NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

APOLLO 14 (JAN 31, 1971)

AS-509/CSM-110/LM-8

FINAL

FLIGHT PLAN

PREPARED BY
APOLLO FLIGHT PLANNING SECTION
FLIGHT PLANNING BRANCH
FLIGHT CREW SUPPORT DIVISION

MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

CHANGED
JANUARY 18, 1971

This final version of **the Apollo 14 Flight Plan** is number two of a set sent to Honeysuckle Creek Tracking Station, Canberra, Australia, for support of the mission.

It is dated January 18 1971 and was received at the station on January 27, four days before launch.

Honeysuckle Creek was one of NASA's three prime 26 metre dish tracking sites (the others being Goldstone, California and Madrid, Spain).

This copy was preserved by Honeysuckle Creek's Hamish Lindsay, who was responsible for the station's Technical Support Section.

The Flight Plan was scanned, and this PDF file assembled, by Colin Mackellar for **www.honeysucklecreek.net**, February 2021, the 50th anniversary of Apollo 14.

Blank pages have also been retained.

www.honeysucklecreek.net

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FINAL
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FLIGHT PLAN

PREPARED BY

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MANNED SPACECRAFT CENTER
HOUSTON, TEXAS

DECEMBER 2, 1970

SECTION 1
SECTION 2
SECTION 3
SECTION 4
SECTION 5
SECTION 6

APOLLO 14

(January 31, 1971)

FLIGHT PLAN

January 18, 1971

PREPARED BY: C. L. Stough

C. L. STOUGH
BOOK MANAGER

APPROVED BY: J. W. O'Neill

J. W. O'NEILL, CHIEF
FLIGHT PLANNING BRANCH
FLIGHT CREW SUPPORT DIVISION

It is requested that any organization having comments, questions, or suggestions concerning this document contact C. L. Stough, Flight Planning Branch, CF62, Building 4, room 231, telephone 483-4271.

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes should be submitted to the Apollo Flight Data File Manager T. W. Holloway, CF62, Building 4, room 230, telephone 483-4271.

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(JANUARY 31, 1971)

FLIGHT PLAN

FINAL

DECEMBER 2, 1970

SUBMITTED BY: C. L. Stough

C. L. STOUGH
BOOK MANAGER

APPROVED BY: J. W. O'Neill

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ACKNOWLEDGMENTS

Acknowledgment is made to Messrs. R. Rogers, Richard Shinkle, Wood Calvert, John Owen, Joe Shacter, Don Hutson, Thomas Johnson, Leon Vick, Bob Jefferies, Elvin Pippert, Spencer Gardner, Brian Hurlbut, Marion Griffin, Gerald Shinkle, George Laski, and Richard Meckley for their technical support in the preparation of the Apollo 14 Flight Plan.

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 14 (Mission H-3)" published November 24, 1970.

The CSM and LM attitude information was taken from the document, "Operational Lunar Orbit Attitude Sequence for Apollo 14, (Mission H-3)" to be published by December 22, 1970.

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

APOLLO 14

(JANUARY 31, 1971)

FLIGHT PLAN

DECEMBER 23, 1970

PREPARED BY: C. L. Stough
C. L. STOUGH
BOOK MANAGER

APPROVED BY: FOR J. W. O'NEILL, CHIEF
FLIGHT PLANNING BRANCH
FLIGHT CREW SUPPORT DIVISION

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Flight Plan (January 31, 1971 Launch)
Pen & Ink 1/18/71

Flight Data File Pen and Ink Changes

The enclosed pen and ink changes are included with change C to the Apollo 14 Flight Plan dated 1/18/71. The list of effective pages for change C reflect these pen and ink changes.

1. Page 3-142: At bottom of page change edition from "Final (Jan)" to "Change C (Jan)" and Date from "December 2, 1970" to "January 18, 1971."

2. Page 3-142: At 116:50 change "(000,114,045) HGA P -84, Y 356" to "(184,202,045) HGA P 3, Y 229"

3. Page 3-196: At bottom of page change edition from "Change A (Jan)" to "Change C (Jan)" and date from "December 23, 1970" to "January 18, 1971"

4. Page 3-196: At 139:55 change "CM/EL/250/CEX (f11,1/250,∞)(31FR)" to "CM/EL/250/CEX (f8,1/250,∞)(31FR)"

5. Page 3-198: At bottom of page change edition from "Final (Jan)" to "Change C (Jan)" and date from "December 2, 1970" to "January 18, 1971"

6. Page 3-198: At 140:06 change "Photo TGT 7, North (f11,1/250,∞)" to "Photo TGT 7, North (f8,1/250,∞)"

7. Page 1-16: Delete TV show on Thursday 4, February 7:23 pm CST.

8. Page 3-96: At bottom of page change edition from "CHANGE A (JAN)" to "CHANGE C (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 18, 1971"

9. Page 3-96: At 100:58, delete TV callout "CM5/TV-AVG (f22) TV (GDS) 101:00 - 101:14"

10. Page 3-98: At bottom of page change edition from "CHANGE A (JAN)" to "CHANGE C (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 18, 1971"

11. Page 3-98: From 101:00 to 101:14 delete TV show

FLIGHT DATA FILE PEN AND INK CHANGES

The enclosed pen and ink changes are included with change B to the Apollo 14 Flight Plan dated 1/11/71. The list of effective pages for change B reflect these pen and ink changes.

1. Page 1-16: Under CST and GET for Friday 5, FEB. Change "8:20 AM" to 8:06 AM" and "113:40" to "113:43".

2. Page 1-16: Under CST and GET for Saturday 6, FEB. Change "3:59AM" to "3:56 AM" and "133:31" to "133:33".

3. Page 3-78: Change CSM IMU roll angle for LOI +2 hr DPS abort from "301" to "121".

4. Page 3-78: Change LM FDAI angles for LOI +2 hr DPS abort from "10,81,1" to "170,261,359".

5. Page 3-79: At bottom of page change edition from "FINAL (JAN)" to "CHANGE B (JAN)" and Date from "DECEMBER 2, 1970" to "JANUARY 11, 1971".

6. Page 3-79: In the Notes column under S-IVB LUNAR IMPACT change "LONG 33.250" to "LONG -33.250". Hall Milton

7. Page 3-82: Change "AOS to LOS = 874 SEC" to "AOS TO LOS = 450 SEC".

8. Page 3-86: At bottom of page change edition from "FINAL (JAN)" to "CHANGE B (JAN)" and Date from "DECEMBER 2, 1970" to "JANUARY 11, 1971".

9. Page 3-86: Delete "V48 (21111)(X1111)" and "$\binom{21111}{X1111}$" at the bottom of the page.

10. Page 3-87: At bottom of page change edition from "FINAL (JAN" to "CHANGE B (JAN)" and Date from "DECEMBER 2, 1970" to "JANUARY 11, 1971".

11. Page 3-87: Change DAP LOAD STATUS at top of time column from "21111" to "21101".
Delete "V48 (21101)(X1111)" and "$\binom{21101}{X1111}$" at bottom of page.

12. Page 3-106: At bottom of page change edition from "CHANGE A (JAN)" to "CHANGE B (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 11, 1971".

13. Page 3-106: Under CSM LOW ALTITUDE LANDMARK TRACKING PROFILE change "AOS TO LOS = 72 SEC" to "AOS TO LOS = 52 SEC"

14. Page 3-128: At bottom of page change edition from "CHANGE A (JAN)" to "CHANGE B (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 11, 1971".

15. Page 3-128: At 111:58 add "TERMINATE WASTE WATER DUMP".

16. Page 3-136: At bottom of page change edition from "FINAL (JAN)" to "CHANGE B (JAN)" and date from "DECEMBER 2, 1970" to "JANUARY 11, 1971".

17. Page 3-136: At 114:32 in the time column change
"(10101)" (X1111) to "(11101)" (X1111)

18. Page 3-148: At bottom of page Change edition from "CHANGE A (JAN)" to "CHANGE B (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 11, 1971".

19. Page 3-148: At 118:24 change "CM4/DC/80/VHBW-BRKT-IVL (f2.8/1/60,∞) (51 FR)" to "CM4/DC/80/VHBW-BRKT,IVL, PCM CABLE (f2.8,1/60,∞) (51 FR)".

20. Page 3-214: At bottom of page change edition from "FINAL (JAN)" to "CHANGE B (JAN) and date from "DECEMBER 2, 1970" to "JANUARY 11, 1971".

21. Page 3-214: At 144:16, delete the following: "REMOVE DECOMTAMINATION BAGS (A8) UNSTOW AND ASSEMBLE:
VACUUM CLEANER, PWR CABLE,
HOSE, AND BAG (SIDE A12, SIDE A8)
CONNECT PWR CABLE (PNL 201)".

22. Page 3-216: At 144:32, change "DECONTAMINATION BAGS (A8, U1)" to "DECONTAMINATION BAGS".

23. Page 3-216: At bottom of page change edition from "CHANGE A (JAN)" to "CHANGE B (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 11, 1971".

24. Page 3-225: At bottom of page change edition from "CHANGE A (JAN)" to "CHANGE B (JAN)" and date from "DECEMBER 23, 1970" to "JANUARY 11, 1971".

25. Page 3-225: In the LM LUNAR IMPACT BOX change "LONG 1929°W" to "LONG 19.27°W".

26. Page 3-225: In Notes column change "LAT 3.32°S" to "LAT 3.04°S" and "LONG 23.38°W" to "LONG 24.64°W".

FLIGHT PLAN
(January 31, 1971 Launch)

LIST OF EFFECTIVE PAGES

FINAL DATE 12/2/70
CHANGE DATE 12/23/70
CHANGE DATE 1/11/71
CHANGE DATE 1/18/71 — ✓ change c implemented 27/1/71 fH.

* INDICATES CURRENT CHANGE

PAGE NUMBER	CHANGE DATE
*i thru iia	1/18/71
iii thru vi	12/23/70
vii thru xx	FINAL
1-1 thru 1-15	FINAL
*1-16	1/18/71
1-17 thru 1-27	FINAL
2-1 thru 2-5	FINAL
3-1 thru 3-8	FINAL
3-9 thru 3-14	12/23/70
3-15 thru 3-31	FINAL
3-32	12/23/70
3-33 thru 3-36	FINAL
3-37	12/23/70
3-38 thru 3-49	FINAL
3-50	12/23/70
3-51	FINAL
3-52	12/23/70
3-53 thru 3-76	FINAL
3-77	12/23/70
3-78 and 3-79	1/11/71
3-80 thru 3-81	FINAL
3-82	1/11/71
3-83 thru 3-85	FINAL
*3-86	1/18/71
3-87	1/11/71
3-88 thru 3-95	FINAL
*3-96	1/18/71
3-97	FINAL
*3-98	1/18/71

LIST OF EFFECTIVE PAGES (CONT)

3-99 thru 3-103	FINAL
3-104	12/23/70
3-105	FINAL
3-106	1/11/71
3-107 thru 3-109	FINAL
3-110	12/23/70
3-111 thru 3-116	FINAL
3-117	12/23/70
3-118	FINAL
3-119	12/23/70
3-120	FINAL
3-121 thru 3-123	12/23/70
3-124	FINAL
3-125	12/23/70
3-126 and 3-127	FINAL
3-128	1/11/71
3-129 thru 3-131	FINAL
3-132	12/23/70
3-133 and 3-134	FINAL
3-135	12/23/70
3-136	1/11/71
3-137 and 3-138	FINAL
3-139	12/23/70
3-140 and 3-141	FINAL
*3-142	1/18/71
3-143 thru 145	FINAL
3-146	12/23/70
3-147	FINAL
3-148	1/11/71
3-149	FINAL
3-150	12/23/70
3-151	FINAL
3-152	12/23/70
3-153	FINAL
3-154	12/23/70
3-155 thru 3-173	FINAL
3-174	12/23/70
3-175	FINAL
3-176	12/23/70
3-177 thru 3-179	FINAL
3-180	12/23/70
3-181 thru 3-195	FINAL
*3-196	1/18/71
3-197	FINAL
*3-198	1/18/71
3-199 thru 3-203	FINAL

LIST OF EFFECTIVE PAGES (CONT)

FLIGHT PLAN
(January 31, 1971 Launch)

LIST OF EFFECTIVE PAGES

FINAL DATE 12/2/70
CHANGE DATE 12/23/70 ✓
CHANGE DATE 1/11/71 ✓ change B implemented 27/1/71 RA.

* INDICATES CURRENT CHANGE

PAGE NUMBER	CHANGE DATE
*i thru iia	1/11/71
iii thru vi	12/23/70
vii thru xx	FINAL
1-1 thru 1-15	FINAL
✓ *1-16	1/11/71
1-17 thru 1-27	FINAL
2-1 thru 2-5	FINAL
3-1 thru 3-8	FINAL
3-9 thru 3-14	12/23/70
3-15 thru 3-31	FINAL
3-32	12/23/70
3-33 thru 3-36	FINAL
3-37	12/23/70
3-38 thru 3-49	FINAL
3-50	12/23/70
3-51	FINAL
3-52	12/23/70
3-53 thru 3-76	FINAL
3-77	12/23/70
✓ *3-78 and 3-79	1/11/71
3-80 thru 3-81	FINAL
✓ *3-82	1/11/71
3-83 thru 3-85	FINAL
✓ ✓ *3-86 and 3-87	1/11/71
3-88 thru 3-95	FINAL
3-96	12/23/70
3-97	FINAL
3-98	12/23/70

LIST OF EFFECTIVE PAGES (CONT)

3-99 thru 3-103	FINAL
3-104	12/23/70
3-105	FINAL
*3-106	1/11/71
3-107 thru 3-109	FINAL
3-110	12/23/70
3-111 thru 3-116	FINAL
3-117	12/23/70
3-118	FINAL
3-119	12/23/70
3-120	FINAL
3-121 thru 3-123	12/23/70
3-124	FINAL
3-125	12/23/70
3-126 thru 3-127	FINAL
*3-128	1/11/71
3-129 thru 3-131	FINAL
3-132	12/23/70
3-133 and 3-134	FINAL
3-135	12/23/70
*3-136	1/11/71
3-137 thru 3-138	FINAL
3-139	12/23/70
3-140 thru 3-145	FINAL
3-146	12/23/70
3-147	FINAL
*3-148	1/11/71
3-149	FINAL
3-150	12/23/70
3-151	FINAL
3-152	12/23/70
3-153	FINAL
3-154	12/23/70
3-155 thru 3-173	FINAL
3-174	12/23/70
3-175	FINAL
3-176	12/23/70
3-177 thru 3-179	FINAL
3-180	12/23/70
3-181 thru 3-195	FINAL
3-196	12/23/70
3-197 thru 3-203	FINAL
*3-204	1/11/71
3-205	FINAL
3-206	12/23/70
3-207	FINAL
3-208	12/23/70
3-209 thru 3-210	FINAL
3-211	12/23/70
3-212 and 3-213	FINAL

LIST OF EFFECTIVE PAGES (CONT)

CONTENTS

CONTENTS (CONT)

TABLES

TABLES (CONT)

CHARTS AND GRAPHS

ABBREVIATIONS

ABB	abbreviation or abbreviated
AC	alternating current
ACCEL	accelerometer
ACN	Ascension
ACT	activation
ACQ	acquisition or acquire
AEA	abort electronics assembly
AGS	abort guidance subsystem
AH	ampere hours
ALSCC	Apollo lunar surface close-up camera
ALSD	Apollo lunar surface drill
ALSEP	Apollo lunar surface experiment package
ALT	altitude
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
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
BP	barber pole
BRKT	bracket
BSLSS	buddy secondary life support system
BT	burn time
BU	backup
BW	black and white (Film 3400)
BWD	backward
BW1	black and white (Film 3401)

ABBREVIATIONS (CONT)

CAP COM	capsule communicator
CALIB	calibration
CAM	camera
CB	circuit breaker
CCGE	cold cathode gage experiment
CCIG	cold cathode ion gage
CCW	counter clockwise
CDH	constant delta altitude
CDR	Commander
CDU	coupling data unit
CEX	color external (S0358)
CIN	color internal (S0168)
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
CONT	continue or contingency
CP	control point
CPLEE	charged particle lunar environment experiment
CRO	Carnarvon, Australia
CRYO	cryogenic
CS	contingency sample
CSC	close-up stereo camera
CSI	coelliptic sequence initiation
CSM	command and service modules
CST	central standard time
C/S	central station
C&WS	caution and warning system
CW	clockwise
CWEA	caution and warning electronics assembly
CYI	Grand Canary Island
DAC	data acquisition camera
DAP	digital auto pilot
DB	deadband
DC	direct current or data camera (70mm)

ABBREVIATIONS (CONT)

DCA	digital command assembly
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
DPS	descent propulsion system
DRT	dome removal tool
DS	documented sample
DSE	data storage equipment(CSM)
DSEA	data storage equipment assembly (LM)
DSKY	display and keyboard
DTO	detailed test objective
DUA	digital uplink assembly
DWN	down
E	erasable or enter
ECS	environmental control system
ED	explosive device
EDT	eastern daylight time
EFH	earth far horizon
EI	earth (atmosphere) interface and entry interface
EKG	electrocardiogram
EL	electric Hasselblad camera
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
EST	eastern standard time
ETB	equipment transfer bag
EVA	extravehicular activity

ABBREVIATIONS (CONT)

EVAP	evaporator
EVCS	extravehicular communications system
EVT	extravehicular transfer
EXT	external
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)
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
GBI	Grand Bahama Islands
GBM	Grand Bahama (MSFN)
GDC	gyro display coupler
GDS	Goldstone, California
GET	ground elapsed time
GETI	ground elapsed time of ignition
GETIL	ground elapsed time of landing for TIG time of abort burn
GLY	glycol
GMT	Greenwich mean time
G&N	guidance and navigation
GNCS	guidance, navigation and control system (CSM)
GWM	Guam
GYM	Guaymas, Mexico
H_2	hydrogen
HA	apogee altitude
HAW	Hawaii
HBR	high bit rate (TLM)
HD	highly desirable
HFE	heat flow experiment
HGA	high-gain antenna
HI	high (switch position)

ABBREVIATIONS (CONT)

HOR	horizon
H2O	water
HP	perigee altitude
HR	hour(s)
HSK	Honeysuckle (Canberra, Australia)
HTC	hand tool carrier
HTR	heater
HTV	USNS Huntsville
ICDU	inertial coupling data unit
ID	identification
IGA	inner gimbal angle
IGN	ignition
IMU	inertial measurement unit
IND	indicator
INIT	initialization
INT	interval
IP	initial point
ISA	interim stowage assembly
IU	instrumentation unit
IVC	intervehicular communications
IVL	intervalometer
IVT	intravehicular transfer
i_R	inclination of the ascending return
JETT	jettison
KM	kilometer
kwh	kilowatt hour
LA	launch azimuth
LAT	latitude
LBR	low bit rate (TLM)
LB or lb	pound(s)
LCG	liquid cooled garment
L/D	lift/drag
LD	lunar day (TV lens)
LDG	landing
LDMK	landmark
LEB	lower equipment bay
LEC	lunar equipment conveyor
LEVA	lunar extravehicular visor assembly
LFH	lunar far horizon
LGC	LM guidance computer
LH	left-hand
L/H	local horizontal

ABBREVIATIONS (CONT)

LHEB	left-hand equipment bay
LHFEB	left-hand forward equipment bay
LHSSC	left-hand side storage container
LiOH	lithium hydroxide
LLM	lunar landing mission
LLOS	landmark line of sight
LM	lunar module
LMP	Lunar Module Pilot
LNH	lunar near horizon
L/O	lift-off
LOI	lunar orbit insertion
LONG	longitude
LOS	loss of signal or loss of site
LPD	landing point designator
LPO	lunar parking orbit
LPM	lunar portable magnetometer
LR	landing radar
LRRR or LR^3	laser ranging retro-reflector
L/S	landing site or lunar surface
LSM	lunar surface magnetometer
LT	light
LTC	lunar topographic camera
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
MBW	medium black and white film
MCC	midcourse correction
MCC-H	Mission Control Center - Houston
MDC	main display console
MEAS	measurement
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

ABBREVIATIONS (CONT)

MNA or MNB	main electrical bus A or B
MNVR	maneuver
MON	monitor
MPL	mid-Pacific line
MPS	main propulsion system
M/R	mixture ratio (fuel to oxidizer)
MSFN	Manned Space Flight Network
MTVC	manual thrust vector control
N_2	nitrogen
NAV	navigation
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
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
PLSS	portable life support system
PM	phase modulated
POL	polarity or polarizing

ABBREVIATIONS (CONT)

PRE	Pretoria, South Africa
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
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
RCV	receiver
REACQ	reacquire
REFSMMAT	reference stable member matrix
REG	regulator
REQD	required
REV	revolution
RH	right-hand
RHC	rotational hand controller
RING	ringsite
RLS	radius of landing site
RNDZ	rendezvous
RNG	range or ranging
RR	rendezvous radar
RSI	roll stability indicator
RSLV	resolver
RT	realtime
RTC	realtime command
RTG	radioisotope thermoelectric generator
RXX	Routine XX

ABBREVIATIONS (CONT)

SA	shaft angle
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
SHUT	shutter speed, TOPO camera
SIDE	suprathermal ion detector experiment
SII	Saturn II (second stage)
S-IVB	Saturn IVB(third stage)
SLA	service module LM adapter
SLOS	star line-of-sight
SM	service module
SPOT	spot meter
SPS	service propulsion system
SR	sunrise
SRC	sample return container
SRX	S-Band receiver mode no. X
SS	sunset or subsolar
STBY	standby
STX	S-Band transmit mode no. X
S.V.	state vector
SW	switch
SWC	solar wind composition
SWE	solar wind experiment
SXT	sextant
SYS	system
T EPHEM	time of Ephemeris update
TA	trunnion angle
TAN	Tananarive, Madagascar
TB	time base 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

ABBREVIATIONS (CONT)

TEI	transearth injection
TEMP	temperature
TERM	terminate
TEX	Corpus Christi, Texas
TGT	target
THC	translation hand controller
TIG	time of ignition
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
TV	television
TVC	thrust vector control
TWR	tower
UCTA	urine collection transfer assembly
UHT	universal hand tool
ULC	utility light clamp
ULL	ullage
UMB	umbilical
UNBAL	unbalance (meter)
UNDK	undock
US	United States
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-azis
VZ	velocity along the Z-axis
VAN	USNS vanguard
VHBW	very high speed black and white film
VHF	very high frequency
VLV	valve
VOX	voice keying
VXX	Verb XX

ABBREVIATIONS (CONT)

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	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
#	frame number(s) (for camera data)
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 (film type on LTC camera only)

DDD - Film Type (direction of flight of CM, i.e., SEF, BEF, for LTC camera only)

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, LTC, EL or
JJ - Frame Rate for the DAC only

KK - Magazine percent for the DAC only

CODE EXAMPLE:

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

Meaning: Photos are taken from CM right hand rendezvous window using the DAC with 18mm lens and S0368 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, and 50% of MAG to be used.

2. CM4/EL/80/BW-BRKT, IVL (f6.5,1/125,∞) (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) f6.5, shutter speed 1/125, and focus at infinity. The operation of the shutter will be controlled by the intervalometer. Ten frames have been alloted for this sequence.

PHOTOGRAPHIC NOMENCLATURE (CONT)

3. CM3/LTC/BW/SEF - SHUT-1/100, RNG - 74.2, INT 66.0) (164 FR)

Meaning: Photos are taken from the hatch window of the CM with the Lunar Topographic camera, with black and white film. The SC is oriented such that the sharp end (+X axis) is forward (in the direction of flight) and the camera is mounted with the "arrow" pointing in the direction of flight. The controls are set for a shutter speed of 1/100 of a second, the range to the calculated counter setting of 74.2 and the interval of 66.0 frames per minute. One hundred and sixty four (164) frames have been alloted for this photographic 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

CM4 - Electric Hasselblad (EL) +X axis +12°

CM4 - Electric Hasselblad reseau (DC) +X axis +12°

CM4 - Electric Hasselblad (EL) with 500mm lens only +X axis +10°

CM2 or 4 - Data Acquisition Camera with right angle mirror (DAC) +X axis

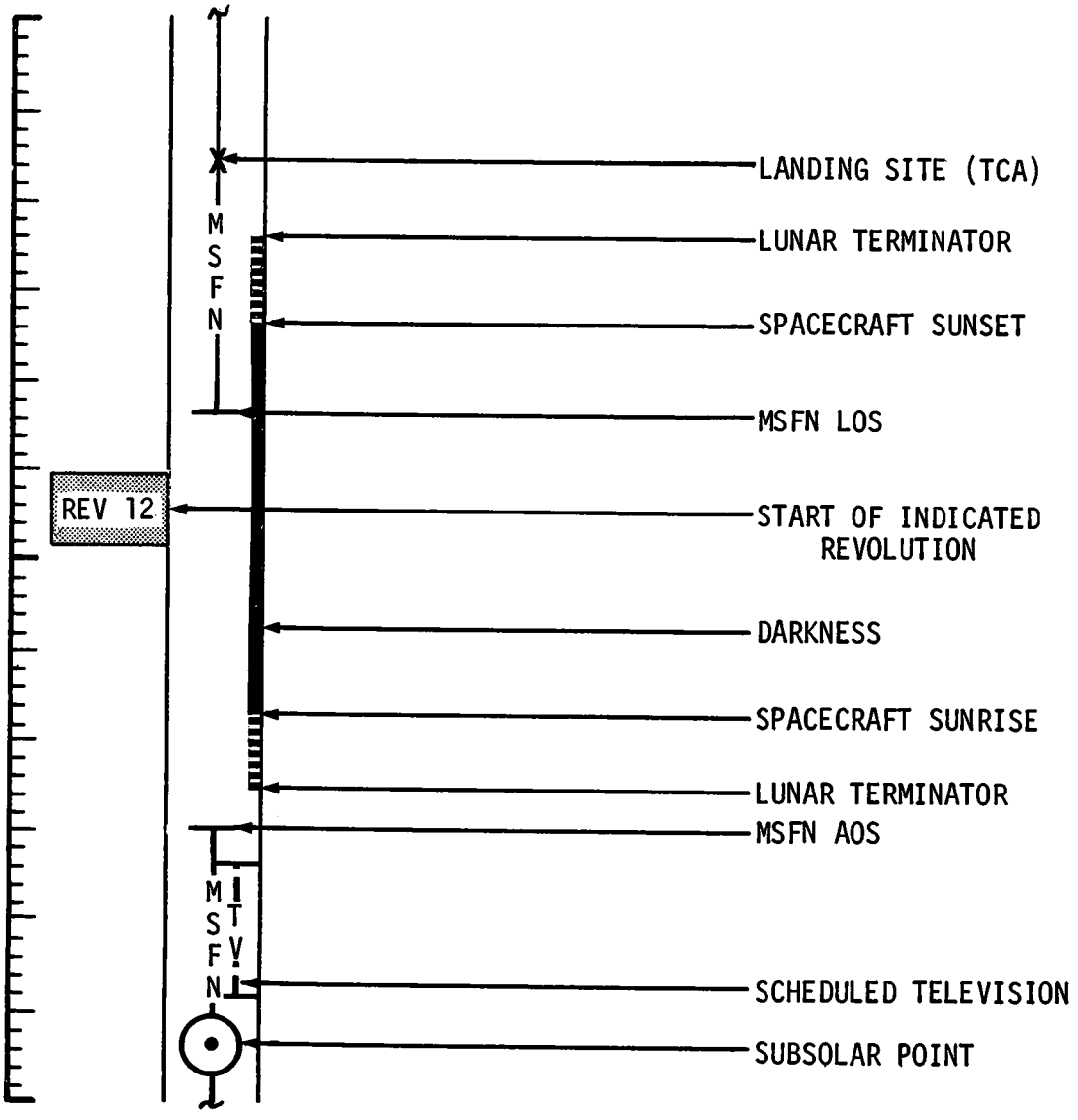
SXT - Data Acquisition Camera with SXT Adapter - same as SXT shaft & trunnion

CM3 - Lunar Topographic Camera - (perpendicular to hatch window) +X axis +57°

CM3 - Electric Hasselblad (EL) +X axis +57°

CM3 - Electric Hasselblad (DC) +X axis +57°

SYMBOL NOMENCLATURE



SECTION I - FLIGHT PLAN NOTES

I. Crew

A. Crew designations are as follows:

Designation	Prime	Backup
Commander (CDR)	Shepard	Cernan
Command Module Pilot (CMP)	Roosa	Evans
Lunar Module Pilot (LMP)	Mitchell	Engle

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 will be worn as follows:

ACTIVITY	PRESSURIZED HARD SUIT	SUITED (SOFT SUIT)	PARTIAL SUIT WITHOUT HELMET & GLOVES	SHIRT SLEEVES
LAUNCH		ALL		
EARTH ORBIT THRU S-IVB EVASIVE MNVR			ALL	
TLC & TEC				ALL
LM ACTIVATION			ALL	
UNDOCKING THRU CIRC		CDR & LMP	CMP	
CIRC TO TD		CDR & LMP		CMP
LUNAR STAY EXCEPT EVA	VARIES ACCORDING TO CHECKLIST FOR CDR & LMP			CMP
SURFACE EVA	CDR & LMP			CMP
LIFT-OFF THRU DOCKING		CDR & LMP	CMP	
LM JETTISON THRU TEI				ALL
ENTRY				ALL

D. Crew status reports will be voiced to MCC-H before and after crew sleep periods. After waking, the crew will report sleep obtained during the last 24 hours and personal dosimeter readings. Before going to sleep, the crew will report medication used and any other pertinent information on activities performed. Before ascent prep, the LM crew will report personal dosimeter readings and medication used.

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

F. All onboard gauge readings will be 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. OMNI B and VHF LEFT will be selected for lift-off. OMNI D will be selected by the crew during boost. OMNI D will probably be the best antenna for earth orbit.

3. VHF Duplex B will be used for launch, and Simplex A will be used for earth-orbit operations.

4. During TLC and TEC, OMNI antennas will normally 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.

5. MSFN relay will be used for LM/CSM communication during descent and ascent frontside passes. Communications during lunar stay periods will be through MCC-H.

6. Table 1-1 is a summary of the MSFN coverage available for the CSM.

7. Table 1-2 contains a summary of the scheduled CSM TV transmissions.

8. 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.

B. DSE

1. 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.

2. 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.

3. CSM HBR DATA for stereo and LTC photographic strips are required for a minimum of 5 minutes at the beginning and at the end of the strip. If HGA coverage is not available, these data will be recorded on the DSE.

4. During the 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.

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

6. CSM HBR will be recorded during all CSM engine burns.

7. LM LBR data will be recorded during LOS periods before PDI.

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

9. All HGA activations will be recorded on DSE.

C. Electrical Power

1. The CSM will normally remain powered up throughout the mission.

2. Table 1-3 lists the fuel cell purges and waste water dumps.

3. Based on cryo purity and performance, the time between fuel cell O_2 purges will be increased to coincide with water dump times. The O_2 purge at 6 hours will allow a judgement to be made on the defined purge schedule.

4. The cryogenic heaters will be managed such that the planned usage is obtained out of each O_2 tank. The H_2 heaters will be in AUTO during the mission. The H_2 fans will be operated manually for one minute before and after each sleep cycle, prior to SPS or S-IVB thrusting and pre-CSM/LM ejection.

5. Table 1-9 contains the battery charge schedule.

D. ECS and Water Management

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

2. Waste water dump and fuel cell purge criteria:

(a) Waste water dumps and fuel cell purges will be scheduled as follows:

(1) Once during each 24 hours, if possible, following the initial dump and purge

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

(b) The most opportune time 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

(c) If possible, dumps and purges will not be scheduled during the following periods:

(1) Ten hours before MCC-2 or a TLC P23

(2) Eight hours before MCC-5 or a TEC P23

(3) MSFN tracking periods during two lunar orbits before TEI

(d) Dumps and purges will not be scheduled during the following MSFN tracking periods:

(1) Ten hours before MCC-4 until after LOI

(2) Four hours before DOI until six hours after PDI

(3) Six hours before ascent from the lunar surface until after LM jettison

(4) Ten hours before MCC-7 until entry

(e) All waste water dumps will be manual.

3. Only one CO_2 absorber filter (LiOH canister) is changed at a time. Table 1-4 lists the LiOH canister change schedule. There are 20 filters on board, with 18 stowed at launch.

4. At lift-off, the cabin will contain 60% O_2 and 40% N_2. 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. CSM O_2 will be used to pressurize the LM after transposition and docking; and repressurizing the LM before TLC LM entry, LOI and LM activation.

E. Guidance and Navigation

1. REFSMMAT Definitions

(a) The "Launch Pad" REFSMMAT will be 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. The FDAI, at launch, will display roll 162° (launch azimuth +90°), pitch 90°, and yaw 0°.

(b) The "PTC" REFSMMAT will be 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 then perpendicular to the ecliptic and directed south. At the beginning of the PTC Mode, during TLC, the spacecraft will maneuver to an FDAI display of pitch 90°. During TEC, the pitch attitude will be 270°.

(c) The "Landing Site" REFSMMAT will be used for LOI, DOI, PDI, landing, and CSM lunar orbit activities up to the first plane change. This REFSMMAT places the CSM 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 will display roll 0°, pitch 0°, and yaw 0°.

(d) A "Preferred" REFSMMAT will be used by the CSM for all lunar-orbit plane changes, and TEI. The CSM IMU X-axis will normally be aligned with the spacecraft X-body axis at the vehicle attitude for ignition with the thrust directed through the center of gravity. In the case of large plane change maneuvers, the IMU X-axis may be aligned 45° from the spacecraft body axis at ignition attitude. The Z-axis will be in the plane formed by the X-axis and the position vector and directed up away from the moon for plane changes. At burn ignition, the FDAI will display roll 0° (180° for TEI), pitch 0°, and yaw 0°.

(e) The "Lift-Off" REFSMMAT will be used for all lunar activities after plane change 1, through rendezvous, and LM jettison. This REFSMMAT places the CSM IMU X-axis along the positive lunar radius vector at the landing site at predicted lift-off time, with the Z-axis parallel to the CSM orbital plane. At nominal lift-off time, the LM FDAI will display 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, lift up, heads down, the FDAI will display roll 0°, pitch 180°, and yaw 0°.

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

3. The time tags on maneuvers in Section 3 indicate the completion time of the maneuvers 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 will normally be at the rate of 0.2°/sec (0.5°/sec after rendezvous and docking) unless other rates are required.

5. Undocking will be done radially, CSM below, 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. The separation maneuver will then be performed immediately.

6. LM jettison will be done radially, CSM below, with jettison providing approximately 0.4 foot per second thrust radial. The separation burn will be performed five minutes after jettison, providing one foot per second thrust retrograde.

F. Propulsion Systems

1. In order to conserve SM RCS, the SPS engine will be used to "back-up" all LM rendezvous burns. The SPS gimbal motors will not be turned on during the normal maneuver preparation.

2. 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. The first engine ignition will be started on bank A.

3. Table 1-5 lists the CSM propulsion burns.

III. LM Systems

A. Communications

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

2. The LM voice recorder (DSEA) will be used to record LM voice. Table 1-8 is a schedule of LM voice recorder usage.

3. Figure 1-1 shows the communications mode for the first part of the EVA (CDR EVA only) and for the one-man contingency EVA. Figure 1-2 shows the nominal two-man EVA communications configuration.

B. ECS

1. The LM will contain ambient air at lift-off. During launch the pressure will bleed to zero psia. CSM O_2 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. After the first LM egress, the LM will be isolated and allowed to leak down. For the entry into the LM before undocking, the CSM O_2 will be used to pressurize the LM. This procedure insures a higher percentage of oxygen in the LM at the first EVA.

2. LM O_2 will be used to pressurize the LM three times; after EVA-1 and EVA-2, and after equipment jettison.

C. Guidance Systems

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

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

3. The RR will be powered down after TD plus 2 hours until lift-off preparation.

4. The IMU will be powered down and the LGC placed in standby approximately 3 hours and 25 minutes after TD until after the eat period following sleep on the lunar surface.

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

D. Propulsion Systems

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

2. Table 1-6 lists the LM propulsion burns.

IV. Procedures

A. CSM - Crew procedures called out in the flight plan may be found in the following documents:

1. Apollo Operations Handbook - CSM 110 (AOH), Volume 2
2. Crew Checklists
3. CSM Rendezvous Procedures
4. Photographic and TV Procedures
5. Lunar Landmark Tracking Attitude Studies
6. Lunar Orbit Attitude Sequence for Mission H-3

B. LM - Crew procedures called out in the flight plan may be found in the following documents:

1. Apollo Operations Handbook LM-8, Volume 2
2. Crew Checklists
3. LM Rendezvous Procedures
4. LM Descent/Ascent Procedures
5. Photographic and TV Procedures
6. Orbital EVA Procedures
7. Lunar Surface Procedures

V. Medical Data During Sleep Periods

A. During translunar and transearth coast phases, and in lunar orbit when all three crewmembers are in the CSM, an EKG and ZPN will be transmitted continuously from at least one crewman.

B. During lunar orbit, when the CMP is the sole occupant of the CSM, the CMP's EKG and ZPN will be transmitted to MCC-H.

C. While on the lunar surface, an EKG will be transmitted continuously from at least one crewman.

VI. Synchronization of Ground Elapsed Time (GET)

The realtime GET will be synchronized with the flight plan GET if the difference is more than ± 1 minute. The time changes will occur approximately 30 hours before the second lunar orbit, and prior to LOS on the tenth orbit. The time changes will be based on the expected difference between realtime and flight plan GET's at the start of lunar orbit revs 2 and 20. The synchronization is performed by a V70 uplink from the ground followed by the crew synchronizing the mission time to the CMC clock.

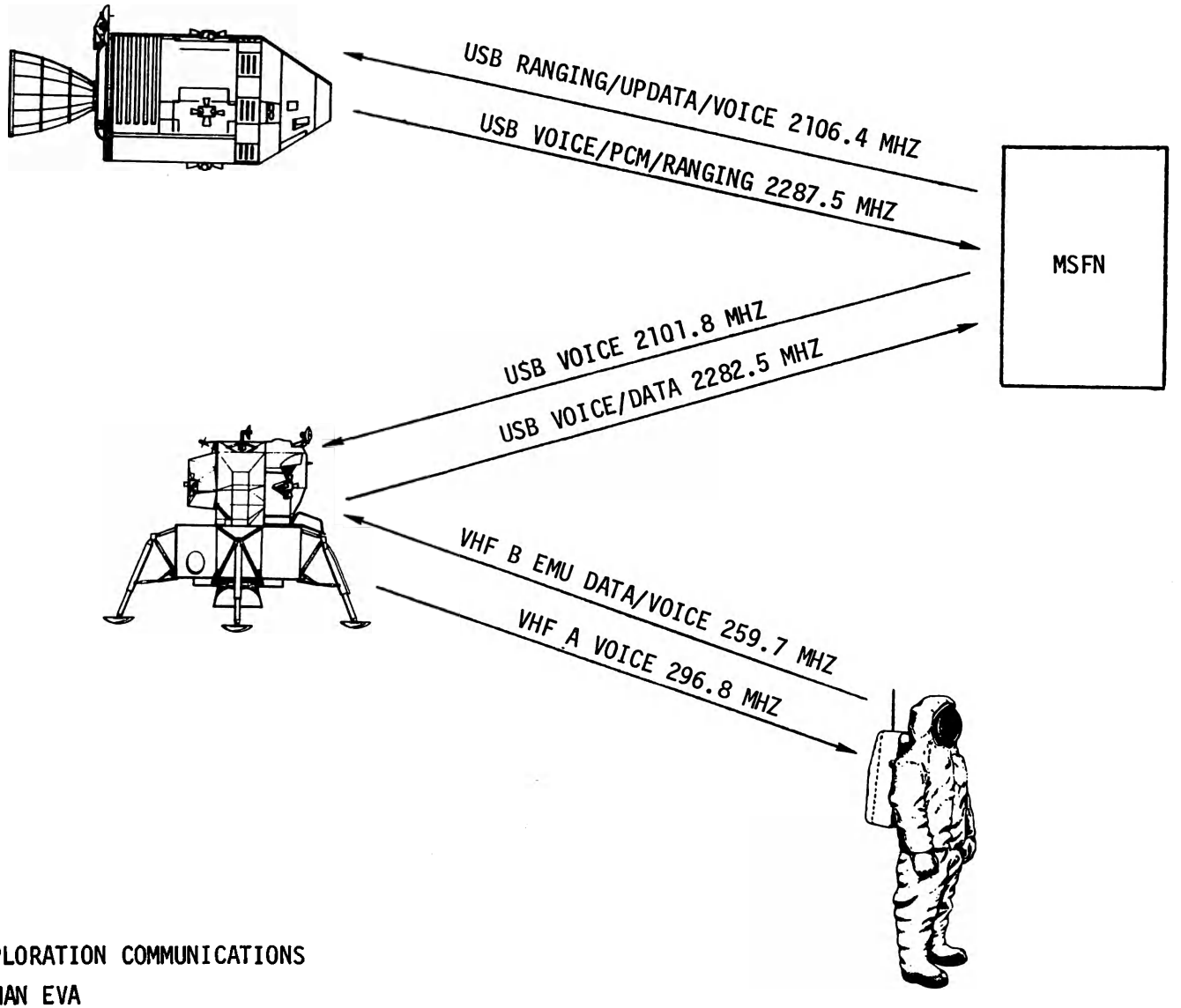
VII. Miscellaneous

A. Table 1-7 contains a summary of the expected block data update times.

B. Table 1-10 is the Landmark Tracking Table.

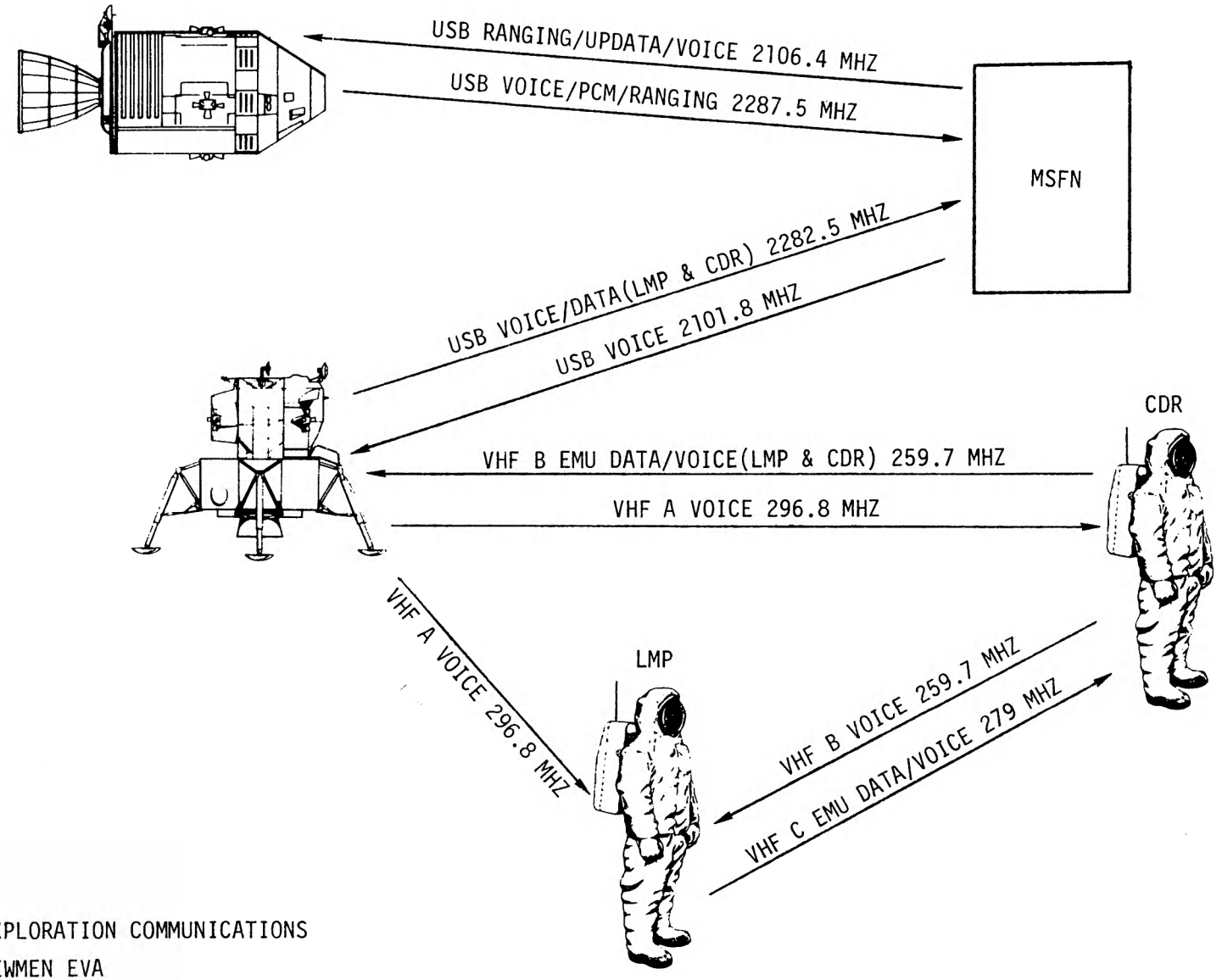
C. Table 1-11 is a schedule of the P23 cislunar navigation sightings.

D. Table 1-12 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

TABLE 1-1

SC Coverage By MSFN Stations Using 85FT/210FT Dish/Antenna

	GOLDSTONE (GDS)		PARKS		HONEYSUCKLE (HSK)		MADRID (MAD)	
	AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
EARTH ORBIT					1:00	1:06		
	1:29	1:34			2:36	2:37		
TRANS-LUNAR COAST	2:50	13:11						
					7:47	16:18		
							14:38	30:36
	22:49	30:36					30:36	30:37
	30:36	37:55			32:27	41:11	39:20	54:50
	47:16	62:05			56:34	65:29	63:36	78:52
	71:28	82:25			80:32	82:24		
TRANS-EARTH COAST	149:25	160:25					149:26	153:13
			159:15	159:41	154:54	164:00	162:08	177:09
	170:00	184:25						
					178:56	188:17		
			182:40	184:40			186:31	201:08
	194:30	208:29						
					203:12	214:07		
			206:22	210:32				
							212:56	215:12
					216:01	216:27		

TABLE 1-1 (CONTINUED)

SC Coverage By MSFN Stations Using 85FT/210FT Dish/Antenna

REV	GET AT END OF REV	GOLDSTONE (GDS)		PARKS AUSTRALIA		HONEYSUCKLE (HSK)		MADRID (MAD)	
		AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
1	84:45	82:57	84:22			82:57	84:21		
2	86:53	85:05	86:11			85:05	86:30		
3	88:47					87:15	88:20	87:49	88:20
4	90:41					89:09	89:45	89:09	90:14
5	92:34							91:03	92:08
6	94:28							92:56	94:02
7	96:22	95:54	95:55					94:50	95:55
8	98:16	96:44	97:49					96:44	97:49
9	100:09	98:38	99:43					98:38	99:43
10	102:03	100:31	101:36					100:32	101:37
11	103:57	102:26	103:30					102:26	103:31
12	105:51	104:19	105:24						
13	107:49	106:12	107:24			106:12	107:23		
14	109:47	108:11	109:22			108:10	109:22		
15	111:46	110:09	111:42			110:09	111:21		
16	113:44					112:07	113:19	112:39	113:18
17	115:42					114:05	114:37	114:05	115:17
18	117:41							116:04	117:15
19	119:39							118:02	119:14
20	121:38	120:48	121:12					120:00	121:12

TABLE 1-1 (CONTINUED)

SC Coverage By MSFN Stations Using 85FT/210FT Dish/Antenna

REV	GET AT END OF REV	GOLDSTONE (GDS)		PARKS AUSTRALIA		HONEYSUCKLE (HSK)		MADRID (MAD)	
		AOS	LOS	AOS	LOS	AOS	LOS	AOS	LOS
21	123:36	121:58	123:10					121:59	123:11
22	125:34	123:57	125:09					123:57	125:09
23	127:32	125:55	127:07					125:56	127:07
24	129:31	127:54	129:06					127:54	128:37
25	131:29	129:52	131:04			130:20	131:04		
26	133:27	131:51	133:03			131:50	133:02		
27	135:26	133:49	135:01			133:49	135:01		
28	137:24	135:47	136:03			135:47	136:59		
29	139:22					137:46	138:57	137:46	138:57
30	141:21							139:44	140:56
31	143:19							141:42	142:54
32	145:17							143:41	144:52
33	147:16	145:45	146:51					145:39	146:51
34	149:14	147:37	148:48					147:37	148:49

TABLE 1-2

APOLLO 14 TV SCHEDULE

DAY	DATE	CST	GET, HR:MIN	DURATION, HR:MIN	ACTIVITY SUBJECT	VEHICLE	STATION
SUNDAY	31 JAN	5:28 PM	03:05	00:25	TRANSPOSITION & DOCKING	CSM	GDS
WEDNESDAY	3 FEB	4:08 AM	61:45	00:45	INTERIOR & IVT TO LM	CSM	GDS/HSK
~~THURSDAY~~	~~4 FEB~~	~~7:23 PM~~	~~101:00~~	~~00:14~~	~~FRA MAURO LANDING SITE~~	~~CSM~~	~~GDS~~
FRIDAY	5 FEB	8:06 AM	113:43	04:00	LUNAR SURFACE EVA-1	LM	HSK/MAD
SATURDAY	6 FEB	3:56 AM	133:33	07:43	LUNAR SURFACE EVA-2	LM	HSK/GDS/MAD
SATURDAY	6 FEB	2:14 PM	143:51	00:06	RENDEZVOUS	CSM	MAD
SATURDAY	6 FEB	2:29 PM	144:06	00:04	DOCKING	CSM	MAD
SUNDAY	7 FEB	6:53 PM	172:30	00:30	INFLIGHT DEMONSTRATIONS	CSM	GDS

TABLE 1-3

FUEL CELL PURGE AND WATER DUMP SCHEDULE

GET, HR:MIN	O_2 FUEL CELL PURGE AND WATER DUMP NUMBER	O_2 FUEL CELL PURGE AND WATER DUMP ΔTIME, HR:MIN	H_2 FUEL CELL PURGE NUMBER	H_2 FUEL CELL PURGE ΔTIME, HR:MIN	REMARKS
05:55	1	05:55			IF NO MCC-1
11:30	1	11:30			IF MCC-1 PERFORMED
30:15	2	24:20/18:45	1	30:15	MCC-2
60:20	3	30:05			MCC-3
84:50	4	24:30	2	54:35	LOI+2HR
111:40	5	26:50			LOS MIDPOINT
139:20	6	27:40	3	54:30	
166:00	7	26:40			MCC-5
193:10	8	27:10		53:50	IF NO MCC-6
194:10	8	28:10	4	54:50	IF MCC-6 PERFORMED
216:12		23:02/22:02			CM/SM SEPARATION

TABLE 1-4

LiOH CANISTER CHANGE SCHEDULE

CHANGE NO.	APPROXIMATE GET, HR:MIN	APPROXIMATE ΔT, HR	INSTALL		REMOVE & STOW	
			CANISTER	POSITION	CANISTER NO.	STOWAGE LOCATION
1	12:00		3	A	1	B5
		14				
2	26:10		4	B	2	B5
		12				
3	38:00		5	A	3	B5
		13				
4	51:10		6	B	4	B5
		13				
5	64:12		7	A	5	B6
		12				
6	76:10		8	B	6	B6
		14				
7	90:15		9	A	7	B6
		13				
8	103:38		10	B	8	B6
		16				
9	119:30		11	A	9	A3
		27				
10	147:05		12	B	10	A3
		15				
11	162:10		13	A	11	A3
		12				
12	174:00		14	B	12	A3
		13				
13	187:00		15	A	13	A4
		12				
14	199:00		16	B	14	A4
		11				
15	210:00		17	A	15	A4

TABLE 1-5

CSM BURN SCHEDULE

BURN MNVR	GETI BURN TIME	ΔVT, FPS	ULLAGE ΔV,FPS	REFSMMAT	RESULTANT HA & HP	REMARKS
TLI	02:30:38 5 MIN 55.6 SEC	10353.1		PAD		S-IVB BURN
CSM/LM EJECTION	03:56 3.0 SEC	0.4	---------	PAD	---------	RCS BURN
MCC-1	11:36:33	-------	---------	PTC	---------	NOM ZERO
MCC-2	30:36:07 11.08 SEC	73.40	NOT REQ'D	PTC	---------	SPS BURN
MCC-3	60:38:14	-------	---------	PTC	---------	NOM ZERO
MCC-4	77:38:14	-------	---------	PTC	---------	NOM ZERO
LOI	82:38:14 6 MIN:06.6 SEC	2986.0	NOT REQ'D	LDG SITE	HA 170.00 HP 57.14	SPS BURN
DOI	86:56:57 21.38 SEC	206.6	4 JET 14.0 SEC	LDG SITE	HA 58.44 HP 9.77	SPS BURN
BAILOUT BURN	87:27:31 10.17 SEC	100.0	4 JET 14.0 SEC	LDG SITE		SPS BURN
UNDOCK & SEP	104:27:31 3.07 SEC	1.00	---------	LDG SITE	HA 59.48 HP 8.23	RCS BURN
CIRC BURN	105:46:48 3.79 SEC	72.46	4 JET 11.0 SEC	LDG SITE	HA 63.51 HP 56.04	SPS BURN
PC-1	118:09:40 18.4 SEC	360.70	4 JET 11.0 SEC	PLANE CHANGE	HA 61.71 HP 57.41	SPS BURN
CSM SEP BURN	146:28:31	1.00		LIFT-OFF	HA 58.26 HP 60.24	3 AXIS RCS BURN
TEI	149:14:50 2 MIN 27.4 SEC	3449.55	4 JET 12 SEC	TEI	---------	SPS BURN
MCC-5	166:14:50	-------	---------	PTC	---------	NOM ZERO
MCC-6	194:26:59	-------	---------	PTC	---------	NOM ZERO
MCC-7	213:26:59	-------	---------	ENTRY	---------	---------

NOTES: 1. HA & HP ARE HEIGHTS ABOVE LANDING SITE RADIUS (937.73488 NM).
2. BURN TIME DOES NOT INCLUDE ULLAGE OR TAILOFF BT.

TABLE 1-6

LM BURN SCHEDULE

BURN MNVR	GETI BURN TIME	ΔVT, FPS	ULLAGE ΔV,FPS	REFSMMAT	RESULTANT HA & HP	REMARKS
PDI	108:42:01 11 MIN 31.5 SEC	6637.7	2 JET 7.5 SEC	LDG SITE	---------	DPS BURN
ASCENT	142:24:29 7 MIN 10.7 SEC	6053.4	NONE	LIFT-OFF	HA 50.96 HP 9.14	APS BURN
TPI	143:09:40 4.0 SEC	92.2	2 JET 13 SEC	LIFT-OFF	HA 61.0 HP 44.6	APS BURN
LM DEORBIT	147:52:58.9 1 MIN 17 SEC	183.7		LIFT-OFF	N/A	RCS BURN

NOTES: 1. HA & HP ARE HEIGHTS ABOVE LANDING SITE RADIUS (937.73488 NM).
2. BURN TIME DOES NOT INCLUDE ULLAGE OR TAILOFF BT.

TABLE 1-7

FINAL APOLLO 14 RETURN TO EARTH
BLOCK DATA SCHEDULE

BLOCK DATA	PASSED DATA, GET, HR:MIN	GETI, HR:MIN	ΔV, FPS	GETIL, HR:MIN	i_R, DEG	PAD TYPE
TLI + 90 MIN	1:40	4:00	7488	12:12	32.8°D	COMPLETE P30
L/O + 8 HR	1:40	8:00	3209	46:29	32.8°A	P37
L/O + 15 HR	6:00	15:00	5557	45:56	32.8°A	P37
L/O + 25 HR	14:00	25:00	4873	70:03	33.0 A	P37
L/O + 35 HR	14:00	35:00	7376	69:28	33.3 A	P37
L/O + 45 HR	14:00	45:00	5630	93:49	34.1 A	P37
L/O + 60 HR	14:00	60:00	5166	117:53	36.9 A	P37
LOI-5 FLYBY	35:00	77:38	403	165:57	40.0 D	COMPLETE P30(DOCKED)
PC + 2	76:00	84:36	1519	141:42	30.1 D	ABB P30 (DOCKED)
TEI 4	79:30	91:15	3955	141:47	40° A	ABB P30
TEI 5	85:05	92:30	3220	166:14	40° A	ABB P30
TEI 12	89:20	105:54	3630	166:24	40° A	ABB P30
TEI 19	100:45	119:38	3326	191:13	40° A	ABB P30
TEI 34 (PRELIM)	115:00	149:15	3451	216:40	40° A	COMPLETE P30
TEI 34 (NOM)	147:40	149:15	3451	216:40	40° A	COMPLETE P30
TEI 35	147:40	151:14	3523	216:16	40° A	ABB P30

NOTES:

1. The TLI + 90 minute abort is to the AOL. All other block data maneuvers are to the MPL line [Nominal TEI (REV 34) is to EOM ϕ,λ].
2. Lift-off + 15 hours abort assumes no MCC-1.
3. Lift-off + 35 hours abort assumes MCC-2.
4. Update flyby early if pericynthion is not clear of moon.
5. Pericynthion + 2 hours fast return to MPL assumes MCC-4.
6. TEI 4 assumes LOI and no DOI.
7. TEI 5 assumes DOI.
8. TEI 12 assumes no circularization maneuver.
9. TEI 19 assumes circularization and no plane change maneuvers.
10. TEI 34 (PRELIM) assumes the plane change maneuver.
11. All TEI's are i_R = 40° ascending returns.

TABLE 1-8

APOLLO 14/LM - 8 DSEA SCHEDULE

ACTIVITY	GET, HR:MIN	MODE	RECORD TIME x DUTY CYCLE (%) = TAPE TIME USED, HR:MIN	TOTAL TAPE TIME USED* HR:MIN
UNDOCK PREP TO POST-UNDOCKING	104:26 104:35	ICS/PTT	00:09 x 100% = 00:09	00:09
PDI PREP TO POST-TD (PDI+20)	108:20 109:02	VOX	00:42 x 63% = 00:27	00:36
EVA-1 PLSS COMM TO POST-EVA-1	112:50 117:55	VOX	5:05 x 63% = 3:12	03:48
EVA-2 PLSS COMM TO POST-EVA-2	133:35 138:40	VOX	5:05 x 63% = 3:12	07:00
LIFT-OFF (-16) TO LIFT-OFF (-) 2	142:08 142:22	ICS/PTT	00:14 x 100% = 00:14	07:14
LIFT-OFF (-) 2 TO INSERTION	142:22 142:34	VOX	00:12 x 63% = 00:08	07:22
INSERTION TO POST-DOCKING	142:34 144:15	ICS/PTT	1:41 x 100% = 1:41	09:03

*REMAINING TAPE WILL BE REQUIRED IF EVA'S ARE EXTENDED

TABLE 1-9

BATTERY CHARGE SCHEDULE

GET, HR:MIN	BATTERY
04:25	B
26:15	A
32:20	A
53:00	B
106:15	B
112:30	A
132:20	B
136:15	A
166:18	B
186:25	A

TABLE 1-10

LANDMARK AND LANDING SITE DATA

SITE	REV	LATITUDE	LONGITUDE	*ALTITUDE (NM)
MÖSTING A	2	3.250°S	5.283°W	000.00
H-3	3	3.691°S	7.542°W	000.00
14-1	12, 13, 15	4.046°S	15.600°W	-000.44
14-2		3.610°S	15.317°W	-000.15
14-3		3.919°S	15.139°W	-000.38
14-4		3.470°S	14.890°W	-000.87
RP3	15	3.533°S	131.700°E	000.00
RP5	15	10.567°S	99.400°E	000.00
DAGUERRE 66	15	11.717°S	33.200°E	000.00
LDG SITE	17	3.672°S	17.463°W	-000.76
RP2	18	0.283°S	141.250°E	000.00
12-1	18	5.736°S	112.309°E	000.00
DOLLOND E	18	10.433°S	15.733°E	000.00
FM1	18	3.246°S	17.317°W	000.00
RP4	29	5.850°S	120.250°E	000.00
ANSGARIUS N	29	11.633°S	81.067°E	000.00
DE2	29	9.250°S	19.592°E	000.00
ENKE E	29	0.283°N	40.300°W	000.00

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

TABLE 1-11

P23 CISLUNAR NAVIGATION

GET	STAR/HORIZON	COMMON NAME
9:30	72/EFH	GACRUX
	236/ENH	DELTA OPHIUCHI
	53/EFH	GAMMA CENTAURI
	202/ENH	ZETA OPHIUCHI
28:30	202/ENH	ZETA OPHIUCHI
	165/EFH	ETA CENTAURI
	33/ENH	ANTARES
	172/EFH	BETA LIBRAE
164:00	40/ENH	ALTAIR
	212/EFH	DELTA SAGITTARII
	33/EFH	ANTARES
	35/EFH*	RASALHAGUE
	211/EFH*	BETA OPHIUCHI
	214/ENH*	ZETA SAGITTARII
166:45	16/MFH	PROCYON
(TEI+17.5)	50/MFH	POLLUX
	22/MNH	REGULUS
167:15	40/ENH	ALTAIR
(TEI+18)	212/EFH	DELTA SAGITTARII
	33/EFH	ANTARES
173:00	40/ENH	ALTAIR
(TEI+24)	212/EFH	DELTA SAGITTARII
	33/EFH	ANTARES
	35/EFH*	RASALHAGUE
	211/EFH*	BETA OPHIUCHI
	42/ENH*	PEACOCK
188:27	37/EFH	NUNKI
(EI-28)	33/EFH	ANTARES
	120/ENH	AL NA'IR
	40/ENH*	ALTAIR
	35/EFH*	RASALHAGUE
	211/EFH*	BETA OPHIUCHI

*Constraint Stars

TABLE 1-11

P23 CISLUNAR NAVIGATION (CONT)

GET	STAR/HORIZON	COMMON NAME
192:27	37/EFH	NUNKI
(EI-24)	33/EFH	ANTARES
	120/ENH	AL NA'IR
196:27	37/EFH	NUNKI
(EI-20)	33/EFH	ANTARES
	120/ENH	AL NA'IR
	40/ENH*	ALTAIR
	211/EFH*	BETA OPHIUCHI
	214/EFH*	ZETA SAGITTARII
208:27	44/ENH	ENIF
(EI-8)	212/EFH	DELTA SAGITTARII
	213/EFH	LAMBDA SAGITTARII
	45/ENH	FOMALHAUT
211:27	22/MFH	REGULUS
(EI-5)	64/MNH	ALHENA
	23/MFH	DENEBOLA
	151/MFH	GAMMA-PRIME LEONIS
	16/MNH	PROCYON
213:57	22/MFH	REGULUS
(EI-2.5)	23/MFH	DENEBOLA
	16/MNH	PROCYON

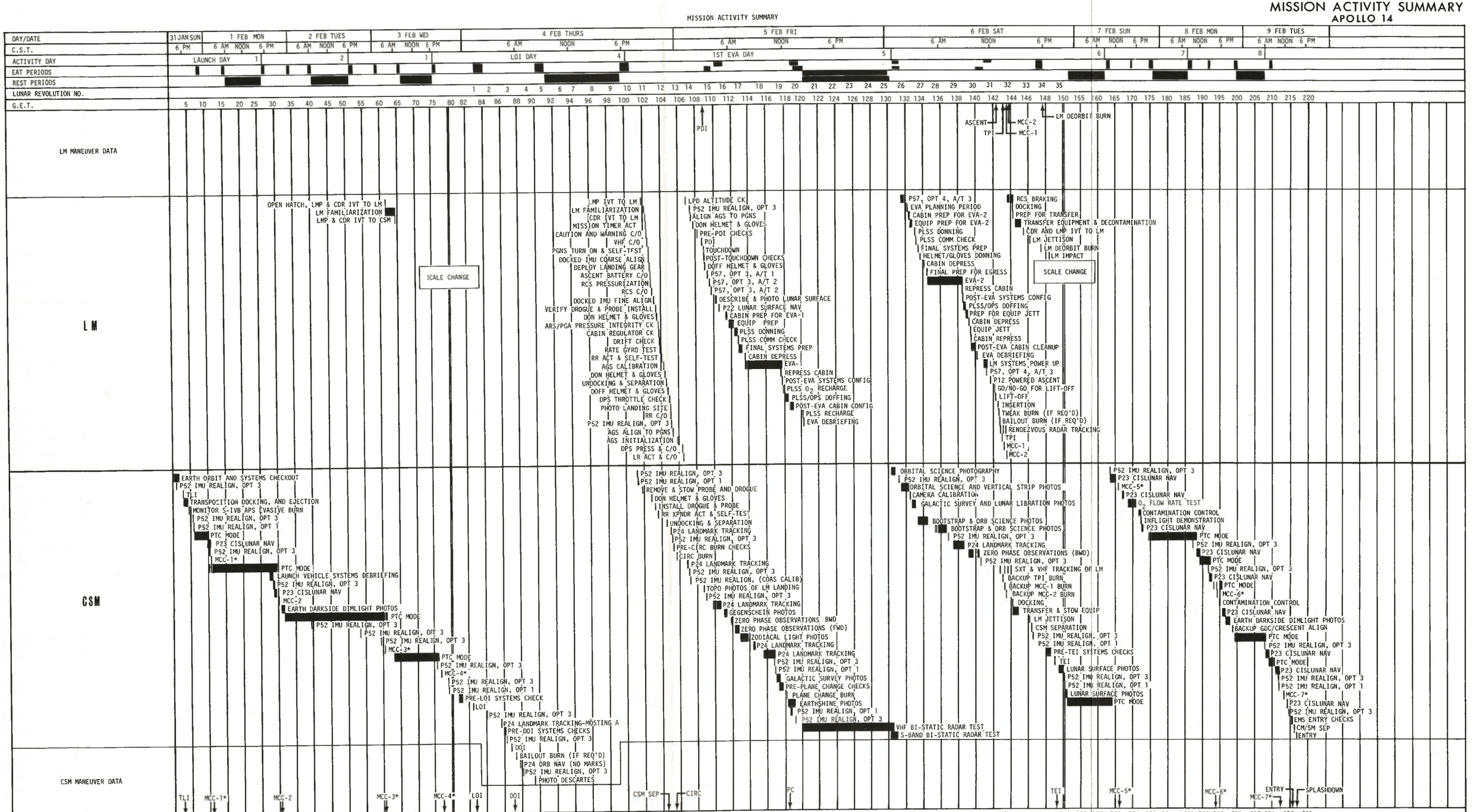
*Constraint Stars

TABLE 1-12

MISSION ACTIVITY SUMMARY

APOLLO 14

MISSION ACTIVITY SUMMARY



SECTION 2 - MISSION OBJECTIVES

SECTION 2

MISSION OBJECTIVES

This section contains an activity summary, reflecting the objectives for Apollo 14 as described in "Mission Requirements H-3 Type Mission." Table 2-1 provides a functional breakdown of the objectives and indicates the page(s) in the timeline where the activity occurs. The alphanumeric listing presented in Table 2-1 is not intended to represent a priority or a sequential listing.

Details of the implemented test requirements are adequately covered in the Mission Requirements Document, the Lunar Surface Procedures Plan, and the Photographic and TV and Procedures Document.

TABLE 2-1
MISSION OBJECTIVE SUMMARY
REFERENCE

NUMBER	OBJECTIVE	ACTIVITY	PAGE NUMBER
4.1	Photographs of Candidate Exploration Sites		
4.1.1	Obtain photographs of a selected lunar site from low altitude	LUNAR ORBIT	3-89
4.1.2	Obtain stereoscopic photographs and landmark tracking of selected lunar sites	LUNAR ORBIT	3-176-178/190-194
4.1.3	Obtain high-resolution photographs of selected lunar sites	LUNAR ORBIT	3-180-186
4.2	Modular Equipment Transporter Evaluation		
4.2.1	Demonstrate that an astronaut can unload and deploy the MET from a landed LM	EVA-1	3-133
4.2.2	Obtain data on the dynamic interaction between the MET and the lunar surface	EVA-2	3-183
4.3	Selenodetic Reference Point Update	LUNAR ORBIT	3-83/120-124
4.3.1	Obtain lunar landmark tracking data to permit an update of the selenodetic coordinates of selected lunar reference points.	LUNAR ORBIT	3-138-142 3-190-194
4.4	Transearth Lunar Photography		
4.4.1	Obtain lunar photographs after TEI to permit extension of selenodetic control and mapping	TEC	3-227/231/232
4.5	EMU Water Consumption Measurement		
4.5.1	Obtain data for improving confidence in present method of computing water remaining during EVA	LUNAR SURFACE	3-153
4.6	CSM Oxygen FLOW RATE		
4.6.1	Obtain data on a single O2 tank under a maximum flow rate conditions when the quantity is between 60% and 40%	TEC	3-244-248
4.6.2	Obtain data on a single O2 tank under nominal flow rate conditions when the quantity is between 20% and 5%	TEC	3-248-288
4.7	Visibility at High Sun Angles		
4.7.1	Obtain crew comments and photographs while viewing pre selected target areas under specified sun elevation and line-of-sight elevation angles	LUNAR ORBIT	3-128-130 3-196-198

TABLE 2-1
MISSION OBJECTIVE SUMMARY
REFERENCE (CONT)

NUMBER	OBJECTIVE	ACTIVITY	PAGE NUMBER
4.8	Thermal Coating Degradation		
4.8.1	Obtain data on the optical properties of twelve thermal control coatings after being covered with lunar dust	EVA-2	3-183/184
4.8.2	Obtain data on the optical properties of twelve thermal control coatings after the lunar dust has been removed by brushing	EVA-2	3-183/184
4.9	EVA Communication System Performance		
4.9.1	Determine the effects upon communication of obstructing lunar surface features between EVC-1 and the LM	EVA-2	3-187
4.10	CSM Orbital Science Photography		
4.10.1	Obtain photographs of lunar surface areas of prime scientific interest, using the Lunar Topographic Camera	LUNAR ORBIT	3-89/118 3-180-182 3-186 3-225
4.10.2	Obtain photographs of lunar surface areas of prime scientific interest, using the Hasselblad camera with the 250mm lens.	LUNAR ORBIT	3-174/178 3-184-186/198
4.10.3	Obtain the photographs of specific segments of the lunar surface in earthshine and in low level light near the terminator, using the 16mm sequence camera with the 18mm lens and either type of Hasselblad camera with an 80mm lens	LUNAR ORBIT	3-150-152
4.11	Dim Light Photography		
4.11.1	Obtain photographs of diffuse galactic light of four celestial subjects	LUNAR ORBIT	3-144/178/180
4.11.2	Obtain photographs of zodiacal light as the CSM approaches sunrise	LUNAR ORBIT	3-132
4.11.3	Obtain photographs of the Lunar libration region, L4	LUNAR ORBIT	3-180
4.11.4	Obtain photographs through the CSM sextant of the earth's darkside	TLC/TEC	3-33/271
4.11.5	Obtain earth limb photographs during solar eclipse by the earth; and obtain comet photography, if appropriated trajectory and celestial conditions exist	TEST CONDITIONS DO NOT EXIST	
5.1	Contingency Sample Collection	EVA-1	3-135
5.1.1	Provide a contingency sample for postflight scientific investigation		

TABLE 2-1
MISSION OBJECTIVE SUMMARY
REFERENCE (CONT)

NUMBER	OBJECTIVE	ACTIVITY	PAGE NUMBER
5.2	Selected Sample Collection		
5.2.1	Collect rock samples and fine-grained fragmental material	EVA-2	3-189
5.2.2	Collect one large rock	EVA-2	3-189
5.5	Apollo Lunar Surface Experiments Package		
5.5.1	Deploy the passive seismic experiment (S-031)	EVA-1	3-141
5.5.2	Deploy the active seismic experiment (S-033)	EVA-1	3-141
5.5.3	Deploy the suprathermal ion detector experiment (S-036) and the cold cathode ion gauge experiment (S-058)	EVA-1	3-141
5.5.4	Deploy the charged particle lunar environment experiment (S-038)	EVA-1	3-141
5.5.5	Deploy the lunar dust detector experiment (M-515)	EVA-1	3-139
5.6	Lunar Geology Investigation		
5.6.1	Examine, describe, photograph, and collect lunar geologic samples for return to earth	EVA-1 & 2	3-145/185/187
5.6.2	Examine, describe, and photograph field relationships (such as shape, size, range, patterns of alignment or distribution) of all accessible types of lunar topographic features	EVA-2	3-185/187/189
5.6.3	Collect special soil samples (i.e., core tube samples, a 4-kilogram sample and trench samples) from the lunar surface and subsurface	EVA-1	3-143
5.6.4	Collect large equidimensional rock samples from the lunar surface	EVA-1	3-142-145
5.6.5	Collect special container soil samples (i.e., lunar environment soil sample and exhaust-contaminated sample) from the lunar surface and subsurface	EVA-2	3-189/191
5.7	Laser Ranging Retro-Reflector		
5.7.1	Deploy the laser ranging retro-reflector (LR3) experiment (S-078)	EVA-1	3-141
5.8	Solar Wind Composition		
5.8.1	Conduct the solar wind composition experiment (S-080)	EVA-1 & 2	3-135/193

TABLE 2-1
MISSION OBJECTIVE SUMMARY
REFERENCE (CONT)

NUMBER	OBJECTIVE	ACTIVITY	PAGE NUMBER
5.9	CSM/LM S-Band Transponder Experiment		
5.9.1	Obtain S-Band Doppler tracking measurements of the docked CSM/LM and the undocked CSM during non powered flight while in lunar orbit	PASSIVE	
5.9.2	Obtain S-Band Doppler tracking measurements of the LM during non-powered portions of the lunar descent	PASSIVE	
5.9.3	Obtain S-Band Doppler tracking measurements of the LM ascent stage during non powered portions of the descent for lunar impact	PASSIVE	
5.10	Down-Link Bi-static Radar Observations of the Moon		
5.10.1	Obtain data on the spectral properties of S-band bistatic radar echoes from the lunar crust	CSM SOLO	3-174-176
5.10.2	Obtain data to allow a determination of the Brewster angle of the lunar crust in the S-band	CSM SOLO	3-174-176
5.10.3	Obtain data on the spectral properties of VHF bi-static radar echoes from the lunar crust	CSM SOLO	3-152-176
5.10.4	Obtain data to allow a determination of the Brewster angle of the lunar crust in the VHF band	CSM SOLO	3-152-176
5.11	Portable Magnetometer		
5.11.1	Obtain data on the local magnetic field by use of a portable magnetometer	EVA-2	3-183/185/189
5.12	Soil Mechanics		
5.12.1	Obtain data on the lunar surface and subsurface characteristics relative to the orgin and nature of the lunar soil, to construction of a shelter and to mobility of a roving vehicle	EVA-2	3-189
5.12.2	Obtain data on lunar soil mechanical behavior	EVA-2	3-189
5.12.3	Obtain a representative sample of fine-grained fragmental material	EVA-1	3-143
5.13	Gegenschein from Lunar Orbit		
5.13.1	Obtain data on the spatial distribution of the Gegenschein and Moulton point	CSM SOLO	3-126-128
S-176	Apollo Window Meteroid Experiment	PASSIVE	
T-029	Pilot Describing Function	PASSIVE	

SECTION 3 - DETAILED TIMELINE

FLIGHT PLAN

MCC-H

1423 CST

00:00 (31102 01111)

LIFT-OFF JANUARY 31, 1971

CSM LAUNCH CHECKLIST

MSFN

:10

SECO
INSERTION AND SYSTEMS CHECKS PAGE L 2-11

CYI

UPDATE TO CSM
Z TORQUING ANGLE

:20

00:30

:40

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LAUNCH ORIENT)

:50

DUMP DSE

CRO

01:00

NOTES

L/O CREW POSITIONS
LEFT COUCH - CDR
CENTER COUCH - CMP
RIGHT COUCH - LMP
AT SECO+20 SEC, S-IVB MNVRS TO LH AND INITIATES ORB RATE (HEADS DOWN)

THE DAP LOAD WILL BE SHOWN WHEN APPLICABLE IN THE TIME COLUMN OR AS A NOTE TO INDICATE STATUS

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

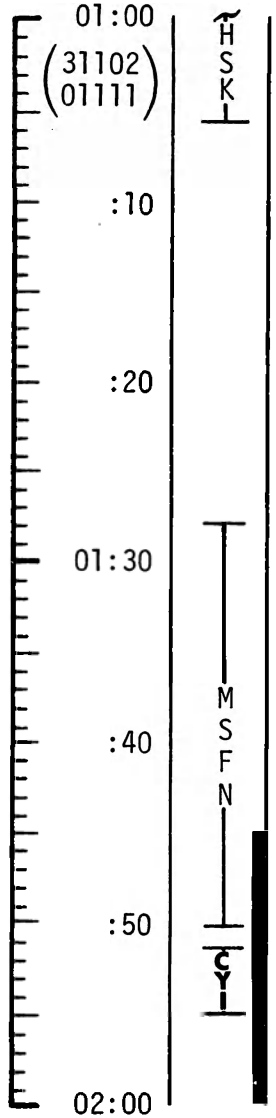
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	00:00 - 01:00	1/E.O.	3-1

MCC-H

1523 CST

FLIGHT PLAN

NOTES



REPORT: GYRO TORQUING ANGLES

SCS ATT REF COMPARISON CHECK PAGE L 2-17
EXTEND DOCKING PROBE PAGE L 2-18

GO/NO-GO FOR PYRO ARM (CUE MSFN)
LOGIC ON

TLI PREPARATION PAGE L 2-23

PYRO ARM

DUMP DSE

UPDATE TO CSM
TLI PAD
TLI +90 MIN ABORT PAD
P37 (L/O+8) PAD
UPLINK TO CSM
CSM S.V. & V66
GO/NO-GO FOR PYRO ARM

AS A GENERAL RULE, EXCEPT DURING TEC, UNDOCKED PERIODS AND WHILE THE LM IS ON THE LUNAR SURFACE, MCC-H WILL UPLINK THE STATE VECTOR TO THE CSM SLOT AND TRANSFER IT VIA V66 TO THE LM SLOT IN ORDER TO HAVE REDUNDANT STATE VECTORS ONBOARD

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	01:00 - 02:00	1/E.O.	3-2

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TLI
BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TERMINATE	±45° TERMINATE	V_i = PAD VALUE + 2 SEC	NO TRIM

TABLE 3-1

MCC-H

1623 CST

FLIGHT PLAN

NOTES

02:00

(31102)
(01111)

:10

:20

NOMINAL TLI CHECKLIST PAGE L 2-24
TB6 02:21:00.1

GO/NO-GO FOR TLI

GO/NO-GO FOR TLI
P47 THRUST MONITOR

02:30

TLI

TIG: 02:30:38
BT: 5 MIN 55.6 SEC
ΔVT: 10 353.1 FPS

CRO
ARIA
MSFN

POO CMC IDLING
V66 SET CSM S.V. INTO LM S.V.
TLI BURN STATUS REPORT
CDR - TRANS TO CENTER COUCH, CMP - LEFT COUCH
LMP - RIGHT COUCH
WASTE STOWAGE VENT - CLOSED
NORMAL SC/BOOSTER SEPARATIONS PAGE L 3-1
DIRECT O_2 VLV - OPEN, UNTIL CABIN IS 5.7 PSI, THEN CLOSE
V48 (11103)(01111)

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

:40

DUMP DSE

(11103)
(01111)

:50

S-IVB MNVRS TO SEP ATT 02:51:34
(000,158,319) OMNI C

GO/NO-GO FOR T&D

GO/NO-GO FOR TRANSPOSITION AND DOCKING

CSM SEPARATION PREPARATION PAGE L 3-1

03:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	02:00 - 03:00	1/TLC	3-5

FLIGHT PLAN

MCC-H

1723 CST

03:00

(11102)
(01111)

:10

:20

03:30

(21101)
(X1111)

:40

:50

04:00

T V

M S F N

CSM/S-IVB SEP 03:01

CSM MNVR TO DOCK ATT (301,338,041)(03:05)
V48 (11102)(01111) HGA P -3, Y 299
TV (GDS) 03:05 TO 03:30 CM/TV - PEAK, BRKT (f22)
VISUALLY INSPECT AND PHOTOGRAPH S-IVB AND LM

DOCK 03:11

CSM/LM PRESSURE EQUALIZATION PAGE L 3-5

TUNNEL HATCH REMOVAL PAGE L 3-5
DOCKING LATCH VERIFICATION PAGE L 3-6

LM UMBILICAL CONNECTIONS PAGE L 3-6

HATCH INSTALLATION PAGE L 3-6

PRE LM SEP & EJECTION PAGE L 3-7

S-IVB NON-PROPULSIVE VENT START (03:36:33.7)

V48 (21101) (X1111)
GO/NO-GO PYRO ARM (CUE MSFN)
LOGIC ON
PYRO ARM
P47 THRUST MONITOR

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

S-IVB NON-PROPULSIVE VENT COMPLETE (03:51:33.7)

PHOTOGRAPH LM EJECTION

TLI CUTOFF + 1 HR 20 MIN

CSM/LM EJECTION

P00, V66 SET CSM S.V. INTO LM S.V.
REPORT: GOOD EJECTION

NOTES

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

DURING TLC, HGA IS REQUIRED ONLY FOR TD&E, TV TRANSMISSION, AND MCC'S. THE ANTENNA WILL BE STOWED AT OTHER TIMES. DURING PTC MCC-H WILL COMMAND OMNI SELECTION.

