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
APOLLO 12
APOLLO AS-507/CSM-108/LM-6
FINAL FLIGHT PLAN
OCTOBER 15, 1969

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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.
ACKNOWLEDGMENTS


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
ALS CC 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)
BWL Black & White (Film 3401)

CAP COM Capsule Communicator
CAL ° 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
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LHSSC  Left Hand Side Storage Container
LiOH   Lithium Hydroxide
LLM    Lunar Landing Mission
LLLOS  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  Mission Control Center - Houston
or MCC
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  Pericythian
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
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<td>Definition</td>
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<td>Transposition Docking &amp; LM Ejection</td>
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<td>Terminal Phase Midcourse</td>
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<td>Velocity</td>
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<td>Velocity along the X-axis</td>
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<td>Velocity along the Y-axis</td>
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<td>VZ</td>
<td>Velocity along the Z-axis</td>
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<td>Abbreviation</td>
<td>Description</td>
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<td>VAN</td>
<td>USNS Vanguard</td>
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<td>Very High Frequency</td>
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<td>VLV</td>
<td>Valve</td>
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<td>VOX</td>
<td>Voice Keying</td>
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<td>Verb XX</td>
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</tr>
<tr>
<td>W/O</td>
<td>Without</td>
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</tr>
<tr>
<td>WRT</td>
<td>With Respect to</td>
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</tr>
<tr>
<td>WTN</td>
<td>USNS Watertown</td>
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<td>Time of Closest Approach (Symbol)</td>
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<td>Rate of Change along the X axis</td>
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<td>Transfer</td>
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<td>XMIT</td>
<td>Transmit or Transmitter</td>
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</tr>
<tr>
<td>XPONDER</td>
<td>Transponder</td>
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</tr>
<tr>
<td>Y</td>
<td>Yaw</td>
<td></td>
</tr>
<tr>
<td>YDOT</td>
<td>Rate of Change along the Y axis</td>
<td></td>
</tr>
<tr>
<td>ZDOT</td>
<td>Rate of Change along the Z axis</td>
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</tr>
<tr>
<td>∆Az</td>
<td>Azimuth Change (Difference)</td>
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<tr>
<td>∆H</td>
<td>Altitude Change (Difference)</td>
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</tr>
<tr>
<td>∆P</td>
<td>Pressure Change (Difference)</td>
<td></td>
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<tr>
<td>∆R</td>
<td>Position Change (Difference)</td>
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<tr>
<td>∆V</td>
<td>Velocity Change (Difference)</td>
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<tr>
<td>∆VC</td>
<td>Velocity Change at Engine Cutoff</td>
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</tr>
</tbody>
</table>
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

xviii
SYMBOL NOMENCLATURE

LANDING SITE
LUNAR TERMINATOR
SPACECRAFT SUNSET
MSFN LOS
START OF INDICATED REVOLUTION
DARKNESS
SPACECRAFT SUNRISE
LUNAR TERMINATOR
MSFN AOS
SUBSOLAR POINT
SECTION I - GENERAL
FLIGHT PLAN NOTES

A. Crew

1. Crew designations are as follows:

<table>
<thead>
<tr>
<th>Designation</th>
<th>Prime</th>
<th>Backup</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commander (CDR)</td>
<td>Conrad</td>
<td>Scott</td>
</tr>
<tr>
<td>Command Module Pilot (CMP)</td>
<td>Gordon</td>
<td>Worden</td>
</tr>
<tr>
<td>Lunar Module Pilot (LMP)</td>
<td>Bean</td>
<td>Irwin</td>
</tr>
</tbody>
</table>

2. The nominal CM couch positions are:

<table>
<thead>
<tr>
<th>Activity</th>
<th>Left</th>
<th>Center</th>
<th>Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch thru TLI</td>
<td>CDR</td>
<td>CMP</td>
<td>LMP</td>
</tr>
<tr>
<td>T&amp;D thru Entry</td>
<td>CMP</td>
<td>CDR</td>
<td>LMP</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>PRESSURIZED SUIT</th>
<th>SUITED SUIT (SOFT SUIT)</th>
<th>PARTIAL SUIT</th>
<th>SHIRT SLEEVES</th>
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<tbody>
<tr>
<td>LAUNCH</td>
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<tr>
<td>EARTH ORBIT</td>
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<tr>
<td>TLI THROUGH</td>
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<tr>
<td>SLINGSHOT MNVR</td>
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<tr>
<td>TEC &amp; TEC</td>
<td></td>
<td></td>
<td></td>
<td>ALL</td>
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<tr>
<td>LM ACTIVATION</td>
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<td>ALL</td>
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<td>UNDOCKING</td>
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<td>CMP</td>
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<td>ALL</td>
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<td></td>
<td></td>
<td></td>
<td>CDR &amp; LMP</td>
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<tr>
<td>LUNAR STAY</td>
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<td>Varies according to</td>
<td></td>
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<td>EXCEPT EVA</td>
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<td>checklist for CDR &amp; LMP</td>
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<td>SURFACE EVA</td>
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<td>CDR &amp; LMP</td>
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<td>LIFTOFF</td>
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<td>CDR &amp; LMP</td>
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<td>ALL</td>
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<tr>
<td>THRU DOCKING</td>
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<td>CDR &amp; LMP</td>
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<td>ALL</td>
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<tr>
<td>POST JETTISON</td>
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<td></td>
<td>ALL</td>
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<tr>
<td>THRU TEI</td>
<td></td>
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<td>ALL</td>
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</tbody>
</table>

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 gauges with no calibration bias applied.

1-1
B. CSM Systems
   1. Communications
      (a) The preferred S-Band communication modes are:
          (1) Uplink Mode 6 (Voice, PRN, and Updata)
          (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 (ΔR, ΔV) 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°/sec or 0.5°/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, Updata)
       (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
LUNAR EXPLORATION COMMUNICATIONS
BOTH CREWMEN EVA
EVCS DUAL MODE (RELAY)

Figure 1-2
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**TABLE 1-3**

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<tr>
<td>DOI</td>
<td>109:23:00</td>
<td>72.1</td>
<td>2 JET</td>
<td>LDG SITE</td>
<td>HA 59.3 HP 8.3</td>
<td>DPS</td>
</tr>
<tr>
<td></td>
<td>BT-28.2 sec</td>
<td></td>
<td>7.5 Sec</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PDI</td>
<td>110:20:00</td>
<td>6612.6</td>
<td>2 JET</td>
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<td>DPS</td>
</tr>
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<td></td>
<td>BT-11Min.18.5</td>
<td></td>
<td>7.5 Sec</td>
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<tr>
<td>ASCENT</td>
<td>142:01:17.9</td>
<td>6046.2</td>
<td>None</td>
<td>LIFT OFF</td>
<td>HA 44.7 HP 8.3</td>
<td>APS</td>
</tr>
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<td>BT-7Min10.0</td>
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</tr>
<tr>
<td>CSI</td>
<td>142:58:05.2</td>
<td>50.3</td>
<td>--</td>
<td>LIFT OFF</td>
<td>HA 45.6 HP 44.6</td>
<td>RCS BURN</td>
</tr>
<tr>
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<td>BT-45.3 Sec</td>
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</tr>
<tr>
<td>PLANE CHANGE</td>
<td>143:26:27.5</td>
<td>0.0</td>
<td>--</td>
<td>LIFT OFF</td>
<td>HA 45.6 HP 44.6</td>
<td>RCS BURN</td>
</tr>
<tr>
<td>CDH</td>
<td>143:56:27.5</td>
<td>0.0</td>
<td>--</td>
<td>LIFT OFF</td>
<td>HA 45.6 HP 44.6</td>
<td>RCS BURN</td>
</tr>
<tr>
<td>TPI</td>
<td>144:36:25.7</td>
<td>24.6</td>
<td>--</td>
<td>LIFT OFF</td>
<td>HA 61.9 HP 44.2</td>
<td>RCS BURN</td>
</tr>
<tr>
<td></td>
<td>BT 22.1 Sec</td>
<td></td>
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</tr>
<tr>
<td>MCC-1</td>
<td>144:51:25.7</td>
<td>--</td>
<td>--</td>
<td>LIFT OFF</td>
<td>HA 61.9 HP 44.2</td>
<td>RCS BURN</td>
</tr>
<tr>
<td>MCC-2</td>
<td>145:06:25.7</td>
<td>--</td>
<td>--</td>
<td>LIFT OFF</td>
<td>HA 61.9 HP 44.2</td>
<td>RCS BURN</td>
</tr>
<tr>
<td>LM DEORBIT</td>
<td>149:24:41.2</td>
<td>189.7</td>
<td>--</td>
<td>ASCENT</td>
<td>--</td>
<td>RCS BURN</td>
</tr>
<tr>
<td></td>
<td>1 MIN 23.83 SEC</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**NOTE:** HA & HP are calculated from the landing site
<table>
<thead>
<tr>
<th>TYPE DATA</th>
<th>GET</th>
<th>REV</th>
</tr>
</thead>
<tbody>
<tr>
<td>TLI + 90 Min</td>
<td>(P30)</td>
<td>01:30</td>
</tr>
<tr>
<td>L/O + 8 Hrs</td>
<td>(P37)</td>
<td>01:30</td>
</tr>
<tr>
<td>L/O + 15 Hrs</td>
<td>(P37)</td>
<td>05:55</td>
</tr>
<tr>
<td>L/O + 25 Hrs</td>
<td>(P37)</td>
<td>14:00</td>
</tr>
<tr>
<td>L/O + 35 Hrs</td>
<td>(P37)</td>
<td>14:00</td>
</tr>
<tr>
<td>L/O + 45 Hrs</td>
<td>(P37)</td>
<td>14:00</td>
</tr>
<tr>
<td>L/O + 60 Hrs</td>
<td>(P37)</td>
<td>14:00</td>
</tr>
<tr>
<td>LOI - 5 Abort Pad</td>
<td>(P30)</td>
<td>35:00</td>
</tr>
<tr>
<td>PC + 2</td>
<td>(P30)</td>
<td>77:30</td>
</tr>
<tr>
<td>TEI 1</td>
<td>(P30)</td>
<td>81:15</td>
</tr>
<tr>
<td>TEI 4</td>
<td>(P30)</td>
<td>81:15</td>
</tr>
<tr>
<td>TEI 5</td>
<td>(P30)</td>
<td>86:15</td>
</tr>
<tr>
<td>TEI 11</td>
<td>(P30)</td>
<td>91:00</td>
</tr>
<tr>
<td>TEI 34</td>
<td>(P30)</td>
<td>102:30</td>
</tr>
<tr>
<td>TEI 39</td>
<td>(P30)</td>
<td>149:15</td>
</tr>
<tr>
<td>TEI 41</td>
<td>(P30)</td>
<td>158:00</td>
</tr>
<tr>
<td>TEI 43</td>
<td>(P30)</td>
<td>161:30</td>
</tr>
<tr>
<td>TEI 45</td>
<td>(P30)</td>
<td>165:00</td>
</tr>
<tr>
<td>TEI 45 (Prelim.)</td>
<td>(P30)</td>
<td>169:00</td>
</tr>
<tr>
<td>TEI 45 (Nominal)</td>
<td>(P30)</td>
<td>171:20</td>
</tr>
<tr>
<td>TEI 46</td>
<td>(P30)</td>
<td>171:20</td>
</tr>
</tbody>
</table>

(1) Assumes No MCC-1
(2) Assumes MCC-2
(3) Abbreviated P30 Pad: Includes - Purpose, Propulsion, Weight, Pitch & Yaw Trim, Time, $\Delta V_x$, $\Delta V_y$, $\Delta V_z$, and Pitch
(4) Assumes No LOI-2
(5) Abbreviated P30 Pad: Includes - Purpose, Propulsion, Time, $\Delta V_x$, $\Delta V_y$, $\Delta z$, and Pitch
(6) Assumes LOI-2 Accomplished
(7) Assumes No Plane Change
### APOLLO 12/LM-6

**DSEA SCHEDULE**

**TABLE 1-8**

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

*Estimated duty cycle in mode indicated*
TABLE 1-9
BATTERY CHARGE SCHEDULE

<table>
<thead>
<tr>
<th>GET HR:MIN</th>
<th>BATTERY</th>
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<tbody>
<tr>
<td>04:30</td>
<td>B</td>
</tr>
<tr>
<td>11:30</td>
<td>A</td>
</tr>
<tr>
<td>62:00</td>
<td>B</td>
</tr>
<tr>
<td>76:30</td>
<td>A</td>
</tr>
<tr>
<td>88:10</td>
<td>B</td>
</tr>
<tr>
<td>131:30</td>
<td>A</td>
</tr>
<tr>
<td>137:25</td>
<td>B</td>
</tr>
<tr>
<td>186:00</td>
<td>B</td>
</tr>
<tr>
<td>193:15</td>
<td>A</td>
</tr>
<tr>
<td>LANDMARKS</td>
<td>LATITUDE</td>
</tr>
<tr>
<td>-------------------</td>
<td>----------</td>
</tr>
<tr>
<td>H1*</td>
<td>1.517° S</td>
</tr>
<tr>
<td>SITE 7*</td>
<td>2°58'56&quot; S (2.9822°)</td>
</tr>
<tr>
<td>190</td>
<td>2.957° S</td>
</tr>
<tr>
<td>191</td>
<td>3.437° S</td>
</tr>
<tr>
<td>193*</td>
<td>3.437° S</td>
</tr>
<tr>
<td>194</td>
<td>3.009° S</td>
</tr>
<tr>
<td>195</td>
<td>3.377° S</td>
</tr>
<tr>
<td>Lalande Site **</td>
<td>4.783° S</td>
</tr>
<tr>
<td>CP 1*</td>
<td>5.667° S</td>
</tr>
<tr>
<td>CP 2*</td>
<td>10.250° S</td>
</tr>
<tr>
<td>Descartes Site **</td>
<td>8.858° S</td>
</tr>
<tr>
<td>DE 1*</td>
<td>8.883° S</td>
</tr>
<tr>
<td>DE 2</td>
<td>9.333° S</td>
</tr>
<tr>
<td>DE 3</td>
<td>8.767° S</td>
</tr>
<tr>
<td>Fra Mauro Site **</td>
<td>3.617° S</td>
</tr>
<tr>
<td>FM 1*</td>
<td>3.228° S</td>
</tr>
<tr>
<td>FM 2</td>
<td>4.117° S</td>
</tr>
<tr>
<td>FM 3</td>
<td>4.567° S</td>
</tr>
<tr>
<td>Lansberg A *</td>
<td>0.150° N</td>
</tr>
</tbody>
</table>

*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)
<table>
<thead>
<tr>
<th>DAY/DATE</th>
<th>FRI NOV 14</th>
<th>SAT NOV 15</th>
<th>SUN NOV 16</th>
<th>MON NOV 17</th>
<th>TUES NOV 18</th>
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</thead>
<tbody>
<tr>
<td>ACTIVITY DAY</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4 (LCO DAY)</td>
<td>5 (DOY DAY)</td>
</tr>
<tr>
<td>PERIODS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LUNAR REVOLUTION NO.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G.E.T.</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5 (LCO)</td>
</tr>
<tr>
<td>MANEUVER DATA</td>
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<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**LM**

- EARTH ORBIT AND SYSTEMS CHECKOUT
  - P2 IMU REALIGN
  - TLI
  - TRANSPORT, DOCKING, AND LM EJECTION MONITOR S-VIR (E-VIR) MINERVA
  - P2 IMU REALIGN
- CUSLUNAR NAVIGATION OPTICAL SIGHTING - STAR/Earth HORIZON
  - P2 IMU REALIGN
  - PTC MODE
  - MCC-1
  - MCC-2

**CSM**

- EARTH ORBIT AND SYSTEMS CHECKOUT
  - P2 IMU REALIGN
  - P2 IMU REALIGN
  - P2 IMU REALIGN
  - MCC-1
  - MCC-2
  - MCC-3
  - MCC-4
  - TV
  - TV

**CSM MANEUVER DATA**

- EARTH ORBIT AND SYSTEMS CHECKOUT
  - P2 IMU REALIGN
  - MCC-1
  - MCC-2
  - MCC-3
  - MCC-4
  - TV
  - TV

**LUNAR REVOLUTION NO.**

- TH CANISTER CHANGE
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
  - 8
  - 9
  - 10
  - 11
  - 12
  - 13
  - 14
  - 15

