

# Ascent Checklist

## STS-117

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**Mission Operations Directorate  
Flight Design and Dynamics Division**

**Final  
January 10, 2007**

National Aeronautics and  
Space Administration

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





<b>ASCENT C/L STS-117</b>	<b>FINAL (Jan 10, 2007)</b>
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**PCN-1 (Feb 14, 2007) Sheet 1 of 1**

List of Implemented Change Requests (482s):

ASC-1771  
ASC-1772  
ASC-1773

Incorporate the following:

1. Replace v thru viii
2. Replace FB 2-5 & FB 2-6
3. Replace 9-17 & 9-18, 9-23 & 9-24

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Book Manager *02/14/07* Lead Ascent GPO

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

Encl: 10 pages

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

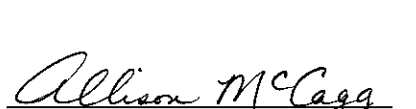



MISSION OPERATIONS DIRECTORATE

**ASCENT CHECKLIST  
STS-117**

FINAL  
January 10, 2007

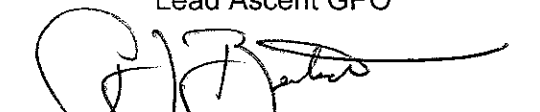
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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on FDF Workflow Crew Procedure Change Request (CR) to DO3/FDF Manager.

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.

ASC/117/FIN

Incorporates the following:		
482#:	ASC-1762	ASC-1767
	ASC-1763	ASC-1769
	ASC-1766	ASC-1770

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DM4/A. McCagg	281-483-7752
Switch List	CA4/S. Kieffer	281-244-8333
Entry	DM4/M. Trump	281-483-8029
	G. Jordan-Moore	281-483-1261

## NOTES

1. The STS-117 trajectory data in this checklist is based on the STS-117 One Cycle to Flight R4 load and the February environment.
2. The Handover/Ingress Switch List gives the vehicle configuration at LCC/MCC handover (SRB Ignition) and flight crew ingress (T-3:00). If there is a switch position difference between ingress and handover, the ingress position will be boxed beside the handover position.
3. The time reference used in the Prelaunch procedures is the T- (Time to Launch) that LCC uses. This time does not reflect planned holds. The second time referenced in parentheses reflects the planned holds. The mission elapsed time (MET) has MET = 0 at SRB ignition.
4. Normal Flight Procedures are for liftoff through the OMS 2 burn.
5. The Abort to Orbit (ATO) procedures and the Backup Flight System (BFS) procedures are integrated into the appropriate parts of this checklist.
6. AOA procedures terminate with ENTRY MANEUVERS Cue Cards.
7. Ascent Flip Book for the CDR and PLT will be fabricated from the FB pages in section 2.
8. Ascent related cue cards are contained in this document. The cue cards are listed in the Ascent Cue Card section. Some cards are printed in the body of the checklist for MS use and also in the Cue Card Config section for reference of crop marks and fabrication instructions.
9. Mission STS-117 is flown with vehicle OV104.



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ASCENT CHECKLIST  
STS-117

**LIST OF EFFECTIVE PAGES**

FINAL 01/10/07  
PCN-1 02/14/07

Sign Off .....	*	117/FIN	FB 2-7 .....	117/FIN
ii.....	*	117/FIN	FB 2-8 .....	117/FIN
iii.....	*	117/FIN	FB 2-9 .....	117/FIN
iv.....	*	117/FIN	FB 2-10 .....	117/FIN
v .....	*	117/FIN 1	FB 2-11 .....	117/FIN
vi.....	*	117/FIN	FB 2-12 .....	<input checked="" type="checkbox"/> 117/FIN
vii.....	*	117/FIN 1	FB 2-13 .....	117/FIN
viii.....	*	117/FIN	FB 2-14 .....	<input checked="" type="checkbox"/> 117/FIN
ix.....	*	117/FIN	FB 2-15 .....	117/FIN
x .....	*	117/FIN	FB 2-16 .....	117/FIN
xi.....		117/FIN	FB 2-17 .....	117/FIN
xii.....		117/FIN	FB 2-18 .....	117/FIN
1-1 .....		117/FIN	FB 2-19 .....	117/FIN
1-2 .....		117/FIN	FB 2-20 .....	117/FIN
1-3 .....		117/FIN	FB 2-21 .....	117/FIN
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1-5 .....		117/FIN	FB 2-23 .....	117/FIN
1-6 .....		117/FIN	FB 2-24 .....	117/FIN
1-7 .....		117/FIN	FB 2-25 .....	117/FIN
1-8 .....		117/FIN	FB 2-26 .....	117/FIN
1-9 .....		117/FIN	2-27.....	117/FIN
1-10.....	<input checked="" type="checkbox"/>	117/FIN	2-28.....	117/FIN
1-11.....		117/FIN	2-29.....	117/FIN
1-12.....		117/FIN	2-30.....	117/FIN
1-13.....		117/FIN	2-31.....	117/FIN
1-14.....		117/FIN	2-32.....	117/FIN
2-1 .....		117/FIN	2-33.....	117/FIN
FB 2-2 .....		117/FIN	2-34.....	117/FIN
FB 2-3 .....		117/FIN	2-35.....	* 117/FIN
FB 2-4 .....		117/FIN	2-36.....	* 117/FIN
FB 2-5 .....		117/FIN	2-37.....	* 117/FIN
FB 2-6 .....		117/FIN 1	2-38.....	* 117/FIN

\* – Omit from flight book

– Prelift-off information required

2-39.....	*	117/FIN	6-17.....	117/FIN
2-40.....	*	117/FIN	6-18.....	117/FIN
2-41.....	*	117/FIN	6-19.....	117/FIN
2-42.....	*	117/FIN	6-20.....	117/FIN
2-43.....	*	117/FIN	6-21.....	117/FIN
2-44.....	*	117/FIN	6-22.....	117/FIN
2-45.....	*	117/FIN	6-23.....	117/FIN
2-46.....	*	117/FIN	6-24.....	117/FIN
3-1.....		117/FIN	6-25.....	117/FIN
3-2.....		117/FIN	6-26.....	117/FIN
3-3.....		117/FIN	6-27.....	117/FIN
3-4.....		117/FIN	6-28.....	117/FIN
3-5.....		117/FIN	6-29.....	117/FIN
3-6.....		117/FIN	6-30.....	117/FIN
3-7.....		117/FIN	6-31.....	117/FIN
3-8.....		117/FIN	6-32.....	117/FIN
4-1.....		117/FIN	6-33.....	117/FIN
4-2.....		117/FIN	6-34.....	117/FIN
4-3.....		117/FIN	6-35.....	117/FIN
4-4.....		117/FIN	6-36.....	117/FIN
5-1.....		117/FIN	6-37.....	117/FIN
5-2.....		117/FIN	6-38.....	117/FIN
5-3.....		117/FIN	6-39.....	117/FIN
5-4.....		117/FIN	6-40.....	117/FIN
6-1.....		117/FIN	7-1.....	117/FIN
6-2.....		117/FIN	7-2.....	117/FIN
6-3.....		117/FIN	7-3.....	117/FIN
6-4.....		117/FIN	7-4.....	117/FIN
6-5.....		117/FIN	7-5.....	117/FIN
6-6.....		117/FIN	7-6.....	117/FIN
6-7.....		117/FIN	7-7.....	117/FIN
6-8.....		117/FIN	7-8.....	117/FIN
6-9.....		117/FIN	7-9.....	117/FIN
6-10.....		117/FIN	7-10.....	117/FIN
6-11.....		117/FIN	8-1.....	117/FIN
6-12.....		117/FIN	8-2.....	117/FIN
6-13.....		117/FIN	8-3.....	☒ 117/FIN
6-14.....		117/FIN	8-4.....	☒ 117/FIN
6-15.....		117/FIN	8-5.....	☒ 117/FIN
6-16.....		117/FIN	8-6.....	☒ 117/FIN

\* – Omit from flight book

☒ – Prelift-off information required

8-7 .....	☒	117/FIN	CC 10-7 .....	*	117/FIN
8-8 .....		117/FIN	CC 10-8 .....	*	117/FIN
9-1 .....	*	117/FIN	CC 10-9 .....	*	117/FIN
9-2 .....	*	117/FIN	CC 10-10 .....	*	117/FIN
9-3 .....	*	117/FIN	CC 10-11 .....	*	117/FIN
9-4 .....	*	117/FIN	CC 10-12 .....	*	117/FIN
9-5 .....	*	117/FIN	CC 10-13 .....	*	117/FIN
9-6 .....	*	117/FIN	CC 10-14 .....	*	117/FIN
9-7 .....	*	117/FIN	CC 10-15 .....	*	117/FIN
9-8 .....	*	117/FIN	CC 10-16 .....	*	117/FIN
9-9 .....	*	117/FIN	CC 10-17 .....	*	117/FIN
9-10 .....	*	117/FIN	CC 10-18 .....	*	117/FIN
9-11 .....	*	117/FIN	CC 10-19 .....	*	117/FIN
9-12 .....	*	117/FIN	CC 10-20 .....	*	117/FIN
9-13 .....	*	117/FIN	CC 10-21 .....	*	117/FIN
9-14 .....	*	117/FIN	CC 10-22 .....	*	117/FIN
9-15 .....	*	117/FIN	CC 10-23 .....	*	117/FIN
9-16 .....	*	117/FIN	CC 10-24 .....	*	117/FIN
9-17 .....	*	117/FIN 1	CC 10-25 .....	*	117/FIN
9-18 .....	*	117/FIN	CC 10-26 .....	*	117/FIN
9-19 .....	*	117/FIN	CC 10-27 .....	*	117/FIN
9-20 .....	*	117/FIN	CC 10-28 .....	*	117/FIN
9-21 .....	*	117/FIN	CC 10-29 .....	*	117/FIN
9-22 .....	*	117/FIN	CC 10-30 .....	*	117/FIN
9-23 .....	*	117/FIN	CC 10-31 .....	*	117/FIN
9-24 .....	*	117/FIN 1	CC 10-32 .....	*	117/FIN
9-25 .....	*	117/FIN	CC 10-33 .....	*	117/FIN
9-26 .....	*	117/FIN	CC 10-34 .....	*	117/FIN
9-27 .....	*	117/FIN	CC 10-35 .....	*	117/FIN
9-28 .....	*	117/FIN	CC 10-36 .....	*	117/FIN
10-1 .....	*	117/FIN	CC 10-37 .....	*	117/FIN
CC 10-2 .....	*	117/FIN	CC 10-38 .....	*	117/FIN
CC 10-3 .....	*	117/FIN	CC 10-39 .....	*	117/FIN
CC 10-4 .....	*	117/FIN	CC 10-40 .....	*	117/FIN
(A)CC 10-5 .....	*	117/FIN	CC 10-41 .....	*	117/FIN
(A)CC 10-6 .....	*	117/FIN	10-42 .....	*	117/FIN
(B)CC 10-5 .....	*	117/FIN			
(B)CC 10-6 .....	*	117/FIN			
(C)CC 10-5 .....	*	117/FIN			
(C)CC 10-6 .....	*	117/FIN			

☒ – Prelift-off information required

\* – Omit from flight book

## ASCENT CUE CARDS

<u>Title</u>	<u>Ref. Page</u>	<u>Card No.</u>
ADI ERROR/RATE SWITCH		
ASCENT (Front).....	CC 10-2	ASC-1a/A,E/E
ENTRY (Back).....	CC 10-2	ASC-1b/A,E/E
ASCENT/ENTRY SPEC		
(Front).....	CC 10-3	ASC-2a/A,E/E
(Back).....	CC 10-3	ASC-2b/A,E/C
SPEED BRAKE CMD		
(Front).....	CC 10-4	ASC-3a/A,E/D
(Back).....	CC 10-4	ASC-3b/A,E/C
CONTINGENCY ABORT		
CDR (Front).....	(A)CC 10-5	ASC-30a/117/A/A
RTLS CONTINGENCY		
CDR (Back).....	(A)CC 10-6	ASC-30b/117/A/A
CONTINGENCY ABORT		
PLT (Front).....	(B)CC 10-5	ASC-31a/117/A/A
RTLS CONTINGENCY		
PLT (Back).....	(B)CC 10-6	ASC-31b/117/A/A
CONTINGENCY ABORT		
MS (Front).....	(C)CC 10-5	ASC-32a/117/A/A
RTLS CONTINGENCY		
MS (Back).....	(C)CC 10-6	ASC-32b/117/A/A
OMS 2 BURN MONITOR (Front)	CC 10-7	ASC-5a/117/A,O/A
OMS FAILURES (Back).....	CC 10-8	ASC-5b/A,O,E/I
OMS 2/ORBIT OMS BURNS		
(Front).....	CC 10-9	ASC-6a/117/A,O/A
OPS 1 RCS BURN (Back).....	CC 10-10	ASC-6b/117/A,O/A
ASCENT ADI – NOMINAL		
(Front).....	CC 10-11	ASC-14a/117/A/A
ENTRY ALPHA – KSC 15		
(Back).....	CC 10-11	ASC-14b/117/A,E/A
AOA DEORBIT BURN (2 ENG)		
(Top/Front).....	CC 10-12	ASC-8a/A/E
(Bottom/Front).....	CC 10-13	ASC-8aa/117/A/A
AOA DEORBIT BURN (1 ENG)		
(Top/Back).....	CC 10-14	ASC-8b/A/B
(Bottom/Back).....	CC 10-15	ASC-8bb/117/A/A
AOA DEORBIT BURN (RCS)		
(Top/Front).....	CC 10-16	ASC-7a/A/B
(Bottom/Front).....	CC 10-17	ASC-7aa/117/A/A
(Top/Back).....	CC 10-18	ASC-7b/A/B
(Bottom/Back).....	CC 10-19	ASC-7bb/A/B

ZZA TAL REDESIGNATION		
(Front).....	CC 10-20	ASC-9a/117/A/A
ECAL – ZZA or MRN or FMI PRIME TAL		
(Back).....	CC 10-21	ASC-9b/117/A/A
MRN TAL REDESIGNATION		
(Front).....	CC 10-22	ASC-10a/117/A/A
ECAL – ZZA or MRN or FMI PRIME TAL		
(Back).....	CC 10-23	ASC-10b/117/A/A
FMI TAL REDESIGNATION		
(Front).....	CC 10-24	ASC-12a/117/A/A
ECAL – ZZA or MRN or FMI PRIME TAL		
(Back).....	CC 10-25	ASC-12b/117/A/A
ASCENT/ABORT SUMMARY		
(Front).....	CC 10-26	ASC-11a/117/A/A
(Back).....	CC 10-26	ASC-11b/A/C
EMERGENCY EGRESS		
(Front).....	CC 10-27	ASC-15a/A,E/I
ACES TROUBLESHOOTING		
(ASCENT/ENTRY) (Back) .....	CC 10-28	ASC-15b/A,E/E
ESCAPE PANEL EGRESS		
(Front).....	CC 10-29	ASC-16a/A,E/D
(Back).....	CC 10-29	ASC-16b/A,E/C
GPC/FCS CHANNEL CONFIG		
(Front).....	CC 10-30	ASC-17a/A,O,E/B
(Back).....	CC 10-30	ASC-17b/A,O,E/B
PANEL R14 – OV104 ONLY		
(Front).....	CC 10-31	ASC-22a/A,O,E/C
(Back).....	CC 10-32	ASC-22b/A,O,E/D
LOC/BREAK-UP.....	CC 10-33	ASC-21a/A/D
EMERGENCY EGRESS (OVERSIZED)		
(Top/Front) .....	CC 10-34	ASC-25a/A,E/F
(Bottom/Front) .....	CC 10-35	ASC-25aa/A,E/D
(Top/Back).....	CC 10-36	ASC-25b/A,E/B
(Bottom/Back).....	CC 10-37	ASC-25bb/A,E/B
EMERGENCY EGRESS (RUSSIAN)		
(Top/Front) .....	CC 10-38	ASC-26a/A,E/D
(Bottom/Front) .....	CC 10-39	ASC-26aa/A,E/C
(Top/Back).....	CC 10-40	ASC-26b/A,E/B
(Bottom/Back).....	CC 10-41	ASC-26bb/A,E/B

PLT & CDR Ascent

<u>Flip Book</u> .....	FB 2-2 thru FB 2-26
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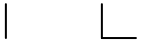
<u>CONTENTS</u>	<u>PAGE</u>
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ASCENT PROCEDURES (FLIP BOOK).....	2-1
RTL CDR (CIL) .....	FB 2-12
TAL CDR (CIL) .....	FB 2-14
ASCENT/ENTRY CUE CARDS .....	2-27
ABORT CUE CARDS.....	2-35
POST OMS 1 BURN PROCEDURES.....	3-1
OMS 2 BURN CARDS .....	4-1
POST OMS 2 BURN PROCEDURES.....	5-1
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AOA PROCEDURES .....	6-7
AOA DEORBIT BURN AND DEORBIT BURN MONITOR CARDS .....	6-17
AOA POST DEORBIT BURN.....	6-27
OMS/RCS POST BURN RECONFIG (CIL).....	6-28
OMS FAILURE .....	6-37
OMS/RCS $\Delta V$ .....	6-39
OMS TARGETS, COMM COVERAGE, LAND SITES .....	7-1
WEATHER PADS .....	8-1
SWITCH LIST .....	9-1
CUE CARD CONFIG .....	10-1



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PRELAUNCH PROCEDURES



## PRELAUNCH PROCEDURES

### ABORT/RECYCLE PROCEDURES

#### NOTE

These recycle procedures will be used inside T-5 min

OTC (or NTD) will call for BFS Safing, SRB Safing, APU Shutdn, Heater Reconfig (Aerosurface positioning complete), MPS He Reconfig, OMS/RCS Reconfig, RCS Driver and OMS Safing, and Main Bus Switch Safing as reqd

#### C **BFS SAFING (On NTD call)**

O6 GPC MODE 5 – HALT  
Report BFS Safing complete

#### MS1 **SRB SAFING (On NTD call – if reqd)**

O17 MEC 1 – OFF  
. . . Wait 2 sec, then . . .  
MEC 2 – OFF  
Report SRB Safing complete

#### P **APU SHUTDN (On OTC call)**

R2 APU OPER (three) – OFF  
FU TK VLV (three) – CL  
√Shutdn (HYD PRESS < 200)  
CNTLR PWR (three) – OFF  
HYD CIRC PUMP (three) – GPC  
  
Report APU SHUTDN complete

#### C **HEATER RECONFIG (On OTC call)**

L2 FLASH EVAP FDLN HTR (two) – 2  
  
Report Heater Reconfig complete

NOTE

Numerous non-time-critical steps  
for recycle will be individually  
called by OTC

**P MPS He RECONFIG (On OTC call)**

R2 MPS He ISOL A,B (six) – GPC  
PNEU He ISOL – GPC

Report MPS He Reconfig complete

**P OMS/RCS RECONFIG (On OTC call)**

O8 L,R OMS  
√TK ISOL (four) – GPC (tb-OP)  
√XFEED (four) – GPC (tb-CL)  
FWD RCS  
He PRESS (two) – GPC (tb-OP)  
√TK ISOL (two) – GPC (tb-OP)  
√MANF ISOL 1,2,3,4,5 (five) – GPC  
(tb-OP)

O7 AFT L,R RCS  
He PRESS (four) – GPC (tb-OP)  
√TK ISOL (six) – GPC (tb-OP)  
√MANF ISOL 1,2,3,4,5 (ten) – GPC  
(tb-OP)

Report OMS/RCS Reconfig complete

C, **RCS DRIVER AND OMS SAFING**  
MS2 **(On OTC call)**

MS2 O14:F RJD DRIVER (three) – OFF  
          LOGIC (three) – OFF  
          L OMS ENG VLV – OFF  
O15:F RJD DRIVER (two) – OFF  
          LOGIC (two) – OFF  
O16:F RJD DRIVER (four) – OFF  
          LOGIC (three) – OFF  
          R OMS ENG VLV – OFF

C C3 OMS ENG (two) – OFF

Report RCS Driver and OMS Safing  
complete

MS2 **MAIN BUS SWITCH SAFING (On OTC call)**

O13:A cb ESS 1BC MNA CONTR – op  
      :C           2CA MNB CONTR – op  
      :E           3AB MNC CONTR – op  
O14:B MNA MNC CONTR – op  
O15:B MNB MNA CONTR – op  
O16:B MNC MNB CONTR – op

Report Main Bus Switch Safing complete

1: GNC GPC MEMORY	2: GNC 104 GND IMU CNTL/MON
3: GNC GPC MEMORY	

-3:00:00  
(Hold)

### PRE-INGRESS SW RECONFIG

ASP configures OI PCMMU PWR – 1 \*\*\* (C3),  
 ESS BUS SOURCE FC (three) – ON, AC BUS  
 SNSR (three) – OFF (1 sec) then AUTO TRIP  
 (R1), cb APU FU TK VLV ENA (six) – cl (R2).  
 OTC will call: (~2 min) ESS BUS SOURCE FC  
 (three) – OFF, AC BUS SNSR (three) – OFF  
 (1 sec) then MON (R1), cb ESS MN CONTR  
 (three) – cl (O13), cb MN CONTR (three) – cl  
 (O14,O15,O16), cb AC1 H2O LOOP PUMP  
 1 A/2(three) – op (L4)

### PAYLOAD ACTIVATION

A6U √PL RETEN PL SEL – MON

### NAVAIDS ACTIVATION

O8     MLS CH pb/tw (three)   – 6  
           RADAR ALTM (two)     – ON  
 O7     TACAN CH pb/tw (three) – 059Y  
           ANT SEL (three) – AUTO  
           MODE (three)       – GPC

If OV104:

A13     GPS PRE AMPL (two) – ON  
           PWR                   – ON  
           √ENCRYPT           – NORM

-2:25:00 A  
(-3:15:00)

### INGRESS ORBITER & SEATS

During seat ingress COMM  
 PWR – ON (L5,R6)  
 CCU PWR – ON (A11,A15,MO39M)

O5,O9, AUD VOX SENS (as needed) – adj as reqd  
 R10,L9, Contact LCC (OTC & NTD) and MCC on  
 MO42F A/G 1

1: GNC GPC MEMORY	2: GNC 104 GND IMU CNTL/MON
3: GNC GPC MEMORY	

Install ASC Flip Cards  
 ✓ Cue Card positions

-2:10:00  
 (-3:00:00)

**POST INGRESS SW RECONFIG**

ASP turns on RCS 1,2,3,4  
 DRIVERS (eight) (O14,O15,O16),  
 OMS ENG VLV (two) (O14,O16),  
 GPC OUTPUT 5 – B/U (O6)

NOTE

ASP doing C/W VOL adjust,  
 expect MA

-1:57:00  
 (-2:47:00)

**(IDP Equivalent)**

NOTE

IMU preflight align begins

-1:35:00 A  
 (-2:25:00)

**LCC ASTRO COMM CHECK**

LCC will contact all crew on A/G 1,  
 A/G 2, ICOM A, ICOM B then A/A

**A MCC A/G VOICE CHECK**

**B** A/G 1 Voice Check  
 O5,O9 L,R AUD A/G 2 (two) – OFF  
 A/A (two) – OFF  
 Voice check with MCC

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

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

1: GNC GPC MEMORY	2: GNC 104 GND IMU CNTL/MON
3: GNC GPC MEMORY	

A SIMO VOICE CHECK (LAUNCH CONFIG)  
 O5,O9, L,R AUD A/G 1 (two) – T/R  
 R10,L9, 2 (two) – T/R  
 MO42F Voice check with MCC

NOTE  
 Side hatch closure

-1:10:00 C **CABIN LEAK CHECK**  
 (-2:00:00)  
 L2 CAB VENT ISOL – OP (tb-OP)  
 √tb – CL  
 O1 √CAB PRESS – incr to 16.7 (MA)

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

-45:00 C **CABIN VENT REDUNDANCY CONFIG**  
 (-1:35:00)  
NOTE  
 Vent vlv operation may occur earlier or later at LCC direction  
 L2 CAB VENT ISOL – CL (tb-CL)  
 VENT – OP (tb-OP)

-40:00 C **CABIN VENT**  
 (-1:30:00)  
 L2 CAB VENT ISOL – OP (tb-OP)  
 (klaxon)  
 √tb – OP  
 O1 √PRESS – decr

1: GNC GPC MEMORY    2: GNC 104 GND IMU CNTL/MON

3: GNC GPC MEMORY

-32:00    C  
(-1:22:00)

**PASS/BFS TRANSFER PREP**

O6    √GPC MODE 5    – STBY (tb-RUN)  
C3    √BFC CRT SEL: 3+1  
          DISP – ON

3: GNC BFS MEMORY

CRT3    PASS/BFS XFER ENA – ITEM 25 EXEC  
          √ITEM 25 (\*)

NOTE

    \*\* blanks when transfer is complete  
    (~10 min)

-30:00    C  
(-1:20:00)

**OMS GN2 PRESS**

C3    OMS ENG (two) – ARM/PRESS

P    **WSB GN2 SUPPLY ACTIVATION**

R2    BLR N2 SPLY (three) – ON

-25:00    A  
(-1:15:00)

**A/G VOICE CHECK**

SIMO VOICE CHECK (LAUNCH CONFIG)  
Voice check with MCC

Update Abort Winds Pad, ASC Flip Book,  
and ALTM, 1-10 (if reqd)

NOTE

Cabin Press Reporting and vent vlv  
closure may occur earlier or later at  
LCC direction

-22:00    C  
(-1:12:00)

**REPORT CABIN PRESS**

3: BFS, SM SYS SUMM 1

CRT3,O1 Report cabin pressure (two) to OTC

3: BFS, GNC BFS MEMORY

C    **CLOSE VENT VLVS**

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



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

NOTE

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

TRAJECTORY UPDATE

√MCC for max rates and trajectory  
config, 8-7

-20:00  
(-1:00:00)

**OPS 1 LOAD (IDP Equivalent)**

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

Report faults other than from unpwr  
equipment

CRT1 GNC, SPEC 99 PRO

-18:30 C  
(-58:30)

**BFS TO OPS 1**

3: BFS, GNC FAULT
-------------------

CRT3 GNC, SPEC 99 PRO  
O6 GPC MODE 5 – RUN (tb-RUN)

CRT3 GNC, OPS 101 PRO

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

Report faults other than from unpwr  
equipment

CRT3 GNC, SPEC 99 PRO

1: GNC FAULT	2: GNC LAUNCH TRAJ
--------------	--------------------

3: BFS, GNC FAULT
-------------------

2: GNC 50 HORIZ SIT
---------------------

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

-17:00 P **HORIZ SIT CONFIG**  
 (-57:00)

ALTM – ITEM 9 + 

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

	<u>PASS ITEM</u>		<u>BFS ITEM</u>	
PTI	INH	√1		
TAL SITE (MCC)	3(4,29)	√40	3(4,29)	√40
RTLS SITE	1	√41	1	√41
PRI (MCC)	KSC 15	√3	KSC 15	√3
SEC (MCC)	KSC 33	√4	KSC 33	√4
TAC	-59	√5	-59	√5
RA	blank	√46		
TAEM TGT				
G&N	OVHD	√6	OVHD	√6
HSI	blank		blank	
XEP	NEP	√7	NEP	√7
AIM	NOM	√8	NOM	√8
	(or CLSE)		(or CLSE)	
TAC	INH	√20	INH	√20
GPS	INH	√43	INH	√43
DRAG H	AUT	√22	AUT	√22
ADTA H	INH	√26	INH	√26
ADTA TO G&C	INH	√29	AUT	√28
TAC	DELTA	√35		
AIF_G	INH	√48		

1: GNC LAUNCH TRAJ	2: GNC SYS SUMM 1
--------------------	-------------------

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

**C CONFIG CONT ABORT YAW STEER**

CRT1 √ITEM 5 

E	N	A
---	---	---

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

-16:00 P **MPS He RECONFIG**  
(-56:00)  
R2 MPS He ISOL A,B (six) – OP  
PNEU He ISOL – OP

NOTE

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

C **√INTERCOM VOICE**

√Intercom voice with all crewmembers  
prior to entering T-9 hold

**WEATHER UPDATE (if reqd)**

Update Abort winds, RWY and ALTM  
setting

-9:00 P **CLEAR HARDWARE C/W MEMORY**  
(~-17:00)  
C3 C/W MEM – CLEAR

-9:00 MS1  
(~-15:00) Activate V10 Recorder

-9:00 **'GO FOR LAUNCH' (All)**

C2 EVENT TIMER – START  
F7 √TIME ind – counting down

NOTE

GLS starts

-8:00 P **CONNECT ESS BUSES TO FC (GLS √@ T-7:24)**

R1 ESS BUS SOURCE FC (three) – ON

-7:30

NOTE

Access arm retract

√ACES gloves  
Cinch down shoulder harness and lap belt

1: GNC LAUNCH TRAJ      2: GNC SYS SUMM 1

3: BFS, GNC SYS SUMM 2

3: BFS, SM SYS SUMM 2

-6:15      P      **APU PRE START (GLS √ @ T-5:25)**

- R2      √BLR N2 SPLY (three)      – ON
- √PWR (three)      – ON
- √CNTLR/HTR (three)      – A
- √HYD CIRC PUMP (three)      – GPC
- √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
- FU TK VLV (three)      – OP
- √APU/HYD RDY tb (three)      – gray

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

-5:00      P      **APU START (GLS √ @ T-4:05)**

R2      APU OPER (three) – START/RUN

HYD/  
APU      √HYD PRESS ind (three) – LO green

R2      √APU/HYD RDY tb (three) – bp  
          HYD MN PUMP PRESS (three) – NORM

HYD/  
APU      √PRESS ind (three) – HI green

R2      CIRC PUMP (three) – OFF

F7      √PRESS It – off

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

**C    HTR RECONFIG**

L2      FLASH EVAP FDLN HTR (two) – OFF

NOTE

Motion/Vibration may be felt in crew module due to Main Engine gmb1 profile cks at -3:25 and move to start at -3:10

-2:30    P    **CLEAR C/W MEMORY**

2: GNC FAULT  
3: BFS, GNC FAULT

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

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

C3      C/W MEM – CLEAR

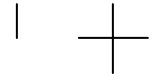
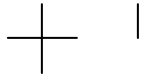
-2:00    A    **SUIT PREP**

√Tabs/visor – cl/LES O2 – ON



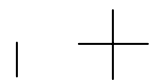
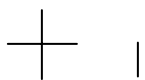
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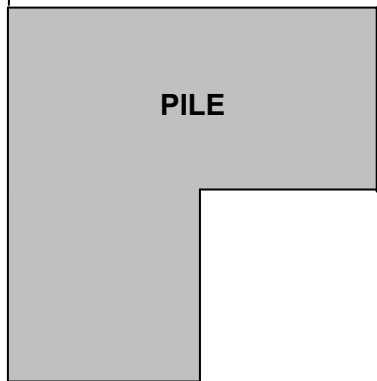


ASCENT PROCEDURES  
(FLIP BOOK)

**BAILOUT  
EGRESS**



TAB TITLE BLANK ON THIS PAGE ONLY  
TOP  
MOUNT ON LEFT SIDE OF BACKBOARD FACING  
'BAILOUT MODE 8'



**ASCENT FLIP BOOK  
(EMERGENCY EGRESS)**

**PRELAUNCH  
MODE 1**

TABS – RELEASE  
VISOR – CLOSE / LOCK  
SUIT O2 – ON  
GREEN APPLE – PULL  
KNEEBOARDS – REMOVE  
COOLING – DISCONNECT  
SEAT RESTRAINT – RELEASE  
PARACHUTE (four) – RELEASE  
COMM – DISCONNECT  
SUIT O2 – DISCONNECT  
EGRESS SEAT  
HATCH – OPEN MANUALLY  
SLIDEWIRE BASKETS

**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  
SLIDE/ESCAPE PANEL



HOOK

ASC

- BAILOUT  
MODE 8**
- 
- REPORT POSITION**  
 $\sqrt{\text{MACH}} < 1.0$   
 P, R/Y – CSS  
 OPS 305/603 PRO (if reqd)  
 SB – AUTO; BF – AUTO  
 FLY 185-195 KEAS,  $\Phi = 0^\circ$   
 ABORT MODE – ATO  
 ABORT PBI – PUSH  
 P,R/Y – AUTO  
 FLT CNTLR PWR (two) – OFF
- ~50K FT**
- TABS – RELEASE  
 VISOR – CLOSE / LOCK  
 SUIT O2 – ON  
 GREEN APPLE – PULL
- ~40K FT**
- MS3 – VENT CABIN  
 CDR,PLT SEATS – LOWER  
 KNEEBOARDS – REMOVE  
 COOLING – DISCONNECT  
 SEAT RESTRAINT – RELEASE  
 D-RING – UNCOVER
- ~30K FT**
- MS3 – JETTISON HATCH  
 COMM – DISCONNECT  
 (G-SUIT CLIP – PULL)  
 SUIT O2 – DISCONNECT  
 EGRESS SEAT  
 POLE – DEPLOY  
 D-RING – HOOK UP  
 BAILOUT

TOP  
BACK OF 'EMERGENCY EGRESS'

BAILOUT  
EGRESS

PILE

**SYS FLIGHT RULES**

	RTLS	TAL
<b>OMS</b> – 2 He TKs		
– 1 OX & 1 FU TKs (diff pods)		X
– 2 OX or 2 FU TKs		X
<b>APU/HYD</b> – Impending loss of all capability	X	X
<b>CABIN LEAK</b> – (-EQ dP/dT > .15)	X	X
<b>CRYO</b> – All O2(H2)	X	X
<b>2 FREON LOOPS</b> ↓ [Accum Qty (↓ and decr) and/or Flow (↓)]	X	X
<b>2 MAIN BUSES</b> ↓	X	
<b>THERMAL WINDOW PANE</b>	X	

**NO COMM MODE BOUNDARIES**

<b>NEG RETURN (104)</b>	7900	<b>2 ENG ZZA (104)</b>	6100
<b>PRESS TO ATO (104)</b>	11100	<b>ABORT TAL ZZA (4)</b>	
<b>SE OPS 3 (109)</b>	12200	<b>EO VI</b>	<input type="text"/>
<b>SE ZZA (104)</b>	14300	<b>SE OPS 3 ZZA (109)</b>	(4) <input type="text"/>
<b>PRESS TO MECO (104)</b>	17200	<b>SE ZZA (104)</b>	(4) <input type="text"/>
<b>SE PRESS (104)</b>	19200		
<b>NEG MRN (2 @ 67)</b>	19900	<b>2 ENG MRN (104)</b>	5900
<b>LAST PRE MECO TAL</b>	23000	<b>ABORT TAL MRN (3)</b>	
<b>LAST TAL</b>		<b>EO VI</b>	<input type="text"/>
YJT	19900	<b>SE OPS 3 MRN (109)</b>	(3) <input type="text"/>
YYT	20200	<b>SE MRN (104)</b>	(3) <input type="text"/>
YQX	22000		
IKF	23700	<b>2 ENG FMI (104)</b>	6300
INN	23900	<b>ABORT TAL FMI (29)</b>	
FFA	24200	<b>EO VI</b>	<input type="text"/>
BEJ	24300	<b>SE OPS 3 FMI (109)</b>	(29) <input type="text"/>
MRN	24400	<b>SE FMI (104)</b>	(29) <input type="text"/>
KBO	24500		
ESN	24900		
ZZA, KKI	25100		
FMI	25200		
JDG	25300		

**ASCENT PROCEDURES**

**HOOK**

R180

LVLH

.98M

√P<sub>c</sub> → 72%

1.26M

√P<sub>c</sub> → 104%

P<sub>c</sub> < 50+5 s

√SRB SEP (Backup AUTO SEP 2:21)

√TMECO

- \* If NOT STABLE (10 sec): \*
- \* NO COMM – CSS & MAN THROT \*

MM103+10 s

√OMS assist

Close suit O2, open visor

3:00

√EVAP OUT (T < 60)

- \* If Systems ABORT reqd: \*
- \* RTLS at 3:40 or \*
- \* TAL Select prior to 23000 \*
- \* Otherwise Manual MECO 23700 \*

V<sub>I</sub> = 13.2K

√Roll Heads Up

- \* If Man Throttle (3 eng): \*
- \* Man Shutdn at 25700 \*
- \* If 1 eng: \*
- \* TRAJ √SERC ON \*
- \* When MPS PRPLT = 2%: \*
- \* MAN THROT, P<sub>c</sub> → 67% \*
- \* Man MECO @ CO mark BFS \*

MECO

√V<sub>I</sub> = 25819

MECO+20 s

√ET SEP

- \* If 'SEP INH': \*
- \* ET SEP – MAN \*
- \* If Rates > .7,.7,.7: \*
- \* MPS PRPLT DUMP SEQ – STOP \*
- \* Null rates \*
- \* ET SEP – SEP \*
- \* Post ET Sep -Z xlation: \*
- \* MPS PRPLT DUMP SEQ – GPC \*
- \* If Rates < .7,.7,.7: \*
- \* Assume Feedline Fail \*
- \* If V<sub>I</sub> < 25760 or BFS Engaged: \*
- \* OPS 104 – PRO (√BFS 104) \*
- \* NOTE: Expect – 'Illegal Entry' (PASS) \*
- \* 'Illegal TIG' (BFS) \*

► MM104+2 s

If ET Sep complete and HA > 72 :  
+X xlation for 11 sec

√TGTS

√ASC PKT for failures

If OMS 1 not reqd:

OMS ENG (two) – OFF

Go to POST OMS 1

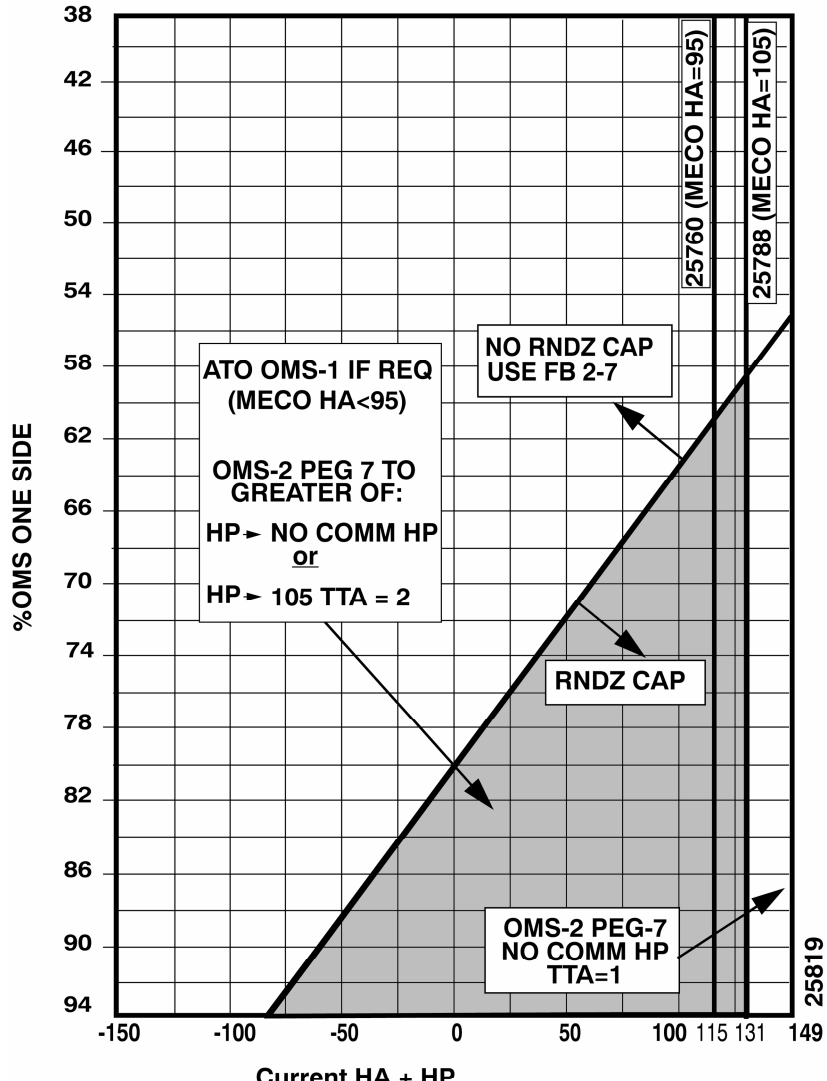
**OMS 1  
TGTING**

TOP  
BACK OF 'ASCENT PROCEDURES'

PILE

STS-117 OCFR2 CY  
OMS 1/2 TGTING  
RENDEZVOUS RECOVERY

ASC



Current HA + HP

PLANAR WINDOW

	1	2
NOMINAL OMS-2 HT		
NO COMM OMS-2 HP		

FB 2-6

ASC/117/FIN 1

TOP

# STS-117 OCFR2 CY OMS 1/2 TGTING

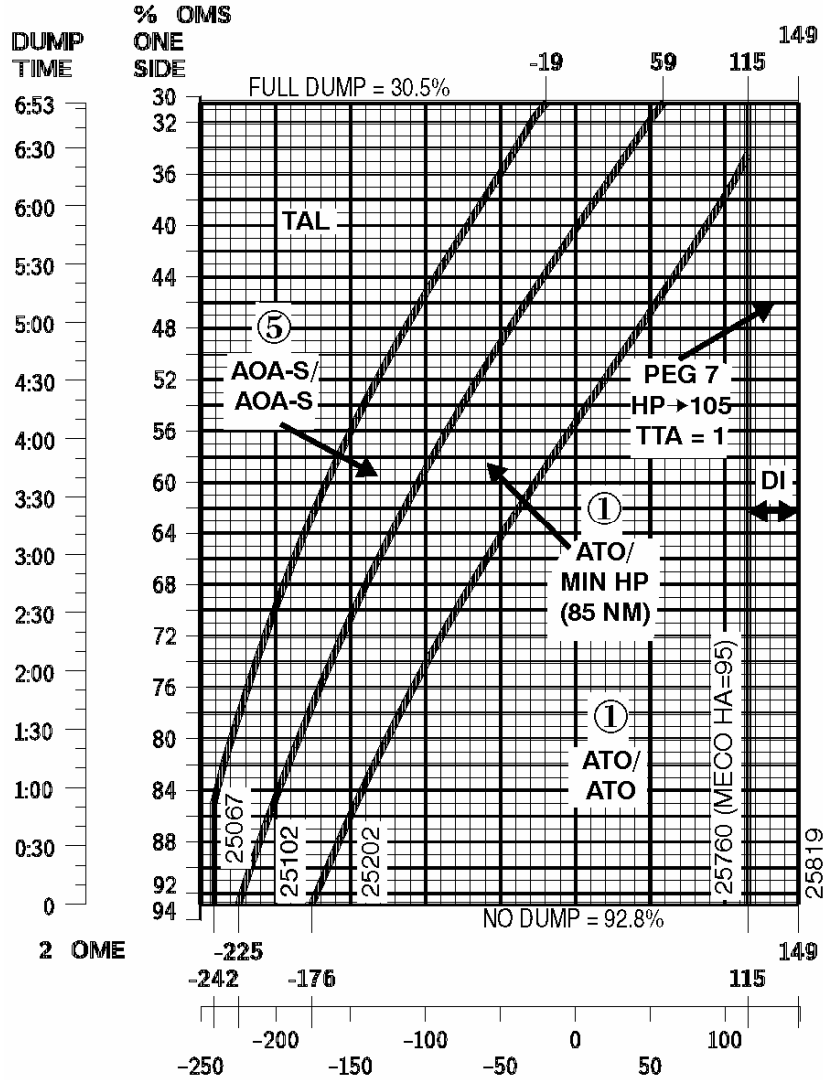
HOOK

OMS 1 TIG:

MECO+2

TTA=2

VI 25.1 25.3 25.8



OMS 1  
BURN

POST NOMINAL  
OMS ASSIST

% OMS/SIDE  
66

DUMP TIME  
2 : 58

FB 2-7

ASC/117/FIN

PILE

OMS 1 BURN

OMS 1  
TGTING

\* **IF TIG LATER THAN MECO + 6 min:**  
\* MECO + 4 min: √BDY FLP pb – lt off (MPS dump complete) \*  
\* √MCC for APU shutdn (if time permits) \*  
\* **FEEDLINE FAIL:** \*  
\* Expect 'Illegal Entry' (PASS)/'Illegal TIG' (BFS) @ tgt select \*  
\* pre ET Sep; input TIG manually & LOAD tgt \*  
\* If TIG > MECO + 6 min: \*  
\* TIG-1:30 or MECO + 6 min (whichever comes first): \*  
\* ET SEP – SEP >> \*  
\* If TIG < MECO + 6 min: \*  
\* MPS PRPLT DUMP SEQ – STOP \*  
\* TIG-1:30: ET SEP – SEP \*  
\* Post ET SEP -Z xlation: \*  
\* MPS PRPLT DUMP SEQ – GPC \*  
\* **1 OMS ENG FAIL and ΔVTOT > 500:** \*  
\* Burn good OMS + l'cncnt both OMS to RCS, THC +X at TIG \*

DAP – AUTO/DISC  
√ENG/TRIM CONFIG, LOAD TGTS, MNVR – (√INRTL)  
OMS XFEED (four) – OP  
√CNTLR PWR (two) – ON  
√OMS ENG (two) – ARM/PRESS

Note ΔVTOT \_\_\_\_\_ TIG   :

