

Entry Checklist

STS-400 Flight Supplement

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

**Final
April 18, 2008**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



ENTRY C/L, STS-400 FLT SUPPL

FINAL (April 18, 2008)

PCN-1 (Sept 8, 2008) Sheet 1 of 1

List of Implemented Change Requests (482s):

ENT_FS-0010

Incorporate the following:

1. Replace FS xi thru FS xiv
2. After FS CC 8-18, add FS CC 8-20a thru FS CC 8-20d (4 pgs)

Prepared by:


Book Manager
Lead, Entry GPO

Approved by:


Chief, Ascent/Descent Dynamics Branch

Encl: 8 pages

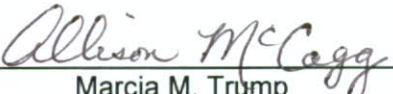
File this PCN immediately behind the front cover as a permanent record

MISSION OPERATIONS DIRECTORATE

**ENTRY CHECKLIST
STS-400 FLIGHT SUPPLEMENT**

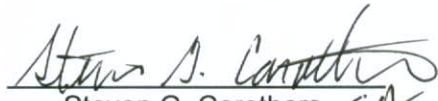
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PREPARED BY:

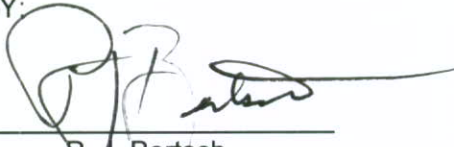


Marcia M. Trump
Book Manager

APPROVED BY:



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

Additional distribution of this book, for official use only, may be requested in writing to DO3/PMO Administrator. The request must include justification and requester's name, organization, position, and phone number. Contractor requests are made through the NASA or DOD organization supported. Deletions, reduction in quantity, or change of address may be submitted to DO3/FDF Management Office, 281-244-1184.

Incorporates the following:
482#: MULTI-1816

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DM43/M. Trump	281-483-8029
Deorbit Burn to Entry Interface	DM43/G. Pogue	281-483-8067
Contingency Procedures and Entry Interface thru Rollout	DM43/G. Pogue	281-483-8067

NOTE

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

ENTRY CHECKLIST
STS-400 FLIGHT SUPPLEMENT

LIST OF EFFECTIVE PAGES

FINAL 04/18/08
PCN-1 09/08/08

Sign Off	* generic	3-9.....	generic
ii.....	* generic	3-10.....	generic
Sign Off	* 400/FIN	3-11.....	generic
FS iv	* 400/FIN	3-12.....	generic
v	* generic	3-13.....	generic
vi.....	* generic	3-14.....	generic
vii.....	* generic	FS 3-15	400/FIN
viii.....	* generic	FS 3-16	400/FIN
ix.....	* generic	FS 3-17	400/FIN
x	* generic	FS 3-18	400/FIN
FS xi.....	* 400/FIN 1	3-19.....	generic
FS xii.....	* 400/FIN 1	3-20.....	generic
FS xiii	* 400/FIN 1	3-21.....	generic
FS xiv	* 400/FIN	3-22.....	generic
xv.....	generic	3-23.....	generic
xvi.....	generic	3-24.....	generic
1-1 (3 pgs).....	† generic	3-25.....	generic
1-2 (3 pgs).....	† generic	3-26.....	generic
2-1	generic	3-27	generic
2-2 (6 pgs).....	† generic	3-28.....	generic
2-3 (6 pgs).....	† generic	FS 3-29	400/FIN
2-4	generic	FS 3-30	400/FIN
FS 2-5	400/FIN	3-31	generic
FS 2-6	400/FIN	3-32.....	generic
FS 3-1	400/FIN	FS 3-33	400/FIN
FS 3-2	400/FIN	FS 3-34	400/FIN
FS 3-3	400/FIN	3-35.....	generic
FS 3-4	400/FIN	3-36.....	generic
3-5.....	generic	3-37.....	generic
3-6.....	generic	3-38.....	generic
FS 3-7	400/FIN	3-39.....	generic
FS 3-8	400/FIN	3-40.....	generic

* – Omit from flight book

† – Extra pages in crew copy only

3-41.....	generic	5-23.....	generic
3-42.....	generic	5-24.....	generic
3-43.....	generic	6-1.....	generic
3-44.....	generic	6-2.....	generic
4-1.....	generic	6-3.....	generic
4-2.....	generic	6-4.....	generic
4-3.....	generic	7-1.....*	generic
4-4.....	generic	7-2.....*	generic
FS 4-5.....	400/FIN	FS 8-1.....*	400/FIN
FS 4-6.....	400/FIN	FS CC 8-2.....*	400/FIN
FS 4-7.....	400/FIN	FS CC 8-3.....*	400/FIN
FS 4-8.....	400/FIN	FS CC 8-4.....*	400/FIN
FS 4-9.....	400/FIN	CC 8-5.....*	generic
FS 4-10.....	400/FIN	CC 8-6.....*	generic
4-11.....	generic	CC 8-7.....*	generic
4-12.....	generic	CC 8-8.....*	generic
5-1.....	generic	CC 8-9.....*	generic
5-2.....	generic	CC 8-10.....*	generic
5-3.....	generic	CC 8-11.....*	generic
5-4.....	generic	CC 8-12.....*	generic
5-5.....	generic	CC 8-13.....*	generic
5-6.....	generic	CC 8-14.....*	generic
5-7.....	generic	CC 8-15.....*	generic
5-8.....	generic	CC 8-16.....*	generic
5-9.....	generic	FS CC 8-17.....*	400/FIN
5-10.....	generic	FS CC 8-18.....*	400/FIN
5-11.....	generic	CC 8-19.....*	generic
5-12.....	generic	8-20.....*	generic
5-13.....	generic	FS CC 8-20a.....*	400/FIN 1
5-14.....	generic	FS CC 8-20b.....*	400/FIN 1
5-15.....	generic	FS CC 8-20c.....*	400/FIN 1
5-16.....	generic	FS CC 8-20d.....*	400/FIN 1
5-17.....	generic	CC 8-21.....*	generic
5-18.....	generic	CC 8-22.....*	generic
FS 5-19.....	400/FIN	FS CC 8-23.....*	400/FIN
FS 5-20.....	400/FIN	FS CC 8-24.....*	400/FIN
5-21.....	generic		
5-22.....	generic		

