

Provenance

The Eugene A. Cernan Space Collection

APOLLO 17	
LM TIMELINE BOOK	
PART NO.	S/N
SKB32100123-388	1001

Flown To Lunar Surface
Apollo XVII
E. Cernan

APOLLO 17

LM TIMELINE BOOK

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Landed on the Moon
aboard the Apollo 17 LM "Challenger"

Gene Cerny

ACKNOWLEDGMENT

<u>AREA</u>	<u>NAME/BRANCH</u>	<u>LOCATION</u>
Rendezvous (Sec. 2, 4)	S. Grega Flight Procedures CG4	Ext 5348 Bldg 4, Rm 252
Post Docking (Sec. 3)	G. Doerre Spacecraft Systems CG2	Ext 4371 Bldg 4, Rm 250

It is requested that any organization having comments in the above areas contact the responsible individuals.

THIS IS THE BEGINNING, UNDOCK TO DPS THROTTLE CHECK

NOT THE END

110:15

PREP FOR UNDOCKING

USE ACTIVATION & C.O.

C/L TO 10 MIN BEFORE UNDOCK

CHECK ATT (0, 180/284, 060)

V48 22012

LM WT 36711 (36,744)

PRO, V34

V06N20 COPY LM AND CSM ANGLES AND TIME

P47

UNDOCK & SEPARATION

V77E TRIM TO .1 FPS

P00, V60

YAW LT 60°

PITCH UP 90°

*SEQUENCE CAMERA - ON (1 MIN)

FDAI (0, 280/013, 0)

*VHF ANT - FWD

*SEQUENCE CAMERA - OFF

*SUIT GAS DIVERter - EGRESS

*CABIN GAS RETURN - EGRESS

LANDING RADAR CHECKOUT

CB(11) PGNS: LDG RDR - CLOSE

CK TEMP (60° - 95°)

X-PNTRS - HI MULT

MODE SEL - LR

TM SW - H/H

LDG ANT - AUTO

RDR TEST - LDG

POWER SIGNAL LIGHT OUT

TEST MON - ALT/VEL XMTR (2.1 - 5.0), AGC

X-PNTRS PEGGED UP, LEFT

TM - H (8000 ± 100), H (-480 ± 2)

V63 N12 OPT 2, PRO

N66 8286 ± 10, ANT POS 1 (00001), PRO

N67 V_x (-00495 ± 2), V_y (+01862 ± 2),V_z (+01331 ± 2)

V34, RDR TEST OFF (ALT - 0, POWER SIGNAL

LIGHT ON, X-PNTRS - CENTERED)

CB(11) PGNS: LDG RDR - OPEN

110:35

110:35

30109

28453

35948

22012

110:28

110:24

110:24

110:24

110:24

110:24

110:24

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110:24

*CAMERA SETTINGS FOR CABIN PHOTOS
 *LM/DAC/10/CEX (T/1.8, 1/60, 2ft)
 * 6 FPS, .125 MAG 0, (2 MIN)
 *LM/DC/60/CEX (f5.6, 1/30, FOCUS)
 * 5 FR, MAG A

*S-BD ANT - FWD, VERIFY COMM
 *V-S-BD P (9)
 * Y (-37)
 *S-BD ANT - SLEW (>3.0)
 *TRACK MODE - AUTO
 *VHF B XMTR - OFF
 *BIOMED - LEFT, PCM - HI
 *UPLINK SQUELCH - OFF

VOICE N20 ANGLES AND TIME TO MSFN

DPS THROTTLE CHECK

*CB(16) STAB/CONT: ENG ARM - CLOSE
 THROT CONT - MAN/CDR
 TTCA (BOTH) - THROTTLE (MIN)
 *VERIFY MSFN CONTACT
 ENG STOP - PUSH
 ENG ARM - DES (DES REG LT - ON)
 TTCA MIN (6.6% - 13.4%)
 THEN SOFT STOP (46.2% - 59.2%)
 THEN MAX (93.6% - 100+%)
 THEN MIN

ADJUST FRICTION

MAN THROT - LMP
 *REPEAT TEST FOR LMP TTCA
 ENG ARM - OFF
 *CYCLE CMEA (DES REG LT - OFF)
 ENG STOP - RESET
 THROT CONT - AUTO/CDR
 TTCA (BOTH) - JETS

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110:45

UNDOCK TO DPS
THROTTLE CHECK

DPS PRESS TO
MSFN UPDATE

DPS PRESS TO MSFN UPDATE

22012

DPS PRESS & C.O.

PRPLNT TEMP/PRESS MON - DES 1 & 2

FUEL 50°-75°F 50-130 PSI

OXID 50°-75°F 30-80 PSI

HELIUM MON: SUPCRIT PRESS 1070-1570

: AMB PRESS 1495-1750 1620 bp

DES He REG 1 tb - GRAY, REG 2 tb -

MASTER ARM - ON

DES PRPLNT ISOL VLV - FIRE

He PRESS/DES START - FIRE

MASTER ARM - OFF

PRPLNT TEMP/PRESS MON: DES 1 & 2

FUEL & OXID 50°-90°F 200-250 PSI

HELIUM MON: AMB PRESS 200-1110

: SUPCRIT PRESS 1070-1570

AGS ACTIVATION

*AGS STATUS - STBY (MASTER ALARM,
* & AGS WARNING LT - ON)

*CB(16) STAB/CONT: AEA - CLOSE

* (AGS WARNING LT - OFF)

CB(11) AC BUS B: AGS - CLOSE

*RECORD TIME 110:52:00

*AGS STATUS - OPERATE (MASTER ALARM,

* & AGS WARNING LT - ON)

*02/H2O QTY MON - C/W RESET

*ATT MON (LMP) - AGS

*412R+1 SELF TEST SATISFACTORY

*000 +888888 (OPR ERR LT - ON)

*123 -45679 (DO NOT ENTR)

*V16 N65E

*SET AGS TIME USING 110 HR BIAS

* 377 (+00450)

*616+0

*224 (+60457)

*225 (+29364)

*226 (+60366)

*305 (+00642)

*662 (-33007)

*673 (-54456)

*574R DESCENT STAGE (+ NOT STAGED)

*604R LUNAR SURFACE FLAG

* (+ NOT ON LUNAR SURFACE)

*612R STAGING COUNTER (+0 NOM)

*232R +00600

*233R +00250

*464R +00500

*465R +00195

*623R +00000

*514R -60000

*515R -44223

*516R +00000

MSFN UPDATE

*COPY AGS K FACTOR 109:59:59.94

V47E

V25E LOAD AGS K FACTOR UPDATE

*414+1

*400+3 (AFTER 50 16)

V83, SET ORDEAL

*317R, 440R (0.20NM, 1fps)

110:50

110:55

110:45

110:50

AGS CHECK TO COAS CAL

AGS CONT CHECK

MODE CONT (AGS) - ATT HOLD
GUID CONT - AGS
MNVR TO FDI (0, 315/330, 0) IF DYNAMICS

ABNORMAL,
SAY "SHIT"

*CAMERA SETTINGS FOR REV 12 TCA
*LM3/DAC/10/CEX (T/2.8, 1/250, ∞)
* 1 FPS, .05 MAG 0, (5 MIN)
*LM/DC/60/CEX (f5.6, 1/125, 74 ft)
* 5 FR, MAG A

*SEQUENCE CAMERA - ON (1110:56)

REV 12 LS TCA : : (111:01)

*SEQUENCE CAMERA - OFF

RENDEZVOUS RADAR CHECKOUT

GUID CONT - PGNS
CB(11) AC BUS A: RNDZ RDR - CLOSE

CB(11) PGNS: RNDZ RDR - CLOSE
*VHF A XMTR - VOICE/RNG

✓ TEMP (10° - 75°)

RT/ERR MON - RR

RR SLEW, MANUAL LOCK-ON, RR LGC

TM - RNG/RNG RT

V63, PRO, NO TRACK LIGHT OUT, PRO, N78

COMPARE N78, VHF, TM
V34

*VHF A XMTR - VOICE
V41N72E (+18000, +28300)

CB(11) PGNS: RNDZ RDR - OPEN

CB(11) AC BUS A: RNDZ RDR - OPEN

V44, RR - SLEW

RT/ERR MON - LDG RDR/CMPTR

TM - H/H

111:05

22012

MSFN UPDATE

*COPY CSM CIRC P76
*COPY PADS FOR
* NO PDI + 12 ABORT
* PDI
* PDI EARLY ABORT
* PDI LATE ABORT
* T2 ABORT
* T3 TIG
* SHE PRESSURE
*SET DET TO COUNT DN TO DOI-2

IMU FINE ALIGN

V76
P52 OPT 3
CB(11) AC BUS B: AOT LAMP - CLOSE
AOT - DETENT F/0.0°
PGNS MODE CONT - AUTO
1ST STAR PROCYON (216)
PRO
2ND STAR ALDEBARAN (211)
N05 ANGLE DIFF 00003
PRO
N93 TORQUING ANG
X +000056
Y +000044
Z -000020
PRO, RCD GET : :
N25, (ENTR FOR NO COAS CAL)

COAS CALIBRATION

PRO, ENTR
N70, ENTR 011 (ALDBN), PRO
N87, (+00000, +00000) PRO, PRO
P00

DETENT CL
CB AOT LAMP - OPEN

BIAS AZ 0

EL 549

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	R	R
MAX Δ.27 NM	7 FPS	
N78	.52	.6
VHF	.50	1.0
TM	32.00	

111:20

AGS CHECK
TO COAS CAL

MSFN UPLINK
TO DOI-2

MSFN UPLINK TO DOI-2

*400R+0
*READ AND RECORD CAL VALUES

INIT	CAL	Δ LIM	Δ Nom
540 -00002	-3	± .039	0.0
541 -00002	7	± .039	0.0
542 -00002	0	± .039	0.0
544 -00002	32	± 2.00	0.3
545 -00101	87	± 2.00	0.3
546 -00023	63	± 2.00	0.3

GO/NO GO FOR DOI-2

CONFIGURE COMM FOR LOS

- *MATCH INDICATED ANGLES
- *TRACK MODE - SLEW
- *S-BD ANT - FWD
- *SET P (+90)
- *Y (-45)
- *PCM - LO
- *UPLINK SQUELCH - ENABLE
- *COMM CHK WITH CSM

DOI-2 PREP

- P30 LOAD PAD
- SET DET, PRO
- P41
- N18 R,P,Y BYPASS MNVR
- N85
- MNVR TO N85 -VGX,0,0 (0,085,0)
- V77E
- N40E
- √DET, VG
- *410+5, 373+TIG
- *450-VGX, 451+0, 452+VGZ
- *310R √DET, 370R √VG
- *500R

CSM CIRC 111:52:3009(111:55)

DOI-2 112:02:4092(112:01) [5 MIN MAX SLIP]

T=0 NULL VG'S TO .2FPS
V82E √HP (7.2)

0 +.1 +.1 61.4 x 7.0 (6.7)

22012 111:45

*UPDATA LINK - DATA
*UPLINK CSM/LM S.V., E-MEMORY
*DESCENT TARGETING
*UPDATA LINK - OFF
*COPY AND LOAD GYRO DRIFT COMP, PIPA BIAS
* (REF P2 DATA CARD BOOK)

None

V47 *414+1 400+3
V83, SET ORDEAL
*317R, 440R

MNVR TO AGS CAL ATT

V49, +02250 OGA ROLL 24 }
+06750 IGA PITCH 77 } FDAI
+02250 MGA YAW 339 }

*VHF ANT - AFT
*VHF B XMTR - DATA
*VHF / WITH CSM

AGS CALIBRATION

*READ AND RECORD INITIAL CAL. NOS.
PGNS MODE CONT - ATT HOLD
*VERIFY 25 MIN SINCE TURN-ON
V60, V76, V16N20E
RATES < 0.075°/SEC
*400+6 (647R > 00034)
*400R

MONITOR ICPU LIMITS

{ OGA +00000 / +04500 }
{ IGA +04500 / +09000 } LIMITS
{ MGA +00000 / +04500 }

BEFORE LIMITS ARE EXCEEDED, 400+0.
IF TIME IS LESS THAN 5 MINUTES
REPEAT AGS CALIBRATION

*CHECK ECS, RCS, EPS, APS
*CYCLE CMEA CB

111:45

112:05

P76 (UPDATE CSM S.V.) TO MSFN UPLINK

112:15

P76 (UPDATE CSM S.V.) PRO
V82 ✓CSM HA/HP (70.3/54.3) (70.1 x 55.0)
*PCM - HI

V47 *
*414+1
V83 *
*317R, 440R
*PCM - LO
*373 _____ (+01696)(PDI)
*410+0 *

P63 IGNITION ALGORITHM TEST

P63 *
*RESET DET TO COUNT DN TO PDI
PGNS MODE CONT - AUTO
N18 R, P, Y (0, 108, XXX) PRO
YAW TO 290°
P00
V48, 22112, 00011, PRO, V34

22112

*CAMERA SETTING (PDI)
*LM3/DAC/10/CEX-WDG (T/2.8, 1/500, ∞)
* 12 FPS, .75 MAG (6 MIN)
*CAMERA SETTING (EARTH RISE)
*LM/DC/60/CEX (f16, 1/250, 74 ft)
* 5 FR, MAG A

COAS TO OVERHEAD WINDOW
VERIFY LOOSE GEAR STOWED
RESTRAINTS ATTACHED
VERIFY FDAI'S INERTIAL

PRE-PDI ECS CHECKOUT

HELMETS AND GLOVES ON
*CABIN REPRESS - CLOSE
*SUIT GAS DIVERter - EGRESS
*CABIN GAS RETURN - EGRESS
*PRESS REGS A&B - EGRESS

PRE-PDI SWITCH SETTING CHECK

*VHF ANT - FWD
CB(11)EPS: INV 1 - CLOSE
*SELECT INV 1

112:15

CB(11) STAB/CONT: AELD - CLOSE
CB(11) STAB/CONT: ABORT STAGE - CLOSE
RESET ENG STOP PB
SET WINDOW BARS

*CB(16) STAB/CONT: AELD - CLOSE
CB(16) STAB/CONT: ABORT STAGE - CLOSE
*CYCLE CWEA CB
*BATS 5 & 6 NORM FEED - ON
*RECORD GET/12:19:00
-35 or Earlier

THROT CONT - AUTO
CDR TTCA - THROTTLE - MIN
*LMP TTCA - THROTTLE SOFT STOP
RATE SCALE - 25°/SEC
ATT/TRANSL - 4 JET
CHECK DPS, APS, RCS, ECS, EPS, RECORD APS DATA
CHECK SWITCH GUARDS
PRPLNT QTY MON - DES 1
✓DPS CONFIG CARD

✓ PDI RULES

AUDIO MODE (BOTH - VOX)
*S-BD ANT - FWD, VERIFY COMM
*S-BD P _____ (-33)
* Y _____ (+54)
*S-BD ANT - SLEW (>3.0)
*TRACK MODE - AUTO
*S-BD P _____ (-24)
* Y _____ (-3)
*VHF B XMTR - OFF
*BIOMED - LEFT, PCM - HI
*UPLINK SQUELCH - OFF
DOI-2 BURN REPORT
*CHECK ED BATTs AND REPORT
*VOICE ASC BATT ON TIME TO MSFN

MSFN UPLINK, UPDATE

*UPDATA LINK - DATA
*UPLINK LM S.V., RLS
*UPDATA LINK - VOICE BU
*COPY, LOAD AGS RLS (231) _____

P76 TO MSFN
UPLINK

AGS INITIALIZE
TO PDI

AGS INITIALIZE TO PDI

22112

AGS INITIALIZE
V47

*414+1

V83

*317R, 440R
*240 + (231 RLS PAD)
*254+01944
*262-00143
*400+3
*400+1

MODE SEL - AGS

*X-PTA-LO MULT

POWERED DESCENT INITIATION
V25 N69E (IF NO UPLINK)

-8

P63
PGNS MODE CONT - AUTO (V77)
AGS MODE CONT - AUTO
*RESET DET
N18, R, P, Y (0, 108, 290)
VERIFY FDAI

-5 CB(11) PGNS: LDG RDR - CLOSE

✓ALT XMTR
PRO - FINAL TRIM
ENTR, ✓DET
GO/NO-GO FOR PDI
COMM CHECK WITH CSM
RESET WATCH

-4

MASTER ARM - ON
MODE SEL - PGNS
*471R

-2:00

-0:30 ENG ARM - DES
-0:07.5 ULLAGE
-0:05 PRO

0:00 PDI 112:49:235 (112:49:38)
+0:02 (NO IGN) - START PB - PUSH
+0:05 DES ENG CMD OVRD - ON
MASTER ARM - OFF

112495187
+2.8

GO-AROUND

SECURE SYSTEMS

ENG ARM - OFF
MASTER ARM - OFF
P00

LR - OFF

ASC BATTS - OFF

PRLPNT QTY MON - OFF

AUDIO - PTT

ECS - CABIN MODE

HELMETS & GLOVES - OFF (OPTIONAL)
AGS - ATT HOLD

ALIGN IMU

P52 (SAME STARS)
400+3

MSFN UPDATE

COPY PADS FOR:

NO PDI + 12

PDI

PDI EARLY ABORT

PDI LATE ABORT

T2 ABORT

T3 TIG

AGS ABORT CONSTANTS

224,225,226,305,662,673

AGS T2 UPDATE - 254

AGS 373 UPDATE

MSFN UPLINK

DESCENT TARGETING, ABORT CONSTANTS,
V47 LM & CSM S.V.

