Space Shuttle Program

FLIGHT DATA FILE

JSC-48006-37

Ascent Checklist

STS-37 Flight Supplement

Mission Operations Directorate
Flight Design and Dynamics Division

Final, Rev B
January 27, 1991

PCN-1

This Revision is to be used with 3703 load and subs

NASA

National Aeronautics a
Space Administration

Lyndon B. Johnson Sp
Houston, Texas

Space Shuttle Program
FLIGHT DATA FILE

JSC-48006
(Supersedes JSC-18547)

Ascent Checklist

Mission Operations Directorate
Flight Design and Dynamics Division

Generic, Rev A
December 7, 1990

NOTE
Use this Revision only with
STS-39 FIN A
STS-37 FIN B
STS-40 FIN B
and subsequent flights

NASA
National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

ASCENT C/L STS-37 FS	FINAL Rev B (Jan 27, 1991)

PCN-1 (Mar 6, 1991) Sheet 1 of 1

List of Implemented Change Requests (482s)

ASC-771
ASC-815
ASC-817A
ASC-818

Replace/add the following pages:

1. FS ix thru FS xii
2. FB 2-5 & FB 2-6, FB 2-15 thru FB 2-18
3. FS 4-1 & FS 4-2
4. FS 7-1 & 7-2, FS 7-7 thru 7-10
5. Section 9 (FS 9-1 thru FS 9-26)

Prepared by: Robert L Walsh 3/5/91
Book Manager

Approved by: Donald D Epp 3/5/91
Head, Guidance and Procedures Section

Michael A Coffey
Chief, Trajectory Operations Branch

Encl: 44 pages

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

MISSION OPERATIONS DIRECTORATE

ASCENT CHECKLIST
STS-37 FLIGHT SUPPLEMENT

FINAL, REVISION B
January 27, 1991

PREPARED BY:

Robert L Walsh 1/25/91
Robert L. Walsh
Book Manager

APPROVED BY:

Chirold D. Epp Michael F. Collins

Chirold D. Epp
Head, Guidance and
Procedures Section

Michael F. Collins
Chief, Trajectory
Operations Branch

This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on JSC Form 482 to DH4/FDF Manager.

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Incorporates the following:		
482#: ASC-747	ASC-788	ASC-801
ASC-777(R)	ASC-791(R)	ASC-809
ASC-781(R)	ASC-795	ASC-812
ASC-787(R)	ASC-799(R)	

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DM4/R. Walsh	483-1968
Switchlist & Prelaunch & Powered Flight & OMS Burns & AOA	DM4/R. Walsh	483-1968
Contingency Aborts & TAL & RTLS	DM4/D. Bentley DM4/J. Bertsch	483-1966 483-1974
Deorbit Burns	DM4/J. Patterson	483-1987
Entry	DM4/W. Anderson	483-8036
Cue Cards	DF4/S. Jones	483-2582

NOTES

1. This Flight Supplement can be integrated into the Generic Ascent Checklist. Insert the Flight Supplement (FS) pages in the proper numerical order in the Generic Ascent Checklist or add behind last section of the Generic Book.

2. Ascent Flip Book for the CDR & PLT will be fabricated from the FB pages in Section 2 of the FS.

3. The List of Effective Pages (LOEP) provides the sequence to merge the Ascent Checklist flight and vehicle specific pages to create a complete STS-37 Ascent Checklist.

4. The trajectory data in this checklist is for the STS-37 Flight Cycle flight load (3703) and is usable for any launch day thru 30 May.

5. Ascent related cue cards are contained in this document. The cue cards are listed in the Cue Card Section. Some cards are printed in the body of the checklist for MS use and also in the Cue Card Section for reference of crop marks and fabrication instructions.

6. Mission STS-37 is flown with vehicle 104.

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ASCENT CHECKLIST
STS-37 FLIGHT SUPPLEMENT

LIST OF EFFECTIVE PAGES

FINAL 04/02/90
REV B 01/27/91
PCN-1 03/06/91

(*) - Omit from flight book
(☒) - Prelift-off information required

3-7.....	generic
3-8.....	generic
FS 4-1.....	37/FIN B,1
FS 4-2.....	37/FIN B,1
FS 4-3.....	37/FIN B
FS 4-4.....	37/FIN B
5-1.....	generic
5-2.....	generic
5-3.....	generic
5-4.....	generic
FS 6-1.....	37/FIN B
FS 6-2.....	37/FIN B
6-3.....	generic
6-4.....	generic
6-5.....	generic
6-6.....	generic
6-7.....	generic
6-8.....	generic
6-9.....	generic
6-10.....	generic
6-11.....	generic
6-12.....	generic
FS 6-13.....	37/FIN B
FS 6-14.....	37/FIN B
FS 6-15.....	37/FIN B
FS 6-16.....	37/FIN B
FS 6-17.....	37/FIN B
FS 6-18.....	37/FIN B
FS 6-19.....	37/FIN B
FS 6-20.....	37/FIN B
6-21.....	generic
6-22.....	generic
FS 6-23.....	37/FIN B
FS 6-24.....	37/FIN B
6-25.....	generic
6-26.....	generic
6-27.....	generic
6-28.....	generic
6-29.....	generic
6-30.....	generic
FS 7-1.....	37/FIN B,1
FS 7-2.....	37/FIN B,1
FS 7-3.....	37/FIN B
FS 7-4.....	37/FIN B
FS 7-5.....	37/FIN B
FS 7-6.....	37/FIN B
FS 7-7.....	37/FIN B,1
FS 7-8.....	37/FIN B,1
FS 7-9.....	37/FIN B,1
FS 7-10.....	37/FIN B,1
8-1.....☒	generic
8-2.....☒	generic
8-3.....☒	generic
8-4.....☒	generic
FS 9-1.....*	37/FIN B,1
FS 9-2.....*	37/FIN B,1
FS 9-3.....*	37/FIN B,1
FS 9-4.....*	37/FIN B,1
FS 9-5.....*	37/FIN B,1
FS 9-6.....*	37/FIN B,1
FS 9-7.....*	37/FIN B,1
FS 9-8.....*	37/FIN B,1
FS 9-9.....*	37/FIN B,1
FS 9-10.....*	37/FIN B,1
FS 9-11.....*	37/FIN B,1
FS 9-12.....*	37/FIN B,1
FS 9-13.....*	37/FIN B,1
FS 9-14.....*	37/FIN B,1
FS 9-15.....*	37/FIN B,1
FS 9-16.....*	37/FIN B,1
FS 9-17.....*	37/FIN B,1
FS 9-18.....*	37/FIN B,1
FS 9-19.....*	37/FIN B,1
FS 9-20.....*	37/FIN B,1
FS 9-21.....*	37/FIN B,1
FS 9-22.....*	37/FIN B,1
FS 9-23.....*	37/FIN B,1
FS 9-24.....*	37/FIN B,1
FS 9-25.....*	37/FIN B,1
FS 9-26.....*	37/FIN B,1
FS CC 10-1...*	37/FIN B
FS CC 10-2...*	37/FIN B
FS CC 10-3...*	37/FIN B
FS CC 10-4...*	37/FIN B

(☒) - Prelift-off information required
(*) - Omit from flight book

FS CC 10-5...* 37/FIN B
FS 10-6.....* 37/FIN B
CC 10-7.....* generic
CC 10-8.....* generic
CC 10-9.....* generic
CC 10-10.....* generic
FS CC 10-11..* 37/FIN B
FS CC 10-12..* 37/FIN B
FS CC 10-13..* 37/FIN B
FS CC 10-14..* 37/FIN B
FS CC 10-15..* 37/FIN B
FS CC 10-16..* 37/FIN B
FS CC 10-17..* 37/FIN B
FS CC 10-18..* 37/FIN B
FS CC 10-19..* 37/FIN B
FS CC 10-20..* 37/FIN B
FS CC 10-21..* 37/FIN B
FS 10-22.....* 37/FIN B

ASCENT CUE CARDS

LIST OF EFFECTIVE PAGES

GENERIC 03/01/88
REV A 12/07/90

(*) - Omit from flight book
(Δ) - Replace with page from Flight Supplement

8-1.....⊠ ALL/GEN A
8-2.....⊠ ALL/GEN A
8-3.....⊠ ALL/GEN A
8-4.....⊠ ALL/GEN A
9-1.....Δ ALL/GEN A
9-2.....Δ ALL/GEN A
10-1.....Δ ALL/GEN A
10-2.....Δ ALL/GEN A
CC 10-7.....* ALL/GEN A
CC 10-8.....* ALL/GEN A
CC 10-9.....* ALL/GEN A
CC 10-10....* ALL/GEN A
10-11.....Δ ALL/GEN A
10-12.....Δ ALL/GEN A

(⊠) - Prelift-off information required
(Δ) - Replace with page from Flight Supplement
(*) - Omit from flight book

ASCENT CUE CARDS

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CONTENTS PAGE

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RECYCLE PROCEDURES

NOTE
These recycle procedures will be used inside T-5 min

Test Conductor calls for BFS safing, SRB Safing, APU Shutdown and Heater Reconfiguration (Aerosurface positioning complete)

C **BFS SAFING**

If BFS in MM102:
06 GPC MODE 5 - HALT

MS1 **SRB SAFING**

017 MEC 1 - OFF
Wait 2 sec, then
MEC 2 - OFF

P **APU SHUTDOWN**

R2 APU OPER (three) - OFF
FUEL TK VLV (three) - CL
✓Shutdn (Hyd Press)
CNTLR PWR (three) - OFF
HYD CIRC PUMP (three) - GPC

Report APU Shutdown Complete

C **HEATER RECONFIGURATION**

L2 FLASH EVAP FDLN HTR (two) - 2

Report Heater Reconfiguration Complete

NOTE
Numerous non time-critical steps for recycle will be individually called by the Test Conductor

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

-3:00:00 (Hold) **PRE-INGRESS SW RECONFIGURATION**

NOTE

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 SENSOR (three) - OFF
(1 sec) then MONITOR (R1),
cb ESS MN CONTR (three) - cl
(013), cb MN CONTR (three) - cl
(014,015,016), RADAR ALTM
(two) - ON (08), TACAN MODE
(three) - GPC (07)

-2:25:00 A (-2:45:00) **INGRESS ORBITER & SEATS**

NOTE

During seat ingress COMM
PWR - ON (L5,R6)
CCU PWR - ON (A11,A15,M039M)

05/09 R10/L9 AUD VOX SENS (as needed) - adj as reqd
M042F Contact LCC (OTC & NTD) on A/G 1

Install ASC Flip Cards and Ascent ADI Cards
✓Cue Card positions

-2:10:00 (-2:30:00) **POST INGRESS SW RECONFIGURATION**

NOTE

ASP turns on RCS 1,2,3,4
DRIVERS (eight) (014,015,016),
OMS ENG VLV (two) (014,016),
GPC OUTPUT 5 - B/U (06)

PRE-LAUNCH

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

NOTE
ASP doing C/W VOL adjust, expect MA

-1:35:00 A **LCC ASTRO COMM CHECK**
(-1:55:00)

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
05/09 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
A/G 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

A

Simo Voice Check (Launch Config)
L,R AUD A/G 1 (two) - T/R
A/G 2 (two) - T/R
Voice check with MCC

NOTE
Side hatch closure

-1:10:00 C **CABIN LEAK CHECK**
(-1:30:00)

L2 CAB VENT ISOL - OP (tb-OP)
✓VENT tb - CL

01 ✓CAB PRESS - increasing to 16.7 (MA)

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

3: GNC GPC MEMORY

-1:01:00 **(DEU Equivalent)**
(-1:21:00)

NOTE
IMU preflight align begins

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

-45:00 C **CABIN VENT REDUNDANCY CONFIGURATION**
(-1:05:00)

NOTE
Vent vlv operation may occur earlier or later at LCC direction

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

-32:00 C **PASS/BFS TRANSFER PREP**
(-52:00)

06 GPC MODE 5 - STBY (tb-RUN)
C3 ✓BFC CRT SEL - 3+1
DISP - ON

3: BFS, GNC BFS MEMORY

CRT3 PASS/BFS XFER ENA - ITEM 25 EXEC
✓ITEM 25 (*)

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

3: BFS, GNC BFS MEMORY

-30:00 C **OMS GN2 PRESS**
(-50:00)

C3 OMS ENG (two) - ARM/PRESS

C **CABIN VENT**

L2 CAB VENT ISOL - OP (tb-OP)
(klaxon)
✓VENT tb - OP

01 ✓CAB PRESS - decreasing

-25:00 A **A/G VOICE CHECK**
(-45:00)

Simo Voice Check (Launch Config)
Voice check with MCC

Update Abort Winds Pad, ASC Flip Book, and ALTM, 1-7 (if reqd)

-22:00 C **PASS/BFS TRANSFER (DEU Equivalent)**
(-42:00) (ONE-SHOT TRANSFER)

CRT3 ✓ITEM 25 (no *)

3: BFS, SM SYS SUMM 1

CRT3,01 Report cabin pressure (two) to OTC

3: BFS, GNC BFS MEMORY

NOTE
Vent vlv closure may occur earlier or later at LCC direction

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 minute hold

-20:00 (-30:00) **OPS 1 LOAD (DEU Equivalent)**

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

1: GNC FAULT

Report faults other than from unpowered equipment

CRT1 GNC, SPEC 99 PRO

NOTE
Gnd-Controlled Fuel Cell Purge

-19:00 (-29:00) C **BFS TO OPS 1**

3: BFS, GNC FAULT

CRT3 GNC, SPEC 99 PRO
06 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 unpowered equipment

CRT3 GNC, SPEC 99 PRO

PRE-

1: GNC FAULT | 2: GNC LAUNCH TRAJ

3: BFS, GNC FAULT

-17:00 P **HORIZ SIT CONFIG**
(-27:00)

2: GNC 50 HORIZ SIT

3: BFS, GNC 50 HORIZ SIT

ALTM - ITEM 9 + [ ][ ][.][ ][ ]

CRT3, ITEM 41 +1 EXEC (BFS INIT)

	PASS ITEM		BFS ITEM	
PTI (OV104)	ENA	1		
(OV102,3)	INH	1		
TAL SITE	2(3,4,5)	40✓	2(3,4,5)	40✓
RTLS SITE	1	41✓	1	41✓
PRI	KSC 15	3*✓	KSC 15	3*✓
SEC	KSC 33	4✓	KSC 33	4✓
TAC	59Y	5✓	59Y	5✓

* If RWY KSC 33 selected: *
* 08 MLS CH tw (three) - 6 *

G&N	OVHD	6✓	OVHD	6✓
XEP	NEP	7✓	NEP	7✓
AIM	NOM (or CLSE)	8✓	NOM (or CLSE)	8✓
SPDBK	NOM	39✓		
TAC	INH	20✓	INH	20✓
DRAG H	AUT	22✓	AUT	22✓
ADTA H	INH	26✓	INH	26✓
ADTA TO G&C	INH	29✓	AUT	28✓
TAC	DELTA	35✓		-
HUD	0	37✓		-
	0	38✓		-

P **CONFIG OMS I'CNCT (PASS/BFS)**

2: GNC 51 OVERRIDE

3: BFS OVERRIDE

CRT2 ITEM 5 [E][N][A] INCNCT

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

3: BFS, GNC SYS SUMM 2

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

-16:00 P **MPS He RECONFIGURATION**
(-26:00)

R2 MPS He ISOL A,B (six) - OP
PNEU He ISOL - OP

-15:00 **CONFIG OMS/RCS XFEED VLVS**
(-25:00)

NOTE
OMS/RCS XFEED vlvs are reconfigured for launch by LPS

P CRT3 Report RCS QTYs F,L,R OX,FU

	OX	FU
F		
L		
R		

NOTE
At T-9 there will be a planned 10 min hold

WEATHER UPDATE (if reqd)

Update Abort winds, RWY and ALTM setting. Set MLS Chs

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

C2 EVENT TIMER - START
F7 ✓EVENT TIME ind - counting down

NOTE
GLS starts

-8:00 P **CONNECT ESS BUSSES TO FC**

R1 ESS BUS SOURCE FC (three) - ON

-7:30 NOTE
Access arm retract

✓Seat in launch position
✓LES zippers and gloves
Cinch down shoulder harness & lap belt

-6:00 P **APU PRE START**

R4 ✓HYD LG RET/CIRC VLV - CL

R2 ✓BLR N2 SPLY (three) - ON
✓PWR (three) - ON
✓CNTLR/HTR (three) - A
✓APU AUTO SHUTDN (three) - ENA
CNTLR PWR (three) - ON
HYD MN PUMP PRESS (three) - LO
✓APU SPEED SEL (three) - NORM
✓OPER (three) - OFF
✓FUEL PUMP/VLV COOL (two) - OFF
✓FUEL TK VLV (three) - CL
✓HYD CIRC PUMP (three) - GPC
✓cb APU FU TK VLV ENA (six) - cl
APU FUEL TK VLV (three) - OP
✓APU/HYD RDY tb (three) - gray

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

-5:00 P **APU START**

R2 APU OPER (three) - START/RUN

F8 ✓HYD PRESS ind (three) - LO green

R2 ✓APU/HYD RDY tb (three) - bp
HYD MN PUMP PRESS (three) - NORM

F8 ✓PRESS ind (three) - HI green

R2 CIRC PUMP (three) - OFF

F7 ✓PRESS lt - 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 gimbal profile cks at -3:25 and move to start at -3:10

-2:30 P **CLEAR C/W MEMORY**

2: GNC 99 FAULT
3: BFS, GNC 99 FAULT

Verify no unexpected errors

CRT2, CRT3 GNC, SPEC 99 PRO

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

C3 C/W MEM - CLEAR

-2:00 A **CLOSE VISOR**

Open suit O2

ASCENT PROCEDURES

PILE

BAILOUT

REPORT POSITION

MACH < .95, OPS 305 or 603

SB - AUTO BF - AUTO

FLY 185-195 KEAS, Ø = 0°

ABORT MODE - ATO

ABORT PBI - push

P, R/Y - AUTO

FLT CNTLR PWR (two) - OFF

- ~40K ft
  - LES O2 - ON/VISOR
  - VENT T HANDLE - PULL
- ~30-20K ft
  - HATCH JETT T HANDLE - PULL
  - COMMENCE BAILOUT

ASCENT FLIP BOOK
(CDR & PLT)

HOOK

'MODE 1' PAD EGRESS

VISOR/GREEN APPLE
LAP BELT
RELEASE CHUTE
EVACUATE
SLIDEWIRE

BAILOUT

LOWER SEAT
VISOR/GREEN APPLE
LAP BELT
EGRESS SEAT

'MODE 5' POST LDG EGRESS

LOWER SEAT
LAP BELT
RELEASE CHUTE
LES O2 ON/VISOR
GREEN APPLE
MS3-SIDE HATCH
PLT-EMERGENCY POWER DOWN
EVACUATE

PILE

SYS FLIGHT RULES

	RTLS	TAL
OMS - 2 He TKs		
- 1 OX & 1 FU TKS (diff pods)		X
- 2 OX or 2 FU TKS		X
APU/HYD - 2↓ & 1 failing	X	X
CABIN LEAK - (-EQ dP/dT >.15)	X	X
CRYO - All O_2 (H_2)	X	X
2 FREON LOOPS ↓	X	X
2 MAIN BUSSES ↓	X	
THERMAL WINDOW PANE	X	

NO COMM MODE BOUNDARIES

NEG RETURN (104)	8300
PRESS TO ATO (104)	9800
LAST MRN (104)	10400
DROOP BYD (109)	12300
PRESS TO MECO (104)	12900
SE BYD (104)	13800
LAST BEN (104)	14600
SE PRESS (104)	16800
LAST PRE MECO TAL	23000
LAST TAL	
AML	23900
BYD	24400
ROB	24600
KIN	25200
HDS	25300

2 ENG BYD (104)	5800
ABORT TAL BYD (5)	
EO VI	
DROOP BYD (109) (5)	
SE BYD (104) (5)	

2 ENG BEN (104)	6400
ABORT TAL BEN (2)	
EO VI	
DROOP BYD (109) (5)	
SE BYD (104) (5)	
SE BEN (109) (2)	

2 ENG MRN (104)	7700
ABORT TAL MRN (3)	
EO VI	
DROOP BEN (109) (2)	
SE BYD (104) (5)	
SE BEN (104) (2)	
SE MRN (109) (3)	

ASCENT PROCEDURES

R180	LVLH
0.4M	✓P_C → 89%
0.6M	✓P_C → 67%
1.3M	✓P_C → 104%

Pc < 50 ✓Rates < 5,2,2 (Backup AUTO SEP 2:20)
* 'SEP INH' + 5 sec - MAN SRB SEP *
✓TMECO
* If NOT STABLE (10 sec): *
* NO COMM - CSS & MAN THROT *

Close suit O2, Open visor

3:00 ✓EVAP OUT (T < 60)
* If ATO reqd: *
* G51 INH INCNCT - ITEM 5 *
* ABORT ATO *
* If Systems ABORT reqd: *
* RTLS at 3:40 or *
* TAL Select prior to 23000 *
* Otherwise Manual MECO *
* If Man Throttle (3 eng): *
* Man Shutdn at 25890 *
* If 1 eng: *
* When MPS PRPLT = 2%: *
* MAN THROT, Pc → 65% *
* Man Shutdn at C/O mark *

MECO ✓V_I = 26010
MECO+18 ✓ET SEP
* If 'SEP INH': *
* ET SEP - MAN *
* OPS 104 - PRO (✓BFS 104) *
* If Rates > .7, .7, .7: *
* | Null rates *
* | ET SEP - SEP *
* If Rates < .7, .7, .7: *
* Assume Feedline Fail *
* MPS MANF PRESS (two) - CL *

MM104 ✓TGTS
If OMS 1 not reqd:
MECO+2:00 MPS PRPLT DUMP SEQ - START
OMS ENG (two) - OFF
Go to POST OMS 1

OMS 1 TARGETING
(DIR INSERTION)

FAILURE	OMS 1 TARGET	OMS 2
OMS - 1 or 2 He TK - 1 PRPLT TK - 2 OMS ENG - 2 N2 TKS (I'cnct to RCS) EPS - MNA & B, MNB & C MNA & C ET SEP	NO OMS 1	PEG 7 TTA = 1 CUTOFF HP = 85
APU/HYD - 2↓ & 1 failing	NO OMS 1	AOA
OMS - 2 OX or 2 FU TKS - 1 OX & 1 FU TK diff PODS	NO OMS 1	AOA
2 FREON LOOPS 2 H2O LOOPS CABIN LEAK (-EQ dP/dT ≥ .08)	NO OMS 1	AOA
CRYO - All O_2 (H_2)	NO OMS 1	AOA

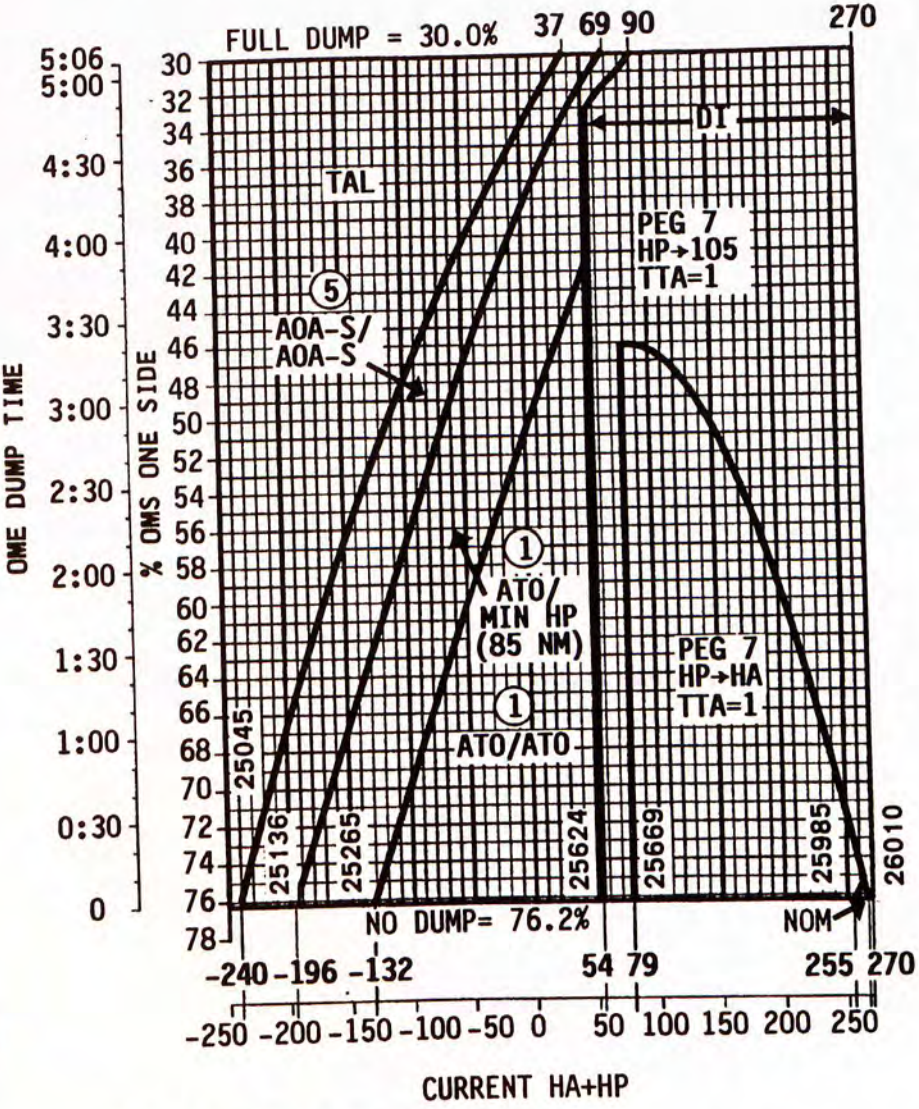
OMS

He	%	He	%
N/A	90	3300	50
N/A	80	3000	40
4200	76	2710	30
3920	70	2420	20
3610	60	2140	10

