

Entry Checklist

Mission Operations Directorate Flight Design and Dynamics Division Final July 30, 2024

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



NOTES

1. This Checklists is made by Johan Meza Bracamontes (Johan2011 on Orbiter Forum).
2. The Design of the Checklists Will be the same of the Original NASA Checklists as possible.
3. This Checklists is made for the Space Shuttle Vessel (SSV) Addon by GLS.

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MNVR PADS

OMS/RCS ΔV

OMS% GAGE	OMS He Press *	OMS V	RCS V	RCS BURN MIN:SEC
50	3300	244	202	7:19
40	2900	190	158	5:42
38	2820	180	150	5:23
36	2740	169	141	5:04
34	2660	158	132	4:45
32	2580	147	123	4:26
30	2500	137	114	4:06
28	2420	126	105	3:47
26	2340	115	96	3:28
24	2260	104	87	3:09
22	2180	93	79	2:49
20	2100	83	70	2:30
18	2020	72	61	2:11
16	1940	61	51	1:51
14	1860	50	42	1:31
12	1780	39	33	1:12
10	1700	28	24	0:52
8	1620	17	15	0:32
6	1540	6	5	0:12
5	1500	1	1	0:03

* He pressure not valid until 1 hr after last burn

V CAPABILITY	
ARCS V fps = 0.8 x [L% + R% - AFT QTY 1]	
FRCS V fps =	0.8 x FRCS %
OMS V fps =	5.4 x OMS %

NOTE: Uses assumed vehicle weight of 245,158 lb

DEORBIT MNVR PAD

OMS BOTH 1	<input type="text"/>	BURN ATT	<input type="text"/>	VTOT	<input type="text"/>
L 2	<input type="text"/>	R 24	<input type="text"/>	TGO	<input type="text"/>
R 3	<input type="text"/>	P 25	<input type="text"/>	VGO X	(<input type="text"/>) <input type="text"/>
RCS SEL 4	<input type="text"/>	Y 26	<input type="text"/>	VGO Y	(<input type="text"/>) <input type="text"/>
TV ROLL 5	<input type="text"/>	REI	<input type="text"/>	VGO Z	(<input type="text"/>) <input type="text"/>
TRIM LOAD		TXX	<input type="text"/>	HA	<input type="text"/>
P 6	(<input type="text"/>) <input type="text"/>			HP	(<input type="text"/>) <input type="text"/>
LY 7	(<input type="text"/>) <input type="text"/>			TGT	<input type="text"/>
RY 8	(<input type="text"/>) <input type="text"/>				
WT 9	<input type="text"/>				
TIG 10	<input type="text"/>				
TGT PEG 4					
C1 14					
C2 15	(<input type="text"/>) <input type="text"/>				
HT 16					
BT 17					
PRPLT18	(<input type="text"/>) <input type="text"/>				

NOTES

RCS I'CNCT:

L OMS → RCS

R OMS → RCS

NONE

DEL PAD

<u>PRE-DEORBIT</u>																													
APU START: SINGLE APU START, ATTEMPT					APU(s)																								
APU START SEQUENCE					THEN																								
<u>DEORBIT</u>																													
BURN CUE CARD:																													
OMS TIG SLIP – NO EXEC > TIG +					<table border="1" style="display: inline-table; width: 100px; height: 20px;"> <tr><td></td><td>:</td><td></td><td></td></tr> </table>						:																		
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RCS DOWNMODING					<table border="1" style="display: inline-table; width: 100px; height: 20px;"> <tr><td></td><td>:</td><td></td><td></td></tr> </table>						:																		
	:																												
STOP/CONTINUE CUES: L OMS FAIL HP																													
R OMS FAIL HP																													
OMS ENG FAIL XFEED QTY CUE					%L		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				%R																		
ENG FAIL HP																													
SAFE HP																													
TOT AFT QTY 1 (%)																													
TOT AFT QTY 2 (%)																													
CAPTURE HP		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				PB/FLIP HP		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				AFT HP		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				B/U SITE		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>									
FRCS: DUMP TO % (USE TIME AS CUE)										OX		FU																	
<u>ENTRY/LANDING</u>																													
EI - 5 MM303 INRTL ATT					R		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td><td></td><td></td></tr> </table>						P		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td><td></td><td></td></tr> </table>						Y								
MM304 PREBANK (ENT MNVR Cue Card)										L		R																	
ALTM SET																													
CLG INIT										<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td><td>:</td><td></td></tr> </table>				:															
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EXPECTED AIL TRIM										L		R																	
VREL 1ST REVERSAL																													
XCG AT TD																													
LAND SITE		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				RWY		<table border="1" style="display: inline-table; width: 80px; height: 20px;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table>								50K		/											
L		OVHD		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				deg		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				MLS		38K		/											
R		STRT		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				TAC		28K		/																	
T MACH < 1 TO HAC				MAX Nz		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				Nz LIMIT		<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				20K		/											
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T HAC INIT to H = 20K										7K		/																	
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		:																											
AIMPOINT				SPEEDBRAKE				% @ 3K		1K		/																	
NOM				NOM				<table border="1" style="display: inline-table; width: 40px; height: 20px;"> <tr><td></td><td></td></tr> </table>				SURFACE		/															
CLOSE-IN				S.F.																									
REMARKS:																													

DEORBIT BURN

LANDING SITE TABLE
(50° to 63.5° INCLINATION)

S I T E	LOCATION	RWY	TACANS		MLS CH	LG	+ OVR RUN
				ITEM 5			
1	KSC	KSC 15 KSC 33	TTS 59Y	COF 97	8 6	15000 15000	1000 1000
2	BEN GUERIR	BEN 36 BEN 18	MAK 80 ■	CBA 116 ■	- -	13720 13220	0 1000
3	MORON AB	MRN 20 MRN 02	MRN 100	AOG 23	◆6 -	11730 11730	1000 1000
4	ZARAGOZA	ZZA 30L ZZA 12R	ZZA 64	ZAR 77 ■	◆6 -	12200 12200	1000 1010
5	MYRTLE BEACH	MYR 36 MYR 18	ILM 117	FLO 99	- -	9500 9500	1000 1000
6	WILMINGTON	ILM 06 ILM 24	ILM 117	DIW 107 ■	- -	7500 7500	0 0
7	CHERRY POINT	NKT 32L NKT 23R	EWN 83 ■	NCA 101	- -	7110 7100	800 880
8	OCEANA NAS	NTU 32R NTU 23L	NGU 86Y	ORF 116	- -	7500 11500	0 0
9	WALLOPS	WAL 28 WAL 04	SBY 49	SWL 71	- -	7510 8750	0 0
10	DOVER AFB	DOV 32 DOV 19	SIE 95	CYN 81	- -	12400 9100	0 0
11	ATLANTIC CITY	ACY 31 ACY 13	CYN 81	SIE 95	- -	9500 9500	0 0
12	BEN GUERIR	BEN 36 BEN 18	MAK 80 ■	CBA 116 ■	- -	13720 13220	0 1000
13	*MORON AB	MRN 20 MRN 02	MRN 100	AOG 23	◆6 -	11730 11730	1000 1000
14	*ZARAGOZA	ZZA 30L ZZA 12R	ZZA 64	ZAR 77 ■	◆6 -	12200 12200	1000 1010
15	GABRESKI	FOK 06 FOK 24	HTO 83	GON 45Y■	- -	8500 8500	1000 1000