* – Omit from flight book

ENTRY CUE CARDS

<u>Title</u>	<u>Ref. Page</u>	<u>Card No.</u>
DEORBIT BURN FLIGHT		
RULES (Front).....	FS CC 8-2	ENT-1a/400/D/A
(Back).....	FS CC 8-3	ENT-1b/400/D/A
DEORBIT BURN (RCS)		
(Front)	FS CC 8-4	ENT-3a/D/L
(Back).....	CC 8-6	generic
DEORBIT BURN (2 ENG)		
(Front)	CC 8-8	generic
DEORBIT BURN (1 ENG)		
(Back).....	CC 8-10	generic
UNBALANCED PRPLT		
DEORBIT BURN		
(Front)	CC 8-12	generic
DEORBIT BURN (MIXED		
XFEED) (Back).....	CC 8-14	generic
ENTRY MANEUVERS		
(Front)	CC 8-16	generic
(Back).....	FS CC 8-17	ENT-6b/400/E/A
ENTRY NO-GO CHECKLIST		
(Front)	FS CC 8-18	ENT-7a/E/K
EMERGENCY EGRESS		
(Back).....	CC 8-19	generic
STS-400 MIDDECK		
EMERGENCY EGRESS		
(Front/Left Side)	FS CC 8-20a	ENT-8a/400/E/A
(Front/Right Side).....	FS CC 8-20b	ENT-8aa/400/E/A
(Back/Left Side).....	FS CC 8-20c	ENT-8b/400/E/A
(Back/Right Side)	FS CC 8-20d	ENT-8bb/400/E/A
ENTRY CONTROL		
(Front)	CC 8-21	generic
(Back).....	CC 8-22	generic
DEORBIT BURN MONITOR		
(Front)	FS CC 8-23	ENT-2a/400/A,O,D,E/A
OMS FAILURES (Back)....	FS CC 8-24	ENT-2b/400/A,O,D,E/A



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OMS/
RCS ΔV

OMS/RCS ΔV

FS 2-5

ENT/400/FIN



OMS He PRESS/ Δ V/BURN TIME

OMS/
RCS Δ V

OMS% GAGE	OMS He Press *	OMS Δ V	RCS Δ V	RCS BURN MIN:SEC
50	3270	276	230	7:18
40	2870	215	180	5:42
38	2790	203	170	5:23
36	2710	191	160	5:04
34	2630	179	150	4:45
32	2550	167	140	4:26
30	2470	155	130	4:07
28	2390	143	120	3:48
26	2310	131	110	3:28
24	2230	119	100	3:09
22	2150	106	90	2:50
20	2070	94	80	2:31
18	1990	82	70	2:12
16	1910	70	59	1:52
14	1830	57	49	1:33
12	1750	45	38	1:13
10	1670	33	28	0:53
8	1590	21	17	0:34
6	1510	8	7	0:14
5	1470	2	2	0:04

* He pressure not valid until 1 hr after last burn

ΔV CAPABILITY	
ARCS Δ V fps =	$\boxed{0.9} \times [L\% + R\% - \text{AFT QTY } 1]$
FRCS Δ V fps =	$\boxed{0.9} \times \text{FRCS } \%$
OMS Δ V fps =	$\boxed{6.0} \times \text{OMS } \%$

NOTE: Uses assumed vehicle weight of 217,140 lb



DEORBIT BURN

DEORBIT
BURN



FS 3-1

ENT/400/FIN

**STS-400 LANDING SITE TABLE
(28.45° to 49.9° INCLINATION)**

**DEORBIT
BURN**

S I T E	LOCATION	RWY	MLS CH	LG	+ OVR RUN
1	KSC	KSC 15 KSC 33	8 6	15000 15000	1000 1000
2	BEN GUERIR	BEN 36 BEN 18	- -	13720 13220	0 1000
3	MORON AB	MRN 20 MRN 02	◆6 -	11730 11730	1000 1000
4	ZARAGOZA	ZZA 30L ZZA 12R	◆6 -	12200 12200	1000 1010
5	BANJUL INT'L	BYD 32 BYD 14	- -	11820 11820	1000 1000
6	BERMUDA	BDA 30 BDA 12	- -	9210 9210	0 0
7	AMILCAR CABRAL	AML 01 AML 19	- -	9350 9350	0 0
8	LAS PALMAS	GDV 03L GDV 21R	- -	9670 9670	0 0
9	LAJES	LAJ 15 LAJ 33	- -	10870 10870	970 990
10	BEJA	BEJ 01L BEJ 19R	- -	10820 10820	0 900
11	ISTRES AB	FMI 33 FMI 15	◆6 -	11300 12300	3960 0
12	WILMINGTON INT'L	ILM 06 ILM 24	- -	7500 7500	0 0
13	*MORON AB	MRN 20 MRN 02	◆6 -	11730 11730	1000 1000
14	CHERRY POINT	NKT 32L NKT 23R	- -	7110 7100	800 880
15	MATAVERI INT'L	EIP 10 EIP 28	- -	10390 10390	0 0

◆ Available for TAL Only

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

**STS-400 LANDING SITE TABLE
(28.45° to 49.9° INCLINATION)**

S I T E	LOCATION	RWY	MLS CH	LG	+ OVR RUN
16	MONROVIA	LRB 04 LRB 22	- -	9300 9300	0 0
17	NDJILI INT'L	KIN 24 KIN 06	- -	14920 14920	0 0
18	HOEDSPRUIT	AHS 18 AHS 36	- -	13100 13100	980 1740
19	TAMANRASSET	AAT 02 AAT 20	- -	11310 11310	0 0
20	SOUDA	GSA 29 GSA 11	- -	10490 10490	0 0
21	KING KHALID	KKI 15R KKI 33L	- -	13300 13300	0 0
22	DIEGO GARCIA	JDG 31 JDG 13	- -	12000 12000	950 950
23	PEARCE	PEA 18L PEA 36R	- -	7500 7500	0 0
24	TINDAL RAAF	PTN 14 PTN 32	- -	8500 8500	0 0
25	AMBERLEY	AMB 15 AMB 33	- -	9500 9500	0 0
26	YOKOTA AB	JTY 36 JTY 18	- -	11000 11000	1000 1000
27	ANDERSEN AFB	GUA 06L GUA 24R	- -	10560 10560	1050 1000
28	WAKE ISLAND	WAK 28 WAK 10	- -	9360 9360	0 0
29	HONOLULU	HNL 08R HNL 26L	- -	11500 11500	0 0
30	HAO ATOLL	HAO 12 HAO 30	- -	10390 10390	0 0

