

Ascent Checklist

STS-127

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

**Final
March 5, 2009**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



ASCENT C/L STS-127	FINAL (Mar 5, 2009)
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PCN-2 (May 22, 2009) Sheet 1 of 1

List of Implemented Change Requests (482s):

ASC-01878 REF-01120
ASC-01884

Incorporate the following:

1. Replace v thru viii
2. Replace 1-5 & 1-6
3. Replace 9-11 thru 9-16, 9-19 & 9-20, 9-27 & 9-28

Prepared by: Allison McCagg
Book Manager 05/15/09

Steven A. Caruth^{GP} 5-15-09
Lead Ascent GPO

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

Encl: 16 pages

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ASCENT C/L STS-127	FINAL (Mar 5, 2009)
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PCN-1 (April 10, 2009) Sheet 1 of 1

List of Implemented Change Requests (482s):

- ASC-01871
- ASC-01872
- ASC-01873

Incorporate the following:

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

Prepared by:

Allison McCagg Stuart S. Crumb 4-1-09
 Book Manager 04/01/09 Lead Ascent GPO GP.

Approved by:

[Signature]
 Chief, Ascent/Descent Dynamics Branch

Encl: 8 pages

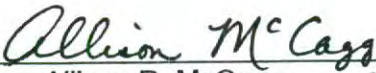
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MISSION OPERATIONS DIRECTORATE

**ASCENT CHECKLIST
STS-127**


FINAL
March 5, 2009

PREPARED BY:

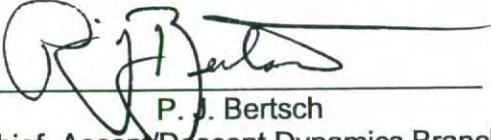


Allison R. McCagg ^{03/11/2009}
Book Manager

APPROVED BY:



Steve G. Carothers
Lead Ascent GPO



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

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ASC/127/FIN

Incorporates the following:
482#: ASC-01870

AREAS OF TECHNICAL RESPONSIBILITY

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

NOTES

1. The STS-127 trajectory data in this checklist is based on the STS-127 One Cycle to Flight R1 load and the May 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-127 is flown with vehicle OV105.



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ASCENT CHECKLIST
STS-127

LIST OF EFFECTIVE PAGES

FINAL 03/05/09
PCN-1 04/10/09
PCN-2 05/22/09

Sign Off	* 127/FIN	FB 2-7	127/FIN
ii.....	* 127/FIN	FB 2-8.....	127/FIN
iii.....	* 127/FIN	FB 2-9.....	127/FIN
iv.....	* 127/FIN	FB 2-10.....	127/FIN
v.....	* 127/FIN 2	FB 2-11.....	127/FIN
vi.....	* 127/FIN	FB 2-12.....	<input checked="" type="checkbox"/> 127/FIN
vii.....	* 127/FIN 2	FB 2-13.....	127/FIN
viii.....	* 127/FIN	FB 2-14.....	<input checked="" type="checkbox"/> 127/FIN
ix.....	* 127/FIN	FB 2-15.....	127/FIN
x.....	* 127/FIN	FB 2-16.....	127/FIN
xi.....	127/FIN	FB 2-17.....	127/FIN
xii.....	127/FIN	FB 2-18.....	127/FIN
1-1.....	127/FIN	FB 2-19.....	127/FIN
1-2.....	127/FIN	FB 2-20.....	127/FIN
1-3.....	127/FIN	FB 2-21.....	127/FIN
1-4.....	127/FIN	FB 2-22.....	127/FIN
1-5.....	127/FIN 2	FB 2-23.....	127/FIN
1-6.....	127/FIN	FB 2-24.....	127/FIN
1-7.....	127/FIN	FB 2-25.....	127/FIN
1-8.....	127/FIN	FB 2-26.....	127/FIN
1-9.....	127/FIN	2-27.....	127/FIN
1-10.....	<input checked="" type="checkbox"/> 127/FIN	2-28.....	127/FIN
1-11.....	127/FIN	2-29.....	127/FIN
1-12.....	127/FIN	2-30.....	127/FIN
1-13.....	127/FIN	2-31.....	127/FIN
1-14.....	127/FIN	2-32.....	127/FIN
2-1.....	127/FIN	2-33.....	127/FIN
FB 2-2.....	127/FIN	2-34.....	127/FIN
FB 2-3.....	127/FIN	2-35.....	* 127/FIN
FB 2-4.....	127/FIN	2-36.....	* 127/FIN
FB 2-5.....	127/FIN	2-37.....	* 127/FIN
FB 2-6.....	127/FIN 1	2-38.....	* 127/FIN

* – Omit from flight book

– Prelift-off information required

2-39.....	*	127/FIN	6-17.....	127/FIN
2-40.....	*	127/FIN	6-18.....	127/FIN
2-41.....	*	127/FIN	6-19.....	127/FIN
2-42.....	*	127/FIN	6-20.....	127/FIN
2-43.....	*	127/FIN	6-21.....	127/FIN
2-44.....	*	127/FIN	6-22.....	127/FIN
2-45.....	*	127/FIN	6-23.....	127/FIN
2-46.....	*	127/FIN	6-24.....	127/FIN
3-1.....		127/FIN	6-25.....	127/FIN
3-2.....		127/FIN	6-26.....	127/FIN
3-3.....		127/FIN	6-27.....	127/FIN
3-4.....		127/FIN	6-28.....	127/FIN
3-5.....		127/FIN	6-29.....	127/FIN
3-6.....		127/FIN	6-30.....	127/FIN
3-7.....		127/FIN	6-31.....	127/FIN
3-8.....		127/FIN	6-32.....	127/FIN
4-1.....		127/FIN	6-33.....	127/FIN
4-2.....		127/FIN	6-34.....	127/FIN
4-3.....		127/FIN	6-35.....	127/FIN
4-4.....		127/FIN	6-36.....	127/FIN
5-1.....		127/FIN	6-37.....	127/FIN
5-2.....		127/FIN	6-38.....	127/FIN
5-3.....		127/FIN	6-39.....	127/FIN
5-4.....		127/FIN	6-40.....	127/FIN
6-1.....		127/FIN	7-1.....	127/FIN
6-2.....		127/FIN	7-2.....	127/FIN
6-3.....		127/FIN	7-3.....	127/FIN
6-4.....		127/FIN	7-4.....	127/FIN
6-5.....		127/FIN	7-5.....	127/FIN
6-6.....		127/FIN	7-6.....	127/FIN
6-7.....		127/FIN	7-7.....	127/FIN
6-8.....		127/FIN	7-8.....	127/FIN
6-9.....		127/FIN	7-9.....	127/FIN
6-10.....		127/FIN	7-10.....	127/FIN
6-11.....		127/FIN	8-1.....	127/FIN
6-12.....		127/FIN	8-2.....	127/FIN
6-13.....		127/FIN	8-3.....	☒ 127/FIN
6-14.....		127/FIN	8-4.....	☒ 127/FIN
6-15.....		127/FIN	8-5.....	☒ 127/FIN
6-16.....		127/FIN	8-6.....	☒ 127/FIN

* – Omit from flight book

☒ – Prelift-off information required

8-7.....	☒	127/FIN	CC 10-7.....	*	127/FIN
8-8.....		127/FIN	CC 10-8.....	*	127/FIN
9-1.....	*	127/FIN	CC 10-9.....	*	127/FIN
9-2.....	*	127/FIN	CC 10-10.....	*	127/FIN
9-3.....	*	127/FIN	CC 10-11.....	*	127/FIN
9-4.....	*	127/FIN	CC 10-12.....	*	127/FIN
9-5.....	*	127/FIN	CC 10-13.....	*	127/FIN
9-6.....	*	127/FIN	CC 10-14.....	*	127/FIN
9-7.....	*	127/FIN	CC 10-15.....	*	127/FIN
9-8.....	*	127/FIN	CC 10-16.....	*	127/FIN
9-9.....	*	127/FIN	CC 10-17.....	*	127/FIN
9-10.....	*	127/FIN	CC 10-18.....	*	127/FIN
9-11.....	*	127/FIN	CC 10-19.....	*	127/FIN
9-12.....	*	127/FIN 2	CC 10-20.....	*	127/FIN
9-13.....	*	127/FIN 2	CC 10-21.....	*	127/FIN
9-14.....	*	127/FIN	CC 10-22.....	*	127/FIN
9-15.....	*	127/FIN	CC 10-23.....	*	127/FIN
9-16.....	*	127/FIN 2	CC 10-24.....	*	127/FIN
9-17.....	*	127/FIN	CC 10-25.....	*	127/FIN
9-18.....	*	127/FIN	CC 10-26.....	*	127/FIN
9-19.....	*	127/FIN	CC 10-27.....	*	127/FIN
9-20.....	*	127/FIN 2	CC 10-28.....	*	127/FIN
9-21.....	*	127/FIN	CC 10-29.....	*	127/FIN
9-22.....	*	127/FIN	CC 10-30.....	*	127/FIN
9-23.....	*	127/FIN 1	CC 10-31.....	*	127/FIN
9-24.....	*	127/FIN 1	CC 10-32.....	*	127/FIN
9-25.....	*	127/FIN	CC 10-33.....	*	127/FIN
9-26.....	*	127/FIN	CC 10-34.....	*	127/FIN
9-27.....	*	127/FIN 2	CC 10-35.....	*	127/FIN
9-28.....	*	127/FIN	CC 10-36.....	*	127/FIN
10-1.....	*	127/FIN	CC 10-37.....	*	127/FIN
CC 10-2.....	*	127/FIN	CC 10-38.....	*	127/FIN
CC 10-3.....	*	127/FIN	CC 10-39.....	*	127/FIN
CC 10-4.....	*	127/FIN	CC 10-40.....	*	127/FIN
(A)CC 10-5....	*	127/FIN	CC 10-41.....	*	127/FIN
(A)CC 10-6....	*	127/FIN	10-42.....	*	127/FIN
(B)CC 10-5....	*	127/FIN			
(B)CC 10-6....	*	127/FIN			
(C)CC 10-5....	*	127/FIN			
(C)CC 10-6....	*	127/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/H
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/D
SPEED BRAKE CMD		
(Front).....	CC 10-4	ASC-3a/A,E/E
(Back).....	CC 10-4	ASC-3b/A,E/D
CONTINGENCY ABORT		
CDR (Front).....	(A)CC 10-5	ASC-30a/127/A/A
RTLS CONTINGENCY		
CDR (Back).....	(A)CC 10-6	ASC-30b/127/A/A
CONTINGENCY ABORT		
PLT (Front).....	(B)CC 10-5	ASC-31a/127/A/A
RTLS CONTINGENCY		
PLT (Back).....	(B)CC 10-6	ASC-31b/127/A/A
CONTINGENCY ABORT		
MS (Front).....	(C)CC 10-5	ASC-32a/127/A/A
RTLS CONTINGENCY		
MS (Back).....	(C)CC 10-6	ASC-32b/127/A/A
OMS 2 BURN MONITOR (Front)..	CC 10-7	ASC-5a/127/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/127/A,O/A
OPS 1 RCS BURN (Back).....	CC 10-10	ASC-6b/127/A,O/A
ASCENT ADI – NOMINAL		
(Front).....	CC 10-11	ASC-14a/127/A/A
ENTRY ALPHA – KSC 15		
(Back).....	CC 10-11	ASC-14b/127/A,E/A
AOA DEORBIT BURN (2 ENG)		
(Top/Front).....	CC 10-12	ASC-8a/A/E
(Bottom/Front).....	CC 10-13	ASC-8aa/127/A/A
AOA DEORBIT BURN (1 ENG)		
(Top/Back).....	CC 10-14	ASC-8b/A/B
(Bottom/Back).....	CC 10-15	ASC-8bb/127/A/A
AOA DEORBIT BURN (RCS)		
(Top/Front).....	CC 10-16	ASC-7a/A/B
(Bottom/Front).....	CC 10-17	ASC-7aa/127/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/127/A/A
ECAL – ZZA or MRN or FMI PRIME TAL		
(Back).....	CC 10-21	ASC-9b/127/A/A
MRN TAL REDESIGNATION		
(Front).....	CC 10-22	ASC-10a/127/A/A
ECAL – ZZA or MRN or FMI PRIME TAL		
(Back).....	CC 10-23	ASC-10b/127/A/A
FMI TAL REDESIGNATION		
(Front).....	CC 10-24	ASC-12a/127/A/A
ECAL – ZZA or MRN or FMI PRIME TAL		
(Back).....	CC 10-25	ASC-12b/127/A/A
ASCENT/ABORT SUMMARY		
(Front).....	CC 10-26	ASC-11a/127/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/F
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 – OV105 ONLY		
(Front).....	CC 10-31	ASC-19a/A,O,E/D
(Back).....	CC 10-32	ASC-19b/A,O,E/C
LOC/BREAK-UP.....	CC 10-33	ASC-21a/A/D
EMERGENCY EGRESS (OVERSIZED)		
(Top/Front)	CC 10-34	ASC-25a/A,E/G
(Bottom/Front)	CC 10-35	ASC-25aa/A,E/E
(Top/Back).....	CC 10-36	ASC-25b/A,E/D
(Bottom/Back).....	CC 10-37	ASC-25bb/A,E/D
EMERGENCY EGRESS (RUSSIAN)		
(Top/Front)	CC 10-38	ASC-26a/A,E/E
(Bottom/Front)	CC 10-39	ASC-26aa/A,E/D
(Top/Back).....	CC 10-40	ASC-26b/A,E/D
(Bottom/Back).....	CC 10-41	ASC-26bb/A,E/D

PLT & CDR Ascent

<u>Flip Book</u>	FB 2-2 thru FB 2-26
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<u>CONTENTS</u>	<u>PAGE</u>
PRELAUNCH PROCEDURES.....	1-1
ASCENT PROCEDURES (FLIP BOOK).....	2-1
RTLS CDR (CIL)	FB 2-12
TAL CDR (CIL)	FB 2-14
ASCENT/ENTRY CUE CARDS	2-27
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POST OMS 1 BURN PROCEDURES.....	3-1
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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 ΔV	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

**PRE-
LAUNCH**



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

If OV105:

O7 √GPS PRE AMPL UPPER (three) – ON
 LOWER (three) – ON
 √PWR (three) – ON
 √ENCRYPT (three) – 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

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

-16:00
(-56:00)

P **MPS He RECONFIG**

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

(~17:00) P

CLEAR HARDWARE C/W MEMORY

C3 C/W MEM – CLEAR

-9:00

(~15:00)

MS1

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

1-11

ASC/127/FIN

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

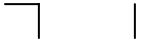
C3 C/W MEM – CLEAR

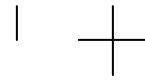
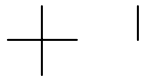
-2:00 **A SUIT PREP**

√Tabs/visor – cl/LES O2 – ON



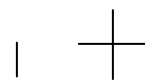
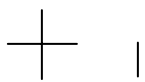
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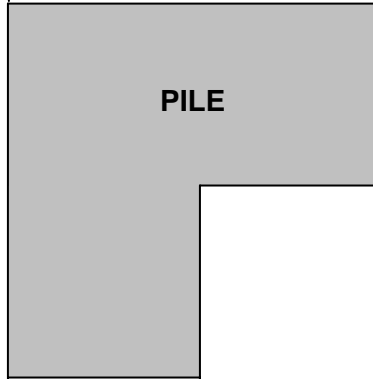


ASCENT PROCEDURES
(FLIP BOOK)

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

NO COMM MODE BOUNDARIES

NEG RETURN (104)	8100	2 ENG ZZA (104)	5800
PRESS TO ATO (104)	10100	ABORT TAL ZZA (4)	
SE OPS 3 (109)	12100	EO VI	<input type="text"/>
SE ZZA (104)	14300	SE OPS 3 ZZA (109) (4)	<input type="text"/>
PRESS TO MECO (104)	15800	SE ZZA (104) (4)	<input type="text"/>
SE PRESS (104)	18400		
NEG MRN (2 @ 67)	20000		
LAST PRE MECO TAL	23000	2 ENG MRN (104)	5700
LAST TAL		ABORT TAL MRN (3)	
YJT	19900	EO VI	<input type="text"/>
YYT	20200	SE OPS 3 MRN (109) (3)	<input type="text"/>
YQX	21900	SE MRN (104) (3)	<input type="text"/>
IKF	23800		
INN	24100		
BEJ	24300		
MRN,FFA	24400	2 ENG FMI (104)	6000
KBO	24600	ABORT TAL FMI (29)	
ESN	25000	EO VI	<input type="text"/>
ZZA, KKI	25100	SE OPS 3 FMI (109) (29)	<input type="text"/>
FMI	25200	SE FMI (104) (29)	<input type="text"/>
JDG	25300		

ASCENT PROCEDURES

HOOK

R180

LVLH

.81M

√P_c → 72%

1.09M

√P_c → 104%

P_c < 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_I = 13.2K

√Roll Heads Up

- * If Man Throttle (3 eng): *
- * Man Shutdn at 25700 *
- * If 1 eng: *
- * TRAJ √SERC ON *
- * When MPS PRPLT = 5%: *
- * MAN THROT *
- * When MPS PRPLT = 2%: *
- * MIN THROT (P_c → 67%) *
- * AUTO THROT *

MECO

√V_I = 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_I < 25760: *
- * 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

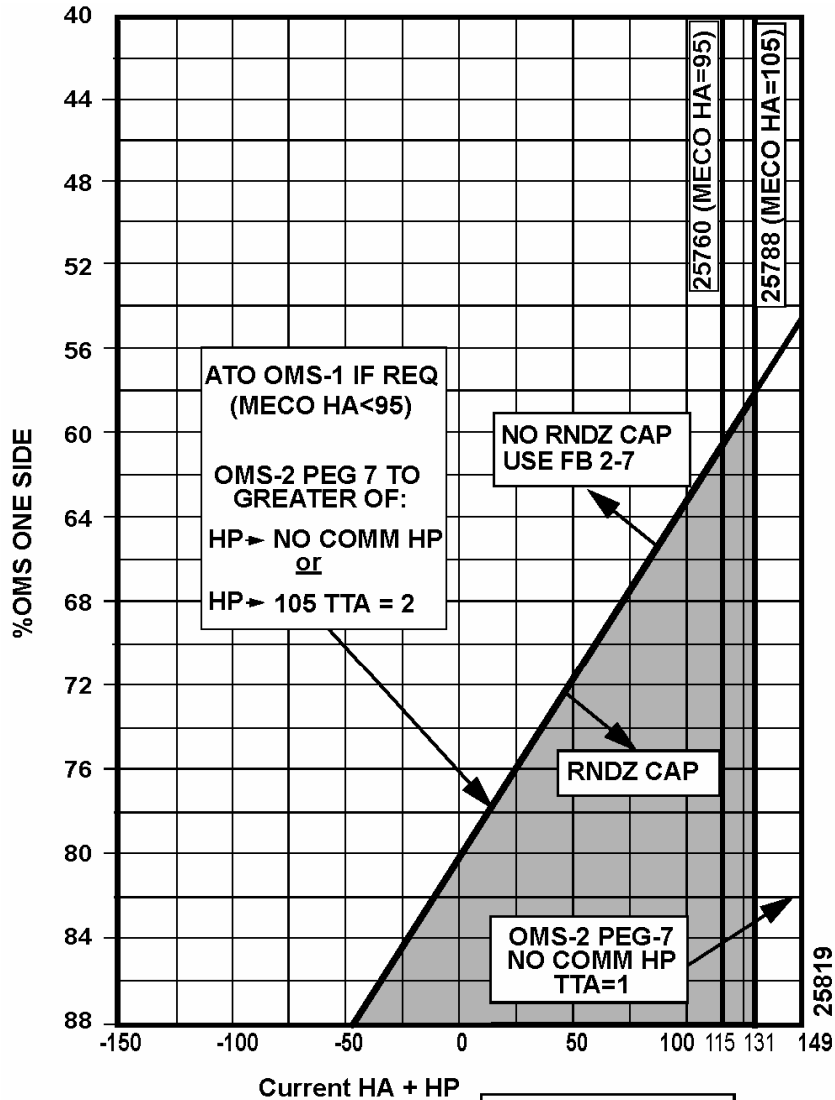
Go to POST OMS 1

**OMS 1
TGTING**

PILE

STS-127 OCFR1 CY
OMS 1/2 TGTING
RENDEZVOUS RECOVERY

ASC



Current HA + HP

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

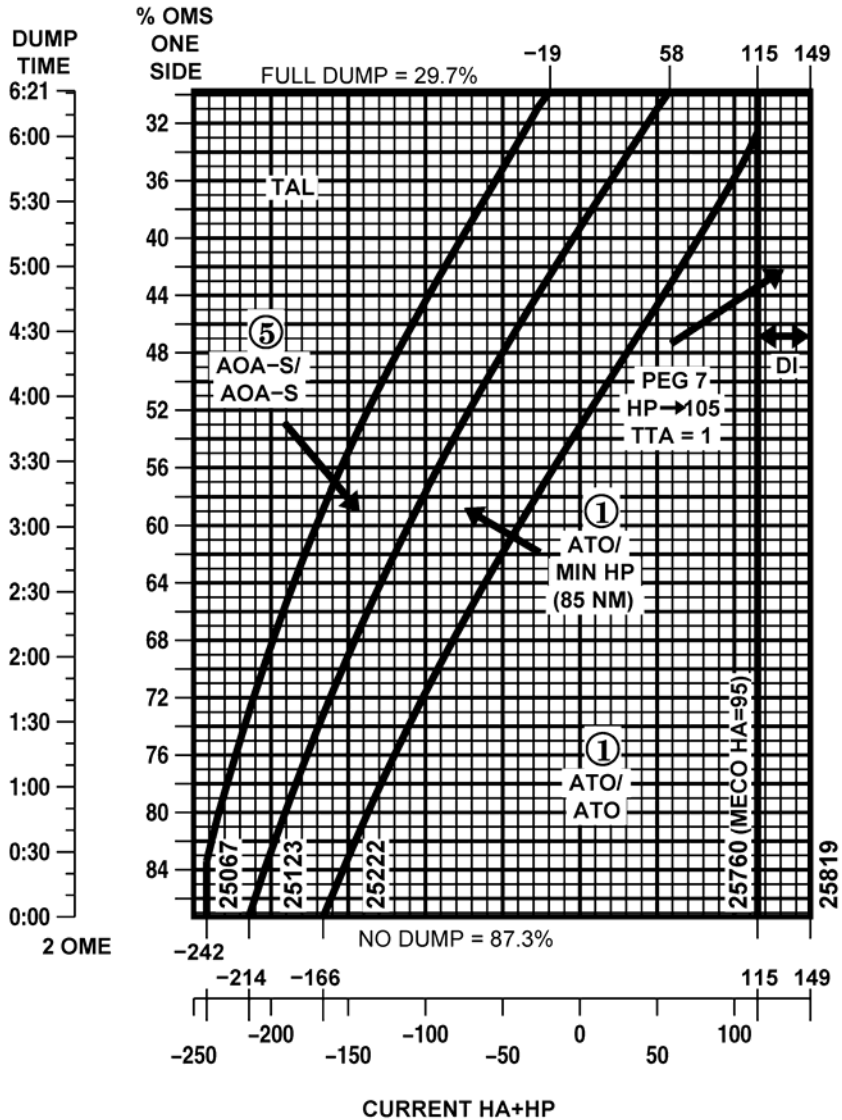
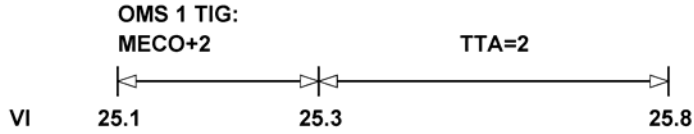
FB 2-6

