

National Space Transportation System

JSC-22728

FLIGHT DATA FILE

# Systems AOA Procedures

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**Mission Operations Directorate  
Systems Division**

**Basic  
April 25, 1988**

**NASA**

National Aeronautics and  
Space Administration

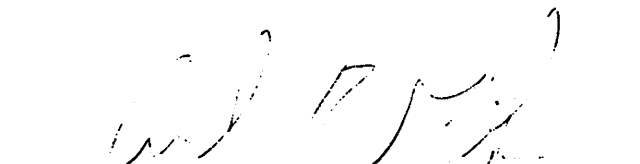
**Lyndon B. Johnson Space Center  
Houston, Texas**

MISSION OPERATIONS DIRECTORATE

**SYSTEMS ABORT-ONCE-AROUND PROCEDURES**

Basic  
April 25, 1988

PREPARED BY:

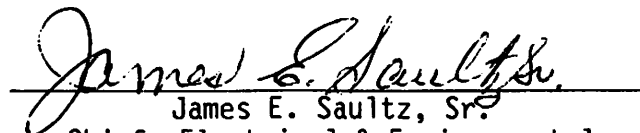


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Incorporates the following:

482#: SYS AOA-1B  
SYS AOA-2

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DF7/C. Guderian	483-2563
Loss of Two Freon Loops (AOA)	DF7/R. Floyd	483-0752
Loss of Two H2O Loops (AOA)	DF7/D. Randall	483-0746

SYSTEMS AOA PROCEDURES

**LIST OF EFFECTIVE PAGES**

BASIC 04/25/88

Sign Off.....*	ALL/BAS	9-4.....	ALL/BAS
ii.....*	ALL/BAS	9-5.....	ALL/BAS
iii.....*	ALL/BAS	9-6.....	ALL/BAS
iv.....*	ALL/BAS	9-7.....	ALL/BAS
v.....	ALL/BAS	9-8.....	ALL/BAS
vi.....	ALL/BAS	10-1.....	ALL/BAS
1-1.....	ALL/BAS	10-2.....	ALL/BAS
1-2.....	ALL/BAS	11-1.....	ALL/BAS
1-3.....	ALL/BAS	11-2.....	ALL/BAS
1-4.....	ALL/BAS	12-1.....	ALL/BAS
2-1.....	ALL/BAS	12-2.....	ALL/BAS
2-2.....	ALL/BAS	12-3.....	ALL/BAS
2-3.....	ALL/BAS	12-4.....	ALL/BAS
2-4.....	ALL/BAS		
2-5.....	ALL/BAS		
2-6.....	ALL/BAS		
2-7.....	ALL/BAS		
2-8.....	ALL/BAS		
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3-2.....⊗	ALL/BAS		
3-3.....	ALL/BAS		
3-4.....	ALL/BAS		
3-5.....	ALL/BAS		
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5-2.....	ALL/BAS		
6-1.....	ALL/BAS		
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6-4.....	ALL/BAS		
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7-4.....	ALL/BAS		
8-1.....	ALL/BAS		
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8-4.....	ALL/BAS		
8-5.....	ALL/BAS		
8-6.....	ALL/BAS		
8-7.....	ALL/BAS		
8-8.....	ALL/BAS		
8-9.....	ALL/BAS		
8-10.....	ALL/BAS		
9-1.....	ALL/BAS		
9-2.....⊗	ALL/BAS		
9-3.....	ALL/BAS		

(\*) - Omit from flight book

(⊗) - Highlights required

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CONTENTS

PAGE

LOSS OF TWO FREON LOOPS (AOA) STAND-ALONE PROCEDURES..... 1-1

    CDR AND PLT PWRDNS..... 2-1

    DEORBIT BURN MONITOR..... 2-6

    POST BURN ACTIONS..... 3-1

    LOSS OF TWO FREON LOOPS ENTRY MANEUVERS ACTIONS..... 4-1

    MS OVERHEAD & AFT PNL PWRDN..... 5-1

    COMM..... 6-1

LOSS OF TWO H2O LOOPS (AOA) STAND-ALONE PROCEDURES..... 7-1

    CDR AND PLT PWRDNS..... 8-1

    DEORBIT BURN MONITOR..... 8-8

    POST BURN ACTIONS..... 9-1

    LOSS OF TWO WATER LOOPS ENTRY MANEUVERS ACTIONS..... 10-1

    MS OVERHEAD PANEL PWRDN..... 11-1

    COMM..... 12-1

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LOSS OF TWO FREON LOOPS (AOA)  
STAND-ALONE PROCEDURES

2 FREON  
LOOPS (AOA)

**IMMEDIATE AOA DEORBIT BURN STEPS**

1. If time to AOA TIG > 15 min, skip this page
2. FC Purge HTR - ON  
VLVS (three) - OP
3. In MM 105 select AOA TGTs
4. OPS 301 PRO; 302 PRO; PASS, BFS I/O RESET
5. Have MS perform MS OVHD & AFT PANEL PWRDN, pg 5-1
6. Have another MS perform COMM PWRDN (COMM, pg 6-1) after BDA LOS
7. GNC 50 ✓LDG site: EDW-6, NOR-8
8. LOAD TGTs
9. MNVR TO ATTITUDE (If manual MNVR reqd, LVLH: P 180°, R 180°, then Yaw -80° out-of-plane)
10. CDR/PLT: accomplish CDR AND PLT PWRDNS as time permits
11. Perform DEORBIT BURN (Cue Card, pg 2-7)
12. POST BURN: Go to CDR AND PLT PWRDNS, execute steps not yet performed, and catch-up to AOA timeline of this procedure.



NOTES

- Fuel Cell flooding and excessive stack temperatures caused by loss of cooling are of primary concern. Begin Fuel Cell Purge (MS OVHD & AFT PNL PWRDN) ASAP.
- Procedure is zero-fault tolerant and assumes no other failures. Actions taken for previous failures should be integrated carefully with this procedure.
- Perform powerdowns in parallel ASAP after failure. The Summary Timeline (1-3) is provided as an overview showing latest completion times for powerdown procedures.
- This procedure powers down comm. If comm reqd, preferred comm config (in order of least heat production):
  1. UHF
  2. STDN LO PWR - If reqd
  3. TDRS - Only if mandatory

<p><u>CAUTION</u> TDRS or STDN - HI may be limited to 10 min. (Power amp will overheat)</p>
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## SUMMARY TIMELINE FOR LOSS OF TWO FREON LOOPS (AOA) PWRDN

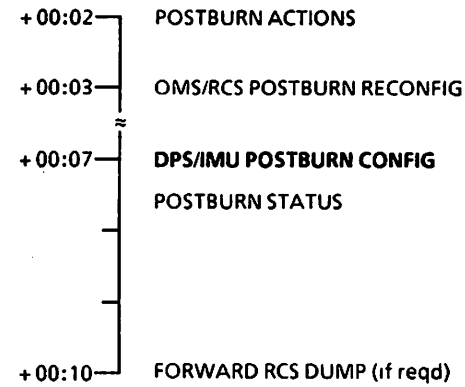
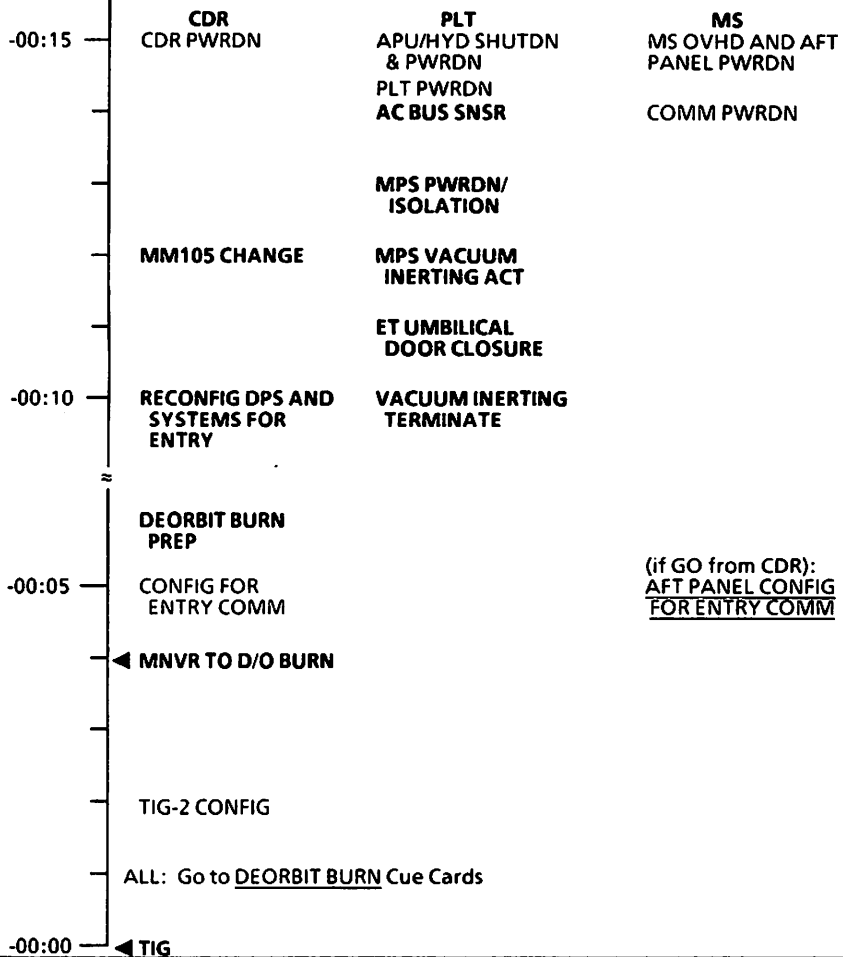
Prior to Deorbit Burn, actions are to be performed in parallel. Boldface steps must be completed by time shown. Pwrdns may, if necessary, be completed postburn.

TIG  
(HR:MN)

**NOTE**  
This timeline reflects latest possible failure time.  
Do not wait to perform powerdown steps.

TIG  
(HR:MN)

+00:02 POSTBURN ACTIONS



EI  
(HR:MN)

-00:10 APU HOT RESTART (1,3)

-00:07 PRE-EI AND ENTRY SWITCH CHECK

-00:05 Go to LOSS OF 2 FREON LOOPS ENTRY MANEUVERS ACTIONS

-00:00 ENTRY INTERFACE

At Wheel stop: Go to EXPEDITED PWRDN Cue Card

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**CDR AND PLT PWRDNS  
TIME CRITICAL PROCEDURES**

1. MS perform MS OVHD & AFT PANEL PWRDN, pg 5-1 ASAP (✓Fuel Cell Purge)
2. MS perform COMM PWRDN (COMM), pg 6-1) ASAP
3. Perform CDR & PLT PWRDNS in parallel ASAP

**CDR**

**PLT**

- Note**  
Time reqd to execute deorbit burn using these procedures is 15 min
- CDR PWRDN**
- C3 1. MSTR MADS PWR - OFF, use only one CRT, one FLT CNTLR PWR, one INST PWR as reqd
- L1 2. Minimize lighting
3. HUMIDITY SEP (two) - OFF
- ✓IMU FAN B - ON
- ✓FAN A,C (two) - OFF
- ✓H2O PUMP LOOP 1 - OFF
- ✓2 - ON
- ✓CAB TEMP CNTLR - OFF
- ✓CAB FAN (two) - OFF
- ✓AV BAY 1 FAN B - ON
- ✓2,3 FAN (four) - OFF
- FREON PUMP LOOP 1,2 (two) - OFF (one - ON, if any flow)
- ✓RAD CNTLR LOOP 1,2 (two) - OFF
- ✓NH3 CNTLR (two) - OFF
- If no FREON PUMPS ON, then
- FLASH EVAP CNTLR PRI A,B (two) - OFF
- TOP EVAP HTR NOZ (two) - OFF
- DUCT - OFF
- HI LOAD DUCT HTR - OFF
- FLASH EVAP FDLN HTR SPLY (two) - OFF
- If one FREON PUMP ON, then
- FLASH EVAP CNTLR PRI A - ON
- TOP EVAP HTR NOZ (two) - OFF
- ✓DUCT - ON
- FLASH EVAP FDLN HTR B SPLY - OFF

