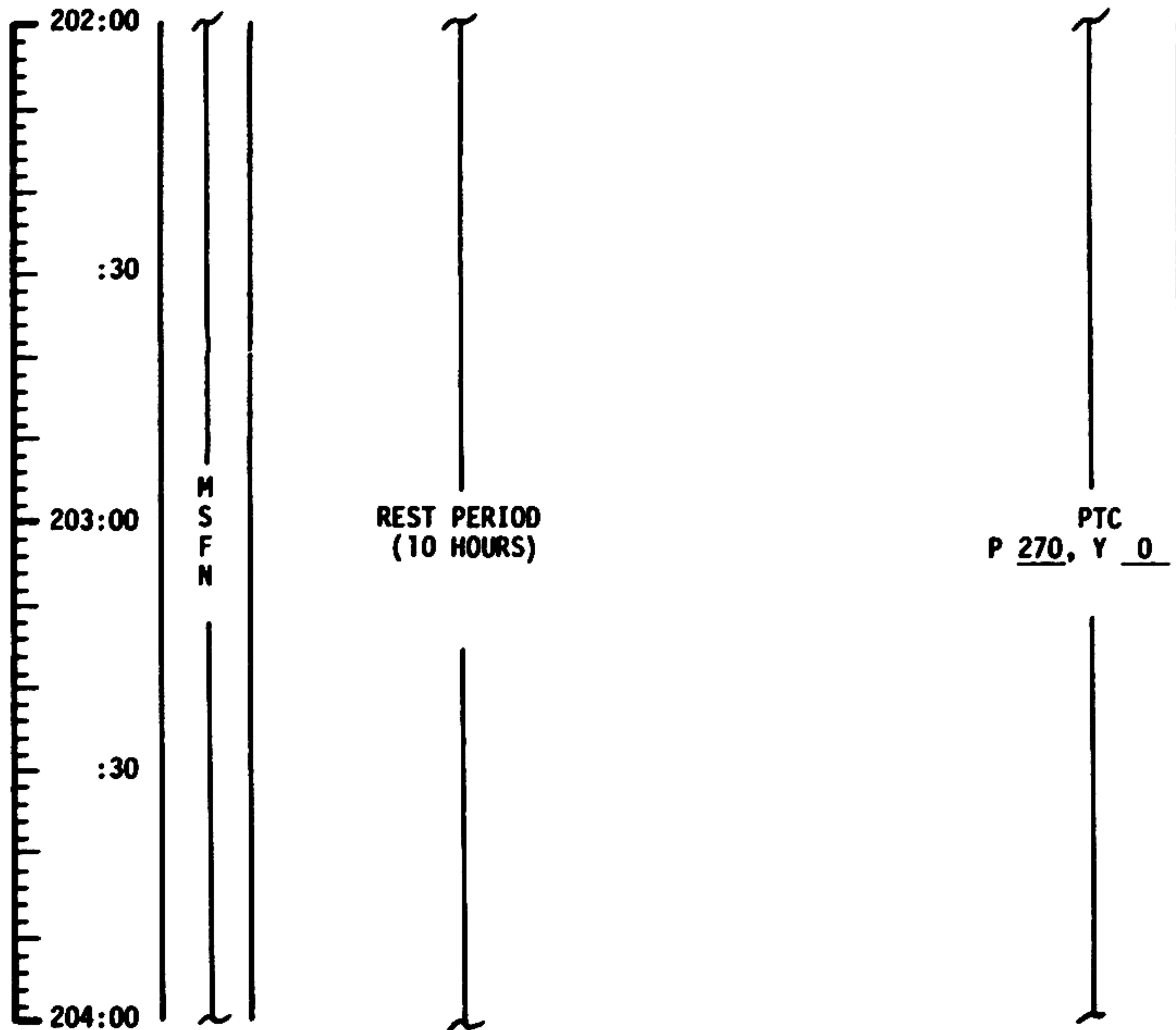
FLIGHT PLANNING BRANCH

MCC-H

2022 CST

FLIGHT PLAN

NOTES



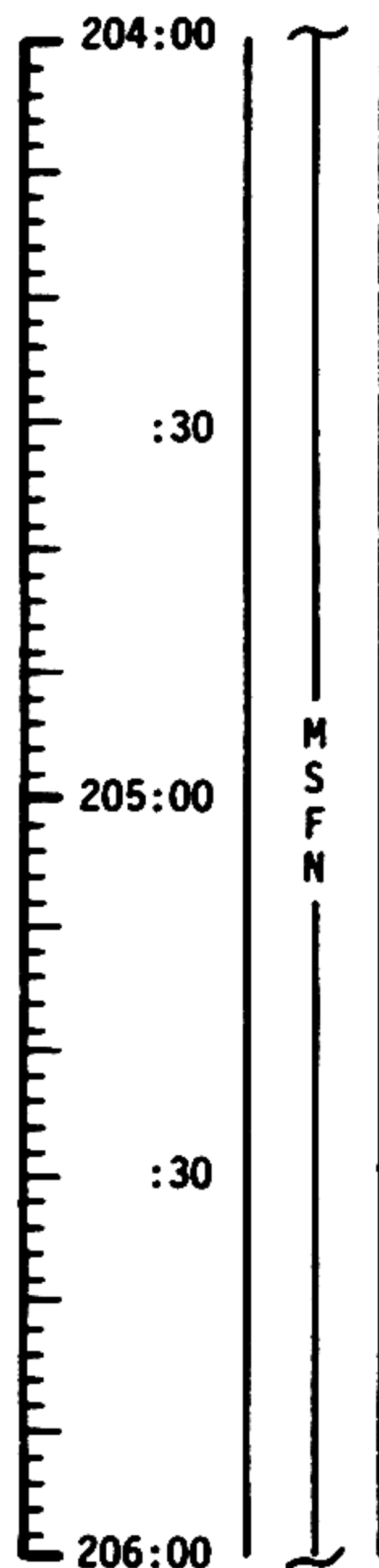
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	202:00 - 204:00	8/TEC	3-177

MCC-H

2222 CST

FLIGHT PLAN

NOTES



REST PERIOD
(10 HOURS)

PTC
P 270, Y 0

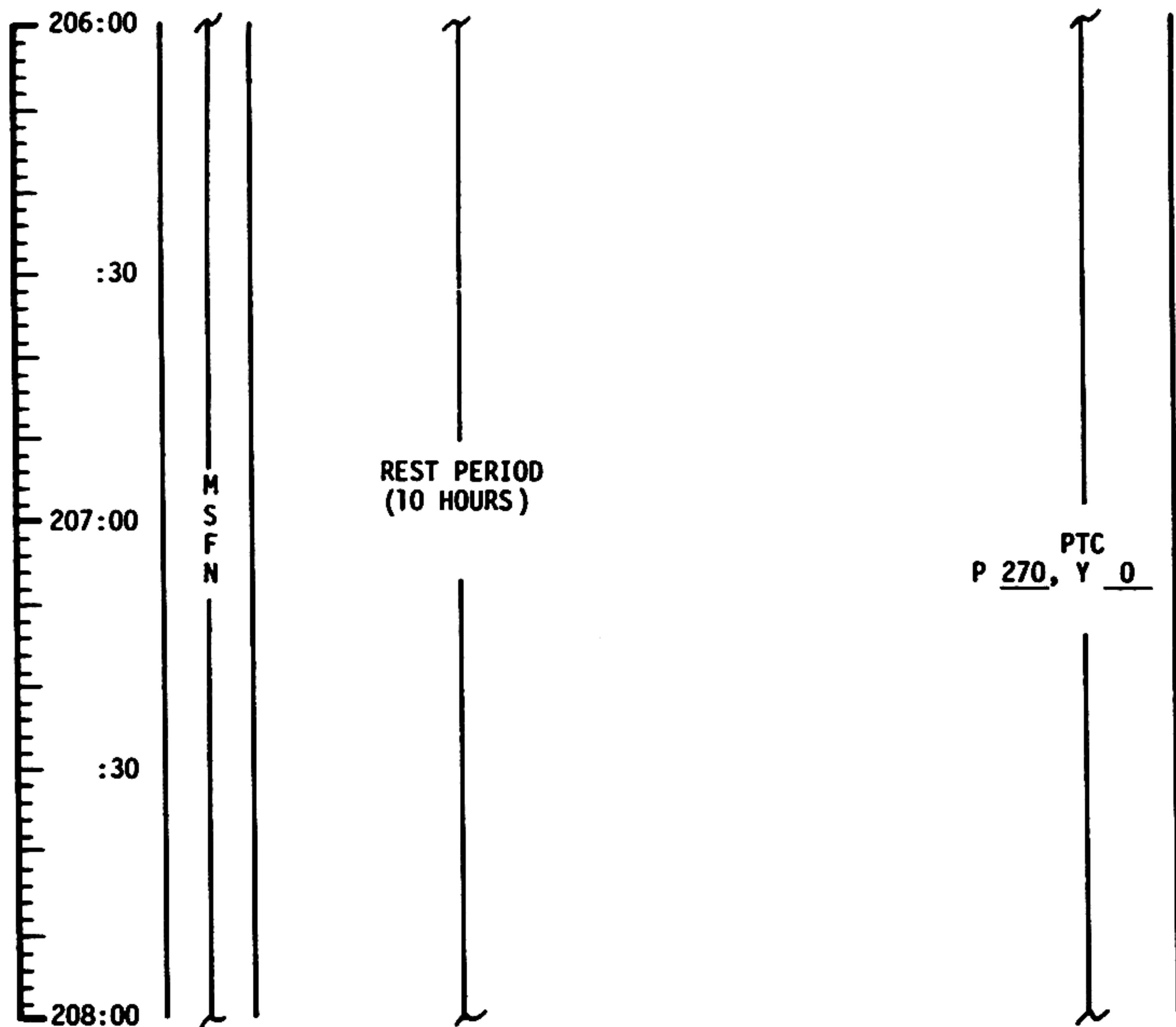
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	204:00 - 206:00	8/TEC	3-178

MCC-H

0022 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	206:00 - 208:00	8/TEC	3-179

MCC-H

0222 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN

UPLINK TO CSM
STATE VECTOR & V66

208:00

:30

209:00

:30

210:00

M
S
F
N

O₂ FUEL CELL PURGE
WASTE WATER DUMP
LiOH CANISTER CHANGE NO 16
(18 INTO B, STOW 16 IN A4)

EAT PERIOD

EMS ENTRY CHECK

POSTSLEEP CHECKLIST:
CREW STATUS REPORT
CONSUMABLES UPDATE
CYCLE H₂ & O₂ FANS
FLIGHT PLAN UPDATE
NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF
OMNI OPS
S-BD ANT - OMNI
S-BD ANT OMNI - B
HGA OPS
S-BD ANT - HI GAIN
CREW MANAGES ANT
OPS

CREW STATUS REPORT

	CDR	CMF	LMP
SLEEP	_____	_____	_____
PRD	_____	_____	_____

PTC
P 270, Y 0

CSM CONSUMABLES UPDATE

GET: _____:_____
RCS TOTAL _____ %
QUAD A _____ % B _____ %
C _____ % D _____ %
H₂ TOTAL _____ %
O₂ TOTAL _____ %

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	208:00 - 210:00	9/TEC	3-180

**LOG SHEET
FOR
LIGHT FLASHES & RADIO SIGNALS BEHIND MOON**

G.E.T.**REMARKS**

FLIGHT PLAN

DATE 10/5/69

LIGHT FLASH
& RADIO LOG

REMARKS

[illegible]

DATE 10/5/69

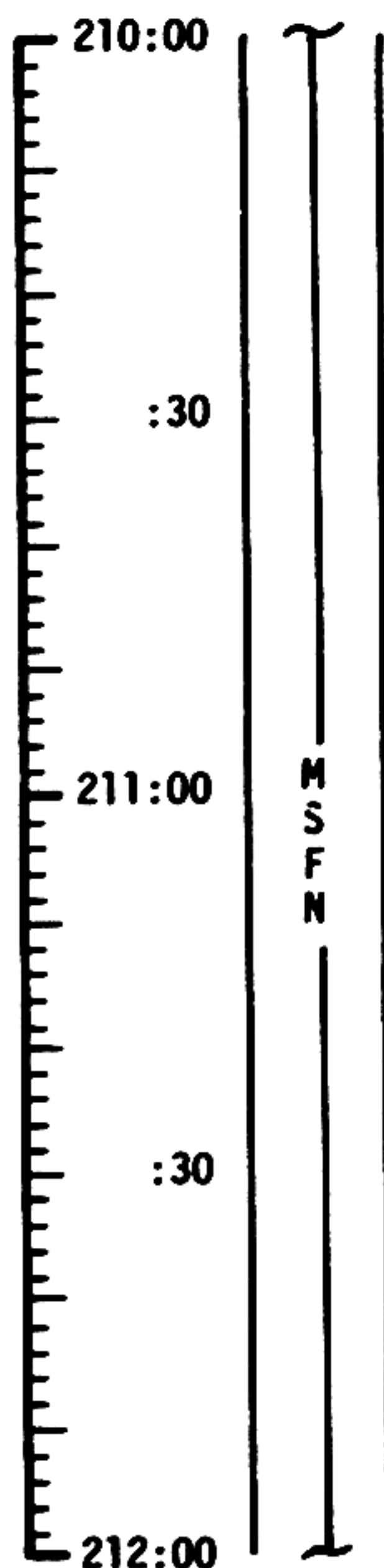
LIGHT FLASH: & RADIO LOG

MCC-H

0422 CST

FLIGHT PLAN

NOTES



P52-IMU REALIGN
OPTION 3 REFSMMAT
(OPTIONAL)

REPORT GYRO TORQUING ANGLES

P52 (PTC ORIENT)

N71: _ _ _ , _ _ _

N05: _ _ _ . _ _ _

N93: _ _ _ . _ _ _

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

Z _ _ _ . _ _ _

GET _ _ _ : _ _ _ : _ _ _

PTC
P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	210:00 - 212:00	9/TEC	3-181

MCC-H

0622 CST

FLIGHT PLAN

NOTES

212:00

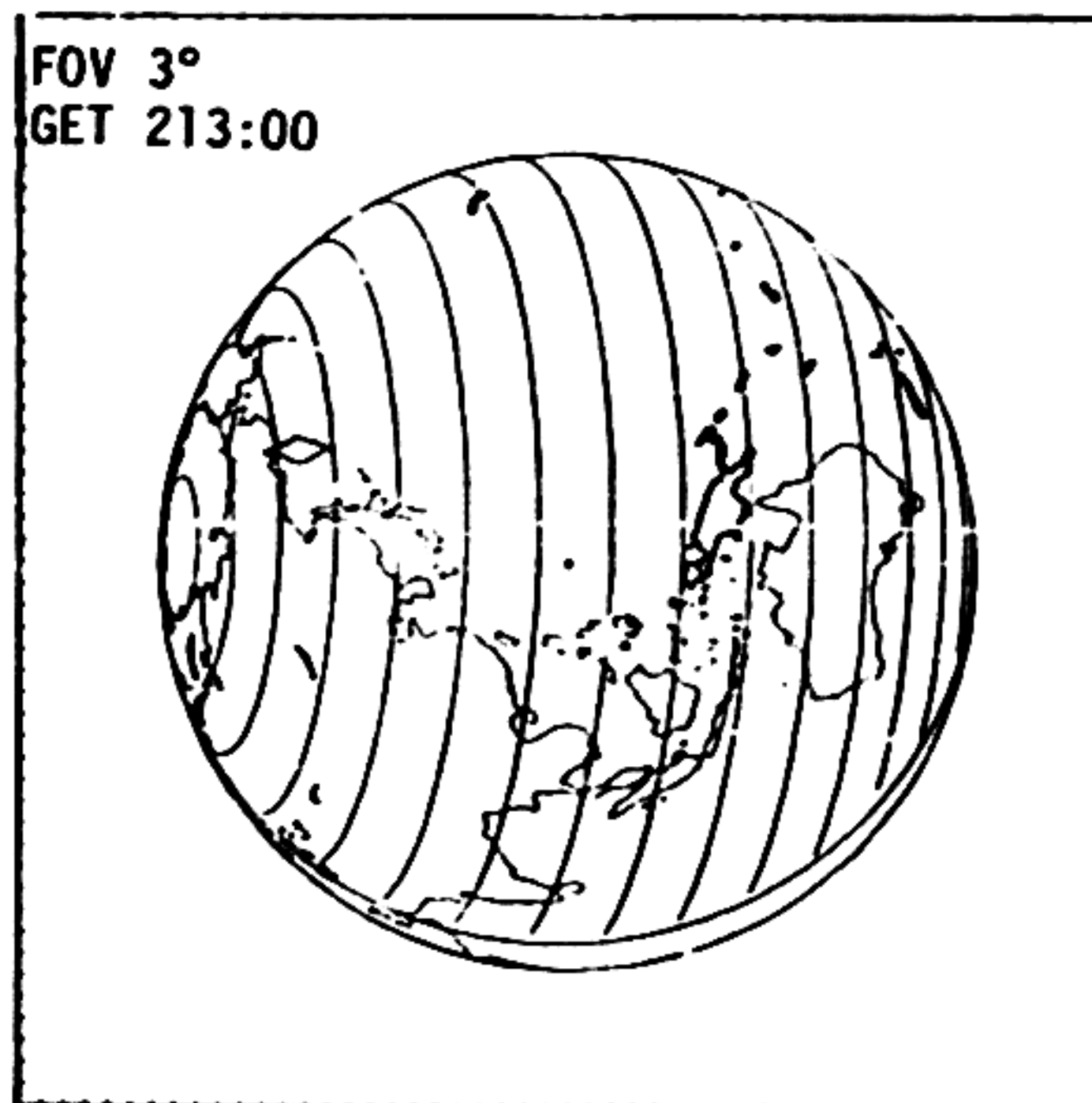
:15

212:30

:45

213:00

M
S
F
N



STOP PTC AT ROLL 235°

PTC

P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	212:00 - 213:00	9/TEC	3-182

MCC-H

0722

FLIGHT PLAN

NOTES

213:00

MNVR TO OPTICS CALIBRATION ATT
 P23 - CISELUNAR NAVIGATION
 OPTICS CALIBRATION
 STAR 1 2

R 235
 P 272
 Y 0

:15

P00
 V49 - MNVR TO SIGHTING ATT
 STAR/EARTH HORIZON
 P23 - CISELUNAR NAVIGATION

R 90
 P 155 99
 Y 328 327

LOAD W MATRIX (R1 +4 5 0 0 0) (R2 +0 0 0 0 6)

1. VENUS ENH (R3 = 0 0 1 1 0)

N88: (R1 = -6 9 2 0 2) (R2 = -6 7 0 1 8) (R3 = -2 6 8 3 2)

DO NOT PROCEED ON F 06 49

2. STAR 2 0 4 ENH (R3 = 0 0 1 1 0)

N88: (R1 = -2 1 3 8 9) (R2 = -9 3 8 6 8) (R3 = -2 7 0 4 2)

213:30

M
S
F
N

3. STAR 2 6 EFH (R3 = 0 0 1 2 0)

4. STAR 1 6 0 EFH (R3 = 0 0 1 2 0)

N88: (R1 = -9 4 7 0 3) (R2 = -2 5 6 7 8) (R3 = +1 9 2 8 6)

5. STAR 1 6 5 ENH (R3 = 0 0 1 1 0)

N88: (R1 = -5 8 2 1 6) (R2 = -4 6 1 3 9) (R3 = -6 6 9 4 8)

:45

6. STAR 3 1 EFH (R3 = 0 0 1 2 0)

214:00

3 MARKS ON EACH STAR

INCORPORATE P23
 MARK DATA AND
 UPDATE ONBOARD
 STATE VECTOR

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	213:00 - 214:00	8/TEC	3-183

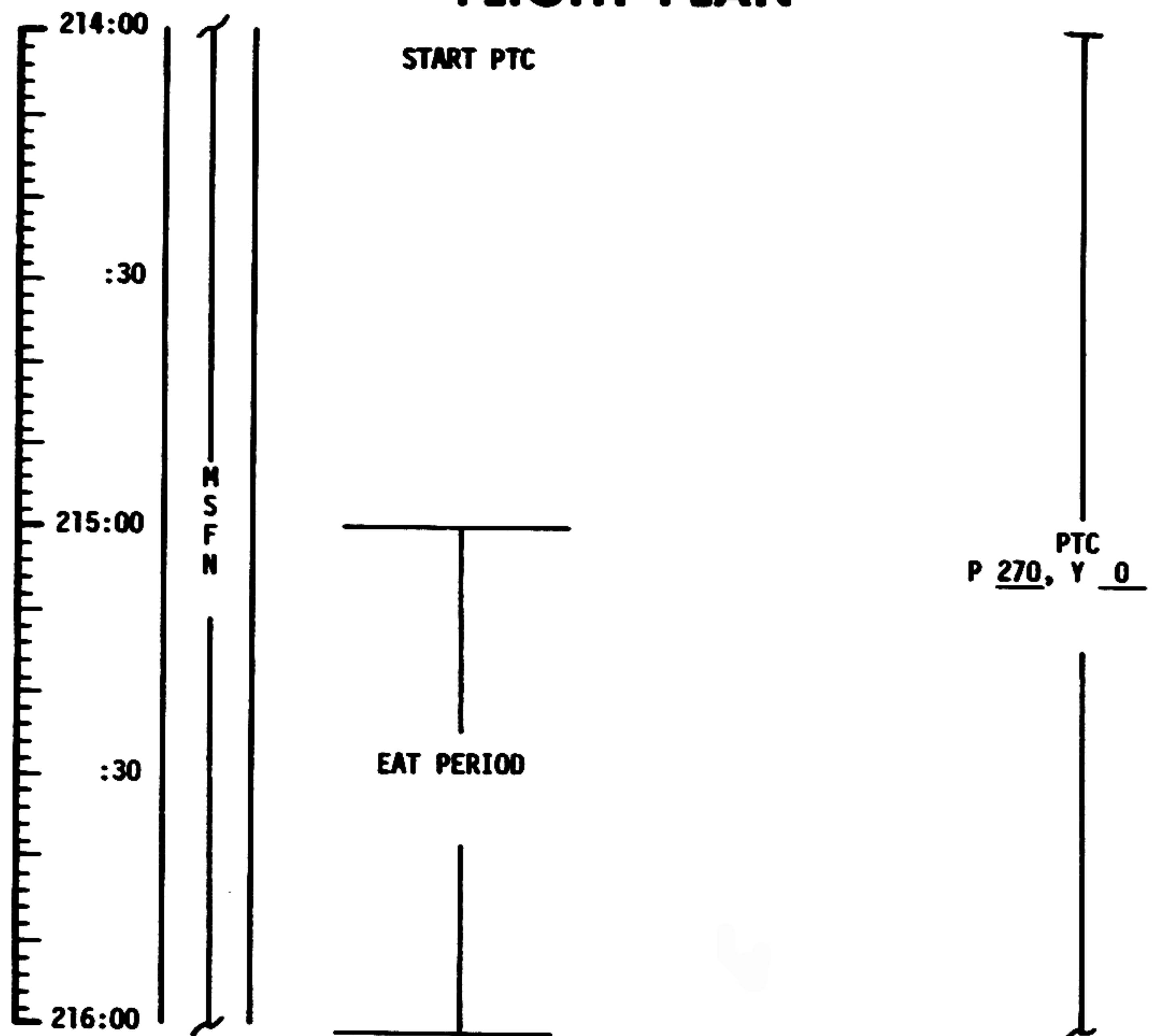
MCC-N

0822 CST

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (MOV. 14)	OCTOBER 15, 1969	214:00 - 216:00	9/TEC	3-184