Length after displaced threshold

**STS-400 LANDING SITE TABLE
(28.45° to 49.9° INCLINATION)**

S I T E	LOCATION	RWY	MLS CH	LG	+ OVR RUN
31	ASCENSION	HAW 13	-	9520	0
		HAW 31	-	9520	0
32	ESENBOGA	ESN 03R	-	11800	0
		ESN 21L	-	11800	0
33	NASSAU	YNN 14	-	10520	0
		YNN 32	-	10520	0
34	SKID STRIP	PMR 13	-	9500	0
		PMR 31	-	9500	0
35	ORLANDO INT'L	MCO 18R	-	11500	700
		MCO 36L	-	12000	200
36	CECIL FIELD	NZC 18L	-	12000	0
		NZC 36R	-	12000	0
37	MACDILL AFB	MCF 04	-	10920	0
		MCF 22	-	10920	0
38	CHINA LAKE	NID 03	-	9490	0
		NID 21	-	9490	0
39	VANDENBERG	VBG 12	-	14500	0
		VBG 30	-	14500	0
40	EDW TEMP	EDT 22R	8	12000	1000
		EDT 04L	6	12000	1000
41	NORTHROP	NOR 17	6	15000	Lkbd
		NOR 23	6	15000	Lkbd
42	NORTHROP	NOR 05	-	15000	Lkbd
		NOR 35	-	15000	Lkbd
43	EDWARDS AFB	EDW 15	-	16300	Lkbd
		EDW 33	-	16300	Lkbd
44	EDWARDS AFB	EDW 18L	-	15000	Lkbd
		EDW 18L	-	15000	Lkbd
45	EDWARDS AFB	EDW 22	8/†	15010	0
		EDW 04	6	14010	1800

† MSBLS Jr. Ch 8 - Requires Uplink

Length after displaced threshold

FS 3-4

ENT/400/FIN

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

HORIZ SIT CONFIG

ALTM – ITEM 9 +

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

	<u>PASS ITEM</u>		<u>BFS ITEM</u>	
PTI	INH	√1		
LAND SITE (DEL PAD)		√41		√41
RWY (DEL PAD)		√3		√3
		√4		√4
TAEM TGT				
G&N	OVHD	√6	blank	
HSI	blank		blank	
XEP	NEP	√7	NEP	√7
AIM (DEL PAD)	NOM	√8	NOM	√8
	(or CLSE)		or (CLSE)	
SPDBK	NOM	√39		
NAV				
GPS	INH	√43	INH	√43
DRAG H	AUT	√22	AUT	√22
ADTA H	INH	√26	INH	√26
MLS	AUT	√50		
G&C				
GPS	INH	√48		
ADTA	INH	√29	AUT	√28

- * If BFS engaged: *
- * Set BFS HSD ITEMS to PASS config *

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

Hemi	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
N Desc	23	23	23	23	22	24	24	24	22	23	23	23
S Asc	24	24	22	23	23	23	23	23	23	23	22	24
N Asc	22											
S Desc	22											

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

3: GNC 51 OVERRIDE

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

3: BFS, GNC 51 OVERRIDE

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

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

2: GNC DEORB MNVR COAST

3: BFS, GNC DEORB MNVR COAST

- √BFS GMBL sel config same as PASS GMBL sel config



DEORBIT BURN CARDS

**BURN
CARDS**

MS ONLY

FS 3-15

ENT/400/FIN



DEORBIT BURN FLIGHT RULES
ONE-ORBIT LATE AVAILABLE ENT-1a/400/D/A

**BURN
CARDS**

FAILURE	PRE TIG		POST TIG
	Delay (max)		Stop Burn, > Safe HP
	One Orbit	One Day	
APU/HYD			
1 No APU operating .....	... X ...	.....
DPS			
2 RDNT fail, Split.....	.....	...X...	.....X
3 1 GPC.....	... X ...	.....
4 BFS .....	.....	...X...	
5 GPC BITE (Multiple GPCs) .....	.....	...X...	
ECLS			
6 2 Av Bay Fans in Bay 3.....	... X ...	.....
7 2 Av Bay Fans in Bay 1 or 2.....	.....	...X...	
ELEC			
8 H2 Manf or TK leak (not in depleted tk(s) _____).....	... X ...	.....
9 2 MN Buses.....	.....	...X...	.....X
10 CNTL CA1 (No BFS Engage in GPC 3/5).....	.....	...X...	
11 Multi Φ AC BUS (unshorted) .....	... X ...	.....
GNC			
12 1 MLS (if reqd), IMU, or GPS (C-band not avail).....	... X ...	.....
13 IMU Dilemma.....	.....	...X...	.....X
14 RHC Dilemma .....	... X ...	.....
15 2 IMUs (Not targeting EDW/NOR) .....	.....	...X...	
16 2 ADTAs (Winds > 80kts or Dynamic Wx) ....	... X ...	.....
HOOK VELCRO			HOOK VELCRO
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	... X ...	.....
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	... X ...	.....
OMS			
19 Prplt Tank .....	... X ...	.....	.....X ①
20 Ignition (neither eng ignites).....	... X ...	.....	.....X ②
21 Both OMS Eng fail.....	.....	.....	.....X ②
22 Prplt Lk after LAST LOS.....	perigee adjust		
AFT RCS			
23 2 jets, same direction, same pod .....	... X ...	.....
24 Prplt Lk after LAST LOS.....	... X ...	.....
25 1 AFT RCS PROP TK fail .....	... X ...	.....
COMM			
26 MCC GO for DEORBIT not rcvd .....	.....	...X...	