**APU/HYD SHUTDN AND PWRDN:**

1. If MPS dump not complete: perform PLT PWRDN then APU/HYD SHUTDN when MPS dump complete
  - If MPS dump complete: continue
- F4 2. ✓BDY FLP pb - lt off (dump complete) (~2 min 21 sec)
- R4 3. HYD MPS/TVC ISOL VLV SYS (three) - CL
- R2 4. ✓APU AUTO SHUTDN (three) - ENA
- BLR PWR (three) - OFF
- APU OPERATE (three) - OFF
- FUEL TK VLV (three) - CL
- CNTLR PWR (three) - OFF
- FUEL PUMP/VLV COOL A - AUTO
- BLR N2 SPLY (three) - OFF
- CNTLR/HTR (three) - OFF

**PLT PWRDN**

1. Use only one CRT, one FLT CNTLR PWR, one INST PWR as reqd
  2. Minimize lighting
  3. Perform PAYLOAD PWRDN (APCL, TEMP 10-25)
- 07 4. AFT L,R RCS MANF ISOL 1,4 (four) - CL (tb-cl)
- TACAN MODE (three) - OFF
- 08 5. RADAR ALTM (two) - OFF
- FWD RCS MANF ISOL 1,2,3,4 (four) - CL (tb-cl)
- C3 6. ✓FCS CH 1,2,3,4 (four) - AUTO
- R4 7. ✓MPS ENG CNTLR HTR (three) - OFF

**AC BUS SNSR**

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

CDR

PLT

- L2 4. ANTISKID - OFF  
NWS - OFF  
02 SYS 1,2 SPLY (two) - OP (tb-OP)
- C3 5. BFC CRT DISP - OFF
- GNC 0 GPC MEMORY
6. Restriring to GPC 1  
CONFIG - ITEM 1 +1 EXEC  
Modify MC1 per →  
CONFIG - ITEM 1 +3 EXEC  
Modify MC3 per →
- | CONFIG GPC | 1<br>12340 | 3<br>10000 |
|------------|------------|------------|
| STR 1      | 1          | 1          |
| 2          | 1          | 1          |
| 3          | 1          | 1          |
| 4          | 1          | 1          |
| PL 1/2     | 1          | 1          |
| CRT 1      | 1          | 1          |
| 2          | 1          | 1          |
| 3          | 1          | 1          |
| 4          | 0          | 0          |
| L 1        | 1          | 0          |
| 2          | 1          | 0          |
| MM 1       | 1          | 1          |
| 2          | 1          | 1          |
- NOTE  
The following must be an OPS mode recall:  
GNC, OPS 10X PRO  
For any CRT that is OFF:  
GPC/CRT 1/X EXEC
- 06 7. GPC MODE 2,3,4 (three) - STBY (tb-bp)  
- HALT (tb-bp)  
PWR 2,3,4 (three) - OFF  
MODE 5 - STBY (tb-RUN)  
- HALT (tb-bp)  
OUTPUT 5 - NORM  
PWR 5 - OFF
8. MDM FF 1,4 (two) - OFF  
FA 1,4 (two) - OFF

MPS PWRDN/ISOLATION

- R2 1. MPS ENG PWR (six) - OFF  
He ISOL (six) - GPC
- NOTE  
Expect MPS C/W for MPS He P as REGs blow down
- R4 2. √MPS He I'CONNECT (three) - GPC  
MANF PRESS (two) - CL
- R2 3. He ISOL B L - CL  
PNEU L ENG He XOVR - CL
- 017:B 4. EIU L-C, C-R, R-L (three) - OFF  
:D 5. MEC 1 - OFF, wait 2 sec, then  
2 - OFF

MPS VACUUM INERTING ACT

- R2 1. √MPS PNEU He ISOL - OP
- R4 2. H2 PRESS LINE VENT - OP  
FILL/DRAIN (four) - OP

**CDR**

**PLT**

9. **GNC 51, OVERRIDE**

IMU 1,2 - DESEL  
Confirm IMUs 1,2 PWR - OFF with MS

- F6 10. CDR disp - green dot
- CRT 11. L,R OMS: sel SEC GMBL

**MM 105 CHANGE**

- CRT 1. GNC, OPS 105 PRO
- C4F 2. Unstow ENT PKT C/L  
Stow ASC PKT C/L
- R3A 3. Stow ASCENT Cue Cards
- C1 Use DEORBIT BURN MONITOR (LOSS OF TWO FREON  
LOOPS) procedure on pg 2-6

**RECONFIG OF DPS AND SYSTEMS FOR ENTRY**

NOTE

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

- L1 1. ✓G3 NBAT - ALL STRINGS TO GPC 1
- C3 2. ✓MS OVHD & AFT PNL PWRDN, pg 5-1, complete
- MS/O14:F 3. IMU FAN (three) - OFF
- MS/O15:F 4. ✓FCS CH 1,2,3,4 (four) - AUTO
- 5. ✓ASA 1,4 - OFF
- 6. ✓2,3 - ON
- 7. GNC, OPS 301 PRO (✓DAP)
- MS/O15:F 8. MMU 2 - OFF
- 9. ASA 2 - OFF
- MS/O16:F 10. 3 - OFF

**ET UMBILICAL DOOR CLOSURE**

WARNING

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

NOTE

Double times for single mtr ops

R2

- ET UMB DR
- MODE - GPC/MAN
- CTRLINE LAT - STO
- ✓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
- CTRLINE LAT - GND
- L,R DR (two) - OFF
- LAT (two) - OFF

**PDF CONFIG**

R3A  
C1

- Post MM105:
- Stow ASCENT Cue Cards
- Use DEORBIT BURN MONITOR (LOSS OF TWO FREON  
LOOPS) procedure on pg 2-6

GNC 50 HORIZ SIT

AOA RWY OPTIONS

ETR LOW INCLINATIONS			
SITE	RWY	TACANS	MLS
1	KSC 15	TTS 59Y - COF 97	8
	KSC 33	TTS 59Y - COF 97	6
6	EDW 22	EDW 111 - PMD 92	8
	EDW 17	EDW 111 - PMD 92	6
8	NOR 17	SNG 121Y - HMN 92	8
	NOR 23	SNG 121Y - HMN 92	-
9	EDW 23	EDW 111 - PMD 92	-
	EDW 15	EDW 111 - PMD 92	-
10	EDW 04	EDW 111 -	-
	NOR 05	SNG 121Y -	-

11. ✓RWY selection

L1 12. CAB FAN B - ON

**DEORBIT BURN PREP**

1. GNC, OPS 302 PRO

GNC DEORB MNVR EXEC

2. TRIM LOAD ITEM 6 +0.4 -5.7 +5.7 EXEC

3. ✓or enter Target from OVS TARGETS (ASC)4. LOAD - ITEM 22 EXEC  
TIMER - ITEM 23 EXEC**DEORBIT BURN PREP**

08

1. L,R OMS

✓He PRESS/VAP ISOL A,B (four) - GPC

✓TK ISOL (four) - OP (tb-OP)

XFEED (four) - CL (tb-CL)

CDR

PLT

5. DEORBIT BURN TIG ADJUST (if reqd)

LOAD - ITEM 22 EXEC

- ITEM 23 EXEC

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

Enter new TIG

LOAD - ITEM 22 EXEC

TIMER - ITEM 23 EXEC

Repeat until delta RANGE < 50

CRT

**MNVR TO DEORBIT BURN ATTITUDE**

F6

✓ADI ATT - INRTL

✓ERR - MED

✓RATE - MED

TIG -5 min

**CONFIG FOR ENTRY COMM**

Give MS GO to perform AFT PNL CONFIG for  
ENTRY COMM (COMM, pg 6-2)

TIG -2 min

**TIG -2 CONFIG**

O6

1. MDM FA 4 - ON

2. GNC I/O RESET

Use 1 CRT, 1 CNTLR PWR

MS/014:E 3. cb MNA DDU L - c1

MS/015:E 4. MNB DDU L,R (two) - c1

MS/016:E 5. MNC DDU R - c1

**MNVR TO DEORBIT BURN ATTITUDE**

MS/016:E

cb MNC DDU R - c1

Mnvr to deorbit burn attitude

(✓ADI ATT with CRT BURN ATT)

If manual mnvr reqd:

LVLH: P 180°, R 180°, then yaw ~80°

out-of-plane

cb MNC DDU R - op

TIG -5 min

**VACUUM INERTING TERMINATE**

R4

1. MPS H2 PRESS LINE VENT - GND

FILL/DRAIN

LH2,LO2 OUTBD (two) - CL

Wait 10 sec, then - GND

LH2,LO2 INBD (two) - GND

R2

2.

PNEU He ISOL - GPC

Go to DEORBIT BURN Cue Cards



**DEORBIT BURN MONITOR  
(LOSS OF TWO FREON LOOPS AOA)**

**DEORBIT  
BURN**

OMS PC LOW OMS ↓	OMS PRPLT FAIL
NO OMS ↓	SENSOR FAIL
OMS OX/FU TK P (monitor meter) OX & FU LOW	He PRESS/VAP ISOL (two) - OP
OX LOW	Burn to OMS ↓, then OMS PRPLT FAIL
FU LOW	He PRESS/VAP ISOL (two) - CL Burn to OMS ↓, then OMS PRPLT FAIL
OX & FU HIGH	Cycle He to maint OMS TK P 234-284
OMS GMBL FAIL	If control problems or high RCS fuel usage: Affected OMS ENG - OFF OMS ENG FAIL

# DEORBIT BURN (2 ENG)

✓MM302 .. ✓OMS BOTH 1 CNTLR PWR - ON  
 Enter TGO + 5 sec  
 ✓TRIM: P + 0.0, LY -5.7, RY + 5.7  
 ✓DAP - push DAP AUTO pbi ADI - LVLH/HI/MED  
 L,R OMS He PRESS/VAP ISOL A (two) - OP  
 B (two) - GPC ..