◆ Available for TAL Only
* LO XRNG TAL Site

■ DME
Length after displaced threshold

**LANDING SITE TABLE
(50° to 63.5° INCLINATION)**

S I T E	LOCATION	RWY	TACANS		MLS CH	LG	+ OVR RUN
				ITEM 5			
16	CAPE COD CGAS	FMH 32 FMH 23	PVD 103	ACK 109 ■	- -	9000 7500	0 0
17	PEASE INT'L	PSM 34 PSM 16	ENE 118	BOS 74 ■	- -	10020 10020	0 0
18	HALIFAX INT'L	YHZ 23 YHZ 32	UAW 38	YHZ 98 ■	- -	8800 7700	0 0
19	STEPHEENVILLE	YJT 09 YJT 27	YJT 78	YDF 80 ■	- -	9500 9500	0 0
20	ST JOHNS INT'L	YYT 29 YYT 11	UYT 23	YYT 82 ■	- -	8500 8500	0 0
21	GANDER INT'L	YQX 21 YQX 31	YQX 74	IQX 32 ■	- -	9700 8900	0 0
22	GOOSE BAY	YYR 26 YYR 34	UYR 40	YYR 120 ■	- -	10550 9080	0 0
23	LAJES AB	LAJ 15 LAJ 33	TRM 109	LAJ 45	- -	10870 10870	970 990
24	BEJA AB	BEJ 01L BEJ 19R	MOJ 37	BEJ 105	- -	10820 10820	0 900
25	KEFLAVIK INT'L	IKF 20 IKF 29	KEF 57	HL 44 ■	- -	9520 9560	0 0
26	SHANNON	INN 06 INN 24	SHA 80 ■	CRK 93 ■	- -	9540 9540	0 0
27	FAIRFORD	FFA 27 FFA 09	FFA 81	BZN 56	- -	9490 9490	990 970
28	KOLN-BONN	KBO 14L KBO 32R	GIX 18	DOR 23Y ■	- -	12020 12020	0 0
29	ISTRES AB	FMI 33 FMI 15	◆FMI 16	NIM 53	◆6 -	11300 12300	3960 0
30	ESSENBOGA	ESN 03R ESN 21L	BAG 76 ■	BUK 90 ■	- -	11800 11800	0 0

◆ Available for TAL Only

■ DME

Length after displaced threshold

**LANDING SITE TABLE
(50° to 63.5° INCLINATION)**

S I T E	LOCATION	RWY	TACANS		MLS CH	LG	+ OVR RUN
				ITEM 5			
31	KING KHALED	KKI 15R KKI 33L	RIY 92	KIA 80	- -	13300 13300	0 0
32	DIEGO GARCIA	JDG 31 JDG 13	NKW 57	NKW 57	- -	12000 12000	950 950
33	AMBERLEY TINDAL RAAF	AMB 15 PTN 14	AMB 94 -	- TDL 70	- -	9500 8500	0 0
34	YOKOTA AB	JTY 36 JIY 18	SHT 19	NJA 98	- -	11000 11000	1000 1000
35	ANDERSEN AFB	GUA 06L GUA 24R	UAM 54	UNZ 105	- -	10560 10560	1050 1000
36	WAKE ISLAND	WAK 28 WAK 10	AWK 82	AWK 82	- -	9340 9340	0 0
37	HONOLULU	HNL 08R HNL 26L	HNL 95	NGF 93	- -	11500 11500	0 0
38	ELMENDORF	EDF 24 EDF 06	EDF 81	BGQ 72	- -	9500 9500	0 0
39	HAO ATOLL	HAO 12 HAO 30	HAO 85 ■	HAO 85 ■	- -	10690 10690	0 0
40	EDW TEMP	EDT 22R EDT 04L	EDW 111	LHS 21	8 6	12000 12000	1000 1000
41	ASCENSION	HAW 13 HAW 31	ASI 59	ASI 59	- -	9520 9520	0 0
42	NORTHROP	NOR 17 NOR 23	SNG 121Y	HMN 92	6 6	15000 15000	Lkbd Lkbd
43	NORTHROP	NOR 05 NOR 35	SNG 121Y	HMN 92	- -	15000 15000	Lkbd Lkbd
44	EDWARDS AFB	EDW 15 EDW 18L	EDW 111	LHS 21	- -	16300 15000	Lkbd Lkbd
45	EDWARDS AFB	EDW 22 EDW 04	EDW 111	LHS 21	8/† 6	15020 14020	0 1800

† MSBLS Jr. Ch 8 - Requires Uplink

■ DME
Length after displaced threshold

TIG-45 CRT1 GNC OPS 301 PRO (DEORB MNVR COAST)

CRT3 GNC BFS SPEC 50 PRO (HORIZ SIT)

√LAND SITE per DEL PAD

CRT1 LOAD – ITEM 22 EXEC

TIMER – ITEM 23 EXEC

CRT1,3 √PASS & BFS TGTs per MNVR PAD:

BURN ATT

VTOT

TGO

HA HP

APU PRE START (GLS √ @ T-5:25)

R2	√BLR N2 SPLY (three)	– ON
	√BL RPWR (three)	– ON
	√BLR CNTLR/HTR (three)	– B
	√APU FU TK VLV (three)	– CL
	√APU OPER (three)	– OFF
	√HYD MN PUMP PRESS (three) – LO	
	APU CNTLR PWR (three)	– ON
	APU FU TK VLV (three)	– OP
	√APU/HYD RDY tb (three)	– gray
	APU FU TK VLV (three)	– CL