MCC-H

1022 CST

FLIGHT PLAN

NOTES

216:00

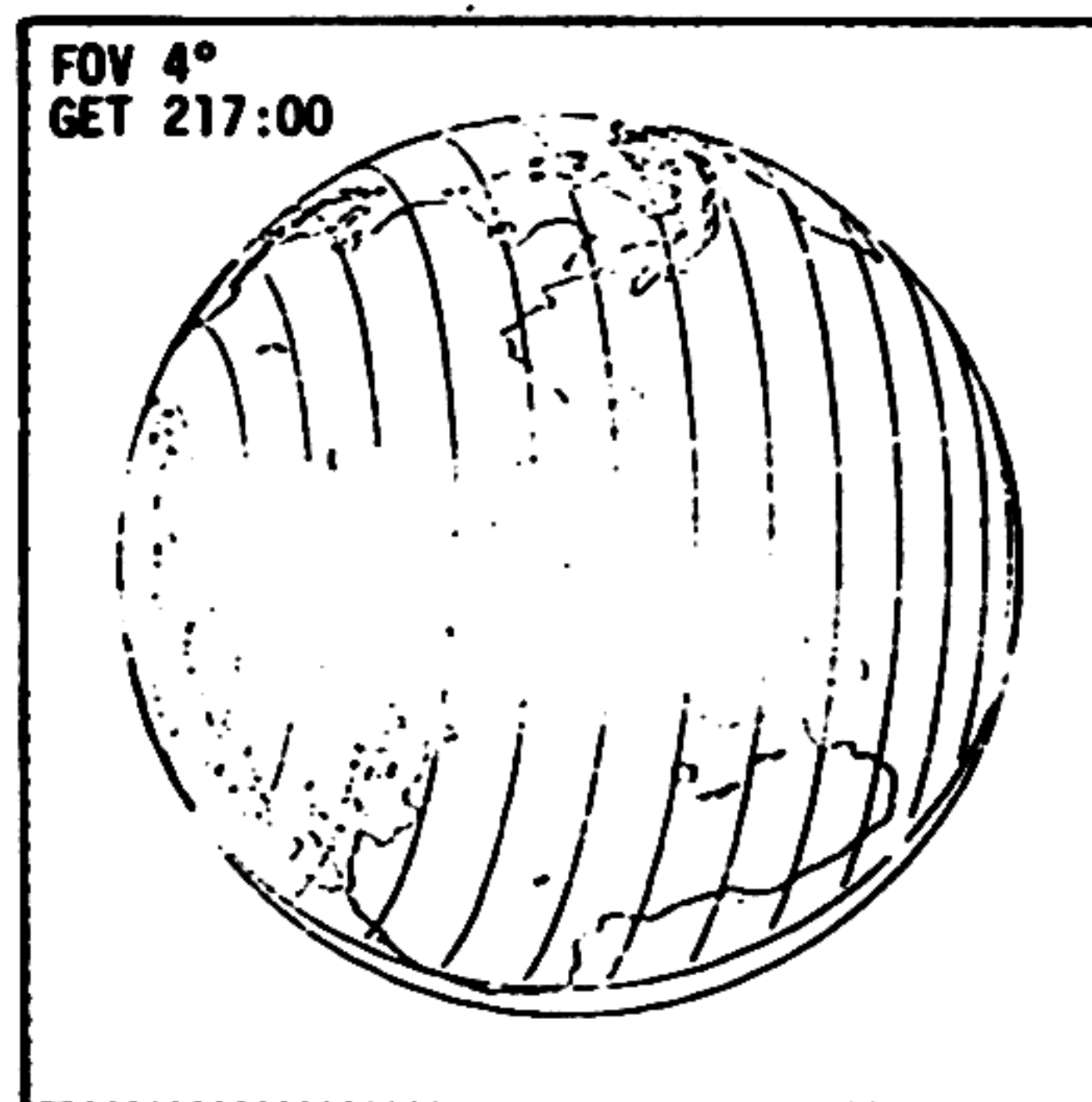
:15

216:30

:45

217:00

M
S
F
N



PTC
P 270, Y 0

STOP PTC AT ROLL 235°

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	216:00 - 217:00	9/TEC	3-185

MCC-H

1122 CST

FLIGHT PLAN

NOTES

217:00	M S F N	MNVR TO OPTICS CALIBRATION ATT	R 235
		P23 - CISELUNAR NAVIGATION	P 272
:15		OPTICS CALIBRATION	Y 0
		STAR 1 2	
		P00	
		V49 - MNVR TO SIGHTING ATT	R 90
		STAR/EARTH HORIZON	P 135 180
		P23 - CISELUNAR NAVIGATION	Y 329 328
		1. STAR 1 7 2 ENH (R3 = 0 0 1 1 0)	
		N88: (R1 = -6 4 9 4 7)(R2 = -7 4 3 1 2)(R3 = -1 6 1 1 4)	
		2. STAR 2 4 EFH (R3 = 0 0 1 2 0)	
217:30		3. STAR 2 0 4 ENH (R3 = 0 0 1 1 0)	
		N88: (R1 = -2 1 3 8 9)(R2 = -9 3 8 6 8)(R3 = -2 7 0 4 2)	
		4. JUPITER EFH (R3 = 0 0 1 2 0)	
		N88: (R1 = -8 9 9 7 6)(R2 = -4 0 7 8 2)(R3 = -1 5 5 3 8)	
		DO NOT PROCEED ON F 06 49	
		5. STAR 3 1 EFH (R3 = 0 0 1 2 0)	
:45		6. STAR 1 6 6 ENH (R3 = 0 0 1 1 0)	
		N88: (R1 = -5 2 0 0 3)(R2 = -4 3 6 0 7)(R3 = -7 3 4 4 5)	
218:00			

3 MARKS ON EACH STAR

INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR

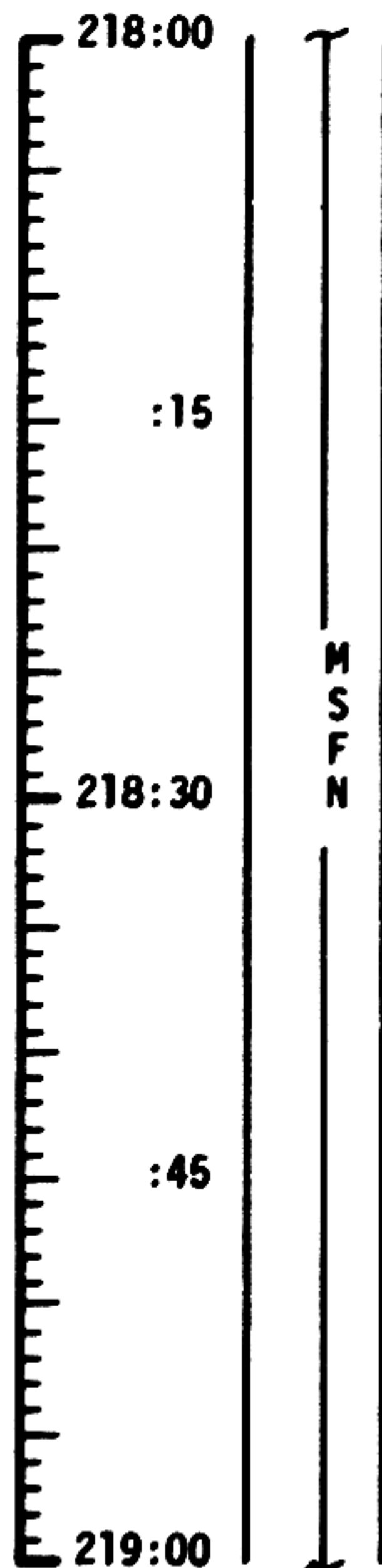
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	217:00 - 218:00	9/TEC	3-186

MCC-N

1222 CST

FLIGHT PLAN

NOTES



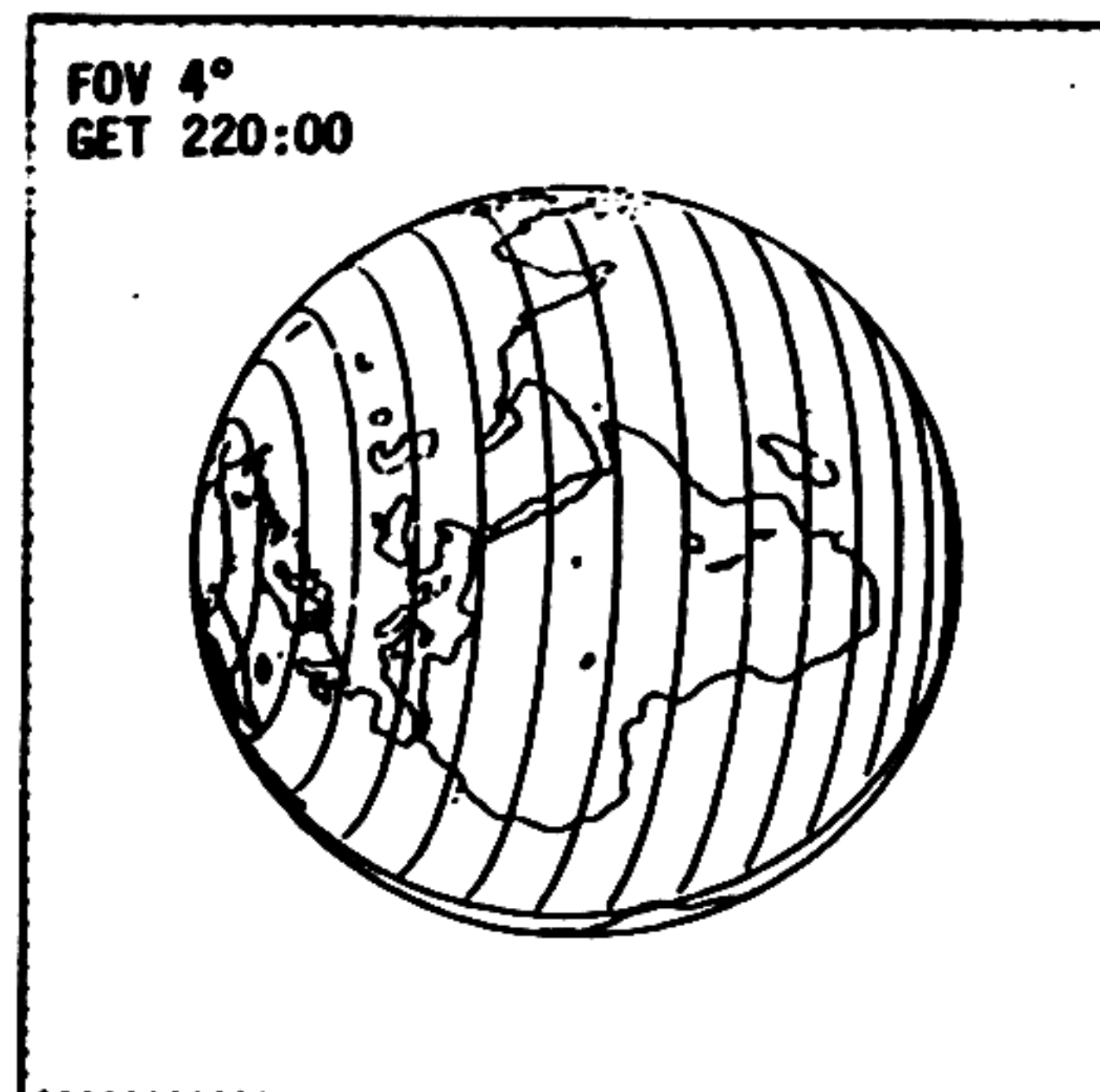
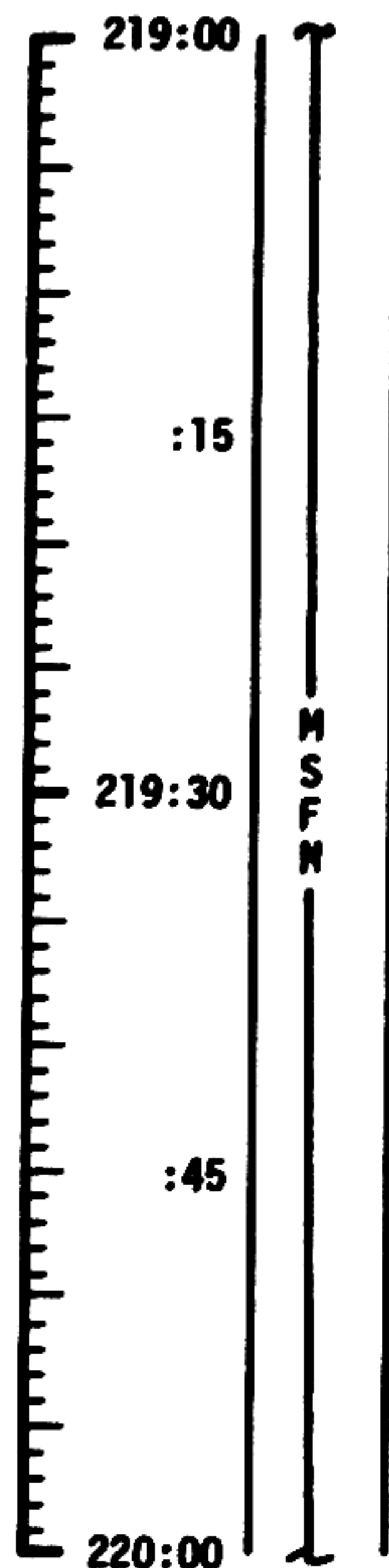
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	218:00 - 219:00	9/TEC	3-186A

MCC-N

1322 CST

FLIGHT PLAN

NOTES



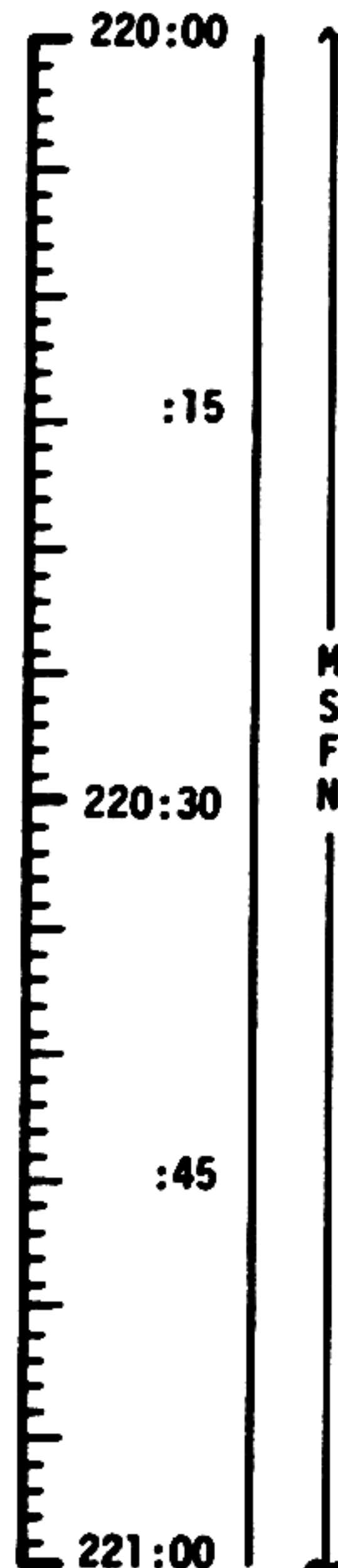
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	219:00 - 220:00	9/TEC	3-187

MCC-H

1422 CST

FLIGHT PLAN

NOTES



MNVR TO OPTICS CALIBRATION ATT
 P23 - CISELUNAR NAVIGATION
 OPTICS CALIBRATION
 STAR 1 2

R 235
 P 272
 Y 0

P00
 V49 - MNVR TO SIGHTING ATT
 STAR/EARTH HORIZON
 P23 - CISELUNAR NAVIGATION

R 90
 P 118 137
 Y 338 329

3 MARKS ON EACH STAR

INCORPORATE P23
 MARK DATA AND
 UPDATE ONBOARD
 STATE VECTOR

1. STAR 1 6 1 EFH (R3 = 0 0 1 2 0)
 N88: (R1 = -7 6 6 1 5)(R2 = -2 7 1 1 3)(R3 = -5 9 5 5 9)

2. STAR 1 7 4 ENH (R3 = 0 0 1 1 0)
 N88: (R1 = -5 5 9 9 2)(R2 = -8 2 0 7 3)(R3 = +1 1 3 5 3)

3. STAR 2 6 EFH (R3 = 0 0 1 2 0)

4. STAR 1 5 6 EFH (R3 = 0 0 1 2 0)
 N88: (R1 = -9 8 4 4 6)(R2 = -1 7 4 2 0)(R3 = -0 2 2 4 3)

5. JUPITER EFH (R3 = 0 0 1 2 0)
 N88: (R1 = -8 9 9 7 6)(R2 = -4 0 7 8 2)(R3 = -1 5 5 3 8)

DO NOT PROCEED ON F 06 49

6. STAR 1 2 5 ENH (R3 = 0 0 1 1 0)

N88: (R1 = -2 5 4 7 2)(R2 = -7 8 6 4 7)(R3 = -5 6 2 6 6)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	220:00 - 221:00	9/TEC	3-188

MCC-H

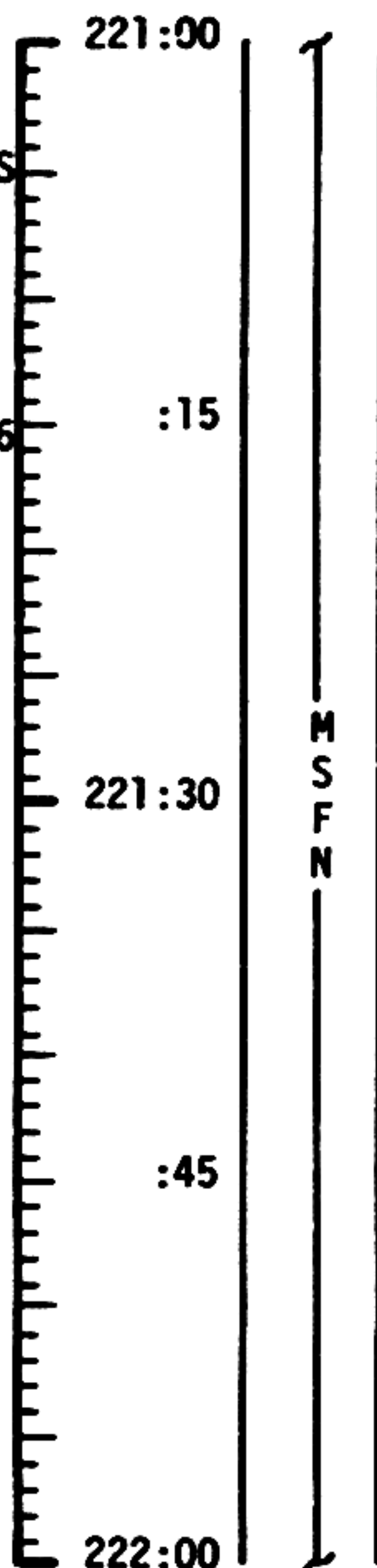
1522 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MCC-6 PAD DATA
ENTRY PAD (ASSUMES
MCC-6)

UPLINK TO CSM
STATE VECTOR & V66
MCC-6 TGT LOAD



L10H CANISTER CHANGE NO. 17
(19 INTO A, STOW 17 IN A6)

WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREA
CONTAMINATION CONTROL

P52 - IMU REALIGN
OPTION 3 - REFSMMAT

REPORT GYRO TORQUING ANGLES

P30 EXTERNAL ΔV
H₂ PURGE LINE HTRS - ON

P52 (PTC ORIENT)

N71: _ _ _ ' _ _ _

N05: _ _ _ ' _ _ _

N93:

X _ _ _ ' _ _ _

Y _ _ _ ' _ _ _

Z _ _ _ ' _ _ _

GET _ _ _ : _ _ _ : _ _ _

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	221:00 - 222:00	9/TEC	3-189

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FLIGHT PLAN

MCC-6
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	6T + 1 SEC	TRIM X AXIS ONLY TO 0.2

TABLE 3-13
3-190

MCC-N

1622 CST

FLIGHT PLAN

NOTES

(EI-22 HRS)

222:00

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)

:30

223:00

M
S
F
N

V49 - MNVR TO BURN ATT

SXT STAR CHECK

H2 & O2 FUEL CELL PURGE

WASTE WATER DUMP

P40/41 - SPS/RCS THRUST

GDC ALIGN TO IMU

MCC-6

V66 - TRANSFER CSM SV TO LM SLOT

MCC-6 BURN STATUS REPORT

MNVR TO TV ATTITUDE BY 223:15

R

P

Y

HGA

P

Y

TIG: 222:21:47.5
 ΔV : NOMINALLY ZERO

BURN STATUS REPORT

X	X		•	ΔTIG	
X	X		•		BT
			•		
TRIM					
X	X	X		R	
X	X	X		P	
X	X	X		Y	
			•	V _{gx}	
			•	V _{gy}	
			•	V _{gz}	
			•	ΔV_c *	
X	X	X		FUEL *	
X	X	X		OX *	
X	X	X		UNBAL	

*ITEMS TO BE
REPORTED TO MSFNTV (GDS) 223:15-223:45
CM 4/TV-IN (f5.6/f22)

EAT PERIOD

:30

224:00

MNVR TO PTC ATTITUDE
WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREAP 270
Y 0

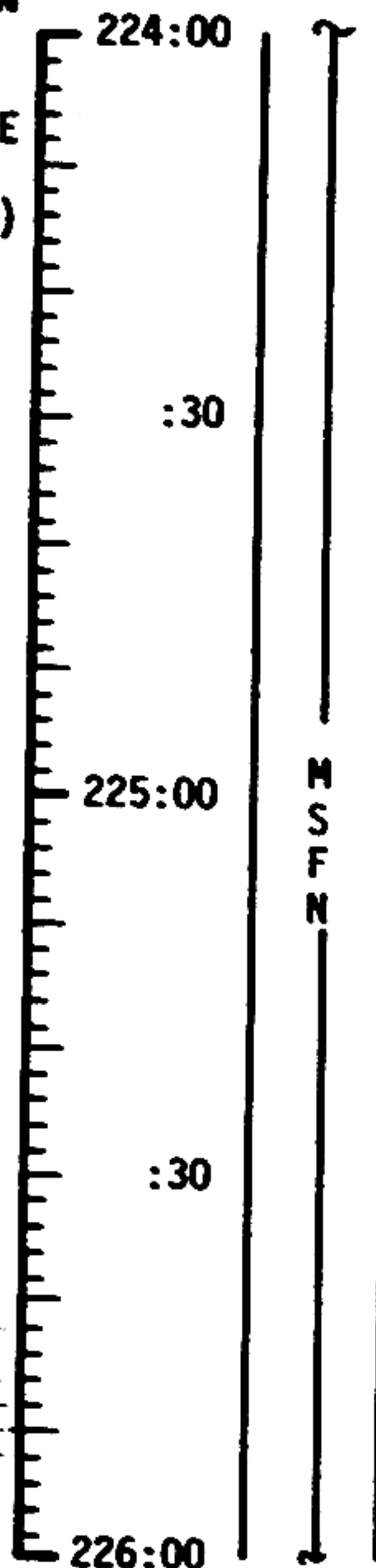
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	222:00 - 224:00	9/TEC	3-191