TIG-2 OMS ENG (two) - ARM/PRESS ..  :   
 -:15 EXEC .. (NO EXEC > TIG +  :   
 -:15 If OMS AFT QTY < 11%, THC + X to OMS IGN + 1 sec  
 :00 TIG .. (✓Pc, ΔVTOT, ENG VLVs; start watch)

\* If no OMS ignition, APUs - SHUT DN \*  
 \* **OMS PRPLT FAIL:** \*  
 \* HP >   L or   R (STOP): \*  
 \* OMS ENG (two) - OFF, APUs - SHUT DN \*  
 \* Affected OMS TK ISOL (two) - CL \*  
 \* HP <   L or   R (CONTINUE): \*  
 \* Failed OMS ENG - OFF \*  
 \* ITEM 18 + 0 EXEC \*  
 \* Affected OMS He PRESS (two) - CL \*  
 \* TK ISOL (two) - CL \*  
 \* When Pc < 80%, 2nd OMS ENG - OFF \*  
 \* Complete RCS (PRPLT FAIL) \*  
 \* **OMS ENG FAIL (CONTINUE BURN):** \*  
 \* Failed ENG - OFF \*  
 \* OMS XFEED at     \*  
 \*  %L  %R  $\frac{1}{2}$  of ΔVTOT    \*  
 \* at FAIL \*  
 \* **RCS COMPLETION:** \*  
 \* **ANY OMS PRPLT FAIL:** \*  
 \* If HP >   , safe HP: APUs - SHUT DN \*  
 \* If HP <   , safe HP: l'cnect to good OMS PRPLT \*  
 \* THC + X (✓OMS % vs RCS Burn Time) \*  
 \* AFT RCS RECONFIG \*  
 \* THC + X to TGT HP or TOT AFT QTY 1   % \*  
 \* If CUR HP ≤ AFT HP   , THC + X to TGT HP \*  
 \* If CUR HP ≤ PRI HP   , FRCS to PRI Site \*  
 \* If CUR HP > PRI HP   & ≤ B/U HP   \*  
 \* FRCS to B/U Site \*  
 \* If CUR HP > B/U HP   , THC + X \*  
 \* to B/U HP   \*  
 \* or TOT AFT QTY 2   ; FRCS to B/U Site \*  
 \* MNVR to -X ATT (pitch up at 3°/sec to VGOz = (+) $\frac{1}{4}$  ΔVTOT) \*  
 \* THC - X \*  
 \* **BOTH OMS ENG FAIL:** \*  
 \* OMS ENG - OFF \*  
 \* Interconnect OMS to RCS \*  
 \* THC + X (✓OMS % vs RCS Burn Time) \*  
 \* OMS TK SW \*  
 \* THC + X (✓OMS % vs RCS Burn Time) \*

CUTOFF ..  :   
 +:02 OMS ENG(s) - OFF .. (If < 3 IMU, at  :   
 \* AFT RCS RECONFIG IF INTERCONNECT \*  
 TRIM X,Z residuals < 2 fps (< 0.5 fps if shallow)

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**POST BURN ACTIONS**

NOTE

Time critical APU HOT RESTART  
at EI-10 (pg 3-5)

- 1. ✓CDR and PLT PWRDN complete
- 2. Minimize CRT use
- 015:A 3. IMU 2 - ON
- MS/014:E 4. cb MNA DDU L - op
- 015:E 5. MNB DDU L,R (two) - op
- 016:E 6. MNC DDU R - op
- 06 7. MDM FA 4 - OFF
- F7 8. FLT CNTLR PWR - OFF
- F8 9. ✓PWR - OFF
- 10. Determine PREBANK  
Determine DELTA HP (CUR HP - TGT HP)  
Use PREBANK TABLE  
Record PREBANK on LOSS OF TWO FREON LOOPS ENTRY MANEUVERS ACTIONS, pg 4-1
- R2 11. ✓BLR CNTLR/HTR 1,3 (two) - A

**OMS/RCS POST BURN RECONFIG**

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

**DPS POST BURN CONFIG**

- 06 1. GPC PWR 3 - ON  
MODE 3 - STBY (tb-RUN)  
- RUN (tb-RUN)
- 2. Reassign strings to GPC 3 in MC3  
GNC OPS 301 PRO  
**GNC 0 GPC MEMORY**  
CONFIG - ITEM 1 +3 EXEC  
Modify MC3 per table →  
GNC OPS 301 PRO (push DAP Auto pbi)  
**GNC 50 HORIZ SIT**  
✓RWY selection  
Reselect AOA RWY  
GNC, OPS 302,303 PRO  
For any CRT that is OFF:  
GPC/CRT 3/X EXEC  
**GNC 0 GPC MEMORY**  
DOWNLIST GPC - ITEM 44 +3 EXEC
- 06 3. GPC MODE 1 - STBY (tb-bp)  
- HALT (tb-bp)  
PWR 1 - OFF
- L1 4. AV BAY 1 FAN B - OFF  
3 FAN B - ON

	CONFIG GPC	3 10300
STR	1	3
	2	3
	3	3
	4	3
P/L 1/2		3
CRT	1	3
	2	3
	3	3
	4	0
L	1	0
	2	0
MM	1	3
	2	3

**POST BURN  
ACTIONS**

**IMU POST BURN CONFIG**

- CRT 1. GNC 21 IMU ALIGN  
 ✓IMU 2 - DESEL (\*)  
 ✓IMU 2 OPER (\*) within 4 min of PWR - ON, then  
 2. GNC I/O RESET  
 3. IMU/IMU ALIGN - IMU 2 to IMU 3  
 4. When align complete:  
GNC 50 HORIZ SIT  
 5. NAV DELTA - ZERO (ITEM 16 EXEC)  
 6. IMU 2 - SEL  
 7. IMU 3 - DESEL  
 016:A IMU 3 - OFF  
 8. Powerup R DDU as reqd to achieve/maintain EI-5 attitude

**POST BURN STATUS**

P CRTX GNC, OPS 303 PRO \*\*  
 C CRT1 ✓or load INRTL EI-5 MM303 ATT:

R - ITEM 24 + 

--	--	--

P - ITEM 25 + 

--	--	--

Y - ITEM 26 + 

--	--	--

PREBANK TABLES  
(to EDW)

(AOA steep entries)

ΔHP	0	1	2	12	20	23	25	26
PREBANK	0	53	58	89	120	136	152	166

ΔHP	0							
PREBANK	0							

(AOA shallow entries)

ΔHP	0	1	2	5	7	8	9
PREBANK	90	100	108	124	136	148	180

ΔHP	0				
PREBANK	90				

POST BURN ACTIONS

\*\*\*\*\*

# MNVR TO EI-5 ATT

- \* If UNDERBURN, ignore INRTL ATT ERR \*
- \* needles and mnvr to LVLH R001, Y358 \*
- \* and P per table below \*

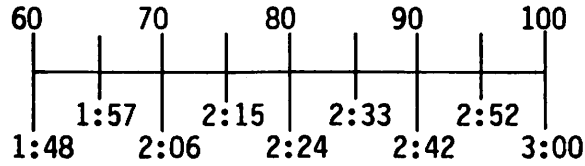
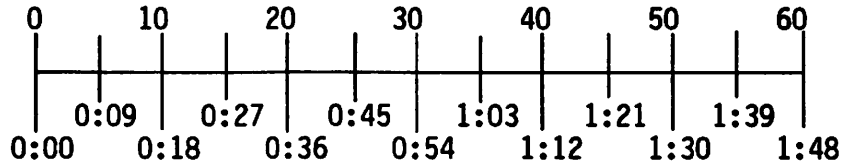
TIME to EI (min)	LVLH PITCH (deg)
20	339
	343
	347
	351
	355
15	359
	3
	7
	11
	15
10	19
	23
	27
	31
	35
5	39

## FORWARD RCS DUMP (if required for Cg)

- FRCS REACTIVATION (if reqd)
- MS/014:B 1. ✓cb MNA OI SIG CONDR OF 1/4A - c1  
:F 2. RJDF 1B F1 DRIVER - ON  
LOGIC - ON
- MS/015:B 3. ✓cb MNB OI SIG CONDR OF 2/3A - c1  
:F 4. RJDF 1A F2 DRIVER - ON  
LOGIC - ON
- MS/016:F 5. RJDF 2A F3 DRIVER - ON  
LOGIC - ON
6. RJDF 2B F4 DRIVER - ON  
F4/F5 LOGIC - ON
- 06 7. MDM FF1,2,3,4 (four) - ON  
GNC I/O RESET
- 08 8. Reopen FRCS  
GNC 23 RCS
- CRT 9. JET RESET - ITEM 45 EXEC  
10. Reselect deselected FRCS jets  
11. JET RESET - ITEM 45 EXEC  
12. Determine FWD RCS 'DUMP TO %' using lowest of Ox or  
Fu qty (calculator, cg wheel, or DEL PAD). Use FOUR  
JET DUMP

FOUR JET DUMP:

F RCS PRPLT TO BE DUMPED (%)

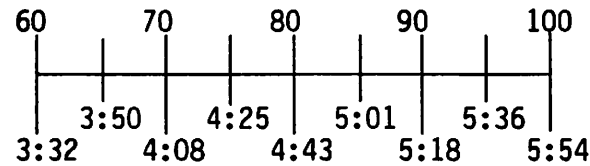
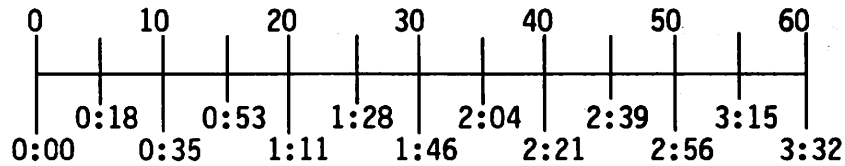


TIME FROM DUMP INITIATION (M:S)

NOTE  
During dump disregard  
FRCS qty

TWO JET DUMP:

F RCS PRPLT TO BE DUMPED (%)



TIME FROM DUMP INITIATION (M:S)

NOTE  
During dump, disregard  
FRCS QTY

CRT2

FWD RCS ARM - ITEM 36 EXEC  
DUMP - ITEM 37 EXEC  
(Start watch)  
When dump time achieved:  
OFF - ITEM 38 EXEC

ISOLATE FRCS

When dump complete:

- 08 FWD RCS MANF ISOL 1,2,3,4 (four) - c1 (tb-c1)
- 06 MDM FF 1,4 (two) - OFF
- MS/014:F RJDF 1B F1 DRIVER - OFF  
LOGIC - OFF
- MS/015:F RJDF 1A F2 DRIVER - OFF  
LOGIC - OFF
- MS/016:F RJDF 2A F3 DRIVER - OFF  
LOGIC - OFF  
2B F4 DRIVER - OFF  
F4/F5 LOGIC - OFF

**APU HOT RESTART (APUs 1 and 3) (EI - 10)**

- F8 1. INST PWR - ON
- R2 2. BLR N2 SPLY (two) - ON  
PWR (two) - ON  
✓CNTLR/HTR (two) - A
- 3. ✓APU AUTO SHUTDN (three) - ENA
- 4. APU CNTLR PWR (two) - ON
- 5. HYD MN PUMP PRESS (two) - LO  
APU SPEED SELECT (three) - NORM  
OPERATE (three) - OFF  
FUEL PUMP/VLV COOL A - AUTO  
FUEL TK VLV (three) - CL  
cb FU TK VLV ENA (six) - CL
- 6. APU FUEL TK VLV (two) - OP  
OPERATE (two) - START ORIDE/RUN  
(Wait 3:30 for APU start)
- F8 7. ✓HYD PRESS ind (two) - LO green

- R2 \* If APU 1(3) does not start: \*
- \* BLR CNTLR/HTR 2 - A \*
- \* N2 SPLY 2 - ON \*
- \* PWR 2 - ON \*
- \* APU CNTLR PWR 2 - ON \*
- \* HYD MN PUMP PRESS 2 - LO \*
- \* APU FUEL TK VLV 2 - OP \*
- \* OPERATE 2 - START ORIDE/RUN \*
- \* (Wait 3:30 for APU start) \*
- F8 \* ✓HYD PRESS ind 2 - LO green \*
- R2 \* APU AUTO SHUTDN - INH \*
- \* If any APU does not start: \*
- \* Affected APU: \*
- \* BLR CNTLR/HTR - OFF \*
- \* APU OPERATE - OFF \*
- \* FUEL TK VLV - CL \*
- \* ✓Shutdown (hyd press) \*
- \* CNTLR PWR - OFF \*
- \* HYD MN PUMP PRESS - NORM \*

- F8 8. INST PWR - OFF

NOTE

Running HYD MN PUMP PRESS switches  
will be taken to NORM at  $\bar{q}$  bar = 1



