

Entry Pocket Checklist

Volume II: OV102,4

**Mission Operations Directorate
Operations Division**

**Generic, Rev H
August 9, 1999**

NOTE
For STS-108 and subsequent OV102,4 flights
Cover replaced in PCN-12
Also see note #8 on page iii

AESP:	MM101
APCL:	MM104
OPCL:	MM106
EPCL:	MM301
AESP:	MM304

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



Verify this is the correct version for the pending operation (training, simulation or flight).
Electronic copies of FDF books are available. URL: <http://fltproc.jsc.nasa.gov/dfd>

ENTRY POCKET CHECKLIST

GENERIC, Rev H (Aug 9, 1999)

PCN-13 (Oct 22, 2001) Sheet 1 of 1

List of Implemented Change Requests (482s):

MULTI-1560
MULTI-1562**NOTE**
For STS-108 and subsequent flights~~Incorporate the following changes to Volume I (OV103,5):~~

- ~~1. Replace v thru x~~
- ~~2. Replace 3-3 thru 3-6, 3-13 thru 3-16, 3-19 and 3-20~~
- ~~3. Replace A4-13 thru B4-14 with 4-13 and 4-14~~

Incorporate the following changes to Volume II (OV102,4):

1. Replace v thru x
2. Replace 3-3 thru 3-6, 3-13 thru 3-16, 3-19 and 3-20
3. Replace 4-13 and 4-14

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Encl: Volume I - 18 pages; Volume II - 18 pages

File this PCN immediately behind the front cover as a permanent record

MISSION OPERATIONS DIRECTORATE

ENTRY POCKET CHECKLIST

GENERIC, REVISION H
August 9, 1999

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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on JSC Form 482 to DO3/FDF Manager.

Additional distribution of this book for official use must be requested in writing to DO3/FDF Manager. The request must include justification and requester's name, organization, position, and phone number. Contractor requests are made through the NASA or DOD organization supported. Deletions, reduction in quantity, or change of address may be submitted to DO3/FDF Management Office, 281-244-1184.

EPCL/ALL/GEN H

Incorporates the following:		
482#:	MULTI-1433	EPCL-224
	MULTI-1443	EPCL-225
	MULTI-1444	
	MULTI-1448A	
	MULTI-1450	
	MULTI-1454	
	MULTI-1469	

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DO35/C. Simon	281-483-0656
Alternate	DO35/J. Gourdine	281-244-1189
APU/HYD	DF05/R. Doremus	281-483-0680
COMM	DF2/S. Murray	281-483-4061
DPS	DF2/T. Murphy	281-483-3290
ECLS	DF8/P. Hasbrook	281-483-0768
EPS	DF7/J. Azbell	281-483-0742
GNC	DF6/K. Dwyer	281-483-2476
OMS/RCS	DF6/C. Koerner	281-483-2617
MPS	DF5/N. Knight	281-483-4899
PWRDN	DF7/J. Azbell	281-483-0742

NOTES

1. The pocket checklists contain contingency procedures to safe a system and continue the flight. Normally, these procedures do not troubleshoot a malfunction to determine its cause.
2. The Entry Pocket Checklist is in effect from transition-to-MM301-for-entry until MM304 transition.
3. The absence of a procedure implies no immediate action required.
4. '(Cue Card)' after a procedure indicates that it can also be found on a cue card.
5. Steps are numbered sequentially to facilitate reference for orbiter/ground communications and for procedural cross-reference. All procedures should be completed promptly and in the step sequence noted.
6. Applicable procedures from the PL PWR book (i.e., Section 4) are placed at the end of the flight copies of this book.
7. Applicable procedures from the A/E SYS book (i.e., Sections E1 thru E9) are placed after the PL PWR sections (above) in the flight copies of this book.
8. This document (Entry Pocket Checklist) is published in multiple volumes to accommodate vehicle configuration differences. Volume I is dedicated to OV103 and OV105; Volume II is dedicated to OV102 and OV104. Pages which contain procedures that are applicable to all vehicles are duplicated in each volume. The number of volumes and vehicles covered by a particular volume will change as required to keep pace with hardware and/or software upgrades. Only the applicable volume will be manifested on a given flight.

Although published with separate covers, the volumes will be considered together as one book for configuration control, review, and sign-off purposes. This is to ensure that all vehicle configurations are considered when individual procedure changes are made. Updates to all the various affected volumes will be made at the same time regardless of the flights to which the vehicles are assigned.

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ENTRY POCKET CHECKLIST – Vol II

LIST OF EFFECTIVE PAGES

GENERIC	07/22/87	PCN-7	10/13/00
REV H	08/09/99	PCN-8	11/20/00
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PCN-3	03/17/00	PCN-11	04/24/01
PCN-4	05/23/00	PCN-12	09/26/01
PCN-5	08/11/00	PCN-13	10/22/01
PCN-6	08/31/00		

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* – Omit from flight book

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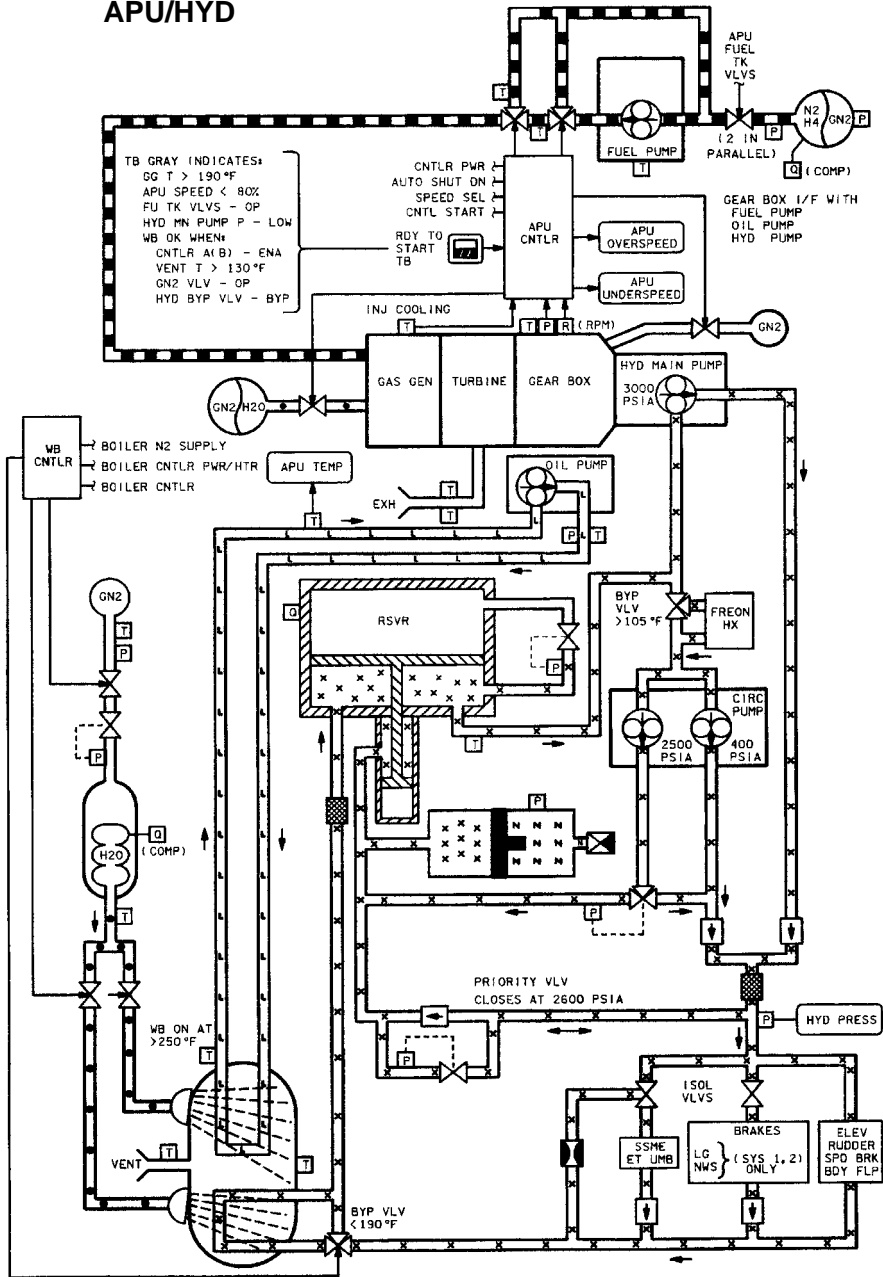
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APU/HYD

APU/
HYD



DATE 08/09/99

480330101.SCH;2

APU/
HYD

**APU OVERSPEED/
UNDERSPEED**

BFS, SM SYS SUMM 2

If overspeed or underspeed confirmed by CRT:

1. Go to APU SHUTDN

APU SPD HI

BFS, SM SYS SUMM 2

If SPEED HI confirmed by CRT:

1. (Aff) APU SPEED SEL – HI

If two good APUs:

2. Perform APU SHUTDN, then:

At M = 7:

3. Go to APU COOLDOWN (A/E SYS, PLT WND FB,
APU/HYD)

APU OIL OVERTEMP

BFS, SM SYS SUMM 2

1. (Aff) BLR CNTLR/HTR – A(B)
If APU OIL OUT TEMP > 305 and OIL IN TEMP incr:
 2. Perform APU SHUTDN, then:
At M = 7:
 3. Go to APU COOLDOWN (A/E SYS, PLT WND FB, APU/HYD)

APU PUMP LEAK P

BFS, SM SYS SUMM 2

1. ✓MCC
If two good APUs:
 2. Perform APU SHUTDN, then:
At M = 7:
 3. Go to APU COOLDOWN (A/E SYS, PLT WND FB, APU/HYD)

EPCL/ALL/GEN H

APU SPEED

1-3

APU OIL T/PUMP LK P

APU RESTART (Aff APU)

1. APU CNTLR PWR – ON
2. HYD MN PUMP PRESS – LO
3. ✓APU SPEED SEL – NORM
 - ✓OPER – OFF
 - ✓AUTO SHUTDN – ENA
 - ✓FUEL TK VLV – CL
 - ✓cb APU FU TK VLV ENA – cl
4. APU FUEL TK VLV – OP
 - OPER – INJ COOL (start watch)

If after 1.5 min, APU INJ TEMP not decr:

5. Go to step 8

At 3.5 min:

6. APU OPER – START/RUN

If Restart successful:

7. HYD MN PUMP PRESS – NORM >>

If Restart unsuccessful:

8. Go to APU SHUTDN

APU SHUTDN (Aff APUs)

1. APU OPER – OFF
 - FUEL TK VLV – CL
 - ✓SHUTDN (HYD PRESS)
 - Report APU F7 Its
 - APU CNTLR PWR – OFF

If one APU/HYD failed:

2. At TAEM: APU SPEED SEL (two) – HI >>

If two APU/HYD failed:

3. (Good) APU AUTO SHUTDN (one) – INH
 - HYD MN PUMP PRESS (one) – LO

4. Delay MM304 trans until EI-2

Immed prior to MM304 trans:

5. (Good) HYD MN PUMP PRESS (one) – NORM
 - APU SPEED SEL (one) – HI

HYD PRESS LOW

GNC 51 OVERRIDE
BFS, SM SYS SUMM 2

If only one APU remaining:

1. ✓ APU AUTO SHUTDN (one) – INH
2. (Good) HYD MN PUMP PRESS – LO

Immed prior to MM304 trans:

3. (Good) HYD MN PUMP PRESS – NORM
APU SPEED SEL – HI >>

If 2/3 APUs remaining:

4. Compare 'PRL SYS X' status and aff HYD PRESS:

PRL SYS	HYD PRESS	ACTION
'↓'	P > 300	HYD MN PUMP PRESS – LO Go to step 5
	P < 300	APU SHUTDN >>
blank	meter <u>and</u> CRT P < 2600	If first HYD sys degraded: HYD MN PUMP PRESS – LO Go to step 5 If two HYD sys degraded: HYD MN PUMP PRESS (two) – NORM, then: – LO on system with lowest pressure – (Good) APU AUTO SHUTDN (one) – INH Go to step 5
	either meter <u>or</u> CRT P – OK (~ 3000)	No action reqd >>
'?'		No action reqd >>

5. At TAEM: APU SPEED SEL (two) – HI

EPCL/ALL/GEN H

PU RESTART/SHUTDN

1-5

HYD P LOW

HYD RSVR QTY LOW

BFS, SM SYS SUMM 2

1. (Aff) HYD MN PUMP PRESS – LO
2. At TAEM: (Good) APU SPEED SEL (two) – HI

If second sys failure:

3. (Good) APU AUTO SHUTDN (one) – INH
4. HYD MN PUMP PRESS (two) – LO

Immed prior to MM304 trans:

5. (Good) HYD MN PUMP PRESS – NORM
6. (30 sec after MM304) – LO

At $\bar{q} = 20$:

7. HYD MN PUMP PRESS – NORM

HYD RSVR T

BFS, SM SYS SUMM 2

1. (Aff) BLR CNTLR/HTR – A(B)

If HYD RSVR T rises to 250:

2. (Aff) HYD MN PUMP PRESS – LO

If system reqd:

3. (Aff) HYD MN PUMP PRESS – NORM

HYD ACCUM P (LOW)

BFS, SM SYS SUMM 2

If aff APU/HYD sys running:

1. HYD MN PUMP PRESS – NORM
CIRC PUMP – ON >>

If aff APU/HYD sys not running:

2. HYD CIRC PUMP – ON
Leave HYD CIRC PUMP ON for APU start and entry

W/B QTY (LOW)

BFS, SM SYS SUMM 2

1. If QTY = zero >>
2. BLR CNTLR/HTR – A(B)
3. Note QTY

Wait 2 min, then:

4. ✓QTY
5. If QTY change < 3 >>

If QTY change \geq 3:

6. Perform APU SHUTDN, then:

At M = 7:

7. Go to APU COOLDOWN (A/E SYS, PLT WND FB,
APU/HYD)

EPCL/ALL/GEN H

HYD RSVR QTY/T

1-7

HYD ACCUM P/W/B QTY

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COMM

COMMUNICATIONS

EPCL/ALL/GEN H,10

2-1

**COMM LOST
ICOM LOST**

COMM LOST (mult pnls)

SM 76 COMMUNICATIONS

COMM

- 1. AUD CTR – 2
- If all ICOM and A/G failed (✓3 ATUs):
 - 2. ✓cb AUD CTR (two) – cl (pnl R14:A,F)
 - 3. Go to step 11

- 4. S–BD PM CNTL – PNL,CMD (pnl C3)
- 5. **BFS, GNC 51 OVERRIDE**

Config for TDRS,STDN, or SGLS per Comm Coverage:

- TDRS – ITEM 46 EXEC (*)
- STDN–HI– ITEM 47 EXEC (*)
- SGLS – ITEM 49 EXEC (*)

If * not next to selected config:

- 6. Config pnl A1 for STDN,SGLS, or TDRS per site coverage:

	STDN/SGLS	TDRS
PM MODE	STDN LO/SGLS	TDRS DATA
DATA RATE (two)	HI	HI
CODING (two)	OFF	ON

- 7. S–BD PM CNTL – PNL,CMD to effect reconfig (pnl C3)
- 8. Sel best ant, F9 meter > 300 (If TDRS, reorient veh and try diff ant); if no joy, return to GPC

NOTE

When selecting between DC Amps and Signal Strength posns, expect fluctuations which will dampen out within 1 min

- 9. Attempt UHF PRI,ALT and G (say freq) per site coverage (30 sec reqd for site reconfig)
- 10. Bypass encryption (1 min reqd for MCC reconfig):
 - NSP ENCRYPTION MODE – SEL (pnl A1L)
 - SEL – BYP

Cont next page

If MCC GO for deorbit received:

11. Continue with deorbit >>

If MCC GO for deorbit not received:

12. Terminate deorbit procedure

13. Confirm U/L CMD capability:

Cue MCC with: ITEM 88 +8 8 8 8 8 8

✓Flashing U/L on PASS display

Ack with: ITEM 99 +9 9 9 9 9 9

✓Abort light cycling ON/OFF (MCC ack)

✓No flashing U/L

If U/L CMD confirmed:

14. Go to MAL, COMM, SSR-1, LOSS OF ALL VOICE
COMM >>

If no COMM and no U/L CMD:

15. Go to MAL, COMM, 2.3a, NO S-BD COMM: TDRS 1 |

ICOM LOST

1. (Aff) AUD CNTL sel – select alternate

If still no ICOM AUDIO:

2. AUD CTR – 2

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DPS

DATA PROCESSING SYSTEM

3-1

EPCL/ALL/GEN H

MULT DATA PATH LOSS (non-Recov)

NOTE

If LRU data path loss due to GPC problem and not MDM, BFS will pick up MDM(s)/LRU(s) when engaged

DPS

FAILURE	TYPE	ACTIONS
GPC/FF 1,2	I/O or B	Use R BODY FLAP and TRIM ENA SWs
GPC/FF 3,4	I/O or B	Use L BODY FLAP and TRIM ENA SWs
GPC/FA 1,2	I/O	Preburn (TVC): L OMS ENG – OFF RCS Deorbit: Translate +Z or –Z
GPC/FA 1,3 or 2,4	I/O	Preburn (IGN): R OMS ENG – OFF
GPC/FA 1,4 or 2,3	I/O	Preburn (IGN): L OMS ENG – OFF
GPC/FA 3,4	I/O	Preburn (TVC): R OMS ENG – OFF

FF(FA) MDM OUTPUT

FAULT

- ◇ (Take action only if annun by entire set)
 - If single 'MDM OUTPUT' msg:
 - If 'FF MDM OUTPUT' msg:
 1. **GNC 51 OVERRIDE**
(Aff) IMU(s) – desel
 2. Go to FF(FA) MDM I/O ERROR >>
 - If both MDM FF and MDM FA annun:
 3. **GNC 51 OVERRIDE**
(Aff) IMU(s) – desel
 4. I/O RESET; if reqd: BFS I/O RESET
 - If msgs repeat:
 5. Go to PASS GPC (1st FAIL) >>
 - 6. If reqd, (aff) FCS CH – ORIDE,AUTO
 - ◇
 7. **GNC 50 HORIZ SIT**
NAV DELTA zero update
 8. **GNC 51 OVERRIDE**
IMU – resel

GPC BITE (Pre-TIG)

- If BFS annun GPC BITE:
 1. Go to BFS GPC FAIL (Pre-TIG) >>
- If single PASS GPC annun single GPC BITE:
 2. Time permitting, ✓MCC for possible restrng >>
- If single PASS GPC annun cyclic GPC BITE:
 3. Go to PASS GPC (1st FAIL) (Pre-TIG) >>
- If multiple PASS GPCs annun single or cyclic GPC BITE:
 4. Delay deorbit, ✓MCC

GPC BITE (Post-TIG)

- If OPS 303 and cyclic GPC BITE on single PASS GPC:
 1. Go to PASS GPC (1st FAIL) (Post Burn)

EPCL/ALL/GEN H,13

MULT DATA PATH LOSS 3-3

FF(FA) MDM OUTPUT
GPC BITE

DUAL DPS DISPLAY COMMANDERS/DK XMTR 1(2,3)

1. BFC CRT SEL – (aff) IDP
If reqd to clean up display:
2. (Aff) IDP/CRT PWR – OFF, ON

I/O ERROR CRT/DPS DISPLAY ANOMALY

1. If IDP4(CRT4): IDP/CRT4 PWR – OFF >>
If NO big X/POLL FAIL:
 2. MDU PWR – OFF, ON; if recovered >>
If MCC GO for power cycle:
 3. IDP/CRT PWR – OFF, ON; if recovered >>
- If big X/POLL FAIL:
 4. IDP/CRT PWR – OFF, ON; if recovered >>
If PASS:
 5. GPC/CRT – same GPC/aff IDP; if recovered >>
 6. BFC CRT SEL – aff IDP: Go to step 10
 - If BFS:
 7. BFC CRT SEL – unaff IDP; if both IDPs OK >>
 8. – original position
 9. In PASS: GPC/CRT 5X EXEC for aff IDP
10. If reqd: In PASS, deassign/assign IDPs to maintain PASS interface with three IDPs

FLT INST DISPLAY ANOMALY

1. DATA BUS Select alternate FC BUS(s); if recovered >>
2. PORT SELECT aff MDU; if recovered >>
3. MDU PWR – OFF,ON

SUBSYS STATUS DISPLAY ANOMALY

1. PORT SELECT aff MDU; if recovered >>
2. MDU PWR – OFF,ON; if recovered >>

PL MDM I/O ERROR

1. BFS I/O RESET; if recovered >>
 2. GNC 1 DPS UTILITY
PL 1/2 – port mode
 3. BFS I/O RESET; if recovered >>
- If I/O Error PL for other MDM (GPC problem):
4. Repeat steps 2,3 if reqd to recover PL2, then:
Go to step 9
- If I/O Error PL repeats for same MDM:
- If before TIG-5 and MCC GO for power cycle:
5. (Aff) MDM PL – OFF,ON
 6. BFS I/O RESET; if recovered >>
 7. Orig ports resel
 8. BFS I/O RESET; if recovered >>
 9. FLASH EVAP CNTLR PRI B(A) – ON
- If PL2 and no COMM at AOS:
10. Sel best S-BD PM ANT
- If PL2 ↓ and AOA/TAL < 120K ft:
11. NH3 CNTLR B – SEC/ON

PCM I/O ERROR

BFS, SM SYS SUMM 1(2)

- ◇ 1. OI PCMMU PWR – 2(1)

G3 to G2/G8 TRANS

1. If MM302: GNC, OPS 301 PRO
If no SM GPC and SM GPC desired:
2. Perform G3 to S2(4) TRANS, then:
If SM GPC available:
3. ✓ SM GPC OUTPUT – TERM
4. UL CNTL AUTO – ITEM 35 EXEC
UPLK – ENA
5. Perform LOAD PCMMU FORMAT (ORB OPS
FS, COMM/INST), then:

Cont next page

EPCL/2,4/GEN H,13

**DUAL DPS DISPLAY
CMDRS/DK XMTR
DISPLAY ANOMALIES
BCE STRG X (3-8)**

3-5

**PL MDM/PCM I/O
MC TRANS**

If no G2FD and one desired:

6. **GNC 0 GPC MEMORY**
Deselect tgt FD GPC from MC 3
Assign all STRGs, CRTs, MMUs to remaining
GNC GPCs
✓ PL1/2 deassigned from tgt FD GPC
GNC, OPS 301 PRO
7. IDP/CRTX MAJ FUNC – PL
Assign FD GPC to IDP X
X: PL 0 GPC MEMORY
CONFIG – ITEM 45 +2 EXEC
GPC – ITEM 46 +(FD GPC) EXEC
STORE – ITEM 47 EXEC
Store complete when MC = 02 (~18 sec)
8. (FD) GPC MODE – STBY (tb–bp), HALT
– STBY (tb–RUN)
– HALT (tb–bp)

If (BFS) GPC PWR – ON:

9. (BFS) GNC, OPS 000 PRO
GPC OUTPUT – NORM
 10. BFC CRT DISP – OFF
 11. **GNC 0 GPC MEMORY**
✓ Desired MC 2
✓ STAR TRACKERS (two) – ON
GNC, OPS 201 PRO
 12. If reqd: GNC, OPS 801 PRO
- If remaining in orbit config:
13. RGA (four) – OFF
As reqd, RJD – OFF

SM to G3 TRANS (G3/BFS)

1. (BFS) GPC MODE – RUN
2. SM, OPS 000 PRO
3. SM GPC OUTPUT – NORM (tb–gray)
4. Assign current SM GPC to MC 3 with its STRG
5. Reassign PL1/2
6. GNC, OPS 301 PRO
7. (BFS) GNC, OPS 000 PRO, OPS 301 PRO
8. **GNC 50 HORIZ SIT**
✓ PASS R/W sel

G2/G8 to G3 TRANS

1. ✓RGA (four) – ON
✓Pri RJD LOGIC,DRIVER (sixteen) – ON
✓ADTA (four) – CL
✓MLS (three) – ON
✓ASA (four) – ON
✓FCS CH (four) – AUTO
2. Assign current GNC GPCs, STRGs, CRTs, and MMUs to MC 3
3. If SM GPC active: ✓PL1/2 deassigned
4. GNC, OPS 301 PRO
5. Perform LOAD PCMMU FORMAT (ORB OPS FS, COMM/INST), then:

If nominal Ent MC 3 desired:

6. Assign GPCs, STRGs, PL1/2, CRTs, and MMUs (deassign L1,2)
7. (FD) GPC PWR – ON
MODE – STBY,RUN (tb–RUN)

If SM GPC active:

8. (SM) GPC OUTPUT – NORM
9. SM 1 DPS UTILITY
UL CNTL ENA – ITEM 36 EXEC
10. SM, OPS 000 PRO
11. GNC, OPS 301 PRO
12. (BFS) GPC PWR – ON
MODE – STBY (tb–RUN),RUN
OUTPUT – B/U

If (BFS) GPC PWR – ON:

13. BFC CRT DISP – ON
SEL – 3+1
14. (BFS) GNC, OPS 301 PRO

G3 to S2(4) TRANS (G3/BFS)

1. If MM302: GNC, OPS 301 PRO
2. Desel tgt SM GPC from MC 3
Reassign tgt SM GPCs STRG
Deassign PL1/2
3. GNC, OPS 301 PRO
4. BFS I/O RESET
5. Assign tgt SM GPC, PL1/2, CRTs, L1, and MMUs to MC 4(5)
6. IDP/CRTX MAJ FUNC – SM
Assign tgt SM GPC to IDP X
SM, OPS 201(401) PRO
7. (BFS) GPC MODE – STBY

BCE STRG X (no 'MDM OUTPUT' msg)

If ADTA (MLS, GPS, TACAN, MTU):

1. I/O RESET; if recovered >>
2. GNC 1 DPS UTILITY
(Aff) STRING – port mode
3. Go to step 22

If NSP:

4. I/O RESET; if recovered >>
- If msg repeats and LOS/no COMM:
5. Go to COMM LOST (mult pnls), step 5 >>

If A(B,C,D):

6. I/O RESET; if recovered >>
7. GNC 1 DPS UTILITY
(Aff) STRING – port mode
8. If recovered: Go to step 22
9. (Aff) MDM FF A(B) or MDM FA C(D) – OFF,ON
10. I/O RESET
11. If MDM FA pwr cycled: (aff) FCS CH – ORIDE,
AUTO
12. If recovered: Go to step 22
13. GNC 1 DPS UTILITY
Orig ports – resel
14. Go to step 22

If IMU:

15. GNC 21 IMU ALIGN ✓IMU OPER (wait up to 90
sec); if STBY, go to step 17
16. I/O RESET; if recovered: Go to step 23
17. GNC 1 DPS UTILITY
(Aff) STRING – port mode
18. If recovered: Go to step 22
19. (Aff) MDM FF – OFF,ON
20. I/O RESET; if recovered: Go to step 22
21. GNC 1 DPS UTILITY
Orig ports – resel
22. BFS I/O RESET

If recovered and IMU:

23. GNC 21 IMU ALIGN ✓att ANG; if Delta > 1°,
✓MCC for IMU/IMU align >>
24. GNC 50 HORIZ SIT
NAV DELTA zero update
25. GNC 21 IMU ALIGN
(Aff) IMU – resel
26. If pre-TIG: Go to step 27

Cont next page

If recovered and other:

If pre-TIG and String 1(2,3) port moded or MDM

FF1(2,3) pwr cycled:

27. If MM302: BFS GNC, OPS 301 PRO
28. BFS GNC, OPS 000 PRO
OPS 301(302) PRO
29. Reload BFS Ent Mnvr tgts
30. BFS, GNC 50 HORIZ SIT
✓BFS R/W sel

If not recovered:

31. If IMU >>

If pre-TIG and not IMU and String 1(2,3) port moded or MDM FF1(2,3) pwr cycled:

32. Perform steps 27–30, then:

If msg 'BCE STRG X A(B,C,D)':

If < 3Y or 2P jets/pod/dir:

33. GNC 23 RCS
(Aff) jet DES INH (*) (Reprioritize)
(Aff) MANF VLVS STAT OP – OVRD

If BCE STRG 1D(4D) and pre-MM303:

34. L(R) OMS – sel SEC GMBL

If BCE STRG 1A(2A):

35. CDR(PLT) sws – green dot

If 'BCE STRG B':

36. BFS, GNC 51 OVERRIDE
(Aff) AA – desel

If 'BCE STRG D':

37. BFS, GNC 51 OVERRIDE
(Aff) SURF feedback, RGA – desel

38. ✓FWD(AFT) RCS RM LOSS

39. ✓MULT DATA PATH LOSS

PASS GPC (1st FAIL) (Pre-TIG)NOTE

If reqd to complete proc, delay 1 orbit.

As reqd, ✓MCC for reapplication of GMEMs

1. (Aff) GPC PWR – OFF
 2. MODE – STBY, HALT
 3. If MM302: GNC, OPS 301 PRO
 4. Restrng to highest # GPC
✓PL1/2 assigned
 5. (BFS) GNC, OPS 000 PRO
OPS 301 PRO
 6. BFS, GNC 50 HORIZ SIT ✓BFS R/W sel
 7. Reload BFS Ent Mnvr tgts
- If STRG 1(2,3) recovered:
8. GNC 50 HORIZ SIT NAV DELTA zero update
 9. GNC 21 IMU ALIGN (aff) IMU – resel
 10. On MCC GO, perform PASS/BFS HISAM AND SOFTWARE DUMP, then:
 11. Any PASS IDP, GNC 0 GPC MEMORY:
ERR LOG RESET – ITEM 48 EXEC
 12. BFC CRT DISP – OFF
 13. (Aff) GPC PWR – OFF,ON
 14. IPL SOURCE – MMU 1(2)
 15. (Aff) GPC IPL pb – push (tb-IPL, bp in 2 min)
- When tb – bp or 2 min:
16. (Aff) GPC MODE – STBY (tb-RUN in 2 min)
- When tb – RUN or 2 min:
17. (Aff) GPC MODE – RUN (tb remains RUN)
 18. Desired IDP/CRT, MAJ FUNC – PL
Assign IPL'd GPC to desired IDP
GNC 0 GPC MEMORY
- If GPC CANNOT drive an IDP:
- If first IPL attempt:
19. (Aff) GPC MODE – HALT
PWR – OFF,ON
 20. IPL SOURCE – MMU 2(1)
 21. Go to step 15
- If second IPL attempt:
22. Go to step 30
 23. IPL SOURCE – OFF
 24. Restrng STRG 4 to aff GPC (✓DAP)
 25. BFC CRT DISP – ON
 26. (BFS) GNC, OPS 000 PRO, OPS 301 PRO
 27. BFS, GNC 50 HORIZ SIT ✓BFS R/W sel
 28. Reload BFS Ent Mnvr tgts
 29. GNC 50 HORIZ SIT ✓PASS R/W sel >>

Cont next page

If GPC unrecoverable:

30. (Aff) GPC PWR – OFF
31. IPL SOURCE – OFF
32. BFC CRT DISP – ON

PASS GPC (2nd FAIL) (Pre-TIG)

NOTE

If reqd to complete proc, delay deorbit.
As reqd, ✓MCC for reapplication of GMEMs

1. (Aff) GPC PWR – OFF
2. MODE – STBY,HALT
3. If MM302: GNC, OPS 301 PRO
4. Restrिंग: 1,3 to one GPC, 2,4 to other; PL1/2 and MM(s) to nonfailed GPC(s)
5. BFS I/O RESET

If STRG 1(2,3) recovered:

- ◇
6. GNC 50 HORIZ SIT
NAV DELTA zero update
 7. GNC 21 IMU ALIGN
(Aff) IMU(s) – resel
 8. FCS CH (four) – ORID
 9. On MCC GO, perform PASS/BFS HISAM AND SOFTWARE DUMP, then:
 10. IPL each failed GPC, perform PASS GPC (1st FAIL) (pre-TIG), steps 11 thru 23, then:
- If both GPCs recovered (4 GPC set):
11. Restrिंग STRG 3 to one recovered GPC, STRG 4 to other
- If one GPC recovered (3 GPC set):
12. Restrिंग STRG 3 to recovered GPC
 13. (BFS) GNC, OPS 000 PRO, OPS 301 PRO
 14. BFS, GNC 50 HORIZ SIT
✓BFS R/W sel

Cont next page

EPCL/ALL/GEN H

PASS GPC (1st) (Pre) 3-11 **PASS GPC (2nd) (Pre)**

15. Reload BFS Ent Mnvr tgts

16. GNC 50 HORIZ SIT

✓PASS R/W sel

If four GPC set exists:

17. FCS CH (four) – AUTO

If three GPC set exists and any GPC commanding more than one FCS CH:

18. FCS CH (one) – OFF

BFS GPC FAIL (Pre-TIG)

NOTE

Delay deorbit if reqd to complete proc

1. (BFS) GPC PWR – OFF
2. MODE – STBY,HALT
OUTPUT – TERM
3. MDM PL (two) – OFF,ON
4. FLASH EVAP CNTLR PRI B(A) – ON
5. If no COMM: sel best S-BD PM ANT
6. On MCC GO, perform PASS/BFS HISAM AND SOFTWARE DUMP, BFS HISAM dump only, then:
7. Go to MAL, DPS, GPC FRP-3, BFS GPC FAIL RECOVERY (ENTRY)

PASS/BFS HISAM AND SOFTWARE DUMP

NOTE

✓MCC for TFL compatibility

HISAM dump:

1. ✓GPC MODE – HALT
 2. OUTPUT – TERM
 3. PWR – ON
 4. MEM DUMP sel – 1(2,3,4,5) (pnl MO42F)
- If PASS, select GPC to be dumped as downlister:
5. GNC 0 GPC MEMORY
ITEM 44 +X EXEC
 6. On MCC GO, GPC MODE – STBY (starts dump)

Cont next page

After 4 min for PASS dump; 8 min for BFS dump:

7. GPC MODE – HALT (stops dump)
- If PASS, select lowest ID GNC GPC as downlister:
 8. GNC 0 GPC MEMORY
ITEM 44 +X EXEC
 9. GPC OUTPUT – NORM
 10. MEM DUMP sel – OFF (pnl MO42F)