**NASA — MSC**

MSC 1529-70
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>
<thead>
<tr>
<th>NUMBER</th>
<th>OBJECTIVE</th>
<th>ACTIVITY</th>
<th>PAGE NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Contingency Sample Collection</td>
<td>EVA-1</td>
<td>3-93</td>
</tr>
<tr>
<td>A-1</td>
<td>Provide a contingency sample for postflight scientific investigations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>Lunar Surface EVA Operations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B-1</td>
<td>Evaluate walking pace on typical terrain</td>
<td>EVA-1, EVA2</td>
<td>3-93</td>
</tr>
<tr>
<td>B-2</td>
<td>Evaluate the capability of the crew to lift and maneuver large packages</td>
<td>EVA 1</td>
<td>3-94</td>
</tr>
<tr>
<td>B-3</td>
<td>Evaluate the capability of the crew to unstow and deploy the erectable S-band antenna</td>
<td>EVA-1</td>
<td>3-94</td>
</tr>
<tr>
<td>B-4</td>
<td>Evaluate the adequacy of the preflight estimates of time required to perform specific EVA activities</td>
<td>EVA-1, EVA-2</td>
<td>3-93, 3-109</td>
</tr>
<tr>
<td>C</td>
<td>PLSS Recharge</td>
<td>POST EVA-1</td>
<td>3-97, 3-100</td>
</tr>
<tr>
<td>C-1</td>
<td>Demonstrate the capability to recharge the PLSS while in the LM on the lunar surface</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F</td>
<td>Selected Sample Collection</td>
<td>EVA-1</td>
<td>3-96</td>
</tr>
<tr>
<td>F-1</td>
<td>Collect rock samples and fine-grained fragmental material</td>
<td></td>
<td></td>
</tr>
<tr>
<td>F-2</td>
<td>Collect one large rock</td>
<td>EVA-1</td>
<td>3-96</td>
</tr>
<tr>
<td>F-3</td>
<td>Collect a core tube sample</td>
<td>EVA-1</td>
<td>3-96</td>
</tr>
<tr>
<td>NUMBER</td>
<td>OBJECTIVE</td>
<td>ACTIVITY</td>
<td>PAGE NO.</td>
</tr>
<tr>
<td>--------</td>
<td>-----------</td>
<td>----------</td>
<td>----------</td>
</tr>
<tr>
<td>G</td>
<td>Photographs of Candidate Exploration Sites</td>
<td>POST LM JETTISON</td>
<td>3-137, 3-139</td>
</tr>
<tr>
<td>G-1</td>
<td>Obtain stereoscopic photographs of selected lunar sites</td>
<td>POST LM JETTISON</td>
<td>3-141</td>
</tr>
<tr>
<td>G-2</td>
<td>Obtain high resolution photographs of selected lunar sites</td>
<td></td>
<td>3-153</td>
</tr>
<tr>
<td>H</td>
<td>Lunar Surface Characteristics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H-1</td>
<td>Obtain data on the mechanical behavior and terrain characteristics of the lunar surface</td>
<td>EVA-1, EVA-2</td>
<td>3-93, 3-109</td>
</tr>
<tr>
<td>H-2</td>
<td>Determine the LM landing gear stroking, footpad lunar surface interaction, LM attitude and ground clearance after landing</td>
<td>TOUCHDOWN, EVA-1</td>
<td>3-87, 3-94</td>
</tr>
<tr>
<td>H-3</td>
<td>Determine the extent of lunar surface erosion and the effects of surface ejecta on the LM resulting from DPS exhaust impingement during landing</td>
<td>EVA-1</td>
<td></td>
</tr>
<tr>
<td>I</td>
<td>Lunar Environment Visibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-1</td>
<td>Deleted</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I-2</td>
<td>Obtain data on the ability to perform visual tasks while on the lunar surface</td>
<td>EVA-1</td>
<td>3-93, 3-109</td>
</tr>
<tr>
<td>I-3</td>
<td>Obtain data on the ability to observe contrast in the lunar shadow and on the lunar terrain</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>J</td>
<td>Landed LM Location</td>
<td>DOI THROUGH TOUCHDOWN</td>
<td>3-88, 3-90</td>
</tr>
<tr>
<td>J-1</td>
<td>Determine the position of the landed LM in real time</td>
<td>DOI THROUGH TOUCHDOWN</td>
<td>3-90</td>
</tr>
<tr>
<td>J-2</td>
<td>Obtain data to permit a postflight determination of the landed LM location</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NUMBER</td>
<td>OBJECTIVE</td>
<td>ACTIVITY</td>
<td>PAGE NO</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------</td>
<td>-------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>L</td>
<td>Photographic Coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L-1</td>
<td>Obtain photographs of the lunar surface during LM descent</td>
<td>PDI THROUGH TOUCHDOWN</td>
<td>3-87</td>
</tr>
<tr>
<td>L-2</td>
<td>Obtain photographs of the lunar surface after touchdown and prior to cabin depressurization</td>
<td>POST TOUCHDOWN</td>
<td>3-88</td>
</tr>
<tr>
<td>L-3</td>
<td>Obtain photographs of the landed LM, of various EVA evaluation tasks and of operations related to geologic inspection and sampling</td>
<td>EVA-1, EVA-2</td>
<td>3-93</td>
</tr>
<tr>
<td>M</td>
<td>Television Coverage</td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-1</td>
<td>Provide TV camera coverage of an astronaut descending to the lunar surface</td>
<td>EVA-1, EVA-2</td>
<td>3-93</td>
</tr>
<tr>
<td>M-2</td>
<td>Provide TV camera coverage of an external view of the landed LM</td>
<td>EVA-1</td>
<td>3-94</td>
</tr>
<tr>
<td>M-3</td>
<td>Provide TV camera coverage of the lunar surface in the general vicinity of the LM</td>
<td>EVA-1</td>
<td>3-94</td>
</tr>
<tr>
<td>M-4</td>
<td>Provide TV camera panoramic coverage of distant terrain features</td>
<td>EVA-1</td>
<td>3-94</td>
</tr>
<tr>
<td>M-5</td>
<td>Provide TV camera coverage of an astronaut during lunar surface activities</td>
<td>EVA-1, EVA-2</td>
<td>3-93</td>
</tr>
<tr>
<td>N</td>
<td>Surveyor III Investigation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>N-1</td>
<td>Obtain photographs of lunar material in vicinity of Surveyor III</td>
<td>EVA-2</td>
<td>3-113</td>
</tr>
<tr>
<td>N-2</td>
<td>Obtain samples of lunar material in the crater containing the Surveyor III</td>
<td>EVA-2</td>
<td>3-113</td>
</tr>
<tr>
<td>N-3</td>
<td>Obtain photographs of Surveyor III</td>
<td>EVA-2</td>
<td>3-113</td>
</tr>
<tr>
<td>N-4</td>
<td>Obtain parts of the Surveyor III</td>
<td>EVA-2</td>
<td>3-113</td>
</tr>
<tr>
<td>N-5</td>
<td>Obtain data on the extent of mirror debonding on Surveyor III</td>
<td>EVA-2</td>
<td>3-113</td>
</tr>
<tr>
<td>NUMBER</td>
<td>OBJECTIVE</td>
<td>ACTIVITY</td>
<td>PAGE NO.</td>
</tr>
<tr>
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<td>-----------</td>
<td>----------</td>
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</tr>
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<td>0</td>
<td>Selenodetic Reference Point Update</td>
<td>CSM SOLO-REV 26</td>
<td>3-111</td>
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<tr>
<td>0-1</td>
<td>Obtain lunar landmark tracking data to permit an update of the selenodetic coordinates of a selected lunar reference point</td>
<td>EVA-1</td>
<td>3-95</td>
</tr>
<tr>
<td>ALSEP</td>
<td>Apollo Lunar Surface Experiments Package</td>
<td>EVA-1</td>
<td>3-95</td>
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<tr>
<td>ALSEP-1</td>
<td>Deploy the Lunar Passive Seismic Experiment (S-031)</td>
<td>EVA-1</td>
<td>3-95</td>
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<td>ALSEP-2</td>
<td>Deploy the Lunar Surface Magnetometer Experiment (S-034)</td>
<td>EVA-1</td>
<td>3-95</td>
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<td>ALSEP-3</td>
<td>Deploy the Solar Wind Spectrometer Experiment (S-035)</td>
<td>EVA-1</td>
<td>3-95</td>
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<tr>
<td>ALSEP-4</td>
<td>Deploy the Suprathermal Ion Detector Experiment (S-036) and the Cold Cathode Ion Gauge Experiment (S-058)</td>
<td>EVA-1</td>
<td>3-95</td>
</tr>
<tr>
<td>S-059</td>
<td>Lunar Field Geology</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>S-059-1</td>
<td>Deleted</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>S-059-2</td>
<td>Examine, describe, photograph and collect lunar geologic samples for return to earth</td>
<td>EVA-2</td>
<td>3-109</td>
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<tr>
<td>S-159-3</td>
<td>Collect a lunar environment sample of lunar surface material</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>S-059-4</td>
<td>Collect a gas analysis sample of lunar surface material</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>S-059-5</td>
<td>Obtain core samples of lunar material</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>S-059-6</td>
<td>Study and describe field relationships (such as shape, size, range, patterns of alignment or distribution) of all accessible types of lunar topographic features</td>
<td>EVA-2</td>
<td>3-109</td>
</tr>
<tr>
<td>NUMBER</td>
<td>OBJECTIVE</td>
<td>ACTIVITY</td>
<td>PAGE NO.</td>
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<td>S-080</td>
<td>Solar Wind Composition Conduct the Solar Wind Composition Experiment (S-080)</td>
<td>EVA-1, EVA-2</td>
<td>3-94, 3-113</td>
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<td>S-080-1</td>
<td>Multispectral photography</td>
<td>CSM SOLO</td>
<td>3-113</td>
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<td>S-158</td>
<td>Pilot Describing Function Experiment (No crew activity required)</td>
<td>Post Mission Debriefing &amp; Analysis</td>
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<td>T-029</td>
<td>Lunar Dust Detector Experiment (no crew activity required)</td>
<td>EVA-1</td>
<td>3-95</td>
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<td>M-515</td>
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<td>-00:09</td>
<td>LCC: REPORT IGNITION</td>
<td>CREW POSITIONS @ L/O</td>
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<td>CDR - LH COUCH</td>
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<td>00:00</td>
<td>LCC: CDR: REPORT LIFT-OFF</td>
<td>CMP - CENTER COUCH</td>
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<tr>
<td>00:02</td>
<td>CDR: REPORT YAW MNVR</td>
<td>LMP - RH COUCH</td>
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<td>00:11</td>
<td>CDR: REPORT ROLL AND PITCH PROGRAM</td>
<td>LIFTOFF 1022 CST</td>
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<td>CDR: REPORT ROLL COMPLETE</td>
<td>NOVEMBER 14, 1969, 72.1° L.A.</td>
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<td>00:42</td>
<td>MCC: REPORT MARK MODE IB</td>
<td>TARGETED FOR LANDING SITE 7.</td>
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<td>LMP: REPORT CABIN PRESS DECREASING</td>
<td>ALTITUDE 14,000 ft</td>
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<tr>
<td>01:24</td>
<td>MAX Q</td>
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<td>MCC: REPORT MARK MODE IC</td>
<td>ALTITUDE 100,000 ft</td>
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<td>02:16</td>
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<td>CMP: REPORT TOWER JETT</td>
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<td></td>
<td>CDR: REPORT S/C GO/NO-GO</td>
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<td></td>
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<tr>
<td>TIME</td>
<td>EVENT</td>
<td>REMARKS</td>
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<td>03:23</td>
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<td>03:53</td>
<td>MCC: REPORT TRAJECTORY GO/NO-GO</td>
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<td>04:00</td>
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<tr>
<td>05:00</td>
<td>LMP: REPORT S/C GO/NO-GO</td>
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<tr>
<td>05:25</td>
<td>MCC: REPORT S-IVB TO COI CAPABILITY</td>
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<tr>
<td>06:00</td>
<td>CDR: REPORT S/C GO/NO-GO</td>
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<tr>
<td>06:25</td>
<td>MCC: REPORT S/C GO/NO-GO</td>
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<tr>
<td></td>
<td>MCC: REPORT TIME OF LEVEL SENSE ARM AND S-II CUTOFF</td>
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<tr>
<td>07:00</td>
<td>CDR: REPORT S/C GO/NO-GO</td>
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<td>08:00</td>
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<td>MCC &amp; CDR: REPORT S/C GO/NO-GO FOR STAGING</td>
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<td>MCC: REPORT MARK MODE IV</td>
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<td>CDR: REPORT S-II CUTOFF</td>
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<td>MCC: REPORT PREDICTED SECO</td>
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<td>11:00</td>
<td>CDR: REPORT S/C GO/NO-GO</td>
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<td>11:29</td>
<td>CDR: REPORT SECO TB₅ = 0 S-IVB MAINTAINS COMMANDED CUTOFF INERTIAL ATTITUDE</td>
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<tr>
<td>SECO +10 SEC</td>
<td>MCC: REPORT ORBITAL GO/NO-GO</td>
<td>INSERTION</td>
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<tr>
<td>SECO +20 SEC</td>
<td>S-IVB MANEUVERS TO LH AND INITIATES ORB RATE (HEADS DOWN)</td>
<td></td>
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<tr>
<td>SECO +59 SEC</td>
<td>S-IVB INITIATES CONTINUOUS LH₂ VENTING (TERMINATES AT TB₆ + 42.2 SEC GET = 2:38:24)</td>
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<tr>
<td></td>
<td>V66-TRANSFER CSM STATE VECTOR TO LM SLOT</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>V45-RESET LUNAR SURFACE FLAG</td>
<td></td>
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</tr>
<tr>
<td>12:50</td>
<td>BDA LOS</td>
<td>INSERTION CHECKLIST</td>
<td></td>
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<tr>
<td>16:04</td>
<td>VAN LOS</td>
<td></td>
<td></td>
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<tr>
<td>16:37</td>
<td>CYI AOS</td>
<td>MCC UPDATE: Z TORQUING ANGLE</td>
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<tr>
<td>23:44</td>
<td>CYI LOS SYSTEM MONITORING &amp; CHECKING POST INSERTION ECS CONFIGURATION</td>
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</table>

MISSION APOLLO 12 EDITION FINAL (NOV 14) DATE OCTOBER 15, 1969 PAGE 3-iii
### FLIGHT PLAN

<table>
<thead>
<tr>
<th>TIME</th>
<th>EVENT</th>
<th>REMARKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>31:31</td>
<td>CONFIGURE CAMERA FOR T&amp;D AND S-IVB PHOTO</td>
<td>LMP HOLDS CAMERA</td>
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<tr>
<td></td>
<td>[CM2/DAC/18/CEX-BRKT, MIR (f8,250,7) 6fps, 0.3]</td>
<td></td>
</tr>
<tr>
<td></td>
<td>MAG (5 MIN)</td>
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</tr>
<tr>
<td></td>
<td>[CM2/EL/80/CEX (f8,250,30) 10]</td>
<td></td>
</tr>
<tr>
<td>52:20</td>
<td>UNSTOW TVカメラ</td>
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<tr>
<td></td>
<td>PRE-TLI SYSTEM VERIFICATION AND MONITORING</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CDR INSTALL COAS</td>
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<tr>
<td></td>
<td>CMP JETTISON OPTICS COVERS</td>
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<tr>
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<td>P52 IMU REALIGN</td>
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<tr>
<td></td>
<td>Option 3-REFSMMAT</td>
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<tr>
<td></td>
<td>REPORT GYRO TORQUING ANGLES</td>
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</tr>
<tr>
<td>58:11</td>
<td>CRO AOS</td>
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<tr>
<td></td>
<td>DUMP DSE</td>
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<td>GDC ALIGN TO IMU</td>
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</table>

**MISSION** APOLLO 12  **EDITION** FINAL (NOV 14)  **DATE** OCTOBER 15, 1969  **PAGE** 3-iv

**MSC FORM 2114C (JUL 67)**
FLIGHT PLAN

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 - REFSSMAT)
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 MNTRS TO LH AND INITIALIZES ORB RATE (HEADS DOWN)

COOLANT CONTROL ATTENUATION PANEL NOT OPENED

P52 (PAD ORIENT)
N71: ------------
N05: ------------
N92: ------------
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-N
1022 CST

UPDATE TO CSM Z TORQUING ANGLE

DUMP DSE
### FLIGHT PLAN

**01:00**
- SM RCS HOT FIRE
  - (MIN IMPULSE - ALL JETS)
  - GO/NO GO FOR PYRO ARM (CUE MSFN)
  - LOGIC-On
  - BEGIN TLI PREP

**01:28**
- UPLINK TO CSM
  - STATE VECTOR & V66

**01:30**
- DUMP DSE

**01:30**
- UPDATING TO CSM
  - TLI PAD
  - TLI +90 MIN
  - ABORT PAD
  - P37 (L/0+8) PAD

**02:00**
- GO/NO-GO FOR PYRO ARM

**02:00**
- EMS AV TEST

---

### MISCELLANEOUS

#### MISSION
- **APOLLO 12**

#### EDITION
- **FINAL (Nov 14)**

#### DATE
- **OCTOBER 15, 1969**

#### TIME
- **01:00 - 02:00**

#### DAY/REV
- **1/1-2**

#### PAGE
- **3-2**

---

**NOTES**

As a general rule, MSFN will always uplink the state vector to the CSM slot and transfer it via V66 to the LM slot in order to have redundant state vectors on board.
**FLIGHT PLAN**

**TLI**

**BURN TABLE**

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
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</thead>
<tbody>
<tr>
<td>10°/SEC SHUTDOWN</td>
<td>+45° SHUTDOWN</td>
<td>BT + 6 SEC &amp; $V_1 = \text{PAD VALUE}$</td>
<td>NO TRIM</td>
</tr>
</tbody>
</table>

**TABLE 3-1**

3-3
FLIGHT PLAN

02:00
PYRO ARM

GDC ALIGN TO IMU

SET ORDEAL

02:30
GO/NO GO FOR TLI

TB-6 (02:37:41.8)

P47 - THRUST MONITOR

TIG: 02:47:19.8
BT: 5:45.0
ΔV: 10,510 FPS

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

03:00
POO - CMC IDLING
VL66 - TRANS CSM SV TO LM SLOT
TLI BURN STATUS REPORT
CDR - TRANS TO CENTER COUCH, CMP - LEFT COUCH
LMP - RIGHT COUCH

---

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

MSC Form 29 (May 69) FLIGHT PLANNING BRANCH
FLIGHT PLAN

03:00

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

CSM SEP PREPARATION

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 LP
LEAVE TUNNEL EQUALIZATION VALVE CLOSED
CYCLE O₂ & H₂ FANS

03:15

GET: 03:33

03:30

03:00 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)
LOAD DOCKING GIMBAL ANGLES

CSM SEP PREPARATION

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 LP
LEAVE TUNNEL EQUALIZATION VALVE CLOSED
CYCLE O₂ & H₂ FANS

03:45

GET: 03:33

04:00

NOTES

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
FLIGHT PLAN

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)

GO/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 04:18

3 SEC

BATTERY CHARGE, BATTERY B
CONTINUE TO MONITOR S-IVB THROUGH WINDOW UNTIL COMPLETION OF SLINGSHOT MANEUVER

S-IVB SLINGSHOT MNVR GET = 04:46

S-IVB APS EVASIVE MNVR GET = 04:25

ΔV ≈ 9.6 FPS

S-IVB APS EVASIVE MNVR GET = 04:25

ΔV ≈ 9.6 FPS

SLINGSHOT ΔV = 68.7 FPS

NOTES

SPRING ACTUATOR
ΔV ≈ 0.8 FPS. 4 JET RCS -X TRANSLATION
0.4 FPS FOR A TOTAL
ΔV ≈ 1.2 FPS.
5 SEC AFTER EJECTION
THERE IS AN RCS -X
TRANSLATION FOR 3 SEC.

ΔV ≈ 0.8 FPS. 4 JET RCS -X TRANSLATION
0.4 FPS FOR A TOTAL
ΔV ≈ 1.2 FPS.
5 SEC AFTER EJECTION
THERE IS AN RCS -X
TRANSLATION FOR 3 SEC.

ΔV ≈ 0.8 FPS. 4 JET RCS -X TRANSLATION
0.4 FPS FOR A TOTAL
ΔV ≈ 1.2 FPS.
5 SEC AFTER EJECTION
THERE IS AN RCS -X
TRANSLATION FOR 3 SEC.

ΔV ≈ 0.8 FPS. 4 JET RCS -X TRANSLATION
0.4 FPS FOR A TOTAL
ΔV ≈ 1.2 FPS.
5 SEC AFTER EJECTION
THERE IS AN RCS -X
TRANSLATION FOR 3 SEC.

