

# Entry Checklist

## STS-130 Flight Supplement

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

**Final  
July 24, 2009**

National Aeronautics and  
Space Administration

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



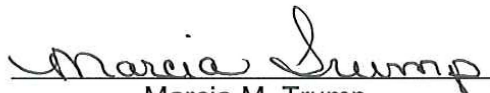


MISSION OPERATIONS DIRECTORATE

**ENTRY CHECKLIST  
STS-130 FLIGHT SUPPLEMENT**

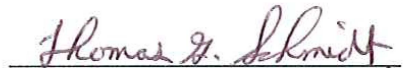
FINAL  
July 24, 2009

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Incorporates the following:
482#: NONE – Establishes baseline

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-130 FLIGHT SUPPLEMENT

**LIST OF EFFECTIVE PAGES**

FINAL      07/24/09

Sign Off .....	* generic	3-9 .....	generic
ii .....	* generic	3-10 .....	generic
Sign Off .....	* 130/FIN	3-11 .....	generic
FS iv .....	* 130/FIN	3-12 .....	generic
v .....	* generic	3-13 .....	generic
vi .....	* generic	3-14 .....	generic
vii .....	* generic	FS 3-15 .....	130/FIN
viii .....	* generic	FS 3-16 .....	130/FIN
ix .....	* generic	FS 3-17 .....	130/FIN
x .....	* generic	FS 3-18 .....	130/FIN
FS xi .....	* 130/FIN	3-19 .....	generic
FS xii .....	* 130/FIN	3-20 .....	generic
FS xiii .....	* 130/FIN	3-21 .....	generic
FS xiv .....	* 130/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 .....	130/FIN
2-4 .....	generic	FS 3-30 .....	130/FIN
FS 2-5 .....	130/FIN	3-31 .....	generic
FS 2-6 .....	130/FIN	3-32 .....	generic
FS 3-1 .....	130/FIN	FS 3-33 .....	130/FIN
FS 3-2 .....	130/FIN	FS 3-34 .....	130/FIN
FS 3-3 .....	130/FIN	3-35 .....	generic
FS 3-4 .....	130/FIN	3-36 .....	generic
3-5 .....	generic	3-37 .....	generic
3-6 .....	generic	3-38 .....	generic
FS 3-7 .....	130/FIN	3-39 .....	generic
FS 3-8 .....	130/FIN	3-40 .....	generic

\* – Omit from flight book

† – Extra pages in crew copy only

FS xi

ENT/130/FIN

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.....	130/FIN	FS 8-1.....*	130/FIN
FS 4-6.....	130/FIN	FS CC 8-2.....*	130/FIN
FS 4-7.....	130/FIN	FS CC 8-3.....*	130/FIN
FS 4-8.....	130/FIN	FS CC 8-4.....*	130/FIN
FS 4-9.....	130/FIN	CC 8-5.....*	generic
FS 4-10.....	130/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.....*	130/FIN
5-10.....	generic	FS CC 8-18.....*	130/FIN
5-11.....	generic	CC 8-19.....*	generic
5-12.....	generic	8-20.....*	generic
5-13.....	generic	CC 8-21.....*	generic
5-14.....	generic	CC 8-22.....*	generic
5-15.....	generic	FS CC 8-23.....*	130/FIN
5-16.....	generic	FS CC 8-24.....*	130/FIN
5-17.....	generic		
5-18.....	generic		
FS 5-19.....	130/FIN		
FS 5-20.....	130/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/130/D/A
(Back).....	FS CC 8-3	ENT-1b/130/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/130/E/A
ENTRY NO-GO CHECKLIST		
(Front) .....	FS CC 8-18	ENT-7a/E/K
EMERGENCY EGRESS		
(Back).....	CC 8-19	generic
ENTRY CONTROL		
(Front) .....	CC 8-21	generic
(Back).....	CC 8-22	generic
DEORBIT BURN MONITOR		
(Front) .....	FS CC 8-23	ENT-2a/130/A,O,D,E/A
OMS FAILURES (Back)....	FS CC 8-24	ENT-2b/130/A,O,D,E/A



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OMS/  
RCS ΔV

OMS/RCS ΔV

FS 2-5

ENT/130/FIN



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

OMS/  
RCS  $\Delta$ V

OMS% GAGE	OMS He Press *	OMS $\Delta$ V	RCS $\Delta$ V	RCS BURN MIN:SEC
50	3210	280	234	7:18
40	2810	219	183	5:42
38	2730	207	173	5:23
36	2650	194	163	5:04
34	2570	182	153	4:45
32	2490	170	142	4:26
30	2410	157	132	4:07
28	2330	145	122	3:47
26	2250	133	112	3:28
24	2170	120	102	3:09
22	2090	108	91	2:50
20	2010	96	81	2:31
18	1930	83	71	2:12
16	1850	71	60	1:52
14	1770	58	50	1:33
12	1690	46	39	1:13
10	1610	33	28	0:53
8	1530	21	18	0:34
6	1450	8	7	0:14
5	1410	2	2	0:04