Software dump (PASS only):

Select GPC to be dumped as downlister:

11. GNC 0 GPC MEMORY
DOWNLIST GPC – ITEM 44 +X EXEC
12. START ID – ITEM 40 +0 0 0 0 EXEC
13. NO WORDS – ITEM 41 +2 6 2 1 4 4 EXEC
14. WDS/FRAME – ITEM 42 +1 2 8 EXEC
15. On MCC GO, DUMP – ITEM 43 EXEC

When dump complete (items 40,41 blank):

16. Select lowest ID GNC GPC as downlister:
DOWNLIST GPC – ITEM 44 +X EXEC

FA MDM I/O ERROR (Pre-TIG)

1. I/O RESET; if recovered: BFS I/O RESET >>
2. If MDM FA1: L OMS – sel SEC GMBL
FA4: R OMS – sel SEC GMBL

If BFS 'BCE STRG X PASS' (GPC problem):

If MDM FA1(2,3):

3. Restrung to swap aff string with string 4
- If GPC fails during restrung:
 4. (Aff) GPC PWR – OFF
 5. Restrung assigning failed GPCs string to highest # GPC
6. Go to step 24

If MDM FA4:

7. GNC 1 DPS UTILITY string 4 – port mode
8. BFS I/O RESET >>

Cont next page

EPCL/ALL/GEN H,3

BFS GPC (Pre)

3–13

FA MDM I/O ERROR

~
|
If no BFS 'BCE STRG X PASS' (MDM problem):

9. GNC 1 DPS UTILITY (aff) string – port mode

10. If recovered: Go to step 24

If MCC GO for power cycle:

11. (Aff) MDM FA – OFF,ON

12. I/O RESET; if recovered: Go to step 23

13. Orig ports – resel

14. If recovered: Go to step 23

15. BFS I/O RESET

16. (Aff) MDM FA – OFF

17. ✓GNC SYS SUMM 1

18. (Aff) FCS CH – OFF

If second FCS CH failure:

19. (Remaining) FCS CH (two) – ORIDE

20. BFS, GNC 51 OVERRIDE (aff) SURF feedback,
RGA – desel

21. ✓MULT DATA PATH LOSS

22. Go to step 25

If recovered:

23. (Aff) FCS CH – ORIDE,AUTO if reqd

24. BFS I/O RESET

25. If MDM FA4 >>

26. If MM302: BFS GNC, OPS 301 PRO

27. BFS GNC, OPS 000 PRO
OPS 301(302) PRO

28. BFS, GNC 50 HORIZ SIT ✓BFS R/W sel

29. Reload BFS Ent Mnvr tgts

FF MDM I/O ERROR (Pre-TIG)

1. I/O RESET; if recovered: Go to step 20
- If BFS 'BCE STRG X PASS' (GPC problem):
 2. If MDM FF4, ✓MULT DATA PATH LOSS >>
If MDM FF1(2,3):
 3. Restrting to swap aff strg with string 4
 - If GPC fails during restrg:
 4. (Aff) GPC PWR – OFF
 5. Restrting, assigning failed GPCs string to highest # GPC
 6. Go to step 20
- If no BFS 'BCE STRG X PASS' (MDM problem):
 - : 7. GNC 1 DPS UTILITY aff string – port mode
 - : 8. If recovered: Go to step 20
 - : If MCC GO for power cycle:
 - : 9. (Aff) MDM FF – OFF,ON (may cage IMU)
 - : 10. I/O RESET; if recovered: Go to step 20
 - : 11. Orig ports – resel
 - : 12. If recovered: Go to step 20
 - : 13. BFS I/O RESET
 - : 14. (Aff) MDM FF – OFF
 - : 15. If MDM FF1: L OMS – sel SEC GMBL
FF4: R OMS – sel SEC GMBL
 - : 16. ✓GNC SYS SUMM 1
 - : If FF1(2):
 - : 17. CDR(PLT) disp sws (eight) – green dot
 - : 18. BFS, GNC 51 OVERRIDE (aff) AA desel
 - : 19. ✓MULT DATA PATH LOSS >>
 - : If MDM FF1(2,3) recovered:
 - ◇: 20. GNC 50 HORIZ SIT
NAV DELTA zero update
 - : 21. GNC 21 IMU ALIGN (aff) IMU – resel
 - : 22. If MM302: BFS GNC, OPS 301 PRO
 - : 23. BFS GNC, OPS 000 PRO
OPS 301(302) PRO
 - : 24. BFS, GNC 50 HORIZ SIT ✓BFS R/W sel
 - : 25. Reload BFS Ent Mnvr tgts >>
 - : If MDM FF4 recovered:
 - L 26. BFS I/O RESET

POST
BURN

EPCL/ALL/GEN H,13

POST
BURN

PASS GPC (1st FAIL) (Post Burn)

1. (Aff) GPC PWR – OFF
2. On MCC call: Restricting to highest # GPC
3. ✓ PL1/2 assigned
4. BFS I/O RESET

If MDM FF1 Power Cycled:

5. GNC 21 IMU ALIGN
 - ✓ IMU 1 IN OPER – ITEM 4 (*)
 - I/O RESET
 - IMU/IMU ALIGN – ITEM 14 +2(3) EXEC
 - ITEM 10(11,12) EXEC (*)
 - ITEM 16 EXEC (*)

If STRG 1(2,3) recovered:

- ◇ 6. GNC 50 HORIZ SIT NAV DELTA zero update
7. GNC 21 IMU ALIGN (aff) IMU – resel

PASS GPC (2nd FAIL) (Post Burn)

If Hp > safe Hp:

1. Go to PASS GPC (2nd FAIL) (pre-TIG) >>
2. (Aff) GPC PWR – OFF
3. On MCC call: Restricting: 1,3 to one GPC; 2,4 to other; PL1/2 and MM(s) to nonfailed GPC(s)
4. BFS I/O RESET

If MDM FF1 Pwr Cycled:

5. GNC 21 IMU ALIGN
 - ✓IMU 1 IN OPER – ITEM 4 (*)
 - I/O RESET
 - IMU/IMU ALIGN – ITEM 14 +2(3) EXEC
 - ITEM 10(11,12) EXEC (*)
 - ITEM 16 EXEC (*)

If STRG 1(2,3) recovered:

- ◇ 6. GNC 50 HORIZ SIT NAV DELTA zero update
7. GNC 21 IMU ALIGN (aff) IMU(s) – resel
8. FCS CH (four) – ORIDE

EPCL/ALL/GEN H

PASS GPC (1st) (Post) 3–17 PASS GPC (2nd) (Post)

BFS GPC FAIL (Post Burn)

1. GPC MODE – STBY,HALT,pause,STBY,RUN

If recovered:

2. PRO to OPS 303

3. BFS: GNC 50 HORIZ SIT

√BFS R/W sel >>

If SM only:

4. GPC MODE – STBY

5. Go to step 7

6. GPC MODE – HALT

◇ 7. OUTPUT – TERM

8. If no COMM: sel best S–BD PM ANT

9. MPS He ISOL B (three) – CL

PNEU He ISOL – CL

If AOA/TAL < 120K:

10. NH3 CNTLR B – SEC/ON

FA MDM I/O ERROR (Post Burn)

1. I/O RESET; if recovered: BFS I/O RESET >>
If pre-MM303:
 2. If MDM FA1: L OMS – sel SEC GMBL
FA4: R OMS – sel SEC GMBL
- If BFS 'BCE STRG X PASS' (GPC problem):
 - If MDM FA4:
 3. GNC 1 DPS UTILITY STRING 4 – port mode
 4. BFS I/O RESET >>
 - If MDM FA1(2,3): Go to step 15
- If no BFS 'BCE STRG X PASS' (MDM problem):
 5. GNC 1 DPS UTILITY (aff) STRING – port mode
 6. If recovered: BFS I/O RESET >>
 - If MCC GO for power cycle:
 7. (Aff) MDM FA – OFF,ON
 8. I/O RESET; if recovered: Go to step 20
 9. Orig ports – resel
 10. If recovered: Go to step 20
 11. BFS I/O RESET
 12. (Aff) MDM FA – OFF
 13. GNC SYS SUMM 1
 14. BFS, GNC 51 OVERRIDE (aff) SURF feedback,
RGA – desel
 15. (Aff) FCS CH – OFF
 16. GNC 53 ENTRY CONTROLS (aff) SURF
feedback – desel
- If second FCS CH failure:
 17. (Remaining) FCS CH (two) – ORIDE
 18. (Aff) SURF feedback – desel
 19. MULT DATA PATH LOSS >>
- If recovered:
 20. (Aff) FCS CH – ORIDE,AUTO if reqd
 21. BFS I/O RESET

EPCL/ALL/GEN H,13

BFS GPC (Post) 3-19

FA MDM I/O ERROR (Post)
FF MDM I/O ERROR (Over)

FF MDM I/O ERROR (Post Burn)

1. I/O RESET; if recovered: Go to step 20
- If BFS 'BCE STRG X PASS' (GPC problem):
- If MDM FF1(2,3):
 2. GNC 1 DPS UTILITY (aff) STRING – port mode (MDM FA1(2,3) given up), then: Go to step 17
 3. If MDM FF4, ✓MULT DATA PATH LOSS >>
- If no BFS 'BCE STRG X PASS' (MDM problem):
4. GNC 1 DPS UTILITY (aff) STRING – port mode
 5. If recovered: Go to step 20
- If MCC GO for power cycle:
6. (Aff) MDM FF – OFF,ON (may cage IMU)
 7. I/O RESET; if recovered: Go to step 20
 8. Orig ports – resel
 9. If recovered: Go to step 20
 10. BFS I/O RESET
 11. (Aff) MDM FF – OFF
- If pre-MM303:
12. If MDM FF1: L OMS – sel SEC GMBL
FF4: R OMS – sel SEC GMBL
 13. BFS, GNC 51 OVERRIDE (aff) AA – desel
 14. ✓GNC SYS SUMM 1
- If MDM FF1(2):
15. CDR(PLT) disp sws (eight) – green dot
 16. ✓MULT DATA PATH LOSS >>
 17. (Aff) FCS CH – OFF
- If second FCS CH failure:
18. (Remaining) FCS CH (two) – ORIDE
 19. (Aff) SURF feedback – desel
- If MDM FF1(2,3) recovered:
20. GNC 50 HORIZ SIT NAV DELTA zero update
 21. GNC 21 IMU ALIGN (aff) IMU – resel
 22. BFS I/O RESET
- If MDM FA given up:
23. ✓MULT DATA PATH LOSS >>
- If MDM FF4 recovered:
24. BFS I/O RESET

EQUIPMENT COOLING MATRIX

AIR-COOLED		WATER-COOLED	
FORCED	FREE-FLOW		
AV BAY 1		AV BAY 1	
GPC 1,4 ① TACAN 1 ② MLS RF & DECODER 1 ADTA 3 AV BAY FAN A,B	BFC 1 (ENGAGE) CICU AA 1,4 PROXIMITY SW INVERTER DIST & CNTL BRK CNTL 1 SMOKE DET A,B CURRENT SNSR ADTA 1	AC INV 1A,1B,1C LCA(FWD) 1 PCA(FWD) 1 MCA(FWD) 1 MDM PL1,OF1, FF1,LF1 DSC OF1 ACCU 1,2 PWR SUPPLY/BATT CHARGER	MMU 1 RJDF 1A,1B P/L RECORDER PCMMU 1 PDI RADAR ALT 1
AV BAY 2		AV BAY 2	
GPC 2,5 ① TACAN 2 ② MLS RF & DECODER 2,3 ADTA 2,4 AV BAY FAN A,B	BFC 2,3 (ENGAGE) AA 2,3 PROXIMITY SW INVERTER DIST & CNTL BRK CNTL 2 SMOKE DET A,B CURRENT SNSRS	AC INV 2A,2B,2C LCA(FWD) 2 PCA(FWD) 2 MCA(FWD) 2 MDM PL2,OF2, FF2,FF4 DSC OF2 PL INTEROG 1,2	MMU 2 RJDF 2A,2B PCMMU 2 S-BD PI RF COAX SW OPS RECORDER 1,2 RADAR ALT 2 PSP 1,2
AV BAY 3A		AV BAY 3A	
GPC 3 ① TACAN 3 ② AV BAY FAN A,B C/W LIMIT MODULE SSOR ③	S-BAND EQUIP: FM MLTPLXR QUAD ANT SW ASSEMBLY FM SIG PRCSR SW BEAM ANT CNTL ASSY FM RF SWITCH CURRENT SNSR INVERTER DIST & CNTL SMOKE DET A,B	AC INV 3A,3B,3C LCA(FWD) 3 PCA(FWD) 3 MCA(FWD) 3 MDM FF3,OF3 DSC OF3 NSP 1,2 S-BAND PA 1,2; PRE-AMP 1,2; XPNDR 1,2; FM XMTR 1,2	EBIA (BYPASS SWITCH) COMSEC 1,2,3 UHF EVA XCVR KU-BND EA 1,2 GCIL
		AV BAY 3B	
		MTU KU-BAND SIGNAL PROCESSOR HUD ELECT 1,2 GPS 2	

09/17/99

- ① GPC INSTALLATION REFERS TO CPU/IOP/MEMORY UNIT.
- ② TACAN CONFIG IS ORBITER-UNIQUE.
GOULD (AC) TACANS ARE FORCED-AIR COOLED.
COLLINS (DC) TACANS ARE FREE-FLOW AIR COOLED.
- ③ IF FLOWN.

Cont next page

EQUIPMENT COOLING MATRIX (Continued)

AIR-COOLED		WATER-COOLED
FORCED	FREE-FLOW	
CABIN		ECLSS EQUIPMENT BAY
MDUs (eleven) DDU 1,2,3	MTRS/LTS/IND C/W ANNUN SPKR UNITS ATUs CAMCORDER COLOR PRINTER PGSC VTR CSA CAB TEMP CNTLR A,B WMS HUMIDITY SEP SMOKE DET: L,R FLT DECK CABIN	WATER PUMP 1A,1B SEC
		FLIGHT DECK
CAB FAN A,B IMU 1,2,3 IMU FANS ④ TV MONITORS RCU VSU MCIU IDP 1,2,3,4	ADC 1A,1B,2A,2B MCM HUD PDU L,R	MDM OF4
MADS RCDR ⑤ MS & PS STATION		

ECLS

FREON-COOLED			
AFT COLDPLATES			MIDBODY
BAY 4	BAY 5	BAY 6	
LCA-1 PCA-1,4 MCA-1 MDM FA1 OA1 APU CNTLR 1 ATVC ELECT 1 EIU 1 MPS ULL P SC1 ASA 1 RGA 1 RJDA 1 MEC 1 DSC OA1 DBIA 1	LCA-2 PCA-2,5 MCA-2 MDM FA2 OA2 APU CNTLR 2 ATVC ELECT 2 EIU 2 MPS ULL P SC2 ASA 2 RGA 2 MEC 2 DSC OA2 DBIA 2 PT SNSR	LCA-3 PCA-3,6 MCA-3 MDM FA3,4 OA3 APU CNTLR 3 ATVC ELECT 3,4 EIU 3 MPS ULL P SC3 ASA 3,4 RGA 3,4 RJDA 2 MPS DP SC DSC OA3	PCA(MID) 1,2,3 MCA(MID) 1,2,3,4 MDM PM1 RMA 1,2 FEA 1,2 SGSC H2/O2 CRYO HTR 1A,1B,2A,2B FCL 1 PMP A,B 2 PMP A,B FUEL CELLS 1,2,3 MN DA 1,2,3 MIDBODY PIC CNTLR DSC OM1,OM2,OM3

08/31/00

- ④ IMU FANS ARE LOCATED IN AVIONICS BAY 1 BUT CIRCULATE CABIN AIR RATHER THAN FLOW FROM AVIONICS BAY 1 THROUGH THE IMUs FOR COOLING.
- ⑤ MADS RECORDER DUCT COOLING.

O2(N2) FLOW HIGH/CAB P LOW/dP/dT BFS, SM SYS SUMM 1

WARNING
If, after alarm, O2(N2) flow > 1.0:
Assume flow rate exceeds 5.0 lb/hr (OSH)

- MO10W 1. 14.7 CAB REG INLET SYS 1,2 vlv (two) – CL
- LEAK ISOLATION
- L2 2. CAB RELIEF A – CL (tb-CL) (pause)
B – CL (tb-CL)
3. ✓ CAB VENT ISOL – ctr (tb-bp)
✓ VENT – ctr (tb-bp)
- ML31C 4. ✓ VAC VENT ISOL VLV BUS SEL – MNA
✓ CNTL – CL (tb-CL)
5. NEG PRES RLF vlv covers (two) – press firmly
6. Remove INNER A/L HATCH Equal vlv caps (two)
Equal vlv (two) – OFF
7. If dP/dT EQ zero >>
- UNISOLABLE LEAK: PREPARE FOR DEORBIT
8. INNER A/L HATCH Equal vlvs (two) – EMER
- If TIG not complete, quantify leak and determine Tmax:
9. Log dP/dT _____; CAB P _____; MET _____:____:____;
N2 QTY 1 _____; N2 QTY 2 _____
10. Determine latest possible TIG, Tmax, and avail
landing sites using PGSC
(preferred)/NOMOGRAPH
- If T max < planned TIG:
11. Select NEW TIG (PGSC or wx tpr msg) < T
max
- If T max > planned TIG:
12. Use planned TIG
- If -dP/dT EQ > 0.35:
- C5 : 13. DIRECT O2 vlv – OP
- C6, : 14. Don LES, open LEH O2 vlvs,
MO32M, : ✓ Tabs/visor – cl/LES O2 – ON
MO69M :
L2 : 15. O2/N2 CNTLR VLV SYS 1,2 (two) – OP (N2)
- MO10W L 16. O2 REG INLET SYS 1,2 vlv (two) – CL >>

Cont next page

Flow Max O2

- R1 17. O2 MANF VLV TK1,TK2 (two) – OP (tb–OP)
TK1,TK2,TK3 HTRS A (three) – AUTO
If any O2 PRESS ↓:
18. (Aff) O2 TK HTR B – AUTO
- C5 19. DIRECT O2 vlv – OP
- L2 20. O2/N2 CNTLR VLV SYS 1 – CL (O2)
2 – OP (N2)
O2 XOVR SYS 1 – CL
√2 – OP
- MO10W 21. 14.7 CAB REG INLET SYS 1 vlv – OP
2 vlv – CL
O2 REG INLET SYS 1 vlv – OP
2 vlv – CL
22. MS perform LOSS OF CAB PRESS (PWRDN)

WARNING

Maintain O2 concentration < 29% (CABIN PRESS > 10.3)
or PPO2 < 3.0 (CABIN PRESS ≤ 10.3); refer to O2 CON-
CENTRATION PLOT for O2 concentration determination

If –dP/dT EQ > 0.48 or PPO2 < 2.2, don LES (step 25)

Manage O2 Levels

- MO10W, Using O2 REG INLET SYS 1 vlv and
C5 DIRECT O2 vlv:
When CABIN PRESS > 10.3:
23. Maintain PPO2 > 2.2 and O2 conc < 29%
When CABIN PRESS ≤ 10.3:
24. Maintain PPO2 between 2.2 and 3.0
If –dP/dT EQ > 0.48 or when PPO2 < 2.2:
25. Don LES, open LEH O2 vlvs,
√Tabs/visor – cl/LES O2 – ON
- C6,
MO32M,
MO69M

8 PSI CABIN MAINTENANCE (Flow N2)

When CABIN PRESS reaches 8:

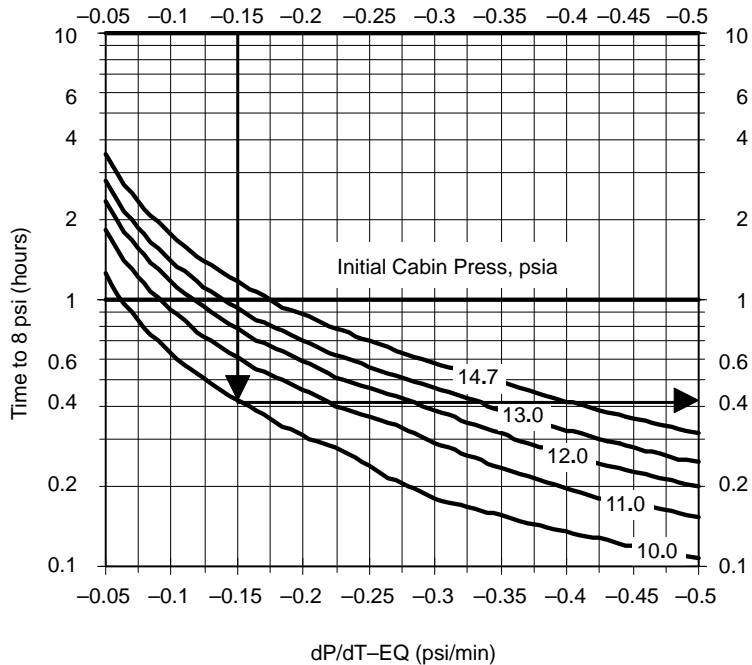
26. Maintain O2 mgmt per step 24

If CABIN PRESS does not remain ≥ 7.8 psi (max N2 flow
reqd):

- MO10W 27. 14.7 CAB REG INLET SYS 1 vlv – CL
- L2 28. O2/N2 CNTLR VLV SYS 1,2 (two) – OP (N2)
O2 XOVR SYS 1,2 (two) – OP
- MO10W 29. REG INLET SYS 1,2 vlv (two) – CL

CABIN PRESS LEAK NOMOGRAPH*

Orb + A/L



Procedure:

1. Fill in values to right, compute Usable N2
2. Determine Time to 8 psi from above graph, record
3. On opposite, determine Time to N2 Depletion on graph, record
4. Add results from steps 2, 3 to obtain Total Available Time
5. Add step 4 to Current MET to obtain Time to TD, MET
6. Subtract default 1 hr for time from TIG to TD to obtain Latest TIG, TMAX

dP/dT-EQ = _____ psi/min
 Cabin P = _____ psi
 N2 Qty 1 = _____ lbm
 + 2 = _____ lbm

_____ lbm

If 4(5,6) tank set, subtract:
 - 0(7.5, 14.8) lbm

Usable N2 = _____ lbm

Time to 8 psi, hr _____

Basis:

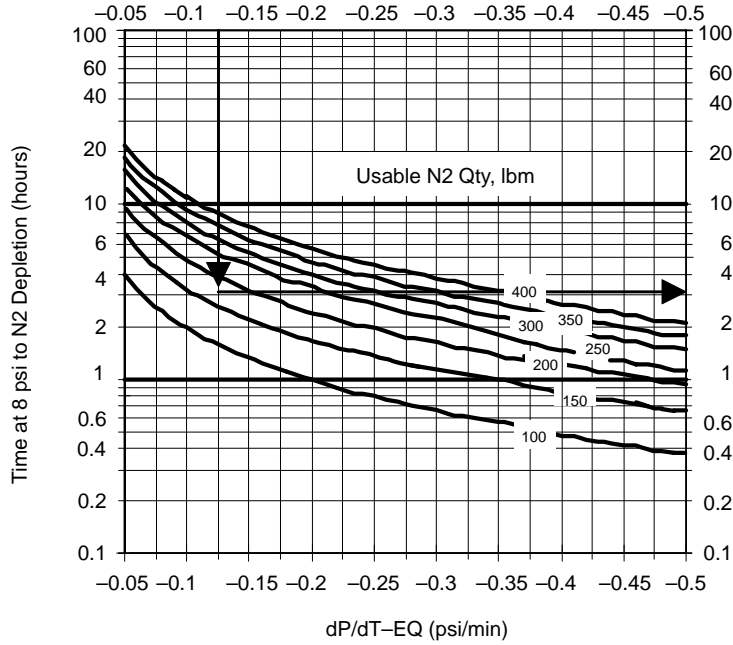
O2 Flow: on/off at 50 lb/hr after 10 min, with PPO2 > 2.2 psi, % O2 < 29
 Total Volume = 2703
 Volumes = Orb (2475 ft³) + Ext A/L (228 ft³)

01/17/97

*THESE NOMOGRAPHS ARE APPLICABLE FOR BOTH INT & EXT A/L CONFIGS. RESULTS ARE SLIGHTLY CONSERVATIVE FOR INT A/L CONFIG

CABIN PRESS LEAK NOMOGRAPH*

Orb + A/L



Time at 8 psi to
N2 Depletion, hr _____

= Total Avail Time, hr ____

+

Current MET ____/ ____ : ____

= Time to TD ____/ ____ : ____
(MET)

- Time, TIG to TD 01:00

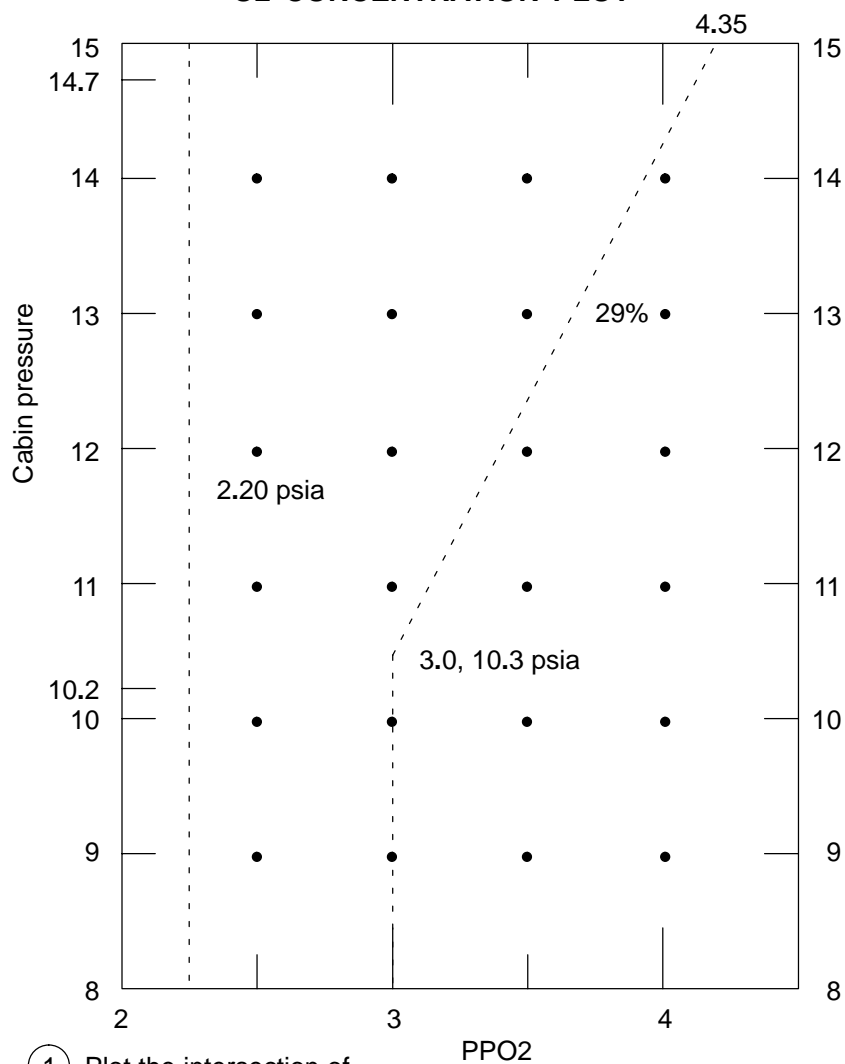
= Latest TIG,
TMAX, (MET) ____/ ____ : ____

01/17/97

Basis:
O2 Flow: on/off at 50 lb/hr after 10 min, with PPO2 > 2.2 psi, % O2 < 29
Total Volume = 2703
Volumes = Orb (2475 ft³) + Ext A/L (228 ft³)

*THESE NOMOGRAPHS ARE APPLICABLE FOR BOTH INT & EXT A/L
CONFIGS. RESULTS ARE SLIGHTLY CONSERVATIVE FOR INT A/L
CONFIG

O2 CONCENTRATION PLOT



- ① Plot the intersection of cabin pressure and PPO2
- ② 2.20 psia PPO2 protects minimum physiological PPO2 level at 8 psi; 29% protects 30% O2 concentration during depress
- ③ Plot used during cabin depress to 8 psia in OPS 3. Once at 10.3 psia, plot is no longer used and PPO2 is maintained between 2.20 and 2.90

12/30/93

j_48021_001

H2O LOOP PRESS LOW(HIGH)

BFS, SM SYS SUMM 1

1. Switch to Loop 1
- If press high in Loop 1:
2. Go to step 4
- If press < 45 psia in Loop 1:
3. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
Switch pumps
- If press still < 45 psia and CABIN HX OUT T rising:
4. H2O PUMP LOOP 1 – OFF
- If press was high in Loop 2:
5. Go to step 8
- If press was low in Loop 2:
6. ✓cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
H2O PUMP LOOP 2 – GPC
- If CABIN HX OUT T not decr:
7. H2O PUMP LOOP 2 – OFF
 8. MSTR MADS PWR – OFF
- If TIG > 45 min:
9. Go to LOSS OF 2 H2O LOOPS (ORB PKT, PWRDN) >>
- If TIG ≤ 45 min:
10. Go to LOSS OF 2 H2O LOOPS (ENTRY) (PWRDN)

AV BAY FAN ΔP

BFS, SM SYS SUMM 2

1. Switch fans
- If FAN ΔP still high(low) and AV BAY TEMP decr, airflow is lost:
2. Go to LOSS OF AV BAY COOLING (PWRDN)

AV BAY TEMP HIGH

BFS, SM SYS SUMM 2

1. (Aff) AV BAY FAN (two) – ON
- If temp not decr:
2. Switch H2O loops
- If temp not decr:
3. H2O LOOP 1(2) BYP MAN – DECR (hold 40 sec)
- If temp still rising:
4. Go to LOSS OF AV BAY COOLING (PWRDN)

FREON FLOW LOW

BFS, SM 0 THERMAL
BFS, SM SYS SUMM 2

1. Switch pumps in aff loop

If flow still low:

2. (Aff) RAD BYP VLV MODE – AUTO
CNTLR LOOP – AUTO A(B) (wait 90 sec)

If flow still low in both loops:

3. Go to LOSS OF 2 FREON LOOPS (ENTRY) (PWRDN) >>

If flow still low in one loop:

If RAD OUT T in good loop not incr in 3–5 min >>

If RAD OUT T in good loop incr in 3–5 min:

4. (Aff) FREON PUMP LOOP – OFF

If FREON LOOP 1(2) deactivated:

5. O2 SPLY VLV – CL

6. (In good loop) ✓FLOW PROP VLV LOOP – ICH

7. FLASH EVAP CNTLR PRI A(B) – OFF
SEC – ON (HI LOAD ENA)

If EVAP OUT T stable or decr:

8. FLASH EVAP CNTLR SEC – OFF
PRI A(B) – ON

9. Go to LOSS OF 1 FREON LOOP OR HI LOAD EVAP
(ENTRY) (PWRDN)

EPCL/ALL/GEN H,2

H2O LOOP P LOW(HIGH)

AV BAY FAN ΔP

AV BAY TEMP HIGH

4–9

FREON FLOW LOW

EVAP OUT T HIGH

BFS, SM SYS SUMM 2

If EVAP OUT T (two) > 65:

1. FLASH EVAP CNTLR PRI A(B) – OFF
B(A) – ON (wait 30 sec)

If EVAP OUT T decr (PRI A(B) CNTL lost) >>

If EVAP OUT T not decr (PRI A,B CNTL lost):

2. FLASH EVAP CNTLR PRI B(A) – OFF
SEC – ON (HI LOAD ENA)
3. Minimize ltg (wait 30 sec)

If EVAP OUT T decr:

4. TACAN MODE sel (three) – OFF
RADAR ALTM (two) – OFF
MLS (three) – OFF
TOP EVAP HTR NOZ (two) – OFF
DUCT sel – OFF >>

If EVAP OUT T not decr (SEC HI LOAD failed):

5. HI LOAD EVAP – OFF (TOPPING ENA)
6. MSTR MADS PWR – OFF (wait 30 sec)

If EVAP OUT T decr:

7. HI LOAD DUCT HTR sel – OFF
8. Go to LOSS OF 1 FREON LOOP OR HI LOAD EVAP
(ENTRY) (PWRDN) >>

If EVAP OUT T not decr (All FES lost):

If AOA:

9. RAD BYP VLV MODE 1,2 (two) – MAN
MAN SEL (two) – RAD FLOW, 3 sec
✓1,2 tb (two) – RAD
✓CNTLR OUT TEMP – NORM

~
Cont next page

- ~ If during or after TIG:
- 10. Go to LOSS OF FES/1 FC (ASC PKT, PWRDN) >>
- If prior to TIG:
- 11. Open doors ASAP (step 17), then
 - 12. Go to LOSS OF FES/1 FC (ASC PKT, PWRDN) >>
- If not AOA:
- 13. RAD BYP VLV MODE 1,2 (two) – AUTO
 - CNTRL LOOP 1,2 (two) – AUTO A(B) (wait 90 sec)
 - ✓BYP VLV 1,2 tb (two) – RAD
 - ✓CNTRL OUT TEMP – NORM
- If TIG ≤ 15 min or Post TIG:
- 14. Go to LOSS OF FES (PWRDN) >>
- If TIG between 15 and 45 min:
- If one rev late deorbit not available, or doors cannot be opened:
 - 15. Go to LOSS OF FES (PWRDN) >>
 - If one rev late deorbit available:
 - 16. Select new TIG, then go to step 17
- If TIG ≥ 45 min:
- 17. Open doors ASAP:

MS/R13L PL BAY DR SYS 1,2 (two) – ENA
BFS, SM 63 PL BAY DOORS
 AC POWER ON – ITEM 1 EXEC
 AUTO MODE SEL – ITEM 3 EXEC
 PBD SW BYPASS – ITEM 14 EXEC
 OPEN – ITEM 15 EXEC
 Monitor CRT for proper seq
 After doors open:
 PBD STOP – ITEM 16 EXEC
 AC POWER OFF – ITEM 2 EXEC
 PL BAY DR SYS 1,2 (two) – DSBL