HORIZ SIT CONFIG

		<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		
TAC	INH	20	INH	20
GPS	INH	43	INH	43
DRAG H	AUT	22	AUT	22
ADTA H	INH	26	INH	26
ADTA TO G&C	INH	29	AUT	28
DES any failed TACANs				
TAC	DELTA	35		
AIF_G	INH	48		

OMS BURN PREP

CRT1,2,3 GNC OPS 301 PRO (DEORB MNVR COAST)

CRT2 OMS ENG TRIMS

2 ENG BURN:

√TRIM LOAD per MNVR PAD or:

L,R – ITEM 6 +0.0 -5.7 +5.7 EXEC

1 ENG BURN:

√TRIM LOAD per MNVR PAD or:

P – ITEM 6 +0.0 EXEC

Good eng Y:

LY – ITEM 7 +5.2 EXEC

RY – ITEM 8 -5.2 EXEC

CRT1,2,3 GNC OPS 302 PRO (DEORB MNVR EXEC)

If NO-GO for DEORBIT BURN:

R2 HYD MN PUMP PRESS (three) – NORM

CRT1 GNC OPS 301 PRO (DEORB MNVR COAST)

TIG-20	MANVR TO DEORBIT BURN ATT		
C3	√DAP: AUTO		
F6/F8	√ADI ATT (two)		– INRTL
	√ERR (two)		– MED
	√RATE (two)		– MED
CRT1	MNVR – ITEM 27 EXEC (*)		
	(√ADI ATT with CRT BURN ATT)		
CRT3	GNC SYS SUMM2		

TIG-5	PERFORM GMBL CK		
CRT1	GMBL CK – ITEM 34 EXEC		

SINGLE APU START

R2	APU FU TK VLV	– OP
	OPER	– START/RUN
MDU	√HYD PRESS ind	– LO green
	√BURN ATT ± 5°	
	Go to DEORBIT BURN (Cue Card)	

DEORBIT BURN CUECARDS

DEORBIT BURN (2 ENG)

CRT	√MM302	
	√OMS BOTH (ITEM 1)	
	Enter TGO + 5 sec	
	TRIM per MNVR PAD or P +0.0, LY -5.7, RY +5.7t	
C3	DAP – AUTO(PASS)/DISC	
F6/F8	ADI – LVLH(REF)/HI/MED	
	FLT CNTLR PWR (two)	– ON
TIG -02:00		
C3	OMS ENG (two)	– ARM/PRESS
TIG -00:15	EXEC (NO EXEC > TIG + ____ / ____ : ____)	
	If OMS AFT QTY < 11%, THC +X to OMS IGN + 1	
sec		
TIG		
00:00	Start watch (Pc, VTOT, ENG VLVs)	
	If no OMS ignition: APUs – SHUT DN	

RCS COMPLETION (If reqrd)

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

FRCS COMPLETION (if applicable):

MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4)

THC -X to TGT HP or FRCS depletion (JETS FAIL

OFF)

CUTOFF

+00 :02

C3	OMS ENG(s)	– OFF
	Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)	
F6/F8	FLT CNTLR PWR (two)	– OFF
C3	√DAP: AUTO	

DEORBIT BURN (1 ENG)

CRT	√MM302
	√OMS L or R (ITEM 2/3)
	Enter TGO + 10 sec
	√TRIM per MNVR PAD or P +0.0, LY +5.2, RY -5.2
C3	√DAP – AUTO(PASS)/DISC
F6/F8	ADI – LVLH(REF)/HI/MED
	FLT CNTLR PWR (two) – ON
TIG-00:02	Good OMS ENG – ARM/PRESS :)
- 00:15	EXEC (NO EXEC > TIG + ____ / ____ : ____)
	 If OMS AFT QTY < 11%, THC +X to OMS IGN + 1
sec	
TIG	
00:00	Start watch (√Pc, VTOT, ENG VLVs)
	* If no OMS ignition: APUs – SHUT DN *

RCS COMPLETION (If reqrd)

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

FRCS COMPLETION (if applicable):

MNVR to -X Att (pitch up at 3°/sec to VGOz = +1/4
THC -X to TGT HP or FRCS depletion (JETS FAIL

OFF)
CUTOFF
+00 :02

C3	OMS ENG	– OFF
	Trim X,Z residuals < 2 fps (< 0.5 fps if shallow)	
F6/F8	FLT CNTLR PWR (two)	– OFF
C3	√DAP: AUTO	

DEORBIT BURN (RCS)

√MM302
√RCS SEL (ITEM 4)

C3 L,R OMS He PRESS/VAP ISOL A (two) – OP

Wait 2 sec
L,R OMS He PRESS/VAP ISOL B (two) – OP
√DAP – INRTL/DISC

F6/F8 ADI – LVLH(REF)/MED/MED
FLT CNTLR PWR (two) – ON

TIG THC +X to TGT HP
Maintain PITCH ATT ERR ± 3
CUTOFF: VGOx = 0, release THC

If no OMS IGNITION at TIG:
C3 OMS ENG (two) – OFF
R2 √APU – SHUT DN

CRT GNC OPS 301 PRO (DEORB MNVR COAST)

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

If burn terminated with HP > SAFE HP:
C3 √OMS ENG (two) – OFF
R2 √APU – SHUT DN

CRT GNC OPS 301 PRO (DEORB MNVR COAST)

UNDERBURN

Determine HP (CUR HP – TGT HP)

Record prebank on **ENTRY MANEUVERS** Cue Card

PREBANK TABLE EDW (HA = 201 NM)

EDW									
ΔHP	0	3	6	9	12	REDES.	13	(14)	REDES.
PREBANK	0	70	100	115	135	NOR ELS	150	170	YR
NOR							IF NOR NOGO		
G50 ITEM 41 +4 2, √RWY 17 SET TACAN tw (three) 121Y									
ΔHP		10	11	12	13	15	17	(18)	REDES.
PREBANK		105	105	110	120	135	165	180	YR
YR									
G50 ITEM 41 +2 2, √RWY 26 SET TACAN tw (three) 040X									
ΔHP					15	19	22	24	(26) 28
PREBANK					65	90	105	125	145 180

PREBANK TABLE KSC (HA = 201 NM)

KSC									
ΔHP	0	2	5	7	9	12	14	(15)	REDES.
PREBANK	0	50	90	105	110	130	155	175	YQX
YQX									
G50 ITEM 41 +2 1, √RWY 21 SET TACAN tw (three) 074X									
ΔHP						16	22	(25)	RED.
PREBANK						95	135	170	INN
INN									
G50 ITEM 41 +2 6, √RWY 06 SET TACAN tw (three) 080X									
ΔHP								26	28
PREBANK								135	180

