Entry Checklist

STS-125 Flight Supplement

Mission Operations Directorate
Flight Design and Dynamics Division

Final
March 7, 2008

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
List of Implemented Change Requests (482s):
MULTI-1816

Incorporate the following:
1. Replace FS xi thru FS xiv
2. Replace FS 4-5 thru FS 4-8
3. Replace FS CC 8-17 & FS CC 8-18

Prepared by: Allison McCagg
Book Manager

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

Endl: 10 pages

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

ENTRY CHECKLIST
STS-125 FLIGHT SUPPLEMENT

FINAL
March 7, 2008

PREPARED BY:

Marcia M. Trump
Book Manager

APPROVED BY:

Steven G. Carothers
Lead Entry GPO

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

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Incorporates the following:

| 482# | NONE – Establishes baseline |

### AREAS OF TECHNICAL RESPONSIBILITY

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**NOTE**

This Flight Supplement must be integrated into the generic Entry Checklist to have a complete document for flight. Insert the Flight Supplement (FS) pages in the proper numerical order in the generic Entry Checklist by using the List of Effective Pages (LOEP) which provides the sequence for merging pages to create a complete Entry Checklist.
### LIST OF EFFECTIVE PAGES

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* – Omit from flight book
† – Extra pages in crew copy only

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FS 4-5............ 125/FIN 1 FS CC 8-2........ 125/FIN
FS 4-6............ 125/FIN FS CC 8-3........ 125/FIN
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FS 4-8............ 125/FIN CC 8-5........... 125/FIN
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* – Omit from flight book

FS xii ENT/125/FIN 1
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FS xiii                      ENT/125/FIN 1
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* He pressure not valid until 1 hr after last burn

### ΔV CAPABILITY

- **ARCS ΔV fps** = \[ 0.8 \times [L\% + R\% - AFT QTY 1] \]
- **FRCS ΔV fps** = \[ 0.9 \times \text{FRCS \%} \]
- **OMS ΔV fps** = \[ 5.5 \times \text{OMS \%} \]

**NOTE:** Uses assumed vehicle weight of 237,968 lb
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◆ Available for TAL Only
* LO XRNG TAL Site
■ DME
Length after displaced threshold
# STS-125 LANDING SITE TABLE

(28.45° to 49.9° INCLINATION)

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DME
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† MSBLS Jr. Ch 8 - Requires Uplink

DME
Length after displaced threshold
HORIZ SIT CONFIG

ALTM – ITEM 9 + [ ] [ ] [ ] [ ]

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<td>SPDBK</td>
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* If BFS engaged: *
* Set BFS HSD ITEMS to PASS config *

G51 SEL ATMOSPHERE:
- incl ≤ 50° ITEM 22 EXEC
- incl > 50° SEL ITEM NR (table)

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FS 3-7 ENT/125/FIN
1: GNC DEORB MNVR COAST
2: GNC 50 HORIZ SIT
3: GNC 51 OVERRIDE

- ELEVON AUTO – ITEM 17 (*)
- SSME REPOS – ITEM 19 (ENA)
- WRAP MODE – ITEM 45 (ENA)
- If PLB holding > 10K lb:
  - FILTER ALT – ITEM 21 EXEC (*)

3: BFS, GNC 51 OVERRIDE

- ELEVON AUTO – ITEM 17 (*)
- SSME REPOS – ITEM 19 (ENA)
- WRAP MODE – ITEM 45 (ENA)
- If PLB holding > 10K lb:
  - FILTER ALT – ITEM 21 (*)