# EI-7: PRE-EI AND ENTRY SWITCH CHECK

- C3 1. FCS CHANNEL 1 - OFF
  - 2 - ORIDE
  - 3 - ORIDE
  - 4 - OFF
- MS/014:E 2. cb MNA DDU L - c1
  - :F ASA 1 - ON
  - MS/015:E cb MNB ADTA 2 - c1
  - cb MNB DDU LEFT - c1
  - :F ASA 2 - ON
  - MS/016:A BRAKES MNC - ON
  - :E cb MNC ADTA 3 - c1
  - :F ASA 3 - ON
  - ASA 4 - ON
- F6 3. INST PWR - FLT
  - 4. DATA BUS - 2
  - 5. GNC I/O RESET
  - 6. GNC 53
    - DES SURF FDBK 1,4 - ITEM 18,21 EXEC (\*)
    - √2,3 - ITEM 19,20 (no \*)
- F6/F8 7. Use LOSS OF TWO FREON LOOPS ENTRY MANEUVERS ACTIONS  
(next page)
- MA73C:A,B MCA LOGIC MID,AFT (eleven) - OFF
  - FWD (three) - ON
  - :C 8. cb MCA PWR AC1 3φ FWD 1 - op
    - FWD 3 - op
- R1 9. AC BUS SNSR (three) - OFF (1 sec), then MONITOR
- 07 10. √TACAN MODE (three) - OFF
  - ANT SEL (three) - AUTO
  - CH (three) - 111X (EDW)
  - 059Y (KSC)
  - 069X (NOR)
- 08 11. √RADAR ALTM (two) - OFF
  - √MLS (three) - OFF
  - √MLS CH (three) - 8 (EDW22, KSC15, NOR17)
  - 6 (EDW17, KSC33)
- L2 12. √CAB RELIEF (two) - ENA (tb-ENA)
  - √ANTISKID - OFF
  - √NWS - OFF
  - √ENTRY MODE - AUTO
  - 13. GNC 51 OVERRIDE
    - √ENTRY ROLL MODE - AUTO
- L2/C3 14. √SBTC - FULL FWD
  - C3 √SRB SEP - AUTO
  - √ET SEP - AUTO
- F6/F8 15. √AIR DATA - NAV
  - √ADI ERR - MED
  - √RATE - MED
- F6 16. √HSI SEL MODE - ENTRY
  - √SOURCE (two) - NAV,1
  - F8 √SOURCE (two) - NAV,2
- F3 17. L TRIM RHC/PNL - INH
  - PNL - ON
- F7 18. FLT CNTLR PWR - ON
- 19. MS/PS INGRESS SEATS
- 20. Go to LOSS OF TWO FREON LOOPS ENTRY MANEUVERS ACTIONS  
(next page)



**ENT MNVR  
ACTIONS**

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## MS PULL OUT SECTION

Pull this section for MS use. Complete MS OVERHEAD PANEL PWRDN, ASAP.  
If STDN LOS, have another MS perform COMM PWRDN (COMM) at the same time

### MS OVERHEAD & AFT PNL PWRDN

- Begin Fuel Cell Purge:
- R12 1. FC PURGE HTR - ON  
VLVS (three) - OP
- 06 2. Minimize lighting on AFT FLT Deck
- 013:A 3. ANNUN BUS SEL ACA 2/3 - OFF
4. cb ESS 1BC C/W A - op (MA)  
MTU A - op (leave closed for SMS)
- :B CRYO QTY (two) - op
- :C ESS 2CA C/W B - op  
MTU B - op
- :E ESS 3AB GPC STAT - op
- 014:A 5. BRAKES MNA - OFF  
RGA 1 - OFF  
IMU 1 - OFF (✓IMU deselected)
- :B cb MNA MDM OF 1/2 A - op  
3/4 A - op  
H2O BYP LOOP 1 SNSR - op  
MSN TIMER FWD - op  
EVENT TIMER AFT - op
- :C UTIL PWR 019/M052J - op
- :D FREON RAD CNTLR 1,2 (two) - op  
GPS PRE AMPL UC,LC (two) - op  
O2/N2 CNTLR 1 - op  
CAB VENT - op  
ISOL - op
- :E ADTA 1 - op  
ACCEL 1 - op  
DDU L - op (close if TIG < 10 min)  
DDU AFT - op
- :F MMU 1 - OFF  
Verify with PLT:  
FRCS MANF VLVS - CL: then  
RJDA 2A L4/R4 LOGIC - OFF  
DRIVER - OFF  
RJDF 1B F1 LOGIC - OFF  
DRIVER - OFF  
ASA 1 - OFF
- 015:A 6. BRAKES MNB - OFF  
RGA 4 - OFF  
IMU 2 - OFF (✓IMU deselected)
- :B cb MNB MDM OF 1/2 B - op  
H2O BYP LOOP 2 SNSR - op  
MSN TIMER AFT - op  
EVENT TIMER FWD - op
- :D FREON RAD CNTL 1,2 (two) - op  
O2/N2 CNTLR 2 - op
- :E ADTA 2 - op  
DDU L - op (leave cl if TIG < 10 min)  
DDU R - op
- :F RJDA 1B L1/L5/R1 LOGIC - OFF  
DRIVER - OFF

(Continued next page)

RJDF 1A F2 LOGIC - OFF  
           DRIVER - OFF  
 ACCEL 4 - OFF  
 016:A 7. BRAKES MNC - OFF  
       :B    cb MNC MDM OF 3/4 B - op  
           AUX TIMING BUFF - op  
       :D    GPS PRE AMPL UC,LC (two) - op  
           ✓02 EMER - op  
       :E    ADTA 3 - op  
           4 - op  
           DDU RIGHT - op  
           AFT - op  
       :F    RJDF 2A F3 LOGIC - OFF  
           DRIVER - OFF  
           2B F4/F5 LOGIC - OFF  
           F4 DRIVER - OFF  
           ASA 4 - OFF  
           ✓RJD MANF L5/F5/R5 DRIVER - OFF  
 017:A 8. ATVC 1,2,3,4 (four) - OFF  
       :C    SIG CONDR FREON A,B (two) - OFF  
           (AC2,AC3 if any flow)  
       :D    MDM OA 1/2/3 - OFF  
 A11 9. ✓CRYO TK 4 HTR (four) - OFF  
 A12 10. HYD HTR (eight) - OFF  
       APU HTR GAS GEN/FUEL PUMP 2 - OFF  
           LUBE OIL LINE 2 - OFF  
           TK/FU LINE/H2O/SYS 1A,2A,2B,3A (four) - OFF  
                   ✓1B,3B - AUTO  
 A14 11. RCS/OMS HTR FWD RCS - OFF  
           OMS CRSFD LINES (two) - OFF  
           FWD RCS JET (five) - OFF  
           AFT RCS JET 5 - OFF

# MS PULLOUT SECTION

COMM

## COMM PWRDN

MS/CDR: As soon as possible after BDA LOS, perform following powerdown.

- A1L 1. S-BD PM ANT SW ELEC - OFF  
PRE AMP - OFF  
PWR AMPL STBY - OFF  
OPER - OFF  
MODE - STDN LO  
XPNDR - OFF
  - 2. NSP PWR - OFF  
ENCRYPTION PWR - OFF  
(Encryption disabled for rest of flight)  
ENCRYPTION MODE - SEL  
SEL - BYP
  - C3 3. S-BD PM CNTL - PNL  
OI PCMMU FORMAT - FXD  
PWR - OFF  
AUD CTR - OFF (pwr up as reqd for cockpit audio)
  - A1L 4. ✓S-BD PL CNTL - PNL  
✓PWR SYS - OFF  
PL DATA INTRLV R PWR - OFF
  - A1R 5. OPS RCDRS PWR (two) - OFF  
S-BD FM CNTL - PNL  
PWR - OFF  
PL RCDR PWR - OFF
  - 06 6. UHF MODE - OFF
  - 06 ✓MDM PL1, PL2 (two) - OFF
  - R15:B 7. cb MNA, MNC GCILC (two) - op
- If after TIG-5:
- 8. Perform AFT PANEL CONFIG FOR ENTRY COMM, pg 6-2

Contact MCC at first available AOS using COMM POWERUP procedures. Preferred comm config in order of least heat production:

- 1. UHF
- 2. STDN LOW PWR - if reqd
- 3. TDRS - only if mandatory

<p><b>CAUTION</b> TDRS or STDN HI may be limited to 10 min (Power amp will overheat)</p>
--

# AFT PANEL CONFIG FOR ENTRY COMM

COMM

## 1. On GO from CDR at TIG -5 min:

R15:B	cb MNA,MNC GCILC (two)	- c1
C3	S-BD PM CNTL	- CMD
A1L	S-BD PM ANT SW ELEC	- 2
	MODE	- STDN LO (SGLS)
	XPNDR	- 2
	NSP PWR	- 2
	DATA RATE XMIT	- HI
	RCV	- HI
	✓UPLK DATA	- S-BD
	✓CODING XMIT	- OFF
	✓RCV	- OFF

## MS PULLOUT SECTION

### COMM POWERUP (If COMM reqd prior to landing site coverage)

Power up audio system

C3 1. AUD CTR - 1  
05 ✓L AUD PWR - AUD  
09 ✓R AUD PWR - AUD

If UHF available, config for UHF comm (voice only)

06 2. UHF MODE - SPLX  
✓UHF SPLX PWR AMP - ON  
3. After comm with MCC complete, perform COMM PWRDN

If UHF site unavailable or if MCC requests data:

Config for GSTDN(SGLS) S-BD

C3 4. ✓S-BD PM CNTL - PNL  
A1L ANT SW ELEC - 2  
MODE - STDN LO (SGLS)  
XPNDR - 2

NSP PWR - 2  
DATA RATE XMIT - HI  
RCV - HI

CODING XMIT - OFF  
RCV - OFF

✓UPLK DATA - S-BD

Select best S-BD PM ANT

If MCC requests data:

014:B 5. cb MNA OI MDM OF 1/2,3/4 A (two) - c1  
017:D SIG CONDR OA 1/2/3 - ON  
MDM OA 1/2/3 - ON

C3 OI PCMMU PWR - 1  
06 MDM PL2 - ON  
GNC, I/O RESET

At end of data transmission:

014:B 6. cb MNA OI MDM OF 1/2,3/4 A (two) - op  
017:0 SIG CONDR OA 1/2/3 - OFF  
MDM OA 1/2/3 - OFF

7. After comm/data complete, perform COMM PWRDN

If UHF site and GSTDN unavailable and comm/data critical:

Config for TDRS S-BD

#### CAUTION

This is a High Power Mode. On-time should be limited to 10 min maximum due to Power Amp Thermal constraints. A 3 min delay occurs after activation before Pwr Amp comes on. Uplink not affected. Proceed with selection of best antenna

(Continued next page)



C3  
A1L

8. ✓S-BD PM CNTL - PNL  
S-BD PM ANT SW ELEC - 2  
PRE AMP - 2  
PWR AMPL OPER - 2  
MODE - TDRS DATA  
XPNDR - 2  
NSP PWR - 2  
✓DATA RATE XMIT - HI  
✓RCV - LO  
CODING XMIT - ON  
RCV - ON  
✓UPLK DATA - S-BD  
Select best S-BD PM ANT

If MCC requests data:

- 014:B 9. cb MNA OI MDM OF 1/2,3/4 A (two) - c1  
017:D SIG CONDR OA 1/2/3 - ON  
MDM OA 1/2/3 - ON  
C3 OI PCMMU PWR - 1  
06 MDM PL2 - ON  
GNC, I/O RESET

At end of data transmission:

- 014:B 10. cb MNA OI MDM OF 1/2,3/4 A (two) - op  
017:0 SIG CONDR OA 1/2/3 - OFF  
MDM OA 1/2/3 - OFF  
11. After comm/data complete, perform COMM PWRDN