ASC/127/FIN 1

TOP

STS-127 OCFR1 CY OMS 1/2 TGTING

HOOK



OMS 1
BURN

POST NOMINAL
OMS ASSIST

% OMS/SIDE
77

DUMP TIME
1: 05

FB 2-7

ASC/127/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'cnct both OMS to RCS, THC +X at TIG *

DAP – AUTO/DISC
√ENG/TRIM CONFIG, Select TGT (ITEM 35) then TIG
LOAD TGTS and MNVR
OMS XFEED (four) – OP
√CNTLR PWR (two) – ON
√OMS ENG (two) – ARM/PRESS
Note ΔVTOT _____ TIG :
-:15 EXEC
:00 TIG; start watch (√P_c, 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

OMS TEMP* FU IN P ≥ <table border="1" style="display: inline-table;"><tr><td>L</td><td>R</td></tr><tr><td>219</td><td>220</td></tr></table> ≤ <table border="1" style="display: inline-table;"><tr><td>L</td><td>R</td></tr><tr><td>201</td><td>208</td></tr></table> or No FU IN P	L	R	219	220	L	R	201	208	OMS ENG FAIL OMS ENG FAIL (PRPLT FAIL if 1 Pod Feed)
L	R								
219	220								
L	R								
201	208								
OMS PC* & OMS ↓ (BFS: √accel)	OMS ENG FAIL								
OMS OX/FU TK P (√ENG IN P) OX/FU LOW	He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At 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								
OMS He TK P LOW (√ <table border="1" style="display: inline-table;"><tr><td>OMS/MPS</td></tr></table>)	OMS/MPS	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							
OMS/MPS									
OMS N2 REG P HIGH or LOW	OMS ENG – ARM								
OMS N2 TK P LOW (√ <table border="1" style="display: inline-table;"><tr><td>OMS/MPS</td></tr></table>)	OMS/MPS	At N2 TK P < 470: OMS ENG – ARM							
OMS/MPS									
OMS GMBL	PRI fail L(R) OMS GMBL – SEC SEC fail If high RCS usage: OMS ENG FAIL								
GPC 1(4) & Burning OMS aff	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC								
SEC GMBL lost 2 FAs lost	If high RCS usage: OMS ENG FAIL √MAN SHUTDN								
I/O ERROR FA 1(4)	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								
BCE STRG D 1(4)	I/O RESET (if recov: >>) If high RCS usage: L(R) OMS GMBL – SEC								
I/O ERROR PCM	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) – 1 or 2 OMS ENGs – 1 He TK – 1 PRPLT TK EPS – MNA & B, MNB & C MNA & C ET SEP	PEG 7; TTA = 1 CUTOFF HP = 85
OMS – 2 He Tks – 2 OX or 2 FU TKs – 1 OX & 1 FU TK diff PODs	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	%
4320	86.8	2450	40
4050	80	2050	30
3650	70	1650	20
3250	60	1250	10
2850	50	850	0

TOP

HOOK

ATO

NOTE

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

DUAL POD - OMS REQUIRED				
Includes 8.8 % Unusable (4.4 % per pod)				
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	37.8	19.1	33.8	20.8
90	39.2	16.8	31.5	17.7
85	40.8	15.3	29.2	14.9
80	42.7	15.0	26.7	12.1
75	44.7	16.6	23.6	9.2
70	46.5	18.6	20.6	8.8
65	47.7	20.0	18.3	8.8
60	48.5	21.3	17.6	8.8
55	48.9	22.4	18.6	8.8
50	49.6	23.6	18.4	8.8
45	---	25.0	20.9	8.8

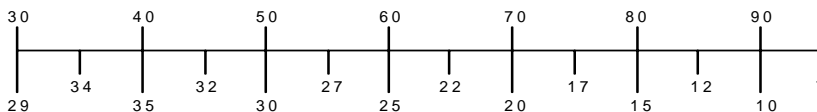
STS-127 OCFR1 CY

SINGLE POD - OMS REQUIRED				
Includes 4.4 % Unusable				
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	33.4	14.7	29.4	16.4
90	34.8	12.4	27.1	13.3
85	36.4	10.9	24.8	10.5
80	38.3	10.6	22.3	7.7
75	40.3	12.2	19.2	4.8
70	42.1	14.2	16.2	4.4
65	43.3	15.6	13.9	4.4
60	44.2	16.9	13.2	4.4
55	44.5	18.0	14.2	4.4
50	45.2	19.2	14.0	4.4
45	---	20.6	16.5	4.4

RTLS

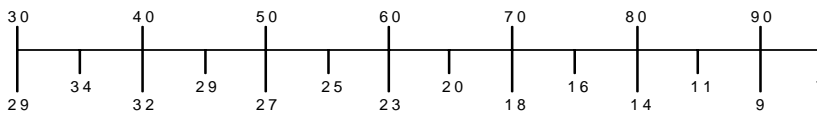
OMS BLOWDOWN

LEFT OMS GAGE QTY (%)



LEFT OMS BLDN EQUIV (%)

RIGHT OMS GAGE QTY (%)



RIGHT OMS BLDN EQUIV (%)

FB 2-11

ASC/127/FIN

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	/
SPDBK @ 3000 FT	

After PPA: √BFS ITEM 1 (*)

TRAJ √Bugs, HSI √, 

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

SPDBK @ 3000 FT

**OMS 2
TGTING**

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

- √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 √ α vs Mach
 $V = 5K$ √RUD, AIL TRIM
 $\& EAS < 333 \downarrow$ 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 θ	PITCHAROUND at % (8°/sec)	FLYBACK INITIAL θ
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

G50 \sqrt{GPS} , INCORPORATE

MM603 **G50** \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	HDG
ZZA	010
MRN	016
FMI	006

*LO XRNG

TAL CDR

If $V_1 > 23000$ manual MECO 23700 , go to post MECO
ABORT TAL

$G50$ \checkmark SITE & RWY (PASS/BFS), \checkmark HDG

SITE	RWY	MLS	LENGTH
2	BEN 36/18	-/-	13720/13220
3	MRN 20/02	6/-	11730/11730
4	ZZA 30L/12R	6/-	12200/12200
12	BEN 36/18	-/-	13720/13220
13	*MRN 20/02	6/-	11730/11730
14	*ZZA 30L/12R	6/-	12200/12200
19	YJT 09/27	-/-	9500/9500
20	YYT 29/11	-/-	8500/8500
21	YQX 21/31	-/-	9700/8900
23	LAJ 15/33	-/-	10870/10870
24	BEJ 01L/19R	-/-	10820/10820
25	IKF 20/29	-/-	9520/9560
26	INN 06/24	-/-	9540/9540
27	FFA 27/09	-/-	9490/9490
28	KBO 14L/32R	-/-	12020/12020
29	FMI 33/15	6/-	11300/12300
30	ESN 03R/21L	-/-	11800/11800
31	KKI 15R/33L	-/-	13300/13300
32	JDG 31/13	-/-	12000/12000

* If second eng fails: $TRAJ$ \checkmark SERC ON *
* $G50$ \checkmark SITE (\checkmark Redes card) *

$V_1 = 15.0K$ \checkmark Roll Heads Up

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

MECO+20 s \checkmark ET SEP, \checkmark AUTO -Z TRANS
MECO+37 s \checkmark MM104

Abort TAL (if reqd):

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

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

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

BFS, OPS 301 PRO (\checkmark 304)
 $G50$ \checkmark SITE, RWY
S/B & ALTM (PASS/BFS)

$TRAJ$ \checkmark BUGS, HSI \checkmark H , RANGE, AMI \checkmark $\alpha = 43^\circ$

* 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) *

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

\checkmark SPDBK $\rightarrow 81\%$
Go to ENTRY MANEUVERS SURF WIND
(Cue Card)

SPDBK @ 3000 FT

ALTM			
AIM PT			
SPDBK			

RTL5

TAL PLT

HOOK

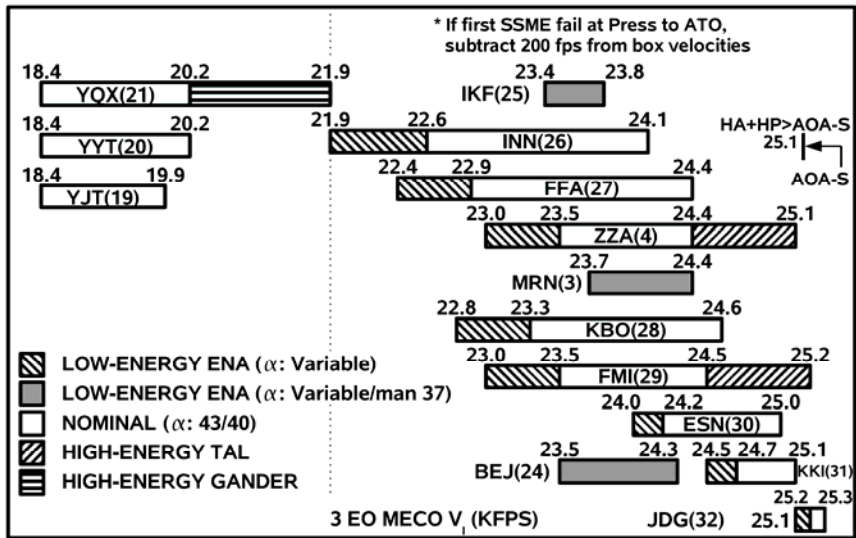
√OMS DUMP

- * If second eng fail: *
- * **G51** DUMP – ITEM 6 (*), 7 (*) *
- * Failed ME SHUTDN pb (two) – push *

√AUTO THROT

- * If STUCK TAL: *
- * When MPS PRPLT = 2%: *
- * MAN THROT, P_C → 67% *
- * AUTO THROT *

----- MECO -- V_I ~24.0K @ CO mark ----- 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)

G50 √GPS, INCORPORATE

V = 10K * If RCS < **57** % 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

PILE

POWERED ECAL

G51 √MAX THROT – ITEM 4 (*)


√ADI (two) – REF

√θ → 60°, Yaw → 45°

√Roll to Heads Up

G50 Select SITE

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
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
*6.8-8.6	*6.7-6.9 6.9-8.1 *8.1-8.4	6.7-7.9 *7.9-8.0	Cherry Point	7	NKT 32L
RTLS	RTLS	RTLS			
*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
*9.7-10.5	9.2-9.9 *9.9-10.2	8.6-10.5	Wallops	9	WAL 28
	*10.2-10.5	9.5-11.2	Atlantic City	11	ACY 31
	10.5-12.3	10.1-12.7	Gabreski	15	FOK 06
*10.5-10.9 10.9-13.3	10.7-13.4	10.5-13.7	Otis ANGB	16	FMH 32
	11.5-13.2	11.1-13.9	Pease Int'l	17	PSM 34

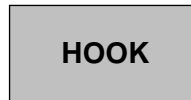
*Probable bailout region

3 E/O ECAL (51.6°)

MM 602 Velocity (Vrel)			Location	Site	RWY
IP - 2:30	In Plane	IP + 2:30			
*5.3-6.6	*5.3-6.6	*5.3-6.7	Wilmington	6	ILM 06
*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
*8.9-10.2	*8.7-10.0	*8.6-9.7			
*10.2-10.9	*10.0-10.7	*9.7-10.6	Wallops	9	WAL 28
	*10.7-11.0	*10.6-11.0	Atlantic City	11	ACY 31
*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
	11.8-12.4	11.2-13.0	Gabreski	15	FOK 06
	12.8-13.8	12.9-14.2	Pease Int'l	17	PSM 34
13.5-17.2	13.3-17.4	13.1-17.2	Halifax Int'l	18	YHZ 23
15.2-18.0	15.0-18.0	14.9-18.0	Stephenville	19	YJT 09
15.4-18.0	15.3-18.0	15.3-18.0	St. Johns Int'l	20	YYT 29
15.5-18.0	15.4-18.0	15.2-18.0	Gander Int'l	21	YQX 21
		17.3-17.6	Goose Bay	22	YYR 26

*Probable bailout region

TAL



HI-ENER
GANDER

ECAL ENTRY

If 3 OUT ECAL or 2 OUT SECOND GREEN:

G50 Select SITE
BFS, OPS 602 PRO

Before NZ Hold:
RHC/PNL TRIM – ENA
If M < 5, √AIL/RUD TRIM

BFS, **G50** √SITE

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 √GPS, 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

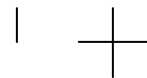
ECAL LANDING:

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°

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

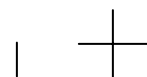
Roll towards site ($\phi \sim 80^\circ$), initial target $\dot{H} = -350$,
hold initial Alpha per table
G50 Hold 3.0g Nz using roll

- * 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 ($\sqrt{304}$)**G50** Select Site YQX – ITEM 41 +2 1**TRAJ** \sqrt{BUGS} , **HSI** $\sqrt{\hat{H}}$, RANGE $\sqrt{ET DOORS}$ – 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,
 $\sqrt{P,R/Y}$ – AUTO**V = 19K** HYD MPS/TVC ISOL VLV (three) – CL
(hold 5 sec, tb-CL)**V = 15K** **G50** \sqrt{RWY} , S/B, ALTM
(PASS/BFS)**V = 10K** * If RCS < **57** % either side: *
* **G51** AFT RCS INH, ITEM 13 EXEC ***V = 10K** $\sqrt{SPDBK} \rightarrow 81\%$
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 before $\dot{H} > +200$)
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, S/B, ALTM
(PASS/BFS)

V = 10K * If RCS < [57] % 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)

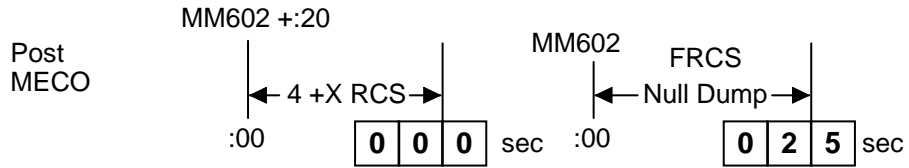
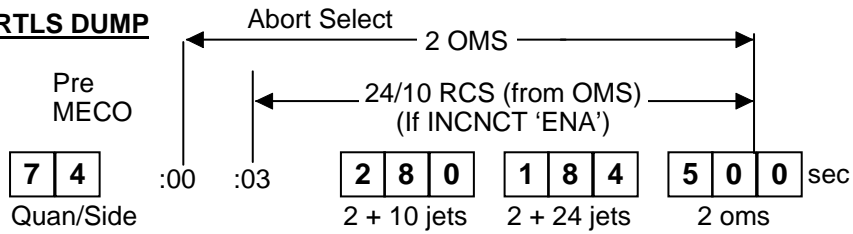
TOP
BACK OF 'ECAL ENTRY'

PILE

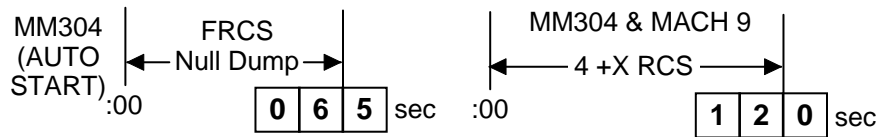
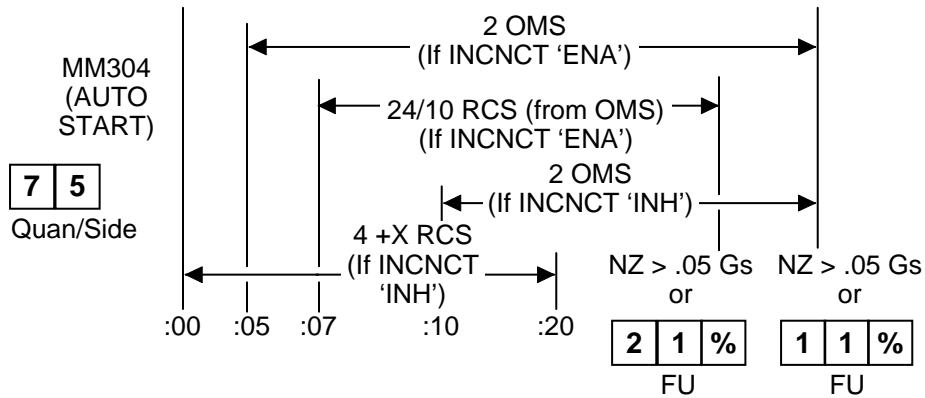
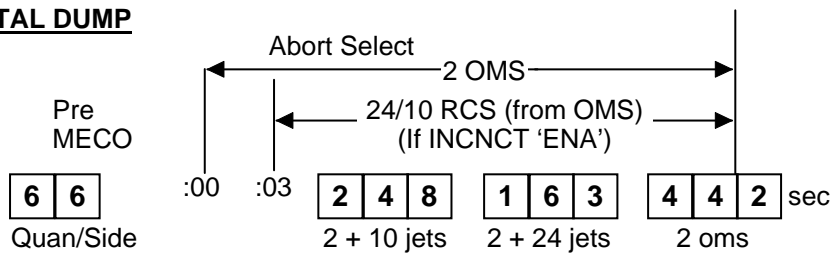
RTLS/TAL DUMPS

HI-ENER
TAL

RTLS DUMP

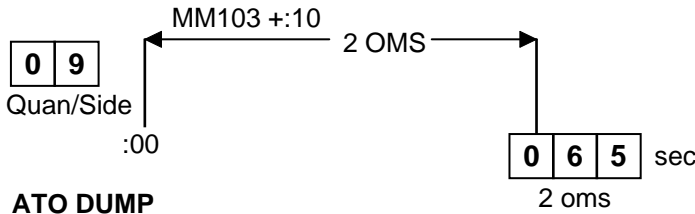


TAL DUMP

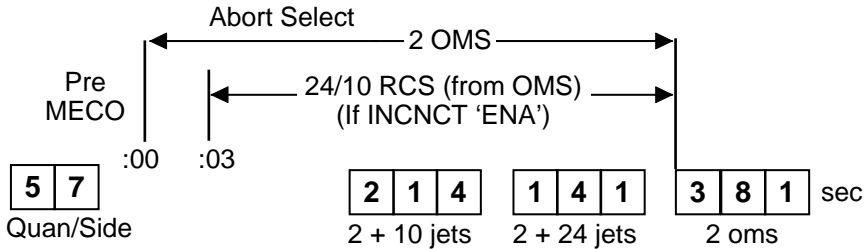




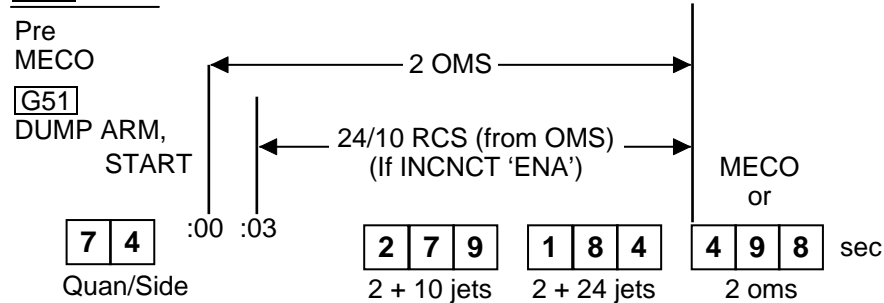
ASSIST/ATO/G51 DUMPS
ASSIST DUMP



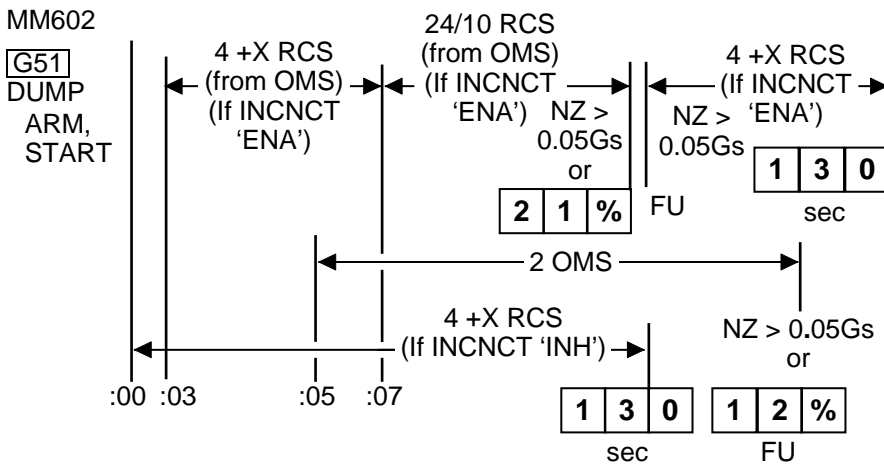
ATO DUMP



G51 DUMP



PWRD
CSS



TOP
BACK OF 'ASSIST/ATO/G51 DUMPS'