FLIGHT PLAN

1822 CST

MCC-N

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)



START PTC
REPORT CM RCS INJECTOR
VALVE TEMPS (SYS TEST METER
5C,D,6A,B,C,D)

REST PERIOD
(10 HOURS)

PRESLEEP CHECKLIST:
CREW STATUS REPORT (MED)
ONBOARD READOUTS
CYCLE O2 & H2 FANS
CHLORINATE POTABLE WATER
VERIFY:
WASTE MNGT OVBD DRAIN - OFF
WASTE STOW VENT VLV - CLOSED
ENER CABIN PRESS VLV - BOTH
SURGE TK O2 VLV - ON
REPRESS O2 VLV - OFF
LM TUNNEL VENT - OFF
"E" MEMORY DUMP
NORMAL LUNAR COMM EXCEPT:
S-BD NORMAL MODE VOICE - OFF
S-BD SQUELCH - ENABLE
S-BD AUX TAPE - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B
TAPE RCDR FWD - OFF

PTC
P 270 Y 0

NOTES

CM RCS INJECTOR TEMP	
5C	5D
6A	6B
6C	6D

ONBOARD READOUT

BAT C _____
PYRO BAT A _____
PYRO BAT B _____
RCS A _____
B _____
C _____
D _____
DC IND SEL - MNA OR B

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	224:00 - 226:00	9/TEC	3-192

MSC Form 29 (May 69)

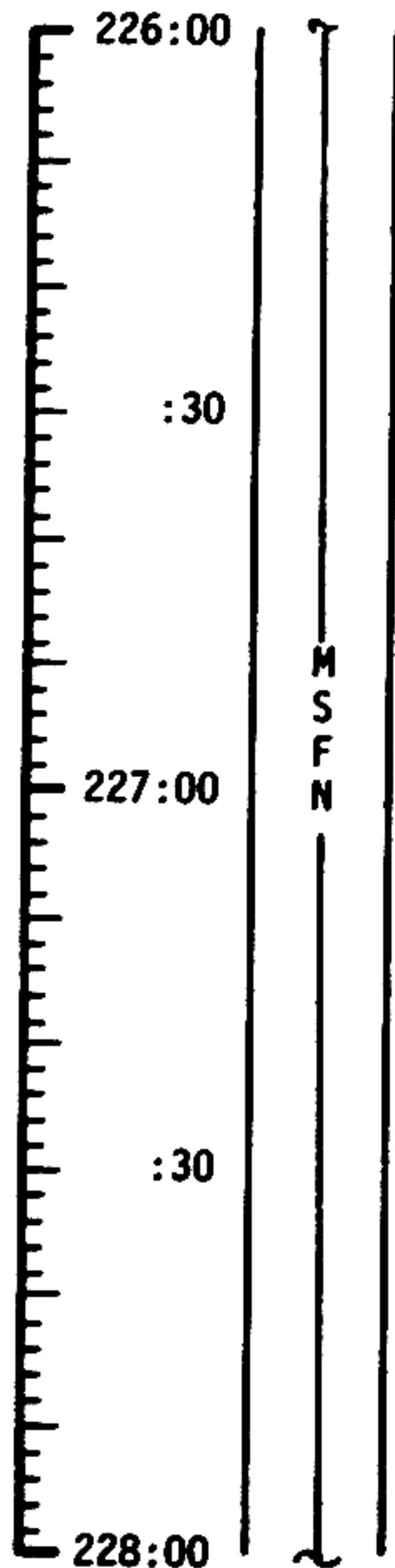
FLIGHT PLANNING BRANCH

MCC-H

2022 CST

FLIGHT PLAN

NOTES



REST PERIOD
(10 HOURS)

PTC
P 270 Y 0

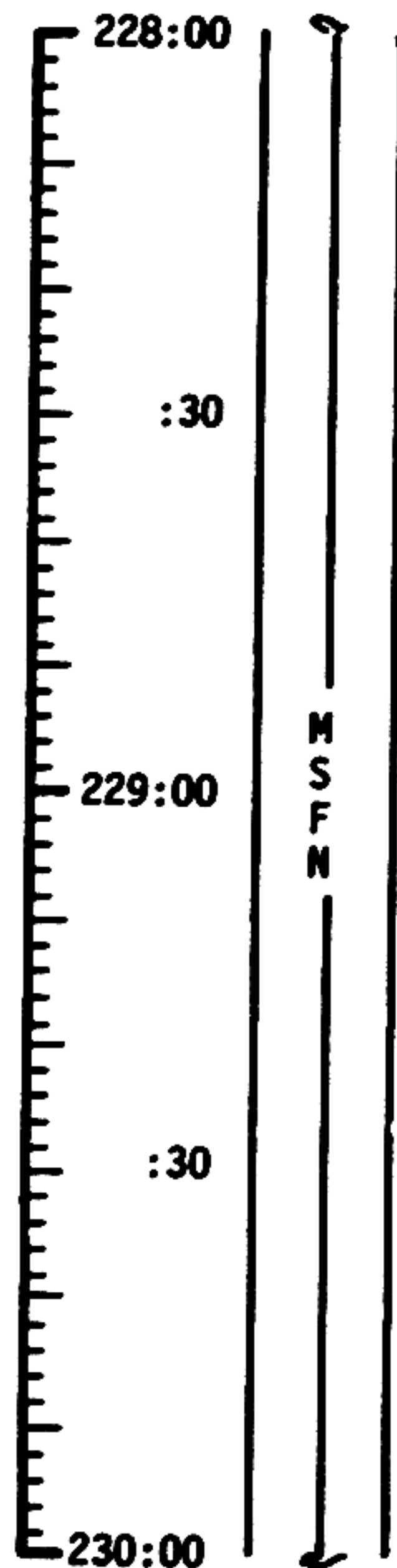
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	-FINAL (NOV 14)	OCTOBER 15, 1969	226:00 - 228:00	9/TEC	3-193

MCC-N

2222 CST

FLIGHT PLAN

NOTES



REST PERIOD
(10 HOURS)

PTC
P 270 Y 0

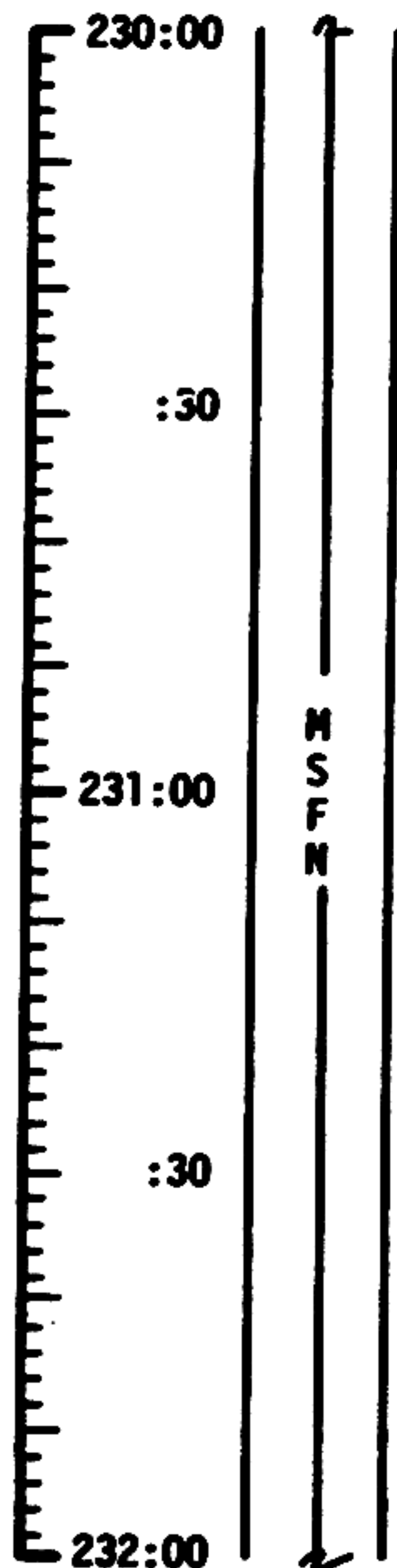
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	228:00 - 230:00	9/TEC	3-194

MCC-N

0022 CST

FLIGHT PLAN

NOTES



REST PERIOD
(10 HOURS)

PTC
P 270 Y 0

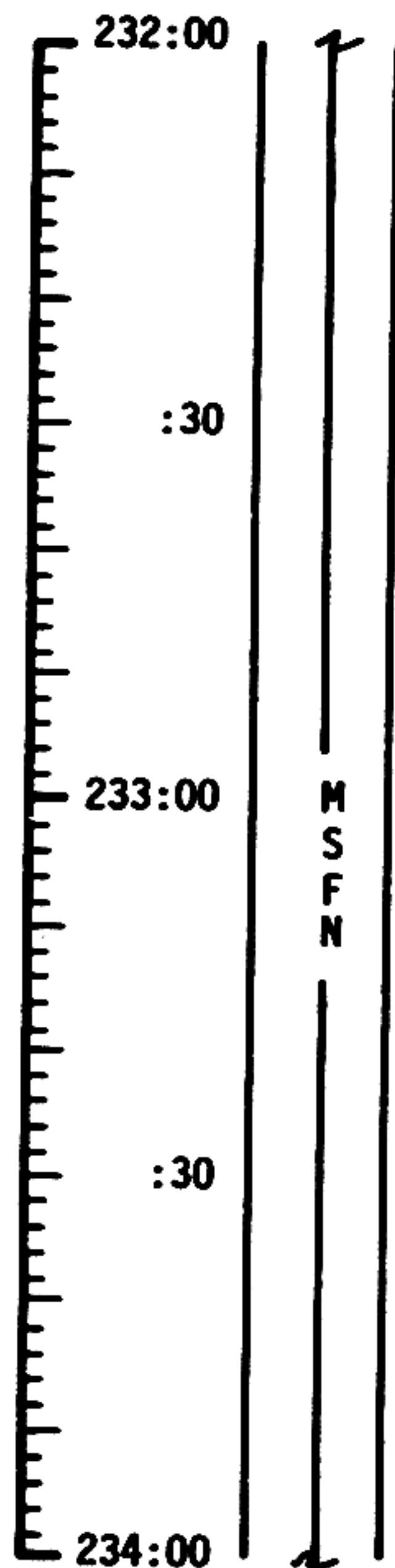
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NGV 14)	OCTOBER 15, 1969	230:00 - 232:00	9/TEC	3-195

MCC-H

0222 CST

FLIGHT PLAN

NOTES

REST PERIOD
(10 HOURS)PTC
P 270 Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (MOV 14)	OCTOBER 15, 1969	232:00 - 234:00	9/TEC	3-196

MSC Form 29 (May 69)

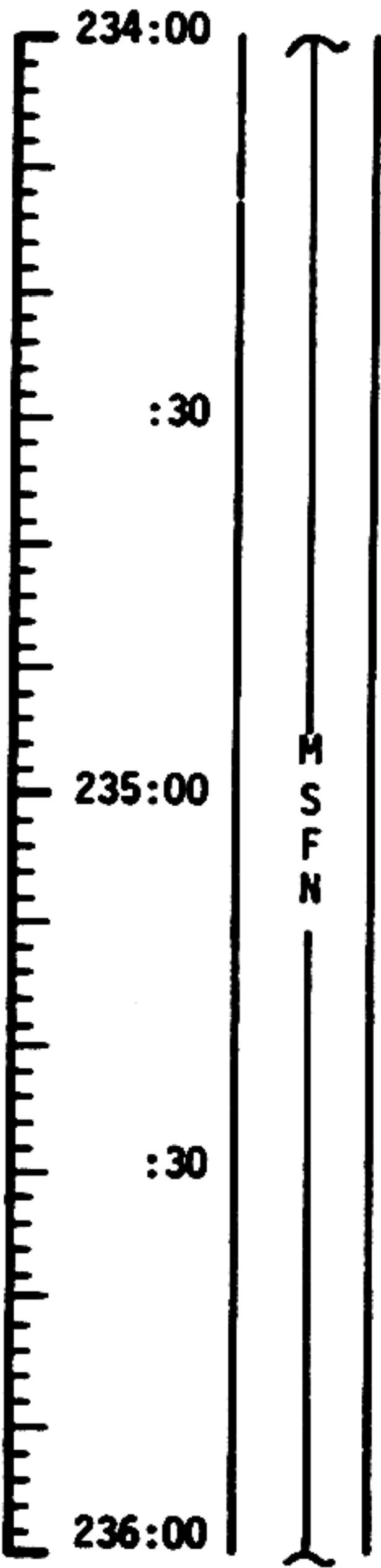
FLIGHT PLANNING BRANCH

MCC-H

0422 CST

FLIGHT PLAN

NOTES



CREW STATUS REPORT			
	CDR	CMP	LMP
SLEEP	_____	_____	_____
PRD	_____	_____	_____

CSM CONSUMABLES UPDATE	
GET:	_____ : _____
RCS TOTAL	_____ %
QUAD A	_____ %
B	_____ %
C	_____ %
D	_____ %
H ₂ TOTAL	_____ %
O ₂ TOTAL	_____ %

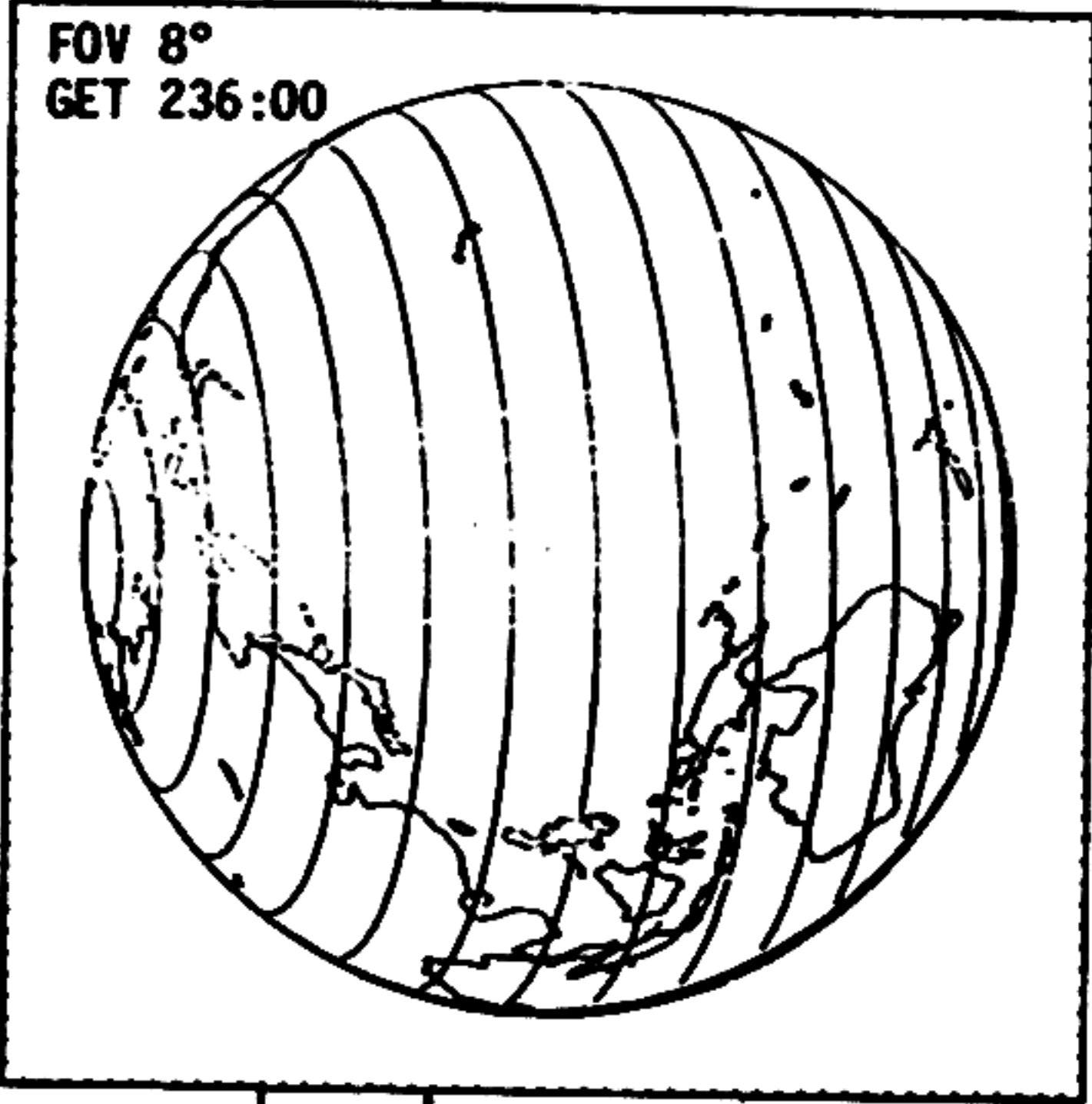
POSTSLEEP CHECKLIST:
CREW STATUS REPORT
CONSUMABLES UPDATE
CYCLE H2 & O2 FANS
FLIGHT PLAN UPDATE
NORMAL LUNAR COMM EXCEPT:
S-BD AUX TAPE - OFF
TAPE RCDR FWD - OFF
OMNI OPS
S-BD ANT - OMNI
S-BD ANT OMNI - B
HGA OPS
S-BD ANT - HI GAIN
CREW MANAGES ANT
OPS

PTC
P 270 Y 0

EAT PERIOD

L10H CANISTER CHANGE NO. 18
(20 INTO B, STOW 18 IN A6)

STOP PTC AT ROLL 235°



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	234:00 - 236:00	10/TEC	3-197

MCC-M

0622 CST

FLIGHT PLAN

NOTES

236:00	M S F N	MNVR TO OPTICS CALIBRATION ATT	R 235
		P23 - CISELUNAR NAVIGATION	P <u>272</u>
		OPTICS CALIBRATION	Y <u>0</u>
		STAR <u>1</u> <u>2</u>	
		P00	
		V49 - MNVR TO SIGHTING ATT	R 90
:15		STAR/EARTH HORIZON	P <u>153</u> 168
		P23 - CISELUNAR NAVIGATION	Y <u>341</u>
		LOAD W MATRIX (R1 +4 5 0 0 0)(R2 +0 0 0 0 6)	
		1. STAR <u>2</u> <u>6</u> EFH (R3 = <u>0</u> <u>0</u> <u>1</u> <u>2</u> <u>0</u>)	
		2. JUPITER EFH (R3 = <u>0</u> <u>0</u> <u>1</u> <u>2</u> <u>0</u>)	
		N88: (R1 = <u>-8</u> <u>9</u> <u>8</u> <u>5</u> <u>4</u>)(R2 = <u>-4</u> <u>1</u> <u>0</u> <u>1</u> <u>4</u>)(R3 = <u>-1</u> <u>5</u> <u>6</u> <u>3</u> <u>6</u>)	
		DO NOT PROCEED ON F 06 49	
236:30		3. STAR <u>7</u> <u>5</u> ENH (R3 = <u>0</u> <u>0</u> <u>1</u> <u>1</u> <u>0</u>)	
		N88: (R1 = <u>-0</u> <u>9</u> <u>8</u> <u>7</u> <u>1</u>)(R2 = <u>-7</u> <u>9</u> <u>1</u> <u>6</u> <u>3</u>)(R3 = <u>-6</u> <u>0</u> <u>2</u> <u>9</u> <u>8</u>)	
		4. STAR <u>1</u> <u>6</u> <u>3</u> EFH (R3 = <u>0</u> <u>0</u> <u>1</u> <u>2</u> <u>0</u>)	
		N88: (R1 = <u>-8</u> <u>3</u> <u>4</u> <u>6</u> <u>4</u>)(R2 = <u>-4</u> <u>4</u> <u>9</u> <u>6</u> <u>6</u>)(R3 = <u>+3</u> <u>1</u> <u>8</u> <u>0</u> <u>9</u>)	
		5. STAR <u>2</u> <u>0</u> <u>5</u> ENH (R3 = <u>0</u> <u>0</u> <u>1</u> <u>1</u> <u>0</u>)	
		N88: (R1 = <u>-0</u> <u>9</u> <u>1</u> <u>5</u> <u>3</u>)(R2 = <u>-5</u> <u>5</u> <u>8</u> <u>9</u> <u>1</u>)(R3 = <u>-8</u> <u>2</u> <u>4</u> <u>1</u> <u>6</u>)	
:45		6. STAR <u>3</u> <u>1</u> EFH (R3 = <u>0</u> <u>0</u> <u>1</u> <u>2</u> <u>0</u>)	
237:00			

3 MARKS ON EACH STAR

INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	236:00 - 237:00	10/TEC	3-198

NSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

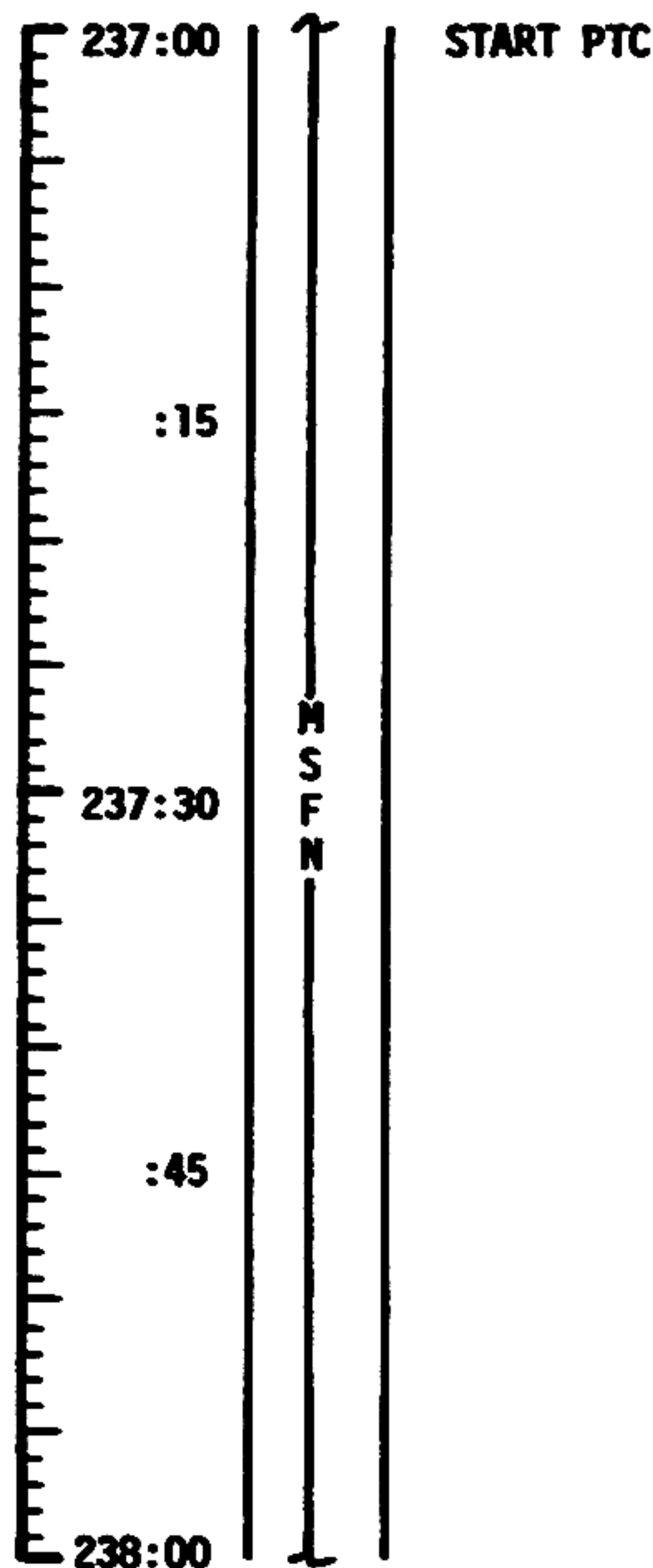
MCC-11

0722 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO DISABLE
FOR PTC (LOWEST
QUANTITY PRPLNT)



