

STS-123/1J/A

FD 12 Execute Package



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Approved by FAO: Telisha M. Harris 

Last Updated: Mar 21 2008 4:34PM GMT

JEDI (Joint Execute package Development and Integration), v2.04.0003

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2 MSG NO. TITLE

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10 111 FD12 LiOH Cue Card

11 112 FD11 MMT Summary

12

13 **1. Exercise Constraints**

14

15 A. The generic exercise constraints that apply to the entire docked timeframe are listed

16 in the table below.

17 Exercise Constraints Table A: Entire Docked Timeframe

Exercise Constraints
RED limited to 3 sec (squats and heel raises) and 2 sec (situps) between repetitions
HC-1 limited to 3 sec (torso bending and rowing) and 2 sec (hammer throw and forearm bending) between repetitions
Use of theraband or any other exercise band while exercising on Shuttle Ergometer is prohibited, except during EVA prebreathe, and always on CEVIS
Use of ISS hard-mounted exercise equipment during 1-jet PRCS attitude control and reboost is prohibited

18

19 B. There are no exercise constraints for any of the activities on FD12.

20

21 **2. OBSS PTU Anomaly**

22

23 We have discovered that the PAN hard stop on the OBSS Pan/Tilt

24 Unit was installed 10 degrees beyond the designed range. This is why your final pan

25 angles had a +10 degree offset during the Flight Day 2 inspections. For the docked

26 late inspection, you will observe the same +10 degree pan offset when following

27 the LDRI Survey procedures.

28

29 **3. FD 12 Late Inspection Procedure Updates**

30

31 The following modifications are required to PDRS procedures for Late Inspection.

32

33 Due to the problems encountered with SPDM Activation, the configuration of SPDM

34 is not as expected preflight. The ground has verified the clearances with the SPDM

35 during Late Inspection and there are no concerns.

36

37 1. OBSS LDRI RCC SURVEY - STBD DOCKED (PDRS, LATE INSPECTION)

38 Step 1, page FS 5-2.

39 Ignore the SPDM position verification lines for Arm 1, Arm 2, and Body Roll.

The following modification is required for LDRI Activation.

2. OBSS LDRI RCC SURVEY - STBD DOCKED (PDRS, LATE INSPECTION)
 Step 1, page FS 5-2.
 Add to the end of Step 1:
 Perform ACTIVATION (LDRI/ITVC Cue Card, P/TV) Steps 1, 3, 4, 5

The following modifications are required to match the attitude control plan for Late Inspection.

3. OBSS LDRI RCC SURVEY - NOSE CAP DOCKED (PDRS, LATE INSPECTION)
 Step 1, page FS 5-31.
 Add:
 Do not perform Nose Cap Survey Procedure until 3.111 HANDOVER ATTITUDE CONTROL ORBITER TO CMG TA (JNT OPS, MATED OPERATIONS) is complete.

4. OBSS LDRI RCC SURVEY - PORT DOCKED (PDRS, LATE INSPECTION)
 Step 2, page FS 5-48.
 Delete:
 When in attitude and on CMG-MM:
 MSS: SSRMS: Thrusters: Thruster Controls for MSS Ops
 Verify 'Desat Request' Inhibit

4. Midday LiOH Changeout:

During today's late inspection, the Station's Carbon Dioxide Removal Assembly (CDRA) will be deactivated and unavailable to remove CO2 for several hours. To control CO2 levels in the Shuttle, a midday LiOH changeout will be performed on MCC call. Another LiOH changeout will be performed Pre-sleep FD12 as usual. Use PPE for LiOH dust and report decal number of cans used to MCC.

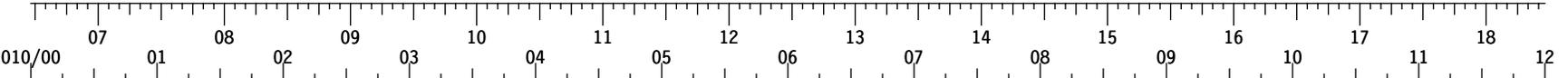
Flight Day	POS A	POS B
MID FD12	STS-118-X	"
PRE FD12	"	STS-118-X

For the remainder of the mission, use the new LiOH cue card in msg 111.