ΔV ≈ 0.8 FPS. 4 JET RCS -X TRANSLATION
0.4 FPS FOR A TOTAL
ΔV ≈ 1.2 FPS.
5 SEC AFTER EJECTION
THERE IS AN RCS -X
TRANSLATION FOR 3 SEC.
1522 CST

05:00

DOFF & STOW PGA's

TRANSFER ITEMS OUT OF PGA POCKETS

05:30

P52 - IMU REALIGN
OPTION 1 - PREFERRED

REPORT GYRO TORQUING ANGLES

GDC ALIGN TO IMU

06:00

VHF A SIMPLEX - OFF

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
FLIGHT PLAN

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

POO
V49 - MNVR TO SIGHTING ATT
STAR/EARTH HORIZON
P23 - CISLUNAR NAVIGATION
LOAD W MATRIX (R1 + 0 0 0 0 0)(R2 + 0 0 0 0 0)
1. STAR 2 3 E N H (R3 = 0 0 1 1 0)

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)

NOTES

3 MARKS ON EACH STAR
INCORPORATE P23 MARK DATA AND UPDATE ONBOARD STATE VECTOR

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

1622 CST
FLIGHT PLAN

**MNVR TO PTC ATTITUDE**

- Establish PTC

**DEACTIVATE PRIMARY EVAPORATOR**

- Gly evap H2O flow - off
- 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

**L10H CANISTER CHANGE NO. 1**

(3 into A, stow 1 in B5)

### MISSION EDITION DATE TIME DAY/REV PAGE

| APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 07:00 - 09:00 | 1/TLC | 3-9 |

**NOTES**

Maneuver to PTC attitude disable two adjacent quads null rates in +.5°/db for 20 minutes, widen dead band to +30°, enable all jets and roll vehicle at 0.3°/sec, disable jets.
**FLIGHT PLAN**

- **09:00**
  - EAT PERIOD

- **10:00**
  - UPLINK TO CSM
  - VECTOR v66
  - MCC-1 TGT LOAD

- **11:00**
  - UPDATE TO CSM
  - MCC-1 MNVR PAD

**CONTINUE PTC IF MCC-1 IS NOT PERFORMED**

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

---

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

---

**NOTES**

- P52 (PTC ORIENT)
- N71: __ __ __
- N05: __ __ __
- N93: __ __ __ __
- X __ __ __
- Y __ __ __
- Z __ __ __
- GET __ __ __
## FLIGHT PLAN

### MCC-1
**BURN TABLE**

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>BT + 1 SEC</td>
<td>IF&lt;2FPS, TRIM X AXIS TO 0.2FPS IF&gt;2FPS, NO TRIM</td>
</tr>
</tbody>
</table>

**TABLE 3-2**

3-11
FLIGHT PLAN

2122 CST

11:00

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

MCC-H

11:47:19.8
ΔV: NOMINALLY ZERO

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

11:30 F SXT STAR CHECK
N BATTERY CHARGE, BATTERY A
O09 FUEL CELL PURGE
STE WATER DUMP
P40/P41 - SPS/RCS THRUST
GDC ALIGN TO IMU

* ITEMS TO BE REPORTED IN MSFN

TIG: 11:47:19.8

MSC Form 29 (May 69) FLIGHT PLANNING BRANCH

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 11:00 - 12:00 | 1/TLC | 3-12
REPORT: LM/CM ΔP
WASTE STOWAGE VENT VLV - CLOSE
VENT BATTs UNTIL SYSTEM TEST METER (4A) = 0

MNVR TO PTC ATT P 90

PTC
P 90 Y 0

UPDATE TO CSM
P37 PADS (L/0 + 25, 35, 45 & 60)

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

FLIGHT PLANNING BRANCH

MCC-H 2222 CST

12:00

:30

MSF

13:00

:30

PTC P 90 Y 0

FLIGHT PLAN
## Flight Plan

### FLIGHT PLAN

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>14:00 - 15:00</td>
<td>1/TLC</td>
<td>3-14</td>
</tr>
</tbody>
</table>

**Notes:**
- P52 IMU REALIGN
- OPTION 3 REFSPM/2AT (OPTIONAL)

**Mission Edition Information:**
- MSC Form 29 (May 69)
- FLIGHT PLANNING BRANCH
**FLIGHT PLAN**

REPORT GYRO TORQUING ANGLES
GDC ALIGN TO IMU

MNVR TO OPTICS CALIBRATION ATT  R 204
P23 - CISLUNAR NAVIGATION     P 262
OPTICS CALIBRATION          Y  0

P23 - CISLUNAR NAVIGATION

V49 - MNVR TO SIGHTING ATT     R 145
STAR/EARTH HORIZON           P 293
P23 - CISLUNAR 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)

---

**NOTES**

3 MARKS EACH STAR

INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR
4. STAR 21E FH (R3 = 00120)

5. STAR 23EN H (R3 = 00100)

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

EAT PERIOD

PTC

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

L10H CANISTER CHANGE NO.2
(4 INTO B, STOW 2 IN B5)
FLIGHT PLAN

0422 CST

18:00

:30

19:00

M

S

F

N

REST PERIOD
(10 HOURS)

20:00

:30

NOTES

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

MISSION |
--- |
APOLLO 12 |

EDITION |
--- |
FINAL (NOV 14) |

DATE |
--- |
OCTOBER 15, 1969 |

TIME |
--- |
18:00 - 20:00 |

DAY/REV |
--- |
1/TLC |

PAGE |
--- |
3-18 |
FLIGHT PLAN

0622 CST

20:00

21:00

22:00

REST PERIOD (10 HOURS)

PTC

P 90 Y 0

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

- **0822 CST**
- 22:00
- 23:00
- 24:00

**REST PERIOD (10 HOURS)**

**PTC P 90 Y 0**

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

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
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<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>24:00 - 26:00</td>
<td>1/TLC</td>
<td>3-21</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

1222 CST

26:00

30:30

27:00

REST PERIOD
(10 HOURS)

28:00

MSC Form 29 (May 69)

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

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

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 28:00 - 29:00 | 2/TLC | 3-23
<table>
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<tr>
<th>G.E.T.</th>
<th>REMARKS</th>
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</tbody>
</table>
FLIGHT PLAN

1522 CST

29:00

EAT PERIOD

MSFN

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)

29:30

30:00

NOTES

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

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

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

ESC Form 29 (May 89)
FLIGHT PLANNING BRANCH
**FLIGHT PLAN**

**MCC-2**

**BURN TABLE**

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>8T + 1 SEC</td>
<td>IF&lt;2FPS, TRIM X AXIS TO 0.2FPS IF&gt;2FPS, NO TRIM</td>
</tr>
</tbody>
</table>

*TABLE 3-3*

3-25
FLIGHT PLAN

MCC-H

1622 CST

30:00

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

BURN STATUS REPORT

ΔTIG
BT

Vgx

TRIM

R

HGA

P

Y

S

30:30

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

TIG: 30:52:43.7
BT: 10.0SEC
ΔV: 68.8 FPS
ULLAGE - NONE

*ITEMS TO BE REPORTED TO MSFN

ATTITUDE FOR MCC-2
BURN IS CONSTRAINED IN ROLL FOR HGA
ACQUISITION FOR TV

AND BY SXT STAR CHECK

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

MSC Form 29 (May 69)  FLIGHT PLANNING BRANCH  NASA — MSC
FLIGHT PLAN

1722 CST

31:00

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

31:00

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

32:00

FOV 4°
GET 32:00

33:00

NOTES

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

HSC Form 20 (May 69)

FLIGHT PLANNING BRANCH
UPDATE TO CSM
LOI-1 MINUS 5 HR
ABORT PAD

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

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

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>35:00 - 37:00</td>
<td>2/TLC</td>
<td>3-29</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

2322 CST

37:00

38:00

39:00

PTC
P 90 Y 0

MISSIONEDITION
APOLLO 12 | FINAL (NOV 14)
OCTOBER 15, 1969
37:00 - 39:00
2/TLC
3-30
FLIGHT PLAN

0122 CST

39:00

REPORT LM/CM ΔP

40:00

H₂ PURGE LINE HTRS - ON

41:00

M F N

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

FLIGHT PLANNING BRANCH
FLIGHT PLAN

0322 CST

41:00

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

42:00

ONBOARD READOUT

43:00

UPLINK TO CSM
STATE VECTOR & V66

ONBOARD READOUT
BAT C
PYRO: BAT A
PYRO BAT B
RCS A
B
C
D

DC IND SEL - MNA OR B

PRESLEEP CHECKLIST:
- CREW STATUS REPORT (MED)
- CYCLE O2 & H2 FANS
- CHLORINATE POTABLE WATER
- VERIFY:
  - WASTE MNGT QVBD 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

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

FLIGHT PLANNING BRANCH
FLIGHT PLAN

0527 CST

43:00

MSFN

REST PERIOD (10 HOURS)

44:00

PTC

P 90 Y 0

45:00

NOTES

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

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>43:00 - 45:00</td>
<td>2/TLC</td>
<td>3-33</td>
</tr>
</tbody>
</table>

WSC Form 29 (May 69)

FLIGHT PLANNING BRANCH
FLIGHT PLAN

FS 0922 CST

47:00

:30

48:00

:30

49:00

REST PERIOD (10 HOURS)

PTC P 90 Y 0

MISSION EDITION DATE TIME DAY/REV PAGE

APOLLO 12 FINAL (NOV 14) OCTOBER 15, 1969 47:00 - 49:00 2/TLC 3-35
**FLIGHT PLAN**

**UPDATE TO CSM**

**CONSUMABLES**

**FLIGHT PLAN**

**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

**EAT PERIOD**

**L10H CANISTER CHANGE**
- NO. 5 (7 INTO A, STOW 5 IN B6)
- REPORT LM/CM AP

**CSM CONSUMABLES UPDATE**
- GET: _ _ _ _ _ _ _ _ _
- RCS TOTAL ______% 
- QUAD A ___% B ___%
- C ___% D ___%
- H2 TOTAL ______% 
- O2 TOTAL ______% 

**CREW STATUS REPORT**
- CDR CMP LMP
- SLEEP ______ ______ ______
- PRD ______ ______ ______

---

**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**

1522 CST
FLIGHT PLAN

PS2 IMU REALIGN
OPTION 3 REFISHMAT
(OPTIONAL)

REPORT GYRO TORQUING ANGLES

UPLINK TO CSM
ΔH (IF REQUIRED)

FOV 3°
GET 55:00

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

NOTES

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 | 55:00 - 57:00 | 3/TLC | 3-39
MCC-H

2122 CST

59:00

EAT PERIOD

P52 - IMU REALIGN
OPTION 3 - REFSMMAT

CONTINUE PTC IF MCC-3 IS NOT PERFORMED

UPDATE TO CSM
GO/NO-GO MCC-3
MCC-3 MNVR PAD

UPLINK TO CSM
STATE VECTOR & V66
MCC-3 TGT LOAD

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 | 59:00 - 61:00 | 3/TLC | 3-41
THIS PAGE INTENTIONALLY LEFT BLANK
**FLIGHT PLAN**

**MCC-3**
**BURN TABLE**

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>BT + 1 SEC</td>
<td>IF &lt;2FPS, TRIM X AXIS TO 0.2FPS. IF &gt;2FPS, NO TRIM</td>
</tr>
</tbody>
</table>

**TABLE 3-4**
3-42
FLIGHT PLAN

P30 - EXTERNAL ΔV

V49 - MNVR TO BURN ATT

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

GDC ALIGN TO IMU

MCC-3

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

MNVR TO PTC ATTITUDE

P 90

Y 0

START PTC

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

(LOI - 22 HRS)

2322 CST

61:00

203 1 15

M S F N

61:30

62:00

61:00

0.15

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

ΔV: NOMINALLY
ZERO

ΔV: 61:25:18.2

* ITEMS TO BE
REPORTED TO MSFN

MISSILE ANALYSIS

APOLLO 12 FINAL (NOV 14)

OCTOBER 15, 1969

61:00 - 62:00

3/TLC

3-43
0022 CST

FLIGHT PLAN

BATTERY CHARGE, BATTERY B

PRESSURIZE CSM TO 5.7 PSIA THEN:
PRESSURIZE LM

STOP PTC AT TV ATTITUDE
HGA: P ___ Y ___

TV(GDS) 63:30 to 64:20
CMA/TV - IN(f5.6)
**FLIGHT PLAN**

### CSM
- Clear Tunnel of CM Hatch
- Inspect Tunnel & Docking Latches
- Remove Probe & Drogue
- Temporarily stow probe & drogue

### CMP

### LMP
- Open LM Hatch
- Record and report roll call angle
- IVT to LM

### CDR
- IVT to LM
- Assist CDR

### LM
- Familiarization

---

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>64:00 - 65:00</td>
<td>3/TLC</td>
<td>3-45</td>
</tr>
</tbody>
</table>

**FLIGHT PLANNING BRANCH**
FLIGHT PLAN

66:00
CMP: INSTALL PROBE AND DROGUE
INSTALL CM HATCH
LM TUNNEL VENT VALVE - LM/CM ΔP

6:30
LiOH CANISTER CHANGE
NO. 6 (8 INTO B, STOW 6 IN B6)

67:00
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

68:00
EAT PERIOD

NOTES
ONBOARD READOUT
BAT C
PYRO BAT A
PYRO BAT B
RCS A
B
C
D
DC IND SEL - MN3 OR B

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

0622 CST

68:00

69:00

REST PERIOD
(8 HOURS)

69:00 |

70:00 |

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

MISSION: APOLLO 12
EDITION: FINAL (NOV 14)
DATE: OCTOBER 15, 1969
TIME: 68:00 - 70:00
DAY/REV: 3/TLC
PAGE: 3-48
REST PERIOD (8 HOURS)
1022 CST

FLIGHT PLAN

72:00

73:00

REST PERIOD (8 HOURS)

74:00

P 90 Y 0

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 72:00 - 74:00 | 3/TLC | 3-50
<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>74:00 - 76:00</td>
<td>3/TLC</td>
<td>3-51</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

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 ______%

LI0H 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

Notes:
- If MCC-4 is not performed, see:
- No MCC-4 Alternate Timeline

Mission: APOLLO 12
Edition: FINAL (NOV 14)
Date: OCTOBER 15, 1969
Time: 76:00 - 78:00
Day/Rev: A/TLC
Page: 3-52
# FLIGHT PLAN

## MCC-4

**BURN TABLE**

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>BT + 1 SEC</td>
<td>TRIM X AXIS ONLY TO 1.0 FPS</td>
</tr>
</tbody>
</table>

---

**TABLE 3-5**

3-53
**FLIGHT PLAN**

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

**MISSION** | **EDITION** | **DATE** | **TIME** | **DAY/REV** | **PAGE**
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 78:00 - 79:00 | 4/TLC | 3-54
1722 CST FLIGHT PLAN NOTES

79:00

79:30

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

80:00
FLIGHT PLAN

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

LM TUNNEL VENT VLV - CM/LM ΔP
**FLIGHT PLAN**

**MNVR TO MOON VIEW ATT BY 81:10 AND GO INERTIAL**

**MNVR TO BURN ATT BY 81:55**

**REPORT GYRO TORQUING ANGLES**

**TV (GDS) 81:30 TO 81:50 CM4/TV-IN (F22)**

**P52 - IMU REALIGN**

**OPTION 3 - REF SMS MAT**

**ASSUME NO LOI-2**

**NOTES**

- P52 (LDG SITE ORIENT)
- N71: __________
- N05: __________
- N93: __________
  - X: ____________
  - Y: ____________
  - Z: ____________
- GET: ____________

**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
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 LOI_{1} burn.
FLIGHT PLAN

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

REST PERIOD (10 HOURS)

PTC P 90, Y 0

NOTES

MSC Form 29 (May 69)
FLIGHT PLANNING BRANCH
(NOMCC-4)

NASA — MSC
**FLIGHT PLAN**

**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 __

**NOTES**
- P52 (PTC ORIENT) OPTION 3 - REFSSMAT
- N71: __ __ __
- N05: __ __ __
- N93: __ __ __
- X __ __ __
- Y __ __ __
- Z __ __ __
- GET __ __ __

**UPLINK TO CSM**
- STATE VECTOR & V66

**UPDATE TO CSM**
- CONSUMABLES
- FLIGHT PLAN
- PERICYNTHION +2

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

**NO MCC-4**
FLIGHT PLAN

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

PRESSURIZE CSM TO 54 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

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>80:00 - 81:00</td>
<td>4/TLC</td>
<td>6-8</td>
</tr>
</tbody>
</table>
**FLIGHT PLAN**

**81:00**
- MNVR TO MOON VIEW ATT BY 81:10
- AND GO INERTIAL R 300 HGA
- P 154 P 4
- Y 20 Y 207

**81:15**
- PS2 - IMU REALIGN
- OPTION 1 - PREFERRED
- REPORT GYRO TORQUING ANGLES

**81:30**
- TV (GDS) 81:30 TO 81:50

**81:45**
- MNVR TO BURN ATT BY 81:55
- EXCEPT FOR ROLL R 124 HGA
- P 261 P -18
- Y 19 Y 251
FLIGHT PLAN

MAP UPDATE REV
LOS
180°
AOS WITH LOI
AOS WITHOUT LOI

UPDATE TO CSM
MAP UPDATE REV 1
LOI-1 MNVR PAD
UPLINK TO CSM
STATE VECTOR & V66
LOI-1 TGT LOAD

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**

<table>
<thead>
<tr>
<th>POR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>BT + 10 SEC</td>
<td>DO NOT TRIM</td>
</tr>
</tbody>
</table>

#### LOI-1 ABORT TABLE

**TABLE 3-7**

<table>
<thead>
<tr>
<th>MODE I (DPS ONLY)</th>
<th>MODE IA (DPS+APS)</th>
<th>MODE IIA (DPS APS)</th>
<th>MODE II (DPS ONLY)</th>
<th>MODE III (DPS ONLY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-20 SEC. BT</td>
<td>20-40 SEC. BT</td>
<td>40SEC-1MIN 30SEC</td>
<td>2MIN 24SEC - 2MIN 50SEC</td>
<td>2MIN 50SEC - END OF BURN</td>
</tr>
<tr>
<td>ΔVm 0-135 (Tight)</td>
<td>ΔVm 135-560 (Tight)</td>
<td>ΔVm 200-650 (Tight)</td>
<td>ΔVm 650-750 (Loose)</td>
<td>ΔVm 1600-1600 (Loose)</td>
</tr>
<tr>
<td>LOI + 2HR.</td>
<td>LOI + 0.5HR.</td>
<td>DPS 3 LOI+1/2HR.</td>
<td>DPS 1 @ LOI + 2HR DPS 2 @ LOI + 1REV</td>
<td>DPS 1 @ LOI + 2HR</td>
</tr>
<tr>
<td>MCC-H TGT</td>
<td>CREW CHART TGT</td>
<td>CREW CHART TGT</td>
<td>MCC-H TGT</td>
<td>MCC-H TGT</td>
</tr>
<tr>
<td>*APS @ LOI+ 2 1/2 HR. MCC-H TGT</td>
<td>*SPS BACKUP</td>
<td>APS ASAP AFTER DPS 2 MCC-H TGT (CONT. OF DPS 2)</td>
<td>MCC-H TGT</td>
<td>MCC-H TGT</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

UPDATE TO CSM
GO/NO-GO LOI-1

ROLL TO BURN ATT R 4 OMNI D
P 261

SXT STAR CHECK Y 19
VERIFY DSE MOTION AT LOS

GDC ALIGN TO IMU

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

ACQUIRE MSFN Y 0 Y 339

LOI-1 BURN STATUS REPORT
LUNAR SURFACE OBSERVATION ATTITUDE
(HATCH WINDOW) - HEADS DOWN
GO ORB RATE BY 84:00

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

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

STOP ORB RATE PITCH AT 231 AND GO INERTIAL P 231 P -38
BY 84:27

**NOTES**

**MISSION**

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
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</thead>
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<td>Apollo 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>84:00 - 85:00</td>
<td>4/1</td>
<td>3-61</td>
</tr>
</tbody>
</table>

MSC Form 29 OT (Mar. 69)
BEGIN REV 2
(180,NA/231,0)
IATTH

MNVR TO LOI-2
BURN ATT
(0,NA/231,0)
IATTH

BEGIN IMU REALIGN
(180,NA/231,0)
IATTH

LEGEND:

- MFSN ACS, LOS
- S/C SUNRISE, SUNSET
- SUBEARTH POINT

(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

3-61A

REV 2
H2 PURGE LINE HTS - ON
VERIFY DSE MOTION AT LOS
EAT PERIOD
H2 AND O2 FUEL CELL PURGE
WASTE WATER DUMP
REACQUIRE MSFN
HGA P-38 Y 189
**FLIGHT PLAN**

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>86:00 - 87:00</td>
<td>4/2</td>
<td>3-63</td>
</tr>
</tbody>
</table>

**UPLINK TO CSM**
- CSM STATE VECTOR & V66
- LOI-2 TARGET LOAD

**UPDATE TO CSM**
- LOI-2 MNVR PAD
- TEI 5 PAD
- MAP UPDATE REV 3

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

**MAP UPDATE REV 3**

**Crew - Pre LOI-2 Systems Checks**
- C&W CHECK
- CM RCS CHECK
- SPS PERIODIC MONITOR CHECK
- ECS PERIODIC MONITOR CHECK

**P52 (LDG SITE ORIENT)**
- N71: ___
- N05: ___
- N93: ___
- X: ___
- Y: ___
- Z: ___
- GET: ___

**Notes**
**FLIGHT PLAN**

LOI-2
BURN TABLE

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>BT + 1 SEC</td>
<td>TRIM X AXIS TO 1 FPS</td>
</tr>
</tbody>
</table>

**TABLE 3-8**
3-64
87:44:10
LOI-2 BURN IGN
(0,NA/231,0)
IATTH

87:39:31
BEGIN REV 3
(0,NA,231,0)
IATTH

BEGIN IMU REALIGN
(180,NA/269,0)
IATTH

MNVR FOR COMM
(180,NA/269,0)
IATTH

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

REV 3

3-64A
FLIGHT PLAN

PIPA BIAS CHECK

GO/NO GO FOR LOI-2

0122 CST

87:00

87:30

88:00

MISSON EDITION DATE TIME DAY/REV PAGE

APOLLO 12 FINAL (NOV 14) OCTOBER 15, 1969 87:00 - 88:00 4/2-3 3-65
**FLIGHT PLAN**

MNVR TO COMM ATTITUDE AND GO INERTIAL R 180° HGA BY 88:00

Y 0 Y 206

BATTERY CHARGE, BATTERY B

LOI - 2 BURN STATUS REPORT

EQUALIZE CM/LM PRESSURE TUNNEL VENT VALVE - LM PRESS

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

**BURN STATUS REPORT**

- ΔTIG
- BT
- V_gx
- TRIM
- R
- P
- Y
- V_gx
- V_gy
- V_gz
- ΔV
- FUEL
- OX
- 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
THIS PAGE INTENTIONALLY LEFT BLANK
89:37:41
BEGIN REV 4
(180,NA/269,0)
IATTH

ROLL 180 DEG TO
DMK TRKNG ATT
(0,NA/269,0)
IATTH

END PITCH RATE;
ROLL TO SLEEP ATT
(126,NA/291,0)
IATTH

BEGIN -0.3 DEG/SEC
PITCH RATE
(0,358/269,0)
IATTH

LEGEND:

- MSFN AOS, LOS
- S/C SUNRISE, SUNSET
- SUBEARTH POINT
(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

3-66A

REVISION B
FLIGHT PLAN

CSM

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

LM

CDR

LM

LMP

COR 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

IVT TO LM

OPEN LM HATCH
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

IVT TO LM

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.