* DES any failed/comm faulted    
* IMU, RGA, AA, or SURF feedback

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

- BFS GMBL sel config same as PASS GMBL
  sel config
DEORBIT BURN CARDS
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<th>POST TIG</th>
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<tbody>
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<td></td>
<td>Delay (max)</td>
<td>Stop Burn, &gt; Safe HP</td>
</tr>
<tr>
<td></td>
<td>One Orbit</td>
<td>One Day</td>
</tr>
<tr>
<td>APU/HYD</td>
<td>No APU operating</td>
<td>X</td>
</tr>
<tr>
<td>DPS</td>
<td>RDNT fail, Split</td>
<td>X</td>
</tr>
<tr>
<td>1 GPC</td>
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<td>2 Av Bay Fans in Bay 1 or 2</td>
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<tr>
<td>ELEC</td>
<td>H2 Manf or TK leak (not in depleted tk(s)</td>
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<td>2 MN Buses</td>
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<tr>
<td>Multi φ AC BUS (unshorted)</td>
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<tr>
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<tr>
<td>IMU Dilemma</td>
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<tr>
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<td>Prplt Tank</td>
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1. Stop Burn > OMS PRPLT FAIL HP (Ref: DEL PAD/BURN Card)
2. Stop Burn > OMS ENG FAIL HP (Ref: DEL PAD/BURN Card)

[Hook VELCRO]

[Hook VELCRO]
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</tr>
<tr>
<td>25 1 AFT RCS PROP TK fail</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 MCC GO for DEORBIT not rcvd</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**HOUR VELCRO**

- 1 Stop Burn > OMS PRPLT FAIL HP (Ref: DEL PAD/BURN Card)
- 2 Stop Burn > OMS ENG FAIL HP (Ref: DEL PAD/BURN Card)
DEORBIT BURN (2 ENG)

√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 CNTLR 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 (\p, \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 aff 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 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 \VTOT 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
  * 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

ENT-4a/D/L
DEORBIT BURN MONITOR

OMS TEMP*  
<table>
<thead>
<tr>
<th>L</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>FU IN P ≥ 230</td>
<td>230</td>
</tr>
<tr>
<td>≤ 214</td>
<td>212</td>
</tr>
<tr>
<td>or No FU IN P</td>
<td></td>
</tr>
</tbody>
</table>

OMS ENG FAIL
OMS PRPLT FAIL

OMS PC* & OMS ↓ (BFS: \\accel)  
ENG VLV 1 or 2 < 70  
or  
OX IN P > 227  

OX IN P ≤ 227  
or No OX IN P

OMS PRPLT FAIL

OMS OX/FU TK P (ENG IN P)

OMS ENG FAIL
OMS PRPLT FAIL

OMS OX/FU TK P (ENG IN P)

Ox/FU LOW

He PRESS/VAP ISOL (two) – OP
If aff TK P not incr:
   He PRESS/VAP ISOL (two) – CL
At PC < 72 or OMS TEMP:
   OMS PRPLT FAIL

OX & FU HIGH

He PRESS/VAP ISOL (two) – CL
Cycle He A(B) to maintain TK P 234-284

OMS GMBL

PRI fail
L(R) OMS GMBL – SEC (two)
If high RCS usage: OMS ENG FAIL

SEC fail
If high RCS usage: OMS ENG FAIL

GPC

1(4) &
Burning OMS aff
aff GPC PWR – OFF
If SEC GMBL avail:
   aff MDM FF 1(4) – OFF, ON
   L(R) OMS GMBL – SEC (twice)
SEC GMBL lost
If high RCS usage: OMS ENG FAIL
   2 FAs lost
   \MAN SHUTDN

I/O ERROR FA

1(4)
L(R) OMS GMBL – SEC
I/O RESET (if recov: BFS I/O RESET)
2 FAs lost
\MAN SHUTDN

BCE STRG D

1(4)
If high RCS usage:
   L(R) OMS GMBL – SEC (twice)

RM DLMA IMU

or

ABOVE SAFE HP ⇒  

STOP BURN: OMS ENG(s) – OFF >>

GPC SET SPLIT

or

2 MN BUSES BELOW SAFE HP ⇒  

IMU DLMA:
   After C/O: \timer [G21]
   If any IMU ACC > 0.03: aff IMU – desel
   I’cnt OMS to RCS (\RCS Burn Time)
   THC +X to TGT HP (EOM) or
   3.5 x timer at C/O (AOA)
   SET SPLIT: Go to “GPC” above

I/O ERROR PCM

OI PCMMU PWR – 2(1)

*If XFD, BLDN, or sensor fail, monitor ENG IN P for off-nominal performance
OMS FAILURES