-:15 EXEC  
:00 TIG; start watch (√P<sub>c</sub>, ΔVTOT, ENG VLVs)

\* **OMS ENG FAIL:** \*  
\* Failed ENG – OFF \*  
\* If ΔVTOT < 500: \*  
\* At QTY = 5%, good OMS TK ISOL (two) – CL \*  
\* If ΔVTOT > 500: \*  
\* RCS XFEED (four) – OP \*  
\* RCS TK ISOL (six) – CL \*  
\* THC +X \*  
\* At first QTY = 5%, good OMS TK ISOL (two) – CL \*  
\* At second QTY = 5%, THC – Release \*  
\* **RCS COMPLETION:** \*  
\* Interconnect to either \*  
\* OMS that was ENG FAIL \*  
\* THC +X (OMS% vs RCS ΔV) \*  
\* OMS TK SW (if reqd) \*

**CUTOFF**  
+:02 OMS ENG (two) – OFF  
Trim inplane X,Z residuals < 2 fps  
OMS XFEED (four) – CL (√RCS straightfeed)

HOOK

**OMS 1 BURN MONITOR**

<b>OMS TEMP*</b> FU IN P ≥ <table border="1" style="display: inline-table;"><tr><td>L</td><td>R</td></tr><tr><td>230</td><td>230</td></tr></table> ≤ <table border="1" style="display: inline-table;"><tr><td>L</td><td>R</td></tr><tr><td>214</td><td>212</td></tr></table> or No FU IN P	L	R	230	230	L	R	214	212	OMS ENG FAIL OMS ENG FAIL (PRPLT FAIL if 1 Pod Feed)	
L	R									
230	230									
L	R									
214	212									
<b>OMS PC* &amp; OMS ↓</b> (BFS: √accel)	OMS ENG FAIL									
<b>OMS OX/FU TK P</b> (√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 Good OMS Qty = 5% OMS XFEED (four) – CL									
OX & FU HIGH	He PRESS/VAP ISOL (two) – CL OMS XFEED (four) – CL Cycle He A(B) to maintain TK P 234-284									
<b>OMS He TK P LOW</b> (√ <table border="1" style="display: inline-table;"><tr><td>O</td><td>M</td><td>S</td></tr><tr><td>/</td><td>/</td><td>/</td></tr><tr><td>M</td><td>P</td><td>S</td></tr></table> )	O	M	S	/	/	/	M	P	S	At He P < 640 √OMS XFEED (four) – OP Aff OMS TK ISOL (two) – CL At Good OMS Qty = 5% OMS TK ISOL (four) – OP XFEED (four) – CL
O	M	S								
/	/	/								
M	P	S								
<b>OMS N2 REG P HIGH or LOW</b>	OMS ENG – ARM									
<b>OMS N2 TK P LOW</b> (√ <table border="1" style="display: inline-table;"><tr><td>O</td><td>M</td><td>S</td></tr><tr><td>/</td><td>/</td><td>/</td></tr><tr><td>M</td><td>P</td><td>S</td></tr></table> )	O	M	S	/	/	/	M	P	S	At N2 TK P < 470: OMS ENG – ARM
O	M	S								
/	/	/								
M	P	S								
<b>OMS GMBL</b>	PRI fail L(R) OMS GMBL – SEC (twice) SEC fail If high RCS usage: OMS ENG FAIL									
<b>GPC</b> <b>1(4) &amp;</b> 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 2 FAs lost	If high RCS usage: OMS ENG FAIL √MAN SHUTDN									
<b>I/O ERROR FA</b> <b>1(4)</b>	L(R) OMS GMBL – SEC I/O RESET (if recov: BFS I/O RESET) If high RCS usage: OMS ENG FAIL									
2 FAs lost	√MAN SHUTDN									
<b>BCE STRG D</b> <b>1(4)</b>	I/O RESET (if recov: >>) If high RCS usage: L(R) OMS GMBL – SEC (twice)									
<b>I/O ERROR PCM</b>	OI PCMMU PWR – 2(1)									

OMS 2  
TGTING

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

TOP  
BACK OF 'OMS 1 BURN MONITOR'

PILE

**OMS 2 TARGETING**  
(DIR INSERTION)

**OMS 1  
BURN**

FAILURE	OMS 2 TARGET
OMS – 2 N2 TKs (Perform burn Single OMS Eng) – 2 OMS ENGs – 1 or 2 He TKs – 1 PRPLT TK EPS – MNA & B, MNB & C MNA & C ET SEP	PEG 7; TTA = 1 CUTOFF HP = <span style="border: 1px solid black; padding: 2px;">85</span>
OMS – 2 OX or 2 FU TKs – 1 OX & 1 FU TK diff PODs – 2 He TKs	AOA-S
2 FREON LOOPS [Accum Qty (↓ and decr) and/or Flow (↓)] 2 H2O LOOPS CABIN LEAK (-EQ dP/dT ≥ .08)	AOA
APU/HYD – impending loss of all capability	AOA
CRYO – All O2(H2)	AOA

OMS

He	%	He	%
4530	92.4	2830	50
4430	90	2430	40
4030	80	2030	30
3630	70	1630	20
3230	60	1230	10
		830	0





**ATO**

NOTE

These tables apply only after ATO OMS 1 burn  
 (ITGT = ①, AOA to KSC ). Assumes OMS and ARCS deorbit

<b>DUAL POD - OMS REQUIRED</b>				
<b>Includes 9.0 % Unusable ( 4.5 % per pod)</b>				
POST OMS 1 HP	ATO OMS 2 & STEEP D/O BURN (%)	MIN HP OMS 2 & SHALLOW D/O BURN (%)	AOA STEEP D/O BURN (%)	AOA SHALLOW D/O BURN (%)
95	41.2	20.1	35.0	21.7
90	42.6	17.7	32.7	18.5
85	44.3	16.3	30.3	15.6
80	46.2	15.9	27.7	12.8
75	48.2	17.6	24.6	9.8
70	50.1	19.6	21.5	9.0
65	51.2	21.0	19.1	9.0
60	52.1	22.3	18.5	9.0
55	52.4	23.5	19.4	9.0
50	53.1	24.7	19.2	9.0
45	---	26.1	21.8	9.0

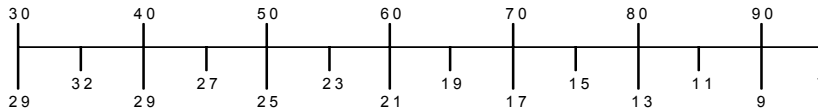
STS-117 OCFR2 CY

<b>SINGLE POD - OMS REQUIRED</b>				
<b>Includes 4.5 % Unusable</b>				
POST OMS 1 HP	ATO OMS 2 & STEEP D/O BURN (%)	MIN HP OMS 2 & SHALLOW D/O BURN (%)	AOA STEEP D/O BURN (%)	AOA SHALLOW D/O BURN (%)
95	36.7	15.6	30.5	17.2
90	38.1	13.2	28.2	14.0
85	39.8	11.7	25.8	11.1
80	41.7	11.4	23.2	8.3
75	43.7	13.1	20.1	5.3
70	45.5	15.1	17.0	4.5
65	46.7	16.5	14.6	4.5
60	47.6	17.8	14.0	4.5
55	47.9	19.0	14.9	4.5
50	48.6	20.2	14.7	4.5
45	---	21.6	17.3	4.5

RTL

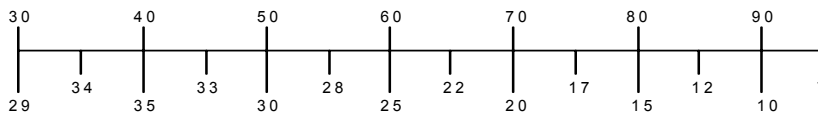
**OMS BLOWDOWN**

LEFT OMS GAGE QTY (%)



LEFT OMS BLDN EQUIV (%)

RIGHT OMS GAGE QTY (%)



RIGHT OMS BLDN EQUIV (%)

**PILE**

**RTLS CDR**

Abort initiated:  
After 2:30 (2 eng)  
At 3:40 (3 eng)

**ABORT RTLS**

- \* No joy: \*
- \* OPS 601 PRO \*

√GUIDANCE STATUS on RTLS TRAJ



Expect PPA when GUID % to go = 0

- \* If GUID 'INHB': \*
- \* √UNCONVERGED GUID TABLE \*
- \* MAN PPA per PRPLT \*
- \* REMAINING \*
- \* After GUID CONVERGE: \*
- \* P,R/Y AUTO/AUTO THROTTLE \*

**WINDS**

50K	/
38	/
28	/
20	/
12	/
7	/
3	/
1	/
SURF	/
<b>SPDBK @ 3000 FT</b>	

After PPA: √BFS ITEM 1 (\*)

TRAJ √Bugs, HSI √, 

Pitchdn ( $\beta = 0^\circ$ ,  $\alpha = -2^\circ$ )

----- **MECO** ----- **MECO** -----

**OMS 2  
TGTING**

- √ET SEP (MECO + 16 sec)
- √MM602 ( $\alpha > 10^\circ$  and SEP + 10 sec)
- √P,R/Y, SPDBK, BDY FLP – AUTO
- $\alpha = 50^\circ$  until ~1.8g, maintain 2.2g

Adjust seat

$\dot{H} > -320 \uparrow$  VERT SIT √ $\alpha$  vs Mach  
V = 5K √RUD, AIL TRIM  
& EAS < 333 ↓ AIR DATA PROBE (two) – Deploy (√Heat)

M = 3.2 √SPDBK → 65%  
M = 2.7 L HUD PWR – ON

\* If M < 2.5, P CSS for ADTA to G&C incorp \*

M = 2.0 Ensure ADTA to G&C else THETA limits  
M < 1.0 P,R/Y – CSS, √SPDBK CMD vs POS  
√NWS – 1

Lock Inertia Reels

POST LANDING: ENT, POST LDG

RTLS PLT

HOOK

If CSS: MAN THROT  
Man MECO

$\sqrt{P_c} = 104\%$  (2 eng)/69% (3 eng)  
 $\sqrt{DUMP}$

**UNCONVERGED GUIDANCE TABLE**

ENG OUT	OUTBOUND INITIAL $\theta$	PITCHAROUND at % (8°/sec)	FLYBACK INITIAL $\theta$
Liftoff	60°	44%	64°
:30	56°	47%	63°
1:00	57°	47%	63°
:30	56°	48%	62°
2:00	49°	51%	61°
:30	42°	51%	52°
3:00	38°	52%	50°
:30	34°	53%	48°
4:00	Last RTLS	52%	46°

$\sqrt{P_c}$  at PPA + 20 sec

- \* If  $P_c = 104\%$  (2 eng): \*
- \* **G51** MAX THROT – ITEM 4 (\*) \*

Pitchdn:  $\sqrt{P_c} \rightarrow 67\%$

**MECO** ----- **MECO**

KEAS = 77  $\sqrt{SPDBK} \rightarrow 81\%$   
 $\sqrt{ET}$  DOORS – Closed and latched (MECO +1:30)  
 $\sqrt{ET}$  SEP, SRB SEP – AUTO  
 Adjust seat  
 $\sqrt{TACANS}$ , INCORPORATE

- \* If KSC TACAN Fail: \*
- \* TACAN Ch 097X (COF), ITEM 5 EXEC \*

**G51**  $\sqrt{AIR}$  DATA, INCORPORATE  
 HYD MPS/TVC ISOL VLV (three) – CL  
 (hold 5 sec, tb-CL)

H = 85K MLS (three) – ON  
 If Rwy 33(15): MLS CH (three) – 6(8)  
 I/O RESET

M = 2.7 R HUD PWR – ON  
 M < 1.0  $\sqrt{R}$  FLT CNTLR PWR – ON  
 Lock Inertia Reels

M = 0.7  $\sqrt{LG}$  EXTD ISO VLV – OP  
 H = 10K  $\sqrt{BDY}$  FLP – TRAIL  
 $\sqrt{A/L}$  (KSC – Tabs, Visors, Suit O2)

POST LANDING: ENT, POST LDG

TAL

TOP  
BACK OF 'RTL5 PLT'

**PILE**

**TAL CDR**

If  $V_1 > [23000]$  manual MECO  $[23700]$ , go to post MECO  
ABORT TAL  
 $[G50]$   $\sqrt{\text{SITE \& RWY (PASS/BFS), \sqrt{HDG}}$

TAL	HDG
ZZA 010	
MRN 016	
FMI 006	

\*LO XRNG

SITE	RWY	TACANS	ITEM 5	MLS	LENGTH
2	BEN 36/18	MAK 80 (DME)	CBA 116 (DME)	-/-	13720/13220
3	MRN 20/02	MRN 100	AOG 23	6/-	11730/11730
4	ZZA 30L/12R	ZZA 64	ZAR 77 (DME)	6/-	12200/12200
12	BEN 36/18	MAK 80 (DME)	CBA 116 (DME)	-/-	13720/13220
13	*MRN 20/02	MRN 100	AOG 23	6/-	11730/11730
14	*ZZA 30L/12R	ZZA 64	ZAR 77 (DME)	6/-	12200/12200
19	YJT 09/27	YJT 78	YDF 80 (DME)	-/-	9500/9500
20	YYT 29/11	UYT 23	YYT 82 (DME)	-/-	8500/8500
21	YQX 21/31	YQX 74	IQX 32 (DME)	-/-	9700/8900
23	LAJ 15/33	TRM 109	LAJ 45	-/-	10870/10870
24	BEJ 01L/19R	MOJ 37	BEJ 105	-/-	10820/10820
25	IKF 20/29	KEF 57	HL 44 (DME)	-/-	9520/9560
26	INN 06/24	SHA 80 (DME)	CRN 37 (DME)	-/-	9540/9540
27	FFA 27/09	FFA 81	BZN 56	-/-	9490/9490
28	KBO 14L/32R	GIX 18	DOR 23Y (DME)	-/-	12020/12020
29	FMI 33/15	FMI 16	NIM 53	6/-	11300/12300
30	ESN 03R/21L	BAG 78 (DME)	BUK 90 (DME)	-/-	11800/11800
31	KKI 15R/33L	RIY 92	KIA 80	-/-	13300/13300
32	JDG 31/13	NKW 57	NKW 57	-/-	12000/12000

\* If second eng fails:  $[TRAJ]$   $\sqrt{\text{SERC ON}}$  \*  
\*  $[G50]$   $\sqrt{\text{SITE (\sqrt{Redes card})}}$  \*

$V_1 = [15.0K]$   $\sqrt{\text{Roll Heads Up}}$

----- **MECO**  $V_1 \sim 24.0K$  @ CO mark **BFS** ----- **MECO** -----

MECO+20 s  $\sqrt{\text{ET SEP, \sqrt{AUTO -Z TRANS}}$   
MECO+37 s  $\sqrt{\text{MM104}}$

**Abort TAL (if reqd):**

$\sqrt{\text{TAL flag set: [G50] ITEM 41 = TAL SITE (any site)}}$   
 $\sqrt{\text{MECO } V_1 \text{ vs HI/LO Energy (TAL PLT)}}$   
 $\sqrt{\text{Rates } < .5^\circ/\text{sec; } \theta > 15^\circ, Y = 0 \pm 30^\circ}$   
**PASS, OPS 301 PRO ( $\sqrt{304}$ )**

\* No joy in 68 sec: BFS - ENGAGE \*  
\* BFS, OPS 301 PRO \*

----- **MM304** -----

BFS, OPS 301 PRO ( $\sqrt{304}$ )  
 $[G50]$   $\sqrt{\text{SITE, RWY, TACAN}}$   
S/B & ALTM (PASS/BFS)

$[TRAJ]$   $\sqrt{\text{BUGS, [HSI] } \sqrt{\text{H}}}$ , RANGE,  $[AMI]$   $\sqrt{\alpha = 43^\circ}$

\* Low energy:  $[TRAJ]$  ITEM 3 (Lo Energy ENA) \*  
\* If Variable/man 37: Pitch - CSS at  $\alpha = 37^\circ$  \*  
\* Pitch - AUTO when  $\dot{H} = 0 \uparrow$  (2nd pullout) \*

$V = 10K$   
 $V = 7K$

$\sqrt{\text{SPDBK} \rightarrow 81\%}$   
Go to **ENTRY MANEUVERS SURF WIND**  
(Cue Card)

**SPDBK @ 3000 FT**

ALTM	/
AIM PT	
SPDBK	

RTL5

TAL PLT



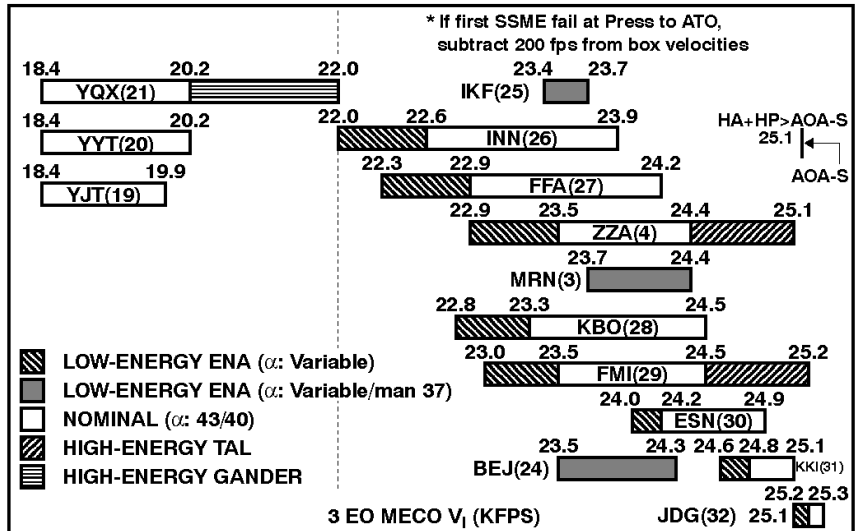
√OMS DUMP

- \* If second eng fail: \*
- \* **G51** DUMP – ITEM 6 (\*), 7 (\*) \*
- \* If OMS He PRESS < 2K: DUMP STOP \*
- \* Failed ME SHUTDN pb (two) – push \*

√AUTO THROT

- \* If second eng fail or STUCK TAL: \*
- \* When MPS PRPLT = 2%: \*
- \* MAN THROT, P<sub>c</sub> → 67% \*
- \* Man MECO @ CO mark **BFS** \*

----- MECO -- V<sub>1</sub> ~24.0K @ CO mark **BFS** ----- MECO -----



----- MM304 -----

√OMS DUMP

√ET DOORS – Closed and latched (MM304 +1:30)

- V = 19K HYD MPS/TVC ISOL VLV (three) – CL (hold 5 sec, tb-CL)
- V = 10K \* If RCS < **N/A** % either side: \*
- \* **G51** AFT RCS INH, ITEM 13 EXEC \*
- V = 7K MLS (three) – ON (√channels)  
I/O RESET  
Go to ENTRY MANEUVERS (Cue Card)

ECAL

TOP  
BACK OF 'TAL PLT'

PILE

**POWERED ECAL**

**G51** √MAX THROT – ITEM 4 (\*)


√ADI (two) – REF

√θ → 60°, Yaw → 45°

√Roll to Heads Up

**G50** Select SITE and TACAN

When EAS > 4 and incr:

√Yaw to 

√Pitch down at 3°/sec

√MECO, ET SEP

**ET SEP + 8s: CSS, pull to α = 58° at 4°/sec, AUTO**

√MM602 (BFS, OPS 602 PRO)

Go to ECAL ENTRY

**2 E/O ECAL (51.6°)**

Velocity (VI)			Location	Site	RWY	TACANs
IP - 2:30	In Plane	IP + 2:30				
*5.3-6.8	*5.3-6.7	*5.3-6.7 6.8-7.3	Wilmington	6	ILM 06	ILM 117
*6.8-8.6	*6.7-6.9 6.9-8.1 *8.1-8.4 RTLS	6.7-7.9 *7.9-8.0 RTLS	Cherry Point	7	NKT 32L	EWN 83 (D)
*8.6-9.7	*8.4-8.6 8.6-9.3	*8.0-8.1 8.1-9.8	Oceana NAS	8	NTU 32R	NGU 48
*9.7-10.5	9.2-9.9 *9.9-10.2	8.6-10.5	Wallops	9	WAL 28	SBY 49
	*10.2-10.5	9.5-11.2	Atlantic City	11	ACY 31	CYN 81
	10.5-12.3	10.1-12.7	Gabreski	15	FOK 06	HTO 83
*10.5-10.9 10.9-13.3	10.7-13.4	10.5-13.7	Otis ANGB	16	FMH 32	BOS 74
	11.5-13.2	11.1-13.9	Pease Int'l	17	PSM 34	ENE 118

\*Probable bailout region

(D) - DME only

**3 E/O ECAL (51.6°)**

MM 602 Velocity (Vrel)			Location	Site	RWY	TACANs
IP - 2:30	In Plane	IP + 2:30				
*5.3-6.6	*5.3-6.6	*5.3-6.7	Wilmington	6	ILM 06	ILM 117
*6.6-8.9	*6.6-8.7	*6.7-7.3 7.3-8.0 *8.0-8.6	Cherry Point	7	NKT 32L	EWN 83 (D)
*8.9-10.2	*8.7-10.0	*8.6-9.7	Oceana NAS	8	NTU 32R	NGU 48
*10.2-10.9	*10.0-10.7	*9.7-10.6	Wallops	9	WAL 28	SBY 49
	*10.7-11.0	*10.6-11.0	Atlantic City	11	ACY 31	CYN 81
*10.9-11.9 11.9-13.9	*11.0-11.6 11.6-14.4	*11.0-11.2 11.2-14.7	Otis ANGB	16	FMH 32	BOS 74
	11.8-12.4	11.2-13.0	Gabreski	15	FOK 06	HTO 83
	12.8-13.8	12.9-14.2	Pease Int'l	17	PSM 34	ENE 118
13.5-17.2	13.3-17.4	13.1-17.2	Halifax Int'l	18	YHZ 23	UAW 38
15.2-18.0	15.0-18.0	14.9-18.0	Stephenville	19	YJT 09	YJT 78
15.4-18.0	15.3-18.0	15.3-18.0	St. Johns Int'l	20	YYT 29	UYT 23
15.5-18.0	15.4-18.0	15.2-18.0	Gander Int'l	21	YQX 21	YQX 74
		17.3-17.6	Goose Bay	22	YYR 26	UYR 40

\*Probable bailout region

(D) - DME only

TAL

HOOK

HI-ENER  
GANDER

**ECAL ENTRY**

**If 3 OUT ECAL or 2 OUT SECOND GREEN:**

**G50 Select SITE and TACAN  
BFS, OPS 602 PRO**

**Before NZ Hold:**

**RHC/PNL TRIM – ENA  
If M < 5, √AIL/RUD TRIM**

BFS, **G50** √SITE and TACAN

Nz Hold:

Expect prebank = 20° if TGT Nz < ~3.3g and ΔAZ > 20°  
At H = -600 ↑ expect initial bank 2xΔAZ (70° max)  
If E/W ≥ STN, expect bank = 70° until ΔAZ increased to 15-30°  
past site, then 2xΔAz

**G50** √TACANS, INCORPORATE

**M < 5 and EAS < 333 ↓:**

**AIR DATA PROBE (two) – Deploy (√Heat)**

**G50** INCORPORATE Air Data ASAP

M = 3.2: √OPS 603

**Select UHF-G T/R**

**NO COMM ECAL LNDG CRITERIA**

@H = 70K, √Range:

- \* If Range < 28 nm or Range > 54 nm: \*
- \* P, R/Y CSS \*
- \* Bank (≤ 30°) to HDG 120° \*
- \* Go to BAILOUT \*

**G50** √SPDBK (ITEM 39) per ECAL LANDING Table

**ECAL LANDING:**

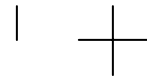
Runway Length + Ovrn	Spdbk	MGTD	Distance
≥ 11,000'	NOM	205	2500
≥ 8500 to < 11,000'	SHORT	205	1500
< 8500'	ELS	195	1000

MAIN GEAR TD: EARLY CHUTE, DEROTATE, √SPDBK – 100%

NOSE GEAR TD: BRAKE – as reqd

- \* If 5K' remaining and V > 140 KGS – MAX BRAKING \*
- \* (smooth application, not < 2 sec) \*

**Go to RTLS (enter POST-MECO M = 2.7 step) or BAILOUT**



ECAL



PILE

**HIGH-ENERGY GANDER CDR**

MM104

**Abort TAL:**

√TAL flag set: **G50** ITEM 41 = TAL SITE (any site)  
√Rates < .5°/sec;  $\theta > 15^\circ$ ,  $Y = 0 \pm 30^\circ$   
**PASS, OPS 301 PRO (√304)**

-----**MM304**-----

MM304

P, R/Y – CSS  
√VREL

VREL	ROLL (CSS)	ALPHA (CSS)
VREL ≥ 19,900	0°	55°
VREL < 19,900	0°	50°

$\dot{H} = -800 \uparrow$

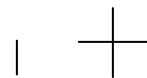
Roll towards site ( $\phi \sim 80^\circ$ ), initial target  $\dot{H} = -350$ ,  
hold initial Alpha per table  
**G50** Hold 3.0g Nz using roll

- \* If Nz ≥ 3.5: \*
- \*     Reduce Alpha ( $40^\circ < \alpha < 55^\circ$ ) and \*
- \*      $\dot{H}$  until Nz < 3.5 \*

**Orbiter bug  
below  
upper line  
or V = 6K**

Pitch down at 1°/sec, center needles,  
P, R/Y – AUTO

Go to ENTRY MANEUVERS (Cue Card)





## HIGH-ENERGY GANDER PLT

HOOK

## -----MM304-----

BFS, OPS 301 PRO (√304)

**G50** Select Site YQX – ITEM 41 +2 1**TRAJ** √BUGS, **HSI** √  $\hat{H}$ , RANGE√ET DOORS – closed and latched  
(MM304 +1:30) **$\dot{H} = -800\uparrow$**  Monitor  $\dot{H}$ , Nz**When  $\dot{H}$   
stabilizes** Ensure Nz stays < 3.5**Monitor  
Traj** Report when orbiter bug reaches upper line**Orbiter bug  
below  
upper line  
or V = 6K** Monitor pitchdown at 1°/sec to center needles,  
√P,R/Y – AUTO**V = 19K** HYD MPS/TVC ISOL VLV (three) – CL  
(hold 5 sec, tb-CL)**V = 15K** **G50** √RWY, TACAN, S/B, ALTM  
(PASS/BFS)**V = 10K** \* If RCS < **N/A** % either side: \*  
\* **G51** AFT RCS INH, ITEM 13 EXEC \***V = 10K** √SPDBK → 81%  
Go to ENTRY MANEUVERS (Cue Card)HI-ENER  
TAL



**PILE**

**HIGH-ENERGY TAL CDR**

MM104

**Abort TAL:**

√TAL flag set: **G50** ITEM 41 = TAL SITE (any site)  
√Rates < .5°/sec;  $\theta > 15^\circ$ ,  $Y = 0 \pm 30^\circ$   
**PASS, OPS 301 PRO (√304)**

**HI-ENER  
GANDER**

-----**MM304**-----

MM304

P, R/Y – CSS  
√VREL

VREL	ROLL (CSS) 4-5°/sec	ALPHA (CSS)
VREL ≥ 23,800	180°	80° ( $\theta = 280^\circ$ )
23,300 ≤ VREL < 23,800	180°	55°
VREL < 23,300	0°	55°

$\dot{H} = -200 \downarrow$  If Alpha = 80°, push to Alpha = 55° ( $\theta = \sim 305^\circ$ )

**Earlier of**  
 $\dot{H} = -600 \downarrow$   
**or Guid Init** Roll Heads Up at 4-5°/sec, maintain Alpha = 55°

$\dot{H} = -500 \uparrow$  R/Y – AUTO (√Rolls toward site)  
Limit roll to 90° until V = 6K:  
TRAJ Roll CMD > 90° R/Y CSS @ 90°  
< 90° R/Y AUTO

**Orbiter bug below upper line** When commanded drag ( $\leftarrow \square$ ) < 40:  
Pitch down at 0.5°/sec, center pitch needle,  
P – AUTO

**V = 6K** If energy still high:  
Pitch down at 1°/sec, center pitch needle,  
P, R/Y – AUTO

Go to ENTRY MANEUVERS (Cue Card)



## HIGH-ENERGY TAL PLT

HOOK

## -----MM304-----

BFS, OPS 301 PRO (√304)

[G50] If [FMI] GO TAL Site – Select [FMI] –  
ITEM 41 + [29]

Otherwise, select best Wx site [ZZA] (Site 4)  
or [FMI]

[TRAJ] √BUGS, [HSI] √ $\hat{H}$ , RANGE

√ET DOORS – closed and latched  
(MM304 +1:30)

ABORT  
DUMPS

**Guid Init:**  
(D = 3,  $\bar{q}$  = 8,  
EAS = 48)

- \* If no comm and [ZZA/FMI] \*
- \* initial Commanded Drag ( $\leftarrow$ )  $\geq$  [35] , \*
- \* [G50] Select Site [ESN] – ITEM 41 + [30] \*
- \* \*

**V = 19K** HYD MPS/TVC ISOL VLV (three) – CL  
(hold 5 sec, tb-CL)

**V = 15K** [G50] √RWY, TACAN, S/B, ALTM  
(PASS/BFS)

**V = 10K** \* If RCS < [N/A] % either side: \*

- \* [G51] AFT RCS INH, ITEM 13 EXEC \*

**V = 10K** √SPDBK → 81%

**V = 7K** MLS (three) – ON (√channels)  
I/O RESET

Go to ENTRY MANEUVERS (Cue Card)

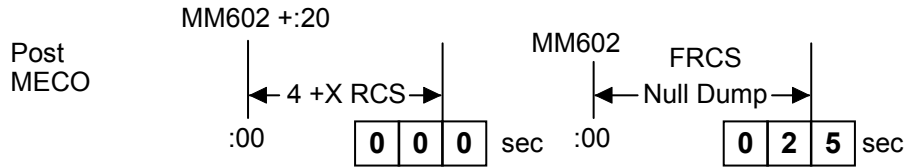
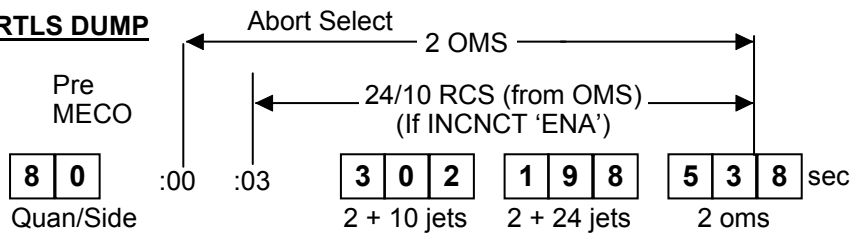
TOP  
BACK OF 'ECAL ENTRY'

**PILE**

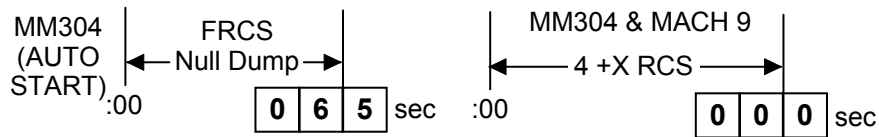
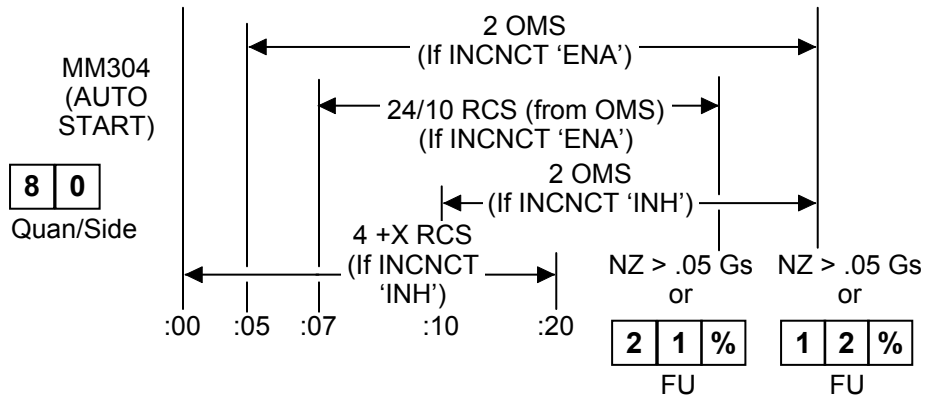
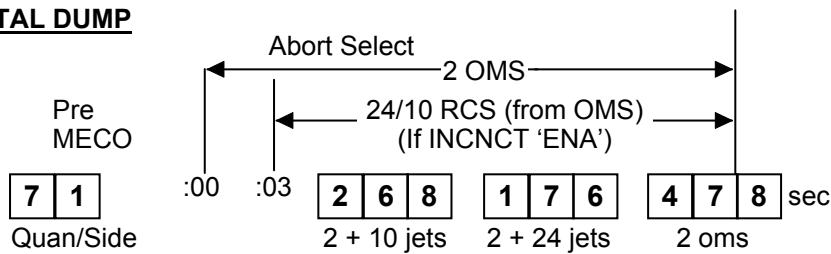
**RTLS/TAL DUMPS**

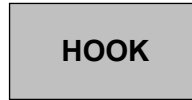
HI-ENER  
TAL

**RTLS DUMP**

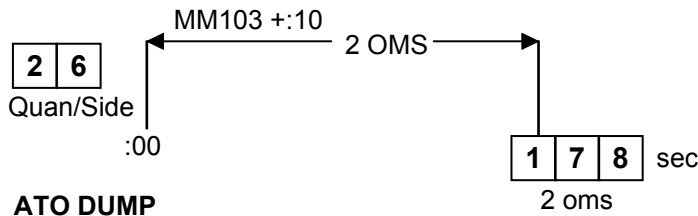


**TAL DUMP**

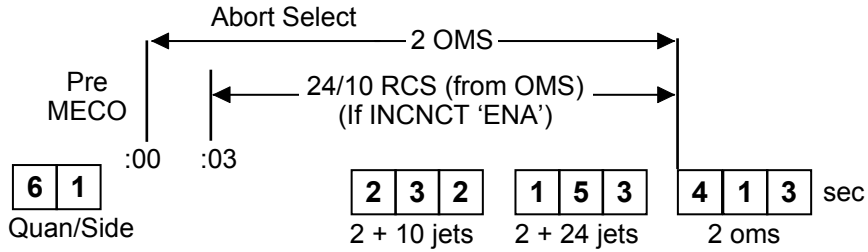




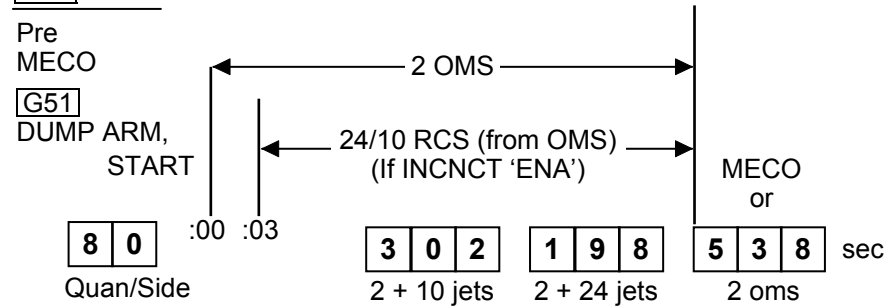
**ASSIST/ATO/ G51 DUMPS**  
**ASSIST DUMP**



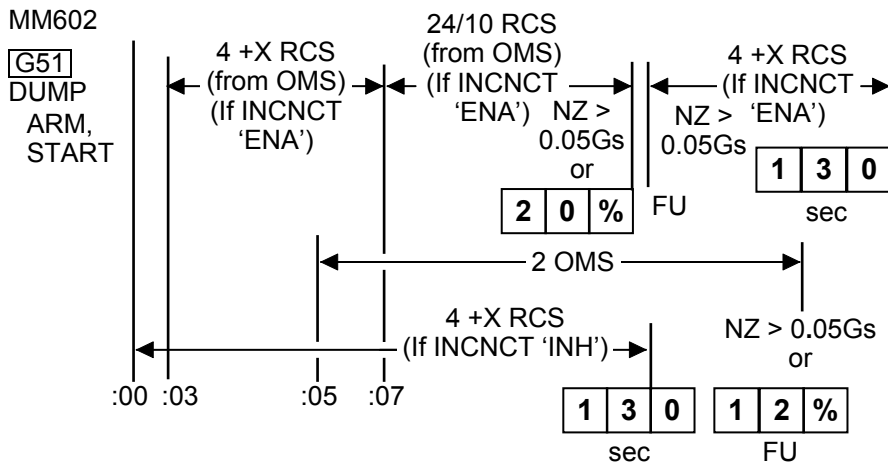
**ATO DUMP**



**G51 DUMP**



PWRD  
 CSS



TOP  
BACK OF 'ASSIST/ATO/G51 DUMPS'

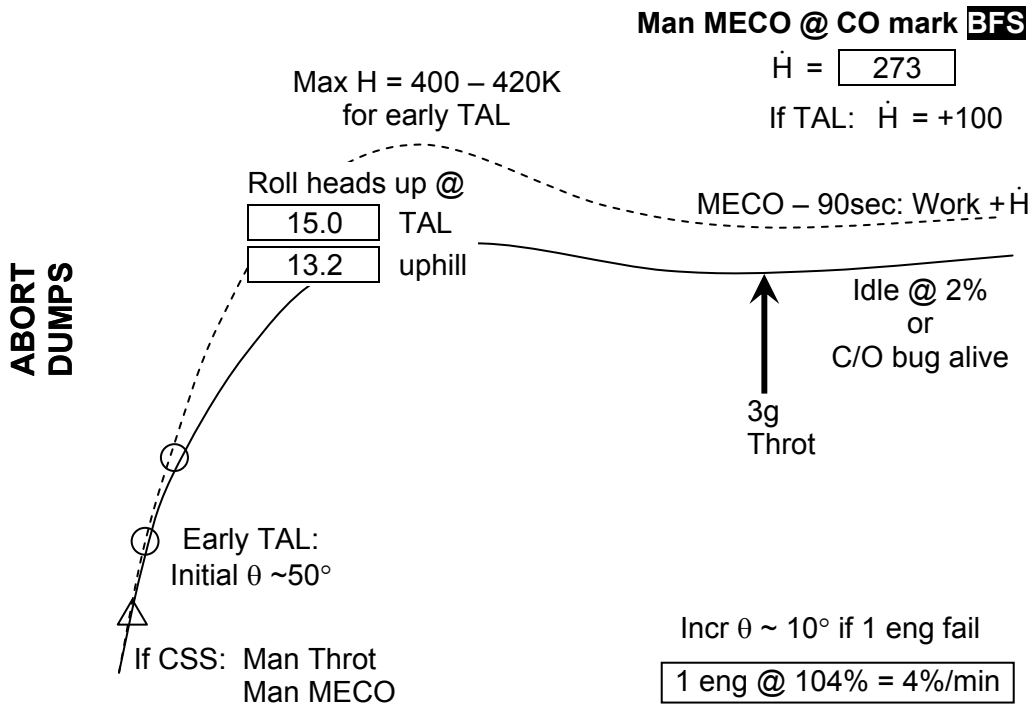
PILE

**POWERED CSS – UPHILL/TAL**

CSS & MAN THROT  
(IF MET < 1:30, ENGAGE BFS)

Yaw to **E** until 2:30  
Then **I** uphill  
or **R** if TAL

If TAL $\sqrt{HDG}$	
ZZA	010
MRN	016
FMI	006



# POWERED CSS – RTLS

**HOOK**

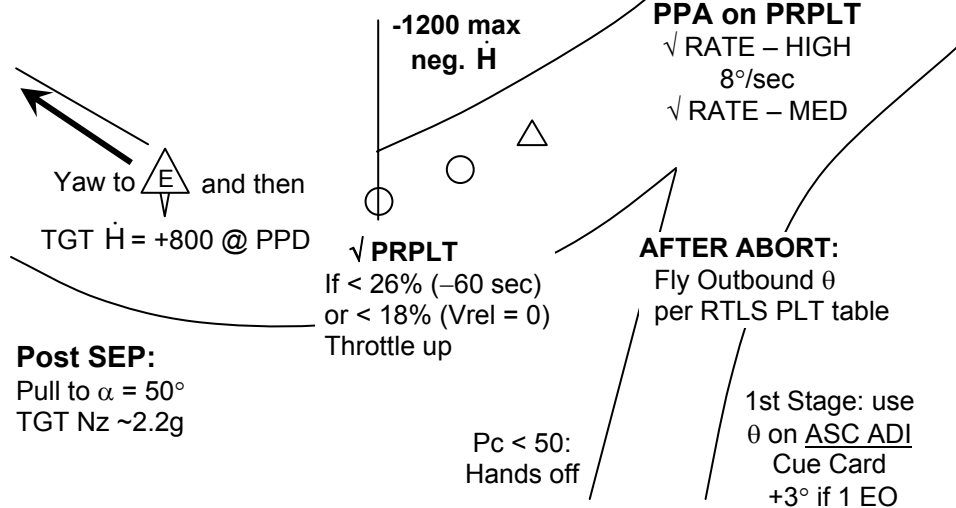
CSS & MAN THROT  
(IF MET < 1:30, ENGAGE BFS)

Post PPA	Pre PPA
2 eng = 100%	2 eng = 104%
3 eng = 69%	3 eng = 69%

**PPD**  
Idle & Pitch DN to  
horiz ( $\alpha -2^\circ$ )  
**Man MECO @ CO mark**  
Hold FWD stick until SEP

**R** Yaw to **R**

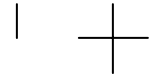
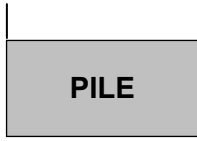
$\dot{H}$  control:  
Use  $\theta$  then  
Throttle



1 eng @ 104% = 4%/min

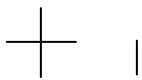
If CSS: Man Throt  
Man MECO

TOP  
BACK OF 'POWERED CSS – RTLS'



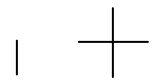
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PWRD  
CSS



FB 2-26

ASC/117/FIN







ASCENT/ENTRY CUE CARDS

**ASC/ENT  
CUE CARDS**



MS ONLY

2-27

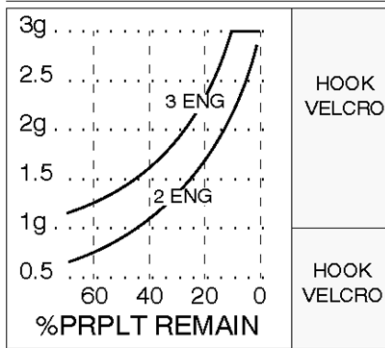
ASC/117/FIN



ASC/ENT  
CUE CARDS

**ASCENT ADI - NOMINAL**

TIME	$\theta$	H	$\dot{H}$	(117 OCFR2 CY)
0:30	68	9K	629	
0:50	63	25K	977	
1:10	55	49K	1392	
1:30	40	81K	1865	
1:50	31	122K	2180	



**-STAGING-**

$V_1$	$\theta$	H	$\dot{H}$	ASC-14a/117/A/A
6	19	219K	1712	
7	16	276	1262	
8	13	311	913	
9	11	333	632	
10	9	346	401	
12	6	356	59	
14	9	355	-148	
16	25	350	-231	
18	23	344	-267	
20	21	339	-217	
22	19	337	-103	
24	17	337	66	
25819	13	345	273	

HOOK VELCRO

### ENTRY ALPHA

VR	αref	R	H	Href	Rref
25	40	4327	400		
24	HI 40	LO 2586	249	-47	L79
23	43	40 37	2135	241	-64 69
22	43	40 37	1791	235	-83 63
21	43	40 37	1515	228	-105 60
20	43	40 37	1294	221	-122 58
19	43	40 37	1121	215	-144 59
18	43	40 37	978	208	-167 60
17	43	40 37	864	201	-186 61
16	43	40 37	766	195	-197 63

## KSC 15

MAX L/D	
M	α
3	17
2	15
1	12

ASC-14b/117/A,E/A

(117 OCFR2 CY)

HOOK  
VELCRO

HOOK  
VELCRO

HOOK  
VELCRO

15	43	40 37	683	188	-119	62
14	43	40 37	615	184	-126	60
13	43	40 37	543	180	-137	58
12	43	40 37	485	175	-151	56
11	42	39 36	424	172	-195	R54
10	41	38 35	372	166	-176	49
9	39	36 33	322	160	-209	46
8	37	34 31	274	152	-242	42
7	33	30 27	227	142	-271	41
6	30	27 24	183	131	-274	L39
5	26	23 20	144	119	-272	39
4	23	20 18	106	104	-264	40
3	19	16 15	74	90	-248	R37
2.5	15		61	83	-250	
2	12		50	77	-268	
1.5	9		37	67	-323	
1	8		27	52	-267	

HOOK VELCRO



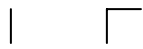
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MS ONLY