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

HORIZON

LANDMARK

RADIUS OF MOON

CENTER OF MOON

FIGURE 3-1

3-68

ΔT₁ = 300 SEC
ΔT₂ = 40 SEC
ΔT₃ = 25 SEC
ΔT₄ = 25 SEC

AOS to LOS = 3 MIN
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

LM

CDR

AID LMP AS REQUIRED

LMP

TRANSFER TO LMP POWER

COMM ACTIVATION

S-BAND/VHF SIMPLEX
VOICE & TM TEST

REPORT OPS SOURCE
PRESSURE

MCC-H

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**

- $\theta_s = 150^\circ$
- $\phi_s = 262^\circ$
- $DB = \pm 10^\circ$

The smallest angle between the spacecraft X body axis and the sun line of sight.

The angle which is measured from the minus Z spacecraft body axis positively about the X body axis to the sun line of sight vector projection in the Y-Z axis plane.
**FLIGHT PLAN**

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
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</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>93:00-95:00</td>
<td>4/5-6</td>
<td>3-73</td>
</tr>
</tbody>
</table>

**Notes**
- REST PERIOD (8.5 HOURS)
- DUMP DSE

**Diagram**
- MCC-11
- 0722 CST
- 93:00
- 94:00
- 95:00
- REST ATT
- REV 6
- WSC Form 29 (May 69)
- FLIGHT PLANNING BRANCH
FLIGHT PLAN

MCC-N

1122 CST

FLIGHT PLAN

97:00

:10

REV 8

:30

:32

:38

:52

98:00

REST PERIOD
(8.5 HOURS)

99:00

DUMP DSE

98:00 (8.5 HOURS) ATT

99:00 | [MISSION]EDITION[—SdDATE~—sd|—Ss=Ss*~SC*STME

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

(Revised Form 29 (May 69) FLIGHT PLANNING BRANCH)
101:27:19
BEGIN REV 10
(126, NA/291, 0)
IATTH

BEGIN IMU REALIGN
(240, NA/270, 0)

MNVR FOR LM
S-BD ANT COMM
(240, NA/270, 0)
IATTH

LEGEND:

☐ MSFN AOS, LOS

○ ○ S/C SUNRISE, SUNSET

⊕ SUBEARTH POINT

(R, LHP/INP, Y)

IATTH - INERTIAL ATTITUDE HOLD

LATTH - LOCAL ATTITUDE HOLD

REVISION B
FLIGHT PLAN

VERIFY DSE MOTION AT LOS

WASTE WATER DUMP
O2 FUEL CELL PURGE
EAT PERIOD

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

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

CREW STATUS REPORT
CDR CMP LMP
SLEEP ___ ___ ___
PRD ___ ___ ___

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

1622 CST

102:00

EAT PERIOD

CMP

CDR

LMP

MCC-H

EAT PERIOD

EAT PERIOD

EAT PERIOD

L10H CANISTER CHANGE
NO. 9-11 INTO A, STOW 9 IN A3

TARGET OF OPPORTUNITY
PHOTOS OF FRA MAURO
OUT RT-HAND SIDE WINDOW
CM4/EL/80/BW
(f2.8,250,INF)IO
T1
T2

MINVR TO COMM ATT BY 102:50
FOR STEERABLE ANTENNA
R240, P270, Y 0
HGA: P-35, Y17

DON LCG

DON LCG

C5M
UPDATE TO CSM
TEI 34 PAD
MAP UPDATE REV 11
CSM DAP PAD
COMM ATT &
HGA ’s (102:50)
UPLINK TO CSM
STATE VECTOR &V66
DESIRED ORIENT
(LDG SITE)

MAP UPDATE REV 11
LOS :
180° :
AOS :

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

WSC Form 8450 (Jan 69)
FLIGHT PLANNING BRANCH
FLIGHT PLAN

103:00

CMP

P52 - IMU REALIGN
OPTION 1 - (PREFERRED)

DON PGA
W/O HELMET & GLOVES

EQUALIZE CM/LM PRESSURE

OPEN & STOW CM HATCH
REMOVE & STOW PROBE & DROGUE
CHECK LATCHES
REACQUIRE MSFN
HGA: P-35, Y117
REPORT DOCKING TUNNEL INDEX ANGLE

LMP

VERIFY DSE MOTION AT LOS

DON PGA W/O HELMET & GLOVES

CDR

104:00

MCC-H

MAP UPDATE REV 12

VERIFIED DOCKING TUNNEL INDEX ANGLE

VERIFIED DOCKING TUNNEL INDEX ANGLE

OPEN LM HATCH
IVT TO LM

DON PGA W/O HELMET & GLOVES

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

MCC Form 9450 (Jan 89)
FLIGHT PLAN

CDR

DON PGA
W/O HELMET & GLOVES

LMP

TRANSFER TO LM POWER
LM FAMILIARIZATION & HOUSEKEEPING (IF NECESSARY)

MCC-H

UPDATE TO CSN
P22 LDMK TRACKING PAD

1822 CST
104:00

CMP

CSM POWER TO LM
OFF AT LMP'S REQUEST

CDR

DISCONNECT & STOW
LM POWER UMBILICAL

LMP

TRANSFER TO LM POWER
LM FAMILIARIZATION & HOUSEKEEPING (IF NECESSARY)

MCC-H

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

104:39

CONFIGURE CAMERAS FOR UNDOCKING
CM2/DAC/18/CEX-BRKT-MIR
(f8,250,7) 6fps, 16 MIN
CM4/Tv-IN BRKT (F22)
CM2/EL/80/CEX
(f8,250,50 ) 10
INHIBIT B3664-5 CSM THRUSTERS

105:00

LM CLOCK SYNC: VO6N65
T EPHEM: VO5NOTE 1706E
LM VHF CHECKOUT:
VHF AM(B)-SIMPLEX
VHF RCV ONLY-B DATA
VHF AM(B)-OFF
VHF AM(A)-SIMPLEX
VO6N20E
(ON CDR'S MARK)
MIN DB FOR LM ALIGN
VERIFY DSE MOTION AT LOS
RECORD LM PCM DATA

CDR

IVT TO LM
TRANSFER HELMET & GLOVES

LMP

IVT TO CM

MCC-H

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

105:49

ECS ACTIVATION & C/O
CONNECT TO LM ECS

105:59

PGNCS TURN-ON & SELF TEST
LGC/CMC CLOCK SYNC
T EPHEM UPDATE
E MEMORY DUMP

DON PGA

DON PGA

DON PGA

STEERABLE ANT \('s

DON PGA

DON PGA

DON PGA

STEERABLE ANT \('s

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

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DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA

DON PGA
THIS PAGE INTENTIONALLY LEFT BLANK
EN0 PITCH RATE; MNVR TO AGS CALIBRATION ATT (8,NA/158,23) IATTH

105:23:52
BEGIN REV 12
(240,NA/270,0) IATTH

END PITCH RATE; MNVR TO AGS CALIBRATION ATT (8,NA/158,23) IATTH

BEGIN -0.3 DEG/SEC PITCH RATE (0,358/270,0)

ROLL 120 DEG TO LDMK TRKNG ATT (0,NA/270,0) LEGEND:
IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

3-80A

REV 12

REVISION B

LEGEND:
- MSFN AOS, LOS
- S/C SUNRISE, SUNSET
- SUBEARTH POINT
(R,LHP/INP,Y)

(240,NA/270,0)
FLIGHT PLAN

**CSM**

- DON HELMET & GLOVES
- PGA PRESSURE INTEGRITY CHECK

**LM**

- DON PGA IN CSM
- TRANSFER HELMET & GLOVES
- CONNECT TO LM ECS & COMM
- ASCENT BATTERY ACTIVATION AND C/O
- RECORD ED BAT VOLTS
- AGS ACT & SELF TEST
- CLOSE AND SECURE HATCH
- STEERABLE ANTENNA: P 68, Y 19
- DUMP DSE
- UPLINK TO CSM
- CSM STATE VECTOR & V66 UPDATE TO LM
- DAP DATA
- BIOMED SW - LEFT
- V47-AGS INITIALIZATION

**MCC-H**

- 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

**Mission**

- Apollo 12

**Edition**

- Final (Nov 14)

**Date**

- October 15, 1969

**Time**

- 105:00 - 106:00

**Day/Rev**

- 5/11-12

**Page**

- 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

HORIZON

LANDMARK

RADIUS OF MOON

CENTER OF MOON

FIGURE 3-1

3-82
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<td>106:00 - 107:00</td>
<td>5/12</td>
<td>3-83</td>
</tr>
</tbody>
</table>

**FLIGHT PLAN**

<table>
<thead>
<tr>
<th>CSM</th>
<th>2022 CST</th>
<th></th>
<th>LM</th>
<th>LMP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CDR</strong></td>
<td></td>
<td></td>
<td><strong>LM</strong></td>
<td><strong>LMP</strong></td>
</tr>
<tr>
<td><strong>DAP SET - GIMBAL &amp; THROTTLE TEST</strong></td>
<td></td>
<td></td>
<td><strong>LOAD AGS PAD</strong></td>
<td></td>
</tr>
<tr>
<td><strong>LOAD DAP - 32022</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>DATE</strong></td>
<td><strong>TIME</strong></td>
<td><strong>PAYLOAD</strong></td>
<td><strong>PAYLOAD</strong></td>
<td></td>
</tr>
<tr>
<td>106:00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>RATE GYRO</strong></td>
<td><strong>SLEW STEERABLE ANT:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>TEST</strong></td>
<td><strong>P 104, Y 01</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>V06N20 ON MARK</strong></td>
<td><strong>FOR AGS CAL PITCH ATT</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>RCS PRESSURIZATION</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>UPDATE TO CSM</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td><strong>MAP UPDATE REV 13</strong></td>
<td></td>
</tr>
<tr>
<td><strong>RCS CHECKOUT</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>RCS PRESSURIZATION</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**MCC-H**

- UPLINK TO LM
- LS REF SMMAT
- 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)
- MAP UPDATE TO CSM
- UNDERWAY

**CSM**

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

**LM**

- VO6N20E
- VERIFY DSE MOTION
- P22-ORBITAL NAVIGATION
- ESTABLISH 0.3°/SEC
- PITCH RATE AT LDMK AOS

**LMP**

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

- STOP AGS CAL PITCH @ 158
- BY 106:35 HGA: P-47, Y168
- V06 N20E
- MNVR TO AGS CAL ATT BY 106:45
- 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

**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**
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 TRANSONDER 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) 107:30 - 108:30
GO/NO-GO
LOAD DAP-CSM ONLY
RI=11102, R2=11111
S/C CONTROL - CMC

SOFUNDOCK
S/C CONTROL - CMC
STATION KEEP @ 40'
RE-ENABLE B3&G JETS

RR ACT & SELF TEST
DON HELMET & GLOVES
ARS/PGA PRESS INTEGRITY CHECK
CABIN REGULATOR CHECK
CABIN REGULATOR CHECK
DPS PRESS & C/O
V47-AGS UPDATE & ALIGN
GO/NO-GO
PREPARE FOR UNDOCKING
P47-THRUST MONITOR
SOFT UNDOCK 107:54:22

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

missions
EDITIONS
DATE
TIME
DAY/REV
PAGE
APOLLO 12 FINAL (NOV 14) OCTOBER 15, 1969 107:00 - 108:00 5/12-13 3-84
**FLIGHT PLAN**

**CSM**
- CMP
- SEQ CAMERA - OFF

**LM**
- CDR
- V83 - SET ORDEAL
- LR ACTIVATION & SELF TEST
- BIOMED SW - RIGHT

**LMP**
- OFFLINE

**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 Y's

**CSM SEPARATION**
- TIG: 108:24:22
- BT: 15.8 SEC
- ΔV: 2.5 fps
- +Z THRUSTERS
- ORBIT: 63.6x55.1

**P30/P41**
- CSM SEPARATION
- TIG: 108:24:22
- BT: 15.8 SEC
- ΔV: 2.5 fps
- +Z THRUSTERS
- ORBIT: 63.6x55.1

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

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

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

**MAP UPDATE REV 14**
- LOS : — — — — — —
- 180° : — — — — — —
- AOS : — — — — — —

**P52-IMU REALIGN**
- OPT3-REFMMAT
- (LDG SITE ORIENT)

**VHF A-SIMPLEX/DATA**
- VERIFY DSE MOTION AT LOS

**UPLINK TO CSM**
- MAP UPDATE REV 14

**MISSION**
- APOLLO 12

**EDITION**
- FINAL (NOV 14)

**DATE**
- OCTOBER 15, 1969

**TIME**
- 108:00 - 109:00

**DAY/REV**
- 5/13

**PAGE**
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<td>3-86</td>
</tr>
</tbody>
</table>

**Flight Plan**

- **CSM**
  - 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
  - MAP UPDATE REV 15

- **LM**
  - CDR
    - SYSTEMS CHECKS
    - P40-DPS THRUST MNVR TO BURN ATT R ᵃ, P ᵃ, Y ᵃ
  - LMP
    - SYSTEMS CHECKS
    - V47-AGS UPDATE & ALIGN

- **Crew**
  - TIG: 109:23:00
  - BT: 28.2 SEC
  - ΔV: 72.1 FPS
  - ULL: 2 JETS, 7.5 SEC
  - ORBIT: 59.3 × 8.3

- **Actions**
  - RR-ON
  - P20-MAN LOCK-ON
  - V63-COMPARE RR & CSM VHF RANGE
  - RR-OFF
  - P30-EXT ΔV LOAD PDI+12 ABORT
  - MINVR TO PDI ATT BY 109:38 R ᵃ, P ᵃ, Y ᵃ
  - VERIFY COMM
  - DOI POST BURN REPORT
  - COAS TO OVHD WINDOW
  - P63-CHECK TIG
  - RR-ON
  - P20-MODE II LOCK-ON

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

- **Map Update**
  - BIOMED SW-LEFT
  - UPDATE TO CSM
  - MAP UPDATE REV 15

- **FLIGHT PLANNING BRANCH**
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>111:00</td>
<td><strong>CDR</strong> Install Window Shades</td>
</tr>
<tr>
<td></td>
<td>P57 - IMU Align</td>
</tr>
<tr>
<td></td>
<td>OPT 3 - REFSSMAT</td>
</tr>
<tr>
<td></td>
<td>A/T 2 - Two Celestial Bodies</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Terminate AGS</td>
</tr>
<tr>
<td></td>
<td><strong>LMP</strong> GYRO Calibration</td>
</tr>
<tr>
<td></td>
<td>P57 - OBSERVE THRU AOT</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Stow Window Shades</td>
</tr>
<tr>
<td></td>
<td><strong>LMP</strong> Align AGS TO PGMC</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Configure for Partial Power Down</td>
</tr>
<tr>
<td></td>
<td><strong>LMP</strong> Describe &amp; Photograph Lunar Surface</td>
</tr>
<tr>
<td></td>
<td>Report features seen during descent and determine LM location with MSFN</td>
</tr>
<tr>
<td></td>
<td>Dump DSE</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Update to CSM</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Update to CSM</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Update to LM</td>
</tr>
<tr>
<td></td>
<td><strong>LM</strong> Update to LM</td>
</tr>
<tr>
<td>112:00</td>
<td>EAT Period</td>
</tr>
</tbody>
</table>

**Mission Information**

<table>
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<td>5/14-15</td>
<td>3-88</td>
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</tbody>
</table>

**Flight Planning Branch**

FIGHT PLANNING BRANCH
111:18:39
BEGIN REV 15
(0,NA/79,0)
IATTH

END ORBRATE, 
ROLL 180 DEG 
FOR COMM 
(180,338/232,0) 
IATTH

MINVR TO LDWK 
TRKNG ATT 
(0,338/328,0) 
LATTH

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

REV 15
CSM LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM LOCAL HORIZONTAL ORBITAL RATE THROUGHOUT TRACKING

\[
\begin{align*}
Y &= a \\
T_1 &= 300 \text{ SEC} \\
T_2 &= 40 \text{ SEC} \\
T_3 &= 25 \text{ SEC} \\
T_4 &= 25 \text{ SEC} \\
T_5 &= 25 \text{ SEC} \\
T_6 &= 25 \text{ SEC} \\
T_7 &= 340 \text{ SEC} \\
\text{AOS TO LOS} &= 146 \text{ SEC} \\
\text{AOS TO FINAL MARK} &= 140 \text{ SEC}
\end{align*}
\]

FIGURE 3-3

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

RADIUS OF MOON

CENTER OF MOON

LAT - 3.437°
LONG/2 - 11.614°
ALT - 1.37 NM

P22 AUTO ACQ P dn 22° R0° Y0°
T1 _____ _____ _____ 193
T2 _____ _____ _____
R _____ °p _____ °y _____
N or S NM _____ SA _____ TA _____
CP N89
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

0222 CST

112:00

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

FLIGHT PLAN

CDR

LM

LMP

EAT PERIOD

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

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 PLANNING BRANCH

MCC-H

FLIGHT PLANNING BRANCH

MCC-H
FLIGHT PLAN

CSM

CMP

0322 CST

113:00

0322 CST

113:00

CDR

LM

LMP

MCC-H

CABIN PREP FOR EVA (CONT)

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

-1:10

-1:20

-1:00

-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

EAT PERIOD

REACQUIRE MSFN

HGA P -23, Y 189

MAP UPDATE REV 17

LOS:

180°W:

AOS:

113:00

114:00

FINAL SYSTEMS PREP

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

MSC Form 1674 (OT)(June 69)

FLIGHT PLAN

MISSION ING BRANCH
BEGIN REV 16
(180,NA/232,0)
IATTH

ROLL 180 DEG
FOR COMM
(180,NA/233,0)
IATTH

END ORBRATE,
ROLL 180 DEG
FOR COMM
(180,NA/233,0)
IATTH

MNVR TO LDMK
(LM)TRKNG ATT
(0,0/NA,0)
LATTH

LEGEND:

☐ XSFK AOS, LOS
○ S/C SUNRISE, SUNSET
⊕ SUBEARTH POINT
(R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

REV 16
3-91A
CSM

MNV 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

LM

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

LMP
VERIFY CB & VALVE CONFIGURATION
PRESSURE INTEGRITY CHECK
PLSS O2 ON
CABIN DEPRESS
CONFIRM "GO" FOR EVA
DEPRESS CABIN TO 3.5 PSIA
SET CHT & CHRONOMETER
FWD DUMP VALVE - OPEN
OPEN FWD HATCH

FLIGHT PLAN

0422 CST
114:00
114:30
115:00

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

MSC Form 1674 (07)(June 69)