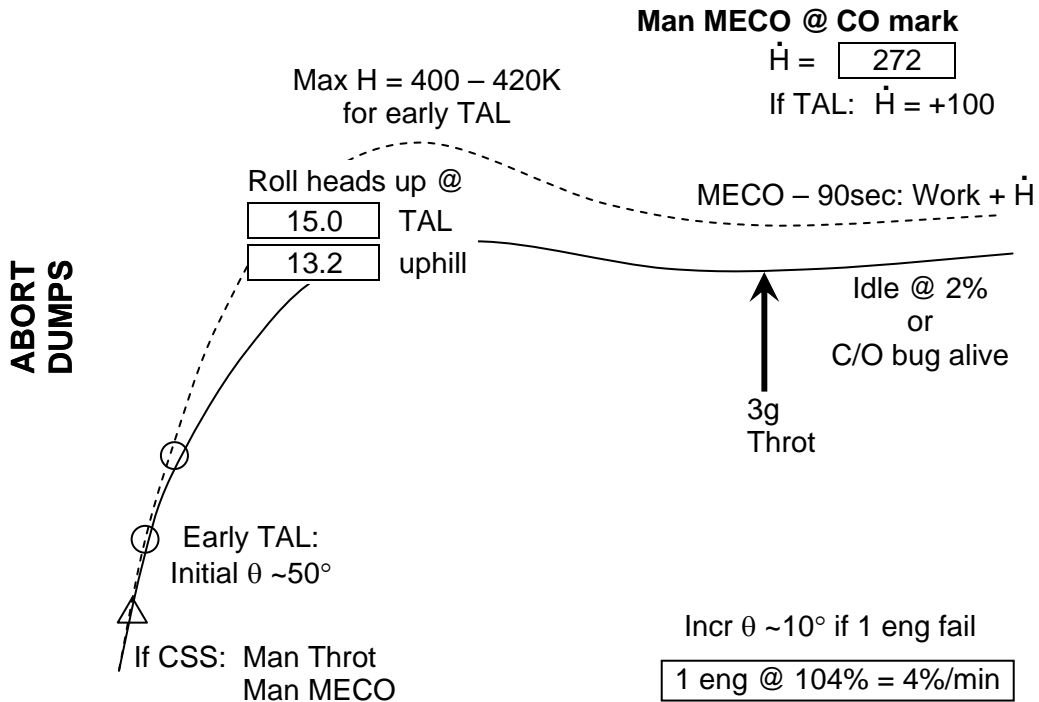
PILE

POWERED CSS – UPHILL/TAL

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

Yaw to $\triangle E$ until 2:30
Then $\triangle I$ uphill
or $\triangle R$ if TAL

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



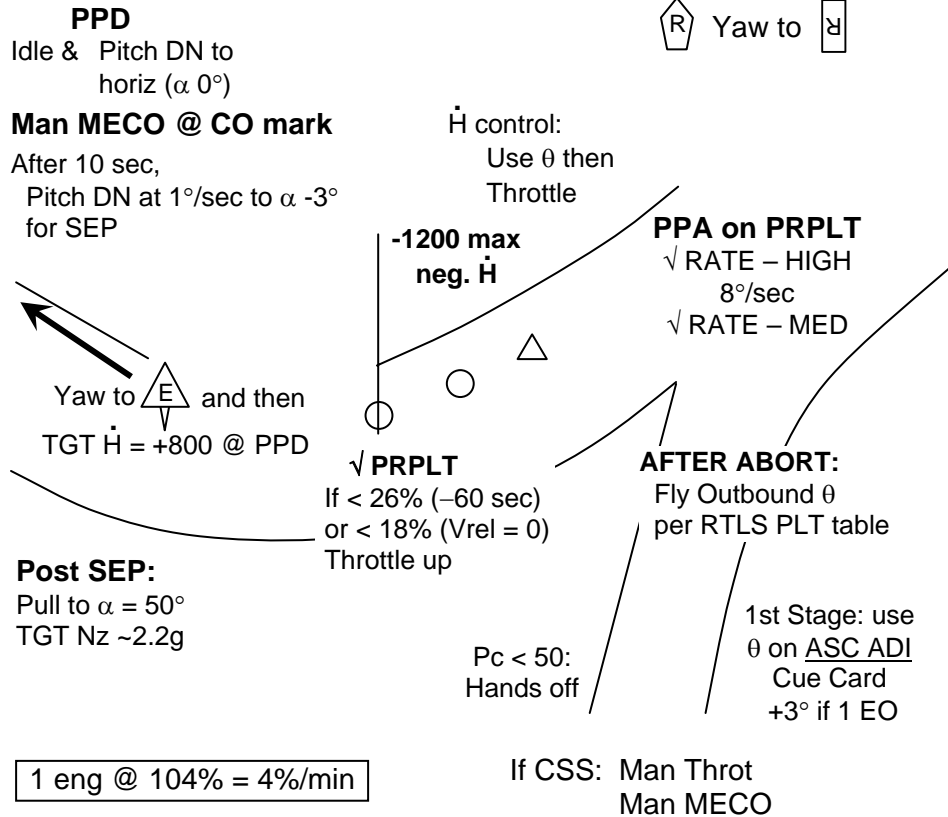
POWERED CSS – RTLS

HOOK

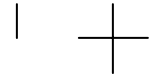
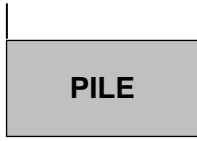
CSS & MAN THROT
(IF MET < 1:30, ENGAGE BFS)

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

R Yaw to **R**



TOP
BACK OF 'POWERED CSS – RTLS'



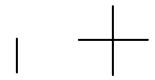
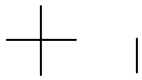
PILE

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**PWRD
CSS**

FB 2-26

ASC/127/FIN





ASCENT/ENTRY CUE CARDS

**ASC/ENT
CUE CARDS**



MS ONLY

2-27

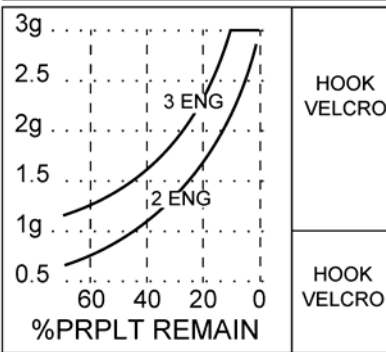
ASC/127/FIN



ASC/ENT
CUECARDS

ASCENT ADI - NOMINAL

TIME	θ	H	\dot{H}	(127 OCFR1 CY)
0:30	68	9K	657	
0:50	61	26K	993	
1:10	53	50K	1431	
1:30	39	84K	1893	
1:50	30	125K	2197	



-STAGING-

V_I	θ	H	\dot{H}	ASC-14a/127/A/A
6	19	217K	1725	
7	16	275	1272	
8	14	310	920	
9	11	332	637	
10	9	346	405	
12	6	356	63	
14	9	355	-147	
16	25	350	-233	
18	23	344	-269	
20	21	339	-220	
22	19	337	-106	
24	17	337	64	
25819	13	345	272	

HOOK VELCRO

ENTRY ALPHA

VR	α ref	R	H	Href	Rref
25	HI 40 LO	4427	400		
24	HI 40 LO	2608	246	-46	L79
23	43 40 37	2149	239	-64	69
22	43 40 37	1792	233	-83	63
21	43 40 37	1510	227	-106	60
20	43 40 37	1292	220	-123	59
19	43 40 37	1115	213	-147	59
18	43 40 37	970	206	-171	61
17	43 40 37	856	200	-191	62
16	43 40 37	764	193	-201	R63

KSC 15

MAX L/D	
M	α
3	17
2	15
1	12

(127 OCFR1 CY)

ASC-14b/127/A,E/A

HOOK VELCRO	HOOK VELCRO
----------------	----------------

15	43 40 37	687	191	-118	61
14	43 40 37	616	185	-126	59
13	43 40 37	548	180	-135	58
12	43 40 37	485	176	-151	56
11	43 40 37	427	170	-193	55
10	41 38 35	371	164	-175	51
9	39 36 33	321	158	-209	46
8	37 34 31	276	152	-241	L41
7	33 30 27	229	143	-267	38
6	30 27 24	185	131	-270	39
5	26 23 20	142	118	-272	40
4	23 20 18	106	104	-264	41
3	19 16 15	74	90	-247	R35
2.5	14	61	82	-269	
2	12	50	76	-264	
1.5	10	38	67	-321	
1	8	27	52	-269	

HOOK VELCRO



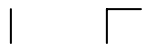
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MS ONLY

2-30

ASC/127/FIN



ENTRY MANEUVERS

FLIGHT CONDITIONS	MANEUVER								
EI-5	√LVLH ATT GNC, OPS 304 PRO * If PREBANK, R/Y – CSS * * Roll at 1°/sec to * * <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 15px; height: 15px;">1</td><td style="width: 15px; height: 15px;">8</td><td style="width: 15px; height: 15px;">0</td></tr></table> if HP ≥ 46, else * * <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td></tr></table> (from Prebank Table) * * Maintain PREBANK ±5° * If previous OMS OX TK, He TK, or RCS OX TK leak: <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 15px; height: 15px;">G51</td></tr></table> VENT DOOR CNTL OPEN – ITEM 43 EXEC (AOA) <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 15px; height: 15px;">SPI</td></tr></table> When SB position – 0%: √HYD MN PUMP PRESS (three) – LO	1	8	0				G51	SPI
1	8	0							
G51									
SPI									
$\bar{q} = 1$	(AOA) HYD MN PUMP PRESS (three) – NORM								
'Guidance Box' @ $\bar{q} \sim 8$ or D ~ 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: <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 15px; height: 15px;">G51</td></tr></table> VENT DOOR CNTL CLOSE – ITEM 44 EXEC	G51							
G51									
D = 11	√DRAG H								
$\Delta Az = 10.5^\circ$	FIRST ROLL REVERSAL <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td><td style="width: 15px; height: 15px;"></td></tr></table> (DEL PAD)								
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%								

ENT-6a/E/Q

**ENT
MNV**

FLIGHT CONDITIONS	MANEUVER			
V = 7K	G50 √GPS, INCORPORATE * 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 Nz <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 15px;"></td><td style="width: 20px; height: 15px;"></td><td style="width: 20px; height: 15px;"></td></tr></table>			
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			
V < 120 KGS or 5K' remaining	BRAKE as required (8-10 fps ² , -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 ² (-0.2G) (Antiskid cutout)			
WHEEL STOP	Go to ENT C/L, <u>POST LANDING PROCEDURES</u>			

ENT-6b/127/E/A
(Partial)

ENT
MNVR

DRAG CHUTE DEPLOY

MCC Call	Flight Condition
Early	Main Gear TD
NOMINAL	195 KEAS
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/127/E/A
(Partial)



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MS ONLY

2-34

ASC/127/FIN





CONT
ABORT

ABORT CUE CARDS



NOT FLOWN

2-35

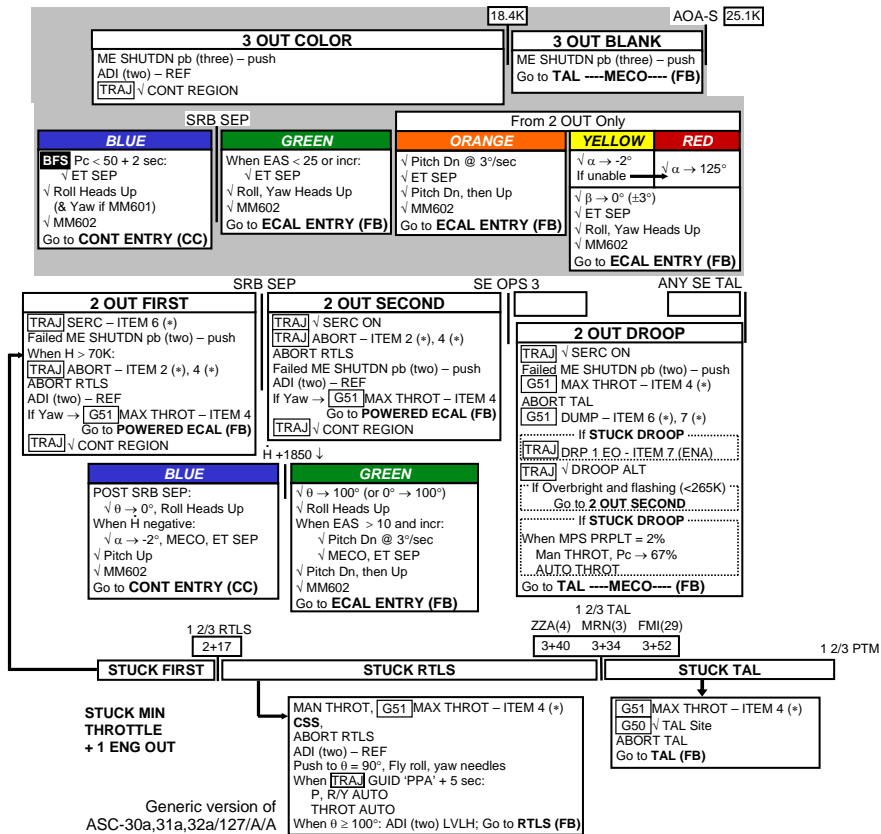
ASC/127/FIN



**CONT
ABORT**

CONTINGENCY ABORT

High Inclination
51.6°



NOT FLOWN

2-36

ASC/127/FIN

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 → 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/127/A/A

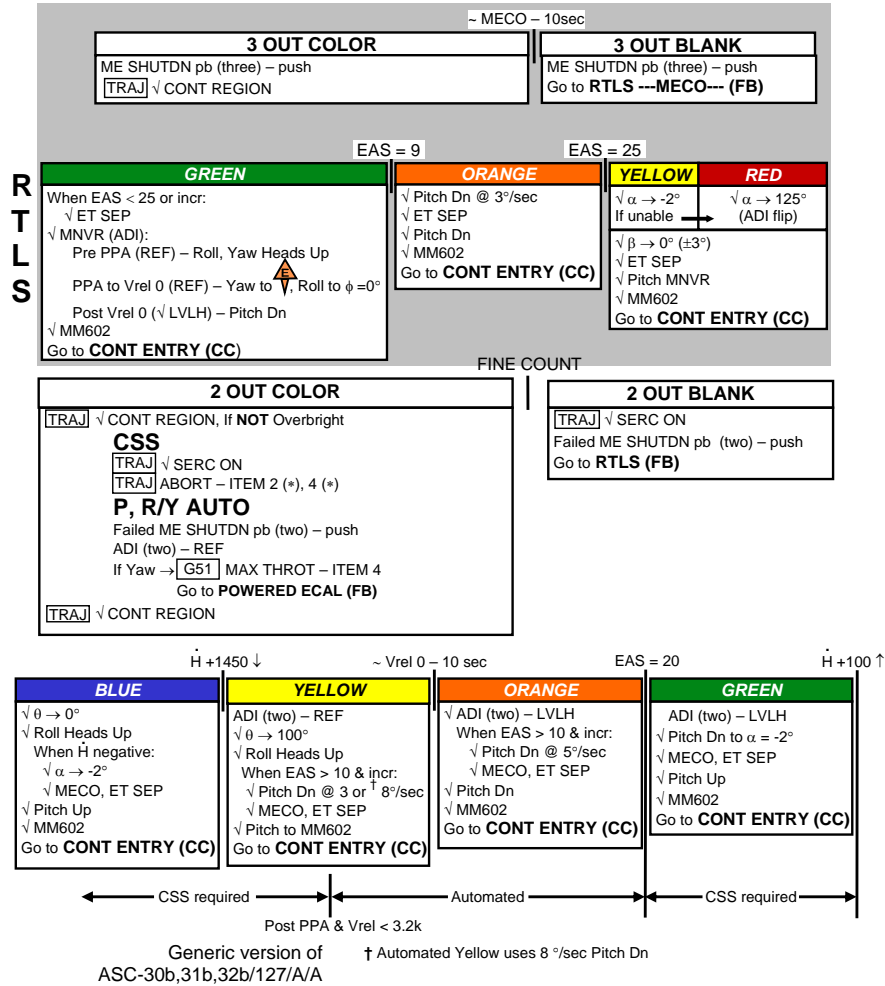
NOT FLOWN

2-37

ASC/127/FIN

RTLS CONTINGENCY

High Inclination
51.6°



RTLS CONTINGENCY

<p>CONT ENTRY / MM602</p> <p>VERT SIT -</p> <p>If ECAL/BDA – INH √ Theta Limits after Nz Hold</p> <p>If ECAL/BDA – ENA ITEM 1 (INH)</p> <p><u>Before NZ Hold</u></p> <p>RHC/PNL TRIM – ENA</p> <p>If M < 5, √ AIL/RUD TRIM</p> <p>If M < 3, S/B = 65%</p> <p>M ≤ 5 and EAS < 333 ↓ ADTA PROBES – Deploy G50 Incorp Air Data ASAP</p> <p>M2 → 1: θ = 0° by M = 1.0</p> <p>Select UHF – G T/R</p> <p>When M < 1.0 Go to BAILOUT (FB)</p>
--

Generic version of
ASC-30b,31b,32b/127/A/A

RED
<p>√ ADI (two) – LVLH</p> <p>√ H → +400 (θmax = 75°)</p> <p>TRAJ AT FINE COUNT: √ Pitch Dn to α = -2° √ MECO, ET SEP</p> <p>√ Pitch Up</p> <p>√ MM602</p> <p>Go to RTLS ---MECO--- (FB)</p>

← Automated →

**ZZA TAL REDESIGNATION
(127 OCFR1 CYC)**

1st E.O. VI		5800	5900	6000	6100	6200	6300	6400	6500
SE OPS 3 ZZA 109	(4)	10900	11000	11000	11000	11100	11100	11100	11200
SE ZZA 104	(4)	17200	17000	16800	16600	16400	16200	16000	15800

1st E.O. VI		6600	6700	6800	6900	7000	7100	7200	7300
SE OPS 3 ZZA 109	(4)	11200	11200	11200	11300	11300	11300	11300	11400
SE ZZA 104	(4)	15600	15400	15200	15100	14900	14700	14600	14400

1st E.O. VI		7400	7500	7600	7700	7800	7900	8000	8100
SE OPS 3 ZZA 109	(4)	11400	11400	11400	11500	11500	11500	11500	11500
SE ZZA 104	(4)	14300	14200	14000	13900	13800	13800	13700	13600

1st E.O. VI		8200	8300	8400	8500	8600	8700	8800	8900
SE OPS 3 ZZA 109	(4)	11500	11600	11600	11600	11600	11600	11600	11600
SE ZZA 104	(4)	13600	13500	13500	13400	13400	13400	13400	13400

1st E.O. VI		9000	9100	9200	9300	9400	9500	9600	9700
SE OPS 3 ZZA 109	(4)	11600	11700	11700	11700	11700	11700	11700	11700
SE ZZA 104	(4)	13400	13400	13400	13400	13400	13400	13400	13400

1st E.O. VI		9800	9900	10000	10100				
SE OPS 3 ZZA 109	(4)	11700	11700	11700	11700				
SE ZZA 104	(4)	13500	13500	13500	13500				

ASC-9a/127/A/A

NOT FLOWN

2-40

ASC/127/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/127/A/A

NOT FLOWN

2-41

ASC/127/FIN

**MRN TAL REDESIGNATION
(127 OCFR1 CYC)**

1st E.O. VI		5700	5800	5900	6000	6100	6200	6300	6400
SE OPS 3 MRN 109	(3)	10700	10900	10900	11000	11000	11000	11100	11100
SE MRN 104	(3)	16800	16600	16500	16300	16100	15900	15700	15500

1st E.O. VI		6500	6600	6700	6800	6900	7000	7100	7200
SE OPS 3 MRN 109	(3)	11100	11200	11200	11200	11300	11300	11300	11400
SE MRN 104	(3)	15400	15200	15000	14900	14700	14600	14400	14300

1st E.O. VI		7300	7400	7500	7600	7700	7800	7900	8000
SE OPS 3 MRN 109	(3)	11400	11400	11400	11500	11500	11500	11500	11500
SE MRN 104	(3)	14200	14000	13900	13800	13800	13700	13600	13500

1st E.O. VI		8100	8200	8300	8400	8500	8600	8700	8800
SE OPS 3 MRN 109	(3)	11600	11600	11600	11600	11600	11600	11600	11700
SE MRN 104	(3)	13500	13400	13400	13400	13300	13300	13300	13300

1st E.O. VI		8900	9000	9100	9200	9300	9400	9500	9600
SE OPS 3 MRN 109	(3)	11700	11700	11700	11700	11700	11700	11700	11700
SE MRN 104	(3)	13300	13300	13300	13300	13300	13300	13300	13300

1st E.O. VI		9700	9800	9900	10000	10100			
SE OPS 3 MRN 109	(3)	11700	11700	11700	11700	11700			
SE MRN 104	(3)	13400	13400	13400	13400	13400			

ASC-10a/127/A/A

NOT FLOWN

2-42

ASC/127/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-10b/127/A/A

NOT FLOWN

2-43

ASC/127/FIN

**FMI TAL REDESIGNATION
(127 OCFR1 CYC)**

1st E.O. VI		6000	6100	6200	6300	6400	6500	6600	6700
SE OPS 3 FMI 109	(29)	10900	11000	11000	11000	11100	11100	11100	11200
SE FMI 104	(29)	17800	17600	17400	17200	16900	16700	16500	16300

1st E.O. VI		6800	6900	7000	7100	7200	7300	7400	7500
SE OPS 3 FMI 109	(29)	11200	11200	11200	11300	11300	11300	11300	11400
SE FMI 104	(29)	16100	15900	15700	15500	15300	15200	15000	14800

1st E.O. VI		7600	7700	7800	7900	8000	8100	8200	8300
SE OPS 3 FMI 109	(29)	11400	11400	11400	11500	11500	11500	11500	11500
SE FMI 104	(29)	14700	14600	14400	14300	14200	14100	14100	14000

1st E.O. VI		8400	8500	8600	8700	8800	8900	9000	9100
SE OPS 3 FMI 109	(29)	11600	11600	11600	11600	11600	11600	11600	11600
SE FMI 104	(29)	13900	13900	13800	13800	13800	13800	13700	13700

1st E.O. VI		9200	9300	9400	9500	9600	9700	9800	9900
SE OPS 3 FMI 109	(29)	11700	11700	11700	11700	11700	11700	11700	11700
SE FMI 104	(29)	13700	13700	13700	13700	13800	13800	13800	13800