LOSS OF TWO WATER LOOPS (AOA)  
STAND-ALONE PROCEDURES

**IMMEDIATE AOA DEORBIT BURN STEPS**

1. If time to AOA TIG > 15 min, skip this page
2. In MM 105 select AOA TGTs
3. OPS 301 PRO; 302 PRO; PASS, BFS I/O RESET
4. Have MS perform MS OVHD PANEL PWRDN, pg 11-1
5. Have another MS perform COMM PWRDN (COMM, pg 12-1) after BDA LOS
6. **GNC 50** ✓LDG site: EDW-6, NOR-8
7. LOAD TGTs

NOTE

Disregard jet msgs during maneuver

8. MNVR TO ATTITUDE (If manual mnvr reqd, LVLH: P 180°, R 180°, then Yaw -80° out-of-plane)
9. CDR/PLT: perform CDR AND PLT PWRDNS on pg 8-1 only as time permits
10. Perform DEORBIT BURN (Cue Card, pg 8-9)
11. Perform these procedural blocks/steps in the CDR AND PLT PWRDNS (if not yet performed):
  - CDR PWRDN, pg 8-1
  - PLT PWRDN, pg 8-1
  - Reassign all strings to GPC 1 in MC3 with target set 12340
  - GNC, OPS 302 PRO
  - Turn off GPCs 2,3,4
  - Operate AV BAY FANS 1A and 2A only
  - CDR SYSTEMS PWRDN (steps 8-12 only), pg 8-3
  - CDR POST OMS-1 ACTIVITIES (FES ACTIVATION/PL MDM CONFIG only), pg 8-3
  - DEACTIVATE FRCS, pg 8-4
12. Go to POST BURN ACTIONS, pg 9-1, and catch up with timeline

2 H2O LOOPS  
(AOA)

NOTES

- Perform pwrdns in parallel ASAP after failure. The Summary Timeline (pg 7-3) is provided as an overview showing latest possible completion times for pwrdn procedures.
- Loss of water loop cooling affects both water and air cooled equipment.
- This procedure powers down comm. If comm reqd, preferred COMM config in order of cost heat production:
  1. UHF
  2. STDN LO PWR - If reqd
  3. TDRS - Only if mandatory

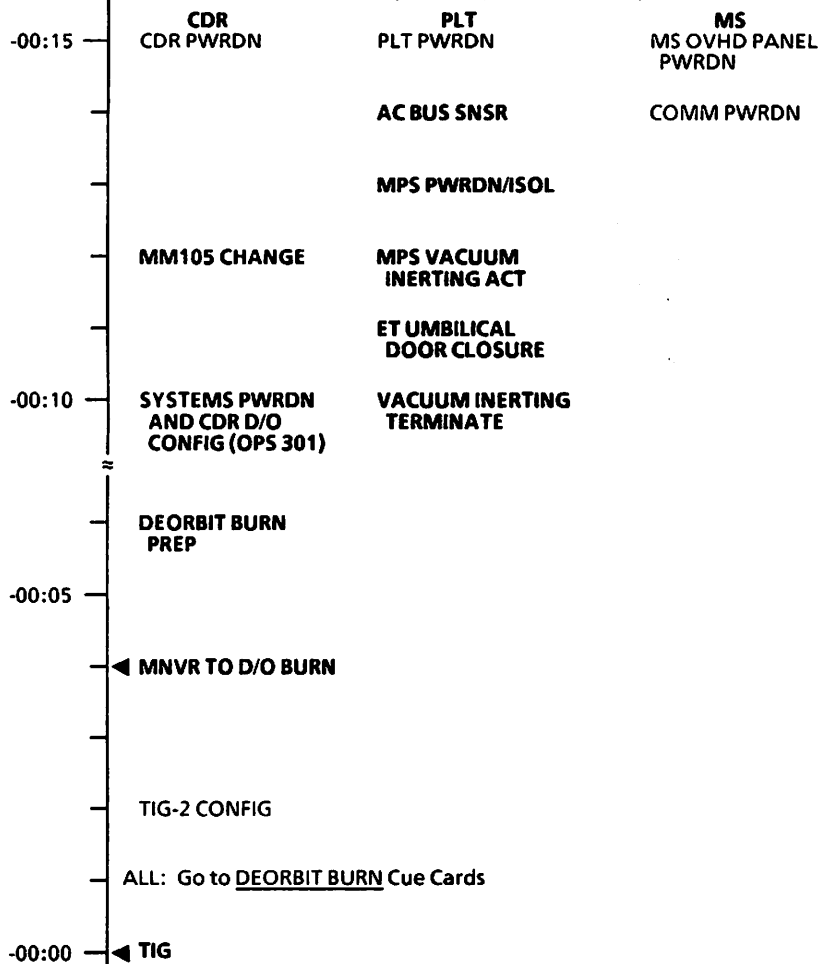
<p style="text-align: center;"><u>CAUTION</u></p> <p>TDRS or STDN - HI may be limited to 10 min. (Power amp will overheat)</p>
--

## SUMMARY TIMELINE FOR LOSS OF TWO H2O LOOPS (AOA) PWRDN

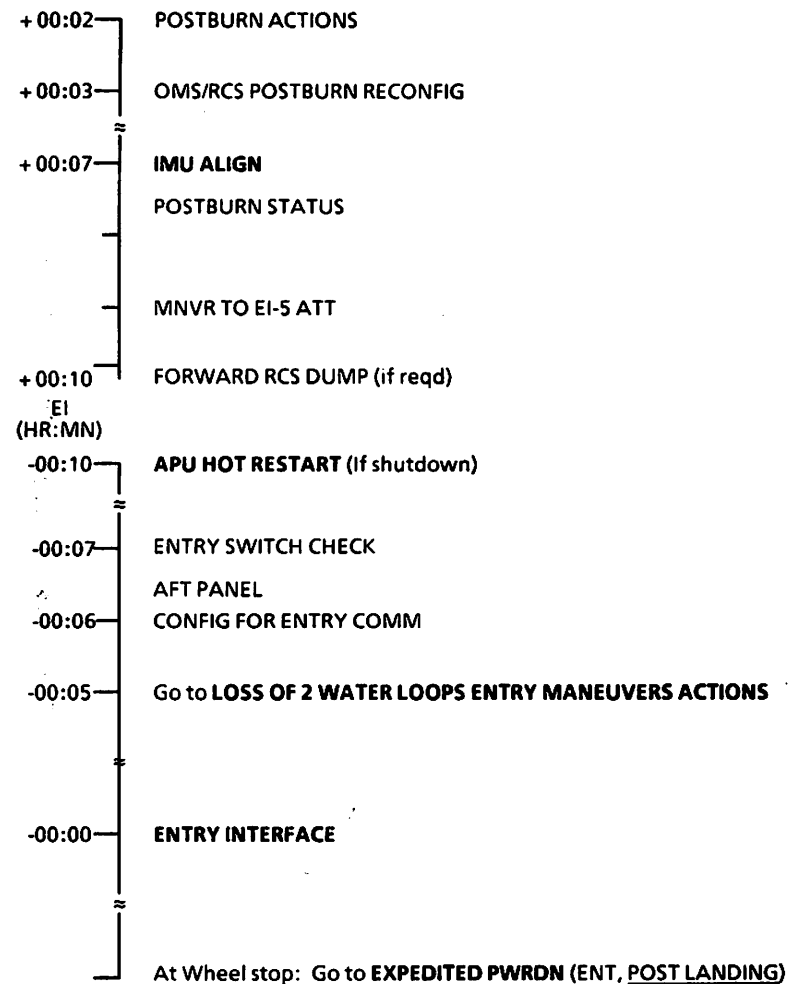
Prior to Deorbit Burn, actions are to be performed in parallel. Boldface steps must be completed by time shown. Pwrdns may be completed postburn.

TIG  
(HR:MN)

**NOTE**  
This timeline reflects latest possible failure time.  
Do not wait to perform powerdown steps.



TIG  
(HR:MN)



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**CDR AND PLT PWRDNS  
TIME CRITICAL PROCEDURES**

1. MS perform MS OVERHEAD PANEL PWRDN, pg 11-1 ASAP
2. MS perform COMM PWRDN (COMM, pg 12-1) ASAP
3. Perform CDR & PLT PWRDNS in parallel ASAP

**CDR**

**PLT**

**NOTE**

Time reqd to execute deorbit burn  
using these procedures is 15 min

**CDR PWRDN**

1. Minimize lighting
2. Use only one CRT, one INST PWR, and one FLT CNTLR PWR as reqd
- L1 3. ✓H2O PUMP LOOP 1,2 (two) - OFF  
(one ON if any flow)  
HUMIDITY SEP (two) - OFF  
(one ON if either H2O pump ON)  
CAB FAN A,B (two) - OFF  
ALL AV BAY FANS (except AV BAY 1 FAN B) - OFF  
FREON PUMP LOOP 1 - OFF
- L2 4. 02 SYS 1 SPLY - CL (tb - CL)  
ANTISKID - OFF  
NWS - OFF

**OMS-1 BURN**

If OMS-1 scheduled:  
Perform ASC, OMS-1 procedures

**DIRECT INSERTION (if no OMS-1)**

- MECO+2:00 1. +X xlation (5 sec)
- 
- C3 2. OMS ENG (two) - OFF

**PLT PWRDN (perform ASAP)**

- C3 1. ✓MSTR MADS PWR - OFF  
Minimize lighting  
Use only one CRT, one INST PWR, and one FLT CNTLR PWR as reqd  
Perform PAYLOAD PWRDN (APCL, PWRDN, TEMP 10-25)
- 07 2. ✓TACAN MODE (three) - OFF
- 08 3. ✓RADAR ALTM (two) - OFF

**DIRECT INSERTION (if no OMS-1; PLT action)**

- R2 MPS PRPLT DUMP SEQ - START

CDR

PLT

MAJOR MODE CHANGE

CRT GNC OPS 105 PRO

CDR SYSTEMS PWRDN (perform ASAP)

Reassign strings to GPC 1 in MC 1,3

CRT GNC 0 GPC MEMORY

06 1. CONFIG - ITEM 1 +1 EXEC  
Modify MC 1 per table →

2. CONFIG - ITEM 1 +3 EXEC  
Modify MC 3 per table →

NOTE  
The following must be an  
OPS mode recall:  
GNC, OPS 10X PRO

3. For any CRT that is off:  
GPC/CRT 1/X EXEC
4. Select AOA targets, but do  
not load until OPS 301
5. BFS: GNC, OPS 106 PRO  
BFS: GNC, OPS 000 PRO

CRT

CONFIG	GPC	1	2	3	4
STR	1	1			
	2	1			
	3	1			
	4	1			
P/L	1/2	1			
CRT	1	1			
	2	1			
	3	1			
	4	0			
L	1	1			
	2	1			
MM	1	1			
	2	1			
CONFIG	GPC	3	1	2	4
STR	1	1			
	2	1			
	3	1			
	4	1			
P/L	1/2	1			
CRT	1	1			
	2	1			
	3	1			
	4	0			
L	1	1			
	2	1			
MM	1	1			
	2	1			

PLT POST OMS-1 ACTIVITIES (if not yet performed)

HYD DEPRESS

- F4 1. ✓BDY FLP pb - 1t OFF (dump complete)  
(~2 min 21 sec)
- R4 2. HYD MPS/TVC ISOL VLV (three) - CL (tb-CL)
- R2 3. ✓APU SPEED SEL (three) - NORM  
✓AUTO SHUTDN - ENA  
HYD MN PUMP PRESS (three) - LO (MA)

HTR ACTIVATION

- R1 02 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

MPS PWRDN/ISOL

- R2 1. MPS ENG PWR (six) - OFF  
He ISOL (six) - GPC  
✓He I'CONNECT (three) - GPC