CONFIGURE COMM FOR LOS

PICK UP WITH P63 IGNITION ALGORITHM TEST, P.5

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[Signature]

PDI THRU TD+3 MIN

-2:00 MASTER ARM-ON
MODE SEL-PGNS

471R

- :30 ENG ARM-DES

- :07.5 ULLAGE

- :05 PRO

+ :00 **PDI**

+ :02 (NO IGN) ----

START PB-PUSH

+ :05 DES ENG OVRD-ON

MASTER ARM-OFF

+ :26 THROTTLE UP

 $\sqrt{T/W} > 1.6$

367R

+2 V21 N69E (DN RNG)

+4 ✓ ED BATTS

YAW TO 340°

V57E TO PERMIT

LR DATA

+5 V24 N69E (DN RNG,

X-RNG)

30K, YAW = 0

N68

EVAL MAIN CONT

+8 V23 N69E (ALT)

223+00130 (E @ 13K)

360-0XXX0E

TFI	θ	ΔHMAX	(-HMAX) -HDOT	H	DPS	SBD
0:00	108	1310	67.0	56500	95	-33/54
0:30	108		66.0	54500	95	
1:00	98	1410	69.0	52400	95	-23/55
1:30	93		69.0	50300	92	
2:00	89	1400	68.0	48300	87	-8/55
2:30	85		65.0	46300	82	
3:00	82	1310	63.0	44400	76	3/53
3:30	79		62.0	42500	71	
4:00	77	1230	63.0	40600	66	11/51
4:30	76		66.0	38800	61	
5:00	75	+19800	70.0	36200	55	-19/14
5:30	73	+19800	76.0	34000	50	
6:00	72	+19800	85.0	31100	45	-17/13
6:30	72	+19800	(516.0)	30800	39	
7:00	67	+19800	(480.0)	26900	34	-27/-3
7:30	63	+16000	(450.0)	23900	30	
8:00	57	+11200	(402.0)	19500	27	-20/-9
SEQ CAMERA - ON			133.0			
8:30	56	+8400	(348.0)	15000	24	
9:00	56	+8000	(288.0)	10700	21	-19/-10
			154.0			

P64

P64 + 15 SEC:
NO THROTTLE DN
- ABORT

169 + 03400
7+26

MODE CONT (PGNS)-ATT HOLD

P66

X-PNTR - LO MULT

BINGO FUEL
DES QTY LT+1+31

TOUCHDOWN

ENG STOP - PUSH

ENG ARM - OFF

PRO

DES ENG CMD OVRD - OFF

MODE CONT (PGNS)-ATT HLD

MODE CONT (AGS)-AUTO

413+1

RECYCLE PARKER VALVES

THROTTLE/JETS - JETS

H	(-HMAX) -HDOT	DPS	VH (362)
7000	(225.0) 169.0	18	258
6000	(206.0) 152.0	18	240
5000	(184.0) 132.0	17	223
4000	(161.0) 110.0	16	200
3000	(134.0) 88.0	15	173
2000	(103.0) 63.0	14	138
1000	(63.0) 35.0	12	85
500	(35.0) 17.0	11	43
400	(28.0) 14.0	11	31
300	(20.0) 9.0	10	16
200	(12.0) 5.0	9	-5

ABORT STAGE - PUSH

ENG ARM - ASC

ENG STOP - RESET

ENG START - PUSH

V22 N46 E,E

MODE CONT (BOTH) - AUTO

PDI THRU
TD+3 MIN

TD+3 THRU
T2 ABORT

TD +3 THRU T2 ABORT

N76 5515.7 V HORZ
19.5 V VERT
CROSS RNG (<8.1)
N74 TFI, YAW, PITCH

*
*RECYCLE PARKER VALVES
PRPLNT TEMP PRESS MON - ASC, THEN DES
ASC He MON - CYCLE
*02/H2O QTY MON - ASC 1, 2, THEN DES 2, 1 *
*SEQUENCE CAMERA - OFF *
CB(11) PGNS: LDG RDR - OPEN

223/360 TO 40 AS REQUIRED

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[Signature]

17:16 T1 STAY/NO STAY

NO STAY

V22 N46 E,E
MODE CONT (BOTH) - AUTO
ABORT STAGE - PUSH
ENG ARM - ASC
ENG STOP - RESET
ENG START - PUSH

STAY

*414+2
*400+4
*400+1 (DO NOT ENTR)

P68
ENG STOP - RESET
PRO
P12
MODE CONT (PGNS) - AUTO
N33 T-2 (113:14:23)

22:45 NO STAY
T2 STAY/NO STAY AND GO/NO-GO FOR
DPS VENT
-2:00
ASC He SEL - BOTH
MASTER ARM - ON
ASC He PRESS - FIRE
ASC He REGS 1, 2 - OPEN
*A ASC FEED 2-OPEN (UNLESS CDR) *
*A MAIN SOV -CLOSE (BUSS LOSS) *
*B ASC FEED 2-OPEN (UNLESS LMP) *
*B MAIN SOV -CLOSE (BUSS LOSS) *
*CRSFD - CLOSED *
*BAT 1,3 - OFF *
*BAT 2,4 - OFF *
*CB(16) EPS:ASC ECA CONT-CLOSE *
*DES BAT - DEADFACE *
*SELECT ASC H2O TANK *
*DES 02 - CLOSE *
*ASC 1 02 - OPEN *
*DES H2O - CLOSE *
*ASC H2O - OPEN *
*400+1, 367R *
- :10 ABORT STAGE - PUSH (AT T=0 FOR AGS)
ENG ARM - ASC
- :05 PRO
- :00 *DET - RESET, RELEASE
T2 : : (113:14:23)
+ :01 ENG START - PUSH
STAY
*TAPE RECORDER - OFF
AUDIO MODE - ICS/PTT
P00

N43
20.21
30.75

FDAI AND OVERHEAD WINDOW ANGLES FOR MANUAL DESCENT ABORT

DPS/APS

1:00	260/0	4:30	0/LV	8:00	0/LV
2:24	SD(FDAI)	4:44	300/36	8:14	300/36
2:36	SD(OHW)	6:26	270/5	10:16	270/15
		7:32	250/0	14:30	250/0
		8:19	SD	14:43	SD
1:30	0/0	5:00	0/LV	8:30	0/LV
1:44	300/0	5:14	300/36	8:44	300/36
2:30	260/0	6:58	270/5	11:12	270/15
3:20	SD	8:20	250/0	15:18	250/0
		9:03	SD	15:31	SD
2:00	0/LV	5:30	0/LV	9:00	0/LV
2:14	300/36	5:44	300/36	9:14	300/36
3:00	300/0	7:34	270/10	12:10	270/16
3:18	260/0	9:04	250/0	16:04	250/0
4:16	SD	9:46	SD	16:18	SD
2:30	0/LV	6:00	0/LV	9:30	0/LV
2:44	300/36	6:14	300/36	9:44	300/36
3:46	300/0	8:04	270/11	12:56	270/16
4:02	260/0	9:50	250/0	16:44	250/0
5:12	SD	10:39	SD	16:58	SD
3:00	0/LV	6:30	0/LV	10:00	0/LV
3:14	300/36	6:44	300/36	10:14	300/36
4:34	270/0	8:34	270/11	13:16	270/16
5:10	250/0	11:04	250/0	17:32	SD
5:57	SD(FDAI)	11:47	SD		
6:06	SD(OHW)				
3:30	0/LV	7:00	0/LV	10:30	0/LV
3:44	300/36	7:14	300/36	10:44	300/36
5:24	270/0	9:06	270/14	13:48	270/16
5:54	250/0	12:26	250/0	18:05	SD
6:50	SD(FDAI)	12:53	SD		
7:02	SD(OHW)				
4:00	0/LV	7:30	0/LV	11:00	0/LV *
4:14	300/36	7:44	300/36	11:20	308/39
5:56	270/0	9:38	270/14	12:00	305/38
6:38	250/0	13:38	250/0	12:30	302/36
7:34	SD(FDAI)	13:53	SD	CONT MANUAL	
7:40	SD(OHW)			ASCENT ANGLES	

AT 2:00 min

APS

ALL PITCH RATES
5°/SEC

1:00	260/0	4:30	0/LV	8:00	0/LV
2:18	SD(FDAI)	5:10	300/36	8:40	300/36
2:36	SD(OHW)	6:22	270/10	12:06	270/14
		8:26	250/0	14:26	250/0
		8:51	SD	15:05	SD
1:30	0/LV	5:00	0/LV	8:30	0/LV
2:10	260/0	5:40	300/36	9:10	300/36
3:32	SD(FDAI)	7:08	270/10	13:00	270/14
3:52	SD(OHW)	9:20	250/0	15:02	250/0
		9:46	SD	15:50	SD
2:00	0/LV	5:30	0/LV	9:00	0/LV
2:40	300/0	6:10	300/36	9:40	300/36
3:10	260/0	7:54	270/12	13:54	270/14
4:24	SD(FDAI)	10:14	250/0	15:34	250/0
4:34	SD(OHW)	10:42	SD	16:31	SD
2:30	0/LV	6:00	0/LV	9:30	0/LV
3:10	300/0	6:40	300/36	10:10	300/36
4:00	250/0	8:44	270/14	14:30	270/14
5:18	SD	11:08	250/0	16:12	250/0
		11:37	SD	17:07	SD
3:00	0/LV	6:30	0/LV	10:00	0/LV
3:40	300/36	7:10	300/36	10:40	300/36
4:22	270/0	9:34	270/14	14:30	270/14
5:28	250/0	12:02	250/0	17:00	250/0
6:09	SD	12:33	SD	17:37	SD
3:30	0/LV	7:00	0/LV	10:30	0/LV
4:10	300/36	7:40	300/36	11:10	300/36
5:00	270/5	10:24	270/14	14:48	270/14
6:30	250/0	12:56	250/0	17:50	250/0
7:02	SD	13:28	SD	18:09	SD
4:00	0/LV	7:30	0/LV	11:00	0/LV *
4:40	300/36	8:10	300/36	11:20	308/39
5:40	270/5	11:12	270/14	12:00	305/38
7:28	250/0	13:48	250/0	12:30	302/36
7:56	SD	14:19	SD	CONT MANUAL	
				ASCENT ANGLES	

AT 2:00 min

* ESTABLISH POSITIVE
HDOT, THEN ABORT
STAGE

MANUAL ABORT

ASCENT
MONITOR

188.01:36

TIG-2 MASTER ARM - ON
AUDIO MODE (BOTH) - VOX
400+1E GUID STEERING
RESET WATCH
367R (604+0 FOR AGS)
START CAMERA
ABORT STAGE - PUSH (AT T=0 FOR AGS)
ENG ARM - ASC
PRO
+ :00 ASC (188:03:15)
+ :01 ENG START-PUSH (IF AUTO IGN)
AGS MODE CONT - AUTO
CHECK S-BD ANT
+1:00 YAW RT 30°, 623+1
N76E (VTGT, HDOT, XRG)
V16 N77E (Tgo, VGY, VI)
+4:00 STOP CAMERA
500R
500 FPS MAIN SOV (2) - OPEN+
ASC FEED 2 (2) - CLOSE+
200 FPS ENG ARM-OFF (IF IGN WAS AUTO)
0 FPS ABORT STAGE-RESET
ENG STOP - PUSH
410+5
PRO, NULL X < 2 FPS
PRO
STOP DET, RESET WATCH
COPY GET
ENG STOP - RESET
P00
MCC FOR TWEAK

FOR NO VOICE (TRIM <2 FPS)
PGNS, AGS DIFFER <10 FPS,
TRIM ACTIVE SYSTEM
PGNS, AGS DIFFER >10 FPS,
TRIM SYSTEM THAT AGREES
WITH RR
(10° IN OHW) (0° YAW)
V82

ASCENT

TFI	θ	OHW (0° YAW)	VGX	H DOT	H	SBD
0:00			1070.0	0.0	0	
0:10			890.0	52.0	300	
0:30	308	40	4820.0	88.0	1600	
1:00	305	38	4650.0	123.0	5000	141/-52
1:30	302	36	4470.0	149.0	9100	
2:00	299	34	4250.0	168.0	13900	145/-47
2:30	296	32	4000.0	181.0	19200	
3:00	293	30	3720.0	188.0	24700	148/-42
3:30	289	27	3400.0	188.0	30400	
4:00	286	25	3060.0	183.0	36000	152/-37
4:30	282	22	2680.0	173.0	41300	
5:00	278	20	2270.0	157.0	46300	156/-31
5:30	274	17	1840.0	136.0	50700	
6:00	269	14	1370.0	111.0	54400	160/-24
6:30	265	11	870.0	83.0	57300	
7:00	260	8	330.0	52.0	59300	164/-20
7:18	257	6	0.0	32.0	60100	166/-15

NO AUTO IGNITION
WITHIN 30 SEC:
1. GUID CONT - AGS
2. ACA HOT FIRE
3. AGS MODE CONT - AUTO
STILL NO IGNITION:
1. ABORT STAGE - RESET
2. ENG ARM - OFF

MANUAL ASCENT (WILL NOMINALLY
BE TARGETED 11.5 MIN LATE)
CONFIGURATION NOMINAL EXCEPT:
MODE CONT - ATT HOLD
PROFILE NOMINAL EXCEPT:
7-STEP FOR DIRECT MODE

TFI	FDAI	OHW	PITCH RATES 5°/SEC
0:00	0		
0:15	305	38	
2:00	295	31	
3:00	290	28	
4:00	285	24	
5:00	275	18	
6:00	265	11	
7:00	260	8	

MSFN WILL CALL PITCH AND
ROLL BIAS COMMANDS FROM
GROUND TRACKING.