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

TIG:	03:56
BT:	3 SEC
ΔVT:	0.4 FPS
ULLAGE:	NONE
ORBIT:	N/A

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	03:00 - 04:00	1/TLC	3-6

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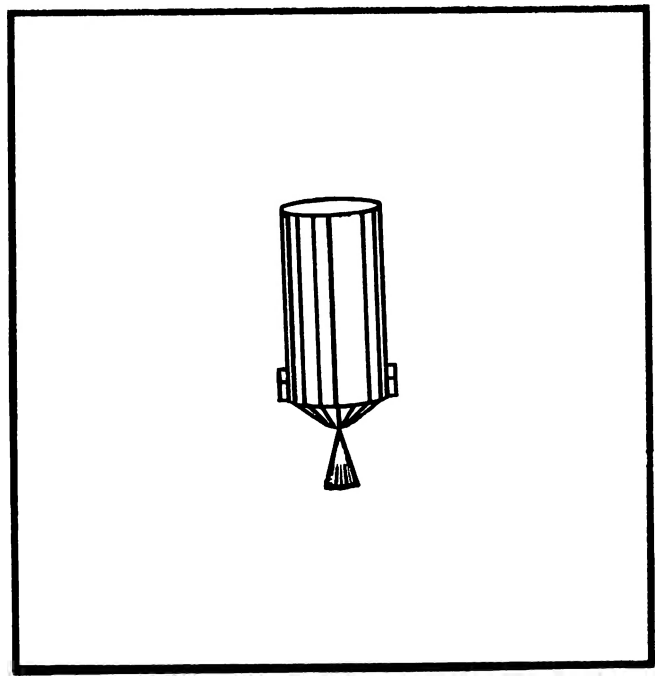
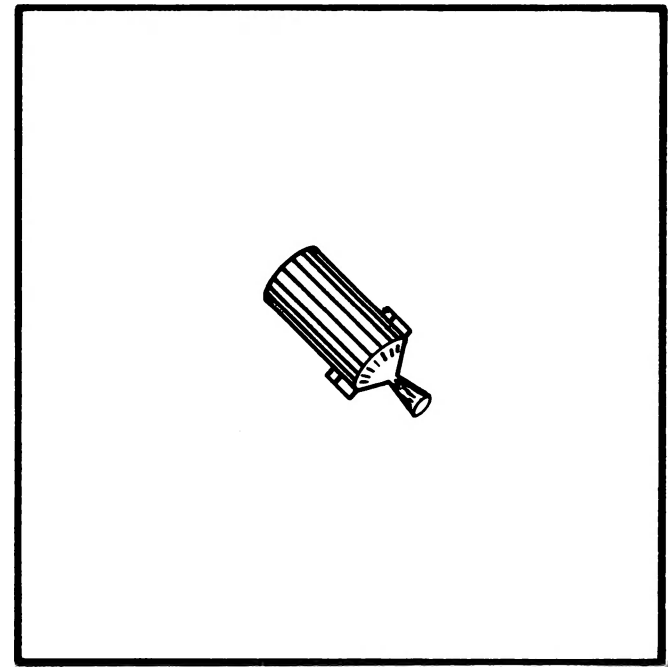
GET 04:19 FOV 5°



S-IVB APS EVASIVE INITIATION
CSM/S-IVB RANGE 1583 FT

GET 04:40 FOV 1°



S-IVB LOX DUMP INITIATION
CSM/S-IVB RANGE 12 023 FT

FLIGHT PLAN

MCC-H	1823 CST		NOTES
	04:00 (21101) (X1111)	V49 MNVR TO VIEW S-IVB IN HATCH WINDOW BY 04:09 (090,340,356) OMNI D REPORT: GO FOR S-IVB YAW MNVR VISUALLY INSPECT S-IVB/IU THERMAL SHROUD, TAKE PHOTOS IF DAMAGE IS EVIDENT	THE MNVR TO ACQUIRE THE S-IVB WILL BE PERFORMED AT 0.2°/SEC AND WILL BE INITIATED AFTER GOOD EJECTION IS VERIFIED
GO FOR S-IVB YAW MNVR INITIATION	:10	S-IVB YAW MNVR 04:09 (GROUND COMMAND)	
GO/NO-GO FOR S-IVB EVASIVE BURN		REPORT: GO FOR S-IVB EVASIVE BURN	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.
DUMP DSE	:20	S-IVB APS EVASIVE BURN 04:19 (GROUND COMMAND)	
		CHARGE BATTERY B	
	04:30	S-IVB MNVRS TO PROPELLANT DUMP ATT (04:29) REPORT: LM/CM ΔP	THE S-IVB YAW MNVR WILL BE PERFORMED NOMINALLY AT LM EJECTION +13 MIN
		S-IVB CONTINUOUS H_2 VENT-ON (04:36)	EVASIVE BURN ΔV ≈9.4 FPS
	:40	V49 MNVR TO P52 ATTITUDE (05:20) (230,300,356) HGA P 31, Y 310 S-IVB LOX DUMP (04:40)	LOX DUMP ΔV ≈ 28 FPS
	:50	DOFF PGA'S	
		TRANSFER ITEMS OUT OF PGA POCKETS ZIP SUIT AND INSTALL ELECTRICAL COVER PRIOR TO STOWING (PGA BAG) STOW COMM CARRIERS & UCTA (PGA BAG)	
	05:00		

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	04:00 - 05:00	1/TLC	3-9

MCC-H

1923 CST

FLIGHT PLAN

NOTES

05:00 (21101 X1111)

PREPARE FOR LAUNCH VEHICLE SYSTEMS PERFORMANCE DEBRIEFING AT 27 HOURS. SEE QUESTIONS ON PAGE 3-28

SC INTERIOR PHOTOGRAPHY AT CREW OPTION
CM/DAC/10/CIN- SPOT
(T2.8,1/60,3) 6 fps
(87% MAG)
(MAG (H) ___, FR # ___

:10

ATT DEADBAND - MIN
RATE - LOW
BMAG (3) - ATT 1/RATE 2
SC CONT - SCS

UPLINK TO CSM
DESIRED ORIENTATION
(PTC)
ZERO TRUNNION BIAS

:20

MSFN

STARS ____, ____
SA ____, ____
TA ____, ____

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LAUNCH ORIENT)

05:30

REPORT: GYRO TORQUING ANGLES

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

:40

P52 IMU REALIGN
OPTION 1 PREFERRED
(PTC ORIENT)

SC CONT - CMC
BMAG (3) - RATE 2
OMNI C

:50

SECURE HGA, HGA TRACK - MAN
O_2 FUEL CELL PURGE } IF NO MCC-1
WASTE WATER DUMP
VHF A SIMPLEX - OFF
VERIFY WASTE STOWAGE VENT VALVE - VENT

HGA P -52, Y 270

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

P37 PAD ASSUMES
NO MCC-1

06:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	05:00 - 06:00	1/TLC	3-10

FLIGHT PLAN

MCC-H

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

2023 CST

06:00
:10
:20
06:30
:40
:50
07:00

MSFN

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20,090,000)
V79 (-0.3750)
(+030.00)
(+00000)

CREW EXERCISE PERIOD

PTC

NOTES

S-IVB APS MCC-1
GET≈06:30
ΔV≈30 FPS
DAP LOAD STATUS
(21101)(X1111)

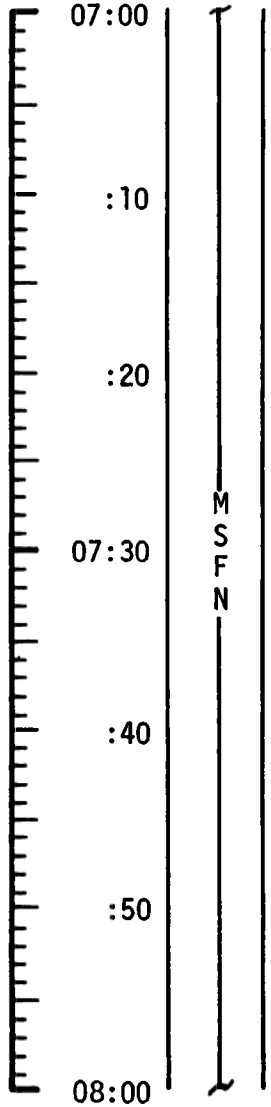
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	06:00 - 07:00	1/TLC	3-11

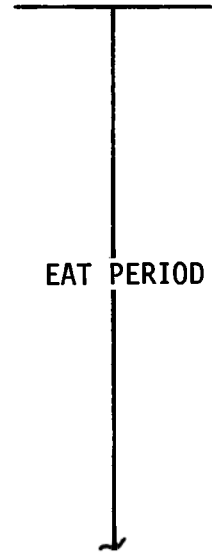
MCC-H

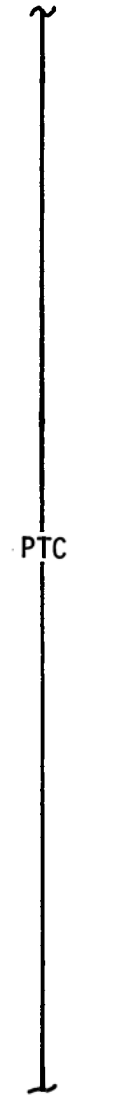
2123 CST

FLIGHT PLAN

NOTES







DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	07:00 - 08:00	1/TLC	3-12

MCC-H

2223 CST

FLIGHT PLAN

08:00

:10

:20

08:30

:40

:50

09:00

MSFN

EAT PERIOD

CSM SYSTEMS CHECKLIST

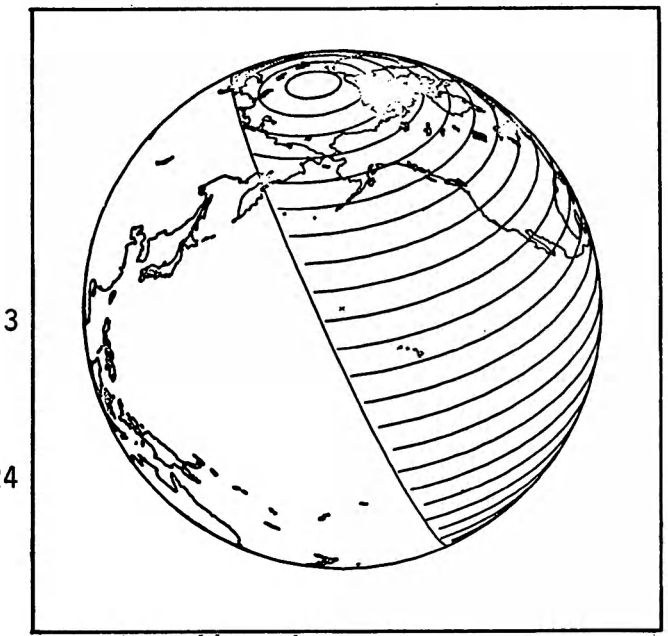
DEACTIVATE PRIMARY EVAP — PAGE S 1-13

COMM MODE -
NORMAL LUNAR CONFIGURATION
COAST AWAKE — PAGE S 1-24

PTC

GET: 9:00

F.O.V. 10°



S-IVB MCC-2 GET ≈ 09:30
ΔV IS NOMINALLY ZERO
EARTH DISTANCE
≈44 241 NM

NOTES

DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	08:00 - 09:00	1/TLC	3-13

MCC-H

2323 CST

FLIGHT PLAN

09:00

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

:10

REPORT: GYRO TORQUING ANGLES

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK PAGE G 2-5
REPORT: BIAS

:20

EXIT G&N PTC PAGE G 8-3
V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(153,224,328)
OMNI A
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00034)
P00

09:30
(21101)
(X1111)

V49 MNVR TO SIGHTING ATTITUDE
(173,275,310) OMNI B
V67 (+80000) (+00070) (+00003)

:40

P23 CISLUNAR NAVIGATION
5 MARKS ON EACH STAR, UPDATE STATE VECTOR
1. N70 (00000) (00000) (00120)
N88 (-54083) (-07011) (-83821)

:50

10:00

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

LOAD W MATRIX

72 GACRUX
(EFH)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	09:00 - 10:00	1/TLC	3-14

FLIGHT PLAN

MCC-H 0023 CST

10:00 (21101) (X1111)

:10

:20

10:30

:40

:50

11:00

MSFN

2. N70 (00000)(00000)(00110)
   N88 (-44989)(-89085)(-06316)

3. N70 (00000)(00000)(00120)
   N88 (-64872)(-11412)(-75242)

4. N70 (00000)(00000)(00110)
   N88 (-35412)(-91724)(-18240)

P00
V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(153,224,328) OMNI A
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00034)

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2

V49 MNVR TO PTC ATTITUDE
(N20,090,000)
V79 (-0.3750)
(+030.00)
(+00000)

PTC

UPDATE TO CSM
MCC-1 MNVR PAD
CSM S.V.
UPLINK TO CSM
CSM S.V. & V66
MCC-1 TGT LOAD

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

NOTES

236 DELTA
OPHIUCHI (ENH)

53 GAMMA
CENTAURI (EFH)

202 ZETA
OPHIUCHI (ENH)

DAP LOAD STATUS
(21101)(X1111)
START PTC IF
MCC-1 NOT REQUIRED

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	10:00 - 11:00	1/TLC	3-15

MCC-1
BURN TABLE

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

TABLE 3-2

FLIGHT PLAN

MCC-H

0123 CST

11:00 (21101) (X1111)

:10

:20

11:30

:40

:50

12:00

TLI CUTOFF +9 HR

MSFN

P30 EXTERNAL ΔV

V49 MNVR TO PAD BURN ATTITUDE
WASTE STOWAGE VENT VLV - CLOSE (8 HOURS FROM VENT)
O_2 HEATERS 1&2 (2) - OFF
O_2 HEATERS 3 (1) - AUTO

SXT STAR CHECK
P40 SPS THRUSTING OR P41 RCS THRUSTING
O_2 FUEL CELL PURGE
WASTE WATER DUMP
} IF NOT PERFORMED AT 05:55

MCC-1

TIG: 11:36:33
BT: NOM ZERO
ΔVT: NOM ZERO
ULLAGE: NONE
ORBIT: N/A

V66 SET CSM S.V. INTO LM S.V.
BURN STATUS REPORT

REPORT: LM/CM ΔP

VENT BATTERIES UNTIL SYSTEM TEST METER 4A=0

LiOH CANISTER CHANGE
(3 INTO A, STOW 1 IN B5)

PTC

NOTES

MCC-1 WILL BE DELAYED TO MCC-2 IF PROPELLANT COST IS NOT PROHIVITIVE

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	11:00 - 12:00	1/TLC	3-17

MCC-H

0223 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM QUADS TO ENABLE FOR PTC SPINUP

12:00

:10

:20

12:30

:40

:50

13:00

MSFN

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2

V49 MNVR TO PTC ATTITUDE
(N20,090,000)
V79 (-0.3750)
(+030.00)
(+00000)

PTC

DAP LOAD STATUS
(21101)(X1111)

START PTC IF MCC-1 WAS PERFORMED

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	12:00 - 13:00	1/TLC	3-18

FLIGHT PLAN

MCC-H

0323 CST

13:00

:10

:20

13:30

:40

:50

14:00

MSFN

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

UPDATE TO CSM
P37 PADS (LAUNCH
+ 25, 35, 45 & 60)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	13:00 - 14:00	1/TLC	3-19

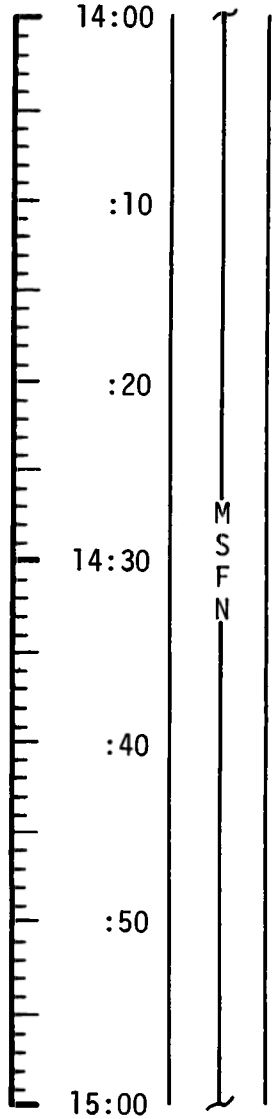
MCC-H

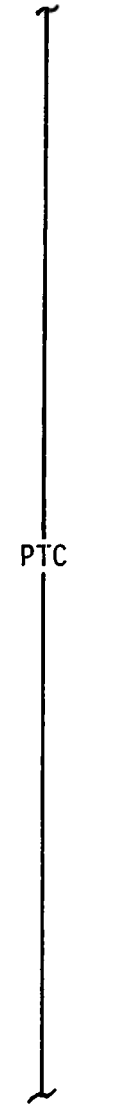
0423 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)





MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	14:00 - 15:00	1/TLC	3-20

MCC-H

0523 CST

FLIGHT PLAN

15:00

:10

:20

15:30

:40

:50

16:00

MSFN

EAT PERIOD

PTC

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST

PAGE S 1-26

NOTES

DAP LOAD STATUS
(21101)(X1111)

ONBOARD READOUT

BAT C _____

PYRO BAT A _____

PYRO BAT B _____ _____

RCS A _____

B _____

C _____

D _____

DC IND SEL - MNA OR B

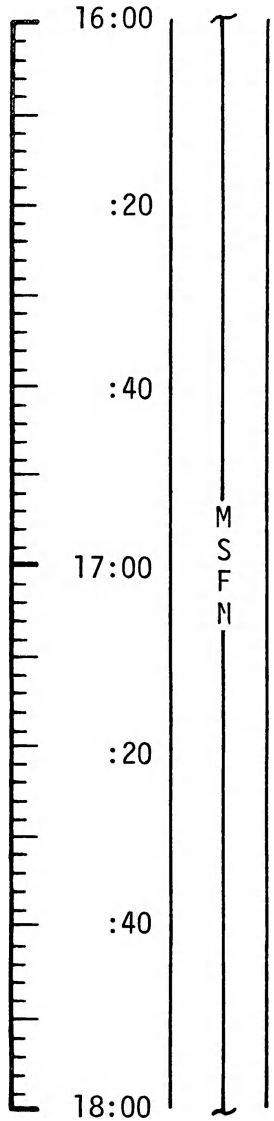
EARTH DISTANCE
≈73 991 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	15:00 - 16:00	1/TLC	3-21

MCC-H

0623 CST

FLIGHT PLAN



M
S
F
N

REST PERIOD
(10 HOURS)

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)
DURING REST PERIOD,
TWO CREWMEN IN
REST STATIONS AND
ONE IN COUCH

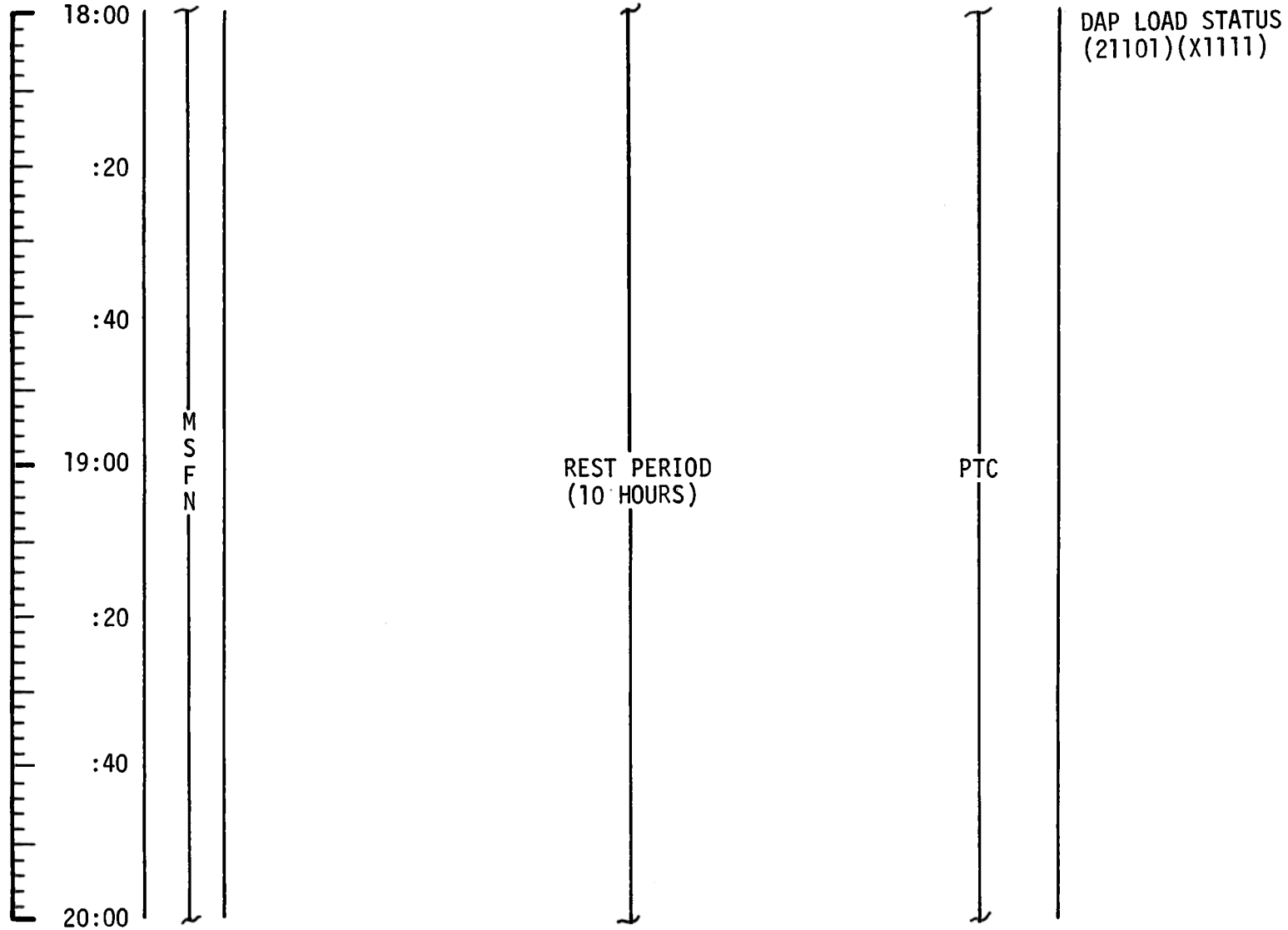
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	16:00 - 18:00	1/TLC	3-22

MCC-H

0823 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	18:00 - 20:00	1/TLC	3-23

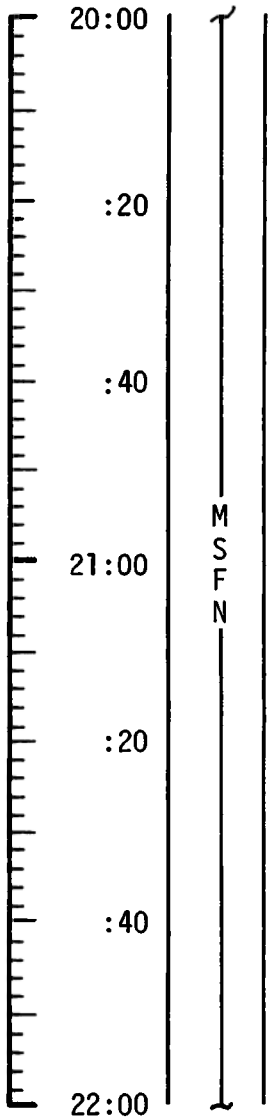
MCC-H

1023 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)



MSFN

REST PERIOD
(10 HOURS)

PTC

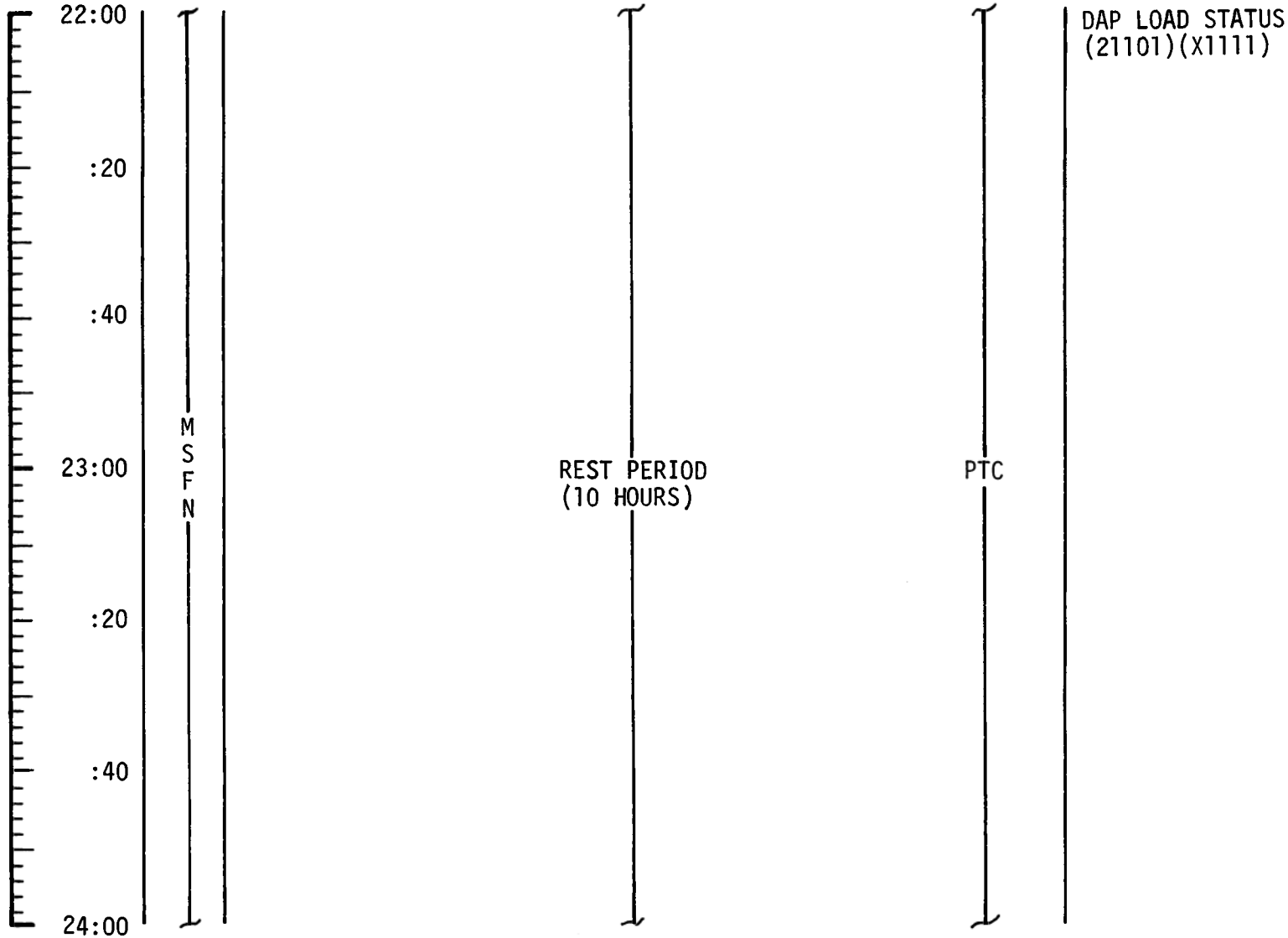
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	20:00 - 22:00	1/TLC	3-24

MCC-H

1223 CST

FLIGHT PLAN

NOTES



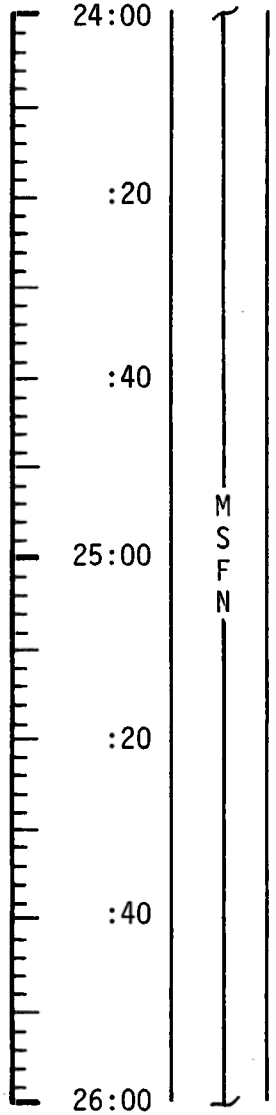
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	22:00 - 24:00	1/TLC	3-25

MCC-H

1423 CST

FLIGHT PLAN

NOTES



MSFN

REST PERIOD
(10 HOURS)

PTC

DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	24:00 - 26:00	1/TLC	3-26

FLIGHT PLAN

MCC-H

1623 CST

JPDATE TO CSM
CONSUMABLES
FLIGHT PLAN

26:00

:10

:20

26:30

:40

:50

27:00

M
S
F
N

CSM SYSTEMS CHECKLIST

POST-SLEEP CHECKLIST

PAGE S 1-26

LiOH CANISTER CHANGE
(4 INTO B, STOW 2 IN B5)

CHARGE BATTERY A

EAT PERIOD

REPORT: LM/CM ΔP

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

CSM CONSUMABLES UPDATE

GET: __ __ __:__ __

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

EARTH DISTANCE
≈106 014 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	26:00 - 27:00	2/TLC	3-27

FLIGHT PLAN

MCC-H

1723 CST

LAUNCH VEHICLE DEBRIEFING

27:00
:10
:20
27:30
:40
:50
28:00

MSFN

LAUNCH VEHICLE SYSTEMS PERFORMANCE DEBRIEFING ⇒ 28:00

1. WERE THERE ANY SIGNIFICANT CHANGES IN NOISE LEVEL BETWEEN STAGES OF POWERED FLIGHT?
2. WERE THERE ANY SIGNIFICANT CHANGES IN NOISE/VIBRATION LEVEL DURING A SINGLE STAGE OF POWERED FLIGHT?
3. WERE THERE ANY UNEXPECTED ACCELERATION TRANSIENTS EXPERIENCED AT INITIATION OF IGN, SII SECO, MAX Q OR M/R SHIFT FOR BOTH SII AND S-IVB?
4. AFTER SC SEPARATION, DESCRIBE THE CONDITIONS OF THE IU THERMAL SHROUD. WAS THERE ANY LOOSENESS?
5. HOW WAS GROUND/SC COMM AT IGNITION/LIFT-OFF TIME REGION RELATIVE TO VIBRATION AND ACOUSTIC ENVIRONMENTS?
6. DESCRIBE ANY VISIBLE VENTING OR SUSPECTED LEAK AFTER SEPARATION.
7. WHEN, AND AT WHAT DISTANCE, WAS THE S-IVB SEEN FOR THE LAST TIME?
8. ARE THERE ANY COMMENTS RELATIVE TO S-IVB/IU TLI GUIDANCE CUTOFF CONDITIONS (PREDICTED VS ACTUAL SC DISPLAY)?
9. WHAT DID THE ORDEAL BALL LOOK LIKE DURING TLI?

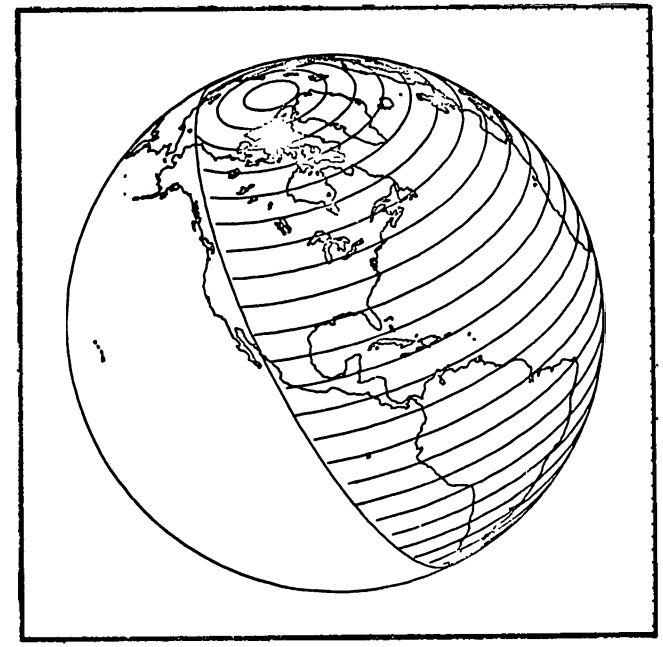
PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

GET: 28:30

F.O.V. 4°



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	27:00 - 28:00	2/TLC	3-28

MCC-H

FLIGHT PLAN

1823 CST

28:00

:10

:20
(21101
X1111)

28:30

:40

:50

29:00

MSFN

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK PAGE G 2-5
REPORT: BIAS

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

EXIT G&N PTC PAGE G 8-3

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(151,227,333)
OMNI A
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00034)
P00
V49 MNVR TO SIGHTING ATTITUDE
(155,265,310) OMNI B
V67 (+45000) (+00006) (+00003)

P23 CISLUNAR NAVIGATION
5 MARKS ON EACH STAR, UPDATE STATE VECTOR
1. N70 (00000)(00000)(00110)
N88 (-35412)(-91724)(-18240)

2. N70 (00000)(00000)(00120)
N88 (-58200)(-46152)(-66954)

-29.1 PTC

Cancel

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

EARTH DISTANCE
≈114 188 NM

LOAD W MATRIX

202 ZETA
OPHIUCHI (ENH)

165 ETA
CENTAURI (EFH)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	28:00 - 29:00	2/TLC	3-29

FLIGHT PLAN

MCC-H

1923 CST

NOTES

29:00 (21101) (X1111)

3. N70 (00033)(00000)(00110)

33 ANTARES (ENH)

:10

4. N70 (00000)(00000)(00120)
N88 (-64929)(-74326)(-16121)

172 BETA LIBRAE (EFH)

P00
V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(151,227,333)
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00034)
ACQUIRE MSFN HGA P -64 Y 102

:20

MSFN

29:30

UPLINK TO CSM
CSM S.V. & V66
MCC-2 TGT LOAD

:40

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

H_2 PURGE LINE HEATERS - ON

:50

IF HGA LOCK IS LOST ACQUIRE MANUALLY WITH HGA P -2 Y 356

P30 EXTERNAL ΔV
V49 MNVR TO PAD BURN ATTITUDE
(208,347,316)

30:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	29:00 - 30:00	2/TLC	3-30

MCC-2
BURN CHART

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

TABLE 3-3

EARTH DARKSIDE DIM LIGHT PHOTOGRAPHY

CONFIGURE CAMERA
CM/DAC/SXT/VHBW, (EXP 1/500) 24 fps (2.5% MAG)
MAG (J)____ MAG % ____

UTILITY POWER - ON

V49 MNVR TO EARTH DARKSIDE PHOTO ATTITUDE (30:55)
(156,269,310) OMNI B
SECURE HGA, HGA TRACK-MAN, HGA P -52, Y 270

DAMP VEHICLE RATES PER PTC PROCEDURE STEP 5
AFTER 20 MIN DISABLE ALL JETS
P22 ORBIT NAVIGATION (NO MARKS)
LDMK: LAT + 15.000 SA +314.00
LONG/2 - 42.500 TA + 04.000
ALT +000.00
VERIFY THRU SXT THAT OPTICS BORESIGHTED ON EARTH DARKSIDE
MOUNT DAC ON SXT, DAC-ON AT 24 fps FOR 2 SEC
CHANGE DAC TO TIME & 1/60

1 FRAME, EXP TIME 60 SEC
1 FRAME, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC

CHANGE DAC TO 24 fps & 1/500; DAC ON AT 24 fps FOR 2 SEC
CYCLE CMC MODE - FREE AUTO
ENABLE JETS
RECORD MAG % ____
REMOVE AND STOW DAC

FLIGHT PLAN

MCC-H

2023 CST

30:00
(21101)
(X1111)
:10
:20
30:30
:40
:50
31:00

MSFN

TLI CUTOFF +28 HR

SXT STAR CHECK
P40 SPS THRUSTING
H_2 & O_2 FUEL CELL PURGE
WASTE WATER DUMP
H_2 PURGE LINE HEATERS - OFF

MCC-2

V66 SET CSM S.V. INTO LM S.V.
BURN STATUS REPORT

TIG:	30:36:07
BT:	11.08 SEC
ΔVT:	73.40 FPS
ULLAGE:	NONE
ORBIT:	N/A

EARTH DARKSIDE
DIM LIGHT PHOTOGRAPHY

NOTES

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	30:00 - 31:00	2/TLC	3-33

MCC-H

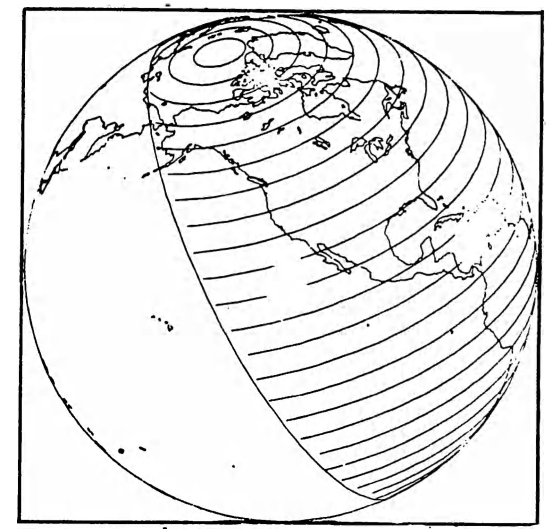
2123 CST

FLIGHT PLAN

NOTES

GET: 31:00

F.O.V. 4°



31:00
(21101)
(X1111)

:10

:20

31:30

:40

:50

32:00

MSFN

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

EARTH DARKSIDE
DIM LIGHT PHOTOGRAPHY

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20,090,000)
V79 (-0.3750)
(+030.00)
(+00000)

PTC

DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	31:00 - 32:00	2/TLC	3-34

MCC-H

2223 CST

FLIGHT PLAN

NOTES

32:00

VENT BATTERIES UNTIL SYSTEM TEST METER 4A=0

CREW EXERCISE PERIOD

DAP LOAD STATUS
(21101)(X1111)

:10

:20

CHARGE BATTERY A

MSFN

32:30

PTC

:40

:50

33:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	32:00 - 33:00	2/TLC	3-35

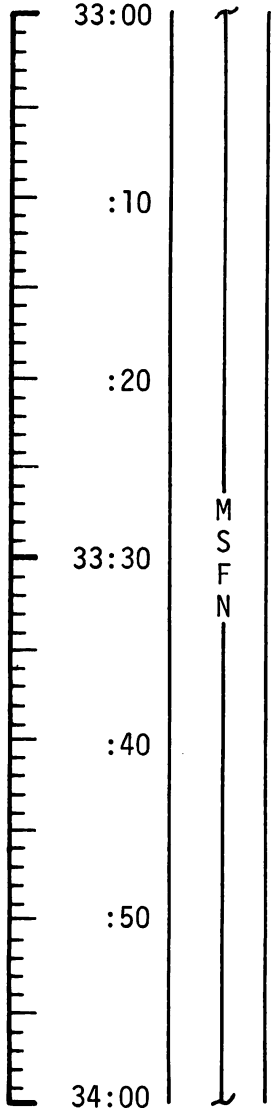
MCC-H

2323 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)



MSFN

EAT PERIOD

PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	33:00 - 34:00	2/TLC	3-36

FLIGHT PLAN

MCC-H

0023 CST

34:00
:10
:20
34:30
:40
:50
35:00

MSFN

LTC CHECKOUT
UNSTOW LTC
CM3/LTC/MBW/BEF - (SHUT 1/100, RNG 10.0, INT 8) (12 FR)
MAG (V) ____, FR # ____
LTC INSTALLATION (DECAL)
RECORD LTC CLOCK TIME
RECORD TIME __:__:__ & DAY ____ (LTC CLOCK)

AT GET _____ :____:__ __
LTC CHECKOUT (DECAL)
LTC FILM MAGAZINE CHANGE (DECAL)
ADVANCE 4 FRAMES, RECORD FR # ____
PUT MAG (W) ON LTC
RESET FRAME COUNTER
LTC REMOVAL (DECAL) & STOW

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

LOI MINUS 5 HR FLYBY IS A CIRCUMLUNAR TRAJECTORY TO THE PRIME MPL AND WITH A PERICYNTHION BETWEEN 60 AND 1500 NM

UPDATE TO CSM
LOI MINUS 5 HR
FLYBY

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	34:00 - 35:00	2/TLC	3-37

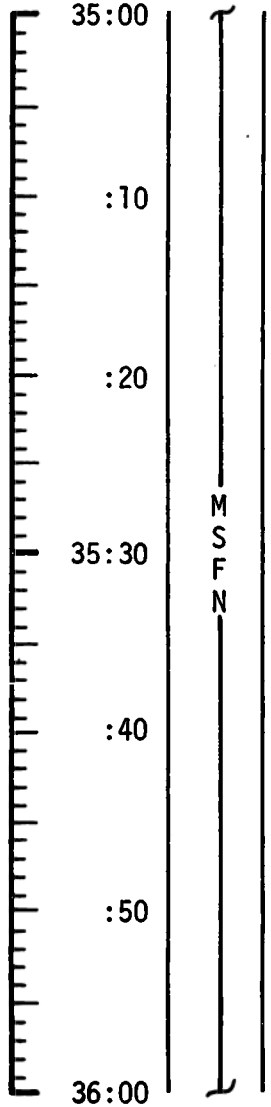
MCC-H

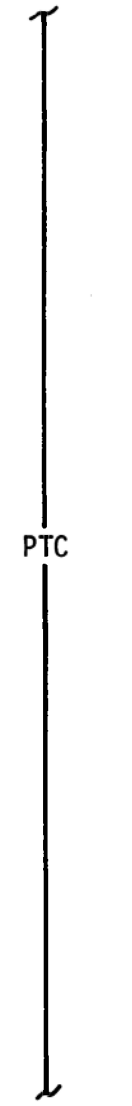
0123 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)





MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	35:00 - 36:00	2/TLC	3-38

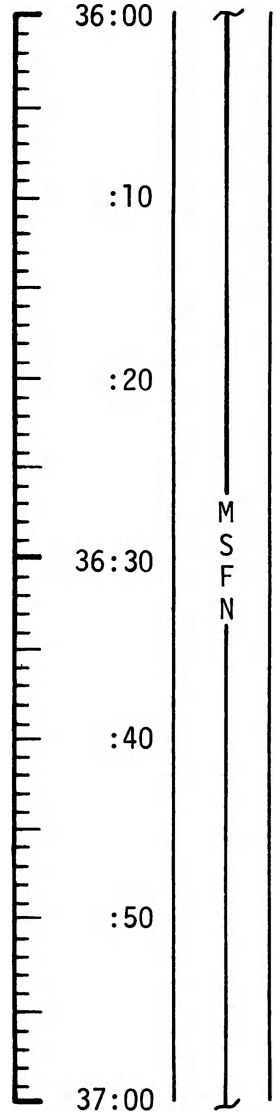
MCC-H

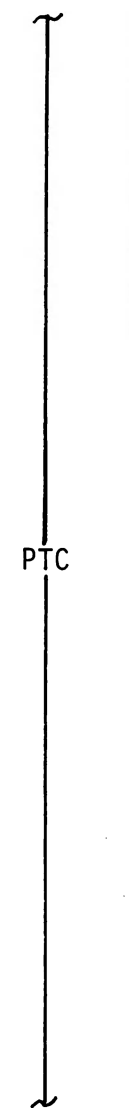
0223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)





MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	36:00 - 37:00	2/TLC	3-39

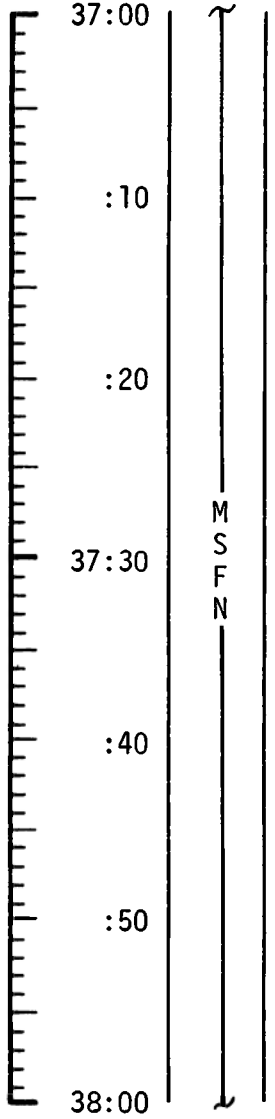
MCC-H

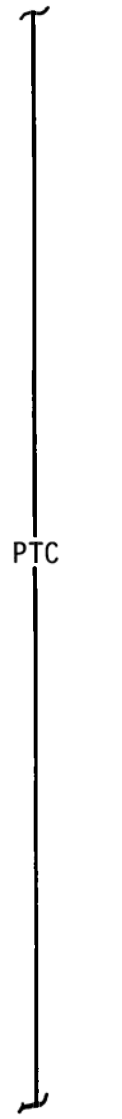
0323 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)





MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	37:00 - 38:00	2/TLC	3-40

MCC-H

0423 CST

FLIGHT PLAN

NOTES

38:00

:10

:20

38:30

:40

:50

39:00

MSFN

LiOH CANISTER CHANGE
(5 INTO A, STOW 3 IN B5)

REPORT: LM/CM ΔP

PTC

DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	38:00 - 39:00	2/TLC	3-41

MCC-H

0523 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

39:00

:10

:20

39:30

:40

:50

40:00

MSFN

PTC

UPLINK TO CSM
CSM S.V. & V66

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	39:00 - 40:00	2/TLC	3-42

MCC-H

0623 CST

FLIGHT PLAN

NOTES

40:00

:10

:20

40:30

:40

:50

41:00

MSFN

EAT PERIOD

PTC

DAP LOAD STATUS
(21101)(X1111)

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

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST PAGE S 1-26

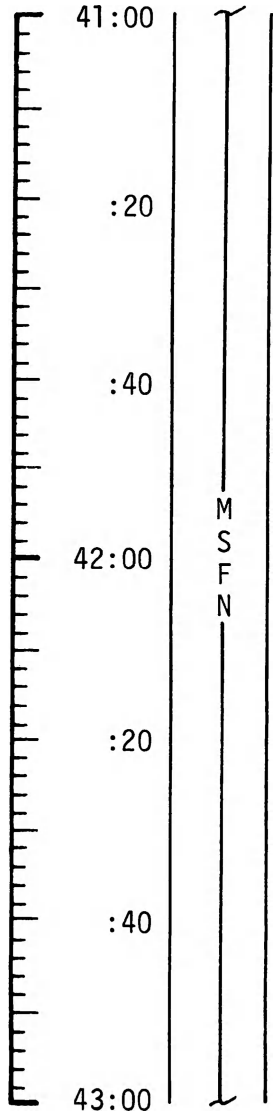
EARTH DISTANCE
≈141 981 NM

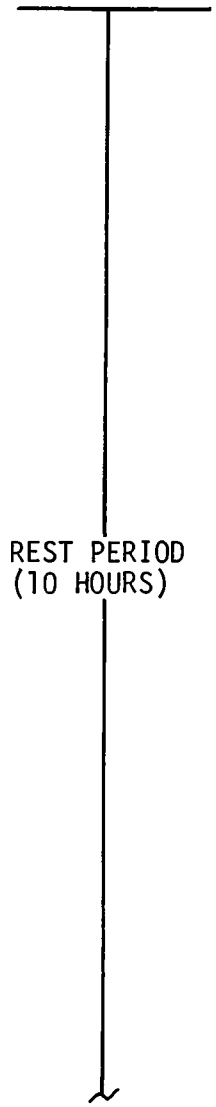
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	40:00 - 41:00	2/TLC	3-43

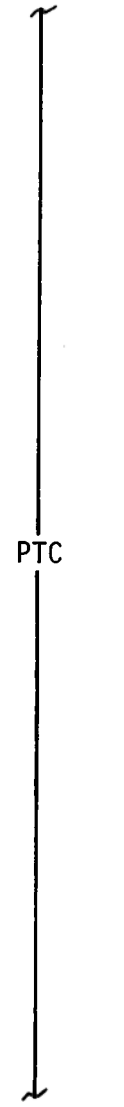
MCC-H

0723 CST

FLIGHT PLAN







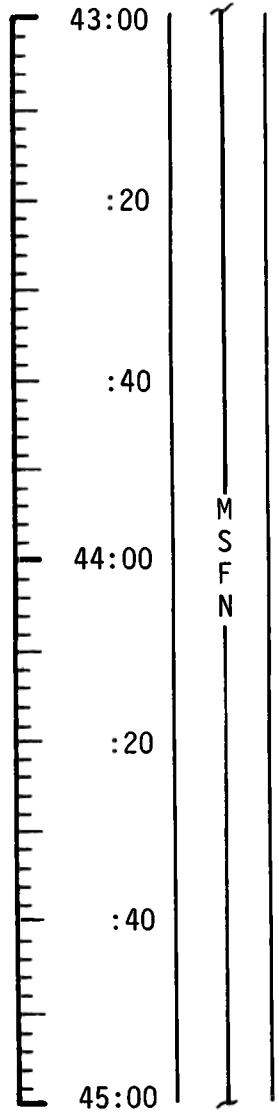
NOTES

DAP LOAD STATUS
(21101)(X1111)
DURING REST PERIOD,
TWO CREWMEN IN
REST STATIONS AND
ONE IN COUCH

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	41:00 - 43:00	2/TLC	3-44

MCC-H

FLIGHT PLAN



MSFN

REST PERIOD
(10 HOURS)

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	43:00 - 45:00	2/TLC	3-45

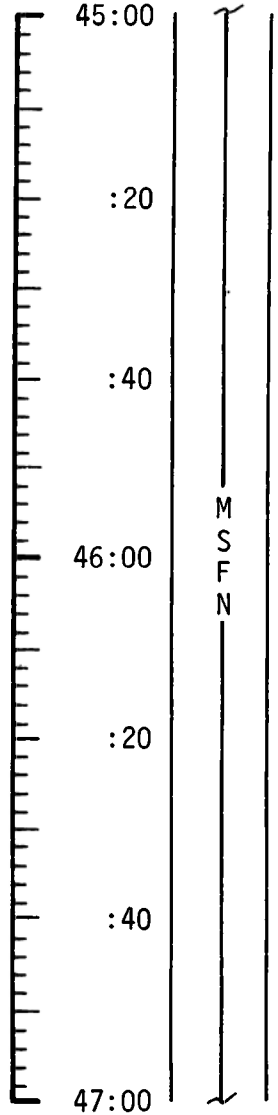
MCC-H

1123 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)



MSFN

REST PERIOD
(10 HOURS)

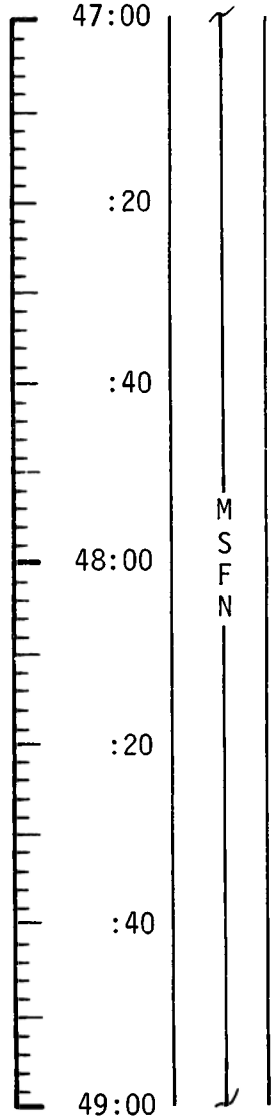
PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	45:00 - 47:00	2/TLC	3-46

MCC-H

1323 CST

FLIGHT PLAN



M
S
F
N

REST PERIOD
(10 HOURS)

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

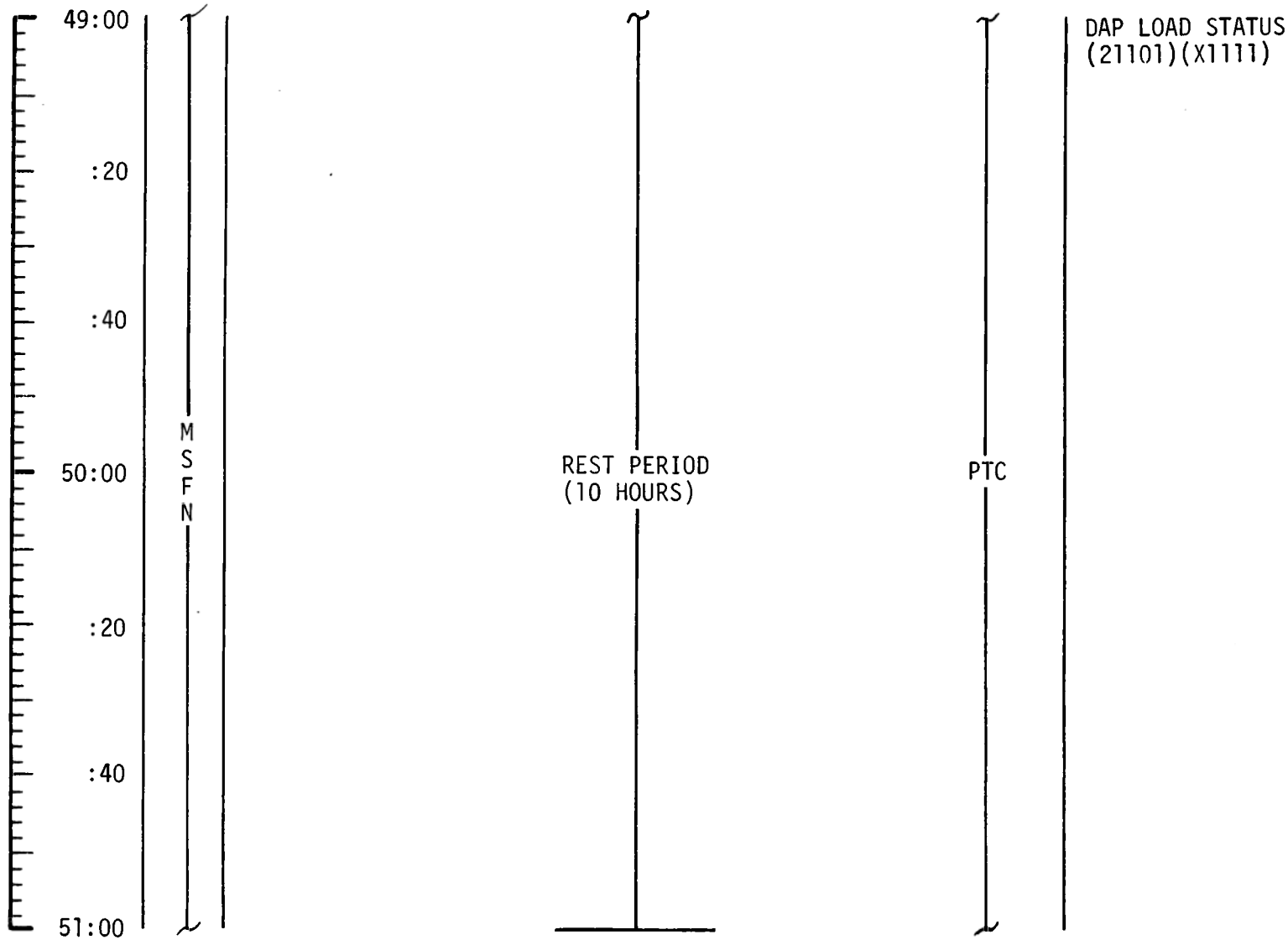
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	47:00 - 49:00	2/TLC	3-47

MCC-H

1523 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	49:00 - 51:00	2/TLC	3-48

FLIGHT PLAN

MCC-H

1723 CST

51:00

:10

:20

51:30

:40

:50

52:00

MSFN

CSM SYSTEMS CHECKLIST
POST-SLEEP CHECKLIST

PAGE S 1-26

LiOH CANISTER CHANGE
(6 INTO B, STOW 4 IN B5)

REPORT: LM/CM ΔP

UPDATE TO CSM CONSUMABLES FLIGHT PLAN

EAT PERIOD

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

CSM CONSUMABLES UPDATE

GET: __ __ __:__ __

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

EARTH DISTANCE
≈160 954 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	51:00 - 52:00	3/TLC	3-49

MCC-H

1823 CST

FLIGHT PLAN

52:00
:10
:20
52:30
:40
:50
53:00

MSFN

S-170 BISTATIC RADAR FREQUENCY CHECK
VHF AM B - DUPLEX
VHF RANGING - ON
VHF ANT - LEFT (VERIFY)
NOTE: MSFN WILL TURN OFF S-BAND UPLINK FOR APPROXIMATELY 5 MIN WHILE S-BAND DOWNLINK FREQUENCY IS MEASURED

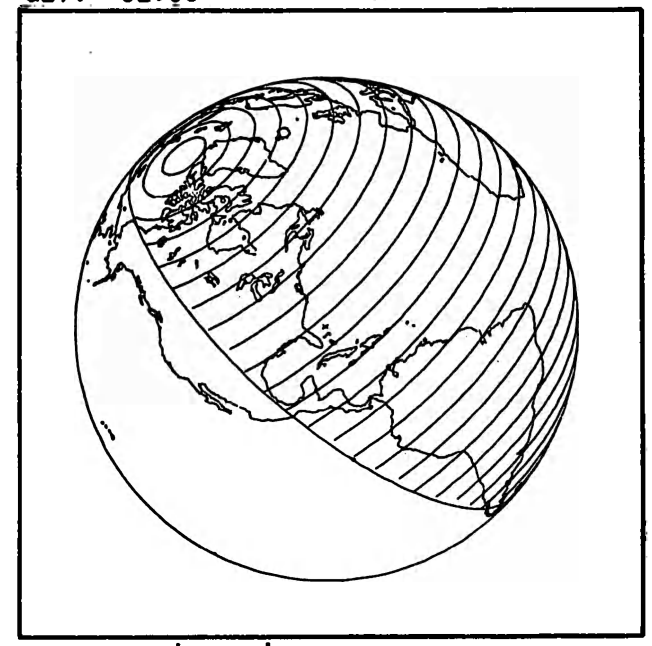
ON GROUND CUE:
VHF AM B - OFF
VHF RANGING - OFF

NOTES

DAP LOAD STATUS
(21101)(X1111)

GET: 52:00

F.O.V. 3°



PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	52:00 - 53:00	3/TLC	3-50

MCC-H

1923 CST

FLIGHT PLAN

NOTES

53:00

CHARGE BATTERY B

:10

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

:20

REPORT: GYRO TORQUING ANGLES

53:30

:40

:50

54:00

MSFN

PTC

DAP LOAD STATUS
(21101)(X1111)

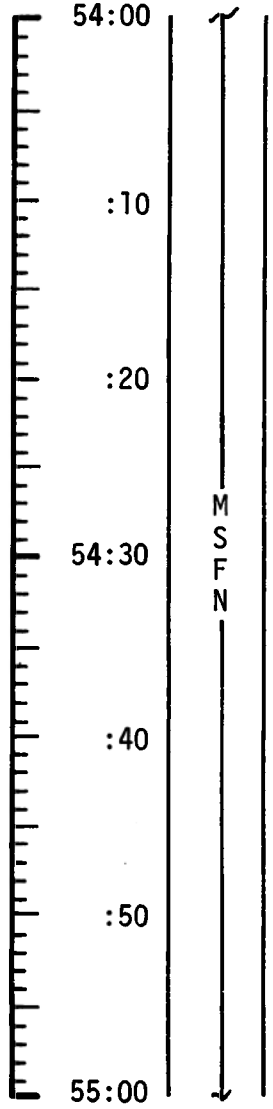
P52 IMU REALIGN
N71: __ __,__ __
N05: __ __ __.__ __
N93:
X __ __.__ __ __
Y __ __.__ __ __
Z __ __.__ __ __
GET __ __ __:__ __:__ __

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	53:00 - 54:00	3/TLC	3-51

MCC-H

FLIGHT PLAN

2023 CST



UPLINK TO CSM
LIFT-OFF TIME
(IF REQ'D)
UPDATE TO CSM
T EPHEM
(IF REQ'D)
P37 (L/O +60 TIG)
(IF REQ'D)
LOI-5 FLYBY TIG
(IF REQ'D)

SYNCHRONIZE MISSION TIMER TO CMC (IF REQUIRED)
V05N01E, 1706 E

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

T EPHEM UPDATE	
OID	LOAD B
03	_ _ _ _ _
04	_ _ _ _ _
05	_ _ _ _ _

LIFT-OFF TIME WILL BE UPDATED IF THE TIME PROPAGATED AHEAD TO START OF REV 2 DIFFERS FROM 84:45:12 BY MORE THAN 1 MIN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	54:00 - 55:00	3/TLC	3-52

MCC-H 2123 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

55:00

:10

:20

55:30 MSFN PTC

:40 Dim light photo while in PTC P52

:50

1423 56:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	55:00 - 56:00	3/TLC	3-53

MCC-H

2223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

1423

56:00

:10

:20

56:30

:40

:50

1523

57:00

MSFN

PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	56:00 - 57:00	3/TLC	3-54

MCC-H

2323 CST

FLIGHT PLAN

NOTES

1523

57:00

CREW EXERCISE PERIOD

DAP LOAD STATUS
(21101)(X1111)

:10

:20

M
S
F
N

57:30

PTC

:40

:50

1623

58:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	57:00 - 58:00	3/TLC	3-55

MCC-H

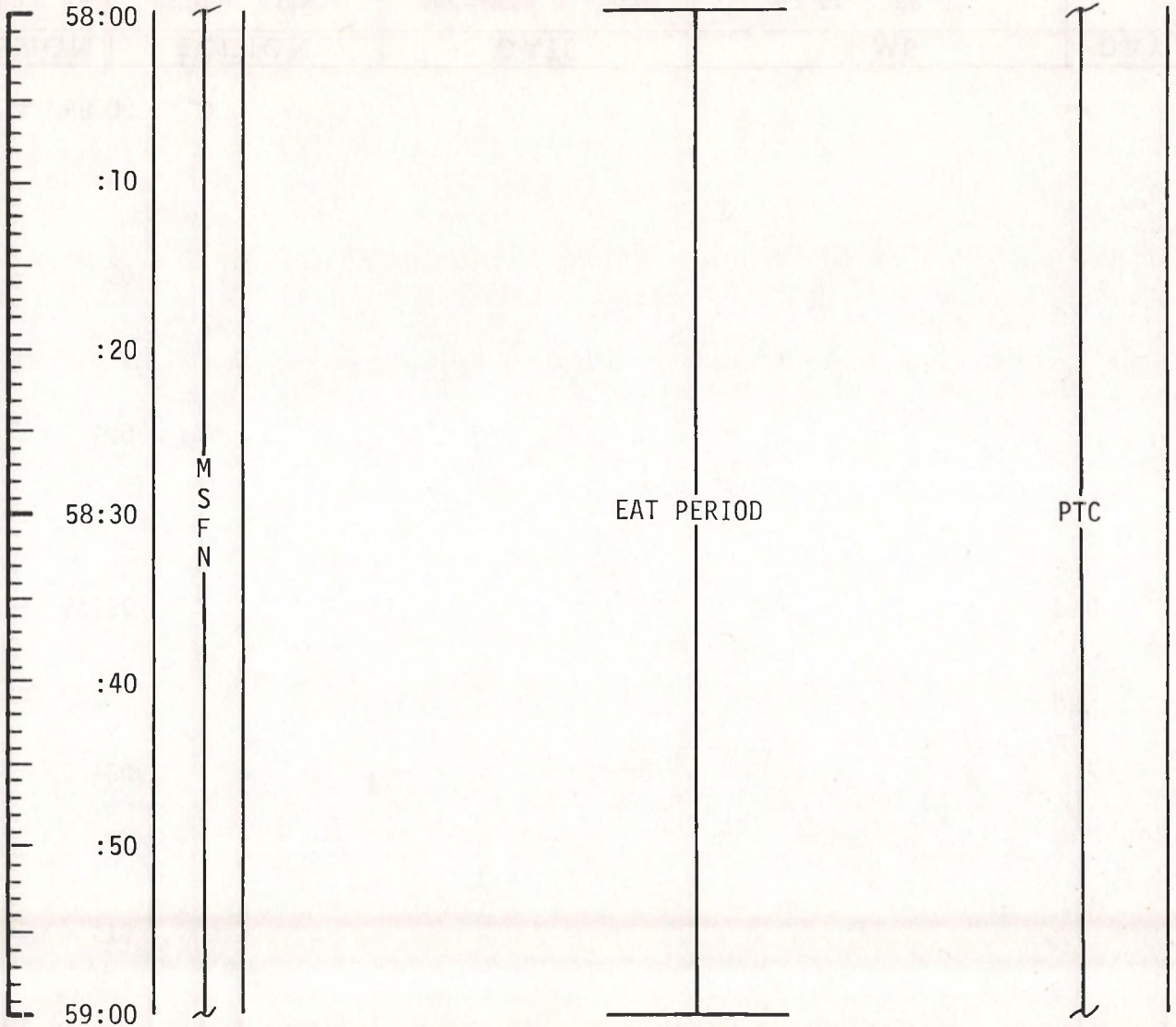
0023 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

1623



1723

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	58:00 - 59:00	3/TLC	3-56

MCC-H | 0123 CST

FLIGHT PLAN

NOTES

1723

59:00

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK — PAGE G 2-5

REPORT: BIAS

DAP LOAD STATUS (21101)(X1111)

P52 IMU REALIGN

N71: __ __, __ __

N05: __ __ __. __ __

N93:

X __ __. __ __ __

Y __ __. __ __ __

Z __ __. __ __ __

GET __ __ __: __ __: __ __

:10

UPLINK TO CSM
CSM S.V. & V66
MCC-3 TGT LOAD

:20

IF LM/CM ΔP <2.7 PSID - VENT UNTIL ΔP $\geq$2.7

MSFN

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

59:30

O_2 HEATERS 1&2 (2) - AUTO

O_2 HEATERS 3 (1) - OFF

PTC

:40

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

:50

REPORT: GYRO TORQUING ANGLES

(21101 X1111)

EXIT G&N PTC IF MCC-3 IS REQUIRED — PAGE G 8-3

1823

60:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	59:00 - 60:00	3/TLC	3-57

MCC-3
BURN CHART

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

TABLE 3-4

FLIGHT PLAN

MCC-H

0223 CST

60:00 (21101 / X1111)

:10

:20

60:30

:40

:50

61:00

MSFN

LOI - 22 HR

P30 EXTERNAL ΔV
V49 MNVR TO PAD BURN ATTITUDE

SXT STAR CHECK
P40 SPS THRUSTING OR P41 RCS THRUSTING
O_2 FUEL CELL PURGE
WASTE WATER DUMP

MCC-3

TIG: 60:38:14
BT: NOM. ZERO
ΔVT: NOM. ZERO
ULLAGE: NONE
ORBIT: N/A

V66 SET CSM S.V. INTO LM S.V.

BURN STATUS REPORT

PREPARE TRANSFER ITEMS PER
LM ACTIVATION CHECKLIST
REMOVE 16MM & 70MM MAG FROM R13

PTC

NOTES

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

BURN STATUS REPORT

X	X	□	●	ΔTIG
X	X		●	BT
□			●	V_{gx}
		TRIM		
X	X	X		R
X	X	X		P
X	X	X	.	Y
□			●	V_{gx}
□			●	V_{gy}
□			●	V_{gz}
□			●	ΔV_c *
X	X	X		FUEL *
X	X	X		OX *
X	X	X		UNBAL

*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	60:00 - 61:00	3/TLC	3-59

FLIGHT PLAN

MCC-H

0323 CST

UPLINK TO CSM
ΔH (IF REQUIRED)

1923

61:00
(21101
X1111)

:10

:20

61:30

:40
(21111
X1111)

:50

2023

62:00

MSFN

TV

CSM SYSTEMS CHECKLIST
IVT TO LM (CHECK OUT, TLC) PAGE S 2-1
PRESSURIZE CSM TO 5.7 PSIA

TV (HSK) 61:45 to 62:30
CM/TV - AVG (f5.6)

PRESSURIZE LM
EXIT G&N PTC PAGE G 8-3
V48 (21111)(X1111)
V49 MNVR TO TV ATTITUDE (61:45)
(282,090,000)
ACQ MSFN HGA P 34, Y 263

PREPARE FOR LM INGRESS
REMOVE TUNNEL HATCH AND STOW
REMOVE PROBE & DROGUE AND STOW

PTC

NOTES

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	61:00 - 62:00	3/TLC	3-60

FLIGHT PLAN

CSM		LM		MCC-H
CMP	0423 CST	CDR	LMP	
2023		ACTIVATION CHECKLIST	PAGE 1-1	
REPORT: DOCKING TUNNEL INDEX ANGLE	62:00 (21111 X1111)		IVT TO LM	
		IVT TO LM	ENTRY STATUS CHECK	
	:10			
	:20			
	62:30			
OMNI C				
SECURE HGA, HGA TRACK-MAN, HGA P -52, Y 270		HOUSEKEEPING	HOUSEKEEPING	
	:40			
	:50			
2123.	63:00			

T V

M S F N

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	62:00 - 63:00	3/TLC	3-61

FLIGHT PLAN

CSM		LM	
CMP	0523 CST	CDR	LMP
2123	63:00 (21111) (X1111)	HOUSEKEEPING	HOUSEKEEPING
	:10		
CSM POWER TO LM-OFF (AT LMP REQUEST)	:20	COMM ACTIVATION	COMM ACTIVATION
	63:30		
VHF SIMPLEX VOICE CHECK WITH LM			S-BAND/VHF SIMPLEX VOICE TEST
	:40		
		OPS CHECKOUT	OPS CHECKOUT
	:50		
CSM POWER TO LM - ON (AT LMP REQUEST)		COMM DEACTIVATION	COMM DEACTIVATION
2225	64:00		

MSFN

MCC-H

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	63:00 - 64:00	3/TLC	3-62

FLIGHT PLAN

MCC-H

2223

0623 CST

NOTES

64:00 (21111) (X1111)

:10 (21101) (X1111)

:20

64:30

:40

:50

65:00

MSFN

LMP & CDR IVT TO CSM & CLOSE LM HATCH
INSTALL PROBE, DROGUE AND CM HATCH

LM TUNNEL VENT VALVE - LM/CM ΔP
CYCLE CMC MODE - FREE/AUTO
V48 (21101)(X1111)
LiOH CANISTER CHANGE
(7 INTO A, STOW 5 IN B6)

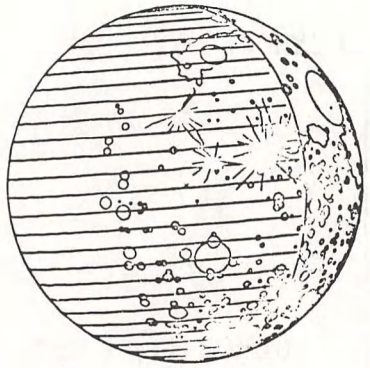
CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2 PTC
(N20,090,000)
V79 (-0.3750)(+030.00)(+00000)

DAP LOAD STATUS
(21101)(X1111)

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

GET: 65:00 F.O.V. 3°



GET: 65:00 F.O.V. 5°

2323

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	64:00 - 65:00	3/TLC	3-63

FLIGHT PLAN

MCC-H

2323

0723 CST

65:00

:10

:20

65:30

:40

:50

66:00

M S F N

O_2 HEATERS 1&2 (2) - OFF

O_2 HEATERS 3 (1) - AUTO

EAT PERIOD

PTC

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST

PAGE S 1-26

UPDATE TO CSM

CSM S.V. (67:00)

0023

NOTES

DAP LOAD STATUS
(21101)(X1111)

ONBOARD READOUT

BAT C _____

PYRO BAT A _____

PYRO BAT B _____ _____

RCS A _____

B _____

C _____

D _____

DC IND SEL - MNA OR B

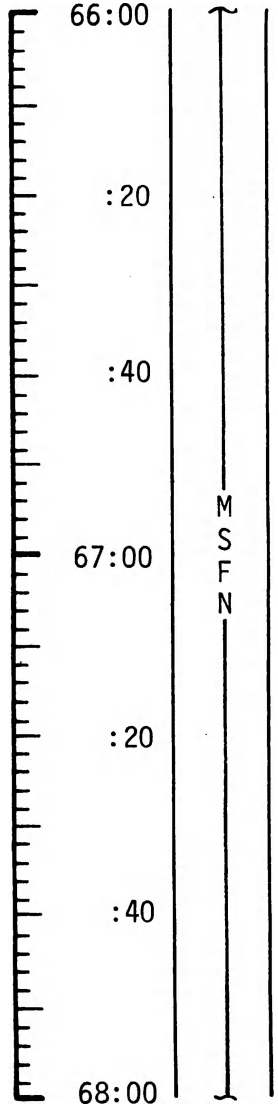
EARTH DISTANCE
≈184 307 NM

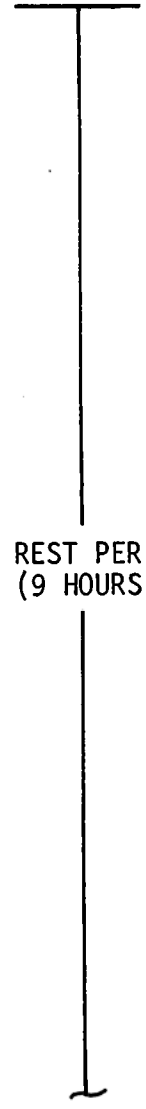
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	65:00 - 66:00	3/TLC	3-64

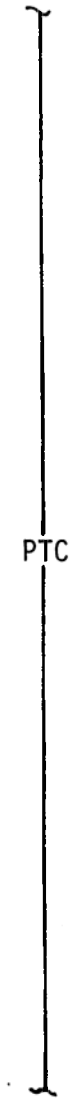
MCC-H

0823 CST

FLIGHT PLAN







NOTES

DAPLOAD STATUS
(21101)(X1111)

DURING REST PERIOD, TWO CREWMEN IN REST STATIONS AND ONE IN COUCH

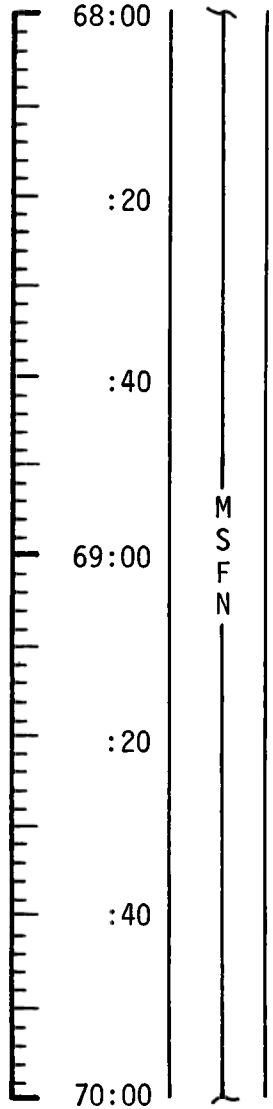
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	66:00 - 68:00	3/TLC	3-65

MCC-H

1023 CST

FLIGHT PLAN

NOTES



MSFN

REST PERIOD
(9 HOURS)

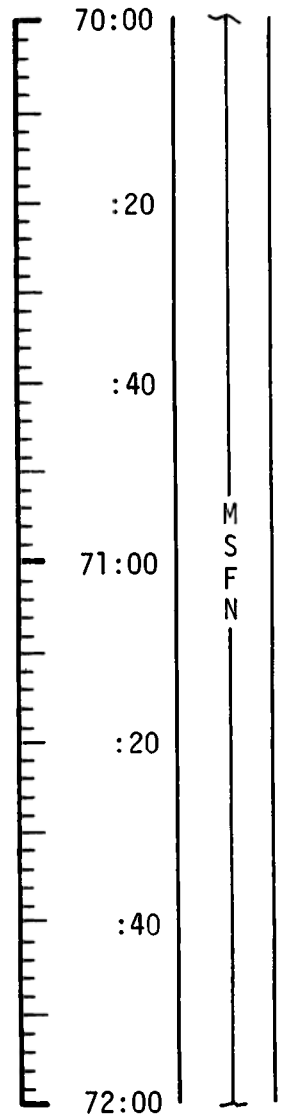
PTC

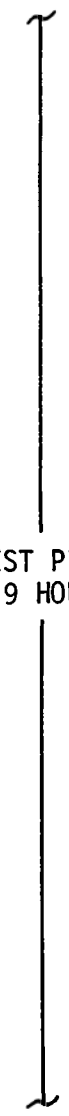
DAP LOAD STATUS
(21101)(X1111)

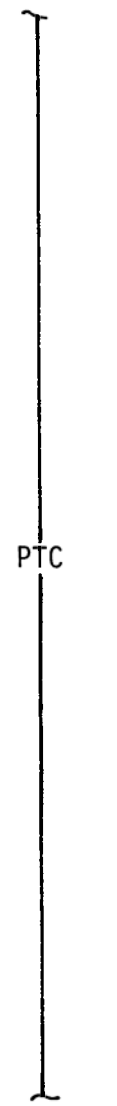
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	68:00 - 70:00	3/TLC	3-66

MCC-H

FLIGHT PLAN







NOTES

DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	70:00 - 72:00	3/TLC	3-67

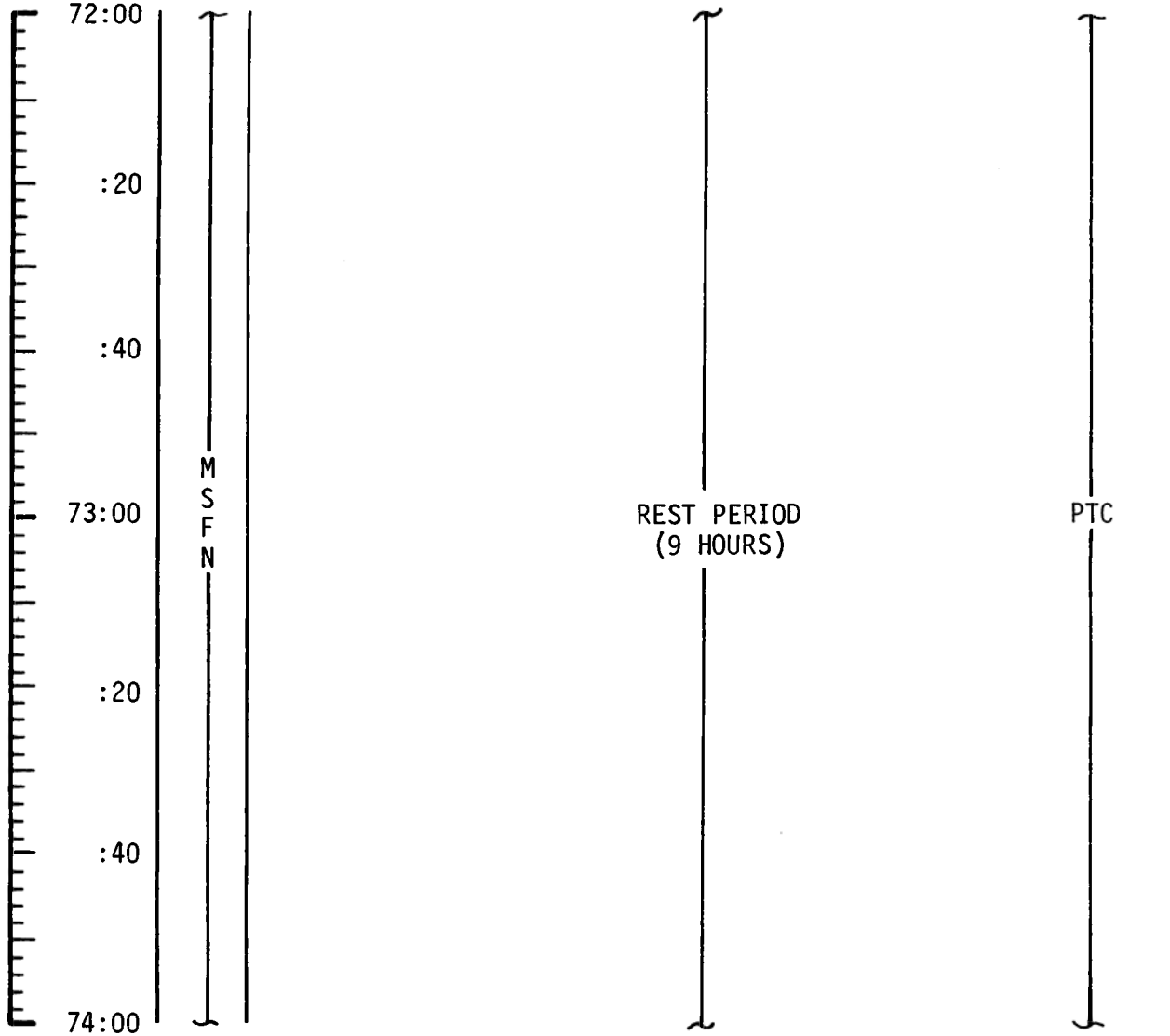
MCC-H

1423 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	72:00 - 74:00	3/TLC	3-68

FLIGHT PLAN

MCC-H

0423

0923

1023

1623 CST

74:00

:20

:40

75:00

:20

:40

76:00

MSFN

REST PERIOD
(9 HOURS)

CSM SYSTEMS CHECKLIST

POST-SLEEP CHECKLIST

PAGE S 1-26

EAT PERIOD

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

IF MCC-4 IS NOT PERFORMED, CREW AWAKE TIME IS 78:00

EARTH DISTANCE
≈196 739 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	74:00 - 76:00	3-4/TLC	3-69

FLIGHT PLAN

MCC-H 1023

1823 CST

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

76:00

:10

:20

76:30

UPLINK TO CSM
CSM S.V. & V66
MCC-4 TGT LOAD

:40

:50

(21101)
(X1111)

1123

77:00

MSFN

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK PAGE G 2-5
REPORT: BIAS

LiOH CANISTER CHANGE
(8 INTO B, STOW 6 IN B6)

NOTE: PERICYNTHION +2 HR ABORT PAD TARGETED FOR A FAST RETURN TO MPL. PTC

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES
EXIT G&N PTC PAGE G 8-3

NOTES

DAP LOAD STATUS
(21101)(X1111)

CSM CONSUMABLES UPDATE

GET: __ __ __:__ __

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

P52 IMU REALIGN

N71: __ __,__ __

N05: __ __ __.__ __

N93:

X __ __.__ __ __

Y __ __.__ __ __

Z __ __.__ __ __

GET __ __ __:__ __:__ __

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	76:00 - 77:00	4/TLC	3-70

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MCC-4
BURN CHART

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

TABLE 3-5

FLIGHT PLAN

MCC-H

1123

1223

1923 CST

77:00

:10

:20

77:30

:40

:50

78:00

MSFN

P30 EXTERNAL ΔV
V49 MNVR TO PAD BURN ATTITUDE

SXT STAR CHECK
P40 SPS THRUSTING OR P41 RCS THRUSTING

LOI -5 HR

MCC-4

V66 SET CSM S.V. INTO LM S.V.

BURN STATUS REPORT

PTC

77 38 13 9

TIG: 77:38:14
BT: NOM. ZERO
ΔVT: NOM. ZERO
ULLAGE: NONE
ORBIT: N/A

ΔV 00 38

NOTES

DAP LOAD STATUS
(21101)(X1111)

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	77:00 - 78:00	4/TLC	3-73

FLIGHT PLAN

MCC-H

1223

2023 CST

78:00

:10

:20

78:30

:40

:50

(21111)
(X1111)

79:00

1323

MSFN

UPDATE TO CSM
(IF NO MCC-4)
FLIGHT PLAN
CONSUMABLES (76:10)
PERICYNTHION +2 HR
ABORT PAD

CSM SYSTEMS CHECKLIST

PRE-LOI SECONDARY GLYCOL LOOP CHECK PAGE S 1-15

REPORT: LM/CM ΔP

VERIFY LM/CM ΔP <2.4 PSID
IF LM/CM ΔP >2.4 PSID
PRESSURIZE CSM TO 5.7 PSIA

EXIT G&N PTC PAGE G 8-3
V48 (21111)(X1111)

V49 MNVR TO MOON VIEW ATTITUDE (79:10)
(352,110,311) (HATCH WINDOW)
HGA P -30, Y 293

PTC

NOTES

DAP LOAD STATUS
(21101)(X1111)

IF NO MCC-4, CREW
WILL BE AWAKENED
AT 78:00. CREW
WILL ACCOMPLISH
THE FOLLOWING:
EAT PERIOD (75:00)
POST-SLEEP C/L (75:05)
CANISTER CHANGE (76:10)
AND PROCEED WITH
ACTIVITIES AT 78:00

EARTH DISTANCE
≈200 444 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	78:00 - 79:00	4/TLC	3-74

FLIGHT PLAN

MCC-H

1323

2123 CST

79:00
(21111)
(X1111)

:10

:20

79:30

:40

:50

80:00

M S F N

UPLINK TO CSM
CSM S.V. & V66
(PRELIMINARY)
LOI TGT LOAD
(PRELIMINARY)
DESIRED ORIENTATION
(LDG SITE)

UPDATE TO CSM
LOI MNVR PAD
(PRELIMINARY)
TEI 4 PAD

CSM SYSTEMS CHECKLIST
CSM/LM PRESSURE EQUALIZATION (DECAL) PAGE S 2-3

CHECK MISSION TIMER AGAINST CMC CLOCK

ATT DEADBAND - MIN
RATE - LOW
BMAG (3) - ATT 1/RATE 2
SC CONT - SCS

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

STARS_____,_____
SA_____,_____
TA_____,_____

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN
OPTION 1 PREFERRED
(LDG SITE ORIENT)

SC CONT - CMC
BMAG (3) - RATE 2

NOTES

TEI 4 PAD
ASSUMES NO DOI

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

1423

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	79:00 - 80:00	4/TLC	3-75

MCC-H

2223 CST

FLIGHT PLAN

1423

80:00
(21111
X1111)
:10
:20
80:30
:40
:50
81:00

MSFN

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK
REPORT: BIAS

PAGE G 2-5

NOTES

LUNAR PHOTOGRAPHY
AT CREW OPTION

CM /EL/80 OR 250/BW
(f5.6,250,∞)(10 FR)
MAG (P)__, FR # ___

CM /EL/80 OR 250/CEX
(f5.6,250,∞)(10 FR)
MAG (L)__, FR # ___

1523

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	80:00 - 81:00	4/TLC	3-76

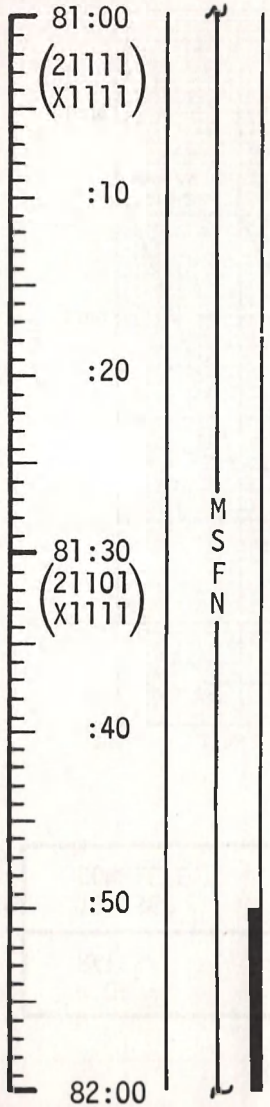
1523
MCC-H

FLIGHT PLAN

2323 CST

UPDATE TO CSM
LOI MNVR PAD
MAP UPDATE REV 1

UPLINK TO CSM
CSM S.V. & V66
LOI TGT LOAD



CSM SYSTEMS CHECKLIST

C&W SYSTEM OPERATIONAL CHECK	PAGE S 1-17
CM RCS MONITORING CHECK	PAGE S 1-1
SM RCS MONITORING CHECK	PAGE S 1-1
SPS MONITORING CHECK	PAGE S 1-1
ECS MONITORING CHECK	PAGE S 1-5

OXIDIZER FLOW VALVE INCR - INCR (VERIFY)
O_2 HEATERS 1&2 (2) - AUTO
O_2 HEATERS 3 (1) - OFF
CYCLE CMC MODE - FREE/AUTO
V48 (21101) (X1111)

P30 EXTERNAL ΔV

V49 MNVR TO PAD BURN ATTITUDE (82:00)
(355,261,327)

ACQ MSFN OMNI C

NOTES

MAP UPDATE REV 1
LOS: __ __ __:__ __:__ __
180°: __ __ __:__ __:__ __
AOS WITH LOI: __ __ __:__ __:__ __
AOS WITHOUT LOI: __ __ __:__ __:__ __

THE PU VALVE SHOULD BE USED TO MAINTAIN THE INDICATED UNBALANCE TO WITHIN ±50 LBS OF THE STABILIZED READING (TIG +25 SEC) UNTIL CROSSOVER. AFTER CROSSOVER THE VALVE SHOULD BE USED TO CONTROL THE UNBALANCE WITHIN THE GREEN BAND (0 ± 100 LBS). DURING NORMAL ENGINE OPERATION THE PU VALVE DECREASE POSITION SHOULD NOT BE USED.

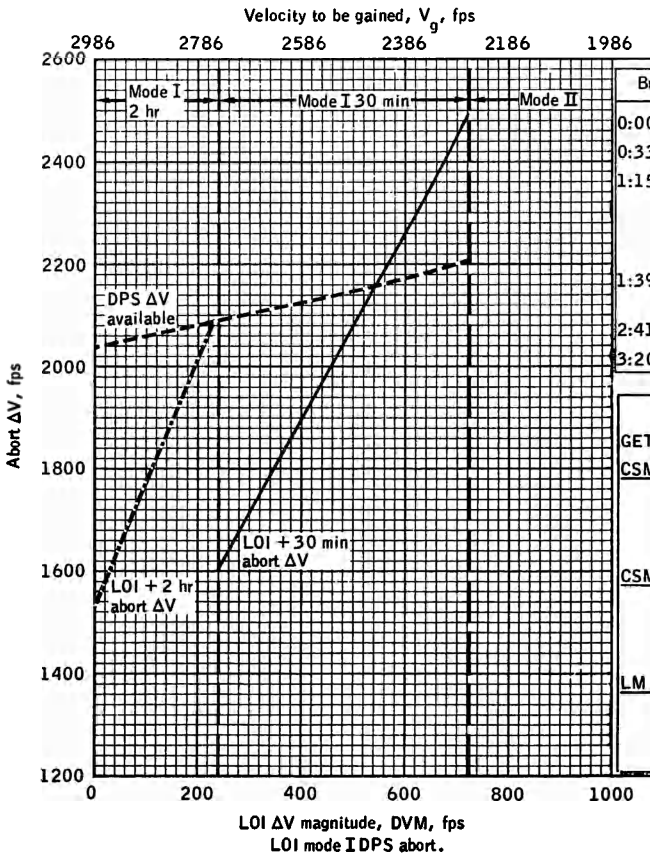
THE APPROXIMATE TIME OF CROSSOVER IS 04:06 TO 04:10 INTO THE LOI BURN.

1623

FLIGHT PLAN

TABLE 3-6
LOI
BURN TABLE AND ABORT CHART

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



CSM 4-1.- LOI mode I DPS abort. 11/13/70 Final

Burntime	ΔVM	Mode	SPS	Type
0:00 - 0:33	0 - 238	I	TIGHT	DPS at 2 hr (RTCC)
0:33 - 1:15	238 - 545	I	LOOSE	DPS at 30 min (crewchart)
1:15 - 1:39	545 - 725	I	LOOSE	DPS at 30 min to depletion + APS at 2 1/2 hr (RTCC); Loss of comm, DPS followed immediately by APS (crewchart)
1:39 - 2:41	725 - 1202	II	LOOSE	DPS at 2 hr + DPS at perilune (RTCC)
2:41 - 3:20	1202 - 1513	III	LOOSE	DPS at perilune (RTCC)
3:20 - Cutoff	1513 - Cutoff	III	TIGHT	DPS at perilune (RTCC)

	Nominal	Update
GET LOI ignition	82:38:13.63	
CSM IMU angles for LOI + 30 min DPS abort		
GET abort ignition	83:08:13.63	
Roll	127	
Pitch	263	
Yaw	348	
CSM IMU angles for LOI + 2 hr DPS abort		
GET abort ignition	84:38:13.63	
Roll	[redacted]121	
Pitch	261	
Yaw	350	
LM FDAI angles for LOI + 2 hr DPS abort		
GET abort ignition	84:38:13.63	
Roll	[redacted]170	
Pitch	[redacted]261	
Yaw	[redacted]359	

1 change B 1/4/71

1 change B 1/4/71

FLIGHT PLAN

MCC-H 1623

0023 CST

RECORD VG_{IMU} DATA

GO/NO-GO FOR LOI

DUMP DSE 1723

82:00 (21101) (X1111)

:10

:20

82:30

REV 1

:40

(21111) (X1111)

:50

83:00

MSFN

SXT STAR CHECK

P40 SPS THRUSTING

GO/NO-GO FOR LOI

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

LOI

TIG: 82:38:14
BT: 6 MIN 06.6 SEC
ΔVT: 2,986.0 FPS
ULLAGE: NONE
ORBIT: 170x57.1 NM

V66 SET CSM S.V. INTO LM S.V.

V48 (21111)(X1111)
V49 MNVR TO COMM ATTITUDE (82:57)
(000,176,000)

ACQ MSFN HGA P -15, Y 180
BURN STATUS REPORT

change B 1/14/71

NOTES

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN
**REPORT IF OFF MORE THAN 1 SEC
***REPORT IF >0.2 FPS

S-IVB LUNAR IMPACT
(GET 83:07:46.5)
LAT -1.596 1°36'S
LONG-33.250 33°15'W

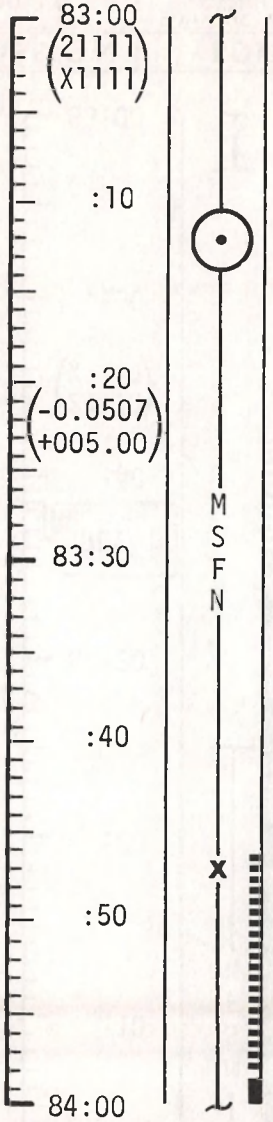
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE B ~~FINAL~~ (JAN)	JANUARY 11, 1971 ~~DECEMBER 8, 1970~~	82:00 - 83:00	4/1	3-79

FLIGHT PLAN

MCC-H

1723

0123 CST



UPDATE TO CSM
MAP UPDATE REV 2

ESTABLISH ORB RATE TO OBSERVE LUNAR SURFACE
V79 (-0.0507)
(+005.00)
(+00001)
PRO TO START PITCH RATE (000,215/176,000)

EAT PERIOD

1623

NOTES

LINE UNDER PITCH ATTITUDE INDICATES AN ORDEAL (LOCAL HORIZONTAL) ANGLE.