\* He pressure not valid until 1 hr after last burn

<b><math>\Delta</math>V CAPABILITY</b>	
ARCS $\Delta$ V fps =	$\boxed{0.9} \times [L\% + R\% - \text{AFT QTY } 1]$
FRCS $\Delta$ V fps =	$\boxed{1.0} \times \text{FRCS } \%$
OMS $\Delta$ V fps =	$\boxed{6.1} \times \text{OMS } \%$

NOTE: Uses assumed vehicle weight of 213,738 lb



DEORBIT BURN

DEORBIT  
BURN



FS 3-1

ENT/130/FIN

DEORBIT  
BURN

**STS-130 LANDING SITE TABLE  
(50° to 63.5° INCLINATION)**

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	MYRTLE BEACH	MYR 36 MYR 18	- -	9500 9500	1000 1000
6	WILMINGTON	ILM 06 ILM 24	- -	7500 7500	0 0
7	CHERRY POINT	NKT 32L NKT 23R	- -	7110 7100	800 880
8	OCEANA NAS	NTU 32R NTU 23L	- -	7500 11500	0 0
9	WALLOPS	WAL 28 WAL 04	- -	7510 8750	0 0
10	DOVER AFB	DOV 32 DOV 19	- -	12400 9100	0 0
11	ATLANTIC CITY	ACY 31 ACY 13	- -	9500 9500	0 0
12	BEN GUERIR	BEN 36 BEN 18	- -	13720 13220	0 1000
13	*MORON AB	MRN 20 MRN 02	◆6 -	11730 11730	1000 1000
14	*ZARAGOZA	ZZA 30L ZZA 12R	◆6 -	12200 12200	1000 1010
15	GABRESKI	FOK 06 FOK 24	- -	8500 8500	1000 1000

◆ Available for TAL Only

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

**STS-130 LANDING SITE TABLE  
(50° to 63.5° INCLINATION)**

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

◆ Available for TAL Only

**Length** after displaced threshold

**STS-130 LANDING SITE TABLE  
(50° to 63.5° INCLINATION)**

<b>S I T E</b>	<b>LOCATION</b>	<b>RWY</b>	<b>MLS CH</b>	<b>LG</b>	<b>+ OVR RUN</b>
31	KING KHALID	KKI 15R KKI 33L	- -	13300 13300	0 0
32	DIEGO GARCIA	JDG 31 JDG 13	- -	12000 12000	950 950
33	AMBERLEY TINDAL RAAF	AMB 15 PTN 14	- -	9500 8500	0 0
34	YOKOTA AB	JTY 36 JTY 18	- -	11000 11000	1000 1000
35	ANDERSEN AFB	GUA 06L GUA 24R	- -	10560 10560	1050 1000
36	WAKE ISLAND	WAK 28 WAK 10	- -	9360 9360	0 0
37	HONOLULU	HNL 08R HNL 26L	- -	11500 11500	0 0
38	ELMENDORF	EDF 24 EDF 06	- -	9500 9500	0 0
39	HAO ATOLL	HAO 12 HAO 30	- -	10690 10690	0 0
40	EDW TEMP	EDT 22R EDT 04L	8 6	12000 12000	1000 1000
41	ASCENSION	HAW 13 HAW 31	- -	9520 9520	0 0
42	NORTHROP	NOR 17 NOR 23	6 6	15000 15000	Lkbd Lkbd
43	NORTHROP	NOR 05 NOR 35	- -	15000 15000	Lkbd Lkbd
44	EDWARDS AFB	EDW 15 EDW 18L	- -	16300 15000	Lkbd Lkbd
45	EDWARDS AFB	EDW 22 EDW 04	8/† 6	15020 14020	0 1800

† MSBLS Jr. Ch 8 - Requires Uplink  
**Length** after displaced threshold

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
<b>N Desc</b>	23	23	23	23	22	24	24	24	22	23	23	23
<b>S Asc</b>	24	24	22	23	23	23	23	23	23	23	22	24
<b>N Asc</b>	22											
<b>S Desc</b>												