PTC
P 270, Y 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	237:00 - 238:00	10/TEC	3-199

MCC-N

0822 CST

FLIGHT PLAN

NOTES

(EI-6 HRS)
GO/NO-GO

238:00

:30

GO/NO-GO FOR MCC-7
REPORT CM RCS INJECTOR
VALVE TEMPS (SYS TEST METER 5C, D, 6A, B, C, D)

CM RCS INJECTOR TEMP

5C	5D
6A	6B
6C	6D

PTC
P 270 Y 0

239:00

M
S
F
N

VHF SIMPLEX A-ON
(COMM CHECK)

UPDATE TO CSM
MCC-7 MNVR PAD
ENTRY PAD
(EI-5 HRS)

:30

DON MAE WEST & FOOT RESTRAINTS

UPLINK TO CSM
STATE VECTOR & V66
MCC-7 TGT LOAD
DESIRED ORIENT(ENT)

STOP PTC

240:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	238:00 - 240:00	10/TEC	3-200

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

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FLIGHT PLAN

MCC-7 BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TAKEOVER	+10° TAKEOVER	BT + 1 SEC	TRIM X AXIS ONLY TO 0.2 FPS

TABLE 3-14
3-201

MCC-N

1022 CST

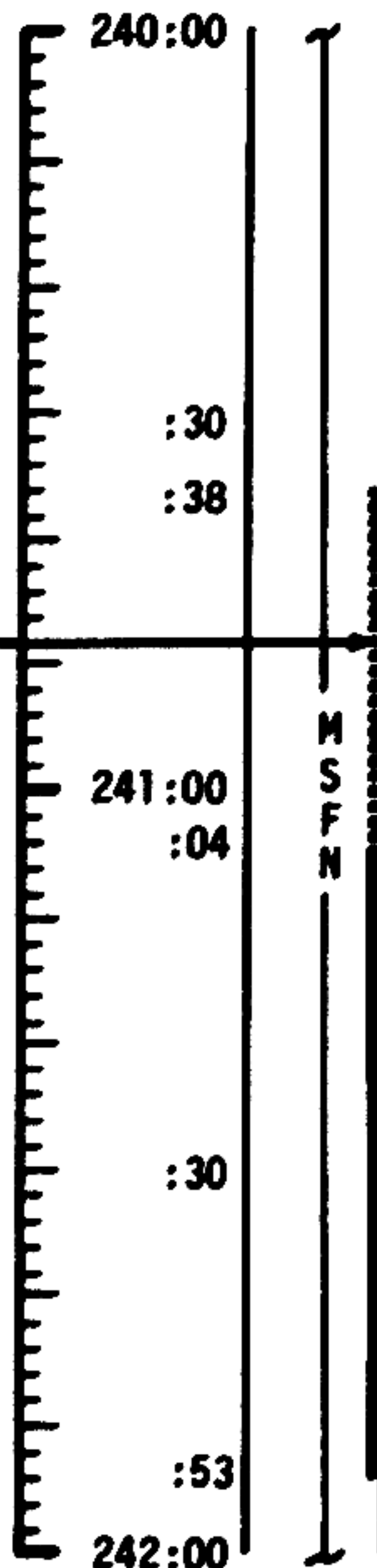
FLIGHT PLAN

NOTES

(EL - 4 HRS)

EARTH PENUMBRA

(EI - 3 HRS)



P52 - IMU REALIGN
OPTION 1 - PREFERRED

REPORT GYRO TORQUING ANGLES
ECS & EPS CK
SPS CHECK
CM RCS MON CK
SM RCS MON CK
C & W SYS CK
CMC SELF TEST
DSKY COND LT TEST

P30 - EXTERNAL ΔV
V49 - MNVR TO BURN ATT BY 240:50:00

SXT STAR CHECK
P40/P41-SPS/RCS THRUST

GDC ALIGN TO IMU

MCC-7

MCC-7 BURN STATUS REPORT
V66 - TRANS CSM SV TO LM SLOT

TIG: 241:21:48
ΔV: NOMINALLY ZERO

*ITEMS TO BE REPORTED
to MSFN

P52 (REENTRY ORIENT)

N71: — — — —

N05: — — — —

N93: — — — —

X — — — —

Y — — — —

Z — — — —

GET : :

BURN STATUS REPORT

X	X		•	ΔTIG
X	X		•	BT
			•	V _{gx}
TRIM				
X	X	X		R
X	X	X		P
X	X	X		Y
			•	V _{gx}
			•	V _{gy}
			•	V _{gz}
			•	ΔV _c *
X	X	X		FUEL*
X	X	X		OX*
X	X	X		UNBAL

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	240:00 - 242:00	10/TEC	3-202

MCC-N

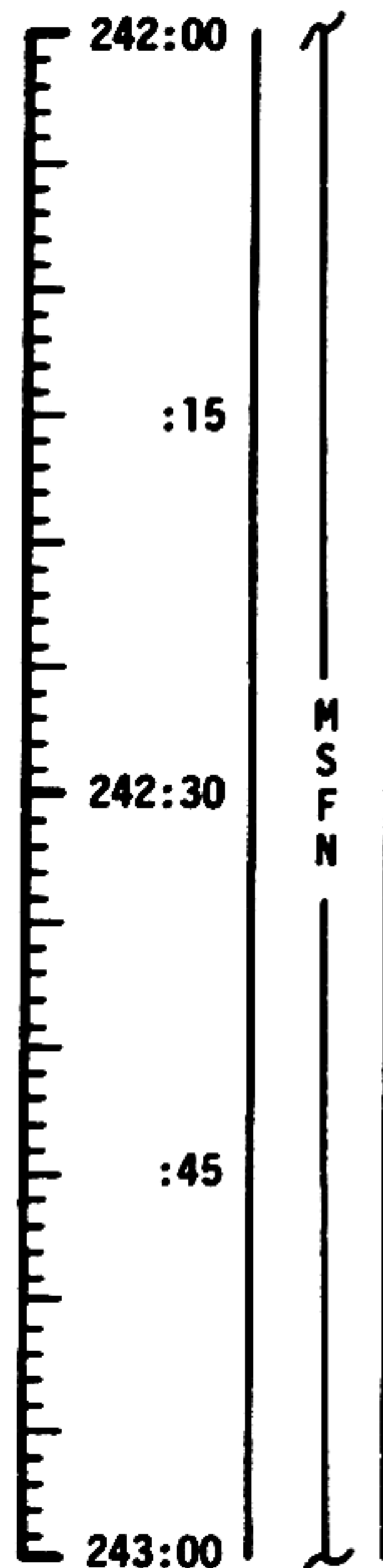
1222 CST

FLIGHT PLAN

NOTES

(EI - 2 HRS)

GO/NO GO FOR PYRO
ARM



LOGIC SEQUENCE CHECK
GO/NO GO FOR PYRO ARM (CUE MSFN)
LOGIC-ON

MNVR TO ENTRY ATTITUDE R ☐
 P ☐
 Y ☐

SXT AND BORESIGHT STAR CHECK

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	242:00 - 243:00	10/TEC	3-203

MCC-N

1322 CST

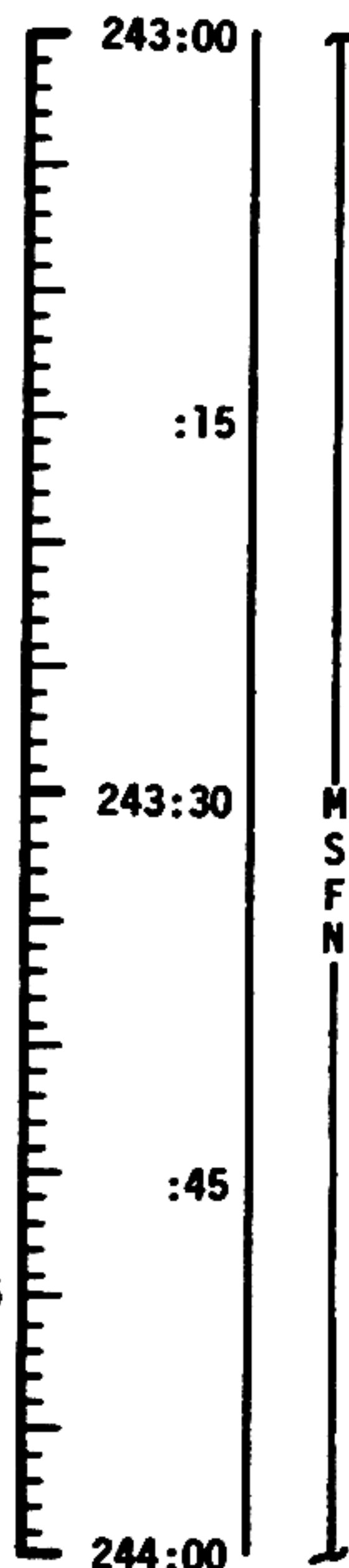
FLIGHT PLAN

NOTES

(EI - 1 HR)

UPDATE TO CSM
ENTRY PAD
RECOVERY PAD
GO/NO GO FOR PYRO
ARM

UPLINK TO CSM
STATE VECTOR & V66
(EI - 30 MIN)



P52 - IMU REALIGN
OPTION 3 - REFSMMAT

REPORT GYRO TORQUING ANGLES
GDC ALIGN TO IMU
EMS ENTRY CHECK

PRIM & SEC WATER EVAP ACTIVATION
CM RCS PRE-HEAT (IF REQ'D)
FINAL STOWAGE

CONFIGURE CAMERA EQUIP FOR FIREBALL AND CHUTES PHOTOS

CM/DAC/18/6IN-(f11,250,7) 12 FPS, .5MAG (4 MIN) FIREBALL
HCEX-(f11,125,7) 12 FPS, .5MAG (4 MIN) CHUTES

TERMINATE CM RCS PREHEAT
SYS TEST PANEL CONFIGURATION
PYRO BATT CHECK
FINAL GDC DRIFT CK
CM RCS ACTIVATION
GO/NO GO FOR PYRO ARM (CUE MSFN)
LOGIC-ON
SET DET (UP, TO EI)
EMS INITIALIZATION
RSI ALIGN TO GDC

CM RCS CK

SEPARATION CHECKLIST

P52 (REENTRY ORIENT)

N71: _ _ _ , _ _ _

N05: _ _ _ . _ _ _

N93:

X _ _ _ . _ _ _

Y _ _ _ . _ _ _

Z _ _ _ . _ _ _

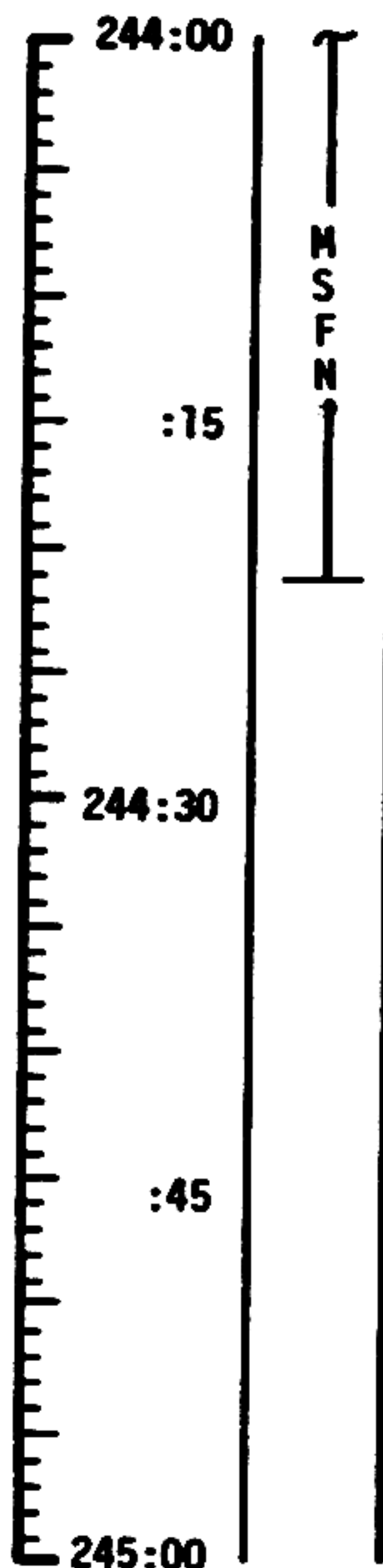
GET _ _ _ : _ _ _ : _ _ _

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	243:00 - 244:00	10/TEC	3-204

1422 CST

FLIGHT PLAN

NOTES



PYRO ARM

P61 - ENTRY PREP

P62 - CM/SM SEP ATT

 R
 P
 Y

CM/SM SEP

MNVR TO ENTRY ATT

P63 - ENTRY INIT

 R
 P
 Y

EI - GET = 244:21:48

P64 - ENTRY POST 0.056

TRAJECTORY EVENTS

400,000 FEET (GET 244:21:48

ENTER S BAND BLACKOUT

0.056

KA - INITIATE CONSTANT DRAG

RDOT = -700 FPS

PEAK G

SUBCIRCULAR VELOCITY

P64 TO P67

EXIT S BAND BLACKOUT

GUIDANCE TERMINATION

DROGUE DEPLOYMENT

MAIN DEPLOYMENT

SPLASHDOWN

TIME FROM EI
MIN : SEC

00 : 00

00 : 18

00 : 30

00 : 52

01 : 18

01 : 22

02 : 10

02 : 12

03 : 23

07 : 06

08 : 08

08 : 54

13 : 35

 Y = -6 . 5° -
 L/D = 0 . 3 0 9
 V = 3 6 1 1 6
 R = 1 2 5 0

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	FINAL (NOV 14)	OCTOBER 15, 1969	244:00 - 245:00	10/TEC	3-205

SECTION 5 - ABBREVIATED TIMELINE

**ABBREVIATED
TIMELINE**

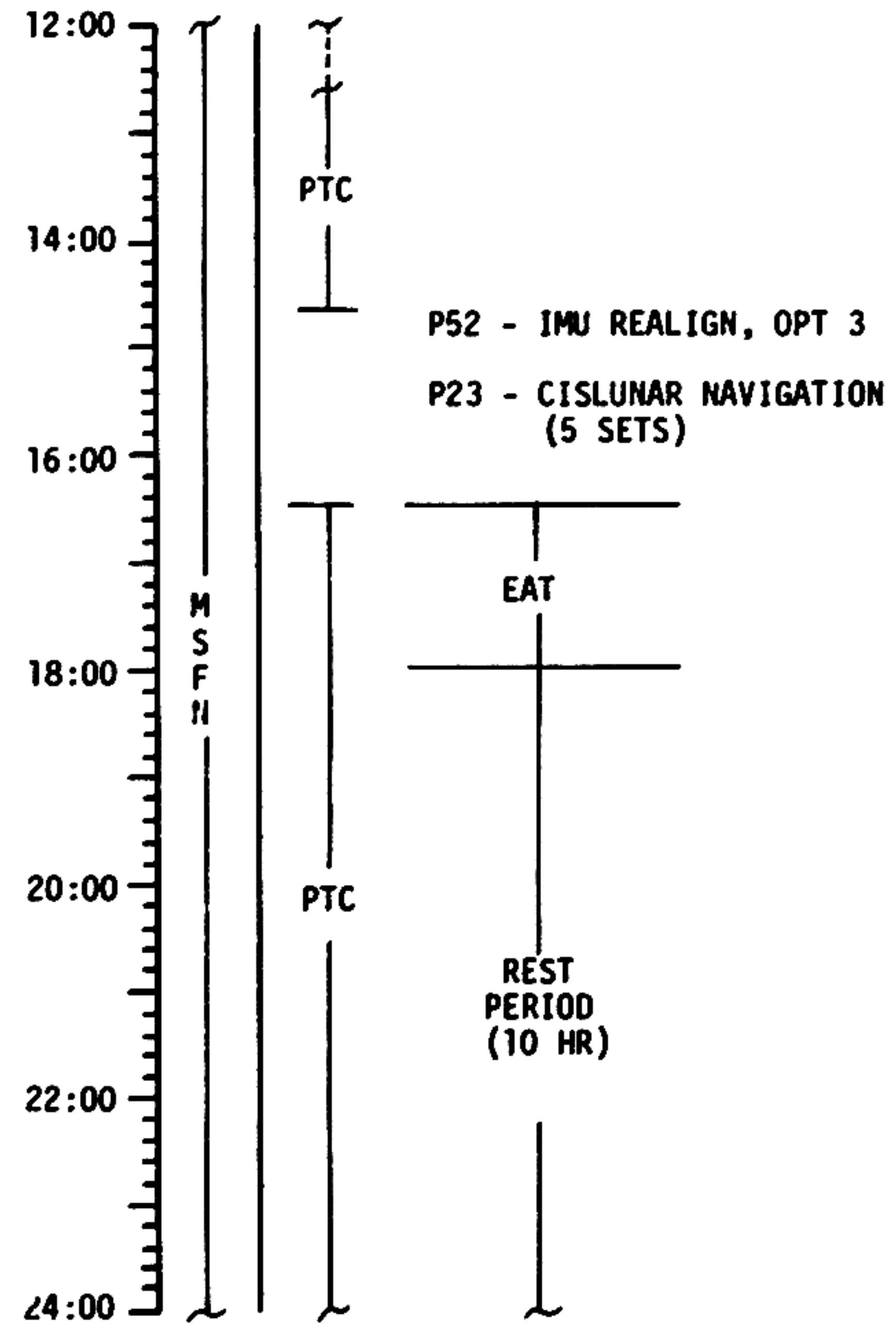
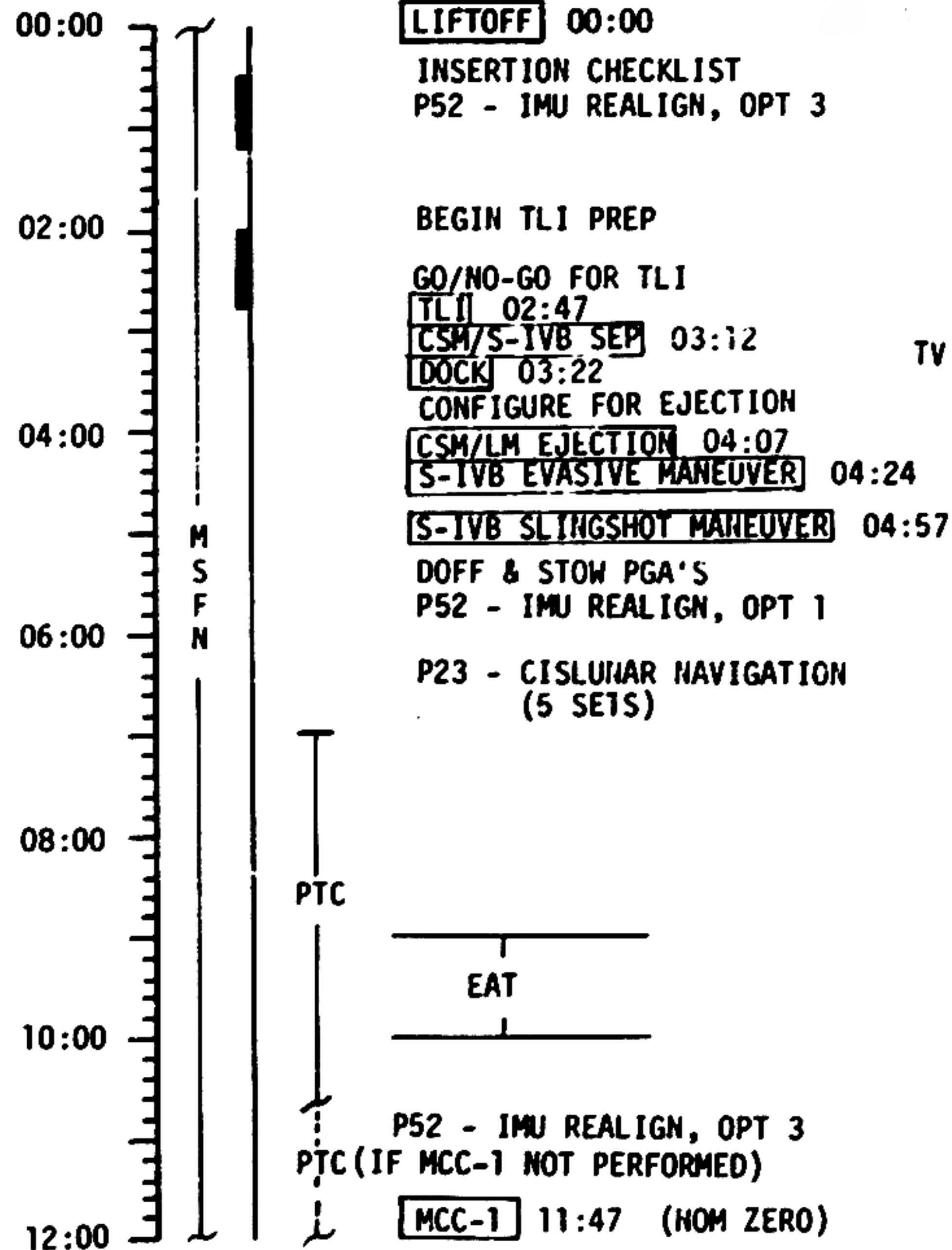
ABBREVIATED TIMELINE