THE SC CONTROLLING RATE AND DEADBAND WILL BE SHOWN IN THE TIME COLUMN IF OTHER THAN THE DAP LOAD

MAP UPDATE REV 2	
LOS	: : :
180°	: : :
AOS	: : :

DURING LUNAR ORBIT, URINE DUMPS SHOULD BE PERFORMED, WHEN REQUIRED, WHILE THE SC IS ON THE BACK SIDE OF THE MOON

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	83:00 - 84:00	4/1	3-80

MCC-H

1823

0223 CST

FLIGHT PLAN

84:00 (21111) (X1111)

MSFN

STOP ORB RATE AT P52 ATTITUDE (84:05)
(000,065,000) HGA P -54, Y 0

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LDG SITE ORIENT)

REPORT: GYRO TORQUING ANGLES

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

:10

:20

CSM SYSTEMS CHECKLIST

COMM MODE - NORMAL LUNAR CONFIGURATION PAGE S 1-23

84:30

H_2 PURGE LINE HEATERS ON

CYCLE CMC MODE - FREE/AUTO

(21101) (X1111)

:40

V48 (21101)(X1111)
V49 MNVR TO LDMK TRACK ATTITUDE (85:00)
(000,262,000)

PERICYNTHION +2 HR

REV 2

:50

H_2 & O_2 FUEL CELL PURGE
WASTE WATER DUMP
H_2 PURGE LINE HEATERS - OFF

1973

85:00

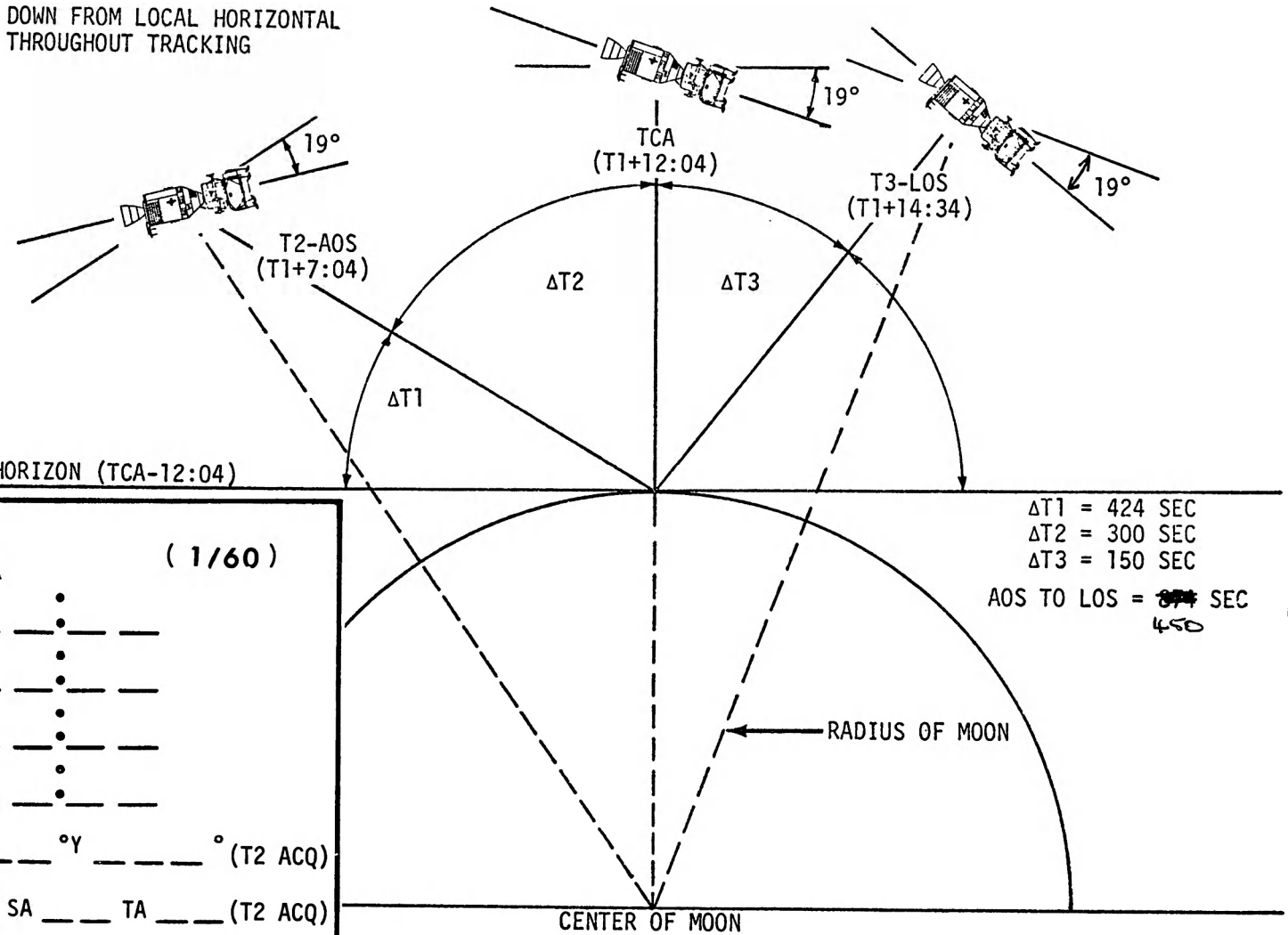
NOTES

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	84:00 - 85:00	4/1-2	3-81

CSM LANDMARK TRACKING PROFILE
(60 x 170 NM ORBIT)

19 DEG PITCH DOWN FROM LOCAL HORIZONTAL
ORBITAL RATE THROUGHOUT TRACKING



P24 LDMK TRACKING
TGT: MÖSTING A (1/60)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R ____ °P ____ °Y ____ ° (T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT -03.250
LONG/2 -02.642
ALT +000.00

cl. B
1/4/71.

FLIGHT PLAN

MCC-H 1923

0323 CST

UPDATE TO CSM
LDMK TRK PAD REV 2
TEI 5 PAD
LDMK H-3 PAD REV 3
MAP UPDATE REV 3
UPLINK TO CSM
CSM S.V. & V66

85:00 (21101 X1111)

:10

:20

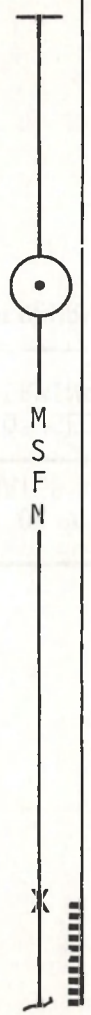
85:30

:40 (-.0433 +00.50)

:50

(21101 X1111) 2023

86:00



ACQ MSFN OMNI C

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK PAGE G 2-5
REPORT: BIAS

CONFIGURE CAMERA: (LDMK TRACK)
CM/DAC/SXT/CEX (EXP PAD) 1 fps (9% MAG)
MAG (B)____ MAG %____
UTILITY POWER-ON
P24 (MÖSTING A)
OPT ZERO-OFF
OPT MODE-CMC
SC CONTROL-CMC/AUTO (VERIFY)
V79 (N16 LOAD T2 TIME)
(-0.0433)
(+000.50)
(+00001)
PRO (AUTO PITCH RATE AT T2 TIME)

RECORD PCM LBR ON
DSE DURING P24

TRACK LDMK MÖSTING A
30 SEC BETWEEN MARKS

START DAC AT T2 -1 MIN
STOP DAC AT T3

UPDATE TO CSM
DOI MNVR PAD

RECORD MAG %____
V49 MNVR TO BURN PAD ATTITUDE EXCEPT IN ROLL (86:10)
(060,269,000) HGA P 29, Y 255

NOTES

TEI 5 PAD ASSUMES
NOMINAL DOI
ACCOMPLISHED

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

LDMK IS AT 10.6°
SUN ANGLE

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	85:00 - 86:00	4/2	3-83

DOI
BURN TABLE

P OR Y RATES	ATT DEVIATIONS	SHUTDOWN TIME	RESIDUALS
10°/SEC TERMINATE	±10° TERMINATE	BT	*TRIM OVERBURNS IN X TO WITHIN 1 FPS, DO NOT TRIM Y & Z

*IF OVERBURN IS >2.2 FPS PITCH 180 AND TRIM

TABLE 3-7

FLIGHT PLAN

MCC-H

2023

0423 CST

NOTES

86:00 (21101) (X1111)

DUMP DSE
UPLINK TO CSM
DOI TARGET LOAD
CSM S.V. & V66
(IF REQ'D)
PIPA BIAS CHECK
GO/NO-GO FOR DOI

RECORD VG_{IMU} DATA

:10

:20

86:30

:40

:50

REV 3

87:00

MSFN

CSM SYSTEMS CHECKLIST

C&W SYSTEM OPERATIONAL CHECKLIST	PAGE S 1-17
CM RCS MONITORING CHECK	PAGE S 1-1
SPS MONITORING CHECK	PAGE S 1-1
ECS MONITORING CHECK	PAGE S 1-5

P52 IMU REALIGN
OPTION 3 REFSMMAT
LDG SITE ORIENT

REPORT: GYRO TORQUING ANGLES
P30 EXTERNAL ΔV
P40 SPS THRUSTING
V49 MNVR TO PAD BURN ATTITUDE (86:40)
(000,269,000)
VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

SXT STAR CHECK
P40 SPS THRUSTING

DOI

V66 SET CSM S.V. INTO LM S.V.

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

TIG: 86:56:57
BT: 21.38 SEC
ΔVT: 206.6 FPS
ULLAGE: 4 JET 14 SEC
ORBIT: 58.4x9.8 NM

2123

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	86:00 - 87:00	4/2-3	3-85

MCC-H

0523 CST

FLIGHT PLAN

2123

87:00
(21101)
(X1111)
:10
:20
87:30
:40
:50
88:00

MSFN

X

STAY/BAILOUT
DUMP DSE

V49 MNVR TO BAILOUT BURN ATTITUDE (87:10)
(325,063,000)

ACQ MSFN HGA P-39,Y325
BURN STATUS REPORT

```
* * * * * * * * * * * * * * * * *
*AOS - NO UP VOICE PROCEDURE*
*1.  WAIT 30 SEC, CHECK HGA *
*2.  SELECT OMNI B          *
*3.  SELECT SEC XPNDR       *
*4.  AFTER 3 MIN GO TO LOSS *
*    OF COMM CUE CARD       *
* * * * * * * * * * * * * * * * *
```

SC CONTROL-SCS
P47 THRUST MONITOR
BAILOUT BURN } IF REQ'D

TIG:	87:27:31
BT:	10.17 SEC
ΔVC:	100.0 FPS
ULLAGE:	4 JET 14 SEC
ORBIT:	N/A

V49 MNVR TO LANDMARK OBSERVATION ATTITUDE (87:45)
(000,292,000) OMNI D

P24 ORB NAV
MONITOR LDMK
NO MARKS

LDMK	H-3
T HOR:	__ __:__ __:__ __
TCA -20 SEC:	__ __:__ __:__ __
LAT:	-03.691
LONG/2:	-03.771
ALT:	+00000

2223

NOTES

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN
**REPORT IF OFF MORE THAN 1 SEC
***REPORT IF >0.2 FPS

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE C (JAN)	JANUARY 18, 1971	87:00 - 88:00	4/3	3-86

FLIGHT PLAN

MCC-H 2223
Change B 1 1/4/71

0623 CST

UPDATE TO CSM
MAP UPDATE REV 4

88:00
(21101 X1111)
:10
:20
88:30
:40
REV 4
:50
~~(21101 X1111)~~
89:00

MSFN

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LDG SITE ORIENT)

REPORT: GYRO TOROUING ANGLES
VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

V49 MNVR TO LTC ATTITUDE (89:05)
(181,257,359)

CONFIGURE CAMERA: TARGET 9 (DESCARTES)
CM3/LTC/BW/BEF - (SHUT 1/200, RNG PAD, INT 65.0) (402 FR)
MAG (W) ____, FR # ____
LTC INSTALLATION (DECAL)
RECORD TIME: __ __:__ __:__ __, DAY __ __ __ (LTC CLOCK)
AT GET: ____:____:__ __
LTC CHECKOUT (DECAL)
CYCLE CMC MODE - FREE/AUTO
~~V83 (21101)(X1111)~~

Change B 1 1/4/71

2223.

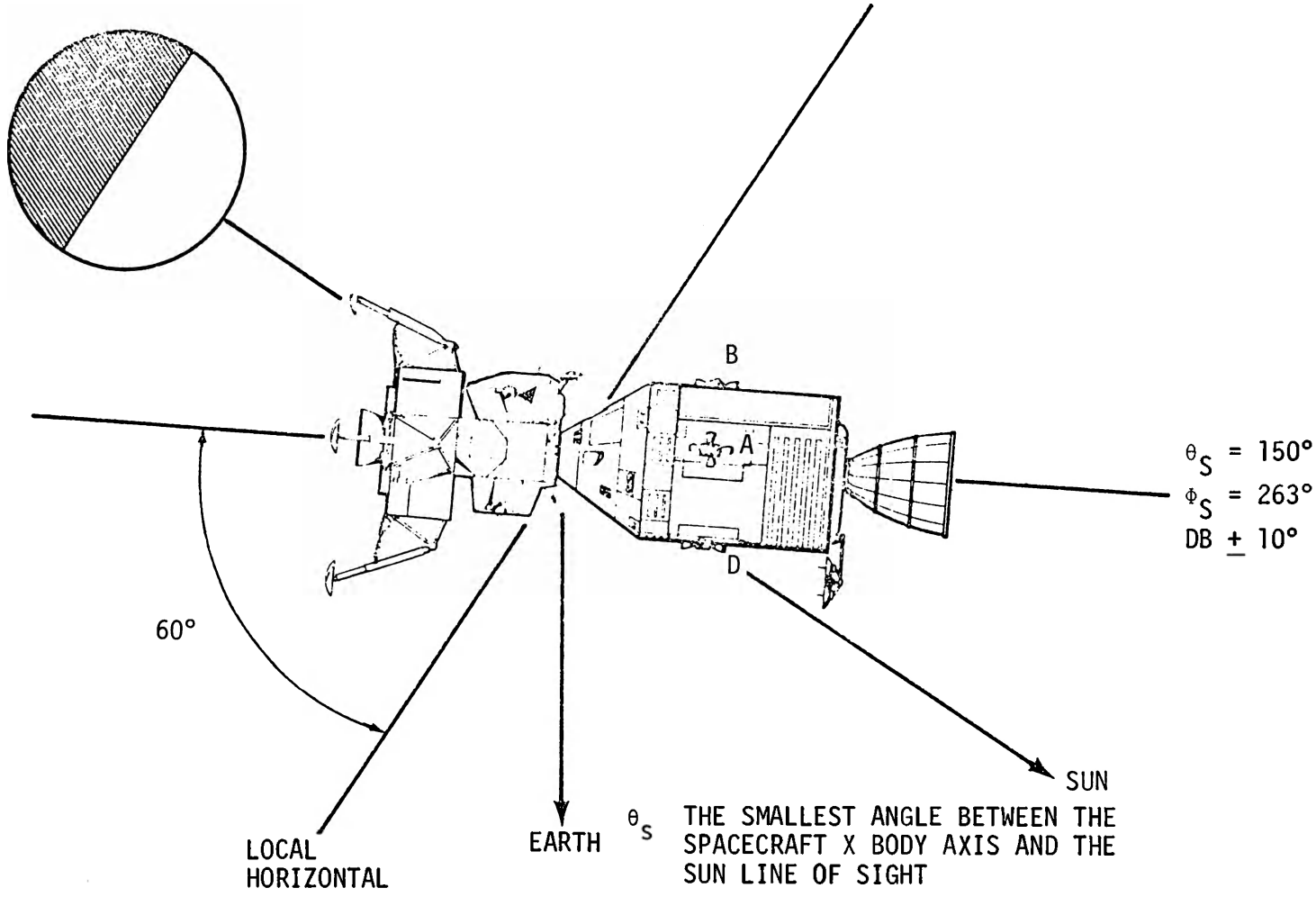
NOTES

MAP UPDATE REV 4
LOS : __ __ __:__ __:__ __
180° : __ __ __:__ __:__ __
AOS : __ __ __:__ __:__ __

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	~~FINAL~~ CHANGE B (JAN)	~~DECEMBER 2, 1970~~ JANUARY 11, 1971.	88:00 - 89:00	4/3-4	3-87

LUNAR ORBIT REST PERIOD ATTITUDE



θ_S THE SMALLEST ANGLE BETWEEN THE SPACECRAFT X BODY AXIS AND THE SUN LINE OF SIGHT

Φ_S 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

MCC-H 0723 CST

2323

FLIGHT PLAN

NOTES

89:00

(21101)
(X1111)

DUMP DSE

:10 ACQ MSFN HGA P -64, Y 177

UPDATE TO CSM
LTC PHOTO PAD
TEI 12 PAD
MAP UPDATE REV 10
UPLINK TO CSM
CSM S.V. & V66

:20 V49 TWEAK MNVR TO LTC PAD ATTITUDE

VERIFY LTC MODE - STANDBY/PWR - ON (T START - 1 MIN)
ZERO DET

89:30 MSFN

LTC MODE - AUTO, DET - START/UP (T START)
PHOTO TGT 9 (DESCARTES)
(SEE PAD FOR RANGE CHANGES)

:40 LTC MODE - STANDBY (T STOP)
LTC FILM MAG CHANGE (DECAL)
ADVANCE 4 FRAMES, RECORD FR # ____
PUT MAG (V) ON LTC
RESET FRAME COUNTER

:50 LTC REMOVAL (DECAL) & STOW
V49 MNVR TO REST ATTITUDE (90:00)
(126,286,000) HGA P -35, Y 272
MAN ATT (3) - ACCEL CMD
SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0000) (+010.00) (+00001)

90:00 MAN ATT (3) - RATE CMD

0023

LTC PHOTO PAD TGT: 9(DESCARTES)
(181,257,359)
R ____ P ____ Y ____
T START: ___ ___ ___:___ ___:___ ___
T STOP: ___ ___ ___:___ ___:___ ___
RNG: ____ (51.7) (T START)
RNG: ____ (53.0) (T START + 00:54)
RNG: ____ (44.5) (T START + 01:23)
RNG: ____ (36.4) (T START + 02:21)
RNG: ____ (33.0) (T START + 04:41)
RNG: ____ (28.1) (T START + 05:18)

MAP UPDATE REV 10
LOS : ___ ___ ___:___ ___:___ ___
180° : ___ ___ ___:___ ___:___ ___
AOS : ___ ___ ___:___ ___:___ ___

MCC-H

0823 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
TRAJECTORY STATUS

90:00
(-0.0000
+010.00)

MSFN

:10

:20

90:30

:40

REV 5

:50

91:00

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST PAGE S -126
(DO NOT CHLORINATE WATER UNTIL AFTER EAT PERIOD)

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
LiOH CANISTER CHANGE
(9 INTO A, STOW 7 IN B6)

EAT PERIOD

REST ATT

ONBOARD READOUT

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

DAP LOAD STATUS
(21101) (X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	90:00 - 91:00	4/4-5	3-90

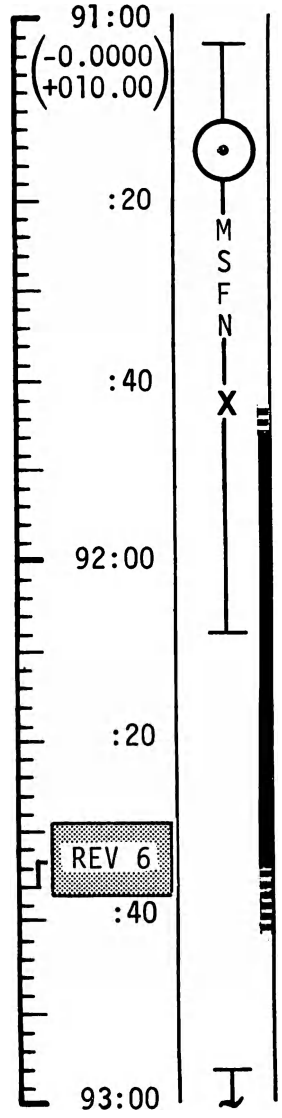
FLIGHT PLAN

MCC-H

0923 CST

NOTES

DUMP DSE



REST PERIOD
(8.5 HOURS)

REST ATT

DAP LOAD STATUS
(21101)(X1111)

DUMP DSE

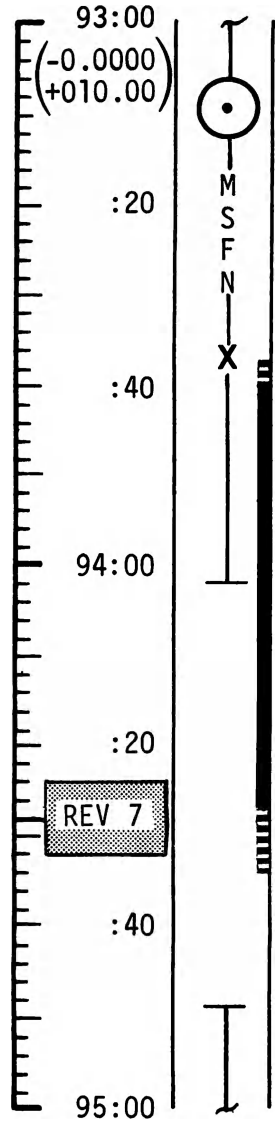
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	91:00 - 93:00	4/5-6	3-91

MCC-H

1123 CST

FLIGHT PLAN

NOTES



DUMP DSE

REST PERIOD
(8.5 HOURS)

REST ATT

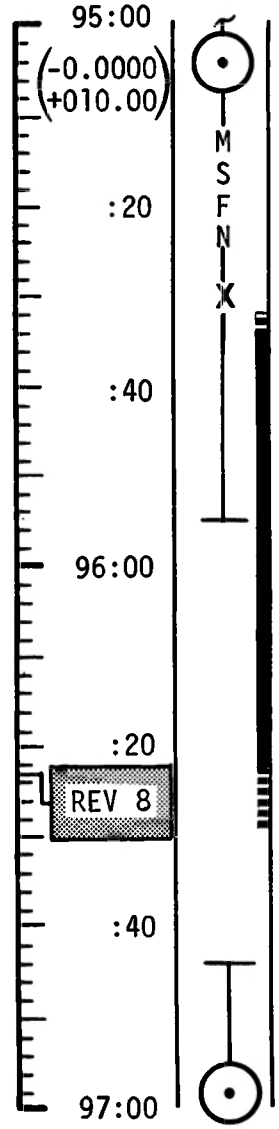
DAP LOAD STATUS
(21101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	93:00 - 95:00	4/6-7	3-92

FLIGHT PLAN

MCC-H

1323 CST



DUMP DSE

REST PERIOD
(8.5 HOURS)

REST ATT

NOTES

DAP LOAD STATUS
(21101)(X1111)

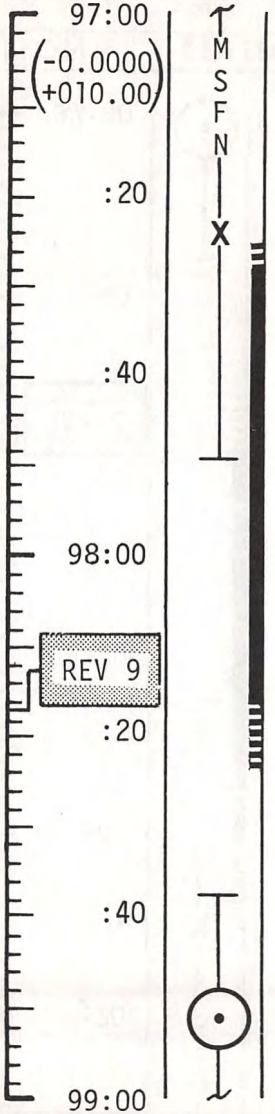
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	95:00 - 97:00	4/7-8	3-93

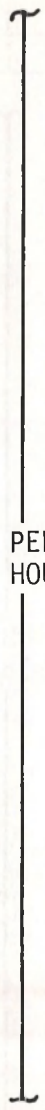
MCC-H

1523 CST

FLIGHT PLAN

NOTES





REST PERIOD
(8.5 HOURS)

REST ATT

DAP LOAD STATUS
(21101)(X1111)

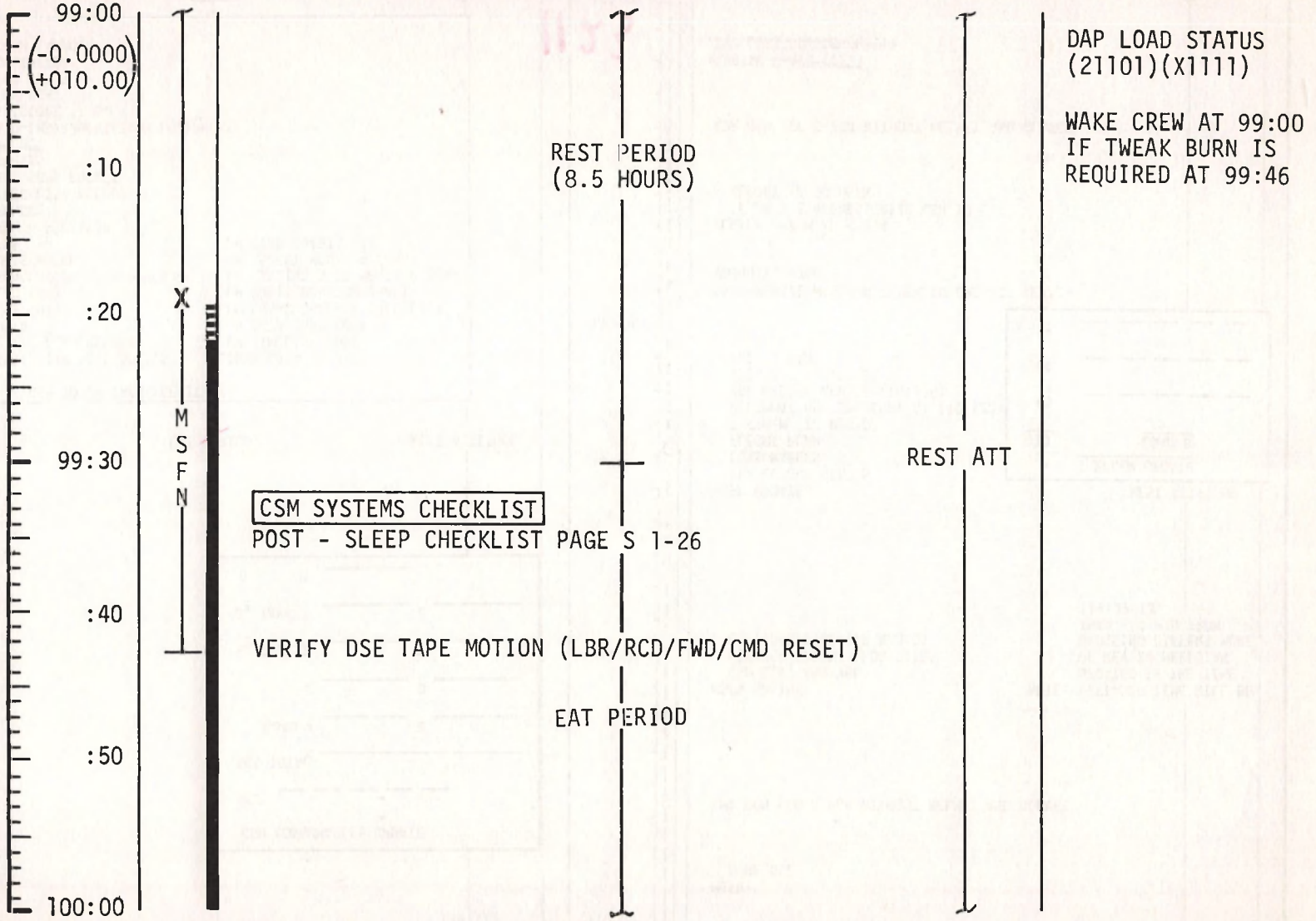
DUMP DSE

0933.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	97:00 - 99:00	4/8-9	3-94

MCC-H

FLIGHT PLAN



1013

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	99:00 - 100:00	5/9	3-95

CSM FLIGHT PLAN

1023

100:00 (-.0000) (+10.00)

REV 10

100:10

100:20

100:30

SET UP TV (101:00)

DAP LOAD STATUS (21101) (X1111)

CSM CONSUMABLES UPDATE

GET: ___ ___ ___ • ___ ___

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

EAT PERIOD

REST ATTITUDE

CSM TO LM TRANSFER ITEMS:

SUIT WITH ACCESSORIES (EACH CREWMAN)
UCTA
FCS (U1)
LCG (U1)
SUNGLASSES WITH POUCH
WRISTWATCH
PEN
PEN - FELT TIP
PENCIL
CHECKLIST POCKET
SCISSORS POCKET
GLOVES
HELMET
BIO-INSTRUMENTATION EQUIPMENT
SCISSORS (1 ONLY)
PENLIGHT
EAR PLUGS
DOSIMETER
COMM EARMOLD

FLIGHT DATA IN BAG
LM TIMELINE BOOK
LM DATA CARD BOOK
LM LUNAR SURFACE CHECKLIST
LM ORBIT MONITOR CHART
LM LANDING SITE MONITOR CHART
LM ASCENT MONITOR CHART
LM STAR CHARTS (4)

1123

100:30 (-.0000) (+10.00)

100:40

100:50

101:00

MSFN

ACQ MSFN HGA P -34, Y 266

MSFN:
DUMP DSE

LMP DON LCG & PGA WITHOUT HELMET AND GLOVES

MSFN UPLINK:
CSM S.V. AND V66
DESIRED ORIENT (LDG SITE)
LIFT-OFF TIME (IF REQ'D)

NOTE: LIFT-OFF TIME WILL BE UPDATED IF THE TIME OF REV 20 MERIDIAN CROSSING DIFFERS MORE THAN ± 1 MIN FROM 119:39:13

MSFN UPDATE:
TRAJECTORY STATUS
CONSUMABLES
FLIGHT PLAN
T EPHEM (IF REQ'D)
REFSMMAT 00 TIME COPY AT (101:22)
MAP UPDATE REV 11 (101:35)
TEI 12 TIG (IF REQ'D)
TEI 19 PAD

REST ATTITUDE

T EPHEM UPDATE

OID	LOAD B
03	___ ___ ___ ___ ___
04	___ ___ ___ ___ ___
05	___ ___ ___ ___ ___

SYNCHRONIZE MISSION TIMER TO CMC (IF REQ'D)
V05N01E, 1706 E

VERIFY LM/CM ΔP < 2.4
IF ΔP > 2.4 PRESSURIZE CSM TO 5.7
REPORT ΔP TO MSFN

CDR DON LCG & PGA WITHOUT HELMET AND GLOVES

~~CMS/TV — AV8 (122)~~

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE C (JAN)	~~DECEMBER 23, 1970~~ January 18, 1971	3-96

1 ch. C 1/18/71

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CSM FLIGHT PLAN

1123

change 1/18/71

101:00

(-.0000)
(+10.00)

TV deleted

REST ATTITUDE

16MM & 70MM CAMERA MAGAZINES USED FROM 100:00 TO 120:00

CAMERA	MAGAZINES	TYPE (DECAL-COLOR)	STOWAGE LOCATION
EL	L	CEX (BLUE)	B3
	N	CEX (BLUE)	A13
DC	R	MBW (SILVER)	A10
	S	VHBW (SILVER/BLACK)	A10
DAC	B, C	CEX (BLUE)	B8 Cushion
	J, K	*VHBW (SILVER/BLACK)	B2

*Should be left in B2 or kept out of direct sunlight.

101:10

REFSMMAT 00 TIME

+	0	0				HRS
+	0	0	0			MIN
+	0					SEC

CYCLE CMC MODE-FREE/AUTO
P52 (OPTION 3)
(LDG SITE ORIENT)

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN

N71: ___ ___ ___ ___

N05: ___ ___ ___.___ ___

N93:

X ___ ___.___ ___ ___

Y ___ ___.___ ___ ___

Z ___ ___.___ ___ ___.

GET ___ ___ ___.___ ___.___ ___

(21101)
(X1111)

P52 (OPTION 1)
(LDG SITE ORIENT)

101:20

CDR V49 MNVR TO AGS CALIB ATTITUDE (101:36)
(007.5,112.5,022.5) HGA P -80, Y 98

101:30

101:30

(21101)
(X1111)

CMP DON PGA WITHOUT HELMET AND GLOVES

(21111)
(X1111)

LMP VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
V48 (21111)
(X1111)

MAP UPDATE REV 11

LOS : ___ ___ ___.___ ___.___ ___ ___

180°: ___ ___ ___.___ ___.___ ___ ___

AOS : ___ ___ ___.___ ___.___ ___ ___

101:40

PREPARE COUCH FOR HATCH
REMOVE PROBE STRAPS (A1)

VERIFY LM/CM ΔP < 0.2
IF ΔP > 0.2 PERFORM CM/LM PRESSURE EQUALIZATION (DECAL)
TUNNEL HATCH REMOVAL (DECAL); STOW HATCH
PROBE REMOVAL (DECAL); STOW PROBE
DROGUE REMOVAL (DECAL); STOW DROGUE

RECORD DOCKING TUNNEL INDEX ANGLE _____

101:50

1223

AT LMP REQUEST:
LM PWR - RESET/OFF
SYS TEST - 4D
SYS TEST ind - 0 volts

102:00

LM FLIGHT PLAN

MCC-H

1123

1923 CST

CDR	LMP	NOTES

101:00

:10

:20

M
S
F
N

101:30

:40

:50

1223

102:00

LM ACTIVATION CHECKLIST PAGE 2-1

IVT TO LM
OPEN HATCH
VERIFY DOCKING ANGLE
TRANSFER POWER

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	101:00 - 102:00	5/10	3-99

CSM FLIGHT PLAN

102:00

(21111)
(X1111)

REV 11

MARK TO LM FOR LM MISSION
TIMER SYNC AT CDR REQUEST

102:10

CONFIGURE CAMERAS FOR UNDOCKING
CM2/EL/80/CEX (f8,1/250, FOCUS) (10 FR)

MAG (N) _____ , FR # ____
CM2/DAC/18/CEX-BRKT,MIR (T8,1/250,7) 12 fps (100% MAG)

MAG (C) _____, MAG % _____
UTILITY PWR - ON

SWITCH TO CDR COMM UMB

102:20

VHF C/O AT LMP REQUEST
VHF ANT - RIGHT
VHF AM B - SIMPLEX FOR VHF B CHECK
VHF AM A - SIMPLEX FOR VHF A CHECK

ACQ MSFN HGA P -80, Y 98

MSFN

102:30

102:30

(21111)
(X1111)

REPORT DOCKING TUNNEL INDEX ANGLE TO MSFN
MSFN UPLINK:
CSM S.V. AND V66

MSFN UPDATE:
DAP DATA (103:20)
MAP UPDATE REV 12 (103:30)
UNDOCK/SEP PAD COPY AT (104:05)
P24 TRK PAD: (L/S LDMK 14-X) (104:35)

MAN ATT(3) RATE CMD
ATT DB - MIN
RATE - LOW
SC CONT - SCS
BMAG (3) - ATT 1/RATE 2

LM DOCKED IMU COARSE ALIGN
V06N20E
VOICE ANGLES TO LM
ON CDR MARK - ENTER
RECORD GIMBAL ANGLES
VOICE ANGLES TO LM

```
* * * * * * * * * * * * *
* N20:
*    R _____.____
*
*    P _____.____
*
*    Y _____.____
*
* * * * * * * * * * * * *
```

102:40

MSFN

SC CONT - CMC, ATT DB - MAX
BMAG MODE (3) - RATE 2

LM CLOCK SYNC:
V16N65E
ON CDR MARK - V06N65E

102:50

LM T EPHEM UPDATE:
V05N01E, 1706E
DON HELMET AND GLOVES

LM LANDING GEAR DEPLOY

SUIT CKT INTEGRITY CHECK (DECAL)

103:00

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-100

LM FLIGHT PLAN

MCC-H 1223

2023 CST	CDR	LMP	NOTES
102:00		LIGHTS ON DES O_2 AND H_2O - OPEN	
REV 11	IVT TO LM TRANSFER HELMETS & GLOVES MISSION TIMER ACTIVATION	EPS ACTIVATION CONNECT TO LM COMM CONFIGURE S-BAND	
:10		PRIMARY GLYCOL LOOP ACT	
	ECS ACTIVATION AND C/O	CAUTION/WARNING C/O	
	CONNECT TO LM ECS	CONNECT TO LM ECS CB ACTIVATION	
:20	PGNS TURN-ON & SELF-TEST	VHF CHECKOUT	
102:30		REPORT: LM POWER TRANSFER TIME SEC S-BAND VOICE CHECK, PRIM S-BAND CHECK, STEERABLE ANTENNA ACTIVATION P116, Y41	
:40	DOCKED IMU COARSE ALIGN REPORT: GIMBAL ANGLES & GET LGC/CMC CLOCK SYNC T EPHEM UPDATE E-MEMORY DUMP V48 (32022) DEPLOY LANDING GEAR	SUIT FAN/H_2O SEP CHECK GLYCOL PUMP CHECK BIOMED - RIGHT	
:50 (32022)		ASCENT BATTERY ACTIVATION AND C/O REPORT: ED BAT VOLTAGE	
1323	RCS PRESSURIZATION REPORT: He PRESSURE		
103:00			

MSFN

DUMP DSE
UPLINK TO CSM
CSM S.V. & V66
UPDATE TO CSM
DAP DATA
MAP UPDATE REV 12
UNDOCK & SEP PAD
P24 TRK PAD

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	102:00 - 103:00	5/10-11	3-101

CSM FLIGHT PLAN

103:00

(21111)
(X1111)

AT CDR'S REQUEST DURING RCS CHECKOUT
CMC - FREE FOR RCS HOT FIRE

```
* * * * * * * * * * * * * * *
* PANEL 10                   *
*                            *
* MODE - VOX                 *
* VOX SENS tw - 5            *
* S-BD - OFF                 *
* INTERCOM - OFF             *
* VHF AM T/R - T/R (VERIFY)  *
* * * * * * * * * * * * * * *
```

103:10

AFTER LM RCS CHECKOUT
CMC - AUTO

ROLL (8) - OFF UNTIL LM/CM ΔP > 3.5 PSID
REMOVE AND STOW CSM/LM UMBILICAL IN F1 or F2
INSTALL DROGUE AND PROBE (DECAL)
PRE-LOAD PROBE (DECAL)
DOCKING LATCH RELEASE (DECAL)
HATCH INSTALLATION (DECAL)
HATCH INTEGRITY CHECK (DECAL)

M S F N

103:20

(21101)
(X1111)

CYCLE CMC MODE - FREE/AUTO
ROLL (4) - ON
V48 (21101)
(X1111)
LOAD N47 & N48

+						WT N47
	0	0				P_{TRIM} N48
	0	0				Y_{TRIM}

V49 TRIM TO AGS CALIB ATT
(007.5,112.5,022.5)

```
* * * * * * * * * * * * * * * * * * * * * * *
* CB RNDZ XPNDR FLT BUS - CLOSE (VERIFY)     *
* RNDZ XPNDR - HTR (VERIFY)                   *
* VHF ANT - RIGHT (VERIFY)                    *
* VHF RCV ONLY - B DATA                       *
* VHF AM A - SIMPLEX                          *
* VHF AM B - OFF                              *
* * * * * * * * * * * * * * * * * * * * * * *
```

103:30

103:30

(21101)
(X1111)

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
DOFF HELMET AND GLOVES

MAP UPDATE REV 12

LOS :
180°:
AOS :

LiOH CANISTER CHANGE:
(10 INTO B, STOW 8 IN B6)

103:40

RR XPNDR ACTIVATION AND SELF-TEST (DECAL)

RNDZ XPNDR - HTR

103:50

SET DET COUNTING UP TO UNDOCK/SEP
UNDOCK CUE CARD

LM DRIFT CHECK
V06N20E
ON CDR MARK - ENTER
RECORD GIMBAL ANGLES
VOICE ANGLES TO LM

```
* * * * * * * * * * * * *
* N20:
*    R _____._____
*
*    P _____._____
*
*    Y _____._____
*
* * * * * * * * * * * * *
```

REV 12

LM RR SELF-TEST
RNDZ XPNDR - HTR (VERIFY)
AUTO RCS SEL B3 - OFF

104:00

LM FLIGHT PLAN

MCC-H 1323

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

2123 CST		CDR	LMP	NOTES
103:00 (32022)		RCS CHECKOUT		
(31022) :10	X	V48 (31022)		
	MSFN	DOCKED IMU FINE ALIGN	COPY UPDATES	
		VERIFY DROGUE & PROBE INSTALLATION	AGS ACTIVATION & SELF-TEST	
:20		CLOSE AND SECURE HATCH	AGS TIME INITIALIZATION LOAD AGS PAD COPY AGS K FACTOR V47 INITIALIZE AGS (K) CONFIGURE COMM FOR LOS STEERABLE ANT P132, Y48	
103:30		DON HELMETS & GLOVES		
:40		ARS/PGA INTEGRITY CHECK		
		CABIN REGULATOR CHECK		
:50		DOFF HELMETS & GLOVES (CREW OPTION)		
REV 12		DRIFT CHECK	RATE GYRO TEST	
104:00				

1423

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	103:00 - 104:00	5/11-12	3-103

CSM FLIGHT PLAN

104:00
(21101)
(X1111)

VERIFY:
CM2/EL/80/CEX (f8,1/250,FOCUS)
CM2/DAC/18/CEX-BRKT, MIR (T8,1/250,7) 12 fps
UTILITY PWR - ON

LM AGS CALIB
RATE < 0.075°/SEC
CMC MODE - FREE
AFTER COMPLETION OF AGS CALIB
(APPROX 6 MIN) CMC MODE - AUTO

P30; LOAD UNDOCK/SEP

104:10

WHEN LM RR SELF-TEST COMPLETE:
AUTO RCS SEL B3 - ON, RNDZ XPNDR - PWR

V49 MNVR TO UNDOCK PAD ATT (104:19)

LOAD ΔV IN EMS TO -100.0
CHECK NULL BIAS
VERIFY EMS -100.0/ΔV/STBY

GDC ALIGN
VERIFY ORDEAL
ALT SET = 40 NM

PERFORM UNDOCKING SWITCH CONFIGURATION:

ACQ MSFN HGA P -80, Y 13

104:20

GO/NO-GO FOR UNDOCK/SEP
P41 (TRIM)

SC CONT - SCS
BMAG (3) - ATT 1/RATE 2

(11101) M
(X1111) S
F
N

V48 (11101)
(X1111)
RHC & THC - ARMED

PERFORM UNDOCKING CHECKLIST

104:30

UNDOCKING SWITCH CONFIGURATION
ATT DB - MIN
RATE - LOW
RHC PWR NORM - AC/DC
RHC PWR DIR - MNA/MNB
AUTO RCS (16) - MNA/MNB
CB DOCKING PROB (2) - CLOSED

UNDOCK/SEPARATION (000,090/102,000)
_____:_____:_____._____

TIG: 104:27:31
BT: 3.07 SEC
ΔVT: 1 FPS
ULLAGE: N/A
ORBIT: 59.5 x 8.2

P30 MANEUVER

SET STARS	C R	S C	M S/G	S &	E N	P A	PURPOSE / PROP/GUID
	+			N	/	A	WT N47
R_{ALIGN} ___ ___ ___		O	O	N	/	A	P_{TRIM} N48
P_{ALIGN} ___ ___ ___		O	O	N	/	A	Y_{TRIM}
Y_{ALIGN} ___ ___ ___	+	O	O				HRS GETI
	+	O	O	O			MIN N33
	+	O					SEC
ULLAGE ___	+	0	0	0	0	0	ΔV_X N81
___	+	0	0	0	0	0	ΔV_Y
___	−	0	0	0	1	0	ΔV_Z
___	X	X	X				R (000)
	X	X	X				P (102)
	X	X	X				Y (000)

UNDOCKING CHECKLIST

59:30 EMS MODE - NORM, DAC - ON
THC PWR - ON

00:00 PROBE EXT/REL - EXT/REL (MOM)
VERIFY PROBE EXTENDED, LM ATTACHED
ALLOW MOTION TO DAMP (5 SEC)
PROBE EXT/REL - EXT/REL (HOLD)(< 20 SEC)
AFTER 2 SEC XLATE (4 JET) AFT
FOR ~ 3 SEC (VGX to + 2.0)
AFTER PROBE/DROGUE DISENGAGED,
PROBE EXT/REL - OFF
THC & RHC - LOCKED, THC PWR - OFF
POO
SC CONT - CMC, ATT DB - MAX
ΔV CG - CSM
BMAG (3) - RATE 2
RHC PWR DIR - OFF
ROLL (4) - OFF
EMS FUNC - ΔV SET/VHF RNG
EMS MODE - VHF RNG
VHF ANT - LEFT
VHF AM A - OFF
VHF AM B - DUPLEX
VHF RANGING - RANGING

LM FLIGHT PLAN

MCC-H 1423

2223 CST

	CDR	LMP	NOTES
104:00 (31022)	RR ACTIVATION & SELF-TEST	V47 INITIALIZE AGS (S.V.)	
:05		AGS CALIBRATION	
:10			
104:15	UNDOCKING PREPARATION MOUNT CAMERA ON WINDOW BAR CONFIGURE CB'S FOR UNDOCKING	BIOMED - LEFT LM TIMELINE BOOK	
(21002)	VERIFY UNDOCKING ATTITUDE V48 (21002) DON HELMET & GLOVES	DON HELMET & GLOVES	
:20		CONFIGURE COMM FOR UNDOCKING STEERABLE ANT P132, Y48	
:25	REPORT: DRIFT CHECK GIMBAL ANGLES AND GET P47 THRUST MONITOR	MONITOR AGS ΔVX RECORDER - ON	
	UNDOCKING & SEPARATION		TIG: 104:27:31
104:30	YAW LEFT 60°, PITCH UP 90° (000,014,000)	STEERABLE ANTENNA P100, Y-42	

MSFN

GO/NO-GO FOR UNDOCKING & SEPARATION

DUMP DSE 1453

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	104:00 - 104:30	5/12	3-105

CSM FLIGHT PLAN

104:30

(11101)
(X1111)

VERIFY LM TRACKER LT - ON
DAC - OFF

RECORD MAG %_____, FR #_____
GDC ALIGN
VERIFY ORDEAL
ALT SET = 40 NM
V49 MNVR TO LDMK TRK PAD ATT 104:48
OMNI C

104:40

MONITOR S-BAND

CONFIGURE CAMERA: (LDMK TRK)
CM/DAC/SXT/CEX (EXP-PAD) 1 fps (2.7% MAG)

MAG (B) _____, MAG % _____
UTILITY PWR - ON

104:50

P24 (L/S LDMK 14-X)
OPT ZERO - OFF, OPT MODE - CMC
OPT TEL TRUN - SLAVE TO SXT
OPT COUPLING - RSLV, OPT SPEED - HI

SC CONT - CMC/AUTO & MAN ATT (3) - RATE CMD (VERIFY)
V79 (N16 LOAD T2 TIME)
(-2.0000)
(+000.50)
(+00001)
PRO

0:00 - T1 (HORIZON) DET - ZERO/UP/START, DAC - ON

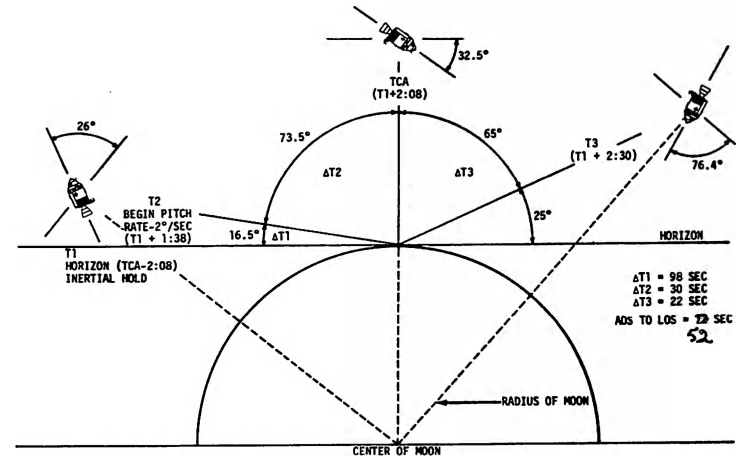
(-2.000)
(+00.50)

1:38 - T2 (AUTO PITCH RATE BEGINS) OPT MODE - MAN, TAKE MARKS
2:08 - TCA
2:30 - T3 (LDMK LOSS) DAC - OFF

105:00

M S F N

CSM LOW ALTITUDE LANDMARK TRACKING PROFILE



P24 LDMK TRACKING
TGT: L/S LDMK 14-X (1/60)

T_1 — — — — — — —
T_2 — — — — — — —
TCA — — — — — — —
T_3 — — — — — — —

R ___ °P ___ °Y ___ ° (T2 ACQ)
(020) (298) (000)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89	14-1	14-2	14-3	14-4
LAT	-04.046	-03.610	-03.919	-03.470
LONG/2	-07.800	-07.659	-07.570	-07.445
ALT	-000.44	-000.15	-000.38	-000.87

8 changes 1/4/71

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE 8 (JAN)	~~DECEMBER 23, 1970~~ JANUARY 11, 1971.	3-106

LM FLIGHT PLAN

MCC-H

1453

2253 CST

	CDR	LMP	NOTES
104:30 (21002)	EXTERIOR LTG - TRACK-OFF	UNDOCKING PHOTOGRAPHY DAC - ON (1 MIN) DC 10 FRAMES RECORDER - OFF	
:35	DOFF HELMET & GLOVES	DOFF HELMET & GLOVES	
UPDATE TO LM REV 12 TCA (LS)			
:40		V47 INITIALIZE AGS (S.V.)	
UPLINK TO LM CSM S.V. PIPA BIAS (IF REQ'D) GYRO COMPENSATION (IF REQ'D)	V83 SET ORDEAL		
104:45	DPS THROTTLE CHECK		
:50	PITCH TO OBSERVE LANDING SITE (104:55) (000,325/337,000)		
:55	OBSERVE AND PHOTO LANDING SITE DAC - ON (5 MIN) DC 5 FRAMES		
RECORD PCM LBR ON DSE DURING P24			
105:00			

M S F N

1523

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	104:30 - 105:00	5/12	3-107

CSM FLIGHT PLAN

105:00

(11101)
(X1111)

STOP PITCH RATE AT BURN ATT P 110
VHF RNG - RESET, COMPARE RR AND VHF RANGE
ACQ MSFN HGA P -67, Y 85

RECORD MAG % ____
REMOVE & STOW DAC

P52 (OPTION 3)
(LDG SITE ORIENT)

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN

N71: __ __ __ __

N05: __ __ __ . __ __

N93:

X __ __ . __ __ __

Y __ __ . __ __ __

Z __ __ . __ __ __

GET __ __ __ . __ __ . __ __

MSFN UPLINK:
CSM S.V.
CIRC TARGET LOAD

105:10

MSFN UPDATE:
CIRC PAD
MAP UPDATE REV 13
PADS A-D COPY AT (106:10)
P24 TRK PAD: (L/S LDMK 14-1) (106:35)

P30; VERIFY CIRC TIG AND ΔV'S

V49 TRIM TO CIRC BURN PAD ATT

SXT STAR CHECK

(P40)
(0.5° DB)

P40 (TRIM)

GO/NO-GO FOR CIRC

MAP UPDATE REV 13

LOS : __ __ __ . __ __ . __ __

180°: __ __ __ . __ __ . __ __

AOS : __ __ __ . __ __ . __ __

105:20

* * * * * * * * * * * * * *
* VHF AM B - OFF *
* VHF AM A - SIMPLEX *
* VHF RCV ONLY - B DATA *
* * * * * * * * * * * * * *

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

GDC ALIGN
VERIFY ORDEAL
ALT SET = 50 NM

105:30

MSFN

LM FLIGHT PLAN

2323 CST

MCC-H		CDR	LMP	NOTES
DUMP DSE 1523	105:00 (21002)	MNVR TO RR CHECKOUT ATTITUDE (000,329,000)	STEERABLE ANTENNA P 150, Y -23	
		RR & VHF RANGING CHECKOUT		
UPDATE TO LM PDI$_0$ ABORT PAD	:05	COPY CSM CIRC TIG & ΔVS		
UPLINK TO CSM CSM S.V. CIRC TARGET LOAD UPDATE TO CSM CIRC PAD MAP UPDATE REV 13 PADS A-D P24 TRACK PAD	:10			
	105:15	P52 IMU REALIGN OPTION 3 REFSMMAT (LDG SITE ORIENT)		
GO/NO-GO FOR CIRC	:20		CONFIGURE COMM FOR LOS SLEW STEERABLE ANTENNA P 14, Y -10 BIOMED - OFF	
		LPD CALIBRATION		
	:25			
1553	105:30	V49 MNVR TO AGS CALIB ATT (105:31) (024,239,021)	ALIGN AGS TO PGNS	

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	105:00 - 105:30	5/12	3-109

CSM FLIGHT PLAN

105:30

(P40)
(0.5° DB)

SET DET COUNTING UP TO CIRC

105:40

CIRC BURN TABLE			
P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TERMINATE	±10° TERMINATE	BT + 1 SEC	TRIM X TO < 1 FPS TRIM Y TO < 0.2 FPS DO NOT TRIM Z

CSM CIRCULARIZATION(000,352/110,359)

____:____:____.____

TIG: 105:46:48
BT: 3.79 SEC
ΔVT: 72.46 FPS
ULLAGE: 4 JET, 11 SEC
ORBIT: 63.5 x 56

(11101)
(X1111)

P00; VOICE P76 BURN DATA TO LM
V82

105:50

REV 13

(11111)
(X1111)

V48 (11111)
(X1111)

DOFF PGA

ZIP SUIT & INSTALL ELECTRICAL COVER PRIOR TO STOWING (PGA BAG)
STOW COMM CARRIERS & UCTA (PGA BAG)

106.00

P30 MANEUVER

SET STARS	C S	I P	R S/G	C	&	N	PURPOSE / PROP/GUID
	+						WT N47
R_{ALIGN} ___ ___ ___		O	O				P_{TRIM} N48
P_{ALIGN} ___ ___ ___		O	O				Y_{TRIM}
Y_{ALIGN} ___ ___ ___	+	O	O				HRS GETI
	+	O	O	O			MIN N33
	+	O					SEC
ULLAGE _____							ΔV_X N81
							ΔV_Y
							ΔV_Z
	X	X	X				R (000)
	X	X	X				P (110)
	X	X	X				Y (359)
	+						H_A N44
							H_P
	+						ΔVT
HORIZON/WINDOW _____	X	X	X				BT
	X						ΔVC
	X	X	X	X			SXTS
	+					O	SFT
	+				O	O	TRN
	X	X	X				BSS
	X	X					SPA
	X	X	X				SXP
OTHER _____		O					LAT N61
							LONG
	+						RTGO EMS
	+						V10
							GET 0.05G

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-110

LM FLIGHT PLAN

MCC-H 1553

2353 CST

105:30 (21002)	CDR	LMP	NOTES
(21012) :35	UNDOCKED AGS CALIBRATION V48 (21012)		
:40	SYSTEMS CHECKS		
1608 105:45	MNVR TO OBSERVE CSM CIRCULARIZATION BURN (105:45) (000,236,000)	DAC-ON (5 MIN) DC 2 FRAMES	CSM CIRCULARIZATION 105:46:48
:50 REV 13	P76 TARGET ΔV (UPDATE CSM S.V.)	V47 INITIALIZE AGS (S.V.)	
:55	V83 SET ORDEAL ESTABLISH ORBITAL RATE (000,325/148,000)		
1623 106:00			

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	105:30 - 106:00	5/12-13	3-111

CSM FLIGHT PLAN

106:00

(11111)
(X1111)

106:10

ACQ MSFN HGA P -86, Y 48

REPORT: BURN STATUS

CHARGE BATTERY B

106:20

MSFN

MSFN UPLINK:
CSM S.V. (PDI-10)
LM S.V.
PIPA BIAS

CYCLE CMC MODE - FREE/AUTO
V48 (11101)
(X1111)
V49 MNVR TO LDMK TRACK ATT (106:42)
(000,274,000) OMNI D

(11101)
(X1111)

MSFN UPDATE TO LM
WITH CSM COPY:
PADS E-N

106:30

BURN STATUS REPORT

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

*REPORT IF OFF MORE THAN 1 SEC
**ITEMS TO BE REPORTED TO MSFN

	PURPOSE		PDI_0 ABORT PAD					
A	GETI N33	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				
B	N84 LOCAL VERT	ΔVX						
		ΔVY						
		ΔVZ						
C	GETI CSI N11	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				
D	GETI TPI N37	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

	PURPOSE		PDI_1 PAD					
I	GETI PDI N33	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

	PURPOSE		PDI_1 ABORT EARLY PAD					
J	GETI TPI N37	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

	PURPOSE		PDI_1 ABORT LATE PAD					
K	GETI TPI N37	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

	PURPOSE		NO PDI_1+12 ABORT					
E	GETI N33	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				
F	N84 LOCAL VERT	ΔVX						
		ΔVY						
		ΔVZ						
G	GETI CSI N11	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				
H	GETI TPI N37	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

	PURPOSE		T2-1 ABORT PAD					
L	GETI T2	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				
M	GETI TPI N37	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

	PURPOSE		T3 ABORT PAD					
N	GETI T3	HRS	+	0	0			
		MIN	+	0	0	0		
		SEC	+	0				

LM FLIGHT PLAN

MCC-H 1623

0023 CST

	CDR	LMP	NOTES
106:00 (21012)			CSM DUMP: USE 2 DECOMS HI/LO BR. COMBINATION 3C BIO on Net 3
DUMP DSE	RESET DET TO COUNT DOWN TO PDI$_0$	VERIFY COMM AT AOS STEERABLE ANTENNA P 14, Y -10 BIOMED - RIGHT REPORT: DELTA GYRO ANGLES, GET, LPD BIAS	
106:15			
UPLINK TO CSM CSM S.V. (PDI-10) LM S.V. PIPA BIAS UPDATE TO CSM PADS E-N UPDATE TO LM NO PDI + 12 PAD PDI PAD PDI ABORT EARLY PDI ABORT LATE T2 ABORT PAD AND T3 TIG 1653	DPS PRESSURIZATION AND CHECKOUT		
:20			
:25	LANDING RADAR CHECKOUT		
106:30			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	106:00 - 106:30	5/13	3-113

106:30

(11101)
(X1111)

CONFIGURE CAMERA: (LDMK TRACKING)
CM/DAC/SXT/CEX (EXP-PAD) 1 fps (3.8% MAG)

MAG (B) ____, MAG % ____
UTILITY PWR - ON

VERIFY ORDEAL
ALT SET = 60 NM

106:40

P24 (L/S LDMK 14-1)
OPT ZERO - OFF, OPT MODE - CMC
SC CONT - CMC/AUTO
V79 (N16 LOAD ALL ZERO'S)
(-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)

PRO TO START PITCH RATE (000,338/274,000)

106:50

0:00 - T1 (HORIZON) DET - ZERO/UP/START

3:50 - DAC - ON

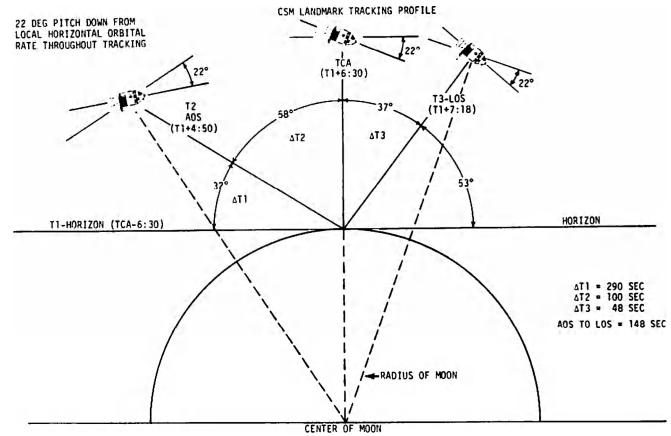
4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA
7:18 - T3 (LDMK LOSS) DAC - OFF

(11112)
(X1111)

V48 (11112)
(X1111)
V49 MNVR TO P52 AND COAS CALIB ATT (107:05)
(180,236,354) HGA P -32, Y 177

107:00



P24 LDMK TRACKING
TGT: L/S LDMK 14-1 (1/60)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R ____ °P ____ °Y ____ ° (T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT -04.046
LONG/2 -07.800
ALT -000.44

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-114

LM FLIGHT PLAN

MCC-H 1653

0053 CST

UPLINK TO LM
CSM S.V. (PDI-10)
LM S.V.
PIPA BIAS
DESCENT TARGET
LPD BIAS (IF REQ'D)

RECORD PCM LBR
ON DSE DURING P24

1723

106:30 (21012)	CDR	LMP	NOTES
	V83 SET ORDEAL	V47 INITIALIZE AGS (S.V.)	
:35	MNVR TO LPD ALTITUDE CHECK ATTITUDE ESTABLISH ORBITAL RATE (000,295/354,000)		
:40			
106:45	LPD ALTITUDE CHECK (IF DESIRED)		
:50			
:55	PITCH TO OBSERVE LANDING SITE		
107:00			

M S F N

X

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	106:30 - 107:00	5/13	3-115

CSM FLIGHT PLAN

107:00
(11112)
(X1111)

MSFN

MSFN UPDATE:
MAP UPDATE REV 14
LTC PADS (TGT 16, 12 (LDG LM) (108:15))

107:10

P52 (OPTION 3)
(LDG SITE ORIENT)

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN

N71: ___ ___ ___ ___

N05: ___ ___ ___ ___ ___

N93:

X ___ ___ ___ ___ ___

Y ___ ___ ___ ___ ___

Z ___ ___ ___ ___ ___

GET ___ ___ ___ ___ ___ ___ ___

P52 (COAS CALIB)
USE POLLUX N88 (-.38513)
(+.79364)
(+.47097)

107:20

COAS CALIB - N92

SHAFT: ___ ___ ___ ___ ___

TRUN: ___ ___ ___ ___ ___

GDC ALIGN
VERIFY ORDEAL

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

* * * * * * * * * * * * * * * * * *
* MSFN ENABLES MSFN S-BAND RELAY*
* * * * * * * * * * * * * * * * * *

MAP UPDATE REV 14

LOS : ___ ___ ___ ___ ___ ___ ___

180°: ___ ___ ___ ___ ___ ___ ___

AOS : ___ ___ ___ ___ ___ ___ ___

107:30

107:30
(11101)
(X1111)

CYCLE CMC MODE - FREE/AUTO
V48 (11101)
(X1111)
V49 MNVR TO LTC TGT: 16 PHOTO PAD ATT (107:52)

CONFIGURE CAMERAS: (LTC & EL ORB SCIENCE PHOTOS)
CM/EL/500/CEX (f8,1/125,∞)(133 FR)

MAG (L) _____, FR # _____

CM3/LTC/MBW/BEF (SHUT 1/100,RNG 1-PAD, INT 8.2)(127 FR)

MAG (V) _____, FR # _____
LTC INSTALLATION (DECAL)
LTC CHECKOUT (DECAL)

107:40

LTC PHOTO PAD TGT: 16 (000,302,000)

R _____ P _____ Y _____

T START: ___ ___ ___ ___ ___ ___ ___

T STOP : ___ ___ ___ ___ ___ ___ ___

RNG 1_____(91.1) T START

RNG 2_____(90.0) T START + 7:10

REV 14

107:50

ORBITAL SCIENCE PHOTOGRAPHY

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)

PRO TO START PITCH RATE AT ORDEAL P 212

PHOTO TGT 14, SOUTH (f8,1/125,∞) 30 FR AT 4 SEC (500 NM)
(180° +0:10)

108:00

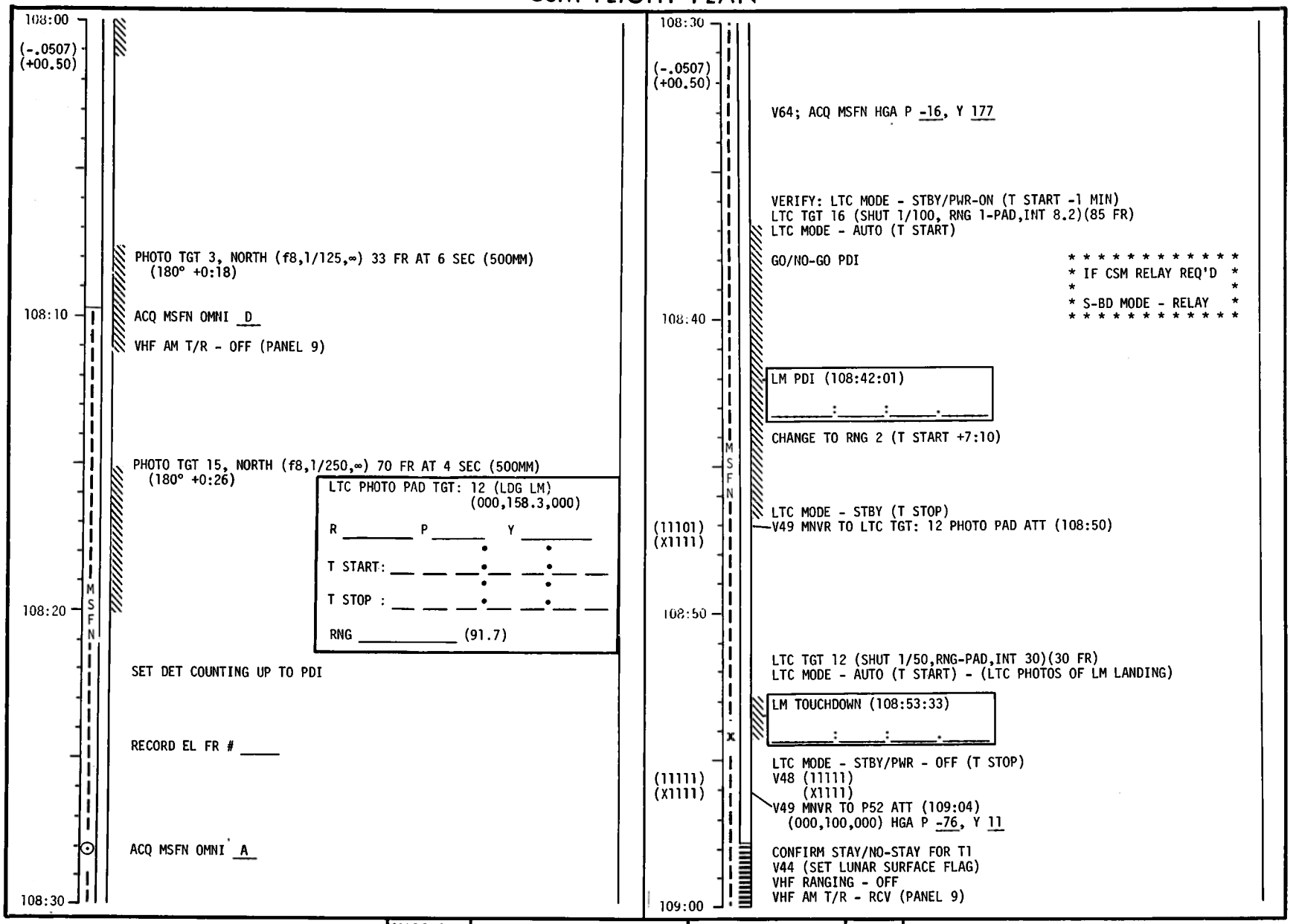
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-116

LM FLIGHT PLAN

MCC-H	0123 CST	CDR	LMP	NOTES
UPDATE TO CSM MAP UPDATE REV 14 LTC PADS (TGT 16, 12 (LDG LM)) 1723	107:00 (21012)	MSFN P52 IMU REALIGN OPTION 3 REFSMMAT (LDG SITE ORIENT)		
	:10	REPORT: DELTA GYRO ANGLES, GET		
	:20	COAS CALIBRATION	CONFIGURE COMM FOR LOS STEERABLE ANT P 2, Y 2 BIOMED - OFF RELOCATE DAC ABOVE RH WINDOW	
ENABLE MSFN S-BD RELAY	107:30			
	:40 (22112)	START MNVR TO PDI ATTITUDE P30 EXTERNAL ΔV (NO PDI + 12 ABORT) V48 (22112) P63 MNVR TO PDI ATT (107:45) (000,113,000) P00 COAS TO OVERHEAD WINDOW	ALIGN AGS TO PGNS VERIFY LOOSE GEAR STOWED RESTRAINTS ATTACHED	
	REV 14 :50	DON HELMET & GLOVES	DON HELMET & GLOVES CONFIGURE EGRESS MODE CHECK SYSTEMS CONFIGURATION	
1823	108:00			

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	107:00 - 108:00	5/13-14	3-117

CSM FLIGHT PLAN



LM FLIGHT PLAN

MCC-H 1823

0223 CST

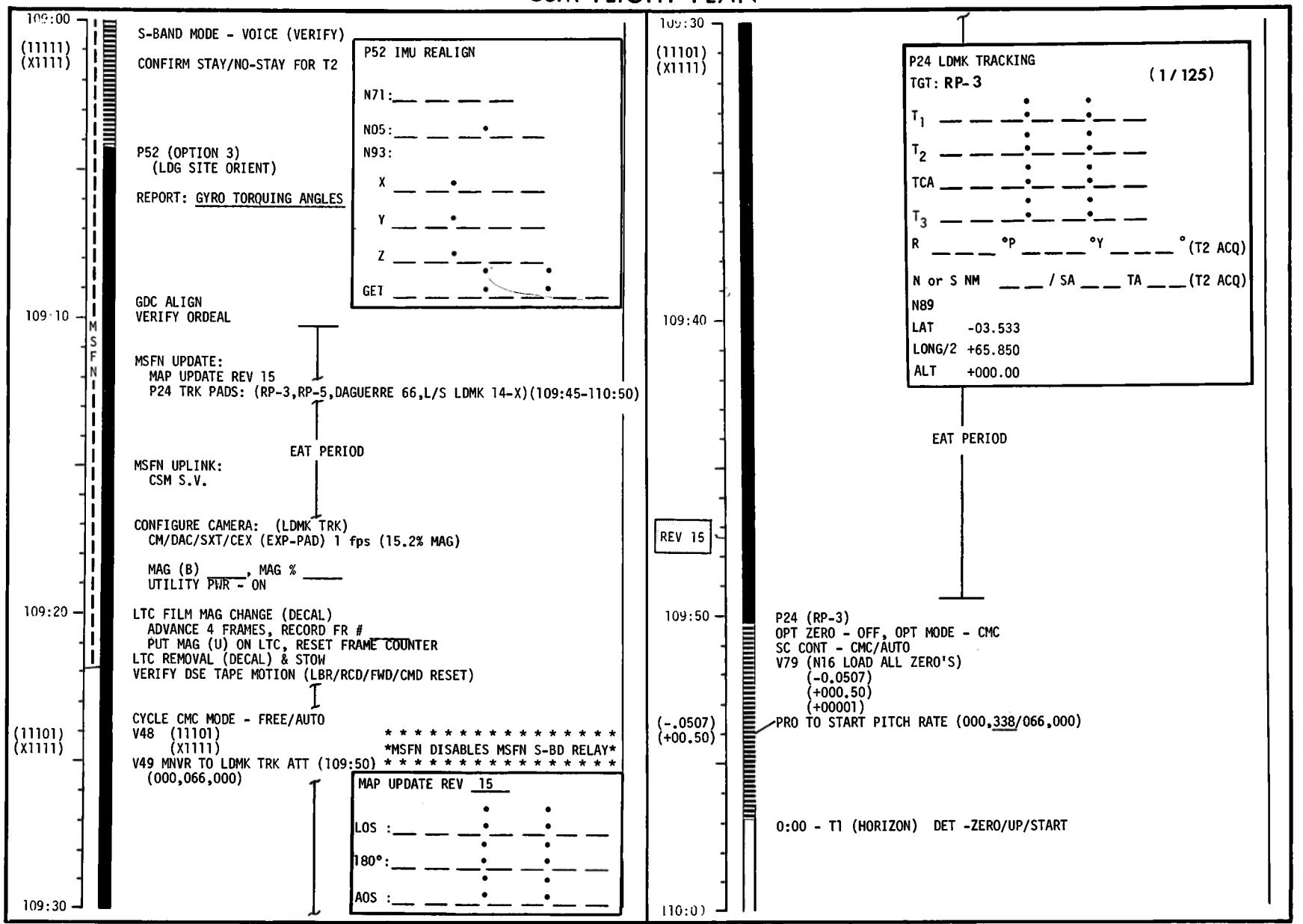
		CDR	LMP	NOTES
	108:00	PRE-PDI SW SETTINGS	BATS 5 & 6 NORM FEED-ON VERIFY COMM AT AOS STEERABLE ANTENNA P 2, Y 2 BIOMED - LEFT	
	(22112)			
UPLINK TO LM LM S.V. RLS GYRO COMPENSATION UPDATE TO LM AGS RLS (231)	:10	SYSTEMS CHECKS	REPORT: ASCENT BAT-ON TIME	
	:20		RECORDER - ON V47 INITIALIZE AGS (S.V.) TARGET AGS FOR ABORT	
	108:30	LR-ON P63 BRAKING PHASE FINAL TRIM	ALIGN AGS TO PGNS	
GO/NO-GO FOR PDI		GO/NO-GO FOR PDI RESET WATCH	COMM CHECK WITH CSM ON S-BAND RELAY	
	:40	PDI		TIG: 108:42:01 BT: 11 MIN 31.5 SEC ΔVR: 6637.7 FPS ULLAGE: 4 JET 7.5 SEC
UPDATE TO LM Δ RLS		PITCH OVER AT P64	UPDATE LM ΔRLS (N69) SYSTEMS MONITOR DAC-ON (PHOTO LANDING) UPDATE AGS ALT AT 12 000 FT	
	:50	P66 LANDING PHASE (ROD)		
DUMP DSE		TOUCHDOWN		108:53:33
STAY/NO-STAY FOR T1		ENG STOP-PUSH STAY/NO-STAY FOR T1 P68 LDG CONFIRMATION	AGS LUNAR AZ STORED UPDATE AND ALIGN AGS DAC-OFF	
	109:00			

MSFN

1923

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	108:00 - 109:00	5/14	3-119

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-120

LM FLIGHT PLAN

MCC-H	0323 CST		CDR	LMP	NOTES
1923	109:00		P12 POWERED ASCENT STAY/NO-STAY FOR T2 LR-OFF	RECORDER-OFF	
STAY/NO-STAY FOR T2	(22112)		LUNAR SURFACE CHECKLIST		
				BAT 5&6 - OFF	
	:10		DOFF HELMET & GLOVES	DOFF HELMET & GLOVES REPORT DEDA 047,053	
COPY AGS AZIMUTH UPDATE TO CSM MAP UPDATE REV 15 P24 TRACK PADS UPLINK TO CSM CSM S.V.			P57 IMU ALIGN OPTION 3 REFSMMAT A/T 1-GRAVITY & LM Z AXIS (LDG SITE ORIENTATION)	AGS LUNAR SURFACE GYRO CALIBRATION, BIOMED - RIGHT CONFIGURE COMM FOR LUNAR SURFACE STEERABLE ANT: P 119, Y-39	
	:20		INSTALL WINDOW SHADES	TERMINATE AGS GYRO CALIBRATION	
DISABLE MSFN S-BD RELAY		M S F N			
	109:30		P57 LUNAR SURFACE ALIGN OPTION 3 REFSMMAT A/T 2 - TWO CELESTIAL BODIES (LDG SITE ORIENTATION)		
	:40				
STAY/NO-STAY FOR POWER DOWN	:50		P57 LUNAR SURFACE ALIGN OPTION 3 REFSMMAT A/T 2 - TWO CELESTIAL BODIES (LDG SITE ORIENTATION)		
				ALIGN AGS TO PGNS STORE AZIMUTH	
UPLINK TO LM RLS (IF REQ'D) CSM S.V.			STOW WINDOW SHADES	AGS TO STBY	
2023	110:00				

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	109:00 - 110:00	5/14-15	3-121

CSM FLIGHT PLAN

110:00

(-.0507)
(+00.50)

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

P24 (RP-5)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

0:00 - T1 (HORIZON) DET - ZERO/UP/START
ACQ MSFN OMNI D

110:10

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

MSFN

P24 (DAGUERRE 66)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

110:20

0:00 - T1 (HORIZON) DET -ZERO/UP/START

110:30

P24 LDMK TRACKING
TGT: **RP-5** (1/250)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R _____ °P _____ °Y _____ ° (T2 ACQ)

N or S NM ____ / SA ___ TA ___ (T2 ACQ)

N89
LAT -10.567
LONG/2 +49.700
ALT +000.00

P24 LDMK TRACKING
TGT: **DAGUERRE 66** (1/250)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R _____ °P _____ °Y _____ ° (T2 ACQ)

N or S NM ____ / SA ___ TA ___ (T2 ACQ)

N89
LAT -11.717
LONG/2 +16.600
ALT +000.00

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-122

LM FLIGHT PLAN

MCC-H	0423 CST	CDR	LMP	NOTES
UPDATE TO LM P22 ACQ TIME 2023	110:00 (22112)	CONFIGURE FOR PARTIAL POWER DOWN (BIOMED - AS DESIRED)		
RECORD PCM LBR ON DSE DURING P24	:05	DESCRIBE AND PHOTOGRAPH LUNAR SURFACE REPORT FEATURES SEEN DURING DESCENT DETERMINE LM LOCATION WITH MCC-H REPORT ANGLE OF +Z WITH RESPECT TO WEST		
	:10			
	110:15			
	:20			
	:25	EAT PERIOD		
2053	110:30			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	110:00 - 110:30	5/15	3-123

110:30

(-.0507)
(+00.50)

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

P24 (L/S LDMK 14-X)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

110:40

M
S
F
N

0:00 - T1 (HORIZON) DET - ZERO/UP/START

110:50

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

X

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF
V48 (11102) (X1111)
(11102)
(X1111)
V49 MNVR TO ANTI-SOLAR PT ATT (111:05)
(197,251,346) HGA P -41, Y 156

RNDZ XPNDR - OFF

RECORD MAG % ____

111:00

P24 LDMK TRACKING
TGT: L/S LDMK 14-X (1/60)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R _____ °P _____ °Y _____ ° (T2 ACQ)

N or S NM ___ ___ / SA ___ ___ TA ___ ___ (T2 ACQ)

N89	14-1	14-2	14-3	14-4
LAT	-04.046	-03.610	-03.919	-03.470
LONG/2	-07.800	-07.659	-07.570	-07.445
ALT	-000.44	-000.15	-000.38	-000.87

LM FLIGHT PLAN

MCC-H	0453 CST	CDR	LMP	NOTES
UPDATE TO LM LM CONSUMABLES 2053	110:30 (22112)			
	:35			
	:40	RR-ON P22 LUNAR SURFACE NAVIGATION		
	110:45		EAT PERIOD	
	:50			
UPDATE TO LM DAP LOAD	:55 (12102)	TERMINATE P22 LUNAR SURFACE NAVIGATION DESIGNATE THEN POWER DOWN RR V48 (12102) & LM WEIGHT E-MEMORY DUMP		
2123	111:00			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	110:30 - 111:00	5/15	3-125

111:00

(11102)
(X1111)

CONFIGURE CAMERA: (GEGENSCHEIN)
INSTALL CAMERA SHIELD
CM4/DAC/18/VHBW-BRKT, MIR, CONT (T1,1/500,∞) 24fps (7.4% MAG)

MAG (J) _____, MAG % _____

UTILITY PWR - ON

(11101)
(X1111)

V48 (11101)
(X1111)

MAP UPDATE REV 16

LOS :
180°:
AOS :

111:10

MSFN

MSFN UPDATE:
MAP UPDATE REV 16
ZERO PHASE PADS (111:45, 112:10)

GEGENSCHEIN PHOTOGRAPHY

111:20

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

INHIBIT - A3,C4,B3,D4 THRUSTERS
DAC - ON AT 24fps FOR 2 SEC, CHANGE TO TIME & 1/60
DIM INTERIOR LIGHTS
2 FRAMES, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC
CHANGE TO 24fps & 1/500, RUN DAC FOR 2 SEC, LIGHTS UP

ENABLE - A3,C4,B3,D4 THRUSTERS
V49 MNVR TO MIDWAY PT ATT (111:27)
(197,261,346)

INHIBIT - A3,C4,B3,D4 THRUSTERS
DAC - ON AT 24fps FOR 2 SEC, CHANGE TO TIME & 1/60
DIM INTERIOR LIGHTS
2 FRAMES, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC

111:30

LM FLIGHT PLAN

MCC-H	0523 CST	CDR	LMP	NOTES
UPLINK TO LM 2123 INITIATE GRAVITY MEASUREMENT TEST	111:00	CONFIGURE CB'S FOR POWER DOWN (EXCEPT IMU OPR - CLOSE) UPDATA LINK - DATA		
DUMP DSE UPDATE TO LM TIME OF LIFT-OFF FOR REV 16 THRU 19	:05			
		CREW STATUS REPORT (DOSIMETER, MEDICATION)		
UPDATE TO CSM MAP UPDATE REV 16 ZERO PHASE PADS	:10			
	111:15	EAT PERIOD		
	:20			
	:25			
2153	111:30			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	111:00 - 111:30	5/15	3-127

CSM FLIGHT PLAN

111:30

CHANGE TO 24fps & 1/500, RUN DAC FOR 2 SEC, LIGHTS UP

ENABLE - A3,C4,B3,D4 THRUSTERS
(11101) V49 MNVR TO MOULTON PT ATT (111:34)
(X1111) (197,272,346)

INHIBIT - A3,C4,B3,D4 THRUSTERS
DAC - ON AT 24fps FOR 2 SEC, CHANGE TO TIME & 1/60
DIM INTERIOR LIGHTS
2 FRAMES, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC
CHANGE TO 24fps & 1/500, RUN DAC FOR 2 SEC, LIGHTS UP

ENABLE - A3,C4,B3,D4 THRUSTERS

RECORD MAG % ____

111:40

(11102) V48 (11102)
(X1111) (X1111)
V49 MNVR TO ZERO PHASE TGT 1 & 2 ATT (111:50)
(196.8,358.1,359.3)

O_2 FUEL CELL PURGE
WASTE WATER DUMP

REV 16

CONFIGURE CAMERA: (ZERO PHASE)
CM3/DC/80/MBW-BRKT, IVL, PCM CABLE (f5.6,1/250,∞) (46 FR)

MAG (R) ____, FR # ____

111:50

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)
(-.0507) PRO TO START PITCH RATE (196.8,268/358.1,359.3)
(+00.50)

ZERO PHASE OBSERVATIONS - BACKWARD LOOKING

SELECT OMNI A

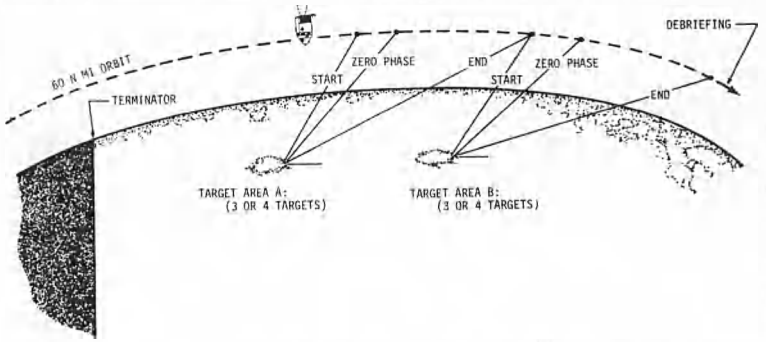
Ch. B 1/11/71.