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/130/FIN



**DEORBIT BURN FLIGHT RULES**  
**ONE-ORBIT LATE AVAILABLE** ENT-1a/130/D/A

**BURN  
CARDS**

FAILURE	PRE TIG		POST TIG
	Delay (max)		Stop Burn, > Safe HP
	One Orbit	One Day	
<b>APU/HYD</b>			
1 No APU operating .....	... X ...	.....	
<b>DPS</b>			
2 RDNT fail, Split.....	.....	...X...	.....X
3 1 GPC.....	... X ...	.....	
4 BFS .....	.....	...X...	
5 GPC BITE (Multiple GPCs) .....	.....	...X...	
<b>ECLS</b>			
6 2 Av Bay Fans in Bay 3.....	... X ...	.....	
7 2 Av Bay Fans in Bay 1 or 2.....	.....	...X...	
<b>ELEC</b>			
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 $\Phi$ AC BUS (unshorted) .....	... X ...	.....	
<b>GNC</b>			
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 ...	.....	
<b>HOOK VELCRO</b>			<b>HOOK VELCRO</b>
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	... X ...	.....	
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	... X ...	.....	
<b>OMS</b>			
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		
<b>AFT RCS</b>			
23 2 jets, same direction, same pod .....	... X ...	.....	
24 Prplt Lk after LAST LOS.....	... X ...	.....	
25 1 AFT RCS PROP TK fail .....	... X ...	.....	
<b>COMM</b>			
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/130/D/A

FAILURE	PRE TIG	POST TIG
	Delay (max)	Stop Burn, > Safe HP
	One Day	
<b>APU/HYD</b>		
1 No APU operating .....	..... X .....	
<b>DPS</b>		
2 RDNT fail, Split.....	..... X .....	.....X
3 1 GPC.....	..... X .....	
4 BFS .....	..... X .....	
5 GPC BITE (Multiple GPCs) .....	..... X .....	
<b>ECLS</b>		
6 2 Av Bay Fans in Bay 3.....	..... X .....	
7 2 Av Bay Fans in Bay 1 or 2.....	..... X .....	
<b>ELEC</b>		
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 .....	
<b>GNC</b>		
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 .....	
<b>HOOK VELCRO</b>		<b>HOOK VELCRO</b>
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	..... X .....	
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	..... X .....	
<b>OMS</b>		
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	
<b>AFT RCS</b>		
23 2 jets, same direction, same pod .....	..... X .....	
24 Prplt Lk after LAST LOS.....	..... X .....	
25 1 AFT RCS PROP TK fail .....	..... X .....	
<b>COMM</b>		
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 MONITOR

<b>OMS TEMP*</b> FU IN P $\geq$ <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="padding: 2px;">L</td><td style="padding: 2px;">R</td></tr><tr><td style="padding: 2px;">219</td><td style="padding: 2px;">220</td></tr><tr><td style="padding: 2px;">201</td><td style="padding: 2px;">208</td></tr></table> or No FU IN P	L	R	219	220	201	208	OMS ENG FAIL OMS PRPLT FAIL
L	R						
219	220						
201	208						
<b>OMS PC* &amp; OMS ↓</b> (BFS: $\sqrt{\text{accel}}$ ) ENG VLV 1 or 2 < 70 or OX IN P > 227 OX IN P $\leq$ 227 or No OX IN P	OMS ENG FAIL OMS PRPLT FAIL						
<b>OMS OX/FU TK P</b> ( $\sqrt{\text{ENG IN P}}$ ) OX/FU LOW OX & FU HIGH	He PRESS/VAP ISOL (two) – OP If aff TK P not incr: He PRESS/VAP ISOL (two) – CL At PC < 72 or OMS TEMP: OMS PRPLT FAIL He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284						
<b>OMS GMBL</b> PRI fail SEC fail	L(R) OMS GMBL – SEC If high RCS usage: OMS ENG FAIL						
<b>GPC</b> <b>1(4) &amp;</b> Burning OMS aff SEC GMBL lost 2 FAs lost	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC If high RCS usage: OMS ENG FAIL $\sqrt{\text{MAN SHUTDN}}$						
<b>I/O ERROR FA</b> <b>1(4)</b> 2 FAs lost	L(R) OMS GMBL – SEC ♦ I/O RESET (if recov: BFS I/O RESET) If high RCS usage: OMS ENG FAIL $\sqrt{\text{MAN SHUTDN}}$						
<b>BCE STRG D</b> <b>1(4)</b>	I/O RESET (if recov: >>) If high RCS usage: L(R) OMS GMBL – SEC						
<b>RM DLMA IMU</b> or <b>ABOVE SAFE</b> HP $\Rightarrow$ <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 15px;"></td><td style="width: 20px; height: 15px;"></td></tr></table> <b>GPC SET SPLIT</b> or <b>2 MN BUSES</b> <b>BELOW SAFE</b> HP $\Rightarrow$			STOP BURN: OMS ENG(s) – OFF >> IMU DLMA: After C/O: $\sqrt{\text{timer}}$ <b>G21</b> If any IMU ACC > 0.03: aff IMU – desel I'cnct OMS to RCS ( $\sqrt{\text{RCS Burn Time}}$ ) THC +X to TGT HP (EOM) or 3.5 x timer at C/O (AOA) SET SPLIT: Go to "GPC" above				
<b>I/O ERROR PCM</b>	OI PCMMU PWR – 2(1)						