1022 CST

NOV 14

CSM

CSM



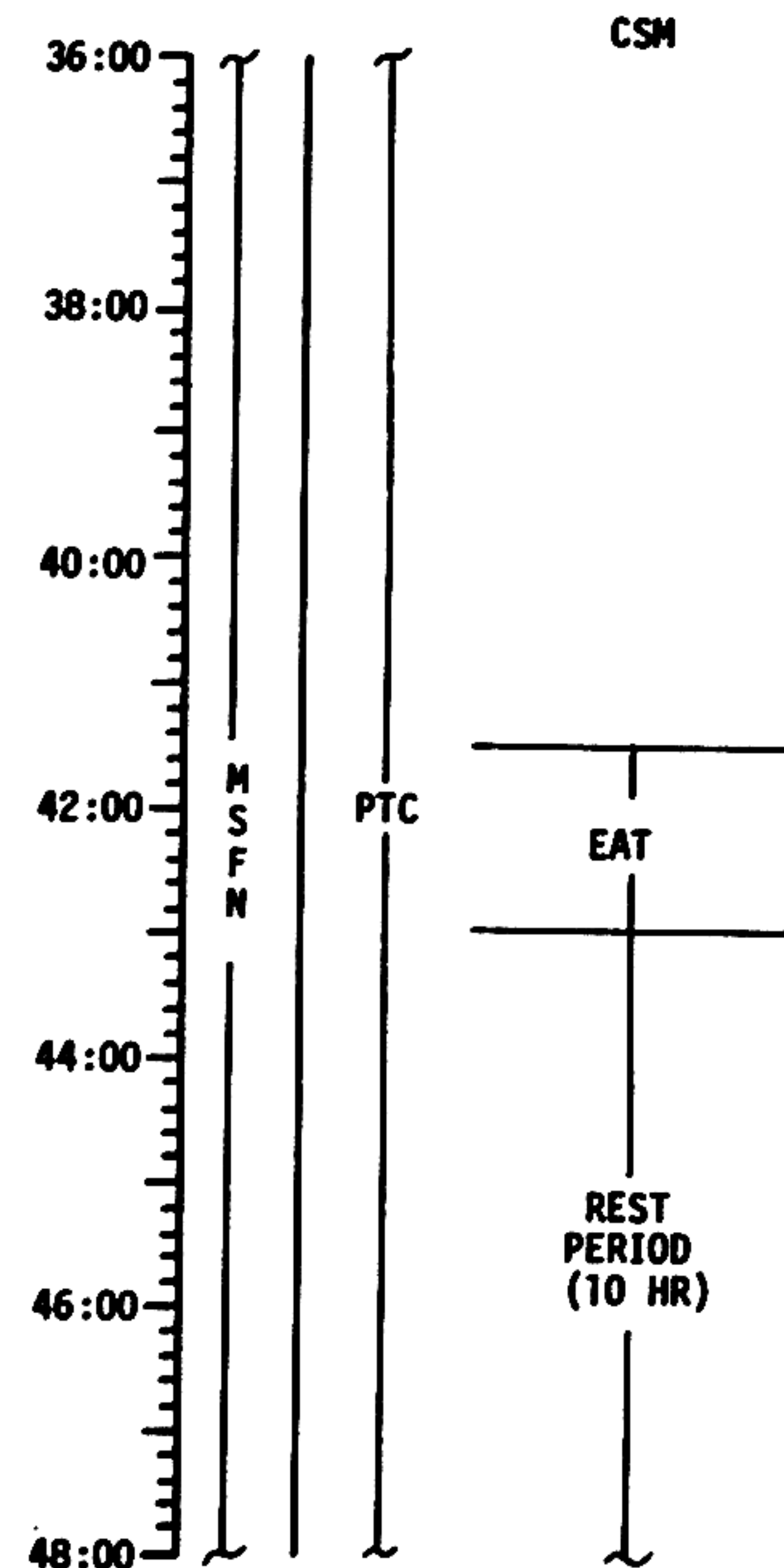
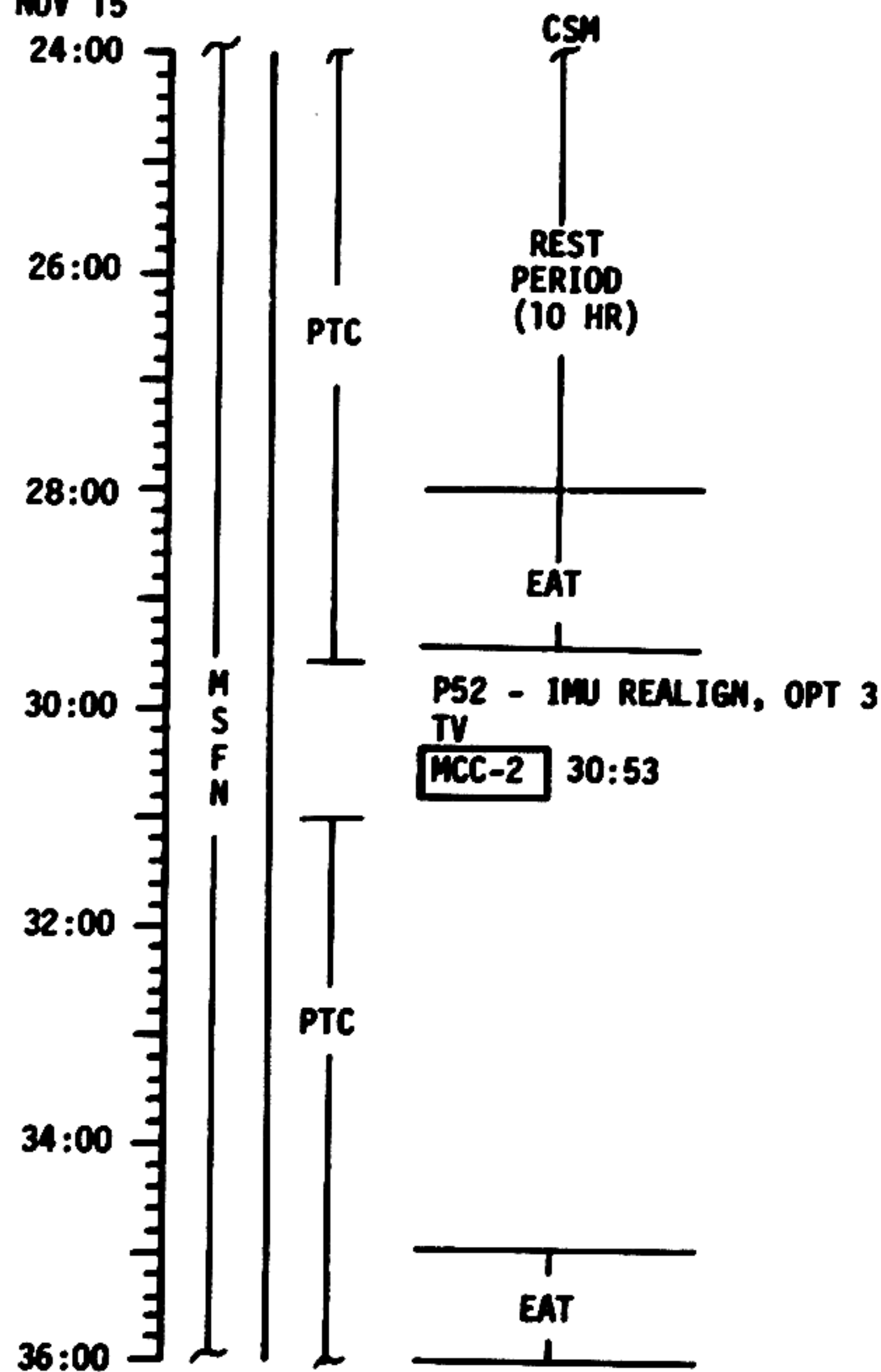
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	00:00 - 24:00	1/TLC	5-1

NOV 14 1969 (Nov 14)

FLIGHT PLANNING BRANCH

ABBREVIATED TIMELINE

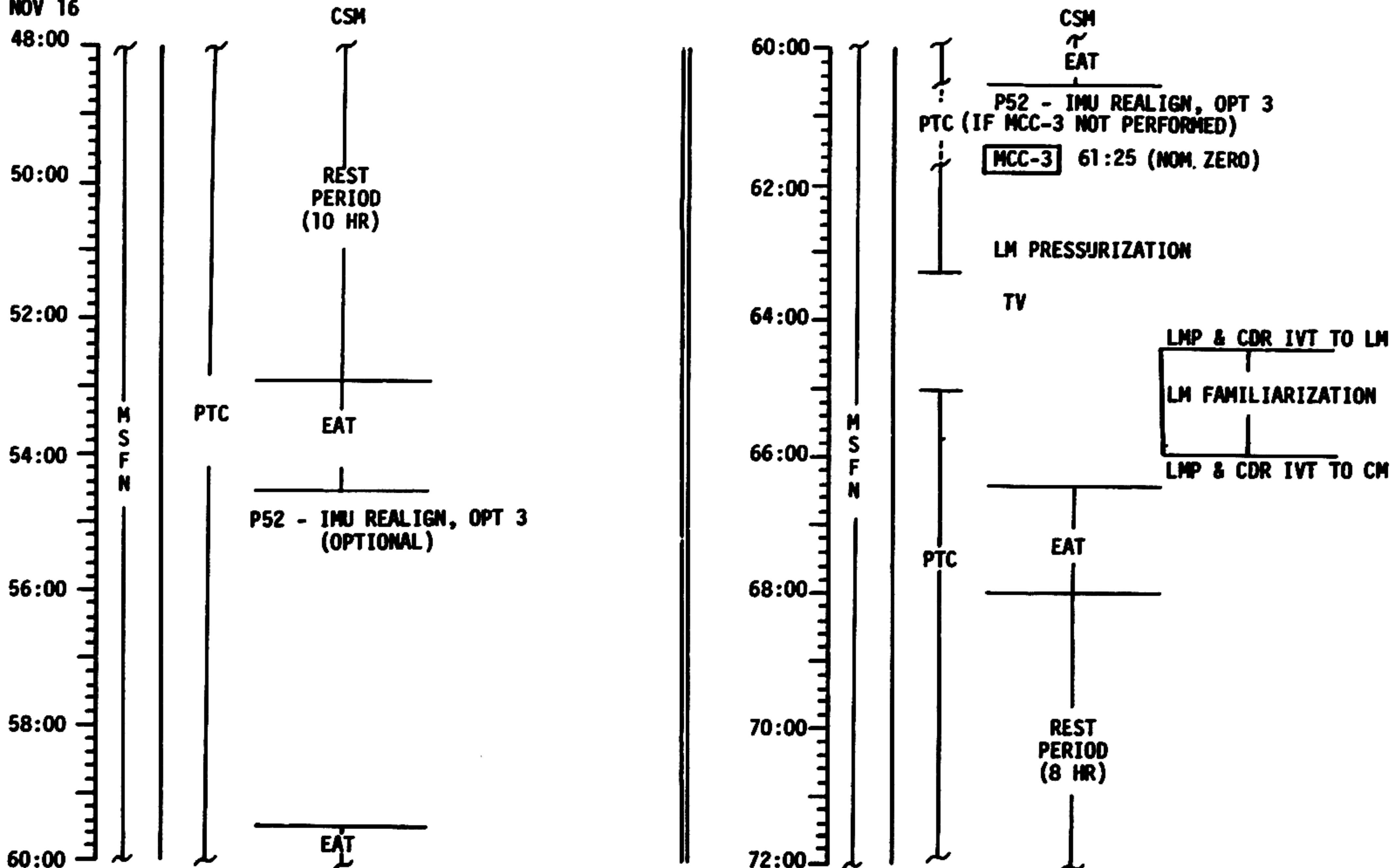
1022 CST
NOV 15



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	24:00 - 48:00	2/TLC	5-2

ABBREVIATED TIMELINE

1022 CST
NOV 16



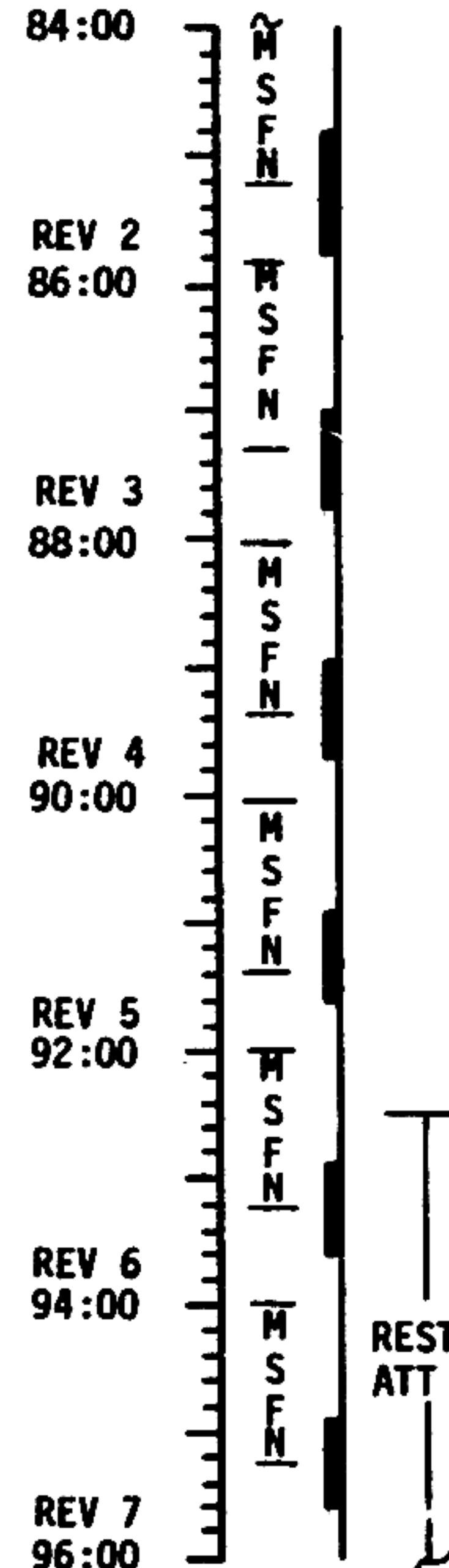
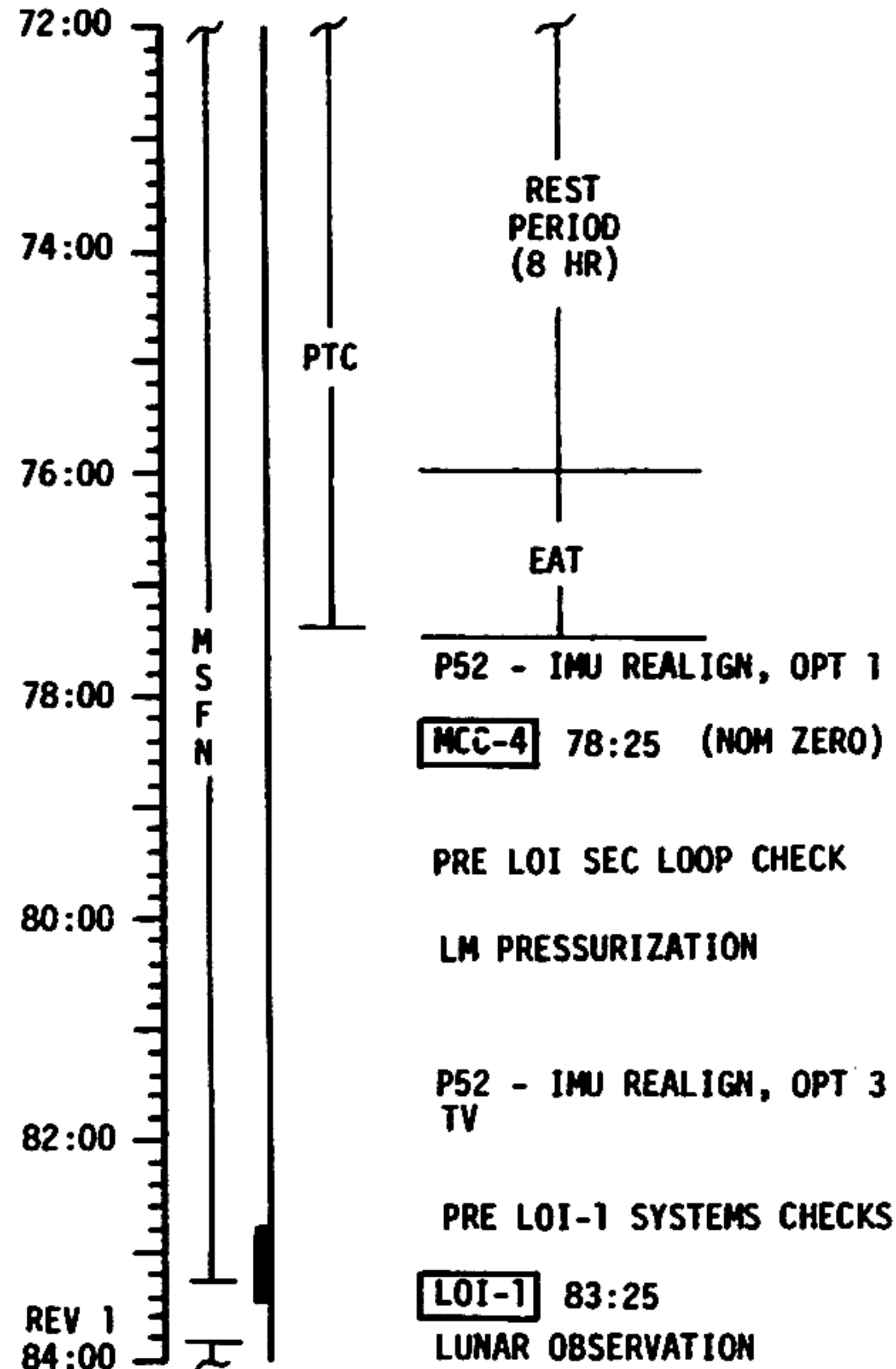
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	48:00 - 72:00	3/TLC	5-3

MSC Form 1057 OT (Mar 69)

FLIGHT PLANNING BRANCH

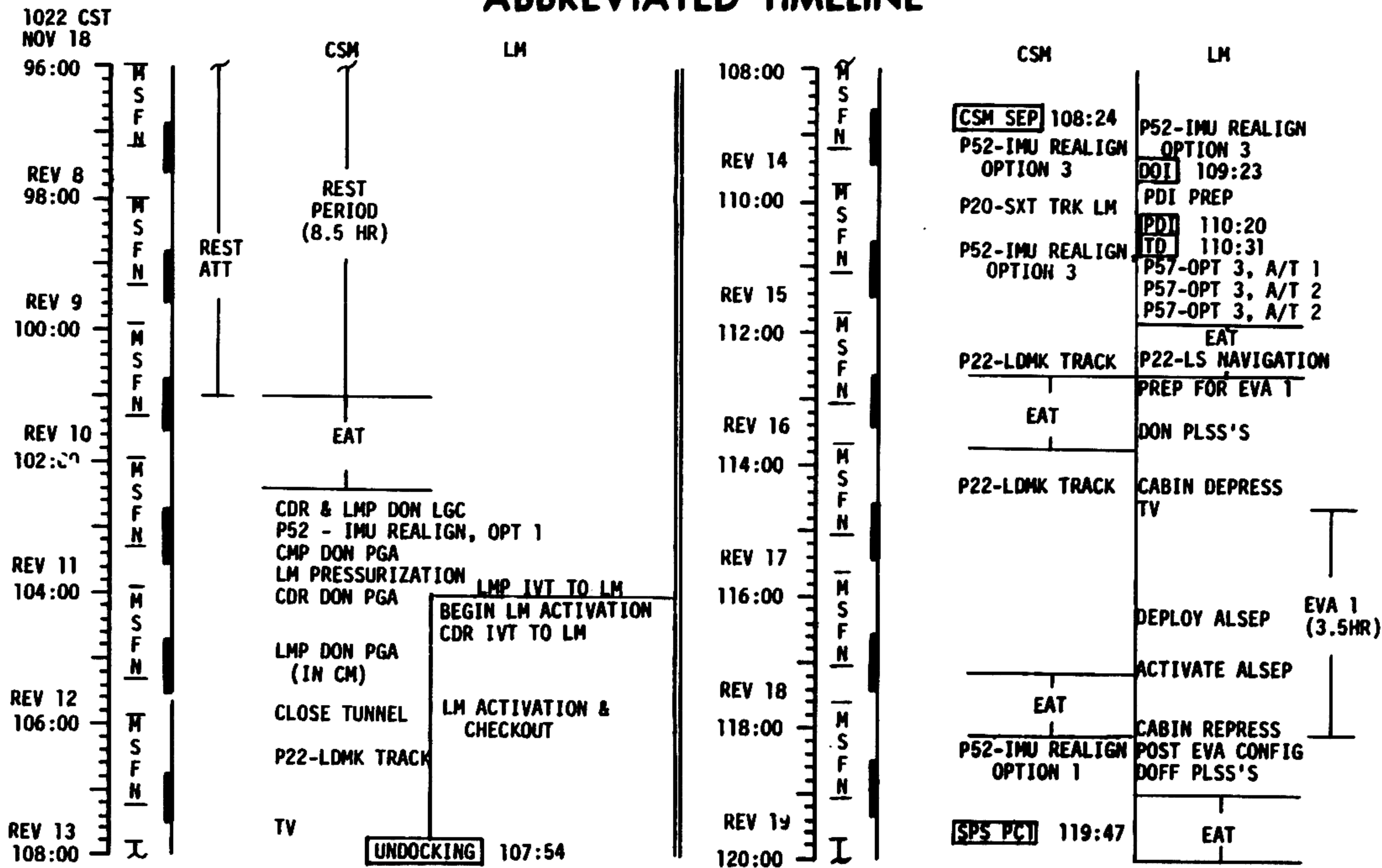
ABBREVIATED TIMELINE

1022 CST
NOV 17



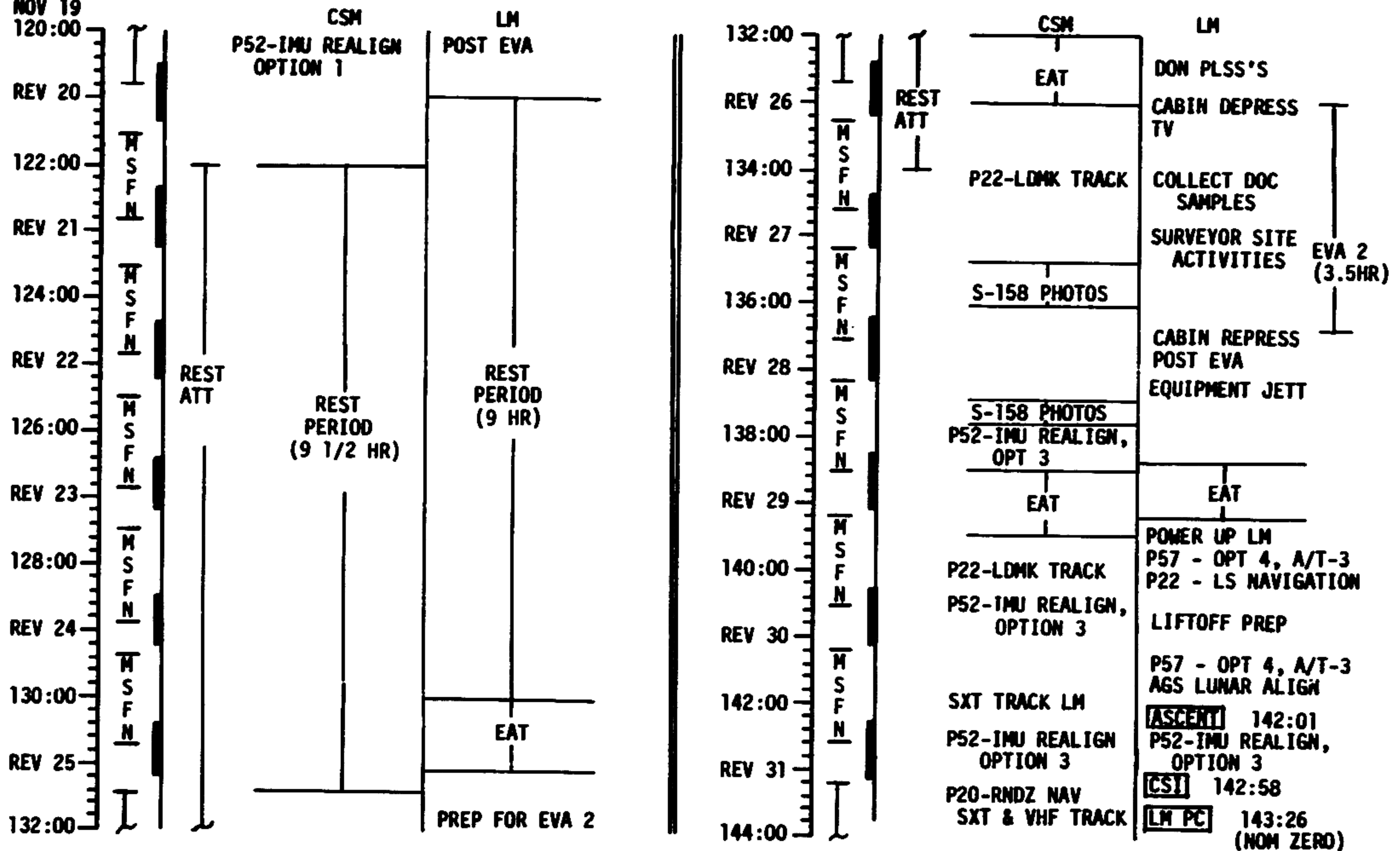
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	72:00 - 96:00	4/TLC, 1-7	5-4