FLIGHT PLANNING BRANCH
**FLIGHT PLAN**

<table>
<thead>
<tr>
<th>CSM</th>
<th>06:22 CST 116:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMP</td>
<td></td>
</tr>
</tbody>
</table>

- **CDR**
  - 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

- **LM**
  - Connect Pkg #2 to Carry Bar
  - AlSEP Traverse
  - Carry AlSEP Pkg's to Deployment Site
  - Rest enroute
  - AlSEP System Interconnect
  - Position Pkg's
  - 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

**MISSION**
- **APOLLO 12**
- **Edition**
- **DATE**
  - **October 15, 1969**
- **TIME**
  - **116:00 - 117:00**
- **DAY/REV**
  - **5/17**
- **PAGE**
  - **3-95**

**MCC-H**
- **1:30**
- **1:40**
- **1:50**
- **UPDATE TO CSM**
- **MAP UPDATE REV 18**

**LAUNCH**
- **1:30**
- **1:40**
- **1:50**
- **UPDATE TO CSM**
- **MAP UPDATE REV 18**
**FLIGHT PLAN**

**CSM**
- CMP
- EAT PERIOD

**LM**
- CDR
- LMP
- 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

**LM**
- 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)

**LM**
- 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

**LM**
- 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

**MISSION**
- APOLLO 12

**EDITION**
- FINAL (OCT 14)

**DATE**
- OCTOBER 15, 1969

**TIME**
- 118:00 - 119:00

**DAILY/REV**
- 5/18

**PAGE**
- 3-97

---

**MSC Form 1674 (OT) (June 69)**

**FLIGHT PLANNING BRANCH**

**REVISION B**
## FLIGHT PLAN

### CSM PLANE CHANGE #1

#### BURN TABLE

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>BT + 1 SEC</td>
<td>NO TRIM</td>
</tr>
</tbody>
</table>

Table 3-9

3-98

Revision B
MNVR TO P52 ATT BY 120:10
R 39, P 273, Y 0
HGA P 30, Y 245

MAP 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 A3
O₂ FUEL CELL PURGE
WASTE WATER DUMP

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 - DO VOICE BUS - BD PWR AMPL - OFF
CREW STATUS (RADIATION, MEDICATION)
CONFIGURE SLEEP STATIONS

REST PERIOD
9 HOURS

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
CSM

CMP

122 CST

122:00

CMF

MSFN

REST PERIOD

9 1/2 HOURS

LM

CDR

LMP

MCC-H

123:00

REST PERIOD

9 HOURS

124:00

REST PERIOD

9 HOURS

DUMP DSE

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

MSC Form 1674 (OT) (June 69)  FLIGHT PLANNING BRANCH
CSM

LM

MCC-H

CDR

LMP

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

CHANGE LM LION CARTRIDGE, LGC TO OPERATE TO
UPDATE LGC CLOCK THEN BACK TO STANDBY

UPDATE LM

UPDATE LM

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

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

EAT PERIOD

EAT PERIOD

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

CMP

REST PERIOD
9 1/2 HOURS

BATTERY CHARGE, BATTERY A
HGA P-24, Y254

LM

CDR

EAT PERIOD

131:00

EVA PLANNING PERIOD

131:15

STOW ALL LOOSE ITEMS NOT REQ'D FOR EVA

UNSTOW EVA 2 PREP & POST CARD

STOW LUNAR SURFACE CHECKLIST

131:23

CABIN PREP FOR EVA

EQUIPMENT PREP

SET DET FOR CABIN DEPRESS

PREPARE CAMERAS
COLLECT ITEMS FOR JETTISON
UNSTOW AND CHECK BOTH OPS

LMP

EAT PERIOD

MCC-H

DUMP DSE

CREW STATUS REPORT
CMP
SLEEP
PRD

UPDATE TO CSM
CONSUMABLES

CSM CONSUMABLES UPDATE
GET:

RCS TOTAL

QUAD A B C

H2 TOTAL

O2 TOTAL

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

MSC Form 1674 (01) (June 69) FLIGHT PLANNING BRANCH
EQUIPMENT PREP (CONT)

PLSS DONNING
- Configure LMP's PLSS/OPS for donning
- Unstow RCU's
- Unstow CDRs PLSS/OPS
- Verify RCU controls and connect to PLSS/PGA

PLSS COMM CHECK
- Audio switches check, activate PLSS comm systems
  - S-BD PWR AMPL-DRIM (TV CB - close then open)

FINAL SYSTEMS PREP
- Connect 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 CHECK
- PLSS O₂ on
- Cabin depress
- Confirm "go" for EVA
- Depress cabin to 3.5 PSIA
END ORBRATE, ROLL 180 DEG FOR COMM (180,338/232,0) IATTH

132:59:56
BEGIN REV 26
(121,NA/278,0) IATTH

@MNVR TO LDMK TRKNG ATT (0,338/NA,0) LATTH

LEGEND:

- MSFN AOS, LOS
- S/C SUNRISE, SUNSET
- SUBEARTH POINT
- LATTH - LOCAL ATTITUDE HOLD
- IATTH - INERTIAL ATTITUDE HOLD

REVISION B
22 DEG PITCH DOWN FROM LOCAL HORIZONTAL ORBITAL RATE THROUGHOUT TRACKING

CSM LANDMARK TRACKING PROFILE

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

ΔT1 = 300 SEC
ΔT2 = 40 SEC
ΔT3 = 25 SEC
ΔT4 = 25 SEC
ΔT5 = 25 SEC
ΔT6 = 25 SEC
ΔT7 = 340 SEC

AOS TO LOS - 146 SEC
AOS TO FINAL MARK - 140 SEC

LAT + 0.150°
LONG/2 - 15.575°
ALT - 0.54 NM

CENTER OF MOON

FIGURE 3-3
3-110
## FLIGHT PLAN

### CSM

- **0022 CST**
- **134:00**

**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**

### LM

- **134:00**

**COLLECT DOCUMENTED SAMPLES**

**COLLECT CORE TUBE SAMPLES**

**TRENCH SITE SAMPLING**

**COLLECT GAS ANALYSIS SAMPLES**

**MAKE GENERAL OBSERVATIONS**

### MCC-H

- **1:00**

**UPDATE TO CSM S-158 PAD (REV 27)**

### Time Table

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>134:00 - 135:00</td>
<td>6/26-27</td>
<td>3-111</td>
</tr>
</tbody>
</table>

MSC Form 1674 (OT) (June 69) FLIGHT PLANNING BRANCH
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

MSC Form 167I (OT) (June 69) FLIGHT PLANNING BRANCH
134:58:13
BEGIN REV 27
(180,NA/232,0)
IATTH

MNVR TO 5158
PHOTO ATT
(0,213/NA ,0)
LATTH

Legend:
- MSFN AOS, LOS
- S/C SUNRISE, SUNSET
- SUBEART POINT

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

Revision B
FLIGHT PLAN

CSM

0122

0000 CST

135:00

CDR

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 +2 PAD
RETRIEVE ALSSC&TAKE PHOTOS
OF SURFACE
PUT ALSSC FILM IN ETB

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

MSC Form 1674 (OF)(June 69) FLIGHT PLANNING BRANCH
FLIGHT PLAN

CSM
CMR

0222 CST
136:00

MAP UPDATE REV 28

136:30

VERIFIED D.O.E. MOTION @ LOS

LM

LMP

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

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

TRANSFER SURVEYOR PARTS BAG

DISCARD LEC

CLOSE HATCH & REPRESS CABIN

POST EVA SYSTEMS CONFIGURATION
CONFIGURE VALVES AND CIRCUIT BREAKERS

DOFF GLOVES
DISCONNECT OPS 02 HOSES & CONNECT LM 02 HOSES
DISCONNECT PLSS H2O HOSES & CONNECT LM H2O HOSES
LCG PUMP CB-CLOSE
SWITCH TO LM COMM SYSTEM

PLSS/OPS DOFFING
REMOVE RCU'S DISCONNECT PLSS 02 HOSES
DOFF PLSS/OPS
REMOVE OPS & CHECKOUT

MCC-H

CSM Form 1674 (OT)(June 69) FLIGHT PL. NING BRANCH
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)
FLIGHT PLAN

CSM

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

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

CDR

LM

LMP

0322 CST
137:00

10

15

18

137:30

137:00

VERIFICATION

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

PRESSURE INTEGRITY CHECK
CHECK VALVE POSITIONS
VERIFY GAGE READINGS

CABIN DEPRESS
OPEN DUMP VALVE

HATCH OPENING
OPEN HATCH
JETTISON EQUIPMENT

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

MSC Form 167- (CT)(June 65) FLIGHT PLANNING BRANCH REVISION A
CSM

EAT PERIOD 138:00 CABIN REPRESS

LM

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

EAT PERIOD EAT PERIOD
139:00 |

MCC-H

DUMP DSE

P52 (LIFT OFF-ORIENT)
N71:
N05:
N93:
X:
Y:
Z:
GET:

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

VERIF Y DSE MOTION @ LOS

STOW S-158

EAT PERIOD

R180 P310 Y 0
HGA P-74 Y 337
GO INERTIAL
RR TRANSPONDER ACTIVATION
AND SELF TEST

MICROSCOPE TO P52 ATT BY 138:06

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

EAT PERIOD

VERIFY MASTER ALARM & WARNING LIGHTS ON
DOFF GLOVES, HELMETS, & VISORS

STOW SURVEYOR BAG
STOW ALL EVA ON BOARD DATA
IN FLT DATA FILE

EVA DEBRIEFING

STOW SRC #2
STOW SURVEYOR BAG
STOW ALL EVA ON BOARD DATA
IN FLT DATA FILE

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

CREW STATUS REPORT (MEDICATION, DOSIMETER)

EAT PERIOD

EAT PERIOD

EAT PERIOD

VERIF Y DSE MOTION @ LOS

VERIF Y DSE MOTION @ LOS

STOW S-158

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

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)

APOLLO 12 FINAL (NOV 14)
THIS PAGE INTENTIONALLY LEFT BLANK
BEGIN IMU REALIGN
(180,NA/312,0)
IATTH

ROLL 180 DEG
TO LDMK
TRKNG ATT
(0,338/NA,0)
LATTH

LEGEND:

- M$$\text{SF}$$ AOS, LOS
- S/C SUNRISE, SUNSET
- SUBEARTH POINT
- (R,LHP/INP,Y)

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

REV 29

3-117A
**FLIGHT PLAN**

**CSM**
- **CMP**
- **EAT PERIOD**
- **REACQUIRE MSFN**
  - HGA P -74 Y -337
- **RNDZ XPNDR - PWR (VERIFY)**
- **MAHEUVER TO LDMK 193 ATT BY 139:41, GO ORB RATE**
  - RO P338/NA Y 0
  - SELECT OMNI D
- **P22-ORBITAL NAVIGATION**

**LM**
- **CDR**
  - **EAT PERIOD**
  - **SYSTEMS STATUS CHECK**
    - PGNCS - OPERATE
    - POWER UP SYSTEMS (TV-OFF)
    - PGNCS SELF TEST
    - ERASABLE MEMORY DUMP
  - **P57-LUNAR SURFACE ALIGN OPTION 4-LANDING SITE A/T-3-GRAVITY & ONE CELESTIAL BODY (LIFTOFF ORIENTATION)**
- **LMP**
  - **EAT PERIOD**
  - **SYSTEMS STATUS CHECK AGS STATUS - OPERATE POWER UP SYSTEMS AGS SELF TEST**
  - **ALIGN AGS TO PGNCS AGS GYRO CALIBRATION**
  - **CONFIGURE FOR RR TRACKING**
  - **V63 - RR SELF TEST**
  - **P22-LUNAR SURFACE NAVIGATION**
  - **TRACK CSM WITH RR**

**MCC-H**
- **CSM CONSUMABLES UPDATE**
  - GET: __ __ __ __
  - RCS TOTAL ___% QUAD A ___% B ___% C ___% D ___% H2 TOTAL ___% O2 TOTAL ___%
- **DUMP DSE UPLINK TO CSM CSM S.V. (L/0)-2+20**
- **UPLINK TO LM CSM S.V. (L/0)-2+20**
- **UPDATE TO CSM P22 TRACKING PAD MAP UPDATE REV 30 CONSUMABLES PAD**

---

**MISSION** | **EDITION** | **DATE** | **TIME** | **DAY/REV** | **PAGE**
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 139:00 - 140:00 | 6/29 | 3-118
22 DEG PITCH DOWN FROM LOCAL HORIZONTAL ORBITAL RATE THROUGHOUT TRACKING

22°

HORIZON

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

ΔT1 = 300 SEC
ΔT2 = 40 SEC
ΔT3 = 25 SEC
ΔT4 = 25 SEC
ΔT5 = 25 SEC
ΔT6 = 340 SEC

AOS TO LOS - 146 SEC
AOS TO FINAL MARK - 140 SEC

LAT -3.437
LONG/2 -11.615
ALT -1.37
<table>
<thead>
<tr>
<th>MISSION</th>
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<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (Nov 14)</td>
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<td>140:00 - 141:00</td>
<td>6/29-30</td>
<td>3-119</td>
</tr>
</tbody>
</table>
C5M LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM LOCAL HORIZONTAL ORBITAL RATE THROUGHOUT TRACKING

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

NOTE: Coordinates of LM to be updated Real time

NOTE: Coordinates of LM to be updated Real time

FIGURE 3-3

3-120
REV 30

142:01:18
LM LIFT-OFF
(0,NA/166,0)
LOSM TO LM, MAN

140:53:02
BEGIN REV 30
(180,NA/312,0)
IATTH

ROLL 180 DEG TO
LM TRKNG ATT
(0,NA/312,0)
IATTH

140:53:02
BEGIN REV 30
(180,NA/312,0)
IATTH

END IATTH, BEGIN LATTH
(0,338/NA,0)
LATTH

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

3-120A

REVISION B
FLIGHT PLAN

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 O P 312 Y 0
OMNI D

P22-ORBITAL NAVIGATION
GO ORB RATE @ 141:39
R O P 338/NA Y 0

TRACK LM @ AOS

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 183-OFF
ENTER AGS LUNAR ALIGN
PRELAUNCH SWITCH CHECKS
VENT DPS & SHE

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

LOAD DAP N46-12002
PI2-POWERED ASCENT
GO/NO-GO FOR LIFTOFF

PRELAUNCH SWITCH CHECKS
CHECK APS BURN CARD
CHECK APS, RCS, EPS, ECS
SEQ CAMERA - ON

L/O - 6 MINUTES:
DISABLE MSFN RELAY

UPDATE TO CSM
LM S.V. (INS + 18)
CSM S.V. (INS + 18)

GO/NO-GO FOR LIFTOFF
ENTER AGS LUNAR ALIGN
PRELAUNCH SWITCH CHECKS
CHECK CB STATUS
CHECK APS, RCS, EPS, ECS
SEQ CAMERA - ON

APOLLO 12
FINAL (NOV 14)
OCTOBER 15, 1969
141:00 - 142:00
6/30
3-121

FLIGHT PLANNING BRANCH
REVISION A
THIS PAGE INTENTIONALLY LEFT BLANK
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

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

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

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

FIRST LM BRAKING

BEARING
CSM(60,NA/9,0)
LOSM TO LM
LM(0,NA/238,0)
LOSM TO CSM

FINAL LM BRAKING

BEARING
CSM(0,NA/334,0)
LOSM TO LM ALONG
X-AXIS
LM(0,NA/244,0)
LOSM TO CSM

LEGEND:

- MSFN ACS, LOS
- S/C SUNRISE, SUNSET
- SUBEAPTH POINT

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD

REV 32
# FLIGHT PLAN

**CSM**

**Final MCC-1 Comp**
- P41 - RCS Thrusting
- Confirm LM MCC-2
- P00 (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, N46-11002
- 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 AP
- Remove and Stow Hatch
- Verify Latches
- Collapse Probe and pass to CDR

**LM**

**P41 - RCS Thrusting**
- Null Residuals
- P00 (Terminate P20)
- V48 - Load DAP, N46-11002
- V63 - RR Self Test
- RR-Off

**LMP**

**Load AGS MCC-2 Ext AV**
- Omni-Aft, Biomed-Eff
- 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

**Docking**
- Configure PGNCS & AGS
- V48 Load DAP, N46-12021
- Prep for Transfer
- Doff Helmet & Gloves
- Open Hatch
- Remove & Stow Drogue
- Receive & Stow Probe
- Assist CDR

---

**MISSION | EDITION | DATE | TIME | DAY/REV | PAGE**

| Apollo 12 | Final (Nov 14) | October 15, 1969 | 145:00 - 146:00 | 6/32 | 3-125 |
CSM
TRANSFER BAGS, VACUUM
BRUSH, AND HOSE TO LM

LiOH CANNISTER CHANGE
NO 11 - 13 INTO A,
STOW 11 IN A3

STOW LM EQUIPMENT

VERIFY DSE MOTION @ LOS

LM
CONFIGURE SUIT LOOP
FOR VACUUMING

UNSTOW SRC'S, VACUUM &
BAG, AND PASS TO CSM

VACUUM, BAG, & TRANSFER
TO THE CSM:
CSRC
CSC CASSETTE
70MM MAGS(2)
GLOVES (4)
HELMETS(2)
LUNAR BOOTS
SURVEYOR TOOLS AND
HARDWARE

VACUUM PGA'S

STOW VACUUM BRUSH AND
HOSE

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

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

**SELECTED TIMES**

**FLIGHT PLANNING BRANCH**
146:47:52
BEGIN REV 33
(180,NA/336,0) MAVR TO LM JETT ATT
IATTH

MNVR TO LM JETT ATT
(219,NA/358,342)
IATTH

BEGIN SXT TRKNG
CSM(180,NA/267,0)
LOSM TO LM, AUTO

CSM SEP MNVR
(180,90/11A,0)
IATTH

147:57:00
LM JETT
(219,NA/358,342)
IATTH

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

REV 33
FLIGHT PLAN

CSM 1322 CST

CMP

147:00

04

DISCONNECT FROM LM
IVT TO CM

CDR

147:09

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

LM

LMP

MCC-H

15

CONFIGURE MSFN
HGA P-41 Y 5

REACQUIRE MSFN

09

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

04

DEPRESS TUNNEL
CONFIGURE CSM FOR JETT
SET UP CAMERA FOR JETT
CM4/DAC/18/CEX-BRKT,
MIR(18,250,7)12FPS,
0.5 MAG, 4 MIN
PYRO ARM
V48-LOAD DAP,N46-
R1(11102)
R2(01111)
P47-THRUST MONITOR

LM JETTISON
SET ORDEAL

148:30

148:45

MAP UPDATE REV 34

OS : __________

180°W : __________

AOS : __________

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

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

FLIGHT PLANNING BRANCH

REVISION A
FLIGHT PLAN

CSM SEPARATION
R180 P90/NA Y 0
HGA P-36 Y352

CSM SEP ATTITUDE

UPLINK TO LM
P42-APS THRUSTING

SET ORDEAL

P20-RENNEOUS NAVIGATION
AUTO MNVR TO LM TRACK ATT
SET UP CAMERA FOR LM IMPACT
CM/DAC/SXT/CEX
(FIXED,250,FIXED) 1 FPS,0.5 MAG,46 MIN
TRACK LM AND PHOTOGRAPH THROUGH SEXTANT
VERIFY DSE MOTION @ LOS
VACUUM, DOFF, BAG, AND STOW PGA'S

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

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

**NOTES**

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

TEI 39 PAD ASSUMES NO PLANE CHANGE 2

**ONBOARD READOUT**

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

**LM DEORBIT BURN**

TIG: 149:24:41.2
BT: 83.8 SEC
AVR: 189.7 FT/SEC

**LM LUNAR IMPACT**

GET: 149:52:50.5
LAT: 3°17'S
LONG: 23°23'W

**MISSION**

<table>
<thead>
<tr>
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<td>OCTOBER 15, 1969</td>
<td>149:00 - 150:00</td>
<td>6/34</td>
<td>3-129</td>
</tr>
</tbody>
</table>