LEFT OMS

MNA (ALC1) CNTLAB1 † FA4

MNB (ALC2) CNTLAB2 † FA1

MNA (ALC1) CNTLAB1 † FA3 *

MNB (ALC2) CNTLAB2 † FA2

MNA (APC1) FF1 FA1

MNB (APC2) FF2 FA2

Left OMS Ignition

Left OMS Sec TVC

† If CNTL AB1 or AB2 (CA1 or CA2) failed and ign path still exists at OMS fail, assume L(R) OMS ↓ is PRPLT FAIL

* If L(R) Pc failed high during burn, or FA3(4) failed, at L(R) OMS fail, no guidance downmode after L(R) OMS ENG switch OFF (TGO slow, ADI needles in error, 6 ft/s underburn)

RIGHT OMS

MNC (ALC3) CNTLCA1 † FA3

MNA (ALC1) CNTLCA2 † FA1

MNC (ALC3) CNTLCA1 † FA4 *

MNA (ALC1) CNTLCA2 † FA2

MNC (APC3) FF4 FA4 *

MNA (APC1) FF3 FA3

Right OMS Ignition

Right OMS Sec TVC

If two FA MDMs lost

<table>
<thead>
<tr>
<th>MDMs</th>
<th>Preburn: ENG – OFF</th>
<th>During burn: MAN SHUTDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2</td>
<td>LEFT (TVC)</td>
<td>BOTH</td>
</tr>
<tr>
<td>1,3</td>
<td>RIGHT (IGN)</td>
<td>LEFT</td>
</tr>
<tr>
<td>1,4</td>
<td>LEFT (IGN)</td>
<td>RIGHT</td>
</tr>
<tr>
<td>2,3</td>
<td>LEFT (IGN)</td>
<td>RIGHT</td>
</tr>
<tr>
<td>2,4</td>
<td>RIGHT (IGN)</td>
<td>LEFT</td>
</tr>
<tr>
<td>3,4</td>
<td>RIGHT (TVC)</td>
<td>BOTH</td>
</tr>
</tbody>
</table>

ENT-2b/125/A,O,D,E/A

MS ONLY FS 3-30 ENT/125/FIN
**PREBANK TABLE EDW (HA = 302 NM)**

<table>
<thead>
<tr>
<th>ΔHP</th>
<th>0</th>
<th>3</th>
<th>7</th>
<th>10</th>
<th>REDES</th>
<th>11</th>
<th>12</th>
<th>(13)</th>
<th>REDES</th>
<th>NOR ELS</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREBANK</td>
<td>75</td>
<td>110</td>
<td>135</td>
<td></td>
<td></td>
<td>145</td>
<td>160</td>
<td>180</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NOR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* G50 ITEM 41 +4 1, \(\sqrt{R}\)WY 17 SET TACAN tw (three) 121Y
* ΔHP | 8 | 9 | 11 | 13 | 14 | 15 | (16) | REDES |
| PREBANK | 95 | 105 | 120 | 140 | 150 | 165 | 180 | KSC |

* G50 ITEM 41 +0 1, \(\sqrt{R}\)WY 15 SET TACAN tw (three) 59Y
* ΔHP | 14 | 17 | 18 | 19 | 20 | (21) |
| PREBANK | 100 | 130 | 140 | 155 | 170 | 180 |

**PREBANK TABLE KSC (HA = 302 NM)**

<table>
<thead>
<tr>
<th>ΔHP</th>
<th>0</th>
<th>2</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>(13)</th>
<th>REDES</th>
<th>BDA</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREBANK</td>
<td>55</td>
<td>90</td>
<td>105</td>
<td>120</td>
<td>130</td>
<td>155</td>
<td>175</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* G50 ITEM 41 +0 6, \(\sqrt{R}\)WY 30 SET TACAN tw (three) 86X
* ΔHP | 14 | 16 | (18) | RED |
| PREBANK | 125 | 150 | 180 | AML |

* G50 ITEM 41 +0 Z, \(\sqrt{R}\)WY 01 SET TACAN tw (three) 100X
* ΔHP | 19 | 22 |
| PREBANK | 115 | 180 |
1: GNC DEORB MNVR EXEC 2: GNC DEORB MNVR EXEC
3: BFS, GNC SYS SUMM 2