1st E.O. VI		10000	10100						
SE OPS 3 FMI 109	(29)	11700	11700						
SE FMI 104	(29)	13800	13800						

ASC-12a/127/A/A

NOT FLOWN

2-44

ASC/127/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-12b/127/A/A

NOT FLOWN

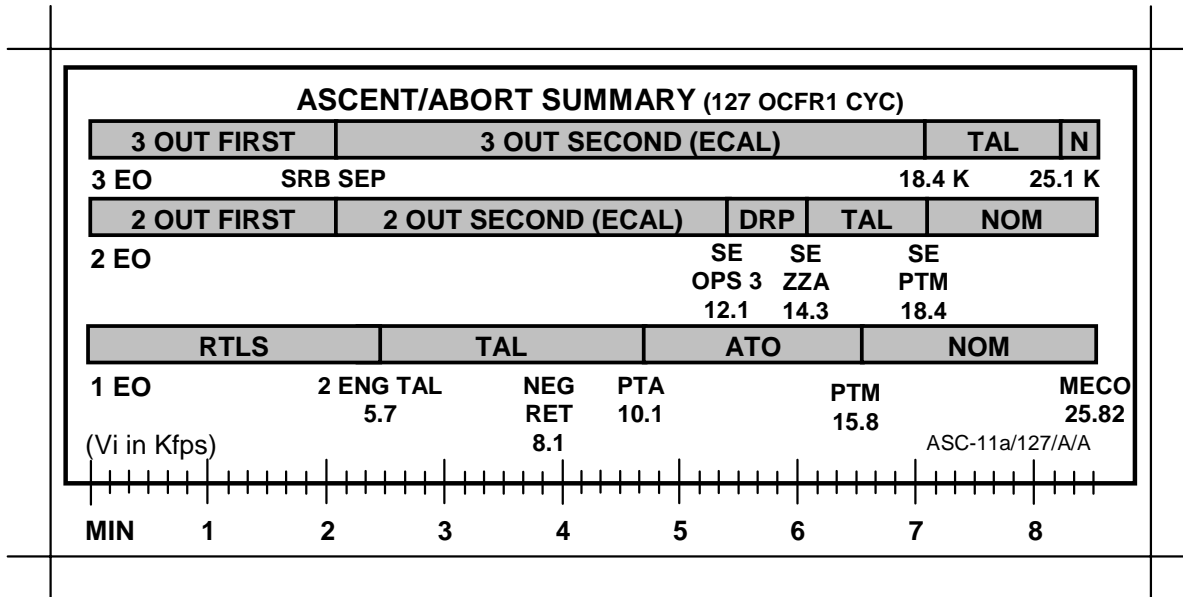
2-45

ASC/127/FIN

NOT FLOWN

2-46

ASC/127/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 $\sqrt{\text{MCC}}$,
ADI – REF

- * If Feedline Fail: *
- * $\sqrt{\text{MCC}}$ 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 $\sqrt{\text{BDY FLP pb}}$ – 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 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

25:00 ♦ **MPS PWRDN**

- R2 MPS ENG PWR L (two) – OFF
- CTR (two) – OFF
- R (two) – OFF

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 *

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

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 LAT (two) – LAT (tb-bp)

√After 6 sec, L,R LAT tb (two) – LAT

* If doors do not latch within 12 sec: *

* L,R DR (two) – OFF *

* LAT (two) – OFF *

* √MCC *

L,R DR (two) – OFF

LAT (two) – OFF

MODE – GPC



OMS 2 BURN CARDS

OMS 2

MS ONLY

4-1

ASC/127/FIN



OMS 2 BURN MONITOR

OMS TEMP* FU IN P > L 219 R 220 ≤ 201 208 or No FU IN P	OMS ENG FAIL OMS PRPLT FAIL
OMS PC* & OMS ↓ (BFS: √accel) ENG VLV 1 or 2 < 70 or OX IN P > 227 OX IN P ≤ 227 or No OX IN P	OMS ENG FAIL OMS PRPLT FAIL
OMS OX/FU TK P (√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
OMS He TK P LOW (√ OMS/MPS)	At He P < 640 or QTY ≤ 41: If HP < 85 : OMS XFEED from good OMS At HP > 85 : OMS PRPLT FAIL
OMS N2 REG P HIGH or LOW	OMS ENG – ARM
OMS N2 TK P LOW (√ OMS/MPS)	At N2 TK P < 470: OMS ENG – ARM
OMS GMBL PRI fail SEC fail	L(R) OMS GMBL – SEC If high RCS usage: OMS ENG FAIL
GPC 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 If high RCS usage: OMS ENG FAIL √MAN SHUTDN
I/O ERROR FA 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
BCE STRG D 1(4)	I/O RESET (if recov: >>) If high RCS usage: L(R) OMS GMBL – SEC
I/O ERROR PCM	OI PCMMU PWR – 2(1)

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

ASC-5a/127/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 = 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/127/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	

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/127/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							2 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		RWY				50K		/	
<input type="checkbox"/> L		<input type="checkbox"/> OVHD				38K		/	
<input type="checkbox"/> R		<input type="checkbox"/> STRT				28K		/	
ΔT MACH < 1 TO HAC		MAX Nz		Nz LIMIT		20K		/	
						12K		/	
ΔT HAC INIT TO H = 20K						7K		/	
						3K		/	
						1K		/	
AIMPOINT		SPEEDBRAKE				SURFACE		/	
<input type="checkbox"/> NOM		<input type="checkbox"/> NOM							
<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 (%)							[] [] [] [] []				
TOT AFT QTY 2 (%)							[] [] [] [] []				
FLIP HP =					() [] []		+ [] []		OR [] [] [] []		
					TGT HP				[] [] [] []		
							+ [] []		= [] []		
							+ ([] [] [] [])		= [] []		
							+ ([] [] [] [])		= [] []		
AFT HP =					() [] []		+ [] [] [] []		= [] []		
							+ ([] [] [] [])		= [] []		
B/U SITE					[] [] [] [] [] [] [] [] [] []						
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 [] [] [] [] [] []				50K /		
									38K /		
<input type="checkbox"/> L <input type="checkbox"/> OVHD					[] [] [] [] deg		[] [] MLS		28K /		
<input type="checkbox"/> R <input type="checkbox"/> STRT					[] [] [] [] TAC				20K /		
ΔT MACH < 1 TO HAC					MAX Nz [] [] [] []		Nz LIMIT [] [] [] []		12K /		
[] [] [] [] [] []					[] [] [] []		[] [] [] []		7K /		
ΔT HAC INIT TO H = 20K					[] [] [] [] [] []				3K /		
[] [] [] [] [] []									1K /		
AIMPOINT					SPEEDBRAKE				SURFACE /		
<input type="checkbox"/> NOM					<input type="checkbox"/> NOM		[] [] % @ 3K				
<input type="checkbox"/> CLOSE-IN					<input type="checkbox"/> S.F.						
REMARKS:											

6-4

ASC/127/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

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 *

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

* 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 LAT (two) – LAT (tb-bp)

√After 6 sec, L,R LAT tb (two) – LAT

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

L,R DR (two) – OFF

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

CAUTION
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	MLS
1	KSC 15	8
	KSC 33	6
40	EDT 22R	–
	EDT 04L	–
42	NOR 17	6
	NOR 23	6
43	NOR 05	–
	NOR 35	–
44	EDW 15	–
	EDW 18L	–
45	EDW 22	8/†
	EDW 04	6

† MSBLS Jr. Channel 8 – Requires Uplink

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 Δ TIG (if REI – REF > 50)
from OMS TARGETS

CRTX Enter new TIG

LOAD – ITEM 22 EXEC
TIMER – ITEM 23 EXEC

Repeat until Δ 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

6-17

ASC/127/FIN

DEORBIT CARDS

DEORBIT BURN MONITOR

OMS TEMP* FU IN P \geq <table border="1" style="display: inline-table; border-collapse: collapse;"> <tr><td style="padding: 2px;">219</td><td style="padding: 2px;">220</td></tr> <tr><td style="padding: 2px;">201</td><td style="padding: 2px;">208</td></tr> </table> or No FU IN P	219	220	201	208	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;">L</td><td style="padding: 2px;">R</td></tr> </table> Oms Eng Fail Oms PRPLT Fail	L	R
219	220						
201	208						
L	R						
OMS PC* & OMS ↓ (BFS: √accel) ENG VLV 1 or 2 < 70 or OX IN P > 227 OX IN P ≤ 227 or No OX IN P	Oms Eng Fail Oms PRPLT Fail						
OMS OX/FU TK P (√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: Oms PRPLT Fail He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284						
OMS GMBL PRI fail SEC fail	L(R) OMS GMBL – SEC If high RCS usage: Oms Eng Fail						
GPC 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 If high RCS usage: Oms Eng Fail √MAN SHUTDN						
I/O ERROR FA 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						
BCE STRG D 1(4)	I/O RESET (if recov: >>) If high RCS usage: L(R) OMS GMBL – SEC						
RM DLMA IMU or GPC SET SPLIT or 2 MN BUSES	STOP BURN: Oms Eng(s) – OFF >> IMU DLMA: After C/O: √timer G21 If any IMU ACC > 0.03: aff IMU – desel I'cnct OMS to RCS (√RCS Burn Time) THC +X to TGT HP (EOM) or 3.5 x timer at C/O (AOA) SET SPLIT: Go to "GPC" above						
I/O ERROR PCM	OI PCMMU PWR – 2(1)						

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

ENT-2a/127/A,O,D,E/A



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MS ONLY

6-19

ASC/127/FIN



AOA DEORBIT BURN (2 ENG)

- √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_c, 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_c < 80 or OMS TEMP, *
- * OMS ENG – OFF *
- * √ADI – LVLH, center needles *
- * RCS COMPLETION *
- * **OMS ENG FAIL:** *
- * Failed OMS ENG – OFF *
- * OMS XFEED at 1/2 ΔVTOT at fail

--	--	--	--

 *
- * or OMS QTY

--	--

 %L or

--	--

 %R *
- * **2nd OMS FAIL (ENG or PRPLT):** *
- * Failed OMS ENG – OFF *
- * If PRPLT FAIL: *
- * Secure aff OMS *
- * ITEM 18 +0 EXEC *
- * √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

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/127/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_C, 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/127/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 ΔV or *

* if CUR $\Delta VTOT$: TOT AFT QTY 2 % then *

* FRCS COMPLETION *

* FLIP ----- *

* ΔV 4 8 FRCS COMPLETION *

* AFT ----- *

* ΔV 2 9 THC +X to TGT ΔV *

* TGT ----- *

* ΔV 0 0 *

* 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 – OFF (If < 3 IMU, at :)

* AFT RCS RECONFIG if INTERCONNECT *

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

ASC-8bb/127/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 *
- * 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 *

ASC-7a/A/B

HINGE

MS ONLY

6-24

ASC/127/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 ΔV or *
* if CUR $\Delta VTOT$: 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 $\Delta VTOT$) *
* 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/127/A/A



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MS ONLY

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ASC/127/FIN





**POST D/O
BURN**

AOA POST DEORBIT BURN

6-27

ASC/127/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**

Δ HP	0	4	8	12	16	18	22	24	26
PREBANK	0	55	85	95	100	105	125	145	170

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

Δ HP	0	1	2	3	4	5	6	7	8
PREBANK	90	105	110	115	120	130	140	155	175

127 oct 1

C POST BURN STATUS

NOMINAL

Δ 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 √SPI: Stop drive test when elevon posns within +12° to -27°:
SURF DRIVE OFF, ITEM 40 EXEC (*)
- CRT1 3. √POS STIM ENA, ITEM 7 – (no *)
- C3 4. √FCS CH 1,2,3,4 – AUTO
- CRT1 5. SEC ACT CK, CH 1 – ITEM 1 EXEC (*)
CK START – ITEM 5 EXEC (*)
- 6. √All CH 1 ports bypass ‘↓’
STOP – ITEM 6 EXEC (*)
- C3 7. FCS CH 1 – ORIDE
- CRT1 √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	

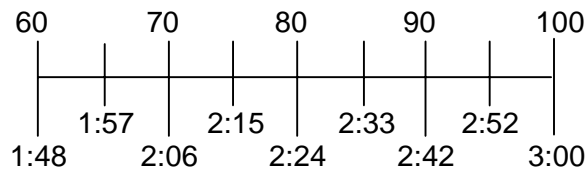
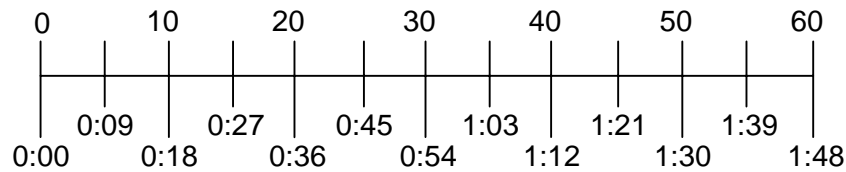
1: GNC 23 RCS	2: GNC DEORB MNVR COAST
3: BFS, GNC SYS SUMM 2	

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)

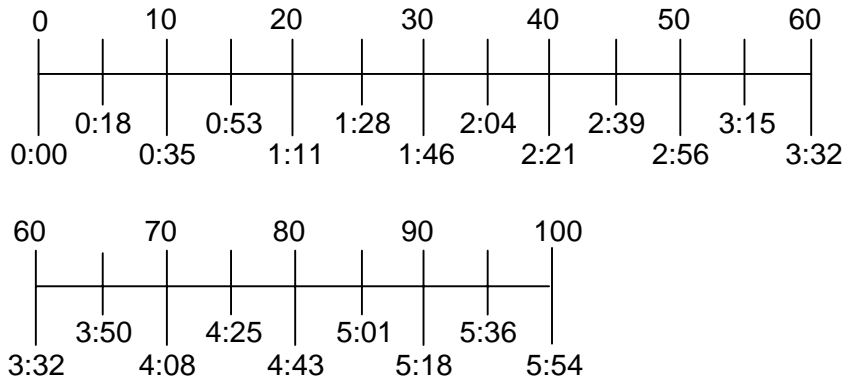
NOTE

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
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		
NAV			
GPS	INH √43	INH	√43
DRAG H	AUT √22	AUT	√22
ADTA H	INH √26	INH	√26
MLS	AUT √50		
G&C			
GPS	INH √48		
ADTA	INH √29	AUT	√28

* 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

- 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

KSC 33	EDW 04
NOR 17	NOR 23
- 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) *
- * *
- *

GNC 53 CONTROLS

 *
- * *
- * 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

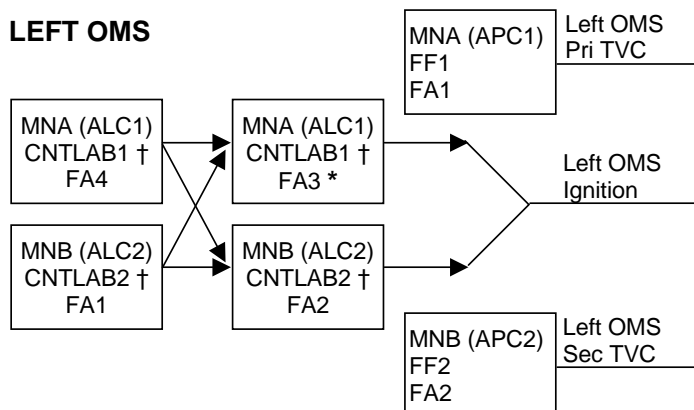
6-37

ASC/127/FIN



OMS FAILURES

LEFT OMS

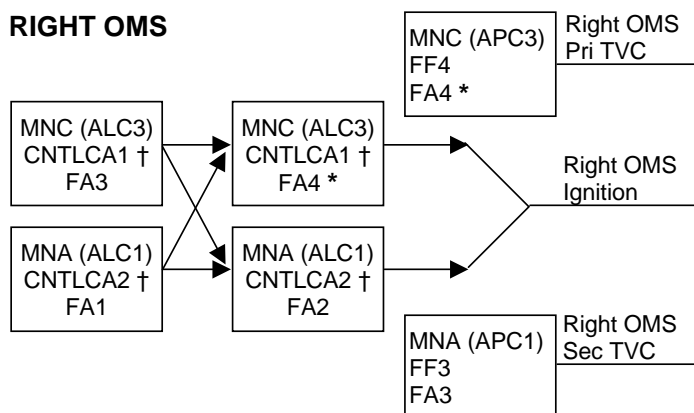


† If CNTL AB1 or AB2 (CA1 or CA2) failed and ign path still exists at OMS fail, assume L(R) OMS ↓ is PRPLT FAIL

* If L(R) P_c 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 ΔV

**OMS/
RCS ΔV**



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ASC/127/FIN

OMS He PRESS/ Δ V/BURN TIME

OMS% GAGE	OMS He Press	OMS Δ V	RCS Δ V	RCS BURN MIN:SEC
86.8	4320	428	355	13:15
85	4250	419	348	12:57
80	4050	393	327	12:09
75	3850	368	306	11:21
70	3650	342	284	10:33
65	3450	316	263	09:45
60	3250	290	242	08:57
55	3050	265	220	08:09
50	2850	239	199	07:21
45	2650	213	178	06:32
40	2450	187	156	05:44
35	2250	160	134	04:56
30	2050	134	113	04:08
25	1850	108	91	03:20
20	1650	82	69	02:32
15	1450	55	47	01:43
10	1250	29	24	00:54
5	1050	2	2	00:04

OMS/
RCS Δ V

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

NOTE: Uses assumed vehicle weight of $\boxed{255,547}$ lb

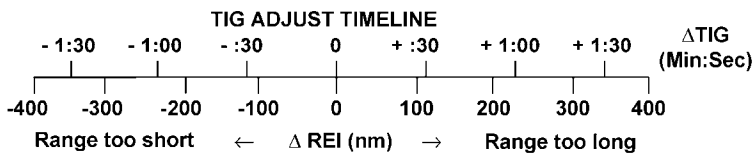
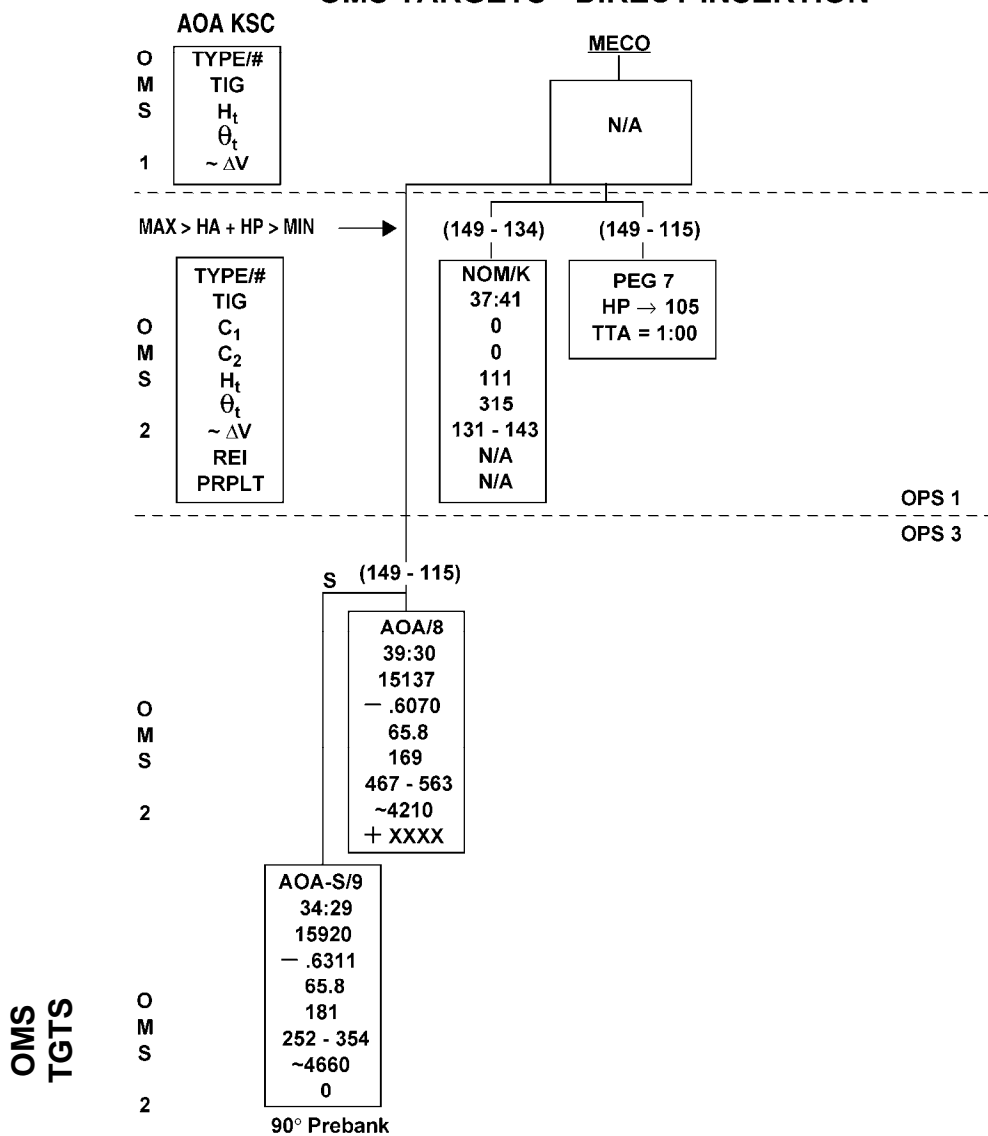