2-30

ASC/117/FIN



### ENTRY MANEUVERS

FLIGHT CONDITIONS	MANEUVER
EI-5	√LVLH ATT GNC, OPS 304 PRO * If PREBANK, R/Y – CSS * * Roll at 1°/sec to <input type="text"/> <input type="text"/> <input type="text"/> * * Maintain PREBANK ±5° * If previous OMS OX TK, He TK, or RCS OX TK leak: <input type="text"/> G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC (AOA) <input type="text"/> SPI When SB position – 0%: √HYD MN PUMP PRESS (three) – LO
$\bar{q} = 1$	(AOA) HYD MN PUMP PRESS (three) – NORM
'Guidance Box' @ $\bar{q} \sim 8$ or $D \sim 3$	CLOSED LOOP GUIDANCE ____:____:____ * If PREBANK: P,R/Y – AUTO * Begin AIL trim monitoring
V = 24K	If previous OMS OX TK, He TK, or RCS OX TK leak: <input type="text"/> G51 VENT DOOR CNTL CLOSE – ITEM 44 EXEC
D = 11	√DRAG H (FORCE if editing)
V = 19K	√HYD MPS/TVC ISOL VLV SYS (three) – CL
V = 15K	√NAVAIDS (I/O RESET if reqd)
V = 12K	RAD BYP VLV MODE (two) – AUTO CNTLR LOOP (two) – AUTO B(A)
V = 10K	√SPDBK to 81%
$\Delta Az = 10.5^\circ$	FIRST ROLL REVERSAL <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>

ENT-6a/E/O

**ENT  
MNVR**

ENT  
MNVR

FLIGHT CONDITIONS	MANEUVER
V = 7K	√TACAN status * If ELS: UHF MODE – G T/R *
V = 5K	ADTA PROBES – DEPLOY (√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	√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 √Theta limits
M < 1.0	√R FLT CNTLR – ON P,R/Y – CSS as reqd √SPDBK CMD vs POS √NWS – 1 Lock Inertia Reels MAX N <sub>z</sub> <input type="text"/> . <input type="text"/>
M = 0.7	√LG EXT D ISO VLV – OP
h = 15K	√MLS
h = 10K	√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	√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 √Auto Load Relief √HYD BK ISOL VLV (three) – OP
MIDFIELD and V < 140 KGS	BRAKE as required (8-10 fps <sup>2</sup> , -0.25 to -0.3G)
* 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 <sup>2</sup> (-0.2G) (Antiskid cutout)
WHEEL STOP	Go to ENT C/L, <u>POST LANDING PROCEDURES</u>

ENT-6b/E/W  
(Partial)

**DRAG CHUTE DEPLOY**

<b>MCC Call</b>	<b>Flight Condition</b>
Early	Main Gear TD
<b>NOMINAL</b>	<b>195 KEAS</b>
Late	Post-Nose Gear TD Xwind DTO
Emergency Only	No Deploy Except CDR call
NO DEPLOY prior to MGTD > 230 KEAS < 80 KGS Xwind > 15 kts	

**FAILED TIRE TECHNIQUE**

Post-MGTD	P – AUTO
185 KEAS	Deploy drag chute
180 KEAS	√Auto derotation
NGTD	Max RHC roll away from failed tire

50K	/
38K	/
28K	/
20K	/
12K	/
7K	/
3K	/
1K	/
SURF	/

ENT-6b/E/W  
(Partial)



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MS ONLY

2-34

ASC/117/FIN







CONT  
ABORT

ABORT CUE CARDS



NOT FLOWN

2-35

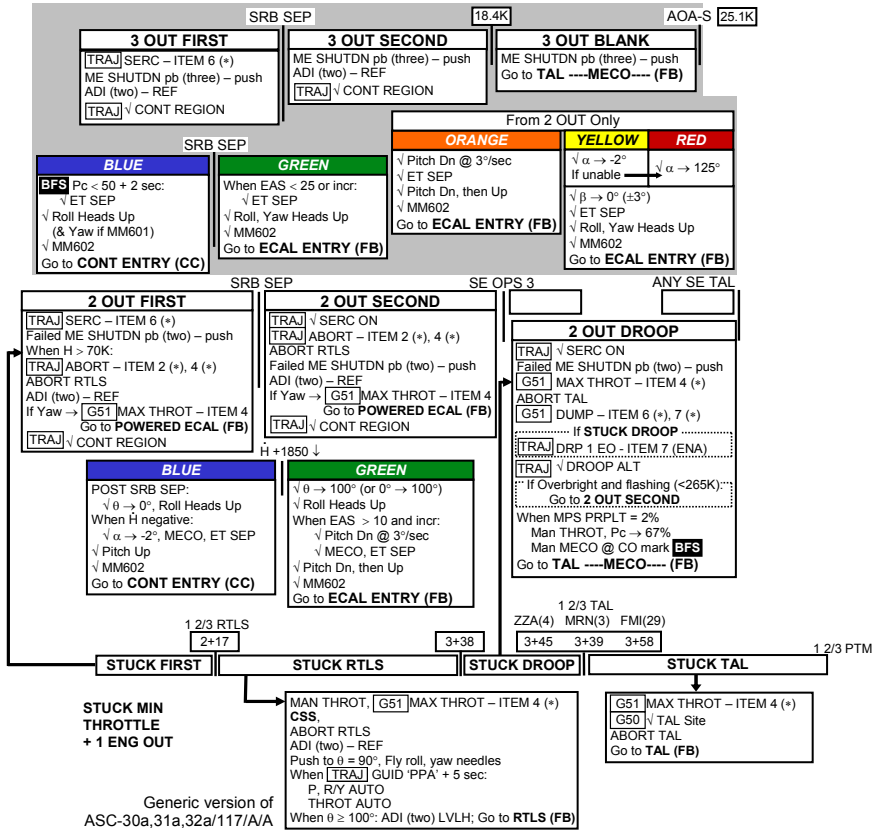
ASC/117/FIN



**CONT  
ABORT**

**CONTINGENCY ABORT**

High Inclination  
51.6°



# CONTINGENCY ABORT

## **CONT ENTRY / MM602**

**VERT SIT** INH ECAL/BDA –  
ITEM 1 (INH)

Before NZ Hold  
RHC/PNL TRIM – ENA  
If  $M < 5$ ,  
    √ AIL/RUD TRIM  
If  $M < 3$ , S/B = 65%

$M \leq 5$  and  $EAS < 333$  ↓  
ADTA PROBES – Deploy  
**G50** Incorp Air Data ASAP

$M2 \rightarrow 1$ :  $\theta = 0^\circ$  by  $M = 1.0$

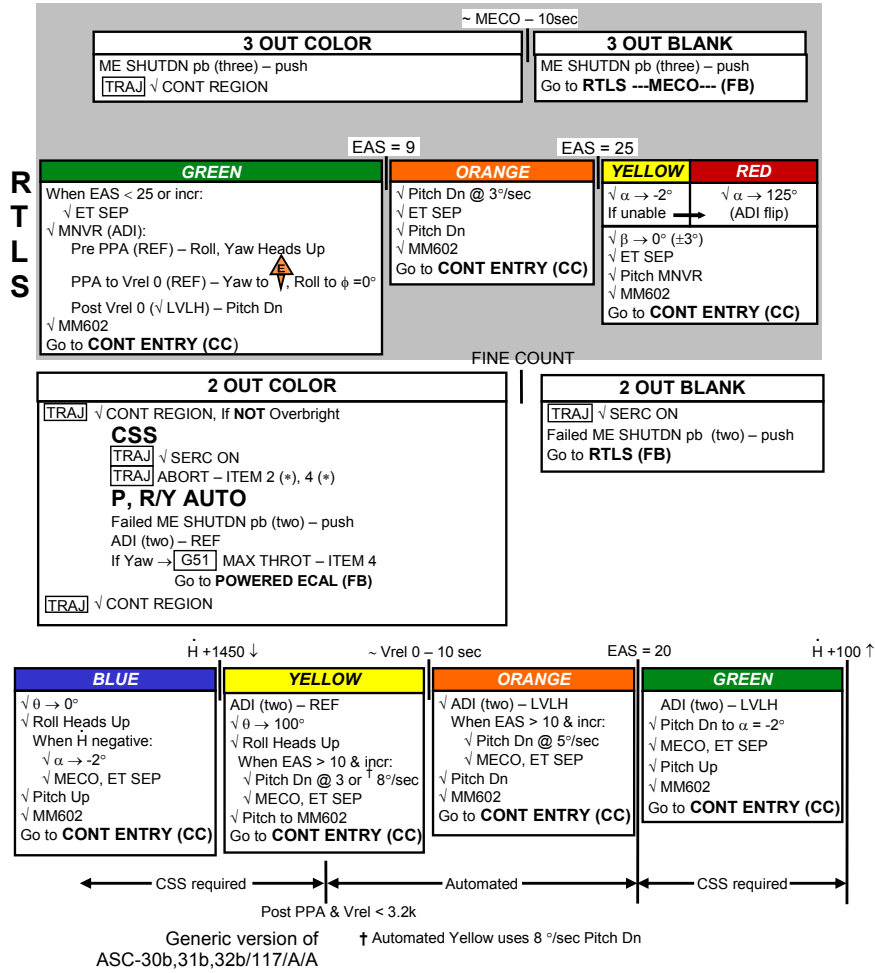
Select UHF – G T/R

When  $M < 1.0$   
Go to **BAILOUT (FB)**

Generic version of  
ASC-30a,31a,32a/117/A/A

# RTLS CONTINGENCY

High Inclination  
51.6°



# RTLS CONTINGENCY

## **CONT ENTRY / MM602**

**VERT SIT** -  
If ECAL/BDA – INH  
√ Theta Limits after Nz Hold  
If ECAL/BDA – ENA  
ITEM 1 (INH)

Before NZ Hold  
RHC/PNL TRIM – ENA  
If  $M < 5$ ,  
√ AIL/RUD TRIM  
If  $M < 3$ , S/B = 65%

$M \leq 5$  and  $EAS < 333$  ↓  
ADTA PROBES – Deploy  
**G50** Incorp Air Data ASAP

$M2 \rightarrow 1$ :  $\theta = 0^\circ$  by  $M = 1.0$

Select UHF – G T/R

When  $M < 1.0$   
Go to **BAILOUT (FB)**

Generic version of  
ASC-30b,31b,32b/117/A/A

## **RED**

√ ADI (two) – LVLH  
√  $\dot{H} \rightarrow +400$  ( $\theta_{max} = 75^\circ$ )  
**TRAJ** AT FINE COUNT:  
√ Pitch Dn to  $\alpha = -2^\circ$   
√ MECO, ET SEP  
√ Pitch Up  
√ MM602  
Go to **RTLS ---MECO--- (FB)**

← Automated →

**ZZA TAL REDESIGNATION  
(117 OCFR2 CYC)**

1st E.O. VI		6100	6200	6300	6400	6500	6600	6700	6800
SE OPS 3 ZZA 109	(4)	11000	11100	11100	11100	11100	11100	11200	11200
SE ZZA 104	(4)	17200	17100	16900	16700	16500	16400	16200	16000

1st E.O. VI		6900	7000	7100	7200	7300	7400	7500	7600
SE OPS 3 ZZA 109	(4)	11200	11200	11200	11200	11300	11300	11300	11300
SE ZZA 104	(4)	15900	15700	15500	15400	15200	15100	15000	14800

1st E.O. VI		7700	7800	7900	8000	8100	8200	8300	8400
SE OPS 3 ZZA 109	(4)	11300	11400	11400	11400	11400	11400	11500	11500
SE ZZA 104	(4)	14700	14600	14400	14300	14200	14100	14100	14000

1st E.O. VI		8500	8600	8700	8800	8900	9000	9100	9200
SE OPS 3 ZZA 109	(4)	11500	11500	11500	11600	11600	11600	11600	11600
SE ZZA 104	(4)	13900	13800	13800	13700	13700	13600	13600	13600

1st E.O. VI		9300	9400	9500	9600	9700	9800	9900	10000
SE OPS 3 ZZA 109	(4)	11700	11700	11700	11700	11700	11800	11800	11800
SE ZZA 104	(4)	13600	13500	13500	13500	13500	13500	13500	13500

1st E.O. VI		10100	10200	10300	10400	10500	10600	10700	10800
SE OPS 3 ZZA 109	(4)	11800	11800	11900	11900	11900	11900	12000	12000
SE ZZA 104	(4)	13500	13500	13600	13600	13600	13600	13600	13700

1st E.O. VI		10900	11000	11100					
SE OPS 3 ZZA 109	(4)	12000	12000	12000					
SE ZZA 104	(4)	13700	13700	13700					

ASC-9a/117/A/A

NOT FLOWN

2-40

ASC/117/FIN

**ECAL – ZZA or MRN or FMI PRIME TAL**

1st EO VI (KFPS)	5.6	5.8	6.0	6.2	6.4	6.6	6.8
CHERRY POINT (7)		6.7 - 7.0	6.7 - 7.2	6.8 - 7.3	6.8 - 7.4	6.9 - 7.5	6.9 - 7.6
OTIS ANGB (16)		10.3 - 11.1	10.3 - 11.2	10.2 - 11.3	10.2 - 11.5	10.2 - 11.6	10.2 - 11.6

1st EO VI (KFPS)	7.0	7.2	7.4	7.6	7.8	8.0	8.2
CHERRY POINT (7)	7.0 - 7.7	7.2 - 7.8	7.4 - 7.9	7.6 - 7.9	7.8 - 8.0	8.0 - 8.0	
GABRESKI (15)					10.5 - 10.7	10.4 - 10.8	10.3 - 11.0
OTIS ANGB (16)	10.2 - 11.7	10.2 - 11.8	10.2 - 11.9	10.2 - 12.0	10.2 - 12.1	10.2 - 12.1	10.3 - 12.2

1st EO VI (KFPS)	8.4	8.6	8.8	9.0	9.2	9.4	9.6
OCEANA NAS (8)		8.6 - 9.0	8.8 - 9.1	9.0 - 9.2	9.2 - 9.3		
WALLOPS (9)				9.4 - 9.6	9.2 - 9.7	9.4 - 9.8	9.6 - 9.8
GABRESKI (15)	10.3 - 11.1	10.3 - 11.2	10.3 - 11.3	10.4 - 11.3	10.4 - 11.4	10.4 - 11.5	10.4 - 11.5
OTIS ANGB (16)	10.3 - 12.3	10.3 - 12.3	10.3 - 12.4	10.4 - 12.4	10.4 - 12.5	10.5 - 12.6	10.5 - 12.6
PEASE INT'L (17)	11.3 - 11.7	11.3 - 11.9	11.3 - 12.0	11.3 - 12.1	11.3 - 12.2	11.3 - 12.2	11.3 - 12.3

1st EO VI (KFPS)	9.8	10.0	10.2	10.4	10.6	10.8	11.0
WALLOPS (9)	9.8 - 9.9						
GABRESKI (15)	10.4 - 11.6	10.5 - 11.7	10.5 - 11.7	10.5 - 11.8	10.6 - 11.8	10.8 - 11.9	11.0 - 11.9
OTIS ANGB (16)	10.5 - 12.7	10.5 - 12.7	10.6 - 12.8	10.6 - 12.8	10.7 - 12.9	10.8 - 12.9	11.0 - 12.9
PEASE INT'L (17)	11.3 - 12.4	11.4 - 12.5	11.4 - 12.5	11.5 - 12.6	11.5 - 12.6	11.5 - 12.7	11.5 - 12.7

1st EO VI (KFPS)	11.2	11.4	11.6	11.8	12.0	12.2	12.4
GABRESKI (15)	11.2 - 12.0	11.4 - 12.0	11.6 - 12.1	11.8 - 12.2	12.0 - 12.2	12.2 - 12.3	
OTIS ANGB (16)	11.2 - 13.0	11.4 - 13.0	11.6 - 13.1	11.8 - 13.1	12.0 - 13.2	12.2 - 13.2	12.4 - 13.2
PEASE INT'L (17)	11.5 - 12.8	11.5 - 12.8	11.6 - 12.9	11.8 - 12.9	12.0 - 13.0	12.2 - 13.0	12.4 - 13.0

1st EO VI (KFPS)	12.6	12.8	13.0	13.2	13.4	13.6	13.8
OTIS ANGB (16)	12.6 - 13.3	12.8 - 13.3	13.0 - 13.4	13.2 - 13.4	13.4 - 13.4		
PEASE INT'L (17)	12.6 - 13.1	12.8 - 13.1	13.0 - 13.1				

ASC-9b/117/A/A

NOT FLOWN

2-41

ASC/117/FIN

**MRN TAL REDESIGNATION  
(117 OCFR2 CYC)**

1st E.O. VI		5900	6000	6100	6200	6300	6400	6500	6600
SE OPS 3 MRN 109	(3)	10900	11000	11000	11000	11000	11100	11100	11100
SE MRN 104	(3)	16900	16800	16600	16500	16300	16100	16000	15800

1st E.O. VI		6700	6800	6900	7000	7100	7200	7300	7400
SE OPS 3 MRN 109	(3)	11100	11100	11200	11200	11200	11200	11300	11300
SE MRN 104	(3)	15700	15500	15400	15200	15100	14900	14800	14700

1st E.O. VI		7500	7600	7700	7800	7900	8000	8100	8200
SE OPS 3 MRN 109	(3)	11300	11300	11400	11400	11400	11400	11400	11500
SE MRN 104	(3)	14600	14400	14300	14200	14100	14000	13900	13900

1st E.O. VI		8300	8400	8500	8600	8700	8800	8900	9000
SE OPS 3 MRN 109	(3)	11500	11500	11500	11500	11600	11600	11600	11600
SE MRN 104	(3)	13800	13700	13700	13600	13600	13500	13500	13500

1st E.O. VI		9100	9200	9300	9400	9500	9600	9700	9800
SE OPS 3 MRN 109	(3)	11600	11700	11700	11700	11700	11700	11800	11800
SE MRN 104	(3)	13400	13400	13400	13400	13400	13400	13400	13400

1st E.O. VI		9900	10000	10100	10200	10300	10400	10500	10600
SE OPS 3 MRN 109	(3)	11800	11800	11800	11900	11900	11900	11900	11900
SE MRN 104	(3)	13400	13400	13400	13400	13400	13500	13500	13500

1st E.O. VI		10700	10800	10900	11000	11100			
SE OPS 3 MRN 109	(3)	12000	12000	12000	12000	12000			
SE MRN 104	(3)	13500	13600	13600	13600	13600			

ASC-10a/117/A/A

NOT FLOWN

2-42

ASC/117/FIN



**ECAL – ZZA or MRN or FMI PRIME TAL**

1st EO VI (KFPS)	<b>5.6</b>	<b>5.8</b>	<b>6.0</b>	<b>6.2</b>	<b>6.4</b>	<b>6.6</b>	<b>6.8</b>
CHERRY POINT (7)		6.7 - 7.0	6.7 - 7.2	6.8 - 7.3	6.8 - 7.4	6.9 - 7.5	6.9 - 7.6
OTIS ANGB (16)		10.3 - 11.1	10.3 - 11.2	10.2 - 11.3	10.2 - 11.5	10.2 - 11.6	10.2 - 11.6

1st EO VI (KFPS)	<b>7.0</b>	<b>7.2</b>	<b>7.4</b>	<b>7.6</b>	<b>7.8</b>	<b>8.0</b>	<b>8.2</b>
CHERRY POINT (7)	7.0 - 7.7	7.2 - 7.8	7.4 - 7.9	7.6 - 7.9	7.8 - 8.0	8.0 - 8.0	
GABRESKI (15)					10.5 - 10.7	10.4 - 10.8	10.3 - 11.0
OTIS ANGB (16)	10.2 - 11.7	10.2 - 11.8	10.2 - 11.9	10.2 - 12.0	10.2 - 12.1	10.2 - 12.1	10.3 - 12.2

1st EO VI (KFPS)	<b>8.4</b>	<b>8.6</b>	<b>8.8</b>	<b>9.0</b>	<b>9.2</b>	<b>9.4</b>	<b>9.6</b>
OCEANA NAS (8)		8.6 - 9.0	8.8 - 9.1	9.0 - 9.2	9.2 - 9.3		
WALLOPS (9)				9.4 - 9.6	9.2 - 9.7	9.4 - 9.8	9.6 - 9.8
GABRESKI (15)	10.3 - 11.1	10.3 - 11.2	10.3 - 11.3	10.4 - 11.3	10.4 - 11.4	10.4 - 11.5	10.4 - 11.5
OTIS ANGB (16)	10.3 - 12.3	10.3 - 12.3	10.3 - 12.4	10.4 - 12.4	10.4 - 12.5	10.5 - 12.6	10.5 - 12.6
PEASE INT'L (17)	11.3 - 11.7	11.3 - 11.9	11.3 - 12.0	11.3 - 12.1	11.3 - 12.2	11.3 - 12.2	11.3 - 12.3

1st EO VI (KFPS)	<b>9.8</b>	<b>10.0</b>	<b>10.2</b>	<b>10.4</b>	<b>10.6</b>	<b>10.8</b>	<b>11.0</b>
WALLOPS (9)	9.8 - 9.9						
GABRESKI (15)	10.4 - 11.6	10.5 - 11.7	10.5 - 11.7	10.5 - 11.8	10.6 - 11.8	10.8 - 11.9	11.0 - 11.9
OTIS ANGB (16)	10.5 - 12.7	10.5 - 12.7	10.6 - 12.8	10.6 - 12.8	10.7 - 12.9	10.8 - 12.9	11.0 - 12.9
PEASE INT'L (17)	11.3 - 12.4	11.4 - 12.5	11.4 - 12.5	11.5 - 12.6	11.5 - 12.6	11.5 - 12.7	11.5 - 12.7

1st EO VI (KFPS)	<b>11.2</b>	<b>11.4</b>	<b>11.6</b>	<b>11.8</b>	<b>12.0</b>	<b>12.2</b>	<b>12.4</b>
GABRESKI (15)	11.2 - 12.0	11.4 - 12.0	11.6 - 12.1	11.8 - 12.2	12.0 - 12.2	12.2 - 12.3	
OTIS ANGB (16)	11.2 - 13.0	11.4 - 13.0	11.6 - 13.1	11.8 - 13.1	12.0 - 13.2	12.2 - 13.2	12.4 - 13.2
PEASE INT'L (17)	11.5 - 12.8	11.5 - 12.8	11.6 - 12.9	11.8 - 12.9	12.0 - 13.0	12.2 - 13.0	12.4 - 13.0

1st EO VI (KFPS)	<b>12.6</b>	<b>12.8</b>	<b>13.0</b>	<b>13.2</b>	<b>13.4</b>	<b>13.6</b>	<b>13.8</b>
OTIS ANGB (16)	12.6 - 13.3	12.8 - 13.3	13.0 - 13.4	13.2 - 13.4	13.4 - 13.4		
PEASE INT'L (17)	12.6 - 13.1	12.8 - 13.1	13.0 - 13.1				

ASC-10b/117/A/A

NOT FLOWN

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ASC/117/FIN

**FMI TAL REDESIGNATION  
(117 OCFR2 CYC)**

1st E.O. VI		6300	6400	6500	6600	6700	6800	6900	7000
SE OPS 3 FMI 109	(29)	11100	11200	11200	11200	11200	11200	11300	11300
SE FMI 104	(29)	17700	17600	17400	17200	17000	16800	16600	16400

1st E.O. VI		7100	7200	7300	7400	7500	7600	7700	7800
SE OPS 3 FMI 109	(29)	11300	11300	11300	11400	11400	11400	11400	11400
SE FMI 104	(29)	16300	16100	15900	15800	15600	15400	15300	15200

1st E.O. VI		7900	8000	8100	8200	8300	8400	8500	8600
SE OPS 3 FMI 109	(29)	11500	11500	11500	11500	11500	11600	11600	11600
SE FMI 104	(29)	15000	14900	14800	14600	14500	14400	14400	14300

1st E.O. VI		8700	8800	8900	9000	9100	9200	9300	9400
SE OPS 3 FMI 109	(29)	11600	11600	11700	11700	11700	11700	11700	11700
SE FMI 104	(29)	14200	14100	14100	14000	14000	13900	13900	13900

1st E.O. VI		9500	9600	9700	9800	9900	10000	10100	10200
SE OPS 3 FMI 109	(29)	11800	11800	11800	11800	11800	11800	11900	11900
SE FMI 104	(29)	13800	13800	13800	13800	13800	13800	13800	13800

1st E.O. VI		10300	10400	10500	10600	10700	10800	10900	11000
SE OPS 3 FMI 109	(29)	11900	11900	11900	12000	12000	12000	12000	12000
SE FMI 104	(29)	13800	13800	13800	13900	13900	13900	13900	13900

1st E.O. VI		11100							
SE OPS 3 FMI 109	(29)	12000							
SE FMI 104	(29)	13900							

ASC-12a/117/A/A

NOT FLOWN

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ASC/117/FIN

**ECAL – ZZA or MRN or FMI PRIME TAL**

1st EO VI (KFPS)	<b>5.6</b>	<b>5.8</b>	<b>6.0</b>	<b>6.2</b>	<b>6.4</b>	<b>6.6</b>	<b>6.8</b>
CHERRY POINT (7)		6.7 - 7.0	6.7 - 7.2	6.8 - 7.3	6.8 - 7.4	6.9 - 7.5	6.9 - 7.6
OTIS ANGB (16)		10.3 - 11.1	10.3 - 11.2	10.2 - 11.3	10.2 - 11.5	10.2 - 11.6	10.2 - 11.6

1st EO VI (KFPS)	<b>7.0</b>	<b>7.2</b>	<b>7.4</b>	<b>7.6</b>	<b>7.8</b>	<b>8.0</b>	<b>8.2</b>
CHERRY POINT (7)	7.0 - 7.7	7.2 - 7.8	7.4 - 7.9	7.6 - 7.9	7.8 - 8.0	8.0 - 8.0	
GABRESKI (15)					10.5 - 10.7	10.4 - 10.8	10.3 - 11.0
OTIS ANGB (16)	10.2 - 11.7	10.2 - 11.8	10.2 - 11.9	10.2 - 12.0	10.2 - 12.1	10.2 - 12.1	10.3 - 12.2

1st EO VI (KFPS)	<b>8.4</b>	<b>8.6</b>	<b>8.8</b>	<b>9.0</b>	<b>9.2</b>	<b>9.4</b>	<b>9.6</b>
OCEANA NAS (8)		8.6 - 9.0	8.8 - 9.1	9.0 - 9.2	9.2 - 9.3		
WALLOPS (9)				9.4 - 9.6	9.2 - 9.7	9.4 - 9.8	9.6 - 9.8
GABRESKI (15)	10.3 - 11.1	10.3 - 11.2	10.3 - 11.3	10.4 - 11.3	10.4 - 11.4	10.4 - 11.5	10.4 - 11.5
OTIS ANGB (16)	10.3 - 12.3	10.3 - 12.3	10.3 - 12.4	10.4 - 12.4	10.4 - 12.5	10.5 - 12.6	10.5 - 12.6
PEASE INT'L (17)	11.3 - 11.7	11.3 - 11.9	11.3 - 12.0	11.3 - 12.1	11.3 - 12.2	11.3 - 12.2	11.3 - 12.3

1st EO VI (KFPS)	<b>9.8</b>	<b>10.0</b>	<b>10.2</b>	<b>10.4</b>	<b>10.6</b>	<b>10.8</b>	<b>11.0</b>
WALLOPS (9)	9.8 - 9.9						
GABRESKI (15)	10.4 - 11.6	10.5 - 11.7	10.5 - 11.7	10.5 - 11.8	10.6 - 11.8	10.8 - 11.9	11.0 - 11.9
OTIS ANGB (16)	10.5 - 12.7	10.5 - 12.7	10.6 - 12.8	10.6 - 12.8	10.7 - 12.9	10.8 - 12.9	11.0 - 12.9
PEASE INT'L (17)	11.3 - 12.4	11.4 - 12.5	11.4 - 12.5	11.5 - 12.6	11.5 - 12.6	11.5 - 12.7	11.5 - 12.7

1st EO VI (KFPS)	<b>11.2</b>	<b>11.4</b>	<b>11.6</b>	<b>11.8</b>	<b>12.0</b>	<b>12.2</b>	<b>12.4</b>
GABRESKI (15)	11.2 - 12.0	11.4 - 12.0	11.6 - 12.1	11.8 - 12.2	12.0 - 12.2	12.2 - 12.3	
OTIS ANGB (16)	11.2 - 13.0	11.4 - 13.0	11.6 - 13.1	11.8 - 13.1	12.0 - 13.2	12.2 - 13.2	12.4 - 13.2
PEASE INT'L (17)	11.5 - 12.8	11.5 - 12.8	11.6 - 12.9	11.8 - 12.9	12.0 - 13.0	12.2 - 13.0	12.4 - 13.0

1st EO VI (KFPS)	<b>12.6</b>	<b>12.8</b>	<b>13.0</b>	<b>13.2</b>	<b>13.4</b>	<b>13.6</b>	<b>13.8</b>
OTIS ANGB (16)	12.6 - 13.3	12.8 - 13.3	13.0 - 13.4	13.2 - 13.4	13.4 - 13.4		
PEASE INT'L (17)	12.6 - 13.1	12.8 - 13.1	13.0 - 13.1				

ASC-12b/117/A/A

NOT FLOWN

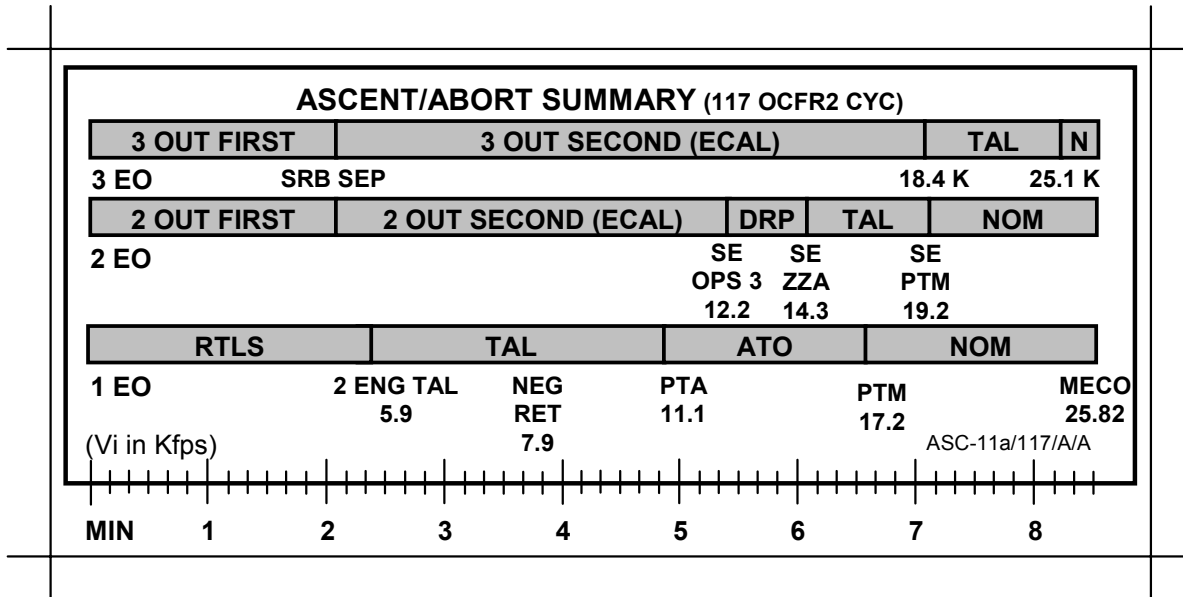
2-45

ASC/117/FIN

NOT FLOWN

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ASC/117/FIN





POST OMS 1 BURN PROCEDURES

**POST  
OMS 1**



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

**ET PHOTO MANEUVER/MPS DUMP**

- \* If OMS 1 Burn performed, go to \*
- \* POST BURN STATUS \*

B  $\sqrt$ MCC,  
ADI – REF

- \* If Feedline Fail: \*
- \*  $\sqrt$ MCC GO for +X and Pitch Mnvr \*
- \* At MECO + 6 min: (14:23 Nom) \*
- \* ET SEP – SEP \*
- \* At MM104 + 2 sec \*
- \* +X xlation for 11 sec \*
- \* At OMS 1 TIG: (16:05 Nom) \*
- \* Pitch up at 2°/sec until ET in O/H \*
- \* window (P ~110°) \*
- \* Go to MPS DUMP complete \*

If NO-GO for Photo Pitch Mnvr, go to MPS DUMP complete; do not pitch

**MPS DUMP start** (MECO + 2:03)

C At OMS 1 TIG + 30 sec: (MECO + 2:33)  
(10:56 Nom)

C3 DAP – INRTL: R (DISC), P (PULSE), Y (DISC),  
Orbiter pitches up

Control pitch rate 2°/sec to 3°/sec

- \* If no pitch rate, go to MPS DUMP complete \*

When ET in O/H window (MS call or P ~90°):

P – DISC

Adjust pitch photo att as reqd for MS

P **MPS DUMP complete**

F4  $\sqrt$ BDY FLP pb – It off (MECO + 4 min) (12:24 Nom)

- \* C If no pitch rate, \*
- \* P – DISC \*
- \* Pitch up at 2°/sec until ET \*
- \* in O/H window (P ~85°) \*

POST  
OMS 1

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

**C POST BURN STATUS**

NOMINAL  OMS 1 TIG TO MCC  :

- \* C **ALPHA MANAGEMENT (if reqd)** \*
- \* \*
- \* If underspeed (ATO or AOA-S) OMS 1 \*
- \* and Post OMS 1 HP ≤ 75 nm: \*
- \* Maneuver to LVLH R000, P340, Y000 \*
- \* (maintain LVLH P = 0 ± 20) \*
- \* After 10 min: \*
- \* Maneuver to LVLH P = 340 \*
- \* After 10 min: \*
- \* Maneuver to Burn Attitude \*

P When MPS dump complete:  
R4 HYD MPS/TVC ISOL VLV (1,2,3; 5 sec interval) –  
CL (hold each 5 sec, tb-CL)

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

**IF AOA**  
If two Freon Loops ↓ or two H2O Loops ↓:  
Go to SYS AOA  
Otherwise, go to AOA

- \* If no comm and MPS dump complete: \*
- \* HYD MN PUMP PRESS (three) – \*
- \* LO (MA) \*

**P APU/HYD SHUTDN**

R2 √MCC  
√APU AUTO SHTDN (three) – ENA  
BLR PWR (three) – OFF  
N2 SPLY (three) – OFF  
APU OPER (1,2,3; 5 sec interval) – OFF (MA)  
FU TK VLV (three) – CL  
√Shutdn (HYD PRESS < 200)  
CNTLR PWR (three) – OFF  
√HYD MN PUMP PRESS (three) – NORM

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

### TAIL ONLY CONTROL (√MCC)

2: GNC 23 RCS
---------------

CRT2 OVRD FWD RCS MANF STATs 1,2,3,4 – CL

### FES & HEATER ACTIVATION

C L1 FLASH EVAP CNTLR PRI A – ON  
L2 FDLN HTR (two) – 1

P R1 O2 TK1,2 HTRS B (two) – AUTO  
H2 TK1,2 HTRS B (two) – AUTO

MS1 A12 APU HTR TK/FU LN/H2O SYS 1A,2A,3A (three) –  
AUTO

### AC BUS SNSR

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

### MAJOR MODE CHANGE

CRT1 GNC, OPS 105 PRO

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



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

**B OMS 2 BURN SETUP**

√OMS 2 TARGETING, Flip Book

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

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

NOTE

Onboard computed TIG may vary slightly but is acceptable

√Targets, OMS TARGETS

LOAD – ITEM 22 EXEC  
TIMER – ITEM 23 EXEC

CRT3 √BFS TGT

1: GNC OMS 2 MNVR EXEC

2: GNC OMS 2 MNVR EXEC

3: BFS, GNC OMS 2 MNVR EXEC

**P MPS PWRDN/ISOL**

NOTE

Expect multiple MAs for MPS He P  
as regs bleed down

R2	MPS ENG PWR L (two)	- OFF
	CTR (two)	- OFF
	R (two)	- OFF
	He ISOL (six)	- GPC
	PNEU He ISOL	- GPC
	$\sqrt{\text{He I'CNCT}}$ (three)	- GPC

**MPS GH2 INERTING**

R4      MPS H2 PRESS LINE VENT - OP  
(Start watch)  
After 1 min:  
            MPS H2 PRESS LINE VENT - GND

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

**P ET UMBILICAL DOOR CLOSURE**

\* If Feedline fail, √MCC before closure \*

<p><b>WARNING</b>  ET CTRLINE LATCHES must be  stowed prior to L,R DR closure to  prevent door drive damage</p>
---

**NOTE**

Double times for single motor operation

R2

ET UMB DR

MODE – GPC/MAN  
CTRLINE LAT – STO

√After 6 sec, CTRLINE LAT tb – STO

\* If CTRLINE LAT does not stow within 12 sec: \*  
\* CTRLINE LAT – GND \*  
\* √MCC \*

CTRLINE LAT – GND  
L,R DR (two) – CL (tb-bp)

√After 24 sec, L,R DR tb (two) – CL

\* If doors do not close within 48 sec: \*  
\* L,R DR (two) – OFF \*  
\* √MCC \*

L,R DR (two) – OFF  
LAT (two) – LAT (tb-bp)

√After 6 sec, L,R LAT tb (two) – LAT

\* If doors do not latch within 12 sec: \*  
\* L,R LAT (two) – OFF \*  
\* √MCC \*

L,R LAT (two) – OFF  
MODE – GPC

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

**OMS BURN PREP**

- \* For single eng burn/No PROP \*
- \* failures: \*
- \* XFEED failed eng PROP to \*
- \* good eng \*

- P O8 L,R OMS  
 √He PRESS/VAP ISOL A (two) – GPC  
 B (two) – CL  
 √TK ISOL (four) – GPC (tb-OP)  
 √XFEED (four) – GPC (tb-CL)
- B Wedge Install OMS 2/ORBIT OMS BURN and  
OMS 2 BURN MONITOR Cue Cards  
 (F6,F8)
- If FRCS reqd,  
 Go to OPS 1 RCS BURN (Cue Card)

**OMS 2 BURN ATTITUDE MNVR**

- B F6,F8 √ADI ATT (two) – INRTL  
 RATE (two) – 1
- C MNVR – ITEM 27 EXEC (\*)

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

**B SEAT SAFING AND ADJUSTMENT**

Adjust Back Angle

- TIG-5 B Go to OMS 2/ORBIT OMS BURN  
 (Cue Card)



OMS 2 BURN CARDS

**OMS 2**



MS ONLY

4-1

ASC/117/FIN



### OMS 2 BURN MONITOR

<b>OMS TEMP*</b> FU IN P $\geq$ <table style="display: inline-table; border: 1px solid black; text-align: center;"><tr><td style="padding: 0 5px;">L</td><td style="padding: 0 5px;">R</td></tr><tr><td style="padding: 0 5px;">230</td><td style="padding: 0 5px;">230</td></tr></table> $\leq$ <table style="display: inline-table; border: 1px solid black; text-align: center;"><tr><td style="padding: 0 5px;">214</td><td style="padding: 0 5px;">212</td></tr></table> or No FU IN P	L	R	230	230	214	212	OMS ENG FAIL ----- OMS PRPLT FAIL
L	R						
230	230						
214	212						
<b>OMS PC* &amp; OMS <math>\downarrow</math></b> (BFS: $\sqrt{\text{accel}}$ ) ENG VLV 1 or 2 < 70 or OX IN P > 227  OX IN P $\leq$ 227 or No OX IN P	OMS ENG FAIL ----- OMS PRPLT FAIL						
<b>OMS OX/FU TK P</b> ( $\sqrt{\text{ENG IN P}}$ ) OX/FU LOW  ----- OX & FU HIGH	He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At PC < 72 or OMS TEMP or HP > <b>85</b> : OMS PRPLT FAIL ----- He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284						
<b>OMS He TK P LOW</b> ( $\sqrt{\text{OMS/MPS}}$ )	At He P < 640 or QTY $\leq$ 41: If HP < <b>85</b> : OMS XFEED from good OMS At HP > <b>85</b> : OMS PRPLT FAIL						
<b>OMS N2 REG P HIGH or LOW</b>	OMS ENG – ARM						
<b>OMS N2 TK P LOW</b> ( $\sqrt{\text{OMS/MPS}}$ )	At N2 TK P < 470: OMS ENG – ARM						
<b>OMS GMBL</b> PRI fail SEC fail	L(R) OMS GMBL – SEC (twice) ----- If high RCS usage: OMS ENG FAIL						
<b>GPC</b> <b>1(4) &amp;</b> Burning OMS aff  ----- SEC GMBL lost 2 FAs lost	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC (twice) ----- If high RCS usage: OMS ENG FAIL ----- $\sqrt{\text{MAN SHUTDN}}$						
<b>I/O ERROR FA</b> <b>1(4)</b>  ----- 2 FAs lost	L(R) OMS GMBL – SEC ----- I/O RESET (if recov: BFS I/O RESET) If high RCS usage: OMS ENG FAIL ----- $\sqrt{\text{MAN SHUTDN}}$						
<b>BCE STRG D</b> <b>1(4)</b>	I/O RESET (if recov: >>) ----- If high RCS usage: L(R) OMS GMBL – SEC (twice)						
<b>I/O ERROR PCM</b>	OI PCMMU PWR – 2(1)						

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

ASC-5a/117/A,O/A

OMS 2

**OMS 2/ORBIT OMS BURNS**

√MM105/202(302)  
 Enter TGO +5 sec (2 eng) or TGO +10 sec (1 eng)  
 √BURN ATT (INRTL) then REF, pb – push  
 √ENG SEL √DAP TRANS – NORM (MM202)  
 CNTL PWR (two) – ON √DAP – AUTO(PASS)/DISC  
 √GMBL TRIM  
 2 engine: P = +0.4 LY = -5.7 RY = +5.7  
 1 engine: P = +0.4 LY = +5.2 RY = -5.2  
 L,R OMS He PRESS/VAP ISOL A (two) – OP  
 . . . Wait 2 sec . . .  
 L,R OMS He PRESS/VAP ISOL B (two) – GPC (OP for SE  
 burn)  
 GPC OP CL

ORB BURN A

B		

TIG-2 SEL OMS ENG(s) – ARM/PRESS (√P VLVs OP)  
 If P VLV CL: Aff OMS ENG – OFF

WARNING  
 Do not burn aff engine if:  
 OMS N2 TK P < 470(564) (NONCRIT BURN)  
 He TK P < 640  
 FU ENG IN P < 216(244)  
 OX ENG IN P < 151(244)

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ΔVTOT: OMS XFEED RETURN (Planned Single Engine)

-:15 EXEC  
 If OMS ENG P<sub>C</sub> MSG and non critical burn: Aff ENG – OFF  
 If Leaking OMS PROP, burn RCS +X TIG - 15 sec to  
 OMS IGN + 1 sec  
 :00 TIG; start watch (√P<sub>C</sub>, ΔVTOT, ENG VLVs)

\* **OMS PRPLT FAIL:** \*  
 \* **HP < [85]** (CONTINUE BURN): \*  
 \* Failed OMS ENG – OFF \*  
 \* √XFEED (two) – CL \*  
 \* TK ISOL (two) – CL \*  
 \* He PRESS (two) – CL \*  
 \* **HP > [85]** (STOP BURN): \*  
 \* OMS ENG (two) – OFF \*  
 \* √Failed OMS XFEED (two) – CL \*  
 \* TK ISOL (two) – CL \*  
 \* He PRESS (two) – CL \*  
 \* **OMS ENG FAIL:** \*  
 \* ASCENT or CRIT O/O (Continue Burn) \*  
 \* Failed ENG – OFF \*  
 \* OMS XFEED at → 1/2 ΔVTOT [ ] [ ] \*  
 \* at FAIL [ ] [ ] \*  
 \* **RCS COMPLETION:** (Hp < [85] or CRIT O/O) \*  
 \* Interconnect to either OMS that was ENG FAIL \*  
 \* THC +X (Hp = [85]) \*  
 \* Post burn, AFT RCS RECONFIG \*

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

Trim

	OMS 2	TAIL ONLY CNTL	Orbit
Residuals:	VGO X < 0.2 fps	VGO X < +0.2 fps	All axes < 0.2 fps
	VGO Y,Z < 2 fps		

ASC-6a/117/A,O/A

## OPS 1 RCS BURN

### AFT RCS

✓RCS BURN CONFIG:  
 OMS TK ISOL (all) – OP                      OMS TK  
 L(R) OMS XFEED (two) – OP                switch at  
 R(L) OMS XFEED (two) – CL                1/2 ΔVTOT  
 AFT L,R RCS XFEED (four) – OP (If reqd)  
    TK ISOL (six) – CL

TIG-2    L,R OMS He PRESS/VAP ISOL A – OP  
           . . . Wait 2 sec . . .  
           L,R OMS He PRESS/VAP ISOL B – OP  
 ✓MM105  
 CNTLR PWR (two) – ON  
 ✓BURN ATT (INRTL) then REF, pb – push  
 ✓RCS SEL  
 DAP: INRTL/DISC  
 :00       + X  
           Maintain PITCH ATT ERR ± 3°  
           Monitor OMS data  
           Monitor ΔVTOT  
 CUTOFF   Release THC  
           CNTLR PWR (two) – OFF

