



ASCENT CHECKLIST

STS

8

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NORMAL PROCEDURES - PRELAUNCH

RECYCLE PROCEDURES

NOTE

These recycle procedures will be used inside T-5 min

B W1/W6 ✓16mm Camr (two) - off

Test Conductor calls for APU Shutdown and Heater Activation (Aerosurface positioning complete)

P APU SHUTDOWN

R2 APU CNTL (three) - OFF
FUEL TK VLV (three) - CL
✓CNTLR PWR (three) - ON

C HEATER ACTIVATION

L2 FLASH EVAP FOLN HTR (two) - 2

Report APU Shutdown and Heater Activation Complete

NOTE

Numerous non time-critical steps for recycle will be individually called by the Test Conductor

1: GNC GPC MEMORY 2: GNC IO4 GND IMU CNTL/MON
3: GNC I DPS UTILITY

-2:15:00 **PRE-INGRESS SW RECONFIGURATION**

NOTE

ASP configures OI PCMMU
PWR - 1**(C3), RCS/OMS HTR
FWD, AFT RCS JET 1,2,3,4
(eight) - OFF (A14), ESS
BUS SOURCE FC (three) - ON, AC
BUS SNSR (three) - OFF (1
sec) then AUTO TRIP (R1)

-1:50:00 A **INGRESS ORBITER & SEATS**
(-2:10:00)

NOTE

During seat ingress COMM
PWR - ON (L5, R6)
CCU PWR - ON (A11, A15, M039M)

05/09 AUD VOX SENS (four) - adj as reqd
R10/L9 Contact LCC (OTC & NTD) on A/G 1
M042F

-1:45:00 **POST INGRESS SW RECONFIGURATION**
(-2:05:00)

NOTE

ASP turns on RCS 1,2,3,4
DRIVERS (eight) (014,015
& 016), OMS ENG VLV (two)
(014,016), GPC OUTPUT 5 -
B/U (06)

Install ASC Flip Cards and Ascent
ADI Cards

✓Cue Card positions

-1:35:00
(-1:55:00)

NOTE

ASP doing C/W VOL adjust,
expect MA

LAUNCH

1: GNC GPC MEMORY 2: GNC 104 GND IMU CNIL/MON
3: GNC 1 DPS UTILITY

-1:30:00 A **ASTRO COMM CHECK**
(-1:50:00)

LCC will contact CDR, PLT, MS1 &
MS2 on A/G 2, ICOM A, ICOM B
then A/A

A **A/G VOICE CHECK**

B A/G 1 Voice Check
05/09 L,R AUD A/G 2 (two) - OFF
 A/A (two) - OFF
Voice check with MCC

A/G 2 Voice Check
L,R AUD A/G 2 (two) - T/R
 A/G 1 (two) - OFF
Voice check with MCC

A/A Voice Check
L,R AUD A/A (two) - T/R
 A/G 2 (two) - OFF
Voice check with MCC

A Simo Voice Check (Launch Config)
L,R AUD A/G 1 (two) - T/R
 A/G 2 (two) - T/R
Voice check with MCC

NOTE
Side hatch closure

-1:10:00 C **CABIN LEAK CHECK**
(-1:30:00)

L2 CAB VENT ISOL - OP (tb-OP)
 √VENT tb - CL

01 √CAB PRESS - increasing to 16.7 (MA)

I: GNC GPC MEMORY | 2: GNC 104 GND IMU CNTL/MON |
| 3: GNC 1 DPS UTILITY |

-1:01:00 (DEU Equivalent)
(-1:21:00)

✓ | 2: GNC 104 GND IMU CNTL/MON |

NOTE

IMU preflight align begins

NOTE

Flt crew functions from this point on will be initiated by a call from the OTC to proceed. The flt crew will report back to the OTC after completion

-50:00 P **H2O BOILER PRACTIVATION**
(-1:10:00)

R2 BLR CNTLR (three) - ON
N2 SPLY (three) - ON

NOTE

Vent vlv operation may occur earlier or later at LCC direction

-45:00 C **CABIN VENT REDUNDANCY CHECK**
(-1:05:00)

L2 CAB VENT ISOL - CL (tb-CL)
VENT - OP (tb-OP)

-32:00 C **PASS/BFS TRANSFER PREP**
(-52:00)

| 3: GNC GPC MEMORY |

O6 GPC 5 MOD - STBY (tb-RUN)
C3 ✓BFC CRT SEL - 3+1
DISP - ON

| 3: BFS, GNC BFS MEMORY |

CRT3 PASS/BFS XFER ENA - ITEM 25 EXEC

|1: GNC GPC MEMORY | 2: GNC 104 GND IMJ CNTL/MON |
|3: BFS, GNC BFS MEMORY |

-30:00
(-50:00)

OMS GN2 PRESS

C3 OMS ENG (two) - ARM/PRESS

CABIN VENT

L2 CAB VENT ISOL - OP (tb-OP)
(klaxon)

01 ✓VENT tb - OP
✓CAB PRESS - decreasing

-25:00 A
(-45:00)

A/G VOICE CHECK

Simo Voice Check (Launch Config)
Voice check with MCC

Update Abort Winds Pad, ASC Flip
Book, and ALTM, 1-7 (if reqd)

-22:00
(-42:00)

PASS/BFS TRANSFER (DEU Equivalent)
(ONE-SHOT TRANSFER)

|1: GNC 100 GTS DISPLAY|

CRT3 ✓ITEM 25 - (no *)

01 Report cabin pressure to OTC

NOTE

Vent vlv closure may occur
earlier or later at LCC
direction

-21:00 C
(-41:00)

CLOSE VENT VLVS

L2 CAB VENT ISOL - CL (tb-CL)
VENT - CL (tb-CL)

1: GNC 100 GTS DISPLAY	2: GNC 104 GND IMU CNTL/MON
3: BFS, GNC BFS MEMORY	

NOTE

At T-20 there will be a
planned 10 minute hold

-20:00 **OPS 1 LOAD (DEU Equivalent)**
(-30:00)

1: GNC LAUNCH TRAJ	2: GNC LAUNCH TRAJ
1: GNC 0 GPC MEMORY	

1: GNC FAULT

Report faults other than from
unpowered equipment

CRT1 GNC, SPEC 99 PRO

NOTE

Gnd-Controlled Fuel Cell Purge

-19:00 **BFS to OPS 1**
(-29:00)

3: BFS, GNC FAULT

CRT3 GNC, SPEC 99 PRO

06 GPC 5 MODE - RUN (LD-RUN)

CRT3 GNC, OPS 101 PRO

3: BFS, GNC LAUNCH TRAJ I
3: BFS, GNC FAULT

Report faults other than from
unpowered equipment

CRT3 GNC, SPEC 99 PRO

[1: GNC FAULT] [2: GNC LAUNCH TRAJ]
 [3: BFS, GNC FAULT]

P HORIZ SIT CONFIG

[2: GNC 50 HORIZ SIT]
 [3: BFS, GNC 50 HORIZ SIT]

ALTM - ITEM 9 * [2] [9] * [8] [7]

	PASS ITEM	BFS ITEM
PTI EXEC	INH 2✓	
RWY	KSC 15 3*✓	KSC 15 3*✓
	KSC 33 4✓	KSC 33 4✓
	(TAL) 5✓	5✓

- * If RWY KSC 33 selected: *
- * 08 MLS CH tw (three) - 6 *

G&N	OVHD 6✓	OVHD 6✓
NEP	NEP 7✓	NEP 7✓
AIM	NOM 8✓	NOM 8✓
TAC	INH 20✓	INH 20✓
DRAG H	AUT 22✓	AUT 22✓
ADTA H	INH 26✓	INH 26✓
ADTA TO G&C	INH 29✓	AUT 28✓
TAC	DELTA 35✓	-
HUD	Blank 37✓	-
	Blank 38✓	-