OMS TARGETS, COMM COVERAGE, LAND SITES

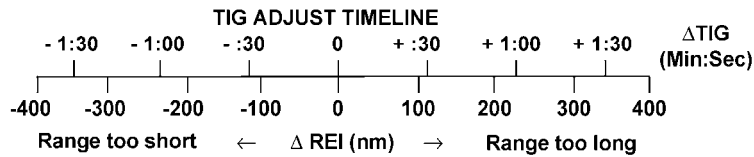
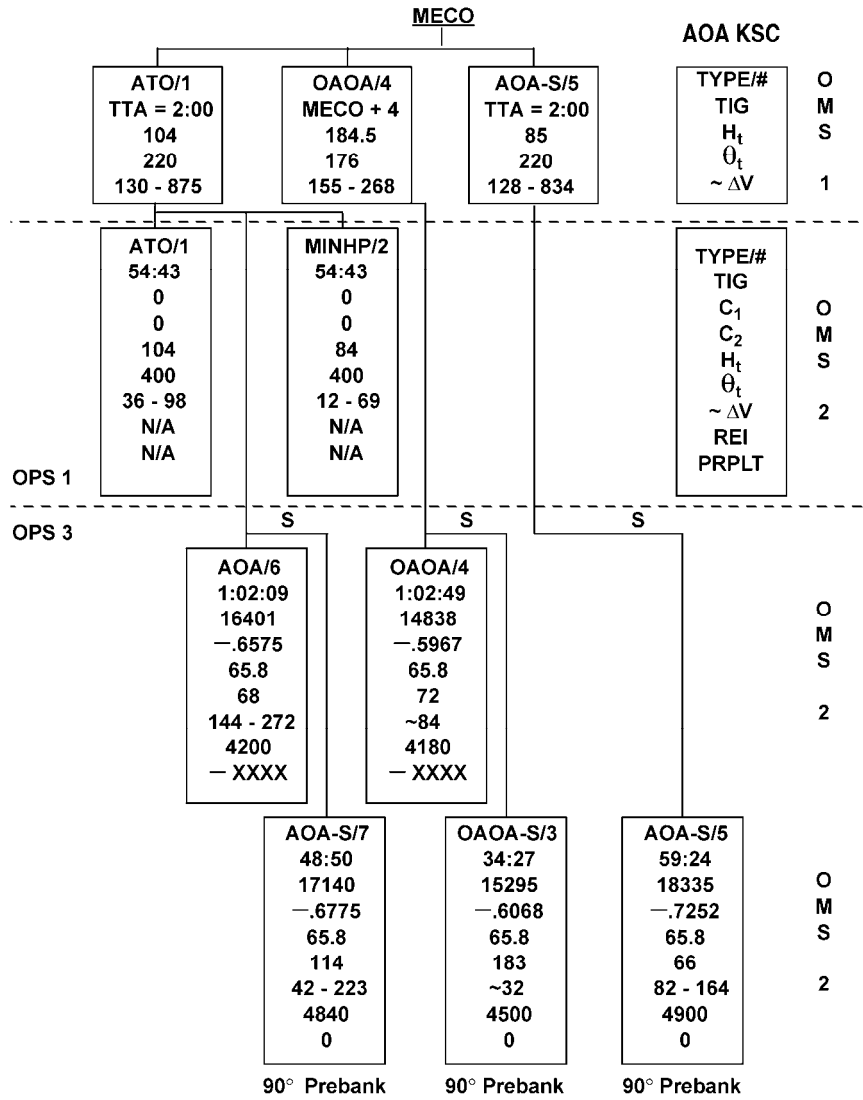
**OMS
TGTS**



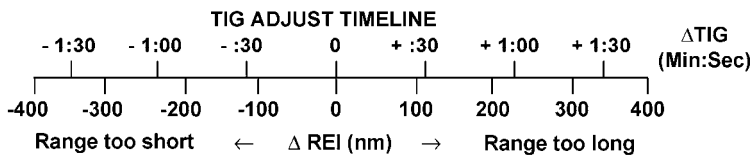
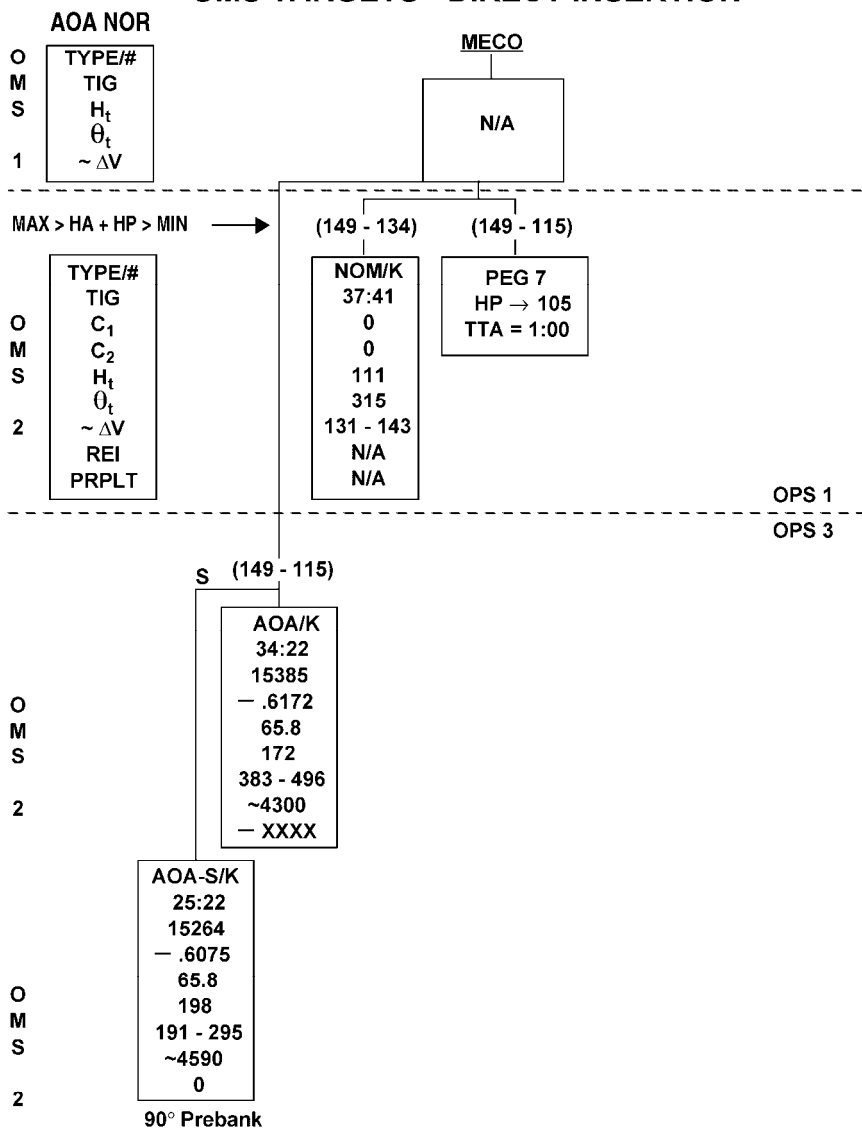
STS-127 OCFR1 CY OMS TARGETS - DIRECT INSERTION



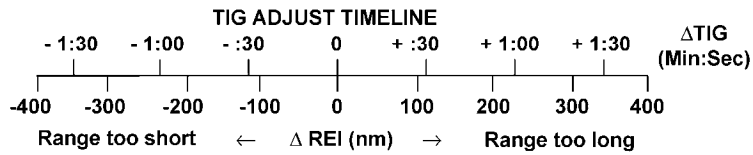
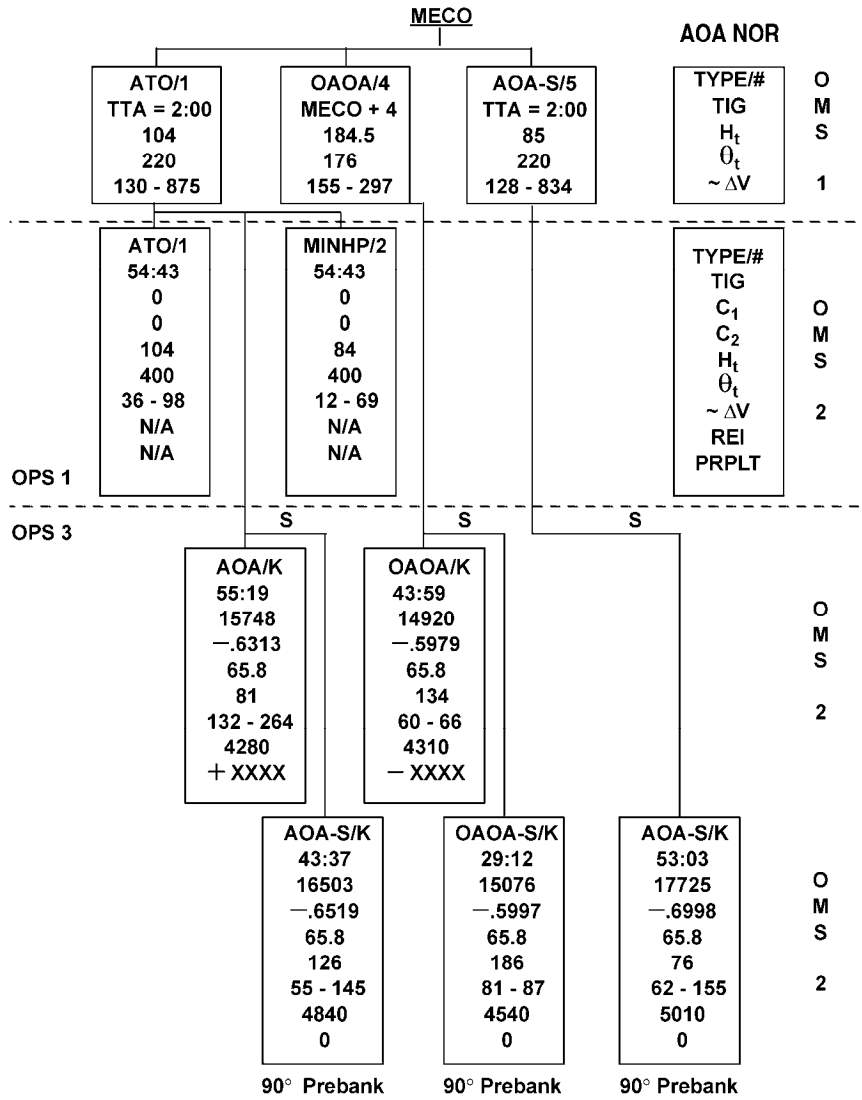
STS-127 OCFR1 CY OMS TARGETS - W/OMS 1



STS-127 OCFR1 CY OMS TARGETS - DIRECT INSERTION

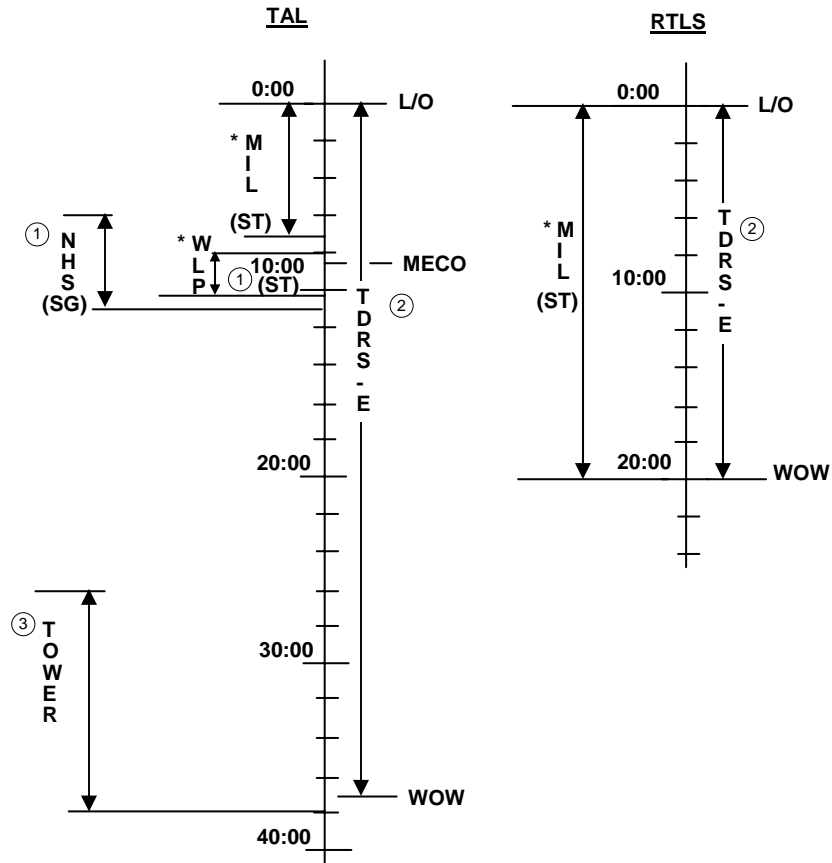


STS-127 OCFR1 CY OMS TARGETS - W/OMS 1



**COMM
COVER**

COMMUNICATION COVERAGE – (TAL/RTLS)



MODE

ST – STDN
 SG – SGLS

*UHF available

NOTE: ① NHS/WLP coverage only on high inclinations

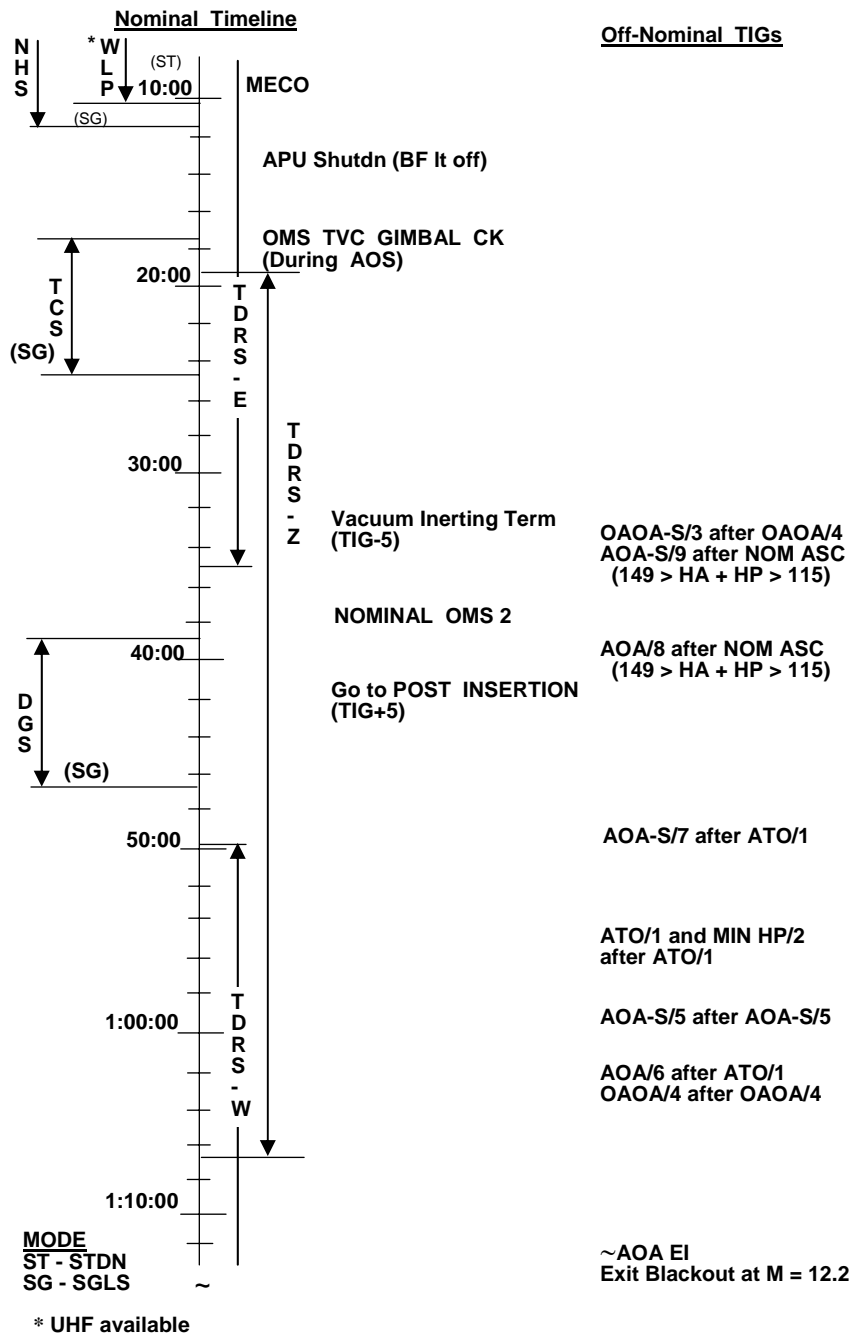
② ET blocks coverage until vehicle upright

③ Tower UHF installed at all TAL sites

**COMM
 COVER**

COMMUNICATION COVERAGE – (AOA to **KSC**)

LAND
SITE



STS-127 LANDING SITE TABLE
(50° to 63.5° INCLINATION)

S I T E	LOCATION	RWY	MLS CH	LG	+ OVR RUN
1	KSC	KSC 15	8	15000	1000
		KSC 33	6	15000	1000
2	BEN GUERIR	BEN 36	-	13720	0
		BEN 18	-	13220	1000
3	MORON AB	MRN 20	◆6	11730	1000
		MRN 02	-	11730	1000
4	ZARAGOZA	ZZA 30L	◆6	12200	1000
		ZZA 12R	-	12200	1010
5	MYRTLE BEACH	MYR 36	-	9500	1000
		MYR 18	-	9500	1000
6	WILMINGTON	ILM 06	-	7500	0
		ILM 24	-	7500	0
7	CHERRY POINT	NKT 32L	-	7110	800
		NKT 23R	-	7100	880
8	OCEANA NAS	NTU 32R	-	7500	0
		NTU 23L	-	11500	0
9	WALLOPS	WAL 28	-	7510	0
		WAL 04	-	8750	0
10	DOVER AFB	DOV 32	-	12400	0
		DOV 19	-	9100	0
11	ATLANTIC CITY	ACY 31	-	9500	0
		ACY 13	-	9500	0
12	BEN GUERIR	BEN 36	-	13720	0
		BEN 18	-	13220	1000
13	*MORON AB	MRN 20	◆6	11730	1000
		MRN 02	-	11730	1000
14	*ZARAGOZA	ZZA 30L	◆6	12200	1000
		ZZA 12R	-	12200	1010
15	GABRESKI	FOK 06	-	8500	1000
		FOK 24	-	8500	1000

◆ Available for TAL Only

* LO XRNG TAL Site **Length** after displaced threshold

**STS-127 LANDING SITE TABLE
(50° to 63.5° INCLINATION)**

S I T E	LOCATION	RWY	MLS CH	LG	+ OVR RUN
16	OTIS ANGB	FMH 32	-	9000	0
		FMH 23	-	7500	0
17	PEASE INT'L	PSM 34	-	10020	0
		PSM 16	-	10020	0
18	HALIFAX INT'L	YHZ 23	-	8800	0
		YHZ 32	-	7700	0
19	STEPHENVILLE	YJT 09	-	9500	0
		YJT 27	-	9500	0
20	ST JOHNS INT'L	YYT 29	-	8500	0
		YYT 11	-	8500	0
21	GANDER INT'L	YQX 21	-	9700	0
		YQX 31	-	8900	0
22	GOOSE BAY	YYR 26	-	10550	0
		YYR 34	-	9080	0
23	LAJES	LAJ 15	-	10870	970
		LAJ 33	-	10870	990
24	BEJA	BEJ 01L	-	10820	0
		BEJ 19R	-	10820	900
25	KEFLAVIK	IKF 20	-	9520	0
		IKF 29	-	9560	0
26	SHANNON	INN 06	-	9540	0
		INN 24	-	9540	0
27	FAIRFORD	FFA 27	-	9490	990
		FFA 09	-	9490	970
28	KOLN-BONN	KBO 14L	-	12020	0
		KBO 32R	-	12020	0
29	ISTRES AB	FMI 33	◆6	11300	3960
		FMI 15	-	12300	0
30	ESENBOGA	ESN 03R	-	11800	0
		ESN 21L	-	11800	0

◆ Available for TAL Only

Length after displaced threshold

**STS-127 LANDING SITE TABLE
(50° to 63.5° INCLINATION)**

S I T E	LOCATION	RWY	MLS CH	LG	+ OVR RUN
31	KING KHALID	KKI 15R	-	13300	0
		KKI 33L	-	13300	0
32	DIEGO GARCIA	JDG 31	-	12000	950
		JDG 13	-	12000	950
33	AMBERLEY TINDAL RAAF	AMB 15	-	9500	0
		PTN 14	-	8500	0
34	YOKOTA AB	JTY 36	-	11000	1000
		JTY 18	-	11000	1000
35	ANDERSEN AFB	GUA 06L	-	10560	1050
		GUA 24R	-	10560	1000
36	WAKE ISLAND	WAK 28	-	9360	0
		WAK 10	-	9360	0
37	HONOLULU	HNL 08R	-	11500	0
		HNL 26L	-	11500	0
38	ELMENDORF	EDF 24	-	9500	0
		EDF 06	-	9500	0
39	HAO ATOLL	HAO 12	-	10390	0
		HAO 30	-	10390	0
40	EDW TEMP	EDT 22R	-	12000	1000
		EDT 04L	-	12000	1000
41	ASCENSION	HAW 13	-	9520	0
		HAW 31	-	9520	0
42	NORTHROP	NOR 17	6	15000	Lkbd
		NOR 23	6	15000	Lkbd
43	NORTHROP	NOR 05	-	15000	Lkbd
		NOR 35	-	15000	Lkbd
44	EDWARDS AFB	EDW 15	-	16300	Lkbd
		EDW 18L	-	15000	Lkbd
45	EDWARDS AFB	EDW 22	8/†	15010	0
		EDW 04	6	14010	1800

† MSBLS Jr. Ch 8 - Requires Uplink

Length after displaced threshold

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WEATHER PADS

8-1

ASC/127/FIN

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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	/	/	/	/	/	/

BLOCK 1 TRAJECTORY MESSAGE

DEORB ORB	APPROX TIG	SITE/RWY	OOP TIG WINDOW	
			OPEN	CLOSE
<u>MAX RATES (1st STAGE)</u>			<u>MISCELLANEOUS</u>	
<u>NOTE:</u> IGNORE ATTITUDE ERRORS DURING LOAD RELIEF			NOTAMS: _____	
ROLL _____°/sec at _____			_____	
PITCH _____°/sec at _____			_____	
YAW _____°/sec			_____	
<u>TRAJECTORY LOFTING (2nd STAGE)</u>				
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 FLOOR... 9-15	
R4..... 9-6	MO63P..... 9-15	L9..... 9-23
R6..... 9-6		L10L..... 9-23
R side OVHD	MIDDECK EXPERIMENTS	L10U..... 9-24
Flood..... 9-6		L11U..... 9-24
	MIDDECK (TEPC).. 9-16	L12UL..... 9-24
C2..... 9-6		L12UR..... 9-24
C3..... 9-6	AIRLOCK	L12LL..... 9-24
C5..... 9-7		L12LR..... 9-24
S2..... 9-7	AW18A..... 9-17	L12L..... 9-24
C6..... 9-7	AW18D..... 9-17	R12..... 9-24
C7..... 9-7	AW18H..... 9-17	
	AW82B..... 9-17	A15..... 9-25
O1..... 9-7	AW82D..... 9-17	A14..... 9-25
O2..... 9-7	AW82H..... 9-17	A13..... 9-25
O3..... 9-7	TW58T..... 9-17	A12..... 9-25
O5..... 9-7	A/L IN HATCH..... 9-17	A11..... 9-26
O6..... 9-7	A/L OUT HATCH.... 9-17	
O7..... 9-8	SH HATCH..... 9-17	R14..... 9-26
O8..... 9-8	EXT A/L UPPER	
O9..... 9-8	HATCH..... 9-17	HARDWARE
O13..... 9-9	TNL ADP HATCH.... 9-17	C/W..... 9-27
O14..... 9-9		MEDS CONFIG
O15..... 9-9		FOR INGRESS 9-28
O16..... 9-9		
O17..... 9-10		
O19..... 9-10		