OMS 1/2 TGTING

OMS 1 TIG:
TTA = 2

VI 25.0 — 25.6



IF 1 ENG & ΔV > 500
1 OMS + FAILED OMS INTERCONNECTED TO RCS THC +X

OMS 1 BURN

IF TIG LATER THAN MECO + 6 min:
MECO +2 min MAN MPS DUMP
✓DUMP/STOW complete (B/F lt out)
✓MCC for APU Shutdn
(if time permits)

FEEDLINE FAIL:
TIG -1:30 or MECO +6 min (whichever comes 1st)
ET SEP - SEP

MNVR - BURN ATT (✓INRTL)
✓MPS DUMP SEQ - GPC
✓CNTLR PWR (two) - ON
DAP - AUTO/DISC
✓OMS ENG (two) - ARM/PRESS
Note ΔVTOTI — — — TIG ☐☐ : ☐☐
-:15 EXEC
:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

OMS PRPLT FAIL:
Failed ENG - OFF
XFEED (two) - CL
TK ISOL (two) - CL
He PRESS (two) - CL

OMS ENG FAIL:
Failed ENG - OFF
If ΔV < 500, OMS XFEED at
If ΔV > 500:
Interconnect failed OMS to RCS
THC +X
(stop when QTY = 3%)

1/2 of ΔVTOT at FAIL ☐☐☐

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 1 BURN MONITOR

HOOK

OMS Pc LOW OMS ↓ and ENG VLV 1 or 2 ≤ 70%	OMS ENG FAIL
OMS ↓ and ENG VLV 1 & 2 ≥ 70% and OX IN P > 227	OMS ENG FAIL
P ≤ 227	OMS PRPLT FAIL
No OMS ↓	SENSOR FAIL
OMS TEMP L R FU IN P ≥ 220 224	OMS ENG FAIL
P ≤ 204 209	OMS PRPLT FAIL
P 205-219 210-223	SENSOR FAIL
OMS OX/FU TK P (✓ENG IN P) OX & FU Low	He PRESS/VAP ISOL (two) - OP If Tk P no incr: OMS PRPLT FAIL
OX LOW FU LOW	Burn to OMS ↓, then OMS PRPLT FAIL He PRESS/VAP ISOL (two) - CL Burn to OMS ↓, then OMS PRPLT FAIL
OX & FU High	Cycle He to maint OMS TK P 234-284 Cycle He A(B) to isolate failed leg
OMS HE TK P LOW (✓CRT & meter) P > 640 & QTY > 41%	✓Leaking OMS TK ISOL (two) - OP ✓He PRESS/VAP ISOL (two) - OP L,R OMS XFEED (four) - OP Good OMS TK ISOL (two) - CL He PRESS/VAP ISOL (two) - CL When P < 640 or QTY ≤ 41%, continue
P < 640 or QTY ≤ 41%	✓Good OMS TK ISOL (two) - OP ✓He PRESS/VAP ISOL (two) - OP L,R OMS XFEED (four) - OP Failed OMS TK ISOL (two) - CL He PRESS/VAP ISOL (two) - CL
N2 REG P HIGH or LOW	OMS ENG - ARM
N2 TK P LOW (✓CRT & meter)	When N2 TK P < 470: OMS ENG - ARM
OMS GMBL 1st FAIL 2nd FAIL	Select SEC GMBL (twice) If control problems or high RCS fuel usage: OMS ENG FAIL
GPC1(4)	GPC1(4) MODE - STBY,HALT FF1(4) - OFF,ON L(R) OMS Gimbals - sel SEC
FA1(4)	L(R) OMS Gimbals - sel SEC

ABORT
ASC CUE CARDS
RT
OMS 2
RTLS
TAL
BERMUDA

PILE

OMS 2 TARGETING
(DIR INSERTION)

FAILURE	OMS 2 TARGET
OMS - 1 PRPLT TK - 2 N2 TKS (I'cnct to RCS) - 2 OMS ENG - 1 or 2 He TK EPS - MNA & B, MNB & C MNA & C ET SEP	PEG 7; TTA = 1 CUTOFF HP = 85
OMS - 2 OX or 2 FU TKS - 1 OX & 1 FU TK diff PODS	AOA
2 FREON LOOPS 2 H2O LOOPS CABIN LEAK (-EQ dP/dT ≥ .08)	AOA
APU/HYD - 2↓ & 1 failing	AOA
CRYO - All O_2 (H_2)	AOA

OMS

He	%	He	%
N/A	90	3300	50
N/A	80	3000	40
4200	76	2710	30
3920	70	2420	20
3610	60	2140	10

ATO

HOOK

NOTE

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

DUAL POD - OMS REQUIRED Includes 8.4% unusable (4.2% 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 (%)
93	35	14	33	21
90	36	14	32	20
85	37	13	30	18
80	39	14	28	16
75	40	15	25	14
70	41	17	24	13
65	-	18	22	11

SINGLE POD - OMS REQUIRED Includes 4.2% 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 (%)
93	30	10	28	17
90	31	10	27	16
85	33	9	25	14
80	34	9	23	12
75	36	11	21	10
70	37	13	19	8
65	-	14	17	6

ΔV AVAILABLE FOR OMS 2

OMS: 5 FPS/% PER POD

LIFTOFF BLDN PER POD [83]

MIXED XFD [81]

MAX BLDN (39%) PER POD [189]

AFT RCS: ABOVE AFT QTY 1 [72] (Rev 3)

2 [107] (Rev 3)

FWD RCS: [48] (AVAIL FOR UPHILL IF HP ≥ 70)

PILE

RTLS CDR

Abort initiated:
after 2:30 (2 eng)
at 3:40 (3 eng)

ABORT RTLS
* No Joy *
* OPS 601 PRO *

PPA MONITOR: SPEC 0
ITEM 26 +200
28 + BD6E (PRED M, GUID CONV)
30 + BCD0 (PPA TGT M)
Expect PPA when ITEM 28 ≤ ITEM 30

* If GUID not converged: *
* CSS, MAN THROTTLE *
* MAN PPA per PRPLT *
* REMAINING *

After PPA, ✓BFS ITEM 1 (*)
✓bugs, V_{rel}, Waypoint 1
Pitchdown ($\beta = 0°$, $\alpha = -4°$)

WINDS	
50K	/
40	/
30	/
20	/
7	/
SURF	/
SPDBK @ 3000 FT	

---------- MECO ---------- MECO ----------

ET SEP (MECO + 14 sec)
✓MM602 (α > 10° and SEP + 10 sec)
✓P,R/Y, SPDBK, BDY FLP - AUTO
α = 50° until ~1.8g, maintain 2.2g

Adjust seat

$\dot{H}$ > -250 ✓α vs Mach
V = 5 AIR DATA PROBES (two) - DEPLOY, (✓Heat)
✓RUD, AIL TRIM
M = 3.2 ✓SPDBK → 65%
M = 2.7 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 = 0.9 P,R/Y - CSS, SPDBK - MAN (as reqd)
✓NWS - GPC
POST LANDING: ENT C/L, POST LANDING

HOOK

ABORT DUMPS | SW LIST | ASC CUE CARDS | BURN | CONT ABORT | OMS FAILURE | POST OMS 1 | TGTS | TAL | BERMUDA

If CSS: MAN THROT
Man MECO
✓Pc = [104%] (2 eng)/ [69%] (3 eng)
✓DUMP

UNCONVERGED GUIDANCE TABLE

ENG OUT	OUTBOUND INITIAL θ	PITCHAROUND at % (10°/sec)	FLYBACK INITIAL θ
Liftoff	55°	46%	65°
:30	49°	48%	63°
1:00	52°	49%	63°
:30	54°	49%	62°
2:00	42°	51%	61°
:30	42°	51%	49°
3:00	38°	52%	48°
:30	34°	54%	48°
4:03	Last RTLS	52%	46°

✓Pc at PPA + 20 sec
* If Pc = 104% (2 eng): *
* [G51] MAX THROT - ITEM 4 *
Pitchdown: ✓Pc → 65%

---------- MECO ---------- MECO ----------

✓ET DOORS - Closing
KEAS = 77 ✓SPDBK → 80%
✓ET SEP, SRB SEP - AUTO
Adjust seat
✓TACANS, INCORPORATE
* If KSC TACAN Fail: *
* TACAN Ch 97X (COF), ITEM 5 EXEC *
[G51] ✓AIR DATA, INCORPORATE
MM603 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 HUD PWR (two) - ON
M = 0.9 ✓R FLT CNTLR PWR - ON (GPC NWS reqd)
H = 10K ✓BDY FLP - TRAIL
LES Visors - DOWN
POST LANDING: ENT C/L, POST LANDING

PILE

TAL CDR

If V_I > [23000] manual MECO, Go to Post MECO

ABORT TAL

[G50] SEL SITE, RWY (PASS/BFS)

SITE	RWY	TACANS	MLS	LENGTH
2	BEN 36 BEN 18	BEN 118 - CBA 116 (DME) BEN 118 - CBA 116 (DME)	6 -	13720 12720
3	MRN 21 MRN 03	MRN 100 - AOG 23 MRN 100 - AOG 23	6 -	12000 11800
5	BYD 32 BYD 14	BYD 121Y - BJ 76 (DME) BYD 121Y - BJ 76 (DME)	6 -	12011 11811
* 6	ROB 04 KIN 25	ROB 85 (DME) BZ 78 (DME)	- -	11160 15510
* 7	KKI 15 HDS 18	RIY 92 HS 73	- -	13770 13120
* 9	AML 02 DDN 29	CVS 100 (DME) DN 84	- -	10890 11260

* OPS 3 ONLY

V_I = [15.4K] Roll to Heads Up (If V_I < [19.8K] at TAL select)

--- **MECO** -BFS - C/O BUG (V_I approx [24.0K])----- **MECO** ----

MECO+18 ✓ET SEP, ✓AUTO -Z TRANS

MECO+35 ✓MM104

* If not previously selected, [G51] ABORT TAL *

✓P = 10±30, Y = 0±30; RATES < .5°/sec

✓ET DOORS MOVING

PASS OPS 301 PRO (✓304)

* No joy in 68 sec: BFS - ENGAGE *

* BFS OPS 301 PRO *

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

✓Roll to Heads up

BFS OPS 301 PRO (✓304)

[G50] ✓SITE, RWY, SPDBK & ALT (PASS/BFS)

✓BUGS, HDG, RANGE, α = 40°

* Low energy: CSS, α = 40° *
* WINGS LEVEL *
* At Ḣ = 0: Bank *
* 2 x ΔAZ (70° max) *
* At Ḣ = 400: fly α = 31° *
* Maintain ΔAZ ≤ 10° *

V = 10 ✓SPDBK → 81%

V = 7 Go to ENTRY MANEUVERS Cue Card

WINDS

50K	/
40	/
30	/
20	/
7	/
SURF	/
SPDBK @ 3000 FT	
ALT	
AIM PT	
SPDBK	

TAL PLT

HOOK

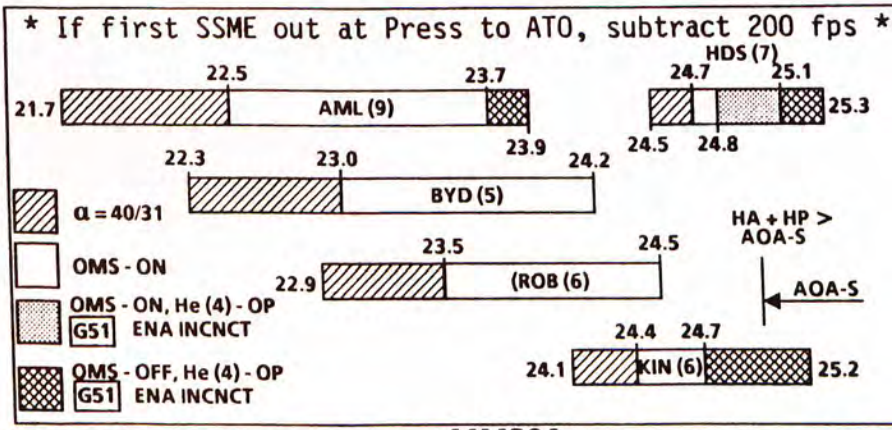
✓OMS DUMP

```
* If/When second Eng Fail:                    *
*  ME SHUTDN pb (two) - push                  *
*  [G51] MAX THROT (if reqd)                  *
*        DUMP ARM, START                      *
*  If OMS He PRESS < 2K: DUMP STOP            *
*  When MPS PRPLT = 2%:                       *
*   MAN THROT, Pc → 65%                       *
*   Man Shutdn at C/O mark                    *
```

✓AUTO THROT

--------- **MECO** ----- BFS - C/O BUG (V_I approx [24.0K]) -- **MECO** ---

MM104 ET DOORS - CL (✓Doors moving)



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

✓OMS config
[G51] OMS DUMP ARM, START
✓ET DOORS - CL
L, R LAT (two) - LAT
FWD RCS MANF ISOL 1,2,3,4 - CL (tb-CL)

V = 19 DOUBLE TOGGLE (✓OVHD)
HYD MPS/TVC ISOL VLV (three) - CL
(Hold 5 sec) ✓tb - CL

V = 10

```
* If RCS < [36] % either side:      *
*  [G51] Aft RCS INH, ITEM 13 EXEC  *
```

V = 7 MLS (three) - ON (✓channels)
I/O RESET
Go to ENTRY MANEUVERS Cue Card

PILE

BERMUDA CONTINGENCY ABORT

2 ENG OUT (9K - 11.5K: Assumes prior TAL to BEN or MRN)

AREA	RWY	TACAN
4	GDV 03 BDA 30	TGN 103 BDA 86

ME SHUTDN PB (two)
CSS
Pc MAN 109%
ET SEP - MAN
ADI - REF (two)
Push to & Yaw Rt to
$\theta = 60°$, $y = 45°$ (soft stop)
Roll Rt to Φ REF = 0°

G51 DUMP

BFS, OPS 104 PRO
BFS, OPS 301 PRO (✓304)

PASS G50 ITEM 41 +4 EXEC
ITEM 4 EXEC

When EAS > 4 & incr:
Yaw to course pointer (soft stop)

ADI - LVLH
WINGS LEVEL

Push at 4 deg/sec
ET SEP - SEP
-Z THC 8 sec
OPS 104 PRO
ABORT - RTLS
$\alpha = 58°$

P,R/Y AUTO

Go to BERMUDA CONT ENTRY

BERMUDA CONTINGENCY ABORT

HOOK

BERMUDA CONT ENTRY

Before NZ Hold:

BF Set =

M	15	11	10	8	5
BF	A	70	65	60	55	A

PASS/BFS G50 ✓BDA SITE

✓ET DOORS - CL

At $\dot{H}$ = -600:
CSS R/Y
Bank 2 x ΔAZ (70° max)
BF - AUTO

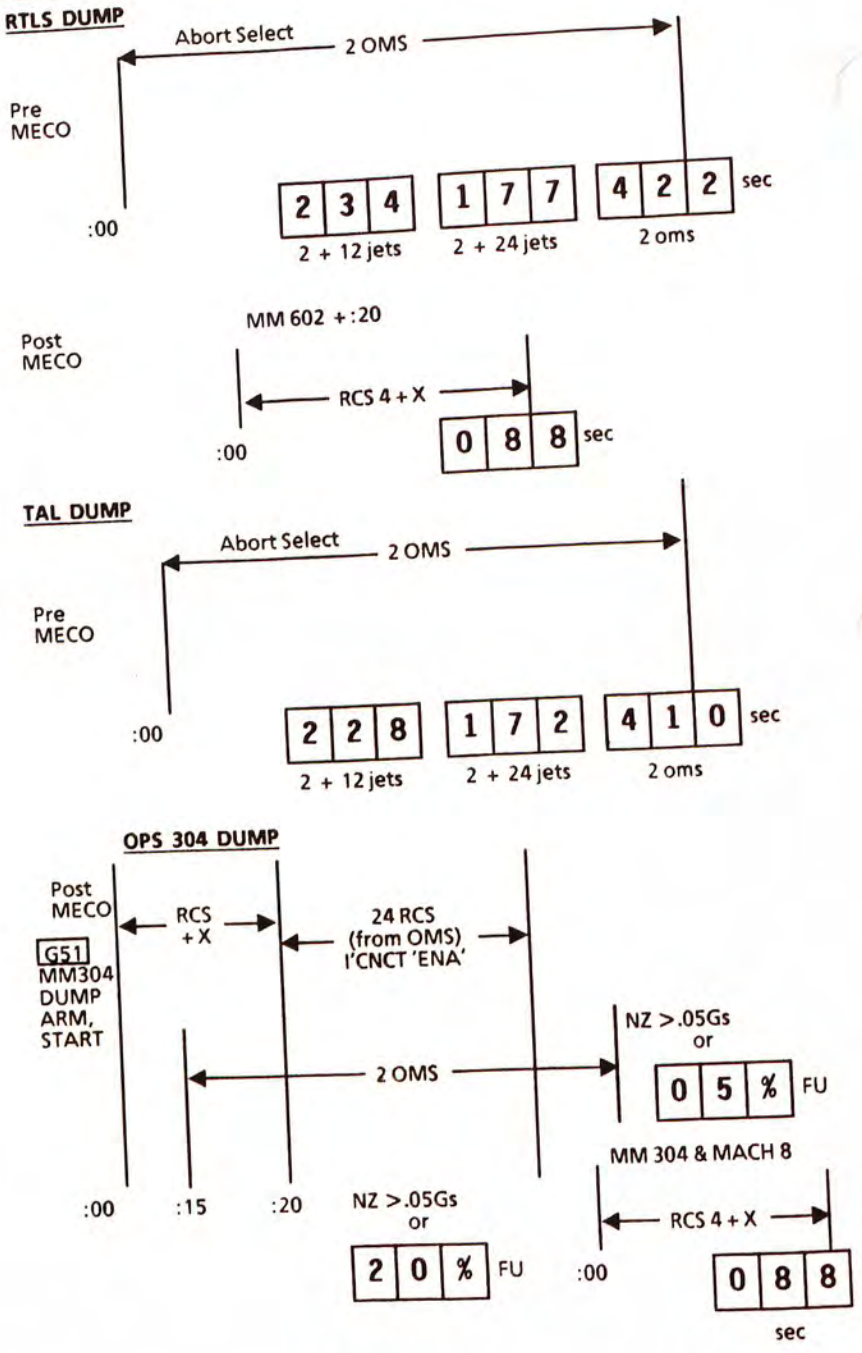
Maintain NZ < 2.5g

* If Low Energy: *
* When ΔAZ < 10°, *
* CSS pitch *
* Fly α = 31° or LO *

G50 Incorp Air Data (when stabilized < 105k and before M = 2)

When M = 3.2: OPS 603 PRO
P,R/Y AUTO
Go to RTLS (POST-MECO) or BAILOUT

RTLS/TAL DUMPS

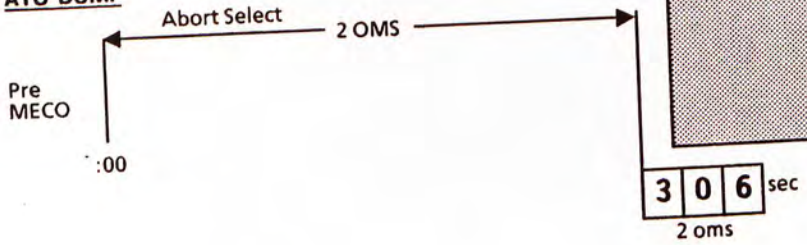


ATO/CONTINGENCY DUMPS

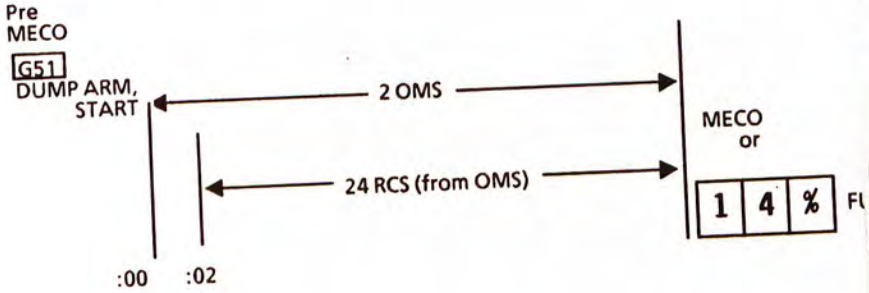
HOOK

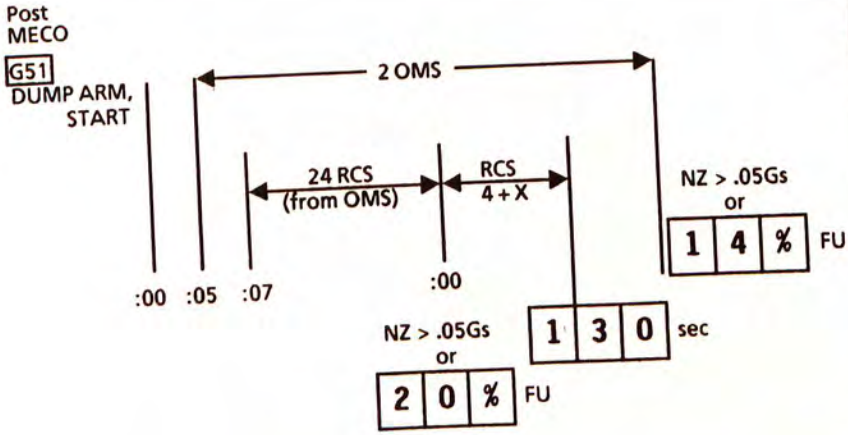
AUA PADS

ATO DUMP



CONTINGENCY DUMP





ASC CUE CARDS

CONT ABORT

POST OMS 1

POST OMS 2

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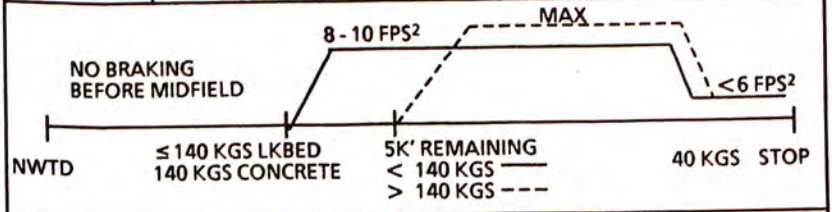
ASCENT CUE CARDS

ENTRY ALPHA
(37 FLT CY R2)

VR	α	R	H	Ḣref	Rref
24.8	40	4105	400		
24	40	2670	250	-45	L85
23	40	2185	245	-62	74
22	40	1815	235	-81	67
21	41	1530	230	-103	63
20	40	1300	225	-120	62
19	40	1115	215	-144	62
18	40	970	210	-167	63
17	40	855	200	-186	63
16	40	760	195	-195	R64
15	HI 44 LO	680	193	-119	62
14	43 42 37	605	185	-127	60
13	43 39 37	540	180	-137	60
12	43 39 37	475	175	-157	58
11	42 39 36	420	170	-199	56
10	41 38 35	365	163	-177	51
9	39 36 33	316	157	-210	47
8	36 35 30	268	152	-242	L40
7	33 31 27	222	142	-268	38
6	29 27 23	178	130	-273	41
5	26 23 20	136	117	-273	42
4	22 19 17	100	102	-264	R41
3	19 15 15	71	89	-247	36
2.5	13	60	82	-269	
2	11	49	77	-275	
1.5		37	67	-332	
1		27	52	-270	

α / MACH - L/D MAX	17	15	12
	3	2	1

ENT-14a/37/A,E/C

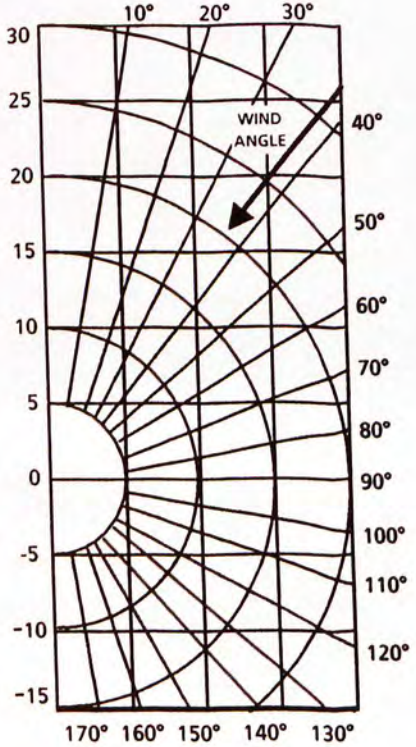
FLIGHT CONDITIONS	MANEUVER
V = 7K	✓ TACAN status
V = 5K	ADTA PROBES - DEPLOY(✓HEAT) Begin AIL and RUD trim monitoring
M = 4	Begin $\dot{H}$ monitoring (✓ < 500 fps)
M = 2.7	✓APUs HUD PWR (two) - ON
	* If M < 2.5; P CSS for ADTA to G&C incorp *
M = 2.0	Ensure ADTA to G&C else ✓Theta limits
M = 0.9	P, R/Y - CSS as reqd ✓SPDBK CMD vs POS R FLT CNTLR - ON ✓NWS - GPC
M = 0.7	✓HYD LG ISOL 1,2 - OP
h = 15K	✓MLS
h = 10K	✓A/L, LES VISORS - DOWN (KSC)
MAIN GEAR TOUCHDOWN	SPDBK - 100%
NOSE GEAR TOUCHDOWN	SRB SEP - MAN/AUTO and depress pb ✓Auto Load Relief
	
STOP	Go to ENT C/L, POST LANDING PROCEDURES, 5-1

BAILOUT: M < .95, OPS 305/603
SB,BF - AUTO
FLY 185-195 KEAS, Φ = 0 deg
ABORT - ATO, PBI - PUSH

P, R/Y - AUTO
FLT CNTLR PWR (two) - OFF
LES O2 - ON/VISOR
~40 K ft Vent Handle - pull
~30-20 K ft Hatch Jett, BAILOUT

