NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 17

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FINAL

FLIGHT PLAN

PREPARED BY

FLIGHT PLANNING BRANCH
CREW PROCEDURES DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

OCTOBER 23, 1972

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APOLLO 17

FINAL

FLIGHT PLAN

OCTOBER 28, 1972

SUBMITTED BY:
T. W. HOLLOWAY
BOOK MANAGER

APPROVED BY:
JAMES W. BILODEAU, CHIEF
CREW PROCEDURES DIVISION

for
DONALD K. SLAYTON
DIRECTOR OF FLIGHT CREW OPERATIONS

CONCURRENCE:
OWEN MORRIS, MANAGER
APOLLO SPACECRAFT PROGRAM OFFICE

HOWARD W. TINDALL
DIRECTOR OF FLIGHT OPERATIONS

It is requested that any organization having comments, questions, or suggestions concerning this document contact T. W. Holloway, Flight Planning Branch, CG52, Building 4, room 230, telephone 483-4271.

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Principal Contributors

Wood Calvert
Richard Meckley
Billy Pinkston
Steve Pollock
Richard Rogers
Dennis Wammack
Chuck Stough
Leon Vick
William Wolf
Elvin Pippert
Tom Hanchett

Graphics and Copy Preparation Support

Andy Adams
Erin Applegate
Barbara Bolthouse
Mike Cox
Pat Dewey
Barbara Forse
Evelyn Franks
Netha Mayberry
Christine Rizzo
Lela Stewart
James Wilkinson
Marcy Kennedy
Margaret Jones
Gary Green

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Consumable Analysis data were prepared by the Consumables Analysis Section of the Mission Planning and Analysis Division.

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DETAILED TIMELINE TABLES

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ABB	abbreviation or abbreviated
AC	alternating current
ACCEL	accelerometer
ACN	Ascension
ACT	activation
ACQ	acquisition or acquire
ADAPT	adapter
AEA	abort electronics assembly
AGS	abort guidance subsystem
AH	ampere hours
ALSCC	Apollo lunar surface close-up camera
ALSD	Apollo lunar surface drill
ALSEP	Apollo lunar surface experiment package
ALT	altitude
ALTM	altimeter
AM	amplitude modulation
AMP or amp	amperes
AMPL	amplifier
ANG	Antigua
ANT	antenna
AOH	Apollo Operations Handbook
AOL	Atlantic Ocean line
AOS	acquisition of signal or acquisition of site
AOT	alignment optical telescope
AP	alpha particle spectrometer
APS	ascent propulsion subsystem
ARIA	Apollo range instrumentation aircraft
ARS	atmosphere revitalization system
ASC	ascent
A/T	alignment technique
ATT	attitude
AUX	auxiliary
AZ	azimuth
BAT	battery
BEF	blunt end forward
BD	band
BDA	Bermuda
BIOMED	bio-medical data
BKWD	backward
BMAG	body mounted attitude gyro
BP	barber pole
BRKT	bracket
BSLSS	buddy secondary life support system
BT	burn time
BU	backup
BUSS	biomedical urine sampling system

B/W	black and white (Film 3400)
BW1	black and white (Film 3401)
CAP COM	capsule communicator
CAL	calibration
CAMR or CAM	camera
CARR	carrier
CB or cb	circuit breaker
CCGE	cold cathode gage experiment
CCIG	cold cathode ion gage
CCU	comm carrier umbilical
CCW	counter clockwise
CDH	constant delta altitude
CDR	Commander
CDU	coupling data unit
CEX	color exterior (SO-368)
CIN	color interior (SO-168)
CIRC	circulation
CK	check
CKT	circuit
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 or compensate
CONT	continue or contingency
CP	control point
CPLEE	charged particle lunar environment experiment
CRO	Carnarvon, Australia
CRYO	cryogenic
CS	contingency sample
CSI	coelliptic sequence initiation
CSM	command and service modules
CST	central standard time
CSVC	core sample vacuum container
C/S	central station
CTR	center
C&WS	caution and warning system
CW	clockwise
CWEA	caution and warning electronics assembly

CWG	constant wear garment
CYI	Grand Canary Island
DAC	data acquisition camera
DAP	digital auto pilot
DB	deadband
DC	direct current or data camera (70mm)
DC5	500mm data camera/lens
DCA	digital command assembly
DCC	commander's data camera
DCL	Lunar Module Pilot's data camera
DECON	decontamination
DEDA	data entry and display assembly
DEG	degrees
DEPL	depletion
DES	descent
DET	digital event timer
DIFF	difference
DIR	direct
DK	docked
DO	detailed objective
DOI	descent orbit insertion
DPLY	deployment
DPS	descent propulsion system
DR	door
DRT	dome removal tool
DS	documented sample
DSCRM	discriminator
DSE	data storage equipment(CSM)
DSEA	data storage equipment assembly (LM)
DSKY	display and keyboard
DSM	deep space measurement
DTO	detailed test objective
DUA	digital uplink assembly
DWN	down
E	erasable or enter
ECS	environmental control system
ED	explosive device
EDT	eastern daylight time
EFH	earth far horizon
EI	earth (atmosphere) interface and entry interface
EKG	electrocardiogram
EL	electric Hasselblad camera
ELECT	electrical
ELEV	elevation

EMER	emergency
EMS	entry monitor system
EMU	extravehicular mobility unit
ENG	engine
ENH	earth near horizon
ENT	entry
E.O.	earth orbit
EOM	end of mission
EPO	earth parking orbit
EPHEM	Ephemeris
EPS	electrical power subsystem
EQUIP	equipment
ERECT	erectable
ERR	error
EST	eastern standard time
ETB	equipment transfer bag
EV	extravehicular
EVA	extravehicular activity
EVAP	evaporator
EVCS	extravehicular communications system
EVT	extravehicular transfer
EXP	experiment
EXT	external
EXTD	extend
f	f-stop
FAM	familiarize or familiarization
FC	fuel cell
FCS	fecal containment system
FDAI	flight director attitude indicator
FLT	flight
FM	frequency modulated
FOV	field of view
FPS	feet per second
fps	frames per second
FR	frame(s)
FREQ	frequency
FT or ft	feet
FTO	flight test objective
FTP	full throttle position
FTT	fuel tranfer tool
FWD	forward
G.A.	gas analysis
GA	gimbal angle
GAL	galactic

GBI	Grand Bahama Islands
GBM	Grand Bahama (STDN)
GDC	gyro display coupler
GDS	Goldstone, California
GET	ground elapsed time
GETI	ground elapsed time of ignition
GETIL	ground elapsed time of landing for TIG time of abort burn
GLY	glycol
GMT	Greenwich mean time
G&C	guidance and control
G&N	guidance and navigation
GNCS	guidance, navigation and control system (CSM)
GR	gamma ray spectrometer
GWM	Guam
GYM	Guaymas, Mexico
H_2	hydrogen
HA	apogee altitude
HAW	Hawaii
HBR	high bit rate (TLM)
HBW	high speed black and white film
HD	highly desirable
HDC	hasselblad data camera
HFE	heat flow experiment
HGA	high-gain antenna
HI	high (switch position)
HOR	horizon
H_2O	water
HP	perigee altitude
HR	hour(s)
HSB	helmet stowage bag
HSK	Honeysuckle (Canberra, Australia)
HTC	hand tool carrier
HTR	heater
HTV	USNS Huntsville
ICDU	inertial coupling data unit
ID	identification
ICG	inflight coverall garment
ICS	intercomm system
IGA	inner gimbal angle
IGN	ignition
IMC	image motion compensation
IMU	inertial measurement unit
INCR	increase
IND	indicator

INIT	initialization
INT	interval
IP	initial point
ISA	interim stowage assembly
ISS	interim stowage shelf
IU	instrumentation unit
IVC	intervehicular communications
IVL	intervalometer
IVT	intravehicular transfer
iR	inclination of the ascending return
IR	infrared scanning radiometer
JETT	jettison
KG	kilogram
KM	kilometer
kwh	kilowatt hour
LA	launch azimuth or laser altimeter
LACE	lunar atmospheric composition experiment
LAT	latitude
LBR	low bit rate (TLM)
LB or lb	pound(s)
LCG	liquid cooled garment
LCRU	lunar communications relay unit
L/D	lift/drag
LD	lunar day (TV lens)
LDG	landing
LDMK	landmark
LEAM	lunar ejecta & meteorite (experiment)
LEB	lower equipment bay
LEC	lunar equipment conveyor
LEVA	lunar extravehicular visor assembly
LFH	lunar far horizon
LGC	LM guidance computer
LH	left-hand
L/H	local horizontal
LHEB	left-hand equipment bay
LHFEB	left-hand forward equipment bay
LHSSC	left-hand side storage container
LiOH	lithium hydroxide
LLM	lunar landing mission
LLOS	landmark line of sight
LM	lunar module
LMP	Lunar Module Pilot
LMS	lunar mass spectrometer

LNH	lunar near horizon
L/O	lift-off
LOD	lunar orbit docked
LOI	lunar orbit insertion
LONG	longitude
LOS	loss of signal or loss of site
LPD	landing point designator
LPO	lunar parking orbit
LPM	lunar portable magnetometer
LR	landing radar
LRRR or LR3	laser ranging retro-reflector
LRV	lunar roving vehicle
L/S or LS	landing site or lunar surface
LS	lunar sounder
LSG	lunar surface gravimeter
LSM	lunar surface magnetometer
LSPE	lunar seismic profile experiment
LT	light
LTG	lighting
LUB	lubrication
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
MBW	medium black and white film
MC	mapping camera
MCC	midcourse correction
MCC-H	Mission Control Center - Houston
MDC	main display console
MEAS	measurement
MED	medical
MEED	microbial ecology evaluation device
MESA	modular experiment stowage assembly
MET	mission event timer
MGA	middle gimbal angle
M/I	minimum impulse
MIN	minimum or minutes(s)
MIR	mirror
MLA	Merrit Island, Florida, launch area
mm or MM	millimeter

MNA or MNB	main electrical bus A or B
MNVR	maneuver
MON	monitor
MONO	monaural
MPL	mid-Pacific line
MPS	main propulsion system
M/R	mixture ratio (fuel to oxidizer)
MS	mass spectrometer
MSFN	Manned Space Flight Network
MSO	mass spectrometer outgasing
MTN	motion
MTVC	manual thrust vector control
MULT	multiplier
N_2	nitrogen
NAV	navigation
NEG	negative
NK	Nikon camera
NM	nautical miles
NO.	number
NOM	nominal
NXX	Noun XX
O_2	oxygen
OBS	observation
O/F	oxidizer to fuel ratio
OGA	outer gimbal angle
OID	octal identifier
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
PAN	panoramic
PART	particle
PCM	pulse code modulation
PC	plane change or chamber pressure
PDI	powered descent initiation

PER	Pericynthion
PGA	pressure garment assembly
PGNCS	primary guidance, navigation and control system (LM)
PGNS	primary guidance navigation system (LM)
PHOTO	photograph
PIPA	pulse integrating pendulous accelerometer
PKG	package
PKS	Parks, Australia
PLSS	portable life support system
PM	phase modulated
POL	polarity or polarizing
POS	positive
PRD	personal radiation dosimeter
PRO	proceed
PREF	preferred
PREP	preparation
PRESS	pressure
PRIM	primary
PROP	proportional
PRN	pseudo random noise
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
PTT	push to talk
PU	propellant utilization
PUGS	propellant utilization gaging system
PWR	power
PXX	Program XX
PYRO	pyrotechnic
QTY	quantity
QUAD	quadrant
R	roll or range
R&B	red and blue
RAD	radiator, radial, or radiation
RCDR	recorder
RCS	reaction control system
RCU	remote control unit
RCVR	receiver
REACQ	reacquire
REFSMMAT	reference stable member matrix

REG	regulator
REL	release
REQD	required
RETR	retract
REV	revolution
RH	right-hand
RHC	rotational hand controller
RING	ringsight
RLS	radius of landing site
RMT	remote
RNDZ	rendezvous
RNG	range or ranging
ROD	rate of descent
RR	rendezvous radar
RSI	roll stability indicator
RSLV	resolver
RT	realtime
RTC	realtime command
RTG	radioisotope thermoelectric generator
RXX	Routine XX
SA	shaft angle
SATT	satellite
S-BD	S-BAND
SC	spacecraft
SCE	signal conditioning equipment
SCS	stabilization control system
SCT	scanning telescope
SE	southeast or subearth
SEC	secondary
SECO	S-IVB engine cutoff
SECS	sequential events control system
SEF	sharp end forward
SEL	select
SEP	separate
SEQ	sequence
SEVA	standup extravehicular activity
SIDE	suprathermal ion detector experiment
SII	Saturn II (second stage)
SIM	scientific instrument module
S-IVB	Saturn IVB(third stage)
SLA	service module LM adapter
SLOS	star line-of-sight
SM	service module
SPECT	spectrometer
SPOT	spot meter

SPS	service propulsion system
SR	sunrise
SRC	sample return container
SRX	S-Band receiver mode no. X
SS	sunset or subsolar
STBY	standby
STDN	Spaceflight Tracking and Data Network (formerly MSFN)
STX	S-Band transmit mode no. X
SUBSAT	subsatellite
S.V.	state vector
SW	switch
SWC	solar wind composition
SWE	solar wind experiment
SXT	sextant
SYS	system
T EPHEM	time of Ephemeris update
TA	trunnion angle
TAN	Tananarive, Madagascar
TB	time base or talkback
TCA	time of closest approach
TD	touchdown
T&D	transposition and docking
TD&E	transposition docking and LM ejection
TDS	thermal degradation sample
TEC	transearth coast
TECH	technique
TEI	transearth injection
TEMP	temperature or temporary
TERM	terminate
TEX	Corpus Christi, Texas
TGE	traverse gravimeter experiment
TGT	target
THC	translation hand controller
TIG	time of ignition
TK	tank
TLC	translunar coast
TLI	translunar injection
TLM or TM	telemetry
TPF	terminal phase final
TPI	terminal phase initiation
TPM	terminal phase midcourse
T/R	transmitter/receiver
TRANS	translation
TRK	track or tracking
TRUN	trunnion

TSB	temporary stowage bag
TV	television
TVC	thrust vector control
TWR	tower
UCTA	urine collection transfer assembly
UHT	universal hand tool
ULL	ullage
UMB	umbilical
UNBAL	unbalance (meter)
UNDK	undock
US	United States
UV	ultraviolet spectrometer
V	velocity
VG_{IMU}	velocity to be gained as related to IMU orientation
VGX	velocity to be gained (X-body axis)
VGY	velocity to be gained (Y-body axis)
VGZ	velocity to be gained (Z-body axis)
VR	resultant velocity
VX	velocity along the X-axis
VY	velocity along the Y-axis
VZ	velocity along the Z-axis
VAN	USNS Vanguard
VHBW	very high speed black and white film (2485)
VHF	very high frequency
VLV	valve
VOX	voice keying
VXX	Verb XX
W	Watts
WRT	with respect to
X	time of closest approach (symbol)
XDOT	rate of change along the X-axis
XFER	transfer
XMIT	transmit or transmitter
XPNDER XPNDR	transponder
Y	yaw
YDOT	rate of change along the Y-axis
ZDOT	rate of change along the Z-axis
ZPN	impedance pneumogram

ΔAz	azimuth change (difference)
ΔH	altitude change (difference)
ΔP	pressure change (difference)
ΔR	position change (difference)
ΔV	velocity change (difference)
ΔVC	velocity change at engine cutoff
ΔVT	velocity change loaded pre-burn
#	numbers
ϕ	latitude
λ	longitude

PHOTOGRAPHIC NOMENCLATURE

AAA/BBB/CCC/DDD - EEE, EEE, (fGG, HHH, III) JJ fps or JJ FR (KK% MAG)

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.)

fGG - Lens Aperture Setting

HHH - Shutter Speed

III - Focus Distance in Feet

JJ - Number of frames for DC, EL & NK cameras
JJ - Frame Rate for the DAC only

KK - Magazine percent for the DAC only

CODE EXAMPLE:

1. CM4/DAC/18/CEX-BRKT, SPOT (S,1/250,∞) 12 fps (50% MAG)

Meaning: Photos are taken from CM right hand rendezvous window using the DAC with 18mm lens and SO368 film. The camera will be bracket mounted with the following camera settings: f-stop from spotmeter reading, shutter speed 1/250 of a second, focus at infinity, 12 frames per second, 50% MAG.

2. CM4/EL/80/BW-BRKT, IVL 8 (f5.6,1/250,∞) 10 FR

Meaning: Photos are taken from CM right hand rendezvous window using the Electric Hasselblad camera with the 80mm lens and black & white film (3400). The camera will be bracket mounted with the following settings: f-stop (aperture) f5.6, shutter speed 1/250, and focus at infinity. The operation of the shutter will be controlled by the intervalometer; IVL 8 representing 8 sec between frames and IVL 20 representing 20 sec between frames. Ten frames have been allotted for this sequence.