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

ENT-2a/130/A,O,D,E/A

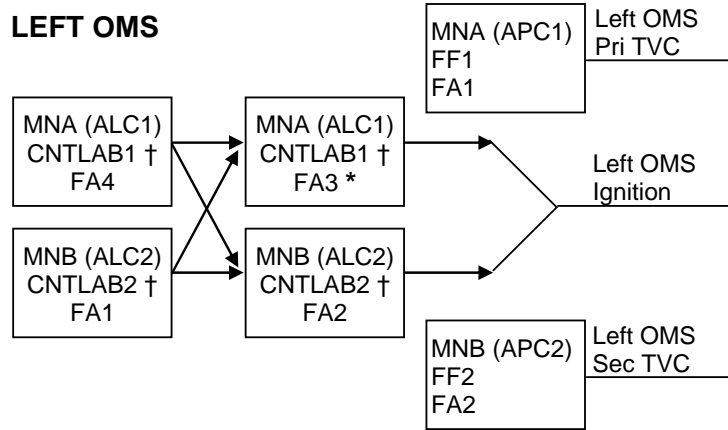
MS ONLY

FS 3-29

ENT/130/FIN

## OMS FAILURES

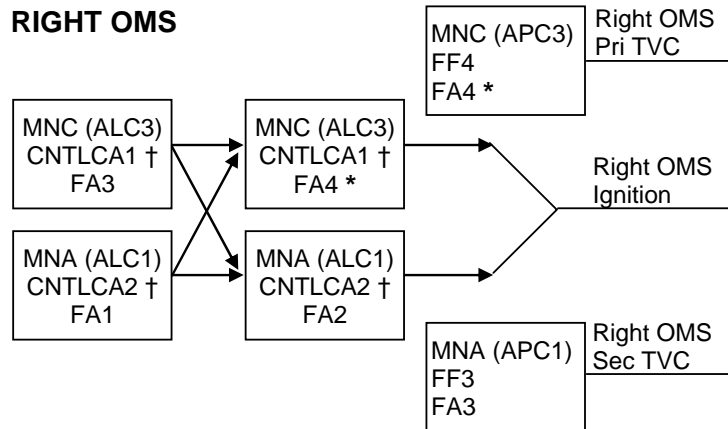
### LEFT OMS



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

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

### 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/130/A,O,D,E/A

MS ONLY

FS 3-30

ENT/130/FIN

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

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

* <b>PREBANK TABLE EDW (HA = 191 NM)</b> *										
* <b>EDW</b> *										
* $\Delta$ HP	0	4	8	12	REDES.	13	14	(15)	REDES.	
* PREBANK	0	80	105	130	NOR ELS	145	160	180	YR	
* <b>NOR</b>					IF NOR NOGO					
* <u>G50</u> ITEM 41 +4 2, $\sqrt$ RWY 17										
* $\Delta$ HP		11	12	13	15	16	17	(18)	REDES.	
* PREBANK		105	110	115	135	145	160	175	YR	
* <b>YR</b>										
* <u>G50</u> ITEM 41 +2 2, $\sqrt$ RWY 26										
* $\Delta$ HP					16	19	21	24	(26)	28
* PREBANK					75	90	100	125	145	180
* <b>PREBANK TABLE KSC (HA = 190 NM)</b> *										
* <b>KSC</b> *										
* $\Delta$ HP	0	2	4	6	8	10	13	(15)	REDES.	
* PREBANK	0	55	80	95	105	115	140	175	YQX	
* <b>YQX</b>										
* <u>G50</u> ITEM 41 +2 1, $\sqrt$ RWY 21										
* $\Delta$ HP							16	22	(25)	RED.
* PREBANK							95	135	170	INN
* <b>INN</b>										
* <u>G50</u> ITEM 41 +2 6, $\sqrt$ RWY 06										
* $\Delta$ HP									26	28
* PREBANK									135	180