ENT-6b/37/E/B

ORBITER XWIND LIMITS



Enter chart using max Gust Velocity

50K	/
40K	/
30K	/
20K	/
7K	/
SURF	/

ENT-6b/37/E/B

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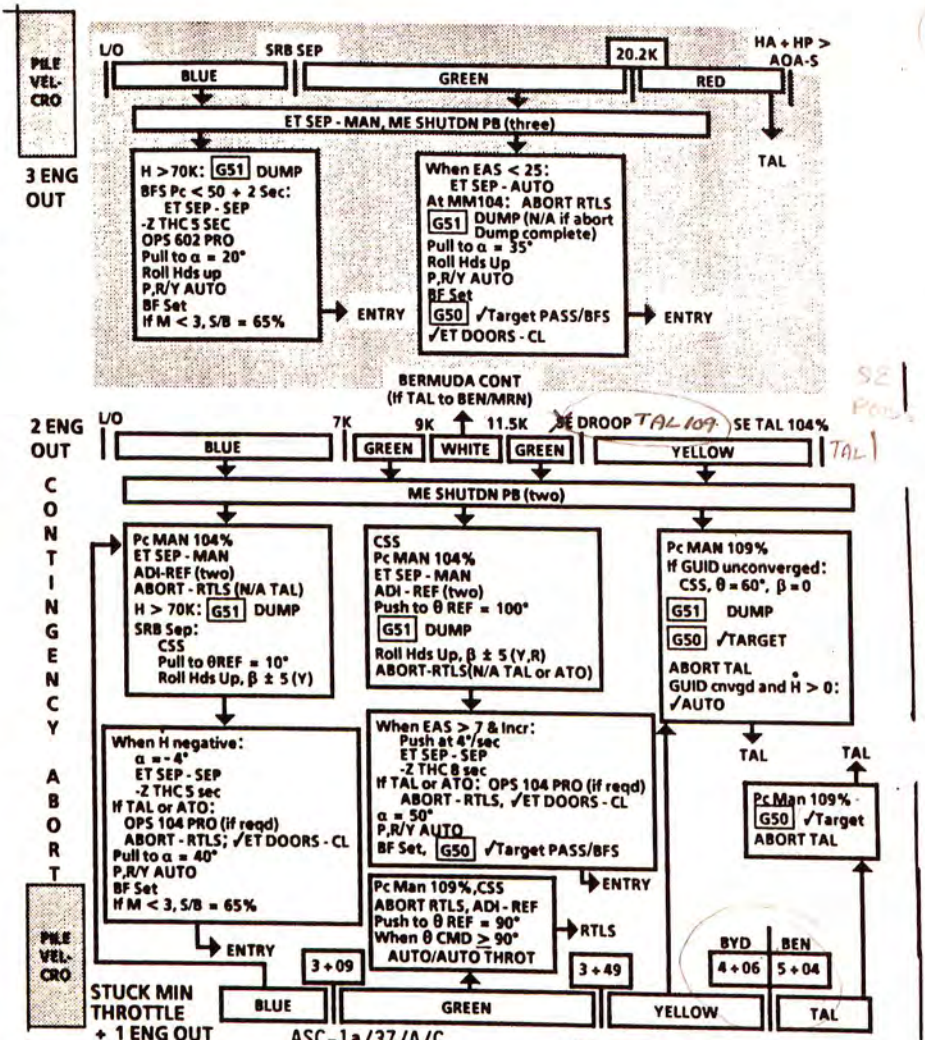
CONTINGENCY ABORT CUE CARDS

CONTINGENCY ABORT



CONTINGENCY ABORT

PILE VEL-CRO

ENTRY

Before NZ Hold

M	15	11	10	8	5
BF	A	70	65	60	55	A

If M > 3.5, expect α = 58°
If M < 5, ✓AIL/RUD TRIM

After NZ Hold

$\dot{H}$ = Positive (NZ < 2):
BF - AUTO
Monitor - M/α

M	> 12	9	6	3	.95
α	40	35	26	18	12

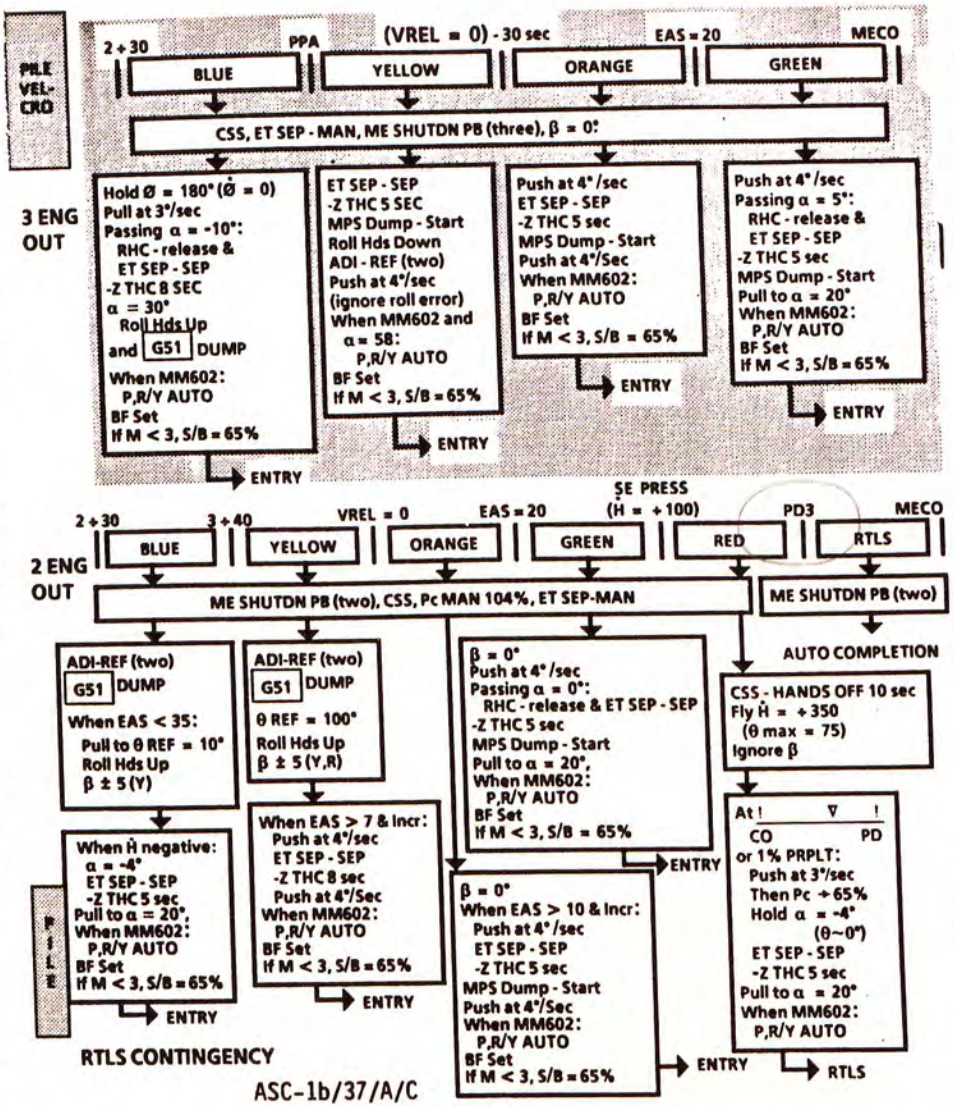
G50 Incorp Air Data (when stabilized < 105K and before M = 2)

BAILOUT
When M = .95:
P,R/Y CSS
OPS 603 PRO

Go to BAILOUT

ASC-1a/37/A/C

RTLS CONTINGENCY



RTLS CONTINGENCY

ASC-1b/37/A/C

PILE VEL-CRO

RTLS CONTINGENCY

ENTRY

Before NZ Hold

M		7	2	
BF	AUTO	40		AUTO

If M > 3.5, expect α = 58°
✓AIL/RUD TRIM

After NZ Hold

$\dot{H}$ = Positive (NZ < 2):
BF - AUTO
Monitor - M/α

M	8	6	4	2	.95
α	32	26	20	15	12

G50 Incorp Air Data (when stabilized <105K and before M = 2)

BAILOUT
When M = .95:
P,R/Y CSS
OPS 603 PRO

Go to BAILOUT

ASC-1b/37/A/C

BYD TAL REDESIGNATION
(37 FLT CY R2)

NOTE: DROOP IS 109% THROTTLE;
FOR 104% THROTTLE, ADD 300 FPS

1ST E.O. VI		5800	5900	6000	6100	6200	6300	6400
DROOP BYD (109)	(5)	11200	11200	11200	11300	11300	11300	11400
SE BYD (104)	(5)	16800	16700	16500	16300	16100	15900	15700

1ST E.O. VI		6500	6600	6700	6800	6900	7000	7100
DROOP BYD (109)	(5)	11400	11400	11500	11500	11500	11600	11600
SE BYD (104)	(5)	15600	15400	15200	15000	14800	14700	14500

1ST E.O. VI		7200	7300	7400	7500	7600	7700	7800
DROOP BYD (109)	(5)	11600	11600	11700	11700	11700	11700	11700
SE BYD (104)	(5)	14400	14200	14100	14000	13900	13800	13700

1ST E.O. VI		7900	8000	8100	8200	8300	8400	8500
DROOP BYD (109)	(5)	11700	11700	11800	11800	11800	11800	11800
SE BYD (104)	(5)	13700	13600	13600	13500	13500	13500	13500

1ST E.O. VI		8600	8700	8800	8900	9000	9100	9200
DROOP BYD (109)	(5)	11800	11800	11800	11800	11800	11800	11800
SE BYD (104)	(5)	13500	13500	13500	13500	13500	13500	13500

1ST E.O. VI		9300	9400	9500	9600	9700	9800
DROOP BYD (109)	(5)	11800	11800	11800	11800	11800	11800
SE BYD (104)	(5)	13500	13500	13600	13500	13500	13500

ASC-8a/37/A/C

BEN TAL REDESIGNATION
(37 FLT CY R2)

NOTE: DROOP IS 109% THROTTLE;
FOR 104% THROTTLE, ADD 300 FPS

1ST E.O. VI		6400	6500	6600	6700	6800	6900	7000
DROOP BYD (109)	(5)	11200	11300	11300	11300	11300	11400	11400
SE BYD (104)	(5)	-	-	16200	16100	16000	15800	15700
SE BEN (109)	(2)	17000	16900	16700	16600	16400	16200	16100

1ST E.O. VI		7100	7200	7300	7400	7500	7600	7700
DROOP BYD (109)	(5)	11400	11400	11500	11500	11500	11500	11500
SE BYD (104)	(5)	15600	15500	15300	15200	15100	15000	14900
SE BEN (109)	(2)	15900	15800	15600	15500	15400	15200	15100

1ST E.O. VI		7800	7900	8000	8100	8200	8300	8400
DROOP BYD (109)	(5)	11600	11600	11600	11600	11600	11600	11600
SE BYD (104)	(5)	14800	14700	14600	14500	14400	14400	14300
SE BEN (109)	(2)	15000	14900	14800	14800	14700	14700	14600

1ST E.O. VI		8500	8600	8700	8800	8900	9000	9100
DROOP BYD (109)	(5)	11700	11700	11700	11700	11700	11700	11700
SE BYD (104)	(5)	14200	14200	14200	14100	14100	14100	14100
SE BEN (109)	(2)	14600	14600	14500	14500	14500	14500	14500

1ST E.O. VI		9200	9300	9400	9500	9600	9700	9800
DROOP BYD (109)	(5)	11700	11700	11700	11700	11700	11700	11700
SE BYD (104)	(5)	14000	14000	14000	14000	13900	13900	13900
SE BEN (109)	(2)	14500	14500	14500	14500	14500	14500	14500

ASC-8b/37/A/C

MRN TAL REDESIGNATION
(37 FLT CY R2)

NOTE: DROOP IS 109% THROTTLE;
FOR 104% THROTTLE, ADD 300 FPS

1ST E.O. VI		7700	7800	7900	8000	8100	8200	8300
DROOP BEN (109)	(2)	11400	11300	11200	11200	11100	11000	10900
SE BYD (104)	(5)	-	-	-	-	-	-	-
SE BEN (104)	(2)	15800	15600	15400	15300	15100	14900	14700
SE MRN (109)	(3)	17300	17100	16900	16700	16500	16300	16100

1ST E.O. VI		8400	8500	8600	8700	8800	8900	9000
DROOP BEN (109)	(2)	10900	10800	10800	10800	10800	10800	10900
SE BYD (104)	(5)	-	-	-	-	-	-	15200
SE BEN (104)	(2)	14600	14500	14300	14300	14200	14200	14300
SE MRN (109)	(3)	15900	15800	15700	15600	15600	15700	15700

1ST E.O. VI		9100	9200	9300	9400	9500	9600	9700
DROOP BEN (109)	(2)	10900	11000	11100	11200	11300	11400	11500
SE BYD (104)	(5)	15100	15000	14900	14900	14800	14700	14600
SE BEN (104)	(2)	14300	14400	14400	14500	14600	14700	14800
SE MRN (109)	(3)	15800	16000	16100	16300	16400	16600	16800

1ST E.O. VI		9800
DROOP BEN (109)	(2)	11600
SE BYD (104)	(5)	14500
SE BEN (104)	(2)	14900
SE MRN (109)	(3)	16900

ASC-10a/37/A/C

POST OMS 1 BURN PROCEDURES

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

```
* If Feedline Fail:                    *
*    MECO +6 min (~14:30 Nom),         *
*     ET SEP - SEP                     *
```

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 R180, P340, Y000 *
*       (maintain LVLH P = 0 ±20)      *
*      After 10 min:                   *
*       Maneuver to LVLH P = 340       *
*      After 10 min:                   *
*       Maneuver to Burn Attitude      *
```

P **MPS DUMP**

F4 ✓BDY FLP pb - lt off (MPS dump complete)
(≤ 2 min 21 sec)

C **ET PHOTO DTO** (if reqd)
✓MCC, ADI - REF, Pitch up 2°/sec
until ET in O/H window ~100°

B F7/F8 FLT CNTLR PWR (two) - OFF
C3 ✓DAP - AUTO

P **APU/HYD SHUTDOWN (Not AOA)**

R4 HYD MPS/TVC ISOL VLV (three) - CL (Hold 5 sec)
✓tb - CL

R2 ✓APU AUTO SHUTDN (three) - ENA
BLR PWR (three) - OFF
N2 SPLY (three) - OFF
APU OPER (three) - OFF (MA)
FUEL TK VLV (three) - CL
✓Shutdn (Hyd Press)
CNTLR PWR (three) - OFF
FUEL PUMP/VLV COOL A - AUTO

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

* P **HYD DEPRESS (AOA only)** *
*
* R4 HYD MPS/TVC ISOL VLV (three) - CL (Hold 5 sec) *
* ✓tb - CL *
* R2 ✓APU SPEED SEL (three) - NORM *
* ✓AUTO SHUTDN (three) - ENA *
* HYD MN PUMP PRESS (three) - LO (MA) *

FES & HEATER ACTIVATION

C L1 FLASH EVAP CNTLR PRI A - ON (not AOA)
L2 FLASH EVAP FDLN HTR (two) - 1

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

NOTE
Consult ASC PKT C/L for failures
that occurred during ascent

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

NOTE

If AOA, verify/enter appropriate ABORT TGT number in MM105 but do not LOAD targets until OPS 3

```
* If BFS, do not manually enter    *
*  targeting data (ITEMS 1-4,6-18) *
*  until OPS 3                     *
```

✓Targets, OMS TARGETS

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

✓BFS TGT

P **MPS POWERDOWN (Not AOA)**

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

MPS VACUUM INERTING ACT

R2 MPS He ISOL (six) - GPC
✓PNEU He ISOL - OP
✓He I'CNCT (three) - GPC

If LO2 MAN P < 40
R4 MPS FILL/DRAIN LO2 OUTBD - OP
INBD - OP
OTHERWISE:
✓MCC

R4 MPS FILL DRAIN LH2 OUTBD - OP
INBD - OP
H2 PRESS LINE VENT - OP
(Start watch)
After 1 min:
MPS H2 PRESS LINE VENT - GND

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

: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC

3: BFS, GNC OMS 2 MNVR EXEC

ET UMBILICAL DOOR CLOSURE

* If Feedline fail - ✓MCC before closure *

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

* If CTRLINE LATCHES do not stow, or doors do not close, or doors do not latch, contact MCC. If AOA, prior to OPS 3 transition: *

2: GNC 51 OVERRIDE

ET UMB DR CLOSE - ITEM 40(30) EXEC

NOTE
Double times for single motor operation

ET UMB
DR MODE - GPC/MAN
CTRLINE LAT - STO
✓After 6 sec, DR CTRLINE LAT tb - STO

* If DR CTRLINE LAT does not stow within 14 sec, DR CTRLINE LAT - GND *

L,R DR (two) - CL (tb-bp)
After 24 sec, L,R DR tb - CL

L,R LAT (two) - LAT (tb-bp)
After 6 sec, L,R LAT tb - LAT

DR MODE - GPC
CTRLINE LAT - GND
L,R DR (two) - OFF
LAT (two) - OFF

1: GNC OMS 2 MNVR EXEC | 2: GNC OMS 2 MNVR EXEC

3: BFS, GNC OMS 2 MNVR EXEC

++++++++++++++ If AOA: Go to AOA ++++++++++++++

NOTE
If HYD DEPRESS and not AOA, perform APU/HYD SHUTDOWN, 3-2, then:

OMS BURN PREP

* For single eng burn/No PROP failures: *
* XFEED: Failed engine PROP to good *
* engine *

P 08 L,R OMS
✓He PRESS/VAP ISOL A (two) - GPC
B (two) - CL
✓TK ISOL (four) - GPC (tb-OP)
✓XFEED (four) - GPC (tb-CL)

B Wedge Install OMS 2/ORBIT BURN and OMS BURN MONITOR Cue Cards (F6/F8)

If FRCS reqd,
Go to OPS1 RCS BURN Cue Card

OMS 2 BURN ATTITUDE MNVR

B F6/F8 ✓ADI ATT (two) - INRTL
ADI RATE - 1
C Mnvr to OMS 2 Burn Attitude

3: BFS, GNC SYS SUMM 2

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

B **SEAT SAFING AND ADJUSTMENT**

Open Visor
Adjust Back Angle

TIG-5 P **VACUUM INERTING TERMINATE**

R4 MPS FILL/DRAIN
LH2,LO2 OUTBD (two) - CL
Wait 10 sec - GND
LH2,LO2 INBD (two) - GND

R2 MPS PNEU He ISOL - GPC

* If MPS PRPLT DUMP B/U LH2 VLV *
* sw was set to OP, set sw to CL *

TIG-2> B Go to OMS 2/ORBIT BURN Cue Card

BERMUDA
ABORT DUMPS
ASC CUE CARDS
CONT ABORT
POST
RTLS
TAL

OMS 2 BURN CARDS

HOOK VELCRO

OMS BURN MONITOR

HOOK VELCRO

OMS Pc LOW	
OMS ↓ and ENG VLV 1 or 2 < 70%	OMS ENG FAIL
OMS ↓ and ENG VLV 1 & 2 > 70% and OX IN P > 227	OMS ENG FAIL
P ≤ 227	OMS PRPLT FAIL
No OMS ↓	SENSOR FAIL
OMS TEMP L R	
FU IN P ≥ 220 224	OMS ENG FAIL
P ≤ 204 209	OMS PRPLT FAIL
P 205-219 210-223	SENSOR FAIL
OMS OX/FU TK P (✓ENG IN P) OX & FU LOW	He PRESS/VAP ISOL (two) - OP If Tk P no incr: OMS PRPLT FAIL
OX LOW	If HP > 85: OMS PRPLT FAIL If HP < 85: Burn to OMS ↓, then OMS PRPLT FAIL
FU LOW	If HP > 85: OMS PRPLT FAIL If HP < 85: He PRESS/VAP ISOL (two) - CL Burn to OMS ↓ or HP = 85, then OMS PRPLT FAIL
OX & FU HIGH	Cycle He to maint OMS TK P 234-284 Cycle He A(B) to isolate failed leg
OMS He TK P LOW (✓CRT & meter) P > 640 & QTY > 41%	✓Leaking OMS TK ISOL (two) - OP ✓He PRESS/VAP ISOL(two) - OP L,R OMS XFEED (four) - OP Good OMS TK ISOL (two) - CL He PRESS/VAP ISOL (two) - CL When P < 640 or QTY ≤ 41%, continue
P < 640 or QTY ≤ 41%	✓Good OMS TK ISOL (two) - OP ✓He PRESS/VAP ISOL (two) - OP L,R OMS XFEED (four) - OP Failed OMS TK ISOL (two) - CL He PRESS/VAP ISOL(two) - CL
N2 REG P HIGH or LOW	OMS ENG - ARM
N2 TK P LOW (✓CRT & meter)	When N2 TK P < 470: OMS ENG - ARM
OMS GMBL 1st FAIL	Select SEC GMBL (twice)
2nd FAIL	If control problems or high RCS fuel usage: OMS ENG FAIL
GPC1(4) with String 1(4)	Affected GPC MODE - STBY,HALT FF1(4) - OFF,ON L(R) OMS Gimbals - sel SEC
FA1(4)	L(R) OMS Gimbals - sel SEC

ASC-3a/37/A,O/B

HOOK VELCRO

OMS 2/ ORBIT OMS BURNS

HOOK VELCRO

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

		GPC	OP	CL
ORB BURN	A			
	B			

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

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

[ ][ ][ ] ΔVTOT: OMS XFEED RETURN (Planned Single Engine)

-:15 EXEC
If OMS ENG Pc MSG and non critical burn - Affected Eng - OFF
If Leaking OMS PROP burn RCS + X TIG -15 sec to OMS IGN + 1 sec

:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

OMS PRPLT FAIL:
HP < [85] (CONTINUE BURN):
Failed OMS ENG - OFF
✓XFEED (two) - CL
TK ISOL (two) - CL
He PRESS (two) - CL
HP > [85] (STOP BURN):
OMS ENG (two) - OFF
✓Failed OMS XFEED (two) - CL
TK ISOL (two) - CL
He PRESS (two) - CL

OMS ENG FAIL:
ASCENT or CRIT O/O (Continue Burn)
Failed ENG - OFF
OMS XFEED at → 1/2 ΔVTOT at FAIL [ ][ ][ ]

RCS COMPLETION: (Hp < [85] or CRIT O/O)
Interconnect to either OMS that was ENG FAIL
THC + X (Hp = [85])
Post burn, AFT RCS RECONFIG

CUTOFF
+:02 OMS ENG(s) - OFF
If Orbit Critical Burn,
Trim all axes residuals < 0.2 fps
Otherwise
Trim all axes residuals < 2 fps

ASC-2a/37/A,O/B

POST OMS 2 BURN PROCEDURES

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

C **POST BURN STATUS**

NOMINAL ☐

ΔTIG ☐ : ☐ ☐

B F7/F8 FLT CNTLR PWR (two) - OFF
C3 ✓DAP - AUTO

C **OMS TVC GIMBAL CHECK**

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

P **OMS/RCS POST BURN RECONFIGURATION**

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

08 FWD RCS
He PRESS A - GPC (tb-OP)
B - CL (tb-CL)
TK ISOL (two) - OP (tb-OP)
MANF ISOL 1,2,3,4 (four) - OP (tb-OP)
L,R OMS
He PRESS/VAP ISOL (four) - CL
TK ISOL (four) - OP (tb-OP)
XFEED (four) - CL (tb-CL)

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 C/L (Helmet Bag)
R3A Unstow ORBIT Cue Cards & ORB PKT C/L

Go to POST INSERT, POST INSERTION

* If ATO, go to POST INSERT, ATO *
* POST INSERTION *
* If Rev 3 deorbit reqd, go to *
* CONT DEORB, LAUNCH DAY ORBIT 3 *

This Page Intentionally Blank

DIRECT INSERTION AOA DEL PAD

DEORBIT

PRPLT ( )

BURN CUE CARD:

TOT AFT QTY 1 (%)	087
AFT ΔV	19
PRI ΔV = FRCS ΔV	48
TOT AFT QTY 2 (%)	44

FRCS: DUMP TO % ☐ OX ☐ FU

ENTRY/LANDING

EI-5 MM303 INRTL ATT (6-24) R ☐☐☐ P ☐☐☐ Y ☐☐☐

EI-5 MM304 PREBANK (ENT Mnvr Cue Card) L ☐ R ☐

ALTM SET (6-28) ☐☐.☐☐

VREL 1ST REVERSAL ☐☐☐☐☐

RWY ☐☐☐☐☐

☐ L ☐ R OVHD STRT ☐☐☐ deg

AIM POINT
☐ NOM
☐ CLOSE-IN

WINDS: (ENT Mnvr Cue Card)

50K	/
40K	/
30K	/
20K	/
7K	/
SURFACE	/

SPDBK ☐☐ % @ 3K

REMARKS:

W/OMS 1 AOA DEL PAD

DEORBIT

PRPLT ( )

BURN CUE CARD:
TOT AFT QTY (%) 087

AFT HP = TGT HP ( ) + 10 (AFT ΔV/2) =

PRI HP = TGT HP ( ) + 11 STEEP / 04 SHALLOW ΔHP (PRI SITE) + 24 (FRCS ΔV/2) =

B/U HP = TGT HP ( ) + 19 STEEP / 09 SHALLOW ΔHP (REDES SITE) + 24 (FRCS ΔV/2) =

TOT AFT QTY 2(%) 44

FRCS: DUMP TO % ☐ OX ☐ FU

ENTRY/LANDING

EI-5 MM303 INRTL ATT (6-24) R P Y

EI-5 MM304 PREBANK (ENT Mnvr Cue Card) L R

ALTM SET (6-28)

VREL 1ST REVERSAL

RWY

L R OVHD STRT deg

AIM POINT
NOM
CLOSE-IN

WINDS: (ENT Mnvr Cue Card)

50K	/
40K	/
30K	/
20K	/
7K	/
SURFACE	/

SPDBK % @ 3K

REMARKS:

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 / : : .

PEG 4 TGTS
C1 14
C2 15 ( ) .
HT 16 .
ΘT 17 .
PRPLT 18 ( )

MNVR 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

6-3

ASC/ALL/GEN A

LAND | COMM | OMS | FAILURE | BURN | AOA | PADS

BURN CARD	OMS PRPLT PAD XFEED CUE
DEORBIT BURN (2 ENG)	OMS ENG FAIL [ ][ ] % [ ][ ] %R
DEORBIT BURN (1 ENG)	OMS XFEED [ ][ ][ ] ΔVTOT [ ][ ] % --- OMS TK SW [ ][ ][ ] ΔVTOT
DEORBIT BURN (RCS)	OMS TK SW [ ][ ][ ] ΔVTOT OMS PRPLT LOW [ ][ ] ΔVTOT
UNBALANCED PRPLT DEORBIT BURN	START 1 POD FEED [ ] TK ISOLS CL OMS ENG FAIL (XFEED) [ ] TK ISOLS OP [ ] TK ISOLS CL [ ][ ][ ] ΔVTOT [ ][ ] % [ ] --- AFTER 1 POD FEED STOP 1 POD FEED [ ][ ][ ] ΔVTOT [ ] TK ISOLS OP OMS ENG FAIL (XFEED) [ ][ ] % [ ][ ] %R
DEORBIT BURN (MIXED XFEED)	[ ] OMS ENG - ARM/PRESS --- [ ][ ][ ] ΔVTOT: Feed from GOOD POD [ ][ ][ ] % [ ][ ][ ] [ ] OMS He PRESS OP TK ISOLS OP [ ] OMS He PRESS CL TK ISOLS CL --- RCS COMPLETION, OMS ENG FAIL: [ ] OMS XFEEDS OP Feed from GOOD POD at [ ][ ][ ] ΔVTOT [ ] OMS He PRESS OP TK ISOLS OP [ ] XFEEDS CL

AOA PROCEDURES

OMS 2 MNVR EXEC	2: GNC OMS 2 MNVR EXEC

3: BFS, GNC OMS 2 MNVR EXEC

Stow ASC PKT C/L
Unstow ENT PKT C/L

F8 Install DEORBIT BURN and DEORBIT BURN MONITOR Cue Cards (R3A)

Stow Ascent Cue Cards (R3A)
Transition to OPS 3 NLT TIG-10 min

NOTE

Verify/enter appropriate ABORT TGT number in MM105 but do not LOAD targets until OPS 3

* If BFS, do not manually enter *
* targeting data (ITEMS 1-4,6-18) *
* until OPS 3 *

If APUs are shutdown:

WARNING
Ice in WBS Steam Vent may cause loss of APU/HYD

.P **APU STEAM VENT HEATER ACT**

3: BFS, SM SYS SUMM 2

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

NOTE

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

R2 ✓BLR CNTLR/HTR (three) - A
PWR (three) - ON

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

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

B OMS 2 BURN SETUP

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

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

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

1: GNC 50 HORIZ SIT

✓RWY selection
AOA RWY OPTIONS

ETR INCLINATIONS			
SITE	RWY	TACANS	MLS
1	KSC 15 KSC 33	TTS 59Y - COF 97 TTS 59Y - COF 97	8 6
12	NOR 17 NOR 23	SNG 121Y - HMN 92 SNG 121Y - HMN 92	6 -
13	EDW 04 NOR 35	EDW 111 - SNG 121Y -	- -
14	EDW 23L EDW 15	EDW 111 - PMD 92 EDW 111 - PMD 92	- -
15	EDW 22 EDW 17	EDW 111 - PMD 92 EDW 111 - PMD 92	8 6

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

1: GNC DEORB MNVR EXEC

✓Or enter Target from OMS TARGETS

NOTE
Onboard computed TIG & θ_t may vary slightly and are acceptable if REI is correct

CRT1 LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

CRT3 ✓BFS TGT

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

CRT1 SECONDARY CHECK

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

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

SEAT ADJUSTMENT

Adjust Back Angle

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

P OMS BURN PREP