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

DEORBIT BURN FLIGHT RULES
ONE-ORBIT LATE NOT AVAILABLE ENT-1b/400/D/A

FAILURE	PRE TIG	POST TIG
	Delay (max)	Stop Burn, > Safe HP
	One Day	
APU/HYD		
1 No APU operating .....	..... X	
DPS		
2 RDNT fail, Split.....	..... X .....	.....X
3 1 GPC.....	..... X	
4 BFS .....	..... X	
5 GPC BITE (Multiple GPCs) .....	..... X	
ECLS		
6 2 Av Bay Fans in Bay 3.....	..... X	
7 2 Av Bay Fans in Bay 1 or 2.....	..... X	
ELEC		
8 H2 Manf or TK leak (not in depleted tk(s) .....	..... X	
9 2 MN Buses.....	..... X .....	.....X
10 CNTL CA1 (No BFS Engage in GPC 3/5).....	..... X	
11 Multi Φ AC BUS (unshorted) .....	..... X	
GNC		
12 1 MLS (if reqd), IMU, or GPS (C-band not avail) .....	..... X	
13 IMU Dilemma.....	..... X .....	.....X
14 RHC Dilemma .....	..... X	
15 2 IMUs (Not targeting EDW/NOR) .....	..... X	
16 2 ADTAs (Winds > 80kts or Dynamic Wx) .....	..... X	
HOOK VELCRO		HOOK VELCRO
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	..... X	
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	..... X	
OMS		
19 Prplt Tank.....	..... X .....	.....X ①
20 Ignition (neither eng ignites).....	..... X .....	.....X ②
21 Both OMS Eng fail.....	..... X .....	.....X ②
22 Prplt Lk after LAST LOS.....	perigee adjust	
AFT RCS		
23 2 jets, same direction, same pod .....	..... X	
24 Prplt Lk after LAST LOS.....	..... X	
25 1 AFT RCS PROP TK fail .....	..... X	
COMM		
26 MCC GO for DEORBIT not rcvd .....	..... X	

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

DEORBIT BURN (2 ENG)

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

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

*** OMS PRPLT FAIL:** *

* Failed OMS ENG – OFF *

* STOP BURN: *

L OMS	R OMS	Good OMS ENG – OFF	*
FAIL HP	FAIL HP	APUs – SHUT DN	*
[][]	[][]	Secure aff OMS	*

CONTINUE BURN: *

ITEM 18 +0 EXEC *

When good OMS QTY: *

5%: L,R OMS XFEED (four) – OP *

4%: Good OMS TK ISOL (two) – CL *

 If OMS P_C < 80 or OMS TEMP, *

 OMS ENG – OFF *

 √ADI – LVLH, center needles *

 RCS COMPLETION *

*** OMS ENG FAIL:** *

* Failed OMS ENG – OFF *

* OMS XFEED at 1/2 ΔVTOT at fail [][][][] *

* or OMS QTY [][] %L or [][] %R *

*** 2nd OMS FAIL (ENG or PRPLT):** *

* Failed OMS ENG – OFF *

* If PRPLT FAIL: *

* Secure aff OMS *

* ITEM 18 +0 EXEC *

Both	Either	STOP BURN:	*
ENG FAIL	PRPLT FAIL	APUs – SHUT DN	*
HP	(SAFE) HP		*
[][][]	[][]		*

CONTINUE BURN: *

√ADI – LVLH, center needles *

Interconnect good OMS to RCS *

 THC +X (√OMS% vs RCS Burn Time) *

 RCS I'CNCT TK SW (N/A PRPLT FAIL) *

 THC +X (√OMS% vs RCS Burn Time) *

 AFT RCS RECONFIG *

 RCS COMPLETION *

ENT-4a/D/L

MS ONLY

FS 3-18

ENT/400/FIN

DEORBIT BURN MONITOR

OMS TEMP*	<table border="1" style="margin: auto;"> <thead> <tr> <th></th> <th>L</th> <th>R</th> </tr> </thead> <tbody> <tr> <td>≥</td> <td>219</td> <td>220</td> </tr> <tr> <td>≤</td> <td>201</td> <td>208</td> </tr> </tbody> </table>		L	R	≥	219	220	≤	201	208	
	L	R									
≥	219	220									
≤	201	208									
FU IN P		OMS ENG FAIL									
or No FU IN P		OMS PRPLT FAIL									
OMS PC* & OMS ↓ (BFS: √accel)											
ENG VLV 1 or 2 < 70		OMS ENG FAIL									
or OX IN P > 227											
OX IN P ≤ 227		OMS PRPLT FAIL									
or No OX IN P											
OMS OX/FU TK P (√ENG IN P)											
OX/FU LOW		He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At PC < 72 or OMS TEMP: OMS PRPLT FAIL									
OX & FU HIGH		He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284									
OMS GMBL	PRI fail	L(R) OMS GMBL – SEC (twice)									
	SEC fail	If high RCS usage: OMS ENG FAIL									
GPC	1(4) & Burning OMS aff	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC (twice)									
	SEC GMBL lost	If high RCS usage: OMS ENG FAIL									
	2 FAs lost	√MAN SHUTDN									
I/O ERROR FA	1(4)	L(R) OMS GMBL – SEC									
		I/O RESET (if recov: BFS I/O RESET) If high RCS usage: OMS ENG FAIL									
	2 FAs lost	√MAN SHUTDN									
BCE STRG D		I/O RESET (if recov: >>)									
	1(4)	If high RCS usage: L(R) OMS GMBL – SEC (twice)									
RM DLMA IMU											
or	ABOVE SAFE HP ⇒ <input type="checkbox"/>	STOP BURN: OMS ENG(s) – OFF >>									
GPC SET SPLIT											
or	BELOW SAFE HP ⇒	IMU DLMA: After C/O: √timer G21 If any IMU ACC > 0.03: aff IMU – desel I'cncnt OMS to RCS (√RCS Burn Time) THC +X to TGT HP (EOM) or 3.5 x timer at C/O (AOA) SET SPLIT: Go to "GPC" above									
2 MN BUSES											
I/O ERROR PCM		OI PCMMU PWR – 2(1)									