CRT1,2 GNC OPS 303 PRO (DEORB MNVR EXEC)
 CRT3 GNC SYS SUMM 2

CRT1 Enter INRTL EI-5 MM303 ATT from DEL PAD
 Mnvr to EI-5 ATT – ITEM 27 EXEC (*)
 R – ITEM 24 + _____
 P – ITEM 25 + _____
 Y – ITEM 26 + _____

If UNDERBURN or no DEL PAD, manually mnvr to

LVLH R = 001
 Y = 358
 P = per table →

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

OMS GMBL PWRDN
 CRT1 LEFT – ITEM 32 EXEC
 RIGHT – ITEM 33 EXEC

ENTRY SW CHECK

CRTX GNC SPEC 51 PRO (OVERRIDE)
 VENT DR CL – ITEM 44 EXEC

C3	SRB SEP	– AUTO
	ET SEP	– AUTO
F6/F8	ADI ERR	– MED
	RATE	– MED
O8	RADAR ALTM (two)	– ON

EI-13

REMAINING APUs START

R2	APU FU TK VLV (two)	– OP
	√APU/HYD RDY tb (two)	– gray
	APU OPER (two)	– START/RUN
MDU	√HYD PRESS ind (two)	– LO green
R2	√APU/HYD RDY tb (two)	– bp

If two APUs operating: CONDITIONING
Delay following until EI-6:

R2	HYD MN PUMP PRESS (two)	– NORM
	√PRESS ind (two)	– HI green

If only one APU operating:

R2 **APU AUTO SHTDN (one)** – INH

Delay MM304 trans until EI-2
Immediately prior to MM304 trans:

R2 HYD MN PUMP PRESS (one) – NORM
MDU √PRESS ind (one) – HI green
MDU HYD MN PUMP PRESS (three) – NORM
 √PRESS ind (three) – HI green
F6,F8 FLT CNTLR PWR (two) – ON

EI-6 Go to **ENTRY MANEUVERS** (Cue Card)

ENTRY MANUEVERS

FLIGHT CONDITIONS	MANEUVER
	EI-5 √LVLH ATT GNC, OPS 304 PRO <div style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;"> If PREBANK, R/Y – CSS Roll at 1°/sec to <u>1 8 0</u> → if HP ≥ 46 (not AOA), else — — — → (from <u>Prebank Table</u>) Maintain PREBANK ±5° </div> (AOA) SPI When SB position – 0%: √HYD MN PUMP PRESS (three) – LO
qbar= 1	(AOA) HYD MN PUMP PRESS (three) – NORM
'Guidance Box' @ qbar~ 8 or D ~ 3	CLOSED LOOP GUIDANCE ____:____:____ If PREBANK: P,R/Y – AUTO Begin AIL trim monitoring
D = 11	√DRAG H
Az = 10.5°	FIRST ROLL REVERSAL
V = 19K	√HYD MPS/TVC ISOL VLV SYS (three) – CL
V = 15K	√NAVAIDS (I/O RESET if reqd)
V = 12K	RAD BYP VLV MODE (two) – AUTO CNTLR LOOP (two) – AUTO B(A)
V = 10K	√SPDBK to 81%

FLIGHT CONDITIONS	MANEUVER
V = 5K	ADTA PROBES – DEPLOY (HEAT)
M = 2.7	√APUs HUD PWR (two) – ON
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
M = 0.7	√LND GEAR EXTD ISO VLV – OP
h = 15K	√MLS
h = 10K	√A/L (Tabs)
h = 2K	LDG GEAR ARM pb – push (ARM lt on)
h = 300	LDG GEAR DN pb – push (DN lt on)
MAIN GEAR TD	√SPDBK – 100%
V = 195 KEAS	DRAG CHUTE ARM, DPY pb (two) – push (simo) (All lts on)
V = 185 KEAS	DEROTATE
NOSE GEAR TD	SRB SEP – MAN/AUTO and depress pb √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 lt on)
V = 40 KGS	BRAKE < 6 fps ² (-0.2G) (Antiskid cutout)
WHEEL STOP	Go to ENT C/L, <u>POST LANDING PROCEDURES</u>

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	

ENTRY ALPHA

VR	α	ref	R	H	Href	Rref
25	HI	40 LO	4404	400		
24	HI	40 LO	2596	248	-47	L79
23	43	40 37	2134	240	-64	69
22	43	40 37	1782	233	-84	63
21	43	40 37	1509	227	-106	60
20	43	40 37	1288	222	-124	R59
19	43	40 37	1114	214	-146	60
18	43	40 37	976	207	-169	62
17	43	40 37	862	200	-188	63
16	43	40 37	764	193	-201	65

KSC 15

MAX L/D	
M	α
3	17
2	15
1	12

(133 OCF CY)

HOOK
VELCRO

ASC-14b/133/A,E/A

HOOK
VELCRO

HOOK
VELCRO

15	43	40 37	686	187	-118	64
14	43	40 37	613	183	-127	63
13	43	40 37	546	180	-136	60
12	43	40 37	484	175	-152	59
11	42	39 36	429	171	-192	L56
10	41	38 35	376	166	-174	47
9	39	36 33	327	160	-206	43
8	37	34 31	278	153	-238	39
7	33	30 27	230	143	-267	38
6	30	27 24	185	132	-272	40
5	26	23 20	142	119	-273	41
4	23	20 18	107	106	-262	R38
3	19	16 15	74	91	-248	35
2.5	14		61	83	-251	
2	13		50	78	-257	
1.5	10		39	69	-311	
1	8		28	54	-261	

POST LANDING

00:00

After orbiter stops:
Report, "WHEELS STOP"

ET UNBILICAL DOOR OPENING

R2 ET UMB DR
 MODE – GPC/MAN
 R LAT – REL (tb-bp, REL ~6 sec)
 R LAT – OFF
 R DR – OP (tb-bp)
 Wait 12 sec,
 R DR – OFF (tb-bp)
 L LAT – REL (tb-bp, REL ~6 sec)
 L LAT – OFF
 L DR – OP (tb-bp)
 Wait 12 sec,
 L DR – OFF (tb-bp)
 MODE – GPC

R1 √AC BUS SNSR (three) – AUTO
F6,F8 FLT CNTLR PWR – OFF
F3 HUD PWR (two) – OFF

CRT1 GNC OPS 901 PRO (GPC MEMORY)
CRT2 GNC OPS 901 PRO (GPC MEMORY)
CRT3 GNC OPS 901 PRO (GPC MEMORY)

