Entry Checklist

Mission Operations Directorate
Operations Division

Generic, Rev H
March 15, 2007

NOTE
For STS-118 and subsequent flights

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://mod/jsc/nasa.gov/do3/FDF/index.html
PCN-5 (Oct 10, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):
MULTI-18248
ENT-0869

Incorporate the following:
1. Replace vii thru x
2. Replace 3-5 and 3-6
3. Replace 4-3 and 4-4
4. Replace CC 8-15 and CC 8-16

NOTE
For STS-126 and subsequent flights

Prepared by: 

Approved by: 

Encl: 10 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
MULTI-1809

Incorporate the following:
1. Replace vii and viii
2. Replace 3-11 and 3-12
3. Replace 5-17 and 5-18
4. Replace 6-1 thru 6-4

NOTE
For STS-122 and subsequent flights

Prepared by: Maria Smith
Book Manager

Approved by: John Doe
Chief, Ascent/Descent Dynamics Branch

Encl: 10 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
MULTI-1803

Incorporate the following:
1. Replace vii and viii
2. Replace 5-7 and 5-8, 5-21 thru 5-24

NOTE
For STS-120 and subsequent flights

Prepared by: Marcia Kemp
Book Manager

Approved by: Chief, Ascent/Descent Dynamics Branch

Encl: 8 pages

File this PCN immediately behind the front cover as a permanent record
PCN-2 (Aug 8, 2007) Sheet 1 of 1

List of Implemented Change Requests (482s):
ENT-867 MULTI-1788
MULTI-1799

Incorporate the following:
1. Replace v thru x
2. After 5-6, delete TEMP 5-7 and TEMP 5-8
   After 5-20, delete TEMP 5-21 and TEMP 5-22
   After 5-22, delete TEMP 5-23 and TEMP 5-24
3. Replace 6-1 and 6-2

NOTE
For STS-120 and subsequent flights

Prepared by: [Signature]
Book Manager

Approved by: [Signature]
Chief, Ascent/Descent Dynamics Branch

Encl: 8 pages

File this PCN immediately behind the front cover as a permanent record
List of Implemented Change Requests (482s):
ENT-865
ENT-866

Incorporate the following:

1. Replace v thru viii
2. Replace 5-7 and 5-8 with TEMP 5-7 thru 5-8 (4 pages)
   Replace 5-21 and 5-22 with TEMP 5-21 thru 5-22 (4 pages)
   Replace 5-23 and 5-24 with TEMP 5-23 thru 5-24 (4 pages)

NOTE
For STS-118 and subsequent flights

Prepared by: 
Allison McCagg
Book Manager

Approved by: 
Michael A. Collier
Chief, Ascent/Descent Dynamics Branch

Encl: 16 pages

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

ENTRY CHECKLIST

GENERIC, REVISION H
March 15, 2007

PREPARED BY:

Gwendolyne D. Jordan-Moore
Book Manager

APPROVED BY:

Lead Entry GPO

P.J. Bertsch
Chief, Ascent/Descent
Dynamics Branch

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted via FDF Workflow Crew Procedure Change Request (CR) to DO3/FDF Manager.

Additional distribution of this book, for official use only, may be requested in writing to DO3/PMO Administrator. 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.
Incorporates the following:

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P – Partial

AREAS OF TECHNICAL RESPONSIBILITY

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DM43/G. Jordan-Moore 281-483-1261
DM43/M. Trump 281-483-8029
Replace this page with page(s) from Flight Supplement
NOTES

1. This checklist is an all-vehicle book and is not complete for a specified flight without a Flight Supplement. To obtain complete checklist, incorporate Flight Supplement for specific flight of interest using instructions in Flight Supplement List of Effective Pages.

2. Entry related cue cards are contained in this document. Cue cards are listed in Entry Cue Card Config section. Some cue cards are printed in the body of checklist for MS use and also in the Entry Cue Card Config section for reference of crop marks and fabrication instructions.

3. Velcro placement, size, and shape of cue cards are controlled by Book Manager.

4. Vehicle configuration or procedural steps that are applicable to a specific vehicle are indicated by xxx.
**ENTRY CHECKLIST**

**LIST OF EFFECTIVE PAGES**

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* – Omit from flight book
Δ – Replace with page from Flight Supplement
† – Extra pages in crew copy only

vii  ENT/ALL/GEN H,5
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Δ – Replace with page from Flight Supplement
* – Omit from flight book
## ENTRY CUE CARDS

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<td>OMS XFEED RETURN at ΔVTOT = □ □ □ □ or □ □ □ □ at □ □ □ □ %</td>
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**INITIAL CONFIG:** □ TK ISOLs – CL

While feeding 2 OMS from 1 POD:

**OMS PRPLT FAIL:**
- Secure □ OMS
- Secure □ OMS
- Interconnect □ OMS to RCS
- THC + X for □
  - If □ (XFEED) ENG ‘↓’
  - When □ OMS QTY:
    - 5%: □ OMS TK ISOL (two) – OP
    - 4%: □ OMS TK ISOL (two) – CL
  - If □ (STRAIGHT FEED) ENG ‘↓’
  - OMS ENG FAIL:
    - At ΔVTOT = □ □ □ □ or □ □ □ □ at □ □ □ □ %
    - TK ISOL (two) – OP
    - TK ISOL (two) – CL

Return to 2 ENG, 2 POD FLOW:

- At ΔVTOT = □ □ □ □ TK ISOLs – OP
- OMS QTY □ □ □ □ □ □ % □ □ □ □ □ □ □ □ □ □ %L or □ □ □ □ □ □ □ □ □ □ %R

**FEED FROM GOOD POD:**
- At ΔVTOT = □ □ □ □ or □ □ □ □ at □ □ □ □ %
  - OMS He PRESS (two) – OP
  - TK ISOL (two) – OP
  - XFEED (two) – OP
  - Secure □ OMS

**OMS PRPLT LOW:**
- AFT RCS RECONFIG at ΔVTOT = □ □ □ □

**OMS ENG FAIL:**
- □ OMS He PRESS (two) – OP
- □ TK ISOL (two) – OP
- □ OMS XFEED (two) – CL
### DEL PAD

#### PRE-DEORBIT

- **APU START:** SINGLE APU START, ATTEMPT [ ] APU(s)  
- **APU START SEQUENCE:** [ ] THEN [ ]

#### DEORBIT

**BURN CUE CARD:**
- OMS TIG SLIP – NO EXEC > TIG +
- RCS DOWNSIZING
- STOP/CONTINUE CUES: L OMS FAIL HP
- R OMS FAIL HP
- OMS ENG FAIL XFEED QTY CUE
- ENG FAIL HP
- SAFE HP

**TOT AFT QTY 1 (%)**

**TOT AFT QTY 2 (%)**

**CAPTURE HP**
- PB/FLIP HP
- AFT HP
- B/U SITE

**FRCS:** DUMP TO % (USE TIME AS CUE)
- OX
- FU

#### ENTRY/LANDING

**EI - 5 MM303 INRTL ATT**
- R
- P
- Y

**MM304 PREBANK (ENT MNVR Cue Card)**
- L
- R

**ALTM SET**
- .

**CLG INIT**
- :

**EXPECTED AIL TRIM**
- L
- R

**VREL 1ST REVERSAL**
- .

**XCG AT TD**

**LAND SITE**
- L
- OVHD
- STRT
- TAC

**ATM MACH < 1 TO HAC**
- MAX Nz
- Nz LIMIT

**AT HAC INIT to H = 20K**

**AIMPOINT**
- SPEEDBRAKE
- % @ 3K SURFACE

**REMARKS:**

- TOT AFT QTY 2 (%)

---

2-3 ENT/ALL/GEN H
Replace this page with page(s) from Flight Supplement
Replace this page with page(s) from Flight Supplement
Replace this page with page(s) from Flight Supplement

(Replace with pages FS 3-1 thru FS 3-4)

3-2 ENT/ALL/GEN H
1: GNC DEORB MNVR COAST 2: GNC DEORB MNVR COAST
3: BFS, GNC DEORB MNVR COAST

TIG-45

B DEORB UPDATE/UPLINK

1: GNC 50 HORIZ SIT
3: BFS, GNC 50 HORIZ SIT

CRT1,3 GPS INH – ITEM 43 EXEC

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

MCC UPDATE:
- DEL PAD
- OMS PRPLT PAD

MCC UPLINK:
- PASS, BFS SV
- PASS, BFS TGT
- BFS IMU GYRO/ACCEL

C G50 LAND SITE per DEL PAD

On MCC GO:
C CRT1 LOAD – ITEM 22 EXEC
- TIMER – ITEM 23 EXEC

CRT1,3 PASS & BFS TGTs per MNVR PAD:
- BURN ATT
- △VTOT
- TGO
- HA HP
C  OMS TVC GMBL CHECK  
(Perform during AOS)

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

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

MS  ACES PRESSURE INTEGRITY CHECK  
Dual Suit Controller, Dial-To-Test Knob – full cw

P  APU PRE-START  
(Perform during AOS)

R4 √HYD BK ISOL VLV (three) tb – CL
√LG EXTD ISO VLV tb – CL
* If tb not CL: *
* R2  (Aff) HYD CIRC PUMP – ON *
* R4  (Aff) ISOL VLV – CL *
* Hold 5 sec, √tb – CL *
* R2  HYD CIRC PUMP – OFF *

R2  BLR N2 SPLY (three) – ON
√PWR (three) – ON
√CNTLR/HTR (three) – B
√cb APU FU TK VLV ENA (six) – cl
√APU FU TK VLV (three) – CL
√AUTO SHTDN (three) – ENA
√SPEED SEL (three) – NORM
√OPER (three) – OFF
HYD MN PUMP PRESS (three) – LO
APU CNTLR PWR (three) – ON

3:  BFS, SM SYS SUMM 2

P  R2  APU FU TK VLV (three) – OP
√APU/ HYD RDY tb (three) – gray
APU FU TK VLV (three) – CL

2:  GNC 50 HORIZ SIT

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

P  OMS BURN PREP

CRT2  OMS ENG TRIMS
2 ENG BURN:
√TRIM LOAD per MNVR PAD or:
   L,R – ITEM 6 +0.0 -5.7 +5.7 EXEC

1 ENG BURN:
√TRIM LOAD per MNVR PAD or:
   P – ITEM 6 +0.0 EXEC
Good eng Y:
   LY – ITEM 7 +5.2 EXEC
   RY – ITEM 8 -5.2 EXEC
XFEED: Failed engine prop to
   good engine

RCS DEORBIT OR RCS
He/PRPLT TK FAIL
Do not terminate OMS/RCS Interconnect

O7  AFT L,R RCS
   He PRESS (four) – OP (tb-OP)
   TK ISOL (six) – GPC (tb-OP)
   MANF ISOL (eight) – OP (tb-OP)
   XFEED (four) – GPC (tb-CL)
   √MSTR RCS XFEED – OFF

O8  L,R OMS
   √He PRESS/VAP ISOL (four) – CL
   √TK ISOL (four) – OP (tb-OP)
   √XFEED (four) – CL (tb-CL)
FWD RCS
   He PRESS (two) – OP (tb-OP)
   MANF ISOL (four) – OP (tb-OP)
### RCS BURN PREP

**DAP:** INRTL/PULSE

<table>
<thead>
<tr>
<th>P</th>
<th>O7</th>
<th>AFT L,R RCS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>TK ISOL (six) – CL (tb-CL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XFEED (four) – OP (tb-OP)</td>
</tr>
<tr>
<td>O8</td>
<td>L,R</td>
<td>OMS</td>
</tr>
<tr>
<td></td>
<td>He</td>
<td>PRESS/VAP ISOL (four) – CL</td>
</tr>
<tr>
<td></td>
<td>TK</td>
<td>ISOL (four) – OP (tb-OP)</td>
</tr>
<tr>
<td></td>
<td>R</td>
<td>OMS XFEED (two) – CL (tb-CL)</td>
</tr>
<tr>
<td></td>
<td>L</td>
<td>OMS XFEED (two) – OP (tb-OP)</td>
</tr>
</tbody>
</table>