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

ENT-2a/400/A,O,D,E/A

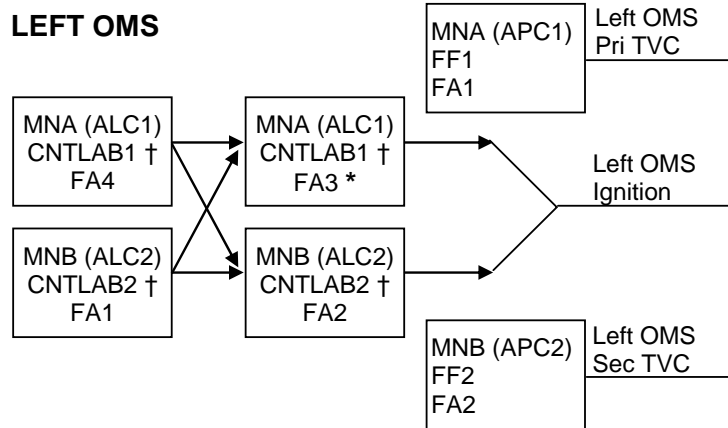
MS ONLY

FS 3-29

ENT/400/FIN

OMS FAILURES

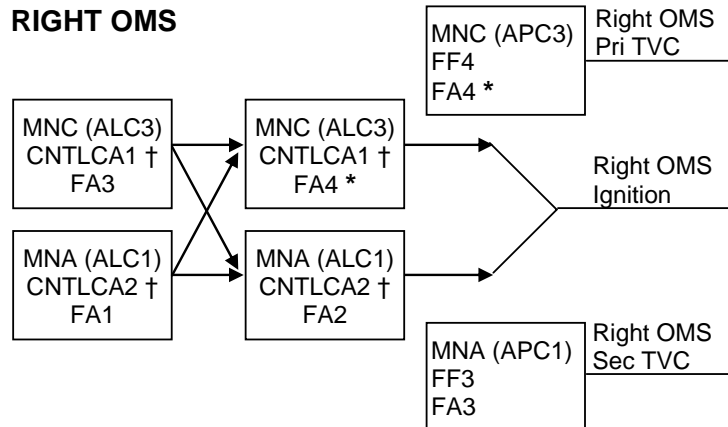
LEFT OMS



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

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

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

ENT-2b/400/A,O,D,E/A

MS ONLY

FS 3-30

ENT/400/FIN

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

- * **UNDERBURN** *
- * Determine Δ HP (CUR HP – TGT HP) *
- * Record prebank on ENTRY MANEUVERS Cue Card *

* **PREBANK TABLE EDW (HA = 307 NM)** *

EDW										
Δ HP	0	3	6	9	12	REDES.	13	(14)	REDES.	
PREBANK	0	75	105	125	160	NOR ELS	180	180	KSC	
NOR								IF NOR NOGO		
G50 ITEM 41 +4 1, \sqrt RWY 17										
Δ HP		10	11	12	13	15	16	(17)	REDES.	
PREBANK		105	115	120	130	160	180	180	KSC	
KSC										
G50 ITEM 41 +0 1, \sqrt RWY 15										
Δ HP						15	17	18	19	21 (22)
PREBANK						105	120	130	145	180 180

* **PREBANK TABLE KSC (HA = 307 NM)** *

KSC										
Δ HP	0	2	4	6	8	11	13	(14)	REDES.	
PREBANK	0	55	85	105	115	145	180	180	BDA	
BDA										
G50 ITEM 41 +0 6, \sqrt RWY 30										
Δ HP							15	17	(19)	RED.
PREBANK							140	175	180	AML
AML										
G50 ITEM 41 +0 7, \sqrt RWY 01										
Δ HP									20	22
PREBANK									125	180

400 ocf

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

C CRT1 **GNC, OPS 303 PRO**

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

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

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

Mnvr to EI-5 ATT – ITEM 27 EXEC (*)	TIME to EI (min)	LVLH PITCH (deg)
	20	339
		343
		347
* If UNDERBURN or no *		351
* DEL PAD, manually *		355
* mnvr to LVLH R 001, *	15	359
* Y 358, P per table *		3
		7
		11
		15
	10	19
		23
		27
		31
		35
	5	39

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

CRT1 Verify GMBL positions:

	<u>L</u>	<u>R</u>
P	+5.9	+5.9
Y	+6.4	-6.4

GMBL OFF – ITEM 32 EXEC
– ITEM 33 EXEC

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

ENT-6b/400/E/A
(Partial)

MS ONLY

FS 4-5

ENT/400/FIN



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MS ONLY

FS 4-6

ENT/400/FIN



DRAG CHUTE DEPLOY

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

FAILED TIRE TECHNIQUE

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

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

ENT-6b/400/E/A
(Partial)

ENTRY
MISC

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MS ONLY

FS 4-8

ENT/400/FIN

ENTRY ALPHA

VR	α ref	R	H	Href	Rref
25	HI 40 LO	4275	400		
24	HI 40 LO	2733	249	-44	L84
23	43 40 37	2241	240	-60	74
22	43 40 37	1862	234	-78	67
21	43 40 37	1566	227	-99	63
20	43 40 37	1332	222	-115	R61
19	43 40 37	1146	215	-136	60
18	43 40 37	997	208	-158	62
17	43 40 37	871	201	-176	62
16	43 40 37	768	195	-188	64

KSC 15

<table border="1" style="margin: auto;"> <thead> <tr><th colspan="2">MAX L/D</th></tr> <tr><th>M</th><th>α</th></tr> </thead> <tbody> <tr><td>3</td><td>17</td></tr> <tr><td>2</td><td>15</td></tr> <tr><td>1</td><td>12</td></tr> </tbody> </table>	MAX L/D		M	α	3	17	2	15	1	12	(400 OCF CY) HOOK VELCRO
MAX L/D											
M	α										
3	17										
2	15										
1	12										
ASC-14b/400/A,E/A	HOOK VELCRO										

15	43 40 37	685	189	-202	65
14	43 40 37	613	183	-127	63
13	43 40 37	545	180	-136	61
12	43 40 37	483	176	-152	59
11	42 39 36	428	172	-192	L56
10	41 38 35	378	167	-173	48
9	39 36 33	326	161	-206	44
8	37 34 31	277	154	-239	40
7	33 30 27	231	144	-266	39
6	30 27 24	184	133	-272	40
5	26 23 20	143	120	-274	41
4	22 19 18	107	108	-262	R38
3	19 16 15	75	92	-248	38
2.5	14	61	85	-214	
2	13	50	79	-260	
1.5	10	38	69	-314	
1	8	28	54	-261	

HOOK VELCRO

MS ONLY

FS 4-9

ENT/400/FIN



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MS ONLY

FS 4-10

ENT/400/FIN



1:	2:
3:	