ABBREVIATED TIMELINE



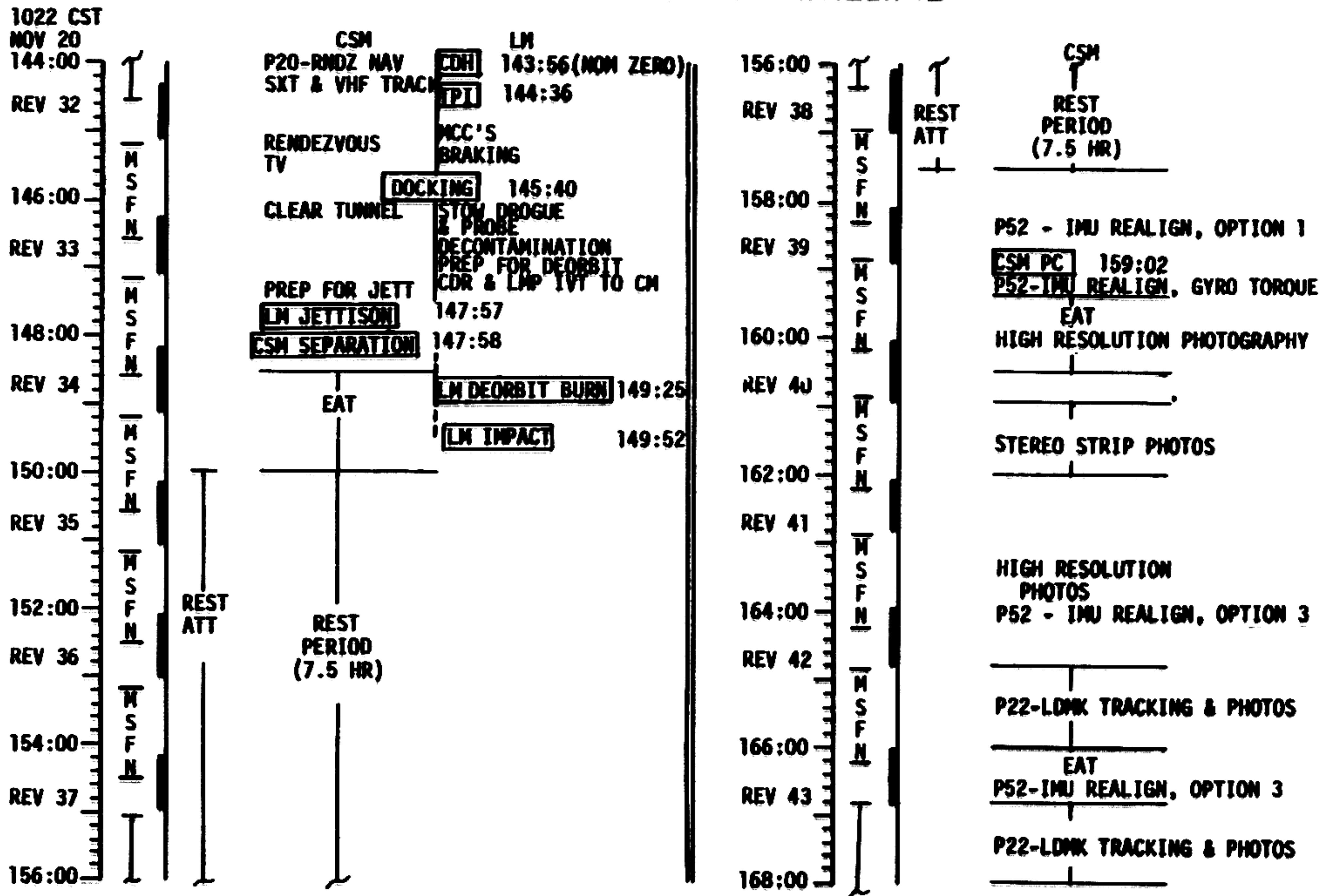
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	96:00 - 120:00	5/7-19	5-5

1022 CST
NOV 19
120:00



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	120:00 - 144:00	5-6/19-31	5-6

ABBREVIATED TIMELINE



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	144:00 - 168:00	6-7/31-43	5-7

ABBREVIATED TIMELINE

1022 CST

NOV 21

168:00

REV 44

170:00

REV 45

172:00

REV 46

174:00

176:00

178:00

180:00

CSM

STEREO STRIP PHOTOS

P52-IMU REALIGN, OPTION 1

PREP FOR TEI

TEI 172:21
TV

P52-IMU REALIGN, GYRO TORQUE
EAT

PTC

REST
PERIOD
(10 HR)

180:00

182:00

184:00

186:00

188:00

190:00

192:00

CSM

REST
PERIOD
(10 HR)

EAT

P52-IMU REALIGN, OPTION 3

PTC

PTC (IF MCC-5 NOT PERFORMED)

MCC-5 187:21 (NOM ZERO)

P23 - CISELUNAR NAVIGATION
(5 SETS)

PTC

EAT

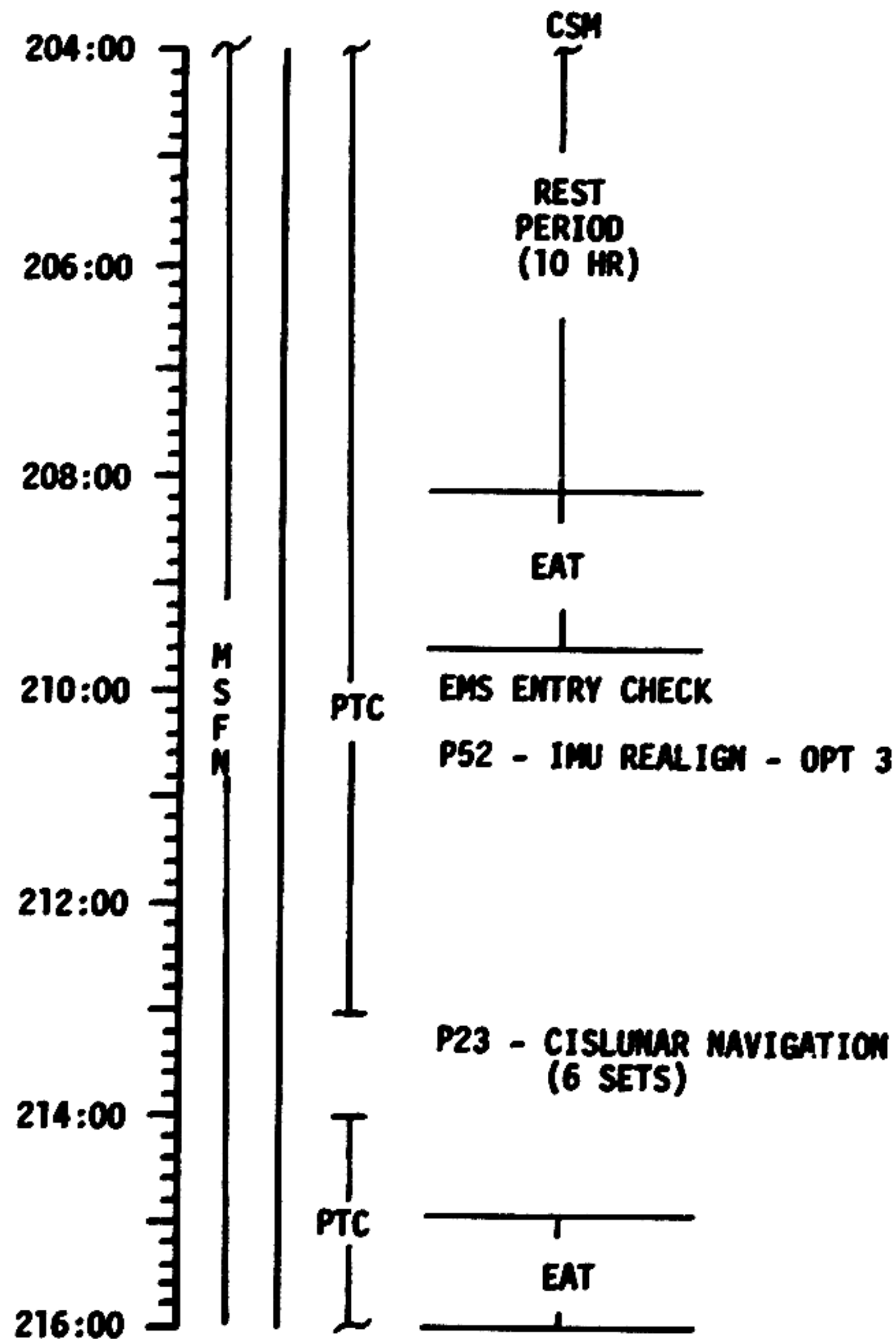
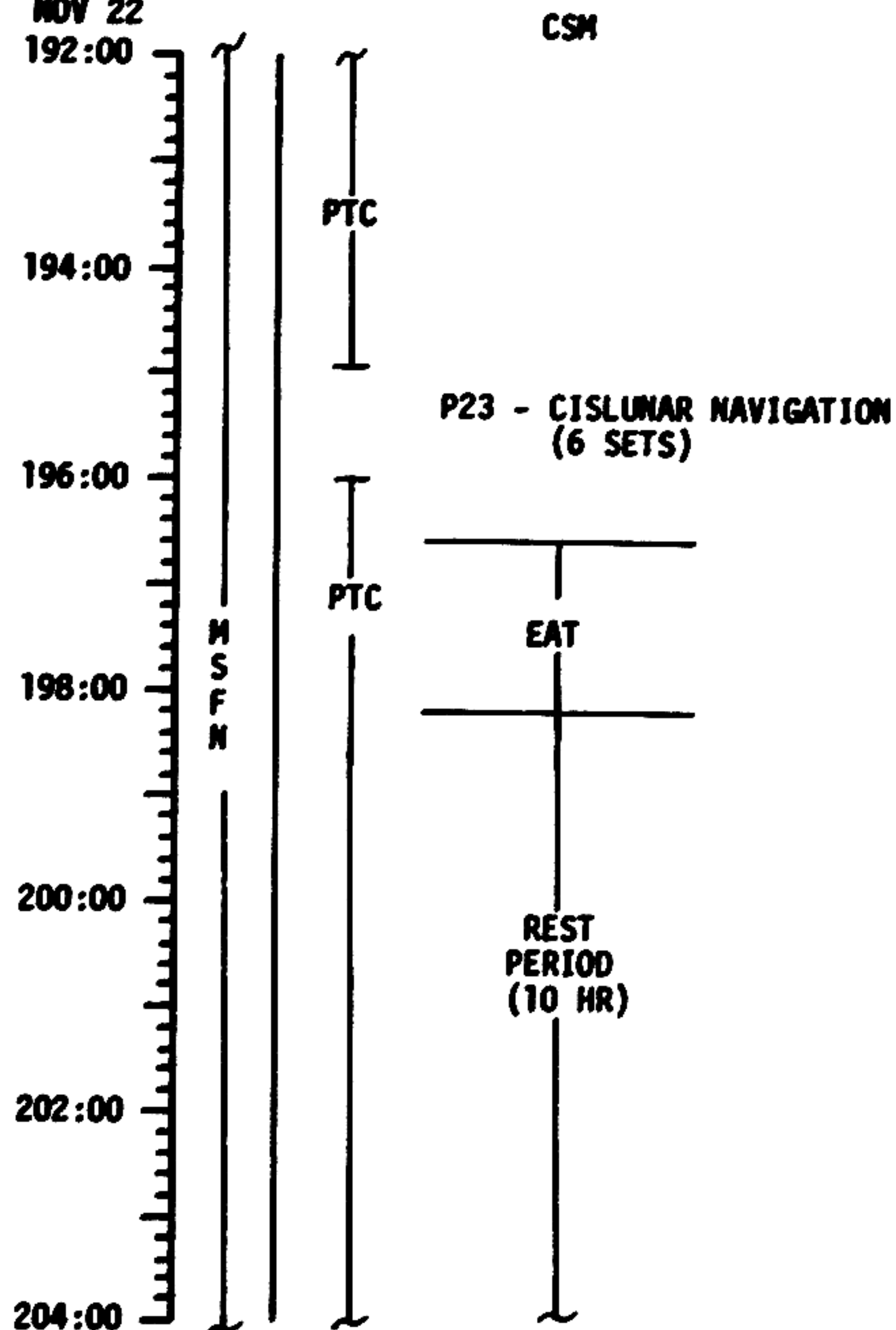
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	168:00 - 192:00	7-8/43-TEC	5-8

1022 CST (Nov 21)

FLIGHT PLANNING BRANCH

ABBREVIATED TIMELINE

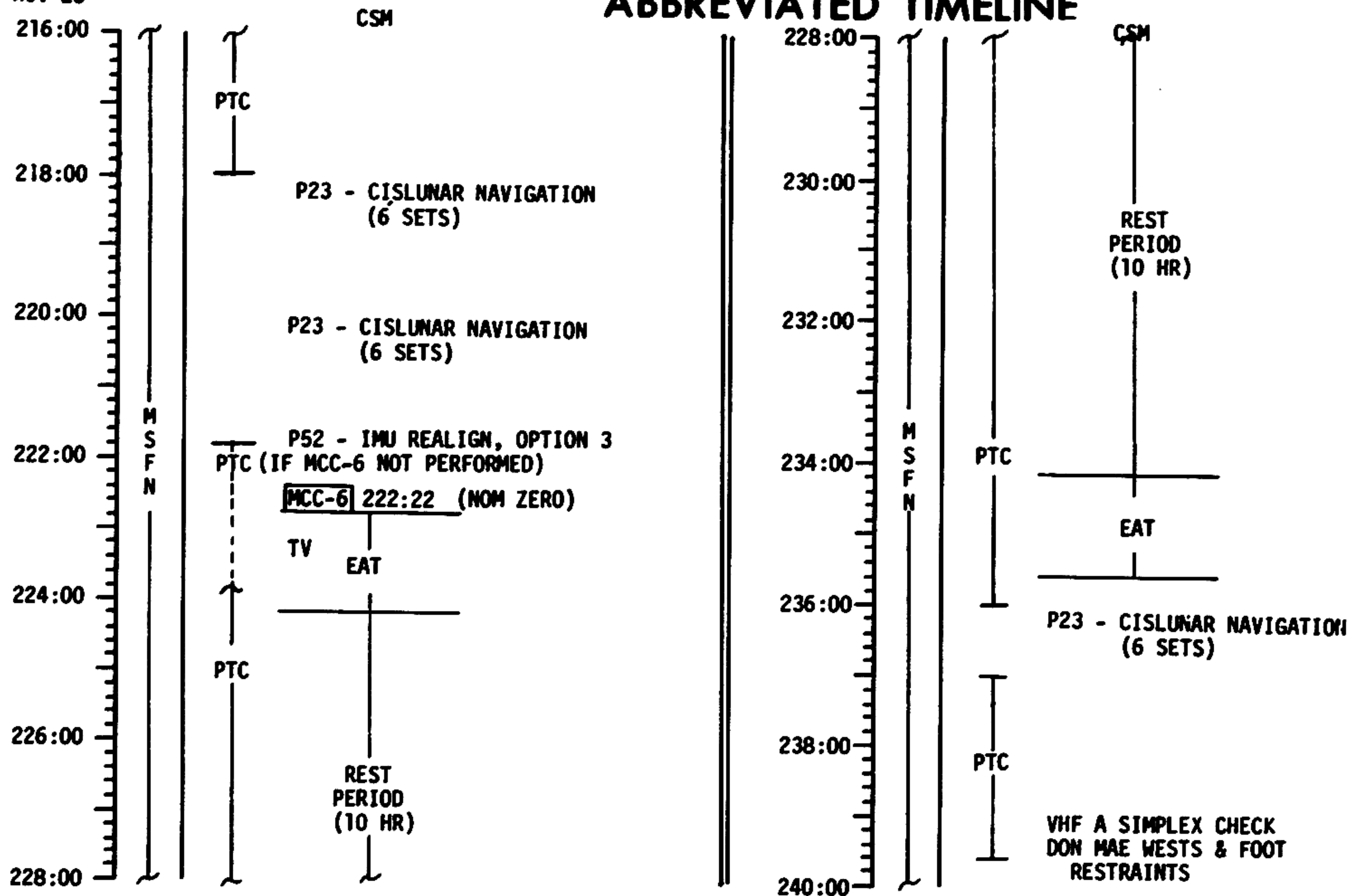
1022 CST
NOV 22
192:00



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	192:00 - 216:00	8-9/TEC	5-9

1022 CST
NOV 23

ABBREVIATED TIMELINE



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	216:00 - 240:00	9-10/TEC	5-10

MSC Form 1057 OT (Mar 69)

FLIGHT PLANNING BRANCH

1022 CST
NOV 24

ABBREVIATED TIMELINE

240:00

CSM
P52 - IMU REALIGN, OPTION 1

242:00

MCC-7 241:22 (NOM ZERO)

BEGIN ENTRY PREP

244:00

P52 - IMU REALIGN, OPTION 3

INITIALIZE EMS
SEPARATION CHECKLIST

CM/SM SEP

ENTRY INTERFACE 244:22

SPLASHDOWN 244:35

246:00

M
S
F
N

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 12	ABBREVIATED TIMELINE (NOV 14)	OCTOBER 15, 1969	240:00 - 246:00	10/TEC	5-11

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PHOTO PLAN

TIME	ACTIVITY or TARGET	CAMERA CONFIGURATION CODE	MAGAZINE
3:20	Transposition/Docking	CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, .3 mag (5 MIN) CM2/EL/80/CEX - (f8,250,30) 10 CM4/TV - IN, BRKT (f22) 1 HR 05 MIN	(A) (Q)
4:15	LM Ejection	CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 12 fps, .7 mag (6 MIN) CM4/EL/80/CEX- (f8,250,30) 5	(A) (Q)
TLC	Earth Photography Distant Moon	CM ₁ /EL/80 or 250/CEX-RING (f11,250,∞) 20 30 CM ₁ /EL/250 or 80/CEX or BW-RING (f5.6,250,∞) 5/5	(Q) (Q) (S)
30:25	Hybrid Burn (MCC2) Crew Activities	CM/TV - IN (f5.6) 35 MIN	
63:30	IVT Transfer	CM/TV - IN (f5.6) 50 MIN	
81:30	Pre-LOI1 Lunar Surface	CM/TV - IN (f22) 20 MIN	
84:00	Lunar Surface	CM/TV - IN (f22) 30 MIN	
107:55	Undocking	CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, 1 mag (16 MIN) CM2/EL/80CEX- (f8,250,50) 10 LM1/DC/60/HCEX-(f11,250,50) 10 LM ₁ /DAC/10/CEX-(f11,250,7) 6 fps .25 mag (4 MIN) CM4/TV - IN BRKT (f22) 20 MIN	(B) (Q) (CC) (K)
Lunar Orbit	Targets of Opportunity Fra Mauro	CM/EL/80 or 250/CEX-(CC,250,∞) 175 CM/EL/80/BW-(f2.8,250,) 10	(Q) (R) (S)
110:26	PDI + 6 MIN/Descent	LM3/DAC/10/CEX- (f2.8,500,30) 12 fps, .75 mag (6 MIN)	(K)
114:40	EVA 1	See Surface Photo and TV Timelines	(L) (M) (N) (AA) (BB) (CC) (DD) (EE) (FF) (GG) (HH) (II) (JJ) (KK) (LL) (MM) (NN) (OO) (PP) (QQ) (RR) (SS) (TT) (UU) (VV) (WW) (XX) (YY) (ZZ)
133:17	EVA 2		
134:10	Sextant Photography- Lansberg Rev 26	CM/DAC/SEXT/CEX-(fixed,60,fixed) 1 fps (5 MIN)	(F)
135:19, 137:25	Lunar Multispectral	Blu- CM3/LMC/80/MBW-IVL,47B FIL (* ,fixed) 150	(BB)
137:47	North Wall of Theophilus	Red-CM3/LMC/80/MBW-IVL,29+ FIL (* ,fixed) 150	(CC)
137:51	Descartes	Grn-CM3/LMC/80/BW-IVL,58 FIL (* ,fixed) 150	(DD)
138:01	Fra Mauro	Blk-CM3/LMC/80/IRBW-IVL,87C FIL (* ,fixed) 120	(AA)

DATE NOVEMBER 3, 1969

PHOTO
PLAN

142:00	LM Ascent	LM3/DAC/10/CEX-(f2.8,500,30) 12 fps, 1 mag (8 MIN)	▽	
145:30	Rendezvous/Docking	CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, 1 mag (16 MIN) CM2/EL/80/CEX- (f8,250,30) 10 LM/DC/60/HCEX-(f11,250,FOCUS) 5 CM4/TV-IN BRKT (f22) 30 MIN	□ ◇ ▽ □	
148:00	LM Jettison	CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 12 fps, .5 mag (4 MIN)	□	
	Crew Option	CM/DAC/SEXT/CEX-(fixed,250,fixed) 1 fps .5 mag (46 MIN)		
159:40	High Resolution/Oblique Photography - LaLande	CM4/EL/500/BW-BRKT,Cont (f8,125,∞) 20 CM2/DAC/18/BW - BRKT, MIR (f8,125,∞) 6 fps .5 mag (8 MIN)	◇ ◇ △	
160:54	Vertical Stereo Strip	CM4/EL/80/BW - BRKT, IVL (f4,250,∞) 180 CM/DAC/SEXT/CEX - (fixed,CC,fixed) 1 fps, 1 mag (93 MIN)	△ □	
163:20	High Resolution/Oblique Photography - Descartes Fra Mauro	CM4/EL/500/BW-BRKT,CONT (f8,125,∞) 150	◇	
		CM2/DAC/18/BW-BRKT,MIR (f8,125,∞) 6 fps, 1.5 mag (24 MIN)	◇	◇
164:50	Landmark Tracking Sextant Photography	CM4/DAC/SEXT/CEX - (fixed,CC,fixed) 1 fps, ~1 mag (88 MIN)	□	
168:51	Vertical Stereo Strip	CM4/EL/80/BW-BRKT,IVL (f4,250,∞) 180	△	
172:55	Lunar Surface	CM/TV - IN (f22) 20 MIN		
TEC	Distant Moon	CM/EL/80 or 250/BW or CEX-RING (f5.6,250,∞) 5/5	◇	◇
	Earth Photography	CM/EL/80 or 250/CEX-RING (f11,250,∞) 10	◇	
223:15	Earth, Interior	CM/TV - IN (f5.6/f22) 30 MIN		
244:30	Reentry	CM/DAC/18/ CEX ^{HCEX} -(f11,250,7)12fps, .5 mag(4 MIN) Fireball -(f11,125,7)12fps, .5 mag(4 MIN) Chutes		◇
Crew Option	Crew/Spacecraft Compatibility	CM/DAC/5/CIN- (f2.8,60,∞)SPOT 6 fps, 1 mag (16 MIN)	◇	
	Stowing/Unstowing Equip- ment (Aft bulkhead)	CM/TV - IN (f5.6)		
	LM to CSM Crew Transfer Donning/Doffing Spacesuit			
Crew Option				
	Crew Observations	CM_/EL/80 or 250/CEX - (Decal)	◇	