NOTE  
Expect multiple MAs for MPS He P  
as regs bleed down

- MS/017:B 2. MEC 1 - OFF, wait 2 sec, then  
MEC 2 - OFF

**CDR**

- 06 6. GPC MODE 2,3,4 (three) - STBY (tb-bp)  
2,3,4 (three) - HALT (tb-bp)  
PWR 2,3,4 (three) - OFF  
If TIG < 25 min, go to step 8
- 06 7. GPC MODE 5 - STBY (tb-RUN)  
- HALT (tb-bp)  
PWR 5 - OFF
- 8. MDM FF4 - OFF
- CRT 9. R OMS: sel SEC GMBL
- 06 10. ANNUN BUS SEL ACA 2/3 - OFF
- C3 11. C/W MODE - ACK
- MS/014:E 12. cb DDU L (two) - op (use as reqd)
- MS/015:E

NOTE

For F7 lights, hold F2 or F4 MA in

**CDR POST OMS-1 ACTIVITIES (perform as time permits)**

POST BURN STATUS

NOMINAL	TIG
__:__:__	__:__:__:__:

- 1. Mnv to minimize earth/sun in windows or install window shades as time permits
- C3 2. ✓DAP - AUTO  
✓only one CRT, FLT CNTLR PWR, and INST PWR

FES ACTIVATION/PL MDM CONFIG

- 06 1. MDM PL 1,2 (two) - OFF
- L1 2. FLASH EVAP CNTLR PRI A - ON
- L2 3. FDLN HTR SPLY (two) - 1

**PLT**

GNC OMS 2 MNVR EXEC

**MPS VACUUM INERTING ACT**

- R2 1. ✓MPS PNEU He ISOL - OP
- R4 2. H2 PRESS LINE VENT - OP
- 3. FILL/DRAIN (four) - OP

**ET UMBILICAL DOOR CLOSURE**

WARNING

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

NOTE

Double times for single mtr ops

- R2 1. ET UMB DR MODE - GPC/MAN  
CTRLINE LAT - STO  
✓After 6 sec, CRTLINE LAT tb - STO  
ET UMB L,R DR (two) - CL (tb-bp)  
✓After 24 sec, L,R DR tb - CL  
\* If L(R) DR tb not CL: \*

- \* Contact MCC before \*
- \* attempting door latching \*
- ET UMB L,R LAT (two) - LAT (tb-bp)
- ✓After 6 sec, L,R LAT tb - LAT
- ET UMB DR MODE - GPC

- \* If doors not closed: \*
- \* **GNC 51 OVERRIDE** \*
- \* ET UMB DR CLOSE - ITEM 40(30) EXEC \*



CDR

PLT

**DEACTIVATE FRCS (after mnvr to shade cabin)**

- MS/014:E,  
015:E,  
016:E
- MS/014:F
- MS/015:F
- MS/016:F
1. Use only one DDU (two cbs) as reqd
  2. RJDF 1B F1 LOGIC - OFF  
DRIVER - OFF
  3. 1A F2 LOGIC - OFF  
DRIVER - OFF
  4. 2A F3 LOGIC - OFF  
DRIVER - OFF
  5. 2B F4/F5 LOGIC - OFF  
F4 DRIVER - OFF

NOTES

For F7 lights, hold-in F2 or F4 MA

Cycle CRTs. If CRT PWR - ON at loss of cooling, turn off within 30 min. Allow 3 min OFF prior to each 1 min ON (MAX ON time = 1 hr). Save at least one FWD CRT for Entry

Possible cabin air OVBD RLF due to loss of cabin cooling

Expect high cabin humidity during entry

2. ET UMB DR CTRLINE LAT - GND  
L,R DR (two) - OFF  
L,R LAT (two) - OFF
3. FWD RCS MANF ISOL 1,2,3,4  
(four) - CL (tb-CL)

NOTES

For F7 lights, hold-in F2 or F4 MA

Cycle CRTs. If CRT PWR - ON at loss of cooling, turn off within 30 min. Allow 3 min OFF prior to each 1 min ON (MAX ON time = 1 hr). Save at least one FWD CRT for Entry

Possible cabin air OVBD RLF due to loss of cabin cooling

Expect high cabin humidity during entry

**PLT DEORBIT CONFIG (complete by TIG -15)**

NOTE

Steps 1-2 may be done as early as desired

C4F/  
R3F  
F6

1. Stow ASC PKT C/L  
Unstow ENT PKT C/L
2. Stow ASC Cue Cards (R3A)

If APUs shutdown, PLT perform one APU HOT RESTART

CDR

CDR DEORBIT CONFIG (complete by TIG -15)

NOTE

Steps 1-3 may be done as early as desired

- 1. Verify with MS: MS OVERHEAD PANEL PWRDN, pg 11-1 complete
- 2. Stow ASC PKT C/L  
Unstow ENT PKT C/L
- 3. Stow ASC Cue Cards (R3A)
- 4. CAB FAN B - ON  
AV BAY 2 FAN A - ON
- 5. GNC, OPS 301 PRO (✓DAP)  
If GPC 5 is on, go to step 7
- 6. GPC PWR 5 - ON  
MODE 5 - STBY (tb-RUN)  
- RUN (tb-RUN)  
OUTPUT 5 - B/U
- 7. BFS: GNC, OPS 301 PRO  
BFS, GNC 51 OVERRIDE  
GNC 51 OVERRIDE  
Deselect IMU 1 (PASS and BFS)
- 8. IMU 1 - OFF
- 9. VENT DOOR CNTL CLOSE - ITEM 44 EXEC (\*)  
GNC, OPS 302 PRO
- 10. MMU 2 - OFF  
GNC 50 HORIZ SIT  
✓Rwy selection (PASS and BFS)  
Reselect AOA Runway → AREA RWY TACAN MLS

C4F/  
R3F  
F8  
L1  
  
CRT  
06  
  
CRT  
  
MS/014:A  
CRT  
MS/015:F

PLT

APU HOT RESTART

- F8 1. INST PWR - ON
  - 2. If BFS is OFF, perform step 4; then go to step 8
  - CRT 3. BFS, SM SYS SUMM 2
  - R2 4. BLR N2 SPLY - ON  
PWR - ON  
CNTLR/HTR - A  
APU AUTO SHUTDN - ENA  
CNTLR PWR - ON  
HYD MN PUMP PRESS - LO  
APU SPEED SEL - NORM  
OPERATE - OFF  
FUEL PUMP/VLV COOL A - AUTO  
TK VLV - CL  
cb FU TK VLV ENA (six) - c1  
APU FUEL TK VLV - OP  
OPERATE - START ORIDE/RUN
- If BFS not active, skip steps 4 and 5  
If after 1.5 min APU INJ TEMP not decr,  
5. Go to step 9  
If APU starts (~3.5 min)  
6. Go to step 10  
If APU does not start  
7. APU OPERATE - OFF  
AUTO SHUTDN - INH  
OPERATE - START ORIDE/RUN  
(start in 3.5 min)

(Cont next page)

**CDR****CDR DEORBIT BURN PREP**

1. Use two CRTs for burn

CRT

**GNC DEORB MNVR EXEC**

2. TRIM LOAD - ITEM 6 +0.4, -5.7, +5.7 EXEC

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

3. ✓Or enter Target from OMS TARGETS (ASC)

NOTE

Onboard computed TIG or  $\theta$ T may vary slightly and are acceptable if REI is correct

4. LOAD - ITEM 22 EXEC  
TIMER - ITEM 23 EXEC  
✓BFS TGT

**MNVR TO DEORBIT BURN ATTITUDE**

ITEM 27 EXEC

If manual MNVR reqd:  
LVLH: P 180°, R 180°, then Yaw ~80°  
out-of-plane

**PLT**

If APU starts (~3.5 min)

8. Go to step 10

If APU does not start

9. APU OPERATE - OFF  
FUEL TK VLV - CL  
CNTLR PWR - OFF

Repeat APU HOT RESTART on another  
APU

F8

10. INST PWR - OFF

If POST DEORBIT BURN,

11. Go to APU ENTRY CONFIG (pg 9-6)

If PRE DEORBIT BURN,

12. Go to PLT DEORBIT BURN PREP

**PLT DEORBIT BURN PREP**OMS GIMBAL CHECK

CRT

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

- \* If R SEC TVC problem, repower \*
- \* MDM FF4 and select R PRI TVC \*

08

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

CDR

PLT

OMS BURN TIG ADJUST (if read)

- CRT 1. LOAD - ITEM 22 EXEC  
 - ITEM 23 EXEC
- Determine  $\Delta$ TIG (if REI - REF > 50) from  
OMS TARGETS (ASC)  
 Enter new TIG  
 LOAD - ITEM 22 EXEC  
 TIMER - ITEM 23 EXEC  
 Repeat until  $\Delta$ RANGE < 50

- CRT 2.  BFS TGT

EQUIP POWERUP

At TIG -10

- 014:E, 1. cb MNA DDU L - c1  
 015:E, MNB DDU L,R (two) - c1  
 016:E, MNC DDU R - c1  
 F6 2.  ADI ATT - INRTL  
 ERR - MED  
 RATE - MED  
 ( ADI ATT with CRT BURN ATT)  
 INRTL BURN ATT

At TIG -2

3. Use only 2 CRTs, L FLT CNTLR PWR for burn  
  
 Go to DEORBIT BURN Cue Cards (next page)

- \* If RCS BURN (I'CNT OMS to RCS): \*
- \* 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) \*

At TIG -10

**VACUUM INERTING TERMINATE**

- R4 1. MPS H2 PRESS LINE VENT - GND  
 MPS FILL/DRAIN  
 LH2,LO2 OUTBD (two) - CL  
 Wait 10 sec, then - GND  
 LH2,LO2 INBD (two) - GND
- R2 2. MPS PNEU He ISOL - GPC

At TIG -2

3. Use only 2 CRTs for burn  
  
 Go to DEORBIT BURN Cue Cards (next page)

## DEORBIT BURN MONITOR (LOSS OF 2 H2O LOOPS AOA)

DEORBIT  
BURN

<b>OMS Pc LOW</b> OMS ↓ AND ENG VLV 1 or 2 < 70% ----- OMS ↓ and ENG VLV 1 and 2 > 70% and FU and OX TK P<185 (System in blowdown) OX IN P > <span style="border: 1px solid black; padding: 0 2px;">227</span> ----- P < <span style="border: 1px solid black; padding: 0 2px;">136</span> ----- No OMS ↓	OMS ENG FAIL ----- Burn to Pc=72%, then OMS OMS PRLT FAIL ----- OMS ENG FAIL ----- OMS PRPLT FAIL ----- Sensor Fail
<b>OMS TEMP</b> FU IN P > 232 ----- < 197 ----- P 198-231	OMS ENG FAIL ----- OMS PRPLT FAIL ----- SENSOR FAIL
<b>OMS OX/FU TK P</b> OX & FU LOW ----- OX LOW ----- FU LOW ----- OX & FU HIGH	He PRESS/VAP ISOL (two) - OP Burn to OMS ↓, then OMS PRPLT FAIL ----- He PRESS/VAP ISOL (two) - CL Burn to OMS ↓, then OMS PRPLT FAIL ----- Cycle He to maint OMS TK P234-284 Cycle He A(B) to isolate failed leg
<b>OMS GMBL</b> 1st L FAIL 1st R FAIL or 2nd L FAIL	Select SEC GMBL (twice) ----- If control problems or high RCS fuel usage: Affected OMS ENG - OFF XFEED if ΔVTOT > 20
Safe HP: HP > <input type="checkbox"/> <input type="checkbox"/> ----- HP < <input type="checkbox"/> <input type="checkbox"/> ----- <b>2 MN DC BUSES</b>	Stop burn, APUs - SHUT DN ----- Continue burn: PASS SET FAIL only - BFS engage PASS SET SPLIT only - Consult MCC on Restrng
<b>GPC1</b>	BFS Engage
<b>FA1</b>	L(R) OMS Gimbals - sel SEC
<b>FA3</b>	If control problems or high RCS fuel usage: R OMS ENG - OFF XFEED IF ΔVTOT > 20

## DEORBIT BURN (2 ENG) (LOSS OF 2 H2O LOOPS AOA)

✓MM302 .. ✓OMS BOTH CNTLR PWR (two) - ON  
 Enter TGO + 5 sec  
 ✓TRIM: P + 0.0, LY - 5.7, RY + 5.7  
 ✓DAP - AUTO (PASS)/DISC .. ADI - LVLH/HI/MED  
 L,R OMS He PRESS/VAP ISOL A (two) - OP  
 B (two) - GPC ..