### FWD RCS

**FRCS BURN PREP**  
 Load DUMMY target for FRCS attitude  
 RCS SEL – ITEM 4 EXEC  
 TIG @ TTA = 2:00 or as reqd  
 ΔVX = -2.1 (ITEM 19)  
 ΔVY = 0        (ITEM 20)  
 ΔVZ = +1.0 (ITEM 21)  
 LOAD – ITEM 22 EXEC  
 TIMER – ITEM 23 EXEC  
 TIG-10 Auto Mnvr to ATT  
 When in attitude:  
 ADI ATT – REF (push)  
 Load External ΔV Burn Target  
 ΔVX = +80  
 ΔVY = 0  
 ΔVZ = 0  
 LOAD – ITEM 22 EXEC  
 TIMER – ITEM 23 EXEC  
 ✓VGOX = negative  
 ✓VGOY = 0  
 ✓VGOZ = +21 ± 2  
 ✓REF ball – 0,0,0

NOTE

Error needles invalid during burn  
 Burn time = ~2X TGO  
 TGT Hp = 85 for ASCENT

-:30    CNTLR PWR (two) – ON  
           DAP: INRTL/DISC  
 :00       -X  
 CUTOFF   CUR HP = TGT HP   , release THC  
           CNTLR PWR (two) – OFF

ASC-6b/117/A,O/A





POST OMS 2 BURN PROCEDURES

**POST  
OMS 2**



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

**C POST BURN STATUS**

NOMINAL

$\Delta$ TIG

	:		
--	---	--	--

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

**C OMS TVC GMBL CHECK**

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

**P OMS/RCS POST BURN RECONFIG**

O7            AFT L,R RCS  
                   He PRESS A (two)            – GPC (tb-OP)  
   B (two)                            – CL (tb-CL)  
                   TK ISOL (six)                            – OP (tb-OP)  
                    $\sqrt$ MANF ISOL 1,2,3,4 (eight) – GPC (tb-OP)  
                   XFEED (four)                            – CL (tb-CL)

O8            FWD RCS  
                   He PRESS A                            – GPC (tb-OP)  
   B    – CL (tb-CL)  
                   TK ISOL (two)                            – OP (tb-OP)  
                    $\sqrt$ MANF ISOL 1,2,3,4 (four) – GPC (tb-OP)

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

POST  
OMS 2

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

### MAJOR MODE CHANGE

CRT1 GNC, OPS 106 PRO

1: GNC OMS 2 MNVR COAST	2: GNC OMS 2 MNVR COAST
-------------------------	-------------------------

B C4A, Stow ASC PKT (Helmet Bag)  
R3A Unstow ORBIT Cue Cards & ORB PKT

- \* If ATO, √MCC for procedure changes \*
- \* If Rev 3 deorbit reqd, go to CONT \*
- \* DEORB, LAUNCH DAY ORBIT 3 \*

Go to POST INSERT, POST INSERTION



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AOA PADS

**AOA  
PADS**

6-1

ASC/117/FIN



# DIRECT INSERTION AOA DEL PAD

DEORBIT									
PRPLT					( )				
BURN CUE CARD:									
OMS ENG FAIL XFEED QTY CUE					%L		%R		
TOT AFT QTY 1 (%)							9 1		
TOT AFT QTY 2 (%)							5 3		
FLIP ΔV							4 8		
AFT ΔV							1 9		
B/U SITE							N / A		
FRCS: DUMP TO % (USE TIME AS CUE)					<input type="checkbox"/> OX		<input type="checkbox"/> FU		
ENTRY / LANDING									
EI - 5 MM303 INRTL ATT (6-30)					R		P		Y
MM304 PREBANK (ENT MNVR Cue Card)					<input type="checkbox"/> L		<input type="checkbox"/> R		
ALTM SET (6-34)							.		
CLG INIT							:		
EXPECTED AIL TRIM					<input type="checkbox"/> L		<input type="checkbox"/> R		.
VREL 1ST REVERSAL							.		
XCG AT TD							.		
LAND SITE		<input type="checkbox"/> <input type="checkbox"/>		RWY		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		50K /	
<input type="checkbox"/> L		<input type="checkbox"/> OVHD		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> deg		<input type="checkbox"/> <input type="checkbox"/> MLS		38K /	
<input type="checkbox"/> R		<input type="checkbox"/> STRT		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> TAC				28K /	
ΔT MACH < 1 TO HAC		MAX Nz		Nz LIMIT		WINDS:		20K /	
<input type="checkbox"/> : <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/> . <input type="checkbox"/>		<input type="checkbox"/> . <input type="checkbox"/>		(ENT MNVR Cue Card)		12K /	
ΔT HAC INIT TO H = 20K								7K /	
<input type="checkbox"/> : <input type="checkbox"/> <input type="checkbox"/>								3K /	
AIMPOINT		SPEEDBRAKE						1K /	
<input type="checkbox"/> NOM		<input type="checkbox"/> NOM		<input type="checkbox"/> <input type="checkbox"/> % @ 3K				SURFACE /	
<input type="checkbox"/> CLOSE-IN		<input type="checkbox"/> S.F.							
REMARKS:									

AOA PADS

# W/OMS 1 AOA DEL PAD

DEORBIT									
PRPLT					( )				
BURN CUE CARD:									
OMS ENG FAIL XFEED QTY CUE					%L		%R		
TOT AFT QTY 1 (%)							9 1		
TOT AFT QTY 2 (%)							5 3		
FLIP HP =		( )	+	[ ]	OR	[ 1 9 ]	STEEP	+	[ 2 4 ] = [ ]
		TGT HP				[ 0 7 ]	SHALLOW		( $\frac{\text{FLIP } \Delta V}{2}$ )
						[ ]	[ ]		
						[ ]	[ ]		
AFT HP =		( )	+	[ 0 9 ] = [ ]					
		TGT HP		( $\frac{\text{AFT } \Delta V}{2}$ )					
B/U SITE					N / A				
FRCS: DUMP TO % (USE TIME AS CUE)					<input type="checkbox"/> OX	<input type="checkbox"/> FU			
ENTRY / LANDING									
EI - 5 MM303 INRTL ATT (6-30)					R		P		Y
MM304 PREBANK (ENT MNVR Cue Card)					<input type="checkbox"/> L	<input type="checkbox"/> R			
ALTM SET (6-34)									.
CLG INIT									:
EXPECTED AIL TRIM					<input type="checkbox"/> L	<input type="checkbox"/> R			
VREL 1ST REVERSAL									.
XCG AT TD									.
LAND SITE		[ ]	RWY	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]
<input type="checkbox"/> L	<input type="checkbox"/> OVHD	[ ]	deg	[ ]	MLS	50K	/		
<input type="checkbox"/> R	<input type="checkbox"/> STRT	[ ]	TAC	[ ]		38K	/		
ΔT MACH < 1 TO HAC					[ ]	[ ]	28K	/	
MAX Nz					[ ]	Nz LIMIT	[ ]	20K	/
[ ]					[ ]	[ ]	12K	/	
ΔT HAC INIT TO H = 20K					[ ]	[ ]	7K	/	
[ ]					[ ]	[ ]	3K	/	
[ ]					[ ]	[ ]	1K	/	
AIMPOINT		SPEEDBRAKE	[ ]	%	@ 3K	SURFACE	/		
<input type="checkbox"/> NOM	<input type="checkbox"/> NOM	<input type="checkbox"/> S.F.							
<input type="checkbox"/> CLOSE-IN	<input type="checkbox"/> S.F.								
REMARKS:									

6-4

ASC/117/FIN

### DEORBIT MNVR PAD

OMS BOTH 1

L 2

R 3

RCS SEL 4

TV ROLL 5

TRIM LOAD

P 6 ( ) .

LY 7 ( ) .

RY 8 ( ) .

WT 9

TIG 10  /  :  :  .

TGT PEG 4

C1 14

C2 15 ( ) .

HT 16

θT 17

PRPLT 18 ( )

#### BURN ATT

R 24

P 25

Y 26

REI

TXX

#### ΔVTOT

TGO

VGO X ( ) .

VGO Y ( ) .

VGO Z ( ) .

HA

HP

TGT

#### NOTES

##### RCS I'CNCT:

L OMS → RCS

R OMS → RCS

NONE



BURN CARD

OMS PRPLT PAD

DEORBIT BURN (1 ENG)	OMS XFEED RETURN at $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/> or <input type="text"/> <input type="text"/> <input type="text"/> at <input type="text"/> <input type="text"/> <input type="text"/> %
DEORBIT BURN (RCS)	RCS I'CNCT TK SW at $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/> OMS PRPLT LOW: $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/>
UNBALANCED PRPLT DEORBIT BURN	INITIAL CONFIG: <input type="checkbox"/> TK ISOLs - CL While feeding 2 OMS from 1 POD: OMS PRPLT FAIL: Secure <input type="checkbox"/> OMS Secure <input type="checkbox"/> OMS Interconnect <input type="checkbox"/> OMS to RCS THC + X for <input type="text"/> : <input type="text"/> <input type="text"/> If <input type="checkbox"/> (XFEED) ENG '↓' When <input type="checkbox"/> OMS QTY: 5%: <input type="checkbox"/> OMS TK ISOL (two) - OP 4%: <input type="checkbox"/> OMS TK ISOL (two) - CL If <input type="checkbox"/> (STRAIGHT FEED) ENG '↓' OMS ENG FAIL: At $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/> or <input type="text"/> <input type="text"/> <input type="text"/> at <input type="text"/> <input type="text"/> <input type="text"/> % <input type="checkbox"/> TK ISOL (two) - OP <input type="checkbox"/> TK ISOL (two) - CL Return to 2 ENG, 2 POD FLOW: At $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/> <input type="checkbox"/> TK ISOLs - OP OMS ENG FAIL: (XFEED CUE) OMS QTY <input type="text"/> <input type="text"/> %L or <input type="text"/> <input type="text"/> %R
DEORBIT BURN (MIXED XFEED)	FEED FROM GOOD POD: At $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/> or <input type="text"/> <input type="text"/> <input type="text"/> at <input type="text"/> <input type="text"/> <input type="text"/> % <input type="checkbox"/> OMS He PRESS (two) - OP TK ISOL (two) - OP XFEED (two) - OP Secure <input type="checkbox"/> OMS OMS PRPLT LOW: AFT RCS RECONFIG at $\Delta VTOT =$ <input type="text"/> <input type="text"/> <input type="text"/> OMS ENG FAIL: <input type="checkbox"/> OMS He PRESS (two) - OP TK ISOL (two) - OP <input type="checkbox"/> OMS XFEED (two) - CL



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AOA

AOA PROCEDURES

AOA

1: GNC OMS 2 MNVR EXEC	2: GNC OMS 2 MNVR EXEC
------------------------	------------------------

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

### P **HYD DEPRESS**

R4       √HYD MPS/TVC ISOL VLV (three) – CL  
R2       √APU SPEED SEL (three)           – NORM  
          √AUTO SHTDN (three)           – ENA  
          HYD MN PUMP PRESS (three)   – LO (MA)

### **FES & HEATER ACTIVATION**

C L2       FLASH EVAP FDLN HTR (two) – 1  
  
P R1       O2 TK1,2 HTRS B (two) – AUTO  
          H2 TK1,2 HTRS B (two) – AUTO  
  
MS1 A12   APU HTR TK/FU LN/H2O SYS 1A,2A,3A (three) –  
          AUTO

### **AC BUS SNSR**

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

### **MAJOR MODE CHANGE**

CRT1       GNC, OPS 105 PRO  
  
          Select any AOA I\_TGT (3-12) to set AOA flag,  
          but do not load until OPS 3

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

NOTE

Manually entered tgt data will be carried over to OPS 3 except: PASS, BFS ITEMS 5 and 18 (ILL ENTRY).

Transition to OPS 3 NLT TIG-10 min

C4F,    Stow ASC PKT  
R3A    Stow ASCENT Cue Cards  
R3F    Unstow ENT PKT

F6,F8    Install AOA DEORBIT BURN and DEORBIT BURN MONITOR Cue Cards (R3A)

**IF APUs SHUTDN:**

WARNING

Ice in W/B Steam Vent may cause loss of APU/HYD

P    **W/B STEAM VENT HTR ACT**

3: BFS, SM SYS SUMM 2

√APU OIL IN TEMP (three) < 230 degF  
√OUT TEMP (three) < 230 degF

NOTE

If any temp > 230, wait until temp < 230 in aff system

R2    √BLR CNTLR/HTR (three) – A  
         PWR (three)            – ON  
         N2 SPLY (three)        – ON

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

**P MPS ISOL**

NOTE

Expect multiple MAs for MPS He P  
as regs bleed down

R2        MPS He ISOL (six)        – GPC  
             PNEU He ISOL        – GPC  
             √He I'CNCT (three) – GPC

**MPS GH2 INERTING**

R4        MPS H2 PRESS LINE VENT – OP  
             (Start watch)  
             After 1 min:  
             MPS H2 PRESS LINE VENT – GND

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

**P ET UMBILICAL DOOR CLOSURE**

\* If Feedline fail, √MCC before closure \*

<p><b>WARNING</b>  ET CTRLINE LATCHES must be  stowed prior to L,R DR closure to  prevent door drive damage</p>
---

\* If ET Doors will not manually close and latch, prior to OPS 3 transition: \*

2: GNC 51 OVERRIDE
--------------------

\* ET UMB DR CLOSE – ITEM 40(30) EXEC \*

**NOTE**

Double times for single motor operation

R2

ET UMB DR

MODE – GPC/MAN

CTRLINE LAT – STO

√After 6 sec, CTRLINE LAT tb – STO

\* If CTRLINE LAT does not stow within 12 sec: \*

\* CTRLINE LAT – GND \*

\* √MCC \*

CTRLINE LAT – GND

L,R DR (two) – CL (tb-bp)

√After 24 sec, L,R DR tb (two) – CL

\* If doors do not close within 48 sec: \*

\* L,R DR (two) – OFF \*

\* √MCC \*

L,R DR (two) – OFF

LAT (two) – LAT (tb-bp)

√After 6 sec, L,R LAT tb (two) – LAT

\* If doors do not latch within 12 sec: \*

\* L,R LAT (two) – OFF \*

\* √MCC \*

L,R LAT (two) – OFF

MODE – GPC

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

### RECONFIG DPS FOR ENTRY

<b>CAUTION</b>
If recovering string(s) due to failed GPC(s), all FCS CH(s) to AUTO prior to OPS 301 PRO

CRT1 GNC, OPS 301 PRO (√DAP)  
 CRT3 BFS, GNC, OPS 301 PRO

CRT1 GNC, OPS 302 PRO

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

√RWY Selection  
 AOA RWY OPTIONS

ALL INCLINATIONS				
SITE	RWY	TACANS	ITEM 5	MLS
1	KSC 15 KSC 33	TTS 59Y	COF 97	8 6
42	NOR 17 NOR 23	SNG 121Y	HMN 92	6 6
43	NOR 05 NOR 35	SNG 121Y	HMN 92	- -
44	EDW 15 EDW 18L	EDW 111	LHS 21	- -
45	EDW 22 EDW 04	EDW 111	LHS 21	8/† 6

† MSBLS Jr. Channel 8 – Requires Uplink



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

1: GNC DEORB MNVR EXEC
------------------------

## B OMS 2 BURN SETUP

CRT1     √Or enter Target (steep or shallow based on  $\Delta V$  capability) from OMS TARGETS or MCC

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

* For single eng burn (good eng):	*
* TRIM LOAD LY – ITEM 7 <u>+5.2</u> EXEC	*
* RY – ITEM 8 <u>-5.2</u> EXEC	*
* OMS L – ITEM 2 EXEC	*
* R – ITEM 3 EXEC	*
* For RCS burn:	*
* RCS SEL – ITEM 4 EXEC	*

### NOTE

Onboard computed TIG and  $\theta_t$  may vary slightly and are acceptable if REI is correct

LOAD – ITEM 22 EXEC  
TIMER – ITEM 23 EXEC

CRT3     √BFS TGT

Fill in AOA DEORBIT BURN CARDS from AOA DEL PAD, 6-2 or 6-3

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

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

**CRT1 SECONDARY CHECK**

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

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

**SEAT ADJUSTMENT**

Adjust Back Angle

**P OMS BURN PREP**

- \* For single eng burn/No PROP failures: \*
- \* XFEED failed eng PROP to good eng \*

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

**RCS BURN PREP (I'CNCT OMS to RCS)**

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

O7 AFT L,R RCS  
 XFEED (four) – OP (tb-OP)  
 TK ISOL (six) – CL (tb-CL)

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

**OMS BURN TIG ADJUST (if reqd)**

CRTX LOAD – ITEM 22 EXEC  
TIMER– ITEM 23 EXEC

Determine  $\Delta$ TIG (if REI – REF > 50)  
from OMS TARGETS

CRTX Enter new TIG

LOAD – ITEM 22 EXEC  
TIMER– ITEM 23 EXEC

Repeat until  $\Delta$ RANGE < 50

CRT3  $\sqrt$ BFS TGT

**MNVR TO DEORBIT BURN ATTITUDE**

B F6,F8  $\sqrt$ ADI ATT (two) – INRTL  
 $\sqrt$ ERR (two) – 5  
 $\sqrt$ RATE (two) – 5

C MNVR – ITEM 27 EXEC (\*)  
( $\sqrt$ ADI ATT with CRT BURN ATT)

3: BFS, GNC SYS SUMM 2

TIG-5 B R3A Go to AOA DEORBIT BURN (Cue Card)



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DEORBIT  
CARDS

AOA DEORBIT BURN AND DEORBIT BURN MONITOR CARDS

MS ONLY

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ASC/117/FIN

DEORBIT CARDS

## DEORBIT BURN MONITOR

<p><b>OMS TEMP*</b></p> <table border="1" style="margin-left: 20px; border-collapse: collapse;"> <thead> <tr> <th></th> <th style="width: 30px;">L</th> <th style="width: 30px;">R</th> </tr> </thead> <tbody> <tr> <td>FU IN P ≥</td> <td style="text-align: center;">230</td> <td style="text-align: center;">230</td> </tr> <tr> <td>≤</td> <td style="text-align: center;">214</td> <td style="text-align: center;">212</td> </tr> </tbody> </table> <p style="margin-left: 20px;">or No FU IN P</p>		L	R	FU IN P ≥	230	230	≤	214	212	<p>OMS ENG FAIL</p> <hr style="border-top: 1px dashed black;"/> <p>OMS PRPLT FAIL</p>
	L	R								
FU IN P ≥	230	230								
≤	214	212								
<p><b>OMS PC* &amp; OMS ↓</b> (BFS: √accel)</p> <p>ENG VLV 1 or 2 &lt; 70</p> <p>or OX IN P &gt; 227</p> <hr style="border-top: 1px dashed black;"/> <p>OX IN P ≤ 227</p> <p>or No OX IN P</p>	<p>OMS ENG FAIL</p> <hr style="border-top: 1px dashed black;"/> <p>OMS PRPLT FAIL</p>									
<p><b>OMS OX/FU TK P</b> (√ENG IN P)</p> <p>OX/FU LOW</p> <hr style="border-top: 1px dashed black;"/> <p>OX &amp; FU HIGH</p>	<p>He PRESS/VAP ISOL (two) – OP</p> <p>If aff TK P not incr:</p> <p style="margin-left: 20px;">He PRESS/VAP ISOL (two) – CL</p> <p style="margin-left: 20px;">At PC &lt; 72 or OMS TEMP:</p> <p style="margin-left: 40px;">OMS PRPLT FAIL</p> <hr style="border-top: 1px dashed black;"/> <p>He PRESS/VAP ISOL (two) – CL</p> <p>Cycle He A(B) to maintain TK P 234-284</p>									
<p><b>OMS GMBL</b></p> <p style="margin-left: 20px;">PRI fail</p> <p style="margin-left: 20px;">SEC fail</p>	<p>L(R) OMS GMBL – SEC (twice)</p> <hr style="border-top: 1px dashed black;"/> <p>If high RCS usage: OMS ENG FAIL</p>									
<p><b>GPC 1(4) &amp;</b></p> <p style="margin-left: 20px;">Burning OMS aff</p> <hr style="border-top: 1px dashed black;"/> <p style="margin-left: 20px;">SEC GMBL lost</p> <p style="margin-left: 20px;">2 FAs lost</p>	<p>aff GPC PWR – OFF</p> <p>If SEC GMBL avail:</p> <p style="margin-left: 20px;">aff MDM FF 1(4) – OFF,ON</p> <p style="margin-left: 20px;">L(R) OMS GMBL – SEC (twice)</p> <hr style="border-top: 1px dashed black;"/> <p>If high RCS usage: OMS ENG FAIL</p> <hr style="border-top: 1px dashed black;"/> <p>√MAN SHUTDN</p>									
<p><b>I/O ERROR FA 1(4)</b></p> <hr style="border-top: 1px dashed black;"/> <p style="margin-left: 20px;">2 FAs lost</p>	<p>L(R) OMS GMBL – SEC</p> <hr style="border-top: 1px dashed black;"/> <p>I/O RESET (if recov: BFS I/O RESET)</p> <p>If high RCS usage: OMS ENG FAIL</p> <hr style="border-top: 1px dashed black;"/> <p>√MAN SHUTDN</p>									
<p><b>BCE STRG D 1(4)</b></p>	<p>I/O RESET (if recov: &gt;&gt;)</p> <hr style="border-top: 1px dashed black;"/> <p>If high RCS usage:</p> <p style="margin-left: 20px;">L(R) OMS GMBL – SEC (twice)</p>									
<p><b>RM DLMA IMU</b></p> <p>or</p> <p style="margin-left: 20px;"><b>ABOVE SAFE</b></p> <p style="margin-left: 20px;">HP ⇒ <input style="width: 20px; height: 15px; border: 1px solid black;" type="text"/> <input style="width: 20px; height: 15px; border: 1px solid black;" type="text"/></p> <p><b>GPC SET SPLIT</b></p> <p>or</p> <p><b>2 MN BUSES</b></p> <p style="margin-left: 20px;"><b>BELOW SAFE</b></p> <p style="margin-left: 20px;">HP ⇒</p>	<p>STOP BURN: OMS ENG(s) – OFF &gt;&gt;</p> <hr style="border-top: 1px dashed black;"/> <p>IMU DLMA:</p> <p style="margin-left: 20px;">After C/O: √timer <span style="border: 1px solid black; padding: 0 2px;">G21</span></p> <p style="margin-left: 20px;">If any IMU ACC &gt; 0.03: aff IMU – desel</p> <p style="margin-left: 20px;">I'cnct OMS to RCS (√RCS Burn Time)</p> <p style="margin-left: 20px;">THC +X to TGT HP (EOM) or</p> <p style="margin-left: 20px;">3.5 x timer at C/O (AOA)</p> <p>SET SPLIT: Go to "GPC" above</p>									
<p><b>I/O ERROR PCM</b></p>	<p>OI PCMMU PWR – 2(1)</p>									