111:58 TERMINATE WASTE WATER DUMP

111:58:40 - DET - ZERO/UP/START (T START)
REVIEW TGT 1 & 2 MAPS

112:00

TYPICAL ZERO PHASE OBSERVATION PASS - BACKWARD LOOKING



ZERO PHASE PAD (BACKWARD)
R ____ °P ____ °Y ____ °
T START: ____ ____ ____ ____ ____ ____
START DET AT 1ST TGT AREA ACQ -5 MIN

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE 8 (JAN)	~~DECEMBER 29, 1970~~ JANUARY 11, 1971.	3-128

LM FLIGHT PLAN

MCC-H

2153

0553 CST

	CDR	LMP	NOTES
111:30	CABIN PREP FOR EVA-1		
	STOW ALL LOOSE ITEMS NOT REQUIRED FOR EVA		
:35			
	UNSTOW EVA-1 PREP & POST CARD		
:40			
	STOW LUNAR SURFACE CHECKLIST		
111:45	EQUIPMENT PREP FOR EVA-1		-1:45
	SET DET		
:50			-1:40
	UNSTOW BSLSS		
	UNSTOW LMP PLSS FROM LM FLOOR		
:55			
	PREPARE LUNAR SURFACE 16MM CAMERA		
112:00			-1:30

M S F N

2223

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	111:30 - 112:00	5/15-16	3-129

CSM FLIGHT PLAN

112:00
(-.0507)
(+00.50)

5:00 - DC - ON, START OBSERVATIONS (TGT AREA 1)

6:40 - ZERO PHASE POINT (TGT AREA 1)

ACQ MSFN OMNI A

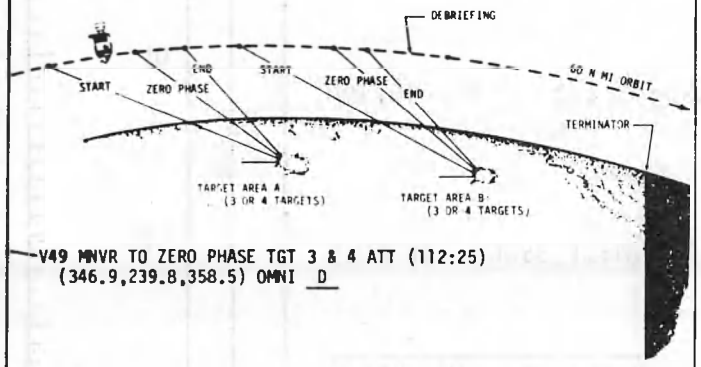
8:24 - STOP OBSERVATIONS
START OBSERVATIONS (TGT AREA 2)
8:54 - ZERO PHASE POINT (TGT AREA 2)

112:10

11:54 - STOP OBSERVATIONS
DEBRIEF (~30 SEC)
12:24 - DC - OFF
ACQ MSFN HGA P -76, Y 80

ZERO PHASE PAD (FORWARD)
R ___ °P ___ °Y ___ °
T START: ___ ___ ___ ___ ___ ___
START DET AT 1ST TGT AREA ACQ -5 MIN

TYPICAL ZERO PHASE OBSERVATION PASS-FORWARD LOOKING



112:20

(11102)
(X1111)
V49 MNVR TO ZERO PHASE TGT 3 & 4 ATT (112:25)
(346.9,239.8,358.5) OMNI D

CHARGE BATTERY A

112:30

112:30
(11102)
(X1111)

ZERO PHASE OBSERVATIONS - FORWARD LOOKING

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)
PRO TO START PITCH RATE (346.9,276/239.8,358.5)

112:35:38 - DET - ZERO/UP/START (T START)
REVIEW TGT 3 & 4 MAPS

112:40

5:00 - DC - ON, START OBSERVATIONS (TGT AREA 3)

8:40 - ZERO PHASE POINT (TGT AREA 3)

9:32 - STOP OBSERVATIONS
START OBSERVATIONS (TGT AREA 4)

11:16 - ZERO PHASE POINT (TGT AREA 4)

12:02 - STOP OBSERVATIONS
DEBRIEF (~ 30 SEC)
12:32 - DC - OFF, REMOVE CAMERA FROM WINDOW

112:50

RECORD FR # ____

(11111)
(X1111)
V48 (11111)
(X1111)
V49 MNVR TO ZODIACAL LIGHT ATT (113:10)
(180,200,000) OMNI C

CONFIGURE CAMERA: (ZODIACAL LIGHT)
CM4/DAC/18/VHBW-BRKT, MIR, CONT (T1,1/500,∞) 24 fps (3% MAG)

MAG (J) ____, MAG % ____
UTILITY PWR - ON

113:00

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-130

LM FLIGHT PLAN

MCC-H	0623 CST		CDR	LMP	NOTES
2223	112:00				-1:30
ACTUAL 2240			DEPLOY EVA ANTENNA		
DUMP DSE	:10		UNSTOW AND DON LUNAR BOOTS		-1:20
			UNSTOW AND CHECK BOTH OPS		
TERMINATE GRAVITY MEASUREMENT	:20		POWER DOWN IMU LGC TO STANDBY UPDATA LINK - OFF		-1:10
2308	112:30	MSFN	PLSS DONNING		-1:00
			CONFIGURE LMP PLSS/OPS FOR DONNING		
			LMP DON PLSS/OPS		
			CONFIGURE CDR PLSS/OPS FOR DONNING		
2311	:40		CDR DON PLSS/OPS		- :50
			UNSTOW RCU'S		
2318			VERIFY RCU CONTROLS AND CONNECT TO PLSS/PGA		
	:50		PLSS COMM CHECK		- :40
2326			TV - ON, FM VOICE CHECK, CONFIGURE EVA COMM MODE BIOMED - OFF, RECORDER - ON VERIFY PLSS COMM AND TM WITH MCC-H TV - OFF FINAL SYSTEMS PREP		
2323	113:00				- :30

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	112:00 - 113:00	5/16	3-131

CSM FLIGHT PLAN

113:00
(11111)
(X1111)

MSFN UPDATE:
ZODIACAL PHOTO PAD
MAP UPDATE REV 17

MAP UPDATE REV 17

LOS :
180°:
AOS :

ZODIACAL LIGHT PHOTO PAD(SR)

T START:
START DET AT SUNRISE -30 MIN

MSFN

113:10
(-.0507)
(+05.00)

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+005.00)
(+00001)
PRO TO START PITCH RATE (180,352/200,000)

ZODIACAL LIGHT PHOTOGRAPHY

113:17:34 - DET - ZERO/UP/START (T START) (SR-30 MIN)
INHIBIT - A3,C4,B3,D4 THRUSTERS
DAC - ON AT 24fps FOR 2 SEC
CHANGE FRAME RATE TO TIME & SHUTTER SPEED TO 1/60
VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
DIM INTERIOR LIGHTS

113:20

5:00 - 1 FRAME, 20 SEC EXP TIME (SR -25:00)
1 FRAME, 10 SEC EXP TIME
1 FRAME, 5 SEC EXP TIME

8:20 - 1 FRAME, 20 SEC EXP TIME (SR -21:40)
1 FRAME, 10 SEC EXP TIME
1 FRAME, 5 SEC EXP TIME

11:40 - 1 FRAME, 16 SEC EXP TIME (SR -18:20)
1 FRAME, 8 SEC EXP TIME
1 FRAME, 4 SEC EXP TIME

113:30

113:30
(-.0507)
(+05.00)

15:00 - 1 FRAME, 16 SEC EXP TIME (SR -15:00)
1 FRAME, 8 SEC EXP TIME
1 FRAME, 4 SEC EXP TIME

18:20 - 1 FRAME, 8 SEC EXP TIME (SR -11:40)
1 FRAME, 4 SEC EXP TIME
1 FRAME, 2 SEC EXP TIME

21:40 - 1 FRAME, 8 SEC EXP TIME (SR -8:20)
1 FRAME, 4 SEC EXP TIME
1 FRAME, 2 SEC EXP TIME

113:40

25:00 - 1 FRAME, 4 SEC EXP TIME (SR -5:00)
1 FRAME, 2 SEC EXP TIME
1 FRAME, 1 SEC EXP TIME
SET FRAME RATE TO 1fps

REV 17

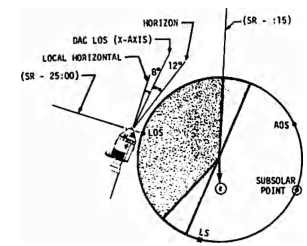
29:00 - DAC ON FOR 1 SEC (SR -1:00)
CHANGE SHUTTER TO 1/125
29:15 - DAC ON FOR 1 SEC (SR -0:45)
CHANGE SHUTTER TO 1/250
29:30 - DAC ON FOR 1 SEC (SR -0:30)
CHANGE SHUTTER TO 1/500
29:45 - DAC ON FOR 1 SEC (SR -0:15)
CHANGE TO 24 FPS AND RUN DAC FOR 2 SEC PRIOR TO SUNRISE
LIGHTS UP

113:50

ENABLE - A3,C4,B3,D4 THRUSTERS

RECORD MAG % _____

ZODIACAL LIGHT PHOTOGRAPHY



114:00

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-132

LM FLIGHT PLAN

MCC-H 2323

UPDATE TO CSM
ZODIACAL LIGHT
PHOTO PAD
MAP UPDATE REV 17

0723 CST

	CDR	LMP	NOTES
113:00	OPS CONNECT LMP UNSTOW OPS AND CONNECT TO RCU & PLSS CDR UNSTOW OPS AND CONNECT TO RCU & PLSS		- :30
:10	HELMET/GLOVES DONNING DON HELMETS AND LEVA'S STOW LM HOSES VERIFY PGA CONFIGURATION VERIFY CB CONFIGURATION FOR EVA DON GLOVES		- :20
:20	PRESSURE INTEGRITY CHECK PLSS O_2 ON		- :10
113:30	CABIN DEPRESS DEPRESS CABIN TO 3.5 PSIA START EVA WATCH FWD DUMP VALVE - OPEN PARTIALLY OPEN FORWARD HATCH		0:00 START EVA
:40	FINAL PREP FOR EGRESS PLSS FEEDWATER - OPEN, FORWARD HATCH - OPEN VERIFY CWEA & PGA STATUS RELEASE PLSS ANTENNAS, LOWER VISOR		
	CDR EGRESS EQUIP JETT, DEPLOY LEC & MESA, DESCEND TO SURFACE	ASSIST AND MONITOR CDR PASS LEC TO CDR, TV-ON	0:10
:50	ENVIRONMENT FAMILIARIZATION	LMP EGRESS CLOSE HATCH AND DESCEND	0:20
	MET OFFLOAD UNSTOW AND MOUNT TV ON TRIPOD	ENVIRONMENT FAMILIARIZATION	0:30
114:00			

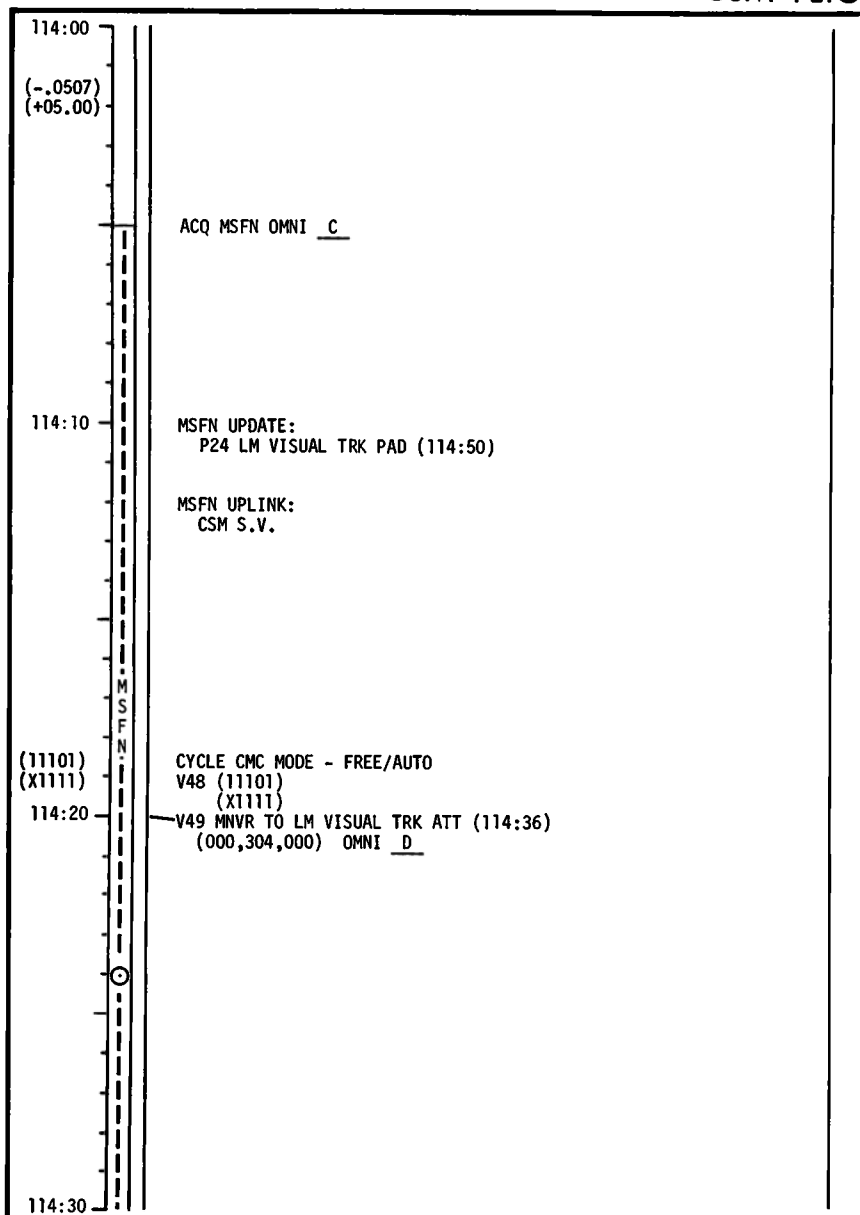
MSFN

TV

0023

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	113:00 - 114:00	5/16-17	3-133

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-134

LM FLIGHT PLAN

MCC-H

0823

0823 CST

UPDATE TO CSM
P24 LM VISUAL TRACK PAD

UPLINK TO CSM
CSM S.V.

0053

0823 CST	MSFN	TV	CDR	LMP	NOTES
114:00	M	T	POSITION TV 50 FT NORTH TO VIEW MESA AND LADDER AREAS	DEPLOY TV CABLE	0:30
:05	S	V	S-BAND ERECT ANT DEPLOY UNSTOW S-BAND ANTENNA ORIENT ANTENNA TOWARD EARTH	CONTINGENCY SAMPLE COLLECTION SWC DEPLOYMENT	
:10	F		DEPLOY LEGS ERECT MAST DEPLOY DISH	OFFLOAD LR^3	0:40
114:15	N		ALIGN S-BAND ANTENNA	ASSIST CDR WITH S-BAND ANTENNA ALIGNMENT	
:20			EXPENDABLES TRANSFER STOW CS IN ETB	S-BAND SWITCHING ASCEND LADDER SWITCH TO ERECTABLE ANTENNA	0:50
:25			TRANSFER ETB INTO LM LM AND SITE INSPECTION TRANSFER ETB TO SURFACE	TRANSFER ETB INTO LM REMOVE AND STOW CONTENTS FROM ETB AND REPACK TRANSFER ETB TO SURFACE	
114:30			ATTACH ETB TO MESA PHOTO LMP EGRESS	EGRESS LM DESCEND LADDER	1:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	114:00 - 114:30	5/17	3-135

change B. 1/11/71

114:30

11101
([illegible])
(X1111)

P24 (LM VISUAL)
OPT ZERO - OFF, OPT MODE - CMC
SC CONT - CMC/AUTO (VERIFY)
V79 (N16 LOAD ALL ZERO'S)
(-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50) — PRO TO START PITCH RATE (000,000/304,000)

114:40

0:00 - T1 (HORIZON-LM ACQ) DET - ZERO/UP/START

MSFN

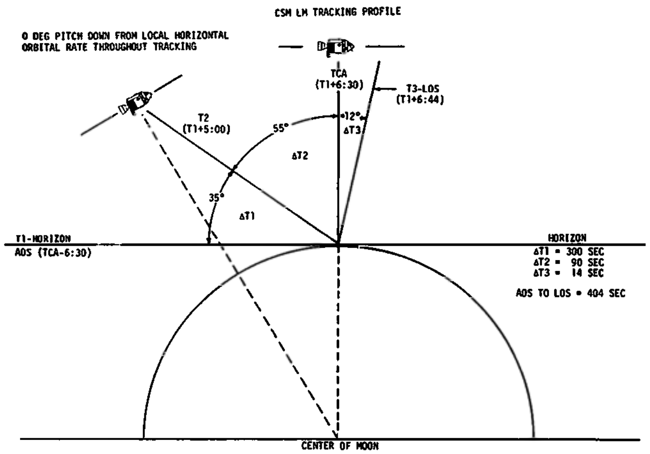
5:00 - T2 OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA
6:44 - T3 (LM LOSS)
V48 (11111)
(X1111)

114:50

(11111)
(X1111) — V49 MNVR TO COMM ATT (114:56)
(060,268,000) HGA P 29, Y 236

115:00



P24 LDMK TRACKING
TGT: **LM VISUAL**

T_1 __ __ __ : __ __ : __ __

T_2 __ __ __ : __ __ : __ __

TCA __ __ __ : __ __ : __ __

T_3 __ __ __ : __ __ : __ __

R ____ °P ____ °Y ____ ° (T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT -03.672
LONG/2 -08.732
ALT -000.76

LM FLIGHT PLAN

MCC-H	0853 CST	CDR	LMP	NOTES
RECORD PCM LBR ON DSE DURING P24 0053	114:30	FLAG DEPLOYMENT	FLAG DEPLOYMENT PLACE 16 MM CAMERA ON SRC TABLE AND TURN ON ASSIST CDR TURN 16 MM CAMERA OFF	1:00
	:35			
	:40	LM & SITE INSPECTION AND PHOTOGRAPHY	TV PANORAMA SITE SURVEY	1:10
	114:45	MET DEPLOYMENT CARRY TV 30 FT EAST OF LM POSITION TO VIEW ALSEP OFFLOAD	MET DEPLOYMENT PULL MET TO QUAD II	
	:50	ALSEP OFFLOAD OFFLOAD ALSEP PKG NO. 1	ALSEP OFFLOAD OPEN SEQ BAY DOORS	1:20
DUMP DSE	:55	REMOVE AND ASSEMBLE BAR ATTACH CARRY BAR TO PACKAGE NO. 1	OFFLOAD ALSEP PKG NO. 2 REMOVE AND EXPAND ALHTC REMOVE DRT & FTT	
0123	115:00			1:30

MSFN TV

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	114:30 - 115:00	5/17	3-137

CSM FLIGHT PLAN

115:00

(11111)
(X1111)

MSFN UPDATE:
P24 TRK PADS: (RP-2, LDMK 12-1, DOLLOND E, FM-1)(115:50-116:45)
MAP UPDATE REV 18
TEI 34 PAD (PRELIMINARY)

M S F N

115:10

P24 LDMK TRACKING
TGT: **RP-2** (1/60)

T_1 — — — : — — : — —
T_2 — — — : — — : — —
TCA — — — : — — : — —
T_3 — — — : — — : — —

R _____ °P _____ °Y _____ °(T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)
N89
LAT -00.283
LONG/2 +70.625
ALT +000.00

P24 LDMK TRACKING
TGT: **LDMK 12-1** (1/250)

T_1 — — — : — — : — —
T_2 — — — : — — : — —
TCA — — — : — — : — —
T_3 — — — : — — : — —

R _____ °P _____ °Y _____ °(T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)
N89
LAT -05.736
LONG/2 +56.155
ALT +000.00

VERIFY DSE TAPE MOTION
(LBR/RCD/FWD/CMD RESET)

115:20

CYCLE CMC MODE - FREE/AUTO
V48 (11101)
(X1111)

(11101)
(X1111)

V49 MNVR TO LDMK TRK ATT (115:43)
(000,075,000) OMNI D

115:30

115:30

(11101)
(X1111)

MAP UPDATE REV 18

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

CONFIGURE CAMERA: (LDMK TRK)
CM/DAC/SXT/CEX (EXP-PAD) 1fps (15.2% MAG)

MAG (B) _____, MAG % _____
UTILITY POWER - ON

115:40

REV 18

P24 (RP-2)
OPT ZERO - OFF, OPT MODE - CMC
SC CONT - CMC/AUTO (VERIFY)
V79 (N16 LOAD ALL ZERO'S)
(-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)

PRO TO START PITCH RATE (000,338/075,000)

115:50

0:00 - T1 (HORIZON) DET - ZERO/UP/START

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

P24 (LDMK 12-1)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC
0:00 - T1 (HORIZON) DET -ZERO/UP/START

116:00

LM FLIGHT PLAN

MCC-H

RECORD RTG REPORT

0123

UPDATE TO CSM
P24 TRACK PADS
MAP UPDATE REV 18
PRELIM TEI 34 PAD

0223

0923 CST	MSFN	TV	CDR	LMP	NOTES
115:00			TIP PKG NO. 2 AND POSITION FOR FUELING, TAKE 70MM PHOTOS IF TIME PERMITS CARRY TV 50 FT NORTH OF LM BW TV CAM TO +Y FOOTPAD POSITION TO VIEW ALSEP SITE UNSTOW THUMPER/GEOPHONE AND PLACE ON MET	REPORT: FUEL RTG, DRT, & FTT TEMP PULL MET TO MESA DISCARD TV BRACKET PUT 70MM CAMERA ON MET PLACE 16MM CAMERA ON STAFF UNSTOW AND OPEN SRC 1 UNSTOW CLOSEUP STEREO CAMERA	1:30
:10			ALSEP TRAVERSE CARRY LR^3, PULL MET DESCRIBE MET HANDLING AND STABILITY	ALSEP TRAVERSE CARRY ALSEP	1:40 1:50
:20			ALSEP SITE SURVEY 16 MM CAMERA - ON	ALSEP SITE SURVEY	
115:30	M S F N	T V	ALSEP DEPLOYMENT PLACE SUBPALLET ABOUT 10 FEET NE OF C/S PACK SURFACE FOR PSE STOOL 10 FEET NORTH	ALSEP DEPLOYMENT POSITION PKG NO. 1 & BAR 10 FEET WEST OF PKG NO. 2	2:00
:40			PSE OFFLOAD 16 MM CAMERA - OFF	THUMPER/GEOPHONE OFFLOAD	2:10
:50			SUNSHIELD DEPLOYMENT	MORTAR PACKAGE DEPLOYMENT CPLEE DEPLOYMENT	2:20
116:00			ALSEP ANTENNA INSTALLATION	SIDE/CCIG DEPLOYMENT	2:30

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	115:00 - 116:00	5/17-18	3-139

CSM FLIGHT PLAN

116:00

(-.0507)
(+00.50)

3:50 - DAC - ON

ACQ MSFN OMNI D
4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

116:10

MSFN

MSFN UPDATE:
MAP UPDATE REV 19 (117:10)
MNVR PAD (PLANE CHANGE) (117:45)

116:20

P24 (DOLLOND E)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

116:30

P24 LDMK TRACKING
TGT: **DOLLOND E** (1/250)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R _____ °P _____ °Y _____ °(T2 ACQ)

N or S NM ____ / SA ____ TA ____(T2 ACQ)

N89
LAT -10.433
LONG/2 +07.866
ALT +000.00

LM FLIGHT PLAN

1023 CST

MCC-H		CDR	LMP	NOTES
RECORD PCM LBR ON DSE DURING P24 0223	116:00		ALIGN AND LEVEL	2:30
		SWITCH NO. 1 - CW SWITCH NO. 5 - CCW		
	:05	PSE DEPLOYMENT	GEOPHONE DEPLOYMENT	
CONFIRM ALSEP DATA	:10	CONFIRM ALSEP DATA WITH MCC-H	FIRST GEOPHONE 10 FT SE OF C/S	2:40
UPDATE TO CSM MAP UPDATE REV 19 PLANE CHANGE MNVR PAD	116:15	DEPLOY LR^3 100 FT W OF C/S	SECOND GEOPHONE 160 FT SE OF C/S THIRD GEOPHONE 310 FT SE OF C/S	
	:20	ALSEP PHOTOGRAPHY PHOTOGRAPH PSE, MORTAR PKG, CPLEE, SIDE/CCIG, RTG & LM, C/S, LR^3 GEOPHONES AND THUMPER		2:50
	:25		THUMPER ACTIVITY ACTIVATE THUMPER NEAR THIRD GEOPHONE AND AT 15 FOOT INTERVALS ALONG CABLE BACK TO C/S (TOTAL 21)	
0253	116:30	SAMPLE COLLECTION COLLECT COMPREHENSIVE SAMPLE	ADVISE CDR OF IMPENDING ACTIVATIONS	3:00

M S F N — T V

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	116:00 - 116:30	5/18	3-141

116:30 — 0:00 - T1 (HORIZON) DET - ZERO/UP/START

(-.0507)
(+00.50)

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

P24 (FM-1)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

116:40 — 0:00 - T1 (HORIZON) DET - ZERO/UP/START

MSFN

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LAST MARK) DAC - OFF RECORD MAG % ____
V48 (11112)
(X1111)

ch.c 1/18/71

116:50 — V49 MNVR TO P52 ATT (116:55)
(11112)
(X1111)
~~(000, [illegible], 045) HGA P = -04, Y = 356~~
(184, 202, 045) HGA P 3 Y 229

CONFIGURE CAMERA: (GALACTIC SURVEY)
CM4/DAC/18/VHBW-BRKT, MIR, CONT (T1,1/500,∞) 24fps (2.5% MAG)

MAG (J) ____, MAG % ____
UTILITY PWR - ON

MSFN UPLINK:
CSM S.V.
PLANE CHANGE TGT LOAD
DESIRED ORIENT (PLANE CHANGE)

P52 (OPTION 3)
(LDG SITE ORIENT)

117:00

P24 LDMK TRACKING
TGT: FM-1 (1/60)
T_1 __ __ __.__ __.__ __
T_2 __ __ __.__ __.__ __
TCA __ __ __.__ __.__ __
T_3 __ __ __.__ __.__ __
R ____ °P ____ °Y ____ ° (T2 ACQ)
N or S NM ___ / SA ___ TA ___ (T2 ACQ)
N89
LAT -03.246
LONG/2 -08.659
ALT +000.00

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

LM FLIGHT PLAN

MCC-H

0253

1053 CST

	CDR	LMP	NOTES
116:30			
:35	COLLECT 4 KILOGRAM SOIL SAMPLE		
:40			3:00
116:45	M S F N T V		3:10
:50		SAMPLE COLLECTION	
:55			3:20
117:00	GO/NO-GO FOR EVA-1 EXTENSION		3:30

UPLINK TO CSM
CSM S.V.
PLANE CHANGE TGT
LOAD
DESIRED ORIENT
(PLANE CHANGE)

GO/NO-GO FOR
EVA-1 EXTENSION

0323

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	116:30 - 117:00	5/18	3-143

117:00

REPORT: GYRO TORQUING ANGLES

(11112)
(X1111)

P52 (OPTION 1)
(PLANE CHANGE ORIENT)

M
S
F
N

GDC ALIGN
VERIFY ORDEAL
CYCLE CMC MODE - FREE/AUTO
V48 (11101)(X1111)
V49 MNVR TO N. ECLIPTIC POLE ATT (117:16)
(272,009,356)

117:10
(11101)
(X1111)

GALACTIC SURVEY PHOTOGRAPHY

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

DAMP RATES:
VERIFY FDAI SCALE - 5/1
DISABLE ALL JETS ON TWO ADJACENT QUADS
WAIT 5 MINUTES FOR RATES TO DAMP
CMC MODE - FREE
VERIFY RATES ON FDAI ARE < 0.2°/SEC IN ALL AXIS
DAC - ON AT 24 fps FOR 2 SEC
CHANGE FRAME RATE TO TIME & SHUTTER SPEED TO 1/60
DIM INTERIOR LIGHTING

117:20

START PHOTO SEQUENCE:
2 FRAMES, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC

VERIFY RATES NOT > 0.2°/SEC IN ANY AXIS,
IF RATES > 0.2°/SEC, AND TIME PERMITS -
DAMP RATES FOR 60 SEC AND REPEAT EXPOSURE SEQUENCE

CHANGE TO 24fps & 1/500, RUN DAC FOR 2 SEC
LIGHTS UP, CMC MODE - AUTO, ENABLE ALL QUADS
REMOVE DAC FROM WINDOW

RECORD MAG % _____

REMOVE CAMERA SHIELD

117:30

MAP UPDATE REV 19

LOS : __ __ __ __ __ __ __

180°: __ __ __ __ __ __ __

AOS : __ __ __ __ __ __ __

LM FLIGHT PLAN

MCC-H

DUMP DSE 0323

1123 CST

	CDR	LMP	NOTES
117:00			3:30
:05	COLLECT FOOTBALL SIZE ROCK	MORTAR PACK ACTIVATION	IF EXTENSION GRANTED MORTAR PACK ACTIVATION WILL BE DELAYED UNTIL AFTER TRAVERSE
:10	RETURN TRAVERSE	RETURN TRAVERSE PULL MET ON TRAVERSE BACK TO LM	3:40
117:15	EVA CLOSEOUT POSITION TV TO VIEW MESA AND LADDER AREAS	EVA CLOSEOUT PULL MET NEAR MESA	
:20	STOW DOCUMENTED SAMPLES IN SRC NO. 1	STOW 70MM CAMERA IN ETB	3:50
	COLLECT ADDITIONAL SAMPLES TO FILL SRC NO. 1	STOW 16MM CAMERA ON MET	
:25	REMOVE SKIRT AND SEAL SRC NO. 1	UNSTOW AND PLACE SRC NO. 2 ON MET	
	CLEAN AND CHECK EMU'S		
117:30			4:00

MSFN TV

0853

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	117:00 - 117:30	5/18	3-145

CSM FLIGHT PLAN

117:30

(11101)
(X1111)

P30; VERIFY PC-1 TIG AND ΔV's
V49 MNVR TO PC-1 BURN PAD ATT (117:38)

SXT STAR CHECK

117:40

REV 19

SET DET COUNTING UP TO PLANE CHANGE

SECURE EQUIPMENT FOR PC-1

(11112)
(X1111)

V48 (11112)
(X1111)

117:50

(P40)
(0.5° DB)

P40 (TRIM)

118:00

P30 MANEUVER

SET STARS	C/S	S/P	M/S/G	P	C/&/	I/N	PURPOSE / PROP/GUID	
	+						WT	N47
R_{ALIGN} ___ ___ ___		O	O				P_{TRIM}	N48
P_{ALIGN} ___ ___ ___		O	O				Y_{TRIM}	
Y_{ALIGN} ___ ___ ___	+	O	O				HRS	GETI
	+	O	O	O			MIN	N33
	+	O					SEC	
							ΔV_X	N81
ULLAGE ___							ΔV_Y	
							ΔV_Z	
	X	X	X				R	(180)
	X	X	X				P	(354)
	X	X	X				Y	(003)
	+						H_A	N44
							H_P	
	+						ΔVT	
HORIZON/WINDOW ___	X	X	X				BT	
	X						ΔVC	
	X	X	X	X			SXTS	
	+					O	SFT	
	+				O	O	TRN	
	X	X	X				BSS	
	X	X					SPA	
	X	X	X				SXP	
OTHER ___		O					LAT	N61
							LONG	
	+						RTGO	EMS
	+						V10	
							GET 0.05G	

LM FLIGHT PLAN

1153 CST

MCC-H 0353

	CDR	LMP	NOTES
117:30		EVA TERMINATION INGRESS CHECK LM & EMU ASSIST CDR	4:00
:35	TRANSFER ETB INTO LM TRANSFER SRC INTO LM ASCEND LADDER		
:40	STOW LEC AND INGRESS CLOSE HATCH	TRANSFER LEC TO CDR	4:10
	REPRESSURIZE CABIN		
117:45	POST-EVA SYSTEMS CONFIGURATION CONFIGURE LM ECS		4:15/0:00
:50	DOFF HELMETS AND GLOVES CONNECT LM ECS HOSES TO SUIT CONNECT TO LM COMM AND RECONFIGURE COMM BIOMED-LEFT, RECORDER-OFF		
:55	PLSS O_2 RECHARGE		
118:00	CONNECT LMP PLSS TO LM O_2 SUPPLY AND FILL (2 MIN) CONNECT CDR PLSS TO LM O_2 SUPPLY AND FILL (2 MIN)		

M S F N — T V

0423.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	117:30 - 118:00	5/18-19	3-147

CSM FLIGHT PLAN

118:00

(P40)
(0.5° DB)

ACQ MSFN HGA P 3, Y 274

GO/NO-GO FOR PLANE CHANGE 1

CSM PLANE CHANGE 1 BURN TABLE			
P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TERMINATE	± 10° TERMINATE	BT + 1 SEC	NO TRIM

118:10

CSM PLANE CHANGE (180, 354,003)

_____:_____:_____._____

TIG: 118:09:40
BT: 18.4 SEC
ΔVT: 360.7 FPS
ULLAGE: 4 JET, 11 SEC
ORBIT: 61.7 X 57.4

(11112)
(X1111)

P00
REPORT: BURN STATUS

MSFN UPLINK:
DESIRED ORIENT (LIFT-OFF)
RLS UPDATE (IF REQ'D)

MSFN UPDATE:
REFSMMAT 00 TIME
EARTHSHINE PHOTO PAD (118:45)
MAP UPDATE REV 20 (119:10)

REFSMMAT 00 TIME						
+	0	0				HRS
+	0	0	0			MIN
+	0					SEC

V49 MNVR TO P52 ATT (118:28)
(329,336,319) HGA P -27, Y 135

118:20

CONFIGURE CAMERAS: (EARTHSHINE)
CM4/DAC/18/VHBW-BRKT, MIR, CONT (T1,1/500,∞) 24 fps (25% MAG)

MAG (K) _____, MAG % _____
UTILITY PWR - ON
DAC-ON AT 24FPS for 2 SEC (COVER LENS)
CHANGE FRAME RATE TO 1 FPS & SHUTTER SPEED TO 1/250

CM4/DC/80/VHBW-BRKT, IVL/A (PCM CABLE) (f2.8,1/60,∞) (51 FR)

MAG (S) _____, FR # _____
COVER LENS, CYCLE 3 FRAMES

P52 (OPTION 1) GYRO TORQUE
(LIFT-OFF ORIENT)

118:30

MSFN

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN

C.R. B 11/1/71

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE B (JAN)	~~DECEMBER 25, 1970~~ January 11, 71.	3-148

LM FLIGHT PLAN

MCC-H	1223 CST	MSFN	TV	CDR	LMP	NOTES
GO/NO-GO FOR PLANE CHANGE	118:00			PLSS/OPS DOFFING		
				REMOVE RCU'S, DOFF PLSS/OPS		
	:05			REPLACE LMP PLSS BAT & LiOH CARTRIDGE		0:20
				REMOVE OPS, CHECK PRESSURE, AND STOW ON ENGINE COVER		
	:10			STOW PLSS (RECHARGE STATION)		
UPLINK TO CSM DESIRED ORIENT (LIFT-OFF) RLS (IF REQ'D) UPDATE TO CSM REFSMMAT 00 TIME EARTHSHINE PHOTO PAD MAP UPDATE REV 20				REPLACE LMP PLSS BAT & LiOH CARTRIDGE		
				REMOVE OPS AND STOW PLSS ON FLOOR		
	118:15			CHECK OPS PRESSURE		0:30
				STOW LMP OPS ON FLOOR		
				STOW PLSS ON FLOOR		
	:20			STOW RCU'S ON DATA FILE		
				STOW DISP CONT ON MID-STEP		
				STOW LEVA'S ON LH FORWARD FLOOR		
	:25					0:40
DUMP DSE				POST-EVA CABIN CONFIGURATION UNSTOW SCALE		
	118:30					

CSM FLIGHT PLAN

118:30

(11112)
(X1111)

GDC ALIGN
VERIFY ORDEAL
V49 MNVR TO EARTHSHINE ATT (118:41)
(000,164,000) HGA P -27, Y 180

118:40

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+005.00)
(+00001)

(-.0507)
(+05.00)

PRO TO START PITCH RATE (000,258/164,000)

EARTHSHINE PHOTOGRAPHY
118:44:39 - DET-ZERO/UP/START (T START)(SS -13 MIN)
INHIBIT - A3,C4,B3,D4 THRUSTERS
DIM INTERIOR LIGHTS

118:50

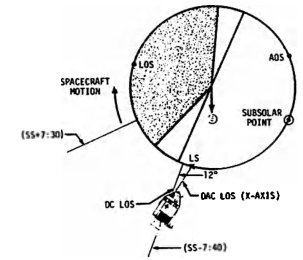
5:20 - DAC - ON (SS -7:40)
5:30 - DC - ON (SS -7:30)

7:30 - CHANGE DC SHUTTER TO 1/15 SEC (SS -5:30)
CHANGE DAC SHUTTER TO 1/60 SEC

119:00

M S F N : X

EARTHSHINE PHOTOGRAPHY



EARTHSHINE PHOTO PAD

T START: __ __ __ • __ __ • __ __

START DET AT SUNSET -13 MIN

LM FLIGHT PLAN

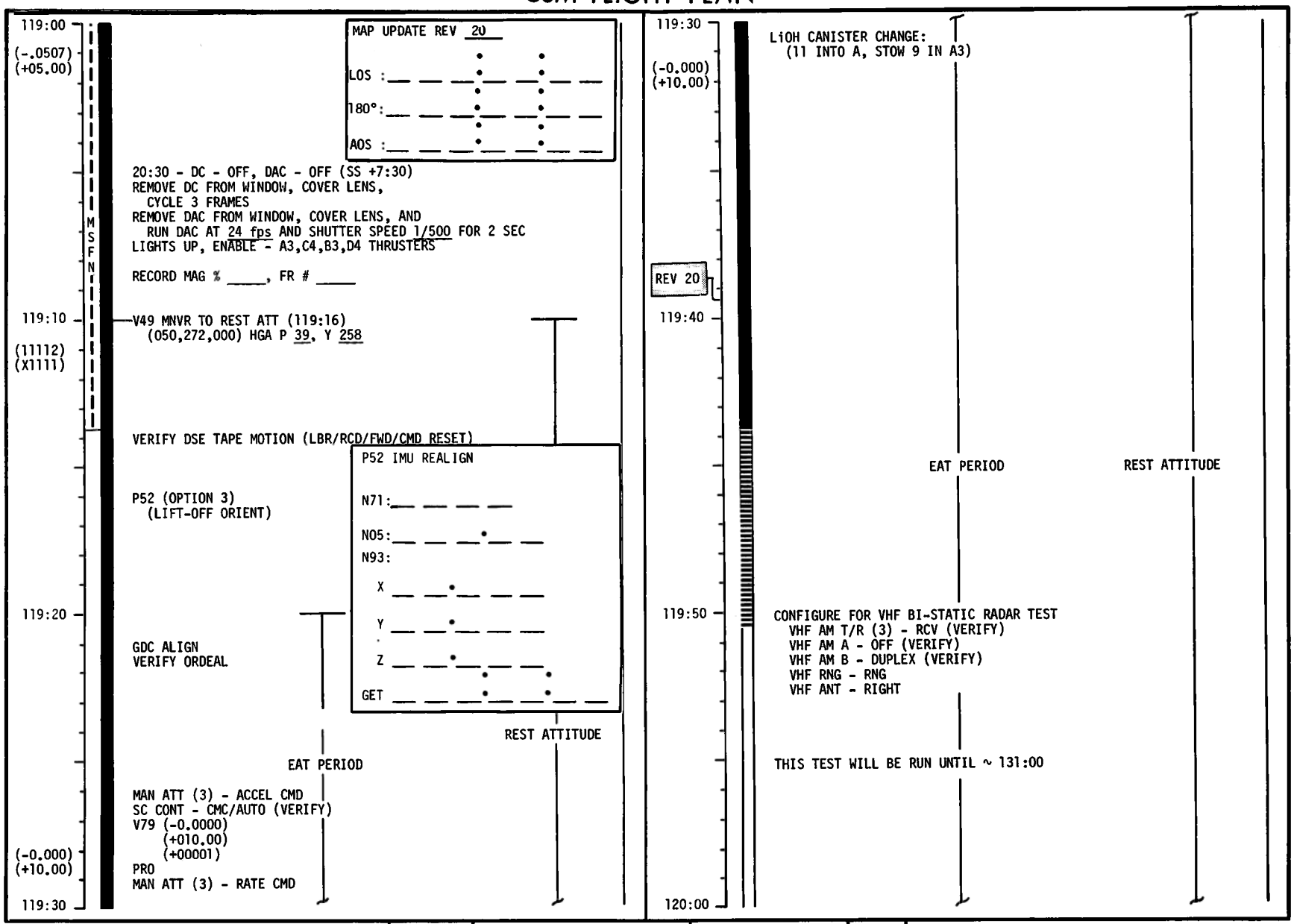
MCC-H	1253 CST	CDR	LMP	NOTES
RECORD SAMPLE BAG WEIGHT	118:30	POST-EVA CABIN CONFIGURATION (CONT) WEIGH SAMPLE BAG, REPORT: WEIGHT EMPTY ETB RECONFIGURE CAMERAS STOW CSRC REPACK ETB WEIGH SRC, REPORT: WEIGHT VERIFY CB CONFIGURATION MODULATE-PM UNSTOW LUNAR SURFACE CHECKLIST STOW EVA-1 PREP & POST CARD		
	:35			0:50
RECORD SRC WEIGHT	:40			
	118:45			1:00
	:50			
	:55	EAT PERIOD		1:10
	119:00			

TV

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	118:30 - 119:00	5/19	3-151

CSM FLIGHT PLAN



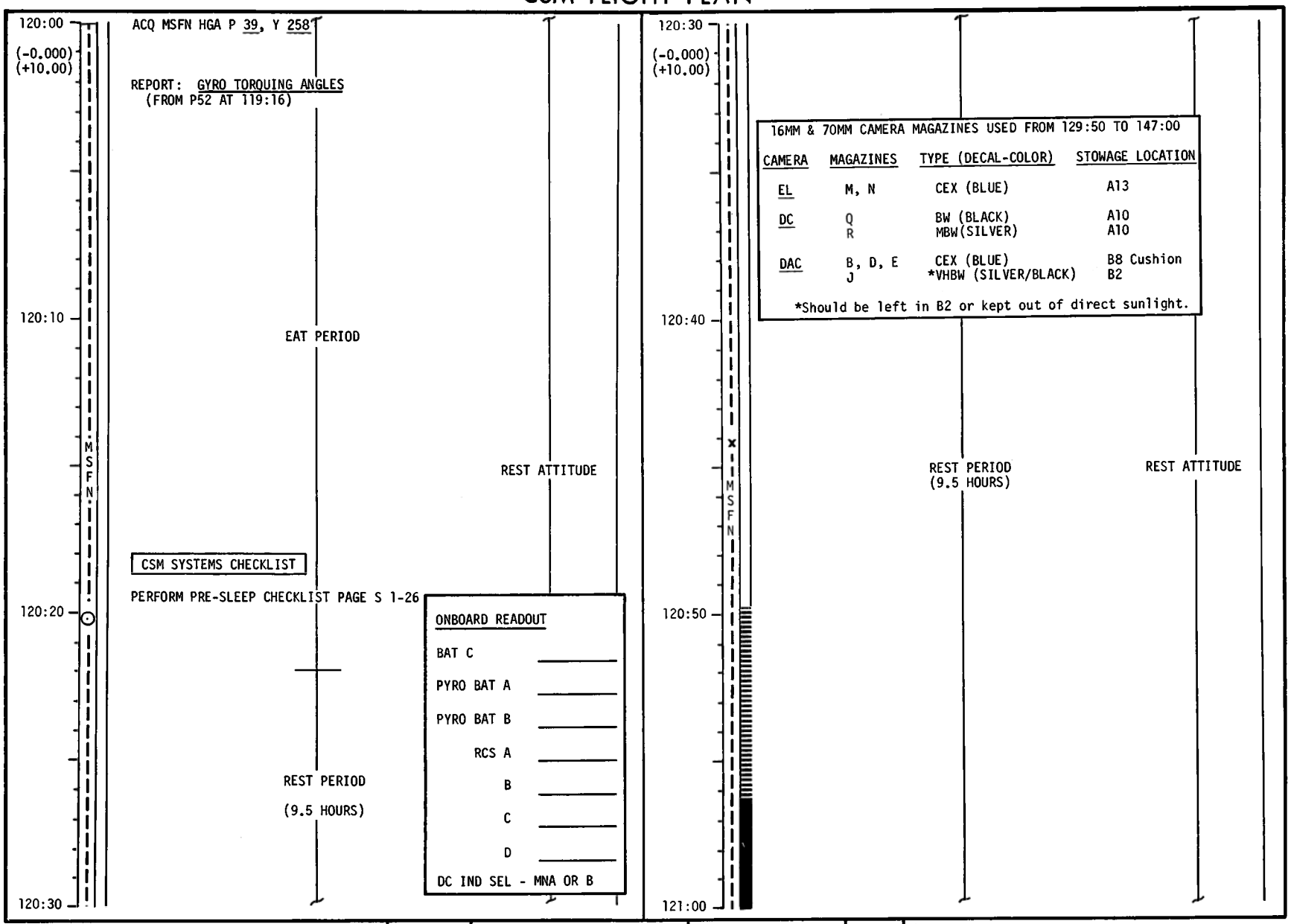
LM FLIGHT PLAN

MCC-H	1323 CST	CDR	LMP	NOTES
	119:00			
	:10			1:20
	:20	EAT PERIOD		1:30
	119:30			1:40
UPDATE TO LM TIME OF LIFT-OFF FOR REV 20 THRU 25				1:50
	:40	PLSS RECHARGE WEIGH RCU PLSS FEEDWATER COLLECTION (BOTH) WEIGH PLSS FEEDWATER COLLECTION BAGS REPORT: RCU & PLSS FEEDWATER WEIGHTS		TIME OF LIFT-OFF ASSUMES NOMINAL PLANE CHANGE 2:00
RECORD RCU & PLSS FEEDWATER WEIGHTS	:50			2:10
	120:00			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	119:00 - 120:00	5/19-20	3-153

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-154

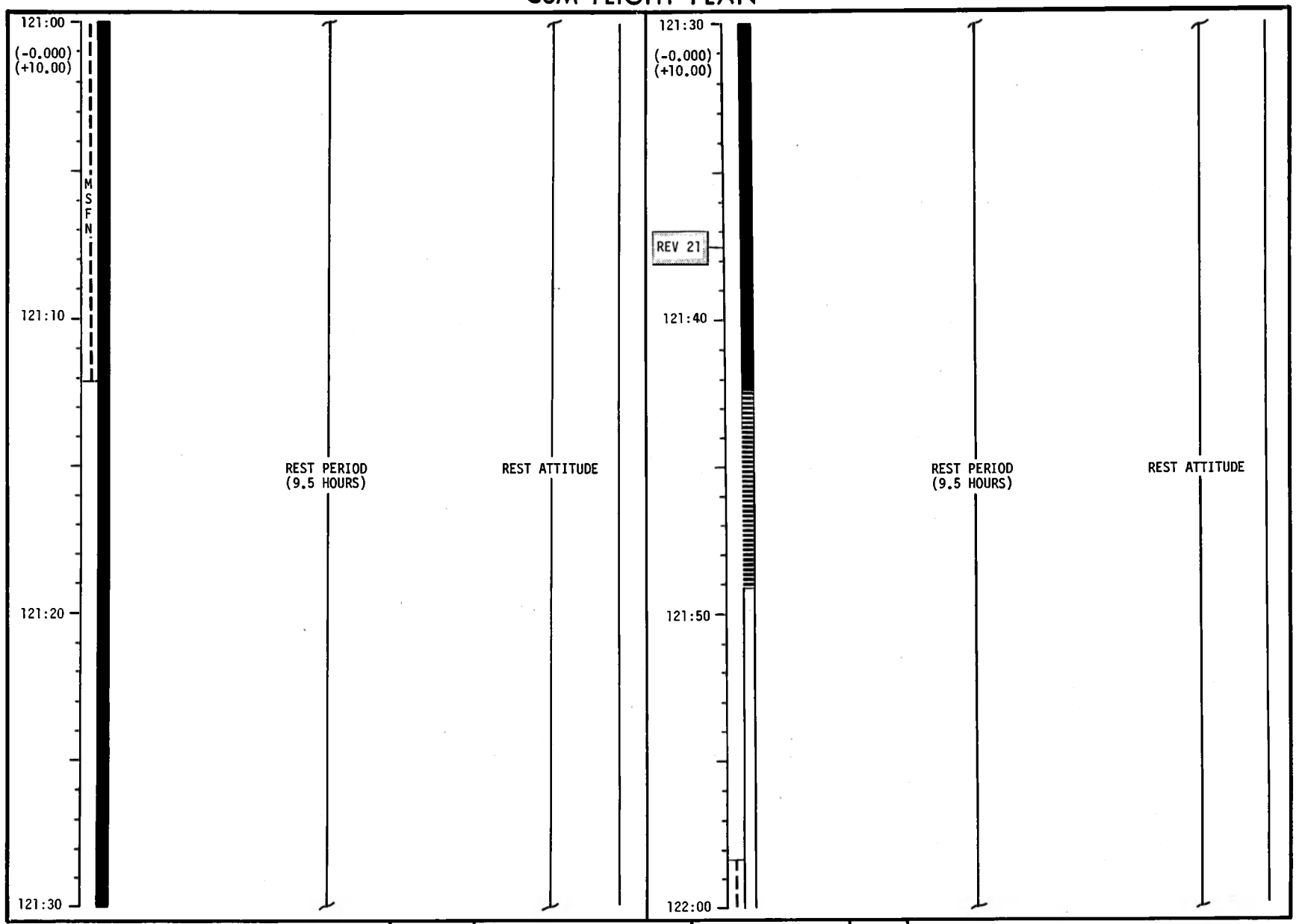
LM FLIGHT PLAN

MCC-H	1423 CST	CDR	LMP	NOTES
DUMP DSE	120:00	LCG PUMP CB - OPEN CONNECT LM O_2 SUPPLY TO PLSS AND FILL (10 MIN) CONNECT LM H_2O SUPPLY TO PLSS AND FILL (3 MIN) CONNECT LM O_2 SUPPLY TO 2ND PLSS AND FILL (10 MIN) CONNECT LM H_2O SUPPLY TO 2ND PLSS AND FILL (3 MIN)		2:20
	:10			
UPDATE TO LM FLIGHT PLAN FOR POSSIBLE EVA-2 EXTENSION	:20	EVA DEBRIEFING (5 MIN) CREW STATUS (RADIATION, MEDICATION) VOICE - DN VOICE BU S-BD PWR AMPL - OFF VHF ANT -AFT		2:30 2:40
	120:30	CONFIGURE SLEEP STATIONS		2:50
	:40			
	:50	REST PERIOD (10 HOURS)		
	121:00			

MSFN

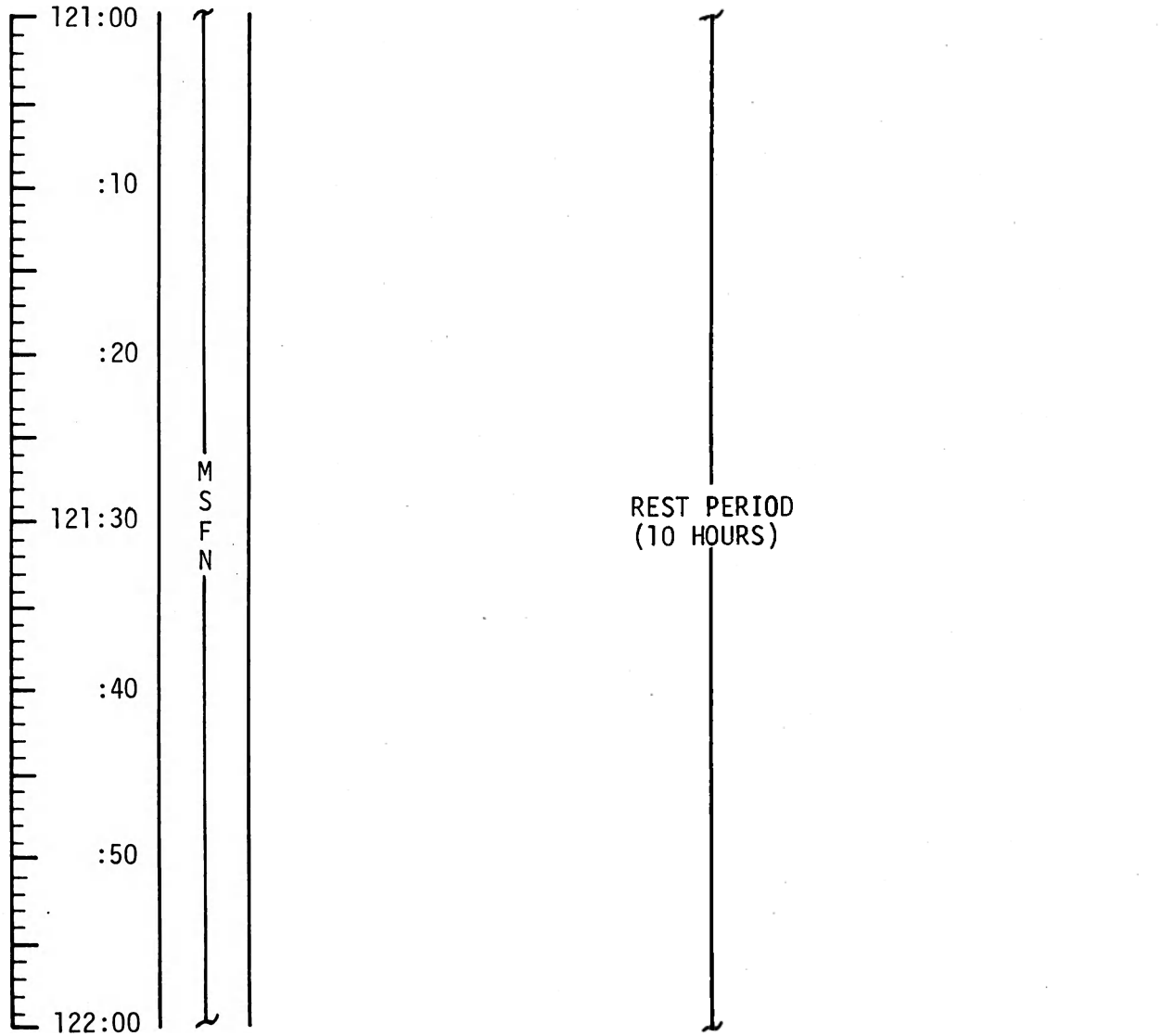
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	120:00 - 121:00	5/20	3-155

CSM FLIGHT PLAN



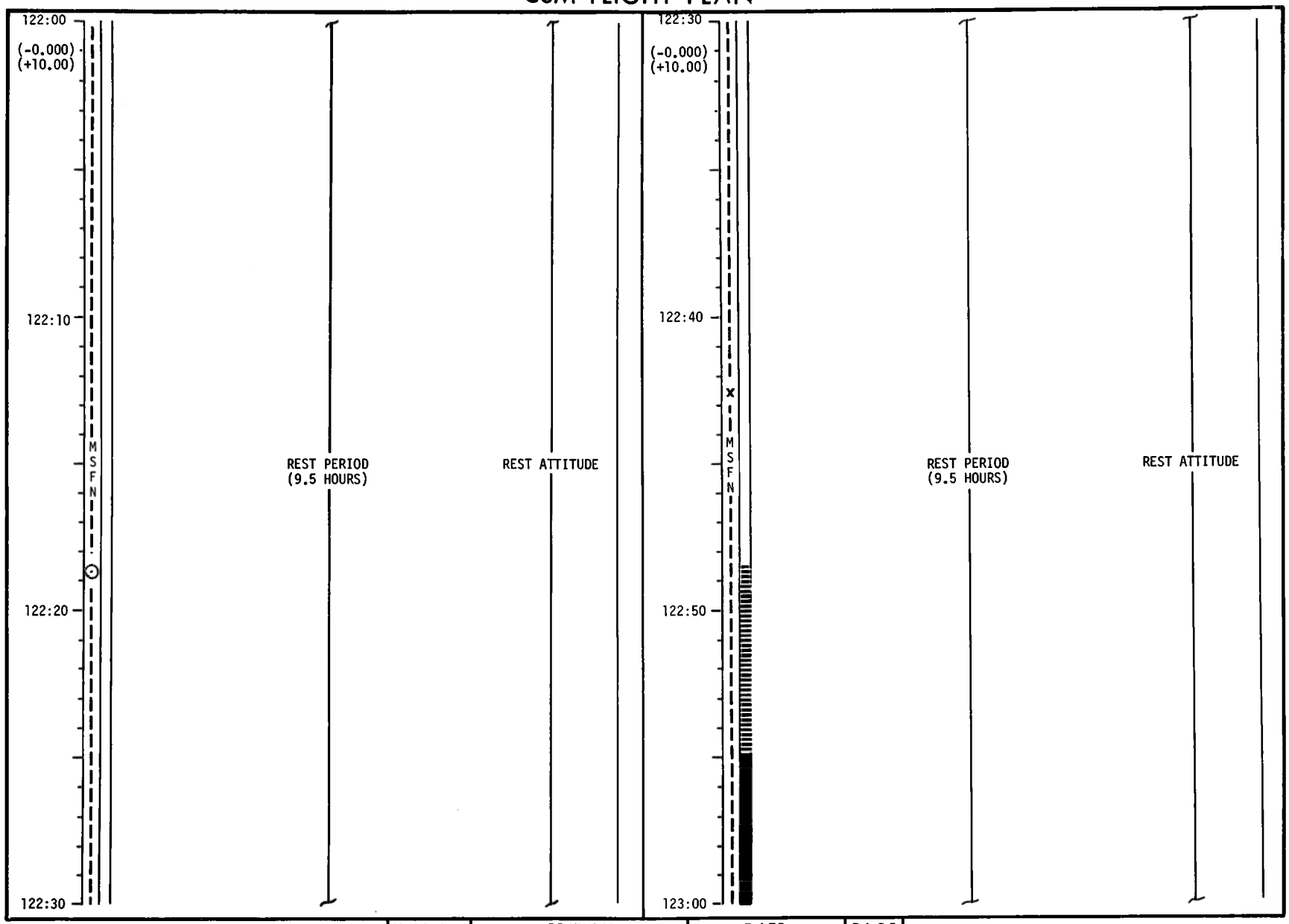
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-156

LM FLIGHT PLAN



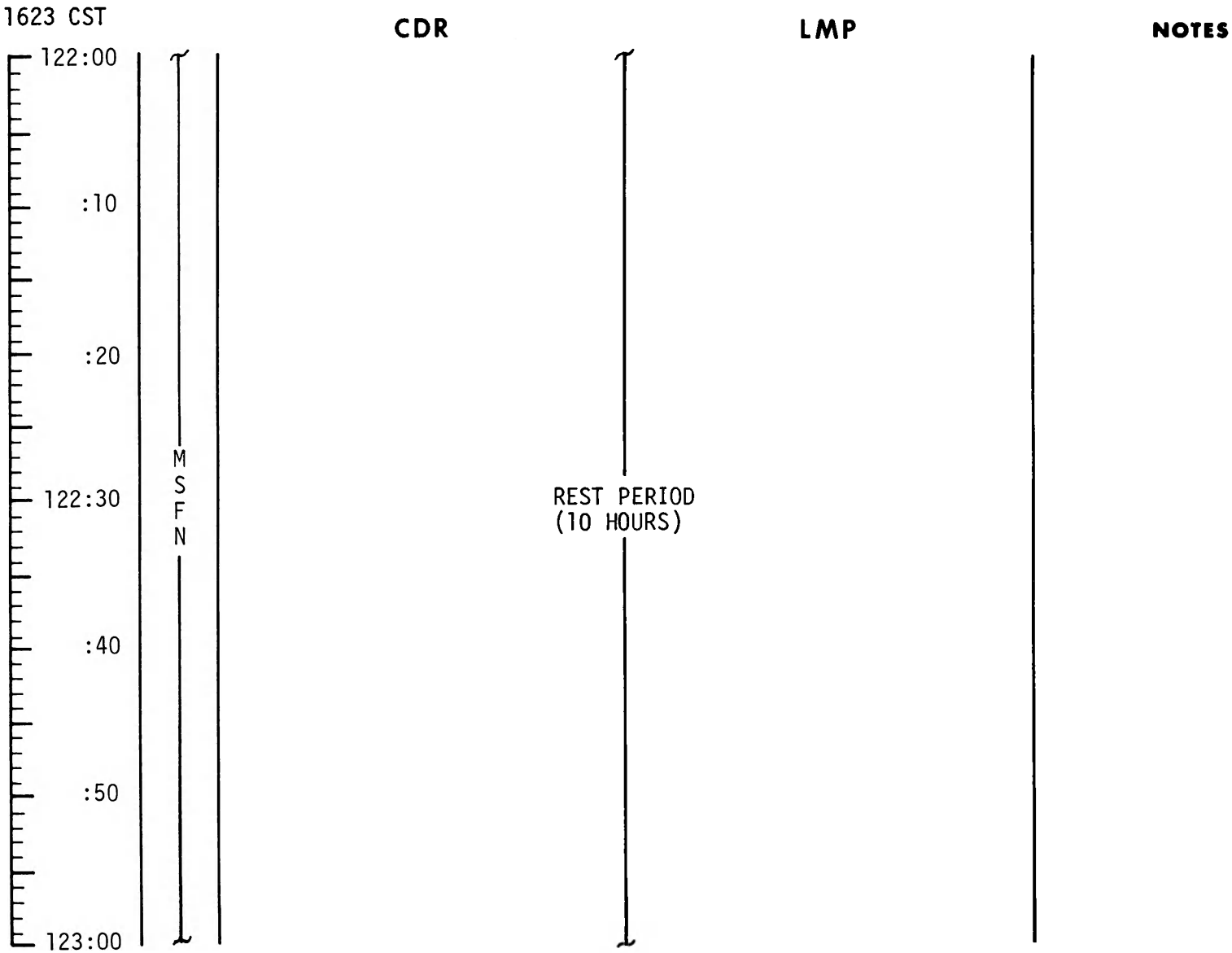
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	121:00 - 122:00	5/20-21	3-157

CSM FLIGHT PLAN



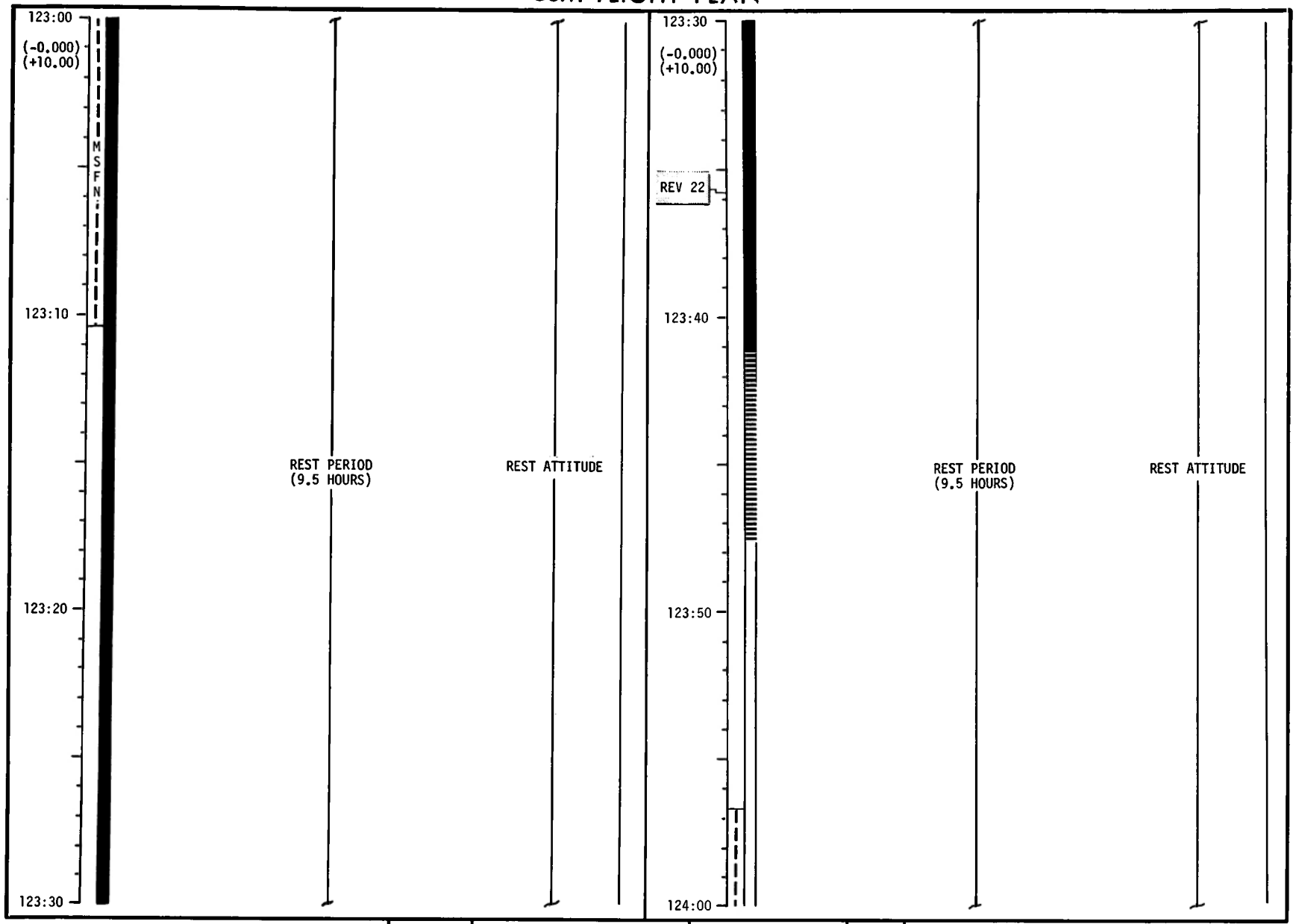
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-158

LM FLIGHT PLAN



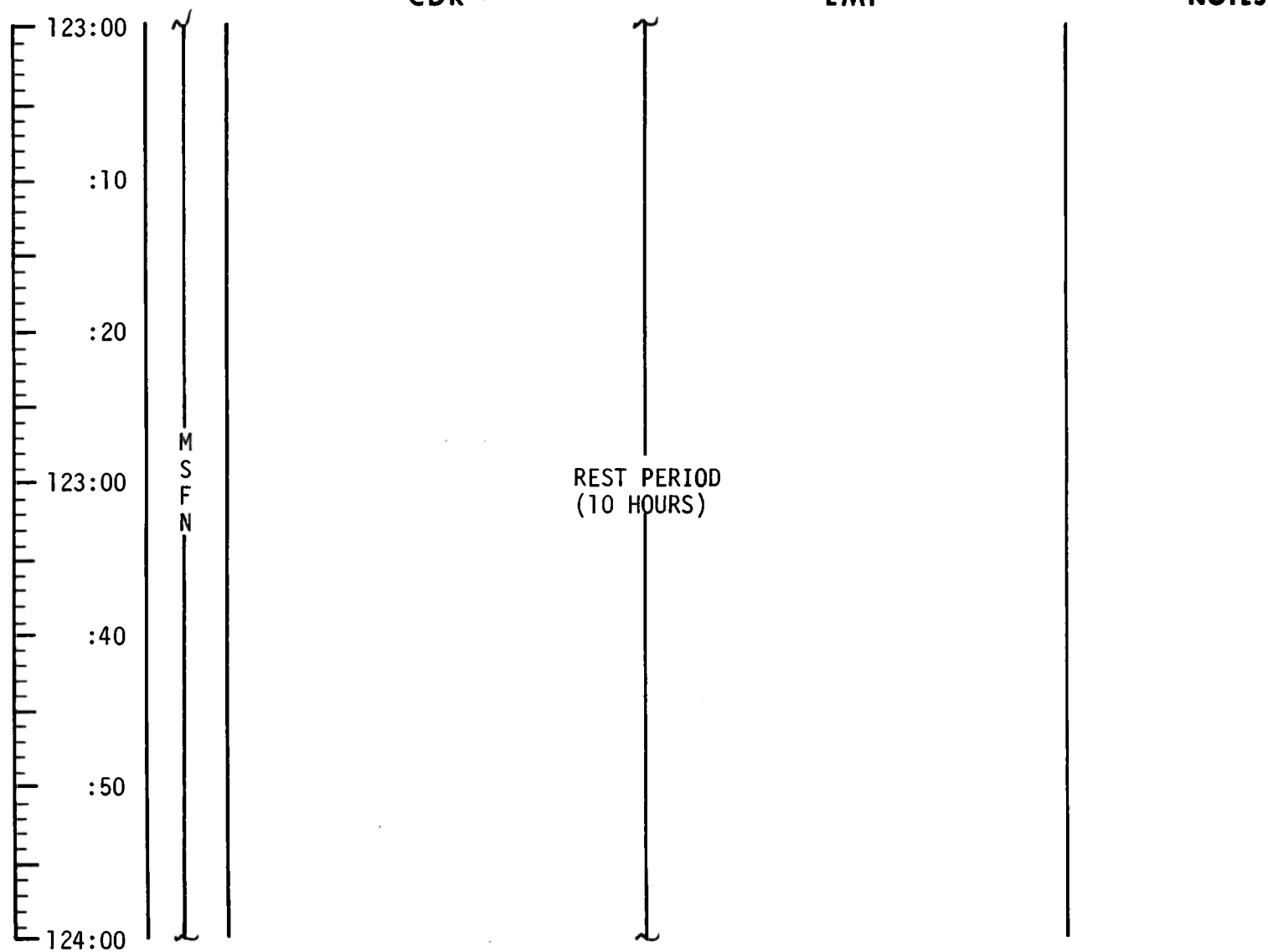
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	122:00 - 123:00	5/21	3-159

CSM FLIGHT PLAN



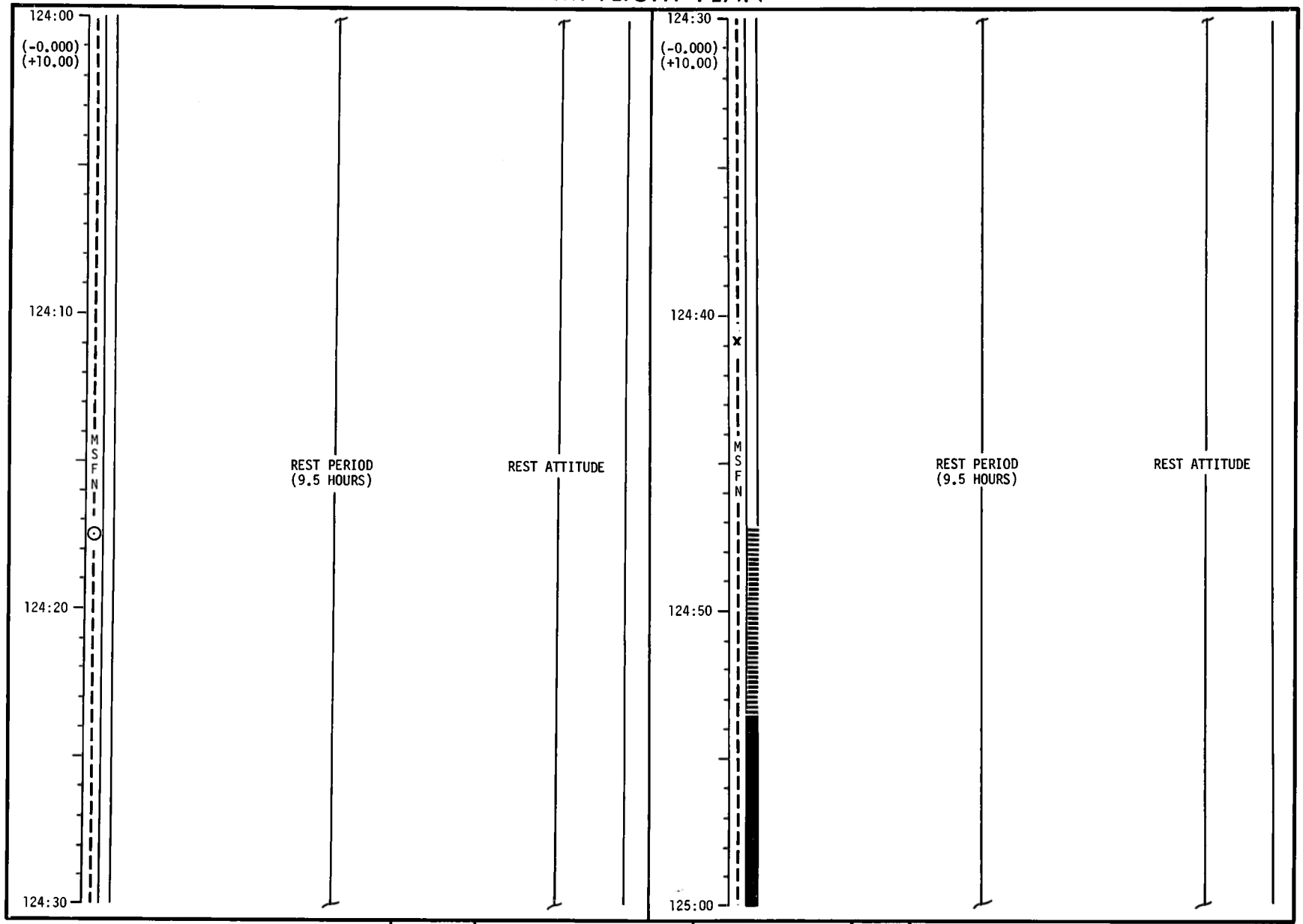
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-160

LM FLIGHT PLAN



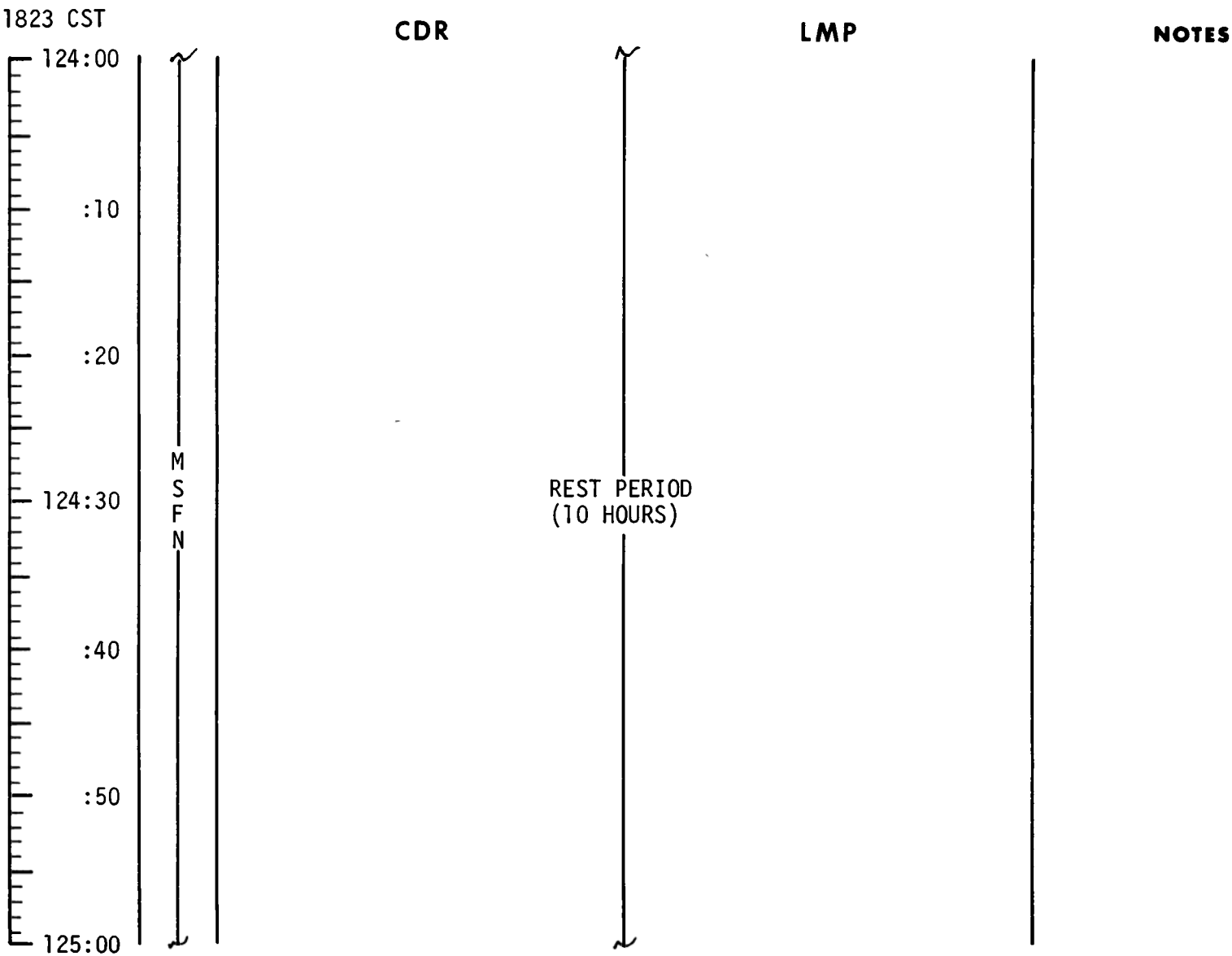
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	123:00 - 124:00	5/21-22	3-161

CSM FLIGHT PLAN



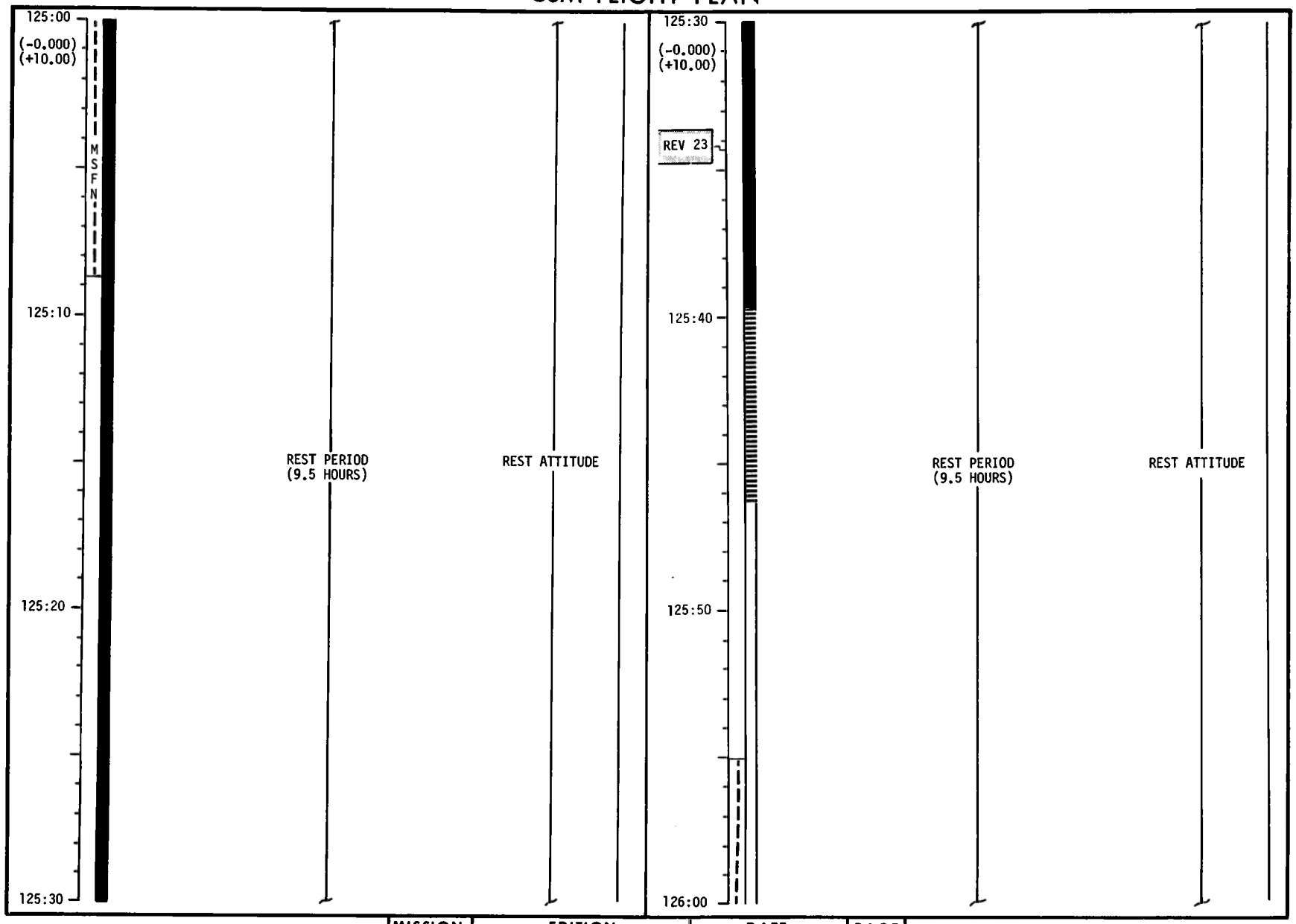
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-162

LM FLIGHT PLAN



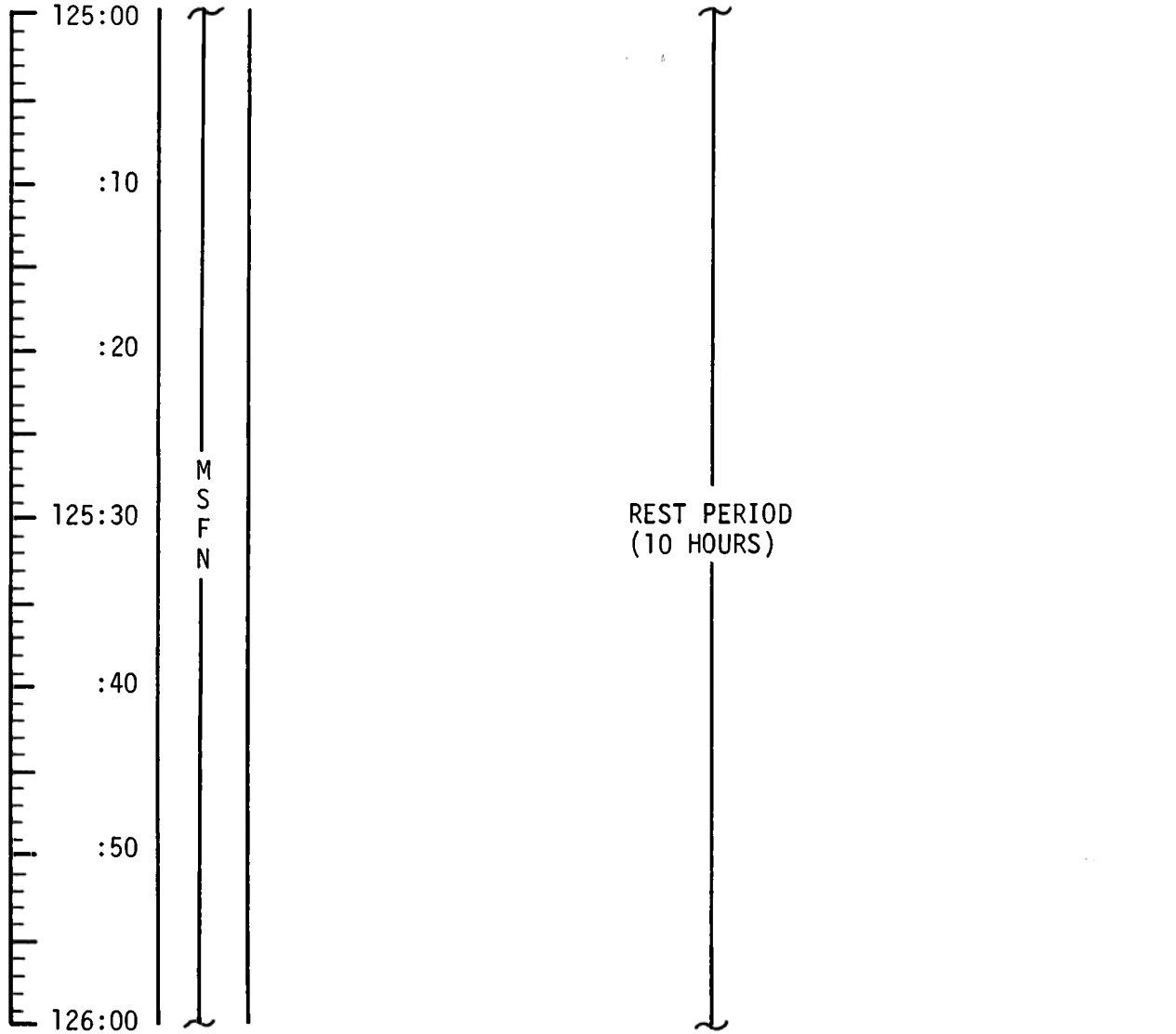
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	124:00 - 125:00	5/22	3-163

CSM FLIGHT PLAN

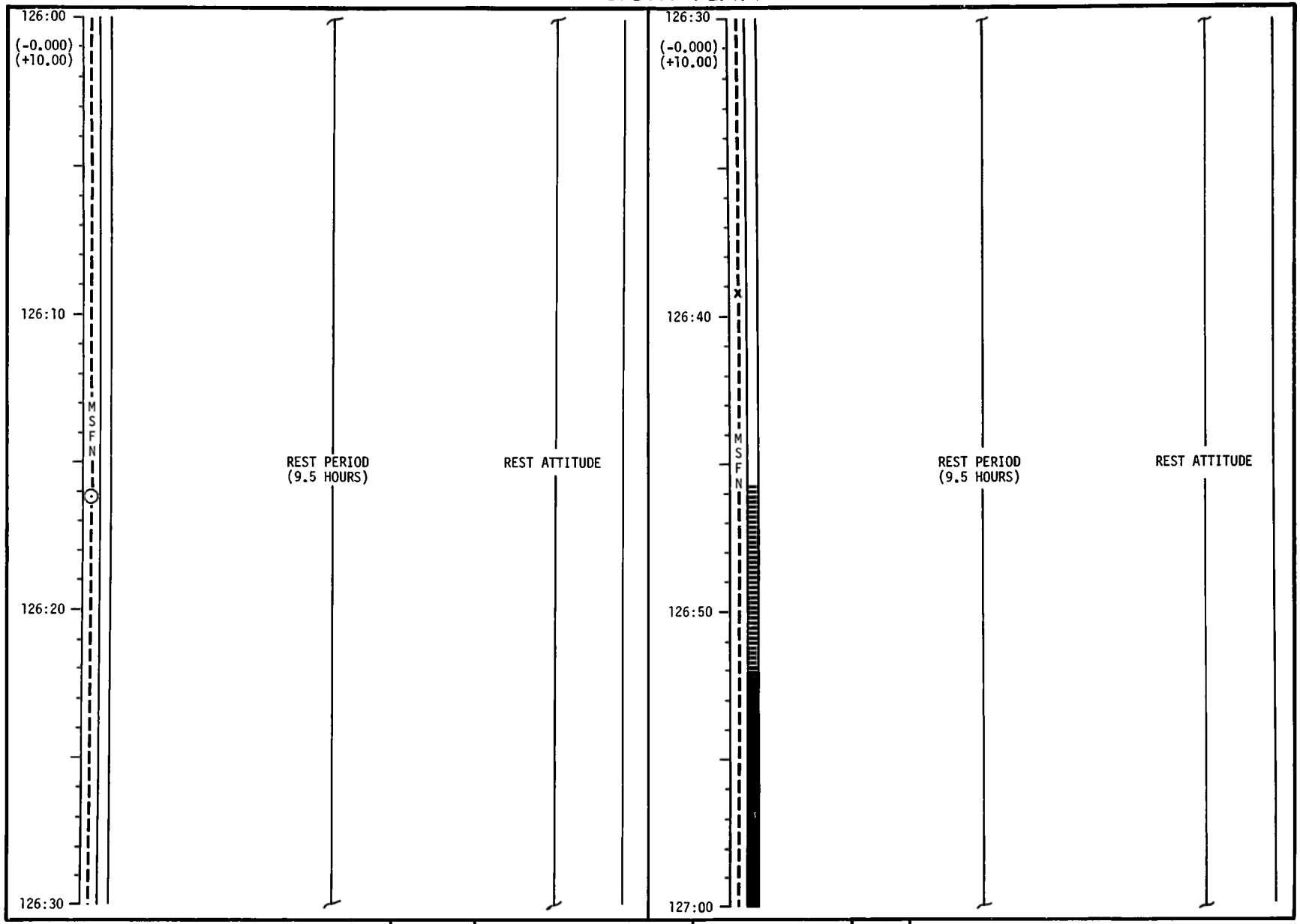


MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-164

LM FLIGHT PLAN

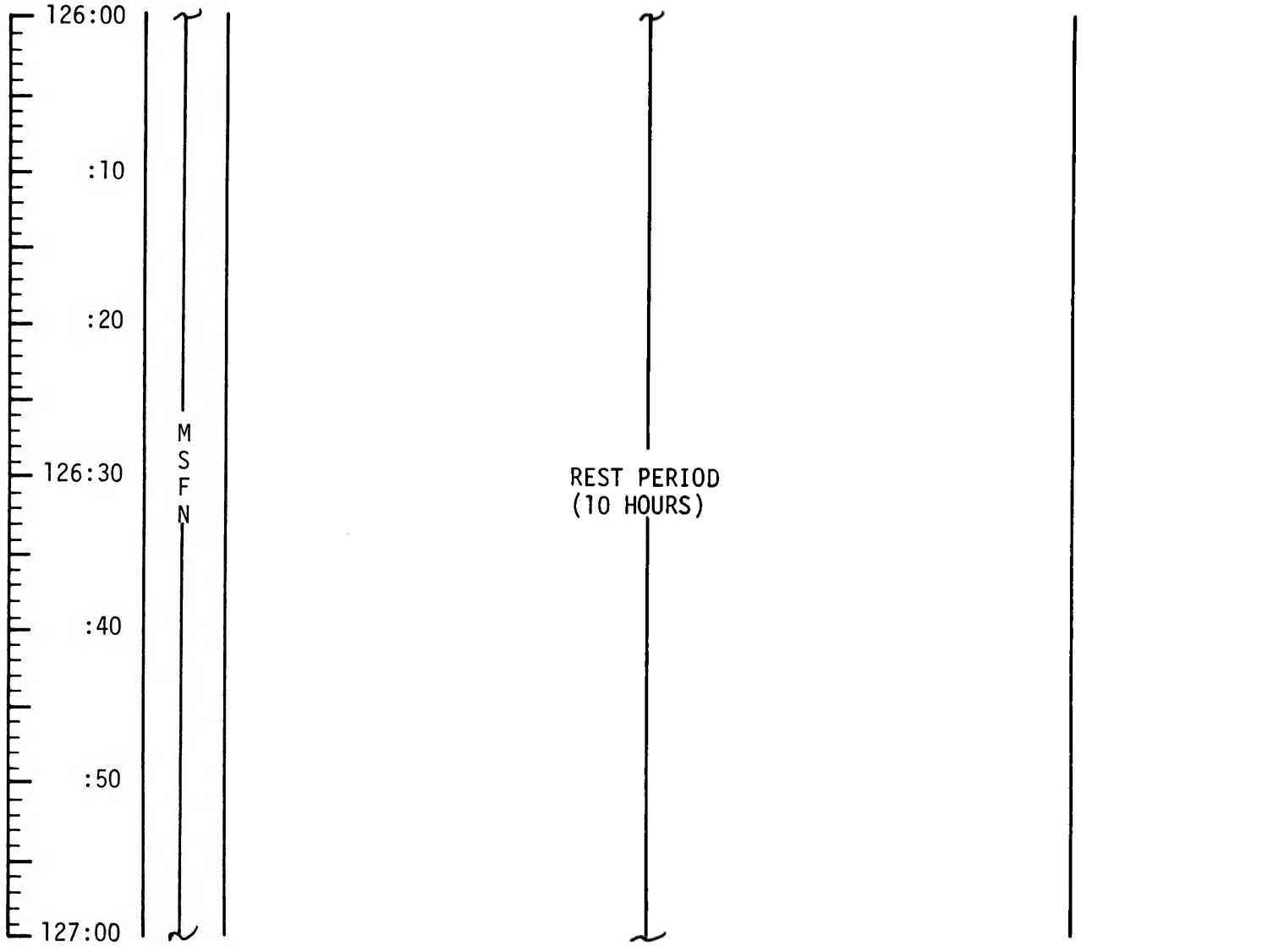


CSM FLIGHT PLAN



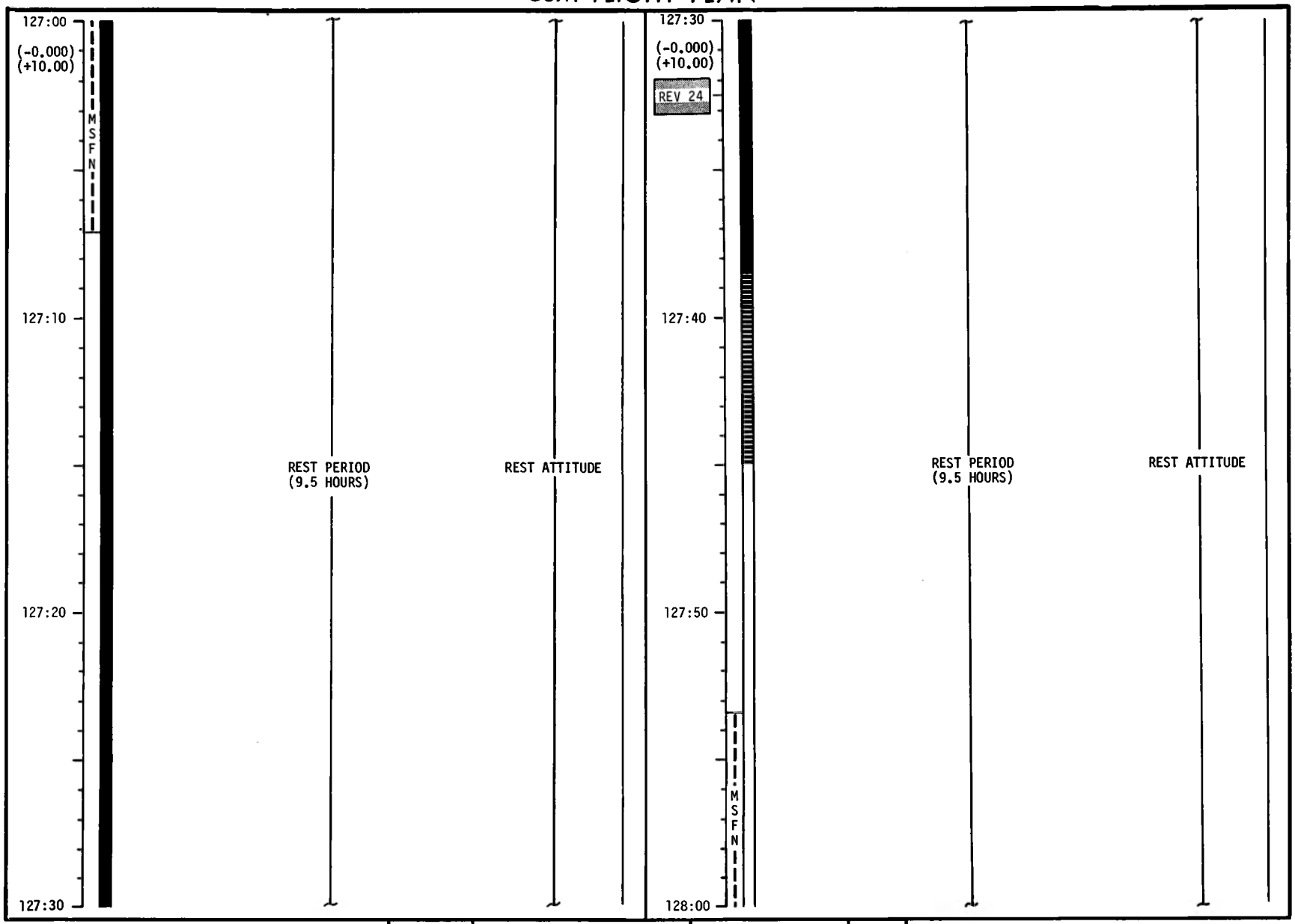
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-166