POST LANDING PAYLOAD ACTIVITIES

N/A



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CUE CARD
CONFIG

ENTRY CUE CARD CONFIG

FAB USE ONLY

FS 8-1

ENT/400/FIN

DEORBIT BURN FLIGHT RULES
ONE-ORBIT LATE AVAILABLE ENT-1a/400/D/A

FAILURE	PRE TIG		POST TIG
	Delay (max)		Stop Burn, > Safe HP
	One Orbit	One Day	
APU/HYD			
1 No APU operating .....	... X ...	.....
DPS			
2 RDNT fail, Split.....	.....	...X...	.....X
3 1 GPC.....	... X ...	.....
4 BFS .....	.....	...X...	
5 GPC BITE (Multiple GPCs).....	.....	...X...	
ECLS			
6 2 Av Bay Fans in Bay 3.....	... X ...	.....
7 2 Av Bay Fans in Bay 1 or 2.....	.....	...X...	
ELEC			
8 H2 Manf or TK leak (not in depleted tk(s)).....	... X ...	.....
9 2 MN Buses.....	.....	...X...	.....X
10 CNTL CA1 (No BFS Engage in GPC 3/5).....	.....	...X...	
11 Multi Φ AC BUS (unshorted) .....	... X ...	.....
GNC			
12 1 MLS (if reqd), IMU, or GPS (C-band not avail).....	... X ...	.....
13 IMU Dilemma.....	.....	...X...	.....X
14 RHC Dilemma .....	... X ...	.....
15 2 IMUs (Not targeting EDW/NOR) .....	.....	...X...	
16 2 ADTAs (Winds > 80kts or Dynamic Wx) ....	... X ...	.....
HOOK VELCRO			HOOK VELCRO
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	... X ...	.....
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	... X ...	.....
OMS			
19 Prplt Tank.....	... X ...	.....	.....X ①
20 Ignition (neither eng ignites).....	... X ...	.....
21 Both OMS Eng fail.....	.....	.....	.....X ②
22 Prplt Lk after LAST LOS.....	perigee adjust		
AFT RCS			
23 2 jets, same direction, same pod .....	... X ...	.....
24 Prplt Lk after LAST LOS.....	... X ...	.....
25 1 AFT RCS PROP TK fail .....	... X ...	.....
COMM			
26 MCC GO for DEORBIT not rcvd .....	.....	...X...	

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

(reduced copy)

TOP
BACK OF 'DEORBIT BURN FLIGHT RULES'

DEORBIT BURN FLIGHT RULES
ONE-ORBIT LATE NOT AVAILABLE ENT-1b/400/D/A

FAILURE	PRE TIG	POST TIG
	Delay (max)	Stop Burn, > Safe HP
	One Day	
APU/HYD		
1 No APU operating .....	..... X	
DPS		
2 RDNT fail, Split.....	..... X .....	.....X
3 1 GPC.....	..... X	
4 BFS .....	..... X	
5 GPC BITE (Multiple GPCs).....	..... X	
ECLS		
6 2 Av Bay Fans in Bay 3.....	..... X	
7 2 Av Bay Fans in Bay 1 or 2.....	..... X	
ELEC		
8 H2 Manf or TK leak (not in depleted tk(s) .....).....	..... X	
9 2 MN Buses.....	..... X .....	.....X
10 CNTL CA1 (No BFS Engage in GPC 3/5).....	..... X	
11 Multi Φ AC BUS (unshorted) .....	..... X	
GNC		
12 1 MLS (if reqd), IMU, or GPS (C-band not avail) .....	..... X	
13 IMU Dilemma.....	..... X .....	.....X
14 RHC Dilemma .....	..... X	
15 2 IMUs (Not targeting EDW/NOR) .....	..... X	
16 2 ADTAs (Winds > 80kts or Dynamic Wx) .....	..... X	
HOOK VELCRO		HOOK VELCRO
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	..... X	
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	..... X	
OMS		
19 Prplt Tank .....	..... X .....	.....X ①
20 Ignition (neither eng ignites).....	..... X .....	.....X ②
21 Both OMS Eng fail.....	..... X .....	.....X ②
22 Prplt Lk after LAST LOS.....	perigee adjust	
AFT RCS		
23 2 jets, same direction, same pod .....	..... X	
24 Prplt Lk after LAST LOS.....	..... X	
25 1 AFT RCS PROP TK fail .....	..... X	
COMM		
26 MCC GO for DEORBIT not rcvd .....	..... X	

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

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

(reduced copy)

FAB USE ONLY

FS CC 8-3

ENT/400/FIN

TOP

HOOK
VELCRO

DEORBIT
BURN
(RCS)

HOOK
VELCRO

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

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

OMS PRPLT LOW

AFT RCS RECONFIG AT ΔVTOT =
RCS COMPLETION

*** OMS PRPLT FAIL (MULTIPLE JETS FAIL OFF):**

*	Secure aff OMS	*
*		*
*	STOP BURN:	*
*	SAFE <input type="text"/> <input type="text"/> APU _s – SHUT DN	*
*	HP -----	*
*	CONTINUE BURN:	*
*	ITEM 18 +0 EXEC	*
*	<input type="text"/> Resel jets	*
*	Interconnect good OMS to RCS	*
*	THC +X (√OMS% vs RCS Burn Time)	*
*	AFT RCS RECONFIG	*
*	RCS COMPLETION	*
*	RCS +X JET FAIL OFF:	*
*	STOP BURN:	*
*	SAFE <input type="text"/> <input type="text"/> APU _s – SHUT DN	*
*	HP -----	*
*	CONTINUE BURN:	*
*	ITEM 18 +0 EXEC	*
*	<input type="text"/> Resel jets	*
*		*

ENT-3a/D/L

HINGE

(reduced copy)

FAB USE ONLY

FS CC 8-4

ENT/400/FIN

TOP
BACK OF 'ENTRY MANEUVERS'