[1: GNC LAUNCH TRAJ] [2: GNC SYS SUMM 1]
 [3: BFS, GNC SYS SUMM 2]

-16:00
 (-26:00)

MPS He RECONFIGURATION

R2 MPS He ISOL A,B (six) - OP
 PNEU He ISOL - OP

1: GNC LAUNCH TRAJ

2: GNC SYS SUMM 1

3: BFS, GNC SYS SUMM 2

CONFIG OMS/RCS XFEED VLVS

NOTE

OMS/RCS XFEED vlvs are reconfigured for launch by LPS

C CRT3 Report RCS QTYs F,L,R OXID, FU

3: BFS, SM SYS SUMM 2

NOTE

At T-9 there will be a planned 10 min hold

WEATHER UPDATE (if reqd)

Update Abort winds, RWY and ALTM setting

-9:00

'GO FOR LAUNCH' - All

C2 EVENT TIMER - START

F7 ✓EVENT TIME ind - counting down

NOTE

GL5 starts

-8:00

P AC SNSR TO MONITOR

R1 AC BUS SNSR (three) - OFF (1 sec), then MONITOR

-7:00

NOTE

ACCESS ARM RETRACT

✓Seat in launch position

-6:00 P **APU PRE START**

- R4 ✓HYD LG RET/CIRC VLV - CL
- R2 ✓BLR N2 SPLY (three) - ON
 - ✓CNTLR (three) - ON
 - ✓CNTLR PWR/HTR (three) - A
- ✓APU FUEL TK VLV (three) - CL
 - ✓PUMP/VLV COOL (two) - OFF
- APU CNTLR PWR (three) - ON
- ✓HYD CIRC PUMP (three) - GPC
 - MN PUMP PRESS (three) - LO
- ✓APU AUTO SHUT DN - ENA
 - ✓SPEED SEL (three) - NORM
 - ✓CNTL (three) - OFF
- APU FUEL TK VLV (three) - OP
- ✓APU/HYD RDY tb (three) - gray

- * If any tb not gray, *
- * consult LCC before *
- * continuing *

-5:00 > **APU START**

- R2 APU CNTL (three) - START/RUN
- F8 ✓HYD PRESS ind (three) - LO green
- R2 ✓READY TO START tb (three) - bp
 - HYD MN PUMP PRESS (three) - NORM
- F8 ✓HYD PRESS ind (three) - HI green
- R2 HYD CIRC PUMP (three) - OFF
- F7 ✓HYD PRESS lt - off

1: GNC LAUNCH TRAJ	2: GNC SYS SUMM 1
3: BFS, SM SYS SUMM 2	

C HTR RECONFIG

L2 FLASH EVAP FDLN HTR (two) - OFF

3: BFS, SM SYS SUMM 1

-4:00 A **CLOSE VISOR**

NOTE
Motion/Vibration may be felt in crew module due to Main Engine gimbal profile cks at -3:25 and move to start at -3:10

-2:30 P **CLEAR C/W MEMORY**

2: GNC 99 FAULT
3: BFS, GNC 99 FAULT

Verify no unexpected errors
CRT2 GNC, SPEC 99 PRO
CRT3 GNC, SPEC 99 PRO

1: GNC LAUNCH TRAJ	2: GNC SYS SUMM 1
3: BFS, GNC SYS SUMM 1	

C3 C/W MEM - CLEAR

-00:30 B W1/W6 16mm Camr (two) - on

POST
OMIS 1

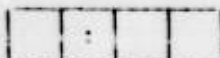
POST OMIS 1 BURN PROCEDURES

1: GNC OMS 1 MNVR EXEC	2: GNC OMS 1 MNVR EXEC
3: BFS, GNC SYS SUMM 2	

C POST BURN STATUS

NOMINAL

Δ TIG



POST
OMS 1

B F7/FR FLT CNTLR PWR (two) - OFF
C3 ✓DAP - AUTO

- * **C ALPHA MANAGEMENT (if reqd)** *
- * *
- * If underspeed ATO or AOA-S OMS 1: *
- * Maneuver to LVLH R180, P340, Y000 *
- * (maintain LVLH P = +20) *
- * After 10 minutes: *
- * Maneuver to LVLH P = 340 *
- * After 10 minutes: *
- * Maneuver to Burn Attitude *

P APU/HYD SHUTDOWN (Not AOA)

- F4 ✓BDY FLP pb - 1t off (MPS stowed)
(-2 min 21 sec)
- R4 HYD MPS/TVC ISOL VLV (three) - CL
(tb-CL)
- R2 ✓APU AUTO SHUT DN - ENA
BLR CNTLR (three) - OFF
APU CNTL (three) - OFF (MA)
FUEL TK VLV (three) - CL
✓CNTLR PWR (three) - ON
BLR N2 SPLY (three) - OFF
APU FUEL PUMP/VLV COOL A - AUTO

1: GNC OMS 2 MNVR EXEC 2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC

- * P **HYD DEPRESS (ACA only)** *
- * F4 ✓BDY FLP pb - 1t off (MPS stowed) *
- * (-2 min 21 sec) *
- * R4 HYD MPS/TVC ISOL VLV (three) - CL *
- * (tb-CL) *
- * R2 ✓API SPEED SEL (three) - NORM *
- * ✓AUTO SHUT DN - ENA *
- * HYD MN PUMP PRESS (three) - LO (MA) *

FES & HEATER ACTIVATION

- C L1 FLASH EVAP CNTLR PRI A - ON
(not AOA)
- L2 FLASH EVAP FULN HTR (two) - 1
- P R1 O2 TK1,2 HTRS A (two) - AUTO
H2 TK1,2 HTRS A (two) - AUTO

AC BUS SNSR

- R1 AC BUS SNSR (three) - OFF (1 sec),
then AUTO TRIP

MAJOR MODE CHANGE

CRT1 GNC, OPS 105 PRO

1: GNC OMS 2 MNVR EXEC 2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC

NOTE
Consult ASE PRT C/L for
failures that occurred
during ascent

CAMERAS OFF

- B W1/W6 16mm Camr (two) - off

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC

B OMS 2 BURN SETUP

✓OMS 2 TARGETING, Flip Book

CRT1 TRIM LOAD - ITEM 6 +0.4 -5.7
+5.7 EXEC

- * For single eng burn (good eng): *
- * TRIM LOAD LY - ITEM 7 + 5.2 EXEC *
- * RY - ITEM 8 - 5.2 EXEC *
- * OMS L - ITEM 2 EXEC *
- * R - ITEM 3 EXEC *

- * For RCS burn: *
- * RCS SEL - ITEM 4 EXEC *

NOTE

Onboard computed TIG may vary slightly but is acceptable

NOTE

If AOA, verify/enter appropriate ABORT TGT number in MM105 but do not LOAD targets until OPS 3

✓Targets, OMS TARGETS

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

CRT3 ✓BFS TGT

1: GNC OMS 2 MNVR EXEC	2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC	

P MPS POWERDOWN

R2 MPS ENG PWR (six) - OFF
He ISOL (six) - CL
√He I'CONNECT (three) - GPC

NOTE

Expect multiple MAs for
MPS He P as regs bleed down

MPS VACUUM INERTING ACT

R2 √MPS PNEU He ISOL - OP

R4 MPS L02 PREVLV (three) - CL
Wait 3 sec - OP

MPS H2 PRESS LINE VENT - OP
(Start watch)

FILL/DRAIN LH2 INBD - CL

OUTBD - CL

L02 INBD - CL

OUTBD - CL

Wait 10 sec:

LH2 INBD - OP

OUTBD - OP

L02 INBD - OP

OUTBD - OP

After 1 minute:

MPS H2 PRESS LINE VENT - GND

I: GNC OMS 2 MNVR EXEC 2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC

P ET UMBILICAL DOOR CLOSURE

WARNING
The ET CTRLINE LATCHES must be stowed prior to L,R DR closure to prevent door drive damage

NOTE

Double times for single motor operation

R2 ET UMB DR
MODE - GPC/MAN
CTRLINE LAT - STOW
✓After 6 sec, CTRLINE LAT tb - STO
L,R DR (two) - CL (tb-bp)
After 24 sec, L,R DR tb - CL
L,R LAT (two) - LAT (tb-bp)
After 6 sec, L,R LAT tb - LAT
MODE - GPC

* If doors not closed: *
* 2: GNC 51 OVERRIDE *
* ET UMB DR CLOSE - ITEM 6(11) *
* EXEC *

CTRLINE LAT - GND
L,R DR (two) - OFF
L,R LAT (two) - OFF

***** If AOA: Go to AOA ***** **

NOTE

If HYD DEPRESS and not AOA,
perform APU/HYD SHUTDOWN,
3-2, then:

1: GNC OMS 2 MNVR EXEC	2: GNC OMS 2 MNVR EXEC
3: BFS, GNC SYS SIMM 2	

C OMS TVC GIMBAL CHECK
(Perform during 5-band AOS)

CRT1 SECONDARY CHECK
Perform SEC L,R then PRI L,R GMBL CK

- * If down arrow(s) or M's: *
- * Select good GMBL *

OMS BURN PREP

P OR L,R OMS
 ✓He PRESS/VAP ISOL A (two) - GPC
 B (two) - CL
 ✓TK ISOL (four) - OP (tb-OP)
 XFEED (four) - CL (tb-CL)

```

.....FRCS BURN PREP..... =
. Load DUMMY target for FRCS . =
. attitude . =
. RCS SEL - ITEM 4 EXEC . =
. TIG = TTA -1:00 . =
. ΔVX = -2.1 (ITEM 19) . =
. ΔVY = 0 (ITEM 20) . =
. ΔVZ = -1.0 (ITEM 21) . =
. LOAD - ITEM 22 EXEC . =
. Mnvr to ATT (error needles) . =
. When in attitude: . =
. ADI ATT - REF (push) . =
.
. Load External ΔV Burn Target . =
. ΔVX = +80 . =
. ΔVY = 0 . =
. ΔVZ = 0 . =
. LOAD - ITEM 22 EXEC . =
. TIMER - ITEM 23 EXEC . =
. ✓VGOX = negative . =
. ✓VGOY = 0 . =
. ✓VGOZ = +21 + 2 . =
. ✓REF ball - 0,0,0 . =
.....
  
```

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC |
3: BFS, GNC SYS SUMM 2 |

B Wedge Install OMS 2/ORBIT BURN and OMS 2 BURN MONITOR Cue Cards (F6/F8) |

OMS 2 BURN ATTITUDE MNVR

B F6/F8 ✓ADI ATT (two) - INRTL
ADI RATE - 1
C Mnr to OMS 2 Burn Attitude

3: BFS, GNC SYS SUMM 2 |

B SEAT SAFING AND ADJUSTMENT

Open Visor
Remove from pocket and install:
Panel Jettison T-Handle Pin
Adjust Back Angle
Take antinotion sickness medication

TIG-5 ▶ P VACUUM INERTING TERMINATE

R4 MPS FILL/DRAIN
LH2, LO2 OUTBD (two) - CL
Wait 10 sec - GND
LH2, LO2 INBD (two) - GND
MPS LO2 PREVLV (three) - CL
Wait 2 sec - GPC

R2 MPS PNEU He ISOL - CL

* If MPS PRPLT DUMP B/U LH2 VLV *
* sw was set to OP, set sw to CL *

TIG-2 ▶ B

Go to OMS 2/ORBIT BURN Cue Card

DELAYED
OMS 1

DELAYED OMS 1 BURN PROCEDURES

|1: GNC OMS 1 MNVR EXEC |2: GNC SYS SUMM 1|
|3: BFS, GNC SYS SUMM 1|

DELAYED OMS 1 BURN

**B OMS 1 TARGET CHECK
(FEEDLINE FAIL ONLY)**

✓MM104
C3 ✓ET SEP - MAN

Check for underspeed:
Load TIG = MECO + 2 (-10:38 Non)
LOAD - ITEM 22 EXEC
✓OMS 1 TARGETING, Flip Book

CAUTION

If targeting requires underspeed
ATO (AOA-S), perform manual ET
SEP and ATO (AOA-S) OMS 1 burn
prior to apogee (TIA = 0)

MANUAL MPS DUMP (PASS)

C *X xlation (5 sec)
P R2 MPS PRPLT DUMP SEQ - START
(Start watch)
After 2:21:
F2/F4 ✓BDY FLP pb - lt off

DELAYED
OMS 1

1: GNC OMS 1 MNVR EXEC	2: GNC SYS SUMM 1
3: BFS, GNC SYS SUMM 1	

C OMS 1 BURN SETUP

MCC give: .
 Nav State
 OMS 1 Target Selection
 ----- Go for APU Shutdown -----

3: BFS, GNC OMS 1 MNVR EXEC

CRT1 Enter Target from OMS TARGETS

LOAD - ITEM 22 EXEC
 TIMER - ITEM 23 EXEC

CRT3 ✓BFS TGT

- * If BFS: *
- * HYD MN PUMP PRESS (three) - LO (MA) *
- * Go to FES & HEATER ACTIVATION, 4-4 *

P APU/HYD SHUTDOWN (Not AOA)

F4 ✓BDY FLP pb - 1t off (MPS stowed)
 (-2 min 21 sec)

R4 HYD MPS/TVC ISOL VLV (three) - CL
 (tb-CL)

R2 ✓APU AUTO SHUT DN - ENA
 BLR CNTLR (three) - OFF
 APU CNTL (three) - OFF(MA)
 FUEL TK VLV (three) - CL
 ✓CNTLR PWR (three) - ON
 BLR N2 SPLY (three) - OFF
 APU FUEL PUMP/VLV COOL A - AUTO

- * **HYD DEPRESS (AOA only)** *
- * *
- * F4 ✓BDY FLP pb - 1t off (MPS stowed) *
- * (-2 min 21 sec) *
- * R4 HYD MPS/TVC ISOL VLV (three) - CL *
- * (tb-CL) *
- * R2 ✓APU SPEED SEL (three) - NORM *
- * ✓AUTO SHUT DN - ENA *
- * HYD MN PUMP PRESS (three) - LO (MA) *

FES & HEATER ACTIVATION

- C L1 FLASH EVAP CNTLR PRI A - ON (not AOA)
- L2 FLASH EVAP FDLN HTR (two) - 1
- P R1 O2 TK1,2 HTRS A (two) - AUTO
- H2 TK1,2 HTRS A (two) - AUTO

P AC BUS SNSR

- R1 AC BUS SNSR (three) - OFF (1 sec), then AUTO TRIP

► C ET SEP (MECO + 6 MIN) (-14:30 Nom)
(FEEDLINE FAIL ONLY)

- ET SEP pb - SEP
- ✓MN ENG STAT 1t (three) - off
- ✓Att within 10⁰ of SEP ATT

- * If not: *
- * Delete +X xlation and *
- * Delay mnvr for 20 sec *

1: GNC OMS 1 MNVR EXEC 2: GNC SYS SUMM 1

3: BFS, GNC OMS 1 MNVR EXEC

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

ATTITUDE MNVR

B F6/F8 ADI ATT (two) - INRTL

Mnvr to OMS 1 Burn Attitude
(Compare ADI ATT with CRT BURN ATT)