RCS, OMS SAFING

C3 √OMS ENG (two) – OFF

DEACT AIR DATA PROBE HTRS

C3 √AIR DATA PROBE (two) – DPY

APU/HYD SHUTDN

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

POST LANDING MPS RECONFIG

	(After APU/HYD shutdn + 1 min)	
R2	MPS He ISOL (six)	– CL
	MPS He I'CNCT L	– OUT OP
	MPS PNEU L ENG He XOVR	– CL

GPC DEACT

O6	GPC MODE 1,2,3,4,5 (five)	– STBY (tb-bp)
	GPC MODE 1,2,3,4,5 (five)	– HALT

MDU's PWRDN

F6	CDR1, 2	– OFF
F7	CRT1, 2, 3	– OFF
	MFD1, 2	– OFF
F8	PLT1, 2	– OFF

VEHICLE PWRDN

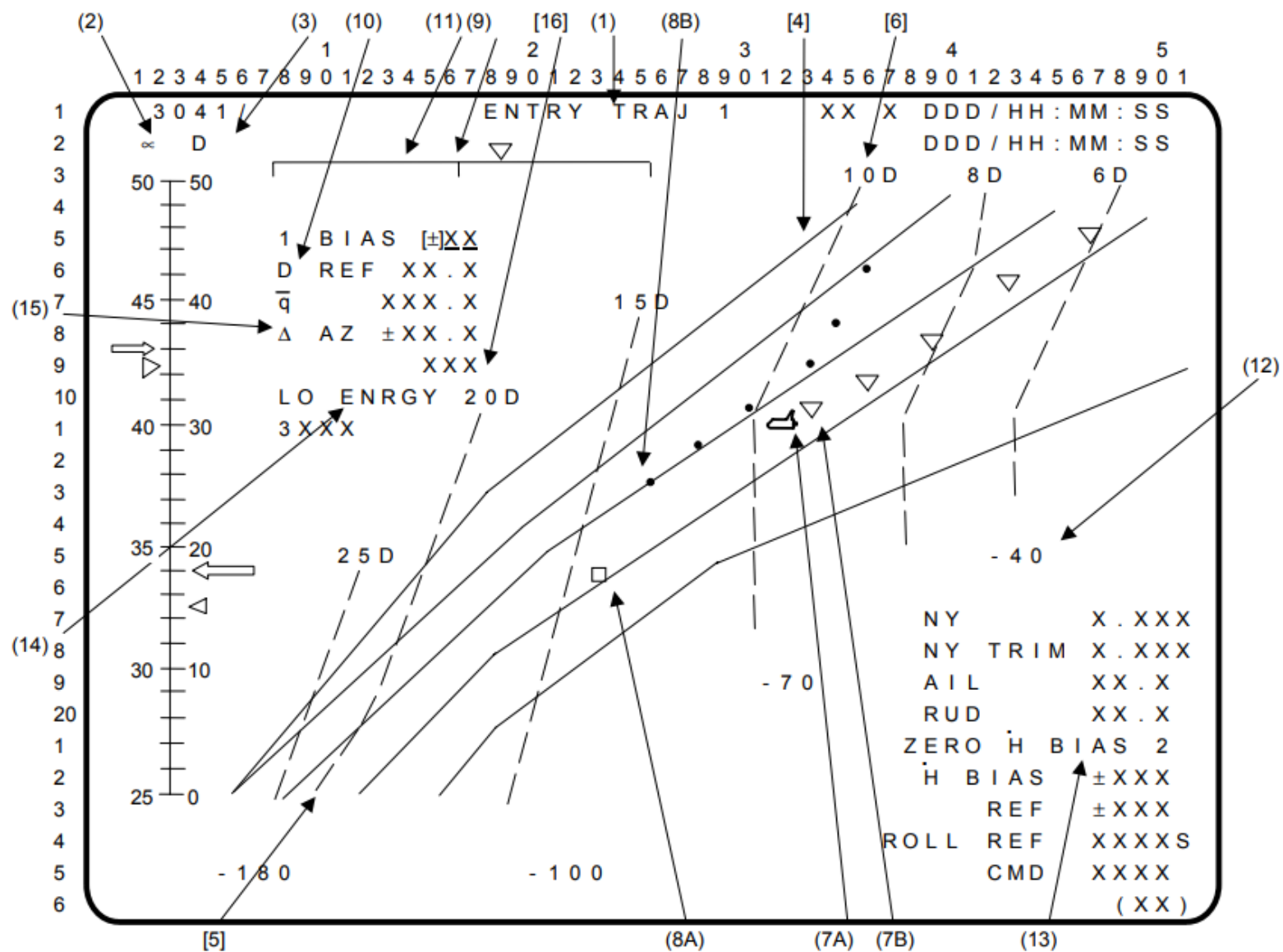
R1	MN BUS TIE (three)	– OFF
	FC/MN BUS (three)	– OFF
	ESS BUS SOURCE FC (three)	– OFF

