Space Shuttle Program
FLIGHT DATA FILE

JSC-48068-125

Payload Operations Checklist

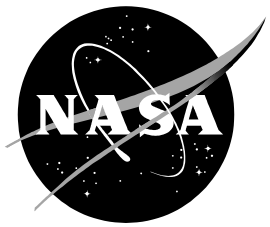
STS-125

Mission Operations Directorate
Operations Division

Final
March 19, 2008

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



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Verify this is the correct version for the pending operation (training, simulation or flight).
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SMS FDF CHANGE NOTIFICATION

SIM PACK

DATE INITIATED	DATE RECEIVED (PMO)
5/20/08	

BOOK TITLE: Payload Operations, STS-125

BK ISSUE (Ed, Rev, PCN): FINAL

SIM PACK NUMBER: SIM-15b

Change is for flights (Also give SMS load if load dependent): 125

SMS UNIQUE? ☐ YES ☒ NO

DEVELOPMENTAL? ☐ YES ☒ NO

FABRICATED ITEM CHANGE? ☒ NONE ☐ CUE CARDS ☐ TRANSPARENCIES ☐ Other _____

INSTRUCTIONS TO USER:

Replace page 3-11 & 3-12

After page 3-12, insert page 3-12a & 3-12b

AUTHORITY FOR CHANGE* (Approved 482 numbers, approved issue at print shop, supervisors deem mandatory, etc.):

DO-08.114-1 in-work. SME DO5/T. Batten requires update to procedure for training.

*Refer to Crew Procedures Management Plan

OTHER AFFECTED FDF BOOKS

None

Are all SIM PACKS submitted? ☐ YES ☐ NO

IMPLEMENTATION REQUIREMENTS

☐ Limited Distribution (List in comments)

☐ NO EARLIER THAN (Date and/or Sim ID) _____

☒ NO LATER THAN (Date and/or Sim ID) 05/28/2008

BOOK MGR (Signature/Date)	SUPERVISOR (If required, Signature/Date)	FDF COORD or FDF MGR (Signature/Date)
Renee' M. Ross 05/21/08	5/21/08	5-21-08

COMMENTS:

MISSION OPERATIONS DIRECTORATE

PAYLOAD OPERATIONS CHECKLIST
STS-125

FINAL
March 19, 2008

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PAYLOAD OPERATIONS CHECKLIST
STS-125

LIST OF EFFECTIVE PAGES

FINAL 03/19/08

* – Omit from flight book
† – Color page in flight book

PAYLOAD OPS CUE CARDS

* – Omit from flight book

CONTENTS PAGE

SSE ACT/FSS PREP

SSE ACTIVATION

1. PRIMARY PAYLOAD ACT

R1 √PL PRI MNC tb – ON
√CAB – MNA

2. FSS AND MULE FMDM-B PWR ON

L12U cb FSS/ORUC A SIDE PWR – cl

FSS FMDM-B PWR – ON (tb-gray)

* If FSS FMDM-B PWR tb – bp, cycle sw *
* If still no joy, continue *

L11U cb MULE B SIDE PWR – cl

MULE FMDM-B PWR – ON (tb-gray)

* If MULE FMDM-B PWR tb – bp, cycle sw *
* If still no joy, continue *

SM 211 SSE OVERVIEW
SM I/O RESET EXEC

* If FSS FMDM-B PWR or MULE FMDM-B PWR tb – bp and 'I/O *
* ERROR FLEX' msg, FMDM failed: *
L12U * FSS FMDM-B PWR – OFF (tb-bp) *
* FMDM-A PWR – ON (tb-gray) *
L11U * MULE FMDM-B PWR – OFF (tb-bp) *
* FMDM-A PWR – ON (tb-gray) *
* *
* SM 1 DPS UTILITY *
* PORT ASSIGN STRING PL 1/2 SEC – ITEM 24 EXEC (*) *

* If 'I/O ERROR FLEX' msg, go to *
* 1.4a 'I/O ERROR FLEX' (PL SYS, SSE) *
* If 'BCE BYPASS' msg, go to 1.4b 'BCE *
* BYP FLEX' (PL SYS, SSE) *

3. VERIFY SSE STATUS

NOTE
Notify MCC of any parameter not in range, continue

SM 211 SSE OVERVIEW

√PCU	– blank/blank
√CCTV ENA OFF	– *
√PWR OFF	– *
√COPE A HTR ZONE 1&2,3 (two)	– (no *)
√B HTR ZONE 1&2,3 (two)	– (no *)
√RNS ENA STAT	– (no *)
√AMPS:	< 0.4

POWER

√FSS EPDSU 1/2 AMPS (two):	< 3.0
√FMDM A/B AMPS:	< 0.15/0.5 to 1.1
√HTR	– blank/blank
√HTR P1/P2 AMPS (two):	< 0.4
√R1/R2 AMPS (two):	< 0.4
√CCTV HTR AMPS:	< 0.10
√ORUC	– blank/blank
√AMPS (two):	< 0.4
√MULE FMDM A/B AMPS:	< 0.15/0.7 to 1.3
√HTR	– (no *)
√HTR AMPS:	< 0.4
√COPE 1A/2A AMPS (two):	< 0.4
√1B&2B AMPS:	< 0.4
√3A/3B AMPS (two):	< 0.4
√SLIC EPDSU AMPS:	0.4 to 1.4
√FSS VOLTS (two):	24.0 to 32.0
√SLIC VOLTS (two):	24.0 to 32.0
√MULE VOLTS:	24.0 to 32.0

DPC

√DPC 1-12 (twelve):	– (no *)
√VOLTS (twelve):	< 0.5
√AMPS (twelve):	< 0.5

THERMAL

√FSS EPDSU TEMP (two):	-20 to 50 degC
√FMDM TEMP:	-3 to 55 degC (active FMDM only)
√PCU TEMP (two):	-20 to 50 degC
√IPCU TEMP:	-30 to 50 degC
√AMSB TEMP:	-20 to 50 degC
√MULE PDSU TEMP:	-20 to 50 degC
√FMDM TEMP:	-3 to 55 degC (active FMDM only)
√SLIC EPDSU TEMP (two):	-20 to 50 degC

4. FSS HEATER ACT

L12U FSS HTR PWR – PRI (tb-gray)

* If tb – bp, cycle sw *
* If still no joy, continue *

CRT √POWER FSS HTR – 1/2

* If POWER FSS HTR NOT 1/2, go to 1.1a POWER *
* FSS HTR NOT 1/2 (S211) (PL SYS, SSE) *

√POWER FSS HTR P1,P2 AMPS (two): $\leq$ 0.4

CRT * If POWER FSS HTR P1 AMPS: > 14 or POWER FSS HTR P2 *
* AMPS: > 11, expect FDA, then *
L12U * FSS HTR PWR – OFF (tb-bp), √MCC *
* If POWER FSS HTR P1 AMPS: 0.4 to 14 or POWER FSS HTR P2 *
* AMPS: 0.4 to 11, then *
* notify MCC, continue *

L12U CCTV HTR PWR – ON (tb-gray)

* If CCTV HTR PWR tb – bp, cycle sw *
* If no joy, continue *

CRT √POWER FSS CCTV HTR AMPS: ≤ 0.9

* If POWER FSS CCTV HTR AMPS: > 0.9, *
L12U * CCTV HTR PWR – OFF (tb-bp), continue *

5. <u>ORUC HTR ACT</u>
L12U ORUC POWER CONTR A – ON (tb-gray)
CONTR B – ON (tb-gray)

* If either tb – bp, *
* cycle sw *
* If still no joy, continue *

CRT √POWER ORUC – A/B
√AMPS (two): < 30
√THERMAL ORUC PRJU TEMP (two): -20 to 50 degC

CRT * If POWER ORUC A or B AMPS > 30: expect FDA, then *
L12U * ORUC POWER CONTR A or B – OFF (tb-bp) *
* √MCC *

CRT * If POWER ORUC not A/B and associated tb – bp: *
* ORUC A or B side failed *
* ORUC POWER CONTR A or B – OFF (tb-bp) *
* Continue with loss of redundancy *

* If POWER ORUC not A/B and associated tb – gray: *
* Possible monitor failure *
* Continue ops *

6. <u>MULE/RNS SURVIVAL HEATER ACT</u>
L11U SURV HTR B PWR – ON (tb-gray)

* If SURV HTR PWR tb – bp, *
* cycle sw *
* If still no joy, continue *

CRT √POWER MULE HTR – *

* If POWER MULE HTR NOT *, go to *
* 1.1b POWER MULE HTR NOT * *
* (S211) (PL SYS, SSE) *

√POWER MULE HTR AMPS: ≤ 0.4

* If POWER MULE HTR AMPS: > 13, expect FDA, then *
L11U * SURV HTR B PWR – OFF *
* √HTR PWR tb – bp *
* √MCC *
* If POWER MULE HTR AMPS 0.4 to 13, then notify MCC, *
* continue *

7. MULE COPE HEATER ACT

L11U MULE COPE HTR B PWR – ON (tb-gray)

* If MULE COPE HTR B PWR tb – bp, *
* cycle sw *
* If still no joy: *
* MULE COPE HTR B PWR – OFF (tb-bp) *
* A PWR – ON (tb-gray) *

CRT √COPE B HTR ZONE 1&2,3 (two) – *
√POWER MULE COPE 1A/2A AMPS (two): ≤ 0.4
√1B&2B AMPS: ≤ 6.0
√3A/3B AMPS: ≤ 0.4/≤ 3.5

* If POWER MULE COPE B AMPS not as expected: *
L11U * expect FDA, then *
* MULE COPE HTR B PWR – OFF (tb-bp), *
* √MCC *
* If POWER MULE COPE A AMPS not as expected, *
* then notify MCC, continue *

8. SLIC PWR ON

L12L cb SLIC A-SIDE PWR ENA – cl
SLIC B-SIDE PWR ENA – ON

9. WSIPE HTR A ON

WSIPE HTR A PWR – ON (tb-UP)

* If WSIPE HTR A PWR tb – bp, cycle sw *
* If still no joy: *
* WSIPE HTR A PWR – OFF (tb-bp) *
* B PWR – ON (tb-UP) *

CRT √POWER SLIC EPDSU AMPS: ≤ 9

* If POWER SLIC EPDSU AMPS: > 9, *
L12L * WSIPE HTR A PWR – OFF (tb-bp) *
* √MCC *

10. BPA STBD HTR B PWR ON

L12L BPA STBD HTR B PWR – ON (tb-gray)

* If BPA STBD HTR B PWR tb – bp, *
* cycle sw *
* If still no joy: *
* BPA STBD HTR B PWR – OFF (tb-bp) *
* A PWR – ON (tb-gray) *

CRT √POWER SLIC EPDSU AMPS: ≤ 11

* If POWER SLIC EPDSU AMPS: > 11, *
L12L * BPA STBD HTR B PWR – OFF (tb-bp) *
* √MCC *

11. BPA PORT HTR A ON

L12L BPA PORT HTR A PWR – ON (tb-gray)

* If BPA PORT HTR A PWR tb – bp, *
* cycle sw *
* If still no joy: *
* BPA PORT HTR A PWR – OFF (tb-bp) *
* B PWR – ON (tb-gray) *

CRT √POWER SLIC EPDSU AMPS: ≤ 13

* If POWER SLIC EPDSU AMPS: > 13, *
L12L * BPA PORT HTR A PWR – OFF (tb-bp), *
* √MCC *

12. SLIC EPDSU HTR PWR B ON

L12L SLIC EPDSU HTR PWR – B ON (tb-gray)

* If SLIC EPDSU HTR PWR tb – bp, cycle sw *
* If still no joy: *
* SLIC EPDSU HTR PWR – OFF (tb-bp) *
* – A ON (tb-gray) *

CRT √POWER SLIC EPDSU AMPS: ≤ 16

* If POWER SLIC EPDSU AMPS: > 16, *
L12L * SLIC EPDSU HTR PWR – OFF (tb-bp) *
* √MCC *

13. RNS PWR ENA

L11U RNS PWR – ENA (tb-gray)

* If RNA PWR (tb-bp), *
* cycle sw *
* If still no joy, continue *

CRT √RNS AMPS: < 1.2

* If RNS AMPS: > 1.2 *
L11U * RNS PWR – DIS (tb-bp), *
* √MCC *

14. VERIFY MECHANISM STATUS

SM 212 SSE MECH/BPA/RNS

√AMSB OFF – *
√AMSB AC AMPS: < 0.20
√AMSB TEMP: -20 to 50 degC
√MECH – blank
√PIVOT LO TACH: < 0.25 deg/min
√ROTATOR TACH: < 0.9 deg/min

15. VERIFY BATT PLATE TEMPERATURE

√BATT PLATE TEMP PORT-FWD: -20.0 to 50.0 degC
√PORT-AFT: -20.0 to 50.0 degC
√STBD-FWD: -20.0 to 50.0 degC
√STBD-AFT: -20.0 to 50.0 degC

16. VERIFY RNS STATUS

√RNS ICE VOLTS: 24.0 to 32.0
√TEMP: -20.0 to 50.0 degC
√RNS OP HTR OFF – *
√AMPS: < 0.4
√RNS SP-CUBE OFF – *
√AMPS: < 0.4
√RNS SENSORS OFF – *
√AMPS: < 0.4

17. RNS TM ACTIVATION

SM 212 SSE MECH/BPA/RNS

RNS TM ON – ITEM 25 EXEC

√RNS ICE AMPS: 0.4 to 1.4

* If RNS ICE AMPS > 1.4, *
* record value and turn OFF TM: *
* RNS TM OFF – ITEM 26 EXEC *
* √MCC *

√FRM CNT: INCR

* If RNS FRM CNT not incrementing, *
* RNS TM OFF – ITEM 26 EXEC *
* RNS TM ON – ITEM 25 EXEC *
* If still no joy, √MCC *

√MSM1 OFF – *
√MSM2 OFF – *

Notify MCC, SSE ACTIVATION complete; report any anomalies

HST BSA INSTALL AND CONFIG

1. UNSTOW BSA AND CABLES

MF71C Remove BSA from storage locker
Remove BSA power cable from storage locker
Remove BSA 14 foot data cable from storage locker
BSA √BSA PWR – OFF
MO13Q √DC UTIL PWR MNB – OFF
Connect: BSA power cable to DC UTIL PWR MNB

2. VERIFY CONNECTORS DEADFACED FOR BSA INSTALLATION

L12L √PSP BY-PASS – DISABLE

3. CONFIGURE PDIP1 PI CONNECTORS

L12L Remove: HST PI 1(2) Turn-around Plug
Connect: BSA 14 foot data cable to PDIP1 HST PI 1(2)
BSA Connect: BSA 14 foot data cable to BSA data port
Connect: BSA power cable to BSA power port

4. CONFIGURE BSA FRONT PANEL

BSA RATE – 32k
POLARITY – Norm
WATCHDOG – Dis

5. BSA POWERUP AND LED VERIFICATION

MO13Q DC UTIL PWR MNB – ON

BSA BSA PWR – ON
√All LEDs illuminate for 4 sec

* If pwr to BSA fails (PWR LED not illuminated): *
* Check pwr cable connection *
* If pwr cable connection OK, *
* BSA PWR – OFF (wait 5 sec) *
* BSA PWR – ON *
* If no joy, √MCC *

After LED check:
√PWR – Green
√SEARCH – Yellow
√SIGNAL LOSS – Red

* If PWR/SEARCH/SIGNAL LOSS *
* do not match this pattern, √MCC *

Velcro BSA to desired location, MCC recommends near the middeck port ladder.
Install BSA Cue Card to exterior of BSA

6. BSA PWR OFF

BSA BSA PWR – OFF

Notify MCC, HST BSA INSTALL AND CONFIG complete

SSE CHECKOUT

1. SSP INTERFACE CHECKS

SM 211 SSE OVERVIEW

PCU ON – ITEM 1 EXEC (*)
√PCU – P/S
√DPC 1-12 (twelve): – *
√VOLTS (twelve): 33.7 to 35.5
√AMPS (twelve): ≤ 0.5

* If any DPC 1-12 (twelve) AMPS: > 0.5, turn off affected DPC *
* DPC OFF – ITEM 24 +X X EXEC (no *) *
* (Refer to DPC ON/OFF INDEX NUMBERS (REF DATA)), *
* √MCC *
* If any other param(s) not in range, record MET and off *
* nominal DPC values; notify MCC *
* Continue *

NOTE

If any parameters out of limits, note and continue

L12U cb SPACE TEL SW PWR – cl
ESS/MN SW ENA – ON (tb-gray)
MAIN BUS EXT PWR – ON (expect no tb)
√IPCU RLY CL tb – gray
MAIN BUS EXT PWR – OFF
√IPCU RLY CL tb – bp
ESS/MN SW ENA – OFF (tb-bp)
RSU SURV HTR PWR – ON (tb-gray)
– OFF (tb-bp)
FHST SHUTTER – CLOSE (tb-gray)
– OPEN (tb-bp)

CRT PCU OFF – ITEM 2 EXEC (*)
√PCU – blank/blank
√DPC 1-12 (twelve) – (no *)
L12U FSS PCU PWR CONTR A – ON
CRT √DPC 1-12 (twelve) – *
L12U FSS PCU PWR CONTR A – OFF
CRT √DPC 1-12 (twelve) – (no *)
L12U FSS PCU PWR CONTR B – ON
CRT √DPC 1-12 (twelve) – *
L12U FSS PCU PWR CONTR B – OFF
CRT √DPC 1-12 (twelve) – (no *)

2. FSS CCTV CHECK

CCTV ENA ON – ITEM 3 EXEC (*)
PWR ON – ITEM 5 EXEC (*)

* If CCTV ENA ON does not indicate '*', *
* re-exec ITEM 3. If still no '*', continue *

