

1-132



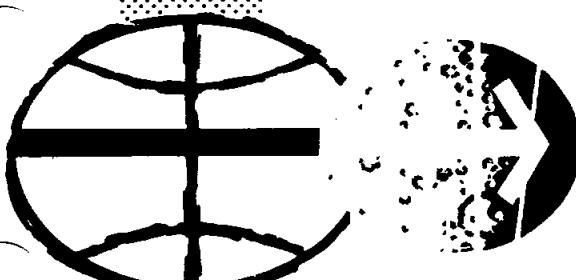
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
405A

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

INDEXING DATA		#	T	PGM	SUBJECT	SIGNATOR	LOC
DATE	OPR		R	APO	(Title)	MSC	079-473

APOLLO 14

(January 31, 1971)

FLIGHT PLAN

January 18, 1971

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Distribution of this document is controlled by W. J. North, Chief, Flight Crew Support Division.

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".
- ✓ 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 "(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 "(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)" to "(11101)"
(X1111) to (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 DECOMMISSIONING
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)
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 PLAN
(January 31, 1971 Launch)

LIST OF EFFECTIVE PAGES

FINAL DATE 12/2/70
CHANGE DATE 12/23/70
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CHANGE DATE 1/18/71

* INDICATES CURRENT CHANGE

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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
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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
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3-82	1/11/71
3-83 thru 3-85	FINAL
*3-86	1/18/71
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3-88 thru 3-95	FINAL
*3-96	1/18/71
3-97	FINAL
*3-98	1/18/71

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3-104	12/23/70
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3-111 thru 3-116	FINAL
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3-118	FINAL
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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
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3-132	12/23/70
3-133 and 3-134	FINAL
3-135	12/23/70
3-136	1/11/71
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3-139	12/23/70
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3-199 thru 3-203	FINAL

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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
CPLLEE	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
LBL	low bit rate (TLM)
LB or 1b	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, TOP0 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-axis
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
ΔA_z	azimuth change (difference)
ΔH	altitude change (difference)
ΔP	pressure change (difference)
ΔR	position change (difference)
ΔV	velocity change (difference)
ΔV_{C}	velocity change at engine cutoff
ΔV_{T}	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 allotted 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 allotted for this photographic sequence.

CAMERA LOCATIONSCOMMAND 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

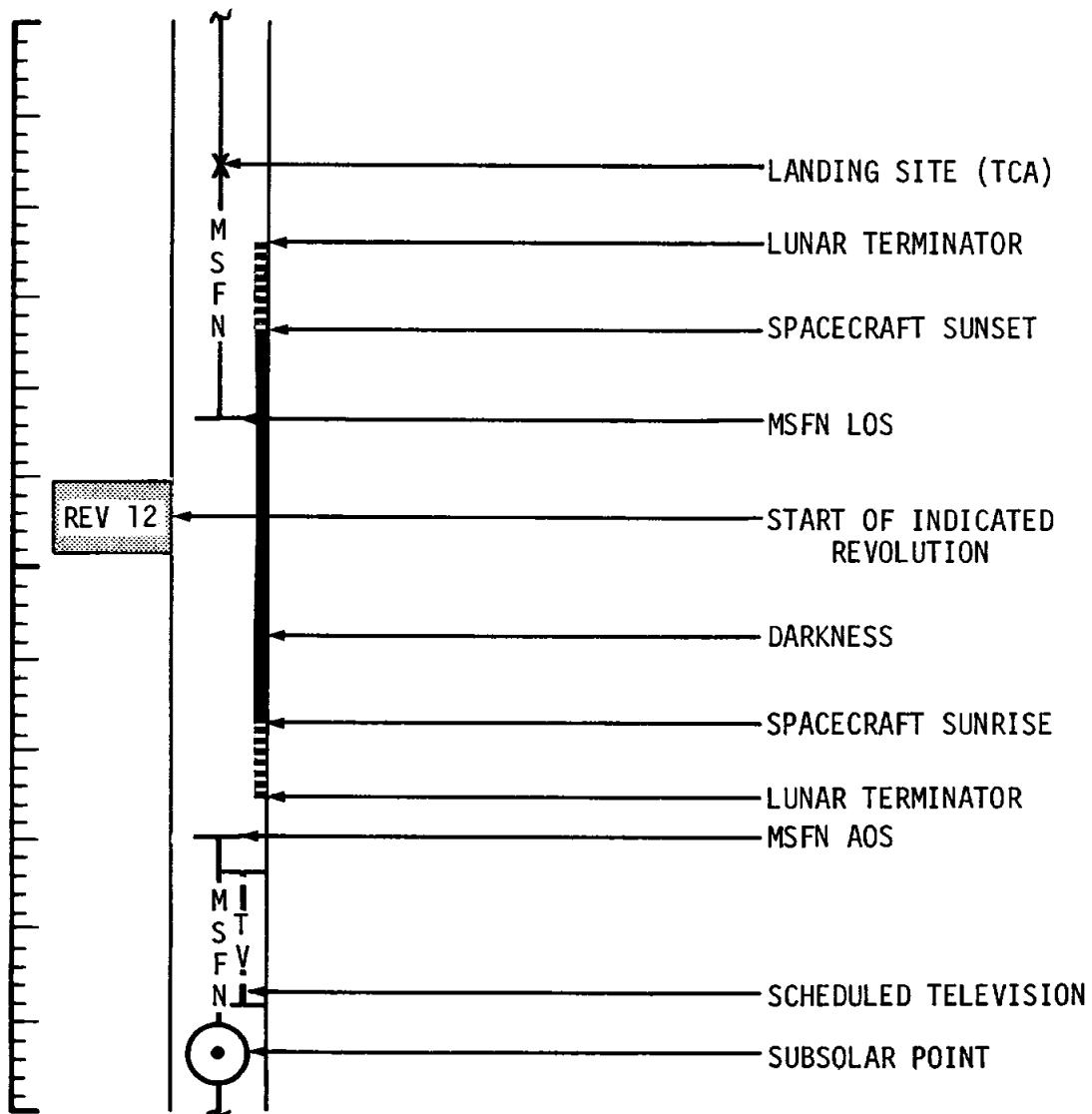
LUNAR MODULE

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

CAMERA MOUNTSCSM

- 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

FLIGHT PLAN NOTES

I. Crew

A. Crew designations are as follows:

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

B. The nominal CM couch positions are:

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

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 CO₂ 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% O₂ and 40% N₂. The CM will be purged after launch. The purge is terminated prior to LM pressurization after TLI. After the LM is configured for ejection, it will be isolated and the CM will be purged for eight more hours.
 5. CSM O₂ 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 O₂ 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 O₂ will be used to pressurize the LM. This procedure insures a higher percentage of oxygen in the LM at the first EVA.
2. LM O₂ 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.

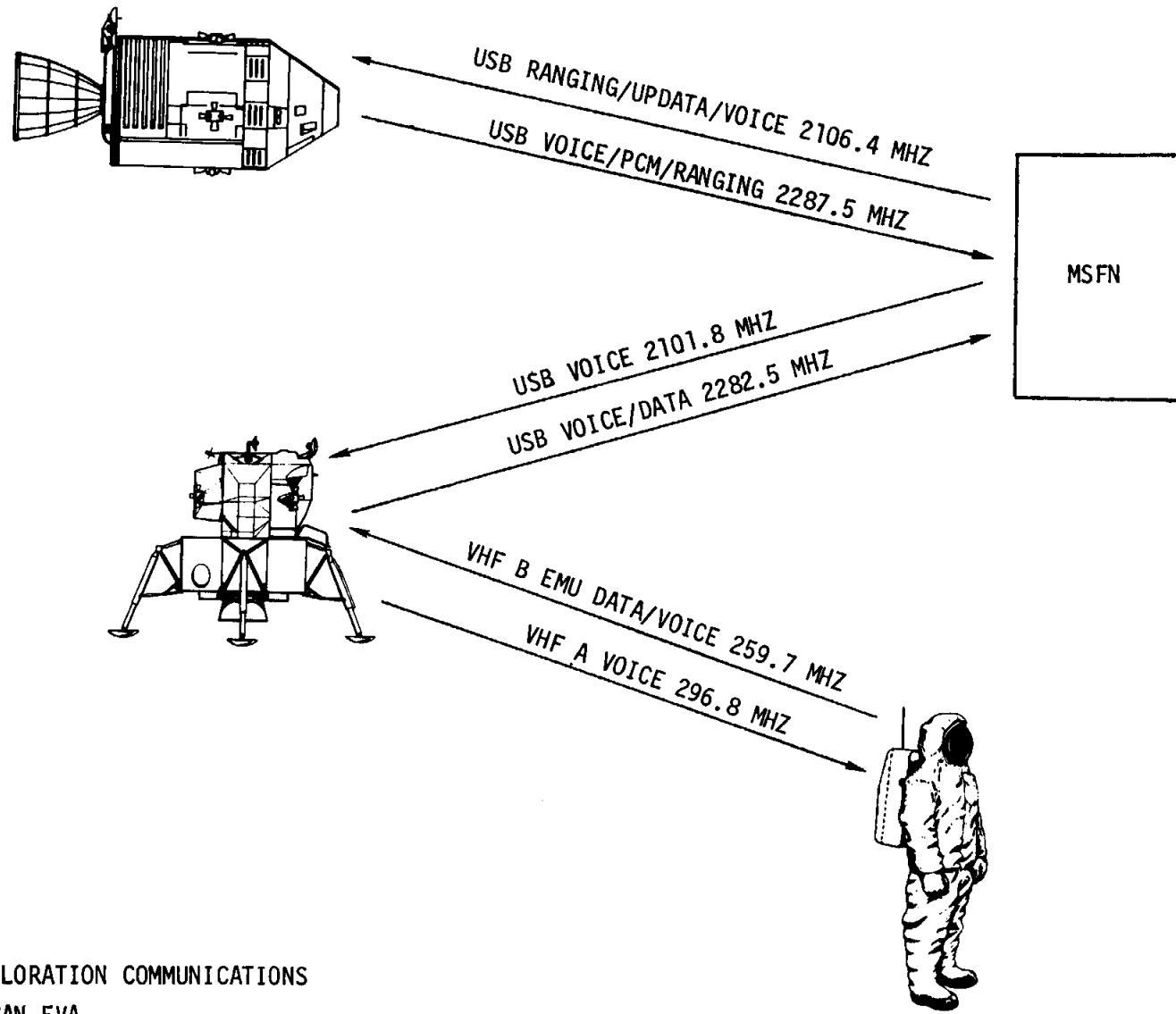
VI. Synchronization of Ground Elapsed Time (GET)

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.

1-11



LUNAR EXPLORATION COMMUNICATIONS
ONE CREWMAN EVA
PRIMARY MODE

Figure 1-1

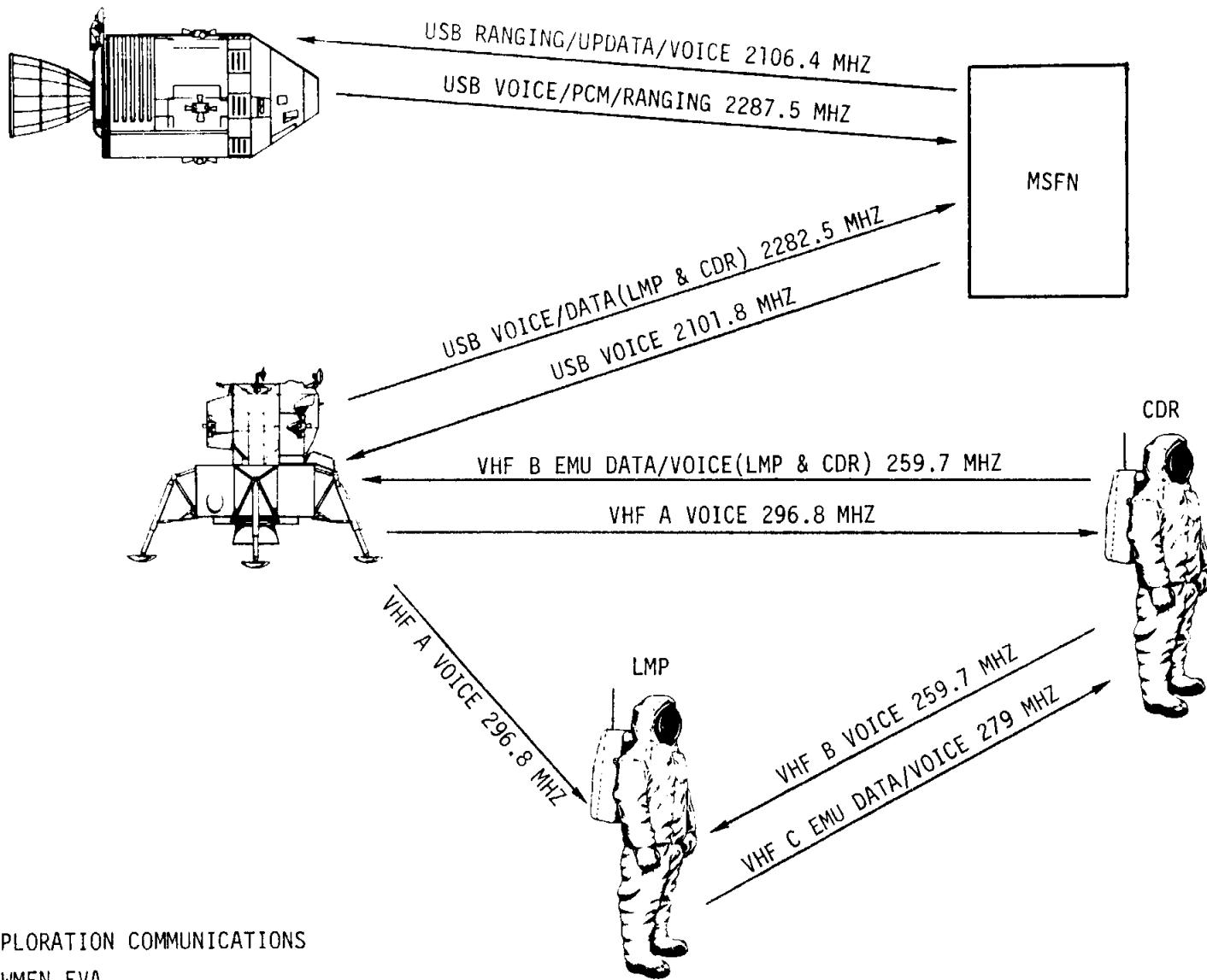


Figure 1-2

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				
					216:01	216:27		
							212:56	215:12

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
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	<i>Cancel TV Show</i> 5:23 PM	10:00	00:14	FRA MAURO LANDING SITE	CSM	GDS
FRIDAY	5 FEB	8:06 AM 8:20 AM	11:31:43 11:34:10	04:00	LUNAR SURFACE EVA-1	LM	HSK/MAD
SATURDAY	6 FEB	8:56 AM 8:59 AM	13:33 13:37	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		H ₂ FUEL CELL PURGE		REMARKS
	NUMBER	ΔTIME, HR:MIN	NUMBER	ΔTIME, HR:MIN	
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
2	26:10	14	4	B	2	B5
3	38:00	12	5	A	3	B5
4	51:10	13	6	B	4	B5
5	64:12	13	7	A	5	B6
6	76:10	12	8	B	6	B6
7	90:15	14	9	A	7	B6
8	103:38	13	10	B	8	B6
9	119:30	16	11	A	9	A3
10	147:05	27	12	B	10	A3
11	162:10	15	13	A	11	A3
12	174:00	12	14	B	12	A3
13	187:00	13	15	A	13	A4
14	199:00	12	16	B	14	A4
15	210:00	11	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	ΔV_T , 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 $i_R = 40^\circ$ 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

<u>SITE</u>	<u>REV</u>	<u>LATITUDE</u>	<u>LONGITUDE</u>	<u>*ALTITUDE (NM)</u>
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

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

*Constraint Stars

TABLE 1-11
P23 CISLUNAR NAVIGATION (CONT)

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

*Constraint Stars

TABLE 1-12
MISSION ACTIVITY SUMMARY
APOLLO 14

***MAY NOT BE REQUIRED**

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		
4.3.1	Obtain lunar landmark tracking data to permit an update of the selenodetic coordinates of selected lunar reference points.	LUNAR ORBIT	3-83/120-124
		LUNAR ORBIT	3-138-142
		LUNAR ORBIT	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
		LUNAR ORBIT	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
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	3-184-186/198 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 origin 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 Meteoroid Experiment	PASSIVE	
T-029	Pilot Describing Function	PASSIVE	

SECTION 3 - DETAILED TIMELINE

MCC-N

1423 CST

FLIGHT PLAN

NOTES

00:00
(31102)
01111T
M
S
F
N

C
Y
I

C
R
O

T

LIFT-OFF JANUARY 31, 1971

CSM LAUNCH CHECKLIST

:10 SEC0
INSERTION AND SYSTEMS CHECKS PAGE L 2-11UPDATE TO CSM
Z TORQUING ANGLE

:20

00:30

:40

:50

01:00

L/O CREW POSITIONS
LEFT COUCH - CDR
CENTER COUCH - CMP
RIGHT COUCH - LMP
AT SEC0+20 SEC, S-IVB
MNTRS 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 : : :

DUMP DSE

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LAUNCH ORIENT)

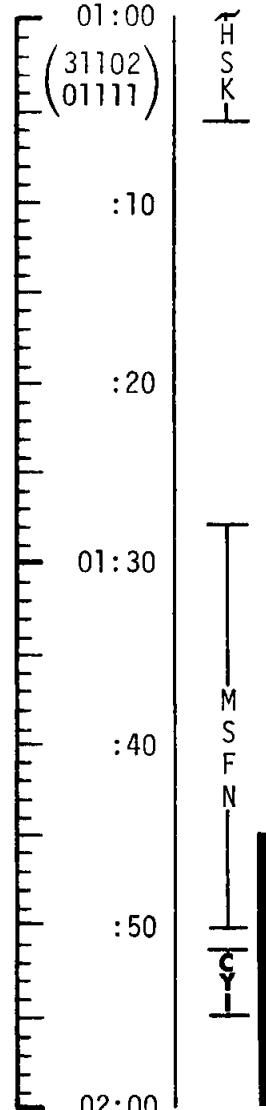
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	00:00 - 01:00	1/E.O.	3-1

MCC-H

1523 CST

FLIGHT PLAN

NOTES

REPORT: GYRO TORQUING ANGLES

DUMP DSE

UPDATE TO CSM

TLI PAD
 TLI +90 MIN ABORT
 PAD
 P37 (L/0+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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

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FLIGHT PLAN

TLI BURN TABLE

P OR Y RATES	ATT DEVIATION	SHUTDOWN TIME	RESIDUALS
10°/SEC TERMINATE	+45° TERMINATE	$V_i = \text{PAD VALUE}$ + 2 SEC	NO TRIM

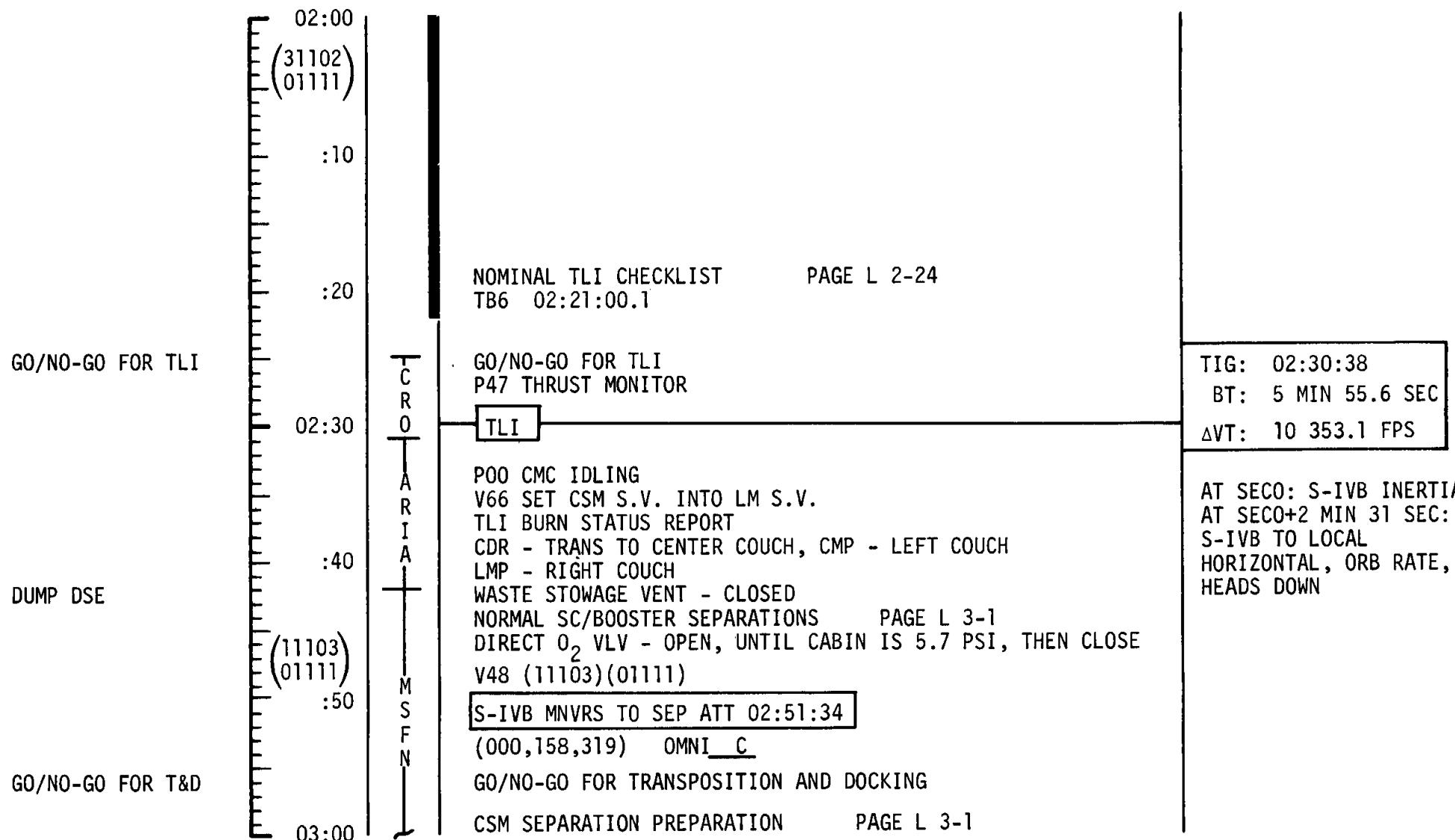
TABLE 3-1
3-4

MCC-H

1623 CST

FLIGHT PLAN

NOTES



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

MCC-H

1723 CST

FLIGHT PLAN

NOTES

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

TLI CUTOFF +
1 HR 20 MIN

03:00
(11102)
(01111)

:10

:20

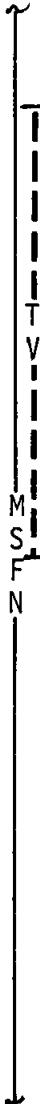
03:30

(21101)
(X1111)

:40

:50

04:00



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 CM4/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-PROPELLIVE VENT START (03:36:33.7)
V48 (21101) (X1111)
GO/NO-GO PYRO ARM (CUE MSFN)
LOGIC ON
PYRO ARM
P47 THRUST MONITOR

S-IVB NON-PROPELLIVE VENT COMPLETE (03:51:33.7)
PHOTOGRAPH LM EJECTION

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

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.

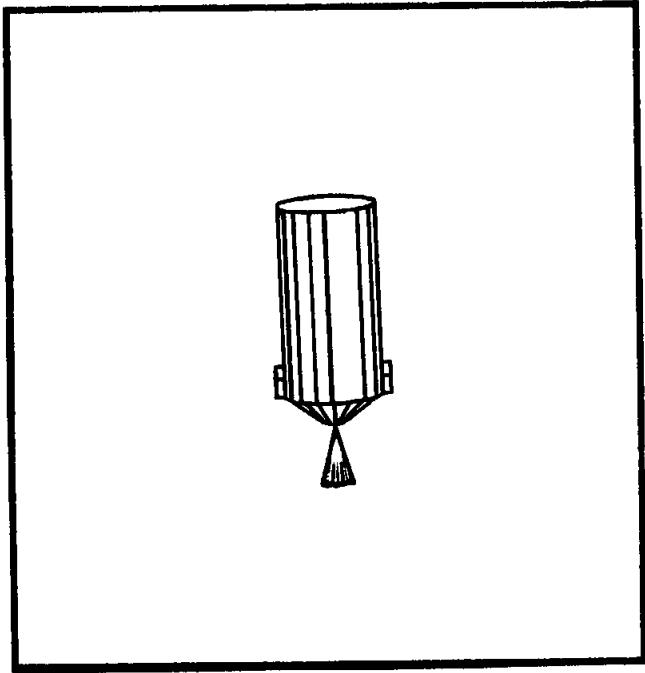
TIG:	03:56
BT:	3 SEC
ΔV T:	0.4 FPS
ULLAGE:	NONE
ORBIT:	N/A

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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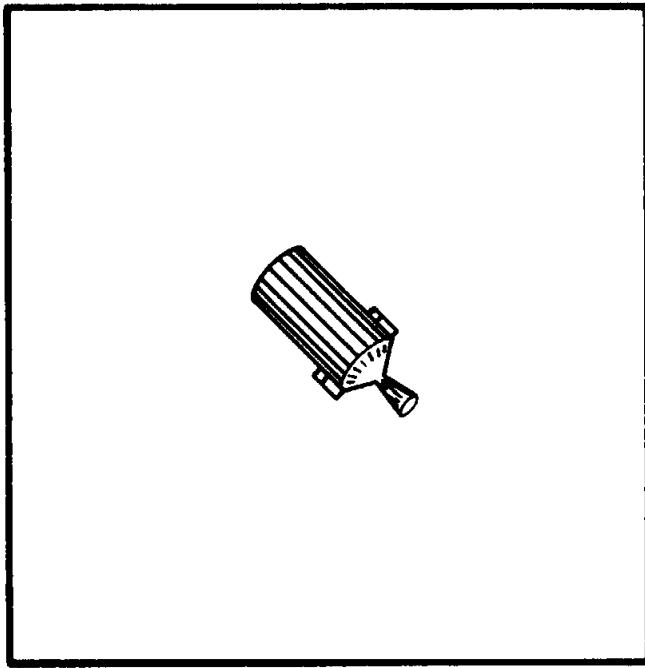
GET 04:19

FOV 5°



GET 04:40

FOV 1°



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

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

MCC-H

1823 CST

04:00

(21101)

(X1111)

GO FOR S-IVB YAW
MNVR INITIATIONGO/NO-GO FOR S-IVB
EVASIVE BURN

DUMP DSE

04:30

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
 S-IVB YAW MNVR 04:09 (GROUND COMMAND)

:10

REPORT: GO FOR S-IVB EVASIVE BURN

:20

S-IVB APS EVASIVE BURN 04:19 (GROUND COMMAND)

CHARGE BATTERY B

S-IVB MNVRS TO PROPELLANT DUMP ATT (04:29)
 REPORT: LM/CM ΔP

:40

S-IVB CONTINUOUS H₂ VENT-ON (04:36)

V49 MNVR TO P52 ATTITUDE (05:20)

(230,300,356) HGA P 31, Y 310

S-IVB LOX DUMP (04:40)

:50

DOFF PGA'S

05:00

TRANSFER ITEMS OUT OF PGA POCKETS
 ZIP SUIT AND INSTALL ELECTRICAL
 COVER PRIOR TO STOWING (PGA BAG)
 STOW COMM CARRIERS & UCTA (PGA BAG)

NOTES

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 INDICATES THAT THE S-IVB IS IN THE CREW FIELD OF VIEW AND ADEQUATE SPACECRAFT SEPARATION HAS BEEN ACHIEVED.

THE S-IVB YAW MNVR WILL BE PERFORMED NOMINALLY AT LM EJECTION +13 MIN

EVASIVE BURN ΔV ≈ 9.4 FPS

LOX DUMP ΔV ≈ 28 FPS

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

UPLINK TO CSM
DESIRED ORIENTATION
(PTC)
ZERO TRUNNION BIAS

05:00
(21101)
(X1111)

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

:10

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

i20

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LAUNCH ORIENT)

5:30

REPORT: GYRO TORQUING ANGLES

40

P52 IMU REALIGN
OPTION 1 PREFERRED
(PTC ORIENT)

:50

SC CONT - CMC
BMAG (3) - RATE 2 OMNI C
SECURE HGA, HGA TRACK - MAN HGA P -52, Y 27
O₂ FUEL CELL PURGE } IF NO MCC-1
WASTE WATER DUMP
VHF A SIMPLEX - OFF
VERIFY WASTE STOWAGE VENT VALVE - VENT

STARS _____, _____

SA ,

TA _____ ,

P52 IMU REALIGN

N71: _____ ,

N05: .

N93

X .

Y .

Z .

GET :

P37 PAD ASSUMES
NO MCC-1

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

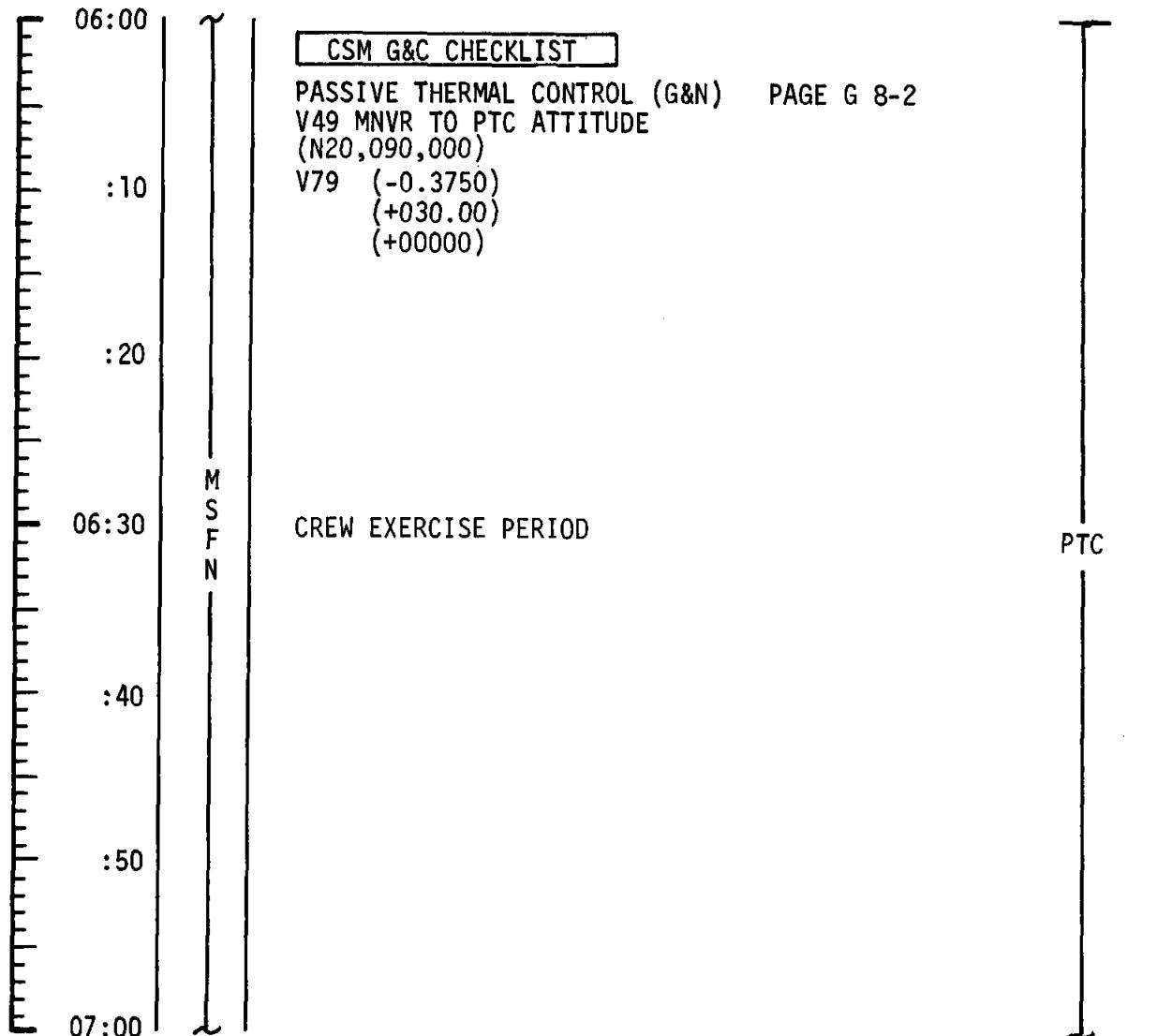
MCC-H

2023 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP



S-IVB APS MCC-1
GET ≈ 06:30
 $\Delta V \approx 30$ FPS
DAP LOAD STATUS
(21101)(X1111)

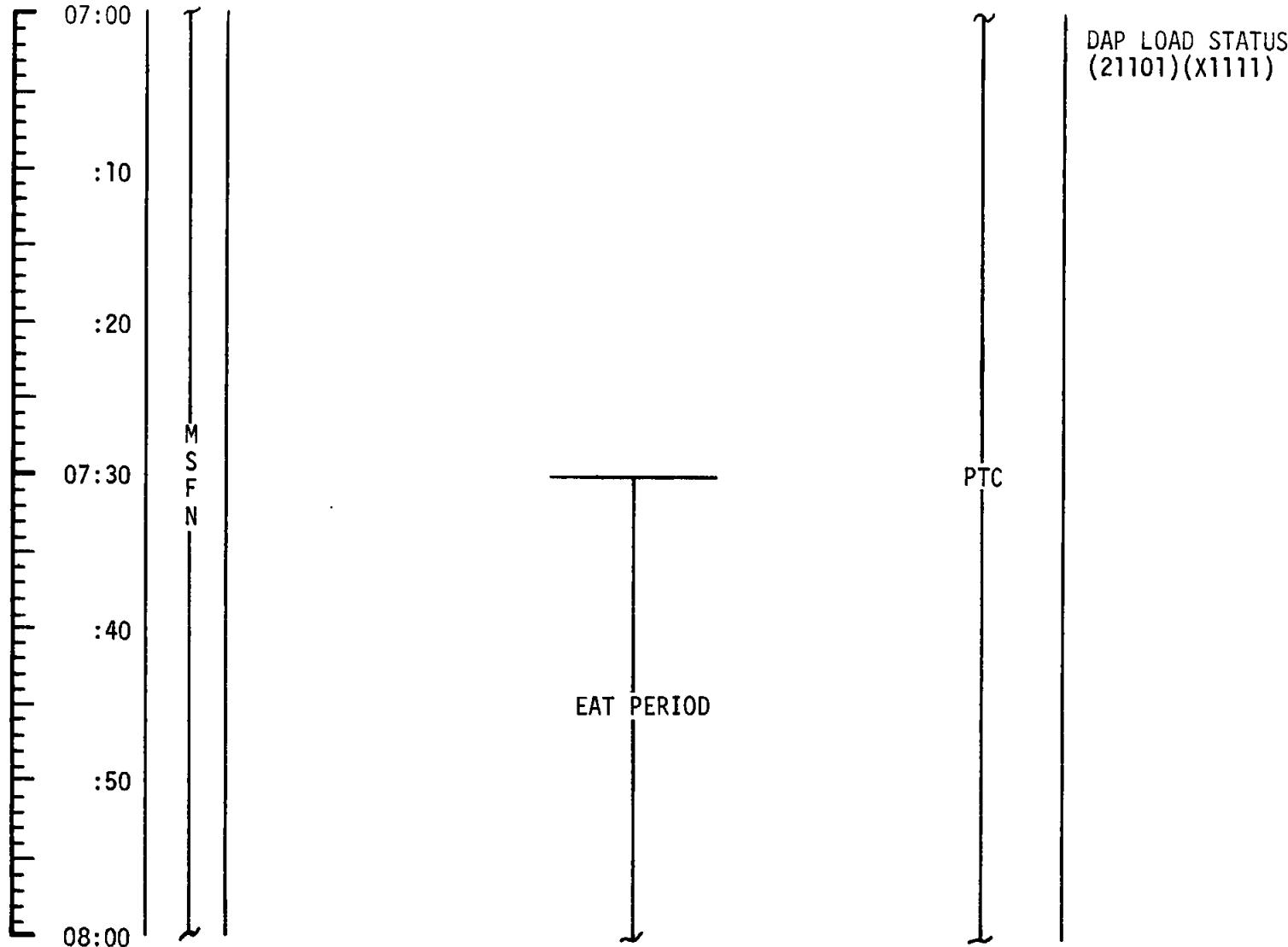
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	06:00 - 07:00	1/TLC	3-11

MCC-H

2123 CST

FLIGHT PLAN

NOTES



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

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

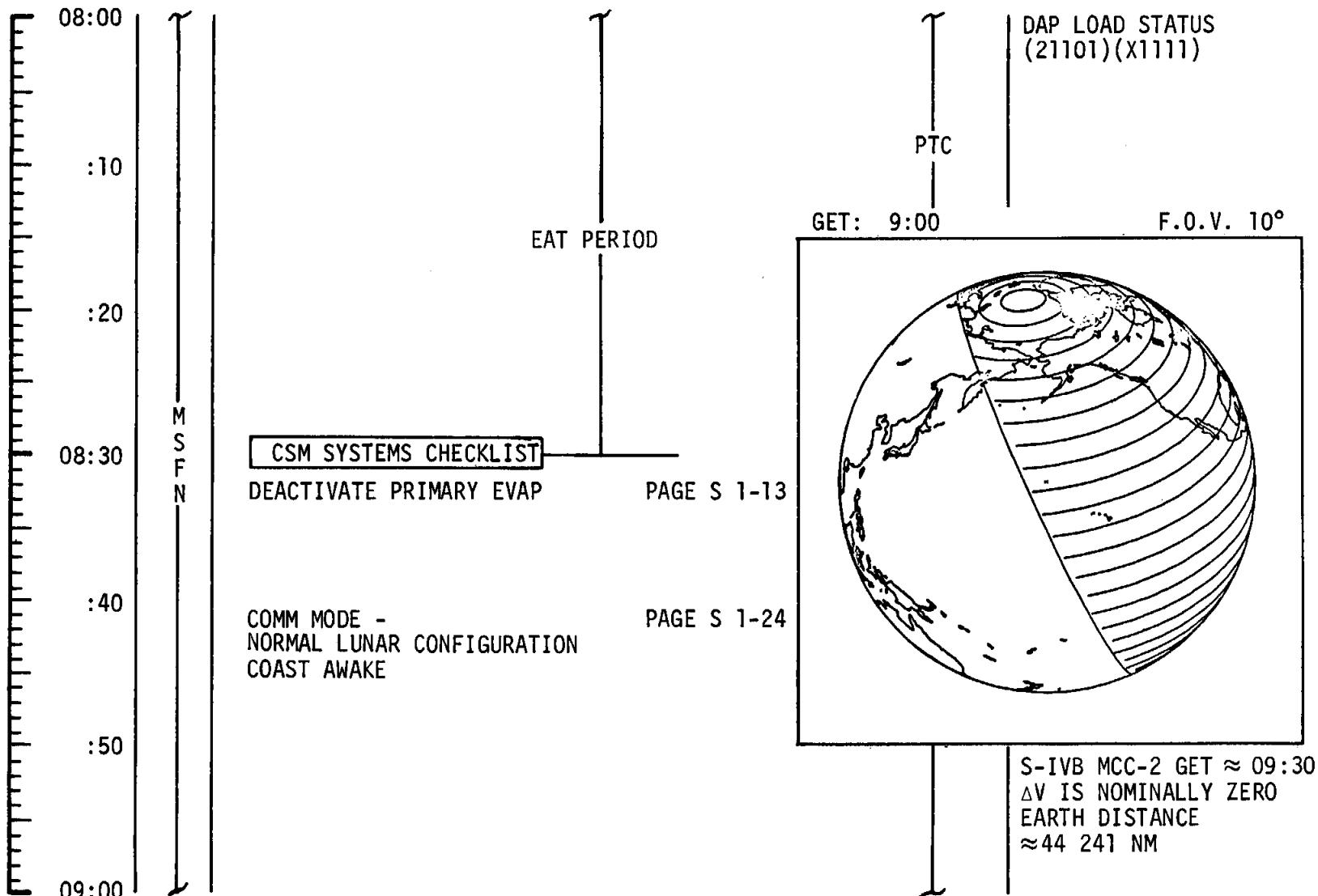
NASA—MSC

MCC-H

2223 CST

FLIGHT PLAN

NOTES



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

NOTES

09:00
 :10
 :20
 09:30
 (21101)
 (X1111)
 :40
 :50
 10:00

P52 IMU REALIGN
 OPTION 3 REFSMMAT
 (PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

CSM G&C CHECKLIST

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

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)

POO

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

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

PTC

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

MCC-H

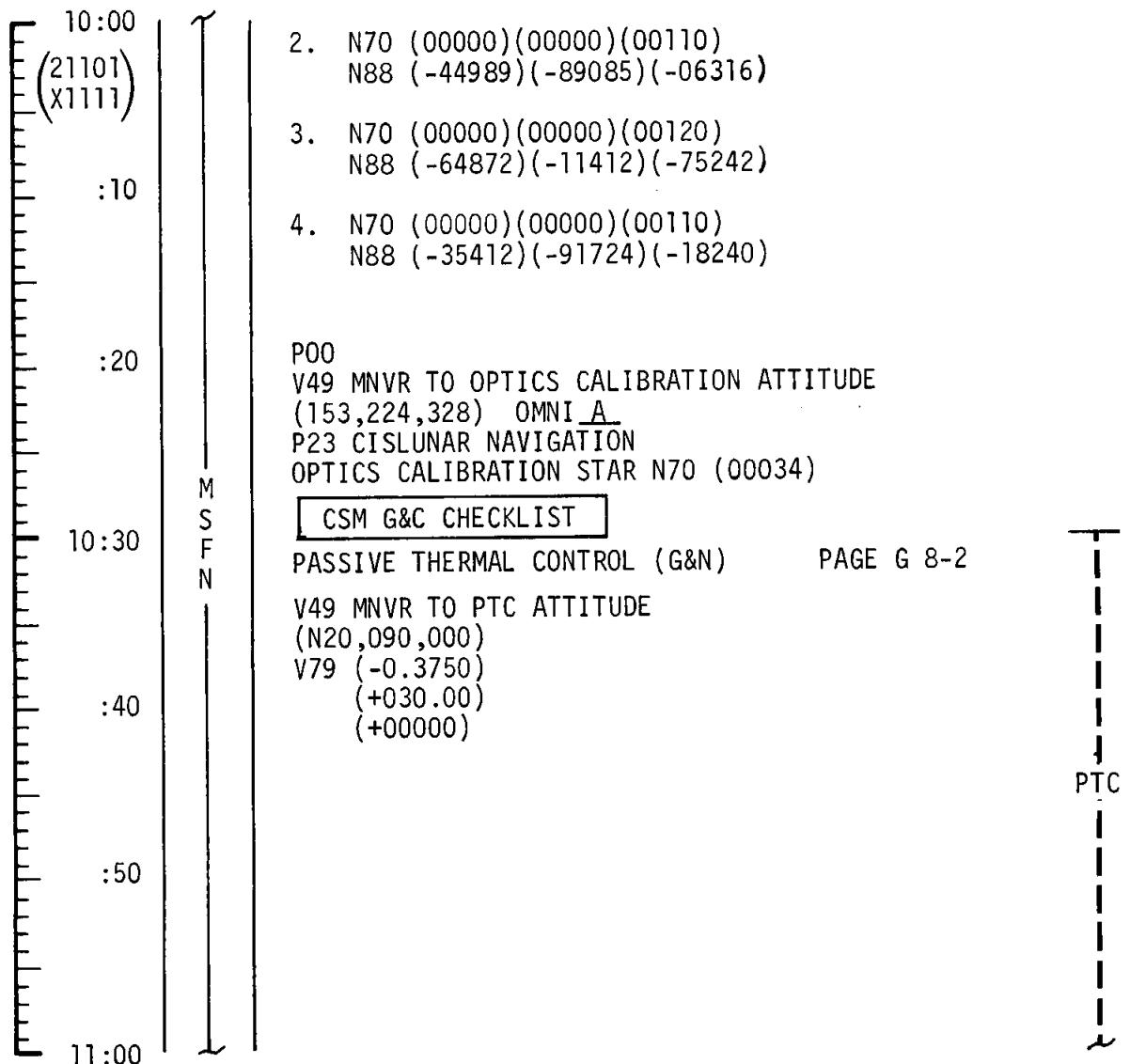
0023 CST

FLIGHT PLAN

NOTES

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

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

FLIGHT PLAN

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

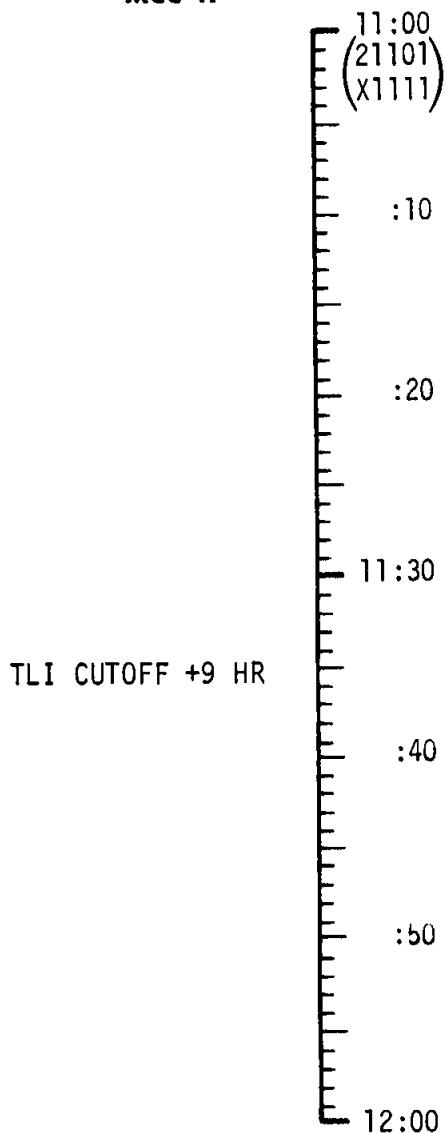
TABLE 3-2
3-16

MCC-H

0123 CST

FLIGHT PLAN

NOTES



MCC-1 WILL BE DELAYED TO MCC-2 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_{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

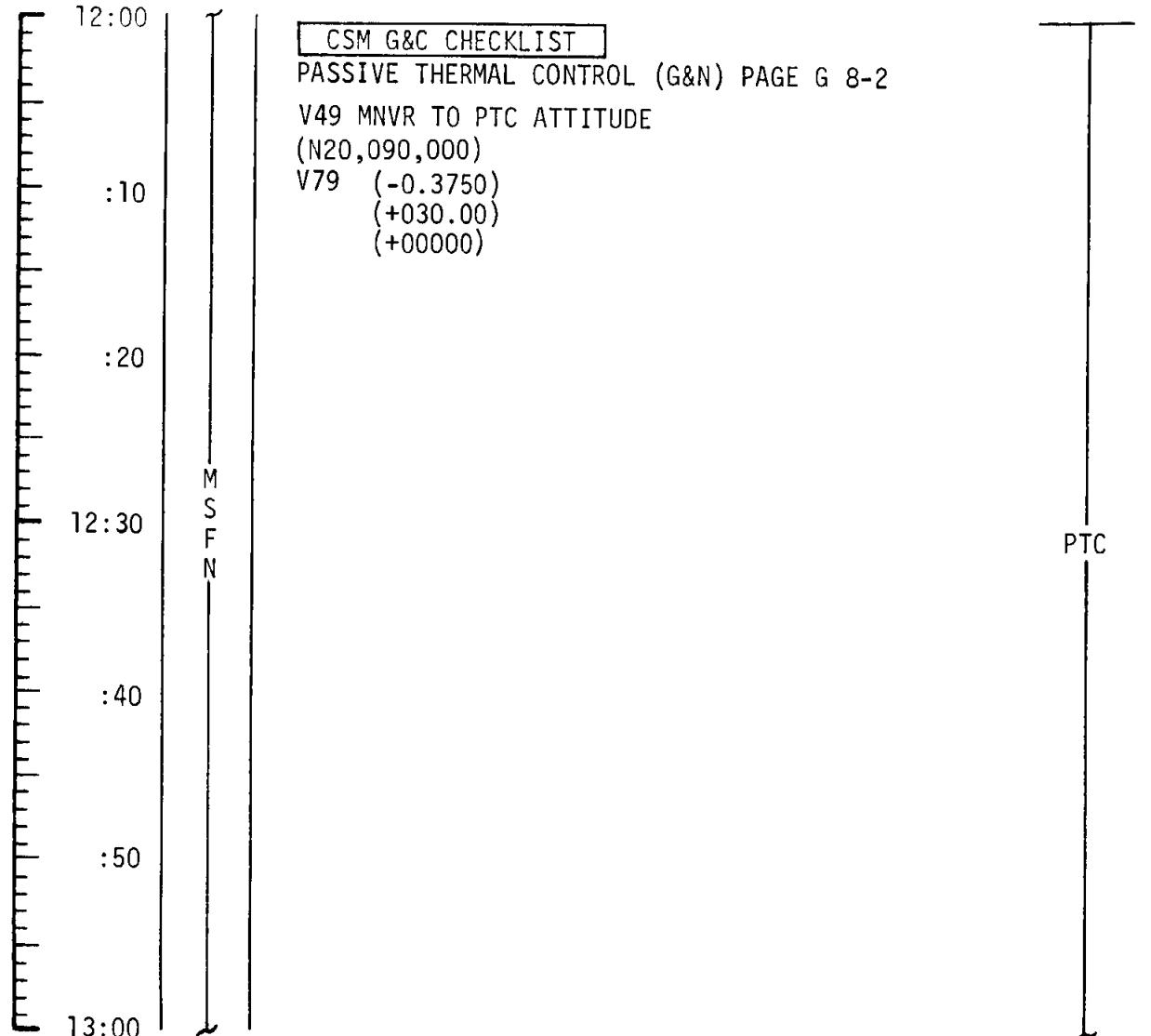
MCC-H

0223 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

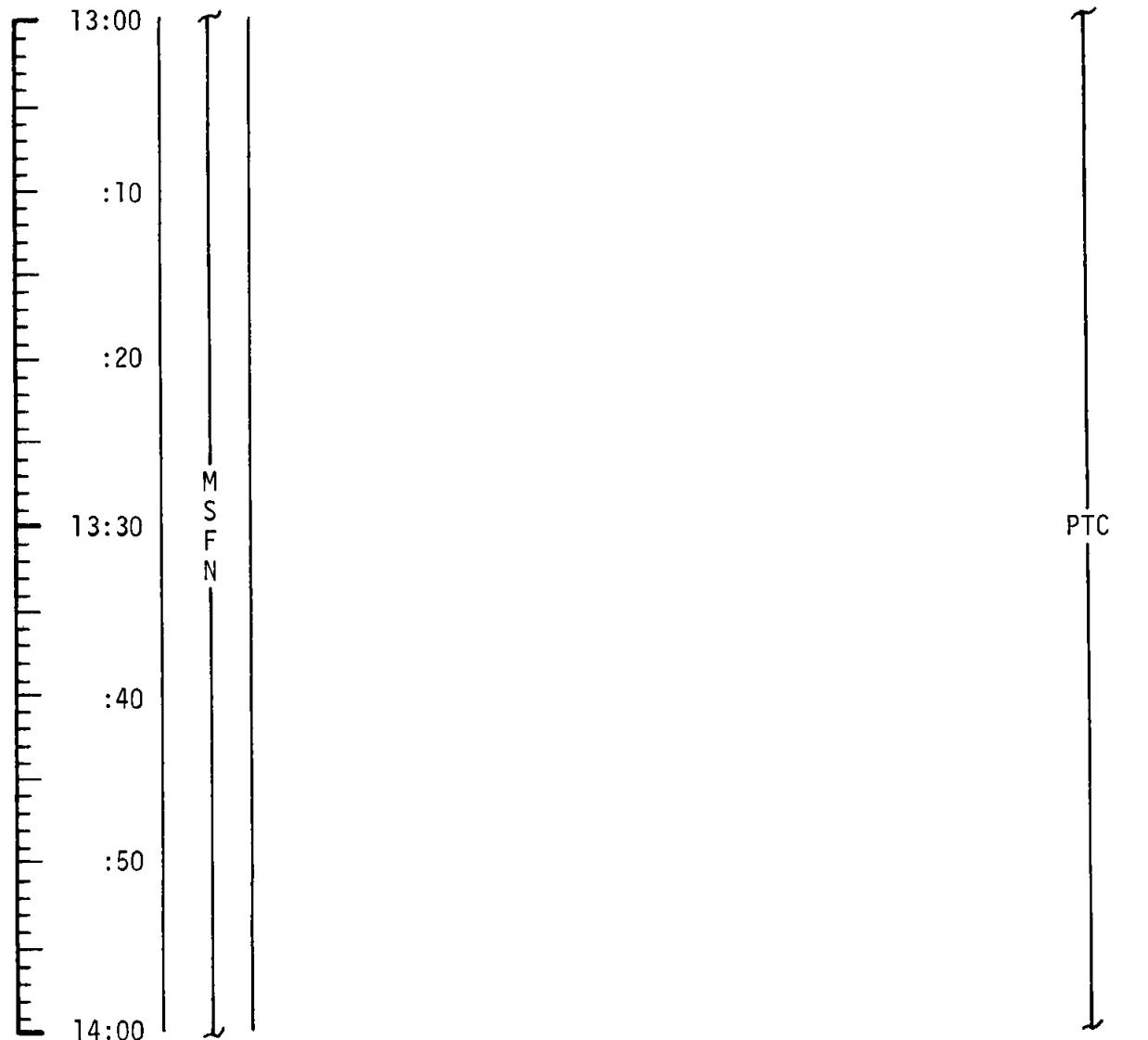
NASA — MSC

MCC-H

0323 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

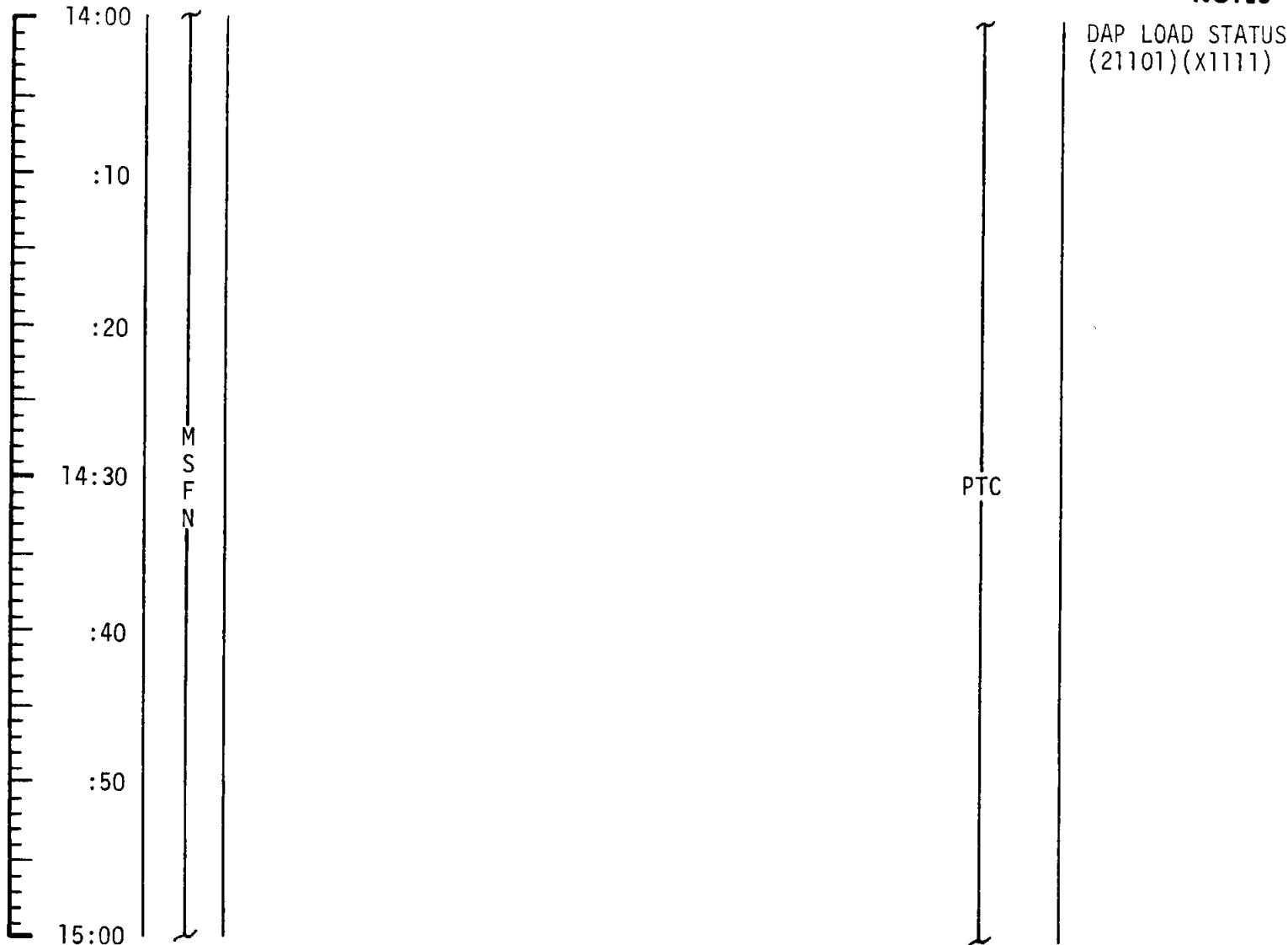
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	13:00 - 14:00	1/TLC	3-19

MCC-H

0423 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

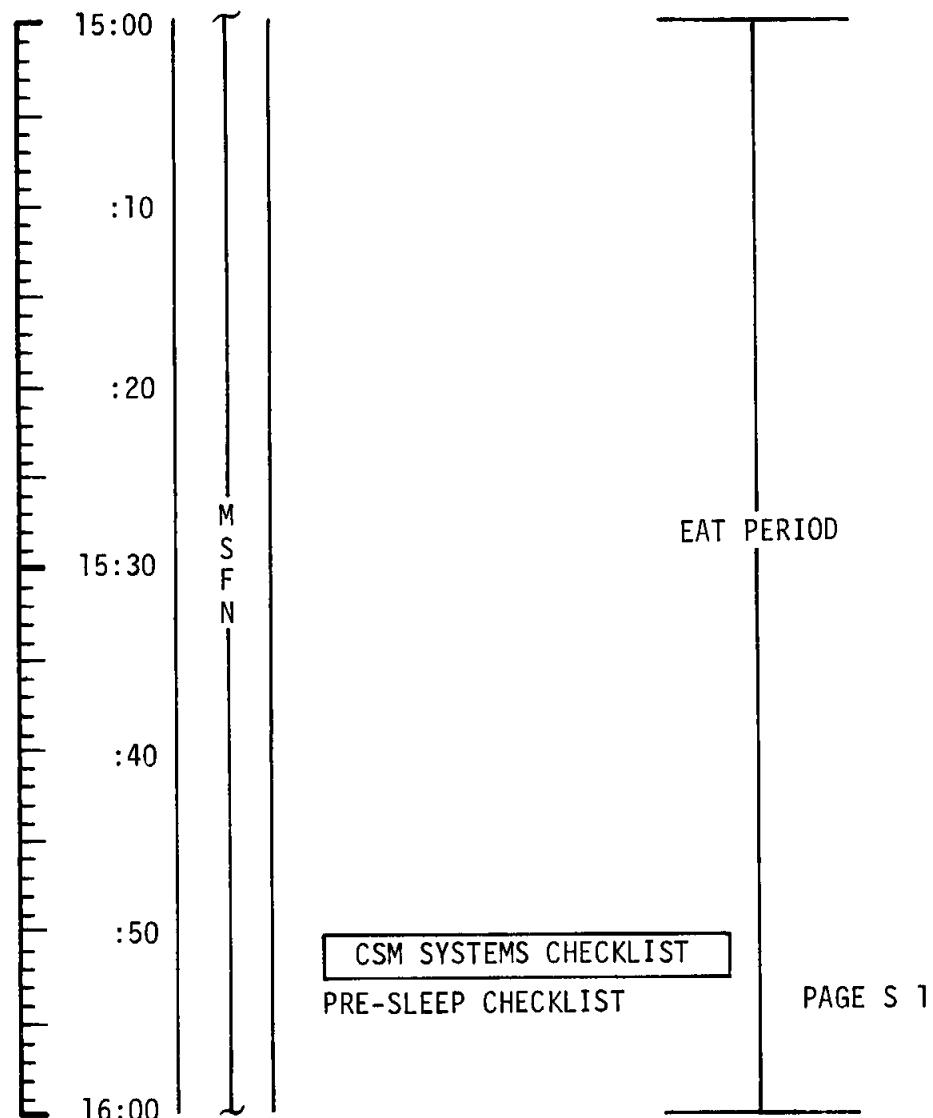
FLIGHT PLANNING BRANCH

NASA — MSC

MCC-H

0523 CST

FLIGHT PLAN



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

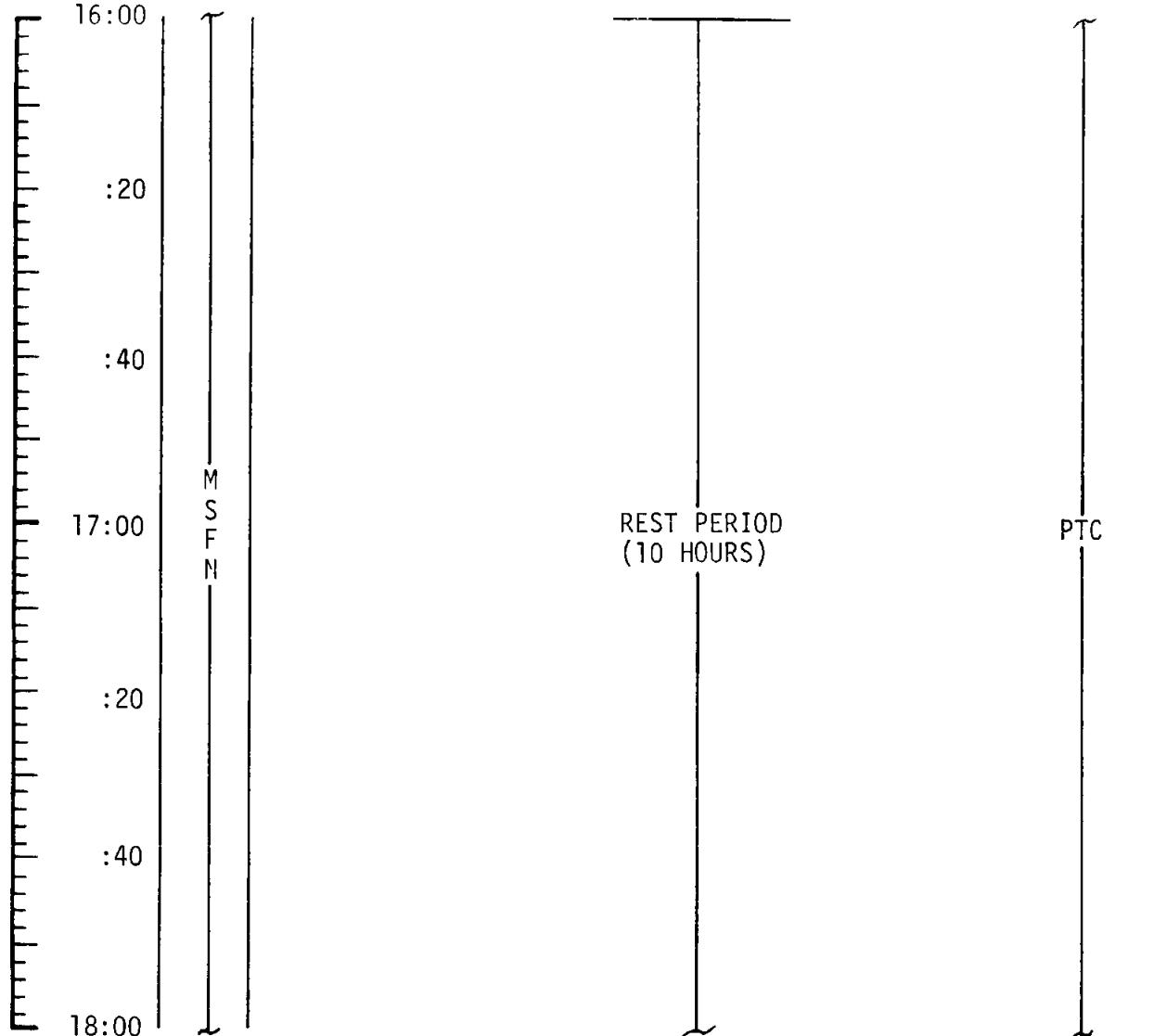
MCC-H

0623 CST

FLIGHT PLAN

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

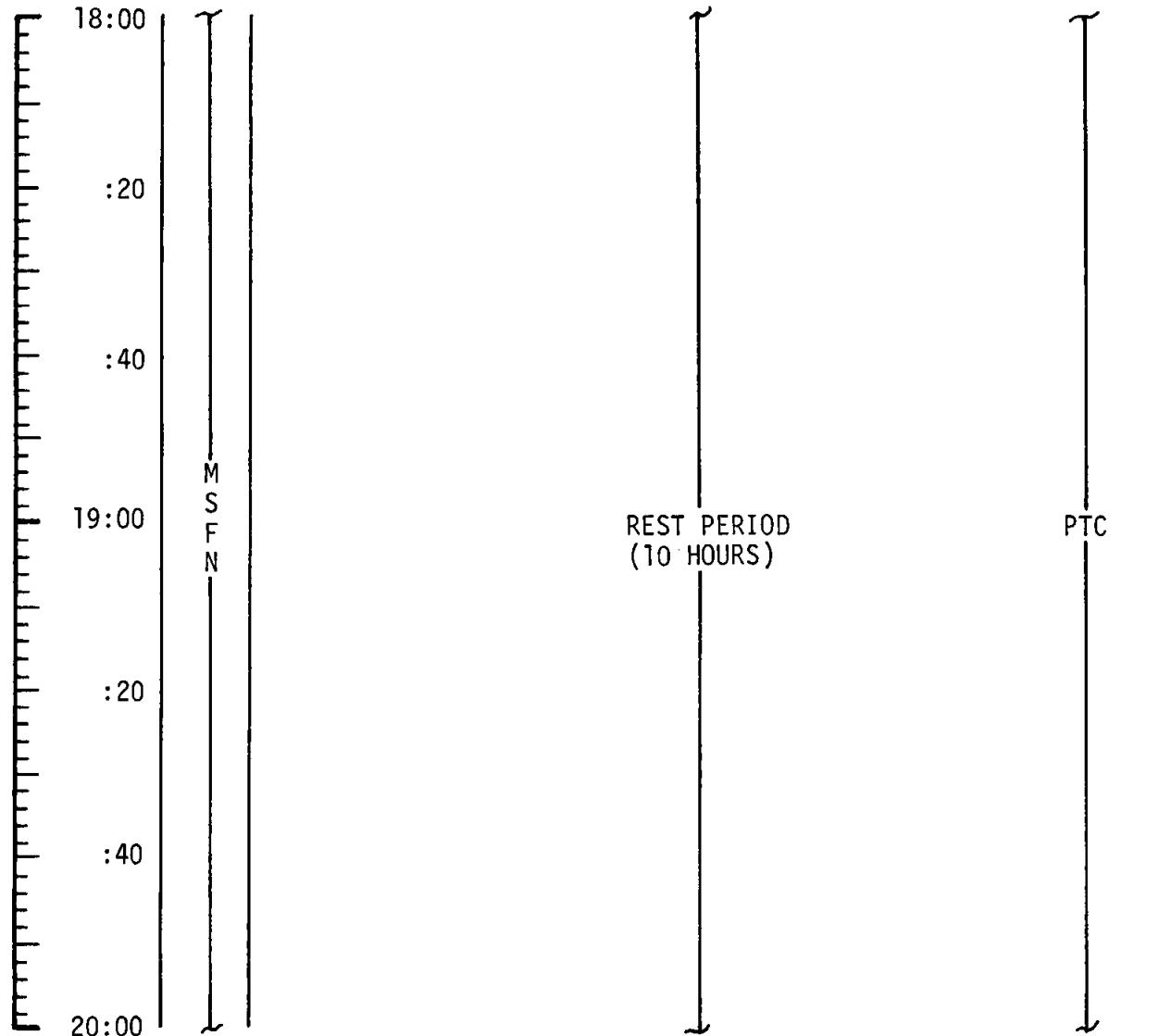
NASA — MSC

MCC-H

0823 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

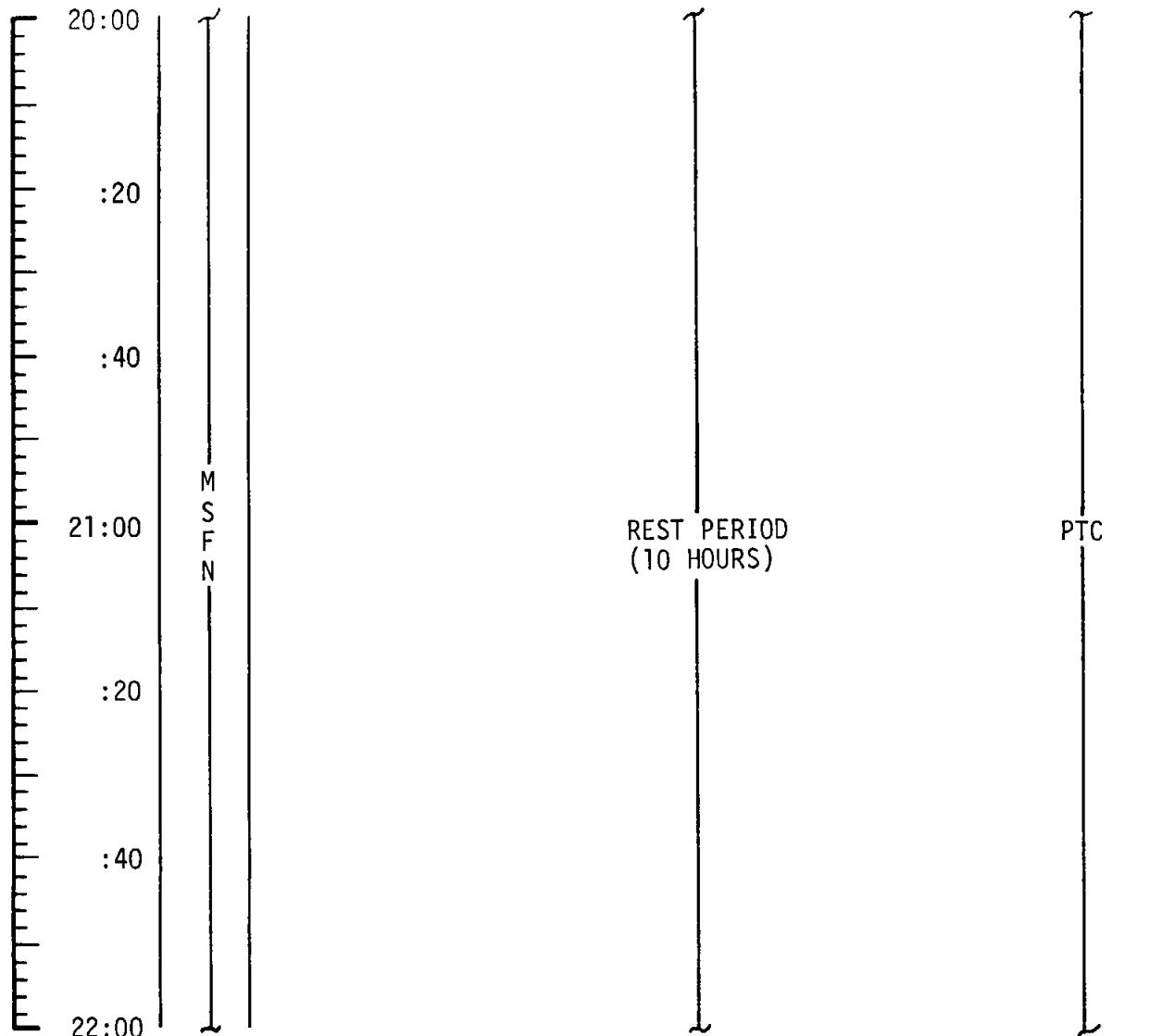
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	18:00 - 20:00	1/TLC	3-23

MCC-H

1023 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

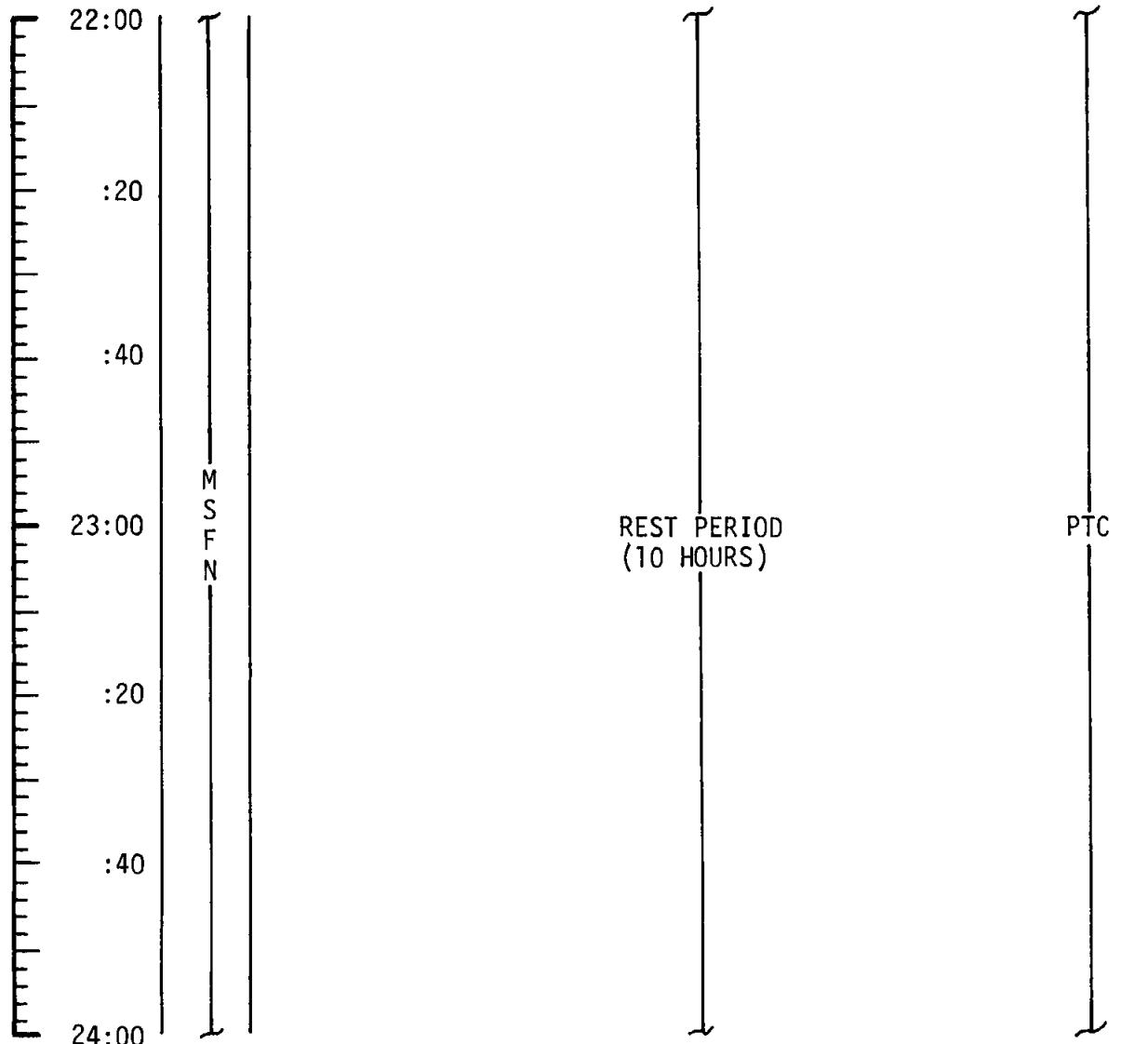
NASA — MSC

MCC-H

1223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

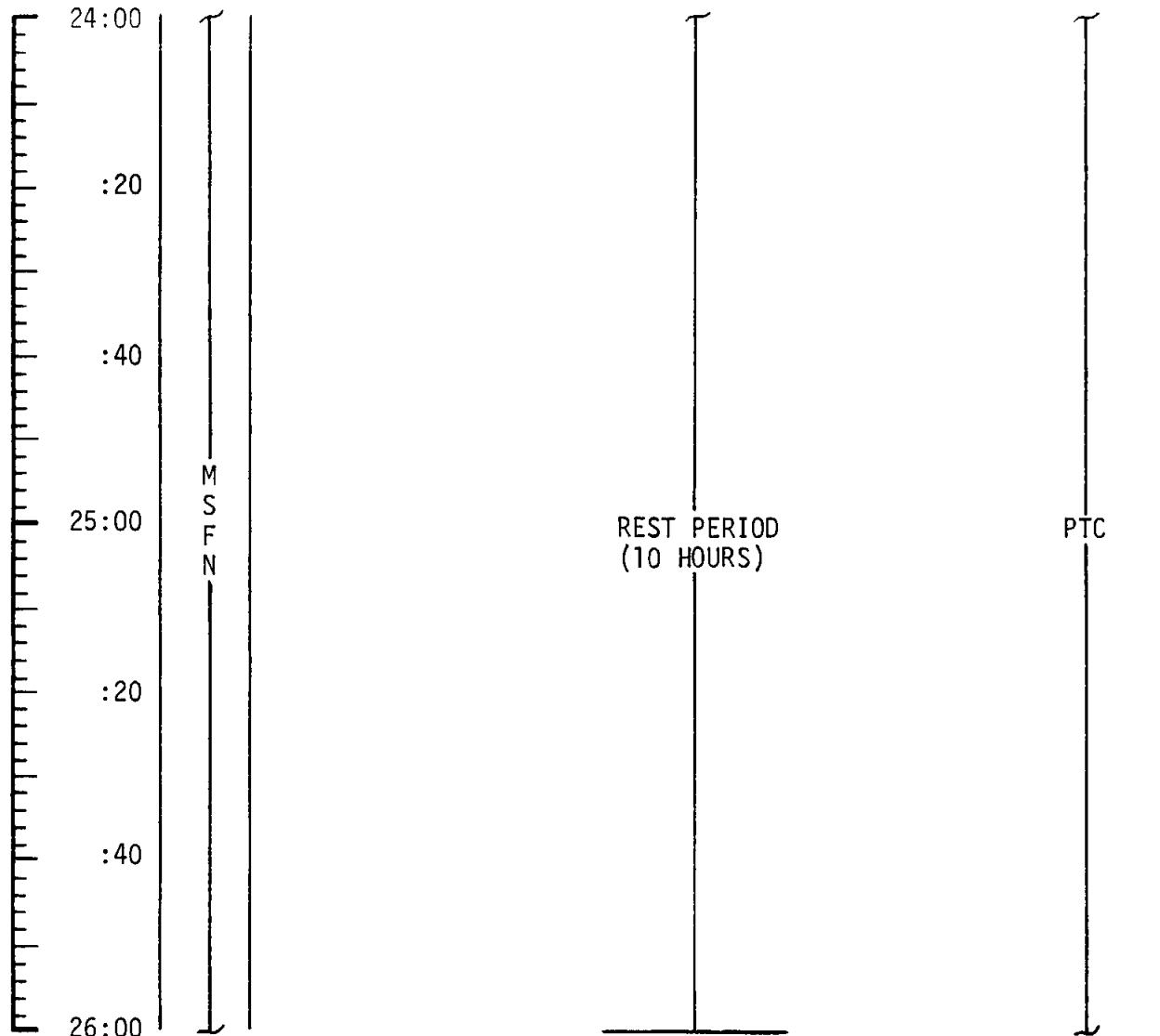
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	22:00 - 24:00	1/TLC	3-25

MCC-H

1423 CST

FLIGHT PLAN

NOTES

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

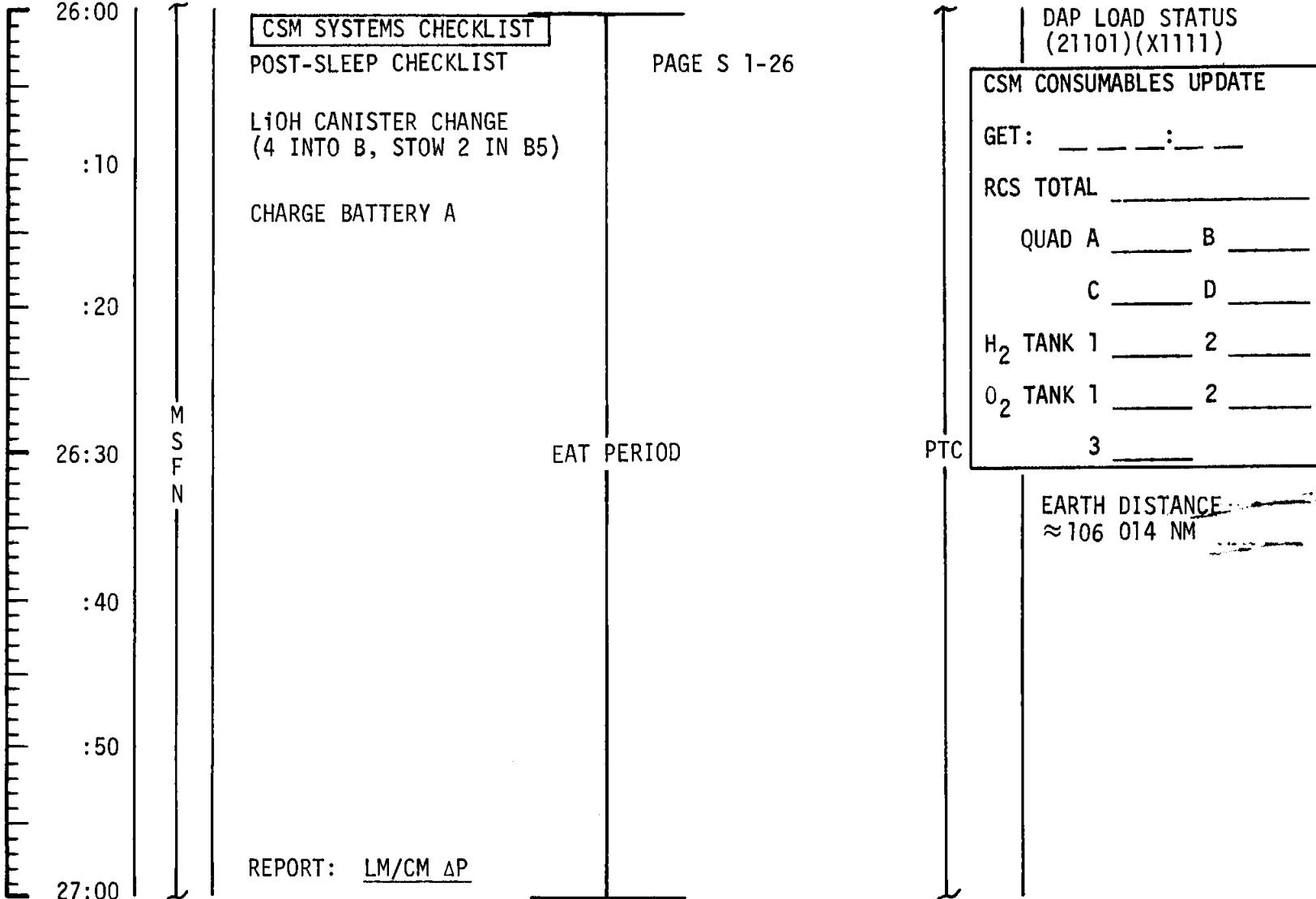
NASA — MSC

MCC-H

1623 CST

FLIGHT PLAN

NOTES



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

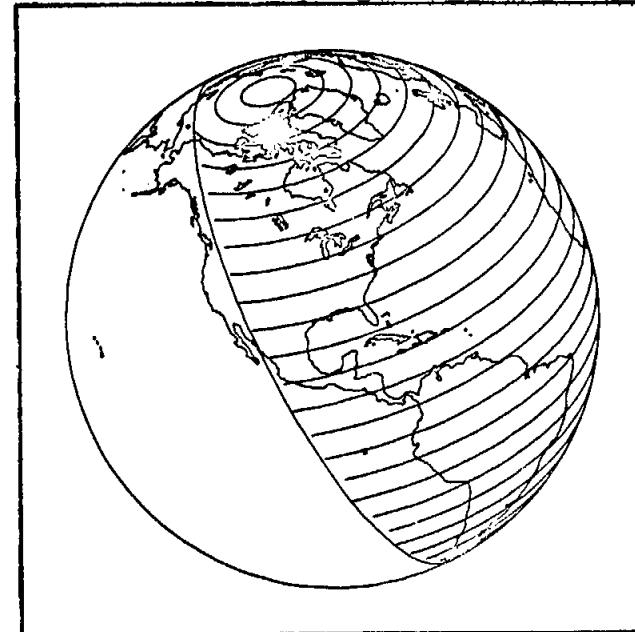
MCC-H

1723 CST

FLIGHT PLAN

NOTES

LAUNCH VEHICLE
DEBRIEFING

	27:00		LAUNCH VEHICLE SYSTEMS PERFORMANCE DEBRIEFING	DAP LOAD STATUS (21101)(X1111)
	:10		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 TRANS- IENTS 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?	PTC
	:20		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?	GET: 28:30
	27:30	M S F N		F.O.V. 4°
	:40			
	:50			
	28:00			

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

MCC-H

1823 CST

FLIGHT PLAN

28:00

:10

:20
(21101)
(X1111)

28:30

:40

:50

29:00

M S F N

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK
REPORT: BIAS

PAGE G 2-5

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)

POO

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)

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)

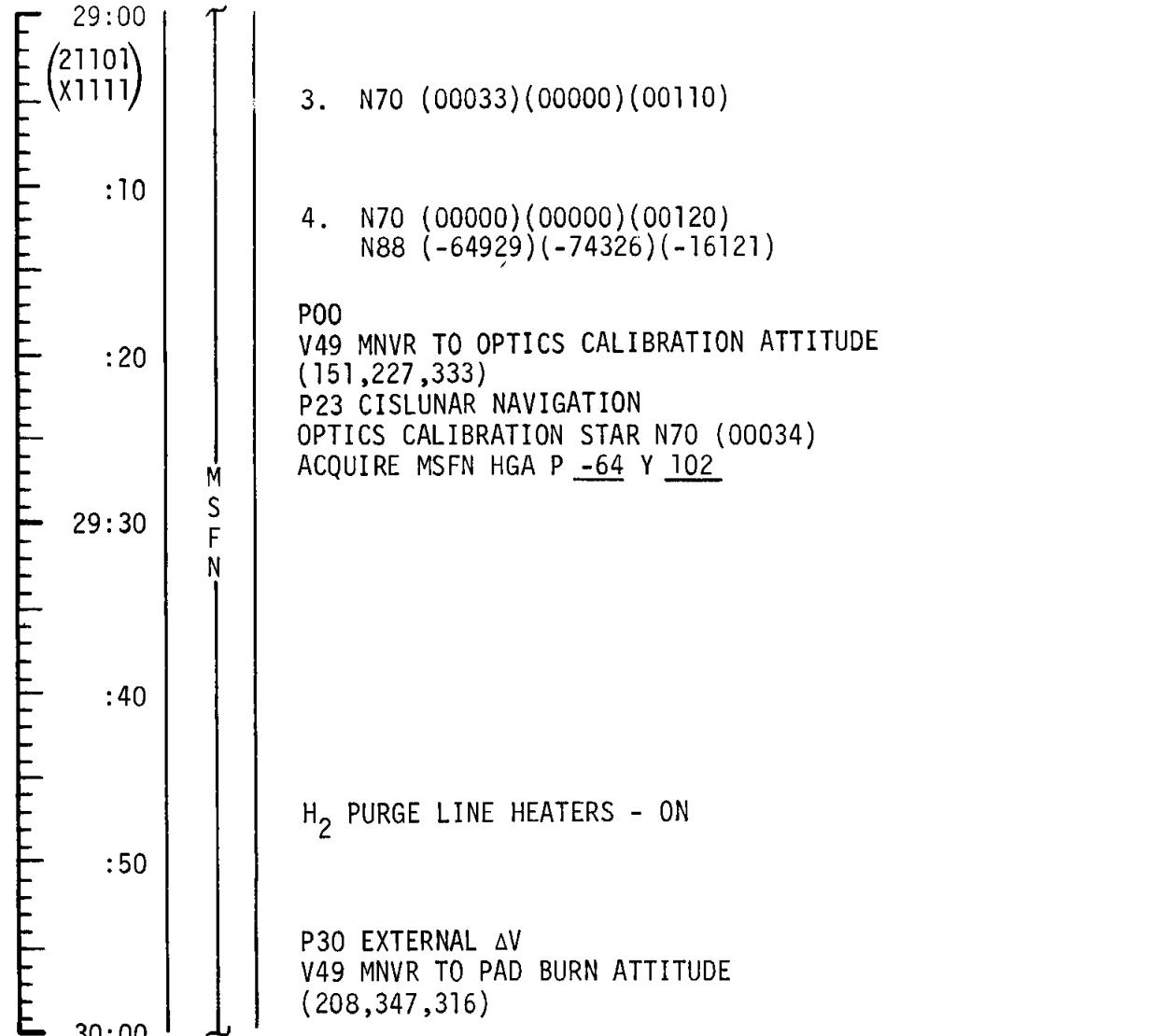
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	28:00 - 29:00	2/TLC	3-29

MCC-H

1923 CST

FLIGHT PLAN

NOTES



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

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

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

FLIGHT PLAN

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
3-31

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	30:50 - 31:30	2/TLC	3-32

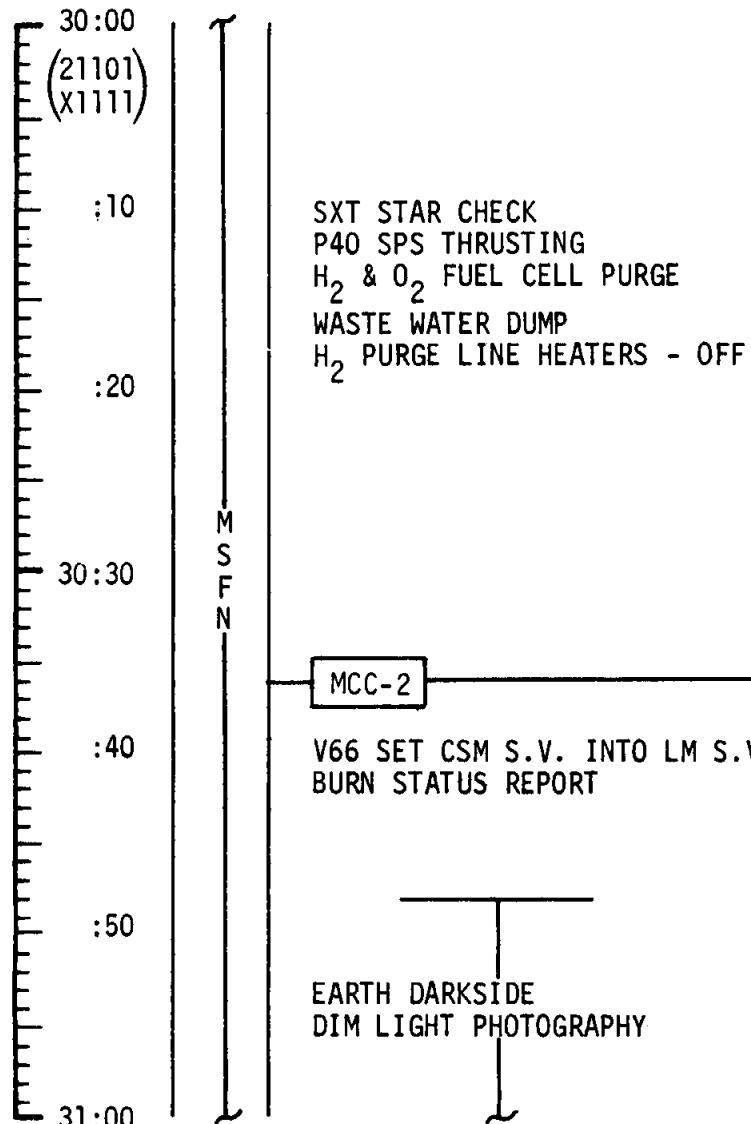
MCC-H

2023 CST

FLIGHT PLAN

NOTES

TLI CUTOFF +28 HR



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

BURN STATUS REPORT		Δ TIG
X	X	
X	X	BT
		V gx
TRIM		R
X	X	P
X	X	Y
X	X	V gx
		V gy
		V gz
		Δ V
X	X	C
X	X	FUEL*
X	X	OX *
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

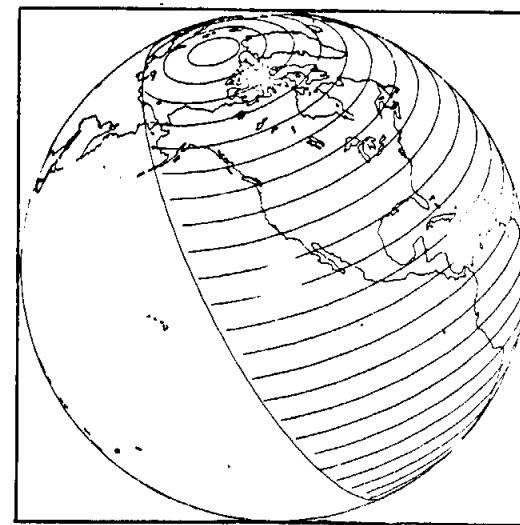
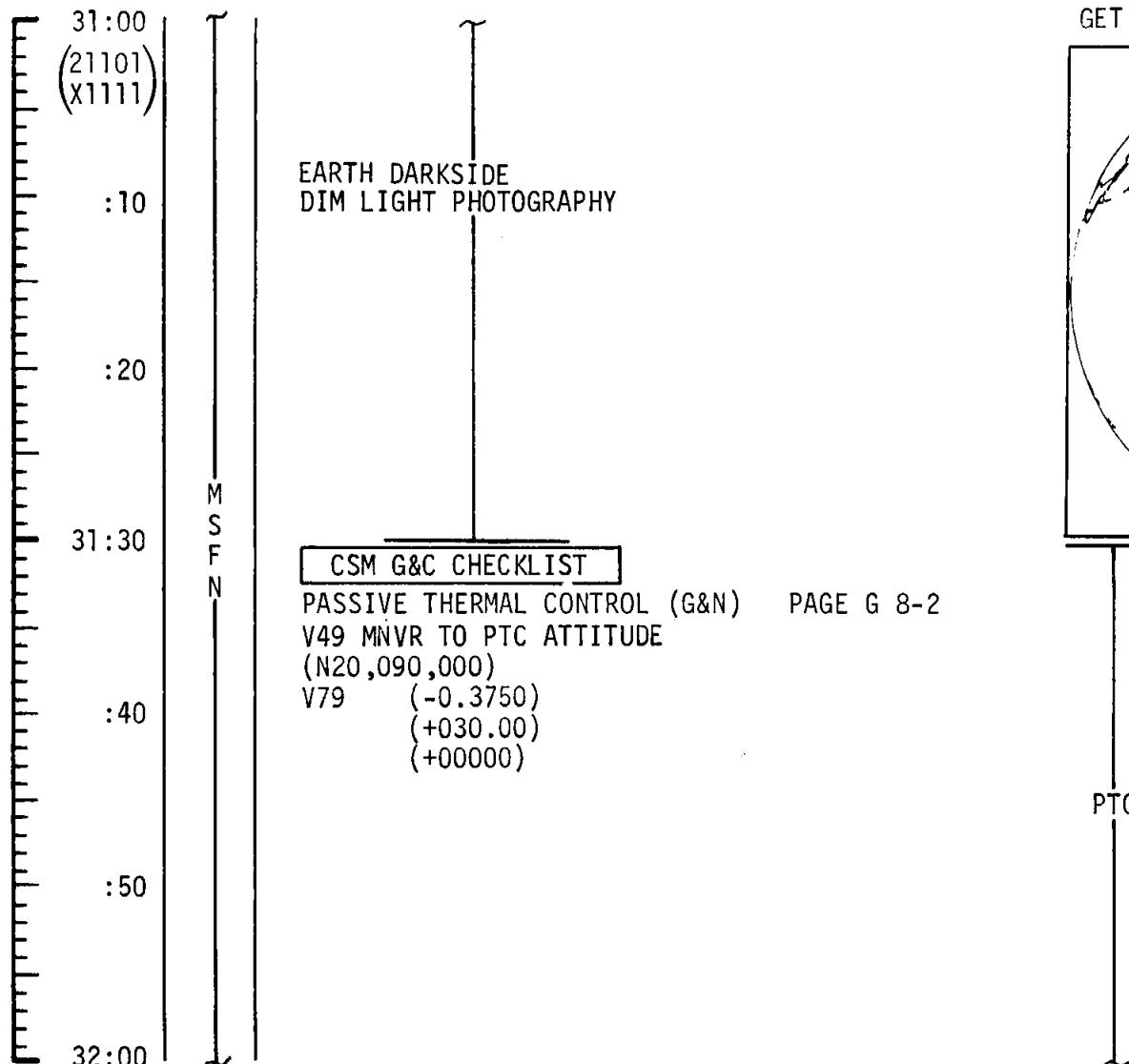
FLIGHT PLAN