C CRT1  GNC, OPS 303 PRO

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

C CRT1  Uplinked INRTL EI-5 MM303 ATT with DEL PAD

* If no deorbit TGT uplink, enter INRTL EI-5 *
* MM303 ATT from DEL PAD *
* R – ITEM 24 + ___ ___ ___ ___ ___ ___ *
* P – ITEM 25 + ___ ___ ___ ___ ___ ___ *
* Y – ITEM 26 + ___ ___ ___ ___ ___ ___ *

Mnvr to EI-5 ATT – ITEM 27 EXEC (*)

<table>
<thead>
<tr>
<th>TIME to EI (min)</th>
<th>LVLH PITCH (deg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20</td>
<td>339</td>
</tr>
<tr>
<td>343</td>
<td></td>
</tr>
<tr>
<td>347</td>
<td></td>
</tr>
<tr>
<td>351</td>
<td></td>
</tr>
<tr>
<td>355</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>359</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>19</td>
</tr>
<tr>
<td></td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>27</td>
</tr>
<tr>
<td></td>
<td>31</td>
</tr>
<tr>
<td></td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>39</td>
</tr>
</tbody>
</table>

C  OMS GMBL PWRDN (PASS ONLY)

C CRT1  Verify GMBL positions:

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

GMBL OFF – ITEM 32 EXEC
– ITEM 33 EXEC

FS 3-34  ENT/125/FIN
<table>
<thead>
<tr>
<th>FLIGHT CONDITIONS</th>
<th>MANEUVER</th>
</tr>
</thead>
</table>
| V = 7K            | G50 \(\sqrt{TACAN \text{ and GPS, INCORPORATE}}\)  
* If ELS: UHF MODE – G T/R * |
| V = 5K            | ADTA PROBES – DEPLOY (\(\sqrt{\text{HEAT}}\))  
Begin AIL and RUD trim monitoring |
| M = 3.5           | If previous OMS OX TK, He TK, or RCS OX TK leak:  
G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC |
| M = 2.7           | \(\sqrt{\text{APUs}}\)  
HUD PWR (two) – ON |
|                   | * If M < 2.5; P CSS for ADTA to G&C incorp * |
| M = 2.0           | Ensure ADTA to G&C else \(\sqrt{\text{Theta limits}}\) |
| \(\sqrt{M < 1.0}\) | \(\sqrt{R \text{ FLT CNTRL – ON}}\)  
P, R/Y – CSS as reqd  
\(\sqrt{\text{SPDBK CMD vs POS}}\)  
\(\sqrt{NWS} = 1\)  
Lock Inertia Reels |
| M = 0.7           | \(\sqrt{LG \text{ EXTD ISO VLV – OP}}\) |
| h = 15K           | \(\sqrt{MLS}\) |
| h = 10K           | \(\sqrt{A/L (KSC – Tabs, Visors, Suit O2)}\) |
| h = 2K            | LDG GEAR ARM pb – push (ARM It on) |
| h = 300           | LDG GEAR DN pb – push (DN It on) |
| MAIN GEAR TD      | \(\sqrt{SPDBK – 100\%}\) |
| V = 195 KEAS      | DRAG CHUTE ARM, DPY pb (two) – push (simo) (All Its on) |
| V = 185 KEAS      | DEROTATE |
| NOSE GEAR TD      | SRB SEP – MAN/AUTO and depress pb  
\(\sqrt{\text{Auto Load Relief}}\)  
\(\sqrt{\text{HYD BK ISOL VLV (three) – OP}}\) |
| V < 120 KGS or    | BRAKE as required (8-10 fps\(^2\), -0.25 to -0.3G) |
5K’ remaining      | * If 5K’ remaining and V > 140 KGS – MAX BRAKING * |
| V = 60 KGS        | DRAG CHUTE JETT pb – push (JETT1, JETT2 It on) |
| V = 40 KGS        | BRAKE < 6 fps\(^2\) (-0.2G) (Antiskid cutout) |
| WHEEL STOP        | Go to ENT C/L, POST LANDING PROCEDURES |

**ENT-6b/125/E/B (Partial)**

**MS ONLY**

**FS 4-5**

**ENT/125/FIN 1**
### DRAG CHUTE DEPLOY

<table>
<thead>
<tr>
<th>MCC Call</th>
<th>Flight Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Main Gear TD</td>
</tr>
<tr>
<td>NOMINAL</td>
<td>195 KEAS</td>
</tr>
<tr>
<td>Late</td>
<td>Post-Nose Gear TD</td>
</tr>
<tr>
<td></td>
<td>Xwind DTO</td>
</tr>
<tr>
<td>Emergency</td>
<td>No Deploy</td>
</tr>
<tr>
<td>Only</td>
<td>Except CDR call</td>
</tr>
</tbody>
</table>