2: GNC OMS 1 MNVR EXEC

3: BFS, GNC SYS SUMM 2

- * If BFS: (Prior to TIG) *
- * HYD MN PUMP PRESS (three) - NORM *

Go to OMS 1 BURN Flip Book

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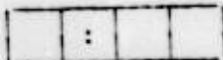
POST DELAYED - OMS 1 BURN

1: GNC OMS 1 MNVR EXEC	2: GNC OMS 1 MNVR EXEC
3: BFS, GNC SYS SUMM 2	

C POST BURN STATUS

NOMINAL

Δ TIG



B F7/F8 FLT CNTLR PWR (two) - OFF
C3 ✓DAP - AUTO

- * If BFS: *
- * ✓BDY FLP pb - 1t off (MPS stowed) *
- * (-2 min 21 sec) *
- * Perform APU/HYD SHUTDOWN, 4-3, *
- * HYD DEPRESS, 4-4, then *

MAJOR MODE CHANGE

CRT1 GNC, OPS 105 PRO

1: GNC OMS 2 MNVR EXEC	2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC	

NOTE

Consult ASC PRT C/L for failures that occurred during ascent

CAMERAS OFF

B W1/W6 16mm Camr (two) - off

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC |
3: BFS, GNC OMS 2 MNVR EXEC |

C OMS 2 BURN SETUP

✓OMS 2 TARGETING, Flip Book

CRT1 TRIM LOAD - ITEM 6 +0.4 -5.7
+5.7 EXEC

- * For single eng burn (good eng): *
- * TRIM LOAD LY - ITEM 7 + 5.2 EXEC *
- * RY - ITEM 8 - 5.2 EXEC *
- * OMS L - ITEM 2 EXEC *
- * R - ITEM 3 EXEC *

- * For RCS burn: *
- * RCS SEL - ITEM 4 EXEC *

✓Target from OMS TARGETS

NOTE

If AOA, verify enter appropriate
ABORT TGT number in MM105 but do
not LOAD targets until OPS 3

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

CRT3 ✓BFS TGT

P MPS POWERDOWN

R2 MPS ENG PWR (six) - OFF
He ISOL (six) - CL
✓He I'CONNECT (three) - GPC

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC
3: BFS, GNC OMS 2 MNVR EXEC

NOTE

Expect multiple MAs for
MPS He P as regs bleed down

MPS VACUUM INERTING ACT

R2 ✓MPS PNEU He ISOL - OP

R4 MPS LO2 PREVLV (three) - CL
Wait 3 sec - OP

MPS H2 PRESS LINE VENT - OP
(Start watch)

FILL/DRAIN LH2 INBD - CL
OUTBD - CL
LO2 INBD - CL
OUTBD - CL

Wait 10 sec:
LH2 INBD - OP
OUTBD - OP
LO2 INBD - OP
OUTBD - OP

After 1 minute:

MPS H2 PRESS LINE VENT - GND

P ET UMBILICAL DOOR CLOSURE

WARNING

The ET CTRLLINE LATCHES must be
stowed prior to L,R DR closure
to prevent door drive damage

NOTE

- If FEEDLINE FAIL and not
ADA, stow CTRLLINE LAT but
DO NOT CLOSE DOORS
- Double times for single motor
operation

|1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC |
|3: BFS, GNC OMS 2 MNVR EXEC|

R2 ET UMB DR

MODE - GPC/MAN

CTRLINE LAT - STOW

✓After 6 sec, CTRLINE LAT tb - STO

L,R DR (two) - CL (tb-bp)

After 24 sec, L,R DR tb - CL

L,R LAT (two) - LAT (tb-bp)

After 6 sec, L,R LAT tb - LAT

MODE - GPC

* If doors not closed: *

* |2: GNC 51 OVERRIDE| *

* ET UMB DR CLOSE - ITEM 6(11) EXEC *

CTRLINE LAT - GND

L,R DR (two) - OFF

L,R LAT (two) - OFF

+++++ If AOA: Go to AOA ++++++ ..

NOTE

If HYD DEPRESS and not AOA, perform APU/HYD SHUTDOWN, 4-3, then:

OMS BURN PREP

P OR

L,R OMS

✓He PRESS/VAP ISOL A (two) - GPC

B (two) - CL

✓TK ISOL (four) - OP (tb-OP)

XFEED (four) - CL (tb-CL)

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC |
 3: BFS, GNC OMS 2 MNVR EXEC |

```

...FRCS BURN PREP..... =
. Load DUMMY target for FRCS =
. attitude =
. RCS SEL - ITEM 4 EXEC =
. TIG = TTA -1:00 =
. ΔVX = -2.1 (ITEM 19) =
. ΔVY = 0 (ITEM 20) =
. ΔVZ = -1.0 (ITEM 21) =
. =
. LOAD - ITEM 22 EXEC =
. =
. Mvnr to ATT (error needles) =
. When in attitude: =
. ADI ATT - REF (push) =
. =
. Load External ΔV Burn Target =
. ΔVX = +80 =
. ΔVY = 0 =
. ΔVZ = 0 =
. =
. LOAD - ITEM 22 EXEC =
. TIMER - ITEM 23 EXEC =
. =
. √VGX = negative =
. √VGY = 0 =
. √VGOZ = +21 +2 =
. √REF ball - 0,0,0 =
..... =
  
```

B Wedge Install OMS 2/ORBIT BURN and OMS BURN |
MONITOR Cue Cards (F6/F8)

OMS 2 BURN ATTITUDE MNVR

- B F6/F8 √ADI ATT (two) - INRTL
 √Rate Needles
 C Mvnr to OMS 2 Burn Attitude

3: BFS, GNC SYS SUMM 2 |

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC
3: BFS, GNC SYS SUMM 2

B SEAT SAFING AND ADJUSTMENT

Open Visor
Remove from pocket and install:
Panel Jettison T-Handle Pin
Adjust Back Angle
Take antiontion sickness
medication

C OMS TVC GIMBAL CHECK

CRT1 SECONDARY CHECK
Perform SEC L,R then PRI L,R
GMBL CK

* If down arrow(s) or M's: *
* Select good GMBL *

TIG-5 ▶ P VACUUM INERTING TERMINATE

R4 MPS FILL/ DRAIN
LH2, LO2 OUTBD (two) - CL
Wait 10 sec - GND
LH2, LO2 INBD (two) - GND
MPS LO2 PREVLV (three) - CL
Wait 2 sec - GPC

R2 MPS PNEU He ISOL - CL

* If MPS PRPLT DUMP B/U LH2 VLV *
* sw was set to OP, set sw to CL *

TIG-2 ▶ B Go to OMS 2/ORBIT BURN Cue Card

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POST OMS 2 BURN PROCEDURES

POST
OMS 2

1: GNC OMS 2 MNVR COAST | 2: GNC OMS 2 MNVR COAST |
3: BFS, GNC SYS SUMM 2 |

C POST BURN STATUS

NOMINAL

Δ TIG

	:		
--	---	--	--

B F6/F8 FLT CNTLR PWR (two) - OFF
C3 ✓DAP - AUTO

C OMS TVC GIMBAL CHECK

CRT1 SECONDARY CHECK

Perform SEC L,R then PRI L,R GMBL CK

P OMS/RCS POST BURN RECONFIGURATION

07 AFT L,R RCS

He PRESS A (two) - GPC (th-OP)

B (two) - CL (th-CL)

TK ISOL (six) - OP (th-OP)

XFEED (four) - CL (th-CL)

08 FWD RCS

He PRESS A - GPC (th-OP)

B - CL (th-CL)

L,R OMS

He PRESS/VAP ISOL (four) - CL

✓TK ISOL (four) - OP (th-OP)

✓XFEED (four) - CL (th-CL)