NOTES

GET: 31:00

F.O.V. 4°

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

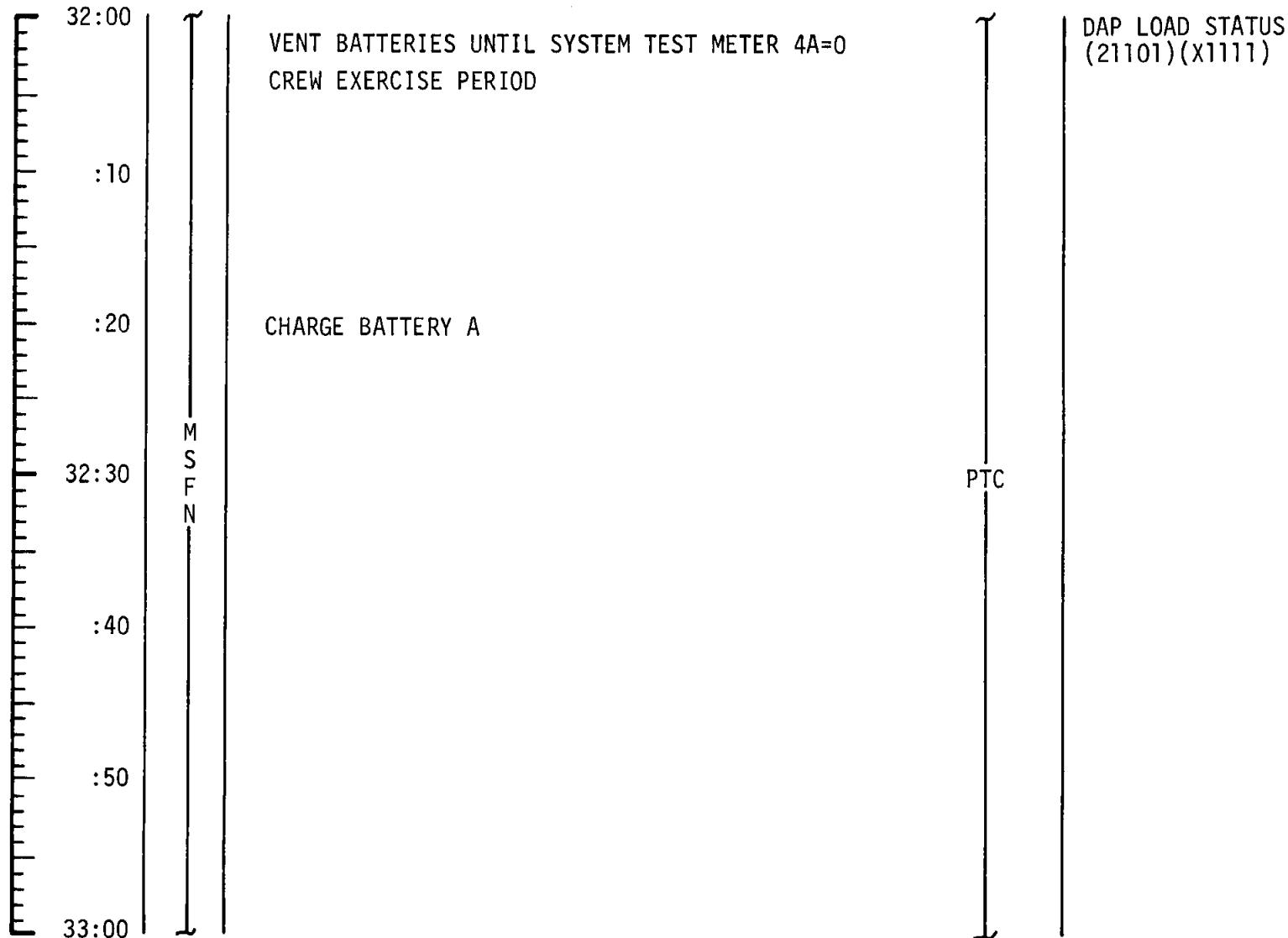
NASA — MSC

MCC-H

2223 CST

FLIGHT PLAN

NOTES



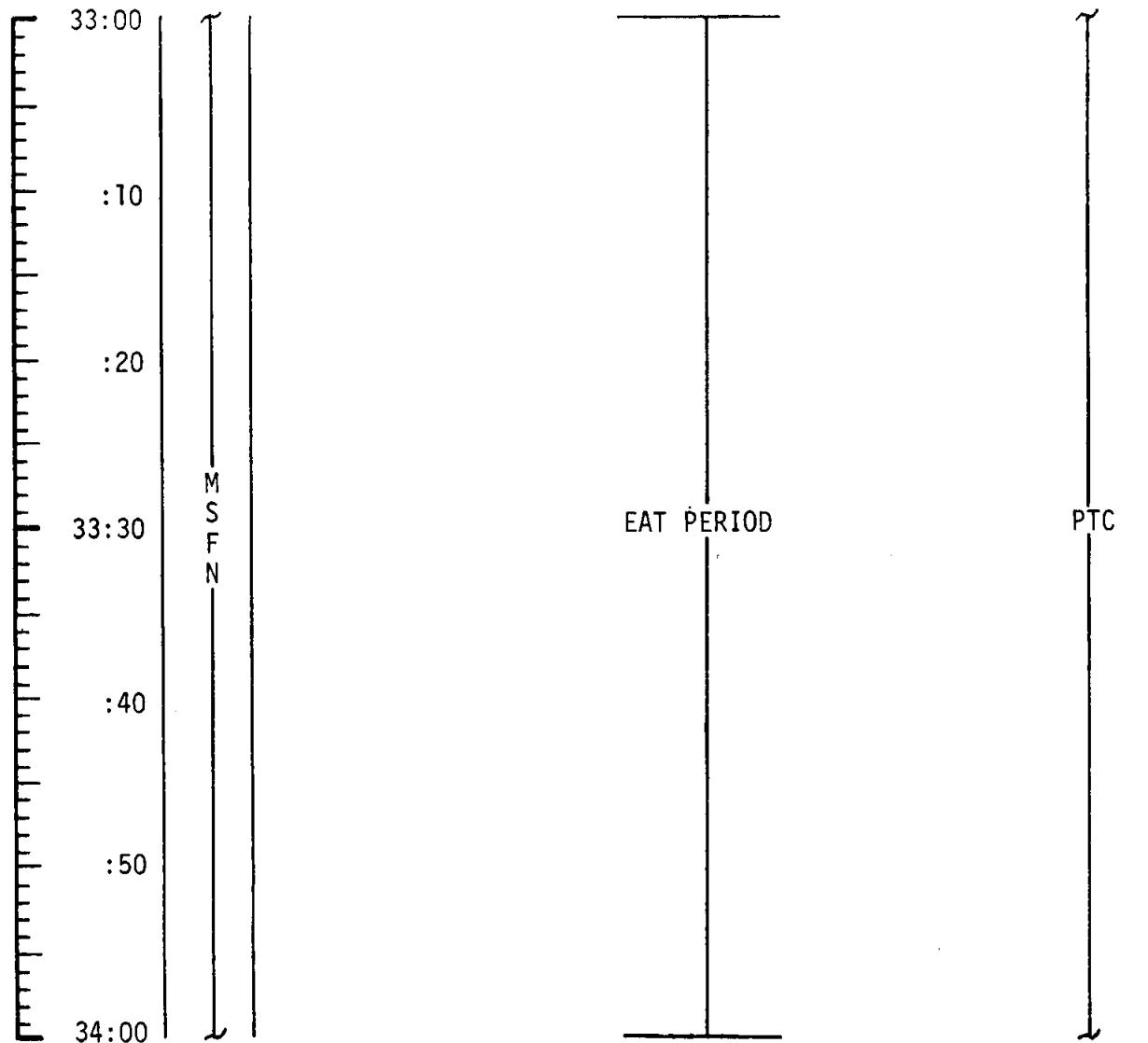
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	32:00 - 33:00	2/TLC	3-35

MCC-H

2323 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

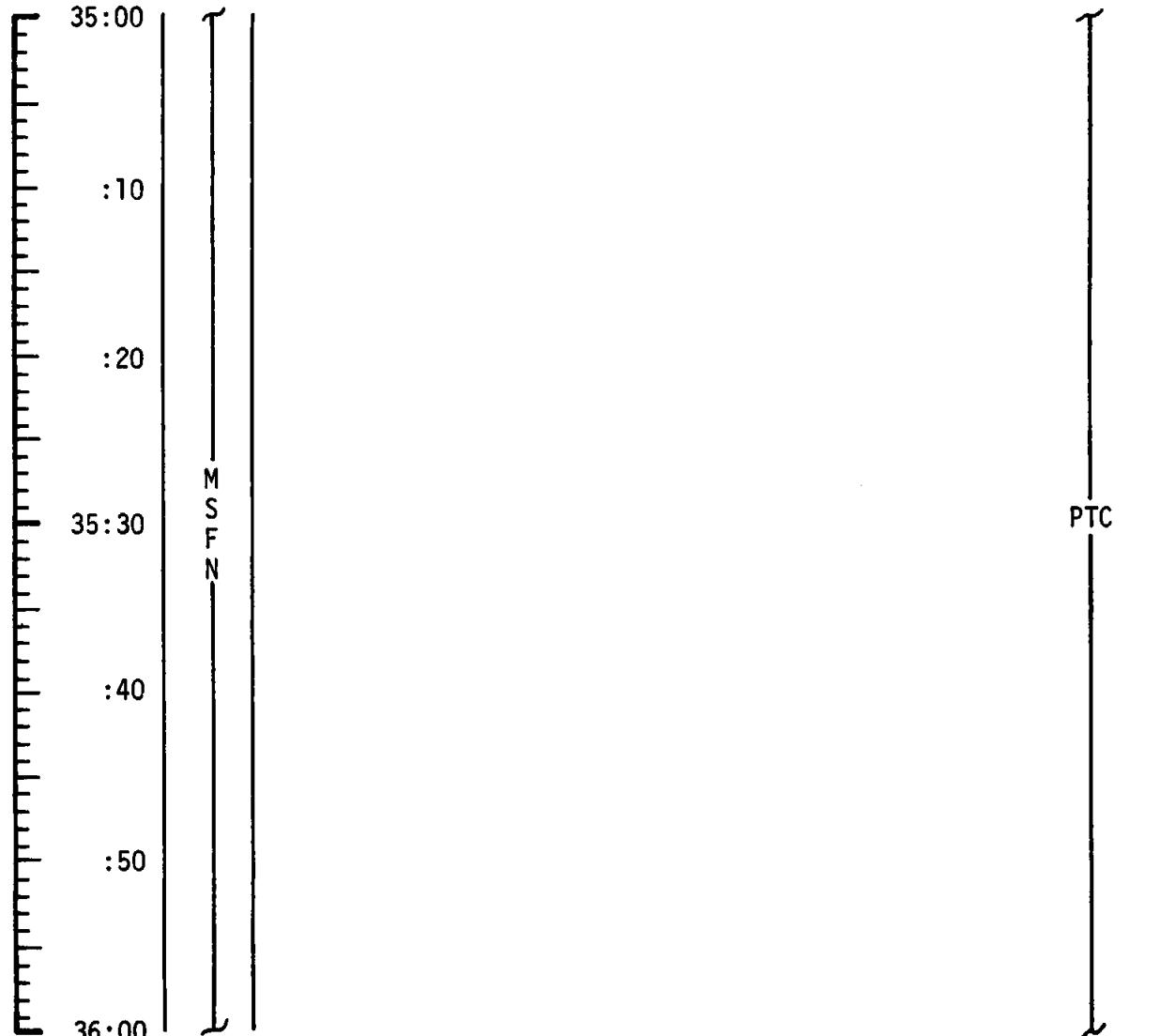
NASA — MSC

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA—MSC

MCC-H

0023 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
LOI MINUS 5 HR
FLYBY

			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)		DAP LOAD STATUS (21101)(X1111)
	:10		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		
	:20	M S F N		PTC	
	34:30				
	:40				LOI MINUS 5 HR FLYBY IS A CIRCUMLUNAR TRAJECTORY TO THE PRIME MPL AND WITH A PERICYNTHION BETWEEN 60 AND 1500 NM
	:50				
	35:00				

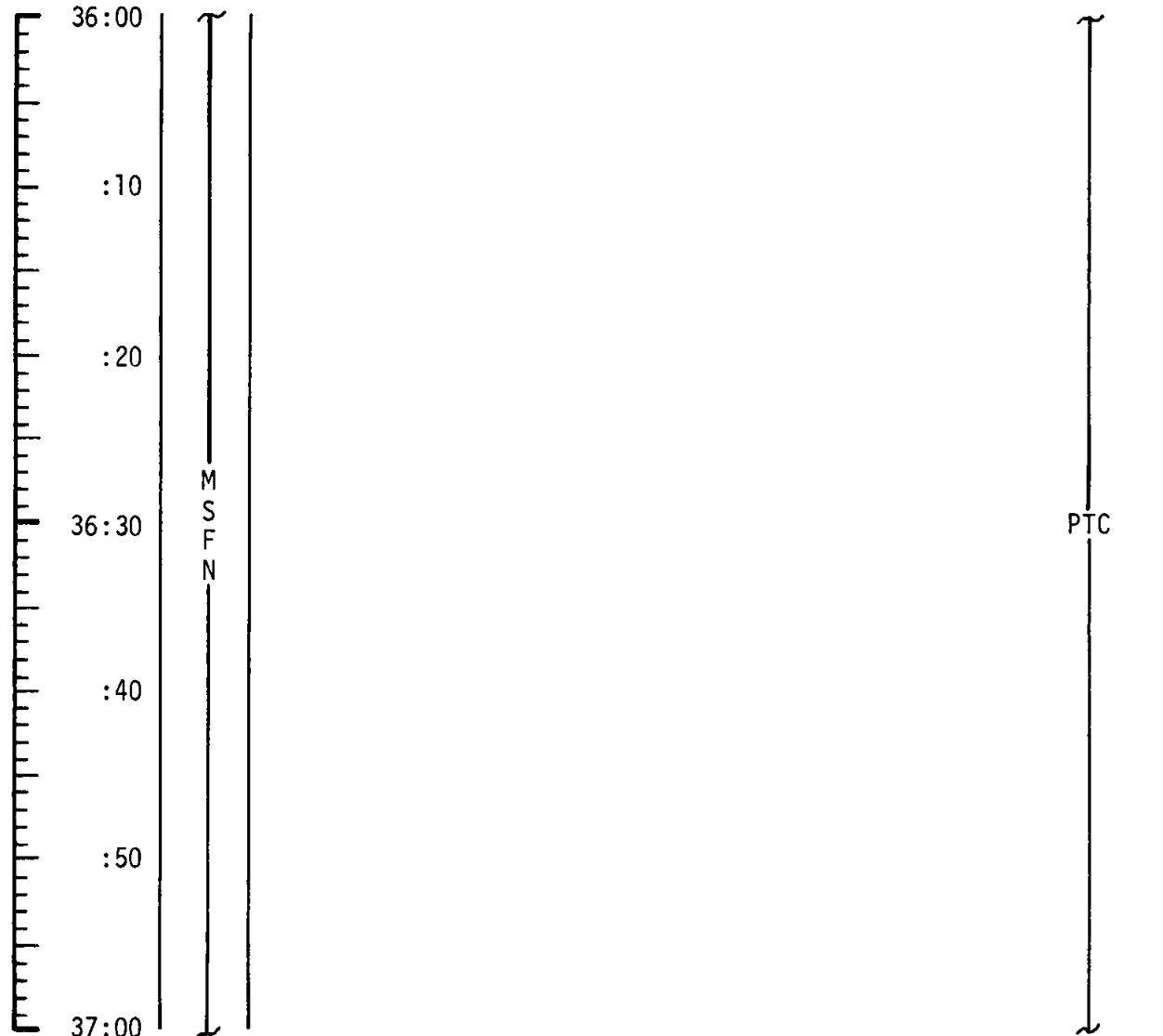
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	34:00 - 35:00	2/TLC	3-37

MCC-H

0223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

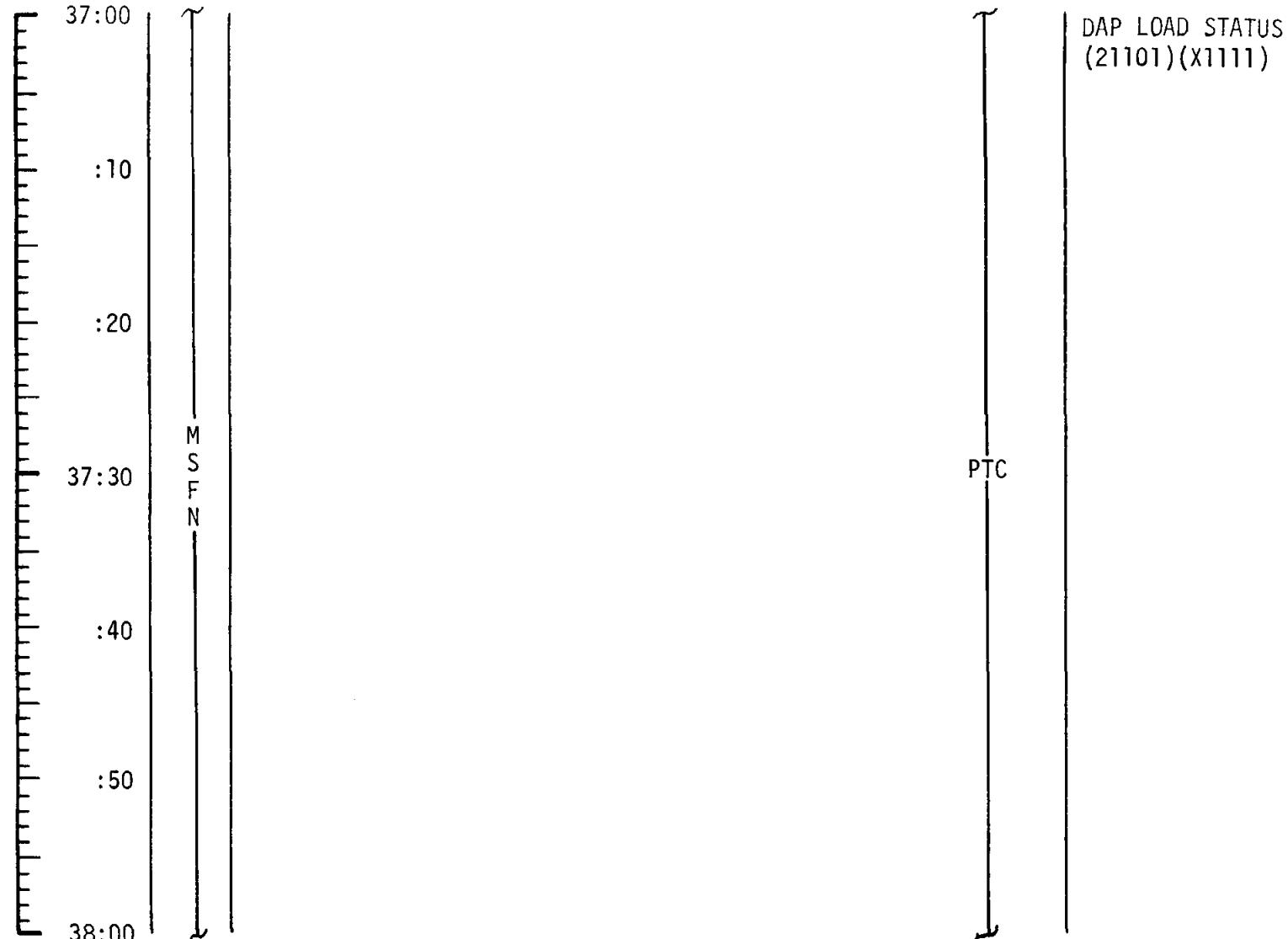
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	36:00 - 37:00	2/TLC	3-39

MCC-H

0323 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

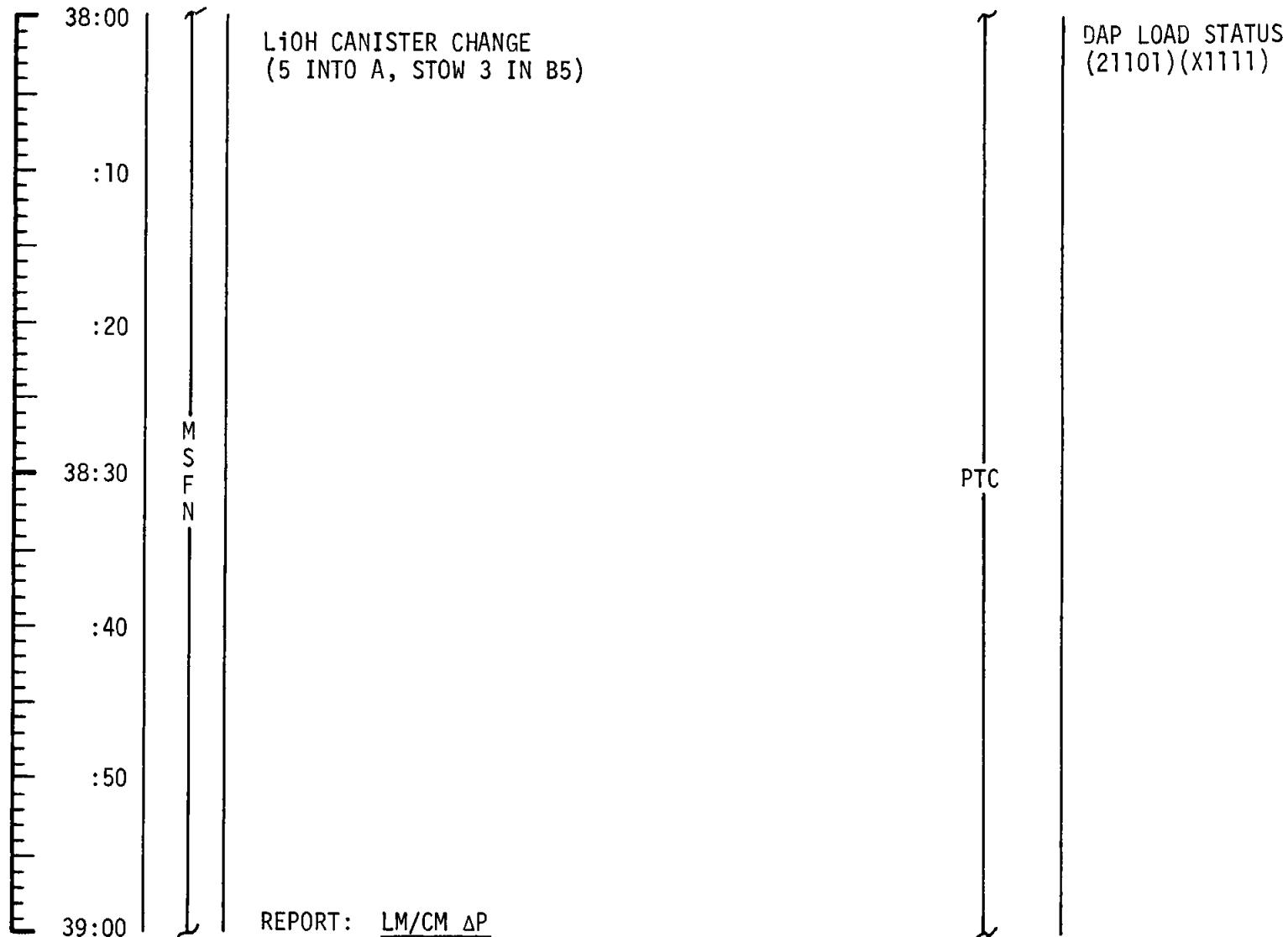
NASA — MSC

MCC-H

0423 CST

FLIGHT PLAN

NOTES



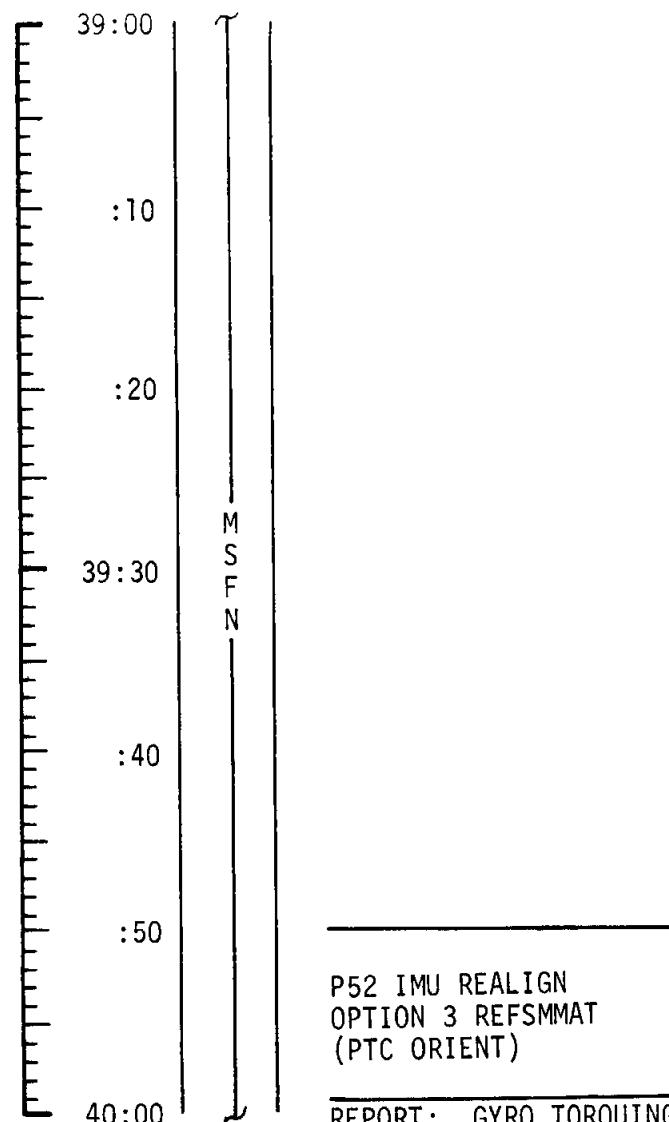
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	38:00 - 39:00	2/TLC	3-41

MCC-H

0523 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)UPLINK TO CSM
CSM S.V. & V66

PTC

P52 IMU REALIGN	
N71:	_____
N05:	_____
N93:	_____
X	_____
Y	_____
Z	_____
GET	_____ : _____

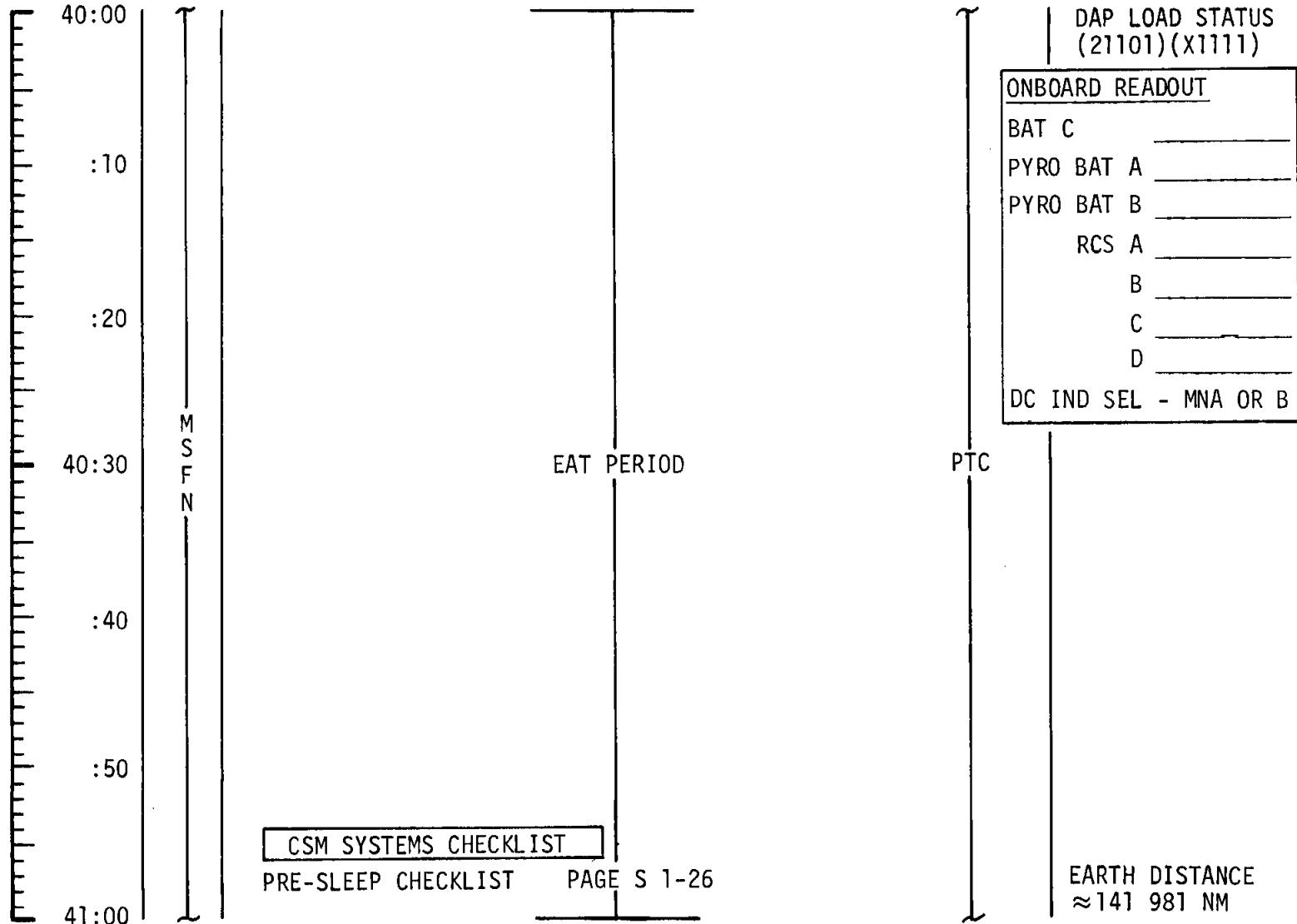
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	39:00 - 40:00	2/TLC	3-42

MCC-H

0623 CST

FLIGHT PLAN

NOTES



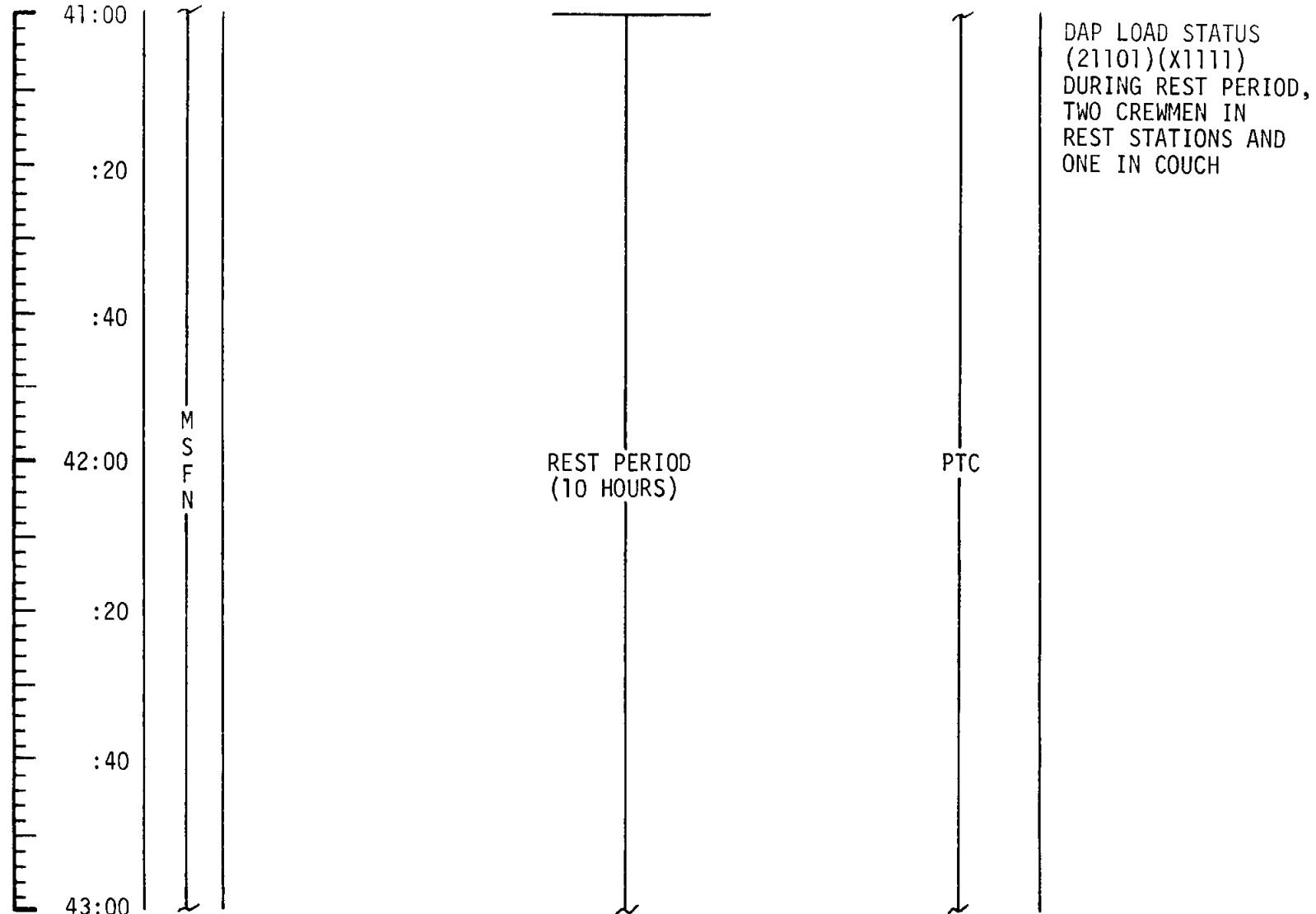
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	40:00 - 41:00	2/TLC	3-43

MCC-H

0723 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

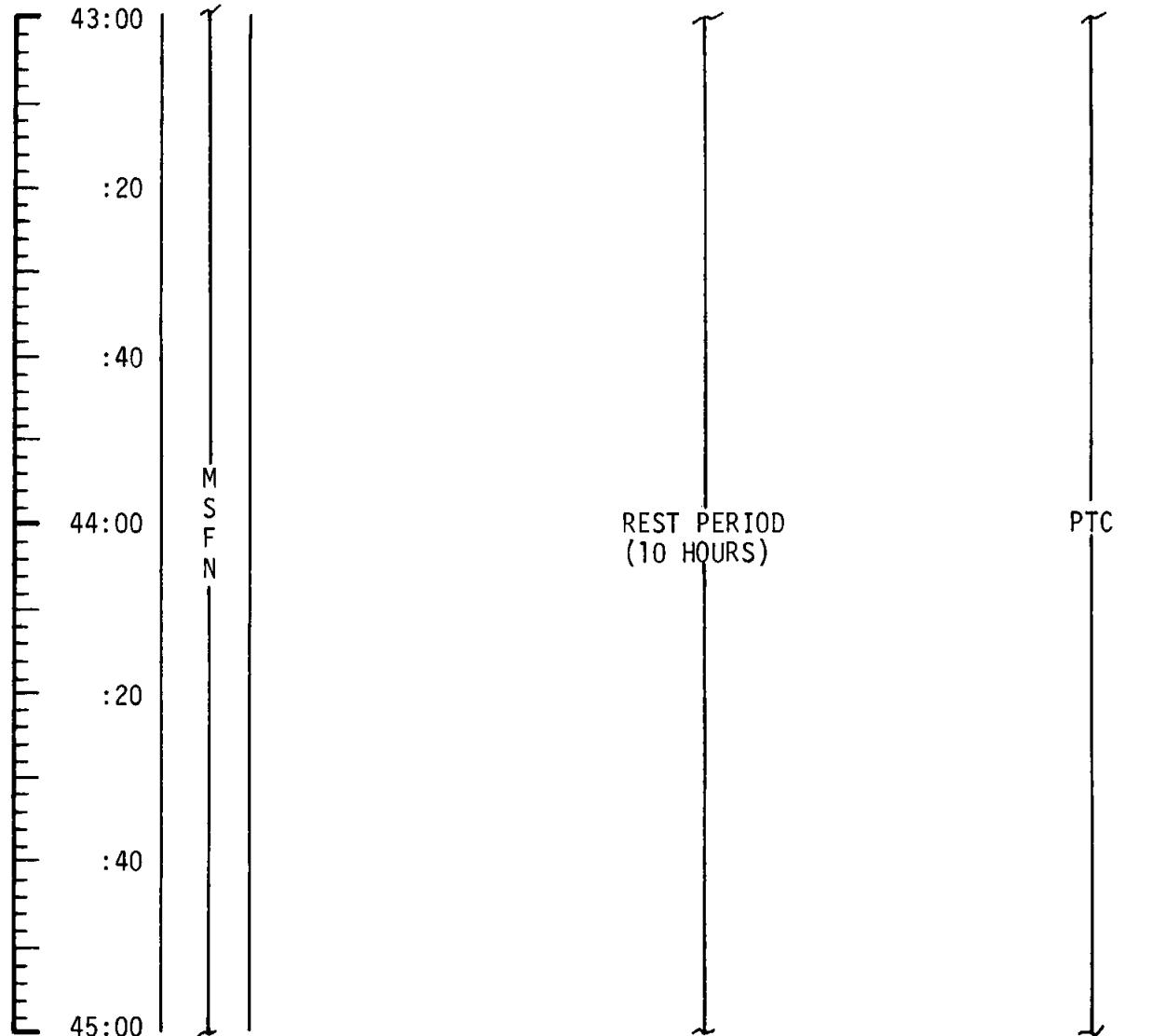
NASA — MSC

MCC-H

0923 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

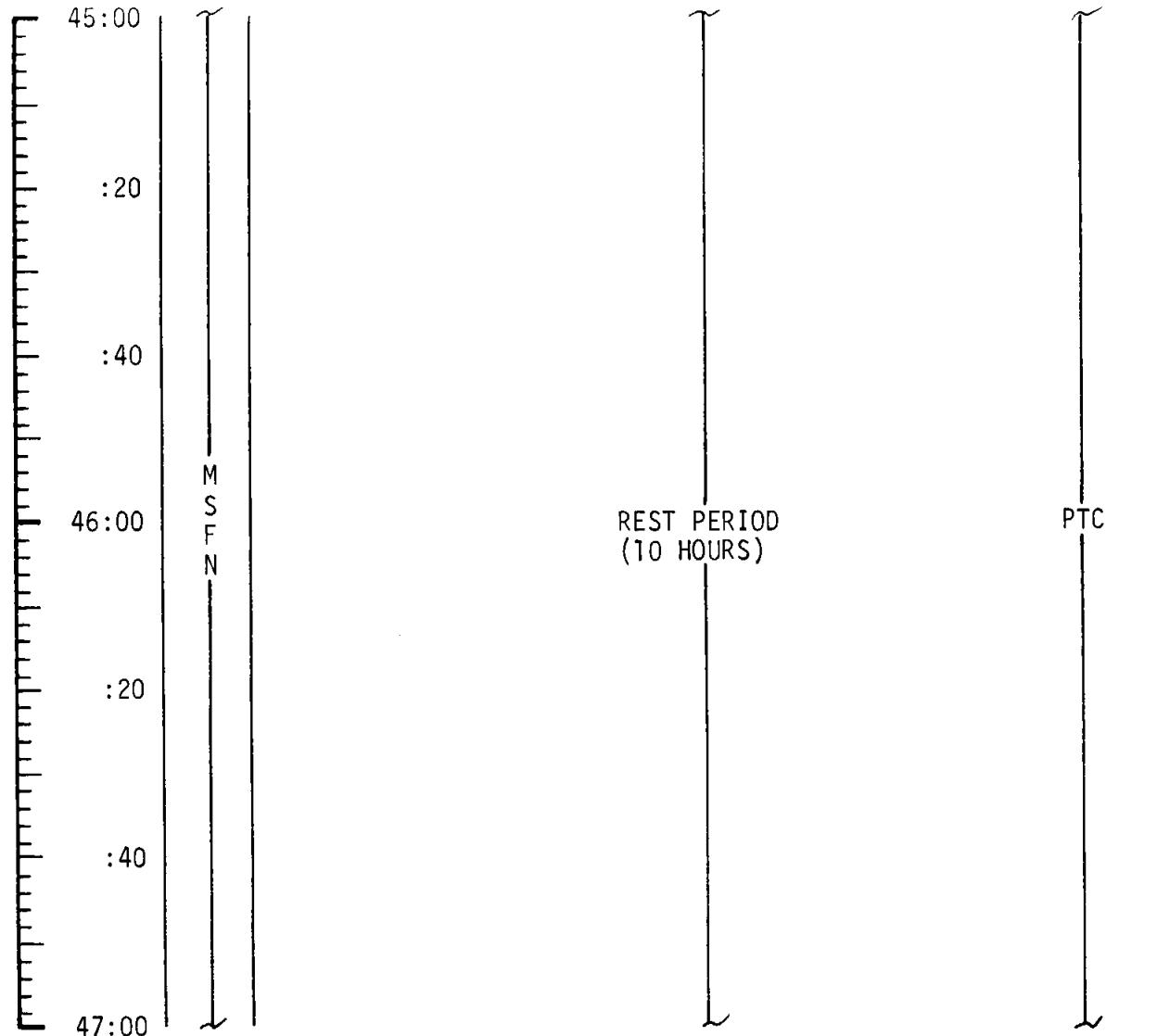
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	43:00 - 45:00	2/TLC	3-45

MCC-H

1123 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

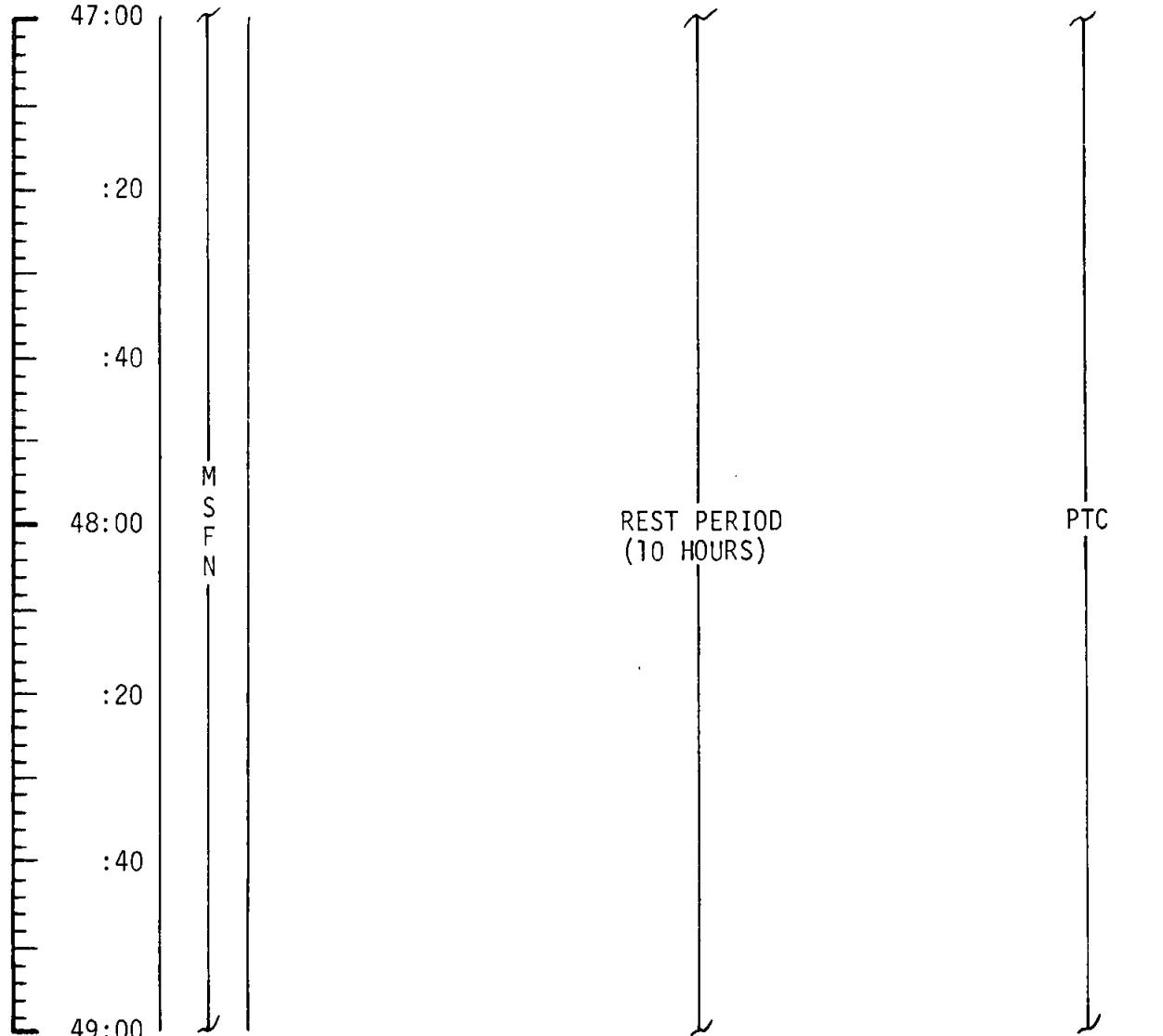
NASA — MSC

MCC-H

1323 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

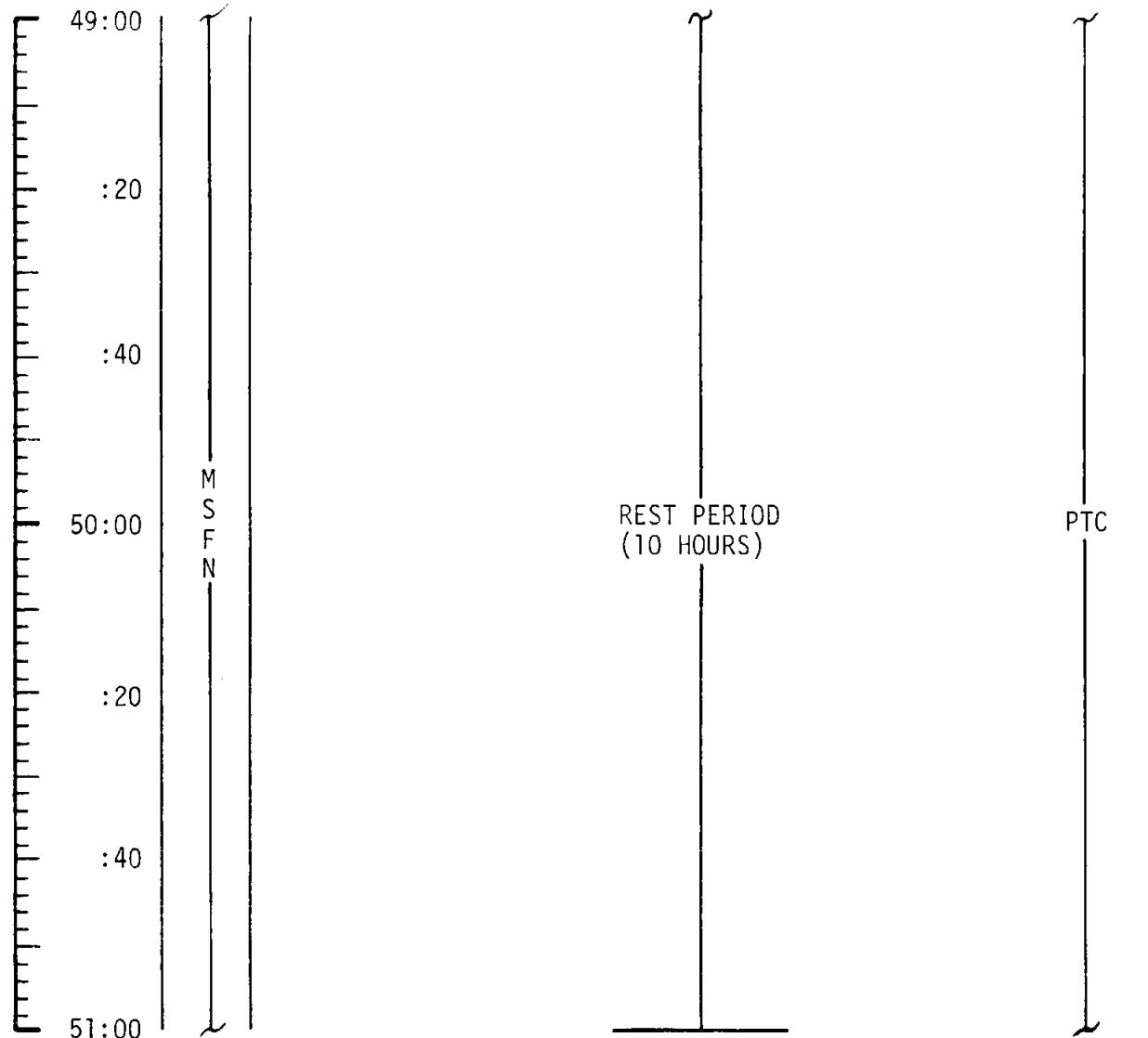
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	47:00 - 49:00	2/TLC	3-47

MCC-H

1523 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

MSC Form 29 (May 69)

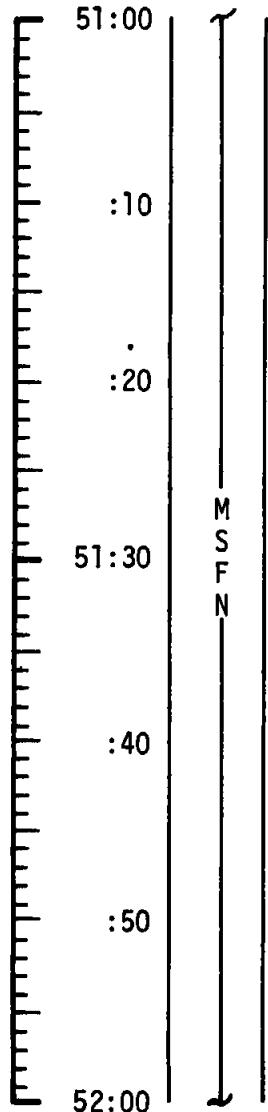
FLIGHT PLANNING BRANCH

NASA — MSC

MCC-H

1723 CST

FLIGHT PLAN



CSM SYSTEMS CHECKLIST

POST-SLEEP CHECKLIST

PAGE S 1-26

L10H CANISTER CHANGE
(6 INTO B, STOW 4 IN B5)REPORT: LM/CM ΔP

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 _____

PTC

EARTH DISTANCE
≈ 160 954 NM

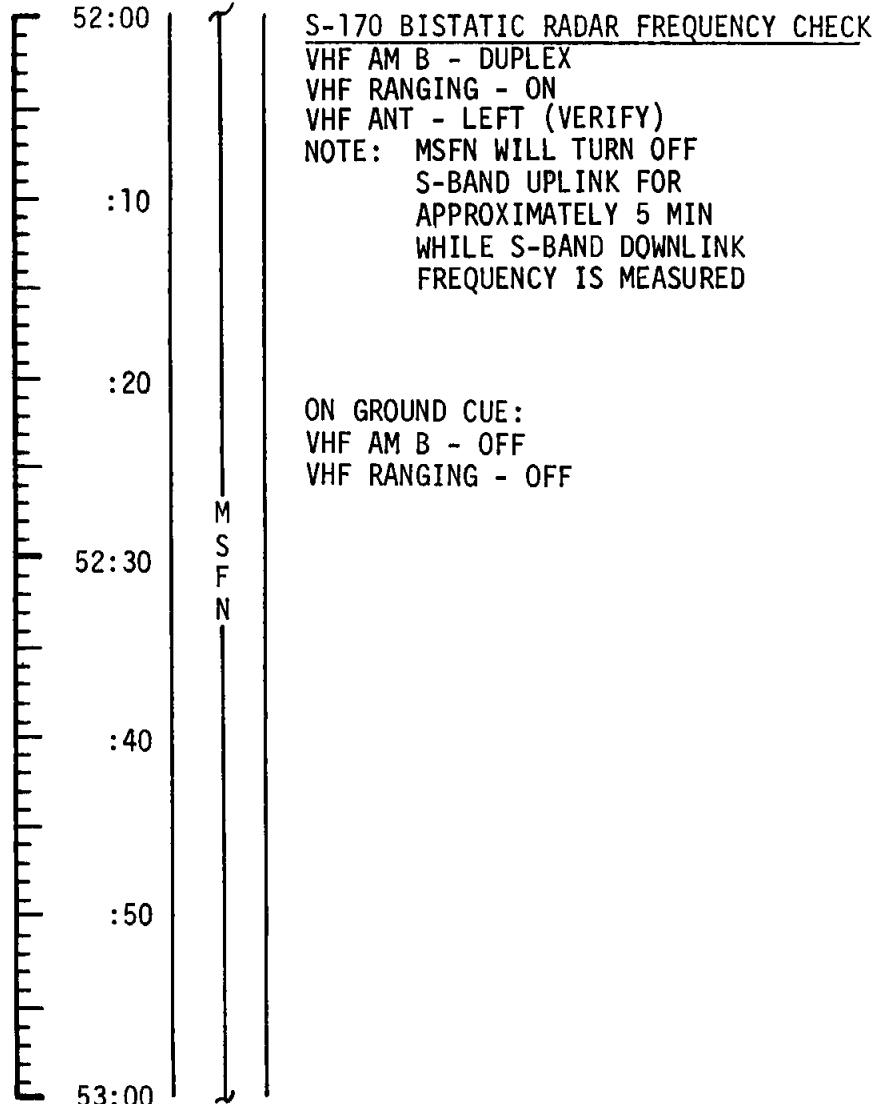
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	51:00 - 52:00	3/TLC	3-49

MCC-H

1823 CST

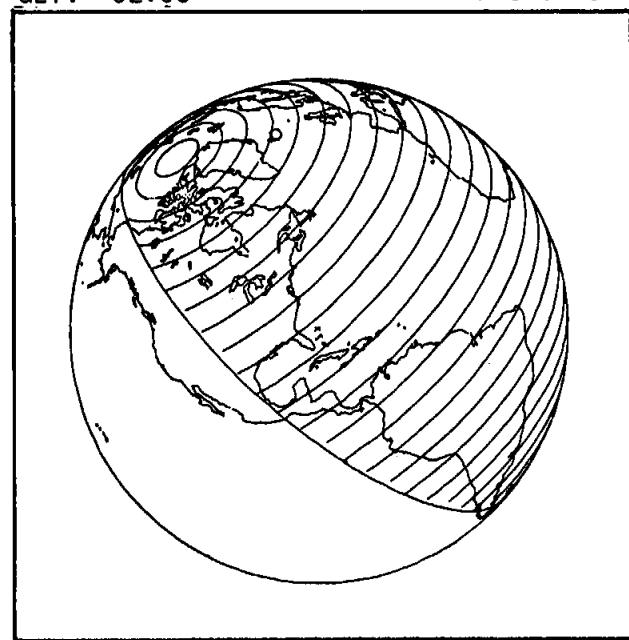
FLIGHT PLAN

NOTES



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

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

NASA—MSC

MCC-H

1923 CST

FLIGHT PLAN

53:00

:10

:20

53:30

:40

:50

54:00

CHARGE BATTERY B

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

REPORT: GYRO TORQUING ANGLES

M S F N

PTC

NOTESDAP 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

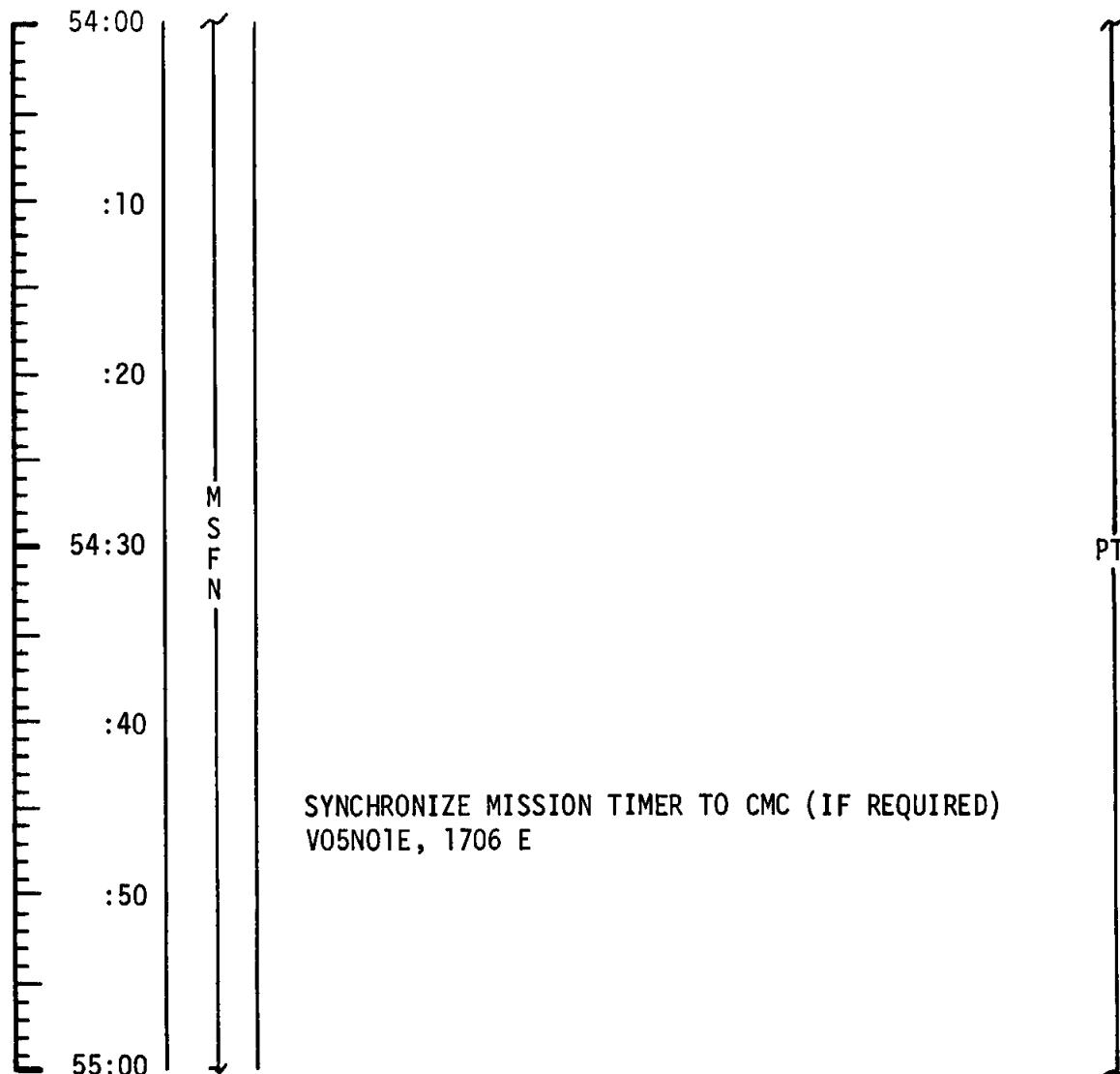
MCC-H

2023 CST

FLIGHT PLAN

NOTES

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)

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

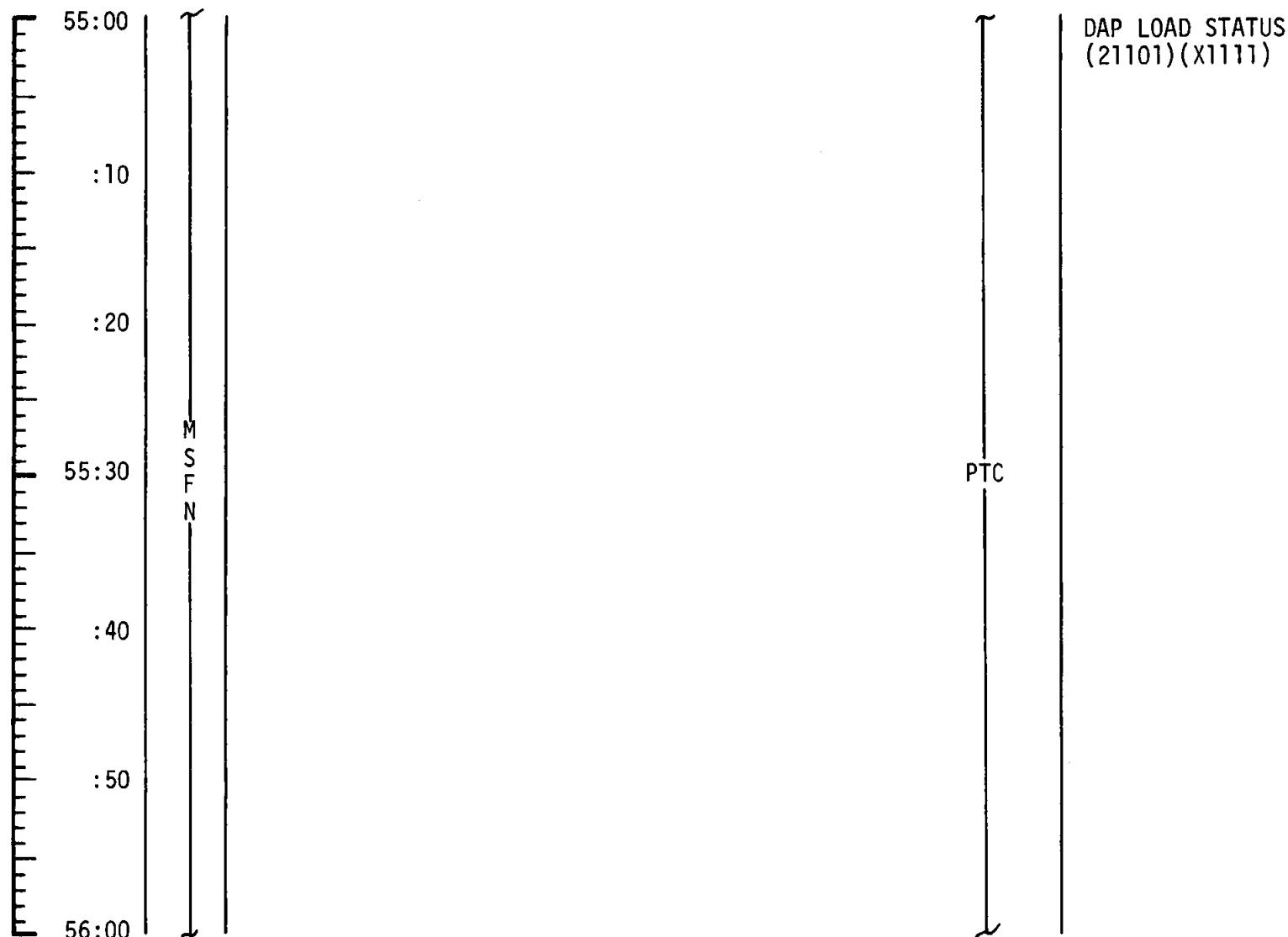
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	54:00 - 55:00	3/TLC	3-52

MCC-H

2123 CST

FLIGHT PLAN

NOTES



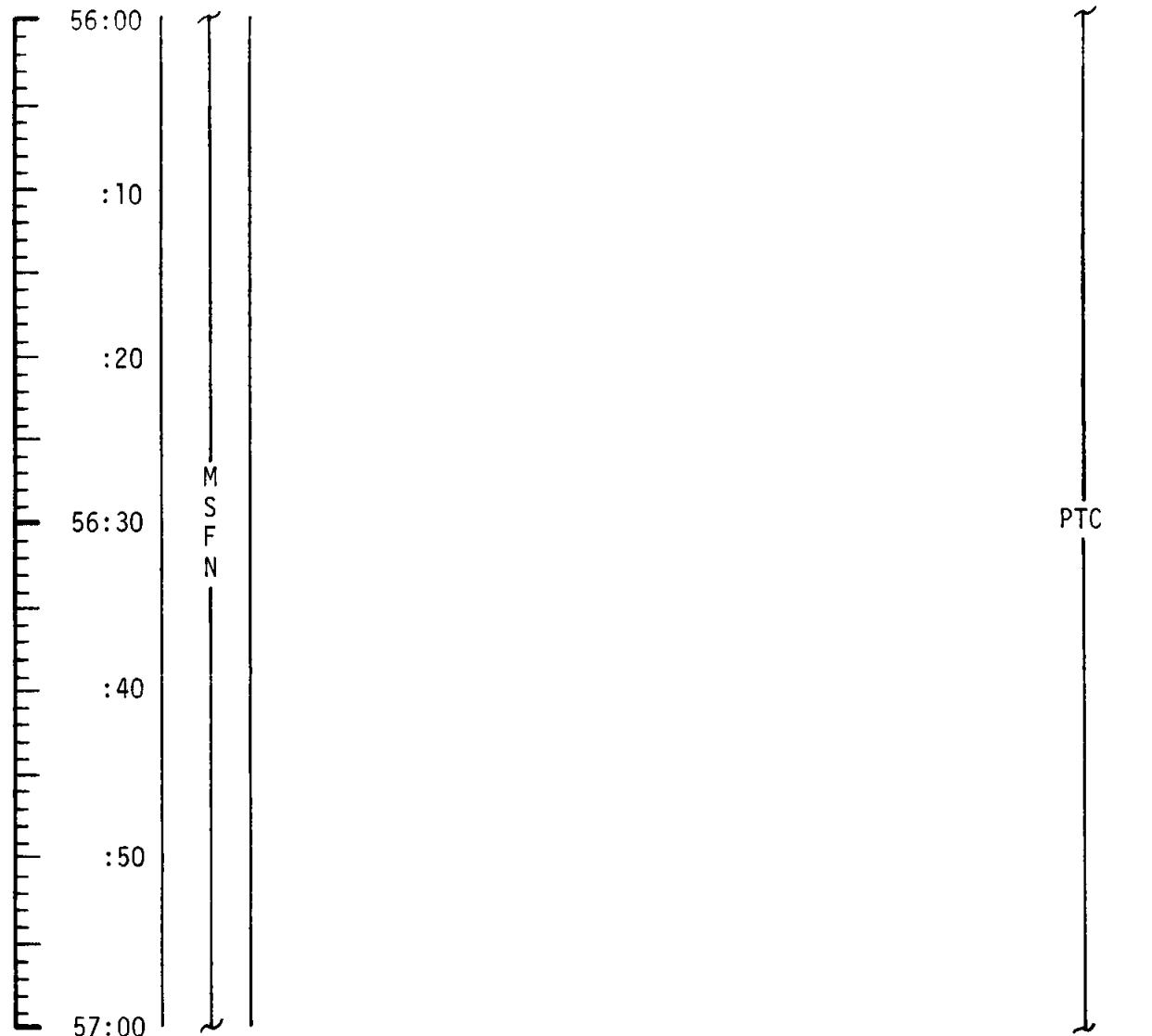
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	55:00 - 56:00	3/TLC	3-53

MCC-H

2223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

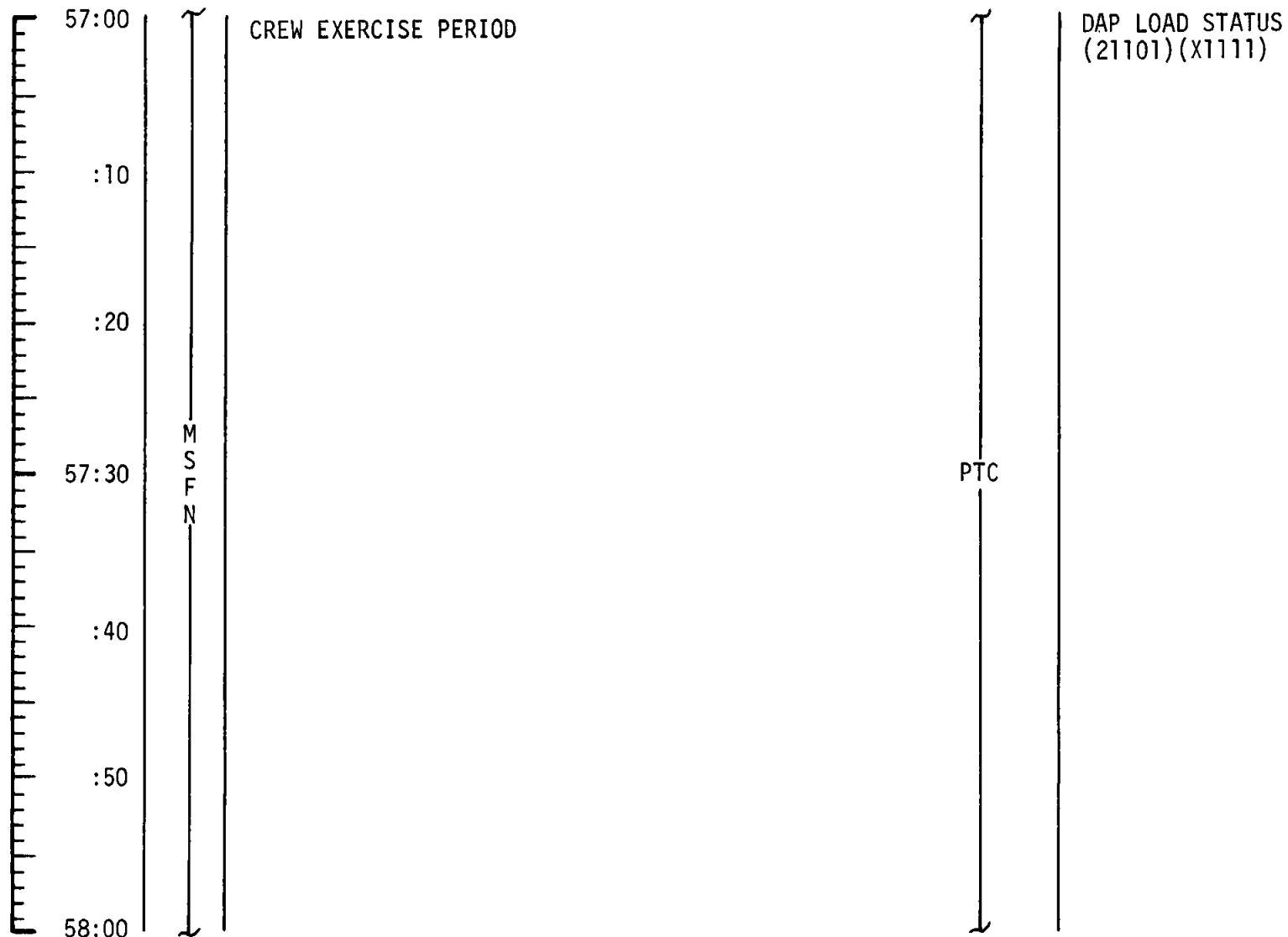
NASA — MSC

MCC-H

2323 CST

FLIGHT PLAN

NOTES



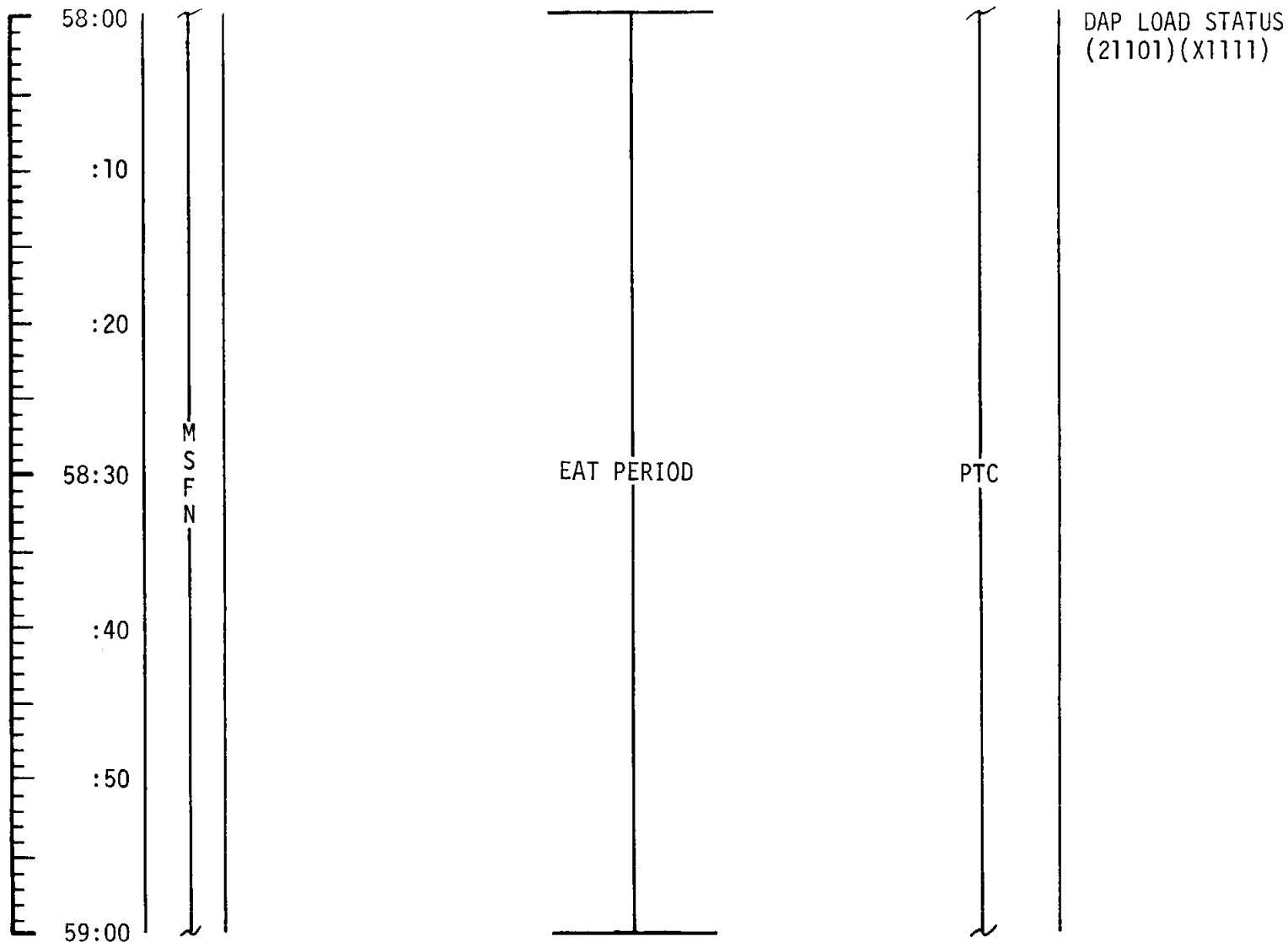
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	57:00 - 58:00	3/TLC	3-55

MCC-H

0023 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

MCC-H

0123 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

P52 IMU REALIGN

N71: _____

N05: _____

N93:

X _____

Y _____

Z _____

GET _____ : _____

PTC

UPLINK TO CSM
CSM S.V. & V66
MCC-3 TGT LOADUPDATE TO CSM
GO/NO-GO MCC-3
MCC-3 MNVR PAD

59:00

CSM G&C CHECKLIST

AV TEST & NULL BIAS CHECK
REPORT: BIAS

PAGE G 2-5

:10

:20

M
S
F
NIF LM/CM ΔP < 2.7 PSID - VENT
UNTIL $\Delta P \geq 2.7$

59:30

 O_2 HEATERS 1&2 (2) - AUTO
 O_2 HEATERS 3 (1) - OFF

:40

:50

(21101)
(X1111)P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

60:00

REPORT: GYRO TORQUING ANGLES
EXIT G&N PTC IF MCC-3
IS REQUIRED

PAGE G 8-3

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

FLIGHT PLAN

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
3-58

MCC-H

0223 CST

FLIGHT PLAN

NOTES

60:00
 (21101)
 X1111

P30 EXTERNAL ΔV
 V49 MNVR TO PAD BURN ATTITUDE

:10

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

60:30

M
S
F
N

MCC-3

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

:40

BURN STATUS REPORT

:50

61:00

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

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

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	R
X	X	P
X	X	Y
		V _{gy}
		V _{gz}
		ΔV _C *
X	X	FUEL*
X	X	OX*
X	X	UNBAL

*ITEMS TO BE
 REPORTED TO MSFN

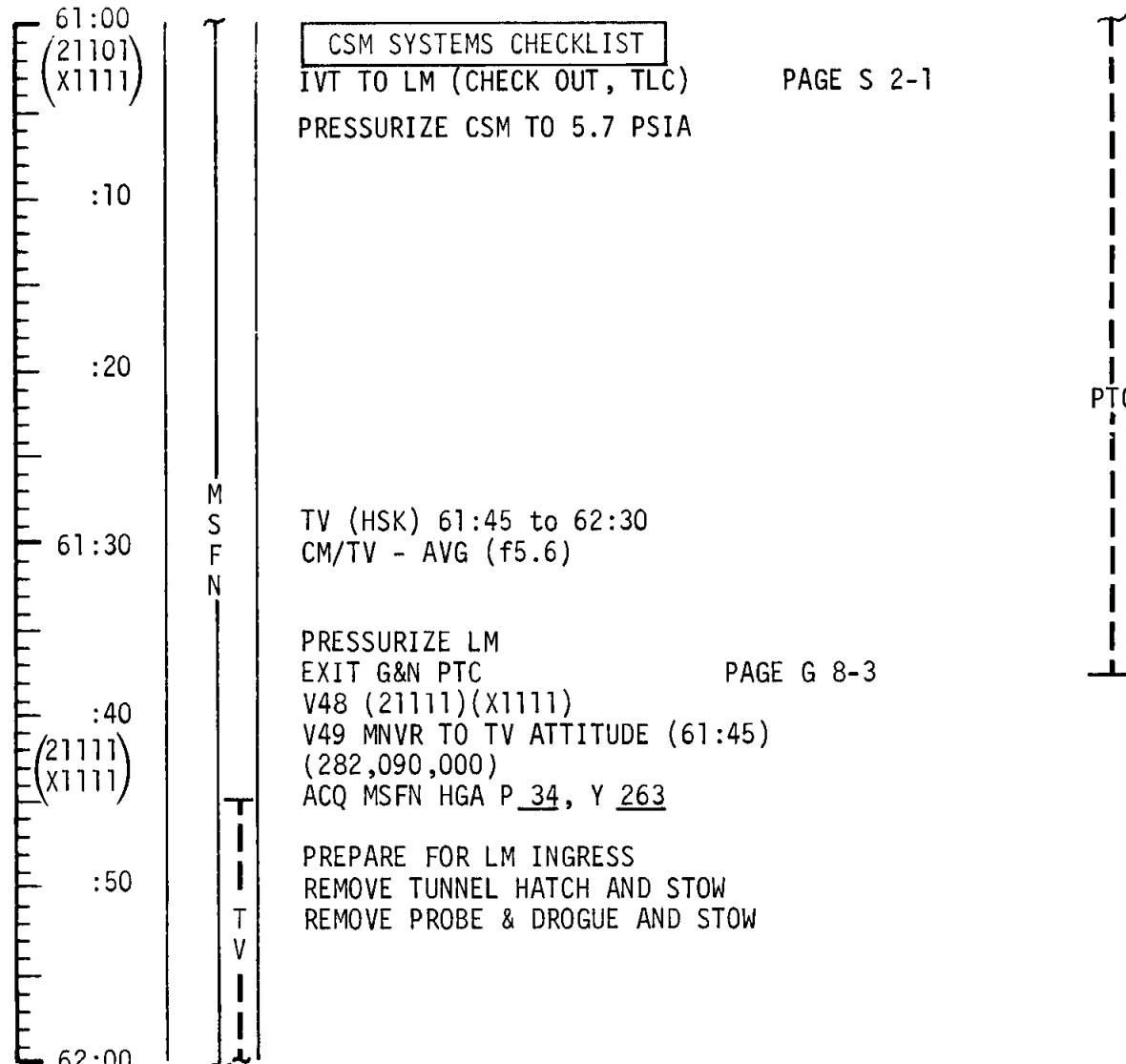
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	60:00 - 61:00	3/TLC	3-59

MCC-M

0323 CST

FLIGHT PLAN

NOTES

UPLINK TO CSM
 ΔH (IF REQUIRED)

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

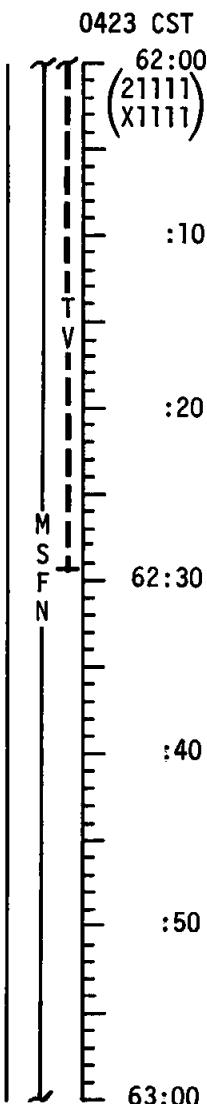
CSM

CMP

REPORT: DOCKING
TUNNEL INDEX ANGLE

OMNI_C

SECURE HGA,
HGA TRACK-MAN,
HGA P -52, Y 270



LM

CDR

ACTIVATION CHECKLIST

LMP

PAGE 1-1

IVT TO LM

ENTRY STATUS CHECK

IVT TO LM

HOUSEKEEPING

HOUSEKEEPING

MCC-H

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

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

MSC Form 1674 (OT) (June 69)

FLIGHT PLANNING BRANCH

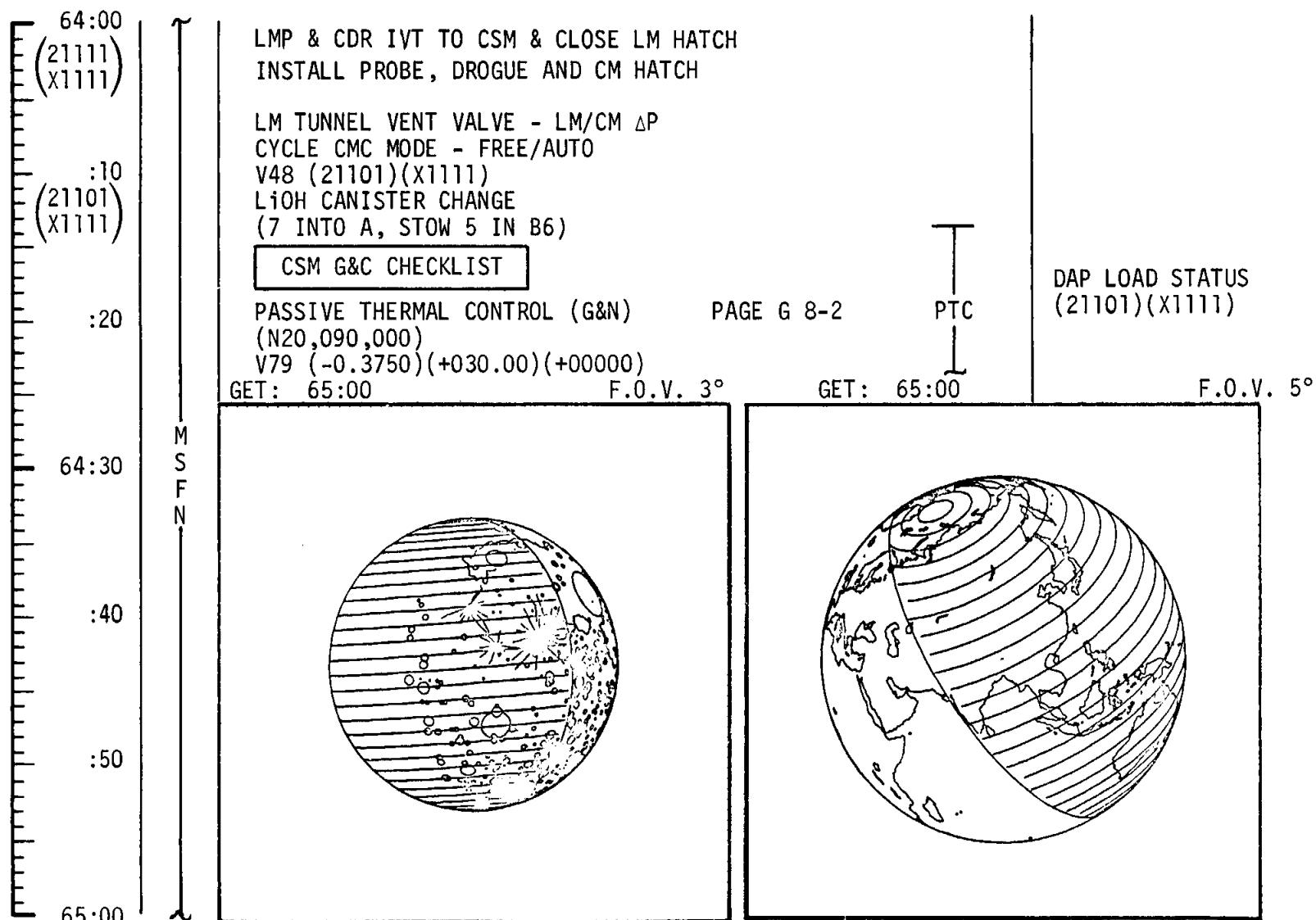
MCC-H

0623 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM QUADS TO ENABLE FOR PTC SPINUP



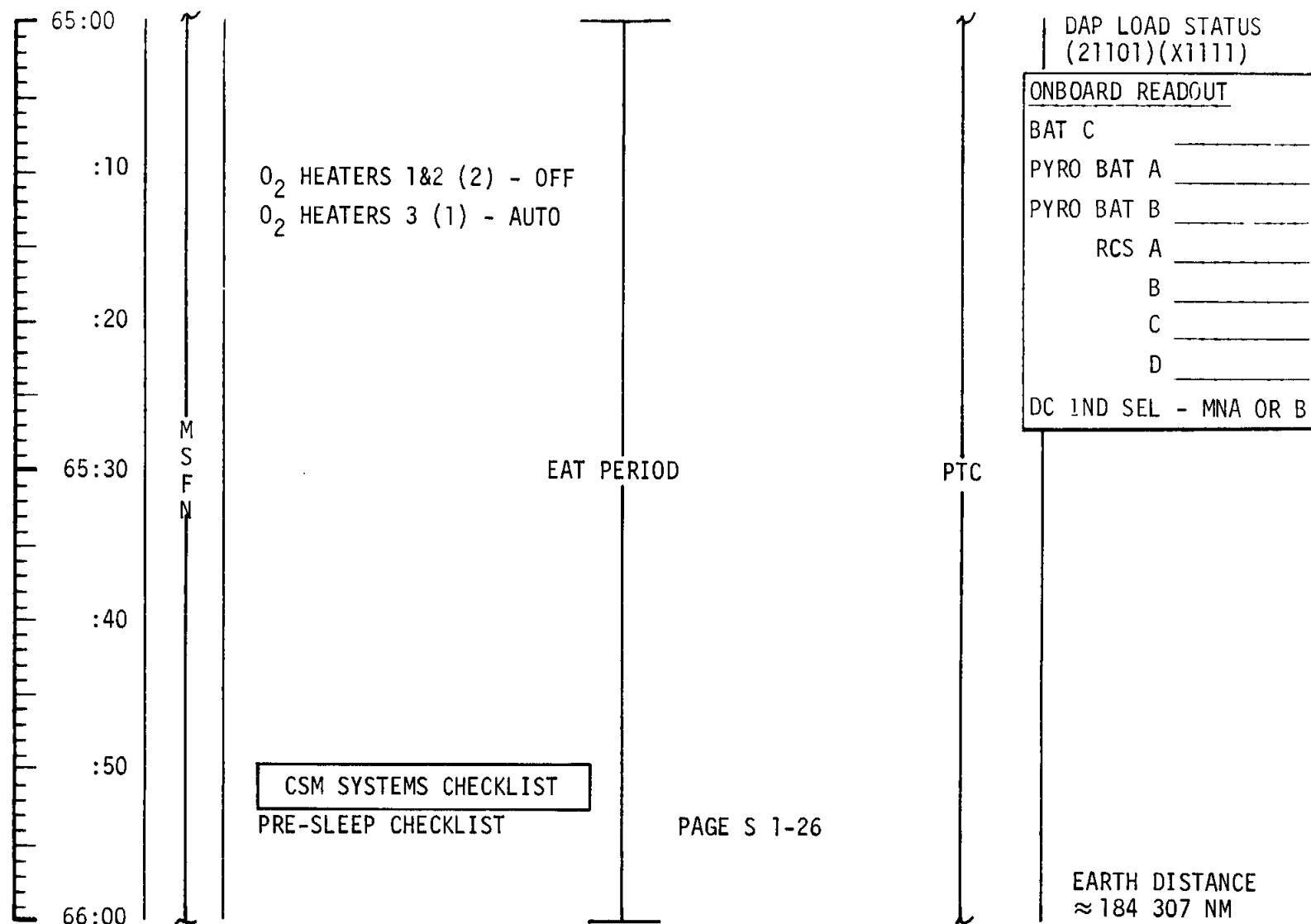
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	64:00 - 65:00	3/TLC	3-63

MCC-H

0723 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

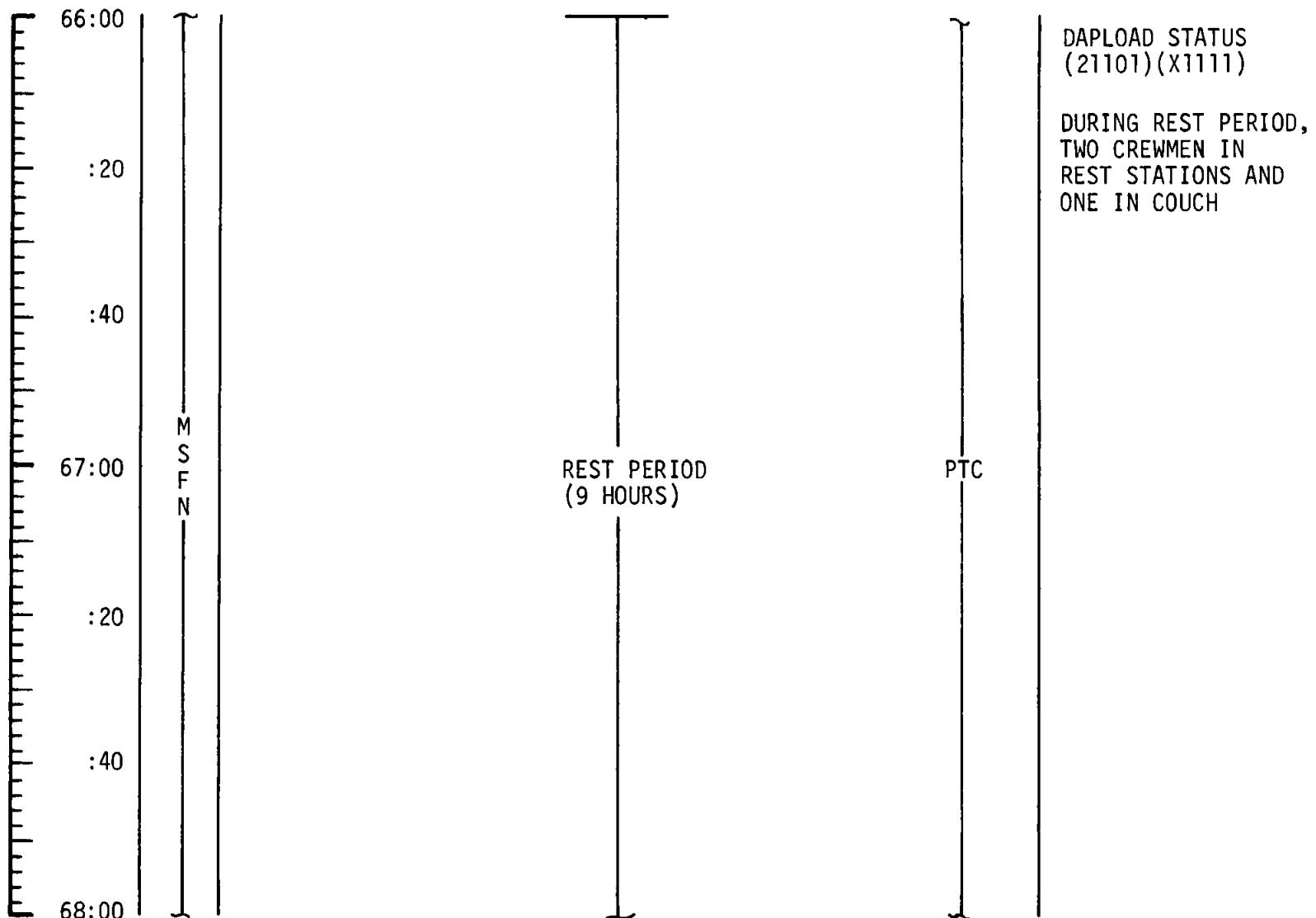
NASA — MSC

MCC-H

0823 CST

FLIGHT PLAN

NOTES



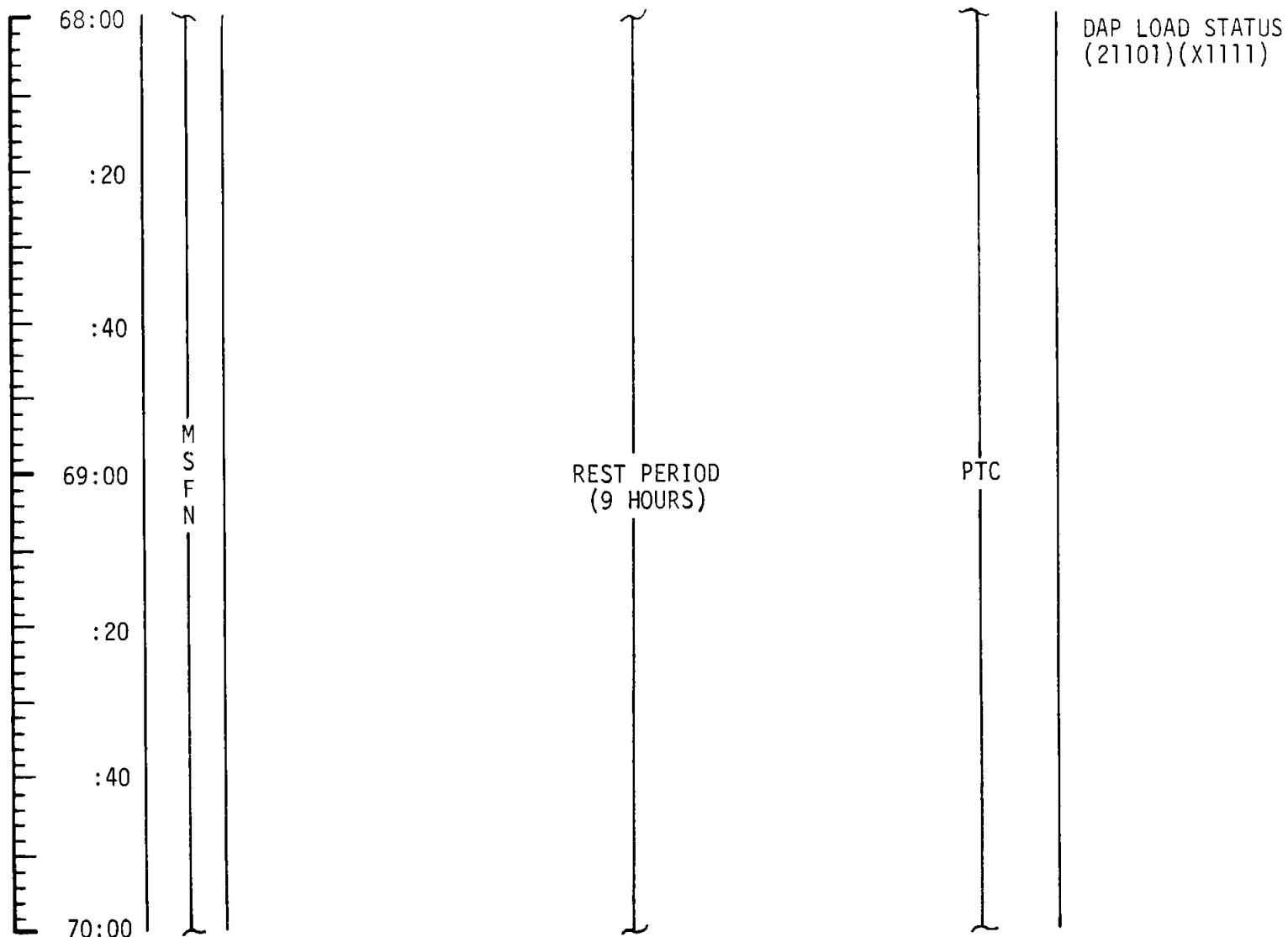
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	66:00 - 68:00	3/TLC	3-65