GPC PWRDN

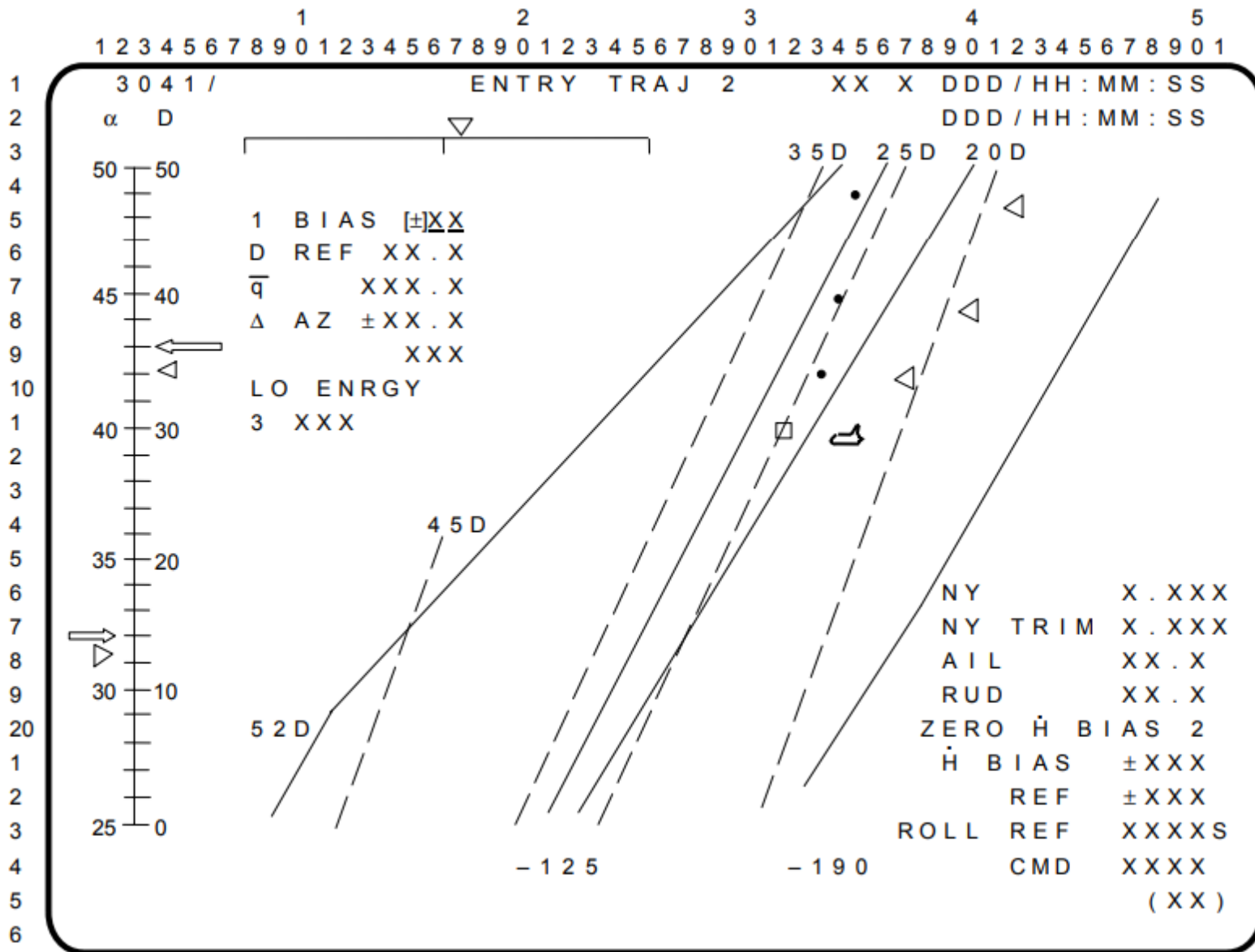
O6	GPC PWR 2,3,4 (three)	– OFF
C2	IDP/CRT 1,2,3 PWR	– OFF
R12	IDP/CRT 4 PWR	– OFF
O8	RADAR ALTM (two)	– OFF

ENTRY DISPLAYS

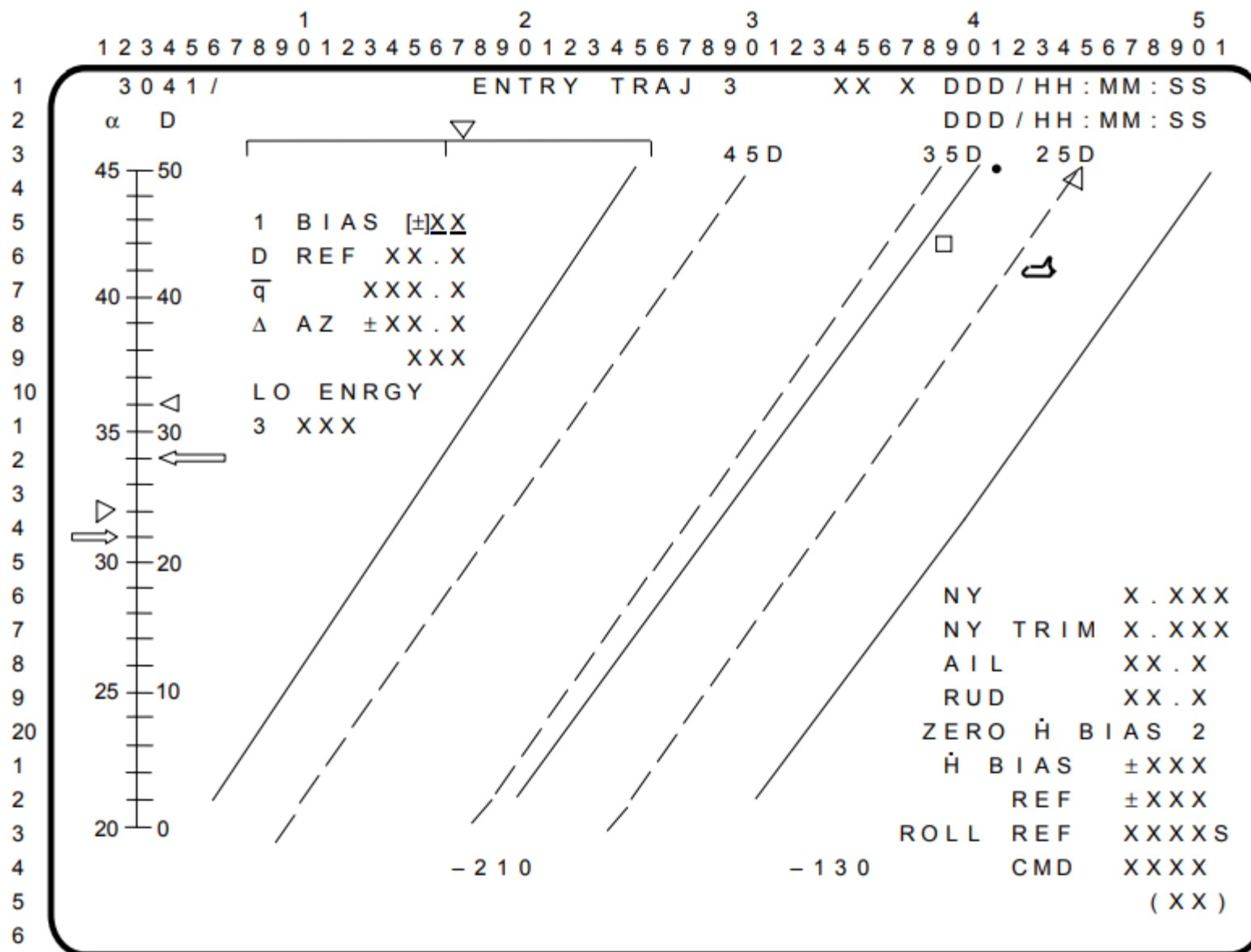
ENTRY TRAJ 1 DISPLAY



ENTRY TRAJ 2 DISPLAY



ENTRY TRAJ 3 DISPLAY



ENTRY TRAJ

1 BIAS \pm XXX
D REF XX.X
 \bar{q} XXX.X
 Δ AZ \pm XX.X
XXX
LO ENRGY
3 XXX

NY X.XXX
NY TRIM X.XXX
AIL XX.X
RUD XX.X
ZERO \dot{H} BIAS 2
 \dot{H} BIAS \pm XXX
REF \pm XXX
ROLL REF XXXXS
CMD XXXX
(XX)