MAJOR MODE CHANGE

CRT1 GNC, OPS 106 PRO

1: GNC OMS 2 MNVR COAST | 2: GNC OMS 2 MNVR COAST |

B CAA/
R3A Stow ASC PKT C/L (Helmet Bag)
Unstow ORBIT Cue Cards & ORB PKT C/L

Go to POST INSERT, POST INSERTION **

- * If ATO, go to POST INSERT, *
- * ATO POST INSERTION *

AOA PADS

AOA
PADS

AOA DEL PAD

DEORBIT

PRPLT

()

BURN CUE CARD:

PRI HP -TGT HP +42 (Delayed NOM/AOA)
 = B/U HP +52 (All other steepes)
 +34 (All shallow entries)

TOT AFT QTY 1 (%)

9 6

TOT AFT QTY 2 (%)

5 3

FRCS: DUMP TO %

OX

ENTRY/LANDING

EI-5 MM303

INRTL ATT

(7-22)

R

P

Y

EI-5 MM304 PREBANK
 (ENT Mnvr Cue Card)

ALTM SET (7-25)

VREL 1ST REVERSAL

L	OVHD		deg	RWY
R	STRT			

WINDS: 50K /
 (ENT Mnvr 40K /
 Cue Card) 30K /
 20K /
 7K /

SURFACE /

REMARKS:

AOA
PADS

AMS 80TH 1
 L 2
 R 3
 REC SEL 4

6 TH HOLD
 7TH HOLD
 8 P
 7 2V
 8 2V
 9 2V
 10 2V

11 2V
 12 2V
 13 2V
 14 2V
 15 2V
 16 2V
 17 2V
 18 2V
 19 2V
 20 2V
 21 2V

22 2V
 23 2V
 24 2V
 25 2V
 26 2V
 27 2V
 28 2V
 29 2V
 30 2V
 31 2V

32 2V
 33 2V
 34 2V
 35 2V
 36 2V
 37 2V
 38 2V
 39 2V
 40 2V
 41 2V

24N ATT
 24 R
 25 P
 26 V

RET
 TKE

34TOT
 T00

34D R
 V
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 34TOT

WV12 PAD

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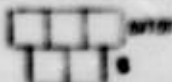
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AOA PROCEDURES

AOA

|1: GNC OMS 2 MNVR EXEC |2: GNC OMS 2 MNVR EXEC |

|3: BFS, GNC OMS 2 MNVR EXEC |

B C4F/ Stow ASC PKT C/L
R3F Unstow ENT PKT C/L

F6/F8 Install DEORBIT BURN and DEORB
BURN MONITOR Cue Cards (R3A)

Stow Ascent Cue Cards (R3A)

NOTE

Verify/enter appropriate ABORT
TGT number in MM105 but do not
LOAD targets until OPS 3

RECONFIGURE DPS FOR ENTRY

CAUTION

If recovering string(s)
due to failed GPC(s), all
FCS CH(s) to AUTO prior
to OPS 301 PRO

CRT1 GNC, OPS 301 PRO (✓DAP)

CRT3 BFS, GNC, OPS 301 PRO

CRT1 GNC, OPS 302 PRO **

|1: GNC DEORB MNVR EXEC |2: GNC DEORB MNVR EXEC |

|3: BFS, GNC DEORB MNVR EXEC |

C3 OI PCMMU FORMAT - FXD

1: GNC DEORB MNVR EXEC	2: GNC DEORB MNVR EXEC
3: BFS, GNC DEORB MNVR EXEC	

B OMS 2 BURN SETUP

CRT1 TRIM LOAD - ITEM 6 +0.4 -5.7
+5.7 EXEC

- * For single engine burn (good engine):
- * TRIM LOAD LY - ITEM 7 + 5.2 EXEC
- * LOAD RY - ITEM 8 - 5.2 EXEC
- * OMS L - ITEM 2 EXEC
- * R - ITEM 3 EXEC
- * For RCS burn:
- * RCS SEL - ITEM 4 EXEC

1: GNC 50 HORIZ SIT

✓RWY selection

- * If required:
- * Select correct runway *

1: GNC DEORB MNVR EXEC

✓Or enter Target from OMS TARGETS

NOTE

Onboard computed TIG & BT may vary slightly and are acceptable if REI is correct

CRT1 LOAD - ITEM 22 EXEC
 TIMER - ITEM 23 EXEC
 ✓PRPLT (after target loaded)

- * If PRPLT change desired:
- * WT - ITEM 9 + _____ EXEC
- * (reenter wt to cause flashing load)
- * PRPLT - ITEM 18 ± _____ EXEC
- * LOAD - ITEM 22 EXEC
- * TIMER - ITEM 23 EXEC

CRT3 ✓BFS TGT

1: GNC DEORB MNVR EXEC | 2: GNC DEORB MNVR EXEC |
3: BFS, GNC DEORB MNVR EXEC |

C OMS TVC GIMBAL CHECK
(Perform during S-band AOS)

CRT1 SECONDARY CHECK
Perform SEC L,R then PRI L,R GMBL CK

- * If down arrow(s) or M's: *
- * Select good GMBL *

SEAT ADJUSTMENT

Adjust Back Angle

P OMS BURN PREP

08 L,R OMS
✓He PRESS/VAP ISOL A (two) - GPC
B (two) - CL
✓TK ISOL (four) - OP (tb-OP)
XFEED (four) - CL (tb-CL)

.....RCS BURN PREP(I'cnect OMS to RCS).....

. P 08 L,R OMS .
. He PRESS/VAP ISOL (four) - CL .
. ✓TK ISOL (four) - OP (tb-OP) .
. L OMS XFEED (two) - OP (tb-OP) .
. R OMS XFEED (two) - CL (tb-CL) .
. 07 AFT L,R RCS .
. XFEED (four) - OP (tb-OP) .
. TK ISOL (six) - CL (tb-CL) .
.....

I: GNC DEORB MNVR EXEC | 2: GNC DEORB MNVR EXEC.
3: BFS, GNC DEORB MNVR EXEC

OMS BURN TIG ADJUST (if reqd)

CRTX LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

Determine Δ TIG (if REI - REF > 50) from
OMS TARGETS

CRTX Enter new TIG

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

Repeat until Δ RANGE < 50

CRT3 \checkmark BFS TGT

MNVR TO DEORBIT BURN ATTITUDE

B F6/F8 \checkmark ADI ATT (two) - INRTL
 \checkmark ERR (two) - 5
 \checkmark RATE (two) - 5

C MnvR to Deorbit Burn Attitude
(\checkmark ADI ATT with CRT BURN ATT)

TIG-10 P VACUUM INERTING TERMINATE

R4 MPS FILL/DRAIN
LH2,LO2 OUTBD (two) - CL
Wait 10 sec... - GND
LH2,LO2 INBD (two) - GND
MPS LO2 PREVLV (three) - CL
Wait 2 sec... - GPC

R2 MPS PNEU He ISOL - CL

| 1: GNC DEORB MNVR EXEC | 2: GNC DEORB MNVR EXEC |
| 3: BFS, GNC DEORB MNVR EXEC |

P MPS/H2 PURGE PREP

R2 MPS He ISOL L (two) - GPC
 I'CONNECT L - IN OP
 I'CONNECT CTR, R - IN CL
 PNEU L ENG He XOVR - OP
 He ISOL - GPC

R4 MPS MANF PRESS (two) - OP
 FILL/DRAIN LH2 INBD - OP

| 3: BFS, GNC SYS SUMM 2 |

TIG-2 B R3A Go to DEORBIT BURN Cue Card |

AOA POST DEORB BURN

P OMS/RCS POST BURN RECONFIGURATION

- 07 AFT L,R RCS
✓He PRESS (four) - OP (th-OP)
✓TK ISOL (six) - GPC (th-OP)
✓XFEED (four) - GPC (th-CL)
- 08 L,R OMS
He PRESS/VAP ISOL (four) - CL
✓TK ISOL (four) - OP (th-OP)
- * If OMS PRPLT FAIL, *
 - * ✓Affected TK ISOL (two) - CL *
- ✓XFEED (four) - CL (th-CL)
- F8 FLT CNTLR PWR - OFF
- * **UNDERBURN** *
 - * *
 - * Determine AHP *
 - * (CUR HP - TGT HP) *
 - * If AHP > 2: *
 - * Use PREBANK TABLE *