Cont next page

EPCL/ALL/GEN H,2

EVAP OUT T HIGH

4-11

- 18. Mnv r to tail sun att (data from MCC or FLIGHT PLAN)
- 19. Go to LOSS OF FES (PWRDN) or

If in one rev late deorbit:

- 20. Perform only steps 1 thru 18 plus MS powerdown, then:
 - 21. Go to CONT DEORBIT PREP, LOSS OF FES and remove LOSS OF FES DEORBIT PREP ENTRY DELTAS PULLOUT PAGE (7-25), and
- MS Perform payload bay door activities per timeline, CONT DEORBIT PREP, LOSS OF FES

EVAP OUT T LOW

- 1. If low in only one loop (snsr failed) >>
- 2. FREON PUMP LOOP 1,2 (two) – OFF
- 3. H2O PUMP LOOP 1 (two) – ON,B

If no PL H2O Loop present:

- 4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)

If PL H2O Loop present:

- 5. Activate PL H2O Loop
- 6. O2 SYS 1,2 SPLY (two) – CL
- 7. ✓RAD BYP VLV MODE (two) – MAN
- 8. ✓MAN SEL (two) – BYP (tb-BYP ~3 sec)
- 9. FLASH EVAP CNTLR PRI A,B,SEC (three) – OFF
- ◇ 10. FREON PUMP LOOP 1,2 (two) – B
NH3 CNTLR A,B (two) – SEC/ON

If FREON LOOP 1(2) running:

- 11. O2 SYS 1(2) SPLY – OP

When EVAP OUT T > 55 for at least 2 min (NH3 depleted):

If any Freon Loop off:

- 12. FREON PUMP LOOP 1(2) – B
- 13. O2 SYS 1(2) SPLY – OP
- 14. Wait 3 min, then:

If FLASH EVAP CNTLR PRI B(A) previously selected:

- 15. FLASH EVAP CNTLR PRI A(B) – GPC

FREON QTY LOW**BFS, SM 0 THERMAL**

If accum qty < 12% and decr:

1. FREON ISOL MODE – MAN
2. (Aff) FREON ISOL LOOP 1(2) – ISOL (hold for 5 sec)

EMER PLBD OPENING**BFS, SM 63 PL BAY DOORS**

1. RAD BYP VLV MODE 1,2 (two) – AUTO
CNTLR LOOP 1,2 (two) – AUTO A(AUTO B) (wait 90 sec)
✓BYP VLV 1,2 tb (two) – RAD

Open PLBD ASAP:

2. PL BAY DR SYS 1,2 (two) – ENA
3. AC POWER ON – ITEM 1 EXEC
AUTO MODE SEL – ITEM 3 EXEC
PBD SW BYPASS – ITEM 14 EXEC
OPEN – ITEM 15 EXEC
4. Monitor CRT for proper seq

After PLBD open:

5. PBD STOP – ITEM 16 EXEC
AC POWER OFF – ITEM 2 EXEC
6. PL BAY DR SYS 1,2 (two) – DSBL

EMER PLBD CLOSING**BFS, SM 63 PL BAY DOORS**

1. ✓No obstructions (Ku ANT, RMS, RAD, etc)

Close PLBD ASAP:

2. PL BAY DR SYS 1,2 (two) – ENA
3. AC POWER ON – ITEM 1 EXEC
AUTO MAN SEL – ITEM 3 EXEC
PBD SW BYPASS – ITEM 14 EXEC
CLOSE – ITEM 17 EXEC

If 'S63 PBD SEQ FAIL' msg during door closure and AFT LATCHES for that DOOR are not 'CL':

4. ✓DOOR SCALLOP on or below target line before continuing in MANUAL mode, otherwise:
5. Perform MAL, MECH SSR–2, CONTINGENCY PLBD CLOSURE, then:

After PLBD closed:

6. PBD STOP – ITEM 16 EXEC
AC POWER OFF – ITEM 2 EXEC
7. PL BAY DR SYS 1,2 (two) – DSBL
8. ✓PL BAY FLOOD DOCKING – OFF (pnl A7U)

EPCL/ALL/GEN H,13

EVAP OUT T LOW

4–13

**FREON QTY LOW
EMER PLBD OP/CL**

CAB FAN FAIL

BFS, SM SYS SUMM 1

1. Switch fans

If no flow:

2. Go to LOSS OF 2 CAB FANS (PWRDN)

IMU FAN FAIL

BFS, SM SYS SUMM 1

1. Switch fans

CAB PRESS HIGH

BFS, SM SYS SUMM 1

If increasing:

1. LES O2 – OFF, open visor

If still increasing:

2. N2 SYS 1,2 REG INLET (two) – CL (tb-CL)
3. O2 SYS 1,2 SPLY (two) – CL (tb-CL)

CAB PPO2 ABNORMAL

BFS, SM SYS SUMM 1

If $PPO2 \leq 2.7$:

1. DIRECT O2 vlv – OP until $PPO2 \geq 2.90$

If $PPO2$ still decr:

2. ✓ O2 REG INLET SYS 1,2 vlv (two) – CL
3. ✓ LEH O2 SPLY 1,2 vlv (two) – OP
4. Don LES suit and helmet
✓ Tabs/close visor/LES O2 – ON >>

If $PPO2 \geq 3.6$:

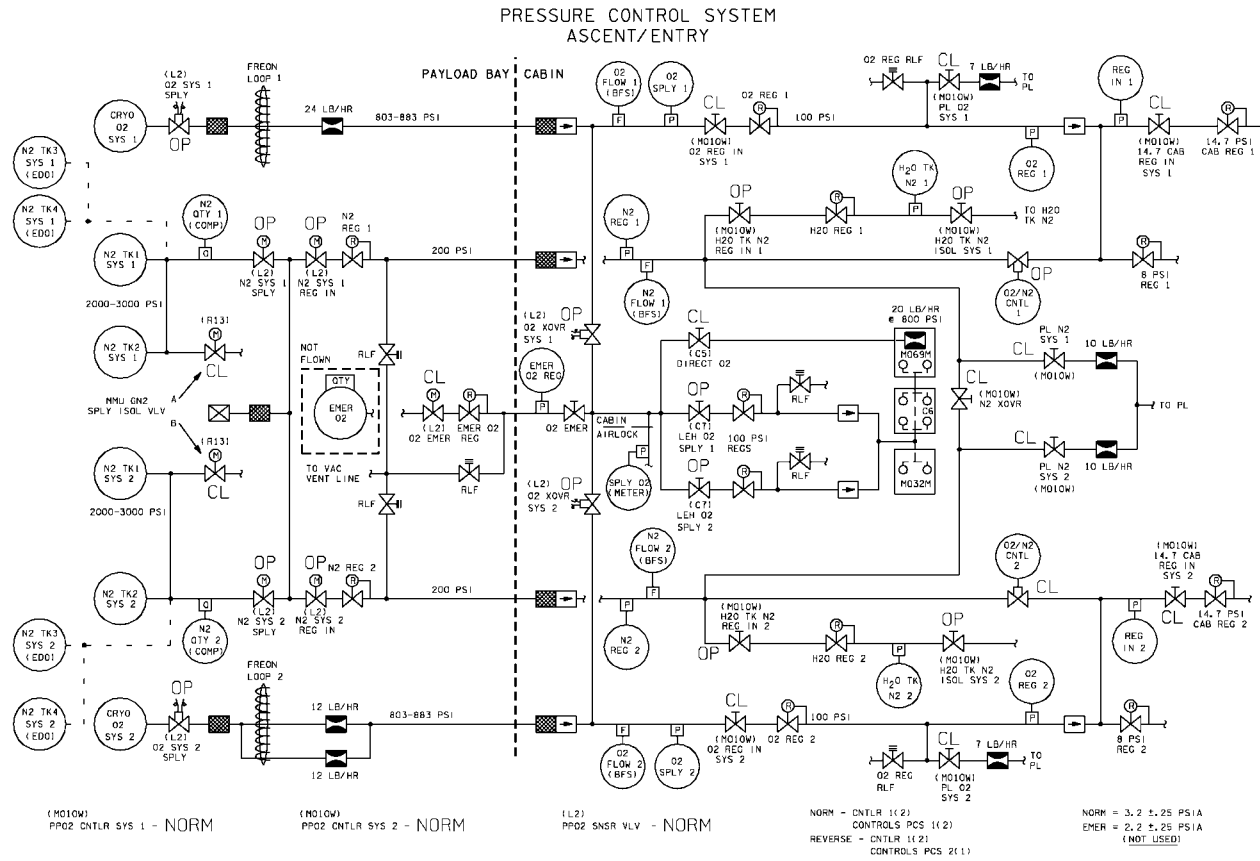
5. LES O2 – OFF, open visor
6. O2 SYS 1,2 SPLY (two) – CL

**CAB/IMU FAN
CAB PRESS HIGH
CAB PPO2 ABNORMAL**

4-15

PCS SCHEMATIC

EPCL/ALL/GEN H,2



THERMAL HTR

BFS, SM 0 THERMAL

If disp param '↑' or '↓' (only), take action as indicated:
 No action reqd for 'M', 'L', or 'H'

PARAM #	PNL #	CRT DISPLAY	ACTION
		H T R T E M P	X / X
		P R P L T	
1-7	A14	P O D	SSSSSSSS → None
8-13	A14	O M S C R S F D	SSSSSSSS
		E V A P	
14-16	L1	H I L O A D	SSS → If '↓' only, Switch to dual htr A/B pos
17-18	L1	T O P D U C T	SS
19	L1	N O Z	S
20-23	L2	F D L N	SSSSS → Switch to alt htr when possible
24	R2	H Y D B L R / H T R	S
		A P U	
25-29	A12	G G / F U P M P H T R	SSSSSS
30-36	A12	T K / F U L N H T R	SSSSSSSS
37-38		P U M P / V L V	SS

If APU was ON (now OFF), do not attempt restart until cool

If '↑', turn htr OFF Switch to alt htr if accessible

PARAMETER (PARAM)

1. POD DRN PNL 1 L(R)
2. VERN PNL 1 L(R)
3. OX DRN PNL 2 L(R)
4. 1 L(R)
5. ENG SERV PNL L(R)
6. FDLN OX AFT L(R)
7. FU L(R)
8. OMS CRSFD BLD MID FU*
9. OX*
10. DRN OX L
11. R
12. BLD AFT FU*
13. OX*
14. EVAP HI LOAD INBD DUCT
15. OUTBD DUCT
16. NOZ
17. TOPPING FWD
18. AFT
19. NOZ L(R)
20. FDLN T FWD A(B)

PARAMETER (PARAM)

21. EVAP FDLN T MID 1 A(B)
22. MID 2 A(B)
23. AFT A(B)
24. W/B X BLR
25. APU X GG BED
26. INJ
27. PUMP OUT
28. GGVM SPLY LN
29. PUMP BYP LN
30. FEED LN
31. PUMP IN
32. TEST LN
33. SERVICE LN
34. PUMP DRN LN 1
35. 2
36. H2O LN INJ
37. FU PUMP BDY
38. GGVM HTSK

*OMS CRSFD High Point Bleedlines removed from all vehicles

POST-FLUSH FES CNTLR SELECTION

If both Topper and HI LOAD core flushes successful:

10. FLASH EVAP CNTLR SEC – OFF
HI LOAD EVAP – ENA
FLASH EVAP CNTLR PRI A – ON (GPC)
After 2.5 min, ✓EVAP OUT temps ~-39

If Topper flush not successful:

11. FLASH EVAP CNTLR SEC – OFF
HI LOAD EVAP – ENA
FLASH EVAP CNTLR SEC – ON
Perform EVAP OUT T HI (step 4 only)

If HI LOAD flush not successful:

12. ✓FLASH EVAP CNTLR SEC – ON
HI LOAD EVAP – OFF
Perform LOSS OF 1 FREON LOOP OR HI LOAD
EVAP (ENTRY) (PWRDN)

ELECTRICAL POWER SYSTEM

EPS

5-1

EPCL/ALL/GEN H

MN BUS UNDERVOLTS/FC VOLTS

BFS, SM SYS SUMM 1

If MN VOLTS < 26.4, FC VOLTS < 26.6, FC AMPS > 480 (2 of 3)

(Short or Degraded FC):

1. MSTR MADS PWR – OFF

If (aff) FC/MN BUS tied:

2. Untie buses

If short eliminated and MN Bus not pwr'd after untie:

3. Go to (aff) MN BUS LOSS ACTION (MN Bus or Tie Bus Short) >>

If short eliminated and all MN Buses pwr'd after untie (Tie Bus Short) >>

If short not eliminated, then:

If (aff) FC/MN BUS connected to PL PRI BUS:

4. PL PRI (three) – OFF (tb-OFF)

If short eliminated (Pri PL Short):

If a MN BUS not powered:

5. Perform BUS TIE (Cue Card), then:

6. Go to PL PWRDN >>

7. (Aff) ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF (tb-OFF)

If aff FC VOLTS < 32 (FC Short):

8. (Aff) FC REAC VLV – CL (tb-CL)

9. Go to FC SHUTDN (Cue Card); (do not stop FC until COOL P < 15 and STACK T < 243) >>

If FC VOLTS ≥ 32 (Bus Short):

CAUTION

Do not Bus Tie to Shorted Bus

10. Go to (aff) MN BUS LOSS ACTIONS >>

If MN VOLTS < 26.4 and FC VOLTS > 32 and FC AMPS < 20

(FC Disconnect):

11. MSTR MADS PWR – OFF

If PL PRI BUS pwr lost due to FC disconnect:

12. PL PRI (three) – OFF (tb-OFF)

13. (Aff) FC/MN BUS – ON (tb-ON)

If PL PRI disconnected in step 12:

14. Perform PL PWRDN, then:

If FC3 aff:

15. PL PRI FC3 – ON (tb-ON)
MNC – ON (tb-ON)

Cont next page

EPS

If first FC problem:

16. Perform BUS TIE (Cue Card), then:

If (aff) FC VOLTS still > 32:

17. Go to FC SHUTDN (Cue Card) >>

18. (Aff) AC BUS SNSR – OFF,AUTO TRIP

19. GNC I/O RESET

If second FC failure and aff MN BUS not recovered:

20. PL PRI (three) – OFF (tb-OFF)

21. Go to 2nd FC SHUTDN

EPCL/ALL/GEN H

**MN BUS UVOLTS/
FC VOLTS**

5-3

AC VOLTS (LOW or HIGH)

BFS, SM SYS SUMM 1

1. If AC OVERLOAD alarm: Go to AC OVERLOAD >>
If single Φ AC VOLTS > 123 or between 10 and 110 (confirm with F9 meter):

If (aff) INV/AC BUS tb – ON (inverter lost):

- 2. (Aff) cb AC CONTR – cl
 INV/AC BUS – OFF (tb–OFF)
 INV PWR – OFF (tb–OFF)
 cb AC CONTR – op

If other Φ AC VOLTS < 110 or AC AMPS >14:

- 3. Go to step 12
- 4. Go to aff BUS LOSS ACTIONS

If (aff) INV/AC BUS tb – OFF (O/V, unannun OVLD, or snsr prob):

If other Φ AMPS > 10:

- : 5. Isolate shorted Φ : Open all (aff) AC1(2,3) three- Φ
- : ganged cbs and all (aff) AC1(2,3) Φ A(B,C) single- Φ
- : cbs as follows:

Number of cbs to open

BUS	L4	MA73C
AC1 3 Φ	1	5
Φ A	15	5
Φ B	15	4
Φ C	12	5

Cont next page

Number of cbs to open (cont)

BUS	L4	MA73C
AC2 3Φ	0	9
ΦA	15	5
ΦB	16	4
ΦC	13	5
AC3 3Φ	1	7
ΦA	15	3
ΦB	16	3
ΦC	12	3

6. Go to aff BUS LOSS ACTIONS >>
 ◇ If recovery critical and MCC GO:
 7. (Aff) AC BUS SNSR – OFF, wait 1 sec, MON
 8. cb AC CONTR – cl
 INV PWR – ON (tb-ON)
 INV/AC BUS – ON (tb-ON)
 If any AC AMPS > 14:
 9. (Aff) INV/AC BUS – OFF (tb-OFF)
 INV PWR – OFF (tb-OFF)
 10. cb AC CONTR – op
- If multi Φ AC VOLTS < 110:
 If (aff) INV/AC BUS tb – ON (FPC Bus loss):
 11. Go to aff BUS LOSS ACTIONS >>
 If any AC AMPS > 14 (unannun OVLD):
 12. (Aff) cb AC CONTR (three) – cl
 INV/AC BUS – OFF (tb-OFF)
 INV PWR – OFF (tb-OFF)
 cb AC CONTR (three) – op
 13. Go to aff BUS LOSS ACTIONS

EPCL/ALL/GEN H,11

AC VOLTS (LOW or HIGH) 5-5

AC OVERLOAD

BFS, SM SYS SUMM 1

If single Φ :

If AC VOLTS < 110 or AC AMPS > 14 (OVLD):

1. (Aff) cb AC CONTR – cl
INV/AC BUS – OFF (tb-OFF)
INV PWR – OFF (tb-OFF)
cb AC CONTR – op

If other Φ VOLTS < 110 or AMPS > 14:

2. Go to step 6
3. Isolate shorted Φ : Open all (aff) AC1(2,3) three- Φ ganged cbs and all (aff) AC1(2,3) Φ A(B,C) single- Φ cbs as noted below:

Number of cbs to open

BUS	L4	MA73C
AC1 3 Φ	1	5
Φ A	15	5
Φ B	15	4
Φ C	12	5
AC2 3 Φ	0	9
Φ A	15	5
Φ B	16	4
Φ C	13	5
AC3 3 Φ	1	7
Φ A	15	3
Φ B	16	3
Φ C	12	3

Cont next page

4. Go to aff BUS LOSS ACTION >>
If AC VOLTS, AMPS normal (snsr prob):
5. (Aff) AC BUS SNSR – OFF >>
If multi Φ (Bus short):
6. (Aff) cb AC CONTR (three) – cl
INV/AC BUS – OFF (tb-OFF)
INV PWR – OFF (tb-OFF)
cb AC CONTR (three) – op
7. Go to aff BUS LOSS ACTION

— | |

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— 5–6b

EPCL/ALL/GEN H,5 —

— | |

| | —

3Φ AC MOTORS STOPPED

(No AC VOLTS Alarm: Φ Shift)

WARNING

If no FC Coolant Pump within 9 min, go to aff AC BUS (2 or 3 Φs) BUS LOSS ACTION

1. Determine (aff) AC BUS:
FC1 and FREON PUMP 2B: AC1
FC2 and FREON PUMP 1B: AC2
FC3 and CAB FAN A: AC3
2. (Aff) FC – STOP
If AC3 aff:
 3. AV BAY 3 FAN B – OFF
A – ON
CAB FAN A – OFFIsolate aff ΦB:
 4. (Aff) cb AC CONTR – cl
INV/AC BUS – OFF (tb–OFF)If AC1(2,3) aff and AV BAY FAN 3(2,3) ΔP < 0.5:
 5. (Aff) INV/AC BUS – ON
cb AC CONTR – op
 6. Repeat from step 4 to isolate aff ΦC,ΦA, then:
 7. (Aff) cb AC CONTR (three) – cl
 8. INV/AC BUS – OFF
 9. Go to aff AC BUS (2 or 3 Φs) BUS LOSS ACTION >>If AC1(2,3) aff and AV BAY FAN 3(2,3) ΔP ≥ 0.5:
 10. (Aff) INV PWR – OFF (mtrs restarted)
cb AC CONTR – op
FC – START (10 sec or ΔP tb–gray)
 11. If AC3 aff: CAB FAN B – ON
 12. Go to aff Φ BUS LOSS ACTION

EPCL/ALL/GEN H

AC OVERLOAD

5–7

3Φ AC MTRS STOPPED

ESS BUS VOLTS LOW

If verified by F9 voltmeter:

	1BC	2CA	3AB
If (aff) cb op	MNA CONTR (pnl O15:B)	MNB CONTR (pnl O16:B)	MNC CONTR (pnl O14:B)
1. (Aff) cb op	MNA CONTR (pnl O13:A)	MNB CONTR (pnl O13:C)	MNC CONTR (pnl O13:E)
2. (Aff) cb cl	MNA CONTR (pnl O15:B)	MNB CONTR (pnl O16:B)	MNC CONTR (pnl O14:B)

3. Perform FC SHUTDN (Cue Card)
[FC/MN BUS A(B,C) and MN BUS TIE A(B,C) tbs lost]
4. Go to aff BUS LOSS ACTION (ESS)

CNTL BUS VOLTS LOW

BFS, SM SYS SUMM 1

1. ✓BUS LOSS ID
- If pwr reqd (<3 sec) for crit function:
2. Hold crit function sw
 3. For CNTL BUS AB(BC,CA) VOLTS LOW,
CNTL BUS PWR MNA(MNB,MNC) – RESET
 4. Go to CNTL BUS SHORT (TIME CRITICAL)

EPCL/ALL/GEN H,2

CNTL BUS SHORT (TIME CRITICAL)

BFS, SM SYS SUMM 1

WARNING

If VISIBLE FIRE/SMOKE AT ANY TIME,
cb CNTL BUS AB1/2/3(BC1/2/3,
CA1/2/3) – op (pnl R14:B)

NOTE

CNTL BUS PWR switches must be held continuously in the RESET position to unpower bus(es)

1. ✓ MCC for any tripped RPCs
If CNTL AB1(AB2,AB3):
If AB3:
 2. NSP ENCRYPTION SEL – BYP (pnl A1L)
 3. CNTL BUS PWR MNA,MNB (two) – RESET (hold) (pnl R1)If CNTL BC1(BC2,BC3):
If BC2:
 4. Perform COMM LOST (mult pnls), steps 5 and 4 (COMM)
 5. CNTL BUS PWR MNB,MNC (two) – RESET (hold) (pnl R1)If CNTL CA1(CA2,CA3):
 6. CNTL BUS PWR MNC,MNA (two) – RESET (hold) (pnl R1)For all CNTL V < 25.0:
 7. Perform BUS LOSS ACTIONS (CNTL), then:
If Pre-TIG and time permits:
 8. Perform CONTROL BUS POWERDOWN (IFM, PROCEDURES A THRU F) for shorted bus, then:
 9. If reqd, back out of BUS LOSS ACTIONS for regained buses

EPCL/ALL/GEN H,2

ESS/CNTL V LOW 5-9
FC COOL PUMP/REAC (5-10)

CNTL BUS SHORT
FC COOL P (5-11)

FC COOLANT PUMP Δ P LOW

BFS, SM SYS SUMM 1

If other 3 Φ AC motors affected, and AC VOLTS OK:

1. Go to 3 Φ AC MOTORS STOPPED >>
2. (Aff) cb FC PUMPS (three) – cl (pnl L4:C)
 \checkmark FC CNTLR – ON [pnl O14(15,16)]
 FC – START (10 sec or Δ P tb–gray)

If FC EXIT T > 164 and not decr or RDY tb – bp (30 sec after START):

3. Go to FC SHUTDN (Cue Card) >>
- If FC EXIT T norm, RDY tb – gray, no MCC in 5 min:
4. Note AC1(2,3) AMPS, then FC – STOP

If AMPS decr:

If decr 0.7–0.9 amp/ Φ :

5. FC – START (hold 30 sec if Δ P tb–bp)
6. If AMPS incr 0.7–0.9 amp/ Φ >>

If Δ not 0.7–0.9 amp/ Φ :

7. Go to FC SHUTDN (Cue Card) >>

If AMPS not decr:

8. Go to FC SHUTDN (Cue Card)

FC REACTANT VLV CLOSED

BFS, SM SYS SUMM 1

1. FC REAC (three) – OP (tb–OP or hold 1 sec max) (pnl R1)
2. Perform BUS TIE (Cue Card), then:

If no joy on REAC open:

3. \checkmark cb FC REAC VLV CL ENA (three) – op (pnl C3)
4. FC REAC (three) – OP (tb–OP or hold 10 sec) (pnl R1)

If aff FC COOL P < 50 (ALERT):

5. Go to FC SHUTDN (Cue Card)

FC COOL P

BFS, SM SYS SUMM 1

1. Perform BUS TIE (Cue Card), then:
If COOL P > 75, incr, and not 100 (H), or
FC COOL PUMP ΔP tb – bp (intermittent), or
STACK/EXIT T unstable, or
FC SS 1(2,3) $\Delta V \geq 150$:
 2. Go to FC SAFING >>
- If aff FC COOL P between 25 and 50, pre TIG–1 hr, and no COMM:
 3. Perform step 3 of FC SHUTDN (Cue Card), then:
 4. RAD BYP FES C/O complete
 5. SPLY H2O TKA OUTLET – OP (tb–OP)
TKB,C,D OUTLET (three) – CL (tb–CL)
 6. Wait 45 min (to FES H2O out of TKA), then:
 7. SPLY H2O TKB,C,D OUTLET (three) – OP (tb–OP)
TKA OUTLET – CL (tb–CL)
 8. GN2 TKA SPLY vlv – CL (pnl ML26C)
TK VENT vlv – VENT (pnl ML26C)
 9. Wait 5 min, then:
 10. (Aff) FC – START (ΔP tb–gray)
- When aff FC RDY tb – gray:
 11. (Aff) FC/MN BUS – ON (tb–ON)
ESS BUS SOURCE FC – ON >>
12. Two min after bus tie, record $\Delta AMPS$ between aff and tied FC
and monitor for 20 min
- If change in $\Delta AMPS > 12$:
 13. Go to FC SHUTDN (Cue Card)

FC STACK T

BFS, SM SYS SUMM 1

1. MSTR MADS PWR – OFF
- If STACK T > 243 and incr:
2. If 2nd FC: Go to 2nd FC SHUTDN >>
 3. PL PRI (three) – OFF
- If aff FC amps < 170 or > 360:
4. Go to MN BUS U/V, step 7 >>
- ◇ 5. Perform BUS TIE (Cue Card), then:
6. (Aff) ESS BUS SOURCE FC – OFF
 7. (Aff) FC/MN BUS – OFF
- If aff FC VOLTS < 32 or STACK T not decr:
8. (Aff) FC REAC – CL
 9. After COOL P < 15 and STACK T < 243:
FC – STOP
10. ✓PWRDN

FC EXIT T

BFS, SM SYS SUMM 1

1. MSTR MADS PWR – OFF
2. Perform BUS TIE (Cue Card), then:
If EXIT T > 164 and incr:
 3. Go to FC SHUTDN (Cue Card) >>
If EXIT T < 131 and decr, and no COMM:
 4. Go to FC SHUTDN (Cue Card)

FC pH 1(2,3)

BFS, SM SYS SUMM 1

1. Perform BUS TIE (Cue Card), then:
If aff FC SS 1(2,3) $\Delta V \geq 150$:
 2. Go to FC SAFING >>
- If aff FC SS 1(2,3) $\Delta V < 150$:
 3. \checkmark FLASH EVAP CNTLR PRI A – OFF
 \checkmark B – ON (GPC if post OPS 3 trans)
SEC (two) – B SPLY, OFF
SPLY H2O TKA INLET – CL (tb-CL)
TKB OUTLET – CL (tb-CL)
 4. Two min after bus tie, record Δ AMPS between aff and tied FC, and monitor for 20 min
If no COMM:
 - If change in Δ AMPS > 12 or FC SS 1(2,3) $\Delta V \geq 150$:
 5. Go to FC SAFING >>
 - If change in Δ AMPS ≤ 12 and FC SS 1(2,3) $\Delta V < 150$:
 6. Remain bus tied to monitor FC performance
 - If COMM available:
 7. \checkmark MCC

FC DELTA V 1(2,3)

BFS, SM SYS SUMM 1

1. Perform BUS TIE (Cue Card), then:
If aff FC pH \downarrow or FC ΔV incr:
 2. Go to FC SAFING >>
- If no aff FC pH \downarrow and FC ΔV not incr:
 3. Two min after bus tie, record Δ AMPS between aff and tied FC, and monitor for 20 min
If change in Δ AMPS > 12 or FC ΔV incr:
 4. Go to FC SAFING >>
 - If change in Δ AMPS ≤ 12 and FC ΔV not incr:
 5. Remain bus tied to monitor FC performance

EPCL/ALL/GEN H

FC STACK T/FC EXIT T

5-13

FC pH/FC DELTA V

FC SHUTDN (1st)

BFS, SM SYS SUMM 1

WARNING

If FC Coolant Pump lost, Emergency FC
use OK for 9 min

1. Pre OMS 2 or Entry: MSTR MADS PWR – OFF
2. If not tied: Perform BUS TIE (Cue Card), then:
If ORB (not D/O Prep), kW > 18:
 3. MN BUS TIE (three) – ON (tb–ON)
4. ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF (tb–OFF)
FC – STOP (COOL PUMP Δ P tb–bp or 1 sec)
5. FC REAC – CL (tb–CL)
6. Go to LOSS OF 1 FC (PWRDN)

2nd FC SHUTDN

BFS, SM SYS SUMM 1

NOTE

If FC Coolant Pump lost, Emergency FC
use OK for 6 min

1. MSTR MADS PWR – OFF
2. If aff FC pwr 1 MN bus: Go to step 6
3. MN BUS TIE (three) – OFF (tb–OFF)
If only MNA(B,C) pwr and APU 2(3,1) started:
 4. Perform APU SHUTDN (APU/HYD) for APU 2(3,1), then:
5. Perform BUS TIE (Cue Card) to good FC/BUS, then:
6. (Aff) ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF (tb–OFF)
FC – STOP (FC COOL PUMP Δ P tb–bp or 1 sec)
7. FC REAC – CL (tb–CL)
8. Go to LOSS OF 2nd FC (ENTRY) (PWRDN)

BUS TIE

BFS, SM SYS SUMM 1

If no bus short:

If MN Volts > 20:

1. Bus Tie (A to B, B to C, C to A) >>

If MN Volts < 20:

2. AC BUS SNSR – OFF
3. cb AC CONTR (three) – cl
4. (Aff) INV/AC BUS – OFF (tb-OFF)
5. (Aff) INV PWR – OFF (tb-OFF)
6. If MNC(B) dn: CAB FAN A(B) – OFF
7. Bus Tie (A to B, B to C, C to A)
8. (Aff) INV PWR – ON (tb-ON)
9. (Aff) INV/AC BUS – ON (tb-ON)
10. cb AC CONTR (three) – op
11. AC BUS SNSR – AUTO TRIP
12. If pwrdn not reqd: ✓CAB FAN A(B) – ON
13. GNC I/O RESET

FC SAFING

BFS, SM SYS SUMM 1

If FC already SHUTDN:

1. ✓FC1(2,3) REAC – CL (O2,H2 tb-CL)
2. FC1(2,3) – START (10 sec or ΔP tb-gray)
3. FC/MN BUS A(B,C) – ON (tb-ON)

When FC1(2,3) COOL P decr to < 15 or FC1(2,3) AMPS ≤ 0:

4. FC/MN BUS A(B,C) – OFF (tb-OFF)

When FC1(2,3) COOL P < 15, then:

5. FC1(2,3) – STOP (ΔP tb-bp or 1 sec) >>

If FC not SHUTDN:

6. MSTR MADS PWR – OFF

If not already tied:

7. Perform BUS TIE (Cue Card), then:
8. FC1(2,3) REAC – CL (O2,H2 tb-CL)

If either FC REAC tb still OP:

9. cb FC1(2,3) REAC VLV CL ENA – CL (pnl C3)
10. FC REAC VLV 1(2,3) – CL (pnl C3)

If no joy:

11. Install Switch Reten Device FC REAC sw (pnl R1)

When FC1(2,3) COOL P decr to < 15 or FC1(2,3) AMPS ≤ 0:

12. ESS BUS SOURCE FC1(2,3) – OFF
13. FC/MN BUS A(B,C) – OFF (tb-OFF)

When FC1(2,3) COOL P < 15, then:

14. FC1(2,3) – STOP (ΔP tb-bp or 1 sec)

Go to LOSS OF 1 FC (2nd FC) (PWRDN)

EPCL/ALL/GEN H,4

FC SHUTDN
2nd FC SHUTDN

5-15

BUS TIE/FC SAFING
CRYO O2/H2 (5-16)

CRYO O2(H2) PRESS/TEMP HIGH

BFS, SM SYS SUMM 2
BFS, SM 168 CRYO PALLET

1. (Aff) O2(H2) TK HTRS (two) – OFF

CRYO O2(H2) LEAK

BFS, SM SYS SUMM 2
BFS, SM 168 CRYO PALLET

1. Use meter if CRT data OSL

If multiple TK Ps low:

2. O2(H2) MANF VLV TK1,TK2 (two) – CL
3. O2(H2) TK3 HTRS A – AUTO

If either MANF VLV fails to close:

4. Hold switch in CLOSE position (install Switch Retention Device if reqd), then:

If TK1 and 2 P decr slowly (HTR logic fail):

5. If QTY > 55%: O2(H2) TK3 HTRS B (one) – AUTO
6. O2(H2) MANF VLV TK1,TK2 (two) – OP >>
7. Perform aff BUS TIE (Cue Card), then:

If O2 leak:

If TK1(2) aff:

8. O2 SYS 1(2) SPLY – CL, then:
9. If P incr: O2 MANF VLV TK1,TK2 (two) – OP >>
10. (Aff) TK HTRS A,B (two) – ON (not AUTO)
11. If HTR T alarm: TK HTRS A,B (two) – OFF
12. Wait for aff FC COOL P alarm, then:
13. ✓(Aff) TK HTRS A – ON (not AUTO)
14. Perform aff FC SHUTDN (Cue Card), then:

If aff TK P not decr (FC leak):