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

ENT-2a/117/A,O,D,E/A



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MS ONLY

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ASC/117/FIN







HINGE

```

* RCS COMPLETION:
* If DIRECT INSERTION:
*   THC +X to ΔVTOT = 0 or TOT AFT QTY 1    %
*
*   At AFT QTY 1      THC +X to FLIP ΔV or
*   if CUR ΔVTOT:    TOT AFT QTY 2    % then
*                   FRCS COMPLETION
*
*   FLIP    -----
*   ΔV           FRCS COMPLETION
*
*   AFT    -----
*   ΔV           THC +X to TGT ΔV
*
*   TGT    -----
*   ΔV     
*
* If w/OMS 1:
*   THC +X to TGT HP or TOT AFT QTY 1    %
*
*   At AFT QTY 1      THC +X to FLIP HP or
*   if CUR HP:        TOT AFT QTY 2    % then
*                   FRCS COMPLETION
*
*   FLIP   -----
*   HP          FRCS COMPLETION
*
*   AFT   -----
*   HP          THC +X to TGT HP
*
*   TGT   -----
*   HP    
*
* FRCS COMPLETION:
*   Mnvr to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
*   THC -X to ΔVTOT = 0 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)  
ASC-8aa/117/A/A

**AOA DEORBIT BURN (1 ENG)**

- √MM302      √OMS L or R
- √OMS BURN CONFIG (L or R XFEED)
  - Enter TGO + 10 sec
- √TRIM: P +0.4, 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
- :15      If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
- :00      Start watch (√P<sub>C</sub>, ΔVTOT, ENG VLVs)

OMS XFEED RETURN at ΔVTOT =   
or  at  %

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

- \* **OMS PRPLT FAIL (CONTINUE BURN):** \*
- \* OMS ENG – OFF \*
- \* ITEM 18 +0 EXEC \*
- \* Secure aff OMS \*
- \* √ADI – LVLH, center needles \*
- \* Interconnect good OMS to RCS \*
- \* THC +X (√OMS% vs RCS Burn Time) \*
- \* AFT RCS RECONFIG \*
- \* RCS COMPLETION \*
- \* **OMS ENG FAIL (CONTINUE BURN):** \*
- \* OMS ENG – OFF \*
- \* √ADI – LVLH, center needles \*
- \* Interconnect good OMS to RCS \*
- \* THC +X (√OMS% vs RCS Burn Time) \*
- \* RCS I'CNCT TK SW \*
- \* THC +X (√OMS% vs RCS Burn Time) \*
- \* AFT RCS RECONFIG \*
- \* RCS COMPLETION \*
- \* **RCS +X JET FAIL OFF:** \*
- \* ITEM 18 +0 EXEC \*
- \*  Resel jet \* \* \* \* \*

ASC-8b/A/B

HINGE

MS ONLY

6-22

ASC/117/FIN

HINGE

\* **RCS COMPLETION:** \*

\* If DIRECT INSERTION: \*

\*     THC +X to  $\Delta VTOT = 0$  or TOT AFT QTY 1    % \*

\*     At AFT QTY 1            THC +X to FLIP  $\Delta V$  or            \*  
    \*     if CUR  $\Delta VTOT$ :        TOT AFT QTY 2    % then        \*  
    \*                            FRCS COMPLETION                    \*  
    \*     FLIP   -----\*  
    \*      $\Delta V$                     FRCS COMPLETION                    \*  
    \*     AFT   -----\*  
    \*      $\Delta V$                     THC +X to TGT  $\Delta V$                     \*  
    \*     TGT   -----\*  
    \*      $\Delta V$                     \*  
    \*     If w/OMS 1:            \*  
    \*     THC +X to TGT HP or TOT AFT QTY 1    %        \*  
    \*     At AFT QTY 1            THC +X to FLIP HP or            \*  
    \*     if CUR HP:             TOT AFT QTY 2    % then        \*  
    \*                            FRCS COMPLETION                    \*  
    \*     FLIP   -----\*  
    \*     HP                        FRCS COMPLETION                    \*  
    \*     AFT   -----\*  
    \*     HP                        THC +X to TGT HP                    \*  
    \*     TGT   -----\*  
    \*     HP                        \*  
    \*     \* **FRCS COMPLETION:**                    \*  
    \*     Mnvr to -X Att (pitch up at  $3^\circ/\text{sec}$  to  $VGOz = +1/4 \Delta VTOT$ )        \*  
    \*     THC -X to  $\Delta VTOT = 0$  or FRCS depletion (JETS FAIL OFF)        \*

CUTOFF

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

\* AFT RCS RECONFIG if INTERCONNECT \*

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

ASC-8bb/117/A/A

**AOA 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  
Maintain PITCH ATT ERR ± 3°  
Monitor ΔVTOT

RCS I'CNCT TK SW at ΔVTOT =   
R OMS XFEED (two) – OP  
L OMS XFEED (two) – CL

-----  
| **OMS PRPLT LOW** |  
| AFT RCS RECONFIG AT ΔVTOT =  |  
RCS COMPLETION

- \* **OMS PRPLT FAIL (MULTIPLE JETS FAIL OFF):** \*
- \*    Secure aff OMS \*
- \*    ITEM 18 +0 EXEC \*
- \*     Resel jets \*
- \*    Interconnect good OMS to RCS \*
- \*    THC +X (√OMS% vs RCS Burn Time) \*
- \*    AFT RCS RECONFIG \*
- \*    RCS COMPLETION \*
- \* **RCS +X JET FAIL OFF:** \*
- \*    ITEM 18 +0 EXEC \*
- \*     Resel jets \*

ASC-7a/A/B

HINGE

MS ONLY

6-24

ASC/117/FIN

HINGE

\* **RCS COMPLETION:** \*  
\* If DIRECT INSERTION: \*  
\*     THC +X to  $\Delta VTOT = 0$  or TOT AFT QTY 1    % \*  
\*     At AFT QTY 1            THC +X to FLIP  $\Delta V$  or \*  
\*     if CUR  $\Delta VTOT$ :        TOT AFT QTY 2    % then \*  
\*                                FRCS COMPLETION \*  
\*     FLIP   ----- \*  
\*      $\Delta V$                     FRCS COMPLETION \*  
\*     AFT   ----- \*  
\*      $\Delta V$                     THC +X to TGT  $\Delta V$  \*  
\*     TGT   ----- \*  
\*      $\Delta V$                     \*  
\* If w/OMS 1: \*  
\*     THC +X to TGT HP or TOT AFT QTY 1    % \*  
\*     At AFT QTY 1            THC +X to FLIP HP or \*  
\*     if CUR HP:             TOT AFT QTY 2    % then \*  
\*                                FRCS COMPLETION \*  
\*     FLIP   ----- \*  
\*     HP                        FRCS COMPLETION \*  
\*     AFT   ----- \*  
\*     HP                        THC +X to TGT HP \*  
\*     TGT   ----- \*  
\*     HP                        \*  
\* **FRCS COMPLETION:** \*  
\*     Mnvr to -X Att (pitch up at 3°/sec to VGOz = +1/4  $\Delta VTOT$ ) \*  
\*     THC -X to  $\Delta VTOT = 0$  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)  
ASC-7aa/117/A/A



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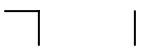


**POST D/O  
BURN**

AOA POST DEORBIT BURN

6-27

ASC/117/FIN



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

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

**P OMS/RCS POST BURN RECONFIG**

**POST D/O  
 BURN**

**IF I'CNCT**  
 Perform I'CNCT RETURN  
 (ENT PKT, RCS)

O7      AFT L,R RCS  
           √He PRESS (four)                    – OP (tb-OP)  
           √TK ISOL (six)                      – GPC (tb-OP)  
           MANF ISOL 1,2,3,4 (eight) – OP (tb-OP)  
           √XFEED (four)                      – GPC (tb-CL)

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

\* If OMS PRPLT FAIL:                    \*  
 \*    √Aff TK ISOL (two) – CL        \*

XFEED (four) – CL (tb-CL)

Determine Prebank  
 Determine ΔHP (CUR HP -TGT HP)

Use RECOVERY PREBANK TABLES  
 Record Prebank on ENTRY MANEUVERS  
 Cue Card



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

\* **RECOVERY PREBANK TABLES (KSC)** \*

\* NOTE: APPLICABLE ONLY IF OMS 1 REQD \*

\* (ATO/AOA steep entries) **KSC** \*

$\Delta$ HP	0	2	6	10	13	16	19	23	26
PREBANK	0	35	75	95	100	110	115	140	175

\* (ATO/AOA shallow entries) **KSC** \*

$\Delta$ HP	0	1	2	3	4	5	6	7	8
PREBANK	90	110	115	120	125	135	145	160	180

\* 117 OCFR2 \*

**C POST BURN STATUS**

NOMINAL

$\Delta$ TIG

	:		
--	---	--	--

P CRT2 **GNC, OPS 303 PRO**

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

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

C CRT1    √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 (\*)

- \* If UNDERBURN or no DEL PAD, \*
- \* manually mnvr to LVLH R001, Y358, \*
- \* P per table below \*

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

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

**C OMS GMBL PWRDN (PASS ONLY)**

CRT1 Verify GMBL positions:

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

GMBL OFF – ITEM 32 EXEC  
– ITEM 33 EXEC

1: GNC 53 CONTROLS	2: BFS, GNC SYS SUMM 2
3: GNC DEORB MNVR COAST	

**C SECONDARY ACTUATOR CHECK (ON MCC GO)**

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

SPI  $\sqrt{\text{SPI}}$ : Stop drive test when elevon posns within +12° to -27°:

SURF DRIVE OFF, ITEM 40 EXEC (\*)

CRT1 3.  $\sqrt{\text{POS}}$  STIM ENA, ITEM 7 – (no \*)

C3 4.  $\sqrt{\text{FCS}}$  CH 1,2,3,4 – AUTO

CRT1 5. SEC ACT CK, CH 1 – ITEM 1 EXEC (\*)  
CK START – ITEM 5 EXEC (\*)

6.  $\sqrt{\text{All}}$  CH 1 ports bypass '↓'  
STOP – ITEM 6 EXEC (\*)

C3 7. FCS CH 1 – ORIDE

CRT1  $\sqrt{\text{All}}$  CH 1 ports reset no '↓'

C3 FCS CH 1 – AUTO

8. Repeat steps 5 thru 7 for CH 2,3,4

R2 9. HYD MN PUMP PRESS (three) – LO

1: GNC 53 CONTROLS	2: BFS, GNC SYS SUMM 2
3: GNC DEORB MNVR COAST	

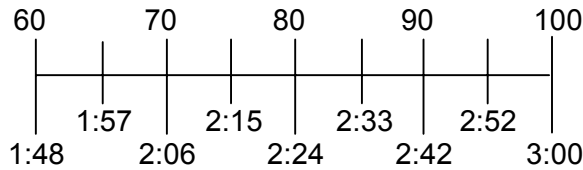
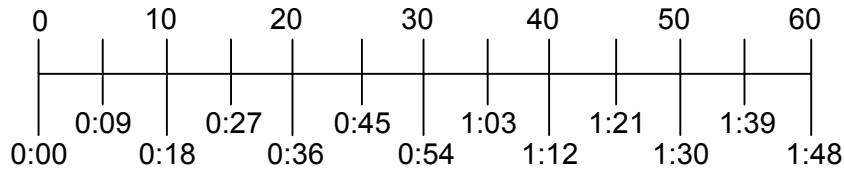
1: GNC 23 RCS	2: GNC DEORB MNVR COAST
3: BFS, GNC SYS SUMM 2	

**P FRCS DUMP**

Determine FWD RCS 'DUMP TO %' using lowest of OX or FU qty (calculator or DEL PAD)

FOUR JET DUMP:

FRCS PRPLT TO BE DUMPED (%)



TIME FROM DUMP INITIATION (M:S)

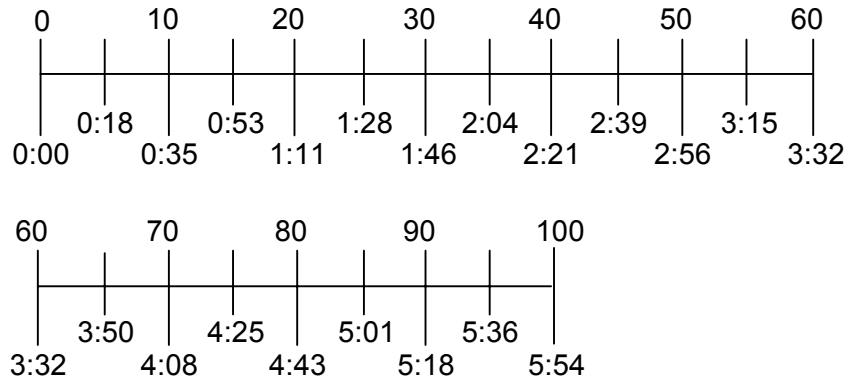
NOTE

During dump, disregard FRCS qty

1: GNC 23 RCS	2: GNC DEORB MNVR COAST
3: BFS, GNC SYS SUMM 2	

TWO JET DUMP:

FRCS PRPLT TO BE DUMPED (%)



TIME FROM DUMP INITIATION (M:S)

NOTE

During dump, disregard FRCS qty

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

1: GNC DEORB MNVR COAST
-------------------------

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

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

2: GNC 50 HORIZ SIT
---------------------

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

**HORIZ SIT CONFIG**

ALTM – ITEM 9 + 

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

	<u>PASS ITEM</u>	<u>BFS ITEM</u>	
PTI	INH √1		
LAND SITE (AOA DEL PAD)	√41		√41
RWY (AOA DEL PAD)	√3		√3
	√4		√4
TAC (per AOA RWY)	√5		√5
RA	blank √46		
TAEM TGT			
G&N	OVHD √6	blank	
HSI	blank	blank	
XEP	NEP √7	NEP	√7
AIM (AOA DEL PAD)	NOM √8	NOM	√8
	(or CLSE)	or (CLSE)	
SPDBK	NOM √39		
TAC	INH √20	INH	√20
GPS	INH √43	INH	√43
DRAG H	AUT √22	AUT	√22
ADTA H	INH √26	INH	√26
ADTA TO G&C	INH √29	AUT	√28
TAC	DELTA √35		
DES any failed TACANS	√		√
AIF_G	INH √48		

\* If BFS engaged: \*

\* Set HSD BFS ITEMS to PASS Config \*

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

**ENTRY SW CHECK**

B F6,F8      Stow AOA DEORBIT BURN Cue Cards (R3A)  
 R3A            Install ENTRY Cue Cards

NOTE

If NAVAIDS 'OFF' due to PKT C/L PWRDN,  
 switch 'ON' per pwrdn procedure

P O7          √TACAN MODE (three) – GPC  
                  √ANT SEL (three) – AUTO  
                  CH (three) – 

111	(EDW)
059Y	(KSC)
121Y	(NOR)

O8            √RADAR ALTM (two) – ON  
                  MLS (three) – ON (PASS)  
                  √CH (three) – 8 

EDW 22	KSC 15
KSC 33	EDW 04
NOR 17	NOR 23

  
                  – 6

I/O RESET

C L2          √CAB RELIEF (two) – ENA (tb-ENA)  
                  √ANTISKID – ON  
                  √NWS – 1  
                  √ENTRY MODE – AUTO  

3: GNC 51 OVERRIDE
--------------------

  
                  √ROLL MODE – AUTO

B L2,C3      √SBTC (two) – full fwd  
 C3            √SRB SEP – AUTO  
                  √ET SEP – AUTO

F6,F8        √AIR DATA (two) – NAV  
                  √ADI ERR (two) – 5  
                  √RATE (two) – 5  
                  √HSI SEL MODE (two) – ENTRY

C F6            √SOURCE (two) – NAV, 1  
 P F8            √SOURCE (two) – NAV, 2

B F3            √TRIM RHC/PNL (two) – INH  
                  √PNL (two) – ON

F6,F8        √RADAR ALTM (two) – 1(C), 2(P)

1: GNC DEORB MNVR COAST	2: GNC 50 HORIZ SIT
3: GNC 51 OVERRIDE	

- \* **If APUs shut down:** \*
- \* Perform APU RESTART \*
- \* (ENT PKT, APU/HYD) \*

**PRE EI CHECKLIST**

- \* If less than four PASS GPCs, config FCS \*
- \* CHs so that each GPC cmd equals number \*
- \* of CHs. See table on POST OPS 3/GRTLs \*
- \* TRANSITION RESTRING (Cue Card) \*
- \* 



 \*
- \* Config SURF FBK (See table on POST \*
- \* OPS 3/GRTLs TRANSITION RESTRING \*
- \* (Cue Card) \*

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

- B F6,F8 FLT CNTLR PWR (two) – ON
  - P If SECONDARY ACTUATOR CHECK performed:
  - R2 HYD MN PUMP PRESS (one) – NORM
- Go to ENTRY MANEUVERS (Cue Card)





OMS FAILURE

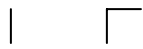
**OMS  
FAILURE**



MS ONLY

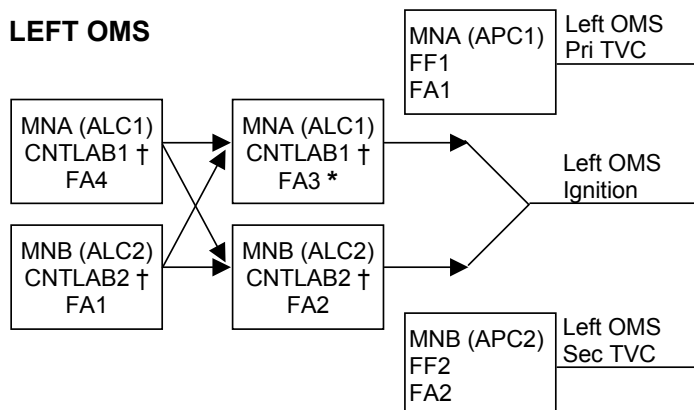
6-37

ASC/117/FIN



## OMS FAILURES

### LEFT OMS

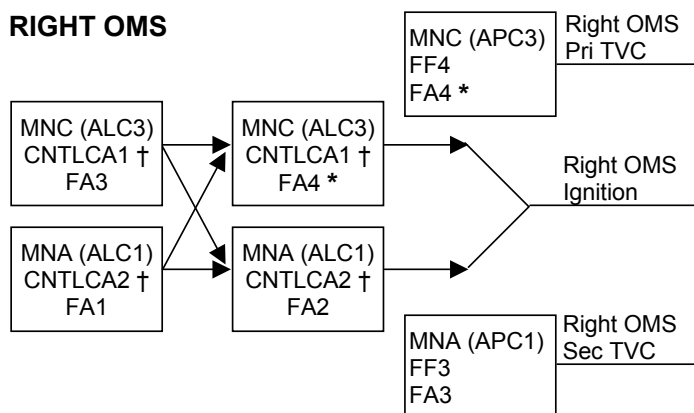


† If CNTL AB1 or AB2 (CA1 or CA2) failed and ign path still exists at OMS fail, assume L(R) OMS ↓ is PRPLT FAIL

\* If L(R) P<sub>c</sub> 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)

OMS FAILURE

### RIGHT OMS



If two FA MDMs lost		
MDMs	Preburn: ENG – OFF	During burn: MAN SHUTDN
1,2	LEFT (TVC)	BOTH
1,3	RIGHT (IGN)	LEFT
1,4	LEFT (IGN)	RIGHT
2,3	LEFT (IGN)	RIGHT
2,4	RIGHT (IGN)	LEFT
3,4	RIGHT (TVC)	BOTH

ASC-5b/A,O,E/I



OMS/RCS  $\Delta V$

**OMS/  
RCS  $\Delta V$**



### OMS He PRESS/ $\Delta$ V/BURN TIME

OMS% GAGE	OMS He Press	OMS $\Delta$ V	RCS $\Delta$ V	RCS BURN MIN:SEC
92.4	4530	458	379	14:09
90	4430	446	369	13:46
85	4230	420	348	12:58
80	4030	395	326	12:10
75	3830	369	305	11:22
70	3630	343	284	10:34
65	3430	317	263	09:46
60	3230	291	242	08:57
55	3030	266	220	08:09
50	2830	240	199	07:21
45	2630	214	178	06:33
40	2430	187	156	05:45
35	2230	161	134	04:57
30	2030	135	113	04:09
25	1830	109	91	03:21
20	1630	82	69	02:33
15	1430	56	47	01:44
10	1230	29	25	00:54
5	1030	3	2	00:05

OMS/  
RCS  $\Delta$ V

<b>OMS-2/AOA <math>\Delta</math>V</b>
<b>ARCS <math>\Delta</math>V fps =</b> $\boxed{0.7} \times [L\% + R\% - \text{AFT QTY } 1]$
<b>FRCS <math>\Delta</math>V fps =</b> $\boxed{0.8} \times \text{FRCS } \%$
<b>OMS <math>\Delta</math>V fps =</b> $\boxed{5.1} \times \text{OMS } \%$

NOTE: Uses assumed vehicle weight of  $\boxed{256,748}$  lb

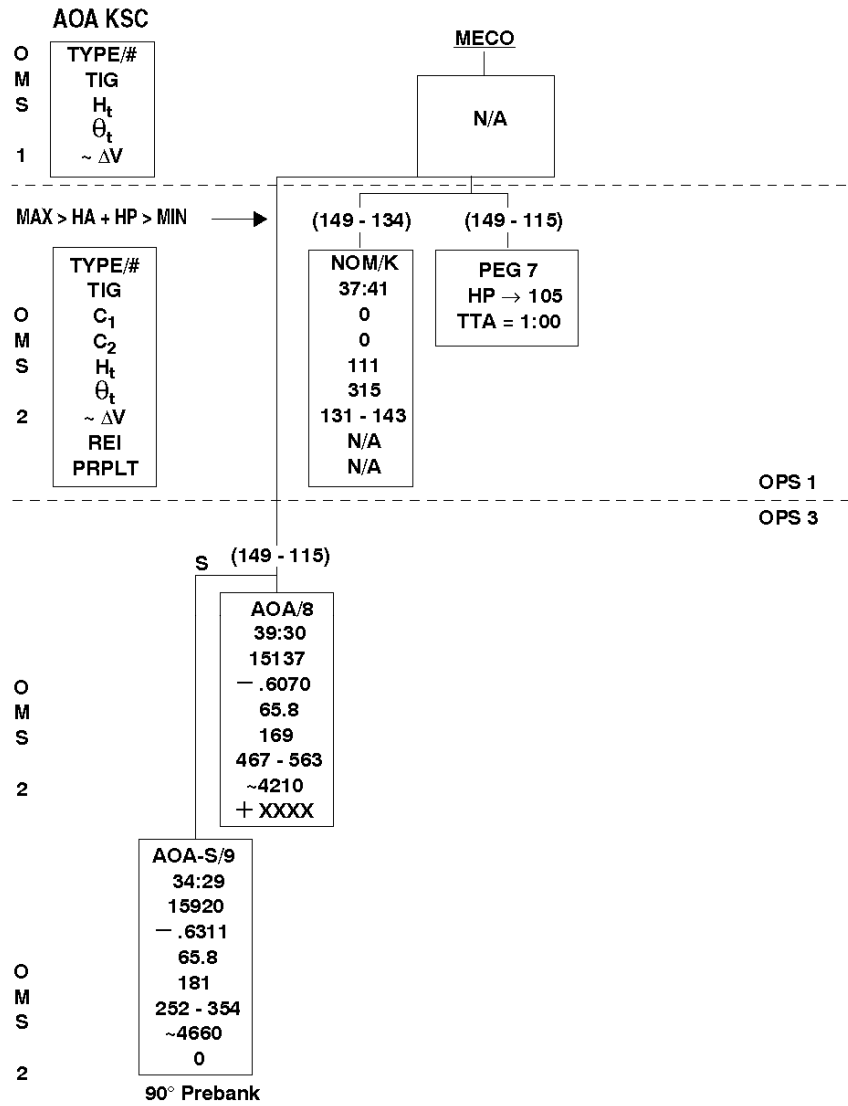


OMS TARGETS, COMM COVERAGE, LAND SITES

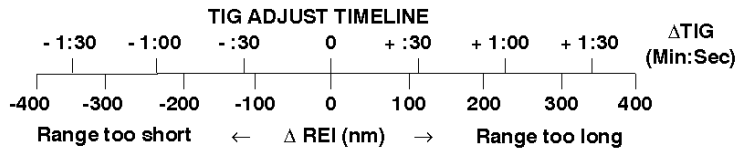
**OMS  
TGTS**



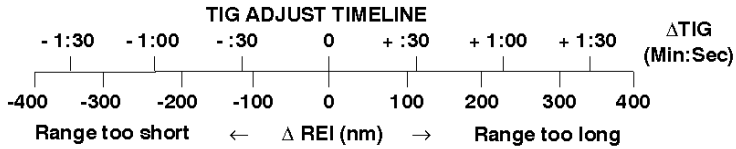
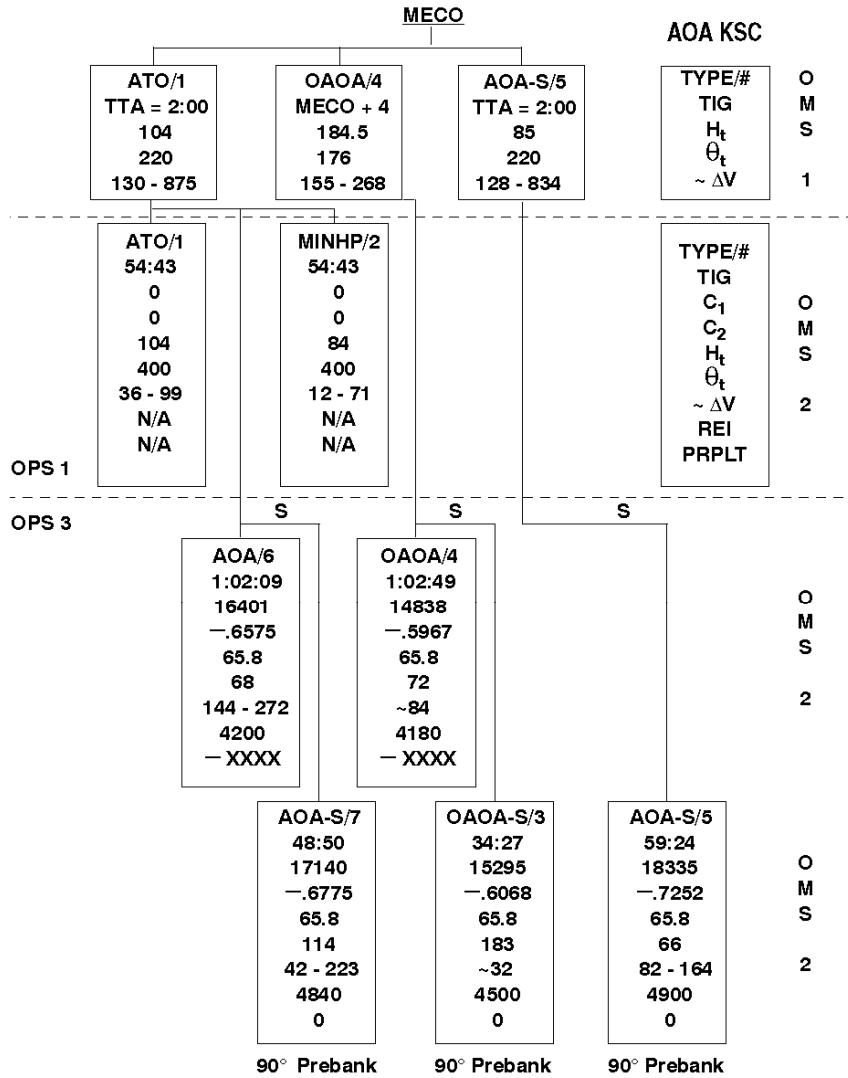
# STS-117 OCFR2 CY OMS TARGETS - DIRECT INSERTION



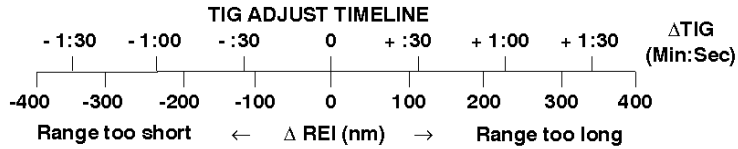
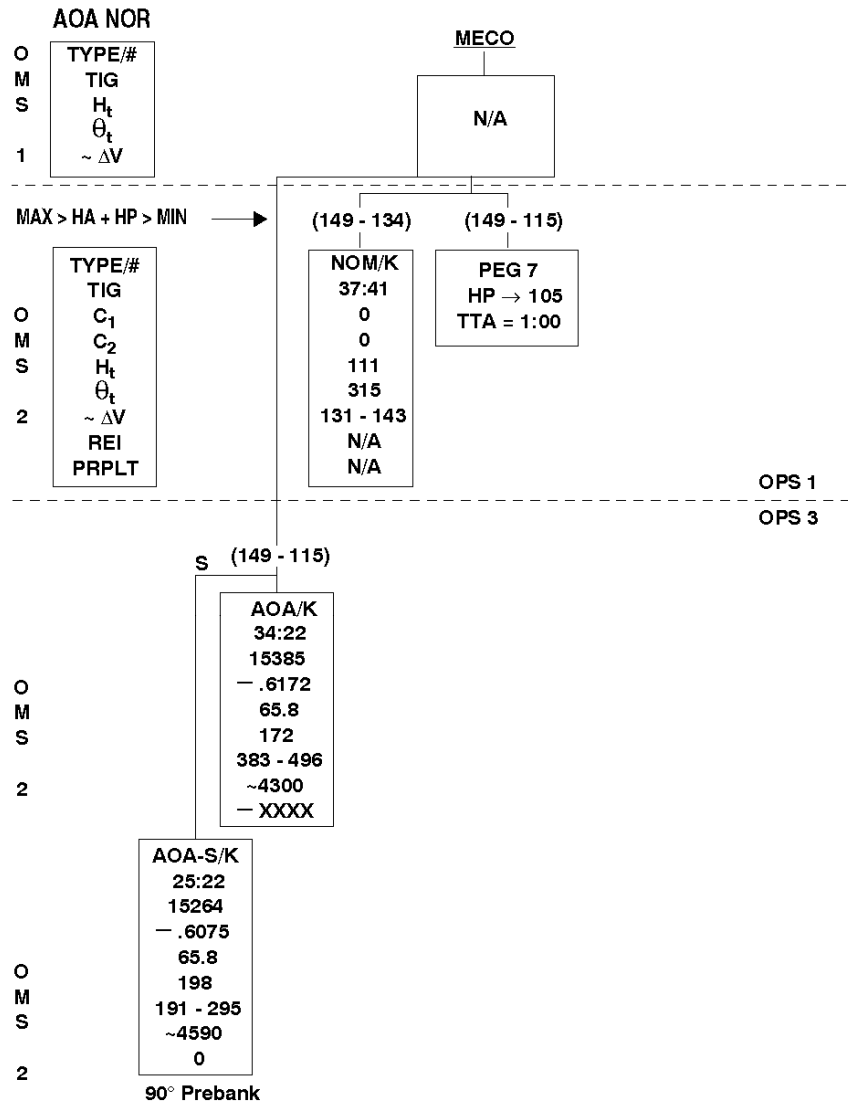
OMS  
TGTS



# STS-117 OCFR2 CY OMS TARGETS - W/OMS 1

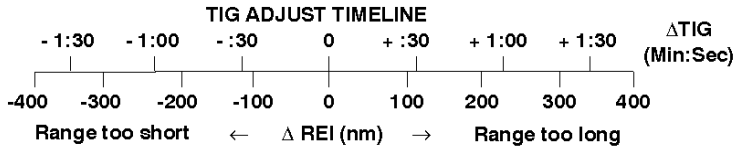
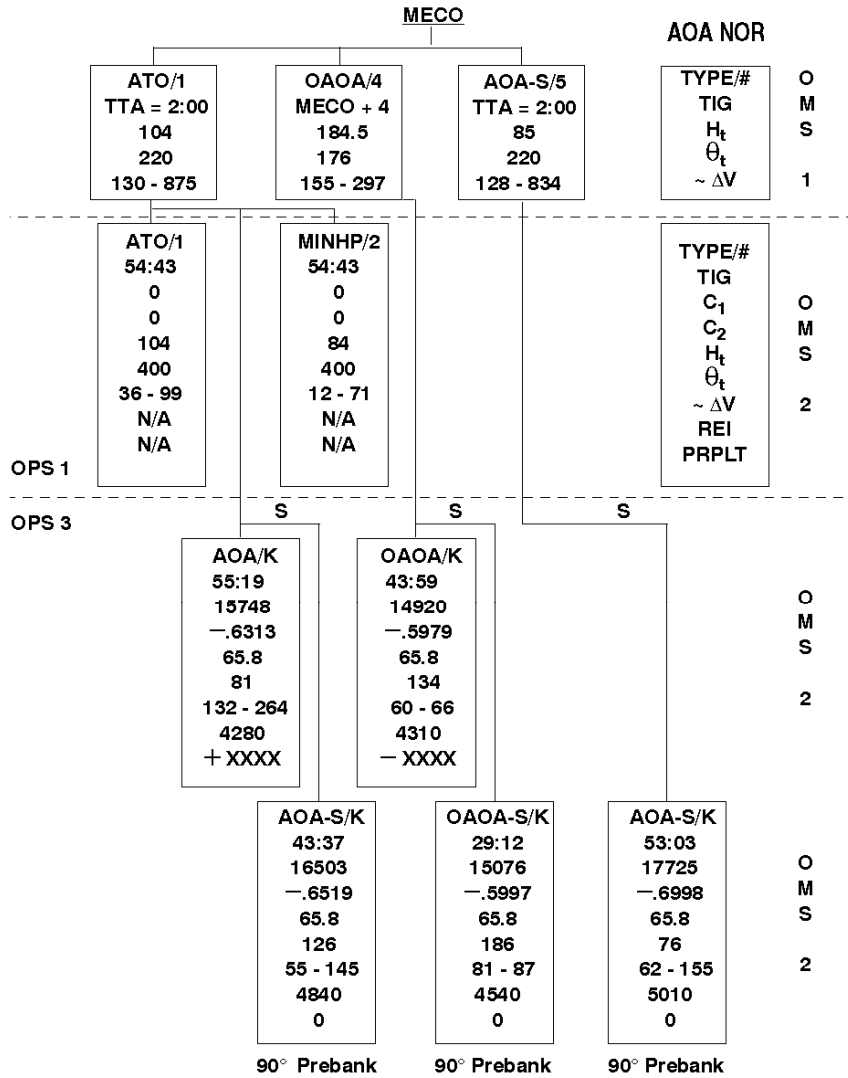


# STS-117 OCFR2 CY OMS TARGETS - DIRECT INSERTION



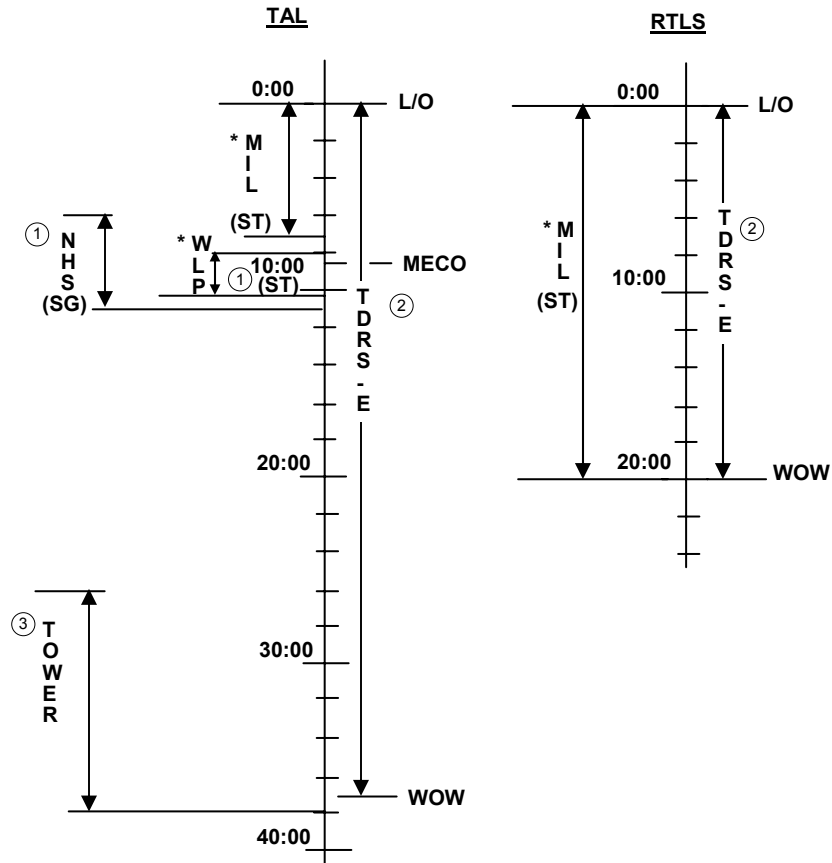


# STS-117 OCFR2 CY OMS TARGETS - W/OMS 1



**COMM  
COVER**

## COMMUNICATION COVERAGE – (TAL/RTLS)



**MODE**

ST – STDN  
 SG – SGLS

\*UHF available

**NOTE:** ① NHS/WLP coverage only on high inclinations

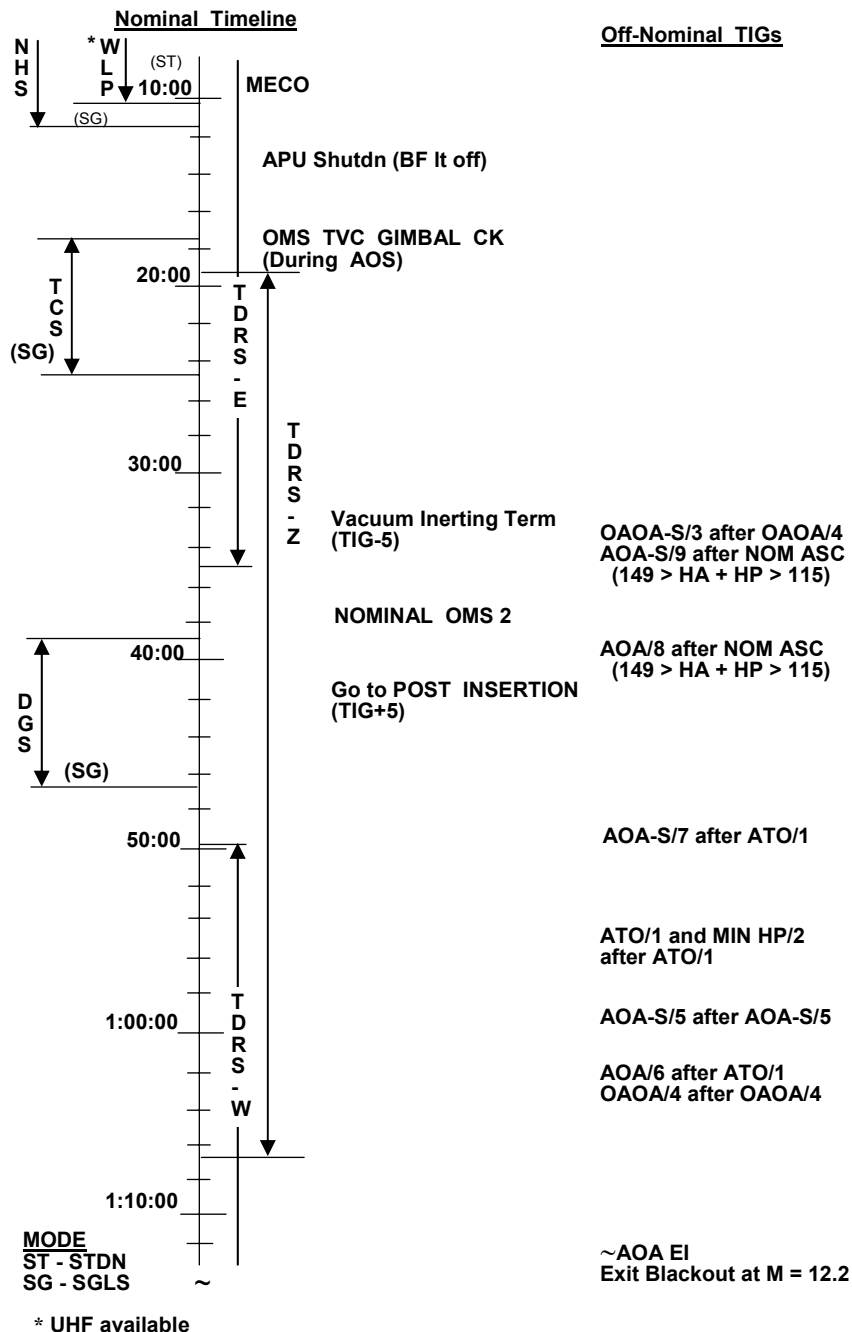
② ET blocks coverage until vehicle upright

③ Tower UHF installed at all TAL sites

**COMM COVER**

# COMMUNICATION COVERAGE – (AOA to KSC)

LAND SITE



**STS-117 LANDING SITE TABLE  
(50° to 63.5° INCLINATION)**

SITE	LOCATION	RWY	TACANS		MLS CH	LG	+ OVR RUN
				ITEM 5			
1	KSC	KSC 15 KSC 33	TTS 59Y	COF 97	8 6	15000 15000	1000 1000
2	BEN GUERIR	BEN 36 BEN 18	MAK 80 ■	CBA 116 ■	- -	13720 13220	0 1000
3	MORON AB	MRN 20 MRN 02	MRN 100	AOG 23	◆6 -	11730 11730	1000 1000
4	ZARAGOZA	ZZA 30L ZZA 12R	ZZA 64	ZAR 77 ■	◆6 -	12200 12200	1000 1010
5	MYRTLE BEACH	MYR 36 MYR 18	ILM 117	FLO 99	- -	9500 9500	1000 1000
6	WILMINGTON	ILM 06 ILM 24	ILM 117	DIW 107 ■	- -	7500 7500	0 0
7	CHERRY POINT	NKT 32L NKT 23R	EWN 83 ■	NCA 101	- -	7110 7100	800 880
8	OCEANA NAS	NTU 32R NTU 23L	NGU 48	ORF 116	- -	7500 11500	0 0
9	WALLOPS	WAL 28 WAL 04	SBY 49	SWL 71	- -	7510 8750	0 0
10	DOVER AFB	DOV 32 DOV 19	SIE 95	CYN 81	- -	12400 9100	0 0
11	ATLANTIC CITY	ACY 31 ACY 13	CYN 81	SIE 95	- -	9500 9500	0 0
12	BEN GUERIR	BEN 36 BEN 18	MAK 80 ■	CBA 116 ■	- -	13720 13220	0 1000
13	*MORON AB	MRN 20 MRN 02	MRN 100	AOG 23	◆6 -	11730 11730	1000 1000
14	*ZARAGOZA	ZZA 30L ZZA 12R	ZZA 64	ZAR 77 ■	◆6 -	12200 12200	1000 1010
15	GABRESKI	FOK 06 FOK 24	HTO 83	GON 45Y ■	- -	8500 8500	1000 1000

◆ Available for TAL Only

■ DME

\* LO XRNG TAL Site

Length after displaced threshold

**STS-117 LANDING SITE TABLE  
(50° to 63.5° INCLINATION)**

S I T E	LOCATION	RWY	TACANS		MLS CH	LG	+ OVR RUN
				ITEM 5			
16	OTIS ANGB	FMH 32	BOS 74	PVD 103	-	9000	0
		FMH 23			-	7500	0
17	PEASE INT'L	PSM 34	ENE 118	BOS 74	-	10020	0
		PSM 16			-	10020	0
18	HALIFAX INT'L	YHZ 23	UAW 38	YHZ 98 ■	-	8800	0
		YHZ 32			-	7700	0
19	STEPHEENVILLE	YJT 09	YJT 78	YDF 80 ■	-	9500	0
		YJT 27			-	9500	0
20	ST JOHNS INT'L	YYT 29	UYT 23	YYT 82 ■	-	8500	0
		YYT 11			-	8500	0
21	GANDER INT'L	YQX 21	YQX 74	IQX 32 ■	-	9700	0
		YQX 31			-	8900	0
22	GOOSE BAY	YYR 26	UYR 40	YYR 120 ■	-	10550	0
		YYR 34			-	9080	0
23	LAJES	LAJ 15	TRM 109	LAJ 45	-	10870	970
		LAJ 33			-	10870	990
24	BEJA	BEJ 01L	MOJ 37	BEJ 105	-	10820	0
		BEJ 19R			-	10820	900
25	KEFLAVIK	IKF 20	KEF 57	HL 44 ■	-	9520	0
		IKF 29			-	9560	0
26	SHANNON	INN 06	SHA 80 ■	CRN 37 ■	-	9540	0
		INN 24			-	9540	0
27	FAIRFORD	FFA 27	FFA 81	BZN 56	-	9490	990
		FFA 09			-	9490	970
28	KOLN-BONN	KBO 14L	GIX 18	DOR 23Y ■	-	12020	0
		KBO 32R			-	12020	0
29	ISTRES AB	FMI 33	◆FMI 16	NIM 53	◆6	11300	3960
		FMI 15			-	12300	0
30	ESENBOGA	ESN 03R	BAG 78 ■	BUK 90 ■	-	11800	0
		ESN 21L			-	11800	0

◆ Available for TAL Only

■ DME

Length after displaced threshold

**STS-117 LANDING SITE TABLE  
(50° to 63.5° INCLINATION)**

S I T E	LOCATION	RWY	TACANS		MLS CH	LG	+ OVR RUN
				ITEM 5			
31	KING KHALID	KKI 15R KKI 33L	RIY 92	KIA 80	-	13300	0
					-	13300	0
32	DIEGO GARCIA	JDG 31 JDG 13	NKW 57	NKW 57	-	12000	950
					-	12000	950
33	AMBERLEY TINDAL RAAF	AMB 15 PTN 14	AMB 94	-	-	9500	0
			-	TDL 70	-	8500	0
34	YOKOTA AB	JTY 36 JTY 18	SHT 19	NJA 98	-	11000	1000
					-	11000	1000
35	ANDERSEN AFB	GUA 06L GUA 24R	UAM 54	UNZ 100	-	10560	1050
					-	10560	1000
36	WAKE ISLAND	WAK 28 WAK 10	AWK 82	AWK 82	-	9360	0
					-	9360	0
37	HONOLULU	HNL 08R HNL 26L	HNL 95	NGF 93	-	11500	0
					-	11500	0
38	ELMENDORF	EDF 24 EDF 06	EDF 81	BGQ 72	-	9500	0
					-	9500	0
39	HAO ATOLL	HAO 12 HAO 30	HAO 85 ■	HAO 85 ■	-	10390	0
					-	10390	0
40	RIO GALLEGOS	AWG 25 AWG 07	GAL 114 ■	GAL 114 ■	-	10900	0
					-	10900	0
41	ASCENSION	HAW 13 HAW 31	ASI 59	ASI 59	-	9520	0
					-	9520	0
42	NORTHROP	NOR 17 NOR 23	SNG 121Y	HMN 92	6	15000	Lkbd
					6	15000	Lkbd
43	NORTHROP	NOR 05 NOR 35	SNG 121Y	HMN 92	-	15000	Lkbd
					-	15000	Lkbd
44	EDWARDS AFB	EDW 15 EDW 18L	EDW 111	LHS 21	-	16300	Lkbd
					-	15000	Lkbd
45	EDWARDS AFB	EDW 22 EDW 04	EDW 111	LHS 21	8/†	15010	0
					6	14010	1800

† MSBLS Jr. Ch 8 - Requires Uplink

■ DME

Length after displaced threshold



WEATHER PADS

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**WEATHER  
PADS**

**WEATHER  
PADS**

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**CONUS TERMINAL FORECASTS RTLS - ORB**

↓ RTLS ACL pg 1-10

DEORB ORBIT	SITE	LDG GMT	SKY	VIS/WX	T/TD (°F)	WIND (MAG)	ALTM	DA	REMARKS
RTLS									
AOA (1)									
AOA (2)									

**UPPER WINDS FORECAST (SFC=MAG, OTHER LEVELS=TRUE)**

FIRST DAY PLS

ALT	RTLS	AOA (1)	AOA (2)	AOA (3)	ORB: _____ DEORB: _____
50K	/	/	/	/	/
38K	/	/	/	/	/
28K	/	/	/	/	/
20K	/	/	/	/	/
12K	/	/	/	/	/
7K	/	/	/	/	/
3K	/	/	/	/	/
1K	/	/	/	/	/
SFC	/	/	/	/	/

TAL ( ) data to ACL FB 2-14

**TAL/CONUS TERMINAL FORECASTS**

DEORB ORBIT	SITE	LDG GMT	SKY	VIS/WX	T/TD (°F)	WIND (MAG)	ALTM	DA	REMARKS
TAL (1)									
TAL (2)									
TAL (3)									

**UPPER WINDS FORECAST (SFC=MAG, OTHER LEVELS=TRUE)**

ALT	TAL (1)	TAL (2)	TAL (3)			
50K	/	/	/			
38K	/	/	/			
28K	/	/	/			
20K	/	/	/			
12K	/	/	/			
7K	/	/	/			
3K	/	/	/			
1K	/	/	/			
SFC	/	/	/			

**ELS TERMINAL FORECASTS (Site Generated)**

SITE	ID	LDG GMT	SKY	VIS/WX	WIND (TRUE)	ALTM	REMARKS

**ELS TERMINAL FORECASTS (Site Generated) (Cont)**

SITE	ID	LDG GMT	SKY	VIS/WX	WIND (TRUE)	ALTM	REMARKS

**BLOCK 1 TRAJECTORY MESSAGE**

DEORB ORB	APPROX TIG	SITE/RWY	OOP TIG WINDOW	
			OPEN	CLOSE
<b><u>MAX RATES (1st STAGE)</u></b>		<b><u>MISCELLANEOUS</u></b>		
<b><u>NOTE:</u> IGNORE ATTITUDE ERRORS DURING LOAD RELIEF</b>		NOTAMS: _____		
ROLL _____°/sec at _____		_____		
PITCH _____°/sec at _____		_____		
YAW _____°/sec		_____		
<b><u>TRAJECTORY LOFTING (2nd STAGE)</u></b>				
LOFTED/DEPRESSED _____ K ft at VI _____ K fps				

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## SWITCH LIST FOR HANDOVER INGRESS

FWD	MIDDECK	AFT
L5..... 9-3	ML86B..... 9-11	R12L..... 9-18
L side OVHD	ML85E..... 9-13	R11U..... 9-18
Flood..... 9-3	SORG..... 9-13	R11L..... 9-18
L4..... 9-3	MO13Q..... 9-13	R10..... 9-18
L1..... 9-3	ML31C..... 9-13	R13U..... 9-18
L2..... 9-3	ML26C..... 9-13	R13L..... 9-19
S1..... 9-4	ML18F..... 9-13	
	ML30N..... 9-13	A1U..... 9-19
F1..... 9-4	MA73C..... 9-13	A1L..... 9-19
F2..... 9-4	MO10W..... 9-14	A1R..... 9-20
F6U(HUD)..... 9-4	WCS..... 9-14	AFT MDU..... 9-20
F3..... 9-4	MO30F..... 9-14	A6U..... 9-20
F8U(HUD)..... 9-4	MO32M..... 9-14	A6L..... 9-20
F4..... 9-4	MO39M..... 9-14	A2..... 9-21
F6..... 9-4	MO42F..... 9-14	A7U..... 9-21
F7..... 9-5	MO51F..... 9-15	A7L..... 9-21
F8..... 9-5	MO58F..... 9-15	A4..... 9-21
F9..... 9-5	MO52J..... 9-15	A8U..... 9-22
	MO69M..... 9-15	A8L..... 9-22
R1..... 9-5	MD44F..... 9-15	A3..... 9-22
R2..... 9-5	MIDDECK	
R4..... 9-6	FLOOR..... 9-15	L9..... 9-23
R6..... 9-6	MO63P..... 9-15	L10L..... 9-23
R side OVHD		L10U..... 9-24
Flood..... 9-6	MIDDECK EXPERIMENTS	L11U..... 9-24
		L12UL..... 9-24
C2..... 9-6	MIDDECK (TEPC).. 9-16	L12UR..... 9-24
C3..... 9-6		L12LL..... 9-24
C5..... 9-7	AIRLOCK	L12LR..... 9-24
S2..... 9-7		L12L..... 9-24
C6..... 9-7	AW18A..... 9-17	R12..... 9-24
C7..... 9-7	AW18D..... 9-17	
	AW18H..... 9-17	A15..... 9-25
O1..... 9-7	AW82B..... 9-17	A14..... 9-25
O2..... 9-7	AW82D..... 9-17	A13..... 9-25
O3..... 9-7	AW82H..... 9-17	A12..... 9-25
O5..... 9-7	TW58T..... 9-17	A11..... 9-26
O6..... 9-7	A/L IN HATCH..... 9-17	
O7..... 9-8	A/L OUT HATCH... 9-17	R14..... 9-26
O8..... 9-8	SH HATCH..... 9-17	
O9..... 9-8	EXT A/L UPPER	HARDWARE
O13..... 9-9	HATCH..... 9-17	C/W..... 9-27
O14..... 9-9	TNL ADP	MEDS CONFIG
O15..... 9-9	HATCH..... 9-17	FOR INGRESS .... 9-28
O16..... 9-9		
O17..... 9-10		
O19..... 9-10		

SW LIST

NOT FLOWN

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NOTES

- HANDOVER from LCC occurs at SRB Ignition (LCC to MCC Handover)
- INGRESS denotes switch status prior to beginning of PRE-INGRESS SW RECONFIGURATION (at T-3:00 (hold)) if different than HANDOVER
- ----- denotes physical break in panel structure
- Radiator flow valve, indicated by \*, is in full radiator flow position and unpowered to allow maximum radiator flow capability if required
- Radiator isolation valve, indicated by \*\*\*\*, is configured in radiator flow and unpowered
- Talkbacks on panels L2, R11, R13, A6, and ML31C indicated by \*\* are bp because cbs on ML86B, A6, and O16 open. Position of valves indicated below:

L2: O2 EMER – CL  
R11L: SPLY H2O DUMP ISOL VLV – CL  
          VLV – CL  
          GALLEY SPLY VLV – CL

R13L: MMU GN2 SPLY ISOL VLV A – CL  
  B – CL

A6L: VEST DEP VLV SYS 1 VENT ISOL – CL  
  VENT – CL  
  2 VENT ISOL – CL  
  VENT – CL

ML31C: WASTE H2O DUMP ISOL VLV – CL  
  VLV – CL  
  VAC VENT ISOL VLV CNTL – CL

- Before turning OI PCMMU PWR switch on C3, indicated by \*\*\*, to OFF, notify LCC so gnd power can be connected; also notify LCC before turning it to 1 after crew ingress
- All unspecified/unlabeled switches – dn (2 position)/ctr (3 position), tb – bp, cb – op, rotaries – full counterclockwise
- PL RETEN PL SEL switch on panel A6U will nominally be 1 for deployable payload missions using only a single PL SEL position but will be MON until PRE-INGRESS SW CONFIG. All other missions will be in MON (Fit Rule A10-281)
- Circuit Breaker snapping color codes:  
{ R } – Red – open all times  
{ G } – Green – open on orbit only  
{ Y } – Yellow – open ascent, closed per procedure  
{ O } – Orange – open orbit thru entry  
{ } – Blank (no ring) – always closed or as required
- STS-117 options affecting switch list:
  - 1) OV104
  - 2) GMTLO
  - 3) Orbit incln = 51.6°
  - 4) Payload: S3/S4 Integrated Truss Segment
  - 5) Crew size of 6
  - 6) Installed: TK CRYO sets (5), SORG, Ku Ant, GN2 (5), External Airlock (ISS), RMS, OBSS, OIU, VPU, WVS, DTV
  - 7) Options N/R: RCRS
- Changes are with respect to STS-115 Switch List as published in FIN A



## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

<p>L5      L COMM PWR – ON <span style="border: 1px solid black; padding: 2px;">OFF</span></p> <hr/> <p>L side OVHD Flood – BRT</p> <hr/> <p>L4:      All cbs – cl { } except:          :B      All cbs – op { Y }          :D      All cbs – cl { O }          :E      All cbs – cl { O }          :F      cb AC1 H2O LOOP PUMP 1 A/2 (three) – op { R } <span style="border: 1px solid black; padding: 2px;">cl</span>                    AC3 SIG CONDR (two)            – op { Y }          :J      AC2 ΦC RAD ISOL A                – cl { }          :N      AC3 ΦC RAD ISOL B                – cl { }          :P      blank cbs (three)                 – op { R }          :Q      cb AC1 ΦC LTG INST OS            – op { Y }                    AC2 ΦC LTG NUMERIC OS       – op { Y }                    AC3 LTG (three)                – op { Y }</p> <hr/> <p>L1      HUM SEP A                    – OFF                    B                                – ON                    CAB TEMP sel                – COOL                            CNTLR – OFF                    FAN A                        – ON                    B                                – OFF                    IMU FAN A,C (two) – OFF                    B                                – ON                    H2O PUMP LOOP 1 (two) – OFF,B                            2                            – ON                    LOOP BYP MAN (two) – ctr                            MODE (two) – MAN</p>	<p>L1      AV BAY 1,3 FAN A (two)        – OFF                    B (two)                        – ON                    2 FAN A                        – ON                    B                                – OFF                    FLOW PROP VLV LOOP (two) – ctr (tb-ICH)                    FREON PUMP LOOP (two)       – B                    RAD CNTLR OUT TEMP            – NORM                            LOOP (two)                – OFF*                    BYP VLV MAN SEL (two) – ctr (tb-BYP)                            MODE (two)                – MAN                    NH3 CNTLR A                    – OFF                    B                                – PRI/GPC                    H2O ALT PRESS                 – CL                    FLASH EVAP CNTLR PRI A       – GPC                            B                                – OFF                            SEC (two) – A SPLY,OFF                    HI LOAD EVAP                    – ENA                    TOP EVAP HTR NOZ (two)       – A AUTO                            DUCT sel                    – A                    HI LOAD DUCT HTR sel         – A</p> <hr style="border-top: 1px dashed black;"/> <p>          FIRE SUPPR AV BAY (three) – SAFE                            pb (three)                – It off                    SMOKE DETN Its (ten)         – It off                            SNSR                            – dn                            CKT TEST                    – OFF</p> <hr/> <p>L2      CAB RELIEF (two) – ctr (tb-ENA)                    VENT (two)                    – ctr (tb-CL)</p>
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## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

L2	FLASH EVAP FDLN HTR SPLY (two) – OFF <span style="border: 1px solid black; padding: 0 2px;">2</span> ANTISKID – ON NWS – 1 BDY FLP – AUTO/OFF ENTRY MODE – AUTO TRIM R,P,Y (three) – ctr FREON ISOL MODE – OFF LOOP 1,2 (two) – ctr **** SBTC – full forward O2 SYS SPLY (two) – ctr (tb-OP) EMER – ctr (tb-bp)** XOVR SYS (two) – OP N2 SYS (four) – ctr (tb-OP) O2/N2 CNTLR VLV SYS 1 – OP 2 – CL PPO2 SNSR/MLV – NORM	F3	L HUD PWR – OFF TRIM RHC/PNL – INH PNL – ON NWS FAIL It – It off ANTISKID FAIL It – It off R TRIM RHC/PNL – INH PNL – ON HUD PWR – OFF DRAG CHUTE pb (six) – It off
S1	CDR SEAT PWR BUS SEL – AC2 (up) CONTR (two) – ctr	F8U	R HUD MODE – NORM MAN BRT sel – mid range HUD BRT – as reqd
F1	DC UTIL PWR MNB – OFF AC UTIL PWR AC1 – OFF	F4	All pb lts off except: BDY FLP pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span> SPDBK/THROT pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span> PITCH pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span> ROLL/YAW pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span>
F2	All pb lts off except: BDY FLP pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span> SPDBK/THROT pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span> PITCH pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span> ROLL/YAW pb – AUTO <span style="border: 1px solid black; padding: 0 2px;">It off</span>	F6	BFC – right HUD DATA BUS – 1 MDU PWR (two) – ON BRT sel (two) – as reqd LDG GEAR pb (two) – It off tb (three) – UP HSI SEL MODE – ENTRY SOURCE (two) – NAV,1 RDR ALTM – 1 FLT CNTLR PWR – ON ADI ATT – REF ERR – MED RATE – MED
F6U	L HUD MODE – NORM MAN BRT sel – mid range HUD BRT – as reqd		

NOT FLOWN

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## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

F6	ABORT MODE sel - OFF pb - lt off RCS CMD lts (three) - lt off RANGE SAFE ARM lt - lt off AIR DATA - NAV
F7	MDU PWR (five) - ON BRT sel (five) - as reqd MN ENG STAT lts (six) - off C/W matrix lts - off <span style="border: 1px solid black; padding: 2px;">all off except HYD PRESS</span>
F8	HUD DATA BUS - 4 MDU PWR (two) - ON BRT sel (two) - as reqd LDG GEAR pb (two) - lt off tb (three) - UP HSI SEL MODE - ENTRY SOURCE (two) - NAV,2 FLT CNTLR PWR - ON RAD ALTM - 2 ADI ATT - REF ERR - MED RATE - MED AIR DATA - NAV
F9	AC VOLTS sel - as reqd DC VOLTS/AMP sel - VOLTS MNB
R1	CNTL BUS PWR (three) - dn ESS BUS SOURCE MN (three) - ON FC (three) - ON <span style="border: 1px solid black; padding: 2px;">OFF</span> FC/MN BUS (three) - ctr (tb-ON) MN BUS TIE (three) - ctr (tb-OFF) PL CAB - OFF PRI MNB - ctr (tb-OFF)

NOT FLOWN

R1	PL PRI FC3 - ctr (tb-OFF) MNC - ctr (tb-OFF) AUX - OFF AFT MNB - OFF MNC - OFF INV PWR (three) - ctr (tb-ON) INV/AC BUS (three) - ctr (tb-ON) cb AC CONTR (nine) - op { } AC BUS SNSR (three) - MON
R1	(CRYO) O2 MANF VLV (two) - ctr (tb-OP) TK1,2 HTRS A (two) - AUTO B (two) - OFF O2 TK1,2 HTRS RESET/TEST (two) - ctr O2 TK3 HTRS (two) - OFF RESET/TEST - ctr FC REAC (three) - ctr tb (six) - OP (three) - ctr RDY tb (three) - gray COOL PUMP ΔP tb (three) - gray H2 MANF VLV (two) - ctr (tb-OP) TK1,2 HTRS A (two) - AUTO B (two) - OFF TK3 HTRS (two) - OFF
R2	MPS PRPLT DUMP (two) - GPC ENG PWR (six) - ON He ISOL (six) - OP <span style="border: 1px solid black; padding: 2px;">GPC</span> PNEU L ENG He XOVR - GPC He ISOL - OP <span style="border: 1px solid black; padding: 2px;">GPC</span> LH2 ULL PRESS - AUTO He I'CNCT (three) - GPC

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ASC/117/FIN

## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

R2	APU/HYD RDY tb (three) – bp APU OPER (three) – START/RUN <span style="border: 1px solid black; padding: 2px;">OFF</span> SPEED SEL (three) – NORM HYD MN PUMP PRESS (three) – NORM cb APU FU TK VLV ENA (six) – cl { } <span style="border: 1px solid black; padding: 2px;">op</span> HYD CIRC PUMP (three) – OFF <span style="border: 1px solid black; padding: 2px;">GPC</span> APU CNTLR PWR (three) – ON <span style="border: 1px solid black; padding: 2px;">OFF</span> FU TK VLV (three) – OP <span style="border: 1px solid black; padding: 2px;">CL</span> AUTO SHTDN (three) – ENA BLR CNTLR/HTR (three) – A PWR (three) – ON N2 SPLY (three) – ON <span style="border: 1px solid black; padding: 2px;">OFF</span> ET UMB DR MODE – GPC CTRLN LAT – GND (tb-bp) L,R DR (two) – OFF (tb-OP) LAT (two) – OFF (tb-REL)	C2	IDP/CRT PWR (three) – ON MAJ FUNC (three) – GNC SEL (two) – as reqd EVENT TIMER MODE – DN CNTL – ctr TIMER SET pb (four) – 0900 TIMER – ctr
		C3	OMS ENG (two) – ARM/PRESS <span style="border: 1px solid black; padding: 2px;">OFF</span> BFC CRT DISP – ON <span style="border: 1px solid black; padding: 2px;">OFF</span> SEL – 3+1 FCS CH (four) – AUTO BDY FLP – AUTO/OFF AIR DATA PROBE STO (two) – INH MN ENG LIMIT SHUTDN – AUTO TRIM R,P,Y (three) – ctr SBTC – full forward DAP – all off SRB SEP – AUTO ET SEP – AUTO AUD CTR – 1 OI PCMMU PWR – 1 <span style="border: 1px solid black; padding: 2px;">OFF***</span> FORMAT – GPC S-BD PM CNTL – CMD ANT sel – GPC AIR DATA PROBE (two) – STOW FC REAC VLV (three) – dn cb FC REAC VLV CL ENA (three) – op { R } UPLK – ENA MSTR MADS PWR – ON C/W MEM – ctr MODE – NORM
R4	HYD BK HTR (three) – OFF ISOL VLV (three) – GPC (tb-CL) MPS/TVC ISOL VLV (three) – ctr (tb-OP) LG/NWS HYD SYS – AUTO 1/2 LG EXTD ISO VLV – GPC (tb-CL) MPS ENG CNTLR HTR (three) – OFF MANF PRESS (two) – GPC FILL/DRAIN (four) – GND H2 PRESS LN VENT – GND LO2 PREVLV (three) – GPC LH2 PREVLV (three) – GPC FDLN RLF ISOL (two) – GPC		
R6	R COMM PWR – ON <span style="border: 1px solid black; padding: 2px;">OFF</span>		
R side OVHD Flood – BRT			

NOT FLOWN

9-6

ASC/117/FIN

## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

C3	RTG PUMP (OV103,4 – no SH) – PRI SHORT ENA (two) (OV104 – no SH) – DSBL SHORT (two) (OV104 – no SH) – OFF PL SAFING (four) (OV103 – no SH) – SAFE (five) (OV105 – no SH) – SAFE SH FIRE SUPPR ARM (two) (SH only) – SAFE DISCH (two) (SH only) – NO-OP H2O LN HTR (SH only) – OFF EMER LTG – OFF/ON	O5	L AUD TACAN ID (two) – OFF,1 VOX SENS sel – as reqd A/G (two) – T/R A/A – T/R ICOM (two) – T/R PWR – AUD/TONE CNTL sel – NORM XMIT/ICOM MODE sel – as reqd (PTT/VOX recommended) VOL pb (five) – as reqd TACAN pb – 5 PAGE – dn
C5	DIRECT O2 vlv – CL		
S2	PL SEAT PWR BUS SEL – AC3 (dn) CONTR (two) – ctr		
C6	LEH O2 vlv (four) – OP		
C7	LEH O2 SPLY vlv (two) – OP		
O1	COAS – OFF AIR TEMP sel – CAB HX OUT H2O PUMP OUT PRESS sel – LOOP 2 FREON sel – LOOP 1 O2/N2 FLOW sel – SYS 1 O2 PPO2 sel – SNSR A	O6	LTG PNL sel (two) – OFF – (1/4 brt if night launch) INST L/CTR sel – OFF – (1/4 brt if night launch) OVHD sel – as reqd – (1/4 brt if night launch) L GLRSHLD FLOOD sel (two) – VAR, as reqd L SEAT/CTR CNSL FLOOD sel (two) – OFF,BRT S TRK DR CNTL (two) – OFF POS tb (two) – CL PWR (two) – OFF UHF SPLX/EVA XMIT FREQ – 259.7/414.2 PWR AMP – ON SPLX SQUELCH – ON EVA STRING – 1 ENCRYPT – ON MODE – SPLX
O2	CRYO O2 HTR ASSY TEMP sel – TK1 1 O2/H2 sel – TK1 FC STACK TEMP sel – 1		
O3	RCS/OMS PRESS sel – RCS He X 10 PRPLT QTY sel – OMS FUEL MSN TIME – MET		

NOT FLOWN

9-7

ASC/117/FIN

## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

O6	ANNUN LAMP TEST – ctr BUS SEL ACA 1 – MNA 2/3 – MNB INTEN sel (two) – BRT, MED MTU – AUTO INT DISP PROC (four) – dn MDM PL1,2 (two) – ON PL3 – OFF FA (four) – ON FF (four) – ON GPC PWR (five) – ON OUTPUT 1,2,3,4 (four) – NORM (tb-gray) 5 – B/U <span style="border: 1px solid black; padding: 2px;">NORM</span> (tb-bp) IPL SOURCE – OFF GPC MODE 1,2,3,4 (four) – RUN (tb-RUN) 5 – RUN <span style="border: 1px solid black; padding: 2px;">STBY</span> (tb-RUN)		O8 RADAR ALTM (two) – ON <span style="border: 1px solid black; padding: 2px;">OFF</span> MLS (three) – OFF MLS CH pb/tw (three) – 6 R SEAT/CTR CNSL FLOOD sel (two) – OFF, BRT LTG PNL R sel (three) – OFF – (1/4 brt if night launch) NUMERIC sel – BRT – (1/4 brt if night launch) R GLRSHLD FLOOD sel (two) – VAR, as reqd OMS KIT He PRESS/VAP ISOL (two) – CL TK ISOL (two) – CL (tb-bp) L OMS He PRESS/VAP ISOL (two) – GPC TK ISOL (two) – GPC (tb-OP) XFEED A – GPC (tb-CL) B – GPC (tb-CL) <span style="border: 1px solid black; padding: 2px;">(tb-OP)</span> R OMS He PRESS/VAP ISOL (two) – GPC TK ISOL (two) – GPC (tb-OP) XFEED (two) – GPC (tb-CL) FWD RCS He PRESS (two) – OP (tb-OP) TK ISOL (two) – GPC (tb-OP) MANF ISOL (five) – GPC (tb-OP) ANNUN LAMP TEST – ctr
O7	TACAN MODE sel (three) – GPC <span style="border: 1px solid black; padding: 2px;">OFF</span> ANT SEL (three) – AUTO <span style="border: 1px solid black; padding: 2px;">as is</span> CH pb/tw (three) – 059Y <span style="border: 1px solid black; padding: 2px;">as is</span> AFT L RCS He PRESS (two) – OP (tb-OP) TK ISOL (three) – GPC (tb-OP) MANF ISOL (five) – GPC (tb-OP) XFEED (two) – GPC (tb-CL) MSTR RCS XFEED – OFF AFT R RCS He PRESS (two) – OP (tb-OP) TK ISOL (three) – GPC (tb-OP) MANF ISOL (five) – GPC (tb-OP) XFEED (two) – GPC (tb-CL)	O9	R AUD PWR – AUD/TONE A/G (two) – T/R A/A – T/R ICOM (two) – T/R VOX SENS sel – as reqd TACAN ID (two) – OFF, as reqd

NOT FLOWN

9-8

ASC/117/FIN

## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

O9 R AUD PAGE - dn  
 VOL pb/tw (five) - as reqd  
 VOL TACAN pb/tw - 5  
 XMIT/ICOM MODE sel - as reqd (PTT/VOX recommended)  
 CNTL sel - NORM

O13: All cbs - cl { } except:  
 :A,C,E cb ESS MN CONTR (three) - cl { } op

O14:A BRAKES MNA - ON  
 RGA 1 - ON  
 IMU 1 - ON  
 FC1 CNTLR - ON  
 :B,C,D,E All cbs - cl { } except:  
 :B cb MNA MNC CONTR - cl { } op  
 :C RAD ISOL CONTR - cl { }  
 :D GPS PRE AMPL UC (OV103,5) - op {R}  
 LC (OV103,5) - cl { }  
 1 PRE AMPL (two)(OV104) - op {R}  
 CAB VENT - cl {O}  
 ISOL - cl {O}  
 :E ADTA 1 - cl {G}  
 ACCEL 1 - cl {G}  
 DDU AFT - op {Y}  
 :F MMU 1 - ON  
 RJDA 1A L2/R2 LOGIC - ON  
 DRIVER - ON OFF  
 2A L4/R4 LOGIC - ON  
 DRIVER - ON OFF  
 RJDF 1B F1 LOGIC - ON  
 DRIVER - ON OFF

O14:F L OMS ENG VLV - ON OFF  
 ASA 1 - ON

O15:A BRAKES MNB - ON  
 RGA (two) - ON  
 IMU 2 - ON  
 FC2 CNTLR - ON  
 :B,C,D,E All cbs - cl { } except:  
 :B cb MNB MNA CONTR - cl { } op  
 :C UTIL PWR F1/MO13Q - op {Y}  
 :E ADTA 2 - cl {G}  
 ACCEL 2 - cl {G}  
 DDU R - cl {G}  
 :F MMU 2 - ON  
 RJDA 1B L1/L5/R1 LOGIC - ON  
 L1/R1 DRIVER - ON OFF  
 RJDF 1A F2 LOGIC - ON  
 DRIVER - ON OFF  
 ASA 2 - ON  
 ACCEL 4 - ON

O16:A BRAKES MNC - ON  
 RGA 3 - ON  
 IMU 3 - ON  
 FC3 CNTLR - ON  
 :B,C,D,E All cbs - cl { } except:  
 :B cb MNC MNB CONTR - cl { } op  
 :D GPS PRE AMPL UC (OV103,5) - cl { }  
 LC (OV103,5) - op {R}  
 3 PRE AMPL (two)(OV104) - op {R}  
 O2 EMER - op {R}

NOT FLOWN

9-9

ASC/117/FIN

## FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

O16:E	cb MNC ADTA 3,4 (two)	- cl	{G}
	DDU R	- cl	{G}
	AFT	- op	{Y}
:F	RJDA 2B L3/R3/R5 LOGIC	- ON	
	L3/R3 DRIVER	- ON	<span style="border: 1px solid black; padding: 2px;">OFF</span>
	RJDF 2A F3 LOGIC	- ON	
	DRIVER	- ON	<span style="border: 1px solid black; padding: 2px;">OFF</span>
	RJDF 2B F4/F5 LOGIC	- ON	
	F4 DRIVER	- ON	<span style="border: 1px solid black; padding: 2px;">OFF</span>
	R OMS ENG VLV	- ON	<span style="border: 1px solid black; padding: 2px;">OFF</span>
	ASA 3,4 (two)	- ON	
	ACCEL 3	- ON	
	RJD MANF L5/F5/R5/DRIVER	- OFF	
<hr/>			
O17:A	ATVC (four)	- ON	
:B	EIU (three)	- ON	
:C	SIG CONDR FREON A	- AC2	
	B	- AC3	
	OL 1/2	- ON	
	OR 1/2	- ON	
:D	SIG CONDR OA 1/2/3	- ON	
	MDM OA 1/2/3	- ON	
	MEC (two)	- ON	
<hr/>			
O19	TV PWR	- ON	<span style="border: 1px solid black; padding: 2px;">OFF</span>
	DC UTIL PWR MNA	- ON	
	COAS PWR	- OFF	
<hr/>			

NOT FLOWN

9-10

ASC/117/FIN



## MIDDECK SWITCH LIST FOR HANDOVER INGRESS

<p>ML86B:A    cb MNA SPLY H2O TKA INLET            - cl { }</p> <p style="padding-left: 20px;">TKB OUTLET                                    - cl { }</p> <p style="padding-left: 20px;">WASTE H2O DUMP VLV/NOZ HTR - op {Y}</p> <p style="padding-left: 20px;">H2O LINE HTR A                                - op {Y}</p> <p style="padding-left: 20px;">MNB SPLY H2O TKB INLET                       - cl { }</p> <p style="padding-left: 40px;">TKC OUTLET                                    - cl { }</p> <p style="padding-left: 40px;">DUMP ISOL                                      - op {Y}</p> <p style="padding-left: 40px;">B SPLY ISOL VLV                               - cl { }</p> <p style="padding-left: 20px;">H2O LINE HTR B                                - op {Y}</p> <p style="padding-left: 20px;">MNC SPLY H2O TKA OUTLET                      - cl { }</p> <p style="padding-left: 40px;">TKC INLET                                      - cl { }</p> <p style="padding-left: 40px;">DUMP VLV/NOZ HTR                            - op {Y}</p> <p style="padding-left: 40px;">XOVR VLV                                       - cl { }</p> <p style="padding-left: 40px;">GALLEY SPLY                                   - op {Y}</p> <p>:B    cb MNA WASTE H2O TK1 VLV               - cl { }</p> <p style="padding-left: 20px;">SPLY H2O TKD OUTLET                        - cl { }</p> <p style="padding-left: 20px;">WASTE H2O DUMP ISOL                        - op {Y}</p> <p style="padding-left: 20px;">VAC VENT ISOL VLV                           - op {Y}</p> <p style="padding-left: 20px;">WCS CNTLR                                     - op {Y}</p> <p style="padding-left: 20px;">GALLEY OVEN                                  - op {Y}</p> <p style="padding-left: 20px;">MNB WASTE H2O TK1 DRAIN                    - cl { }</p> <p style="padding-left: 20px;">SPLY H2O TKD INLET                           - cl { }</p> <p style="padding-left: 20px;">VAC VENT NOZ HTR                            - op {Y}</p> <p style="padding-left: 40px;">ISOL VLV                                       - op {Y}</p> <p style="padding-left: 20px;">WCS CNTLR                                     - op {Y}</p> <p style="padding-left: 20px;">GALLEY H2O HTR                               - op {Y}</p> <p>:C    cb MNA EXT ARLK HTR LINE ZN1 - op {Y}</p> <p style="padding-left: 20px;">    ZN2 - op {Y}</p> <p style="padding-left: 20px;">STRUC    - op {Y}</p>	<p>ML86B:C    cb MNA EXT ARLK HTR VEST               - op {Y}</p> <p style="padding-left: 20px;">MNB EXT ARLK HTR LINE ZN1                - op {Y}</p> <p style="padding-left: 40px;">    ZN2    - op {Y}</p> <p style="padding-left: 40px;">H2O S/O VLV                                   - cl { }</p> <p style="padding-left: 40px;">STRUC     - op {Y}</p> <p style="padding-left: 40px;">VEST     - op {Y}</p> <p style="padding-left: 20px;">MNC EXT ARLK HTR LINE ZN1                - op {Y}</p> <p style="padding-left: 40px;">    ZN2    - op {Y}</p> <p>:D    cb MNA PYRO JETT SYS A KU ANT           - op {R}</p> <p style="padding-left: 20px;">STBD RMS                                      - op {R}</p> <p style="padding-left: 20px;">MMU GN2 SPLY ISOL VLV A                   - op {Y}</p> <p style="padding-left: 40px;">PORT HTR A                                    - op {R}</p> <p style="padding-left: 40px;">STBD HTR A                                   - op {R}</p> <p style="padding-left: 20px;">MNB PYRO JETT SYS A PORT RMS            - op {R}</p> <p style="padding-left: 20px;">MMU GN2 SPLY ISOL VLV B                   - op {R}</p> <p style="padding-left: 40px;">PORT HTR B                                   - op {R}</p> <p style="padding-left: 40px;">STBD HTR B                                   - op {R}</p> <p style="padding-left: 20px;">MNC PYRO JETT SYS B KU ANT               - op {R}</p> <p style="padding-left: 40px;">PORT RMS                                      - op {R}</p> <p style="padding-left: 40px;">STBD RMS                                      - op {R}</p> <p>:E    cb MNA EMU 2 H2O SPLY                    - op {Y}</p> <p style="padding-left: 20px;">    WASTE                                        - op {Y}</p> <p style="padding-left: 20px;">FC PCM                                         - cl { }</p> <p style="padding-left: 20px;">CO2 SYS 1 CNTLR (OV104,5)                - op {R}</p> <p style="padding-left: 20px;">FLOOD TNL ADAPT 2                          - op {R}</p> <p style="padding-left: 20px;">    - (op {Y} if SH flown)</p>
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NOT FLOWN

9-11

ASC/117/FIN

## MIDDECK SWITCH LIST FOR HANDOVER INGRESS

ML86B:E   cb MNB MAR 1   -cl { }  
                   2   -op {Y}  
           SEAT L   -cl { }  
                   R   -cl { }  
           CO2 COM INSTR (OV104,5) -op {R}  
           FLOOD TNL ADAPT 3 -op {R}  
                                   -op {Y} if SH flown)  
           MNC EMU 1 H2O SPLY   -op {Y}  
                   WASTE   -op {Y}  
           SEAT L   -cl { }  
                   R   -cl { }  
           CO2 SYS 2 CNTLR (OV104,5) -op {R}  
           FLOOD TNL ADAPT 4 -op {R}  
                                   -op {Y} if SH flown)  
 :F   cb MNA FLOODS MIDDECK 1/8 -cl { }  
                   WMC/MO13Q -op {Y}  
                   AIRLK 1   -op {Y}  
                   MIDDECK 9   -op {Y}  
           CRYO O2 HTR TK3 SNSR 1 -cl { }  
                   TK5 SNSR 1 -cl { }  
                                   -op {R} if  
                                   TK5 not flown)  
           MNB FLOODS MIDDECK 2/6 -cl { }  
                   BUNK 2/4   -op {Y}  
                   MIDDECK 10 -op {Y}  
                   AIRLK 3   -op {Y}  
           CRYO O2 HTR TK3 SNSR 2 -cl { }  
                   TK4 SNSR 1 -cl { }  
                                   -op {R} if  
                                   TK4 not flown)

ML86B:F   cb MNC FLOODS MIDDECK 5/7   -cl { }  
                                   3/4/MO13Q -cl { }  
                   BUNK 1/3   -op {Y}  
                   AIRLK 4   -op {Y}  
           CRYO O2 HTR TK5 SNSR 2 -cl { }  
                                   -op {R} if  
                                   TK5 not flown)  
           TK4 SNSR 2   -cl { }  
                                   -op {R} if  
                                   TK4 not flown)  
 :G   cb ESS 1BC FLOOD AIRLK 2   -op {Y}  
                   TNL ADAPT 1   -op {R}  
                                   -op {Y} if  
                                   SH flown)  
           CRYO CNTLR TK4 (two) -cl { }  
                                   -op {R} if  
                                   TK4 not flown)  
           QTY TK4 (two)   -cl { }  
                                   -op {R} if  
                                   TK4 not flown)  
           2CA CRYO CNTLR TK5 (two) -cl { }  
                                   -op {R} if  
                                   TK5 not flown)  
           QTY TK5 (two)   -cl { }  
                                   -op {R} if  
                                   TK5 not flown)  
           3AB CRYO CNTLR TK3 (two) -cl { }  
                   QTY TK3 (two)   -cl { }

NOT FLOWN

9-12

ASC/117/FIN

## MIDDECK SWITCH LIST FOR HANDOVER INGRESS

ML85E (MUP – if reqd)  
 AC S1 – OFF  
 cb AC CB1 – op { Y }  
 DC 10 AMP MNB S2 – OFF  
           S3 – ON  
           S4 – OFF  
           S5 – OFF  
 cb DC 10 AMP MNB CB2 – op { Y }  
                   CB3 – cl { }  
                   CB4 – op { Y }  
                   CB5 – op { Y }  
 PUMPS S6 – OFF  
 cb PUMPS (two) – op { Y }

---

SORG (NOTE: Panel deleted if Galley not flown)  
 OVEN FAN – OFF  
 H2O HOT(COLD) pb (two) – lt off  
           VOL sel – as reqd  
 MV2 – as reqd  
 REHYD STA Lever – CL, latched  
 OVEN/RHS – OFF  
 H2O HTR (two) – OFF  
 AUX PORT – cap installed  
 TEST PORT 4 – cap installed  
 ELECT TEST PORT – cap installed  
 OVEN DOOR – CL

---

MO13Q MIDDECK FLOODS 1,2,3,5,7 (five) – OFF  
                   9,10 (two) – OFF  
                   4,6,8 (three) – ON  
                   MO13Q LTG – OFF

MO13Q AIRLK FAN (two) – OFF  
 H2O S/O VLV – ctr (tb-OP)  
 AIRLK 2 – OFF/ON  
 TNL ADAPT 1 – OFF/ON  
 DC UTIL PWR MNB – OFF  
 AC UTIL PWR AC3 – OFF

---

ML31C WASTE H2O TK1 DRAIN VLV – ctr (tb-OP)  
                   VLV – ctr (tb-OP)  
                   DUMP ISOL VLV – ctr (tb-bp)\*\*  
                   VLV – ctr (tb-bp)\*\*  
                   VLV ENA/NOZ HTR – OFF  
 SPLY H2O TKD INLET – ctr (tb-OP)  
                   OUTLET – ctr (tb-OP)  
 VAC VENT ISOL VLV BUS SEL – MNA  
                   CNTL – ctr (tb-bp)\*\*  
                   NOZ HTR – OFF

---

ML26C SPLY H2O GN2 TKA SPLY vlv – CL  
                   TK VENT vlv – VENT

---

ML18F EMER LTG – ON/OFF  
 WMC FLOOD – OFF

---

ML30N Neg Press Relief vlv cap (two) – installed/seated

---

MA73C:A,B MCA LOGIC MNA (four) – ON  
                   MNB (six) – ON  
                   MNC (four) – ON  
 :C,D All cbs – cl { }  
 :E All cbs – op { Y } except:  
       cb AC2 PL 3Φ – op { Y }  
       AC3 PL 3Φ – op { Y }

NOT FLOWN

9-13

ASC/117/FIN



## MIDDECK SWITCH LIST FOR HANDOVER INGRESS

MO51F (CO2 RMVL SYS (RCRS) – OV104,5)  
 CNTLR lts (four) – off  
 MNA – OFF  
 AC1 – ctr  
 CNTLR 1 MODE – ctr  
 COM INSTR – OFF  
 MNC – OFF  
 AC3 – ctr  
 CNTLR 2 MODE – ctr  
 All cbs (six) (OV104,5) – op { R }

---

MO58F TV PWR – OFF

---

MO52J DC UTIL PWR MNA – ON  
 AC UTIL PWR AC1 – OFF  
 MSTR ALARM pb – lt off

---

MO69M LEH O2 7 vlv – CL (OP if seat 7 flown)  
 8 vlv – CL

---

MD44F CAB TEMP CNTL LINK – PRI ACT (pinned)  
 vlv – FULL COOL (**ccw** by  
 using AUTO TEMP  
 CNTLR 1)  
 SEC ACT – FULL HEAT (**cw** by  
 using AUTO TEMP  
 CNTLR 2)

---

### MIDDECK FLOOR

EMU O2 ISOL VLV – CL  
 CAB PURGE VLV – CL  
 ISOL VLV – CL

---

### MO63P (OV103,4 only)

cb CB2/J2 – op { Y }  
 CB3/J3 – op { Y }  
 CB4/J4 – op { Y }  
 CB5/J5 – op { Y }  
 CB6/J6 – op { Y }  
 RLY PWR – op { Y }

J2 – OFF  
 J3 – OFF  
 J4 – OFF  
 J5 – OFF  
 J6 – OFF  
 Left select – 10A  
 Right select – 10A

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NOT FLOWN

9-15

ASC/117/FIN

MIDDECK EXPERIMENTS SWITCH LIST FOR HANDOVER **INGRESS**

MIDDECK (TEPC)  
SW-1 – OFF

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NOT FLOWN

9-16

ASC/117/FIN

## AIRLOCK SWITCH LIST FOR HANDOVER INGRESS

AW18A LTG FLOOD 1,3,4 (three) – OFF  
2 – ON/OFF

AW18D AIRLK AUD PWR – OFF  
A/G 1 – T/R  
A/G 2 – RCV  
A/A – T/R  
ICOM (two) – T/R  
PAGE – dn  
VOL pb (five) – as reqd  
CNTL – NORM  
VOX SENS sel – as reqd  
MSTR VOL 1 sel – MAX  
XMIT/ICOM MODE sel – PTT/VOX  
MSTR VOL 2 sel – MAX

AW18H PWR/BATT CHGR EMU BUS SEL (two) – OFF  
MODE (two) – OFF  
INPUT – EMU 1

AW82B AIRLK DEPRESS vlv – CL  
cap – installed  
O2 vlv (two) – CL

AW82D EMU H2O (four) – ctr (tb-CL)  
CCU PWR (two) – OFF

AW82H EMU H2O SPLY WASTE reg (two) – REGULATING

TW58T (NOTE: Panel deleted if SH not flown)  
TNL LTG FLOOD 1 – ON/OFF  
2,3,4 (three) – OFF  
ADP PL ISOL VLV – CL  
cap – installed

### AIRLOCK INNER HATCH

Actuator Handle – LAT  
Lock Lever – LOCK  
Equal vlv (two) – NORM  
cap (two) – installed

### AIRLOCK OUTER HATCH (if SH-C HATCH)

Actuator Handle – LAT  
Lock Lever – LOCK  
Equal vlv (two) – OFF  
cap (two) – installed

### SH HATCH (D HATCH) (if SH flown)

Actuator Handle – LAT  
Lock Lever – LOCK  
Equal vlv (two) – OFF  
cap (two) – installed

### EXT AIRLOCK UPPER HATCH (if EXT A/L flown)

Actuator Handle – LAT  
Lock Lever – LOCK  
Equal vlv (two) – OFF  
cap (two) – installed

### TUNNEL ADAPTER HATCH (if flown)

Actuator Handle – LAT  
Lock Lever – LOCK  
Equal vlv (two) – OFF  
cap (two) – installed

NOT FLOWN

9-17

ASC/117/FIN 1

## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

R12L NOTE: Panel may be blank if no PL requirement  
(See 9-23 or 9-24)

R11U	FC GPC PURGE SEQ    - dn (tb-bp) PURGE HTR           - GPC VLVS (three) - GPC STARTUP HTR (three) - ENA H2O LINE HTR       - A AUTO RELIEF HTR   - A AUTO MDU PWR             - ON BRT sel       - as reqd	
R11L	IDP/CRT4 PWR         - ON MAJ FUNC       - SM ENCRYPTOR            - NORM MS AUD CNTL         - NORM SPLY H2O TKA INLET   - ctr (tb-OP) OUTLET         - ctr (tb-CL) TKB INLET       - ctr (tb-OP) OUTLET         - ctr (tb-OP) TKC INLET       - ctr (tb-OP) OUTLET         - ctr (tb-OP) DUMP ISOL VLV       - ctr (tb-bp)** VLV             - ctr (tb-bp)** ENA/NOZ HTR - OFF XOVR VLV             - ctr (tb-CL) GALLEY SPLY VLV     - ctr (tb-bp)** B SPLY ISOL VLV     - ctr (tb-OP)	

R10	MS AUD PWR A/G (two)       - T/R A/A             - T/R ICOM (two)      - T/R VOX SENS sel    - as reqd PAGE            - dn VOL pb (five)   - as reqd XMIT/ICOM MODE sel - as reqd (PTT/VOX recommended)	
	LTG PNL sel           - OFF FLOOD sel (two) - ON,BRT - (OFF,BRT if night launch)	
	BIOMED CH 1 sel      - MIDDECK CTR 2 sel     - MIDDECK R	
R13U	C/W TONE VOL (two)   - as is PARAM STATUS   - ctr MEM             - ctr LAMP TEST       - ctr PARAM SEL pb (three) - 120 LIMIT SET VALUE pb (three) - 000 LIMIT     - LOWER FUNC       - ctr PARAM            - ctr	



## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

R13L	PL BAY DR SYS (two) – DSBL MECH PWR SYS (two) – OFF DR – STOP (tb-as is) RAD LAT CNTL (two) – OFF (tb-LAT) CNTL (two) – OFF (tb-STO) KU ANT DIRECT STO – OFF ANT – GND (tb-STO) MMU GN2 SPLY ISOL VLV (two) – ctr (tb-bp)**		A1L	S-BD PL CNTL – CMD ANT POLAR – L CIRC XMTR PWR – LO CH SEL INTRG 1,2 tw (six) – 910,910 FREQ SWEEP – OFF MOD – OFF PWR SYS – OFF SEL – PSP PSP CMD OUTPUT – PL UMB PL DATA INTLVR PWR – ON S-BD PM ANT SW ELEC – 1 PRE AMPL – 1 PWR AMPL STBY – 1 OPER – 1 MODE sel – STDN HI XPNDR – 1 NSP DATA RATE XMIT – HI RCV – HI UPLK DATA – S-BD CODING XMIT – OFF RCV – ON PWR – 1 ENCRYPTION PWR – ON MODE – SEL SEL – RCV
A1U	SLEW AZM – ctr ELEV – ctr RATE – SLOW SIG STRENGTH sel – S-BD PM KU tb (three) – bp sel (two) – MAN SLEW,dn PWR – OFF MODE – RDR PASSIVE RADAR OUTPUT – HI CNTL – CMD SIG PROC HDR – TV LDR – MMU 1 TAGS – CLEAR			

NOT FLOWN

9-19

ASC/117/FIN

## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A1R	S-BD FM CNTL	- CMD
	ANT	- GPC
	PWR	- 1
	DATA SOURCE sel	- ME
	AUD CTR VOICE RCD SEL CH 1 sel	- ICOM A
	2 sel	- ICOM B
	DOCK RING (seven)	- OFF
	SL (seven)	- OFF
	UHF A/G (two)	- OFF
	A/A	- OFF
	PL BAY OUTLETS ICOM (two)	- OFF
<hr/>		
	AFT MDU MDU PWR	- OFF
	BRT sel	- as reqd
<hr/>		
A6U	DAP - all off	
	SENSE: -Z	
	FLT CNTLR PWR	- OFF
	Unused rotary sw	- full c/w
	ADI ATT	- INRTL
	ERR	- MED
	RATE	- MED
	OS LTG FLOOD sel (two)	- ON,BRT
	PNL sel	- OFF
	INST sel	- OFF
	NUMERIC sel	- OFF
	ANNUN BUS SEL	- OFF
	LAMP TEST	- ctr
	INTEN sel (two)	- VAR,MED
	EVENT TIMER SET tw (four)	- as reqd
	MODE	- UP
	CNTL	- ctr
	TIMER	- ctr

A6U	PL RETEN LOGIC PWR (two)	- OFF
	PL SEL	- MON
	LAT (five)	- OFF (tb-bp)
	RDY tb (five)	- bp
<hr/>		
A6L	(DSP)	
	cb ESS SYS PWR CNTL (two)	- op { Y }
	DEP (four)	- op { Y }
	DOCK LT (four)	- op { Y }
	MN LOG (six)	- op { Y }
	PMA 2/3 GRP 1 HOOKS SYS A (two)	- op { R }
	B (two)	- op { R }
	2 HOOKS SYS A (two)	- op { R }
	B (two)	- op { R }
	SYS PWR (two)	- ctr (tb-OFF)
	PMA 2/3 HOOKS (two)	- ctr (tb-bp)
	PYRO PWR (two)	- OFF
	PSU PWR (two)	- OFF
	VEST DEP VLV (four)	- ctr (tb-bp)**
	LTS (four)	- OFF
<hr/>		
A6L	cb MADS PWR MNB	- cl { }
	MADS RCDR PWR	- PCM/WB ENA
	PB FWD	- CMD
	STRAIN GAGE	- PCM ENA
	WB/ACIP PCM	- CMD
	PCM	- CMD
	RCD MODE	- SAMPLE
	FDM CNTL	- DATA
	MAN CALBR sel	- DC 0
	ACIP HTR	- OFF

NOT FLOWN

9-20

ASC/117/FIN

## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A2	DIGI-DIS SEL – EL/AZ	
	X-PNTR SCALE – X10	
<hr/>		
A7U	MSTR ALARM pb	– lt off
	PL BAY FLOOD (eight)	– OFF
	PORT RMS LIGHT	– OFF
	CAMR	– WRIST
	WIRELESS VIDEO (two)	– OFF
	TV CAMR PWR (five)	– ctr (tb-OFF)
	PWR CNTL	– CMD
	CONTR UNIT	– OFF
	DNLK	– ENA
	SYNC	– NORM
	VID IN pb (thirteen)	– lt off
	OUT pb (eight)	– lt off
	CAMR CMD PAN/TILT	– LO RATE
	FOCUS	– ctr
	ZOOM	– ctr
	IRIS	– ctr
	TILT	– ctr
	PAN	– ctr
	MENU pb (three)	– lt off
	MODE pb (three)	– lt off
<hr style="border-top: 1px dashed black;"/>		
A7L	(APDS CNTL PNL)	
	CNTL PNL PWR (three)	– OFF
	HTRS/DCU PWR (three)	– OFF
	APDS PWR (three)	– OFF (lt off)
	STATUS lts (thirty-six)	– off
	PYROS (three)	– OFF (lt off)
	PYRO CIRC PROT OFF lts (two)	– off
<hr/>		
A4	MSN TIMER sel	– MET
<hr/>		

NOT FLOWN

9-21

ASC/117/FIN

## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

<p>A8U (This panel may be replaced or deleted if RMS not flown)</p> <ul style="list-style-type: none"> <li>RMS Mode lts (twelve) – off</li> <li>BRAKES – ON (tb-OFF)</li> <li>SAFING – AUTO (tb-bp)</li> <li>MODE sel – TEST</li> <li>AUTO SEQ – ctr</li> <li style="padding-left: 20px;">lts (two) – off</li> <li>S/W STOP tb – gray</li> <li>C/W TONE VOL – as reqd</li> <li style="padding-left: 20px;">lts (eleven) – off</li> <li>MSTR ALARM pb – lt off</li> <li>RATE MIN tb – OFF</li> <li style="padding-left: 20px;">HOLD tb – OFF</li> <li style="padding-left: 20px;">SCALE tb – gray</li> <li>EE MODE – OFF</li> <li style="padding-left: 20px;">MAN CONTR – ctr</li> <li style="padding-left: 20px;">tb (six) – bp</li> <li>B/U JOINT sel – SY</li> <li style="padding-left: 20px;">PL REL – OFF</li> <li style="padding-left: 20px;">DR – ctr</li> <li>PARAM sel – PORT TEMP</li> <li>LTG ANNUN/NUM sel (two) – VAR,LO</li> <li style="padding-left: 20px;">PNL/INST sel – OFF</li> <li>JOINT sel – CRIT TEMP</li> <li>SINGLE/DIRECT DR – ctr</li> <li>SHDLR BRACE REL – ctr (tb-bp)</li> </ul> <hr style="border-top: 1px dashed black;"/>	<p>A8L (This panel may be deleted if RMS not flown)</p> <ul style="list-style-type: none"> <li>STBD RMS – OFF (tb-STO)</li> <li style="padding-left: 20px;">– (OFF (tb-bp) if no MPMs present)</li> <li style="padding-left: 40px;">RETEN LAT – OFF (tb-LAT)</li> <li style="padding-left: 20px;">– (OFF (tb-bp) if no MRLs present)</li> <li style="padding-left: 40px;">HTR (two) – OFF</li> <li style="padding-left: 20px;">R-F-L tb (three) – gray</li> <li style="padding-left: 40px;">– (bp if no RMS/OBSS flown)</li> <li>RMS SEL – OFF</li> <li style="padding-left: 20px;">PWR – OFF</li> <li>PORT RMS – OFF (tb-STO)</li> <li style="padding-left: 20px;">– (OFF (tb-bp) if no MPMs present)</li> <li style="padding-left: 40px;">HTR (two) – OFF</li> <li style="padding-left: 20px;">RETEN LAT – OFF (tb-LAT)</li> <li style="padding-left: 20px;">– (OFF (tb-bp) if no MRLs present)</li> <li style="padding-left: 40px;">R-F-L tb (three) – gray</li> <li style="padding-left: 40px;">– (bp if no RMS flown)</li> <li>RMS RHC RATE – VERN</li> </ul> <hr style="border-top: 1px solid black;"/> <p>A3</p> <ul style="list-style-type: none"> <li>MON CONTRAST (two) – ctr</li> <li style="padding-left: 20px;">BRT (two) – ctr</li> <li style="padding-left: 20px;">COLOR (two) – as reqd</li> <li style="padding-left: 20px;">TINT (two) – as reqd</li> <li style="padding-left: 20px;">FUNCTION (two) – ctr</li> <li style="padding-left: 20px;">PWR (two) – OFF</li> </ul> <hr style="border-top: 1px solid black;"/>
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NOT FLOWN

9-22

ASC/117/FIN

**AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS**

L9 PS FLOOD sel (two) – ON,BRT  
                                   – (OFF,BRT if night launch)  
       AUD PWR                  – AUD/TONE  
       A/G (two)              – T/R  
       A/A                      – T/R  
       ICOM (two)             – T/R  
       VOX SENS sel          – as reqd  
       PAGE                    – dn  
       VOL pb (five)          – as reqd  
       XMIT/ICOM MODE sel – as reqd (PTT/VOX PTT/PTT  
   recommended)

L10L DISPLAY SEL              – DATA  
       CHARACTER DISPLAY  – OFF  
       INPUT SEL           – VIDEO  
       COUNTER SEL         – TC  
       AUDIO INPUT          – FIX  
           REC LEVEL CH-1 – as is  
                               CH-2 – as is

L10L (MUX)  
       Verify all lts off  
       VTR/CC PWR          – 0 (dn)  
       RATE SEL (three)  – 1  
       MUX BYPASS         – ACT  
       MUX/VTR/CC PWR  – 0 (dn)

-----

L10L (VIP)  
       Verify all lts off  
       PWR                  – 0 (dn)  
       ATU                  – REC  
       CCTV VIDEO IN – J3

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L10L (VTR)  
       Verify all lts off  
       ON/STANDBY lt      – off  
       TIMER               – OFF  
       AUDIO OUTPUT SEL  – CH-1/2  
       PHONE LEVEL       – midrange  
       KEY INH            – OFF  
       CHARACTER DISPLAY (LCD) – ON (no BLACK BACK)

## AFT FLIGHT DECK PAYLOADS SWITCH LIST FOR HANDOVER INGRESS

<p>L10U    (AVIU)            SYNC/VIDEO – VIDEO            HI-Z/75    – HI-Z            PWR SELECT – HI</p>	<p>L12LL    SSP-2            cb PDIP 2 PWR 2 – op            C/L CAM PWR    – OFF</p>
<p>L11U    (PDIP 2)            T-0/OIU/OIU – OIU (ctr)            DC PWR 1    – OFF                      2    – OFF</p>	<p>L12LR    SSP-2            cb PDIP 2 PWR 1 – op</p>
<p>L12UL    SSP-1            Verify all tbs bp            APCU 1 CONV                    – OFF                      OUTPUT RLY            – OP                      2 CONV                    – OFF            cb SW PWR 1                    – op            PDIP 1 PWR 2/KuBAND RLY – op</p>	<p>L12L    (PDIP 1)            Ku BAND RATE – OFF            DC PWR 1    – OFF                      2    – OFF</p>
<p>L12UR    SSP-1            Verify all tbs bp            TCS PWR                        – OFF            cb X1/X2 SW                    – op                      X1/X2 SW PDIP 1 PWR 1 – op            ODS CONN MATE X1 TLM PWR – OFF                                              X2 TLM PWR – OFF            OIU PWR                        – OFF</p>	<p>R12    (VPU/OPP)            VPU PWR – OFF</p> <p>-----</p> <p>R12    (OPP)            cb OBSS SW PWR CB1 – op { Y }            OBSS SW PWR                – OFF</p> <p>-----</p> <p>R12    (OBSS)            RSC PWR    – OFF            ITVC ENA    – OFF            SPEE PWR – OFF</p>

NOT FLOWN

9-24

ASC/117/FIN 1

## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

<p>A15: (All Veh)</p> <p>PS COMM CCU PWR – OFF <span style="border: 1px solid black; padding: 2px;">ON</span></p> <p>DC UTIL PWR MNC – OFF</p> <p>AC UTIL PWR AC3 – OFF</p> <p>:A CRYO TK5 HTRS (four) – OFF</p> <p style="padding-left: 20px;">O2 RESET/TEST – ctr</p> <p style="padding-left: 20px;">(OV104,5)</p> <p>:B cb PPCA CONT PWR (two) – op { R }</p> <p>:C PALLET PWR (two) – ctr (tb-OFF)</p> <p style="padding-left: 20px;">HTRS (two) – OFF</p> <p>:D,E, HTRS (sixteen) – OFF</p> <p style="padding-left: 20px;">F,G O2 RESET/TEST (four) – ctr</p> <p>:H,I, cb PALLET ESS (sixteen) – op { R }</p> <p>:J,K HTR SNSR (eight) – op { R }</p> <hr/> <p>A14 RCS/OMS HTR FWD RCS – OFF</p> <p style="padding-left: 20px;">L POD (two) – A OFF, B OFF</p> <p style="padding-left: 20px;">R POD (two) – A OFF, B OFF</p> <p style="padding-left: 20px;">OMS KIT – OFF</p> <p style="padding-left: 40px;">CRSFD LINES (two) – A AUTO, B AUTO</p> <p style="padding-left: 20px;">FWD RCS JET (five) – AUTO</p> <p style="padding-left: 20px;">AFT RCS JET (five) – AUTO</p> <p style="padding-left: 20px;">CARGO COOL LP HTRS ORB (three) (OV103,5) – OFF</p> <p style="padding-left: 40px;">CARGO LN (two) (OV103,5) – OFF</p> <p style="padding-left: 20px;">PYRO (twelve) – SAFE</p> <p style="padding-left: 20px;">RMS LAT – SAFE</p> <hr/>	<p>A13 OS AUD MSTR SPKR VOL sel – as reqd</p> <p style="padding-left: 20px;">SPKR PWR – OFF</p> <p>GPS PRE AMPL UC (OV103,5) – MNC</p> <p style="padding-left: 20px;">LC (OV103,5) – MNA</p> <p style="padding-left: 20px;">(two) (OV104) – ON</p> <p style="padding-left: 40px;">PWR – ON <span style="border: 1px solid black; padding: 2px;">OFF</span></p> <p>GPS/SIGI PWR (OV103,5) – OFF</p> <p>blank sw (OV104) – dn</p> <p>GPS ENCRYPT – NORM</p> <p>GPS/SIGI ENCRYPT (OV103,5) – NORM</p> <p>blank sw (OV104) – dn</p> <hr/> <p>A12 APU HTR GAS GEN/FUEL PUMP (three) – OFF</p> <p style="padding-left: 20px;">LUBE OIL LINE (three) – OFF</p> <p style="padding-left: 20px;">TK/FU LINE/H2O SYS (six) – OFF</p> <p>LG ARM/DN RESET – dn</p> <p>FC3 STRUCT RTN – ctr (tb-ON)</p> <p>HYD HTR RUD SPD BK A – OFF</p> <p style="padding-left: 20px;">B – AUTO</p> <p style="padding-left: 20px;">BDY FLP A – AUTO</p> <p style="padding-left: 40px;">B – OFF</p> <p style="padding-left: 20px;">ELEV A – AUTO</p> <p style="padding-left: 40px;">B – OFF</p> <p style="padding-left: 20px;">AFT FUS A – AUTO</p> <p style="padding-left: 40px;">B – OFF</p> <p>CIRC PUMP PWR 1 – MNA</p> <p style="padding-left: 20px;">2 – MNB</p> <p style="padding-left: 20px;">3 – MNC</p> <hr/>
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NOT FLOWN

9-25

ASC/117/FIN

## AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A11	CRYO TK4 HTR (four)                   – OFF O2 RESET/TEST – ctr MS COMM CCU PWR                    – ON <span style="border: 1px solid black; padding: 0 2px;">OFF</span> DC UTIL PWR MNC                    – ON (OV105) PALLET HTRS C,D (two)               – OFF TK10 HTRS (four)             – OFF O2 RESET/TEST – ctr TK11 HTRS (four)             – OFF O2 RESET/TEST – ctr TK12 HTRS (four)             – OFF O2 RESET/TEST – ctr TK13 HTRS (four)             – OFF O2 RESET/TEST – ctr (OV104) CRYO TK SEL (eight) – ctr All cbs (104,5)                   – op { R }	R14:C	cb MNA UHF EVA                   – op { Y } MNB KU ELEC                       – op { Y } ANT HTR           – op { Y } CABLE HTR – op { R } MNC UHF EVA                       – op { Y } KU SIG PROC – op { Y }
		:D	All cbs – op { Y } except: cb MNB VPU                       – op { Y } MNC TV CAB                       – cl { }
		:E	MNA D CAMR (three) – op { Y } MNB RMS CAMR (three) – op { Y } – (op { R } if no PORT RMS flown)
		:F	ESS 1BC LDG GEAR ARM/DN RESET – op { R }
<hr/>			
R14:	All cbs – cl { } except: (OV104,5)		
:B	cb MNA PALLET DSC 1A/2B – op { R } 3A       – op { R } MNB PALLET DSC 1B       – op { R } 4B       – op { R } MNC PALLET DSC 2A       – op { R } 3B/4A – op { R }		

NOT FLOWN

9-26

ASC/117/FIN



## HARDWARE CAUTION & WARNING CONFIGURATION

### UPPER LIMIT CHANGE

4 CABIN PRESS  
  
7 OMS TK P OX-L  
  
17 OMS TK P FU-L  
37 OMS TK P OX-R  
39 MPS He Reg 1A P  
  
47 OMS TK P FU-R  
49 MPS He Reg 2A P  
  
55 CAB FAN ΔP  
59 MPS He Reg 3A P  
65 PPO2 #1  
74 CABIN FAN ΔP  
75 PPCO2 #2  
79 MANF P LH2  
85 ARS FAN ΔP  
95 CAB TOTAL PRESS  
105 H2O LOOP 1 PUMP OUT P  
107 FREON LOOP 1 EVAP OUT T  
117 FREON LOOP 2 EVAP OUT T

### TO

3.85 V/15.36 psia (OV103)  
3.90 V/15.53 psia (OV104)  
3.85 V/15.35 psia (OV105)  
3.60 V/288 psi (OV103,5)  
3.70 V/296 psi (OV104)  
3.60 V/288 psi  
3.60 V/288 psi  
4.00 V/816.3 psia (OV103)  
4.10 V/815.5 psia (OV104)  
4.10 V/808.4 psia (OV105)  
3.60 V/288 psi  
4.00 V/810.6 psia (OV103)  
4.10 V/814.6 psia (OV105)  
4.85 V/0.2" H2O (if SH flown)  
4.00 V/811.5 psia (OV105)  
2.30 V/2.7 psi (if SH flown)  
4.25 V/6.80" H2O  
3.80 V/7.6 mmHg (if SH flown)  
3.25 V/65 psi  
4.85 V/0.2" H2O (if SH flown)  
1.55 V/13.8 psi (if SH flown)  
2.85 V/85.5 psia (OV104)  
4.30 V/115.2 °F  
4.30 V/115.2 °F

### LOWER LIMIT CHANGE

4 CABIN PRESS  
  
39 MPS He Reg 1A P  
  
49 MPS He Reg 2A P  
  
59 MPS He Reg 3A P  
74 CABIN FAN ΔP  
105 H2O LOOP 1 PUMP OUT P  
106 FREON FLOW 1  
116 FREON FLOW 2

### TO

3.45 V/13.76 psia (OV103)  
3.45 V/13.74 psia (OV104)  
3.45 V/13.76 psia (OV105)  
3.30 V/676.0 psia (OV103)  
3.45 V/678.7 psia (OV105)  
3.35 V/679.9 psia (OV103)  
3.45 V/684.6 psia (OV105)  
3.35 V/680.0 psia (OV105)  
2.60 V/4.16" H2O  
0.85 V/25.5 psia (OV104)  
0.80 V/1186 lb/hr  
0.80 V/1186 lb/hr

### INHIBIT

8 APU 1 EGT  
18 APU 2 EGT  
28 APU 3 EGT  
30 CRYO O2 P TK4 (if TK4 not flown)  
40 CRYO O2 P TK5 (if TK5 not flown)  
55 CAB FAN ΔP (if SH flown)  
61 CRYO O2 HTR1 TK4 (if TK4 not flown)  
65 PPO2 (if SH flown)  
71 CRYO O2 HTR2 TK4 (if TK4 not flown)  
75 PPCO2 (if SH flown)  
77 OMS PBK OXID TK ULL P  
80 CRYO H2 P TK4 (if TK4 not flown)  
81 CRYO O2 HTR1 TK5 (if TK5 not flown)  
85 ARS FAN ΔP (if SH flown unpowered)  
87 OMS PBK FUEL TK ULL P  
90 CRYO H2 P TK5 (if TK5 not flown)  
95 CAB TOTAL PRESS (if SH flown)

## MEDS CONFIGURATION FOR INGRESS

<b>MDU</b>	<b>View Angle</b>	<b>Port Config</b>	<b>Selected Port</b>	<b>Flight Critical Bus</b>	<b>Display</b>	<b>Edgekey Menu</b>
CRT1	positive	auto	primary	3	DPS	DPS
CRT2	positive	auto	primary	4	DPS	DPS
CRT3	positive	auto	primary	4	DPS	DPS
CRT4	negative	auto	primary	1	DPS	DPS
CDR1	positive	auto	primary	1	A/E PFD	DATA BUS
CDR2	positive	auto	primary	3	A/E PFD	DATA BUS
MFD1	positive	auto	primary	3	HYD/APU	SUBSYS STATUS
MFD2	positive	auto	primary	4	OMS/MPS	SUBSYS STATUS
PLT1	positive	auto	primary	4	A/E PFD	DATA BUS
PLT2	positive	auto	primary	4	HYD/APU	FLT INST
AFD1	negative	auto	n/a	n/a	n/a	n/a



CUE CARD CONFIG

**CUE CARD  
CONFIG**

FAB USE ONLY

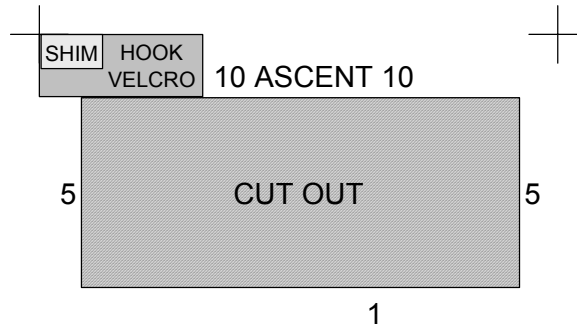
10-1

ASC/117/FIN



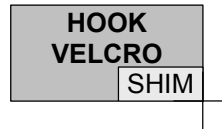
CUE CARD CONFIG

TOP



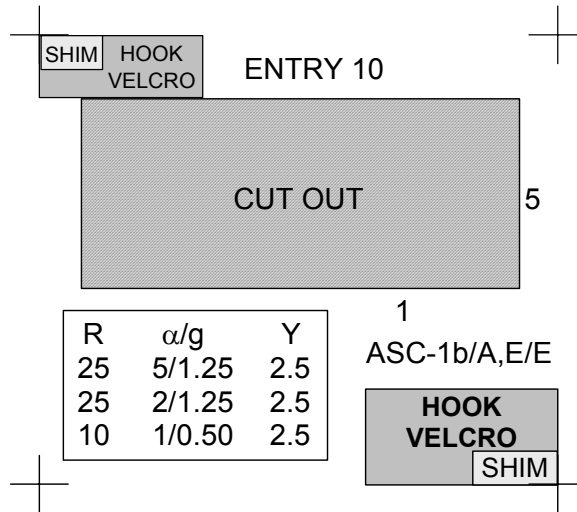
**ADI ERROR/RATE SWITCH**

ASC-1a/A,E/E



TOP

BACK OF 'ADI ERROR/RATE SWITCH'



FAB USE ONLY

CC 10-2

ASC/117/FIN

TOP

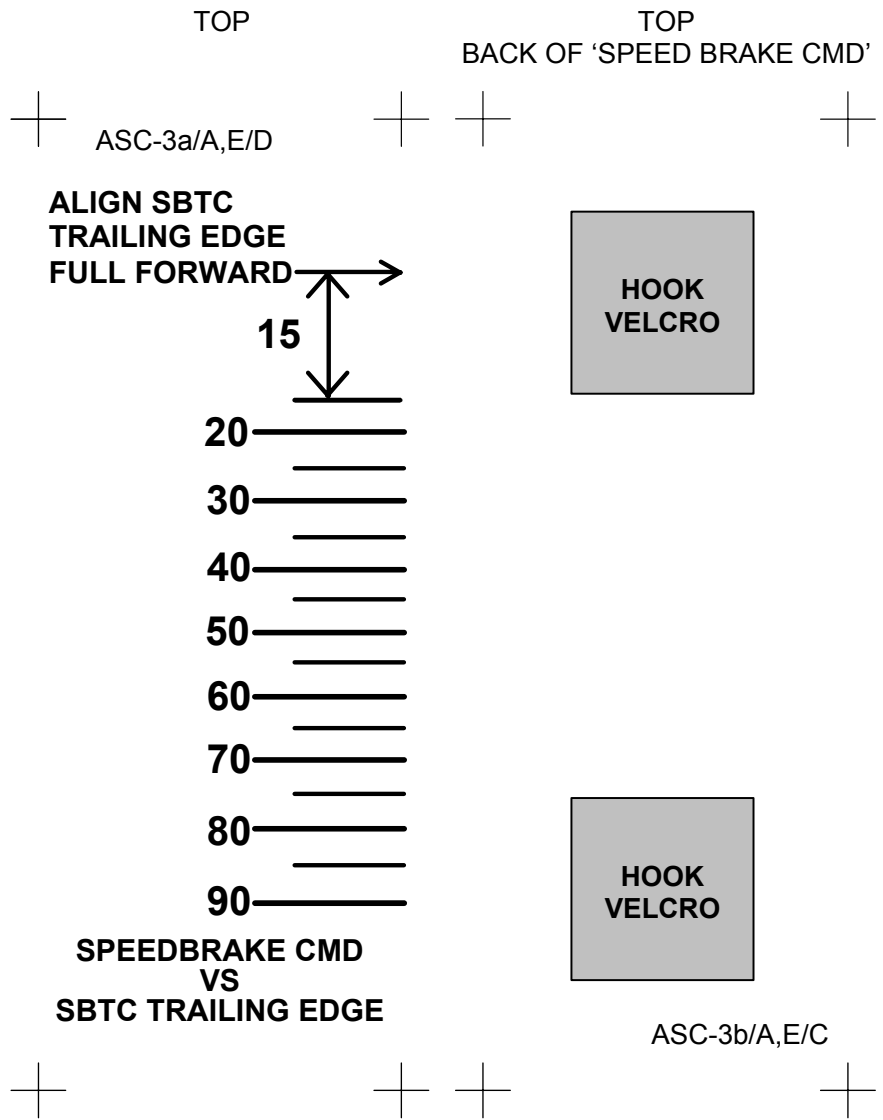
<b>ASCENT/ENTRY SPEC PASS</b>	<b>NO.</b>	<b>ASC-2a/A,E/E BFS</b>	<b>NO.</b>
GPC MEMORY	0	BFS MEMORY	0
IMU ALIGN (301)	21	<u>GNC</u>	
STRK/COAS CNTL (301)	22	HORIZ SIT	50
RCS (OPS 3)	23	OVERRIDE	51
HORIZ SIT	50	GPS STATUS	55
OVERRIDE	51	<u>SM</u>	
ENT CONTROL (OPS 3)	53	PL BAY DOORS	63
GPS STATUS	55		

TOP  
BACK OF 'ASCENT/ENTRY SPEC'

HOOK  
VELCRO  
SHIM

HOOK  
VELCRO  
SHIM

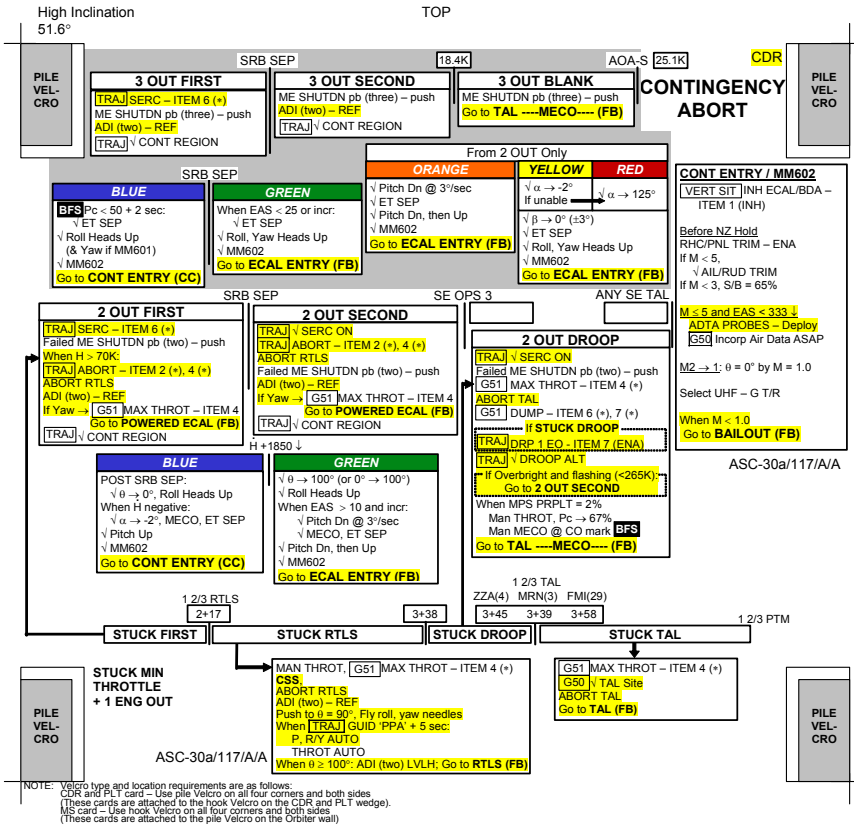
ASC-2b/A,E/C



FAB USE ONLY

CC 10-4

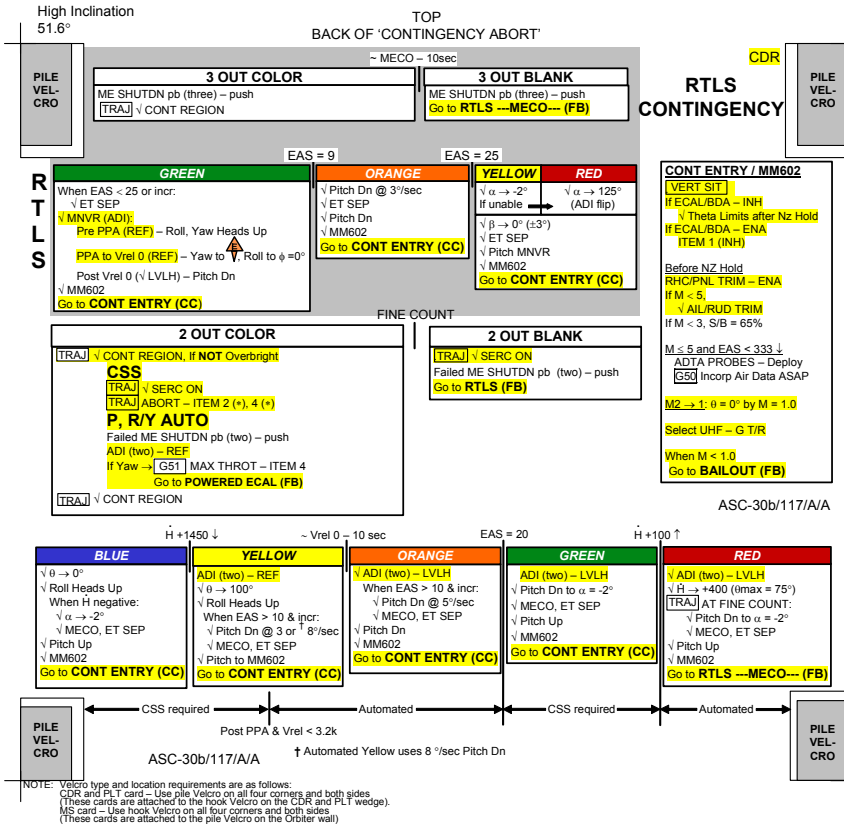
ASC/117/FIN



FAB USE ONLY

(reduced copy)  
 (A)CC 10-5

**CDR**  
 ASC/117/FIN

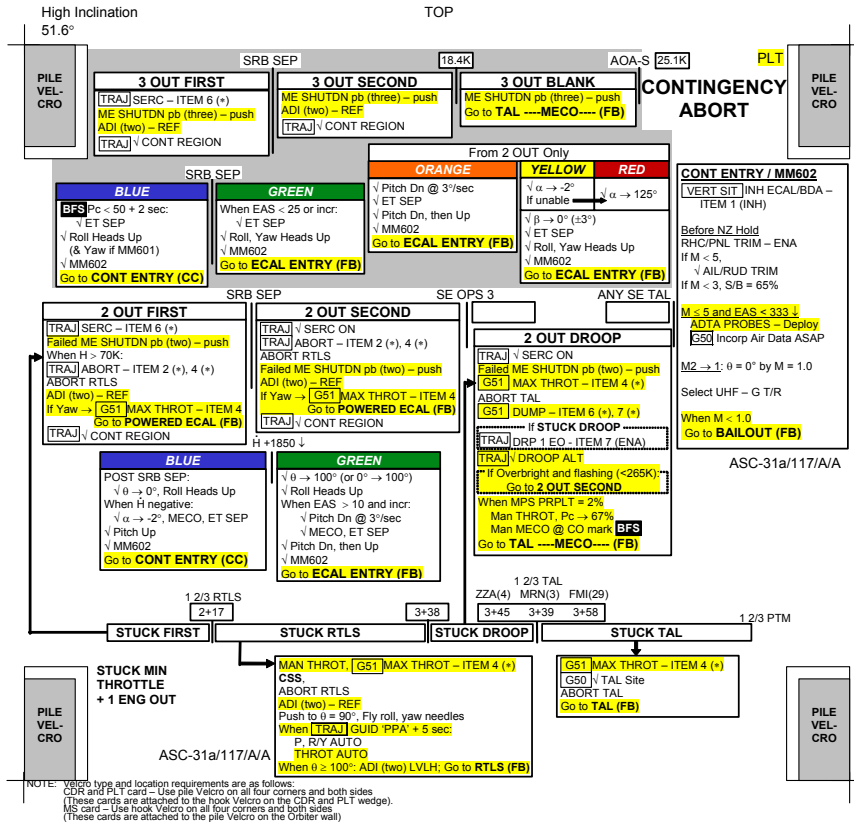


FAB USE ONLY

(reduced copy)  
(A)CC 10-6

CDR  
ASC/117/FIN

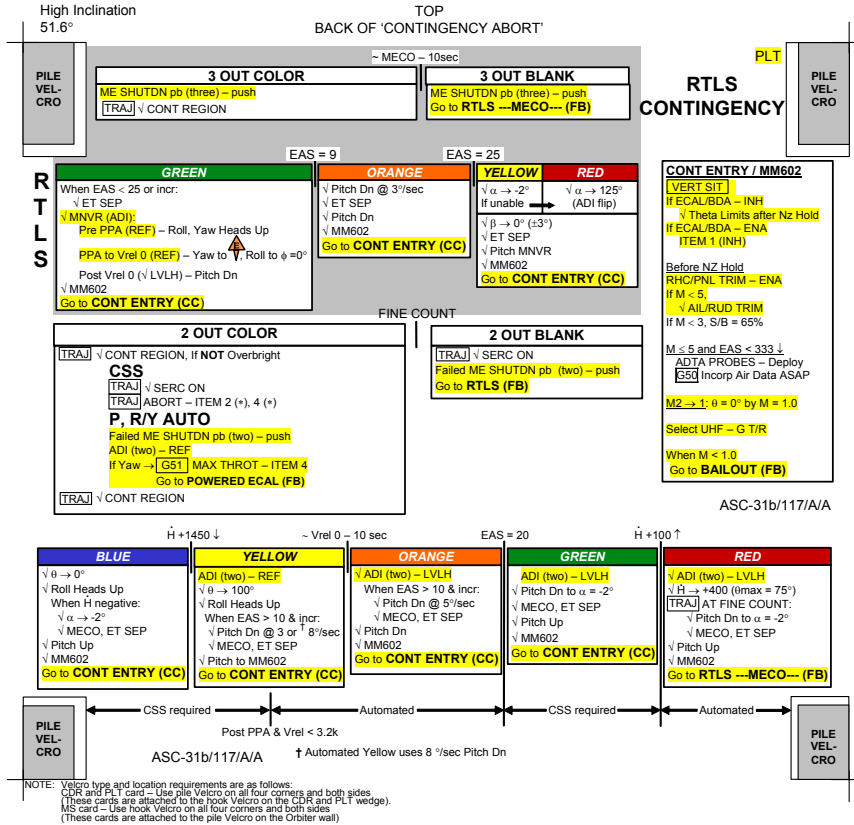




FAB USE ONLY

(reduced copy)  
 (B)CC 10-5

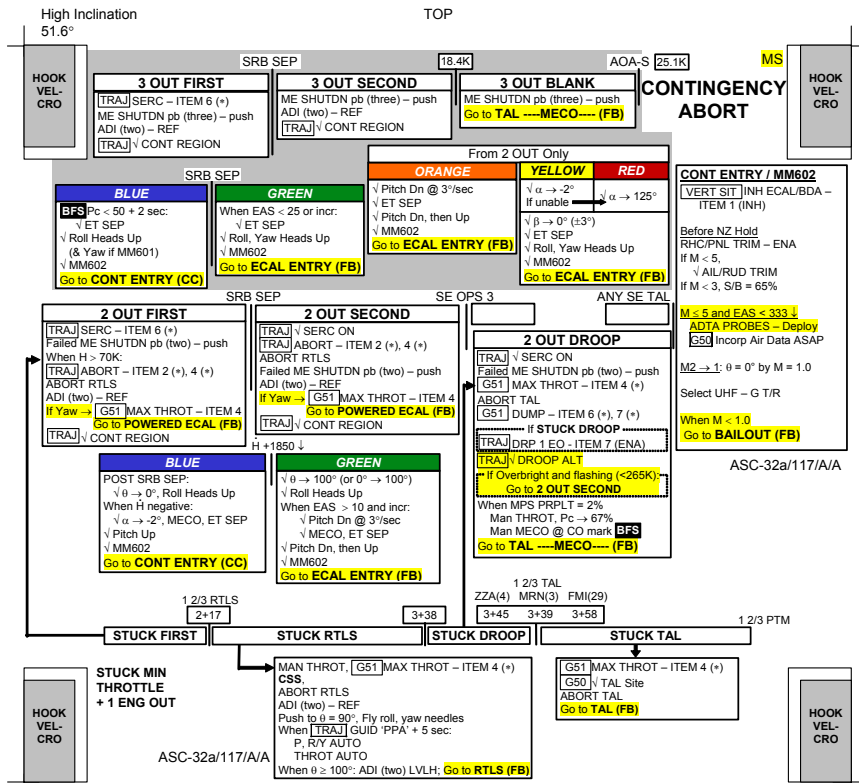
**PLT**  
 ASC/117/FIN

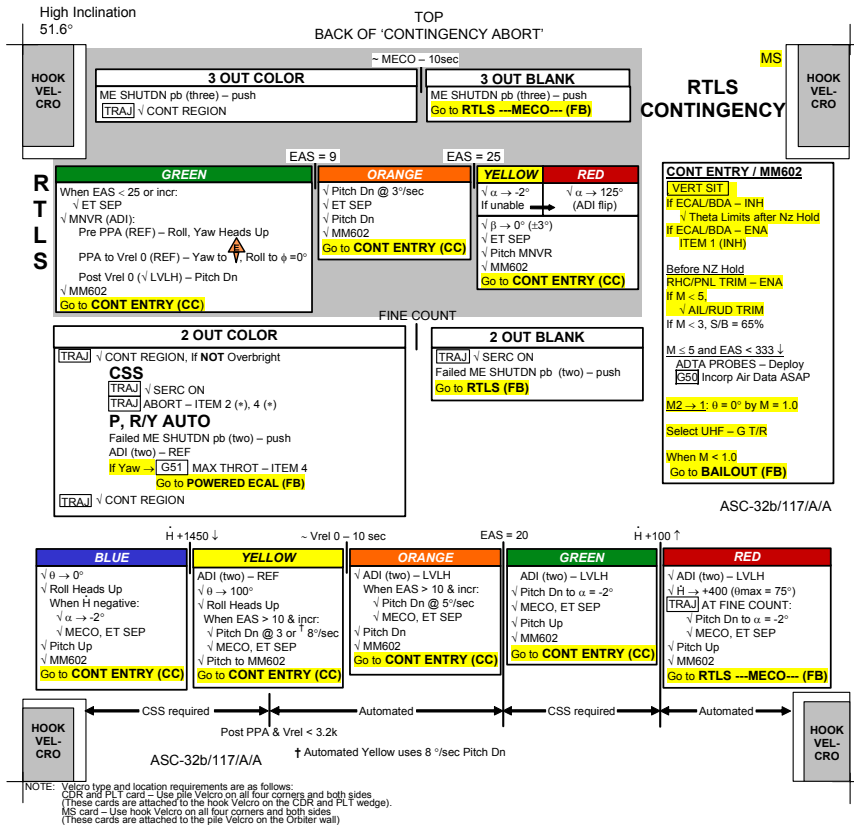


FAB USE ONLY

(reduced copy)  
(B)CC 10-6

PLT  
ASC/117/FIN





FAB USE ONLY

(reduced copy)  
(C)CC 10-6

**MS**  
ASC/117/FIN

TOP

HOOK  
VELCRO
**OMS 2  
BURN  
MONITOR**
HOOK  
VELCRO

<b>OMS TEMP*</b> FU IN P ≥ <table style="display: inline-table; border-collapse: collapse;"><tr><td style="border: 1px solid black; padding: 0 5px;">L</td><td style="border: 1px solid black; padding: 0 5px;">R</td></tr><tr><td style="border: 1px solid black; padding: 0 5px;">230</td><td style="border: 1px solid black; padding: 0 5px;">230</td></tr></table> ≤ <table style="display: inline-table; border-collapse: collapse;"><tr><td style="border: 1px solid black; padding: 0 5px;">214</td><td style="border: 1px solid black; padding: 0 5px;">212</td></tr></table> or No FU IN P	L	R	230	230	214	212	Oms Eng Fail Oms PRPLT Fail
L	R						
230	230						
214	212						
<b>OMS PC* &amp; OMS ↓</b> (BFS: √accel) ENG VLV 1 or 2 < 70 or OX IN P > 227 OX IN P ≤ 227 or No OX IN P	Oms Eng Fail Oms PRPLT Fail						
<b>OMS OX/FU TK P</b> (√ENG IN P) OX/FU LOW OX & FU HIGH	He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At PC < 72 or OMS TEMP or HP > 85: Oms PRPLT Fail He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284						
<b>Oms He TK P LOW</b> (√OMS/MPS)	At He P < 640 or QTY ≤ 41: If HP < 85: Oms XFEED from good Oms At HP > 85: Oms PRPLT Fail						
<b>Oms N2 REG P HIGH or LOW</b> <b>Oms N2 TK P LOW</b> (√OMS/MPS)	Oms Eng – ARM At N2 TK P < 470: Oms Eng – ARM						
<b>Oms GMBL</b> PRI fail SEC fail	L(R) Oms GMBL – SEC (twice) If high RCS usage: Oms Eng Fail						
<b>GPC</b> 1(4) & Burning Oms aff SEC GMBL lost 2 FAs lost	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF.ON L(R) Oms GMBL – SEC (twice) If high RCS usage: Oms Eng Fail √MAN SHUTDN						
<b>I/O ERROR FA</b> 1(4) 2 FAs lost	L(R) Oms GMBL – SEC I/O RESET (if recov: BFS I/O RESET) If high RCS usage: Oms Eng Fail √MAN SHUTDN						
<b>BCE STRG D</b> 1(4)	I/O RESET (if recov: >>) If high RCS usage: L(R) Oms GMBL – SEC (twice)						
<b>I/O ERROR PCM</b>	OI PCMMU PWR – 2(1)						

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

ASC-5a/117/A,O/A

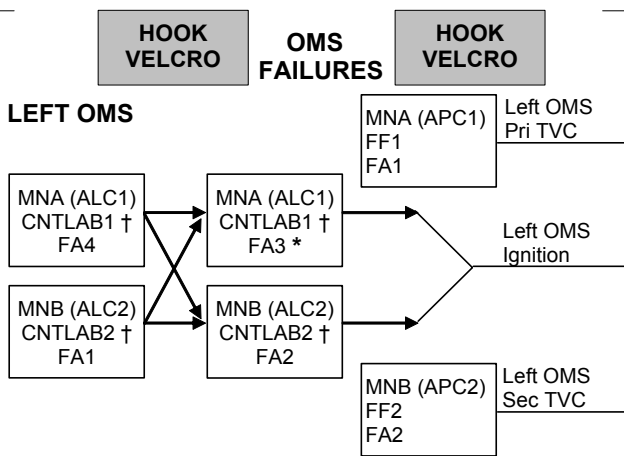
(reduced copy)

FAB USE ONLY

CC 10-7

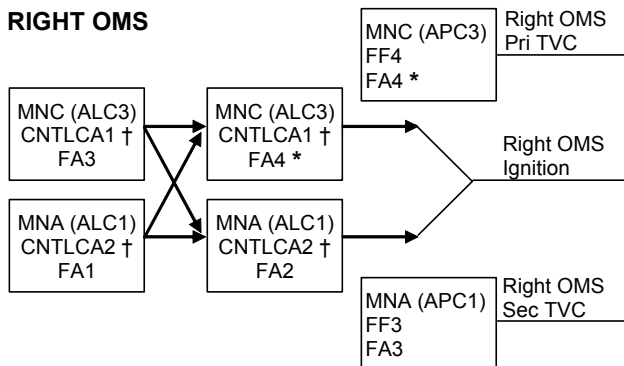
ASC/117/FIN

TOP  
BACK OF 'OMS BURN MONITOR'



† 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) P<sub>c</sub> 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)



If two FA MDMs lost		
MDMs	Preburn: ENG – OFF	During burn: MAN SHUTDN
1,2	LEFT (TVC)	BOTH
1,3	RIGHT (IGN)	LEFT
1,4	LEFT (IGN)	RIGHT
2,3	LEFT (IGN)	RIGHT
2,4	RIGHT (IGN)	LEFT
3,4	RIGHT (TVC)	BOTH

ASC-5b/A,O,E/I

(reduced copy)

FAB USE ONLY

CC 10-8

ASC/117/FIN

TOP

**HOOK VELCRO**      **OMS 2/ ORBIT OMS BURNS**      **HOOK VELCRO**

√MM105/202(302)  
 Enter TGO +5 sec (2 eng) or TGO +10 sec (1 eng)  
 √BURN ATT (INRTL) then REF, pb – push  
 √ENG SEL                      √DAP TRANS – NORM (MM202)  
 CNTL PWR (two) – ON    √DAP – AUTO(PASS)/DISC  
 √GMBL TRIM  
 2 engine: P = +0.4    LY = -5.7    RY = +5.7  
 1 engine: P = +0.4    LY = +5.2    RY = -5.2  
 L,R OMS He PRESS/VAP ISOL A (two) – OP  
 ... Wait 2 sec ...  
 L,R OMS He PRESS/VAP ISOL B (two) – GPC (OP for SE burn)

ORB BURN A			
B			

TIG-2 SEL OMS ENG(s) – ARM/PRESS (√P VLVs OP)  
 If P VLV CL: Aff OMS ENG – OFF

**WARNING**  
 Do not burn aff engine if:  
 OMS N2 TK P < 470(564) (NONCRIT BURN)  
 He TK P < 640  
 FU ENG IN P < 216(244)  
 OX ENG IN P < 151(244)

ΔVTOT: OMS XFEED RETURN (Planned Single Engine)

-:15 EXEC  
 If OMS ENG P<sub>c</sub> MSG and non critical burn: Aff ENG – OFF  
 If Leaking OMS PROP, burn RCS +X TIG - 15 sec to OMS IGN + 1 sec  
 :00 TIG; start watch (√P<sub>c</sub>, ΔVTOT, ENG VLVs)