130 oct

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	<b>G50</b> √GPS, INCORPORATE * If ELS: UHF MODE – G T/R *			
V = 5K	ADTA PROBES – DEPLOY (√HEAT) Begin AIL and RUD trim monitoring			
M = 3.5	If previous OMS OX TK, He TK, or RCS OX TK leak: <b>G51</b> VENT DOOR CNTL OPEN – ITEM 43 EXEC			
M = 2.7	√APUs HUD PWR (two) – ON			
* If M < 2.5; P CSS for ADTA to G&C incorp *				
M = 2.0	Ensure ADTA to G&C else √Theta limits			
M < 1.0	√R FLT CNTLR – ON P,R/Y – CSS as reqd √SPDBK CMD vs POS √NWS – 1 Lock Inertia Reels MAX N <sub>z</sub> <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="width: 20px; height: 15px;"></td><td style="width: 20px; height: 15px;"></td><td style="width: 20px; height: 15px;"></td></tr></table>			
M = 0.7	√LG EXTD ISO VLV – OP			
h = 15K	√MLS			
h = 10K	√A/L (KSC – Tabs, Visors, Suit O2)			
h = 2K	LDG GEAR ARM pb – push (ARM It on)			
h = 300	LDG GEAR DN pb – push (DN It on)			
MAIN GEAR TD	√SPDBK – 100%			
V = 195 KEAS	DRAG CHUTE ARM, DPY pb (two) – push (simo) (All Its on)			
V = 185 KEAS	DEROTATE			
NOSE GEAR TD	SRB SEP – MAN/AUTO and depress pb √Auto Load Relief √HYD BK ISOL VLV (three) – OP			
V < 120 KGS or 5K' remaining	BRAKE as required (8-10 fps <sup>2</sup> , -0.25 to -0.3G)			
* If 5K' remaining and V > 140 KGS – MAX BRAKING *				
V = 60 KGS	DRAG CHUTE JETT pb – push (JETT1,JETT2 It on)			
V = 40 KGS	BRAKE < 6 fps <sup>2</sup> (-0.2G) (Antiskid cutout)			
WHEEL STOP	Go to ENT C/L, <u>POST LANDING PROCEDURES</u>			

ENT-6b/130/E/A  
(Partial)

MS ONLY

FS 4-5

ENT/130/FIN



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MS ONLY

FS 4-6

ENT/130/FIN



**DRAG CHUTE DEPLOY**

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

**FAILED TIRE TECHNIQUE**

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

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

ENT-6b/130/E/A  
(Partial)

ENTRY  
MISC

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MS ONLY

FS 4-8

ENT/130/FIN

### ENTRY ALPHA

VR	$\alpha$ ref	R	H	Href	Rref
25	HI 40 LO 4412	400			
24	HI 40 LO 2606	249	-47	L79	
23	43 40 37 2137	241	-64	69	
22	43 40 37 1784	234	-84	63	
21	43 40 37 1509	228	-106	60	
20	43 40 37 1284	220	-124	59	
19	43 40 37 1115	214	-147	60	
18	43 40 37 972	208	-170		R61
17	43 40 37 859	202	-189		61
16	43 40 37 767	194	-197		63

## KSC 15

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

(130 OCF CY)

HOOK  
VELCRO

ASC-14b/130/A,E/A

HOOK  
VELCRO

HOOK  
VELCRO

15	43 40 37	684	188	-118	64
14	43 40 37	612	184	-127	62
13	43 40 37	544	180	-137	60
12	43 40 37	481	175	-153	58
11	42 39 36	425	170	-195	56
10	41 38 35	374	163	-174	L50
9	39 36 33	326	159	-207	44
8	37 34 31	277	151	-239	40
7	33 30 27	229	141	-267	39
6	30 27 24	185	130	-271	40
5	26 23 20	141	117	-273	41
4	22 19 18	106	104	-264	R40
3	19 16 15	75	91	-248	38
2.5	14	61	83	-259	
2	14	50	77	-256	
1.5	10	39	69	-308	
1	8	28	53	-264	