15. O2(H2) MANF VLV TK1,TK2 (two) – OP (ASAP if FC3)

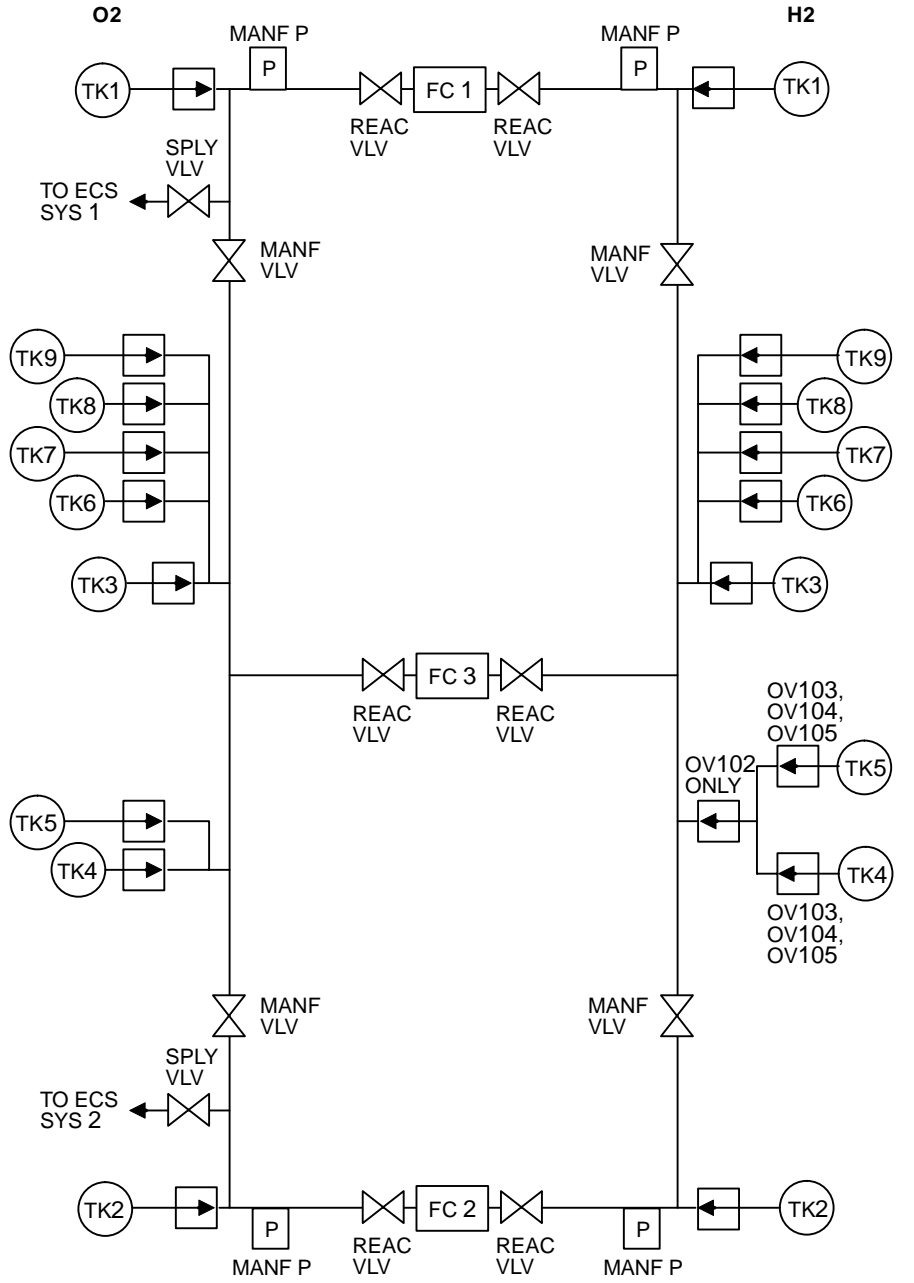
If aff TK P/MANF P decr (MANF leak):

16. MCC may request FC restart if H2 leak
17. (Aff) TK HTRS A,B (two) – OFF

If only one TK P low: (TK leak,xdcr, or cntlr fail)

18. (Aff) TK HTRS A,B (two) – OFF

CRYO



A5-17

EPCL/ALL/GEN H,12

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A5-19

EPCL/2/GEN H,12

O2/H2 HTR LOSS (OV102 Only)																				
BUS LOSS	PAIRED				PAIRED								PAIRED				PAIRED			
	TK1		TK2		TK3		TK4 ↔ TK5				TK6		TK7		TK8		TK9			
	A	B	A	B	A	B	O2	H2A	H2B	O2	H2A	H2B	A	B	A	B	A	B	A	B
MNA DA1	A/M				A/M	A/M							A/M		A/M		A/M		A/M	
MNB DA2			AUTO	A/M	AUTO	A/M	AUTO	A/M	A/M	A/M	AUTO	A/M								
MNC DA3	AUTO	A/M					AUTO	A/M												
CNTL AB1		MAN			MAN								MAN		MAN		MAN		MAN	
AB2		A/M			A/M															
AB3																				
CNTL BC1			MAN				MAN	MAN		MAN	A/M	MAN								
BC2			A/M				A/M	A/M		MAN	MAN	MAN								
BC3				MAN																
CNTL CA1	MAN					MAN								MAN		MAN		MAN		MAN
CA2	A/M				A/M															
CA3				A/M																
ESS 1BC	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO
2CA	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO	*AUTO
3AB	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO	AUTO

*AUTO OPERATION REGAINED IF BOTH A AND B HTR SW OF OTHER PAIRED TANK(S) ARE NOT IN AUTO.
TK1 PAIRED WITH TK2, AND TK3 PAIRED WITH TK4/TK5

A/M = AUTO AND MANUAL LOSS

07/19/94

MAIN DC BUS LOSS ID TABLE

BUS		MAIN A						MAIN B					MAIN C					
		* FPC1		MPC1		APC4		* FPC2		MPC2	APC5		* FPC3		MPC3		APC6	
		F L C 1	F M C 1	M M C 1	M M C 3	A P C 1	A L C 1	A M C 1	F L C 2	F M C 2	M M C 2	A P C 2	A L C 2	F L C 3	F M C 3	M M C 2	M M C 4	A P C 3
C/W	AC VOLTAGE (AC X Lost)	1						2					3					
	APU TEMP (-2 min if APU X ON)					3	3				1	1					2	2
	FREON LOOP (If cooling by FES X only)					B	B										A	A
	H2O LOOP (If Pump X Active)		1A					1B										
	OMS TVC (During OMS PRI GMBL)					L	L										R	R
	OMS TVC (During OMS SEC GMBL)					R	R					L	L					
	RCS JET (When Jet Commanded)		•						•					•				
DISP 67	DC AMPS XY = 0 (X: Fwd,Mid,Aft) (Y: A,B,C)	FA	FA	MA		AA	AA	FB	FB	MB	AB	AB	FC	FC	MC		AC	AC
	DC V PCA XY = 0 (X: Fwd,Aft) (Y: A,B,C)	FA	FA			AA	AA	FB	FB		AB	AB	FC	FC			AC	AC
	CNTL BUS RPC X = "*" (X: A,B,C)	A						B					C					
PLB LTS	PLB,FLOODS (Fwd,Mid,Aft Port,Stbd,Bkhd, Docking)			FP						FB					MS			
				AS						FS					AP			
S-BAND	SYS X ORB voice & PL PSP msg (X: 1,2)												2					
	L2 ATM O2 SYS X SPLY tb - CL			1						2								
F6/F8	LANDING GEAR X tb - bp (X: L,R,NOSE)							LN					RN					
	F7 CRT X Blanks	1						2					3,4					
O1	H2O PUMP OUT P X = 20 (Pump Loss)		1A					1B										
	O7 AFT X RCS He P Y tb - bp (X: Both,L,R) (Y: A,B)					BA	BA				RB	RB					LB	LB
P A N E L S	AFT L,R RCS MANF ISOL 5 tb - bp																•	•
	O8 FWD RCS He P X tb - bp	A						B										
	FWD RCS TK ISOL X tb - bp (X: 1/2,3/4/5)		3										1					
R4	FWD RCS MANF ISOL X tb - bp		1					2					5	4				
	R4 HYD BRAKE ISOL VLV X tb - OP					1	1				2	2					3	3
R13L	LG EXTEND ISOL VLV tb - OP					•	•											
	RAD CNTL X tb - bp (X: PORT,STBD)			PS	S	P									PS	P	S	
A8U	RMS EE (except DERIGID) tbs - bp, MA LT - ON			•														
A8L	X RMS DPY/STO tb - bp (X: PORT,STBD)			P					P						P			
X	RMS RETEN LAT tb - bp (X: PORT,STBD)			P	P				P	P					P	P		
	PORT RMS R-F-L X tb - bp (X: FWD,MID,AFT)			M	M				F	F					A	A		

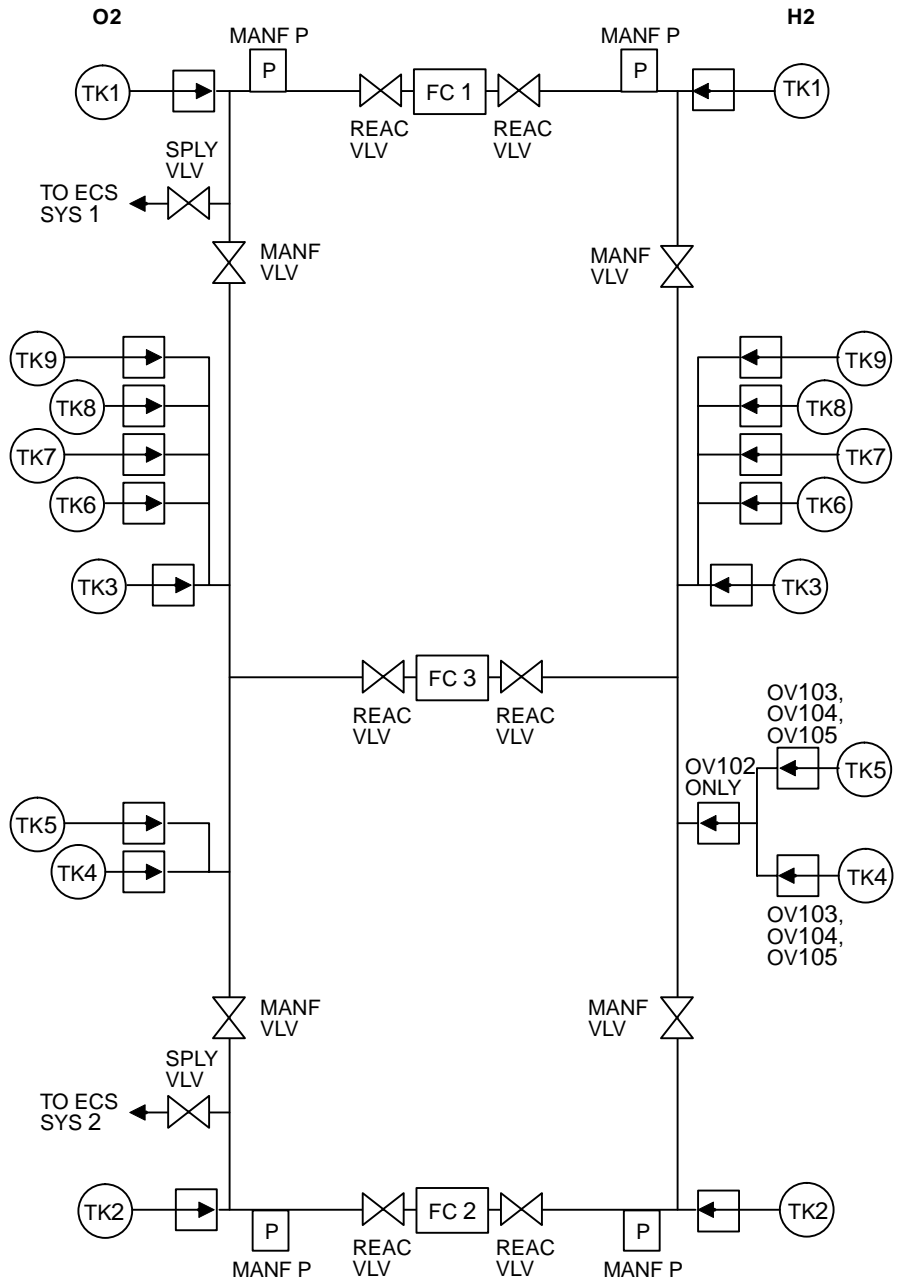
*For MNA(B,C) FPC 1(2,3) many other indications are present, most of which are associated with the resultant AC1(2,3) loads. Only the additional indications that positively identify the FPC bus loss are listed.

DATE 02/02/96

A5-20

EPCL/ALL/GEN H,12

CRYO



B5-17

EPCL/ALL/GEN H,12

B5-18

EPCL/4/GEN H,12

O2/H2 HTR LOSS (All Except OV102)												
BUS LOSS	PAIRED					PAIRED						
	TK1		TK2		TK3		TK4		TK5			
	A	B	A	B	A	B	A	B	A	B		
MNA DA1	A/M					A/M					A/M	
MNB DA2			AUTO	A/M		AUTO	A/M	AUTO	A/M		AUTO	A/M
MNC DA3	AUTO	A/M	A/M					A/M			AUTO	A/M
CNTL AB1		MAN				MAN						
AB2		A/M				A/M						
CNTL BC1			MAN					MAN				MAN
BC2			A/M					A/M				A/M
BC3				MAN				MAN				A/M
CNTL CA1	MAN						MAN				MAN	
CA2	A/M						A/M				A/M	
CA3				A/M					A/M			
ESS 1BC	AUTO*	AUTO*	AUTO	AUTO	AUTO*	AUTO*	AUTO*	AUTO	AUTO		AUTO	AUTO
2CA	AUTO	AUTO	AUTO*	AUTO*							AUTO	AUTO
3AB					AUTO	AUTO	AUTO*	AUTO*				

*AUTO OPERATION REGAINED IF BOTH A AND B HTR SW OF OTHER PAIRED TANK(S) ARE NOT IN AUTO. A/M = AUTO AND MANUAL LOSS

02/02/96

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B5-19

EPCL/4/GEN H,12

MAIN DC BUS LOSS ID TABLE

BUS		MAIN A						MAIN B					MAIN C						
		* FPC1		MPC1		APC4		* FPC2		MPC2	APC5		* FPC3		MPC3		APC6		
		F L C 1	F M C 1	M M C 1	M M C 3	A P C 1	A L C 1	A M C 1	F L C 2	F M C 2	M M C 2	A P C 2	A L C 2	F L C 3	F M C 3	M M C 2	M M C 4	A P C 3	A L C 3
C/W	AC VOLTAGE (AC X Lost)	1						2					3						
	APU TEMP (-2 min if APU X ON)					3	3				1	1					2	2	
	FREON LOOP (If cooling by FES X only)					B	B										A	A	
	H2O LOOP (If Pump X Active)		1A						1B										
	OMS TVC (During OMS PRI GMBL)					L	L										R	R	
	OMS TVC (During OMS SEC GMBL)					R	R					L	L						
	RCS JET (When Jet Commanded)		•						•					•					
DISP 67	DC AMPS XY = 0 (X: Fwd,Mid,Aft) (Y: A,B,C)	FA	FA	MA		AA	AA	FB	FB	MB	AB	AB	FC	FC	MC		AC	AC	
	DC V PCA XY = 0 (X: Fwd,Aft) (Y: A,B,C)	FA	FA			AA	AA	FB	FB		AB	AB	FC	FC			AC	AC	
	CNTL BUS RPC X = "*" (X: A,B,C)	A						B					C						
PLB LTS	PLB,FLOODS (Fwd,Mid,Aft Port,Stbd,Bkhd, Docking)			FP						FB					MS				
				AS						FS					AP				
S-BAND	SYS X ORB voice & PL PSP msg (X: 1,2)																		
	L2 ATM O2 SYS X SPLY tb - CL			1				1		2			2						
	F6/F8 LANDING GEAR X tb - bp (X: L,R,NOSE)							LN					RN						
	F7 CRT X Blanks	1						2					3,4						
	O1 H2O PUMP OUT P X = 20 (Pump Loss)		1A						1B										
	O7 AFT X RCS He P Y tb - bp (X: Both,L,R) (Y: A,B)					BA	BA				RB	RB					LB	LB	
	AFT L,R RCS MANF ISOL 5 tb - bp																•	•	
	O8 FWD RCS He P X tb - bp	A						B											
	FWD RCS TK ISOL X tb - bp (X: 1/2,3/4/5)		3										1						
	FWD RCS MANF ISOL X tb - bp		1						2				5	4					
L S	R4 HYD BRAKE ISOL VLV X tb - OP					1	1				2	2					3	3	
	LG EXTEND ISOL VLV tb - OP					•	•												
	R13L RAD CNTL X tb - bp (X: PORT,STBD)			PS	S	P									PS	P	S		
	A8U RMS EE (except DERIGID) tbs - bp, MA LT - ON			•															
	A8L X RMS DPY/STO tb - bp (X: PORT,STBD)			P						P					P				
	X RMS RETEN LAT tb - bp (X: PORT,STBD)			P	P					P	P				P	P			
	PORT RMS R-F-L X tb - bp (X: FWD,MID,AFT)			M	M					F	F				A	A			

*For MNA(B,C) FPC 1(2,3) many other indications are present, most of which are associated with the resultant AC1(2,3) loads. Only the additional indications that positively identify the FPC bus loss are listed.

DATE 02/02/96

B5-20

EPCL/ALL/GEN H,12

MAIN DC BUS LOSS ID TABLE

INDICATION		MAIN A				MAIN B			MAIN C		
		O 1 4	O 1 4 A 8	R 1 4	M L 8 6 B	O 1 5	R 1 4	M L 8 6 B	O 1 6	R 1 4	M L 8 6 B
C/W	CABIN ATM	•				•					
LIGHTS	FLOODS (L Seat,R Seat, CTR Cnsl, MS,OS,PS)			PS		LC	OS		RC	MS	
	Floods (L,R Ovhd Cnsl)	L				R					
	MIDDECK FLOODS X (X: 1,2,3,4,5,6,7,8)				18			26			34 57
	WMC FLOOD				•						
COMM	All Voice via AUDIO CTR 2									•	
	ATU			MS OS CU			SM			PS AL	
	PS,MS,MD CCU (CU),MD SMU (SM),AL,OS										
	UHF SPLX PWR AMP			•							
TIMERS	X MISSION TIMER (X: Fwd,Aft)	F				A					
	X EVENT TIMER (X: Fwd,Aft)	A				F					
FWD	MDUs			MFD2 PLT1			CDR2 MFD1			CDR1 PLT2	
	AFT MDU									AFD1	
P A N E L S	L2 CAB RELIEF X tb – bp					A			B		
	ATM N2 SYS X SPLY, REG INLET tb – bp	1				2					
	O1 CAB dP/dT = 0.45					•					
	CAB PRESS = 0 psia	•									
	PPO2 SNSR X = 0 psia	A				BC					
	O3 RCS/OMS PRPLT QTY Disp Blanks								•		
	R11L SPLY H2O TK X INLET tb – bp				A			B		C	
	SPLY H2O TK X OUTLET tb – bp				B			C		A	
	SPLY H2O DUMP ISOL, B SPLY ISOL VLV tb – bp							•			
	SPLY H2O DUMP, XOVR, GALLEY SPLY VLV tb – bp										•
A8U RMS EE (6), SAFING, S/W STOP tb – bp, BRAKES tb – OFF		•									
ML31C	WASTE H2O TK X VLV tb – bp				1						
	WASTE H2O DUMP ISOL VLV tb – bp				•						
	SPLY H2O TK D X tb – bp (X: INLET,OUTLET)				0			1			

DATE 02/22/02

5-21

EPCL/2/GEN H,Y

ESS DC BUS LOSS ID TABLE

BUS		ESS1BC						ESS2CA					ESS3AB					
		D A 1	FP & LC 1	M P C 1	F D	O 13 R 14	M L 86 B	D A 2	FP & LC 2	M P C 2	F D	O 13 R 14	D A 3	FP & LC 3	M P C 3	F D	O 13	M L 86 B
INDICATION																		
C/W	MA, but no F7 C/W Lts	•				•												
	O2 PRESS						•	•				•	•					•
	H2 PRESS						•	•				•	•					•
	FC REAC			•				•		•			•		•			
	FC PUMP			•	•			•		•	•		•		•	•		
	PRIMARY C/W (Cannot be Reset)							•				•						
	BACKUP C/W (Cannot be Reset)							•				•						
F9 METER	Aff ESS VOLTS OFF Scale Lo	•			•			•			•			•		•		
SM1	Aff DC VOLTS ESS = 0	•						•				•						
COMM	All Voice via AUDIO CTR 1							•				•						
	X ATU,CCU,MIC (X: Cdr,Plt)	C				C		P			P							
LIGHTS LOST	F7 C/W MATRIX	•				•												
	MA BULBS 2 of 4 per MA (except Lamp Test)	•				•		•			•							
	GPC STATUS LTS											•					•	
	X GLARESHIELD FLOOD (X: L,R)	L				L		R			R							
P A N E L S	O2	24				2	4	1				1	3					3
	R1	A						B				C						
A12	PL PRI MNC tb – OFF											•						
	INV PWR X tb – OFF (Inv OK)		1						2				3				3	
	INV/AC BUS X tb – OFF (Bus OK)	1				1		2			2	3					3	
	O2,H2 MANF VLV TK X tb – CL	1		1				2		2								
	FC X REAC tb – CL	1		1				2		2		3		3				
	FC X RDY tb – bp	1		1	1			2		2	2	3		3	3	3		
	FC X COOL PUMP ΔP tb – bp	1		1	1			2		2	2	3		3	3	3		
FC3 STRUCT RTN tb – OFF											•							

5-22

EPCL/ALL/GEN H,4

DATE 05/23/00



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BUS LOSS ACTION

<u>PAGE</u>	<u>PAGE</u>
AC1 5-26	CNTL AB1 5-42
MNA DA1 (Entire Bus)	AB2 5-42
(Includes AC1)	AB3 5-43
..... (CIL)5-27	BC1 5-44
FPC1 5-28	BC2 5-44
FLC1 5-28	BC3 5-45
FMC1 5-28	CA1 5-46
MPC1 5-28	CA2 5-46
APC4 5-29	CA3 5-47
APC1 5-29	ESS 1BC DA1
ALC1 5-29	(Entire Bus)
O14 5-30 (CIL)5-48
R14 5-30	MPC1 ... (CIL)5-48
AC2 5-32	FD (CIL)5-48
MNB DA2 (Entire Bus)	O13 & R14 ... 5-48
(Includes AC2)	ESS 2CA DA2
..... (CIL)5-33	(Entire Bus)
FPC2 5-34 (CIL)5-49
FLC2 5-34	MPC2 ... (CIL)5-49
FMC2 5-35	FD (CIL)5-49
MPC2 5-35	O13 & R14 ... 5-49
APC5 5-35	ESS 3AB DA3
APC2 5-35	(Entire Bus)
ALC2 5-36 (CIL)5-50
O15 5-36	MPC3 ... (CIL)5-50
AC3 5-38	FD (CIL)5-50
MNC DA3 (Entire Bus)	O13 5-50
(Includes AC3)	
..... (CIL)5-39	
FPC3 5-40	
FLC3 5-40	
MPC3 5-40	
APC6 5-40	
APC3 5-41	
ALC3 5-41	
O16 5-41	
R14 5-41	

AC1/
MNA

EPCL/ALL/GEN H

BUS LOSS ID (5-21) 5-25

BUS LOSS ACTION

AC1/
MNA

AC1 (2 or 3Φs)

- R2 1. BLR CNTLR/HTR 1 – A
3 – B
- L1 2. Perform EC1 SHUTDN (Cue Card), then:
3. HUM SEP B – ON
IMU FAN B(C) – ON
If H2O LOOP 1 active:
4. H2O PUMP LOOP 1 – B
5. AV BAY 1 FAN B – ON
2 FAN A,B (two) – ON
3 FAN A – ON
6. FREON PUMP LOOP 1 – B
2 – A
- F6,F8 7. HSI SEL SOURCE – not TACAN 1
8. P&I ENTRY MANEUVERS (Cue Card):
When V = 12K:
L1 RAD CNTLR LOOP (two) – AUTO A
If AC BUS not shorted and Pre-TIG:
9. Go to MAL, EPS, SSR-200, AC PWR
TRANSFER CABLE >>
10. Go to LOSS OF 1 FC (PWRDN)

AC1 ΦA

- R2 1. BLR CNTLR/HTR 1 – A
- L1 If H2O LOOP 1 active:
2. H2O PUMP LOOP 1 – B
3. FREON PUMP LOOP 1 – B
2 – A
- O6 4. LTG PNL L/CTR sel – OFF
O8 5. R INST sel – OFF
6. P&I ENTRY MANEUVERS (Cue Card):
When V = 12K:
L1 RAD CNTLR LOOP (two) – AUTO A

AC1 ΦB

- L1 If H2O LOOP 1 active:
1. H2O PUMP LOOP 1 – B
2. AV BAY 2 FAN A,B (two) – ON
3. FREON PUMP LOOP 1 – B
2 – A
- O6 4. LTG PNL L/CTR, OVHD sel – OFF
O8 5. NUMERIC sel – OFF
6. P&I ENTRY MANEUVERS (Cue Card):
When V = 12K:
L1 RAD CNTLR LOOP (two) – AUTO A

AC1 ΦC

- R2 1. BLR CNTLR/HTR 3 – B
L1 If H2O LOOP 1 active:
2. H2O PUMP LOOP 1 – B
3. FREON PUMP LOOP 1 – B
2 – A
L4:P 4. cb AC1 ΦC TACAN 1 – op

MNA DA1 (Entire Bus) (Includes AC1)

NOTE

Loss of UHF SPLX Hi Pwr Xmit

- R2 1. BLR CNTR/HTR 1 – A
3 – B
2. Perform FC1 SHUTDN (Cue Card), steps 1 thru 3, then:
R1 3. PL CAB – MNB
R12L 4. MS AUD CNTL – PS (MS can't talk)
R1 5. O2 TK1 HTR B – AUTO
L1 6. HUM SEP B – ON
IMU FAN B(C) – ON
If H2O LOOP 1 active:
7. H2O PUMP LOOP 1 – B
8. AV BAY 1 FAN B – ON
2 FAN A,B (two) – ON
3 FAN A – ON
9. FREON PUMP LOOP 1 – B
2 – A
FLASH EVAP CNTLR PRI A(SEC) – ON
L2 10. O2/N2 CNTLR VLV SYS 2 – OP
O6 11. ANNUN BUS SEL ACA 1 – MNB
F8 12. RADAR ALTM – 2
F6 13. HSI SEL SOURCE – not MLS 1 or TACAN 1
F8 14. XXXXX MNVR YYYYY
L OMS – sel SEC GMBL
Use R AMI, AVVI, HSI
15. Use BFS, GNC SYS SUMM 1 (for SPI)
Use diff braking for steering
16. BFS G51 AA1 – desel

Cont next page

- If > 25 min before APU start:
- A12 17. APU HTR
 GAS GEN/FUEL PUMP 1 – B AUTO
 3 – A AUTO
 TK/FU LINE/H2O/SYS 1B – AUTO
 3A – AUTO
- If prior to TIG-5:
- L1 18. TOP EVAP HTR NOZ L – B AUTO
 DUCT sel – B
 HI LOAD DUCT HTR sel – B
- When V = 12K:
- L1 19. RAD CNTLR LOOP (two) – AUTO A
- When BUS LOSS ACTIONS complete:
20. Perform LOSS OF 1 FC (PWRDN)

MNA FPC1

1. Go to AC1 (2 or 3Φs)

MNA FLC1

- O8 1. FWD RCS MANF ISOL 1 – CL

MNA FMC1

1. GNC 23 RCS ovrd MANF F1 jets – OP
 If H2O LOOP 1 active:
- L1 2. H2O PUMP LOOP 1 – B

MNA MPC1

- R1 1. PL CAB – MNB
 L1 2. TOP EVAP HTR DUCT sel – B
 HI LOAD DUCT HTR sel – B

MNA APC4

- R2 1. BLR CNTLR/HTR 1 – A
3 – B
- L1 2. FLASH EVAP CNTLR PRI A(SEC) – ON
TOP EVAP HTR NOZ L – B AUTO
DUCT sel – B
HI LOAD DUCT HTR sel – B
3. XXXXXX MNVR YYYY
L OMS – sel SEC GMBL
If > 25 min before APU start:
- A12 4. APU HTR
GAS GEN/FUEL PUMP 1 – B AUTO
3 – A AUTO
TK/FU LINE/H2O/SYS 1B – AUTO
3A – AUTO

MNA APC1

1. XXXXXX MNVR YYYY
L OMS – sel SEC GMBL
If > 25 min before APU start:
- A12 2. APU HTR TK/FU LINE/H2O/SYS 1B – AUTO
3A – AUTO

MNA ALC1

- R2 1. BLR CNTLR/HTR 1 – A
3 – B
- L1 2. FLASH EVAP CNTLR PRI A(SEC) – ON
TOP EVAP HTR NOZ L – B AUTO
DUCT sel – B
HI LOAD DUCT HTR sel – B
- If > 25 min before APU start:
- A12 3. APU HTR
GAS GEN/FUEL PUMP 1 – B AUTO
3 – A AUTO
TK/FU LINE/H2O/SYS 1B – AUTO
3A – AUTO

MNA O14

- L2 1. O2/N2 CNTLR VLV SYS 2 – OP
 - 2. NWS – 2
 - O6 3. ANNUN BUS SEL ACA 1 – MNB
 - F8 4. RADAR ALTM – 2
 - F6, 5. HSI SEL SOURCE – not MLS 1
 - F8 6. BFS G51 AA1 – desel
- When < 180K ft:
- L1 7. RAD CNTLR LOOP (two) – AUTO A
 - 8. Use R AMI, AVVI, HSI
 - 9. Use BFS, GNC SYS SUMM 1 (for SPI)

MNA R14

NOTE

Loss of UHF SPLX Hi Pwr Xmit

- R12L 1. MS AUD CNTL – PS (MS can't talk)

AC2/
MNB

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AC2/
MNB

AC2 (2 or 3Φs)

- R2 1. BLR CNTLR/HTR 2 – A
1 – B
- L1 2. Perform FC2 SHUTDOWN (Cue Card), then:
3. HUM SEP A – ON
CAB FAN A – ON
IMU FAN A(C) – ON
- If H2O LOOP 1 active:
- L4:F 4. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 1 – A
5. AV BAY 1 FAN A – ON
2 FAN B – ON
3 FAN A,B (two) – ON
6. FREON PUMP LOOP 1 – A
- F6,F8 7. HSI SEL SOURCE – not TACAN 2
- L4:P 8. ✓cb AC3 ΦA LG SNSR 1 – cl
- O17:C 9. SIG CONDR FREON A – AC3
- If AC BUS not shorted and pre-TIG:
10. Go to MAL, EPS, SSR-200, AC PWR
TRANSFER CABLE >>
11. Go to LOSS OF 1 FC (PWRDN)

AC2 ΦA

- R2 1. BLR CNTLR/HTR 1 – B
- L1 If H2O LOOP 1 active:
- L4:F 2. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 1 – A
3. FREON PUMP LOOP 1 – A
- L4:P 4. ✓cb AC3 ΦA LG SNSR 1 – cl
- O8 5. LTG PNL R OVHD sel – OFF

AC2 ΦB

- L1 If H2O LOOP 1 active:
- L4:F 1. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 1 – A
2. AV BAY 3 FAN A,B (two) – ON
FREON PUMP LOOP 1 – A
- O6 3. LTG INST OVHD sel – OFF
O8 PNL R – OFF
- O17:C 4. SIG CONDR FREON A – AC3

AC2 ΦC

- L1 If H2O LOOP 1 active:
- L4:F 1. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 1 – A
2. FREON PUMP LOOP 1 – A
- L4:P 3. cb AC2 ΦC TACAN 2 – op
- R2 4. BLR CNTLR/HTR 2 – A

MNB DA2 (Entire Bus) (Includes AC2)

CAUTION

Do not sw S-BD PM CNTL to PNL if subsequent Fault Msg – 'BCE STRG 3 NSP' or loss of comm

- R2 1. BLR CNTLR/HTR 2 – A
1 – B
2. Perform FC2 SHUTDN (Cue Card), steps 1 thru 3, then:
- R1 3. O2,H2 TK1 HTRS A,B (four) – AUTO
If CRYO O2 TK1 QTY < 55%:
- L1 4. O2 TK1 HTRS B – OFF
5. HUM SEP A – ON
CAB FAN A – ON
IMU FAN A(C) – ON
If H2O LOOP 1 active:
- L4:F 6. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 1 – A
7. AV BAY 1 FAN A – ON
2 FAN B – ON
3 FAN A,B (two) – ON
8. FREON PUMP LOOP 1 – A
9. FLASH EVAP CNTLR PRI A(B) – ON
- L4:P 10. ✓cb AC3 Φ A LG SNSR 1 – cl
- O17:C 11. SIG CONDR FREON A – AC3
- F8 12. RADAR ALTM – 1
- F6,F8 13. HSI SEL SOURCE – not MLS 2 or TACAN 2
- O6 14. ANNUN BUS SEL ACA 1 – MNA
ACA 2/3 – MNC
15. Use L AMI,AVVI,HSI
16. Use BFS, SM SYS SUMM 2 for APU/HYD data
- For SSME HYD REPRESS:
- R4 17. HYD MPS/TVC ISOL VLV SYS 1,3
(two) – OP. Wait 10 sec, then CL
18. BFS G51 AA2, RGA 2 – desel

Cont next page

MNB FMC2

- L1 If H2O LOOP 1 active:
L4:F 1. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 1 – A
 2. GNC 23 RCS ovrđ MANF F2 jets – OP

MNB MPC2

- L1 1. TOP EVAP HTR DUCT sel – A
 2. HI LOAD DUCT HTR sel – A

MNB APC5

- R2 1. BLR CNTLR/HTR 2 – A
 1 – B
L1 2. FLASH EVAP CNTLR PRI A(B) – ON
 TOP EVAP HTR NOZ L – A AUTO
 R – B AUTO
 DUCT sel – A
 HI LOAD DUCT HTR sel – A
3. BFS G51 RGA 2 – desel

For SSME HYD REPRESS:

- R4 4. HYD MPS/TVC ISOL VLV SYS 1,3 (two) – OP
 Wait 10 sec, then CL

If > 25 min before APU start:

- A12 5. APU HTR
 GAS GEN/FUEL PUMP 1 – A AUTO
 2 – B AUTO
 TK/FU LINE/H2O/SYS 1A – AUTO
 2B – AUTO

MNB APC2

If > 25 min before APU start:

- A12 1. APU HTR TK/FU
 LINE/H2O/SYS 1A – AUTO
 2B – AUTO

MNB ALC2

- R2 1. BLR CNTLR/HTR 2 – A
1 – B
- L1 2. TOP EVAP HTR NOZ L – A AUTO
R – B AUTO
DUCT sel – A
HI LOAD DUCT HTR sel – A

For SSME HYD REPRESS:

- R4 3. HYD MPS/TVC ISOL VLV SYS 1,3 (two) – OP
Wait 10 sec, then CL

If > 25 min before APU start:

- A12 4. APU HTR
GAS GEN/FUEL PUMP 1 – A AUTO
2 – B AUTO
TK/FU LINE/H2O/SYS 1A – AUTO
1B – AUTO

MNB O15

- F6,F8 1. HSI SEL SOURCE – not MLS 2
- F8 2. RADAR ALTM – 1
- O6 3. ANNUN BUS SEL ACA 1 – MNA
ACA 2/3 – MNC
- 4. BFS G51 AA2 – desel

When < 180K ft:

- L1 5. RAD CNTLR LOOP (two) – AUTO B
- 6. Use L AMI, AVVI, HSI
- 7. Use BFS, SM SYS SUMM 2 for APU/HYD data
- F2 8. Use CDR's DRAG CHUTE ARM

**AC3/
MNC**

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AC3/
MNC

AC3 (2 or 3Φs)

- R2 1. BLR CNTLR/HTR 3 – A
2 – B
- R1 2. Perform FC3 SHUTDN (Cue Card), then:
- L1 3. CAB FAN B – ON
IMU FAN B(A) – ON
- L4:F cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 H2O PUMP LOOP 2 – GPC
AV BAY 1 FAN A,B (two) – ON
2 FAN A – ON
3 FAN B – ON
FREON PUMP LOOP 2 – B
- L4:P 4. ✓cb AC2 ΦA LG SNSR 2 – cl
- F6,F8 5. HSI SEL SOURCE – not TACAN 3
- O17:C 6. SIG CONDR FREON B – AC2
If AC BUS not shorted and pre-TIG:
7. Go to MAL, EPS, SSR-200, AC PWR
TRANSFER CABLE >>
8. Go to LOSS OF 1 FC (PWRDN)

AC3 ΦA

- R2 1. BLR CNTLR/HTR 2 – B
- L4:F 2. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 H2O PUMP LOOP 2 – GPC
FREON PUMP LOOP 2 – B
- L4:P 3. ✓cb AC2 ΦA LG SNSR 2 – cl

AC3 ΦB

- L4:F 1. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 H2O PUMP LOOP 2 – GPC
AV BAY 1 FAN A,B (two) – ON
FREON PUMP LOOP 2 – B
- O6 2. LTG PNL L/CTR sel – OFF
- O17:C 3. SIG CONDR FREON B – AC2

AC3 ΦC

- L4:F 1. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 H2O PUMP LOOP 2 – GPC
FREON PUMP LOOP 2 – B
- L4:P 2. cb AC3 ΦC TACAN 3 – op
- R2 3. BLR CNTLR/HTR 3 – A

MNC DA3 (Entire Bus) (Includes AC3)

NOTE

PS AUDIO lost

- R2 1. BLR CNTLR/HTR 3 – A
2 – B
- C3 2. S-BD PM CNTL – PNL,CMD
3. BFS, GNC 51 OVERRIDE
TDRS – ITEM 46 EXEC (*)
AUD CTR – 1
4. Perform FC3 SHUTDN (Cue Card), steps 1 thru 3, then:
- R1 5. O2 TK2 HTRS B – AUTO
6. O2,H2 TK3 HTRS A,B (four) – AUTO
If CRYO O2 TK3 QTY < 55%:
7. O2 TK3 HTRS B – OFF
- L1 8. CAB FAN B – ON
IMU FAN B(A) – ON
- L4:F cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
L1 H2O PUMP LOOP 2 – GPC
AV BAY 1 FAN A,B (two) – ON
2 FAN A – ON
3 FAN B – ON
FREON PUMP LOOP 2 – B
FLASH EVAP CNTLR PRI B – ON
- L4:P 9. ✓cb AC2 Φ A LG SNSR 2 – cl
O6 10. ANNUN BUS SEL ACA 2/3 – MNB
F6,F8 11. HSI SEL SOURCE – not MLS 3 or TACAN 3
12. Use He PRESS for L,R OMS Qty est
- O17:C 13. SIG CONDR FREON B – AC2
14. XXXXXX MNVR YYYYYY
R OMS – sel SEC GMBL
15. BFS, GNC 51 OVERRIDE RGA 3 – desel
- When BUS LOSS ACTIONS complete:
16. Perform LOSS OF 1 FC (PWRDN), then:
For SSME HYD REPRESS:
- R4 17. HYD MPS/TVC ISOL VLV SYS 1,2 (two) – OP
Wait 10 sec, then CL
- If > 25 min before APU start:
- A12 18. APU HTR
GAS GEN/FUEL PUMP 2 – A AUTO
3 – B AUTO
- If prior to TIG-5:
- L1 19. TOP EVAP HTR
NOZ R – A AUTO

MNC FPC3

- C3 1. S-BD PM CNTL – PNL,CMD
- 2. BFS, GNC 51 OVERRIDE
- TDRS – ITEM 46 EXEC (*)
- 3. Go to AC3 (2 or 3Φs)

MNC FLC3

- C3 1. S-BD PM CNTL – PNL,CMD
- 2. BFS, GNC 51 OVERRIDE
- TDRS – ITEM 46 EXEC (*)
- O8 3. FWD RCS MANF ISOL 4 – CL

MNC MPC3

- 1. BFS, GNC 51 OVERRIDE RGA 3 – desel

MNC APC6

- R2 1. BLR CNTLR/HTR 3 – A
- 2 – B
- L1 2. TOP EVAP HTR NOZ R – A AUTO
- FLASH EVAP CNTLR PRI B(SEC) – ON
- 3. XXXXXX MNVR YYYYYY
- R OMS – sel SEC GMBL
- For SSME HYD REPRESS:
- R4 4. HYD MPS/TVC ISOL VLV SYS 1,2
- (two) – OP
- Wait 10 sec, then CL
- If > 25 min before APU start:
- A12 5. APU HTR
- GAS GEN/FUEL PUMP 2 – A AUTO
- 3 – B AUTO
- TK/FU LINE/H2O/SYS 2A – AUTO
- 3B – AUTO

MNC APC3

- 1. XXXXX MNVR YYYY
R OMS – sel SEC GMBL
- If > 25 min before APU start:
- A12 2. APU HTR TK/FU LINE/H2O/SYS 3B – AUTO

MNC ALC3

- R2 1. BLR CNTLR/HTR 3 – A
2 – B
- L1 2. TOP EVAP HTR NOZ R – A AUTO
- 3. FLASH EVAP CNTLR PRI B(SEC) – ON

For SSME HYD REPRESS:

- R4 4. HYD MPS/TVC ISOL VLV SYS 1,2
(two) – OP
Wait 10 sec, then CL
- If > 25 min before APU start:
- A12 5. APU HTR
GAS GEN/FUEL PUMP 2 – A AUTO
3 – B AUTO
TK/FU LINE/H2O/SYS 2A – AUTO
3B – AUTO

CNTL

MNC O16

- O6 1. ANNUN BUS SEL ACA 2/3 – MNB
- F6,F8 2. HSI SEL SOURCE – not MLS 3
- 3. Use He PRESS for L,R OMS Qty est
- F3 4. Use PLT's DRAG CHUTE ARM

MNC R14

NOTE
PS AUDIO lost

- C3 1. AUD CTR – 1

CNTL AB1

CAUTION

Do not sw S-BD PM CNTL to PNL if PNL A1 Encryption sws in either 'T/R', 'RCV', or 'ALL'. Will result in loss of all S-BD COMM

- If FLASH EVAP CNTLR PRI B in 'GPC':
- L1 1. FLASH EVAP CNTLR PRI B – ON
 - 2. TOP EVAP HTR DUCT sel – B
 - 3. HI LOAD DUCT HTR sel – B
 - A12 4. APU HTR
 - GAS GEN/FUEL PUMP 1 – B AUTO
 - 3 – A AUTO
 - TK/FU LINE/H2O/SYS 1B – AUTO
 - 3A – AUTO
 - 5. Use BFS, SM SYS SUMM 2 for APU 1 FUEL QTY
 - 6. Use R Trim and Body Flap sws
 - R2 7. BLR CNTLR/HTR 1 – A

CNTL

CNTL AB2

- F6 1. CDR disp sws (eight) – green dot
- L1 If H2O LOOP 1 active:
 - 2. H2O PUMP LOOP 1 – B
- If FLASH EVAP CNTLR PRI B is ON:
 - 3. FLASH EVAP CNTLR PRI B – GPC
- 4. TOP EVAP HTR NOZ L – A AUTO
 - DUCT sel – B
 - HI LOAD DUCT HTR sel – B
- O8 5. FWD RCS MANF ISOL 1 – CL
- A12 6. APU HTR
 - GAS GEN/FUEL PUMP 1 – B AUTO
 - TK/FU LINE/H2O/SYS 1B – AUTO
 - 3A – AUTO
- R2 7. BLR CNTLR/HTR 1 – A

CNTL AB3

NOTE

CDR's BFS ENGAGE capability lost

If BFS ENGAGE reqd:

1. Use PLT's RHC
2. GPCs 1,2,4 (three) – STBY,HALT
3. BFS I/O RESET

If no S-BD COMM:

- C3
4. S-BD PM CNTL – PNL,CMD
 5. BFS, GNC 51 OVERRIDE
TDRS – ITEM 46 EXEC (*)
- R2
6. BLR CNTLR/HTR 1,3 (two) – B
- If H2O LOOP 1 active:
- L1
7. H2O PUMP LOOP 1 – B
 8. TOP EVAP HTR DUCT sel – B
 9. HI LOAD DUCT HTR sel – B
- Do not perform next step if AB1,2,3 unpwr:
- A12
10. GNC 23 RCS ovrd MANF F1 jets – OP
 11. APU HTR GAS GEN/FUEL PUMP 1 – A AUTO
TK/FU LINE/H2O/SYS 1B – AUTO
3A – AUTO

CNTL BC1

CAUTION
Do not sw S-BD PM CNTL to PNL if
subsequent Fault Msg – ‘BCE
STRG 3 NSP’ or loss of COMM

- L1 1. TOP EVAP HTR NOZ L – B AUTO
DUCT sel – A
HI LOAD DUCT HTR sel – A
- 2. Use R Trim and Body Flap sws
For SSME HYD REPRESS:
- R4 3. HYD MPS/TVC ISOL VLV SYS 1,3
(two) – OP. Wait 10 sec, then CL
- A12 4. APU HTR GAS GEN/FUEL PUMP 1 – A AUTO
2 – B AUTO
TK/FU LINE/H2O/SYS 1A – AUTO
2B – AUTO
- R2 5. BLR CNTLR/HTR 2 – A
- F3,F4 6. Use PLT's DRAG CHUTE DPY/JETT
- 7. BFS, GNC 51 OVERRIDE RGA 2 – desel

CNTL BC2

- C3 1. S-BD PM CNTL – PNL,CMD
- 2. BFS, GNC 51 OVERRIDE
TDRS – ITEM 46 EXEC (*)
- R1 3. O2 TK2 HTRS B – AUTO
If H2O LOOP 1 active:
- L4:F 4. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 H2O PUMP LOOP 1 – A
If FLASH EVAP CNTLR SEC in GPC:
- 5. FLASH EVAP CNTLR SEC – ON
- 6. TOP EVAP HTR DUCT sel – A
- 7. HI LOAD DUCT HTR sel – A
- F8 8. PLT disp sws (eight) – green dot
- O8 9. FWD RCS MANF ISOL 2 – CL
For SSME HYD REPRESS:
- R4 10. HYD MPS/TVC ISOL VLV SYS 1,3
(two) – OP. Wait 10 sec, then CL
- A12 11. APU HTR GAS GEN/FUEL PUMP 2 – B AUTO
TK/FU LINE/H2O/SYS 1A – AUTO
2B – AUTO
- 12. Use BFS, SM SYS SUMM 2 for APU 2
FUEL QTY
- 13. Use L Trim and Body Flap sws
- R2 14. BLR CNTLR/HTR 2 – A
- F3,F4 15. Use PLT's DRAG CHUTE DPY/JETT

CNTL BC3

Do not perform next step if BC1,2,3 unpwr:

1. GNC 23 RCS ovrd MANF F2 jets – OP
 2. BLR CNTLR/HTR 1,2 (two) – B
- If H2O LOOP 1 active:
3. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
H2O PUMP LOOP 1 – A
- If FLASH EVAP CNTLR SEC is ON:
4. FLASH EVAP CNTLR SEC – GPC
 5. TOP EVAP HTR NOZ R – B AUTO
DUCT sel – A
 6. HI LOAD DUCT HTR sel – A
 7. APU HTR GAS GEN/FUEL PUMP 2 – A AUTO
TK/FU LINE/H2O/SYS 1A – AUTO
2B – AUTO

CNTL CA1

NOTE

GPC 3,5 – No BFS ENGAGE capability

If BFS in GPC 3(5):

If pre-TIG (NOM ENTRY):

1. Delay at least 1 rev
2. Perform MAL, DPS, GPC FRP-3, BFS GPC FAIL RECOVERY (ENTRY) to regain BFS capability for ENTRY, then:
Go to step 4

If post-TIG:

- | | |
|-------|---|
| ◇ O6 | 3. GPC OUTPUT 3(5) – TERM |
| L1 | 4. If FLASH EVAP CNTLR PRI A in GPC:
FLASH EVAP CNTLR PRI A – ON |
| R4 | 5. TOP EVAP HTR NOZ R – A AUTO |
| | For SSME HYD REPRESS: |
| R4 | 6. HYD MPS/TVC ISOL VLV SYS 1,2
(two) – OP
Wait 10 sec, then CL |
| A12 | 7. APU HTR
GAS GEN/FUEL PUMP 2 – A AUTO
3 – B AUTO
TK/FU LINE/H2O/SYS 2A – AUTO
3B – AUTO |
| R2 | 8. BLR CNTLR/HTR 3 – A |
| F2,F3 | 9. Use CDR's DRAG CHUTE DPY/JETT |
| | 10. <u>BFS G51</u> RGA 3 – desel |

CNTL CA2

- | | |
|-------|--|
| R1 | 1. O2 TK1 HTRS B – AUTO |
| | If FLASH EVAP CNTLR PRI A is ON: |
| L1 | 2. FLASH EVAP CNTLR PRI A – GPC |
| O8 | 3. FWD RCS MANF ISOL 3 – CL |
| | For SSME HYD REPRESS: |
| R4 | 4. HYD MPS/TVC ISOL VLV SYS 1,2 (two) – OP
Wait 10 sec, then CL |
| A12 | 5. APU HTR GAS GEN/FUEL PUMP 3 – B AUTO
TK/FU LINE/H2O/SYS 2A – AUTO
3B – AUTO |
| L1 | 6. Use L Trim and Body Flap sws |
| R2 | 7. BLR CNTLR/HTR 3 – A |
| F2,F3 | 8. Use CDR's DRAG CHUTE DPY/JETT |

CNTL CA3

- R2 1. BLR CNTLR/HTR 2,3 (two) – B
A12 2. APU HTR GAS GEN/FUEL PUMP 3 – A AUTO
 TK/FU LINE/H2O SYS 2A – AUTO
 3B – AUTO
 3. Use BFS, SM SYS SUMM 2 for APU 3
 FUEL QTY

ESS

ESS 1BC DA1 (Entire Bus)

NOTE

Pri C/W Sys and Matrix lost (B/U C/W Tone remains). GPC 1,4 lost if pwr cycled OFF(ON)

- O5 1. L AUD CNTL sel – R (CDR can't talk)
- 2. Perform FC1 SHUTDN (Cue Card), then:
If add'l ltg reqd:
- C3 3. EMER LTG – ON/OFF
- R1 4. O2,H2 TK2 HTRS A,B (four) – OFF
TK3 HTRS A,B (four) – AUTO
- If CRYO O2 TK3 QTY < 55%:
- 5. O2 TK3 HTRS B – OFF

ESS 1BC MPC1

- 1. Go to FC1 SHUTDN (Cue Card)

ESS 1BC FD

NOTE

GPC 1,4 lost if pwr cycled OFF or ON

- 1. Go to FC1 SHUTDN (Cue Card)

ESS 1BC O13 & R14

NOTE

Pri C/W Sys & Matrix lost (B/U C/W Tone remains)

- O5 1. L AUD CNTL sel – R (CDR can't talk)
- If add'l ltg reqd:
- C3 2. EMER LTG – ON/OFF
- R1 3. O2,H2 TK2 HTRS A,B (four) – OFF
TK3 HTRS A (two) – AUTO

ESS

ESS 2CA DA2 (Entire Bus)

NOTE

C/W B PWR SPLY lost (Pri C/W remains).
FAULT SUMM MSGs must be reset to
avoid C/W Tone masking. GPC 2,5 lost if
pwr cycled OFF(ON)

- C3 1. AUD CTR – 2
- O9 2. R AUD CNTL sel – L (PLT can't talk)
- 3. Perform FC2 SHUTDN (Cue Card), then:
If add'l Itg reqd:
- C3 4. EMER LTG – ON/OFF
- R1 5. O2,H2 TK1 HTRS A,B (four) – OFF
TK3 HTRS A (two) – AUTO

ESS 2CA MPC2

- 1. Go to FC2 SHUTDN (Cue Card)

ESS 2CA FD

NOTE

GPC 2,5 lost if pwr cycled OFF(ON)

- 1. Go to FC2 SHUTDN (Cue Card)

ESS 2CA O13 & R14

NOTE

C/W B PWR SPLY lost (Pri C/W remains).
FAULT SUMM MSGs must be reset to avoid
C/W Tone masking

- C3 1. AUD CTR – 2
- O9 2. R AUD CNTL sel – L (PLT can't talk)
- If additional Itg reqd:
- C3 3. EMER LTG – ON/OFF
- R1 4. O2,H2 TK1 HTRS A,B (four) – OFF
TK3 HTRS A (two) – AUTO

ESS 3AB DA3 (Entire Bus)

NOTE

Do not ENGAGE BFS. Computer Status Matrix lost. GPC 3 lost if pwr cycled OFF(ON)

1. (BFS) GPC OUTPUT – TERM
2. Go to FC3 SHUTDN (Cue Card)

ESS 3AB MPC3

1. Go to FC3 SHUTDN (Cue Card)

ESS 3AB FD

NOTE

Do not ENGAGE BFS. GPC 3 lost if pwr cycled OFF(ON)

- O6
1. (BFS) GPC OUTPUT – TERM
 2. Go to FC3 SHUTDN (Cue Card)

ESS 3AB O13

NOTE

Computer Status Matrix lost

GUIDANCE, NAVIGATION, AND CONTROL

GNC

DISPLAY SW L(R)

1. L(R) disp sw (eight) – green dot

G51 ROLL MODE SW

GNC 51 OVERRIDE

If ROLL MODE ≠ sw pos:

1. AUTO SEL – ITEM 42 EXEC (*)

FCS CH 1(2,3,4) (2nd FAIL)

GNC 53 CONTROLS

1. ✓ MCC or G53
If two FCS CH ↓ on any actuator or no COMM:
2. (Remaining) FCS CH (two) – ORIDE

GNC

SBTC/THC L

If first fail:

1. No action >>

If second fail (dilemma):

2. L FLT CNTLR PWR – OFF (ON only when reqd)

NOTE

If no response to THC in +X axis, and
RCS completion reqd, pitch vehicle to
burn in –X axis

Post MM304 trans:

3. L FLT CNTLR PWR – ON

RHC L(R)

If first fail:

1. No action >>

If second fail (dilemma):

2. (Aff) FLT CNTLR PWR – OFF

If pre-deorbit burn:

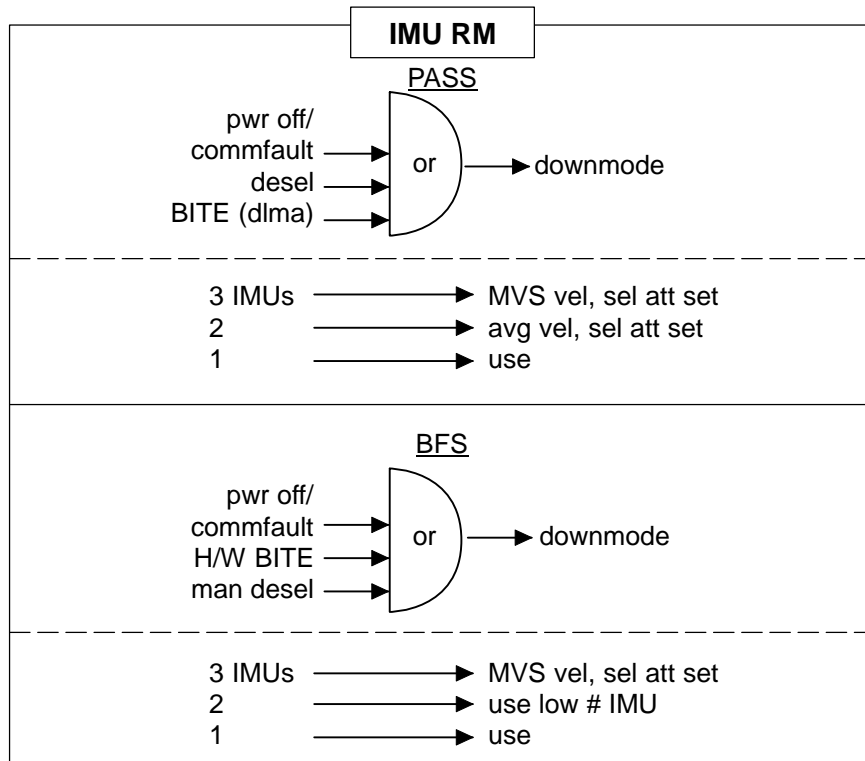
3. Perform G3 to G2/G8 TRANS (DPS), then:
4. GNC 25: RM ORBIT
Desel all CHs on aff RHC – DES (*)
5. (Aff) FLT CNTLR PWR – ON
6. Deflect aff RHC in each axis (✓R,P,Y Xdcrs)
7. (Aff) FLT CNTLR PWR – OFF
8. (Good) RHC CH – DES (no *)
9. Go to G2/G8 to G3 TRANS (DPS)

EPCL/ALL/GEN H

DISP SW/G51 ROLL MODE
FCS CH 1(2,3,4)

6-3

SBTC/THC L
RHC



RM FAIL IMU, RGA, AA

BFS, GNC 51 OVERRIDE

1. (Aff) LRU – desel

RM DLMA IMU

GNC 21 IMU ALIGN

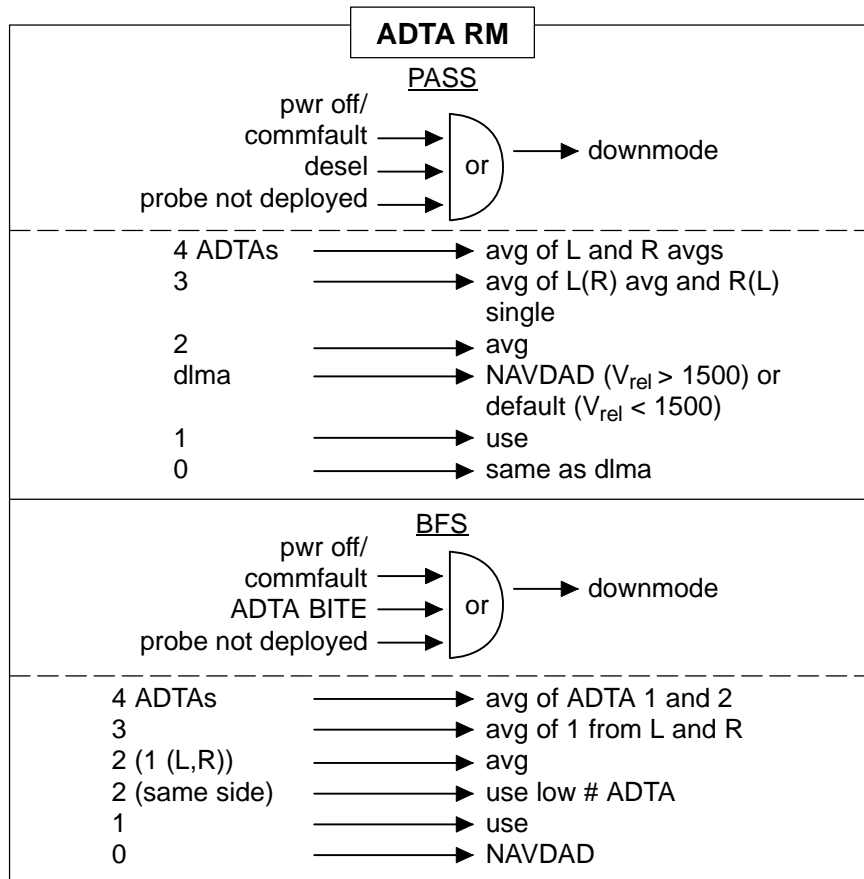
1. \checkmark MCC or ACC > 0.03, bad IMU – desel (PASS and BFS)

EPCL/ALL/GEN H

IMU RM

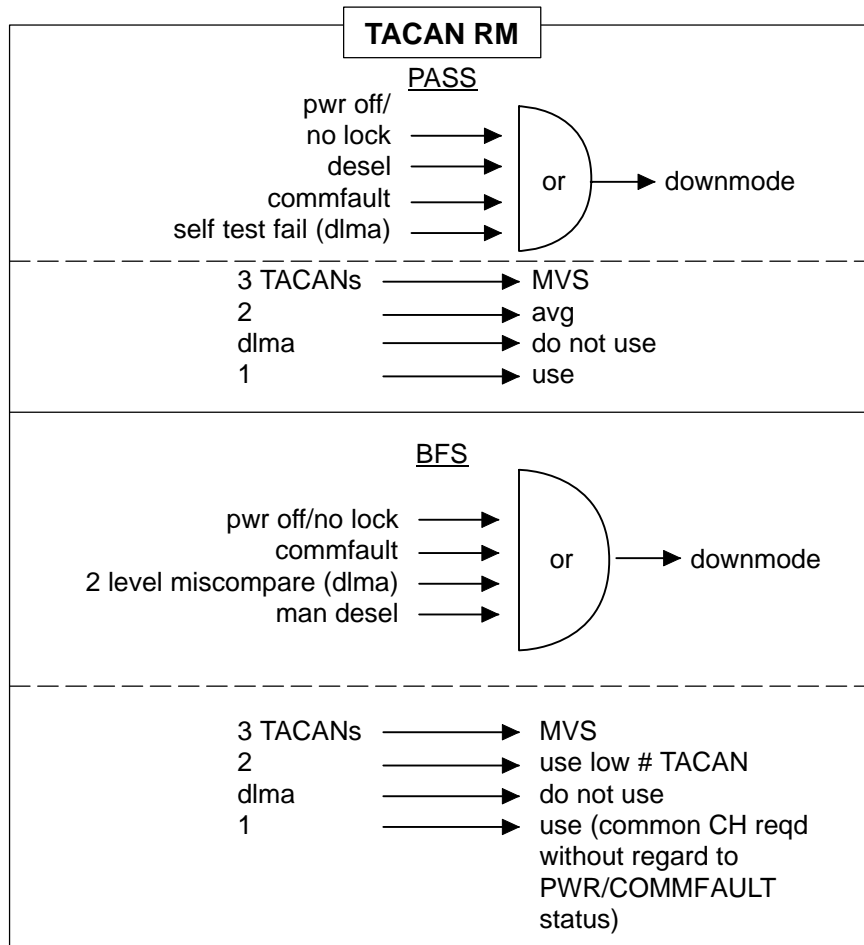
6-5

**RM FAIL IMU,RGA,AA
RM DLMA IMU**



NOTE

When BFS engaged, if a failed ADTA is a candidate for selection, pull ADTA cb, or stow applicable probe

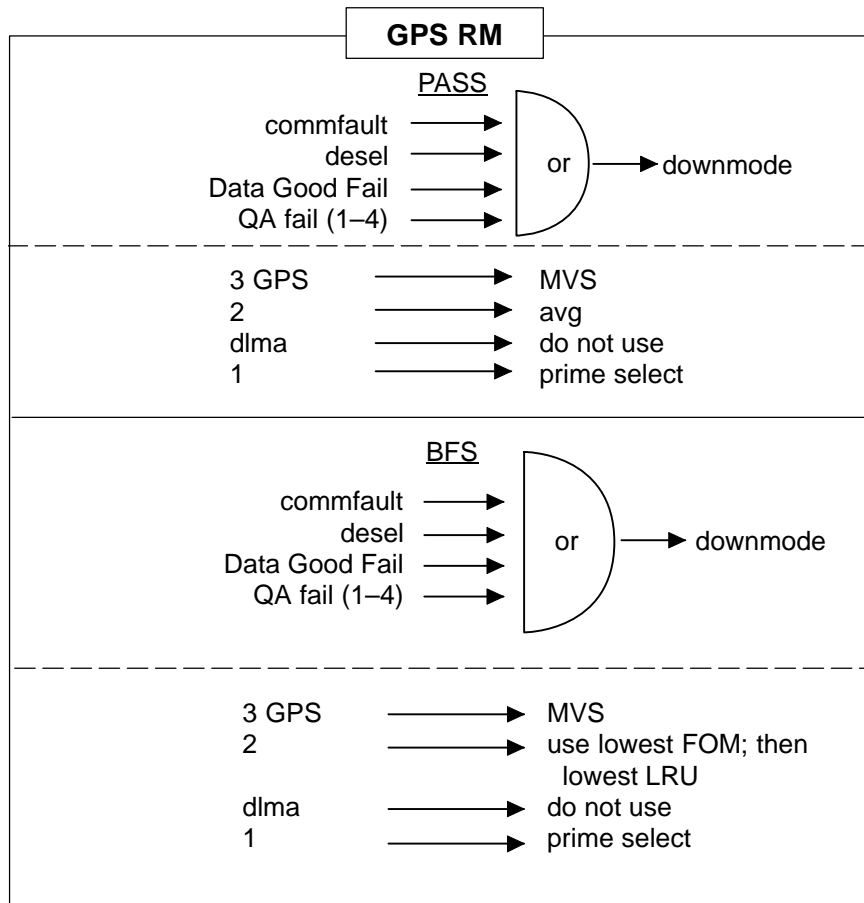


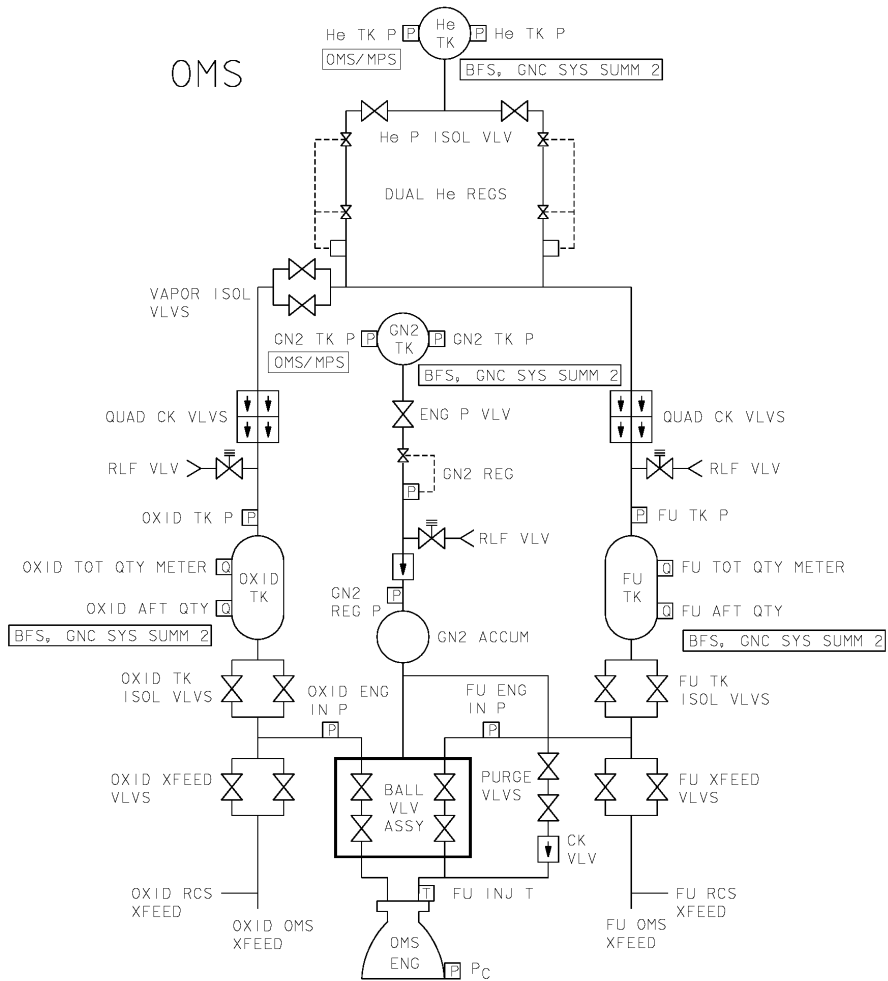
EPCL/ALL/GEN H,1

ADTA RM

6-7

TACAN RM
GPS RM (Over)





DATE 06/17/98

48033A701, SCH 1

OMS

OMS TK P (FU or OX) LOW

BFS, GNC SYS SUMM 2

1. If corresp ENG IN P disagrees >>
2. Perform OMS SECURE, then:

If prior to burn:

If corresp ENG IN P decr (OMS INLET LINE LEAK):

3. ✓MCC >>

If OMS FU(OX) TK P decr (PROP TK LEAK):