* If CCTV PWR ON does not indicate '*', *
* re-exec ITEM 5. If still no '*', attempt to *
* display Camr image on monitor. If no *
* image, √MCC *

A7U Select FSS CCTV, zoom and focus to verify Camr operational

CRT CCTV PWR OFF – ITEM 6 EXEC (*)

* If CCTV PWR OFF not '*', *
* do not perform CCTV ENA – OFF *
* Proceed to step 3 *

Wait 15 sec,
CCTV ENA OFF – ITEM 4 EXEC (*)

3. FSS AMSB CHECKOUT

A6U √PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 1,2 (two) – OFF
√PL SEL – 1

R13L √PL BAY MECH PWR SYS 1,2 (two) – OFF

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (B(A))

* If AMSB ON – blank, *
* record and continue *

√AMSB AC AMPS: < 0.20
√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√PIVOT LO TACH: < 0.25 deg/min
√ROTATOR TACH: < 0.9 deg/min
√O/R DIS (ITEM 22) – *

* If any parameter out of limit, √MCC *

Perform following ITEM entries and checks per table

NOTE

SEL field should show '*' only for MECHANISM selected. For any parameters not as expected, do not deselect; contact MCC

ITEM EXEC	MECHANISM	SEL	STAT	AMSB DC AMPS	MECH	SM 97 PL SEL 1, LAT/REL LATCH 2(1)
9	DLOCK	9 – *	ENG	0.035-0.125	B(A)	01/00(10/00)
Expect 'S212 AMSB DC AMPS' msg						
21	O/R ENA (*)	9 – *	RDY	0.130-0.230		00/00(00/00)
11	PIVOT LO	11 – *	DN	0.035-0.125	B(A)	00/01(00/10)
Expect 'S212 AMSB DC AMPS' msg						
21	O/R ENA (*)	11 – *	RDY	0.130-0.230		00/00(00/00)
22	O/R DIS (*)	11 – *	DN	0.035-0.125	B(A)	00/01(00/10)
12	ROTATOR	12 – *	RDY	0.035-0.125		00/00(00/00)
14	B LAT 1	14 – *	OP	0.035-0.125	B(A)	00/01(00/10)
15	B LAT 2	15 – *	OP	0.035-0.125	B(A)	00/01(00/10)
16	B LAT 3	16 – *	OP	0.035-0.125	B(A)	00/01(00/10)
17	UMB MN	17 – *	REL	0.035-0.125	B(A)	00/01(00/10)
18	UMB B/U	18 – *	MAT	0.035-0.125	B(A)	01/00(10/00)
19	BSP	19 – *	SET	0.035-0.125	B(A)	01/00(10/00)
20	DESEL	9-19 blank		< 0.035		00/00(00/00)

4. B SIDE UMBILICAL TEST

CAUTION
Operating the umbilical in a stalled condition for greater than 30 sec may result in damage to unit. An umbilical stall condition is indicated by AMSB AC AMPS > 0.6 and no mechanism motion

Perform FSS UMBILICAL SURVEY (PDRS OPS, PHOTO SURVEYS)

CCTV Monitor UMB MN operations

A6U PL RETEN LOGIC PWR SYS 2 – ON

R13L PL BAY MECH PWR SYS 2 – ON

CRT MECH UMB MN SEL – ITEM 17 EXEC (* REL)
√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady B

A6U PL RETEN LAT 2 – LAT

CRT √MECH – flashing B
√AMSB AC AMPS: 0.6 to 1.1
√MECH UMB MN STAT – RDY

* If stall condition observed (AMSB AC AMPS > 0.6 and no mechanism motion):
* PL RETEN LAT 2(1) – OFF
* √MCC

Wait 8 sec

√MECH UMB MN STAT – MAT

A6U PL RETEN LAT 2 – OFF

CRT √MECH – steady B

CCTV Visually verify UMB in mated posn

A6U PL RETEN LAT 2 – REL

CRT √MECH – flashing B
√AMSB AC AMPS: 0.6 to 1.1
√MECH UMB MN STAT – RDY

* If stall condition observed (AMSB AC AMPS > 0.6 and no mechanism motion):
* PL RETEN LAT 2(1) – OFF
* √MCC

Wait 8 sec
√MECH UMB MN STAT – REL

A6U PL RETEN LAT 2 – OFF

CRT √MECH – steady B
CCTV Visually verify UMB in released posn
CRT MECH DESEL – ITEM 20 EXEC (√ITEMS 9-19 (eleven) – (no *))
√AMSB DC AMPS: < 0.035
OFF – ITEM 8 EXEC (*)

R13L PL BAY MECH PWR SYS 2 – OFF
A6U RETEN LOGIC PWR SYS 2 – OFF

Notify MCC of any anomalies in SSE CHECKOUT prior to next step

5. SSE SWAP TO A SIDE

L12U FSS FMDM-A PWR – ON (tb-gray)

```
* If FSS FMDM-A PWR tb – bp,  *
*  cycle sw                  *
* If still no joy, continue  *
```

SM 211 SSE OVERVIEW
√POWER FSS FMDM A/B AMPS (two): 0.5 to 1.1

L11U MULE FMDM-A PWR – ON (tb-gray)

```
* If MULE FMDM-A PWR tb – bp,  *
*  cycle sw                   *
* If still no joy, continue   *
```

CRT √POWER MULE FMDM A/B AMPS (two): 0.7 to 1.3

SM1 DPS UTILITY
PORT ASSIGN STRING PL 1/2 SEC – ITEM 24 EXEC (*)

```
* If FSS FMDM-A PWR tb – bp and accompanied by          *
*  'I/O ERROR FLEX' msg, FSS FMDM-A failed:             *
*     PORT ASSIGN STRING PL 1/2 PRI – ITEM 23 EXEC (*), *
L12U *       FSS FMDM-A PWR – OFF (tb-bp)              *
L11U *       MULE FMDM-A PWR – OFF (tb-bp)             *
*    √MCC                                              *
* If MULE FMDM-A PWR tb – bp and accompanied by         *
*  'I/O ERROR FLEX' msg, MULE FMDM-A failed.  MULE      *
*  FMDM-A PWR – OFF (tb-bp).  Go to SSE CHECKOUT        *
*  WITH FAILED MULE FMDM-A (CONTINGENCY OPS)            *
```

6. MULE/RNS SURVIVAL A HEATER ACT

L11U SURV HTR A PWR – ON
HTR B PWR – OFF
√HTR PWR tb – gray

* If SURV HTR PWR tb – bp, *
* cycle SURV HTR A PWR sw *
* If still no joy, continue *

SM 211 SSE OVERVIEW

√POWER MULE HTR – *

* If POWER MULE HTR not *, *
* go to 1.1b POWER MULE HTR *
* NOT * (S211) (PL SYS, SSE) *

√POWER MULE HTR AMPS: ≤ 0.4

* If POWER MULE HTR AMPS: > 13, expect FDA, then *
L11U * SURV HTR A PWR – OFF *
* √HTR PWR tb – bp *
* √MCC *
* If POWER MULE HTR AMPS 0.4 to 13, *
* then notify MCC, continue *

7. MULE COPE-A HEATER ACT

L11U MULE COPE HTR A PWR – ON (tb-gray)

* If MULE COPE HTR A PWR *
* tb – bp, cycle sw *
* If still no joy, continue *

CRT √COPE A HTR ZONE 1&2,3 (two) – *

√POWER MULE COPE 1A/2A AMPS (two): ≤ 3.5
√1B&2B AMPS: ≤ 6.0
√3A/3B AMPS (two): ≤ 3.5

* If any MULE COPE AMPS not as expected, *
L11U * expect FDA, then *
* MULE COPE HTR A PWR – OFF (tb-bp), *
* proceed to step 9 *

L11U MULE COPE HTR B PWR – OFF (tb-bp)

8. VERIFY SSE STATUS

NOTE
If any parameter not in range, do not perform step 10; notify MCC

CRT √PCU – blank/blank
√PCU OFF – *
√CCTV ENA OFF – *
√PWR OFF – *

√COPE A HTR ZONE 1&2,3 (two) – *
√B HTR ZONE 1&2,3 (two) – blank
√RNS ENA STAT – *
√AMPS: < 1.2

POWER
√FSS EPDSU 1/2 AMPS (two): < 3.0
√FMDM A/B AMPS (two): 0.5 to 1.1
√HTR – 1/2
√HTR P1/P2 AMPS (two): < 0.4
√R1/R2 AMPS (two): < 0.4
√CCTV HTR AMPS: < 0.9
√ORUC: A/B
√AMPS (two): < 30.0
√MULE FMDM A/B AMPS (two): 0.7 to 1.3
√HTR – *
√HTR AMPS: < 0.4
√COPE 1A/2A AMPS (two): < 3.5
√1B&2B AMPS: < 0.4
√3A/3B AMPS: < 3.5/< 0.4
√SLIC EPDSU AMPS: < 16
√FSS VOLTS (two): 24.0 to 32.0
√SLIC VOLTS (two): 24.0 to 32.0
√MULE VOLTS: 24.0 to 32.0

DPC
√DPC 1-12 (twelve) – (no *)
√VOLTS (twelve): < 0.5
√AMPS (twelve): < 0.5
THERMAL
√FSS EPDSU TEMP (two): -20 to 50 degC
√FMDM TEMP (two): -3 to 55 degC
√PCU TEMP (two): -20 to 50 degC
√IPCU TEMP: -30 to 50 degC
√AMSB TEMP: -20 to 50 degC
√ORUC PRJU TEMP (two): -20 to 50 degC
√MULE PDSU TEMP: -20 to 50 degC
√FMDM TEMP (two): -3 to 55 degC
√SLIC EPDSU TEMP (two): -20 to 50 degC

9. FMDM-B PWRDN

NOTE
RNS TM will turn off on next step,
expect RNS PDI data to be invalid

L11U MULE FMDM-B PWR – OFF (tb-bp)

* If tb – gray, note and continue *

L12U FSS FMDM-B PWR – OFF (tb-bp)

* If tb – gray, note and continue *

CRT √POWER FSS FMDM A/B AMPS: 0.5 to 1.1/< 0.15
√MULE FMDM A/B AMPS: 0.7 to 1.3/< 0.15

10. FSS PCU CHECKOUT

PCU ON – ITEM 1 EXEC (*)

√PCU – P/S

√DPC 1-12 (twelve) – *

√VOLTS (twelve): 33.7 to 35.5

√AMPS (twelve): ≤ 0.5

* If DPC 1-12 (twelve) AMPS > 0.5, *
* PCU OFF – ITEM 2 EXEC(*) *
* √MCC *

PCU OFF – ITEM 2 EXEC (*)

√PCU – blank/blank

√DPC 1-12 (twelve) – (no *)

11. REACTIVATE RNS TM

SM 212 SSE MECH/BPA/RNS

RNS TM ON – ITEM 25 EXEC

√RNS AMPS: 0.4 to 1.4

* If RNS AMPS > 1.4, record value and turn OFF TM: *
* RNS TM OFF – ITEM 26 EXEC *
* √MCC *

√FRM CNT: INCR

* If RNS FRM CNT not incrementing, *
* RNS TM OFF – ITEM 26 EXEC *
* RNS TM ON – ITEM 25 EXEC *
* If still no joy, √MCC *

√MSM1 OFF – *

√MSM2 OFF – *

12. VERIFY MECH STATUS

√AMSB OFF – *

√AC AMPS: < 0.20

√TEMP: -20 to 50 degC

√MECH – blank

√PIVOT LO TACH: < 0.25 deg/min

√ROTATOR TACH: < 0.9 deg/min

13. AMSB CHECKOUT SIDE A

A6U √PL RETEN LAT 1,2 (two) – OFF

√LOGIC PWR SYS 1,2 (two) – OFF

√PL SEL – 1

R13L √PL BAY MECH PWR SYS 1,2 (two) – OFF

AMSB ON – ITEM 7 EXEC (A(B))

* If AMSB ON – blank, *
* record and continue *

√AMSB AC AMPS: < 0.20
√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√PIVOT LO TACH: < 0.25 deg/min
√ROTATOR TACH: < 0.9 deg/min
√O/R DIS (ITEM 22) – *

* If any parameter out of limit, *
* √MCC *

Perform following ITEM entries and checks per table

NOTE
SEL field should show '*' only for MECHANISM selected. For any parameters not as expected, do not deselect; contact MCC

ITEM EXEC	MECHANISM	SEL	STAT	AMSB DC AMPS	MECH	SM 97 PL SEL 1, LAT/REL LATCH 2(1)
9	DLOCK	9 – *	ENG	0.035-0.125	A(B)	01/00(10/00)
Expect 'S212 AMSB DC AMPS' msg						
21	O/R ENA(*)	9 – *	RDY	0.130-0.230		00/00(00/00)
11	PIVOT LO	11 – *	DN	0.035-0.125	A(B)	00/01(00/10)
Expect 'S212 AMSB DC AMPS' msg						
21	O/R ENA (*)	11 – *	RDY	0.130-0.230		00/00(00/00)
22	O/R DIS (*)	11 – *	DN	0.035-0.125	A(B)	00/01(00/10)
12	ROTATOR	12 – *	RDY	0.035-0.125		00/00(00/00)
14	B LAT 1	14 – *	OP	0.035-0.125	A(B)	00/01(00/10)
15	B LAT 2	15 – *	OP	0.035-0.125	A(B)	00/01(00/10)
16	B LAT 3	16 – *	OP	0.035-0.125	A(B)	00/01(00/10)
17	UMB MN	17 – *	REL	0.035-0.125	A(B)	00/01(00/10)
18	UMB B/U	18 – *	MAT	0.035-0.125	A(B)	01/00(10/00)
19	BSP	19 – *	SET	0.035-0.125	A(B)	01/00(10/00)
20	DESEL	9-19 blank		< 0.035		00/00(00/00)

AMSB OFF – ITEM 8 EXEC (*)

Notify MCC, SSE CHECKOUT complete; report any anomalies

FSS PREP FOR BERTHING

1. FSS AMSB PWR ON

A6U √PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 2(1) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))

* If AMSB ON – blank, *
* record and continue *

√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

* If any param not as expected, √MCC *

R13L PL BAY MECH PWR SYS 1(2) – ON

2. BAPS DOWNLOCK RELEASE

CAUTION
Operating the downlock in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 1.0 and no mechanism motion

CCTV Configure CCTV to monitor downlock ops, P/TV03 FSS OPS (PHOTO/TV FS, SCENES)

CRT MECH DLOCK SEL – ITEM 9 EXEC (* ENG)

* If MECH DLOCK STAT – *, then EOT sw failed: *
* O/R ENA – ITEM 21 EXEC (*) and continue *
* operation of downlock until observed clear *
* of BAPS pin or 20 sec max *
* Expect '212 AMSB DC AMPS' msg *
* If MECH DLOCK STAT – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U √PL RETEN LAT 1 tb – LAT (A side only)
1(2) – REL (tb-bp)

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 1.0 to 2.5
√MECH DLOCK STAT – RDY

* If MECH DLOCK STAT – ENG, then BOT sw failed, *
* continue *
* Expect '*' *

* If stall condition observed at any time during *
* mechanism operations (AMSB AC AMPS > 1.0 *
* and no mechanism motion) immediately perform: *
* PL RETEN LAT 1(2) – OFF *
* √MCC *

Wait 24 sec

√MECH DLOCK STAT – DIS

* If DLOCK STAT – RDY after 30 total sec: *
A6U * PL RETEN LAT 1(2) – OFF *
* Perform 1.3a PRIMARY MOTOR FAILS TO *
* DRIVE MECHANISM (PL SYS, SSE) *

A6U √PL RETEN LAT 1 tb – REL (A side only)
1(2) – OFF

CRT √MECH – steady A(B)

CCTV Visually verify DLOCK clear of BAPS pin

3. PIVOT BAPS UP FOR BERTHING

CAUTION
Operating the pivoter in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.3 and no mechanism motion

CCTV Configure CCTV to monitor pivot ops, P/TV03 FSS OPS (PHOTO/TV FS, SCENES)

CRT MECH PIVOT LO SEL – ITEM 11 EXEC (* DN)

* If MECH PIVOT LO STAT – *, EOT sw failed: *
* MECH DESEL – ITEM 20 EXEC (ITEM 11 – (no *)) *
* Perform SSE SSR-1 FMDM SWAP A→B(B→A) *
* (PL SYS, SSE) and repeat step 3 for alt side *
* If MECH PIVOT LO STAT – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U √PL RETEN LAT 1 tb – REL (A side only)
1(2) – LAT (tb-bp)

Start Timer

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 0.3 to 0.7
√MECH PIVOT LO STAT – RDY

* If MECH PIVOT LO STAT – DN, BOT sw failed, *
* continue *
* Expect '*' in 23.8 min *

CCTV Visually verify BAPS motion, monitor performance

CRT √MECH PIVOT LO TACH: > 2.5 deg/min

* If FDA 'S212 PVT STALL' received, *
A6U * PL RETEN LAT 1(2) – OFF, *
* perform 1.3e 'S212 PVT(ROT) STALL' *
* (PL SYS, SSE) *

* If MECH PIVOT LO TACH: < 0.25 deg/min and *
* AMSB AC AMPS: < 0.2, PL RETEN LAT 1(2) – OFF, *
* perform 1.3a 'PRIMARY MOTOR FAILS TO DRIVE *
* MECHANISM' (PL SYS, SSE) *

CRT √MECH PIVOT LO STAT – UP

A6U √PL RETEN LAT 1 tb – LAT (A side only)
1(2) – OFF

Stop Timer
Record pivot time _____:_____

CRT √MECH – steady A(B)

CCTV Visually verify BAPS properly positioned

Notify MCC of pivot duration

4. AMSB PWRDN

CRT MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *))