MCC-H

1023 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

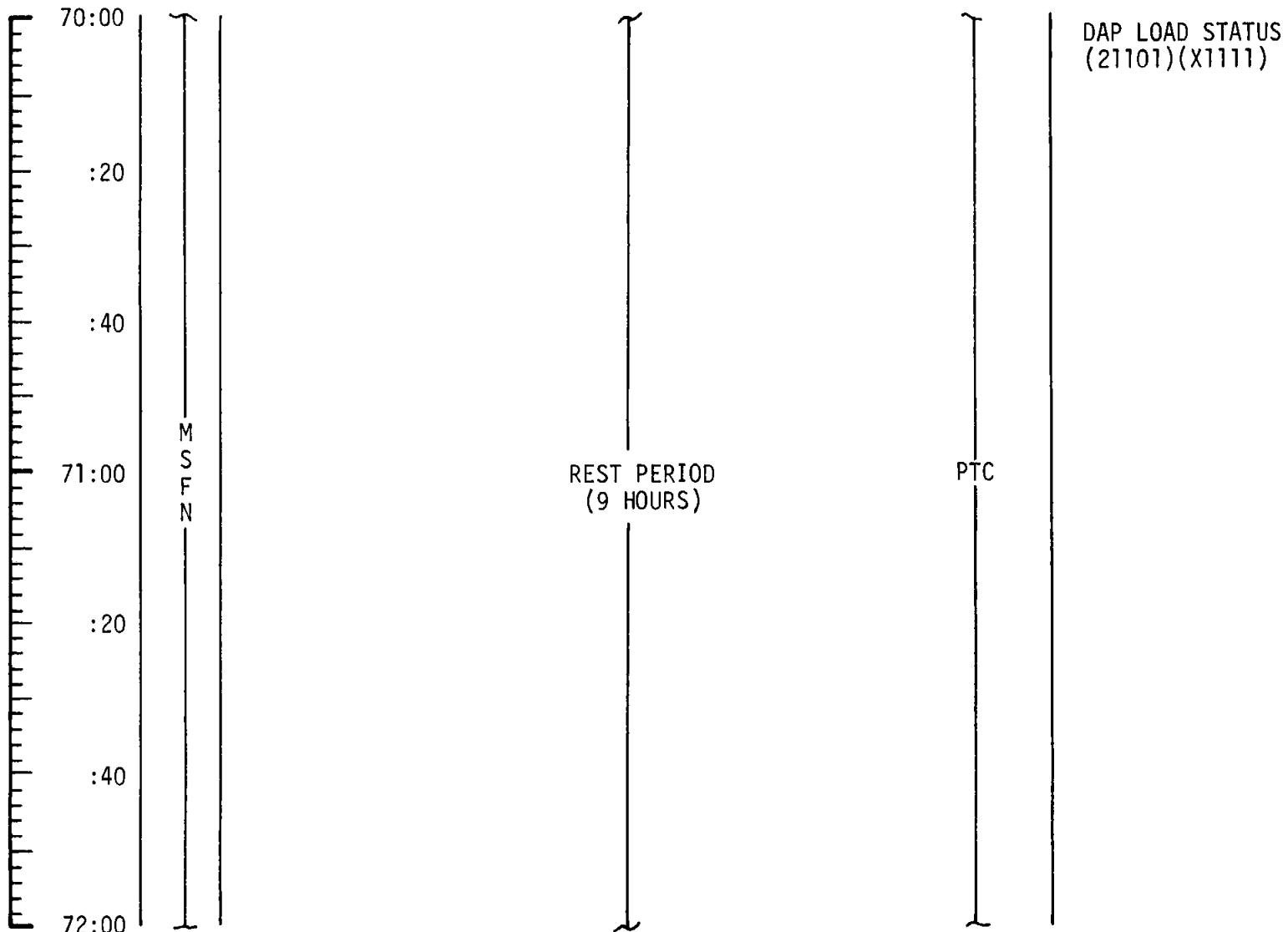
NASA — MSC

MCC-H

1223 CST

FLIGHT PLAN

NOTES



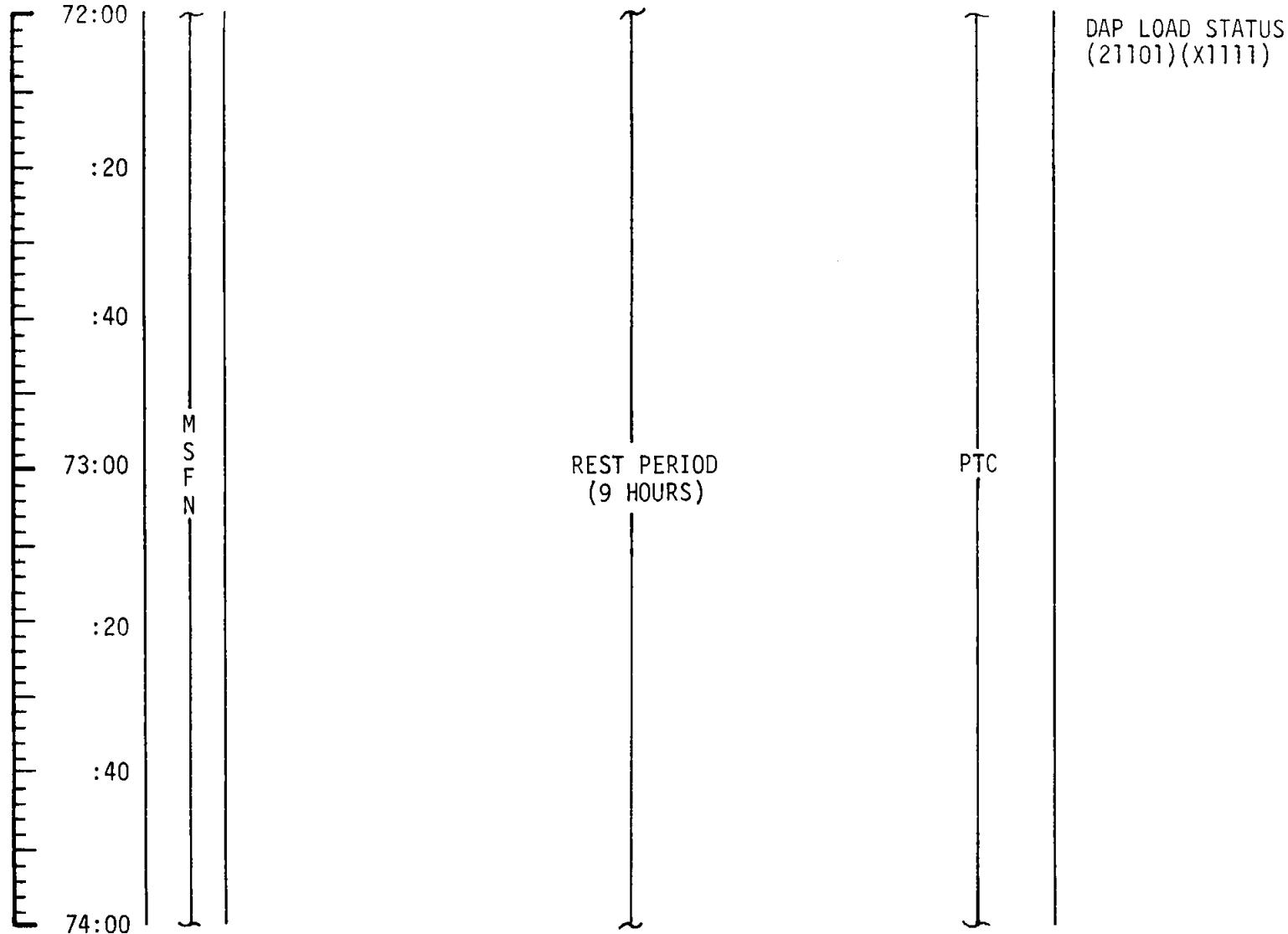
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	70:00 - 72:00	3/TLC	3-67

MCC-H

1423 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

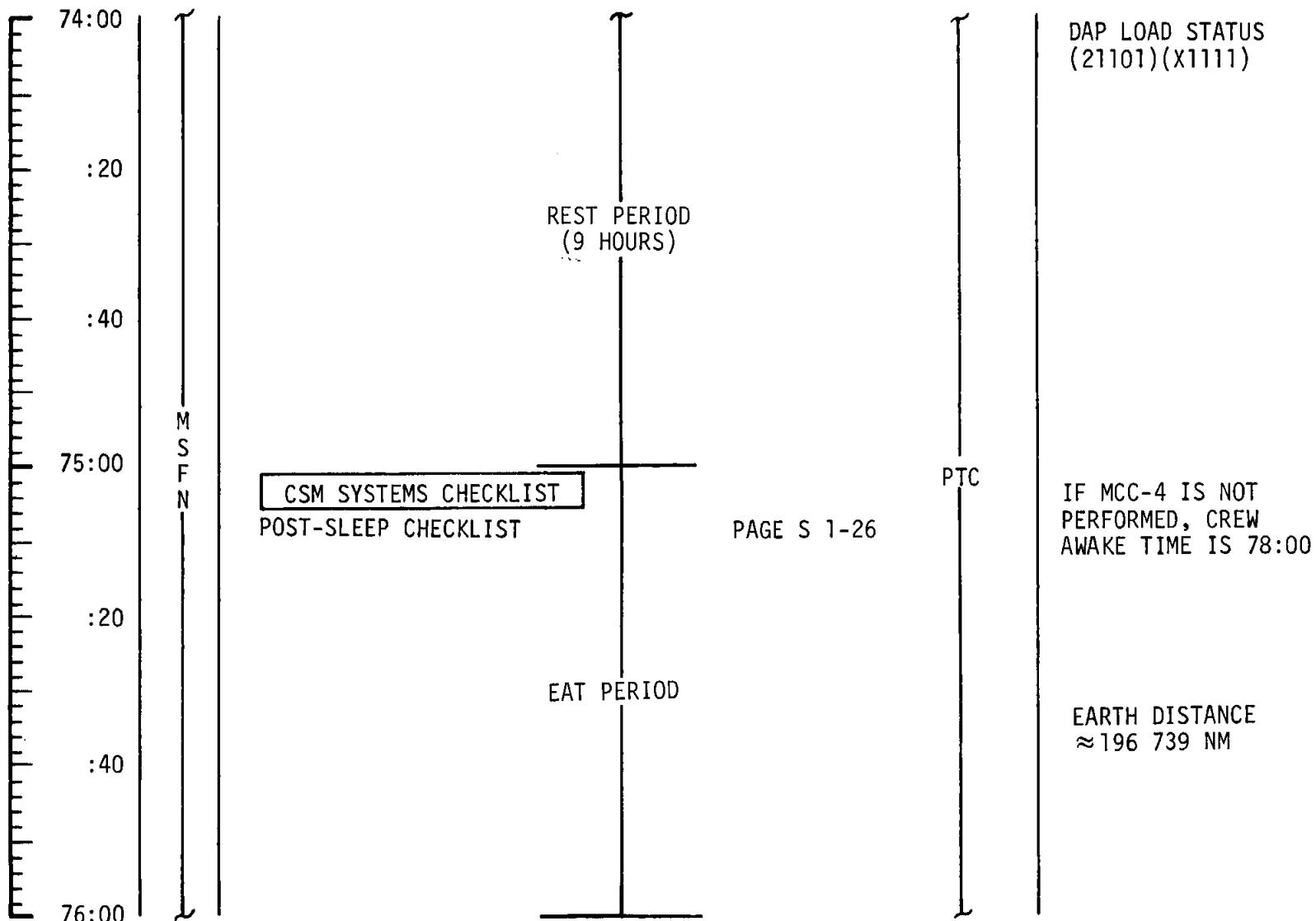
NASA — MSC

MCC-H

1623 CST

FLIGHT PLAN

NOTES



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

MCC-H

1823 CST

FLIGHT PLAN

NOTES

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

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

76:00 :10 :20
76:30 :40 :50
(21101)
(X1111)
77:00

M S F N

CSM G&C CHECKLIST

ΔV TEST & NULL BIAS CHECK
REPORT: BIAS

PAGE G 2-5

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

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

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

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

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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FLIGHT PLAN

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

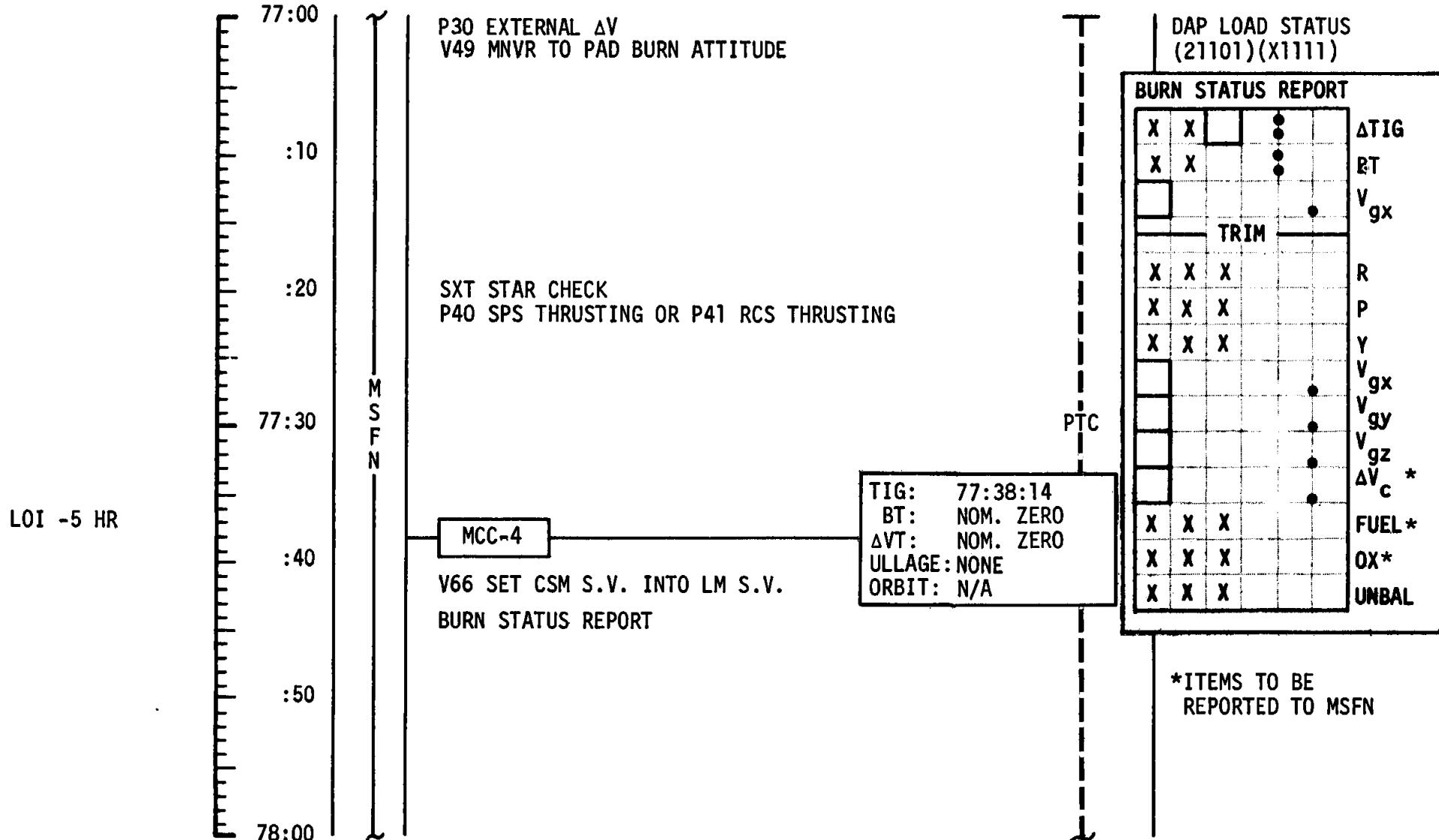
TABLE 3-5
3-72

MCC-H

1923 CST

FLIGHT PLAN

NOTES



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

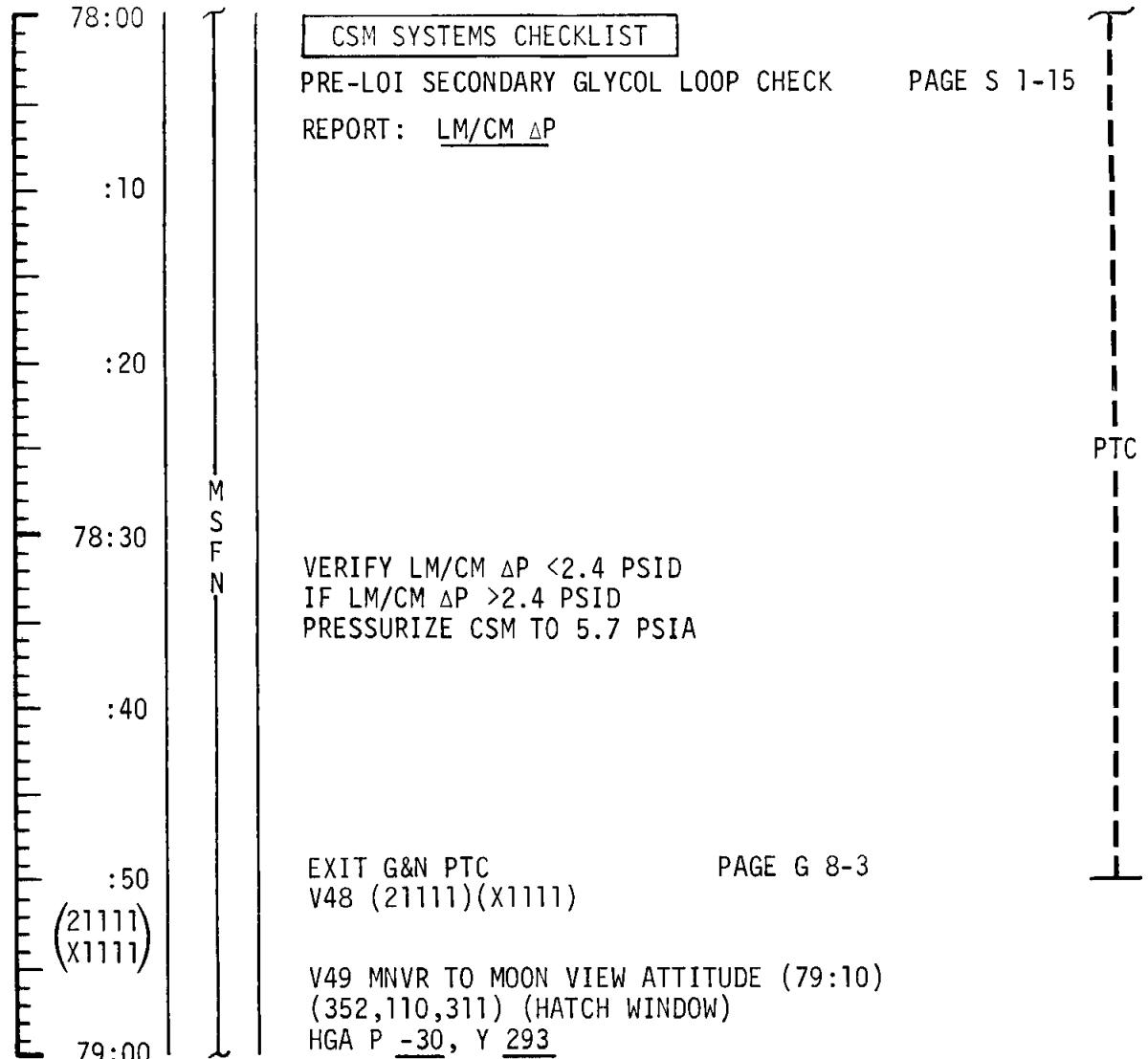
MCC-H

2023 CST

FLIGHT PLAN

NOTES

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

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
 $\approx 200\ 444$ NM

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

MCC-H

2123 CST

FLIGHT PLAN

NOTES

79:00
 E (21111)
 X11111

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 STARS _____,
 OPTION 3 REFSMMAT SA _____,
 (PTC ORIENT) TA _____,

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN
 OPTION 1 PREFERRED
 (LDG SITE ORIENT)

SC CONT - CMC
BMAG (3) - RATE 2

TEI 4 PAD
 ASSUMES NO DOI

P52 IMU REALIGN
N71: _____
N05: _____
N93:
X: _____
Y: _____
Z: _____
GET: _____ : _____

:10

:20

79:30 M S F N

:40

:50

80:00

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

NOTES

80:00
 (21111)
 (X1111)

:10

:20

80:30

:40

:50

81:00

M
S
F
N

CSM G&C CHECKLIST
 ΔV TEST & NULL BIAS CHECK
 REPORT: BIAS

PAGE G 2-5

LUNAR PHOTOGRAPHY
 AT CREW OPTIONCM /EL/80 OR 250/BW
 $(f5.6, 250, \infty)$ (10 FR)
 MAG (P) __, FR # __CM /EL/80 OR 250/CEX
 $(f5.6, 250, \infty)$ (10 FR)
 MAG (L) __, FR # __

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

MCC-H

2323 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
LOI MNVR PAD
MAP UPDATE REV 1

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

81:00
(21111)
(X1111)

:10

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)
 O₂ HEATERS 1&2 (2) - AUTO

M
S
F
N

:20

- O₂ HEATERS 3 (1) - OFF
 CYCLE CMC MODE - FREE/AUTO
 V48 (21101) (X1111)
 P30 EXTERNAL ΔV

81:30
(21101)
(X1111)

:40

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

ACQ MSFN OMNI C

:50

82:00

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.

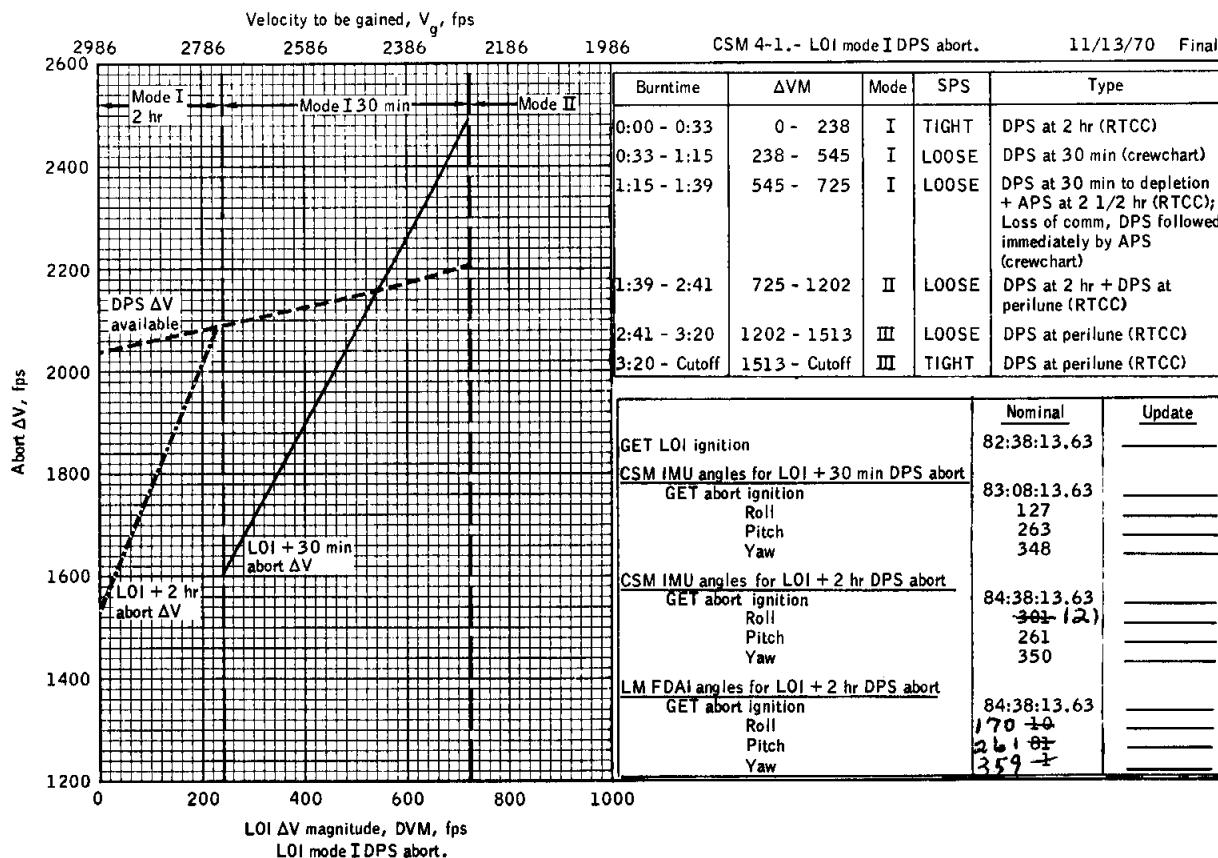
THE APPROXIMATE TIME OF CROSSOVER IS 04:06 TO 04:10 INTO THE LOI BURN.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	81:00 - 82:00	4/TLC	3-77

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



MCC-H

0023 CST

FLIGHT PLAN

NOTES

RECORD VG_{IMU} DATA82:00
(21101
X1111)

T

SXT STAR CHECK
P40 SPS THRUSTINGM
S
F
N

:10

GO/NO-GO FOR LOI

:20

GO/NO-GO FOR LOI

82:30

REV 1

:40

T

LOI

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

(21111
X1111)

:50

T

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

DUMP DSE

83:00

ACQ MSFN HGA P -15, Y 180
BURN STATUS REPORTTIG: 82:38:14
BT: 6 MIN 06.6 SEC
 Δ VT: 2,986.0 FPS
ULLAGE: NONE
ORBIT: 170x57.1 NM

BURN STATUS REPORT

X	-	□	•	Δ TIG**
X	X	-	•	BT **
□	-	-	•	V _{gx}
TRIM				
X	X	X	-	R
X	X	X	-	P
X	X	X	.	Y
□	-	-	•	V _{gx} ***
□	-	-	•	V _{gy} ***
□	-	-	•	V _{gz} ***
□	-	-	•	Δ V _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
LONG -33.250

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	Change B FINAL (JAN)	Dec 11, 1971 DECEMBER 2, 1970	82:00 - 83:00	4/1	3-79

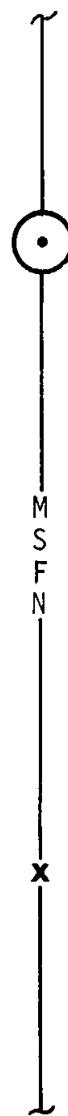
MCC-H

0123 CST

FLIGHT PLAN

NOTES

83:00
 E (21111)
 X (X1111)



:10
 ESTABLISH ORB RATE TO OBSERVE LUNAR SURFACE
 V79 (-0.0507)
 (+005.00)
 (+00001)
 PRO TO START PITCH RATE (000, 215/176,000)

:20
 (-0.0507)
 (+005.00)
 M
 S
 F
 N

EAT PERIOD

83:30
 :40
 :50
 84:00

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

0223 CST

FLIGHT PLAN

NOTES

84:00
 (21111)
 (X1111)

M
S
F
N

:10

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

:20

P52 IMU REALIGN
 OPTION 3 REFSMMAT
 (LDG SITE ORIENT)

REPORT: GYRO TORQUING ANGLES

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

84:30

CSM SYSTEMS CHECKLIST

COMM MODE - NORMAL LUNAR CONFIGURATION

PAGE S 1-23

(21101)
 (X1111)
 :40

H₂ PURGE LINE HEATERS ON

CYCLE CMC MODE - FREE/AUTO

V48 (21101)(X1111)

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

PERICYNTHION +2 HR

REV 2

:50

H₂ & O₂ FUEL CELL PURGE

WASTE WATER DUMP

H₂ PURGE LINE HEATERS - OFF

85:00

P52 IMU REALIGN

N71: _____

N05: _____

N93:

X _____.

Y _____.

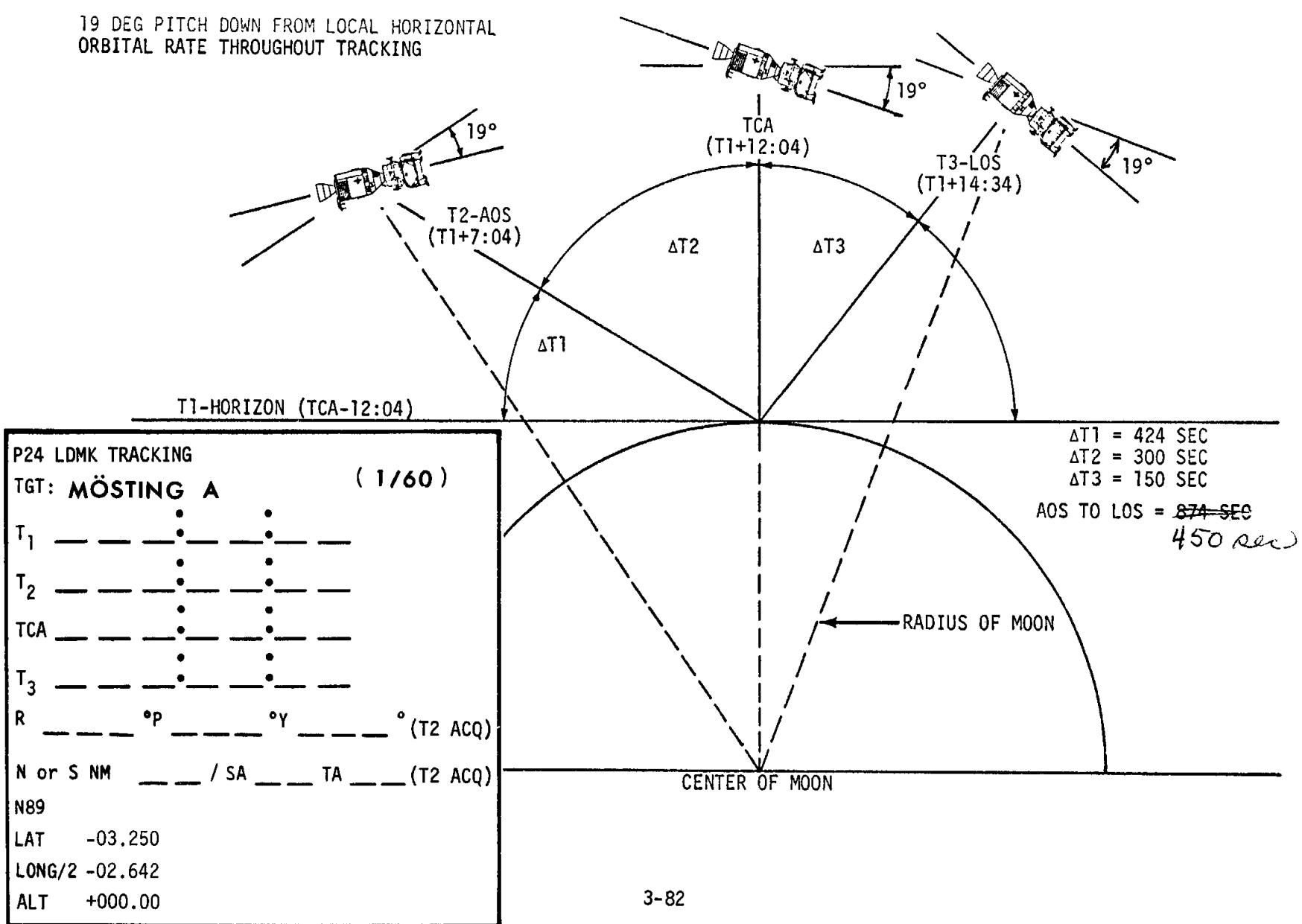
Z _____.

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



MCC-H

0323 CST

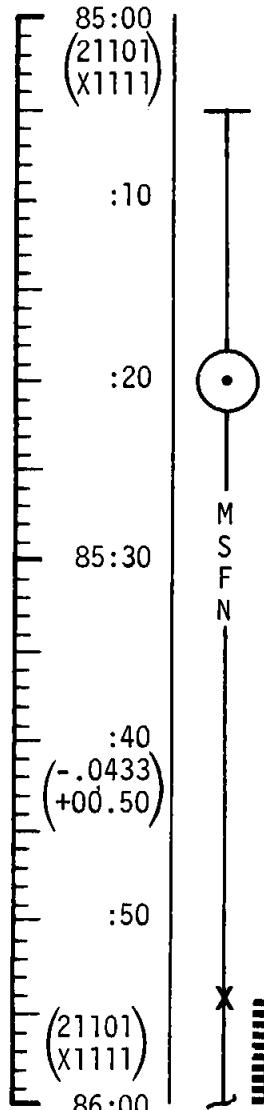
FLIGHT PLAN

NOTES

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

RECORD PCM LBR ON
DSE DURING P24

UPDATE TO CSM
DOI MNVR PAD



ACQ MSFN OMNI C

CSM G&C CHECKLIST

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

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)

TRACK LDMK MÖSTING A
30 SEC BETWEEN MARKSSTART DAC AT T2 -1 MIN
STOP DAC AT T3

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

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

FLIGHT PLAN

DOI BURN TABLE

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

*IF OVERTURN IS >2.2 FPS PITCH 180 AND TRIM

TABLE 3-7
3-84

MCC-H

0423 CST

FLIGHT PLAN

NOTES

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

	86:00			CSM SYSTEMS CHECKLIST	
	(21101)			C&W SYSTEM OPERATIONAL CHECKLIST	
	(X1111)			CM RCS MONITORING CHECK	
				SPS MONITORING CHECK	
				ECS MONITORING CHECK	
		M	S	PAGE S	1-17
	:10	F	N	PAGE S	1-1
	:20			PAGE S	1-1
	86:30			PAGE S	1-5
	:40				
	:50				
	87:00				

- C&W SYSTEM OPERATIONAL CHECKLIST
 CM RCS MONITORING CHECK
 SPS MONITORING CHECK
 ECS MONITORING CHECK
- 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

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

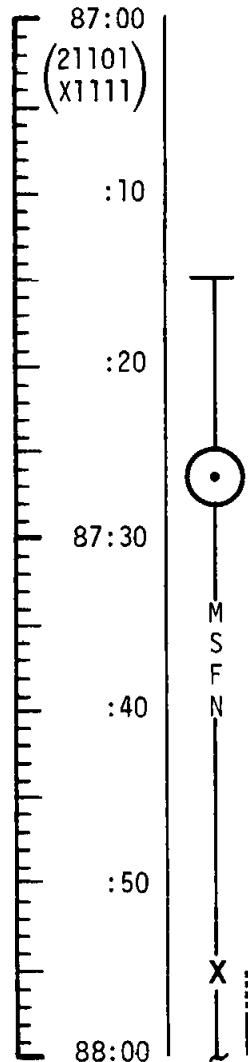
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	86:00 - 87:00	4/2-3	3-85

MCC-H

0523 CST

FLIGHT PLAN

NOTES

STAY/BALLOUT
DUMP DSEV49 MNVR TO BAILOUT BURN ATTITUDE (87:10)
(325,063,000)

* * * * *

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 *

* * * * *

ACQ MSFN HGA P-39, Y325
BURN STATUS REPORT

IF REQ'D

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

V49 MNVR TO LANDMARK OBSERVATION ATTITUDE (87:45)
(000,292,000) OMNI DP24 ORB NAV
MONITOR LDMK
NO MARKS

LDMK H-3

T HOR: ____ : ____ : ____

TCA -20 SEC: ____ : ____ : ____

LAT: -03.691

LONG/2: -03.771

ALT: +00000

BURN STATUS REPORT		NOTES
X	X	ΔTIG**
X	X	BT*
		V gx
	TRIM	R
X	X	P
X	X	Y
		V gx ***
		V gy ***
		V gz ***
		ΔV c *
X	X	FUEL *
X	X	OX *
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

MCC-H

0623 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
MAP UPDATE REV 4

88:00
21101
(X1111)

M
S
F
N

:10

P52 IMU REALIGN
OPTION 3 REFSMMAT
(LDG SITE ORIENT)

:20

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

88:30

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

:40

REV 4

:50

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
V48 (21101)(X1111) Delete

(21101) Delete
(X1111) Delete
89:00

MAP UPDATE REV 4

LOS : _____:_____:

180° : _____:_____:

AOS : _____:_____:

P52 IMU REALIGN

N71: _____, _____

N05: _____, _____

N93:

X _____.

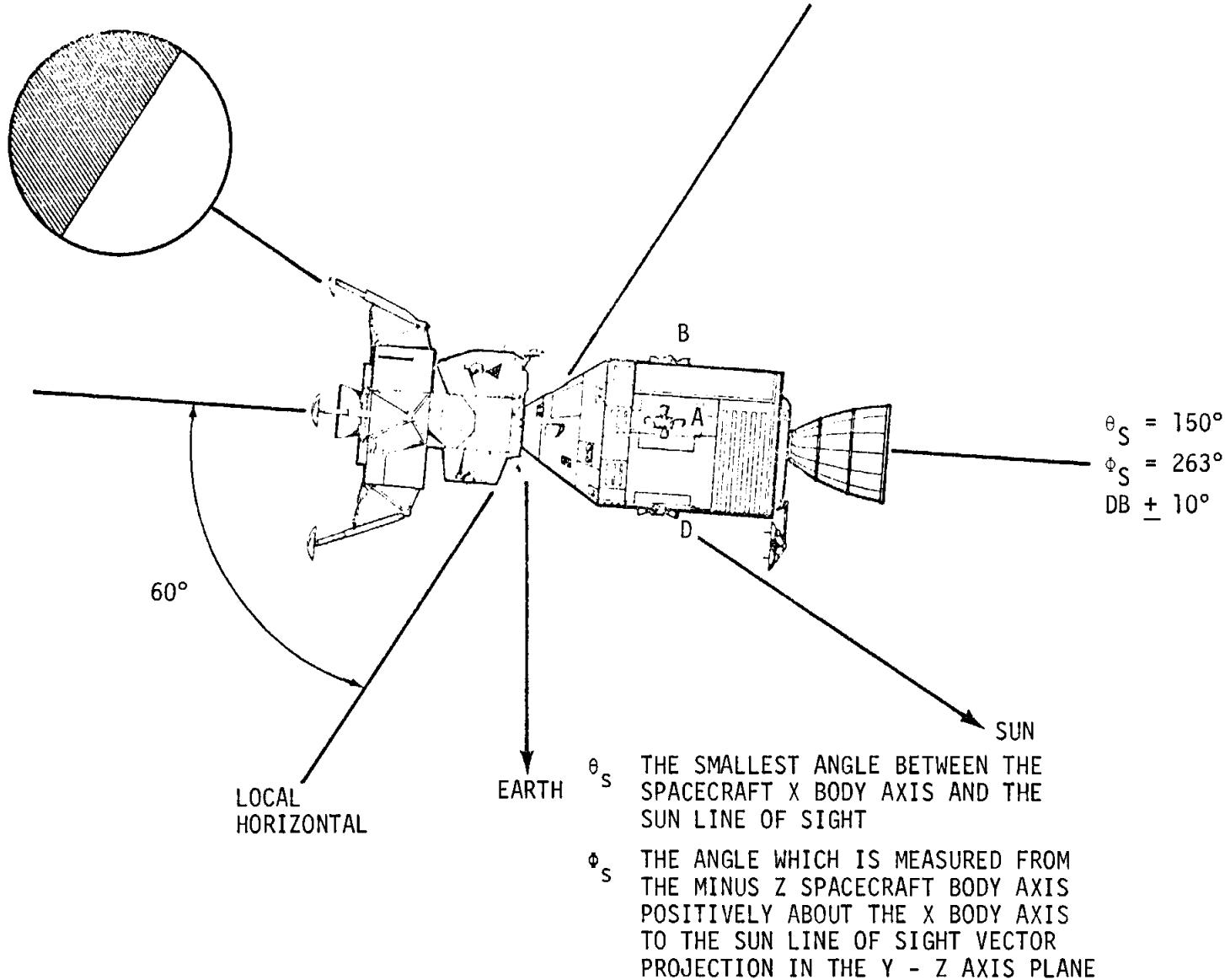
Y _____.

Z _____.

GET _____:_____:

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	Change 3 Final (JAN)	December 2, 1970	88:00 - 89:00	4/3-4	3-87

LUNAR ORBIT REST PERIOD ATTITUDE



MCC-H

0723 CST

FLIGHT PLAN

NOTES

DUMP DSE

UPDATE TO CSM

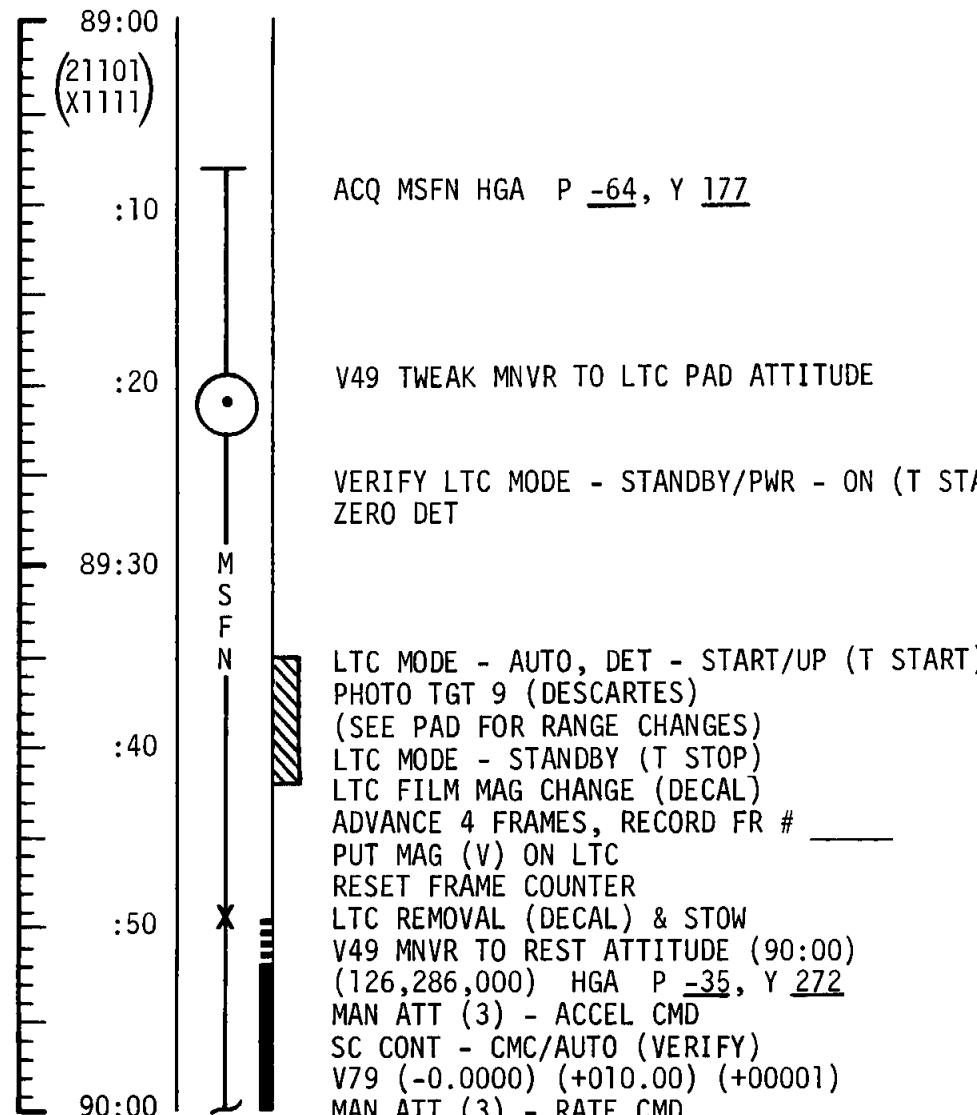
LTC PHOTO PAD

TEI 12 PAD

MAP UPDATE REV 10

UPLINK TO CSM

CSM S.V. & V66



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 : _____ : _____ : _____

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	89:00 - 90:00	4/4	3-89

MCC-H

0823 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
TRAJECTORY STATUS90:00
(-0.000)
(+010.00)T
M
S
F
N

:10

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)

:20

90:30

EAT PERIOD

REST ATT

:40

REV 5

:50

91:00

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

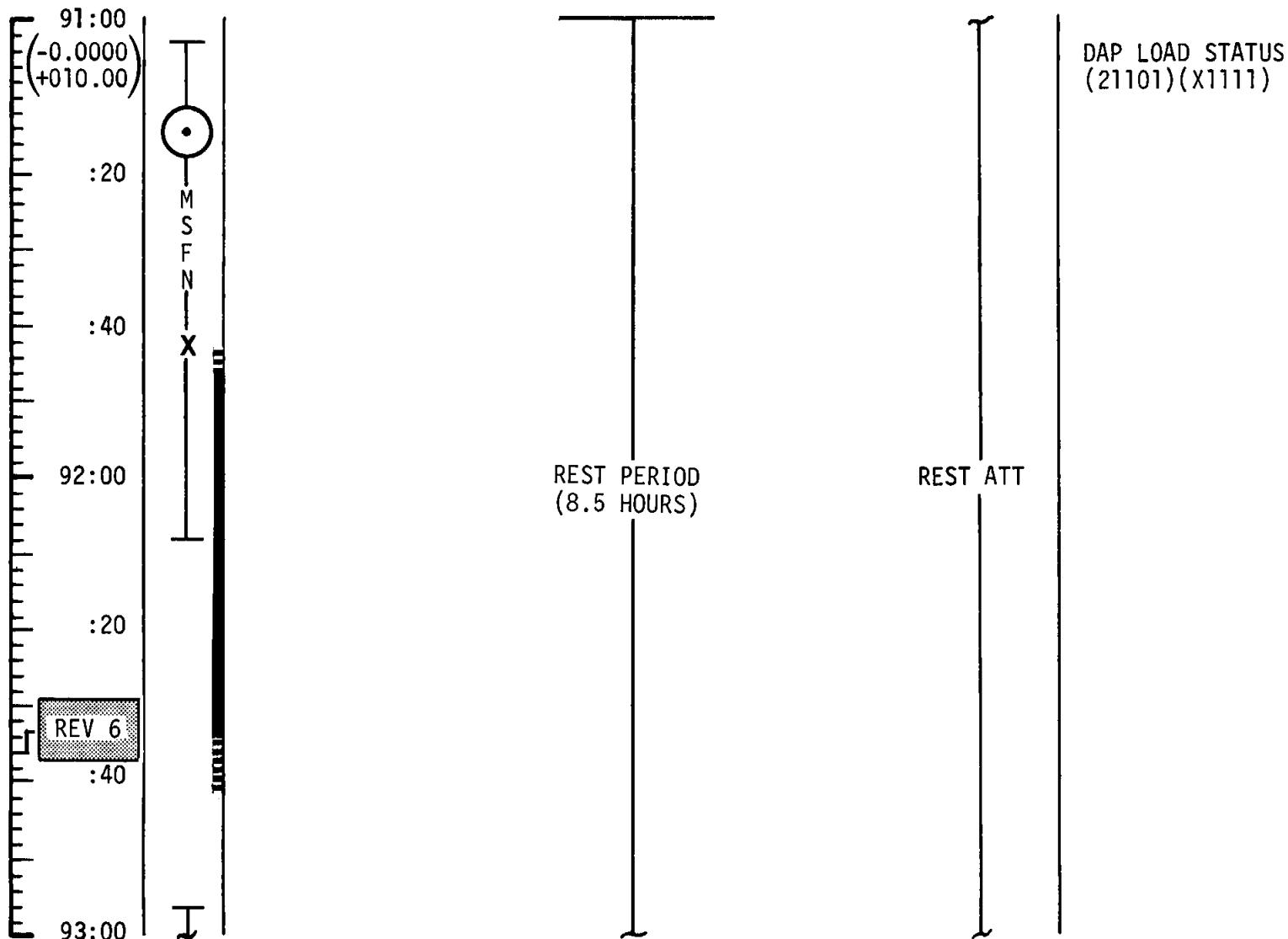
MCC-H

0923 CST

FLIGHT PLAN

NOTES

DUMP DSE



DUMP DSE

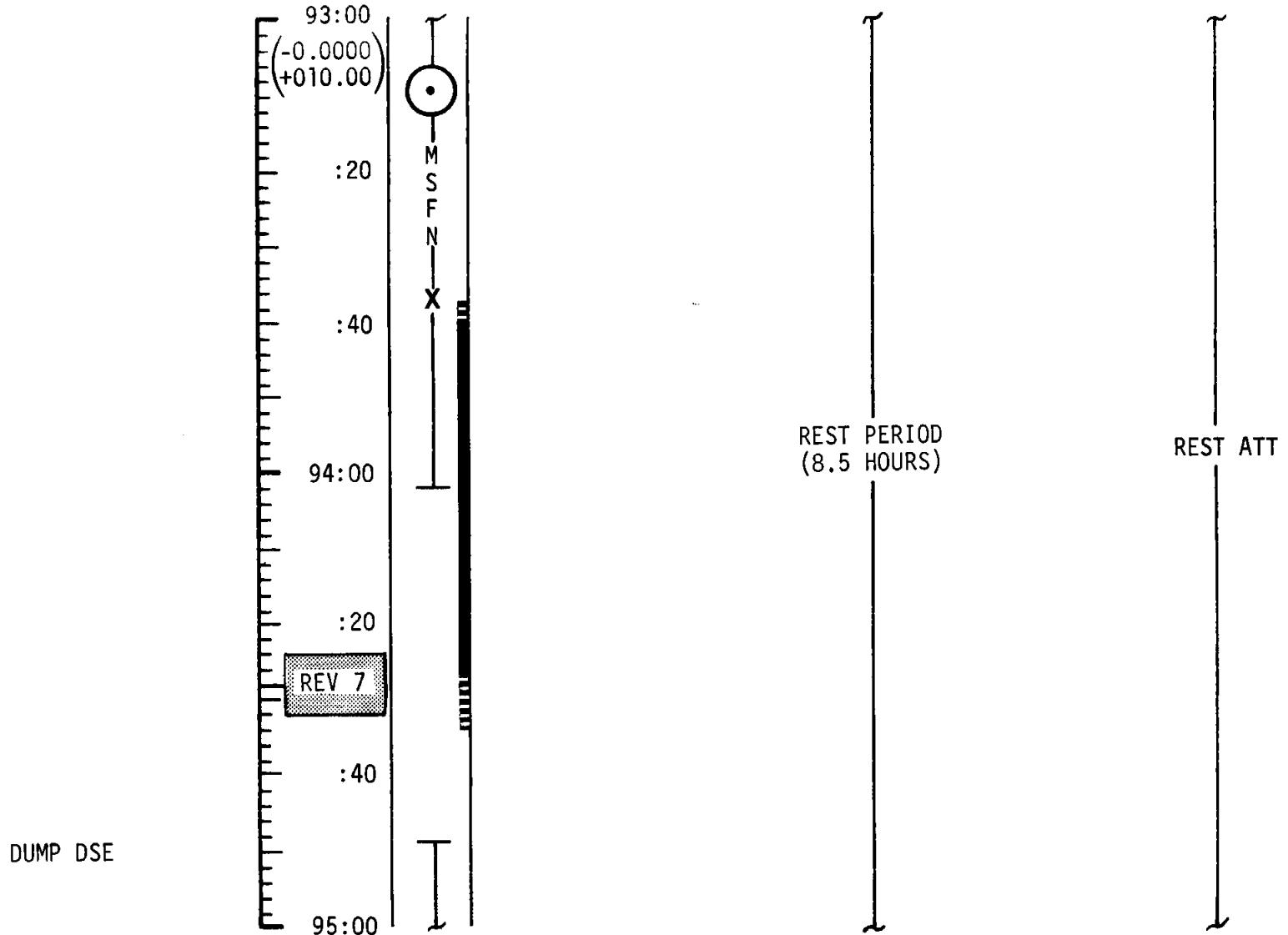
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	91:00 - 93:00	4/5-6	3-91

MCC-H

1123 CST

FLIGHT PLAN

NOTES

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

MSC Form 28 (May 68)

FLIGHT PLANNING BRANCH

NASA—MSC

MCC-H

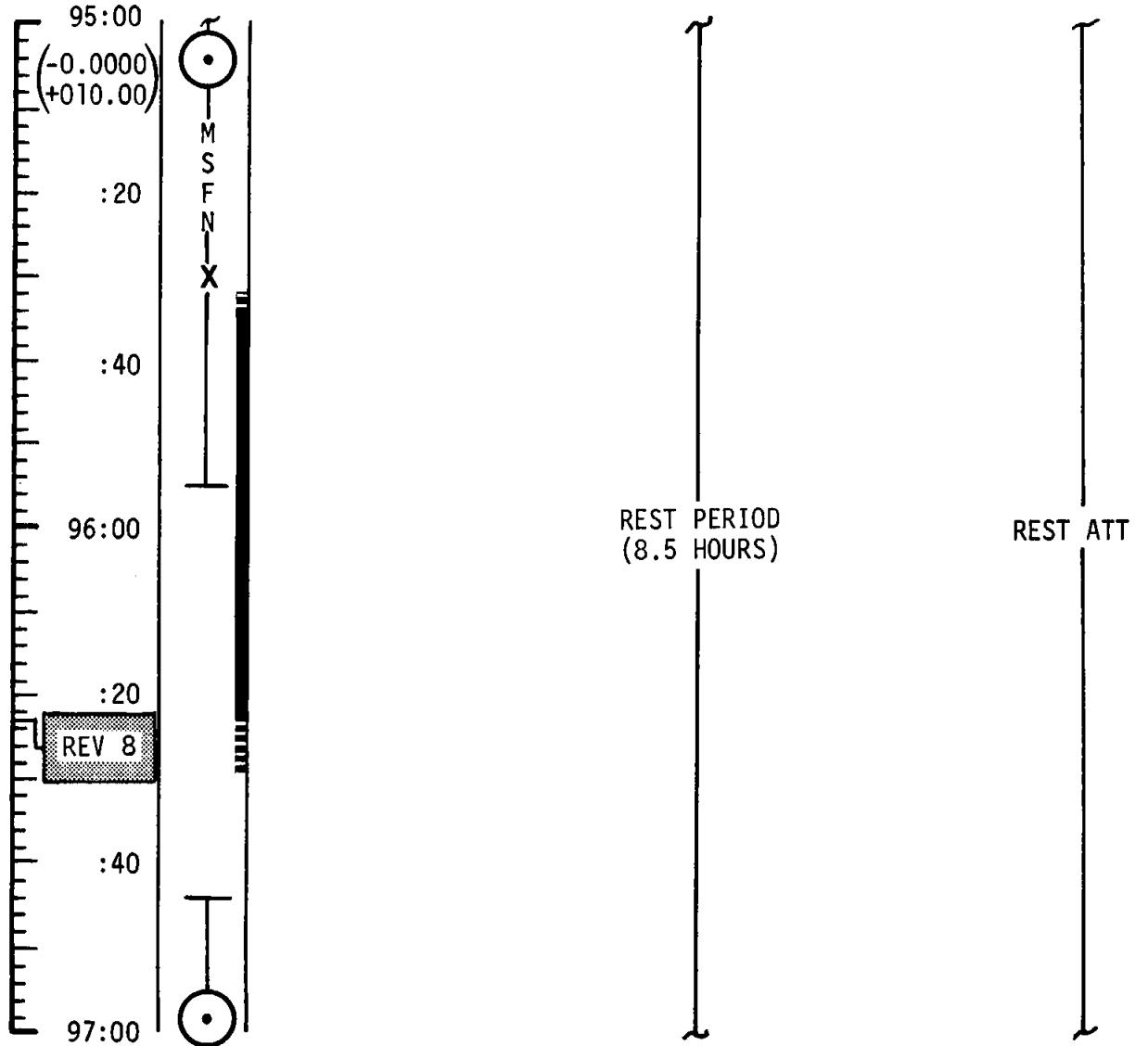
1323 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

DUMP DSE

REST PERIOD
(8.5 HOURS)

REST ATT

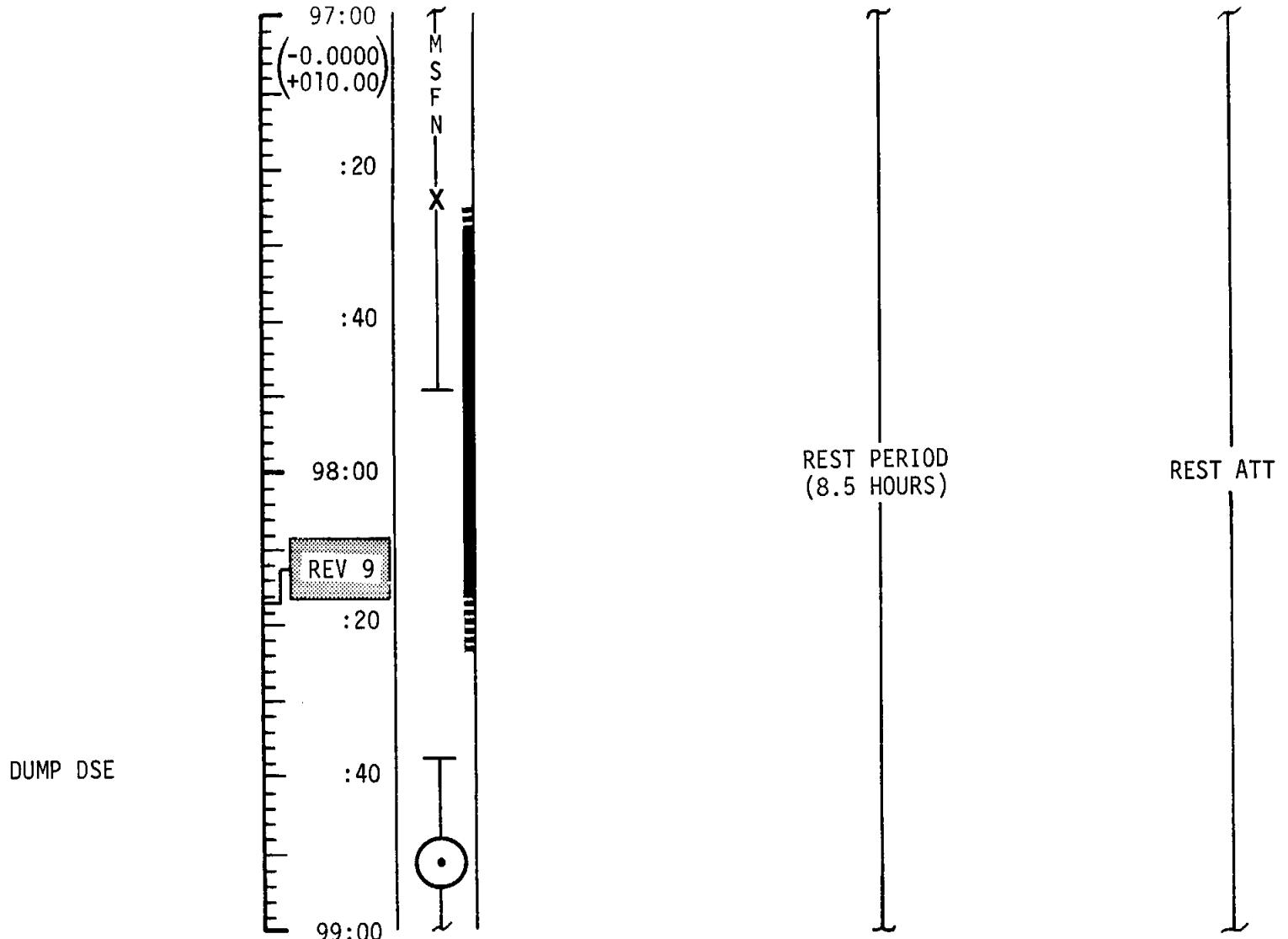
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	95:00 - 97:00	4/7-8	3-93

MCC-H

1523 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(21101)(X1111)

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

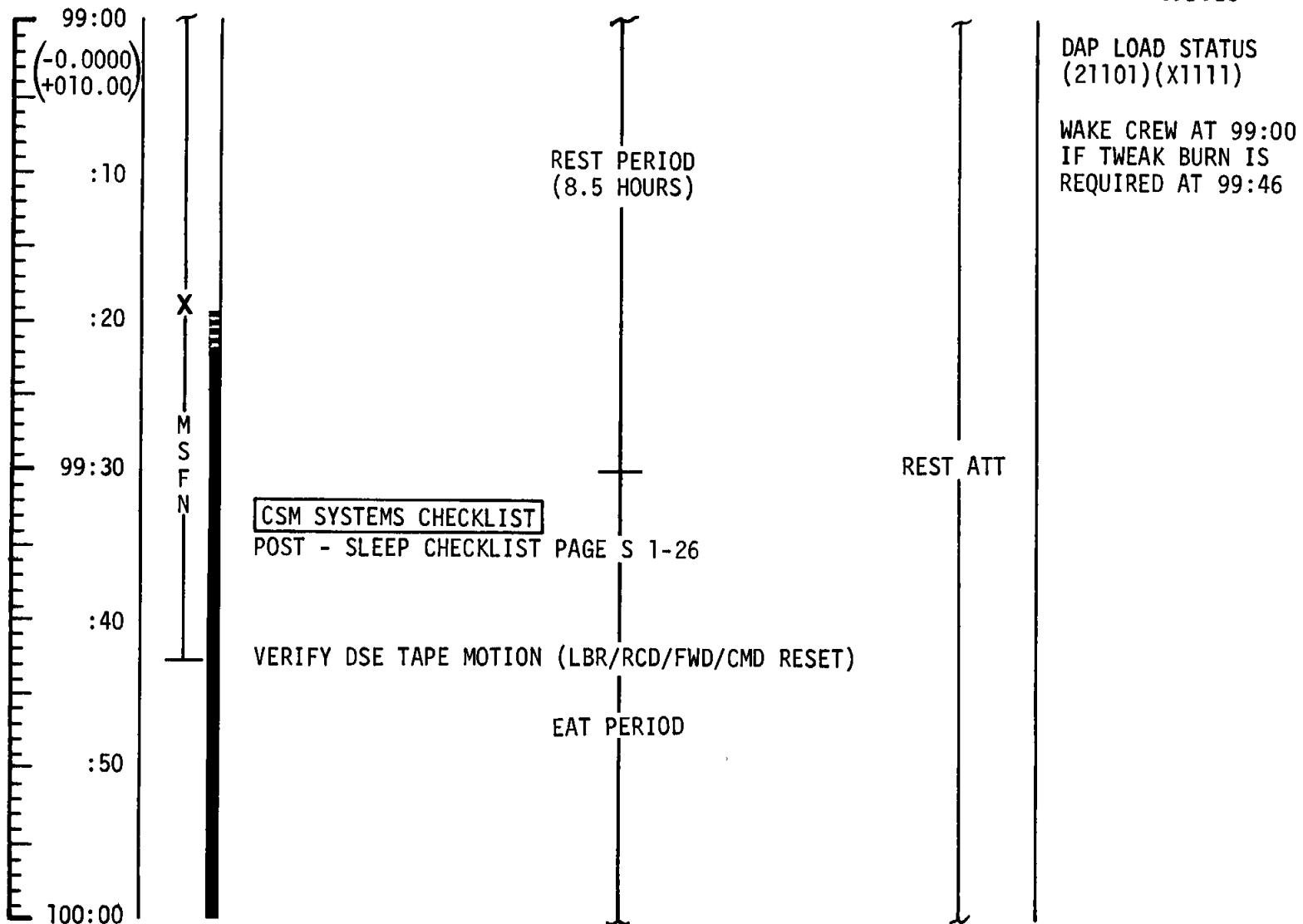
NASA — MSC

MCC-H

1723 CST

FLIGHT PLAN

NOTES



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

<p>100:00 (-.0000) (+10.00)</p> <p>REV 10</p> <p>100:10</p> <p>100:20</p> <p>100:30</p>	<p>SET UP TV (101:00)</p> <p>DAP LOAD STATUS (21101) (X1111)</p> <p>CSM CONSUMABLES UPDATE</p> <p>GET: _____</p> <p>RCS TOTAL _____</p> <p>QUAD A _____ B _____</p> <p>C _____ D _____</p> <p>H₂ TANK 1 _____ 2 _____</p> <p>O₂ TANK 1 _____ 2 _____</p> <p>3 _____</p> <p>EAT PERIOD</p> <p>REST ATTITUDE</p> <p>CSM TO LM TRANSFER ITEMS:</p> <ul style="list-style-type: none"> 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 	<p>100:30 (-.0000) (+10.00)</p> <p>ACQ MSFN HGA P <u>-34</u>, Y <u>266</u></p> <p>MSFN: DUMP DSE</p> <p>LMP DON LCG & PGA WITHOUT HELMET AND GLOVES</p> <p>100:40</p> <p>MSFN UPLINK: CSM S.V. AND V66 DESIRED ORIENT (LDG SITE) LIFT-OFF TIME (IF REQ'D)</p> <p>NOTE: LIFT-OFF TIME WILL BE UPDATED IF THE TIME OF REV 20 MERIDIAN CROSSING DIFFERS MORE THAN ± 1 MIN FROM 119:39:13</p> <p>100:50</p> <p>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</p> <p>REST ATTITUDE</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2">T EPHEM UPDATE</th> </tr> <tr> <th>OID</th> <th>LOAD B</th> </tr> </thead> <tbody> <tr> <td>03</td> <td>_____</td> </tr> <tr> <td>04</td> <td>_____</td> </tr> <tr> <td>05</td> <td>_____</td> </tr> </tbody> </table> <p>SYNCHRONIZE MISSION TIMER TO CMC (IF REQ'D) VO5NOTE, 1706 E</p> <p>VERIFY LM/CM ΔP < 2.4 IF ΔP > 2.4 PRESSURIZE CSM TO 5.7 REPORT ΔP TO MSFN</p> <p>CDR DON LCG & PGA WITHOUT HELMET AND GLOVES</p> <p><i>CM5:TV - AVG (f22) TV-(005) 101:00-101:00 Delete</i></p>	T EPHEM UPDATE		OID	LOAD B	03	_____	04	_____	05	_____
T EPHEM UPDATE												
OID	LOAD B											
03	_____											
04	_____											
05	_____											

MISSION	EDITION	DATE	PAGE
APOLLO 14 <i>Chg 1</i>	CHANGE 1 (JAN)	DECEMBER 29, 1970	3-96

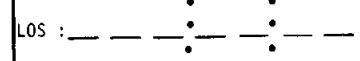
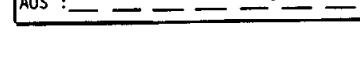
Jan 18, 1971

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CSM FLIGHT PLAN

Delete TV Show

<p>101:00 (-.0000) (+10.00)</p> <p><u>REST ATTITUDE</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="4">16MM & 70MM CAMERA MAGAZINES USED FROM 100:00 TO 120:00</th> </tr> <tr> <th>CAMERA</th> <th>MAGAZINES</th> <th>TYPE (DECAL-COLOR)</th> <th>STOWAGE LOCATION</th> </tr> </thead> <tbody> <tr> <td><u>EL</u></td> <td>L</td> <td>CEX (BLUE)</td> <td>B3</td> </tr> <tr> <td></td> <td>N</td> <td>CEX (BLUE)</td> <td>A13</td> </tr> <tr> <td><u>DC</u></td> <td>R</td> <td>MBW (SILVER)</td> <td>A10</td> </tr> <tr> <td></td> <td>S</td> <td>VHBW (SILVER/BLACK)</td> <td>A10</td> </tr> <tr> <td><u>DAC</u></td> <td>B, C</td> <td>CEX (BLUE)</td> <td>B8 Cushion</td> </tr> <tr> <td></td> <td>J, K</td> <td>*VHBW (SILVER/BLACK)</td> <td>B2</td> </tr> </tbody> </table> <p>*Should be left in B2 or kept out of direct sunlight.</p> <p><u>REFSMAT DO TIME</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 10px;"></td> <td style="width: 10px;">+</td> <td style="width: 10px;">0</td> <td style="width: 10px;">0</td> <td style="width: 10px;"></td> <td style="width: 10px;">HRS</td> </tr> <tr> <td style="width: 10px;"></td> <td style="width: 10px;">+</td> <td style="width: 10px;">0</td> <td style="width: 10px;">0</td> <td style="width: 10px;">0</td> <td style="width: 10px;">MIN</td> </tr> <tr> <td style="width: 10px;"></td> <td style="width: 10px;">+</td> <td style="width: 10px;">0</td> <td style="width: 10px;"></td> <td style="width: 10px;"></td> <td style="width: 10px;">SEC</td> </tr> </table> <p><u>CYCLE CMC MODE-FREE/AUTO</u> <u>P52 (OPTION 3)</u> <u>(LDG SITE ORIENT)</u></p> <p><u>REPORT: GYRO TORQUING ANGLES</u></p> <p><u>P52 (OPTION 1)</u> <u>(LDG SITE ORIENT)</u></p> <p><u>CDR V49 MNVR TO AGS CALIB ATTITUDE (101:36)</u> <u>(007.5,112.5,022.5) HGA P <u>-80</u>, Y <u>98</u></u></p>	16MM & 70MM CAMERA MAGAZINES USED FROM 100:00 TO 120:00				CAMERA	MAGAZINES	TYPE (DECAL-COLOR)	STOWAGE LOCATION	<u>EL</u>	L	CEX (BLUE)	B3		N	CEX (BLUE)	A13	<u>DC</u>	R	MBW (SILVER)	A10		S	VHBW (SILVER/BLACK)	A10	<u>DAC</u>	B, C	CEX (BLUE)	B8 Cushion		J, K	*VHBW (SILVER/BLACK)	B2		+	0	0		HRS		+	0	0	0	MIN		+	0			SEC	<p>101:30 (21101) (X1111)</p> <p>CMP DON PGA WITHOUT HELMET AND GLOVES</p> <p><u>LMP VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</u> V48 (21111) (X1111)</p> <p><u>MAP UPDATE REV <u>11</u></u></p> <p>LOS : </p> <p>180°: </p> <p>AOS : </p> <p><u>PREPARE COUCH FOR HATCH</u> <u>REMOVE PROBE STRAPS (A1)</u></p> <p><u>VERIFY LM/CM ΔP < 0.2</u> 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</p> <p><u>RECORD DOCKING TUNNEL INDEX ANGLE</u> _____</p> <p><u>AT LMP REQUEST:</u> LM PNR - RESET/OFF SYS TEST - 4D SYS TEST ind - 0 volts</p>
16MM & 70MM CAMERA MAGAZINES USED FROM 100:00 TO 120:00																																																			
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<p>101:20 (21101) (X1111)</p> <p><u>GET</u></p>	<p>101:40 (21111) (X1111)</p> <p><u>101:50</u></p>																																																		

MISSION	EDITION	DATE	PAGE
APOLLO 14 <i>lhy</i> CHANGE A (JAN)		DECEMBER 23, 1970	3-98

Jan 18, 1971

LM FLIGHT PLAN

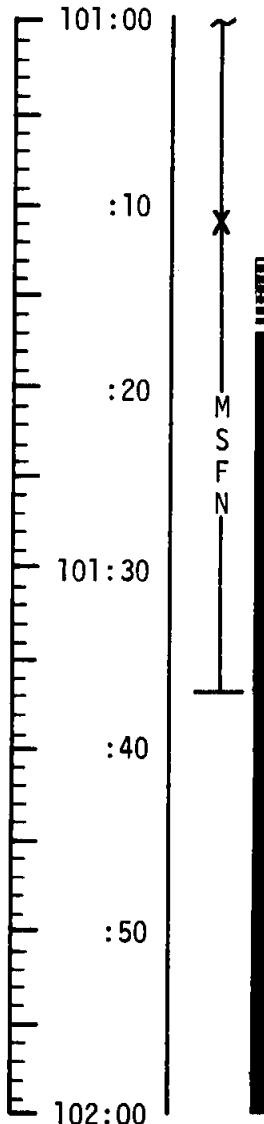
MCC-H

1923 CST

CDR

LMP

NOTES



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

<p>(21111) (X1111)</p> <p>REV 11</p> <p>MARK TO LM FOR LM MISSION TIMER SYNC AT CDR REQUEST</p> <p>CONFIGURE CAMERAS FOR UNDOCKING CM2/EL/80/CEX (f8,1/250, FOCUS) (10 FR)</p> <p>MAG (N) _____, FR # _____ CM2/DAC/18/CEX-BRKT,MIR (T8,1/250,7) 12 fps (100% MAG)</p> <p>MAG (C) _____, MAG % _____ UTILITY PWR - ON</p> <p>SWITCH TO CDR COMM UMB</p> <p>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</p> <p>ACQ MSFN HGA P <u>-80</u>, Y <u>98</u></p>	<p>102:10</p> <p>102:20</p> <p>102:30</p>	<p>102:15</p> <p>102:40</p> <p>102:50</p> <p>103:00</p>	<p>REPORT DOCKING TIMING INDEX ANGLE TO MSFN MSFN UPLINK: CSM S.V. AND V66</p> <p>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)</p> <p>MAN ATT(3) RATE CMD ATT DB - MIN RATE - LOW SC CONT - SCS BMAG (3) - ATT 1/RATE 2</p> <p>LM DOCKED IMU COARSE ALIGN V06N20E VOICE ANGLES TO LM ON CDR MARK - ENTER RECORD GIMBAL ANGLES VOICE ANGLES TO LM</p> <p>SC CONT - CMC, ATT DB - MAX BMAG MODE (3) - RATE 2</p> <p>LM CLOCK SYNC: V16N65E ON CDR MARK - V06N65E</p> <p>LM T EPHEM UPDATE: V05N01E, 1706E DON HELMET AND GLOVES</p> <p>LM LANDING GEAR DEPLOY</p> <p>SUIT CKT INTEGRITY CHECK (DECAL)</p>
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MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-100

LM FLIGHT PLAN

MCC-H

2023 CST

102:00

REV 11

:10

IVT TO LM
TRANSFER HELMETS & GLOVES
MISSION TIMER ACTIVATION

:20

ECS ACTIVATION AND C/O
CONNECT TO LM ECS
PGNS TURN-ON & SELF-TEST

102:30

:40

DOCKED IMU COARSE ALIGN
REPORT: GIMBAL ANGLES
& GET
LGC/CMC CLOCK SYNC
T EPHEM UPDATE
E-MEMORY DUMP
V48 (32022)
DEPLOY LANDING GEAR

:50
(32022)

M
S
F
N

RCS PRESSURIZATION
REPORT: He PRESSURE

CDR

LMP

NOTES

LIGHTS ON
DES O₂ AND H₂O - OPEN

EPS ACTIVATION
CONNECT TO LM COMM
CONFIGURE S-BAND
PRIMARY GLYCOL LOOP ACT
CAUTION/WARNING C/O

CONNECT TO LM ECS
CB ACTIVATION

VHF CHECKOUT

REPORT: LM POWER TRANSFER
TIME
SEC S-BAND VOICE CHECK, PRIM
S-BAND CHECK, STEERABLE
ANTENNA ACTIVATION P116, Y41

SUIT FAN/H₂O SEP CHECK
GLYCOL PUMP CHECK
BIOMED - RIGHT

ASCENT BATTERY ACTIVATION
AND C/O
REPORT: ED BAT VOLTAGE

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) | AT CDR'S REQUEST DURING RCS CHECKOUT
(X1111) | 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 AP > 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)

103:20

ROLL (4) - ON
V48 (21101)
(X1111)

(XIV.11)
LOAD N47 & N48

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

162-30

VERIFY DSL TAPE MOTION (LSP/PCD/FLO/CMD) RESET
DOFF HELMET AND GLOVES

MAP UPDATE REV 12

LOS : _____

180° : _____

AOS : _____

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

BB XPNDR ACTIVATION AND SEL-E-TEST (DECAL)

RNDZ XPNDR - HTR

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

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

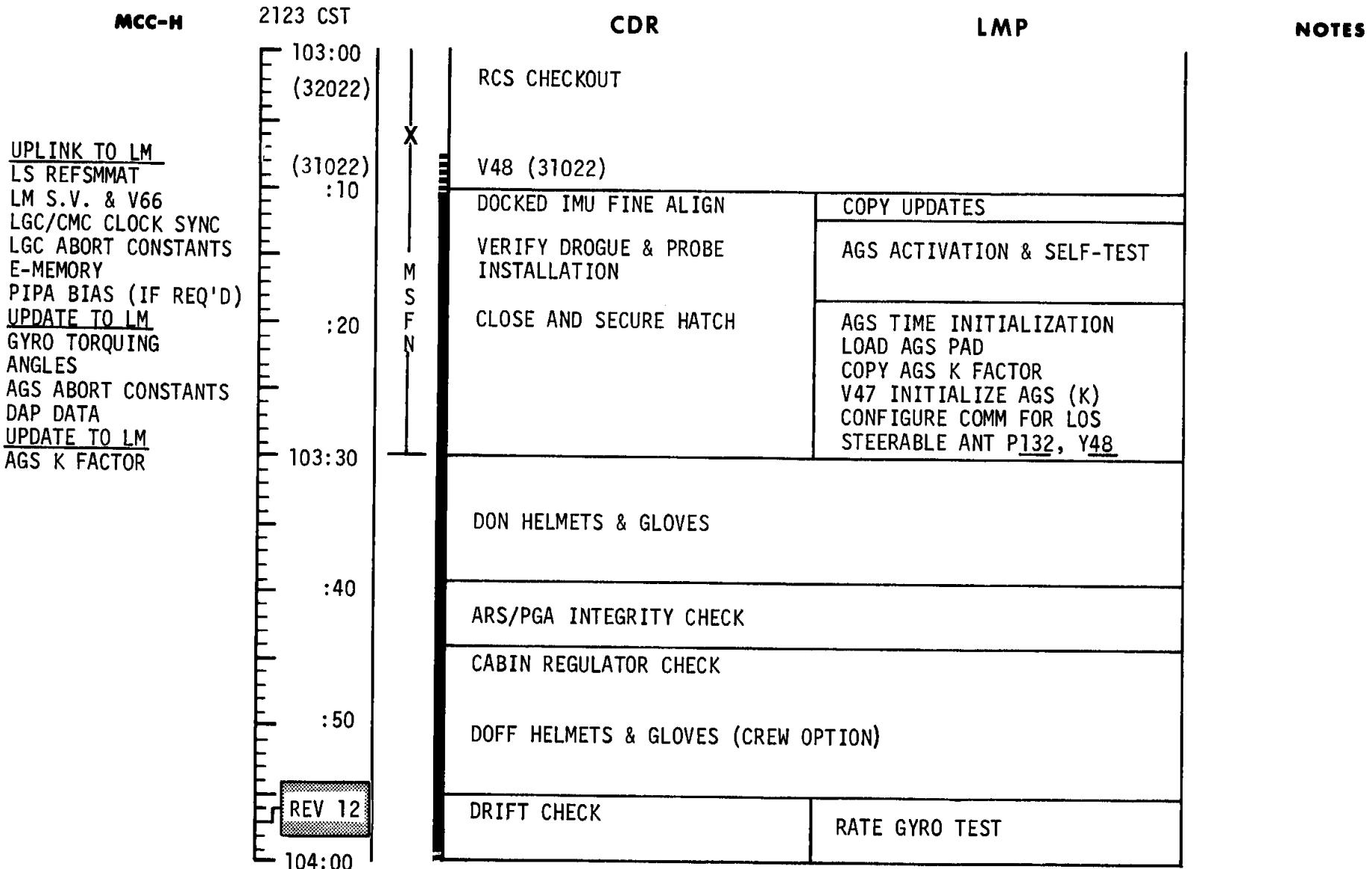
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* * * * * * * * * * * * *
* N2O:
*   R _____ *
*   P _____ *
*   Y _____ *
* * * * * * * * * * * * *

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MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-102

LM FLIGHT PLAN



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

104:07
(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

104:10

P30; LOAD UNDOCK/SEP
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

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

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

104:20

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

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

PERFORM UNDOCKING CHECKLIST

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

M
(11101)
(X1111)

104:30

P30 MANEUVER

SET STARS	C	S	M	S	E	P	PURPOSE
	R	C	S	G	&	N	
R ALIGN	+			N	/	A	WT N47
P ALIGN		0	0	N	/	A	P TRIM N48
Y ALIGN	+	0	0				Y TRIM
	+	0	0	0			HRS GETI
	+	0	0	0			MIN N33
	+	0					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

2223 CST

CDR

LMP

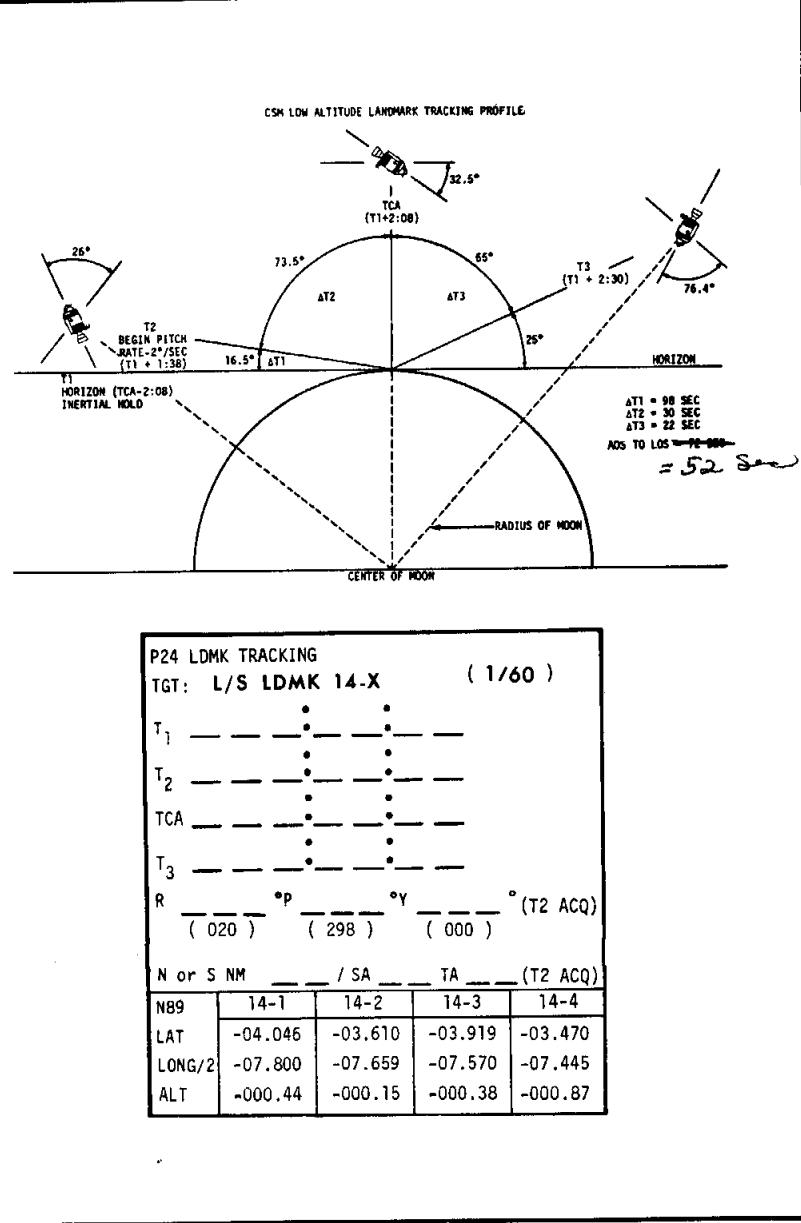
NOTES

<p>104:00 (31022)</p> <p>:05</p> <p>:10</p> <p>104:15 (21002)</p> <p>:20</p> <p>:25</p> <p>104:30</p> <p>GO/NO-GO FOR UNDOCKING & SEPARATION</p> <p>DUMP DSE</p>	<p>RR ACTIVATION & SELF-TEST</p> <p>UNDOCKING PREPARATION</p> <p>MOUNT CAMERA ON WINDOW BAR</p> <p>CONFIGURE CB'S FOR UNDOCKING</p> <p>VERIFY UNDOCKING ATTITUDE</p> <p>V48 (21002)</p> <p>DON HELMET & GLOVES</p> <p>REPORT: <u>DRIFT CHECK GIMBAL ANGLES AND GET</u></p> <p>P47 THRUST MONITOR</p> <p>YAW LEFT 60°, PITCH UP 90° (000,014,000)</p>	<p>V47 INITIALIZE AGS (S.V.)</p> <p>AGS CALIBRATION</p>	
		BIOMED - LEFT	
		LM TIMELINE BOOK	
		DON HELMET & GLOVES	
		CONFIGURE COMM	
		FOR UNDOCKING	
		STEERABLE ANT P <u>132</u> , Y <u>48</u>	
		MONITOR AGS ΔVX	
		RECORDER - ON	
		UNDOCKING & SEPARATION	TIG: 104:27:31
<p>M S F N</p>		<p>STEERABLE ANTENNA <u>P100</u>, Y-<u>42</u></p>	

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

	VERIFY LM TRACKER LT - ON DAC - OFF
(11101) (X1111)	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
M S F N	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 1:38 - T2 (AUTO PITCH RATE BEGINS) OPT MODE - MAN, TAKE MARKS 2:08 - TCA 2:30 - T3 (LDMK LOSS) DAC - OFF
(-2.000) (+00.50)	
105:00	



LM FLIGHT PLAN

MCC-H

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

:40

V47 INITIALIZE AGS (S.V.)

104:45

V83 SET ORDEAL

M
S
F
N

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

105:00

X

UPDATE TO LM
REV 12 TCA (LS)

UPLINK TO LM
CSM S.V.
PIPA BIAS (IF REQ'D)
GYRO COMPENSATION
(IF REQ'D)

RECORD PCM LBR
ON DSE DURING P24

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)	<p>STOP PITCH RATE AT BURN ATT P 110 VHF RNG - RESET, COMPARE RR AND VHF RANGE ACQ MSFN HGA P <u>-67</u>, Y <u>85</u></p> <p>RECORD MAG % REMOVE & STOW DAC</p> <p>P52 (OPTION 3) (LDG SITE ORIENT)</p> <p>REPORT: <u>GYRO TORQUING ANGLES</u></p> <p>MSFN UPLINK: CSM S.V. CIRC TARGET LOAD</p> <p>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)</p> <p>P30; VERIFY CIRC TIG AND ΔV'S V49 TRIM TO CIRC BURN PAD ATT</p> <p>SXT STAR CHECK</p> <p>P40 (TRIM)</p> <p>GO/NO-GO FOR CIRC</p> <p>***** * VHF AM B - OFF * * VHF AM A - SIMPLEX * * VHF RCV ONLY - B DATA * *****</p> <p>VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <p>GDC ALIGN VERIFY ORDEAL ALT SET = <u>50</u> NM</p>	<p>P52 IMU REALIGN</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>N71:</td> <td>— — — —</td> </tr> <tr> <td>N05:</td> <td>— — • — —</td> </tr> <tr> <td>N93:</td> <td>— — — —</td> </tr> <tr> <td>X:</td> <td>— — • — — —</td> </tr> <tr> <td>Y:</td> <td>— — • — — —</td> </tr> <tr> <td>Z:</td> <td>— — • — — —</td> </tr> <tr> <td>GET:</td> <td>— — — • — — —</td> </tr> </table>	N71:	— — — —	N05:	— — • — —	N93:	— — — —	X:	— — • — — —	Y:	— — • — — —	Z:	— — • — — —	GET:	— — — • — — —
N71:	— — — —															
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GET:	— — — • — — —															
105:10 M S F N (P40) (0.5° DB)		<p>MAP UPDATE REV <u>13</u></p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>LOS:</td> <td>• — — —</td> </tr> <tr> <td>180°:</td> <td>— — — —</td> </tr> <tr> <td>AOS:</td> <td>— — — —</td> </tr> </table>	LOS:	• — — —	180°:	— — — —	AOS:	— — — —								
LOS:	• — — —															
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AOS:	— — — —															
105:20																
105:30																

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-108

LM FLIGHT PLAN

MCC-H

2323 CST

CDR

LMP

NOTES

DUMP DSE

UPDATE TO LM
PDI_o ABORT PAD

UPLINK TO CSM
CSM S.V.

CIRC TARGET LOAD
UPDATE TO CSM

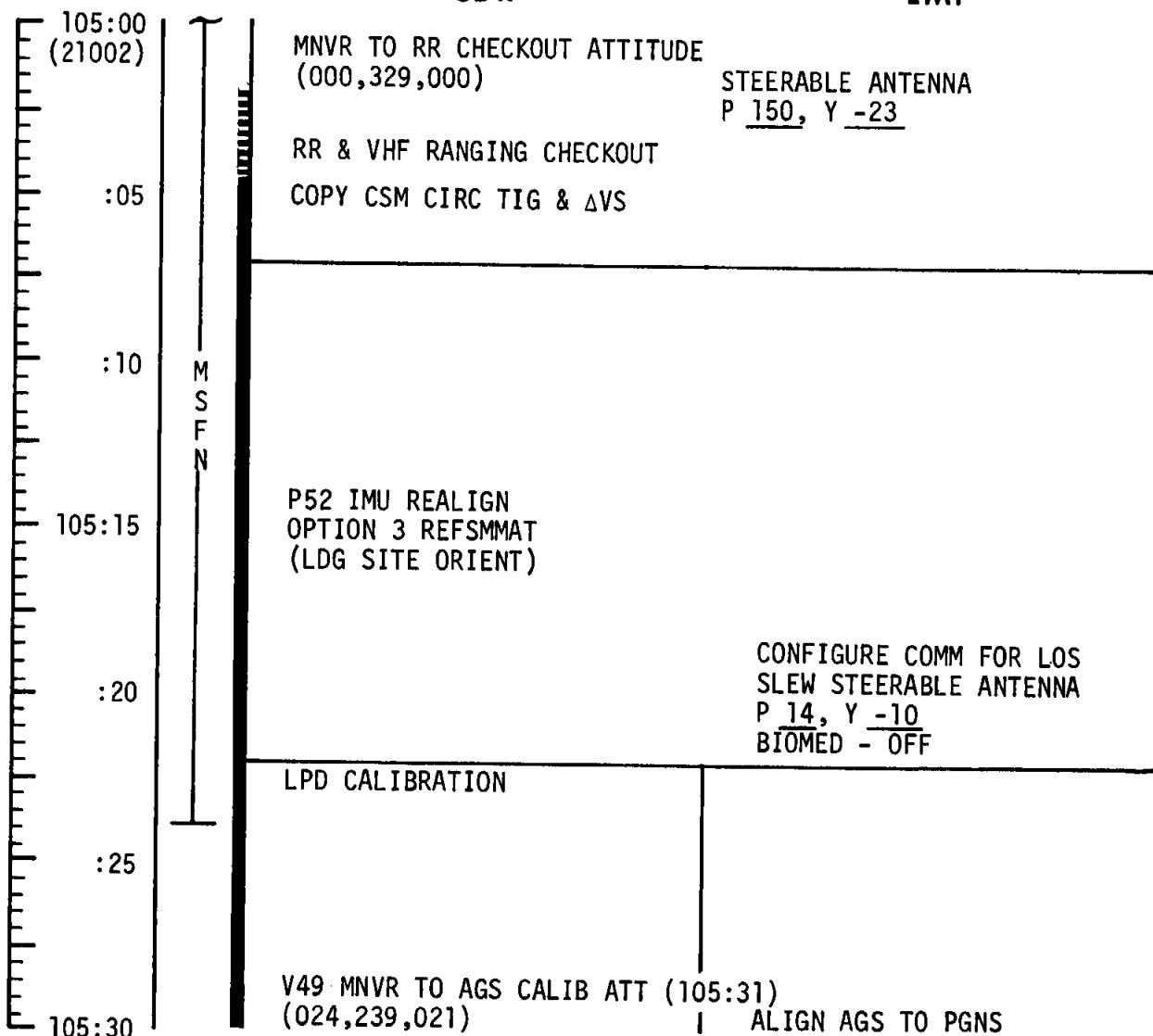
CIRC PAD

MAP UPDATE REV 13

PADS A-D

P24 TRACK PAD

GO/NO-GO FOR CIRC



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

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

LM FLIGHT PLAN

MCC-H

2353 CST

CDR

LMP

NOTES

105:30
(21002)

(21012)
:35

:40

105:45

:50

:55

106:00

REV 13

UNDOCKED AGS CALIBRATION
V48 (21012)

SYSTEMS CHECKS

MNVR TO OBSERVE CSM CIRCULARIZATION BURN (105:45)
(000,236,000)
DAC-ON (5 MIN)
DC 2 FRAMES

P76 TARGET ΔV
(UPDATE CSM S.V.)

V83 SET ORDEAL
ESTABLISH ORBITAL RATE
(000,325/148,000)

V47 INITIALIZE AGS (S.V.)