CAMERA LOCATIONS

COMMAND MODULE

CM-1	LH Side Window
CM-2	LH Rendezvous Window
CM-3	Hatch Window
CM-4	RH Rendezvous Window
CM-5	RH Side Window

LUNAR MODULE

LM-1	LH Window
LM-2	Docking Window
LM-3	RH Window

CAMERA MOUNTS

CSM

Electric Hasselblad (EL) +X axis +12° (in X-Z plane)

Electric Hasselblad (EL) normal to RH Side Window

Data Acquisition Camera (DAC) with right angle mirror +X axis

Data Acquisition Camera (DAC) with SXT Adapter - same as SXT shaft & trunnion.

Data Acquisition Camera (DAC) with right angle mirror rotated 180° looking aft out RH side window.

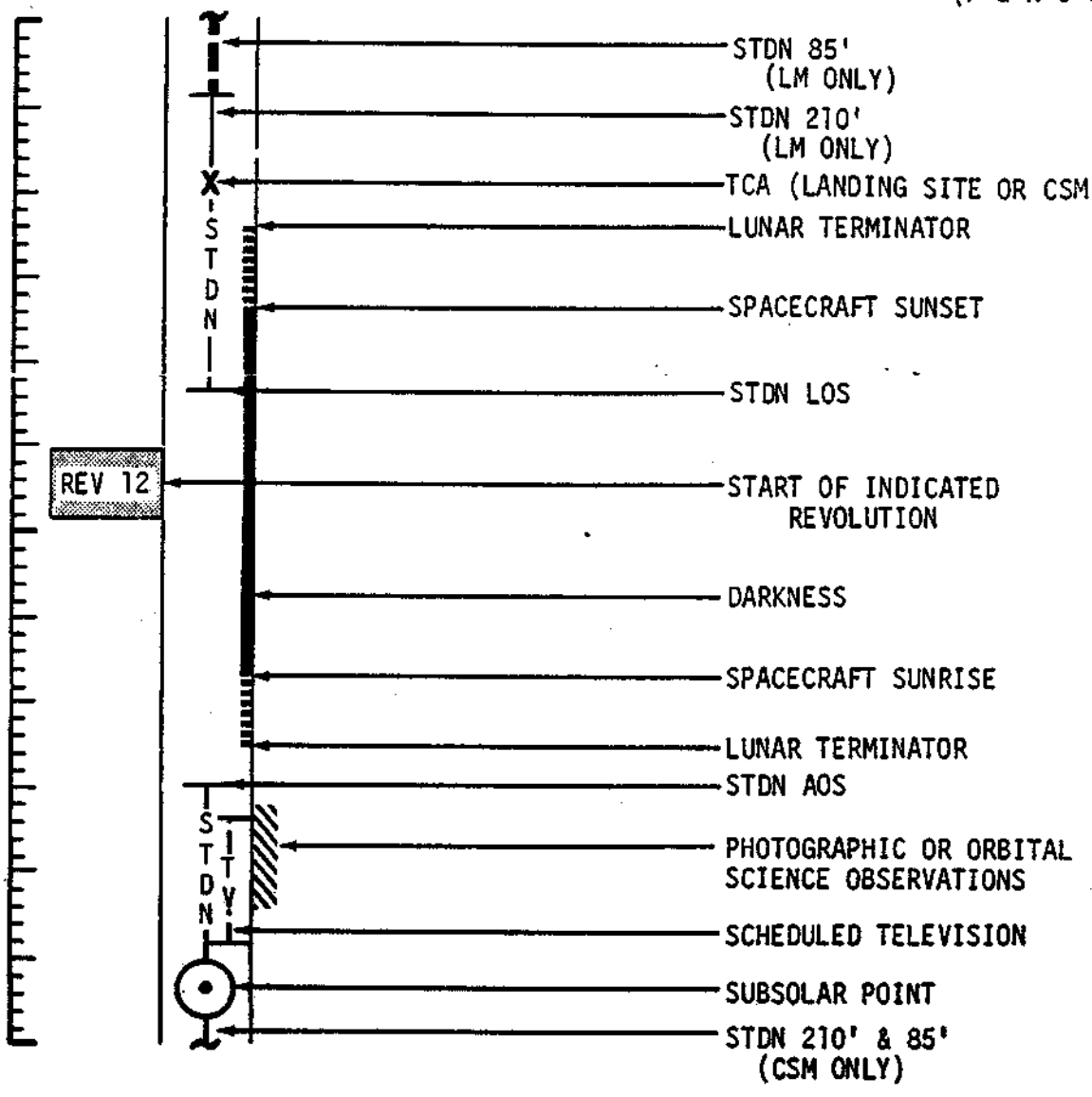
NIKON (NK) Two positions

parallel to +X axis

+X axis +30° (in X-Z plane)

SYMBOL NOMENCLATURE

SIM EXP STATUS
(A B C D E)
(F G H I J)



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SCIENTIFIC INSTRUMENT MODULE
EXPERIMENT STATUS CODE

L1	SIM ATT A	MAP CAM COVER/POS B	LS HF ANT C	IR COVER D	UV COVER E
	+ +X FWD - -X FWD * NON SIM	0 CLOSED 1 OPEN/EXTD 2 OPEN/RETR	0 RETR 1 EXTD	0 CLOSED 1 OPEN	0 CLOSED 1 OPEN
L2	PAN CAM F	MAP CAM/ LASER ALTM G	LS H	IR I	UV J
	0 OFF/STBY 1 PWR/STBY 2 PWR/OPERATE 3 BOOST/STBY	0 OFF/OFF 1 STBY/OFF 2 ON/ON 3 STBY/ON 4 ON/OFF 5 ON(IMC-OFF) /OFF	0 OFF 1 HF MODE 2 VHF MODE 3 RECV ONLY 4 STBY	0 OFF 1 ON	0 OFF 1 ON

USUAL CONFIGURATIONS

PRE - SPS BURN PREP (*0000) (31000) or (31011)

SLEEP (±0011) (01011) or (±0111)

MIN POWER (0000) (00000)

SIM BAY SECURE (Dumps, Thermal, Thrusters) (0000) (01011) or (0001)

SECTION 1 - FLIGHT PLAN NOTES

FLIGHT PLAN NOTES

I. Crew

A. Crew designations are as follows:

Designation	Prime	Backup
Commander (CDR)	Cernan	Young
Command Module Pilot (CMP)	Evans	Roosa
Lunar Module Pilot (LMP)	Schmitt	Duke

B. The nominal CM couch positions are:

Activity	Left	Center	Right
Launch thru TLI	CDR	CMP	LMP
T&D thru Entry	CMP	CDR	LMP

C. The PGA's are worn as shown in Table 2-1.

D. The crew biomedical harness and sensor wearing schedule is shown in Table 2-2.

E. A crew status report for each crewman is voiced to MCC-H after each crew sleep period.

F. Negative reporting is used in reporting completion of each checklist.

G. All onboard gauge readings are read directly from the gauges with no calibration bias applied.

II. CSM Systems

A. Communications

1. The preferred S-Band communication modes are:
   (a) Uplink Mode 6 (Voice, PRN, and Updata)
   (b) Downlink Mode 2 (Voice, PRN, TLM-HBR)

2. VHF Duplex B is used for launch, and Simplex A is used for earth-orbit operations.

3. Table 2-3 summarizes the STDN coverage available for the CSM.

4. Table 2-4 contains a summary of the scheduled CSM & LM TV transmissions.

5. MCC-H switches OMNI antennas during TLC PTC periods, OMNI and HGA during TEC PTC periods. The crew manages antenna operations during all other TLC and TEC periods.

6. The HGA will be managed by the crew and MCC-H in order to minimize SIM bay experiment data loss at AOS and LOS while in lunar orbit during awake periods.

B. DSE

1. During the earth-orbit phase, the CSM LBR data is recorded when the CSM is not within STDN coverage. The DSE is dumped during the pass over the US prior to TLI.

2. CSM LBR data will be recorded during all P24 landmark tracking.

3. CSM HBR will be recorded during Launch, TLI, SIVB/CSM SEP, TD&E, all CSM SPS maneuvers (except LOPC), Sim Door Jettison, docking, undocking, and LM Final Separation.

4. LM LBR data will be recorded during STDN LOS periods between LM comm activation and PDI.

5. All entry data will be recorded in HBR during the blackout.

6. Lunar Sounder data will be managed per Table 2-15.

C. Electrical Power

1. The CSM normally remains powered up throughout the mission.

2. Table 2-5 lists the fuel cell purges.

3. Based on cryo purity and performance, the time between fuel cell O_2 purges may be increased to coincide with water dump times. The first O_2 purge allows a judgement to be made on the defined purge schedule.

4. The cryogenic heaters are managed such that the planned usage is obtained out of each O_2 tank. The H_2 fans are cycled prior to each sleep period.

5. Table 2-6 contains the battery charge schedule.

D. ECS and Water Management

1. Potable water is chlorinated once a day after the eat period prior to each sleep period.

2. Waste water dump, fuel cell purge, and urine collection scheduling criteria:
   (a) Table 2-5 contains the scheduled fuel cell purges, urine dumps and waste water dumps

      (1) Approximately once during each 24 hours following the initial dump and purge when three crewmen are in the CSM. Reduce interval to 22 hours when one crewman is in the CSM.

      (2) H_2 fuel cell purges are scheduled at every other O_2 fuel cell purge after the first O_2 fuel cell purge

   (b) The most opportune times to perform waste water dumps and fuel cell purges are as follows:

      (1) Immediately after the sextant star check in maneuver preparation or cislunar navigation

(2) Behind the moon, with completion of dump or purge before AOS

(3) At least three hours prior to SIM Bay photography and laser altimeter operation

(c) If possible, dumps and purges are not scheduled during the following periods, except just prior to the burn.

(1) Ten hours before MCC-2

(2) Eight hours before MCC-5

(d) Dumps and purges are not scheduled during the following STDN tracking periods:

(1) Between MCC-4 and LOI

(2) Ten hours before MCC-7 until entry, except urine is dumped just prior to MCC-7.

(e) All waste water dumps are manual.

3. Only one CO_2 absorber filter (LiOH canister) is changed at a time. Table 2-7 lists the LiOH canister change schedule. There are 26 filters on board.

4. At lift-off, the cabin contains 60% O_2 and 40% N_2. The CM is purged after launch. The purge is terminated prior to LM pressurization after TLI. After the LM is configured for ejection, it is isolated and the CM is purged for eight more hours. The purge is stopped for a sleep period and reinitiated after sleep.

5. CSM O_2 pressurizes the LM after transposition and docking; and repressurizes the LM before TLC LM entry(s), MCC-4 and LM activation.

E. Guidance and Navigation

1. REFSMMAT Definitions

(a) The "Launch Pad" REFSMMAT is used for launch, TLI, and TD&E. This REFSMMAT places the IMU X-axis along the launch azimuth at the pad and the Z-axis along the negative radius vector.

(b) The "PTC" REFSMMAT is used for all midcourse maneuvers (except MCC-7) and for other operations during TLC and TEC. This REFSMMAT places the X-axis in the ecliptic plane and perpendicular to the earth-moon line projection in the ecliptic plane at the average time of transearth injection for the monthly launch window and azimuth range. The Z-axis is perpendicular to the ecliptic and directed south. At the beginning of the PTC Mode the spacecraft maneuvers to an FDAI display of pitch 90° or 270°.

(c) A "Preferred" REFSMMAT is used by the CSM for LOI, Lunar-Orbit Plane Change, and TEI. The CSM IMU X-axis aligns normally with the spacecraft X-body axis (except LOPC) at the vehicle attitude for ignition with the thrust directed through the center of gravity. At burn ignition, the FDAI displays roll 0°, pitch 0°, and yaw 0°, except roll 180° for TEI. A yaw of 315° is used for LOPC, which places the X-axis 45° from the IMU X-axis.

(d) The "Landing Site" REFSMMAT is used for DOI, PDI, landing, and CSM lunar orbit activities up to the first plane change. This REFSMMAT places the CSM and LM IMU X-axis along the positive lunar radius vector at the landing site at the predicted landing time and places the Z-axis in the direction of flight parallel to the CSM orbital plane. At nominal touchdown, the LM FDAI displays roll 0°, pitch 0°, and yaw 0°.

(e) The "Lift-Off" REFSMMAT is used for all lunar activities after Plane Change, until transearth injection. This REFSMMAT places the CSM and LM IMU X-axis along the positive lunar radius vector at the landing site at predicted lift-off time, with the Z-axis down range parallel to the CSM orbital plane. At nominal lift-off time, the LM FDAI displays roll 0°, pitch 0°, and yaw 0° with slight differences reflecting actual touchdown yaw and slope tilt angles.

(f) The "Entry" REFSMMAT aligns the IMU X-axis in the local horizontal plane in the direction of flight at entry interface. The entry REFSMMAT is used for MCC-7 and all remaining activities. The Z-axis is down along the negative radius at entry interface. At entry interface, with wings level, local horizontal, heat shield forward inplane, lift up, heads down, the FDAI displays roll 0°, pitch 180°, and yaw 0°.

2. The CSM external lighting is operated during the rendezvous from lift-off to docking. The running lights only are on from CSM/LM separation through PDI.

3. The time tags on attitude maneuvers in Section 3 indicate the be-there-by time unless otherwise stated. All maneuver angles are the angles read on the FDAI after the maneuver has been completed.

4. CSM/LM and CSM attitude maneuvers are normally performed at the rate of 0.2°/sec unless other rates are required. LM maneuvers are normally performed at 2°/sec unless otherwise specified.

5. The SIM Bay RCS configuration provides single jet control authority in each axis to eliminate contamination of the SIM experiments. Table 2-8 identifies the periods when the CSM RCS is in an uncoupled configuration.

6. Undocking is done radially, CSM below, using the soft undocking procedure. The probe is extended its full length with the LM held on by the capture latches. When the rates are nulled, the CSM releases the LM. The separation maneuver is then performed immediately.

7. LM jettison is done radially, CSM below, with final sep pyros providing approximately 0.4 foot per second radial thrust. The separation burn is performed five minutes after jettison, providing 2 foot per second posigrade thrust.

8. The standard register load for nouns 78 and 70 for SIM bay experiment pointing using the Universal Tracking Program P20, option 5 is:

N78 (+090.00)
(+052.25)
(+180.00) +X-axis forward
or (+000.00) -X-axis forward
N70 (00050)

9. The SC RCS configuration and maneuver control is shown as a DAP LOAD code in the time column where applicable in Section 3. During passive thermal control the code is shown as a note indicating the status of the DAP.

F. Propulsion Systems

1. In order to conserve SM RCS, the SPS engine is used to "back-up" all LM rendezvous burns requiring a ΔV greater than 12 FPS. The SPS gimbal motors are not turned on during the normal maneuver preparation.

2. The SPS always is started using a single bank, however, the other bank will be opened 2 to 5 seconds after ignition for burns longer than 10 seconds. DOI will be performed on a single bank.

3. Table 2-9 lists the CSM propulsion burns.

G. Scientific Instruments Module

1. The panoramic and mapping cameras will be placed in the boost and standby modes, respectively, during launch through TD&E, rendezvous, and all SPS thrusting maneuvers.

2. The following switches may be left in their command position between uses in order to keep track of SIM Bay experiment status:

   a) Mapping Camera Track
   b) Mapping Camera/Laser Cover
   c) IR Cover
   d) UV Cover

   The logic power will be in the OFF (center) position during SPS burns and all other events that may induce vibration or shock, i.e., undocking and rendezvous through LM jettison.

3. The SIM experiment status will be indicated in the upper righthand corner of each page, or half page in the CSM flight plan, of Section 3. The first line will indicate the CSM attitude and experiments positions at the beginning of each hour or half-hour as applicable. The second line indicates the experiments' functional modes as previously set up. Page xxv defines the SIM experiment position and mode status code.

III. LM Systems

A. Communications

1. The preferred S-Band communications are:
(a) Uplink Mode 7 (Voice, Updata)
(b) Downlink Mode 2 (Voice, TLM-HBR, PRN, BIOMED)

2. The LM DSEA schedule is shown in Table 2-10.

B. ECS

1. The LM contains ambient air at lift-off. During launch the pressure bleeds to zero psia. CSM O_2 pressurizes the LM after T&D. The LM is isolated after T&D and after each entry and allowed to bleed down via leakage. Before the first entry into the LM, the LM is vented to at least 2.7 PSID and repressurized with CSM O_2 in order to enrich the LM atmosphere. CSM O_2 is used to repressurize the LM for the second and third entries.