6+30 - MAIN SOV(2) - OPEN+
ASC FEED 2 (2) - CLOSE+

SHUTDOWN
ENGINE ARM OFF
STANDBY TO RESET ABORT STAGE
Pb AND DEPRESS ENGINE STOP
Pb ON CALL FROM MSFN

Landed on the Moon
aboard the Apollo 17 LM "Challenger"

MISSION APOLLO 17, OCTOBER 25, 1972

INSERTION THRU TPI

12102

TIME	RANGE	RDOT
L0+5	148	1667
L0+6	160	825
L0+7	164	-157
INS	163	-471
1+00	158	-468
2+00	154	-464
3+00	149	-460
4+00	144	-455
5+00	140	-450
6+00	135	-444
7+00	131	-437
8+00	127	-431
9+00	123	-423
10+00	118	-416

INSERTION 188:10:32
 V82
 V76
 AGS MODE CONT-ATT HOLD
 RR MODE-LGC
 RATE/ERR MON(2)-RNDZ RDR *
 SHFT/TRUN +5
 RATE SCALE 5°/SEC
 RNG/ALT MON-RNG/RNG RT
 CB(11) PGNS RR-CLOSED
 *VHF ANT-FWD
 *400+2 Z-AXIS STEER
 *410+4 TPI EXEC
 *373+0537.5 TIG TPI
 *616+00005 ULLAGE
 *623+0
 *COPY AGS DATA
 AUDIO MODE(2)-ICS/PTT
 /INV 2, CB INV 1-OPEN
 CB(11) & (16) ED: LOGIC PWR-OPEN
 CB(11) ECS CABIN FANT-CLOSE
 +1 GO/NO-GO FOR TWEAK
 P47 FDAI (0,257,30)
 *404+0, 405+0, 406+0
 *MONITOR 470, 471, 472
 +3 TWEAK 188:13:32 1212
 ΔV'S -4.0 -9.9+1.0

12102
 P47 FDAI (0,242,0) OR 10° OHW
 *404+0, 405+0, 406+0 *
 *MONITOR 470, 471, 472 *
 42 LM BAILOUT @ L.O.+12:10
 TIG 188:15:32
 ΔVX 39.4
 *EXT LTG-TRACK
 P20, AUTO MNVR
 V80, MAX N49(2.00,12.0)
 P34 TGT TPI
 *VERIFY PGNS WITH MSFN *
 *V47, 414+1, 400+3 *
 *400+2 Z-AXIS STEER *
 *417+1 (7417+0) *
 *411+1 START AUTO(19,18) *
 *310R SET DET *
 *303R @ TPI *
 V82
 V83 SET ORDEAL (35NM)
 *317R, 440R, 277R
 V48, 12012
 LM WT
 35 CSM BAILOUT GET P76 PAD
 30 CHART R/RDOT
 27
 M=15, V32
 24
 *COMPARE CMC, AGS, VHF/RR *
 *POLAR PLOT @ 90 NM
 21
 *CHECK RCS, EPS, ECS
 18

15

*514+0
 *515+4 YAW STEER VEC
 *516+0

12

RDOT }R
 RDOT }R

10 CHART R/RDOT/θ
 RDOT }R

9
 8 PRO-FINAL COMP
 RDOT }R

*411+0 STOP AUTO
 *COMPARE CMC, AGS
 CHECK TIG OF CSM
 */DET & APS BURN CARD
 P42 N86
 *MATCH INDICATED ANGLES
 *TRACK MODE-SLEW
 *S-BD ANT-AFT
 SET P Y (+132)
 Y (-2)
 *BIOMED-OFF, PCM-HI
 *UPLINK SQUELCH-ENABLE
 *404+0, 405+0, 406+0
 *623+1
 *400+1 GUID STEER
 *410+5
 *500R
 ATT CONT-
 MODE CONT

6
 *411+0 STOP AUTO
 *COMPARE CMC, AGS
 CHECK TIG OF CSM
 */DET & APS BURN CARD
 P42 N86
 *MATCH INDICATED ANGLES
 *TRACK MODE-SLEW
 *S-BD ANT-AFT
 SET P Y (+132)
 Y (-2)
 *BIOMED-OFF, PCM-HI
 *UPLINK SQUELCH-ENABLE
 *404+0, 405+0, 406+0
 *623+1
 *400+1 GUID STEER
 *410+5
 *500R
 ATT CONT-
 MODE CONT

5
 *411+0 STOP AUTO
 *COMPARE CMC, AGS
 CHECK TIG OF CSM
 */DET & APS BURN CARD
 P42 N86
 *MATCH INDICATED ANGLES
 *TRACK MODE-SLEW
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 SET P Y (+132)
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 *404+0, 405+0, 406+0
 *623+1
 *400+1 GUID STEER
 *410+5
 *500R
 ATT CONT-
 MODE CONT

1:00 AGS MODE CONT-AUTO
 :30 ABORT STAGE PB-PUSH
 :10 MANUAL ULLAGE
 :05 PRO
 :00 TPI 188:57:32
 ABORT STAGE PB-RESET
 NO IGNITION
 ENG ARM-ASC
 MANUAL START
 MANUAL STOP 3 SEC
 ENG ARM-OFF
 NULL RESIDUALS

1:00 AGS MODE CONT-AUTO
 :30 ABORT STAGE PB-PUSH
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 :05 PRO
 :00 TPI 188:57:32
 ABORT STAGE PB-RESET
 NO IGNITION
 ENG ARM-ASC
 MANUAL START
 MANUAL STOP 3 SEC
 ENG ARM-OFF
 NULL RESIDUALS

INSERTION
THRU TPI

MISSION APOLLO 17, SEPTEMBER 1, 1972

MAN AGS UPDATES

P00 11002
V48, 11002
P47, V63
*404+0, 405+0, 406+0

S-BD ANT-AFT, VERIFY COMM
*V/S-BD P (Y) (+132)
*S-BD ANT-SLEW (>3.0) (-2)
*TRACK MODE-AUTO
*BIOMED-LEFT, PCM-HI
*UPLINK SQUELCH-OFF
TPI BURN REPORT

40 INITIATE BRAKING
30 FPS - 6000 FT DES ATTACHED
20 FPS - 3000 FT 5 FPS - 1000 FT
10 FPS - 1500 FT 3 FPS - 500 FT
5 FPS - 600 FT 1 FPS - 100 FT

*SETUP CAMERA FOR
* DOCKING:
*LM3/DAC/10/CEX-ULC
* (18,1/250,6) 1FPS
* .25 MAG(0), (4MIN)

V34, P00
V76
MANEUVER/PICTURES OF SIMBAY,RCS

55 INITIATE DOCKING

COAS TO OVHD WINDOW
*EXT LTG-DOCK
SHFT/TRUN ±50
V41N72 (+000,+320)
CB RR(2)-OPEN, V44
FDAI (180,282,300)
V77

65 CONTACT
ATT CONT -
MODE CONT

CONFIRM CAPTURE FROM CSM

MAN AGS UPDATES

aboard the Apollo 17 LM "Challenger"

CONFIRM CAPTURE FROM CSM

MAN AGS UPDATES

aboard the Apollo 17 LM "Challenger"

CONFIRM CAPTURE FROM CSM

MAN AGS UPDATES

TPI THRU DOCKING

V76
P35 TGT MCC 2
V93
*VERIFY PGNS (PCM-HI)
*V47, 414+1, 400+3
*411+1 START AUTO
*EXT LTG-OFF

AOS

*410+4 TPI EXEC
*373+TPI TIME +30 MIN
*307+013.00

17
19
21
23
24 CHART 0
25
27 PRO-FINAL COMP

28 CHART R/RDOT/0
*411+0 STOP AUTO
370R TOTAL VEL MCC2
371R ΔV TPF

*404+0, 405+0, 406+0
P41, V77

29
*410+5
*502R
ATT CONT -
MODE CONT

:05 *472R/502R

[30 MCC2]

NULL RESIDUALS

*A/H

*A/H

*A/H

*A/H

*A/H

TPI THRU DOCKING

0 TPI 188:57:32
V76, AGS MODE CONT-ATT HOLD
P35 TGT MCC 1
MAX N49(0.80,5.0)
V67 (+02000,+00020,+00005)
*400+0
*623+0
*417+1 (/621+0)
411+1 START AUTO(13,12)[]
*410+4 TPI EXEC
*373+TPI TIME +15 MIN
*307+028.00

SR

2
4
6
8
9 CHART 0
10
12 PRO FINAL COMP

13 CHART R/RDOT/0
*411+0 STOP AUTO
370R TOTAL VEL MCC1
371R ΔV TPF

*404+0, 405+0, 406+0
P41, V77

14
*410+5
*502R
ATT CONT -
MODE CONT

:05 *472R/502R

[15 MCC1]

NULL RESIDUALS

*A/H

*A/H

*A/H

*A/H

*A/H

*A/H

*A/H

*A/H

10 Receive Decontamination Bags & Jett Bag
From CSM
Transfer Purse To CSM

AOS
191
+36

11 Unstow, Vacuum/Wet Wipe as required and
Transfer to CSM:
(*Decontamination Bag Provided)
✓ 70MM Magazines (4, 3 & 2 in Bags, RHSSC)
(3 and 3 in Bags, Bot
Boot Compt)
✓ APK (1, LHMS - AFT SRC's)
✓ Flag Kit (LHMS - AFT SRC's)
✓ OPS (W/Highest Source Pressure), Perform
Checkout per Decal
✓ *SEP DSEA (Upper Boot Compt)
✓ Neutron Flux (+Z27)
✓ Core Stems (+Z27)
✓ Flight Data File (Place In Jett Bag
and Transfer to CMP)

✓ *Collection Bags (1, LHSSC) (1, RHSSC) - A7
✓ *Collection Bag (1, Recharge Station) - PGA Bag
✓ *BSLSS Rock Bag (+Z27) - A7
✓ *ISA - A2
Collection Bag (Box AFT Eng Cover) - A9

12 Unstow SRC's (2), Vacuum and Transfer to CSM
Receive B5 & B6 from CSM and Stow in SRC Rack

13 Receive Purse (empty) from CSM

14 Receive CSM Jet Bag & stow Behind LMP Restraint
Cables

15 Stow used Fecal & Urine Bags in Purse

16 Transfer Vacuum Cleaner (Leave Bag in LM)
& Purse to CSM

17 Transfer unused food to CSM

192:00

MSFN UPLINK/UPDATE

- 1 UPDATA LINK - DATA
MSFN Uplinks LM State Vector, P30
EXT ΔV Load & P99 Erasable Loads (3)
- 2 Copy LM DAP Wt & DEORBIT Burn Pad
- 3 V48, 12021, PRO
N47 5185 LM WT (From MSFN)
PRO PAD 195 N33
38
1300
- 4 V47E, 414+1
- 5 400+3

192:13

TARGET PGNS

- 1 P30 Target Impact Burn
N45
PRO, P00
ΔV 02860
BT 158
FDA 048
138
075

CONFIGURE AGS

- 1 404+0
405+0
406+0
470R

- 2 MCC-H GO/NO-GO For LM Closeout

- 3 Verify All Items in LM TO CM TRANSFER
LIST (Pg 3-6) Have been Transferred or
Will Be Transferred "ON CREW."

CONFIGURE LM FOR JETTISON

- 1 VERIFY CSM MIN DB/ATT HOLD
GUID CONT - PGNS
PGNS MODE CONT - AUTO (NO DAP Lt - OFF)
AGS MODE CONT - ATT HOLD
ATT CONT (3) - MODE CONT
Verify INV-2
- 2 VHF A: XMTR - VOICE/RANGE
: RCVR - OFF
VHF B: XMTR - OFF
: RCVR - ON
BIOMED - OFF
- 3 ASC FEED (4) - tb-bp
SYS A&B QUADS (8) - ENABLE; tb-gray
CRSFD - tb-bp
SYS A&B MAIN SOV (2) - tb-gray
- 4 SUIT CIRCUIT RELIEF - AUTO
SUIT ISOL VLV (Both) - SUIT DISC
CB(11) COMM: CDR AUDIO - Open
CB(16) COMM: S.E. AUDIO - Open
ECS: LCG PUMP - Open
Both Disconnect LM Hoses & Stow
SUIT FAN Δ P - Open
- 5 S-BAND VOICE - OFF
Verify UPDATA LINK - DATA
- 6 Configure CB's Per Chart

Landed on the Moon
aboard the Apollo 17 LM "Challenger"

[Signature]

ACA REMOVAL

PERFORM ON BACKSIDE OF MOON

1. CB(11) STAB/CONT: ATT DIR CONT - Open
: ATCA (PGNS) - Open
COMM: CDR AUDIO - Open
CB(16) STAB/CONT: S.E. AUDIO - Open
: ATCA (AGS) - Open
ACA PROP (BOTH) - DISABLE
ATTITUDE CONTROL SW's (3) - DIRECT
2. CDR's ACA
Pull slack in cables
Unlock Thumblock (rotate aft)
Rotate ACA approx. 30 Deg. forward
Remove ACA bracket screws (2) - cross slotted
Lift ACA out and remove the cable clamp screws (2) - single slot.
Disconnect PJ709A and PJ708A
Install ACA Shorting Plug on PJ709A
Install ACA Dust Cap on PJ708A
3. LMP's ACA
Remove the ACA bracket screws (2) - single slot
Lift ACA out and remove cable clamp screws (2) - single slot.
Disconnect PJ709B and PJ708B
Cover PJ709B and PJ708B with tape
4. RECONFIGURE
ATTITUDE CONTROL SW's (3) - MODE CONTROL
CB(11) STAB CONT: ATCA (PGNS) - Close
CB(16) STAB CONT: ATCA (AGS) - Close
COMM: S.E. AUDIO - Close

7 - CLOSED

[illegible]

2 - CLOSED

[illegible][illegible]

7 - CLOSED

[illegible][illegible]

POST DOCKING

5 - CLOSED

[illegible]

~~10~~ 12 - CLOSED

[illegible]

970 - CLOSED

[illegible]

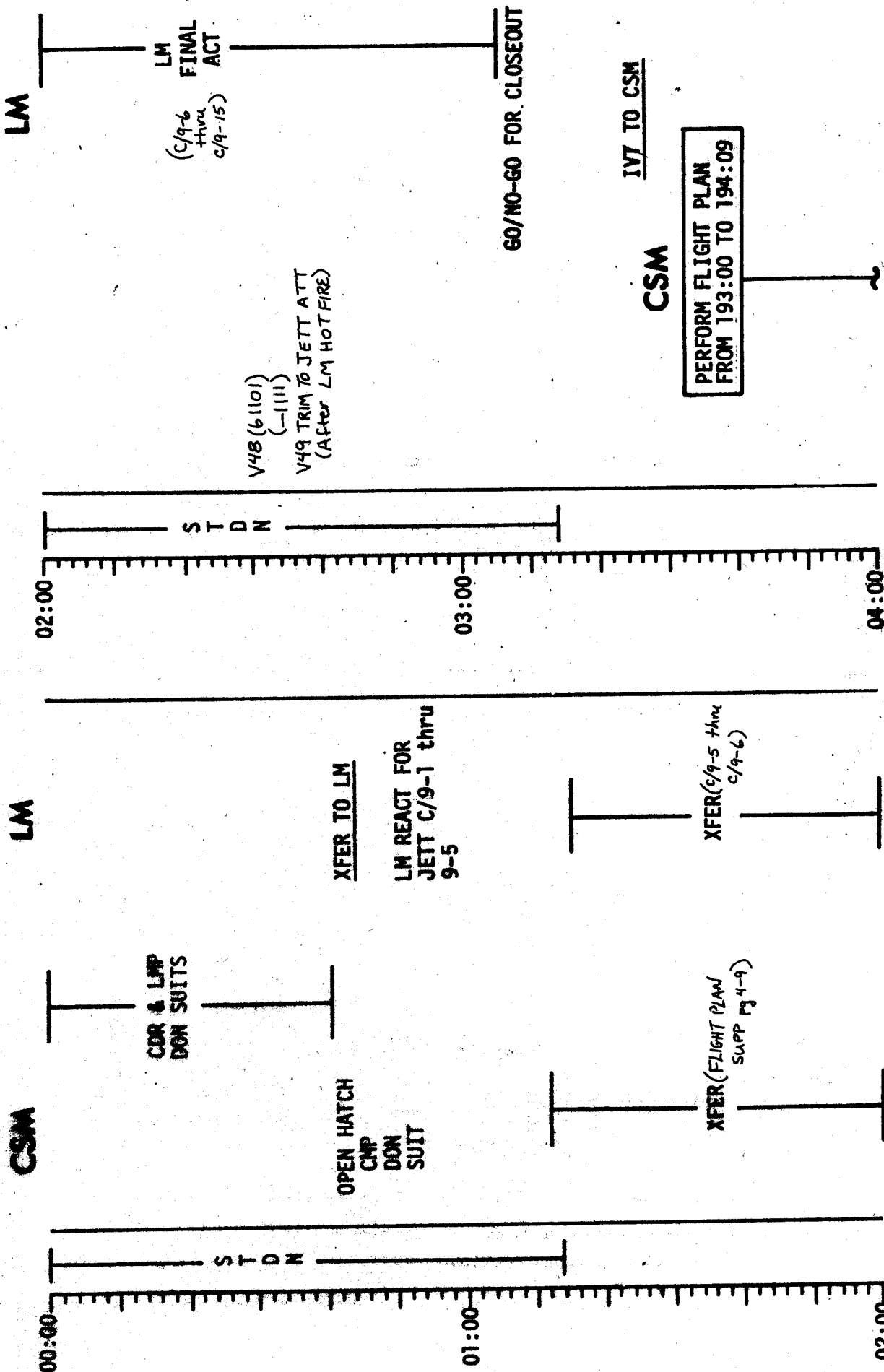
OPEN →

14 - CLOSED

[illegible]