1: GNC DEORB MNVR EXEC 2: GNC DEORB MNVR EXEC
 3: BFS, GNC SYS SUMM 2

PREBANK TABLES

(Delayed Nominal/AOA steep entry)

Δ HP	3	5	8	10	15	18
PREBANK	57	74	90	102	123	149

(All other steep entries)

Δ HP	3	5	8	10	15	20	25	30
PREBANK	37	48	62	69	81	95	113	143

(AOA shallow/AOA shallow entry)

Δ HP	5	10	15	20
PREBANK	97	106	123	167

(All other AOA shallow entries)

Δ HP	2	4	6	8
PREBANK	100	110	124	149

Record UNDERBURN prebank on ENTRY
MANEUVERS Cue Card

C POST BURN STATUS

NOMINAL

--

Δ TIG

	:		
--	---	--	--

P CRT2 GNC, OPS 303 PRO **

1: GNC DEORB MNVR COAST 2: GNC DEORB MNVR COAST

1: GNC DEORB MNVR COAST	2: GNC DEORB MNVR COAST
3: BFS, GNC SYS SUMM 2	

C CRT1 ✓or load INRTL EI-5 MM303 ATT from DEL PAD:

R - ITEM 21 +

--	--	--

P - ITEM 25 +

--	--	--

Y - ITEM 26 +

--	--	--

MNVR to EI-5 Att

- * If UNDERBURN, or no DEL PAD, ignore *
- * INRTL ATT ERR needles and Mnvr to *
- * LVLH ROOL, Y353 and P per table *
- * below *

TIME to EI (min)	LVLH PITCH (deg)
20	339
	343
	347
	351
	355
15	359
	3
	7
	11
	15
10	19
	23
	27
	31
	35
5	39

1: GNC DEORB MNVR COAST | 2: GNC DEORB MNVR COAST

3: BFS, GNC SYS SUMM 2

12: GNC 50 HORIZ SIT

13: BFS, GNC 50 HORIZ SIT

P **STATE VECTOR CHANGE (if reqd)**

CRT2 ΔT - ITEM 18 ()

CRT3 LOAD - ITEM 16 EXEC
.....wait 3 sec(min).....
PASS/BFS SV XFER - ITEM 17 EXEC
LOAD - ITEM 16 EXEC

NOTE

Wait at least 3 sec before
additional ITEM 17 EXEC

C **OMS GIMBAL POWERDOWN (PASS ONLY)**

Verify gimbal positions:

	<u>L</u>	<u>R</u>
P	+5.9	+5.9
Y	+6.4	-6.4

CRT1 GMBL OFF - ITEM 32 EXEC
- ITEM 33 EXEC

1: GNC DEORB MNVR COAST	2: GNC DEORB MNVR COAST
3: BFS, GNC 50 HORIZ SIT	

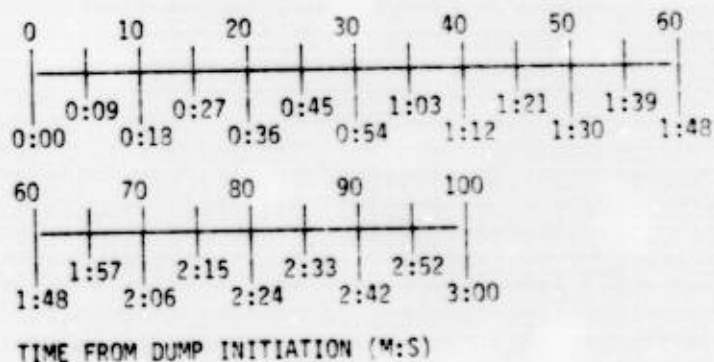
P FORWARD RCS DUMP

2: GNC DEORB MNVR COAST

Determine FWD RCS 'DUMP TO %' (Calculator or DEL PAD)

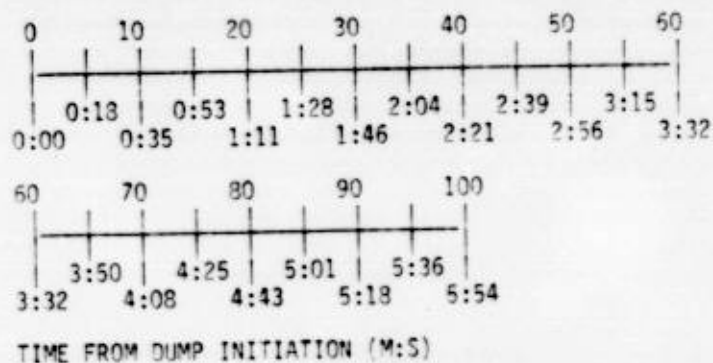
FOUR JET DUMP:

F RCS PRPLT TO BE DUMPED (%)



TWO JET DUMP:

F RCS PRPLT TO BE DUMPED (%)



1: GNC DEORB MNVR COAST 2: GNC DEORB MNVR COAST
3: BFS, GNC 50 HORIZ SIT

CRT2 FWD RCS ARM - ITEM 36 EXEC
 DUMP - ITEM 37 EXEC
 When required:
 OFF - ITEM 38 EXEC

When dump complete:
08 FWD RCS
 MANF ISOL (five) - CL (tb-CL)

HORIZ SIT CONFIG

2: GNC 50 HORIZ SIT

ALTM - ITEM 9

+ [] [] [] [] []

	<u>PASS ITEM</u>	<u>BFS ITEM</u>
RWY	3✓	3✓
✓correct RWY selected per DEL PAD	4✓	4✓
	5✓	5✓
G&N	OVHD 6✓	OVHD 6✓
NEP	7✓	7✓
AIM	NOM 8✓	NOM 8✓
TAC	INH 20✓	INH 20✓
DRAG H	AUT 22✓	AUT 22✓
ADTA H	INH 26✓	INH 26✓
ADTA TO G&C	INH 29✓	AUT 28✓
TAC	DELTA 35✓	-
Failed TACANs deselected	✓	✓
HUD	Blank 37✓	-
	Blank 38✓	-

- * If BFS engaged: *
- * Set HSD BFS ITEMS to PASS Config *

2: GNC DEORB MNVR COAST
3: BFS, GNC DEORB MNVR COAST

- * **If APUs shutdown:** *
- * Perform APU HOT RESTART *
- * (ENT PKT C/L, APIU/HYD), then: *

ENTRY SW CHECK

- B F6/F8 Stow Drobit Sym Cue Cards (RAB)
 +3- Install Entry Cue Cards
- P 07 .TACAN MODT (three) = 7/B
 .VANT SEI (three) = AUTO
 CH (three) = 111X (CW)
 = 059X (KSC)
 = 069X (NOR)
- 00 .RADAR ALTM (two) = ON
 .VLS (three) = ON (PASS)
 .VLS CH (three) = 8 (EDWT, KJCS, NOR)
 = 8 (EDWT, KJCS)
- 1/O RESET EXEC
- C L2 .CRB R.L.T. (two) = ENA (En-TNA)
 .VANTENIO = ON
 .VNW = 00
 .VENTRY MODE = A