DATE NOVEMBER 3, 1969

DATE NOVEMBER 3, 1969

FILM MAGAZINE IDENTIFICATION AND STOWAGE

MAGAZINES

16mm (A) (B) (C) (D) (E) (F) (G) (H) (I) (J) (K) (L) (M) (N) (O) (P)

CEX	X	X	X	X	X	X					X	X	X	X	X	X
CIN							X	X								
HCEX							X									
BW 164									X	X						
TR											X	X	X	X	X	X

70mm (Q) (R) (S) (T) (U) (V) (W) (X) (Y) (Z) (AA) (BB) (CC) (DD) (EE)

CEX	X	X														
HCEX										X	X	X				
BW			X	X	X	X										
MBW							X	X	X							
HBW													X	X		
IRBW									X							
TR										X	X	X	X	X		

TR - Transfer and return

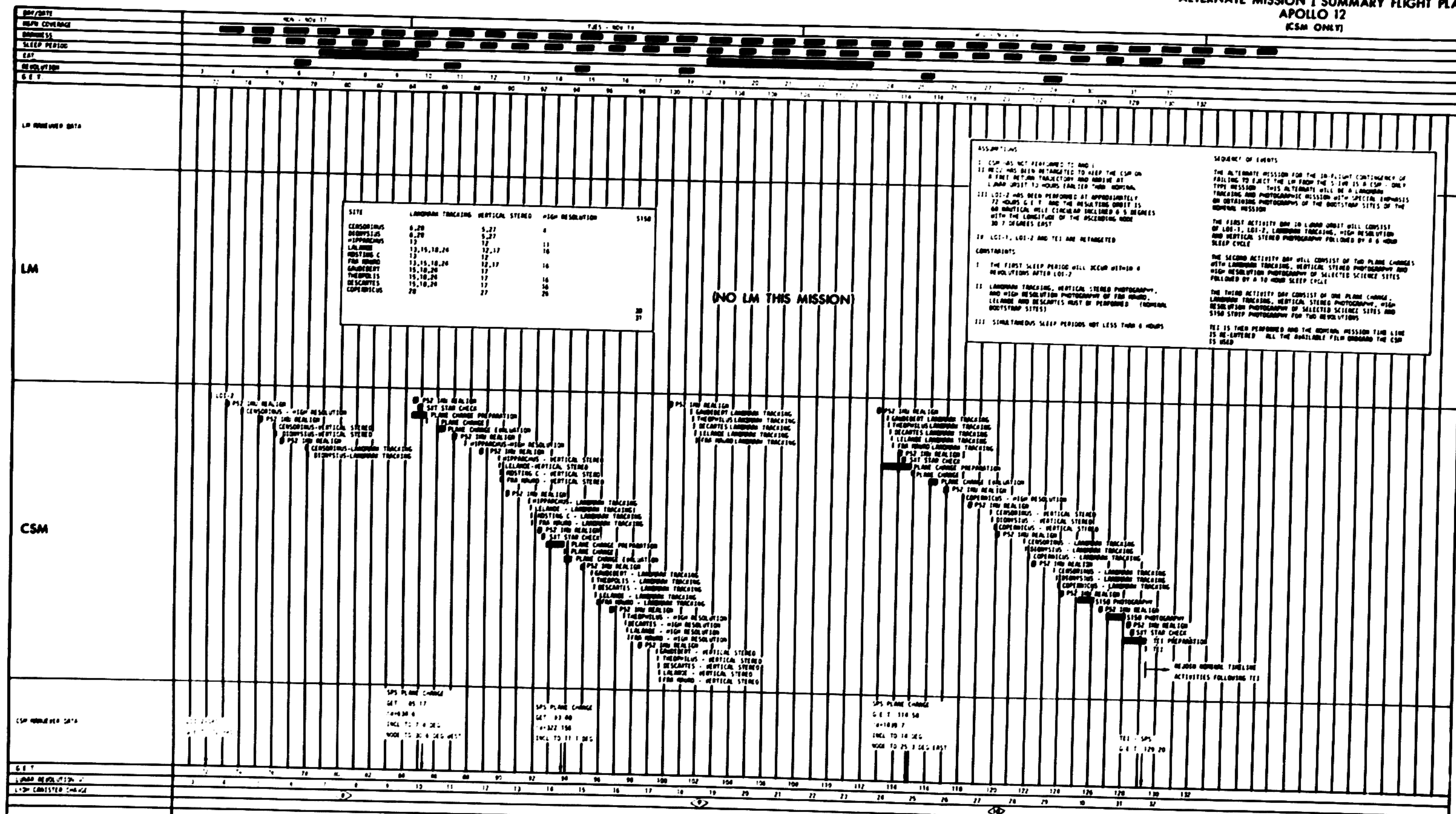
STOWAGE

○	CAMERA
□	B8
⬡	B2
◇	A8
△	A10
▽	R13 (Mag bag)

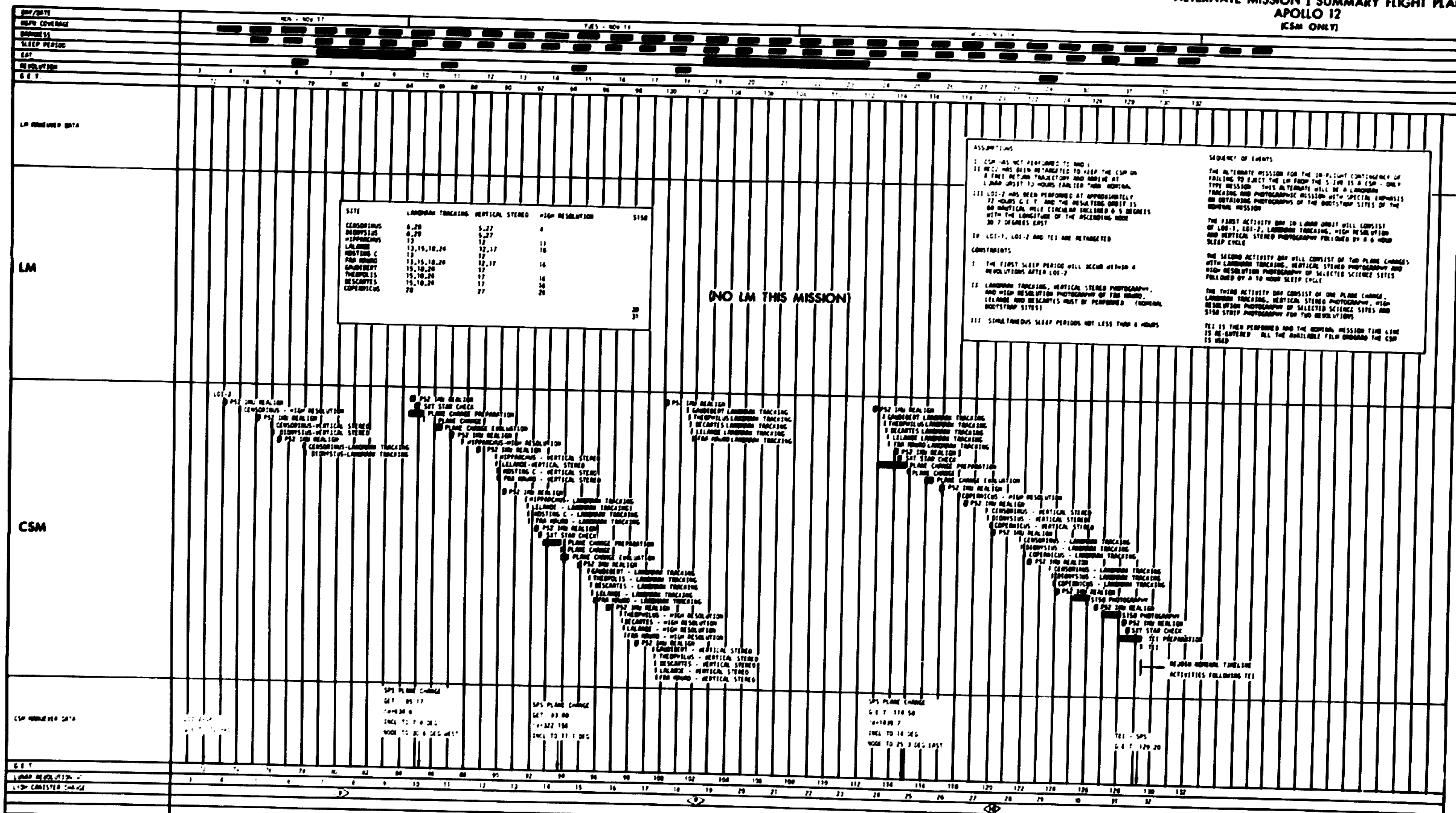
SECTION 6 - ALTERNATE MISSIONS

**ALTERNATE
MISSIONS**

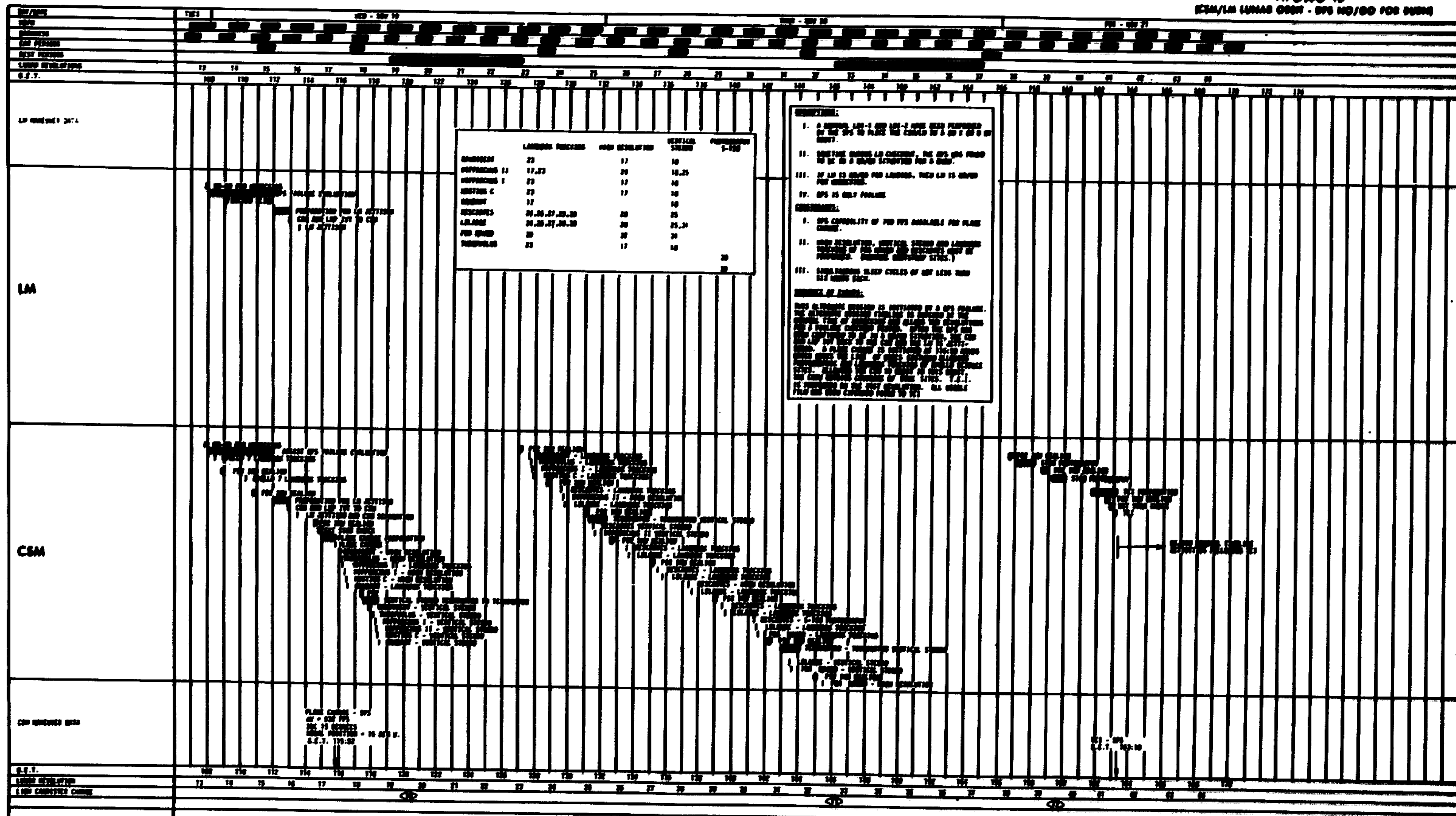
ALTERNATE MISSION 1 SUMMARY FLIGHT PLAN APOLLO 12 (CSM ONLY)



**ALTERNATE MISSION 1 SUMMARY FLIGHT PLAN
APOLLO 12
(KSM ONLY)**

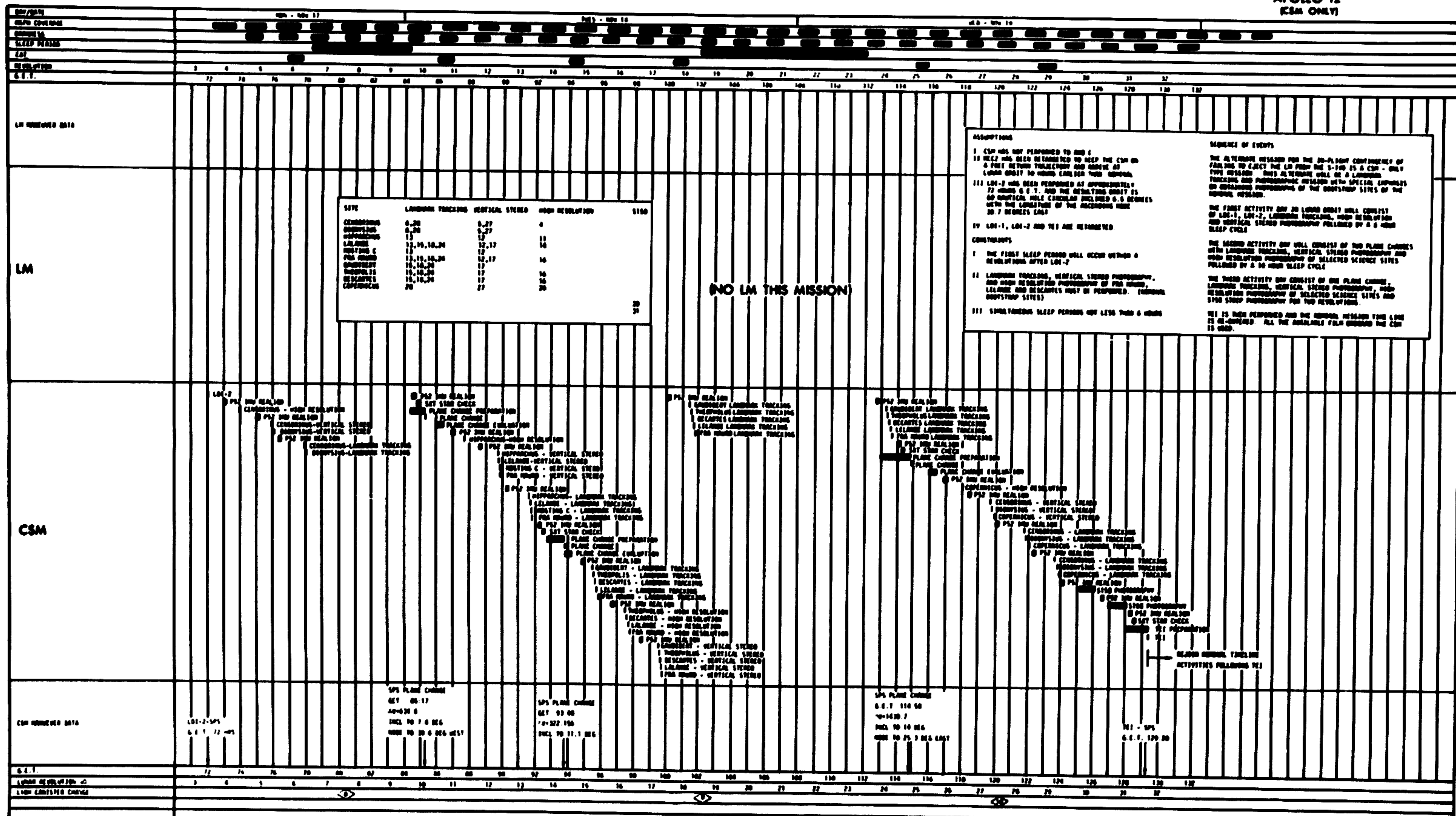


ICM/LM LUNAS OBT - EPS NO/GO FOR MINE



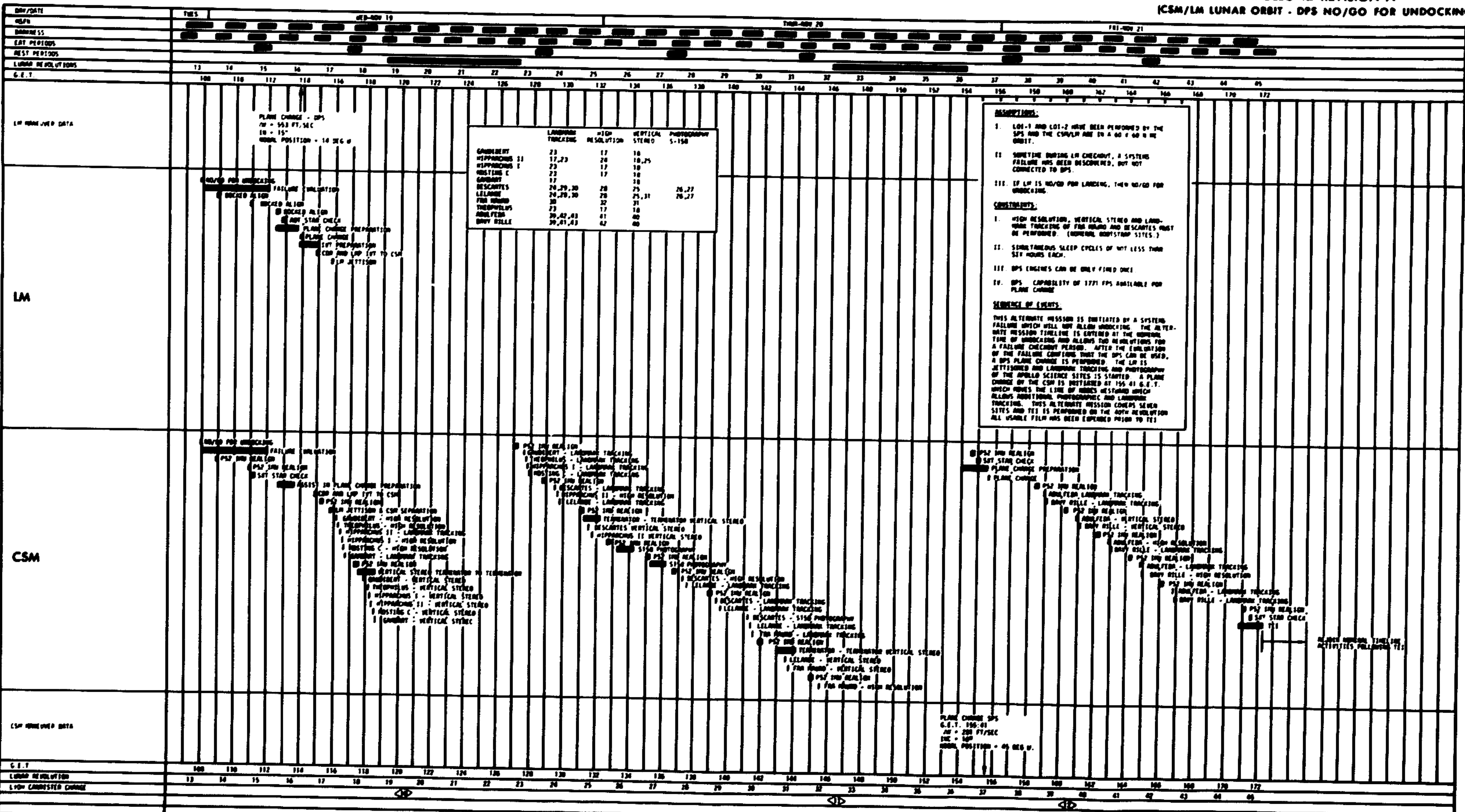
**DISREGARD PREVIOUS
2 IMAGES**

ALTERNATE MISSION 1 SUMMARY FLIGHT PLAN
APOLLO 12
CSM ONLY

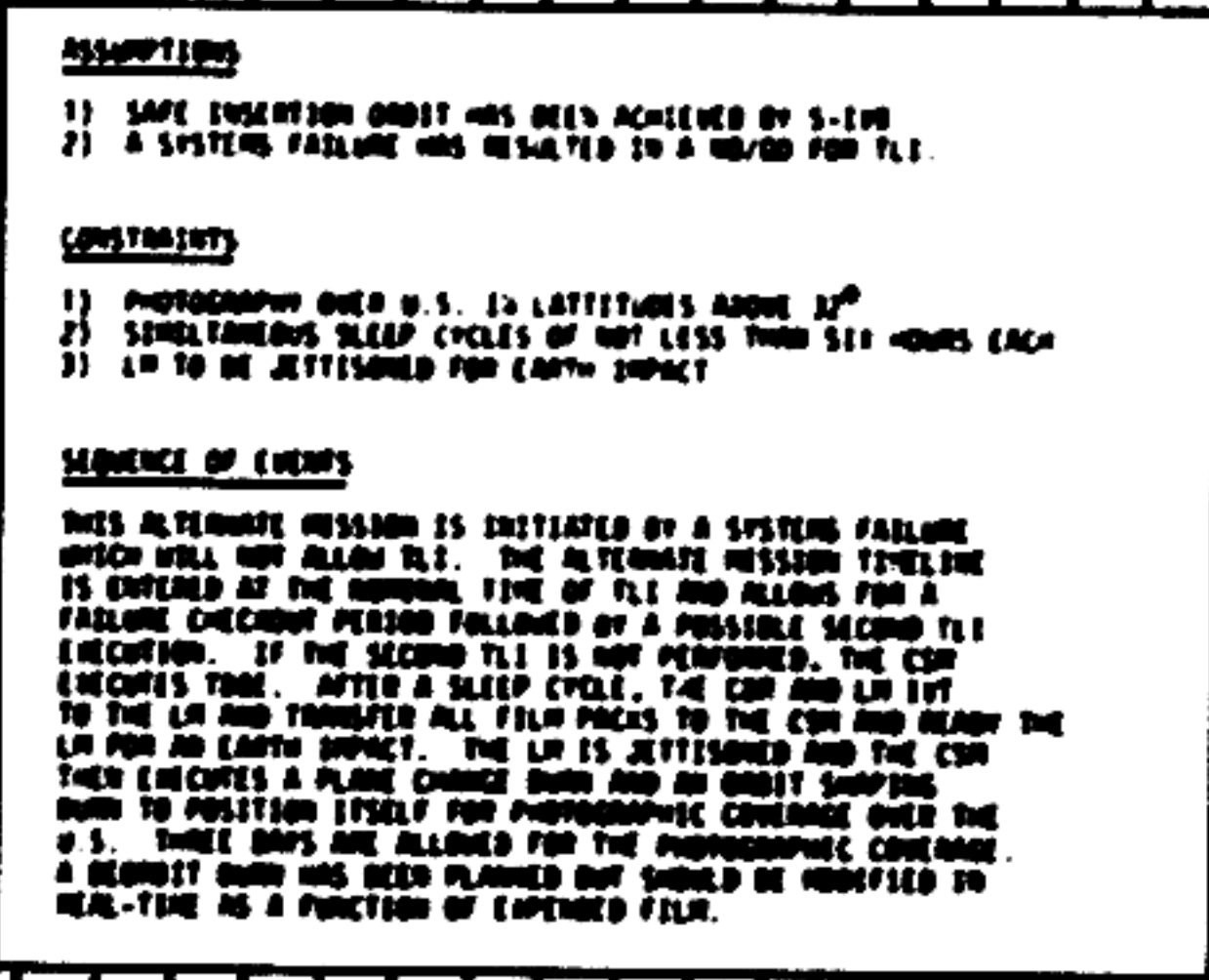




ALTERNATE MISSION 3 SUMMARY FLIGHT PLAN
 APOLLO 12 REVISION A
 (CSM/LM LUNAR ORBIT - DPS NO/GO FOR UNDOCKING)