LM FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	126:00 - 127:00	5/23	3-167

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-168

LM FLIGHT PLAN

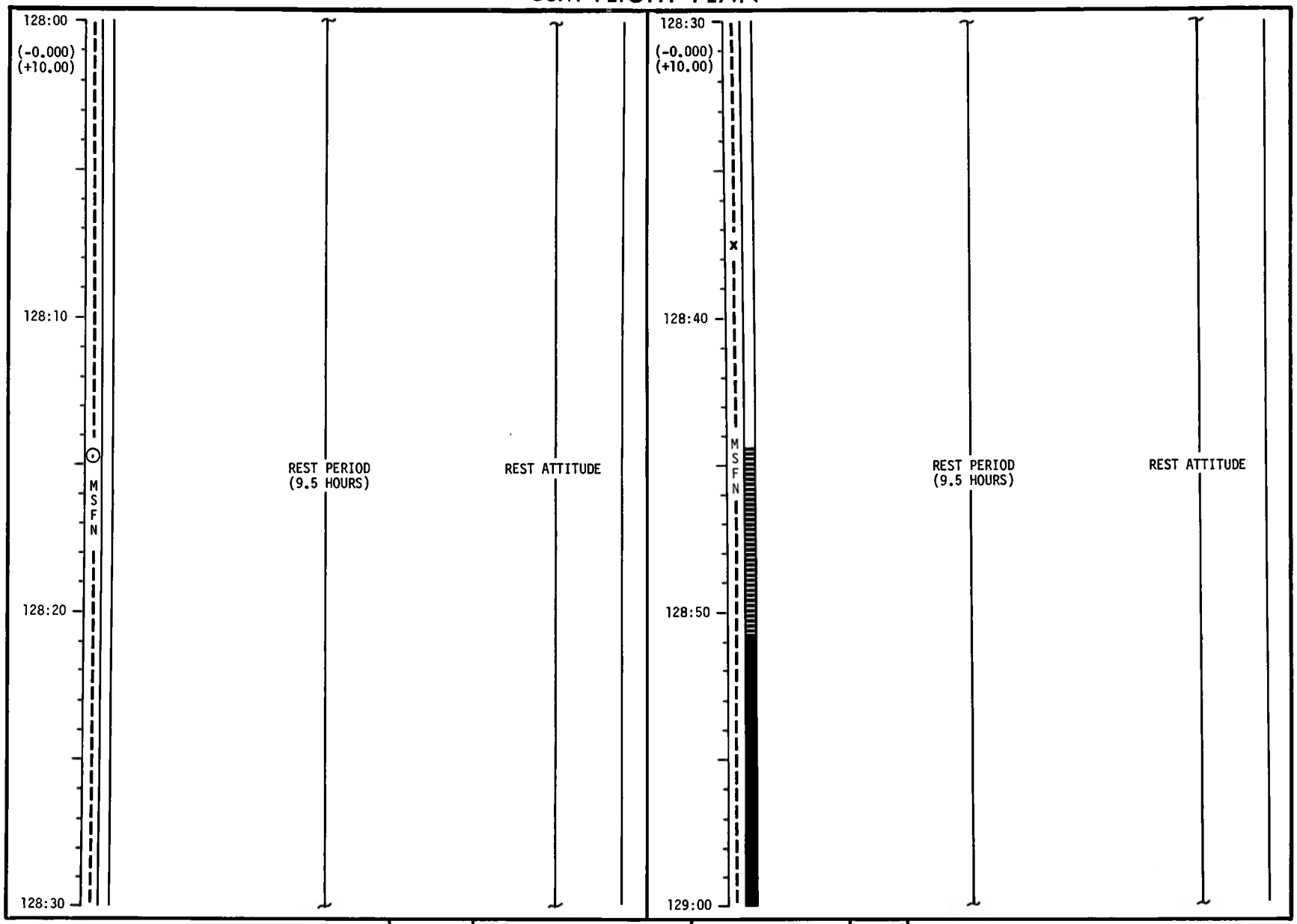
MCC-H	2123 CST	CDR	LMP	NOTES
	127:00	MSFN	REST PERIOD (10 HOURS)	
	:10			
	:20			
	127:30			
	:40			
	:50			
	128:00			

DUMP DSE

1423

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	127:00 - 128:00	5/23-24	3-169

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-170

LM FLIGHT PLAN

MCC-H

1423

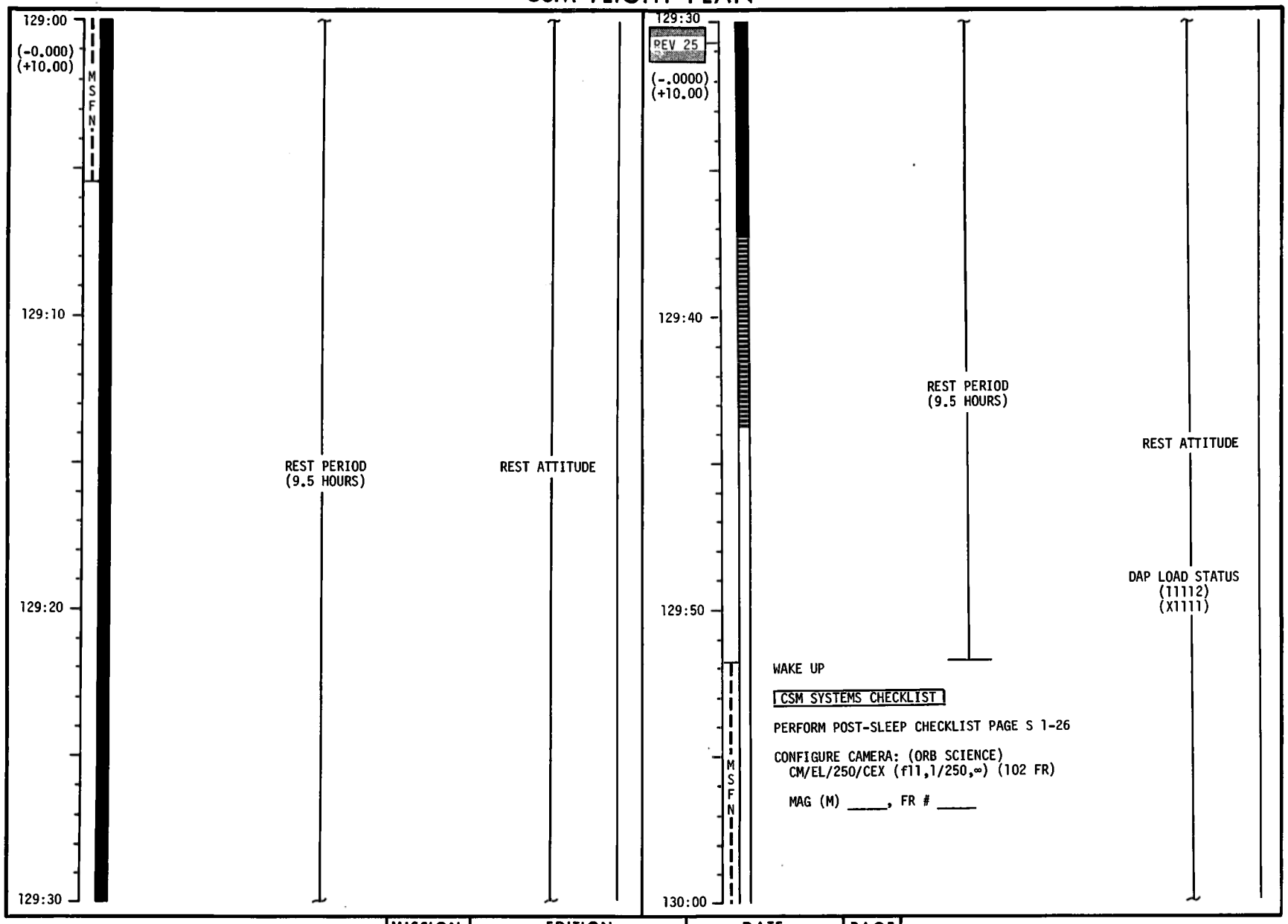
2223 CST

128:00	CDR	LMP	NOTES
:10			
:20			
128:30	MSFN	REST PERIOD (10 HOURS)	
:40			
:50			
129:00			

1523

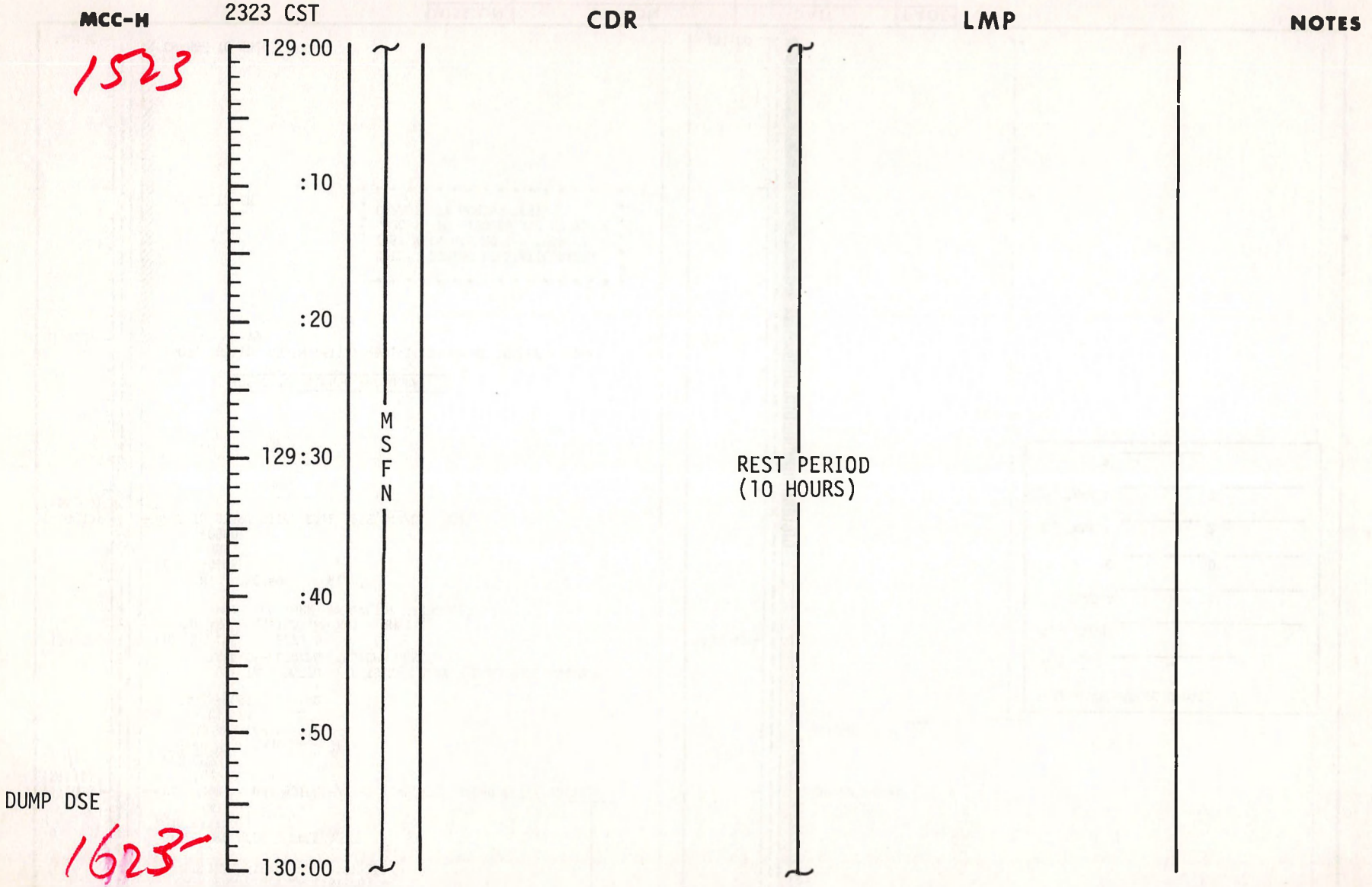
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	128:00 - 129:00	5/24	3-171

CSM FLIGHT PLAN



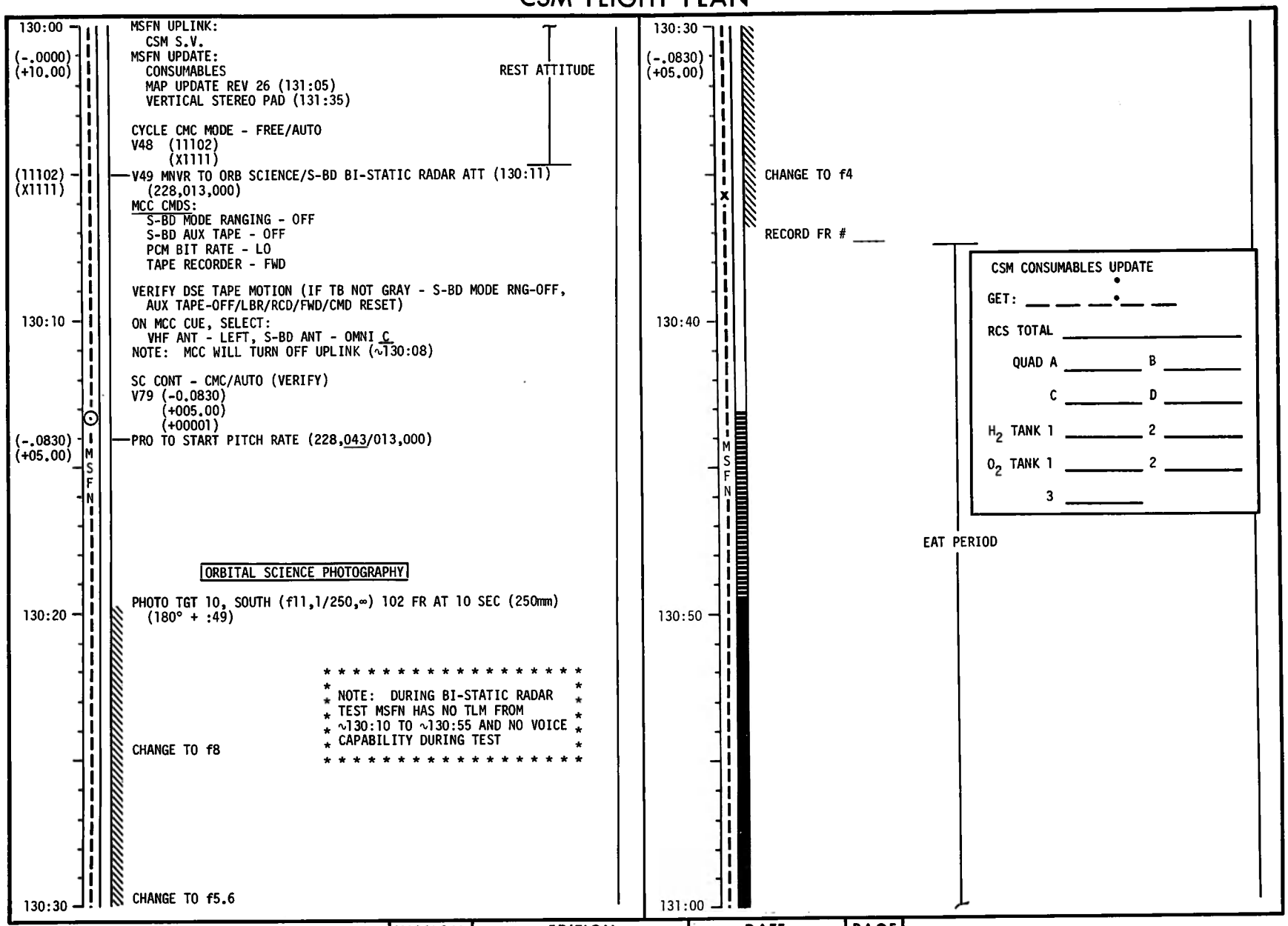
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-172

LM FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	129:00 - 130:00	5/24-25	3-173

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-174

LM FLIGHT PLAN

MCC-H	0023 CST	CDR	LMP	NOTES
UPLINK TO CSM 1623 CSM S.V. UPDATE TO CSM CONSUMABLES MAP UPDATE REV 26 VERTICAL STEREO PAD	130:00			
	:10		REST PERIOD (10 HOURS)	
	:20			
	130:30	STOW HAMMOCKS CHANGE LiOH CANISTER		
	:40		BIOMED - RIGHT EAT PERIOD	
STAY/NO-STAY FOR EVA-2 PREP		STAY/NO-STAY FOR EVA PREP		
	:50			
		CREW STATUS REPORT (SLEEP DOSIMETER)		
1723	131:00			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	130:00 - 131:00	6/25	3-175

CSM FLIGHT PLAN

131:00
(-.0830)
(+05.00)
MSFN
(11102)
(X1111)
131:10
131:20
REV 26
131:30

MAP UPDATE REV 26
LOS :
180°:
AOS :

V46
V49 MNVR TO P52 ATT (131:17)
(180,114,000)

DISCONTINUE BI-STATIC RADAR TEST
VHF RNG - OFF
S-BD MODE RANGING - RANGING (VERIFY)
S-BD AUX TAPE - DN VOICE BU (VERIFY)

EAT PERIOD

P52 (OPTION 3)
(LIFT-OFF ORIENT)

P52 IMU REALIGN
N71:
N05:
N93:
X
Y
Z
GET

GDC ALIGN
VERIFY ORDEAL
V49 MNVR TO VERT STEREO ATT (131:26)
(180,021,000)

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)
PRO TO START PITCH RATE (180,282/021,000)

131:30
(-.0507)
(+00.50)
131:40
131:50
MSFN
132:00

CONFIGURE CAMERA: (VERT STEREO)
CM4/DC/80/BW-BRKT, IVL, PCM CABLE (f4,1/250,∞) (174 FR)

MAG (Q) ____, FR # ____

VERTICAL STEREO PHOTO
T START:
T STOP:

BOOTSTRAP (VERT STEREO) & ORBITAL SCIENCE PHOTOGRAPHY

ADJUST COAS FOR +12° ELEVATION

V06N65 (DO NOT ENTER)
CONFIGURE DSE (HBR/RCD/FWD/CMD RESET)
131:43:19 - ENTER, DC - ON (T START)

RECORD TIME FROM V06N65

PCM BIT RATE - LO

CHANGE DC f-STOP TO (f8)

V64; ACQ MSFN HGA P -57, Y 356
REPORT: GYRO TORQUING ANGLES
(FROM P52 AT 131:18)

VERTICAL STRIP

CONFIGURE CAMERA: (ORB SCIENCE)
CM/EL/250/CEX (f8,1/250,∞) (43 FR)

MAG (M) ____, FR # ____

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-176

LM FLIGHT PLAN

MCC-H

1723

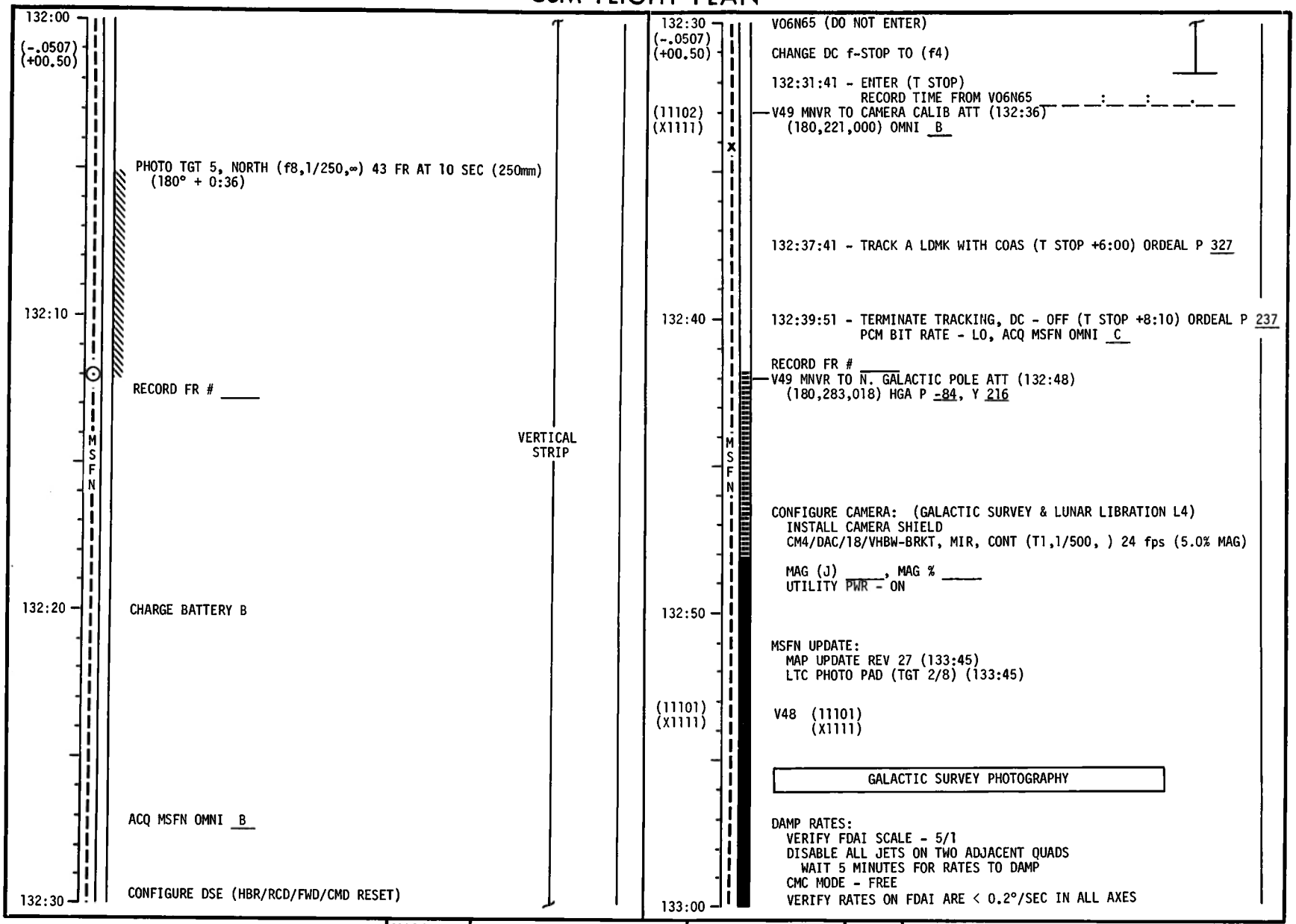
0123 CST

	CDR	LMP	NOTES
131:00			
:10			
:20		EAT PERIOD	
UPDATE TO LM LM CONSUMABLES TIME OF LIFT-OFF FOR REVS 26 THROUGH 31			
131:30	CONFIGURE FOR IMU ALIGN PGNS OPERATE PGNS SELF-TEST E-MEMORY DUMP	VERIFY INVERTER 2 CHECK BAT & BUS VOLTS UPDATA LINK - DATA	
(12102)			
UPLINK TO LM CSM S.V. RLS (IF REQ'D)			
:40			
DUMP DSE	P57 LUNAR SURFACE ALIGN OPTION 4 LANDING SITE A/T 3 - GRAVITY & CELESTIAL BODY (LIFT-OFF ORIENTATION)		
:50			
1823			
132:00			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	131:00 - 132:00	6/25-26	3-177

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-178

LM FLIGHT PLAN

MCC-H	0223 CST	CDR	LMP	NOTES
1823	132:00 (12102)	EVA PLANNING PERIOD		
	:10			
	:20	CABIN PREP FOR EVA-2 CLEAN AND LUBRICATE SEALS AS REQUIRED STOW ALL LOOSE ITEMS NOT REQUIRED FOR EVA UNSTOW EVA-2 PREP & POST CARD STOW LUNAR SURFACE CHECKLIST		
	132:30			
	:40			-1:30
UPDATE TO CSM LTC PHOTO PAD MAP UPDATE REV 27	:50	EQUIPMENT PREP FOR EVA-2 SET DET CDR DON BOOTS UNSTOW AND CHECK BOTH OPS VERIFY EQUIPMENT IN ETB AND STOW FOR EVA		-1:20
1923	133:00	LMP DON BOOTS		

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	132:00 - 133:00	6/26	3-179

CSM FLIGHT PLAN

133:00 — (11101) (X1111) — MSFN

DAC - ON AT 24 fps FOR 2 SEC
CHANGE TO TIME & 1/60 SEC
VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
DIM INTERIOR LIGHTING

START PHOTO SEQUENCE:
2 FRAMES, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC

VERIFY RATES NOT > 0.2°/SEC IN ANY AXIS
IF RATES > 0.2°/SEC, AND TIME PERMITS -
DAMP RATES FOR 60 SEC AND REPEAT EXPOSURE SEQUENCE

CHANGE TO 24 fps & 1/500, RUN DAC FOR 2 SEC
LIGHTS UP, CMC MODE - AUTO, ENABLE ALL QUADS

V49 MNVR TO LUNAR LIBRATION ATT (133:20)
(180,320,349)

133:10

CONFIGURE CAMERA: (BOOTSTRAP/ORB SCIENCE)
CM3/LTC/MBW/SEF (SHUT 1/50,RNG 1-PAD,INT 8.1)(436 FR)

MAG (U) _____, FR #_____

LTC INSTALLATION (DECAL)
LTC CHECKOUT (DECAL)

LUNAR LIBRATION PHOTOGRAPHY

133:20

INHIBIT - A3,C4,B3,D4 THRUSTERS
DAC - ON AT 24 fps FOR 2 SEC, CHANGE TO TIME & 1/60 SEC
DIM INTERIOR LIGHTING

1 FRAME, EXP TIME 60 SEC
2 FRAMES, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC

CHANGE TO 24 fps & 1/500, RUN DAC FOR 2 SEC
LIGHTS UP, ENABLE - A3,C4,B3,D4 THRUSTERS
REMOVE CAMERA FROM WINDOW

RECORD MAG %
REMOVE CAMERA SHIELD

MAP UPDATE REV 27

LOS :
180°:
AOS :

REV 27

133:30

133:30 — (11102) (X1111) — MSFN

V48 (11102)
(X1111)
V49 MNVR TO VERT LTC TGT: 2/8 PAD ATT (133:38)

BOOTSTRAP (VERT LTC) & ORB SCIENCE PHOTOGRAPHY

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)
PRO TO START PITCH RATE AT ORDEAL P 328

133:40

CONFIGURE DSE (HBR/RCD/FWD/CMD RESET)

VERIFY: LTC MODE - STBY/PWR - ON, ZERO DET (T START -1 MIN)
LTC TGT 2/8 (SHUT 1/50, RNG 1-PAD, INT 8.1) (424 FR)
LTC MODE - AUTO, DET - UP/START (T START)

PCM BIT RATE - LO
ACQ MSFN OMNI B

133:50

CHANGE SHUTTER
TO 1/100 SEC

LTC PHOTO PAD TGT: 2/8 (180,032,000)

R _____ P _____ Y _____

T START:

T STOP :

RNG 1_____(91.0) T START
RNG 2_____(91.1) T START +21:25
RNG 3_____(90.9) T START +39:50
RNG 4_____(91.0) T START +44:10
RNG 5_____(91.1) T START +47:30

V64; ACQ MSFN HGA P -47, Y 357

134:00

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-180

LM FLIGHT PLAN

MCC-H 1923

0323 CST

133:00 (12102)	CDR	LMP	NOTES
	PREPARE VISORS & HELMETS FOR EVA UNLOCK FORWARD HATCH HANDLE		-1:10
:10			
	PLSS DONNING CONFIGURE LMP PLSS FOR DONNING LMP DON PLSS CONFIGURE CDR PLSS FOR DONNING CDR DON PLSS UNSTOW RCU'S AND VERIFY CONFIGURATION CONNECT RCU TO PLSS		-1:00 -0:05
:20			
133:30			
1720	PLSS COMM CHECK FM VOICE CHECK (TV ON) CONFIGURE FOR EVA COMM, BIOMED-OFF RECORDER - ON VERIFY PLSS COMM & TM		-0:40
:40	FINAL SYSTEMS PREP		
	OPS CONNECT LMP UNSTOW OPS AND CONNECT TO RCU & PLSS CDR UNSTOW OPS AND CONNECT TO RCU & PLSS VERIFY ITEMS PREPARED FOR JETTISON		-0:30
:50			
	HELMET/GLOVE DONNING DON HELMETS & LEVA'S STOW LM HOSES		-0:20
134:00			

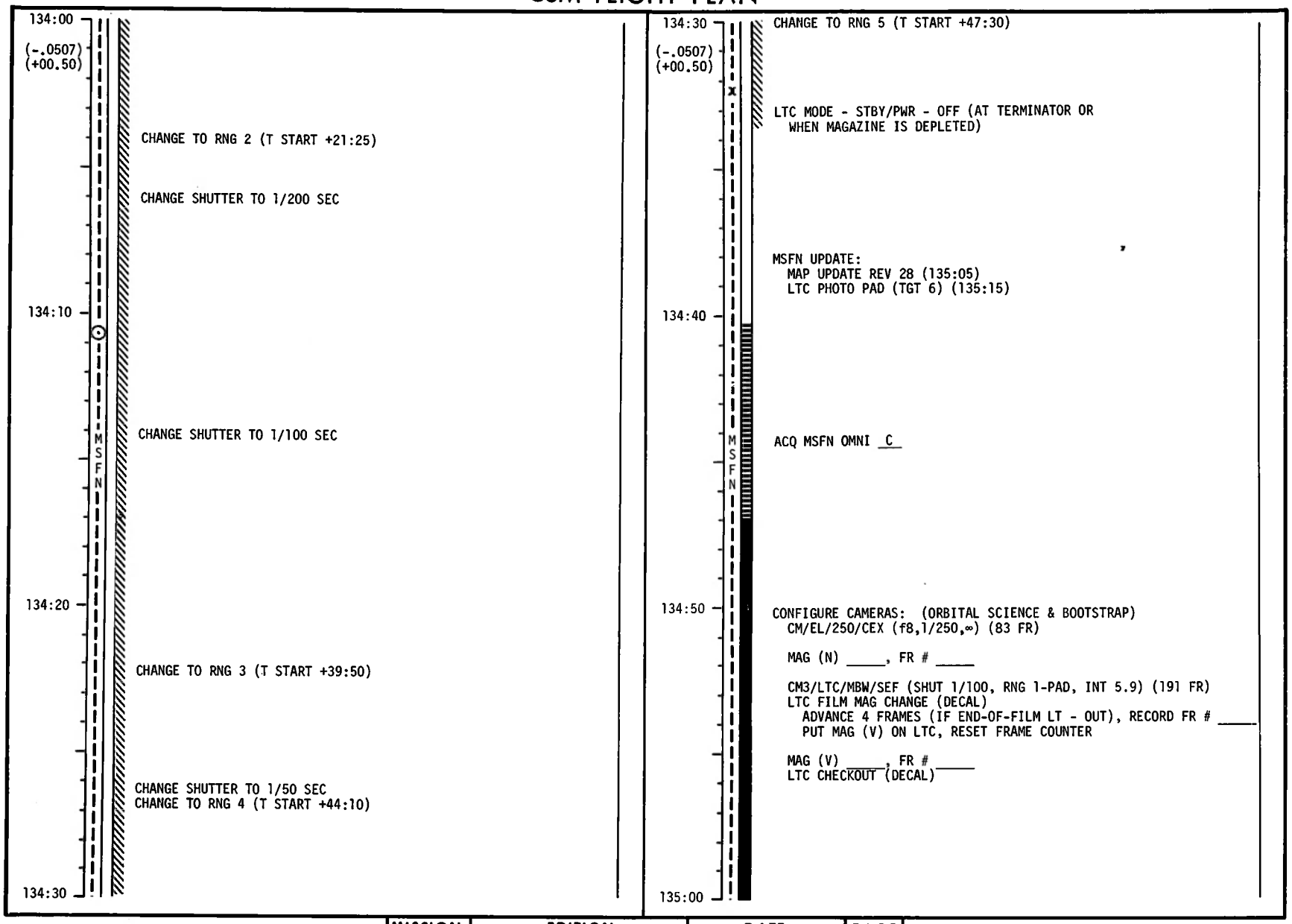
MSFN

TV

DUMP DSE 2023

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	133:00 - 134:00	6/26-27	3-181

CSM FLIGHT PLAN



LM FLIGHT PLAN

MCC-H	0423 CST	CDR	LMP	NOTES
2023	134:00 (12102)	VERIFY PGA CONFIGURATION VERIFY CB CONFIGURATION FOR EVA DON GLOVES		-0:10
	:10	PRESSURE INTEGRITY CHECK PLSS O_2 - ON		
		CABIN DEPRESS DEPRESS CABIN TO 3.5 PSIA, START EVA WATCH OVHD OR FWD DUMP VALVE - OPEN PARTIALLY OPEN FWD HATCH		0:00 START EVA
	:20	FINAL PREP FOR EGRESS PLSS FEEDWATER - OPEN, FWD HATCH - OPEN VERIFY CWEA & PGA STATUS RELEASE PLSS ANTENNAS, LOWER VISOR		0:10
		CDR EGRESS AND TRANSFER DESCEND TO SURFACE DEPLOY LEC TRANSFER ETB TO SURFACE AND STOW ON MESA	RECEIVE AND HOOK UP LEC LOAD ETB FOR TRANSFER	
	134:30	MET LOAD MOVE MET NEAR MESA OPEN SRC AND STOW EQUIPMENT ON MET	LMP EGRESS CLOSE HATCH AND DESCEND	0:20
UPDATE TO CSM LTC PHOTO PAD MAP UPDATE REV 28	:40		MET LOAD ASSIST STOW CAMERAS AND TOOLS ON MET. PULL MET TO SEQ BAY	0:30
		MAGNETOMETER OFFLOAD MET TRACK & FOOTPRINT EVAL	MAGNETOMETER OFFLOAD, STOW ON MET	
	:50	TRAVERSE TO STATION A PHOTOGRAPH AND COMMENT ON MET TRACKS	TRAVERSE TO STATION A	0:40
123	135:00	STATION A TDS EXPERIMENT	STATION A LMP POINT MEASUREMENT	

M S F N — T V T

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	134:00 - 135:00	6/27	3-183

CSM FLIGHT PLAN

135:00
(-.0507)
(+00.50)

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

MAP UPDATE REV 28

LOS : _ _ _ : _ _ : _ _

180°: _ _ _ : _ _ : _ _

AOS : _ _ _ : _ _ : _ _

LTC PHOTO PAD TGT: 6 (180,013,000)

R _____ P _____ Y _____

T START: _ _ _ : _ _ : _ _

T STOP : _ _ _ : _ _ : _ _

RNG 1 _____ (93.3) T START

RNG 2 _____ (93.1) T START +4:50

RNG 3 _____ (93.2) T START +12:00

RNG 4 _____ (93.3) T START +19:40

135:10

V48 (11101)
(X1111)
V49 MNVR TO OBLIQUE LTC TGT: 6 PAD ATT (135:33)

135:20
(11101)
(X1111)

REV 28

135:30

135:30
(11101)
(X1111)

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)

PRO TO START PITCH RATE AT ORDEAL P 298

BOOTSTRAP (OBLIQUE LTC) & ORB SCIENCE PHOTOGRAPHY

135:40

PHOTO TGT 3, NORTH (f8,1/250,∞) 10 FR AT 20 SEC (250mm)
(180° +0:18)

V64; ACQ MSFN HGA P -45, Y 356

135:50

M
S
F
N

PHOTO TGT 4, SOUTH (f8,1/250,∞) 73 FR AT 10 SEC (250mm)
(180° +0:30)

136:00

LM FLIGHT PLAN

MCC-H 0523 CST

	CDR	LMP	NOTES
135:00 (12102)	REBAG AND STOW TDS SAMPLES PHOTO PANORAMA SITE DESCRIPTION COLLECT SAMPLES	REPORT X,Y,Z READINGS AT EACH OF THREE POSITIONS PHOTOGRAPH SITE STOW SENSOR/TRIPOD ON MET REWIND CABLE, STOW ON MET	0:50
:10			
:20	DOUBLE CORE PLACE GNOMON HAMMER TUBES INTO SURFACE STOW HAMMER & GNOMON	DOUBLE CORE ASSEMBLE TUBES PHOTOGRAPH TUBES IN SURFACE REMOVE AND STOW TUBES	1:00
	TRAVERSE TO STATION B		1:10
135:30	STATION B SAMPLE COLLECTION	STATION B PHOTO PANORAMA SITE DESCRIPTION SAMPLE COLLECTION	
	TRAVERSE TO BEND AREA		1:20
	BEND AREA: PHOTO PANORAMA AND SITE DESCRIPTION		
:40	TRAVERSE TO CONE CRATER VIA STATION D		
	REST EN ROUTE		1:30
:50			
	CONE CRATER RIM SITE DESCRIPTION SAMPLE COLLECTION PROCEED TO SOUTH RIM	CONE CRATER RIM PHOTO PANORAMA SAMPLE COLLECTION PROCEED TO SOUTH RIM	1:40
136:00			

MSFN TV

DUMP DSE

GO/NO-GO FOR EVA-2 EXTENSION

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	135:00 - 136:00	6/27-28	3-185

CSM FLIGHT PLAN

136:00
(-.0507)
(+00.50)

RECORD FR # _____

VERIFY: LTC MODE - STBY/PWR - ON, ZERO DET (T START -1 MIN)

LTC TGT 6 (SHUT 1/100, RNG 1-PAD, INT 5.9) (183 FR)
LTC MODE - AUTO, DET - UP/START (T START)

136:10

MSFN

CHANGE TO RNG 2 (T START +4:50)

CHARGE BATTERY A

136:20

CHANGE SHUTTER TO 1/50 SEC
CHANGE TO RNG 3 (T START +12:00)

CHANGE TO RNG 4 (T START +19:40)

136:30

136:30
(-.0507)
(+00.50)

ACQ MSFN OMNI C

LTC MODE - STBY/PWR - OFF (T STOP)

136:40

RECORD FR # _____

(11111)
(X1111)

V48 (11111)
(X1111)

MSFN

MSFN UPDATE:
MAP UPDATE REV 29
LDMK TRK PADS (RP-4, ANSGARIUS N, DE-2, ENCKE E)
(137:30 - 138:30)

MSFN UPLINK:
CSM S.V.

136:50

MAP UPDATE REV 29

LOS :
180°:
AOS :

STOP ORB RATE AT INERTIAL P 122

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

137:00

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-186

LM FLIGHT PLAN

MCC-H

2223

0623 CST

136:00 (12102)

:10

:20

136:30

:40

:50

137:00

M S F N

T V

CDR	LMP	NOTES
SAMPLE COLLECTION	SAMPLE COLLECTION	
SAMPLE BOULDER TRACKS	SAMPLE BOULDER TRACKS	1:50 2000
ROLL BOULDERS INTO CRATER		
EVA COMM EVALUATION ACTUAL 2.	PARTIAL PANORAMA TO WEST	2:00 2010
SITE DESCRIPTION	PHOTO PANORAMA	2:10 2020
TRAVERSE TO STATION D SAMPLE COLLECTION		
STATION D SITE DESCRIPTION SAMPLE COLLECTION	STATION D PHOTO PANORAMA SAMPLE COLLECTION	2:20 2030
TRAVERSE TO STATION E REST EN ROUTE		2:30 2040
STATION E DIG TRENCH 10° OFF DOWNSUN	STATION E LPM MEASUREMENT (SINGLE)	2:40 2050
PHOTOGRAPH TRENCH		

UPDATE TO CSM
MAP UPDATE REV 29
LDMK TRACK PADS
UPLINK TO CSM
CSM S.V.

2323

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	136:00 - 137:00	6/28	3-187

CSM FLIGHT PLAN

137:00

(11111)
(X1111)

P52 (OPTION 3)
(LIFT-OFF ORIENT)

P52 IMU REALIGN

N71:__ __ __ __

N05:__ __ __.__ __

N93:

X __ __.__ __ __

Y __ __.__ __ __

Z __ __.__ __ __

GET __ __ __.__ __.__ __ __

GDC ALIGN
VERIFY ORDEAL

(11101)
(X1111)

CYCLE CMC MODE - FREE/AUTO
V48 (11101)
(X1111)

137:10

V49 MNVR TO LDMK TRK ATT (137:30)
(000,053,000)

CONFIGURE CAMERA (LDMK TRK)
CM/DAC/SXT/CEX (EXP - PAD) 1 fps (15.2% MAG)

MAG (B)_____, MAG %_____
UTILITY POWER - ON

LTC REMOVAL (DECAL) & STOW

137:20

REV 29

137:30

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-188

LM FLIGHT PLAN

0723 CST

MCC-H

2323.

	CDR	LMP	NOTES
137:00 (12102)	MAKE BOOTPRINT IN FILL SPECIAL ENVIRONMENTAL SAMPLE SAMPLE TRENCH INTERIOR	PHOTOGRAPH TRENCH SPECIAL ENVIRONMENTAL SAMPLE SAMPLE TRENCH INTERIOR	2:50 2100
137:15	TRAVERSE TO STATION F		3:00 2110
137:20	STATION F SITE DESCRIPTION SAMPLE COLLECTION TRIPLE CORE SAMPLE	STATION F PHOTO PANORAMA SAMPLE COLLECTION TRIPLE CORE SAMPLE	3:10 2120.
137:30			

MSFN TV

~~07/0053~~ 2353.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	137:00 - 137:30	6/28-29	3-189

CSM FLIGHT PLAN

137:30

(11101)
(X1111)

P24 (RP-4)
OPT ZERO - OFF, OPT MODE - CMC
SC CONT - CMC/AUTO
V79 (N16 LOAD ALL ZERO'S)
(-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)

PRO TO START PITCH RATE (000,338/053,000)

0:00 - T1 (HORIZON) DET - ZERO/UP/START

137:40

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

ACQ MSFN OMNI D

P24 (ANSGARIUS N)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

137:50

0:00 - T1 (HORIZON) DET - ZERO/UP/START

MSFN

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

138:00

P24 LDMK TRACKING
TGT: RP-4 (1/125)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R ___ °P ___ °Y ___ ° (T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT -05.850
LONG/2 +60.125
ALT +000.00

P24 LDMK TRACKING
TGT: ANSGARIUS N (1/250)

T_1 — — —•— —•— —
T_2 — — —•— —•— —
TCA — — —•— —•— —
T_3 — — —•— —•— —

R ___ °P ___ °Y ___ ° (T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT -11.633
LONG/2 +40.533
ALT +000.00

LM FLIGHT PLAN

MCC-H

2353

0753 CST

	CDR	LMP	NOTES
137:30 (12102)			
:35	TRAVERSE TO STATION G		3:20 2130
:40	STATION G SITE DESCRIPTION SAMPLE COLLECTION	STATION G PHOTO PANORAMA SAMPLE COLLECTION	
137:45	TRAVERSE TO LM		3:30 2140
:50	AT LM CONTAMINATED SAMPLE COLLECTION		
:55	EVA CLOSEOUT STOW CAMERA FILM STOW DOCUMENTED SAMPLES	EVA CLOSEOUT STOW CAMERA FILM	3:40 2150
138:00			

RECORD PCM LBR ON DSE DURING P24's

M S F N

T V

07/60 23

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	137:30 - 138:00	6/29	3-191

CSM FLIGHT PLAN

138:00
(-.0507)
(+00.50)

P24 (DE-2)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

138:10

0:00 - T1 (HORIZON) DET - ZERO/UP/START

M
S
F
N

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF

138:20

P24 (ENCKE E)
V79E, PRO, PRO
OPT ZERO - OFF, OPT MODE - CMC

REPORT: GYRO TORQUING ANGLES
(FROM P52 AT 137:00)

138:30

P24 LDMK TRACKING
TGT: **DE-2** (1/250)

T_1 — — — — — — —
T_2 — — — — — — —
TCA — — — — — — —
T_3 — — — — — — —

R _____ °P _____ °Y _____ °(T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT -09.250
LONG/2 +09.796
ALT +000.00

P24 LDMK TRACKING
TGT: **ENCKE E** (1/60)

T_1 — — — — — — —
T_2 — — — — — — —
TCA — — — — — — —
T_3 — — — — — — —

R _____ °P _____ °Y _____ °(T2 ACQ)

N or S NM ___ / SA ___ TA ___ (T2 ACQ)

N89
LAT +00.283
LONG/2 -20.150
ALT +000.00

LM FLIGHT PLAN

MCC-H 0823 CST

	CDR	LMP	NOTES
138:00 (12102)		RETRIEVE AND STOW SWC FOIL	
	PACK AND SEAL SRC	ASSIST CDR	
:05	STOW WEIGH BAGS IN ETB	EVA TERMINATION	3:50 2200
	CLEAN AND CHECK EMU'S	CLEAN EMU'S	
:10	HAND SRC TO LMP	ASCEND TO MIDDLE LADDER RUNG	
	TRANSFER ETB VIA LEC	RIG LEC FOR ETB AND TRANSFER	
138:15		INGRESS TRACKING LIGHT TEST	4:00 2210
		PLACE ETB ON ASC ENG COVER CHECK EMU & LM SYSTEMS	
:20		PASS LEC TO CDR	
	EVA TERMINATION ASCEND TO PLATFORM	STOW SRC ON ASC ENG COVER	
	DISCARD LEC	ASSIST CDR	
:25	INGRESS		4:10 2220.
		CLOSE HATCH	
	REPRESSURIZE CABIN		4:15/0:00 2225.
138:30			

MSFN: T V

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	138:00 - 138:30	6/29	3-193

CSM FLIGHT PLAN

138:30
(-.0507)
(+00.50)

0:00 - T1 (HORIZON) DET - ZERO/UP/START

3:50 - DAC - ON

4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART

6:30 - TCA

7:18 - T3 (LDMK LOSS) DAC - OFF
V48 (11112)
(X1111)
V49 MNVR TO COMM ATT (138:42)
(110,216,000) HGA P -2, Y 194

(11112)
(X1111)
138:40

RECORD MAG % _____

MSFN

MSFN UPDATE:
MAP UPDATE REV 30
ZERO PHASE PADS (139:20, 140:15)

138:50

MAP UPDATE REV 30

LOS :
180°:
AOS :

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

139:00

H_2 PURGE LINE HEATERS - ON

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-194

LM FLIGHT PLAN

MCC-H 0053

0853 CST

		CDR	LMP	NOTES
	138:30 (12102)	POST-EVA SYSTEMS CONFIGURATION CONFIGURE LM ECS, DOFF GLOVES		4:15/0:00
		CONNECT LM ECS HOSES TO SUIT		
	:35	CONNECT TO LM COMM AND RECONFIGURE BIOMED - LEFT, RECORDER - OFF		
DUMP DSE	:40	PLSS/OPS DOFFING		0:10
		DISCONNECT OPS & RCU FROM PLSS		
UPDATE TO CSM MAP UPDATE REV 30 ZERO PHASE PADS	138:45	DISCONNECT AND DOFF PLSS/OPS (LMP FIRST)		
	:50	CDR, THEN LMP, DISASSEMBLE PLSS/OPS CHECKOUT AND STOW OPS		0:20
	:55	VERIFY POWER DOWN CB CONFIGURATION		
		PREP FOR EQUIPMENT JETTISON DOFF LUNAR BOOTS, STOW IN DISPOSABLE CONTAINER STOW RCU'S IN DISPOSABLE CONTAINER STOW PLSS CONDENSATE CONTAINER IN DISPOSABLE CONTAINER		
0123	139:00			0:30

MSFN STV

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	138:30 - 139:00	6/29	3-195

CSM FLIGHT PLAN

139:00

(-.0507)
(+00.50)

CONFIGURE CAMERA: (ZERO PHASE)
CM3/DC/80/MBW-BRKT, IVL, PCM CABLE (f5.6,1/250,∞) (41 FR)

MAG (R) _____, FR # _____

RR XPNDR ACTIVATION AND SELF-TEST (DECAL)

ZERO PHASE PAD (BACKWARD)
R ___ °P ___ °Y ___ °
T START: ___ ___ ___ ___ ___ ___ ___
START DET AT 1ST TGT AREA ACQ -5 MIN

139:10

V48 (11101)
(X1111)
V49 MNVR TO ZERO PHASE TGT 5 & 6 ATT (139:30)
(196.1,341.6,359.3)

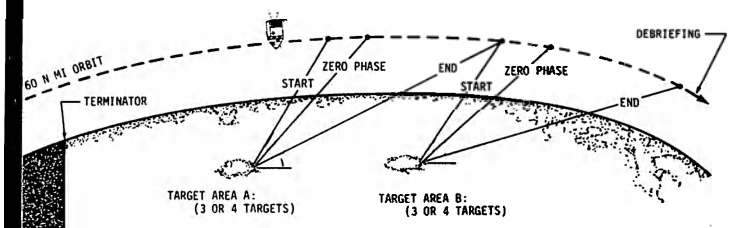
(11101)
(X1111)

139:20

H_2 & O_2 FUEL CELL PURGE
WASTE WATER DUMP
H_2 PURGE LINE HEATERS - OFF

REV 30

TYPICAL ZERO PHASE OBSERVATION PASS-BACKWARD LOOKING



139:30

139:30

(11101)
(X1111)

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)

(-.0507)
(+00.50)

PRO TO START PITCH RATE (196.1,268/341.6,359.3)

ZERO PHASE OBSERVATIONS - BACKWARD LOOKING

139:40

139:40:12 - DET - ZERO/UP/START (T START)
REVIEW TGT 5 & 6 MAPS

ACQ MSFN HGA P -68, Y 34

5:00 - DC - ON, START OBSERVATIONS (TGT AREA 5)

6:40 - ZERO PHASE POINT (TGT AREA 5)

8:06 - STOP OBSERVATIONS
START OBSERVATIONS (TGT AREA 6)
8:46 - ZERO PHASE POINT (TGT AREA 6)

139:50

MSFN

11:48 - STOP OBSERVATIONS
DEBRIEF (~ 30 SEC)
12:18 - DC - OFF

CONFIGURE CAMERA: (ORBITAL SCIENCE)
CM/EL/250/CEX (~~f11,1/250,∞~~) ~~(31 FR)~~
(f8,1/250,∞) (31 FR)
MAG (N) _____, FR # _____

(11102)
(X1111)

V48 (11102)
(X1111)

140:00

ch.C 18/1/71

MISSION	EDITION	DATE	PAGE
APOLLO 14	ch. C ~~CHANGE A~~ (JAN)	~~DECEMBER 23, 1970~~ JANUARY 18, 1971	3-196

LM FLIGHT PLAN

MCC-H

0923 CST

Q/23

	CDR	LMP	NOTES
139:00 (12102)	REMOVE AND STOW ARMREST IN DISPOSABLE CONTAINER POSITION PLSS'S FOR JETTISON DON EV GLOVES		0:30
:10	PRESSURE INTEGRITY CHECK		0:40
	CABIN DEPRESS FOR JETTISON		
	OPEN HATCH, JETTISON DISPOSABLE CONTAINER AND PLSS'S CLOSE HATCH		
:20	DUMP VALVES - AUTO REPRESSURIZE CABIN		0:50
	POST-EVA CABIN CLEANUP		
	SECURE OPS ON CABIN FLOOR		
139:30			1:00
	STOW EQUIPMENT FOR RETURN		
	WEIGH SRC, ISA, & WEIGH BAGS, REPORT TO MCC-H		
	STOW SCALE & SRC		
:40	STOW LM EVA ANTENNA		1:10
	INSTALL ISA IN AFT CABIN		
	STOW EVA ONBOARD DATA IN FLIGHT DATA FILE		
:50			1:20
140:00			1:30

M S F N — T V

DUMP DSE

6 223

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	139:00 - 140:00	6/29-30	3-197

CSM FLIGHT PLAN

140:00
(11102)
(X1111)

V49 MNVR TO ZERO PHASE TGT 7 & 8 ATT (140:06)
(347.0,222.4,358.7) OMNI D

PHOTO TGT 7, NORTH (~~f11,1/250,∞~~) 31 FR AT 10 SEC (250mm)
(180° + 1:15) (f8, 1/250,∞)

140:10

SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+000.50)
(+00001)

M
S
F
N

(-.0507)
(+00.50)

PRO TO START PITCH RATE (347.0,276/222.4,358.7)

ZERO PHASE OBSERVATIONS - FORWARD LOOKING

140:17:24 - DET - ZERO/UP/START (T START)
REVIEW TGT 7 & 8 MAPS

140:20

5:00 - DC-ON, START OBSERVATIONS (TGT AREA 7)

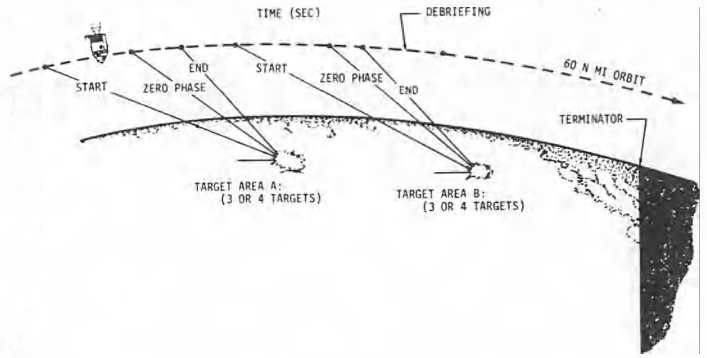
8:40 - ZERO PHASE POINT (TGT AREA 7)
9:00 - STOP OBSERVATIONS
START OBSERVATIONS (TGT AREA 8)
9:56 - ZERO PHASE POINT (TGT AREA 8)
10:38 - STOP OBSERVATIONS
DEBRIEF (~ 30 SEC)
11:08 - DC-OFF, REMOVE CAMERA FROM WINDOW

X

RECORD FR # _____

140:30

TYPICAL ZERO PHASE OBSERVATION PASS - FORWARD LOOKING



ZERO PHASE PAD (FORWARD)		
R ___	°P ___	°Y ___ °
	•	•
T START: ___	___ • ___	___ • ___
START DET AT 1ST TGT AREA ACQ -5 MIN		

MISSION	EDITION	DATE	PAGE
APOLLO 14	change C ~~FINAL~~ (JAN)	~~DECEMBER 2, 1970~~ January 18, 1971	3-198

LM FLIGHT PLAN

1023 CST

MCC-H

0223

	CDR	LMP	NOTES
140:00 (12102)	POST-EVA DEBRIEFING		
:05			
:10	CREW STATUS REPORT (MEDICATION, DOSIMETER)		
140:15			
:20	EAT PERIOD		
:25			
140:30			

M S F N — T V

0253

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	140:00 - 140:30	6/30	3-199

CSM FLIGHT PLAN

140:30
(11112)
(X1111)

V48 (11112)
(X1111)
V49 MNVR TO P52 COAS CALIB ATT (140:38)
(180,254,348)

V64; ACQ MSFN HGA P -52, Y 173
MSFN UPLINK:
LM S.V. (INS + 18)
CSM S.V. (L/O)
RESET SURFACE FLAG
MSFN UPDATE:
CONSUMABLES (IF REQ'D)
MAP UPDATE REV 31
CSM S.V. (L/O) COPY AT 141:15

140:40

MSFN

MSFN UPDATE TO LM WITH CSM COPY:
ASCENT PADS AND CSM WEIGHT COPY AT 142:10

P52 (OPTION 3)
(LIFT-OFF ORIENT)
REPORT: GYRO TORQUING ANGLES

P52 (COAS CALIB)
USE STAR NO. 22

140:50

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
MSFN ENABLES MSFN S-BAND RELAY

141:00

CSM CONSUMABLES UPDATE

GET: ___ ___ ___ ___ ___

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

P52(IMU REALIGN)

N71: ___ ___ ___ ___

N05: ___ ___ ___ ___ ___

N93:

X ___ ___ ___ ___ ___

Y ___ ___ ___ ___ ___

Z ___ ___ ___ ___ ___

GET ___ ___ ___ ___ ___ ___ ___

COAS CALIB - N92

SHAFT: ___ ___ ___ ___ ___

TRUN: ___ ___ ___ ___ ___

MAP UPDATE REV 31

LOS : ___ ___ ___ ___ ___ ___ ___

180°: ___ ___ ___ ___ ___ ___ ___

AOS : ___ ___ ___ ___ ___ ___ ___

LM FLIGHT PLAN

MCC-H

0253

1053 CST

CDR

LMP

NOTES

140:30
(12102)

:35

:40

140:45

:50

:55

141:00

<u>UPLINK TO CSM</u>
LM S.V. (INS +18)
CSM S.V. (L/O)
RESET SURFACE FLAG

<u>UPDATE TO CSM</u>
CONSUMABLES
(IF REQ'D)
MAP UPDATE REV 31
CSM S.V. (L/O)
<u>UPDATE TO CSM</u>
ASCENT PADS
CSM WEIGHT
<u>UPDATE TO LM</u>
LM CONSUMABLES
ASCENT PADS
CSI PAD
<u>UPLINK TO LM</u>
CSM S.V. (L/O)
ZERO POS/NEG CELLS

ENABLE MSFN
S-BD RELAY

0323

M S F N

T V

EAT PERIOD

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	140:30 - 141:00	6/30	3-201

141:00
(11112)
(X1111)

CONFIGURE CAMERAS FOR DOCKING:

CM2/DAC/18/CEX-BRKT,MIR (T8,1/250,7) 6 fps (100% MAG)

MAG (D) ______, MAG % ______
UTILITY PWR - ON

CM/EL/80/CEX (f8,1/250,FOCUS) (10 FR)

MAG (N) ______, FR # ______

CM4/TV/PEAK, BRKT
(f44) 11 MIN

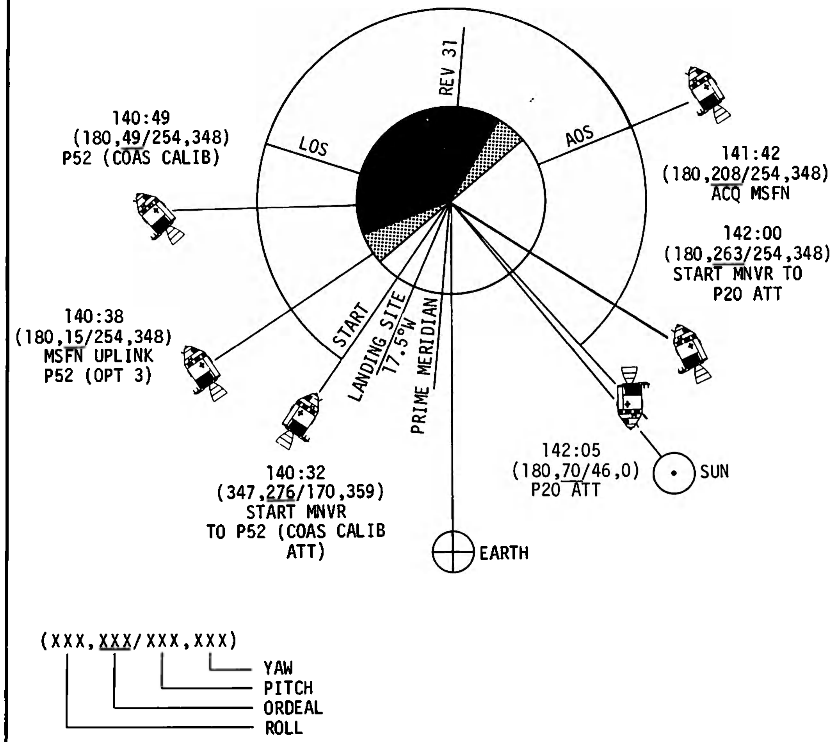
CSM S.V. (L/O)		P27 UPDATE
PURP	V	V
GET	: :	: :
304 01	INDEX	INDEX
02		
03		
04		
05		
06		
07		
10		
11		
12		
13		
14		
15		
16		
17		
20		
21		
22		
23		
24		

141:10

141:20
REV 31

EAT PERIOD

141:30



LM FLIGHT PLAN

MCC-H	1123 CST	CDR	LMP	NOTES
0313	141:00 (12102)			
	:05	EAT PERIOD		
	:10	VERIFY GUIDANCE CONFIGURATION CONFIGURE CB'S (TV-OFF)	CONFIGURE COMM CONFIGURE CB'S FOR L/O PREP	
	141:15	V63 RR SELF-TEST	AGS STATUS-OPERATE	
	:20		ALIGN AGS TO PGNS AGS GYRO CALIBRATION LOAD AGS ASCENT TARGETING	
	:25			
0353	141:30			

MSFN: TV

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	141:00 - 141:30	6/30-31	3-203

CSM FLIGHT PLAN

141:30 (11112) (X1111)

DON PGA WITHOUT HELMET AND GLOVES

UNSTOW JETTISON BAG (R13)
PACK JETTISON ITEMS
INSTALL CABIN FAN LUNAR DUST FILTER (PGA BAG)
INSTALL SPRINGS AND CLIPS ON A8, A6, A3, AND PNL 350
INSTALL TEMP STOWAGE BAGS ON LH AND RH SIDES OF LEB
REMOVE B5 AND B6 POUCHES
REMOVE COVERALLS, CWG AND INSTALL T-ADAPTERS
UNSTOW AND ASSEMBLE:
  VACUUM CLEANER, PWR CABLE, HOSE AND BAG (SIDE A12, SIDE A8)
REMOVE DECONTAMINATION BAGS (A8, U1)

141:40

ACQ MSFN HGA P -52, Y 173
MSFN UPDATE TO LM WITH CSM COPY:
  ASCENT UPDATE PAD (IF REQ'D) COPY AT 142:15

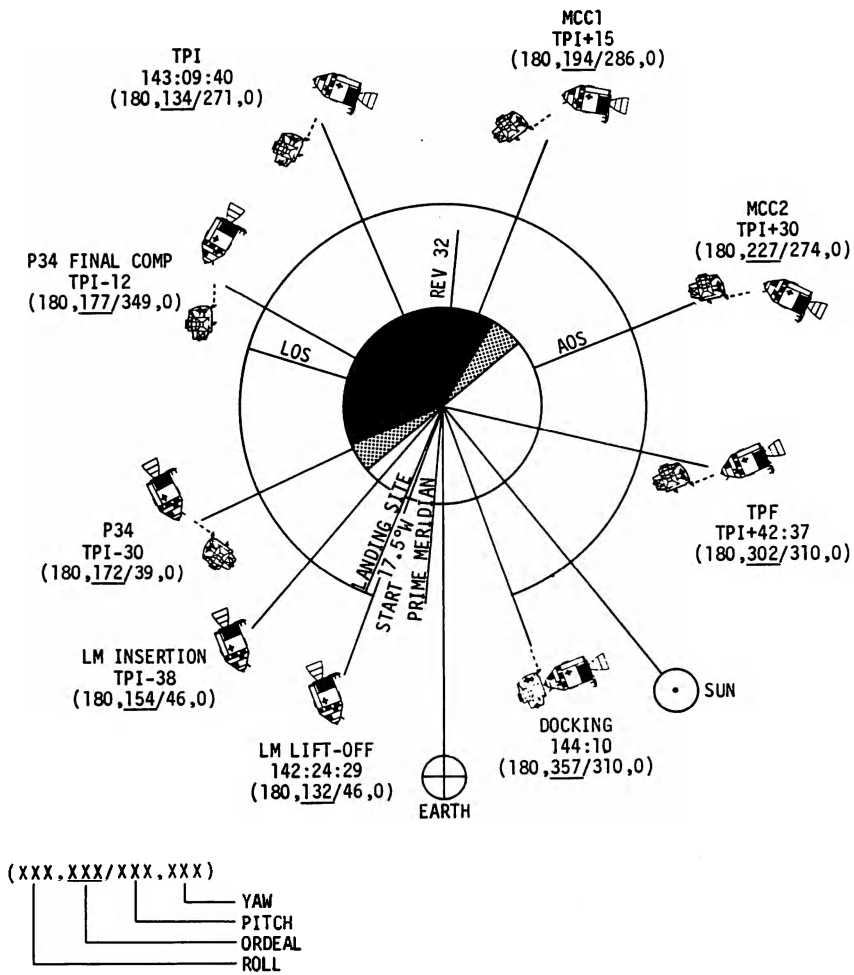
EAT PERIOD

141:50

MSFN

VHF AM B - DUPLEX (VERIFY)
VHF AM A - OFF (VERIFY)
VHF RANGING - ON (UP)
VHF AM T/R - OFF (PANEL 9)
VHF ANT - LEFT
RNDZ XPNDR - PWR (VERIFY)
EXT RNDZ LT - ON
EXT RUN/EVA LT - ON

142:00



MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE B (JAN)	JANUARY 11, 1971	3-204

LM FLIGHT PLAN

MCC-H	1153 CST		CDR	LMP	NOTES
0353	141:30 (12102)		RATE GYRO TEST	LGC CLOCK SYNC V47 AGS INITIALIZATION (SET BIAS)	
UPDATE TO LM AGS K-FACTOR	:35		RCS CHECKOUT		
	:40				
DUMP DSE UPDATE TO CSM ASCENT PAD (IF REQ'D) UPDATE TO LM ASCENT PAD (IF REQ'D) UPLINK TO LM CSM S.V. (L/O) (IF REQ'D) RLS (IF REQ'D) LGC GYRO COMP (IF REQ'D)	141:45	M S F N	P57 LUNAR SURFACE ALIGN OPTION 4 LANDING SITE A/T 3 - GRAVITY AND CELESTIAL BODY (LIFT-OFF ORIENTATION)		
	:50		P12 POWERED ASCENT	ALIGN AGS TO PGNS BATS 5&6-ON, 1&3-OFF/RESET SET CAMERA: LM3/DAC	
	:55		PRELAUNCH SWITCH CHECKS	AGS LUNAR ALIGN PRELAUNCH SWITCH CHECKS	
0423	142:00				

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	141:30 - 142:00	6/31	3-205

CSM FLIGHT PLAN

142:00 (11102) (X1111)

CYCLE CMC MODE - FREE/AUTO
V48 (11102) (X1111)
V49 MNVR TO P20 ATT (142:05)
(180,46,0) OMNI D

GDC ALIGN
VERIFY ORDEAL

-15
142:10

GO/NO GO FOR LM LIFT-OFF
AND DIRECT ASCENT RNDZ
MSFN UPDATE:
MAP UPDATE REV 32
COPY AT 142:50

MSFN

V67 (+10000, +00100, +00001)
LOAD N37 AND N55

-5
142:20

VHF VOICE CHECK

VHF ANT - RIGHT
VHF RNG - RESET

LM LIFT-OFF

0

142:24:29

X

CONFIGURE SWITCHES FOR BAILOUT:

FDAI SCALE - 5/5	SCS TVC (2) - RATE CMD
MAN ATT (3) - RATE CMD	TVC GMBL DRIVE (BOTH) - AUTO
ATT DB - MIN	SPS He VLVS (2) - AUTO
RATE - HIGH	AUTO RCS SEL(16) - MNA/MNB
THC PWR - ON (UP)	
RHC PWR DIR (BOTH) - MNA/MNB	
BMAG MODE (3) - RATE 2	

142:30

DIRECT ASCENT RNDZ PAD								UPDATE (IF REQ'D)						
GETI LIFT-OFF	HRS	+	0	0				+	0	0				
	MIN	+	0	0	0			+	0	0	0			
	SEC	+	0					+	0					
GETI	HRS	+	0	0				+	0	0				
TPI	MIN	+	0	0	0			+	0	0	0			
N37	SEC	+	0					+	0					

CSM WT	+					
LM WT	+	0	5	7	0	0

COELLIPTIC RNDZ PAD								UPDATE (IF REQ'D)						
GETI LIFT-OFF	HRS	+	0	0				+	0	0				
	MIN	+	0	0	0			+	0	0	0			
	SEC	+	0					+	0					
GETI	HRS	+	0	0				+	0	0				
CSI	MIN	+	0	0	0			+	0	0	0			
N11	SEC	+	0					+	0					
GETI	HRS	+	0	0				+	0	0				
TPI	MIN	+	0	0	0			+	0	0	0			
N37	SEC	+	0					+	0					

LM FLIGHT PLAN

MCC-H: 0423

0453

1223 CST	CDR	LMP	NOTES
142:00 (12102)	VENT DPS FUEL, OXID, & SHe DON HELMET & GLOVES PRESSURIZE APS	DON HELMET & GLOVES	
:05	CONFIGURE ASCENT FEEDS		
:10	GO/NO-GO FOR LIFT-OFF VERIFY CB STATUS FOR LIFT-OFF	V47 VERIFY AGS BIAS LIFT-OFF COMM, RECORDER - ON BATS 2 & 4 - OFF/RESET DEADFACE DES BATS VERIFY CB STATUS FOR LIFT-OFF	GO/NO-GO FOR LIFT-OFF ON REV 31, GUIDANCE RECOMMENDATION & DIRECT ASCENT UPDATE TO CSM MAP UPDATE REV 32
142:15			
:20	CHECK APS BURN CARD	CHECK APS, RCS, EPS, ECS VHF VOICE CHECK	
	LM TIMELINE BOOK		
:25	LM LUNAR LIFT-OFF YAW RIGHT 30°	DAC-ON	TIG: 142:24:29 BT: 7 MIN 10.7 SEC ΔVT: 6053.4 FPS ULLAGE: NONE ORBIT:50.96x9.14 NM
142:30			

MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	142:00 - 142:30	6/31	3-207

CSM FLIGHT PLAN

142:30
(11102)
(X1111)
-38

LM INSERTION

142:31:40
R=146.16
Ṙ=-449.5

142:31:40

COMPUTE LM RDOT IF REQ'D *

*IF LM BAILOUT REQ'D:
* COPY P76 DATA FROM LM
*
*33 : : .
*
*84 . . .
*
*GO TO RESCUE BOOK PG 4
* *
* *
*IF CSM BAILOUT REQ'D:
*
*MSFN UPDATE:
* CSM BAILOUT P30 PAD
*P30
*P40 (TRIM); SET UP EMS
SPS BURN CUE CARD (BACKUP PROCEDURES)
*CSM BAILOUT BURN
*GO TO RESCUE BOOK PG 4
* *

MSFN UPLINK:
LM S.V.
MSFN DISABLES MSFN
S-BAND RELAY
GO VHF COMM

P20(TRIM)(180,171/44,0)
P34; VERIFY N37 AND N55
V57;V87

142:40
-30

MSFN 5

VERIFY LM TRACK LT-ON

(IF NO SXT, V77; V54; VHF ONLY UNTIL TPI-18, THEN VHF/COAS(6))

142:45
R=91.27
Ṙ=-370.0

BEFORE STEADY STATE
PRE-TPI: N49 > (+00020,+00120) REJECT/REPEAT
POST-TPI:N49 > (+00008,+00050) REJECT/REPEAT
AFTER STEADY STATE
ANYTIME: N49 > (+00003,+00020) REJECT/REPEAT

VHF/RR COMPARISON

MAP UPDATE REV 32

LOS : . .
180°: . .
AOS : . .

142:50

5

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

-12

P34 FINAL COMP (COPY ON NEXT PAGE)

143:00
R=47.77
Ṙ=-212.3

143:00

BACKUP RR CHECK

R_1	.	$\dot{R}=\frac{100 \times \Delta R}{MIN}$
R_2	.	$\dot{R}=$.
ΔR	.	