**NO DEPLOY** prior to MGTD
- > 230 KEAS
- < 80 KGS
- Xwind > 15 kts

### FAILED TIRE TECHNIQUE

<table>
<thead>
<tr>
<th>Post-MGTD</th>
<th>185 KEAS</th>
<th>180 KEAS</th>
<th>NGTD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Deploy drag chute</td>
<td>√Auto derotation</td>
<td>Max RHC roll away from failed tire</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Speeds</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50K</td>
<td>/</td>
</tr>
<tr>
<td>38K</td>
<td>/</td>
</tr>
<tr>
<td>28K</td>
<td>/</td>
</tr>
<tr>
<td>20K</td>
<td>/</td>
</tr>
<tr>
<td>12K</td>
<td>/</td>
</tr>
<tr>
<td>7K</td>
<td>/</td>
</tr>
<tr>
<td>3K</td>
<td>/</td>
</tr>
<tr>
<td>1K</td>
<td>/</td>
</tr>
<tr>
<td>SURF</td>
<td>/</td>
</tr>
</tbody>
</table>

**ENT-6b/125/E/B** (Partial)
POST LANDING PAYLOAD ACTIVITIES

N/A
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## DEORBIT BURN FLIGHT RULES
### ONE-ORBIT LATE AVAILABLE

#### PRE TIG POST TIG

<table>
<thead>
<tr>
<th>FAILURE</th>
<th>Delay (max)</th>
<th>Stop Burn &gt; Safe HP</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>One Orbit</td>
<td>One Day</td>
</tr>
<tr>
<td>APU/HYD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 No APU operating</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>DPS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 RDNT fail, Split</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>3 1 GPC</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>4 BFS</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>5 GPC BITE (Multiple GPCs)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>ECLS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6 2 Av Bay Fans in Bay 3</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>7 2 Av Bay Fans in Bay 1 or 2</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>ELEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 H2 Manf or TK leak (not in depleted tk(s))</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>9 2 MN Buses</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>10 CNTL CA1 (No BFS Engage in GPC 3/5)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>11 Multi AC BUS (unshorted)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>GNC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12 1 MLS (if reqd), IMU, or TACAN (C-band not avail)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>13 IMU Dilemma</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>14 RHC Dilemma</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>15 2 IMUs</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>16 2 ADTAs (Not targeting EDW/NOR)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>OMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 2 FCS Channels (same surface) (Not targeting NOR/EDW)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>18 2 AAs, RGAs (Not targeting EDW/NOR)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>AFT RCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Prpl Tank</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>20 Ignition (neither eng ignites)</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>21 Both OMS Eng fail</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>22 Prpl Lk after LAST LOS</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>23 2 jets, same direction, same pod</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>24 Prpl Lk after LAST LOS</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>25 1 AFT RCS PROP TK fail</td>
<td>...X...</td>
<td></td>
</tr>
<tr>
<td>26 MCC GO for DEORBIT not rcvd</td>
<td>...X...</td>
<td></td>
</tr>
</tbody>
</table>