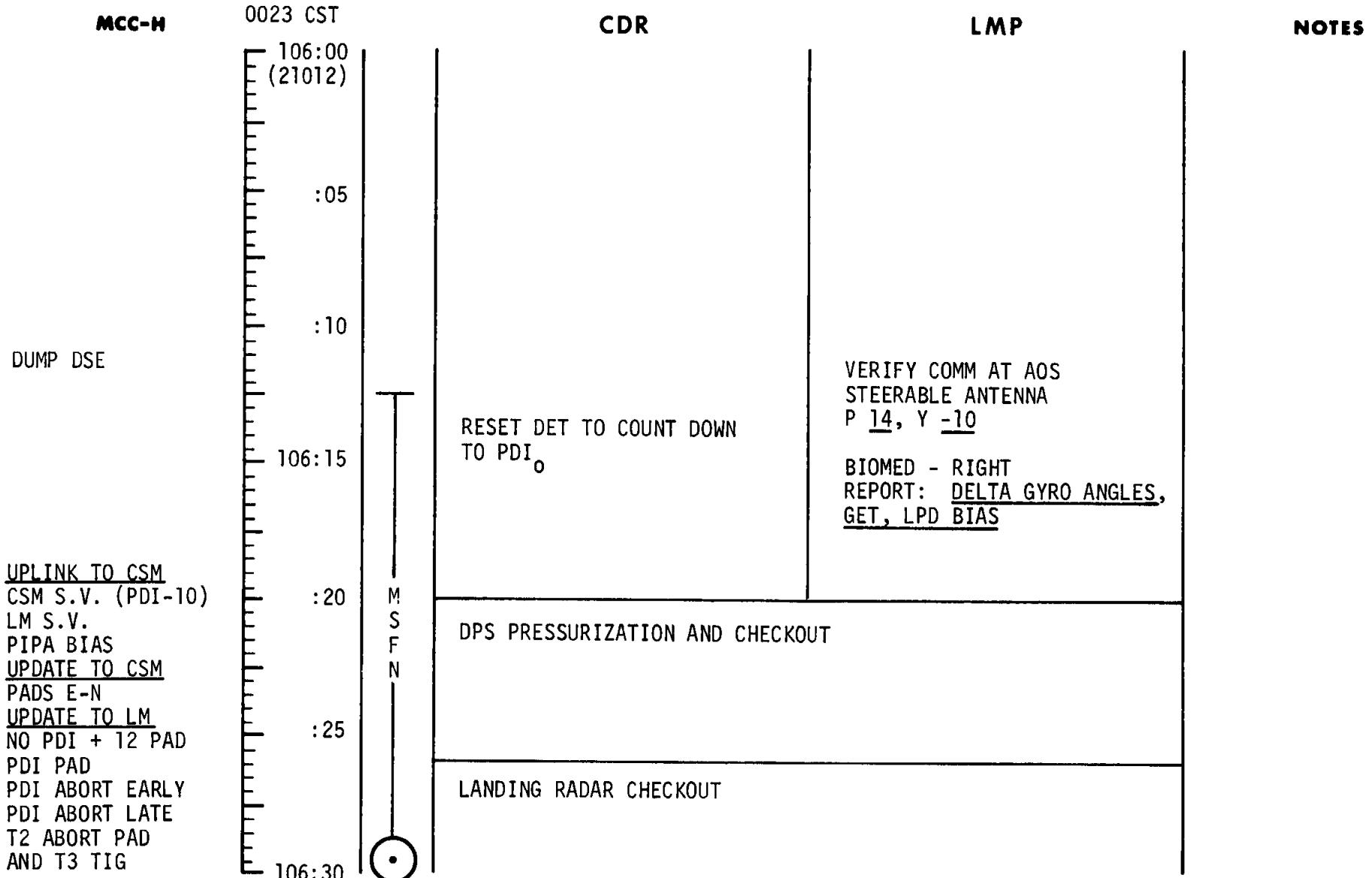
CSM CIRCULARIZATION
105:46:48

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

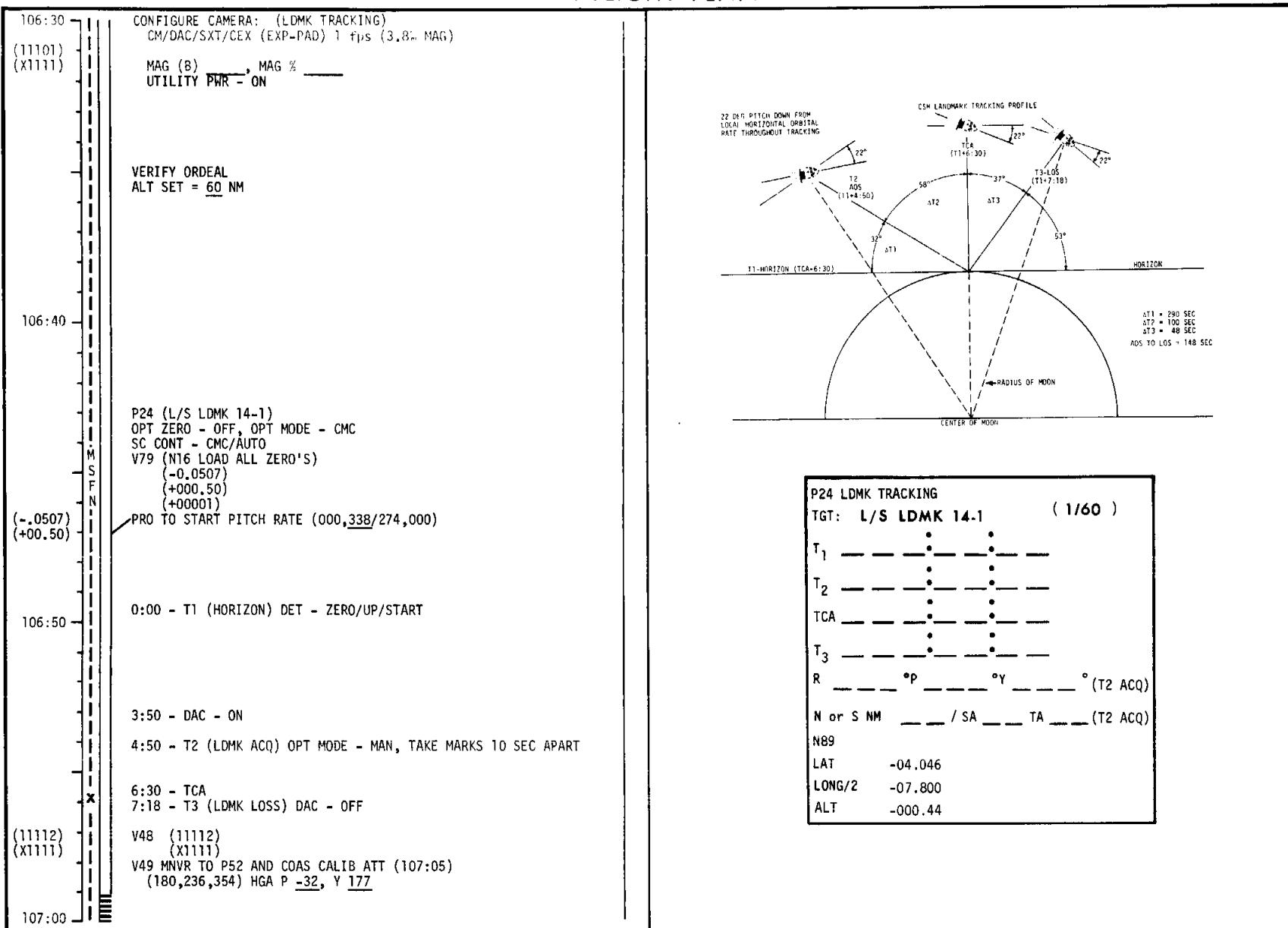
106:00		<p>(11111) (X1111)</p> <p>ACQ MSFN HGA P <u>-86</u>, Y <u>48</u></p> <p>REPORT: <u>BURN STATUS</u></p> <p>CHARGE BATTERY B</p> <p><small>*REPORT IF OFF MORE THAN 1 SEC **ITEMS TO BE REPORTED TO MSFN</small></p>																																																																													
106:10		<p>BURN STATUS REPORT</p> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>X</td><td>X</td><td></td><td></td></tr> <tr><td>X</td><td>X</td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td colspan="4">TRIM</td></tr> <tr><td>X</td><td>X</td><td>X</td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td></td></tr> <tr><td>X</td><td>X</td><td>X</td><td></td></tr> <tr><td></td><td></td><td></td><td></td></tr> <tr><td>R</td><td></td><td></td><td></td></tr> <tr><td>P</td><td></td><td></td><td></td></tr> <tr><td>Y</td><td></td><td></td><td></td></tr> <tr><td>V_{gx} **</td><td></td><td></td><td></td></tr> <tr><td>V_{gy} **</td><td></td><td></td><td></td></tr> <tr><td>V_{gz} **</td><td></td><td></td><td></td></tr> <tr><td>ΔV_C **</td><td></td><td></td><td></td></tr> <tr><td>FUEL **</td><td></td><td></td><td></td></tr> <tr><td>OX **</td><td></td><td></td><td></td></tr> <tr><td>UNBAL</td><td></td><td></td><td></td></tr> </table>	X	X			X	X											TRIM				X	X	X		X	X	X		X	X	X						R				P				Y				V _{gx} **				V _{gy} **				V _{gz} **				ΔV _C **				FUEL **				OX **				UNBAL				
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106:20		<p>MSFN UPLINK: CSM S.V. (PDI-10) LM S.V. PIPA BIAS</p> <p>CYCLE CMC MODE - FREE/AUTO V48 (11101) (X1111)</p> <p>V49 MNVR TO LDMK TRACK ATT (106:42) (000,274,000) OMNI <u>D</u></p> <p>MSFN UPDATE TO LM WITH CSM COPY: PADS E-N</p>																																																																													
106:30		<p>M S F N</p> <p>(11101) (X1111)</p>																																																																													

LM FLIGHT PLAN



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

CSM FLIGHT PLAN



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

LM FLIGHT PLAN

MCC-H

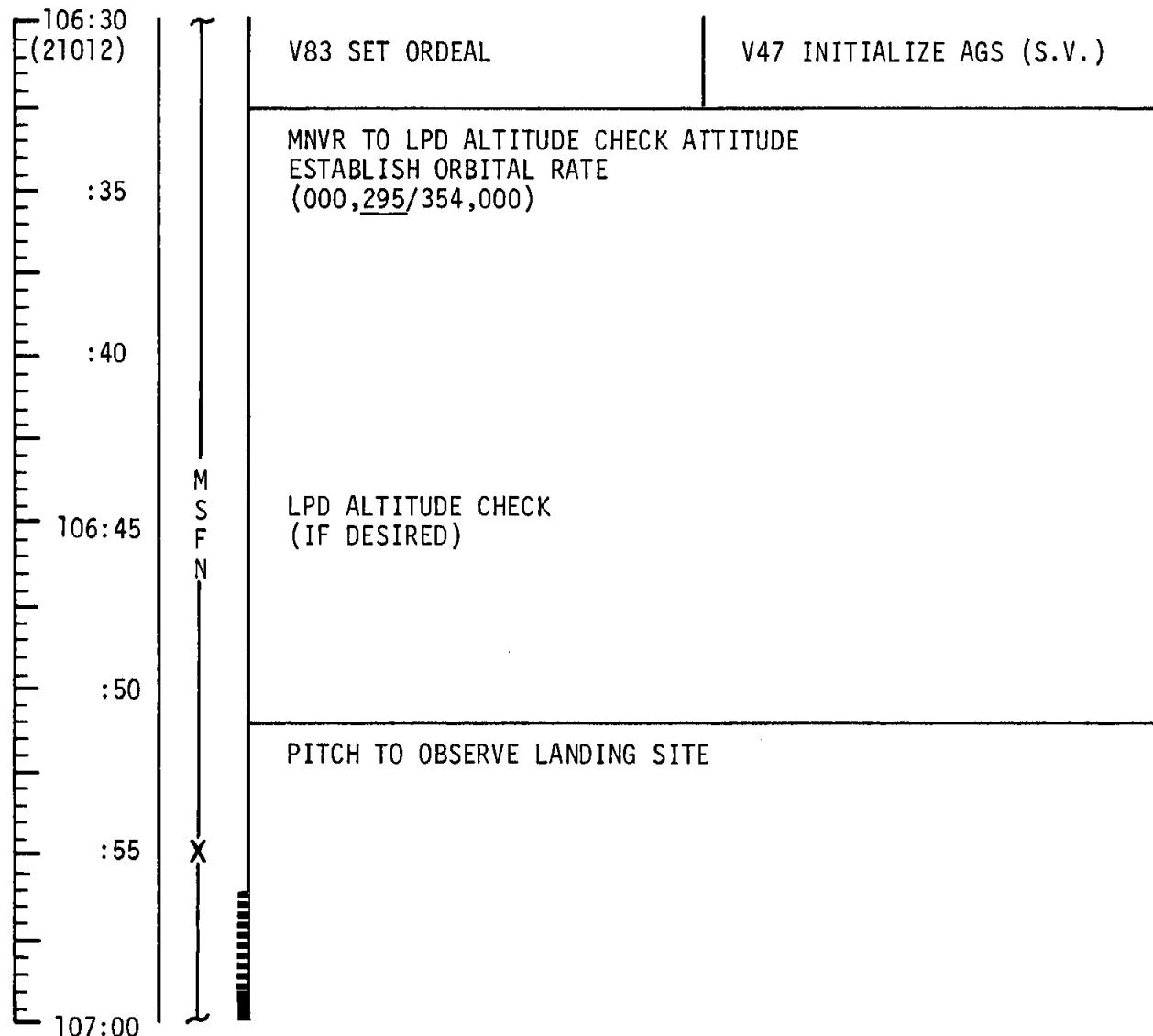
0053 CST

CDR

LMP

NOTES

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

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

<p>107:00 (11112) (X1111)</p> <p>MSFN UPDATE: MAP UPDATE REV 14 LTC PADS (TGT 16, 12 (LDG LM) (108:15))</p>	<p>107:30 (11101) (X1111)</p> <p>CYCLE CMC MODE - FREE/AUTO V48 (11101) (X1111) V49 MNVR TO LTC TGT: 16 PHOTO PAD ATT (107:52)</p>																																															
<p>107:10 P52 (OPTION 3) (LDG SITE ORIENT) REPORT: GYRO TORQUING ANGLES</p> <p>P52 (COAS CALIB) USE POLLUX N88 (-.38513) (+.79364) (+.47097)</p>	<p>107:40 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)</p>																																															
<p>107:20 GDC ALIGN VERIFY ORDEAL</p> <p>COAS CALIB - N92</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>SHAFT:</td><td>-----</td><td>.</td><td>-----</td></tr> <tr><td>TRUN:</td><td>-----</td><td>.</td><td>-----</td></tr> </table> <p>VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <p style="text-align: center;">***** * MSFN ENABLES MSFN S-BAND RELAY * *****</p> <p>MAP UPDATE REV 14</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>LOS :</td><td>.</td><td>.</td></tr> <tr><td>180°:</td><td>.</td><td>.</td></tr> <tr><td>AOS :</td><td>.</td><td>.</td></tr> </table>	SHAFT:	-----	.	-----	TRUN:	-----	.	-----	LOS :	.	.	180°:	.	.	AOS :	.	.	<p>107:50 REV 14</p> <p>LTC PHOTO PAD TGT: 16 (000,302,000)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td>R</td><td>_____</td><td>P</td><td>_____</td><td>Y</td><td>_____</td></tr> <tr><td>T START:</td><td>-----</td><td>.</td><td>-----</td><td>.</td><td>-----</td></tr> <tr><td>T STOP :</td><td>-----</td><td>.</td><td>-----</td><td>.</td><td>-----</td></tr> <tr><td>RNG 1</td><td>_____</td><td>(91.1)</td><td>T START</td><td></td><td></td></tr> <tr><td>RNG 2</td><td>_____</td><td>(90.0)</td><td>T START + 7:10</td><td></td><td></td></tr> </table> <p>ORBITAL SCIENCE PHOTOGRAPHY</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001)</p> <p>PRO TO START PITCH RATE AT ORDEAL P 212</p> <p>PHOTO TGT 14, SOUTH (f8,1/125,∞) 30 FR AT 4 SEC (500 NM) (180° +0:10)</p>	R	_____	P	_____	Y	_____	T START:	-----	.	-----	.	-----	T STOP :	-----	.	-----	.	-----	RNG 1	_____	(91.1)	T START			RNG 2	_____	(90.0)	T START + 7:10		
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<p>107:30</p>	<p>108:00</p>																																															

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

LM FLIGHT PLAN

MCC-H

UPDATE TO CSM
MAP UPDATE REV 14
LTC PADS (TGT 16,
12 (LDG LM))

0123 CST

CDR

LMP

NOTES

ENABLE MSFN
S-BD RELAY

107:00
(21012)

M
S
F
N

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

107:30

START MNVR TO PDI ATTITUDE
P30 EXTERNAL ΔV
(NO PDI + 12 ABORT)
V48 (22112)
P63 MNVR TO PDI ATT (107:45)
(000,113,000)
POO
COAS TO OVERHEAD WINDOW
DON HELMET & GLOVES

ALIGN AGS TO PGNS
VERIFY LOOSE GEAR STOWED
RESTRAINTS ATTACHED

:40
(22112)

REV 14

:50

DON HELMET & GLOVES
CONFIGURE EGRESS MODE
CHECK SYSTEMS CONFIGURATION

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

<p>108:00 (-.0507) (+00.50)</p> <p>PHOTO TGT 3, NORTH (f8,1/125,∞) 33 FR AT 6 SEC (500MM) (180° +0:18)</p> <p>ACQ MSFN OMNI <u>D</u></p> <p>VHF AM T/R - OFF (PANEL 9)</p> <p>PHOTO TGT 15, NORTH (f8,1/250,∞) 70 FR AT 4 SEC (500MM) (180° +0:26)</p> <p>LTC PHOTO PAD TGT: 12 (LDG LM) (000,158.3,000)</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">R _____</td> <td style="padding: 2px;">P _____</td> <td style="padding: 2px;">Y _____</td> </tr> <tr> <td style="padding: 2px;">T START: _____</td> <td style="padding: 2px;">_____</td> <td style="padding: 2px;">_____</td> </tr> <tr> <td style="padding: 2px;">T STOP : _____</td> <td style="padding: 2px;">_____</td> <td style="padding: 2px;">_____</td> </tr> <tr> <td style="padding: 2px;">RNG _____</td> <td style="padding: 2px;">(91.7)</td> <td style="padding: 2px;"></td> </tr> </table> <p>SET DET COUNTING UP TO PDI</p> <p>RECORD EL FR # _____</p> <p>ACQ MSFN OMNI <u>A</u></p>	R _____	P _____	Y _____	T START: _____	_____	_____	T STOP : _____	_____	_____	RNG _____	(91.7)		<p>108:30 (-.0507) (+00.50)</p> <p>V64; ACQ MSFN HGA P <u>-16</u>, Y <u>177</u></p> <p>VERIFY: LTC MODE - STBY/PWR-ON (T START -1 MIN) LTC TGT 16 (SHUT 1/100, RNG 1-PAD, INT 8,2)(85 FR) LTC MODE - AUTO (T START)</p> <p>GO/NO-GO PDI</p> <p>***** * IF CSM RELAY REQ'D * * * S-BD MODE - RELAY * *****</p> <p>LM PDI (108:42:01) : : .</p> <p>CHANGE TO RNG 2 (T START +7:10)</p> <p>LTC MODE - STBY (T STOP) V49 MNVR TO LTC TGT: 12 PHOTO PAD ATT (108:50)</p> <p>LTC TGT 12 (SHUT 1/50,RNG-PAD,INT 30)(30 FR) LTC MODE - AUTO (T START) - (LTC PHOTOS OF LM LANDING)</p> <p>LM TOUCHDOWN (108:53:33) : : .</p> <p>LTC MODE - STBY/PWR - OFF (T STOP) V48 (11111) (X1111) V49 MNVR TO P52 ATT (109:04) (000,100,000) HGA P <u>-76</u>, Y <u>11</u></p> <p>CONFIRM STAY/NO-STAY FOR TI V44 (SET LUNAR SURFACE FLAG) VHF RANGING - OFF VHF AM T/R - RCV (PANEL 9)</p>
R _____	P _____	Y _____											
T START: _____	_____	_____											
T STOP : _____	_____	_____											
RNG _____	(91.7)												

LM FLIGHT PLAN

MCC-H	0223 CST	CDR	LMP	NOTES
<u>UPLINK TO LM</u> LM S.V. RLS GYRO COMPENSATION <u>UPDATE TO LM</u> AGS RLS (231)	108:00 (22112)	PRE-PDI SW SETTINGS	BATS 5 & 6 NORM FEED-ON VERIFY COMM AT AOS STEERABLE ANTENNA P <u>2</u> , Y <u>2</u> BIOMED - LEFT REPORT: <u>ASCENT BAT-ON TIME</u>	
<u>GC/NO-GO FOR PDI</u>	:10	SYSTEMS CHECKS		
<u>UPDATE 2 LM</u> △ RLS	:20		RECORDER - ON V47 INITIALIZE AGS (S.V.) TARGET AGS FOR ABORT	
DUMP DSE	108:30	LR-ON P63 BRAKING PHASE FINAL TRIM GO/NO-GO FOR PDI RESET WATCH	ALIGN AGS TO PGNS COMM CHECK WITH CSM ON S-BAND RELAY	
STAY/NO-STAY FOR T1	:40	PDI	UPDATE LM ΔRLS (N69) SYSTEMS MONITOR DAC-ON (PHOTO LANDING) UPDATE AGS ALT AT 12 000 FT	TIG: 108:42:01 BT: 11 MIN 31.5 SEC ΔVR: 6637.7 FPS ULLAGE: 4 JET 7.5 SEC
	:50	PITCH OVER AT P64		108:53:33
	109:00	P66 LANDING PHASE (ROD)	TOUCHDOWN	
		ENG STOP-PUSH STAY/NO-STAY FOR T1 P68 LDG CONFIRMATION	AGS LUNAR AZ STORED UPDATE AND ALIGN AGS DAC-OFF	

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

<p>109:30 (11111) (X1111)</p> <p>S-BAND MODE - VOICE (VERIFY) CONFIRM STAY/NO-STAY FOR T2</p> <p>P52 (OPTION 3) (LDG SITE ORIENT)</p> <p>REPORT: <u>GYRO TORQUING ANGLES</u></p> <p>GDC ALIGN VERIFY ORDEAL</p> <p>MSFN UPDATE: MAP UPDATE REV 15 P24 TRK PADS: (RP-3, RP-5, DAGUERRE 66, L/S LDMK 14-X) (109:45-110:50)</p> <p>EAT PERIOD</p> <p>MSFN UPLINK: CSM S.V.</p> <p>CONFIGURE CAMERA: (LDMK TRK) CM/DAC/SXT/CEX (EXP-PAD) 1 fps (15.2% MAG)</p> <p>MAG (B) _____, MAG % _____ UTILITY PWR - ON</p> <p>109:20 LTC FILM MAG CHANGE (DECAL) ADVANCE 4 FRAMES, RECORD FR # PUT MAG (U) ON LTC, RESET FRAME COUNTER LTC REMOVAL (DECAL) & STOW VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <p>CYCLE CMC MODE - FREE/AUTO V48 (11101) (X1111) * * * * * * * * * * * * * * * * * * *MSFN DISABLES MSFN S-BD RELAY*</p> <p>V49 MNVR TO LDMK TRK ATT (109:50) * * * * * * * * * * * * * * * * * * (000,066,000)</p> <p>MAP UPDATE REV 15</p> <p>LOS : _____ 180° : _____ AOS : _____</p>	<p>109:30 (11101) (X1111)</p> <p>P52 IMU REALIGN</p> <p>N71: _____</p> <p>N05: _____</p> <p>N93: _____</p> <p>X _____</p> <p>Y _____</p> <p>Z _____</p> <p>GET _____</p>	<p>109:40</p> <p>REV 15</p> <p>109:50 (-.0507) (+.00.50)</p> <p>P24 (RP-3) OPT ZERO - OFF, OPT MODE - CMC SC CONT - CMC/AUTO V79 (N16 LOAD ALL ZERO'S) (-0.0507) (+000.50) (+00001) PRO TO START PITCH RATE (000,338/066,000)</p> <p>0:00 - T1 (HORIZON) DET -ZERO/UP/START</p>
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LM FLIGHT PLAN

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

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

110:20
 M
 S
 F
 N
 P24 (DAGUERRE 66)
 V79E, PRO, PRO
 OPT ZERO - OFF, OPT MODE - CMC

110:30
 0:00 - T1 (HORIZON) DET -ZERO/UP/START

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

 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 (1/250)
 TGT: DAGUERRE 66

 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
UPDATE TO LM
P22 ACQ TIME

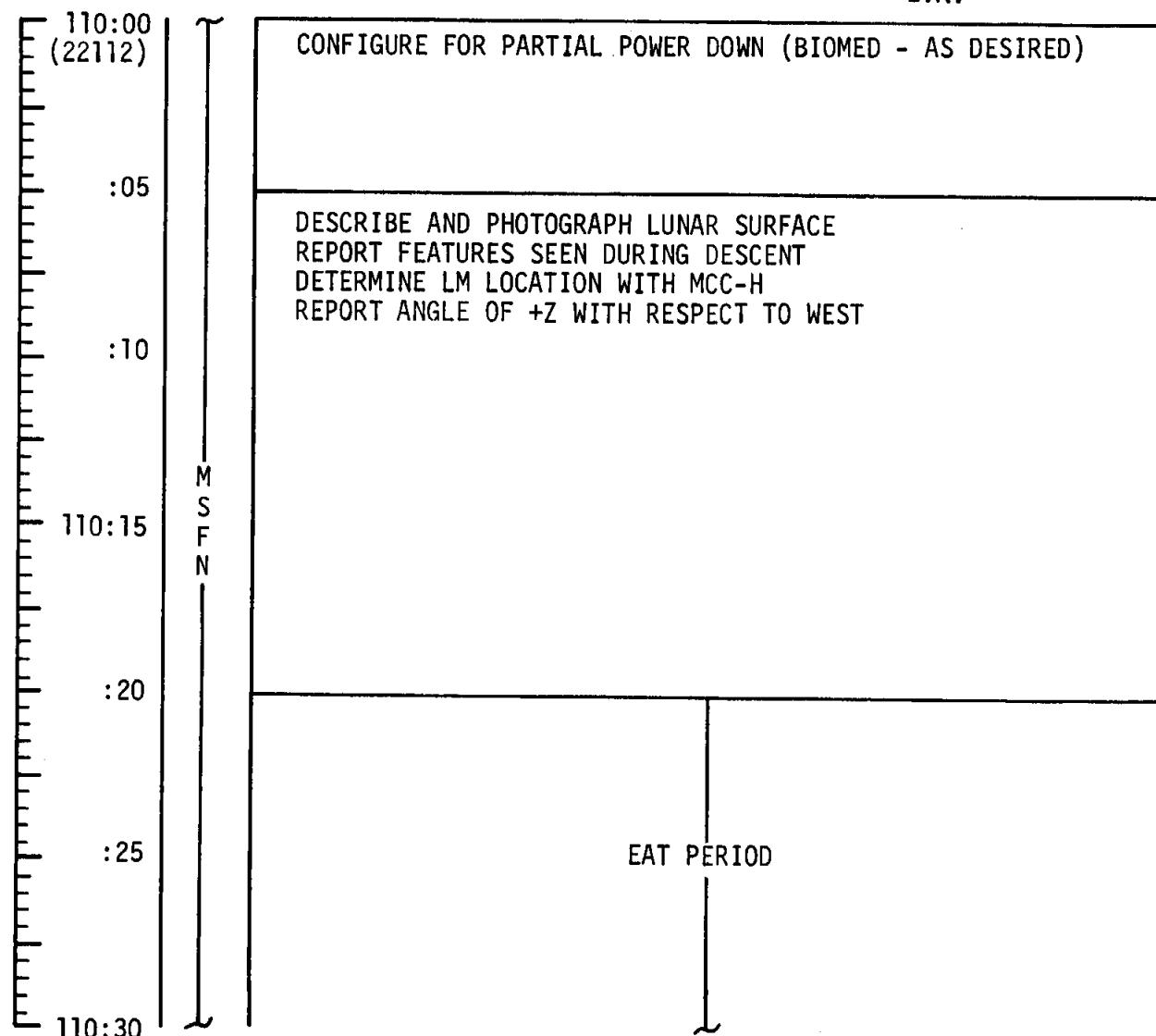
0423 CST

CDR

LMP

NOTES

RECORD PCM LBR
ON DSE DURING P24



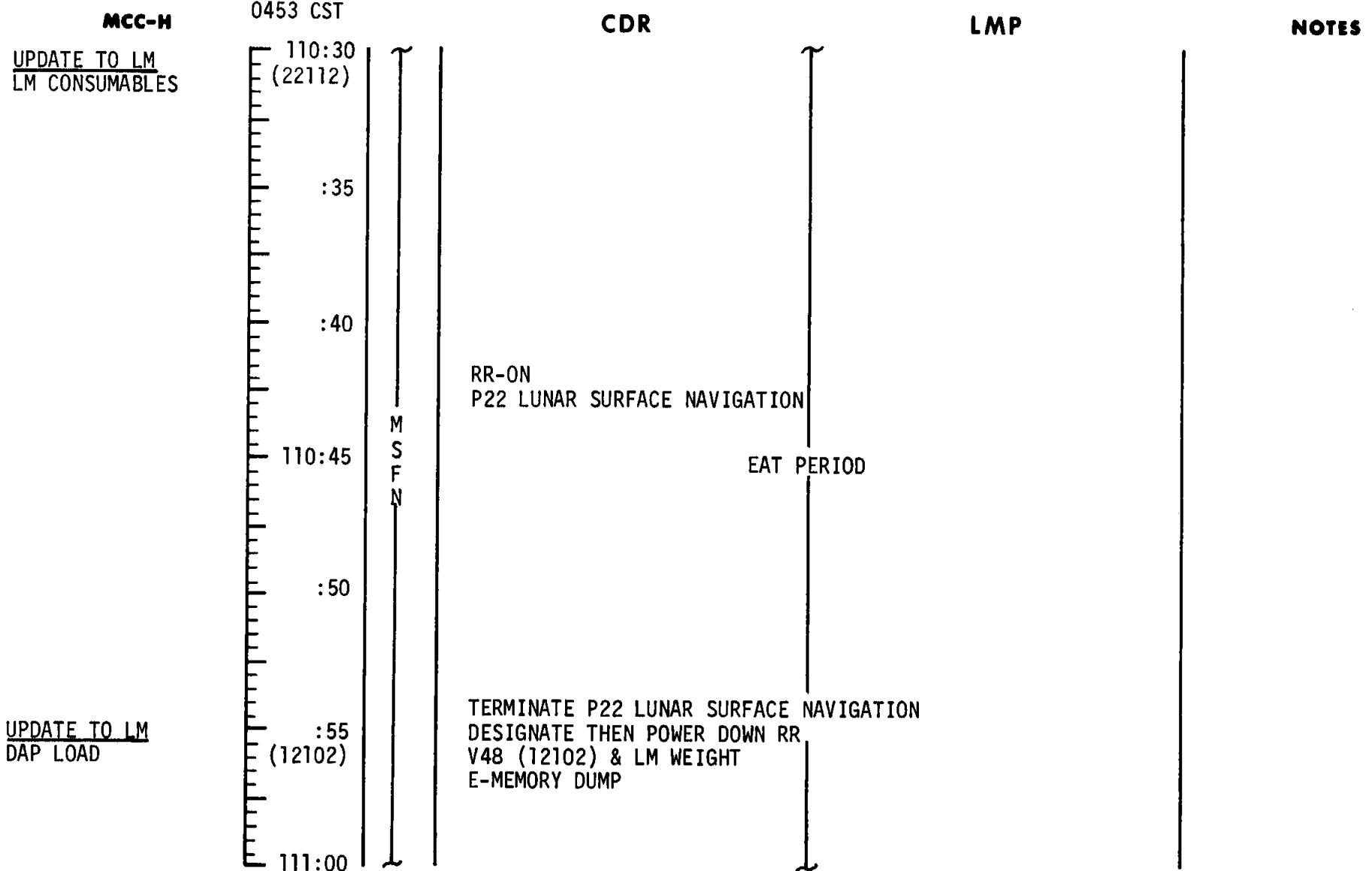
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	110:00 - 110:30	5/15	3-123

CSM FLIGHT PLAN

<p>10:30 (-.0507) (+.00.50)</p> <p>3:50 - DAC - ON</p> <p>4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART</p> <p>6:30 - TCA</p> <p>7:18 - T3 (LDMK LOSS) DAC - OFF</p> <p>P24 (L/S LDMK 14-X) V79E, PRO, PRO OPT ZERO - OFF, OPT MODE - CMC</p> <p>10:40</p> <p>M S F N</p> <p>0:00 - T1 (HORIZON) DET - ZERO/UP/START</p> <p>110:50 3:50 - DAC - ON</p> <p>4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART</p> <p>6:30 - TCA</p> <p>7:18 - T3 (LDMK LOSS) DAC - OFF V48 (11102) (X1111) V49 MNVR TO ANTI-SOLAR PT ATT (111:05) (197,251,346) HGA P <u>-41</u>, Y <u>156</u></p> <p>RNDZ XPNDR - OFF</p> <p>RECORD MAG % _____</p> <p>111:00</p>	<p>P24 LDMK TRACKING (1/60)</p> <p>TGT: L/S LDMK 14-X</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>T₁</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> </tr> <tr> <td>T₂</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> </tr> <tr> <td>TCA</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> </tr> <tr> <td>T₃</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> <td>—</td> <td>•</td> <td>—</td> </tr> <tr> <td>R</td> <td>—</td> <td>—</td> <td>•^P</td> <td>—</td> <td>—</td> <td>•^Y</td> <td>—</td> </tr> </table> <p>N or S NM _____ / SA _____ TA _____ (T2 ACQ)</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>N89</th> <th>14-1</th> <th>14-2</th> <th>14-3</th> <th>14-4</th> </tr> </thead> <tbody> <tr> <td>LAT</td> <td>-04.046</td> <td>-03.610</td> <td>-03.919</td> <td>-03.470</td> </tr> <tr> <td>LONG/2</td> <td>-07.800</td> <td>-07.659</td> <td>-07.570</td> <td>-07.445</td> </tr> <tr> <td>ALT</td> <td>-000.44</td> <td>-000.15</td> <td>-000.38</td> <td>-000.87</td> </tr> </tbody> </table>	T ₁	—	—	•	—	—	•	—	T ₂	—	—	•	—	—	•	—	TCA	—	—	•	—	—	•	—	T ₃	—	—	•	—	—	•	—	R	—	—	• ^P	—	—	• ^Y	—	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
T ₁	—	—	•	—	—	•	—																																																						
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ALT	-000.44	-000.15	-000.38	-000.87																																																									

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-124

LM FLIGHT PLAN



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

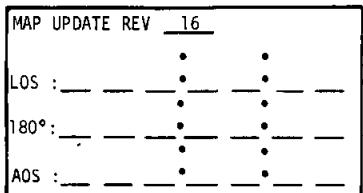
CSM FLIGHT PLAN

111:00

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

MAG (J) ____, MAG % ____

UTILITY PWR - ON

(11101)
(X1111)V48 (11101)
(X1111)

111:10

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)

111:30

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

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-126

LM FLIGHT PLAN

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

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
 V49 MNVR TO MOULTON PT ATT (111:34)
 (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
 V48 (11102)
 (X1111)
 V49 MNVR TO ZERO PHASE TGT 1 & 2 ATT (111:50)
 (196.8,358.1,359.3)

O₂ 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)
 (+00.50)
 PRO TO START PITCH RATE (196.8,268/358.1,359.3)

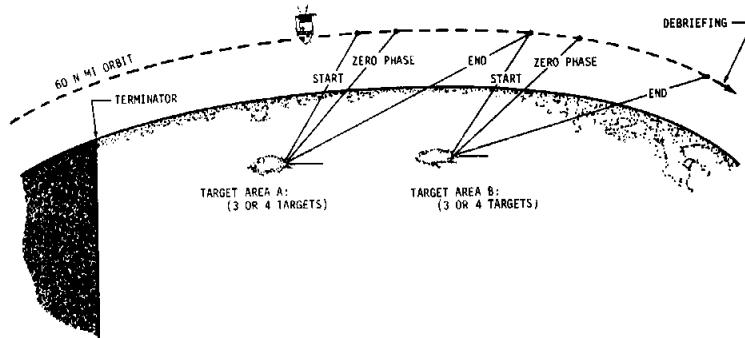
ZERO PHASE OBSERVATIONS - BACKWARD LOOKING

SELECT OMNI A

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 1 (Jan)	DECEMBER 22, 1970	3-128

LM FLIGHT PLAN

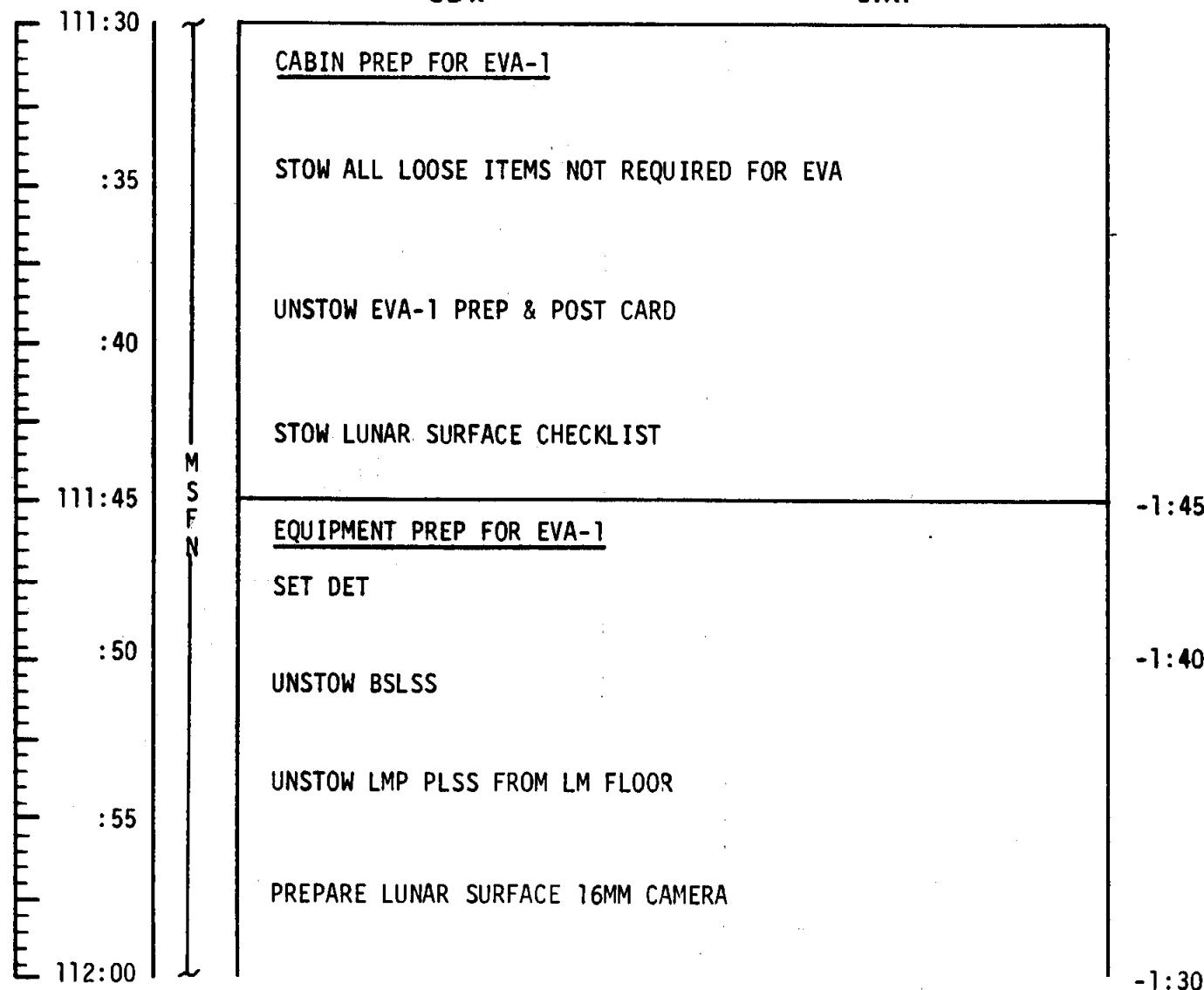
MCC-H

0553 CST

CDR

LAMP

NOTES



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

<p>112:00 (-.0507) (+00.50)</p> <p>5:00 - DC - ON, START OBSERVATIONS (TGT AREA 1)</p> <p>6:40 - ZERO PHASE POINT (TGT AREA 1)</p> <p>ACQ MSFN OMNI <u>A</u></p> <p>8:24 - STOP OBSERVATIONS START OBSERVATIONS (TGT AREA 2)</p> <p>8:54 - ZERO PHASE POINT (TGT AREA 2)</p> <p>112:10 11:54 - STOP OBSERVATIONS DEBRIEF (~30 SEC)</p> <p>12:24 - DC - OFF ACQ MSFN HGA P <u>-76</u>, Y <u>80</u></p> <p>ZERO PHASE PAD (FORWARD)</p> <p>TYPICAL ZERO PHASE OBSERVATION PASS - FORWARD LOOKING</p> <p>(11102) (X1111)</p> <p>V49 MNVR TO ZERO PHASE TGT 3 & 4 ATT (112:25) (346.9,239.8,358.5) OMNI <u>D</u></p> <p>CHARGE BATTERY A</p>	<p>112:30 (11102) (X1111)</p> <p>(-.0507) (+00.50)</p> <p>ZERO PHASE OBSERVATIONS - FORWARD LOOKING</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001)</p> <p>PRO TO START PITCH RATE (346.9,<u>276</u>/239.8,358.5)</p> <p>112:35:38 - DET - ZERO/UP/START (T START) REVIEW TGT 3 & 4 MAPS</p> <p>112:40 5:00 - DC - ON, START OBSERVATIONS (TGT AREA 3)</p> <p>8:40 - ZERO PHASE POINT (TGT AREA 3)</p> <p>9:32 - STOP OBSERVATIONS START OBSERVATIONS (TGT AREA 4)</p> <p>11:16 - ZERO PHASE POINT (TGT AREA 4)</p> <p>12:02 - STOP OBSERVATIONS DEBRIEF (~ 30 SEC)</p> <p>12:32 - DC - OFF, REMOVE CAMERA FROM WINDOW</p> <p>RECORD FR # _____</p> <p>(11111) (X1111)</p> <p>V48 (11111) (X1111)</p> <p>V49 MNVR TO ZODIACAL LIGHT ATT (113:10) (180,200,000) OMNI <u>C</u></p> <p>CONFIGURE CAMERA: (ZODIACAL LIGHT) CM4/DAC/18/VHBB-BRKT, MIR, CONT (T1,1/500,∞) 24 fps (3% MAG)</p> <p>MAG (J) _____, MAG % _____ UTILITY PWR - ON _____</p> <p>112:50 113:00</p>
---	--

LM FLIGHT PLAN

MCC-H	0623 CST	CDR	LMP	NOTES
DUMP DSE	112:00	DEPLOY EVA ANTENNA UNSTOW AND DON LUNAR BOOTS UNSTOW AND CHECK BOTH OPS		-1:30
TERMINATE GRAVITY MEASUREMENT	:10			-1:20
	:20	POWER DOWN IMU LGC TO STANDBY UPDATA LINK - OFF		-1:10
	112:30	<u>PLSS DONNING</u> CONFIGURE LMP PLSS/OPS FOR DONNING LMP DON PLSS/OPS CONFIGURE CDR PLSS/OPS FOR DONNING CDR DON PLSS/OPS UNSTOW RCU'S VERIFY RCU CONTROLS AND CONNECT TO PLSS/PGA		-1:00
	:40			- :50
	:50	<u>PLSS COMM CHECK</u> 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		- :40
	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

113:10
S
F
N
(-.0507)
(+05.00)
M
SC CONT - CMC/AUTO (VERIFY)
V79 (-0.0507)
(+005.00)
(+00001)
PRO TO START PITCH RATE (180,352/200,000)

ZODIACAL LIGHT PHOTOGRAPHY

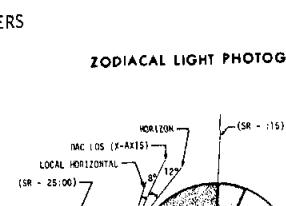
113:17:34 - DET - ZERO/UP/START (T START) (SR-30 MIN)
INHIBIT - A3,C4,B3,D4 THRUSTERS
DAC - ON AT 24fps FOR 2 SEC
CHANGE FRAME RATE TO TIME & SHUTTER SPEED TO 1/60
VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
DIM INTERIOR LIGHTS

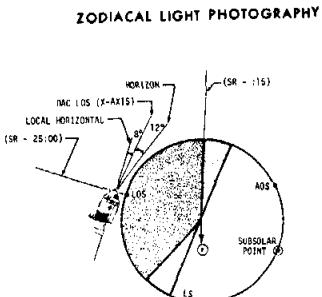
113:20
5:00 - 1 FRAME, 20 SEC EXP TIME (SR -25:00)
1 FRAME, 10 SEC EXP TIME
1 FRAME, 5 SEC EXP TIME

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
 1 FRAME, 2 SEC EXP TIME
 113:40
 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
 REV 17
 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
 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
 114:00
 ENABLE - A3,C4,B3,D4 THRUSTERS
 RECORD MAG % _____
 ZODIACAL LIGHT PHOTOGRAPHY




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

LM FLIGHT PLAN

MCC-H
 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		<u>HELMET/GLOVES DONNING</u> DON HELMETS AND LEVA'S STOW LM HOSES VERIFY PGA CONFIGURATION VERIFY CB CONFIGURATION FOR EVA DON GLOVES	- :20
	:20		<u>PRESSURE INTEGRITY CHECK</u> PLSS O ₂ ON	- :10
M	113:30	S	CABIN DEPRESS DEPRESS CABIN TO 3.5 PSIA START EVA WATCH FWD DUMP VALVE - OPEN PARTIALLY OPEN FORWARD HATCH	0:00 START EVA
F		N	<u>FINAL PREP FOR EGRESS</u> PLSS FEEDWATER - OPEN, FORWARD HATCH - OPEN VERIFY CWEA & PGA STATUS RELEASE PLSS ANTENNAS, LOWER VISOR	
	:40		<u>CDR EGRESS</u> EQUIP JETT, DEPLOY LEC & MESA, DESCEND TO SURFACE	0:10
T		V	ASSIST AND MONITOR CDR PASS LEC TO CDR, TV-ON	
	:50		ENVIRONMENT FAMILIARIZATION	0:20
			MET OFFLOAD	
			UNSTOW AND MOUNT TV ON TRIPOD	
	114:00		CLOSE HATCH AND DESCEND	
			ENVIRONMENT FAMILIARIZATION	0:30

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

114:00

(-.0507)
(+05.00)ACQ MSFN OMNI C

114:10

MSFN UPDATE:
P24 LM VISUAL TRK PAD (114:50)MSFN UPLINK:
CSM S.V.M
S
F
N

(11101)

CYCLE CMC MODE - FREE/AUTO
V48 (11101)

(X1111)

(X1111)

114:20

V49 MNVR TO LM VISUAL TRK ATT (114:36)
(000,304,000) OMNI D

114:30

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

LM FLIGHT PLAN

MCC-H

0823 CST

CDR

LMP

NOTES

UPDATE TO CSM
P24 LM VISUAL TRACK
PAD

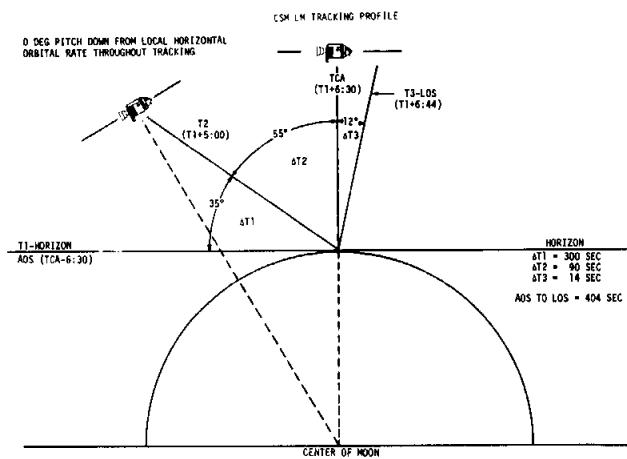
UPLINK TO CSM
CSM S.V.

	114:00		POSITION TV 50 FT NORTH TO VIEW MESA AND LADDER AREAS	DEPLOY TV CABLE	0:30
	:05		<u>S-BAND ERECT ANT DEPLOY</u>	CONTINGENCY SAMPLE COLLECTION	
	:10		UNSTOW S-BAND ANTENNA ORIENT ANTENNA TOWARD EARTH DEPLOY LEGS ERECT MAST DEPLOY DISH	SWC DEPLOYMENT	0:40
	114:15	M S T F V N	ALIGN S-BAND ANTENNA	OFFLOAD LR ³	
	:20		<u>EXPENDABLES TRANSFER</u> STOW CS IN ETB TRANSFER ETB INTO LM	ASSIST CDR WITH S-BAND ANTENNA ALIGNMENT	0:50
	:25		LM AND SITE INSPECTION TRANSFER ETB TO SURFACE	<u>S-BAND SWITCHING</u> ASCEND LADDER SWITCH TO ERECTABLE ANTENNA 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

CSM FLIGHT PLAN

	114:30 (11111) (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) PRO TO START PITCH RATE (000,000/304,000)
	114:40 0:00 - T1 (HORIZON-LM ACQ) DET - ZERO/UP/START
M S F N	
X	5:00 - T2 OPT MODE - MAN, TAKE MARKS 10 SEC APART
	6:30 - TCA 6:44 - T3 (LM LOSS) V48 (11111) (X1111) V49 MNVR TO COMM ATT (114:56) (060,268,000) HGA P <u>29</u> , Y <u>236</u>
	114:50 (11111) (X1111)
	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

MISSION	EDITION	DATE	PAGE
APOLLO 14 <i>114:56</i>	EDM (JAN)	DECEMBER 6, 1970	3-136

Dec 11, 1971

LM FLIGHT PLAN

MCC-H

RECORD PCM LBR
ON DSE DURING P24

0853 CST

CDR

LMP

NOTES

114:30 :35 :40 114:45 :50 :55 115:00	M S T F V N	FLAG DEPLOYMENT	FLAG DEPLOYMENT PLACE 16 MM CAMERA ON SRC TABLE AND TURN ON ASSIST CDR TURN 16 MM CAMERA OFF	1:00
		LM & SITE INSPECTION AND PHOTOGRAPHY	TV PANORAMA SITE SURVEY	1:10
		MET DEPLOYMENT CARRY TV 30 FT EAST OF LM POSITION TO VIEW ALSEP OFFLOAD	MET DEPLOYMENT PULL MET TO QUAD II	1:20
		ALSEP OFFLOAD <u>OFFLOAD ALSEP PKG NO. 1</u>	ALSEP OFFLOAD <u>OPEN SEQ BAY DOORS</u>	1:20
		REMOVE AND ASSEMBLE BAR ATTACH CARRY BAR TO PACKAGE NO. 1	OFFLOAD ALSEP PKG NO. 2 REMOVE AND EXPAND ALHTC REMOVE DRT & FTT	1:30
		DUMP DSE		

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

<p>115:20 (11111) (X1111)</p> <p>MSEN 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)</p> <table border="1"> <thead> <tr> <th colspan="2">P24 LDMK TRACKING</th> </tr> <tr> <th>TGT:</th> <th>(1/60)</th> </tr> </thead> <tbody> <tr> <td>T₁</td> <td>•</td> </tr> <tr> <td>T₂</td> <td>•</td> </tr> <tr> <td>TCA</td> <td>•</td> </tr> <tr> <td>T₃</td> <td>•</td> </tr> <tr> <td>R</td> <td>^{°P} ^{°Y}</td> </tr> <tr> <td>N or S NM</td> <td>/ SA TA (T2 ACQ)</td> </tr> <tr> <td>N89</td> <td></td> </tr> <tr> <td>LAT</td> <td>-00.283</td> </tr> <tr> <td>LONG/2</td> <td>+70.625</td> </tr> <tr> <td>ALT</td> <td>+000.00</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">P24 LDMK TRACKING</th> </tr> <tr> <th>TGT:</th> <th>(1/250)</th> </tr> </thead> <tbody> <tr> <td>T₁</td> <td>•</td> </tr> <tr> <td>T₂</td> <td>•</td> </tr> <tr> <td>TCA</td> <td>•</td> </tr> <tr> <td>T₃</td> <td>•</td> </tr> <tr> <td>R</td> <td>^{°P} ^{°Y}</td> </tr> <tr> <td>N or S NM</td> <td>/ SA TA (T2 ACQ)</td> </tr> <tr> <td>N89</td> <td></td> </tr> <tr> <td>LAT</td> <td>-05.736</td> </tr> <tr> <td>LONG/2</td> <td>+56.155</td> </tr> <tr> <td>ALT</td> <td>+000.00</td> </tr> </tbody> </table> <p>CYCLE CMC MODE - FREE/AUTO V48 (11101) (X1111)</p> <p>V49 MNVR TO LDMK TRK ATT (115:43) (000,075,000) OMNI <u>D</u></p>	P24 LDMK TRACKING		TGT:	(1/60)	T ₁	•	T ₂	•	TCA	•	T ₃	•	R	^{°P} ^{°Y}	N or S NM	/ SA TA (T2 ACQ)	N89		LAT	-00.283	LONG/2	+70.625	ALT	+000.00	P24 LDMK TRACKING		TGT:	(1/250)	T ₁	•	T ₂	•	TCA	•	T ₃	•	R	^{°P} ^{°Y}	N or S NM	/ SA TA (T2 ACQ)	N89		LAT	-05.736	LONG/2	+56.155	ALT	+000.00	<p>115:30 (11101) (X1111)</p> <p>MAP UPDATE REV 18</p> <p>LOS : _____ 180°: _____ AOS : _____</p> <p>115:40 REV 18</p> <p>CONFIGURE CAMERA: (LDMK TRK) CM/DAC/SXT/CEX (EXP-PAD) 1fps (15.2% MAG) MAG (B) _____, MAG % _____ UTILITY POWER - ON</p> <p>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) PRO TO START PITCH RATE (000,338/075,000)</p> <p>0:00 - T1 (HORIZON) DET - ZERO/UP/START</p> <p>3:50 - DAC - ON</p> <p>4:50 - T2 (LDMK ACQ) OPT MODE - MAN, TAKE MARKS 10 SEC APART</p> <p>6:30 - TCA</p> <p>7:18 - T3 (LDMK LOSS) DAC - OFF</p> <p>P24 (LDMK 12-1) V79E, PRO, PRO OPT ZERO - OFF, OPT MODE - CMC 0:00 - T1 (HORIZON) DET -ZERO/UP/START</p>
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MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-138

LM FLIGHT PLAN

MCC-H	0923 CST	CDR	LMP	NOTES
RECORD RTG REPORT	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: <u>FUEL RTG, DRT, & FTT TEMP</u> 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
UPDATE TO CSM P24 TRACK PADS MAP UPDATE REV 18 PRELIM TEI 34 PAD	:10	<u>ALSEP TRAVERSE</u> CARRY LR ³ , PULL MET DESCRIBE MET HANDLING AND STABILITY	<u>ALSEP TRAVERSE</u> CARRY ALSEP	1:40
	:20	ALSEP SITE SURVEY 16 MM CAMERA - ON	ALSEP SITE SURVEY	1:50
	115:30	<u>ALSEP DEPLOYMENT</u> PLACE SUBPALLET ABOUT 10 FEET NE OF C/S PACK SURFACE FOR PSE STOOL 10 FEET NORTH	<u>ALSEP DEPLOYMENT</u> 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	2:20
	116:00	ALSEP ANTENNA INSTALLATION	CPLLE DEPLOYMENT 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 UPDATE:

MAP UPDATE REV 19 (117:10)

MNVR PAD (PLANE CHANGE) (117:45)

M
S
F
N

116:20

P24 (DOLLOND E)

V79E, PRO, PRO

OPT ZERO - OFF, OPT MODE - CMC

116:30

P24 LDMK TRACKING

TGT: DOLLOND E

(1/250)

T₁ —————•—————T₂ —————•—————

TCA —————•—————

T₃ —————•—————

R —————°P————°Y————° (T2 ACQ)

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

N89

LAT -10.433

LONG/2 +07.866

ALT +000.00

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-140

LM FLIGHT PLAN

MCC-H	1023 CST	CDR	LMP	NOTES
RECORD PCM LBR ON DSE DURING P24	116:00	SWITCH NO. 1 - CW SWITCH NO. 5 - CCW	ALIGN AND LEVEL	2:30
CONFIRM ALSEP DATA	:05	<u>PSE DEPLOYMENT</u>	<u>GEOPHONE DEPLOYMENT</u> FIRST GEOPHONE 10 FT SE OF C/S	2:40
UPDATE TO CSM MAP UPDATE REV 19 PLANE CHANGE MNVR PAD	:10	CONFIRM ALSEP DATA WITH MCC-H	SECOND GEOPHONE 160 FT SE OF C/S	
	116:15	M S T F N I A	DEPLOY LR ³ 100 FT W OF C/S	THIRD GEOPHONE 310 FT SE OF C/S
	:20	<u>ALSEP PHOTOGRAPHY</u> PHOTOGRAPH PSE, MORTAR PKG, CPLEE, SIDE/CCIG, RTG & LM, C/S, LR ³ GEOPHONES AND THUMPER	<u>THUMPER ACTIVITY</u> ACTIVATE THUMPER NEAR THIRD GEOPHONE AND AT 15 FOOT INTERVALS ALONG CABLE BACK TO C/S (TOTAL 21)	2:50
	:25	<u>SAMPLE COLLECTION</u>	ADVISE CDR OF IMPENDING ACTIVATIONS	
	116:30	I A	COLLECT COMPREHENSIVE SAMPLE	3:00

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

CSM FLIGHT PLAN

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

M
 S
 F
 N
 X
 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
 V48 {11112} RECORD MAG %
 V49 MNVR TO P52 ATT (116:55)
 (000,114,045) HGA P₄, Y 356
 (184,203,045) HGA P₃, 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)

117:00 P52 (OPTION 3)
 (LDG SITE ORIENT)

P24 LDMK TRACKING
 TGT: FM-1 (1/60)
 T₁ _____ *
 T₂ _____ *
 TCA _____ *
 T₃ _____ *
 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 _____ *

MISSION	EDITION	DATE	PAGE
APOLLO 14 ChgC	FINAL (JAN) ChgC	DECEMBER 2, 1978	3-142

Jan 18, 1971

LM FLIGHT PLAN

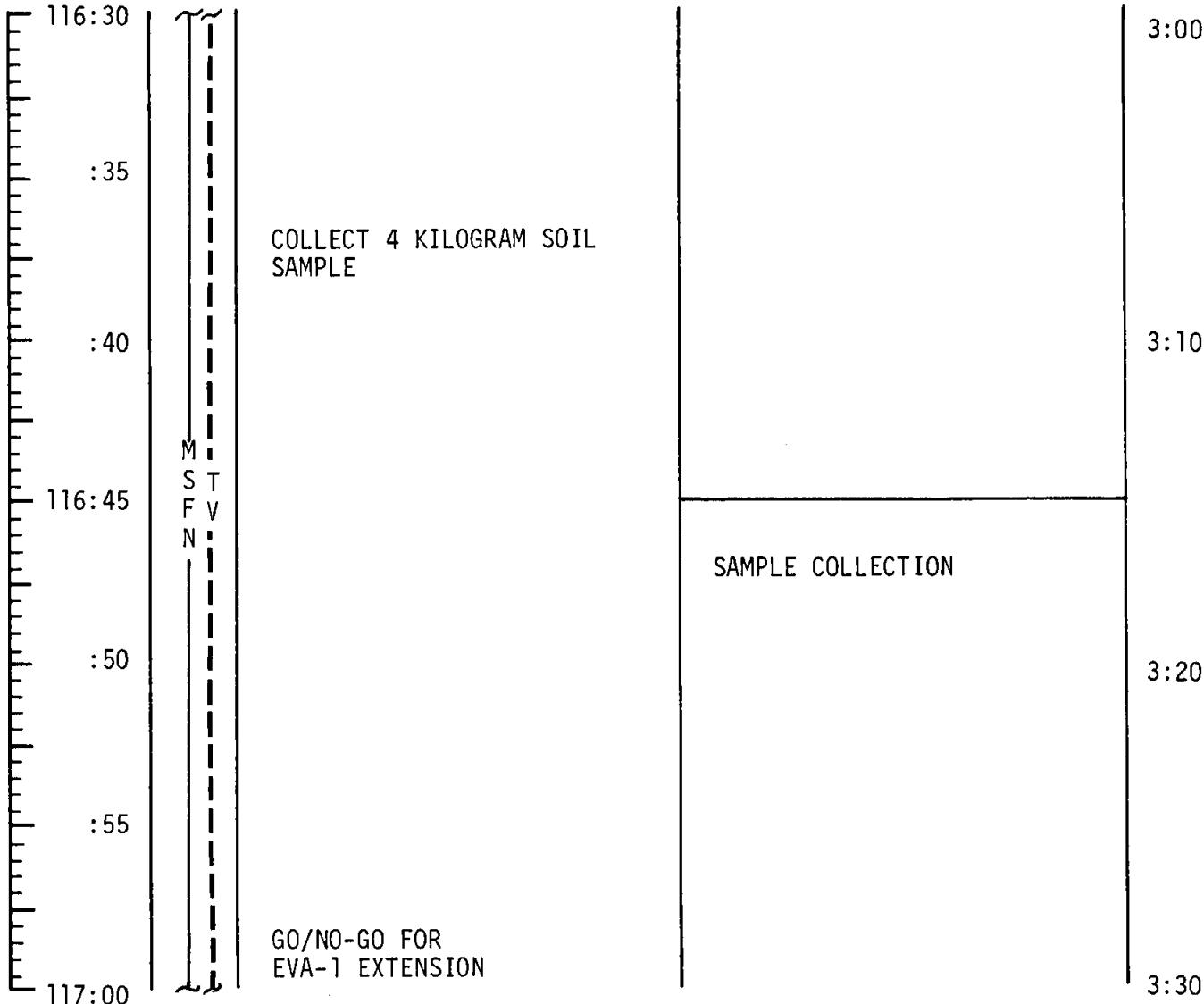
MCC-H

1053 CST

CDR

LMP

NOTES



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

CSM FLIGHT PLAN

117:00 REPORT: GYRO TORQUING ANGLES

(11112)
(X1111)

P52 (OPTION 1)
(PLANE CHANGE ORIENT)

M
S
F
N

117:10 GDC ALIGN
VERIFY ORDEAL
CYCLE CMC MODE - FREE/AUTO
(11101)(X1111)
V48 MNVR TO N, ECLIPTIC POLE ATT (117:16)
(X1111) (272,009,356)

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 : _____

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-144

LM FLIGHT PLAN

MCC-H	1123 CST	CDR	LMP	NOTES
DUMP DSE	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	<u>RETURN TRAVERSE</u> PULL MET ON TRAVERSE BACK TO LM	3:40
	117:15	<u>EVA CLOSEOUT</u> POSITION TV TO VIEW MESA AND LADDER AREAS	<u>EVA CLOSEOUT</u> PULL MET NEAR MESA	
	:20	STOW DOCUMENTED SAMPLES IN SRC NO. 1	STOW 70MM CAMERA IN ETB	3:50
	:25	COLLECT ADDITIONAL SAMPLES TO FILL SRC NO. 1	STOW 16MM CAMERA ON MET	
		REMOVE SKIRT AND SEAL SRC NO. 1	UNSTOW AND PLACE SRC NO. 2 ON MET	
	117:30	CLEAN AND CHECK EMU'S		4:00

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

<p>117:30 (11101) (X1111)</p> <p>P30; VERIFY PC-1 TIG AND ΔV'S V49 MNVR TO PC-1 BURN PAD ATT (117:38)</p> <p>SXT STAR CHECK</p> <p>117:40 REV 19</p> <p>SET DET COUNTING UP TO PLANE CHANGE</p> <p>SECURE EQUIPMENT FOR PC-1</p> <p>V48 (11112) (X1111)</p> <p>117:50 (P40) (0.5° DB)</p> <p>P40 (TRIM)</p> <p>118:00</p>		<p>P30 MANEUVER</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">SET STARS</th><th>C</th><th>S</th><th>M</th><th>P</th><th>C</th><th>I</th><th rowspan="2">PURPOSE</th></tr> <tr> <th>S</th><th>P</th><th>S/G</th><th>&</th><th>N</th><th></th></tr> </thead> <tbody> <tr> <td>R ALIGN</td><td>+</td><td></td><td></td><td></td><td></td><td></td><td>WT N47</td></tr> <tr> <td>P ALIGN</td><td></td><td>0</td><td>0</td><td></td><td></td><td></td><td>P TRIM N48</td></tr> <tr> <td>Y ALIGN</td><td>+</td><td>0</td><td>0</td><td></td><td></td><td></td><td>Y TRIM</td></tr> <tr> <td></td><td>+</td><td>0</td><td>0</td><td>0</td><td></td><td></td><td>HRS GETI</td></tr> <tr> <td></td><td>+</td><td>0</td><td></td><td></td><td></td><td></td><td>MIN N33</td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>SEC</td></tr> <tr> <td>ULLAGE</td><td></td><td></td><td></td><td></td><td></td><td></td><td>ΔV_X N81</td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ΔV_Y</td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>ΔV_Z</td></tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>R (180)</td></tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>P (354)</td></tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>Y (003)</td></tr> <tr> <td></td><td>+</td><td></td><td></td><td></td><td></td><td></td><td>H_A N44</td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>H_P</td></tr> <tr> <td></td><td>+</td><td></td><td></td><td></td><td></td><td></td><td>ΔVT</td></tr> <tr> <td>HORIZON/WINDOW</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>BT</td></tr> <tr> <td></td><td>X</td><td></td><td></td><td></td><td></td><td></td><td>ΔVC</td></tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td>X</td><td></td><td></td><td>SXTS</td></tr> <tr> <td></td><td>+</td><td></td><td></td><td></td><td>O</td><td></td><td>SFT</td></tr> <tr> <td></td><td>+</td><td></td><td></td><td>O</td><td>O</td><td></td><td>TRN</td></tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>BSS</td></tr> <tr> <td></td><td>X</td><td>X</td><td></td><td></td><td></td><td></td><td>SPA</td></tr> <tr> <td></td><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td>SXP</td></tr> <tr> <td>OTHER</td><td>O</td><td></td><td></td><td></td><td></td><td></td><td>LAT N61</td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>LONG</td></tr> <tr> <td></td><td>+</td><td></td><td></td><td></td><td></td><td></td><td>RTGO EMS</td></tr> <tr> <td></td><td>+</td><td></td><td></td><td></td><td></td><td></td><td>VTO</td></tr> <tr> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td>GET 0.05G</td></tr> </tbody> </table>	SET STARS	C	S	M	P	C	I	PURPOSE	S	P	S/G	&	N		R ALIGN	+						WT N47	P ALIGN		0	0				P TRIM N48	Y ALIGN	+	0	0				Y TRIM		+	0	0	0			HRS GETI		+	0					MIN N33								SEC	ULLAGE							ΔV_X N81								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		+						VTO								GET 0.05G	
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LM FLIGHT PLAN

MCC-H

1153 CST

CDR

LMP

NOTES

	117:30				4:00
	:35		EVA TERMINATION INGRESS CHECK LM & EMU ASSIST CDR		
	:40	TRANSFER ETB INTO LM TRANSFER SRC INTO LM ASCEND LADDER STOW LEC AND INGRESS CLOSE HATCH	TRANSFER LEC TO CDR		4:10
M S T F V N	117:45	REPRESSURIZE CABIN <u>POST-EVA SYSTEMS CONFIGURATION</u> 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	<u>PLSS O₂ RECHARGE</u> CONNECT LMP PLSS TO LM O ₂ SUPPLY AND FILL (2 MIN) CONNECT CDR PLSS TO LM O ₂ SUPPLY AND FILL (2 MIN)			
	118:00				

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)

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	$\pm 10^\circ$	BT + 1 SEC	NO TRIM
TERMINATE	TERMINATE		

118:10

{11112}
x1111}

POO
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 OO TIME				HRS
+	0	0		
+	0	0	0	
+	0			SEC

118:20

CONFIGURE CAMERAS: (EARTHSHINE)
CM4/PAC/18/VNPBLR PKT MIR CONT

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

~~PCM CABLE~~
CM4/DC/80/VHBW-BRKT, IVL (f2.8,1/60,∞) (51 FR)

MAG (S) , FR #
COVER LENS. CYCLE 3 FRAMES

P52 (OPTION 1) GYRO TORQUE
(LIFT-OFF ORIENT)

118:30

BURN STATUS REPORT

***ITEMS TO BE REPORTED TO MSFM**

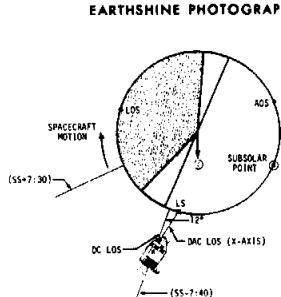
MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN) <i>Chg B</i>	DECEMBER 29, 1970	3-148

LM FLIGHT PLAN

MCC-H	1223 CST	CDR	LMP	NOTES
GO/NO-GO FOR PLANE CHANGE	118:00			
<u>UPLINK TO CSM</u> <u>DESIRED ORIENT</u> <u>(LIFT-OFF)</u> RLS (IF REQ'D) <u>UPDATE TO CSM</u> REFSMMAT 00 TIME EARTHSHINE PHOTO PAD MAP UPDATE REV 20	:05	<u>PLSS/OPS DOFFING</u> REMOVE RCU'S, DOFF PLSS/OPS REPLACE LMP PLSS BAT & LiOH CARTRIDGE REMOVE OPS, CHECK PRESSURE, AND STOW ON ENGINE COVER STOW PLSS (RECHARGE STATION) REPLACE LMP PLSS BAT & LiOH CARTRIDGE REMOVE OPS AND STOW PLSS ON FLOOR CHECK OPS PRESSURE STOW LMP OPS ON FLOOR STOW PLSS ON FLOOR STOW RCU'S ON DATA FILE STOW DISP CONT ON MID-STEP STOW LEVA'S ON LH FORWARD FLOOR		0:20
DUMP DSE	:10			
	118:15	M S F N		0:30
	:20			
	:25			0:40
	118:30		<u>POST-EVA CABIN CONFIGURATION</u> UNSTOW SCALE	

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	118:00 - 118:30	5/19	3-149

CSM FLIGHT PLAN

<p>118:30 (11112) (X1111)</p>	<p>GDC ALIGN VERIFY ORDEAL V49 MNVR TO EARTHSHINE ATT (118:41) (000,164,000) HGA P <u>-27</u>, Y <u>180</u></p> <p>118:40 SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+005.00) (+00001) (-.0507) (+05.00) PRO TO START PITCH RATE (000,<u>258</u>/164,000)</p> <p>EARTHSHINE PHOTOGRAPHY 118:44:39 - DET-ZERO/UP/START (T START)(SS -13 MIN) INHIBIT - A3,C4,B3,D4 THRUSTERS DIM INTERIOR LIGHTS</p> <p>118:50 5:20 - DAC - ON (SS -7:40) 5:30 - DC - ON (SS -7:30)</p> <p>7:30 - CHANGE DC SHUTTER TO 1/15 SEC (SS -5:30) CHANGE DAC SHUTTER TO 1/60 SEC</p>	 <p>EARTHSHINE PHOTOGRAPHY</p> <p>The diagram illustrates the geometry for Earthshine photography. A central circle represents the Earth. The Sun is at the top, and the Subsolar Point is marked on the Earth's surface. The Spacecraft Motion arrow points towards the bottom-left. The LOS (Line of Sight) is shown as a line from the spacecraft to the Earth. The AOS (Acquisition of Signal) angle is indicated by a line from the Subsolar Point to the LOS. The DAC LOS (x-axis) is shown as a line from the spacecraft to the left, labeled with an angle of 12°. The DC LOS is also shown. The time markers (SS-7:30 and SS-7:40) indicate the sequence of events.</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>EARTHSHINE PHOTO PAD</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px;">•</td> <td style="padding: 2px;">•</td> </tr> <tr> <td style="padding: 2px;">•</td> <td style="padding: 2px;">•</td> </tr> <tr> <td style="padding: 2px;">•</td> <td style="padding: 2px;">•</td> </tr> </table> <p>T START: _____</p> <p>START DET AT SUNSET -13 MIN</p> </div>	•	•	•	•	•	•
•	•							
•	•							
•	•							

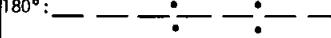
MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-150

LM FLIGHT PLAN

MCC-H	1253 CST 118:30	CDR	LMP	NOTES
RECORD SAMPLE BAG WEIGHT	:35	<u>POST-EVA CABIN CONFIGURATION (CONT)</u> WEIGH SAMPLE BAG, REPORT: <u>WEIGHT</u> EMPTY ETB RECONFIGURE CAMERAS STOW CSRC REPACK ETB		0:50
RECORD SRC WEIGHT	:40	WEIGH SRC, REPORT: <u>WEIGHT</u> VERIFY CB CONFIGURATION MODULATE-PM UNSTOW LUNAR SURFACE CHECKLIST STOW EVA-1 PREP & POST CARD		1:00
	118:45			
	:50			
	:55	EAT PERIOD		1:10
	119:00			

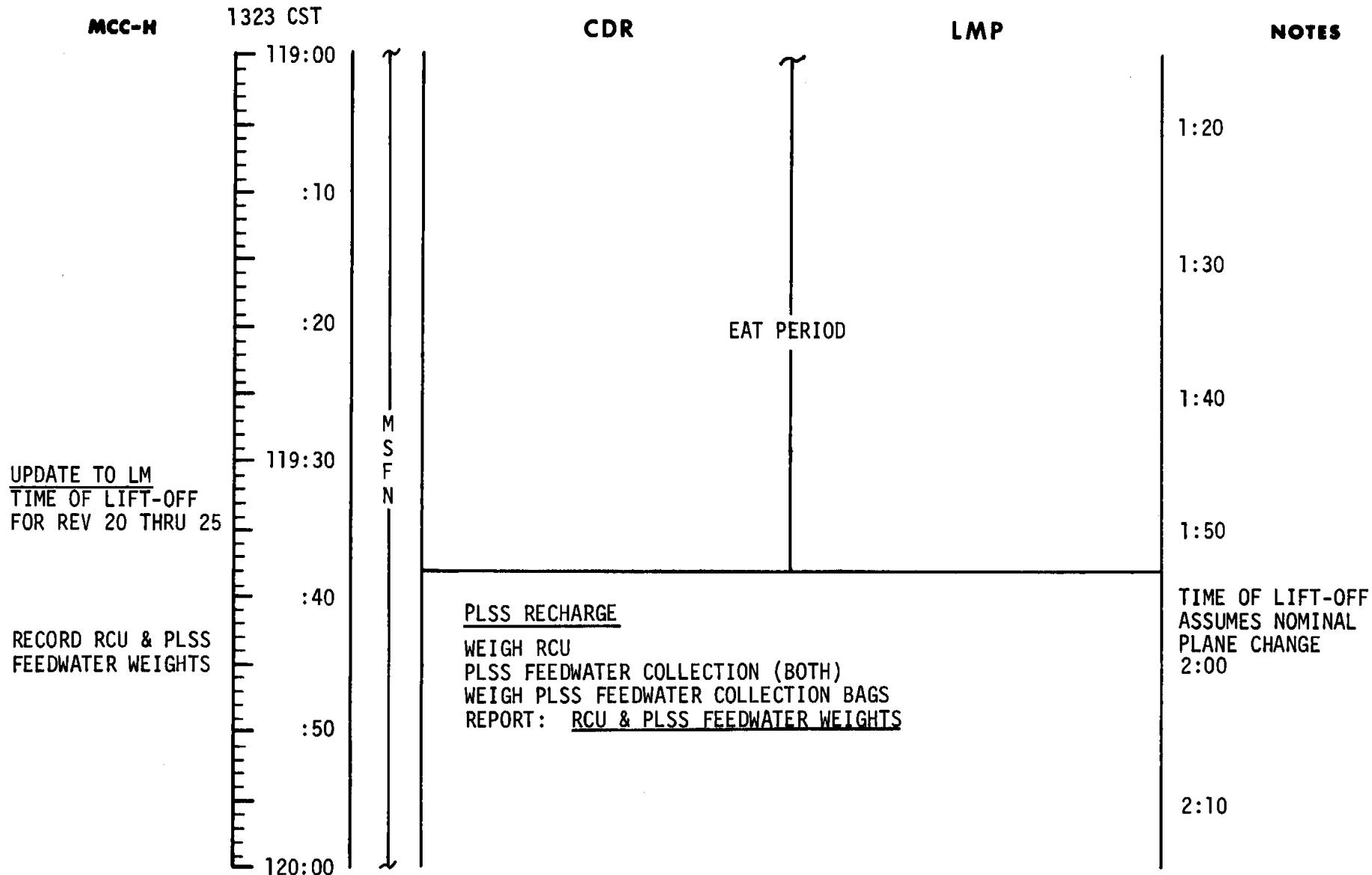
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	118:30 - 119:00	5/19	3-151

CSM FLIGHT PLAN

<p>119:00 (-.0507) (+05.00)</p> <p>MAP UPDATE REV 20</p> <p>LOS : </p> <p>180° : </p> <p>AOS : </p> <p>20:30 - DC - OFF, DAC - OFF (SS +7:30) REMOVE DC FROM WINDOW, COVER LENS, CYCLE 3 FRAMES REMOVE DAC FROM WINDOW, COVER LENS, AND RUN DAC AT 24 fps AND SHUTTER SPEED 1/500 FOR 2 SEC LIGHTS UP, ENABLE - A3,C4,B3,D4 THRUSTERS</p> <p>M S F N RECORD MAG % _____, FR # _____</p> <p>119:10 (11112) (X1111)</p> <p>V49 MNVR TO REST ATT (119:16) (050,272,000) HGA P 39, Y 258</p> <p>VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <p>P52 (OPTION 3) (LIFT-OFF ORIENT)</p> <p>GDC ALIGN VERIFY ORDEAL</p> <p>MAN ATT (3) - ACCEL CMD SC CONT - CMC/AUTO (VERIFY) V79 (-0.0000) (+010.00) (+00001) PRO MAN ATT (3) - RATE CMD</p>	<p>119:30 (-0.000) (+10.00)</p> <p>LIOH CANISTER CHANGE: (11 INTO A, STOW 9 IN A3)</p> <p>REV 20</p> <p>119:40</p> <p>EAT PERIOD</p> <p>REST ATTITUDE</p> <p>119:50</p> <p>CONFIGURE FOR VHF BI-STATIC RADAR TEST VHF AM T/R (3) - RCV (VERIFY) VHF AM A - OFF (VERIFY) VHF AM B - DUPLEX (VERIFY) VHF RNG - RNG VHF ANT - RIGHT</p> <p>120:00</p> <p>THIS TEST WILL BE RUN UNTIL ~ 131:00</p>
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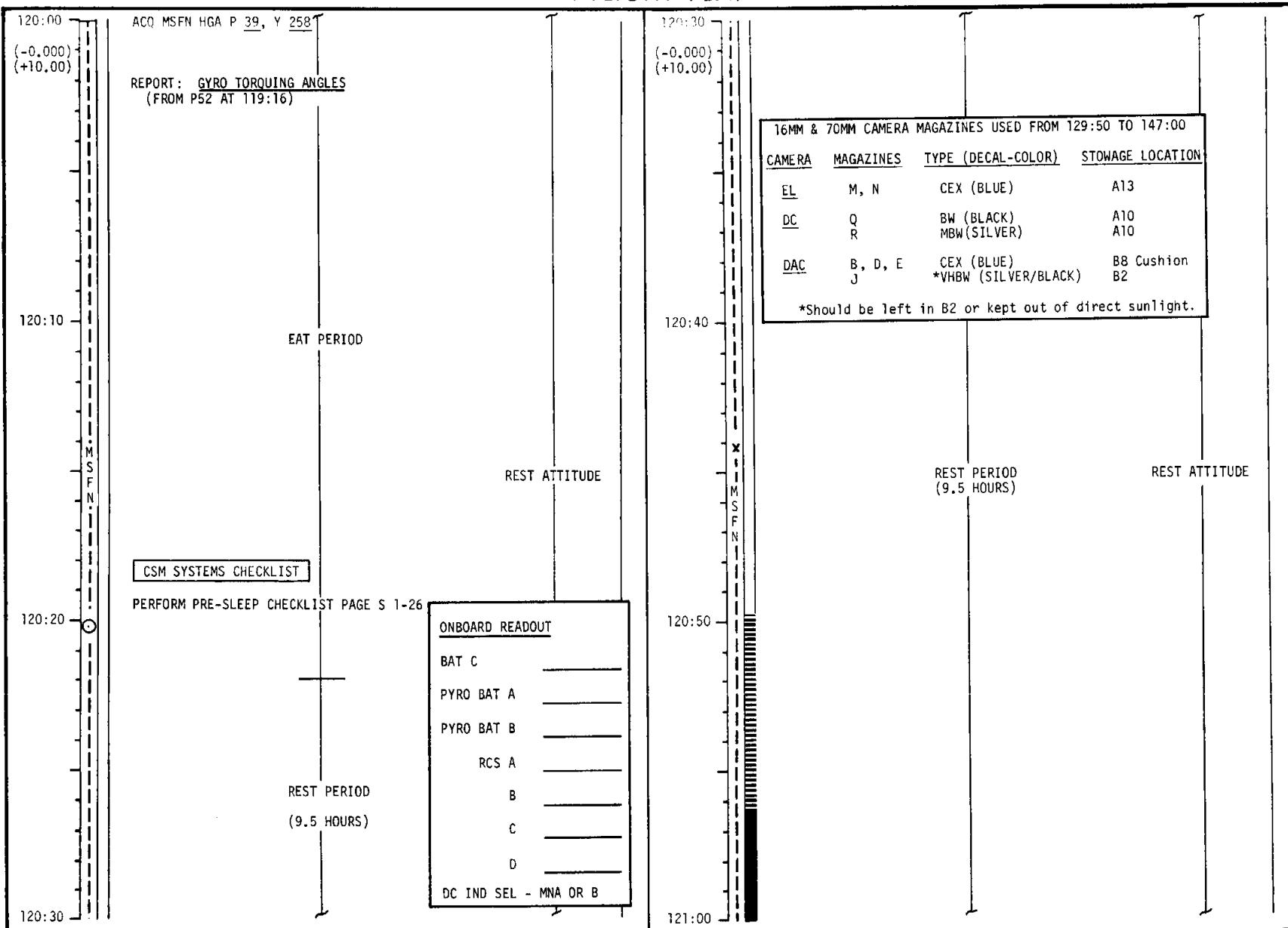
MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-152

LM FLIGHT PLAN

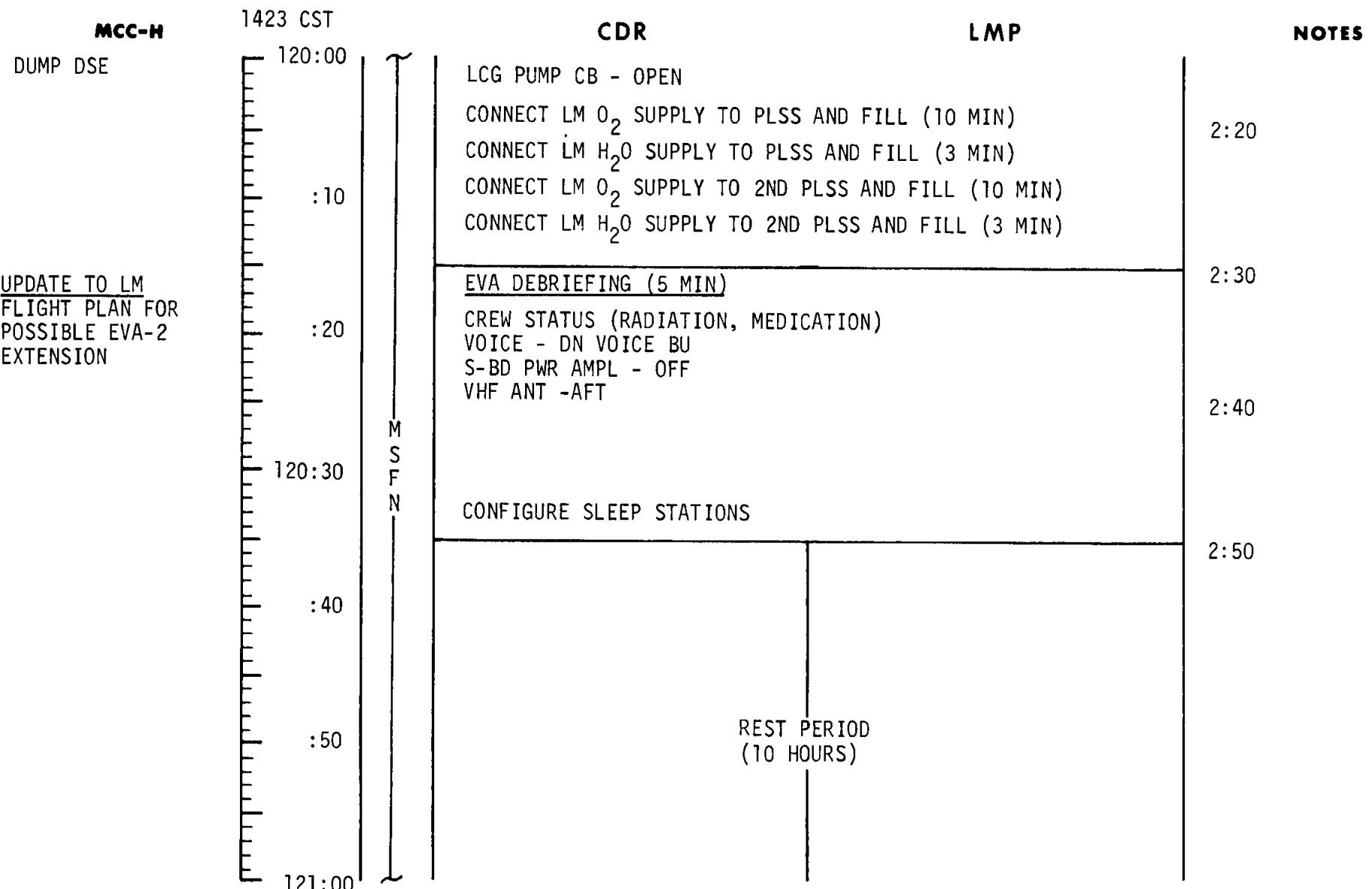


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	119:00 - 120:00	5/19-20	3-153

CSM FLIGHT PLAN

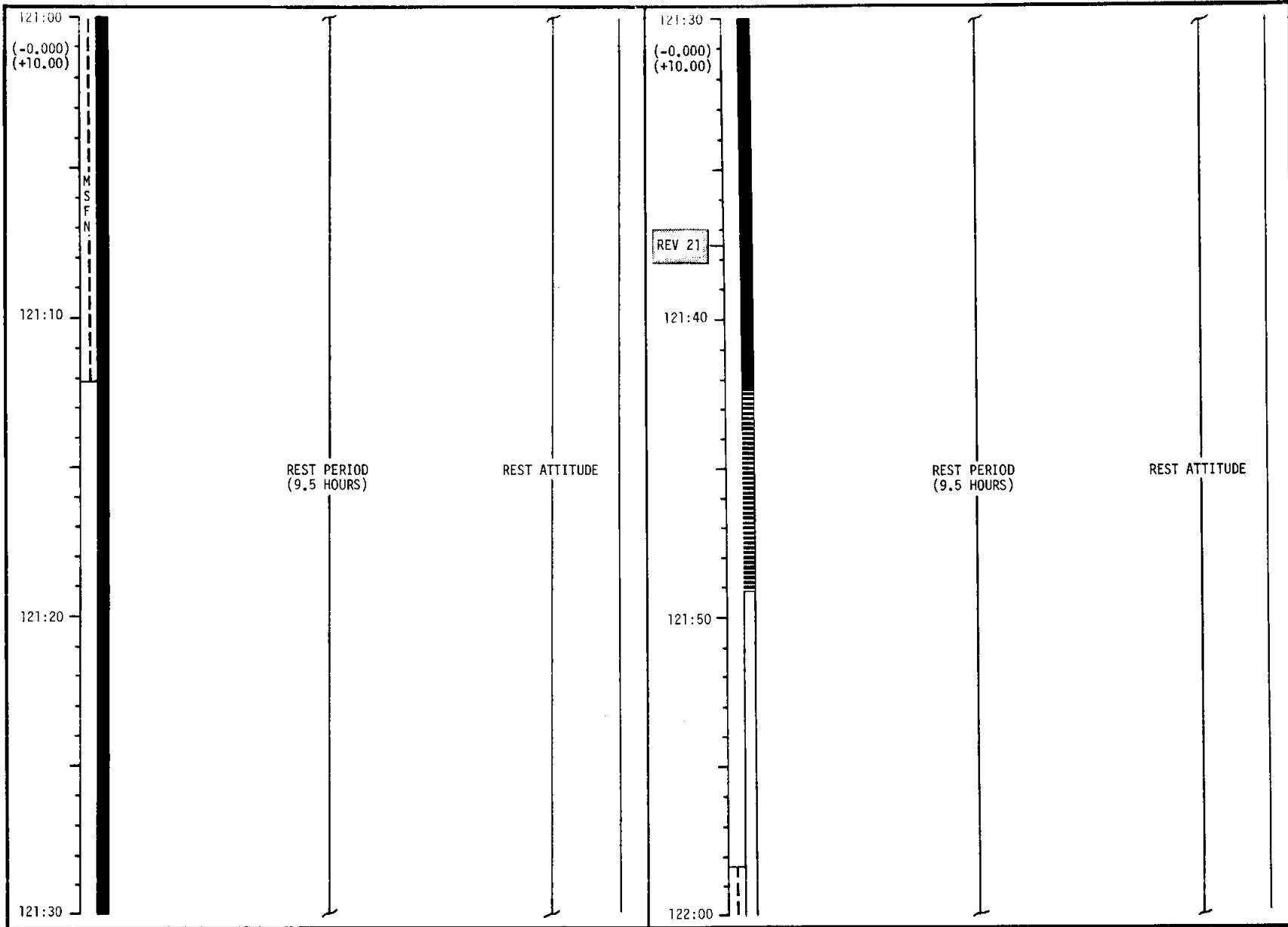


LM FLIGHT PLAN



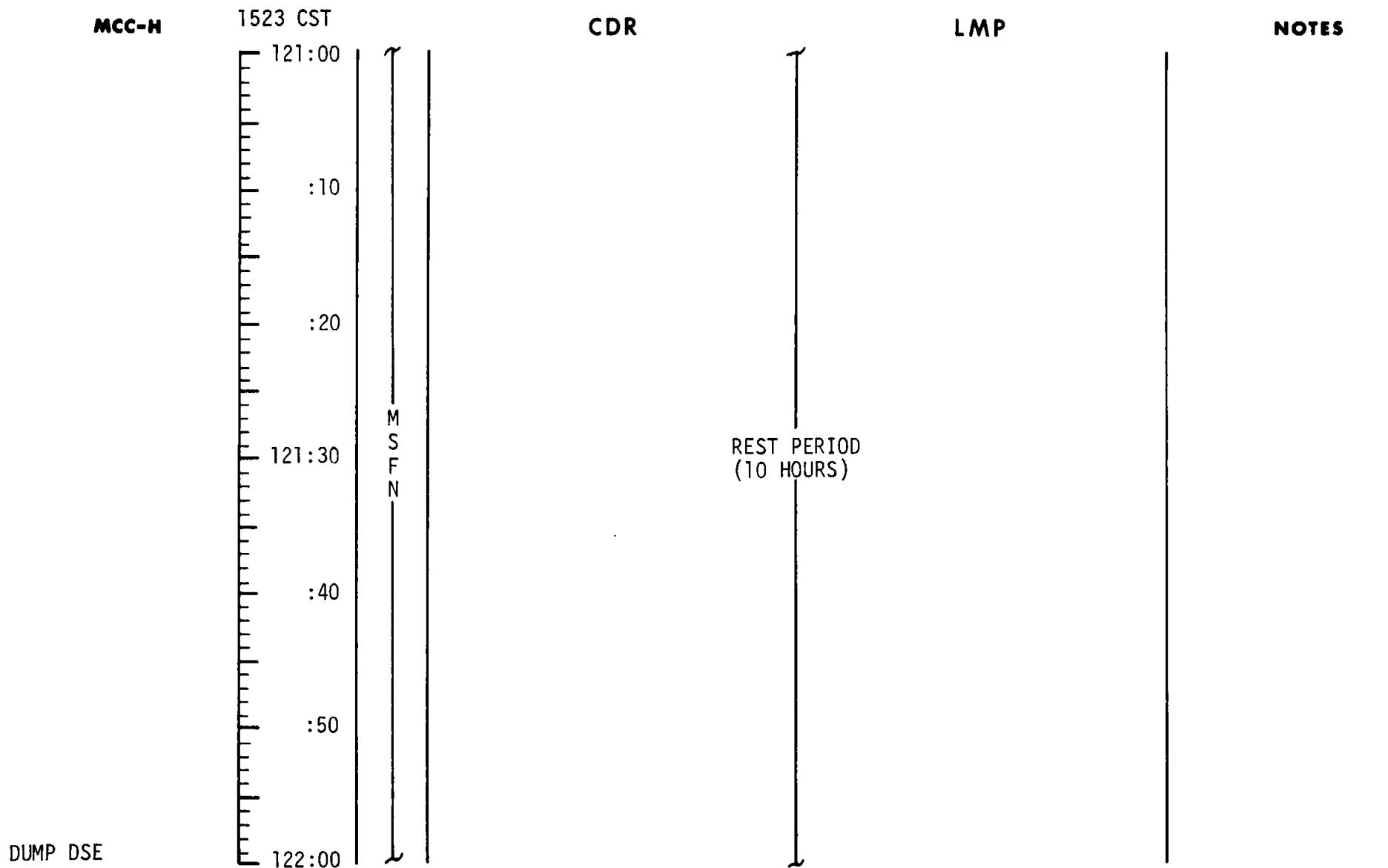
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	120:00 - 121:00	5/20	3-155

CSM FLIGHT PLAN



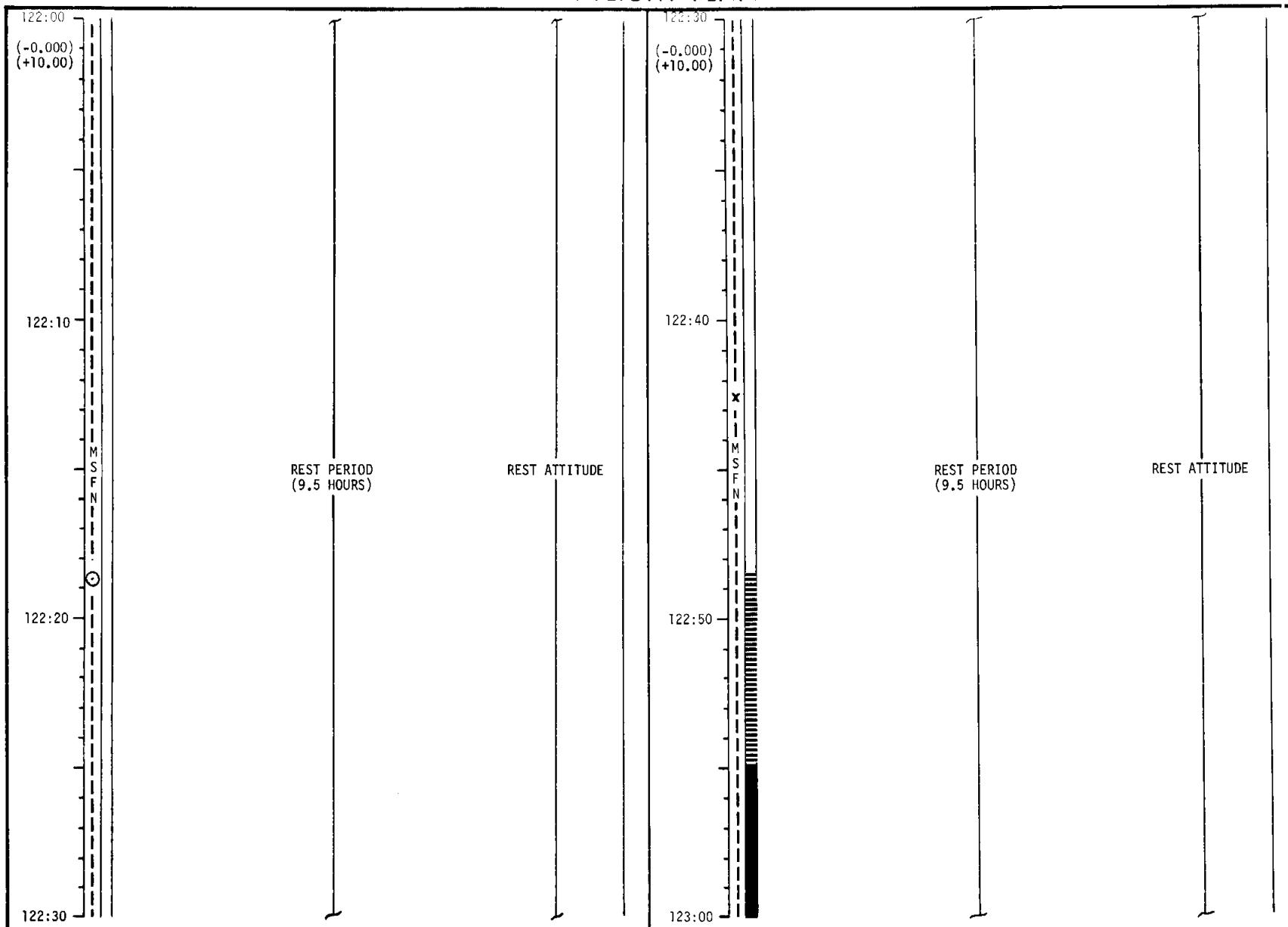
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-156