HOOK VELCRO

MS ONLY

FS 4-9

ENT/130/FIN



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MS ONLY

FS 4-10

ENT/130/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/130/FIN

DEORBIT BURN FLIGHT RULES  
ONE-ORBIT LATE AVAILABLE ENT-1a/130/D/A

FAILURE	PRE TIG		POST TIG
	Delay (max)		Stop Burn, > Safe HP
	One Orbit	One Day	
<b>APU/HYD</b>			
1 No APU operating .....	... X ...	.....	
<b>DPS</b>			
2 RDNT fail, Split.....	.....	...X...	.....X
3 1 GPC.....	... X ...	.....	
4 BFS .....	.....	...X...	
5 GPC BITE (Multiple GPCs).....	.....	...X...	
<b>ECLS</b>			
6 2 Av Bay Fans in Bay 3.....	... X ...	.....	
7 2 Av Bay Fans in Bay 1 or 2.....	.....	...X...	
<b>ELEC</b>			
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 $\Phi$ AC BUS (unshorted).....	... X ...	.....	
<b>GNC</b>			
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 ...	.....	
<b>HOOK VELCRO</b>			
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	... X ...	.....	
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	... X ...	.....	
<b>OMS</b>			
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		
<b>AFT RCS</b>			
23 2 jets, same direction, same pod .....	... X ...	.....	
24 Prplt Lk after LAST LOS.....	... X ...	.....	
25 1 AFT RCS PROP TK fail .....	... X ...	.....	
<b>COMM</b>			
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/130/D/A

FAILURE	PRE TIG	POST TIG
	Delay (max)	Stop Burn, > Safe HP
	One Day	
<b>APU/HYD</b>		
1 No APU operating .....	..... X .....	
<b>DPS</b>		
2 RDNT fail, Split.....	..... X .....	.....X
3 1 GPC.....	..... X .....	
4 BFS .....	..... X .....	
5 GPC BITE (Multiple GPCs) .....	..... X .....	
<b>ECLS</b>		
6 2 Av Bay Fans in Bay 3.....	..... X .....	
7 2 Av Bay Fans in Bay 1 or 2.....	..... X .....	
<b>ELEC</b>		
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 $\Phi$ AC BUS (unshorted) .....	..... X .....	
<b>GNC</b>		
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 .....	
<b>HOOK VELCRO</b>		<b>HOOK VELCRO</b>
17 2 FCS Channels (same surface) (Not targeting NOR/EDW) .....	..... X .....	
18 2 AAs, RGAs (Not targeting EDW/NOR) .....	..... X .....	
<b>OMS</b>		
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	
<b>AFT RCS</b>		
23 2 jets, same direction, same pod .....	..... X .....	
24 Prplt Lk after LAST LOS.....	..... X .....	
25 1 AFT RCS PROP TK fail .....	..... X .....	
<b>COMM</b>		
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/130/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  APU<sub>s</sub> – SHUT DN \*  
 \*    HP ----- \*  
 \*    CONTINUE BURN: \*  
 \*    ITEM 18 +0 EXEC \*  
 \*     Resel jets \*  
 \*    Interconnect good OMS to RCS \*  
 \*    THC +X (√OMS% vs RCS Burn Time) \*  
 \*    AFT RCS RECONFIG \*  
 \*    RCS COMPLETION \*  
 \* **RCS +X JET FAIL OFF:** \*  
 \*    STOP BURN: \*  
 \*    SAFE  APU<sub>s</sub> – SHUT DN \*  
 \*    HP ----- \*  
 \*    CONTINUE BURN: \*  
 \*    ITEM 18 +0 EXEC \*  
 \*     Resel jets \*

ENT-3a/D/L

HINGE

(reduced copy)

FAB USE ONLY

FS CC 8-4

ENT/130/FIN

TOP  
BACK OF 'ENTRY MANEUVERS'