2. LM O_2 is used to pressurize the LM five times; after EVA-1, EVA-2, EVA-3, and two equipment jettison periods.

3. Table 2-7 lists the LiOH canister change schedule.

C. Guidance Systems

1. The LGC and CMC use the same landing site and lift-off REFSMMATS.

2. The AGS is placed in standby after the "GO" is given for lunar stay for T3.

3. The IMU platform is oriented so that all PIPA output axes are normal to the gravity vector, then powered down and the LGC placed in standby approximately 1 hour after TD until approximately 5 hours prior to lift-off. The LGC is placed in OPERATE several times to update the computer clock.

4. To prevent overheating of the antenna, the rendezvous radar is pointed away from the sun and turned off when no functional use is required.

5. The LM tracking light is operated continuously during rendezvous.

D. Propulsion Systems

1. The APS/RCS interconnect is used during the lunar lift-off and ascent only.

2. Table 2-11 lists the LM propulsion burns.

E. Electrical Power System

1. The LM is powered down to a minimum level to conserve battery consumables on the lunar surface from PDI +1:00 to lift-off -5:00 hours.

2. LM battery management is scheduled on the lunar surface to equalize the usage of the five descent stage batteries. Table 2-6 contains the LM battery management schedule.

IV. Procedures

A. CSM - Crew procedures called out in the flight plan may be found in the referenced crew checklist.

B. LM - Crew procedures called out in the flight plan may be found in the referenced crew checklist.

V. Synchronization of Ground Elapsed Time (GET)

The realtime GET is synchronized with the Flight Plan GET. In TLC, the GET is synchronized at 67:30 if the time propagated ahead to start of Rev 2 is more than ±1 minute from the flight plan GET. In lunar orbit the GET is synchronized at 95:40 and at 209:40 if the time propagated ahead to start of Rev 26 and Rev 66 respectively is more than ±2 minutes from the flight plan GET. The synchronization is performed by a V70 uplink from the ground followed by the crew synchronizing the mission timer to the CMC clock.

VI. Miscellaneous

A. Table 2-12 contains a schedule of the return to earth block data updates.

B. Table 2-13 is the landmark tracking and landing site data.

C. Table 2-14 contains the cryo management schedule.

D. Table 2-15 contains the Lunar Sounder Schedule.

E. Table 2-16 contains the Apollo 17 Film Budget.

F. Table 2-17 contains MC, LA and PC schedules.

G. Charts 2-1,2,3,4 & 5 identify principal LUNAR SOUNDER Rev activities.

SECTION 2 - CHARTS & TABLES

TABLE 2-1
(12/6)

SUIT WEARING SCHEDULE

ACTIVITY	PRESSURIZED (HARD SUIT)	SUITED (SOFT SUIT)	PARTIAL SUIT WITHOUT HELMET & GLOVES	SHIRTSLEEVES (ICG)
LAUNCH		ALL		
EARTH ORBIT THRU S-IVB EVASIVE MNVR			ALL	
TLC & TEC EXCEPT TEC EVA				ALL
PGA TEST			ALL	
LM ACTIVATION			ALL	
UNDOCKING		CDR & LMP	CMP*	
UNDOCK +5 MIN THRU CIRC			ALL	
PDI thru TD		CDR & LMP	CMP	
LUNAR STAY EXCEPT EVA				ALL
LUNAR SURFACE EVA'S & EQUIP JETT	CDR & LMP			CMP
LIFT-OFF PREP			ALL	
LIFT-OFF THRU DOCKING		CDR & LMP	CMP	
DOCKING TO LM JETT			ALL	
LM JETT		ALL		
POST LM JETT THRU TEI				ALL
TEC EVA	ALL			
ENTRY				ALL

*CMP DON HELMET & GLOVES FOR DOCKING LATCHES RELEASE.

TABLE 2-2
(12/6)

CREW BIOMED HARNESS WEARING SCHEDULE*

GET (HR:MIN)	CDR	CMP	LMP
LAUNCH	ON	ON	ON
05:50		OFF	OFF
19:00	OFF		ON
36:00		ON	OFF
47:00	ON	OFF	
59:00	OFF		ON
69:35		ON	OFF
85:10	ON	OFF	
95:10	OFF		ON
107:25	ON		
107:50		ON	
125:00	OFF**		
147:30	ON		OFF**
171:00	OFF**		ON
184:25	ON		
194:30	OFF	OFF	
210:43		ON	OFF
217:30	ON	OFF	
230:40	OFF		ON
238:30		ON	OFF
253:55	ON		ON
258:55		OFF	OFF
279:05	OFF		ON
286:55		ON	OFF
300:25	ON		ON

*In the event of an inflight medical problem or illness the Flight Surgeon has the option to revise this schedule.

**Crew option - the crewman not on BIOMED data downlink may elect to remove his BIOMED Harness during the lunar surface rest periods.

TABLE 2-3
(12/6)

CSM COVERAGE BY STDN STATIONS USING 85 FT/210 FT DISH ANTENNA

	GOLDSTONE (GDS)		*PARKS (PKS)		HONEYSUCKLE (HSK)		MADRID (MAD)		*GOLDSTONE (MAR)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
EARTH ORBIT	01:29	01:33			01:00	01:05				
	03:00	03:06							03:01	03:05
TLI (3:21)					04:05	08:26				
	15:17	25:09					07:54	16:59	15:52	24:34
					19:35	33:27				
TRANSLUNAR COAST			22:15	30:58			22:15	30:58		
							32:07	41:52		
	39:28	49:41							40:00	49:08
			46:40	55:08	44:06	57:35				
	63:30	73:54					56:09	66:10	64:02	73:22
LOI (88:56)			70:50	79:11	68:18	81:36				
	87:28	88:44					80:08	88:44	87:59	88:44
TEI (236:40)					242:38	252:30				
			245:42	249:33					236:52	247:40
							250:45	265:01		
	258:25	272:24							258:56	271:52
TRANSEARTH COAST			270:22	272:53	266:52	276:17				
							274:34	289:38		
	282:17	297:25							282:50	296:43
					291:48	299:12				
							298:15	303:49		
EI (304:18)										

* 210 FT DISH ANTENNA

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TABLE 2-3 (CONT)

REF	GET AT START OF REV	GOLDSTONE (GDS)		*PARKS (PKS)		HONEYSUCKLE (HSK)		MADRID (MAD)		*GOLDSTONE (MAR)	
LOI	88:56	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
1	88:56	89:17	90:41					89:17	90:16	89:17	90:41
2	90:59	91:25	92:49			92:27	92:49			91:25	92:49
3	93:07	93:35	94:41			93:35	94:41			93:35	94:41
4	95:01	95:29	96:35	95:29	96:35	95:29	96:35			95:29	96:35
5	96:55	97:23	98:15	97:23	98:29	97:23	98:29			97:23	97:41
6	98:49			99:17	100:23	99:17	100:23				
7	100:43			101:11	102:17	101:11	102:17				
8	102:37			103:05	103:26	103:05	104:12				
9	104:31					105:00	105:54	104:59	106:05		
10	106:25							106:53	107:59		
11	108:19							108:47	109:54		
12	110:13							110:42	111:48		
13	112:07	112:34	113:46					112:34	113:47	112:34	113:46
14	114:06	114:32	115:45					114:33	115:20	114:32	115:45
15	116:04	116:31	117:44			117:28	117:43			116:31	117:44
16	118:01	118:30	119:42			118:29	119:42			118:30	119:42
17	120:02	120:28	121:41	120:28	121:41	120:28	121:41			120:28	121:41
18	122:00	122:27	123:16	122:27	123:39	122:27	123:39			122:27	122:43
19	123:59			124:25	125:38	124:25	125:38				
20	125:57			126:24	127:37	126:24	127:37				
21	127:56					128:23	129:36	128:45	129:35		
22	129:55							130:21	131:34		
23	131:53							132:20	133:33		
24	133:52							134:18	135:31		
25	135:50	136:21	137:30					136:17	137:30	136:51	137:30
26	137:49	138:15	139:28					138:15	139:29	138:15	139:28
27	139:48	140:14	141:27					140:14	140:23	140:14	141:27
28	141:46	142:13	143:26			142:27	143:25			142:13	143:26
29	143:45	144:11	145:24	145:04	145:24	144:11	145:24			144:11	145:24
30	145:43	146:10	147:23	146:09	147:23	146:09	147:23			146:10	147:23
31	147:42	148:08	148:16	148:08	149:21	148:08	149:21				
32	149:41			150:06	151:20	150:06	151:20				
33	151:39			152:05	152:23	152:05	153:19	153:11	153:18		
34	153:38					154:04	154:50	154:04	155:17		
35	155:37							156:02	157:15		
36	157:35							158:01	159:14		
37	159:34	160:50	161:12					159:59	161:13		
38	161:32	161:58	163:11					161:58	163:12	161:58	163:11
39	163:31	163:56	165:10					163:57	165:10	163:56	165:10
40	165:30	165:55	167:08							165:55	167:08
	167:28	167:54	169:07			167:53	169:07			167:54	169:07

* 210 FT ANTENNA

TABLE 2-3 (CONT)

REF	GET AT START OF REV	GOLDSTONE (GDS)		*PARKS (PKS)		HONEYSUCKLE (HSK)		MADRID (MAD)		*GOLDSTONE (MAR)	
LOI	88:56	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
42	169:27	169:52	171:06	170:08	171:05	169:52	171:05			169:52	171:06
43	171:25	171:51	173:04	171:50	173:04	171:50	173:04			171:51	172:51
44	173:24			173:49	175:03	173:49	175:03				
45	175:23					175:48	176:50				
46	177:21					177:46	179:00	177:46	179:00		
47	179:20							179:45	180:58		
48	181:18							181:43	182:57		
49	183:17							183:42	184:56		
50	185:16	185:40	186:54					185:41	186:55	185:49	186:54
51	187:14	187:39	188:53					187:39	188:53	187:39	188:53
52	189:13	189:38	190:52					189:38	190:41	189:38	190:52
53	191:12	191:36	192:50			192:39	192:50			191:36	192:50
54	193:10	193:35	194:49			193:34	194:48			193:35	194:49
55	195:09	195:34	196:48	195:33	196:47	195:33	196:47			195:34	196:48
56	197:08	197:32	198:28	197:32	198:46	197:32	198:46			197:32	197:54
57	199:06			199:31	200:45	199:31	200:45				
58	201:05					201:29	202:44	202:04	202:43		
59	203:04					203:28	203:49	203:28	204:42		
60	205:03							205:27	206:41		
61	207:01							207:25	208:34		
62	209:00	209:52	210:38					209:24	210:38	210:24	210:38
63	210:59	211:22	212:36					211:23	212:37	211:22	212:36
64	212:58	213:21	214:35					213:21	214:36	213:21	214:35
65	214:56	215:20	216:34					215:20	215:51	215:20	216:34
66	216:55	217:19	218:33			217:46	218:32			217:19	218:33
67	218:54	219:17	220:32			219:17	220:31			219:17	220:32
68	220:53	221:16	222:30	221:15	222:30	221:15	222:30			221:16	222:30
69	222:51	223:15	223:35	223:14	224:29	223:14	224:29				
70	224:50			225:13	225:34	225:13	226:27				
71	226:49					227:12	228:26	227:12	228:25		
72	228:48							229:10	230:24		
73	230:46							231:09	232:23		
1	232:45							233.08	234:22		
75	234:44	235:06	236:20					235:07	236:21	235:06	236:20
TEI	236:43	236:53	248:11					236:53	240:51	236:52	247:40

* 210 FT ANTENNA

TABLE 2-4
(12/6)

APOLLO 17 TV SCHEDULE

DAY	DATE	CST	GET (HR:MIN)	DURATION (HR:MIN)	ACTIVITY SUBJECT	VEHICLE	STATION
THURSDAY	7 DEC	01:05AM	4:12	0:20	TRANSPOSITION & DOCKING	CSM	HSK
MONDAY	11 DEC	6:48PM	117:55	5:19	LUNAR SURFACE EVA-1*	LRV	GDS/HSK/PKS
TUESDAY	12 DEC	4:21PM	139:38	6:21	LUNAR SURFACE EVA-2*	LRV	GDS
WEDNESDAY	13 DEC	3:58PM	163:05	6:35	LUNAR SURFACE EVA-3*	LRV	GDS
THURSDAY	14 DEC	4:41PM	187:48	0:25	LM LIFT-OFF	LRV	GDS/MAD
THURSDAY	14 DEC	6:31PM	189:38	0:06	RENDEZVOUS	CSM	GDS/MAD
THURSDAY	14 DEC	6:54PM	190:01	0:05	DOCKING	CSM	GDS/MAD
SATURDAY	16 DEC	5:46PM	236:53	0:32	VIEW OF MOON AFTER TEI	CSM	GDS/MAD
SUNDAY	17 DEC	2:19PM	257:26	1:04	TRANSEARTH EVA	CSM	MAD
MONDAY	18 DEC	5:00PM	284:07	0:30	TEC PRESS CONFERENCE	CSM	GDS/MAD

*TV WILL NOT BE USED WHILE LRV IS IN MOTION

TABLE 2-5
(12/6)

FUEL CELL PURGE, URINE DUMP AND WASTE WATER DUMP SCHEDULE

GET	O_2 FC PURGE		H_2 FC PURGE		WASTE H_2O DUMP		URINE COLLECTION PERIODS			URINE DUMP	
							GET				
(HR:MIN)	NO	ΔT (HR:MIN)	NO	ΔT (HR:MIN)	NO	ΔT (HR:MIN)	START	STOP	ΔT	NO	ΔT (HR:MIN)
*18:30	1	18:30			1	18:30	07:00	18:30	11:30	1	18:30
*35:00	2	16:30	1	35:00	2	16:30	18:30	35:00	16:30	2	16:30
*58:45	3	23:45			3	23:45	35:00	58:45	23:45	3	23:45
*83:30	4	24:45	2	48:30	4	24:45	58:45	83:30	24:45	4	24:45
94:13	5	10:43			5	10:43					
*117:45	6	23:32	3	34:15	6	23:32	83:30	107:00	23:30	5	34:15 &UTCA
**137:45	7	20:00			7	20:00	114:30	133:00	18:30	6	20:00
**159:40	8	21:55	4	41:55	8	21:55	133:00	156:10	23:10	7	21:55
**180:45	9	21:05			9	21:05	156:10	180:45	24:35	8	21:05
194:20										DUMP UCTA'S POST RNDZ	
196:50	10	16:05	5	37:10	10	16:05					
**208:20							180:45	208:00	27:15	DUMP UTS	
218:30	11	21:40			11	21:40					
*230:30	12	12:00	6	33:40	12	12:00	208:00	230:25	22:30	9	22:10
*252:50	13	22:20			13	22:20	230:25	252:50	22:25	10	22:20
*276:50	14	24:00	7	46:20	14	24:00	252:50	276:50	24:00	11	24:00
*300:30							276:50	300:30	23:40	12	23:40
*303:30							300:30	303:30	03:00	NO DUMP	

*DUMP URINE FROM BUSS'S (3)

**DUMP URINE FROM BUSS (1)

DUMP LAUNCH UTCA'S 06:30

TRANSFER TO LM - 108:00

TRANSFER TO CM - 193:00

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TABLE 2-6
(12/6)

CSM BATTERY CHARGE AND LM BATTERY MANAGEMENT SCHEDULES

CSM BATTERY CHARGE SCHEDULE

GET (HR:MIN)	BATTERY
09:00	B
18:40	A
35:55	A
59:55	B
114:35	B
140:22	A
208:02	B
277:00	A
283:57	B

LM BATTERY MANAGEMENT SCHEDULE

GET (HR:MIN)	BATTERY						
	1	2	3	4	5	6	L
108:18	ON	ON	ON	ON	OFF	OFF	OFF
112:20					ON	ON	
113:17					OFF	OFF	
113:37	OFF	OFF					LMP
127:30	ON	ON	OFF	OFF			CDR
137:45			ON	ON			OFF
147:10			OFF	OFF			CDR
161:15	OFF	OFF	ON	ON			LMP
170:50	ON	ON					OFF
187:27	OFF		OFF		ON	ON	
187:49		OFF		OFF			

L - LUNAR BATTERY MAY BE USED ON EITHER CDR OR LMP BUS

TABLE 2-7
(12/6)