CONT POST
DOCKING TIMELINE

CONTINGENCY LM JETT FLIGHT PLAN



CONTINGENCY LM JETT FLIGHT PLAN

CSM

04:00

04:30

05:00

06:00

LM JETT
CSM SEP

INHIBIT ALL JETS EXCEPT:

A1 & C2 OR D1 & B2, A3, C4, B3, D4

V48 (11101)

(1111)

P20 (-X SIM ATT)

N78 (+090.00)

(+052.25)

(+000.00)

N79 (+002.50)

AFTER IN ATTITUDE:

IR COVER - OPEN

UV COVER - OPEN

DOFF SUITS

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aboard the Apollo 17 LM "Challenger"



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CONTINGENCY POST DOCKING XFERCONFIGURE S-BAND

- 1 Verify FWD Dump VLV - AUTO
CB(11): ECS CABIN FAN 1 - OPEN
TAPE RECORDER - OFF
CSM Maneuvers To JETT ATT, Proceed With
~~"PREP FOR TRANSFER" Until Maneuver Completed~~
- 2 MATCH S-BAND X's
Verify: Jettison Attitude (040, 000, 139, 075)
~~SSM in Narrow Deadband, Attitude Hold~~
TRACK MODE - SLEW
- 3 S-BAND: PM, SEC, PRIM, VOICE, PCM, RANGE, RIGHT, L.O
S-BD ANT - AFT, Verify COMM
- 4 Perform DOCKED DEACTIVATION (STAGED)
LM CONTINGENCY C/L Pg 3-9, 3-10 & 3-11

PREP FOR TRANSFER

- 1 Verify Tunnel Pressurized From CSM
OVHD Dump VLV - OPEN
- 2 Doff Helmets and Gloves
- 3 Install Purse (ISA Bottom Pkt)
Remove & Stow In Purse:
CWG Adapter W/Cap (2, Fwd LHSSC)
Lt/Wt Headsets (2, LHSSC)
Purse Vlv (1, Aft LHSSC)
Waist Tethers (2, Fwd RHSSC)
Neck Ring Dust Covers (2, Aft RHSSC)
Monocular (1, RHSSC)

- 4 Remove 16mm Mag from Camr & place
In ISA Top pkt (bag)
Disconnect Lower ISA Hooks
Stow LHSSC Collection Bag Aft of Engine
Cover

- 5 When Tunnel/LM Pressures Equal,
OVHD DUMP VLV - AUTO
Verify PRESS REGS A&B - EGRESS
Place LEVA Bags On Floor, Right Side-Fwd
- 6 Open Hatch
Receive Probe From CMP, And Stow On Left
Hand Side Using Outboard (Double)
Restraint Cable
Receive Drogue From CMP and Stow Over
Probe Using Inboard (Single) Restraint
Cables Through Drogue Handles
- 7 Receive Vacuum Cleaner Assembly From CMP
Transfer LEVA Bags (2), Helmets, & IV Gloves
w/Liner to CMP
- 8 Vacuum PGA's
- 9 Receive Decontamination Bags
Transfer Purse to CSM

Landed on the Moon
aboard the Apollo 17 LM "Challenger"

CONT
XFER

CSM
XFER

- 10 Unstow, Vacuum/Met Wipe as required and Transfer to CSM:
 (*Decontamination Bag Provided)
 70MM Magazines (4, 3 & 2 in Bags, RHSSC)
 (3 and 3 in Bags, Bot Boot Compt)
 *SEP DSEA (Upper Boot Compt)
 Neutron Flux (+Z27)
 Core Stems (+Z27)
 *Collection Bags (1, LHSSC) (1, RHSSC) - A1
 *Collection Bag (1, Recharge Station) - PGA Bag
 *BSLSS Rock Bag (+Z27) - A7
 *ISA - A2
 Collection Bag (Box AFT Eng Cover) - A9
 - 11 Unstow SRC's (2), Vacuum and Transfer to CSM
 Receive B5 & B6 from CSM and Stow in SRC Rack
 - 12 Receive CSM Jet Bag & stow behind LMP Restraint Cables
 - 13 Transfer Vacuum Cleaner (Leave Bag in LM)
- LM CLOSEOUT
- 1 MCC-H GO/NO-GO FOR LM CLOSEOUT
 - 2 Perform FINAL DEACTIVATION Pg 3-12,3-13,3-14 & 3-15
 (LM CONTINGENCY C/L)
 - 14 Both Disconnect LM Hoses & Stow
 Verify OVHD DUMP vlv - AUTO
 TRANSFER TO CSM

RENDEZVOUS TIMELINES
RELATIVE MOTION TRAJECTORIES
INERTIAL PLOTS
AND
ABORT CHARTS

PDI SUMMARY DATA

8/30/72 Final


PAGE	ABORT	INS			BOOST	HAM	CSI		CDH			TPI		AIM		
		TIME PDI+	N76	HA/HINS			TIME INS+	ΔVX	TIME INS+	ΔVX	ΔVZ	TIME PDI+	TIME PDI+	ΔVX	ΔVZ	
A-1	NO 1+12	NA	NA	NA	NA	NA	1+07+00*	58.4	2+09+35*	-126.1	8.4	2+47+26	12+00	106.5	-50.0	
	NO 1+12Δ	NA	NA	NA	NA	NA	1+07+00*	49.4	2+09+15*	-118.2	13.1	2+47+25	12+00	93.0	-50.0	
A-2	1+00	2+05	5656.2	132.6/53784.	NA	NA	0+55+00	57.2	1+57+08	-115.2	-42.4	2+47+30	NA	NA	NA	
	2+00	4+00	5651.9	131.8/58323.	NA	NA		55.5	1+57+03	-113.0	-38.2					
	3+00	5+43	5646.3	128.3/60018.				54.7	1+56+54	-108.5	-31.4					
	4+00	7+18	5639.5	122.9/60023.				54.4	1+56+39	-101.6	-22.5					
	5+00	8+49	5630.0	115.3/60030.				54.4	1+56+18	-92.1	-11.3					
	6+00	10+13	5617.5	105.5/60039.				54.5	1+55+51	-79.8	1.5					
	7+00	12+35	5596.3	91.9/64950.				53.1	1+55+14	-61.8	17.7					
A-3	8+00	14+27	5571.5	76.4/71046.				51.5	1+54+31	-41.4	32.6					
	9+00	16+06	5546.3	59.3/74249.				50.7	1+53+45	-18.2	45.2					
A-4	10+00	17+18	5564.0	71.7/72715.	50+00	1+50+00	2+40+00	38.9	3+39+14	-32.3	-59.4	4+46+26	NA	NA	NA	
	11+00	18+21	5559.6	65.7/67727.				41.8	3+39+01	-26.1	-43.6					
	12+00	19+24	5555.9	59.9/62049.				44.5	3+38+49	-19.8	-29.3					
	13+00	20+27	5547.3	52.7/60251.				46.4	3+38+32	-11.5	-12.3					
	14+00	21+27	5539.8	47.2/60250.				47.2	3+38+19	-4.8	1.1					
	15+00	22+26	5532.2	41.8/60248.				47.9	3+38+05	2.2	11.8					
	16+00	23+26	5524.6	36.3/60246.				48.2	3+37+51	9.3	22.1					
A-5	17+00	24+25	5517.0	30.9/60244.				48.5	3+37+37	16.7	31.4					
	T2-1	7+22Ω	5515.7	30.0/60154.	50+00	3+50+00	4+40+00	42.9	5+37+23	22.9	55.1	6+45+14	NA	NA	NA	
A-6	NO 2+12	NA	NA	NA	1+12+00*	2+12+00*	3+12+00*	47.4	4+15+07*	-141.9	29.0	4+51+40	12+00	122.5	-50.0	
	NO 2+12Δ	NA	NA	NA	1+12+00*	2+12+00*	3+12+00*	38.6	4+14+40*	-130.0	37.6	4+51+39	12+00	110.0	-50.0	
A-7	1+00	2+07	5676.9	149.7/54128.	1+00+00	2+00+00	3+00+00	47.3	4+02+55	-136.4	-18.8	4+51+49	NA	NA	NA	
	2+00	4+02	5672.6	149.1/59080.				45.1	4+02+51	-134.8	-15.8					
	3+00	5+44	5669.5	147.1/60019.				44.6	4+02+45	-131.8	-8.7					
	4+00	7+20	5666.3	144.5/60024.				44.2	4+02+37	-128.2	5.5					
	5+00	8+50	5661.7	140.7/60031.				43.8	4+02+26	-123.4	11.7					
	6+00	10+15	5655.9	136.0/60040.				43.5	4+02+13	-117.2	25.2					
A-8	7+00	12+41	5665.0	146.4/65188.	NA	NA	0+55+00	50.4	1+57+38	-127.8	-57.1	2+52+54	NA	NA	NA	
	8+00	14+33	5641.5	130.9/71212.				49.9	1+56+57	-109.7	-32.3					
A-9	9+00	16+11	5617.9	113.9/74326.				50.0	1+56+12	-89.3	-8.6					
	10+00	17+20	5602.3	100.8/72751.				50.9	1+55+37	-72.9	7.4					
	11+00	18+23	5590.1	88.7/67752.				52.3	1+55+05	-57.5	20.2					
A-10	12+00	19+25	5578.4	76.7/62072.				53.8	1+54+33	-41.9	31.1					
	13+00	20+28	5560.6	62.5/60253.				54.3	1+53+54	-22.9	42.0					
A-10	14+00	21+27	5545.8	51.6/60250.				54.2	1+53+25	-8.0	48.4					
	15+00	22+26	5530.8	40.8/60247.				54.0	1+52+56	7.3	53.6					
A-4	T2-2	7+22Ω	5515.7	30.0/60154.	50+00	1+50+00	2+40+00	48.4	3+37+34	17.8	32.9	4+51+43	NA	NA	NA	

Δ INDICATES TIME IS REFERENCED TO LIFT-OFF.

* INDICATES TIME IS REFERENCED TO PDI.

Δ ASSUMES NO DOI-2

Landed on the Moon
 aboard the Apollo 17 LM "Challenger"



RANGE AND RANGE RATE AT INS AND 10 MINUTES PRIOR TO SUBSEQUENT BURNS
8/30/72 Final

PAGE	ABORT TIME PDI+	INS		BOOST		HAM		CSI		CDH	
		RANGE	RANGE RATE	RANGE	RANGE RATE	RANGE	RANGE RATE	RANGE	RANGE RATE	RANGE	RANGE RATE
A-1	NO 1+12	NA	NA	NA	NA	NA	NA	177.3	-592.2	97.7	-167.9
	NO 1+12Δ	NA	NA	NA	NA	NA	NA	151.6	-536.6	97.2	-172.5
A-2	01+00	133.5	570.0	NA	NA	NA	NA	163.7	-495.8	106.5	-125.8
	02+00	130.6	555.2					158.8	-485.4	101.8	-126.1
	03+00	117.5	526.6					144.1	-460.1	100.2	-131.8
	04+00	96.1	472.7					121.9	-417.4	99.9	-144.9
	05+00	69.4	331.8					91.7	-346.6	99.4	-138.8
	06+00	53.2	-86.6					55.6	-208.5	98.0	-150.2
	07+00	78.7	-454.3					30.8	203.1	94.1	-159.3
A-3	08+00	144.9	-497.4					74.9	215.5	92.3	-163.1
	09+00	219.9	-473.2					135.3	72.1	90.2	-170.1
A-4	10+00	283.7	-452.9	216.8	152.4	188.7	-390.4	37.3	47.2	97.5	-67.3
	11+00	339.9	-481.8	261.2	91.3	214.3	-405.6	69.7	28.9	98.6	-79.1
	12+00	397.3	-474.7	314.2	49.3	241.6	-420.7	96.0	-0.4	99.6	-93.8
	13+00	462.1	-459.9	374.5	-2.8	271.6	-430.2	126.2	-37.5	99.9	-105.7
	14+00	511.9	-445.3	420.8	-45.6	294.2	-433.3	149.3	-69.2	98.1	-116.7
	15+00	561.4	-430.6	466.5	-88.9	287.1	-426.7	172.1	-103.0	96.3	-126.2
	16+00	610.5	-415.7	511.7	-132.7	339.7	-432.6	194.5	-138.8	94.1	-133.9
	17+00	659.3	-400.7	556.5	-177.3	362.5	-429.2	216.3	-177.0	92.3	-142.2
A-5	T2-1	1024.9	-334.7	934.1	-187.4	373.0	-394.8	244.9	-200.9	88.3	-174.6
A-6	NO 2+12	NA	NA	398.8	-815.2	174.9	562.0	208.2	-693.5	99.9	-192.0
	NO 2+12Δ	NA	NA	345.9	-742.6	149.1	500.3	169.1	-613.2	98.9	200.0
A-7	01+00	381.6	666.8	385.8	-738.2	143.5	516.3	209.7	-635.0	107.4	-160.7
	02+00	379.2	652.6	380.7	-728.7	144.8	506.5	206.4	-627.7	103.8	-146.4
	03+00	365.7	643.2	365.2	-717.7	138.3	504.6	196.5	-615.3	101.7	-166.5
	04+00	341.8	634.0	340.7	-699.7	127.6	505.6	182.6	-596.5	100.3	-174.0
	05+00	307.5	622.8	306.6	-673.9	112.1	506.1	163.9	-568.0	99.2	-183.9
	06+00	262.8	608.2	263.1	-638.0	92.9	500.8	141.2	-527.2	98.8	-184.6
A-8	07+00	208.1	599.4	NA	NA	NA	NA	224.3	-591.1	101.6	-125.6
	08+00	135.1	530.3					155.3	-480.1	97.9	-131.0
	09+00	68.8	337.1					88.6	-337.2	95.4	-138.2
	10+00	53.8	-246.9					41.5	-105.0	94.6	-144.2
A-9	11+00	92.5	-482.8					36.0	278.7	94.6	-157.2
	12+00	145.4	-512.8					72.8	227.6	95.3	-163.7
	13+00	209.0	-502.4					122.7	108.1	92.9	-170.5
A-10	14+00	259.0	-484.8					161.7	15.0	92.2	-174.9
	15+00	309.2	-465.0					200.3	-78.7	89.7	-175.3
A-4	T2-2	677.7	-396.9	573.6	-188.3	374.1	-428.6	227.5	-187.1	96.6	-149.3

Δ ASSUMES NO DOI-2

RANGE
RANGE RATE

MISSION APOLLO 17, OCTOBER 6, 1972

CSI THRU CDH

58 CSI
V76
P33 TGT CDH
MAX N49(0.80,5.0)
V67 (+02000,+00020,+00005)
ATT CONT-PULSE
MODE CONT-AUTO
*
*417+1 (/621+0)
*410+2 TGT CDH
*373R TM CDH (RECORD)
*310R SET DET
*COPY AGS DATA
55 *411+1 START AUTO(19,19)*

V82

V83 SET ORDEAL (45NM)
*317R, 440R, 277R

54

SR

51 M=7, V32

48 V90, LOAD CDH-30

*COMPARE CMC,AGS,VHF/RR *

45

M=15, V32

42

39 V34, P30 (PC ONLY)
38 *411+0 STOP AUTO

V90 LOAD CDH-30
OBTAIN CMC LM YDOT

36 CHART RDOT
P41, V77

35 *373+ TIG PC
*410+5 LOAD ΔV
*263R
*501R
ATT CONT-
MODE CONT

:05 *270R/501R
30 PLANE CHANGE

V76
P33 TGT CDH
V93
*VERIFY PGNS WITH MSFN
*V47, 414+1, 400+3
*400+2 Z-AXIS STEER
*410+2 TGT CDH
*373+ TIG CDH IF PC
*451+0 YDOT
*COPY AGS DATA
28 *411+1 START AUTO