* If any MECH SEL – *, do not turn AMSB – OFF; *
* notify MCC, continue *

√AMSB DC AMPS: < 0.035
OFF – ITEM 8 EXEC (*)

R13L PL BAY MECH PWR SYS 1(2) – OFF

A6U PL RETEN LOGIC PWR SYS 1(2) – OFF

Notify MCC, FSS PREP FOR BERTHING complete; report any deviation

CAUTION
Do not proceed without MCC GO. Potential hardware damage if activated outside of operational temperature

On MCC GO:

1. RNS OPS ACTIVATION

SM 212 SSE MECH/BPA/RNS
RNS OPS ON – ITEM 37 EXEC

SM 211 SSE OVERVIEW
√RNS AMPS: 3.0 to 13.0

SM 212 SSE MECH/BPA/RNS
√RNS MSM1 ON – *
√MSM2 ON – *
√OP HTR ON – *
√AMPS: < 8.5
√SP-CUBE ON – *
√AMPS: 1.0 to 2.0
√SENSORS ON – *
√AMPS: 0.8 to 1.8

Start timer

2. RNS DATA RECORD

NOTE
Wait for MSM hard drives to be powered sequentially

Wait 2.5 min

L11U RNS CAM REC – START (tb-UP)

* If RNS CAM REC (tb-bp), *
* note and continue *

RNS GPS REC – START (tb-UP)

* If RNS GPS REC (tb-bp), *
* note and continue *

NOTE
Ground will acquire RNS data for 30 sec

Wait 30 sec

RNS CAM REC – STOP (tb-bp)
GPS REC – STOP (tb-bp)

3. RNS OPS DEACTIVATION
RNS OPS OFF – ITEM 38 EXEC

√RNS ICE AMPS: 0.4 to 1.4
√MSM1 OFF – *
√MSM2 OFF – *
√OP HTR OFF – *
√AMPS: < 0.4
√SP-CUBE OFF – *
√AMPS: < 0.4
√SENSORS OFF – *
√AMPS: < 0.4

Notify MCC, RNS ON-ORBIT CHECKOUT complete; report any anomalies

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RETRIEVAL OPERATIONS

PI CONFIG

1. √PDI CONFIG

   SM 62 PCMMU/PL COMM

   √TFL: 206

   √PDI config 768

DECOM	INPUT	FMT	SOURCE
1	1(2)	10	4 kbps A Normal
2	1(2)	18	32 kbps INV T
3	4	28	4 kbps RNS
4	1(2)	19	32 kbps T Normal
5-FPM	(510)		

2. CONFIG PL COMM

L12L PSP BY-PASS – ENABLE

A1U SIGNAL STRENGTH – S-BAND PL

A1L
- √S-BD PL CNTL – CMD
- √ANT POLAR – L CIRC
- √XMTR PWR – LO
- √PWR SYS – 1(2)
- √PSP CMD OUTPUT – PL UMB
- √MOD – OFF
- CH SEL INTRG 1,2 tw (six) – 701,701
- S-BD PL PWR SEL – BOTH

3. BSA PWR ON

BSA BSA PWR – ON

√All LEDs illuminate for 4 sec

```
* If pwr to BSA fails (PWR LED not illuminated): *
*      Check pwr cable connection                *
*      If pwr cable connection OK,               *
*        BSA PWR – OFF (wait 5 sec)              *
*        BSA PWR – ON                            *
*      If no joy, √MCC                           *
```

4. VERIFY BSA CONFIG SETUP

√RATE – 32k
√POLARITY – Norm
√WATCHDOG – Dis

After LED check:

√PWR – Green
√SEARCH – Yellow
√SIGNAL LOSS – Red

***** If PWR/SEARCH/SIGNAL LOSS *****
***** do not match this pattern, √MCC *****

Notify MCC, PI CONFIG complete

NOTE

Step 5 will occur after HST Berth

5. POST BERTH BSA CONFIG

BSA

BSA RATE – Auto
WATCHDOG – Ena

√PWR – Green
√RATE – 32k – Green
√SYNC – Bit – Green
√SYNC – Frame – Green

LATCH AND MATE HST

WARNING
Operation of two FSS mechanisms may result in HST collision with orbiter
For any SM ALERT during FSS ops: A6U PL RETEN LAT 1,2 (two) – OFF R13 PL BAY MECH PWR SYS 1,2 (two) – OFF √MCC

CAUTION
Operating a berthing latch in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 1.0 and no mechanism motion

1. AMSB PWR ON

A6U
√PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 1(2) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))

* If AMSB ON – blank, continue *

√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

* If any param not as expected, AMSB OFF – ITEM 8 EXEC *
* (*), and perform SSE SSR-1 FMDM SWAP A→B(B→A) *
* (PL SYS, SSE), then proceed to step 2 on alt side *

R13L
PL BAY MECH PWR SYS 1(2) – ON
Return to HST BERTH, step 6 (PDRS OPS FS, NOMINAL HST RETRIEVAL)
or SJ HST BERTH, step 6 (PDRS OPS FS, OFF-NOMINAL HST RETRIEVAL)

2. BERTH LAT 2 PARTIAL CLOSURE

Verify with RMS operator that HST is in latch posn

CCTV
Perform P/TV04 HST RETRIEVE/BERTH, OPS, FSS/HST Latching (PHOTO/TV FS, SCENES)

CAMR B(C)
√Berth latch 2 align and monitor operations
Start VTR

√DAP: FREE

CRT
MECH B LAT 2 SEL – ITEM 15 EXEC (* OP)

* If MECH B LAT 2 STAT – * and visually observed open, *
* then EOT sw failed: *
* MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *)) *
* Perform SSE SSR-1 FMDM SWAP A→B(B→A) (PL SYS, SSE) *
* and complete steps 2-9 on alt side *
* If MECH B LAT 2 STAT – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U √PL RETEN LAT 1 tb – REL (A side only)
1(2) – LAT (tb-bp), drive to cage ~8 sec

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 1.0 to 2.5

* If stall condition observed (AMSB AC AMPS *
* > 1.0 and no mechanism motion): *
A6U * PL RETEN LAT 1(2) – OFF *
* √MCC *

A6U PL RETEN LAT 1(2) – OFF

CRT √MECH B LAT 2 STAT – RDY
√MECH – blank

CCTV √Latch 2 cages berthing pin

* If latch not caging berthing pin, perform *
* 1.3a PRIMARY MOTOR FAILS TO *
* DRIVE MECHANISM (PL SYS, SSE) *

3. BERTH LAT 1 PARTIAL CLOSURE

CCTV √Berth LAT 1 align and monitor operations
CAMR C(D)

CRT MECH B LAT 1 SEL – ITEM 14 EXEC (* OP)

* If MECH B LAT 1 STAT – * and visually observed open, *
* then EOT sw failed: *
* MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *)) *
* Perform SSE SSR-1 FMDM SWAP A→B(B→A) (PL SYS, SSE) *
* and complete steps 3-9 on alt side *
* If MECH B LAT 1 STAT – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U √PL RETEN LAT 1 tb – REL (A side only)
1(2) – LAT (tb-bp), drive to cage ~8 sec

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 1.0 to 2.5

* If stall condition observed (AMSB AC AMPS *
* > 1.0 and no mechanism motion): *
* PL RETEN LAT 1(2) – OFF *
* √MCC *

A6U PL RETEN LAT 1(2) – OFF

CRT √MECH B LAT 1 STAT – RDY
√MECH – blank

CCTV √Latch 1 cages berthing pin

* If latch not caging berthing pin, perform *
* 1.3a PRIMARY MOTOR FAILS TO *
* DRIVE MECHANISM (PL SYS, SSE) *

Return to HST BERTH, step 8 (PDRS OPS FS, NOMINAL HST RETRIEVAL)
or SJ HST BERTH, step 8 (PDRS OPS FS, OFF-NOMINAL HST RETRIEVAL)

4. BERTH LAT 3 COMPLETE CLOSURE
Verify with RMS operator that RMS in TEST MODE

CCTV √Latch 3 align and monitor operations
CAMR B

CRT MECH B LAT 3 SEL – ITEM 16 EXEC (*OP)

* If MECH B LAT 3 STAT – * and visually observed open, then EOT *
* sw failed: *
* MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven – (no *)) *
* Perform SSE SSR-1 FMDM SWAP A→B(B→A) (PL SYS, SSE) *
* and complete steps 4-9 on alt side *
* If MECH B LAT 3 STAT – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U √PL RETEN LAT 1 tb – REL (A side only)
1(2) – LAT (tb-bp)

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 1.0 to 2.5
√MECH B LAT 3 STAT – RDY

* If stall condition observed (AMSB AC AMPS *
* > 1.0 and no mechanism motion): *
A6U * PL RETEN LAT 1(2) – OFF *
* √MCC *

* If MECH B LAT 3 STAT – OP and motion observed, *
* BOT sw failed. Continue and expect '*' *

Wait 15 sec,
CRT √MECH B LAT 3 STAT – CL

* If MECH B LAT 3 STAT – OP or RDY after 30 total sec: *
A6U * PL RETEN LAT 1(2) – OFF *
* Perform 1.3a PRIMARY MOTOR FAILS TO DRIVE *
* MECHANISM (PL SYS, SSE) *

A6U √PL RETEN LAT 1 tb – LAT (A side only)
1(2) – OFF

CRT √MECH – steady A(B)

CCTV √Latch 3 completely closed

5. BERTH LAT 2 COMPLETE CLOSURE

CCTV Monitor Latch 2 closure operations
CAMR B(C)

CRT MECH B LAT 2 SEL – ITEM 15 EXEC (* RDY)

√AMSB DC AMPS: 0.035 to 0.125
√MECH – blank

A6U PL RETEN LAT 1(2) – LAT

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 1.0 to 2.5
√MECH B LAT 2 STAT – RDY

* If stall condition observed (AMSB AC AMPS *
* > 1.0 and no mechanism motion): *
* PL RETEN LAT 1(2) – OFF *
* √MCC *

* If MECH B LAT 2 STAT – OP, BOT sw *
* failed. Continue and expect (*) *

Wait 7 sec,
√MECH B LAT 2 STAT – CL

* If MECH B LAT 2 STAT – RDY after 30 total sec: *
* PL RETEN LAT 1(2) – OFF *
A6U * Perform 1.3a PRIMARY MOTOR FAILS TO *
* DRIVE MECHANISM (PL SYS, SSE) *

A6U √PL RETEN LAT 1 tb – LAT (A side only)
1(2) – OFF

CRT √MECH – steady A(B)

CCTV √Latch 2 completely closed

6. BERTH LAT 1 COMPLETE CLOSURE

CCTV CAMR B(C),D — Monitor Latch 1 closure operations

CRT — MECH B LAT 1 SEL – ITEM 14 EXEC (* RDY)

√AMSB DC AMPS: 0.035 to 0.125
√MECH – blank

A6U — PL RETEN LAT 1(2) – LAT

CRT
√MECH – flashing A(B)
√AMSB AC AMPS: 1.0 to 2.5
√MECH B LAT 1 STAT – RDY

* If stall condition observed (AMSB AC AMPS > 1.0 and no mechanism motion):
* PL RETEN LAT 1(2) – OFF
* √MCC

* If MECH B LAT 1 STAT – OP, BOT sw failed. Continue and expect '*'

Wait 7 sec,
√MECH B LAT 1 STAT – CL

* If MECH B LAT 1 STAT – RDY after 30 total sec:

A6U
* PL RETEN LAT 1(2) – OFF
* Perform 1.3a PRIMARY MOTOR FAILS TO DRIVE MECHANISM (PL SYS, SSE)

√PL RETEN LAT 1 tb – LAT (A side only)
1(2) – OFF

CRT — √MECH – steady A(B)

CCTV CAMR B(C),D
√Latch 1 completely closed

CCTV — Perform P/TV04 HST RETRIEVE/BERTH, DEACT (PHOTO/TV FS, SCENES)

Notify MCC, MECH B LAT ops complete. Ready for ungrapple
RMS return to HST BERTH, step 7 (PDRS OPS FS, NOMINAL HST RETRIEVAL) or SJ HST BERTH, step 7 (PDRS OPS FS, OFF-NOMINAL HST RETRIEVAL)

7. UMBILICAL DEADFACE VERIFICATION

SM 211 SSE OVERVIEW

CRT
√PCU – blank/blank
√DPC 1-12 (twelve) – (no *)

L12U
√FHST SHUTTER – OPEN (tb-bp)
√RSU SURV HTR PWR – OFF (tb-bp)
√ESS/MN SW ENA – OFF (tb-bp)
√SSM WK LTS – OFF

8. MAIN UMBILICAL MATE

CAUTION
Operating the umbilical in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.6 and no mechanism motion

CCTV Monitor UMB operations
CAMR A,B

CCTV Perform P/TV04 HST RETRIEVE/BERTH, OPS, FSS/HST Umbilical Mate (PHOTO/TV FS, SCENES)

SM 212 SSE MECH/BPA/RNS
MECH UMB MN SEL – ITEM 17 EXEC (* REL)

* If MECH UMB MN STAT – *: *
* MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *)) *
* Perform SSE SSR-1 FMDM SWAP A→B(B→A) (PL SYS, SSE) *
* and complete steps 8,9 on alt side *
* If MECH UMB MN – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U √PL RETEN LAT 1 tb – REL (A side only)
1(2) – LAT (tb-bp)

CRT √MECH – flashing A(B)
√AMSB AC AMPS: 0.6 – 1.2
√MECH UMB MN STAT – RDY

* If stall condition observed (AMSB AC AMPS *
* > 0.6 and no mechanism motion): *
* PL RETEN LAT 1(2) – OFF *
* √MCC *

Wait 8 sec,
√MECH UMB MN STAT – MAT

* If MECH UMB MAT STAT – RDY or REL after 30 total sec: *
A6U * PL RETEN LAT 1(2) – OFF *
* Perform 1.3a PRIMARY MOTOR FAILS TO DRIVE *
* MECHANISM (PL SYS, SSE) *

√PL RETEN LAT 1 tb – LAT (A side only)
1(2) – OFF

CRT √MECH – steady A(B)

CCTV Visually verify UMB mated

L12U √MN BUS PWR ON tb – gray
√ESS BUS INT PWR tb – UP

SM 210 HST SYS
√UMB SG V INT MN BUS > 26
√ESS BUS > 26

***** If either tb – bp or any UMB SG V ≤ 26, *****
***** √MCC *****

9. AMSB PWRDN

SM 212 SSE MECH/BPA/RNS

DESEL – ITEM 20 EXEC (√ITEMS 9-19 (eleven) – (no *****))

***** If any MECH SEL – *****, do not turn *****
***** AMSB OFF; notify MCC, continue *****

√AMSB DC AMPS: < 0.035
OFF – ITEM 8 EXEC (*****)

A6U PL RETEN LOGIC PWR SYS 1(2) – OFF

R13L PL BAY MECH PWR SYS 1(2) – OFF

Notify MCC, LATCH AND MATE HST complete; report any anomalies

ACTIVATE HST EXTERNAL PWR

1. SETUP

L12U √cb SPACE TEL SW PWR – cl
FHST SHUTTER – CLOSE (remains bp)
SM 210 HST SYS
√TLM COUNT – incr
√EPS INT ESS BUS A,B,C – * * *

SM 211 SSE OVERVIEW
PCU ON – ITEM 1 EXEC (*)

* If 'PDI DECOM FAIL' msg accompanied by MN *
L12U * BUS PWR ON tb – bp, notify MCC and hold *

CRT √PCU – P/S
√DPC 1-12 (twelve) – *
√VOLTS (twelve): 33.7 to 35.5
√AMPS (twelve): ≤ 0.5

* If any DPC 1-12 (twelve) AMPS: > 0.5, turn off *
* affected DPC, DPC OFF – ITEM 24 +X X EXEC (*) *
* (DPC ON/OFF INDEX NUMBERS (REF DATA)), *
* √MCC *
* If any other param(s) not in range, record MET and *
* off nominal DPC values, notify MCC *

L12U √FHST SHUTTER tb – gray

2. EXTERNAL PWR ACTIVATION

On MCC GO:
ESS/MN SW ENA – ON (tb-gray)
MAIN BUS EXT PWR – ON (tb-gray)
√IPCU RLY CL tb – gray

* If either tb – bp, notify MCC, continue *
* If both tb – bp, cycle sw (up only) *
* If no joy, √MCC *

CRT √DPC 1-12 VOLTS (twelve): 33.8 to 35.3
√AMPS (twelve): 2-7

L12U ESS BUS EXT PWR – ON (tb-UP)

SM 210 HST SYS
√UMB SG V EXT MN BUS > 30
√ESS BUS > 30

3. INT ESS PWR OFF

On MCC GO:
L12U ESS BUS INT PWR – OFF (tb-bp)
ESS/MN SW ENA – OFF (tb-bp)

Notify MCC, ACTIVATE HST EXTERNAL PWR complete; repeat any anomalies

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IN-BAY OPERATIONS

SINGLE (DUAL) SA SLEW

1. SETUP

Set up CCTVs to monitor SA slew

CCTV CAMR A,D — Perform P/TV03 FSS OPS (OPS), #3 SA SLEWS, SETUP (PHOTO/TV FS, SCENES)

Perform following only if VRCS available:

√In ATT

DAP: B11/AUTO/VERN

SM 210 HST SYS

√SOLAR ARRAY SLEW – blank,blank

Inform MCC ready for SINGLE (DUAL) SA SLEW

2. STOCC INITIATE SLEW

* For any observed uncontrolled SA motion, or if unable to go free drift on time:
* SM 210 HST SYS
* SOLAR ARRAY SADE OFF – ITEM 9 +9 9 EXEC (OFF)
* Notify MCC

On MCC call:

DAP: FREE

STOCC — CMD ± WING SLEW

NOTE

Expect 'S210 SADE WING' msg in ~30 sec

Visually verify SAs slewing

CRT — √SOLAR ARRAY SLEW – +OP -OP one (or both) flash

SA MNVR SIZE (deg)	SLEW TIME (Motor Op, mm:ss)
15	08:32
20	09:10
30	10:16
45	11:37
60	12:45
90	14:38
100	15:11
105	15:28
180	19:08

On MCC call:

DAP: B11/AUTO/VERN(ALT)

* If no comm 2 min after SOLAR ARRAY SLEW +OP -OP not flashing:
* DAP: B11/AUTO/VERN(ALT)

ROTATE HST

WARNING
Operation of two FSS mechanisms may result in HST collision with orbiter
For any SM ALERT during FSS ops: A6U PL RETEN LAT 1,2 (two) – OFF R13 PL BAY MECH PWR SYS 1,2 (two) – OFF √MCC

CAUTION
Operating the rotator in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.3 and no mechanism motion

1. FSS AMSB PWR ON

A6U
√PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 2(1) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

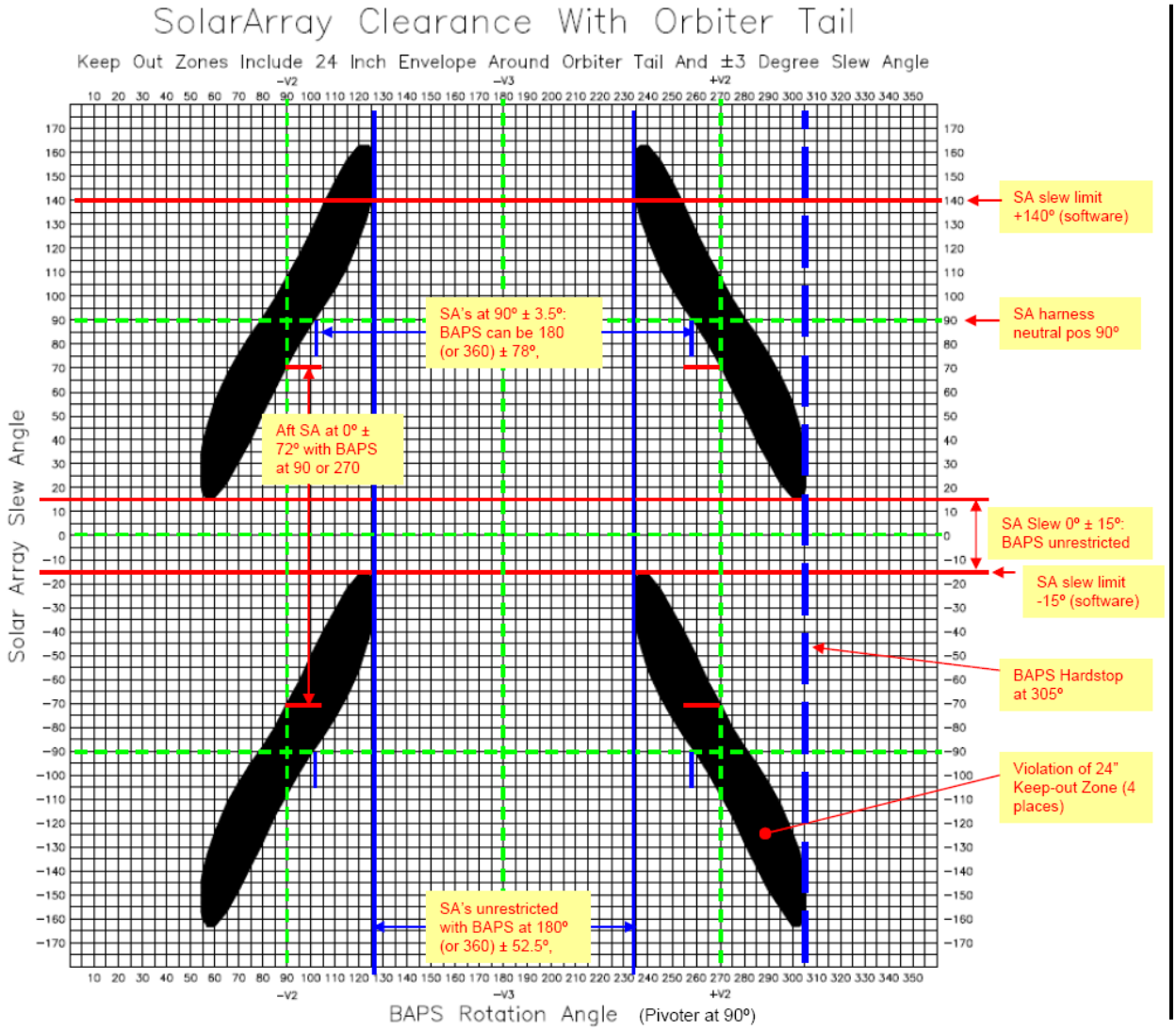
SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))

√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

* If any param not as expected, √MCC *
* If rotation reqd to continue EVA, AMSB OFF – ITEM 8 *
* EXEC (*), perform SSE SSR-1 FMDM SWAP *
* A→B(B→A) (PL SYS, SSE) and proceed to step 2 *

R13L
PL BAY MECH PWR SYS 1(2) – ON

2. HST ROTATION
Check HST in safe posn:
SM 210 HST SYS



If in a configuration not identified, √MCC

CCTV CAMR B(D), ELBOW — Perform P/TV03 FSS OPS, OPS (PHOTO/TV FS, SCENES)
Monitor HST posn during rotation

SM 212 SSE MECH/BPA/RNS
MECH ROTATOR SEL – ITEM 12 EXEC (*RDY)

* If ROTATOR STAT – ccw or cw and visually *
* verified not at EOT, then EOT sw failed: *
* O/R ENA – ITEM 21 EXEC (*), continue *

√AMSB DC AMPS: 0.035 to 0.125

Mnvr to reqd posn:

TASK	POSN
Berth	B(-V3)
RSUs	-V3
Bay 3 Battery Module	-V3
WFC3	-V3
Bay 2 Battery Module	-V3
COS	-V2
ACS Repair Part I	-V2
NOBL bay 8	+V3
STIS Repair	+V2
NOBL bay 5	+V2
NOBL bay 7	+V3
ACS Repair Part II	+V3
FGS 2	+V3

FSS ROTATOR POSN CORRELATION				
POSN TO → FROM ↓	B (-V3) HST 180°	-V2 HST 90°	+V2 HST 270°	(+V3) HST 0°
B (-V3) HST 180°		06:05 LAT	06:05 REL	12:11 LAT
-V2 HST 90°	06:05 REL		12:11 REL	06:05 LAT
+V2 HST 270°	06:05 LAT	12:11 LAT		18:16 LAT
(+V3) HST 0°	12:11 REL	06:05 REL	18:16 REL	

Times based on 14.8 deg/min actual run time during previous missions
NOTE: Table contains duration of motion in mm:ss, REL LAT switch posn

A6U PL RETEN LAT 1(2) – REL or LAT (tb-bp) as reqd

CRT √MECH – flashing A(B)
√ROTATOR STAT – RDY

CCTV √Rotator posn visually
CAMR B(D)

CRT √ROTATOR TACH: > 10 deg/min
√AMSB AC AMPS: 0.3 to 0.7

```
*  If FDA 'S212 ROT STALL' received,                *
A6U *  PL RETEN LAT 1(2) – OFF, perform 1.3e 'S212  *
*  PVT(ROT) STALL' (PL SYS, SSE)                    *
*                                                   *
*  If ROTATE TACH: < 0.9 deg/min and AMSB AC        *
*  AMPS: < 0.2, PL RETEN LAT 1(2) – OFF,            *
*  perform 1.3a PRIMARY MOTOR FAILS TO              *
*  DRIVE MECHANISM (PL SYS, SSE)                    *
```

Once at target position,

A6U PL RETEN LAT 1(2) – OFF

CRT √MECH – blank

3. AMSB PWRDN

DESEL – ITEM 20 EXEC (MECH SEL, ITEMS 9-19 (eleven) – (no *))

* If any MECH SEL – *, do not turn AMSB – OFF; *
* notify MCC. Continue *

√AMSB DC AMPS: < 0.035

OFF – ITEM 8 EXEC (*)

A6U PL RETEN LOGIC PWR SYS 1(2) – OFF

R13L PL BAY MECH PWR SYS 1(2) – OFF

Report to MCC when complete; report any anomalies

PIVOT HST

WARNING
Operation of two FSS mechanisms may result in HST collision with orbiter
For any SM ALERT during FSS ops: A6U PL RETEN LAT 1,2 (two) – OFF R13 PL BAY MECH PWR SYS 1,2 (two) – OFF √MCC
Do not pivot up with BSP latch engaged

1. FSS AMSB PWR ON

A6U √PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 2(1) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))
√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

* If any param not as expected, √MCC *
* If pivot reqd to continue EVA, AMSB OFF – ITEM 8 *
* EXEC (*), perform SSE SSR-1 FMDM SWAP *
* A→B(B→A) (PL SYS, SSE) and proceed to step 2 *

R13L PL BAY MECH PWR SYS 1(2) – ON

2. BSP LATCH RELEASE

If pivoting up from 43.8°, continue; else, go to step 3

CRT BSP SEL – ITEM 19 EXEC (*)
√STAT – SET
√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U PL RETEN LAT 1(2) – REL, wait 4 sec, OFF
CRT √BSP STAT – REL
√BSP – DIS *

* If BSP STAT not REL and BSP DIS *, continue *
* If BSP STAT REL and BSP DIS A, DIS B, continue *
* Else, perform 1.3b BSP FAILS TO DISENGAGE *
* (PL SYS, SSE) *

3. BSP LATCH SET VERIFICATION

If pivoting down to 43.8°, continue; else, go to step 4

BSP SEL – ITEM 19 EXEC (*)
√AMSB DC AMPS: 0.035 to 0.125
√BSP STAT – SET

***** If BSP STAT not SET, √MCC *****

√BSP – blank/blank/blank

***** If BSP not blank, record and assume switch failed *****
***** Ignore affected status and continue *****

4. HST PIVOT

WARNING
With HST attached and HGA Booms Stowed do not pivot below 70° without notifying MCC. Could violate HST HGA pointing constraints

CAUTION
Operating the pivoter in a stalled condition for greater than than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.3 and no mechanism motion

CCTV Monitor HST posn during pivot, verify envelope clear of obstructions

CCTV Perform P/TV03 FSS OPS, OPS (PHOTO/TV FS, SCENES)
CAMR B(D), ELBOW

Verify BSP PIP pins removed

DAP: FREE

CRT MECH PIVOT LO SEL – ITEM 11 EXEC (***** RDY)
√AMSB DC AMPS: 0.035 to 0.125

Maneuver to reqd posn

FSS PIVOTER POSN CHANGES TIME CORRELATION					
POSN TO → FROM ↓	0°	43.8°	75°	85°	90°
0°		11:35 LAT	19:50 LAT	22:29 LAT	23:48 LAT
43.8°	11:35 REL		8:15 LAT	10:54 LAT	12:13 LAT
75°	19:50 REL	8:15 REL		2:39 LAT	3:58 LAT
85°	22:29 REL	10:54 REL	2:39 REL		1:19 LAT
90°	23:48 REL	12:13 REL	3:58 REL	1:19 REL	

Times based on 3.8 deg/min actual run time during previous missions
NOTE: Duration displayed in mm:ss

Start Timer

NOTE
With BSP installed, pivoter will stall when reaching 43.8° or 90° posn and FDA will annunciate 15 sec later. 15 sec stall is reqd to preload BSP

A6U PL RETEN LAT 1(2) – REL for pivot dn or LAT for pivot up as reqd

CRT √MECH – flashing A(B)

CCTV CAMR B(D), ELBOW Visually verify BAPS motion

CRT √MECH PIVOT LO TACH: > 2.5 deg/min
√AMSB AC AMPS: 0.3 to 0.7

* If unexpected 'S212 PVT STALL' msg received *
A6U * PL RETEN LAT 1(2) – OFF, perform *
* 1.3e 'S212 PVT(ROT) STALL' (PL SYS, SSE) *

* If MECH PIVOT LO TACH: < 0.25 deg/min and AMSB AC AMPS: *
* < 0.2, PL RETEN 1(2) – OFF, perform 1.3a PRIMARY MOTOR *
* FAIL TO DRIVE MECHANISM (PL SYS, SSE) *

√DAP: FREE

If pivoting to 43.8°:
Expect 'S212 PVT STALL' msg
A6U PL RETEN LAT 1(2) – OFF
Stop Timer
CRT √BSP – ENG *****, RET *****

* If BSP – ENG *****, continue; *
* else, perform 1.3d BSP FAILS TO ENGAGE *
* (PL SYS, SSE) *

If pivoting to 90°:
Expect 'S212 PVT STALL' msg
A6U PL RETEN LAT 1(2) – OFF
Stop Timer
If pivoting to any intermediate posn:
At expected pivot completion time:
CCTV CAMR B(D), ELBOW Visually confirm pivoter posn

A6U PL RETEN LAT 1(2) – OFF
Stop Timer

CRT √MECH – blank
DAP: B11/AUTO/VERN(ALT)

5. BSP LATCH RESET

If pivoted up from 43.8°, continue; else, go to step 6

MECH BSP SEL – ITEM 19 EXEC (*)

√AMSB DC AMPS: 0.035 to 0.125

√MECH – steady A(B)

A6U PL RETEN LAT 1(2) – LAT, wait 4 sec, OFF

CRT √MECH BSP STAT – SET

* If BSP STAT – * or L/A, √MCC *

6. AMSB PWRDN

MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *))

* If any MECH SEL – *, do not turn *
* AMSB OFF; notify MCC. Continue *

√AMSB DC AMPS: < 0.035

OFF – ITEM 8 EXEC (*)

A6U PL RETEN LOGIC PWR SYS 1(2) – OFF

R13L PL BAY MECH PWR SYS 1(2) – OFF

Notify MCC, PIVOT HST complete; report any anomalies

HGA DEPLOYMENT

1. SETUP

CCTV Set up CCTVs to monitor HGA deployment (P/TV08 HST RELEASE, OPS, HGA Deploy (PHOTO/TV FS, SCENES))

Perform following only if VRCS available:
√In ATT
DAP: B11/AUTO/VERN

NOTE
Expect MCC call immediately prior to commanded mechanism operations

SM 210 HST SYS
√TLM COUNT – incr
√HGA +V3,-V3 HNG (two) – STWD
√LAT (two) – REL

WARNING
√Within 45 deg of ±V2 FWD for crew safety.
If not within 45 deg of ±V2 FWD, call MCC

Inform MCC ready for HGA deployment

2. HGA DEPLOYMENT

NOTE
HGA deployment nominally performed simo. HGA mast deploy takes ~8 min. Mast deploy speed will vary during deployment

On MCC call:
DAP: FREE

STOCC Command ±HGA HNG – DPLY

SM 210 HST SYS
√HGA +V3,-V3 HNG (two) – TRAN

Visually verify both HGA masts deploying

Note posn of HGA dish upon clearing latches

√HGA +V3,-V3 HNG (two) – DPLY

On MCC call:
DAP: B11/AUTO/VERN(ALT)

* If no comm 2 min after HGA Deploy *
* HGA +V3,-V3 HNG (two) - DPLY: *
* DAP: B11/AUTO/VERN(ALT) *

3. HGA SLEW TO 0,0 POSITION

NOTE

HGA slew nominally performed simo. HGA slew takes ~15 min

STOCC Command HGA slew to 0,0 (straight out)

4. HGA SLEW TO STRUCTURAL CLEARANCE POSITION

NOTE

HGA slew nominally performed simo. HGA slew takes ~15 min

STOCC Command HGA slew to RMS/tail clearance posn

Visually verify both HGA dishes in the RMS/tail clearance posn

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UNBERTH BSA CONFIG

1. CONFIGURE BSA

BSA
RATE – 32k
WATCHDOG – Dis

√PWR – Green
√RATE – 32k – Green
√SYNC – Bit – Green
√SYNC – Frame – Green

NOTE
Step 2 and subs will occur after HST Sep burn

2. POWER OFF BSA

BSA
BSA PWR – OFF

3. DISABLE PSP-BYPASS

L12L
PSP BY-PASS – DISABLE

4. CONFIGURE PDIP1 PI CONNECTORS

L12L
Disconnect BSA 14 foot data cable from HST PI 1(2)
Re-install HST PI 1(2) Turn-Around Plug

5. DISCONNECT BSA CABLE

MO13Q
DC UTIL PWR MNB – OFF
Disconnect BSA power cable from BSA power port

BSA
Disconnect BSA data cable from BSA data port

6. STOW HST BSA AND DATA CABLE

MF71C
Stow BSA, BSA power cable, and BSA 14-foot data cable in locker

Notify MCC, HST BSA stowage complete

7. CONFIG PL COMM

A1U
SIG STR – S-BD PM

A1L
√S-BD PL CNTL – CMD
√ANT POLAR – L CIRC
√XMTR PWR – LO
√PWR SYS – 1
√PSP CMD OUTPUT – PL UMB
√PL MOD – OFF
CH SEL INTRG 1,2 tw (six) – 910,910
PL PWR SEL – PSP
CNTL – PNL
wait 5 sec
CMD

A1R
S-BAND FM POWER – 1

FSS STOW WITH BSP INSTALLED

CAUTION
Operating the pivoter or rotator in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.3 and no mechanism motion

1. FSS AMSB PWR ON

A6U √PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 2(1) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC A(B)

√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

* If any param not as expected, √MCC *
* If pivot reqd to continue EVA, AMSB OFF – ITEM 8 EXEC (*), *
* perform SSE SSR-1 FMDM A→B(B→A) (PL SYS, SSE) and *
* proceed to step 2 on alt side *