1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1

1 3 0 4 1 / ENTRY TRAJ 5 XX X DDD / HH : MM : SS

2 α D DDD / HH : MM : SS

3 30 50 30 D 20 D

4 25 40

5 1 BIAS [±] XX.X

6 D REF XX.X

7 \bar{q} XXX.X

8 Δ AZ ±XX.X

9 XXX

10 LO ENRGY

1 3 XXX

2 20 30

3 15 20

4 10 10

5 5 0

6 -245 -275

7 NY X.XXX

8 NY TRIM X.XXX

9 AIL XX.X

10 RUD XX.X

11 ZERO H BIAS 2

12 H BIAS ±XXX

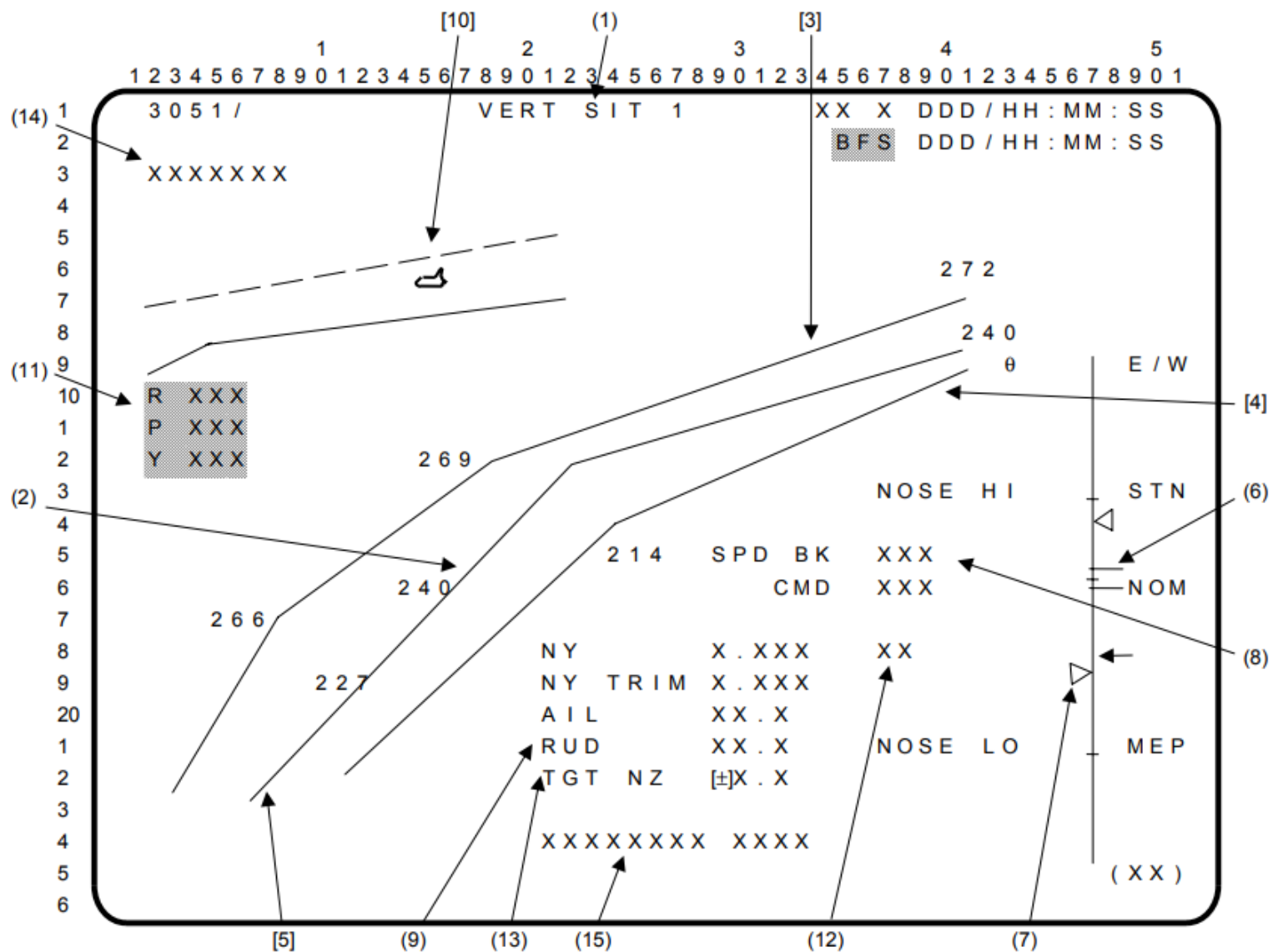
13 REF ±XXX

14 ROLL REF XXXXS

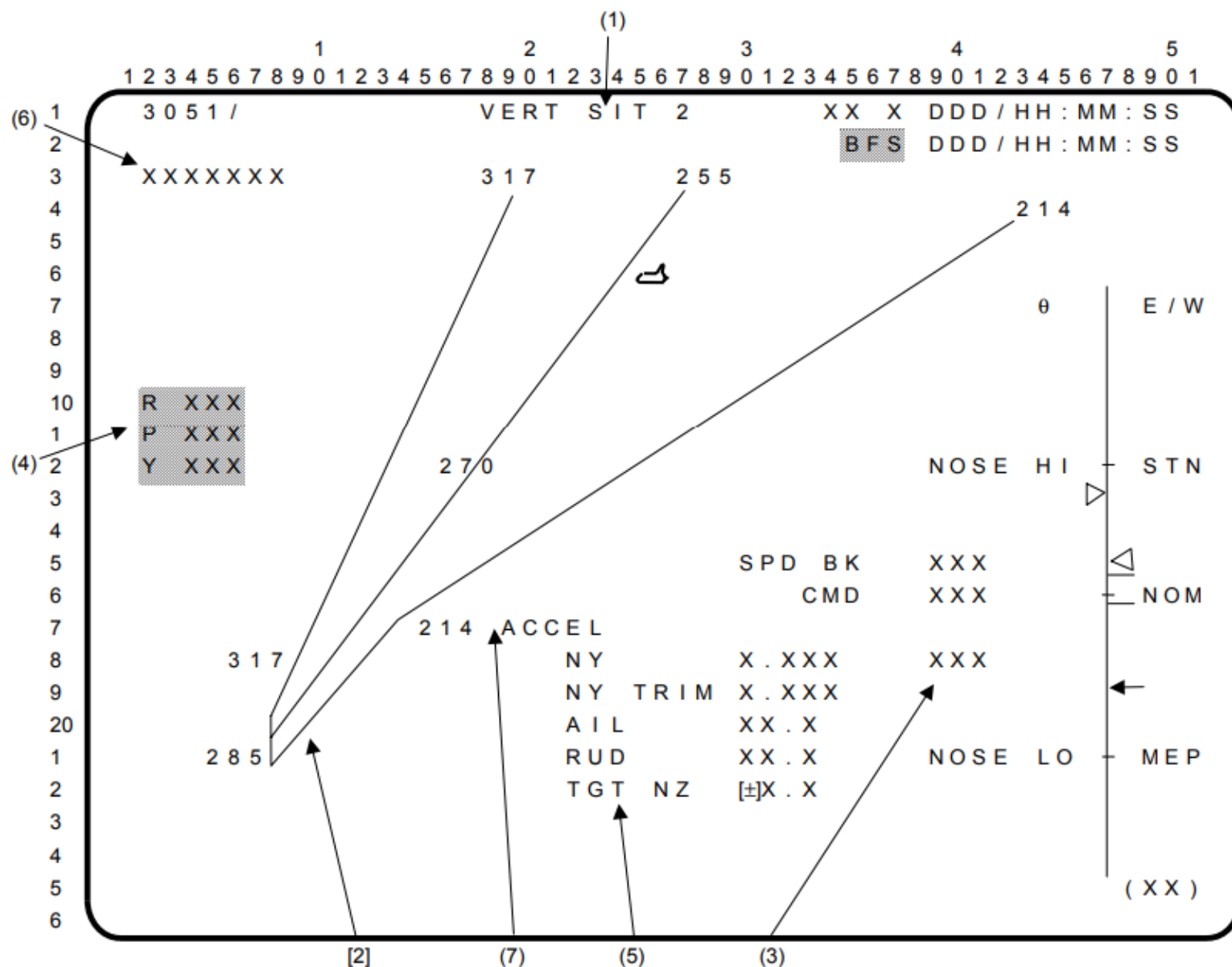
15 CMD XXXX

16 (XX)

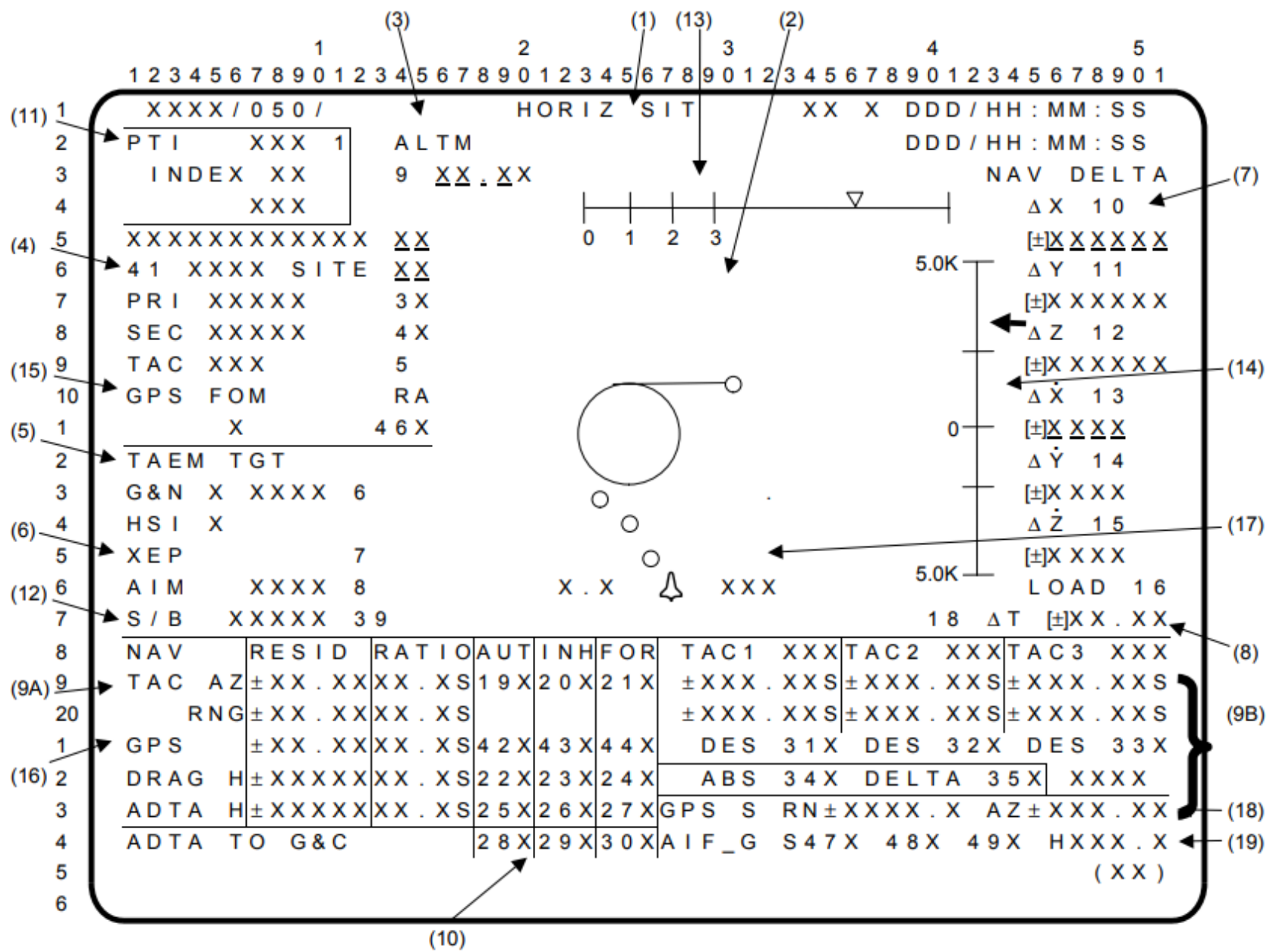
VERT SIT 1 DISPLAY



VERT SIT 2 DISPLAY



HORIZ SIT DISPLAY



(1)





<h1>ENTRY CHECKLIST</h1>	<h1>STS ALL</h1>
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Flight Cover (trim bottom to expose tabs)