27
S-BD ANT-FWD,VERIFY COMM
*S-BD P (-16)
Y (-28)
*S-BD ANT-SLEW (>3.0)
*TRACK MODE-AUTO
*BIOMED-LEFT, PCM-HI
*UPLINK SQUELCH-OFF

CSI BURN REPORT
TIG,ΔV'S, RESIDUALS

CSI THRU CDH

24 RDOT

23 CHART RDOT

21 RDOT

M=7, V32
*COMPARE CMC,AGS,VHF/RR *

18 RDOT

*CHECK RCS, EPS, ECS *

15 RDOT

V90 OBTAIN CMC LM YDOT

12 RDOT

10 CHART RDOT
PRO-FINAL COMP

N81 LOAD CMC LM YDOT

9 RDOT

*411+0 STOP AUTO
*VERIFY PGNS (PCM-HI)
*V47, 414+1, 400+3
*400+2 Z-AXIS STEER
*COPY AGS DATA

V83, SET ORDEAL
*317R, 440R, 277R

P41, V77, N86
(LARGE ΔV USE APS OR DPS)

5 *410+5
*370R TOT ΔV
*500R
*502R
ATT CONT-
MODE CONT

:05 *500R/502R
:00 CDH

NULL RESIDUALS

CDH THRU TPI

CDH THRU TPI

Landed on the Moon
aboard the Apollo 17 LM "Challenger"

aboard the Apollo 17 LM "Challenger"

15 [53 CDH] [V76] [ATT CONT-PULSE] [MODE CONT-AUTO] [RDOT] [R]
 12 P34 TGT TPI [MAX N49(0.80,5.0)] [V93] [RDOT] [R]
 *417+1 (/621+0) *
 *SET DET *
 V82 *410+3 TPI SRCH *
 *310+TIME TO TPI *
 *303R @ TPI *
 *410+4 (When 303=26.6) *
 [43] *411+1 START AUTO(19,19)* [310R]
 *POLAR PLOT @ 75 NM *
 42 [RDOT] [R]
 39 M=7, V32 [RDOT] [R]
 *COMPARE TPI TIME *
 36 [RDOT] [R]
 33 [RDOT] [R]
 30 [RDOT] [R]
 27 [RDOT] [R]
 *MONITOR 303R @ TPI AND *
 *RETARGET IF REQ *
 *COPY AGS DATA *
 24 [RDOT] [R]
 M=15, V32
 *COMPARE CMC, AGS, VHF/RR *
 *VOICE LM TPI TIME *
 *TO CSM *
 21 [RDOT] [R]
 18 [RDOT] [R]
 *CHECK RCS, EPS, ECS *

MISSION APOLLO 17, OCTOBER 6, 1972

CB(11) ECS CABIN FAN1-CLOSE

P00

V48, 11002

P47, V63

*404+0, 405+0, 406+0

S-BD ANT-FWD, VERIFY COMM

*/S-BD P

Y

*S-BD ANT-SLEW (>3.0)

*TRACK MODE-AUTO

*BIOMED-LEFT, PCM-HI

*UPLINK SQUELCH-OFF

TPI BURN REPORT

40 INITIATE BRAKING

30 FPS - 6000 FT

20 FPS - 3000 FT

10 FPS - 1500 FT

5 FPS - 600 FT

*SETUP CAMERA FOR

*DOCKING:

*LM3/DAC/10/CEX-ULC

* (T8, 1/250, 6) 1 FPS

* .25 MAG(0), (4MIN)

V34, P00

V76

MANEUVER/PICTURES OF SIMBAY

50 INITIATE DOCKING

COAS TO OVHD WINDOW

*EXT LTG-DOCK

SHFT/TRUN +50

V41N72 (+000,+320)

CB RR(2)-OPEN, V44

FDAI (180,294,300)

V77

60 CONTACT

CONFIRM CAPTURE FROM CSM

MODE CONT (BOTH)-OFF

POST DOCKING PROCEDURES

ATT CONT-PULSE

MODE CONT

ATT CONT-PULSE

MODE CONT

ATT CONT-PULSE

MODE CONT

ATT CONT-PULSE

MODE CONT

TPI THRU DOCKING

V76

P35 TGT MCC 2

V93

*VERIFY PGNS (PCM-HI)

*V47, 414+1, 400+3

*400+2 Z-AXIS STEER

*411+1 START AUTO

*EXT LTG-OFF

*410+4 TPI EXEC

*373+TPI TIME +30 MIN

*307+013.00

RDOT

RDOT

RDOT

RDOT

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0 TPI

V76

*507+0 Z-AXIS TRACT

P35 TGT MCC 1

MAX N49(0.80,5.0)

V93

*417+1 (/621+0)

*411+1 START AUTO(13,12)

*410+4 TPI EXEC

*373+TPI TIME +15 MIN

*307+028.00

RDOT

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RDOT

05

15 MCC1

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

*472R/502R

NULL RESIDUALS

*A/H

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

RDOT

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RDOT

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RDOT

RDOT

RDOT

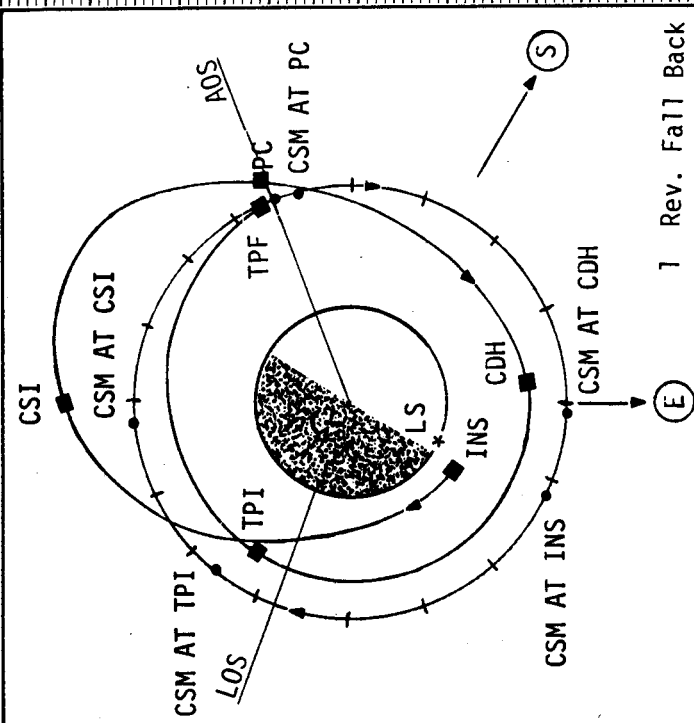
RDOT

RDOT

TPI THRU DOCKING

A-1

EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	



APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS

NO DOI 1 AT PDI 1+12
NO PDI 1+12

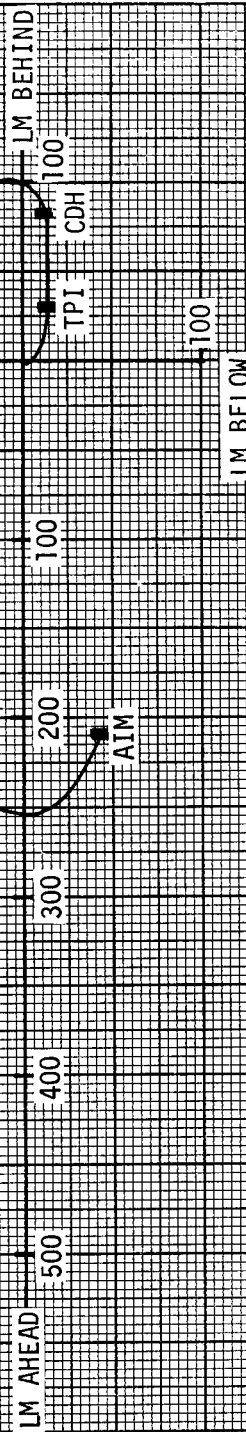
Landed on the Moon
about the Apollo 17 LM "Challenger"

Steve Perry

Landed on the Moon
about the Apollo 17 LM "Challenger"

VERTICAL
DISPLACEMENT (NM)

HORIZONTAL DISPLACEMENT (NM)

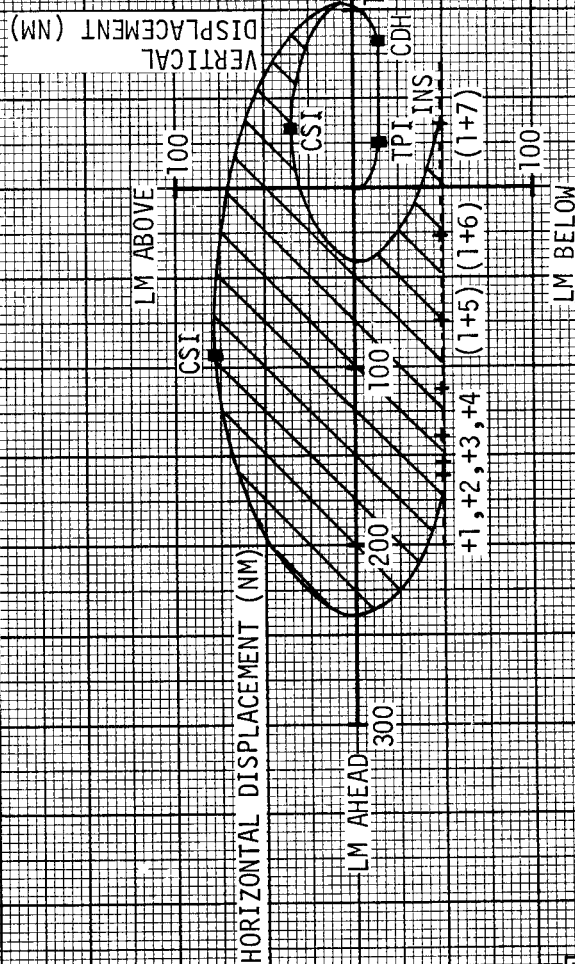
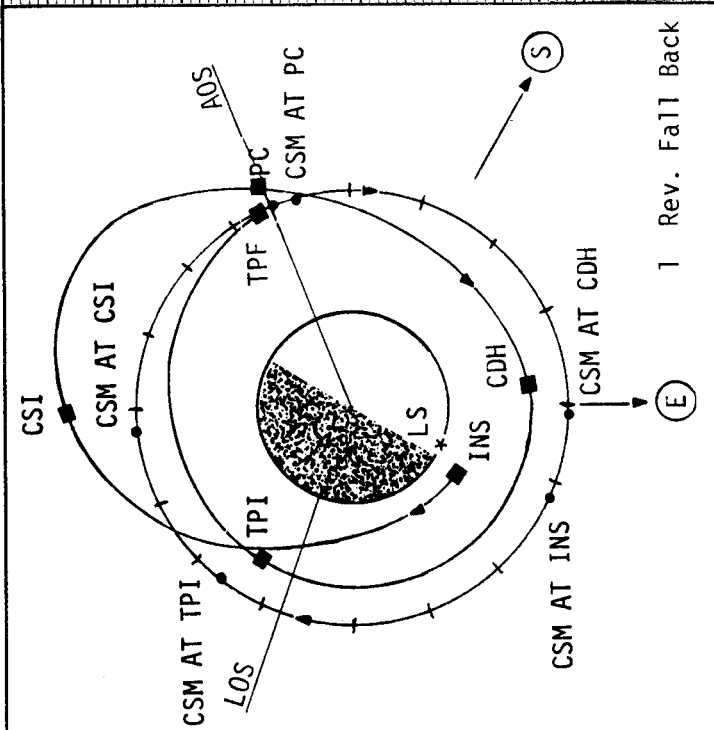


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SEPTEMBER 1, 1972

PAGE A-1

APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS

1. $1 \leq \text{PDI} \leq 7$

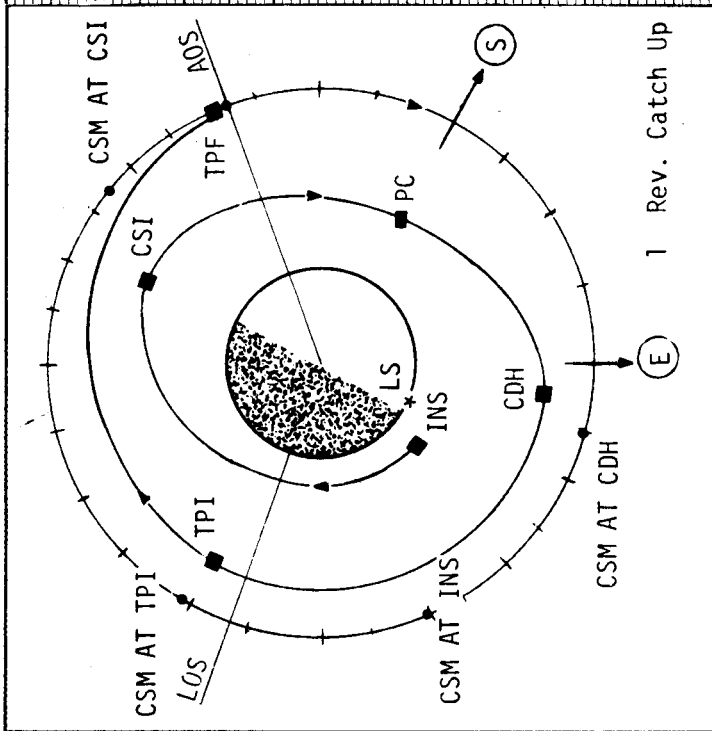


EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	

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DECEMBER 25, 1971

A-3

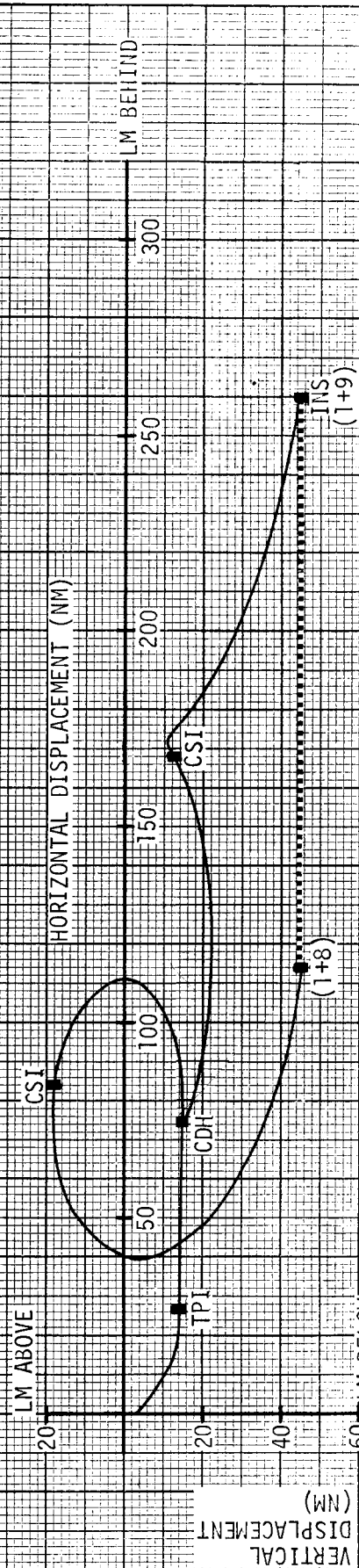
APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS
 $8 < \text{PDI } 1 < 9$



Landed on the Moon
aboard the Apollo 17 LM "Challenger"