HOOK VELCRO	FLIGHT CONDITIONS	MANEUVER	DRAG CHUTE DEPLOY		HOOK VELCRO
			MCC Call	Flight Condition	
	V = 7K	<input type="checkbox"/> G50 √GPS, INCORPORATE * If ELS: UHF MODE – G T/R *	Early	Main Gear TD	
	V = 5K	ADTA PROBES – DEPLOY (√HEAT) Begin ALL and RUD trim monitoring	<b>NOMINAL</b>	<b>195 KEAS</b>	
	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	Late	Post-Nose Gear TD Xwind DTO	
	M = 2.7	√APUs HUD PWR (two) – ON	Emergency Only	No Deploy Except CDR call	
	* If M < 2.5, P CSS for ADTA to G&C incorp *		NO DEPLOY		
	M = 2.0	Ensure ADTA to G&C else √Theta limits	prior to MGTD > 230 KEAS < 80 KGS Xwind > 15 kts		
	M < 1.0	√R FLT CNTLR – ON P,R/Y – CSS as reqd √SPDBK CMD vs POS √NWS – 1 Lock Inertia Reels MAX Nz <input type="text"/> . <input type="text"/>	<b>FAILED TIRE TECHNIQUE</b>		
	M = 0.7	√LG EXT D ISO VLV – OP	Post-MGTD	P – AUTO Deploy drag chute √Auto derotation Max RHC roll away from failed tire	
	h = 15K	√MLS	185 KEAS		
	h = 10K	√A/L (KSC – Tabs, Visors, Suit O2)	180 KEAS		
	h = 2K	LDG GEAR ARM pb – push (ARM It on)	NGTD		
	h = 300	LDG GEAR DN pb – push (DN It on)			
	MAIN GEAR TD	√SPDBK – 100%	50K	/	
	V = 195 KEAS	DRAG CHUTE ARM, DPY pb (two) – push (simo) (All Its on)	38K	/	
	V = 185 KEAS	DEROTATE	28K	/	
	NOSE GEAR TD	SRB SEP – MAN/AUTO and depress pb √Auto Load Relief √HYD BK ISOL VLV (three) – OP	20K	/	
	V < 120 KGS or 5K' remaining	BRAKE as required (8-10 fps <sup>2</sup> , -0.25 to -0.3G)	12K	/	
	* If 5K' remaining and V > 140 KGS – MAX BRAKING *		7K	/	
	V = 60 KGS	DRAG CHUTE JETT pb – push (JETT1, JETT2 It on)	3K	/	
	V = 40 KGS	BRAKE < 6 fps <sup>2</sup> (-0.2G) (Antiskid cutout)	1K	/	
	WHEEL STOP	Go to ENT C/L, <u>POST LANDING PROCEDURES</u>	SURF	/	
			ENT-6b/130/E/A		
HOOK VELCRO					HOOK VELCRO

(reduced copy)

FAB USE ONLY

FS CC 8-17

ENT/130/FIN

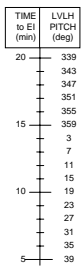
TOP

HOOK  
VELCRO

HOOK  
VELCRO

**ENTRY NO-GO CHECKLIST**

FAILURE OF:	AERO PTI DTO	AUTO FCS MODE	XWIND DTC ①
<b>APU/HYD:</b> 1 APU.....			X
2 APUs.....			X
<b>DISPLAYS:</b> 2 ADIs.....	X		
CDR HUD.....			X ②
<b>CONTROLLERS:</b>			
RHC: 1L.....			X
2L & 2R.....	X		X
RPTA: 2L or 2R.....	X		X
<b>SNC:</b> 2 AAs (LAT).....	X	X ③	X
2 AAs (NORM).....	X (M < 2.5)		X
2 RGS.....			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
<b>DPS:</b> 2 FCS CH (same surface).....	X		X ④
1 GPC (not restrung).....			X ④
2 GPC (restrung).....	X	X ⑤	X ④
2 GPC (not restrung).....	X	X ⑤	X ④
1 FF.....			X
2 FF.....	X	X ⑥	X
<b>RCS:</b> 2 FA.....	X		X
LEAK (AFT - during ENT).....	X		X
2 YAW JETs (same side).....	X		X
MIN RCS QTY.....	X		X
<b>TRIM:</b> All > ± 2.0 deg.....	X		X
<b>DOWNMODE:</b>			
FCS problem.....	X	X	X
ADA.....	X		X
<b>PLB:</b> PLBD Latch Gang.....	X		X
<b>LDC/DECEL:</b>			
Tire Leak.....			X
HYD BRAKE ISOL VLV.....			X
< 100% Brake.....			X
NWS.....			X
<b>ENERGY - OFF NOMINAL:</b>			
Roll Ref Alert.....	X		X
Above Upper Traj Line.....	X		X
MCC GCA, or VEL & PSN update.....	X	X	X
No AL by 6K ft.....	X		X
<b>DATA: SOLID STATE RECORDERS... X (LOS)</b>			
<b>XWIND:</b>			
< 10 Knots Peak.....			X
> 15 Knots Peak.....			X
> 10 Knots Gust.....			X
<b>GROUND SYSTEMS:</b>			
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

(reduced copy)