LiOH CANISTER CHANGE SCHEDULE

CSM LiOH CANISTER CHANGE

CHANGE NO	APPROX GET (HR:MIN)	APPROX ΔT (HR)	INSTALL		REMOVE & STOW		TOTAL TIME INSTALLED
			CANISTER NO.	POSITION	CANISTER NO.	STOWAGE LOCATION	
1	08:50	15	3	A	1	B5	*08:50
2	23:00	10	4	B	2	B5	*23:00
3	33:00	14	5	A	3	B5	24:10
4	47:00	10	6	B	4	B5	24:00
5	57:30	14	7	A	5	B6	24:30
6	71:00	12	8	B	6	B6	24:00
7	83:00	12	9	A	7	B6	25:30
8	95:00	13	10	B	8	B6	24:00
9	108:10	24	11	A	9	A9	25:10
10	132:00	11	12	B	10	A9	37:00
11	143:15	25	13	A	11	A9	35:05
12	167:45	14	14	B	12	A9	35:45
13	181:00	14	15	A	13	A3	37:45
14	195:25	13	16	B	14	A3	27:40
15	208:35	10	17	A	15	A3	27:35
16	218:12	13	18	B	16	A3	22:47
17	231:00	10	19	A	17	A4	22:25
18	240:30	12	20	B	18	A4	22:18
19	252:15	12	21	A	19	A4	21:15
20	264:30	16	22	B	20	A4	24:00
21	281:00	8	23	A	21	A5	28:45
22	287:50		24	B	22	A5	23:20

LM LiOH CANISTER CHANGE: GET (HR:MIN) 137:30 AND 172:55

TOTAL CM LiOH CANISTERS AVAILABLE 26
*GET FROM LIFTOFF

TABLE 2-8
(12/6)

CSM RCS UNCOUPLED CONFIGURATION

FROM (HR:MIN)	TO (HR:MIN)	REASON
8:35	8:55	RATE DAMPING FOR PTC
19:20	19:40	RATE DAMPING FOR PTC
42:35	43:50	RATE DAMPING FOR PTC & HEAT FLOW EXP
63:50	64:10	RATE DAMPING FOR PTC
90:39	91:22	SIM EXP
94:29	106:52	SIM EXP
113:18	182:16	SIM EXP
183:12	184:30	ROLL AXIS ONLY FOR MC/PC
194:14	233:05	SIM EXP
233:05	234:23	ROLL AXIS ONLY FOR MC/PC
236:48	240:45	SIM EXP
240:50	241:10	RATE DAMPING FOR PTC
256:45	259:20	CSM EVA
259:20	263:40	SIM EXP
263:40	264:00	RATE DAMPING FOR PTC
265:00	265:20	RATE DAMPING FOR PTC
276:30	285:30	SIM EXP
285:30	285:35	RATE DAMPING FOR PTC
286:15	287:20	SIM EXP
288:15	288:40	RATE DAMPING FOR PTC

TABLE 2-9
(12/6)

CSM BURN/EVENT SCHEDULE

BURN/ EVENT	GET I(HR:MIN)/ BURN TIME	ΔVT (FPS)	ULLAGE BT	REFSMMAT	RESULTANT HA/HP(NM)	DATE/ CST
LAUNCH SATURN	00:00 11 MIN 51.5 SEC	24,263	--	LAUNCH	93.4 89.7	DEC 6 20:53
S-IVB TLI	03:21:19.3 5 MIN 45.7 SEC	10,346.8	--	LAUNCH	--	DEC 7 00:14
CSM/LM EJECTION	05:07:00.0 3.0 SEC	1.2	--	LAUNCH	--	DEC 7 1:54
MCC-1	08:45	Nom Zero	--	PTC	--	DEC 7 05:38
MCC-2	35:30	Nom Zero	--	PTC	--	DEC 8 08:23
MCC-3	66:55	Nom Zero	--	PTC	--	DEC 9 15:48
MCC-4	83:55	Nom Zero	--	PTC	--	DEC 10 8:48
LOI SPS	88:55:37.5 06 MIN 35.4 SEC	2979.9	--	LOI	170.8 51.4	DEC 10 13:48
DOI SPS	93:13:08.5 22.9 SEC	198.7	4 JETS 15 SEC	LDG SITE	59.00 15.00	DEC 10 18:06
BAILOUT SPS	93:48:16.8 11.05 SEC	100	4 JETS 17 SEC	LDG SITE	61.5 5.0	DEC 10 18:41
DOI TRIM SPS	AS REQD			LS OR LOPC-1 AS REQD		
UNDOCK & SEP(RCS)	110:27:55.2 3.3 SEC	1.0	--	LDG SITE	60.33 13.6	DEC 11 11:20
CSM CIRC SPS	111:55:22.7 4.0 SEC	70.1	4 JETS 12 SEC	LDG SITE	70.3 54.3	DEC 11 12:48
LOPC SPS	182:35:45.3 18.7 SEC	336.7	4 JETS 12 SEC	LOPC-1	63.0 61.3	DEC 14 11:29
LM JETT	193:58:30.0	2.5	--	LIFT-OFF	62.2 60.3	DEC 14 22:51
CSM SEP RCS	194:03:30.0 12.6 SEC	2.0	--	LIFT-OFF	63. 62	DE 22 56

TABLE 2-9 (CONT)

CSM BURN/EVENT SCHEDULE

BURN/ EVENT	GET I(HR:MIN) BURN TIME	ΔVT (FPS)	ULLAGE BT	REFSMMAT	RESULTANT HA/HP(NM)	DATE/ CST
TEI SPS	236:39:51.1 2 MIN 22.2 SEC	3045.7	4 JETS 12 SEC	TEI	--	DEC 16 17:33
MCC-5	253:40	Nom Zero	--	PTC	--	DEC 17 10:33
MCC-6	282:18	Nom Zero	--	PTC	--	DEC 18 15:11
MCC-7	301:18	Nom Zero	--	ENTRY	--	DEC 19 10:11
EI	304:18:0.5	NO BURN	--	ENTRY	--	DEC 19 13:11
SPLASH-DOWN	304:31:10.5	NO BURN	--	ENTRY	--	DEC 19 13:24

TABLE 2-10

APOLLO 17 LM DSEA

ACTIVITY	MODE	GET (HR:MIN)	TAPE USED* (HR:MIN)	ACCUM. TAPE USED (HR:MIN)
COMM ACTIVATION	ICS/PTT	108:37	3:58 X 100%	
PDI PREP	VOX	112:35	= 3:58	3:58
PDI PREP	VOX	112:35	0:37 X 63%	
POST TOUCHDOWN (T2)	OFF	113:12	= 0:23.3	4:21
EVA-1 PLSS COMM CK	VOX	116:10	0:50 X 63%	
EVA-1 LMP EGRESS	OFF	117:00	= 0:31.5	4:53
EVA-2 PLSS COMM CK	VOX	138:40	0:50 X 63%	
EVA-2 LMP EGRESS	OFF	139:30	= 0:31.5	5:24
EVA-3 PLSS COMM CK	VOX	162:10	0:50 X 63%	
EVA-3 LMP EGRESS	OFF	163:00	= 0:31.5	5:56
JETTISON #1 PREP	VOX	170:40	0:20 X 63%	
JETTISON #1 POST	OFF	171:00	= 0:12.3	6:08
JETTISON #2 PREP	VOX	185:13	0:17 X 63%	
JETTISON #2 POST	OFF	185:30	= 0:10.7	6:19
ASCENT COMM (L/O -17 MIN)	ICS/PTT	187:46	0:17 X 100%	
LIFT-OFF -2 MIN	VOX	188:01	= 0:17	6:36
LIFT-OFF -2 MIN	VOX	188:01	0:10 X 63%	
INSERTION	ICS/PTT	188:11	= 0:6.3	6:42
INSERTION	ICS/PTT	188:11	1:59 X 100%	
POST DOCKING	OFF	190:10	= 1:59	8:41

*TAPE USED = RECORD TIME X DUTY CYCLE
**REMAINING TAPE (1:19) MAY BE USED AT CREW DISCRETION.

TABLE 2-11
(12/6)

LM BURN/EVENT SCHEDULE

BURN/ EVENT	GETI(HR:MIN) BURN TIME	ΔVT (FPS)	ULLAGE BT	REFSMMAT	RESULTANT HA/HP(NM)	DATE/ CST
DOI-2	112:00:33.7 26.9 SEC	9.4	--	LDG SITE	60.0 7.2	DEC 11 12:53
PDI	112:49:37.7 12 MIN 00 SEC	6701.8	4 JET 7.5SEC	LDG SITE	--	DEC 11 13:42
LANDING	113:01:38.1	NO BURN	--	--	LUNAR SURFACE	DEC 11 13:54
EVA-1	116:40	NO BURN	--	--	--	DEC 11 17:33
EVA-2	139:10	NO BURN	--	--	--	DEC 12 16:03
EVA-3	162:40	NO BURN	--	--	--	DEC 13 15:33
ASCENT	188:03:14.6 7 MIN 17.7 SEC	6062.2	None	LIFTOFF	47.85 9.06	DEC 14 16:56
ORBIT INSERTION	188:10:32.3	NO BURN	--	--		DEC 14 17:03
TPI	188:57:32.3 2.7 SEC	76.6	4 JET 10 SEC	LIFTOFF	64.4 46.7	DEC 14 17:50
BRAKING GATES	189:36:35.0 to 189:43:10.5		--	--	62.4 61.8	DEC 14 18:29
DOCKING	190:05:00.0	NO BURN	--	--	62.4 61.8	DEC 14 19:53
LM DEORBIT	195:39:13.0 1 MIN 56.4 SEC	281.8	--	LIFTOFF	64.9 -141.8	DEC 15 01:34

TABLE 2-12
(12/6)
APOLLO 17 RETURN TO EARTH BLOCK DATA SCHEDULE

DATA	GET UPDATE (HR:MIN)	GETI (HR:MIN)	PAD TYPE
TLI+90	01:30	04:50	COMPLETE P-30
L/O+9	01:30	09:00	P37
L/O+15	08:30	15:00	P37
L/O+25	08:30	25:00	P37
L/O+35	16:30	35:00	P37
L/O+45	16:30	45:00	P37
L/O+55	16:30	55:00	P37
L/O+65	16:30	65:00	P37
*FLYBY	40:55	83:56	P30
*PER+2	82:40	90:56	ABB P-30
TEI 4	85:10	97:22	ABB P-30
TEI 5	91:45	98:41	ABB P-30
TEI 12	95:30	111:56	ABB P-30
TEI 19	95:30	125:49	ABB P-30
TEI 26	118:37	139:43	ABB P-30
TEI 38	137:00	163:24	ABB P-30
TEI 49	144:15	185:17	ABB P-30
TEI 55	170:30	197:01	ABB P-30
TEI 65	195:47	216:43	ABB P-30
TEI 72	213:37	230:39	ABB P-30
PREL			
TEI 75	229:58	236:41	COMPLETE P-30
NOM			
TEI 75	235:32	236:41	COMPLETE P30
ONE REV LATE			
TEI 76	235:32	238:37	ABB P-30

*ASSUMES DOCKED CONFIGURATION

TABLE 2-12 (CONT)
(12/6)

APOLLO 17 RETURN TO EARTH BLOCK DATA SCHEDULE

NOTES:

1. All block data maneuvers are to the MPL line except
   a. TLI +90 abort is to the AOL
   b. Nominal TEI 75 and backup Rev TEI 76 is to the EOM target (λ=166°W)
2. Pass FLYBY early if pericynthion is not clear of moon
3. The FLYBY and PER+2 maneuvers are docked. All other aborts are undocked.
4. TEI 4 assumes no DOI.
5. TEI 5 assumes DOI.
6. TEI 12 assumes no CIRC.
7. TEI 19 assumes CIRC.
8. TEI 49 assumes no LOPC.
9. TEI 55 assumes LOPC.

TABLE 2-13
(12/6)

LANDMARK AND LANDING SITE DATA

SITE	REV	LATITUDE (DEG)	LONGITUDE (DEG)	ALTITUDE* (NM)
TAURUS LITTROW		20.164	30.750	-1.95
J-3	3	19.948	40.102	0.0
17-1	12,13,50	20.160	30.809	-1.96
17-2	12**	20.020	30.804	-1.97
17-3	12**	20.272	30.700	-1.89
RP-3	13	-3.694	131.912	0.0
F-1	50	1.863	88.250	0.0

*Difference between landmark radius vector and 938.4935 NM (mean Lunar Radius)

**Rev 12 Alternates for Perigee < 10 NM

TABLE 2-14
(12/6)

CRYO MANAGEMENT SCHEDULE

GET	O_2 HTRS 1,2,&3		H_2 HTRS 1&2		H_2 FANS 1,2,&3		
HRS:MIN	AUTO	OFF	AUTO	OFF	AUTO	ON	OFF
00:00	1,2	3	1,2			3	1,2
04:17	1,2,3						
05:05	1,2	3					
08:40	3	1,2			3		
15:10				1,2			
39:05	1,2,3						
39:55	3	1,2					
60:10*	1,2,3						
60:30*	3	1,2					
65:00			1,2			3	
81:15*	1,2,3						
82:50*	3	1,2					
84:40**	1,2	3					
234:18***							
256:50	1,2,3						
259:50	1,2	3					

*If LM/CM $\Delta P > 2.4$ PSID, these actions are required.

**Open 100W cb in oxygen tanks 1 & 2 at 84:40

***Close 100W cb in O_2 tanks 1 & 2

***Open 50W cb in O_2 tanks 1, 2, & 3.

TABLE 2-15
(12/6)

LUNAR SOUNDER SCHEDULE

REV	TARGET	GET		LONGITUDE		FILM
		START	STOP	START	STOP	HR:MIN
14	LS EMI TEST	115:10	115:59			0:08
16,17,18	HF MODE	118:54	122:59	28°E	3°E	4:05
24-26	GROUND TRACK VHF MODE	135:10	139:15	57°W	64°W	4:05
35	REINER γ & MARE RIDGE VHF MODE	156:51	156:56	49°W	64°W	0:05
36	REINER γ & MARE RIDGE HF MODE	158:50	158:55	49°W	64°W	0:05
39,40	*RCV-ONLY SEP-ON	163:56	167:23	104°E	165°W	N/A
40	MARIUS HILLS HF MODE	166:43	166:48	45°W	60°W	0:05
55	CRISIUM, SERENITATIS, FRA MAURO APENNINE BENCH EULER HILLS HF MODE	195:33	196:20	99°E	36°W	0:47
63,64	LS RCV ONLY SEP-OFF HF MODE	211:20	213:19	113°E	110°E	N/A
64	PASTEUR HF MODE	213:19	213:23	110°E	98°E	0:04
64	LS RCV ONLY SEP-OFF HF MODE	213:23	213:41	98°E	49°E	N/A

*REV 40 - "REC-ONLY SEP-ON" IS TERMINATED FOR 5 MIN FOR "MARIUS HILLS HF MODE".