**MCC-H**

1522 CST
149:00
02
08
15
30
45
150:00

**UPDATE TO CSM**

UPD-182
P-42 APS THRUSTING

**UPDATE TO LM**

COMMAND ULLAGE OFF

**DUMP DSE**
FLIGHT PLAN

MCC-H 1622 CST

150:00
01
08
20
30

151:00
01
06
30

152:00

REST PERIOD
(7.5 HOURS)

NOTES

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

WSC Form 29 (May 68) FLIGHT PLANNING BRANCH NASA — MSC
MISSION: APOLLO 12  
EDITION: FINAL (NOV 14)  
DATE: OCTOBER 15, 1969  
TIME: 152:00 - 154:00  
DAY/REV: 6/35-36  
PAGE: 3-131
FLIGHT PLAN

REST PERIOD (7.5 HOURS)

DUMP DSE

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

**POSTSLEEP CHECKLIST**
- Crew Status Report
- Consumables Update
- Flight Plan Update
- Cycle H₂, O₂ Fans
- Pot H₂O HTR On
- Normal Lunar Comm Except: Verify DSE Motion At LOS
- S BD Ant - Hi Gain
- Crew Manages Ant Ops

**CSM Consumables Update**
- Get:
  - RCS Total
  - Quad A %B %
  - C %
  - H₂ Total
  - O₂ Total

**CREW STATUS REPORT**
- CDR
- CMP
- LMP
- Sleep
- PRD

**MAP UPDATE REV 39**
- LOS:
- 180°:
- AOS:

**NOTES**
- TEI 41 Assumes Plane Change 2

**P52 (Plane Change Orient)**
- N71:
- N05:
- N93:
  - X
  - Y
  - Z
- GET:

---

**MISSION** | **EDITION** | **DATE** | **TIME** | **DAY/REV** | **PAGE**
--- | --- | --- | --- | --- | ---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 158:00 - 159:00 | 7/38-39 | 3-134
MNVR TO PC2
BURN ATT
(0,NA/0,0)
IATTH

AFTER IMU REALIGN
(57,NA/326,24)
IATTH
LOPC #2 ORIENT

END REST ATT,
MNVR FOR IMU
REALIGN
(180,NA/278,45)
IATTH

156:38:58
BEGIN REV 38
(123,NA/278,0)
IATTH

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

3-134A

REVISION B
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## FLIGHT PLAN

### CSM PLANE CHANGE #2

**BURN TABLE**

<table>
<thead>
<tr>
<th>P or Y Rates</th>
<th>Att Deviation</th>
<th>Shutdown Time</th>
<th>Residuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/sec Takeover</td>
<td>+10° Takeover</td>
<td>BT + 1 sec</td>
<td>NO TRIM</td>
</tr>
</tbody>
</table>

**TABLE 3-10**

3-136
BEGIN IMU REALIGN
(180,NA/263,0)
IATTH

158:37:11
BEGIN REV 39
(0,NA/0,0)
IATTH

159:01:46
PC2 BURN IGN
(0,NA/0,0)
IATTH

MNVR FOR IMU
REALIGN
(0,NA/273,0)
IATTH

AFTER IMU REALIGN
(89,NA/307,0)
IATTH
PHOTOGRAPHY ORIENT

MNVR FOR IMU
REALIGN
(180,NA/263,0)
IATTH

END HR PHOTO
(0,NA/140,0)
IATTH

BEGIN HR PHOTO
OF LALANDE
(0,NA/257,0)
LOSM TO LDMK

MNVR TO HR
PHOTO ATT
(0,NA/257,0)
IATTH

LEGEND:

□ FSFr 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 PLANE CHANGE #2**

- **MNVR TO P52 ATT BY 159:07**
  - R O
  - P 273
  - Y 0
  - HGA P 3, Y 281

- **P52 IMU REALIGN**
  - Y 0

- **OPTION 1 PREFERRED**

- **GYRO TORQUE**
  - ULLAGE: 4 JET 11 SEC
  - ORBIT: 58.6 X 56.5 NM

- **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 O

- **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**
  - R 180
  - P 263
  - Y 0
  - HGA P -56
  - Y 186

**NOTES**

- T1 IS 3 MINUTES PRIOR TO TCA
- T2 IS 1 MINUTE AFTER TCA
- EL CAM TO BE MANUALLY ACTUATED AT APPROX. 20 SECOND INTERVALS

**BURN STATUS REPORT**

- ΔTIG
- BT
- Vx
- TRIM
- Vx
- Vy
- Vz
- ΔVc
- FUEL
- OX
- UNBAL

---

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APOLLO 12 | FINAL (REV 14) | OCTOBER 15, 1969 | 159:00 - 160:00 | 7/39 | 3-137
FLIGHT PLAN

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/CX,(FIXED,60,FIXED),1FPS(1MAG=93MIN)

P52 IMU REALIGN
OPTION 3 REFSSMRT
GDC ALIGN TO IMU
ZERO OPTICS & MANUALLY SET SA=0°, TR=45°

V83E ALIGN FDAI #1
ORDERAL R O, P270/ NA, Y O
V79E R1 = -0.0007
R2 = +008.00
R3 = +11111
SELECT OMNI D
V06N55 AT GROUND TERMINATOR
BEGIN PHOTOGRAPHY AT GROUND TERMINATOR (+)1 MIN(T1)
RECORD START TIME + -- GET
V16N91 AT GROUND TERMINATOR (+) 2 MINUTES
FLIGHT PLAN

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 __ __:__)

V05N65 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

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

UPDATE TO CSM
RESOLUTION PHOTOS

162:00

REPORT GYRO TORQUING ANGLES

VERIFY DSE MOTION AT LOS

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,°),160-120

REACQUIRE MSFN
HGA P -64, Y 173

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
TCA (-) 3 MIN

DAC LOS (PARALLEL TO +X AXIS)

+X AXIS

TCA (+) 1 MIN

FIGURE 3-4
3-142
FLIGHT PLAN

Dump DSE

Update to CSM
Map Update Rev 42

Update to CSM
LDMK Track Pad

Update to CSM
Csm State Vector & V66

NOTEs

MAP UPDATE REV 42
LOS: __ __ __
180°: __ __ __
AOS: __ __ __

0522 CST
163:00

DUMP DSE FLIGHT PLAN
163:00

OMNI D
P 283
Y 0

Update to CSM
Map Update Rev 42

MAP UPDATE REV 42
LOS: __ __ __
180°: __ __ __
AOS: __ __ __

163:16

MlvR-TO ATT FOR DESCARTES PHOTOGRAPHY BY 163:16

R 0
OMNI D
P 283
Y 0

Track Descartes Thru Coas and Start Camera at T1, Stop Cameras at T2

MlvR to Attitude for FRA Mauro Photo by 163:33

R 0
OMNI D
P 250
Y 0

Track FRA Mauro Thru Coas and Start Camera at T1, Stop Camera at T2

V64 Acquire Msfn @ Pitch = 135°

MlvR to P52 Att by 163:45

R 0
P 56
Y 0

Uplink to CSM

Notes

FLIGHT PLANNING BRANCH

NASA — MSC
22 DEG PITCH DOWN FROM LOCAL HORIZONTAL ORBITAL RATE THROUGHOUT TRACKING

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

\[ \Delta T_1 = 300 \text{ SEC} \]
\[ \Delta T_2 = 40 \text{ SEC} \]
\[ \Delta T_3 = 25 \text{ SEC} \]
\[ \Delta T_4 = 25 \text{ SEC} \]
\[ \Delta T_5 = 25 \text{ SEC} \]
\[ \Delta T_6 = 340 \text{ SEC} \]

AOS TO LOS - 146 SEC
AOS TO FINAL MARK - 140 SEC
Tyee

MISSION
APOLLO 12

EDITION
FINAL (NOV 14)

DATE
OCTOBER 15, 1969

TIME
164:00 - 165:00

DAY/REV
7/41-42

PAGE
3-145
BEGIN IMU REALIGN
(180, NA/238, 0)
IATTH

164:31:39
BEGIN Rev 42
(0, NA/56, 0)
IATTH

BEGIN IMU REALIGN
(180, NA/238, 0)
IATTH

END LDMK TRKNG,
MNVR FOR IMU
REALIGN
(180, 338/238, 0)
IATTH

MNVR TO LDMK
TRKNG ATT
(0, 338/NA, 0)
LATTH

LEGEND:

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

IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD
FLIGHT PLAN

MSFN

0622 CST 0622 CST

164:00 164:00

:07 :07

:15 :15

164:30 164:30

REV 42 REV 42

165:00 165:00

P52 IMU REALIGN
OPTION 3 REFSMMAT

VERIFY DSE MOTION AT LOS

GDC ALIGN TO IMU
O2 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(1 MAG-88 MIN)

SELECT OMNI _D_

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

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

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 164:00 - 165:00 7/41-42 3-146
FLIGHT PLAN

UPDATE TO CSM
MAP UPDATE REV 43
TEI 45 PAD

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

165:00
0722 CST

START DAC @ T2(-) 1 MIN
CP-2 LDMK IS
AT ~66° SUN ANGLE
STOP DAC AFTER MARK 5

START DAC @ T2(-) 1 MIN
DESCARTES LDMK IS
AT ~71.5° SUN ANGLE
STOP DAC AFTER MARK 5

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

NOTE:
MAP UPDATE REV 43
LOS : __ __ __ __ __ __ __
180° : __ __ __ __ __ __ __
AOS : __ __ __ __ __ __ __
CSM LANDMARK TRACKING PROFILE

22 DEG PITCH DOWN FROM LOCAL HORIZONTAL ORBITAL RATE THROUGHOUT TRACKING

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

ΔT1 = 300 SEC
ΔT2 = 40 SEC
ΔT3 = 25 SEC
ΔT4 = 25 SEC
ΔT5 = 25 SEC
ΔT6 = 25 SEC
ΔT7 = 340 SEC

AOS TO LOS - 146 SEC
AOS TO FINAL MARK - 140 SEC
<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>166:00 - 167:00</td>
<td>7/42-43</td>
<td>3-149</td>
</tr>
</tbody>
</table>
THIS PAGE INTENTIONALLY LEFT BLANK
END LDMK TRKNG, MNVR FOR IMU REALIGN (180, 338/239, 0) IATTH

MNVR TO LDMK TRKNG ATT (0, 338/NA, 0) LATTH

166:29:44
BEGIN REV 43
(180, NA/238, 0) IATTH

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

3-149A

REV 43

REVISION B
0822 CST

UPLINK CSM
STATE VECTOR & V66

166:00

VERIFY DSE MOTION AT LOS

P52 IMU REALIGN
OPTION 3 REFISHMAT

STATE VECTOR VERIFY DSE MOTION AT LOS & V66 05.

P52 IMU REALIGN
OPTION 3 REFISHMAT

P52 (LOG SITE ORIENT)
H71:]
N05:]
N93:
X
Y
Z
GET

166:30

EAT PERIOD

5 MARKS STOP DAC AFTER MARK 5

167:00

SELECT OMNI D

MCC-H

GDC ALIGN TO IMU

SEXT UP DAC FOR LDMK TRACKING PHOTO'S THRU SXT
CM/DAC/SXT/CEX (SEE LDMK TRACK PAD) 1FPS

MNVR TO LDMK TRACK ATT BY 166:45
GO ORB RATE

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

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

MISSION EDITION DATE TIME DAY/REV PAGE

APOLLO 12 FINAL (NOV 14) OCTOBER 15, 1969 166:00 - 167:00 7/42-43 3-150
FLIGHT PLAN

REPORT GYRO TORQUING ANGLES

<table>
<thead>
<tr>
<th>TRACK LDMK CP-2</th>
<th>START DAC @ T2(-)1 MIN</th>
<th>CP 2 LDMK IS</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO NOT PRO ON FINAL</td>
<td>25 SEC BETWEEN MARKS</td>
<td>AT ~67° SUN ANGLE</td>
</tr>
<tr>
<td>N89</td>
<td>5 MARKS</td>
<td>STOP DAC AFTER MARK 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRACK LDMK DE-1</th>
<th>START DAC @ T2(-)1 MIN</th>
<th>DESCARTES LDMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO NOT PRO ON FINAL</td>
<td>25 SEC BETWEEN MARKS</td>
<td>AT ~72.5 SUN ANGLE</td>
</tr>
<tr>
<td>N89</td>
<td>5 MARKS</td>
<td>STOP DAC AFTER MARK 5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>TRACK LDMK FM-1</th>
<th>START DAC @ T2(-)1 MIN</th>
<th>FR. MAURO LDMK</th>
</tr>
</thead>
<tbody>
<tr>
<td>DO NOT PRO ON FINAL</td>
<td>25 SEC BETWEEN MARKS</td>
<td>AT ~40.5 SUN ANGLE</td>
</tr>
<tr>
<td>N89</td>
<td>5 MARKS</td>
<td>STOP DAC AFTER MARK 5</td>
</tr>
</tbody>
</table>

STOP PITCH AND MNVR TO ACQUIRE MSFN BY 167:40
R 180  HGA:
P 239  P -29
Y 0   Y 184

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
168:27:49
BEGIN REV 44
(180,NA/239,0)
IATTH

MNVR TO STRIP
PHOTO ATT
(0,258/NA,0)
LATTH

183,NA/145,4
IATTH
TEI ORIENT

AFTER IMU REALIGN
(183,NA/145,4)
IATTH
TEI ORIENT

END STRIP PHOTO,
MNVR FOR IMU
REALIGN
(180,IA/268,0)
IATTH

LEGEND:
□ ■ HSFN AOS, LOS
○ ● S/C SUNRISE, SUNSET
⊕ SUBEARTH POINT
(R, LHP/INP, Y)
IATTH - INERTIAL ATTITUDE HOLD
LATTH - LOCAL ATTITUDE HOLD
STEREO STRIP PHOTOGRAPHY
REV 44

FIGURE 3-5
3-152
FLIGHT PLAN

1022 CST

168:00

:03

:15

168:30

2

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
V83E
ALIGN FDAO #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

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

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

1122 CST
169:00

169:15
STEREO STRIP PHOTOGRAPHY

169:30

DUMP DSE

CSM

169:45

UPDATEREV 45

TEI 45 PAD
(PRELIMINARY)

170:00

**NOTES**

MAP UPDATE REV 45

180°

AOS

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

**MISSION** | **EDITION** | **DATE** | **TIME** | **DAY/REV** | **PAGE**
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 169:00 - 170:00 | 7/44 | 3-154
MNVR TO TEI BURN ATT
(180,NA/0,0)
IATTH

TEI BURN IGN
(180,NA/0,0)
IATTH

170:25:55
BEGIN REV 45
(183,NA/145,4)
IATTH

LEGEND:

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

REVISION B

3-154A
FLIGHT PLAN

170:00
VERIFY DSE MOTION AT LOS
P52 IMU REALIGN
OPTION 1 PREFERRED

170:15
GDC ALIGN TO IMU

170:30
DUMP DSE

170:45
REACQUIRE MSFN
HGA: P -55 Y 186
REPORT GYRO TORQUING ANGLES

NOTES

P52 (TEI ORIENT)
N71:
N05:
N93:
X
Y
Z
GET

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

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 △V

V49-MNVR TO BURNT ATT BY 171:51

SXT STAR CHECK
P40-SPS THRUST
VERIFY DSE MOTION AT LOS

MAP UPDATE REV 46
LOS
180°
AOS WITH TEI
AOS WITHOUT TEI
## FLIGHT PLAN

### TEI

**BURN TABLE**

<table>
<thead>
<tr>
<th>P or Y Rates</th>
<th>ATT Deviation</th>
<th>Shutdown Time</th>
<th>Residuals</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>FOR G&amp;N C/O &gt;3 SEC EARLY &amp; ΔVC &gt;+50 FPS SWITCH TO SCS AUTO &amp; RESTART SPS</td>
<td>BT + 2 SEC &amp; ΔVC = -40 FPS</td>
</tr>
</tbody>
</table>

**Table 3-11**

3-157
### FLIGHT PLAN

**GDC ALIGN TO IMU**

- **TIG:** 172:21:14.7
- **BT:** 02:08.9 SEC
- **ΔV:** 3035.9 FPS
- **ULLAGE:** 4 JETS, 12 SEC

**V66 TRANSFER CSM SV TO LM SLOT**

**MNVR TO TV ATT BY 172:46**
- **R:** 187
- **HGA**

**TV (MAD) 172:55 TO 173:15**
- **P:** 200
- **P:** -71

**CM4/TV-IN (F22)**
- **R:**
- **MS:**
- **SF:**
- **FN:**

**TEI BURN STATUS REPORT**

**LiOH CANISTER CHANGE NO. 13**
- **(15 INTO A, STOW 13 IN A4)**

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>172:00 - 173:00</td>
<td>7/45-TEC</td>
<td>3-15B</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

WIPE EXCESSIVE MOISTURE FROM TUNNEL HATCH AREA
CONTAMINATION CONTROL

P52 - IMU REALIGN
GYRO TORQUE

REPORT GYRO TORQUING ANGLES

MNVR TO PTC ATTITUDE P270
START PTC

EAT PERIOD

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

DUMP DSE

1522 CST

173:00

173:15

173:30

174:00

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 | 173:00 - 174:00 | 7/TEC   | 3-159

WSP Form 29 (May 68)

FLIGHT PLANNING BRANCH
**FLIGHT PLAN**

- **TIME:** 174:00 - 176:00

---

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>174:00 - 176:00</td>
<td>7/TEC</td>
<td>3-160</td>
</tr>
</tbody>
</table>

---

**PRESLEEP CHECKLIST:**
- CREW STATUS REPORT
- ONBOARD READOUTS
- CYCLE O2 & H2 FANS
- CHLORINATE POTABLE WATER

Verifying:
- WASTE MNGT OVBD DRAIN - OFF
- WASTL 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

**ONBOARD READOUTS:**
- BAT C
- PYRO BAT A
- PYRO BAT B

**DC IND SEL:**
- MIA OR B
MCC-H

1822 CST

176:00

177:00

178:00

FLIGHT PLAN

REST PERIOD
(10 HOURS)

176:00 - 178:00

NOTES

PTC

P 270 Y 0

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

MSC Form 29 (May 69) DIGNIT PLANED BRANCH

FLIGHT PLANNING BRANCH
2022 CST FLIGHT PLAN

178:00

REST PERIOD (10 HOURS)

179:00

PTC P 270 Y 0

180:00

MISSION EDITION DATE TIME DAY/REV PAGE
APOLLO 12 FINAL (NOV 14) OCTOBER 15, 1969 178:00 - 180:00 7/TEC 3-162
2222 CST

FLIGHT PLAN

180:00

181:00

182:00

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
<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>182:00 - 184:00</td>
<td>7/TEC</td>
<td>3-164</td>
</tr>
</tbody>
</table>

**FLIGHT PLAN**

- **REST PERIOD** (10 HOURS)
- **PTC**
  - P 270, Y 0

**Notes**

**Diagram**

- Time markers: 182:00, 183:00, 184:00
  - 182:00:00
  - 183:00:00
  - 184:00:00

**Table**

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
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<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>182:00 - 184:00</td>
<td>7/TEC</td>
<td>3-164</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

SCRIPT:

184:00

POSTSLEEP CHECKLIST:
- CREW STATUS REPORT
- CONSUMABLES UPDATE
- CYCLE H2 & O2 FANS
- FLIGHT PLAN UPDATE

NORMAL LUNAR COMM EXCEPT:
- S-BD AUX TAPE - OFF
- TAPE RCVR FWD - OFF
- OMNI OPS
- S-BD ANT - OMNI
- S-BD ANT OMNI - B
- HGA OPS
- S-BD ANT-HI GAIN