Sam Elroy

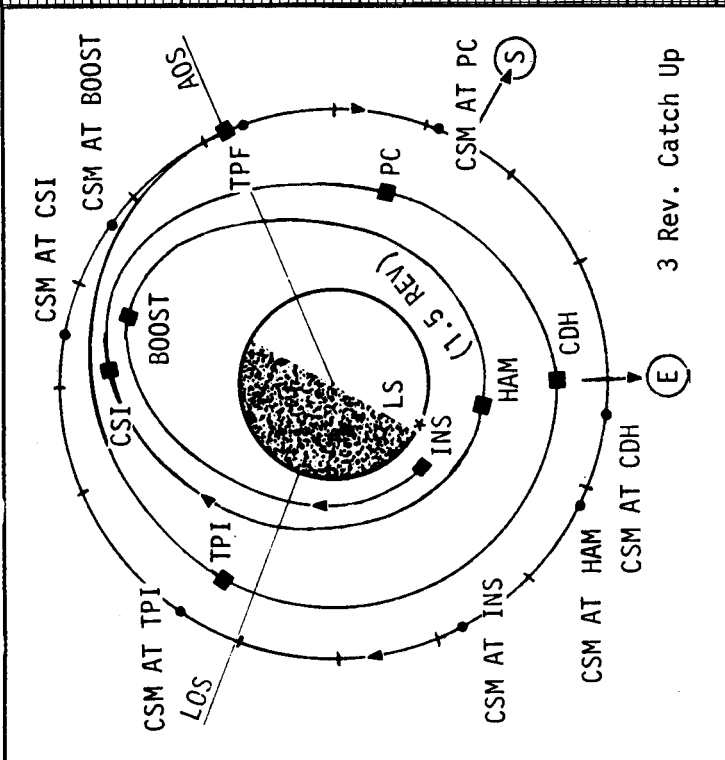
EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	



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SEPTEMBER 27, 1972

A-5

EVENT	GET TIG
INS	
BOOST	
HAM	
CSI	
PC	
CDH	
TPI	



APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS

T2-1

PROCEDURES:

BOOST BURN PERFORMED
P00
V82
V76

1 REV COASTING FLIGHT
60 MIN PRIOR TO HAM
DO PROCEDURES FOR
BOOST THRU HAM.
ON PAGE 4-5

BURN GROUND HAM

Landed on the Moon
about 17:14 17 Oct 1969
[Signature]

VERTICAL
DISPLACEMENT (NM)

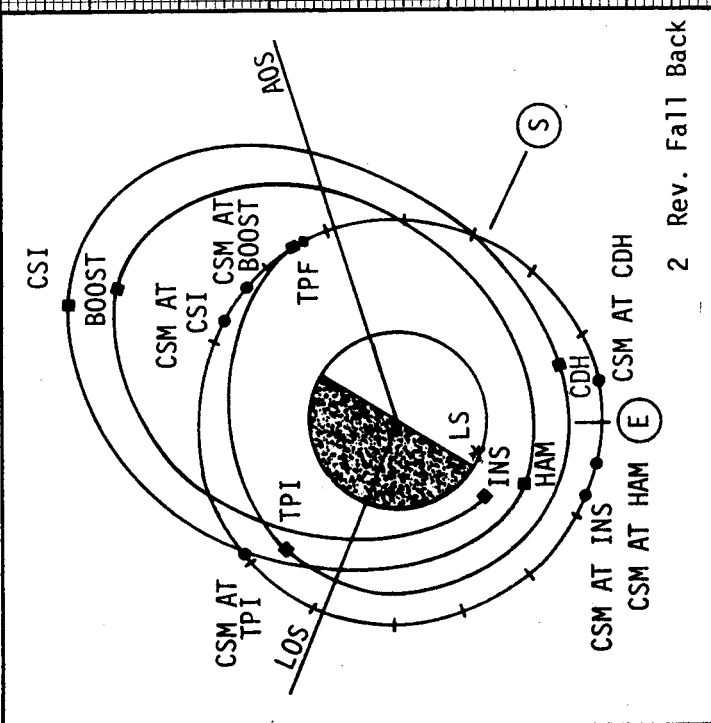
LM AHEAD
LM ABOVE
LM BEHIND
LM BELOW

HORIZONTAL DISPLACEMENT (NM)

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OCTOBER 25, 1972

PAGE A-5

APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS
NO DOI 2 AT PDI 2+12
NO PDI 2+12

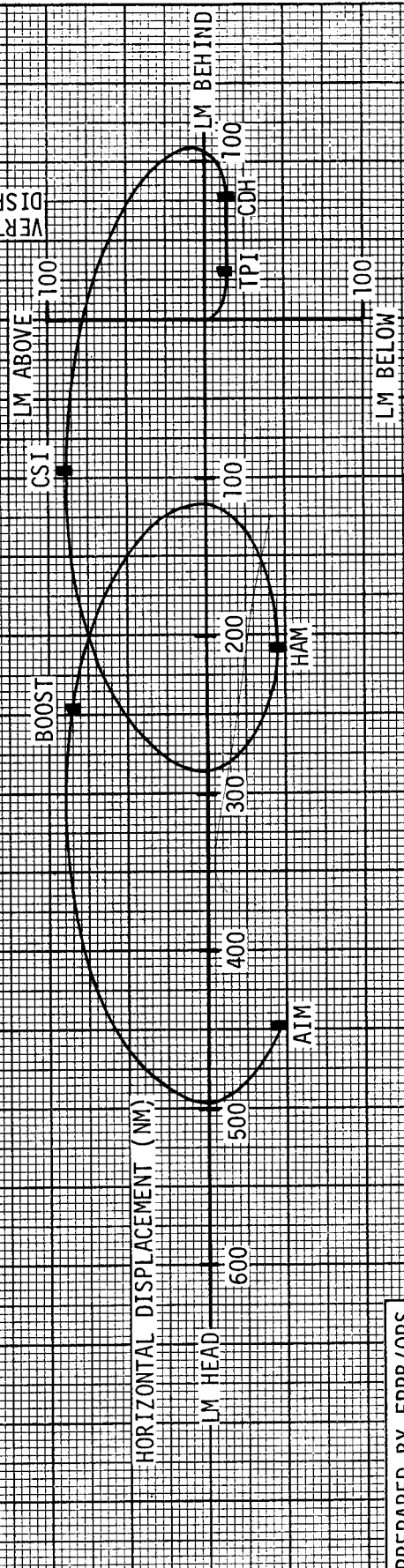


2 Rev. Fall Back

EVENT	GET TIG
INS	
BOOST	
HAM	
CSI	
PC	
CDH	
TPI	

VERTICAL DISPLACEMENT (NM)

HORIZONTAL DISPLACEMENT (NM)



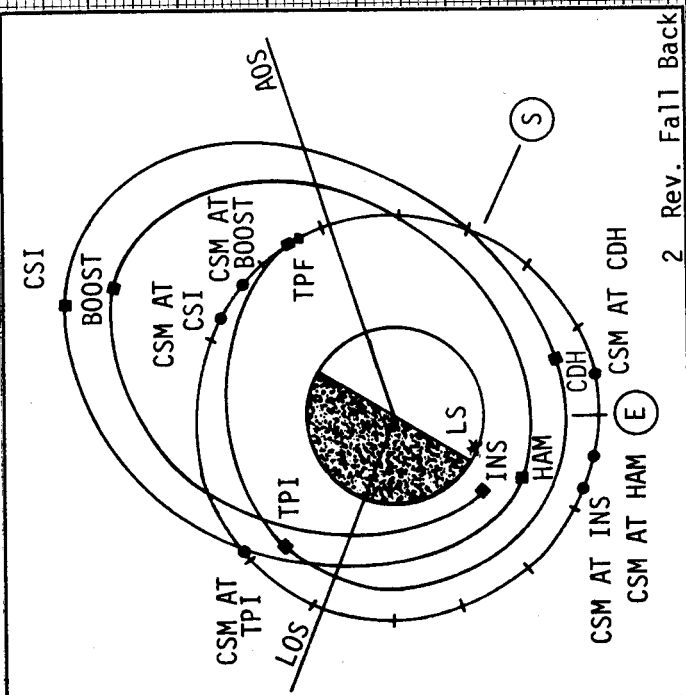
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SEPTEMBER 1, 1972

APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS

1. $1 \leq \text{PDI} \leq 6$

Landed on the Moon
above the Apollo 17 LM Challenger

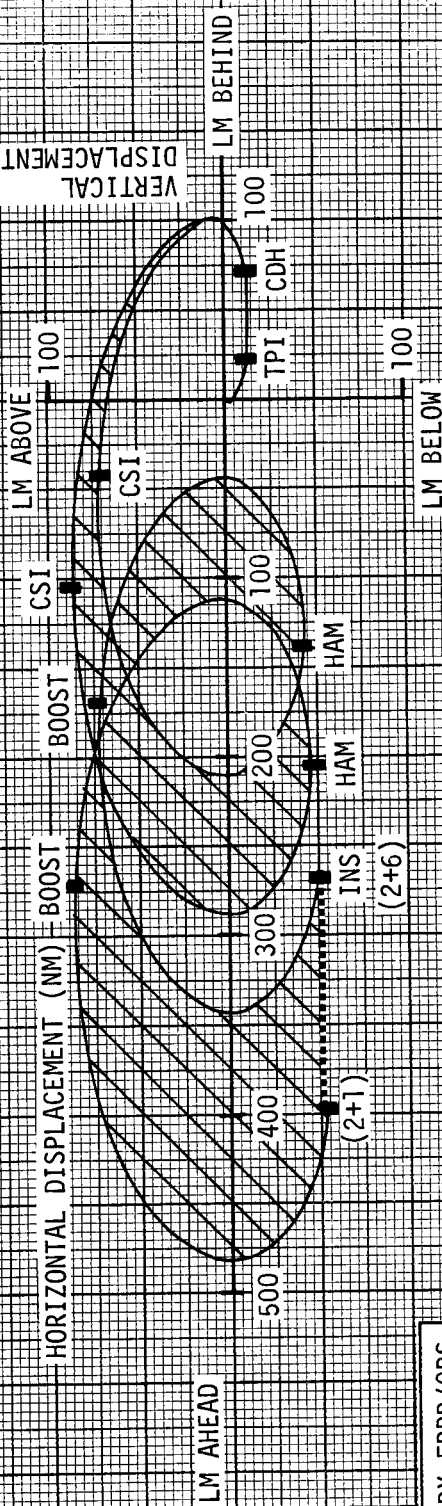
[Signature]



2. Rev. Fall Back

EVENT	GET TIG
INS	
BOOST	
HAM	
CSI	
PC	
CDH	
TPI	

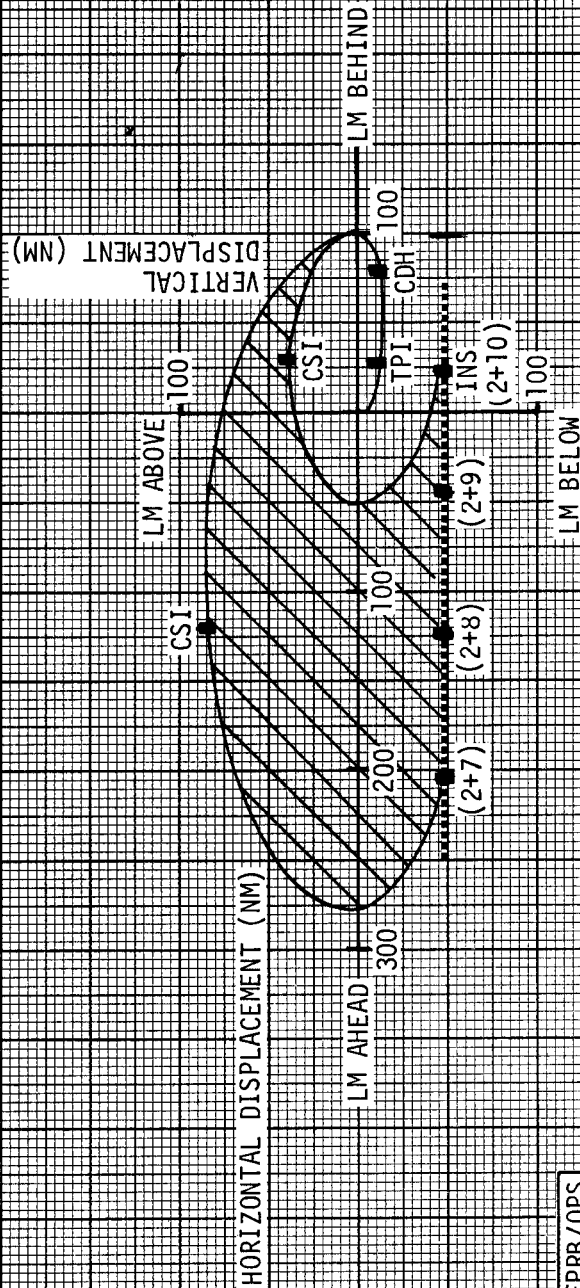
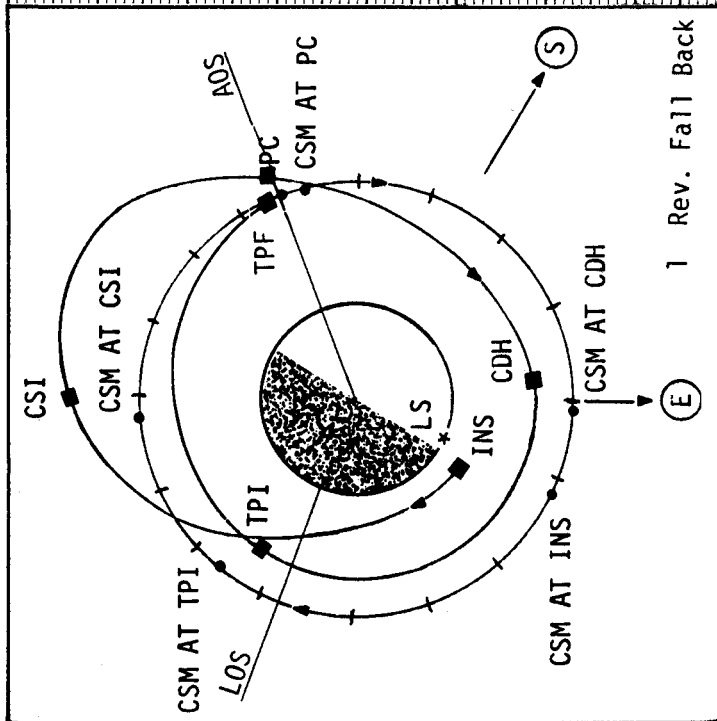
VERTICAL
DISPLACEMENT (NM)



PREPARED BY FPRB/OPS
SEPTEMBER 1, 1972

APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS
7 < PDI 2 < 10

EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	



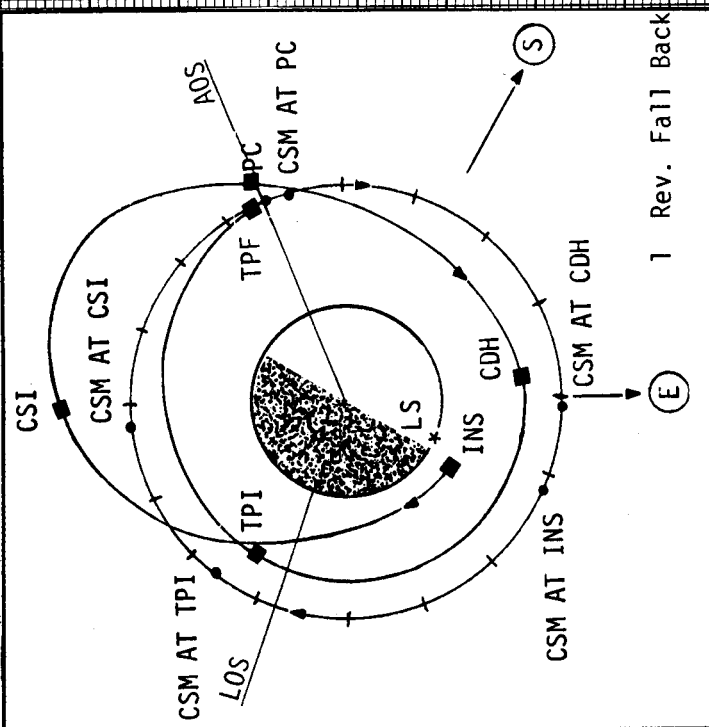
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DECEMBER 25, 1971