TABLE 2-15 (CONT)
(12/6)

LUNAR SOUNDER SCHEDULE

REV	TARGET	GET		LONGITUDE		FILM HR:MIN
		START	STOP	START	STOP	
64	TRANQUILITATIS-SERENITATIS HF MODE	213:41	213:59	49°E	8°W	0:18
64	LS RCV ONLY SEP OFF HF MODE	213:59	214:47	8°W	152°W	N/A
73	TSIOLKOVSKY FERMI HF MODE	231:00	231:06	135°E	117°E	0:06
73	APOLLONIUS VOLCANICS HF MODE	231:26	231:48	58°E	8°W	0:22
73	HERTZSPRUNG HF MODE	232:24	232:33	117°W	144°W	0:09
					TOTAL FILM	10:19

APOLLO 17 FILM BUDGET

CSM

CAMERA:	DAC	FILM: CEX	MAGAZINE: AA	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
4:20	TL	UNDOCK S48LN	30%	70%	OPS
5:07	TL	LM EJECTION	70%	0%	OPS

CAMERA:	DAC	FILM: CEX	MAGAZINE: BB	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
84:25	TL	DOOR JETT	5%	95%	OPS
110:59	12	LDMK TRK 17-X	3%	92%	LMK
112:20	13	LDMK TRK RP-3	4%	88%	LMK
112:54	13	LDMK TRK 17-1	4%	84%	LMK
185:43	50	F-1 TRACK	4%	80%	LMK
186:03	50	17-1 TRACK	4%	76%	LMK
189:38	52	RNDZ/DOCK	40%	36%	OPS

CAMERA:	DAC	FILM: CEX	MAGAZINE: CC	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
110:27	12	UNDOCKING	100%	0%	OPS

CAMERA:	DAC	FILM: CEX	MAGAZINE: DD	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
193:58	53	LM JETTISON	50%	50%	OPS

CSM

CAMERA:	DAC	FILM: CEX	MAGAZINE: EE	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00		UNSCHEDULED	0%	100%	

CAMERA:	DAC	FILM: CEX	MAGAZINE: FF	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
257:30	TE	CMP ON EVA	100%	0%	OPS

CAMERA:	DAC	FILM: CEX	MAGAZINE: GG	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
303:08	EE	FIREBALL	50%	50%	OPS
303:20	EE	DROGUE CHUTE	50%	0%	OPS

CAMERA:	DAC	FILM: CIN	MAGAZINE: HH	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
43:00	TL	HEATFLOW	50%	50%	X4
45:20	TL	HEATFLOW	50%	0%	X4

CAMERA:	DAC	FILM: CIN	MAGAZINE: II	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
8:00	TL	SC INT (OPT)	100%	0%	OPS

APOLLO 17 FILM BUDGET

CSM

CAMERA: DAC FILM: VHBW MAGAZINE: JJ CAPACITY: 100%

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00		UNSCHEDULED	0%	100%	

CAMERA: EL FILM: CEX MAGAZINE: KK CAPACITY: 160 FR

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
19:35	TL	EARTH	4 FR	156 FR	OPS
90:51	01	AITKEN	58 FR	98 FR	OS
110:27	12	UNDOCKING	10 FR	88 FR	OPS
118:04	16	AITKEN	73 FR	15 FR	OS

CAMERA: EL FILM: CEX MAGAZINE: LL CAPACITY: 160 FR

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
119:57	17	SNIADECKI	46 FR	114 FR	OS
136:39	25	LDG SITE	24 FR	90 FR	OS
142:26	28	PICARD	36 FR	54 FR	OS
144:02	29	ARABIA	21 FR	33 FR	OS

CSM

CAMERA: EL FILM: CEX MAGAZINE: MM CAPACITY: 160 FR

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
144:24	2[illegible]	PIERCE	88 FR	72 FR	OS
157:35	36	MARE INGENII	34 FR	38 FR	OS
164:26	39	D-CALDERA	19 FR	19 FR	OS

CAMERA: EL FILM: CEX MAGAZINE: NN CAPACITY: 160 FR

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
4:20	TL	UNDOCK S4BLM	10 FR	150 FR	OPS
5:07	TL	LM EJECTION	5 FR	145 FR	OPS
190:01	52	DOCKING	10 FR	135 FR	OPS
215:56	6[illegible]	IMBRIUM(S)	28 FR	107 FR	OS

CAMERA: EL FILM: CEX MAGAZINE: OO CAPACITY: 160 FR

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00	LC	SCHMITT OPT	160 FR	0 FR	OPT

CAMERA: EL FILM: CEX MAGAZINE: PP CAPACITY: 160 FR

GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00	LC	EVANS OPT	160 FR	0 FR	OPT

TABLE 2-16

APOLLO 17 FILM BUDGET

CSM

CAMERA:	EL	FILM: VHBW	MAGAZINE: QQ	CAPACITY: 115 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
89:41	01	LDG SITE	12 FR	103 FR	NST
121:00	17	(NORTH)	12 FR	91 FR	NST
137:34	25	SR CORONA	9 FR	82 FR	X9
144:42	29	(SOUTH)	24 FR	58 FR	NST
159:36	37	AITKEN	12 FR	46 FR	FST
208:17	61	SS CORONA	9 FR	37 FR	X7

CAMERA:	EL	FILM: VHBW	MAGAZINE: RR	CAPACITY: 115 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
209:09	62	GAGARIN (N)	18 FR	97 FR	FST
210:09	62	(NORTH)	24 FR	73 FR	NST
218:08	66	(SOUTH)	24 FR	49 FR	NST
233:58	74	(SOUTH)	12 FR	37 FR	NST

CAMERA:	NK	FILM: CIN	MAGAZINE: SS	CAPACITY: 70 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
68:00	TL	ALFMED	6 FR	64 FR	X1

CAMERA:	NK	FILM: CIN	MAGAZINE: TT	CAPACITY: 70 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00		UNSCHEDULED	0 FR	70 FR	

CAMERA:	NK	FILM: VHBW	MAGAZINE: UU	CAPACITY: 40 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00		PREFLT CAL	40 FR	0 FR	CAL

CSM

CAMERA:	NK	FILM: VHBW	MAGAZINE: VV	CAPACITY: 40 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00		DIM LT BU	40 FR	0 FR	CAL

CAMERA:	NK	FILM: VHBW	MAGAZINE: WW	CAPACITY: 40 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
121:06	17	EARTHSHINE	40 FR	0 FR	X17

CAMERA:	NK	FILM: VHBW	MAGAZINE: XX	CAPACITY: 40 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
133:29	23	ZOD LT RED	13 FR	27 FR	X13
163:12	38	ZOD LT BLUE	13 FR	14 FR	X13

CAMERA:	NK	FILM: VHBW	MAGAZINE: YY	CAPACITY: 40 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
185:00	49	ZOD LT POL	24 FR	16 Fr	X11

CAMERA:	NK	FILM: VHBW	MAGAZINE: ZZ	CAPACITY: 40 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
0:00		UNSCHEDULED	0 FR	40 FR	

TABLE 2-16

APOLLO 17 FILM BUDGET

LM

CAMERA: DCL	FILM: CEX	MAGAZINE: A	CAPACITY: 160 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
110:30	12	LM/CM SEP	10 FR	150 FR	OPS
110:35	12	CABIN (OPT)	5 FR	145 FR	OPS
111:00	12	LDG SITE	5 FR	140 FR	OPS
112:35	13	EARTHRISE	5 FR	135 FR	OPS
116:40	LS	EVA-1	95 FR	40 FR	
CAMERA: DCC	FILM: CEX	MAGAZINE: B	CAPACITY: 160 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
116:40	LS	EVA-1	94 FR	66 FR	
CAMERA: DCC	FILM: CEX	MAGAZINE: C	CAPACITY: 160 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
139:20	LS	EVA-2	155 FR	5 FR	
CAMERA: DCC	FILM: CEX	MAGAZINE: D	CAPACITY: 160 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
139:20	LS	EVA-2	94 FR	66 FR	
CAMERA: DCC	FILM: CEX	MAGAZINE: E	CAPACITY: 160 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
163:40	LS	EVA-3	151 FR	9 FR	
CAMERA: DCC	FILM: CEX	MAGAZINE: F	CAPACITY: 160 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
163:40	LS	EVA-3	99 FR	61 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: G	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
116:40	LS	EVA-1	130 FR	40 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: H	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
139:20	LS	EVA-2	128 FR	42 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: I	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
9:20	LS	EVA-2	162 FR	8 FR	

LM

CAMERA: DCL	FILM: HBW	MAGAZINE: J	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
139:20	LS	EVA-2	161 FR	9 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: K	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
139:20	LS	EVA-2	135 FR	35 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: L	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
163:40	LS	EVA-3	154 FR	16 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: M	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
163:40	LS	EVA-3	165 FR	5 FR	
CAMERA: DCL	FILM: HBW	MAGAZINE: N	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
163:40	LS	EVA-3	127 FR	43 FR	
CAMERA: DAC	FILM: CEX	MAGAZINE: O	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
110:30	12	LM/CM SEP	6%	94%	OPS
110:35	12	CABIN (OPT)	13%	81%	OPS
111:00	12	LDG SITE	6%	75%	OPS
112:50	13	DESCENT	75%	0%	OPS
CAMERA: DAC	FILM: CEX	MAGAZINE: P	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
113:02	LS	SURFACE OPT	100%	0%	
CAMERA: DAC	FILM: CEX	MAGAZINE: Q	CAPACITY: 100%	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
188:03	51	ASCENT	100%	0%	
CAMERA: DC5	FILM: HBW	MAGAZINE: R	CAPACITY: 170 FR	
GET	REV	TARGET	FILM USED	FILM REMAINING	REF
163:40	LS	EVA 3	50 FR	120 FR	

TABLE 2-16

TABLE 2-17

MC/LA OPERATIONS

NOTE: BECAUSE OF ABUNDANT MC FILM, ALL MC/LA START/STOP TIMES ARE ± 2 MIN/6°

REV	T START	T STOP	TYPE	LONG(START)	LONG(STOP)	DEG	HR/MIN
1/2	90:48	91:51*	VERT	144°W	26°E	190°	1:03
13/14	114:00	115:03	VERT	162°W	7°E	191°	1:03
14/15	115:59	117:25	VERT	164°W	63°W	259°	1:26
23/24	133:48	134:52	VERT	168°W	2°W	194°	1:04
26/27	139:44	140:46	N.OBL	168°W	4°E	188°	1:03
27/29	140:46	144:46	VERT	4°E	6°W	730°	4:00
35/36	157:25	158:39	S.OBL	147°W	14°W	227°	1:14
38	161:38	163:32	VERT	162°E	177°E	345°	1:54
49	183:21	184:25	VERT	167°E	28°W	195°	1:04
62/63	209:05	211:08	VERT	163°E	150°E	373°	2:03
65	215:05	215:30	N.OBL	152°E	77°E	75°	0:25
65	215:30	215:35	MNVR	77°E	62°E	15°	0:05
65	215:35	216:10	S.OBL	62°E	47°W	109°	0:35
66	216:10	218:07	VERT	47°W	41°W	354°	1:57
73/74	232:39	235:47**	VERT	161°W	13°W	572°	3:08
POST TEI							

*LA OFF AT 91:28 TO AVOID ALTITUDE PROBLEMS
**RETR, CLOSE COVER AT 234:05

TOTAL	4017°	22:24
VERTICAL	3082°	17:15
OBLIQUE	614°	3:22
RUNOUT	321°	1:47

PC OPERATIONS

REV	T START	T STOP	TYPE	LONG(START)	LONG(STOP)	DEG	HR/MIN
1/2	90:51	91:11	STEREO	152°W	144°E	58°	0:20
2	91:18	91:28	STEREO	123°E	95°E	28°	0:10
13/14	114:03	114:33	STEREO	172°W	100°E	88°	0:30
15	116:31	117:00	STEREO	102°E	14°E	88°	0:29
28	141:54	142:19	STEREO	155°E	85°E	70°	0:25
49	183:50	184:09	STEREO	80°E	26°E	54°	0:19
62	209:14	209:29	STEREO	133°F	90°F	43°	0:15
62	209:49	209:51	MONO	33°E	27°E	6°	0:02
74	233:21	233:36	STEREO	67°E	25°E	42°	0:15
74	233:45	233:58	STEREO	5°W	45°W	40°	0:13
						514°	2:57

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CHART 2-1
(12/6)

LUNAR SOUNDER EMI TEST
REV 14
FILM USED: 5 MIN

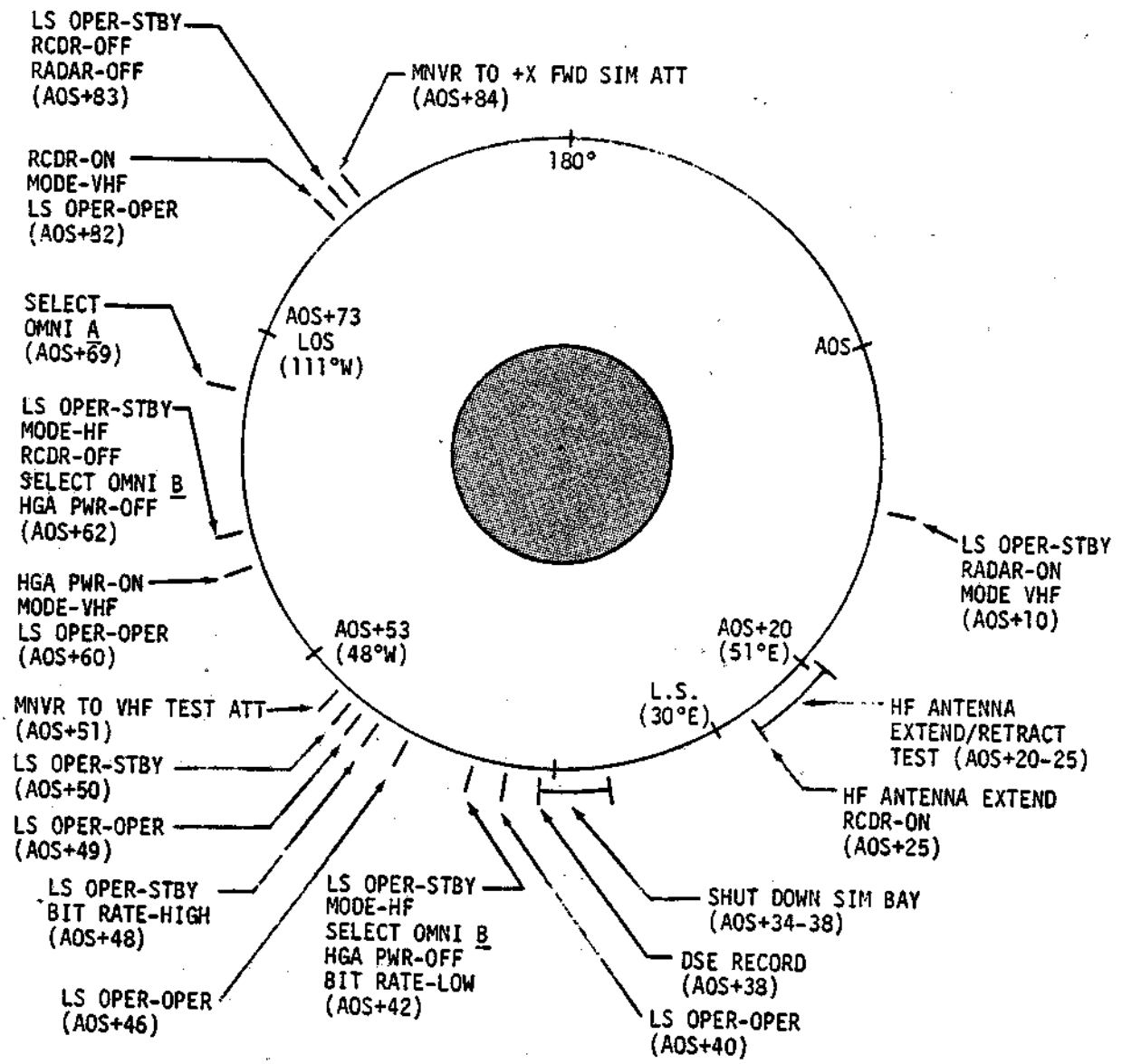

CHART 2-2
(12/6)
LUNAR SOUNDER HF MODE
REVS 16, 17, 18
FILM USED - 245 MIN

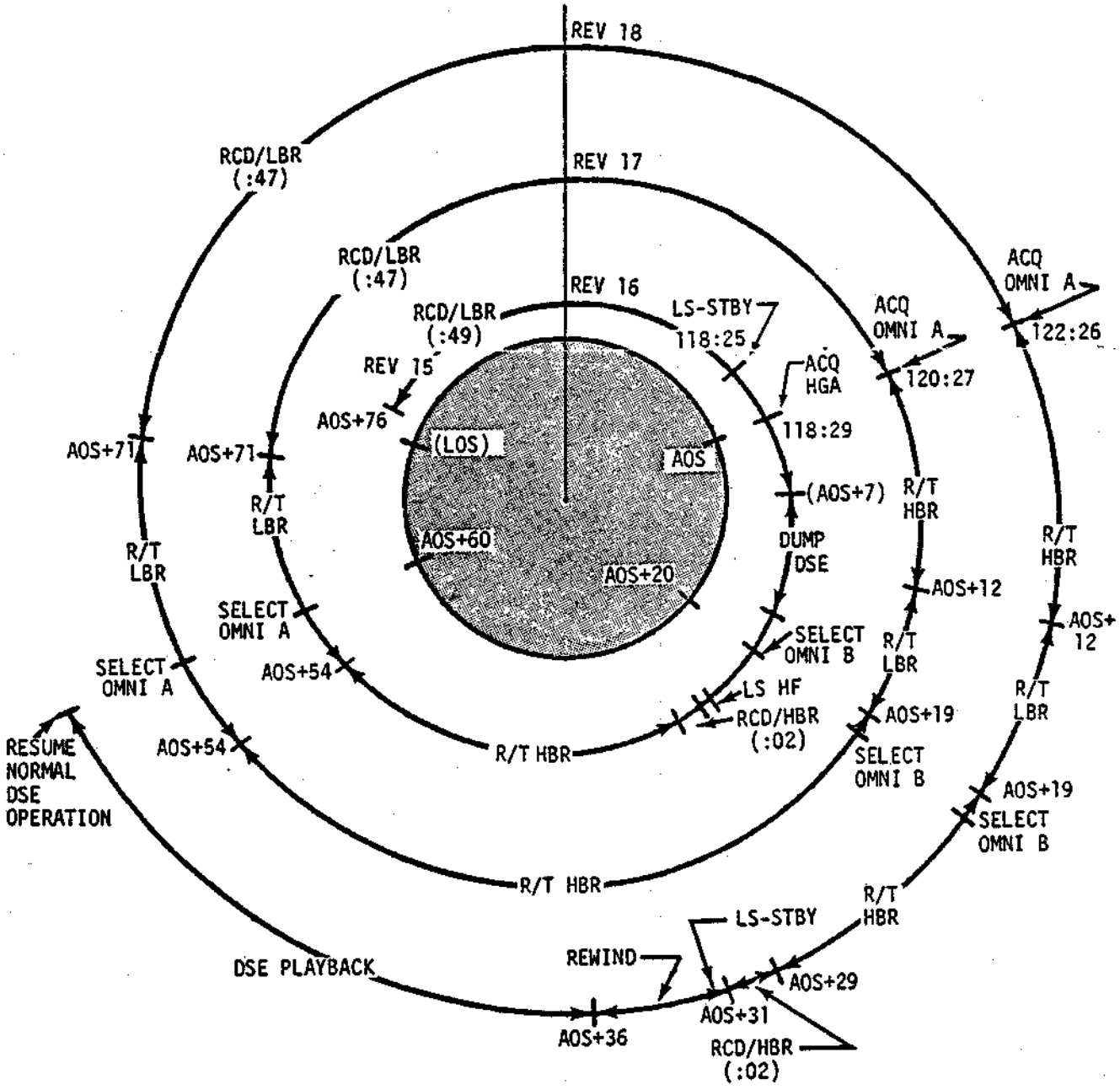

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CHART 2-3
(12/6)
LUNAR SOUNDER VHF MODE
REVS 24, 25, 26, 27
FILM USED - 245 MIN