1: GNC 5: OVERVIEW

- .ENTRY R MODE = AUTO
- K L7/C3 .SBTC = Full Rad
- C3 .CRB SEP = AUTO
 .VLT SEP = AUTO
- F6/F8 .VLR DATA = NAV
 .VADJ CAN = 0
 .VRATE = 0
 .VADJ SEL MODE = ENTRY
- C F6 .SOURCE (two) = NAV, 1
 P F8 .SOURCE (two) = NAV, 1
- B F3 .TRIM SAC/PNL (two) = ON
 .VPNL (two) = ON
- F7/F8 .RADAR ALTM = 1/C, 2/P
 .VLT CNTLR Pnl (two) = ON

[1: GNC DEORB M22R COAST] [2: GNC DEORB M22R COAST]
[3: BFS, GNC DEORB M22R COAST]

PRE EI CHECKLIST

- If only one APH running: *
- Good HYD MAIN PUMP PRESS - LOW *
- Delay M22R transition to EI-2 *
- Just prior to transition: *
- Good HYD MAIN PUMP PRESS - NORM *
- APH SPEED SEL - HIGH *

- If 3 PASS GPC configuration: *
- FCS CH8 - OFF *

NOTE

If OMS/PCS No or Te PRESS low,
do not perform this procedure

[2: GNC ST INCRTRK] |

-EI-5 CRT2 VENT DOOR CNTL CL - ITEM 23 (S) EXEC

[2: GNC DEORB M22R EXEC] |

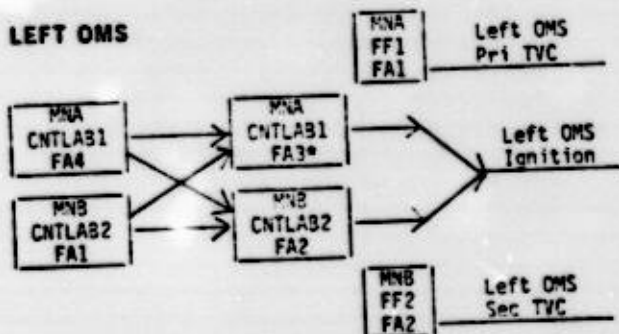
Go to ENTRY MANUEVER'S Cue Cards

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OMS FAILURES

OMS
TGT'S

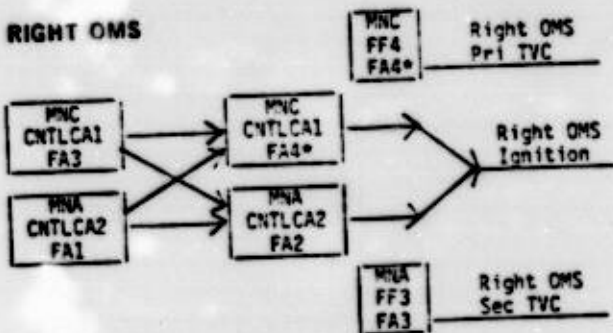
LEFT OMS



*Loss of FA3(4) or Pc Fail High:

Guidance will not downcode to single engine logic with closure of Left (Right) Arm/Arm/Press Switch. (Guidance needles in error, TGO countdown slow, expect 5 sec underburn - 6 ft/sec)

RIGHT OMS



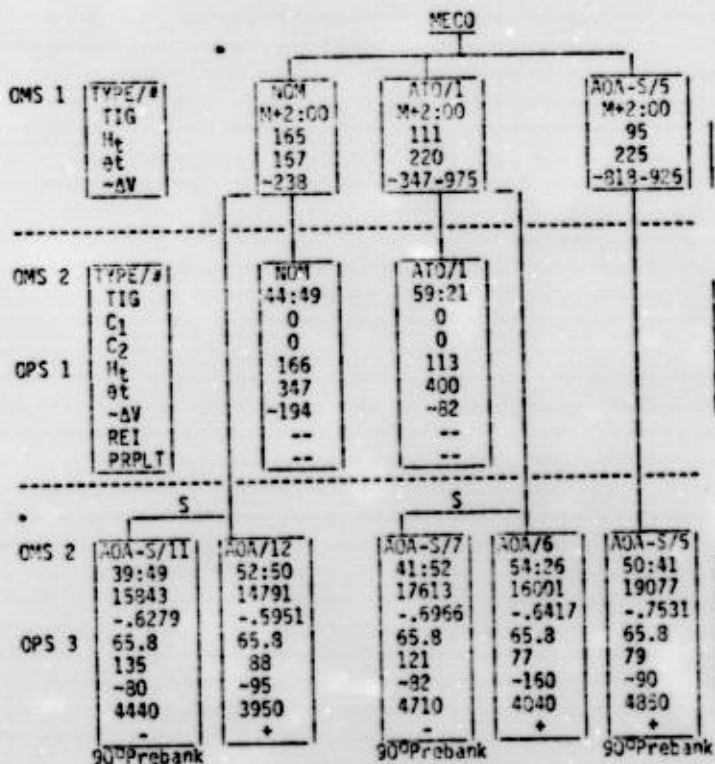
If during OMS burn and two FA MOMs lost,
Plan Shudn reqd:

MOMs	ENGs	MOMs	ENGs
1&2	BOTH	2&3	RIGHT
1&3	LEFT	2&4	LEFT
1&4	RIGHT	3&4	BOTH

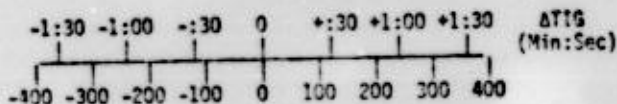
OMS TARGETS - ON TIME

OMS
TGTS

AOA EDM **



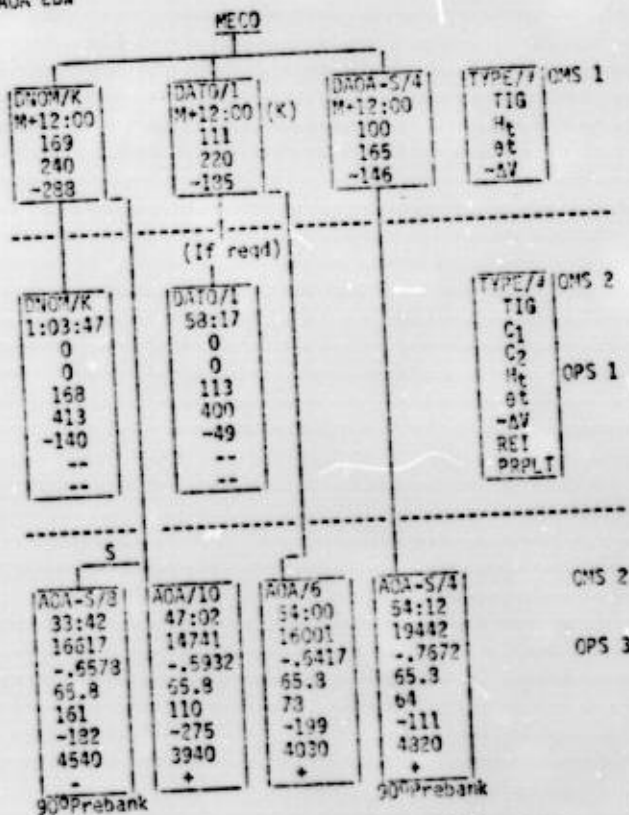
TIG ADJUST TIMELINE



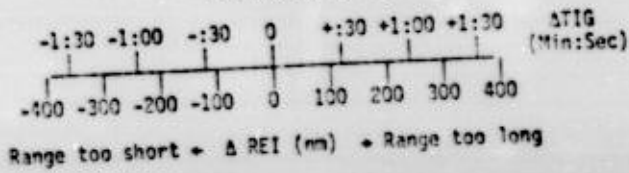
Range too short ← Δ REI (mm) → Range too long