A-9

APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS

11 ≤ PDI 2 ≤ 13

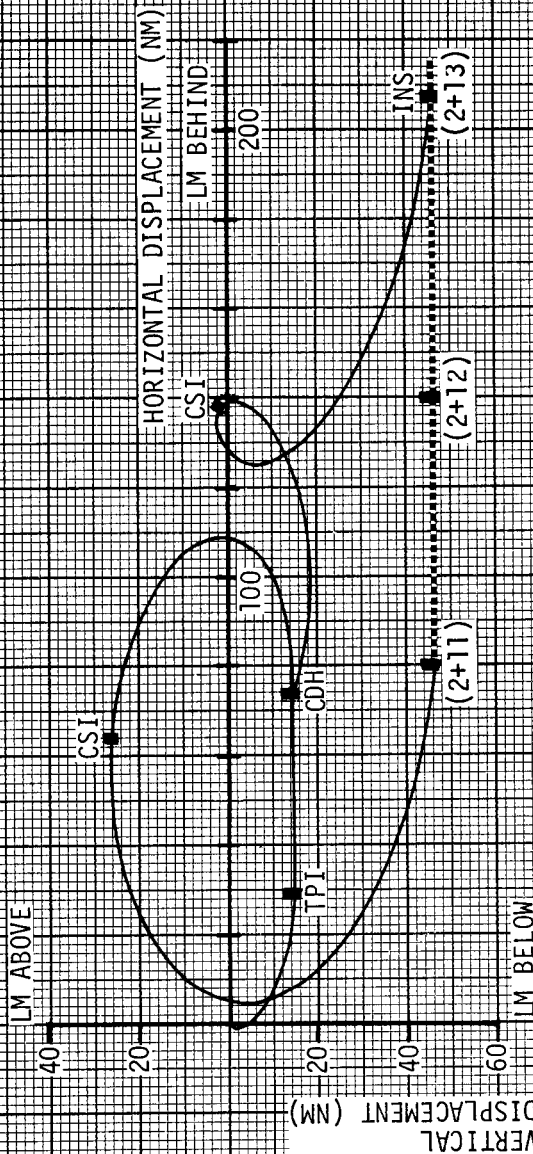
PAGE A-9



Landed on the Moon
about the Apollo 17 LM "Challenger"

[Signature]

EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	

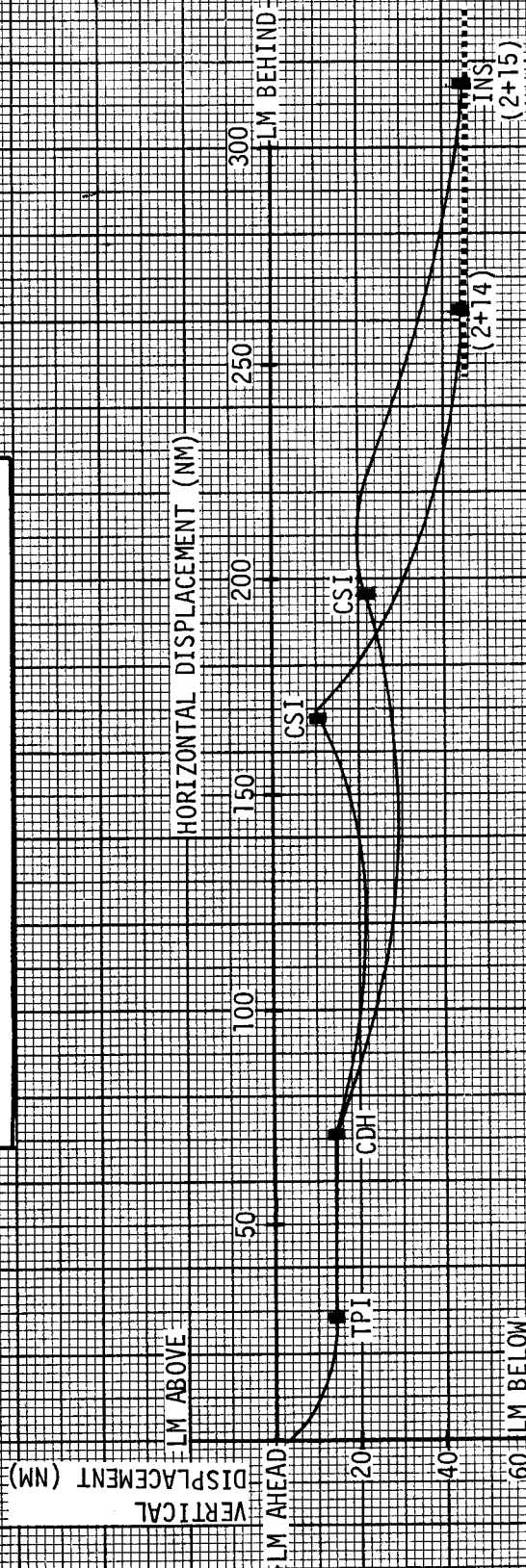
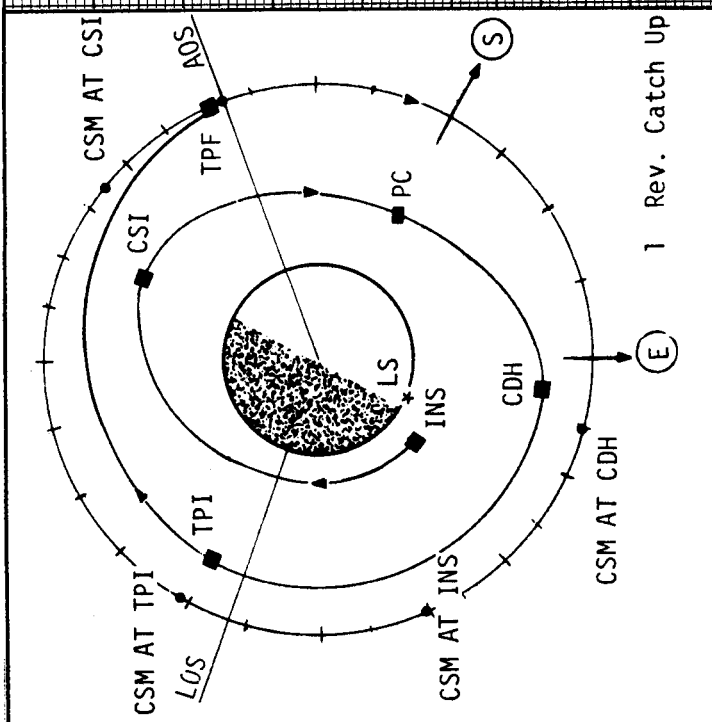


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EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	

APOLLO 16/17 MISSIONS INERTIAL AND RELATIVE PLOTS

14 < PDI 2 < 15

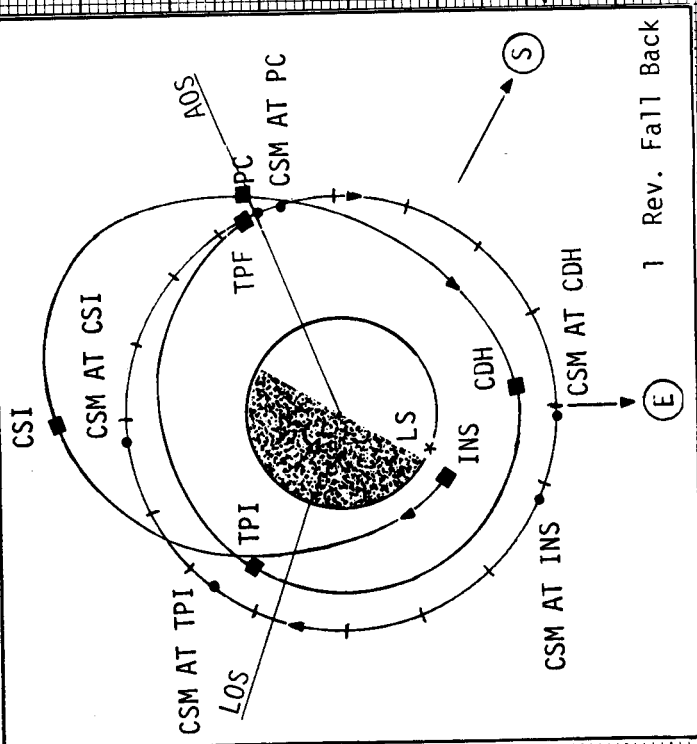


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DECEMBER 25, 1971

LM BAILOUT REL
TRAJECTORY

APOLLO 16/17 MISSIONS
INERTIAL AND RELATIVE PLOTS

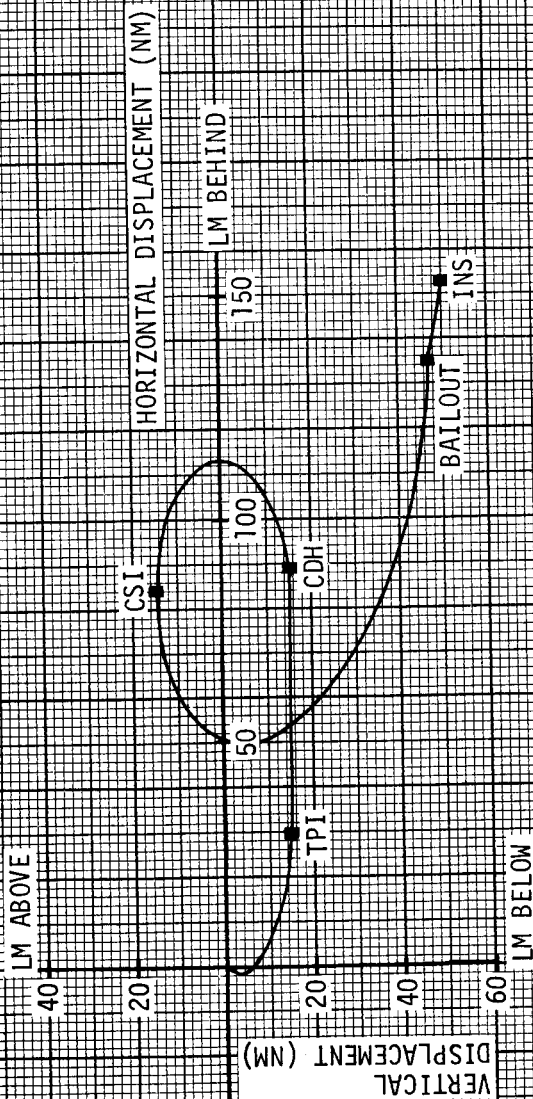
BAILOUT



1 Rev. Fall Back

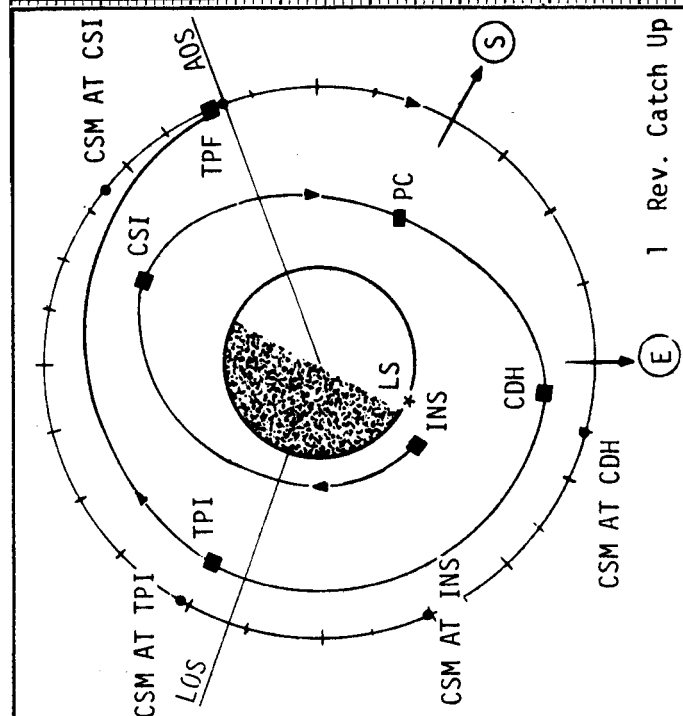
Landed on the Moon
aboard the Apollo 17 LM "Challenger"

Steve Boney



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DECEMBER 25, 1971

APOLLO 16/17 MISSIONS INERTIAL AND RELATIVE PLOTS			
NOMINAL COELLIPTIC RNDZ			
ΔT	RANGE	RDOT	
INS	285.6	-456.6	
-48	281.1	-452.3	
-44	263.6	-429.7	
-40	247.3	-399.1	
-36	232.2	-362.0	
-32	218.7	-320.2	
-28	206.9	-275.8	
-24	196.9	-230.9	
-20	188.7	-188.0	
-16	182.0	-149.3	
-12	176.8	-116.8	
-8	172.7	-92.0	
-4	169.4	-76.0	
CSI	166.6	-69.4	
CDH	95.7	-122.2	
TPI	33.5	-110.2	
+4	27.8	-129.3	
+8	22.9	-120.4	
+12	18.4	-108.8	
+16	14.3	-95.2	
+20	10.9	-80.4	
+24	8.0	-65.7	
+28	5.6	-52.5	
+32	3.8	-42.0	
+36	2.3	-35.3	
+40	.9	-32.4	
+42	.3	-31.9	