TIG-2 OMS ENG (two) - ARM/PRESS ..  :    
 -:15 EXEC .. (NO EXEC > TIG +  :   )  
 -:15 If OMS AFT QTY < 11%, THC + X to OMS IGN + 1 sec  
 :00 TIG .. (✓Pc, ΔVTOT, ENG VLVs; start watch)

\* If no OMS ignition, APUs - SHUT DN  
 \* **OMS PRPLT FAIL:**  
 \* HP >    L or    R (STOP):  
 \* OMS ENG (two) - OFF, APUs - SHUT DN  
 \* Affected OMS TK ISOL (two) - CL  
 \* HP <    L or    R (CONTINUE):  
 \* Failed OMS ENG - OFF  
 \* ITEM 18 + 0 EXEC  
 \* Affected OMS He PRESS (two) - CL  
 \* TK ISOL (two) - CL  
 \* When Pc < 80%, 2nd OMS ENG - OFF  
 \* Complete RCS (PRPLT FAIL)  
 \* **OMS ENG FAIL (CONTINUE BURN):**  
 \* Failed ENG - OFF  
 \* OMS XFEED at    %L    %R  $\frac{1}{2}$  of ΔVTOT     
 \* at FAIL  
 \* **RCS COMPLETION:**  
 \* **ANY OMS PRPLT FAIL:**  
 \* If HP >   , safe HP: APUs - SHUT DN  
 \* If HP <   , safe HP: l'cnect to good OMS PRPLT  
 \* THC + X (✓OMS % vs RCS Burn Time)  
 \* AFT RCS RECONFIG  
 \* THC + X to TGT HP or TOT AFT QTY 1    %  
 \* If CUR HP ≤ AFT HP   , THC + X to TGT HP  
 \* If CUR HP ≤ PRI HP   , FRCS to PRI Site  
 \* If CUR HP > PRI HP   & ≤ B/U HP    
 \* FRCS to B/U Site  
 \* If CUR HP > B/U HP   , THC + X    
 \* to B/U HP  
 \* or TOT AFT QTY 2   ; FRCS to B/U Site  
 \* MNVR to -X ATT (pitch up at 3°/sec to VGOz = (+)  $\frac{1}{2}$  ΔVTOT)  
 \* THC -X  
 \* **BOTH OMS ENG FAIL:**  
 \* OMS ENG - OFF  
 \* Interconnect OMS to RCS  
 \* THC + X (✓OMS % vs RCS Burn Time)  
 \* OMS TK SW  
 \* THC + X (✓OMS % vs RCS Burn Time)  
 \* CUTOFF ..  :    
 \* +:02 OMS ENG(s) - OFF .. (If < 3 IMU, at  :   )  
 \* \* AFT RCS RECONFIG if INTERCONNECT \*  
 \* TRIM X,Z residuals < 2 fps (< 0.5 fps if shallow)

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**POST BURN ACTIONS**

- MS/014:E, 1. cb MNA DDU L - op  
 015:E, MNB DDU L,R (two) - op  
 016:E, MNC DDU R - op  
 014:A 2. IMU 1 - ON (already ON if IMMEDIATE AOA DEORBIT BURN STEPS performed)  
 C3 3. Use only one CRT  
 F7 4. FLT CNTLR PWR - OFF  
 Determine PREBANK  
 Determine  $\Delta$ HP (CUR HP - TGT HP)

Use PREBANK TABLE  
 Record PREBANK on LOSS OF TWO WATER LOOPS AOA ENT MNVR  
 page 10-1

**OMS/RCS POST BURN RECONFIG**

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

PREBANK TABLES  
 (to EDW)

(AOA steep entries)

$\Delta$ HP	0	1	2	12	20	23	25	26
PREBANK	0	53	58	89	120	136	152	166

$\Delta$ HP	0							
PREBANK	0							

(AOA shallow entries)

$\Delta$ HP	0	1	2	5	7	8	9
PREBANK	90	100	108	124	136	148	180

$\Delta$ HP	0				
PREBANK	90				

POST BURN ACTIONS



C

**POST BURN STATUS**

NOMINAL

--

Δ TIG

	:		
--	---	--	--

GNC, OPS 303 PRO \*\*

-EI-23

**IMU ALIGN**

(if IMMEDIATE AOA DEORBIT BURN STEPS performed,  
skip steps 1 and 2)

CRT

**GNC 21 IMU ALIGN**

1. ✓IMU 1 in ✓DES - ITEM 7 (\*)  
                   OPER - ITEM 4 (\*) within 4 min of PWR - ON, then  
       GNC, I/O RESET  
       IMU/IMU ALIGN - IMU 1,2 TO IMU 3  
       When align complete,

CRT

**GNC 50 HORIZ SIT**

2. NAV DELTA zero (ITEM 16 EXEC)

CRT

**GNC 21 IMU ALIGN**

**BFS, GNC 51 ORIDE**

016:A

3. IMU 1 - SEL  
       IMU 3 - DES  
       IMU 3 - OFF

**POST BURN  
ACTIONS**

GNC DEORB MNVR COAST

-EI-17

**FRCS REACTIVATION**

If forward RCS dump reqd:

- 014:B 1. cb OI SIG CONDR OF 1/4 A - c1
- :F 2. RJDF 1B F1 DRIVER - ON
- LOGIC - ON
- 015:B 3. cb OI SIG CONDR OF 2/3 A - c1
- :F 4. RJDF 1A F2 DRIVER - ON
- LOGIC - ON
- 016:F 5. RJDF 2A F3, 2B F4 DRIVER (two) - ON
- 2A F3, 2B F4/F5 LOGIC (two) - ON
- 06 6. ✓MDM FF1,2,3 (three) - ON
- MDM FF4 - ON
- GNC I/O RESET
- 08 7. FWD RCS MANF ISOL 1,2,3,4 (four) - OP (tb-OP)
- GNC 23 RCS
- 8. JET RESET - ITEM 45 EXEC
- 9. Reselect deselected FRCS jets
- 10. JET RESET - ITEM 45 EXEC
- 11. Power either DDU as reqd to achieve/maintain EI-5 attitude

**MNVR TO EI-5 ATT**

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

R - ITEM 24 + 

--	--	--

P - ITEM 25 + 

--	--	--

Y - ITEM 26 + 

--	--	--

- \* If UNDERBURN, ignore INRTL ATT ERR \*
- \* needles and mnvr to LVLH ROO1, Y358 \*
- \* 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

**OMS GMBAL PWRDN**

1. Verify gimbal positions:

	L	R
P	+5.9	+5.9
Y	+6.4	-6.4

CRT

2. GMBL OFF - ITEM 32 EXEC  
 - ITEM 33 EXEC

**FORWARD RCS DUMP (if reqd) -- FOUR JETS**

06

1. ✓MDM FF4 - ON

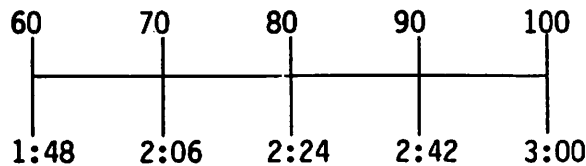
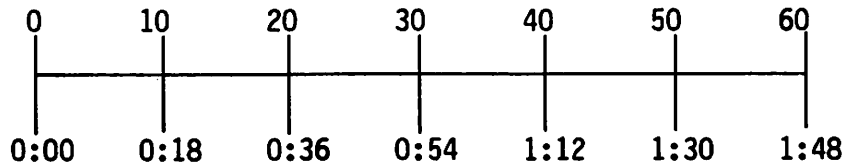
NOTE

Use BFS qtys for all calculations

Determine FWD RCS 'DUMP TO %' using lowest of  
 Ox or Fu qty (calculator, cg wheel, or DEL PAD)

FOUR JET DUMP:

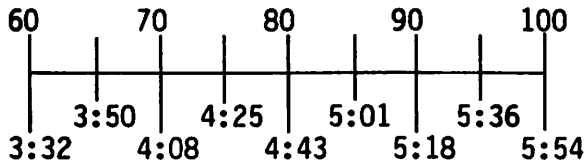
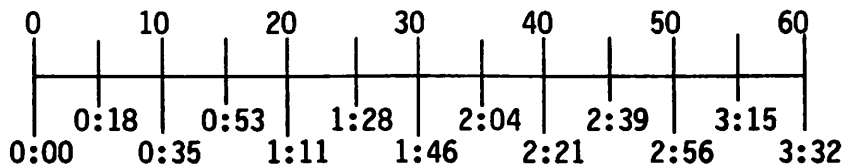
F RCS PRPLT TO BE DUMPED (%)



TIME FROM DUMP INITIATION (M:S)

TWO JET DUMP:

F RCS PRPLT TO BE DUMPED (%)



TIME FROM DUMP INITIATION (M:S)

NOTE

During dump, disregard FRCS QTY

- CRT
2. FWD RCS ARM - ITEM 36 EXEC
  3. DUMP - ITEM 37 EXEC
- When dump time achieved:
4. FWD RCS OFF - ITEM 38 EXEC

**ISOLATE FRCS**

- When dump complete:
- 08 1. FWD RCS MANF ISOL 1,2,3,4 (four) - CL (tb-CL)
- 06 2. MDM FF4 - OFF
- 014:B 3. cb OI SIG CONDR OF 1/4 A - op
- :F 4. RJDF 1B F1 DRIVER - OFF  
LOGIC - OFF
- 015:B 5. cb OI SIG CONDR OF 2/3 A - op
- :F 6. RJDF 1A F2 DRIVER - OFF  
LOGIC - OFF
- 016:F 7. RJDF 2A F3, 2B F4 DRIVER (two) - OFF  
2A F3, 2B F4/F5 LOGIC (two) - OFF

~EI-13  
P

**STATE VECTOR CHANGE (if reqd)**

CRT2            ΔT - ITEM 18    

( )			.		
-----	--	--	---	--	--

- CRT3
- LOAD - ITEM 16 EXEC
- .....wait 8 sec(min).....
- PASS/BFS SV XFER - ITEM 17 EXEC
- LOAD - ITEM 16 EXEC

At EI -12:

### APU ENTRY CONFIG

Perform APU HOT RESTART (pg 8-5) simultaneously for all shutdown APUs

### DPS ENTRY CONFIG

06

1. GPC PWR 3 - ON  
MODE 3 - STBY (tb-RUN)  
- RUN

2. Reassign strings to GPC 3 in MC3  
GNC OPS 301 PRO

GNC 0 GPC MEMORY

CRT

CONFIG ITEM 1 +3 EXEC

Modify MC 3 per table →

GNC OPS 301 PRO (✓DAP)

GNC 50 HORIZ SIT

GNC OPS 302,303 PRO

For any CRT that is off:

GPC/CRT 3/X EXEC

BFS: GNC I/O RESET

GNC 0 GPC MEMORY

DOWNLIST GPC - ITEM 44 +3  
EXEC

CONFIG GPC	3	10300
STR	1	3
	2	3
	3	3
	4	3
P/L 1/2		3
CRT	1	3
	2	3
	3	3
	4	0
L	1	0
	2	0
MM	1	3
	2	3

06

3. GPC MODE 1 - STBY (tb-bp)  
- HALT (tb-bp)  
PWR 1 - OFF
4. ✓FCS CH (four) - AUTO

# HORIZ SIT CONFIG

ALTM -ITEM 9

+ 

		.		
--	--	---	--	--

		<u>PASS ITEM</u>		<u>BFS ITEM</u>
LAND SITE	✓correct SITE/	41✓		41✓
RWY	RWY selected	3✓		3✓
	per DEL PAD	4✓		4✓
TACAN		5✓		5✓
G&N	OVHD	6✓	OVHD	6✓
XEP	NEP	7✓	NEP	7✓
AIM	NOM	8✓	NOM	8✓
SPD BRK	NOM	39✓		
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 \*

## ECLSS ENTRY CONFIG

L1

IMU FAN (three) - OFF  
 AV BAY 3 FAN B - ON  
     ✓2 FAN A - ON  
 ✓All other AV BAY FANS - OFF  
 NH3 CNTLR B - PRI/GPC  
     A - OFF

-EI-7

## ENTRY SWITCH CHECK

- R3A  
07
1. Install ENTRY Cue Cards
  2. ✓TACAN MODE (three) - OFF
    - ✓ANT SEL (three) - AUTO
    - CH (three) - 111X (EDW)  
059Y (KSC)  
069X (NOR)
- 08
3. ✓RADAR ALTM (two) - OFF
  4. ✓MLS (three) - OFF
    - ✓MLS CH (three) - 8 (EDW22, KSC15, NOR17)  
- 6 (EDW17, KSC33)
- L2
5. ✓CAB RELIEF (two) - ENA (tb-ENA)
    - ✓ANTISKID - OFF
    - ✓NWS - OFF
    - ✓ENTRY MODE - AUTO
- GNC 51 OVERRIDE
- L2/C3  
C3
6. ✓ENTRY ROLL MODE - AUTO
  7. ✓SBTC - full fwd
  7. ✓SRB SEP - AUTO
  - ✓ET SEP - AUTO
- F6/F8
8. ✓AIR DATA - NAV
    - ✓ADI ERR - MED
    - ✓RATE - MED
    - ✓HSI SEL MODE - ENTRY
- F6  
F8
- ✓SOURCE (two) - NAV,1
  - NAV,2
- F3
9. L,R TRIM RHC/PNL (two) - INH  
PNL - ON
- 014:A  
:E
10. BRAKES MNA - ON
    - cb ACCEL 1 - c1
    - DDU L - c1
- 015:A  
:E
11. BRAKES MNB - ON
    - cb ACCEL 2 - c1
    - DDU L - c1
- 016:A  
:E
12. BRAKES MNC - ON
    - ACCEL 3 - ON
- F7  
015:D  
R1
13. L FLT CNTLR PWR - ON
  14. cb MNB 02/N2 CNTLR 2 - c1
  15. AC BUS SNSR (three) - OFF (1 sec), then MONITOR

Before OPS 304:

16. Have MS complete AFT PANEL CONFIG FOR ENTRY COMM (COMM, pg 12-2) (Comm will be activated at V = 10K)
17. Go to LOSS OF TWO WATER LOOPS AOA ENTRY MANEUVERS ACTIONS on next page





**ENT MNVR  
ACTIONS**

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## MS PULLOUT SECTION

Pull this section for MS use. Complete MS OVERHEAD PANEL PWRDN, ASAP.  
If STDN LOS, have another MS perform COMM PWRDN (COMM) at the same time

### MS OVERHEAD PANEL PWRDN

1. Minimize lighting on AFT FD & MIDDECK
- 013:A      2.    cb ESS 1BC MTU A - op  
      :C            cb ESS 2CA C/W B - op  
                  (Expected MA and two F7 lts)  
      :E            cb ESS 3AB GPC STAT - op
- 014:A      3.    BRAKES MNA - OFF  
      :B      4.    cb MNA OI SIG CONDR OF 1/4 A - op  
                  MDM OF 1/2 A,3/4 A (two) - op  
                  H2O BYP LOOP 1 SNSR - op  
                  MSN TIMER FWD - op  
                  EVENT TIMER AFT - op  
      :D      5.    GPS PRE AMPL UC,LC (two) - op  
                  CAB VENT - op  
                  VENT ISOL - op  
      :E      6.    ADTA 1 - op  
                  ACCEL 1 - op  
                  ✓DUU AFT - op  
      :F      7.    MMU 1 - OFF
- 015:A      8.    BRAKES MNB - OFF  
      :B      9.    cb MNB OI SIG CONDR OF 1/4 B,2/3 A (two) - op  
                  MDM OF 1/2 B - op  
                  H2O BYP LOOP 2 SNSR - op  
                  MSN TIMER AFT - op  
                  EVENT TIMER FWD - op  
      :D     10.    O2/N2 CNTLR 2 - op  
      :E     11.    ADTA 2 - op  
                  ACCEL 2 - op  
                  DDU R - op  
      :F     12.    ACCEL 4 - OFF
- 016:A     13.    BRAKES MNC - OFF  
      :B     14.    cb MNC OI SIG CONDR OF 2/3 B - op  
                  MDM OF 3/4 B - op  
      :D     15.    GPC PRE AMPL UC,LC (two) - op  
                  O2 EMER - op  
      :E     16.    ADTA 3,4 (two) - op  
                  DDU R - op  
                  ✓AFT - op  
      :F     17.    ACCEL 3 - OFF

MS OVHD  
PNL PWRDN

MS OVHD  
PNL PWRDN

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# MS PULLOUT SECTION

COMM

MS: As soon as possible after BDA LOS perform COMM PWRDN.

## COMM PWRDN

- A1L 1. S-BD PM ANT SW ELEC - OFF  
PRE AMP - OFF  
PWR AMPL STBY - OFF  
OPER - OFF  
MODE - STDN LO  
XPNDR - OFF
2. NSP PWR - OFF  
ENCRYPTION PWR - OFF  
(Encryption disabled for rest of flight)  
NSP ENCRYPTION MODE - SEL  
SEL - BYP
- C3 3. S-BD PM CNTL - PNL  
OI PCMMU FORMAT - FIXED  
PWR - OFF
- O6 4. UHF MODE - OFF
- A1L 5. ✓S-BD PL CNTL - PNL  
✓PWR SYS - OFF  
PL DATA INTRLVR PWR - OFF
- A1R 6. OPS RCDRS PWR (two) - OFF  
S-BD FM CNTL - PNL  
PWR - OFF  
PL RCDR PWR - OFF
- R15:B 7. cb MNA,MNC GCILC (two) - op
- If after EI-5:  
8. Perform AFT PANEL CONFIG FOR ENTRY COMM, pg 12-2

Contact MCC at first available AOS using COMM POWERUP procedures.  
Preferred comm config in order of least heat production:

1. UHF
2. STDN LO PWR - if reqd
3. TDRS - only if mandatory

<p><b>CAUTION</b> TDRS on STDN HI may be limited to 10 min (Power Amp will overheat)</p>
--

## MS PULLOUT SECTION

### AFT PANEL CONFIG FOR ENTRY COMM

COMM

On GO from CDR prior to MS/PS seat ingress:

- R15:B 1. cb MNA,MNC GCILC (two) - c1
- C3 2. S-BD PM CNTL - CMD
- A1L 3. S-BD PM ANT SW ELEC - 2  
MODE - STDN LO (SGLS)  
XPNDR - 2
- 4. NSP PWR - 2
  - ✓DATA RATE XMIT - HI
  - RCV - HI
  - ✓UPLK DATA - S-BD
  - ✓CODING XMIT - OFF
  - ✓RCV - OFF

#### NOTE

CDR will activate COMM at V = 10K

MS PULLOUT SECTION

ES  
31A

COMM POWERUP (If COMM reqd prior to landing site coverage)

Power up audio system

C3 1. AUD CTR - 1

05 ✓L AUD PWR - AUD

09 ✓R AUD PWR - AUD

If UHF available, config for UHF comm (voice only)

06 2. UHF MODE - SPLX

✓UHF SPLX PWR AMP - ON

3. After Comm with MCC complete, perform COMM POWERDOWN

If UHF site unavailable or if MCC requests data:

Config for GSTDN (SGLS) S-BD

C3 4. ✓S-BD PM CNTL - PNL

ALL ANT SW ELEC - 2

MODE - STDN LO (SGLS)

XPNDR - 2

NSP PWR - 2

DATA RATE XMIT - HI

RCV - LO

CODING XMIT - OFF

RCV - OFF

✓UPLK DATA - S-BD

Select best S-BD PM ANT

If MCC requests data:

014:B 5. cb MNA OI MDM OF 1/2,3/4, A (two) - c1

C3 OI PCMMU PWR - 1

GNC, I/O RESET

06 MDM PL2 - ON

BFS I/O RESET

At end of data transmission:

014:B 6. cb MNA OI MDM OF 1/2,3/4, A (two) - op

7. After comm/data complete, perform COMM POWERDOWN

If UHF site and GSTDN unavailable and comm/data critical:

Config for TDRS S-BD

CAUTION

This is a High Power Mode. On-time should be limited to 10 min maximum due to Power Amp Thermal constraints. A 3 min delay occurs after activation before Pwr Amp comes on. Uplink not affected. Proceed with selection of best antenna

(Continued next page)

C3  
ALL

8. ✓S-BD PM CNTL - PNL  
ANT SW ELEC - 2  
PRE AMP - 2  
PWR AMPL OPER - 2  
MODE - TDRS DATA  
XPNDR - 2

- NSP PWR - 2  
✓DATA RATE XMIT - HI  
✓RCV - LO  
CODING XMIT - ON  
RCV - ON  
✓UPLK DATA - S-BD  
Select best S-BD PM ANT

If MCC requests data:

- 014:B 9. cb MNA OI MDM OF 1/2,3/4, A (two) - c1
- C3 OI PCMMU PWR - 1  
GNC, I/O RESET
- 06 MDM PL2 - ON  
BFS I/O RESET

At end of data transmission:

- 014:B 10. cb MNA OI MDM OF 1/2,3/4, A (two) - op

11. After comm/data complete, perform COMM POWERDOWN

FLIGHT DATA FILE  
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CA7/Chief  
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DF75/Sys. Analysis Sect.  
DG6/Rockwell  
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STIC Library

Allied/Bendix Aerospace  
OAG Suite 450  
10210 Greenbelt Rd  
Seabrook, MD 20706  
Attn: J. F. Ryan (3)

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HS-04/D. Bennett

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MC/R. Tucker

Kennedy Space Center  
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LSO-207/J. Likon  
LSO-209/Eng Learning Ctr,  
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Lockheed - Houston  
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Rockwell - Houston  
R12A/W. E. Smith  
R16E/Support (3)

Singer-Link - Houston  
SMS Data Library

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Clearwater, FL 33546  
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Martin-Marietta Corp. - Denver  
- GOLDENROD -  
G6245/Library  
G6496/J. Barnes

Space Division  
Worldway Postal Center  
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Los Angeles, CA 90009  
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CSTC  
P.O. Box 3430  
Sunnyvale, CA 94088  
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Wyle Laboratories  
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3000 Bowers Ave.  
Santa Clara, CA 95051  
G. Asher

LAB For ATMOS & SPACE PHYS  
5525 Central Ave.  
Boulder, CO 80301  
Attn: Alan Stern

Total 110

SYSTEMS AOA  
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Sunnyvale, CA 94088  
VOS/Lt. Col. W. Etbauer (50)

Intermetrics, Inc  
1750-112th Ave. NE Suite D-151  
Bellevue, WA 98004  
Attn: John Hanaway

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