**DAP:** AUTO/DISC

---

### WARNING

Eye and skin UV damage can occur in as little as 10 sec

Don Sunglasses

**MS3** Remove and stow Side Hatch UV Filter and Locking Device, and Pyro Box Safing Pin

---

**TIG-25 VENT DOOR CLOSE**

**NOTE**

VENT DOOR CLOSE must be performed prior to MM302 transition

---

**2: GNC 51 OVERRIDE**

<table>
<thead>
<tr>
<th>P</th>
<th>CRT2</th>
<th>VENT DOOR CNTL CLOSE – ITEM 44 EXEC (*), wait 1 min, then</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>CRT1</td>
<td>GNC, OPS 302 PRO</td>
</tr>
<tr>
<td>MS1/MS2</td>
<td>SEAT INGRESS</td>
<td></td>
</tr>
</tbody>
</table>

---

3-10 ENT/ALL/GEN H
MCC/CREW GO/NO-GO FOR DEORBIT BURN

**IF NO-GO FOR DEORBIT BURN:**

* P R2  HYD MN PUMP PRESS (three) – NORM
* C CRT1  GNC, OPS 301 PRO

**IF 1 ORBIT DELAY:**

Go to section 6, 1-ORB LATE

**IF 24-HR EXTENSION**

<table>
<thead>
<tr>
<th>P</th>
<th>O7</th>
<th>AFT L,R RCS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>He PRESS A (two) – GPC (tb-OP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B (two) – CL (tb-CL)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TK ISOL (six) – OP (tb-OP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>MANF ISOL (eight) – GPC (tb-OP)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>XFEED (four) – CL (tb-CL)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>O8</th>
<th>FWD RCS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>He PRESS A – GPC (tb-OP)</td>
</tr>
<tr>
<td></td>
<td>B – CL (tb-CL)</td>
</tr>
<tr>
<td></td>
<td>MANF ISOL (four) – GPC (tb-OP)</td>
</tr>
</tbody>
</table>

C6 Unstow ORB PKT C/L
Terminate Deorbit Procedures, go to DEORB PREP, D/O PREP BACKOUT
1: GNC DEORB MNVR EXEC   2: GNC DEORB MNVR EXEC
3: BFS, GNC DEORB MNVR EXEC

TIG-20> MNVR TO DEORBIT BURN ATT

C C3  \DAP: AUTO
B F6/F8  \ADI ATT (two) – INRTL
   \ERR (two) – MED
   \RATE (two) – MED
C CRT1  MNVR – ITEM 27 EXEC (*)
   (\ADI ATT with CRT BURN ATT)
B Copy last DEL PAD and OMS PRPLT PAD
data on DEORBIT BURN Cue Cards
F6/F8  \DEORBIT BURN and DEORBIT BURN
   MONITOR Cue Cards installed
A14 RCS/OMS HTR
   FWD RCS – OFF
   L POD (two) – A OFF,B OFF
   R POD (two) – A OFF,B OFF
   OMS CRSFD LINES (two) –
      A AUTO,B AUTO
   FWD RCS JET 5 (one) – OFF
   AFT RCS JET 5 (one) – OFF
TIG-5 P SINGLE APU START (Attempt one APU)

WARNING
Do not start APU while APU TEMP INJ > 437 or APU TEMP GG BED > 456

* If APU TEMP INJ > 437 or APU TEMP GG BED > 456:
  ♦ Start any available APU within temperature limits

R2 APU FU TK VLV – OP
OPER – START/RUN

MDU HYD PRESS ind – LO green

* If no start:
  * Do not execute Deorbit Burn
  * Shut down APU:
    * APU SHUTDN (ENT PKT, APU/HYD) >>

R2 HYD CIRC PUMP (three) – OFF

3: BFS, GNC SYS SUMM 2

C BURN ATT ± 5°

B Go to DEORBIT BURN (Cue Card)
SINGLE APU START (Attempt two APUs)

**WARNING**
Do not start APU while APU TEMP INJ > 437 or APU TEMP GG BED > 456

* If APU TEMP INJ > 437 or APU TEMP GG BED > 456:
  * Start any available APU within temperature limits

**R2**
APU FU TK VLV – OP
OPER – START/RUN
MDU

HYD PRESS ind – LO green

* If no start:
  * APU OPER – OFF
  * Start another APU
  *

* If second APU starts,
  * shut down unstarted APU:
    * APU SHUTDN (ENT PKT, APU/HYD)

* If neither starts:
  * Do not start third APU
  * Do not execute Deorbit Burn
  * Shut down unstarted APUs:
    * APU SHUTDN (ENT PKT, APU/HYD) >>

**R2**
HYD CIRC PUMP (three) – OFF

**3: BFS, GNC SYS SUMM 2**

C

\[ \text{\textbackslash{}BURN ATT } \pm 5^\circ \]

B
Go to **DEORBIT BURN** (Cue Card)
Replace this page with page(s) from Flight Supplement

(Replace with pages FS 3-15 thru FS 3-18)

3-16

ENT/ALL/GEN H
**RCS COMPLETION:**

* THC +X to TGT HP or TOT AFT QTY 1 %
* THC +X to CAPTURE HP or TOT AFT QTY 2 % then
* At AFT QTY 1 TOT AFT QTY 2
* If CUR HP:

PREBANK/FRCS COMPLETION to downrange site

CAPTURE PREBANK/FRCS COMPLETION to downrange site

PREBANK/FLIP PREBANK/FRCS COMPLETION

AFT THC +X to TGT HP

TGT

FRCS COMPLETION (if applicable):

* MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
* THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)

CUTOFF

+ :02 OMS ENG(s) – OFF (if < 3 IMU, at : )

* AFT RCS RECONFIG if INTERCONNECT *

Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)
DEORBIT BURN (1 ENG)

√MM302  √OMS L or R
√OMS BURN CONFIG (L or R XFEED)
Enter TGO + 10 sec
√TRIM per MNVR PAD or P +0.0, LY +5.2, RY -5.2
L,R OMS He PRESS/VAP ISOL A (two) – OP
... Wait 2 sec ... B (two) – OP
√DAP – AUTO(PASS)/DISC
ADI – LVLH(REF)/HI/MED
FLT CNTLR PWR (two) – ON

TIG-2
Good OMS ENG – ARM/PRESS

- .15 EXEC (NO EXEC > TIG +
- .15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
.00 TIG Start watch (\(V_{pc}, \Delta V_{TOT}, \text{ENG VLWs})

* If no OMS ignition: APUs – SHUT DN *

OMS XFEED RETURN at \(\Delta V_{TOT} = \) 
or \(\) \(\) at \(\) %

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

* * OMS PRPLT FAIL:
* STOP BURN:
* APUs – SHUT DN
* Secure aff OMS

* ** OMS ENG FAIL:
* STOP BURN:
* APUs – SHUT DN

* ** RCS +X JET FAIL OFF:
* STOP BURN:
* APUs – SHUT DN

* ENT-4b/D/J

MS ONLY 3-20 ENT/ALL/GEN H
RCS COMPLETION:

THC +X to TGT HP or TOT AFT QTY 1 X % then

At AFT QTY 1 THC +X to CAPTURE HP or TOT AFT QTY 2 X % then

If CUR HP: PREBANK/FRCS COMPLETION to downrange site

CAPTURE HP PREBANK/FRCS COMPLETION to downrange site

PREBANK/FLIP HP PREBANK/FRCS COMPLETION

AFT HP THC +X to TGT HP

TGT HP

FRCS COMPLETION (if applicable):

MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)

THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)

CUTOFF + :02 OMS ENG – OFF (if < 3 IMU, at X)

* AFT RCS RECONFIG if INTERCONNECT *

Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)

ENT-4bb/D/L
DEORBIT BURN (RCS)

\MM302
\RCS SEL
\RCS BURN CONFIG (L OMS I'CNCT)
L,R OMS He PRESS/VAP ISOL A (two) – OP

\DAP – INRTL/DISC
ADI – LVLH(REF)/MED/MED
FLT CNTLR PWR (two) – ON

TIG
THC +X (No Deorbit > TIG + \[\Delta V\] ± 3°)
Maintain PITCH ATT ERR ± 3°
Monitor \[\Delta V_TOT\]:
RCS I'CNCT TK SW at \[\Delta V_TOT\] =
R OMS XFEED (two) – OP
L OMS XFEED (two) – CL

OMS PRPLT LOW
AFT RCS RECONFIG AT \[\Delta V_TOT\] =
RCS COMPLETION

* OMS PRPLT FAIL (MULTIPLE JETS FAIL OFF):
* Secure aff OMS
* STOP BURN:
* SAFE APUs – SHUT DN
* CONTINUE BURN:
* ITEM 18 +0 EXEC
* \[G23\] Resel jets
* THC +X (\%OMS% vs RCS Burn Time)
* AFT RCS RECONFIG
* RCS COMPLETION

* RCS +X JET FAIL OFF:
* STOP BURN:
* SAFE APUs – SHUT DN
* CONTINUE BURN:
* ITEM 18 +0 EXEC
* \[G23\] Resel jets

ENT-3a/D/L
* RCS COMPLETION:
  * THC +X to TGT HP or TOT AFT QTY 1 ___ ___ %
  * THC +X to CAPTURE HP or TOT AFT QTY 2 ___ ___ % then
  * If CUR HP: PREBANK/FRCS COMPLETION to downrange site
  * PREBANK/FLIP HP PREBANK/FRCS COMPLETION to downrange site
  * AFT HP THC +X to TGT HP
  * TGT HP

* FRCS COMPLETION (if applicable):
  * MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
  * THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)

CUTOFF: VGOx = 0, release THC
AFT RCS RECONFIG
Trim Inplane X,Z residuals < 2 fps (< 0.5 fps if shallow)
ENT-3aa/D/M
UNBALANCED PRPLT DEORBIT BURN

\(\sqrt{\text{MM302}}\)
\(\sqrt{\text{OMS BOTH}}\)
Enter TGO + 5 sec
\(\sqrt{\text{TRIM per MNVR PAD or P +0.0, LY -5.7, RY +5.7}}\)
\(\sqrt{\text{DAP – AUTO(PASS)/DISC}}\)
ADI – LVLH(REF)/Hi/MED
FLT CNTLR PWR (two) – ON
Feed 2 ENG from 1 POD

\(L_R\) OMS He PRESS/VAP ISOL A (two) – GPC
B (two) – OP
\(L_R\) OMS TK ISOL (two) – CL (tb-CL)
L_R OMS XFEED (four) – OP (tb-OP)

TIG-2:
OMS ENG (two) – ARM/PRESS
- :15 EXEC (NO EXEC > TIG +
- :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
:00 TIG Start watch (\(\sqrt{P_c, \Delta VTOT, ENG VLVs}\))

If no OMS ignition: APUs – SHUT DN

* While feeding 2 OMS from 1 POD:

** OMS PRPLT FAIL:
** Failed OMS ENG(s) – OFF
** STOP BURN:
** APUs – SHUT DN
** Secure OMS

** SAFE

** CONTINUE BURN:
** ITEM 18 +0 EXEC
** If Both ENGs ↓:
** Secure OMS
** \(\sqrt{\text{ADI – LVLH, center needles}}\)
** Interconnect OMS to RCS
**
** THC +X for:
** AFT RCS RECONFIG
** RCS COMPLETION
** If (XFEED) ENG ↓:
** When OMS QTY:
** 5%
** 4%
** If OMS P_c < 80 or OMS TEMP,
** OMS ENG – OFF
** \(\sqrt{\text{ADI – LVLH, center needles}}\)
** RCS COMPLETION
**
** If (STRAIGHT FEED) ENG ↓:
** OMS ENG FAIL

** OMS ENG FAIL (CONTINUE BURN):
** Failed OMS ENG – OFF
** at \(\Delta VTOT = \)
** or \(\Delta VTOT = \) at %
** TK ISOL (two) – OP
** TK ISOL (two) – CL

Return to 2 ENG, 2 POD FLOW at \(\Delta VTOT:
\) OMS TK ISOL (two) – OP (tb-OP)
L_R OMS XFEED (four) – CL (tb-CL)
OMS PRPLT FAIL:
• Failed OMS ENG – OFF

STOP BURN:
L OMS FAIL HP  R OMS FAIL HP
CONTINUE BURN:
ITEM 18 +q EXEC
When good OMS QTY:
5%: L/R OMS XFEED (four) – OP
4%: Good OMS TK ISOL (two) – CL
If OMS P_c < 80 or OMS TEMP,
OMS ENG – OFF
√ADI – LVLH, center needles
RCS COMPLETION

OMS ENG FAIL:
• Failed OMS ENG – OFF
OMS XFEED at 1/2 ΔVTOT at fail
or OMS QTY %L or %R