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

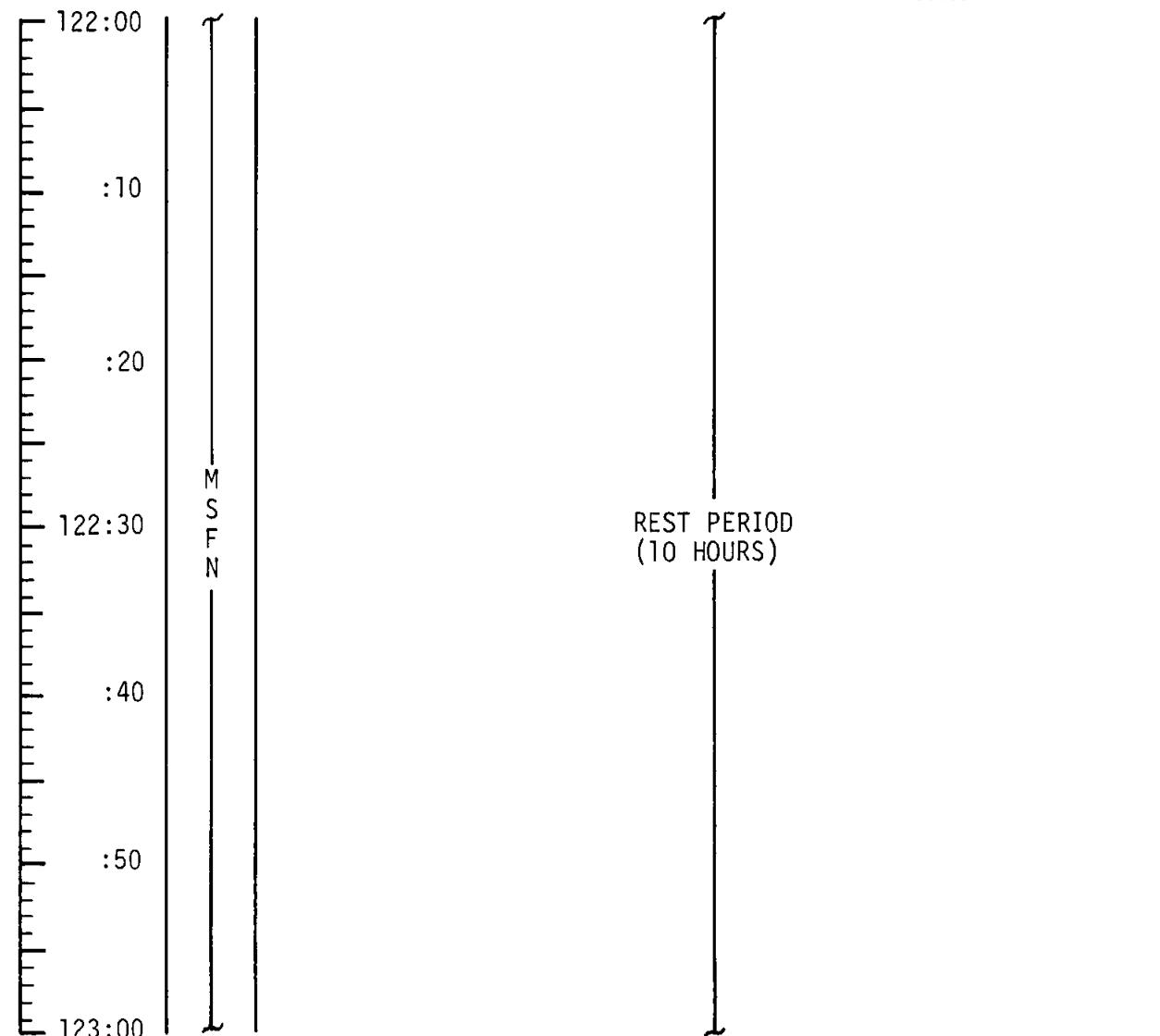
MCC-H

1623 CST

CDR

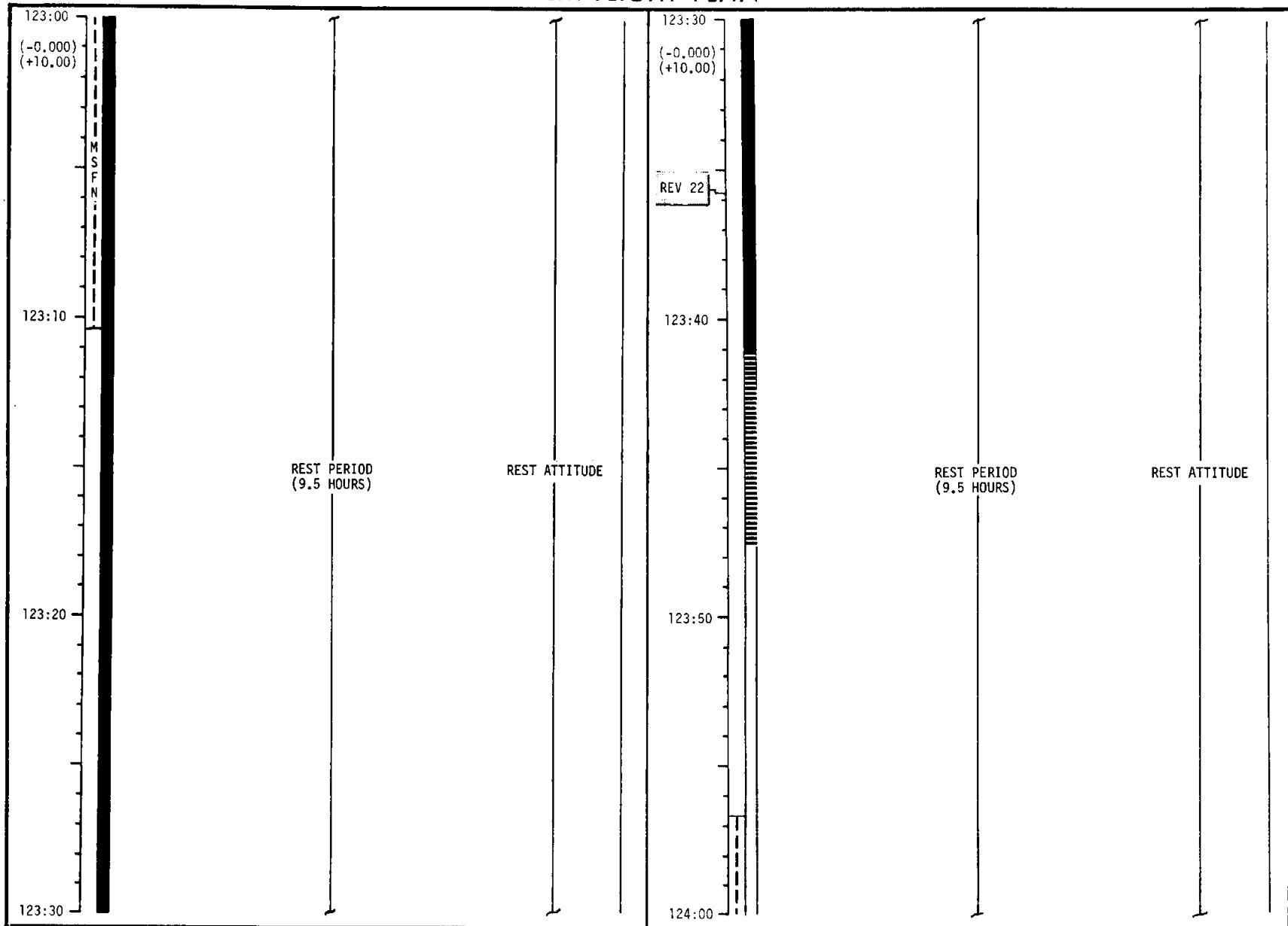
LMP

NOTES



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

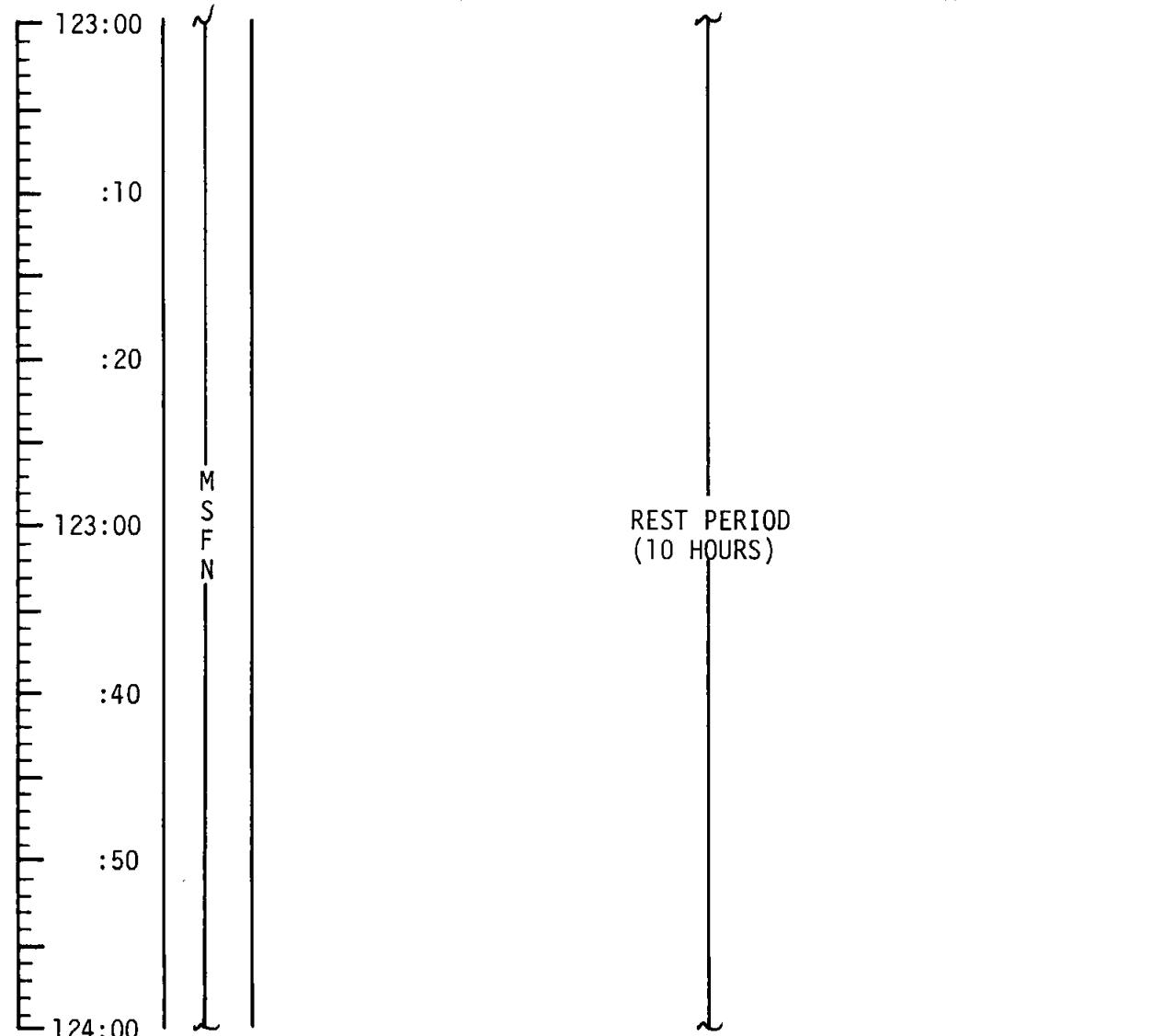
MCC-H

1723 CST

CDR

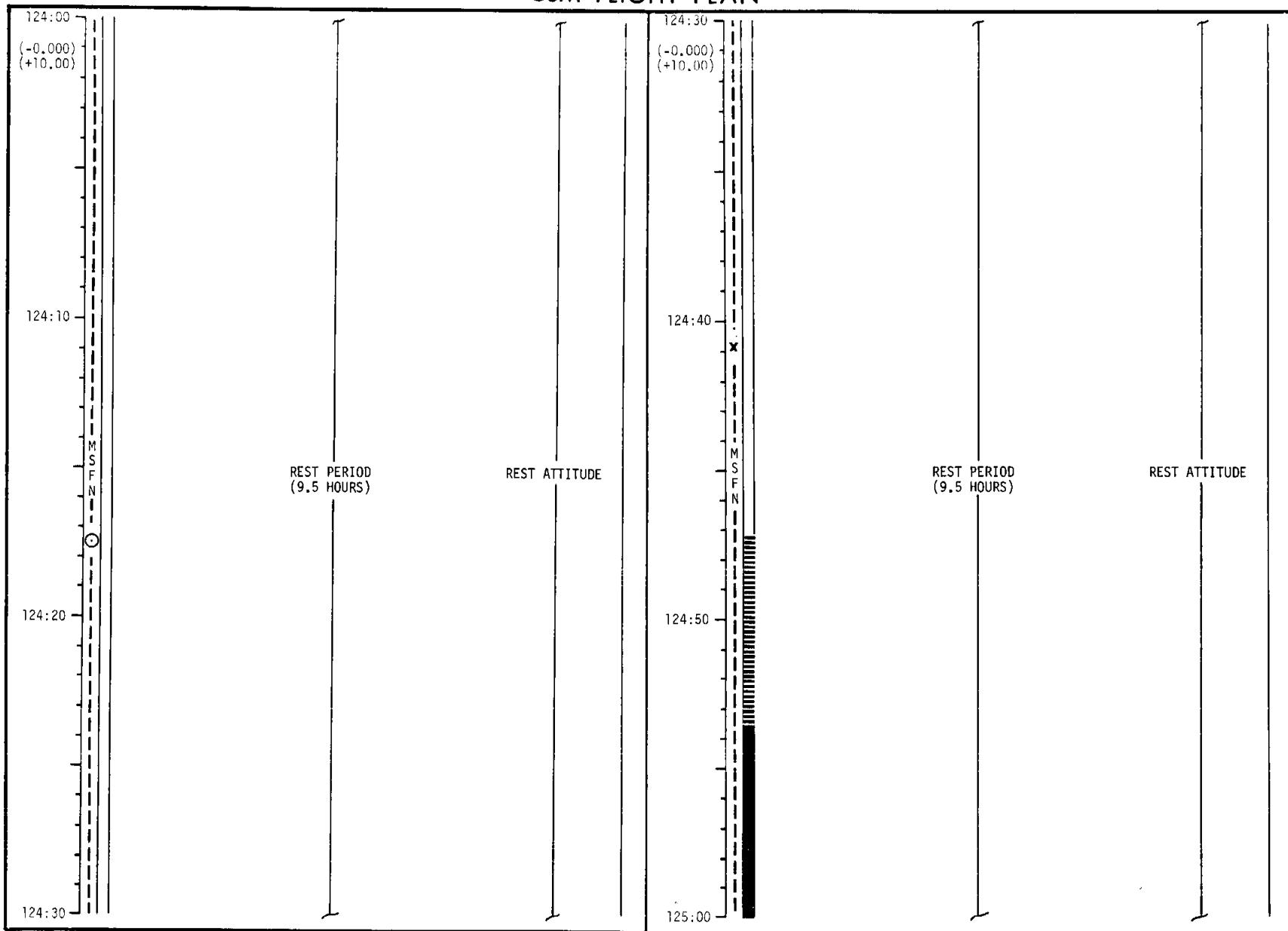
LMP

NOTES



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

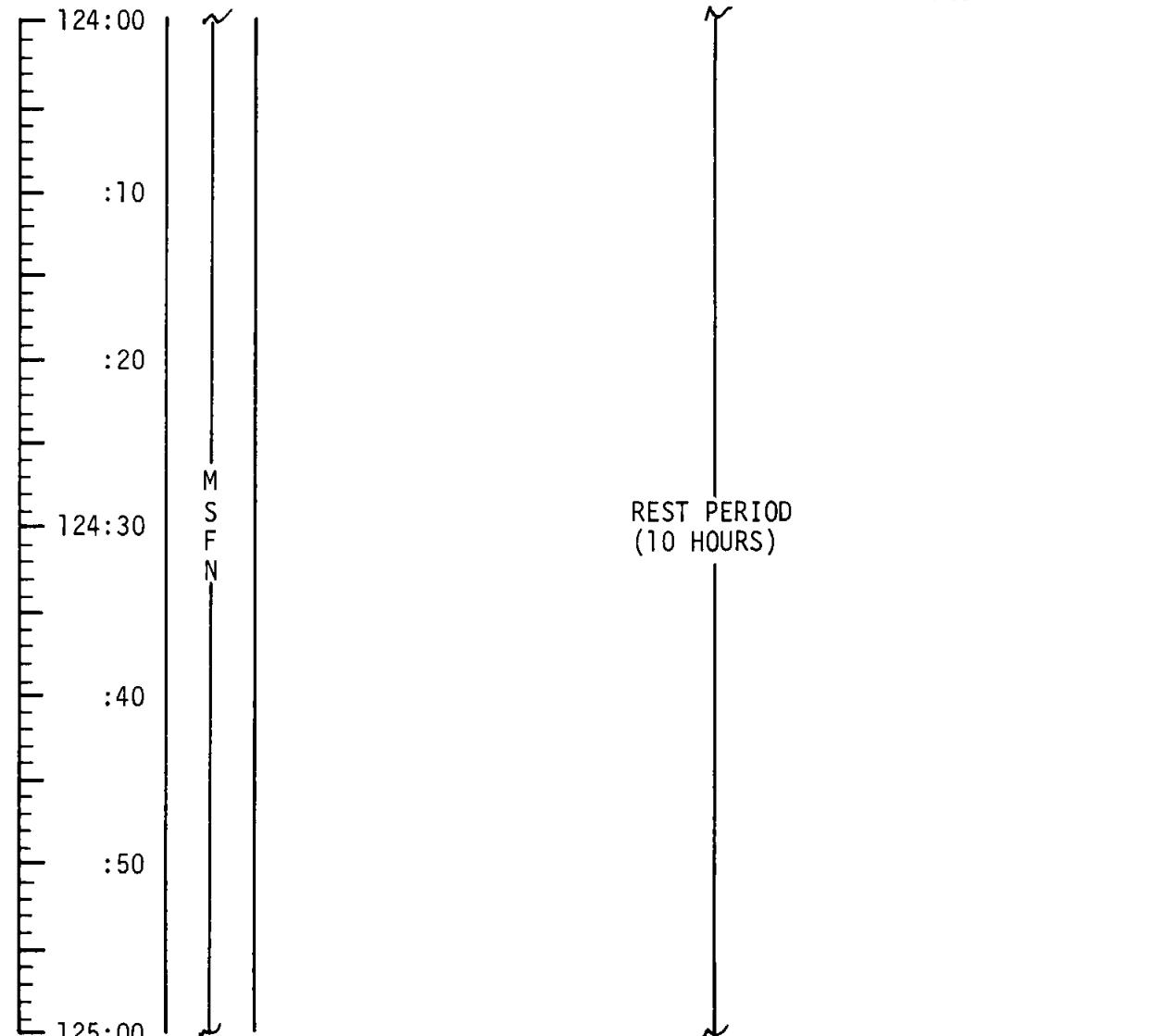
MCC-H

1823 CST

CDR

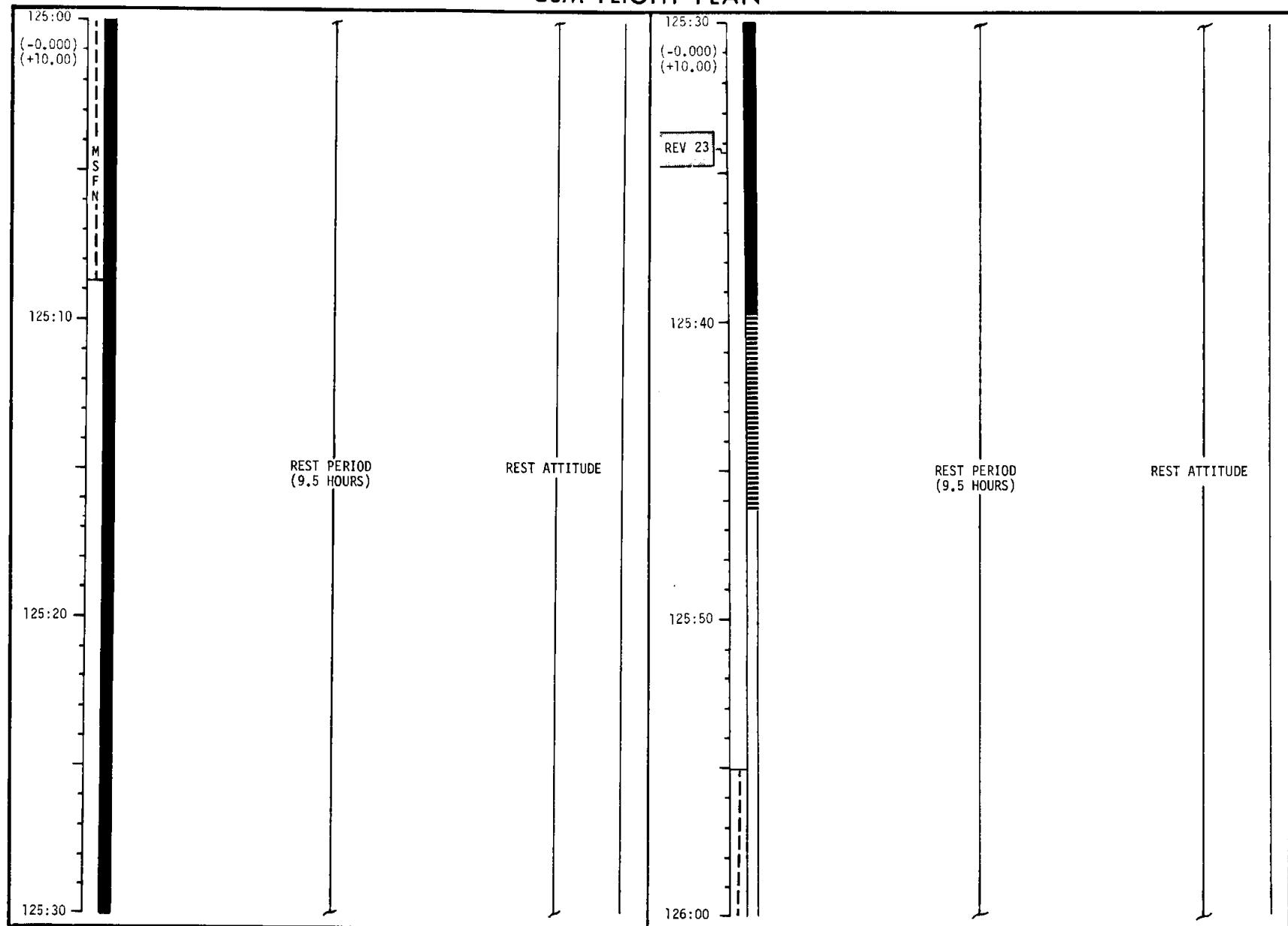
LMP

NOTES



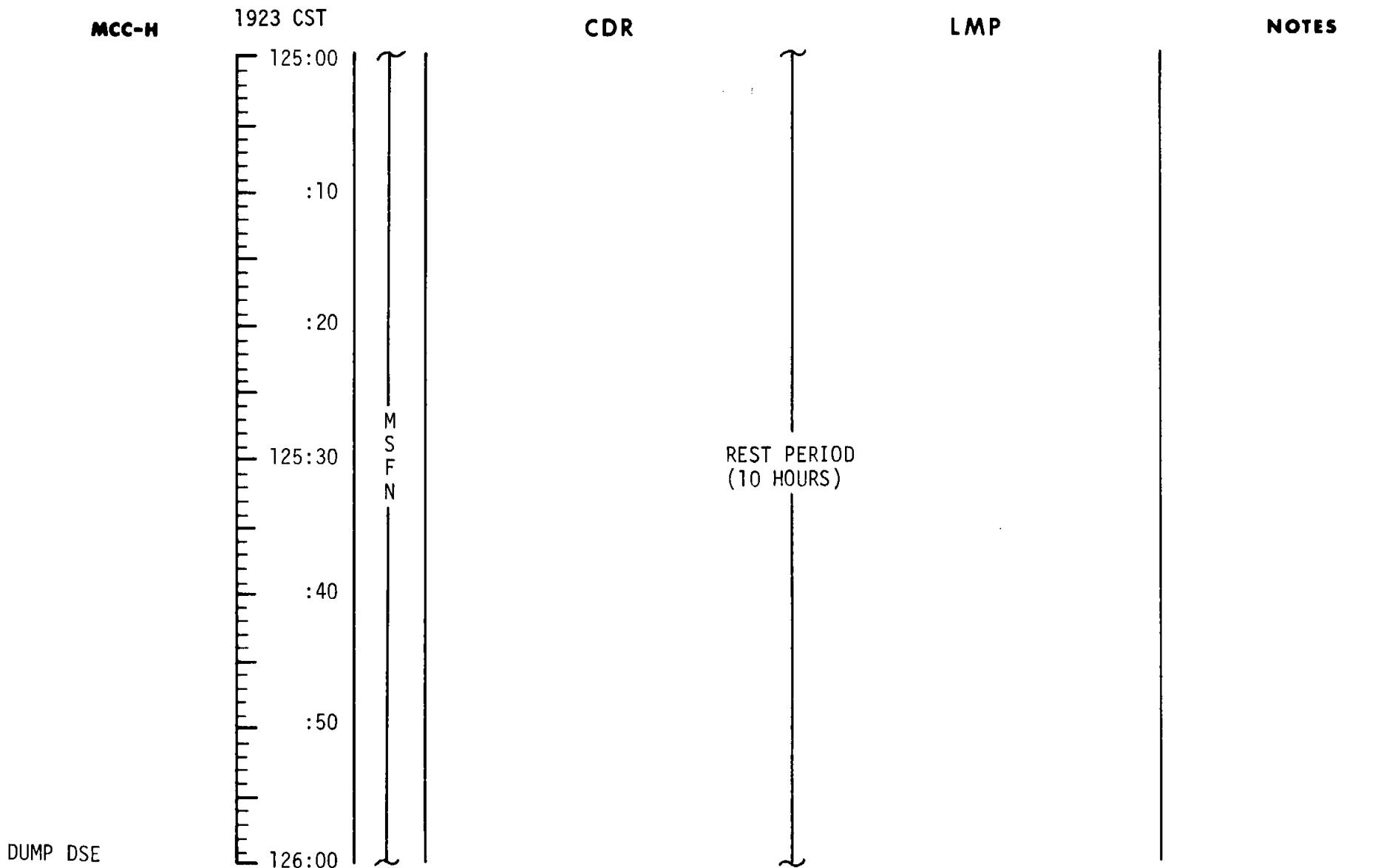
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	124:00 - 125:00	5/22	3-163

CSM FLIGHT PLAN



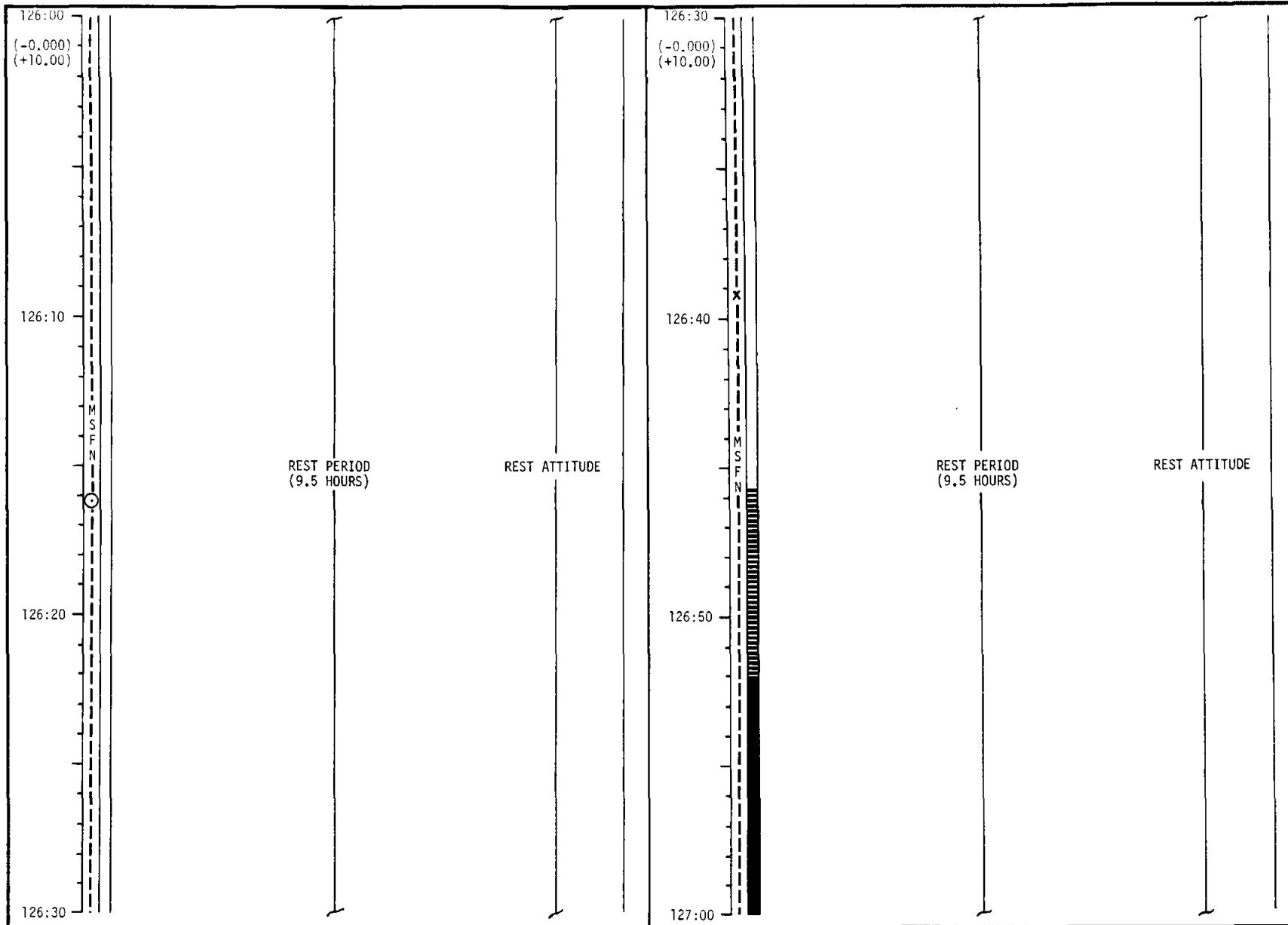
MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-164

LM FLIGHT PLAN



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	125:00 - 126:00	5/22-23	3-165

CSM FLIGHT PLAN



MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-166

LM FLIGHT PLAN

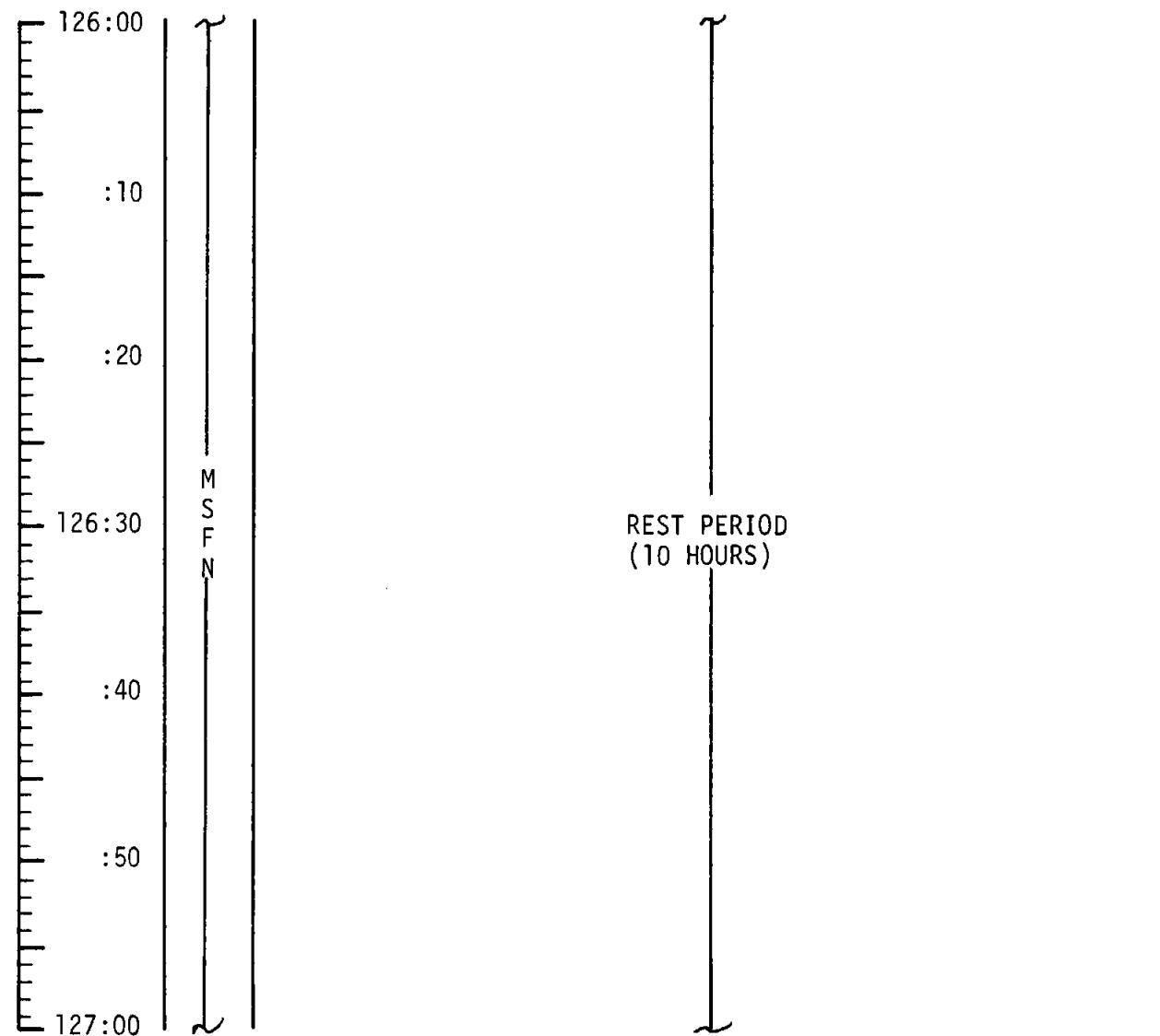
MCC-H

2023 CST

CDR

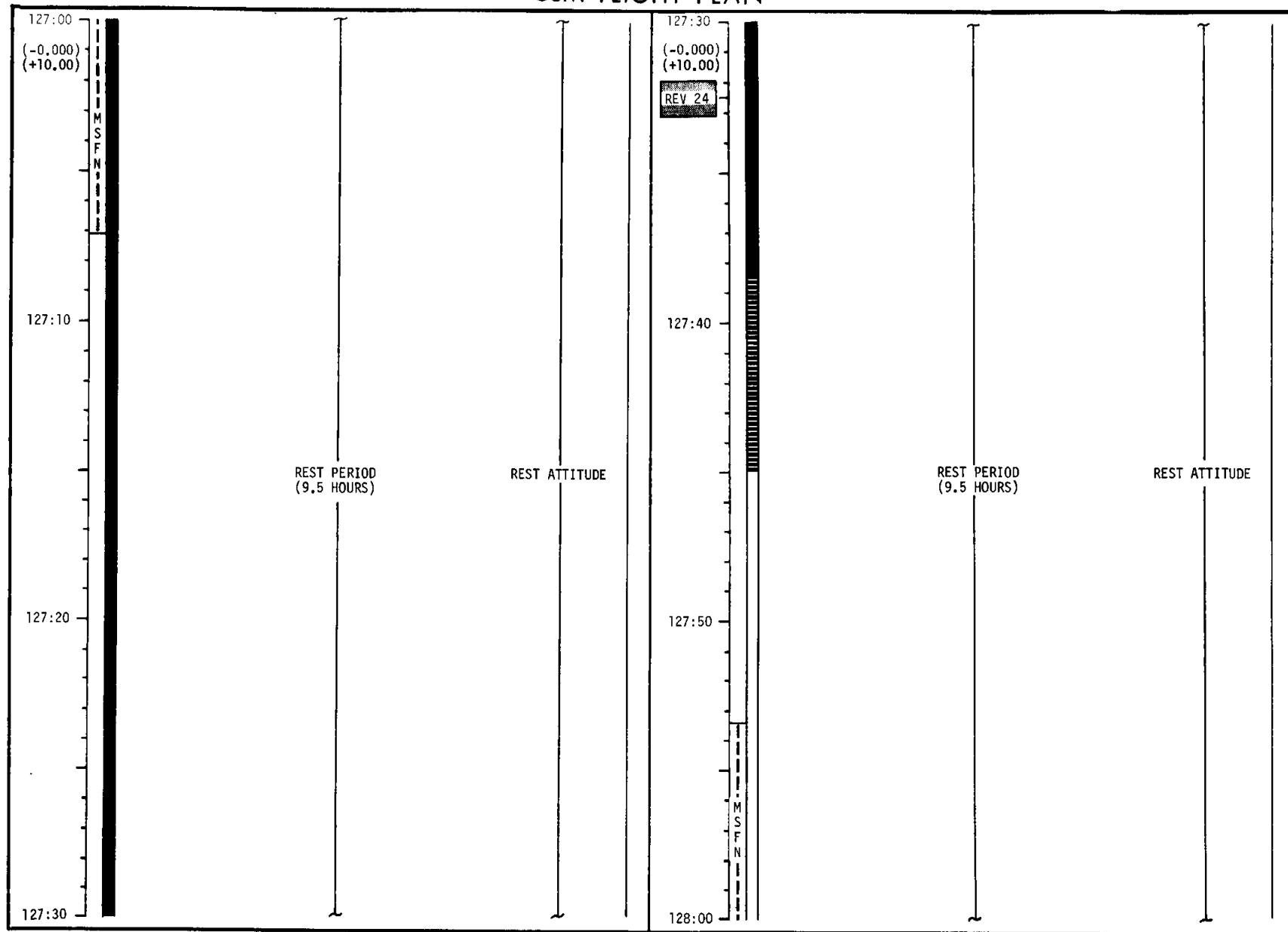
LMP

NOTES



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

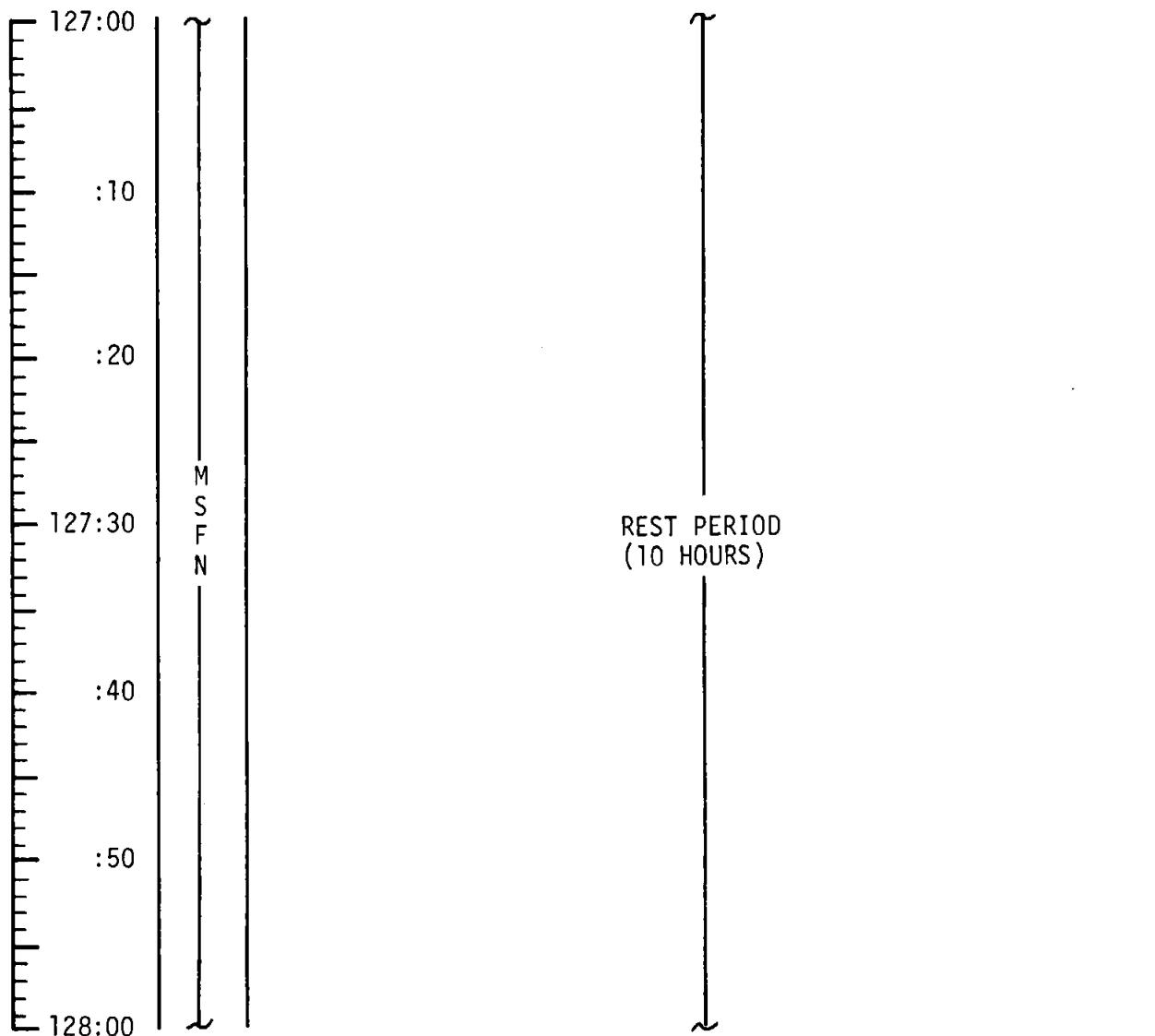
MCC-H

2123 CST

CDR

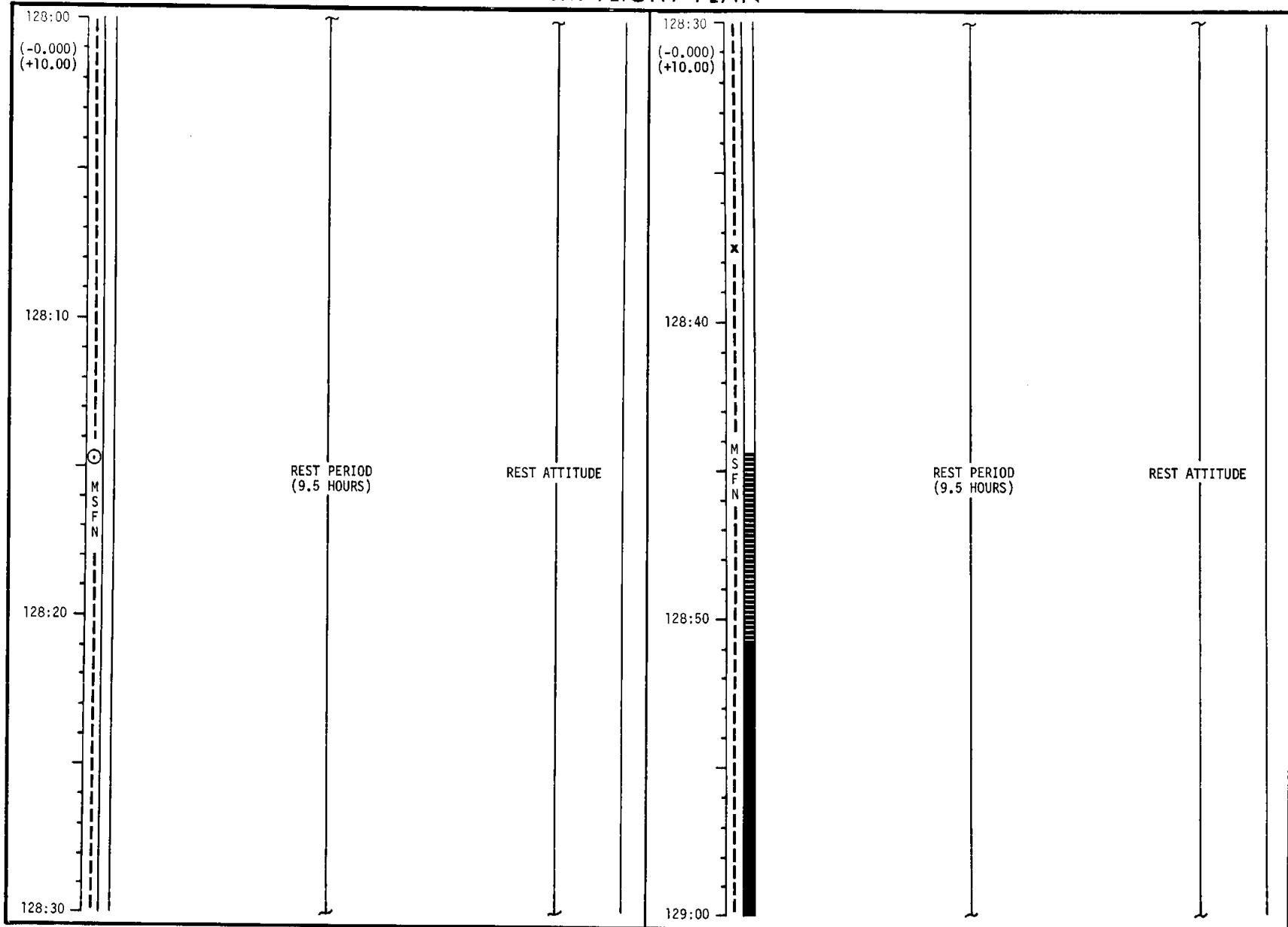
LMP

NOTES



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

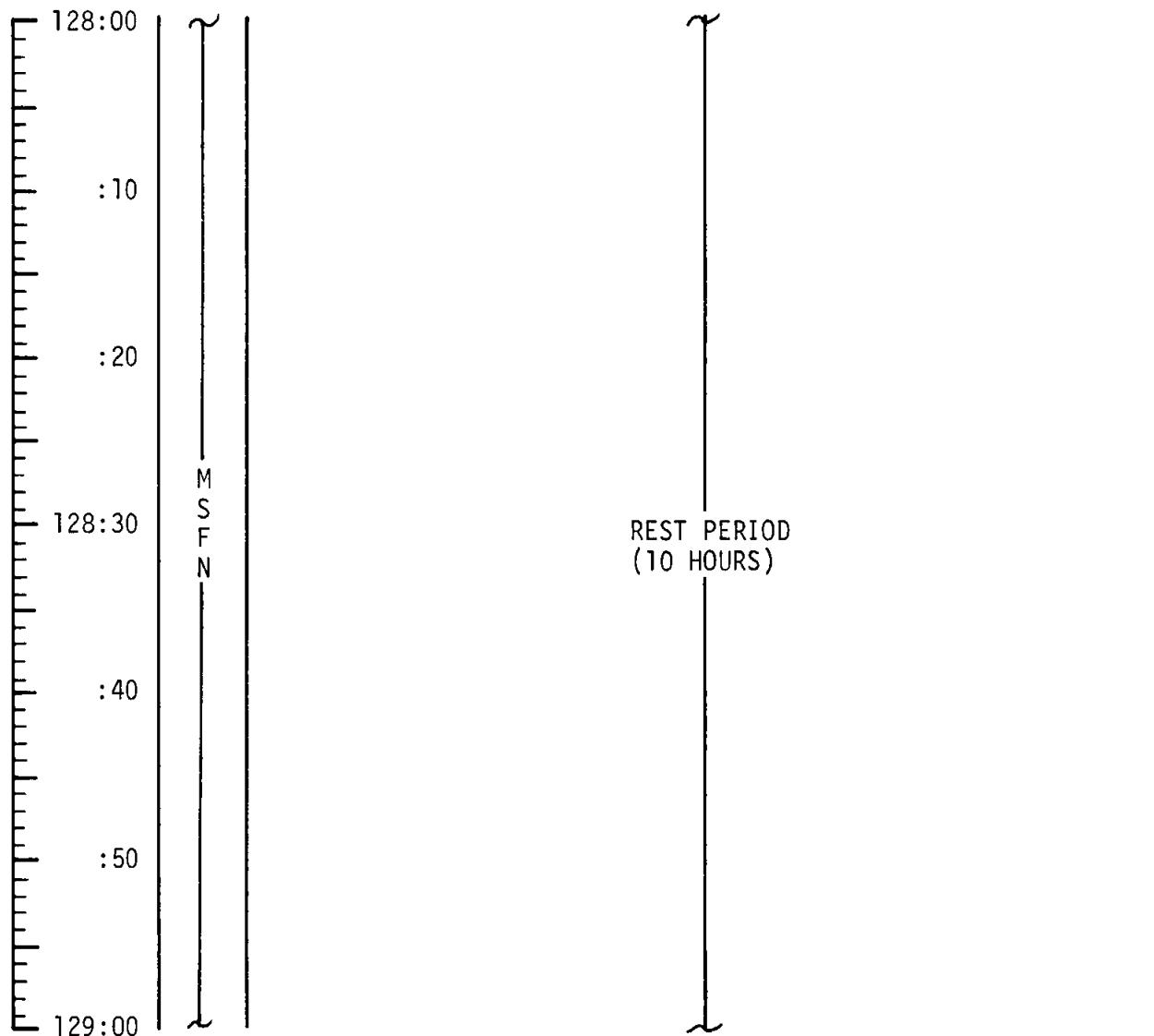
MCC-H

2223 CST

CDR

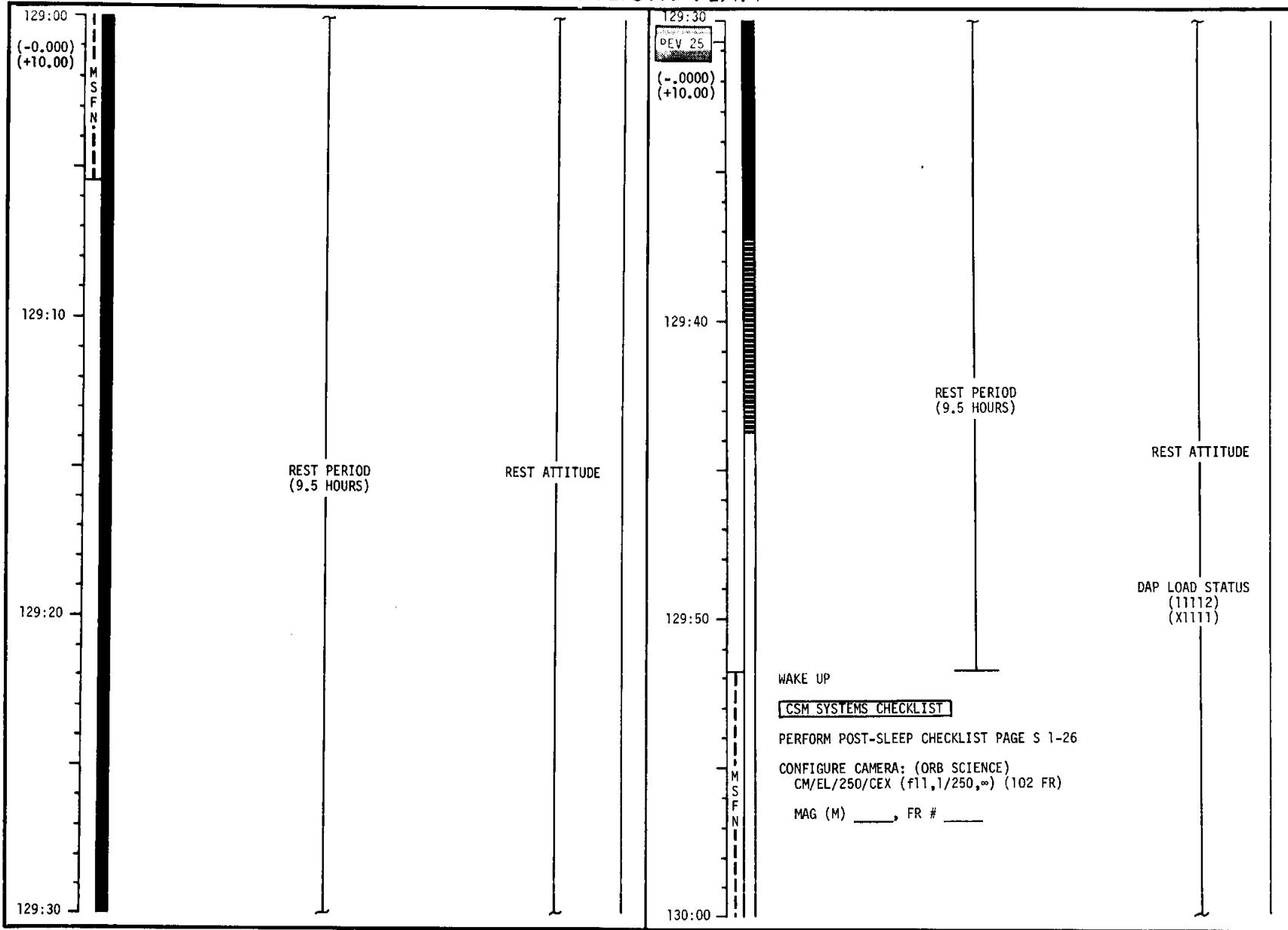
LMP

NOTES



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

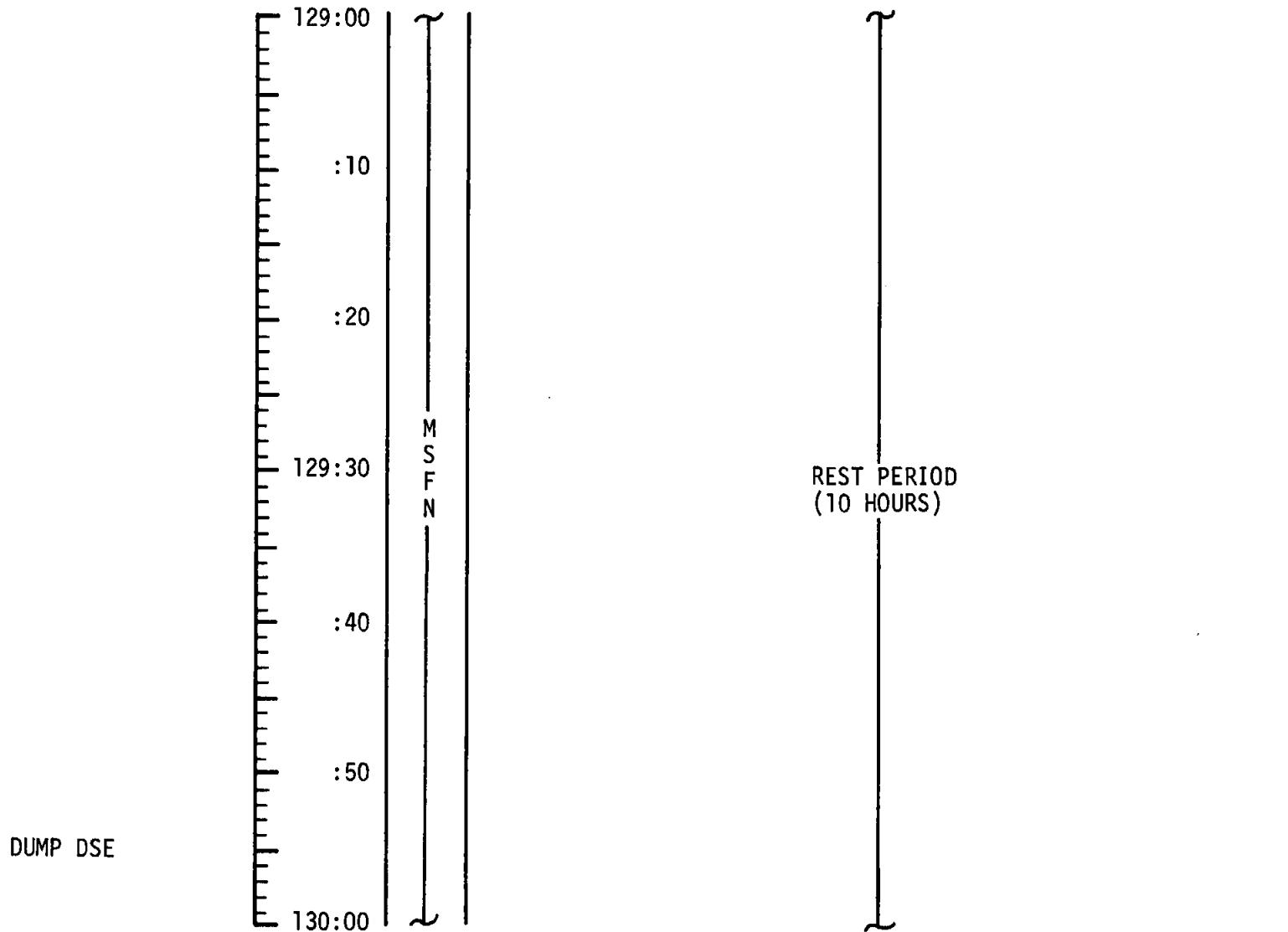
MCC-H

2323 CST

CDR

LMP

NOTES



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

<p>130:00 MSFN UPLINK: CSM S.V. MSFN UPDATE: CONSUMABLES MAP UPDATE REV 26 (131:05) VERTICAL STEREO PAD (131:35)</p> <p>(-.0000) (+10.00)</p> <p>(11102) (X1111)</p> <p>CYCLE CMC MODE - FREE/AUTO V48 (11102) (X1111)</p> <p>V49 MNVR TO ORB SCIENCE/S-BD BI-STATIC RADAR ATT (130:11) (228,013,000)</p> <p>MCC CMDS: S-BD MODE RANGING - OFF S-BD AUX TAPE - OFF PCM BIT RATE - LO TAPE RECORDER - FWD</p> <p>VERIFY DSE TAPE MOTION (IF TB NOT GRAY - S-BD MODE RNG-OFF, AUX TAPE-OFF/LBR/RCD/FWD/CMD RESET)</p> <p>ON MCC CUE, SELECT: VHF ANT - LEFT, S-BD ANT - OMNI C</p> <p>NOTE: MCC WILL TURN OFF UPLINK (~130:08)</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-.0830) (+005.00) (+0001)</p> <p>(-.0830) (+05.00)</p> <p>PRO TO START PITCH RATE (228,043/013,000)</p> <p>M S F N</p>	<p>REST ATTITUDE</p> <p>130:30 (-.0830) (+05.00)</p> <p>X</p> <p>CHANGE TO f4</p> <p>RECORD FR # _____</p> <p>M S F N</p>	<p>130:40</p> <p>M S F N</p> <p>EAT PERIOD</p>										
<p>130:20 PHOTO TGT 10, SOUTH (f11,1/250,∞) 102 FR AT 10 SEC (250mm) (180° + :49)</p> <p>***** * NOTE: DURING BI-STATIC RADAR * * TEST MSFN HAS NO TLM FROM * * ~130:10 TO ~130:55 AND NO VOICE * * CAPABILITY DURING TEST * *****</p> <p>CHANGE TO f8</p> <p>CHANGE TO f5.6</p>	<p>130:50</p>	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>CSM CONSUMABLES UPDATE</p> <p>GET: _____</p> <p>RCS TOTAL _____</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">QUAD A</td> <td style="width: 50%;">B</td> </tr> <tr> <td>C</td> <td>D</td> </tr> <tr> <td>H₂ TANK 1</td> <td>2</td> </tr> <tr> <td>O₂ TANK 1</td> <td>2</td> </tr> <tr> <td>3</td> <td></td> </tr> </table> </div>	QUAD A	B	C	D	H ₂ TANK 1	2	O ₂ TANK 1	2	3	
QUAD A	B											
C	D											
H ₂ TANK 1	2											
O ₂ TANK 1	2											
3												
<p>130:30</p>	<p>131:00</p>											

LM FLIGHT PLAN

MCC-H

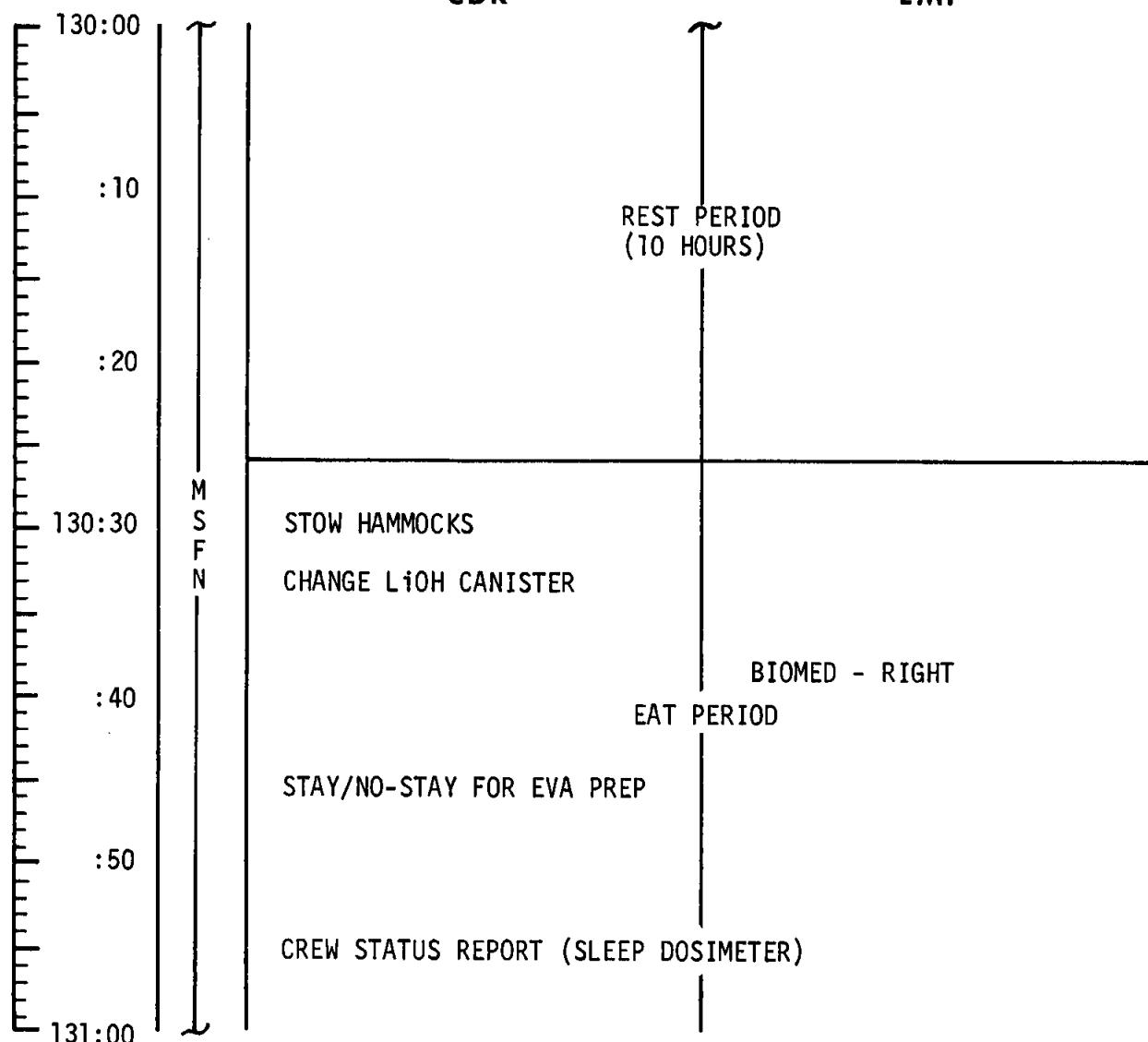
0023 CST

UPLINK TO CSM
CSM S.V.
UPDATE TO CSM
CONSUMABLES
MAP UPDATE REV 26
VERTICAL STEREO PAD

CDR

LMP

NOTES



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

<p>131:00 (-.0830) (+05.00)</p> <p>M S F N</p> <p>(11102) (X1111)</p> <p>V46 V49 MNVR TO P52 ATT (131:17) (180,114,000)</p> <p>DISCONTINUE BI-STATIC RADAR TEST VHF RNG - OFF S-BD MODE RANGING - RANGING (VERIFY) S-BD AUX TAPE - DN VOICE BU (VERIFY)</p> <p>EAT PERIOD</p> <p>P52 (OPTION 3) (LIFT-OFF ORIENT)</p> <p>GDC ALIGN VERIFY ORDEAL V49 MNVR TO VERT STEREO ATT (131:26) (180,021,000)</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001)</p> <p>PRO TO START PITCH RATE (180,282/021,000)</p>	<p>MAP UPDATE REV <u>26</u></p> <p>LOS : _____ . . .</p> <p>180°: _____ . . .</p> <p>AOS : _____ . . .</p> <p>P52 IMU REALIGN</p> <p>N71: _____ . . .</p> <p>N05: _____ . . .</p> <p>N93:</p> <p>X _____ . . .</p> <p>Y _____ . . .</p> <p>Z _____ . . .</p> <p>GET _____ . . .</p>	<p>131:30 (-.0507) (+00.50)</p> <p>M S F N</p> <p>CONFIGURE CAMERA: (VERT STEREO) CM4/DC/80/BW-BRKT, IVL, PCM CABLE (f4,1/250,∞) (174 FR)</p> <p>MAG (Q) _____, FR # _____</p> <p>VERTICAL STEREO PHOTO</p> <p>T START: _____ . . .</p> <p>T STOP: _____ . . .</p> <p>BOOTSTRAP (VERT STEREO) & ORBITAL SCIENCE PHOTOGRAPHY</p> <p>ADJUST COAS FOR +12° ELEVATION</p> <p>V06N65 (DO NOT ENTER) CONFIGURE DSE (HBR/RCD/FWD/CMD RESET) 131:43:19 - ENTER, DC - ON (T START)</p> <p>RECORD TIME FROM V06N65 _____ : _____ : _____</p> <p>PCM BIT RATE - LO</p> <p>CHANGE DC f-STOP TO (f8)</p> <p>V64; ACQ MSFN HGA P <u>-57</u>, Y <u>356</u> REPORT: <u>GYRO TORQUING ANGLES</u> (FROM P52 AT 131:18)</p> <p>CONFIGURE CAMERA: (ORB SCIENCE) CM/EL/250/CEX (f8,1/250,∞) (43 FR)</p> <p>MAG (M) _____, FR # _____</p> <p>VERTICAL STRIP</p>
		<p>131:40</p> <p>131:50</p> <p>132:00</p>

REV 26

131:30

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-176

PGS 3-177 $\frac{1}{2}$

3-178 MISSING

LM FLIGHT PLAN

MCC-H

0223 CST

CDR

LMP

NOTES

<p>132:00 (12102)</p> <p>:10</p> <p>:20</p> <p>132:30</p> <p>:40</p> <p>:50</p> <p>133:00</p>	<p>EVA PLANNING PERIOD</p> <p>CABIN PREP FOR EVA-2</p> <p>CLEAN AND LUBRICATE SEALS AS REQUIRED</p> <p>STOW ALL LOOSE ITEMS NOT REQUIRED FOR EVA</p> <p>UNSTOW EVA-2 PREP & POST CARD</p> <p>STOW LUNAR SURFACE CHECKLIST</p> <p>EQUIPMENT PREP FOR EVA-2</p> <p>SET DET</p> <p>CDR DON BOOTS</p> <p>UNSTOW AND CHECK BOTH OPS</p> <p>VERIFY EQUIPMENT IN ETB AND STOW FOR EVA</p> <p>LMP DON BOOTS</p>	<p>-1:30</p> <p>-1:20</p>

UPDATE TO CSM
LTC PHOTO PAD
MAP UPDATE REV 27

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

<p>133:00 M S F N (11101) (X1111)</p> <p>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</p> <p>START PHOTO SEQUENCE: 2 FRAMES, EXP TIME 20 SEC 1 FRAME, EXP TIME 5 SEC</p> <p>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</p> <p>CHANGE TO 24 fps & 1/500, RUN DAC FOR 2 SEC LIGHTS UP, CMC MODE - AUTO, ENABLE ALL QUADS</p> <p>V49 MNIVR TO LUNAR LIBRATION ATT (133:20) (180, 320, 349)</p> <p>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)</p> <p>LUNAR LIBRATION PHOTOGRAPHY</p> <p>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</p> <p>1 FRAME, EXP TIME 60 SEC 2 FRAMES, EXP TIME 20 SEC 1 FRAME, EXP TIME 5 SEC</p> <p>CHANGE TO 24 fps & 1/500, RUN DAC FOR 2 SEC LIGHTS UP, ENABLE - A3,C4,B3,D4 THRUSTERS REMOVE CAMERA FROM WINDOW</p> <p>RECORD MAG % REMOVE CAMERA SHIELD</p> <p>REV 27</p> <p>133:30</p>	<p>133:30 V48 (11102) (X1111) V49 MNIVR TO VERT LTC TGT: 2/8 PAD ATT (133:3P)</p> <p>133:40 (-.0507) (+00.50) PRO TO START PITCH RATE AT ORDEAL P 328 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)</p> <p>133:50 PCM BIT RATE - LO ACQ MSFN OMNI_B CHANGE SHUTTER TO 1/100 SEC</p> <p>134:00 V64; ACQ MSFN HGA P -47, Y 357</p>
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MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-180

LM FLIGHT PLAN

MCC-H

0323 CST

CDR

LMP

NOTES

133:00 (12102)		PREPARE VISORS & HELMETS FOR EVA		-1:10
:10		UNLOCK FORWARD HATCH HANDLE		
:20		<u>PLSS DONNING</u> 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
133:30	M S F			-0:05
:40	T	<u>PLSS COMM CHECK</u> FM VOICE CHECK (TV ON) CONFIGURE FOR EVA COMM, BIOMED-OFF RECORDER - ON VERIFY PLSS COMM & TM		-0:40
:50	T V	<u>FINAL SYSTEMS PREP</u> <u>OPS CONNECT</u> LMP UNSTOW OPS AND CONNECT TO RCU & PLSS CDR UNSTOW OPS AND CONNECT TO RCU & PLSS VERIFY ITEMS PREPARED FOR JETTISON		-0:30
134:00		<u>HELMET/GLOVE DONNING</u> DON HELMETS & LEVA'S STOW LM HOSES		-0:20
DUMP DSE				

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

<p>134:00 (-.0507) (+00.50)</p> <p>CHANGE TO RNG 2 (T START +21:25)</p> <p>CHANGE SHUTTER TO 1/200 SEC</p> <p>134:10 ○ M S F N</p> <p>CHANGE SHUTTER TO 1/100 SEC</p> <p>134:20 CHANGE TO RNG 3 (T START +39:50)</p> <p>CHANGE SHUTTER TO 1/50 SEC CHANGE TO RNG 4 (T START +44:10)</p> <p>134:30</p>	<p>134:30 (-.0507) (+00.50)</p> <p>X</p> <p>CHANGE TO RNG 5 (T START +47:30)</p> <p>LTC MODE - STBY/PWR - OFF (AT TERMINATOR OR WHEN MAGAZINE IS DEPLETED)</p> <p>134:40 M S F N</p> <p>MSFN UPDATE: MAP UPDATE REV 28 (135:05) LTC PHOTO PAD (TGT 6) (135:15)</p> <p>ACQ MSFN OMNI C</p> <p>134:50 CONFIGURE CAMERAS: (ORBITAL SCIENCE & BOOTSTRAP) CM/EL/250/CEX (f8,1/250,∞) (83 FR) MAG (N) _____, FR # _____ CM3/LTC/MBW/SEF (SHUT 1/100, RNG 1-PAD, INT 5.9) (191 FR) LTC FILM MAG CHANGE (DECAL) ADVANCE 4 FRAMES (IF END-OF-FILM LT - OUT), RECORD FR # _____ PUT MAG (V) ON LTC, RESET FRAME COUNTER MAG (V) _____, FR # _____ LTC CHECKOUT (DECAL) _____</p> <p>135:00</p>
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MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-182

LM FLIGHT PLAN

MCC-H	0423 CST 134:00 (12102)	CDR	LMP	NOTES
		VERIFY PGA CONFIGURATION		
	:10	VERIFY CB CONFIGURATION FOR EVA DON GLOVES		-0:10
	:20	PRESSURE INTEGRITY CHECK PLSS O ₂ - ON		
	134:30	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
	:40	FINAL PREP FOR EGRESS PLSS FEEDWATER - OPEN, FWD HATCH - OPEN VERIFY CWEA & PGA STATUS RELEASE PLSS ANTENNAS, LOWER VISOR		
UPDATE TO CSM LTC PHOTO PAD MAP UPDATE REV 28	M S T F V N	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	0:10
	:50	MET LOAD MOVE MET NEAR MESA OPEN SRC AND STOW EQUIPMENT ON MET	LMP EGRESS CLOSE HATCH AND DESCEND MET LOAD ASSIST STOW CAMERAS AND TOOLS ON MET. PULL MET TO SEQ BAY	0:20
	135:00	MAGNETOMETER OFFLOAD MET TRACK & FOOTPRINT EVAL	MAGNETOMETER OFFLOAD, STOW ON MET	0:30
		TRAVERSE TO STATION A PHOTOGRAPH AND COMMENT ON MET TRACKS	TRAVERSE TO STATION A	0:40
		STATION A TDS EXPERIMENT	STATION A LMP POINT MEASUREMENT	

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

<p>135:00 (-.0507) (+00.50)</p> <p>VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>MAP UPDATE REV <u>28</u></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td>LOS :</td><td>_____</td><td>_____</td></tr> <tr><td>180°:</td><td>_____</td><td>_____</td></tr> <tr><td>AOS :</td><td>_____</td><td>_____</td></tr> </table> </div> <p>135:10 (-.0507) (+00.50)</p> <p>LTC PHOTO PAD TGT: 6 (180,013,000)</p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p>R _____ P _____ Y _____</p> <p>T START: _____ : _____</p> <p>T STOP : _____ : _____</p> <p>RNG 1 _____ (93.3) T START</p> <p>RNG 2 _____ (93.1) T START +4:50</p> <p>RNG 3 _____ (93.2) T START +12:00</p> <p>RNG 4 _____ (93.3) T START +19:40</p> </div> <p>135:20 (11101) (X1111)</p> <p>V48 (11101) (X1111) V49 MNVR TO OBLIQUE LTC TGT: 6 PAD ATT (135:33)</p> <p>135:30 (11101) (X1111)</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001)</p> <p>PRO TO START PITCH RATE AT ORDEAL P <u>298</u></p>	LOS :	_____	_____	180°:	_____	_____	AOS :	_____	_____	<p>135:30 (11101) (X1111)</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001)</p> <p>PRO TO START PITCH RATE AT ORDEAL P <u>298</u></p> <p>135:40 (-.0507) (+00.50)</p> <p>BOOTSTRAP (OBLIQUE LTC) & ORB SCIENCE PHOTOGRAPHY</p> <p>135:50 (-.0507) (+00.50)</p> <p>M S F N</p> <p>PHOTO TGT 3, NORTH (f8,1/250,∞) 10 FR AT 20 SEC (250mm) (180° +0:18)</p> <p>V64; ACQ MSFN HGA P <u>-45</u>, Y <u>356</u></p> <p>PHOTO TGT 4, SOUTH (f8,1/250,∞) 73 FR AT 10 SEC (250mm) (180° +0:30)</p>
LOS :	_____	_____								
180°:	_____	_____								
AOS :	_____	_____								

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	0:50
	:10		STOW SENSOR/TRIPOD ON MET REWIND CABLE, STOW ON MET	1:00
	:20	DOUBLE CORE PLACE GNOMON HAMMER TUBES INTO SURFACE STOW HAMMER & GNOMON	DOUBLE CORE ASSEMBLE TUBES PHOTOGRAPH TUBES IN SURFACE REMOVE AND STOW TUBES	1:10
	135:30	TRaverse TO STATION B		
		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		
		TRaverse TO CONE CRATER VIA STATION D		
DUMP DSE		REST EN ROUTE		1:30
GO/NO-GO FOR EVA-2 EXTENSION	:50			
	136:00	CONE CRATER RIM SITE DESCRIPTION SAMPLE COLLECTION PROCEED TO SOUTH RIM	CONE CRATER RIM PHOTO PANORAMA SAMPLE COLLECTION PROCEED TO SOUTH RIM	1:40

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

<p>136:00 $(-.0507)$ $(+.0050)$</p> <p>RECORD FR # _____</p> <p>VERIFY: LTC MODE - STBY/PWR - ON, ZERO DET (T START -1 MIN)</p> <p>LTC TGT 6 (SHUT 1/100, RNG 1-PAD, INT 5.9) (183 FR) LTC MODE - AUTO, DET - UP/START (T START)</p> <p>136:10</p> <p>M S F N</p> <p>CHANGE TO RNG 2 (T START +4:50) CHARGE BATTERY A</p> <p>136:20</p> <p>CHANGE SHUTTER TO 1/50 SEC CHANGE TO RNG 3 (T START +12:00)</p> <p>136:30</p> <p>X $(-.0507)$ $(+.0050)$</p> <p>ACQ MSFN OMNI C</p> <p>LTC MODE - STBY/PWR - OFF (T STOP)</p> <p>RECORD FR # _____</p> <p>V48 (11111) (X1111)</p> <p>M S F N</p> <p>MSFN UPDATE: MAP UPDATE REV 29 LDMK TRK PADS (RP-4, ANSGARIUS N, DE-2, ENCKE E) (137:30 - 138:30)</p> <p>MSFN UPLINK: CSM S.V.</p> <p>MAP UPDATE REV 29</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>LOS :</td> <td>_____</td> <td>•</td> <td>•</td> </tr> <tr> <td>180°:</td> <td>_____</td> <td>•</td> <td>•</td> </tr> <tr> <td>AOS :</td> <td>_____</td> <td>•</td> <td>•</td> </tr> </table> <p>STOP ORB RATE AT INERTIAL P 122 VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <p>137:00</p>	LOS :	_____	•	•	180°:	_____	•	•	AOS :	_____	•	•
LOS :	_____	•	•									
180°:	_____	•	•									
AOS :	_____	•	•									

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-186

LM FLIGHT PLAN

MCC-H	0623 CST	CDR	LMP	NOTES
	136:00 (12102)	SAMPLE COLLECTION SAMPLE BOULDER TRACKS ROLL BOULDERS INTO CRATER EVA COMM EVALUATION SITE DESCRIPTION	SAMPLE COLLECTION SAMPLE BOULDER TRACKS PARTIAL PANORAMA TO WEST PHOTO PANORAMA	1:50 2:00
	:10			
	:20			
	136:30	<u>TRAVERSE TO STATION D</u> SAMPLE COLLECTION		2:10
M T S F N		STATION D SITE DESCRIPTION SAMPLE COLLECTION	STATION D PHOTO PANORAMA SAMPLE COLLECTION	2:20
	:40	TRAVERSE TO STATION E REST EN ROUTE		2:30
	:50	<u>STATION E</u> DIG TRENCH 10° OFF DOWNSUN PHOTOGRAPH TRENCH	STATION E LPM MEASUREMENT (SINGLE)	2:40
UPDATE TO CSM MAP UPDATE REV 29 LDMK TRACK PADS UPLINK TO CSM CSM S.V.	137:00			

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 P52 (OPTION 3)
(LIFT-OFF ORIENT)
(11111)
(X1111)

P52 IMU REALIGN

N71: _____

N05: _____ *

N93:

X _____ *

Y _____ *

Z _____ *

GDC ALIGN
VERIFY ORDEAL

CYCLE CMC MODE - FREE/AUTO

GET

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

MCC-H

0723 CST

	CDR	LMP	NOTES
137:00 (12102)	MAKE BOOTPRINT IN FILL SPECIAL ENVIRONMENTAL SAMPLE SAMPLE TRENCH INTERIOR	PHOTOGRAPH TRENCH SPECIAL ENVIRONMENTAL SAMPLE SAMPLE TRENCH INTERIOR	
:05			2:50
:10			
137:15	M S T F V N TRaverse to Station F		3:00
:20	STATION F <u>SITE DESCRIPTION</u> SAMPLE COLLECTION TRIPLE CORE SAMPLE	STATION F <u>PHOTO PANORAMA</u> SAMPLE COLLECTION TRIPLE CORE SAMPLE	
:25			3:10
137:30			

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
 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) PRO TO START PITCH RATE (000,338/053,000)
 (+00.50)

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

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

138:00

P24 LDMK TRACKING (1/125)
 TGT: RP-4
 T₁
 T₂
 TCA
 T₃
 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 (1/250)
 TGT: ANSGARIUS N
 T₁
 T₂
 TCA
 T₃
 R °P °Y ° (T2 ACQ)
 N or S NM ____ / SA ____ TA ____ (T2 ACQ)
 N89
 LAT -11.633
 LONG/2 +40.533
 ALT +000.00

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-190

LM FLIGHT PLAN

MCC-H	0753 CST	CDR	LMP	NOTES
	137:30 (12102)			
	:35	TRAVERSE TO STATION G		3:20
	:40	<u>STATION G</u> SITE DESCRIPTION SAMPLE COLLECTION	<u>STATION G</u> PHOTO PANORAMA SAMPLE COLLECTION	
RECORD PCM LBR ON DSE DURING P24's	137:45	M S T F V N	TRAVERSE TO LM	3:30
	:50		AT LM CONTAMINATED SAMPLE COLLECTION	
	:55	EVA CLOSEOUT STOW CAMERA FILM	EVA CLOSEOUT STOW CAMERA FILM	3:40
	138:00	STOW DOCUMENTED SAMPLES		

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
 I
 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)

X
 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		

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-192

LM FLIGHT PLAN

MCC-H

0823 CST

CDR

LMP

NOTES

138:00 (12102)		PACK AND SEAL SRC	RETRIEVE AND STOW SWC FOIL	3:50
:05		STOW WEIGH BAGS IN ETB	ASSIST CDR	3:50
:10		CLEAN AND CHECK EMU'S	EVA TERMINATION	4:00
138:15	M S T F V N	HAND SRC TO LMP	ASCEND TO MIDDLE LADDER RUNG	4:00
:20		TRANSFER ETB VIA LEC	RIG LEC FOR ETB AND TRANSFER	4:10
:25		EVA TERMINATION ASCEND TO PLATFORM DISCARD LEC INGRESS	INGRESS TRACKING LIGHT TEST	4:10
138:30		REPRESSURIZE CABIN	PLACE ETB ON ASC ENG COVER CHECK EMU & LM SYSTEMS	4:15/0:00

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 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

V48 (11112)

(X1111)

(11112)
(X1111)
138:40 V49 MNVR TO COMM ATT (138:42)

(110,216,000) HGA P -2, Y 194

RECORD MAG % _____

M
S
F
N
MSFN UPDATE:

MAP UPDATE REV 30

ZERO PHASE PADS (139:20, 140:15)

138:50

MAP UPDATE REV <u>30</u>	
LOS :	_____
180°:	_____
AOS :	_____

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

139:00

H₂ PURGE LINE HEATERS - ON

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-194

LM FLIGHT PLAN

MCC-H	0853 CST	CDR	LMP	NOTES
	138:30 (12102)	<u>POST-EVA SYSTEMS CONFIGURATION</u> CONFIGURE LM ECS, DOFF GLOVES		4:15/0:00
DUMP DSE	:35	CONNECT LM ECS HOSES TO SUIT		
	:40	CONNECT TO LM COMM AND RECONFIGURE BIOMED - LEFT, RECORDER - OFF		
UPDATE TO CSM MAP UPDATE REV 30 ZERO PHASE PADS	138:45	<u>PLSS/OPS DOFFING</u> DISCONNECT OPS & RCU FROM PLSS DISCONNECT AND DOFF PLSS/OPS (LMP FIRST)		0:10
	:50	CDR, THEN LMP, DISASSEMBLE PLSS/OPS CHECKOUT AND STOW OPS		0:20
	:55	VERIFY POWER DOWN CB CONFIGURATION		
	139:00	<u>PREP FOR EQUIPMENT JETTISON</u> DOFF LUNAR BOOTS, STOW IN DISPOSABLE CONTAINER STOW RCU'S IN DISPOSABLE CONTAINER STOW PLSS CONDENSATE CONTAINER IN DISPOSABLE CONTAINER		0:30

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

<p>139:00 (-.0507) (+.050)</p> <p>CONFIGURE CAMERA: (ZERO PHASE) CM3/DC/80/MBW-BRKT, TVL, PCM CABLE (f5.6,1/250,∞) (41 FR) MAG (R) _____, FR # _____</p> <p>RR XPNDR ACTIVATION AND SELF-TEST (DECAL)</p> <p>139:10</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr><td colspan="2">ZERO PHASE PAD (BACKWARD)</td></tr> <tr><td>R</td><td>----- °P ----- °Y ----- °</td></tr> <tr><td>T START:</td><td>----- • ----- • ----- • -----</td></tr> <tr><td colspan="2">START DET AT 1ST TGT AREA ACQ -5 MIN</td></tr> </table> <p>V48 {11101} (X1111) V49 MNVR TO ZERO PHASE TGT 5 & 6 ATT (139:30) (196.1,341.6,359.3)</p> <p>139:20</p> <p>H₂ & O₂ FUEL CELL PURGE WASTE WATER DUMP H₂ PURGE LINE HEATERS - OFF</p> <p>REV 30</p> <p>TYPICAL ZERO PHASE OBSERVATION PASS - BACKWARD LOOKING</p> <p>139:30</p>	ZERO PHASE PAD (BACKWARD)		R	----- °P ----- °Y ----- °	T START:	----- • ----- • ----- • -----	START DET AT 1ST TGT AREA ACQ -5 MIN		<p>139:30 (11101) (X1111) (-.0507) (+.050)</p> <p>SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001) PRO TO START PITCH RATE (196.1,268/341.6,359.3)</p> <p>139:40</p> <p>ZERO PHASE OBSERVATIONS - BACKWARD LOOKING</p> <p>139:40:12 - DET - ZERO/UP/START (T START) REVIEW TGT 5 & 6 MAPS</p> <p>ACQ MSFN HGA P -68, Y 34 5:00 - DC - ON, START OBSERVATIONS (TGT AREA 5)</p> <p>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)</p> <p>11:48 - STOP OBSERVATIONS DEBRIEF (~ 30 SEC) 12:18 - DC - OFF</p> <p>139:50 M S F N</p> <p>CONFIGURE CAMERA: (ORBITAL SCIENCE) CM/EL/250/CEX (f11,1/250,∞) (31 FR) MAG (N) _____, FR # _____</p> <p>V48 (11102) (X1111)</p> <p>140:00</p>
ZERO PHASE PAD (BACKWARD)									
R	----- °P ----- °Y ----- °								
T START:	----- • ----- • ----- • -----								
START DET AT 1ST TGT AREA ACQ -5 MIN									

MISSION	EDITION	DATE	PAGE
APOLLO 14 Chg C CHANGE-A (JAN)		DECEMBER 29, 1970	3-196

Jan 18, 1971

LM FLIGHT PLAN

MCC-H	0923 CST	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
	:20	CABIN DEPRESS FOR JETTISON OPEN HATCH, JETTISON DISPOSABLE CONTAINER AND PLSS'S CLOSE HATCH		0:50
DUMP DSE	139:30	DUMP VALVES - AUTO REPRESSURIZE CABIN <u>POST-EVA CABIN CLEANUP</u> SECURE OPS ON CABIN FLOOR		1:00
	:40	STOW EQUIPMENT FOR RETURN WEIGH SRC, ISA, & WEIGH BAGS, REPORT TO MCC-H STOW SCALE & SRC STOW LM EVA ANTENNA		1:10
	:50	INSTALL ISA IN AFT CABIN STOW EVA ONBOARD DATA IN FLIGHT DATA FILE		1:20
	140:00			1:30

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 <u>D</u>	<p style="text-align: center;">TYPICAL ZERO PHASE OBSERVATION PASS - FORWARD LOOKING</p> <p>The diagram illustrates a typical zero phase observation pass. It shows the CSM's path as a dashed line with segments labeled 'START', 'ZERO PHASE', and 'END'. The path is divided into two main sections by a 'TERMINATOR'. The first section, labeled 'TARGET AREA A: (3 OR 4 TARGETS)', includes a 'DEBRIEFING' point. The second section, labeled 'TARGET AREA B: (3 OR 4 TARGETS)', also includes a 'DEBRIEFING' point. The entire path is set against a background of Earth's horizon and a '60 N MI ORBIT' curve.</p>
140:10 M S (-.0507) F N (+.0050)	PHOTO TGT 7, NORTH (1/250,∞) 31 FR AT 10 SEC (250mm) (180° + 1:15) <i>f8</i>	
140:15	SC CONT - CMC/AUTO (VERIFY) V79 (-0.0507) (+000.50) (+00001)	
140:17	PRO TO START PITCH RATE (347.0,276/222.4,358.7)	
140:18	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)	
140:25	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	
140:30	RECORD FR # _____	

MISSION	EDITION	DATE	PAGE
APOLLO 14	<i>Chg</i> FINAL (JAN)	DECEMBER 2, 1970	3-198

Jan 18, 1971

LM FLIGHT PLAN

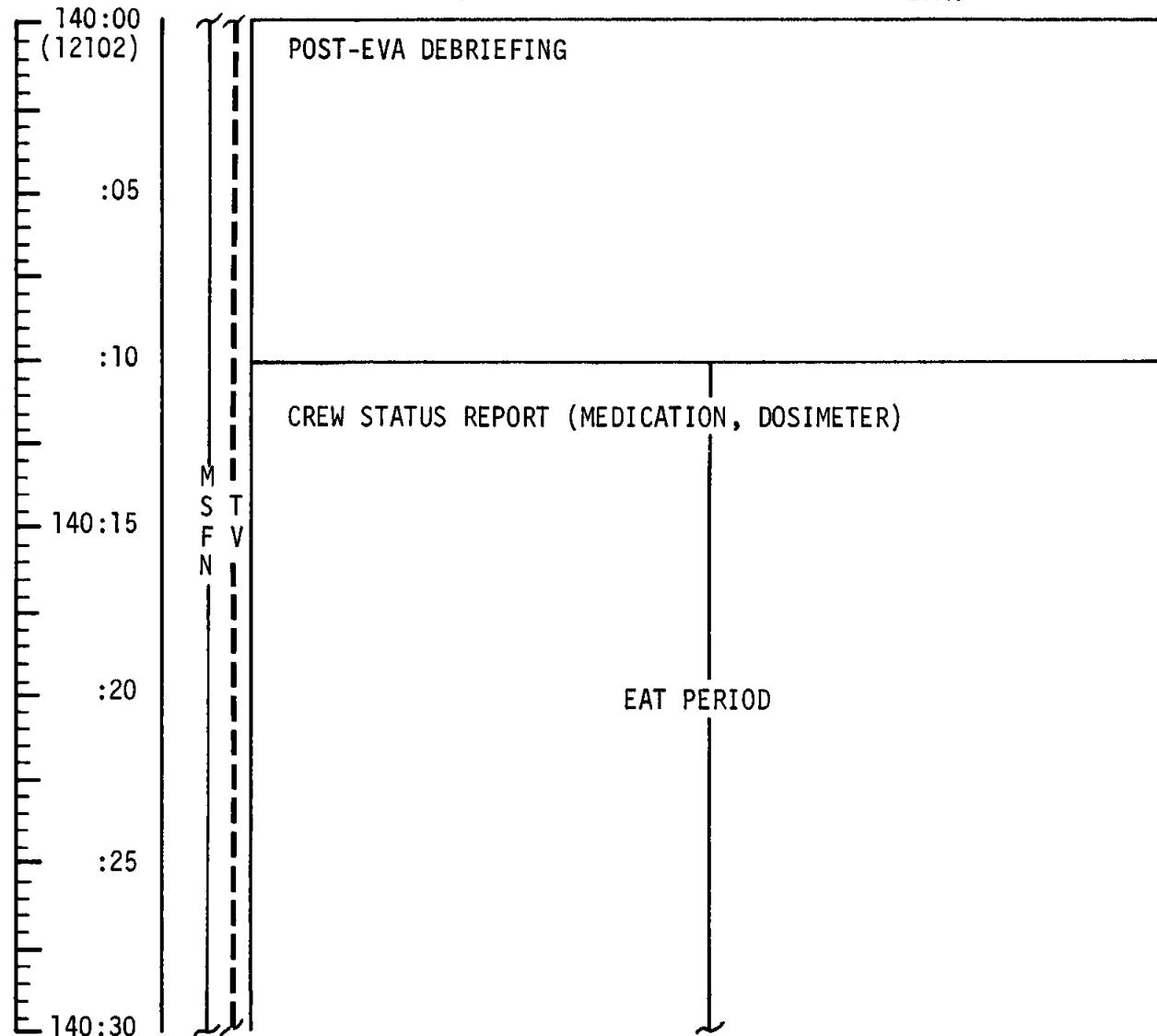
MCC-H

1023 CST

CDR

LMP

NOTES



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
 140:40
 MSFN UPDATE:
 CONSUMABLES (IF REQ'D)
 MAP UPDATE REV 31
 CSM S.V. (L/O) COPY AT 141:15
 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

140:50
 P52 (COAS CALIB)
 USE STAR NO. 22

141:00
 VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)
 MSFN ENABLES MSFN S-BAND RELAY

CSM CONSUMABLES UPDATE

GET: _____

RCS TOTAL _____

QUAD A _____ B _____

C _____ D _____

H₂ TANK 1 _____ 2 _____

O₂ 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 : _____

MISSION	EDITION	DATE	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	3-200

LM FLIGHT PLAN

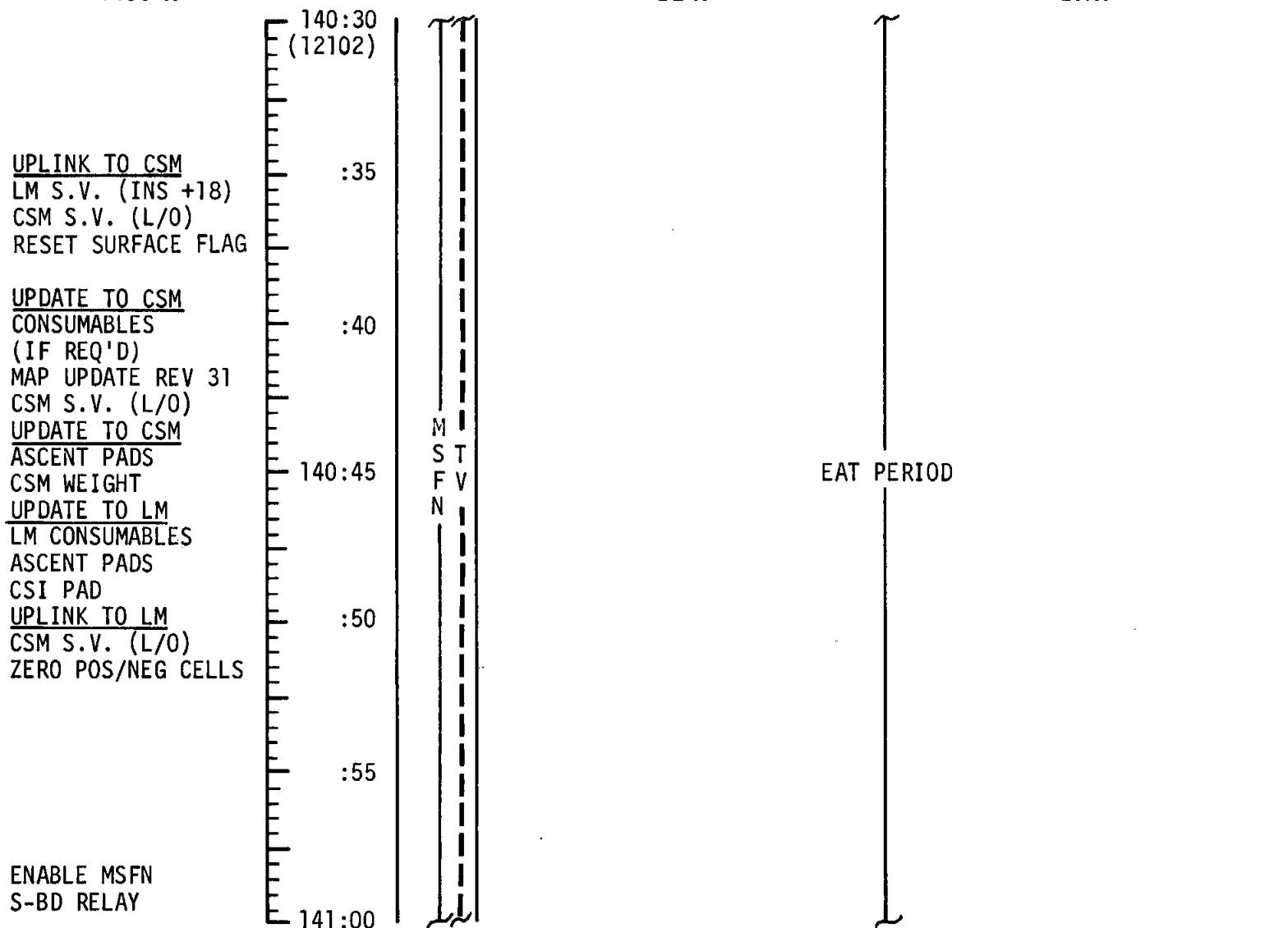
MCC-H

1053 CST

CDR

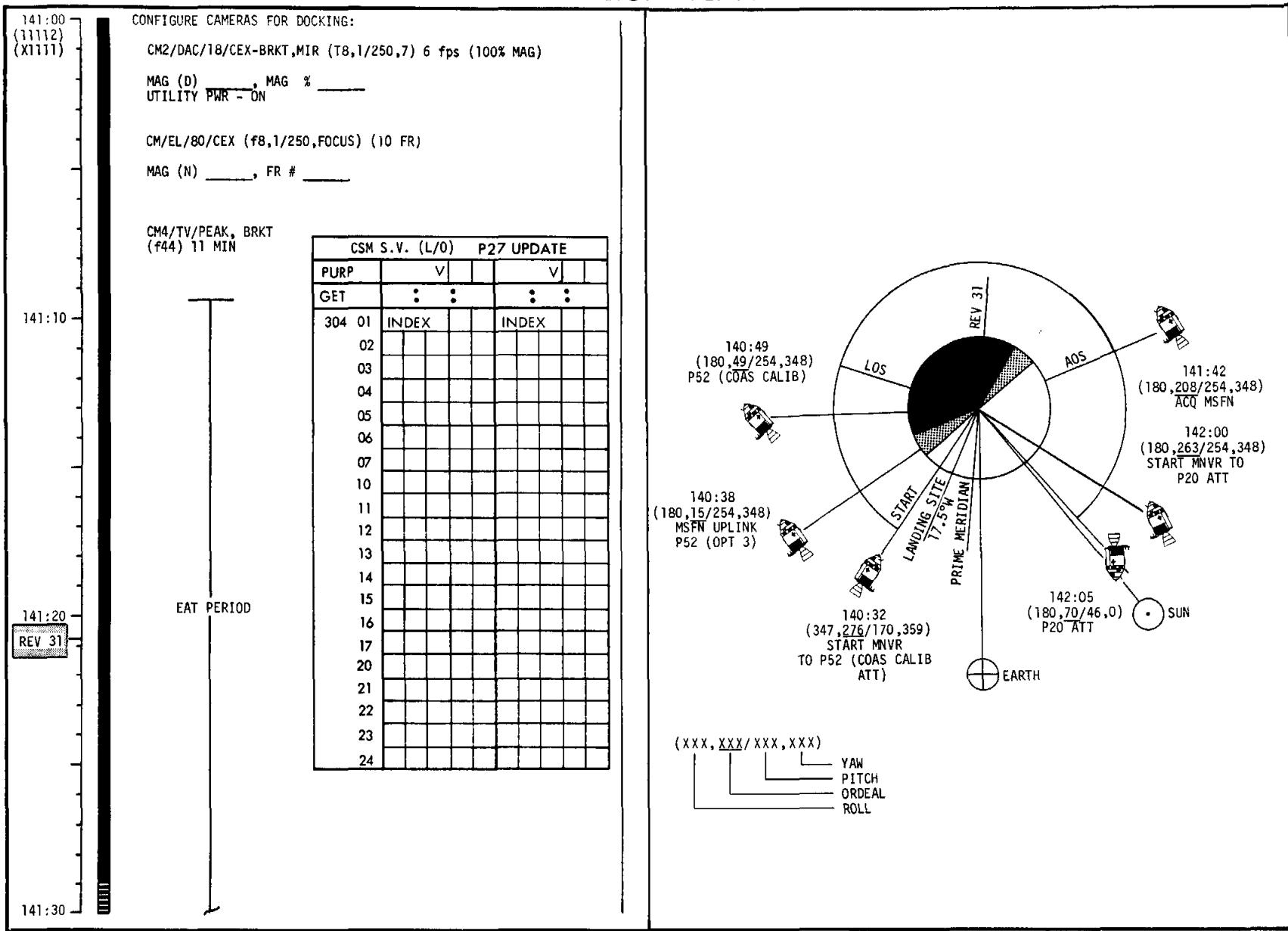
LMP

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	140:30 - 141:00	6/30	3-201

CSM FLIGHT PLAN



LM FLIGHT PLAN

MCC-H

1123 CST

CDR

LMP

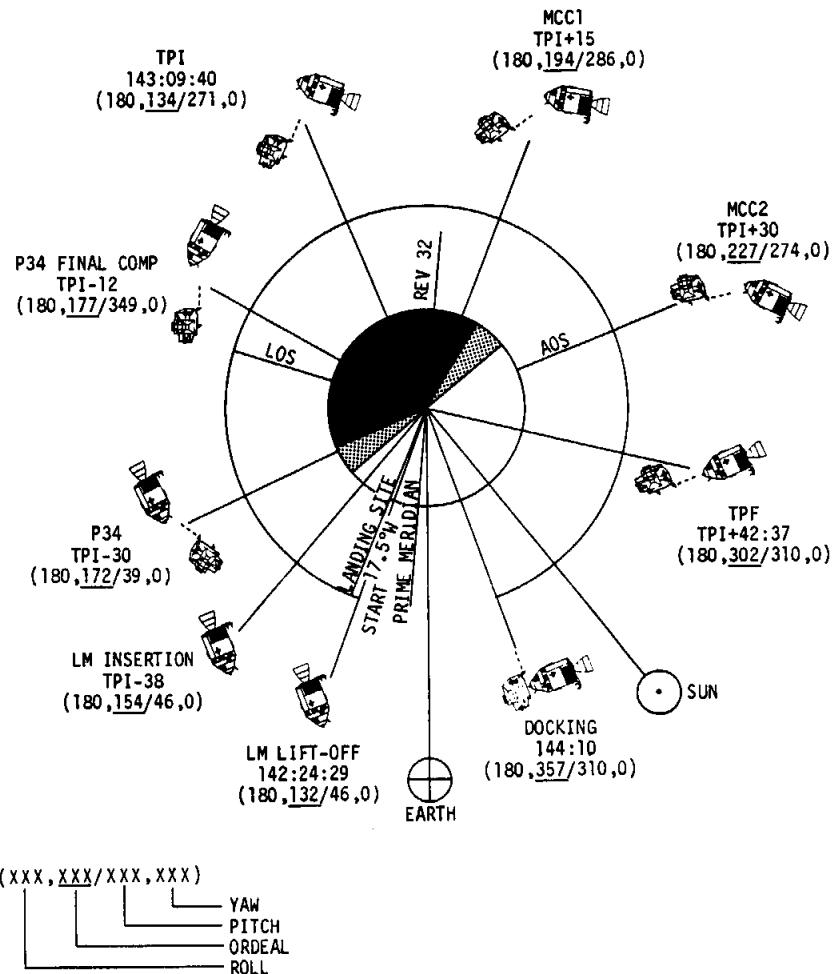
NOTES

141:00 (12102)			
:05		EAT PERIOD	
:10			
141:15	M S F N	VERIFY GUIDANCE CONFIGURATION CONFIGURE CB'S (TV-OFF) V63 RR SELF-TEST	CONFIGURE COMM CONFIGURE CB'S FOR L/O PREP AGS STATUS-OPERATE ALIGN AGS TO PGNS AGS GYRO CALIBRATION LOAD AGS ASCENT TARGETING
:20			
:25			
141:30			

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 M S F N	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	



LM FLIGHT PLAN

MCC-H	1153 CST 141:30 (12102)	CDR	LMP	NOTES
<u>UPDATE TO LM AGS K-FACTOR</u>	:35	RATE GYRO TEST	LGC CLOCK SYNC V47 AGS INITIALIZATION (SET BIAS)	
	:40	RCS CHECKOUT		
DUMP DSE <u>UPDATE TO CSM</u> ASCENT PAD (IF REQ'D) <u>UPDATE TO LM</u> ASCENT PAD (IF REQ'D) <u>UPLINK TO LM</u> 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	
	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 <u>D</u>
-15	GDC ALIGN VERIFY ORDEAL
142:10	GO/NO GO FOR LM LIFT-OFF AND DIRECT ASCENT RNDZ MSFN UPDATE: MAP UPDATE REV 32 COPY AT 142:50
M S F N	V67 (+10000, +00100, +00001) LOAD N37 AND N55
-5	VHF VOICE CHECK
142:20	VHF ANT - RIGHT VHF RNG - RESET
0	LM LIFT-OFF CONFIGURE SWITCHES FOR BAILOUT: FD/AI 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	HRS	+ 0 0			+ 0 0		
LIFT-OFF	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	HRS	+ 0 0			+ 0 0		
LIFT-OFF	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	1223 CST	CDR	LMP	NOTES
	142:00 (12102)	VENT DPS FUEL, OXID, & SHe DON HELMET & GLOVES PRESSURIZE APS	DON HELMET & GLOVES	
GO/NO-GO FOR LIFT-OFF ON REV 31, GUIDANCE RECOMMENDATION & DIRECT ASCENT <u>UPDATE TO CSM</u> MAP UPDATE REV 32	: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	
	142:15	MSFN	CHECK APS BURN CARD	CHECK APS, RCS, EPS, ECS VHF VOICE CHECK
	:20		LM TIMELINE BOOK	
	:25	LM LUNAR LIFT-OFF	DAC-ON	TIG: 142:24:29 BT: 7 MIN 10.7 SEC AVT: 6053.4 FPS ULLAGE: NONE ORBIT: 50.96x9.14 NM
	142:30	YAW RIGHT 30°		

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

BACKUP RR CHECK		
R ₁	.	R = <u>100 × ΔR</u> MIN
R ₂	.	R = .
ΔR	.	