P30 MANEUVER

N/A
SET STARS

R_{ALIGN} N / A
P_{ALIGN} N / A
Y_{ALIGN} N / A

ULLAGE
4 JET, 11 SEC

ΔVC

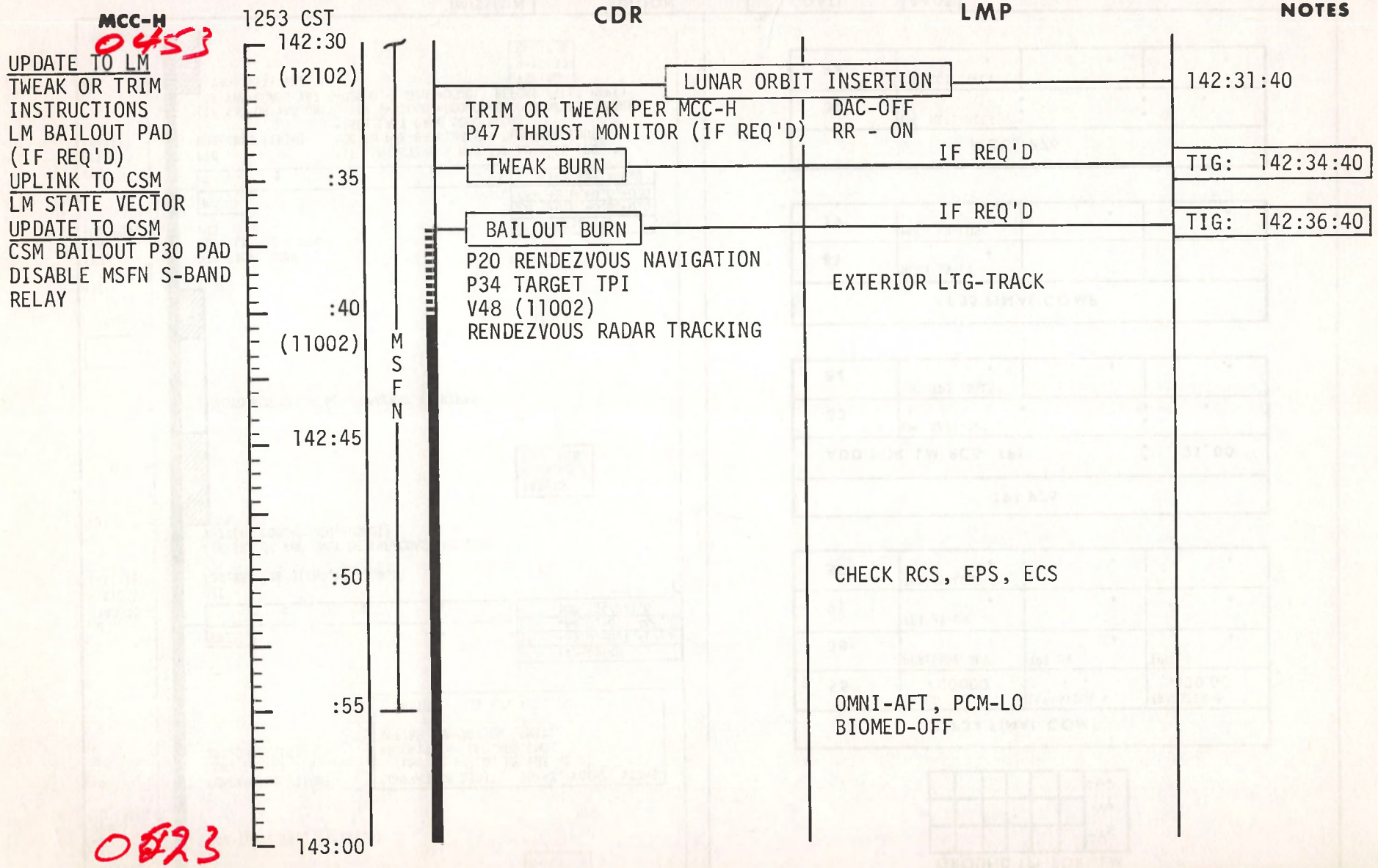
C	S	M	B	/	O	PURPOSE
S	P	S	G	&	N	PROP/GUID
+			N	/	A	WT N47
	0	0	N	/	A	P_{TRIM} N48
	0	0	N	/	A	Y_{TRIM}
+	0	0				HRS GETI
+	0	0	0			MIN N33
+	0					SEC
-						ΔV_X N81
+	0	0	0	0	0	ΔV_Y
+	0	0	0	0	0	ΔV_Z
X	X	X	1	8	0	R
X	X	X				P
X	X	X	0	0	0	Y
+			N	/	A	H_A N44
			N	/	A	H_P

P34 INPUT

37	LM GETI-TPI : : .		
55	INTEG OPT +00000	ELEVATION ± +000.00	TRANSFER ± +130.00

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-208

LM FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	142:30 - 143:00	6/31	3-209

CSM FLIGHT PLAN

143:00
(11102)
(X1111)

-8
(P40)
(0.5°DB)

-6

0
143:10
(11102)
(X1111)

+3

REV 32
143:20

+11

+12
(P41)
(0.5°DB)

+15
(11102)
(X1111)

+18

143:30

143:00
R=47.77
Ṙ=-212.3

P40 (66°)(180,111/271,0)

COMPARE SOLUTIONS
COPY LM TPI P76
SPS CHECKLIST

COMPARISON LIMITS: VGX=3, VGY=7, VGZ=9
(LM VGX + 1.0, LM VGZ -2.0)
PRIORITIES: LGC,AGS,CMC
VHF/RR COMPARISON LIMIT:
$\Delta R = \overline{100} + 0.5\ (\Delta R \geq 1.0)$NM

TPI

143:09:40			
LM	+63.0	+0.1	+67.3
CSM	-64.0	+0.0	-65.3
180,134/271,0			

P76
P35;V58 (36°)(180,175/308,0)

(IF SXT OR VHF ONLY OR VHF/COAS, NO V67)
V67 (+02000,+00020,+00001)
V57;V87

5

143:15
R=25.63
Ṙ=-125.6

AUTO RCS SEL (16) - MNA/MNB (VERIFY)

3

V88

P35 FINAL COMP
COPY LM MCC-1 P76
P41

MCC-1

143:24:40			
LM	+0.0	+0.0	+0.0
CSM	+0.0	+0.0	+0.0
180,194/286,0			

P76
P35; V58 (TRIM)

*IF CSM ACTIVE & N58 TPF ΔV > 55 FPS *
GO TO PRE-BRAKING SPS BURN PROCEDURES
*(SEE LAST PAGE SOLO BOOK) *

(IF SXT OR VHF ONLY, V67 (+02000,+00020,+00001) AFTER 3 MARKS)
(IF VHF/COAS, V67 (+02000,+00020,+00001) BEFORE FIRST MARK)
V93; V57; V87

5

143:30
R=10.30
Ṙ=-77.6

GROUND TPI FOR LM

						ΔV_X
						ΔV_Y
						ΔV_Z

P34 FINAL COMP			
55	INTEG OPT +00000	ELEVATION ☽ •	TRANSFER ☽ +130.00
58	PERILUNE ALT •	TPI ΔV •	TPF ΔV •
81	TPI ΔV-LV •	•	•
59	TPI ΔV-LOS •	•	•

TPI P76			
ADD FOR LM RCS TPI			21.00
33	LM GETI-TPI		
84	LM TPI ΔV-LV •	•	•

P35 FINAL COMP			
81	MCC1 ΔV-LV •	•	•
59	MCC1 ΔV-LOS •	•	•

MCC1 P76			
33	LM GETI-MCC1		
84	LM MCC1 ΔV-LV •	•	•

LM FLIGHT PLAN

MCC-H	1323 CST	CDR	LMP	NOTES
0523	143:00 (11002)	FINAL TPI COMPUTATION		
	(12012)	V48 (12012)		
	:05	P42 APS THRUSTING		
		MANUAL ULLAGE	LOAD AGS TPI EXTERNAL ΔV	TIG: 143:09:40 BT: 4.0 SEC ΔVT: 92.2 FPS ULLAGE:4 JET, 10 SEC ORBIT: 61.0x44.6 NM
	:10	TPI		
		NULL RESIDUALS P35 TARGET MCC-1 RENDEZVOUS RADAR TRACKING		
	143:15			
	REV 32			
		FINAL MCC-1 COMPUTATION		
		P41 RCS THRUSTING	LOAD AGS MCC-1 EXTERNAL ΔV	TIG: 143:24:40 ΔVT: NOM ZERO
	:25	MCC-1		
		NULL RESIDUALS P35 TARGET MCC-2 RENDEZVOUS RADAR TRACKING		
			EXTERNAL LTG - OFF	
0553	143:30			

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	143:00 - 143:30	6/31-32	3-211

CSM FLIGHT PLAN

143:30 (11102) (X1111)

143:30
R=10.30
R=-77.6

3

+26 V88

+27 (P41) (0.5° DB)

P35 FINAL COMP
COPY LM MCC-2 P76
P41

MCC-2

143:39:40
LM +0.0,+0.0,+0.0
CSM +0.0,+0.0,+0.0
180,227/274,0

+30 143:40 (11102) (X1111)

P76
P00;V89 (R2=2)(35°)(180,271/310,0)

V64; ACQ MSFN HGA P -73, Y 349
V83

PERFORM PRE-DOCK CHECKLIST

143:45
R=2.40
R=-35.4

IF CSM ACTIVE:

P47 AT R=1.25 NM

SEC PRPLNT FUEL PRESS (4) - OPEN

V83E
N83E
KEY REL

MSFN

143:50 UTILITY PWR - ON (VERIFY)
TV - ON
DAC - ON
LM PHOTOS WITH DAC/TV

+42 TPF

143:52:17
LM 31.3 (TOTAL)
CSM 32.5 (TOTAL)
180,302/310,0

TV

EMS MODE - STBY
EMS FUNC - OFF
EXT RNDZ LT - OFF
LM STATIONKEEP

P00
DAC/TV - OFF
CONFIGURE SWITCHES FOR PHOTO MNVR:
BMAG MODE (ROLL,YAW) - ATT 1/RATE 2
SC CONT - SCS
MAN ATT (PITCH) - ACCEL CMD
CSM PITCH UP 360° AT 2°/SEC
NULL RATES AFTER PHOTO MNVR
144:00

P35 FINAL COMP			
81	MCC2 ΔV-LV		
59	MCC2 ΔV-LOS		

MCC2 P76			
33	LM GETI-MCC2		
84	LM MCC2 ΔV-LV		

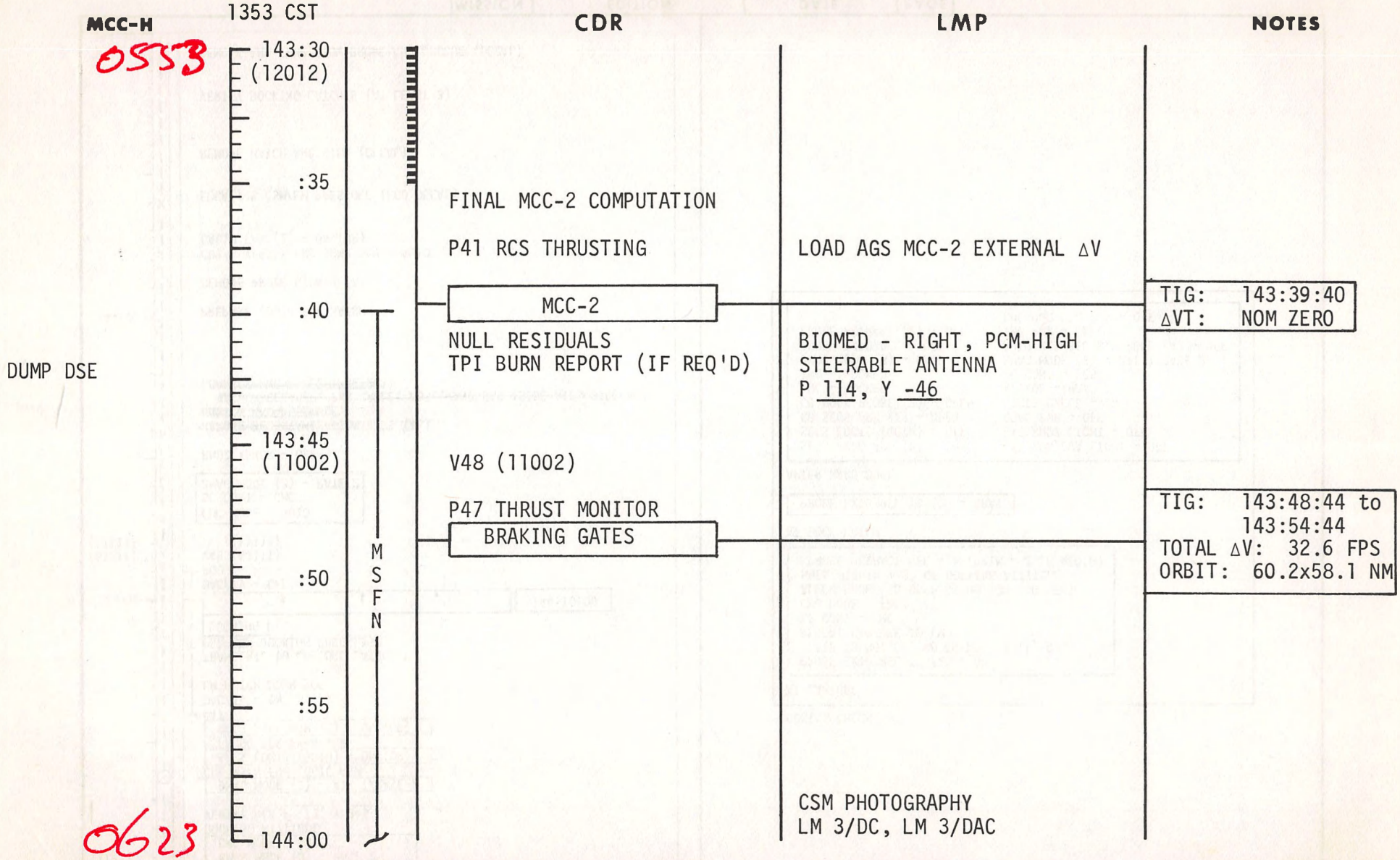
PRE-DOCK CHECKLIST

MAN ATT (3) - RATE CMD (VERIFY)	CB DOCK PROBE (2) - CLOSED
LIMIT CYCLE - OFF (VERIFY)	PROBE RETR (2) - OFF (VERIFY)
ATT DB - MIN	PROBE EXTD/REL - RETR
RATE - LOW (VERIFY)	PROBE EXTD/REL TB (2) - GRAY (VERIFY)
TRANS CONTR PWR - ON (UP)	(IF TB NOT GRAY, GO TO PG S/2-12, E)
ROT CONTR PWR DIRECT (BOTH) - MNA/MNB	CB SECS LOGIC (2) - CLOSED (VERIFY)
SC CONT - CMC (VERIFY)	CB SECS ARM (2) - CLOSED
CMC MODE - AUTO (VERIFY)	EXT LIGHTS RUN/EVA - ON (UP) (VERIFY)
AUTO RCS SEL (16) - MNA/MNB (VERIFY)	COAS PWR - ON (UP) (VERIFY)

BRAKING GATES

R,NM	R,FPS	RETICLE ANG,DEG	R,FT
1.50	45	.08	9000
1.00	30	.13	6000
.50	20	.26	3000
.25	10	.54	1500
.08	5	1.60	500
.05		2.70	300
.03		4.00	200
.02		8.50	100

LM FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	143:30 - 144:00	6/32	3-213

144:00 (11102) (X1111)

SC CONT - CMC
MAN ATT (PITCH) - RATE CMD
BMAG MODE (3) - RATE 2
CMC MODE - AUTO

DOCKING ATTITUDE
VERIFY HGA P -73, Y 349

BMAG MODE (3) - ATT 1/RATE 2
CUE MSFN FOR LOGIC ARM
SECS LOGIC (BOTH) - ON (UP)
MSFN GO FOR PYRO ARM
SECS PYRO ARM (2) - ON (UP)

P47
DAC/TV - ON
LM PITCH DOWN 90°

TRANSLATE TO CAPTURE LATCH
T PERFORM DOCKING CHECKLIST
V DOCKING

144:10 — 144:10:00

DAC/TV - OFF
POO
(61111) V48 (61111)
(11111) (11111)

CMC MODE - AUTO
SC CONT - CMC
BMAG MODE (3) - RATE 2

RNDZ XPNDR - OFF

~~REMOVE DECONTAMINATION BAGS (AB)~~
~~UNSTOW AND ASSEMBLE:~~
~~VACUUM CLEANER, PWR CABLE, HOSE, AND BAG (SIDE A12; SIDE A8)~~
~~CONNECT PWR CABLE (PNL 201)~~

change 1 B 1/11/71

144:20

PREPARE COUCH FOR HATCH

REMOVE PROBE STRAPS (A1)

CDR - VERIFY FWD DUMP VLV - AUTO
CABIN FAN (2) - ON (UP)

EQUALIZE CSM/LM PRESSURE (LOD DECAL)

REMOVE HATCH AND STOW (DECAL)

VERIFY DOCKING LATCHES (AT LEAST 3)

REMOVE AND TEMP STOW PROBE AND DROGUE (DECAL)

144:30

M S F N — X

DOCKING CHECKLIST

AT CAPTURE

PROBE EXTD/REL TB (2) - BP
(IF TB NOT BP, GO TO PG S/2-11, A)
REPORT CAPTURE TO LM
SC CONT - CMC
CMC MODE - FREE
ALLOW PROBE TO DAMP SC MOTION (10 SEC)
WHEN WITHIN ± 3° OF DOCKING ATTITUDE
PROBE RETRACT SEC - 1 (PRIM - 2 IF REQ'D)

AT DOCK LATCH

PROBE EXTD/REL TB (2) - GRAY

AFTER HARD DOCK

SECS PYRO ARM (2) - SAFE	EXT RUN/EVA LIGHT - OFF
SECS LOGIC (BOTH) - OFF	EXT RNDZ LIGHT - OFF
CB SECS ARM (2) - OPEN	COAS PWR - OFF
CB DOCK PROBE (2) - OPEN	LIMIT CYCLE - ON
THC - LOCKED	ATT DB - MAX
RHC - LOCKED	SC CONT - SCS
BMAG MODE (3) - RATE 2	BMAG MODE (3) - ATT 1/RATE 2
PROBE EXTD/REL - OFF	AUTO RCS SEL B/D ROLL (4) - OFF
PROBE RETRACT (2) - OFF	THC PWR - OFF
	RHC PWR DIR (2) - OFF

LM FLIGHT PLAN

MCC-H	1423 CST		CDR	LMP	NOTES
0623	144:00 (11002)		COAS TO OVHD WINDOW		
			RR-OFF		
GO/NO-GO FOR PYRO ARM	:05		PITCH 90°, YAW TO DOCK ATT		
	:10		DOCKING		144:10:00
UPLINK TO LM LM S.V. (TIG-10) P30 TARGET LOAD P99 LM DEORBIT	(12021)		CONFIGURE PGNS V48 (12021) PREP FOR TRANSFER		
UPDATE TO LM DEORBIT BURN PAD DAP LOAD (WEIGHTS)	144:15	MSFN			LM S.V. IS TIME TAGGED FOR DEORBIT BURN MINUS 10 MIN
	:20		VERIFY TUNNEL PRESSURIZED FROM CSM OVHD DUMP VALVE-OPEN DOFF HELMETS & GLOVES		
	:25		WHEN TUNNEL/LM PRESSURES EQUAL, OVHD DUMP VALVE - AUTO VERIFY PRESS REGS A&B - EGRESS OPEN HATCH		
0653	144:30				

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	144:00 - 144:30	6/32	3-215

CSM FLIGHT PLAN

ch. B 1/11/71

144:30
(61111)
(11111)

TRANSFER TO CDR AT HIS REQUEST:
- PROBE
- DROGUE
- VACUUM CLEANER (ASSEMBLED)
- DECONTAMINATION BAGS [redacted]
- HELMET & ACCESSORY BAG (2) (R6)

144:40 — MSFN

MSFN UPLINK:
- CSM S.V. (CSM SEP-10)
- LM S.V. (TIG LM DEORBIT -10)

MSFN UPDATE:
- MAP UPDATE REV 33
- DAP LOAD - UPDATE WEIGHTS COPY AT 145:25
- CSM SEPARATION PAD COPY AT 145:35
- LM JETTISON PAD COPY AT 145:45

144:50

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

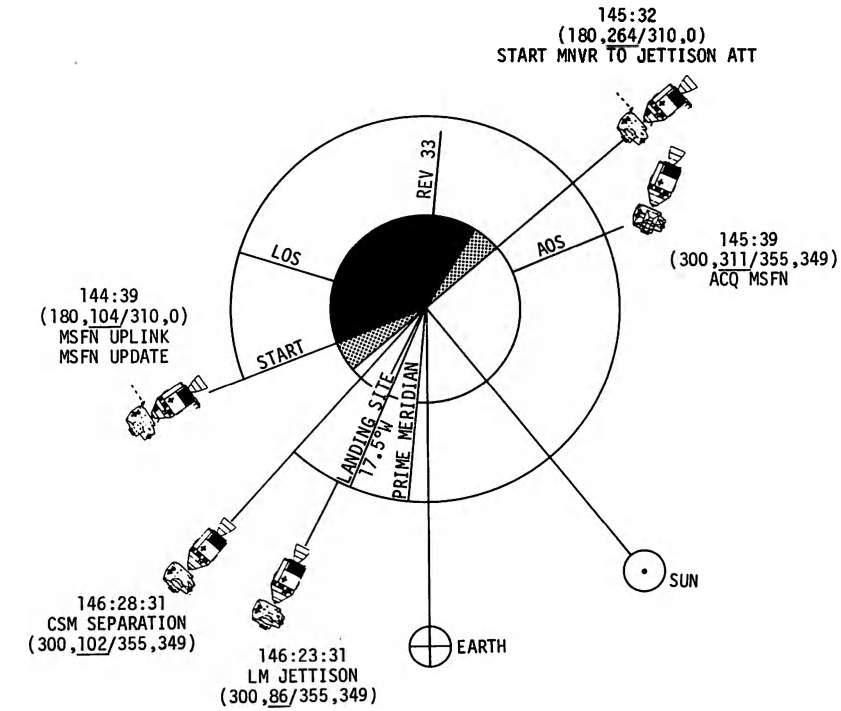
145:00

MAP UPDATE REV 33

LOS :

180°:

AOS :



MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE B (JAN)	~~DECEMBER 23, 1970~~ January 11, 71	3-216

LM FLIGHT PLAN

1453 CST

MCC-H

0653

	CDR	LMP	NOTES
144:30 (12021)	RECEIVE PROBE FROM CMP AND STOW		
	RECEIVE DROGUE FROM CMP AND STOW OVER PROBE		
:35	RECEIVE DECONTAMINATION BAGS & VACUUM CLEANER FROM CSM		
:40			
	UNSTOW, VACUUM/WET-WIPE, BAG AND TRANSFER TO CSM:		
144:45	70 MM MAG BAG (3 MAGS)		
	SURFACE 16 MM BAG (6 MAGS)		
	2 SAMPLE ROCK BAGS		
:50	HELMETS (WITH IV GLOVES)		
	ISA		
:55			
145:00			

MSFN

UPLINK TO CSM
CSM S.V. (SEP-10)
LM S.V. (TIG-10)

UPDATE TO CSM
MAP UPDATE REV 33
CSM SEP BURN PAD
LM JETTISON PAD
DAP LOAD (WEIGHTS)

LM S.V. IS TIME TAGGED FOR DEORBIT BURN MINUS 10 MIN

CSM S.V. IS TIME TAGGED FOR CSM SEP MINUS 10 MIN

0723

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	144:30 - 145:00	6/32	3-217

CSM FLIGHT PLAN

145:00
(61111)
(11111)

RECEIVE ITEMS FROM LM & STOW

145:10

REV 33

145:20

TRANSFER B5 & B6 CONTAINERS TO LM

CSM WT	+						
LM WT	+						

(61102)
(11111)

CYCLE CMC MODE - FREE/AUTO
V48 (61102)
(11111)
LOAD CSM & LM WEIGHTS

145:30

LM TO CSM TRANSFER LIST

ITEM	CM STOWAGE LOCATION
16MM MAGS (6) w/DECOM BAG	R13
70MM MAGS (3) w/DECOM BAG	R13
B1 BAG	TEMP STOWAGE (ON A8)
PURSE	TEMP STOWAGE (ON A8)
ISA w/DECOM BAG	ON A1
ROCK BAGS w/DECOM BAG (2)	ON A10, ON A13
ROCK BOXES w/DECOM BAG (2)	B5, B6
VACUUM CLEANER	SIDE A12
VACUUM HOSE, BRUSH, CABLE	SIDE A8
PGA (2)	PGA BAG
UCTA (2)	PGA BAG
FCS (2)	PGA BAG
LCG (2)	U1
HELMET & ACCESSORY BAGS (2)	PGA BAG
GLOVES (2 PR.)	
HELMET (2)	
BIO INSTRUMENTATION EQUIP (2)	ON CREW
COMM. CARRIER (2)	ON CREW

LM FLIGHT PLAN

1523 CST

MCC-H		CDR	LMP	NOTES
0723	145:00 (12021)			
	:05			
	:10	UNSTOW SRC'S, VACUUM AND BAG, TRANSFER TO CSM		
	145:15			
	REV 33	RECEIVE B5 & B6 FROM CMP AND STOW IN SRC RACK		
	:20	VACUUM PGA'S		
		TRANSFER VACUUM CLEANER TO CSM		
	:25			
0753	145:30			

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	145:00 - 145:30	6/32-33	3-219

CSM FLIGHT PLAN

145:30 (61102) (11111)

P30; LOAD CSM SEP PAD DATA

V49 MNVR TO LM JETTISON PAD ATT (145:38)

DOFF PGA
ZIP SUIT & INSTALL ELECTRICAL COVER PRIOR TO STOWING (PGA BAG)
STOW COMM CARRIERS & UCTA (PGA BAG)

ACQ MSFN OMNI D

145:40

MSFN

145:50

CDR - TRANSFER CM JETTISON ITEMS TO LM

WARNING

NO URINE/FECES
ALL OPENED FOOD MUST
BE TREATED AND
STORED IN BETA BAG

GO/NO-GO FOR LM CLOSEOUT
LMP - CLOSE LM HATCH
DIRECT O_2 VLV - CLOSED (CW)

UNSTOW AND INSTALL FORWARD HATCH (DECAL)

PERFORM HATCH INTEGRITY CHECK (DECAL)

146:00

P30 MANEUVER

SET STARS	C R	S C	M S/C	S G	E &	P N	PURPOSE PROP/GUID
	+			N	/	A	WT N47
R_{ALIGN} ___ ___ ___		0	0				P_{TRIM} N48
P_{ALIGN} ___ ___ ___		0	0				Y_{TRIM}
Y_{ALIGN} ___ ___ ___	+	0	0				HRS GETI
	+	0	0	0			MIN N33
	+	0					SEC
ULLAGE ___	-	0	0	0	1	0	ΔV_X N81
___	+	0	0	0	0	0	ΔV_Y
___	+	0	0	0	0	0	ΔV_Z
___	X	X	X				R (300)
	X	X	X				P (355)
	X	X	X				Y (349)

LM JETTISON PAD

+	0	0				HRS GETI
+	0	0	0			MIN N33
+	0					SEC
X	X	X				R (300) N22
X	X	X				P (355)
X	X	X				Y (349)

LM FLIGHT PLAN

MCC-H	1553 CST	CDR	LMP	NOTES
0753	145:30 (12021)			
	:35	VERIFY LM JETTISON ATTITUDE	STEERABLE ANTENNA P -40, Y 49	
	:40		CONFIGURE S-BAND VERIFY COMM	
		DISABLE AUDIO COMM DISCONNECT LM HOSE AND STOW		
	145:45	DOFF SUIT	INITIALIZE AGS ALIGN AGS TO PGNS DOFF SUIT	
				MSFN
	:50	IVT TO CSM WITH SUITS	P30 TARGET PGNS TARGET AGS ΔV FOR DEORBIT CONFIGURE LM FOR JETTISON STOW CSM JETTISON ITEMS	
GO/NO-GO FOR LM CLOSEOUT	:55		CLOSE HATCH, IVT TO CSM	
0823	146:00			

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	145:30 - 146:00	6/33	3-221

CSM FLIGHT PLAN

0823

146:00
(61102)
(11111)

LM PWR - OFF (VERIFY)
CB SECS ARM (2) - CLOSED
CUE MSFN FOR LOGIC ARM
SECS LOGIC (BOTH) - ON (UP)

MSFN GO FOR PYRO ARM

CONFIGURE CAMERA FOR LM JETTISON PHOTOS
CM2/DAC/18/CEX-BRKT, MIR (f8,250,7) 12 fps (50% MAG)

MAG (E) _____, MAG % _____
146:10 UTILITY PWR - ON

LOAD ΔV IN EMS TO + 100.0
CHECK NULL BIAS
GDC ALIGN
VERIFY ORDEAL

PERFORM PRE-JETTISON CHECKLIST

(11102)
(11111)
V48 (11102)
(11111)
146:20 SECS PYRO ARM (2) - ARM
P47 (JETT - 1 MIN)
EMS MODE NORMAL (JETT - 30 SEC)
DAC - ON

CSM/LM FINAL SEP (BOTH) - ON (0.4 FPS SEP)

LM JETTISON

(P41)
(0.5°DB)

146:23:31
300,86/355,349

P00
DAC - OFF

PERFORM PRE-SEPARATION CHECKLIST
EMS MODE - NORMAL (SEP - 30 SEC)

CSM SEPARATION

146:28:31
-1.0,+0.0,+0.0
300,102/355,349

(11102)
(11111)
P00;V66;V49 MNVR TO P52 ATT (146:36)
(180,245,0) HGA -39, Y 185
146:30

0853

PRE-JETTISON CHECKLIST

BMAG MODE (3) - ATT 1/RATE 2
ATT DB - MIN
RATE - LOW
SC CONT - SCS
EMS FUNC - ΔV
AUTO RCS SEL (16) - MNA/MNB
THC PWR - ON
RHC PWR DIR - MNA/MNB
THC - ARMED
RHC - ARMED

PRE-SEPARATION CHECKLIST

EMS MODE - STBY
SC CONT - CMC
BMAG MODE (3) - RATE 2

P41 (BYPASS MNVR)

SECS PYRO ARM (2) - SAFE
SECS LOGIC (BOTH) - OFF
CB SECS ARM (2) - OPEN

0883

146:30 (11102) (11111)

EMS MODE - STBY
EMS FUNC - OFF
THC PWR - OFF
AUTO RCS SEL B/D ROLL (4) - OFF
RHC PWR DIR - OFF
THC - LOCKED
RHC - LOCKED

SC CLEAN-UP
MSFN: DUMP DSE

MSFN UPLINK:
DESIRED ORIENT (TEI)

MSFN UPDATE:
LTC PHOTO PAD (TGT 11) (COPY IN FLIGHT PLAN AT 147:00)
MAP UPDATE REV 34

146:40 MSFN

P52 (OPTION 3)
(LIFT-OFF ORIENT)
REPORT: GYRO TORQUING ANGLES

P52 (OPTION 1)
(TEI ORIENT)

146:50

GDC ALIGN
VERIFY ORDEAL

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

WIPE EXCESSIVE MOISTURE FROM TUNNEL HATCH AREA

PERFORM CONTAMINATION CONTROL PROCEDURE

147:00

0923

P52 IMU REALIGN

N71: ___ ___ ___ ___

N05: ___ ___ ___ ___ ___

N93:

X ___ ___ ___ ___ ___

Y ___ ___ ___ ___ ___

Z ___ ___ ___ ___ ___

GET ___ ___ ___ ___ ___ ___ ___

MAP UPDATE REV 34

LOS : ___ ___ ___ ___ ___ ___ ___

180°: ___ ___ ___ ___ ___ ___ ___

AOS : ___ ___ ___ ___ ___ ___ ___

CONTAMINATION CONTROL
NOTE: IF WATER IS TO BE COLLECTED,
USE WATER COLLECTION PROCEDURE,
UNSTOW VAC CLEANER & COMPONENTS
AC UTIL PWR - OFF (VERIFY)
ASSEMBLE COMPONENTS & CONNECT PWR CABLE
AC UTIL PWR - ON (UP)
VAC CLEANER PWR SW - ON
VACUUM/BRUSH CM INTERIOR WITH SPECIAL
ATTENTION TO THE FOLLOWING:
TRANSFER TUNNEL WALL AND TOP HATCH SURFACES
OPEN B5 AND B6 COVER AND CLEAN COMPARTMENT
AND SRC BAGS SURFACES
OPEN A5 AND CLEAN COMPARTMENT AND CSC BAG AND
FILM CASSETTE BAGS SURFACES
OPEN R13 AND CLEAN COMPARTMENT AND FILM
MAGAZINE BAG SURFACE
OPEN FOOD CONTAINERS AND CLEAN COMPARTMENT
AND HELMET STOWAGE BAGS SURFACES
PGA BAG SURFACES
MOVE VACUUM CLEANER BRUSH INTO ALL POTENTIAL
"DEAD AIR" POCKETS TO ENSURE THOROUGH
MIXING OF CM ATMOSPHERE,
VAC CLEANER PWR SW - OFF
AC UTIL PWR - OFF
DISCONNECT PWR CABLE & DISASSEMBLE COMPONENTS
STOW VAC CLEANER & COMPONENTS

FLIGHT PLAN

MCC-H

0923

1723 CST

147:00
(11102)
(X1111)

:10

REV 34

:20

147:30

:40

:50

148:00

MSFN

LiOH CANISTER CHANGE
(12 INTO B, STOW 10 IN A3)

V49 MNVR TO LTC PHOTO PAD ATTITUDE (147:30)

EAT PERIOD

ACQ MSFN HGA P-31, Y178

CONFIGURE CAMERA: (S-IVB/LM IMPACT)
CM3/LTC/MBW/SEF (SHUT 1/50,RNG 90.5,INT 8.1)
(73 FR), MAG (V) ____, FR # ____
LTC INSTALLATION (DECAL)
LTC CHECKOUT (DECAL)

DUMP DSE
UPDATE TO CSM
TEI 34 MNVR PAD
TEI 35 MNVR PAD
MAP UPDATE REV 35

NOTES

LTC PHOTO PAD TARGET 11
T START: __ __ __:__ __:__ __
APOLLO 12 LM (208.8,126.1,014.4)
R _____, P _____, Y _____
RNG (90.5) _____

T START +2:33
APOLLO 13 S-IVB (213.1,120.6,010.3)
R _____, P _____, Y _____
RNG (90.6) _____

T START +4:31
APOLLO 14 S-IVB (214.3,115.6,008.0)
R _____, P _____, Y _____
RNG (90.6)
T STOP: __ __ __:__ __:__ __

MAP UPDATE REV 35
LOS : __ __ __:__ __:__ __
180° : __ __ __:__ __:__ __
AOS W/TEI : __ __ __:__ __:__ __
AOS W/O TEI : __ __ __:__ __:__ __

LM DEORBIT BURN
TIG: 147:52:58.9
BT: 77 SEC
ΔV: 183.7 FPS

0923

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	147:00 - 148:00	6/33-34	3-224

FLIGHT PLAN

MCC-H

1023

1823 CST

148:00 (11102) (X1111)

:10

:20

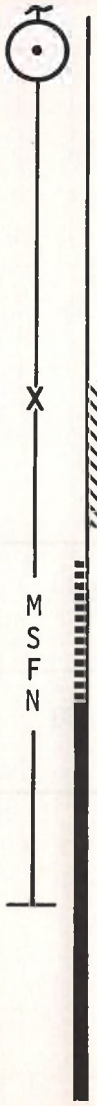
148:30

:40

:50

149:00

1123



UPLINK TO CSM
CSM S.V. & V66
TEI 34 TGT LOAD

RECORD VG_{IMU} DATA

CSM SYSTEMS CHECKLIST

C&WS OPERATIONAL CHECKS	PAGE S 1-17
CM RCS MONITORING CHECK	PAGE S 1-1
SM RCS MONITORING CHECK	PAGE S 1-1
SPS MONITORING CHECK	PAGE S 1-1

CABIN FAN (2) - OFF; REMOVE AND STOW
CABIN FAN LUNAR DUST FILTER WITH BAG (PGA BAG)
LTC MODE-STANDBY/POWER-ON
ZERO DET (T START -1 MIN)
LTC MODE - AUTO, DET - UP/START (T START)
PHOTO TGT 11 (APOLLO 12 LM, APOLLO 13 S-IVB, APOLLO 14 S-IVB)
MNVR BETWEEN TARGETS PER LTC PHOTO PAD
LTC MODE-STANDBY, RECORD FR # ____
LTC REMOVAL (DECAL), AND STOW
P30 EXTERNAL ΔV
V49 MNVR TO PAD BURN ATTITUDE (148:35)
(180,000,000) OMNI D

P40 SPS THRUSTING

VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)

NOTES

LM LUNAR IMPACT
GET: 148:20:58
LAT: 3.5°S
LONG: ~~19.29°~~ 19.24°W

NOTE: IF APOLLO 14 ALSEP IS INOPERABLE, THE LM WILL BE IMPACTED NEAR APOLLO 12 ALSEP AT:
LAT 3.~~35~~ 04°S
LONG ~~23.98°W~~ 24.64°W

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE B (JAN)	~~DECEMBER 23, 1970~~ JANUARY 11 1971	148:00 - 149:00	6/34	3-225

TEI
BURN TABLE

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

TABLE 3-8

FLIGHT PLAN

MCC-H

1123

1923 CST

149:00
(11102)
(X1111)

:10

REV 35

:20

DUMP DSE

149:30

UPLINK TO CSM
DESIRED ORIENT (PTC)

:40

:50

1223

150:00

MSFN

SXT STAR CHECK
P40 SPS THRUSTING

TEI

V66 SET CSM S.V. INTO LM S.V.

UNSTOW DC & EL CAMERAS AND PREPARE FOR LUNAR PHOTOS
CM3/DC/80/MBW (f2.8,250,∞) (11 FR)
MAG (R) ___, FR # ___
CM3/EL/250/MBW (f5.6,1/250,∞) (4 FR)
MAG (T) ____, FR # ____
V49 MNVR TO PHOTOGRAPH LUNAR SURFACE (149:35)
(127,226,330) HGA P -14, Y 303

TEI BURN STATUS REPORT

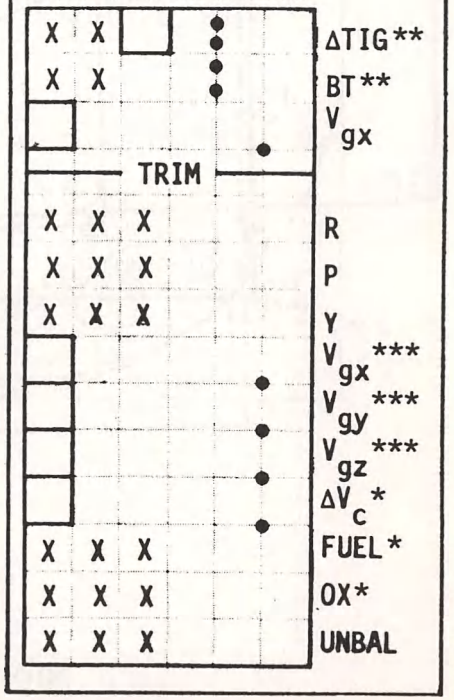
LUNAR SURFACE PHOTOGRAPHY, TEI +26 (149:41) (5 FR)
HAND-HELD, OVERLAPPING, PAN OF VISIBLE DISC,
RAPID SEQUENCE
V49 MNVR TO PHOTOGRAPH LUNAR SURFACE (149:47)
(128,222,331) CHANGE APERTURE TO f4
LUNAR SURFACE PHOTOGRAPHY, TEI +32 (149:47) (4 FR)
HAND-HELD, OVERLAPPING, PAN OF VISIBLE DISC,
RAPID SEQUENCE
V49 MNVR TO PHOTOGRAPH LUNAR SURFACE (149:57)
(131,215,332)
LUNAR SURFACE PHOTOGRAPHY, TEI +42 (149:57) (2 FR)
HAND-HELD, COVER VISIBLE DISC
STOW DC CAMERA, RECORD FR # ___

NOTES

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

TIG: 149:14:50
BT: 2 MIN 27.4 SEC
ΔVT: 3449.55 FPS
ULLAGE:4 JET, 12 SEC
ORBIT: N/A

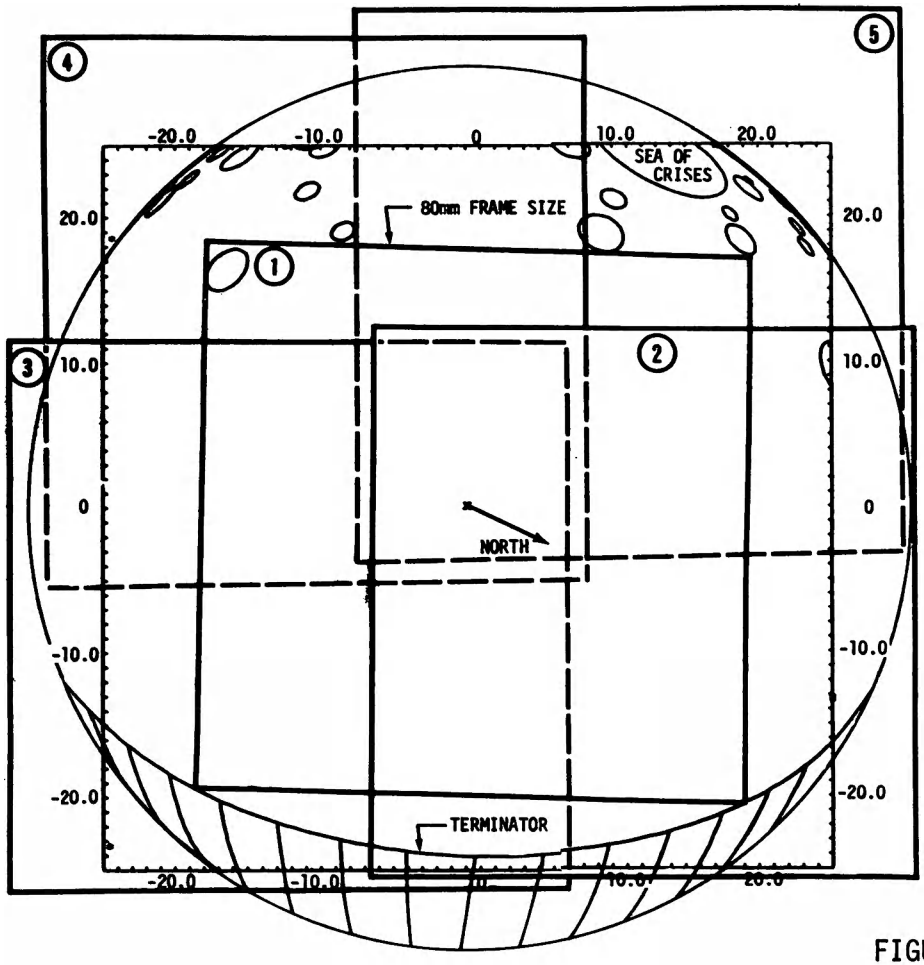
BURN STATUS REPORT



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	149:00 - 150:00	6/34-35/TEC	3-227

POST-TEI PHOTO SEQUENCE

TEI + 26 MIN



TEI + 32 MIN

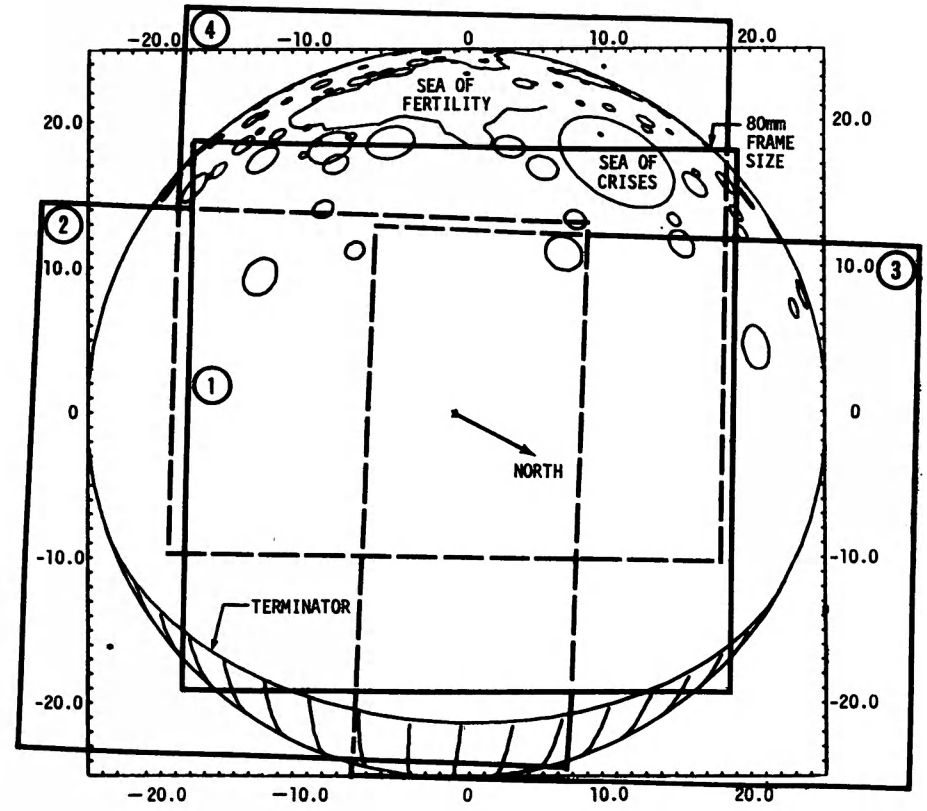
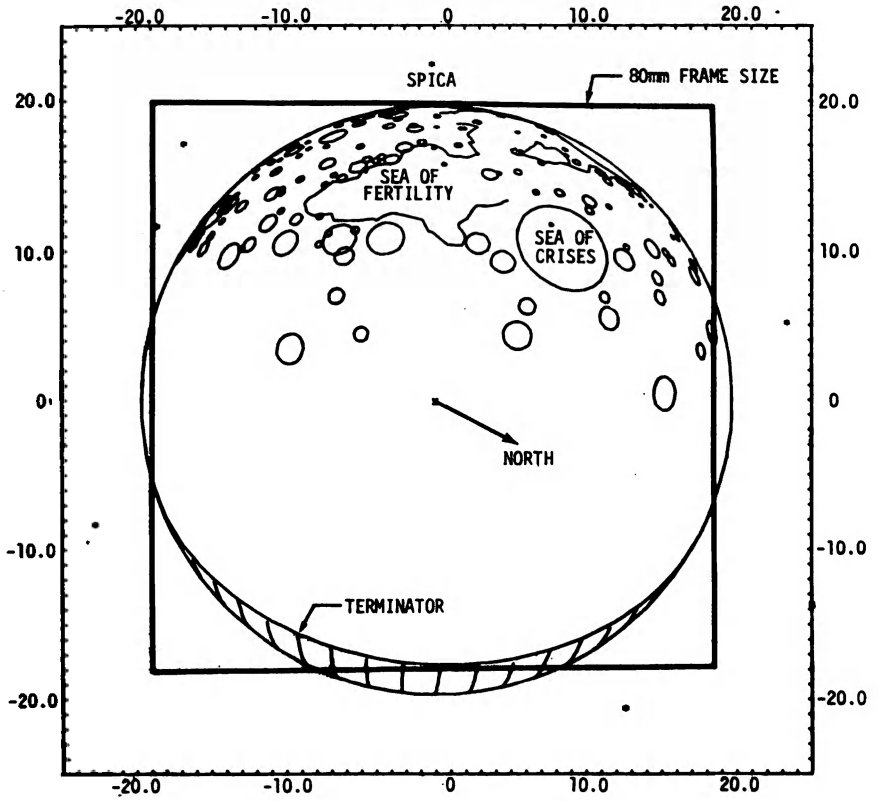


FIGURE 3-3

POST-TEI PHOTO SEQUENCE

TEI + 42 MIN

(TWO PHOTOS, CENTER LUNAR DISC IN FRAME)



TEI + 1 HR

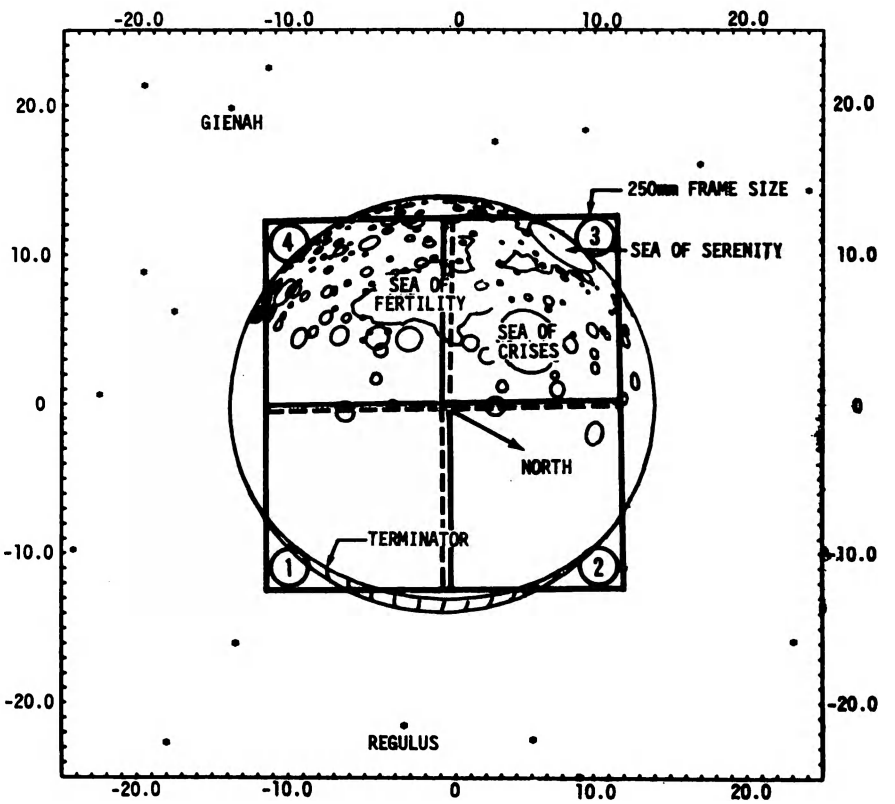


FIGURE 3-4

POST-TEI PHOTO SEQUENCE

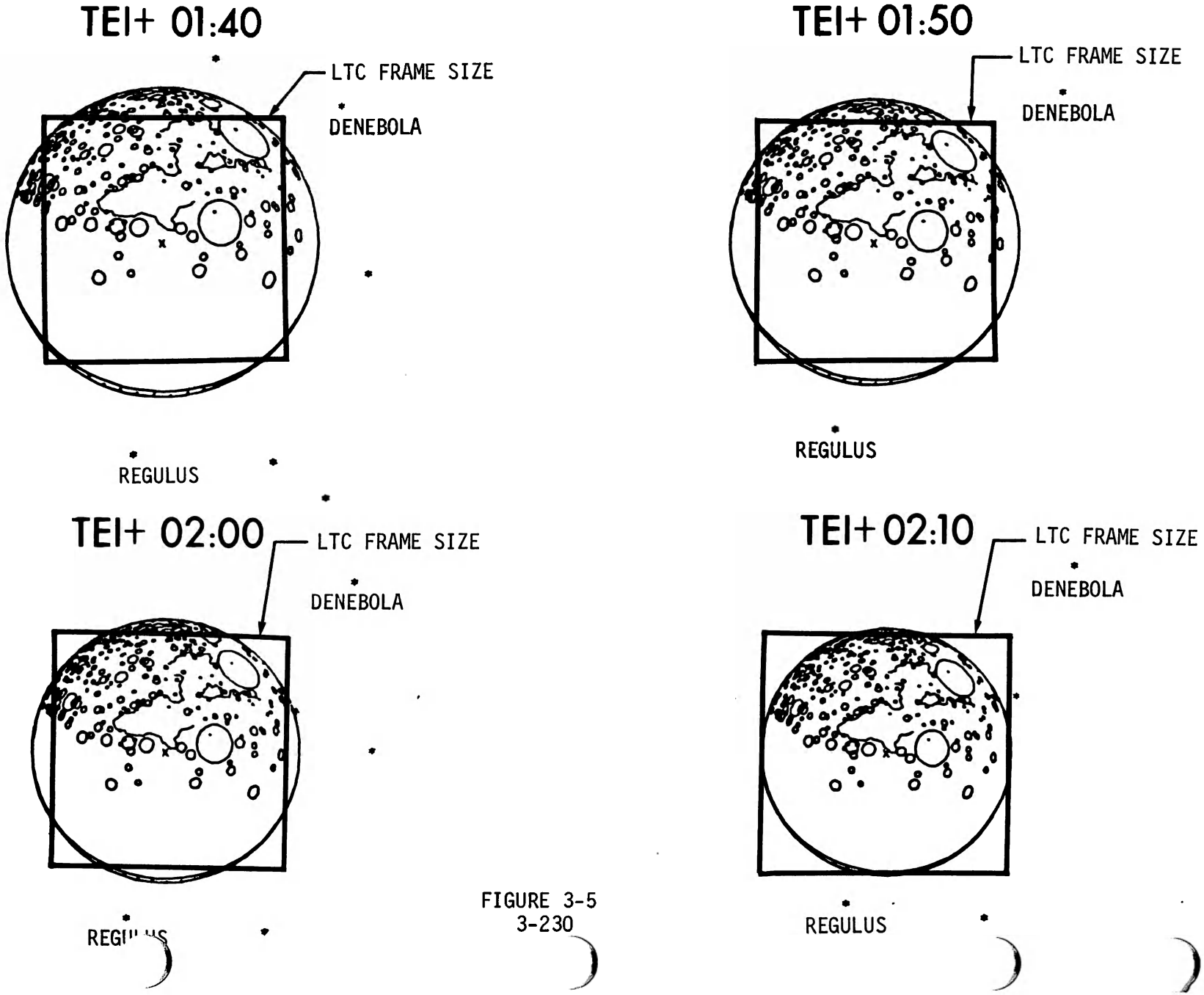


FIGURE 3-5

FLIGHT PLAN

MCC-H | 2023 CST | NOTES

1223

150:00 (11102) (X1111)

P52 IMU ALIGN
OPTION 3 REFSMMAT
(TEI ORIENTATION)
REPORT GYRO TORQUE ANGLES
OPTION 1 PREFERRED
(PTC ORIENTATION)

STARS ____, ____
SA ____, ____
TA ____, ____

:10

V49 MNVR TO PHOTOGRAPH LUNAR SURFACE (150:15)
(040,314,352) HGA P -33, Y 291
LUNAR PHOTOGRAPHY TEI + 1 HR (150:15)
CM3/EL/250/MBW (f5.6,1/250,∞) (4 FR)
HAND-HELD, COVER VISIBLE DISC
STOW EL CAMERA, RECORD FR # ____

:20

MSFN

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

150:30 (11101) (X1111)

VISUAL ASSESSMENT OF VISUAL TARGETS 1 & 2

V48 (11101)(X1111)

LTC PHOTO PAD (TEI +01:40)
R_____, P_____, Y_____

UPDATE TO CSM
LTC PHOTO ATT
(IF REQ'D)

:40

V49 MNVR LTC PHOTO PAD ATTITUDE (150:50)
(046.8,315.7,359.1)
CONFIGURE CAMERA: (LUNAR SURFACE PHOTOS)
CM3/LTC/MBW/SEF-(SHUT 1/200, RNG 99.9 CW, INT-SINGLE FRAME) (12 FR)
MAG (V) ____, FR # ____
LTC INSTALLATION (DECAL)

:50

LTC CHECKOUT (DECAL)
VERIFY LTC MODE-STANDBY/POWER-ON (T START -1 MIN)
LTC MODE-SINGLE
TEI +1 HR 40 MIN (150:55) SINGLE FRAME
GET OF EXPOSURE: ____:___:___
V49 MNVR TO LTC PHOTO PAD ATTITUDE (151:00)
(047.8,315.8,000.1)

LTC PHOTO PAD (TEI +01:50)
R_____, P_____, Y_____

1323

151:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	150:00 - 151:00	6/TEC	3-231

FLIGHT PLAN

MCC-H

1323

2123 CST

151:00 (11101) (X1111)

:10

:20

151:30

:40

:50

152:00

MSFN

TEI + 1 HR 50 MIN (151:05) SINGLE FRAME
GET OF EXPOSURE ___:___:___

V49 MNVR TO LTC PHOTO PAD ATTITUDE (151:10)
(048.6,315.9,001.0)
TEI + 2 HR (151:15) SINGLE FRAME
GET OF EXPOSURE ___:___:___

V49 MNVR TO LTC PHOTO PAD ATTITUDE (151:20)
(049.3,316.0,001.7)
TEI + 2 HR 10 MIN (151:25) SINGLE FRAME
GET OF EXPOSURE ___:___:___
LTC MODE-STANDBY, RECORD FR # ____
LTC REMOVAL (DECAL), AND STOW

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20,270,000)
V79 (-0.3750)
(+030.00)
(+00000)

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST PAGE S 1-26
COMM - OMNI'S

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP
CSM S.V.

UPLINK TO CSM
CSM S.V. (MSFN)
(NO V47)

1423

PTC

NOTES

LTC PHOTO PAD (TEI + 02:00)
R_____, P_____, Y_____

LTC PHOTO PAD (TEI + 02:10)
R_____, P_____, Y_____

EARTH DISTANCE
≈206 148 NM
DAP LOAD STATUS
(11101)(X1111)

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

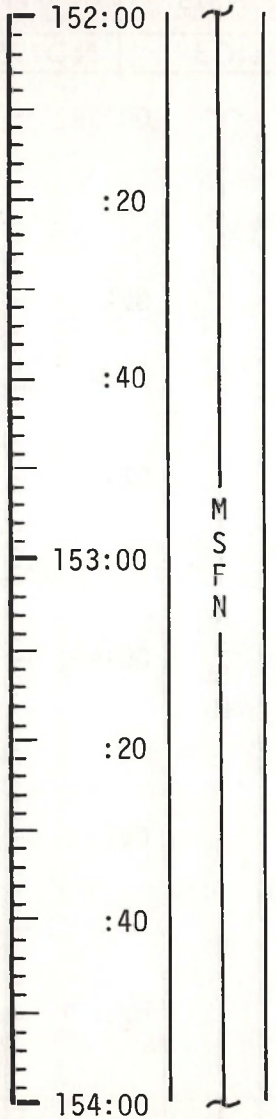
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	151:00 - 152:00	6/TEC	3-232

FLIGHT PLAN

MCC-H

1423

2223 CST



MSFN

REST PERIOD
(10 HOURS)

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

1523.

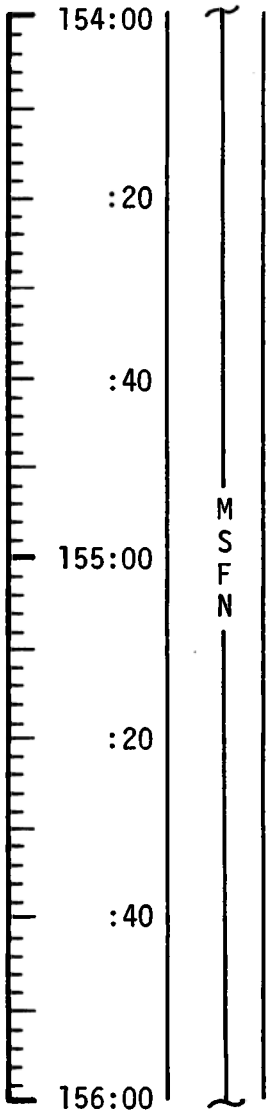
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	152:00 - 154:00	6/TEC	3-233

MCC-H

0023 CST

FLIGHT PLAN

NOTES



MSFN

REST PERIOD
(10 HOURS)

PTC

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	154:00 - 156:00	6/TEC	3-234

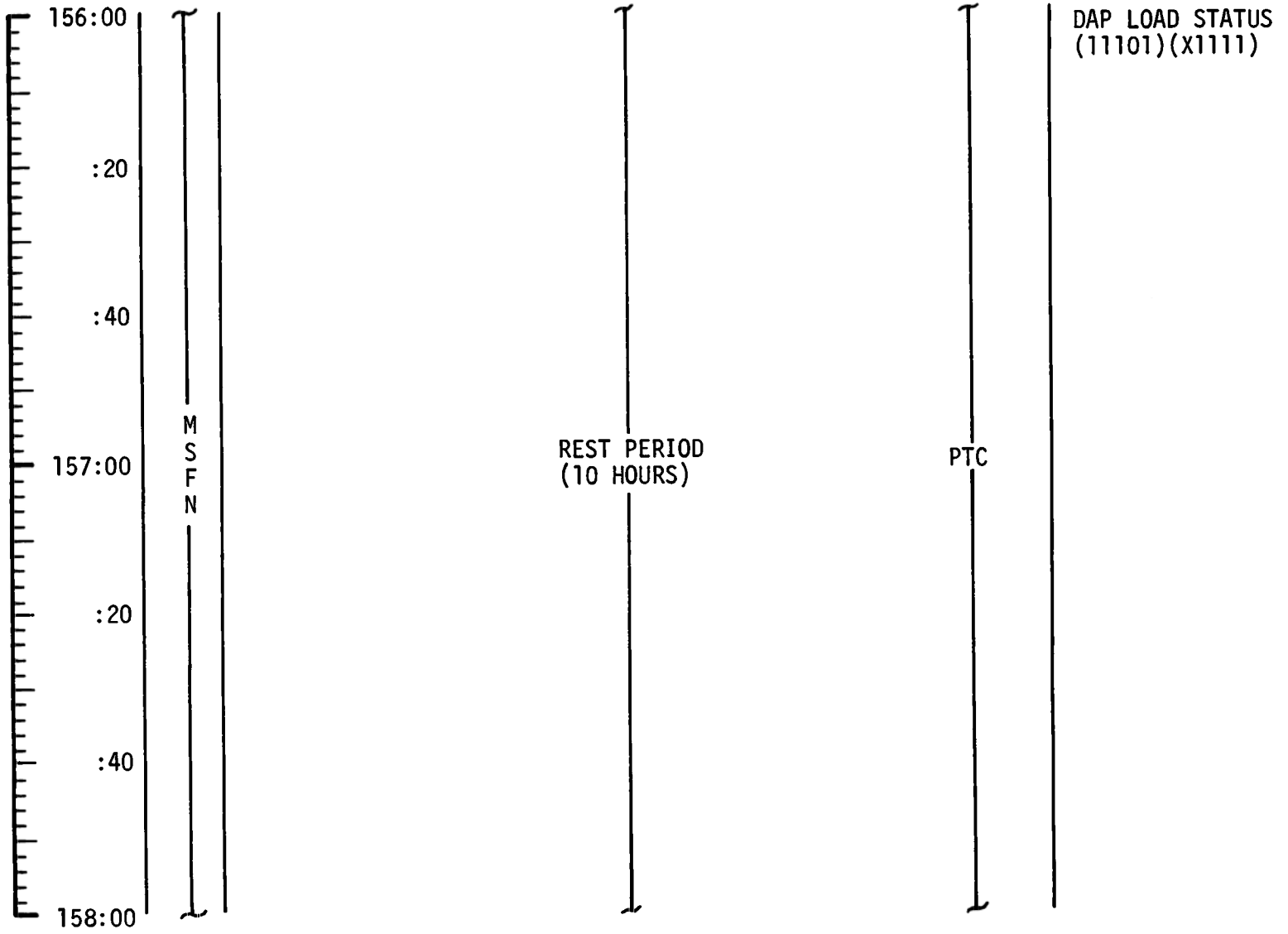
MCC-H

0223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	156:00 - 158:00	6/TEC	3-235

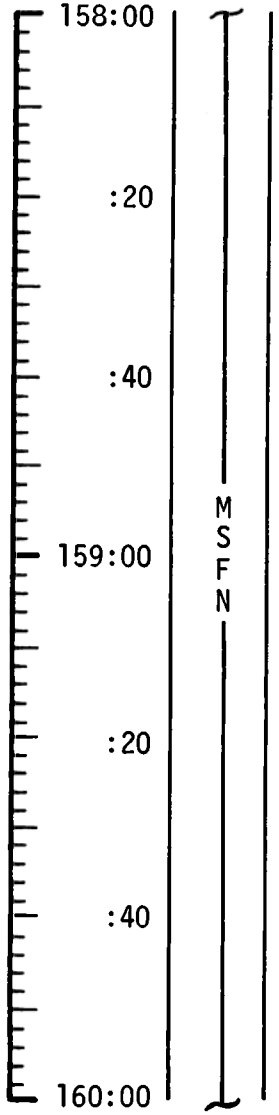
MCC-H

0423 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)



MSFN

REST PERIOD
(10 HOURS)

PTC

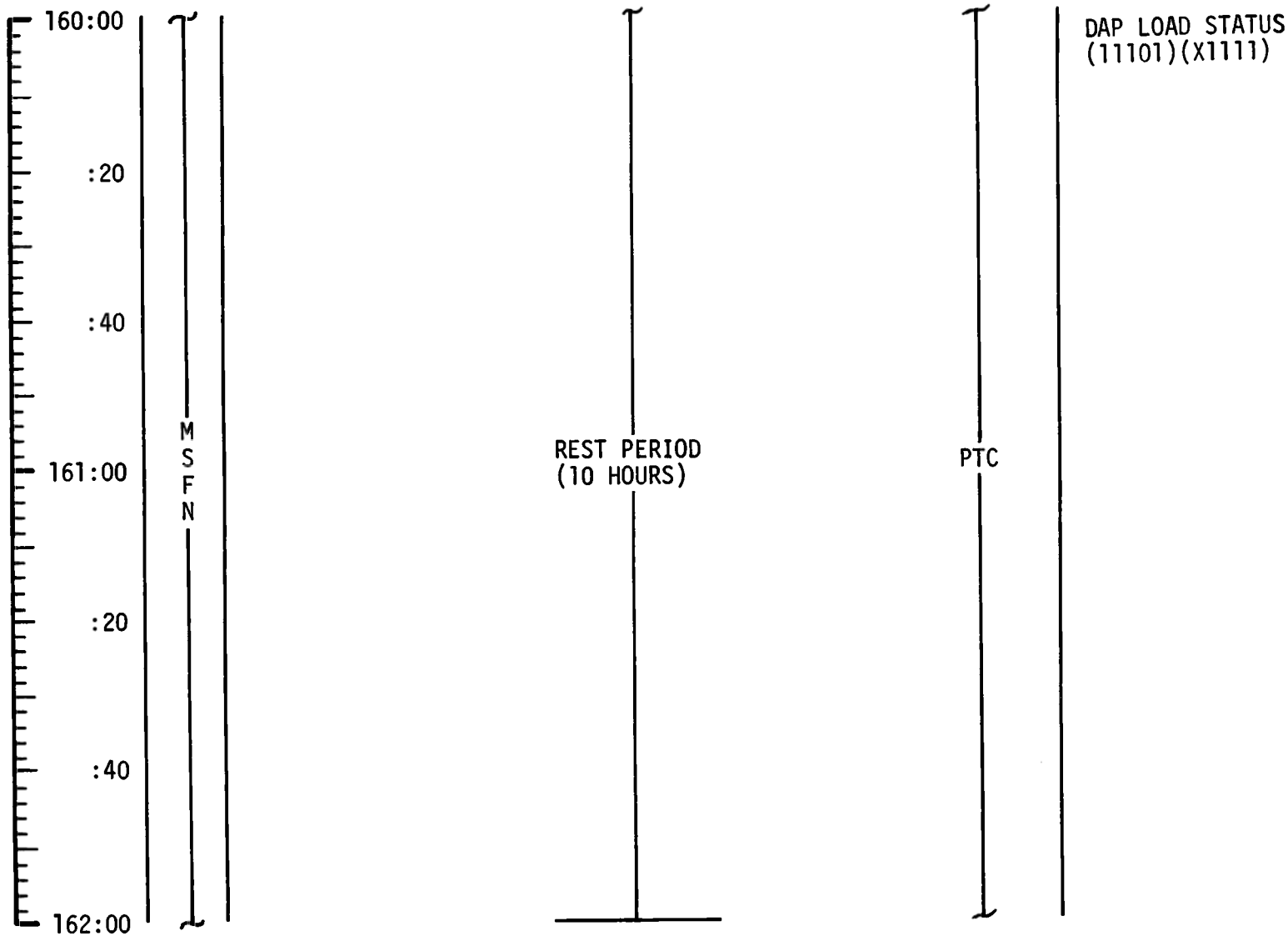
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	158:00 - 160:00	6/TEC	3-236

MCC-H

0623 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	160:00 - 162:00	6/TEC	3-237

FLIGHT PLAN

MCC-H

0823 CST

0023

UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN

162:00
:10
:20
162:30
:40
:50
163:00

MSFN

CSM SYSTEMS CHECKLIST

POST-SLEEP CHECKLIST — PAGE S 1-26
COMM - HGA REACQ MODE
LiOH CANISTER CHANGE
(13 INTO A, STOW 11 IN A3)
O_2 HEATER 2 (1) - OFF

EAT PERIOD

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

CSM CONSUMABLES UPDATE

GET: __ __ __:__ __.

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

EARTH DISTANCE
≈184 381 NM

DURING PTC CREW AWAKE PERIODS, THE ANTENNA CONFIGURATION WILL BE HGA/OMNI COMMANDED FROM MCC-H

8/23

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	162:00 - 163:00	7/TEC	3-238

FLIGHT PLAN

MCC-H

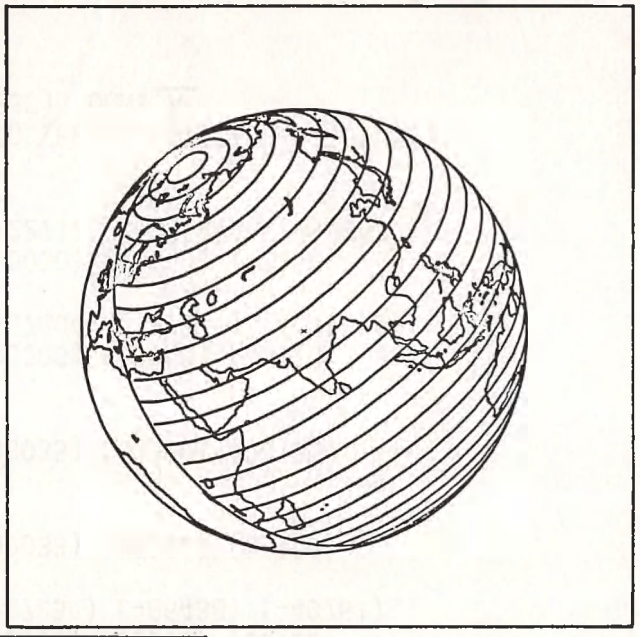
0123

0923 CST

163:00
:10
:20
163:30
:40
:50
(11101)
(X1111)
164:00

MSFN

GET: 164:00 F.O.V. 3°



P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

EXIT G&N PTC

PAGE G 8-3

PTC

NOTES

DAP LOAD STATUS
(11101) (X1111)

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

0223

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	163:00 - 164:00	7/TEC	3-239

MCC-H

1023 CST

FLIGHT PLAN

NOTES

0223

164:00 (11101) (X1111)

:10

:20

164:30

:40

:50

165:00

MSFN

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(113,323,002) HGA P -68, Y 73
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00033)
P00
V49 MNVR TO SIGHTING ATTITUDE
(094,325,335) HGA P -55, Y 3
V67 (+99000) (+00020) (+00003)

EARTH HORIZON
LOAD W MATRIX

P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR

1. N70 (00040) (00000) (00110)

40 ALTAIR (ENH)

2. N70 (00000) (00000) (00120)
   N88 (+07234) (-86438) (-49761)

212 DELTA
SAGITTARII (EFH)

3. N70 (00033) (00000) (00120)

33 ANTARES (EFH)

*4. N70 (00035) (00000) (00120)

35 RASALHAGUE (EFH)

*5. N70 (00000) (00000) (00120)
   N88 (-07804) (-99375) (+07982)

211 BETA
OPHIUCHI (EFH)

*6. N70 (00000) (00000) (00110)
   N88 (+22712) (-83641) (-49884)

214 ZETA
SAGITTARII (ENH)

V49 MNVR TO THERMAL ATTITUDE (165:00)
(184,325,335) OMNI A

*OPTIONAL TEST
STARS, DO NOT
UPDATE S.V.

0123

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	164:00 - 165:00	7/TEC	3-240

FLIGHT PLAN

MCC-H
0323

UPLINK TO CSM
CSM S.V. & V47E
MCC-5 TGT LOAD

UPDATE TO CSM
MCC-5 MNVR PAD

1123 CST

165:00
(1110)
(X111)
:10
:20
165:30
:40
:50
166:00

MSFN

P30 EXTERNAL ΔV

V49 MNVR TO PAD ATT

SXT STAR CHECK
P40 SPS THRUSTING OR
P41 RCS THRUSTING

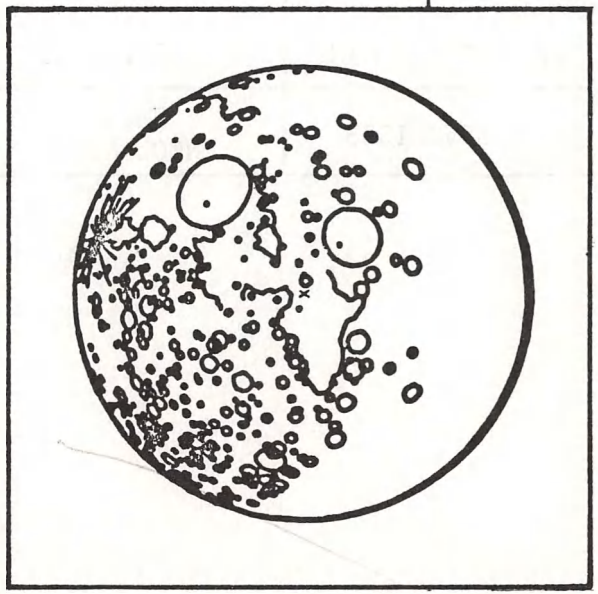
0423

NOTES

THE TEI CMC S.V. WILL BE UPDATED BY ONBOARD NAVIGATION (P-23's) DURING TEC. MCC'S WILL BE PERFORMED WITH A MSFN CALCULATED S.V. REPLACING THE CMC CALCULATED S.V., WHICH WILL BE DOWN-LINKED PRIOR TO THE BURNS. AFTER THE MCC, THE PREVIOUS CMC S.V. (CORRECTED FOR THE BURN) WILL BE UPLINKED TO THE LM SLOT AND TRANSFERRED TO THE CSM SLOT, THUS PRESERVING THE ORIGINAL CMC S.V. AND THE W MATRIX. AFTER THE BURN, MCC-H WILL ALSO UPLINK A CURRENT MSFN S.V. TO THE LM SLOT FOR REFERENCE PURPOSES.

GET: 166:00

F.O.V. 3°



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	165:00 - 166:00	7/TEC	3-241

MCC-5
BURN TABLE

MANEUVER	P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
CORRIDOR CONTROL	10°/SEC COMPLETE	±10° COMPLETE	BT + 1 SEC AND $\Delta V_C = 0$	TRIM X AXIS ONLY TO 0.2 FPS
IP CONTROL	10°/SEC TERMINATE	±10° TERMINATE	BT + 1 SEC AND $\Delta V_C = 0$	TRIM X & Z AXIS TO 0.2 FPS

TABLE 3-9

MCC-H

0423

1223 CST

FLIGHT PLAN

NOTES

166:00

(11101)
(X1111)

:10

TEI +17 HR

UPLINK TO CSM
CSM S.V. (CMC) V47E
CSM S.V. (MSFN)
(NO V47)

:20

166:30

:40

:50

0523

167:00

M S F N

O_2 FUEL CELL PURGE

WASTE WATER DUMP

TIG: 166:14:50
BT: NOM ZERO
ΔVR: NOM ZERO
ULLAGE: N/A
ORBIT: N/A

MCC-5

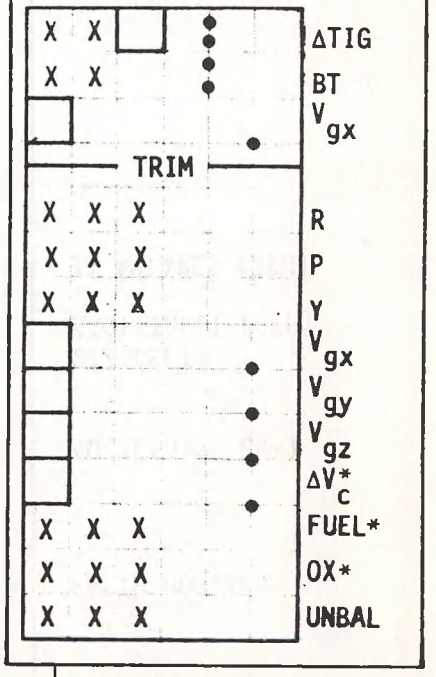
BURN STATUS REPORT
CHARGE BATTERY B

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(290,019,034) OMNI C
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00016)
POO
V49 MNVR TO SIGHTING ATTITUDE — LUNAR HORIZON
(287,032,000) OMNI C
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH START
1. N70 (00016) (00000) (00220) — 16 PROCYON (MFH)

2. N70 (00000) (00000) (00220) — 50 POLLUX (MFH)
N88 (-38513) (+79364) (+47097)

3. N70 (00022) (00000) (00210) — 22 REGULUS (MNH)

BURN STATUS REPORT



*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	166:00 - 167:00	7/TEC	3-243

MCC-H

1323 CST

FLIGHT PLAN

NOTES

0423

167:00
(11101)
(X1111)

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(057,098,359) HGA P -63, Y 261
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00035)
P00

EARTH DISTANCE
≈175 091 NM

:10

V49 MNVR TO SIGHTING ATTITUDE
(081,094,325) HGA P -57, Y 0
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR
1. N70 (00040) (00000) (00110)

EARTH HORIZON

40 ALTAIR (ENH)

:20

2. N70 (00000) (00000) (00120)
N88 (+07234)(-86438)(-49761)

212 DELTA
SAGITTARII (EFH)

3. N70 (00033) (00000) (00120)

33 ANTARES (EFH)

M
S
F
N

167:30

(11111)
(X1111)

V48 (11111)(X1111)
V49 MNVR TO O_2 FLOW RATE TEST ATTITUDE (167:45)
(345,130,344) HGA P 10, Y 279

:40

DISABLE RCS QUADS A&B

:50

UNSTOW ELECTRICAL CABLE FROM R10
REMOVE PROTECTIVE PLUG FROM SIDE HATCH
DUMP NOZZLE
CONNECT CABLE TO HEATER CONNECTOR
PANEL 15 UTILITY PWR - OFF (VERIFY)
CONNECT CABLE TO UTILITY OUTLET
UTILITY PWR - ON

O_2 FLOW
RATE TEST

0623

168:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE C (JAN)	JANUARY 18, 1971	167:00 - 168:00	7/TEC	3-244

MCC-H

1423 CST

FLIGHT PLAN

NOTES

0623

168:00 (11111) (X1111)		CREW EXERCISE PERIOD	
:10		O_2 HEATER 3 (1) - AUTO REPRESS PKG VLV - OFF (VERIFY) CB O_2 ISOL/AUX BAT - CLOSE	
:20		O_2 TANK 3 ISOL VLV - CLOSE (MOMENTARY) O_2 TANK 3 ISOL VLV TB-BP O_2 PRESS IND - SRG/3	
168:30	MSFN	UNSTOW SCREEN & ADAPTER FROM R6 REMOVE PLUG FROM SIDE HATCH ORIFICE AND STOW INSTALL ADAPTER ON HATCH ORIFICE INSTALL SCREEN ON ADAPTER	O_2 FLOW RATE TEST
:40		WHEN SURGE TANK PRESSURE REACHES 750 PSIA, (CRYO O_2 PRESS 1/SRG IND $\leq$ 750 PSIA) SURGE TANK O_2 VLV - OFF	TEST WILL BE TERMINATED 2.5 HOURS AFTER SURGE TANK REACHES 750 PSIA
:50			
169:00			

0723

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE C (JAN)	JANUARY 18, 1971	168:00 - 169:00	7/TEC	3-245

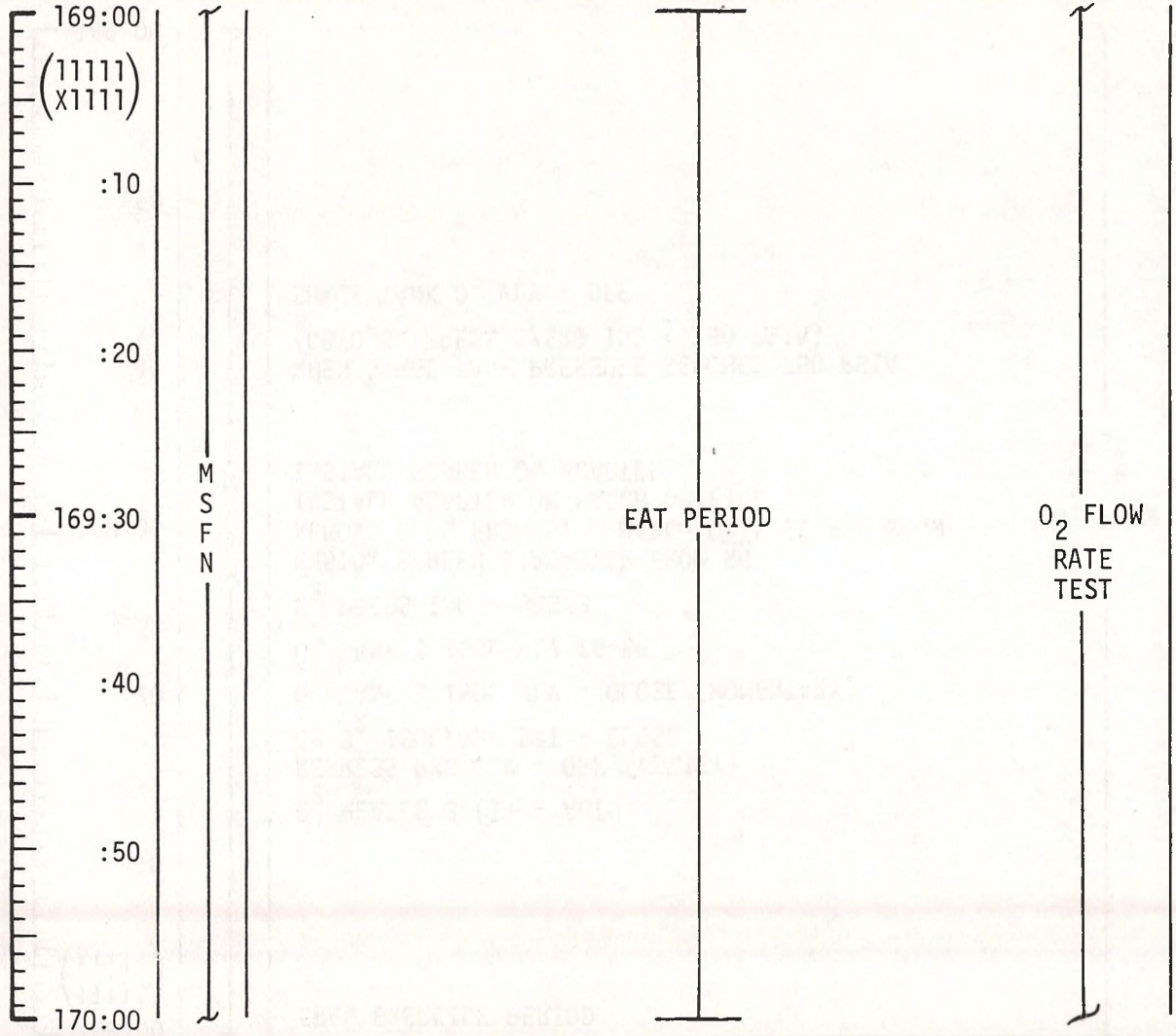
MCC-H

1523 CST

FLIGHT PLAN

NOTES

0723



0823

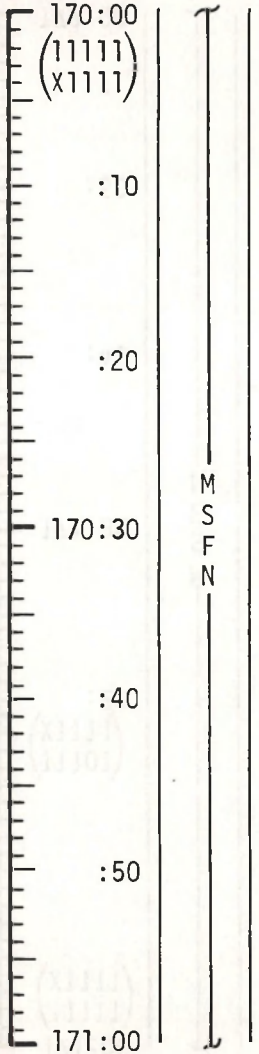
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	169:00 - 170:00	7/TEC	3-246

FLIGHT PLAN

MCC-H

1623 CST

0823



MSFN

O_2 FLOW RATE TEST

NOTES

EARTH DISTANCE
≈ 168 662 NM

0923

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	170:00 - 171:00	7/TEC	3-247

MCC-H

1723 CST

FLIGHT PLAN

NOTES

0923

171:00 (11111) (X1111)

:10

(11101) (X1111)

:20

171:30

:40

:50

172:00

(102)

MSFN

ON CUE FROM MCC-H, APPROXIMATELY 10 MINUTES PRIOR TO TEST COMPLETION,
SURGE TANK O_2 VLV - ON
UTILITY PWR = OFF
DISCONNECT CABLE FROM HEATER AND UTILITY OUTLET AND STOW IN R10
REMOVE AND STOW SCREEN & ADAPTER IN BAG IN R6
UNSTOW PLUG AND REPLACE IN SIDE HATCH ORIFICE
INSTALL PROTECTIVE PLUG ON HATCH NOZZLE
V48 (11101)(X1111)
ENABLE RCS QUADS A&B
V49 MNVR TO THERMAL ATTITUDE (171:30)
(144,002,027) HGA P -29, Y 116
O_2 TANK 3 ISOL VLV - OPEN
O_2 TANK 3 ISOL VLV TB - GRAY
CB O_2 ISOL/AUX BAT - OPEN

WHEN SURGE TANK PRESSURE REACHES 865 PSIA,
O_2 HEATER 1 - OFF

O_2 FLOW RATE TEST

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE C (JAN)	JANUARY 18, 1971	171:00 - 172:00	7/TEC	3-248

MCC-H

1823 CST

FLIGHT PLAN

NOTES

1023

172:00
(11101)
(X1111)

:10

:20

172:30

:40

:50

1123

173:00

M
S
F
N

T
V

CSM SYSTEMS CHECKLIST
CONTAMINATION CONTROL PAGE S 1-16

TV(GDS) 172:30 TO 173:00
CM/TV - AVG (f5.6)
USE MONITOR TO ADJUST APERTURE
FOR INFLIGHT DEMONSTRATION

GET: 173:00

F.O.V. = 3°

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	172:00 - 173:00	7/TEC	3-249

FLIGHT PLAN

MCC-H

1920 CST

			NOTES
173:00 (11101) (X1111)		V49 MNVR TO OPTICS CALIBRATION ATTITUDE (094,103,358) HGA P -79, Y 101 P23 CISLUNAR NAVIGATION OPTICS CALIBRATION STAR N70 (00040) P00	EARTH DISTANCE ≈162 018 NM
:10		V49 MNVR TO SIGHTING ATTITUDE (082,098,325) HGA P -57, Y 0 P23 CISLUNAR NAVIGATION 3 MARKS ON EACH STAR	EARTH HORIZON
		1. N70 (00040) (00000) (00110)	40 ALTAIR (ENH)
:20		2. N70 (00000) (00000) (00120) N88 (+07234) (-86438) (-49761)	212 DELTA SAGITTARII (EFH)
	MSFN	3. N70 (00033) (00000) (00120)	33 ANTARES (EFH)
173:30		*4. N70 (00035) (00000) (00120)	35 RASALHAGUE (EFH)
		*5. N70 (00000) (00000) (00120) N88 (-07804) (-99375) (+07982)	211 BETA OPHIUCHI (EFH)
:40		*6. N70 (00042) (00000) (00110)	42 PEACOCK (ENH)
:50			*OPTIONAL TEST STARS, DO NOT UPDATE S.V.
174:00		LiOH CANISTER CHANGE (14 INTO B, STOW 12 IN A3)	

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	173:00 - 174:00	7/TEC	3-250

FLIGHT PLAN

MCC-H
1223.
UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

2023 CST

174:00
:10
:20
174:30
:40
:50
1327
175:00

MSFN

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20,270,000)
V79 (-0.3750)
(+030.00)
(+00000)

REESTABLISH HGA REACQ MODE

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	174:00 - 175:00	7/TEC	3-251

MCC-H 2123 CST

FLIGHT PLAN

1323

175:00

:10

:20

175:30

:40

:50

176:00

1423

MSFN

EAT PERIOD

PTC

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST
COMM - OMNI'S

PAGE S 1-26

NOTES

DAP LOAD STATUS
(11101)(X1111)

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

EARTH DISTANCE
≈155 133 NM

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	175:00 - 176:00	7/TEC	3-252

MCC-H

FLIGHT PLAN

1423

2223 CST

176:00

:20

:40

177:00

:20

:40

178:00

MSFN

REST PERIOD
(10 HOURS)

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

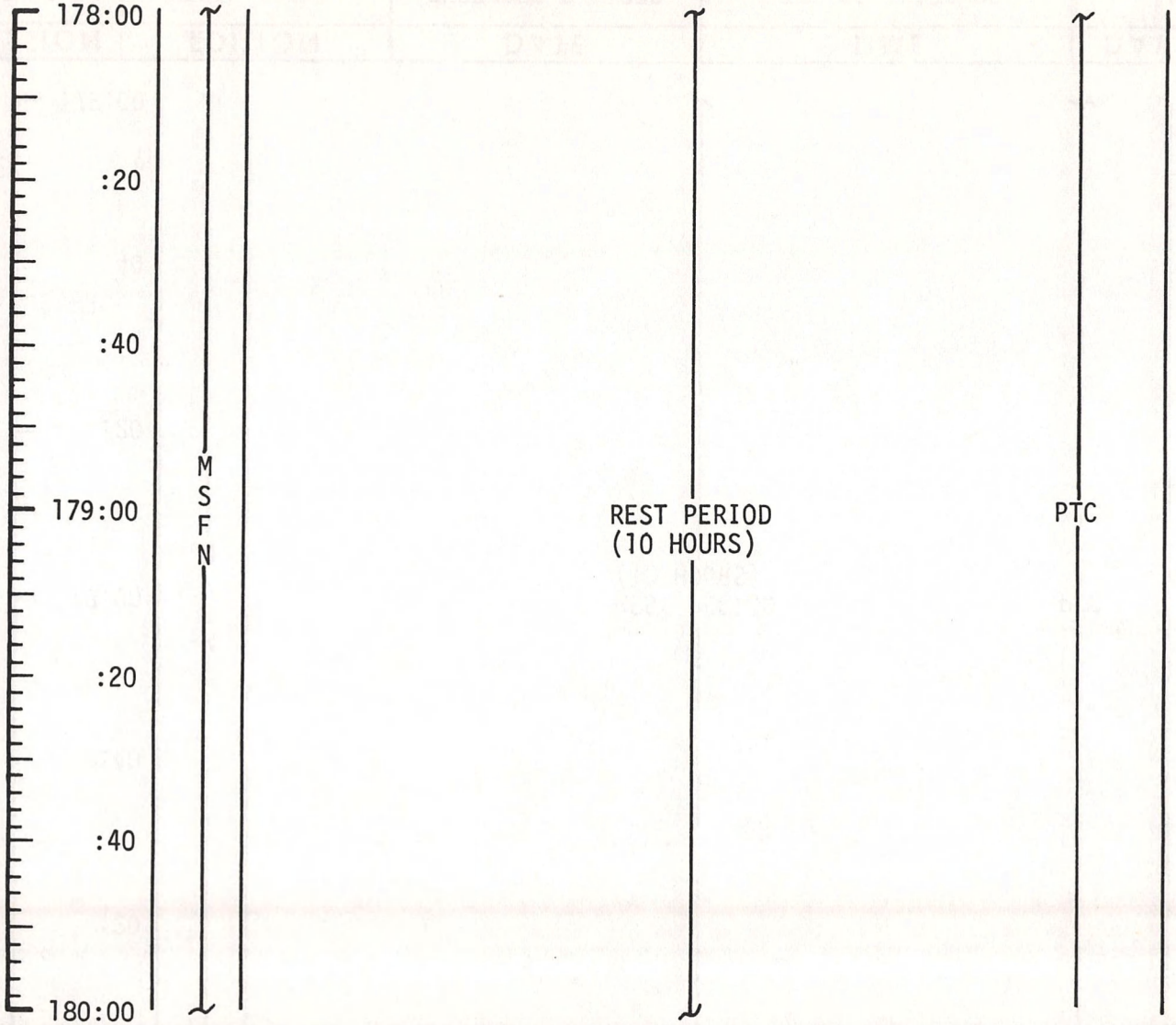
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	176:00 - 178:00	7/TEC	3-253

MCC-H

0023 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	Y/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	178:00 - 180:00	7/TEC	3-254

MCC-H

0223 CST

FLIGHT PLAN

NOTES

18

19

20

180:00

:20

:40

181:00

:20

:40

182:00

MSFN

REST PERIOD
(10 HOURS)

PTC

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	180:00 - 182:00	7/TEC	3-255

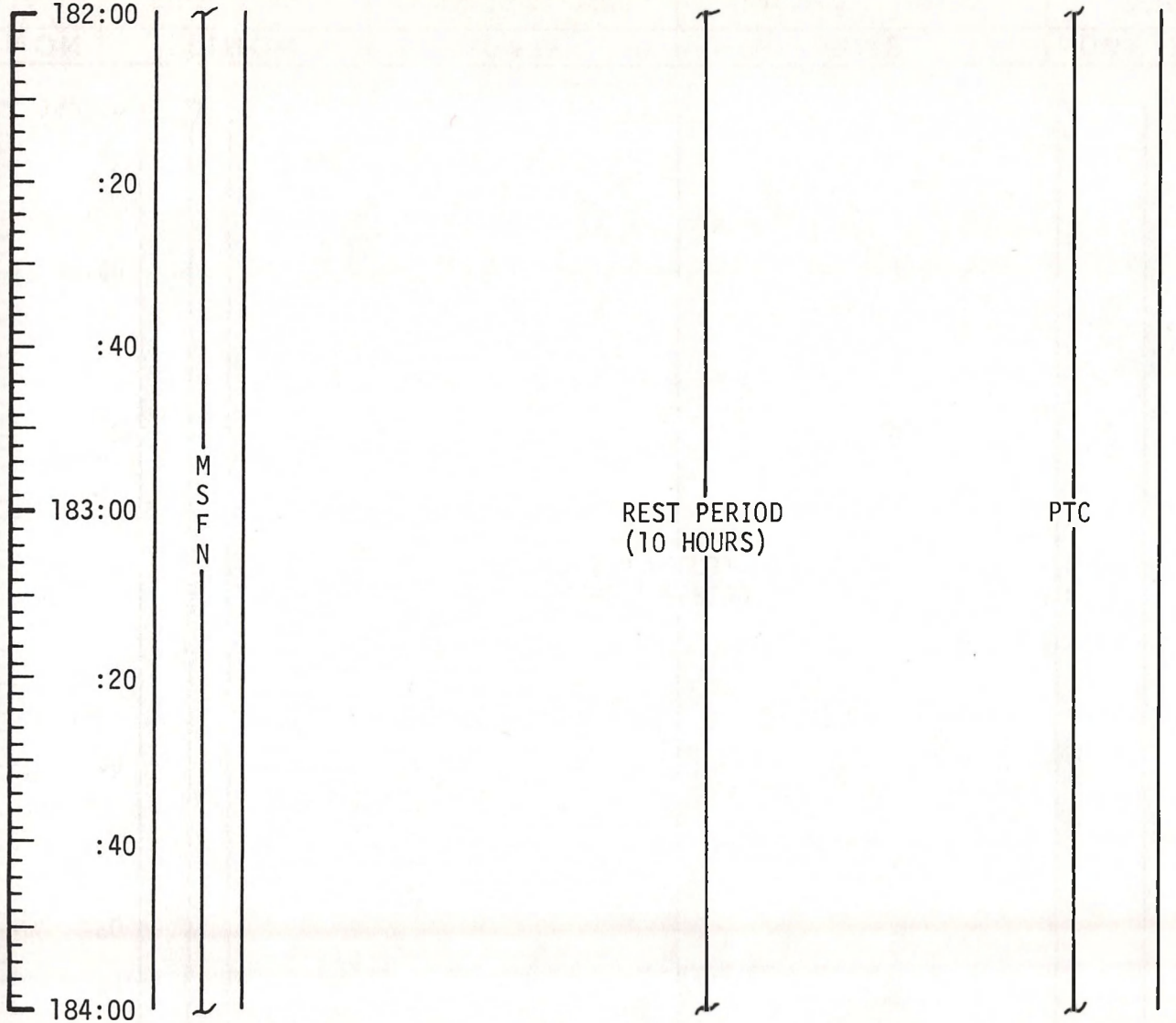
MCC-H

0423 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	182:00 - 184:00	7/TEC	3-256

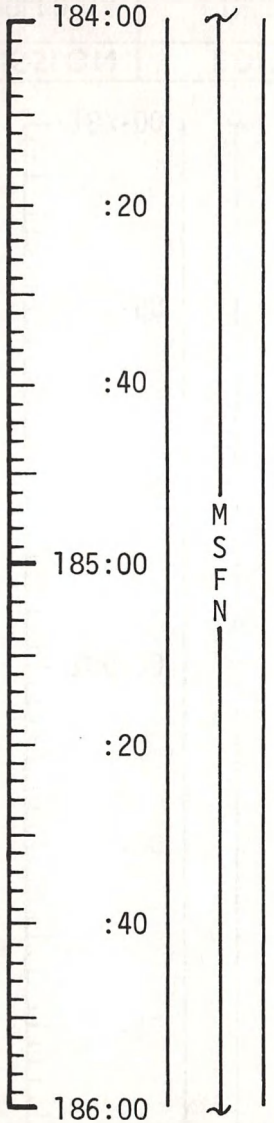
MCC-H

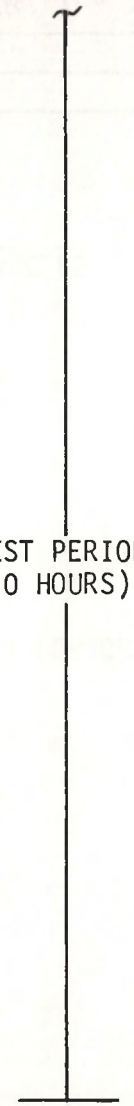
0623 CST

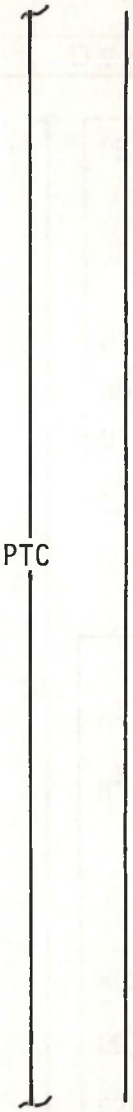
FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)







MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	184:00 - 186:00	7/TEC	3-257

FLIGHT PLAN

MCC-H

0823 CST

0023

UPDATE TO CSM CONSUMABLES FLIGHT PLAN

186:00

:10

:20

186:30

:40

:50

187:00

0123

MSFN

CSM SYSTEMS CHECKLIST

POST-SLEEP CHECKLIST PAGE S 1-26
COMM - HGA REACQ MODE

CHARGE BATTERY A

EAT PERIOD

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

CSM CONSUMABLES UPDATE

GET: __ __ __:__ __

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H_2 TANK 1 _____ 2 _____

O_2 TANK 1 _____ 2 _____

3 _____

EARTH DISTANCE
≈127 376 NM

P52 IMU REALIGN

N71: __ __,__ __

N05: __ __ __.__ __

N93:

X __ __.__ __ __

Y __ __.__ __ __

Z __ __.__ __ __

GET __ __ __:__ __:__ __

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	186:00 - 187:00	8/TEC	3-258

MCC-H

0123

0923 CST

FLIGHT PLAN

NOTES

187:00

:10

:20

187:30

:40

:50

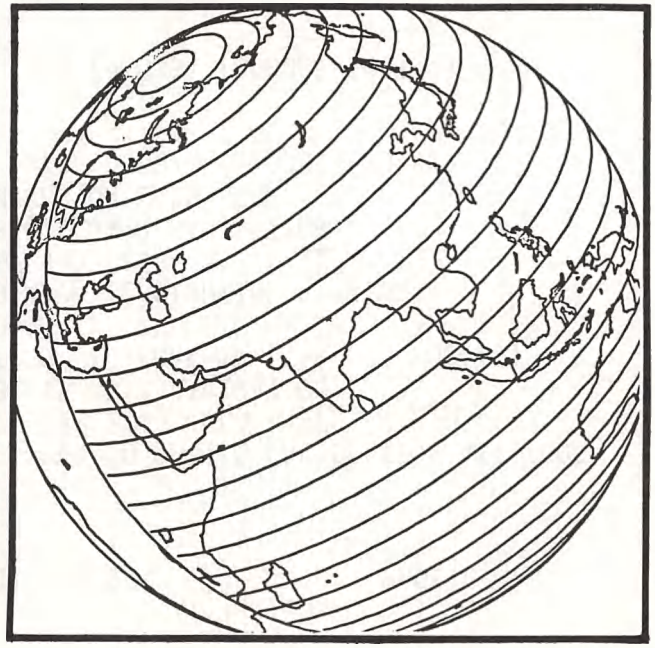
188:00

MSFN

LiOH CANISTER CHANGE
(15 INTO A, STOW 13 IN A4)

CSM ENTRY CHECKLIST
EMS ENTRY CHECK PAGE E 1-4

GET: 188:00 F.O.V. 3°



PTC

DAP LOAD STATUS
(11101)(X1111)

0223

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	187:00 - 188:00	8/TEC	3-259

FLIGHT PLAN

1023 CST

0223

188:00

:10

(11101)
(X1111)

:20

188:30

:40

:50

189:00

6323

MSFN

PTC

EXIT G&N PTC PAGE G 8-3

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(073,138,354) HGA P -75, Y 278
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00040)
P00
V49 MNVR TO SIGHTING ATTITUDE
(087,137,325) HGA P -57, Y 0
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR
1. N70 (00037) (00000) (00120)

2. N70 (00033) (00000) (00120)

3. N70 (00000) (00000) (00110)
N88 (+59879) (-32372) (-73257)

NOTES

DAP LOAD STATUS
(11101)(X1111)

EARTH DISTANCE
≈121 814 MIN

EARTH HORIZON

37 NUNKI (EFH)

33 ANTARES (EFH)

120 AL NA'IR (ENH)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	188:00 - 189:00	8/TEC	3-260

FLIGHT PLAN

MCC-H

0323

1123 CST

189:00 (11101) (X1111)

:10

:20

189:30

:40

:50

190:00

0423

MSFN

*4. N70 (00040) (00000) (00110)

*5. N70 (00035) (00000) (00120)

*6. N70 (00000) (00000) (00120)
N88 (-07804) (-99375) (+07982)

UPDATE TO CSM QUADS TO ENABLE FOR PTC SPINUP

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N)

PAGE G 8-2

V49 MNVR TO PTC ATTITUDE
(N20, 270, 000)
V79 (-0.3750)
(+030.00)
(+00000)
REESTABLISH HGA REACQ MODE

PTC

NOTES

40 ALTAIR (ENH)

35 RASALHAGUE (EFH)

211 BETA OPHIUCHI (EFH)

*OPTIONAL TEST STARS, DO NOT UPDATE S.V.