4. Go to LEAKING OMS PRPLT BURN

NOTE

Post MM304: If OX TK leak, open vent doors

OMS TK P (FU and OX) HIGH

BFS, GNC SYS SUMM 2

1. (Aff) OMS He PRESS/VAP ISOL (two) – CL, then cycle to maintain TK P (234–288)

OMS He TK P LOW

BFS, GNC SYS SUMM 2

1. ✓He TK P < 1500 or decr (**OMS/MPS**) and SPEC)
If He TK P > 640:
2. (Aff) OMS He PRESS/VAP ISOL – OP
3. Continue with planned burn

NOTE

Post MM304: If leak, open vent doors

OMS N2 TK P LOW

BFS, GNC SYS SUMM 2

1. ✓N2 TK P < 1200 or decr (**OMS/MPS**) and SPEC)
If preburn:
2. (Aff) OMS ENG – ARM
3. If N2 REG P decr: (aff) OMS ENG – OFF
4. ✓MCC for use of OMS ENG

OMS

OMS N2 REG P LOW

BFS, GNC SYS SUMM 2

- 1. ✓ N2 TK P decr (OMS/MPS) and SPEC)
- If preburn:
 - 2. (Aff) OMS ENG – OFF
 - 3. ✓ MCC for use of OMS ENG

NOTE

N2 REG P > 299 allows one OMS ENG start

OMS N2 REG P HIGH

BFS, GNC SYS SUMM 2

- 1. ✓ N2 TK P decr (OMS/MPS) and SPEC)
- 2. (Aff) OMS ENG – ARM

L(R) OMS GIMBAL

GNC XXXXX MNVR EXEC

If first failure:

- 1. (Aff) gimbal – sel SEC GMBL (twice) >>

If second failure:

- 2. Go to OMS GMBL, appropriate BURN MONITOR (Cue Card)

OMS SECURE

- 1. (Aff) OMS ENG – OFF
 - XFEED (two) – CL (tb-CL)
 - TK ISOL (two) – CL (tb-CL)
 - He PRESS/VAP ISOL (two) – CL

EPCL/4/GEN H

**OMS TK P FU and/or OX
OMS HE(N2) TK P LOW**

7-3

**OMS N2 REG P
OMS GIMBAL/SECURE**

XFEED: L OMS PRPLT to R OMS ENG

1. ✓ L OMS TK ISOL (two) – OP (tb–OP)
2. R OMS TK ISOL (two) – CL (tb–CL)
3. L,R OMS XFEED (four) – OP (tb–OP)

XFEED: R OMS PRPLT to L OMS ENG

1. ✓ R OMS TK ISOL (two) – OP (tb–OP)
2. L OMS TK ISOL (two) – CL (tb–CL)
3. L,R OMS XFEED (four) – OP (tb–OP)

XFEED RETURN: OMS to OMS (N/A during I'CNCT)

1. L,R OMS XFEED (four) – CL (tb–CL)
TK ISOL (four) – OP (tb–OP)

— | |

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EPCL/ALL/GEN H

OMS XFEEDS

7-5

—

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— | |

| | —

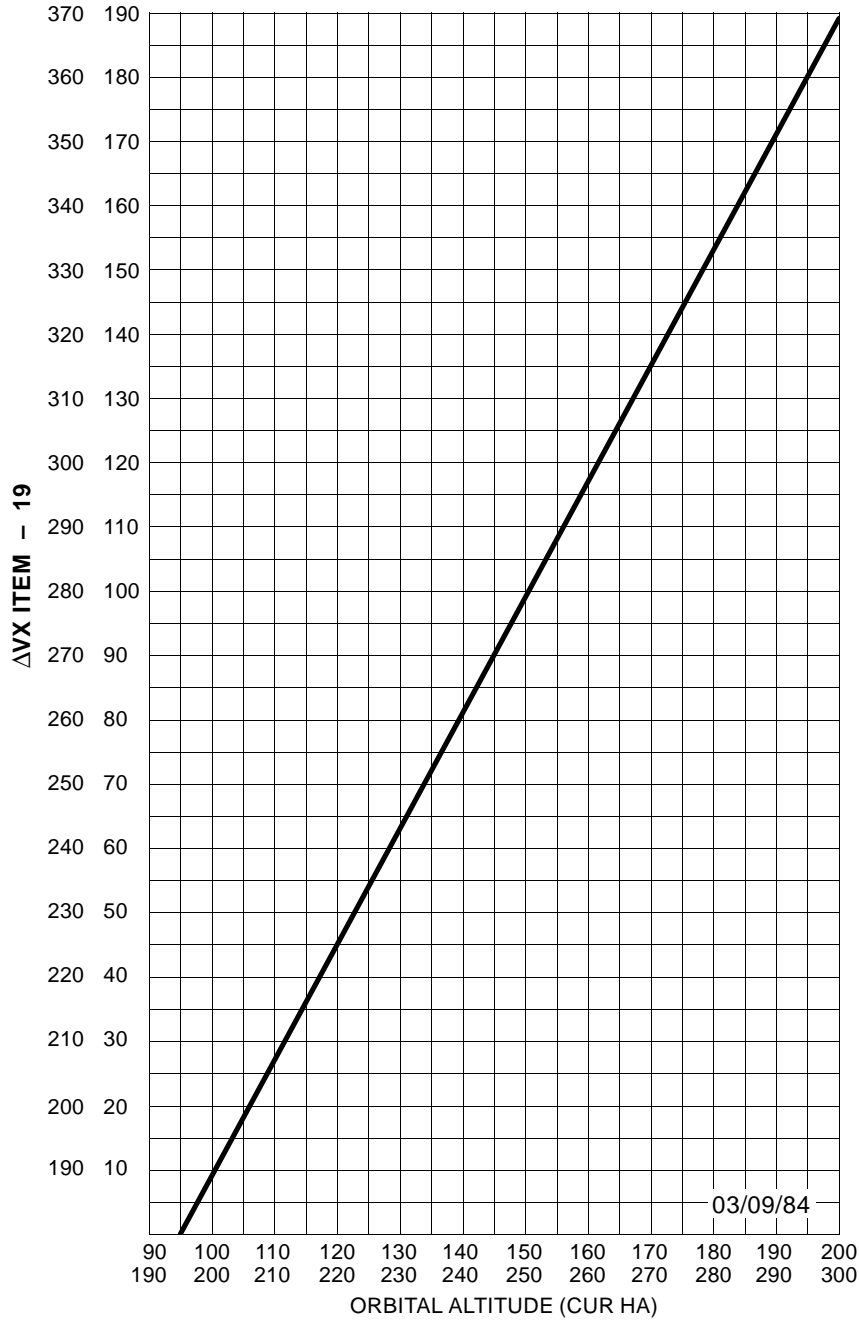
LEAKING OMS PRPLT BURN

1. ✓Vent doors open for OX or He leak
2. Install LEAKING OMS PRPLT/He BURN (Cue Card) and ON-ORBIT OMS BURN MONITOR (Cue Card) (C2 wedge)
3. GNC, OPS 302 PRO
4. GNC DEORB MNVR EXEC leaking OMS – sel, and determine out of plane or retrograde burn based on TIG (MCC or msg)
5. GMBL CK sel sys
6. Enter retrograde ($-\Delta VX$) or out of plane (ΔVY) burn data on LEAKING OMS PRPLT/He BURN (Cue Card) from ΔVX vs ORB ALT chart, 7-7. If out of plane burn, enter $\Delta VY \pm 500$
7. Load burn data
LOAD – ITEM 22 EXEC ✓TGT HP
TIMER – ITEM 23 EXEC
8. GNC 23 RCS L1A or L3A – desel
R1A or R3A – desel
9. Mnvr to burn att. When mnvr complete, update TIG if appropriate

At TIG-4, perform OMS burn prep:

10. Leaking OMS TK ISOL (two) – OP (tb-OP)
✓XFEED (four) – CL (tb-CL)
He PRESS/VAP ISOL A – OP (wait 2 sec),
B – OP
11. Burn to depletion using LEAKING OMS PRPLT/He BURN (Cue Card), then postburn:
12. GNC 23 RCS AFT jets – resel
13. FLT CNTLR PWR (two) – OFF
14. (Aff) OMS He PRESS/VAP ISOL (two) – CL
TK ISOL (two) – CL (tb-CL)
15. GNC, OPS 301 PRO

ΔVX vs ORB ALT



LK PRPLT BURN

7-7

EPCL/ALL/GEN H

ΔVX vs ORB ALT

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RCS**RCS SECURE (FWD,AFT)**

If normal config:

1. RCS MANF ISOL (five) – CL (tb-CL)
XFEED (two) – CL (tb-CL)
TK ISOL (all) – CL (tb-CL)
He PRESS (two) – CL (tb-CL) >>

If (feeding) XFEED:

2. L,R RCS MANF ISOL (ten) – CL (tb-CL)
(Receiving) XFEED (two) – CL (tb-CL)
(Feeding) XFEED (two) – CL (tb-CL)
TK ISOL (three) – CL (tb-CL)
He PRESS (two) – CL (tb-CL) >>

If (receiving) XFEED or OMS/RCS I'CNCT:

3. ✓ RCS TK ISOL (three) – CL (tb-CL)
He PRESS (two) – CL (tb-CL)

I'CNCT: L OMS to RCS

1. L OMS He PRESS/VAP ISOL (two) – OP
2. ✓ OMS TK P > RCS TK P and $\Delta P < 50$
3. L OMS XFEED (two) – OP (tb-OP)
4. L,R RCS XFEED (four) – OP (tb-OP)
TK ISOL (six) – CL (tb-CL)

I'CNCT: R OMS to RCS

1. R OMS He PRESS/VAP ISOL (two) – OP
2. ✓ OMS TK P > RCS TK P and $\Delta P < 50$
3. R OMS XFEED (two) – OP (tb-OP)
4. L,R RCS XFEED (four) – OP (tb-OP)
TK ISOL (six) – CL (tb-CL)

I'CNCT TK SWITCH

1. L(R) OMS XFEED (two) – OP (tb-OP)
He PRESS/VAP ISOL (two) – OP
2. R(L) OMS XFEED (two) – CL (tb-CL)
He PRESS/VAP ISOL (two) – CL

I'CNCT RETURN

If OPS 301:

1. DAP: INRTL/PULSE
2. L(R) OMS He PRESS/VAP ISOL (two) – OP
XFEED (two) – CL (tb-CL)
3. L,R RCS XFEED (four) – CL (tb-CL)
TK ISOL (six) – OP (tb-OP)
4. L(R) OMS He PRESS/VAP ISOL (two) – CL
5. DAP: as reqd >>

If OPS 302,303:

6. ✓L(R) OMS He PRESS/VAP ISOL (two) – OP
7. ✓OMS TK P > RCS TK P and $\Delta P < 50$
8. L,R RCS TK ISOL (six) – OP (tb-OP), GPC
XFEED (four) – CL(tb-CL), GPC
9. L(R) OMS XFEED (two) – CL (tb-CL)
He PRESS/VAP ISOL (two) – CL

EPCL/ALL/GEN H

RCS SECURE
I'CNCTs

8-3

I'CNCT RETURN

— | |

| | —

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8-4

EPCL/ALL/GEN H

—

—

— | |

| | —

XFEED: R RCS to L RCS

If AUTO XFEED:

1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. OMS XFEED (four) – CL (tb-CL)
3. MSTR RCS XFEED – FEED FROM R >>

If MANUAL XFEED:

4. L,R OMS XFEED (four) – CL (tb-CL)
5. RCS XFEED (four) – OP (tb-OP)
6. L RCS TK ISOL (three) – CL (tb-CL)
He PRESS (two) – CL (tb-CL)
7. MSTR RCS XFEED – FEED FROM R

XFEED: L RCS to R RCS

If AUTO XFEED:

1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. OMS XFEED (four) – CL (tb-CL)
3. MSTR RCS XFEED – FEED FROM L >>

If MANUAL XFEED:

1. L,R OMS XFEED (four) – CL (tb-CL)
2. RCS XFEED (four) – OP (tb-OP)
3. R RCS TK ISOL (three) – CL (tb-CL)
He PRESS (two) – CL (tb-CL)
4. MSTR RCS XFEED – FEED FROM L

XFEED RETURN: RCS

If AUTO XFEED:

1. L,R RCS TK ISOL (six) – GPC
XFEED (four) – GPC
2. MSTR RCS XFEED – OFF >>

If MANUAL XFEED:

3. L,R RCS He PRESS (four) – OP (tb-OP)
TK ISOL (six) – OP (tb-OP), GPC
XFEED (four) – CL (tb-CL), GPC
4. MSTR RCS XFEED – OFF

EPCL/ALL/GEN H

FWD RCS RM LOSS

GNC 23 RCS

If loss of FAIL OFF or LK detection capability:

1. (Aff) jet – DES INH (*) (reprioritize)
2. If auto deselected: Resel

If loss of total RM (BCE BYP or MDM fail):

3. If att control still available: Leave MANF STAT closed >>
4. If reqd for –X completion of deorb burn or fwd dump:
 ✓ RJD – ON and DES INH twice (reprioritize, reset RM),
 override MANF STAT open >>

If loss of FAIL ON detection capability:

5. ✓ RJD – ON, MANF STAT – op
6. (Aff) jet – DES INH twice (reprioritize, reset RM)

AFT RCS RM LOSS

GNC 23 RCS

CAUTION

Do not take action which will result in less than fail-safe jet redundancy (3Y, 2P jets/pod/dir)

If loss of FAIL OFF or LK detection capability:

1. (Aff) jet – DES INH (*) (reprioritize)
2. If yaw jet: Desel >>
3. If auto deselected: Resel

If loss of total RM (BCE BYP or MDM fail):

4. ✓RJD – ON
5. (Aff) jet – DES INH twice (reprioritize, reset RM)
If fail-safe redundancy (3Y,2P jets/pod/dir) lost, or if RCS deorbit to regain 4 +X jets:

6. Override MANF STAT open; otherwise, leave closed >>

If loss of FAIL ON detection:

7. ✓RJD – ON, MANF STAT(s) – op
8. (Aff) jet – DES INH twice (reprioritize, reset RM)
9. If yaw jet: Desel

RM DLMA MANF

GNC 51 OVERRIDE

If (aff) MANF tb – OP or sw not thrown:

1. If FRCS: ✓MCC
2. If ARCS: RCS RM MANF CL OVRD – ITEM 41 EXEC
3. If (aff) MANF tb – bp: (aff) MANF – GPC

EPCL/ALL/GEN H

FWD RCS RM LOSS

8-7

AFT RCS RM LOSS
RM DLMA MANF

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RCS JET FAIL (LEAK)

GNC 23 RCS

If OX/FU Qty diverging:

1. (Aff) RCS MANF ISOL – CL (tb–CL)

RCS JET FAIL (ON)

GNC 23 RCS

BFS, GNC SYS SUMM 2

1. (Aff) RCS MANF ISOL – CL (tb–CL)

If MANF P > 130 psi and stable (false alarm):

2. (Aff) RCS MANF ISOL – OP (tb–OP)
3. ✓AFT RCS RM LOSS

RCS JET FAIL (OFF)

GNC 23 RCS

If one jet failed:

1. DES INH * (reprioritize)
2. Continue with jet deselected >>

If more than one jet/pod/dir failed:

If preburn:

3. If available: Delay one orbit
4. Go to MAL, RCS, 10.1a >>

If postburn:

5. DES INH * (reprioritize)
6. Resel jets >>

If more than one jet failed, but no two in same pod and same direction:

7. DES INH * (reprioritize)
8. Continue with jets deselected
9. If time permits: Go to MAL, RCS, 10.1a

EPCL/ALL/GEN H

RCS LEAK ISOL

BFS, GNC SYS SUMM 2

1. If FU or OXID TK P high: Go to RCS TK P HIGH (FU or OX) >>
If FU or OXID TK P normal:
 2. ✓FU(OXID) He P (O3 meter and CRT) decr
 3. DAP: INRTL/PULSE
- After proc complete:
4. DAP: as reqd

SECURE RCS

5. Perform aff RCS SECURE, then:
If aff RCS was receiving XFEED/I'CNCT when leak occurred:
 6. Go to step 9

✓SINGLE MANF

If only one MANF P decr:

7. Return to normal config except leave (aff) MANF closed >>

✓PRPLT TK LEG (✓TWO MANF P)

If MANF 1,2 or MANF 3,4 P decr:

8. Return to normal config except leave (aff) TK ISOL (1/2 or 3/4/5), (aff) MANFs, and corresponding XFEED vlvs closed >>

✓He TK

9. ✓He P

If AFT decr:

10. Return to normal config (see NOTE, 8-11) >>

If FWD decr:

11. Return to normal config

When PRPLT TK P < 190:

12. Go to RCS SECURE >>

Cont next page

✓PRPLT TK

13. ✓PRPLT TK P

If OX leak:

14. Post MM304 transition: Open vent doors

If AFT decr:

15. XFEED from good RCS, then open (aff) MANFs >>

If FWD decr:

16. Return to normal config and perform FORWARD RCS DUMP (ENT, MM303) to depletion or until PRPLT TK P < 190, then go to RCS SECURE >>

✓He LEG

17. Open He PRESS A and B, ✓He P

If AFT decr:

18. Return to normal config except close He PRESS A and B. Cycle to maintain PRPLT TK P 220–245 (see NOTE) >>

If FWD decr:

19. Return to normal config except close He PRESS A and B. Cycle to maintain PRPLT TK P 200–245. When PRPLT TK P < 190, go to RCS SECURE >>

✓XFEED LINES

If aff RCS was feeding XFEED when leak occurred:

20. GNC 23 RCS
RCS L – ITEM 2 EXEC

If XFEED P decr or zero:

21. L,R RCS He PRESS (four) – OP (tb–OP)
TK ISOL (six) – OP (tb–OP)
MANF ISOL (ten) – OP (tb–OP)

22. MSTR RCS XFEED – OFF

23. Do not XFEED/l'CNCT >>

RCS MANF ISOL 5

24. If leak not found above: Assume RCS MANF ISOL 5 leak

25. Return to normal config except leave (aff) RCS MANF ISOL 5 – GPC (tb–CL)

NOTE

When He TK P < 456, l'CNCT from OMS. XFEED from good RCS at EI. If good RCS depleted, leaking RCS usable until PRPLT TK P < 190

EPCL/ALL/GEN H

RCS LK ISOL

8–11

RCS TK P HI (Over)

RCS TK P HIGH (FU or OX)

BFS, GNC SYS SUMM 2

√Via associated MANF P:

1. (Aff) RCS He PRESS (two) – CL (tb-CL)

When good RCS TK P < 220:

2. (Aff) RCS He PRESS A – OP (tb-OP)

If subsequently RCS TK P > 312:

3. (Aff) RCS He PRESS A – CL (tb-CL)

B – OP (tb-OP)

PERIGEE ADJUST -X RCS BURN, OPS 3

1. GNC, OPS 302 PRO
 2. Enter or verify Tgt Data per MNVR PAD
 3. GNC DEORBIT MNVR EXEC Load tgt
Load - ITEM 22 EXEC
Timer - ITEM 23 EXEC
✓ Burn data per MNVR PAD - Ignore computed burn attitude
DO NOT MNVR
 4. Load Inertial Burn Attitude per MNVR PAD
Roll - ITEM 24 + _____
Pitch - ITEM 25 + _____
Yaw - ITEM 26 + _____
 5. Mnv to Burn Attitude
✓ DAP: AUTO
ITEM 27 EXEC
 6. At TIG -00:30:
✓ Burn Att (INRTL), then ADI ATT - REF, pb - push
✓ CNTLR PWR (two) - ON
DAP: INRTL/DISC
✓ VGOX = negative
✓ VGOZ $\approx +1/4 \Delta VTOT$
- NOTE
Error needles invalid during burn.
Burn time $\approx 2 \times TGO$
7. TIG: THC -X: Trim VGOX < 0.2 fps critical burn
< 2.0 fps noncritical burn
or multiple FRCS jets FAIL OFF
 8. CNTLR PWR (two) - OFF
 9. GNC, OPS 301 PRO

Cont next page

10. If cutoff due to FRCS depletion (multiple FRCS jets FAIL OFF):

GNC 23 RCS

FWD page – ITEM 1 EXEC

Override Manifold Status to CL:

ITEM 40 EXEC

ITEM 41 EXEC

ITEM 42 EXEC

ITEM 43 EXEC

MPS

MAIN PROPULSION SYSTEM

**MPS He P/MPS C&W LIGHT
MPS PNEU REG**

R2 1. (Aff) MPS He ISOL – CL

MPS

PWRDN

LOSS OF 2 CAB FANS	10-2
AV BAY 1 COOLING	10-5
2 COOLING	10-7
3 COOLING	10-9
2 H2O LOOPS (ENTRY)	10-11
ENTRY MANEUVERS	10-17
BAILOUT MODE 8	10-19
LOSS OF CAB PRESS	10-29
LOSS OF 1 FREON LOOP OR HI LOAD EVAP (ENTRY)	10-33
LOSS OF FES	10-39
2 FREON LOOPS (ENTRY)	10-45
ENTRY MANEUVERS ...	10-54
BAILOUT MODE 8	10-56
LOSS OF 1 FC	10-67
2nd FC (ENTRY)	10-69

PWRDN

LOSS OF 2 CAB FANS

NOTE

Cabin pressure increase due to air heating may cause noisy CAB PRESS RELIEF vlv cycling

PWRDN

- | | |
|-----------------------|--|
| C3 | 1. MSTR MADS PWR – OFF |
| | 2. Minimize lgt |
| | 3. Perform <u>PL PWRDN</u> , then: |
| L1 | 4. ✓ CAB FAN A,B (two) – OFF |
| | TEMP CNTLR – OFF |
| | 5. HUM SEP A,B (two) – OFF |
| | 6. Use only one IDP/CRT with two MDUs, PGSC; minimize use |
| | If FLT CNTLR PWR not reqd: |
| O14,
O15,
O16:E | 7. cb DDU L,R,AFT (six) – op |
| | 8. Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry |
| O14:B | 9. cb MNA EVENT TIMER AFT – op |
| :C | 10. SMOKE DETN L/R FLT DK – op |
| O15:B | 11. MNB OI H2O BYP LOOP 2 SNSR – op |
| | 12. MSN TIMER AFT – op |
| O16:C | 13. MNC SMOKE DETN CAB – op |
| L4:J | 14. cb AC3 ΦA SIG CONDR HUM SEP – op |

NOTE

Use QDM as needed to provide respiratory cooling. If cabin temp > 95 degF and no evaporative cooling is sensed, don LES, ✓tabs, close visor, LES O2 – ON.

Begin drinking H2O (one 8-oz container every 15 min with salt tablet every other container) and continue through entry

15. Continue with deorbit using DELTAS TO DEORBIT PREP/ENTRY PULLOUT PAGE (10-3) |

DELTA TO DEORBIT PREP/ENTRY PULLOUT PAGE

NOTE

Incorporate the following changes or remove page and use with appropriate checklist or cue card

Deltas to DEORBIT PREP, NOMINAL DEORBIT PREP:

1. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDUs. Use one PGSC only if reqd
2. Minimize lgt
3. Minimize sun in cab (delay mnvr to burn att until TIG-15 if necessary)
4. In ENT SWITCH LIST/VERIF, do not activate pwrn items

Deltas to ENT, DEORBIT BURN:

- | | |
|-------------|--|
| MO10W | 5. If time permits: set up for cabin purge |
| | 6. 14.7 CAB REG INLET SYS 1,2 vlv (two) – OP |
| | 7. O2 REG INLET SYS 1 vlv – OP |
| | √2 vlv – CL |
| L2 | 8. O2/N2 CNTLR VLV SYS 1 – AUTO (O2/N2) |
| | 2 – OP(N2) |
| | 9. ✓O2 SYS 1,2 SPLY (two) – OP (tb-OP) |
| INNER HATCH | 10. Remove inner airk hatch Equal vlv caps (two) |
| | 11. ✓Equal vlv (two) – NORM |
| | 12. Reinstall Equal vlv caps (two) |
| | 13. Open inner hatch |
| ML86B:B | 14. cb MNA VAC VENT ISOL VLV – cl |
| ML31C | 15. VAC VENT ISOL VLV BUS SEL – MNA |
| | CNTL – OP (tb-OP) |
| | NOZ HTR – ON |

At TIG-20 (if set up): Initiate cabin purge

WARNING

Do not use WCS once constant Cabin Purge has started because of high N2 concentration

- | | |
|------------------------|---|
| MO32M,
MO69M,
C6 | 16. LEH O2 1(2,...8) vlv – OP (as reqd) |
| L2 | 17. O2 XOVR SYS 1 – CL |
| | √2 – OP |

Cont next page

- AW82B
18. AIRLK DEPRESS vlv cap – vent, remove
 19. vlv – 5
 20. Close inner hatch
 21. At TIG–15: Mnv r to deorbit burn att
- At TIG–4:
22. Use two IDP/CRTs with four MDUs for deorbit burn
- O14,O15,
O16:E
F6,F8
23. cb DDU L,R (four) – cl
 24. L,R FLT CNTLR PWR (two) – ON
- Deltas to ENT, POSTBURN:
25. Use one IDP/CRT with two MDUs
- F6,F8
O14,
O15,
O16:E
26. L,R FLT CNTLR PWR (two) – OFF
 27. cb DDU L,R (four) – op
- Deltas to ENTRY MANEUVERS (Cue Card):
- At EI:
28. Use only two IDP/CRTs with four MDUs
- O14,O15,
O16:E
F6
29. cb DDU L,R (four) – cl
 30. L FLT CNTLR PWR – ON
- At M = 2.7:
- F3
31. HUD PWR (two) – ON
- At Wheel Stop:
32. Visors open, LES O2 – OFF
 33. Go to EXPEDITED PWRDN (ENT, POST LDG)

LOSS OF AV BAY 1 COOLING

WARNING

There is no smoke detection or air cooling in AV BAY 1. Failure of any LRU still powered in AV BAY 1 may be indicative of fire in progress. Immediately discharge fire suppression bottle

O7
L1

1. ✓TACAN 1 MODE sel – OFF
2. AV BAY 1 FAN (two) – OFF

If after TIG-5, no GPC reconfiguration:

3. Go to step 9

If between MM301 trans and TIG-5:

RECONFIG DPS

GPC OPS	1	2	3	4	5
	-	G3	G3	-	BFS
PWR	ON	ON	ON	ON	ON
OUTPUT	NORM	NORM	NORM	NORM	B/U
MODE	HALT	RUN	RUN	HALT	RUN

Cont next page

REASSIGN STRINGS TO GPCs 2,3 IN MC 3

	4.	<u>GNC 0 GPC MEMORY</u> CONFIG – ITEM 1 +3 EXEC Modify MC 3 per table———→ DOWNLIST GPC – ITEM 44 +2 EXEC	CONFIG GPC	3 12340
CRT	5.	GNC, OPS 30X PRO	STR	1 3 2 2 3 3 4 2
C3	6.	FCS CH (four) – ORIDE	PL	1/2 2
O6	7.	GPC MODE 1,4 (two) – STBY (tb-bp) – HALT	CRT	1 2 2 3 3 2 4 0
	8.	(BFS) GNC I/O RESET	L	1 1 2 2
			MM	1 2 2 3

If prior to TIG perform following pwr dn:

- O14:A 9. BRAKES MNA – OFF
- :E 10. cb MNA ADTA 1 – op
- 11. ACCEL 1 – op
- O15:F 12. ACCEL 4 – OFF
- O16:A 13. BRAKES MNC – OFF
- :E 14. cb MNC ADTA 3 – op
- O8 15. MLS 1 – OFF
- L4:P 16. cb AC3 ΦA LG SNSR 1 – op
- 17. P&I to ENTRY MANEUVERS (Cue Card):
At EI, repwr above components, then:
PASS, BFS I/O RESET
At V = 10K, if TACAN 2 or 3 failed:
TACAN 1 MODE sel – GPC

NOTE

Post rollout: Immediately pwr dn air cooled equipment in AV BAY 1, EQUIPMENT COOLING MATRIX (ECLS), 4-1

LOSS OF AV BAY 2 COOLING

WARNING

There is no smoke detection or air cooling in AV BAY 2. Failure of any LRU still powered in AV BAY 2 may be indicative of fire in progress. Immediately discharge fire suppression bottle

O7
L1

1. ✓ TACAN 2 MODE sel – OFF
 2. AV BAY 2 FAN (two) – OFF
- If after TIG-5, no GPC reconfiguration:
3. Go to step 10
- If between MM301 trans and TIG-5:

RECONFIG DPS

GPC OPS	1 G3	2 -	3 BFS	4 G3	5 -
PWR	ON	ON	ON	ON	ON
OUTPUT	NORM	NORM	B/U	NORM	NORM
MODE	RUN	HALT	RUN	RUN	HALT

REASSIGN STRINGS TO GPC 1,4 IN MC 3

CRT
O6

4. GNC 0 GPC MEMORY
CONFIG – ITEM 1 +3 EXEC
Modify MC 3 per table →
DOWNLIST GPC – ITEM 44
+1 EXEC
5. GNC, OPS 30X PRO
6. GPC MODE 2 – STBY
5 – STBY
2,5 (two) – HALT
OUTPUT 5 – NORM

CONFIG GPC	3 12340
STR 1	1
2	4
3	1
4	4
PL 1/2	1
CRT 1	1
2	4
3	1
4	0
L 1	0
2	0
MM 1	1
2	4

ESTABLISH BFS IN GPC 3

7. Perform MAL, DPS, SSR-7, GPC IPL MENU OPTION (PASS/BFS), then:
8. (BFS) GNC, OPS 301 PRO
GPC OUTPUT 3 – B/U
MODE 3 – RUN

Cont next page

NOTE

After completing reassignment, the following uplinks to the BFS may be required: Guidance targets, ADI quaternions, IMU gyro bias, IMU accelerometer bias, TMBU

- C3 9. FCS CH (four) – ORIDE

- If prior to TIG, perform following pwr dn:
- O15:A 10. BRAKES MNB – OFF
- :E 11. cb MNB ADTA 2 – op
- 12. ACCEL 2 – op
- O16:A 13. BRAKES MNC – OFF
- :E 14. cb MNC ADTA 4 – op
- :F 15. ACCEL 3 – OFF
- O8 16. MLS 2,3 (two) – OFF
- L4:P 17. cb AC2 Φ A LG SNSR 2 – op
- 18. P&I to ENTRY MANEUVERS (Cue Card):
 - At EI, repwr above components, then:
PASS, BFS I/O RESET
 - At V = 10K, if TACAN 1 or 3 failed:
TACAN 2 MODE sel – GPC
- O7

NOTE

Post rollout: Immediately pwr dn air cooled equipment in AV BAY 2, EQUIPMENT COOLING MATRIX (ECLS), 4-1

LOSS OF AV BAY 3 COOLING

WARNING
 There is no smoke detection or air cooling in AV BAY 3. Failure of any LRU still powered in AV BAY 3 may be indicative of fire in progress. Immediately discharge fire suppression bottle

- O7
L1
1. ✓TACAN 3 MODE sel – OFF
 2. AV BAY 3 FAN (two) – OFF
- If after TIG–5, no GPC reconfiguration:
3. Go to step 8
- If between MM301 trans and TIG–5:

RECONFIG DPS

GPC OPS	1 G3	2 G3	3 –	4 G3	5 BFS
PWR	ON	ON	ON	ON	ON
OUTPUT	NORM	NORM	NORM	NORM	B/U
MODE	RUN	RUN	HALT	RUN	RUN

REASSIGN STRINGS TO GPC 1,2,4 IN MC 3

4. GNC 0 GPC MEMORY
 CONFIG – ITEM 1 +3 EXEC
 Modify MC 3 per table →

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

CRT
O6

5. GNC, OPS 30X PRO
6. GPC MODE 3 – STBY
– HALT
7. (BFS) GNC I/O RESET

- O13:A
- If prior to TIG, perform the following pwrdsn:
8. cb ESS 1BC C/W A – op

Cont next page

9. P&I to ENTRY MANEUVERS (Cue Card):

At EI:

O13:A

cb ESS 1BC C/W A – cl

At V = 10K, if TACAN 1 or 2 failed:

O7

TACAN 3 MODE – GPC

NOTE

Post rollout: Immediately pwr dn air cooled
equipment in AV BAY 3, EQUIPMENT
COOLING MATRIX (ECLS), 4-1

LOSS OF 2 H2O LOOPS (ENTRY)

NOTES

- Use ENT procedures except when this pwrn overrides it
- Second failure assumed to occur between EOM TIG-45 min and EI-5 min
- This procedure powers down all comm. If comm reqd, preferred COMM config in order of heat production:
 1. UHF
 2. STDN LO PWR – if reqd
 3. TDRS – only if mandatory (10 min MAX)
- Call ground at every available UHF site

If EOM TIG > 45 min:

1. Go to ORB PKT, PWRDN, LOSS OF 2 H2O LOOPS (time critical) >>

TIME CRITICAL PROCEDURES (execute simo)

2. Have MS perform MS OVHD PANEL PWRDN, 10-21, ASAP
3. Have another MS perform COMM PWRDN, 10-23, ASAP
4. Perform CDR AND PLT PWRDN, ASAP

Cont next page

CDR AND PLT PWRDN

- C3 5. ✓MSTR MADS PWR – OFF
- 6. Minimize ltg
- 7. Perform PL PWRDN, then:
- 8. Use only one IDP/CRT with two MDUs as reqd (cycle IDPs, MDUs)
- F6,F8 9. FLT CNTLR PWR (two) – OFF, use one as reqd (pwr assoc DDU when reqd)
- O7 10. TACAN MODE sel (three) – OFF
- O8 11. RADAR ALTM (two) – OFF
- 12. MLS (three) – OFF
- L1 13. ✓H2O PUMP LOOP 1,2 (two) – OFF
- 14. If any flow: Leave H2O pump on, minimize bypass
If H2O LOOP 1 PUMP A(B) ON:
- MA73C:A 15. ✓MCA LOGIC MNA FWD 1 – ON
MNB FWD 2 – ON
- L1 16. HUM SEP A,B (two) – OFF
(one ON if either H2O Loop ON)
- 17. CAB FAN (two) – OFF
- 18. TEMP CNTLR – OFF
- 19. FREON PUMP LOOP 1 – OFF
✓2 – B
- 20. ✓FLOW PROP VLV LOOP (two) – ICH (tb–ICH)
- 21. FLASH EVAP CNTLR PRI B – OFF
A – GPC
- L2 22. O2 SYS 1 SPLY – CL (tb–CL)
- O6 23. MDM PL1 – OFF
FF4 – OFF