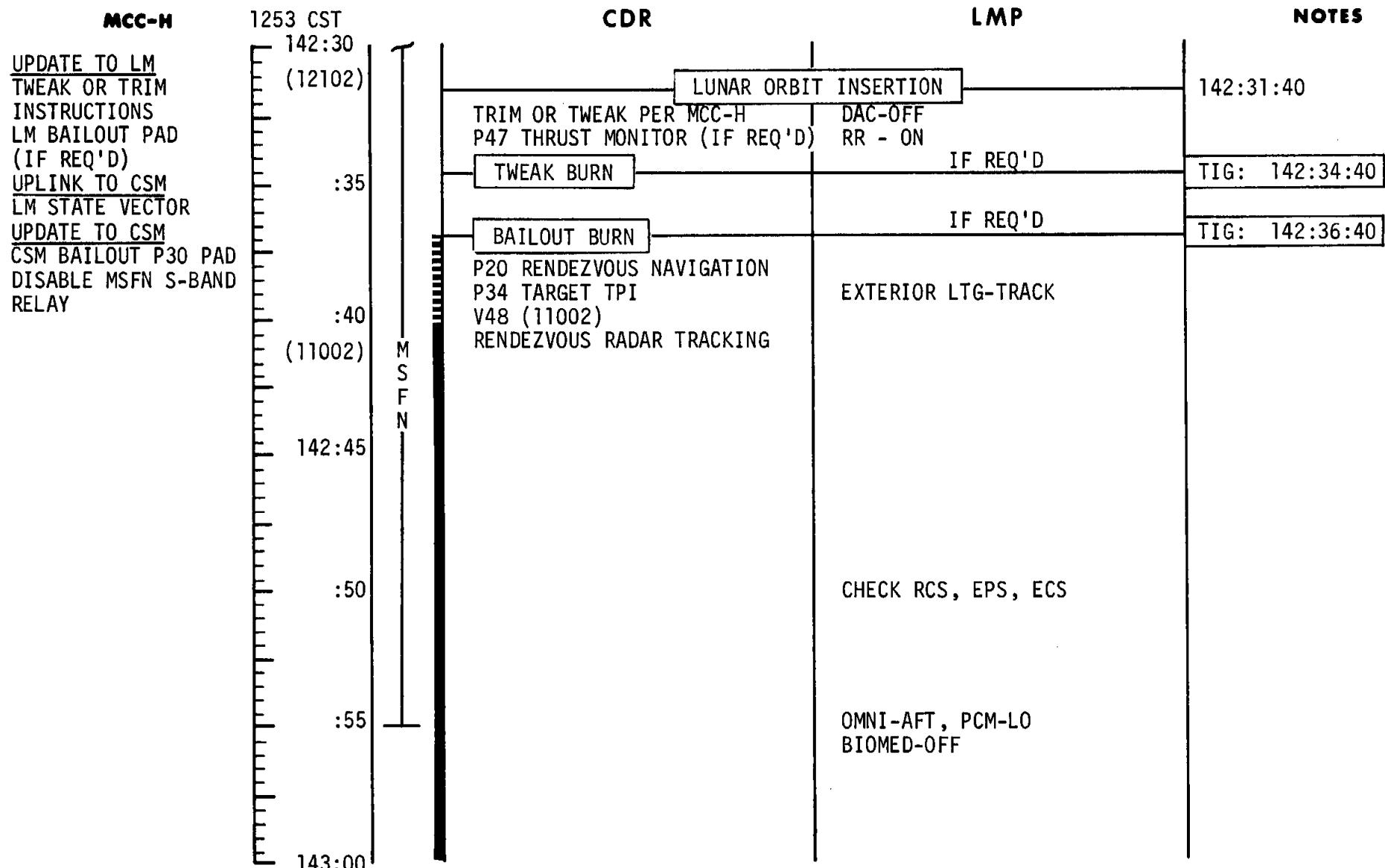
P30 MANEUVER

N/A SET STARS	C	S	M	B	/	O	PURPOSE
	S	P	S/G	&	N		PROP/GUID
R ALIGN N / A	+		N	/	A		WT N47
P ALIGN N / A		0	0	N	/	A	PTRIM N48
Y ALIGN N / A		0	0	N	/	A	YTRIM
ULLAGE _____	+	0	0				HRS GETI
4 JET, 11 SEC	+	0	0	0			MIN N33
	+	0					SEC
	-						
	+	0	0	0	0	0	ΔV_X N81
	+	0	0	0	0	0	ΔV_Y
	+	0	0	0	0	0	ΔV_Z
ΔVC _____	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	EL ELEVATION \$ +000.00	TRANSFER \$ +130.00

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-208

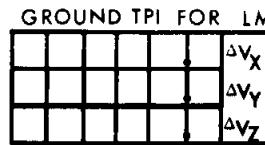
LM FLIGHT PLAN



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)	P40 (66°)(180,111/271,0)	143:00 R=47.77 R=-212.3
-8 (P40) (0.5°DB)	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: $R = 100 + 0.5 (\Delta R \geq 1.0) \text{ NM}$
-6		
0	TPI	143:09:40 LM +63.0,+0.1,+67.3 CSM -64.0,+0.0,-65.3 180,134/271,0
143:10 (11102) (X1111)	P76 P35;V58 (36°)(180,175/308,0)	(IF SXT OR VHF ONLY OR VHF/COAS, NO V67) V67 (+02000,+00020,+00001) V57;V87
+3	5	143:15 R=25.63 R=-125.6
	AUTO RCS SEL (16) - MNA/MNB (VERIFY)	
REV 32		
143:20	3	
+11	V88	
+12 (P41) (0.5°DB)	P35 FINAL COMP COPY LM MCC-1 P76 P41	143:24:40 LM +0.0,+0.0,+0.0 CSM +0.0,+0.0,+0.0 180,194/286,0
+15 (11102) (X1111)	P76 *IF CSM ACTIVE & N58 TPF ΔV > 55 FPS * P35; V58 (TRIM) *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	143:30 R=10.30 R=-77.6
+18	5	
143:30		



P34 FINAL COMP			
	INTEG OPT +00000	ELEVATION §	TRANSFER § +130.00
55		•	
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			
	MCC1 ΔV-LV		
81	•	•	•
59	MCC1 ΔV-LOS	•	•

MCC1 P76			
	LM GETI-MCC1		
33	•	•	•
84	LM MCC1 ΔV-LV	•	•

LM FLIGHT PLAN

MCC-H

1323 CST

143:00
(11002)

(12012)

:05

:10

143:15

REV 32

:25

143:30

CDR

FINAL TPI COMPUTATION

V48 (12012)

P42 APS THRUSTING

MANUAL ULLAGE

TPI

NULL RESIDUALS
P35 TARGET MCC-1
RENDEZVOUS RADAR TRACKING

FINAL MCC-1 COMPUTATION

P41 RCS THRUSTING

MCC-1

NULL RESIDUALS
P35 TARGET MCC-2
RENDEZVOUS RADAR TRACKING

LMP

LOAD AGS TPI EXTERNAL ΔV

LOAD AGS MCC-1 EXTERNAL ΔV

EXTERNAL LTG - OFF

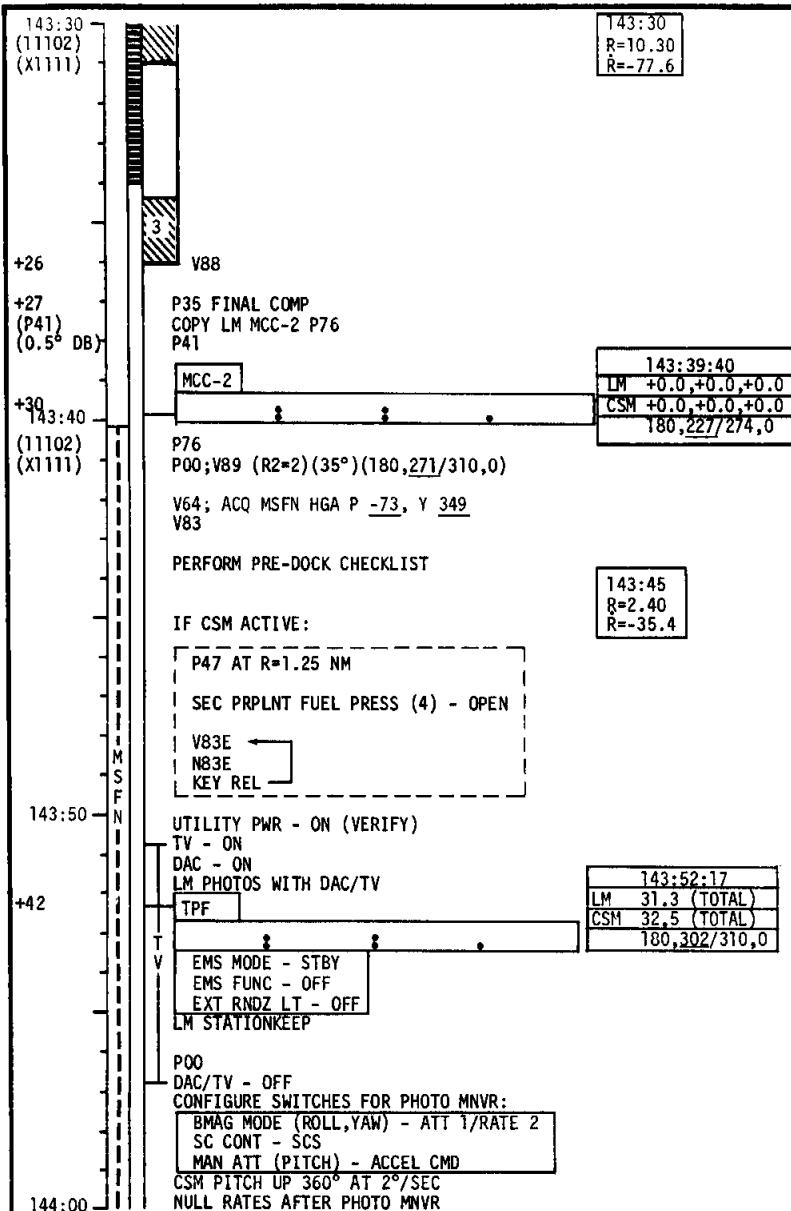
NOTES

TIG: 143:09:40
BT: 4.0 SEC
ΔVT: 92.2 FPS
ULLAGE: 4 JET, 10 SEC
ORBIT: 61.0x44.6 NM

TIG: 143:24:40
ΔVT: NOM ZERO

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
R=10.30
R=-77.6

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

MAIN ATT (3) - RATE CMD (VERIFY)
LIMIT CYCLE - OFF (VERIFY)
ATT DB - MIN
RATE - LOW (VERIFY)
TRANS CONTR PWR - ON (UP)
ROT CONTR PWR DIRECT (BOTH) - MNA/MNB
SC CONT - CMC (VERIFY)
CMC MODE - AUTO (VERIFY)
AUTO RCS SEL (16) - MNA/MNB (VERIFY)

CB DOCK PROBE (2) - CLOSED
PROBE RETR (2) - OFF (VERIFY)
PROBE EXTD/REL - RETR
PROBE EXTD/REL TB (2) - GRAY (VERIFY)
(IF TB NOT GRAY, GO TO PG S/2-12, E)
CB SECS LOGIC (2) - CLOSED (VERIFY)
CB SECS ARM (2) - CLOSED
EXT LIGHTS RUN/EVA - ON (UP) (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

CSM FLIGHT PLAN

144:00 (11102) (X1111)	<p>SC CONT - CMC MAN ATT (PITCH) - RATE CMD BMAG MODE (3) - RATE 2 CMC MODE - AUTO</p> <p>DOCKING ATTITUDE VERIFY HGA P -73, Y 349</p> <p>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)</p> <p>P47 DAC/TV - ON LM PITCH DOWN 90°</p> <p>TRANSLATE TO CAPTURE LATCH PERFORM DOCKING CHECKLIST DOCKING</p>
144:10 (61111) (11111)	<p>DAC/TV - OFF POO V48 (61111) (11111)</p> <p>CMC MODE - AUTO SC CONT - CMC BMAG MODE (3) - RATE 2</p> <p>RNDZ XPNDR - OFF</p> <p>REMOVE DECONTAMINATION BAGS (A8) <i>Delete</i> UNSTOW AND ASSEMBLE VACUUM CLEANER, PWR CABLE, HOSE, AND BAG (SIDE A12, SIDE A8) CONNECT PWR CABLE (PNL 201)</p>
144:20	<p>PREPARE COUCH FOR HATCH</p> <p>REMOVE PROBE STRAPS (A1)</p> <p>CDR - VERIFY FWD DUMP VLV - AUTO CABIN FAN (2) - ON (UP)</p> <p>EQUALIZE CSM/LM PRESSURE (LOD DECAL)</p> <p>REMOVE HATCH AND STOW (DECAL)</p> <p>VERIFY DOCKING LATCHES (AT LEAST 3)</p> <p>REMOVE AND TEMP STOW PROBE AND DROGUE (DECAL)</p>
144:30	

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 \pm 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

MISSION	EDITION	DATE	PAGE
APOLLO 14 <i>Phg B</i>	FINAL (JAN)	DECEMBER 2, 1970	3-214

Jan 11, 1971

LM FLIGHT PLAN

MCC-H

1353 CST

CDR

LMP

NOTES

143:30
(12012)

:35

FINAL MCC-2 COMPUTATION

P41 RCS THRUSTING

LOAD AGS MCC-2 EXTERNAL ΔV

:40

MCC-2

NULL RESIDUALS
TPI BURN REPORT (IF REQ'D)

BIOMED - RIGHT, PCM-HIGH
STEERABLE ANTENNA
P 114, Y -46

TIG: 143:39:40
 ΔV : NOM ZERO

143:45
(11002)

V48 (11002)

P47 THRUST MONITOR

BRAKING GATES

TIG: 143:48:44 to
143:54:44
TOTAL ΔV : 32.6 FPS
ORBIT: 60.2x58.1 NM

:50

M
S
F
N

:55

CSM PHOTOGRAPHY
LM 3/DC, LM 3/DAC

144:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	143:30 - 144:00	6/32	3-213

LM FLIGHT PLAN

MCC-H

1423 CST

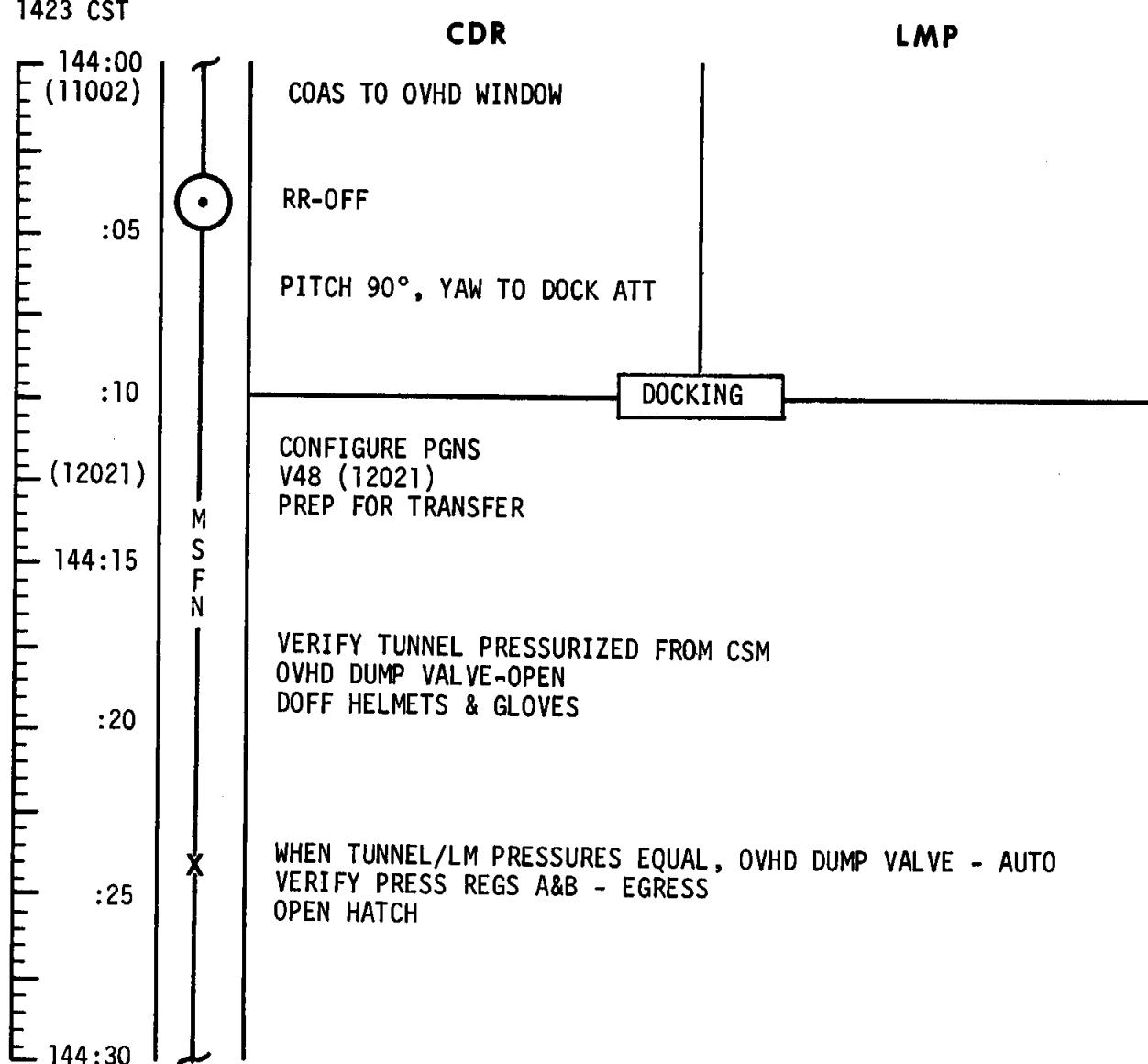
CDR

LMP

NOTES

GO/NO-GO FOR PYRO
ARM

UPLINK TO LM
LM S.V. (TIG-10)
P30 TARGET LOAD
P99 LM DEORBIT
UPDATE TO LM
DEORBIT BURN PAD
DAP LOAD (WEIGHTS)



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

144:30
(61111)
(11111)

TRANSFER TO CDR AT HIS REQUEST:
PROBE
DROGUE
VACUUM CLEANER (ASSEMBLED)
DECONTAMINATION BAGS (10-01)
HELMET & ACCESSORY BAG (2) (R6)

144:40

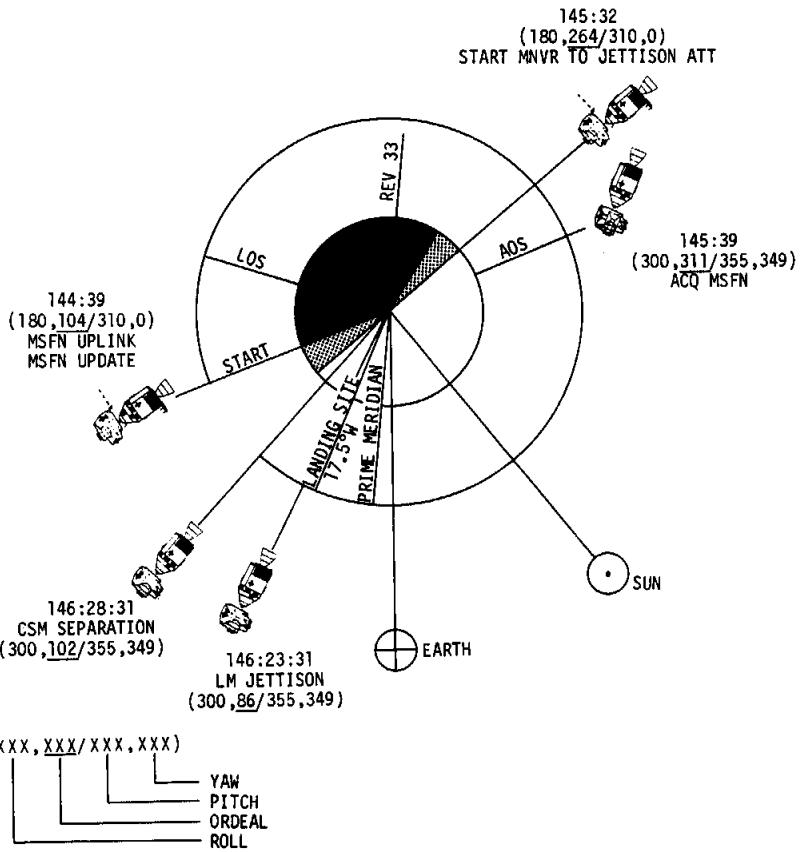
MSFN UPLINK:
CSM S.V. (CSM SEP-10)
LM S.V. (TIG LM DEORBIT -10)
MSFN UPDATE:
MAP UPDATE REV 33
DAP LOAD - UPDATE WEIGHTS COPY AT 145:25
CSM SEPARATION PAD COPY AT 145:35
LM JETTISON PAD COPY AT 145:45

144:50

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

145:00

MAP UPDATE REV <u>33</u>	
LOS :
180° :
AOS :



MISSION	EDITION	DATE	PAGE
APOLLO 14 Chg B	CHANGE-A (JAN)	DECEMBER 23, 1970	3-216

Jan 11, 1971

LM FLIGHT PLAN

MCC-H

1453 CST

CDR

LMP

NOTES

JPLINK 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)

144:30
(12021)

:35

:40

144:45

:50

:55

145:00

RECEIVE PROBE FROM CMP AND STOW
RECEIVE DROGUE FROM CMP AND STOW OVER PROBE
RECEIVE DECONTAMINATION BAGS & VACUUM CLEANER FROM CSM

M
S
N

UNSTOW, VACUUM/WET-WIPE, BAG AND TRANSFER TO CSM:

70 MM MAG BAG (3 MAGS)
SURFACE 16 MM BAG (6 MAGS)
2 SAMPLE ROCK BAGS
HELMETS (WITH IV GLOVES)

ISA

LM S.V. IS
TIME TAGGED FOR
DEORBIT BURN MINUS
10 MIN

CSM S.V. IS
TIME TAGGED FOR
CSM SEP MINUS
10 MIN

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

(61102)
 (11111)

CYCLE CMC MODE - FREE/AUTO
 V48 (61102)
 (11111)
 LOAD CSM & LM WEIGHTS

145:30

CSM WT	+					
LM WT	+					

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

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE B (JAN)	JANUARY 11, 1971	3-218

LM FLIGHT PLAN

MCC-H

1523 CST

CDR

LMP

NOTES

145:00 (12021)			
:05			
:10			
145:15			
REV 33		UNSTOW SRC'S, VACUUM AND BAG, TRANSFER TO CSM	
:20		RECEIVE B5 & B6 FROM CMP AND STOW IN SRC RACK	
		VACUUM PGA'S	
		TRANSFER VACUUM CLEANER TO CSM	
:25			
,			
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)
145:40	ACQ MSFN OMNI <u>D</u>
145:50	CDR - TRANSFER CM JETTISON ITEMS TO LM <div style="border: 1px solid black; padding: 5px;"> WARNING NO URINE/FECES ALL OPENED FOOD MUST BE TREATED AND STORED IN BETA BAG </div> GO/NO-GO FOR LM CLOSEOUT LMP - CLOSE LM HATCH DIRECT O ₂ VLV - CLOSED (CW)
146:00	UNSTOW AND INSTALL FORWARD HATCH (DECAL) PERFORM HATCH INTEGRITY CHECK (DECAL)

P30 MANEUVER

SET STARS	C	S	M	S	E	P	PURPOSE
	R	C	S/G	&	N	A	PROP/GUID
R ALIGN	+			N		A	WT N47
P ALIGN			0	0			P TRIM N48
Y ALIGN			0	0			Y TRIM
ULLAGE			0	0	0		HRS GETI
			0	0	0		MIN N33
			0				SEC
	-	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)

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-220

LM FLIGHT PLAN

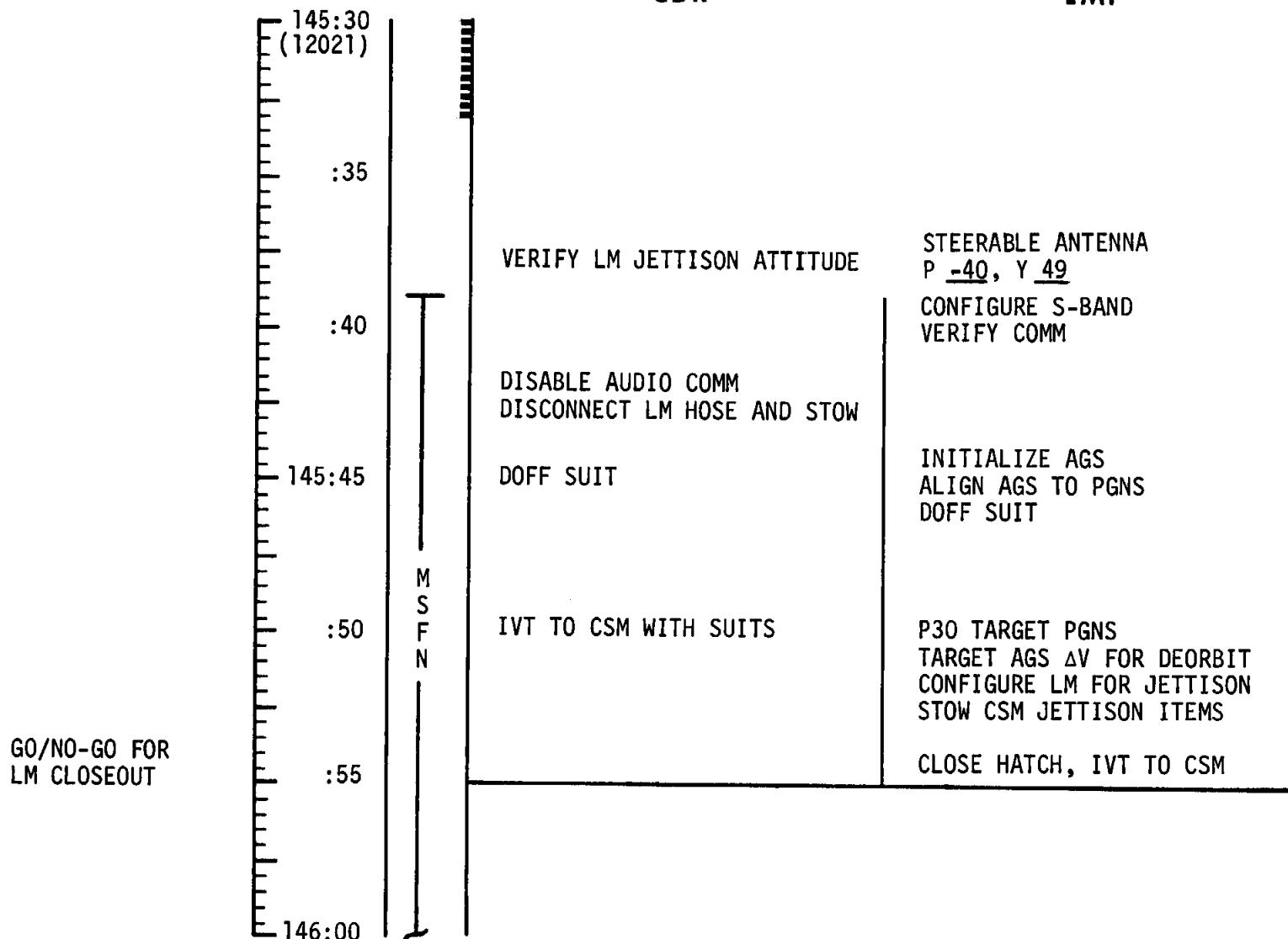
MCC-H

1553 CST

CDR

LMP

NOTES



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

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

146:10

CONFIGURE CAMERA FOR LM JETTISON PHOTOS
 CM2/DAC/18/CEX-BRKT, MIR (f8,250,7) 12 fps (50% MAG)

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

LOAD ΔV IN EMS TO + 100.0
 CHECK NULL BIAS
 GDC ALIGN
 VERIFY ORDEAL

PERFORM PRE-JETTISON CHECKLIST

V48 (11102)
 (11111)
 [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)]

(11102)
 (11111)

146:20

X
 LM JETTISON
 POO
 DAC - OFF

PERFORM PRE-SEPARATION CHECKLIST
 EMS MODE - NORMAL (SEP - 30 SEC)

[CSM SEPARATION]

P00;V66;V49 MNVR TO P52 ATT (146:36)
 (180,245,0) HGA -39, Y 185

146:23:31
 300,86/355,349

146:28:31
 -1.0,+0.0,+0.0
 300,102/355,349

)

)

PRE-JETTISON CHECKLIST

B MAG 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
 THC PWR DIR - MNA/MNB
 THC - ARMED
 RHC - ARMED

PRE-SEPARATION CHECKLIST

EMS MODE - STBY
 SC CONT - CMC
 B MAG MODE (3) - RATE 2
 P41 (BYPASS MNVR)
 SECS PYRO ARM (2) - SAFE
 SECS LOGIC (BOTH) - OFF
 CB SECS ARM (2) - OPEN

MISSION	EDITION	DATE	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	3-222

CSM FLIGHT PLAN

<p>146:30 (11102) (11111)</p> <div style="border: 1px solid black; padding: 5px;"> <p>EMS MODE - STRY EMS FUNC - OFF THC PWR - OFF AUTO RCS SEL B/D ROLL (4) - OFF RHC PWR DIR - OFF THC - LOCKED RHC - LOCKED</p> </div> <p>SC CLEAN-UP MSFN: DUMP DSE</p> <p>MSFN UPLINK: DESIRED ORIENT (TEI)</p> <p>MSFN UPDATE: LTC PHOTO PAD (TGT 11) (COPY IN FLIGHT PLAN AT 147:00) MAP UPDATE REV 34</p> <p>146:40 M S F N REPORT: <u>GYRO TORQUING ANGLES</u></p> <p>P52 (OPTION 1) (TEI ORIENT)</p> <p>146:50 GDC ALIGN VERIFY ORDEAL</p> <p>VERIFY DSE TAPE MOTION (LBR/RCD/FWD/CMD RESET)</p> <p>WIPE EXCESSIVE MOISTURE FROM TUNNEL HATCH AREA</p> <p>147:00 PERFORM CONTAMINATION CONTROL PROCEDURE</p>	<div style="border: 1px solid black; padding: 5px;"> <p>P52 IMU REALIGN</p> <p>N71: _____</p> <p>N05: _____ •</p> <p>N93: _____</p> <p>X _____ • _____</p> <p>Y _____ • _____</p> <p>Z _____ • _____ •</p> <p>GET _____ • _____ •</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>MAP UPDATE REV 34</p> <p>LOS : _____ • _____ •</p> <p>180°: _____ • _____ •</p> <p>AOS : _____ • _____ •</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>CONTAMINATION CONTROL</p> <p>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</p> </div>
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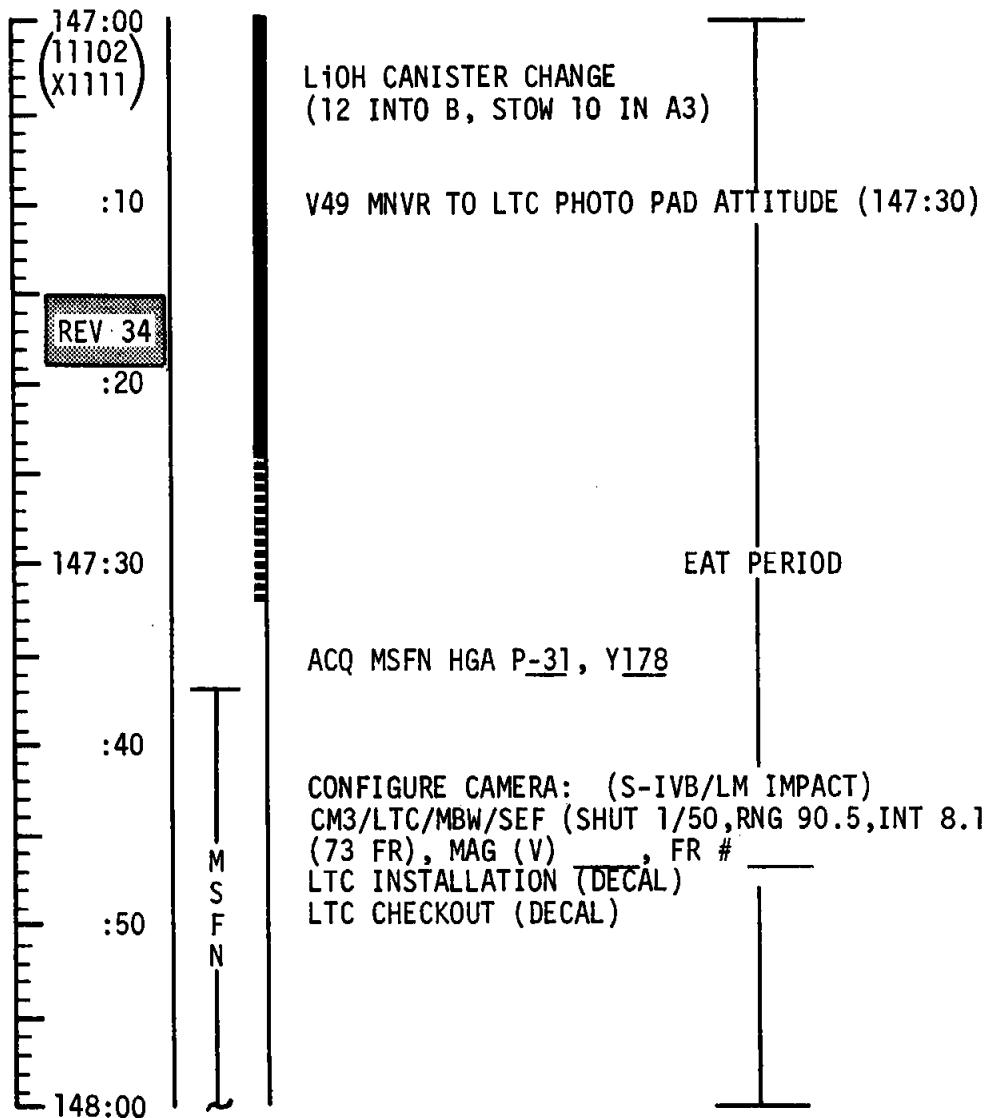
FLIGHT PLAN

MCC-H

1723 CST

NOTES

DUMP DSE
 UPDATE TO CSM
 TEI 34 MNVR PAD
 TEI 35 MNVR PAD
 MAP UPDATE REV 35



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	

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	147:00 - 148:00	6/33-34	3-224

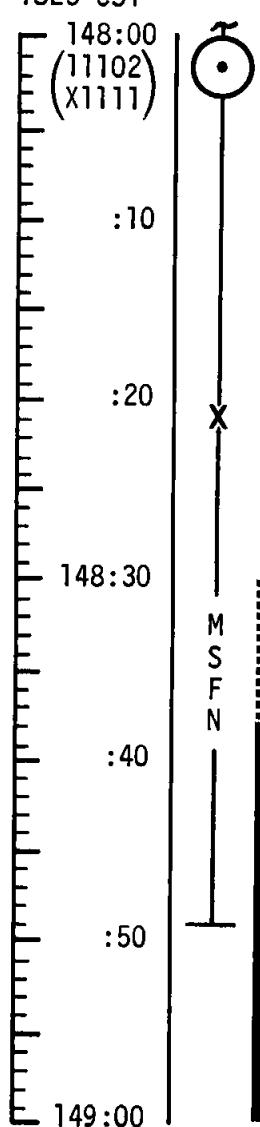
FLIGHT PLAN

MCC-H

1823 CST

NOTES

UPLINK TO CSM
CSM S.V. & V66
TEI 34 TGT LOAD



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)

LM LUNAR IMPACT
GET: 148:20:58
LAT: 3.5°S
LONG: 19.29°W

19.27W
NOTE: IF APOLLO 14
ALSEP IS INOPERABLE,
THE LM WILL BE IM-
PACTED NEAR APOLLO
12 ALSEP AT:
LAT ~~3.32°S~~ 3.04°S
LONG ~~23.38°W~~ 24.64°W

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN) <i>Change B</i>	DECEMBER 23, 1970 <i>Jan 11, 1971</i>	148:00 - 149:00	6/34	3-225

FLIGHT PLAN

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 & Δ VC >+50 FPS SWITCH TO SCS AUTO & RESTART SPS	BT + 2 SEC & Δ VC = -40 FPS	TRIM X AND Z AXIS TO 0.2 FPS

TABLE 3-8
3-226

FLIGHT PLAN

MCC-H

1923 CST

149:00
(11102)
(X1111)

SXT STAR CHECK
P40 SPS THRUSTING

i10

REV 35

TE

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

:20

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

• 40

LUNAR SURFACE PHOTOGRAPHY, TEI +26 (149:41) (5 FR)
HAND-HELD, OVERLAPPING, PAN OF VISIBLE DISC,
RAPID SEQUENCE

• 50

V49 MNVR TO PHOTOGRAPH LUNAR SURFACE (149:47)
(128-222 331) CHANGE APERTURE TO f4

(100,322,331) CHANGE APERTURE TO 14
LUNAR SURFACE PHOTOGRAPHY, TEI +32 (149:47) (4 FR)
HAND HELD, OVERLAPPING, PAN OF MOUNTAIN

HAND-HELD, OVERLAPPING, PAN OF VISIBLE DISC,
RAPID SEQUENCE

V49 MNVR TO PHOTOGRAPH LUNAR SURFACE (149:57)
(131-215-332)

LUNAR SURFACE PHOTOGRAPHY, TEI +
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

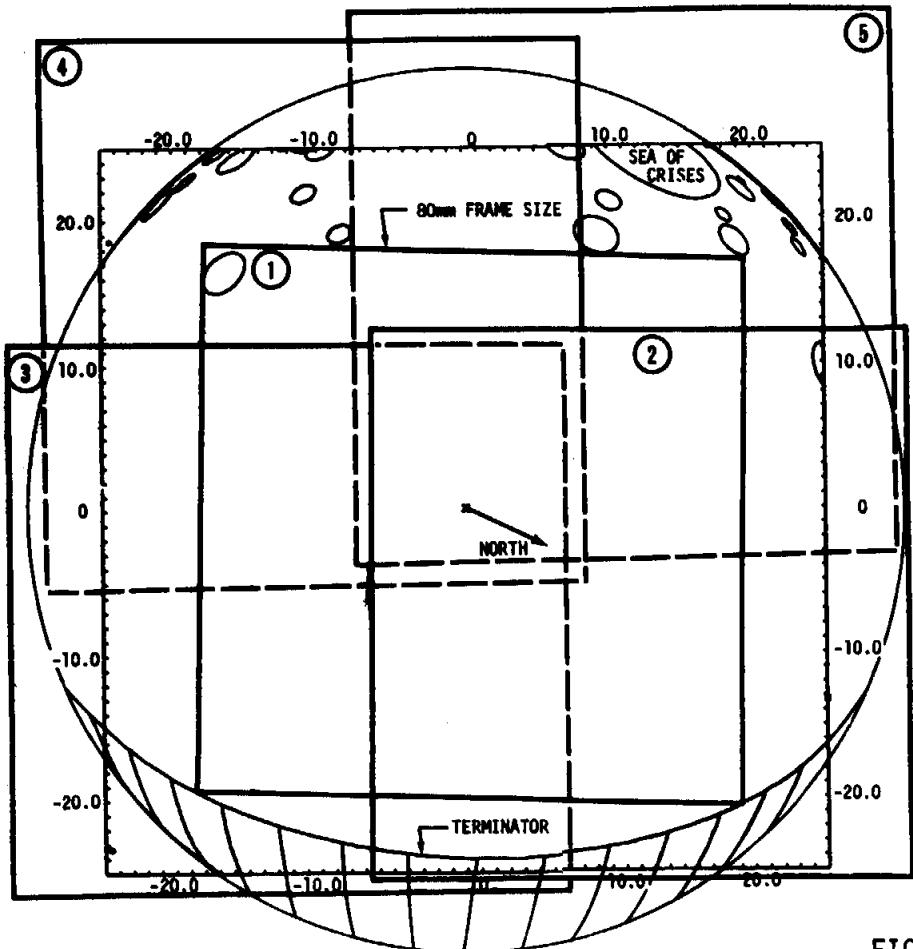
TIG: 149:14:50
BT: 2 MIN 27.4 SEC
ΔVT: 3449.55 FPS
ULLAGE: 4 JET, 12 SEC
ORBIT: N/A

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

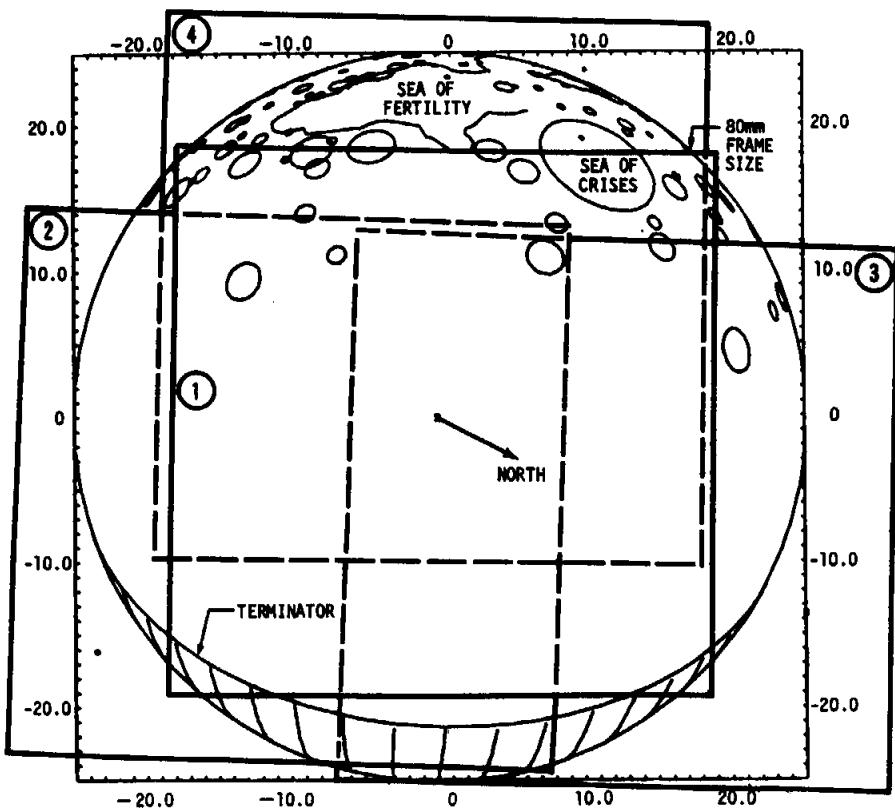
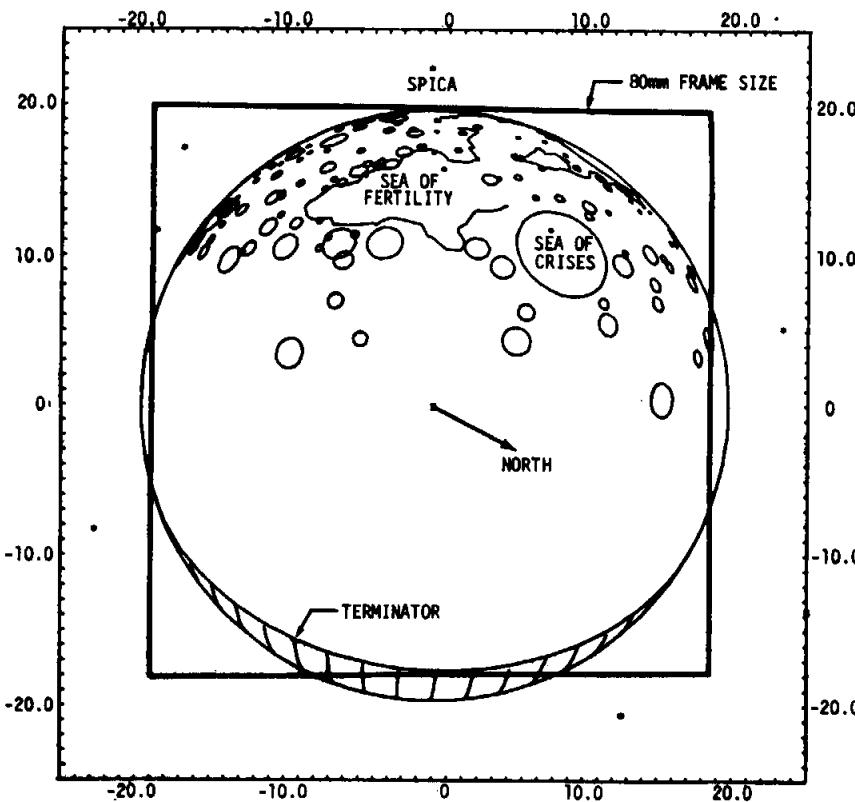


FIGURE 3-3
3-228

POST-TEI PHOTO SEQUENCE

TEI + 42 MIN

(TWO PHOTOS, CENTER LUNAR DISC IN FRAME)



TEI + 1 HR

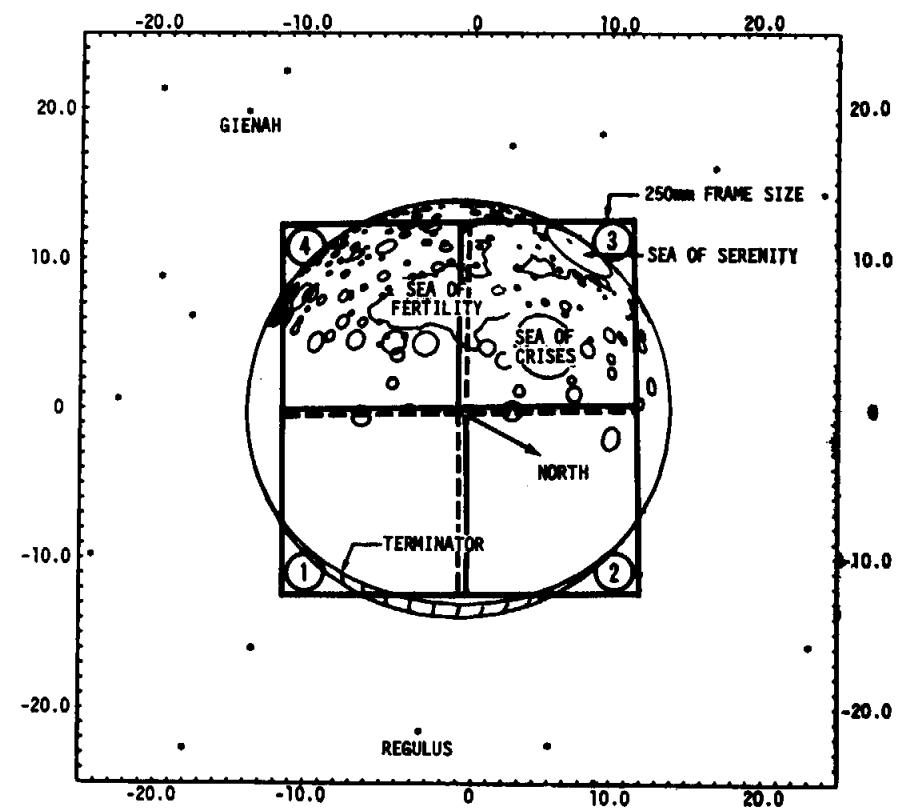
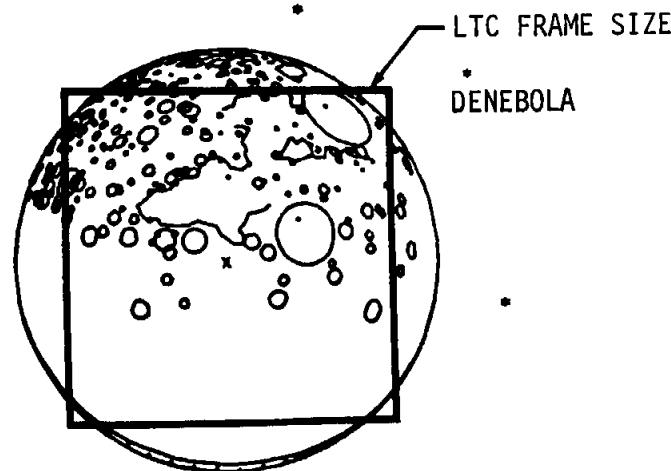


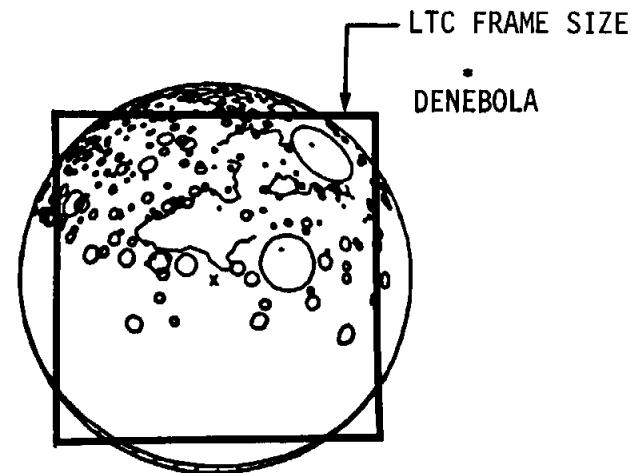
FIGURE 3-4
3-229

POST-TEI PHOTO SEQUENCE

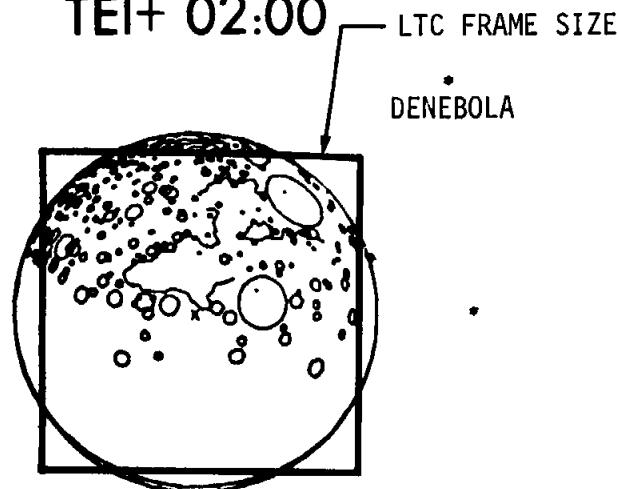
TEI+ 01:40



TEI+ 01:50



TEI+ 02:00



TEI+ 02:10

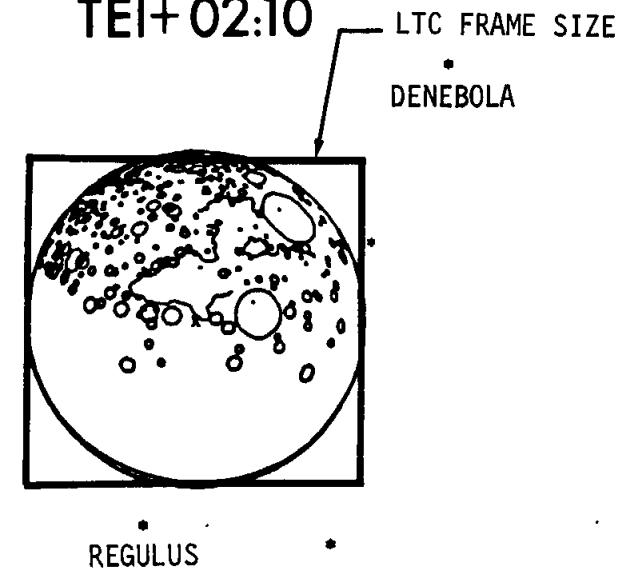


FIGURE 3-5
3-230

MCC-H

2023 CST

FLIGHT PLAN

NOTES

150:00
 E (11102)
 X1111

:10

P52 IMU ALIGN
 OPTION 3 REFSMMAT
 (TEI ORIENTATION)
 REPORT GYRO TORQUE ANGLES
 OPTION 1 PREFERRED
 (PTC ORIENTATION)

STARS _____, _____

SA _____, _____

TA _____, _____

:20

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 # _____

150:30

M
S
F
N

VISUAL ASSESSMENT OF VISUAL TARGETS 1 & 2

V48 (11101)(X1111)

: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)

MAG (V) _____, FR #

LTC INSTALLATION (DECAL)

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)

:50

151:00

P52 IMU REALIGN

N71: _____, _____

N05: _____, _____

N93:

X _____, _____

Y _____, _____

Z _____, _____

GET _____ : _____ :

LTC PHOTO PAD (TEI +01:40)

R _____, P _____, Y _____

(12 FR)

LTC PHOTO PAD (TEI +01:50)

R _____, P _____, Y _____

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

2123 CST

NOTES

151:00
(11101)
(X1111)

TEI + 1 HR 50 MIN (151:05) SINGLE FRAME
GET OF EXPOSURE ____ : ____ :

:10

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 ____ : ____ :

:20

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

M
S
F
N

151:30

CSM G&C CHECKLIST
PASSIVE THERMAL CONTROL (G&N)
V49 MNVR TO PTC ATTITUDE
(N20,270,000)
V79 (-0.3750)
(+030.00)
(+00000)

PAGE G 8-2

:40

CSM SYSTEMS CHECKLIST

PRE-SLEEP CHECKLIST
COMM - OMNI'S

PAGE S 1-26

:50

152:00

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP
CSM S.V.

UPLINK TO CSM
CSM S.V. (MSFN)
(NO V47)

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

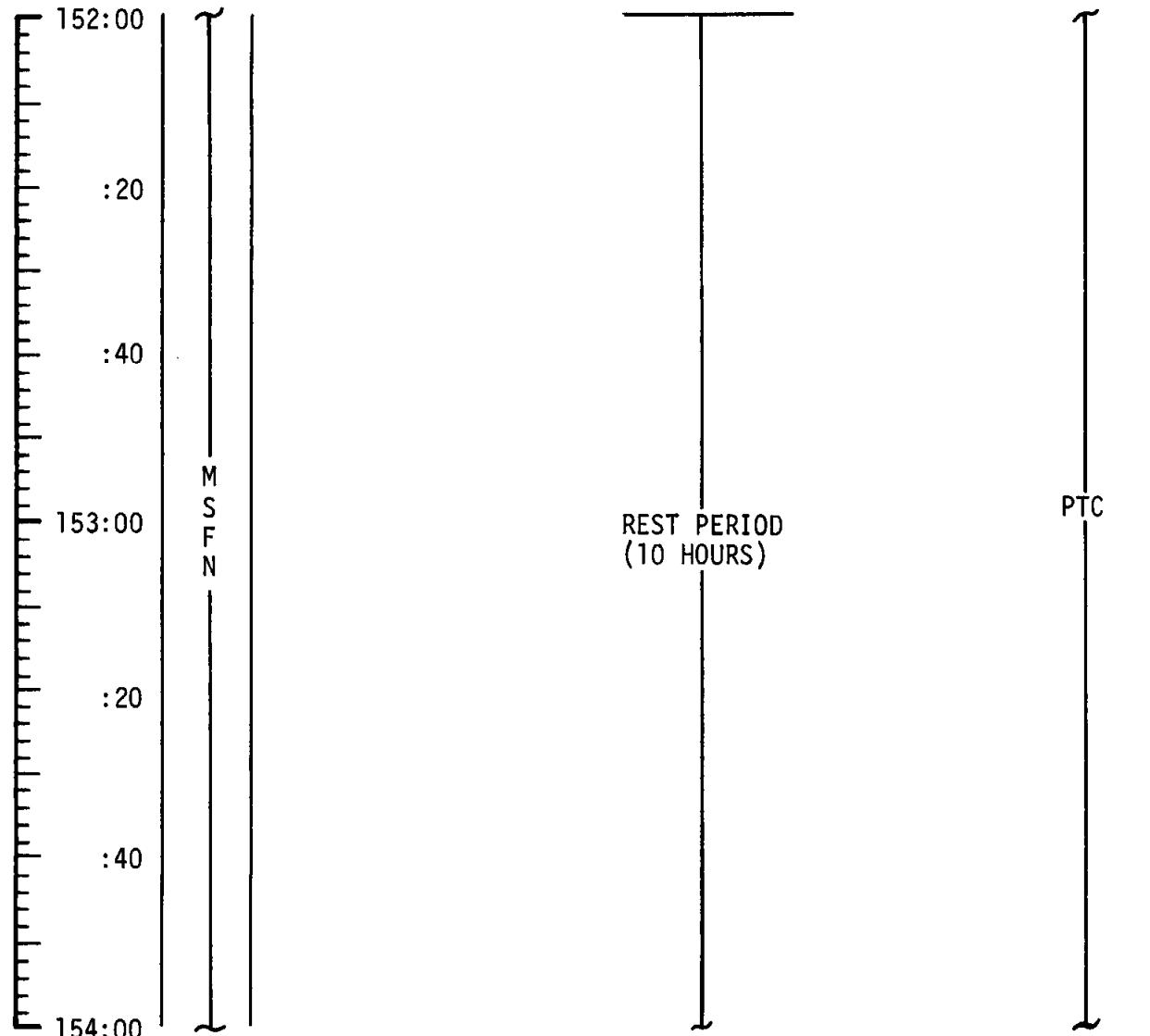
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	151:00 - 152:00	6/TEC	3-232
MSC FOF	9B (APRIL 1970) OT	FLIGHT PL	ING BRANCH	NA'	MSC

MCC-H

2223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)

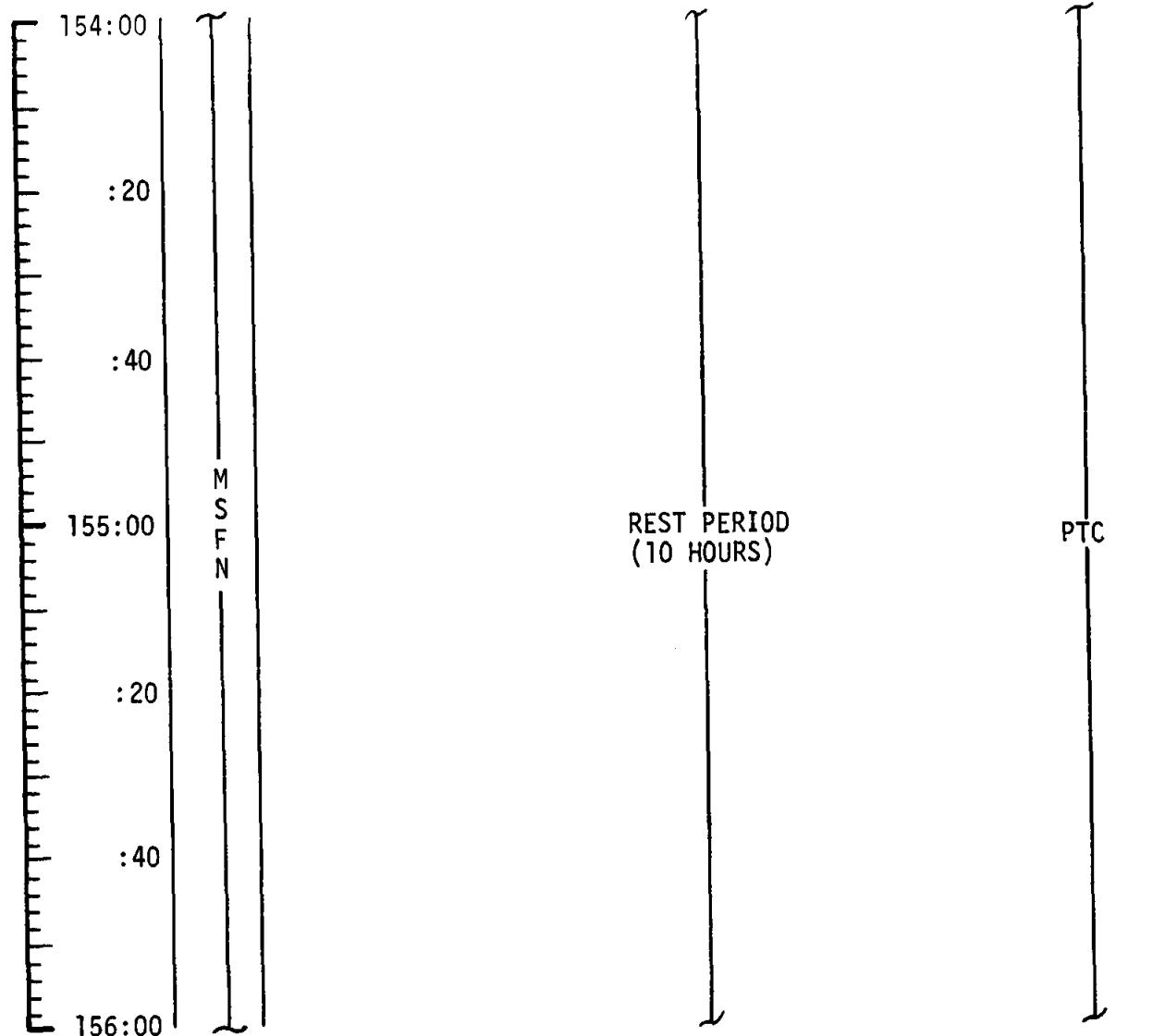
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	152:00 - 154:00	6/TEC	3-233

MCC-H

0023 CST

FLIGHT PLAN

NOTES

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

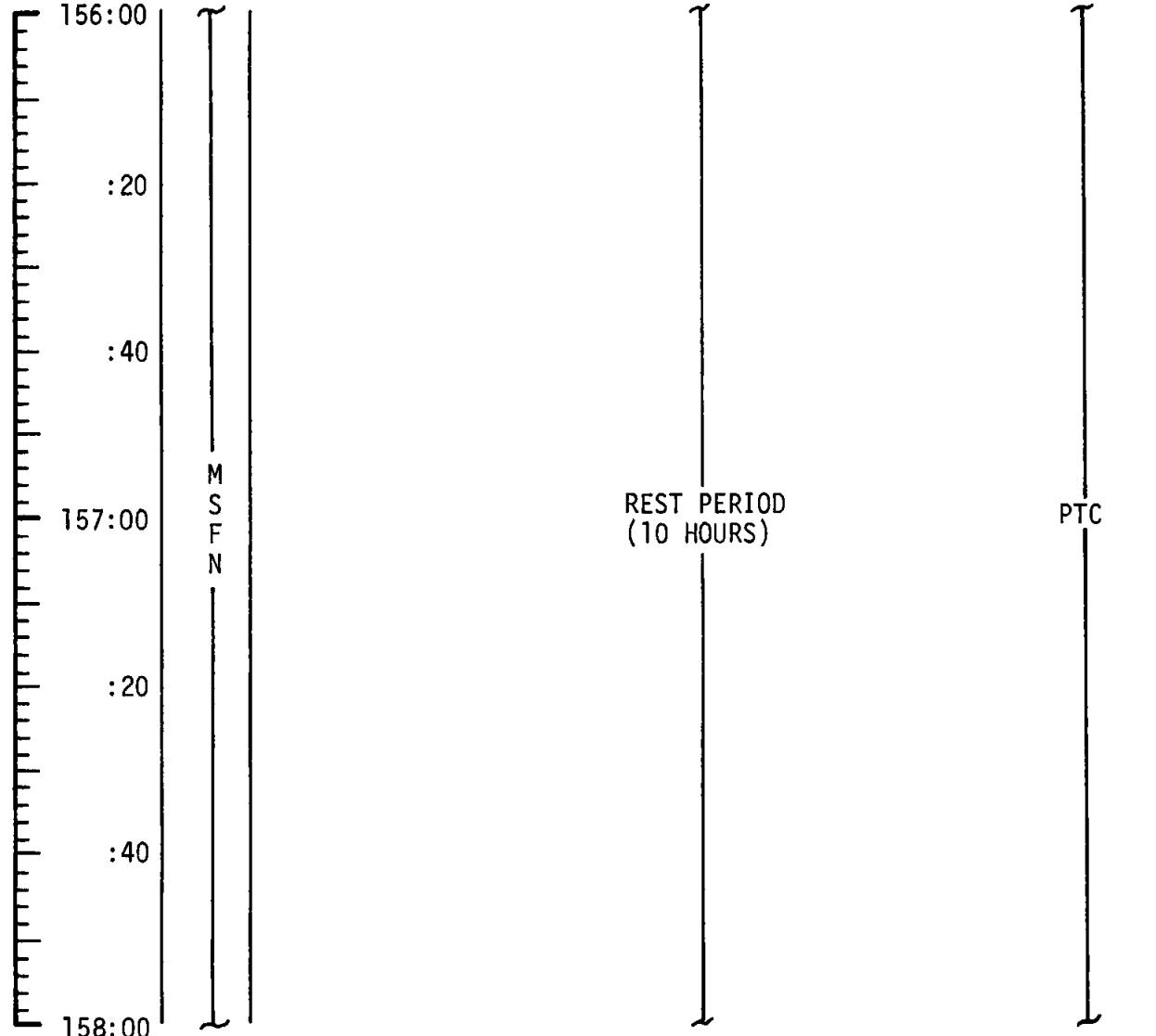
NASA — MSC

MCC-H

0223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)

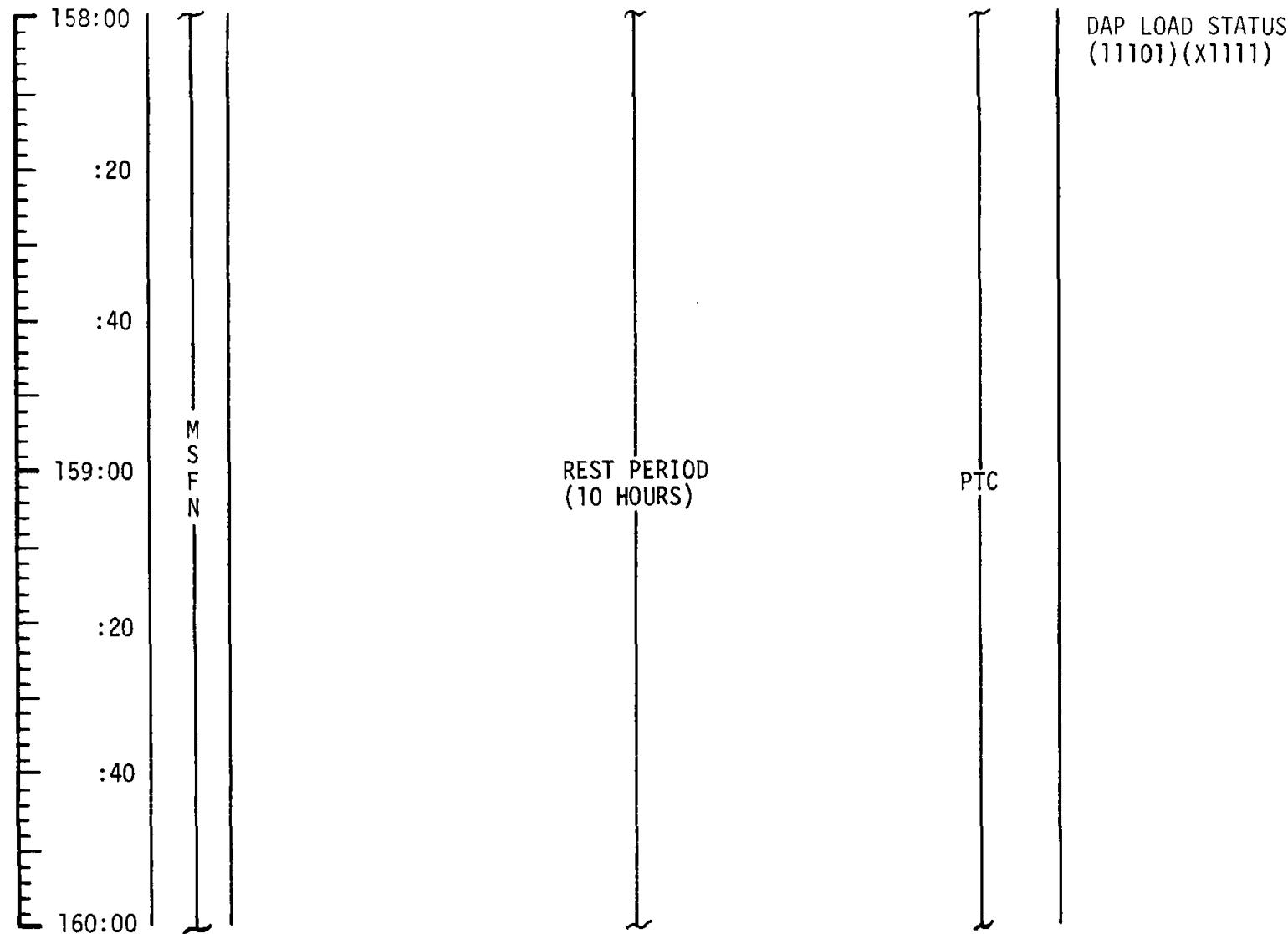
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	156:00 - 158:00	6/TEC	3-235

MCC-H

0423 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	158:00 - 160:00	6/TEC	3-236

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

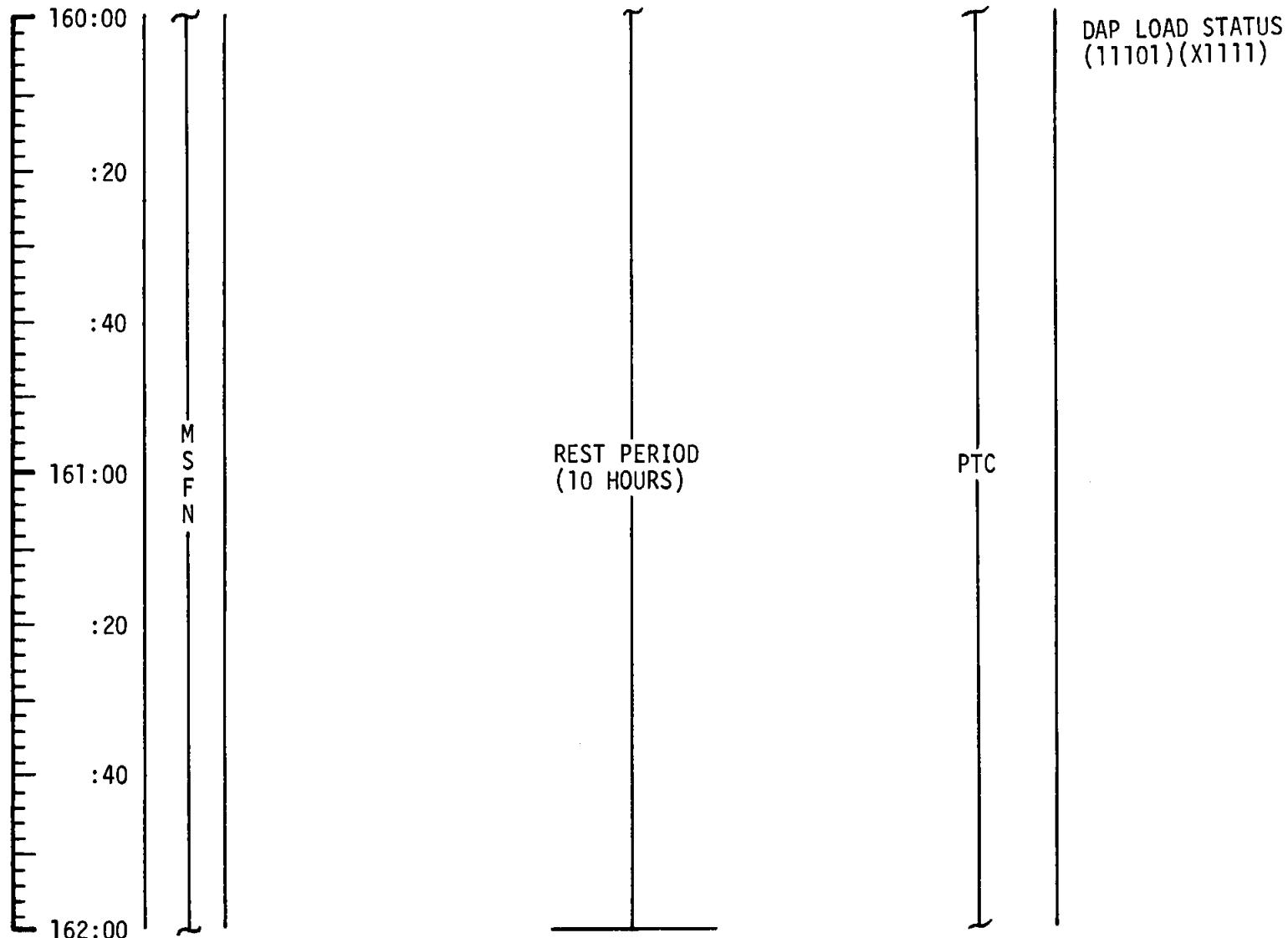
NASA — MSC

MCC-H

0623 CST

FLIGHT PLAN

NOTES



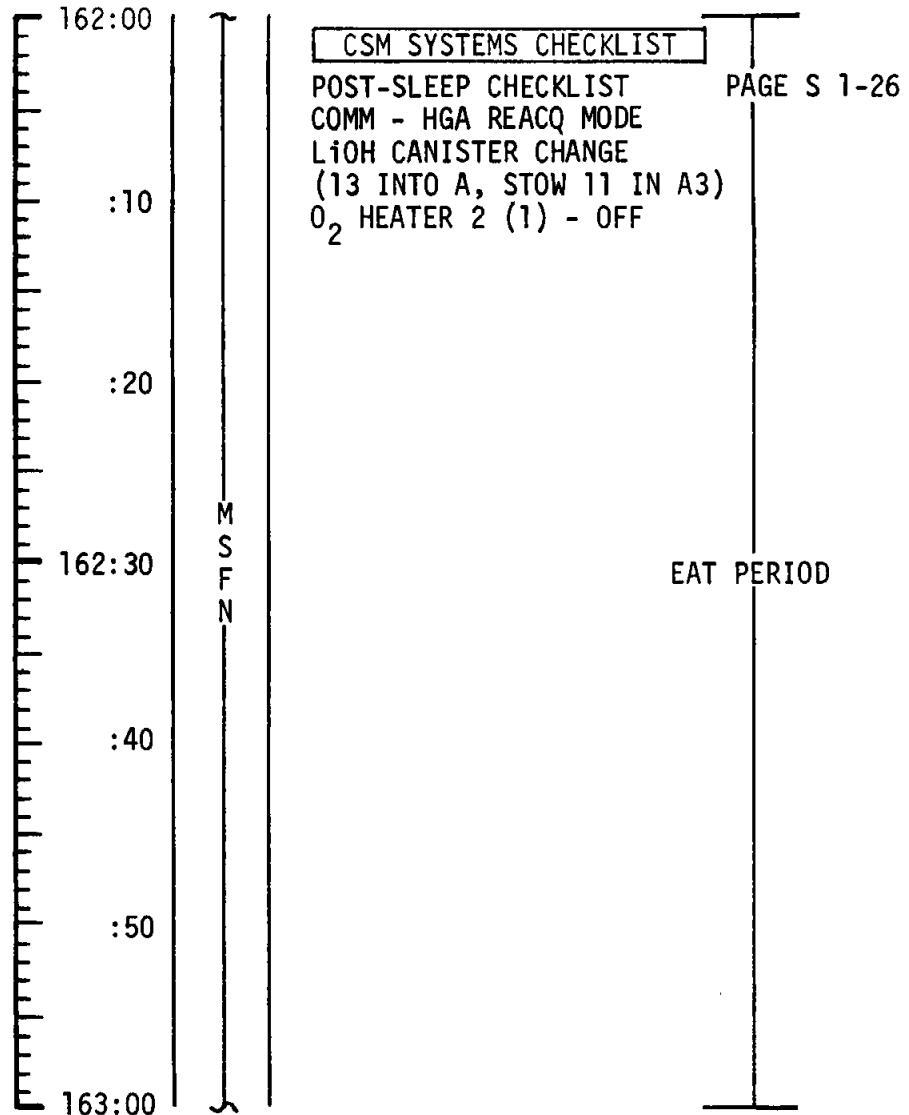
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	160:00 - 162:00	6/TEC	3-237

MCC-H

0823 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN

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 NMDURING PTC CREW
AWAKE PERIODS,
THE ANTENNA
CONFIGURATION
WILL BE HGA/OMNI
COMMANDED FROM
MCC-H

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	162:00 - 163:00	7/TEC	3-238

MCC-H

0923 CST

FLIGHT PLAN

NOTES

163:00

:10

:20

163:30

:40

:50

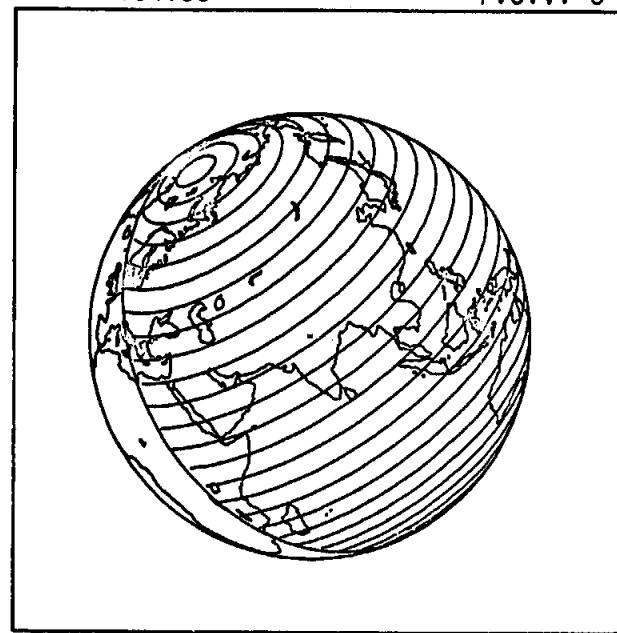
(11101)
(X1111)

164:00

M
S
F
N

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

P52 IMU REALIGN

N71: ____ , ____

N05: ____ . ____

N93:

X ____ . ____

Y ____ . ____

Z ____ . ____

GET ____ : ____ :

NASA — MSC

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

 164:00
 (11101)
 (X1111)

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
 (113,323,002) HGA P -68, Y 73
 P23 CISLUNAR NAVIGATION
 OPTICS CALIBRATION STAR N70 (00033)
 POO
 V49 MNVR TO SIGHTING ATTITUDE
 (094,325,335) HGA P -55, Y 3
 V67 (+99000) (+00020) (+00003)

:10

EARTH HORIZON
LOAD W MATRIX

:20

P23 CISLUNAR NAVIGATION
 3 MARKS ON EACH STAR
 1. N70 (00040) (00000) (00110)

40 ALTAIR (ENH)

M
S
F
N

164:30

2. N70 (00000) (00000) (00120)
 N88 (+07234) (-86438) (-49761)
 3. N70 (00033) (00000) (00120)

212 DELTA
SAGITTARI (EFH)

:40

*4. N70 (00035) (00000) (00120)
 *5. N70 (00000) (00000) (00120)
 N88 (-07804) (-99375) (+07982)

33 ANTARES (EFH)

:50

*6. N70 (00000) (00000) (00110)
 N88 (+22712) (-83641) (-49884)

35 RASALHAGUE (EFH)

165:00

V49 MNVR TO THERMAL ATTITUDE (165:00)
 (184,325,335) OMNI A

211 BETA
OPHIUCHI (EFH)214 ZETA
SAGITTARI (ENH)*OPTIONAL TEST
STARS, DO NOT
UPDATE S.V.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	164:00 - 165:00	7/TEC	3-240

MCC-H

1123 CST

UPLINK TO CSM
 CSM S.V. & V47E
 MCC-5 TGT LOAD

UPDATE TO CSM
 MCC-5 MNVR PAD

165:00
 (11101)
 (X1111)

:10

:20

165:30

:40

:50

166:00

M
S
F
N

P30 EXTERNAL ΔV
 V49 MNVR TO PAD ATT
 SXT STAR CHECK
 P40 SPS THRUSTING OR
 P41 RCS THRUSTING

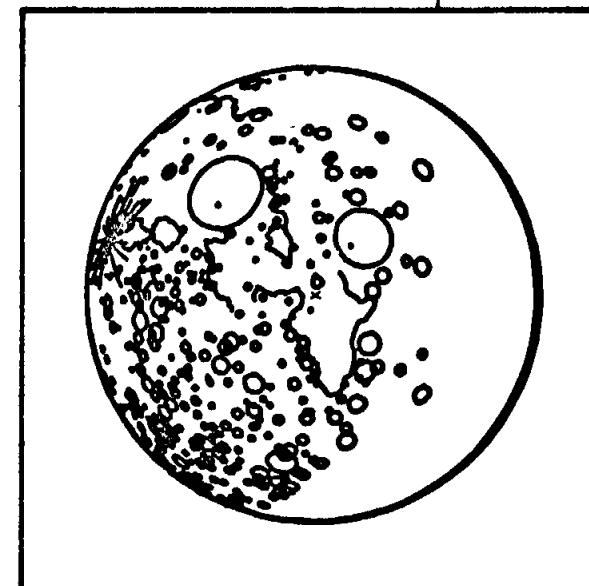
FLIGHT PLAN

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

FLIGHT PLAN

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
3-242

MCC-H

1223 CST

FLIGHT PLAN

NOTES

TEI +17 HR

UPLINK TO CSM

CSM S.V. (CMC) V47E
CSM S.V. (MSFN)
(NO V47)166:00
(11101)
(X1111)

:10

 O_2 FUEL CELL PURGE
WASTE WATER DUMPTIG: 166:14:50
BT: NOM ZERO
AVR: NOM ZERO
ULLAGE: N/A
ORBIT: N/A

:20

MCC-5
BURN STATUS REPORT
CHARGE BATTERY B

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_{gy}
		•	V_{gz}
		•	ΔV^*
X	X	X	C
X	X	X	FUEL*
X	X	X	OX*
X	X	X	UNBAL

166:30

M
S
F
NV49 MNVR TO OPTICS CALIBRATION ATTITUDE
(290,019,034) OMNI C

P23 CISLUNAR NAVIGATION

OPTICS CALIBRATION STAR N70 (00016)

POO

V49 MNVR TO SIGHTING ATTITUDE
(287,032,000) OMNI C

LUNAR HORIZON

P23 CISLUNAR NAVIGATION

3 MARKS ON EACH START

1. N70 (00016) (00000) (00220) 16 PROCYON (MFH)

1. N70 (00016) (00000) (00220) 16 PROCYON (MFH)

2. N70 (00000) (00000) (00220) 50 POLLUX (MFH)

N88 (-38513) (+79364) (+47097) 50 POLLUX (MFH)

3. N70 (00022) (00000) (00210) 22 REGULUS (MNH)

3. N70 (00022) (00000) (00210) 22 REGULUS (MNH)

167:00

*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

		V49 MNVR TO OPTICS CALIBRATION ATTITUDE (057,098,359) HGA P <u>-63</u> , Y <u>261</u> P23 CISLUNAR NAVIGATION OPTICS CALIBRATION STAR N70 (00035) POO	EARTH DISTANCE ≈175 091 NM
:10		V49 MNVR TO SIGHTING ATTITUDE (081,094,325) HGA P <u>-57</u> , Y <u>0</u> P23 CISLUNAR NAVIGATION 3 MARKS ON EACH STAR 1. N70 (00040) (00000) (00110)	EARTH HORIZON
:20		2. N70 (00000) (00000) (00120) N88 (+07234)(-86438)(-49761)	40 ALTAIR (ENH)
	M S F N	3. N70 (00033) (00000) (00120)	212 DELTA SAGITTARI (EFH)
167:30			33 ANTARES (EFH)
(11111) (X1111)		V48 (11111)(X1111) V49 MNVR TO O ₂ FLOW RATE TEST ATTITUDE (167:45) (345,130,344) HGA P <u>10</u> , Y <u>279</u>	
: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
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

		CREW EXERCISE PERIOD	
168:00 E (11111) X1111)	:10		
	:20	O_2 HEATER 3 (1) - AUTO REPRESS PKG VLV - OFF (VERIFY) CB O_2 ISOL/AUX BAT - CLOSE O_2 TANK 3 ISOL VLV - CLOSE (MOMENTARY) O_2 TANK 3 ISOL VLV TB-BP O_2 PRESS IND - SRG/3	
168:30 M S F N		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			

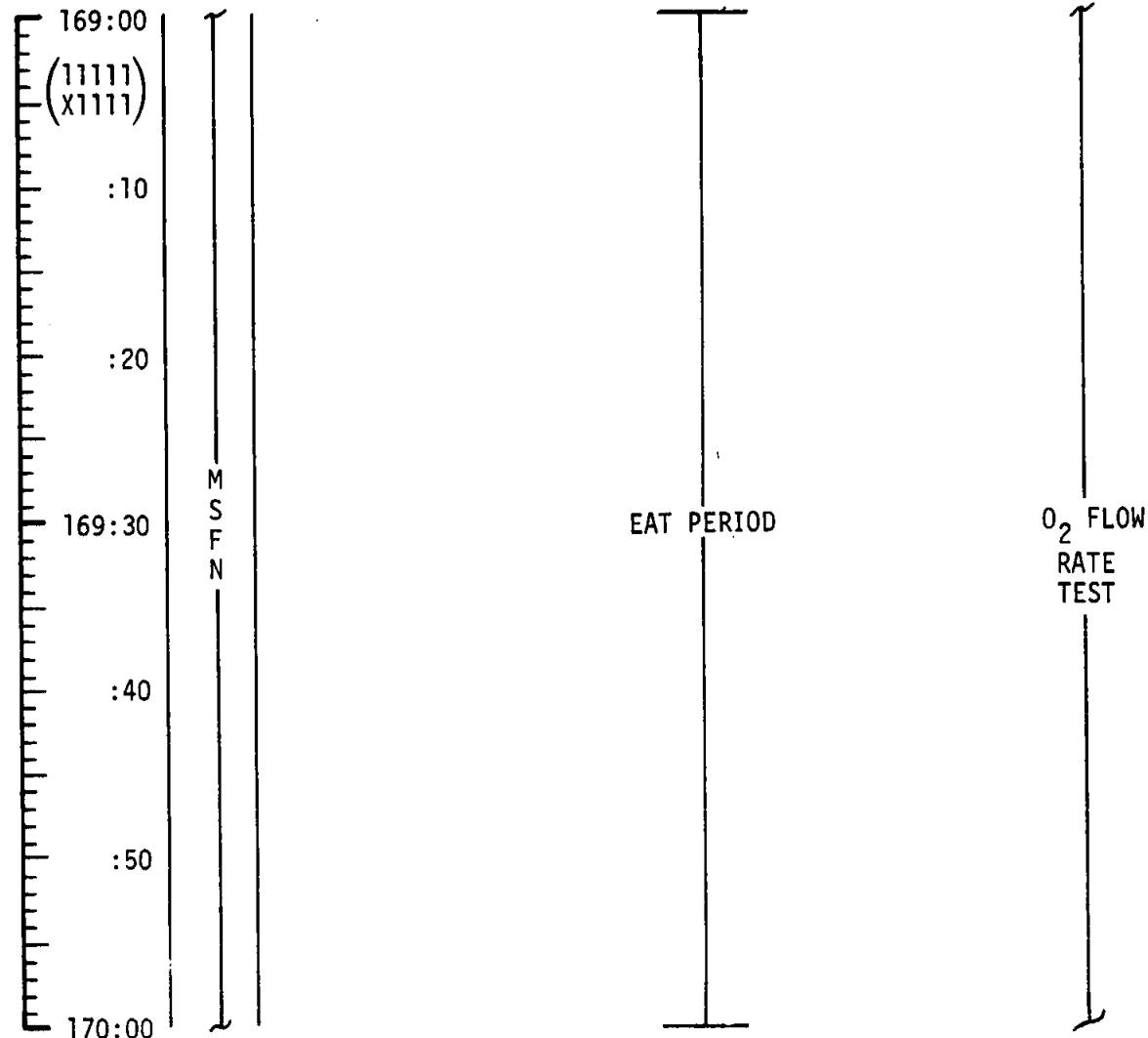
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE C (JAN)	JANUARY 18, 1971	168:00 - 169:00	7/TEC	3-245

MCC-H

1523 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	169:00 - 170:00	7/TEC	3-246

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

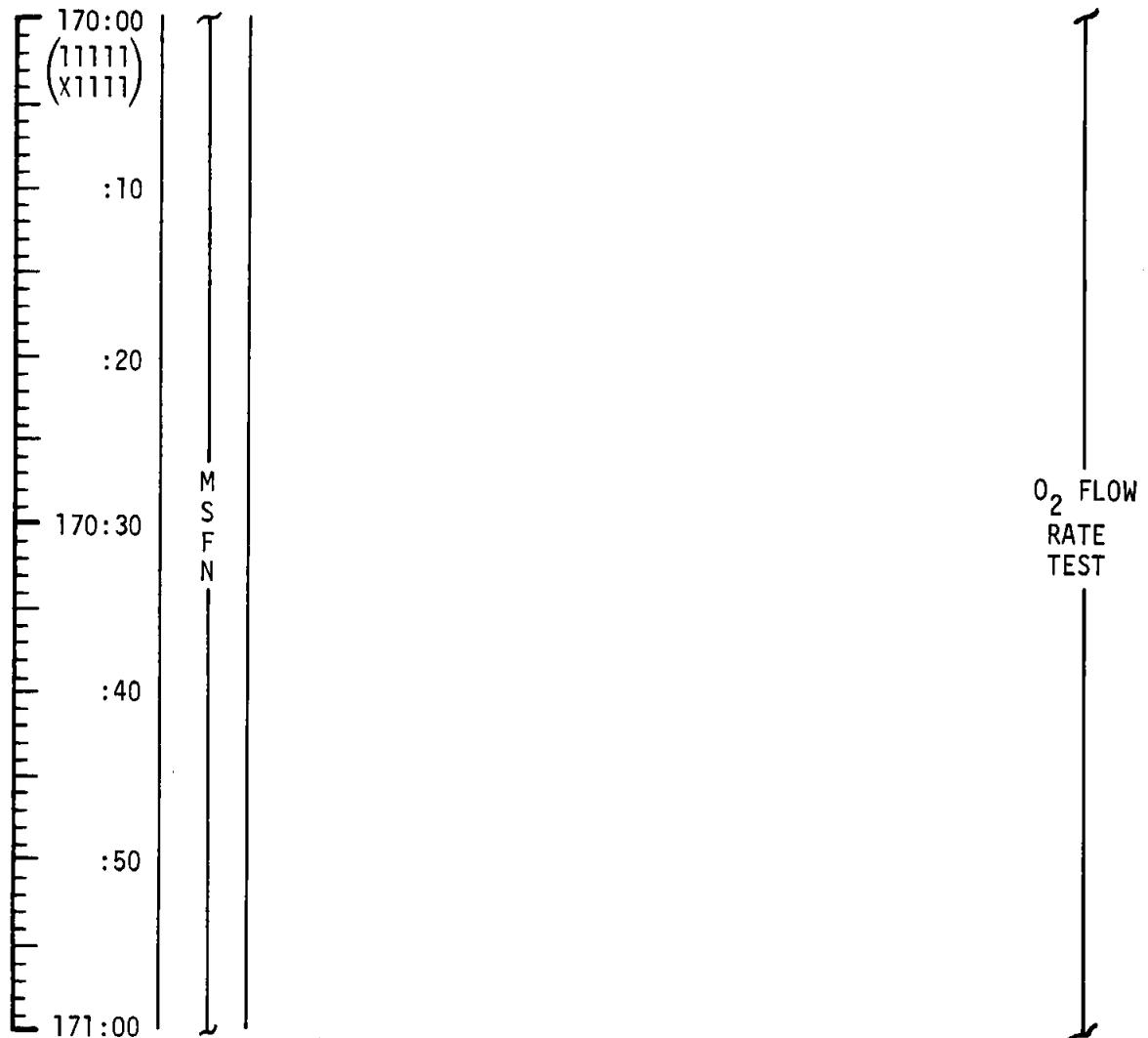
MCC-H

1623 CST

FLIGHT PLAN

NOTES

EARTH DISTANCE
≈ 168 662 NM



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

	E (11111) (X1111)	171:00	ON CUE FROM MCC-H, APPROXIMATELY 10 MINUTES PRIOR TO TEST COMPLETION, SURGE TANK O ₂ VLV - ON UTILITY PWR 2 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 <u>-29</u> , Y <u>116</u> O ₂ TANK 3 ISOL VLV - OPEN O ₂ TANK 3 ISOL VLV TB - GRAY CB O ₂ ISOL/AUX BAT - OPEN	T O ₂ FLOW RATE TEST
		:10		
	(11101) (X1111)	:20	M S F N	
		171:30		
		:40		WHEN SURGE TANK PRESSURE REACHES 865 PSIA, O ₂ HEATER 1 - OFF
		:50		
		172:00		

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE C (JAN)	JANUARY 18, 1971	171:00 - 172:00	7/TEC	3-248

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

MCC-H

1823 CST

FLIGHT PLAN

NOTES

E 172:00
 (11101)
 X1111

:10

:20

172:30

:40

:50

173:00

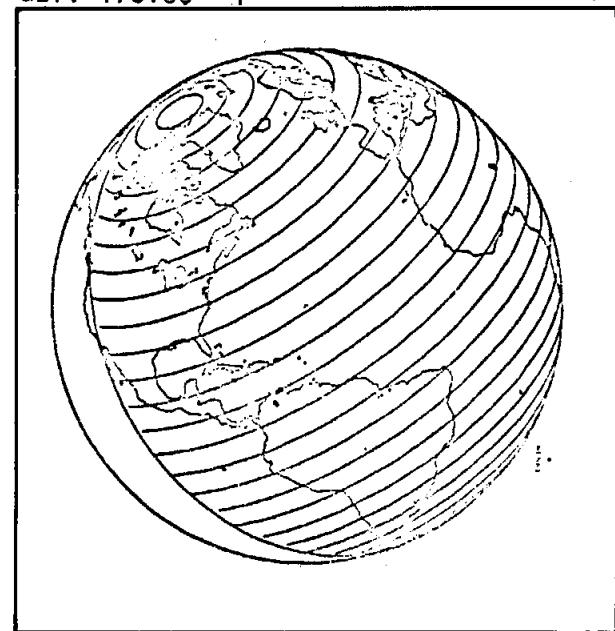
CSM SYSTEMS CHECKLIST
 CONTAMINATION CONTROL PAGE S 1-16

M
 S
 F
 T
 N
 V

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

MCC-H

FLIGHT PLAN

NOTES

1920·CST		V49 MNVR TO OPTICS CALIBRATION ATTITUDE (094,103,358) HGA P <u>-79</u> , Y <u>101</u> P23 CISLUNAR NAVIGATION OPTICS CALIBRATION STAR N70 (00040) POO	EARTH DISTANCE ≈ 162 018 NM
173:00 (11101) (X1111)	T	V49 MNVR TO SIGHTING ATTITUDE (082,098,325) HGA P <u>-57</u> , Y <u>0</u> P23 CISLUNAR NAVIGATION 3 MARKS ON EACH STAR 1. N70 (00040) (00000) (00110)	EARTH HORIZON
:10			40 ALTAIR (ENH)
:20		2. N70 (00000) (00000) (00120) N88 (+07234) (-86438) (-49761)	212 DELTA SAGITTARI (EFH)
173:30	M S F N	3. N70 (00033) (00000) (00120)	33 ANTARES (EFH)
:40		*4. N70 (00035) (00000) (00120)	35 RASALHAGUE (EFH)
:50		*5. N70 (00000) (00000) (00120) N88 (-07804) (-99375) (+07982)	211 BETA OPHIUCHI (EFH)
174:00		*6. N70 (00042) (00000) (00110)	42 PEACOCK (ENH)
		LIOH CANISTER CHANGE (14 INTO B, STOW 12 IN A3)	*OPTIONAL TEST STARS, DO NOT UPDATE S.V.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	173:00 - 174:00	7/TEC	3-250

MCC-H

2023 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

174:00

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N)
V49 MNVR TO PTC ATTITUDE
(N20,270,000)
V79 (-0.3750)
(+030.00)
(+00000)

PAGE G 8-2

DAP LOAD STATUS
(11101)(X1111)