```

* OMS PRFLT FAIL: *
* HP < [85] (CONTINUE BURN): *
* Failed OMS ENG – OFF *
* √XFEED (two) – CL *
* TK ISOL (two) – CL *
* He PRESS (two) – CL *
* HP > [85] (STOP BURN): *
* OMS ENG (two) – OFF *
* √Failed OMS XFEED (two) – CL *
* TK ISOL (two) – CL *
* He PRESS (two) – CL *
* OMS ENG FAIL: *
* ASCENT or CRIT O/O (Continue Burn) *
* Failed ENG – OFF *
* OMS XFEED at → 1/2 ΔVTOT    *
* at FAIL *
* RCS COMPLETION: (Hp < [85] or CRIT O/O) *
* Interconnect to either OMS that was ENG FAIL *
* THC +X (Hp = [85]) *
* Post burn, AFT RCS RECONFIG *
  
```

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

Trim	OMS 2	TAIL ONLY CNTL	Orbit
Residuals:	VGO X < 0.2 fps VGO Y,Z < 2 fps	VGO X < +0.2 fps	All axes < 0.2 fps

ASC-6a/117/A,O/A

(reduced copy)

FAB USE ONLY

CC 10-9

ASC/117/FIN

TOP  
BACK OF 'OMS2/ORBIT OMS BURNS'

<b>HOOK VELCRO</b>	<b>OPS 1 RCS BURN</b>	<b>HOOK VELCRO</b>
------------------------	---------------------------	------------------------

**AFT RCS**

√RCS BURN CONFIG:  
OMS TK ISOL (all) – OP      OMS TK  
L(R) OMS XFEED (two) – OP      switch at  
R(L) OMS XFEED (two) – CL      1/2 ΔVTOT  
AFT L,R RCS XFEED (four) – OP (If reqd)  
TK ISOL (six) – CL

TIG-2    L,R OMS He PRESS/VAP ISOL A – OP  
          ... Wait 2 sec ...  
          L,R OMS He PRESS/VAP ISOL B – OP  
√MM105  
          CNTLR PWR (two) – ON  
√BURN ATT (INRTL) then REF, pb – push  
√RCS SEL  
          DAP: INRTL/DISC  
:00      + X  
          Maintain PITCH ATT ERR ± 3°  
          Monitor OMS data  
          Monitor ΔVTOT  
CUTOFF    Release THC  
          CNTLR PWR (two) – OFF

**FWD RCS**

**FRCS BURN PREP**  
Load DUMMY target for FRCS attitude  
RCS SEL – ITEM 4 EXEC  
TIG @ TTA = 2:00 or as reqd  
ΔVX = -2.1 (ITEM 19)  
ΔVY = 0    (ITEM 20)  
ΔVZ = +1.0 (ITEM 21)  
LOAD – ITEM 22 EXEC  
TIMER – ITEM 23 EXEC  
TIG-10 Auto Mnvr to ATT  
When in attitude:  
ADI ATT – REF (push)  
Load External ΔV Burn Target  
ΔVX = +80  
ΔVY = 0  
ΔVZ = 0  
LOAD – ITEM 22 EXEC  
TIMER – ITEM 23 EXEC  
√VGOX = negative  
√VGOY = 0  
√VGOZ = +21 ± 2  
√REF ball -0,0,0

**NOTE**

Error needles invalid during burn  
Burn time = ~2X TGO  
TGT Hp = **85** for ASCENT

-:30    CNTLR PWR (two) – ON  
          DAP: INRTL/DISC  
:00      -X  
CUTOFF    CUR HP = TGT HP  , release THC  
          CNTLR PWR (two) – OFF

ASC-6b/117/A,O/A

(reduced copy)

FAB USE ONLY

CC 10-10

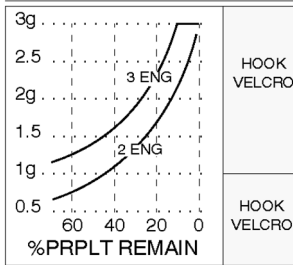
ASC/117/FIN



TOP

**ASCENT ADI - NOMINAL**

TIME	$\theta$	H	$\dot{H}$
0:30	68	9K	629
0:50	63	25K	977
1:10	55	49K	1392
1:30	40	81K	1865
1:50	31	122K	2180



**-STAGING-**

$V_1$	$\theta$	H	$\dot{H}$
6	19	219K	1712
7	16	276	1262
8	13	311	913
9	11	333	632
10	9	346	401
12	6	356	59
14	9	355	-148
16	25	350	-231
18	23	344	-267
20	21	339	-217
22	19	337	-103
24	17	337	66
25819	13	345	273

HOOK VELCRO

(117 OCFR2 CY)

ASC-14a/117/A/A

TOP  
BACK OF 'ASCENT  
ADI - NOMINAL'

**ENTRY ALPHA**

VR	$\alpha_{ref}$	R	H	Href	Rref
25	40	4327	400		
24	HI	40	LO	2586	249 -47 L79
23	43	40	37	2135	241 -64 69
22	43	40	37	1791	235 -83 63
21	43	40	37	1515	228 -105 60
20	43	40	37	1294	221 -122 58
19	43	40	37	1121	215 -144 59
18	43	40	37	978	208 -167 60
17	43	40	37	864	201 -186 61
16	43	40	37	766	195 -197 63

**KSC 15**

MAX L/D	
M	$\alpha$
3	17
2	15
1	12

ASC-14b/117/A,E/A

HOOK VELCRO

15	43	40	37	683	188	-119	62
14	43	40	37	615	184	-126	60
13	43	40	37	543	180	-137	58
12	43	40	37	485	175	-151	56
11	42	39	36	424	172	-195	R54
10	41	38	35	372	166	-176	49
9	39	36	33	322	160	-209	46
8	37	34	31	274	152	-242	42
7	33	30	27	227	142	-271	41
6	30	27	24	183	131	-274	L39
5	26	23	20	144	119	-272	39
4	23	20	18	106	104	-264	40
3	19	16	15	74	90	-248	R37
2.5	15			61	83	-250	
2	12			50	77	-268	
1.5	9			37	67	-323	
1	8			27	52	-267	

HOOK VELCRO

(117 OCFR2 CY)

(reduced copy)

FAB USE ONLY

CC 10-11

ASC/117/FIN

TOP



√MM302      √OMS BOTH  
 Enter TGO + 5 sec  
 √TRIM: P +0.4, 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  
 - :15 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec  
 :00 Start watch (√P<sub>c</sub>, ΔVTOT, ENG VLVs)

\* **OMS PRPLT FAIL (CONTINUE BURN):** \*  
 \* Failed OMS ENG – OFF \*  
 \* 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<sub>c</sub> < 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 \*  
 \* √ADI – LVLH, center needles \*  
 \* Interconnect good OMS to RCS \*  
 \* THC +X (√OMS% vs RCS Burn Time) \*  
 \* RCS I'CNCT TK SW (N/A for OMS PRPLT FAIL) \*  
 \* THC +X (√OMS% vs RCS Burn Time) \*  
 \* AFT RCS RECONFIG \*  
 \* RCS COMPLETION \*

ASC-8a/A/E

HINGE

(reduced copy)

FAB USE ONLY

CC 10-12

ASC/117/FIN

TOP  
HINGED AT BOTTOM OF  
'AOA DEORBIT BURN (2 ENG)'  
HINGE

\* **RCS COMPLETION:** \*

\* If DIRECT INSERTION: \*

\* THC +X to  $\Delta VTOT = 0$  or TOT AFT QTY 1   % \*

\* At AFT QTY 1                      THC +X to FLIP  $\Delta V$  or  
\* if CUR  $\Delta VTOT$ :                      TOT AFT QTY 2   % then  
\*    FRCS COMPLETION \*

\* FLIP   -----  
\*  $\Delta V$     FRCS COMPLETION \*

\* AFT   -----  
\*  $\Delta V$     THC +X to TGT  $\Delta V$  \*

\* TGT   -----  
\*  $\Delta V$  \*

\* If w/OMS 1: \*

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

\* At AFT QTY 1                      THC +X to FLIP HP or  
\* if CUR HP:                              TOT AFT QTY 2   % then  
\*    FRCS COMPLETION \*

\* FLIP   -----  
\* HP    FRCS COMPLETION \*

\* AFT   -----  
\* HP    THC +X to TGT HP \*

\* TGT   -----  
\* HP \*

\* **FRCS COMPLETION:** \*

\* Mnv to -X Att (pitch up at 3°/sec to VGOz = +1/4  $\Delta VTOT$ ) \*  
\* THC -X to  $\Delta VTOT = 0$  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)

ASC-8aa/117/A/A

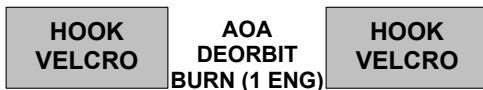
(reduced copy)

FAB USE ONLY

CC 10-13

ASC/117/FIN

TOP  
BACK OF 'AOA DEORBIT BURN (2 ENG)'



- √MM302      √OMS L or R
- √OMS BURN CONFIG (L or R XFEED)
- Enter TGO + 10 sec
- √TRIM: P +0.4, 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
- :15      If OMS AFT QTY < 11%, THC +X to OMS IGN + 1 sec
- :00      Start watch (√P<sub>c</sub>, ΔVTOT, ENG VLVs)

OMS XFEED RETURN at ΔVTOT =     
or   at   %

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

- \* **OMS PRPLT FAIL (CONTINUE BURN):** \*
- \* OMS ENG – OFF \*
- \* ITEM 18 +0 EXEC \*
- \* Secure aff OMS \*
- \* √ADI – LVLH, center needles \*
- \* Interconnect good OMS to RCS \*
- \* THC +X (√OMS% vs RCS Burn Time) \*
- \* AFT RCS RECONFIG \*
- \* RCS COMPLETION \*
- \* **OMS ENG FAIL (CONTINUE BURN):** \*
- \* OMS ENG – OFF \*
- \* √ADI – LVLH, center needles \*
- \* Interconnect good OMS to RCS \*
- \* THC +X (√OMS% vs RCS Burn Time) \*
- \* RCS I'CNCT TK SW \*
- \* THC +X (√OMS% vs RCS Burn Time) \*
- \* AFT RCS RECONFIG \*
- \* RCS COMPLETION \*
- \* **RCS +X JET FAIL OFF:** \*
- \* ITEM 18 +0 EXEC \*
- \*  Resel jet \*

ASC-8b/A/B

HINGE

(reduced copy)

FAB USE ONLY

CC 10-14

ASC/117/FIN

TOP  
HINGED AT BOTTOM OF  
'AOA DEORBIT BURN (1 ENG)'  
HINGE

**\* RCS COMPLETION:**

```

* If DIRECT INSERTION:
*   THC +X to ΔVTOT = 0 or TOT AFT QTY 1   %
*
*   At AFT QTY 1      THC +X to FLIP ΔV or
*   if CUR ΔVTOT:    TOT AFT QTY 2   % then
*                   FRCS COMPLETION
*
*   FLIP   -----
*   ΔV      FRCS COMPLETION
*
*   AFT   -----
*   ΔV      THC +X to TGT ΔV
*
*   TGT   -----
*   ΔV
*
* If w/OMS 1:
*   THC +X to TGT HP or TOT AFT QTY 1   %
*
*   At AFT QTY 1      THC +X to FLIP HP or
*   if CUR HP:        TOT AFT QTY 2   % then
*                   FRCS COMPLETION
*
*   FLIP   -----
*   HP      FRCS COMPLETION
*
*   AFT   -----
*   HP      THC +X to TGT HP
*
*   TGT   -----
*   HP
*
* * FRCS COMPLETION:
*   Mnvr to -X Att (pitch up at 3°/sec to VGOz = +1/4 ΔVTOT)
*   THC -X to ΔVTOT = 0 or FRCS depletion (JETS FAIL OFF)
  
```

**CUTOFF**