OMS TARGETS - DELAYED

AOA EDW **

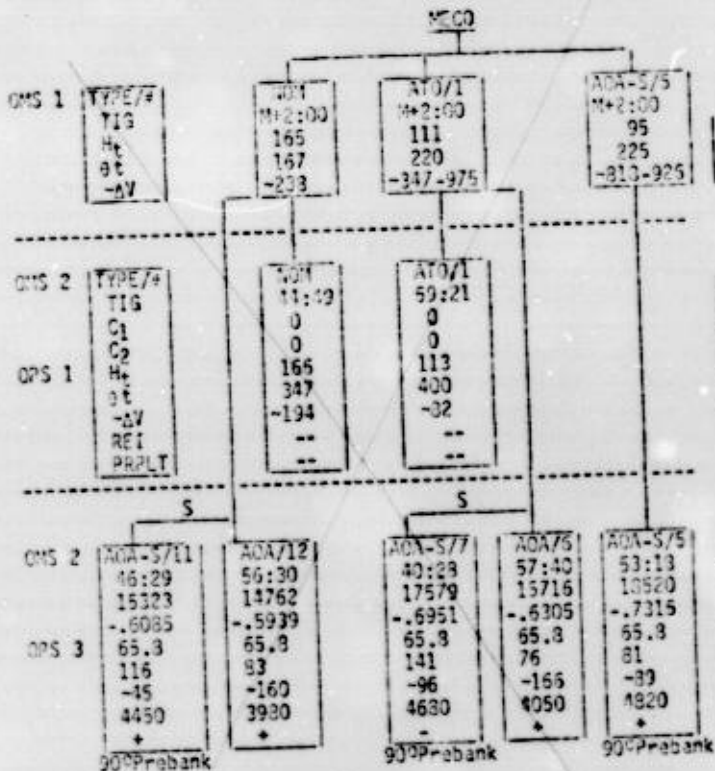


TIG ADJUST TIMELINE

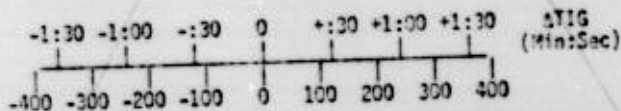


OMS TARGETS - ON TIME

AOA NOR **

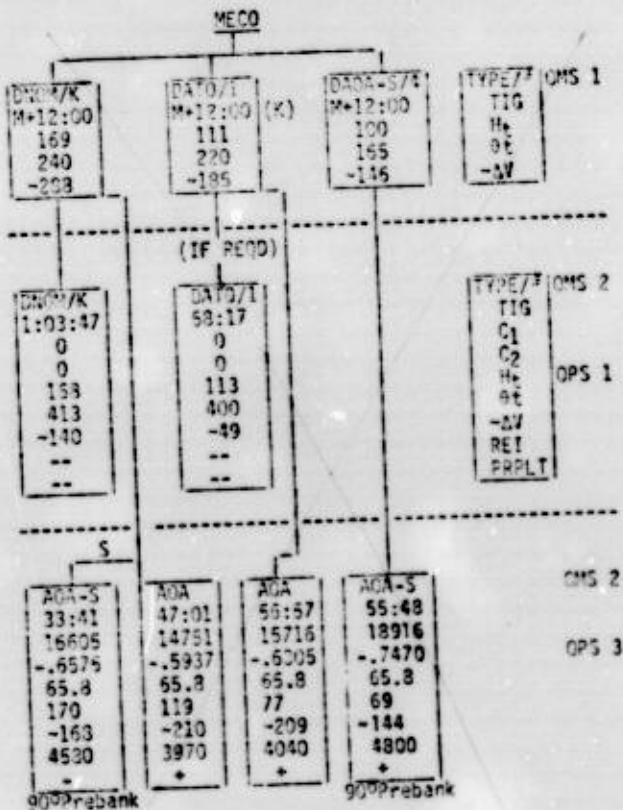


TIG ADJUST TIMELINE

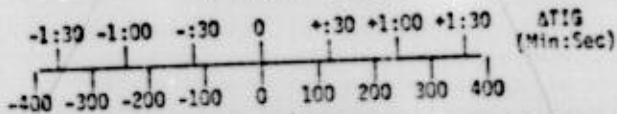


OMS TARGETS - DELAYED

AOA NOR **

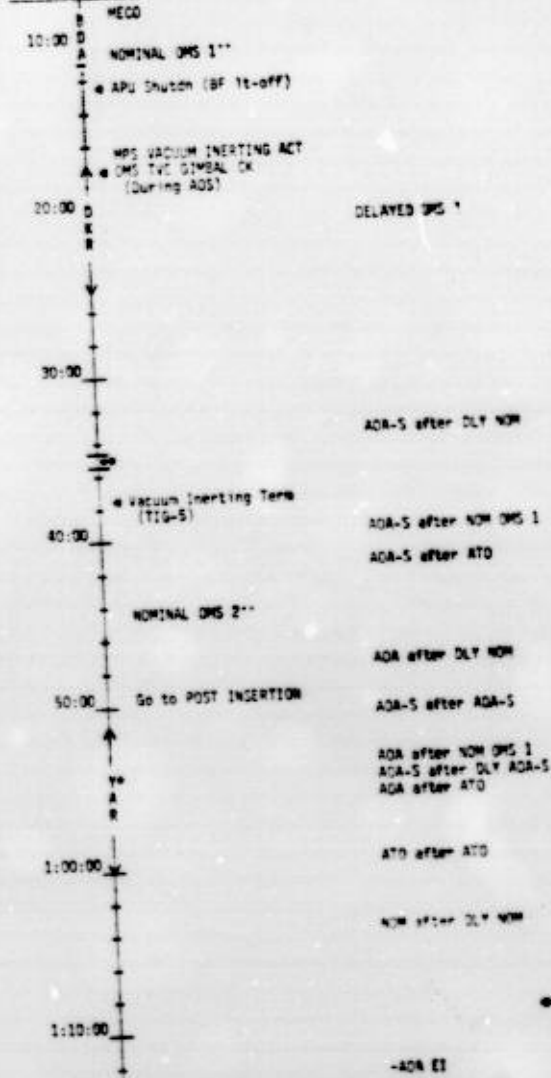


TIG ADJUST TIMELINE



Range too short + Δ REI (nm) - Range too long

COMMUNICATION COVERAGE (ADA to EDW) Off-Nominal Times



voice only
 **DUT, voice only. Coverage may be lost in underspeed MECO cases
 ***At SDA & DNR LOG C1 UPLK - SPC BLA
 At DNR ADS C2 UPLK - ENA

WEATHER PADS

9-1

01099/BAS B

WEATHER
PADS

WEATHER
PADS

U.S. TERMINAL FORECASTS

DEORBIT ORBIT	SITE	LOG GMT	SKY/VIS/WEATHER/T	WIND	ALTN	RVY	REMARKS
RTLS							
AOA							
AOA							
2							
3							
4							
5							
6							

UPPER WINDS FORECAST

ALT	RTLS	TAL	TAL	AOA	AOA	ORB	DEORB
60K	/	/	/	/	/		
50K	/	/	/	/	/		
40K	/	/	/	/	/		
30K	/	/	/	/	/		
20K	/	/	/	/	/		
7K	/	/	/	/	/		
SURF	/	/	/	/	/		

CLS TERMINAL FORECAST (FIRST OPPORTUNITY)

DEORBIT ORBIT	SITE	GMT	SKY/VIS/WEATHER/T	WIND	ALTM	RVP	REMARKS
TAL							
TAL							

MISCELLANEOUS

NOTAMS: _____

EXPECTED RATES DURING LOAD RELIEF

MAX RATES: ROLL _____ °/sec at _____
 PITCH _____ °/sec
 YAW _____ °/sec

IGNORE ATTITUDE ERRORS

DEORB ORB

HP ADJ TIG

RVP

APPROX TIG

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