2nd OMS FAIL (ENG or PRPLT):
• Failed OMS ENG – OFF
If PRPLT FAIL: Secure aff OMS
ITEM 18 +0 EXEC
Both ENG FAIL HP Either PRPLT FAIL (SAFE) HP
STOP BURN:
APUs – SHUT DN
CONTINUE BURN:
√ADI – LVLH, center needles
Interconnect good OMS to RCS
THC +X (√OMS% vs RCS Burn Time)
RCS I’CNCT TK SW (N/A PRPLT FAIL)
THC +X (√OMS% vs RCS Burn Time)
AFT RCS RECONFIG
RCS COMPLETION

RCS COMPLETION:
• THC +X to TGT HP or TOT AFT QTY 1 %
At AFT QTY 1 THC +X to CAPTURE HP or TOT AFT QTY 2 %
If CUR HP: THC +X to CAPTURE HP or TOT AFT QTY 2 %
then PREBANK/FRCS COMPLETION
to downrange site

CAPTURE HP
PREBANK/FRCS COMPLETION to downrange site
PREBANK/FLIP HP
AFT HP
TGT HP

FRCS COMPLETION (if applicable):
• MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
• THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)
CUTOFF
+ :02 OMS ENG(s) – OFF (if < 3 IMU, at )
* AFT RCS RECONFIG if INTERCONNECT *
Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)
DEORBIT BURN (MIXED XFEED)

\textbf{MM302} \textbf{OMS L(R) or RCS}
Enter TGO + 10 sec
\textbf{L,R OMS TK ISOL (four) – GPC}
\textbf{XFEED (four) – GPC}
\textbf{tb config from table (OMS SSR-1)}
\textbf{DAP – AUTO(PASS)/DISC}
\textbf{ADI – LVLH(REF)/HI/MED}
\textbf{FLT CNTLR PWR (two) – ON}

Man repress to maintain good OMS Tk Ps > 234 psi (sim)

\textbf{If OMS BURN INITIATION:}
\textbf{TRIM per MNVR PAD or: P +0.0, LY +5.2, RY -5.2}

\textbf{TIG-2:}
\textbf{Good OMS ENG – ARM/PRESS}
\begin{itemize}
\item [-15] EXEC (No EXEC > TIG +)
\item [-15] If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
\item [00] TIG Start watch (\textit{Pc}, \textit{VTOT}, ENG VLVs)
\end{itemize}
\begin{itemize}
\item * If no OMS ignition, APUs – SHUT DN *
\end{itemize}

\textbf{If RCS BURN INITIATION:}
Man repress L,R OMS > L,R RCS TK Ps
L,R RCS XFEED (four) – OP
TK ISOL (six) – CL

\begin{itemize}
\item [00] THC +X (No Deorbit > TIG +)
\item Maintain PITCH ATT ERR ± 3°
\end{itemize}

\textbf{FEED FROM GOOD POD:}
\textbf{at $\Delta VTOT =$}
\begin{itemize}
\item OMS He PRESS/VAP ISOL (two) – OP
\item TK ISOL (two) – OP (tb-OP)
\item XFEED (two) – OP (tb-OP)
\end{itemize}

\textbf{OMS PRPLT LOW}
AFT RCS RECONFIG at $\Delta VTOT =$
RCS COMPLETION

\textbf{ENT-5b/D/J}
\textbf{MS ONLY 3-26 ENT/ALL/GEN H}
OMS PRPLT FAIL:
OMS ENG – OFF

STOP BURN:
APUs – SHUT DN
Secure L,R OMS

CONTINUE BURN:
Secure L,R OMS
ITEM 18 +0 EXEC
ADI – LVLH, center needles
RCS COMPLETION

OMS ENG FAIL:
OMS ENG – OFF

ENG FAIL HP

STOP BURN:
APUs – SHUT DN

CONTINUE BURN:
Man repress L,R OMS > L,R RCS TK Ps
FEED FROM GOOD POD:

OMS HE PRESS/VAP ISOL (two) – OP
TK ISOL (two) – OP

OMS XFEED (two) – CL
L,R RCS XFEED (four) – OP
TK ISOL (six) – CL

ADI – LVLH, center needles
THC +X (\Lowest OMS % vs RCS Burn Time)
AFT RCS RECONFIG
RCS COMPLETION

RCS +X JET FAIL OFF:

SAFE HP

STOP BURN:
APUs – SHUT DN

CONTINUE BURN:
ITEM 18 +0 EXEC
C23 Resel jet

RCS COMPLETION:
THC +X to TGT HP or TOT AFT QTY 1 %
At AFT QTY 1 THC +X to CAPTURE HP or TOT AFT QTY 2 %
If CUR HP: then PREBANK/FRCS COMPLETION
to downrange site

CAPTURE HP

PREBANK/FLIP HP
PREBANK/FRCS COMPLETION

AFT HP

THC +X to TGT HP

TGT HP

FRCS COMPLETION (if applicable):
MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)

CUTOFF VGOx = 0, Release THC

OMS ENG(s) – OFF (if < 3 IMU, at )
AFT RCS RECONFIG if INTERCONNECT
Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)

ENT-5bb/D/K
Replace this page with page(s) from Flight Supplement
If no OMS IGNITION at TIG:

- OMS ENG (two) – OFF
- √APU – SHUT DN
- C3 MSTR MADS PWR – OFF
- O8 L,R OMS
- He PRESS/VAP ISOL (four) – CL
- XFEED (four) – CL
- GNC, OPS 301 PRO
- F6,F8 FLT CNTRL PWR (two) – OFF
- C3 √DAP: AUTO
- MCC at next AOS

If burn terminated with HP > SAFE HP:

- √OMS ENG (two) – OFF
- √APU – SHUT DN
- C3 MSTR MADS PWR – OFF
- OPS 301 PRO
- If I’CNCT:
  - DAP: INRTL/PULSE
- O8 L,R OMS
- He PRESS/VAP ISOL (four) – CL
- XFEED (four) – CL
- O7 AFT L,R RCS
- He PRESS A (two) – GPC (tb-OP)
  - B (two) – CL (tb-CL)
- TK ISOL (six) – OP (tb-OP)
- XFEED (four) – CL (tb-CL)
- O8 FWD RCS
- He PRESS A – GPC (tb-OP)
  - B – CL (tb-CL)
- F6,F8 FLT CNTRL PWR (two) – OFF
- C3 √DAP: AUTO
- MCC at next AOS on DEORBIT DELAY
  - of 24 hr
**1: GNC DEORB MNVR EXEC**  
2: GNC DEORB MNVR EXEC  
3: BFS, GNC SYS SUMM 2

MS  Stow Flight Deck SpOC

L10  REC pb – press, hold  
(VTR) PLAY pb – press, simo  
(√red dot displayed)  
Install VIP, VTR covers

B  F6,F8  FLT CNTLR PWR (two) – OFF
C3 √DAP: AUTO

**OMS/RCS POST BURN RECONFIG**

P  O7  AFT L,R RCS  
√He PRESS (four) – OP (tb-OP)  
√TK ISOL (six) – GPC (tb-OP)  
√XFEED (four) – GPC (tb-CL)

O8  L,R OMS  
He PRESS/VAP ISOL (four) – CL  
√TK ISOL (four) – OP (tb-OP)

* If OMS PRPTL FAIL,  *  
* √Aff TK ISOL (two) – CL *  

XFEED (four) – CL (tb-CL)

O3  RCS/OMS PRESS sel – RCS as reqd  
PRPLT QTY sel – RCS as reqd
Replace this page with page(s) from Flight Supplement
**SECONDARY ACTUATOR CHECK**
(if not previously performed and time permits)

**NOTE**
If port does not bypass during check, bypass affected port after check:
- SEC ACT BYPASS – ITEM 8 +X X EXEC

If affected port still does not bypass:
- SEC ACT RESET – ITEM 9 +X X EXEC

**R2**
1. HYD MN PUMP PRESS (one) – NORM

**CRT3**
2. SURF DRIVE ON, ITEM 39 EXEC (*)
   - Wait at least 5 sec

**MDU**
- SPI: Stop drive test when elevon posns within +12° to -27°
- SURF DRIVE OFF, ITEM 40 EXEC (*)

**CRT1**
3. √POS STIM ENA, ITEM 7 – (no *)

**C3**
4. √FCS CH 1,2,3,4 – AUTO

**CRT1**
5. SEC ACT CK, CH 1 – ITEM 1 EXEC (*)
   - START – ITEM 5 EXEC (*)
   - √All CH 1 PORTS BYPASS, ‘↓’
   - STOP – ITEM 6 EXEC (*)

**C3**
6. FCS CH 1 – ORIDE

**CRT1**
7. √All CH 1 PORTS RESET, no ‘↓’
   - FCS CH 1 – AUTO

8. Repeat steps 5 thru 7 for CH 2,3,4
FORWARD RCS DUMP
(Use for off-nominal X cg entry)

Determine FWD RCS ‘DUMP TO %’ using lowest of Ox or Fu qty (calculator or DEL PAD)

FOUR JET DUMP:

F RCS PRPLT TO BE DUMPED (%)

TIME FROM DUMP INITIATION (M:S)

NOTE
During dump, disregard FRCS qty
1: GNC 23 RCS  
2: GNC DEORB MNVR COAST  
3: BFS, GNC SYS SUMM 2

TWO JET DUMP:

F RCS PRPLT TO BE DUMPED (%)

<table>
<thead>
<tr>
<th>0</th>
<th>10</th>
<th>20</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

0:00 0:35 1:11 1:46 2:04 2:21 2:39 3:15 3:32

60 70 80 90 100

3:50 4:25 5:01 5:36

3:32 4:08 4:43 5:18 5:54

TIME FROM DUMP INITIATION (M:S)

NOTE
During dump, disregard FRCS qty

CRT2
FWD RCS ARM – ITEM 36 EXEC
DUMP – ITEM 37 EXEC
(Start watch)
When dump time achieved:
FWD RCS OFF – ITEM 38 EXEC
ENTRY SW CHECK

C L2  
\(^\checkmark\) CAB RELIEF A,B – ENA (tb-ENA)
\(^\checkmark\) ANTISKID – ON
\(^\checkmark\) NWS – 1
\(^\checkmark\) ENTRY MODE – AUTO

X: GNC 51 OVERRIDE

\(^\checkmark\) ROLL MODE – AUTO

B L2/C3  \(^\checkmark\) SPD BK – Full Fwd

P C3  \(^\checkmark\) SRB SEP – AUTO
\(^\checkmark\) ET SEP – AUTO

B F6/F8  \(^\checkmark\) AIR DATA – NAV
\(^\checkmark\) ADI ERR – MED
\(^\checkmark\) ADI RATE – MED
\(^\checkmark\) HSI SEL MODE – ENTRY

C F6  \(^\checkmark\) SOURCE (two) – NAV, 1

P F8  \(^\checkmark\) SOURCE (two) – NAV, 2

B F3  \(^\checkmark\) TRIM RHC/PNL (two) – INH
\(^\checkmark\) PNL (two) – ON

Exercise BRAKE PEDALS
NOTE
If NAVAIDS OFF due to PKT C/L PWRDN, switch ON per PWRDN procedure

C F6 \RADAR ALTM – 1
P F8 \RADAR ALTM (two) – ON
O8 \MLS (three) – ON (PASS)
\MLS CH (three), FS 3-2

If OV103, 104:
O7 \TACAN MODE (three) – GPC
\ANT SEL (three) – AUTO
\TACAN CH (three) per DEL PAD or FS 3-2
EI-13

REMAINING APUs START

WARNING
Do not start APU while APU TEMP INJ > 437 or APU TEMP GG BED > 456

* If an APU failed to start at TIG-5, *
  * start remaining good APU only *

* If remaining APU TEMP INJ > 437 or *
  * APU TEMP GG BED > 456: *
  * A12 (Aff) APU HTR GAS GEN/FU *
  * PUMP – OFF *
  * Start aff APU when within *
  * temperature limits *

R2 APU FU TK VLV (two) – OP
√APU/HYD RDY tb (two) – gray

* If tb – bp, attempt normal start *

APU OPER (two) – START/RUN
√APU/HYD PRESS ind (two) – LO green

R2 √APU/HYD RDY tb (two) – bp

* If APU OIL OUT P < 25 and APU *
  * TEMP OIL OUT not increasing *
  * after APU start or no start: *
  * Perform APU SHUTDN (ENT *
  * PKT, APU/HYD) *
If two APUs operating:

- Delete HYD FLUID THERMAL CONDITIONING
- Delay following until EI-6:
  - MDU: \(\sqrt{\text{PRESS ind (two) – HI green}}\)
  - Perform SSME HYD REPRESS
- At TAEM:
  - R2: APU SPEED SEL (two) – HI >>

If only one APU operating:

- R2: APU AUTO SHTDN (one) – INH
- Delete SSME HYD REPRESS and HYD FLUID THERMAL CONDITIONING
- Delay MM304 trans until EI-2;
  - immediately prior to MM304 trans:
    - MDU: \(\sqrt{\text{PRESS ind (one) – HI green}}\)
  - R2: APU SPEED SEL (one) – HI >>

HYD MN PUMP PRESS (three) – NORM

\(\sqrt{\text{PRESS ind (three) – HI green}}\)

**SSME HYD REPRESS**

R2 \(\sqrt{\text{HYD MN PUMP PRESS (three) – NORM}}\)

- If HYD SYS 2 or SYS 1 failed,
  - perform following steps using SYS 3 in place of failed system

R4 HYD MPS/TVC ISOL VLV

SYS 2 – OP (hold 5 sec, tb-OP) (MA possible)
Wait 10 sec
SYS 2 – CL (hold 5 sec, tb-CL)

SYS 1 – OP (hold 5 sec, tb-OP) (MA possible)
Wait 10 sec
SYS 1 – CL (hold 5 sec, tb-CL)
1: GNC DEORB MNVR COAST  2: GNC DEORB MNVR COAST  3: BFS, SM 0 THERMAL

* El-11 P  HYD FLUID THERMAL CONDITIONING  *
* (MCC CALL)  *
* CRT2  SURF DRIVE ON – ITEM 39 EXEC  *
* Start TIMER  *
* MDU √SPI:  Observe AEROSURFACES CYCLING  *
* ELEV U33 to D18 deg  *
* RUD R5 to L5 deg  *
* SPDBK 15 to 10 %  *
* BDY FLP 93.6 to 3.5 %  *
* When SURF DRIVE ON (5 min),  *
* CRT2  SURF DRIVE OFF – ITEM 40 EXEC  *

B  Stow DEORBIT BURN and DEORBIT BURN MONITOR Cue Cards
√ENTRY Cue Cards installed

* If 8 psi cabin entry,  *
* ALL  √Tabs/Visor – CL/LES O2 – ON  *
G SUIT INFLATION

ALL  Load – 1.5 (three turns cw if reqd)

* FCS CH CONFIG
  * If less than four PASS GPCs, config FCS
  * CHs so that each GPC cmds equal
  * number of CHs (see table)

<table>
<thead>
<tr>
<th>AVAILABLE GPCs</th>
<th>FCS CHs</th>
<th>FCH CH CONFIG</th>
<th>SURF FBK</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>4</td>
<td>3 AUTO 1 ORIDE 2 OFF 3 1</td>
<td>3 SEL 1 DESEL 2</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>3 AUTO 1 ORIDE 2 OFF 3 1</td>
<td>3 SEL 1 DESEL 2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2 AUTO 2 ORIDE 2 OFF 2 1</td>
<td>2 SEL 1 DESEL 2</td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td>3 AUTO 2 ORIDE 2 OFF 2 1</td>
<td>2 SEL 1 DESEL 2</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>2 AUTO 2 ORIDE 2 OFF 2 1</td>
<td>2 SEL 1 DESEL 2</td>
</tr>
</tbody>
</table>

* If CH 4 – OFF, do not desel PASS SURF FDBK

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

B  F6,F8  FLT CNTLR PWR (two) – ON

EI-6  Go to ENTRY MANEUVERS (Cue Card)
This Page Intentionally Blank
ENTRY CUE CARDS
## ENTRY NO-GO CHECKLIST

<table>
<thead>
<tr>
<th>FAILURE OF:</th>
<th>AERO PTI DTO</th>
<th>AUTO FCS MODE</th>
<th>XWIND DTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>APU/HYD:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 APU</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2 APUs</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DISPLAYS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ADIs</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDR HUD</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CONTROLLERS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>RHC: 1L</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2L &amp; 2R</td>
<td>X</td>
<td>X (M &lt; 2.5)</td>
<td>X</td>
</tr>
<tr>
<td>RPTA: 2L or 2R</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 AAs (LAT)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GNC: 2 AAs (NORM)</td>
<td>X</td>
<td>X (M &lt; 2.5)</td>
<td>X</td>
</tr>
<tr>
<td>2 RGAs</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 R DDU PWR SPLY</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 IMU (or 1 IMU + BITE)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 ADTAs</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ADTA NOT INCORP</td>
<td>X</td>
<td>X (M &lt; 2)</td>
<td></td>
</tr>
<tr>
<td>OR DLMA</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MLC NOT INCORP</td>
<td>X</td>
<td>(&lt; 6K ft)</td>
<td></td>
</tr>
<tr>
<td>DPS: 2 FCS CH (same surface)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 GPC (not restrung)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 GPC (not restrung)</td>
<td>X</td>
<td>X (M &lt; 2.5)</td>
<td>X</td>
</tr>
<tr>
<td>1 FF</td>
<td>X</td>
<td>X (M &lt; 2.5)</td>
<td>X</td>
</tr>
<tr>
<td>2 FF</td>
<td>X</td>
<td>X (M &lt; 2.5)</td>
<td>X</td>
</tr>
<tr>
<td>2 FA</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>RCS: LEAK (AFT – during ENT)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEAK (TOP)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 YAW JETS (same side)</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TRIM: MIN RCS QTY</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All &gt; ± 2.0 deg</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DOWNMODE:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FCS problem</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>AOA</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PLB: PLBD Latch Gang</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LDG/DECEL:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tire Leak</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HYD BRAKE ISOL VLV</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 100% Brakes</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NWS</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENERGY – OFF NOMINAL:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Roll Ref Alert</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above Upper Traj Line</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MCG GCA, or VEL &amp; PSN update</td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>No A/L by 6K ft</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>XWIND:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt; 10 Knots Peak</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 15 Knots Peak</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&gt; 10 Knots Gust</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GROUND SYSTEMS:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Runway Aim Point</td>
<td>X</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### NOTES

1. Consider runway redesignation (M > 6) to avoid Xwind landing
2. GO if PAPI and BALL BAR available
3. Pitch AUTO mode NO-GO for M < 2.5
4. GO if only string 4 affected

ENT-7a/E/K

MS ONLY 4-3 ENT/ALL/GEN H
# ENTRY MANEUVERS

<table>
<thead>
<tr>
<th>FLIGHT CONDITIONS</th>
<th>MANEUVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI-5</td>
<td>( \sqrt{LVLH\ ATT} ) GNC, OPS 304 PRO</td>
</tr>
<tr>
<td></td>
<td>* If PREBANK, R/Y – CSS *</td>
</tr>
<tr>
<td></td>
<td>* Roll at 1°/sec to *</td>
</tr>
<tr>
<td></td>
<td>* ( 1.80 ) if HP ( \geq 46 ), else *</td>
</tr>
<tr>
<td></td>
<td>* (from Prebank Table) *</td>
</tr>
<tr>
<td></td>
<td>* Maintain PREBANK ( \pm 5° ) *</td>
</tr>
</tbody>
</table>

If previous OMS OX TK, He TK, or RCS OX TK leak:

\[ G51 \] VENT DOOR CNTL OPEN – ITEM 43 EXEC

\( \text{AOA} \) SPI When SB position – 0%:

\( \sqrt{HYD\ MN\ PUMP\ PRESS\ (three) – LO} \)

\( q = 1 \)

\( \text{AOA} \) HYD MN PUMP PRESS (three) – NORM

‘Guidance Box’ @

\( q \approx 8 \) or

\( D \approx 3 \)

\( V = 24K \)

\( \Delta z = 10.5° \)

FIRST ROLL REVERSAL \[ \text{DEL PAD} \]

\( V = 19K \)

\( \sqrt{HYD\ MPS/TVC\ ISOL\ VLV\ SYS\ (three) – CL} \)

\( V = 15K \)

\( \sqrt{NAVAIDS\ (I/O\ RESET\ if\ reqd)} \)

\( V = 12K \)

RAD BYP VLV MODE (two) – AUTO

CNTLR LOOP (two) – AUTO B(A)

\( V = 10K \)

\( \sqrt{SPDBK\ to\ 81\%} \)

\( \text{ENT-6a/E/Q} \)
ENTRY CONTROL

<table>
<thead>
<tr>
<th>ARCS QTY (L + R) &lt; 10 %</th>
<th>1. ENTRY MODE – NO Y JET</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCS QTY = 0 &amp; JETS</td>
<td>(R/Y CSS; expect sluggish control)</td>
</tr>
<tr>
<td>FAIL OFF</td>
<td>2. [G51] ELEVON FIXED – ITEM 18 EXEC (*)</td>
</tr>
<tr>
<td>Q ≥ 20 &amp; M &gt; 6</td>
<td>3. ENTRY MODE – AUTO</td>
</tr>
<tr>
<td></td>
<td>When control regained:</td>
</tr>
<tr>
<td>CONTROL PROBLEMS* &amp;</td>
<td>4. ENTRY MODE – NO Y JET</td>
</tr>
<tr>
<td>ARCS QTY &gt; 0</td>
<td>5. \AIL trim</td>
</tr>
<tr>
<td>M &lt; 6 &amp; ARCS QTY &gt; 0</td>
<td>6. ENTRY MODE – AUTO</td>
</tr>
<tr>
<td>M &lt; 5</td>
<td>7. TRIM/RHC PNL – ENA</td>
</tr>
<tr>
<td></td>
<td>8. TRIM ROLL – away from \AIL trim (to &lt; 1)</td>
</tr>
</tbody>
</table>

*Region of least margin: M 12-8

AIL TRIM ≥ 3°

<table>
<thead>
<tr>
<th>TAL</th>
<th>1. [G51] WRAP MODE – ITEM 45 EXEC (ACT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>\AIL trim = 5</td>
<td>2. BF – MAN</td>
</tr>
<tr>
<td></td>
<td>3. BF – UP (to 0%)</td>
</tr>
<tr>
<td>NO Y JET</td>
<td>4. Perform roll reversals at 3°/s (expect sluggish control)</td>
</tr>
<tr>
<td>M &lt; 13 &amp; \AIL trim = 5</td>
<td>5. P – CSS</td>
</tr>
<tr>
<td></td>
<td>6. Fly \alpha per schedule:</td>
</tr>
<tr>
<td></td>
<td>| M</td>
</tr>
<tr>
<td>\alpha</td>
<td>37</td>
</tr>
<tr>
<td>M &lt; 5</td>
<td>7. TRIM/RHC PNL – ENA</td>
</tr>
<tr>
<td></td>
<td>8. TRIM ROLL – away from \AIL trim (to &lt; 1)</td>
</tr>
<tr>
<td>M &lt; 2</td>
<td>9. P – AUTO</td>
</tr>
<tr>
<td></td>
<td>10. BF – AUTO</td>
</tr>
</tbody>
</table>

HIGH-FREQ OSC OR SURF/JET CYCLE

<table>
<thead>
<tr>
<th>Returning PL &gt; 10K lb</th>
<th>1. [G51] \FILTER ALT – ITEM 21 (*)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osc/Cycle continues</td>
<td>2. P, R/Y – CSS</td>
</tr>
<tr>
<td>Osc/Cycle stops</td>
<td>3. ENTRY MODE – LO GAIN</td>
</tr>
<tr>
<td></td>
<td>4. ENTRY MODE – AUTO</td>
</tr>
<tr>
<td></td>
<td>5. P, R/Y – AUTO</td>
</tr>
</tbody>
</table>

ENT-10a/A,E/B

ENT-10b/A,E/B

MS ONLY 4-11 ENT/ALL/GEN H
POST LANDING PROCEDURES
* LOSS OF COMM
* In event of loss of comm (day or night), the following signals will be utilized to indicate onboard status to convoy:

* NOTE
* Before declaring loss of comm, attempt to contact convoy on 259.7 using PRC-112 radio channel A
* Crew should continue signals until acknowledged by convoy
* From Crew (with Mini Mag light stowed in ACES or Spotlight stowed in volume 3b)
* Crew OK Circular motion
* OMS/RCS & Hatch safed Circular motion
* APU shutdn Circular motion
* Crew needs assistance; will open/blow hatch Vertical motion
* Crew needs assistance; will not open/blow hatch Horizontal motion
* From Convoy
* Convoy will acknowledge crew signals with sequence of three flashes of headlights on convoy vehicle
* Continuous flashing – Emer pwrnd and egress

* EXPEDITED PWRDN
* Accomplish for:
  * Loss of all comm, including hand signals, with convoy elements
  * Loss of telemetry and onboard systems monitoring visibility
  * Fuel leak (OMS, RCS, or APU) if:
    * Nonisolatable, or
    * Leak occurs during RTLS, TAL, AOA, or POST D/O TIG
  * Fire Suppression Bottle discharged during entry for confirmed or suspected fire
* If APU, OMS, RCS Fuel Leak:
  * APUs OFF ASAP
* As time permits:
  * RCS, OMS SAFING (RJDs), 5-4
  * GPC DEACT
  * O6 GPC MODE 1,2,3,4,5 (five) – STBY (tb-bp)
  * – HALT
* ET UMBILICAL DOOR OPENING, 5-5 (RTLS/TAL only)
* ‘MODE 5’ POST LANDING EGRESS Cue Card (CDR or MCC call) then EMER PWRDN Cue Card
POST LANDING

WARNING
APUs OFF ASAP for APU hydrazine, OMS, RCS (FWD or AFT), or MPS propellant leak

00:00 After orbiter stops:

C Report, “WHEELS STOP”
Establish COMM with NCC

L2 SPD BK – MAN, full fwd
NWS – OFF

P If RTLS or TAL abort:
Perform ET UMBILICAL DOOR OPENING, 5-5

R2 √APU AUTO SHTDN (three) – ENA
√SPEED SEL (three) – NORM

R1 √AC BUS SNSR (three) – AUTO

C F6 FLT CNTLR PWR – OFF

B F3 HUD PWR (two) – OFF

If ELS:

P C3 MSTR MADS PWR – OFF
DoD ELS, MCC call DoD OSC on NCC

NOTE
MCC will report “GO/NO-GO TO DOFF SUITS” (post safety assessment)
NOTE
CDR activities are now on even numbered pages and PLT activities on odd numbered pages.

RCS, OMS SAFING (RJDs)
C3 √OMS ENG (two) – OFF
O14:F RJD DRIVER (nine) – OFF
O15:F LOGIC (eight) – OFF
O16:F OMS ENG VLV (two) – OFF

DRAG CHUTE SAFING
(Not performed if ELS)
C,P,MS
O15:E cb MNB DRAG CHUTE SYS 2 – op
O16:E cb MNC DRAG CHUTE SYS 1 – op
F2,F3, √DRAG CHUTE pb (six) – lt off
F4

DEACT AIR DATA PROBE HTRS
C3 √AIR DATA PROBE (two) – DPY

LANDING GEAR SAFING
(Not performed if ELS)
C,P,MS
R14:F cb ESS 1BC LDG GEAR ARM/DN
RESET – cl

NOTE
SM0 TIRE PRESS msgs occur when LG ARM/DN RESET performed
A12 LG ARM/DN RESET – RESET
F6,F8 √LDG GEAR pb (four) – lt off
A12 LG ARM/DN RESET – dn
R14:F cb ESS 1BC LDG GEAR ARM/DN
RESET – op

Check with MS3. Report to MCC: “RJDs OFF, SIDE HATCH, DRAG CHUTE, AND LANDING GEAR SAFED” (MCC report to NCC)
PLT

ET UMBILICAL DOOR OPENING

Report to MCC, “ET UMBILICAL DOORS ARE COMING OPEN”

R2

ET UMB DR

MODE – GPC/MAN

R LAT – REL (tb-bp, REL ~6 sec)

– OFF

DR – OP (tb-bp)

Wait 12 sec, R DR – OFF (tb-bp)

L LAT – REL (tb-bp, REL ~6 sec)

– OFF

DR – OP (tb-bp)

Wait 12 sec, L DR – OFF (tb-bp)

MODE – GPC

HYDRAULIC LOAD TEST (ON MCC CALL)

NOTE

Minimum of two operating hyd systems is reqd for this test

F4

BDY FLP pb – MAN

F8

\sqrt{FLT CNTLR PWR} – ON

NOTE

If only two systems are operating, do not depressurize either hyd pump

R2

HYD MN PUMP PRESS 1 – LO (MA)

C3

Run Full Load Test:

\begin{align*}
\text{BDY FLP} & \rightarrow \text{TRAIL} \\
\text{RHC} & \rightarrow \text{Forward ctr} \\
\text{Rudder full left} & \rightarrow \text{BF}
\end{align*} 

When set, do following simo:

\begin{align*}
\text{BDY FLP} & \rightarrow \text{UP} (\leq 6\%) \\
\text{RHC} & \rightarrow \text{move to aft ctr} \\
\text{Rudder full right} & \rightarrow \text{BF}
\end{align*}

\begin{align*}
\text{RHC} & \rightarrow \text{release} \\
\text{Rudder} & \rightarrow \text{neutral} \\
\text{BDY FLP} & \rightarrow \text{reset to TRAIL}
\end{align*}

R2

HYD MN PUMP

PRESS 1 – NORM

\begin{align*}
3 \rightarrow \text{LO (MA)} & \rightarrow \text{BF}
\end{align*}

C3

Repeat Load Test

R2

HYD MN PUMP PRESS 3 – NORM
CDR

MCC Report GO/NO-GO for DPS transition

DPS TRANSITION – GNC 9 (If PASS)

NOTE
No keyboard entries or sw throws 10 sec:
Before and after moding PASS GPCs to RUN
Before OPS transition or set expansion/contraction requests until new OPS base page is displayed.

MCC will call for BFS to be taken from RUN to STBY for Solid State Recorder dumping and PL monitoring as reqd

√ BFC CRT DISP – ON

CRT3 BFS, GNC, OPS 000 PRO

3: BFS, GNC BFS MEMORY

1: GNC 0 GPC MEMORY

Verify:

<table>
<thead>
<tr>
<th>CONFIG</th>
<th>GPC</th>
<th>9</th>
<th>12340</th>
</tr>
</thead>
<tbody>
<tr>
<td>STR</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
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<td>2</td>
<td>2</td>
<td></td>
</tr>
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<td></td>
<td>3</td>
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<td></td>
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<tr>
<td></td>
<td>4</td>
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</tr>
<tr>
<td>PL</td>
<td>1/2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>CRT</td>
<td>1</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
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<td></td>
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<td>MM</td>
<td>1</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

CRT1 GNC, OPS 901 PRO
<table>
<thead>
<tr>
<th>1:</th>
<th>GNC VERT SIT 2</th>
<th>2:</th>
<th>GNC SYS SUMM 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:</td>
<td>BFS, GNC VERT SIT 2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**PLT**

**SET BODY FLAP (Prior to OPS 9)**

- **F4** BODY FLAP pb – MAN
- **C3** BODY FLAP – DOWN (100%)

**SSME REPO (If PASS, OPS 9, and GO from MCC)**

**NOTE**

Do not resume GNC SPEC 105 until ‘VFB 84 – COMPLETE’ msg rcvd

<table>
<thead>
<tr>
<th>2:</th>
<th>GNC 105 TCS CONTROL</th>
</tr>
</thead>
</table>

**R4**

- HYD MPS/TVC ISOL VLV SYS (three) – OP
  - Hold 5 sec, \tb – OP
  - * If less than two HYD MPS/TVC *
  - * ISOL VLVs open, \MCC *

**CRT2**

- CLEAR MSG – ITEM 8 EXEC
- SELECT ID – ITEM 1 +0 2 EXEC
  - /NAME VFB 84 (~15 sec)
- MM READ – ITEM 2 EXEC
  - /‘AI MODE 1(0,3) COMPLETE’ msg (~2.5 min)
  - /‘VFB 84 – COMPLETE’ msg
  - * If any ‘AI MODE X FAILED RETEST’ msg: *
  - * /MCC, report ECP ERROR *
  - * To terminate: CANCEL – ITEM 5 EXEC *

Go to APU/HYD SHUTDN >>

**SPDBK REPO (No SSME REPO, ON MCC GO)**

**R4**

- HYD MPS/TVC ISOL VLV SYS (three) – CL

**2: GNC 113 ACTUATOR CONTROL**

**CART2**

- AI MODE 1 MDM – ITEM 23 EXEC (*)
  - /ACTUATOR GIMBALING STATUS – RUN, CPLT
- SB – ITEM 1 EXEC (*)
- RATE – ITEM 29 +1 EXEC
- FIN POS – ITEM 30 +8 EXEC
  - /START 31 – → ←
  - START – ITEM 31 EXEC (*→ ←)
  - /STATUS – RUN, CPLT (~30 sec)
  - * If STATUS – STOP or BUSY: *
  - * /MCC, (To terminate: ITEM 32 EXEC) *

Go to APU/HYD SHUTDN >>

5-7 ENT/ALL/GEN H
1: AS DESIRED  2: AS DESIRED
3: AS DESIRED

CDR  RAD RECONFIG
(On MCC call, unless no COMM)

O1  When FREON EVAP OUT TEMP > 40 degF:
   If RTLS/TAL/DAO, go to NH3 RECONFIG, 5-22 >>
L1  RAD OUT TEMP – HI
   H2O PUMP LOOP 1 – ON
   Proceed to NH3 ACT

NH3 ACT

O1  When FREON EVAP OUT TEMP > 55 degF, select one of the following as
     specified by MCC:
L1  NH3 CNTLR A – PRI/GPC ( )
    – SEC/ON ( )
    NH3 CNTLR B – PRI/GPC ( )
    – SEC/ON ( )

*  During NH3 ops:  *
  *  If EVAP OUT TEMP alarm and  *
  *  O1  FREON EVAP OUT TEMP < 32 degF:  *
  *  L1  1. FREON PUMP LOOP 1,2  *
  *  (two) – OFF (ASAP)  *
  *  2. H2O PUMP LOOP 1 – ON  *
  *  3. NH3 CNTLR A(B) – OFF  *
  *  4. FLOW PROP VLV LOOP 1,2  *
  *  (two) – PLHX (tb-PL)  *
  *  5. FREON PUMP LOOP 1 – B  *
  *  Wait 3 min, then:
  *  6. FREON PUMP LOOP 2 – B  *
  *  7. Go to NH3 RECONFIG, 5-22 >> *
  *  If EVAP OUT TEMP alarm and  *
  *  O1  FREON EVAP OUT TEMP > 65 degF:  *
  *  8. Go to NH3 RECONFIG, 5-22  *

5-8  ENT/ALL/GEN H,3
PLT  APU/HYD SHUTDN

\*SSME REPO complete (if PASS)

R4   HYD MPS/TVC ISOL VLV (1,2,3; 5 sec interval) – CL (hold each 5 sec, tb-CL)
R2   BLR PWR (three) – OFF
     N2 SPLY (three) – OFF
     APU OPER
     (1,2,3; 5 sec interval) – OFF (MA)
     APU FU TK VLV (three) – CL
     \*Shutdn (HYD PRESS < 200)
     CNTLR PWR (three) – OFF

Report to MCC, “APU/HYD SHUTDOWN”

MCC  Report to Convoy 1, “SSME REPO COMPLETE AND APU/HYD SHUTDOWN”
     Report, “GO/NO-GO FOR VENT DOOR PURGE POSITIONING”

POST LANDING MPS RECONFIG
(After APU/HYD shutdn + 1 min)

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

R2   MPS He ISOL (six) – CL
     I’CNCT L – OUT OP
     PNEU L ENG He XOVR – CL
1: AS DESIRED 2: AS DESIRED 3: AS DESIRED

C, MS

PCS DEACTIVATION

L2 O2 SYS 1,2 SPLY (two) – CL (tb-CL)
\(\sqrt{\text{EMER tb – bp}}\)

MS

GPS PWRDN

* If landing not at KSC, EDW, or NOR *
* GPS ENCRYPT – ZEROIZE *
* Wait 1 sec *
* GPS ENCRYPT – NORMAL *

If OV103,4:

A13 GPS POWER – OFF
PRE AMPL UC – OFF
LC – OFF

If OV105:

O7 GPS POWER (three) – OFF
PRE AMPL UPPER (three) – OFF
LOWER (three) – OFF

MCC

Report, “GO/NO-GO FOR EXTENDED PWR UP”