SW LIST

NOT FLOWN

9-1

ASC/127/FIN

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

SW LIST

- 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 counter clockwise
- 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-127 options affecting switch list:
 - 1) OV105
 - 2) GMTLO
 - 3) Orbit incln = 51.6°
 - 4) Payload: JEM EF/ELM-ES/ICC-VLD
 - 5) Crew size of 7 up, 7 down
 - 6) Installed: TK CRYO sets (5), SORG, Ku Ant, GN2 (6), External Airlock (ISS), SRMS, OBSS, OIU, VPU, WVS, DTV, OSVS, ODS, SSOR
 - 7) Options N/R: RCRS
- Changes are with respect to STS-126 Switch List as published in FIN 3

FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

<p>L5 L COMM PWR – ON OFF</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 } cl :J AC3 SIG CONDR (two) – op { Y } :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) – lt off SMOKE DETN lts (ten) – 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

<p>F6 ABORT MODE - OFF pb - lt off RCS CMD lts (three) - off RANGE SAFE ARM lt - off AIR DATA - NAV</p> <hr/> <p>F7 MDU PWR (five) - ON BRT sel (five) - as reqd MN ENG STAT lts (six) - off SM ALERT lt - off C/W matrix lts - off all off except HYD PRESS</p> <hr/> <p>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</p> <hr/> <p>F9 AC Volts sel - as reqd DC Volt/Amp sel - VOLTS MNB</p> <hr/> <p>R1 CNTL BUS PWR (three) - dn ESS BUS SOURCE MN (three) - ON FC (three) - ON OFF FC/MN BUS (three) - ctr (tb-ON) MN BUS TIE (three) - ctr (tb-OFF) PL CAB - OFF PRI MNC - ctr (tb-OFF)</p>	<p>R1 PL PRI MNB,FC3 (two) - 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</p> <hr style="border-top: 1px dashed black;"/> <p>R1 (CRYO) O2 MANF VLV (two) - ctr (tb-OP) TK1,2 HTRS A (two) - AUTO B (two) - OFF RESET/TEST (two) - ctr 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</p> <hr/> <p>R2 MPS PRPLT DUMP (two) - GPC ENG PWR (six) - ON He ISOL (six) - OP GPC PNEU L ENG He XOVR - GPC He ISOL - OP GPC LH2 ULL PRESS - AUTO He I'CNCT (three) - GPC</p>
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NOT FLOWN

9-5

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FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

R2	APU/HYD RDY tb (three) – bp APU OPER (three) – START/RUN OFF SPEED SEL (three) – NORM HYD MN PUMP PRESS (three) – NORM cb APU FU TK VLV ENA (six) – cl { } op HYD CIRC PUMP (three) – OFF GPC APU CNTLR PWR (three) – ON OFF FU TK VLV (three) – OP CL AUTO SHTDN (three) – ENA BLR CNTLR/HTR (three) – A PWR (three) – ON N2 SPLY (three) – ON OFF 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 OFF BFC CRT DISP – ON OFF 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 OFF*** 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 SYS (three) – GPC (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 LINE VENT – GND LO2 PREVLV (three) – GPC LH2 PREVLV (three) – GPC FDLN RLF ISOL (two) – GPC		
R6	R COMM PWR – ON OFF		
R side OVHD Flood – BRT			

NOT FLOWN

9-6

ASC/127/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 HTRS (SH only) – OFF EMER LTG – OFF/ON	O5	L AUD TACAN ID (two) (OV103,4) – 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		O6	
S2	PL SEAT PWR BUS SEL – AC3 (dn) CONTR (two) – ctr	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	
C6 LEH O2 vlv (four) – OP		O1	
C7	LEH O2 SPLY vlv (two) – OP	O2	CRYO O2 HTR ASSY TEMP sel – TK1 1 O2/H2 sel – TK1 FC STACK TEMP sel – 1
O1		O3	
O2	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	O3	RCS/OMS PRESS sel – RCS He X 10 PRPLT QTY sel – OMS FUEL MSN TIME – MET

NOT FLOWN

9-7

ASC/127/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 NORM (tb-bp) IPL SOURCE – OFF GPC MODE 1,2,3,4 (four) – RUN (tb-RUN) 5 – RUN STBY (tb-RUN)		O8 RADAR ALTM (two) – ON OFF 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) (tb-OP) 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) (OV103,4) – GPC OFF ANT SEL (three) (OV103,4) – AUTO as is CH pb/tw (three) (OV103,4) – 059Y as is GPS PRE AMPL UPPER (three) (OV105) – ON OFF LOWER (three) (OV105) – ON OFF PWR (three) (OV105) – ON OFF ENCRYPT (three) (OV105) – NORM as is 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) (OV103,4) – OFF, as reqd

NOT FLOWN

9-8

ASC/127/FIN

FWD FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

O9 R AUD PAGE - dn
 VOL pb (five) - as reqd
 TACAN pb - 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
 :D GPS PRE AMPL UC (OV103) - op {R}
 LC (OV103) - op {R}
 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) - cl { }
 LC (OV103) - cl { }
 3 PRE AMPL (two)(OV104) - op {R}
 O2 EMER - op {R}

NOT FLOWN

9-9

ASC/127/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	OFF
	RJDF 2A F3 LOGIC	- ON	
	DRIVER	- ON	OFF
	2B F4/F5 LOGIC	- ON	
	F4 DRIVER	- ON	OFF
	R OMS ENG VLV	- ON	OFF
	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	OFF
	DC UTIL PWR MNA	- ON	
	COAS PWR	- OFF	

NOT FLOWN

9-10

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MIDDECK SWITCH LIST FOR HANDOVER INGRESS

ML86B:E cb MNB MAR 1 - op {Y}
 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/127/FIN 2

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 – OFF
 S4 – OFF
 S5 – OFF
 cb DC 10 AMP MNB CB2 – op { Y }
 CB3 – op { Y }
 CB4 – op { Y }
 CB5 – op { Y }
 PUMPS S6 – OFF
 cb PUMPS (two) – op { R }

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
 A5J105 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 }

NOT FLOWN

9-13

ASC/127/FIN 2

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 cb CB2/J2 – op { Y }
 CB3/J3 – cl { }
 CB4/J4 – op { Y }
 CB5/J5 – op { Y }
 CB6/J6 – op { Y }
 RLY PWR – op { Y }
 J2 – OFF
 J3 – ON
 J4 – OFF
 J5 – OFF
 J6 – OFF
 Left select – 10A
 Right select – 10A

NOT FLOWN

9-15

ASC/127/FIN

MIDDECK EXPERIMENTS SWITCH LIST FOR HANDOVER **INGRESS**

(IF FLOWN)
MIDDECK (TEPC)
SW-1 - OFF

NOT FLOWN

9-16

ASC/127/FIN 2

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/127/FIN

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

R12L	<p><u>NOTE:</u> Panel may be blank if no PL requirement (See 9-23 or 9-24)</p>																																																																												
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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 SYS (two) – OFF (tb-LAT) CNTL SYS (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 AMP – 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/127/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

AFT MDU MDU PWR - OFF
 BRT sel - as reqd

A6U DAP - all off
 SENSE: -Z
 FLT CNTLR PWR - OFF
 Unused rotary sw - full ccw
 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 pb (four) - as reqd
 MODE - UP
 CNTL - ctr
 TIMER - ctr

A6U PL RETEN LOGIC PWR SYS (two) - OFF
 PL SEL - MON
 LAT (five) - OFF (tb-bp)
 RDY tb (five) - bp

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

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/127/FIN 2

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A2	DIGI DIS SEL – EL/AZ				
	X-PNTR SCALE – X10				
<hr/>					
A7U	MSTR ALARM pb	– It off			
	PL BAY FLOOD (eight)	– OFF			
	PORT RMS LIGHT	– OFF			
	CAMR	– ELBOW			
	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)	– It off			
	OUT pb (eight)	– It off			
	CAMR CMD PAN/TILT	– LO RATE			
	FOCUS	– ctr			
	ZOOM	– ctr			
	IRIS	– ctr			
	TILT	– ctr			
	PAN	– ctr			
	MENU pb (three)	– It off			
	MODE pb (three)	– It 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 (It off)
				STATUS lts (thirty-six)	– off
				PYROS (three)	– OFF (It off)
				PYRO CIRC PROT OFF lts (two)	– off
<hr/>					
			A4	MSN TIMER sel – MET	

NOT FLOWN

9-21

ASC/127/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"> RMS Mode lts (twelve) – off BRAKES – ON (tb-OFF) SAFING – AUTO (tb-bp) MODE sel – TEST AUTO SEQ – ctr <li style="padding-left: 20px;">lts (two) – off S/W STOP tb – gray C/W TONE VOL – as reqd <li style="padding-left: 20px;">lts (eleven) – off MSTR ALARM pb – lt off RATE MIN tb – OFF <li style="padding-left: 20px;">HOLD tb – OFF <li style="padding-left: 20px;">SCALE tb – gray EE MODE – OFF <li style="padding-left: 20px;">MAN CONTR – ctr <li style="padding-left: 20px;">tb (six) – bp B/U JOINT sel – SY PL REL – OFF <li style="padding-left: 20px;">DIRECT DR – ctr PARAM sel – PORT TEMP LTG ANNUN/NUM sel (two) – VAR,LO <li style="padding-left: 20px;">PNL/INST sel – OFF JOINT sel – CRIT TEMP SINGLE/DIRECT DR – ctr SHDLR BRACE REL – ctr (tb-bp) <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"> STBD RMS – OFF (tb-STO) <li style="padding-left: 20px;">– (OFF (tb-bp) if NO MPMs present) RETEN LAT – OFF (tb-LAT) <li style="padding-left: 20px;">– (OFF (tb-bp) if no MPMs present) HTR (two) – OFF R-F-L tb (three) – gray <li style="padding-left: 20px;">– (bp if no RMS flown) RMS SEL – OFF <li style="padding-left: 20px;">PWR – OFF PORT RMS – OFF (tb-STO) <li style="padding-left: 20px;">– (OFF (tb-bp) if no MPMs present) RETEN LAT – OFF (tb-LAT) <li style="padding-left: 20px;">– (OFF (tb-bp) if no MRLs present) HTR (two) – OFF R-F-L tb (three) – gray <li style="padding-left: 20px;">– (bp if no RMS flown) RMS RHC RATE – VERN <hr/> <p>A3</p> <ul style="list-style-type: none"> MON CONTRAST (two) – ctr BRT (two) – ctr COLOR (two) – as reqd TINT (two) – as reqd FUNCTION (two) – ctr PWR (two) – OFF <hr/>
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NOT FLOWN

9-22

ASC/127/FIN

AFT FLIGHT DECK PAYLOADS SWITCH LIST FOR HANDOVER INGRESS

<p>L10U (AVIU) SYNC/VIDEO – VIDEO HI-Z/75 – HI-Z PWR SEL – HI</p> <hr/> <p>L11U (PDIP 2) T-O/OIU/OIU – OIU (ctr) DC PWR 1 CABIN P/L – OFF 2 CABIN P/L – OFF</p> <hr/> <p>L12UL SSP-1 Verify all tbs bp cb SW PWR 1 – op PDIP 1 PWR 2/KuBAND RLY – op ANDE2 PWR – OFF PRE-ARM/SAFE – SAFE ARM/SAFE – SAFE DEPLOY/SAFE – SAFE (ctr)</p> <hr/> <p>L12UR SSP-1 Verify all tbs bp TCS PWR – OFF DRAGON SAT D/S DEPLOY – (ctr) PRE-ARM – SAFE cb SW PWR 2 – op PDIP 1 PWR 1 – op D/S ARM – SAFE OIU PWR – OFF (ctr)</p> <hr/> <p>L12LL SSP-2 Verify all tbs bp KEEL 1 PWR (ICC) – OFF ILL PWR (ICC) – OFF 2 PWR (JLE) – OFF ILL PWR (JLE) – OFF cb PDIP 2 PWR 2 – op DRGNEYE PWR – OFF C/L CAM PWR – OFF (ctr)</p>	<p>L12LR SSP-2 Verify all tbs bp JLE HTR 1-2 – (ctr) 3-4 – (ctr) (#1) – OFF ICS-EF HTR (#2) – OFF ICC PFRAM HTRS – (ctr) PPSU 1/2 HTR A – DSBL cb PDIP 2 PWR 1 – op PPSU 1/2 HTR B – DSBL ICC BATT HTRS – (ctr) JLE SEDA-AP HTR (#3) – OFF MAXI HTR (#4) – SAFE</p> <hr/> <p>L12L (PDIP 1) Ku BAND RATE – OFF DC PWR 1 CABIN P/L – OFF DC PWR 2 CABIN P/L – OFF</p> <hr/> <p>R12 (VPU/OPP) VPU PWR – OFF</p> <hr style="border-top: 1px dashed black;"/> <p>R12 (OPP) cb OBSS SW PWR cb1 – op {Y} OBSS SW PWR – OFF</p> <hr style="border-top: 1px dashed black;"/> <p>R12 (OBSS) RSC PWR – OFF ITVC ENA – OFF SPEE PWR – OFF</p>
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NOT FLOWN

9-24

ASC/127/FIN 1

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 #1 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	<u>TO</u> 3.85 V/15.36 psia (OV103) 3.85 V/15.35 psia (OV104) 3.90 V/15.54 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/807.0 psia (OV105) 3.60 V/288 psi 4.00 V/810.6 psia (OV103) 4.85 V/0.2" H2O (if SH flown) 3.90 V/806.5 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
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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	<u>TO</u> 3.45 V/13.76 psia (OV103) 3.45 V/13.75 psia (OV104) 3.45 V/13.74 psia (OV105) 3.30 V/676 psia (OV103) 3.45 V/677.0 psia (OV105) 3.35 V/679.9 psia (OV103) 3.30 V/682.8 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
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INHIBIT

8 APU 1 EGT 14 CAB O2 FLOW 1 (OV105) 18 APU 2 EGT 24 CAB O2 FLOW 2 (OV105) 28 APU 3 EGT 30 CRYO O2 P TK4 (if TK4 not flown) 40 CRYO O2 P TK5 (if TK5 not flown) 54 CAB N2 FLOW 1 (OV105) 55 CAB FAN ΔP (if SH flown) 61 CRYO O2 HTR1 TK4 (if TK4 not flown) 64 CAB N2 FLOW 2 (OV105) 65 PPO2 (if SH flown) 71 CRYO O2 HTR2 TK4 (if TK4 not flown) 75 PPCO2 #1 (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

MDU	View Angle	Port Config	Selected Port	Flight Critical Bus	Display	Edgekey Menu
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	3	OMS/MPS	SUBSYS STATUS
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

MEDS RECONFIGURATION FOR PRELAUNCH MDU FAILURES

Failed MDU	New MDU	Selected Port	Flight Critical Bus	Display	Edgekey Menu
CDR1	—	—	—	—	—
CDR2	CDR1	primary	3	A/E PFD	DATA BUS
MFD1	CDR1	secondary	3	HYD/APU	SUBSYS STATUS
MFD2	CDR1 MFD1	secondary primary	3 3	HYD/APU OMS/MPS	SUBSYS STATUS SUBSYS STATUS
PLT1	PLT2	primary	4	A/E PFD	DATA BUS
PLT2	—	—	—	—	—



CUE CARD CONFIG

**CUE CARD
CONFIG**

FAB USE ONLY

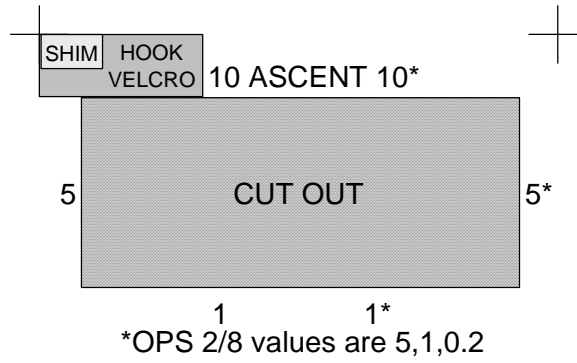
10-1

ASC/127/FIN



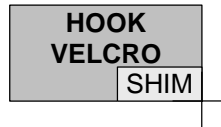
CUE CARD
CONFIG

TOP



ADI ERROR/RATE SWITCH

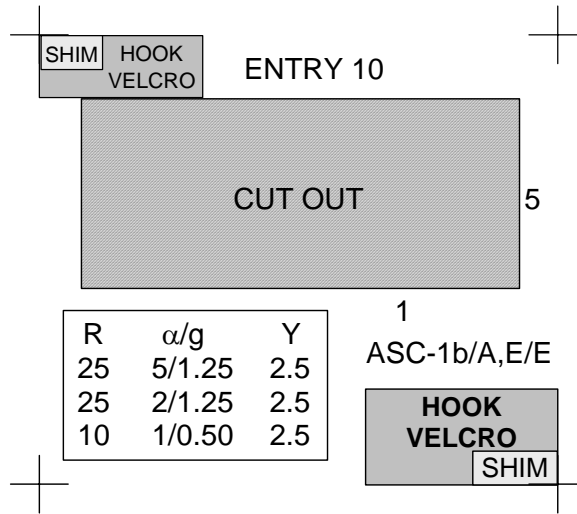
ASC-1a/A,E/H



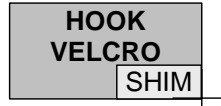
*OPS 2/8 values are 5,1,0.2

TOP

BACK OF 'ADI ERROR/RATE SWITCH'



1
ASC-1b/A,E/E



FAB USE ONLY

CC 10-2

ASC/127/FIN

TOP

ASCENT/ENTRY SPEC PASS	NO.	ASC-2a/A,E/E BFS	NO.
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