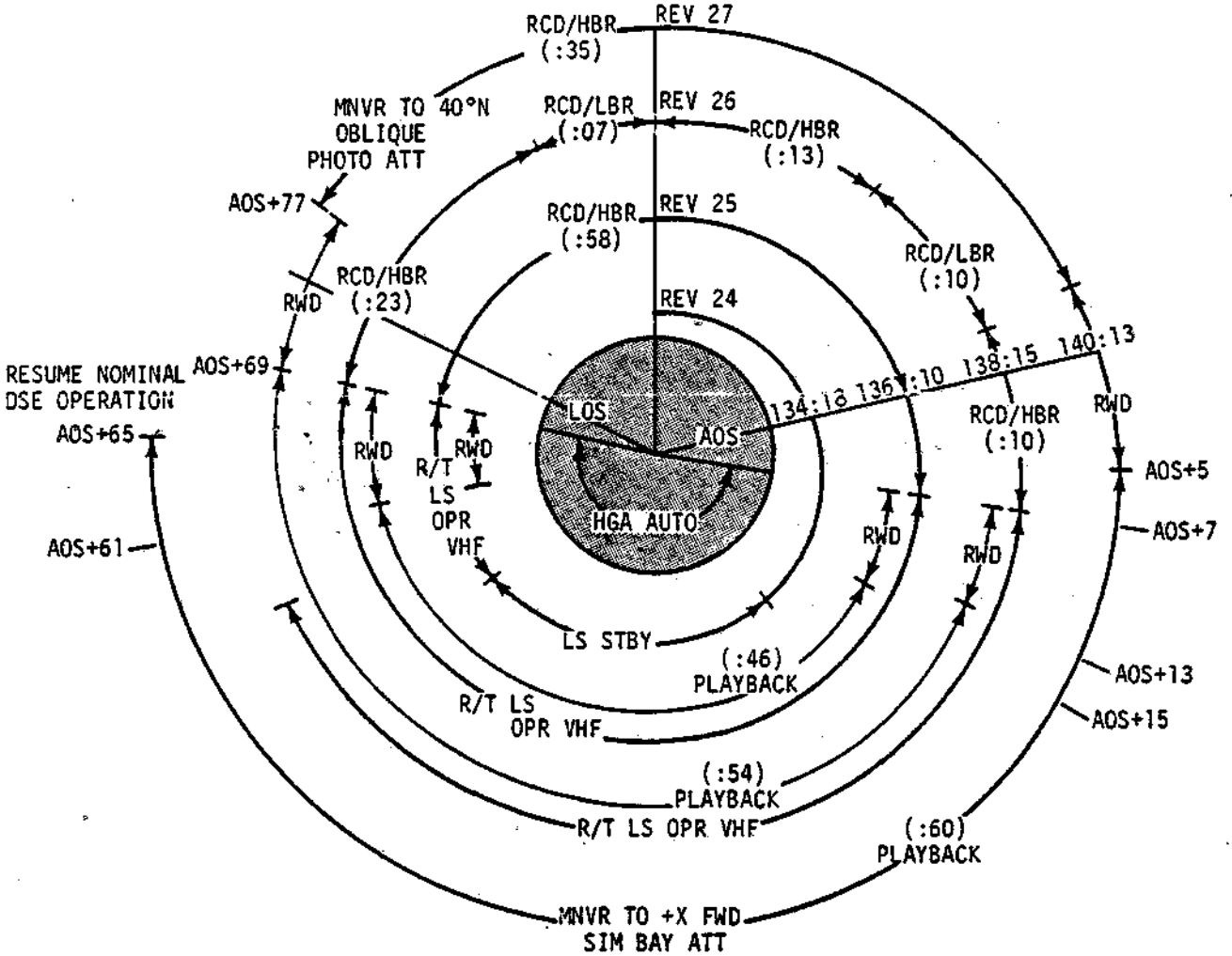


CHART 2-4
(12/6)
LUNAR SOUNDER RECEIVE ONLY (SEP-ON)
REVS 39, 40, 41

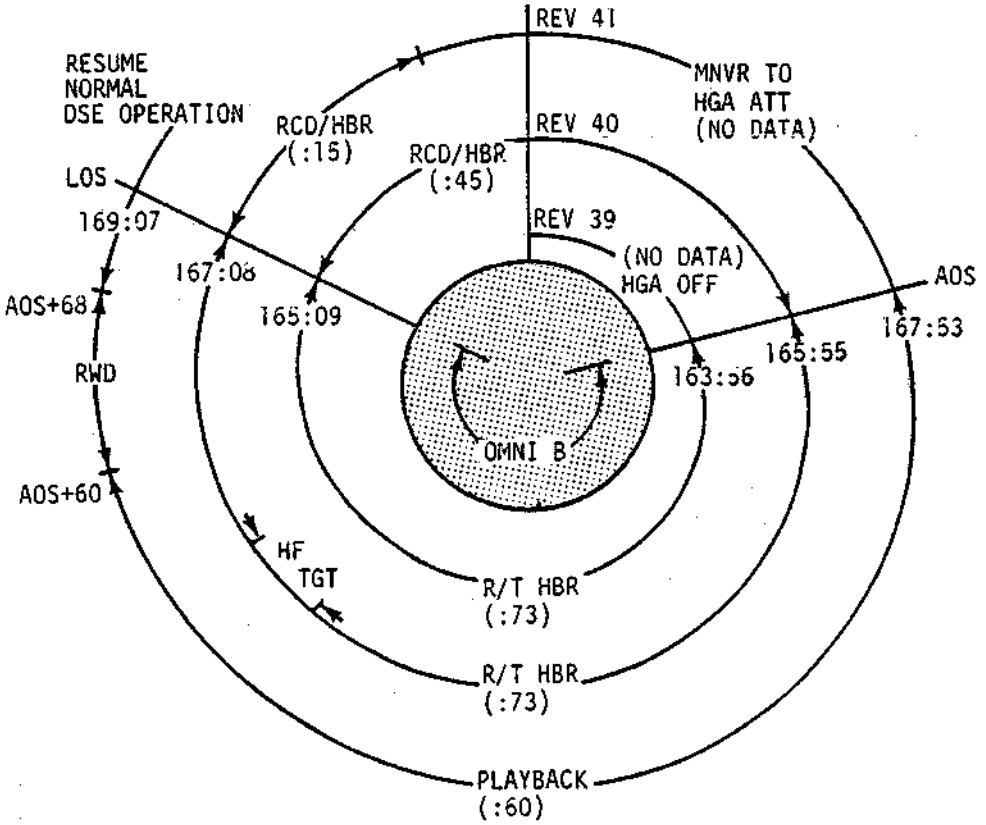
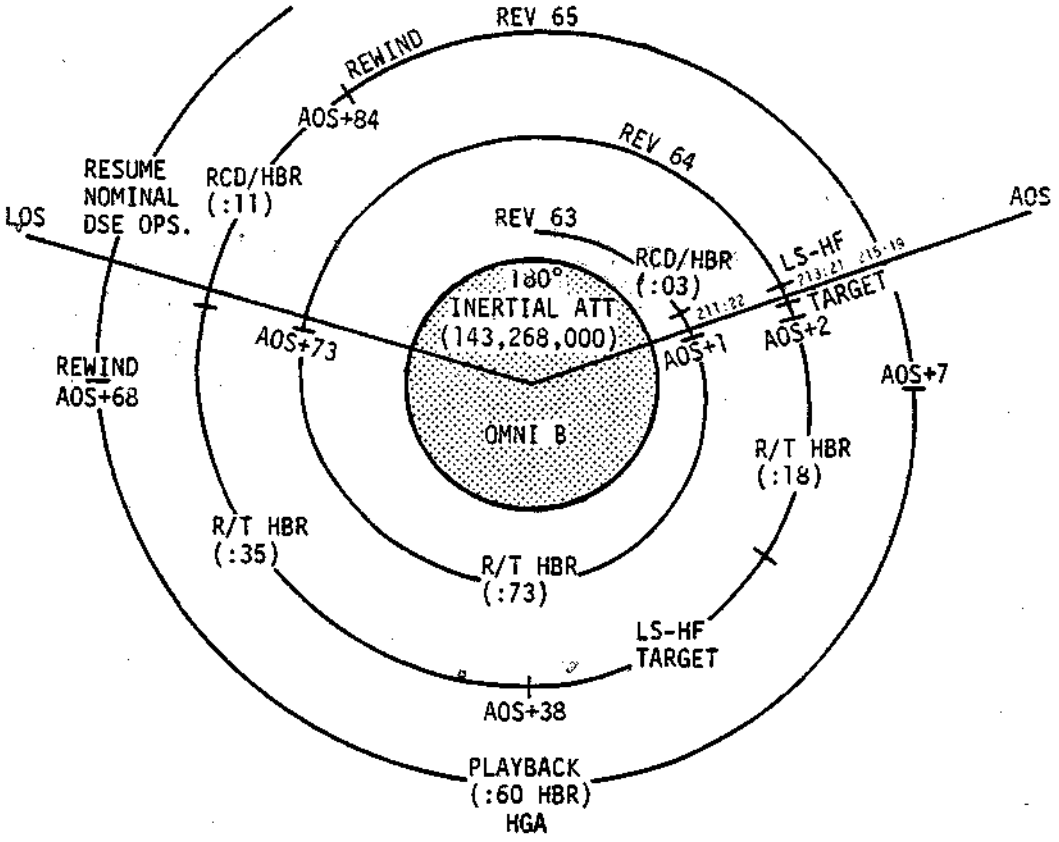


CHART 2-5

(12/6)

LUNAR SOUNDER - RECEIVE ONLY (SEP-OFF)

REVS 63, 64, 65



SECTION 3 - DETAILED TIMELINE

FLIGHT PLAN

MCC-H

2053 CST

NOTES

00:00 (31102) (01111)

LIFT-OFF DEC 6, 1972 CSM LAUNCH CHECKLIST

BOOST PAGE L/2-7 - C-1

STDN

:10

SECO

AT SECO+20 SEC, S-IVB MNVRS TO LH AND INITIATES ORB RATE (HEADS DOWN)

INSERTION AND SYSTEM CHECKS PAGE L/2-11 C-3

CYI

UPDATE
Z TORQUING ANGLE

:20

00:30

OPTICS DUST COVER JETT L/2-16 - C-6

P52 (OPTION 3)
(LAUNCH ORIENT)

:40

:50

GDC ALIGN

CRO

REPORT: GYRO TORQUING ANGLES
TWO WAY S-BAND VOICE CHECK
SCS ATT REF COMPARISON CHECK PAGE L/2-17 - 2-4

01:00

79

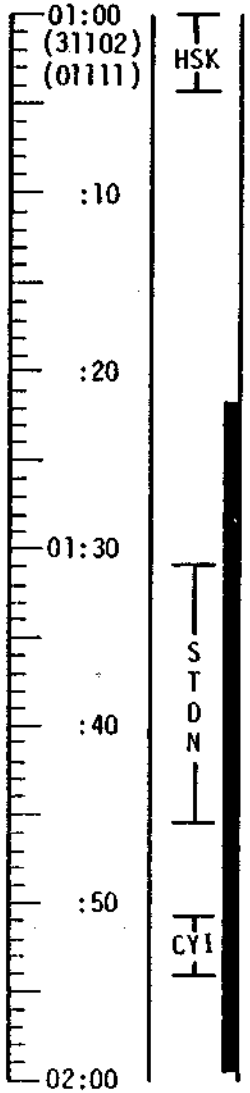
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	00:00 - 01:00	1/LAUNCH-E.O.	3-1

FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

2153 CST



CMD
DUMP DSE
UPDATE
TLI +90 MIN ABORT
PAD
P37 (L/O+9) PAD

EXTEND DOCKING PROBE PAGE L/2-18

P52 (OPTION 3)
(LAUNCH ORIENT)

GDC ALIGN
REPORT: GYRO TORQUING ANGLES

NOTES

P52 IMU REALIGN
N71: . __ __ , __ __
N05: __ __ __ . __ __
N93:
X __ __ . __ __ __
Y __ __ . __ __ __
Z __ __ . __ __ __
GET __ __ __ : __ __ : __ __

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	01:00 - 02:00	I/E.O.	3-2

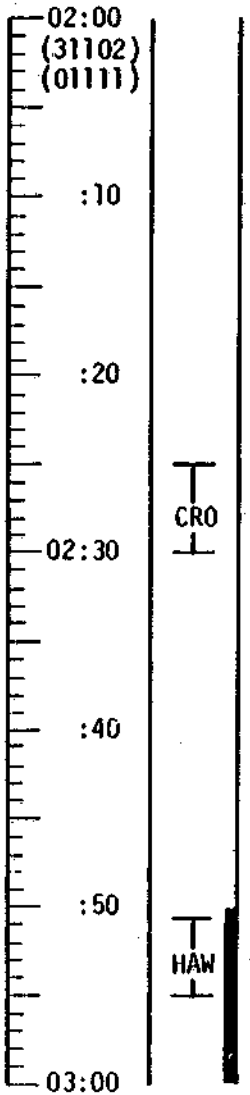
FLIGHT PLANNING BRANCH

08

FLIGHT PLAN

MCC-H

2253 CST



NOTES

GO/NO-GO FOR PYRO
ARM

UPLINK
CSM S/C & V66

TLI PREPARATION PAGE L/2-27
GO/NO-GO FOR PYRO ARM (CUE STDN)
LOGIC ON
TLI NOMINAL & MANUAL PAGE L/2-28

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	02:00 - 03:00	1/E.O.	3-3

TLI
BURN TABLE

ROLL RATES	P OR Y RATES	P OR Y ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
>20°/SEC TERMINATE	>10°/SEC TERMINATE	+45° TERMINATE	CMC T_{GO} = 0 PLUS 1 SECOND	NO TRIM

82

FLIGHT PLAN

MCC-H

2353 CST

NOTES

03:00
(31102)
(01111)

:10

UPDATE
GO/NO-GO FOR TLI

:20

STDN

ARIA

TB6 3:11:41

GO/NO-GO FOR TLI

OMNI C

TLI

TIG: 03:21:19.3
BT: 5 MIN 45.7 SEC
ΔVC: 10,346.8 FPS

OMNI D
P00
V66 SET CSM S.V. INTO LM S.V.