1. Stop Burn > OMS PRPLT FAIL HP (Ref: DEL PAD/BURN Card)
2. Stop Burn > OMS ENG FAIL HP (Ref: DEL PAD/BURN Card)

(reduced copy)
### DEORBIT BURN FLIGHT RULES

**ONE-ORBIT LATE NOT AVAILABLE**

<table>
<thead>
<tr>
<th>FAILURE</th>
<th>PRE TIG</th>
<th>POST TIG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td>Stop Burn, &gt; Safe HP</td>
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<tr>
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<td>One Day</td>
<td></td>
</tr>
<tr>
<td>APU/HYD</td>
<td>No APU operating</td>
<td>X</td>
</tr>
<tr>
<td>DPS</td>
<td>RDNT fail, Split</td>
<td>X</td>
</tr>
<tr>
<td>1 GPC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BFS</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>ECLS</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2 Av Bay Fans in Bay 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Av Bay Fans in Bay 1 or 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ELEC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8 H2 Manf or TK leak (not in depleted tk(s))</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2 MN Buses</td>
<td></td>
<td>X</td>
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<td>X</td>
<td></td>
</tr>
<tr>
<td>13 IMU Dilemma</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>14 RHC Dilemma</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>15 2 IMUs (Not targeting EDW/NOR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 2 ADTAs (Winds&gt;80kts or Dynamic Wx)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Prplt Tank</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>20 Ignition (neither eng ignites)</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>21 Both OMS Eng fail</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>22 Prplt Lk after LAST LOS</td>
<td>perigee adjust</td>
<td></td>
</tr>
<tr>
<td>AFT RCS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 jets, same direction, same pod</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>24 Prplt Lk after LAST LOS</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>25 1 AFT RCS PROP TK fail</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>COMM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 MCC GO for DEORBIT not rcvd</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

1. Stop Burn > OMS PRPLT FAIL HP (Ref: DEL PAD/BURN Card)
2. Stop Burn > OMS ENG FAIL HP (Ref: DEL PAD/BURN Card)

(reduced copy)
**DEORBIT BURN (RCS)**

- MM302
- RCS SEL
- RCS BURN CONFIG (L OMS I'CNCT)
- L, R OMS He PRESS/VAP ISOL A (two) – OP
- Wait 2 sec . . . . . . . B (two) – OP
- DAP – INRTL/DISC
- ADI – LVLH(REF)/MED/MED
- FLT CNTLR PWR (two) – ON

**TIG**

- THC +X (No Deorbit > TIG +
- Maintain PITCH ATT ERR ± 3°
- Monitor \( \Delta V_{TOT} \):
- RCS I'CNCT TK SW at \( \Delta V_{TOT} = \)
- L 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 off OMS
  - STOP BURN:
  - APUs – SHUT DN

* **CONTINUE BURN:**
  - ITEM 18 +0 EXEC
  - THC +X (No OMS% vs RCS Burn Time)
  - AFT RCS RECONFIG
  - RCS COMPLETION

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

* **CONTINUE BURN:**
  - ITEM 18 +0 EXEC
  - THC +X (No OMS% vs RCS Burn Time)

---

(REDUCED COPY)
TOP
BACK OF 'ENTRY MANEUVERS'

<table>
<thead>
<tr>
<th>FLIGHT CONDITIONS</th>
<th>MANEUVER</th>
</tr>
</thead>
<tbody>
<tr>
<td>V = 7K</td>
<td>TACAN and GPS, INCORPORATE</td>
</tr>
<tr>
<td></td>
<td>* If ELS: UHF MODE = G TR *</td>
</tr>
<tr>
<td>V = 5K</td>
<td>AOA PROBES – DEPLOY (UHEAT) Begin AIL and RUD trim monitoring</td>
</tr>
<tr>
<td>M = 3.5</td>
<td>If previous OMS OK TX, HK TX, or RCS OX TX leak</td>
</tr>
<tr>
<td>M = 2.7</td>
<td>√ TVC (ENT DOOR CTRL OPEN – ITEM 43 EXEC)</td>
</tr>
<tr>
<td>* M = 2.3, P CS for AOA to SAC mode *</td>
<td></td>
</tr>
<tr>
<td>M = 2.0</td>
<td>Ensure AOA to SAC site at TCA limits</td>
</tr>
<tr>
<td>M &lt; 1.0</td>
<td>√ FLY CTRL ON</td>
</tr>
<tr>
<td>h = 15K</td>
<td>√ VLS</td>
</tr>
<tr>
<td>h = 10K</td>
<td>√ LVL, (KSC – Tails, Vectors, Suit (JZ))</td>
</tr>
<tr>
<td>h = 2K</td>
<td>√ LG GEAR ARM pb – push (ARM it on)</td>
</tr>
<tr>
<td>h = 300</td>
<td>√ LG GEAR DN pb – push (DN it on)</td>
</tr>
<tr>
<td>MAIN GEAR TO</td>
<td>√ SPDBK – 100%</td>
</tr>
<tr>
<td>V = 195 KEAS</td>
<td>DRAG CHUTE ARM, DPY pb (two) – push (same) (All fix on)</td>
</tr>
<tr>
<td>NOS GEAR TO</td>
<td>DEROTATE</td>
</tr>
<tr>
<td>V = 195 KEAS</td>
<td>SBK SEP – MAN/AUTO and depress pb</td>
</tr>
<tr>
<td></td>
<td>Auto Load Relief</td>
</tr>
<tr>
<td></td>
<td>HYD BK ISOL, VLV (three) – OP</td>
</tr>
<tr>
<td>V = 120 KGS or</td>
<td>BRAKE as required (8-10 fps², 0.25 to -0.3G)</td>
</tr>
<tr>
<td>5K remaining</td>
<td>* If 5K remaining and V = 149 KGS – MAX BREAKING *</td>
</tr>
<tr>
<td>V = 80 KGS</td>
<td>DRAG CHUTE JETT pb – push (JETT1, JETT2 it on)</td>
</tr>
<tr>
<td>V = 40 KGS</td>
<td>BRAKE &lt; 6 fps² (0.25G) (Antiskid cutout)</td>
</tr>
<tr>
<td>WHEEL STOP</td>
<td>Go to ENT C/L, POST LANDING PROCEDURES</td>
</tr>
</tbody>
</table>