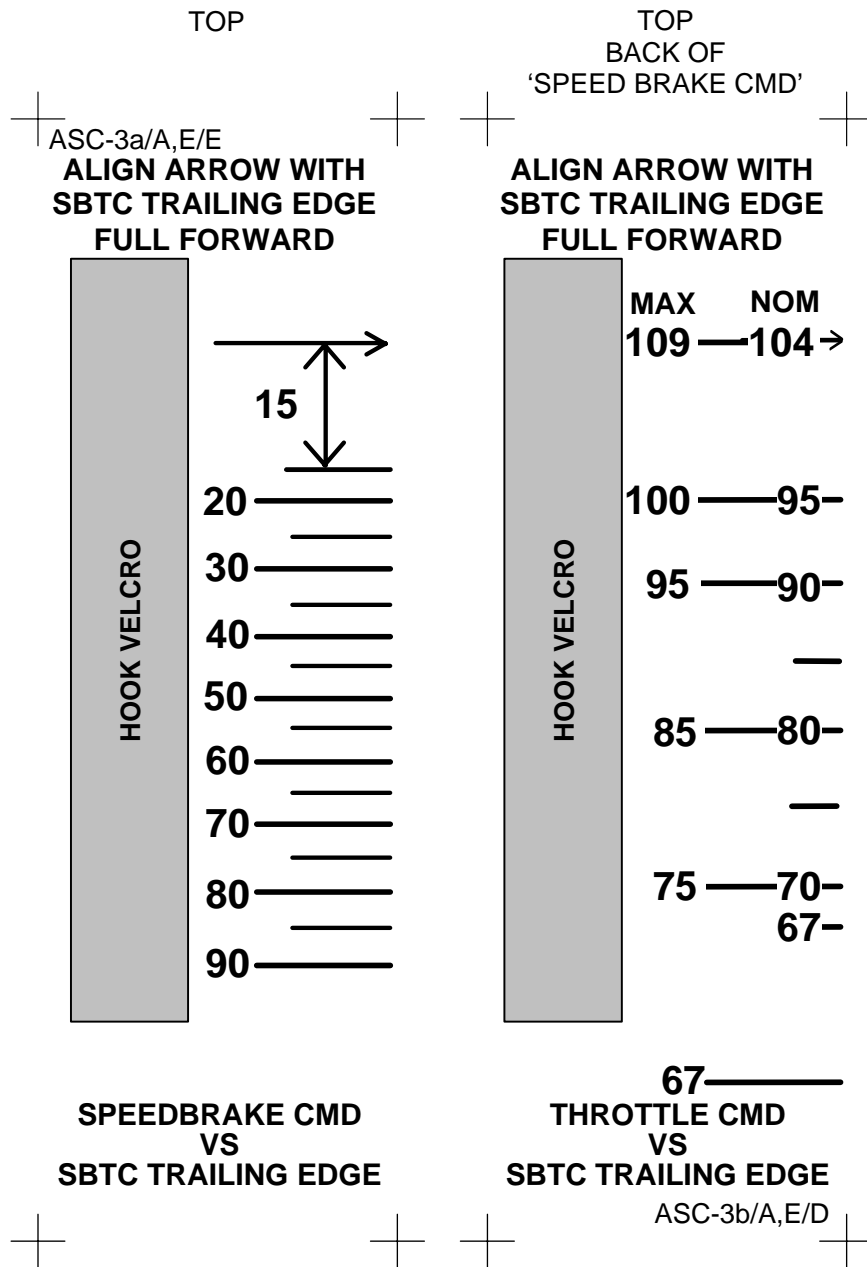
HOOK
VELCRO
SHIM

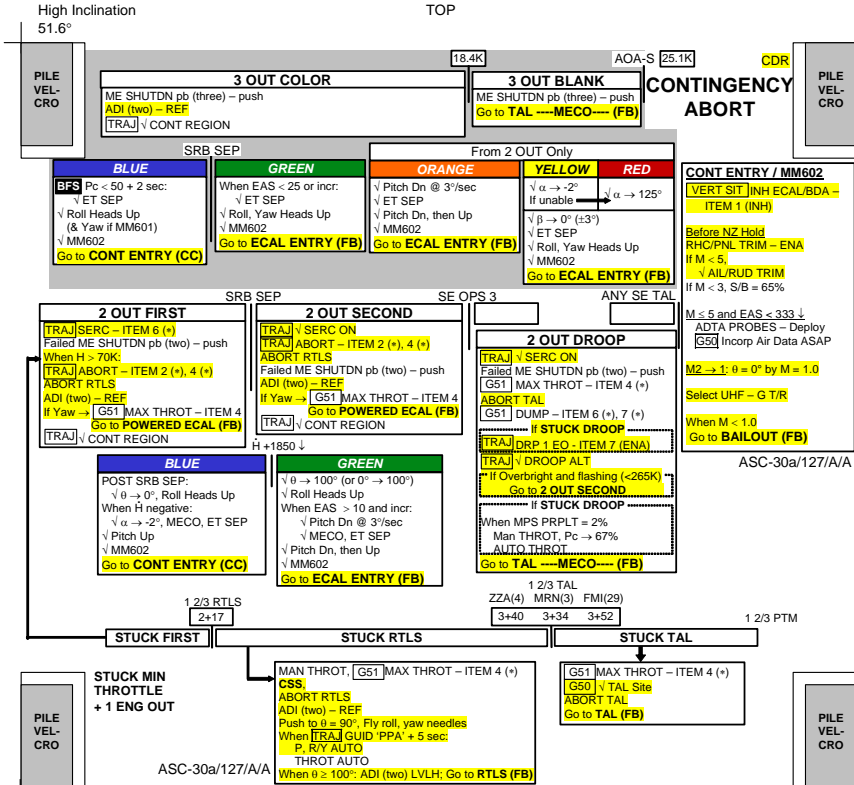
ASC-2b/A,E/D

FAB USE ONLY

CC 10-3

ASC/127/FIN



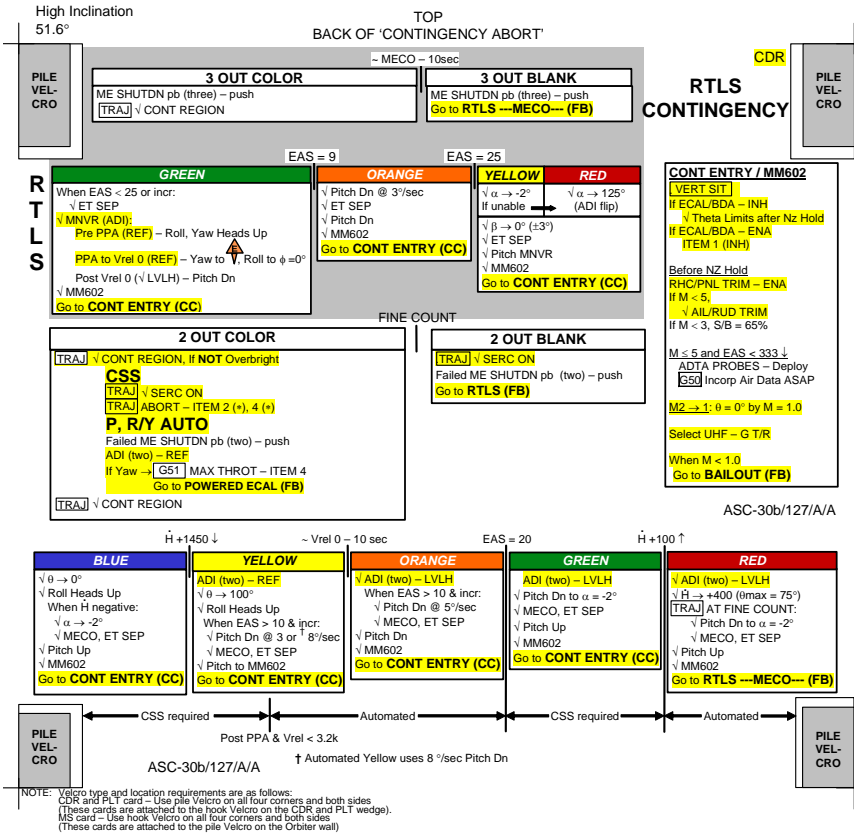


NOTE: Velcro type and location requirements are as follows:
CDR and PL1 card – Use pile Velcro on all four corners and both sides
(These cards are attached to the hook Velcro on the CDR and PL1 wedge).
MS card – Use hook Velcro on all four corners and both sides
(These cards are attached to the pile Velcro on the Orbiter wall)

FAB USE ONLY

(reduced copy)
(A)CC 10-5

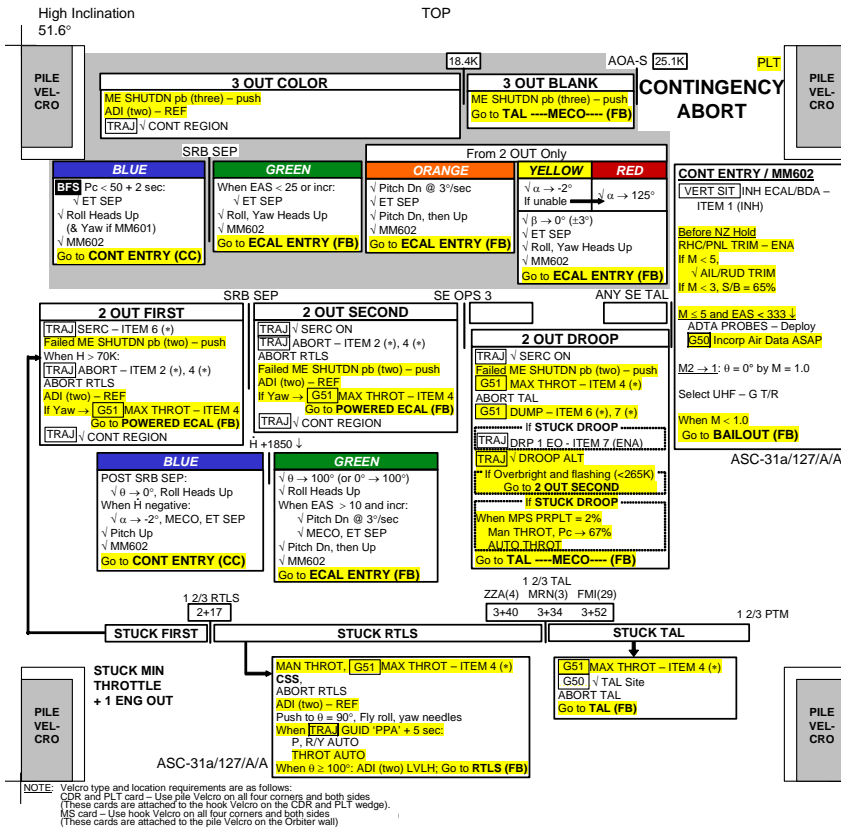
CDR
ASC/127/FIN



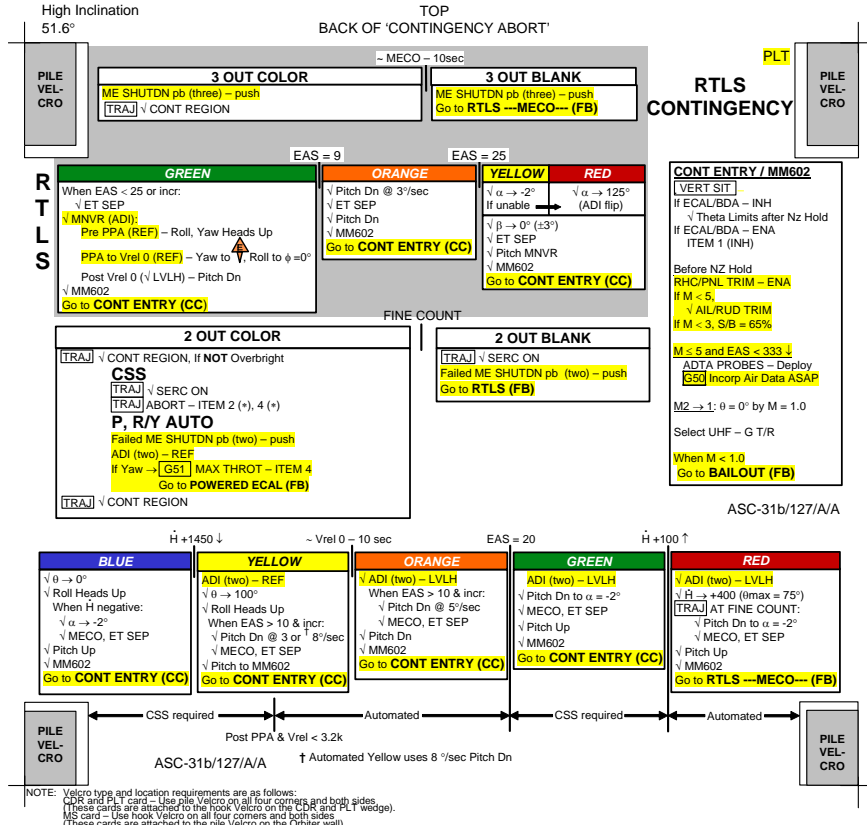
FAB USE ONLY

(reduced copy)
(A)CC 10-6

CDR
ASC/127/FIN



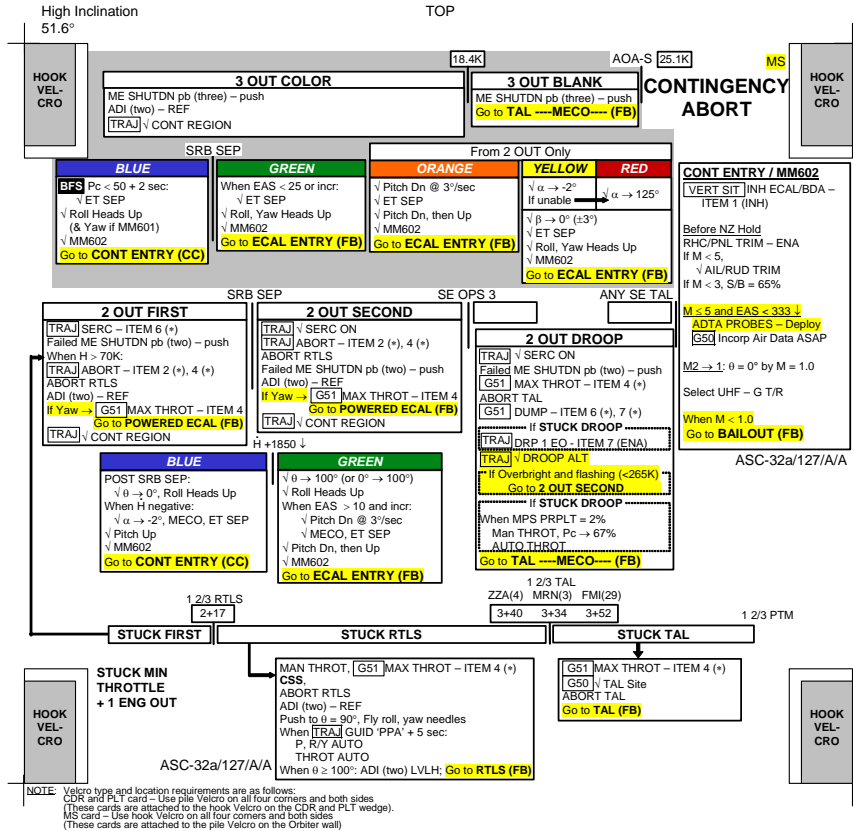
(reduced copy) **PLT**
FAB USE ONLY (B)CC 10-5 ASC/127/FIN



FAB USE ONLY

(reduced copy)
(B)CC 10-6

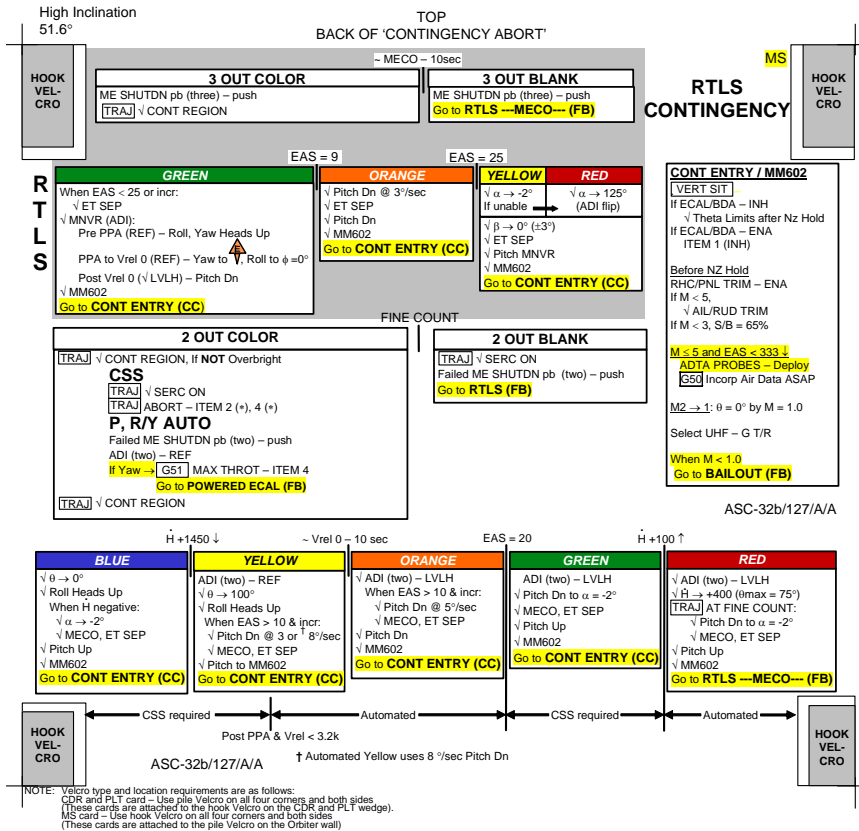
PLT
ASC/127/FIN



FAB USE ONLY

(reduced copy)
(C)CC 10-5

MS
ASC/127FIN



FAB USE ONLY

(reduced copy)
(C)CC 10-6

MS

ASC/127FIN

TOP

HOOK VELCRO		OMS 2 BURN MONITOR	HOOK VELCRO	
OMS TEMP*		L R		
FU IN P ≥		219 220	OMS ENG FAIL	
≤		201 208	OMS PRPLT FAIL	
or No FU IN P				
OMS PC* & OMS ↓ (BFS: √accel)				
ENG VLV 1 or 2 < 70		OMS ENG FAIL		
or OX IN P > 227				
OX IN P ≤ 227		OMS PRPLT FAIL		
or No OX IN P				
OMS OX/FU TK P (√NENG IN P)				
OX/FU LOW		He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At PC < 72 or OMS TEMP or HP > 85: OMS PRPLT FAIL		
OX & FU HIGH		He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284		
OMS He TK P LOW				
(√OMS/MPS)		At He P < 640 or QTY ≤ 41: If HP < 85: OMS XFEED from good OMS At HP > 85: OMS PRPLT FAIL		
OMS N2 REG P HIGH or LOW		OMS ENG – ARM		
OMS N2 TK P LOW		At N2 TK P < 470: OMS ENG – ARM		
(√OMS/MPS)				
OMS GMBL				
PRI fail		L(R) OMS GMBL – SEC		
SEC fail		If high RCS usage: OMS ENG FAIL		
GPC				
1(4) & Burning OMS aff		aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF, ON L(R) OMS GMBL – SEC		
SEC GMBL lost		If high RCS usage: OMS ENG FAIL		
2 FAs lost		√MAN SHUTDN		
I/O ERROR FA				
1(4)		L(R) OMS GMBL – SEC		
		♦ I/O RESET (if recov: BFS I/O RESET)		
		If high RCS usage: OMS ENG FAIL		
2 FAs lost		√MAN SHUTDN		
BCE STRG D				
1(4)		I/O RESET (if recov: >>>)		
		If high RCS usage: L(R) OMS GMBL – SEC		
I/O ERROR PCM		OI PCMMU PWR – 2(1)		

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

ASC-5a/127/A,O/A

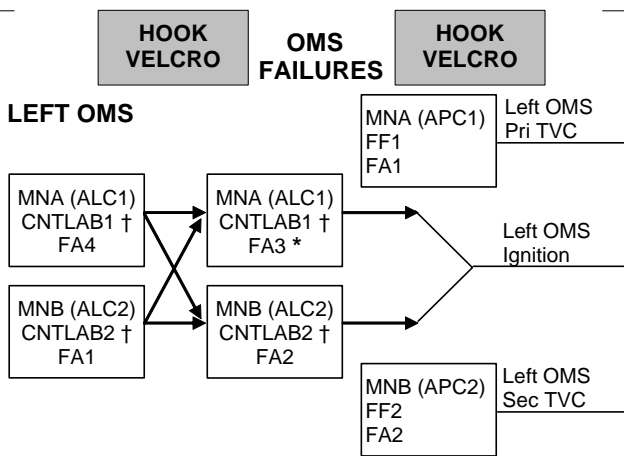
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FAB USE ONLY

CC 10-7

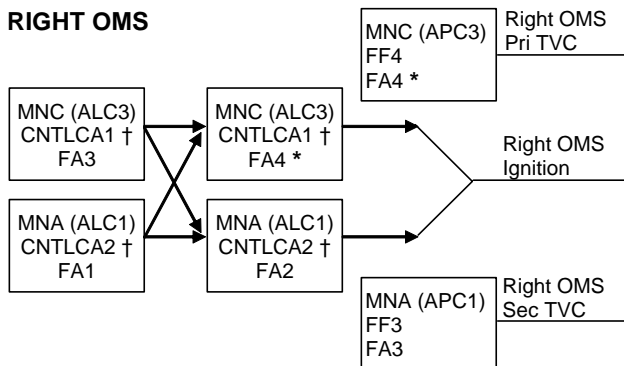
ASC/127/FIN

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_c 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/127/FIN

TOP
BACK OF 'OMS2/ORBIT OMS BURNS'

HOOK VELCRO	OPS 1 RCS BURN	HOOK VELCRO
------------------------	---------------------------	------------------------

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 Mnv'r 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/127/A,O/A

(reduced copy)

FAB USE ONLY

CC 10-10

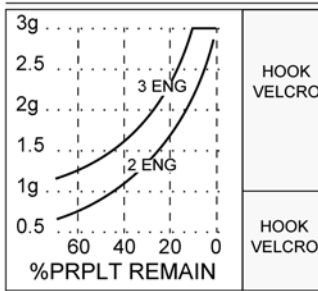
ASC/127/FIN

TOP

TOP
BACK OF 'ASCENT
ADI - NOMINAL'

ASCENT ADI - NOMINAL

TIME	θ	H	\dot{H}	(127 OCFR1 CY)
0:30	68	9K	657	
0:50	61	26K	993	
1:10	53	50K	1431	
1:30	39	84K	1893	
1:50	30	125K	2197	



-STAGING-

V_i	θ	H	\dot{H}	ASC-14a/127/A/A
6	19	217K	1725	
7	16	275	1272	
8	14	310	920	
9	11	332	637	
10	9	346	405	
12	6	356	63	
14	9	355	-147	
16	25	350	-233	
18	23	344	-269	
20	21	339	-220	
22	19	337	-106	
24	17	337	64	
25819	13	345	272	

HOOK VELCRO

ENTRY ALPHA

VR	α ref	R	H	Href	Rref	
25	HI	40	LO	4427	400	
24	HI	40	LO	2608	246	-46 L79
23	43	40	37	2149	239	-64 69
22	43	40	37	1792	233	-83 63
21	43	40	37	1510	227	-106 60
20	43	40	37	1292	220	-123 59
19	43	40	37	1115	213	-147 59
18	43	40	37	970	206	-171 61
17	43	40	37	856	200	-191 62
16	43	40	37	764	193	-201 R63

KSC 15

MAX L/D	
M	α
3	17
2	15
1	12

ASC-14b/127/A,E/A

VR	α ref	R	H	Href	Rref	
15	43	40	37	687	191	-118 61
14	43	40	37	616	185	-126 59
13	43	40	37	548	180	-135 58
12	43	40	37	485	176	-151 56
11	43	40	37	427	170	-193 55
10	41	38	35	371	164	-175 51
9	39	36	33	321	158	-209 46
8	37	34	31	276	152	-241 L41
7	33	30	27	229	143	-267 38
6	30	27	24	185	131	-270 39
5	26	23	20	142	118	-272 40
4	23	20	18	106	104	-264 41
3	19	16	15	74	90	-247 R35
2.5	14			61	82	-269
2	12			50	76	-264
1.5	10			38	67	-321
1	8			27	52	-269

HOOK VELCRO

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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 ΔV or
* if CUR $\Delta VTOT$: 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:** *

* 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/127/A/A

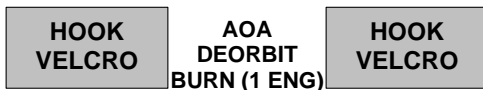
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TOP
 BACK OF 'AOA DEORBIT BURN (2 ENG)'



- √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_c, 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 *
- * **G23** Resel jet *

ASC-8b/A/B

HINGE

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ASC/127/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 *

HINGE

ASC-7a/A/B

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ASC/127/FIN

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 ΔV or
* if CUR $\Delta VTOT$: 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:**

- * 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)

ASC-7aa/127/A/A

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TOP
 BACK OF 'AOA DEORBIT BURN (RCS)'



**HOOK
 VELCRO**

**HOOK
 VELCRO**



HINGE

ASC-7b/A/B



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



ASC-7bb/A/B



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TOP

PILE
VELCRO

HOOK
VELCRO

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**ZZA TAL REDESIGNATION
(127 OCFR1 CYC)**

1st E.O. VI		5800	5900	6000	6100	6200	6300	6400	6500
SE OPS 3 ZZA 109	(4)	10900	11000	11000	11000	11100	11100	11100	11200
SE ZZA 104	(4)	17200	17000	16800	16600	16400	16200	16000	15800

1st E.O. VI		6600	6700	6800	6900	7000	7100	7200	7300
SE OPS 3 ZZA 109	(4)	11200	11200	11200	11300	11300	11300	11300	11400
SE ZZA 104	(4)	15600	15400	15200	15100	14900	14700	14600	14400

1st E.O. VI		7400	7500	7600	7700	7800	7900	8000	8100
SE OPS 3 ZZA 109	(4)	11400	11400	11400	11500	11500	11500	11500	11500
SE ZZA 104	(4)	14300	14200	14000	13900	13800	13800	13700	13600

1st E.O. VI		8200	8300	8400	8500	8600	8700	8800	8900
SE OPS 3 ZZA 109	(4)	11500	11600	11600	11600	11600	11600	11600	11600
SE ZZA 104	(4)	13600	13500	13500	13400	13400	13400	13400	13400

1st E.O. VI		9000	9100	9200	9300	9400	9500	9600	9700
SE OPS 3 ZZA 109	(4)	11600	11700	11700	11700	11700	11700	11700	11700
SE ZZA 104	(4)	13400	13400	13400	13400	13400	13400	13400	13400

1st E.O. VI		9800	9900	10000	10100				
SE OPS 3 ZZA 109	(4)	11700	11700	11700	11700				
SE ZZA 104	(4)	13500	13500	13500	13500				