:10

REESTABLISH HGA REACQ MODE

:20

M
S
F
N

174:30

PTC

:40

:50

175:00

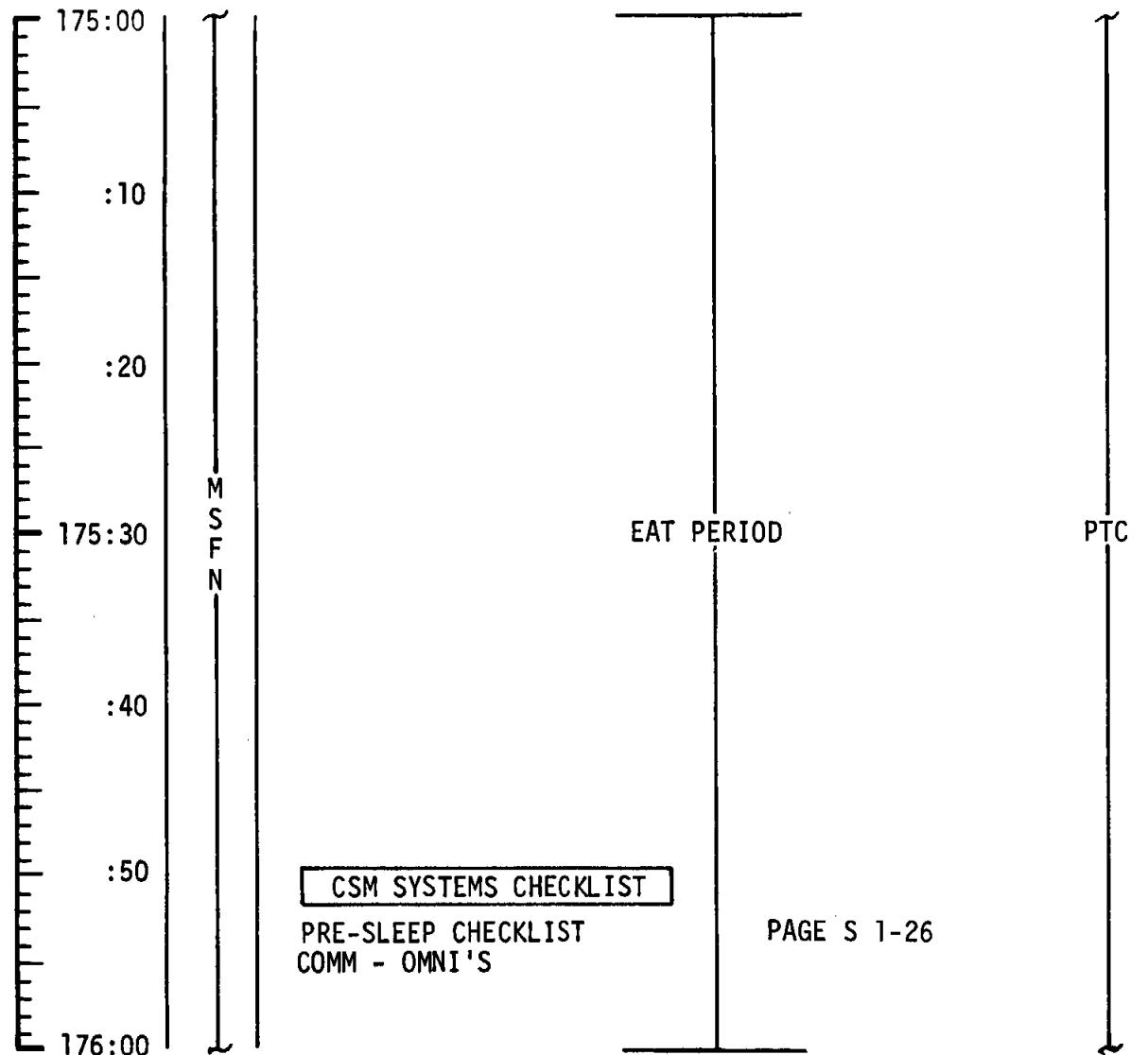
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	174:00 - 175:00	7/TEC	3-251

MCC-H

2123 CST

FLIGHT PLAN

NOTES



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

MSC Form 29 (May 89)

FLIGHT PLANNING BRANCH

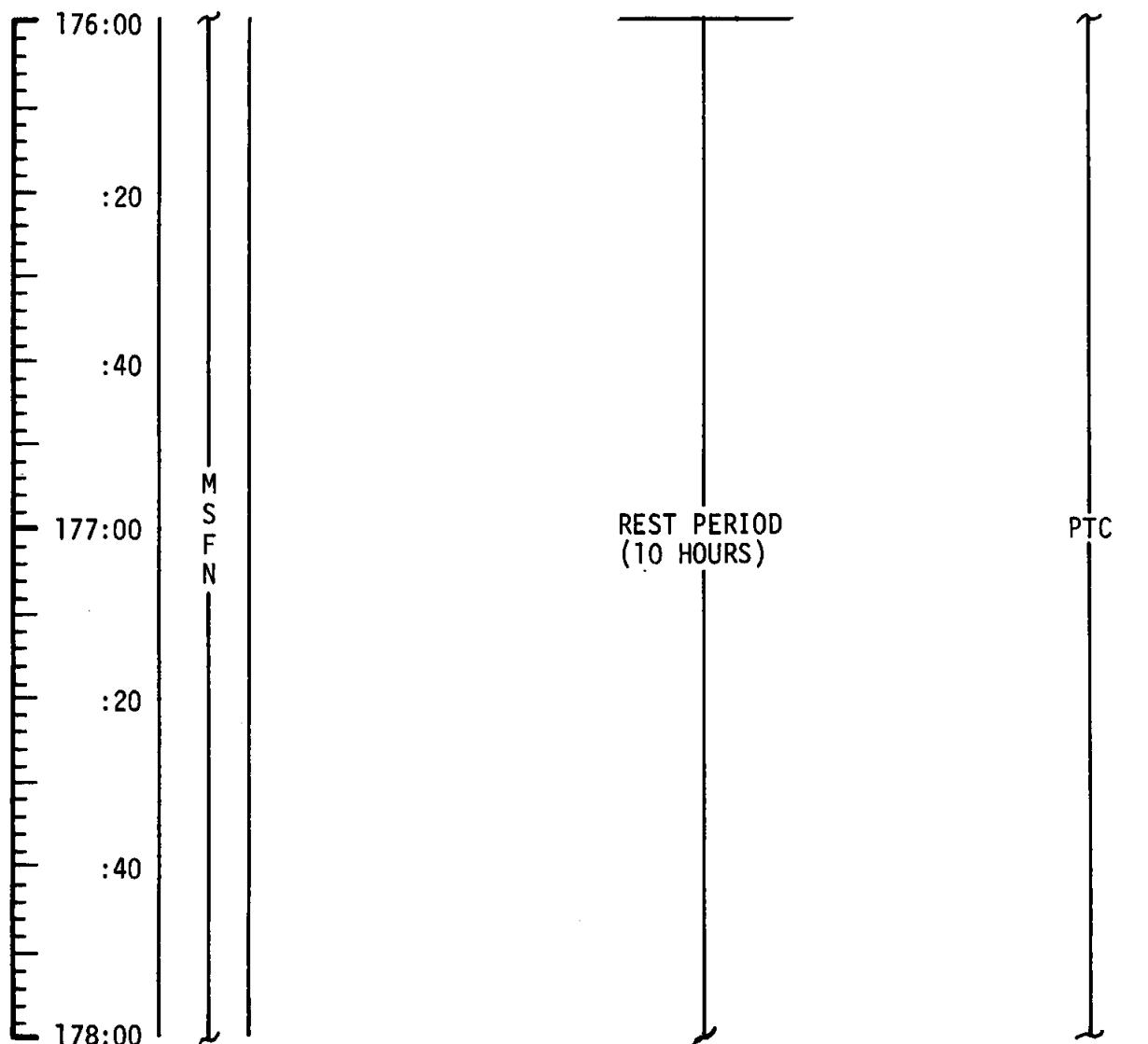
NASA — MSC

MCC-H

2223 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)

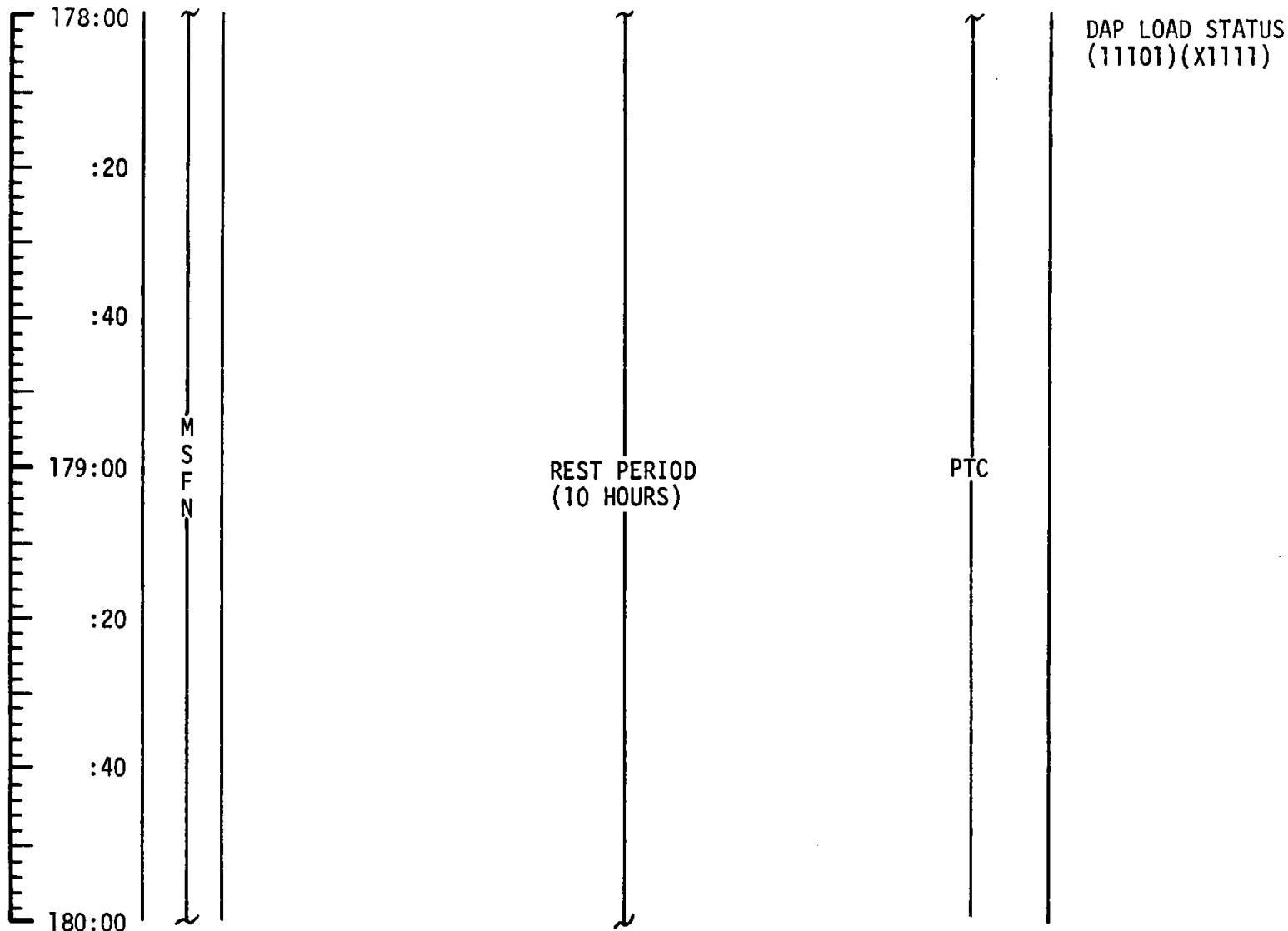
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	176:00 - 178:00	7/TEC	3-253

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

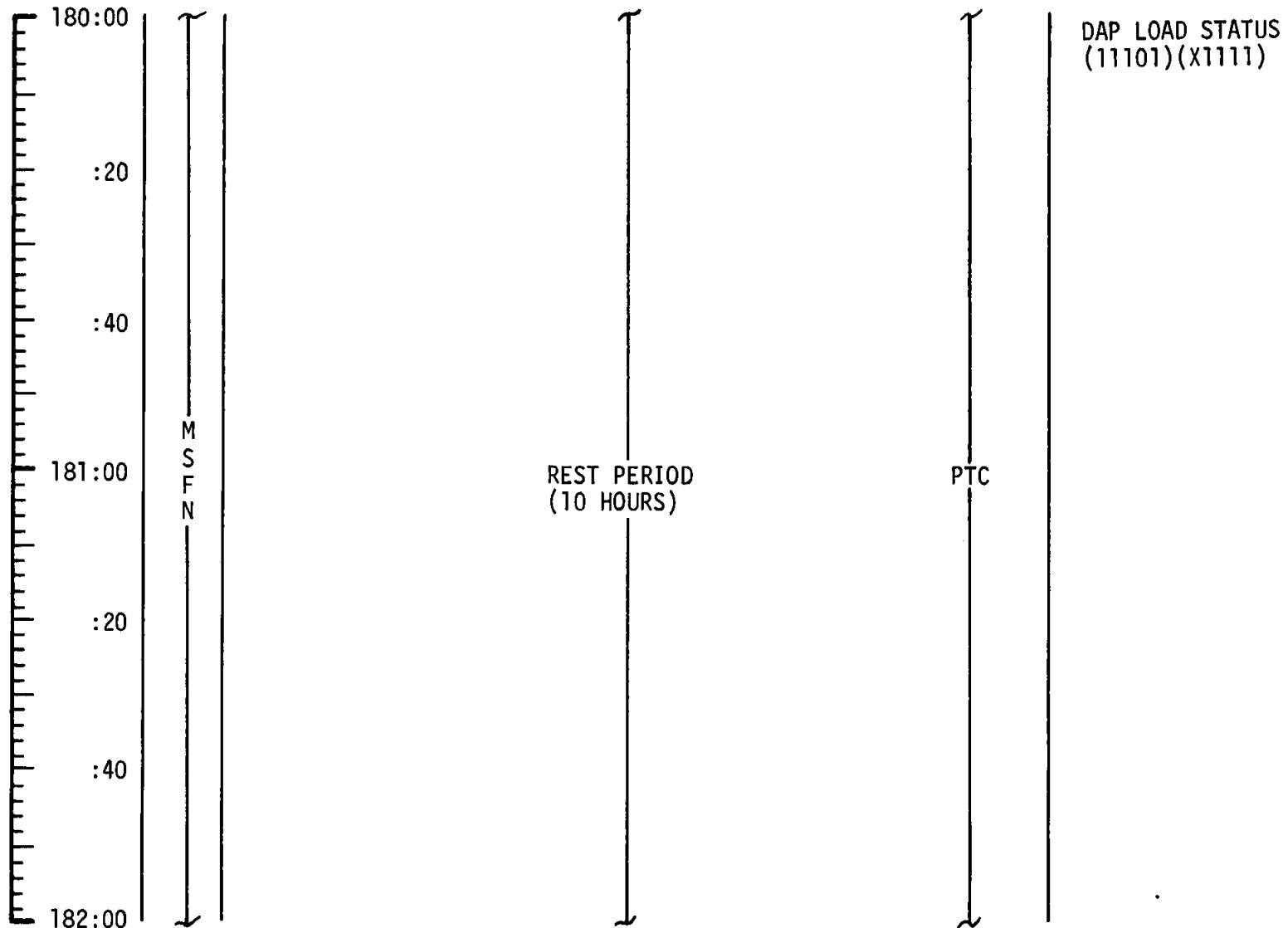
NASA — MSC

MCC-H

0223 CST

FLIGHT PLAN

NOTES



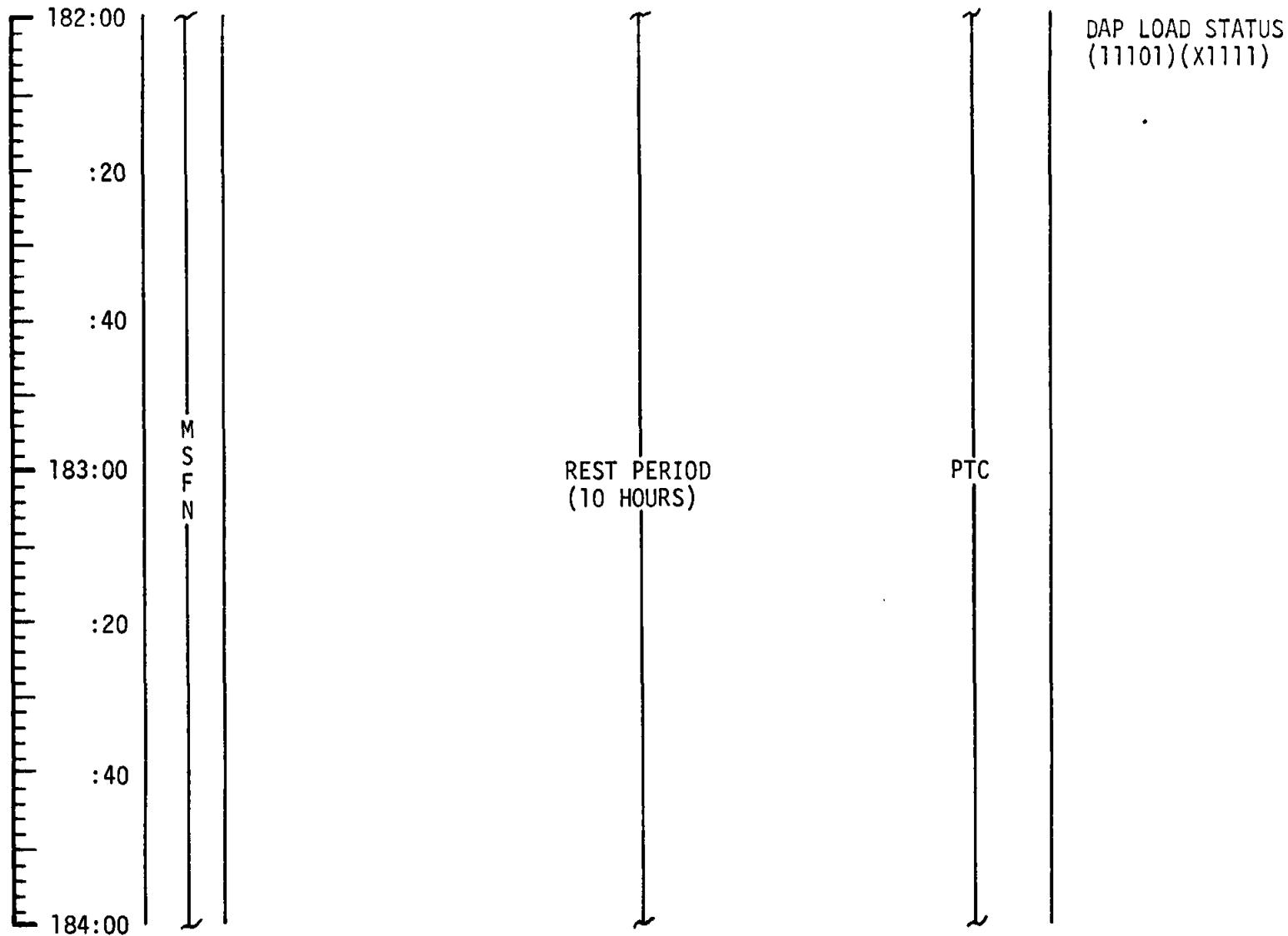
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	180:00 - 182:00	7/TEC	3-255

MCC-H

0423 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	182:00 - 184:00	7/TEC	3-256

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

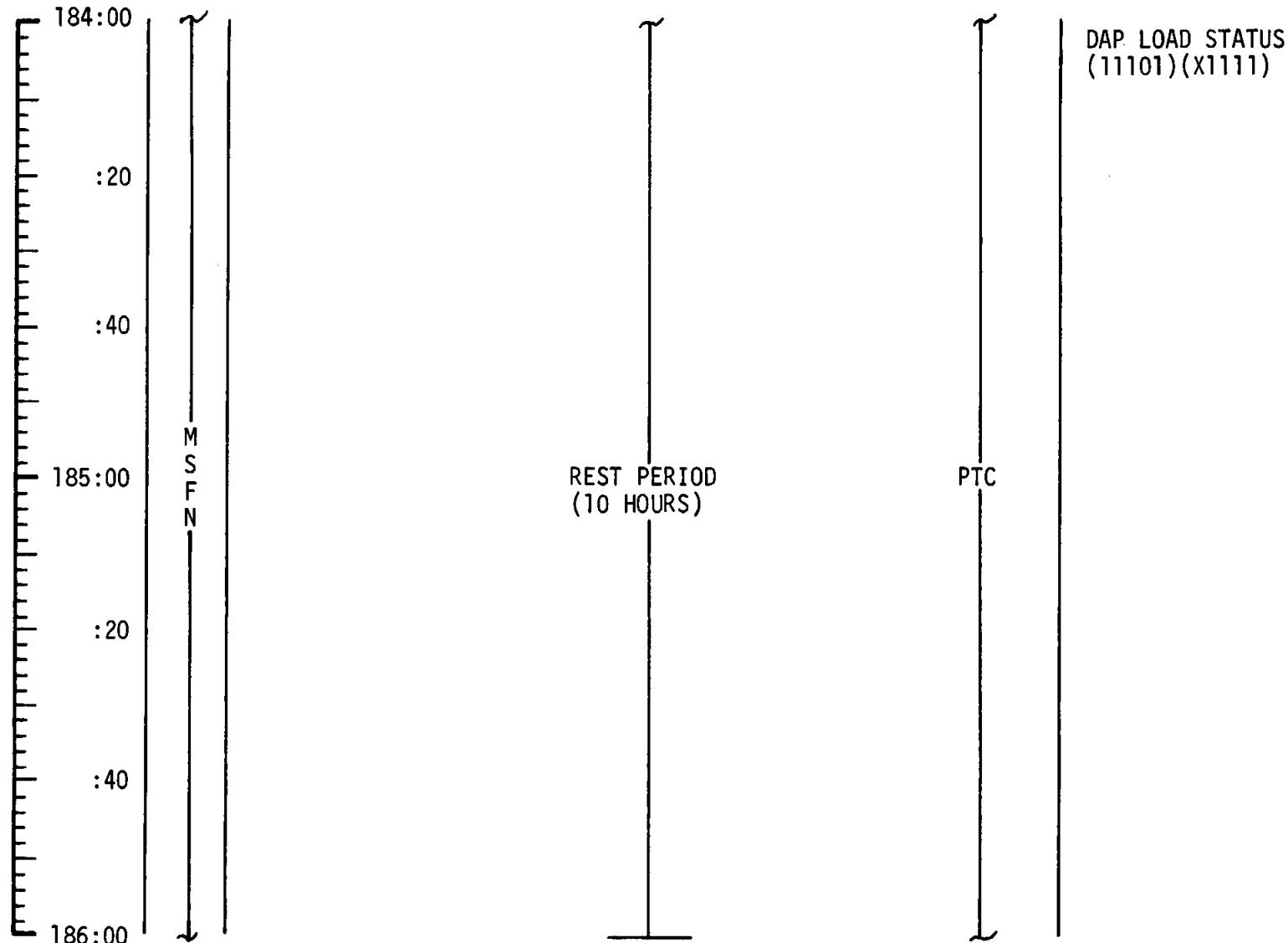
NASA — MSC

MCC-H

0623 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	184:00 - 186:00	7/TEC	3-257

MCC-H

0823 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
CONSUMABLES
FLIGHT PLAN

186:00

CSM SYSTEMS CHECKLIST
POST-SLEEP CHECKLIST PAGE S 1-26
COMM - HGA REACQ MODE

:10

:20

186:30

M
S
F
N

CHARGE BATTERY A

EAT PERIOD

:40

:50

187:00

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)REPORT: GYRO TORQUING ANGLESDAP 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 _____

PTC

EARTH DISTANCE
 $\approx 127\ 376$ 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

0923 CST

FLIGHT PLAN

NOTES

187:00

LiOH CANISTER CHANGE
(15 INTO A, STOW 13 IN A4)

CSM ENTRY CHECKLIST

EMS ENTRY CHECK

PAGE E 1-4

:10

GET: 188:00

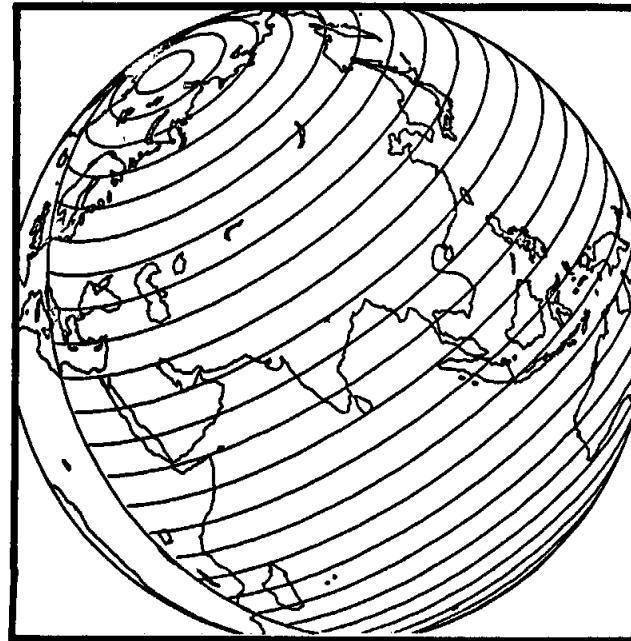
F.O.V. 3°

:20

M S F N

187:30

:40



:50

188:00

PTC

DAP LOAD STATUS
(11101)(X1111)

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	187:00 - 188:00	8/TEC	3-259

1023 CST

FLIGHT PLAN

NOTES

DAP LOAD STATUS
(11101)(X1111)

188:00 :10
 (11101)
 :20
 188:30 :40 :50 189:00

M
S
F
N

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)

PTC

EARTH DISTANCE
 $\approx 121\ 814\ \text{MIN}$

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

MCC-H

1123 CST

FLIGHT PLAN

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

189:00
 (11101)
 (X1111)

:10

:20

189:30

:40

:50

190:00

M
S
F
N

CSM G&C CHECKLIST
 PASSIVE THERMAL CONTROL (G&N)
 V49 MNVR TO PTC ATTITUDE
 (N20, 270, 000)
 V79 (-0.3750)
 (+030.00)
 (+00000)
 REESTABLISH HGA REACQ MODE

PAGE G 8-2

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)

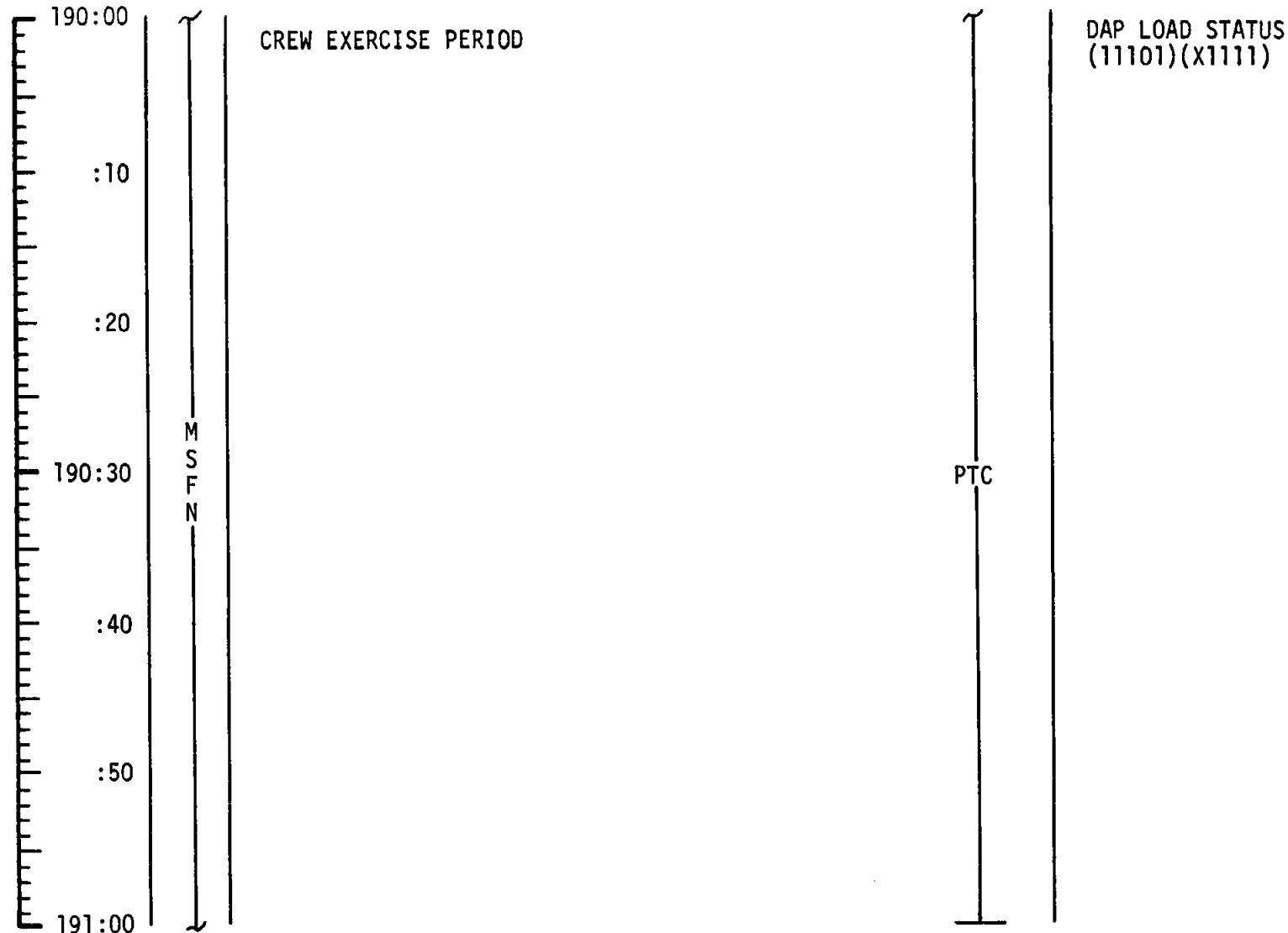
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	189:00 - 190:00	8/TEC	3-261

MCC-H

1223 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	190:00 - 191:00	8/TEC	3-262

MSC Form 28 (May 68)

FLIGHT PLANNING BRANCH

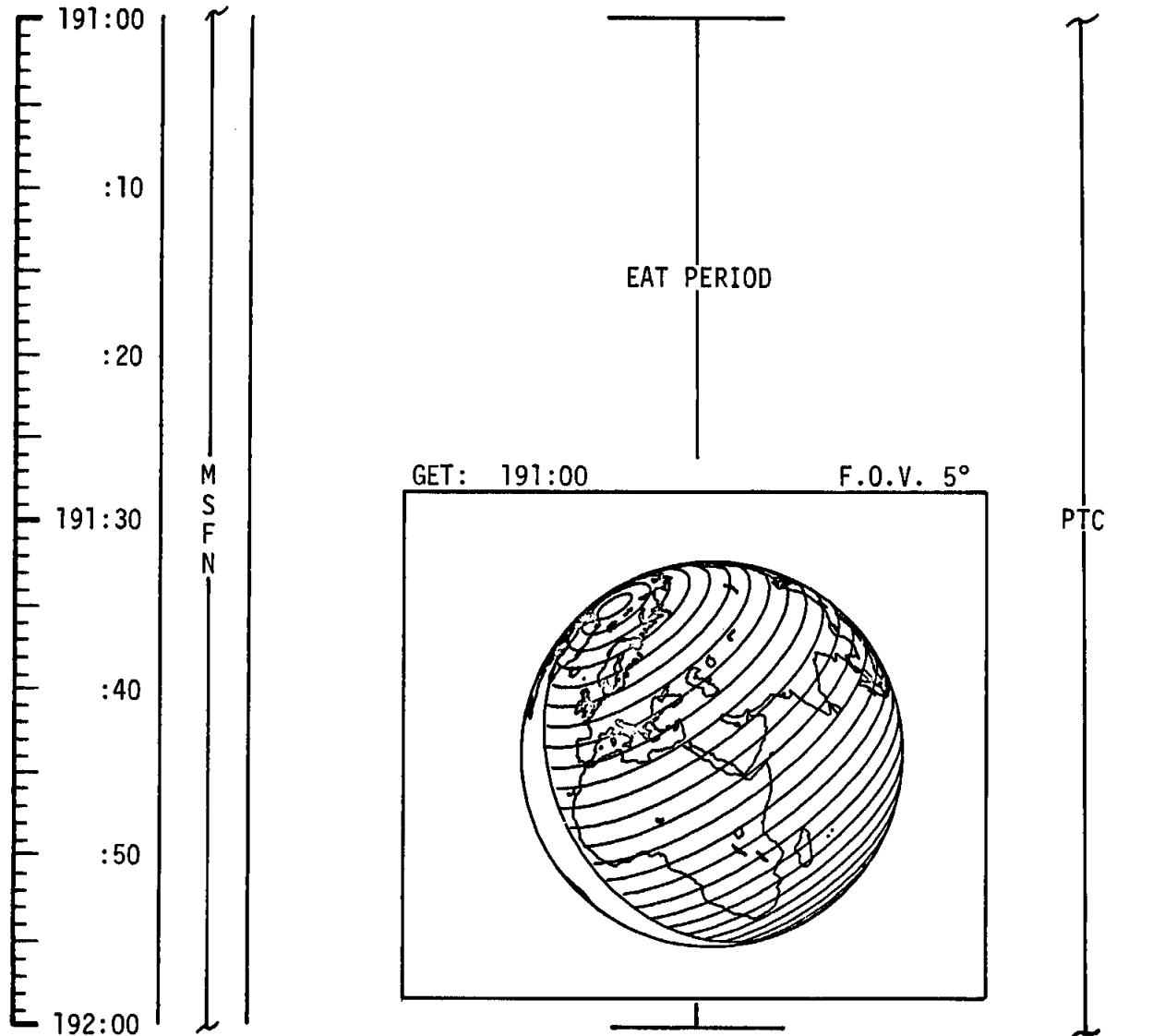
NASA — MSC

MCC-H

1323 CST

FLIGHT PLAN

NOTES

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

192:00 :10
 P52 IMU REALIGN
 OPTION 3 REFSMMAT
 (PTC ORIENT)

:20 REPORT: GYRO TORQUING ANGLES

(11101)
 (X1111)
 192:30 M S F N 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)
 POO

:40 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)

:50 2. N70 (00033) (00000) (00120)

3. N70 (00000) (00000) (00110)
 N88 (+59879) (-32372) (-73257)

193:00

NOTES
 DAP LOAD STATUS
 (11101)(X1111)

PTC

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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

MCC-H

1523 CST

FLIGHT PLAN

NOTES

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

UPDATE TO CSM
 QUADS TO ENABLE
 FOR PTC SPINUP

			H ₂ PURGE LINE HEATER-ON } IF MCC-6 NOT REQUIRED	
	193:00 E (11101) (X1111)	:10		
		:20	H ₂ & O ₂ FUEL CELL PURGE WASTE WATER DUMP H ₂ PURGE LINE HEATER - OFF } IF MCC-6 NOT REQUIRED	
	193:30 M S F N			
		:40	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
		:50		
	194:00 E			

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

FLIGHT PLAN

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
3-266

MCC-H

1623 CST

FLIGHT PLAN

NOTES

EI - 22 HR

UPLINK TO CSM
 CSM S.V. (CMC) V47E
 CSM S.V. (MSFN)
 (NO V47)

194:00
 (11101)
 (X1111)

SXT STAR CHECK
 P40 SPS THRUSTING OR
 P41 RCS THRUSTING

:10

H₂ & O₂ FUEL CELL PURGE
 WASTE WATER DUMP
 H₂ PURGE LINE HEATERS-OFF

} IF NOT PERFORMED
 AT 193:20

PTC

DAP LOAD STATUS
 (11101)(X1111)M
S
F
N

MCC-6

BURN STATUS REPORT

:20

194:30

:40

:50

195:00

TIG: 194:26:59
 BT: NOM ZERO
 ΔVT: NOM ZERO
 ULLAGE: N/A
 ORBIT: N/A

BURN STATUS REPORT			
X	X	□	●
X	X	□	●
□	□	□	●
X	X	X	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

MCC-H

1723 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

195:00

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N)
 V49 MNVR TO PTC ATTITUDE
 (N20,270,000)
 V79 (-0.3750)
 (+030.00)
 (+00000)
 REESTABLISH HGA REACQ MODE

PAGE G 8-2

:10

:20

M
S
F
N

195:30

CSM SYSTEMS CHECKLIST

CONTAMINATION CONTROL

PAGE S 1-16

:40

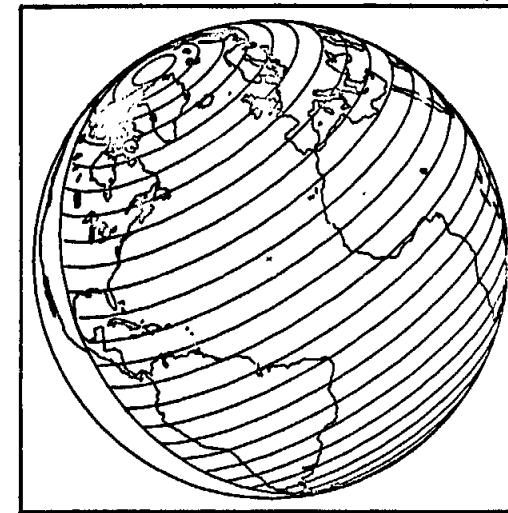
:50

196:00

T
—
—DAP LOAD STATUS
 (11101) (X1111)

GET: 196:00

F.O.V. 5°

PTC
—
—

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	195:00 - 196:00	8/TEC	3-268

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

NASA — MSC

MCC-N

1823 CST

FLIGHT PLAN

NOTES

		P52 IMU REALIGN OPTION 3 REFSMMAT (PTC ORIENT)	DAP LOAD STATUS (11101) (X1111)
	:10	REPORT: GYRO TORQUING ANGLES REPORT: CM RCS INJECTOR VALVE TEMPS (SYS TEST METER 5C, 5D, 6A, 6B, 6C, 6D)	CM RCS INJECTOR TEMP 5C _____ 5D _____ 6A _____ 6B _____ 6C _____ 6D _____
:20	(11101) X1111	EXIT G&N PTC	PAGE G 8-3
196:30	M S F N	V49 MNVR TO OPTICS CALIBRATION ATTITUDE (086,062,012) HGA P <u>-72</u> , Y <u>191</u> P23 CISLUNAR NAVIGATION OPTICS CALIBRATION STAR N70 (00035) POO V49 MNVR TO SIGHTING ATTITUDE (090,062,329) HGA P <u>-57</u> , Y <u>3</u> 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)	EARTH DISTANCE ≈ 97 415 NM EARTH HORIZON P52 IMU REALIGN N71: _____, _____ N05: _____, _____ N93: X _____. Y _____. Z _____. GET _____: _____:
:40			37 NUNKI (EFH)
:50			33 ANTARES (EFH)
197:00			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/VHBT, (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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	197:20 - 198:00	8/TEC	3-270

MCC-H

1923 CST

FLIGHT PLAN

NOTES

E 197:00
 (11101)
 X1111

:10

- *4. N70 (00040) (00000) (00110)
- *5. N70 (00000) (00000) (00120)
 N88 (-07804) (-99375) (+07982)
- *6. N70 (00000) (00000) (00120)
 N88 (+22712) (-83641) (-49884)

:20

197:30

:40

:50

198:00

M
S
F
NEARTH DARKSIDE
DIM LIGHT PHOTOGRAPHY

40 ALTAIR (ENH)

211 BETA
OPHIUCHI (EFH)214 ZETA
SAGITTARII (EFH)*OPTIONAL TEST
STARS, DO NOT
UPDATE S.V.

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	197:00 - 198:00	8/TEC	3-271

MCC-H

2023 CST

FLIGHT PLAN

NOTES

198:00
(11101)
(X1111)

CSM G&C CHECKLIST

BACKUP GDC AND/OR IMU ALIGNMENT
V06 N20 (DO NOT ENTER)

PAGE G 7-3

ONLY THE GDC
ALIGN WILL BE
PERFORMED

:10

:20

198:30

:40

:50

199:00

M
S
F
NAT RELEASE OF GDC ALIGN PB, KEY ENTER,
RECORD ANGLES AND REPORT TO MCC-HCRESCENT ALIGN
V06 N20 (DO NOT ENTER)

PAGE G 7-11

AT RELEASE OF GDC ALIGN PB, KEY ENTER,
RECORD ANGLES AND REPORT TO MCC-H

CSM G&C CHECKLIST

PASSIVE THERMAL CONTROL (G&N)
V49 MNVR TO PTC ATTITUDE
(N20, 270, 000)
V79 (-0.3750)
(+030.00)
(+00000)

PAGE G 8-2

PTC

REESTABLISH HGA REACQ MODE

DAP LOAD STATUS
(11101)(X1111)UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	198:00 - 199:00	8/TEC	3-272

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

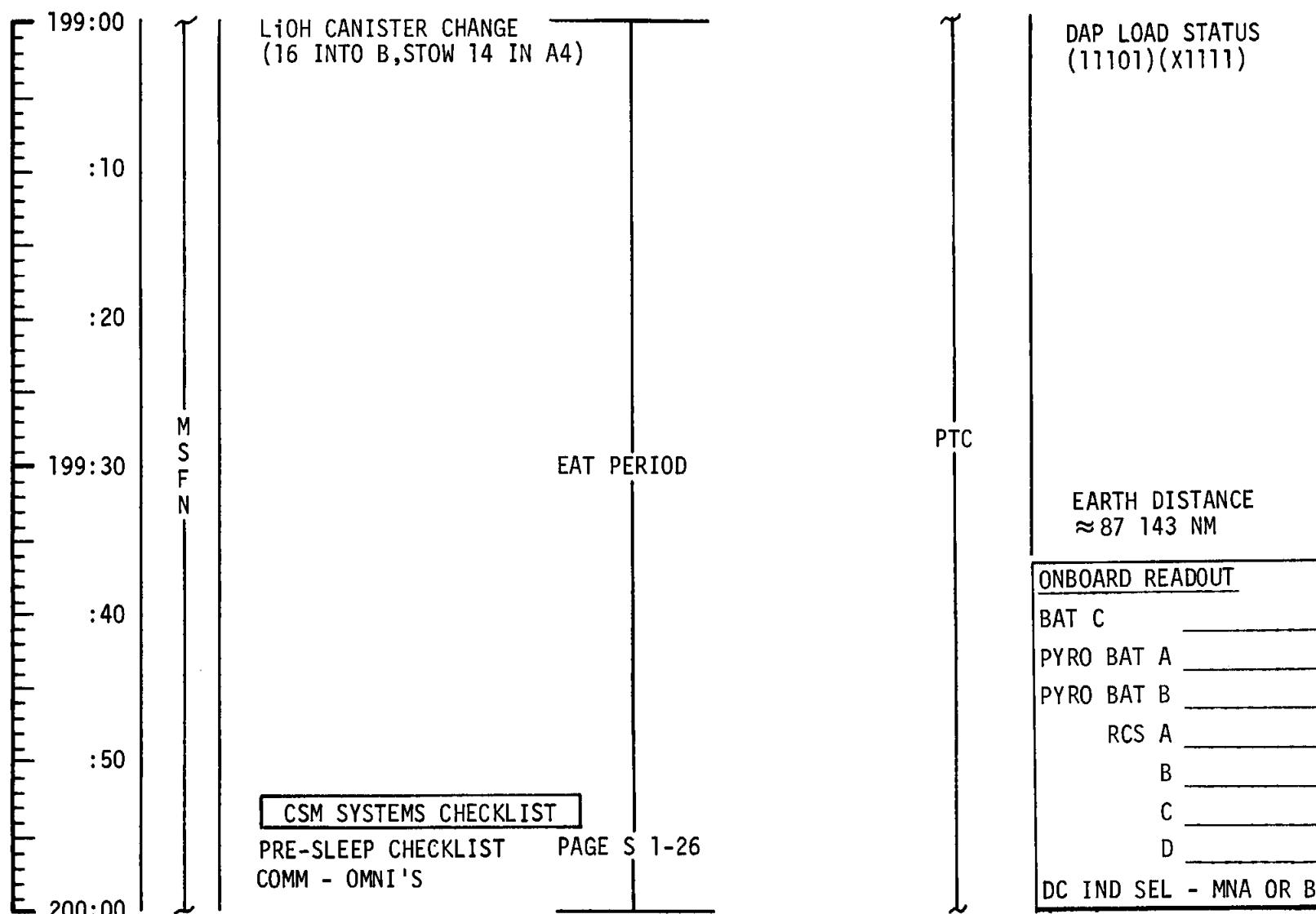
NASA — MSC

MCC-H

2123 CST

FLIGHT PLAN

NOTES



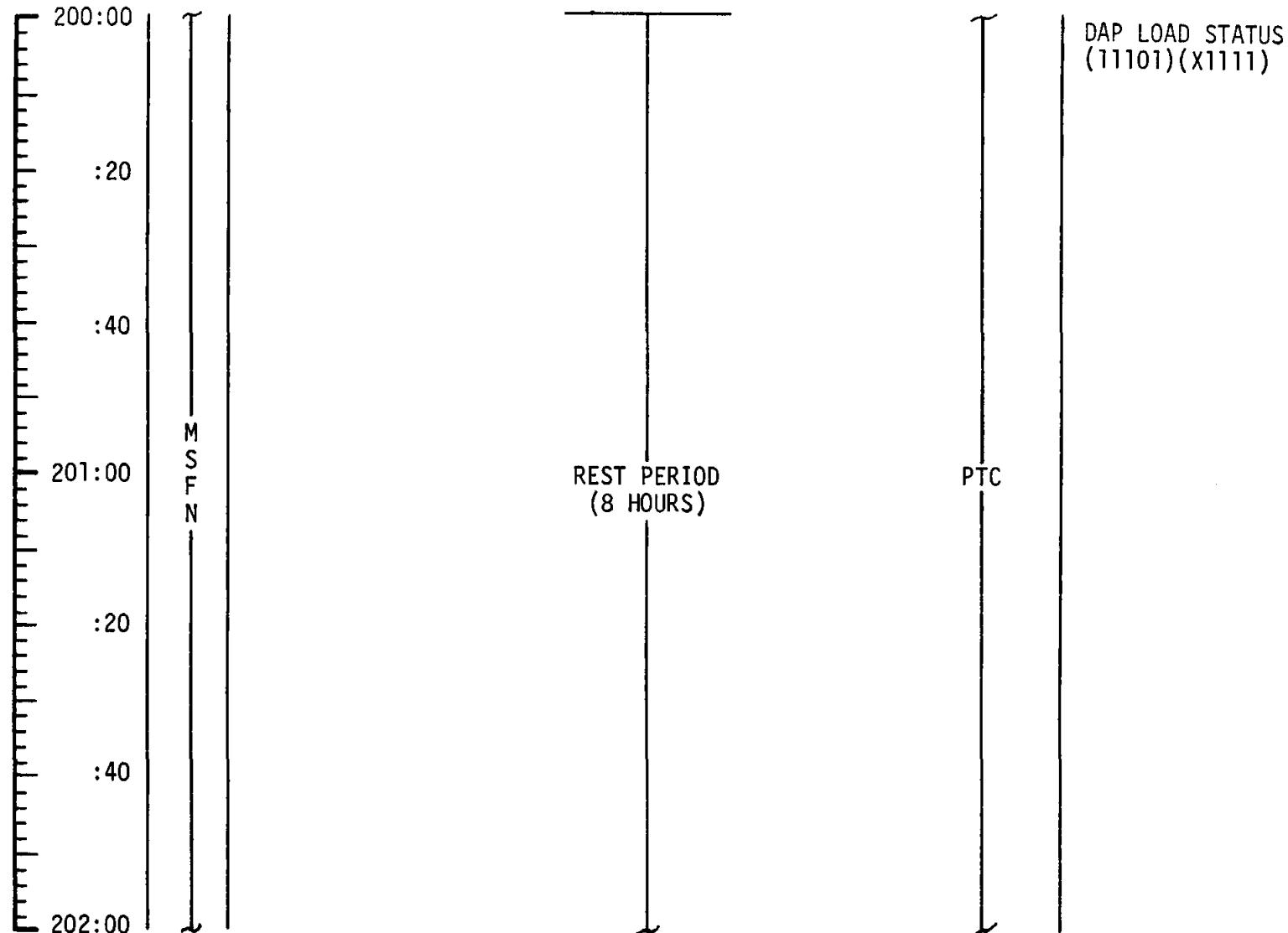
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	199:00 - 200:00	8/TEC	3-273

MCC-H

2223 CST

FLIGHT PLAN

NOTES



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	200:00 - 202:00	8/TEC	3-274

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

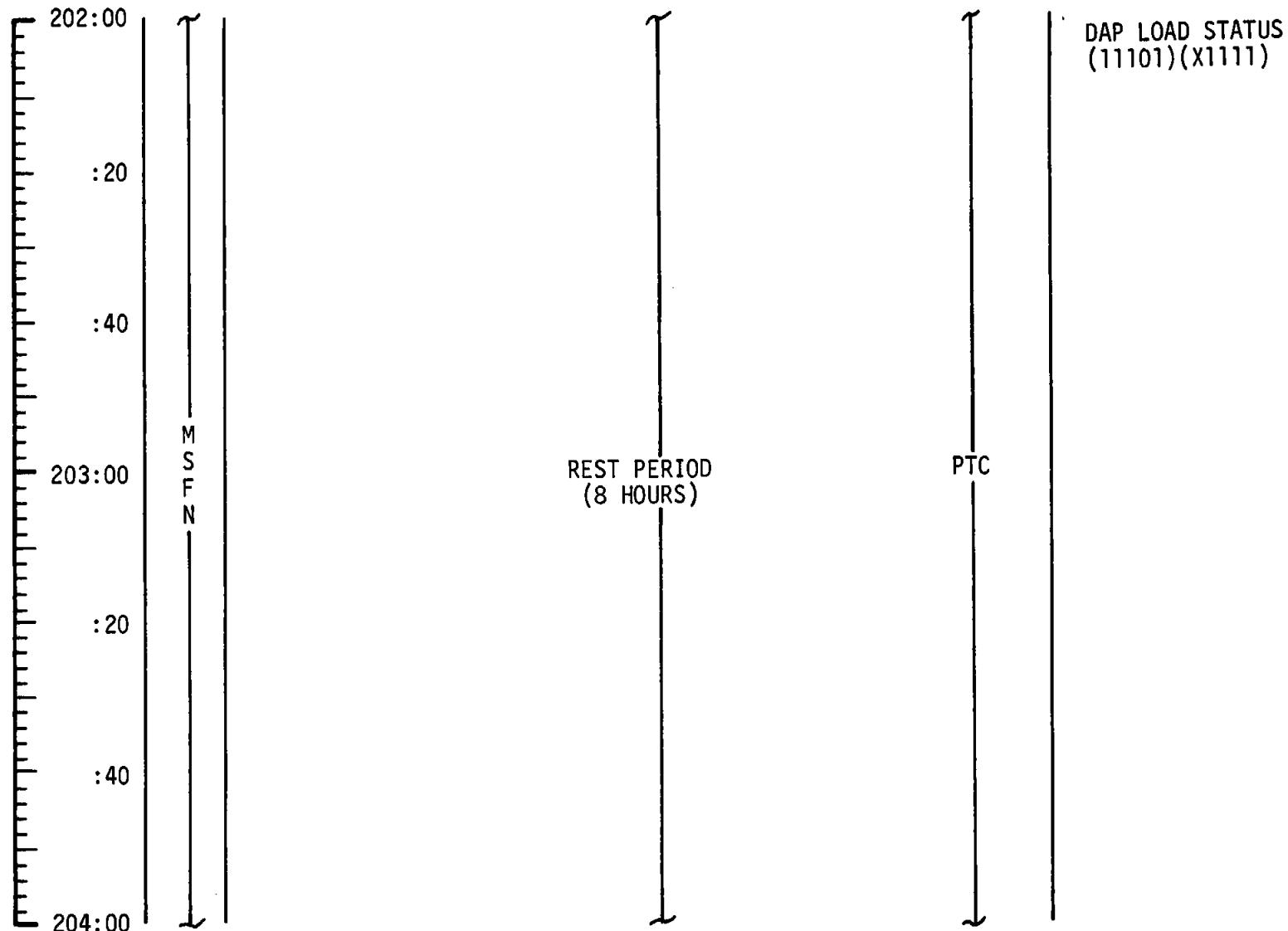
NASA — MSC

MCC-H

0023 CST

FLIGHT PLAN

NOTES



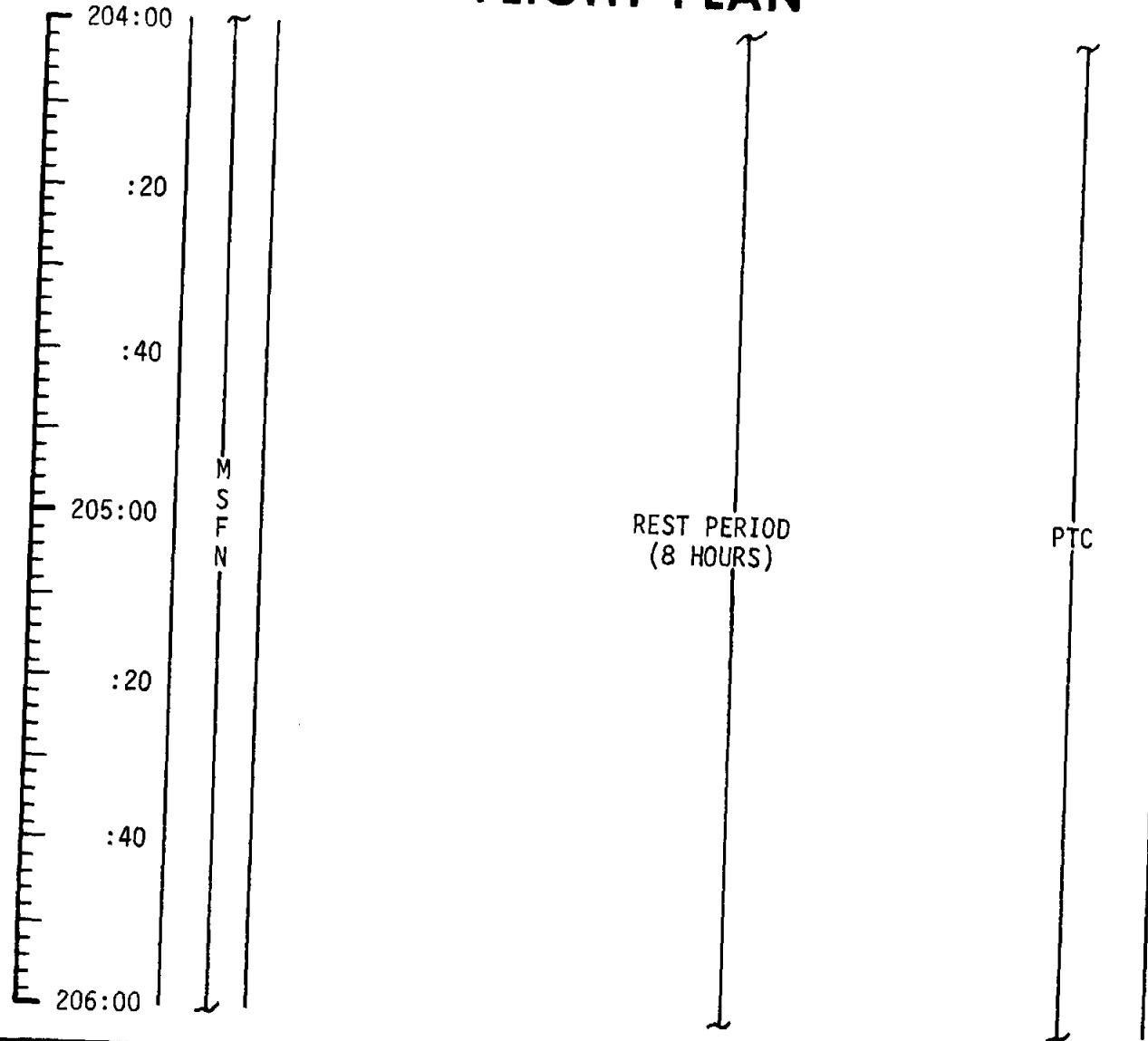
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	202:00 - 204:00	8/TEC	3-275

MCC-H

0223 CST

FLIGHT PLAN

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

MSC Form 28 (May 68)

FLIGHT PLANNING BRANCH

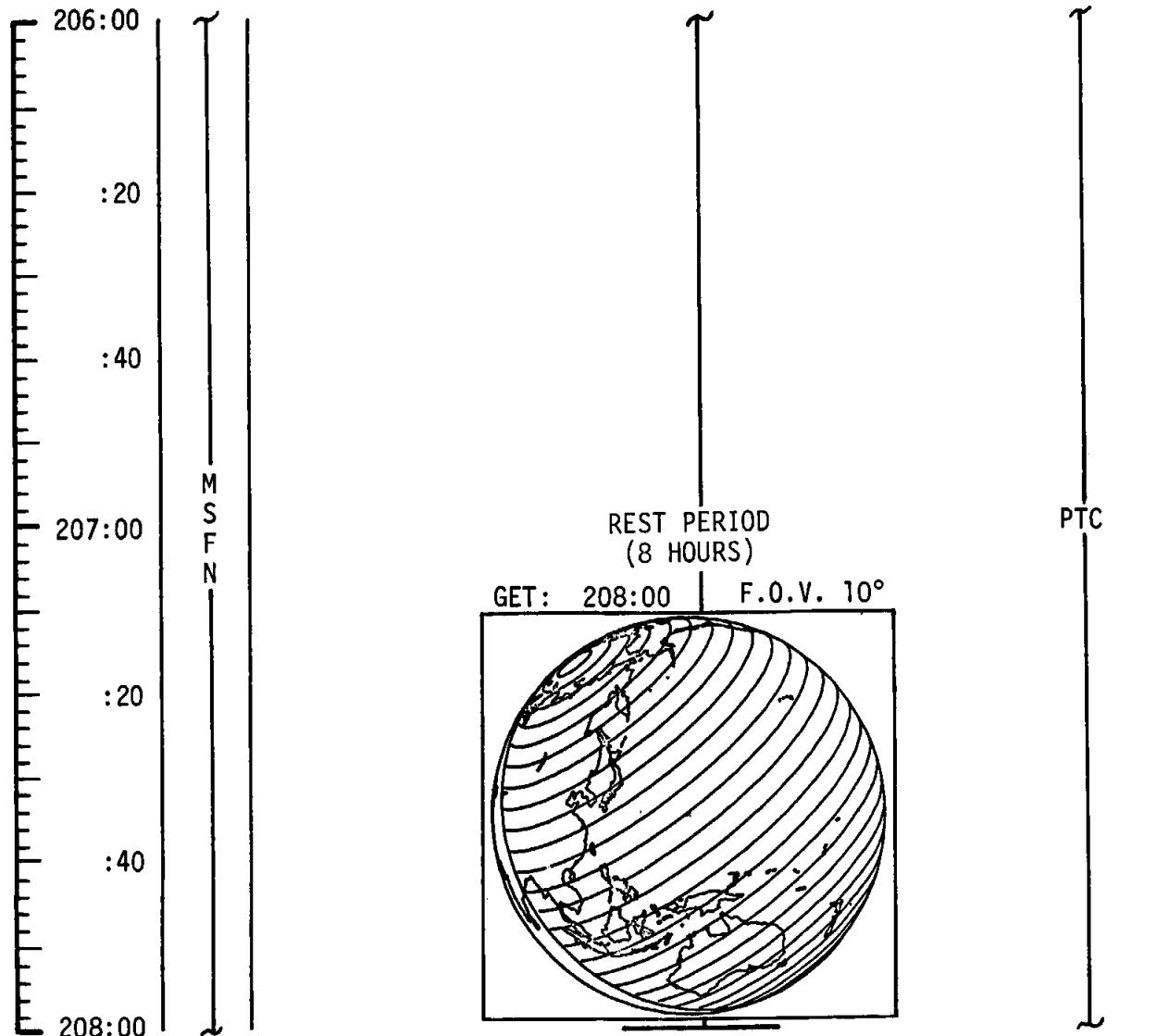
NASA — MSC

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	206:00 - 208:00	8/TEC	3-277

MCC-H

1223 CST

FLIGHT PLAN

NOTES

UPDATE TO CSM
FLIGHT PLAN
CONSUMABLES

208:00

CSM SYSTEMS CHECKLIST
POST-SLEEP CHECKLIST PAGE S 1-26

:10

P52 IMU REALIGN
OPTION 3 REFSMMAT
(PTC ORIENT)

:20

(11101)
(X1111)

REPORT: GYRO TORQUING ANGLES

EXIT G&N PTC PAGE G 8-3

208:30

M
S
F
N

V49 MNVR TO OPTICS CALIBRATION ATTITUDE
(099,252,003) HGA P 73, Y 10
P23 CISLUNAR NAVIGATION
OPTICS CALIBRATION STAR N70 (00042)

POO

EARTH HORIZON

:40

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) SAGITTARI (EFH)
3. N70 (00000) (00000) (00120) 213 LAMBDA
N88 (+10293) (-89715) (-42956) SAGITTARI (EFH)
4. N70 (00045) (00000) (00110) 45 FOMALHAUT (ENH)

209:00

PTC

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

MSC Form 28 (May 69)

FLIGHT PLANNING BRANCH

MCC-H

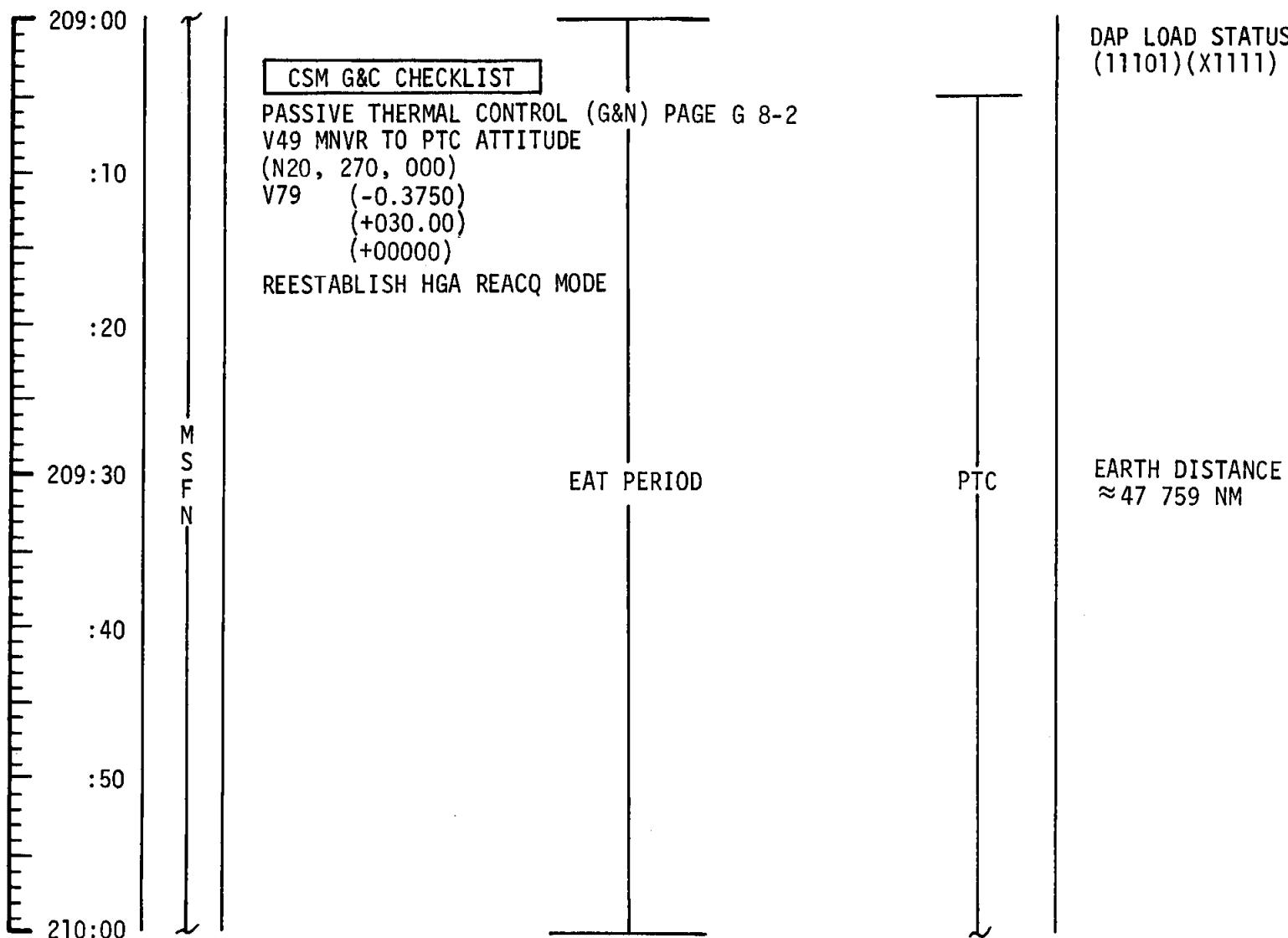
0723 CST

FLIGHT PLAN

UPDATE TO CSM
QUADS TO ENABLE
FOR PTC SPINUP

NOTES

DAP LOAD STATUS
(11101)(X1111)



MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	209:00 - 210:00	9/TEC	3-279

MCC-H

0823 CST

FLIGHT PLAN

NOTES

GO/NO-GO FOR MCC-7
EI - 6 HR

210:00 :10 :20 210:30 :40 :50 211:00

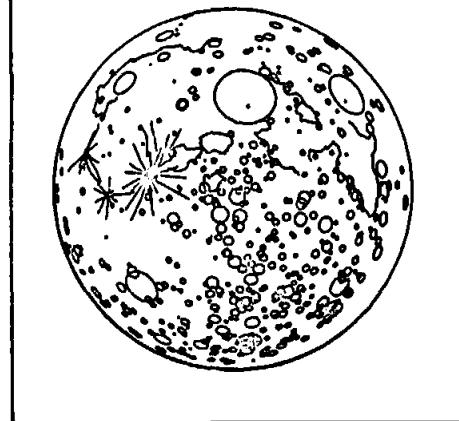
M
S
F
N

LiOH CANISTER CHANGE
(17 INTO A, STOW 15 IN A4)

ENTRY CHECKLIST

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

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

MCC-H

1023 CST

FLIGHT PLAN

NOTES

212:00
 (11101)
 (X1111)

P52 IMU REALIGN
 OPTION 3 REFSMMAT
 (PTC ORIENT)

STARS ___,
 SA ___,
 TA ___,

:10

REPORT: GYRO TORQUING ANGLES

P52 IMU REALIGN

:20

P52 IMU REALIGN
 OPTION 1 PREFERRED
 (ENTRY ORIENT)

N71: ___, ___

SC CONT - CMC
 BMAG (3) - RATE 2

N05: ___ - ___

N93:

X ___ . ___ - ___

Y ___ . ___ - ___

Z ___ . ___ - ___

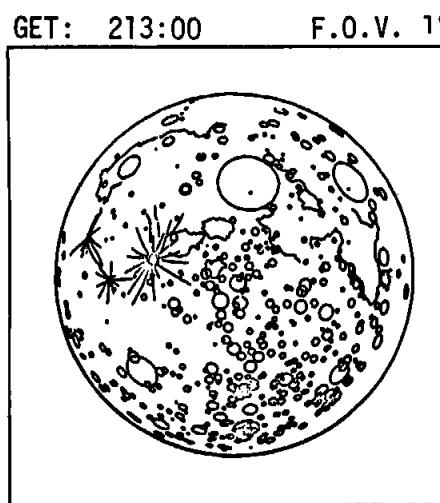
GET ___ : ___ :

EI - 4 HR

212:30

M S F N

:40



:50

P30 EXTERNAL ΔV

213:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	CHANGE A (JAN)	DECEMBER 23, 1970	212:00 - 213:00	9/TEC	3-282

MSC Form 29 (May 68)

FLIGHT PLANNING BRANCH

NASA — MSC

MCC-H

0923 CST

211:00

FLIGHT PLAN**NOTES**DAP LOAD STATUS
(11101)(X1111)

EI - 5 HR

- 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)
POO
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)

LUNAR HORIZON

22 REGULUS (MFH)

64 ALHENA (MNH)

23 DENEBO LA (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

211:00
 :10
 (11101)
 (X1111)
 :20
 211:30
 M S F N
 :40
 :50
 212:00

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

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
Apollo 14	Change A (Jan)	December 23, 1970	211:00 - 212:00	9/TEC	3-281

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FLIGHT PLAN

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
3-284

MCC-H

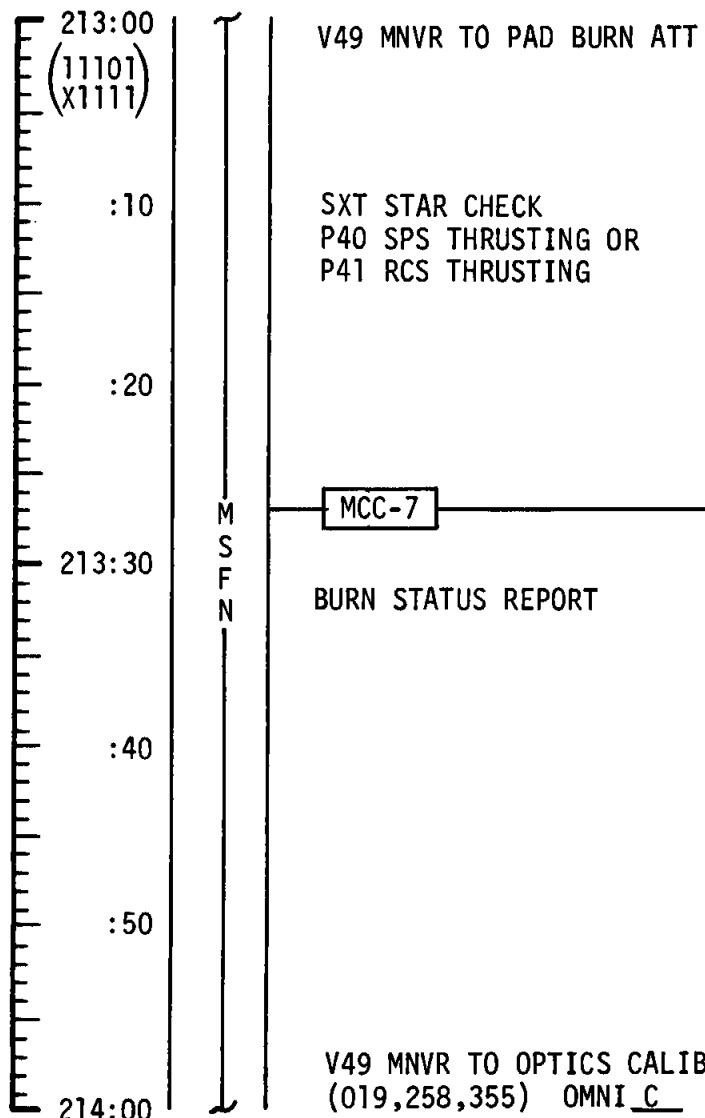
1123 CST

FLIGHT PLAN

NOTES

EI - 3 HR

UPLINK TO CSM
 CSM S.V. (CMC) V47E
 CSM S.V. (MSFN)
 (NO V47)



TIG: 213:26:59
 BT: NOM ZERO
 Δ VT: NOM ZERO
 ULLAGE: N/A
 ORBIT: N/A

BURN STATUS REPORT		
X	X	Δ TIG
X	X	BT
		V _{gx}
		TRIM
X	X	R
X	X	P
X	X	Y
		V _{gy}
		V _{gz}
		Δ V _c *
X	X	FUEL*
X	X	OX*
X	X	UNBAL

*ITEMS TO BE
 REPORTED TO MSFN

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

EI - 2 HR
GO/NO-GO

214:00 (11101) X1111)	P23 CISLUNAR NAVIGATION OPTICS CALIBRATION STAR N70 (00022) POO 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								
:10	2. N70 (00023) (00000) (00220)	22 REGULUS (MFH)								
:20	3. N70 (00016) (00000) (00210)	23 DENEBOLE (MFH)								
214:30 M S F N	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)	16 PROCYON (MNH)								
:40	BORESIGHT AND SXT STAR CHECK									
:50	P52 IMU REALIGN OPTION 3 REFSMMAT (ENTRY ORIENT)									
215:00	REPORT: <u>GYRO TORQUING ANGLES</u>	<table border="1"> <tr><td>P52 IMU REALIGN</td></tr> <tr><td>N71: _____</td></tr> <tr><td>N05: _____</td></tr> <tr><td>N93:</td></tr> <tr><td>X _____</td></tr> <tr><td>Y _____</td></tr> <tr><td>Z _____</td></tr> <tr><td>GET _____ : _____</td></tr> </table>	P52 IMU REALIGN	N71: _____	N05: _____	N93:	X _____	Y _____	Z _____	GET _____ : _____
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

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

MCC-H

1323 CST

FLIGHT PLAN

NOTES

EI - 1 HR

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

 215:00
 (11101)
 X1111

:10

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

:20

MSFN

215:30

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

:40

:50

216:00

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	215:00 - 216:00	9/TEC	3-287

FLIGHT PLAN

NOTES

216:00
 (11101)
 (X1111)

M
S
F
N

:10
 (ENTRY
 DAP)

:20

216:30

:40

:50

217:00

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
 SECS PYRO ARM PAGE E 2-3

CM/SM SEP 216:12

MNVR TO ENTRY ATT

P63 ENTRY INITIATE

EI 216:26:59

P64 ENTRY POST 0.05G

<u>Y</u>	<u>6</u>	<u>.</u>	<u>5</u>	
L/D	.2	9	7	8 4
V	3	6	1	7 0
R	1	2	5	0

TRAJECTORY EVENTS

400 000 FT (GET 216:26:59)
 ENTER S-BAND BLACKOUT
 0.05G
 KA - INITIATE CONSTANT DRAG
 RDOT = -700 FPS
 PEAK G (6.6)
 SUBCIRCULAR VELOCITY
 P64 TO P67
 EXIT S-BAND BLACKOUT
 GUIDANCE TERMINATION
 DROGUE DEPLOYMENT
 MAIN DEPLOYMENT
 SPLASHDOWN

TIME FROM 400K FT,
 MIN:SEC

00:00

00:18

00:30

00:52

01:18

01:20

02:06

02:10

03:32

07:16

08:17

09:04

13:54

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	216:00 - 217:00	9/TEC	3-288

MSC Form 29 (May 69)

FLIGHT PLANNING BRANCH

SECTION 4 - CONSUMABLES

SECTION 4

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. $I_{sp} = 309.97 \pm 3.77$ seconds
- b. Mixture ratio = $1.605 \pm .0258$
- c. Lift-off weight = $10\ 841.5 \pm 38.7$ pounds

TABLE 4-1

APS PROPELLANT SUMMARY

Item	Total propellant, 1b
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 (-3 σ)	-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

^aThe 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 34101.0 ± 36.9 pounds.
- d. Integrated average I_{sp} is 302.5 ± 4.65 seconds.
- e. Mixture ratio is $1.598 \pm .0225$.
- 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, $\Delta V = 6957.8$)	-17 332.5	--
Remaining	835.7	90
Dispersions (-3 σ)	-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

12/8/70 Final

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%)

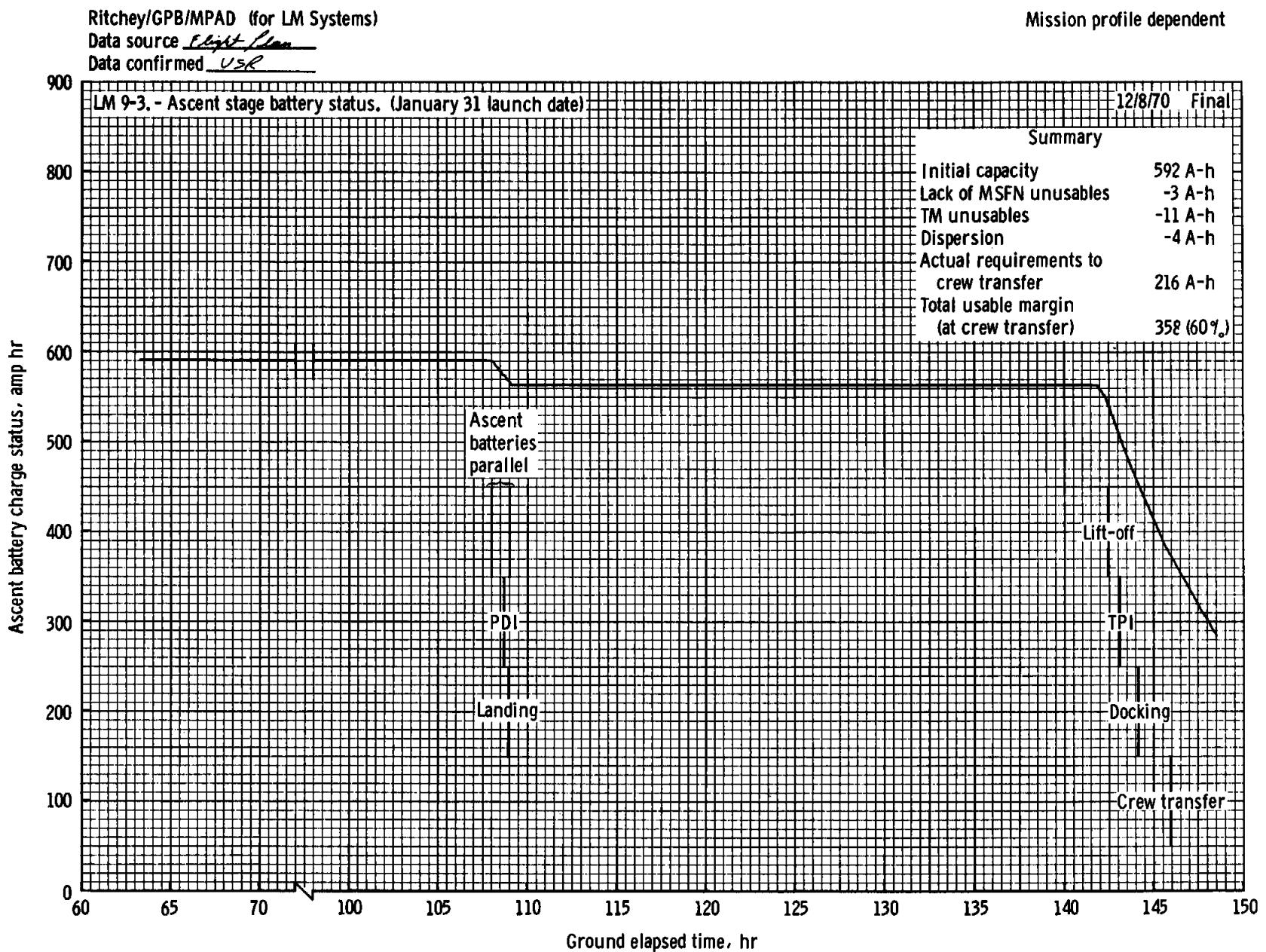


Figure 4-1-- LM-8 ascent stage amp hours remaining.

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%)

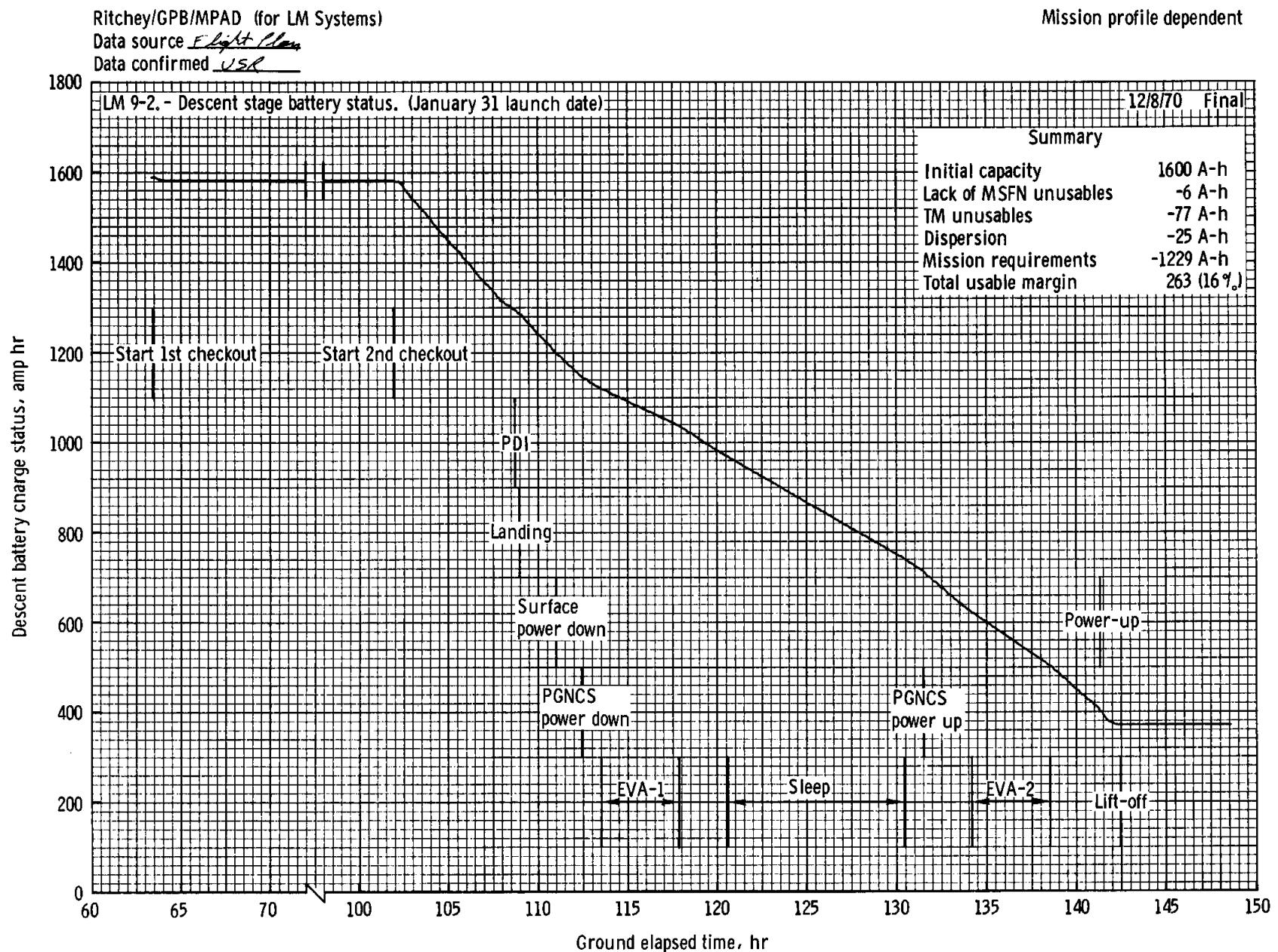


Figure 4-2.- LM-8 descent stage amp hours remaining.

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

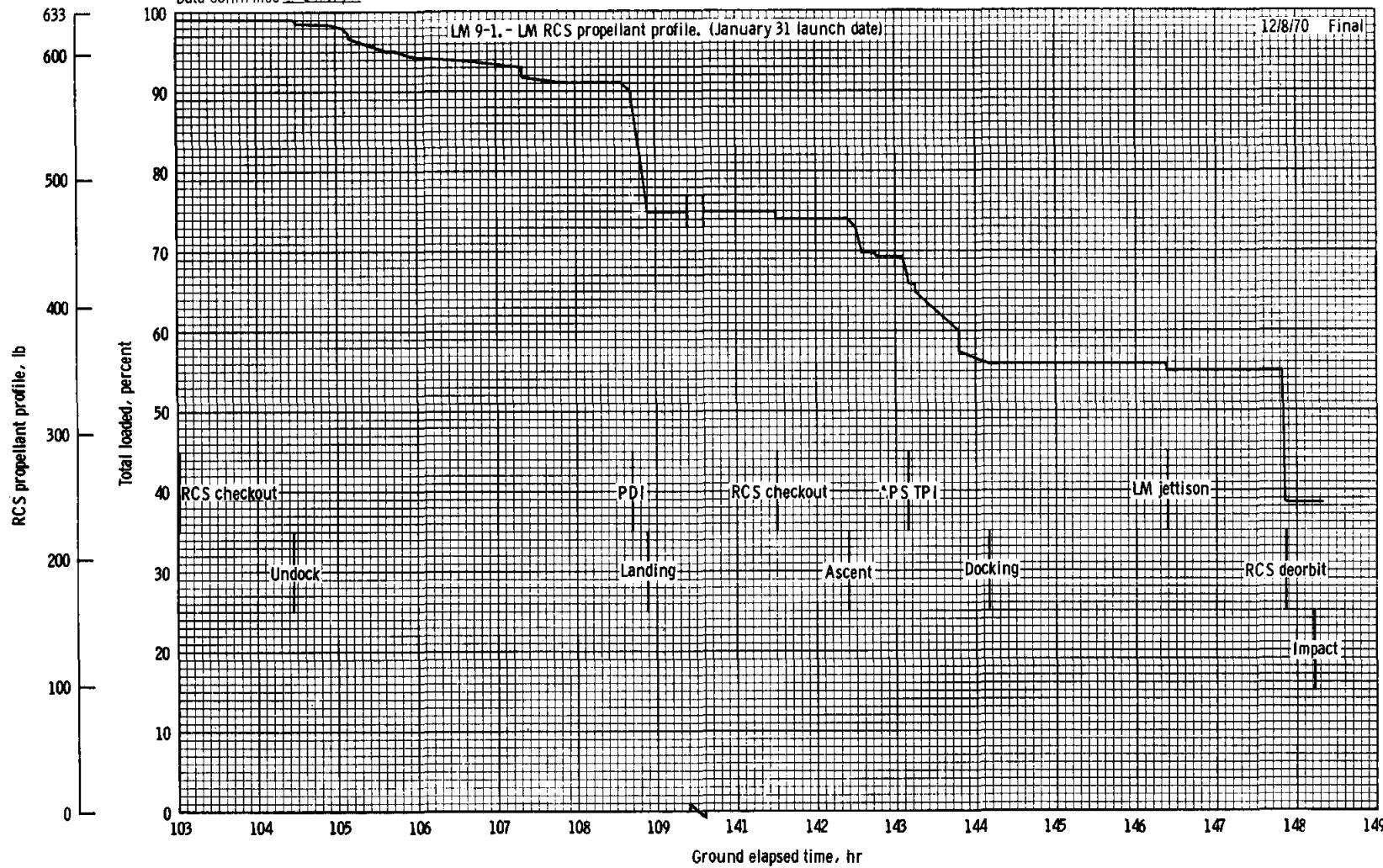


Figure 4-3.- LM RCS propellant profile.

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 $(1.643 \times 10^{-4} \text{ lb/Btu}) \times (\text{metabolic rate, Btu/hr})$.
- 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)

Mission profile dependent

Data source Flight Plan

Data confirmed Bal

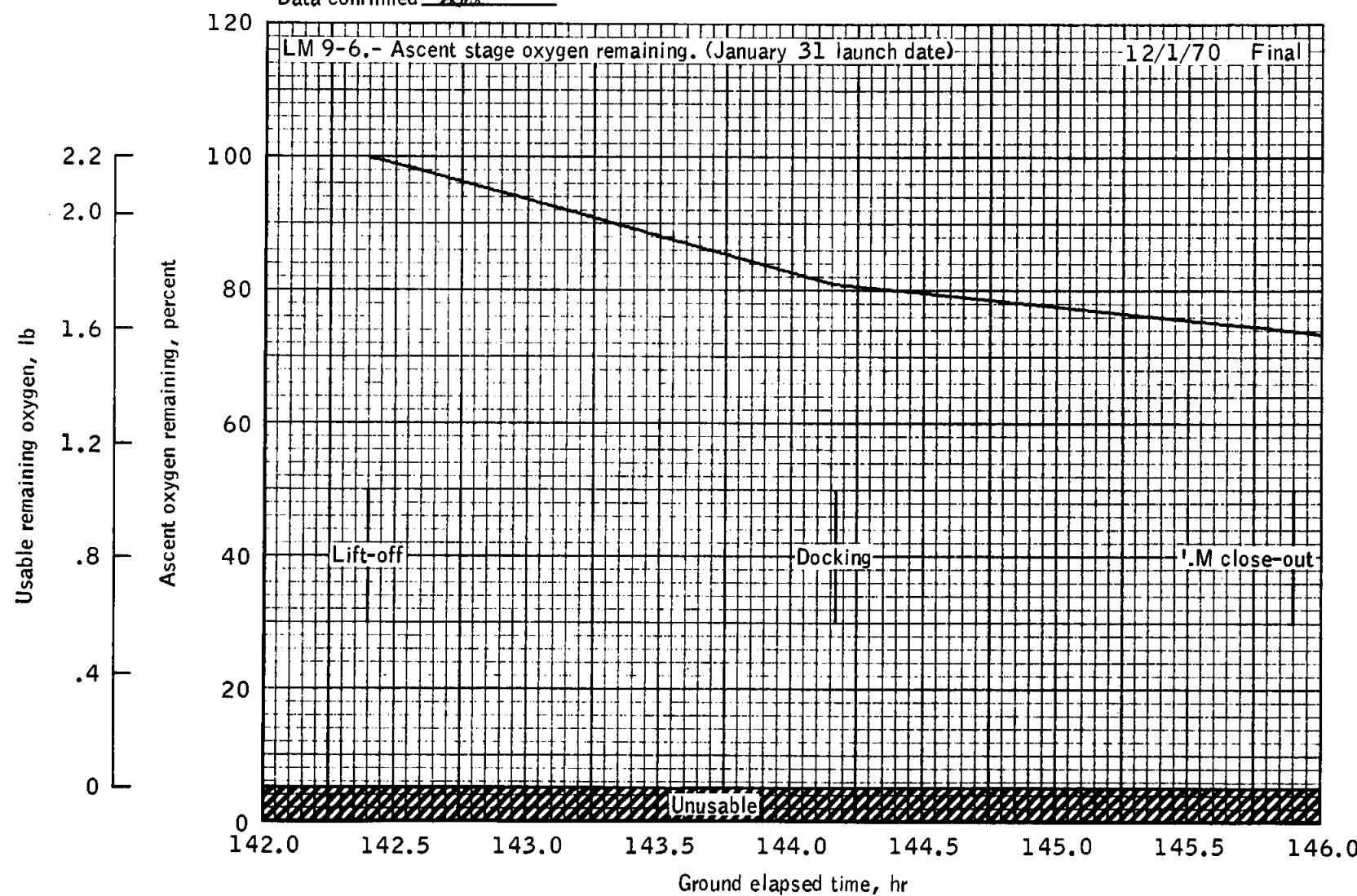


Figure 4-4.- Ascent tank 1 oxygen remaining.

Swalin/GPB/MPAD (for LM Systems)

Data source Flight

Data confirmed Flight

Mission profile dependent

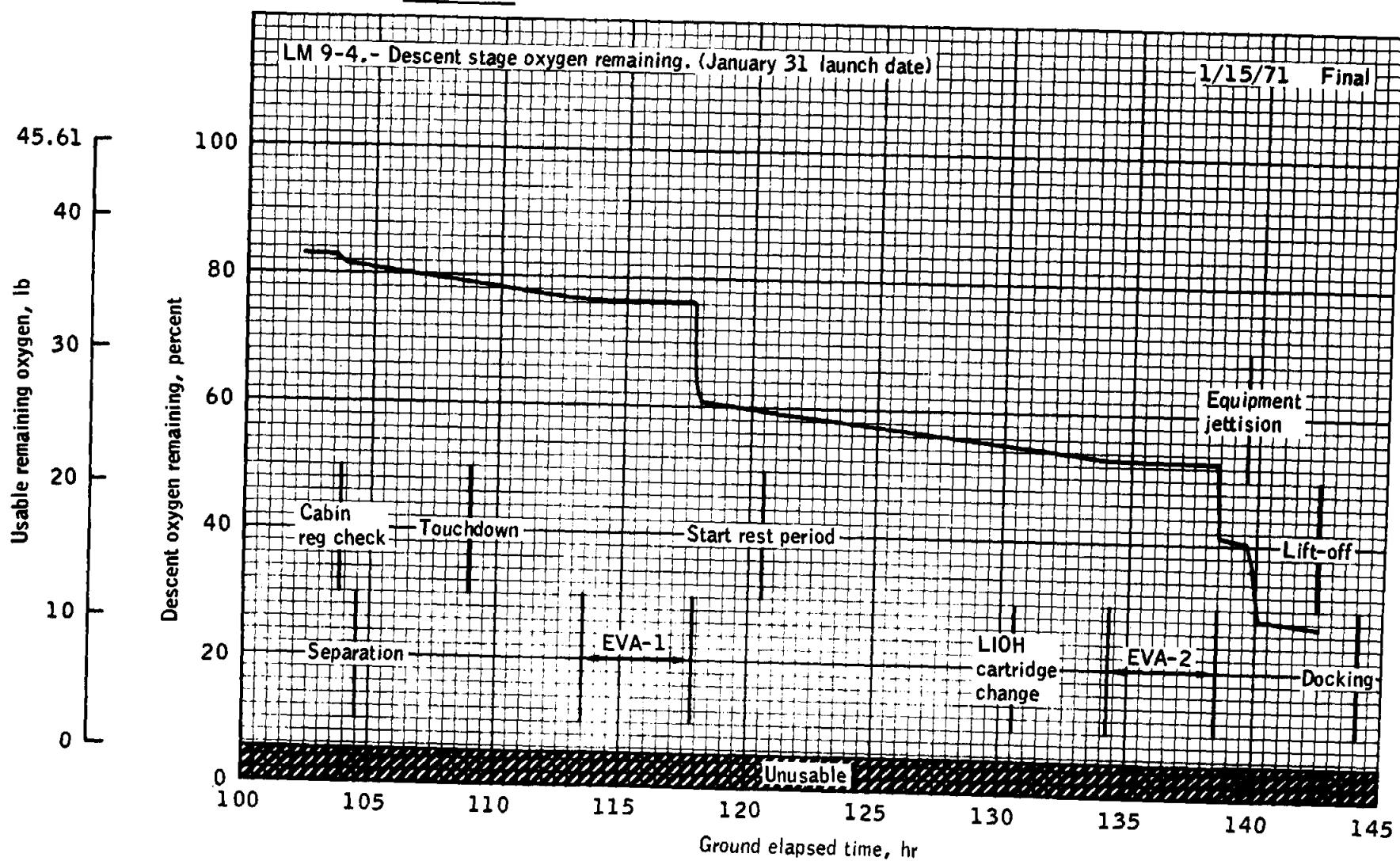


Figure 4.5- Descent oxygen remaining.

Swalin/GPB/MPAD (for LM Systems)

Data source FLIGHT PLAN

Data confirmed Anal

Mission profile dependent

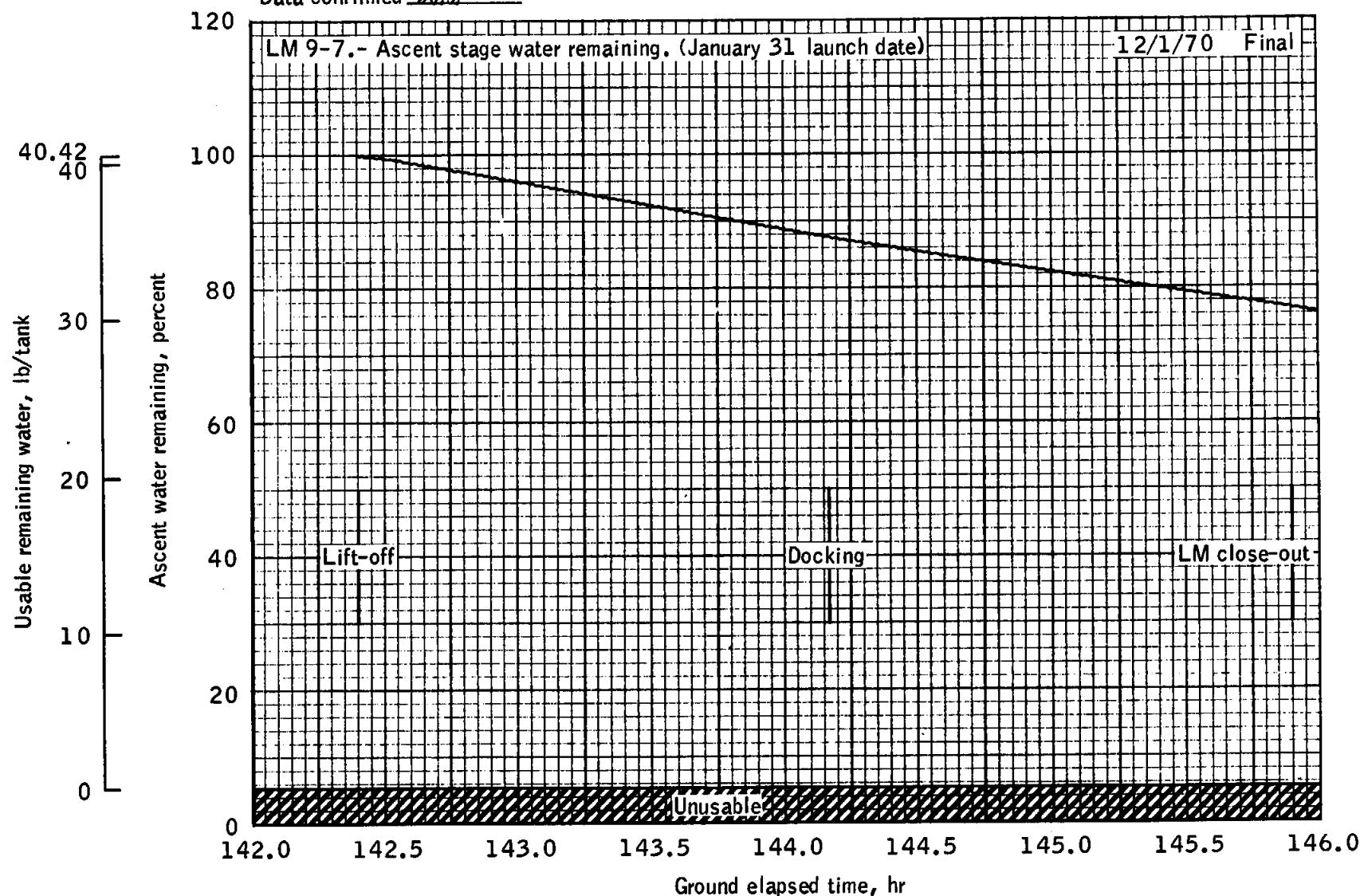


Figure 4-6.- Ascent water remaining.