```

+ :02 OMS ENG – OFF (If < 3 IMU, at  :  )
* AFT RCS RECONFIG if INTERCONNECT *
Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)
  
```

ASC-8bb/117/A/A

(reduced copy)

FAB USE ONLY

CC 10-15

ASC/117/FIN

TOP

**AOA  
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  
          Maintain PITCH ATT ERR ± 3°  
          Monitor ΔVTOT

RCS I'CNCT TK SW at ΔVTOT =   
R OMS XFEED (two) – OP  
L OMS XFEED (two) – CL

**OMS PRPLT LOW**  
AFT RCS RECONFIG AT ΔVTOT =   
RCS COMPLETION

- \* **OMS PRPLT FAIL (MULTIPLE JETS FAIL OFF):** \*
- \*   Secure aff OMS \*
- \*   ITEM 18 +0 EXEC \*
- \*   G23 Resel jets \*
- \*   Interconnect good OMS to RCS \*
- \*   THC +X (√OMS% vs RCS Burn Time) \*
- \*   AFT RCS RECONFIG \*
- \*   RCS COMPLETION \*
- \* **RCS +X JET FAIL OFF:** \*
- \*   ITEM 18 +0 EXEC \*
- \*   G23 Resel jets \*

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TOP  
HINGED AT BOTTOM OF  
'AOA DEORBIT BURN (RCS)'  
HINGE

\* **RCS COMPLETION:**

\* If DIRECT INSERTION:

\* THC +X to  $\Delta VTOT = 0$  or TOT AFT QTY 1    %

\* At AFT QTY 1                      THC +X to FLIP  $\Delta V$  or  
\* if CUR  $\Delta VTOT$ :                      TOT AFT QTY 2    % then  
\*    FRCS COMPLETION

\* FLIP    -----  
\*  $\Delta V$                          FRCS COMPLETION

\* AFT    -----  
\*  $\Delta V$                          THC +X to TGT  $\Delta V$

\* TGT    -----  
\*  $\Delta V$

\* If w/OMS 1:

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

\* At AFT QTY 1                      THC +X to FLIP HP or  
\* if CUR HP:                              TOT AFT QTY 2    % then  
\*    FRCS COMPLETION

\* FLIP    -----  
\* HP    FRCS COMPLETION

\* AFT    -----  
\* HP    THC +X to TGT HP

\* TGT    -----  
\* HP

\* **FRCS COMPLETION:**

- \* Mnv to -X Att (pitch up at 3°/sec to VGOz = +1/4  $\Delta VTOT$ )
- \* THC -X to  $\Delta VTOT = 0$  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)

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TOP  
 BACK OF 'AOA DEORBIT BURN (RCS)'



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 VELCRO**

**HOOK  
 VELCRO**



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TOP  
HINGED AT BOTTOM OF  
BACK OF 'AOA DEORBIT BURN (RCS)'  
HINGE



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TOP

PILE  
VELCRO

HOOK  
VELCRO

PILE  
VELCRO

**ZZA TAL REDESIGNATION  
(117 OCFR2 CYC)**

1st E.O. VI		6100	6200	6300	6400	6500	6600	6700	6800
SE OPS 3 ZZA 109	(4)	11000	11100	11100	11100	11100	11100	11200	11200
SE ZZA 104	(4)	17200	17100	16900	16700	16500	16400	16200	16000

1st E.O. VI		6900	7000	7100	7200	7300	7400	7500	7600
SE OPS 3 ZZA 109	(4)	11200	11200	11200	11200	11300	11300	11300	11300
SE ZZA 104	(4)	15900	15700	15500	15400	15200	15100	15000	14800

1st E.O. VI		7700	7800	7900	8000	8100	8200	8300	8400
SE OPS 3 ZZA 109	(4)	11300	11400	11400	11400	11400	11400	11500	11500
SE ZZA 104	(4)	14700	14600	14400	14300	14200	14100	14100	14000

1st E.O. VI		8500	8600	8700	8800	8900	9000	9100	9200
SE OPS 3 ZZA 109	(4)	11500	11500	11500	11600	11600	11600	11600	11600
SE ZZA 104	(4)	13900	13800	13800	13700	13700	13600	13600	13600

1st E.O. VI		9300	9400	9500	9600	9700	9800	9900	10000
SE OPS 3 ZZA 109	(4)	11700	11700	11700	11700	11700	11800	11800	11800
SE ZZA 104	(4)	13600	13500	13500	13500	13500	13500	13500	13500

1st E.O. VI		10100	10200	10300	10400	10500	10600	10700	10800
SE OPS 3 ZZA 109	(4)	11800	11800	11900	11900	11900	11900	12000	12000
SE ZZA 104	(4)	13500	13500	13600	13600	13600	13600	13600	13700

1st E.O. VI		10900	11000	11100					
SE OPS 3 ZZA 109	(4)	12000	12000	12000					
SE ZZA 104	(4)	13700	13700	13700					

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TOP  
BACK OF 'ZZA TAL REDESIGNATION'

**HOOK  
VELCRO**

**HOOK  
VELCRO**

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VELCRO**

**ECAL – ZZA or MRN or FMI PRIME TAL**

1st EO VI (KFPS)	5.6	5.8	6.0	6.2	6.4	6.6	6.8
CHERRY POINT (7)		6.7 - 7.0	6.7 - 7.2	6.8 - 7.3	6.8 - 7.4	6.9 - 7.5	6.9 - 7.6
OTIS ANGB (16)		10.3 - 11.1	10.3 - 11.2	10.2 - 11.3	10.2 - 11.5	10.2 - 11.6	10.2 - 11.6

1st EO VI (KFPS)	7.0	7.2	7.4	7.6	7.8	8.0	8.2
CHERRY POINT (7)	7.0 - 7.7	7.2 - 7.8	7.4 - 7.9	7.6 - 7.9	7.8 - 8.0	8.0 - 8.0	
GABRESKI (15)					10.5 - 10.7	10.4 - 10.8	10.3 - 11.0
OTIS ANGB (16)	10.2 - 11.7	10.2 - 11.8	10.2 - 11.9	10.2 - 12.0	10.2 - 12.1	10.2 - 12.1	10.3 - 12.2

1st EO VI (KFPS)	8.4	8.6	8.8	9.0	9.2	9.4	9.6
OCEANA NAS (8)		8.6 - 9.0	8.8 - 9.1	9.0 - 9.2	9.2 - 9.3		
WALLOPS (9)				9.4 - 9.6	9.2 - 9.7	9.4 - 9.8	9.6 - 9.8
GABRESKI (15)	10.3 - 11.1	10.3 - 11.2	10.3 - 11.3	10.4 - 11.3	10.4 - 11.4	10.4 - 11.5	10.4 - 11.5
OTIS ANGB (16)	10.3 - 12.3	10.3 - 12.3	10.3 - 12.4	10.4 - 12.4	10.4 - 12.5	10.5 - 12.6	10.5 - 12.6
PEASE INT'L (17)	11.3 - 11.7	11.3 - 11.9	11.3 - 12.0	11.3 - 12.1	11.3 - 12.2	11.3 - 12.2	11.3 - 12.3

1st EO VI (KFPS)	9.8	10.0	10.2	10.4	10.6	10.8	11.0
WALLOPS (9)	9.8 - 9.9						
GABRESKI (15)	10.4 - 11.6	10.5 - 11.7	10.5 - 11.7	10.5 - 11.8	10.6 - 11.8	10.8 - 11.9	11.0 - 11.9
OTIS ANGB (16)	10.5 - 12.7	10.5 - 12.7	10.6 - 12.8	10.6 - 12.8	10.7 - 12.9	10.8 - 12.9	11.0 - 12.9
PEASE INT'L (17)	11.3 - 12.4	11.4 - 12.5	11.4 - 12.5	11.5 - 12.6	11.5 - 12.6	11.5 - 12.7	11.5 - 12.7

1st EO VI (KFPS)	11.2	11.4	11.6	11.8	12.0	12.2	12.4
GABRESKI (15)	11.2 - 12.0	11.4 - 12.0	11.6 - 12.1	11.8 - 12.2	12.0 - 12.2	12.2 - 12.3	
OTIS ANGB (16)	11.2 - 13.0	11.4 - 13.0	11.6 - 13.1	11.8 - 13.1	12.0 - 13.2	12.2 - 13.2	12.4 - 13.2
PEASE INT'L (17)	11.5 - 12.8	11.5 - 12.8	11.6 - 12.9	11.8 - 12.9	12.0 - 13.0	12.2 - 13.0	12.4 - 13.0

1st EO VI (KFPS)	12.6	12.8	13.0	13.2	13.4	13.6	13.8
OTIS ANGB (16)	12.6 - 13.3	12.8 - 13.3	13.0 - 13.4	13.2 - 13.4	13.4 - 13.4		
PEASE INT'L (17)	12.6 - 13.1	12.8 - 13.1	13.0 - 13.1				

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TOP

**PILE  
VELCRO**

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VELCRO**

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**MRN TAL REDESIGNATION  
(117 OCFR2 CYC)**

1st E.O. VI		5900	6000	6100	6200	6300	6400	6500	6600
SE OPS 3 MRN 109	(3)	10900	11000	11000	11000	11000	11100	11100	11100
SE MRN 104	(3)	16900	16800	16600	16500	16300	16100	16000	15800

1st E.O. VI		6700	6800	6900	7000	7100	7200	7300	7400
SE OPS 3 MRN 109	(3)	11100	11100	11200	11200	11200	11200	11300	11300
SE MRN 104	(3)	15700	15500	15400	15200	15100	14900	14800	14700

1st E.O. VI		7500	7600	7700	7800	7900	8000	8100	8200
SE OPS 3 MRN 109	(3)	11300	11300	11400	11400	11400	11400	11400	11500
SE MRN 104	(3)	14600	14400	14300	14200	14100	14000	13900	13900

1st E.O. VI		8300	8400	8500	8600	8700	8800	8900	9000
SE OPS 3 MRN 109	(3)	11500	11500	11500	11500	11600	11600	11600	11600
SE MRN 104	(3)	13800	13700	13700	13600	13600	13500	13500	13500

1st E.O. VI		9100	9200	9300	9400	9500	9600	9700	9800
SE OPS 3 MRN 109	(3)	11600	11700	11700	11700	11700	11700	11800	11800
SE MRN 104	(3)	13400	13400	13400	13400	13400	13400	13400	13400

1st E.O. VI		9900	10000	10100	10200	10300	10400	10500	10600
SE OPS 3 MRN 109	(3)	11800	11800	11800	11900	11900	11900	11900	11900
SE MRN 104	(3)	13400	13400	13400	13400	13400	13500	13500	13500

1st E.O. VI		10700	10800	10900	11000	11100			
SE OPS 3 MRN 109	(3)	12000	12000	12000	12000	12000			
SE MRN 104	(3)	13500	13600	13600	13600	13600			

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VELCRO**

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TOP  
BACK OF 'MRN TAL REDESIGNATION'

**HOOK  
VELCRO**

**HOOK  
VELCRO**

**HOOK  
VELCRO**

**ECAL – ZZA or MRN or FMI PRIME TAL**

1st EO VI (KFPS)	<b>5.6</b>	<b>5.8</b>	<b>6.0</b>	<b>6.2</b>	<b>6.4</b>	<b>6.6</b>	<b>6.8</b>
CHERRY POINT (7)		6.7 - 7.0	6.7 - 7.2	6.8 - 7.3	6.8 - 7.4	6.9 - 7.5	6.9 - 7.6
OTIS ANGB (16)		10.3 - 11.1	10.3 - 11.2	10.2 - 11.3	10.2 - 11.5	10.2 - 11.6	10.2 - 11.6

1st EO VI (KFPS)	<b>7.0</b>	<b>7.2</b>	<b>7.4</b>	<b>7.6</b>	<b>7.8</b>	<b>8.0</b>	<b>8.2</b>
CHERRY POINT (7)	7.0 - 7.7	7.2 - 7.8	7.4 - 7.9	7.6 - 7.9	7.8 - 8.0	8.0 - 8.0	
GABRESKI (15)					10.5 - 10.7	10.4 - 10.8	10.3 - 11.0
OTIS ANGB (16)	10.2 - 11.7	10.2 - 11.8	10.2 - 11.9	10.2 - 12.0	10.2 - 12.1	10.2 - 12.1	10.3 - 12.2

1st EO VI (KFPS)	<b>8.4</b>	<b>8.6</b>	<b>8.8</b>	<b>9.0</b>	<b>9.2</b>	<b>9.4</b>	<b>9.6</b>
OCEANA NAS (8)		8.6 - 9.0	8.8 - 9.1	9.0 - 9.2	9.2 - 9.3		
WALLOPS (9)				9.4 - 9.6	9.2 - 9.7	9.4 - 9.8	9.6 - 9.8
GABRESKI (15)	10.3 - 11.1	10.3 - 11.2	10.3 - 11.3	10.4 - 11.3	10.4 - 11.4	10.4 - 11.5	10.4 - 11.5
OTIS ANGB (16)	10.3 - 12.3	10.3 - 12.3	10.3 - 12.4	10.4 - 12.4	10.4 - 12.5	10.5 - 12.6	10.5 - 12.6
PEASE INT'L (17)	11.3 - 11.7	11.3 - 11.9	11.3 - 12.0	11.3 - 12.1	11.3 - 12.2	11.3 - 12.2	11.3 - 12.3

1st EO VI (KFPS)	<b>9.8</b>	<b>10.0</b>	<b>10.2</b>	<b>10.4</b>	<b>10.6</b>	<b>10.8</b>	<b>11.0</b>
WALLOPS (9)	9.8 - 9.9						
GABRESKI (15)	10.4 - 11.6	10.5 - 11.7	10.5 - 11.7	10.5 - 11.8	10.6 - 11.8	10.8 - 11.9	11.0 - 11.9
OTIS ANGB (16)	10.5 - 12.7	10.5 - 12.7	10.6 - 12.8	10.6 - 12.8	10.7 - 12.9	10.8 - 12.9	11.0 - 12.9
PEASE INT'L (17)	11.3 - 12.4	11.4 - 12.5	11.4 - 12.5	11.5 - 12.6	11.5 - 12.6	11.5 - 12.7	11.5 - 12.7

1st EO VI (KFPS)	<b>11.2</b>	<b>11.4</b>	<b>11.6</b>	<b>11.8</b>	<b>12.0</b>	<b>12.2</b>	<b>12.4</b>
GABRESKI (15)	11.2 - 12.0	11.4 - 12.0	11.6 - 12.1	11.8 - 12.2	12.0 - 12.2	12.2 - 12.3	
OTIS ANGB (16)	11.2 - 13.0	11.4 - 13.0	11.6 - 13.1	11.8 - 13.1	12.0 - 13.2	12.2 - 13.2	12.4 - 13.2
PEASE INT'L (17)	11.5 - 12.8	11.5 - 12.8	11.6 - 12.9	11.8 - 12.9	12.0 - 13.0	12.2 - 13.0	12.4 - 13.0

1st EO VI (KFPS)	<b>12.6</b>	<b>12.8</b>	<b>13.0</b>	<b>13.2</b>	<b>13.4</b>	<b>13.6</b>	<b>13.8</b>
OTIS ANGB (16)	12.6 - 13.3	12.8 - 13.3	13.0 - 13.4	13.2 - 13.4	13.4 - 13.4		
PEASE INT'L (17)	12.6 - 13.1	12.8 - 13.1	13.0 - 13.1				

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**HOOK  
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VELCRO**

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TOP

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**FMI TAL REDESIGNATION  
(117 OCFR2 CYC)**

1st E.O. VI		6300	6400	6500	6600	6700	6800	6900	7000
SE OPS 3 FMI 109	(29)	11100	11200	11200	11200	11200	11200	11300	11300
SE FMI 104	(29)	17700	17600	17400	17200	17000	16800	16600	16400

1st E.O. VI		7100	7200	7300	7400	7500	7600	7700	7800
SE OPS 3 FMI 109	(29)	11300	11300	11300	11400	11400	11400	11400	11400
SE FMI 104	(29)	16300	16100	15900	15800	15600	15400	15300	15200

1st E.O. VI		7900	8000	8100	8200	8300	8400	8500	8600
SE OPS 3 FMI 109	(29)	11500	11500	11500	11500	11500	11600	11600	11600
SE FMI 104	(29)	15000	14900	14800	14600	14500	14400	14400	14300

1st E.O. VI		8700	8800	8900	9000	9100	9200	9300	9400
SE OPS 3 FMI 109	(29)	11600	11600	11700	11700	11700	11700	11700	11700
SE FMI 104	(29)	14200	14100	14100	14000	14000	13900	13900	13900

1st E.O. VI		9500	9600	9700	9800	9900	10000	10100	10200
SE OPS 3 FMI 109	(29)	11800	11800	11800	11800	11800	11800	11900	11900
SE FMI 104	(29)	13800	13800	13800	13800	13800	13800	13800	13800

1st E.O. VI		10300	10400	10500	10600	10700	10800	10900	11000
SE OPS 3 FMI 109	(29)	11900	11900	11900	12000	12000	12000	12000	12000
SE FMI 104	(29)	13800	13800	13800	13900	13900	13900	13900	13900

1st E.O. VI		11100							
SE OPS 3 FMI 109	(29)	12000							
SE FMI 104	(29)	13900							

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VELCRO

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ASC/117/FIN

TOP  
BACK OF 'FMI TAL REDESIGNATION'

HOOK  
VELCRO

HOOK  
VELCRO

HOOK  
VELCRO

**ECAL – ZZA or MRN or FMI PRIME TAL**

1st EO VI (KFPS)	5.6	5.8	6.0	6.2	6.4	6.6	6.8
CHERRY POINT (7)		6.7 - 7.0	6.7 - 7.2	6.8 - 7.3	6.8 - 7.4	6.9 - 7.5	6.9 - 7.6
OTIS ANGB (16)		10.3 - 11.1	10.3 - 11.2	10.2 - 11.3	10.2 - 11.5	10.2 - 11.6	10.2 - 11.6

1st EO VI (KFPS)	7.0	7.2	7.4	7.6	7.8	8.0	8.2
CHERRY POINT (7)	7.0 - 7.7	7.2 - 7.8	7.4 - 7.9	7.6 - 7.9	7.8 - 8.0	8.0 - 8.0	
GABRESKI (15)					10.5 - 10.7	10.4 - 10.8	10.3 - 11.0
OTIS ANGB (16)	10.2 - 11.7	10.2 - 11.8	10.2 - 11.9	10.2 - 12.0	10.2 - 12.1	10.2 - 12.1	10.3 - 12.2

1st EO VI (KFPS)	8.4	8.6	8.8	9.0	9.2	9.4	9.6
OCEANA NAS (8)		8.6 - 9.0	8.8 - 9.1	9.0 - 9.2	9.2 - 9.3		
WALLOPS (9)				9.4 - 9.6	9.2 - 9.7	9.4 - 9.8	9.6 - 9.8
GABRESKI (15)	10.3 - 11.1	10.3 - 11.2	10.3 - 11.3	10.4 - 11.3	10.4 - 11.4	10.4 - 11.5	10.4 - 11.5
OTIS ANGB (16)	10.3 - 12.3	10.3 - 12.3	10.3 - 12.4	10.4 - 12.4	10.4 - 12.5	10.5 - 12.6	10.5 - 12.6
PEASE INT'L (17)	11.3 - 11.7	11.3 - 11.9	11.3 - 12.0	11.3 - 12.1	11.3 - 12.2	11.3 - 12.2	11.3 - 12.3

1st EO VI (KFPS)	9.8	10.0	10.2	10.4	10.6	10.8	11.0
WALLOPS (9)	9.8 - 9.9						
GABRESKI (15)	10.4 - 11.6	10.5 - 11.7	10.5 - 11.7	10.5 - 11.8	10.6 - 11.8	10.8 - 11.9	11.0 - 11.9
OTIS ANGB (16)	10.5 - 12.7	10.5 - 12.7	10.6 - 12.8	10.6 - 12.8	10.7 - 12.9	10.8 - 12.9	11.0 - 12.9
PEASE INT'L (17)	11.3 - 12.4	11.4 - 12.5	11.4 - 12.5	11.5 - 12.6	11.5 - 12.6	11.5 - 12.7	11.5 - 12.7

1st EO VI (KFPS)	11.2	11.4	11.6	11.8	12.0	12.2	12.4
GABRESKI (15)	11.2 - 12.0	11.4 - 12.0	11.6 - 12.1	11.8 - 12.2	12.0 - 12.2	12.2 - 12.3	
OTIS ANGB (16)	11.2 - 13.0	11.4 - 13.0	11.6 - 13.1	11.8 - 13.1	12.0 - 13.2	12.2 - 13.2	12.4 - 13.2
PEASE INT'L (17)	11.5 - 12.8	11.5 - 12.8	11.6 - 12.9	11.8 - 12.9	12.0 - 13.0	12.2 - 13.0	12.4 - 13.0

1st EO VI (KFPS)	12.6	12.8	13.0	13.2	13.4	13.6	13.8
OTIS ANGB (16)	12.6 - 13.3	12.8 - 13.3	13.0 - 13.4	13.2 - 13.4	13.4 - 13.4		
PEASE INT'L (17)	12.6 - 13.1	12.8 - 13.1	13.0 - 13.1				

ASC-12b/117/A/A

HOOK  
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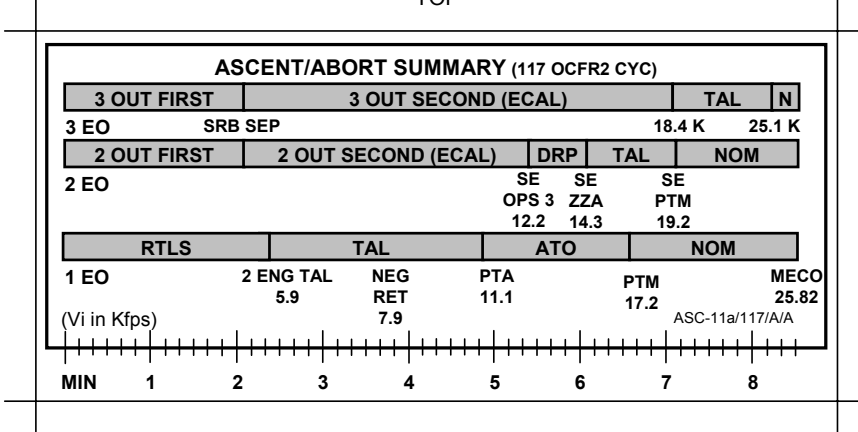
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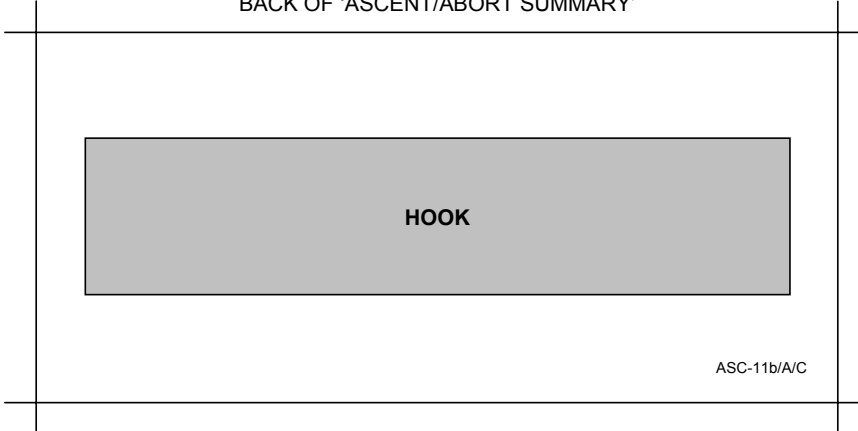
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ASC/117/FIN

TOP



TOP  
BACK OF 'ASCENT/ABORT SUMMARY'



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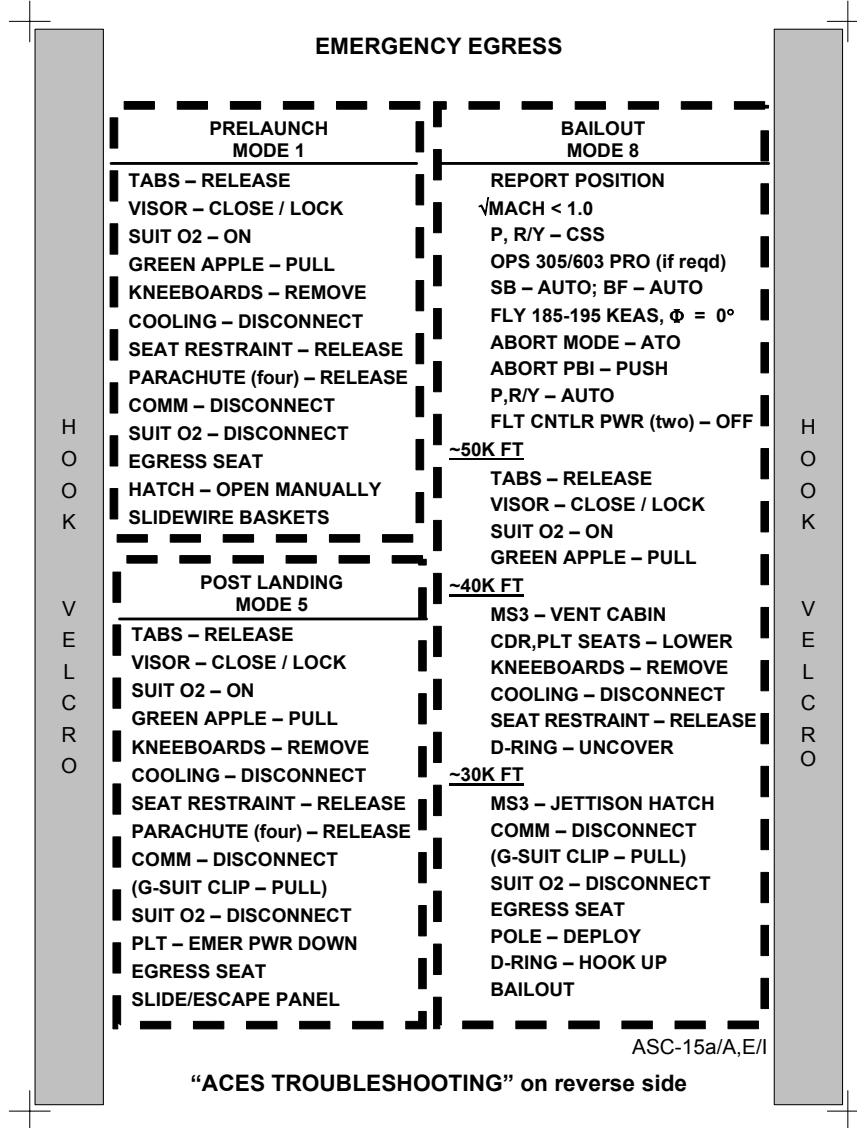
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ASC/117/FIN



TOP



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ASC/117/FIN

TOP  
BACK OF "EMERGENCY EGRESS"

**ACES TROUBLESHOOTING (ASCENT/ENTRY)**

LOSS OF COMM

If LOSS OF XMIT:

NOTE

O2 helmet flow automutes microphones (i.e., inhalation, open or leaking visor, leaking neck dam)

1. ✓TABS – IN
2. ✓Helmet pressure visor seal not obstructed
3. ✓MIC placement
4. ✓CCU PWR – ON

POWER BUS	ATU
ESS BUS 1BC	CDR
ESS BUS 2CA	PLT
MNA	MS STATION
MNB	MIDDECK
MNC	PS STATION

If LOSS OF RECEIVE:

5. HIU VOL – MAX
6. ✓All cable connections mated properly:  
CCA-to-Helmet I/F cable  
Comm pigtail  
HIU  
Comm panel
7. ✓ATU Config (Flight Deck as applicable):  
A/G1, A/G2, A/A, ICOM A, ICOM B – T/R  
MODE – PTT/VOX  
VOX SENS – 2-4  
A/G1, A/G2 tw – 9  
A/A, ICOM A, ICOM B tw – 5

LOSS OF SUIT PRESSURE

1. ✓TABS – IN
2. ✓VISOR – CLOSED/LOCKED
3. ✓Helmet properly attached
4. ✓Gloves properly attached
5. ✓BIP plug secured
6. ✓Suit zipper fully zipped

LOSS OF SUIT O2

1. ✓O2 hose connected to ACES O2 manifold
2. ✓LEH O2 vlv – OP (Flight Deck)
3. ✓O2 hose connected properly at LEH O2 (Flight Deck)

INADVERTENT EOS ACTIVATION (After T-2:00)

1. Remain on shuttle LEH O2
2. Keep visor closed and locked through MECO

NOTE

Prior to opening visor, disconnect EOS O2 line (with locking collar clip) from O2 manifold to prevent EOS O2 flow

ASC-15b/A,E/E

H  
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V  
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K  
  
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C  
R  
O

C6

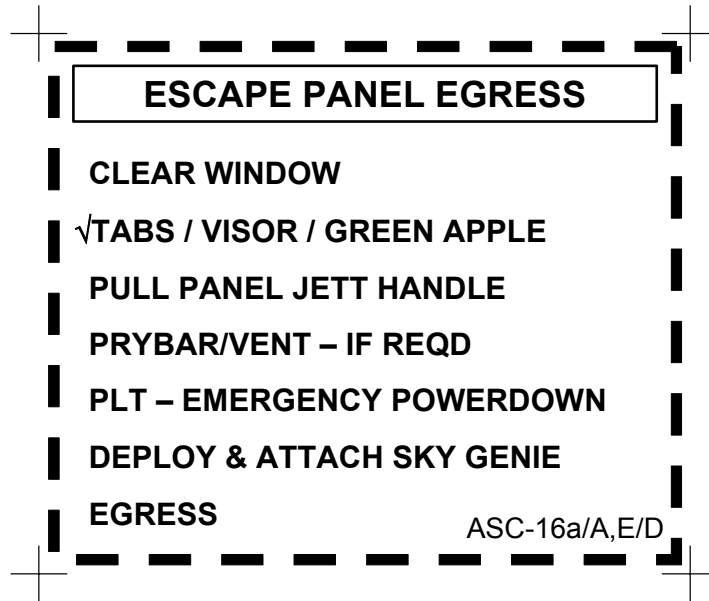
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FAB USE ONLY

CC 10-28

ASC/117/FIN

TOP



TOP  
BACK OF 'ESCAPE PANEL EGRESS'



**HOOK  
VELCRO**

ASC-16b/A,E/C

(reduced copy)

FAB USE ONLY

CC 10-29

ASC/117/FIN

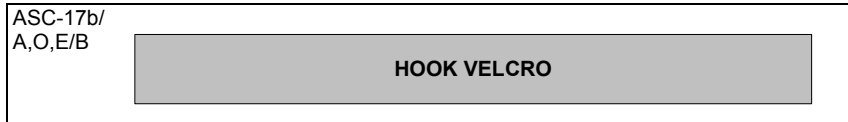
GPC/FCS CHANNEL CONFIGURATION

TOP

GPC

GPC	GPC	GPC	GPC	ASC-17a/ A,O,E/B
Delay 2 sec between each switch throw (AUTO ⇌ ORIDE)				

TOP  
BACK OF 'GPC'



Fabrication Notes

1. Cut to exact outside edge
2. Cover GPC boxes with Scotch tape

(reduced copy)

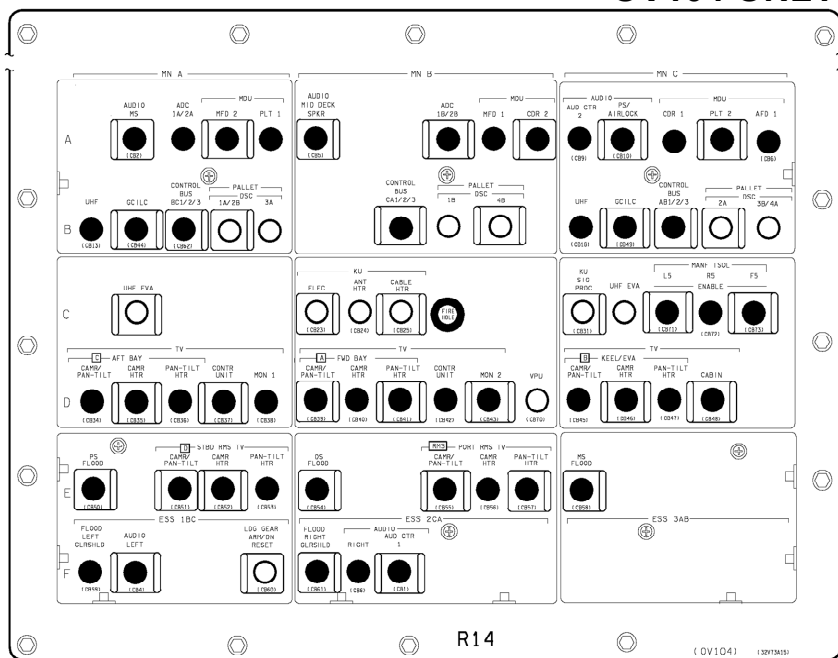
FAB USE ONLY

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ASC/117/FIN

TOP  
 PANEL R14 – OV104 ONLY

**OV104 ONLY**



(OV104) 132913A13  
 10520, PNL, 3  
 ASC-22a/A, O, E/C

(reduced copy)

FAB USE ONLY

CC 10-31

ASC/117/FIN



TOP  
 BACK OF 'PANEL R14 - OV104 ONLY'



ASC-22b/A,O,E/D



(reduced copy)  
 CC 10-32

FAB USE ONLY

ASC/117/FIN



TOP

## LOC/BREAK-UP

### BEFORE 'GO AT THROTTLEUP'

- GREEN APPLE  
LOCK INERTIA REEL
- JETTISON HATCH
- BAILOUT
- PULL RIP CORD

### 'GO AT THROTTLEUP' TO SRB SEP

- GREEN APPLE  
LOCK INERTIA REEL
- VENT
- 'G' SPIKE
- JETTISON HATCH
- √ ALT/SUIT
- BAILOUT (BELOW 40 K)
- PULL RIP CORD

### AFTER SRB SEP

- √ TABS/VISOR/GREEN APPLE  
LOCK INERTIA REEL
- GO TO MIDDECK
- VENT
- 'G' SPIKE
- JETTISON HATCH
- √ ALT/SUIT
- BAILOUT (BELOW 40 K)
- PULL RIP CORD

ASC-21a/AD

NOTE: This crew kneeboard card is optional and has no back facing

(reduced copy)

FAB USE ONLY

CC 10-33

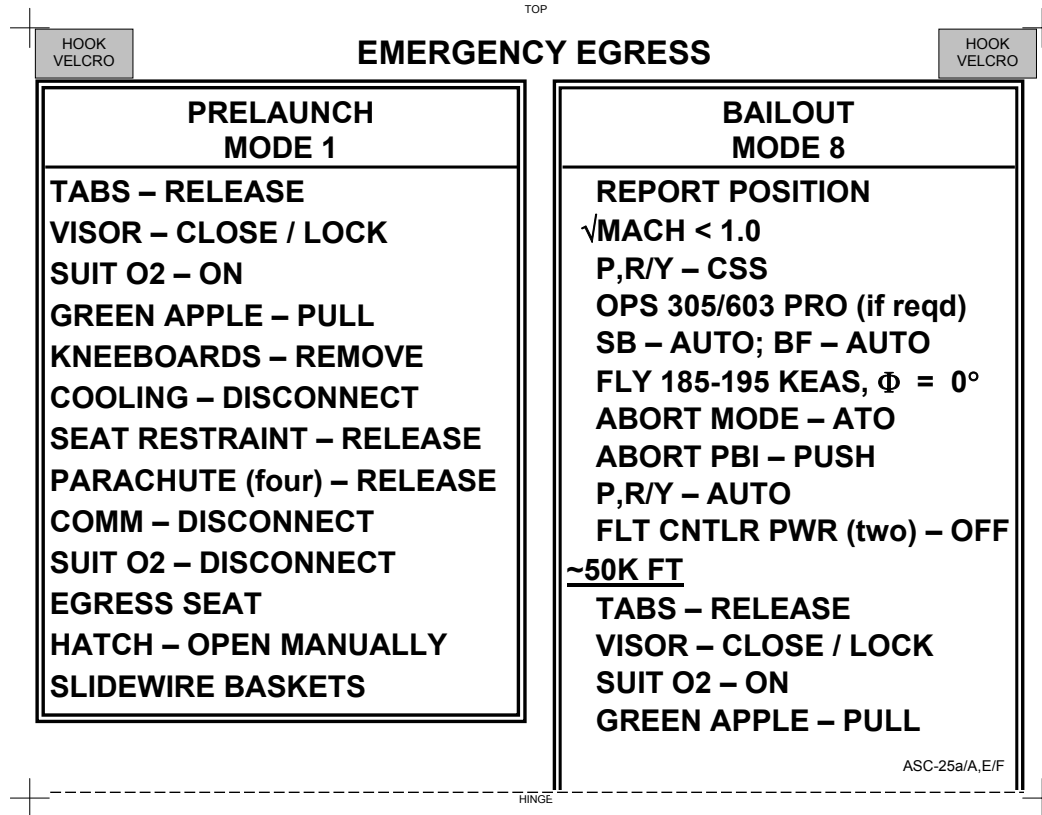
ASC/117/FIN

FAB USE ONLY

CC 10-34

ASC/117/FIN

(reduced copy)



TOP

## EMERGENCY EGRESS

HOOK  
VELCRO

HOOK  
VELCRO

### PRELAUNCH MODE 1

TABS - RELEASE  
VISOR - CLOSE / LOCK  
SUIT O2 - ON  
GREEN APPLE - PULL  
KNEEBOARDS - REMOVE  
COOLING - DISCONNECT  
SEAT RESTRAINT - RELEASE  
PARACHUTE (four) - RELEASE  
COMM - DISCONNECT  
SUIT O2 - DISCONNECT  
EGRESS SEAT  
HATCH - OPEN MANUALLY  
SLIDEWIRE BASKETS

### BAILOUT MODE 8

REPORT POSITION  
 $\sqrt{\text{MACH}} < 1.0$   
P,R/Y - CSS  
OPS 305/603 PRO (if reqd)  
SB - AUTO; BF - AUTO  
FLY 185-195 KEAS,  $\Phi = 0^\circ$   
ABORT MODE - ATO  
ABORT PBI - PUSH  
P,R/Y - AUTO  
FLT CNTLR PWR (two) - OFF  
~50K FT  
TABS - RELEASE  
VISOR - CLOSE / LOCK  
SUIT O2 - ON  
GREEN APPLE - PULL

ASC-25a/A,E/F

HINGE



FAB USE ONLY

CC 10-35

ASC/117/FIN

(reduced copy)

TOP, HINGED AT BOTTOM OF 'EMERGENCY EGRESS'  
HINGE

**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  
SLIDE/ESCAPE PANEL**

PILE  
VELCRO

**~40K FT**

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

**~30K FT**

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

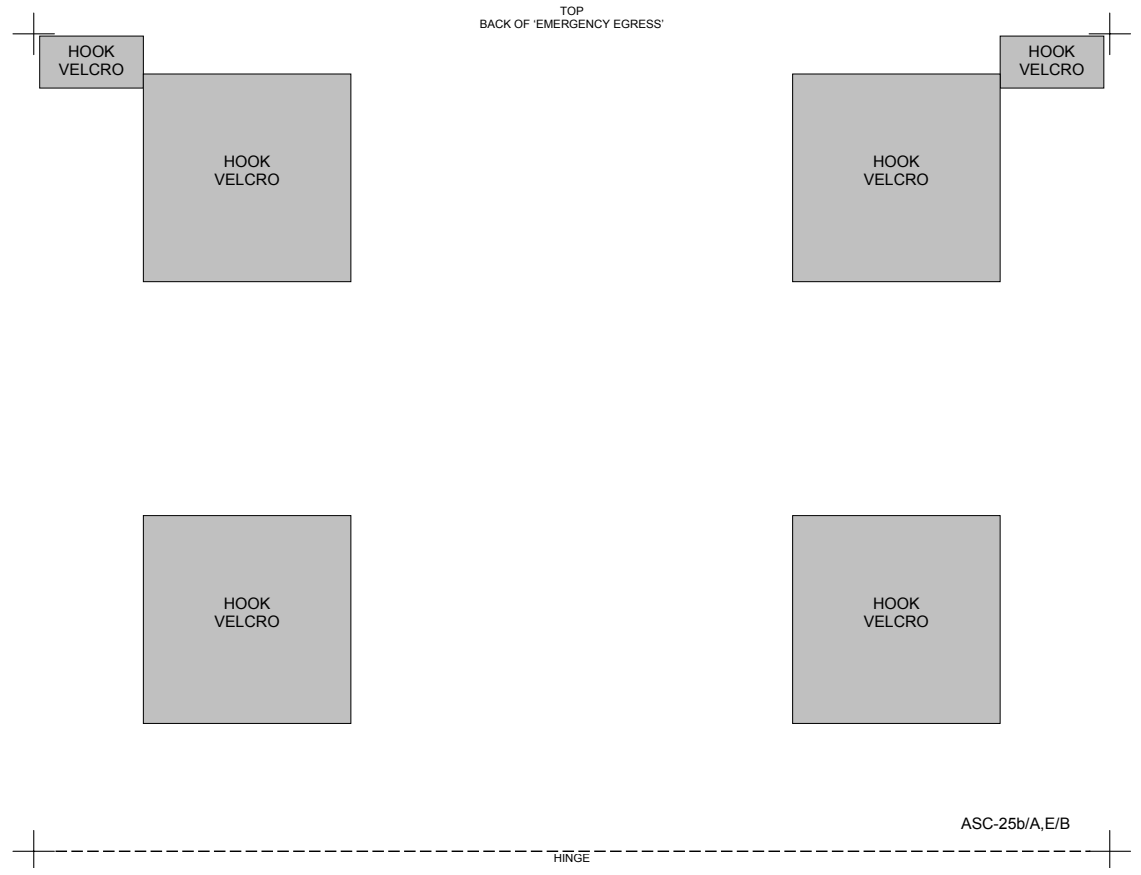
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PILE  
VELCRO

FAB USE ONLY

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CC 10-36

ASC/117/FIN



FAB USE ONLY

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CC 10-37

ASC/117/FIN

TOP, HINGED AT BOTTOM OF 'EMERGENCY EGRESS'  
HINGE

HOOK  
VELCRO

HOOK  
VELCRO

PILE  
VELCRO

ASC-25bb/A,E/B

PILE  
VELCRO

FAB USE ONLY

СС 10-38

ASC/117/FIN

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HOOK  
VELCRO

ВЕРХ

## АВАРИЙНОЕ ПОКИДАНИЕ

HOOK  
VELCRO

### РЕЖИМ 1 ДО СТАРТА

ЯЗЫЧКИ ШЕЙНОЙ ПРОКЛАДКИ - УБРАТЬ  
ШЛЕМ - ОПУСТИТЬ/ ЗАКРЫТЬ  
СК 02 - ВКЛ  
ЗЕЛЕНЬ ШАРИК - ПОТЯНУТЬ  
НАКОЛЕННЫЕ ПЛАНШЕТЫ - УБРАТЬ  
СИСТЕМУ ОХЛАЖДЕНИЯ - ОТСОЕДИНИТЬ  
ПРИВЯЗНЫЕ РЕМНИ КРЕСЛА - ОСВОБОДИТЬ  
ПАРАШЮТ (четыре) - ОТСТЕГНУТЬ  
СВЯЗЬ - ОТСОЕДИНИТЬ  
СК 02 - ОТСОЕДИНИТЬ  
ПОКИНУТЬ КРЕСЛО  
ЛЮК - ОТКРЫТЬ ВРУЧНУЮ  
ИСПОЛЬЗОВАТЬ ЛЮЛЬКУ ДЛЯ СПУСКА

### РЕЖИМ 8 АВАРИЙНОЕ ДЕСАНТИРОВАНИЕ

СООБЩИТЬ ПОЛОЖЕНИЕ  
 $\sqrt{\text{ЧИСЛО МАХА}} < 1,0$   
ТАНГАЖ, РЫСКАНИЕ/КРЕН - CSS  
OPS 305/603 PRO (если необходимо)  
А/Д ТОРМОЗ - АВТО; ПОСАД. ЩИТОК - АВТО  
ВЫБРАТЬ СКОРОСТЬ 185-195 KEAS,  $\Phi = 0^\circ$   
ABORT MODE - АТО  
КН АВОРТ - НАЖАТЬ  
ТАНГАЖ, РЫСКАНИЕ/КРЕН - АВТО  
ТМБ FLT CNTLR PWR (два) - ВЫКЛ  
~50 ТЫСЯЧ ФУТОВ  
ЯЗЫЧКИ ШЕЙНОЙ ПРОКЛАДКИ - УБРАТЬ  
ШЛЕМ - ОПУСТИТЬ/ ЗАКРЫТЬ  
СК 02 - ВКЛ  
ЗЕЛЕНЬ ШАРИК - ПОТЯНУТЬ

ASC-26a/A,E/D

HINGE

FAB USE ONLY

CC 10-39

ASC/117/FIN

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TOP, HINGED AT BOTTOM OF 'EMERGENCY EGRESS'  
HINGE

**РЕЖИМ 5  
ПОСЛЕ ПОСАДКИ**

ЯЗЫЧКИ ШЕЙНОЙ ПРОКЛАДКИ - УБРАТЬ  
ШЛЕМ - ОПУСТИТЬ/ ЗАКРЫТЬ  
СК O2 - ВКЛ  
ЗЕЛЕНЬ ШАРИК - ПОТЯНУТЬ  
НАКОЛЕННЫЕ ПЛАНШЕТЫ - УБРАТЬ  
СИСТЕМУ ОХЛАЖДЕНИЯ - ОТСОЕДИНИТЬ  
ПРИВЯЗНЫЕ РЕМНИ КРЕСЛА - ОСВОБОДИТЬ  
ПАРАШЮТ (четыре) - ОТСТЕГНУТЬ  
СВЯЗЬ - ОТСОЕДИНИТЬ  
(СНЯТЬ КОНТРОВКУ С КЛАПАНА ППК)  
СК O2 - ОТСОЕДИНИТЬ  
ПИЛОТ - ЭКСТРЕННО ОТКЛЮЧИТЬ ПИТАНИЕ  
ПОКИНУТЬ КРЕСЛО  
ИСПОЛЬЗОВАТЬ СКЛИЗ/ВЫХОДНУЮ  
ПАНЕЛЬ

**~40 ТЫСЯЧ ФУТОВ**

MS3 - СБРОСИТЬ ДАВЛЕНИЕ В КАБИНЕ  
КРЕСЛА КЭ И ПИЛОТА - ВНИЗ  
НАКОЛЕННЫЕ ПЛАНШЕТЫ - УБРАТЬ  
СИСТЕМУ ОХЛАЖДЕНИЯ - ОТСОЕДИНИТЬ  
ПРИВЯЗНЫЕ РЕМНИ КРЕСЛА - ОСВОБОДИТЬ  
D-ОБРАЗНОЕ КОЛЬЦО - НАЙТИ

**~30 ТЫСЯЧ ФУТОВ**

MS3 - ОТСТРЕЛИТЬ ЛЮК  
СВЯЗЬ - ОТСОЕДИНИТЬ  
(СНЯТЬ КОНТРОВКУ С КЛАПАНА ППК)  
СК O2 - ОТСОЕДИНИТЬ  
ПОКИНУТЬ КРЕСЛО  
РАЗЛОЖИТЬ НАПРАВЛЯЮЩУЮ ШТАНГУ  
D-ОБРАЗНОЕ КОЛЬЦО - ПРИСТЕГНУТЬ  
ПОКИНУТЬ КОРАБЛЬ

ASC-26aa/A,E/C

PILE  
VELCRO

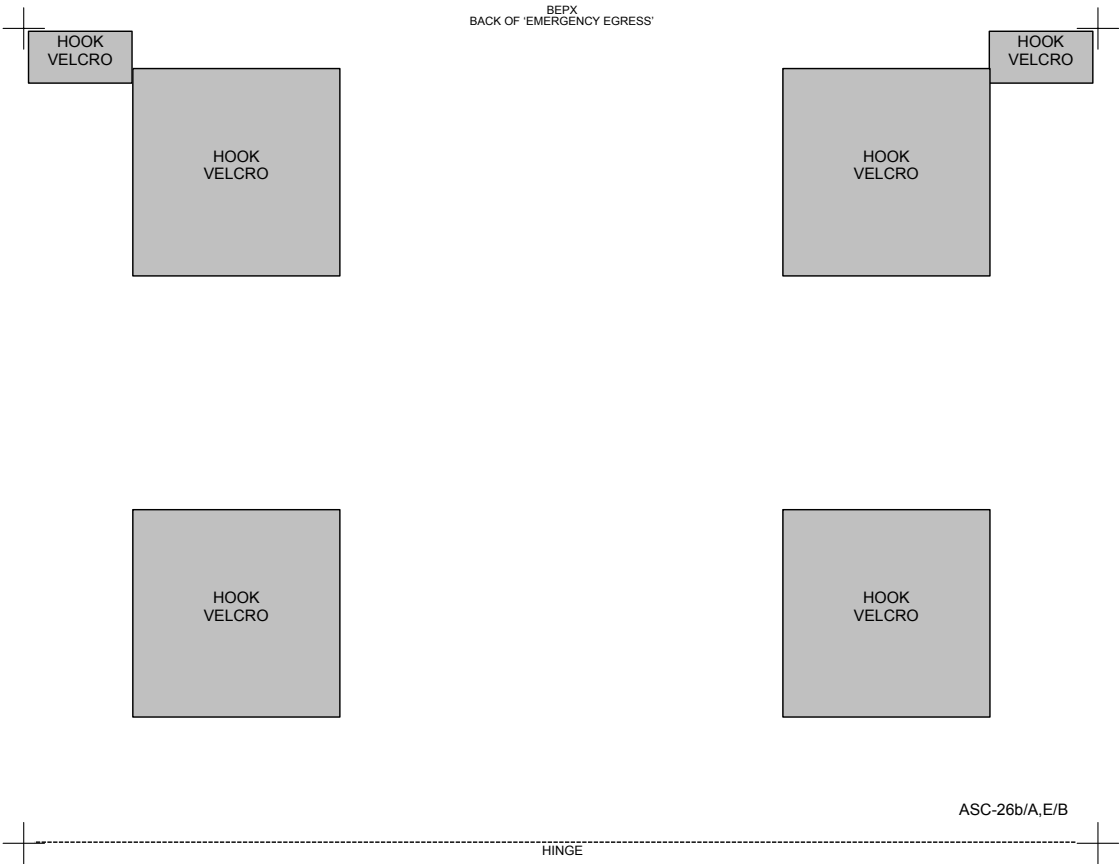
PILE  
VELCRO

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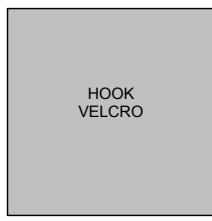


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CC 10-41

ASC/117/FIN

TOP, HINGED AT BOTTOM OF BACK OF 'EMERGENCY EGRESS'  
HINGE



ASC-26bb/A,E/B





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Space Shuttle Program  
FLIGHT DATA FILE

JSC-48005-117  
FINAL



# ASCENT CHECKLIST

STS  
**117**

Flight Cover (trim bottom to expose tabs)