DAP LOAD STATUS
(11101) (X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	189:00 - 190:00	8/TEC	3-261

MCC-H

1223 CST

FLIGHT PLAN

NOTES

0423

190:00

:10

:20

0

190:30

:40

:50

0533

191:00

MSFN

CREW EXERCISE PERIOD

PTC

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	190:00 - 191:00	8/TEC	3-262

MCC-H

1323 CST

FLIGHT PLAN

NOTES

0523

191:00

:10

:20

191:30

:40

:50

0623

192:00

MSFN

EAT PERIOD

GET: 191:00 F.O.V. 5°

PTC

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	191:00 - 192:00	8/TEC	3-263

MCC-H

1423 CST

FLIGHT PLAN

0623

192:00

:10

:20

(11101)
(X1111)

192:30

:40

:50

193:00

0723

MSFN

PTC

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

EXIT G&N PTC PAGE G 8-3
V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(072,016,005) HGA P -73, Y 270
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00033)
P00
V49 MNVR TO SIGHTING ATTITUDE
(090,016,330) HGA P -55, Y 3
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR
1. N70 (00037) (00000) (00120)

2. N70 (00033) (00000) (00120)

3. N70 (00000) (00000) (00110)
N88 (+59879) (-32372) (-73257)

NOTES

DAP LOAD STATUS
(11101)(X1111)

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

EARTH DISTANCE
≈113 101 NM

EARTH HORIZON

37 NUNKI (EFH)

33 ANTARES (EFH)

120 AL NA'IR (ENH)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	192:00 - 193:00	8/TEC	3-264

FLIGHT PLAN

MCC-H

0723

1523 CST

NOTES

193:00
(11101)
(X1111)

:10

:20

193:30

:40

:50

0823

194:00

MSFN

H_2 PURGE LINE HEATER-ON } IF MCC-6 NOT REQUIRED

UPDATE TO CSM
MCC-6 MNVR PAD
ENTRY PAD (ASSUMES MCC-6)
CSM S.V.

UPLINK TO CSM
CSM S.V. & V47E
MCC-6 TGT LOAD

H_2 & O_2 FUEL CELL PURGE
WASTE WATER DUMP } IF MCC-6 NOT REQUIRED
H_2 PURGE LINE HEATER - OFF

UPDATE TO CSM
QUADS TO ENABLE FOR PTC SPINUP

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20,270,000)
V79 (-0.3750)
(+030.00)
(+00000)
REESTABLISH HGA REACQ MODE
P30 EXTERNAL ΔV
V49 MNVR TO PAD BURN ATT
H_2 PURGE LINE HEATERS - ON } IF NOT PERFORMED AT 193:00

PTC

RESTART PTC IF MCC-6 NOT REQ'D

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	193:00 - 194:00	8/TEC	3-265

MCC-6
BURN TABLE

MANEUVER	P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
CORRIDOR CONTROL	10°/SEC COMPLETE	+10° COMPLETE	BT + 1 SEC AND $\Delta V_C = 0$	TRIM X AXIS ONLY TO 0.2 FPS
IP CONTROL	10°/SEC TERMINATE	+10° TERMINATE	BT + 1 SEC AND $\Delta V_C = 0$	TRIM X & Z AXIS TO 0.2 FPS

TABLE 3-10

FLIGHT PLAN

MCC-H

1623 CST

0823

194:00
(11101)
(X1111)

:10

:20

194:30

:40

:50

195:00

MSFN

EI - 22 HR

UPLINK TO CSM
CSM S.V. (CMC) V47E
CSM S.V. (MSFN)
(NO V47)

0923

SXT STAR CHECK
P40 SPS THRUSTING OR
P41 RCS THRUSTING

H_2 & O_2 FUEL CELL PURGE
WASTE WATER DUMP
H_2 PURGE LINE HEATERS-OFF

IF NOT PERFORMED AT 193:20

MCC-6

BURN STATUS REPORT

TIG: 194:26:59
BT: NOM ZERO
ΔVT: NOM ZERO
ULLAGE: N/A
ORBIT: N/A

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

BURN STATUS REPORT

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

*ITEMS TO BE REPORTED TO MSFN

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	194:00 - 195:00	8/TEC	3-267

FLIGHT PLAN

MCC-H
0923
UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

1723 CST

195:00
:10
:20
195:30
:40
:50
196:00

MSFN

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20,270,000)
V79 (-0.3750)
(+030.00)
(+00000)
REESTABLISH HGA REACQ MODE

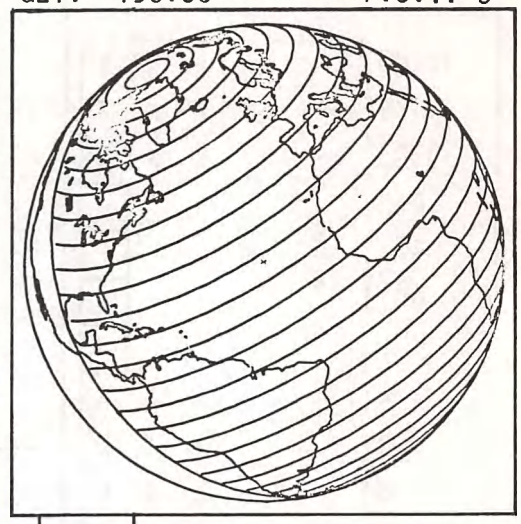
CSM SYSTEMS CHECKLIST

CONTAMINATION CONTROL PAGE S 1-16

NOTES

DAP LOAD STATUS
(11101) (X1111)

GET: 196:00 F.O.V. 5°



PTC

1023

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	195:00 - 196:00	8/TEC	3-268

FLIGHT PLAN

MCC-H

1023

1123

1823 CST

196:00

:10

:20

(11101)
(X1111)

196:30

:40

:50

197:00

MSFN

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES
REPORT: CM RCS INJECTOR VALVE TEMPS
(SYS TEST METER 5C, 5D, 6A, 6B, 6C, 6D)

EXIT G&N PTC PAGE G 8-3

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(086,062,012) HGA P -72, Y 191
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00035)
P00
V49 MNVR TO SIGHTING ATTITUDE
(090,062,329) HGA P -57, Y 3
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR

1. N70 (00037) (00000) (00120)

2. N70 (00033) (00000) (00120)

3. N70 (00000) (00000) (00110)
N88 (+59879) (-32372) (-73257)

PTC

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

NOTES

DAP LOAD STATUS
(11101) (X1111)

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

EARTH DISTANCE
≈97 415 NM

EARTH HORIZON

37 NUNKI (EFH)

33 ANTARES (EFH)

120 AL NA'IR (ENH)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	196:00 - 197:00	8/TEC	3-269

EARTH DARKSIDE DIM LIGHT PHOTOGRAPHY

CONFIGURE CAMERA
CM/DAC/SXT/VHBW, (EXP 1/500) 24 fps (2.5% MAG)
MAG (J) ____ MAG % ____

UTILITY POWER - ON

V49 MNVR TO EARTH DARKSIDE PHOTO ATTITUDE (197:20)
(122,270,000) HGA P -59, Y 90

DAMP VEHICLE RATES PER PTC PROCEDURE STEP 5
AFTER 20 MIN, DISABLE ALL JETS
P22 ORBIT NAVIGATION (NO MARKS)
LDMK: LAT + 10.000 SA +130.60
LONG/2 - 17.500 TA + 44.800
ALT +000.00
VERIFY THRU SXT THAT OPTICS BORESIGHTED ON EARTH DARKSIDE
MOUNT DAC ON SXT, DAC-ON AT 24 fps FOR 2 SEC
CHANGE DAC TO TIME & 1/60

1 FRAME, EXP TIME 60 SEC
1 FRAME, EXP TIME 20 SEC
1 FRAME, EXP TIME 5 SEC

CHANGE DAC TO 24 fps & 1/500; DAC ON AT 24 fps for 2 SEC
CYCLE CMC MODE - FREE/AUTO
ENABLE JETS
RECORD MAG % ____
REMOVE AND STOW DAC

MCC-H

1123

1923 CST

FLIGHT PLAN

197:00 (11101) (X1111)

:10

:20

197:30

:40

:50

198:00

MSFN

*4. N70 (00040) (00000) (00110)

*5. N70 (00000) (00000) (00120)
N88 (-07804) (-99375) (+07982)

*6. N70 (00000) (00000) (00120)
N88 (+22712) (-83641) (-49884)

EARTH DARKSIDE
DIM LIGHT PHOTOGRAPHY

NOTES

40 ALTAIR (ENH)

211 BETA OPHIUCHI (EFH)

214 ZETA SAGITTARII (EFH)

*OPTIONAL TEST STARS, DO NOT UPDATE S.V.

1223

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	197:00 - 198:00	8/TEC	3-271

FLIGHT PLAN

MCC-H

1323

2023 CST

198:00 (11101) (X1111)

:10

:20

198:30

:40

:50

199:00

1323

MSFN

CSM G&C CHECKLIST

BACKUP GDC AND/OR IMU ALIGNMENT PAGE G 7-3
V06 N20 (DO NOT ENTER)

AT RELEASE OF GDC ALIGN PB, KEY ENTER,
RECORD ANGLES AND REPORT TO MCC-H

CRESCENT ALIGN PAGE G 7-11
V06 N20 (DO NOT ENTER)

AT RELEASE OF GDC ALIGN PB, KEY ENTER,
RECORD ANGLES AND REPORT TO MCC-H

CSM G&C CHECKLIST
PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20, 270, 000)
V79 (-0.3750)
(+030.00)
(+00000)
REESTABLISH HGA REACQ MODE

PTC

NOTES

ONLY THE GDC ALIGN WILL BE PERFORMED

UPDATE TO CSM QUADS TO ENABLE FOR PTC SPINUP

DAP LOAD STATUS (11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	198:00 - 199:00	8/TEC	3-272

FLIGHT PLAN

MCC-H

2123 CST

1423

199:00

:10

:20

199:30

:40

:50

200:00

1623

MSFN

LiOH CANISTER CHANGE
(16 INTO B,STOW 14 IN A4)

EAT PERIOD

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST PAGE S 1-26

COMM - OMNI'S

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

EARTH DISTANCE
≈87 143 NM

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 14	FINAL (JAN)	DECEMBER 2, 1970	199:00 - 200:00	8/TEC	3-273

MCC-H

2223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)

14 23

200:00

:20

:40

15

201:00

:20

:40

16

202:00

MSFN

REST PERIOD
(8 HOURS)

PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	200:00 - 202:00	8/TEC	3-274

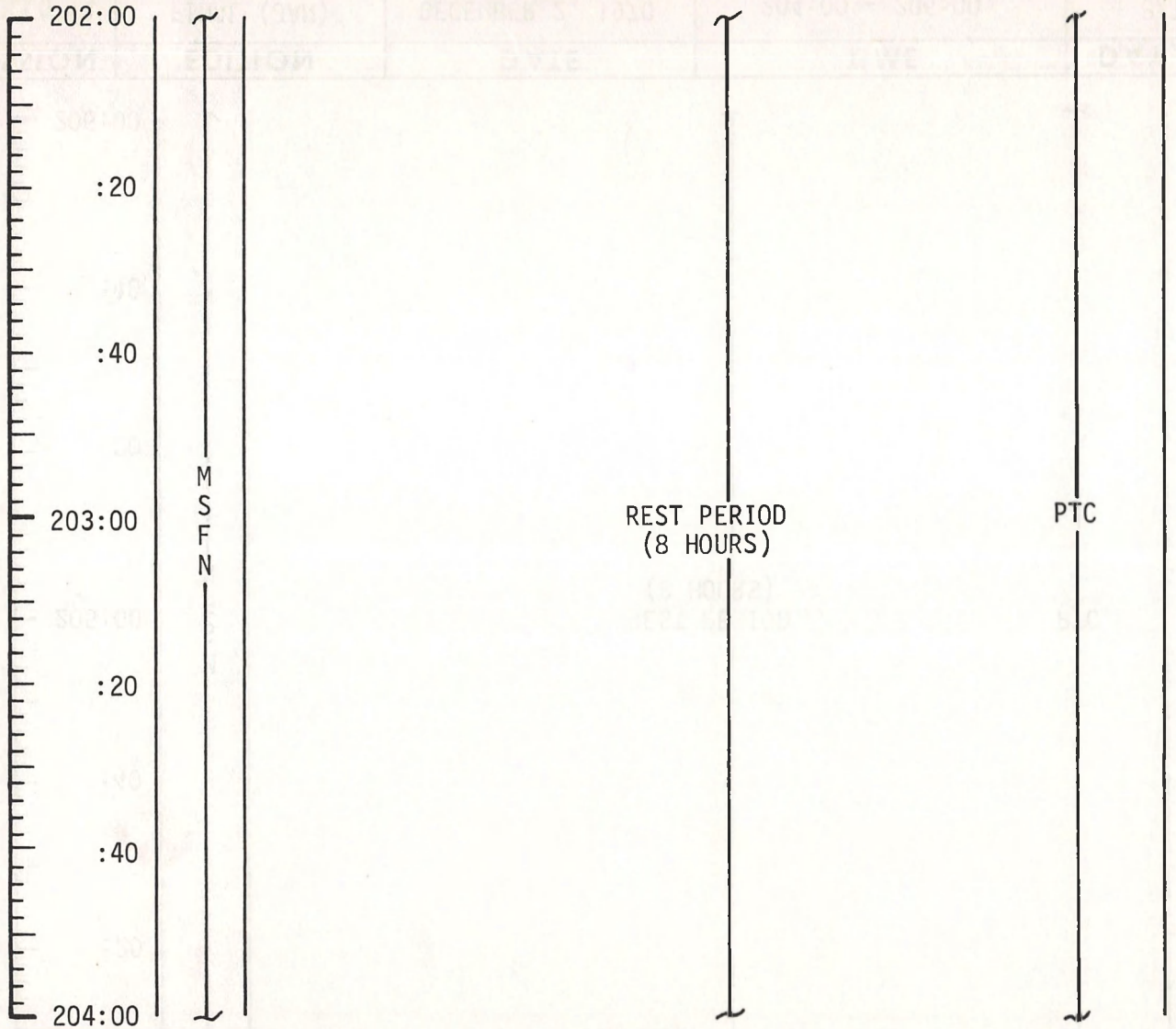
MCC-H

0023 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	202:00 - 204:00	8/TEC	3-275

MCC-H

0223 CST

FLIGHT PLAN

18

19

20

204:00

:20

:40

205:00

:20

:40

206:00

MSFN

REST PERIOD
(8 HOURS)

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	204:00 - 206:00	8/TEC	3-276

MCC-H

0423 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)

10

206:00

:20

:40

21

207:00

:20

:40

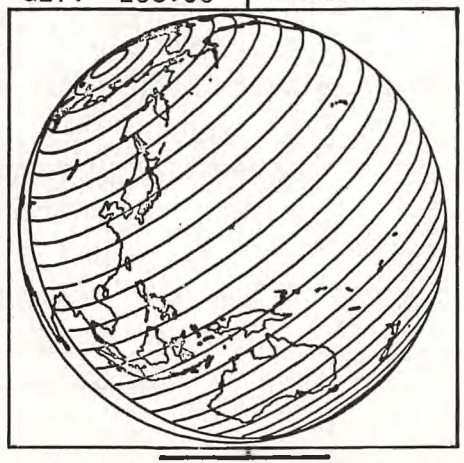
22

208:00

MSFN

REST PERIOD
(8 HOURS)

GET: 208:00 | F.O.V. 10°



PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	206:00 - 208:00	8/TEC	3-277

FLIGHT PLAN

MCC-H

1223 CST

UPDATE TO CSM 2223.
FLIGHT PLAN
CONSUMABLES

208:00
:10
:20
(11101)
(X1111)
208:30
:40
:50
2323
209:00

MSFN

CSM SYSTEMS CHECKLIST
POST-SLEEP CHECKLIST PAGE S 1-26

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES
EXIT G&N PTC PAGE G 8-3

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(099,252,003) HGA P -73, Y 10
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00042)
P00 EARTH HORIZON
V49 MNVR TO SIGHTING ATTITUDE
(078,245,325) HGA P -57, Y 354
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR

1. N70 (00044) (00000) (00110) 44 ENIF (ENH)

2. N70 (00000) (00000) (00120) 212 DELTA
   N88 (+07234) (-86438) (-49761) SAGITTARII (EFH)

3. N70 (00000) (00000) (00120) 213 LAMBDA
   N88 (+10293) (-89715) (-42956) SAGITTARII (EFH)

4. N70 (00045) (00000) (00110) 45 FOMALHAUT (ENH)

PTC

NOTES

DAP LOAD STATUS
(11101) (X1111)

CSM CONSUMABLES UPDATE

GET: __ __ __:__ __
RCS TOTAL _____
QUAD A _____ B _____
C _____ D _____
H_2 TANK 1 _____ 2 _____
O_2 TANK 1 _____ 2 _____
3 _____

P52 IMU REALIGN

N71: __ __,__ __
N05: __ __ __.__ __
N93:
X __ __.__ __ __
Y __ __.__ __ __
Z __ __.__ __ __
GET __ __ __:__ __:__ __

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	208:00 - 209:00	9/TEC	3-278

FLIGHT PLAN

MCC-H

2323

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

0723 CST

209:00

:10

:20

209:30

:40

:50

210:00

MSFN

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N) PAGE G 8-2
V49 MNVR TO PTC ATTITUDE
(N20, 270, 000)
V79 (-0.3750)
(+030.00)
(+00000)
REESTABLISH HGA REACQ MODE

EAT PERIOD

PTC

NOTES

DAP LOAD STATUS
(11101)(X1111)

EARTH DISTANCE
≈47 759 NM

10/00023

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	209:00 - 210:00	9/TEC	3-279

MCC-H

10/0023

0823 CST

FLIGHT PLAN

NOTES

210:00

:10

:20

210:30

:40

:50

211:00

MSFN

LiOH CANISTER CHANGE
(17 INTO A, STOW 15 IN A4)

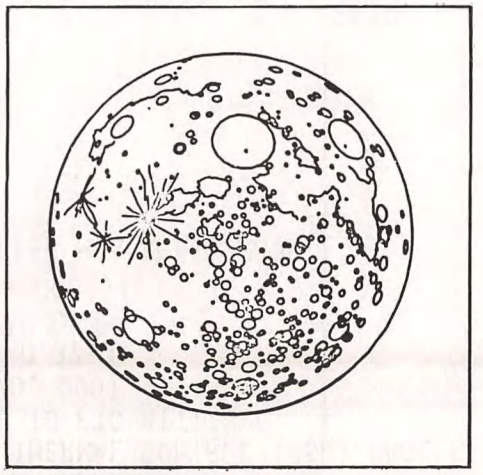
GO/NO-GO FOR MCC-7
EI - 6 HR

ENTRY CHECKLIST

10 hours L.

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

GET: 211:00 F.O.V. 1°



PTC

DAP LOAD STATUS
(11101) (X1111)

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

0123

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	210:00 - 211:00	9/TEC	3-280

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

FLIGHT PLAN

MCC-H

0123.

0923 CST

211:00

(11101)
(X1111)

:10

:20

EI - 5 HR

211:30

:40

:50

212:00

MSFN

VHF SIMPLEX A - ON
EXIT G&N PTC PAGE G 8-3
V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(299,041,337) OMNI C
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00023)
P00
V49 MNVR TO SIGHTING ATTITUDE
(283,033,010) OMNI C
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR
1. N70 (00022) (00000) (00220)

2. N70 (00000) (00000) (00210)
N88 (-15020) (+94736) (+28276)

3. N70 (00023) (00000) (00220)

4. N70 (00000) (00000) (00220)
N88 (-84888) (+40318) (+34184)

5. N70 (00016) (00000) (00210)

ATT DEADBAND - MIN
RATE - LOW
BMAG (3) - ATT 1/RATE 2
SC CONT - SCS

NOTES

DAP LOAD STATUS
(11101)(X1111)

LUNAR HORIZON

22 REGULUS (MFH)

64 ALHENA (MNH)

23 DENEBOLA (MFH)

151 GAMMA PRIME
LEONIS (MFH)

16 PROCYON (MNH)

UPDATE TO CSM
MCC-7 MNVR PAD
ENTRY PAD
UPLINK TO CSM
CSM S.V. & V47
MCC-7 TGT LOAD
DESIRED ORIENT (ENT)
ENTRY LAT & LONG

0223

H/ok CRO 212:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	211:00 - 212:00	9/TEC	3-281

FLIGHT PLAN

MCC-H

1023 CST

0223

212:00
(11101)
(X1111)

:10

:20

:30

212:30

:40

:50

213:00

EI - 4 HR

MSFN

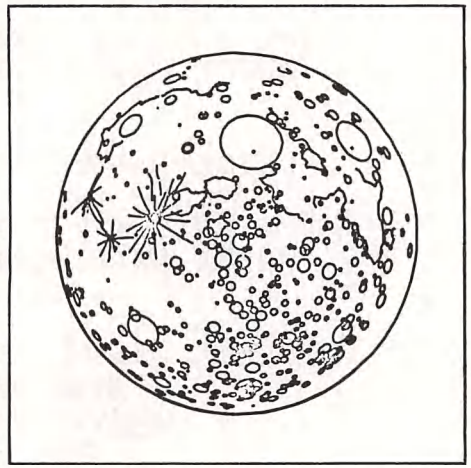
P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN
OPTION 1 PREFERRED
(ENTRY ORIENT)

SC CONT - CMC
BMAG (3) - RATE 2

GET: 213:00 F.O.V. 1°



P30 EXTERNAL ΔV

0323

STARS___,___
SA___,___
TA___,___

NOTES

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	212:00 - 213:00	9/TEC	3-282

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MCC-7
BURN TABLE

MANEUVER	P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
CORRIDOR CONTROL	10°/SEC COMPLETE	±10° COMPLETE	BT + 1 SEC AND $\Delta V_C = 0$	TRIM X AXIS ONLY TO 0.2 FPS

TABLE 3-11

FLIGHT PLAN

MCC-H

1123 CST

NOTES

0323.

213:00 (11101 X1111)

:10

:20

:30

:40

:50

214:00

MSFN

V49 MNVR TO PAD BURN ATT

SXT STAR CHECK
P40 SPS THRUSTING OR
P41 RCS THRUSTING

0422 L.

EI - 3 HR

MCC-7

BURN STATUS REPORT

TIG: 213:26:59
BT: NOM ZERO
ΔVT: NOM ZERO
ULLAGE: N/A
ORBIT: N/A

UPLINK TO CSM
CSM S.V. (CMC) V47E
CSM S.V. (MSFN)
(NO V47)

BURN STATUS REPORT

X X ☐ ●	ΔTIG
X X ●	BT
☐ ●	V_{gx}
TRIM	
X X X	R
X X X	P
X X X .	Y
☐ ●	V_{gx}
☐ ●	V_{gy}
☐ ●	V_{gz}
☐ ●	ΔV_c *
X X X	FUEL *
X X X	OX *
X X X	UNBAL

*ITEMS TO BE REPORTED TO MSFN

#8K LOS. 0418 — 55'

0423

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(019,258,355) OMNI C

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	213:00 - 214:00	9/TEC	3-285

MCC-H

1223 CST

FLIGHT PLAN

NOTES

0423

214:00 (11101) (X1111)

P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00022)
P00
V49 MNVR TO SIGHTING ATTITUDE
(017,270,000) OMNI C
P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR
1. N70 (00022) (00000) (00220)

LUNAR HORIZON

22 REGULUS (MFH)

2. N70 (00023) (00000) (00220)

23 DENEBOLA (MFH)

3. N70 (00016) (00000) (00210)

16 PROCYON (MNH)

:10

:20

EI - 2 HR
GO/NO-GO

MSFN

LOGIC SEQUENCE CHECK PAGE E 1-2
GO/NO-GO FOR PYRO ARM SEQUENCE (CUE MSFN)
LOGIC - ON
V49 MNVR TO ENTRY PAD ATTITUDE (214:45)

214:30

:40

BORESIGHT AND SXT STAR CHECK

:50

P52 IMU REALIGN
OPTION 3 REFSMMAT
(ENTRY ORIENT)

0523

215:00

REPORT: GYRO TORQUING ANGLES

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	214:00 - 215:00	9/TEC	3-286

FLIGHT PLAN

MCC-H

1323 CST

NOTES

0523

215:00

(11101)
(X1111)

:10

:20

215:30

:40

:50

216:00

MSFN

GDC ALIGN PAGE E 1-3

EMS ENTRY CHECK PAGE E 1-4
PRIMARY WATER EVAP ACTIVATION PAGE E 1-4
CONFIGURATE CAMERA EQUIP FOR FIREBALL AND CHUTES PHOTOS PAGE E 1-4
SEC WATER EVAP ACTIVATION PAGE E 1-4
CM RCS PRE-HEAT (IF REQ'D)
FINAL STOWAGE PAGE E 1-5

EI - 1 HR

TERMINATE CM RCS PRE-HEAT PAGE E 1-5
CM RCS ACTIVATION PAGE E 1-6
GO/NO-GO FOR PYRO ARM (CUE MSFN)
LOGIC - ON
SET DET (UP, TO EI) PAGE E 2-1
EMS INITIALIZATION PAGE E 2-1
RSI ALIGNMENT PAGE E 2-1
CM RCS CHECK PAGE E 2-1

GO/NO-GO FOR PYRO ARM
UPDATE TO CSM
ENTRY PAD
RECOVERY PAD
UPLINK TO CSM
CSM S.V. & V66

EI - 30 MIN
VHF A SIMPLEX
COMM CHECK

0623

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	215:00 - 216:00	9/TEC	3-287

MCC-H

1423 CST

FLIGHT PLAN

NOTES

0623

216:00
(11101)
(X1111)
:10
(ENTRY DAP)
:20
:30
:40
:50
217:00

MSFN

HSK AOS 0638

CRO LOS :22

HSK LOS :27

S/D

0723

SEPARATION CHECKLIST PAGE E 2-2

MNVR TO HORIZON CHECK ATT PAGE E 2-2
P61 ENTRY PREP PAGE E 2-2
P62 CM/SM SEP & PRE-ENTRY MNVR PAGE E 2-3
SECS PYRO ARM

CM/SM SEP	216:12

10/0650 L.

MNVR TO ENTRY ATT

P63 ENTRY INITIATE

EI	216:26:59

P64 ENTRY POST 0.05G

γ	= -6.5
L/D	= .29784
V	= 36170
R	= 1250

TRAJECTORY EVENTS	TIME FROM 400K FT, MIN:SEC
400 000 FT (GET 216:26:59)	00:00
ENTER S-BAND BLACKOUT	00:18
0.05G	00:30
KA - INITIATE CONSTANT DRAG	00:52
RDOT = -700 FPS	01:18
PEAK G (6.6)	01:20
SUBCIRCULAR VELOCITY	02:06
P64 TO P67	02:10
EXIT S-BAND BLACKOUT	03:32
GUIDANCE TERMINATION	07:16
DROGUE DEPLOYMENT	08:17
MAIN DEPLOYMENT	09:04
SPLASHDOWN	13:54

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	216:00 - 217:00	9/TEC	3-288

SECTION 4 - CONSUMABLES

ASSUMPTIONS FOR THE APS ANALYSIS

Propellant loading data were obtained from the Apollo 14 preflight data and were optimized for the nominal mission. The LM-8 data were used for engine performance, and ΔV requirements were coordinated with the Landing Analysis Branch and the Orbital Mission Analysis Branch. The ΔV requirement for the lunar ascent differs from that in the Operational Trajectory and Flight Plan because of an increase in the inert vehicle weight.

The budget shown in table 4-1 accounts for an APS TPI, engine valve-pair malfunction, and balanced couples. A touchdown abort was not considered because the nominal lift-off weight is heavier than the abort weight. The following data were used.

a. I_{sp} = 309.97 ± 3.77 seconds

b. Mixture ratio = 1.605 ± .0258

c. Lift-off weight = 10 841.5 ± 38.7 pounds

TABLE 4-1

APS PROPELLANT SUMMARY

Item	Total propellant, lb
Loaded	5224.8
Trapped and unavailable	-51.8
Outage	-10.3
Available for ΔV	5162.7
Required for ascent (6057.7 fps)	-4931.1
Remaining	231.6
Required for APS TPI[a] (70.2 fps)	-41.4
Remaining	190.2
Dispersions (-3σ)	-66.2
Pad	124.0
Contingencies	
Engine valve-pair malfunction ($\Delta MR = +.01$ or $-.018$)	-24.5
Balanced couples	-56.9
Half-degree out of plane (18 fps)	-10.6
Margin	32.0

[a]The total TPI ΔV is 92.2 fps. It is assumed that 22 fps is obtained by 10-sec, 4-jet ullage.

ASSUMPTIONS FOR THE DPS ANALYSIS

Propellant loading data were obtained from the Apollo 14 preflight data and were optimized for the nominal mission. The LM-8 data were used for engine performance, and ΔV requirements were coordinated with the Landing Analysis Branch. The ΔV requirement for lunar descent differs from that in the Operational trajectory and Flight Plan because of an increase in the inert vehicle weight.

The 3σ dispersions represent total propellant cost based on 3σ uncertainties in propellant loading, trapped propellant, I_{sp}, ΔV, separation weight, non-ΔV consumables weight, mixture ratio, and physical location of the low-level sensor.

The following philosophy changes have been included in the budget.

a. A flying time of 2 minutes and 20 seconds below low gate will be called a nominal requirement.

b. A contingency of 5 seconds has been included for a possible early low-level light based on a Grumman Aircraft Corporation presentation to a September 17, 1970, meeting of the Configuration Control Board.

c. The separation weight is 34 101.0 ± 36.9 pounds.

d. Integrated average I_{sp} is 302.5 ± 4.65 seconds.

e. Mixture ratio is 1.598 ± .0225.

f. Non-ΔV consumables from separation to PDI are 83.2 pounds.

TABLE 4-2

DPS PROPELLANT SUMMARY

Item	Total propellant, lb	Hover time, sec
Loaded	18 414.7	--
Trapped and unavailable	-213.1	--
Outage	-33.4	--
Available for ΔV	18 168.2	--
Required for ΔV (140-sec flying time from low gate, ΔV = 6957.8)	-17 332.5	--
Remaining	835.7	90
Dispersions (-3σ)	-318.6	--
Pad	517.1	56
Operational allowances		
Low-level (5 sec, 26.5 fps)	-44.7	--
Abort reserve (20 sec, 106 fps)	-179.5	--
Margin (hover time before abort decision point)	292.9	31

Ground Rules and Assumptions for the LM EPS Analysis

1. Energy available from the descent batteries is 1600 A-h and from the ascent batteries is 592 A-h.

2. Energy unusables caused by lack of continuous MSFN coverage for the descent and ascent stages are 6 and 3 A-h, respectively.

3. Energy unusables caused by TM inaccuracies for the descent and ascent stages were 77 and 11 A-h, respectively.

4. Energy unusables caused by checklist deviations (dispersion) for the descent and ascent stages were 25 and 4 A-h, respectively. This dispersion is obtained by calculating 2 percent of the energy used.

5. In accordance with the flight plan, the PGNCS was in standby mode from 1.3 hours following surface powerdown until 9.75 hours before powerup.

6. The RCS heaters were assumed to have a 100 percent duty cycle for 15 minutes after initial activation and then to decrease to a 7 percent duty cycle until undocking. From undocking until lunar landing plus 2 hours, the heaters were assumed to cycle at 0 percent, but, from landing plus 2 hours until lunar lift-off, the duty cycle was assumed to be 4.5 percent.

7. At the beginning of the analysis, it was assumed that a total of 10 A-h had been used from the descent batteries between 30 minutes before launch and the conclusion of transposition and docking.

8. The CDR and LMP forward window heaters were assumed not to be needed.

9. All floodlights were turned off at the beginning of EVA-1 and on again at powerup.

10. No duty cycle was assigned to the portable utility lights.

11. The liquid cooled garment pump was cycled as dictated by the time line.

12. The short (M=1) rendezvous was considered nominal.

13. The TV camera was assumed to be on from the beginning of EVA-1 until surface powerup.

TABLE 4-3

ASCENT STAGE EPS SUMMARY

Item	A-h required	A-h remaining
Initial capacity	--	592
Total unusables	18	574
Available for mission planning	--	574
Total requirement through crew transfer	216	358
Total usable margin	--	358 (60%)

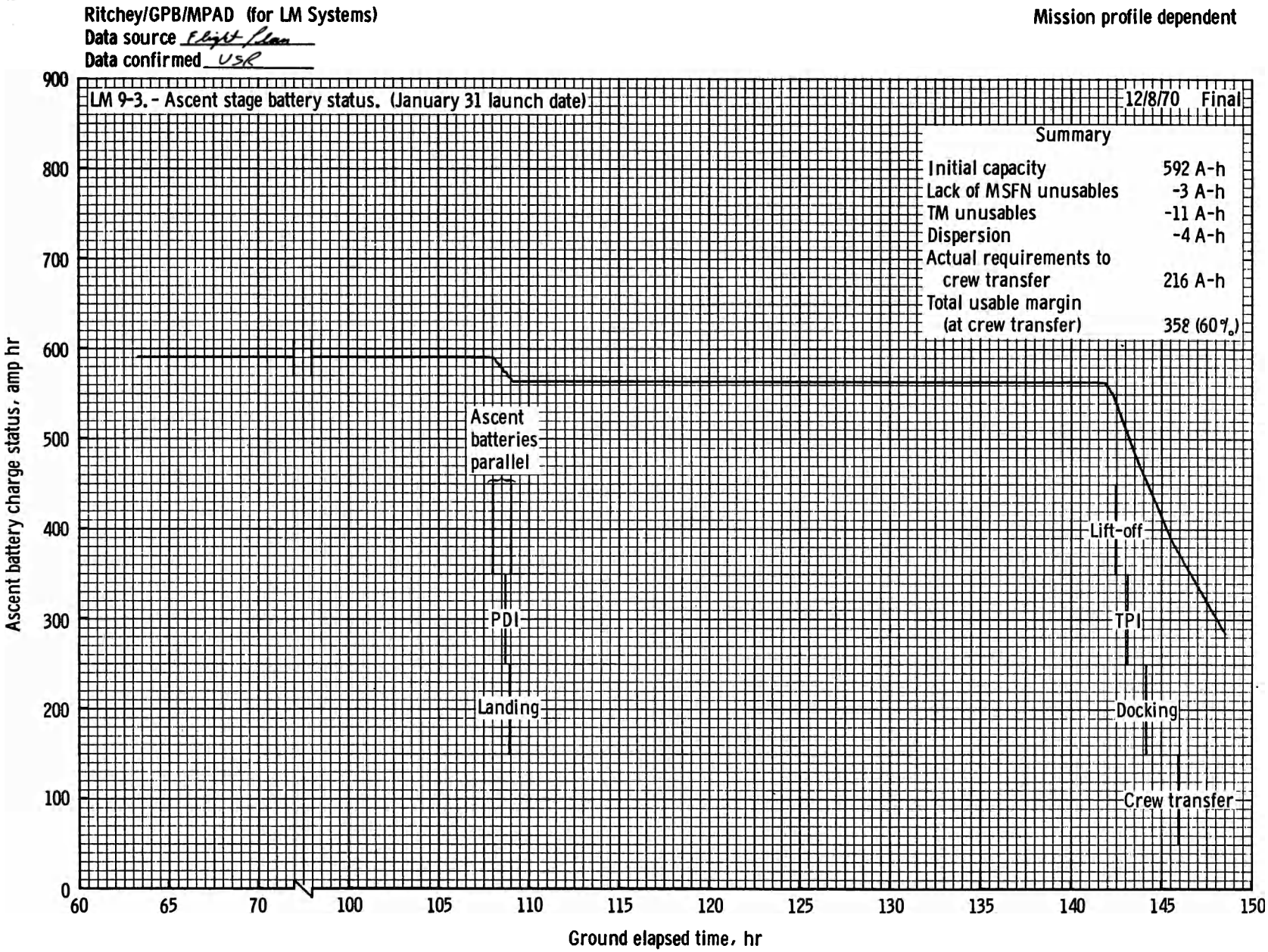


Figure 4-1.- LM-8 ascent stage amp hours remaining.

TABLE 4-4

DESCENT STAGE EPS SUMMARY

Item	A-h required	A-h remaining
Initial capacity	--	1600
Total unusables	108	1492
Available for mission planning	--	1492
Total mission requirement	1229	263
Total usable margin	--	263 (16%)

Ritchey/GPB/MPAD (for LM Systems)
Data source Flight Plan
Data confirmed VSR

Mission profile dependent

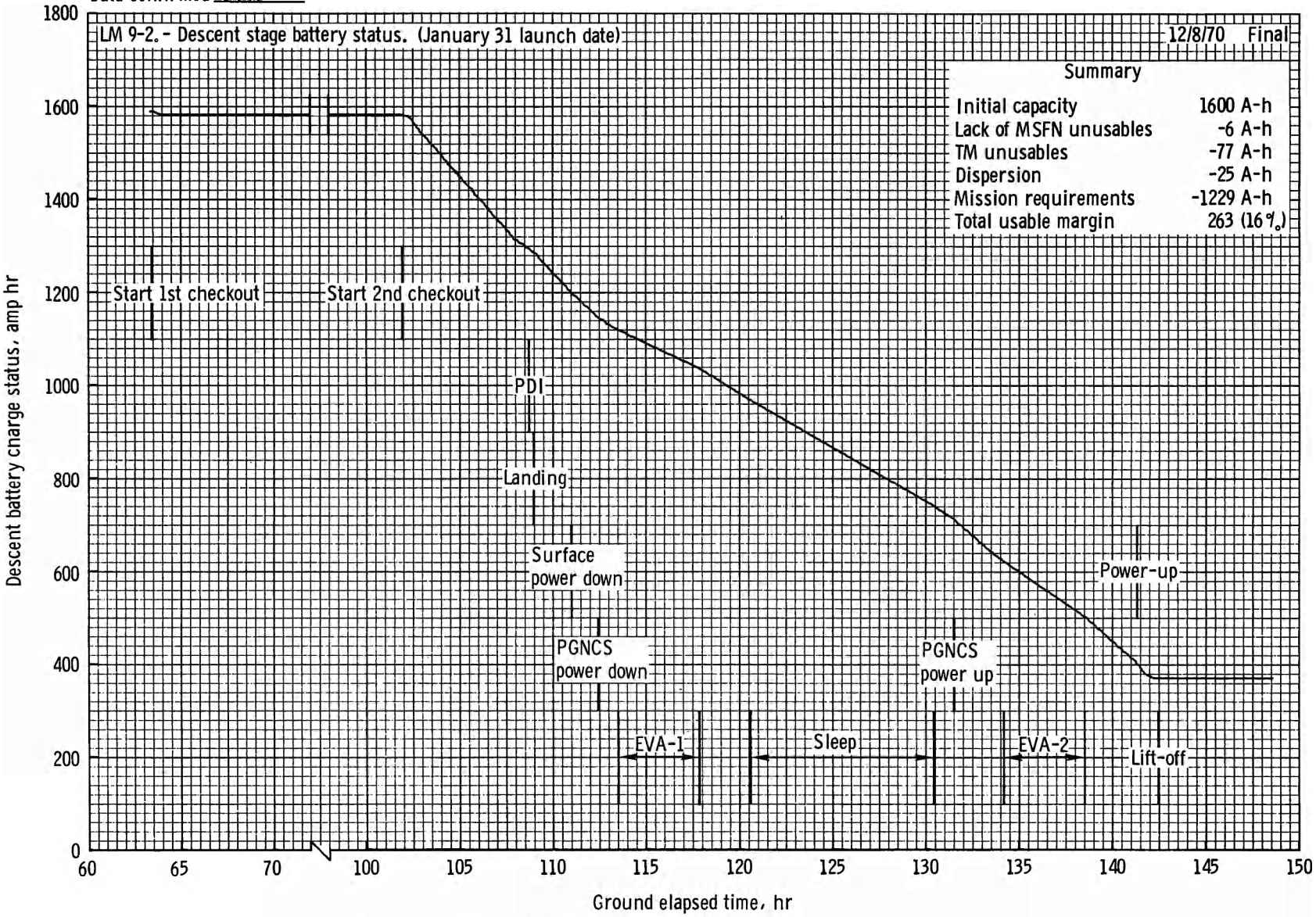


Figure 4-2.- LM-8 descent stage amp hours remaining.

ASSUMPTIONS AND GROUND RULES FOR THE LM RCS PROPELLANT ANALYSIS

1. Data for the LM RCS engine performance and propellant requirements were obtained from the SODB, Volume II, and from postflight analyses of Apollo 9-12 missions.

2. It is assumed that there will be an RCS burn (tweak burn) of 30 fps following LM insertion. The tweak burn is nominally zero.

3. It is assumed that there will be a 10 fps trim following the APS TPI maneuver.

4. The ullage for PDI was defined, subsequent to this analysis, to be an 8-second, four-jet ullage. The increase in RCS propellant usage is approximately 1.0% and is negligible in view of the nominal RCS propellant remaining.

TABLE 4-5

LM RCS PROPELLANT LOADING AND USAGE SUMMARY

Item	Propellant required, lb	Propellant remaining, lb
Loaded		633.0
Trapped	40.6	592.4
Gaging inaccuracy and loading tolerance	43.5	548.9
Mixture ratio uncertainty	17.0	531.9
Usable		531.9
Nominal usage through lunar landing	158.8	373.1
Nominal usage from landing through docking	121.0	252.1
Nominal usage from docking through impact	110.0	142.1
Usable propellant remaining		142.1

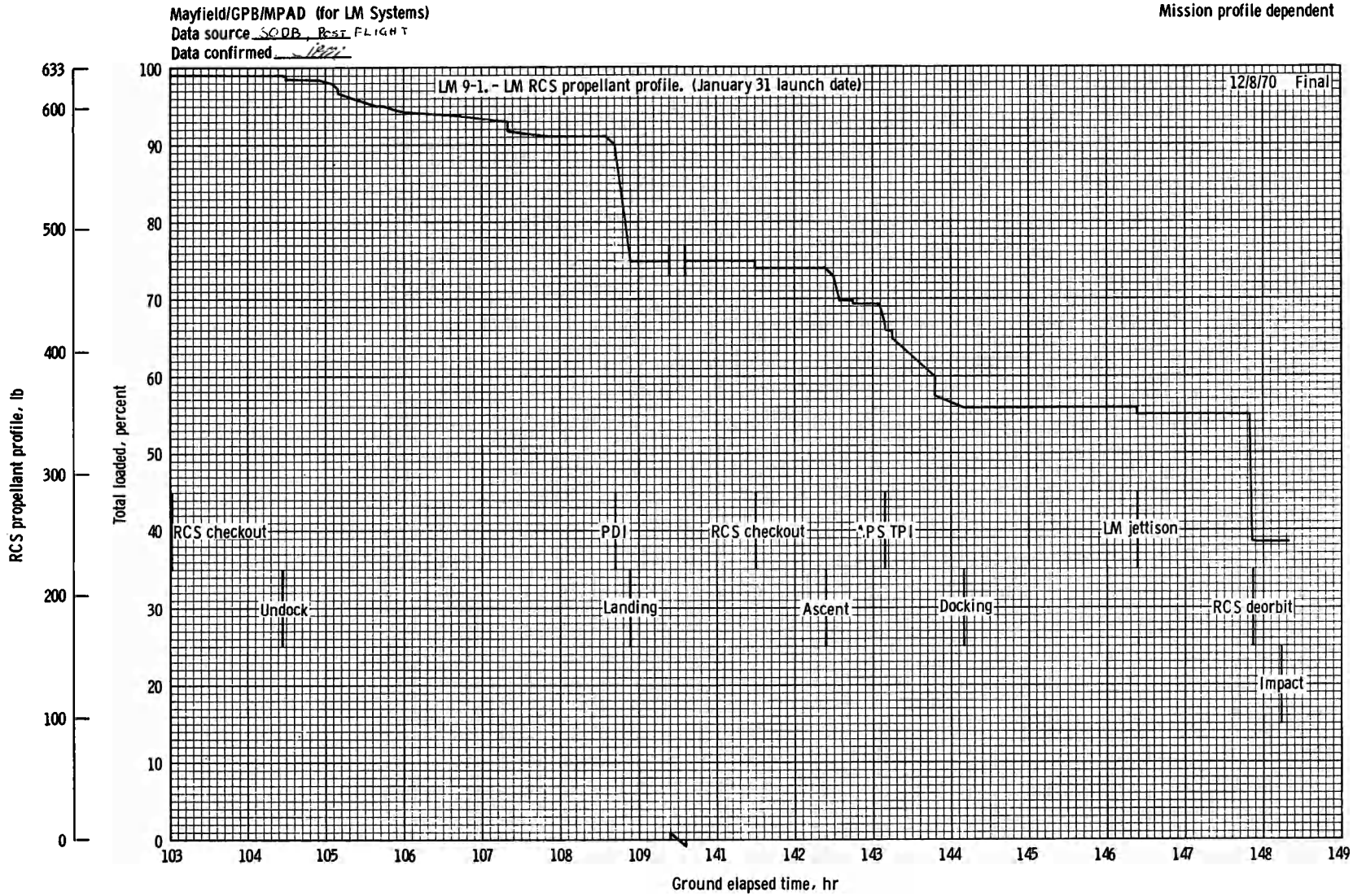


Figure 4-3.- LM RCS propellant profile.

LM ECS Assumptions

a. The oxygen analyses were calculated using a cabin leak rate of 0.06 lb/hr based on previous Apollo postflight analyses.

b. Metabolic rates were varied using the time line of reference 4 and table 4.3-II of reference 2.

c. Metabolic oxygen consumed was calculated by $(1.643 \times 10^{-4}$ lb/Btu) $\times$ (metabolic rate, Btu/hr).

d. The cabin regulator check and the suit integrity check were assumed to require 0.5 pound of oxygen.

e. The cabin was pressurized three times with 5.5 pounds required for each pressurization.

f. The dispersion in the oxygen profile was calculated as 5 percent of the nominal oxygen requirement.

g. The PLSS refill requires 15 pounds of water and 1.7 pounds of oxygen.

h. Water lost through crew micturition was 0.11 lb/hr per man.

i. Water required for thermal control was calculated by dividing the total spacecraft heat load by 1040 Btu/lb.

j. The dispersion in the water profile was calculated as 10 percent of the nominal usage.

k. The average glycol flow rate used in this analysis was 252 lb/hr.

l. It was assumed that the liquid cooled garments were used throughout the LM-active periods.

TABLE 4-6

LM ECS SUMMARY

(a) Water

Description	Descent, lb	Ascent, lb
Loaded	266.0	85.0
Sampling	16.0	--
Residual	6.7	1.7
Loading uncertainty	7.7	2.5
Available for mission	235.6	80.8
Required to lunar landing	35.4	0.0
Required to lunar lift-off	108.1	0.0
Required to LM/CSM docking	0.0	8.7
Required to LM close-out	0.0	6.0
Remaining in tank(s)	92.1	66.1
Dispersion	14.3	1.5
Margin	77.8	64.6

(b) Oxygen

Description	Descent, lb	Ascent 1, lb	Ascent 2, lb
Loaded	41.3	2.4	2.4
Residual	0.8	0.1	0.1
Loading uncertainty	1.5	0.1	0.1
Available for mission	39.0	2.2	2.2
Required to lunar landing	2.2	0.0	0.0
Required to lunar lift-off	24.2	0.0	0.0
Required to LM/CSM docking	0.0	0.4	0.0
Required to LM close-out	0.0	0.5	0.0
Remaining in tank(s)	12.6	1.3	2.2
Dispersion	1.3	0.1	0.0
Margin	11.3	1.2	2.2

Swalin/GPB/MPAD (for LM Systems)
Data source FLIGHT PLAN
Data confirmed Bmk

Mission profile dependent

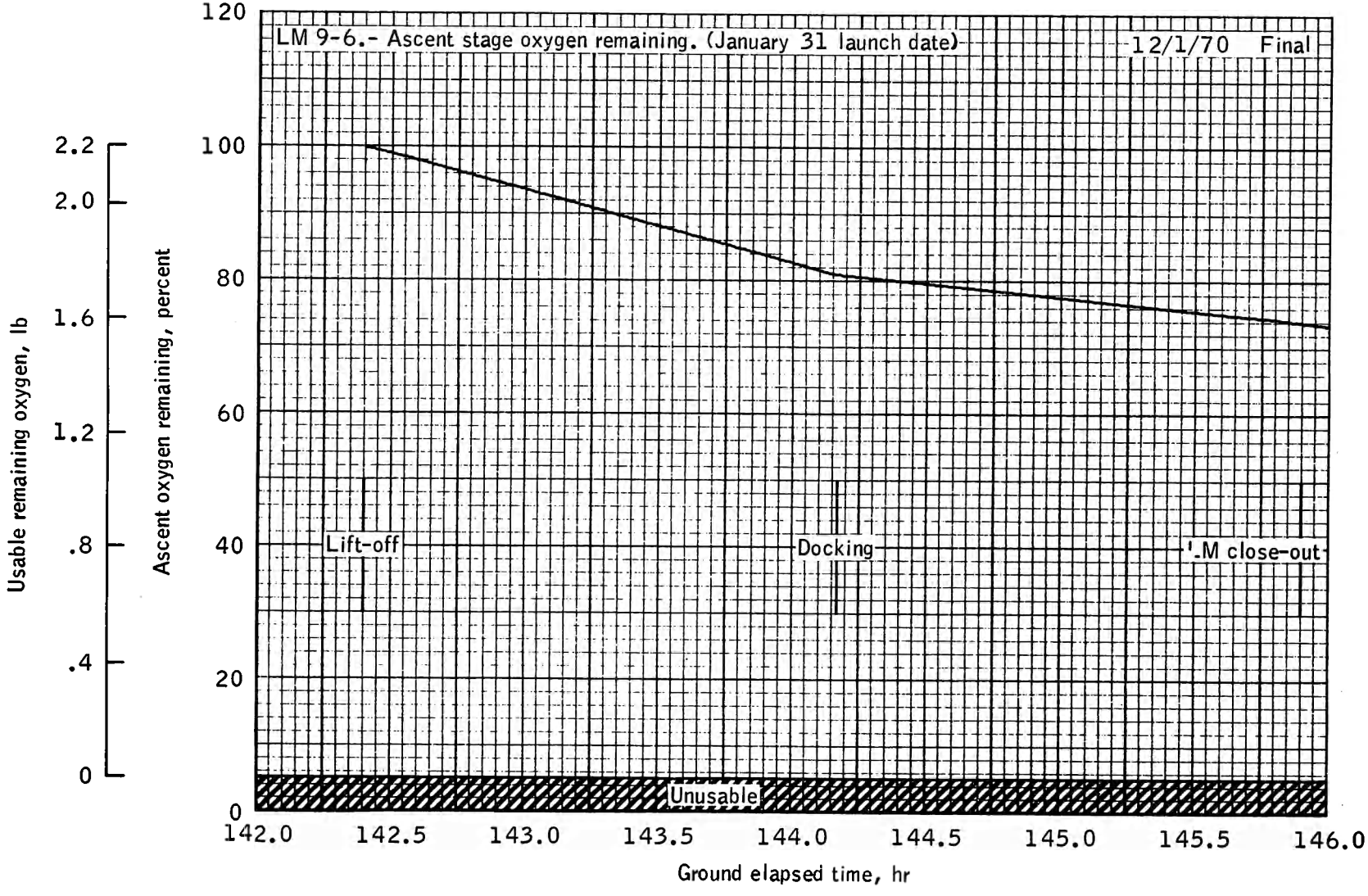


Figure 4-4.- Ascent tank 1 oxygen remaining.

NASA — MSC

Swalin/GPB/MPAD (for LM Systems)
Data source
Data confirmed

Mission profile dependent

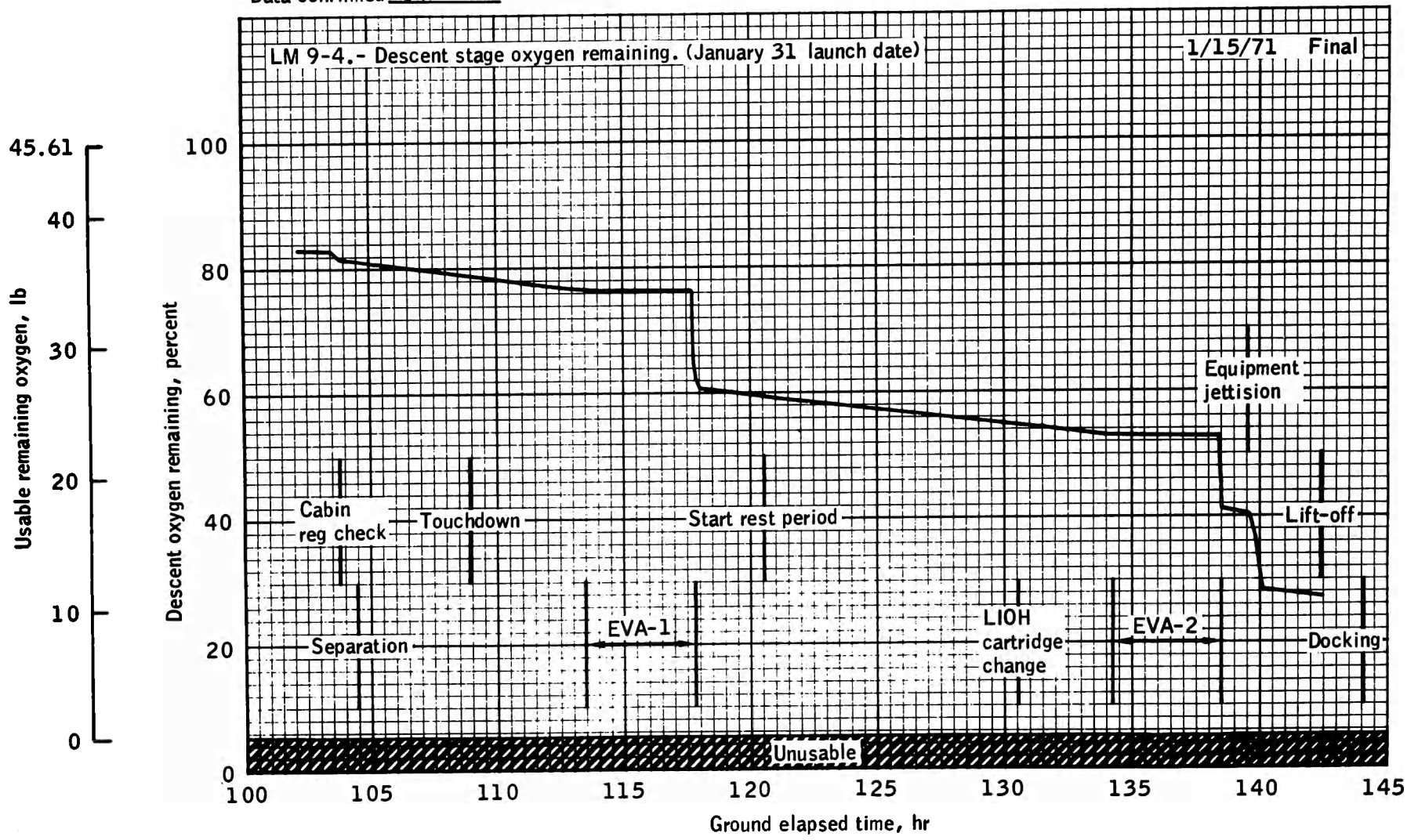


Figure 4.5- Descent oxygen remaining.

NASA — MSC

Swalin/GPB/MPAD (for LM Systems)
Data source FLIGHT PLAN
Data confirmed BMS

Mission profile dependent

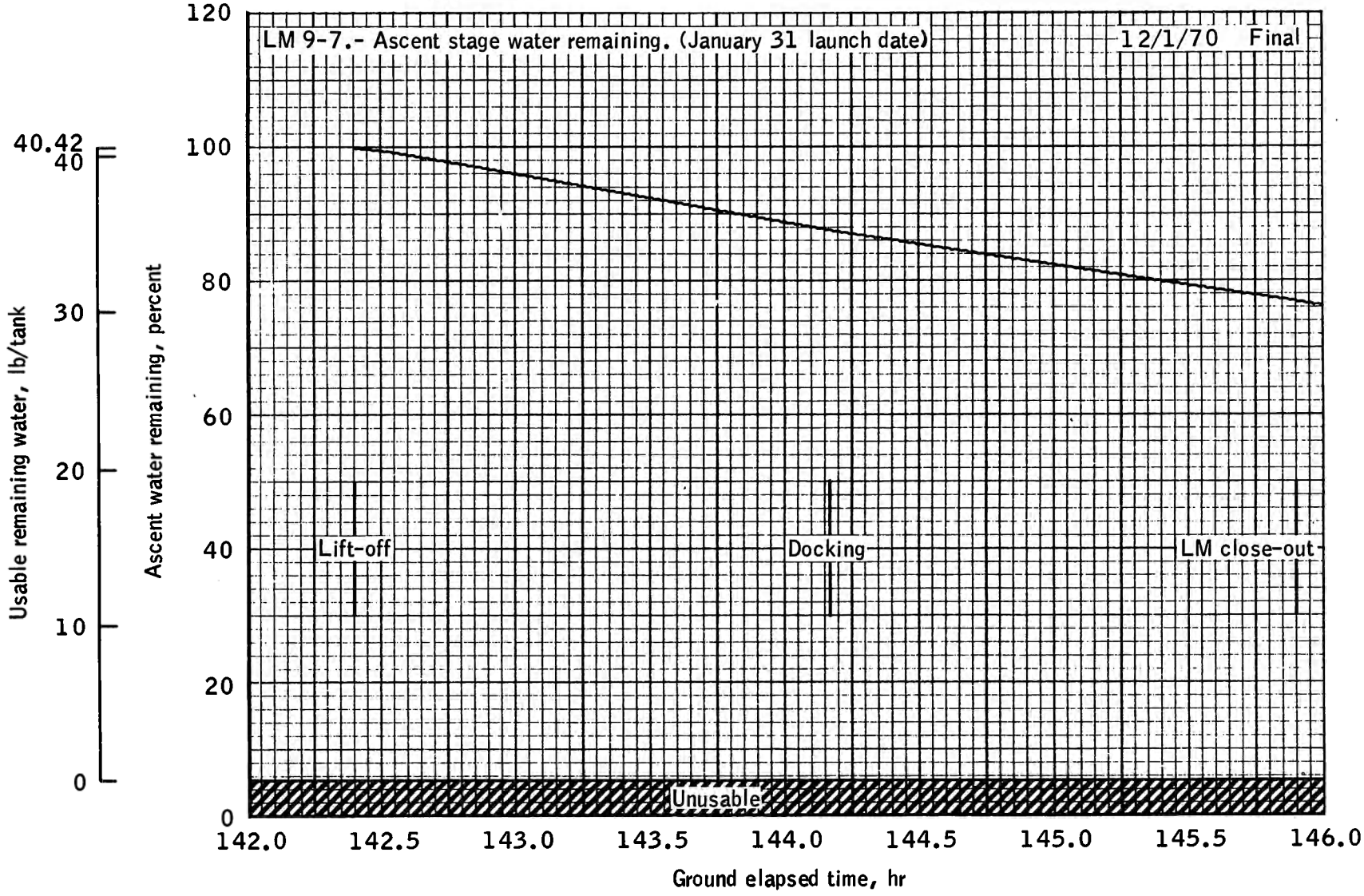


Figure 4-6.- Ascent water remaining.

Swalin/GPB/MPAD (for LM Systems)
Data source FLIGHT PLAN
Data confirmed 3rd

Mission profile dependent

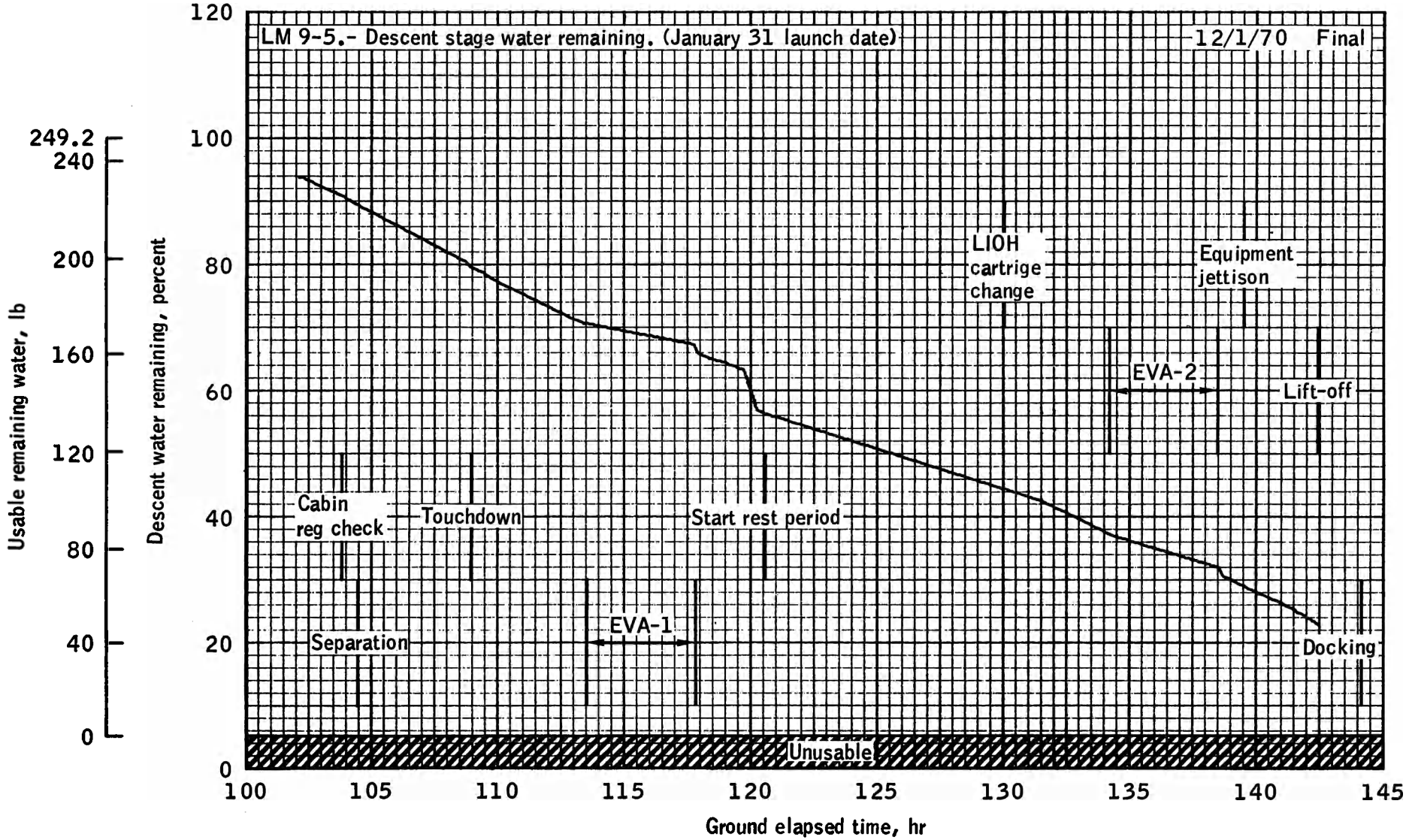


Figure 4-7.- Descent water remaining.

GROUND RULES AND ASSUMPTIONS FOR THE CSM CRYOGENICS

1. Three O_2 tanks and two H_2 tanks are available.

2. Fuel cell purging is included in the EPS requirements.

3. Both H_2 tanks and two of the three O_2 tanks are assumed to be fully loaded. The third O_2 tank is to be off-loaded to approximately 62 percent at lift-off.

4. No cryogenic venting was assumed in flight.

5. The EPS hydrogen consumption rate ($\dot{H}_2$) (lb/hr) = $0.00257 \times I_{fc}$ when I_{fc} is the total fuel cell current.

6. The EPS oxygen consumption rate ($\dot{O}_2$) (lb/hr) = $7.936 \times \dot{H}_2$.

7. The launch redlines for O_2 are defined as points on the curve. These points are contingent upon accomplishing DTO 4.6 which is greater than a tank loss requirement. However, if lift-off were to occur at these points, a somewhat different tank management scheme would have to be employed, even if no tank failed. If a tank failure were to occur then a nominal 40 Amp return level plus ECS would be employed on the remaining two tanks.

TABLE 4-7

APOLLO 14 CRYOGENIC SUMMARY
[31 Jan, 1971 Launch]

	H_2(lbs)	O_2(lbs)
Planning allowance		
Total loaded	58.6	990.3
Less residual	2.3	19.8
Less instrumentation error	1.5	21.8
Available for mission planning	54.8	948.7
Prelaunch requirement	3.7	130.4*
Flight requirement		
EPS (incl. F/C purge)	39.2	310.5
ECS (including cabin purge + EVA)	--	87.5
LM pressurization	--	12.5
Nominal reserves		
EPS uncertainty (2.5%)	1.0	7.8
ECS uncertainty (.08 #/hr)	--	17.3
Total requirement	43.9	566.0
Margin T = 0 (fill/launch)	10.9	382.7

*Prelaunch requirement includes off-loading of tank 3.

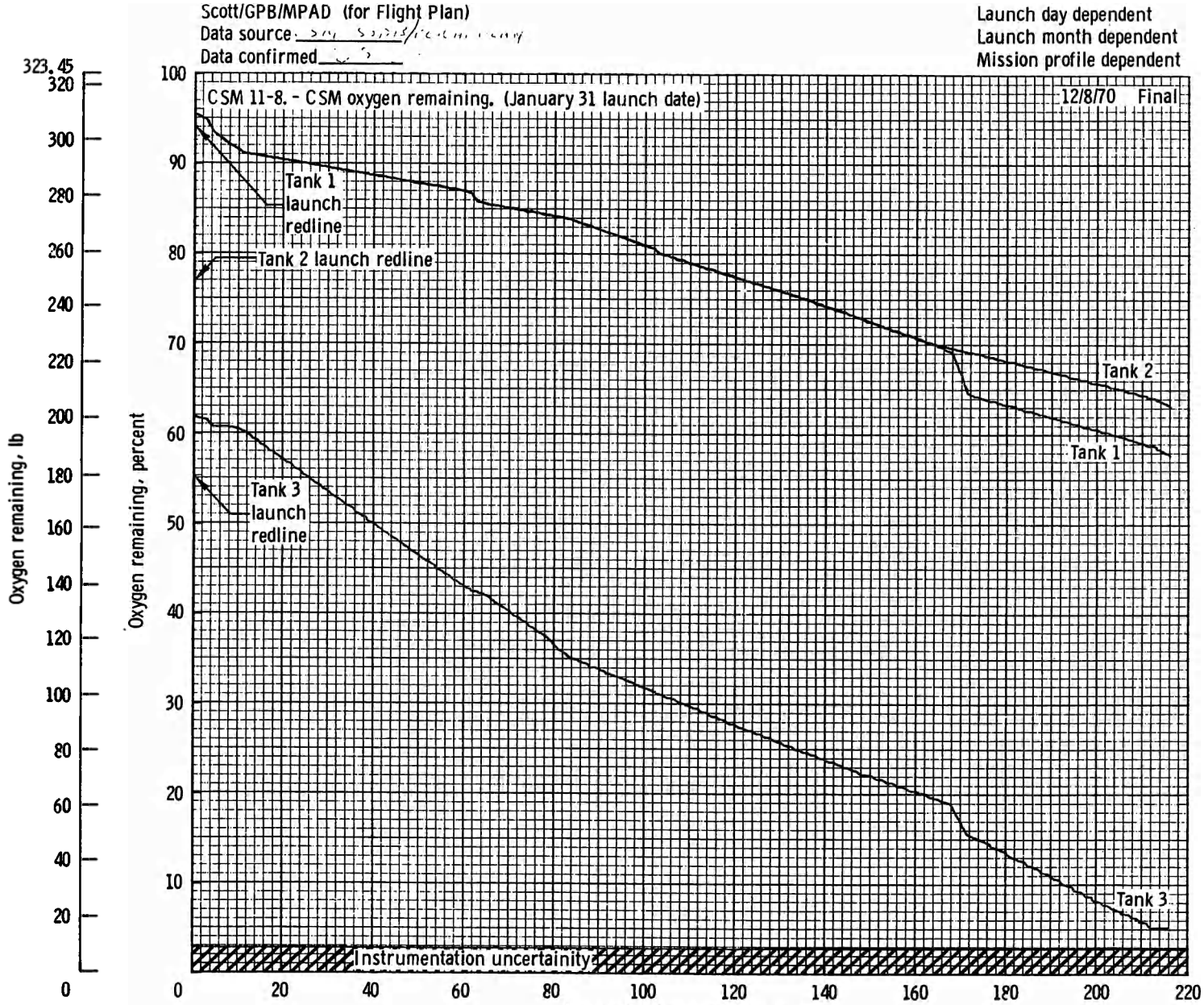


Figure 4-8.- CSM oxygen remaining.

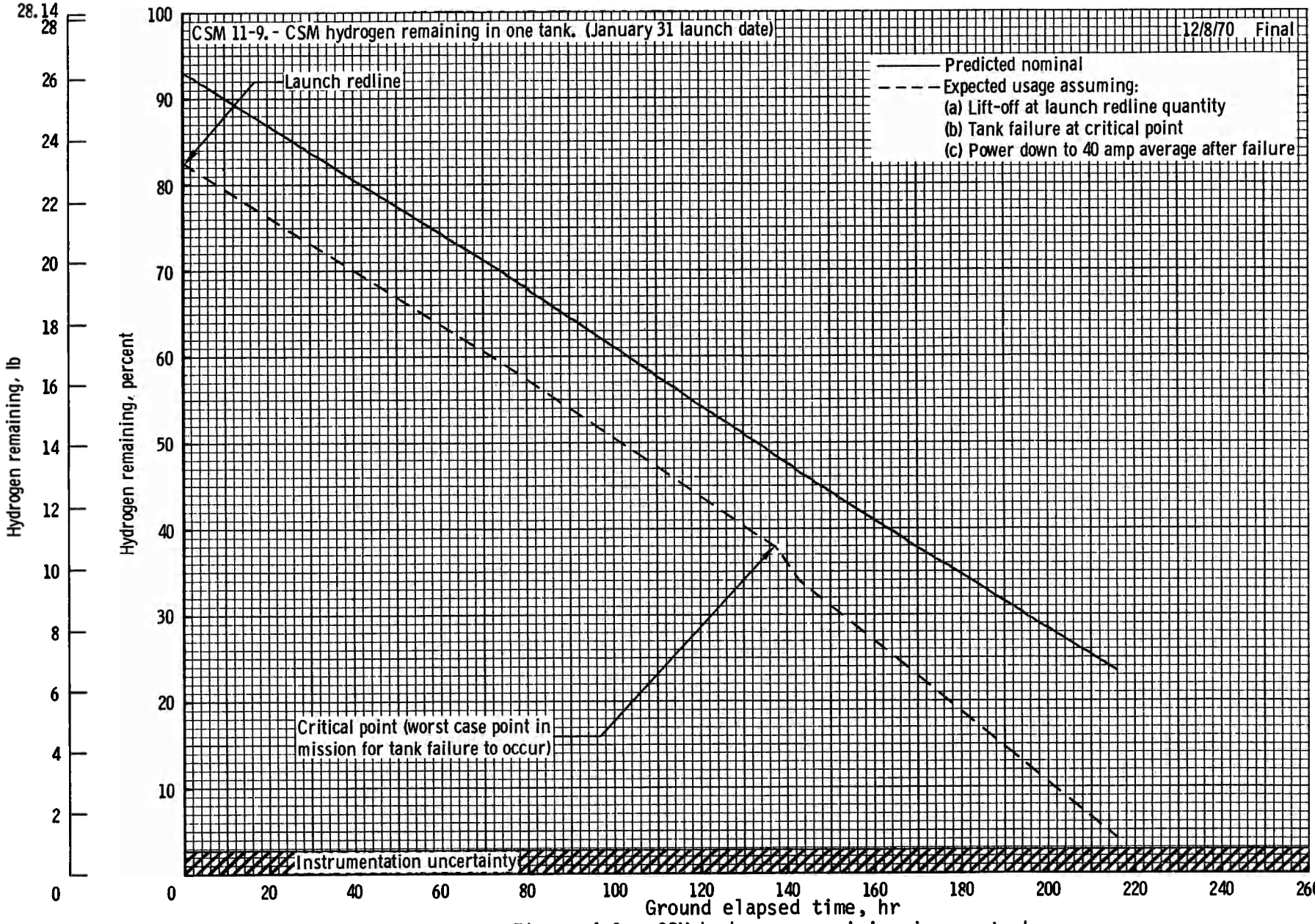


Figure 4-9.- CSM hydrogen remaining in one tank.

THE SPS ANALYSIS

Assumptions for the SPS Propellant Analysis

1. The 3σ dispersions are the RSS of the penalties imposed on the SPS margin by 3σ dispersions in propellant loading, mixture ratio, engine I_{sp}, maneuver ΔV, spacecraft weight, and consumable weight losses. The engine I_{sp} and dispersion utilized in this analysis were taken from Table 11 of the Apollo Mission H3/CSM-110/SPS Preflight Performance Report, NAS 9-8166, dated November 1970. All spacecraft weights and consumable losses are from Volume III, Amendment 88, of the Spacecraft Operational Data Book, dated October 5, 1970.

2. The allowance for the TLMC is now debited from the nominal remaining propellant along with the 3σ dispersions. It is only a format change, not a budgeting technique change.

3. The ground rule for a contingency allowance is to budget for either a LM rescue or a maneuver to avoid adverse weather conditions at entry, whichever produces the least SPS propellant margin. The ΔV for the LM rescue allowance is 600 fps. The ΔV for weather avoidance for previous missions has been 500 fps. However, for this mission, the ΔV requirement for weather avoidance has been reduced to 300 fps. The propellant margin when considering either contingency, LM rescue or the 300 fps for weather avoidance, is approximately the same.

TABLE 4-8

APOLLO 14 SPS PROPELLANT SUMMARY

[Jan. 31, 1971, launch; 72° launch azimuth]

Item	Propellant required, lb	Propellant remaining, lb
Total loaded		40 796.0
Trapped and unavailable	441.4	40 354.6
Outage	59.8	40 294.8
Unbalance meter	100.0	40 194.8
Available for ΔV		40 194.8
Requirement for ΔV		
Hybrid (73.4 fps)	724.2	39 470.6
LOI (2986 fps)	24 777.8	14 692.8
DOI (206.6 fps)	1 470.8	13 222.0
CIRC (72.5 fps)	272.8	12 949.2
LOPC (360.7 fps)	1 269.2	11 680.0
TEI (3449.5 fps)	10 059.4	1 620.6
Nominal remaining		1 620.6
Dispersions		
-3σ performance	473.0	1 147.6
TLMC (33 fps)	346.2	801.4
Contingency (326 fps)*	301.4	0.0
Propellant margin		0.0

*Available for weather avoidance.

SM RCS BUDGET

Ground Rules and Assumptions

1. Following transposition and docking, the S-IVB performs the evasive maneuver.

2. Two midcourse corrections (translunar) are executed as SPS burns with one MCC followed by an RCS trim.

3. One midcourse correction (transearth) is executed as an RCS burn of 5 fps.

4. Quad management is to be determined during the mission.

5. Redlines have been defined by the Flight Control Division as an aid in assuring that mission rules are not violated during the mission. They are subject to review during the mission as mission phases are completed and systems capabilities are evaluated. In the event the rescue redline is violated prior to rendezvous, lunar orbit photography activities can be curtailed to conserve propellant. The lunar orbit redline includes a nominal transearth coast phase (with all navigational sightings) plus a 3 sigma G&N TEI cutoff error MCC. If a rescue is required and the lunar orbit redline is violated prior to the nominal TEI, TEI can be performed early and navigational sighting activity curtailed during the transearth phase. The rescue redline is based on the minimized activity during the transearth phase.

TABLE 4-9

SM RCS PROPELLANT LOADING AND USAGE SUMMARY

Item	Propellant required, lb	Propellant remaining, lb
Expected loading	--	1342.4
Initial outage caused by loading mixture ratio	15.6	--
Total trapped	26.4	--
Gaging inaccuracy	80.4	--
Deliverable	--	1220.0
Nominal usage		
Translunar coast	199	--
Lunar orbit	431	--
Transearth coast	220	--
Total	850	--
Nominal remaining usable propellant	--	370

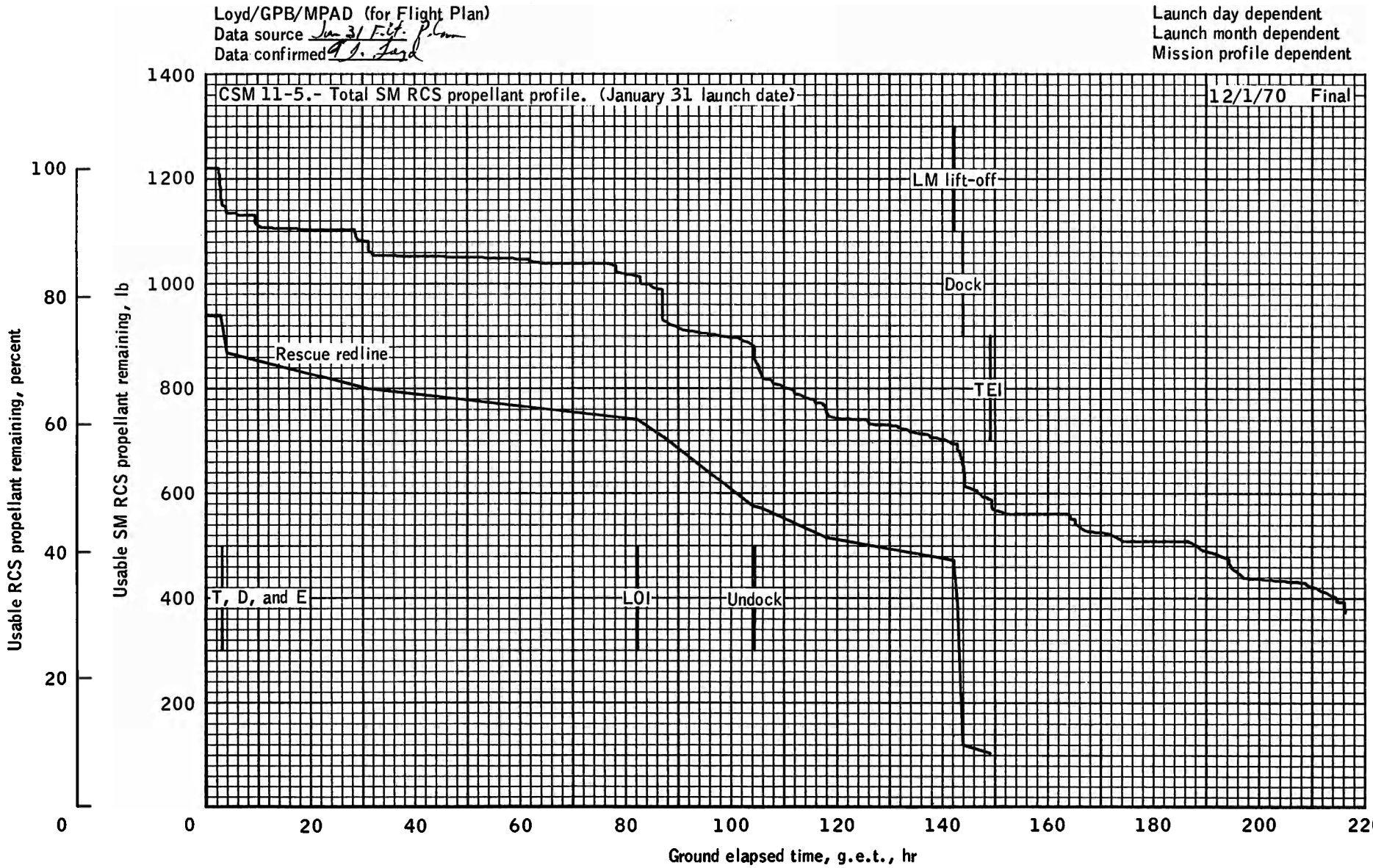


Figure 4-10.- Total SM RCS propellant usage profile.

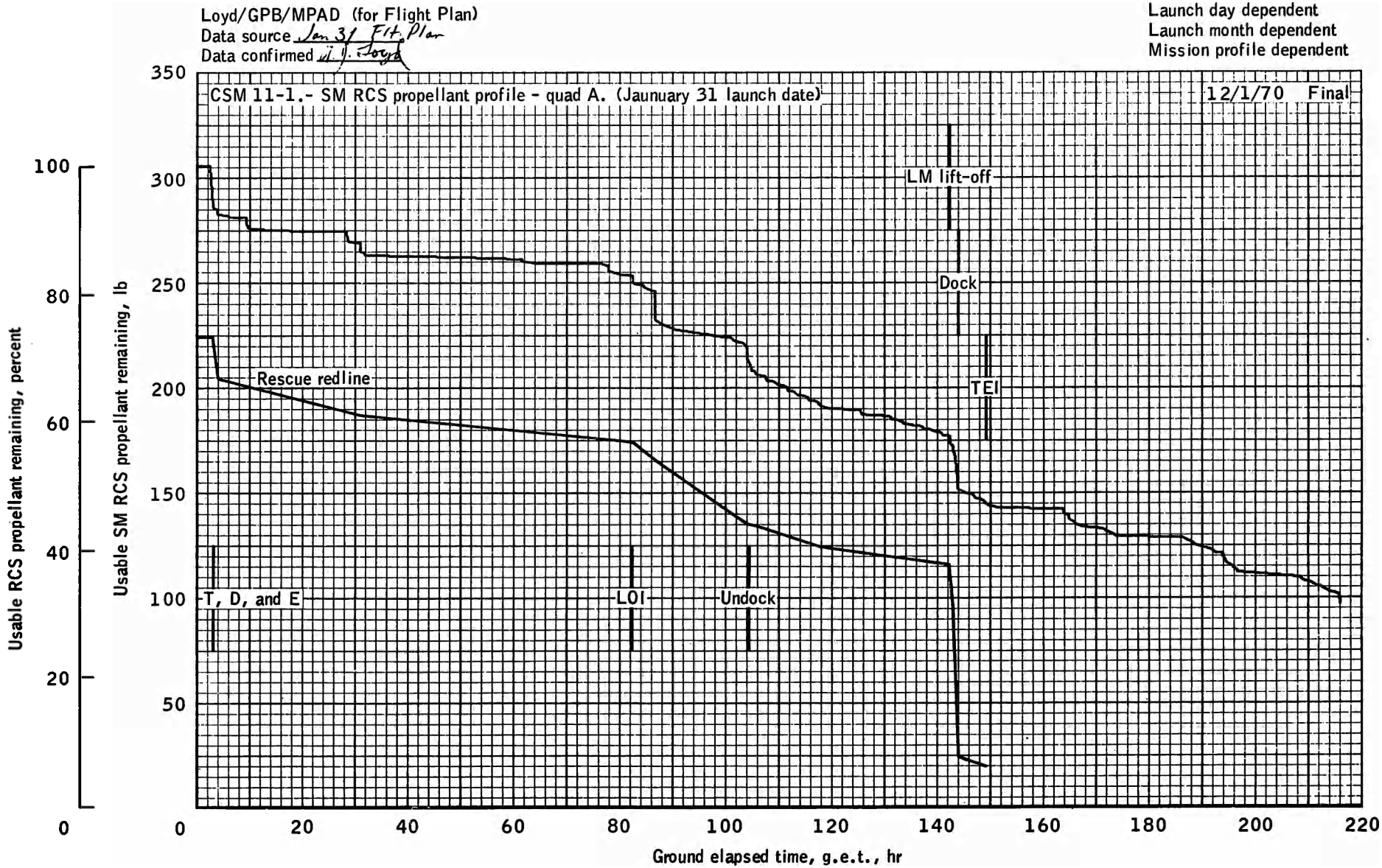


Figure 4-11.- SM RCS propellant profile - quad A.