Cont next page

RECONFIG DPS

Reassign Strings to GPC 1 in MC 3

- | | | CONFIG
GPC | 3
12340 |
|-------|---|---------------|------------|
| | 24. <u>GNC 0 GPC MEMORY</u>
CONFIG - ITEM 1 +3 EXEC
Modify MC 3 per table → | | |
| CRT | 25. GNC, OPS 30X PRO | STR 1 | 1 |
| C3 | 26. ✓ FCS CH (four) - AUTO | 2 | 1 |
| O6 | 27. GPC MODE 2,3,4 (three) | 3 | 1 |
| | - STBY (tb-bp) | 4 | 1 |
| | - HALT | PL 1/2 | 1 |
| | - STBY (tb-RUN) | CRT 1 | 1 |
| | - HALT (tb-bp) | 2 | 1 |
| | PWR 2,4 (two) - OFF | 3 | 1 |
| | | 4 | 0 |
| L1 | 28. ✓ AV BAY 1 FAN B - ON | L 1 | 0 |
| | ✓ 2 FAN A - ON | 2 | 0 |
| | 1 FAN A - OFF | MM 1 | 1 |
| | 2 FAN B - OFF | 2 | 1 |
| | 3 FAN A,B (two) - OFF | | |
| CRT | 29. (BFS) GNC I/O RESET
For any CRT that is OFF: | | |
| | 30. GPC/CRT 1/X EXEC | | |
| | 31. <u>GNC 51 OVERRIDE</u> | | |
| | IMU 3 - desel (PASS and BFS) | | |
| O16:A | 32. IMU 3 - OFF | | |
| C3 | 33. C/W MODE - ACK
For F7 lts, hold in F2 or F4 MA | | |
| | 34. ✓ MS OVHD PANEL PWRDN complete | | |

CONTINUOUS CABIN PURGE (No earlier than TIG-20)

WARNING
Do not use WCS once constant
Cabin Purge has started because
of high N2 concentration

- | | |
|-------|---------------------------------------|
| MO10W | 35. 14.7 CAB REG INLET vlv (two) - OP |
| | 36. O2 REG INLET vlv (two) - CL |
| L2 | 37. O2/N2 CNTLR VLV (two) - OP (N2) |
| C5 | 38. DIRECT O2 vlv - OP |

Cont next page

- O6 57. ✓MDM FF1,FF2,FF3 (three) – ON
 FF4 – ON
58. GNC I/O RESET
59. GNC 23 RCS
 JET RESET – ITEM 45 EXEC
 Reselect deselected FRCS jets
 JET RESET – ITEM 45 EXEC

POST DUMP RECONFIG (If dump performed)

When dump complete:

- O6 60. MDM FF4 – OFF
O14:B 61. cb MNA OI SIG CONDR OF 1/4 A – op
O15:B 62. MNB OI SIG CONDR OF 2/3 A – op

If both H2O Loops lost prior to DEORBIT BURN
TIG–10 min:

63. Perform DPS RECONFIG (just prior to OPS
304 transition):

DPS RECONFIG (if reqd)

- O6 64. ✓GPC PWR 3 – ON
 MODE 3 – STBY (tb–RUN)
 – RUN

Reassign Strings to GPC 3 in MC 3

65. GNC 0 GPC MEMORY
 CONFIG – ITEM 1 +3 EXEC

Cont next page

CRT	66.	GNC, OPS 301 PRO Modify MC 3 per table →	CONFIG	3
			GPC	10300
	67.	GNC, OPS 301,302,303 PRO (BFS) GNC I/O RESET	STR	1 3
				2 3
				3 3
				4 3
			PL	1/2 3
	68.	GNC 50 HORIZ SIT ✓ Landing site		
		For any IDP that is OFF:		
		69. GPC/CRT 3/X EXEC	CRT	1 3
70.	GNC 0 GPC MEMORY		2 3	
	DOWNLIST GPC – ITEM 44		3 3	
	+3 EXEC		4 0	
O6	71.	GPC MODE 1 – STBY (tb-bp) – HALT PWR 1 – OFF	L	1 0
				2 0
			MM	1 3
				2 3
L1	72.	AV BAY 3 FAN B – ON ✓ 2 FAN A – ON 1 FAN A,B (two) – OFF 2 FAN B – OFF 3 FAN A – OFF		

ENTRY MANEUVERS

At OPS 304:

73. Go to LOSS OF 2 H2O LOOPS ENTRY
MNVRS (next page) instead of ENTRY
MANEUVERS (Cue Card)

LOSS OF 2 H2O LOOPS ENTRY MANEUVERS

FLIGHT CONDITIONS	MANEUVER
EI-5	cb MNA,MNB DDU L (two) – cl ✓ LVLH ATT GNC, OPS 304 PRO * If PREBANK, R/Y – CSS * * Roll at 1°/sec to <input type="text"/> <input type="text"/> <input type="text"/> * * Maintain PREBANK ±5° * L FLT CNTLR PWR – ON Use two IDP/CRTs with four MDUs as reqd ✓ IMU FAN B – ON AV BAY 1 FAN A – ON BRAKES MNA,B,C (three) – ON cb ADTA 1,2,3 (three) – cl MDM FF4 – ON GNC I/O RESET
‘Guidance Box’ @ q̄ ~8 or D ~ 3	CLOSED LOOP GUIDANCE _____:_____:_____ * If PREBANK: P,R/Y – AUTO * Begin AIL trim monitoring
D = 11	✓ DRAG H (FORCE if editing)
ΔAZ = 10.5°	FIRST ROLL REVERSAL <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> (DEL PAD)
V = 19K	✓ MPS/TVC ISOL VLV – CL
V = 15K	TACAN 1,3 (two) – GPC
V = 12K	RAD BYP VLV MODE (two) – AUTO CNTLR LOOP (two) – AUTO B(A) <u>ACTIVATE ENTRY COMM</u> ✓ L,R AUD PWR – AUD ✓ AUD CTR – 1 UHF MODE – SPLX S-BD PM CNTL – PNL,CMD GNC I/O RESET OI PCMMU PWR 1 ✓ FORMAT – FXD Select best S-BD PM ANT – suggest LRF
V = 10K	✓ SPD BRK to 81%
V = 7K	✓ TACAN status
V = 5K	ADTA PROBES – DEPLOY (✓HEAT) Begin AIL and RUD trim monitoring

LOSS OF 2 H2O LOOPS ENTRY MANEUVERS

FLIGHT CONDITIONS	MANEUVER
M = 2.9	Pwr 1 HUD 1 MLS, 1 RA for landing GNC I/O RESET
M = 2.7	cb MNB, MNC DDU R (two) - cl R FLT CNTLR PWR - ON ✓ APUs TRIM PNL (two) - OFF RHC/PNL (two) - ENA
* If M < 2.5, P CSS for ADTA to G&C incorp *	
M = 2.0	Ensure ADTA to G&C, else ✓ Theta Limits
M = 0.95	* For Bailout procedures, go to BAILOUT MODE 8 (next page) *
M = 0.9	P, R/Y - CSS as reqd ✓ NWS - 1 ✓ SPBK CMD vs POS ✓ ANTISKID - ON
M = 0.7	✓ LG EXTEND ISOL VLV - OP
h = 15K	✓ MLS (If activated)
h = 10K	✓ A/L, ✓ Tabs/visor - CL/LES O2 - ON (KSC)
MAIN GEAR TD	SPD BRK - 100%
DEROTATION INIT	DRAG CHUTE pb (two) - ARM, DPY (simo)
NOSE GEAR TD	SRB SEP - MAN/AUTO and depress pb ✓ AUTO LOAD RELIEF ✓ HYD BRAKE ISOL VLV (three) - OP
<p style="text-align: center;"> 0.25-0.3 G 8-10 FPS² MAX < 0.2 G < 6 FPS² </p> <p style="text-align: center;"> NO BRAKING BEFORE MIDFIELD NWTD ≤ 140 KGS LKBED 5K' REMAINING 40 KGS STOP 140 KGS CONCRETE < 140 KGS ——— > 140 KGS - - - - </p>	
V = 60 KGS	DRAG CHUTE JET pb - JETT
STOP	DIRECT O2 vlv - CL Go to EMER PWRDN (Cue Card)

**BAILOUT
MODE 8**

REPORT POSITION
MACH < .95, OPS 305/603
SB - AUTO; BF - AUTO
FLY 185-195 KEAS, $\Phi = 0^\circ$
ABORT MODE - ATO
ABORT PBI - PUSH
P, R/Y - AUTO
FLT CNTLR PWR (two) - OFF

~50K FT

TABS - RELEASE
VISOR - CLOSE/LOCK
LES O2 - ON
GREEN APPLE - PULL

~40K FT

MS3 - VENT CABIN
CDR,PLT SEATS - LOWER
KNEEBOARDS - REMOVE
COOLING - DISCONNECT
RESTRAINT - RELEASE
D-RING - UNCOVER

~30K FT

MS3 - JETTISON HATCH
COMM - DISCONNECT
(G-SUIT CLIP - PULL)
LES O2 - DISCONNECT
EGRESS SEAT
POLE - DEPLOY
D-RING - HOOK UP
BAILOUT

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MS OVHD PANEL PWRDN

1. Minimize Itg on Aft FLT Deck and Middeck
- O13:A 2. cb ESS 1BC MTU A – op
- :C 3. 2CA C/W B – op
- O14:A 4. BRAKES MNA – OFF
- :B 5. cb MNA OI SIG CONDR OF 1/4 A – op
6. MDM OF 1/2 A,3/4 A (two) – op
7. H2O BYP LOOP 1 SNSR – op
8. EVENT TIMER AFT – op
- :E 9. ADTA 1 – op
10. DDU L,AFT (two) – op
- :F 11. MMU 1 – OFF
- O15:A 12. BRAKES MNB – OFF
- :B 13. cb MNB OI SIG CONDR OF 1/4 B,2/3 A (two) – op
14. MDM OF 1/2 B – op
15. H2O BYP LOOP 2 SNSR – op
16. MSN TIMER AFT – op
- :E 17. ADTA 2 – op
18. DDU L,R (two) – op
- :F 19. MMU 2 – OFF
20. ACCEL 4 – OFF
- O16:A 21. BRAKES MNC – OFF
- :B 22. cb MNC OI SIG CONDR OF 2/3 B – op
23. MDM OF 3/4 B – op
- :E 24. ADTA 3,4 (two) – op
25. DDU R,AFT (two) – op

**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10–21

EPCL/ALL/GEN H

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**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10-22

EPCL/ALL/GEN H

NOTE

MS Perform COMM PWRDN ASAP. If COMM reqd prior to landing site coverage, use COMM POWERUP procedure (10-25)

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)
ENCRYPTION MODE – SEL
SEL – BYP
- C3 3. S-BD PM CNTL – PNL
OI PCMMU PWR – OFF
FORMAT – FXD
AUD CTR – OFF (pwr up as reqd for cockpit audio)
- O6 4. UHF MODE sel – OFF
- A1L 5. ✓S-BD PL CNTL – PNL
✓PWR SYS – OFF
PL DATA INTLVR PWR – OFF
- A1R 6. OPS RCDRS PWR 1,2 (two) – OFF
S-BD FM CNTL – PNL
PWR – OFF
PL RCDR PWR – OFF
- R14:B 7. cb MNA,MNC GCILC (two) – op
If after TIG-15:
 - 8. Go to AFT PANEL CONFIG FOR ENTRY COMM (10-27)

**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10-23

EPCL/ALL/GEN H

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**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10-24

EPCL/ALL/GEN H

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

- Power up audio system:
- C3 1. AUD CTR – 1
 - O5 ✓L AUD PWR – AUD
 - O9 ✓R AUD PWR – AUD
- If UHF available, config for UHF COMM (voice only):
- O6 2. UHF MODE sel – SPLX
 - ✓SPLX PWR AMP – ON
- After comm with MCC complete:
- 3. Go to 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 5. 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
 - C3/F9 6. Select best S–BD PM ANT
- If MCC requests data:
- O14:B 7. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
 - C3 8. OI PCMMU PWR – 1
 - O6 9. MDM PL2 – ON
 - 10. (BFS) GNC I/O RESET
- At end of data transmission:
- O14:B 11. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
- After comm/data complete:
- 12. Go to COMM PWRDN >>

Cont next page

**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10–25

EPCL/ALL/GEN H

~
|
If UHF site and GSTDN unavailable and comm/data critical:
Config for TDRS S-BD:

CAUTION

This is a High Pwr Mode. On-time should be limited to 10 min max due to Pwr Amp Thermal constraints. A 3-min delay occurs after S-BD PM PNL/CMD before Pwr Amp is active. Uplink not affected. Proceed with selection of best antenna

- C3
A1L
13. ✓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 – HI
CODING XMIT – ON
RCV – ON
✓UPLK DATA – S-BD
- C3/F9
- Select best S-BD PM ANT
- If MCC requests data:
- O14:B 14. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
C3 15. OI PCMMU PWR – 1
O6 16. MDM PL2 – ON
17. (BFS) GNC I/O RESET
- At end of data transmission:
- O14:B 18. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
- After comm/data complete:
19. Go to COMM PWRDN

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10-26

EPCL/ALL/GEN H

AFT PANEL CONFIG FOR ENTRY COMM:

On 'GO' from CDR at deorbit TIG-15 min:

R14:B	1.	cb MNA,MNC GCILC (two) - cl
C3	2.	S-BD PM CNTL - CMD
A1L	3.	ANT SW ELEC - 2 MODE - STDN LO XPNDR - 2
	4.	NSP PWR - 2 DATA RATE XMIT - HI RCV - HI ✓UPLK DATA - S-BD CODING XMIT - OFF RCV - OFF

**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10-27

EPCL/ALL/GEN H

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**LOSS 2 H2O LOOPS
ENTRY
MS PAGE**

10-28

EPCL/ALL/GEN H

LOSS OF CAB PRESS

NOTE

If EQ dP/dT < .6, CAB P
will stabilize at 8 psia

- | | | |
|-------------------|-----|--|
| C3 | 1. | MSTR MADS PWR – OFF |
| | 2. | Minimize Itg |
| | 3. | Use one IDP/CRT with two MDUs |
| | 4. | Use one PGSC only as reqd |
| | | If FLT CNTLR PWR not reqd: |
| O14,O15,
O16:E | 5. | cb DDU L,R,AFT (six) – op |
| O16:E | 6. | cb MNA,MNB,MNC ADTA (four) – op |
| | 7. | MNC RCS/OMS PRPLT QTY GAUGE – op |
| | 8. | Perform <u>PL PWRDN</u> , then: |
| O7 | 9. | TACAN MODE sel (three) – OFF |
| O8 | 10. | MLS (three) – OFF |
| | | RADAR ALTM (two) – OFF |
| L1 | 11. | HUM SEP (two) – OFF |
| | 12. | CAB TEMP CNTLR – OFF |
| | 13. | ✓H2O LOOP 2(1) BYP MODE – MAN |
| | | MAN – DECR (hold 30 sec) |
| | 14. | ✓FLOW PROP VLV LOOP tb (two) – ICH |
| L2 | 15. | ANTISKID – OFF |
| | | NWS – OFF |
| L4:L | 16. | cb AC1,AC2 ΦA CAB T CNTLR 1,2 (two) – op |
| | 17. | Go to LOSS OF CABIN PRESS ENTRY DELTAS
PULLOUT PAGE (10–31) |

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LOSS OF CABIN PRESS ENTRY DELTAS PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

NOTE

Incorporate following changes or remove these pages for use with indicated checklist or cue card

NOTE

Single fault tolerance used for most cabin air cooled equipment. Add'l LRUs may be activated if required and if CAB PRESS stable \geq 8 psia

Deltas to DEORBIT PREP, NOMINAL DEORBIT PREP:

1. Minimize use of IDPs, MDUs, FLT CNTLR PWR, DDUs. Use one PGSC
2. In ENT SWITCH LIST/VERIF, do not activate pwrn items

Deltas to ENT, DEORBIT BURN:

At TIG-4:

3. Use two IDP/CRTs with four MDUs as reqd for deorbit burn
 4. cb DDU L,R (four) – cl
 5. FLT CNTLR PWR (two) – ON
- O14,O15,
O16:E
F6,F8

Deltas to ENT, POSTBURN:

6. Use one IDP/CRT with two MDUs as reqd
 7. L,R FLT CNTLR PWR (two) – OFF
 8. cb DDU L,R (four) – op
- F6,F8
O14,O15,
O16:E

9. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)

Deltas to ENTRY MANEUVERS (Cue Card):

At EI:

10. Use only two IDP/CRTs with four MDUs as reqd
 11. cb DDU L,R (four) – cl
 12. L FLT CNTLR PWR – ON
 13. cb ADTA 1,2,3 – cl
- O14,O15,
O16:E
F6
O14,O15,
O16:E

GNC I/O RESET

Cont next page

**LOSS CAB PRESS
ENTRY
MS PAGE**

10-31

EPCL/4/GEN H

At V = 15K:

If CAB PRESS < 8 psia:

14. Delete NAVAIDS callout

If CAB PRESS ≥ 8 psia:

15. Activate all TACAN, RA, MLS

GNC I/O RESET

Disregard subsequent NAVAID callout

DELTA

At V = 10K:

O7 16. TACAN 2,3 MODE sel (two) – GPC

At M = 2.7:

17. Use two HUD, MLS, and RA as reqd

GNC I/O RESET

At M = 0.9:

L2 18. ANTISKID – ON

NWS – 1

**LOSS CAB PRESS
ENTRY
MS PAGE**

10-32

EPCL/4/GEN H

LOSS OF 1 FREON LOOP OR HI LOAD EVAP (ENTRY)

- C3 1. ✓MSTR MADS PWR – OFF
- 2. Minimize Itg
- O7 3. Use only one IDP/CRT with two MDUs as reqd
- O8 4. TACAN 1,2,3 MODE sel (three) – OFF
- 5. RADAR ALTM 1,2 (two) – OFF
- 6. MLS 1,2,3 (three) – OFF
- L1 7. ✓FLOW PROP VLV LOOP 1,2 tb (two) – ICH
- 8. ✓H2O LOOP 2(1) BYP MODE – MAN
MAN – DECR (hold 30 sec)
- 9. Perform PL PWRDN, then:
- L2 10. NWS – OFF
ANTISKID – OFF
- O14,O15, 11. BRAKES MNA,B,C (three) – OFF
O16:A
If FLT CNTLR PWR not reqd:
- O14,O15, 12. cb DDU L,R (four) – op
O16:E
- 13. cb ADTA 1,2,3,4 (four) – op
- 14. Reset EVAP OUT T C/W upper limit (ch 107,117) to 2.15v (70 deg). ✓MCC to update B/U C/W, if reqd
- 15. Go to DEORB OR ENTRY PULLOUT PAGE for appropriate failure:
LOSS OF HI LOAD EVAP
LOSS OF 1 FREON LOOP

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LOSS OF HI LOAD EVAP DEORB OR ENTRY PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

NOTE

Incorporate following changes or remove this page for use with indicated checklist or cue card. If entering procedure after TIG-10, review entire list of deltas to determine correct configuration

P&I ENT, DEORBIT BURN:

'TIG-10:

- O14,O15,
O16:E
1. cb DDU L,R (four) – cl
 2. Use MDUs, IDPs, FLT CNTLR PWR as reqd for burn'

P&I ENT, POSTBURN:

- F6,F8
O14,O15,
O16:E
- '3. L,R FLT CNTLR PWR (two) – OFF
 4. cb DDU L,R (four) – op
 5. Use two IDP/CRTs with four MDUs'

P&I ENTRY SW CHECK:

'Add:

- O14,O15,
O16:A
L2
6. BRAKES MNA,B,C (three) – ON
 7. ANTISKID – ON
 8. Do not pwr NAV AIDS, NWS'

P&I to ENTRY MANEUVERS (Cue Card):

'At EI:

- O14,O15,
O16:E
F6,F8
- O14,O15,
O16:E
9. cb DDU L,R (four) – cl
 10. FLT CNTLR PWR (two) – ON
 11. Use MDUs, IDPs as reqd
 12. cb ADTA 1,2,3,4 (four) – cl
 13. GNC I/O RESET

Cont next page

- O7
- At V = 15K:
14. Delete NAVAIDS callout
 15. TACAN MODE 1,2,3 sel (three) – GPC
- If AOA:
16. At V = 12K, delete RAD and add:
NH3 CNTLR B – PRI/GPC
- At M = 2.7:
17. Use all HUD, MLS, and RA
GNC I/O RESET'
- Post Wheel Stop:
18. Go to EXPEDITED PWRDN (ENT, POST LDG)

LOSS OF 1 FREON LOOP DEORB OR ENTRY PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

NOTE

Incorporate following changes or remove this page for use with indicated checklist or cue card

P&I ENT, DEORBIT BURN:

'TIG-10:

- O14,O15,
O16:E
1. cb DDU L,R (four) – cl
 2. Use two IDP/CRTs with four MDUs, two FLT CNTLR PWR for burn

TIG-5:

- L1
3. TOP EVAP HTR NOZ (two) – OFF
DUCT sel – OFF
- L2
4. FLASH EVAP FDLN HTR A,B SPLY
(two) – OFF'

P&I ENT, POSTBURN:

- F6,F8
O14,O15,
O16:E
- '5. L,R FLT CNTLR PWR (two) – OFF
 6. cb DDU L,R (four) – op
 7. Use one IDP/CRT with two MDUs'

P&I ENTRY SW CHECK:

'Add:

- O14,O15,
O16:A
8. BRAKES (three) – ON
- L2
9. ANTISKID – ON
 10. DO NOT PWR NAVAIDS, NWS'

P&I to ENTRY MANEUVERS (Cue Card):

'At EI:

- O14,O15,
O16:E
11. cb DDU L,R (four) – cl
- F6
12. L FLT CNTLR PWR – ON
 13. Use two IDP/CRTs with four MDUs
- O14,O15,
O16:E
14. cb ADTA 1,2,3 (three) – cl
- L2
15. GNC I/O RESET
 16. NWS – 1

Cont next page

- At V = 15K:
- O7 17. Delete NAVAIDS callout
 - 18. TACAN MODE sel 2,3 (two) – GPC
- At V = 12K:
- L1 19. Perform RAD FLOW in unfailed loop
- At M = 2.7:
- 20. Use two HUD, MLS, and RA
 - 21. GNC I/O RESET'
- P&I to EVAP OUT TEMP HIGH (Cue Card):
- 'If EVAP OUT T HIGH and V > 12K:
- Establish RAD FLOW in unaffected loop:
- L1 22. RAD BYP VLV MODE 1(2) – AUTO
CNTLR LOOP 1(2) – AUTO A(B)
 - 23. Work steps 2–4, EVAP OUT TEMP HIGH
(RADS COLD SOAKED) as written
- If EVAP OUT T HIGH and V < 12K:
- If FREON LOOP 1(2) failed:
- 24. NH3 CNTLR B(A) – PRI/GPC'
- Post Wheel Stop:
- 25. Go to EXPEDITED PWRDN (ENT, POST LDG)

LOSS OF FES

- MS 1. If prior to TIG (prior to EI-5 if no RAD COLDSOAK):
Go to MS PWRDN (10-43) immediately
- C3 2. ✓MSTR MADS PWR – OFF
3. ✓Minimize Itg
4. Use one PGSC and one IDP/CRT with two MDUs
If FLT CNTLR PWR not reqd:
- O14,O15,
O16:E 5. cb DDU L,R,AFT (six) – op
- O7 6. ✓TACAN MODE sel (three) – OFF
O8 7. ✓RADAR ALTM (two) – OFF
8. ✓MLS (three) – OFF
9. Perform PL PWRDN, then:
- L1 10. CAB TEMP CNTLR – OFF
11. H2O LOOP 2 BYP MODE – MAN
MAN – DECR (hold 30 sec)
PUMP LOOP 1 (two) – OFF, B
12. ✓FLOW PROP VLV LOOP tb (two) – ICH
✓TOP EVAP HTR NOZ (two) – OFF
✓DUCT sel – OFF
✓HI LOAD DUCT HTR sel – OFF
13. ✓FLASH EVAP CNTLR (three) – OFF
- L2 14. NWS – OFF
ANTISKID – OFF
- L4:L
R4 15. cb AC1,AC2 Φ A CAB T CNTLR 1,2 (two) – op
16. ✓MPS ENG CNTLR HTR (three) – OFF
If FRCS DUMP not reqd or time to TIG > 30 min:
- O8 17. FWD RCS MANF ISOL 1,2,3,4 (four) – CL
O14,O15,
O16:F 18. RJDF DRIVER,LOGIC (eight) – OFF
A14 19. RCS/OMS HTR FWD RCS JET (five) – OFF

Cont next page

If TIG between 15 and 60 min, HALT GPC2 and 4 and reconfig DPS:

CRT 20. If OPS 302: GNC OPS 301 PRO

REASSIGN STRINGS GPC 1,3 IN MC3

21. GNC 0 GPC MEMORY

CONFIG – ITEM 1 +3 EXEC
 Modify MC 3 per table ----->

CRT

22. GNC, OPS 301 PRO

23. BFS I/O RESET

24. ✓ Runway selection

If OPS 302 reqd:

25. GNC, OPS 302 PRO

O6

26. GPC MODE 2,4

- (two) – STBY,HALT
- STBY (tb–RUN)
- HALT (tb–bp)

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

27. Go to DELTAS TO DEORBIT/ENTRY PULLOUT PAGE (10–41)

DELTA TO DEORBIT/ENTRY PULLOUT PAGE

DO NOT DISCARD; USE TO LANDING

NOTE

Incorporate following changes or remove this page for use with indicated checklist or cue card

1. If AOA: Go to step 8

Deltas to ENT, DEORBIT BURN:

2. CDR/PLT transition to ENT at nominal time
TIG-15:

3. MS Perform CONFIG FOR PLBD CLOSING (DEORB PREP, NOMINAL DEORBIT PREP)
Minimize Itg and TV use
4. CDR/PLT Mvnr to deorbit burn att
Use two IDP/CRTs with four MDUs as reqd, two FLT CNTLR PWR/DDU as reqd for burn
5. Do not perform RCS/OMS HTR config (steps 3-9)

TIG-10:

6. MS Perform EMER PLBD CLOSING (ECLS), 4-13, then:

TIG-5:

7. MS Perform POST CLOSING CONFIG (DEORB PREP, NOMINAL DEORBIT PREP), then:

Deltas to ENT, POSTBURN:

8. Minimize use of MDUs, IDPs, use one FLT CNTLR PWR, DDU only as reqd

At EI-18, if FRCS DUMP reqd:

9. RJDF LOGIC, DRIVERS (eight) – ON
O14, O15, O16:F
O8
10. FWD RCS MANF ISOL 1,2,3,4 (four) – OP (tb-OP)
11. GNC 23 RCS
JET RESET – ITEM 45 EXEC
Reselect deselected FRCS jets
JET RESET – ITEM 45 EXEC
12. Post FRCS DUMP (if performed),
RJDF LOGIC, DRIVERS (eight) – OFF
O14, O15, O16:F

Cont next page

**LOSS OF FES
D/O PULLOUT PAGE**

10-41

EPCL/4/GEN H

13. Delete ANTISKID, NWS callouts (ENTRY SW CHECK)
 Prior to MM304 transition, if GPCs HALTED, reconfig DPS:

O6 14. GPC MODE 2,4 (two) – STBY (tb–RUN)
 – RUN

REASSIGN STRINGS IN MC3

CRT 15. GNC 0 GPC MEMORY
 16. GNC, OPS 301 PRO
 CONFIG – ITEM 1 +3 EXEC
 Modify MC 3 per table →
 17. GNC, OPS 301 PRO
 (✓Runway selection)
 18. BFS I/O RESET
 19. GNC OPS 302,303,304 PRO

CONFIG	3
GPC	12340
STR 1	1
2	2
3	3
4	4
PL 1/2	1
CRT 1	1
2	2
3	3
4	0
L 1	0
2	0
MM 1	1
2	2

Deltas to ENTRY MANEUVERS

(Cue Card):

At EI–5:

O14,O15, 20. BRAKES (three) – ON
 O16:A

O16:E 21. cb ADTA 1,2,3,4
 (four) – cl

CRT 22. GNC I/O RESET
 O14,O15, 23. ✓cb DDU L,R (four) – cl
 O16:E

At EI:

L1 24. NH3 CNTLR B – SEC/ON

F6,F8 25. L,R FLT CNTLR PWR (two) – ON

O7 26. At V = 15K: Delete NAVAIDS callout
 TACAN MODE sel (three) – GPC

27. V = 12K: Delete ref to rad flow

L1 28. V = 6K: NH3 CNTLR B – OFF
 A – PRI/GPC

29. M = 2.7: Use two HUD, three MLS, and two
 RA as reqd

CRT 30. GNC I/O RESET

L2 31. NWS – 1
 ANTISKID – ON

Post Wheel Stop:

32. Go to EXPEDITED PWRDN (ENT, POST
LDG)

MS PULLOUT PAGE

MS PWRDN

- O14,O15,
O16:A 1. BRAKES (three) – OFF
- O16:E 2. cb MNA,B,C ADTA (four) – op
- O14,O15:B 3. MSN TIMER FWD,AFT (two) – op
- 4. EVENT TIMER AFT,FWD (two) – op
- O15:F 5. MMU (two) – OFF
- A1R 6. PL RCDR PWR – OFF
- A6U 7. ANNUN BUS SEL – OFF
- A12 8. APU HTR LUBE OIL LINE (three) – OFF
- 9. HYD HTR (eight) – OFF
- A14 10. RCS/OMS HTR FWD RCS – OFF
- L,R POD (four) – OFF
- FWD RCS JET (five) – OFF
- AFT RCS JET 5 – OFF
- R14:D 11. cb TV (fifteen) – op
- :E 12. RMS TV (six) – op
- A3 13. MON PWR (two) – OFF
- ML86B:A 14. cb MNA,MNB H2O LINE HTR (two) – op
- If Manned Mnv Unit pwrn:
- ML86B:D 15. cb MNA,MNB STBD HTR (two) – op
- PORT HTR (two) – op

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**LOSS FES
ENTRY
MS PAGE**

10-44

EPCL/ALL/GEN H

LOSS OF 2 FREON LOOPS (ENTRY)

WARNING
FC purge must be started and loads powered down ASAP
If all 3 FC remain running, orbiter lifetime is expected to be 120 min from LOSS OF 2nd FREON LOOP. This assumes 3 FC are pwr'd down to total level of 8kW immediately and are continuously purged
If 2 FC are shut down for ON-ORBIT WAIT, max orbiter lifetime from time of failure is expected to be > 120 min
Earliest possible landing is req'd

NOTES

- Failure requires an immediate deorbit to first available landing site, while pwr'd down to very low level
- Failure assumed to occur after Deorbit TIG-2:05 and before EI
- COMM POWERUP and COMM PWRDN procedures should be used for comm until landing
- Preferred COMM Config is:
 1. UHF only
 2. GSTDN S-BD or SGLS (If req'd)
 3. Use TDRS only if mandatory

TIME CRITICAL PROCEDURES

1. Have MS execute MS OVHD AND AFT PANEL CONFIG thru FDF CONFIG (10-57 thru 10-62) ASAP
Have second MS execute COMM PWRDN (10-63) ASAP.
Delay 10 min max if AOS
Write down MET of 2nd Freon Loop failure:

___/___ __:___ __:___ __

Cont next page

- C3 16. ✓BFC CRT DISP – OFF
- O6 17. GPC MODE 2,3,4 (three) – STBY (tb–bp)
 - HALT
 - STBY (tb–RUN)
 - HALT (tb–bp)
- 18. PWR 2,3,4 (three) – OFF
- 18. (BFS) GNC, OPS 301 PRO
 - 000 PRO
- 19. GPC MODE 5 – STBY (tb–RUN)
 - HALT (tb–bp)
 - OUTPUT 5 – NORM
 - PWR 5 – OFF
- CDR 20. Go to step 27
- PLT/O7 21. ✓TACAN MODE sel (three) – OFF
- O8 22. ✓RADAR ALTM (two) – OFF
 - ✓MLS (three) – OFF
- C3 23. FCS CH (four) – AUTO
- R4 23. HYD BRAKE HTR (three) – OFF
- 24. ✓MPS ENG CNTLR HTR (three) – OFF
 - MANF PRESS LO2(LH2) (two) – CL
- R2 25. ✓MPS ENG PWR (six) – OFF
 - He ISOL (six) – CL
 - PNEU He ISOL – CL
 - L ENG He XOVR – CL
 - HYD CIRC PUMP (three) – OFF
- PLT 26. Continue at step 50
- L1 27. HUM SEP (two) – OFF
- 28. ✓IMU FAN B – ON
 - A,C (two) – OFF
- L4:F 29. cb AC1 H2O LOOP PUMP 1A/2 (three) – cl
- L1 29. H2O PUMP LOOP 1 – A
 - ON
- 30. LOOP 1 BYP MODE – MAN
 - MAN – DECR (hold 30 sec)
- 31. PUMP LOOP 2 – OFF
- 32. CAB TEMP sel – COOL
- 33. FAN (two) – OFF
- 34. AV BAY 1,2,3 FAN (six) – OFF
- 35. ✓FREON PUMP LOOP 1,2 (two) – OFF
 - (one ON if any flow)
- 36. RAD CNTLR LOOP 1,2 (two) – OFF
- 37. ✓NH3 CNTLR A,B (two) – OFF

Cont next page

If time to TIG \leq 40 min, then NO On-Orbit Wait reqd:

64. Bus Tie all MN Buses and continue at step 78

If time to TIG $>$ 40 min, then On-Orbit Wait reqd:

65. Disconnect and shut down 2 FCs for On-Orbit Wait:

NOTE

Only UHF available w/Fuel
Cells 2,3 shut down

DO NOT BUS TIE

- | | |
|------|--|
| R11U | 66. FC PURGE VLVS 2,3 (two) – CL |
| R1 | 67. ESS BUS SOURCE FC2,FC3 (two) – OFF |
| | 68. FC/MN BUS B,C (two) – OFF |
| | 69. FC2,FC3 – STOP |
| | 70. AC BUS SNSR 2,3 (two) – OFF |
| | 71. cb AC CONTR AC2,AC3 (six) – cl |
| | 72. INV/AC BUS 2,3 (two) – OFF |
| | 73. INV PWR 2,3 (two) – OFF |
| | 74. cb AC CONTR AC2,AC3 (six) – op |

WARNING

Limit operation of GPC 1 to 1 hr. If reqd,
restring to GPC 2 and pwr dn GPC 1

If FC1 on:

O14:B | 75. cb MNA OI SIG COND OF 1/4 A – cl

If FC2 on:

O15:B | 76. cb MNB OI SIG COND OF 2/3 A – cl

If FC3 on:

O16:B | 77. cb MNC OI SIG COND OF 2/3 B – cl

Cont next page

WARNING

Monitor FC performance. If FC STK T \geq 250 deg
or FC V \leq 27, go immediately to ON-ORBIT
WAIT BACKOUT (CONT DEORB, LOSS OF 2
FREON LOOPS). Restart FCs immediately and
perform remaining ON-ORBIT WAIT BACKOUT
at specified times

If not being currently used for COMM:

- O6 78. MDM PL1,PL2 (two) – OFF
L4:J 79. cb AC3 Φ A SIG CONDR HUM SEP – op
 Φ B SIG CONDR IMU FAN – op
 :K 80. AC1 Φ A H2O CNTLR 2 – op
 :L CAB T CNTLR 2 – op
 Φ B AV BAY 2 S/C – op
 81. AC2 Φ A CAB T CNTLR 1 – op
 Φ B AV BAY 3 S/C – op
R1 82. \checkmark O2,H2 MANF VLV TK1,TK2 (four) – OP
 83. O2,H2 TK2 HTRS A,B (four) – OFF
 TK1,TK3 HTRS A,B (eight) – AUTO
If O2 TK1(TK3) QTY < 80%:
 84. O2 TK1,TK3 HTRS A (two) – OFF
R2 85. BLR CNTLR/HTR 2 – OFF
 PWR 2 – OFF
If no On-Orbit Wait (2 FCs not shut down):
 If TIG > 15 min:
 86. Unstow CONT DEORB and go to ENTRY
 CONFIG (CONT DEORB, LOSS OF 2
 FREON LOOPS D/O PREP). Omit step 1 of
 DPS ENTRY CONFIG) >>
 If TIG < 15 min:
 87. Go to ENT with DELTAS TO ENT, DEORBIT
 BURN (10-51) >>
If proceeding with On-Orbit Wait (2 FCs shut down):
O6 88. MDM FA1,2,3,4 (four) – OFF
 FF1,2,4 (three) – OFF
L4:P 89. cb AC2,AC3 Φ A LG SNSR 1,2 (two) – op

Cont next page

- W1-10 90. Install Window Shades (remove as reqd to monitor att or control cabin temp)

NOTE

Cycle MDUs. If ON at loss of cooling, turn OFF within 30 min. Allow 3 min OFF prior to each 1 min ON (30 min max ON time). Save two MDUs that interface with a single IDP for entry

91. Continue monitoring FC and go to ON-ORBIT WAIT BACKOUT (CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP) (omit step 1 of DPS ENTRY CONFIG) >>

Deltas to ENT, DEORBIT BURN:

- TIG-15: 92. Omit RCS/OMS HTR RECONFIG
TIG-5: 93. Omit Single APU Start
TIG-4: 94. MDM FA4 – ON (pnl O6)
GNC I/O RESET
95. cb ESS 1BC MTU A – op (pnl O13:A)
96. ✓RJDA LOGIC,DRIVERS (eight) – ON
(pnl O14,O15,O16:F)
97. Select L,R Secondary Gimbals

Deltas to ENT, POSTBURN:

- Postburn: 98. MDM FA 4 – OFF (pnl O6)
99. ✓FLT CNTLR PWR – OFF (pnl F6)
Minimize MDU, IDP use
100. ✓cb DDU – op (pnl O15:E)

Cont next page

CAUTION
Monitor FC performance through landing
(steps 101–105)

- 101. If any single FC STK T \geq 250:
 - 102. (Aff) ESS BUS SOURCE FC 1(2,3) – OFF
 - 103. (Aff) FC MAIN BUS A (B,C) – OFF
 - 104. When FC STK T within 5° of either remaining FC, reconnect to buses
- 105. If all 3 FC STK TEMPS \geq 250 – no action

Postburn prior to OPS 304:

If active GPC pwrd without cooling since TIG–10 min:
Restricting to GPC 3 (Due to 1 hr limit without cooling):

- 106. GPC PWR 3 – ON (pnl O6)
 - MODE 3 – STBY (tb–RUN)
 - RUN
- 107. GNC, OPS 301 PRO

REASSIGN STRINGS TO GPC 3 IN MC3

108. **GNC 0 GPC MEMORY**

CONFIG – ITEM 1 +3 EXEC
Modify MC 3 per table →

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

109. GNC, OPS 301,302,303 PRO

110. **GNC 50 HORIZ SIT**
Reselect RWY

For any IDPs that are OFF:

111. GPC/CRT 3/X EXEC

112. **GNC 0 GPC MEMORY**
DOWNLIST GPC – ITEM 44 +3 EXEC

- O6 113. GPC MODE 1 – STBY (tb–bp)
 - HALT
 - PWR – OFF

114. ✓ OMS/RCS POSTBURN RECONFIGURATION

115. At EI–18: Omit FRCS DUMP (unless reqd for cg)

Cont next page

If reqd, FRCS ACTIVATION:

- O14:B 116. ✓cb OI SIG CONDR OF 1/4A – cl
O15:B 2/3A – cl
O14,O15, 117. RJDF LOGIC,DRIVERS (eight) – ON
O16:F
O6 118. ✓MDM FF 2,3 – ON
FF 1,4 – ON
O8 119. GNC I/O RESET
120. Reopen FRCS
121. GNC 23 RCS
RCS FWD – ITEM 1 EXEC
JET RESET – ITEM 45 EXEC
Reselect deselected FRCS Jets
JET RESET – ITEM 45 EXEC
122. Perform FRCS DUMP per ENT
When Dump complete:
O8 123. FWD RCS MANF ISOL 1,2,3,4 (four) – CL
(tb-CL)
O6 124. MDM FF1,4 (two) – OFF
O14,O15, 125. RJDF LOGIC,DRIVERS (eight) – OFF
O16:F

At ENT SW CHECK:

126. Leave NWS – OFF
ANTISKID – OFF
NAV AIDS – OFF
(CDR Green dot)
127. At EI-13: Omit Remaining APUs Start
128. At EI-12: Omit SSME HYD REPRESS
129. At EI-11: Omit HYD FLUID THERMAL
CONDITIONING
130. At EI-10: Perform APU Pre-start on 1,3 (F8 INST
PWR – ON)
131. At EI-8: Go to LOSS OF 2 FREON LOOPS
ENTRY MANEUVERS (next page)

LOSS OF 2 FREON LOOPS ENTRY MANEUVERS

FLIGHT CONDITIONS	MANEUVER
EI-8	L1 AV BAY 3 FAN B – ON CAB FAN A – ON C3 FCS CH 1,4 (two) – OFF 2,3 (two) – ORIDE L4:P ✓ cb AC2 ΦA LG SNSR 2 – cl cb AC3 ΦA LG SNSR 1 – cl O14 ASA 1 – ON O14:E cb DDU L – cl O15:E cb MNB ADTA 2 – cl ACCEL 2 – cl DDU L – cl ASA 2 – ON O16:E cb MNC ADTA 3 – cl :F ACCEL 3 – ON ASA 3 – ON ASA 4 – ON Use one IDP/CRT with two MDUs O6 MDM FF1,4 – ON GNC I/O RESET Perform APU 1,3 start, <u>APU RESTART</u> (Cue Card) ✓ LVLH ATT R1 AC BUS SNSRS – OFF (1 sec), MON GNC, OPS 304 PRO Wait 60 sec, then O6 MDM FF1,4 – OFF * If PREBANK, R/Y – CSS * * Roll at 1°/sec to <input type="text"/> <input type="text"/> <input type="text"/> * * Maintain PREBANK ±5° *
'Guidance Box' @ q̄ ~8 or D ~3	CLOSED LOOP GUIDANCE ____:____:____ * If PREBANK: P,R/Y – AUTO * Begin ALL trim monitoring
D = 11	✓ DRAG H (FORCE if editing)
ΔAZ = 10.5°	FIRST ROLL REVERSAL <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> (DEL PAD)
V = 19K	✓ MPS/TVC ISOL VLV – CL
V = 12K	O15:A BRAKES MNB – ON O16:A BRAKES MNC – ON O6 UHF MODE – SPLX (G T/R if ELS) C3 AUD CTR – 1 ✓ OI PCMMU FORMAT – FXD O5 ✓ L AUD PWR – AUD O9 ✓ R AUD PWR – AUD L9,R10 PS, MS AUD PWR – AUD (if reqd) If FREON LP 1(2) – FLOW: L1 NH3 CNTLR A(B) – PRI/GPC
	If command or data reqd: C3 OI PCMMU PWR – 2 O6 MDM PL2 – ON C3 S-BD PM CNTL – PNL,CMD CRTX GNC I/O RESET ANT SW – Select best ANT On MCC call: O6 MDM PL2 – OFF C3 OI PCMMU PWR – OFF
V = 10K	✓ SPD BRK to 81% O7 TACAN 3 – GPC
V = 7K	✓ TACAN status

LOSS OF 2 FREON LOOPS ENTRY MANEUVERS

FLIGHT CONDITIONS	MANEUVER
V = 5K	ADTA PROBES – DEPLOY (✓HEAT, only 1 side if reqd) Begin AIL and RUD trim monitoring
M = 4	MDM FF4 – ON GNC I/O RESET
M = 2.9	O6 MDM FF1 – ON (if NWS reqd) GNC I/O RESET O8 RADAR ALTM 2 – ON L1 CAB FAN (two) – OFF Use no landing aids (HUD, MLS) unless reqd to safely land the vehicle L HUD DATA BUS – 2, if reqd
M = 2.7	✓APUs R2 APU SPEED SEL (two) – HI F3 TRIM PNL (two) – OFF RHC/PNL (two) – ENA
* If M < 2.5, P CSS for ADTA to G&C incorp *	
M = 2.0	Ensure ADTA to G&C, else ✓Theta Limits
M = 0.95	* For Bailout procedures, go to BAILOUT MODE 8 (next page) *
M = 0.9	O15:E cb MNB DDU R – cl (if NWS reqd) O16:E cb MNC DDU R – cl (if NWS reqd) F7 L FLT CNTLR PWR – ON P,R/Y – CSS as reqd ✓SPDBK CMD vs POS F8 R FLT CNTLR – ON (if NWS reqd) L2 NWS – 1 (if reqd) ANTISKID – ON
M = 0.7	R4 LG EXTEND ISOL VLV – OP HYD BRAKE ISOL VLV 1,3 – OP
h = 15K	✓MLS (If on)
h = 10K	✓A/L, ✓Tabs/visor – CL/LES O2 – ON (KSC)
MAIN GEAR TD	SPD BRK – 100%
DEROTATION INIT	DRAG CHUTE pb (two) – ARM, DPY (simo)
NOSE GEAR TD	SRB SEP – MAN/AUTO and depress pb ✓AUTO LOAD RELIEF
V = 60 KGS	DRAG CHUTE JETT pb – JETT
STOP	Go to EMER PWRDN (Cue Card)

**BAILOUT
MODE 8**

REPORT POSITION
MACH < .95, OPS 305/603
SB - AUTO; BF - AUTO
FLY 185-195 KEAS, $\Phi = 0^\circ$
ABORT MODE - ATO
ABORT PBI - PUSH
P, R/Y - AUTO
FLT CNTLR PWR (two) - OFF

~50K FT

TABS - RELEASE
VISOR - CLOSE/LOCK
LES O2 - ON
GREEN APPLE - PULL

~40K FT

MS3 - VENT CABIN
CDR,PLT SEATS - LOWER
KNEEBOARDS - REMOVE
COOLING - DISCONNECT
RESTRAINT - RELEASE
D-RING - UNCOVER

~30K FT

MS3 - JETTISON HATCH
COMM - DISCONNECT
(G-SUIT CLIP - PULL)
LES O2 - DISCONNECT
EGRESS SEAT
POLE - DEPLOY
D-RING - HOOK UP
BAILOUT

MS OVHD AND AFT PANEL CONFIG

NOTE

Execute continuous purge ASAP

- R11U 1. FC PURGE HTR – ON
VLVS (three) – OP
2. Minimize Itg on Aft Flt Deck

NOTE

Items marked with * will be repowered at EI-8.

Items marked with ** will be repowered at V = 12K

- O13:A 3. cb ESS 1BC C/W A – op
:B 4. CRYO QTY O2,H2 TK2 (two) – op
:C 5. cb ESS 2CA C/W B – op (all SM tones and C/W
lights and tones lost; CRT FAULT SUMM and SM
ALERT It remains)
cb ESS 2CA MTU B – op
:E 6. 3AB GPC STAT – op
O14:A 7. BRAKES MNA – OFF
8. RGA 1 – OFF
:B 9. cb MNA OI 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 10. UTIL PWR O19/MO52J – op
:D 11. FREON RAD CNTLR 1,2 (two) – op
O2/N2 CNTLR 1 – op
CAB VENT – op
VENT ISOL – op
:E 12. ADTA 1 – op
ACCEL 1 – op
DDU L – op
AFT – op
:F 13. MMU 1 – OFF

Cont next page

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10-57

EPCL/4/GEN H,2

O15:A 14. **BRAKES MNB – OFF
RGA 4 – OFF
:B 15. cb MNB OI MDM OF 1/2 B – op
H2O BYP LOOP 2 SNSR – op
MSN TIMER AFT – op
EVENT TIMER FWD – op
:C 16. UTIL PWR F1/MO13Q – op (cl if F1 pwrs
PGSC)
GPS 2 PRE AMPL UPPER – op
:D 17. FREON RAD CNTLR 1,2 (two) – op
O2,N2 CNTLR 2 – op
GPS 2 PRE AMPL LOWER – op
:E 18. *ADTA 2 – op
*ACCEL 2 – op
DDU L – op
R – op
:F 19. MMU 2 – OFF
ACCEL 4 – OFF
O16:A 20. **BRAKES MNC – OFF
:B 21. cb MNC OI MDM OF 3/4 B – op
AUX TIMING BUFF – op
:C 22. cb MNC UTIL PWR A11/A15/MO30F – op (If no
Galley, leave cl until FLUID LOADING PREP (10–61)
complete)
:D 23. cb MNC O2 EMER – op
:E 24. *ADTA 3 – op
4 – op
DDU R – op
AFT – op
RCS/OMS PRPLT QTY GAUGE – op
:F 25. *ACCEL 3 – OFF
O17:A 26. ATVC (four) – OFF
:B EIU (three) – OFF
:C SIG CONDR FREON A,B (two) – OFF
:D OA 1/2/3 – OFF
MDM OA 1/2/3 – OFF
MEC 1 – OFF, wait 2 sec, then:
2 – OFF
If all APUs shut dn:
O14,O15, 27. *ASA (four) – OFF
O16:F

Cont next page

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10–58

EPCL/4/GEN H,2

- O19 28. TV PWR – OFF
 - COAS PWR – OFF
 - A12 29. APU HTR GAS GEN/FUEL PUMP 2 – OFF
 - LUBE OIL LINE 2 – OFF
 - TK/FU LINE/H2O/SYS 2B – OFF
 - HYD HTR (eight) – OFF
 - A14 30. RCS/OMS HTR FWD RCS – OFF
 - OMS CRSFD LINES (two) –
 - A,B OFF
 - FWD RCS JET (five) – OFF
 - AFT RCS JET (five) – OFF
 - L POD (two) – A OFF
 - B OFF
 - R POD (two) – A OFF
 - B OFF
- If Vent Doors Closed:
- O6 31. ✓FF1 – ON
 - ✓FA1 – ON
 - 32. GNC I/O RESET
 - 33. GNC 51 OVERRIDE
 - VENT DOOR CNTL OPEN – ITEM 43 EXEC
 - Wait 1 min
 - 34. MDM FF1,FA1 – OFF
 - 35. Continue at step 36
- If Vent Doors Open:
- MA73C:A,B 36. MCA LOGIC MNA,B,C
 - MID 1,2,3,4 (eight) – OFF
 - AFT 1,2,3 (three) – OFF
 - ✓FWD 1,2,3 (three) – ON
 - MA73C:C 37. cb MCA PWR AC1 3Φ FWD 1 – op
 - AC3 3Φ FWD 3 – op

LOSS 2 FREON LOOPS
ENTRY
MS PAGE

10–59

EPCL/4/GEN H,2

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**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10-60

EPCL/ALL/GEN H

FLUID LOADING PREP (If reqd)

- GALLEY 1. OVEN/RHS – ON
- 2. Unstow, fill 4 drink containers (per crewmember) with 8 oz water each. Stow temporarily near seat
- 3. Unstow 8 salt tablets (per crewmember). Temp stow in Flight Suit pocket
- 4. OVEN/RHS – OFF
- 5. ✓H2O HTRS (two) – OFF
- 6. ✓REHYD STA Lever – cl (push in)
- 7. ✓OVEN DOOR LATCH – latched
- MA73C:G 8. cb AC3 GALLEY FAN Φ A, Φ B, Φ C (three) – op
- ML86B:A 9. cb MNC SPLY H2O GALLEY SPLY – op
- B 10. MNA GALLEY OVEN – op
- 11. MNB GALLEY H2O HTR – op
- 12. Stow Personal Hygiene Hose

FLUID LOADING

- 1. At TIG–1:00 (if possible), begin Fluid Loading 32 oz water with salt over next 1.5 hr (two salt tablets per 8 oz)

CABIN CONFIG

- 1. Stow loose equipment
- 2. Remove, stow side hatch UV filter (except 102), locking device, and pyro box safing pin
- 3. Tape foot loops in egress routes
- 4. Remove, stow Window Shades (if not needed for cabin T control)

WCS DEACT

- WCS 1. Foot Restraints – up, locked
- ML31C 2. VAC VENT ISOL VLV CNTL – CL (tb–CL)

Cont next page

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10–61

EPCL/ALL/GEN H

POLE SETUP

1. Perform ESCAPE POLE STOWAGE/SETUP (Cue Card), then:

SEAT INSTALLATION

1. ✓ Minimum Itg on Middeck

FDF CONFIG

If TIG > 15 min:

1. Unstow CONT DEORB, LOSS OF 2 FREON LOOPS D/O PREP; pull out COMM pages for COMM Cycling >>

If POST TIG-10 min:

Configure AFT PANEL FOR ENTRY COMM:

NOTE

Procedure configures aft panel for landing site comm coverage at V = 12K

- | | | |
|-------|----|---|
| R14:B | 2. | cb GCILC (two) - cl |
| C3 | 3. | ✓S-BD PM CNTL - CMD |
| A1L | 4. | S-BD PM ANT SW ELEC - 2
MODE - STDN LO
XPNDR - 2 |
| | 5. | NSP PWR - 2
DATA RATE XMIT - HI
RCV - HI
✓UPLK DATA - S-BD
✓CODING XMIT - OFF
✓RCV - OFF |

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10-62

EPCL/ALL/GEN H

COMM PWRDN

- | | | |
|------------|-----|---|
| MS/
CDR | 1. | Pwr dn COMM ASAP after comm with MCC no longer reqd. Use COMM POWERUP (10-65) if MCC comm reqd. COMM will be pwrd on entry by AFT PANEL CONFIG FOR ENTRY COMM (see MS PAGE 10-62) and special <u>ENTRY MANEUVERS</u> (Cue Card) |
| A1L | 2. | S-BD PM ANT SW ELEC - OFF
PRE AMP - OFF
PWR AMPL STBY - OFF
OPER - OFF
MODE - STDN LO
XPNDR - OFF |
| | 3. | NSP PWR - OFF
ENCRYPTION PWR - OFF
(Encryption disabled for rest of flt)
ENCRYPTION MODE - SEL
SEL - BYP |
| C3 | 4. | S-BD PM CNTL - PNL, CMD
OI PCMMU FORMAT - FXD
PWR - OFF
AUD CTR - OFF (pwr up as reqd for cockpit audio) |
| A1L | 5. | ✓S-BD PL CNTL - PNL
✓PWR SYS - OFF
PL DATA INTLVR PWR - OFF |
| A1R | 6. | OPS RCDRS PWR (two) - OFF
S-BD FM CNTL - PNL
PWR - OFF
PL RCDR PWR - OFF |
| A3 | 7. | MON PWR (two) - OFF |
| A7U | 8. | TV PWR CONTR UNIT - OFF |
| O5 | 9. | L AUD PWR - AUD |
| O9 | 10. | R AUD PWR - AUD |
| O6 | 11. | UHF MODE - OFF
✓MDM PL1, PL2 (two) - OFF |
| R12L | 12. | VTR PWR - OFF |

Cont next page

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10-63

EPCL/ALL/GEN H

13. cb MNA ADC 1A/2A – op
 MNB ADC 1B/2B – op
 MNA,MNC GCILC (two) – op
 TV cbs (fifteen) – op
 RMS TV cbs (six) – op
14. PS,MS AUD PWR (two) – OFF
15. MIDDECK SPKR AUD PWR – OFF
16. If post TIG-10, perform AFT PANEL CONFIG FOR
 ENTRY COMM (10-62)

LOSS 2 FREON LOOPS
ENTRY
MS PAGE

10-64

EPCL/4/GEN H

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

- Pwr up audio system:
- C3 1. AUD CTR – 1
 - O5 2. ✓L AUD PWR – AUD
 - O9 3. ✓R AUD PWR – AUD
- Config for UHF comm (voice only):
- O6 4. UHF MODE sel – SPLX
✓SPLX PWR AMP – ON
 - 5. After Comm with MCC complete: Go to COMM PWRDN >>
- If UHF site unavailable or if MCC requests data
(Config for GSTDN (SGLS) S–BD):
- C3 6. ✓S–BD PM CNTL – PNL
 - A1L 7. ANT SW ELEC – 2
MODE – STDN LO (SGLS)
XPNDR – 2
 - 8. NSP PWR – 2
DATA RATE XMIT – HI
RCV – HI
✓CODING XMIT – OFF
RCV – OFF
UPLK DATA – S–BD
 - C3/F9 9. Select best S–BD PM ANT
- If MCC requests data:
- O14:B 10. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
 - O17:D 11. SIG CONDR OA 1/2/3 – ON
MDM OA 1/2/3 – ON
 - C3 12. OI PCMMU PWR – 1
 - O6 13. MDM PL2 – ON
GNC I/O RESET
- At end of data transmission:
- O14:B 14. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
 - O17:D 15. SIG CONDR OA 1/2/3 – OFF
MDM OA 1/2/3 – OFF
- After comm/data complete:
- 16. Go to COMM PWRDN >>

Cont next page

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10–65

EPCL/ALL/GEN H

~
If UHF site and GSTDN unavailable and comm/data critical:
Config for TDRS S-BD:

CAUTION

This is a High Pwr Mode. On-time should be limited to 10 min max due to Pwr Amp Thermal constraints. A 3-min delay occurs after S-BD PM PNL/CMD before Pwr Amp is active. Uplink not affected. Proceed with selection of best antenna

- C3
A1L
17. ✓S-BD PM CNTL – PNL
18. ✓ANT SW ELEC – 2
✓PRE AMP – 2
✓PWR AMPL OPER – 2
✓MODE – TDRS DATA
✓XPNDR – 2
19. ✓NSP PWR – 2
✓DATA RATE XMIT – HI
✓RCV – HI
CODING XMIT – ON
RCV – ON
✓UPLK DATA – S-BD
- C3/F9
20. Select best S-BD PM ANT
If MCC requests data:
- O14:B
O17:D
21. cb MNA OI MDM OF 1/2 A,3/4 A (two) – cl
22. SIG CONDR OA 1/2/3 – ON
MDM OA 1/2/3 – ON
- C3
O6
23. OI PCMMU PWR – 1
24. MDM PL2 – ON
25. GNC I/O RESET
- At end of data transmission:
- O14:B
O17:D
26. cb MNA OI MDM OF 1/2 A,3/4 A (two) – op
27. SIG CONDR OA 1/2/3 – OFF
MDM OA 1/2/3 – OFF
- After comm/data complete:
28. Go to COMM PWRDN

**LOSS 2 FREON LOOPS
ENTRY
MS PAGE**

10-66

EPCL/ALL/GEN H

LOSS OF 1 FC

1. ✓ Minimize lgt
 2. Use only one FLT CNTLR PWR and two IDP/CRTs
 - O7 3. TACAN 1,2,3 MODE sel (three) – OFF
 - O8 4. RADAR ALTM 1,2 (two) – OFF
 5. MLS 1,2,3 (three) – OFF
 - F1 6. DC UTIL PWR MNB – OFF
 - L2 7. FLASH EVAP FDLN HTR A,B SPLY (two) – OFF
 - L1 8. ✓ CAB FAN A(B) – ON
- If Total Power > 17 kW:
- C3 9. MSTR MADS PWR – OFF
(MCC will call for MADS cycle ON/OFF)

NOTE

If 2nd FC degrades during entry,
immediately switch MSTR MADS PWR – OFF

10. Perform PL PWRDN, then:
Deltas to ENT, DEORBIT BURN:
Add at TIG-5:
 - L1 11. TOP EVAP HTR NOZ L,R (two) – OFF
DUCT sel – OFF
HI LOAD DUCT HTR sel – OFF
HUM SEP A,B (two) – OFF
- Deltas to EPS procedures this book:
FC COOL P:
12. Change step 1 to read:
If aff FC/MN BUS tied and NO COMM:
 1. MN BUS TIE (three) – OFF
Perform BUS TIE (Cue Card)
good FC/BUS to unpwr bus
 13. Change step 3 to read:
 3. ESS BUS SOURCE FC – OFF
FC/MN BUS – OFF
FC – STOP
 14. Replace steps 4–8 with:
 4. H2O TK N2 ISOL vlv (two) – CL
(MO10W)
 5. SPLY H2O GN2 TK VENT vlv – VENT
(ML26C)
 15. Delete steps 12,13

Cont next page

FC REACTANT VLV CLOSED:

16. Replace step 2 with
 2. If aff FC/MN BUS Tied and COOL
P > 40:
MN BUS TIE (three) – ON (ASAP)
(Aff) MN BUS TIE (one) – OFF
(ASAP)
17. Delete following steps:
FC DELTA V 1(2,3), steps 1,4,5;
FC pH 1(2,3), steps 1,5,6
18. Replace following steps with:
If aff FC/MN BUS TIED:
MAIN BUS TIE (three) – ON
(Aff) MAIN BUS TIE (one) – OFF
FC DELTA V 1(2,3), step 3;
pH 1(2,3), step 4;
SAFING, step 7
19. BUS TIE: In steps 1 and 7, delete (A to ...A)
Deltas to ENTRY MANEUVERS (Cue Card):
At V = 15K:
20. Repwr all TACAN, MLS, and RA

LOSS OF 2nd FC (ENTRY)

1. Perform PWRDN ASAP while continuing nominal deorbit prep and/or entry activities
 - * FC capability is ~12 kW for sustained operations, *
 - * ~13 kW for short duration (~4 hr), ~16 kW for *
 - * contingency situations (~15 min). Purge FC at *
 - * 430 amps or less *
- C3 2. ✓MSTR MADS PWR – OFF
If prior to TIG and 2 MN Buses lost:
 3. Delay deorbit, contact MCC, and continueIf 1 MN BUS down:
 4. Perform EPS, BUS LOSS ACTION, 5–25 only, then:
- R2 5. HYD CIRC PUMP (three) – OFF
6. Minimize Itg
7. Perform PL PWRDN, then:
8. Use only one FLT CNTLR PWR, one PGSC, and two IDP/CRTs
- Recover any aff IMUs:
 9. GNC 21 IMU ALIGN
Wait for OPER *(~4 min), then I/O RESET
Align IMU, using IMU/IMU option
When align complete:
 10. GNC 50 HORIZ SIT
NAV DELTA zero update
 11. GNC 51 OVERRIDE
(Aff) IMU – resel
- O7 12. ✓TACAN MODE sel (three) – OFF
- O8 13. ✓RADAR ALTM (two) – OFF
14. ✓MLS (three) – OFF
- L2 15. ✓FLASH EVAP FDLN HTR SPLY (two) – OFF
- L1 16. ✓CAB FAN A(B) – ON
✓One FAN in each AV BAY – ON

Cont next page

- If no MANF leaks:
- R1 17. ✓ O2,H2 MANF VLV (four) – OP
 TK1 HTRS B – AUTO (MNA or MNB ↓), or
 TK2 HTRS B – AUTO (MNC or NO
 MN BUS ↓); then:
 All others OFF
- If MANF leak:
18. ✓ O2/H2 HTR LOSS TABLE (EPS)
 Sel one htr in one O2,H2 TK
- A1R 19. PL RCDR PWR – OFF
 S-BD FM CNTL – PNL
 PWR – OFF
- If MNC is pwrd:
- O6 20. Proceed with normal COMM operations
 MDM PL1 – OFF
- If MNB is pwrd and MNC is not:
- A1L 21. ✓ NSP CODING XMIT – ON
 C3 ✓RCV – ON
 S-BD PM MODE – TDRS DATA
 CNTL – PNL,CMD
- A1R 22. OPS RCDRS PWR (two) – OFF

Reconfig DPS:
REASSIGN STRINGS TO GPC 1,4 IN MC3

23. GNC 0 GPC MEMORY
 CONFIG – ITEM 1 +3 EXEC
 Modify MC 3 per table ----->

CONFIG	3	
GPC	1	2340
STR	1	1
	2	4
	3	1
	4	4
PL	1/2	1
CRT	1	1
	2	1
	3	4
	4	0
L	1	0
	2	0
MM	1	1
	2	4

C3 24. FCS CH (four) – ORIDE
 O6 25. GNC, OPS 30X PRO
 26. GPC MODE 2,3 (two) – STBY
 (tb-bp)
 – HALT
 PWR 2,3 (two) – OFF
 27. (BFS) GNC I/O RESET

Cont next page

If Vent Doors Closed:

28. GNC 51 OVERRIDE
VENT DOOR CNTL OPEN – ITEM 43
EXEC, wait 60 sec, then:
- MA73C:A 29. MCA LOGIC MID (four) – OFF
 : B ✓FWD (three) – ON
 MID (four) – OFF
 AFT (three) – OFF

If MNB and AC2 pwr:

- MA73C:C 30. cb MCA PWR AC1 3Φ FWD 1 – op
 AC3 3Φ FWD 3 – op

If only one MN BUS pwr:

31. Perform BUS TIE (Cue Card)

If two MN BUSES lost:

32. Modify entry procedures per MCC
direction >>

NOTE

Incorporate following changes or remove these
pages for use with indicated checklist/cue card

Deltas to ENT, DEORBIT BURN:

- At TIG-25 (3-7):
- L1 33. Omit VENT DOOR CLOSE
- At TIG-5:
- L1 34. TOP EVAP HTR NOZ (two) – OFF
35. DUCT sel – OFF
36. HI LOAD DUCT HTR sel – OFF
37. Insert after SINGLE APU START (DEORBIT
BURN):
- R4 38. ✓HYD BRAKE ISOL VLV (three) – GPC (tb-CL)
 ✓LG EXTEND ISOL VLV – GPC (tb-CL)
- At TIG-2:
- L1 39. AV BAY FAN (six) – OFF

Deltas to ENT, POSTBURN:

40. AV BAY FAN (three) – ON
(3 sec between each start)
- After SSME HYD REPRESS:
- O17:A 41. ATVC (four) – OFF
 :B 42. ✓EIU (three) – OFF
 :D 43. ✓MEC (two) – OFF

Cont next page

Deltas to ENTRY MANEUVERS (Cue Card):

At V = 15K:

If MNA(MNB,MNC) unpwr:

- 44. TACAN 2&3(1&3,1&2) MODE sel (two) – GPC
- 45. ✓TACAN ANT SEL (two) – AUTO

At V = 5K:

- 46. AIR DATA PROBE L – DPY (wait 30 sec)
R – DPY

* (Heat only one probe if reqd) *

At M = 2.7:

- L1 47. CAB FAN (two) – OFF
- 48. ✓AV BAY 1 FAN B – ON
2,3 FANS (four) – OFF

When AIR DATA incorporated:

- O7 49. TACAN 1,2,3 MODE sel (three) – OFF
- 50. Use 1 HUD, 1 MLS, 1 RA

At H = 85K:

- L1 51. FLASH EVAP CNTLR PRI A(B) – OFF

At Wheel Stop, add:

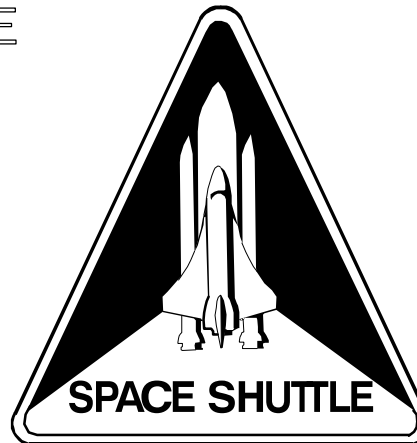
- L1 52. HUD,RA,MLS (all) – OFF
- 53. CAB FAN – ON

Wait 10 sec, then:

- 54. AV BAY 2,3 FAN (two) – ON
(3 sec between each start)
- 55. Go to ENT, POST LDG

Space Shuttle Program
FLIGHT DATA FILE

JSC-48021-II
GENERIC, REV H



AESP:	MM101
APCL:	MM104
OPCL:	MM106
EPCL:	MM301
AESP:	MM304

ENTRY POCKET CHECKLIST

OV
102,
104

Flight Cover (trim bottom to expose tabs)