If GO for EXTENDED PWR UP, go to
SYS DEACT FOR EXTENDED PWR UP, 5-14
1: AS DESIRED
2: GNC 105 TCS CONTROL
3: AS DESIRED

PLT VENT DOOR PURGE POSITIONING (PASS)
(on MCC GO, not performed if ELS)
(Do not perform during SYS DEACT FOR EXTENDED PWRUP)

CRT2 CLEAR MSG – ITEM 8 EXEC
SELECT ID – ITEM 1 +0 3 EXEC
\'NAME ‘VFB89’ (~15 sec)
MM READ – ITEM 2 EXEC
After ‘VFB89 – ENTERING 30 MIN DELAY’ msg, CANCEL – ITEM 5 EXEC

RCS, OMS VALVE TEST
Pause 1 sec between each line
O7 MSTR RCS XFEED – OFF
O8 L,R OMS He PRESS/VAP ISOL (four) – CL,GPC
L OMS XFEED (two) – OP (tb-OP),
then – CL (tb-CL)
R OMS XFEED (two) – OP (tb-OP),GPC
then – CL (tb-CL),GPC
L,R OMS TK ISOL (four) – CL (tb-CL),
then – OP (tb-OP),GPC
L OMS XFEED (two) – OP (tb-OP),GPC
FWD RCS
He PRESS (two) – CL (tb-CL),GPC
TK ISOL (two) – CL (tb-CL),
then – OP (tb-OP),GPC
MANF ISOL (five) – CL (tb-CL)
then – OP (tb-OP),GPC
O7 L,R RCS
He PRESS (four) – CL (tb-CL),GPC
MANF ISOL (ten) – CL (tb-CL),
then – OP (tb-OP),GPC
TK ISOL (six) – CL (tb-CL)
XFEED (four) – OP (tb-OP),
then – CL (tb-CL),GPC
TK ISOL (six) – OP (tb-OP),GPC

5-11 ENT/ALL/GEN H
<table>
<thead>
<tr>
<th>1: AS DESIRED</th>
<th>2: AS DESIRED</th>
<th>3: AS DESIRED</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td><strong>GPC DEACT (If NO-GO FOR EXTENDED PWR UP)</strong>&lt;br&gt;(Perform after RCS/OMS VALVE TEST completed by PLT)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>O6 GPC MODE 1,2,3,4,5 (five) – STBY (tb-bp) – HALT&lt;br&gt;Inform MS to proceed with POST&lt;br&gt;LANDING PAYLOAD ACTIVITIES (if reqd), FS 5-19</td>
<td></td>
</tr>
<tr>
<td>1: OFF</td>
<td>2: OFF</td>
<td>3: OFF</td>
</tr>
<tr>
<td>C,MS,PS</td>
<td><strong>HATCH OPENING (KSC,EDW,NOR)</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>SEAT EGRESS</strong></td>
<td></td>
</tr>
<tr>
<td>C,MS,PS</td>
<td>Pull G SUIT controller clip (if inflated)&lt;br&gt;Lap Belt and Chute – Release&lt;br&gt;Egress seat (Helmet reqd if ELS)</td>
<td></td>
</tr>
<tr>
<td>MS,PS</td>
<td>Unstow ‘Return to Houston’ Bags (except ELS)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>HATCH OPENING (not KSC,EDW,NOR)</strong></td>
<td></td>
</tr>
<tr>
<td>ALL</td>
<td>√Tabs/Visor – CL&lt;br&gt;Green Apple – PULL</td>
<td></td>
</tr>
<tr>
<td>MS</td>
<td>Open Hatch/Deploy Slide per decal</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Give PLT GO for VEHICLE PWRDN</td>
<td></td>
</tr>
<tr>
<td>C,MS,PS</td>
<td><strong>ORBITER UNAIDED EGRESS</strong></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Egress orbiter&lt;br&gt;Hand carry Landing Site Data book&lt;br&gt;(if ELS) (reference ELS POST&lt;br&gt;LANDING procedures)</td>
<td></td>
</tr>
</tbody>
</table>
PLT

NOTE
If GO for EXTENDED PWR
UP, go to SYS DEACT FOR
EXTENDED PWR UP, 5-15.

If NO-GO for EXTENDED PWR
UP, continue ops

HATCH OPENING (not KSC,EDW,NOR)

Before hatch opening:
√Tabs/Visor – CL

Green Apple – PULL

VEHICLE PWRDN (on GO from CDR)

NOTE
All vehicle lighting and orbiter
O2 will be lost at pwrdn

R1 MN BUS TIE (three) – OFF
FC/MN BUS (three) – OFF
ESS BUS SOURCE FC (three) – OFF

EGRESS

Pull G SUIT controller clip (if inflated)
Egress seat, orbiter
(Helmet reqd if ELS)

MCC TO KSC HANOVER (at crew egress)
CDR SYS DEACT FOR EXTENDED PWR UP
(Do not perform during VENT DOOR PURGE POSITION, SSME REPO, or SPDBK REPO sequence)

NOTE
No keyboard entries or sw throws 10 sec:
  Before and after moding PASS GPCs to RUN
  Before OPS transition or set expansion/contraction requests until new OPS base page is displayed

| EXTEND | PWR UP |

1: GNC 0 GPC MEMORY

| CONFIG |
| GPC | 9 |
| STR | 1 |
| 2 | 1 |
| 3 | 1 |
| 4 | 1 |
| PL | 1/2 |
| 1 | 1 |
| CRT | 1 |
| 2 | 1 |
| 3 | 1 |
| 4 | 0 |
| L | 1 |
| 2 | 1 |
| MM | 1 |
| 2 | 1 |

CRT1 GNC, OPS 901 PRO

GPC PWRDN

O6 GPC MODE 2,3,4 (three) – STBY (tb-bp)
  – HALT
C2 IDP/CRT 2 PWR – OFF

Inform MS2 to proceed with MS Sys Deact activities, 5-18
1: GNC 0 GPC MEMORY
2: AS DESIRED
3: AS DESIRED

PLT SYS DEACT FOR EXTENDED PWR UP

F8 FLT CNTLR PWR – OFF
F3 TRIM PNL – OFF
RHC – INH
R4 HYD BK HTR (three) – OFF
O8 LTG (five) – OFF
O17:A ATVC (four) – OFF
1: AS DESIRED  
2: OFF  
3: AS DESIRED

C,MS,PS

C   L2   ANTISKID – OFF
     \NWS – OFF
C3  \FCS CH (four) – AUTO
F3  TRIM PNL – OFF
     \RHC – INH

IDP/CRT 4 PWRDN

MS   R12   IDP/CRT 4 PWR – OFF

EGRESS
(After MS Sys Deact complete, and ASP Comm check with MCC complete)

C   L5   L COMM PWR – OFF

C,MS,PS   Pull G SUIT controller clip (if inflated)
          Egress seat

MS   A11,A15,
     MO39M   COMM CCU PWR – OFF

MS,PS   Unstow ‘Return to Houston’ Bags

C,MS,PS   Egress orbiter
1: AS DESIRED  2: OFF
3: AS DESIRED

PLT  EGRESS
(When desired after ground support personnel establishes comm at PS station)

R6  R COMM PWR – OFF
    Pull G SUIT controller clip (if inflated)
    Egress seat, orbiter

MCC TO KSC HANOVER
(At crew egress or GSE cooling activation, whichever occurs later)
1: AS DESIRED 2: OFF

3: AS DESIRED

**MS**

**MS SYS DEACT FOR EXTENDED PWR UP**

MS1 Perform POST LANDING PAYLOAD ACTIVITIES (if reqd), FS 5-19

**MS2**

**LRU DEACTIVATION**

(After APU/HYD SHUTDN)

O14, O15, O16

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRAKES (three)</td>
<td>OFF</td>
</tr>
<tr>
<td>RGA (four)</td>
<td>OFF</td>
</tr>
<tr>
<td>IMU (three)</td>
<td>OFF</td>
</tr>
<tr>
<td>ASA (four)</td>
<td>OFF</td>
</tr>
<tr>
<td>cb ADTA (four)</td>
<td>op/OFF</td>
</tr>
<tr>
<td>cb/sw ACCEL (four)</td>
<td>op/OFF</td>
</tr>
<tr>
<td>cb DDU (six)</td>
<td>op</td>
</tr>
<tr>
<td>MNA NWS</td>
<td>op</td>
</tr>
<tr>
<td>MNB NWS</td>
<td>op</td>
</tr>
</tbody>
</table>

O7 TACAN MODE (three) – OFF

(OV103, 104 only)

O8 RADAR ALTM (two) – OFF

MLS (three) – OFF

C L1 IMU FAN (three) – OFF

**APU HEATER DEACTIVATION**

(After APU/HYD SHUTDN)

A12 APU HTR

<table>
<thead>
<tr>
<th>Component</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TK/FU LN/H2O SYS (six)</td>
<td>OFF</td>
</tr>
<tr>
<td>GAS GEN/FU PUMP (three)</td>
<td>OFF</td>
</tr>
<tr>
<td>LUBE OIL LN (three)</td>
<td>OFF</td>
</tr>
</tbody>
</table>

**RCS/OMS HEATERS PWRDN**

A14 OMS CRSFD LINE A,B (two) – OFF

If reqd, install and lock PL Bay Window Shades

**MS2**

Inform CDR, “POST LANDING PROCEDURE COMPLETE”
Replace this page with page(s) from Flight Supplement
Replace this page with page(s) from Flight Supplement
1: AS DESIRED  
2: OFF 
3: AS DESIRED 

**ASP INTEGRATED POST LANDING PROCEDURES FOR EXTENDED PWR UP**

**ASP 1 A15**  
Connect Comm (PS)  
PS Comm CCU PWR – ON  
Comm ck with MCC

**ASP to MCC**  
Report when “CREW READY TO EGRESS”

Report “POST LANDING PROCEDURE COMPLETE”
1: AS DESIRED  2: OFF  3: AS DESIRED

**NH3 RECONFIG**

(On MCC call; Cooling Cart not ready)

**L1**
1. NH3 CNTLR A(B) – OFF
   If RTLS/TAL/AOA:
   2. RAD BYP VLV LOOP 1,2 – RAD FLOW
      Wait 1 min
      H2O PUMP LOOP 1 – ON

**O1**
When FREON EVAP OUT TEMP > 55 degF, select one of the following as specified by MCC:

**L1**
3. NH3 CNTLR A – PRI/GPC (      )
   A – SEC/ON (      )
   B – PRI/GPC (      )
   B – SEC/ON (      )

* During NH3 ops:
  * If EVAP OUT TEMP alarm and
  * O1 FREON EVAP OUT TEMP < 32 degF:
  * L1 1. FREON PUMP LOOP 1,2 (two) – OFF (ASAP)
  * 2. √H2O PUMP LOOP 1 – ON
  * 3. NH3 CNTLR A(B) – OFF
  * 4. FLOW PROP VLV LOOP 1,2 (two) – PL HX (tb-PL)
  * If no comm:
  * 5. Go to VEHICLE PWRDN, 5-13 >>
  * 6. √MCC
  * If EVAP OUT TEMP alarm and
  * O1 FREON EVAP OUT TEMP > 65 degF:
  * 7. Go to POST LANDING LOSS OF COOLING, 5-24

5-22   ENT/ALL/GEN H,3
<table>
<thead>
<tr>
<th>Action</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1: AS DESIRED</td>
<td></td>
</tr>
<tr>
<td>2: OFF</td>
<td></td>
</tr>
<tr>
<td>3: AS DESIRED</td>
<td></td>
</tr>
</tbody>
</table>

**CDR NH3 DEACT**

(On MCC call if Cooling Cart ready)

**L1**
1. NH3 CNTLR A(B) – OFF
2. RAD OUT TEMP – NORM

* After NH3 TERMINATION:

* If EVAP OUT TEMP alarm and

* O1 FREON EVAP OUT TEMP < 32 degF:

* L1 1. FREON PUMP LOOP 1,2
     (two) – OFF (ASAP)
* 2. √H2O PUMP LOOP 1 – ON
* 3. FLOW PROP VLV LOOP 1,2
     (two) – PL HX (tb-PL)
* If no comm:
* 4. Go to VEHICLE PWRDN,
* 5. 5-13 >>
* 5. MCC
* If EVAP OUT TEMP alarm and