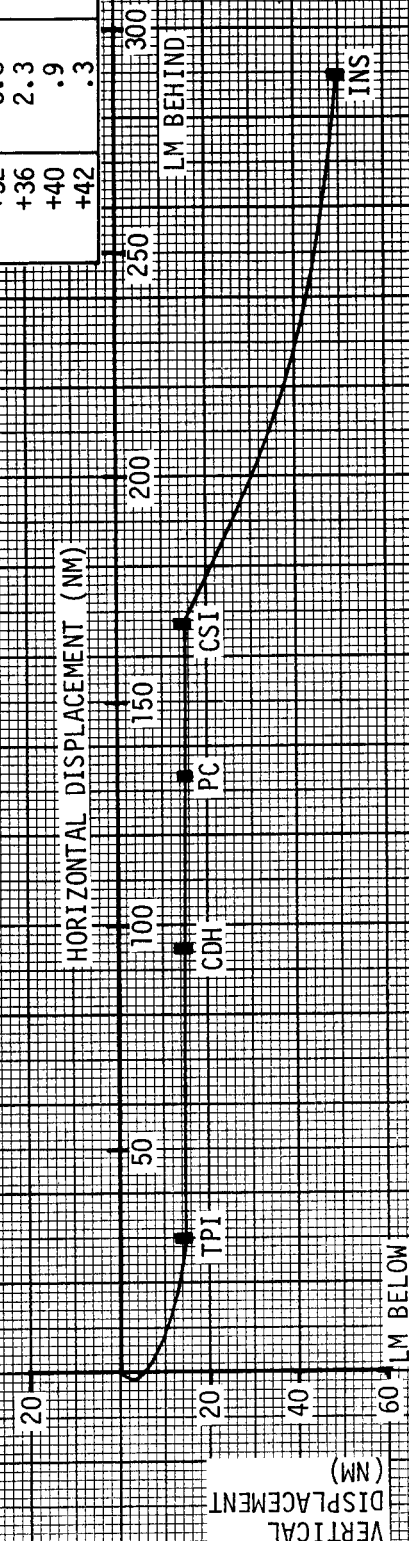


EVENT	GET TIG
INS	
CSI	
PC	
CDH	
TPI	

Landed on the Moon

Assured the Apollo 16/17 LM Challenge

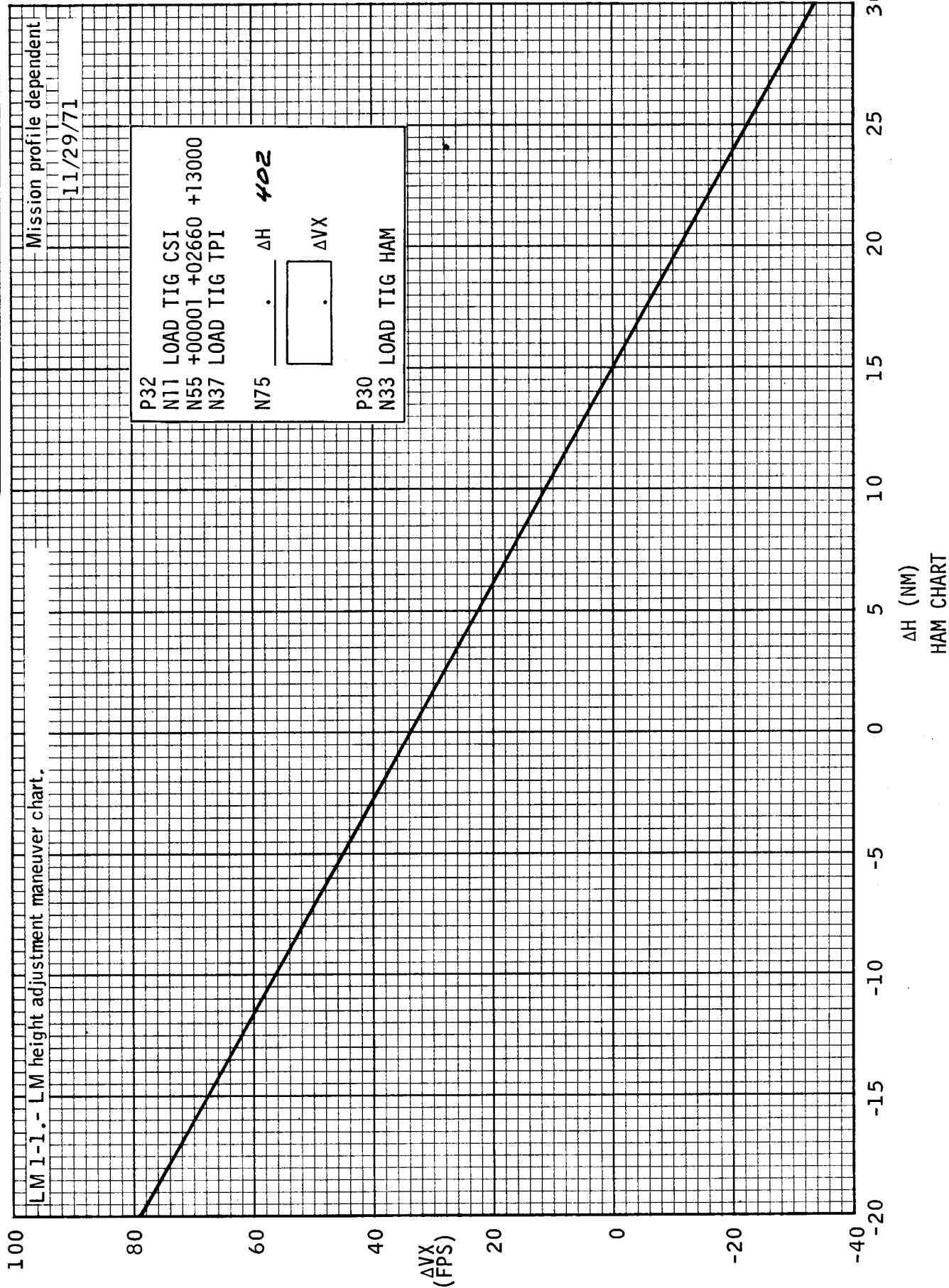
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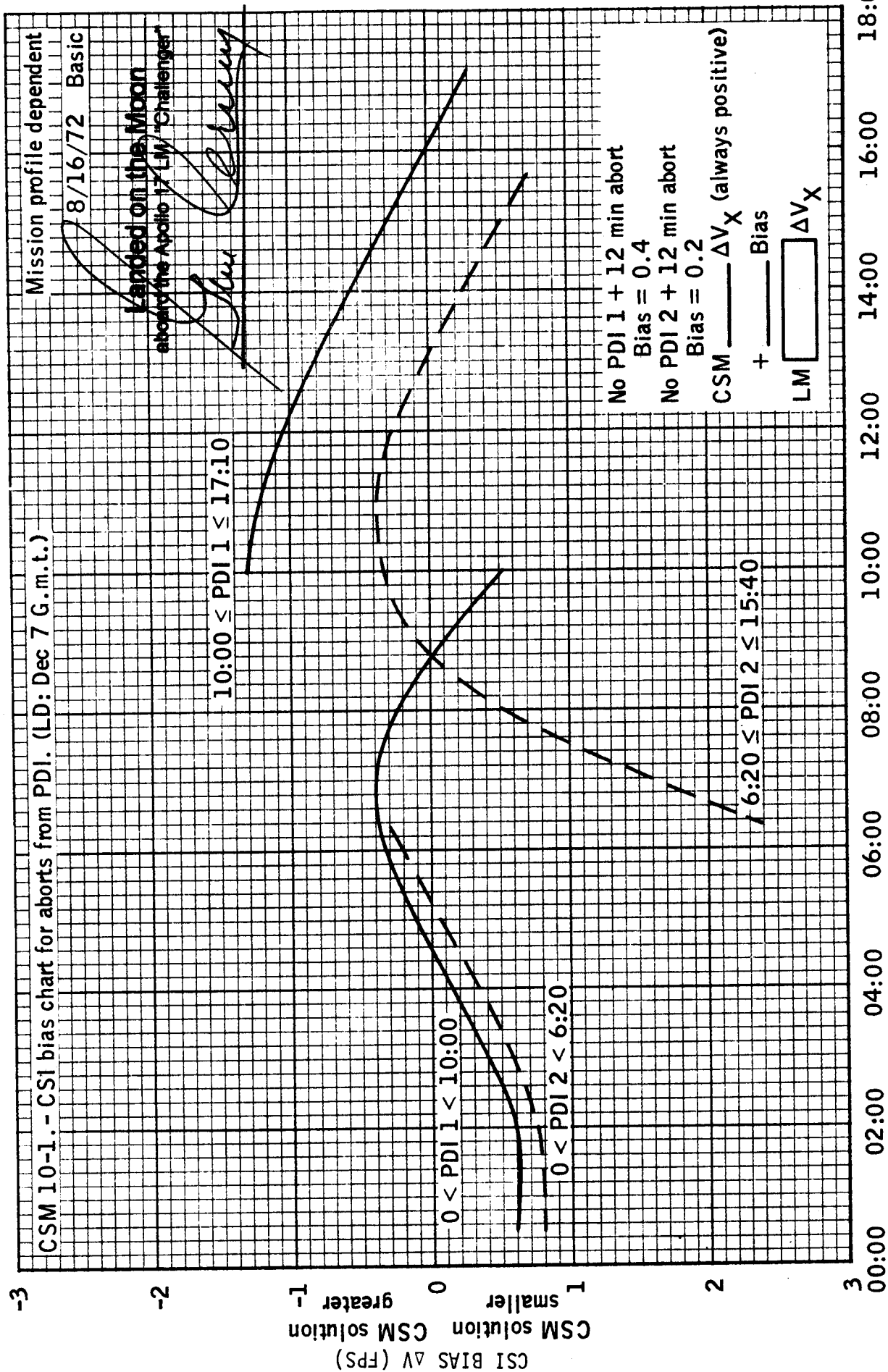
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DECEMBER 25, 1971

RELATIVE TRA
NOM COEL RNDZ

HAM CHART



CSI BIAS CHART



TIME FROM PDI (MIN:SEC)

CSI BIAS
DELTA V

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CSI BIAS
DELTA V

Landed on the Moon
 aboard the Apollo 17 LM "Challenger"

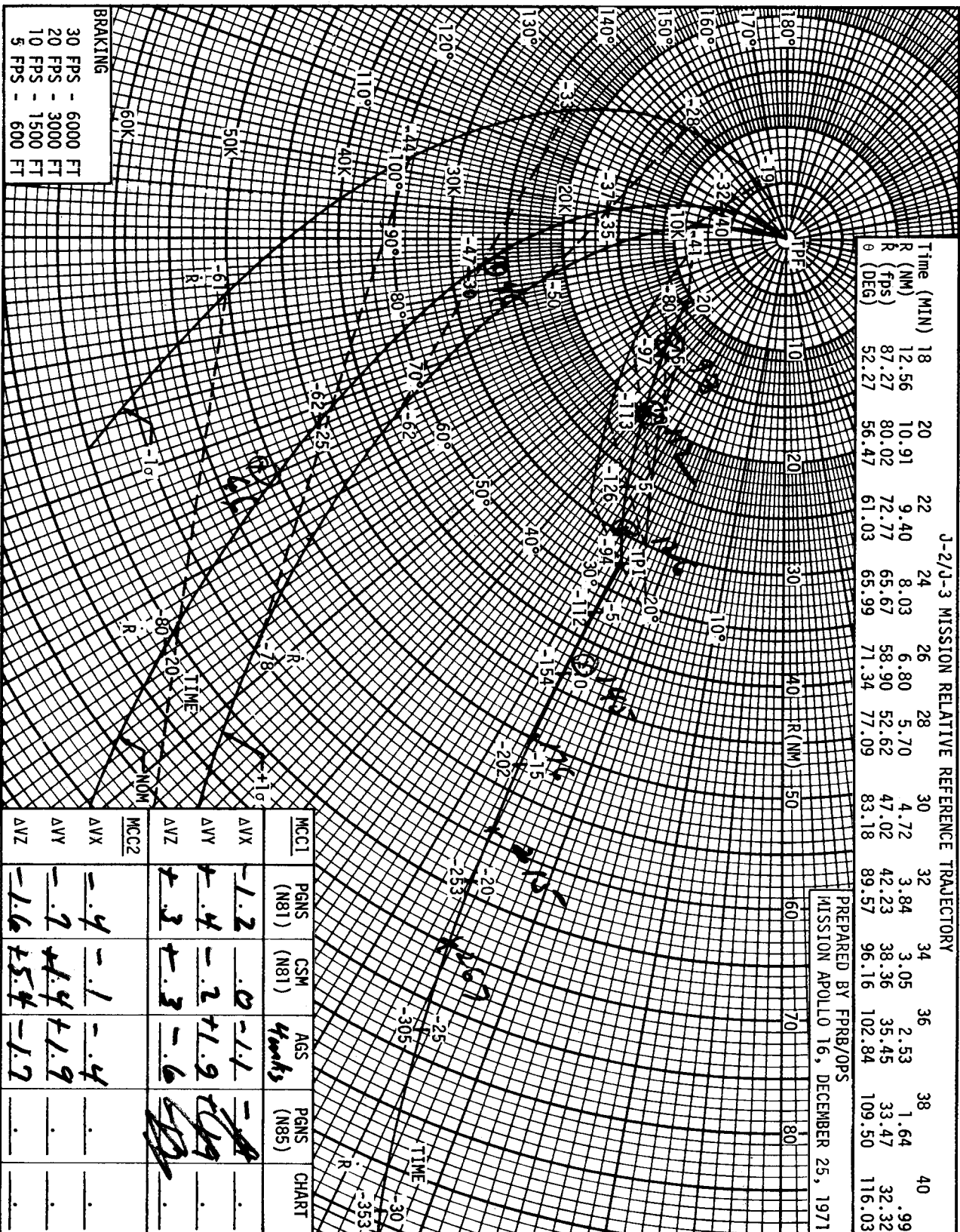
Gene Cerny

REL TRAJ
 DIRECT ASCENT

J-2/J-3 MISSION RELATIVE REFERENCE TRAJECTORY

Time (MIN)	18	20	22	24	26	28	30	32	34	36	38	40
R (NM)	12.56	10.91	9.40	8.03	6.80	5.70	4.72	3.84	3.05	2.53	1.64	.99
R (fps)	87.27	80.02	72.77	65.67	58.90	52.62	47.02	42.23	38.36	35.45	33.47	32.32
θ (DEG)	52.27	56.47	61.03	65.99	71.34	77.09	83.18	89.57	96.16	102.84	109.50	116.03

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 MISSION APOLLO 16, DECEMBER 25, 1971



BRACING
 30 FPS - 6000 FT
 20 FPS - 3000 FT
 10 FPS - 1500 FT
 5 FPS - 600 FT

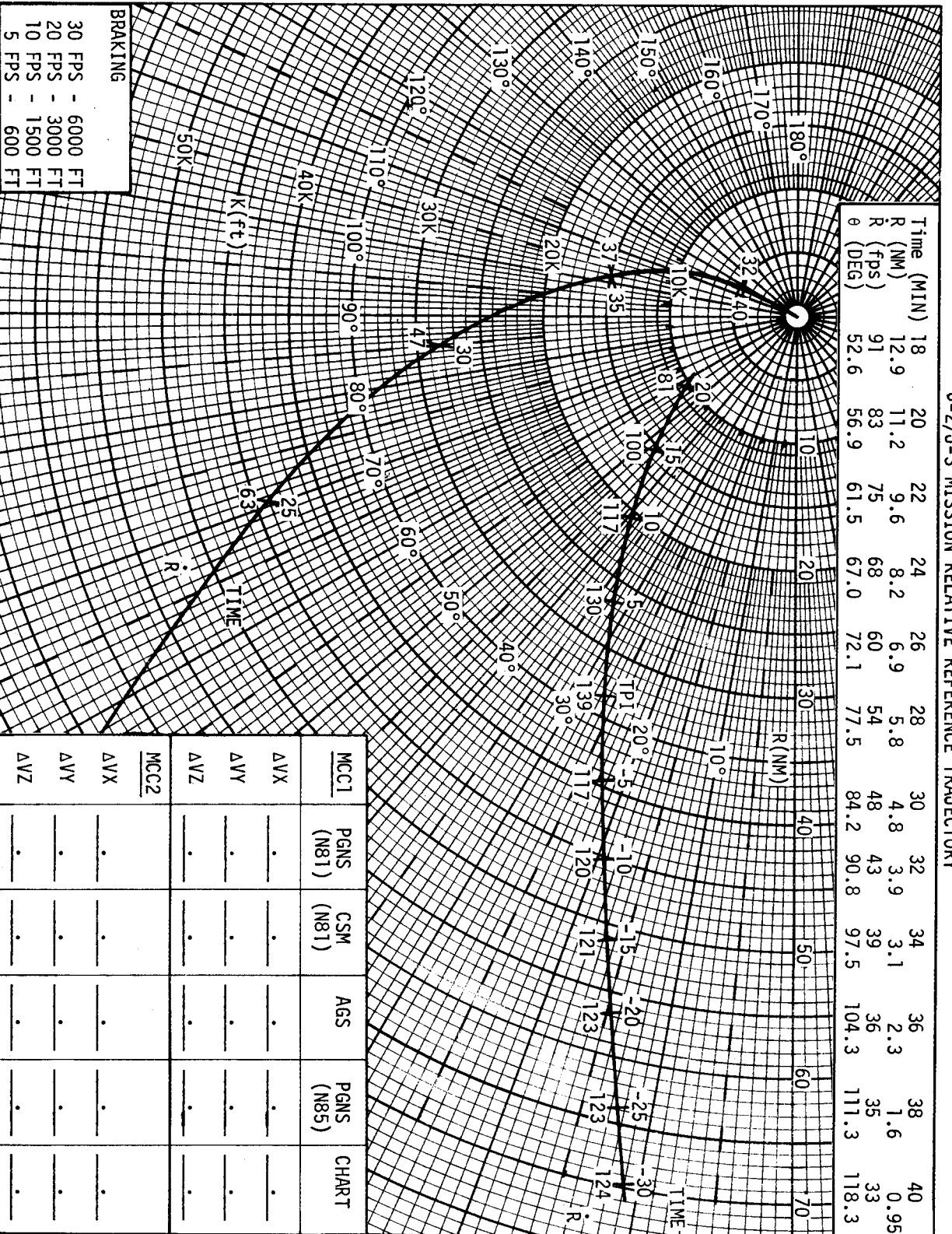
MC1	PGNS (N81)	CSM (N81)	AGS	PGNS (N85)	CHART
AVX	-1.2	.0	-1.1	-1.1	.
AVY	+.4	-.2	+1.9	+1.9	.
AVZ	+.3	+.3	-.6	-.6	.
MC2					
AVX	-.4	-.1	-.4	-.4	.
AVY	-.7	+1.4	+1.9	+1.9	.
AVZ	-1.6	+5.4	-1.7	-1.7	.

NASA-MSC

THIS IS THE END

NOT THE BEGINNING

J-2/J-3 MISSION RELATIVE REFERENCE TRAJECTORY



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MISSION APOLLO 16, DECEMBER 25, 1971