(CSM/LM LOW EARTH ORBIT)



APOLLO XII (CONRAD - RED VELCRO)

Check items eaten

MEAL	Day 1*, 5**, 9			Day 2, 6, 10			Day 3, 7, 11			Day 4, 8				
	1	5	9		2	6	10		3	7	11		4	8
A Peaches Corn Flakes Bacon Squares (8) Orange Drink Coffee w/Sugar				Apricots Sausage Patties Scrambled Eggs Grapefruit Drink Coffee w/Sugar				Pears Corn Flakes Bacon Squares (8) Grape Drink Coffee w/Sugar				Canadian Bacon & Applesauce Scrambled Eggs Cinnamon Bread (4) Orange-G.F. Drink Coffee w/Sugar		
B Tuna Salad Beef & Gravy WP Jellied Candy Grape Punch				Turkey & Gravy WP Cheese Crackers (4) Chocolate Pudding Orange-G.F. Drink				Frankfurters WP Applesauce Chocolate Bar P.A.-G.F. Drink				Shrimp Cocktail Ham & Potatoes WP Apricots Chocolate Pudding Orange Drink		
C Cream of Chicken Soup Chicken & Rice Sugar Cookies (4) Butterscotch Pudding P.A.-G.F. Drink				Pork & Scalloped Potatoes Bread Slice Sand- wich Spread WP Jellied Candy Cocoa Orange Drink				Salmon Salad Chicken Stew Butterscotch Pudding Peaches Grapefruit Drink				Spaghetti w/Meat Beef Stew Banana Pudding Cocoa Grape Drink		

* Day 1 consists of Meal B and C only

**Day 5 consists of Meal A only

WP = Wet Pack

APOLLO XII (GORDON - WHITE VELCRO)

MEAL		Check items eaten			Day 2, 6, 10			Day 3, 7, 11			Day 4, 8		
Day 1*, 5, 9		1	5	9	Day 2, 6, 10			Day 3, 7, 11			Day 4, 8		
A Peaches					Apricots			Pears			Canadian Bacon		
Corn Flakes					Scrambled Eggs			Corn Flakes			& Applesauce		
Bacon Squares (8)					Sausage Patties			Bacon Squares (8)			Strawberry Cubes (4)		
Orange Drink					Grapefruit Drink			Grape Drink			Scrambled Eggs		
Coffee (black)					Coffee (black)			Coffee (black)			Orange-G.F. Drink		
B Tuna Salad					Turkey & Gravy WP			Frankfurters WP			Shrimp Cocktail		
Beef & Gravy WP					Cheese Crackers (4)			Applesauce			Ham & Potatoes		
Jellied Candy					Chocolate Pudding			Chocolate Bar			Apricots		
Grape Punch					Orange-G.F. Drink			P.A.-G.F. Drink			Chocolate Pudding		
(Day 5)											Orange Drink		
Beef & Potatoes WP													
C Pea Soup					Pork & Scalloped			Salmon Salad			Spaghetti w/Meat		
Chicken & Rice					Potatoes			Beef & Gravy			Beef Stew		
Sugar Cookies (4)					Bread Slice			Butterscotch Pudding			Banana Pudding		
Butterscotch Pudding					Sandwich Spread WP			Peaches			Cocoa		
P.A.-G.F. Drink					Date Fruitcake (4)			Grapefruit Drink			Grape Drink		
					Cocoa								
					Orange Drink								

*Day 1 consists of Meal B and C only

WP = Wet Pack

APOLLO XII (BEAN - BLUE VELCRO)

Check items eaten														
MEAL	Day 1*, 5**, 9			Day 2, 6, 10			Day 3, 7, 11			Day 4, 8				
	1	5	9		2	6	10		3	7	11		4	8
A Peaches Corn Flakes Canadian Bacon & Applesauce Cocoa Orange Drink				Fruit Cocktail Corn Flakes Jellied Candy Grapefruit Drink P.A.-G.F. Drink				Peaches Corn Flakes Canadian Bacon & Applesauce Cocoa Orange Drink				Fruit Cocktail Corn Flakes Jellied Candy Cocoa Orange-G.F. Drink		
B Beef & Gravy WP Fruit Cocktail Jellied Candy Grapefruit Drink				Cream of Chicken Soup Turkey & Gravy WP Peaches Orange-G.F. Drink				Potato Soup Beef and Gravy Jellied Candy P.A.-G.F. Drink				Cream of Chicken Soup Chicken Stew Peaches Chocolate Pudding Orange Drink		
C Potato Soup Chicken & Rice Spaghetti w/Meat Butterscotch Pudding Orange-G.F. Drink				Pork & Scalloped Potatoes Bread Slice Sandwich Spread Chocolate Pudding Cocoa Orange Drink				Chicken & Rice Fruit Cocktail Cinnamon Bread (4) Butterscotch Pudding Grapefruit Drink				Spaghetti w/Meat Banana Pudding Cocoa P.A.-G.F. Drink		

* Day 1 consists of Meal B and C only

**Day 5 consists of Meal A only

WP = Wet Pack

Front

Color _____

APOLLO XII/LM-6 MENU

CDR - Red Velcro

LMP - Blue Velcro

Check Items Eaten

Day 1 Meal C

Day 1 Meal C

Cream of Chicken Soup
Ham Salad - Bread WP
Jellied Candy
Apricots
Grapefruit Drink
Pineapple-Grapefruit
Drink

Cream of Chicken Soup
Ham Salad - Bread WP
Jellied Candy
Chocolate Pudding
Grapefruit Drink
Pineapple-Grapefruit
Drink

Day 2 Meal A

Day 2 Meal A

Peaches
Scrambled Eggs
Bacon Squares (8)
Cocoa
Orange Drink

Peaches
Corn Flakes
Canadian Bacon &
Applesauce
Cocoa
Orange Drink

Day 2 Meal B

Day 2 Meal B

Beef and Gravy WP
Pears
Butterscotch Pudding
Pineapple-Grapefruit
Drink
Grape Drink

Beef and Gravy WP
Butterscotch Pudding
Pineapple-Grapefruit
Drink
Grapefruit Drink

Day 2 Meal C

Day 2 Meal C

Turkey and Gravy
Chicken Stew
Apricots
Jellied Candy
Orange-Grapefruit
Drink

Turkey and Gravy WP
Chicken Stew
Fruit Cocktail
Jellied Candy
Orange-Grapefruit
Drink

2 Spoons

WP = Wet Pack

Basic Date _____
Changed _____

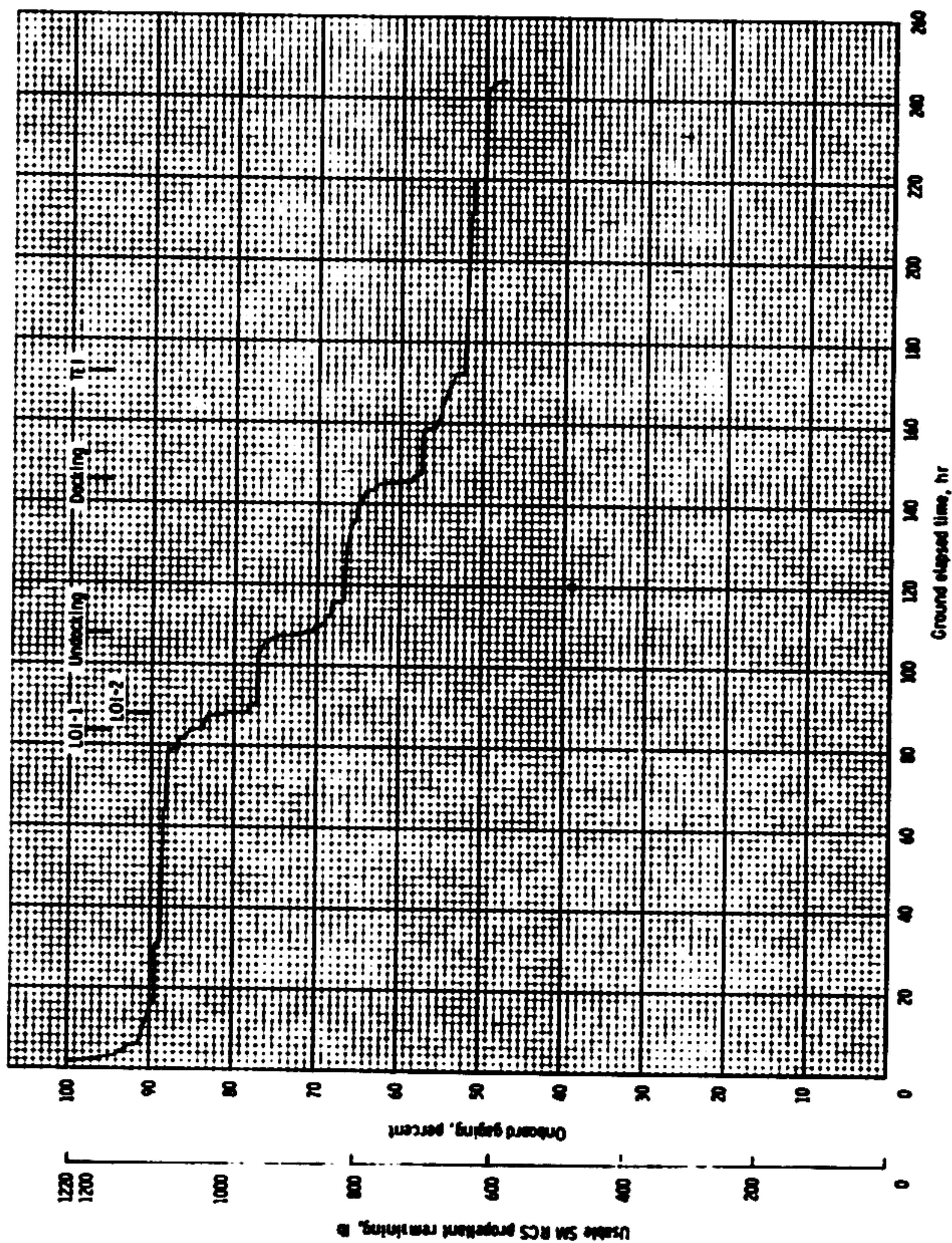
FOOD LOG

FOOD LOG

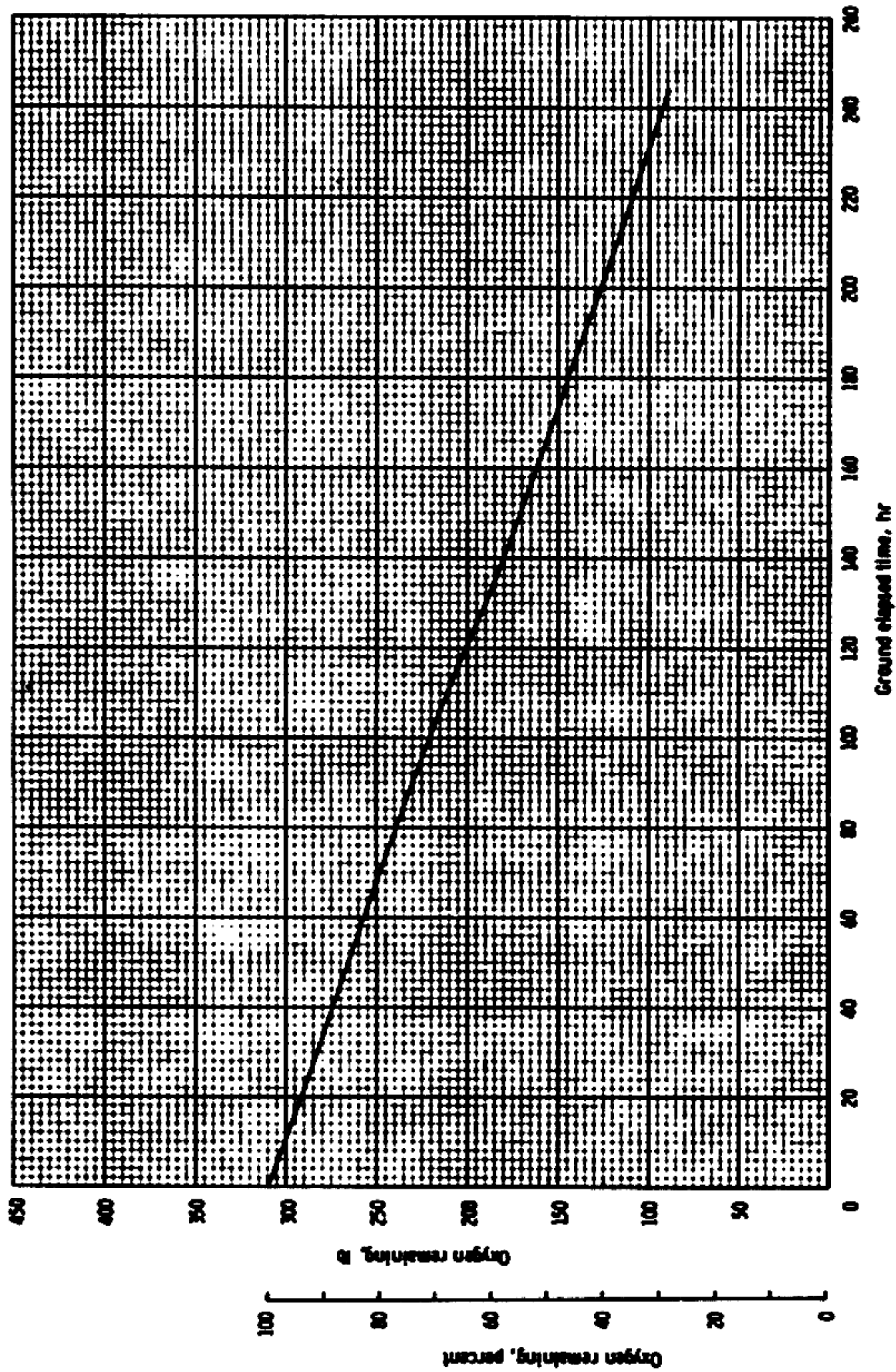
FOOD LOG

FOOD LOG

DATE NOVEMBER 3, 1969

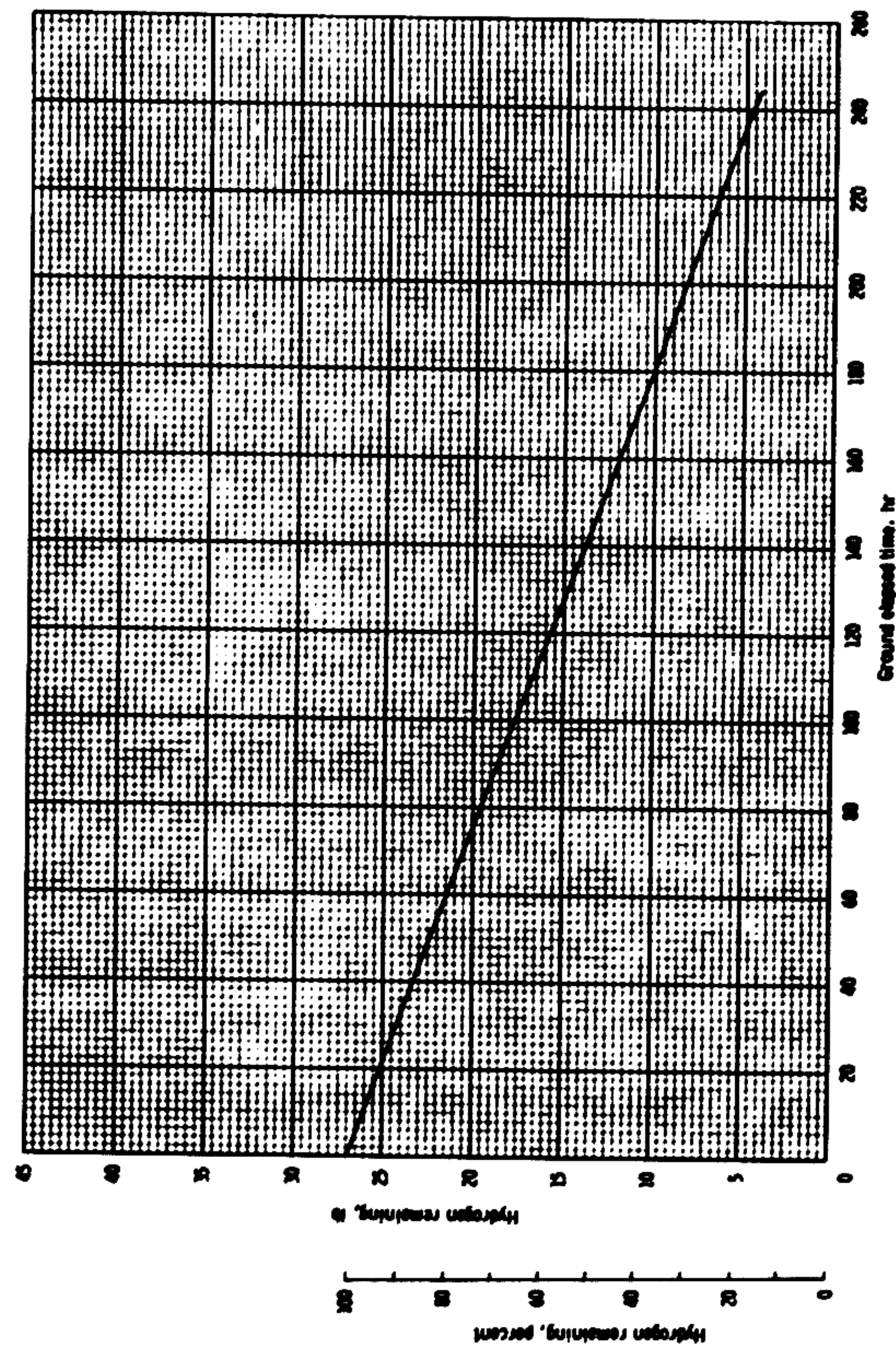


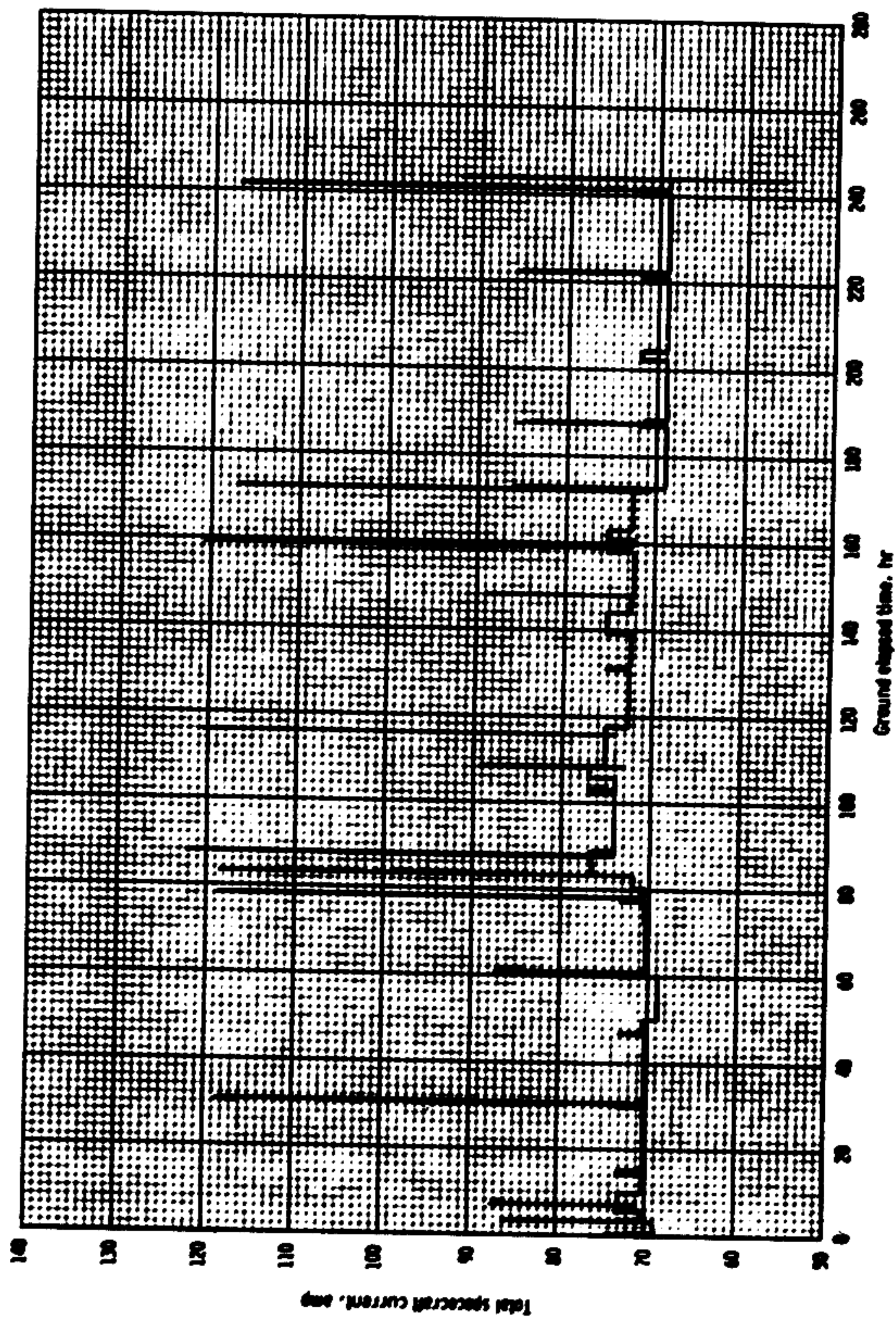
TOTAL SM RCS



DATE NOVEMBER 3, 1969

DATE NOVEMBER 3, 1969





DATE NOVEMBER 3, 1969