```
        * For single eng burn/No PROP failures: *
        *   XFEED:  Failed engine PROP to good  *
        *   engine                              *

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

.....RCS BURN PREP (I'CNCT OMS to RCS).....
.                                          .
.  P  08    L,R OMS                        .
.             He PRESS/VAP ISOL (four) - CL .
.             TK ISOL (four) - OP (tb-OP)   .
.           L OMS XFEED (two) - OP (tb-OP)  .
.           R OMS XFEED (two) - CL (tb-CL)  .
.     07    AFT L,R RCS                     .
.             XFEED (four)  - OP (tb-OP)    .
.             TK ISOL (six) - CL (tb-CL)    .
..........................................
```

1: GNC DEORB MNVR EXEC	2: GNC DEORB MNVR EXEC

3: BFS, GNC OMS 2 MNVR EXEC

OMS BURN TIG ADJUST (if reqd)

CRTX LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

Determine ΔTIG (if REI - REF > 50) from OMS TARGETS

CRTX Enter new TIG

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

Repeat until ΔRANGE < 50

CRT3 ✓BFS TGT

MNVR TO DEORBIT BURN ATTITUDE

B F7/F8 ✓ADI ATT (two) - INRTL
✓ERR (two) - 5
✓RATE (two) - 5

C Mnvr to Deorbit Burn Attitude
(✓ADI ATT with CRT BURN ATT)

TIG-10 P **VACUUM INERTING TERMINATE**

R4 MPS FILL/DRAIN
LH2,LO2 OUTBD (two) - CL
Wait 10 sec - GND
LH2,LO2 INBD (two) - GND

R2 MPS PNEU He ISOL - GPC

3: BFS, GNC SYS SUMM 2

TIG-2 B R3A Go to AOA DEORBIT BURN Cue Card

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DEORBIT BURN AND DEORBIT BURN MONITOR CARDS

DEORBIT BURN MONITOR

OMS Pc LOW OMS ↓ and ENG VLV 1 or 2 < 70%	OMS ENG FAIL
OMS ↓ and ENG VLV 1 and 2 > 70% and FU and OX TK P < 185 (System in Blowdown)	Burn to Pc = 72% then OMS PRPLT FAIL
OX IN P > 227	OMS ENG FAIL
P ≤ 227	OMS PRPLT FAIL
No OMS ↓	SENSOR FAIL
OMS TEMP L R FU IN P ≥ 220 224	OMS ENG FAIL
P ≤ 204 209	OMS PRPLT FAIL
P 205-219 210-223	SENSOR FAIL
OMS OX/FU TK P OX & FU LOW	He PRESS/VAP ISOL (two) - OP
OX LOW	Burn to OMS ↓, then OMS PRPLT FAIL
FU LOW	He PRESS/VAP ISOL (two) - CL Burn to OMS ↓, then OMS PRPLT FAIL
OX & FU HIGH	Cycle He to maint OMS TK P 234-284 Cycle He A(B) to isolate failed leg
OMS GMBL 1st FAIL	Select SEC GMBL (twice)
2nd FAIL	If control problems or high RCS fuel usage: Aff OMS ENG - OFF XFEED if ΔVTOT > 20
RDNT FAIL, 4-WAY OR 2-2 SPLIT or **IMU DLMA** Safe HP: HP > ☐☐	Stop burn, APUs - SHUT DN
or HP < ☐☐ **2 MN DC BUSES**	Continue burn: PASS SET FAIL only - BFS engage PASS SET SPLIT only - ✓MCC on Restring IMU DLMA - Postburn, desel IMU with "ACC" > 0.03 (PASS & BFS)
GPC1(4)	GPC1(4) MODE - STBY,HALT FF1(4) - OFF,ON L(R) OMS Gimbals - sel SEC
FA1(4)	L(R) OMS Gimbals - sel SEC

ENT-2a/37/A,O,D,E/C

AOA
DEORBIT
BURN (RCS)

✓MM302 ✓RCS SEL CNTLR PWR (two) - ON
✓DAP - MAN/DISC ADI - LVLH/MED/MED
✓RCS BURN CONFIG

TIG-2 L,R OMS He PRESS/VAP ISOL A (two) - OP
.....Wait 2 sec.....B (two) - OP

:00 +X
Maintain PITCH ATT ERR ±3°
Monitor ΔVTOT

[ ][ ][ ] ΔVTOT

OMS TK SW:
R OMS XFEED (two) - OP
L OMS XFEED (two) - CL

OMS PRPLT FAIL (CONTINUE BURN):
Affected OMS He PRESS (two) - CL
TK ISOL (two) - CL
XFEED (two) - CL
ITEM 18 + 0

..If OMS PRPLT LOW.....

Release THC at ⟶ [ ][ ] ΔVTOT
Aft RCS RECONFIG

If DIRECT INSERTION:
THC +X to ΔVTOT = 0 or TOT AFT QTY 1 [0][8][7] %
If CUR ΔVTOT ≤ AFT ΔV [1][9], THC +X to ΔVTOT = 0
If CUR ΔVTOT ≤ PRI ΔV [4][8], FRCS to ΔVTOT = 0
If CUR ΔVTOT > PRI ΔV [4][8], THC +X to PRI ΔV or
TOT AFT QTY 2 [4][4], then FRCS to ΔVTOT = 0

If w/OMS 1:
THC +X to TGT HP or TOT AFT QTY 1 [0][8][7] %
If CUR HP ≤ AFT HP [ ][ ], THC +X to TGT HP
If CUR HP ≤ PRI HP [ ][ ], FRCS TO PRI Site
If CUR HP > PRI HP [ ][ ] & ≤ B/U HP [ ][ ], FRCS to B/U site
If CUR HP > B/U HP [ ][ ], THC +X to B/U HP [ ][ ] or
TOT AFT QTY 2 [4][4], then FRCS to B/U Site
MNVR to -X ATT (pitch up @ 3°/sec to VGOz = (+)1/4ΔVTOT)
THC -X

CUTOFF VGO_X = 0, RELEASE THC
AFT RCS RECONFIG
Trim inplane X,Z residuals < 2 fps
(< 0.5 fps if shallow)

ASC-7a/37/A/C

HOOK VELCRO | **AOA DEORBIT BURN (2 ENG)** | HOOK VELCRO

✓MM302 ✓OMS BOTH CNTLR PWR (two) - ON
Enter TGO + 5 sec
✓TRIM: P = 0.0, LY -5.7, RY +5.7
✓DAP - AUTO (PASS)/DISC ADI - LVLH/HI/MED
L,R OMS He PRESS/VAP ISOL A (two) - GPC
B (two) - OP

TIG-2 OMS ENG (two) - ARM/PRESS
-:15 EXEC
-:15 If OMS AFT QTY < 11%, THC +X to OMS IGN +1 sec
:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

OMS PRPLT FAIL (CONTINUE BURN):
Failed OMS ENG - OFF
Item 18 + 0 EXEC
Affected OMS He PRESS (two) - CL
TK ISOL (two) - CL
When Pc < 80%, 2nd OMS ENG - OFF
Complete RCS (PRPLT FAIL)

OMS ENG FAIL (CONTINUE BURN):
Failed ENG - OFF
OMS XFEED at

[ ][ ] %L [ ][ ] %R 1/2 of ΔVTOT at FAIL [ ][ ][ ]

RCS COMPLETION:
ANY OMS PRPLT FAIL:
Interconnect to good OMS PRPLT
THC +X (✓OMS% vs RCS Burn Time)
AFT RCS RECONFIG

ASC-9a/37/A/C

HINGE

HINGE

If DIRECT INSERTION:

THC +X to ΔVTOT = 0 or TOT AFT QTY 1 [0|8|7] %

If CUR ΔVTOT ≤ AFT ΔV [1|9], THC +X to ΔVTOT = 0

If CUR ΔVTOT ≤ PRI ΔV [4|8], FRCS to ΔVTOT = 0

If CUR ΔVTOT > PRI ΔV [4|8], THC +X to PRI ΔV or

TOT AFT QTY 2 [4|4], then FRCS to ΔVTOT = 0

If w/OMS 1:

THC +X to TGT HP or TOT AFT QTY 1 [0|8|7] %

If CUR HP ≤ AFT HP [|], THC +X to TGT HP

If CUR HP ≤ PRI HP [|], FRCS TO PRI Site

If CUR HP > PRI HP [|] & ≤ B/U HP [|], FRCS to B/U site

If CUR HP > B/U HP [|], THC +X to B/U HP [|] or

TOT AFT QTY 2 [4|4], then FRCS to B/U Site

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

THC -X

BOTH OMS ENG FAIL:

OMS ENG - OFF

Interconnect OMS to RCS

THC +X (✓OMS% vs RCS Burn Time)

OMS TK SW

THC +X (✓OMS vs RCS Burn Time)

CUTOFF

+:02 OMS ENGs - OFF (If < 3 IMU, at [ ] : [ ])

* AFT RCS RECONFIG if INTERCONNECT *

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

ASC-9aa/37/A/C

HOOK VELCRO | **AOA DEORBIT BURN (1 ENG)** | HOOK VELCRO

✓MM302 ✓OMS L or R CNTLR PWR (two) - ON
Enter TGO + 10 sec
✓TRIM: P = 0.0, LY +5.2, RY -5.2
✓DAP - AUTO (PASS)/DISC ADI - LVLH/HI/MED
L,R OMS He PRESS/VAP ISOL A (two) - OP
.....Wait 2 sec.....B (two) - OP

TIG-2 OMS ENG (good) - ARM/PRESS
-:15 EXEC
-:15 If OMS AFT QTY < 11%, THC +X to OMS IGN +1 sec
:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

ΔVTOT: OMS XFEED RETURN
%

OMS PRPLT FAIL (CONTINUE BURN):
Failed OMS ENG - OFF
Item 18 + 0 EXEC
Affected OMS He PRESS (two) - CL
TK ISOL (two) - CL
XFEED (two) - CL
Complete RCS (PRPLT FAIL)

OMS ENG FAIL (CONTINUE BURN):
Failed ENG - OFF
Complete RCS (OMS ENG FAIL)

RCS COMPLETION:
OMS PRPLT FAIL:
Interconnect to good OMS PRPLT
THC +X (✓OMS% vs RCS Burn Time)
AFT RCS RECONFIG

ASC-9b/37/A/C

HINGE

If DIRECT INSERTION:

THC +X to ΔVTOT = 0 or TOT AFT QTY 1 [0|8|7] %

If CUR ΔVTOT ≤ AFT ΔV [1|9], THC +X to ΔVTOT = 0

If CUR ΔVTOT ≤ PRI ΔV [4|8], FRCS to ΔVTOT = 0

If CUR ΔVTOT > PRI ΔV [4|8], THC +X to PRI ΔV or TOT AFT QTY 2 [4|4], then FRCS to ΔVTOT = 0

If w/OMS 1:

THC +X to TGT HP or TOT AFT QTY 1 [0|8|7] %

If CUR HP ≤ AFT HP [|], THC +X to TGT HP

If CUR HP ≤ PRI HP [|], FRCS TO PRI Site

If CUR HP > PRI HP [|] & ≤ B/U HP [|], FRCS to B/U site

If CUR HP > B/U HP [|], THC +X to B/U HP [|] or TOT AFT QTY 2 [4|4], then FRCS to B/U Site

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

THC -X

OMS ENG FAIL:

Interconnect OMS to RCS

THC +X, OMS TK SW at ⟶ [| |] ΔVTOT

THC +X (√OMSX vs RCS Burn Time)

CUTOFF

+:02 OMS ENGs - OFF (If < 3 IMU, at [ ] : [ ])

* AFT RCS RECONFIG if INTERCONNECT *

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

ASC-9bb/37/A/C

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AOA POST DEORB BURN

P **OMS/RCS POST BURN RECONFIGURATION**

```
. If I'CNCT:                .
.  Perform I'CNCT RETURN    .
.   (ENT PKT C/L, RCS)      .
```

07 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)

08 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:          *
*  ✓Affected TK ISOL (two) - CL *
```

XFEED (four) - CL (tb-CL)

Determine Prebank
Determine ΔHP (CUR HP - TGT HP)

Use PREBANK TABLE
Record Prebank on ENT MNVR Cue Card

1: GNC DEORB MNVR EXEC	2: GNC DEORB MNVR EXEC

3: BFS, GNC SYS SUMM 2

PREBANK TABLES
(to EDW)

(ATO/AOA steep entries)

ΔHP	0	5	8	(11)
PREBANK	0	40	55	65

RED
NOR

EDW

18	25	29	34
90	115	140	180
NOR	N/A		

(ATO/AOA steep entries) Redesignate NOR

ΔHP		12	(19)	30	36	42
PREBANK		30	65	105	135	180

(ATO/AOA shallow entries)

ΔHP	0	(4)
PREBANK	90	105

RED
NOR

EDW

6	7	8	10	11	13
115	120	125	140	150	170
NOR	N/A				

(ATO/AOA shallow entries) Redesignate NOR

ΔHP		5	8	(9)	11	13	16	18
PREBANK		90	95	105	115	130	155	175

NOTE: PREBANK is N/A for DIRECT INSERTION AOA

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 ✓or load INRTL EI-5 MM303 ATT from DEL PAD:

R - ITEM 24 + | | | |

P - ITEM 25 + | | | |

Y - ITEM 26 + | | | |

MNVR to EI-5 Att

* If UNDERBURN, or no DEL PAD, ignore *
* INRTL ATT ERR needles and mnvr to *
* LVLH R001, Y358 and 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 GIMBAL PWRDN (PASS ONLY)**

CRT1 Verify gimbal positions:

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

GMBL OFF - ITEM 32 EXEC
- ITEM 33 EXEC

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

C **SECONDARY ACTUATOR CHECK**
(IF TIME PERMITS)

NOTE
If port does not bypass during check, bypass affected port after check.
SEC ACT BYPASS - ITEM 8 +X X EXEC
If affected port still does not bypass:
SEC ACT RESET - ITEM 9 +X X EXEC

R2 1. HYD MN PUMP PRESS (one) - NORM

CRT1 2. ✓POS STIM ENA, ITEM 7 - (no *)

C3 3. ✓FCS CH 1,2,3,4 - AUTO

CRT1 4. SEC ACT CK, CH 1 - ITEM 1 EXEC (*)
SEC ACT CK START - ITEM 5 EXEC (*)

5. ✓All CH 1 ports bypass ('↓')
STOP - ITEM 6 EXEC (*)

C3 6. FCS CH 1 - ORIDE
CRT1 ✓All CH 1 ports reset (no '↓')
C3 FCS CH 1 - AUTO

7. Repeat steps 4 thru 6 for CH 2,3 & 4

R2 8. HYD MN PUMP PRESS (three) - LO

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

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

P **FORWARD RCS DUMP**

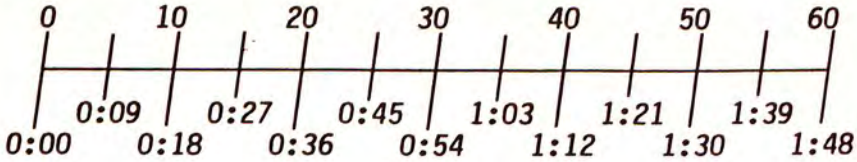
NOTE

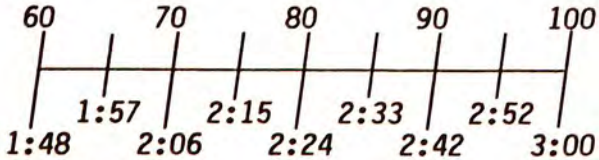
Use BFS qtys for all calculations

Determine FWD RCS 'DUMP TO %' using lowest of OX or FU qty (calculator, C.G. wheel, or DEL PAD)

FOUR JET DUMP:

F RCS PRPLT TO BE DUMPED (%)



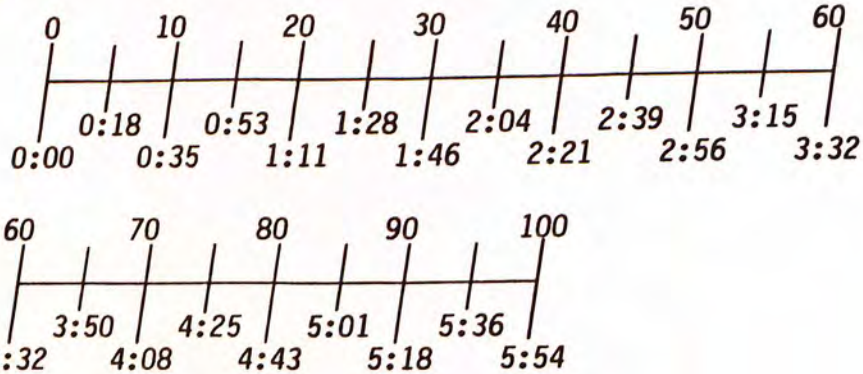


TIME FROM DUMP INITIATION (M:S)

NOTE

During dump disregard FRCS qty

TWO JET DUMP:
F RCS 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

ISOLATE FWD RCS

When dump complete:
08 FWD RCS MANF ISOL 1,2,3,4 (four) - CL
(tb-CL)

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	

P **STATE VECTOR CHANGE (if reqd)**

CRT2 ΔT - ITEM 18 ( ) .

LOAD - ITEM 16 EXEC
Wait 8 sec (minimum)
CRT3 PASS/BFS SV XFER - ITEM 17 EXEC
LOAD - ITEM 16 EXEC

HORIZ SIT CONFIG

ALTM - ITEM 9 + .

		PASS ITEM		BFS ITEM	
LAND SITE	✓Correct SITE/		41✓		41✓
RWY	RWY selected per DEL PAD		3✓		3✓
			4✓		4✓
TACAN			5✓		5✓
G&N		OVHD	6✓	OVHD	6✓
XEP		NEP	7✓	NEP	7✓
AIM		NOM	8✓	NOM	8✓
SPDBK		NOM	39✓		
TAC		INH	20✓	INH	20✓
DRAG H		AUT	22✓	AUT	22✓
ADTA H		INH	26✓	INH	26✓
ADTA TO G&C		INH	29✓	AUT	28✓
TAC		DELTA	35✓		-
Failed TACANs deselected			✓		✓
HUD		0	37✓		
		0	38✓		

* 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 powerdown procedure

P 07 ✓TACAN MODE (three) - GPC
✓ANT SEL (three) - AUTO
CH (three) - 111X (EDW)
- 059Y (KSC)
- 121Y (NOR)

08 ✓RADAR ALTM (two) - ON
MLS (three) - ON (PASS)
✓MLS CH (three) - 8 (EDW22, KSC15)
- 6 (EDW17, KSC33, NOR17)

I/O RESET

C L2 ✓CAB RELIEF (two) - ENA (tb-ENA)
✓ANTISKID - ON
✓NWS - GPC
✓ENTRY MODE - AUTO

3: GNC 51 OVERRIDE

✓ENTRY R MODE - AUTO

B L2/C3 ✓SBTC - full fwd
C3 ✓SRB SEP - AUTO
✓ET SEP - AUTO
F6/F8 ✓AIR DATA - NAV
✓ADI ERR - 5
✓RATE - 5
✓HSI SEL MODE - ENTRY

C F6 ✓SOURCE (two) - NAV, 1
P F8 ✓SOURCE (two) - NAV, 2
B F3 ✓TRIM RHC/PNL (two) - INH
✓PNL (two) - ON
F7/F8 ✓RADAR ALTM - 1(C), 2(P)
✓FLT CNTLR PWR (two) - ON

1: GNC DEORB MNVR COAST | 2: GNC 50 HORIZ SIT

3: GNC 51 OVERRIDE

* **If APUs shutdown:** *
* Perform APU HOT RESTART *
* (ENT PKT, APU/HYD), then: *

PRE EI CHECKLIST

* If only one APU running: *
* Good HYD MN PUMP PRESS - LO *
* Delay MM304 transition to EI-2 *
* Just prior to transition: *
* Good HYD MN PUMP PRESS - NORM *
* APU SPEED SEL - HI *
*
* If less than four PASS GPCs, *
* config FCS CHs so that each GPC *
* cmds equal no. of CHs. See Table *
* on ENTRY RESTRING (Cue Card) *
*
* GNC 53 ENTRY CONTROLS *
*
* Config SURF FBK *

2: GNC 51 OVERRIDE

~EI-5 CRT2 VENT DOOR CNTL CL - ITEM 44 EXEC

2: GNC DEORB MNVR COAST

3: BFS, GNC DEORB MNVR COAST

R1 AC BUS SNSR (three) - OFF (1 sec), then MON

3: BFS, SM 0 THERMAL

✓BRAKE PRESS during following:
(If any > 120 psi, report to MCC)

R4 HYD LG HYD ISOL VLV 3 - OP (Hold 5 sec)
✓tb - OP

L2 ANTISKID - OFF (5 sec)
- ON

R4 HYD LG HYD ISOL VLV 3 - CL (Hold 5 sec)
✓tb - CL

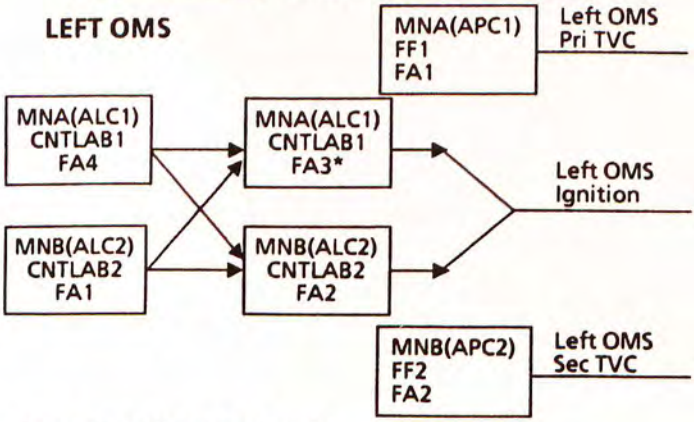
Go to ENTRY MANEUVERS Cue Cards

HOOK VELCRO

OMS FAILURES

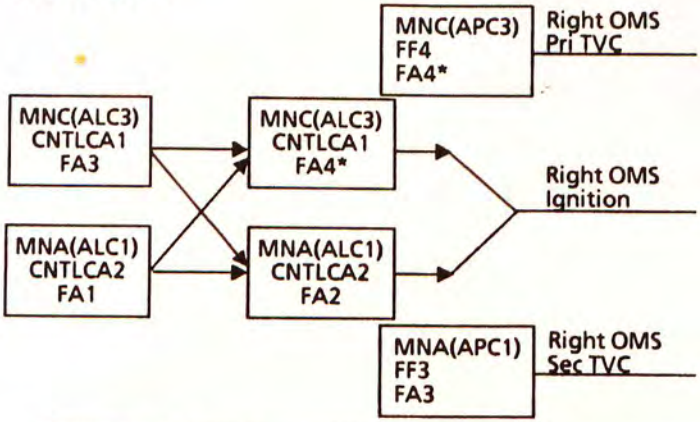
HOOK VELCRO

LEFT OMS



*Loss of FA3(4) or Pc Fail High:
Guidance will not downmode to single engine logic with closure of Left (Right) Arm/Press Switch. (Guidance needles in error, TGO countdown slow, expect 6 sec underburn ~ 6 ft/sec)