CREW MANAGES ANT

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 - REFRESHMAT
REPORT GYRO TORQUING ANGLES

186:00

EAT PERIOD

185:00

STATE VECTOR & V66 MCC-5 TGT LOAD

UPLINK TO CSM

CONSUMABLES
MCC-5 MNVR PAD
FLIGHT PLAN

UPDATE TO CSM

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

P52 (PTC ORIENT)
N71: __ __ __ __
NO5: __ __ __ __
N93: __ __ __ __
X __ __ __ __
Y __ __ __ __
Z __ __ __ __
GET __ __ __ __

CREW STATUS REPORT
CDR CMP LMP
SLEEP _______ _______ _______
PRD _______ _______ _______

CLASSIFICATION: SBUCKET

APOLLO 12 FINAL (NOV 14)
OCTOBER 15, 1969 184:00 - 186:00
8/TEC 3-165
Flight had I not like this.
**FLIGHT PLAN**

MCC-5
BURN TABLE

<table>
<thead>
<tr>
<th>PROP V RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC</td>
<td>+10° TAKEOVER</td>
<td>BT + 1 SEC</td>
<td>TRIM X AXIS ONLY TO 0.2 FPS</td>
</tr>
</tbody>
</table>

**TABLE 3.12**
3-109
FLIGHT PLAN

BATTERY CHARGE, BATTERY B

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

ΔV: NOMINALLY ZERO

* ITEMS TO BE REPORTED TO MSFN

PTC
P 270, Y 0

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

MSC Form 28 (May 69) FLIGHT PLANNING BRANCH REVISION A NASA — MSC
0722 CST

189:00

P23 - CISLUNAR NAVIGATION
OPTICS CALIBRATION

POO
V49 - MNVR TO SIGHTING ATT
STAR/Earth Horizon

P23 - CISLUNAR NAVIGATION

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)

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

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

5. STAR 2 6 EFH (R3 = 0 0 1 2 0)
UPDATE TO CSM QUADS TO DISABLE FOR PTC (LOWEST QUANTITY PRPLNT)

NOTE:

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
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<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>190:00 - 192:00</td>
<td>8/TEC</td>
<td>3-170</td>
</tr>
</tbody>
</table>
BATTERY CHARGE, BATTERY A
FLIGHT PLAN

1322 CST

195:00

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

POO
V49 - MNVR TO SIGHTING ATT
STAR/EARTH HORIZON
P23 - CISLUNAR NAVIGATION

1. VENUS ENH (R3 = 0 0 1 1 0)
N88: (R1 = -2 4 7 0 3)(R2 = -2 5 6 7 8)(R3 = -2 6 2 9 2)
DO NOT PROCEED ON F06 49

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

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

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

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

196:00
START PTC
WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREA
CONTAMINATION CONTROL
LI0H CANISTER CHANGE NO. 15
(17 INTO A, STOW 15 IN A4)

0:30

197:00

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 02 VLV - ON
REPRESS 02 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

198:00

EAT PERIOD

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
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<td>OCTOBER 15, 1969</td>
<td>203:00 - 203:00</td>
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</table>

FLIGHT PLANNING BRANCH

FLIGHT PLAN

20:00

K S

3:30

REST PERIOD
(10 HOURS)

NOTES:

P 270, Y 0
FLIGHT PLAN

202:00

203:00

REST PERIOD
(10 HOURS)

204:00

PTC
P 270, Y 0

MCC-11

2022 CST

FLIGHT PLANNING BRANCH

MISSION | EDITION | DATE | TIME | DAY/REV |
---|---|---|---|---|
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 202:00 - 204:00 | 8/TEC | 3-177
<table>
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<td>206:00 - 208:00</td>
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<td>8/TEC</td>
<td>3-179</td>
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</table>
FLIGHT PLAN

UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN

UPLINK TO CSM
STATE VECTOR & V66

0222 CST

0208:00

0209:00

0210:00

0230

0200

0200

0210

0210

0230

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

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

CREW STATUS REPORT
CDR CMP LMP
SLEEP PRD

PTC P 270, Y 0

CREW MANAGES ANT

H2 TOTAL
O2 TOTAL

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
---|---|---|---|---|---
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 0208:00 - 0210:00 | 9/TEC | 3-180
<table>
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</tbody>
</table>
FLIGHT PLAN

0422 CST

210:00

P52-IMU REALIGN
OPTION 3 REFRESHMAT (OPTIONAL)

REPORT GYRO TORQUING ANGLES

211:00

MSFN

212:00

NOTES

P52 (PTC ORIENT)
N71:
N05:
N93:
X
Y
Z
GET

PTC
P 270, Y 0
FLIGHT PLAN

FOV 3°
GET 213:00

STOP PTC AT ROLL 235°

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

NASA — MSC
## FLIGHT PLAN

<table>
<thead>
<tr>
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<th>Details</th>
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<tr>
<td>213:00</td>
<td>MNVR TO OPTICS CALIBRATION ATT R 235</td>
<td>P 272</td>
</tr>
<tr>
<td></td>
<td>OPTICS CALIBRATION STAR 1 2</td>
<td>Y 0</td>
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<tr>
<td></td>
<td>POO V49 - MNVR TO SIGHTING ATT</td>
<td>R 90</td>
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<tr>
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<td>STAR/Earth Horizon</td>
<td>P 589 99</td>
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<td>213:30</td>
<td>P23 - CISLUNAR NAVIGATION</td>
<td>Y 372 327</td>
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<tr>
<td></td>
<td>LOAD W MATRIX (R1 +4 5 0 0 0) R2 +0 0 0 0 6</td>
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<tr>
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<td>VENUS ENH (R3 = 0 0 1 1 0)</td>
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<td>N88: (R1 = -6 9 2 0 2) R2 = -6 7 0 1 8 R3 = -2 6 8 3 2</td>
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<td>DO NOT PROCEED ON F0649</td>
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<tr>
<td>214:00</td>
<td>STAR 204 ENH (R3 = 0 0 1 1 0)</td>
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<tr>
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<td>N88: (R1 = -2 1 3 8 9) R2 = -9 3 8 6 8 R3 = -2 7 0 4 2</td>
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<tr>
<td></td>
<td>STAR 2 6 EFH (R3 = 0 0 1 2 0)</td>
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<td></td>
<td>STAR 1 6 0 EFH (R3 = 0 0 1 2 0)</td>
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<tr>
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<td>N88: (R1 = -9 4 7 0 3) R2 = -2 5 6 7 8 R3 = +1 9 2 8 6</td>
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</tr>
<tr>
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<td>STAR 1 6 5 ENH (R3 = 0 0 1 1 0)</td>
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<tr>
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<td>N88: (R1 = -6 8 2 1 6) R2 = -4 6 1 3 9 R3 = -6 6 9 4 8</td>
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<tr>
<td></td>
<td>STAR 3 1 EFH (R3 = 0 0 1 2 0)</td>
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</table>

### Notes
- 3 marks on each star
- INCORPORATE P23
- MARK DATA AND UPDATE ONBOARD STATE VECTOR

### Mission Details

<table>
<thead>
<tr>
<th>Mission</th>
<th>Edition</th>
<th>Date</th>
<th>Time</th>
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<td>OCTOBER 15, 1969</td>
<td>213:00 - 214:00</td>
<td>8/TEC</td>
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</table>
UPDATE TO CSM QUADS TO DISABLE FOR PTC (LOWEST QUANTITY PLANT)
FLIGHT PLAN

FOV 4°
GET 217:00

STOP PTC AT ROLL 235°

<table>
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<tr>
<th>MISSION</th>
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<th>DAY/REV</th>
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<td>OCTOBER 15, 1969</td>
<td>216:00 - 217:00</td>
<td>9/TEC</td>
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</table>

MCC-H

1022 CST FLIGHT PLAN
216:00

NOTES
FLIGHT PLAN

1122 CST 217:00

217:00

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

V49 - MNVR TO SIGHTING ATT
STAR/Earth horizon
P23 - CISLUNAR NAVIGATION

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

3. STAR 2 0 4 ENH (R3 = 0 0 0 0 1 0)
N88: (R1 = -8 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 0649

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

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

3 MARKS ON EACH STAR
INCORPORATE P23
MARK DATA AND
UPDATE ONBOARD
STATE VECTOR

<table>
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<th>MISSION</th>
<th>EDITION</th>
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<th>TIME</th>
<th>DAY/REV</th>
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<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>217:00 - 218:00</td>
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NASA — MSC
FLIGHT PLAN

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

MCC-H
1222 CST
218:00

FWC Fore 20 (Nec 69)
FLIGHT PLANNING BRANCH
FLIGHT PLAN

FOV 4°
GET 220:00

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

1422 CST

220:00

MNVR TO OPTICS CALIBRATION ATT
P23 - CISLUNAR NAVIGATION
OPTICS CALIBRATION

STAR 1 2

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

R 235
P 272
Y 0

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)
NBB: (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)
NBB: (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)
NBB: (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)
NBB: (R1 = -8 9 9 7 6)(R2 = -4 0 7 8 2)(R3 = -1 5 5 3 8)
DO NOT PROCEED ON F06 49

6. STAR 1 2 5 ENH (R3 = 0 0 1 1 0)
NBB: (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-11
FLIGHT PLAN

1522 CST

221:00

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

WIPE EXCESSIVE MOISTURE FROM
TUNNEL HATCH AREA
CONTAMINATION CONTROL

221:30

P52 - IMU REALIGN
OPTION 3 - REFSMMAT

REPORT GYRO TORQUING ANGLES

222:00

P30 EXTERNAL ΔV
H₂ PURGE LINE HTRS - ON

NOTES

P52 (PTC ORIENT)
N71: ___·___
N05: ___·___
N93:
X ___·___
Y ___·___
Z ___·___
GET ___·___·___·___·___
## FLIGHT PLAN

### MCC-6
### BURN TABLE

<table>
<thead>
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<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
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<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>6T + 1 SEC</td>
<td>TRIM X AXIS ONLY TO 0.2</td>
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</table>

**TABLE 3-13**
3-190
FLIGHT PLAN

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

TV (GDS) 223:15-223:45
CM 4/TV-IN (f5.6/f22)
EAT PERIOD

MNVR TO PTC ATTITUDE
WIPE EXCESSIVE MOISTURE FROM TUNNEL HATCH AREA

*ITEMS TO BE REPORTED TO MSFN

NOTES

BURN STATUS REPORT

ΔTIG
BT
V gx
ΔV:
TRIM

R
P
V gy
V gz
ΔV c
FUEL
OX
UNBAL

OCTOBER 15, 1969
APOLLO 12 FINAL (NOV 14)
DATE
TIME
DAY/REV
PAGE
222:00 - 224:00
9/TEC
3-191

FLIGHT PLANNING BRANCH

MCC-6
1622 CST
222:00
223:00
224:00

(EI-22 HRS)

UPDATE TO CSM QUAD TO DISABLE FOR PTC (LOWEST QUANTITY PRPLNT)
FLIGHT PLAN

START PTC
REPORT CM RCS INJECTOR
VALVE TEMPS (SYS TEST METER
5C,D,6A,B,C,D)

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

PRESLEEP CHECKLIST:
CREW STATUS REPORT (MED)
ONBOARD READOUTS
CYCLE O2 & H2 FANS
CHLORINATE POTABLE WATER
VERIFY:
WASTE MNGT OVB DRAIN - OFF
WASTE STOW VENT VLV - CLOSED
EMER 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-B0 NORMAL MODE VOICE - OFF
S-BD SQUELCH - ENABLE
S-BD AUX TAPE - OFF
S-BD ANT - OMNI
S-BD ANT OMNI - B
TAPE RCOR FWD - OFF

ONBOARD READOUT

BATTERY C
PYRO BAT A
PYRO BAT B
RCS A
B
C
D

DC IND SEL - MMA 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
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<td>226:00 - 228:00</td>
<td>9/TEC</td>
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</table>

**FLIGHT PLAN**

- 226:00
- 227:00: REST PERIOD (10 HOURS)
- 228:00
FLIGHT PLAN

228:00

229:00

REST PERIOD
(10 HOURS)

230:00

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
-------|---------|------|------|---------|-----
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 228:00 - 230:00 | 9/TEC | 3-194
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<td>230:00 - 232:00</td>
<td>9/TEC</td>
<td>3-195</td>
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</table>
FLIGHT PLAN

0422 CST

234:00

CREW STATUS REPORT
CDR CMP LMP
SLEEP __________
PRD __________

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

L10H CANISTER CHANGE NO. 18
(20 INTO B, STOW 18 IN A6)

STOP PTC AT ROLL 235°

235:00

EAT PERIOD

236:00

FOV 8°
GET 236:00

NOTES

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

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
----------|--------|------|------|---------|-----
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 234:00 - 236:00 | 10/TEC | 3-197

MCC-H

PTC

270 Y O
FLIGHT PLAN

236:00

MNVR TO OPTICS CALIBRATION ATT R 235
P23 - CISLUNAR NAVIGATION P 272
OPTICS CALIBRATION Y 0

STARS

V49 - MNVR TO SIGHTING ATT R 90
STAR/EARTH HORIZON P 355-168
P23 - CISLUNAR NAVIGATION Y 341

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

1. STAR 26 EFH (R3 = 0 0 1 2 0)

JUPITER EFH (R3 = 0 0 1 2 0)

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

DO NOT PROCEED ON F 06 49

3. STAR 75 ENH (R3 = 0 0 1 1 0)

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

4. STAR 163 EFH (R3 = 0 0 1 2 0)

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

5. STAR 205 ENH (R3 = 0 0 1 1 0)

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

6. STAR 31 EFH (R3 = 0 0 1 2 0)

236:30

M SFN

237:00

3 MARKS ON EACH STAR

INCORPORATE P23 MARK DATA AND UPDATE ONBOARD STATE VECTOR

MISSILE | EDITION | DATE | TIME | DAY/REV |
|--------|--------|-----|------|---------|
| APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 236:00 - 237:00 | 10/TEC | 3-198
**FLIGHT PLAN**

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

<table>
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<th>TIME</th>
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<td>237:00 - 238:00</td>
<td>10/TEC</td>
<td>3-199</td>
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**FLIGHT PLANNING BRANCH**
FLIGHT PLAN

0822 CST

238:00

GO/NO-GO FOR MCC-7
REPORT CM RCS INJECTOR VALVE TEMPS (SYS TEST METER 5C, D, 6A, B, C, D)

239:00

VHF SIMPLEX A-ON (COMM CHECK)

240:00

DON MAE WEST & FOOT RESTRAINTS

STOP PTC

CM RCS INJECTOR TEMP
5C 5D
6A 6B
6C 6D

PTC
P 270 Y 0

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 (Nov 89) FLIGHT PLANNING BRANCH

NASA—MSC
FLIGHT PLAN

MCC-7
BURN TABLE

<table>
<thead>
<tr>
<th>P OR Y RATES</th>
<th>ATT DEVIATION</th>
<th>SHUTDOWN TIME</th>
<th>RESIDUALS</th>
</tr>
</thead>
<tbody>
<tr>
<td>10°/SEC TAKEOVER</td>
<td>+10° TAKEOVER</td>
<td>$BT + 1$ SEC</td>
<td>TRIM X AXIS ONLY TO 0.2 FPS</td>
</tr>
</tbody>
</table>

TABLE 3-14
3-201
FLIGHT PLAN

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 AV
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

NOTES

P52 (REENTRY ORIENT)
N71: ---
N05: ---
N93: ---

**ITEMS TO BE REPORTED to MSFN**

<table>
<thead>
<tr>
<th>MISSION</th>
<th>EDITION</th>
<th>DATE</th>
<th>TIME</th>
<th>DAY/REV</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APOLLO 12</td>
<td>FINAL (NOV 14)</td>
<td>OCTOBER 15, 1969</td>
<td>240:00 - 242:00</td>
<td>10/TEC</td>
<td>3-202</td>
</tr>
</tbody>
</table>
FLIGHT PLAN

1222 CST

242:00

(EI - 2 HRS)

GO/NO GO FOR PYRO ARM

242:30

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

243:00

MISSION | EDITION | DATE | TIME | DAY/REV | PAGE
APOLLO 12 | FINAL (NOV 14) | OCTOBER 15, 1969 | 242:00 - 243:00 | 10/TEC | 3-203
FLIGHT PLAN

1322 CST

243:00

P52 - IMU REALIGN
OPTION 3 - REFSSMAT

REPORT GYRO TORQUING ANGLES
GDC ALIGN TO IMU
EMS ENTRY CHECK

PRIM & SEC WATER EVAP ACTIVATION
CM RCS PRE-HEAT (IF REQ'D)
FINAL STORAGE

CONFIGURE CAMERA EQUIP FOR FIREBALL AND CHUTES PHOTOS
CM/DAC/18/G1N-(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

Notes:

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
SECTION 5 - ABBREVIATED TIMELINE
**ABBRUVATED TIMELINE**

**CSM**

**00:00**
- LIFTOFF

**Insertion Checklist**
- P52 - IMU REALIGN, OPT 3

**Begin TLI Prep**
- GO/NO-GO FOR TLI
  - TLI: 02:47
  - CSM/S-IVB SEP: 03:12
  - DOCK: 03:22
- CONFIGURE FOR EJECTION
  - CSM/LM EJECTION: 04:07
  - S-IVB EVASIVE MANEUVER: 04:24
  - S-IVB SLINGSHOT MANEUVER: 04:57
  - DOFF & STOW PGA'S
  - P52 - IMU REALIGN, OPT 1
  - P23 - CISLUNAR NAVIGATION (5 SETS)

**11:47 (HOM ZERO)**
- MCC-1

**12:00**
- PTC
  - EAT
  - MCC-1: 11:47 (HOM ZERO)

**PTC (IF MCC-1 NOT PERFORMED)**
- P52 - IMU REALIGN, OPT 3

**Rest Period (10 HR)**
- P23 - CISLUNAR NAVIGATION (5 SETS)

---

**MISSION** | **EDITION** | **DATE** | **TIME** | **DAY/REV** | **PAGE**
---|---|---|---|---|---
APOLLO 12 | ABBREVIATED TIMELINE (NOV 14) | OCTOBER 15, 1969 | 00:00 - 24:00 | 1/TLC | 5-1

**FLIGHT PLANNING BRANCH**
ABBREVIATED TIMELINE

CSM
P52-IMU REALIGN
OPTION 1

LM
POST EVA

REV 20

122:00

REV 21

124:00

REV 22

126:00

REV 23

128:00

REV 24

130:00

REV 25

132:00

CSM
EAT

REV 26

132:00

POST EVA

POST EVA

POST EVA

POST EVA

138:00

S-158 PHOTOS

P22-LDMK TRACK

COLLECT DOC

SURVEYOR SITE

ACTIVITIES

S-158 PHOTOS

P52-IMU REALIGN,
OPT 3

EAT

P22-LDMK TRACK

P52-IMU REALIGN,
OPT 3

SXT TRACK LM

P52-IMU REALIGN,
OPT 3

P20-RNDZ NAV
SXT & VHF TRACK

CSM
EAT

REV 27

134:00

REV 28

136:00

REV 29

138:00

REV 30

140:00

REV 31

142:00

REV 32

144:00

CSM
DON PLSS’S
CABIN DEPRESS
TV

P52-IMU REALIGN,
OPT 3

CABIN REPRESS
POST EVA
EQUIPMENT JETT

P57 - OPT 4, A/T-3
P22 - LS NAVIGATION

POWER UP LM
P57 - OPT 4, A/T-3
AGS LUNAR ALIGN

ASCERT 142:01

P52-IMU REALIGN,
OPT 3

CSU 142:58

LM PC 143:26
(NOM ZERO)

MISSION
APOLLO 12

EDITION
ABBREVIATED TIMELINE (NOV 14)