DRAG CHUTE DEPLOY

<table>
<thead>
<tr>
<th>DEPLOY</th>
<th>Flight Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early</td>
<td>Main Gear '10</td>
</tr>
<tr>
<td>NOMINAL</td>
<td>185 KEAS</td>
</tr>
<tr>
<td>Late</td>
<td>Pod/Noise Gear TO XWRD DTO</td>
</tr>
<tr>
<td>Emergency</td>
<td>No Display</td>
</tr>
<tr>
<td>HDY DEPLOY</td>
<td>Only</td>
</tr>
<tr>
<td>prior to MGTD</td>
<td>Except CDR call</td>
</tr>
<tr>
<td>&gt; 250 KEAS</td>
<td>&gt; 60 KGS</td>
</tr>
<tr>
<td>XWRD &gt; 15 kts</td>
<td>&gt; 180 KGS</td>
</tr>
</tbody>
</table>

FAILED TIRE TECHNIQUE

<table>
<thead>
<tr>
<th>P300/MGTD</th>
<th>F = AUTO</th>
</tr>
</thead>
<tbody>
<tr>
<td>185 KEAS</td>
<td>Deploy drag chute</td>
</tr>
<tr>
<td>180 KEAS</td>
<td>Auto deconsat</td>
</tr>
<tr>
<td>NGTD</td>
<td>Max RHC roll away from failed tire</td>
</tr>
</tbody>
</table>

ENT-6b/125/E/B

(reduced copy)

FAB USE ONLY
FS CC 8-17
ENT/125/FIN 1
### DEORBIT BURN MONITOR

<table>
<thead>
<tr>
<th>OMS TEMP*</th>
<th>L</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>FU IN P</td>
<td>≥ 230</td>
<td>≥ 230</td>
</tr>
<tr>
<td></td>
<td>≤ 214</td>
<td>≤ 212</td>
</tr>
</tbody>
</table>

- OMS ENG FAIL
- OMS PRPLT FAIL

- or No FU IN P

**OMS PC* & OMS ↓ (BFS: "vacos")**

- ENG VLV 1 or 2 < 70
- OX IN P > 227

- OMS ENG FAIL

- or No OX IN P

**OMS OX/FU TK P (ENG IN P)**

- OX/FU LOW
  - He PRESS/VAP ISOL (two) – OP
  - He PRESS/VAP ISOL (two) – CL
  - At PC < 72 or OMS TEMP:
    - OMS PRPLT FAIL

- OX & FU HIGH
  - Cycle He A(B) to maintain TK P 234-284

**OMS GMBL**

- PRI fail
- SEC fail

- If high RCS usage: OMS ENG FAIL

**GPC**

- 1(4)
- Burning OMS aff

- aff GPC PWR – OFF

- If SEC GMBL avail:
  - aff MDM FF 1(4) – OFF, ON
  - L(R) OMS GMBL – SEC (twice)