	FLIGHT CONDITIONS	MANEUVER	DRAG CHUTE DEPLOY																												
HOOK VELCRO	V = 7K	<input type="checkbox"/> G50 √GPS, INCORPORATE * If ELS: UHF MODE – G T/R *	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>MCC Call</th> <th>Flight Condition</th> </tr> </thead> <tbody> <tr> <td>Early</td> <td>Main Gear TD</td> </tr> <tr> <td>NOMINAL</td> <td>195 KEAS</td> </tr> <tr> <td>Late</td> <td>Post-Nose Gear TD Xwind DTO</td> </tr> <tr> <td>Emergency Only</td> <td>No Deploy Except CDR call</td> </tr> </tbody> </table>	MCC Call	Flight Condition	Early	Main Gear TD	NOMINAL	195 KEAS	Late	Post-Nose Gear TD Xwind DTO	Emergency Only	No Deploy Except CDR call																		
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	V = 5K	ADTA PROBES – DEPLOY (√HEAT) Begin ALL and RUD trim monitoring	HOOK VELCRO																												
	M = 3.5	If previous OMS OX TK, He TK, or RCS OX TK leak: <input type="checkbox"/> G51 VENT DOOR CNTL OPEN – ITEM 43 EXEC																													
	M = 2.7	√APUs HUD PWR (two) – ON																													
	* If M < 2.5, P CSS for ADTA to G&C incorp *																														
M = 2.0	Ensure ADTA to G&C else √Theta limits																														
M < 1.0	√R FLT CNTLR – ON P,R/Y – CSS as reqd √SPDBK CMD vs POS √NWS – 1 Lock Inertia Reels MAX N ₂ <input type="text"/> . <input type="text"/>																														
M = 0.7	√LG EXT D ISO VLV – OP																														
h = 15K	√MLS																														
h = 10K	√A/L (KSC – Tabs, Visors, Suit O2)																														
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MAIN GEAR TD	√SPDBK – 100%	HOOK VELCRO																													
V = 195 KEAS	DRAG CHUTE ARM, DPY pb (two) – push (simo) (All Its on)																														
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V < 120 KGS or 5K' remaining	BRAKE as required (8-10 fps ² , -0.25 to -0.3G)																														
* If 5K' remaining and V > 140 KGS – MAX BRAKING *																															
V = 60 KGS	DRAG CHUTE JETT pb – push (JETT1,JETT2 It on)																														
V = 40 KGS	BRAKE < 6 fps ² (-0.2G) (Antiskid cutout)																														
WHEEL STOP	Go to ENT C/L, <u>POST LANDING PROCEDURES</u>																														
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FAILED TIRE TECHNIQUE																															
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7K	/																														
3K	/																														
1K	/																														
SURF	/																														

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FAB USE ONLY

FS CC 8-17

ENT/400/FIN

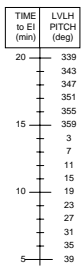
TOP

HOOK
VELCRO

HOOK
VELCRO

ENTRY NO-GO CHECKLIST

FAILURE OF:	AERO FTI DTO	AUTO FCS MODE	XWIND DTC ①
APU/HYD: 1 APU.....			X
2 APUs.....			X
DISPLAYS: 2 ADIs.....	X		
CDR HUD.....			X ②
CONTROLLERS:			
RHC: 1L.....			X
2L & 2R.....	X		X
RPTA: 2L or 2R.....	X		X
SNC: 2 AAs (LAT).....	X	X ③	X
2 RAs.....	X		X
2 AAs (NORM).....	X (M < 2.5)	X ③	X
2 RAs.....	X		X
2 R DDU PWIR SPLY.....			X
2 IMU (or 1 IMU + BITE).....	X		X
2 ADTAs.....			X
ADTA NOT INCORP OR DLMA.....	X (M < 2)		X
MLS NOT INCORP.....	X (< 6K ft)		X
DPS: 2 FCS CH (same surface).....	X		X ④
1 GPC (not restrung).....			X ④
2 GPC (restrung).....	X		X ④
2 GPC (not restrung).....	X	X ④	X ④
1 FF.....			X
2 FF.....	X	X ④	X
RCS: 2 FA.....	X		X
LEAK (AFT - during ENT).....	X		X
2 YAW JETs (same side).....	X		X
MIN RCS QTY.....	X		X
TRIM: All > ± 2.0 deg.....	X		X
DOWNMODE:			
FCS problem.....	X	X	X
ADA.....	X		X
PLB: PLBD Latch Gang.....	X		X
LDC/DECEL:			
Tire Leak.....			X
HYD BRAKE ISOL VLV.....			X
< 100% Brake.....			X
NWS.....			X
ENERGY - OFF NOMINAL:			
Rot Ref Alert.....	X		X
Above Upper Traj Line.....	X		X
MCC GCA, or VEL & PSN update.....	X	X	X
No ALL by 6K ft.....	X		X
DATA: SOLID STATE RECORDERS... X (LOS)			
XWIND:			
< 10 Knots Peak.....			X
> 15 Knots Peak.....			X
> 10 Knots Gust.....			X
GROUND SYSTEMS:			
No Runway Aim Point.....			X



HOOK
VELCRO

HOOK
VELCRO

HOOK
VELCRO

HOOK
VELCRO

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

ENT-7a/E/K

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FAB USE ONLY

FS CC 8-18

ENT/400/FIN

TOP

STS-400 MIDDECK EMERGENCY EGRESS

POST LANDING MODE 5

TABS – RELEASE
VISOR – CLOSE / LOCK
SUIT O2 – ON
GREEN APPLE – PULL
KNEEBOARDS – REMOVE
COOLING – DISCONNECT
SEAT RESTRAINT – RELEASE
PARACHUTE (four) – RELEASE
COMM – DISCONNECT
G-SUIT CLIP – PULL
√GREEN APPLE – PULLED
SUIT O2 – DISCONNECT
PLT – EMER PWR DOWN
EGRESS SEAT
SLIDE/ESCAPE PANEL

HINGED TO RIGHT SIDE

ENT-8a/400/E/A

(reduced copy)

FAB USE ONLY

FS CC 8-20a

ENT/400/FIN 1

TOP

STS-400 MIDDECK EMERGENCY EGRESS

BAILOUT MODE 8

~70K FT

TABS – RELEASE
VISOR – CLOSE / LOCK
SUIT O2 – ON
GREEN APPLE – PULL
KNEEBOARDS – REMOVE
COOLING – DISCONNECT
SEAT RESTRAINT – RELEASE
D-RING – UNCOVER
KNEEL AT SEAT

~40K FT

√GREEN APPLE – PULLED
MS3 – VENT CABIN

~30K FT

MS3 – JETTISON HATCH
COMM – DISCONNECT
G-SUIT CLIP – PULL
SUIT O2 – DISCONNECT
POLE – DEPLOY
D-RING – HOOK UP
BAILOUT

HINGED TO LEFT SIDE

ENT-8aa/400/E/A

(reduced copy)