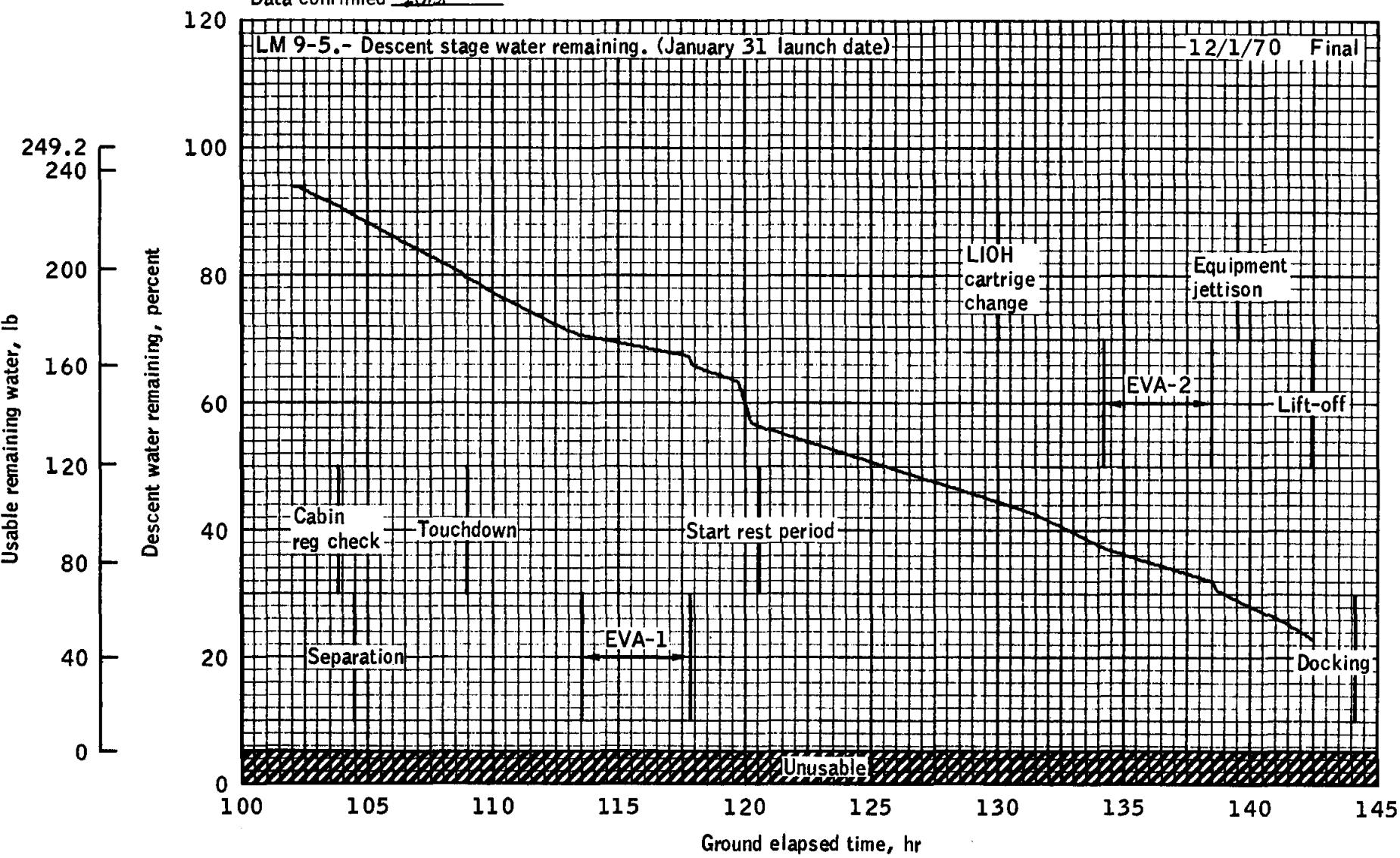


Figure 4-7.- Descent water remaining.

12/8/70 Final

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	<u>1.5</u>	<u>21.8</u>
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.

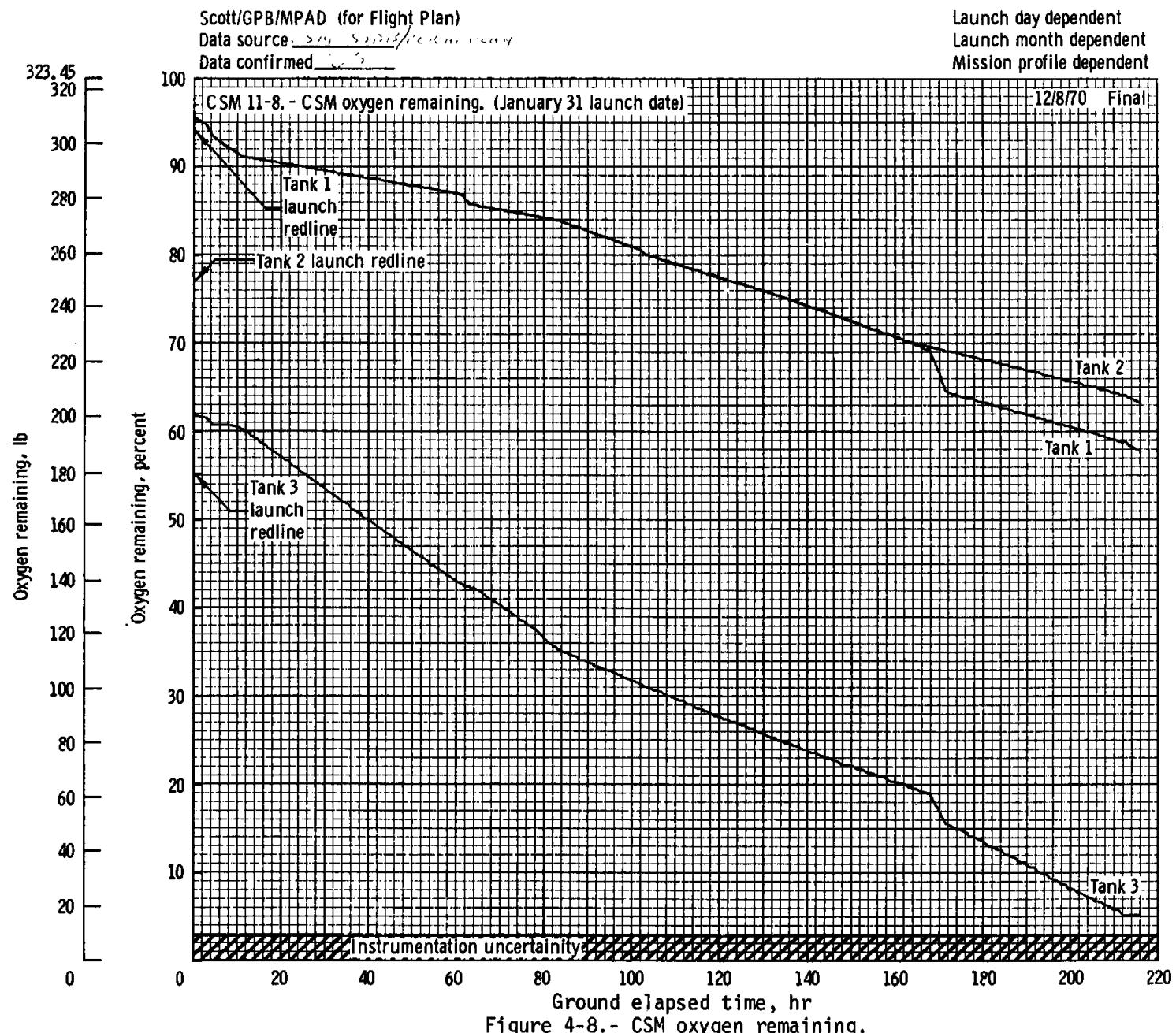


Figure 4-8.- CSM oxygen remaining.

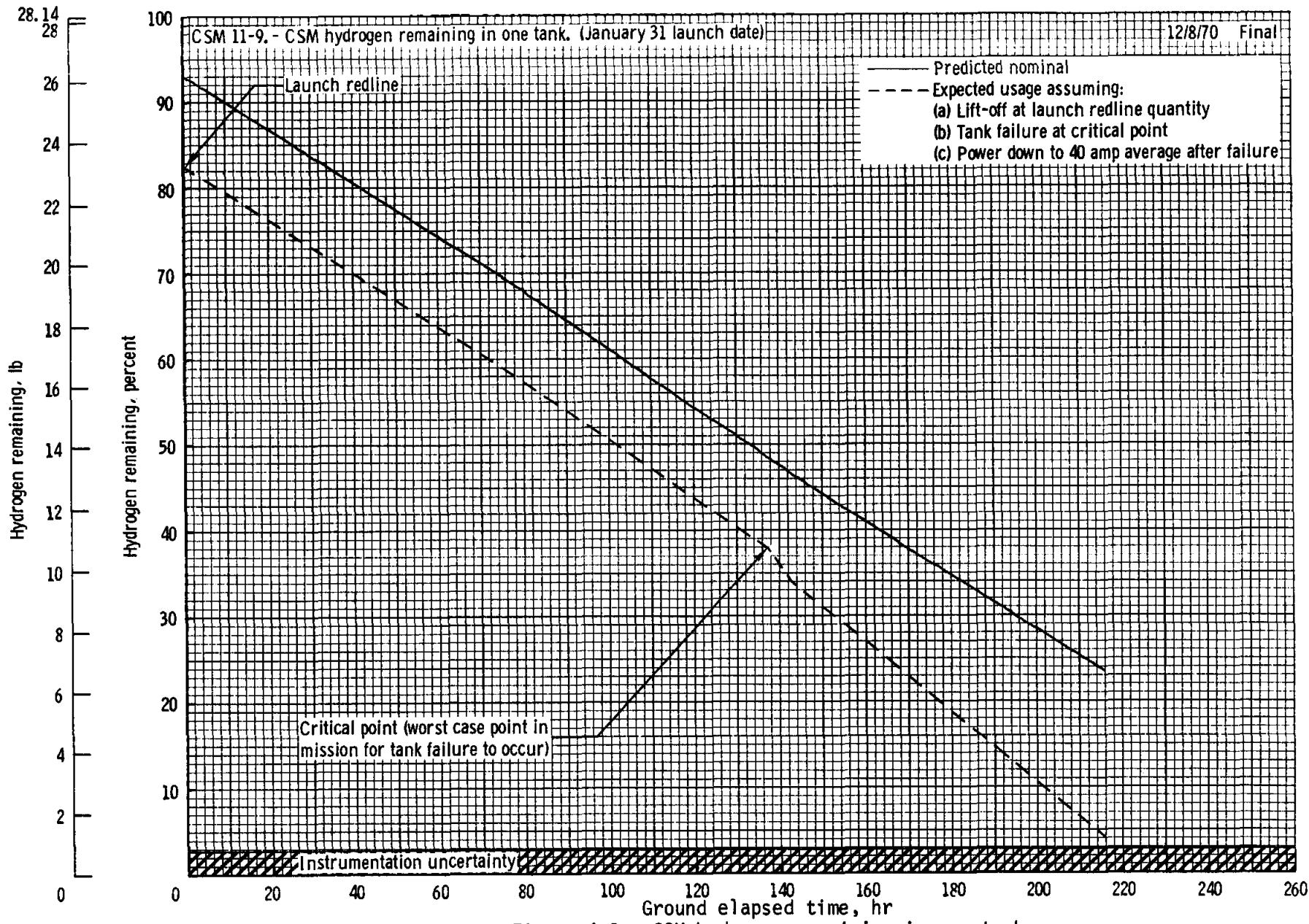


Figure 4-9.- CSM hydrogen remaining in one tank.

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

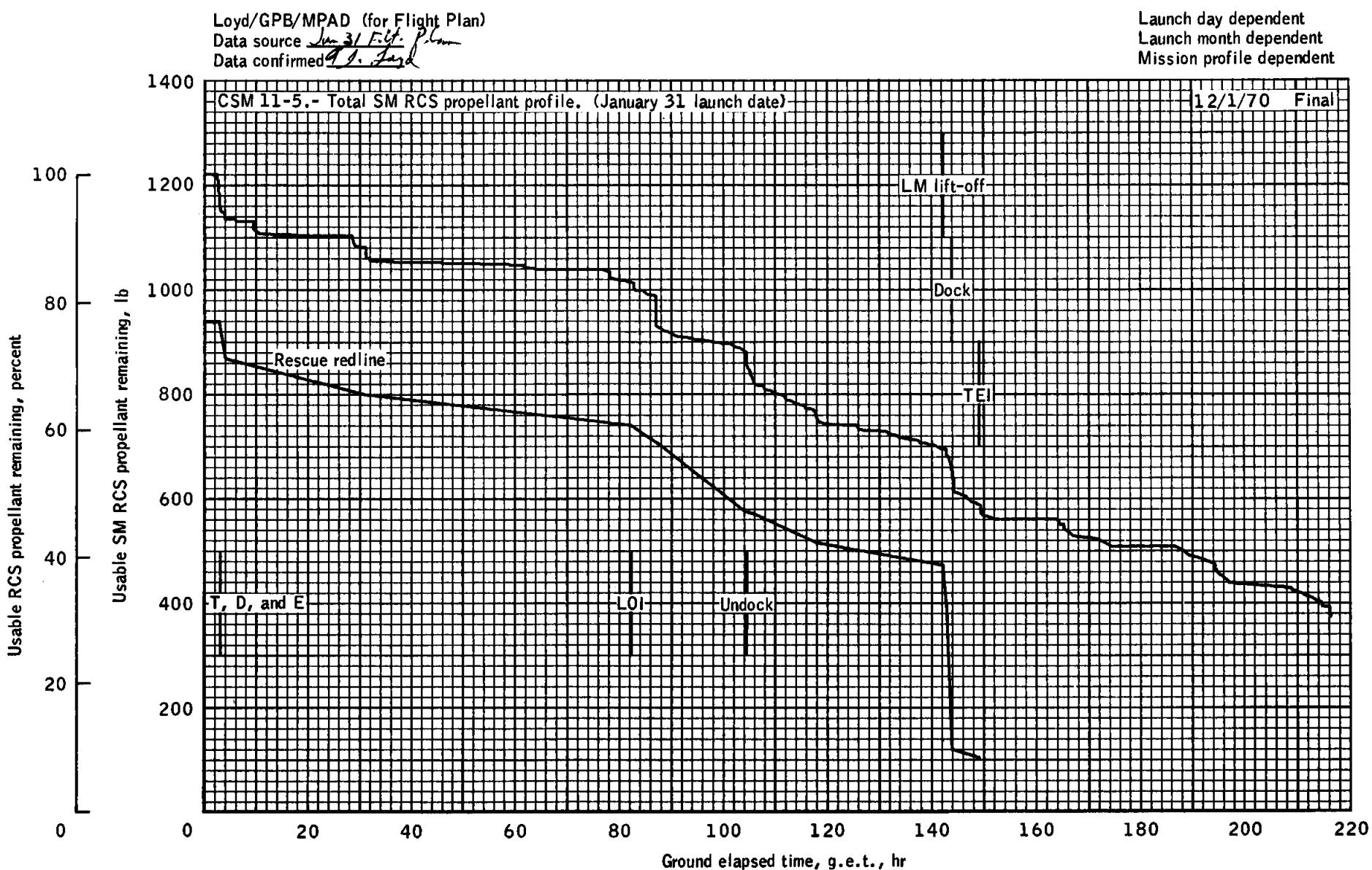


Figure 4-10.- Total SM RCS propellant usage profile.

Loyd/GPB/MPAD (for Flight Plan)

Data source Jan 31 Fit Plan

Data confirmed 1/31/70

Launch day dependent
Launch month dependent
Mission profile dependent

12/1/70 Final

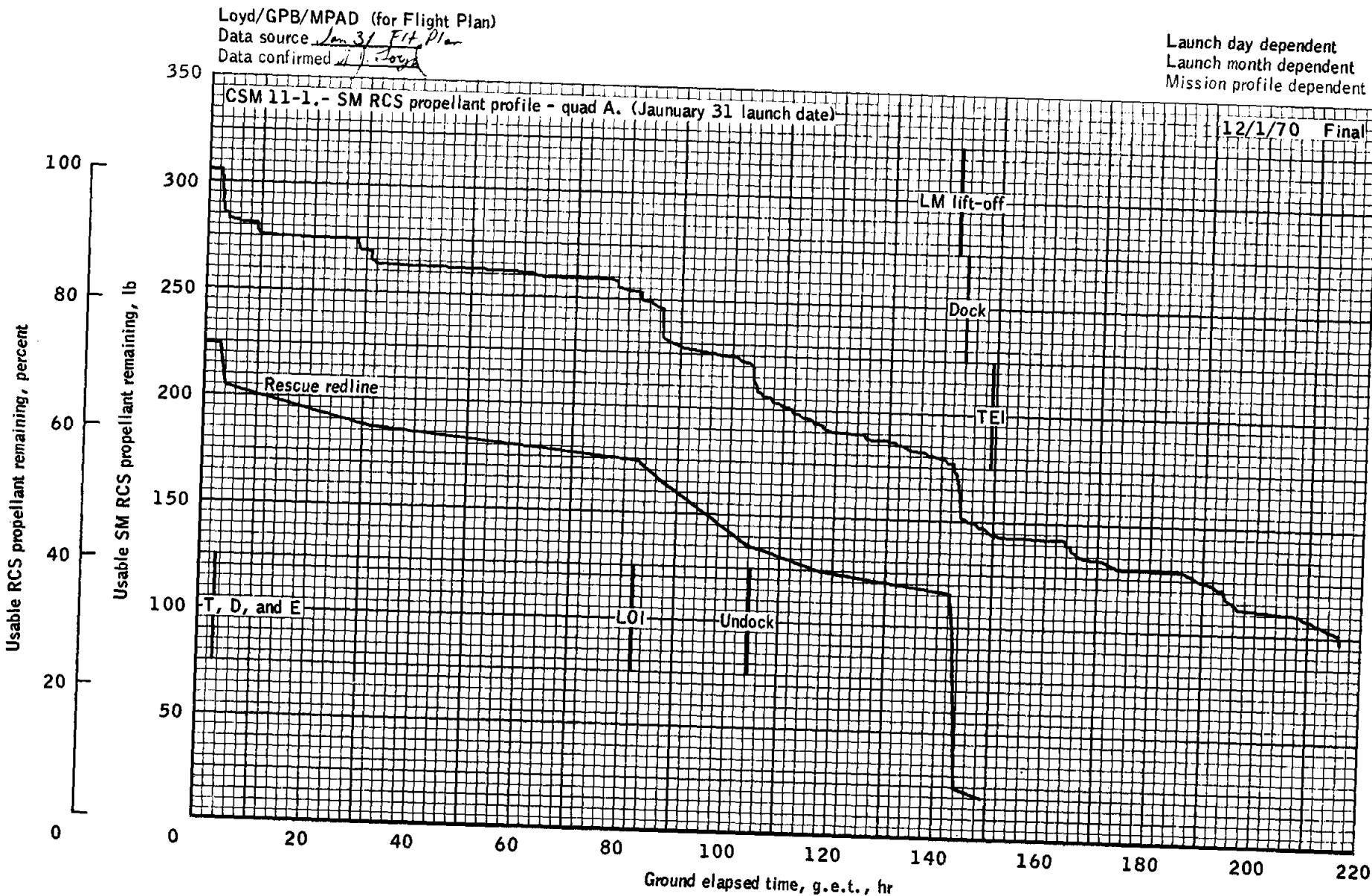


Figure 4-11.- SM RCS propellant profile - quad A.

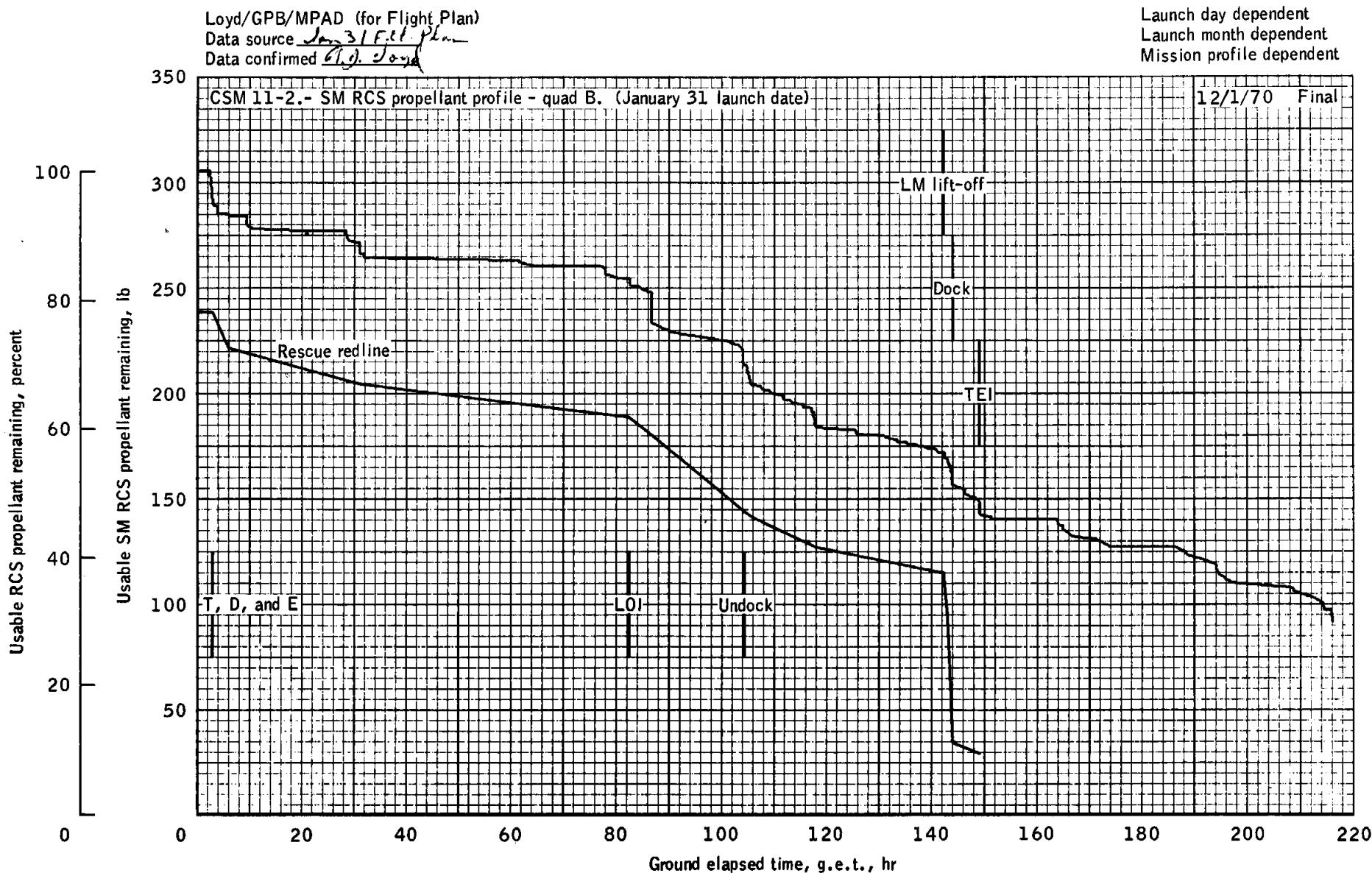


Figure 4-12.- SM RCS propellant profile - quad B.

Loyd/GPB/MPAD (for Flight Plan)
Data source Jan 31 Fct. Plan
Data confirmed CP 31 Jan 70

Launch day dependent
Launch month dependent
Mission profile dependent

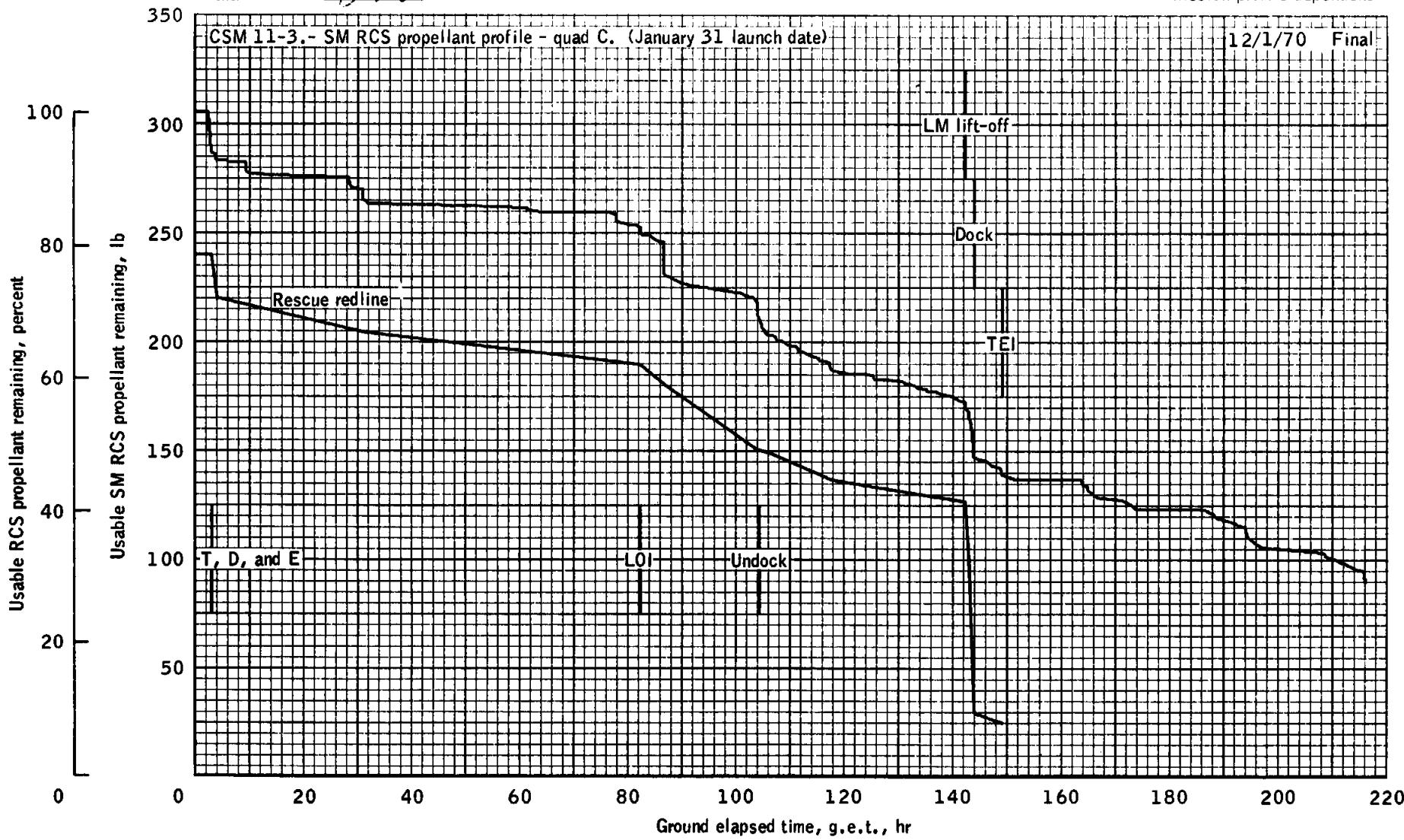


Figure 4-13.- SM RCS propellant profile - quad C.

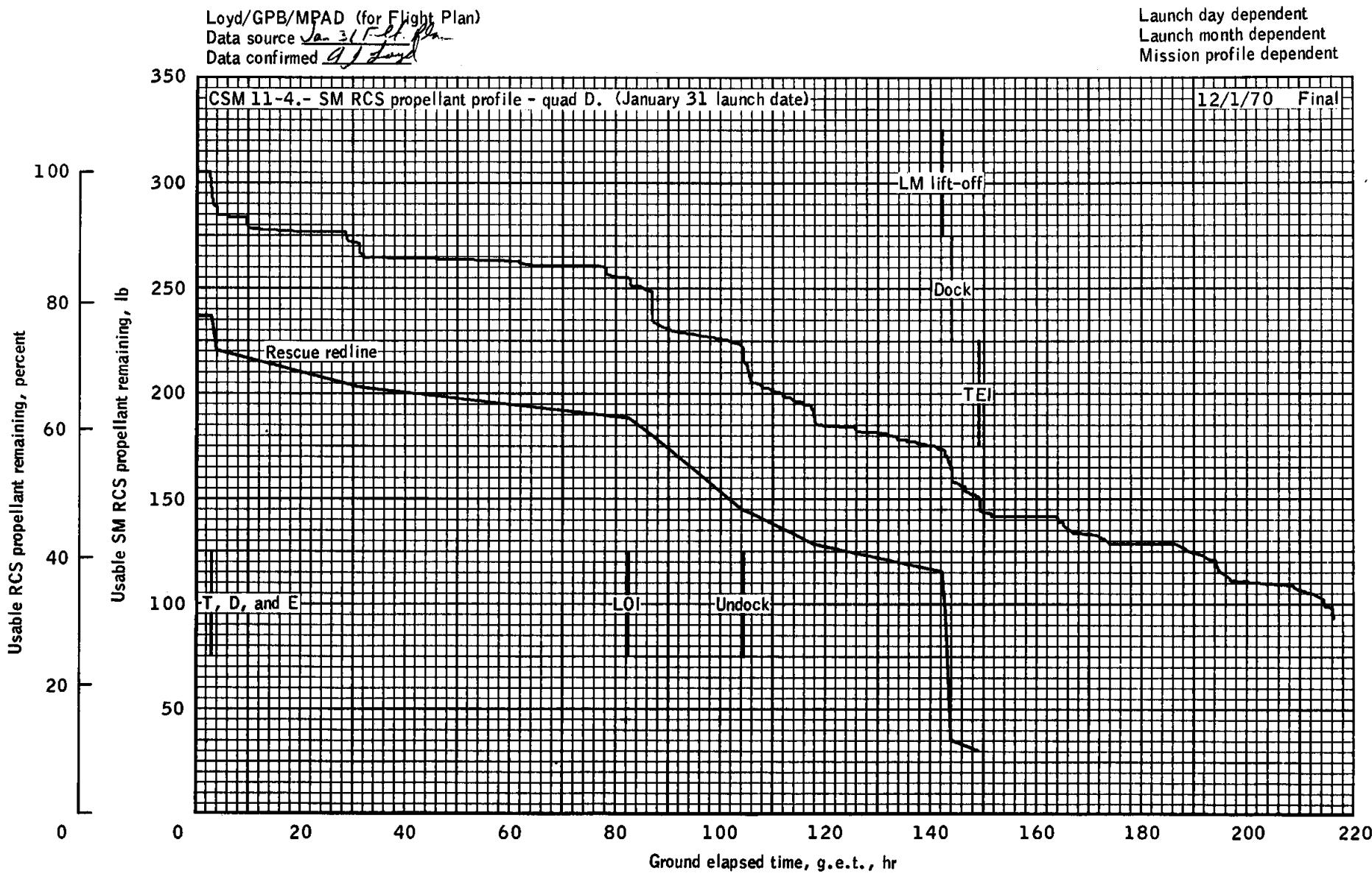


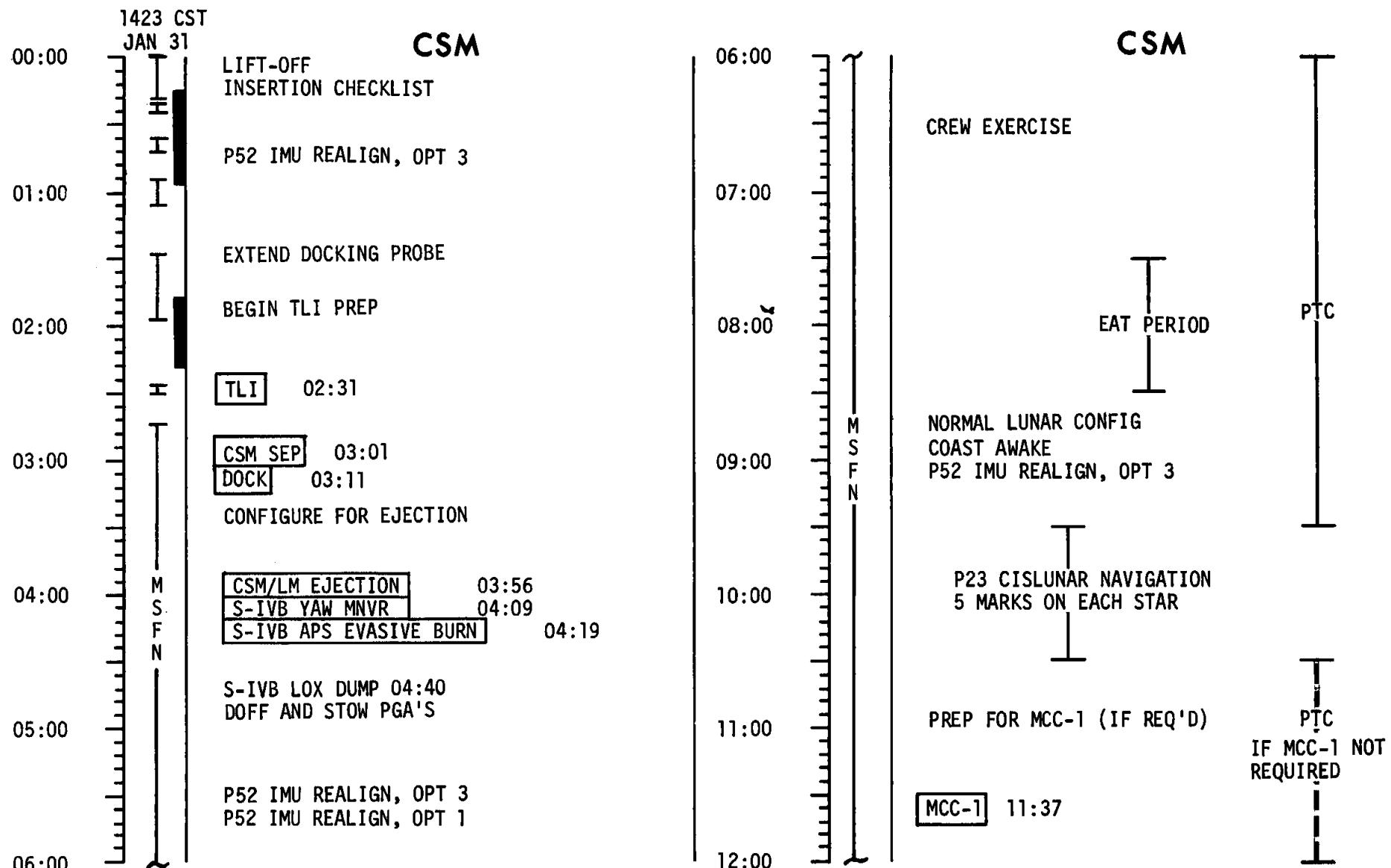
Figure 4-14.- SM RCS propellant profile - quad D.

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

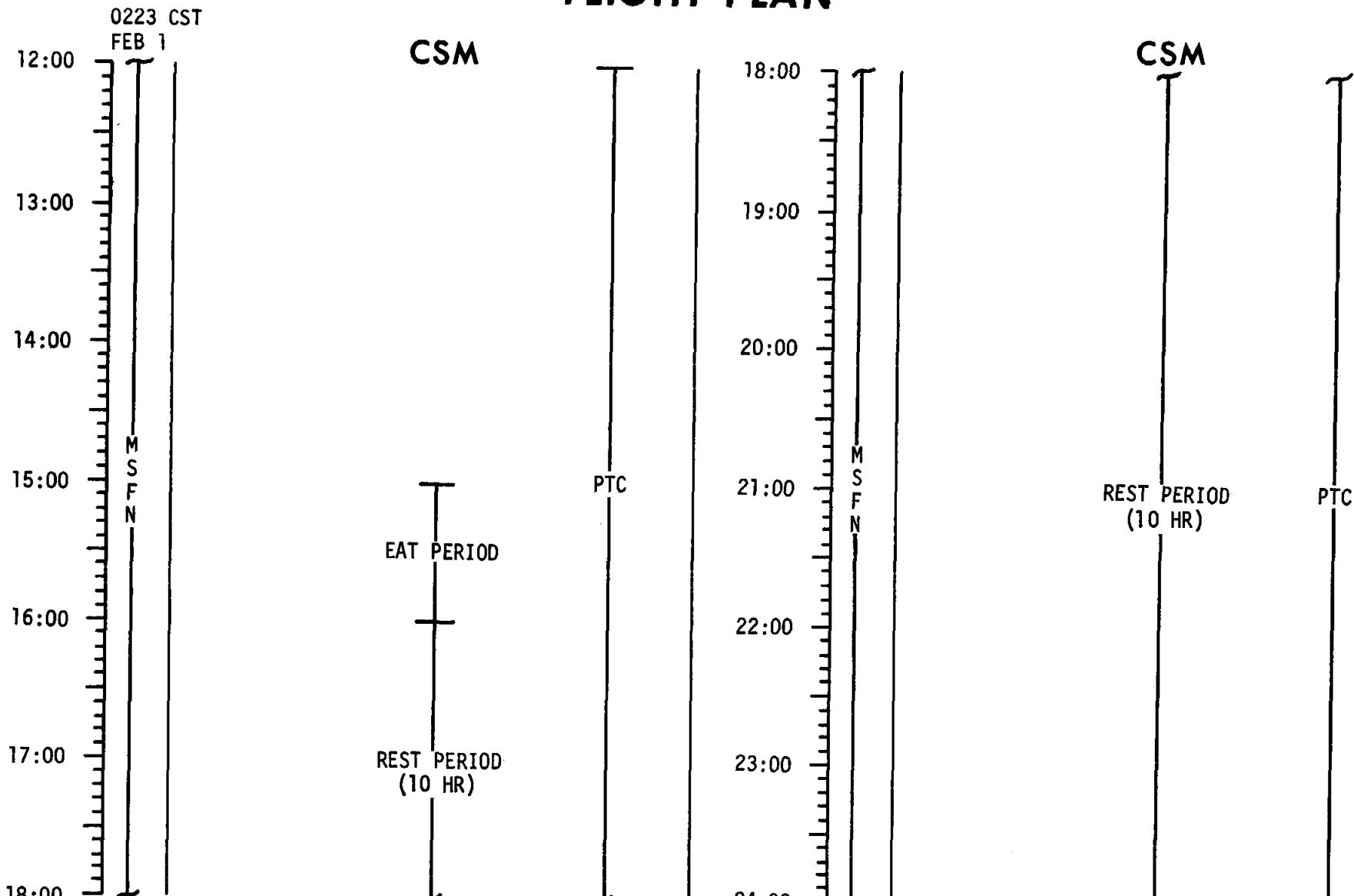
SECTION 5 - ABBREVIATED TIMELINE

FLIGHT PLAN



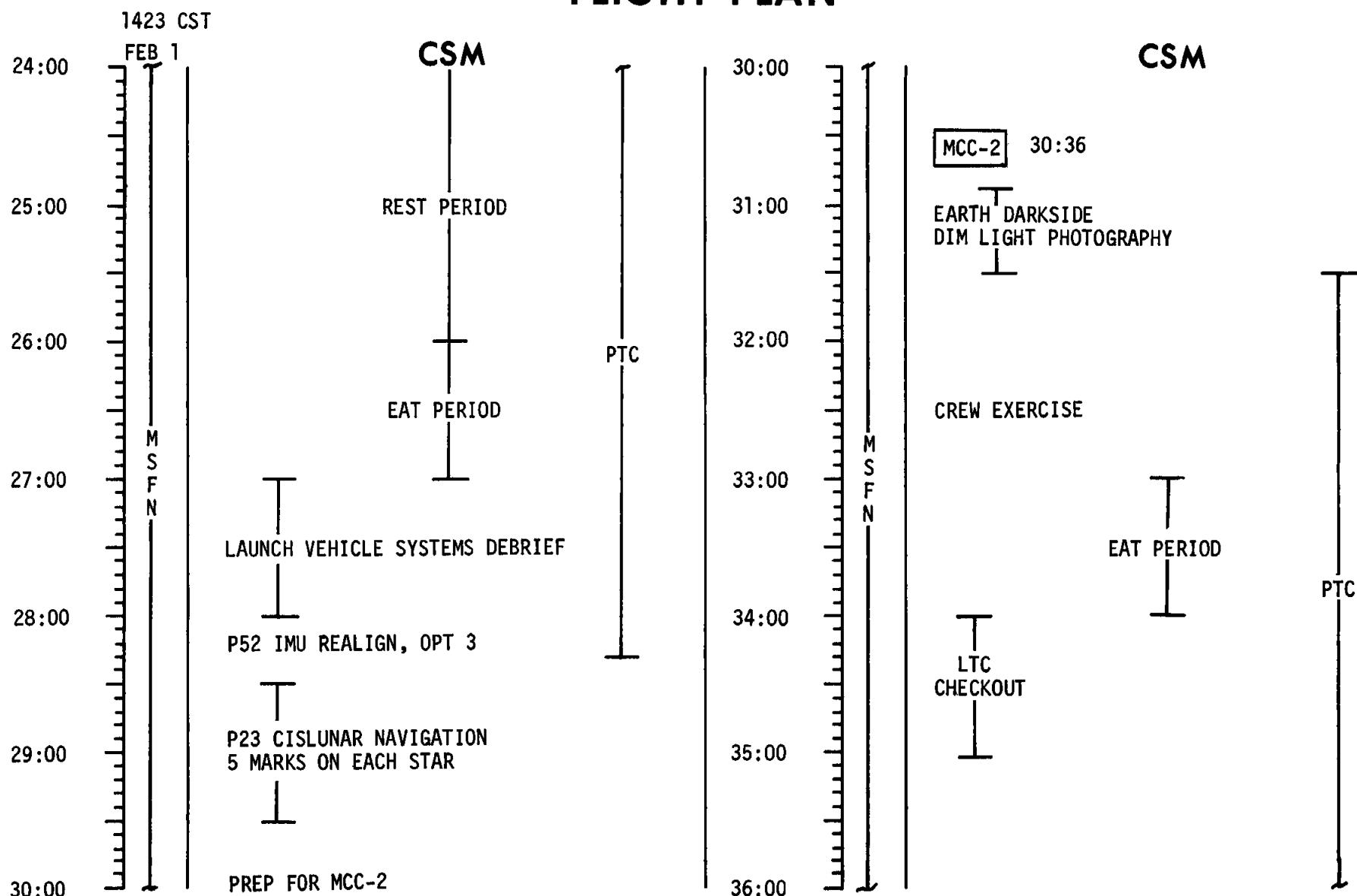
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	00:00 - 12:00	1/TLC	5-1

FLIGHT PLAN



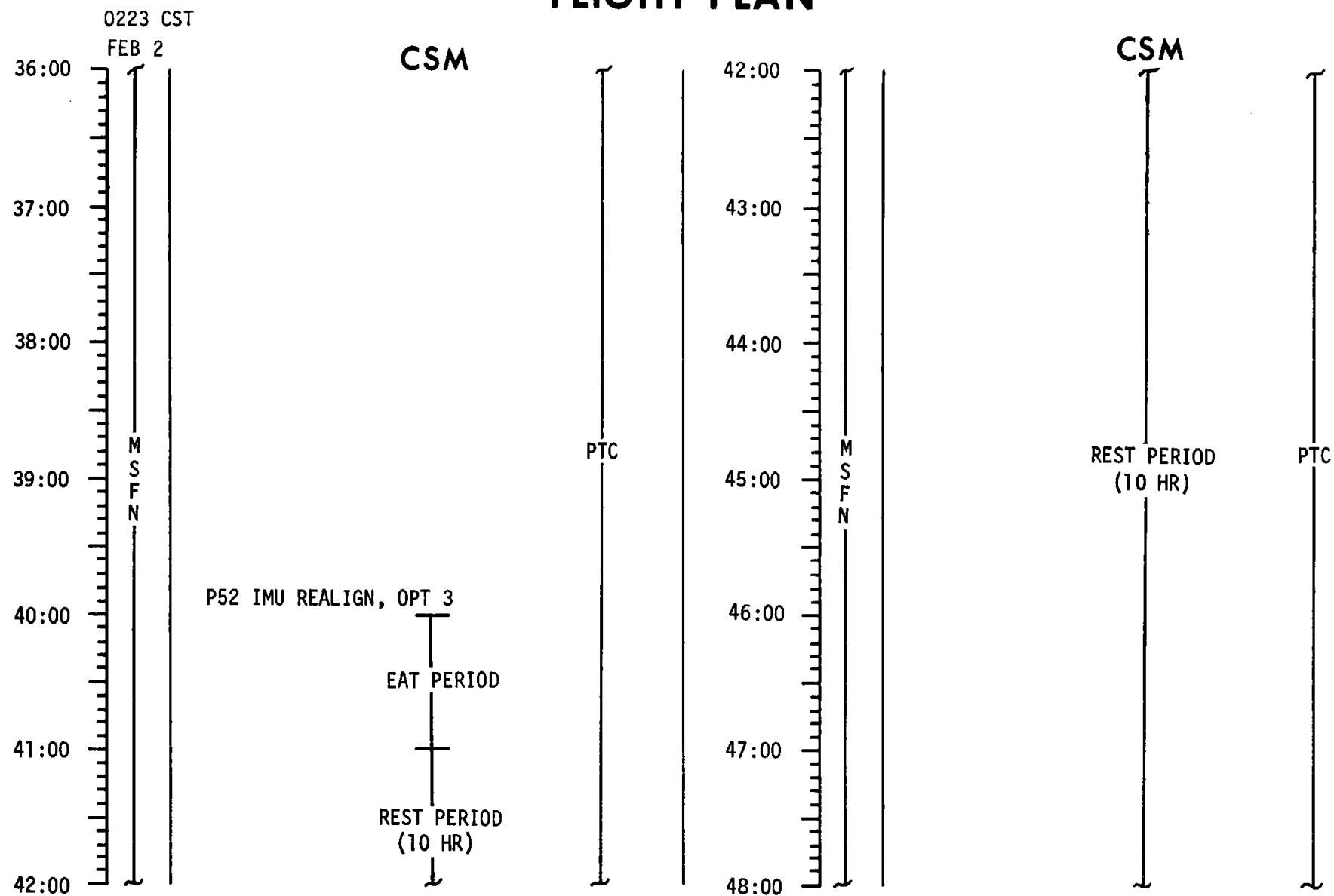
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	12:00 - 24:00	1/TLC	5-2

FLIGHT PLAN



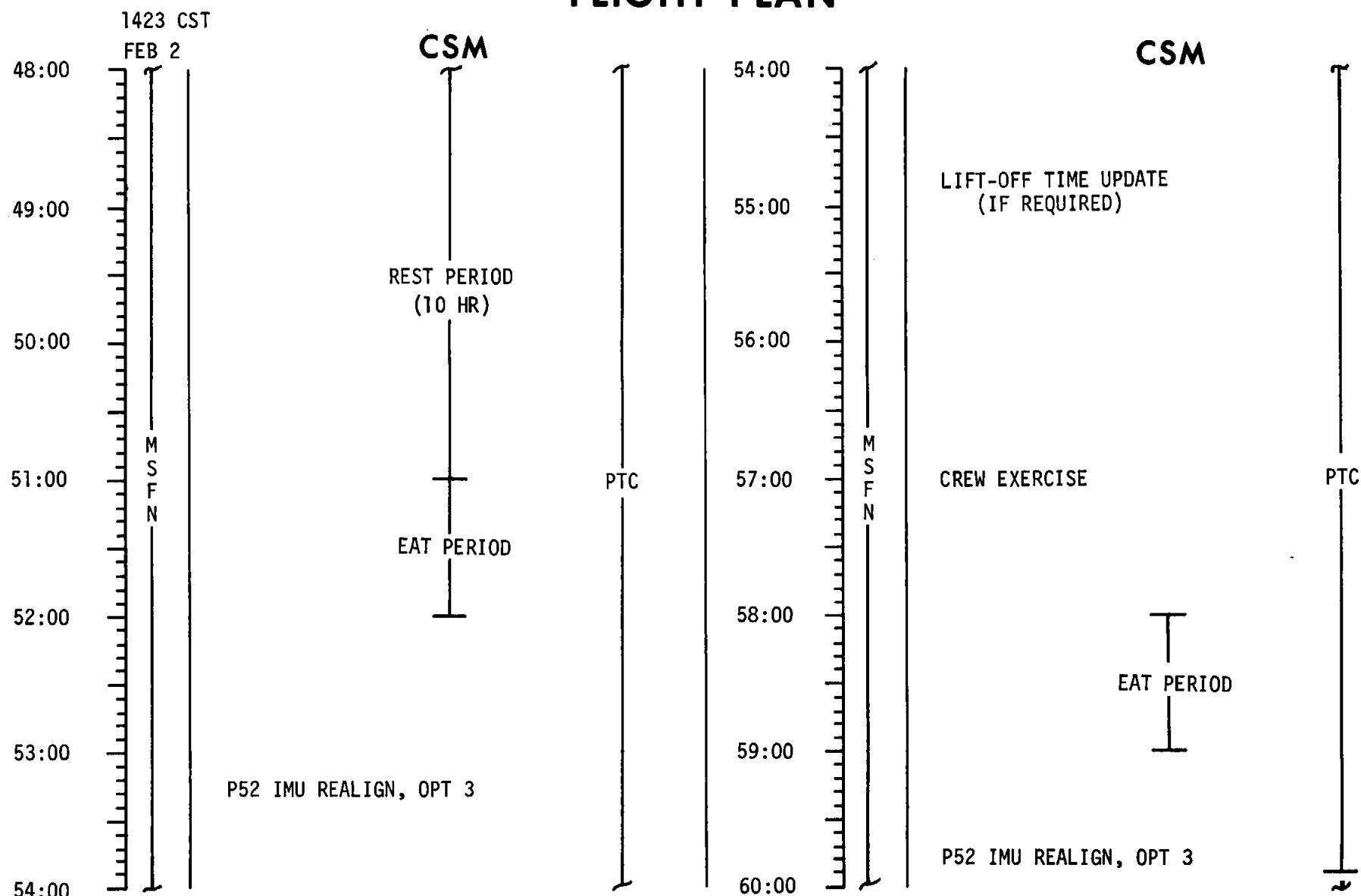
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	24:00 - 36:00	1-2/TLC	5-3

FLIGHT PLAN



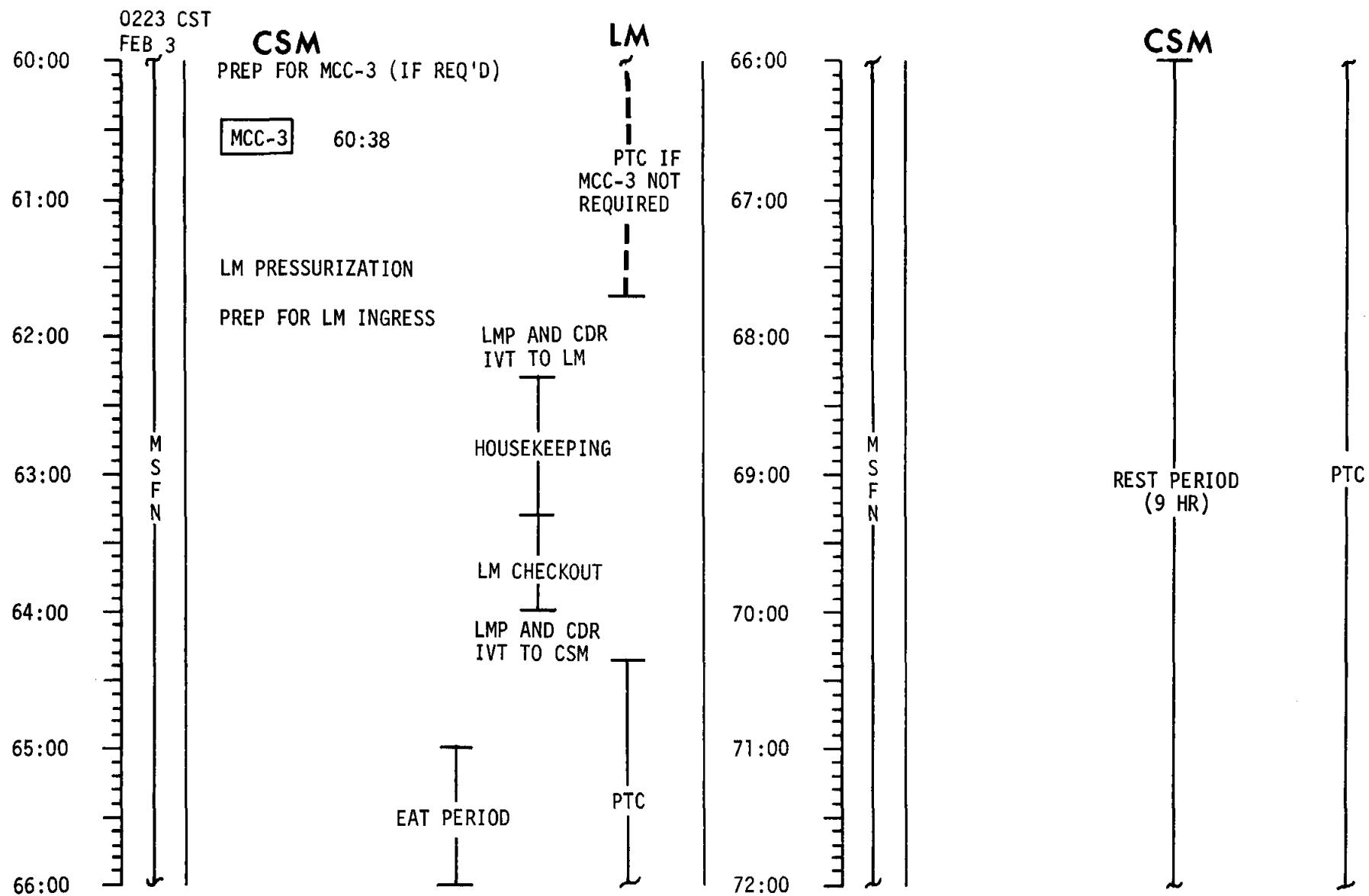
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	36:00 - 48:00	2/TLC	5-4

FLIGHT PLAN



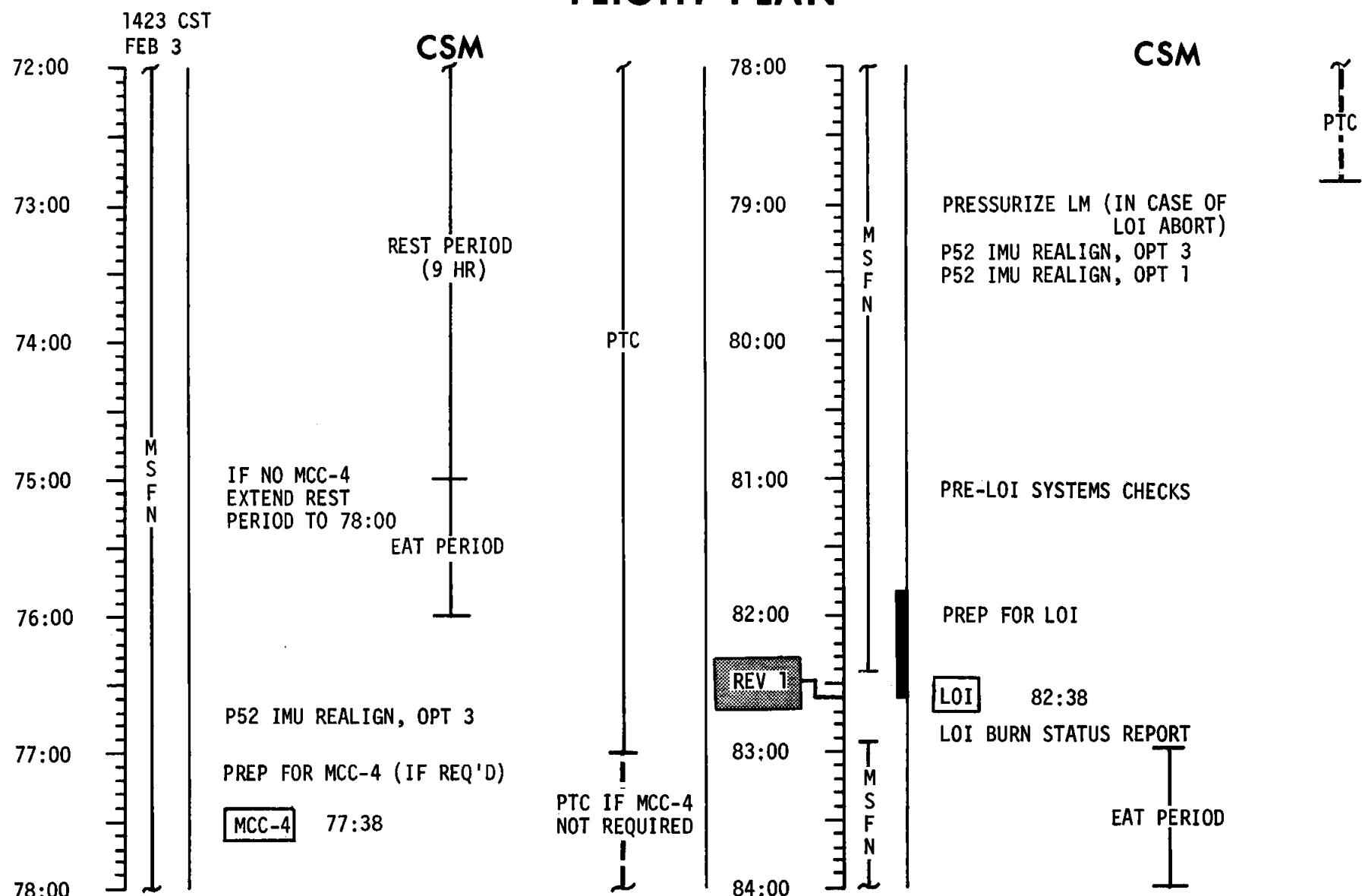
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	48:00 - 60:00	2-3/TLC	5-5

FLIGHT PLAN



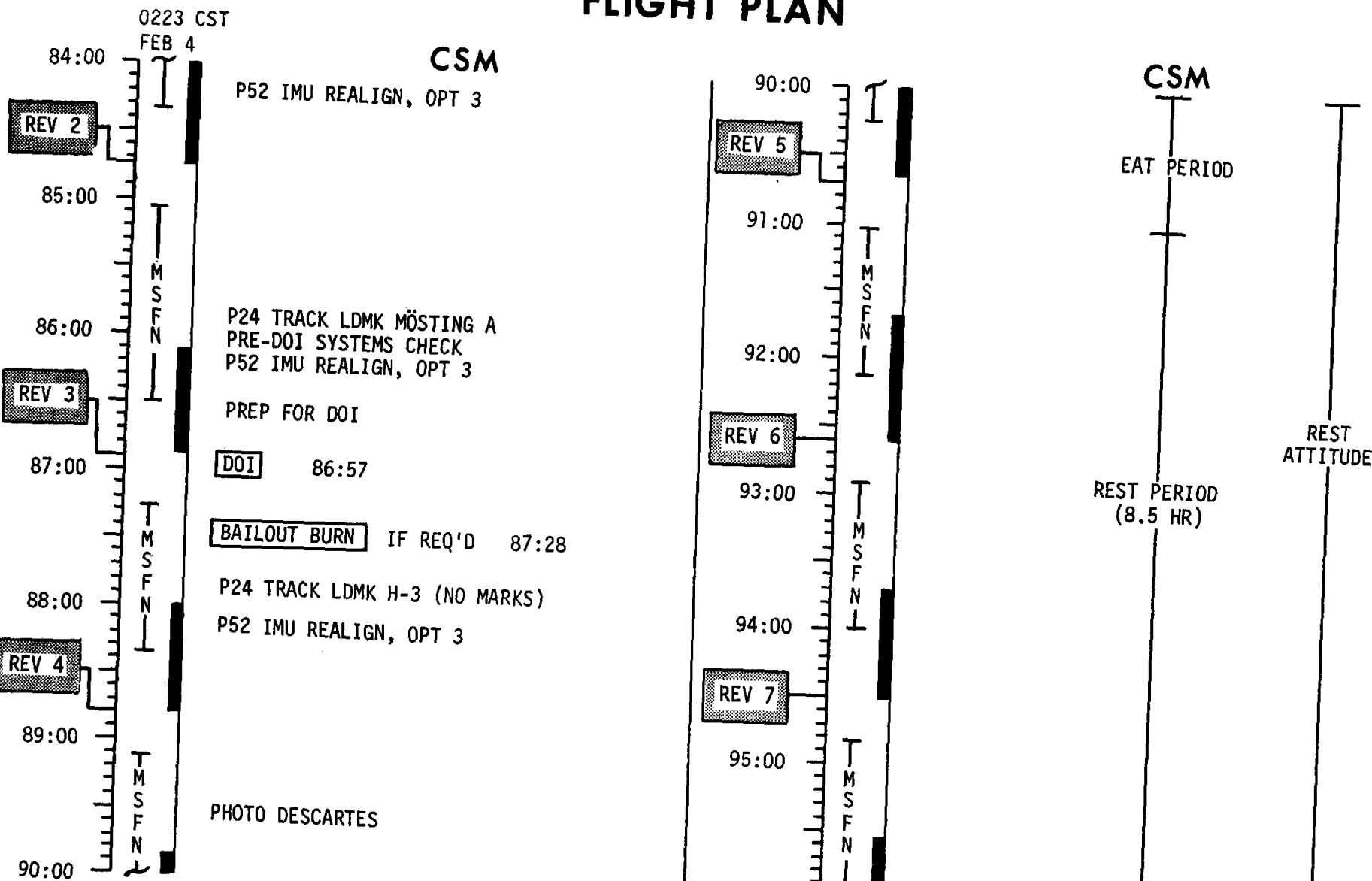
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	60:00 - 72:00	3/TLQ	5-6

FLIGHT PLAN



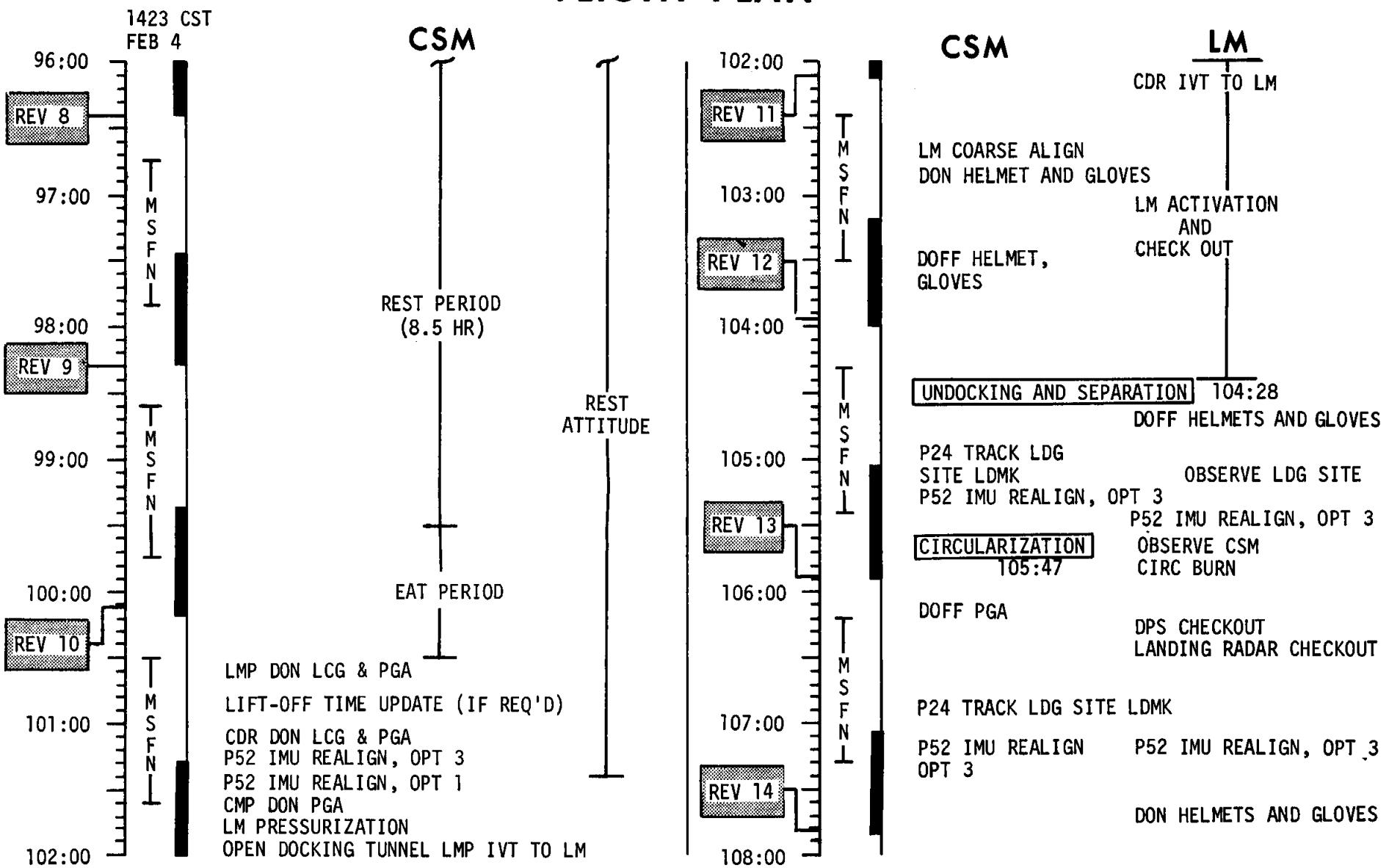
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	72:00 - 84:00	3-4/TLC-1	5-7

FLIGHT PLAN



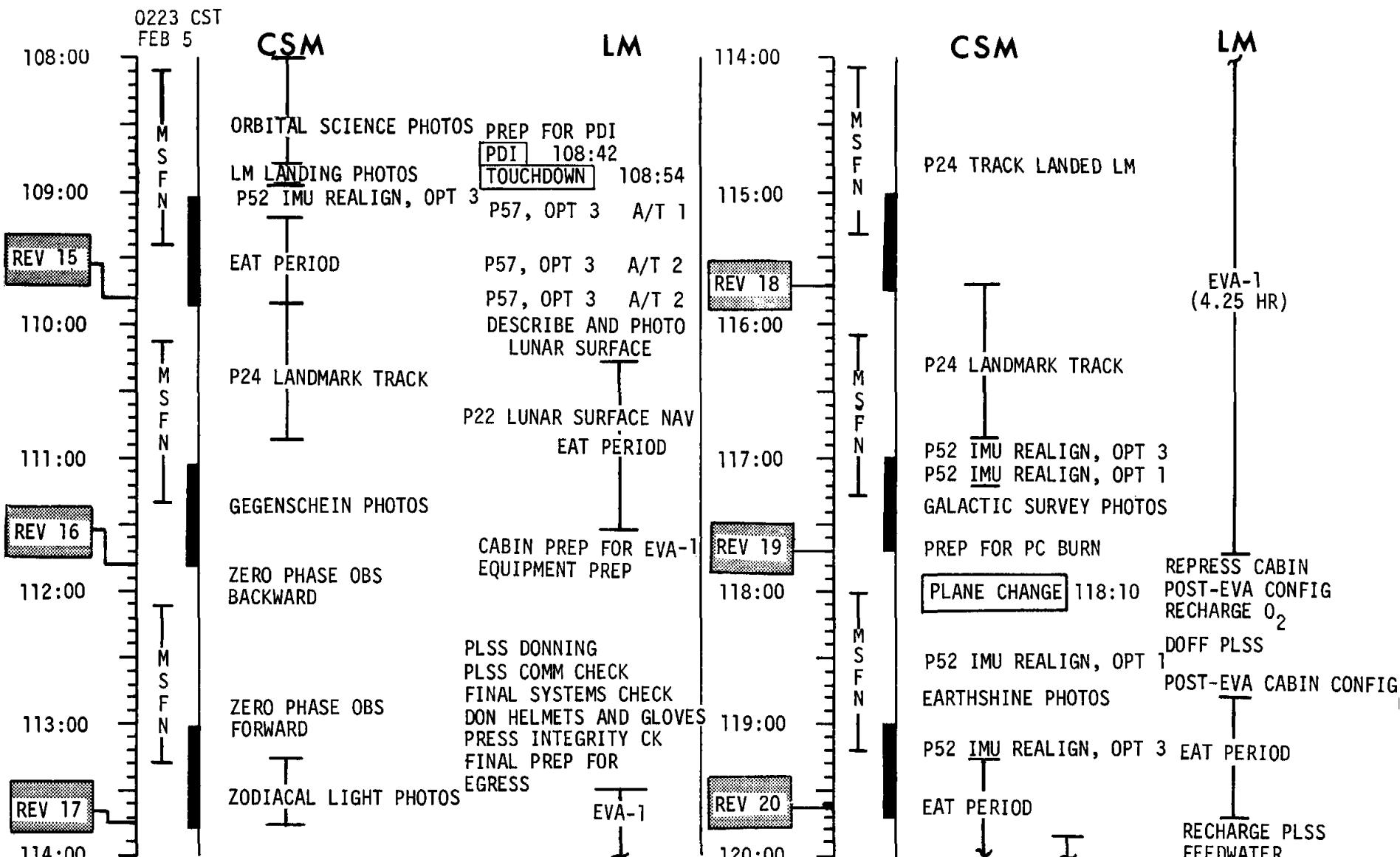
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	84:00 - 96:00	4/1-7	5-8

FLIGHT PLAN



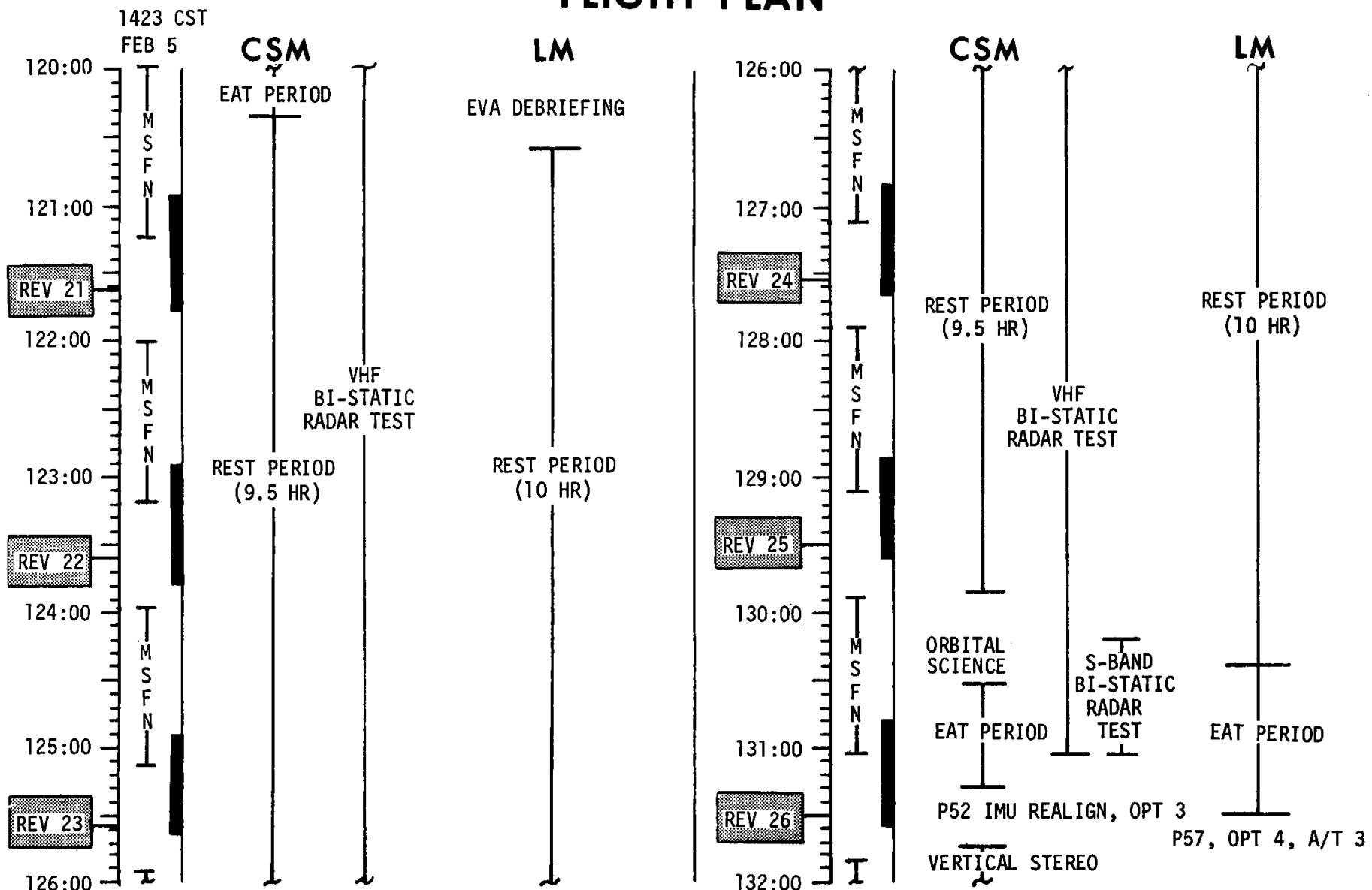
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	96:00 - 108:00	4-5/7-14	5-9

FLIGHT PLAN



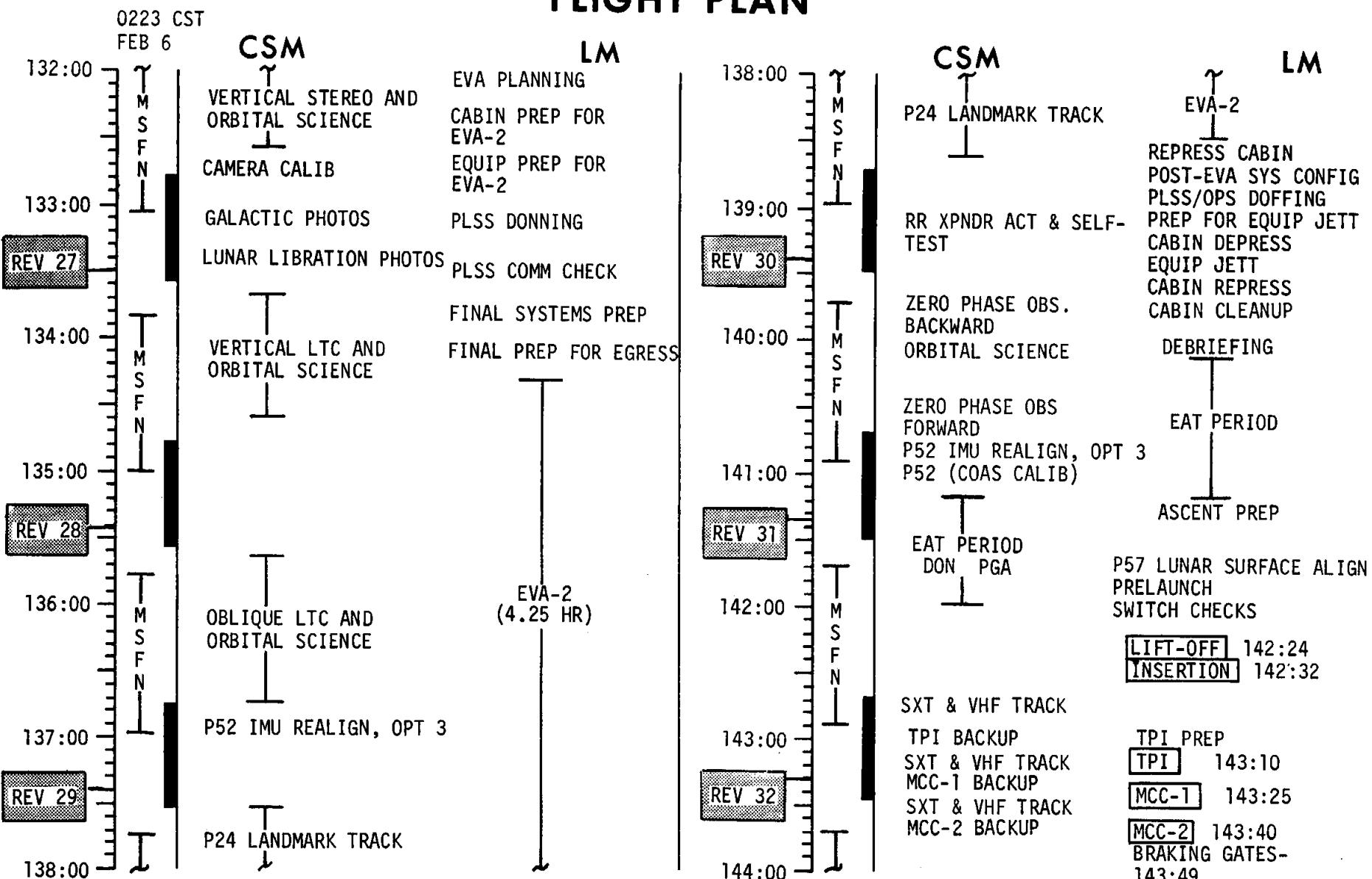
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	108:00 - 120:00	5/14-20	5-10

FLIGHT PLAN



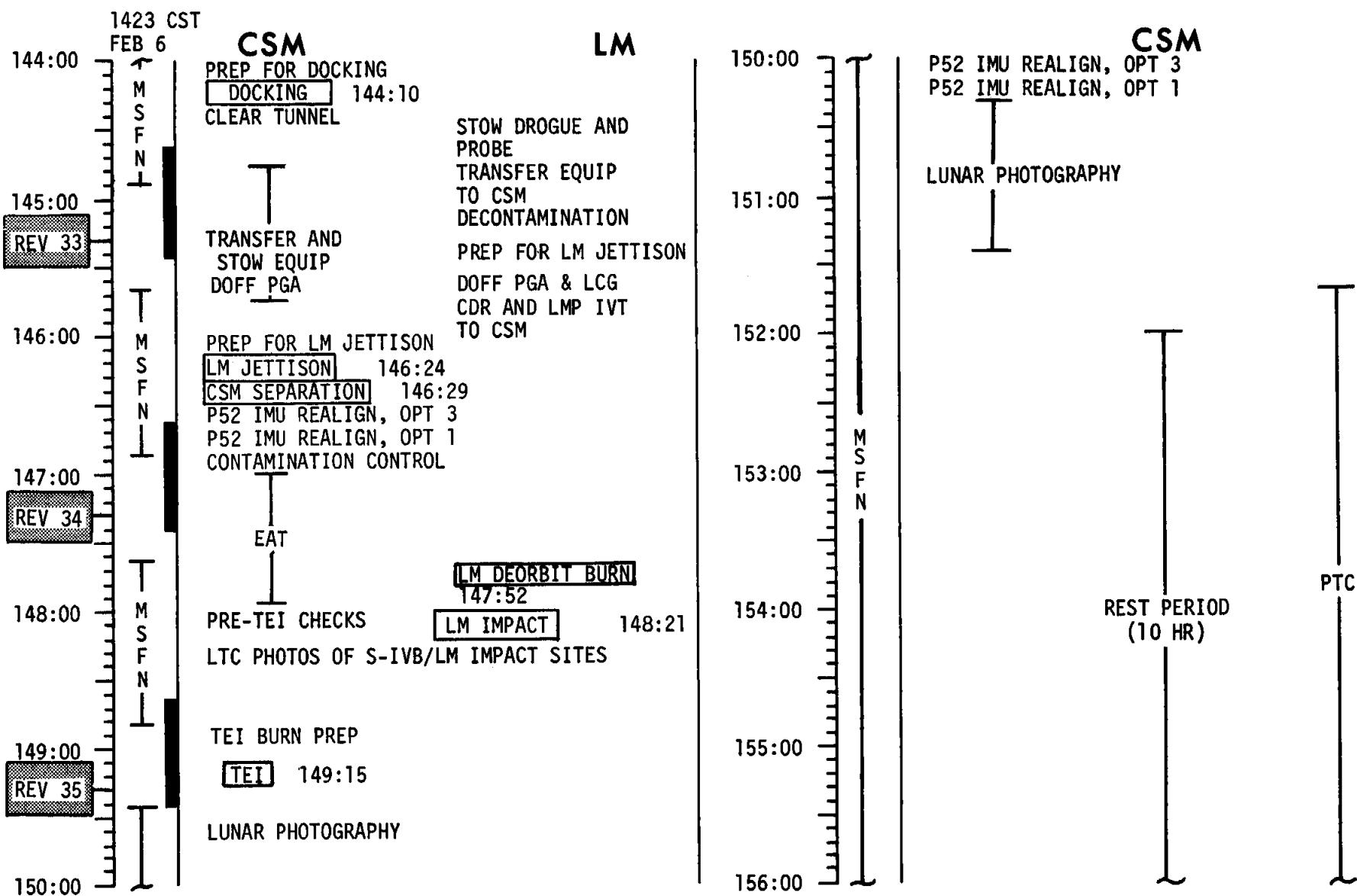
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	120:00 - 132:00	5-6/20-26	5-11

FLIGHT PLAN

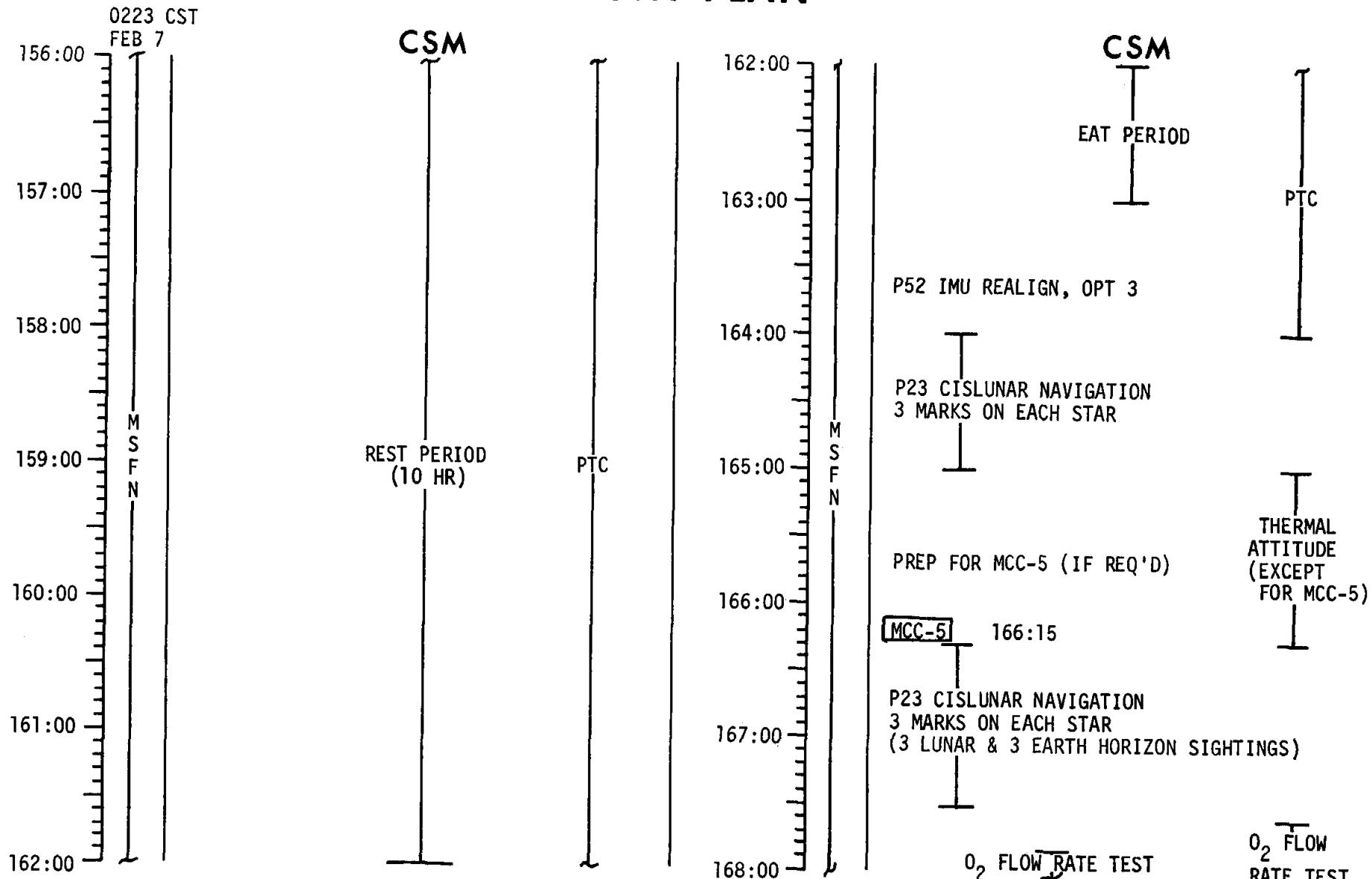


MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	132:00 - 144:00	6/26-32	5-12

FLIGHT PLAN

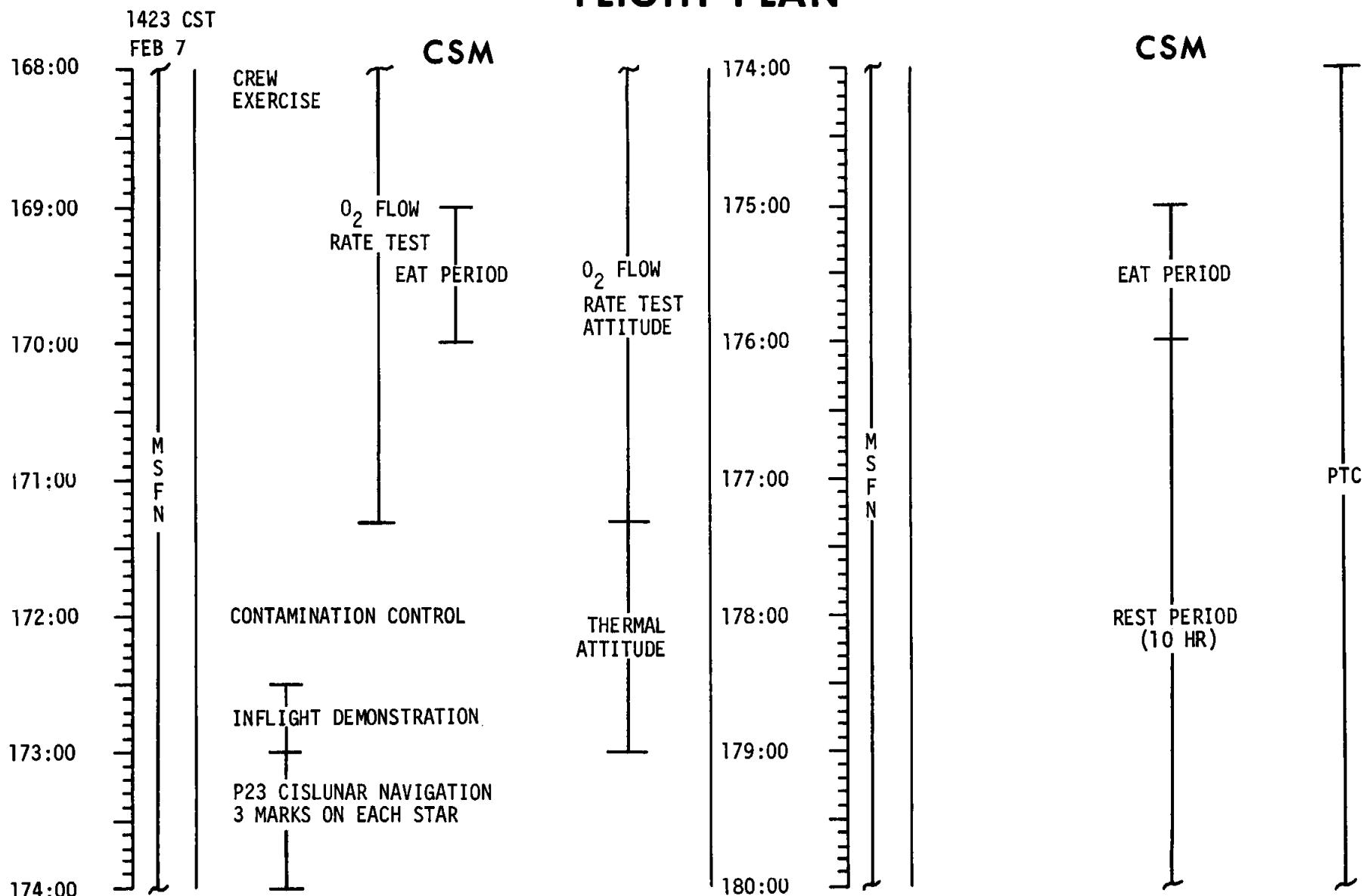


FLIGHT PLAN



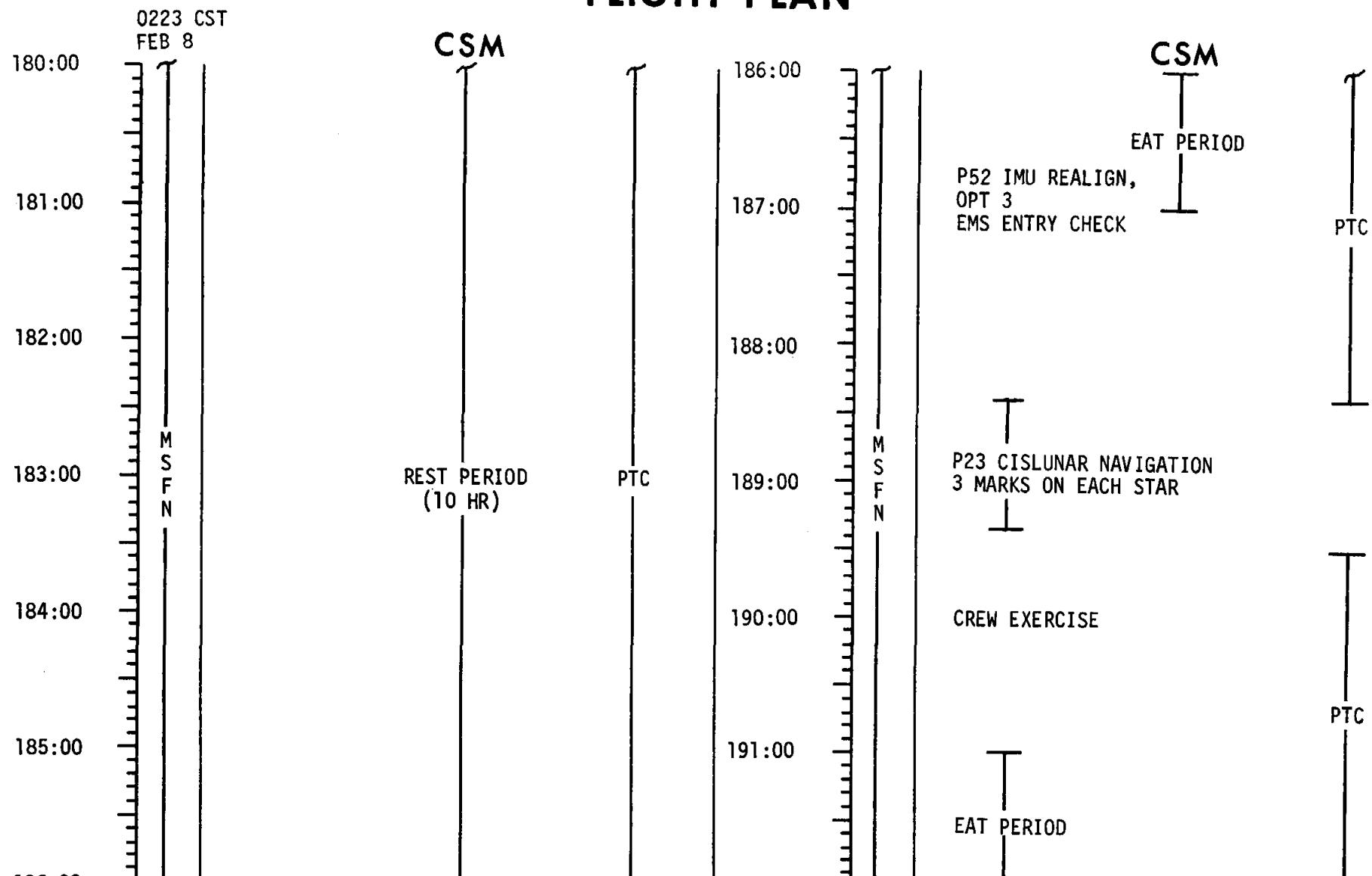
MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	156:00 - 168:00	6-7/TEC	5-14

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

1423 CST
FEB 8

CSM

P52 IMU REALIGN, OPT 3

P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR

PREP FOR MCC-6 (IF REQ'D)

MCC-6 194:27

CONTAMINATION CONTROL

P23 CISLUNAR NAVIGATION
3 MARKS ON EACH STAR

EARTH DARKSIDE
DIM LIGHT PHOTOS

M
S
F
N

FLIGHT PLAN

PTC

198:00

199:00

200:00

201:00

202:00

203:00

204:00

PTC IF
NO MCC-6

PTC

CSM
BACKUP GDC ALIGNMENT
CRESCENT ALIGN

EAT PERIOD

M
S
F
N

REST PERIOD
(8 HR)

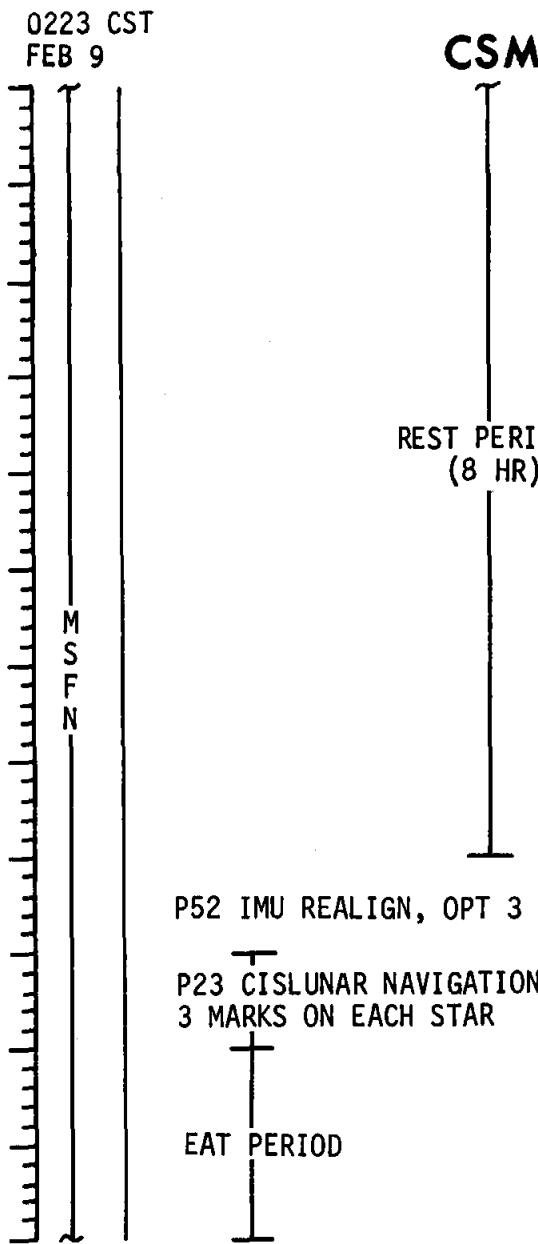
PTC

MISSION	EDITION	DATE	TIME	DAY/REV	PAGE
APOLLO 14	FINAL (JAN)	DECEMBER 2, 1970	192:00 - 204:00	8/TEC	5-17

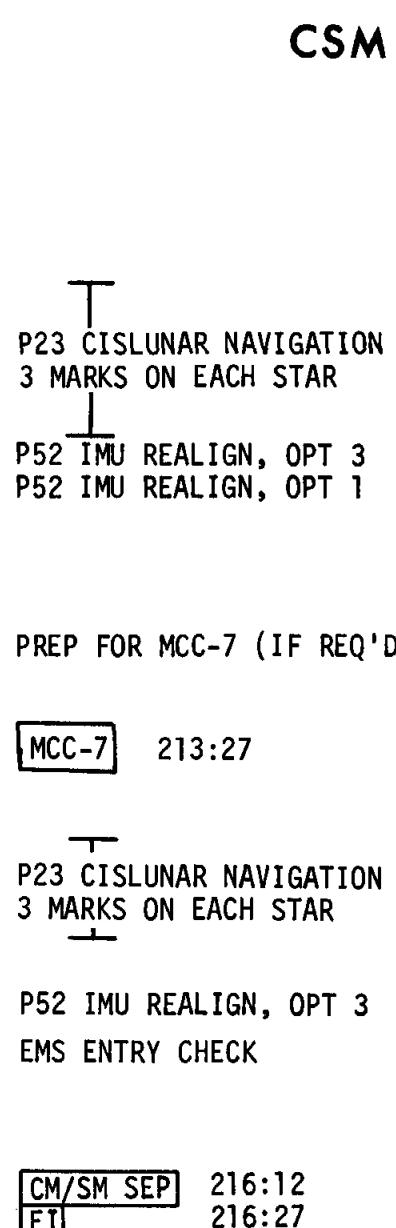
0223 CST
FEB 9

FLIGHT PLAN

204:00
205:00
206:00
207:00
208:00
209:00
210:00



210:00
211:00
212:00
213:00
214:00
215:00
216:00



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)

(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		
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	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										
GET												
LM MANEUVER DATA												
LM												
CSM												
CSM MANEUVER DATA												
CSM DEORBIT												

LM MANEUVER DATA

LM JETTISON - LM RCS
 $\Delta V = 2 \text{ FPS}$
 $(101.8198.4)$

LM DEORBIT - LM RCS
 $\Delta V = 130 \text{ FPS}$

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

NO-GO FOR TLI
FAILURE EVALUATION
NO-GO FOR TLI2
TD&E
P52 IMU REALIGN
CSM/LM-S-IVB SEP

IVT PREP
CDR AND LMP IVT TO LM
RECEIVE 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.

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.

P52 TMU REALIGN
PHOTOS - S. AMERICA
PHOTOS - EUROPE
GALACTIC LIGHT PHOTOS
GALACTIC LIGHT PHOTOS
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

P52 IMU REALIGN
PHOTOS - S. AMERICA
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

P52 IMU REALIGN
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.
PHOTOS - U.S.

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) SIMULTANEOUS 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/S-IVB SEP
 $\Delta V = 2 \text{ FPS}$
 $(103.4/99.0)$

CSM PLANE CHANGE - SPS
 $\Delta V = 3354.2 \text{ FPS}$
 $(568.2/10/.4)$

CSM ORBIT SHAPING BURN - SPS
 $\Delta V = 1302.7 \text{ FPS}$
 $(171.0/100.7)$

LIOH CANNISTER CHANGE