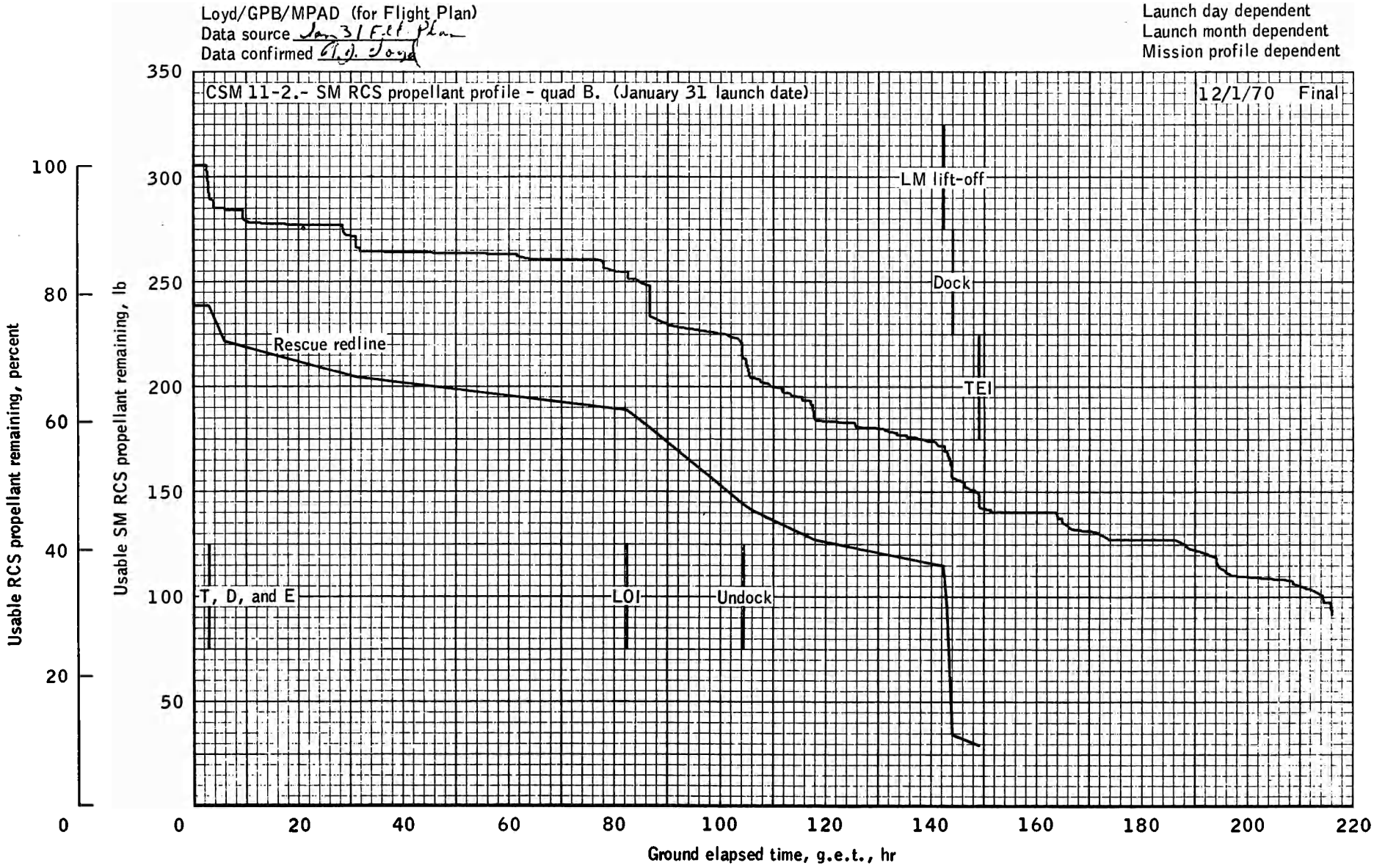


Figure 4-12.- SM RCS propellant profile - quad B.

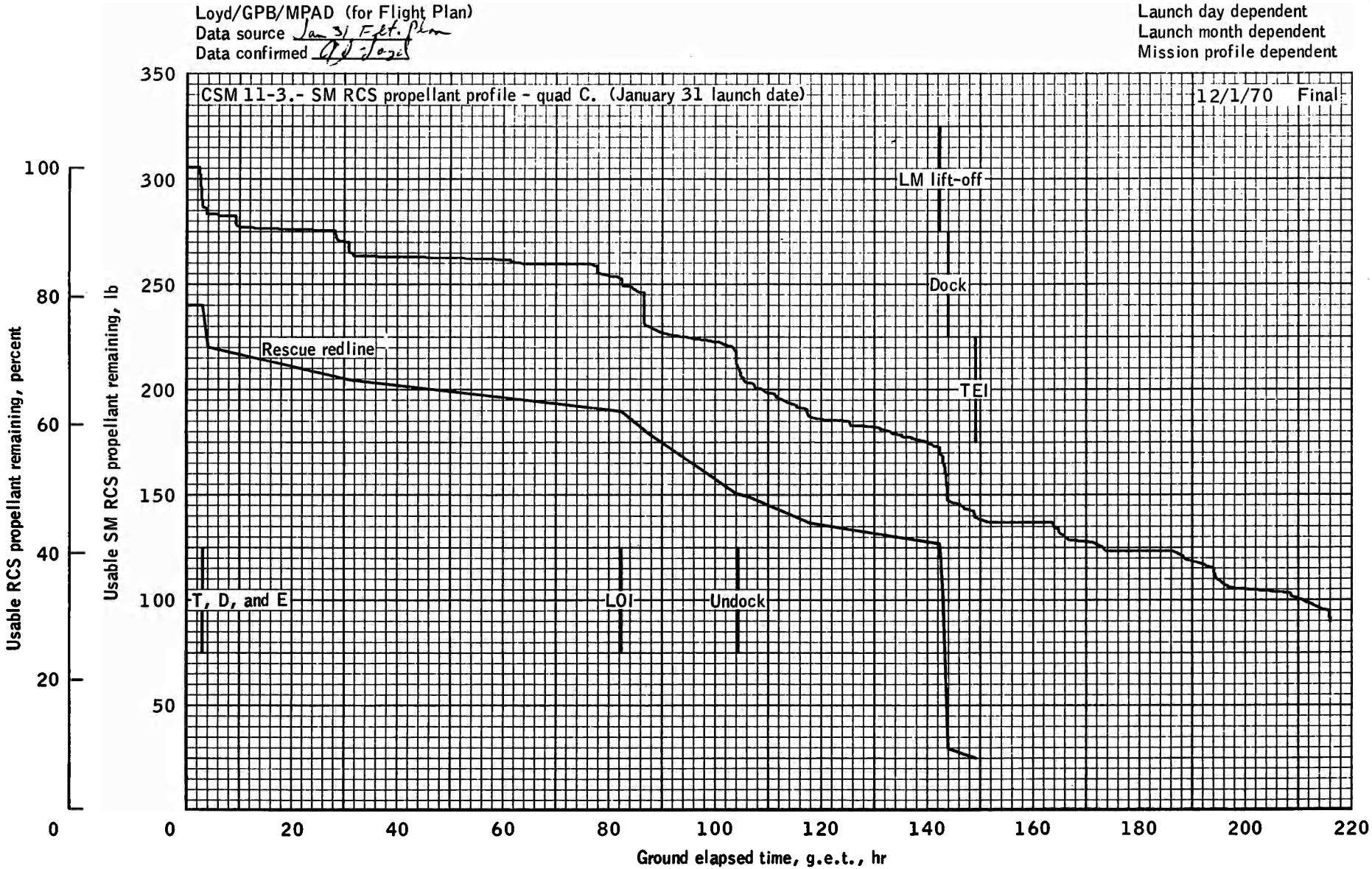


Figure 4-13.- SM RCS propellant profile - quad C.

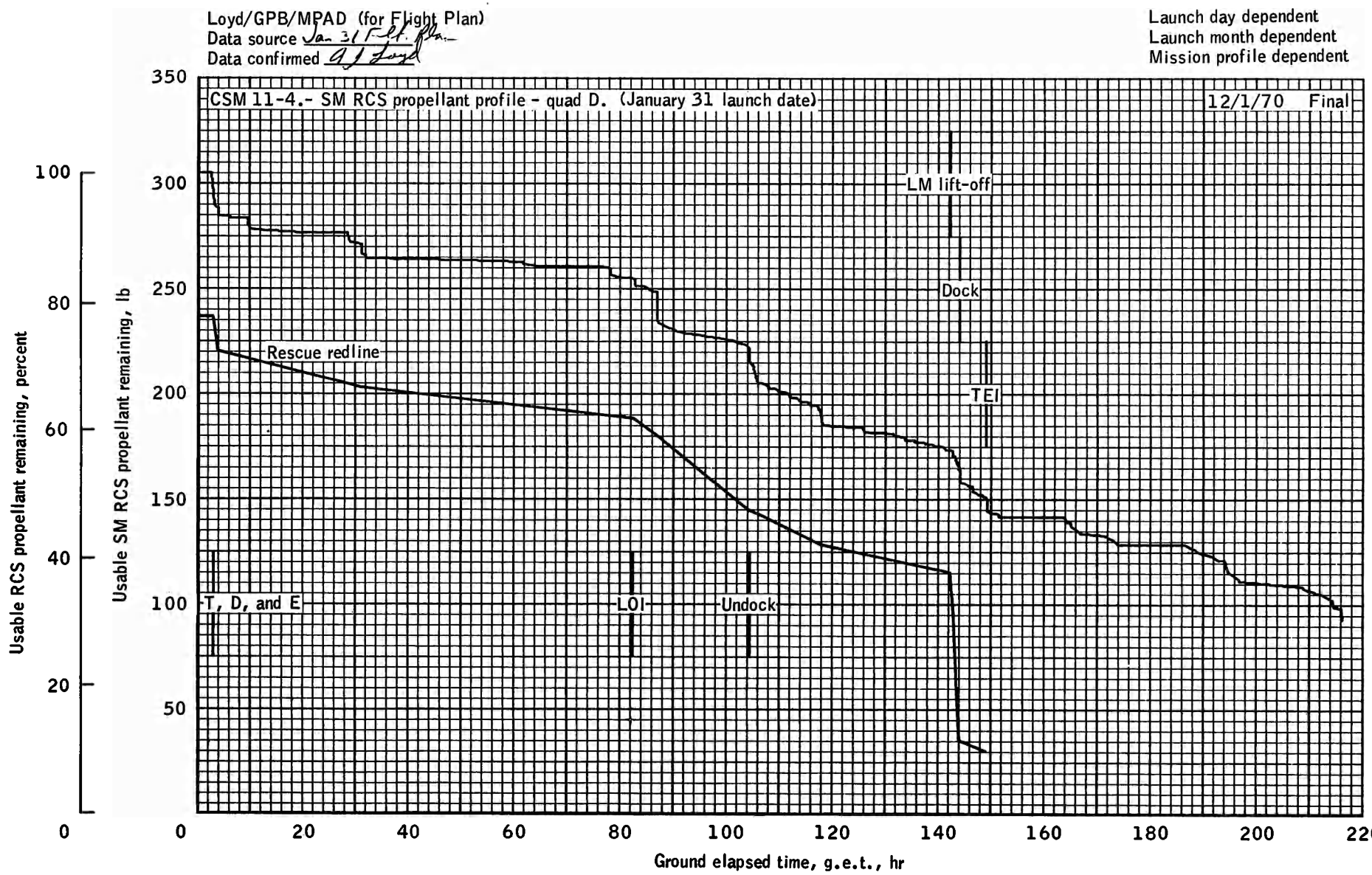


Figure 4-14.- SM RCS propellant profile - quad D.

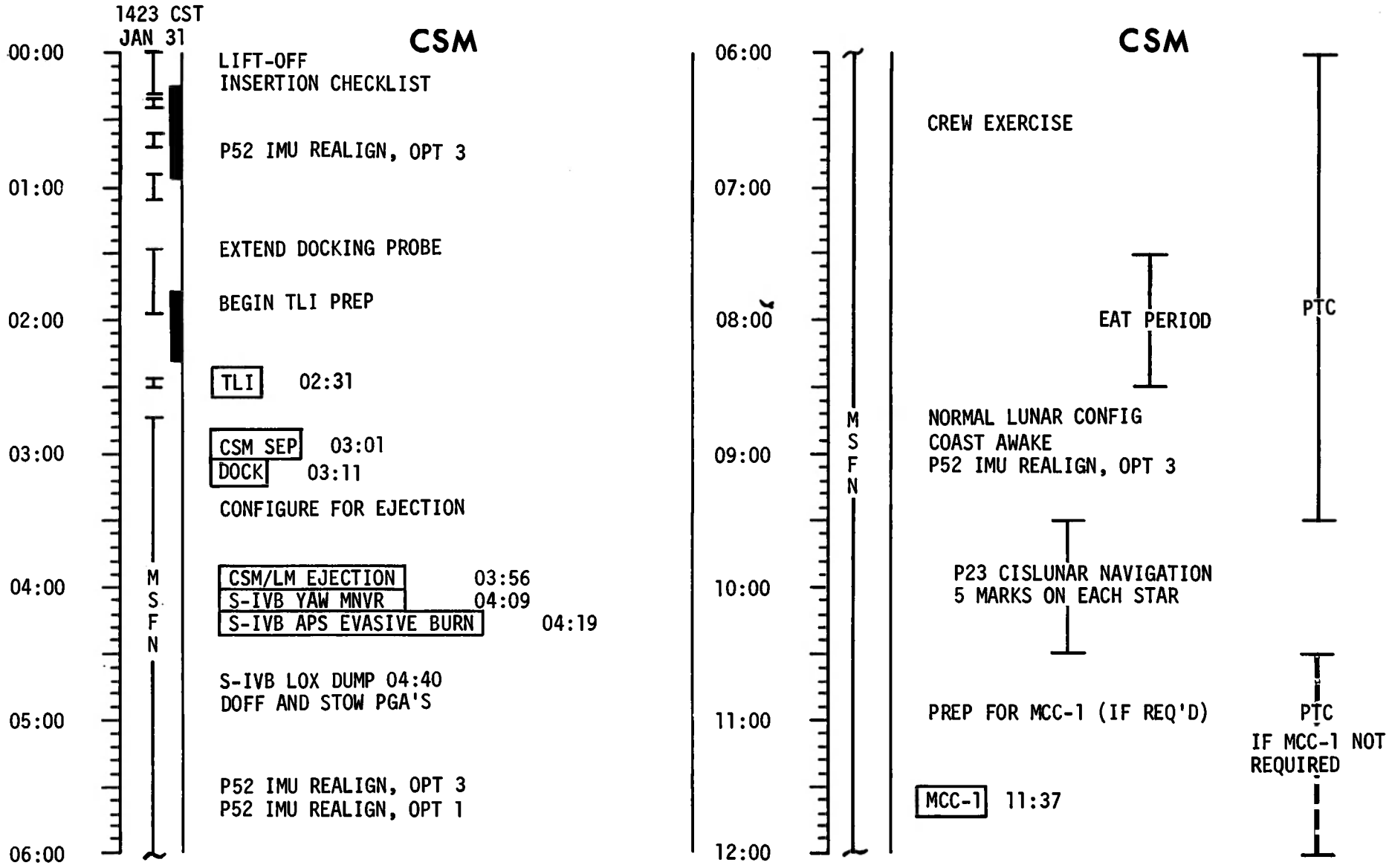
TABLE 4-10

CM RCS PROPELLANT SUMMARY

Item	Propellant required, lb	Propellant remaining, lb
Loaded	--	245.0
Trapped	36.4	208.6
Available for mission planning	--	208.6
Nominal usage	38.9	169.7
Nominal remaining	--	169.7

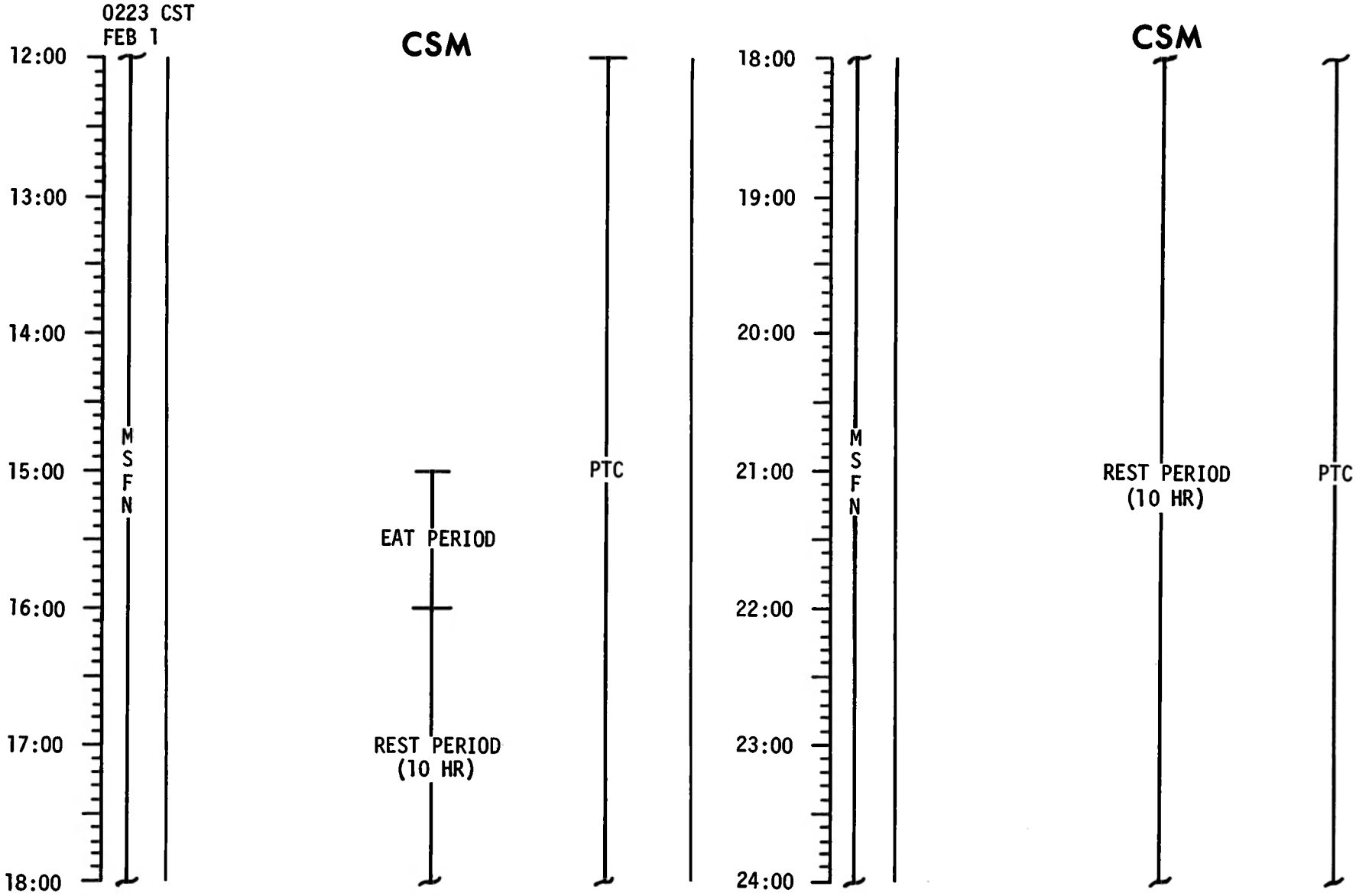
SECTION 5 - ABBREVIATED TIMELINE

FLIGHT PLAN



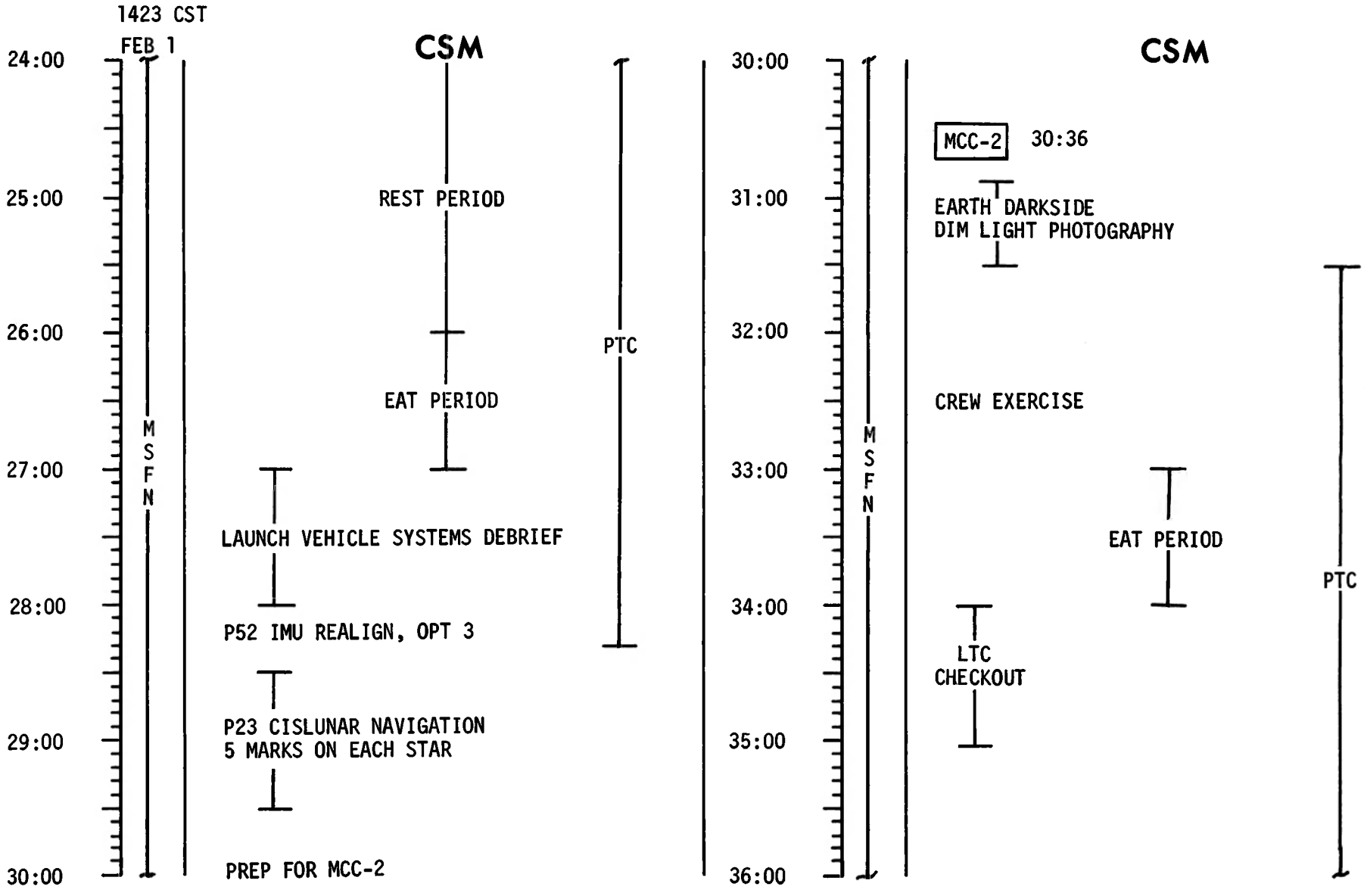
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	00:00 - 12:00	1/TLC	5-1

FLIGHT PLAN



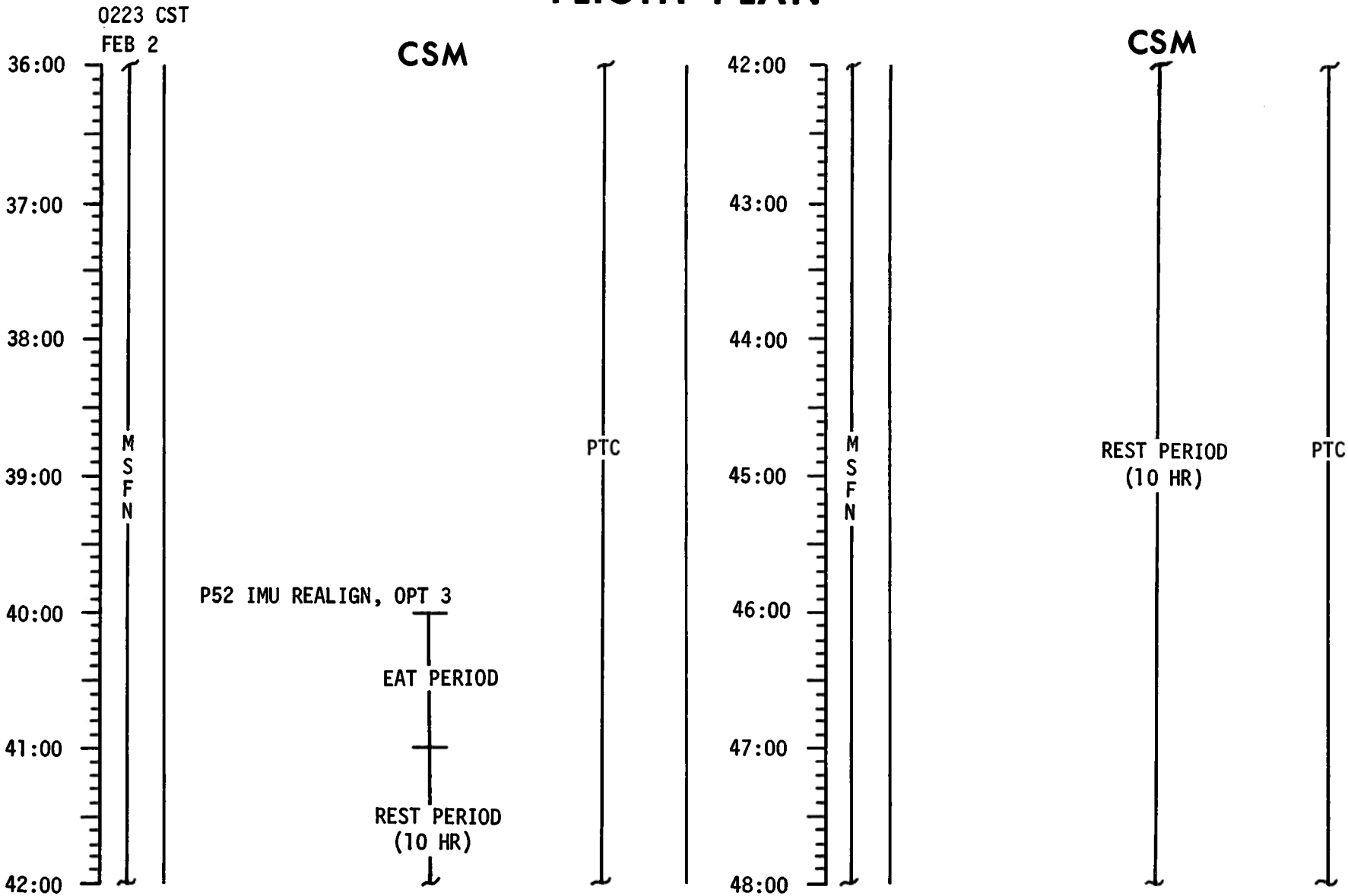
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	12:00 - 24:00	1/TLC	5-2

FLIGHT PLAN



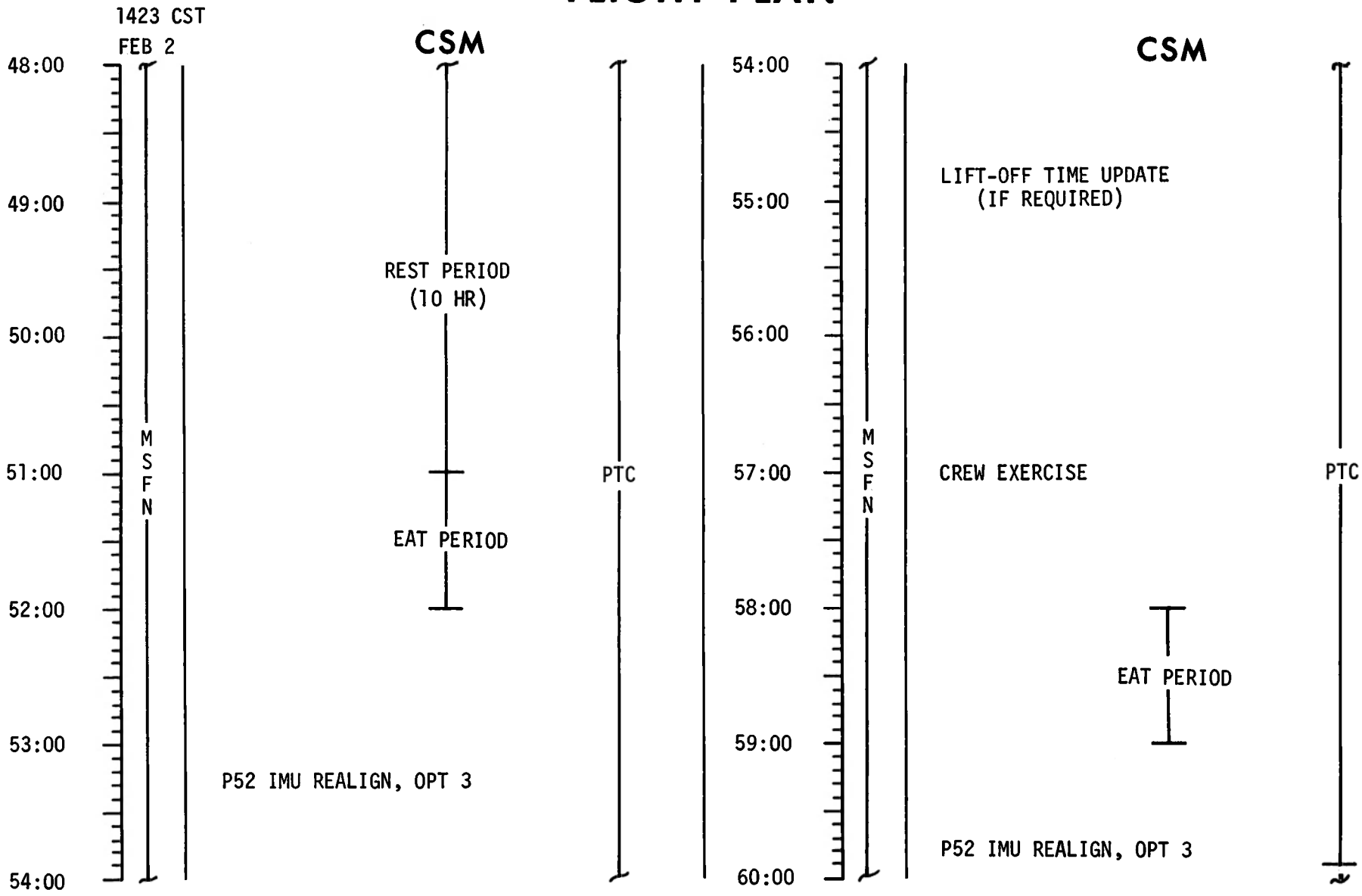
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	24:00 - 36:00	1-2/TLC	5-3

FLIGHT PLAN



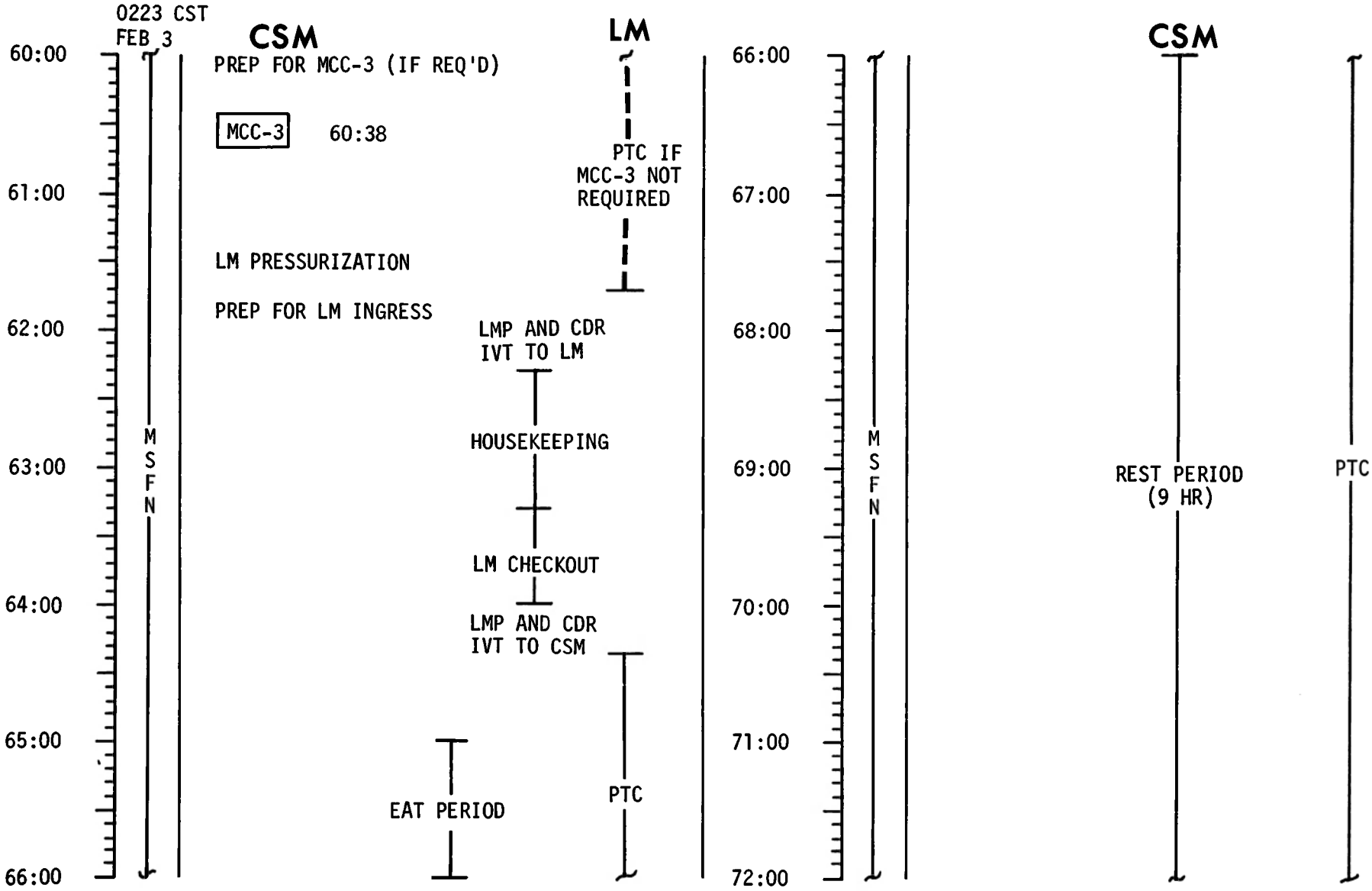
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	36:00 - 48:00	2/TLC	5-4

FLIGHT PLAN



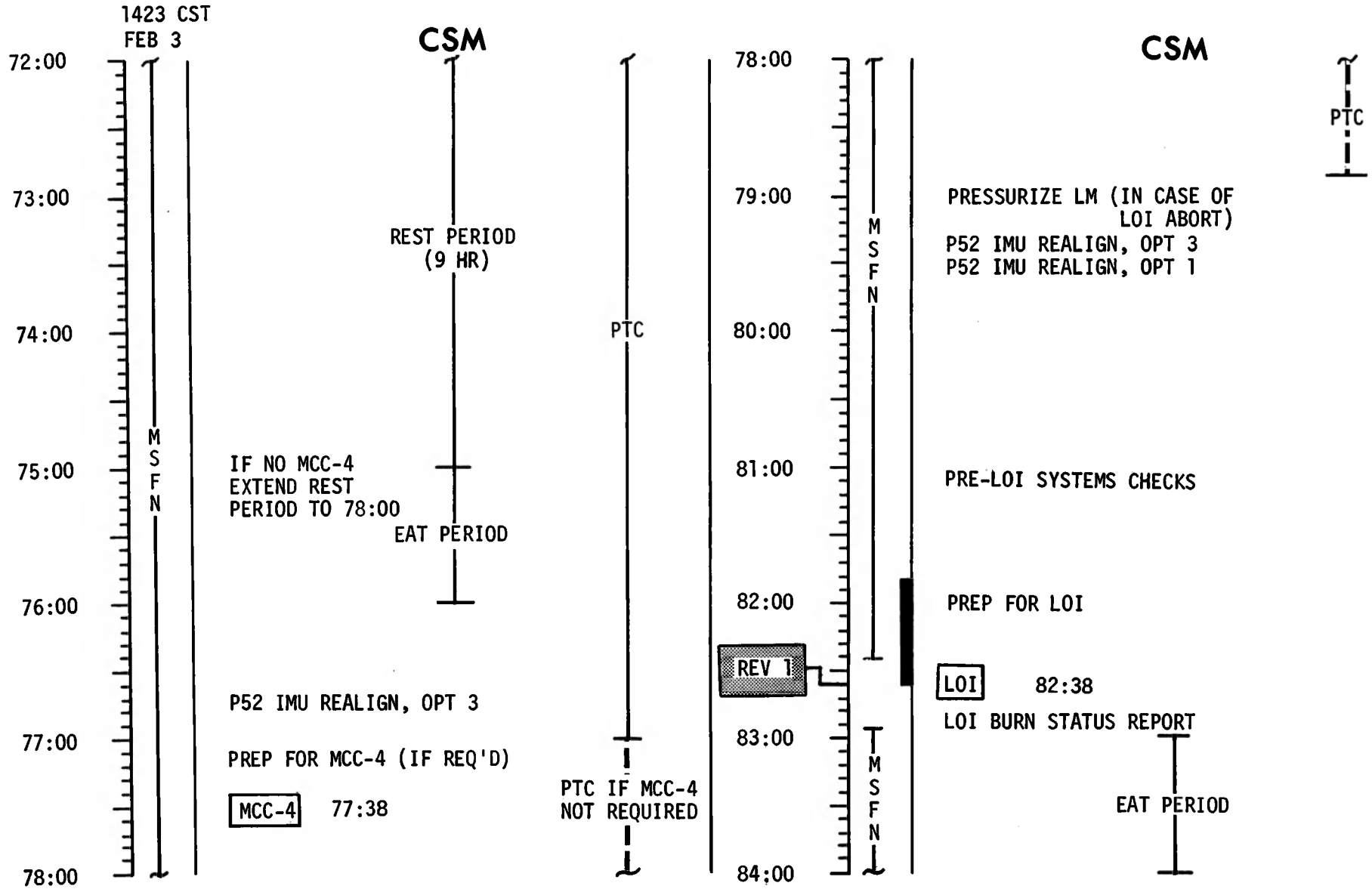
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	48:00 - 60:00	2-3/TLC	5-5

FLIGHT PLAN



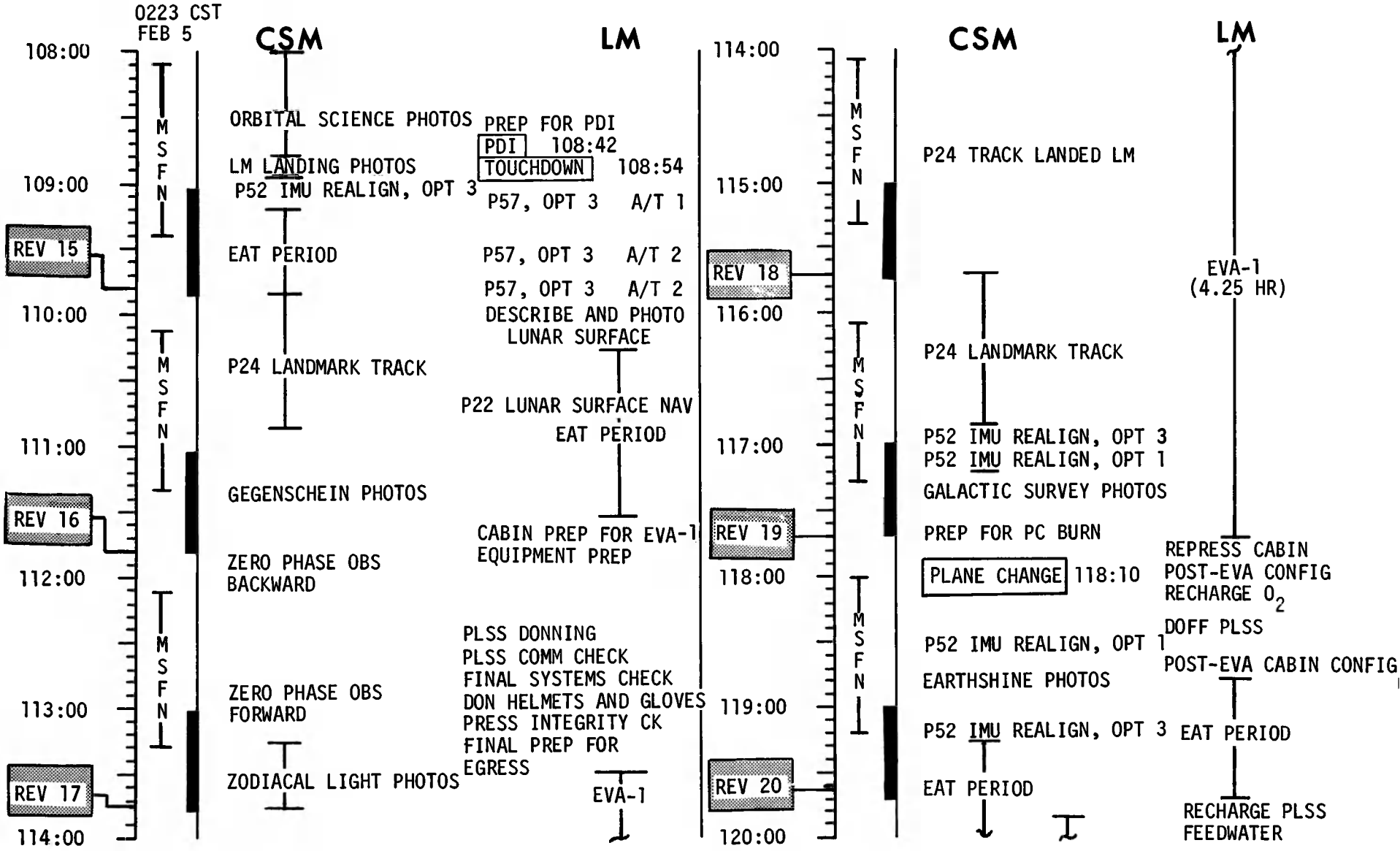
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	60:00 - 72:00	3/TLC	5-6

FLIGHT PLAN



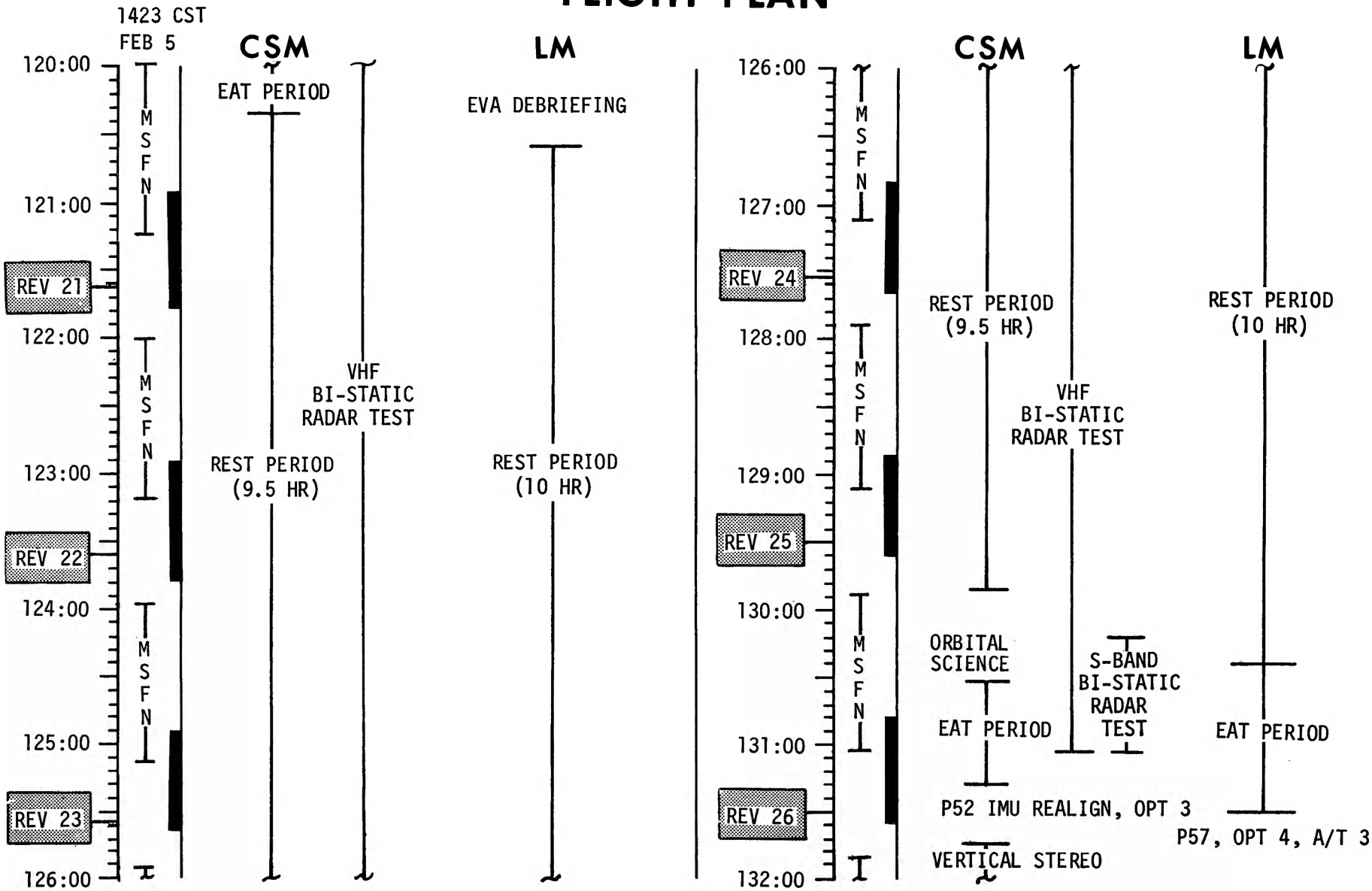
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	72:00 - 84:00	3-4/TLC-1	5-7

FLIGHT PLAN



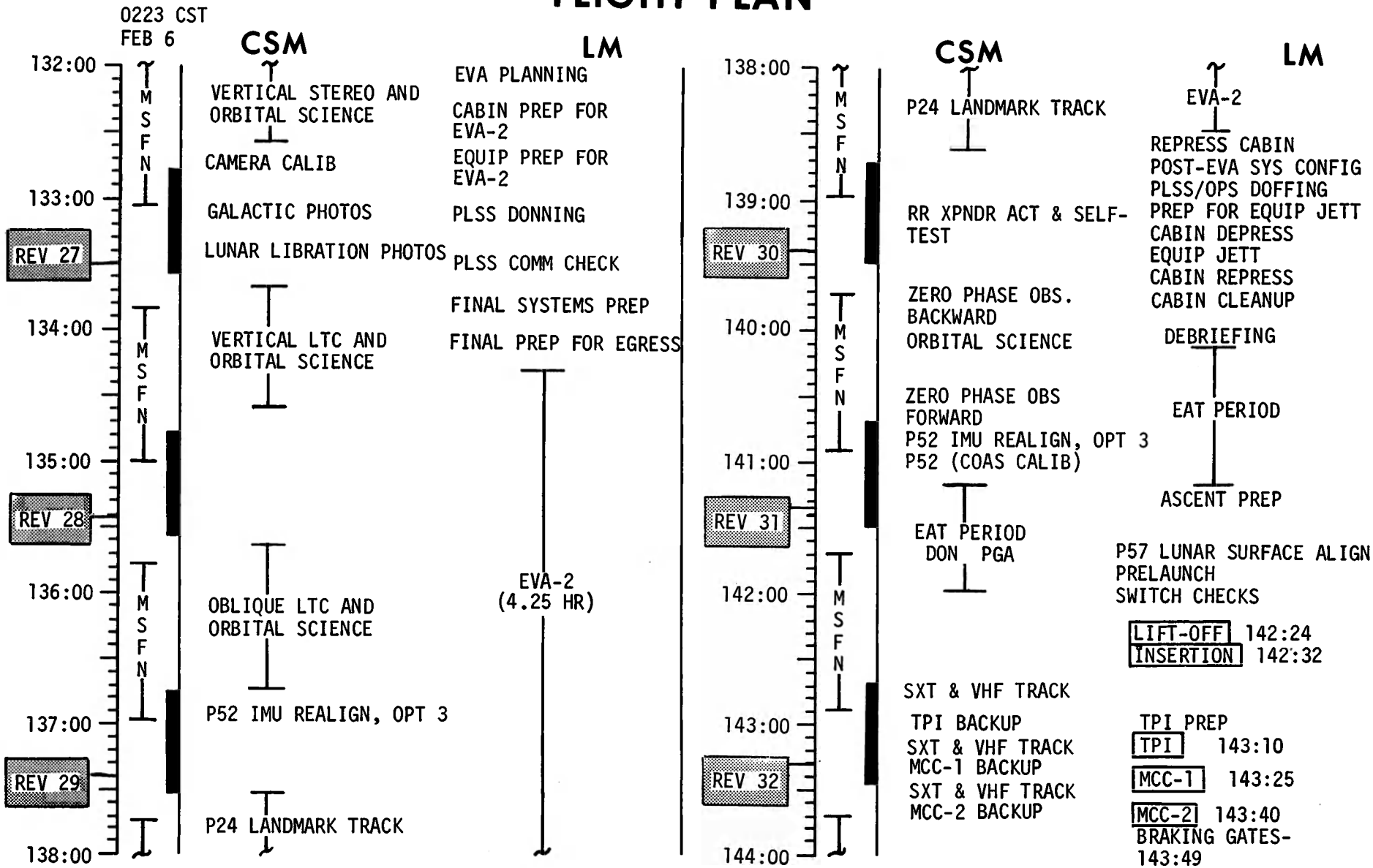
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	108:00 - 120:00	5/14-20	5-10

FLIGHT PLAN



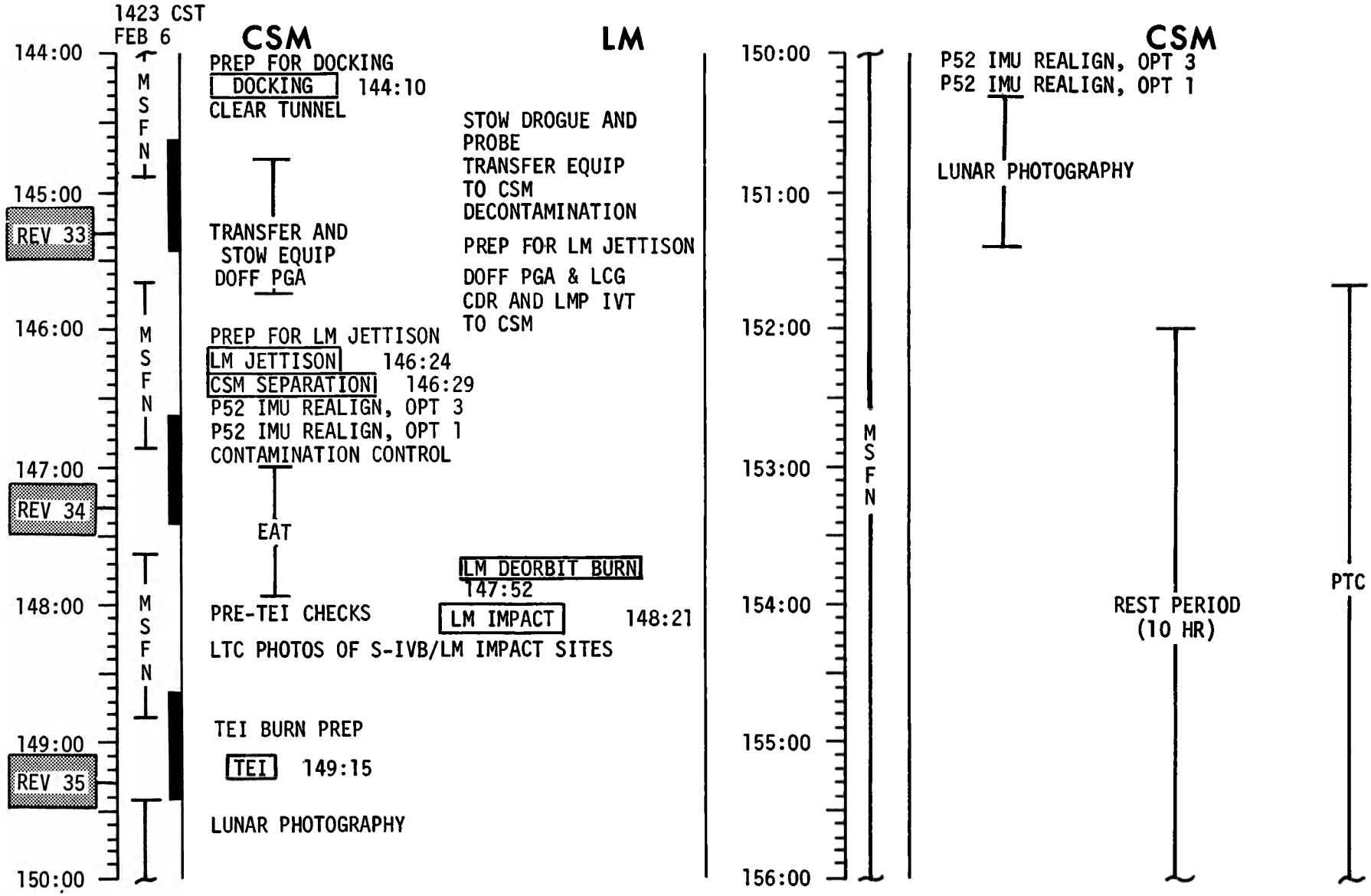
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	120:00 - 132:00	5-6/20-26	5-11

FLIGHT PLAN



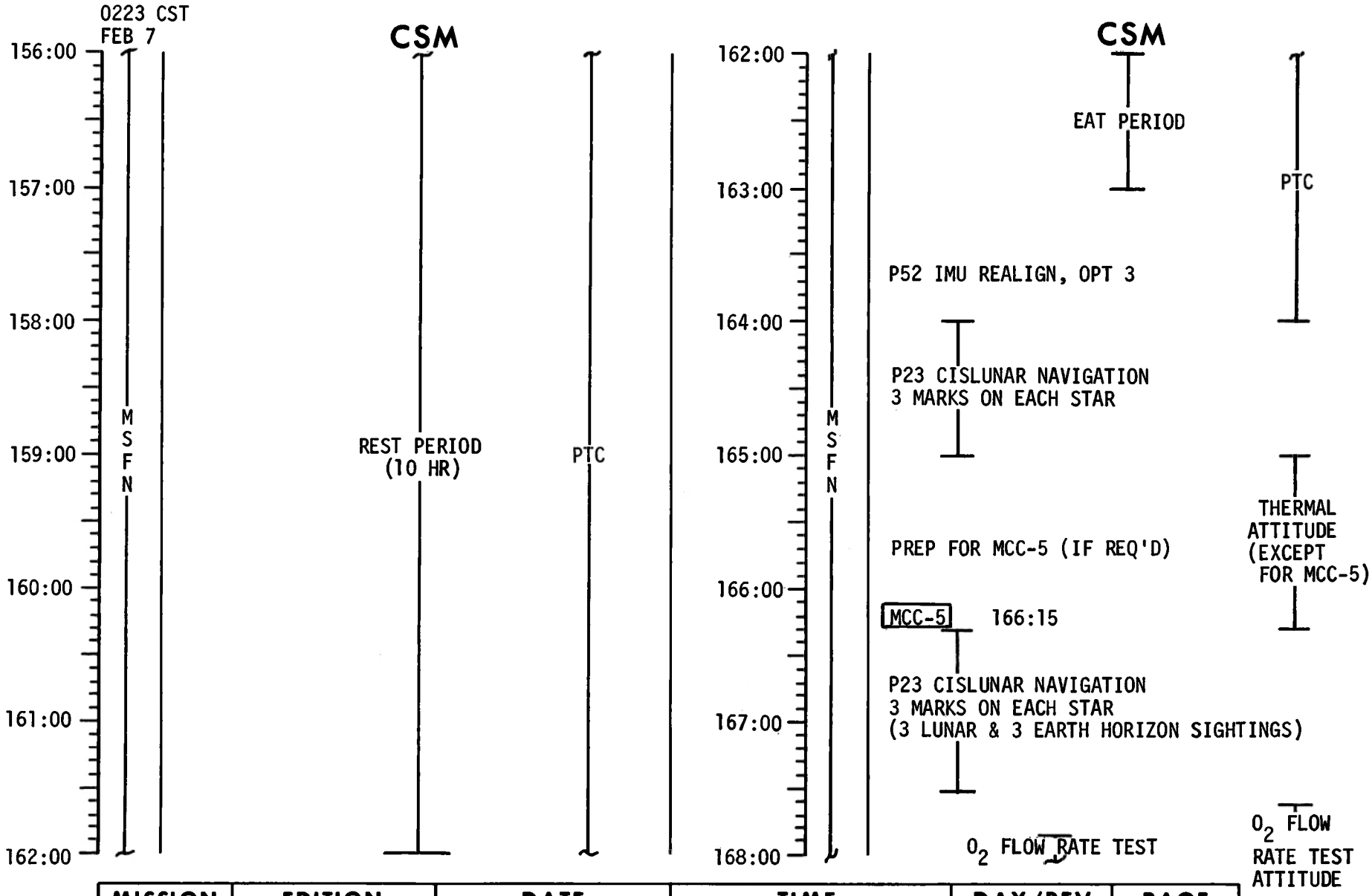
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	132:00 - 144:00	6/26-32	5-12

FLIGHT PLAN



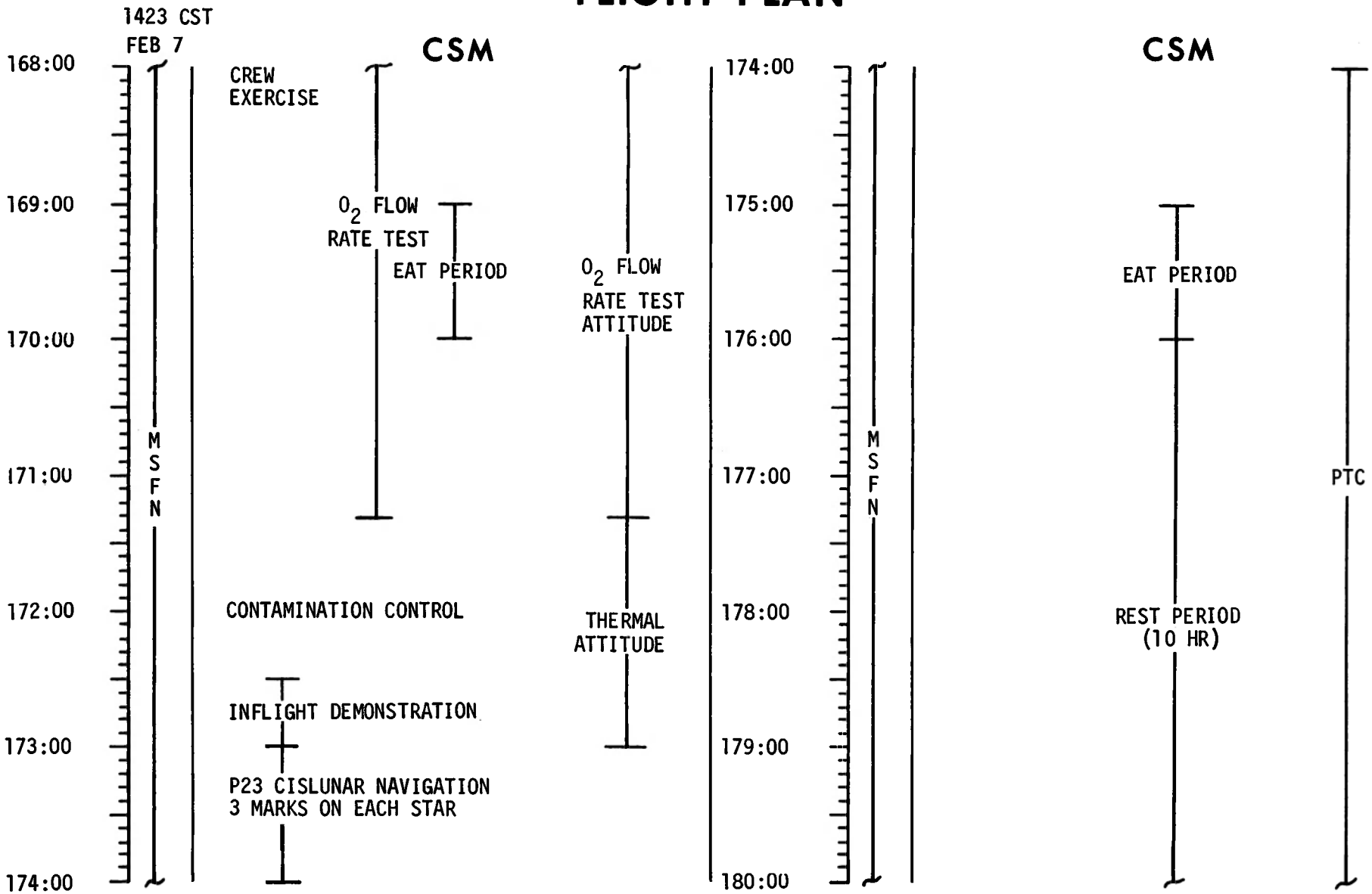
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	144:00 - 156:00	6 /32-TEC	5-13

FLIGHT PLAN



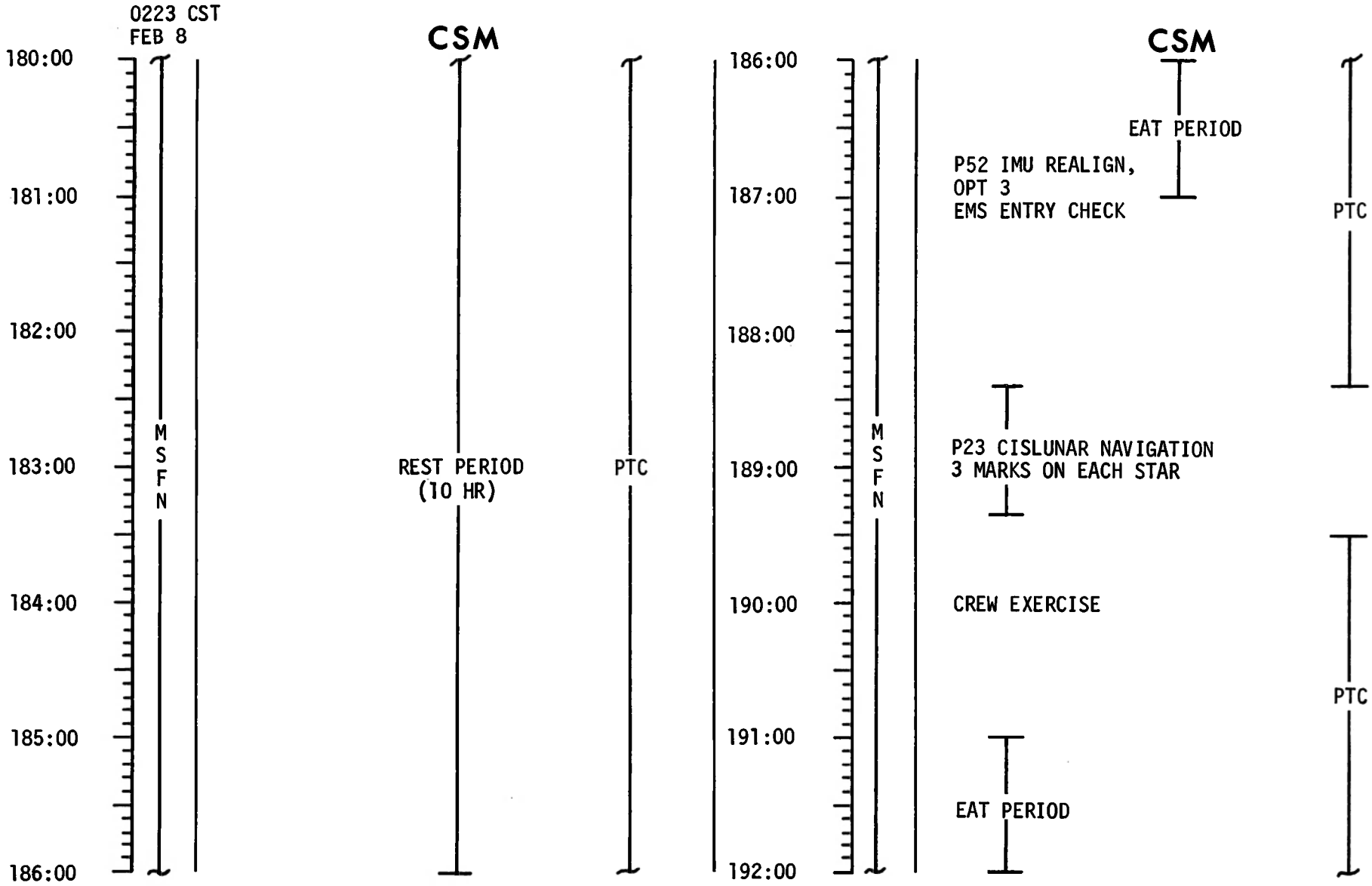
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	156:00 - 168:00	6-7/TEC	5-14

FLIGHT PLAN



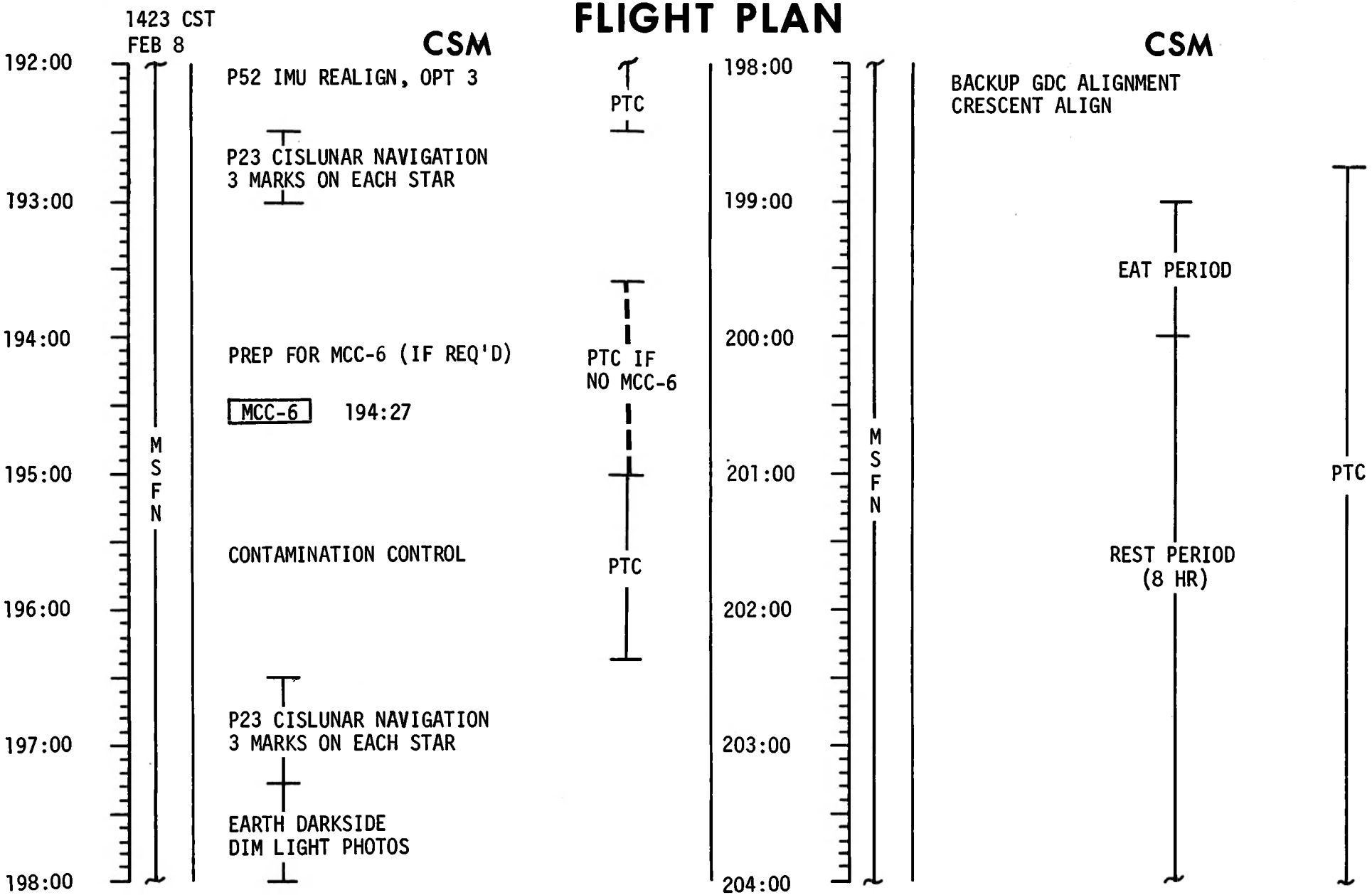
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	168:00 - 180:00	7/TEC	5-15

FLIGHT PLAN



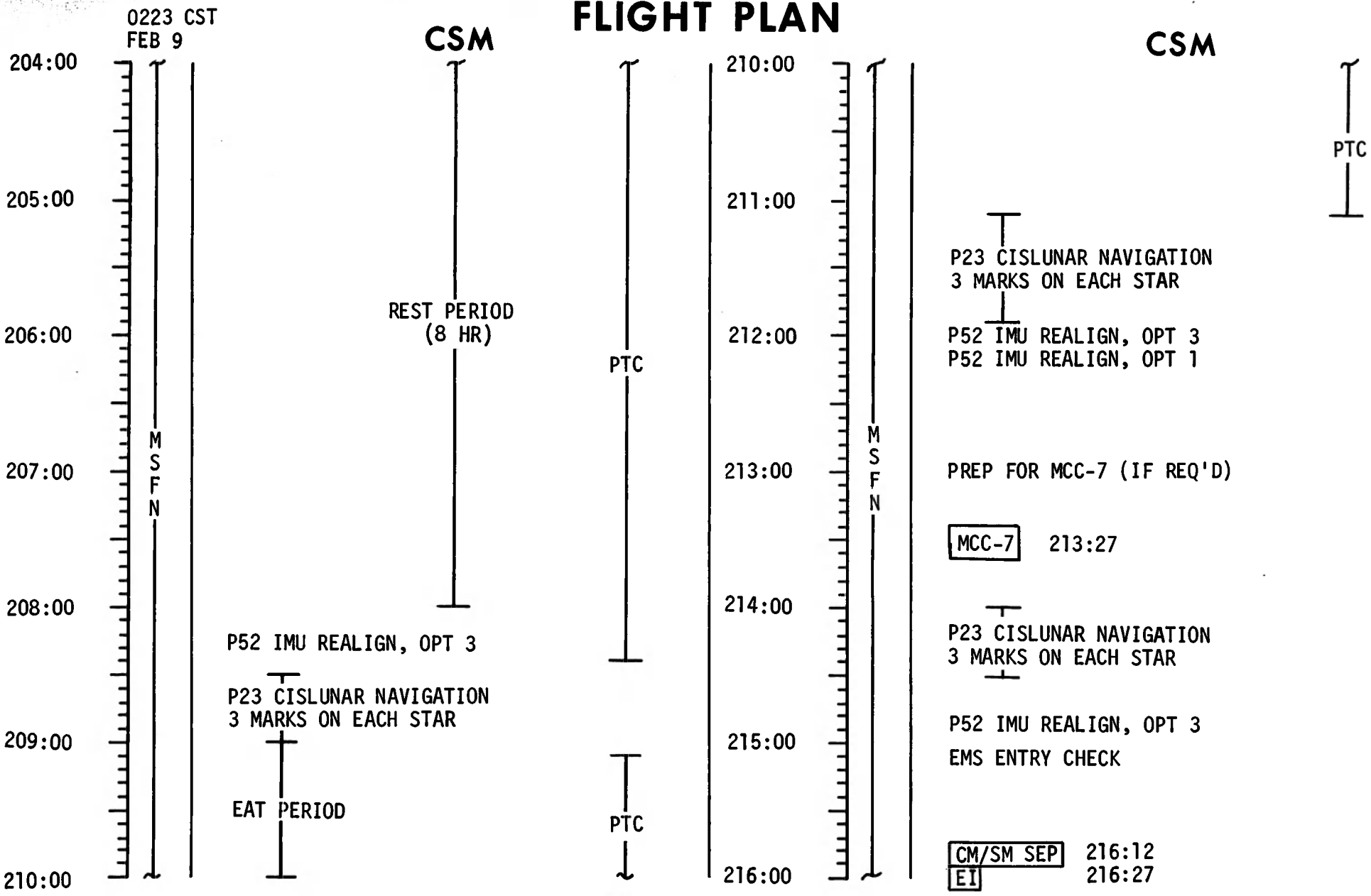
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	180:00 - 192:00	7-8/TEC	5-16

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	192:00 - 204:00	8/TEC	5-17

FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	204:00 - 216:00	8-9/TEC	5-18

SECTION 6 - ALTERNATE MISSION TIMELINES

ALTERNATE MISSION 1 SUMMARY FLIGHT PLAN
APOLLO 14
(CSM/LM LOW EARTH ORBIT)

EAT PERIODS

REST PERIODS

CST: 6 PM | 6 AM | NOON | 6 PM | 6 AM | NOON | 6 PM | 6 AM | NOON | 6 PM | 6 AM | NOON | 6 PM | 6 AM | NOON | 6 PM

DAY/DATE: SAT 31 JAN 71 | SUN 1 FEB | MON 2 FEB | TUES 3 FEB | WEDS 4 FEB | THURS 5 FEB | FRI 6 FEB

REVOLUTION NO.: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79

GET: 2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128

LM MANEUVER DATA

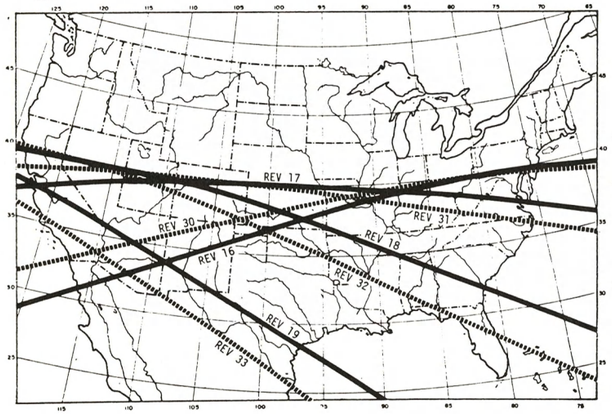
LM JETTISON - LM RCS
ΔV=2 FPS
(101.8198.4)

LM DEORBIT - LM RCS
ΔV 130 FPS

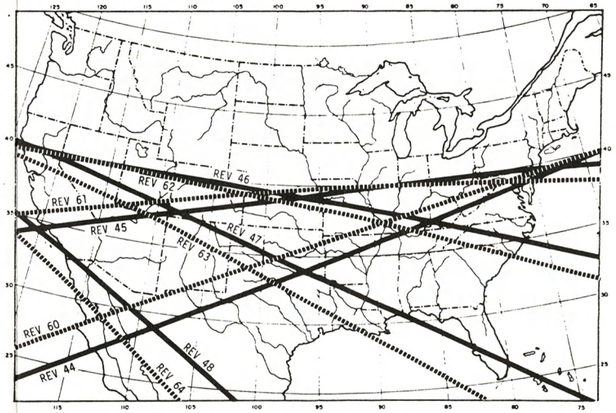
LM

CDR AND LMP IVT TO LM
TRANSFER AND STOW EQUIP
PREP FOR LM JETTISON
DOCKED IMU ALIGN
CDR AND LMP IVT TO CSM
LM JETTISON
LM DEORBIT

2ND ACTIVITY DAY U.S. ORBITAL PHOTO COVERAGE
3RD ACTIVITY DAY U.S. ORBITAL PHOTO COVERAGE



4TH ACTIVITY DAY U.S. ORBITAL PHOTO COVERAGE
5TH ACTIVITY DAY U.S. ORBITAL PHOTO COVERAGE



CSM

NO-GO FOR TLI
FAILURE EVALUATION
NO-GO FOR TLI$_2$
TD&E
P52 IMU REALIGN
CSM/LM-S-IVB SEP

IVT PREP
CDR AND LMP IVT TO LM
RECIEVE AND STOW EQUIP.
CDR AND LMP IVT TO CSM
LM JETTISON
PREP FOR PLANE CHANGE BURN
P52 IMU REALIGN
CSM PLANE CHANGE BURN
PREP FOR ORBIT SHAPING BURN
P52 IMU REALIGN
ORBIT SHAPING BURN
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

P52 IMU REALIGN
PHOTOS - S. AMERICA
PHOTOS - EUROPE
ZODIACAL LIGHT PHOTOS
PHOTOS - C. AMERICA
ZODIACAL LIGHT PHOTOS
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

P52 IMU REALIGN
PHOTOS - S. AMERICA
PHOTOS - EUROPE
GALACTIC LIGHT PHOTOS
GALACTIC LIGHT PHOTOS
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

P52 IMU REALIGN
PHOTOS - S. AMERICA
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

P52 IMU REALIGN
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
P52 IMU REALIGN
PREP FOR DEORBIT BURN
DEORBIT
SPLASHDOWN

ASSUMPTIONS

1) SAFE INSERTION ORBIT HAS BEEN ACHIEVED BY S-IVB
2) A SYSTEMS FAILURE HAS RESULTED IN A NO/GO FOR TLI.

CONSTRAINTS

1) PHOTOGRAPHY OVER U.S. IN LATITUDES ABOVE 32°
2) SIMILTANEOUS SLEEP CYCLES OF NOT LESS THAN SIX HOURS EACH
3) LM TO BE JETTISONED FOR EARTH IMPACT

SEQUENCE OF EVENTS

THIS ALTERNATE MISSION IS INITIATED BY A SYSTEMS FAILURE WHICH WILL NOT ALLOW TLI. THE ALTERNATE MISSION TIMELINE IS ENTERED AT THE NOMINAL TIME OF TLI AND ALLOWS FOR A FAILURE CHECKOUT PERIOD FOLLOWED BY A POSSIBLE SECOND TLI EXECUTION. IF THE SECOND TLI IS NOT PERFORMED. THE CSM EXECUTES TD&E. AFTER A SLEEP CYCLE, THE CDR AND LM IVT TO THE LM AND TRANSFER ALL FILM PACKS TO THE CSM AND READY THE LM FOR AN EARTH IMPACT. The LM IS JETTISONED AND THE CSM THEN EXECUTES A PLANE CHANGE BURN AND AN ORBIT SHAPING BURN TO POSITION ITSELF FOR PHOTOGRAPHIC COVERAGE OVER THE U.S. FOUR DAYS ARE ALLOWED FOR THE PHOTOGRAPHIC COVERAGE. A DEORBIT BURN HAS BEEN PLANNED BUT COULD BE MODIFIED IN REAL-TIME AS A FUNCTION OF EXPENDED FILM. TO INCREASE MISSION DURATION TO SIX DAYS.

CSM MANEUVER DATA

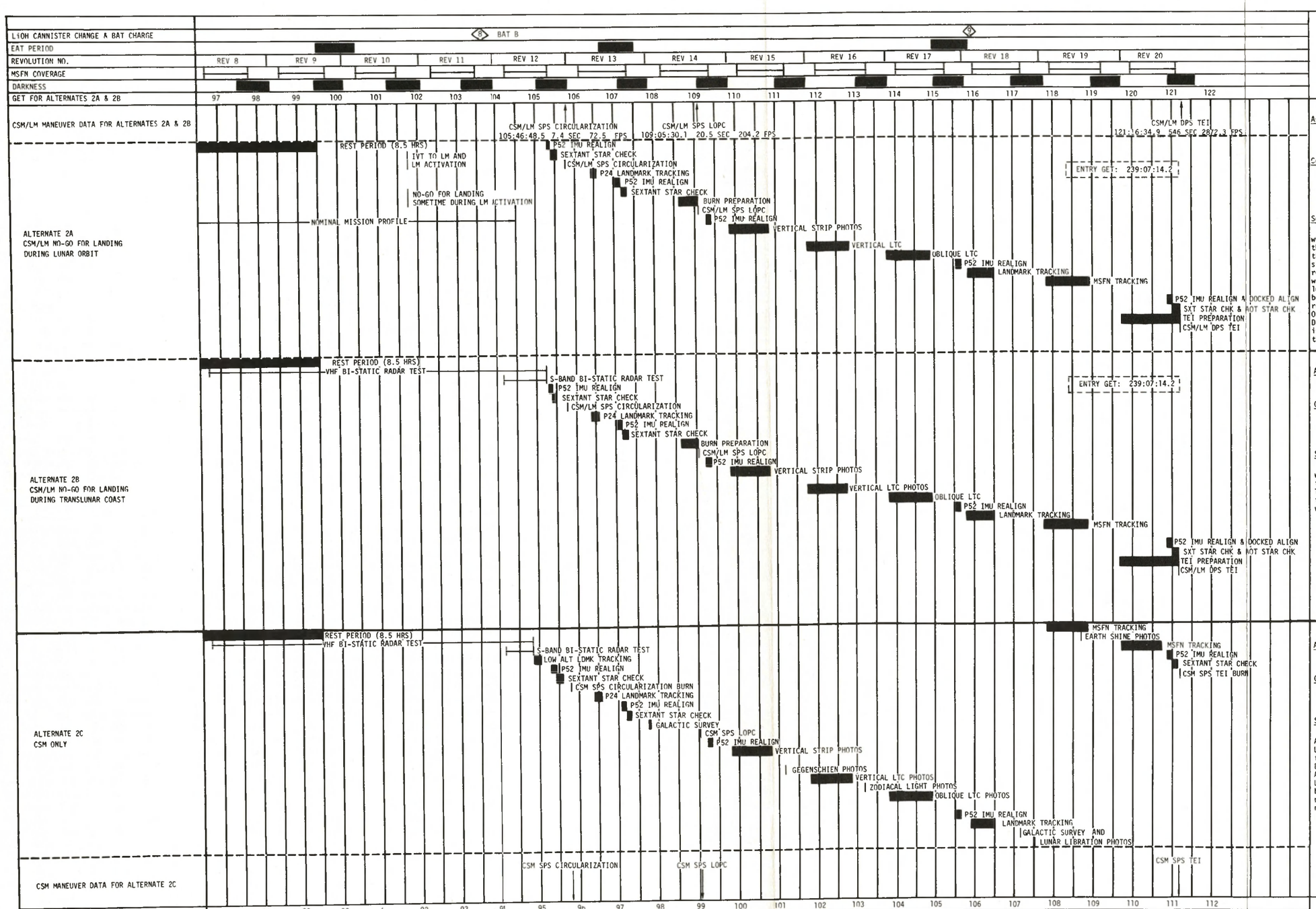
CSM/S-IVB SEP
ΔV = 2 FPS
(103.4/99.0)

CSM PLANE CHANGE - SPS
ΔV = 3354.2 FPS
(568.2/10/.4)

CSM ORBIT SHAPING BURN - SPS
ΔV = 1302.7 FPS
(171.0/100.7)

CSM DEORBIT

2 4 6 8 10 12 14 16 18 20 22 24 26 28 30 32 34 36 38 40 42 44 46 48 50 52 54 56 58 60 62 64 66 68 70 72 74 76 78 80 82 84 86 88 90 92 94 96 98 100 102 104 106 108 110 112 114 116 118 120 122 124 126 128



LUNAR ORBIT ALTERNATE 2A, 2B, 2C

ALTERNATE 2A

Assumptions

1) Nominal LOI and DOI Burn have been achieved by the SPS
2) A system failure while in Lunar Orbit has resulted in a NO/GO for Landing.

Constraints

1) Maintain DPS TEI capability
2) Adhere to nominal flight plan activities through revolution thirteen (13) with the exception of the Low Altitude Landmark Tracking.
3) Obtain Bootstrap Photography of Descartes
4) DPS TEI

Sequence of Events

This alternate mission is initiated by a systems failure, other than the DPS, which will not allow a landing mission. The nominal mission timeline is followed through the Circularization Burn at the beginning of revolution thirteen (13) with the exception of the Low Altitude Landmark Tracking which is not possible in the stacked configuration. An SPS Plane Change burn of 2.3 degrees will be performed on revolution fourteen (14) with the burn initiated at 57° West longitude. This burn will allow the same ground track over Descartes as in the nominal mission on revolution 26, 27, 28, and 29. On revolution fifteen (15) of the alternate mission the bootstrap sequence will be initiated with Vertical Stereo photography of Descartes, revolution sixteen (16) Vertical Topographic photography, revolution seventeen (17) Oblique Topographic photography and revolution eighteen (18) Landmark Tracking of Descartes. On revolution nineteen (19) MSFN tracking will again be performed in preparation for TEI on revolution twenty (20). TEI will be accomplished using the DPS.

ALTERNATE 2B

Assumptions

1) Nominal TLI burn has been achieved by the S-IVB
2) A systems failure during TLC has resulted in a NO/GO for Landing

Constraints

1) Maintain DPS TEI Capability
2) Adhere to the nominal flight plan activities through revolution eight (8).
3) Obtain Bootstrap Photography of Descartes
4) DPS TEI

Sequence of Events

This alternate mission is initiated by a system failure other than the DPS which will not allow a landing mission. The nominal mission timeline is followed through revolution eight (8) (96 hours GET) at which time the VHF Bi-Static Radar Test will be accomplished along with the S-Band Bi-Static Radar Test. The completion of the alternate mission would be exactly like alternate mission 2A starting with the Circularization Burn on revolution thirteen (13).

ALTERNATE 2C

Assumptions

1) Nominal TLI burn has been achieved by the S-IVB
2) A systems failure at T.D. & E. has resulted in a CSM-Only Alternate Mission.

Constraints

1) SPS midcourse burn to return to a free return trajectory
2) Adherence to the nominal flight plan as much as possible
3) Obtain Bootstrap Photography of Descartes

Sequence of Events

This alternate mission is initiated by a failure to eject the LM at T.D. & E. A SPS midcourse will be performed to return to a free return trajectory, placing LOI approximately ten hours earlier than the nominal time. The CSM will adhere to the nominal flight plan activities through revolution eight (8) where the VHF Bi-Static Radar Test and S-Band Bi-Static Radar Test will be performed as in Alternate mission 2B. The CSM-only alternate mission will perform Low Altitude Landmark tracking on revolution twelve (12) as per the nominal flight plan and will be exactly like alternate missions 2A and 2B with the exception of being able to perform the Dim Light Photography experiments in conjunction with the Bootstrap photography of Descartes and performing TEI using the SPS.

NOTE: This alternate is still under consideration by management for this mission.