DATE
OCTOBER 15, 1969

TIME
120:00 - 144:00

DAY/REV
5-6/19-31

PAGE
5-6
ABBREVIATED TIMELINE

MISSION: APOLLO 12
EDITION: ABBREVIATED TIMELINE (NOV 14)
DATE: OCTOBER 15, 1969
TIME: 144:00 - 168:00
DAY/REV: 6-7/31-43
PAGE: 5-7

MSC Form 1057 OT (Mar 69)
FLIGHT PLANNING BRANCH
ABBREVIATED TIMELINE

168:00  
STEREO STRIP PHOTOS

170:00  
P52-IMU REALIGN, OPTION 1

172:00  
PREP FOR TEI

174:00  
P52-IMU REALIGN, GYRO TORQUE

176:00  
REST PERIOD (10 HR)

178:00  
PTC

180:00  
CSM

CSM

180:00

PTC

REST PERIOD (10 HR)

182:00

PTC

184:00

PTC (IF MCC-5 NOT PERFORMED)

186:00

MCC-5

187:21 (NOM ZERO)

188:00

P23 - CISLUNAR NAVIGATION (5 SETS)

190:00

EAT

192:00

EAT

192:00

MISSON | EDITION | DATE | TIME | DAY/REV | PAGE
---|---|---|---|---|---
APOLLO 12 | ABBREVIATED TIMELINE (NOV 14) | OCTOBER 15, 1969 | 168:00 - 192:00 | 7-8/43-TDC | 5-8

FLIGHT PLANNING BRANCH
**ABBREVIATED TIMELINE**

1022 CST

NOV 24

240:00

CSM

P52 - IMU REALIGN, OPTION 1

MCC-7 241:22 (NOM ZERO)

BEGIN ENTRY PREP

P52 - IMU REALIGN, OPTION 3

INITIALIZE EMS

SEPARATION CHECKLIST

CM/SM SEP

ENTRY INTERFACE 244:22

SPLASHDOWN 244:35

---

**MISSION** | **EDITION** | **DATE** | **TIME** | **DAY/REV** | **PAGE**
---|---|---|---|---|---
APOLLO 12 | ABBREVIATED TIMELINE (NOV 14) | OCTOBER 15, 1969 | 240:00 - 246:00 | 10/TEC | 5-11

**FLIGHT PLANNING BRANCH**
THIS PAGE INTENTIONALLY LEFT BLANK
# APOLLO 12 FLIGHT DATA FILE

## PHOTO PLAN

<table>
<thead>
<tr>
<th>TIME</th>
<th>ACTIVITY or TARGET</th>
<th>CAMERA CONFIGURATION CODE</th>
<th>MAGAZINE</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:20</td>
<td>Transposition/Docking</td>
<td>CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, .3 mag (5 MIN)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM2/EL/80/CEX - (f8,250,30) 10</td>
<td></td>
</tr>
<tr>
<td>4:15</td>
<td>LM Ejection</td>
<td>CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 12 fps, .7 mag (6 MIN)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM4/EL/80/CEX - (f8,250,30) 5</td>
<td></td>
</tr>
<tr>
<td>TLC</td>
<td>Earth Photography</td>
<td>CM_/EL/80 or 250/CEX-RING (f11,250,60)</td>
<td>30</td>
</tr>
<tr>
<td></td>
<td>Distant Moon</td>
<td>C_/EL/250 or 80/CEX or BW-RING (f5.6,250,60)</td>
<td>3/5</td>
</tr>
<tr>
<td>30:25</td>
<td>Hybrid Burn (MCC2) Crew Activities</td>
<td>CM/TV - IN (f5.6) 35 MIN</td>
<td></td>
</tr>
<tr>
<td>63:30</td>
<td>IVT Transfer</td>
<td>CM/TV - IN (f5.6) 50 MIN</td>
<td></td>
</tr>
<tr>
<td>81:30</td>
<td>Pre-LOI Lunar Surface</td>
<td>CM/TV - IN (f22) 20 MIN</td>
<td></td>
</tr>
<tr>
<td>84:00</td>
<td>Lunar Surface</td>
<td>CM/TV - IN (f22) 30 MIN</td>
<td></td>
</tr>
<tr>
<td>107:55</td>
<td>Undocking</td>
<td>CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, 1 mag (16 MIN)</td>
<td>B</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM2/EL/80/CEX - (f8,250,50) 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LM_/DAC/10/CEX-(f11,250,7) 6 fps .25 mag (4 MIN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM4/TV - IN BRKT (f22) 20 MIN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, 1 mag (16 MIN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM2/EL/80/CEX - (f8,250,50) 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LM_/DAC/10/CEX-(f11,250,7) 6 fps .25 mag (4 MIN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM4/TV - IN BRKT (f22) 20 MIN</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM2/DAC/18/CEX-BRKT,MIR (f8,250,7) 6 fps, 1 mag (16 MIN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM2/EL/80/CEX - (f8,250,50) 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>LM_/DAC/10/CEX-(f11,250,7) 6 fps .25 mag (4 MIN)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>CM4/TV - IN BRKT (f22) 20 MIN</td>
<td></td>
</tr>
<tr>
<td>Lunar</td>
<td>Targets of Opportunity Fra Mauro</td>
<td>CM/EL/80 or 250/CEX- (CC,250,60) 175</td>
<td></td>
</tr>
<tr>
<td>Orbit</td>
<td></td>
<td>CM/EL/b0/BW-(f2.8,250, ) 10</td>
<td></td>
</tr>
<tr>
<td>110:26</td>
<td>PDI + 6 MIN/Descent</td>
<td>LM3/DAC/10/CEX- (f2.8,500,30) 12 fps, .75 mag (6 MIN)</td>
<td></td>
</tr>
<tr>
<td>114:40</td>
<td>EVA 1</td>
<td>See Surface Photo and TV Timelines</td>
<td></td>
</tr>
<tr>
<td>133:17</td>
<td>EVA 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>134:10</td>
<td>Sextant Photography- Lamsberg Rev 26</td>
<td>CM/DAC/SEXT/CEX-((fixed,60, fixed) 1 fps (5 MIN)</td>
<td></td>
</tr>
<tr>
<td>135:19</td>
<td>Lunar Multispectral</td>
<td>Blu- CH3/LMC/80/MBW-IVL,47B FIL (*) fixed (150</td>
<td></td>
</tr>
<tr>
<td>137:25</td>
<td></td>
<td>Red-CH3/LMC/80/MBW-IVL,29+ FIL (*) fixed (150</td>
<td></td>
</tr>
<tr>
<td>137:47</td>
<td>North Wall of Theophilus</td>
<td>Grn-CH3/LMC/80/MBW-IVL,58 FIL (*) fixed (150</td>
<td></td>
</tr>
<tr>
<td>137:51</td>
<td>Descartes</td>
<td>Blk-CH3/LMC/80/1RBW-IVL,87C FIL (*) fixed (120</td>
<td></td>
</tr>
<tr>
<td>138:01</td>
<td>Fra Mauro</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**CAMERA CONFIGURATION CODE:**

- CM: Camera Mode
- DAC: Data Acquisition System
- CEX: Camera Exchange
- BRKT: Bracketed
- MIR: Mirror
- EL: Electronic
- TV: Television
- CC: Color Conversion
- BW: Black and White
- IVL: Image Verification Lab
- FIL: Film Type
- (+): Additional Information

**PHOTO PLAN:**

- CM/T: Camera Tool
- IN: Insert
- 5 MIN: Five Minutes
- 30 MIN: Thirty Minutes
- 50 MIN: Fifty Minutes
- 1 HR: One Hour
- 2 HR: Two Hours
- 5/5: Five/Five
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/BW-CIN- (f8,250,30) 10
CM/LC/60/HCIN-(f11,250,FOCUS) 5
CM4/TV-IN - BRKT (f22) 30 MIN

148:00 LM Jettison
Crew Option
CM2/DAC/18/CEX-BRKT,MIR (f8,250,7)
12 fps, .5 mag (4 MIN)
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
CM/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/TG - IN (f22) 20 MIN

TEC Distant Moon
Earth Photography
CM/EL/80 or 250/BW or CEX-RING
(f5.6,250,=) 5/5
CM/EL/80 or 250/CEX-RING (f11,250,=) 10

223:15 Earth, Interior
CM/TG - IN (f5.6/f22) 30 MIN

244:30 Reentry
CM/DAC/18/CEX-(f11,250,7) 12 fps, .5 mag (4 MIN) Fireball
- (f11,250,7) 12 fps, .5 mag (4 MIN) Chutes

Crew Crew/Spacecraft Compatibility
Option
Stowing/Unstowing Equipment (Aft bulkhead)
LM to CSM Crew Transfer
Donning/Doffing Spacesuit
Crew Option
Crew Observations
CM/EL/80 or 250/CEX - (Decal)
### Film Magazine Identification and Stowage

**16mm**

<table>
<thead>
<tr>
<th>MAGAZINES</th>
<th>STOWAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEX</td>
<td>X X X X X X X X X X</td>
</tr>
<tr>
<td>CIN</td>
<td># X</td>
</tr>
<tr>
<td>HCEX</td>
<td>X</td>
</tr>
<tr>
<td>BW 164</td>
<td>X X</td>
</tr>
<tr>
<td>TR</td>
<td>X X X X X X X X</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**70mm**

<table>
<thead>
<tr>
<th>MAGAZINES</th>
<th>STOWAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CEX</td>
<td>X X</td>
</tr>
<tr>
<td>HCEX</td>
<td>X X X X</td>
</tr>
<tr>
<td>BW</td>
<td>X X X X X</td>
</tr>
<tr>
<td>MBW</td>
<td>X X X X</td>
</tr>
<tr>
<td>HBW</td>
<td>X X X</td>
</tr>
<tr>
<td>IRBW</td>
<td>X</td>
</tr>
<tr>
<td>TR</td>
<td>X X X X X X</td>
</tr>
</tbody>
</table>

**TR** - Transfer and return
SECTION 6 - ALTERNATE MISSIONS
DISREGARD PREVIOUS
2 IMAGES
**ALTERNATE MISSION 1 SUMMARY FLIGHT PLAN**

**APOLLO 12**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>00:00</td>
<td>Launch</td>
<td>CSM launches from Launch Complex 39A at 00:00:00.</td>
</tr>
<tr>
<td>01:00</td>
<td>Crew Activation</td>
<td>Crew activates systems.</td>
</tr>
<tr>
<td>02:00</td>
<td>EVA 1</td>
<td>Astronauts perform EVA 1.</td>
</tr>
<tr>
<td>03:00</td>
<td>EVA 2</td>
<td>Astronauts perform EVA 2.</td>
</tr>
<tr>
<td>04:00</td>
<td>EVA 3</td>
<td>Astronauts perform EVA 3.</td>
</tr>
<tr>
<td>05:00</td>
<td>EVA 4</td>
<td>Astronauts perform EVA 4.</td>
</tr>
</tbody>
</table>

** NOTES:**
- **Launch:** CSM launches from Launch Complex 39A at 00:00:00.
- **Crew Activation:** Crew activates systems.
- **EVA 1:** Astronauts perform EVA 1.
- **EVA 2:** Astronauts perform EVA 2.
- **EVA 3:** Astronauts perform EVA 3.
- **EVA 4:** Astronauts perform EVA 4.

** ADJUSTMENTS:**
- If an event takes longer than expected, the schedule will be adjusted accordingly.
- All events are subject to change based on mission progress.
### APOLLO XII (CONRAD - RED VELCRO)

#### Check items eaten

<table>
<thead>
<tr>
<th>MEAL</th>
<th>Day 1*, 5**, 9</th>
<th>Day 2, 6, 10</th>
<th>Day 3, 7, 11</th>
<th>Day 4, 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Peaches</td>
<td>Apricots</td>
<td>Pears</td>
<td>Canadian Bacon</td>
</tr>
<tr>
<td></td>
<td>Corn Flakes</td>
<td>Sausage Patties</td>
<td>Corn Flakes</td>
<td>&amp; Applesauce</td>
</tr>
<tr>
<td></td>
<td>Bacon Squares (8)</td>
<td>Scrambled Eggs</td>
<td>Bacon Squares (8)</td>
<td>Scrambled Eggs</td>
</tr>
<tr>
<td></td>
<td>Orange Drink</td>
<td>Grapefruit Drink</td>
<td>Grape Drink</td>
<td>Cinnamon Bread (4)</td>
</tr>
<tr>
<td></td>
<td>Coffee w/Sugar</td>
<td>Coffee w/Sugar</td>
<td>Coffee w/Sugar</td>
<td>Orange-G.F. Drink</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Coffee w/Sugar</td>
</tr>
<tr>
<td>B</td>
<td>Tuna Salad</td>
<td>Turkey &amp; Gravy WP</td>
<td>Frankfurters WP</td>
<td>Shrimp Cocktail</td>
</tr>
<tr>
<td></td>
<td>Beef &amp; Gravy WP</td>
<td>Cheese Crackers (4)</td>
<td>Applesauce</td>
<td>Ham &amp; Potatoes WP</td>
</tr>
<tr>
<td></td>
<td>Jellied Candy</td>
<td>Chocolate Pudding</td>
<td>Chocolate Bar</td>
<td>Apricots</td>
</tr>
<tr>
<td></td>
<td>Grape Punch</td>
<td>Orange-G.F. Drink</td>
<td>P.A.-G.F. Drink</td>
<td>Chocolate Pudding</td>
</tr>
<tr>
<td>C</td>
<td>Cream of Chicken Soup</td>
<td>Pork &amp; Scalloped</td>
<td>Salmon Salad</td>
<td>Spaghetti w/Meat</td>
</tr>
<tr>
<td></td>
<td>Chicken &amp; Rice</td>
<td>Potatoes</td>
<td>Chicken Stew</td>
<td>Beef Stew</td>
</tr>
<tr>
<td></td>
<td>Sugar Cookies (4)</td>
<td>Bread Slice Sandwich</td>
<td>Butterscotch Pudding</td>
<td>Banana Pudding</td>
</tr>
<tr>
<td></td>
<td>Butterscotch Pudding</td>
<td>with Spread</td>
<td>Peachesc</td>
<td>Cocoa</td>
</tr>
<tr>
<td></td>
<td>P.A.-G.F. Drink</td>
<td>Jellied Candy</td>
<td>Grapefruit Drink</td>
<td>Grape Drink</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Cocoa</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Orange Drink</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Day 1 consists of Meal B and C only
**Day 5 consists of Meal A only
WP = Wet Pack
<table>
<thead>
<tr>
<th>MEAL</th>
<th>Day 1*, 5, 9</th>
<th>Day 2, 6, 10</th>
<th>Day 3, 7, 11</th>
<th>Day 4, 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Check items eaten</td>
<td>Check items eaten</td>
<td>Check items eaten</td>
<td>Check items eaten</td>
</tr>
<tr>
<td>Peaches Corn Flakes Bacon Squares (8) Orange Drink Coffee (black)</td>
<td>Apricots Scrambled Eggs Sausage Patties Grapefruit Drink Coffee (black)</td>
<td>Pears Corn Flakes Bacon Squares (8) Grape Drink Coffee (black)</td>
<td>Canadian Bacon &amp; Applesauce Strawberry Cubes (4) Scrambled Eggs Orange-G.F. Drink Coffee (black)</td>
<td></td>
</tr>
<tr>
<td>B Tuna Salad Beef &amp; Gravy WP Jellied Candy Grape Punch</td>
<td>Turkey &amp; Gravy WP Cheese Crackers (4) Chocolate Pudding Orange-G.F. Drink</td>
<td>Frankfurters WP Applesauce Chocolate Bar P.A.-G.F. Drink</td>
<td>Shrimp Cocktail Ham &amp; Potatoes Apricots Chocolate Pudding Orange Drink</td>
<td></td>
</tr>
<tr>
<td>(Day 5) Beef &amp; Potatoes WP</td>
<td>Pork &amp; Scalloped Potatoes Bread Slice Sandwich Spread WP Date Fruitcake (4) Cocoa Orange Drink</td>
<td>Salmon Salad Beef &amp; Gravy Butterscotch Pudding Peaches Grapefruit Drink</td>
<td>Spaghetti w/Meat Beef Stew Banana Pudding Cocoa Grape Drink</td>
<td></td>
</tr>
</tbody>
</table>

*Day 1 consists of Meal B and C only

WP = Wet Pack
## APOLLO XII (BEAN - BLUE VELCRO)

### Check items eaten

<table>
<thead>
<tr>
<th>MEAL</th>
<th>Day 1*, 5**, 9</th>
<th>Day 2, 6, 10</th>
<th>Day 3, 7, 11</th>
<th>Day 4, 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Peaches</td>
<td>Fruit Cocktail</td>
<td>Peaches</td>
<td>Fruit Cocktail</td>
</tr>
<tr>
<td></td>
<td>Corn Flakes</td>
<td>Corn Flakes</td>
<td>Corn Flakes</td>
<td>Corn Flakes</td>
</tr>
<tr>
<td></td>
<td>Canadian Bacon</td>
<td>Jellied Candy</td>
<td>Canadian Bacon</td>
<td>Jellied Candy</td>
</tr>
<tr>
<td></td>
<td>&amp; Applesauce</td>
<td>Grapefruit Drink</td>
<td>&amp; Applesauce</td>
<td>Cocoa</td>
</tr>
<tr>
<td></td>
<td>Cocoa</td>
<td>P.A.-G.F. Drink</td>
<td>Cocoa</td>
<td>Orange-G.F. Drink</td>
</tr>
<tr>
<td></td>
<td>Orange Drink</td>
<td></td>
<td>Orange Drink</td>
<td></td>
</tr>
</tbody>
</table>

| B    | Beef & Gravy WP | Cream of Chicken | Potato Soup | Cream of Chicken |
|      | Fruit Cocktail  | Soup            | Beef and Gravy Soup | Soup |
|      | Jellied Candy   | Turkey & Gravy WP | Jellied Candy | Chicken Stew |
|      | Grapefruit Drink| Peaches         | P.A.-G.F. Drink | Peaches |
|      |                | Orange-G.F. Drink |               | Chocolate Pudding |

| C    | Potato Soup     | Pork & Scalloped Potatoes | Chicken & Rice | Spaghetti w/Meat |
|      | Chicken & Rice  | Bread Slice | Fruit Cocktail | Banana Pudding |
|      | Spaghetti w/Meat | Sandwich Spread | Cinnamon Bread (4) | Cocoa |
|      | Butterscotch Pudding | Chocolate Pudding | Butterscotch Pudding | P.A.-G.F. Drink |
|      | Orange-C.F. Drink | Cocoa | Grapefruit Drink |               |
|      |                 | Orange Drink |               |               |

* Day 1 consists of Meal B and C only

**Day 5 consists of Meal A only

WP = Wet Pack
APOLLO XII/LM-6 MENU

CDR - Red Velcro
LMP - Blue Velcro

Day 1 Meal C
Cream of Chicken Soup
Ham Salad - Bread WP
Jellied Candy
Apricots
Grapefruit Drink
Pineapple-Grapefruit Drink

Day 2 Meal A
Peaches
Scrambled Eggs
Bacon Squares (8)
Cocoa
Orange Drink

Day 2 Meal B
Beef and Gravy WP
Pears
Butterscotch Pudding
Pineapple-Grapefruit Drink
Grapefruit Drink

Day 2 Meal C
Turkey and Gravy
Chicken Stew
Apricots
Jellied Candy
Orange-Grapefruit Drink

2 Spoons
WP = Wet Pack

Check Items Eaten

Day 2 Meal A
Peaches
Corn Flakes
Canadian Bacon & Applesauce
Cocoa
Orange Drink

Day 2 Meal B
Beef and Gravy WP
Butterscotch Pudding
Pineapple-Grapefruit Drink
Grapefruit Drink

Day 2 Meal C
Turkey and Gravy WP
Chicken Stew
Fruit Cocktail
Jellied Candy
Orange-Grapefruit Drink

MSC FORM 2208A (JUL 67)