R13L PL BAY MECH PWR SYS 1(2) – ON

2. ROTATE BAPS

CCTV Perform P/TV03 FSS OPS, OPS, FSS CONFIG FOR LANDING (PHOTO/TV FS, SCENES)

CRT MECH ROTATOR SEL – ITEM 12 EXEC (* RDY)

* If ROTATOR STAT – ccw or cw and visually *
* verified not at EOT, then EOT sw failed: *
* O/R ENA – ITEM 21 EXEC (*), continue *

√AMSB DC AMPS: 0.035 to 0.125

A6U PL RETEN LAT 1(2) – REL or LAT as reqd
Rotate until any berthing latch aligns with fixed target

CRT √MECH – flashing A(B)
√ROTATOR TACH: > 10 deg/min
√AMSB AC AMPS: 0.3 to 0.7
√ROTATOR STAT – RDY

* If FDA 'S212 ROT STALL' received, PL RETEN *
* LAT 1(2) – OFF, perform 1.3e 'S212 PVT(ROT) *
* STALL' (PL SYS, SSE) *

* If ROTATE TACH: < 0.9 deg/min and AMSB AC *
A6U * AMPS: < 0.2, PL RETEN LAT 1(2) – OFF, *
* perform 1.3a PRIMARY MOTOR FAILS TO *
* DRIVE MECHANISM (PL SYS, SSE) *

√Rotator posn visually (Berthing latch aligned with fixed target)

A6U PL RETEN LAT 1(2) – OFF
CRT √MECH – blank

3. BSP LATCH SET VERIFICATION
MECH BSP SEL – ITEM 19 EXEC (**)
√AMSB DC AMPS: 0.035 to 0.125
√MECH BSP STAT – SET

** If BSP STAT not SET, √MCC **

√BSP – blank/blank/blank

** If BSP not blank, record and assume switch failed **
** Ignore affected status and continue **

Verify BSP PIP pins removed

4. MECH PIVOT DOWN TO 43.8°

CAUTION
Operating the pivoter in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.3 and no mechanism motion

CRT MECH PIVOT LO SEL – ITEM 11 EXEC (** RDY)
√AMSB DC AMPS: 0.035 to 0.125

NOTE
With BSP installed, pivoter will stall when reaching 43.8° posn (~12 min 13 sec) and 'S212 PVT STALL' FDA will annunciate 15 sec later. 15 sec stall is reqd to preload BSP

A6U PL RETEN LAT 1(2) – REL for approximately 12:13 (wait for FDA)

CRT √MECH – flashing A(B)

CCTV CAMR A,B Visually verify BAPS motion

CRT √MECH PIVOT LO TACH: > 2.5 deg/min
√AMSB AC AMPS: 0.3 to 0.6

** If unexpected 'S212 PVT STALL' msg received, **
** PL RETEN LAT 1(2) – OFF, perform 1.3e **
** 'S212 PVT(ROT) STALL' (PL SYS, SSE) **

** If MECH PIVOT LO TACH: < 0.25 deg/min and **
A6U ** AMSB AC AMPS: < 0.2, PL RETEN LAT 1(2) – **
** OFF, perform 1.3a PRIMARY MOTOR FAILS **
** TO DRIVE MECHANISM (PL SYS, SSE) **

Expect ‘S212 PVT STALL’ msg:

A6U PL RETEN LAT 1(2) – OFF

CRT √MECH BSP – ENG *, RET *

* If BSP – ENG*, continue; *
* else, perform 1.3d BSP FAILS TO ENGAGE *
* (PL SYS, SSE) *

CRT √MECH – blank

5. AMSB PWRDN
   MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *))

   √AMSB DC AMPS: < 0.035
   OFF – ITEM 8 EXEC (*)

A6U PL RETEN PL SEL – MON
LOGIC PWR SYS 1(2) – OFF

R13L PL BAY MECH PWR SYS 1(2) – OFF

Notify MCC when complete; report any anomalies

ACTIVATE HST ESS BUS INTERNAL PWR

1. PRECHECKS

   SM 210 HST SYS

   √TLM COUNT – incr

   √EPS INT ESS BUS ABC (three) – no ***

L12U √cb SPACE TEL SW PWR – cl

2. CONNECT BATTERIES TO ESS BUS

   On MCC GO:

   ESS/MN SW ENA – ON (tb-gray)

   ESS BUS INT PWR – ON (tb-UP)

   * If ESS BUS INT PWR tb-bp, *
   * Perform 2.1a ESS BUS INT PWR tb-bp *
   * WHEN SHOULD BE tb-UP (WHEN CMDED) *
   * (PL SYS, HST) *

   SM 210 HST SYS

   √EPS INT ESS BUS ABC – ***

   * If INT ESS BUS ABC not ***, √MCC *

   Notify MCC, ACTIVATE HST ESS BUS INTERNAL PWR complete

SSE DEACT

NOTE
If any tb – gray, note and continue

1. DEACT SLIC HTRS

L12L
WSIPE HTR A(B) PWR – OFF (tb-bp)
BPA STBD HTR B(A) PWR – OFF (tb-bp)
BPA PORT HTR A(B) PWR – OFF (tb-bp)
SLIC EPDSU HTR PWR – OFF (tb-bp)

SM 211 SSE OVERVIEW
√POWER SLIC EPDSU AMPS: 0.4 to 1.4

2. SLIC PWR OFF

L12L
SLIC B-SIDE PWR ENA – OFF
cb SLIC A-SIDE PWR ENA – op

3. DEACT CCTV HTR

L12U
CCTV HTR PWR – OFF (tb-bp)

4. DEACT ORUC PWR

ORUC PWR CONTR A – OFF (tb-bp)
B – OFF (tb-bp)

SM 211 SSE OVERVIEW
√POWER ORUC – blank/blank
√AMPS (two): < 0.4

5. DEACT FSS HTRS

FSS HTR PWR – OFF (tb-bp)

CRT
√POWER FSS HTR P1/P2 AMPS (two): < 0.4
√R1/R2 AMPS (two): < 0.4

6. DEACT MULE/RNS HTRS

L11U
SURV HTR A(B) PWR – OFF
√HTR PWR tb – bp

CRT
√POWER MULE HTR AMPS: < 0.4

L11U
MULE COPE HTR A(B) PWR – OFF (tb-bp)

CRT
√MULE COPE 1A/2A AMPS (two): < 0.4
√1B&2B AMPS: < 0.4
√3A/3B AMPS (two): < 0.4

7. RNS PWR DISABLE

L11U
RNS PWR – DIS (tb-bp)

8. MULE FMDM PWR OFF

NOTE
Expect 'I/O ERROR FLEX' msg

L11U MULE FMDM-A(B) PWR – OFF (tb-bp)
cb MULE B SIDE PWR – op

9. FSS FMDM PWR OFF

NOTE
Expect 'I/O ERROR FLEX' msg

L12U FSS FMDM-A(B) PWR – OFF (tb-bp)

cb FSS/ORUC A SIDE PWR – op
√cb SPACE TEL SW PWR – op

10. PAYLOAD BUS DEACT
R1 PL PRI MNC – OFF (tb-OFF)

Notify MCC, SSE DEACT complete; report any anomalies

ORU/ORI OPERATIONS

DEADFACE WFPC2

SM 210 HST SYS

√PSP ENA (ITEM 1) – 1
√TLM COUNT – incr
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____
√ORU/ORI WFPC2 – ON
ORU/ORI WFPC2 OFF – ITEM 10 +9 8 EXEC
– ITEM 10 +9 9 EXEC
√ORU/ORI WFPC2 – OFF

Log CMD CT: _____ _____
MET: ___/___:___:___

* If ORU/ORI WFPC2 ON, command not received. *
* Reverify comm config and re-exec command *
* If still no joy, √MCC *

Notify EVA crewmembers, ready for WFC3 changeout

BAY 3 BATT PREP FOR REMOVAL

SM 213 HST BATT

√TLM COUNT – incr
√PSP ENA (ITEM 1) – 1
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

√BATT TRIM 4-6,EE (four) – (no *)
√BYPASS 4-6 (three) – (no *)
√CURR 4-6 (three): -0.2 to +0.6

* If any parameters not as expected, √MCC *

BATT DEACT BAY 3 – ITEM 4 +9 6 (97) EXEC
√SA SECT BAY 3 – OFF
√DISCHG BAY 3 – OFF

* If any parameters not as expected, command not received. *
* Attempt alt CDI cmd: *
* BATT DEACT ITEM 4 +9 7 (96) EXEC *
* √SA SECT BAY 3 – OFF *
* √DISCHG BAY 3 – OFF *
* If still no joy, √MCC *

BATT DEACT BAY 3 – ITEM 4 +9 8 (99) EXEC
√PRI HTR BAY 3 – OFF
√VIK BAY 3 – OFF

√BATT TRIM 4-6,EE (four) – *(INVALID STATE; DUE TO CT BUS OFF)
√BATT 4-6 PRESS (three): < +70.0
√4-6 CURR (three): < -24.0

* If any parameters not as expected, command not received. Attempt alt *
* CDI cmd: *
* BATT DEACT ITEM 4 +9 9 (98) EXEC *
* √PRI HTR BAY 3 – OFF *
* √VIK BAY 3 – OFF *
* *
* √BATT TRIM 4-6,EE (four) – *(INVALID STATE; DUE TO CT BUS OFF) *
* √BATT 4-6 PRESS (three): < +70.0 *
* √4-6 CURR (three): < -24.0 *
* If still no joy, √MCC *

√BATT 4 VOLTS at least 0.5 volts below DIODE BUS B VOLTS
√5 VOLTS at least 0.5 volts below DIODE BUS C VOLTS
√6 VOLTS at least 0.5 volts below DIODE BUS C VOLTS

Notify EVA crewmembers, BAY 3 BATTERIES ready for changeout

NOTE
Expect: BATT DISCHG BAY 3 – ON when
first battery P1 connector is demated

DEADFACE RSU/ECU

SM 210 HST SYS

√PSP ENA (ITEM 1) – 1
√TLM COUNT – incr
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

L12U √RSU SURV HTR PWR – OFF (tb-bp)

CRT √RSU STAT 1,2,3 (three) – ON
√MAMP 1,2,3 (three): 84-168
1 OFF – ITEM 15 +9 9 EXEC
2 OFF – ITEM 16 +9 9 EXEC
3 OFF – ITEM 17 +9 9 EXEC
√MAMP 1,2,3 (three): ≤ 20
√STAT 1,2,3 (three) – OFF

Log CMD CT: _____
MET: ___/___:___:___

* If RSU STAT ON or MAMPs > 20, command not received. *
* Reverify comm config and re-exec command *
* If still no joy, √MCC *

When MAMPs < 20 for 10 min (spindown complete), notify EVA crewmembers RSU ready for changeout

BAY 2 BATT PREP FOR REMOVAL

SM 213 HST BATT

√TLM COUNT – incr
√PSP ENA (ITEM 1) – 1
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

√BATT TRIM 1-3,EE (four) – (no *)
√BYPASS 1-3 (three) – (no *)

√BATT CURR 1-3 (three): -0.2 to +0.6 (all 3)

* If any parameters not as expected, √MCC *

BATT DEACT BAY 2 – ITEM 3 +9 6 (97) EXEC
√SA SECT BAY 2 – OFF
√DISCHG BAY 2 – OFF

* If any parameters not as expected, command not received. *
* Attempt alt CDI cmd: *
* BATT DEACT ITEM 3 +9 7 (96) EXEC *
* √SA SECT BAY 2 – OFF *
* √DISCHG BAY 2 – OFF *
* If still no joy, √MCC *

BATT DEACT BAY 2 – ITEM 3 +9 8 (99) EXEC
√PRI HTR BAY 2 – OFF
√VIK BAY 2 – OFF

√BATT TRIM 1-3,EE (four) – * (INVALID STATE; DUE TO CT BUS OFF)
√BATT 1-3 PRESS (three): < +70.0
√1-3 CURR (three): < -24.0

* If any parameters not as expected, command not received. Attempt alt *
* CDI cmd: *
* BATT DEACT ITEM 3 +9 9 (98) EXEC *
* √PRI HTR BAY 2 – OFF *
* √VIK BAY 2 – OFF *
* *
* *
* √BATT TRIM 1-3,EE (four) – * (INVALID STATE; DUE TO CT BUS OFF) *
* √BATT 1-3 PRESS (three): < +70.0 *
* √1-3 CURR (three): < -24.0 *
* If still no joy, √MCC *

√BATT 1 VOLTS at least 0.5 volts below DIODE BUS A VOLTS
√2 VOLTS at least 0.5 volts below DIODE BUS A VOLTS
√3 VOLTS at least 0.5 volts below DIODE BUS B VOLTS

Notify EVA crewmembers, BAY 2 BATTERIES ready for changeout

NOTE
Expect: BATT DISCHG BAY 2 – ON when
first battery P1 connector is demated

DEADFACE COSTAR

SM 210 HST SYS

√PSP ENA (ITEM 1) – 1
√TLM COUNT – incr
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

√ORU/ORI COSTAR – ON
ORU/ORI COSTAR OFF – ITEM 11 +9 7 EXEC
– ITEM 11 +9 8 EXEC
– ITEM 11 +9 9 EXEC
√ORU/ORI COSTAR – OFF

Log CMD CT: _____ _____
MET: ___/___:___:___

* If ORU/ORI COSTAR ON, command(s) not received. *
* Reverify comm config and re-exec command *
* If still no joy, √MCC *

Notify EVA crewmembers, ready for COS install

DEADFACE ACS

SM 210 HST SYS

√PSP ENA (ITEM 1)– 1
√TLM COUNT – incr
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

√ORU/ORI ACS – ON
ORU/ORI ACS OFF – ITEM 13 +9 6 EXEC
– ITEM 13 +9 7 EXEC
– ITEM 13 +9 8 EXEC
– ITEM 13 +9 9 EXEC
√ORU/ORI ACS – OFF

Log CMD CT: _____ _____
MET: ___/___:___:___

* If ORU/ORI ACS ON, command(s) not received. *
* Reverify comm config and re-exec command *
* If still no joy, √MCC *

Notify EVA crewmembers, ready for ACS Repair

DEADFACE STIS

SM 210 HST SYS

√PSP ENA (ITEM 1) – 1
√TLM COUNT – incr
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

√ORU/ORI STIS – ON
ORU/ORI STIS OFF – ITEM 12 +9 7 EXEC
– ITEM 12 +9 8 EXEC
– ITEM 12 +9 9 EXEC
√ORU/ORI STIS – OFF

Log CMD CT: _____ _____
MET: ___/___:___:___

* If ORU/ORI STIS ON, command(s) not received. *
* Reverify comm config and re-exec command *
* If still no joy, √MCC *

Notify EVA crewmembers, ready for STIS repair

DEADFACE FGS-2

SM 210 HST SYS

√PSP ENA (ITEM 1) – 1
√TLM COUNT – incr
√RCVR 1(2) LOCK – *
Log CMD CT: _____ _____

CRT
√FGS EPT V > 5.0
√FGS 2 BUS 2 – *
√FGS 2 V > 14.0
FGS 2 OFF – ITEM 20 +9 8 EXEC
– ITEM 20 +9 9 EXEC

√FGS EPT V < 5.0
√FGS 2 BUS 2 – (no *)
√FGS 2 V < 14.0
√FGS AME 2 V < 1.0

Log CMD CT: _____ _____
MET: ___/___:___:___

* If FGS EPT V > 5.0, FGS 2 V > 14.0, FGS AME 2 V > 1.0 *
* or FGS 2 BUS 2 *, command not received. Reverify *
* comm config and re-exec command *
* If still no joy, √MCC *

Notify EVA crewmembers, FGS-2 ready for changeout

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CONTINGENCY OPERATIONS

FSS STOW WITHOUT BSP

1. FSS AMSB PWR ON

A6U
√PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 2(1) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))
√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

R13L
PL BAY MECH PWR SYS 1(2) – ON

2. BAPS PIVOT DOWN FOR STOW

CAUTION
Operating the pivoter in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 0.3 and no mechanism motion

CCTV
Perform P/TV03 FSS OPS, OPS, FSS CONFIG FOR LANDING (PHOTO/TV FS, SCENES)

CRT
MECH PIVOT LO SEL – ITEM 11 EXEC (* UP)

* If MECH PIVOT LO STAT – *, EOT sw failed: *
* MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *)) *
* Perform SSE SSR-1 FMDM SWAP A→B(B→A) *
* (PL SYS, SSE) and continue on alt side *
* If MECH PIVOT LO STAT – RDY, continue *

√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)

A6U
√PL RETEN LAT 1 tb – LAT (A side only)
1(2) – REL (tb-bp)

CRT
√MECH – flashing A(B)
√PIVOT LO TACH: > 2.5 deg/min
√AMSB AC AMPS: 0.3 to 0.7
√MECH PIVOT LO STAT – RDY

* If MECH PIVOT LO STAT – UP, EOT sw *
* failed, continue *
* Expect '*' in 23.8 min *

CCTV
CAMR
A,B,C
Visually verify BAPS motion; monitor performance

CONTINGENCY OPERATIONS

```
                * If FDA 'S212 PVT STALL' received,                *
A6U             *   PL RETEN LAT 1(2) – OFF, perform 1.3e 'S212    *
                *   PVT(ROT) STALL' (PL SYS, SSE)                  *

                * If MECH PIVOT LO TACH:  < 0.25 deg/min and       *
                *   AMSB AMPS:  < 0.2, PL RETEN LAT 1(2) –         *
                *   OFF, perform 1.3a PRIMARY MOTOR FAILS          *
                *   TO DRIVE MECHANISM (PL SYS, SSE)               *

          Wait 23.8 min

CRT       √MECH PIVOT LO STAT – DN
A6U       √PL RETEN LAT 1 tb      – REL (A side only)
                        1(2)      – OFF
CRT       √MECH                   – steady A(B)
          Visually verify BAPS properly positioned
```