* O1 FREON EVAP OUT TEMP > 65 degF
* for 5 min:
* 6. Go to POST LANDING LOSS OF COOLING, 5-24

5-23 ENT/ALL/GEN H,3
POST LANDING LOSS OF COOLING (NH3 FAILED OR DEPLETED)

C

1. NH3 CNTLR A,B (two) – OFF
2. √RAD BYP VLV MAN SEL (two) – RAD FLOW (tb-RAD, 3 sec)
3. √RAD CNTLR OUT TEMP – NORM

C,P,MS

4. √Complete post landing procedures thru ENT C/L, 5-18 & FS 5-19 ASAP
   Assume GO for EXTENDED PWR UP

B

5. √BFC CRT SEL – 3+1
   DISP – ON

BFS, SM SYS SUMM 2

Terminate monitoring if ground cooling established (Convoy commander call) >>

CRT3

6. Monitor AV BAY TEMP (three)
   When AV BAY TEMP 1 or 2 > 113 or AV BAY TEMP 3 > 107 or no temperature insight:

P

7. Go to VEHICLE PWRDN, 5-13 >>

A

8. Crew egress if not already complete
1-ORBIT LATE DEORBIT PROCEDURES

Refer to DEORBIT BURN FLIGHT RULES
Cue Card for failures that require 1-orbit delay
1: GNC DEORB MNVR COAST  2: GNC DEORB MNVR COAST  
3: BFS, GNC DEORB MNVR COAST

1-ORBIT LATE DEORBIT PROCEDURES

These procedures assume:
1. All DEORB PREP completed
2. DEORBIT BURN completed up to but not including SINGLE APU START,
3-13. If activities are not complete, then do them during troubleshooting time

C  CRT1  GNC, OPS 301 PRO R2  √ HYD MN PUMP PRESS (three) – NORM
B  A14  RCS/OMS HTR
   FWD RCS – A AUTO
   L POD (two) – A AUTO,B OFF
   R POD (two) – A AUTO,B OFF
   OMS CRSFD LINES (two) – A AUTO,B OFF
   FWD RCS JET 5 (one) – AUTO
   AFT RCS JET 5 (one) – AUTO

1: GNC 50 HORIZ SIT
3: BFS, GNC 50 HORIZ SIT

CRT1  √ GPS, INCORPORATE

TIG-1:10>  IMU/IMU ALIGN

Perform IMU/IMU alignment using best IMU as reference. √MCC for reference IMU

1: GNC 21 IMU ALIGN

C  CRT1  REF IMU – ITEM 14 + __ EXEC
   √ TYPE, ITEM 15 – TORQUE
   ALIGN IMU 1(2,3) –
   ITEM 10(11,12) EXEC (*)
   If no comm, EXEC – ITEM 16 EXEC (*)
   Rcd MET __/__/:
   √EXEC, ITEM 16 – (no *) (4-6 min)

6-2  ENT/ALL/GEN H,4
ALL FLUID LOADING: 1-ORBIT LATE

Approx 1 hr prior to new TIG, drink 8 fluid oz water plus take 2 salt tablets every 15 min for total of 16 fluid oz water and 4 salt tablets per crewmember

FINAL DEORB UPDATE/UPLINK

C MCC UPDATE:
   DEL PAD
   OMS PRPLT PAD
MCC UPLINK:
   PASS, BFS SV (if reqd)
   PASS, BFS TGT

[LAND SITE as reqd]

On MCC GO:
CRT1 LOAD – ITEM 22 EXEC
   TIMER – ITEM 23 EXEC
CRT1,3 PASS & BFS TGTS per MNVR PAD:
   BURN ATT
   ΔVTOT
   TGO
   HA HP
1: GNC DEORB MNVR EXEC
2: GNC DEORB MNVR EXEC
3: BFS, GNC DEORB MNVR EXEC

IF WAVEOFF
Go to IF NO-GO FOR DEORBIT BURN, 3-11

TIG-15> B A14 RCS/OMS HTR
FWD RCS – OFF
L POD (two) – A OFF, B OFF
R POD (two) – A OFF, B OFF
OMS CRSFD LINES (two) – A AUTO, B AUTO
FWD RCS JET 5 (one) – OFF
AFT RCS JET 5 (one) – OFF

TIG-10> MNVR TO 1-ORBIT LATE DEORBIT ATT

C3 √DAP: AUTO
B F6,F8 √ADI ATT (two) – INRTL
√ERR (two) – MED
√RATE (two) – MED
C CRT1 MNVR – ITEM 27 EXEC (*)
(√ADI ATT with CRT BURN ATT)
B Copy last DEL PAD and OMS PRPLT PAD
data on DEORBIT BURN Cue Cards

F6/F8 √DEORBIT BURN and DEORBIT BURN MONITOR Cue Cards installed

3: BFS, SM SYS SUMM 2

R2 HYD MN PUMP PRESS (three) – LO

Return to DEORBIT BURN Cue Cards and SINGLE APU START, 3-13
SWITCH LIST AT WHEELS STOP **EGRESS**

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Replace this page with page(s) from Flight Supplement
Replace this page with page(s) from Flight Supplement

(Replace with pages FS CC 8-2 thru FS CC 8-4)

8-2 ENT/ALL/GEN H
TOP
HINGED AT BOTTOM OF 'DEORBIT BURN (RCS)'
HINGE

* RCS COMPLETION:
* THC +X to TGT HP or TOT AFT QTY 1 [ ] %
* THC +X to CAPTURE HP or TOT AFT QTY 1 [ ] %
* At AFT QTY 1 TOT AFT QTY 2 [ ] % then
* If CUR HP: PREBANK/FRCS COMPLETION to downrange site
* CAPTURE HP [ ] PREBANK/FRCS COMPLETION to downrange site
* PREBANK/FLIP HP [ ] PREBANK/FRCS COMPLETION
* AFT HP [ ] THC +X to TGT HP
* TGT HP

* FRCS COMPLETION (if applicable):
* MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
* THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)

CUTOFF: VGOx = 0, release THC
AFT RCS RECONFIG
Trim Inplane X,Z residuals < 2 fps (< 0.5 fps if shallow)

ENT-3aa/D/M

(reduced copy)
TOP

HOOK VELCRO

DEORBIT

BURN (2 ENG)

HOOK VELCRO

√MM302
√OMS BOTH
Enter TGO + 5 sec
√TRIM per MNVR PAD or P +0.0, LY -5.7, RY +5.7
L R OMS He PRESS/VAP ISOL A (two) – GPC
B (two) – OP
√DAP – AUTO/PASS/DISC
ADI – LVLH/REF/Hi/MED
FLT CTNLR PWR (two) – ON

TIG-2 OMS ENG (two) – ARM/PRESS
- :15 EXEC (NO EXEC > TIG +
- :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
:00 TIG Start watch (√Pc, ∆VTOT, ENG VLVs)
If no OMS ignition: APUs – SHUT DN

* OMS PRPLT FAIL:
* Failed OMS ENG – OFF
* STOP BURN:
L OMS R OMS
FAIL HP FAIL HP
Good OMS ENG – OFF
APUs – SHUT DN
Secure aft OMS

CONTINUE BURN:
ITEM 18 +0 EXEC
When good OMS QTY:
5%: L, R OMS XFEED (four) – OP
4%: Good OMS TK ISOL (two) – CL
If OMS Pc < 80 or OMS TEMP,
√ADI – LVLH, center needles
OMS ENG – OFF
RCS COMPLETION

OMS ENG FAIL:
Failed OMS ENG – OFF
OMS XFEED at 1/2 ∆VTOT at fail
or OMS QTY %L or %R

2nd OMS FAIL (ENG or PRPLT):
Failed OMS ENG – OFF
If PRPLT FAIL:
Secure aft OMS
ITEM 18 +0 EXEC

Both ENG FAIL HP
Either PRPLTL FAIL (SAFE) HP
STOP BURN:
APUs – SHUT DN

CONTINUE BURN:
√ADI – LVLH, center needles
Interconnect good OMS to RCS
THC +X (√OMS% vs RCS Burn Time)
RCS I’CNCT TK SW (N/A PRPLT FAIL)
THC +X (√OMS% vs RCS Burn Time)
AFT RCS RECONF/G
RCS COMPLETION

ENT-4a/D/L

Hinge

(reduced copy)

FAB USE ONLY

CC 8-8

ENT/ALL/GEN H
TOP
HINGED AT BOTTOM OF 'DEORBIT BURN (2 ENG)'
HINGE

* RCS COMPLETION:
* THC +X to TGT HP or TOT AFT QTY 1 % %
* THC +X to CAPTURE HP or TOT AFT QTY 2 % then
* At AFT QTY 1 TOT AFT QTY 2 %
* If CUR HP: PREBANK/FRCS COMPLETION
to downrange site
* CAPTURE HP
* PREBANK/FLIP HP
* AFT HP
* TGT HP

* FRCS COMPLETION (if applicable):
* MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
* THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)
* CUTOFF + :02 OMS ENG(s) – OFF (if < 3 IMU, at )
* AFT RCS RECONFIG if INTERCONNECT *
Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)

(reduced copy)
FAB USE ONLY CC 8-9 ENT/ALL/GEN H
TOP
BACK OF 'DEORBIT BURN (2 ENG')

HOOK VELCRO  DEORBIT BURN (1 ENG)  HOOK VELCRO

√MM302  √OMS L or R
√OMS BURN CONFIG (L or R XFEED)
Enter TGO + 10 sec
√TRIM per MNVR PAD or P +0.0, LY +5.2, RY -5.2
LR OMS He PRESS/VAP ISOL A (two) – OP
.................. Wait 2 sec ................ B (two) – OP
√DAP – AUTO(PASS)/DISC
ADI – LVH(REF)/HI/MED
FLT CNTLR PWR (two) – ON

TIG-2
Good OMS ENG – ARM/PRESS
- :15 EXEC (NO EXEC > TIG +
- :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
:00 TIG Start watch (\(\Delta p_{c}\), \(\Delta v_{TOT}\), ENG VLVs)
* If no OMS ignition: APU s – SHUT DN
* OMS XFEED RETURN at \(\Delta v_{TOT} = \) or \(\) %
L,R OMS TK ISOL (four) – OP
XFEED (four) – CL

OMS PRPLT FAIL:
OMS ENG – OFF

STOP BURN:
APU s – SHUT DN
Secure aff OMS

CONTINUE BURN:
Secure aff OMS
ITEM 18 +0 EXEC
√ADI – LVH, center needles
Interconnect good OMS to RCS
THC +X(\(\Delta v_{OMS}\% vs RCS Burn Time))
AFT RCS RECONFIG
RCS COMPLETION

OMS ENG FAIL:
OMS ENG – OFF

ENG FAIL HP

STOP BURN:
APU s – SHUT DN

CONTINUE BURN:
√ADI – LVH, center needles
Interconnect good OMS to RCS
THC +X(\(\Delta v_{OMS}\% vs RCS Burn Time))
RCS I’CNCT TK SW
THC +X(\(\Delta v_{OMS}\% vs RCS Burn Time))
AFT RCS RECONFIG
RCS COMPLETION

RCS +X JET FAIL OFF:

STOP BURN:
APU s – SHUT DN

CONTINUE BURN:
ITEM 18 +0 EXEC
G23 Resel jets

(reduced copy)

ENT-4b/D/J

FAB USE ONLY  CC 8-10  ENT/ALL/GEN H
**RCS COMPLETION:**

- THC +X to TGT HP or TOT AFT QTY 1
- THC +X to CAPTURE HP or TOT AFT QTY 2
- PREBANK/FRCS COMPLETION
- If CUR HP: PREBANK/FRCS COMPLETION
- At AFT QTY 1 PREBANK/FRCS COMPLETION to downrange site
- PREBANK/FLIP HP
- AFT HP
- TGT HP

**FRCS COMPLETION** (if applicable):

- MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
- THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)