AT SECO: S-IVB INERTIAL
AT SECO +2 MIN 31 SEC:
S-IVB TO LOCAL
HORIZONTAL, ORB RATE
HEADS DOWN

03:30

ACN

TLI BURN STATUS REPORT
CDR - TRANS TO CENTER COUCH, CMP - LEFT COUCH

(11103)
(01111)
:40

NORMAL SC/BOOSTER SEPARATIONS PAGE L/3-1
DIRECT O2 VLV - OPEN, UNTIL CABIN IS 5.7 PSI, THEN CLOSE
V48 (11103)(01111)

S-IVB MNVRS TO SEP ATT 03:42:05

(002,310,041) OMNI D

UPDATE
GO/NO-GO FOR T&D

:50

STDN

GO/NO-GO FOR TRANSPOSITION AND DOCKING
CSM SEPARATION PREP PAGE L/3-1

T&D MNVR
+X FOR 3 SEC (ΔV ~0.5 FPS)
AFTER 15 SEC PITCH UP AT
0.5°/SEC. V49 AUTO MNVR
TO DOCKING ATT. NULL
TRANSLATION AND RATES,
+X FOR 4 SEC (ΔV ~0.7 FPS)

04:00

83

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	03:00 - 04:00	E.O./TLC	3-5

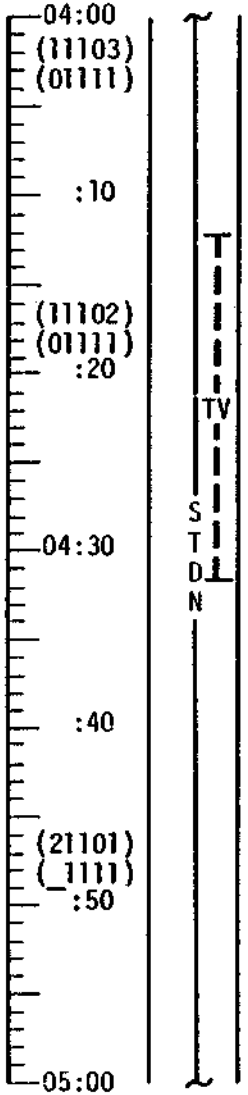
FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

0053 CST

NOTES



CSM/S-IVB SEP 04:12

CSM MNVR TO DOCK ATT (298,130,319) (04:18)
V48 (11102)(01111)
TV (HSK) 04:12 TO 04:32 CM4-BRKT (f22, MONITOR)
VISUALLY INSPECT AND PHOTOGRAPH S-IVB AND LM, MAG (AA,NN)

DOCK 04:22

CM/LM PRESSURE EQUALIZATION (DECAL) PAGE L/3-5

S-IVB NON-PROPULSIVE VENT START 4:27:05

TUNNEL HATCH REMOVAL (DECAL)
DOCKING LATCH VERIFICATION (DECAL)

LM UMBILICAL CONNECTIONS (DECAL)

HATCH INSTALLATION (DECAL)

S-IVB NON-PROPULSIVE VENT COMPLETE 4:42:05

PRE LM SEP & EJECTION

V48 (21101)(_1111)
GO/NO-GO FOR PYRO ARM (CUE STDN)
LOGIC ON
PYRO ARM

CMD
DUMP DSE

UPDATE
GO/NO-GO FOR
PYRO ARM AND
CSM/LM EJECTION

48

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	04:00 - 05:00	1/TLC	3-6

FLIGHT PLANNING BRANCH

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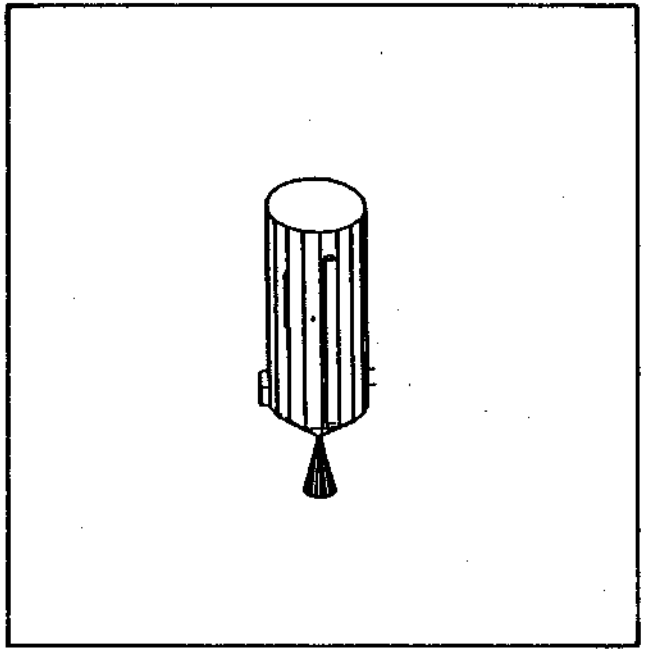
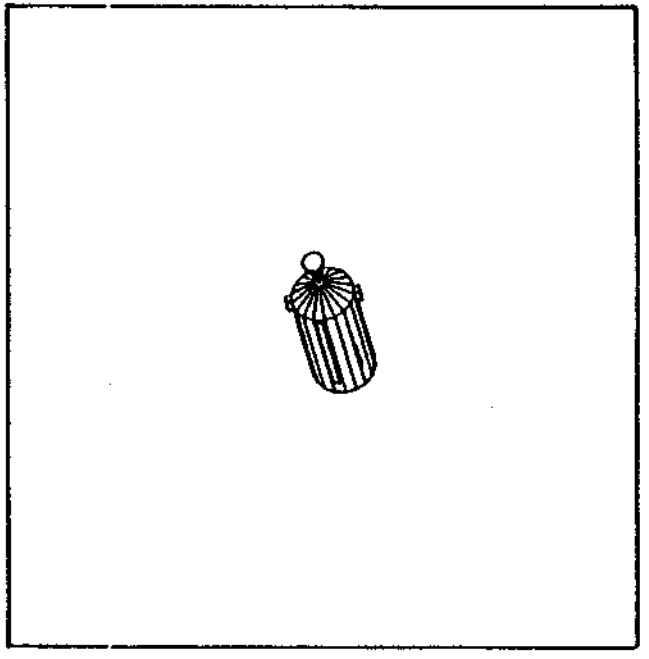
FLIGHT PLAN

GET 05:10 FOV 5°



S-IVB APS EVASIVE INITIATION

GET 05:31 FOV 1°



S-IVB LOX DUMP INITIATION

FLIGHT PLAN

MCC-H	0153 CST			NOTES
	05:00		P47 THRUST MONITOR PHOTOGRAPH LM EJECTION, MAG (AA,NN)	SPRING ACTUATOR ΔV ~0.8 FPS. 5 SEC AFTER EJECTION THERE IS A 4 JET RCS -X TRANSLATION FOR 3 SEC (ΔV ~ 0.4 FPS) TOTAL ΔV ~ 1.2 FPS.
	(21101) (_1111)			
TLI CUTOFF + 1 HR 40 MIN			CSM/LM EJECTION 05:07	
	:10		P00, V66 SET CSM S.V. INTO LM S.V. REPORT: GOOD EJECTION V49 MNVR TO VIEW S-IVB IN HATCH WINDOW BY 05:16 (270.0,129.8,004.3) HGA P -1, Y 273 REPORT: GO FOR S-IVB YAW MNVR VISUALLY INSPECT S-IVB/IU THERMAL SHROUD	THE MNVR TO ACQUIRE THE S-IVB WILL BE PERFORMED AT 0.2°/SEC AND WILL BE INITIATED AFTER GOOD EJECTION IS VERIFIED.
UPDATE GO FOR S-IVB YAW MNVR INITIATION				
	:20		S-IVB YAW MNVR 05:20 (GROUND COMMAND) REPORT: GO FOR S-IVB EVASIVE BURN	
	(21111) (_1111)		V48 (21111)(_1111)	GO FOR S-IVB YAW MNVR INDICATES THAT THE S-IVB IS IN THE CREW FIELD OF VIEW AND ADEQUATE SPACECRAFT SEPARATION HAS BEEN ACHIEVED.
UPDATE GO/NO-GO FOR S-IVB EVASIVE BURN	05:30	STDN	S-IVB APS EVASIVE BURN 05:30 (GROUND COMMAND) REPORT: LM/CM ΔP INSTALL CABIN FAN FILTER (U2)	THE S-IVB YAW MNVR WILL BE PERFORMED NOMINALLY AT LM EJECTION +13 MIN
			CSM SYSTEMS CHECKLIST DEACTIVATE PRIMARY EVAP PAGE S/1-16	
	:40		S-IVB MNVRS TO PROPELLANT DUMP ATT 05:40 VHF A SIMPLEX - OFF WASTE STOWAGE VENT VALVE - VENT (VERIFY)	EVASIVE BURN ΔV ~9.4 FPS
			S-IVB CONTINUOUS H_2 VENT - ON 05:47	
	:50		S-IVB LOX DUMP 05:51	LOX DUMP ΔV ~28 FPS
			DOFF PGA'S TRANSFER ITEMS OUT OF PGA POCKETS TRANSFER PRD TO CWG CMP & LMP DOFF BIOMED HARNESS DUMP UCTA	
	06:00			

87

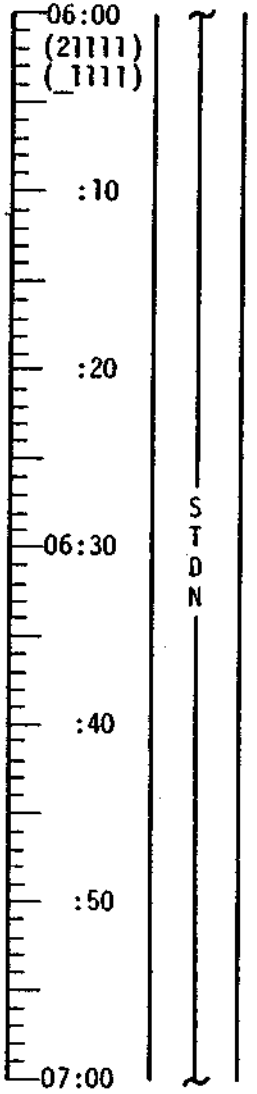
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	05:00 - 06:00	1/TLC	3-9

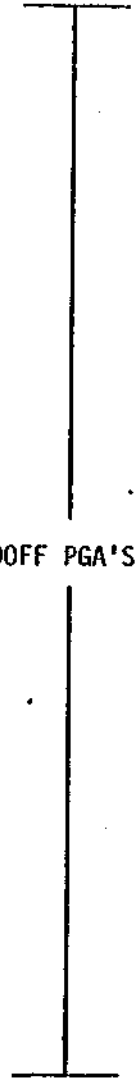
FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

0253 CST





NOTES

S-IVB APS MCC-1
GET ~ 06:35
ΔV ~30 FPS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	06:00 - 07:00	1/TLC	3-10

FLIGHT PLANNING BRANCH

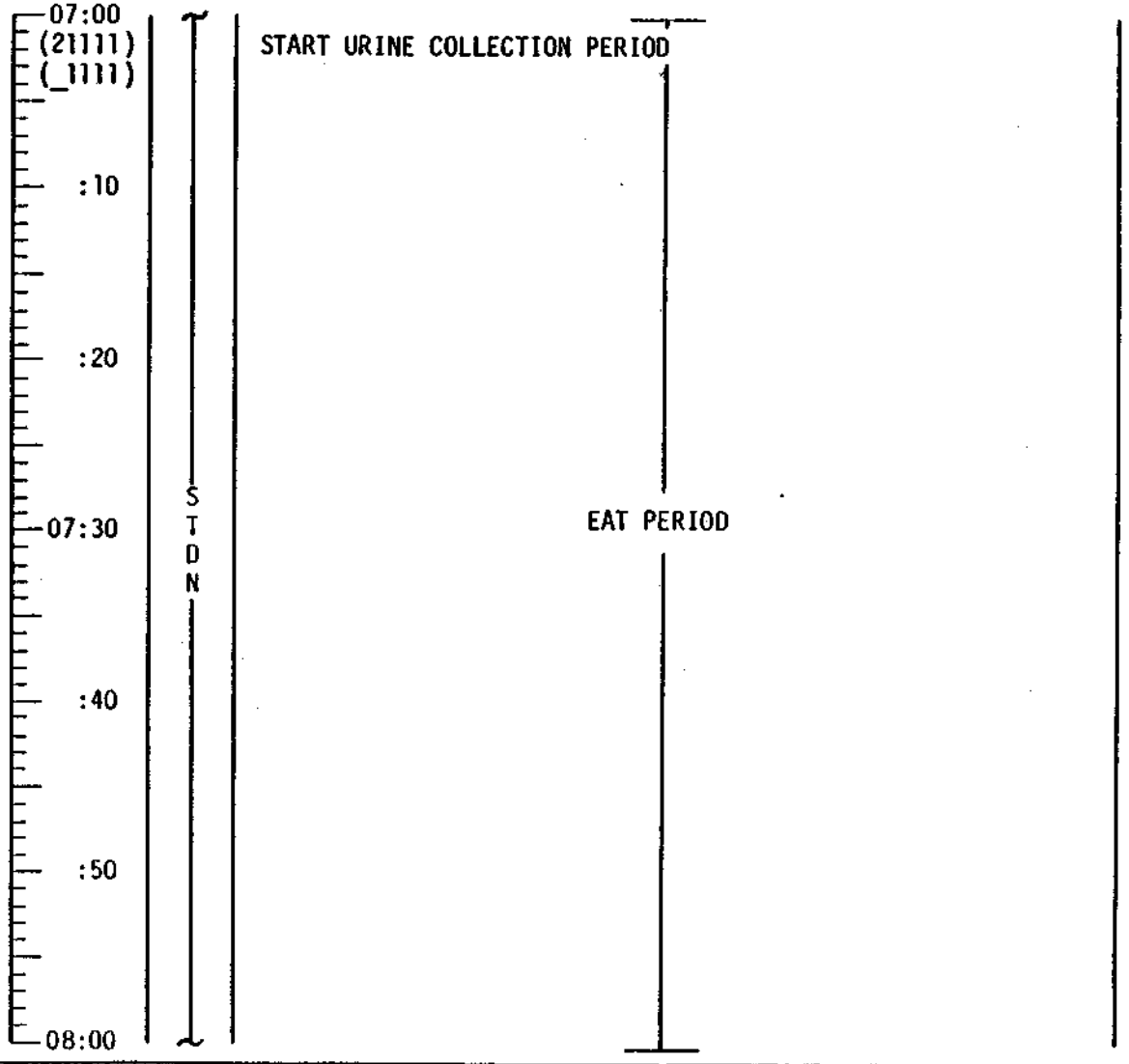
88
88

FLIGHT PLAN

MCC-H

0353 CST

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	07:00 - 08:00	1/TLC	3-11

FLIGHT PLANNING BRANCH

68

FLIGHT PLAN

MCC-H 0453 CST

UPLINK
ZERO TRUNNION BIAS
DESIRED ORIENT (PTC)

08:00
(21111)
(_1111)
:10
:20

UPDATE
QUADS TO ENABLE
FOR PTC SPINUP
P37 PAD (L/O+15,25)
FLIGHT PLAN

(21101)
(_1111)
08:30
:40
:50
09:00

STDN

WASTE STOWAGE VENT VALVE - CLOSE

LIMIT CYCLE - ON
ATT DEADBAND - MIN
RATE - LOW
BMAG (3) - ATT 1/RATE 2
SC CONT - SCS
P52 (OPTION 3)
(LAUNCH ORIENT)

STARS _____, _____
SA _____, _____
TA _____, _____

REPORT: GYRO TORQUING ANGLES
P52 (OPTION 1)
(PTC ORIENT)
GDC ALIGN
SC CONT - CMC
BMAG (3) - RATE 2
CYCLE CMC MODE - FREE/AUTO
V48 (21101)(_1111)

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G/8-2
V49 MNVR TO PTC ATTITUDE
(N20,90,000)
H2 HEATERS 1 & 2 - AUTO (VERIFY)
H2 FANS 3 - AUTO
O2 HEATERS 1 & 2 - OFF
O2 HEATERS 3 - AUTO
P20 OPT 2, X-AXIS
N78 (0,0,0)
N79 (-0.4200, +000.50)
N34 (0,0,0)
LiOH CANISTER CHANGE
(3 INTO A, STOW 1 in B5)

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST PAGE S/1-29
COMM - OMNI

PTC

NOTES

SC INTERIOR PHOTOGRAPHY AT CREW OPTION
CM/DAC/10/CIN- SPOT
(T2.8,1/60,3) 6 fps

MAG (II) ___, FR #____

PTC REFSMMAT ATT
R 196, P 169, Y 055

P52 IMU REALIGN
N71: __ __,__ __
N05: __ __ __.__ __
N93:
X __ __.__ __ __
Y __ __.__ __ __
Z __ __.__ __ __
GET __ __ __:__ __:__ __

IF MCC-1 IS REQUIRED
PERFORM AT GET 08:45

DAP LOAD STATUS
(21101)(_1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	08:00 - 09:00	1/TLC	3-12

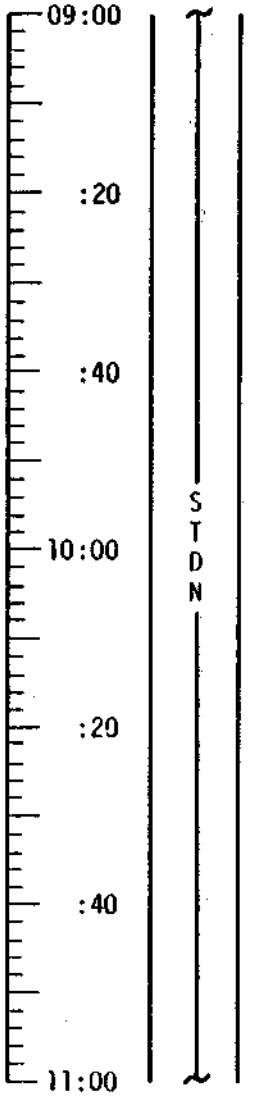
FLIGHT PLANNING BRANCH

06

FLIGHT PLAN

MCC-H

0553 CST



STDN

CHARGE BATTERY B

FILM MAGS REQUIRED FOR NEXT DAY

EL: KK

REST PERIOD
(5.75 HOURS)