3. DOWNLOCK INSERTION

> CAUTION
> Operating the downlock in a stalled condition for greater than 30 sec may result in damage to unit. A stalled condition is indicated by AMSB AC AMPS > 1.0 and no mechanism motion

> WARNING
> The downlock engagement is required for landing if SCM is on FSS

```
          MECH DLOCK SEL – ITEM 9 EXEC (* DIS)

                * If MECH DLOCK STAT – *, then EOT sw failed:     *
                *      DESEL – ITEM 20 EXEC (ITEM 9 – (no *))     *
                *      Perform SSE SSR-1 FMDM SWAP A→B(B→A)       *
                *       (PL SYS, SSE) and continue on alt side    *
                * If MECH DLOCK STAT – RDY, continue               *

          √AMSB DC AMPS:  0.035 to 0.125
          √MECH – steady A(B)

A6U       √PL RETEN LAT 1 tb – REL (A side only)
                        1(2) – LAT (tb-bp)

CRT       √MECH              – flashing A(B)
          √AMSB AC AMPS:  1.0 to 2.5
          √MECH DLOCK STAT – RDY

                * If stall condition observed (AMSB AC AMPS > 1.0 *
                *   and no mechanism motion):                    *
A6U             *      PL RETEN LAT 1,2 (two) – OFF              *
                *    √MCC                                        *

                * If MECH DLOCK STAT – DIS, continue              *
                * Expect '*'                                      *
```

Wait 24 sec,
√MECH DLOCK STAT – ENG

* If MECH DLOCK STAT – RDY after 30 total sec: *
A6U * PL RETEN LAT 1(2) – OFF *
* Perform 1.3a PRIMARY MOTOR FAILS TO *
* DRIVE MECHANISM (PL SYS, SSE) *

√MECH DLOCK STAT – ENG
A6U √PL RETEN LAT 1 tb – LAT (A side only)
1(2) – OFF
CRT √MECH – steady A(B)
Visually verify DOWNLOCK engaged

4. AMSB PWRDN

SM 212 SSE MECH/BPA/RNS

MECH DESEL – ITEM 20 EXEC (ITEMS 9-19 (eleven) – (no *))
√AMSB DC AMPS: < 0.035
OFF – ITEM 8 EXEC (*)

A6U PL RETEN PL SEL – MON
LOGIC PWR SYS 1(2) – OFF

R13L PL BAY MECH PWR SYS 1(2) – OFF

Notify MCC, FSS STOWED

HST JETTISON FOR RAPID SAFE

1. CHECK PL BAY CONFIG
   If EVA:
   √BSP PIP pin removed prior to EV crew ingress
   √RMS/OBSS clear of payload envelope

2. DAP/TIMER SETUP
   DAP: A10/INRTL/VERN(ALT), LO Z

O14, O15, O16 — Pri RJD LOGIC, DRIVER (sixteen) – ON
√cb MNA,C DDU AFT (two) – cl

SM 2 TIME

F7,A4 — Set CRT and Event Timers counting down to SEP 1
MET ____/____:____:____

-10:00

3. ADI SETUP

A6U
ADI ATT – LVLH
ERR – MED
RATE – LO
SENSE: – Z

4. ACTIVATE LOGIC AND MECH POWER
√PL RETEN LAT 1,2 (two) – OFF
LOGIC PWR SYS 1,2 (two) – ON
√PL SEL – 1

R13 — PL BAY MECH PWR SYS 1,2 (two) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))

5. PIVOT HST
   Perform this step only if pivoter not at 90°; else, go to step 6

MECH PIVOT LO SEL – ITEM 11 EXEC (* RDY)

A6U — PL RETEN LAT 1(2) – LAT

CRT — √MECH – flashing A(B)

Pivot to 90°

A6U — PL RETEN LAT 1(2) – OFF

6. DEADFACE UMBILICAL

L12U
ESS/MN SW ENA – ON (tb-gray)
ESS BUS INT PWR – ON (tb-UP)
EXT PWR – OFF (tb-bp)
MAIN BUS EXT PWR – OFF (tb-bp)
FHST SHUTTER – OPEN (tb-bp)

7. DISCONNECT UMBILICAL

CRT MECH UMB MN SEL – ITEM 17 EXEC (* MAT)
A6U PL RETEN LAT 1(2) – REL

CRT √MECH UMB MN STAT – RDY (wait 8 sec)
√STAT – REL

A6U PL RETEN LAT 1(2) – OFF

8. FINAL SETUP

A4 Set Event Timer to count up from SEP 1 TIG

GNC UNIV PTG
√RATES: < 0.1 deg/sec

-:02:00 DAP: A/FREE/VERN(PRI)

GNC 20 DAP CONFIG
Change DAP A,B to A1,B1

-01:00 9. OPEN BERTHING LATCHES

NOTE
Perform SEP 1 BURN ASAP once LATCH 2 open and verified clear

SM 212 SSE MECH/BPA/RNS
MECH B LAT 3 SEL – ITEM 16 EXEC (* CL)

A6U PL RETEN LAT 1(2) – REL

CRT √MECH B LAT 3 STAT – RDY (wait 15 sec)
√3 STAT – OP

A6U PL RETEN LAT 1(2) – OFF

CRT MECH B LAT 1 SEL – ITEM 14 EXEC (* CL)

A6U PL RETEN LAT 1(2) – REL

CRT √MECH B LAT 1 STAT – RDY (wait 15 sec)
√1 STAT – OP

A6U PL RETEN LAT 1(2) – OFF

CRT MECH B LAT 2 SEL – ITEM 15 EXEC (* CL)

A6U PL RETEN LAT 1(2) – REL

CRT √MECH B LAT 2 STAT – RDY (wait 15 sec)
√2 STAT – OP

A6U PL RETEN LAT 1(2) – OFF

Visually verify LATCHES open and umbilical clear

10. HST TO SUN POINT

NOTE
Expect 'PDI DECOM FAIL' msg

SM 210 HST SYS
PCS MODE – ITEM 7 +9 5 EXEC
– ITEM 7 +9 6 EXEC
– ITEM 7 +9 7 EXEC

11. SEP 1 BURN

A6U √SENSE: -Z
FLT CNTLR PWR – ON

√DAP: A1/FREE/VERN(PRI)
DAP TRANS: PULSE/PULSE/PULSE, LO Z

If OMS or RCS propellant leak,
DAP: NORM Z

+:00:00 AFT THC: +Z (out) 1 pulse (0.1 fps)
When HST clear of latches,
DAP: A1/INRTL/VERN(PRI)

If LO Z:
AFT THC +Z (out) 9 pulses (0.9 fps)
If NORM Z:
AFT THC +Z (out) 7 pulses (0.7 fps)

Record MET ____/____:____:____

NOTE
Perform steps 15,16 in parallel with steps 12,13

12. PERFORM OUT-OF-PLANE MNVR

GNC UNIV PTG
CRT CNCL – ITEM 21 EXEC
GNC, OPS 202 PRO

GNC ORBIT MNVR EXEC
RCS SEL – ITEM 4 EXEC (*)

Set TIG to current time + 2:00 (+3:00 if NORM Z)
TGT PEG 7 ΔVx – ITEM 19 +0 EXEC
7 ΔVy – ITEM 20 +2 EXEC
ΔVz – ITEM 21 +0 EXEC
LOAD – ITEM 22 EXEC
TIMER – ITEM 23 EXEC
√VGOZ: ≥ 0

* If VGO Z < 0: *
* TGT PEG 7 ΔVy – ITEM 20 (-2) EXEC *
* LOAD – ITEM 22 EXEC *
* TIMER – ITEM 23 EXEC *
* √VGOZ: ≥ 0 *

Do not mnvr to burn att

A6U At TIG, deflect THC to null VGOs

13. PERFORM FINAL SEP

GNC ORBIT MNVR EXEC

CRT √RCS SEL – ITEM 4 EXEC (**)

If ΔVy (step 12) +2:
TV ROLL – ITEM 5 +2 7 0 EXEC
If ΔVy (step 12) -2:
TV ROLL – ITEM 5 +0 9 0 EXEC

Set TIG to TIG from step 12 +15:00
TGT PEG 7 ΔVx – ITEM 19 +3 EXEC
ΔVy – ITEM 20 +0 EXEC
ΔVz – ITEM 21 +0 EXEC

LOAD – ITEM 22 EXEC
TIMER – ITEM 23 EXEC
DAP: A/AUTO/PRI

At TIG-8:00,
MNVR – ITEM 27 EXEC (**)

A6U At TIG, deflect THC to null VGOs
FLT CNTLR PWR – OFF

14. RADAR NAV (IF DESIRED)
ENABLE RNDZ NAV, 5-15
POST REL RADAR ACQUISITION, 5-15
RR NAV, 5-15

15. ROTATOR (DUAL MOTOR DRIVE)
If B/L aligned with fixed target (+V3 FWD), go to step 16

NOTE
Rotate to align closest berthing latch to fixed target

SM 212 SSE MECH/BPA/RNS
MECH ROTATOR SEL – ITEM 12 EXEC (** RDY)

A6U PL RETEN LAT 1(2) – REL or LAT as reqd

L12U FSS FMDM-B(A) PWR – ON (tb-gray)

SM 1 DPS UTILITY
PORT ASSIGN STRING PL 1/2 PRI(SEC) – ITEM 23(24) EXEC (**)

SM 212 SSE MECH/BPA/RNS
AMSB PWR ON – ITEM 7 EXEC (**)
MECH ROTATOR SEL – ITEM 12 EXEC (** RDY)

A6U PL RETEN LAT 2(1) – REL or LAT as reqd

CRT √MECH – flashing A,B
Complete maneuver to reqd posn

CCTV When rotator in posn:
A6U PL RETEN LAT 1,2 (two) – OFF

16. START PIVOT DN (DUAL MOTOR DRIVE)

SM 212 SSE MECH/BPA/RNS

MECH BSP SEL – ITEM 19 EXEC (* SET)

* If BSP STAT not SET, √MCC *

MECH PIVOT LO SEL – ITEM 11 EXEC (* RDY)

If step 15 not performed:
A6U PL RETEN LAT 1(2) – REL
L12U FSS FMDM-B(A) – ON

SM 1 DPS UTILITY

PORT ASSIGN STRING PL 1/2 PRI(SEC) – ITEM 23(24) EXEC (*)

SM 212 SSE MECH/BPA/RNS

AMSB PWR ON – ITEM 7 EXEC (*)
MECH PIVOT LO SEL – ITEM 11 EXEC (* RDY)

A6U PL RETEN LAT 2(1) – REL
CRT √MECH – flashing A,B
After BSP – ENG/RET status received (06:06):
PL RETEN LAT 1,2 (two) – OFF
Go to step 17

A6U PL RETEN LAT 2(1) – REL

SM 1 DPS UTILITY

PORT ASSIGN STRING PL 1/2 SEC(PRI) – ITEM 24(23) EXEC (*)

SM 212 SSE MECH/BPA/RNS

CRT MECH PIVOT LO SEL – ITEM 11 EXEC (* RDY)

A6U PL RETEN LAT 1(2) – REL

CRT √MECH – flashing A,B

After BSP-ENG/RET status received (06:06),
A6U PL RETEN LAT 1,2 (two) – OFF

17. VERIFY BSP ENGAGED

CRT √MECH BSP – ENG *
√MECH BSP – RET (not blank)

* If BSP – ENG (no *) or *
* BSP – RET (blank), √MCC *

18. CLOSEOUT

A6U √PL RETEN LAT 1,2 (two) – OFF
LOGIC PWR SYS 1,2 (two) – OFF
PL SEL – MON

R13L PL BAY MECH PWR SYS 1,2 (two) – OFF

19. SSE RAPID DEACT

NOTE
Expect 'I/O ERROR FLEX' msg

R1 PL PRI MNC – OFF (tb-OFF)

SLIC JETTISON

1. PRE-REL CONFIG
   √RMS/OBSS MPMs deployed
   √Elbow Camr stowed
   √HST deployed
   √FSS stowed for landing
   Perform SSE DEACT, (IN-BAY OPERATIONS)

2. AFT STATION CONFIG FOR RELEASE

A6U
   ADI ATT – LVLH
   ERR – MED
   RATE – LO
   SENSE: -Z

O14, O15, O16
   Pri RJD LOGIC,DRIVER (sixteen) – ON
   √cb MNA,C DDU AFT (two) – cl

A1U
   √CNTL – CMD
   √KU BD PWR – ON
   MODE – RDR PASSIVE
   RADAR OUTPUT – LO
   sel – GPC
   SIG STR – KU
   SLEW RATE – as reqd

A2
   DIGI-DIS SEL – R/RDOT
   √X-PNTR SCALE – X1

   Install -Z COAS

3. MNVR TO BACKAWAY JETTISON ATT
   √DAP A1,B1 loaded

   GNC UNIV PTG
   TGT ID: 2
   BODY VECT: 2
   OM: 180
   TRK – ITEM 19 EXEC (CUR - *)
   ERR TOT – ITEM 23 EXEC (*)
   DAP: A/AUTO/VERN, no LO Z

4. ENABLE RNDZ NAV
   ENABLE RNDZ NAV, 5-15

5. LATCH REL
   EV crewmember cuts carrier umbilicals and RF bond straps

   On EV call:
   GNC UNIV PTG
   √Rates < 0.1 deg/sec
   DAP: A/FREE/VERN(PRI)
   GNC 33 REL NAV
   ORB TO TGT – ITEM 10 EXEC

   EV crewmember opens passive latches per RMS/PRLA CONTINGENCY EVA (EVA, ORB CONT EVA)
   Verify EVA crewmembers clear of SLIC

A6U PL RETEN PL SEL – 3
LOGIC PWR SYS 1,2 (two) – ON
R13L PL BAY MECH PWR SYS 1,2 (two) – ON
A6U RETEN LAT 5 – REL (tb-bp)

After ~30 sec (60 sec max):
√PL RETEN LAT 5 tb – REL
LAT 5 – OFF
R13L PL BAY MECH PWR SYS 1,2 (two) – OFF
A6U RETEN LOGIC PWR SYS 1,2 (two) – OFF
PL SEL – MON

00:00:00 6. <u>SEP 1 BURN</u>
A6U √SENSE: -Z
FLT CNTLR PWR – ON
On EV call:
AFT THC: +Z (out) 1 pulse (0.1 fps)
When separation confirmed,
AFT THC: +Z (out) 4 pulses (0.4 fps)
√VZ ~0.5 fps

00:01:00 7. <u>SEP 2 BURN (RETROGRADE)</u>
A6U AFT THC: +Z (out) 15 pulses (1.5 fps)
FLT CNTLR PWR – OFF
DAP: A/INRTL/VERN

8. <u>RADAR NAV</u> (if desired)
POST REL RADAR ACQUISITION, 5-15
RR NAV, 5-15

ORUC JETTISON

1. PRE-REL CONFIG
   √RMS/OBSS MPMs deployed
   √Elbow Camr stowed
   √HST deployed
   √FSS stowed for landing
   Perform SSE DEACT, (IN-BAY OPERATIONS)
   Perform P/TV09 ICBC3D DEACTIVATION

2. AFT STATION CONFIG FOR RELEASE

A6U
   ADI ATT – LVLH
   ERR – MED
   RATE – LO
   SENSE: – Z

O14, O15, O16
   Pri RJD LOGIC, DRIVER (sixteen) – ON
   √cb MNA,C DDU AFT (two) – cl

A1U
   √CNTL – CMD
   √KU BD PWR – ON
   MODE – RDR PASSIVE
   RADAR OUTPUT – LO
   sel – GPC
   SIG STR – KU
   SLEW RATE – as reqd

A2
   DIGI-DIS SEL – R/RDOT
   √X-PNTR SCALE – X1

   Install -Z COAS

3. MNVR TO BACKAWAY JETTISON ATT
   √DAP A1,B1 loaded

   GNC UNIV PTG
   TGT ID: 2
   BODY VECT: 2
   OM: 180
   TRK – ITEM 19 EXEC (CUR - *)
   ERR TOT – ITEM 23 EXEC (*)
   DAP: A/AUTO/VERN, no LO Z

4. ENABLE RNDZ NAV
   ENABLE RNDZ NAV, 5-15

5. LATCH REL
   EV crew cuts carrier umbilicals and RF bond straps

   On EV call:
   GNC UNIV PTG
   √Rates < 0.1 deg/sec
   DAP: A/FREE/VERN(PRI)
   GNC 33 REL NAV
   ORB TO TGT – ITEM 10 EXEC

   EV crewmember opens passive latches per RMS/PRLA CONTINGENCY EVA (EVA, ORB CONT EVA)
   Verify EVA crewmembers clear of ORUC

A6U PL RETEN PL SEL – 2
LOGIC PWR SYS 1,2 (two) – ON
R13L PL BAY MECH PWR SYS 1,2 (two) – ON
A6U RETEN LAT 4 – REL (tb-bp)

After ~30 sec (60 sec max):
√PL RETEN LAT 4 tb – REL
LAT 4 – OFF
R13L PL BAY MECH PWR SYS 1,2 (two) – OFF
RETEN LOGIC PWR SYS 1,2 (two) – OFF
PL SEL – MON

00:00:00 6. <u>SEP 1 BURN</u>
A6U √SENSE: -Z
FLT CNTLR PWR – ON
On EV call:
AFT THC: +Z (out) 1 pulse (0.1 fps)
When separation confirmed,
AFT THC: +Z (out) 4 pulses (0.4 fps)
√VZ ~0.5 fps