ASC-9a/127/A/A

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TOP
BACK OF 'ZZA TAL REDESIGNATION'

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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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**MRN TAL REDESIGNATION
(127 OCFR1 CYC)**

1st E.O. VI		5700	5800	5900	6000	6100	6200	6300	6400
SE OPS 3 MRN 109	(3)	10700	10900	10900	11000	11000	11000	11100	11100
SE MRN 104	(3)	16800	16600	16500	16300	16100	15900	15700	15500

1st E.O. VI		6500	6600	6700	6800	6900	7000	7100	7200
SE OPS 3 MRN 109	(3)	11100	11200	11200	11200	11300	11300	11300	11400
SE MRN 104	(3)	15400	15200	15000	14900	14700	14600	14400	14300

1st E.O. VI		7300	7400	7500	7600	7700	7800	7900	8000
SE OPS 3 MRN 109	(3)	11400	11400	11400	11500	11500	11500	11500	11500
SE MRN 104	(3)	14200	14000	13900	13800	13800	13700	13600	13500

1st E.O. VI		8100	8200	8300	8400	8500	8600	8700	8800
SE OPS 3 MRN 109	(3)	11600	11600	11600	11600	11600	11600	11600	11700
SE MRN 104	(3)	13500	13400	13400	13400	13300	13300	13300	13300

1st E.O. VI		8900	9000	9100	9200	9300	9400	9500	9600
SE OPS 3 MRN 109	(3)	11700	11700	11700	11700	11700	11700	11700	11700
SE MRN 104	(3)	13300	13300	13300	13300	13300	13300	13300	13300

1st E.O. VI		9700	9800	9900	10000	10100			
SE OPS 3 MRN 109	(3)	11700	11700	11700	11700	11700			
SE MRN 104	(3)	13400	13400	13400	13400	13400			

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TOP
BACK OF 'MRN TAL REDESIGNATION'

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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-10b/127/A/A

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**HOOK
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**HOOK
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ASC/127/FIN

TOP

**PILE
VELCRO**

**HOOK
VELCRO**

**PILE
VELCRO**

**FMI TAL REDESIGNATION
(127 OCFR1 CYC)**

1st E.O. VI		6000	6100	6200	6300	6400	6500	6600	6700
SE OPS 3 FMI 109	(29)	10900	11000	11000	11000	11100	11100	11100	11200
SE FMI 104	(29)	17800	17600	17400	17200	16900	16700	16500	16300

1st E.O. VI		6800	6900	7000	7100	7200	7300	7400	7500
SE OPS 3 FMI 109	(29)	11200	11200	11200	11300	11300	11300	11300	11400
SE FMI 104	(29)	16100	15900	15700	15500	15300	15200	15000	14800

1st E.O. VI		7600	7700	7800	7900	8000	8100	8200	8300
SE OPS 3 FMI 109	(29)	11400	11400	11400	11500	11500	11500	11500	11500
SE FMI 104	(29)	14700	14600	14400	14300	14200	14100	14100	14000

1st E.O. VI		8400	8500	8600	8700	8800	8900	9000	9100
SE OPS 3 FMI 109	(29)	11600	11600	11600	11600	11600	11600	11600	11600
SE FMI 104	(29)	13900	13900	13800	13800	13800	13800	13700	13700

1st E.O. VI		9200	9300	9400	9500	9600	9700	9800	9900
SE OPS 3 FMI 109	(29)	11700	11700	11700	11700	11700	11700	11700	11700
SE FMI 104	(29)	13700	13700	13700	13700	13800	13800	13800	13800

1st E.O. VI		10000	10100						
SE OPS 3 FMI 109	(29)	11700	11700						
SE FMI 104	(29)	13800	13800						

ASC-12a/127/A/A

**PILE
VELCRO**

**HOOK
VELCRO**

**PILE
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TOP
BACK OF 'FMI TAL REDESIGNATION'

HOOK
VELCRO

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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				

ASC-12b/127/A/A

HOOK
VELCRO

HOOK
VELCRO

HOOK
VELCRO

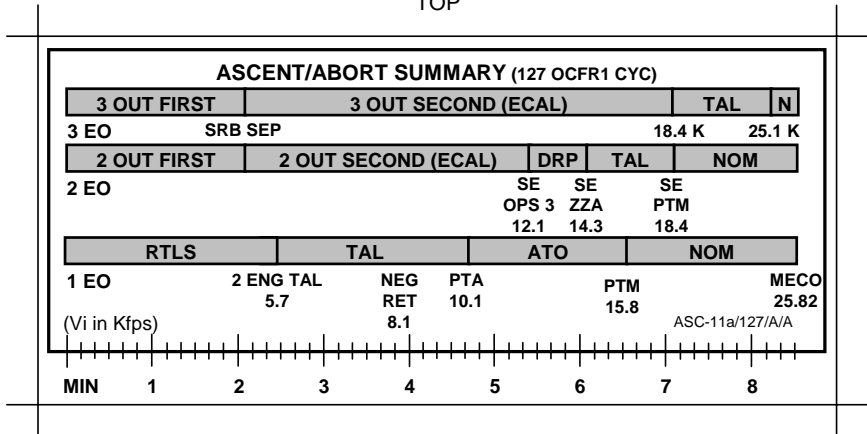
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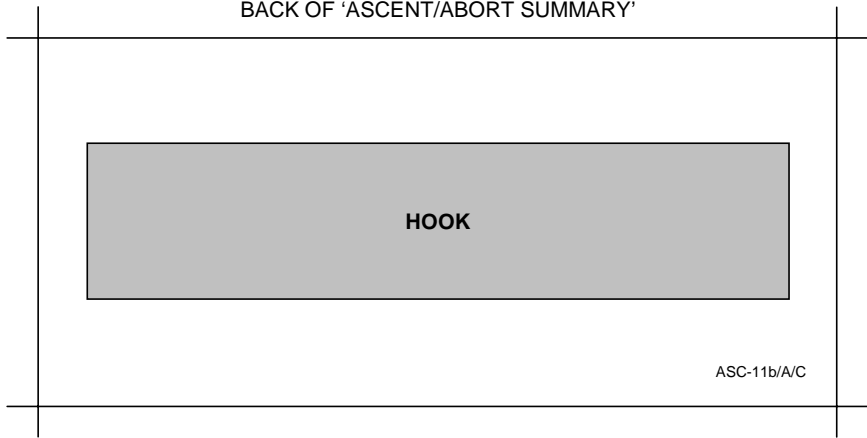
CC 10-25

ASC/127/FIN

TOP



TOP
BACK OF 'ASCENT/ABORT SUMMARY'



(reduced copy)

FAB USE ONLY

CC 10-26

ASC/127/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	R14 CDR
ESS BUS 2CA	R14 PLT
MNA	R14 MS STATION
MNB	R14 MIDDECK
MNC	R14 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

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ASC-15b/A,E/F

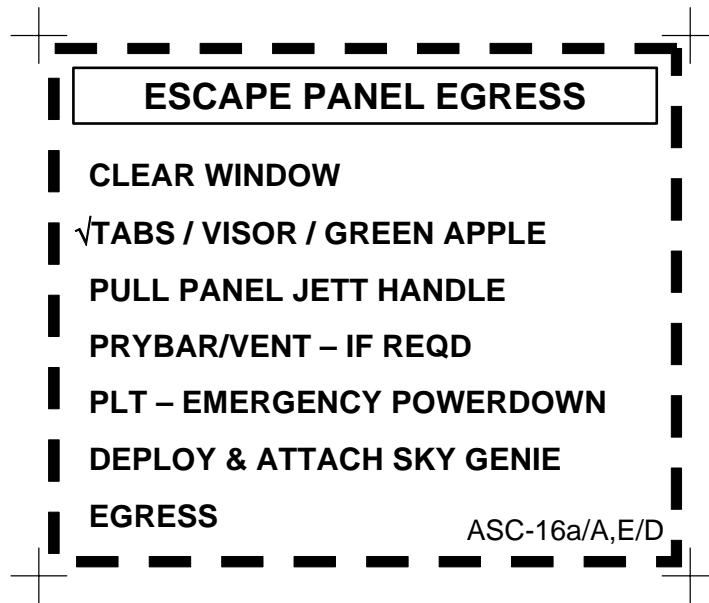
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FAB USE ONLY

CC 10-28

ASC/127/FIN

TOP



TOP
BACK OF 'ESCAPE PANEL EGRESS'



**HOOK
VELCRO**

ASC-16b/A,E/C

(reduced copy)

FAB USE ONLY

CC 10-29

ASC/127/FIN

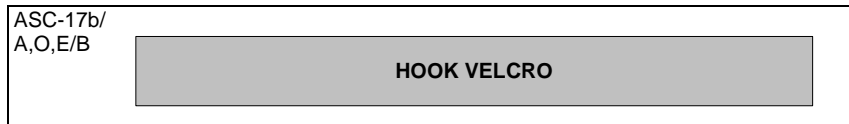
GPC/FCS CHANNEL CONFIGURATION

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)

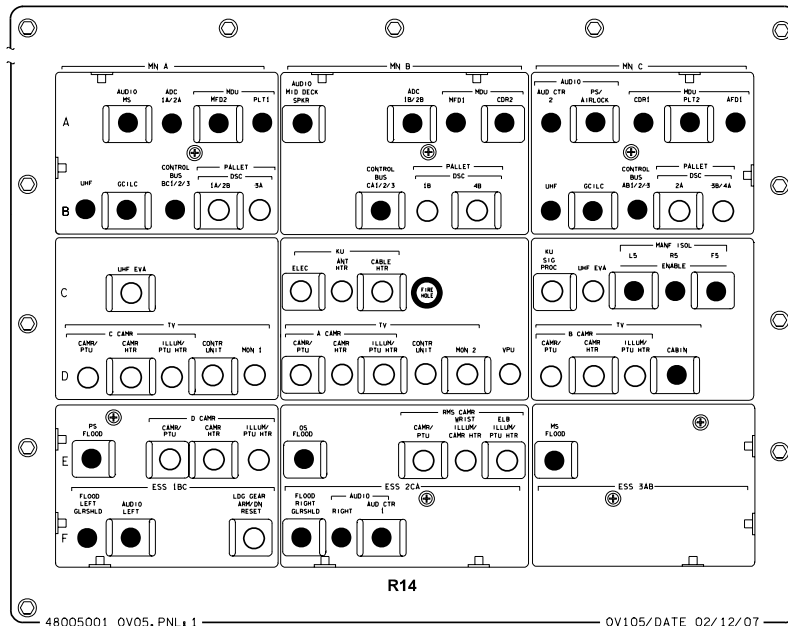
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ASC/127/FIN

TOP
 PANEL R14 – OV105 ONLY

OV105 ONLY



48005001_OV05_PNL 1

OV105/DATE 02/12/07

ASC-19a/A,O,E/D

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FAB USE ONLY

CC 10-31

ASC/127/FIN



TOP
 BACK OF 'PANEL R14 – OV105 ONLY'



HOOK
 VELCRO

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ASC-19b/A,O,E/C

FAB USE ONLY

(reduced copy)
 CC 10-32

ASC/127/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/127/FIN

FAB USE ONLY

CC 10-34

ASC/127/FIN

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HOOK
VELCRO

EMERGENCY EGRESS

TOP

NOTE
'LOSS OF COMM TROUBLESHOOTING'
ON REVERSE SIDE

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/G

HINGE

FAB USE ONLY

CC 10-35

ASC/127/FIN

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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**

~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**

ASC-25aa/A,E/E

PILE
VELCRO

NOTE

'SUIT PRESS AND O2, EOS ACTIVATION TROUBLESHOOTING' ON REVERSE SIDE

PILE
VELCRO

FAB USE ONLY

CC 10-36

ASC/127/FIN

(reduced copy)

TOP
BACK OF 'EMERGENCY EGRESS' HEAD TO TOE

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	R14 CDR
ESS BUS 2CA	R14 PLT
MNA	R14 MS STATION
MNB	R14 MIDDECK
MNC	R14 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

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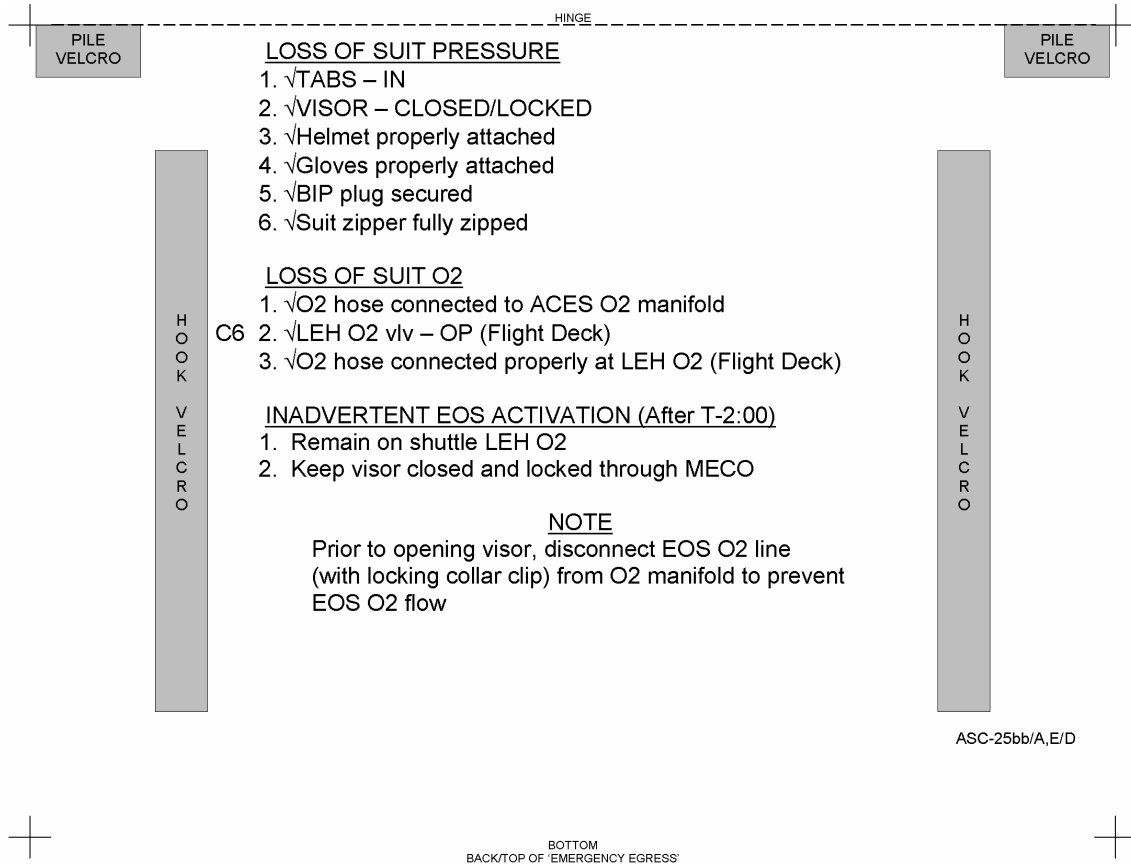
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FAB USE ONLY

CC 10-38

ASC/127/FIN

(reduced copy)

HOOK
VELCRO

АВАРИЙНОЕ ПОКИДАНИЕ

ВЕРХ

ПРИМЕЧАНИЕ
"УСТРАНЕНИЕ НЕИСПРАВНОСТЕЙ ПРИ ПОТЕРЕ СВЯЗИ"
НА ОБРАТНОЙ СТОРОНЕ

HOOK
VELCRO

РЕЖИМ 1 ДО СТАРТА

ЯЗЫЧКИ ШЕЙНОЙ ПРОКЛАДКИ - УБРАТЬ
ШЛЕМ - ОПУСТИТЬ/ ЗАКРЫТЬ
СК O2 - ВКЛ
ЗЕЛЕНый ШАРИК - ПОТЯНУТЬ
НАКОЛЕННЫЕ ПЛАНШЕТЫ - УБРАТЬ
СИСТЕМУ ОХЛАЖДЕНИЯ - ОТСОЕДИНИТЬ
ПРИВЯЗНЫЕ РЕМНИ КРЕСЛА - ОСВОБОДИТЬ
ПАРАШЮТ (четыре) - ОТСТЕГНУТЬ
СВЯЗЬ - ОТСОЕДИНИТЬ
СК O2 - 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 O2 - ВКЛ
ЗЕЛЕНый ШАРИК - ПОТЯНУТЬ

ASC-26a/A,E/E

HINGE

FAB USE ONLY

CC 10-39

ASC/127/FIN

(reduced copy)

TOP, HINGED AT BOTTOM OF 'EMERGENCY EGRESS'
HINGE

**РЕЖИМ 5
ПОСЛЕ ПОСАДКИ**

ЯЗЫЧКИ ШЕЙНОЙ ПРОКЛАДКИ - УБРАТЬ
ШЛЕМ - ОПУСТИТЬ/ ЗАКРЫТЬ
СК O2 - ВКЛ
ЗЕЛЕНый 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/D

PILE
VELCRO

ПРИМЕЧАНИЕ
УСТРАНЕНИЕ НЕИСПРАВНОСТЕЙ ПРИ ПОТЕРЕ ДАВЛЕНИЯ В СК, ПОДАЧЕ O2 И ВКЛЮЧЕНИИ СИСТЕМЫ EOS
НА ОБРАТНОЙ СТОРОНЕ

PILE
VELCRO

УСТРАНЕНИЕ НЕИСПРАВНОСТЕЙ СК ACES (ВЫВЕДЕНИЕ/СПУСК)

ПОТЕРЯ СВЯЗИ

ЕСЛИ ПОТЕРЯ СВЯЗИ В РЕЖИМЕ ПЕРЕДАЧИ:

ПРИМЕЧАНИЕ

Поток O2 в шлеме загл микрофоны (т.е. дыхание, откр или негерм смотр щиток, негерм шейная прокладка)

1. ✓Язычки шейной прокладки – IN (убраны)
2. ✓Гермоуплотнение смотр щитка шлема - свободно
3. ✓Размещение микрофона
4. ✓ПИТАНИЕ ССУ – ON (Вкл)

ШИНА ПИТАНИЯ	БЛОК ATU
ESS BUS 1BC	R14 CDR
ESS BUS 2CA	R14 PLT
MNA	R14 MS STATION
MNB	R14 MIDDECK
MNC	R14 PS STATION

ЕСЛИ ПОТЕРЯ СВЯЗИ В РЕЖИМЕ ПРИЕМА:

5. HIU VOL – MAX (Громкость на HIU - максимум)
6. ✓Все кабели пристыкованы правильно:
Интерфейсный кабель CCA-to-Helmet
Короткий конец кабеля связи
HIU (Устройство сопряжения с гарнитурой)
Пульт связи
7. ✓Конфигурация ATU (Полетная палуба, как предписано):
A/G1, A/G2, A/A, ICOM A, ICOM B – T/R (ПРД/ПРМ)
MODE – PTT/VOX
VOX SENS – 2-4
A/G1, A/G2 диск переключ – 9
A/A, ICOM A, ICOM B диск переключ – 5

FAB USE ONLY

CC 10-40

ASC/127/FIN

(reduced copy)

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VELCRO

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ASC-26b/A,E/D

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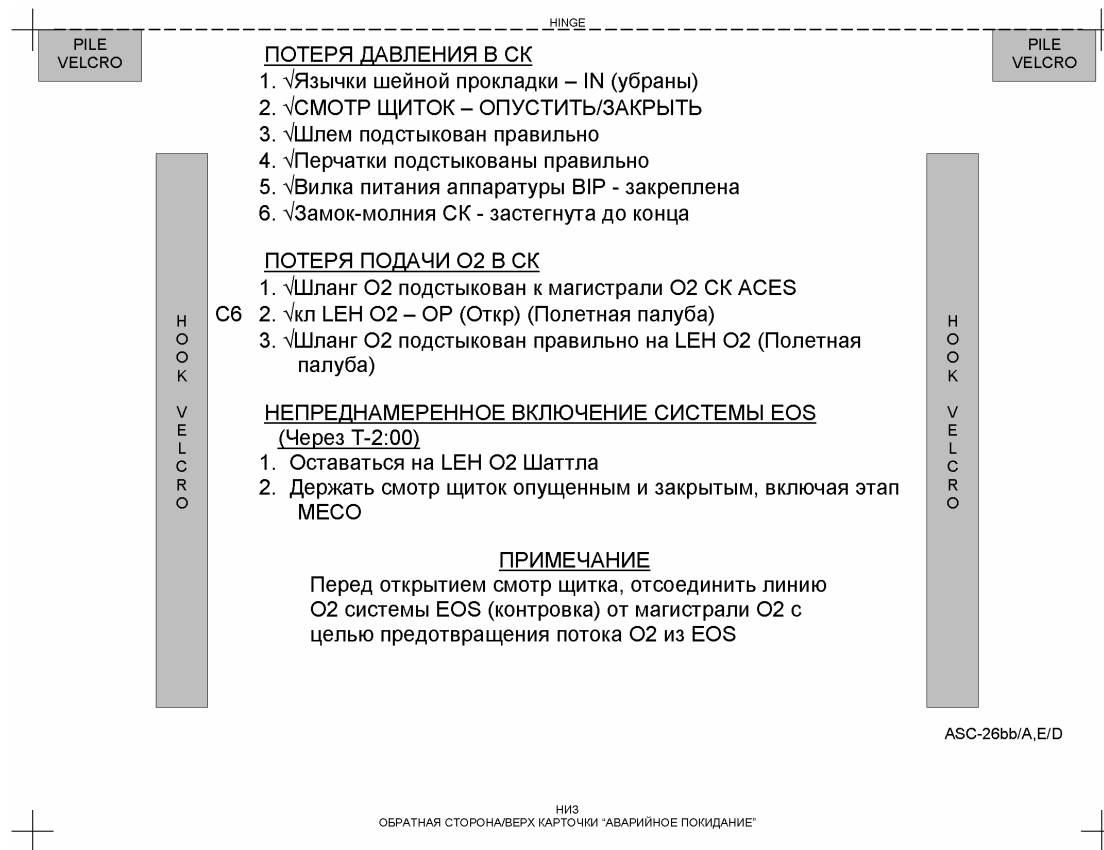
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FAB USE ONLY

10-42

ASC/127/FIN



Space Shuttle Program
FLIGHT DATA FILE

JSC-48005-127
FINAL



ASCENT CHECKLIST

STS
127

Flight Cover (trim bottom to expose tabs)