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-3b/A,O,E/B

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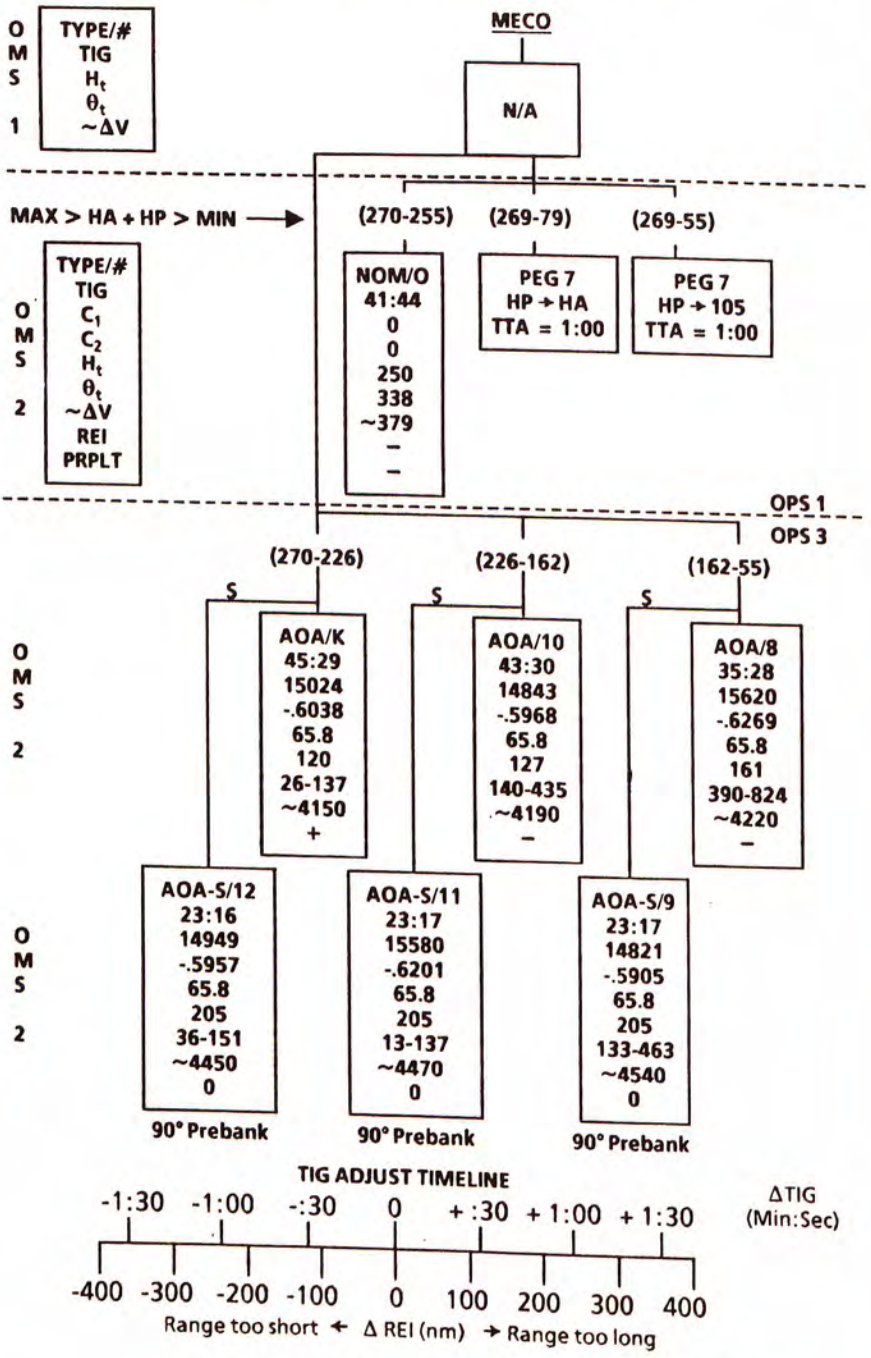
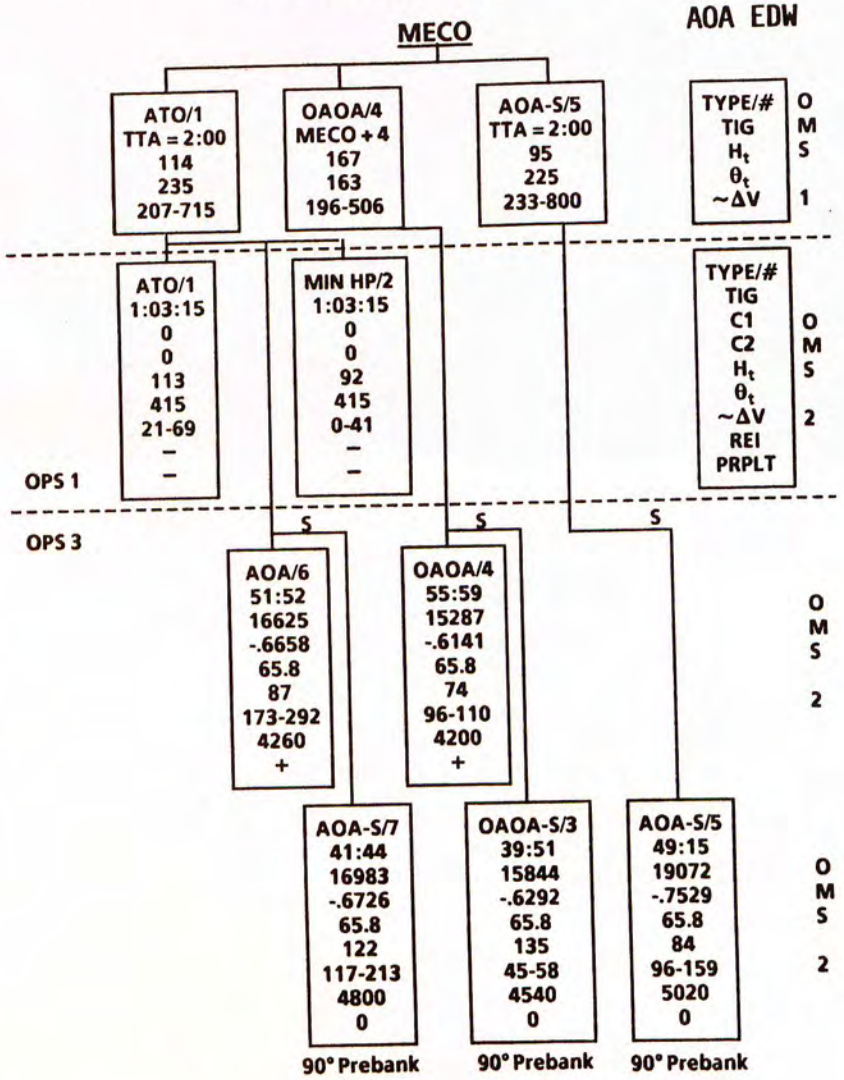
OMS TARGETS, COMM COVERAGE, LAND SITES

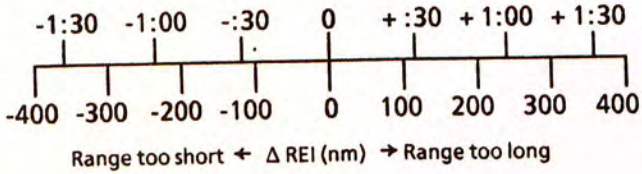
OMS TARGETS - DIRECT INSERTION



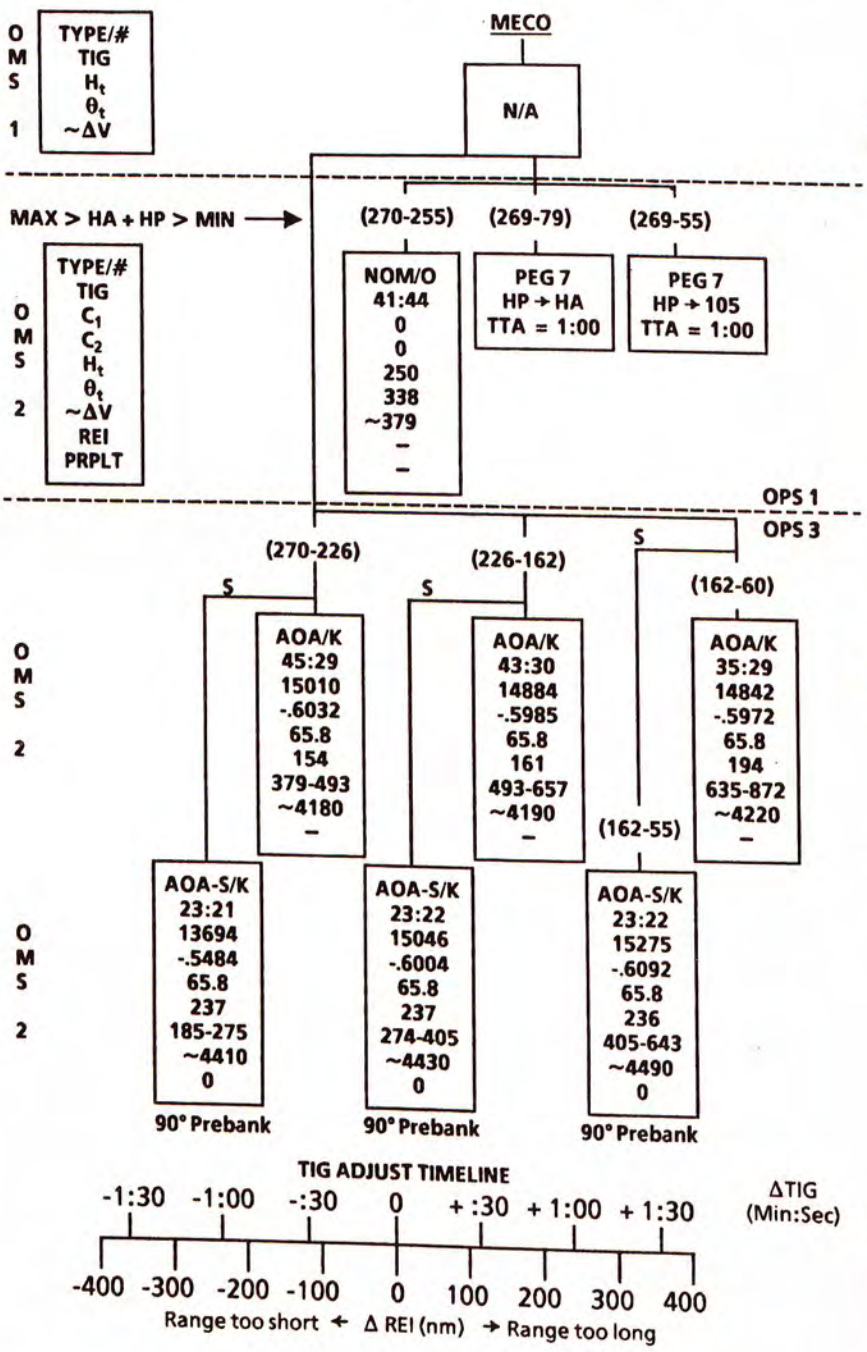
OMS TARGETS - W/OMS 1



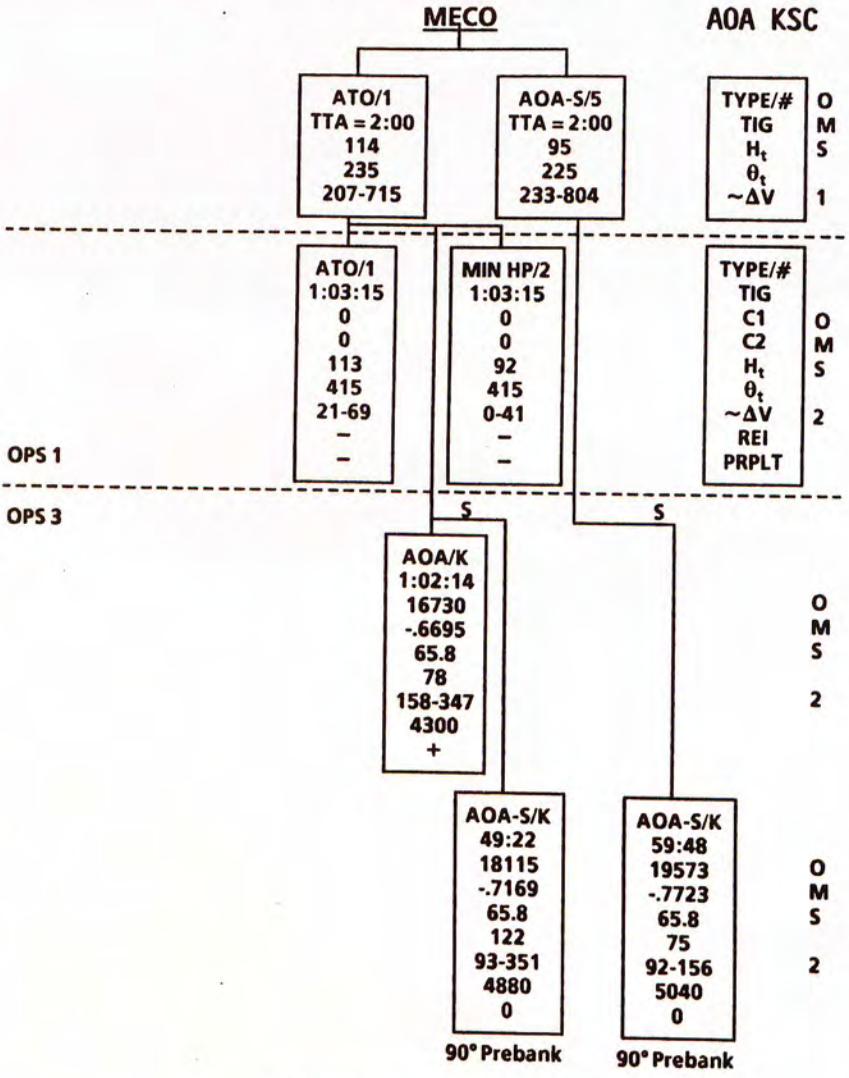
TIG ADJUST TIMELINE



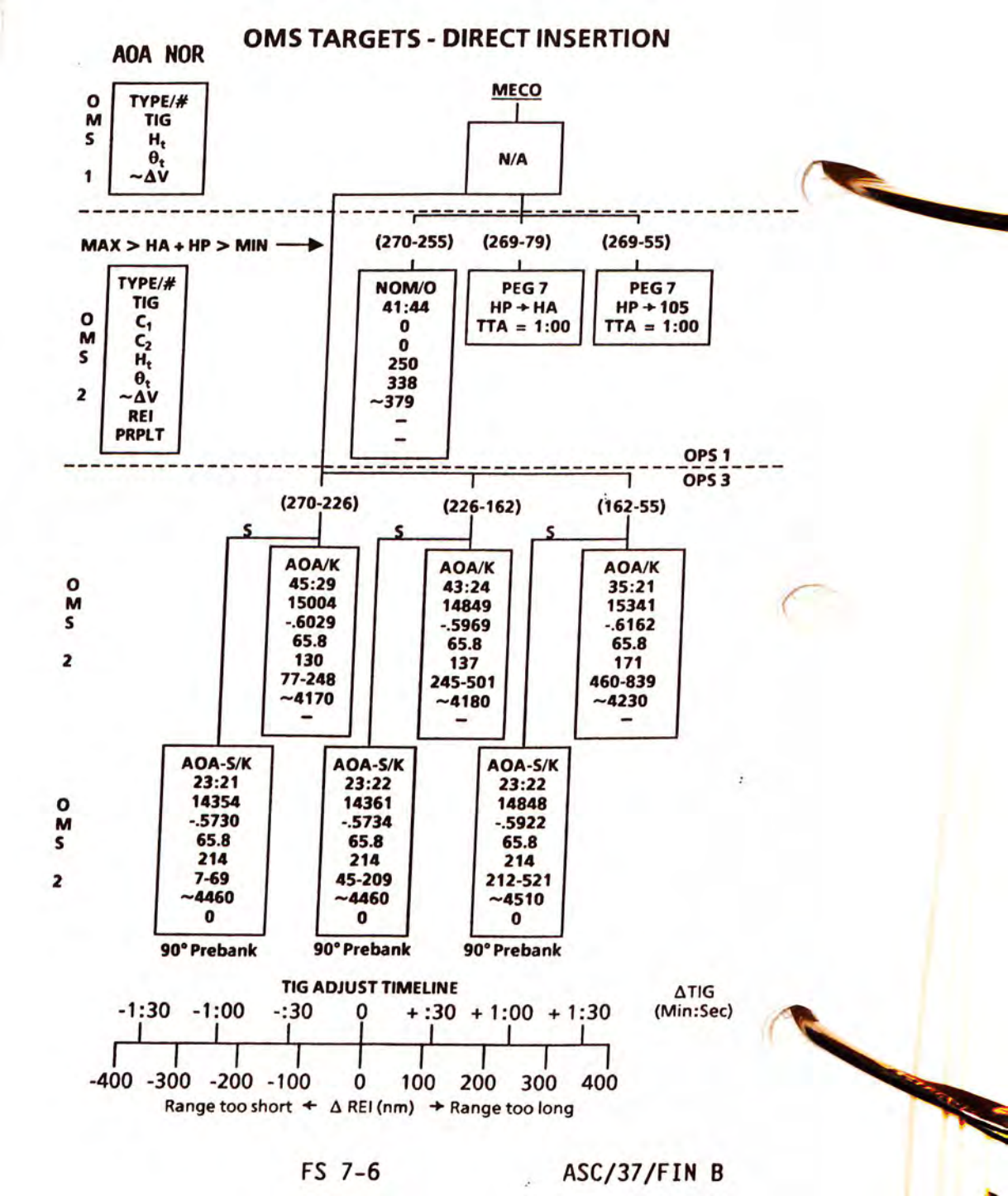
OMS TARGETS - DIRECT INSERTION

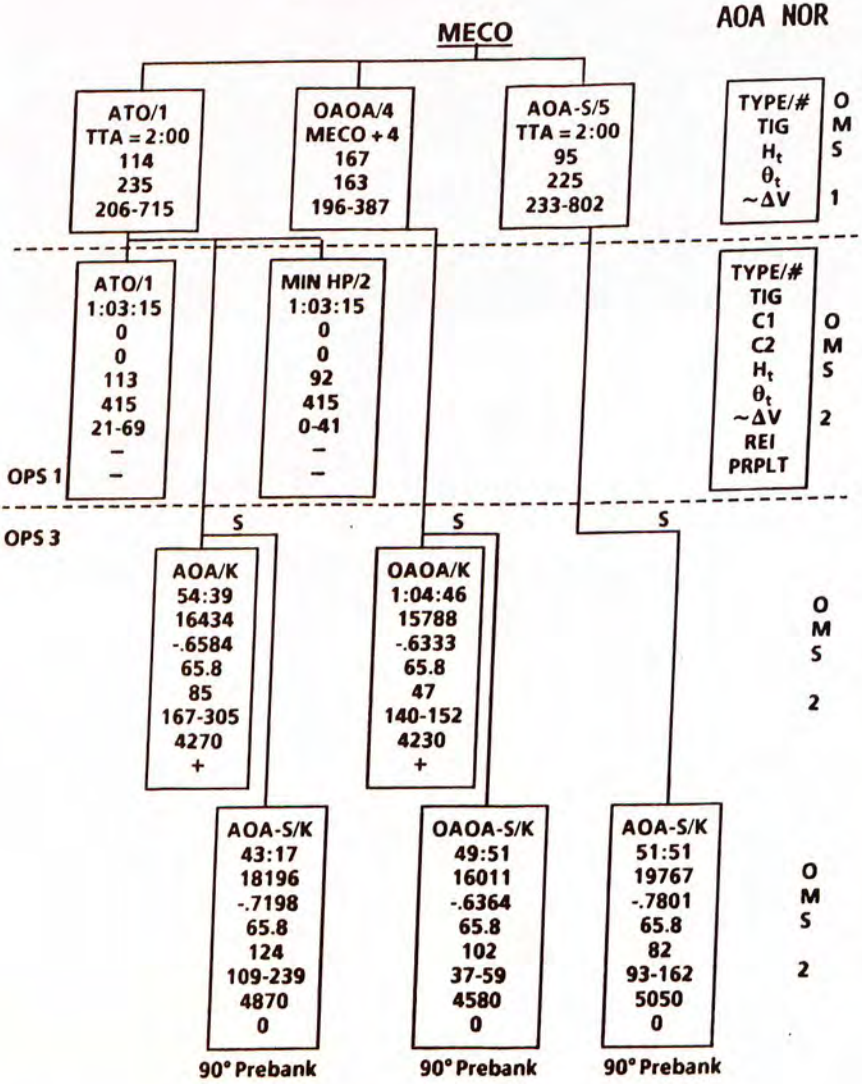


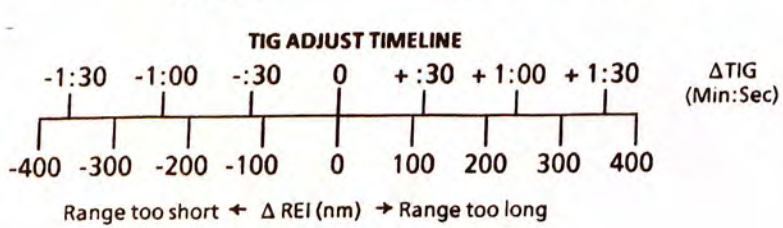
OMS TARGETS - W/OMS 1



OMS TARGETS - DIRECT INSERTION




MECO
ATO/1
TTA = 2:00
114
235
206-715
OAOA/4
MECO + 4
167
163
196-387
AOA-S/5
TTA = 2:00
95
225
233-802
TYPE/#
TIG
H_t
θ_t
~ΔV
OMS 1
ATO/1
1:03:15
0
0
113
415
21-69
–
–
MIN HP/2
1:03:15
0
0
92
415
0-41
–
–
TYPE/#
TIG
C1
C2
H_t
θ_t
~ΔV
REI
PRPLT
OMS 2
OPS 1
OPS 3
S
S
S
AOA/K
54:39
16434
-.6584
65.8
85
167-305
4270
+
OAOA/K
1:04:46
15788
-.6333
65.8
47
140-152
4230
+
OMS 2
AOA-S/K
43:17
18196
-.7198
65.8
124
109-239
4870
0
OAOA-S/K
49:51
16011
-.6364
65.8
102
37-59
4580
0
AOA-S/K
51:51
19767
-.7801
65.8
82
93-162
5050
0
OMS 2
90° Prebank
90° Prebank
90° Prebank


TIG ADJUST TIMELINE
-1:30 -1:00 -:30 0 +:30 +1:00 +1:30
ΔTIG (Min:Sec)
-400 -300 -200 -100 0 100 200 300 400
Range too short ← Δ REI (nm) → Range too long

COMMUNICATION COVERAGE - (AOA to EDW)

BERMUDA AOA PADS

AOA

CU

P/DEORB BURN

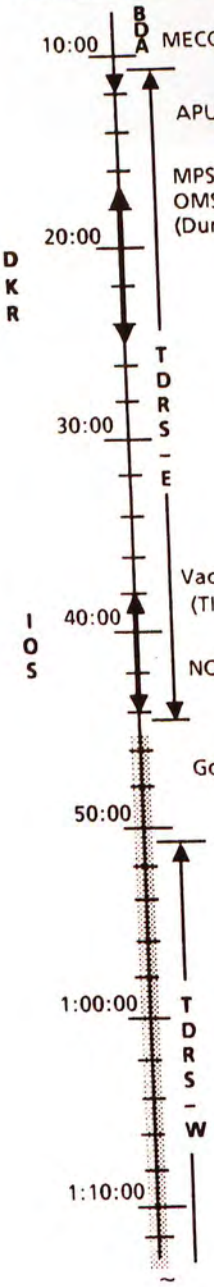
NT IRT

OMS FAILURE

OMS TGTS

COMM COVER

POST OMS 2



OFF-Nominal TIGs

AOA-S after NOM ASC
(270 > HA + HP > 55)

AOA after NOM ASC
(162 > HA + HP > 55)

OAOA-S after OAOA

AOA-S after ATO

AOA after NOM ASC
(226 > HA + HP > 162)

AOA after NOM ASC
(270 > HA + HP > 226)

AOA-S after AOA-S

AOA after ATO

OAOA after OAOA

ATO and MIN HP after ATO

~AOA EI
Exit Blackout at M = 12.2

LAND SITE DATA CHART
(OPS 1/6/3) (28.5° INCLINATION)

SITE	LOCATION	RWY	TACANS (PRI)	TACANS (SEC)	MLS CH	LENGTH
1	KSC	KSC 15 KSC 33	TTS 59Y TTS 59Y	COF 97 COF 97	8 6	15000 15000
2	BEN GUERIR	BEN 36 BEN 18	BEN 118 BEN 118	CBA116(DME) CBA116(DME)	6 -	13720 12720
3	MORON	MRN 21 MRN 03	MRN 100 MRN 100	AOG 23 AOG 23	6 -	12000 11800
4	LAS PALMAS BERMUDA	GDV 03 BDA 30	TGN 103 BDA 86	- -	- -	9900 9662
5	BANJUL	BYD 32 BYD 14	BYD 121Y BYD 121Y	BJ 76 (DME) BJ 76 (DME)	6 -	12011 11811
			(OPS 3)			
6	ROBERTS FIELD KINSHASA	ROB 04 KIN 25	ROB 85 (DME) BZ 78 (DME)	- -	- -	11160 15510
7	KING KHALID HOEDSPRUIT	KKI 15 HDS 18	RIY 92 HS 73	- -	- -	13770 13120
8	DIEGO GARCIA	JDG 31 JDG 13	NKW 57 NKW 57	- -	- -	12040 12040
9	AMILCAR CABRAL DARWIN	AML 02 DDN 29	CVS 100(DME) DN 84	- -	- -	10890 11260
10	HONOLULU	HNL 08R HNL 26L	HNL 95 HNL 95	CKH 86 CKH 86	- -	10700 11500
11	GUAM HAO	GUA 06L HAO 12	UAM 54 HA 80	- -	6 -	10755 11090
12	NORTHRUP	NOR 17 NOR 23	SNG 121Y SNG 121Y	HMN 92 HMN 92	6 -	15000 15000
13	EDWARDS NORTHRUP	EDW 04 NOR 35	EDW 111 SNG 121Y	- -	- -	13995 15000
14	EDWARDS	EDW 23L EDW 15	EDW 111 EDW 111	PMD 92 PMD 92	- -	15000 15000
15	EDWARDS	EDW 22 EDW 17	EDW 111 EDW 111	PMD 92 PMD 92	8 6	14995 15000