+00:01:00 7. <u>SEP 2 BURN (RETROGRADE)</u>
A6U AFT THC: +Z (out) 15 pulses (1.5 fps)
FLT CNTLR PWR – OFF
DAP: A/INRTL/VERN

8. <u>RADAR NAV</u> (if desired)
POST REL RADAR ACQUISITION, 5-15
RR NAV, 5-15

ENABLE RNDZ NAV

√MCC for target vector onboard
GNC 33 REL NAV
RNDZ NAV ENA – ITEM 1 EXEC (*)
√SV SEL, ITEM 4 – (PROP)
√INH RNG, ITEM 18 – (*)
RDOT, ITEM 21 – (*)
Angles, ITEM 24 – (*)
RR – ITEM 13 EXEC (*)

POST REL RADAR ACQUISITION

GNC 33 REL NAV
KU ANT ENA – ITEM 2 EXEC (*)
GNC I/O RESET

A2 √DIGI-DIS SEL – R/RDOT

SM ANTENNA
RDR RNG MIN – ITEM 17 EXEC (*)
A1U √KU BD RDR OUTPUT – LO
√sel – GPC
√MODE – RDR PASSIVE
CNTL – PNL (wait 3 sec)
PWR – ON

* If no lock within 2 min: *
* KU sel – AUTO TRACK *
* √EL, AZ angles < 30 deg (as seen in COAS) *
* SLEW – as reqd (as seen in COAS) *
* KU SEARCH – SEARCH (tb-gray) *
* Repeat slew and search as reqd *
* If acquistition not successful, √MCC *

POST REL RR NAV

A1U √KU TRACK tb – gray
GNC 33 REL NAV
√RR – ITEM 13 (*)

IF RATIO > 1.0
FORCE 3 MARKS

If RATIO still > 1.0 call MCC

AUTO RNG – ITEM 17 EXEC
RDOT – ITEM 20 EXEC
Angles – ITEM 23 EXEC

When updates small and stable,
SV SEL – ITEM 4 EXEC (FLTR)

SM ANTENNA
RDR RNG AUTO – ITEM 16 EXEC (*)

When R > 400 ft,
KU RDR OUTPUT – HI

BSP MECHANISM CHECKOUT

1. FSS AMSB PWR ON

A6U √PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 2(1) – OFF
√PL SEL – 1
LOGIC PWR SYS 1(2) – ON

SM 212 SSE MECH/BPA/RNS
AMSB ON – ITEM 7 EXEC (A(B))
√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√O/R DIS (ITEM 22) – *

R13L PL BAY MECH PWR SYS 1(2) – ON

2. BSP REL

CRT If MECH BSP DIS A, DIS B or DIS *, √MCC
MECH BSP SEL – ITEM 19 EXEC (*)
√AMSB DC AMPS: 0.035 to 0.125
√MECH – steady A(B)
√BSP STAT – SET
A6U PL RETEN LAT 1(2) – REL, wait 4 sec, then OFF
CRT √MECH BSP STAT – REL

* If BSP STAT not REL: *
* Perform 1.3a PRIMARY MOTOR FAILS *
* TO DRIVE MECHANISM (PL SYS, SSE) *

3. BSP SET

On MCC GO:
A6U PL RETEN LAT 1(2) – LAT, wait 4 sec, then OFF
CRT √MECH BSP STAT – SET

* If BSP STAT not SET: *
* Perform 1.3a PRIMARY MOTOR FAILS *
* TO DRIVE MECHANISM (PL SYS, SSE) *

4. AMSB PWRDN

CRT MECH DESEL – ITEM 20 EXEC (MECH SEL ITEMS 9-19 (eleven) – (no *))

* If any MECH SEL – *, do not turn *
* AMSB OFF; notify MCC, continue *

√AMSB DC AMPS: < 0.035
OFF – ITEM 8 EXEC (*)
A6U PL RETEN LOGIC PWR SYS 1(2) – OFF
R13L BAY MECH PWR SYS 1(2) – OFF

Notify MCC BSP MECHANISM CHECKOUT complete; report any anomalies

SSE CHECKOUT WITH FAILED MULE FMDM-A

1. MULE/RNS SURVIVAL HEATER C/O

L11U SURV HTR A PWR – ON
B PWR – OFF
√PWR tb – gray
B PWR – ON
A PWR – OFF
√PWR tb – gray

* If SURV HTR PWR tb – bp, *
* cycle SURV HTR A PWR sw *
* If still no joy, continue *

2. MULE COPE A HEATER C/O
MULE COPE HTR A PWR – ON (tb-gray)

* If MULE COPE HTR A PWR tb – bp, *
* cycle sw *
* If still no joy, continue *

COPE HTR A PWR – OFF (tb-bp)

3. VERIFY SSE STATUS

NOTE
If any parameter not in range, notify MCC

SM 211 SSE OVERVIEW
√PCU – blank/blank
√PCU OFF – *
√CCTV ENA OFF – *
√PWR OFF – *
POWER
√FSS EPDSU 1/2 AMPS (two): < 3.0
√FMDM A/B AMPS (two): 0.5 to 1.1
√HTR – 1/2
√HTR P1/P2 AMPS (two): < 0.4
√R1/R2 AMPS (two): < 0.4
√CCTV HTR AMPS: < 0.9
√ORUC – A/B
√AMPS (two): < 30

√SLIC EPDSU AMPS: < 16
√FSS VOLTS (two): 24.0 to 32.0
√SLIC VOLTS (two): 24.0 to 32.0

√DPC 1-12 (twelve) – (no *)
√VOLTS (twelve): < 0.5
√AMPS (twelve): < 0.5

THERMAL

√FSS EPDSU TEMP (two): -20 to 50 degC
√FMDM TEMP (two): -3 to 55 degC
√PCU TEMP (two): -20 to 50 degC
√IPCU TEMP: -30 to 50 degC
√AMSB TEMP: -20 to 50 degC
√ORUC PRJU TEMP (two): -20 to 50 degC
√SLIC EPDSU TEMP (two): -20 to 50 degC

4. AMSB CHECKOUT SIDE A

SM 212 SSE MECH/BPA/RNS

√AMSB OFF – *
√AMSB AC AMPS: < 0.20
√AMSB TEMP: -20 to 50 degC
√MECH – blank
√PIVOT LO TACH: < 0.25 deg/min
√ROTATOR TACH: < 0.9 deg/min

A6U √PL RETEN LAT 1,2 (two) – OFF
√LOGIC PWR SYS 1,2 (two) – OFF
√PL SEL – 1

R13L √PL BAY MECH PWR SYS 1,2 (two) – OFF

CRT AMSB ON – ITEM 7 EXEC (A(B))

* If AMSB ON – blank, *
* record and continue *

√AMSB AC AMPS: < 0.20
√MECH – blank
√SEL (ITEMS 9-19) (eleven) – (no *)
√STAT (ITEMS 9-19) (eleven) – blank
√PIVOT LO TACH: < 0.25 deg/min
√ROTATOR TACH: < 0.9 deg/min
√O/R DIS (ITEM 22) – *

* If any parameter out of limit, √MCC *

Perform following ITEM ENTRIES and checks per table

NOTE

SEL field should show '*' for only MECHANISM selected.
For any parameters not as expected, do not deselect;
contact MCC

ITEM EXEC	MECHANISM	SEL	STAT	AMSB DC AMPS	MECH	SM 97 PL SEL 1, LAT/REL LATCH 2(1)
9	DLOCK	9 – *	ENG	0.035-0.125	A(B)	01/00(10/00)
Expect 'S212 AMSB DC AMPS' msg						
21	O/R ENA(*)	9 – *	RDY	0.130-0.230		00/00(00/00)
11	PIVOT LO	11 – *	DN	0.035-0.125	A(B)	00/01(00/10)
Expect 'S212 AMSB DC AMPS' msg						
21	O/R ENA (*)	11 – *	RDY	0.130-0.230		00/00(00/00)
22	O/R DIS (*)	11 – *	DN	0.035-0.125	A(B)	00/01(00/10)
12	ROTATOR	12 – *	RDY	0.035-0.125		00/00(00/00)
14	B LAT 1	14 – *	OP	0.035-0.125	A(B)	00/01(00/10)
15	B LAT 2	15 – *	OP	0.035-0.125	A(B)	00/01(00/10)
16	B LAT 3	16 – *	OP	0.035-0.125	A(B)	00/01(00/10)
17	UMB MN	17 – *	REL	0.035-0.125	A(B)	00/01(00/10)
18	UMB B/U	18 – *	MAT	0.035-0.125	A(B)	01/00(10/00)
19	BSP	19 – *	SET	0.035-0.125	A(B)	01/00(10/00)
20	DESEL	9-19 blank		< 0.035		00/00(00/00)

AMSB OFF – ITEM 8 EXEC (*)

5. FSS PCU CHECKOUT

SM 211 SSE OVERVIEW

PCU ON – ITEM 1 EXEC (*)
√PCU – P/S
√DPC 1-12 (twelve) – *
√VOLTS (twelve): 33.7 to 35.5
√AMPS (twelve): ≤ 0.5

* If any DPC 1-12 AMPS (twelve): > 0.5, *
* PCU OFF – ITEM 2 EXEC (*), *
* √MCC *

PCU OFF – ITEM 2 EXEC (*)
√PCU – blank/blank
√DPC 1-12 (twelve) – (no *)

6. FSS FMDM-A PWRDN

SM 1 DPS UTILITY

PORT ASSIGN STRING PL 1/2 PRI – ITEM 23 EXEC (*)
L12U FSS FMDM-A PWR – OFF (tb-bp)

* If tb – gray, note and continue *

SM 211 SSE OVERVIEW

√POWER FSS FMDM A/B AMPS: < 0.15/0.5 to 1.1

Notify MCC, SSE CHECKOUT WITH FAILED MULE FMDM-A complete; report any anomalies

EVA HARDWARE JETTISON

1. CONFIG HST
   Pivot FSS to 90° and rotate as reqd:
   Perform PIVOT HST (IN-BAY OPS)
   Perform ROTATE HST (IN-BAY OPS)
   √MCC (SA slew may be reqd)
   √BSP pinned

2. ACQUIRE FAILED ORU
   Configure orbiter lighting as reqd to support night jettison
   Unstow HHL

MS — √VTR recording

SM 94 PDRS CONTROL
√PL ID, ITEM 3: 4
√INIT ID, ITEM 24: 4

RHC — RATE – as reqd (VERN within 10 ft)
A8U — BRAKES – OFF (tb-OFF)
MODE – ORB LD, ENTER

MS/EV — If acquiring other failed hardware,
mnvr as reqd to grasp failed ORU

CDR/PLT 3. ORBITER MNVR TO JETTISON ATTITUDE
O14,O15, O16:E — cb DDU (six) – cl

O14,O15, O16:F — PRI RJD DRIVER,LOGIC (sixteen) – ON

√DAP: A10/AUTO/VERN(ALT)

GNC 2011 UNIV PTG
TRK OPTION:

TGT ID	+2
BODY VECTOR	+2
√P	+180.0
√Y	+0.0
OM	+0.0

TRK – ITEM 19 EXEC (CUR - *****)

4. RMS MNVR TO HARDWARE JETTISON POSN

SM 94 PDRS CONTROL

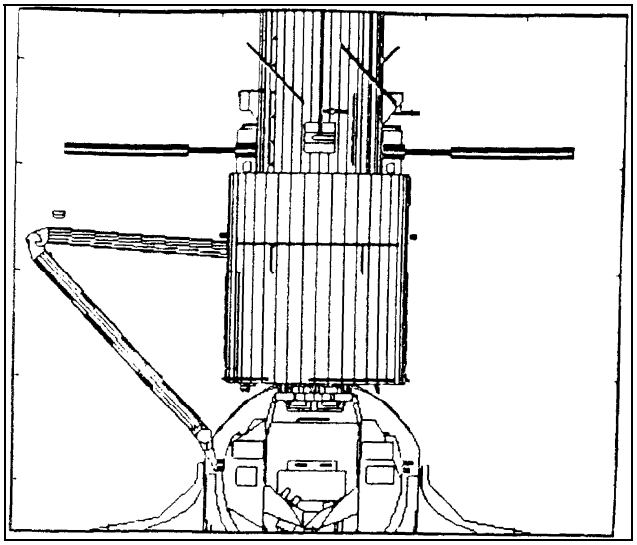
MS PL ID – ITEM 3 +5 EXEC
INIT ID – ITEM 24 +5 EXEC

RHC RATE – as reqd (VERN within 10 ft)
A8U BRAKES – OFF (tb-OFF)
MODE – ORB LD, ENTER

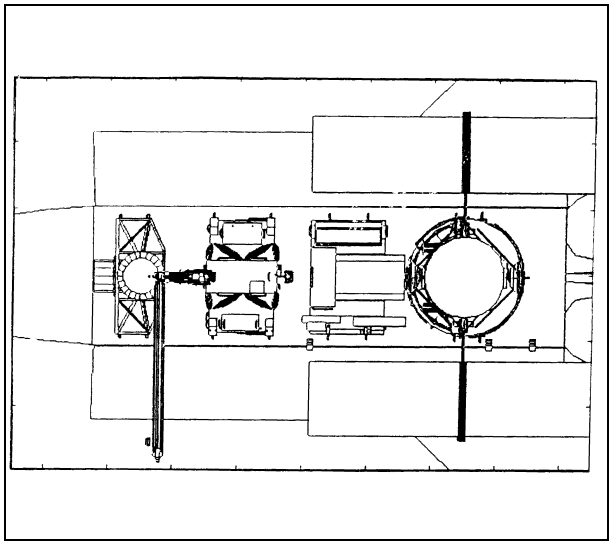
When hardware clear of HST:
DAP: A/AUTO/VERN(ALT),
FREE as reqd to maintain control of jettison hardware

Mnvr to Hardware Jettison posn:

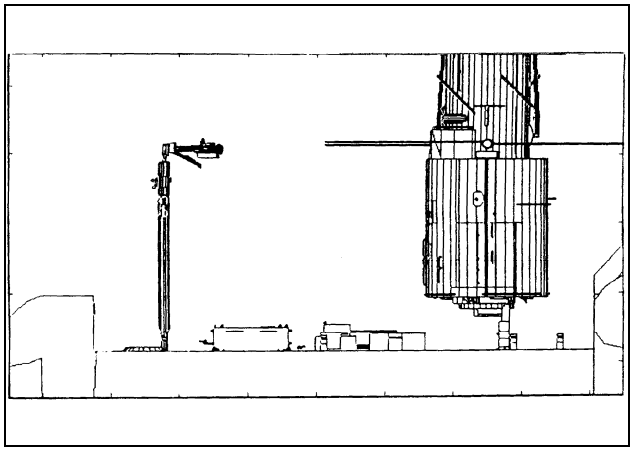
X	Y	Z	PITCH	YAW	ROLL	PL ID
-734	1	-983	350	330	0	3
-750	10	-980	350	330	0	4
-750	10	-980	350	330	0	5
SY	SP	EP	WP	WY	WR	
-95.4	+85.5	-40.3	-87.5	+62.7	-133.6	



FRONT



OVERHEAD



PORT

5. PREP FOR RELEASE

GNC 20 DAP CONFIG

REBOOST CFG – ITEM 8 +2 EXEC
INTVL – ITEM 9 +5.1 2 EXEC

GNC UNIV PTG

Set start time to current time:
START TIME – ITEM 1 +_ _ _ +_ _ +_ _ +_ _ EXEC

When RMS EV stable at jettison position:
DAP: A/AUTO/VERN(ALT)
√DAP TRANS: PULSE/PULSE/PULSE, LO Z

6. HARDWARE RELEASE

When in jettison attitude with rates damped:
√MCC GO for release
DAP: FREE

SM 94 PDRS CONTROL

MS PL ID – ITEM 3 +4 EXEC
INIT ID – ITEM 24 +4 EXEC

RHC RATE – COARSE (RATE MIN tb-OFF)
A8 BRAKES – OFF (tb-OFF)
MODE – ORB LD, ENTER

NOTE

WY singularity should be monitored during RMS EV back-away. Expect MA, C/W SINGULAR lt – on (WY)

EV Release Hardware
MS Mnvr RMS EV 5 ft (minimum) clear of jettisoned hardware
Maintain 5 ft clearance to structure during reboost

RMS EV Back-away posn: (for reference only)

X	Y	Z	PITCH	YAW	ROLL	PL ID
-699	1	-903	350	330	0	3
-715	10	-900	350	330	0	4
SY	SP	EP	WP	WY	WR	
-105.6	+101.2	-74.1	-87.4	+69.2	-113.9	

7. REBOOST

GNC UNIV PTG

Set DURATION to 0:01:31.0
RBST – ITEM 25 EXEC (CUR - *****)

NOTE

Reboost firings will start 14 sec after ITEM 25. Reboost can be aborted with an ITEM 26 on UNIV PTG

Report HHL Range, Rdot to MCC

8. POST-REBOOST CLEANUP
When reboost cmplt:
DAP: A/LVLH/VERN(ALT)

O14,O15, O16:E — cb DDU (six) – op

O14,O15, O16:F — PRI RJD DRIVER,LOGIC (sixteen) – as reqd

Return to FLIGHT PLAN attitude

RAPID SAFING WITHOUT HST

1. √PL BAY CONFIG
   If EVA:
   √BSP PIP pin removed prior to EV crew ingress
   √RMS/OBSS clear of payload envelope

2. ACTIVATE LOGIC AND MECH POWER
   Perform this step only if FSS not stowed for entry; else, go to step 7

A6U √PL RETEN LAT 1,2 (two) – OFF
LOGIC PWR SYS 1,2 (two) – ON
√PL SEL – 1

R13L PL BAY MECH PWR SYS 1,2 (two) – ON

SM 212 SSE MECH/BPA/RNS
AMSB PWR ON – ITEM 7 EXEC (A(B))