- SEC GMBL lost

- If high RCS usage: OMS ENG FAIL

- 2 FAs lost

- MAN SHUTDN

**I/O ERROR FA**

- 1(4)

- I/O ERROR FA

- L(R) OMS GMBL – SEC (twice)

- If high RCS usage: OMS ENG FAIL

- 2 FAs lost

- MAN SHUTDN

**BCE STRG D**

- 1(4)

- I/O RESET (if recov. >>)

- If high RCS usage:
  - L(R) OMS GMBL – SEC (twice)

**RM DLMA IMU or ABEVE SAFE**

| HP => | STOP BURN: OMS ENG(s) – OFF >> |

**GPC SET SPLIT or**

<table>
<thead>
<tr>
<th>HP =&gt;</th>
<th>IMU DLMA:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>After C/O: *timer ≥ 21</td>
</tr>
<tr>
<td></td>
<td>If any IMU ACC &gt; 0.03: aff IMU – desel</td>
</tr>
<tr>
<td></td>
<td>Forc OMS to RCS (RCS Burn Time)</td>
</tr>
<tr>
<td></td>
<td>THC+X to TGT HP (EOM) or</td>
</tr>
<tr>
<td></td>
<td>3.5 x timer at C/O (AOA)</td>
</tr>
<tr>
<td></td>
<td>SET SPLIT: Go to “GPC” above</td>
</tr>
</tbody>
</table>

**I/O ERROR PCM**

- OI PCMMU PWR – 2(1)

*If XFD, BLDN, or sensor fail, monitor ENG IN P for off-nominal performance*
### OMS Failures

**TOP BACK OF ‘DEORBIT BURN MONITOR’**

<table>
<thead>
<tr>
<th>Hook VELCRO</th>
<th>OMS Failures</th>
<th>Hook VELCRO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MNA (APC1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FF1</td>
<td>FA1</td>
</tr>
<tr>
<td></td>
<td>MNA (ALC1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNTLCA1 †</td>
<td>FA4</td>
</tr>
<tr>
<td></td>
<td>MNA (ALC1)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNTLCA1 †</td>
<td>FA3 *</td>
</tr>
<tr>
<td></td>
<td>MNB (ALC2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNTLCA2 †</td>
<td>FA1</td>
</tr>
<tr>
<td></td>
<td>MNB (ALC2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>CNTLCA2 †</td>
<td>FA2</td>
</tr>
<tr>
<td></td>
<td>MNB (APC2)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>FF2</td>
<td>FA2</td>
</tr>
</tbody>
</table>

† If CNTL AB1 or AB2 (CA1 or CA2) failed and ign path still exists at OMS fail, assume L(R) OMS ↓ is PRPT FAIL

* If L(R) Pc failed high during burn, or FA3(4) failed, at L(R) OMS fail, no guidance downmode after L(R) OMS ENG switch OFF (TGO slow, ADI needles in error, 6 ft/s underburn)

### Left OMS

- MNA (ALC1) CNTLCA1 † FA4
- MNB (ALC2) CNTLCA2 † FA1

### Right OMS

- MNC (ALC3) CNTLCA1 † FA3
- MNA (ALC1) CNTLCA2 † FA1

### If two FA MDMs lost

<table>
<thead>
<tr>
<th>MDMs</th>
<th>Preburn: ENG – OFF</th>
<th>During burn: MAN SHUTDN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,2</td>
<td>LEFT (TVC)</td>
<td>BOTH</td>
</tr>
<tr>
<td>1,3</td>
<td>RIGHT (IGN)</td>
<td>LEFT</td>
</tr>
<tr>
<td>1,4</td>
<td>LEFT (IGN)</td>
<td>RIGHT</td>
</tr>
<tr>
<td>2,3</td>
<td>LEFT (IGN)</td>
<td>RIGHT</td>
</tr>
<tr>
<td>2,4</td>
<td>RIGHT (IGN)</td>
<td>LEFT</td>
</tr>
<tr>
<td>3,4</td>
<td>RIGHT (TVC)</td>
<td>BOTH</td>
</tr>
</tbody>
</table>

### ENT-2b/125/A,O,D,E/A

(Revised copy)

FAB USE ONLY  FS CC 8-24  ENT/125/FIN
ENTRY CHECKLIST

Flight Cover (trim bottom to expose tabs)