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CONUS TERMINAL FORECASTS RTLS - ORB

↓ RTLS ACL pg 1-7

DEORBIT ORBIT	SITE	LDG GMT	SKY/VIS/WEATHER	TEMP (°F)	WIND	ALTM	DA	REMARKS
RTLS								
AOA (1)								
AOA (2)								

UPPER WINDS FORECAST

FIRST DAY PLS

ALT	RTLS	AOA (1)	AOA (2)	AOA (3):	ORB : DEORB :
50K	/	/	/	/	/
40K	/	/	/	/	/
30K	/	/	/	/	/
20K	/	/	/	/	/
7K	/	/	/	/	/
3K	/	/	/	/	/
SFC	/	/	/	/	/

ACL PG FB2-14

TAL/ELS TERMINAL FORECASTS

DEORBIT ORBIT	SITE	LDG GMT	SKY/VIS/WEATHER	TEMP (°F)	WIND	ALTM	DA	REMARKS
TAL(1)								
TAL(2)								
TAL(3)								

UPPER WINDS FORECAST

ALT	TAL(1)	TAL(2)	TAL(3)			
50K	/	/	/			
40K	/	/	/			
30K	/	/	/			
20K	/	/	/			
7K	/	/	/			
3K	/	/	/			
SFC	/	/	/			

TERMINAL FORECASTS (Cont)

DEORBIT ORBIT	SITE	LDG GMT	SKY/VIS/WEATHER	TEMP (°F)	WIND	ALTM	DA	REMARKS

BLOCK 1 TRAJECTORY MESSAGE

DEORB ORB	APPROX TIG	SITE/RWY	OOP TIG WINDOW OPEN	OOP TIG WINDOW CLOSE

EXPECTED RATES DURING LOAD RELIEF

MAX RATES: ROLL _____ °/sec at _____

PITCH _____ °/sec

YAW _____ °/sec

IGNORE ATTITUDE ERRORS

TRAJ LOFTED/DEPRESSED FT _____ VI _____

MISCELLANEOUS

NOTAMS:

_____

_____

_____

_____

SWITCH LIST FOR HANDOVER INGRESS

LEFT SEAT

L5..... FS 9-3
L4..... FS 9-3
L1..... FS 9-3
L2..... FS 9-3
L Seat..... FS 9-4

F1..... FS 9-4
F2..... FS 9-4
L HUD..... FS 9-4
F3..... FS 9-4
R HUD..... FS 9-4
F6..... FS 9-4
F7..... FS 9-5

C2..... FS 9-5
C3..... FS 9-5

01..... FS 9-5
02..... FS 9-5
L side OVHD Flood..... FS 9-5
05..... FS 9-5
06..... FS 9-6
07..... FS 9-6
013..... FS 9-6
014..... FS 9-7
015..... FS 9-7

RIGHT SEAT

016..... FS 9-8
017..... FS 9-8
08..... FS 9-8
09..... FS 9-9
R side OVHD Flood..... FS 9-9
03..... FS 9-9

F4..... FS 9-9
F8..... FS 9-9
F9..... FS 9-9

R1..... FS 9-9
R2..... FS 9-10
R4..... FS 9-10
R Seat..... FS 9-10
R6..... FS 9-10
R7..... FS 9-11

AFT

019..... FS 9-12
C5..... FS 9-12
C6..... FS 9-12
C7..... FS 9-12

R10..... FS 9-12
R11L..... FS 9-12
R12U..... FS 9-12
R12L..... FS 9-12
R13U..... FS 9-13
R13L..... FS 9-13
R15..... FS 9-13

A1U..... FS 9-13
A1L..... FS 9-13
A1R..... FS 9-14
A2..... FS 9-14
A4..... FS 9-14
A3..... FS 9-14
A6U..... FS 9-14
A7U..... FS 9-15
A7L..... FS 9-15
A8U..... FS 9-16
A8L..... FS 9-16
A11..... FS 9-16
A12..... FS 9-16
A13..... FS 9-17
A14..... FS 9-17
A15..... FS 9-17

L9..... FS 9-17
L10..... FS 9-18
L11..... FS 9-18
L12UL..... FS 9-18
L12UR..... FS 9-18
L12LR..... FS 9-18
L12/DPP..... FS 9-18

MIDDECK - FWD

MO42F..... FS 9-19
MO58F..... FS 9-19
MO32M..... FS 9-19
MO39M..... FS 9-19
MO69M..... FS 9-19
MO29J..... FS 9-19
MO52J..... FS 9-19
MO30F..... FS 9-19
ML86B..... FS 9-19
MD44F..... FS 9-22
MF14H..... FS 9-22
MF14M..... FS 9-22

MIDDECK - AFT

MA73C..... FS 9-23
MA9F..... FS 9-23
MO13Q..... FS 9-23
ML18F..... FS 9-23
ML26C..... FS 9-23
ML30N..... FS 9-23
ML31C..... FS 9-23
MO10W..... FS 9-24
WCS..... FS 9-24
GALLEY..... FS 9-24
OPS..... FS 9-24
TAGS..... FS 9-24

AIRLOCK

AW18A..... FS 9-25
AW18D..... FS 9-25
AW18H..... FS 9-25
AW82B..... FS 9-25
AW82D..... FS 9-25
AW82H..... FS 9-25
TW58T..... FS 9-25
INNER HATCH..... FS 9-25
OUTER HATCH..... FS 9-25

HARDWARE C/W..... FS 9-26

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

(Cont)

NOTES (Cont)

- ------ denotes a physical break in panel structure
- Radiator flow valve, indicated by an *, is in full radiator flow position and unpowered to allow maximum radiator flow capability if required
- Talkbacks on panels L2, R12, R13 and ML31C that are indicated by ** are bp because cbs on ML86B and O16 are open. Position of valves are indicated below:

  L2: O2 EMER - CL
  R12L: SPLY H2O DUMP ISOL VLV - CL
  VLV - CL
  GALLEY SPLY VLV - OP

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

  ML31C: WASTE H2O TK1 DRAIN VLV - CL
  DUMP ISOL VLV - CL
  VLV - CL
  VAC VENT ISOL VLV CNTL - CL

- Before turning OI PCMMU PWR switch on C3, indicated by ***, to OFF, notify the LCC so gnd power can be connected; also notify the LCC before turning it to 1 after crew ingress
- Circuit Breaker snapring 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 37 options:
  1) OV104
  2) Day launch
  3) Low orbit incln
  4) Non-DOD
  5) Payload - GRO, PCG, BIMDA
  6) Crew size of 5
  7) No MMUs or ADU
  8) 3TK CRYO sets, Galley, Ku Ant, VTRS (2), TAGS, RMS, Payload Recorder, and Teleprinter installed
- Changes are with respect to STS-39 Switch List

LEFT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

L5	L COMM PWR - ON [OFF]	
L4:	All cbs - cl { } except:	- op {Y}
:B	All cbs	- op {Y}
:J	cb AC3 ϕA SIG CONDR HUM SEP	- op {Y}
	ϕB SIG CONDR IMU FAN	- op {Y}
:Q	cb AC1 LTG PNL (two)	- (cl { } if night launch)
	ϕC LTG INST OS	- op {Y}
	AC2 LTG PNL (two)	- op {Y}
		- (cl { } if night launch)
	ϕC LTG NUMERIC OS	- op {Y}
	AC3 LTG (three)	- op {Y}

L1	HUMIDITY SEP A	- OFF
	B	- ON
	CAB TEMP	- COOL
	TEMP 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

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	- PRI/GPC
	B	- OFF
	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	- A
	HI LOAD DUCT HTR	- A
	FIRE SUPPR AV BAY (three)	- SAFE
	AV BAY pb (three)	- lt off
	SMOKE DETN SNSR	- dn
	CKT TEST	- OFF

L2	CAB RELIEF (two)	- ctr (tb-ENA)
	VENT (two)	- ctr (tb-CL)

LEFT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

L2

FLASH EVAP FDLN HTR (two)	- OFF [2]
ANTISKID	- ON
NWS	- GPC
BDY FLP	- AUTO/OFF
ENTRY MODE	- AUTO
TRIM R,P,Y (three)	- ctr
SBTC	- full forward
O2 SYS SPLY (two)	- ctr (tb-OP)
EMER	- ctr (tb-bp)**
XOVR SYS (two)	- OP
N2 SYS (four)	- ctr (tb-OP)
O2/N2 CNTLR VLV SYS 1	- OP
2	- CL
PPO2 SNSR/VLV	- NORM

L SEAT PWR BUS SEL - AC2 (up)

F1

DC UTIL PWR MNB - OFF
AC UTIL PWR AC1 - OFF

F2

All pb lts off except:

BDY FLP pb	- AUTO	lt off
SPDBK/THROT pb	- AUTO	lt off
PITCH pb	- AUTO	lt off
ROLL/YAW pb	- AUTO	lt off

L HUD MODE - NORM
MAN BRT - mid range
HUD BRT - as reqd

F3

L HUD PWR	- OFF
TRIM RHC/PNL	- INH
PNL	- ON
NWS FAIL lt	- off
ANTISKID FAIL lt	- off
R TRIM RHC/PNL	- INH
PNL	- ON
HUD PWR	- OFF

R HUD MODE - NORM
MAN BRT - mid range
HUD BRT - as reqd

F6

INST PWR	- FLT/MPS
DATA BUS	- 3
AIR DATA	- NAV
ADI ATT	- REF
ERR	- MED
RATE	- MED
LDG GEAR pb (two)	- lts off
tb (three)	- UP
HSI SEL MODE	- ENTRY
SOURCE (two)	- NAV, 1
BFC DISENGAGE	- dn
ABORT MODE	- OFF
pb	- lt off

NOT FLOWN

LEFT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

F7	OMS PRESS N2/He TK sel	- He
	FLT CNTLR PWR	- ON
	RADAR ALTM	- 1
	MN ENG STAT lts (six)	- off
	MPS PRESS He sel	- TK
	C/W matrix lts - off	[ALL off except HYD PRESS]

C2	CRT PWR (three)	- ON
	MAJ FUNC (three)	- GNC
	L CRT SEL	- as reqd
	R CRT SEL	- as reqd
	EVENT TIMER MODE	- DN
	CNTL	- ctr
	TIMER SET tw (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 STOW (two)	- INH
	MN ENG VIB SHUTDN (OV102)	- 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

C3	OI PCMMU PWR	- 1 [OFF***]
	FORMAT	- GPC
	S-BD PM CNTL	- CMD
	ANT	- GPC
	AIR DATA PROBE (two)	- STOW
	UPLK	- ENA
	MSTR MADS PWR (OV103,104)	- ON
	MSTR OEX PWR (OV102)	- ON
	C/W MEM	- ctr
	MODE	- NORM
	RTG PUMP (OV103)	- PRI
	PL SAFING (four) (OV103)	- SAFE
	RTG PUMP (OV104)	- PRI
	SHORT ENA (two) (OV104)	- DSBL
	SHORT (two) (OV104)	- OFF
	PL SAFING (five) (OV102)	- SAFE
	EMER LTG	- OFF/ON

O1	COAS	- OFF
	AIR TEMP sel	- CAB HX OUT
	H2O PUMP OUT PRESS sel	- LOOP 2
	FREON sel	- LOOP 1
	O2/N2 FLOW sel	- SYS 1 O2
	PPO2 sel	- SNSR A

O2	CRYO O2 HTR ASSY TEMP sel	- TK1 1
	O2/H2 sel	- TK1
	FC STACK TEMP sel	- 1

	L side OVHD Flood	- BRT

O5	L AUD TACAN ID (two)	- OFF, 1
	VOX SENS	- as reqd
	A/G (two)	- T/R
	A/A	- T/R

ASC/37/FIN B,1

NOT FLOWN

LEFT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

05	L AUD ICOM (two)	- T/R
	PWR	- AUD/TONE
	CNTL	- NORM
	XMIT/ICOM MODE	- as reqd (PTT/VOX recommended)
	VOL tw (five)	- as reqd
	VOL TACAN tw	- 5
	PAGE	- dn

06	LTG PNL (two)	- OFF - (1/4 brt if night launch)
	INST L/CTR	- OFF - (1/4 brt if night launch)
	OVHD	- as reqd - (1/4 brt if night launch)
	L GLRSHLD FLOOD (two)	- VAR, as reqd
	L SEAT/CTR CNSL FLOOD (two)	- OFF, BRT
	STAR TRKR DR (two)	- OFF (tb-CL)
	PWR (two)	- OFF
	UHF XMIT FREQ	- 259.7
	SPLX PWR AMP	- ON
	SQUELCH	- ON
	MODE	- SPLX
	ANNUN LAMP TEST	- ctr
	BUS SEL ACA 1	- MNA
	ACA 2/3	- MNB
	INTEN (two)	- BRT, MED
	MTU	- AUTO
	DEU (four)	- dn

06	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 (tb-RUN) [HALT (tb-bp)]

07	TACAN MODE (three)	- GPC [OFF]
	ANT SEL (three)	- AUTO [LOWER]
	CH tw (three)	- 118X - (064X if high incln orbit)
	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)

013 All cbs - cl { }

NOT FLOWN

LEFT SEAT SWITCH LIST FOR HANDOVER INGRESS

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

O15:F 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

NOT FLOWN

CARDS

RIGHT SEAT SWITCH LIST FOR HANDOVER INGRESS

```
016:A   BRAKES MNC - ON
        RGA 3      - ON
        IMU 3      - ON
        FC3 CNTLR  - ON
  :B,C,D,E  All cbs - cl { } except:
  :D    cb MNC GPS PRE AMPL (two) - op {R}
              O2 EMER             - op {R}
  :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]
        RJDF 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
```

```
017: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
```

```
08      RADAR ALTM (two)  - ON [OFF]
        MLS (three)       - OFF
        MLS CH tw (three) - 8
                          - (6 if high incln)
        R SEAT/CTR CNSL FLOOD (two) - OFF, BRT
        LTG PNL R (three) - OFF
                          - (1/4 brt if night launch)
              NUMERIC     - BRT
                          - (1/4 brt if night launch)
           R GLRSHLD FLOOD (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
```

NOT FLOWN

FS 9-8

ASC/37/FIN B,1

RIGHT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

09

R AUD PWR - AUD/TONE
A/G (two) - T/R
A/A - T/R
ICOM (two) - T/R
VOX SENS - as reqd
TACAN ID (two) - OFF, as reqd
PAGE - dn
VOL tw (five) - as reqd
VOL TACAN tw - 5
XMIT/ICOM MODE - as reqd (PTT/VOX recommended)
CNTL - NORM

R side OVHD Flood - BRT

03

RCS/OMS PRESS sel - RCS He
PRPLT QTY sel - OMS FUEL
MSN TIME sel - MET

F4

All pb lts off except:
BDY FLP pb - AUTO [lt off]
SPDBK/THROT pb - AUTO [lt off]
PITCH pb - AUTO [lt off]
ROLL/YAW pb - AUTO [lt off]

F8

INST PWR - ON
DATA BUS - 4
AIR DATA - NAV
ADI ATT - REF
ERR - MED
RATE - MED

F8

LDG GEAR pb (two) - lts off
tb (three) - UP
HSI SEL MODE - ENTRY
SOURCE (two) - NAV, 2
FLT CNTLR PWR - ON
RADAR ALTM - 2
APU sel (two) - FUEL, 1

F9

AC Volts sel - as reqd
DC Volt/Amp sel - VOLTS MNA

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 MNB, FC3 (two) - ctr (tb-OFF)
PRI MNC - ctr (tb-ON)
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) - MONITOR

NOT FLOWN

RIGHT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

R1

- 02 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
- FC (three) - ctr
- RDY tb (three) - gray
- FC COOL PUMP ΔP tb (three) - gray
- H2 MANF VLV (two) - ctr (tb-OP)
- TK1,2 HTRS A (two) - AUTO
- B (two) - OFF
- TK3 HTRS (two) - OFF

R2

- MPS PRPLT DUMP (two) - GPC
- ENG PWR (six) - ON
- He ISOL (six) - OP [GPC]
- PNEU L ENG He XOVR - GPC
- PNEU He ISOL - OP [GPC]
- LH2 ULL PRESS - AUTO
- He I'CNCT (three) - GPC
- 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 { }
- HYD CIRC PUMP (three) - OFF [GPC]

R2

- APU CNTLR PWR (three) - ON [OFF]
- FUEL TK VLV (three) - OP [CL]
- AUTO SHUT DN (three) - ENA
- FUEL PUMP/VLV COOL (two) - OFF
- BLR CNTLR/HTR (three) - A
- PWR (three) - ON
- N2 SPLY (three) - ON
- ET UMB DR MODE - GPC
- CTRLINE LAT - GND (tb-bp)
- L DR - OFF (tb-OP)
- L LAT - OFF (tb-REL)
- R DR - OFF (tb-OP)
- R LAT - OFF (tb-REL)

R4

- HYD BRAKE HTR (three) - OFF
- LG HYD ISOL VLV (three) - GPC (tb-CL)
- MPS/TVC ISOL VLV SYS (three) - ctr (tb-OP)
- LG RET/CIRC VLV - 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

R SEAT PWR BUS SEL - AC3 (dn)

R6 R COMM PWR - ON [OFF]

NOT FLOWN

RIGHT SEAT SWITCH LIST FOR HANDOVER [INGRESS]

R7 (NOTE: Panel deleted if Spacelab not flown)

EPDS VOLTS/AMPS sel - VOLTS MN DC
SS INV - ctr (lt-off)
EXP INV - ctr (lt-off)
SS AC BUS - ctr (lt-off)
EXP AC BUS - ctr (lt-off)
SS AC/DC PWR - ctr (lt-off)
AV FAN ON (two) - ctr (lt-off)
H2O LOOP PUMP (two) - ctr (lt-off)
O2 SPLY VLV - CL (lt-off)
FSS ANNUN (six) - ENA (lt-off)
SMOKE SNSR - NORM
AGENT DISCH - SAFE (lt-off)
CAB DEPRESS - SAFE
VLV - CL
NOT CL lt - off
FULL OP lt - off
DEMS RCDR - START [down]
IPS JETT - INHB
LAMP TEST - ctr

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER [INGRESS]

019	TV PWR	- OFF
	DC UTIL PWR MNA	- ON [OFF]
	COAS PWR	- OFF
C5	DIRECT O2 vlv	- CL
C6	LEH O2 vlv (four)	- OP
C7	LEH O2 SPLY vlv (two)	- OP
R10	MS AUD PWR	- AUD/TONE
	A/G (two)	- T/R
	A/A	- T/R
	ICOM (two)	- T/R
	VOX SENS	- as reqd
	PAGE	- dn
	VOL tw (five)	- as reqd
	XMIT/ICOM MODE	- as reqd (PTT/VOX recommended)
	MS LTG PNL	- OFF
	FLOOD (two)	- ON, BRT
		- (OFF, BRT if night launch)
	BIOMED CH 1	- MIDDECK CTR
	2	- MIDDECK R
R11L, R11U	(NOTE: If VTR not flown, panel BLANK)	
	VTR NO VIDEO lt	- off
	EOT lt	- off (if available)
	VID MODE	- NTSC COLOR (if available)
R11L, R11U	VTR PWR	- OFF
	cb VTR	- cl
	VTR AUD MODE	- PTT (if available)
	VTR Controls	- as reqd
R12U	FC GPC PURGE SEQ	- dn (tb-bp)
	PURGE HTR	- GPC
	VLVS (three)	- GPC
	STARTUP HTR (three)	- ENA
	H2O LINE HTR	- A AUTO
	RELIEF HTR	- A AUTO
R12L	CRT4 PWR	- OFF
	MAJ FUNC	- SM
	ENCRYPTOR	- NORM
	MS AUD CNTL	- NORM
	SPLY H2O TKA INLET	- ctr (tb-OP)
	TKA OUTLET	- ctr (tb-CL)
	TKB INLET	- ctr (tb-OP)
	TKB OUTLET	- ctr (tb-OP)
	TKC INLET (OV102,104)	- ctr (tb-OP)
	TKC OUTLET (OV102,104)	- ctr (tb-OP)
	TKC INLET (OV103)	- ctr (tb-CL)
	TKC OUTLET (OV103)	- ctr (tb-CL)
	DUMP ISOL VLV	- ctr (tb-bp)**
	VLV	- ctr (tb-bp)**
	ENA/NOZ HTR	- OFF
	XOVR VLV	- ctr (tb-CL)
	GALLEY SPLY VLV	- ctr (tb-bp)**
	B SPLY ISOL VLV	- ctr (tb-OP)

NOT FLOWN

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

R13U

C/W TONE VOL (two) - as is
PARAM STATUS - ctr
MEM - ctr
LAMP TEST - ctr
PARAM SEL tw (three) - 120
dP/dT SNSR (OV102) - CAB
LIMIT SET VALUE tw (three) - 0
LIMIT - LOWER
FUNC - ctr
PARAM - ctr

R13L

PL BAY DR SYS (two) - DISABLE
MECH PWR SYS (two) - OFF
DR - STOP (tb-as is)
RAD LAT CNTL (two) - OFF (tb-LAT)
CNTL (two) - OFF (tb-STO)
KU ANT DIRECT STO - OFF
ANT - GND (tb-STO)
- (GND (tb-bp) if not flown)
MMU GN2 SPLY ISOL VLV (two) - ctr (tb-bp)**

R15: All cbs - cl { } except:

:A cb MNC ACIP HTR (OV102) - op {R}

:C cb MNB KU ELEC - op {Y}
ANT HTR - op {Y}
CABLE HTR - op {R}
MNC KU SIG PROC - op {Y}

:D All cbs - op {Y} except:
cb MNB CCTV ADU - op {R}

:E cb MNA STBD RMS TV (three) - op {Y}
cb MNB OS FLOOD - op {Y}
- (cl { } if night launch)

R15:E cb MNB PORT RMS TV (three) - op {Y}
- (op {R} if no PORT RMS flown)

:F cb ESS 1BC LDG GEAR ARM/DN RESET - op {R}

A1U

SLEW AZM - ctr
ELEV - ctr
RATE - SLOW
SIG STRENGTH sel - S-BD PM
KU tb (three) - bp
KU (two) - MAN SLEW,dn
PWR - OFF
MODE - RDR PASSIVE
RADAR OUTPUT - HI
CNTL - CMD
SIG PROC HDR - TV
LDR - OPS RCDR
TAGS - CLEAR

A1L

S-BD PL CNTL - CMD
ANT POLAR - R CIRC
XMTR PWR - LO
CH SEL tw (two) - 000
FREQ SWEEP - OFF
MOD - OFF
PWR SYS - OFF
SEL - PSP
PSP CMD OUTPUT - INTRG
PL DATA INTLVR PWR - ON

NOT FLOWN

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A1L

S-BD PM ANT SW ELEC - 1
PRE AMPL - 1
PWR AMPL STBY - 1
OPER - 1
MODE - STDN HI
XPNDR - 1
NSP DATA RATE XMIT - HI
RCV - LO
UPLK DATA - S-BD
CODING XMIT - OFF
RCV - OFF
PWR - 1
ENCRYPTION PWR - ON
MODE - SEL
SEL - RCV

A1R

OPS RCDRS PNL CNTL tb (two) - bp
MODE (two) - RCD (tb-RCD) tb-bp
rotary sw - MAN
PWR (two) - ON
ANOM SEQ - OFF (tb-bp)
S-BD FM CNTL - CMD
ANT - GPC
PWR - 1
DATA SOURCE - ME
PL RCDR PNL CNTL tb - bp
FUNC - OPERATE
MODE - STOP (tb-bp)
PWR - OFF

A1R

PL RCDR SPEED - 2
AUD CTR VOICE RCD SEL CH 1 - ICOM A
2 - A/A
DOCK RING (seven) - OFF
SL (seven) - OFF
UHF A/G (two) - OFF
A/A - T/R
PL BAY OUTLETS ICOM (two) - OFF

A2

DIGI-DIS SEL - EL/AZ
X-PNTR SCALE - X10
PTT sw - ctr
MIC LEVEL - ccw

A4

MSN TIMER sel - GMT

A3

MON CONTRAST (two) - as reqd
BRT (two) - as reqd
SOURCE (two) - PNL
MODE (two) - NORM
SCAN (two) - UNDER
DATA (two) - ON
SYNC (two) - INT
X-HAIR (two) - ON
PWR (two) - OFF
FAULT lt (two) - off

A6U

DAP - all off
SENSE - -Z
FLT CNTLR PWR - OFF
DATA BUS - 1

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A6U	ADI ATT	- INRTL
	ERR	- MED
	RATE	- MED
	OS LTG FLOOD (two)	- ON, BRT
	PNL	- OFF
	INST	- OFF
	NUMERIC	- OFF
	ANNUN BUS SEL	- OFF
	LAMP TEST	- ctr
	INTEN (two)	- VAR, MED
	EVENT TIMER SET tw (four)	- as reqd
	MODE	- UP
	CNTL	- ctr
	TIMER	- ctr
	PL RETEN LOGIC PWR (two)	- OFF
	PL SEL	- 1
	LAT (five)	- OFF (tb-LAT)
	RDY tb (five)	- gray