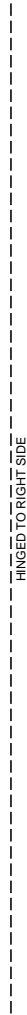
FAB USE ONLY

FS CC 8-20b

ENT/400/FIN 1



TOP
 BACK OF 'STS-400 MIDDECK EMERGENCY EGRESS'



ENT-8b/400/E/A

FAB USE ONLY

(reduced copy)
 FS CC 8-20c

ENT/400/FIN 1



TOP
BACK OF 'STS-400 MIDDECK EMERGENCY EGRESS'



HINGED TO LEFT SIDE



ENT-8bb/400/E/A

FAB USE ONLY

(reduced copy)
FS CC 8-20d

ENT/400/FIN 1



TOP

HOOK
VELCRO

HOOK
VELCRO

**DEORBIT
BURN
MONITOR**

OMS TEMP*	<table border="1"> <tr> <td></td> <td>L</td> <td>R</td> </tr> <tr> <td>FU IN P ≥</td> <td>219</td> <td>220</td> </tr> <tr> <td>≤</td> <td>201</td> <td>208</td> </tr> </table>		L	R	FU IN P ≥	219	220	≤	201	208	OMS ENG FAIL ----- OMS PRPLT FAIL
	L	R									
FU IN P ≥	219	220									
≤	201	208									
or No FU IN P											
OMS PC* & OMS ↓ (BFS: √accel)	ENG VLV 1 or 2 < 70 or OX IN P > 227 ----- OX IN P ≤ 227 or No OX IN P	OMS ENG FAIL ----- OMS PRPLT FAIL									
OMS OX/FU TK P (√ENG IN P)	OX/FU LOW	He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At PC < 72 or OMS TEMP: OMS PRPLT FAIL									
	OX & FU HIGH	He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284									
OMS GMBL	PRI fail SEC fail	L(R) OMS GMBL – SEC (twice) ----- If high RCS usage: OMS ENG FAIL									
GPC	1(4) & Burning OMS aff	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC (twice)									
	SEC GMBL lost 2 FAs lost	----- If high RCS usage: OMS ENG FAIL √MAN SHUTDN									
I/O ERROR FA	1(4)	L(R) OMS GMBL – SEC ----- I/O RESET (if recov: BFS I/O RESET) If high RCS usage: OMS ENG FAIL									
	2 FAs lost	----- √MAN SHUTDN									
BCE STRG D	1(4)	I/O RESET (if recov: >>) ----- If high RCS usage: L(R) OMS GMBL – SEC (twice)									
RM DLMA IMU or	ABOVE SAFE HP ⇒ <input type="checkbox"/>	STOP BURN: OMS ENG(s) – OFF >>									
GPC SET SPLIT or											
2 MN BUSES	BELOW SAFE HP ⇒	IMU DLMA: After C/O: √timer <input type="checkbox"/> G21 If any IMU ACC > 0.03: aff IMU – desel I'cnct OMS to RCS (√RCS Burn Time) THC +X to TGT HP (EOM) or 3.5 x timer at C/O (AOA) SET SPLIT: Go to "GPC" above									
I/O ERROR PCM		OI PCMMU PWR – 2(1)									

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

ENT-2a/400/A,O,D,E/A

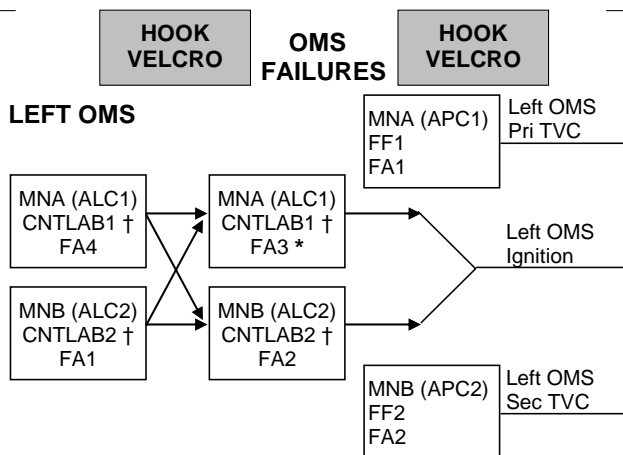
(reduced copy)

FAB USE ONLY

FS CC 8-23

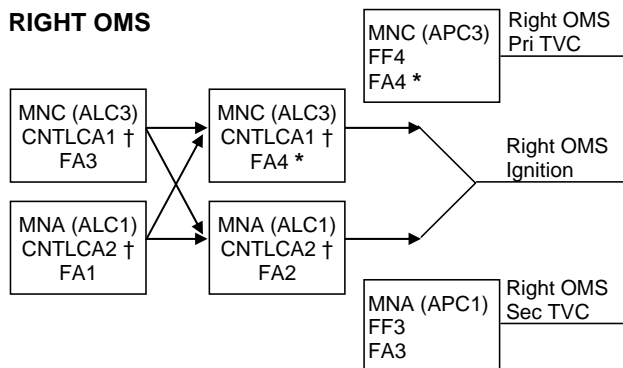
ENT/400/FIN

TOP
BACK OF 'DEORBIT BURN MONITOR'



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

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



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

ENT-2b/400/A,O,D,E/A

(reduced copy)

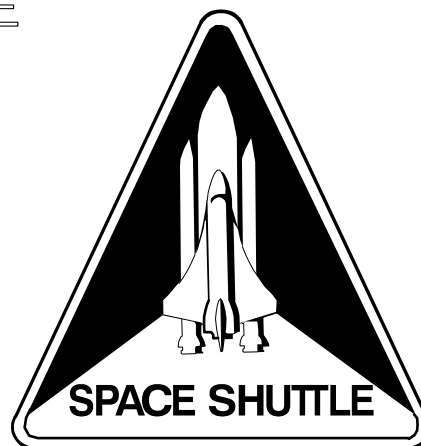
FAB USE ONLY

FS CC 8-24

ENT/400/FIN

Space Shuttle Program
FLIGHT DATA FILE

JSC-48020-400
FINAL



ENTRY CHECKLIST

STS
400

Flight Cover (trim bottom to expose tabs)