3. ROTATE (DUAL MOTOR DRIVE)
   Perform this step only if BSP installed and B/L not aligned with fixed target (+V3 FWD); else, go to step 4

NOTE
Rotate to align closest berthing latch to fixed target.
If hardstop encountered, reverse direction

MECH ROTATOR SEL – ITEM 12 EXEC (* RDY)

A6U PL RETEN LAT 1(2) – REL or LAT as reqd

L12U FSS FMDM-B(A) PWR – ON (tb-gray)

SM 1 DPS UTILITY
PORT ASSIGN STRING PL 1/2 PRI(SEC) – ITEM 23(24) EXEC (*)

SM 212 SSE MECH/BPA/RNS
AMSB PWR ON – ITEM 7 EXEC (*)
MECH ROTATOR SEL – ITEM 12 EXEC (* RDY)

A6U PL RETEN LAT 2(1) – REL or LAT as reqd

CRT √MECH – flashing A,B
Complete rotation to reqd posn

CCTV When rotator in posn:
A6U PL RETEN LAT 1,2 (two) – OFF

4. PIVOT DOWN (DUAL MOTOR DRIVE)
   SM 212 SSE MECH/BPA/RNS
   MECH BSP SEL – ITEM 19 EXEC (* SET)
   MECH PIVOT LO SEL – ITEM 11 EXEC (* RDY or UP)

If step 3 not performed:

A6U PL RETEN LAT 1(2) – REL

L12U FSS FMDM-B(A) – ON

SM 1 DPS UTILITY

PORT ASSIGN STRING PL 1/2 PRI(SEC) – ITEM 23(24) EXEC (*****)

SM 212 SSE MECH/BPA/RNS

AMSB PWR ON – ITEM 7 EXEC (*****)

MECH PIVOT LO SEL – ITEM 11 EXEC (***** RDY)

A6U PL RETEN LAT 2(1) – REL

CRT √MECH – flashing A,B

If BSP installed, go to step 5, else complete pivot to 0°

√MECH PIVOT LO STAT – (***** DN)

A6U PL RETEN LAT 1,2 (two) – OFF

PL RETEN LAT 2(1) – REL

SM 1 DPS UTILITY

PORT ASSIGN STRING PL 1/2 SEC(PRI) – ITEM 24(23) EXEC (*****)

SM 212 SSE MECH/BPA/RNS

CRT MECH PIVOT LO SEL – ITEM 11 EXEC (***** RDY)

A6U PL RETEN LAT 1(2) – REL

CRT √MECH – flashing A,B

√MECH PIVOT LO STAT – (***** DN)

A6U PL RETEN LAT 1,2 (two) – OFF

5. VERIFY BSP ENGAGED

If BSP not installed proceed to step 6

After BSP-ENG/RET status received,

A6U PL RETEN LAT 1,2 (two) – OFF

CRT √MECH BSP – ENG *****

***** If BSP not ENG (*****), √MCC *****

Proceed to step 7

6. ENGAGE DOWNLOCK

WARNING

The downlink engagement is required for landing if SCM is on FSS

SM 212 SSE MECH/BPA/RNS

CRT MECH DLOCK SEL – ITEM 9 EXEC (* DIS)

A6U PL RETEN LAT 1,2 (two) – LAT

CRT After MECH DLOCK STAT – ENG status received,

A6U PL RETEN LAT 1,2 (two) – OFF

7. CLOSEOUT

A6U PL RETEN LOGIC PWR SYS 1,2 (two) – OFF
PL SEL – MON

R13L BAY MECH PWR SYS 1,2 (two) – OFF

8. SSE RAPID DEACT

NOTE
Expect 'I/O ERROR FLEX' msg

R1 PL PRI MNC – OFF (tb-OFF)

RNS PWRDN

1. RNS PWRDN

   SM 212 SSE MECH/BPA/RNS

   On MCC GO:

   RNS OPS OFF – ITEM 38 EXEC

   √RNS ICE AMPS: – 0.4 to 1.4
   - √MSM1 OFF – *
   - √MSM2 OFF – *
   - √OP HTR OFF – *
   - √SP-CUBE OFF – *
   - √SENSORS OFF – *

   * If any RNS parameter not as expected *
   * notify MCC, continue *

   Notify MCC when complete

CONFIGURE PRIME COMM STRING FOR HST BSA

NOTE
Possible 'S62 PDI DECOM FAIL' msg

1. DEADFACE PI CONNECTOR

L12L PSP BY-PASS – DISABLE

2. CONFIGURE PDIP1 PI CONNECTORS

L12L Remove Turn-Around Plug from HST PI 1(2)
Connect BSA data cable to HST PI 1(2)

3. BSA PWR ON

BSA BSA PWR – ON

* If pwr to BSA fails: *
* Check pwr cable connection *
* BSA PWR – OFF (wait 5 sec) *
* BSA PWR – ON *

4. ENABLE PSP-BYPASS

L12L PSP BY-PASS – ENABLE

Notify MCC "HST BSA installation on prime COMM string complete"

CONFIGURE PRIME COMM STRING FOR PSP-BYPASS (TURN-AROUND PLUG)

NOTE

Possible 'S62 PDI DECOM FAIL' msg

1. BSA PWR OFF

BSA — BSA PWR – OFF

2. DEADFACE PI CONNECTOR

L12L — PSP BY-PASS – DISABLE

3. CONFIGURE PDIP1 PI CONNECTORS

L12L — Disconnect BSA data cable from HST PI 1(2)
Install Turn-Around Plug on HST PI 1(2)

4. ENABLE PSP BYPASS

L12L — PSP BY-PASS – ENABLE

Notify MCC "HST prime COMM string configured for PSP-BYPASS"

ENABLE RNS OP HTRS

SM 212 SSE MECH/BPA/RNS

On MCC GO:
RNS OP HTR ON – ITEM 27 EXEC (*)

* If RNS OP HTR ON – (no *) *
* record and continue *

√RNS OP HTR AMPS < 8.5

* If RNS OP HTR ON > 8.5, *
* expect FDA then, *
* RNS OP HTR OFF – ITEM 28 EXEC (*) *
* Notify MCC *

DEORBIT PREP

PAYLOAD DEACT

R1 PL CAB – OFF

PAYLOAD REACT

SSE
Perform SSE ACTIVATION (SSE ACT/FSS PREP)

PAYLOAD ENTRY SW LIST/VERIF

TIG-1:55

R1
√PL CAB – OFF
√PRI MNC – ctr (tb-OFF)
√MNB,FC3 (two) – ctr (tb-OFF)
√AUX – ON
√AFT MNB – OFF
√MNC – OFF

A6U
√PL RETEN LAT 1,2 (two) – OFF (tb-bp)
√PL SEL – MON
√LOGIC PWR SYS 1,2 (two) – OFF

R13L
√PL BAY MECH PWR SYS 1,2 (two) – OFF

L12U
(FSS/ORUC)
√FSS PCU PWR CONTR A,B (two) – OFF
√ORUC PWR CONTR A,B (two) – OFF (tb-bp)
√CCTV HTR PWR – OFF (tb-bp)
√FSS FMDM-A,B PWR (two) – OFF (tb-bp)
√HTR PWR – OFF (tb-bp)
√cb FSS/ORUC A SIDE PWR – op
√PDIP1 PWR 2/Ku BAND RLY – op

(TELESCOPE)
√ESS BUS EXT PWR – ctr (tb-bp)
√INT PWR – ctr (tb-bp)
√FHST SHUTTER – OPEN (tb-bp)
√RSU SURV HTR PWR – OFF (tb-bp)
√MN BUS INT PWR – ctr
√PWR ON tb – bp
√ESS/MN SW ENA – OFF (tb-bp)
√IPCU RLY CL tb – bp
√MAIN BUS EXT PWR – ctr (tb-bp)
√SSM WK LTS – OFF
√cb SPACE TEL SW PWR – op
√PDIP PWR 1 – op

L12L
(APCU/PSP BY-PASS/ICBC3D)
√APCU 1 CONV – OFF (tb-bp)
√OUTPUT RLY – OPEN (tb-bp)
√2 CONV – OFF (tb-bp)
√OUTPUT RLY – OPEN (tb-bp)
√ICBC3D PWR – OFF (tb-bp)
√EMER RUN – OFF (tb-bp)
√PSP BY-PASS – DISABLE
√cb SW PWR – op
√PDIP2 PWR 2 – op

(SLIC)
√WSIPE HTR A PWR – ctr (tb-bp)
√B PWR – ctr (tb-bp)
√BPA PORT HTR A PWR – OFF (tb-bp)
√B PWR – OFF (tb-bp)
√SLIC B SIDE PWR ENA – OFF
√BPA STBD HTR A PWR – OFF (tb-bp)
√B PWR – OFF (tb-bp)
√SLIC EPDSU HTR PWR – OFF (tb-bp)
√cb SLIC A SIDE PWR ENA – op
√PDIP 2 PWR 1 – op

L11U (SSP-3)
√HTR ILLUM – OFF
√KEEL CAM ENABLE – OFF
√cb KEEL CAM SW – op
√CB2 – op

(MULE/RNS)
√RNS GPS REC – ctr (tb-bp)
CAM REC – ctr (tb-bp)
√MULE FMDM-A PWR – OFF (tb-bp)
√FMDM-B PWR – OFF (tb-bp)
√SURV HTR A PWR – OFF
√B PWR – OFF
√HTR PWR tb – bp
√RNS PWR – DIS (tb-bp)

√MULE COPE HTR A PWR – OFF (tb-bp)
√B PWR – OFF (tb-bp)
√cb MULE B SIDE PWR – op
√KEEL CAM PWR – op

L12L (PDIP)
√Ku BAND RATE – LO
√DC PWR 1,2 CAB PL (two) – OFF

ML86B √cb MNB MAR 1 – op
√2 – op

ML85E √AC S1 – OFF
√cb AC CB1 – op
√DC 10 AMP MNB S2,S3,S4 (three) – OFF
√cb DC 10 AMP MNB CB2,CB3,CB4 (three) – op
√DC 10 AMP MNB S5 – ON
√cb DC 10 AMP MNB CB5 – cl
√PUMPS – OFF
√cb PUMPS 1,2 (two) – op

HST QUICK RESPONSE

SA SLEW (INADVERTENT)

SM 210 HST SYS

SOLAR ARRAY SADE OFF – ITEM 9 +9 9 EXEC (OFF)

Notify MCC

REFERENCE DATA

DPC ON/OFF INDEX NUMBERS

SM 211 SSE OVERVIEW

	DPC ON – ITEM 23 +x x	DPC OFF – ITEM 24 +x x
DPC	X X	X X
1	01	71
2	02	72
3	03	73
4	04	74
5	05	75
6	06	76
7	07	77
8	08	78
9	09	79
10	10	80
11	11	81
12	12	82

REFERENCE DATA

CUE CARD CONFIGURATION

HOOK VELCRO

HOOK VELCRO

BIT SYNC ASSEMBLY

BSA MANUAL MODE
RNDZ/UNBERTH CONFIG

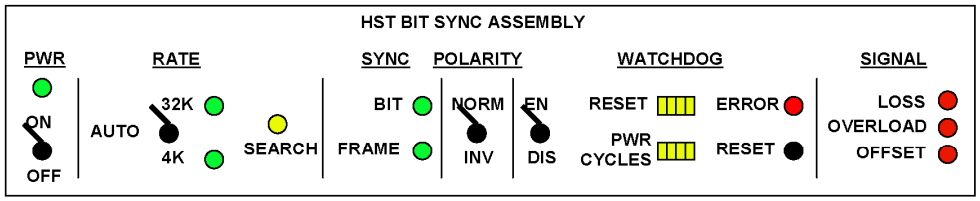
BSA

1. CONFIGURE BSA
   RATE – 32k
   WATCHDOG – Dis
2. VERIFY BSA CONFIG
   √PWR – Green
   √RATE – 32k – Green
   √SYNC – Bit – Green
   √SYNC – Frame – Green

BSA AUTOMATIC MODE
HST BERTHED CONFIG

BSA

1. CONFIGURE BSA
   BSA RATE – Auto
   WATCHDOG – Ena
2. VERIFY BSA CONFIG
   √PWR – Green
   √RATE – 32k – Green
   √SYNC – Bit – Green
   √SYNC – Frame – Green



RATE
32K: Aydin card configured for 32 kbps
Auto: Switch center position. Upon loss of Frame lock, BSA will select and configure Aydin bit rate based on sampled input data rate
4K: Aydin card configured for 4 kbps
Search: If yellow, indicates BSA sampled input data rate does not match present Aydin card configured rate

SYNC
Bit: If green, Aydin card has established a bit sync lock at selected rate
Frame: If green, BSA controller card has established an HST Telemetry Frame Header lock on the data provided by the Aydin card output

POLARITY
Norm: Aydin card configured to provide normal differential output data with respect to input data
Inv: Aydin card configured to provide inverted differential output data with respect to input data

WATCHDOG
En/Dis: Enable or Disable Watchdog feature
Resets: Binary counter of reset commands issued to Aydin card by watchdog since power up or reset
Pwr Cycles: Binary counter of power cycles executed by BSA controller since power up or reset
Error: If red, indicates BSA watchdog can not resolve out of lock condition and manual intervention is required
Reset: Momentary push button providing soft reset to BSA controller card

SIGNAL (Diagnostic)
Loss: If red, there may be no input signal or the input signal amplitude is smaller than the gain control circuit can accommodate
Overload: If red, the input signal amplitude is too great for the gain control circuit to accommodate and the bit sync is saturated
Offset: If red, the input signal has more offset than the correction circuit can accommodate

PL OPS-1a/125/O/A

CUE CARD CONFIG

HOOK VELCRO

HOOK VELCRO

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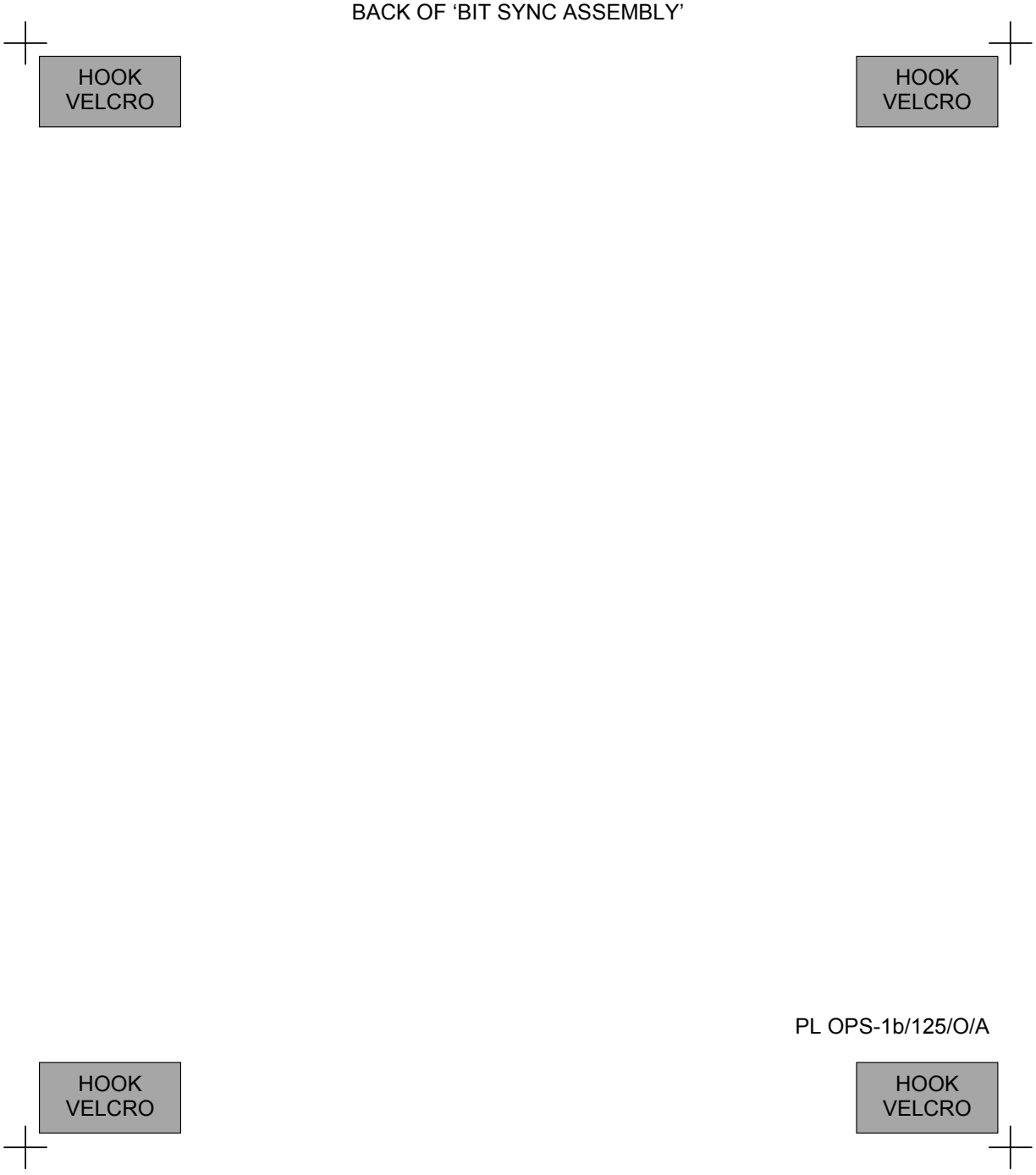
TOP
BACK OF 'BIT SYNC ASSEMBLY'



PL OPS-1b/125/O/A

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Space Shuttle Program
FLIGHT DATA FILE

JSC-48068-125
FINAL

PAYLOAD OPS CHECKLIST

STS
125

Flight Cover (trim bottom to expose tabs)