A7U	MSTR ALARM pb	- lt off
	PL BAY FLOOD (eight)	- OFF
	RMS SPOT (two)	- OFF
	CAMR (two)	- ELBOW
	TV CAMR PWR (five)	- ctr (tb-OFF)
	PWR CNTL	- CMD
	CONTR UNIT	- OFF
	DNLK	- ENA
	SYNC	- NORM

A7U	VID IN pb (thirteen)	- lt off
	OUT pb (eight)	- lt off
	CAMR CMD PAN/TILT	- LO RATE
	FOCUS	- ctr
	ZOOM	- ctr
	IRIS	- ctr
	TILT	- ctr
	PAN	- ctr
	ALC pb (three)	- lt off
	GAMMA pb (three)	- lt off

A7L	(OV103,104)	
	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	- 0
	ACIP HTR	- OFF
A7L	(OV102)	
	ACIP HTR	- OFF
	OEX EQUIP	- ON
	SILTS HTR	- OFF
	cb SILTS CAMR AC3ΦA	- op
	SILTS PWR	- OFF
	MADS FDM CNTL	- DATA
	MAN CALBR	- 0

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER [INGRESS]

A8U (This panel may be deleted if RMS not flown)
- RMS Mode lts - all off
- BRAKES - ON (tb-OFF)
- SAFING - AUTO (tb-bp)
- MODE - TEST
- AUTO SEQ - ctr
- AUTO SEQ lts (two) - off
- S/W STOP tb - gray
- C/W TONE VOL - as reqd
- lts - all off
- MSTR ALARM pb - off
- RATE MIN tb - OFF
- HOLD tb - OFF
- SCALE tb - gray
- EE MODE - OFF
- MAN CONTR - ctr
- tb (six) - bp
- B/U JOINT - SY
- PL REL - OFF
- DR - ctr
- PARAM sel - PORT TEMP
- LTG ANNUN/NUM (two) - VAR, LOW
- PNL/INST - OFF
- JOINT - CRIT TEMP
- SINGLE/DIR DR - ctr
- SHDLR BRACE REL - ctr (tb-bp)

A8L (This panel may be deleted if RMS not flown)
- STBD RMS - OFF (tb-bp)
- HTR (two) - OFF
- RETEN LAT - OFF (tb-bp)
- R-F-L tb (three) - bp
- RMS SEL - OFF
- PWR - OFF
- PORT RMS - OFF (tb-STO)
- HTR (two) - OFF
- RETEN LAT - OFF (tb-LAT)
- (OFF (tb-REL) if no RMS flown)
- R-F-L tb (three) - gray
- (bp if no RMS flown)
- RMS RHC RATE sw - VERN

A11 (OV103,104)
- CRYO TK4 HTR O2 (two) - OFF
- RESET/TEST - ctr
- H2 (two) - OFF
- MS COMM CCU PWR - ON [OFF]
- DC UTIL PWR MNC - ON [OFF]

A11 (OV102)
- CRYO TK4,5 HTR O2 (two) - OFF
- TK4/5 HTR O2 RESET/TEST - ctr
- H2 (two) - OFF
- MS COMM CCU PWR - ON [OFF]
- OS COMM CCU PWR - OFF
- DC UTIL PWR MNC - ON [OFF]

A12 APU HTR GAS GEN/FUEL PUMP (three) - OFF
- LUBE OIL LINE (three) - OFF

NOT FLOWN

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

A12
APU HTR TK/FU LINE/H2O SYS (six) - OFF
LG ARM/DN RESET - dn
FC3 STRUCT RTN - ctr (tb-ON)
HYD HTR A (four) - AUTO
B (four) - OFF
CIRC PUMP PWR 1 - MNA
2 - MNB
3 - MNC

A13
(OV103,104)
OS AUD MSTR SPKR VOL - as reqd
SPKR PWR - OFF
GPS PRE AMPL UC - OFF
LC - OFF
RCVR/PROC ASSY PWR (two) - OFF
MODE (two) - HALT

A13
(OV102)
OS AUD PWR - OFF
A/G 1 - T/R
A/G 2 - OFF
A/A - T/R
ICOM (two) - OFF
VOX SENS - as reqd
MSTR SPKR VOL - as reqd
PAGE - dn
VOL tw (five) - as reqd
XMIT/ICOM MODE - as reqd (PTT/PTT recommended)
SPKP PWR - OFF

A14
RCS/OMS HTR FWD RCS - OFF
L POD (two) - OFF
R POD (two) - OFF
OMS KIT - OFF
CRSFD LINES - A AUTO
- B AUTO
FWD RCS JET (five) - AUTO
AFT RCS JET (five) - AUTO
PYRO (twelve) - SAFE
RMS LAT - SAFE

A15
PS COMM CCU PWR - ON OFF
DC UTIL PWR MNC - ON OFF
AC UTIL PWR AC3 - OFF

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

NOT FLOWN

AFT FLIGHT DECK SWITCH LIST FOR HANDOVER INGRESS

L10, L11 (BLANK)

L12UL

(GRO)
GRO INT PWR SOURCE - ctr
DISCNCT PRI - ctr
MPS tb (two) - bp
AESE CONV CMD 5-8 PRI - ctr
1-4 SEC - NORM
OUTPUTS RPC 1-4 tb - gray
5-8 BYP tb - bp
MPS tb - bp
cb SW PWR-1 - op
APDGS LOCKED tb - bp
GRO INT PWR DISCNCT SEC - ctr
AESE CONV 5-8 DISTR PRI - BYP
CONV-5/6 RLY MPS tb - bp
-7/8 RLY MPS tb - bp
TEST CMD VERIF tb - bp

L12UR

(GRO)
GRO CONV SOURCE - ctr
SEL - ctr
CONT BATTS - NORM
AESE CONV CMD 1-4 PRI - ctr
5-8 SEC - NORM
1/2 tb - gray
3/4 tb - gray
5/6 tb - bp
7/8 tb - bp
HTRS - DSBL
INPUT PWR tb - gray

NOT FLOWN

L12UR

cb SW PWR-2 - op
GRO HTRS SOURCE - ctr (tb-bp)
AESE CONV 5-8 DISTR SEC - BYP
SURS RET tb (two) - bp

L12LR

KEEL CAMR PWR - OFF
CONTR - OFF
cb KEEL CAMR PWR - op
HTR PWR - op

L12/DPP

SURS SEL - OFF
ENA - DSBL
RETRACT - OFF
MAN PTG CNTL SEL - 1
PWR - OFF

NOTE: L10, L11, L12 - All unlabeled 2/3 position switches-dn/ctr, tb-bp, cb-op, rotaries-as reqd

MIDDECK - FORWARD SWITCH LIST FOR HANDOVER INGRESS

M042F MIDDECK AUD PWR (OV102) - AUD/TONE
MIDDECK SPKR AUD PWR (OV103,104) - AUD/TONE
A/G 1 - T/R
A/G 2 - T/R
A/A - T/R
ICOM (two) - T/R
VOX SENS - as reqd
MSTR SPKR VOL - as reqd
PAGE - dn
VOL tw (five) - as reqd
XMIT/ICOM MODE - as reqd (PTT/VOX recommended)
TONES - ACCU/BYP
SPKR PWR - OFF
GPC MEM DUMP - OFF
BYP TONE VOL - as reqd

M058F (OV103,104)
TV PWR - OFF
(OV102)
AIRLK 1 B/U PWR - OFF
A/G 1 - T/R
A/G 2 - RCV
A/A - T/R
ICOM (two) - T/R
VOX SENS - as reqd
PAGE - dn

M058F AIRLK 1 B/U VOL tw (five) - as reqd
XMIT/ICOM MODE - as reqd(PTT/VOX recommended)
TV PWR - OFF

M032M LEH O2 5 vlv - OP (CL if crew is 7 or less)
6 vlv - OP (CL if crew is 4 or less)

M039M MIDDECK COMM CCU PWR - ON OFF

M069M LEH O2 7 vlv - OP (CL if crew is 5 or less)
8 vlv - OP (CL if crew is 6 or less)

M029J PTT sw - ctr
MIC LEVEL - ccw

M052J DC UTIL PWR MNA - ON OFF
AC UTIL PWR AC1 - OFF
MSTR ALARM pb - lt off

M030F DC UTIL PWR MNC - OFF

ML86B:A cb MNA SPLY H2O TKA INLET - cl { }
TKB OUTLET - cl { }
WASTE H2O DUMP VLV/NOZ HTR - op {Y}
H2O LINE HTR A - op {Y}
MNB SPLY H2O TKB INLET - cl { }
TKC OUTLET - cl { }
DUMP ISOL - op {Y}
B SPLY ISOL VLV - cl { }
H2O LINE HTR B - op {Y}

NOT FLOWN

MIDDECK - FORWARD SWITCH LIST FOR HANDOVER INGRESS

ML86B:A cb MNC SPLY H2O TKA OUTLET - cl { }
TKC INLET - cl { }
DUMP VLV/NOZ HTR - op {Y}
XOVR VLV - cl { }
GALLEY SPLY - op {Y}
:B cb MNA WASTE H2O TK1 VLV - cl { }
SPLY H2O TKD OUTLET - cl { }
WASTE H2O DUMP ISOL - op {Y}
VAC VENT ISOL VLV - op {Y}
WCS CNTLR - op {Y}
GALLEY OVEN - op {Y}
MNB WASTE H2O TK1 DRAIN - op {R}
SPLY H2O TKD INLET - cl { }
VAC VENT NOZ HTR - op {Y}
ISOL VLV - op {Y}
WCS CNTLR - op {Y}
GALLEY H2O HTR - op {Y}
:C (No cb installed)
:D cb MNA PYRO JETT SYS A KU ANT - op {R}
STBD RMS - op {R}
MMU GN2 SPLY ISOL VLV A - op {R}
- (op {Y} if MMU flown)
PORT HTR A - op {R}
- (cl { } if MMU flown)

ML86B:D cb MNA MMU STBD HTR A - op {R]
- (cl { } if MMU flown)
MNB PYRO JETT SYS A PORT RMS - op {R}
MMU GN2 SPLY ISOL VLV B - op {R}
- (op {Y} if MMU flown)
PORT HTR B - op {R}
- (cl { } if MMU flown)
STBD HTR B - op {R}
- (cl { } if MMU flown)
MNC PYRO JETT SYS B KU ANT - op {R}
PORT RMS - op {R}
STBD RMS - op {R}
:E cb MNA EMU 2 H2O SPLY - op {Y}
WASTE - op {Y}
FLOOD TNL ADAPT 2 - op {R}
- (op {Y} if S/L MOD flown)
MNB SEAT L - cl { }
R - cl { }
FLOOD TNL ADAPT 3 - op {R}
- (op {Y} if S/L MOD flown)

NOT FLOWN

MIDDECK - FORWARD SWITCH LIST FOR HANDOVER **INGRESS**

ML86B:E cb MNC EMU 1 H2O SPLY - op {Y}
WASTE - op {Y}
SEAT L - cl { }
R - cl { }
FLOOD TNL ADAPT 4 - op {R}
- (op {Y} if S/L MOD flown)

:F cb MNA FLOODS MIDDECK 1/8 - cl { }
WMC/MO13Q - op {Y}
AIRLK 1 - op {Y}
CRYO O2 HTR TK3 SNSR 1 - cl { }
MNB FLOODS MIDDECK 2/6 - cl { }
BUNK 2/4 - op {Y}
PHS - op {Y}
AIRLK 3 - op {Y}
CRYO O2 HTR TK3 SNSR 2 - cl { }
TK4 SNSR 1
(OV103,104) - op {R}
- (cl { } if TK4 flown)
TK4/5 SNSR 1
(OV102) - op {R}
- (cl { } if TK4/5 flown)
MNC FLOODS MIDDECK 5/7 - cl { }
3/4/MO13Q - cl { }
BUNK 1/3 - op {Y}
AIRLK 4 - op {Y}
CRYO O2 HTR TK4 SNSR 2
(OV103,104) - op {R}
- (cl { } if TK4 flown)

ML86B:F cb MNC CRYO O2 HTR TK4/5 SNSR 2
(OV102) - op {R}
- (cl { } if TK4/5 flown)

:G cb ESS 1BC FLOOD AIRLK 2 - op {Y}
TNL ADAPT 1 - op {R}
- (op {Y} if S/L MOD flown)
CRYO CNTLR O2 TK4
(OV103,104) - op {R}
- (cl { } if TK4 flown)
CYRO CNTLR O2 TK4/5
(OV102) - op {R}
- (cl { } if TK4/5 flown)
CRYO CNTLR H2 TK4
(OV103,104) - op {R}
- (cl { } if TK4 flown)
CRYO CNTLR H2 TK4/5
(OV102) - op {R}
- (cl { } if TK4/5 flown)
CRYO QTY O2 TK4 - op {R}
- (cl { } if TK4 flown)
H2 TK4 - op {R}
- (cl { } if TK4 flown)

NOT FLOWN

MIDDECK - FORWARD SWITCH LIST FOR HANDOVER INGRESS

ML86B:G cb ESS 2CA CRYO QTY O2 TK5
(OV102) - op {R}
- (cl { } if TK5 flown)
QTY H2 TK5
(OV102) - op {R}
- (cl { } if TK5 flown)
3AB CRYO CNTLR O2 TK3 - cl { }
H2 TK3 - cl { }
QTY O2 TK3 - cl { }
H2 TK3 - cl { }

MD44F CABIN TEMP CONTROL ACTUATOR LINKAGE - PRIMARY ACTUATOR (pinned)
CAB TEMP CNTL vlv - FULL COOL (by using AUTO TEMP CNTLR)

MF14H BIMDA PWR - ON
TEMP SET - 200°
INCU/COOL - COOL

MF14M PCG PWR - ON
TEMP SET - 22°
cb PCG - cl

NOT FLOWN

FS 9-22

ASC/37/FIN B,1

MIDDECK - AFT SWITCH LIST FOR HANDOVER **INGRESS**

MA73C:A,B	MCA LOGIC MNA (four)	- ON
	MNB (six)	- ON
	MNC (four)	- ON
:C,D	All cbs	- cl { }
:E	All cbs	- op {Y} except:
	cb AC2 PL 3φ	- op {R}
		- (op {Y} if S/L flown)
	AC3 PL 3φ	- op {R}
		- (op {Y} if S/L flown)
:F	cb AC1 RMS PRI φA	- op {Y}
		- (op {R} if no RMS flown)
	OPS INST HYD ACTR φC	- cl { }
	AC2 RMS B/U φA	- op {Y}
		- (op {R} if no RMS flown)
	L SEAT 3φ	- cl { }
	OPS INST HYD ACTR φC	- cl { }
	AC3 L SEAT 3φ	- cl { }
:G	All cbs	- op {R} except:
	cb AC2 R SEAT 3φ	- cl { }
	AC3 GALLEY FAN (three)	- op {Y}
	R SEAT 3φ	- cl { }
	OMS KIT VLV LOGIC	- OFF
:H,I	All cbs	- cl { }
:I	AFT POD VLV LOGIC (three)	- ON

MA9F	TPNTR PWR	- ON
	lt (two)	- lt off

NOT FLOWN

MA9F	HI PWR MODE lt	- off
	MODE	- AUTO
	SELF TEST	- dn
	PAPER LOW lt	- off
	FEED	- out

MO13Q	MIDDECK FLOODS 1,2,3,5,7 (five)	- OFF
	4,6,8 (three)	- ON
	MO13Q LTG	- OFF
	AIRLK 2	- OFF/ON
	TNL ADAPT 1	- OFF/ON
	DC UTIL PWR MNB	- ON
	AC UTIL PWR AC3	- OFF

ML18F	EMER LTG	- ON/OFF
	WMC FLOOD	- OFF

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

ML30N	Neg Press Relief vlv cap (two)	- Installed/seated

ML31C	WASTE H2O TK1 DRAIN VLV	- ctr (tb-bp)*
	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

MIDDECK - AFT SWITCH LIST FOR HANDOVER INGRESS

MO10W	14.7 CAB REG INLET vlv (two)	- CL
	PPO2 CNTLR (two)	- NORM
	O2 REG INLET SYS vlv (two)	- CL
	H2O TK N2 REG INLET vlv (two)	- OP
	PL N2 SYS vlv (two)	- CL
	O2 EMER vlv	- CL
	N2 XOVR vlv	- CL
	H2O TK N2 ISOL vlv (two)	- OP
	PL O2 SYS vlv (two)	- CL
WCS	COMMODE CNTL	- DN/OFF
	MODE	- OFF
	VAC VLV	- CL
	FAN SEP BYPASS (two)	- OFF
	SEP	- 1
	HOSE BLOCK	- SEP 1
	BALLAST vlv	- CAN
	COMPACTOR ANGLE	- ~0
GALLEY	(NOTE: Panel deleted if Galley not flown)	
	OVEN FAN	- OFF
	H2O HOT(COLD) pb	- lt off
	VOL	- as reqd
	MV2 vlv	- COLD
	MV3 vlv	- ON
	OVEN/RHS	- OFF
	H2O HTRS	- OFF
	AUX H2O QD outlet	- Cap Installed
OPS	WATER DISPENSER (deleted if Galley flown)	
	H2O SEL VLV	- OFF
	Quantity Sel	- 8
	lt/pb	- not illuminated
	BYPASS VLV	- as is
TAGS	TAGS PWR	- ctr
	ADV	- ctr
	BRT	- 3
	GAMMA	- 3
	CONTRAST	- 3
	LAMP TEST	- ctr
	MSTR PWR	- OFF

NOT FLOWN

FS 9-24

ASC/37/FIN B,1

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 tw (five)	- as reqd
	CNTL	- NORM
	VOX SENS	- as reqd
	MSTR VOL 1	- MAX
	XMIT/ICOM MODE	- as reqd (PTT/VOX recommended)
	MSTR VOL 2	- MAX
AW18H	PWR/BATT CHGR EMU BUS SEL (two)	- OFF
	MODE (two)	- OFF
	INPUT sel	- EMU 1
AW82B	AIRLK DEPRESS vlv	- CL
	cap	- Installed
	EV-1,EV-2 O2 vlv (two)	- CL
AW82D	EMU 1 H2O (two)	- ctr (tb-CL)
	EMU 2 H2O (two)	- ctr (tb-CL)
	CCU PWR (two)	- OFF

AW82H	EMU H2O SPLY WASTE REG (two)	- REGULATING
TW58T	(NOTE: Panel deleted if Spacelab not flown	
	TNL LTG FLOOD 1	- ON/OFF
	2,3,4 (three)	- OFF
AIRLOCK INNER HATCH		
	Equalization vlv (two)	- NORM
	cap (two)	- Installed
AIRLOCK OUTER HATCH		
	Equalization vlv (two)	- OFF
	cap (two)	- Installed

HARDWARE CAUTION & WARNING CONFIGURATION

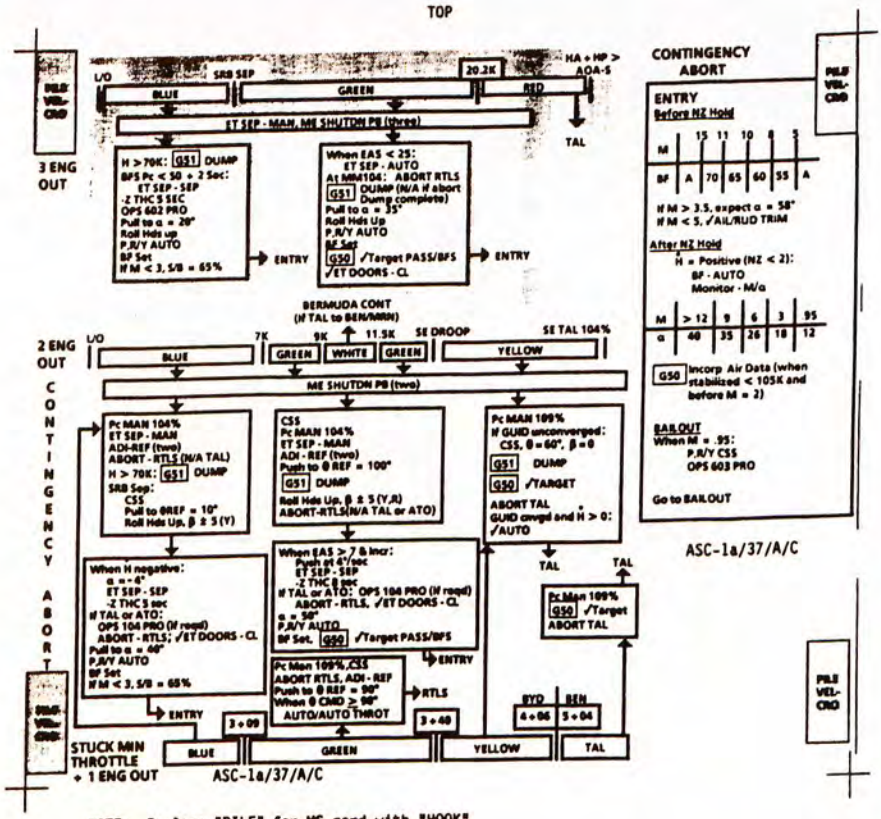
UPPER LIMIT CHANGE		**TO**
4	CABIN PRESS	3.90 V/15.54 psia (OV103) 3.90 V/15.41 psia (OV102) 3.90 V/15.50 psia (OV104)
7	OMS TK P OX-L	3.60 V/288 psi
17	OMS TK P FU-L	3.60 V/288 psi
37	OMS TK P OX-R	3.60 V/288 psi
47	OMS TK P FU-R	3.60 V/288 psi
74	CABIN FAN ΔP	4.25 V/6.80" H2O
107	FREON LOOP 1 EVAP OUT T	4.30 V/115.0° F
117	FREON LOOP 2 EVAP OUT T	4.30 V/115.0° F

LOWER LIMIT CHANGE		**TO**
4	CABIN PRESS	3.40 V/13.54 psia (OV103) 3.45 V/13.66 psia (OV102) 3.45 V/13.71 psia (OV104)
74	CABIN FAN ΔP	2.65 V/4.20" H2O

INHIBIT

8 APU 1 EGT
18 APU 2 EGT
20 CRYO O2 P TK3 (if TK3 not flown)
28 APU 3 EGT
30 CRYO O2 P TK4/5 (if TK4 and 5 not flown)
61 CRYO O2 HTR1 TK4 (if TK4 and 5 not flown) |
70 CRYO H2 P TK3 (if TK3 not flown)
71 CRYO O2 HTR2 TK4 (if TK4 and 5 not flown) |
77 OMS PBK OXID TK ULL P
80 CRYO H2 P TK4/5 (if TK4 and 5 not flown)
87 OMS PBK FUEL TK ULL P

NOT FLOWN



NOTE: Replace "PILE" for MS card with "HOOK"

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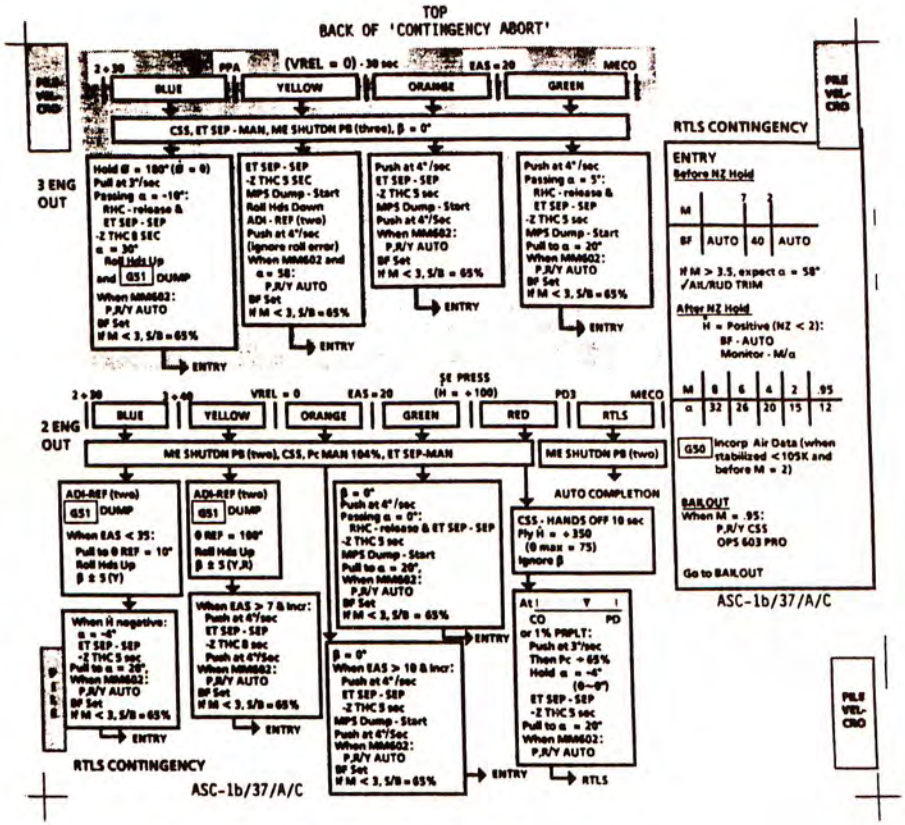

NOTE: Replace "PILE" for MS card with "HOOK"

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TOP

HOOK VELCRO

OMS 2/ ORBIT OMS BURNS

HOOK VELCRO

✓MM105/202(302)
✓BURN ATT (INRTL) then REF, pb - push
✓ENG SEL
✓DAP - AUTO(PASS)/DISC
CNTL PWR (two) - ON
✓DAP TRANS - NORM
✓GIMBAL TRIM
2 engine: P = +0.4 LY = −5.7 RY = +5.7
1 engine: P = +0.4 LY = +5.2 RY = −5.2
L,R OMS He PRESS/VAP ISOL A (two) - OP
wait 2 sec ..... B (two) - GPC (OP for SE burn)

		GPC	OP	CL
ORB BURN	A			
	B			

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

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

[ ][ ][ ] ΔVTOT: OMS XFEED RETURN (Planned Single Engine)

-:15 EXEC
If OMS ENG Pc MSG and non critical burn - Aff Eng - OFF
If Leaking OMS PROP burn RCS + X TIG -15 sec to OMS IGN + 1 sec

:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

OMS PRPLT FAIL:
HP < [85] (CONTINUE BURN):
Failed OMS ENG - OFF
✓XFEED (two) - CL
TK ISOL (two) - CL
He PRESS (two) - CL
HP > [85] (STOP BURN):
OMS ENG (two) - OFF
✓Failed OMS XFEED (two) - CL
TK ISOL (two) - CL
He PRESS (two) - CL

OMS ENG FAIL:
ASCENT or CRIT O/O (Continue Burn)
Failed ENG - OFF
OMS XFEED at T → 1/2 ΔVTOT at FAIL [ ][ ][ ]

RCS COMPLETION: (Hp < [85] or CRIT O/O)
Interconnect to either OMS that was ENG FAIL
THC + X (Hp = [85])
Post burn, AFT RCS RECONFIG

CUTOFF
+:02 OMS ENG(s) - OFF
If Orbit Critical Burn,
Trim all axes residuals < 0.2 fps
Otherwise
Trim all axes residuals < 2 fps

ASC-2a/37/A,O/B

(reduced copy)

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

XFEED at 1/2 ΔVTOT (if reqd) [ ][ ][ ]

TIG-2 L,R
He PRESS/VAP ISOL A - OP
...Wait 2 sec... B - OP

✓MM105
✓CNTLR PWR (two) - ON
✓BURN ATT (INRTL) then REF, pb-push
✓RCS SEL
:00 +X
Maintain PITCH ATT ERR ± 3°
Monitor OMS data
Monitor ΔVTOT
CUTOFF RELEASE THC

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
TIG-10 Mnvr to ATT (error needles)
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

:00 -X
CUTOFF CUR HP = TGT HP [ ][ ][ ] , RELEASE THC

ASC-2b/37/A,O/A

(reduced copy)

TOP

HOOK VELCRO

OMS BURN MONITOR

HOOK VELCRO

OMS Pc LOW OMS ↓ and ENG VLV 1 or 2 < 70%	OMS ENG FAIL
OMS ↓ and ENG VLV 1 & 2 > 70% and OX IN P > 227	OMS ENG FAIL
P ≤ 227	OMS PRPLT FAIL
No OMS ↓	SENSOR FAIL
OMS TEMP L R FU IN P ≥ 220 224	OMS ENG FAIL
P ≤ 204 209	OMS PRPLT FAIL
P 205-219 210-223	SENSOR FAIL
OMS OX/FU TK P (✓ENG IN P) OX & FU LOW	He PRESS/VAP ISOL (two) - OP If Tk P no incr: OMS PRPLT FAIL
OX LOW	If HP > 85: OMS PRPLT FAIL If HP < 85: Burn to OMS ↓, then OMS PRPLT FAIL
FU LOW	If HP > 85: OMS PRPLT FAIL If HP < 85: He PRESS/VAP ISOL (two) - CL Burn to OMS ↓ or HP = 85, then OMS PRPLT FAIL
OX & FU HIGH	Cycle He to maint OMS TK P 234-284 Cycle He A(B) to isolate failed leg
OMS He TK P LOW (✓CRT & meter) P > 640 & QTY > 41%	✓Leaking OMS TK ISOL (two) - OP ✓He PRESS/VAP ISOL(two) - OP L,R OMS XFEED (four) - OP Good OMS TK ISOL (two) - CL He PRESS/VAP ISOL (two) - CL When P < 640 or QTY ≤ 41%, continue
P < 640 or QTY ≤ 41%	✓Good OMS TK ISOL (two) - OP ✓He PRESS/VAP ISOL (two) - OP L,R OMS XFEED (four) - OP Failed OMS TK ISOL (two) - CL He PRESS/VAP ISOL(two) - CL
N2 REG P HIGH or LOW	OMS ENG - ARM
N2 TK P LOW (✓CRT & meter)	When N2 TK P < 470: OMS ENG - ARM
OMS GMBL 1st FAIL	Select SEC GMBL (twice)
2nd FAIL	If control problems or high RCS fuel usage: OMS ENG FAIL
GPC1(4) with String 1(4)	Affected GPC MODE - STBY,HALT FF1(4) - OFF,ON L(R) OMS Gimbals - sel SEC
FA1(4)	L(R) OMS Gimbals - sel SEC

ASC-3a/37/A,O/B

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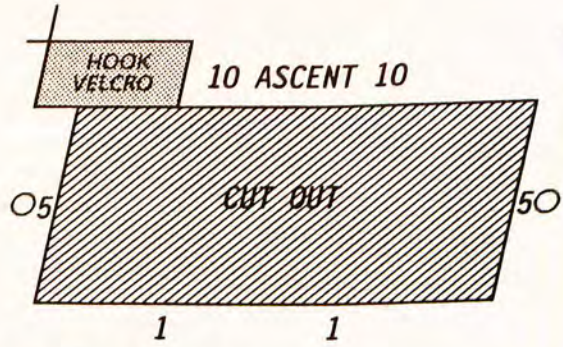
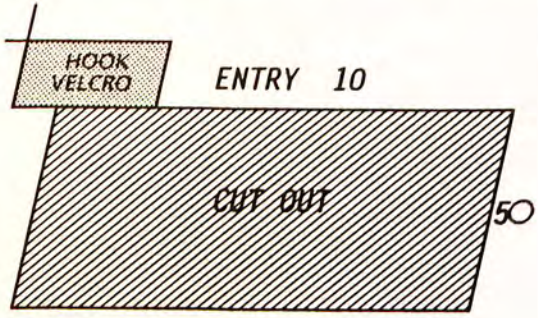
TOP



ADI ERROR/RATE SWITCH

ASC-4a/A,E/A

TOP
BACK OF 'ADI ERROR/RATE SWITCH'



R	a/g	Y
25	5/1.25	2.5
25	2/1.25	2.5
10	1/0.50	2.5

ASC-4b/A,E/A

TOP

ASCENT/ENTRY SPEC PASS	NO.	ASC-5a/A,E/A BFS	NO.
GPC MEMORY	0	BFS MEMORY	0
ENT CONTROL (OPS 3)	53		
HORIZ SIT	50	GNC	
IMU ALIGN (301)	21	HORIZ SIT	50
OVERRIDE	51	OVERRIDE	51
RCS (OPS 3)	23	SM	
STRK/COAS CNTL (301)	22	PL BAY DOORS	63

TOP
BACK OF 'ASCENT/ENTRY SPEC'

HOOK VELCRO SHIM

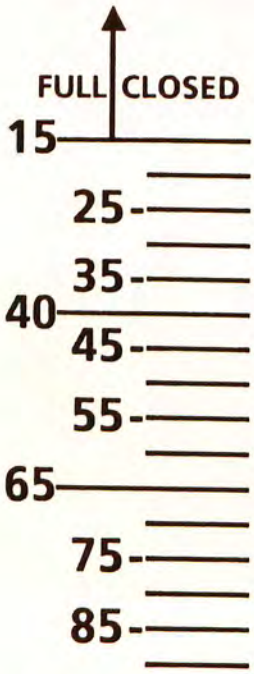
HOOK VELCRO SHIM

ASC-5b/A,E/A

TOP

ASC-6a/A,E/A

TOP
BACK OF 'SPEED BRAKE COMMAND'



SPEED BRAKE CMD
vs
SBTC TRAILING EDGE

HOOK VELCRO

HOOK VELCRO

ASC-6b/A,E/A

"Back of this card in ASC FS"

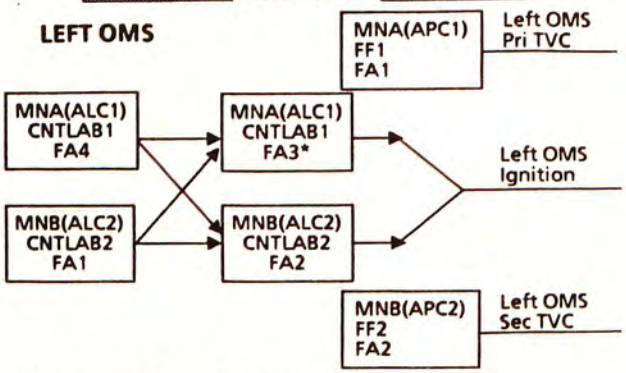
TOP
BACK OF 'OMS BURN MONITOR'

HOOK VELCRO

OMS FAILURES

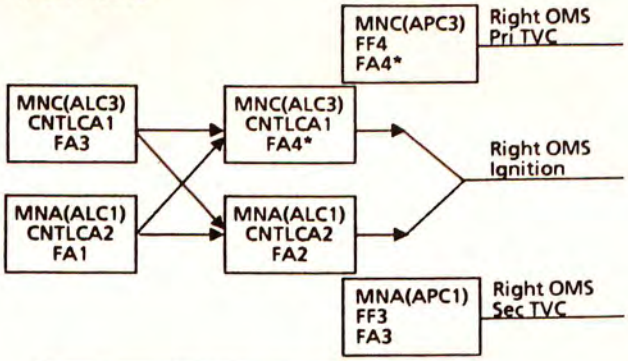
HOOK VELCRO

LEFT OMS



*Loss of FA3(4) or Pc Fail High:
Guidance will not downmode to single engine logic with closure of Left (Right) Arm/Press Switch.
(Guidance needles in error, TGO countdown slow, expect 6 sec underburn ~ 6 ft/sec)

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-3b/A,O,E/B

(reduced copy)

TOP

ENTRY ALPHA
(37 FLT CY R2)

VR	α	R	H	Ḣref	Rref	
24.8	40	4105	400			
24	40	2670	250	-45	L85	
23	40	2185	245	-62	74	
22	40	1815	235	-81	67	
21	41	1530	230	-103	63	
20	40	1300	225	-120	62	
19	40	1115	215	-144	62	
18	40	970	210	-167	63	
17	40	855	200	-186	63	
16	40	760	195	-195	R64	

TOP
BACK OF 'ENTRY ALPHA'

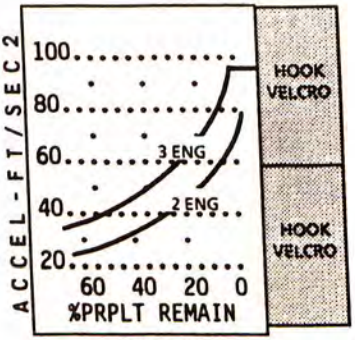
ASCENT ADI - NOMINAL
(37 FLT CY R2)

TIME	θ	Ḣ	H
0:30	70	627	9K
0:50	65	935	25K
1:10	60	1358	47K
1:30	43	1886	80K
1:50	36	2264	122K

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO



HOOK VELCRO

HOOK VELCRO

15	HI 44	LO	680	193	-119		62
14	43	42 37	605	185	-127		60
13	43	39 37	540	180	-137		60
12	43	39 37	475	175	-157		58
11	42	39 36	420	170	-199		56
10	41	38 35	365	163	-177		51
9	39	36 33	316	157	-210		47
8	36	35 30	268	152	-242	L40	
7	33	31 27	222	142	-268	38	
6	29	27 23	178	130	-273	41	
5	26	23 20	136	117	-273	42	
4	22	19 17	100	102	-264	R41	
3	19	15 15	71	89	-247	36	
2.5		13	60	82	-269		
2		11	49	77	-275		
1.5			37	67	-332		
1			27	52	-270		

α / MACH	L/D MAX	17	15	12
		3	2	1

-STAGING-

VI	θ	Ḣ	H
6	19	1772	38nm
7	16	1301	48
8	13	939	54
9	11	647	58
10	9	409	60
12	6	60	61
14	4	-152	61
16	2	-248	60
18	0	-243	59
20	0	-149	58
22	0	17	58
24	-1	227	58
26	0	482	60
26010	0	488	60

ENT-14a/37/A,E/C

ASC-14b/37/A/C

(reduced copy)

FAB USE ONLY

FS CC 10-11

ASC/37/FIN

TOP

HOOK VELCRO	AOA DEORBIT BURN (2 ENG)	HOOK VELCRO

✓MM302 ✓OMS BOTH CNTLR PWR (two) - ON
Enter TGO + 5 sec
✓TRIM: P = 0.0, LY -5.7, RY +5.7
✓DAP - AUTO (PASS)/DISC ADI - LVLH/HI/MED
L,R OMS He PRESS/VAP ISOL A (two) - GPC
B (two) - OP

TIG-2 OMS ENG (two) - ARM/PRESS
-:15 EXEC
-:15 If OMS AFT QTY < 11%, THC +X to OMS IGN +1 sec
:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

OMS PRPLT FAIL (CONTINUE BURN):
Failed OMS ENG - OFF
Item 18 + 0 EXEC
Affected OMS He PRESS (two) - CL
TK ISOL (two) - CL
When Pc < 80%, 2nd OMS ENG - OFF
Complete RCS (PRPLT FAIL)

OMS ENG FAIL (CONTINUE BURN):
Failed ENG - OFF
OMS XFEED at

[ ][ ] %L [ ][ ] %R 1/2 of ΔVTOT at FAIL [ ][ ][ ]

RCS COMPLETION:
ANY OMS PRPLT FAIL:
Interconnect to good OMS PRPLT
THC +X (✓OMS% vs RCS Burn Time)
AFT RCS RECONFIG

ASC-9a/37/A/C

HINGE

(reduced copy)

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

If DIRECT INSERTION:

THC +X to ΔVTOT = 0 or TOT AFT QTY 1 [0|8|7] %
If CUR ΔVTOT ≤ AFT ΔV [1|9], THC +X to ΔVTOT = 0
If CUR ΔVTOT ≤ PRI ΔV [4|8], FRCS to ΔVTOT = 0
If CUR ΔVTOT > PRI ΔV [4|8], THC +X to PRI ΔV or
TOT AFT QTY 2 [4|4], then FRCS to ΔVTOT = 0

If w/OMS 1:

THC +X to TGT HP or TOT AFT QTY 1 [0|8|7] %
If CUR HP ≤ AFT HP [| |], THC +X to TGT HP
If CUR HP ≤ PRI HP [| |], FRCS TO PRI Site
If CUR HP > PRI HP [| |] & ≤ B/U HP [| |], FRCS to B/U site
If CUR HP > B/U HP [|], THC +X to B/U HP [|] or
TOT AFT QTY 2 [4|4], then FRCS to B/U Site

MNVR to -X ATT (pitch up @ 3°/sec to
VGOz = (+)1/4ΔVTOT)
THC -X

BOTH OMS ENG FAIL:

OMS ENG - OFF
Interconnect OMS to RCS
THC +X (√OMS% vs RCS Burn Time)
OMS TK SW
THC +X (√OMS vs RCS Burn Time)

CUTOFF
+:02 OMS ENGs - OFF (If < 3 IMU, at[ ] :[ ])

* AFT RCS RECONFIG if INTERCONNECT *

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

ASC-9aa/37/A/C

(reduced copy)

FAB USE ONLY FS CC 10-13 ASC/37/FIN B

TOP

BACK OF 'AOA DEORBIT BURN (2 ENG)'

HOOK VELCRO	AOA DEORBIT BURN (1 ENG)	HOOK VELCRO

✓MM302 ✓OMS L or R CNTLR PWR (two) - ON
Enter TGO + 10 sec
✓TRIM: P = 0.0, LY +5.2, RY -5.2
✓DAP - AUTO (PASS)/DISC ADI - LVLH/HI/MED
L,R OMS He PRESS/VAP ISOL A (two) - OP
.....Wait 2 sec.....B (two) - OP

TIG-2 OMS ENG (good) - ARM/PRESS
-:15 EXEC
-:15 If OMS AFT QTY < 11%, THC +X to OMS IGN +1 sec
:00 TIG (✓Pc, ΔVTOT, ENG VLVs; start watch)

ΔVTOT: OMS XFEED RETURN
%

OMS PRPLT FAIL (CONTINUE BURN):
Failed OMS ENG - OFF
Item 18 + 0 EXEC
Affected OMS He PRESS (two) - CL
TK ISOL (two) - CL
XFEED (two) - CL
Complete RCS (PRPLT FAIL)

OMS ENG FAIL (CONTINUE BURN):
Failed ENG - OFF
Complete RCS (OMS ENG FAIL)

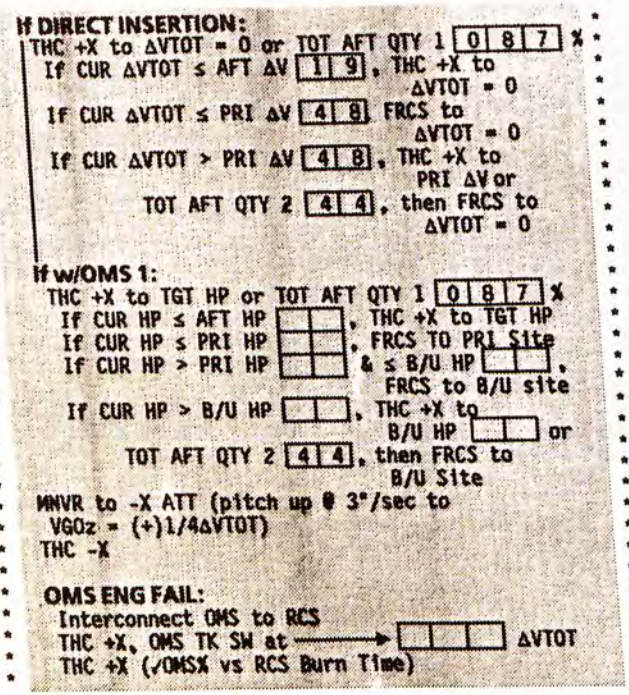
RCS COMPLETION:
OMS PRPLT FAIL:
Interconnect to good OMS PRPLT
THC +X (✓OMS% vs RCS Burn Time)
AFT RCS RECONFIG

ASC-9b/37/A/C

HINGE

(reduced copy)

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



CUTOFF
+:02 OMS ENGs - OFF (If < 3 IMU, at [ ] : [ ])

* AFT RCS RECONFIG if INTERCONNECT *

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

ASC-9bb/37/A/C

(reduced copy)

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TOP

AOA
DEORBIT
BURN (RCS)

✓MM302 ✓RCS SEL CNTLR PWR (two) - ON
✓DAP - MAN/DISC ADI - LVLH/MED/MED
✓RCS BURN CONFIG
TIG-2 L,R OMS He PRESS/VAP ISOL A (two) - OP
.....Wait 2 sec.....B (two) - OP

:00 +X
Maintain PITCH ATT ERR ±3°
Monitor ΔVTOT

[ ][ ][ ] ΔVTOT

OMS TK SW:
R OMS XFEED (two) - OP
L OMS XFEED (two) - CL

OMS PRPLT FAIL (CONTINUE BURN):
Affected OMS He PRESS (two) - CL
TK ISOL (two) - CL
XFEED (two) - CL
ITEM 18 + 0

..If OMS PRPLT LOW.....

Release THC at ⟶ [ ][ ] ΔVTOT
Aft RCS RECONFIG

If DIRECT INSERTION:
THC +X to ΔVTOT = 0 or TOT AFT QTY 1 [0][8][7] %
If CUR ΔVTOT ≤ AFT ΔV [1][9], THC +X to ΔVTOT = 0
If CUR ΔVTOT ≤ PRI ΔV [4][8], FRCS to ΔVTOT = 0
If CUR ΔVTOT > PRI ΔV [4][8], THC +X to PRI ΔV or
TOT AFT QTY 2 [4][4], then FRCS to ΔVTOT = 0

If w/OMS 1:
THC +X to TGT HP or TOT AFT QTY 1 [0][8][7] %
If CUR HP ≤ AFT HP [ ][ ], THC +X to TGT HP
If CUR HP ≤ PRI HP [ ][ ], FRCS TO PRI Site
If CUR HP > PRI HP [ ][ ] & ≤ B/U HP [ ][ ],
FRCS to B/U site
If CUR HP > B/U HP [ ][ ], THC +X to
B/U HP [ ][ ] or
TOT AFT QTY 2 [4][4], then FRCS to B/U Site
MNVR to -X ATT (pitch up @ 3°/sec to
VGOz = (+)1/4ΔVTOT)
THC -X

CUTOFF VGO_X = 0, RELEASE THC
AFT RCS RECONFIG
Trim inplane X,Z residuals < 2 fps
(< 0.5 fps if shallow)

ASC-7a/37/A/C

(reduced copy)

TOP

BACK OF 'AOA DEORBIT BURN (RCS)'

HOOK VELCRO

HOOK VELCRO

ASC-7b/37/A/A

(reduced copy)

FAB USE ONLY

FS CC 10-17

ASC/37/FIN B

TOP

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

BYD TAL REDESIGNATION
(37 FLT CY R2)

NOTE: DROOP IS 109% THROTTLE:
FOR 104% THROTTLE, ADD 300 FPS

1ST E.O. VI		5800	5900	6000	6100	6200	6300	6400
DROOP BYD (109)	(5)	11200	11200	11200	11300	11300	11300	11400
SE BYD (104)	(5)	16800	16700	16500	16300	16100	15900	15700

1ST E.O. VI		6500	6600	6700	6800	6900	7000	7100
DROOP BYD (109)	(5)	11400	11400	11500	11500	11500	11600	11600
SE BYD (104)	(5)	15600	15400	15200	15000	14800	14700	14500

1ST E.O. VI		7200	7300	7400	7500	7600	7700	7800
DROOP BYD (109)	(5)	11600	11600	11700	11700	11700	11700	11700
SE BYD (104)	(5)	14400	14200	14100	14000	13900	13800	13700

1ST E.O. VI		7900	8000	8100	8200	8300	8400	8500
DROOP BYD (109)	(5)	11700	11700	11800	11800	11800	11800	11800
SE BYD (104)	(5)	13700	13600	13600	13500	13500	13500	13500

1ST E.O. VI		8600	8700	8800	8900	9000	9100	9200
DROOP BYD (109)	(5)	11800	11800	11800	11800	11800	11800	11800
SE BYD (104)	(5)	13500	13500	13500	13500	13500	13500	13500

1ST E.O. VI		9300	9400	9500	9600	9700	9800
DROOP BYD (109)	(5)	11800	11800	11800	11800	11800	11800
SE BYD (104)	(5)	13500	13500	13600	13500	13500	13500

ASC-8a/37/A/C

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

(reduced copy)

FAB USE ONLY FS CC 10-18 ASC/37/FIN B

TOP
BACK OF 'BYD TAL REDESIGNATION'

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

BEN TAL REDESIGNATION
(37 FLT CY R2)

NOTE: DROOP IS 109% THROTTLE;
FOR 104% THROTTLE, ADD 300 FPS

1ST E.O. VI		6400	6500	6600	6700	6800	6900	7000
DROOP BYD (109)	(5)	11200	11300	11300	11300	11300	11400	11400
SE BYD (104)	(5)	-	-	16200	16100	16000	15800	15700
SE BEN (109)	(2)	17000	16900	16700	16600	16400	16200	16100

1ST E.O. VI		7100	7200	7300	7400	7500	7600	7700
DROOP BYD (109)	(5)	11400	11400	11500	11500	11500	11500	11500
SE BYD (104)	(5)	15600	15500	15300	15200	15100	15000	14900
SE BEN (109)	(2)	15900	15800	15600	15500	15400	15200	15100

1ST E.O. VI		7800	7900	8000	8100	8200	8300	8400
DROOP BYD (109)	(5)	11600	11600	11600	11600	11600	11600	11600
SE BYD (104)	(5)	14800	14700	14600	14500	14400	14400	14300
SE BEN (109)	(2)	15000	14900	14800	14800	14700	14700	14600

1ST E.O. VI		8500	8600	8700	8800	8900	9000	9100
DROOP BYD (109)	(5)	11700	11700	11700	11700	11700	11700	11700
SE BYD (104)	(5)	14200	14200	14200	14100	14100	14100	14100
SE BEN (109)	(2)	14600	14600	14500	14500	14500	14500	14500

1ST E.O. VI		9200	9300	9400	9500	9600	9700	9800
DROOP BYD (109)	(5)	11700	11700	11700	11700	11700	11700	11700
SE BYD (104)	(5)	14000	14000	14000	14000	13900	13900	13900
SE BEN (109)	(2)	14500	14500	14500	14500	14500	14500	14500

ASC-8b/37/A/C

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

(reduced copy)

FAB USE ONLY FS CC 10-19 ASC/37/FIN B

TOP

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

MRN TAL REDESIGNATION
(37 FLT CY R2)

NOTE: DROOP IS 109% THROTTLE:
FOR 104% THROTTLE, ADD 300 FPS

1ST E.O. VI		7700	7800	7900	8000	8100	8200	8300
DROOP BEN (109)	(2)	11400	11300	11200	11200	11100	11000	10900
SE BYD (104)	(5)	-	-	-	-	-	-	-
SE BEN (104)	(2)	15800	15600	15400	15300	15100	14900	14700
SE MRN (109)	(3)	17300	17100	16900	16700	16500	16300	16100

1ST E.O. VI		8400	8500	8600	8700	8800	8900	9000
DROOP BEN (109)	(2)	10900	10800	10800	10800	10800	10800	10900
SE BYD (104)	(5)	-	-	-	-	-	-	15200
SE BEN (104)	(2)	14600	14500	14300	14300	14200	14200	14300
SE MRN (109)	(3)	15900	15800	15700	15600	15600	15700	15700

1ST E.O. VI		9100	9200	9300	9400	9500	9600	9700
DROOP BEN (109)	(2)	10900	11000	11100	11200	11300	11400	11500
SE BYD (104)	(5)	15100	15000	14900	14900	14800	14700	14600
SE BEN (104)	(2)	14300	14400	14400	14500	14600	14700	14800
SE MRN (109)	(3)	15800	16000	16100	16300	16400	16600	16800

1ST E.O. VI		9800
DROOP BEN (109)	(2)	11600
SE BYD (104)	(5)	14500
SE BEN (104)	(2)	14900
SE MRN (109)	(3)	16900

ASC-10a/37/A/C

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

(reduced copy)

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FS CC 10-20

ASC/37/FIN B

TOP
BACK OF 'MRN TAL REDESIGNATION'

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

ASC-10b/37/A/A

HOOK VELCRO

HOOK VELCRO

HOOK VELCRO

(reduced copy)

FAB USE ONLY

FS CC 10-21

ASC/37/FIN B