**CUTOFF**

- OMS ENG – OFF (if < 3 IMU, at )
- AFT RCS RECONFIG if INTERCONNECT
- Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)
\^MM302 \^OMS BOTH
Enter TGO + 5 sec
\^TRIM per MNVR PAD or P +0.0, LY -5.7, RY +5.7
\^DAP – AUTO(PASS)/DISC
\^ADI – LVLH(REF)/HI/MED
FLT CTNLR PWR (two) – ON
Feed 2 ENG from 1 POD
L/R OMS He PRESS/VAP ISOL A (two) – GPC
B (two) – OP
\c OMS TK ISOL (two) – CL (tb-CL)
\f OMS XFEED (four) – OP (tb-OP)
TIG-2: OMS ENG (two) – ARMPRESS
- :15 EXEC (NO EXEC > TIG +
- :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
:00 TIG Start watch (\p, \pVTOT, ENG VLVs)
If no OMS ignition: APUs – SHUT DN
* While feeding 2 OMS from 1 POD:
** OMS PRPLT FAIL:
Failed OMS ENG(s) – OFF
STOP BURN:
APUs – SHUT DN
Secure OMS
SAFE HP
** CONTINUE BURN:
ITEM 18 <0 EXEC
If Both ENS < 1:
Secure OMS
\^ADI – LVLH, center needles
Interconnect OMS to RCS
THC +X for:
AFT RCS RECONFIG
RCS COMPLETION
If \c (XFEED) ENG ↓:
When OMS QTY:
5%: OMS TK ISOL (two) – OP
4%: OMS TK ISOL (two) – CL
If OMS P < 80 or OMS TEMP,
OMS ENG – OFF
\^ADI – LVLH, center needles
RCS COMPLETION
If \c (STRAIGHT FEED) ENG ↓:
OMS ENG FAIL (CONTINUE BURN):
Failed OMS ENG – OFF
at \pVTOT =
or \c TK ISOL (two) – OP
\c TK ISOL (two) – CL
Return to 2 ENG, 2 POD FLOW at \pVTOT:
\c OMS TK ISOL (two) – OP (tb-OP)
L/R OMS XFEED (four) – CL (tb-OP)

Hinge
(reduced copy)
TOP
BACK OF 'UNBALANCED PRPLT DEORBIT BURN'

HOOK
VELCRO

DEORBIT BURN (MIXED XFEED)

HOOK
VELCRO

√MM302
√OMS L(R) or RCS

Enter TGO + 10 sec
√L,R OMS TK ISOL (four) – GPC
√XFEED (four) – GPC
√tb config from table (OMS SSR-1)
√DAP – AUTO(PASS)/DISC
 ADI – LVLH(REF)/HI/MED

FLT CNTLR PWR (two) – ON
Man repress to maintain good OMS Tk Ps > 234 psi (simo)

If OMS BURN INITIATION:
√TRIM per MNVR PAD or: P +0.0, LY +5.2, RY -5.2

Good OMS ENG – ARM/PRESS

TIG-2:
- .15 EXEC (No EXEC > TIG + [-15 -15])
- .15 TIG Start watch (∇PC, ∇VTOT, ENG VLVs)
  If no OMS ignition, APU s – SHUT DN

If RCS BURN INITIATION:
Man repress L,R OMS > L,R RCS TK Ps
L,R RCS XFEED (four) – OP
TK ISOL (six) – CL

0.00 THC +X (No Deorbit > TIG + [0 0])
Maintain PITCH ATT ERR ± 3°

FEED FROM GOOD POD:
at ∇VTOT = X
or at %

O2 He PRESS/VAP ISOL (two) – OP
TK ISOL (two) – OP (tb-OP)
XFEED (two) – OP (tb-OP)
SECURE OMS

OMS PRPLT LOW
AFT RCS RECONFIG at ∇VTOT = 
RCS COMPLETION

(reduced copy)

FAB USE ONLY

CC 8-14

ENT-5b/D/J

ENT/ALL/GEN H
OMS PRPLT FAIL:
OMS ENG – OFF
SAFE HP
CONTINUE BURN:
Secure L,R OMS
ITEM 18 +0 EXEC
√ADI – LVLH, center needles
RCS COMPLETION

OMS ENG FAIL:
OMS ENG – OFF
ENG FAIL HP
CONTINUE BURN:
Man repress L,R OMS > L,R RCS TK Ps
FEED FROM GOOD POD:
☐ OMS HE PRESS/VAP ISOL (two) – OP
☐ TK ISOL (two) – OP
☐ OMS XFEED (two) – CL
☐ L,R RCS XFEED (four) – OP
☐ TK ISOL (six) – CL
√ADI – LVLH, center needles
THC +X (√Lowest OMS % vs RCS Burn Time)
AFT RCS RECONFIG
RCS COMPLETION

RCS +X JET FAIL OFF:
SAFE HP
CONTINUE BURN:
APUs – SHUT DN

RCS COMPLETION:
THC +X to TGT HP or TOT AFT QTY 1
At AFT QTY 1 THC +X to CAPTURE HP or TOT AFT QTY 2
If CUR HP: then PREBANK/FRCS COMPLETION to downrange site
CAPTURE HP
PREBANK/FLIP HP
AFT HP
TGT HP
FRCS COMPLETION (if applicable):
MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
THC -X to TGT HP or FRCS depletion (JETS FAIL OFF)
CUTOFF VGOx = 0, Release THC
+ .02 OMS ENG(s) – OFF (if < 3 IMU, at )
★ AFT RCS RECONFIG if INTERCONNECT ★
Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)
### ENTRY MANEUVERS

<table>
<thead>
<tr>
<th>FLIGHT CONDITIONS</th>
<th>MANEUVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>EI-5</td>
<td></td>
</tr>
<tr>
<td>LVLH ATT</td>
<td></td>
</tr>
<tr>
<td>GNC, OPS 304 PRO</td>
<td></td>
</tr>
<tr>
<td>* If PREBANK, R/Y – CSS</td>
<td></td>
</tr>
<tr>
<td>* Roll at 1°/sec to</td>
<td></td>
</tr>
<tr>
<td>* If HP &gt; 46, else</td>
<td></td>
</tr>
<tr>
<td>* Maintain PREBANK &lt;5°</td>
<td></td>
</tr>
<tr>
<td>* From Prebank Table</td>
<td></td>
</tr>
<tr>
<td>If PREBANK, R/Y – CSS</td>
<td></td>
</tr>
<tr>
<td>Roll at 1°/sec to</td>
<td></td>
</tr>
<tr>
<td>if HP ≥ 46, else</td>
<td></td>
</tr>
<tr>
<td>(from Prebank Table)</td>
<td></td>
</tr>
<tr>
<td>Maintain PREBANK &lt;5°</td>
<td></td>
</tr>
<tr>
<td>If previous OMS OX TK, He TK, or RCS OX TK leak:</td>
<td></td>
</tr>
<tr>
<td>G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC</td>
<td></td>
</tr>
<tr>
<td>* If PREBANK: P,R,Y – AUTO *</td>
<td></td>
</tr>
<tr>
<td>Begin All trim monitoring</td>
<td></td>
</tr>
<tr>
<td>V = 24K If previous OMS OX TK, He TK, or RCS OX TK leak:</td>
<td></td>
</tr>
<tr>
<td>G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC</td>
<td></td>
</tr>
<tr>
<td>D = 11 √ DRAG H</td>
<td></td>
</tr>
<tr>
<td>∆Az = 10.5° FIRST ROLL REVERSAL</td>
<td></td>
</tr>
<tr>
<td>V = 19K √ HYD MPS/TVC ISOL VLV SYS (three) – CL</td>
<td></td>
</tr>
<tr>
<td>V = 15K √ NAVIADS (I/O RESET if reqd)</td>
<td></td>
</tr>
<tr>
<td>V = 12K RAD BYP VLV MODE (two) – AUTO CNTLR LOOP (two) – AUTO B(A)</td>
<td></td>
</tr>
<tr>
<td>V = 10K √ SPDBK to 81%</td>
<td></td>
</tr>
</tbody>
</table>

* * *

(Entry continued on next page)
Replace this page with page(s) from Flight Supplement
Replace this page with page(s) from Flight Supplement
REPORT POSITION
MACH < 1.0
F, R, Y – CSS
OPS 200,000 PRD (if needed)
GR – AUTO; BF – AUTO
FLY 185-195 KEAS, g = 0°
ABORT MODE – ATO
ABORT PRD – PUSH
F, R, Y – AUTO
FLT ENTR PRW (b/w) – OFF

50K FT
TABS – RELEASE
VISOR – CLOSE/LOCK
SUIT O2 – ON
GREEN APPLE – PULL

50K FT
MS 3 – VENT CABIN
CO/PFT SEATS – LOWER
COOLING – DISCONNECT
SEAT RESTRAINT – RELEASE
D-RING – UNCOVER

50K FT
MS 3 – JETTISON HATCH
COMM – DISCONNECT
G-SUIT CLIP – PULL
SUIT O2 – DISCONNECT
EGRESS SEAT
POLE – DEPLOY
D-RING – HOOK UP
BAILOUT

POST LANDING MODE 5
TABS – RELEASE
VISOR – CLOSE/LOCK
SUIT O2 – ON
GREEN APPLE – PULL
KNEEBOARDS – REMOVE
COOLING – DISCONNECT
SEAT RESTRAINT – RELEASE
PARACHUTE (four) – RELEASE
COMM – DISCONNECT
G-SUIT CLIP – PULL
SUIT O2 – DISCONNECT
PLT – EMER PWR DOWN
EGRESS SEAT
SLIDESCAPE PANEL

(reduced copy)
**ENTRY CONTROL**

<table>
<thead>
<tr>
<th>ARCS QTY (L + R) &lt; 10 %</th>
<th>ENTRY MODE – NO Y JET</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCS QTY = 0 &amp; JETS</td>
<td>(RY CSS; expect sluggish control)</td>
</tr>
<tr>
<td>2 ≤ 20 &amp; M &gt; 6</td>
<td>2. CSS ELEVON FIXED – ITEM 18 EXEC (*)</td>
</tr>
<tr>
<td><strong>CONTROL PROBLEMS</strong> &amp;</td>
<td>3. ENTRY MODE – AUTO</td>
</tr>
<tr>
<td>ARCS QTY &gt; 0</td>
<td>When control regained:</td>
</tr>
<tr>
<td></td>
<td>4. ENTRY MODE – NO Y JET</td>
</tr>
<tr>
<td></td>
<td>5. VAIL trim</td>
</tr>
<tr>
<td>M &lt; 6 &amp; ARCS QTY &gt; 0</td>
<td>6. ENTRY MODE – AUTO</td>
</tr>
<tr>
<td>M &lt; 5</td>
<td>7. TRIM/RHC PNL – ENA</td>
</tr>
<tr>
<td></td>
<td>8. TRIM ROLL – away from AIL trim (to &lt; 1)</td>
</tr>
</tbody>
</table>

*Region of least margin: M 12-8

**AIL TRIM ≥ 3°**

| IAL trim = 5            | 1. WRAP MODE – ITEM 45 EXEC (ACT) |
| NO Y JET                | 2. BF – MAN |
| M < 13 & AIL trim = 5   | 3. BF – UP (to 0%) |
| M < 5                   | 4. Perform roll reversals at 3°/s (expect sluggish control) |
|                         | 5. P – CSS |
|                         | 6. Fly α per schedule: |
| α ≤ 37                  | M | 12 | 11 | 10 | 9 | 8-6 | 5 |
|                         | α | 36 | 35 | 33 | 30 | 26 |
| M < 5                   | 7. TRIM/RHC PNL – ENA |
|                         | 8. TRIM ROLL – away from AIL trim (to < 1) |
| M < 2                   | 9. P – AUTO |
|                         | 10. BF – AUTO |

(Continued on back for 'HIGH-FREQ OSC OR SURF/JET CYCLE')
### HIGH-FREQ OSC OR SURF/JET CYCLE

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Returning PL &gt; 10K lb</td>
<td>1. <strong>CSS</strong>: FILTER ALT – ITEM 21 (*)</td>
</tr>
<tr>
<td>Osc/Cycle continues</td>
<td>2. <strong>P, R/Y</strong> – <strong>CSS</strong></td>
</tr>
<tr>
<td>Osc/Cycle stops</td>
<td>3. <strong>ENTRY MODE</strong> – <strong>LO GAIN</strong></td>
</tr>
<tr>
<td></td>
<td>4. <strong>ENTRY MODE</strong> – <strong>AUTO</strong></td>
</tr>
<tr>
<td></td>
<td>5. <strong>P, R/Y</strong> – <strong>AUTO</strong></td>
</tr>
</tbody>
</table>

**FAB USE ONLY**

**TOP BACK OF ‘ENTRY CONTROL’**

**HOOK VELCRO**

**ENT-10b/A,E/B**
Replace this page with page(s) from Flight Supplement