PTC

NOTES

DAP LOAD STATUS
(21101)(_1111)

S-IVB APS MCC-2
GET ~10:20
ΔV NOM. ZERO

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	09:00 - 11:00	1/TLC	3-13

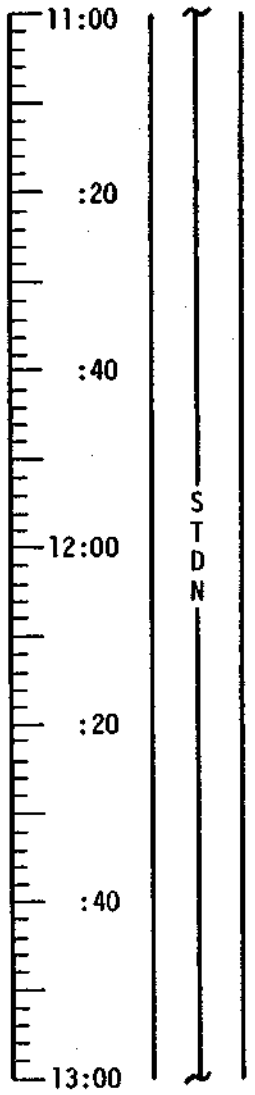
FLIGHT PLANNING BRANCH

97

FLIGHT PLAN

MCC-H

0753 CST



STDN

REST PERIOD
(5.75 HOURS)

PTC

NOTES

DAP LOAD STATUS
(21101)(_1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	11:00 - 13:00	1/TLC	3-14

FLIGHT PLANNING BRANCH

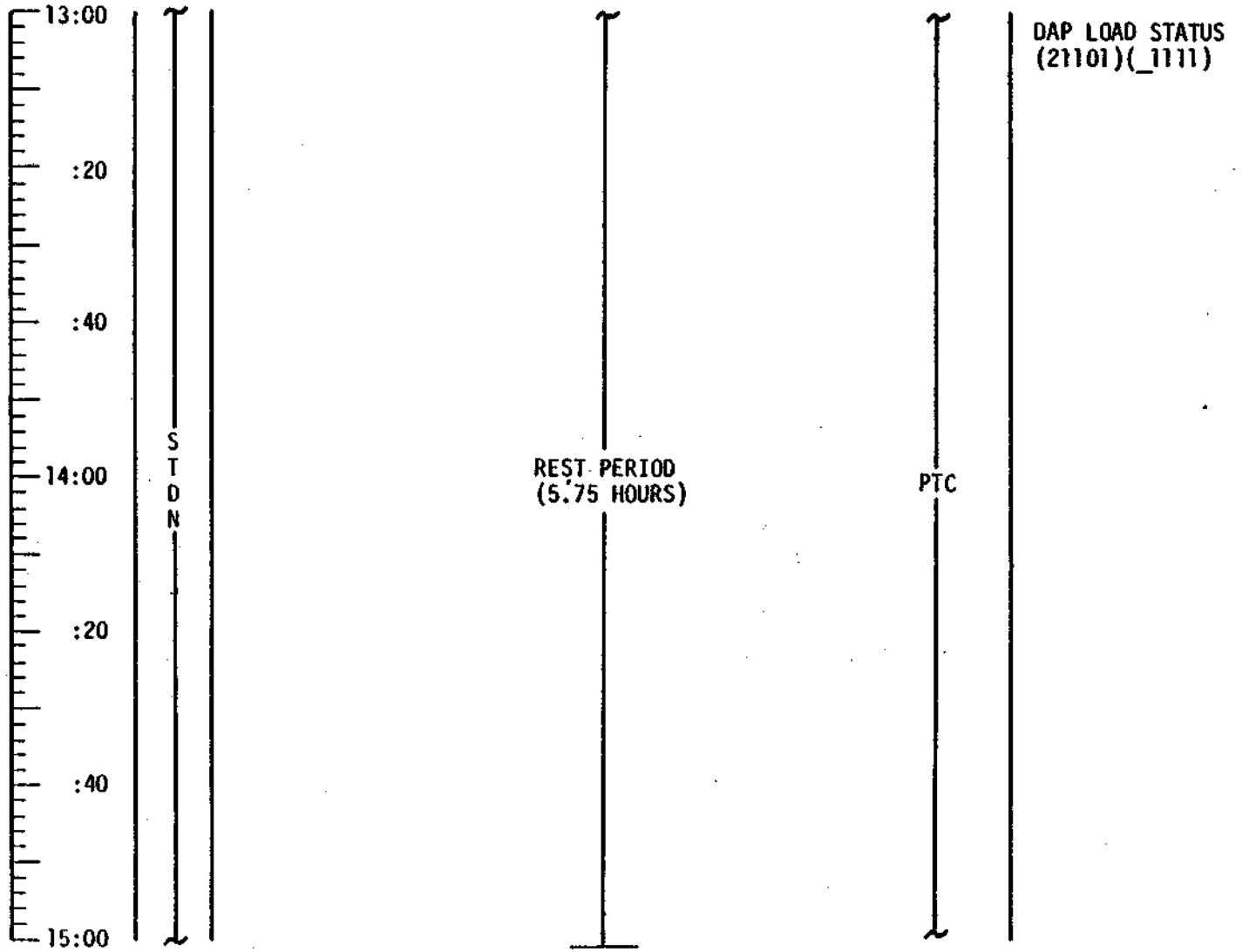
FLIGHT PLAN

MCC-H

0953 CST

NOTES

DAP LOAD STATUS
(21101)(_1111)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	13:00 - 15:00	1/TLC	3-15

FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

1153 CST

15:00

:10

:20

15:30

:40

:50

16:00

STDN

CSM SYSTEMS CHECKLIST

POST-SLEEP CHECKLIST PAGE S/1-29

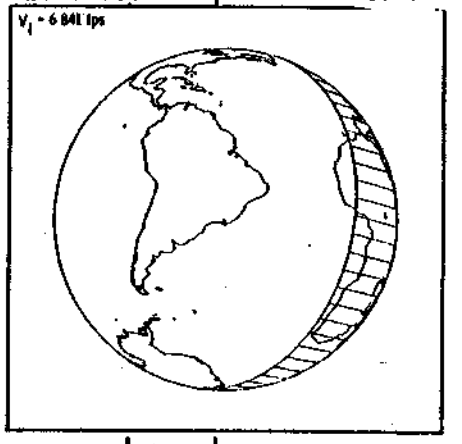
H_2 HEATERS 1&2 - OFF

EAT PERIOD

PTC

GET=15:00

FOV=7°



NOTES

DAP LOAD STATUS
(21101)(_1111)

EARTH DISTANCE
~66,783 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	15:00 - 16:00	2/TLC	3-16

FLIGHT PLANNING BRANCH

46

FLIGHT PLAN

MCC-H

1253 CST

16:00
(21101)
(_1111)
:10
:20
16:30
:40
:50
17:00

STDN

EAT PERIOD

PTC

NOTES

UPDATE
P37 PADS (LAUNCH +35,45,55, & 65)
FLIGHT PLAN

P52 (OPTION 3)
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES
GDC ALIGN

CSM G&C CHECKLIST
EXIT G&N PTC PAGE G/8-3
WASTE STOWAGE VENT VLV - OPEN

P52 IMU REALIGN
N71: __ __,__ __
N05: __ __ __.__ __
N93:
X __ __.__ __ __
Y __ __.__ __ __
Z __ __.__ __ __
GET __ __ __:__ __:__ __

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	16:00 - 17:00	2/TLC	3-17

FLIGHT PLANNING BRANCH

96

FLIGHT PLAN

MCC-H

1353 CST

17:00
(21101)
(_1111)

:10

:20

17:30

:40

:50

18:00

STDN

V49 MNVR TO OPTICS CALIBRATION ATTITUDE (17:13)
(175,298,330) HGA P -58, Y 307

P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00022)
P00
V49 MNVR TO SIGHTING ATTITUDE (17:17)
(204,313,340) HGA P -55, Y 357
V67 (+80000) (+00070) (+00003)
P23 CISLUNAR NAVIGATION
5 MARKS ON EACH STAR, UPDATE STATE VECTOR
1. N70 (00000) (00000) (00110)
   N88 (-53277)(+14235)(+83420)

2. N70 (00000) (00000) (00120)
   N88 (+02745)(+99128)(+12885)

3. N70 (00000) (00000) (00110)
   N88 (-84900)(+40299)(+34176)

NOTES

113 MERAK
(ENH)

55 BETELGEUSE
(EFH)

151 GAMMA PRIME
LEONIS
(ENH)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	17:00 - 18:00	2/TLC	3-18

FLIGHT PLANNING BRANCH

96

FLIGHT PLAN

MCC-H

1453 CST

18:00
(21101)
(_1111)

:10

:20

:30

:40

:50

19:00

STDN

4. N70 (00000) (00000) (00120)
N88 (+00780)(+70773)(+70644)

P00
V49 MNVR TO OPTICS CALIBRATION ATTITUDE (18:22)
(175,298,330) HGA P -58, Y 307
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00022)
CONFIGURE FOR URINE DUMP

O_2 FUEL CELL PURGE
SAMPLE BUSS's (3) - STOW SAMPLES (3)
DUMP URINE FROM BUSS's (3) - STOW
START NEW URINE COLLECTION PERIOD
WASTE WATER DUMP TO 10 PERCENT
CHARGE BATTERY A

CSM EXP/EVA CHECKLIST
PC & MC FILM CYCLING PAGE X/1-17

ON STDN CUE: CYCLE FILM

NOTES

106 MENKALINAN
(EFH)

97

CMD
DATA SYS - OFF

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	18:00 - 19:00	2/TLC	3-19

FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

1553 CST

NOTES

19:00 (21101) (_1111)

:10

:20

19:30

:40

:50

20:00

STDN

LMP DON BIOMED HARNESS

OMNI B
SECURE HGA: MAN, WIDE P -52, Y 270

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL PAGE G/8-2
V49 MNVR TO PTC ATTITUDE
(N20,090,000)
P20 OPT 2, X-AXIS
N78 (0,0,0)
N79 (-0.4200, +000.50)
N34 (0,0,0)

CHECK LMP BIOMED
CDR DOFF BIOMED HARNESS

EARTH PHOTOS
CM/EL/250-CEX(f8,1/250,∞) 4 FR

MAG (KK) ____, FR # ____

PTC

UPDATE
QUADS TO ENABLE
FOR PTC SPINUP
FLIGHT PLAN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	19:00 - 20:00	2/TLC	3-20

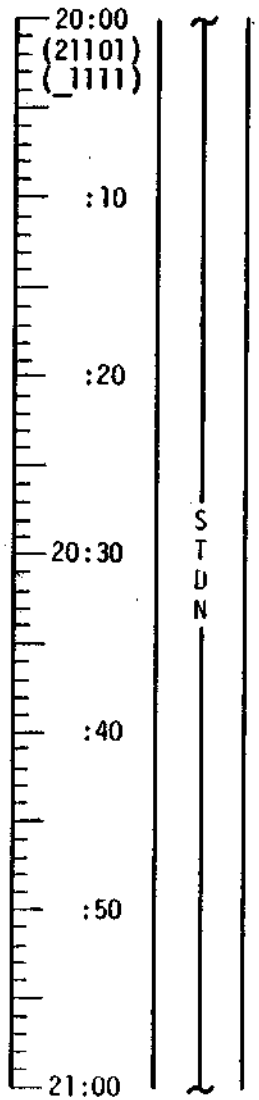
FLIGHT PLANNING BRANCH

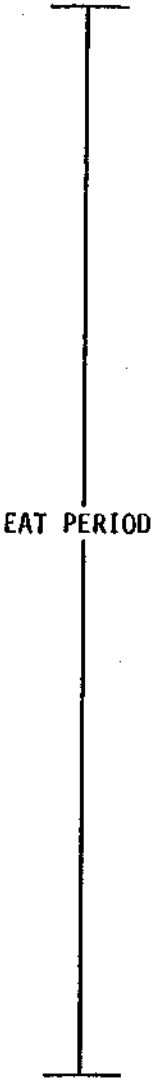
86

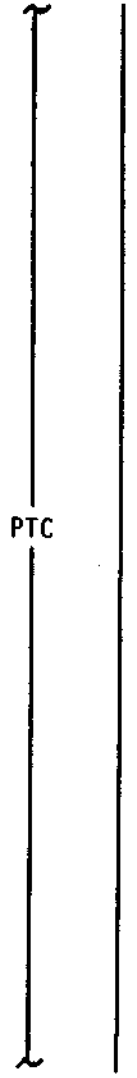
FLIGHT PLAN

MCC-H

1653 CST







NOTES

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MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	20:00 - 21:00	2/TLC	3-21

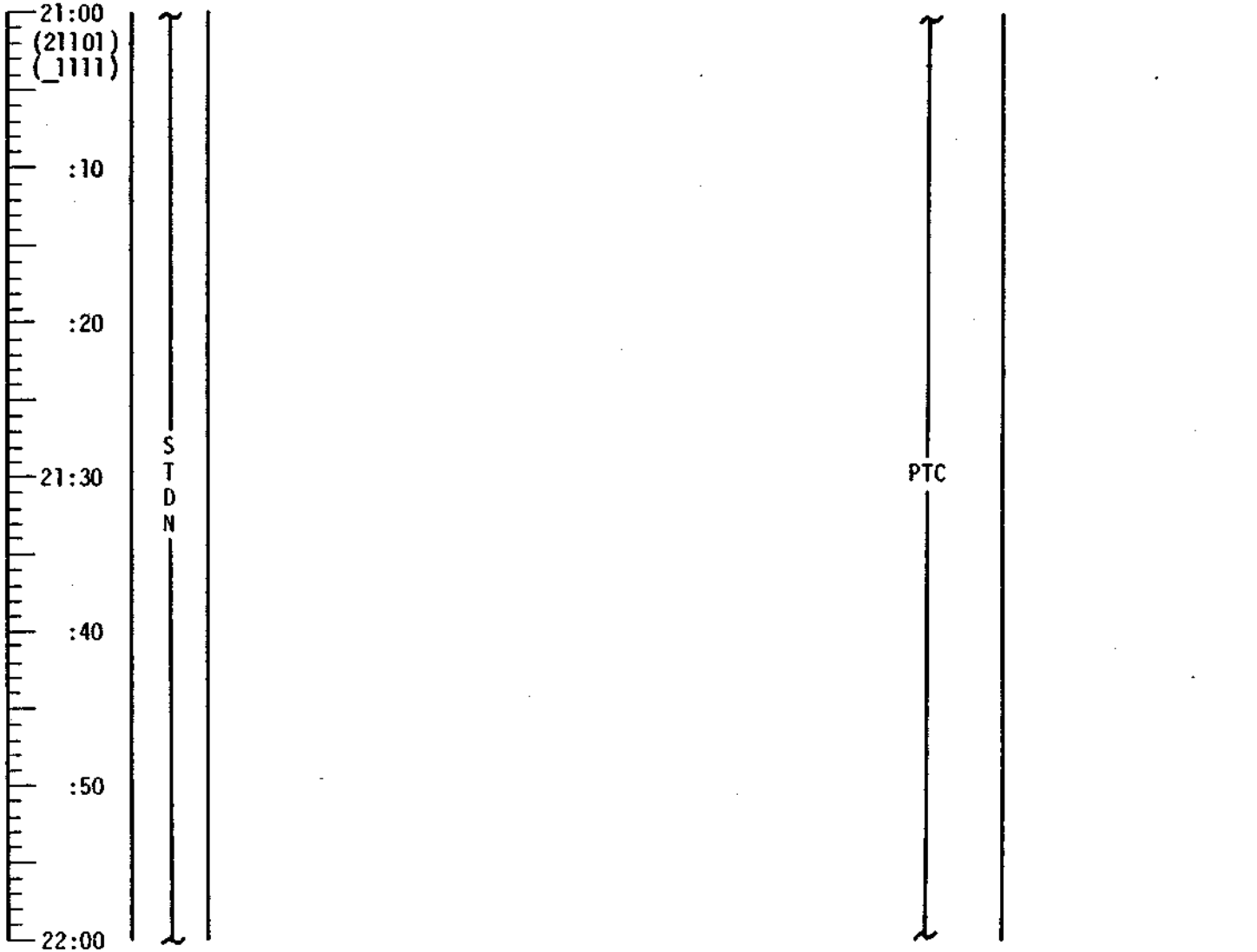
FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

1753 CST

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 17	FINAL (12/6)	10/23/72	21:00 - 22:00	2/TLC	3-22

FLIGHT PLANNING BRANCH

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