FAB USE ONLY

FS CC 8-18

ENT/130/FIN

TOP

HOOK  
VELCRO

HOOK  
VELCRO

**DEORBIT  
BURN  
MONITOR**

<b>OMS TEMP*</b> FU IN P $\geq$ <table border="1" style="display: inline-table;"><tr><td>L</td><td>R</td></tr><tr><td>219</td><td>220</td></tr><tr><td>201</td><td>208</td></tr></table> or No FU IN P	L	R	219	220	201	208	OMS ENG FAIL ----- OMS PRPLT FAIL
L	R						
219	220						
201	208						
<b>OMS PC* &amp; OMS ↓</b> (BFS: $\sqrt{\text{accel}}$ ) ENG VLV 1 or 2 < 70 or OX IN P > 227 OX IN P $\leq$ 227 or No OX IN P	OMS ENG FAIL ----- OMS PRPLT FAIL						
<b>OMS OX/FU TK P</b> ( $\sqrt{\text{ENG IN P}}$ ) OX/FU LOW	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						
<b>OMS GMBL</b> PRI fail SEC fail	L(R) OMS GMBL – SEC ----- If high RCS usage: OMS ENG FAIL						
<b>GPC</b> 1(4) & Burning OMS aff	aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC						
SEC GMBL lost 2 FAs lost	If high RCS usage: OMS ENG FAIL ----- MAN SHUTDN						
<b>I/O ERROR FA</b> 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						
<b>BCE STRG D</b> 1(4)	I/O RESET (if recov: >>) ----- If high RCS usage: L(R) OMS GMBL – SEC						
<b>RM DLMA IMU</b> or <b>GPC SET SPLIT</b> or <b>2 MN BUSES</b>	STOP BURN: OMS ENG(s) – OFF >>						
<b>ABOVE SAFE</b> HP $\Rightarrow$ <input type="checkbox"/> <input type="checkbox"/>							
<b>BELOW SAFE</b> HP $\Rightarrow$	IMU DLMA: After C/O: $\sqrt{\text{timer}}$ <input type="checkbox"/> G21 If any IMU ACC > 0.03: aff IMU – desel I'cnct OMS to RCS ( $\sqrt{\text{RCS Burn Time}}$ ) THC +X to TGT HP (EOM) or 3.5 x timer at C/O (AOA) SET SPLIT: Go to "GPC" above						
<b>I/O ERROR PCM</b>	OI PCMMU PWR – 2(1)						

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

ENT-2a/130/A,O,D,E/A

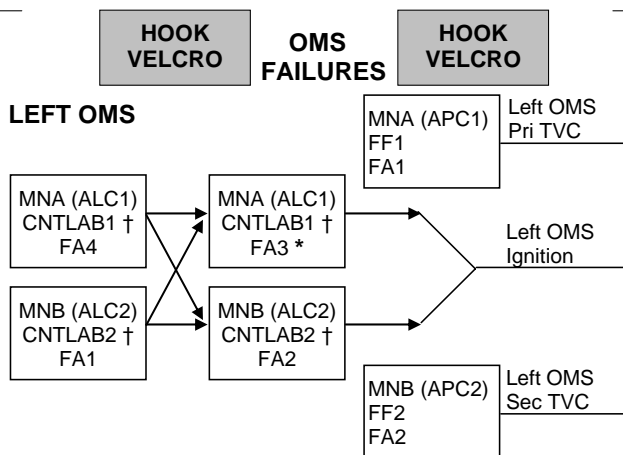
(reduced copy)

FAB USE ONLY

FS CC 8-23

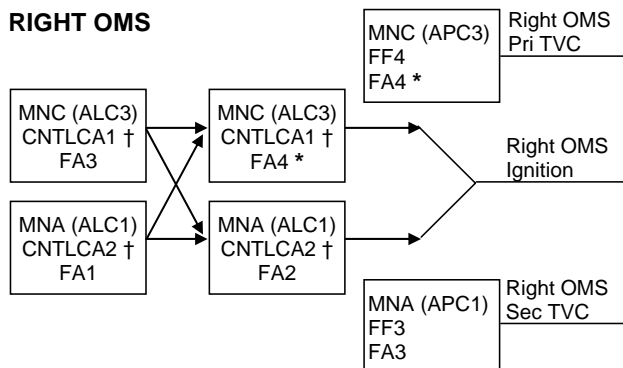
ENT/130/FIN

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



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

ENT-2b/130/A,O,D,E/A

(reduced copy)

FAB USE ONLY

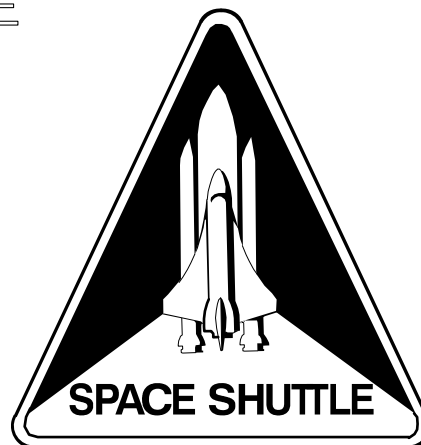
FS CC 8-24

ENT/130/FIN



Space Shuttle Program  
FLIGHT DATA FILE

JSC-48020-130  
FINAL



**ENTRY  
CHECKLIST**

**STS  
130**

Flight Cover (trim bottom to expose tabs)