5. REPLACE PAGES 3-126 THROUGH 3-135.

GMT 03/21/08 (081)

MET $\beta=48$ Day 010

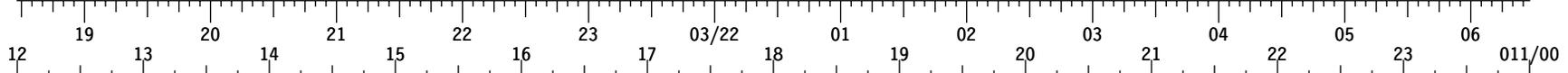


Page 3

S T S - 1 2 3	FD11	CDR GORIE	PRE SLEEP	PMC OCA	PRE SLEEP	SLEEP	FD12	POST SLEEP
		PLT JOHNSON			PRE SLEEP#	SLEEP		POST SLEEP
		MS1 BEHNKEN	EV1	*	PRE SLEEP	SLEEP		POST SLEEP
		MS2 FOREMAN	EV2	⊕	PRE SLEEP	SLEEP		POST SLEEP
		MS3 DOI			PRE SLEEP	CDM 4 OPS SLEEP		POST SLEEP
		MS4 LINNEHAN		♦	PRE SLEEP	SLEEP		POST SLEEP
D N	FE-2 EYHARTS	PW S S R O P T E R I D O P K M W		PRE SLEEP-ISS	SLEEP (8.5)		POST SLEEP	
E X P	ISS CDR WHITSON		* BSA INIT	PRE SLEEP-ISS	SLEEP (8.5)		POST SLEEP	
	FE-1 MALENCHENKO	PREP WORK		PRE SLEEP-ISS	SLEEP (8.5)		POST SLEEP	
U P	FE-2 EXP16 REISMAN	PW S S R O P T E R I D O P K M W		PRE SLEEP-ISS	SLEEP (8.5)		POST SLEEP	
S T S	DAY/NIGHT	[Bar chart showing day/night cycle]						
	ORBIT	159 160 161 162 163 164 165 166 167						
	TDRS	W -171 E -46 Z -275						
	ORB ATT	*POST EVA W/H2O,METOX *20 PUMP OFF ⊕POST EVA W/H2O,METOX ♦POST EVA W/H2O,METOX #HUM SEP CHECK						
	NOTES	2-40 BIAS -XLV -ZVV FLT PLN/123/FLIGHT						

GMT 03/21/08 (081)

MET $\beta=50$ Day 010



S T S - 1 2 3	FD12 CDR GORIE	POST SLEEP		STBD WING SRVY	H/O	MNVR SRVY MEAL	H/O	NOSE CAP SRVY	PORT WING SURVEY	H/O	MNVR TEA	H/O	LDRI DNLK	EVA 5 PROC RVW	PMCA P R L E E P					
	PLT JOHNSON	POST SLEEP		STBD WING SRVY		MEAL	L I O H	NOSE CAP SRVY	PORT WING SURVEY	M S C I U * 2		I M P W R F I L L #3	PRE SLEEP	EVA 5 PROC RVW	LDRI DNLK					
	MS1 BEHNKEN	POST SLEEP	X U P F E D R T	X F E R O P S	EXERCISE	X F E R O P S	L D N R L I K	O B S S K A U A S S Y	E R M L U C T	B M I A E N T T O T / X L		MEAL	EVA5 TOOL CONFG E_LK PREP	PRE SLEEP	EVA 5 PROC RVW	PRE SLEEP				
	MS2 FOREMAN	POST SLEEP	P/TV 06 S/U	POST SLEEP	PWR FILL #2	EXERCISE		O B S S K A U A S S Y	E R M L U C T	B M I A E N T T O T / X L		MEAL	G A P - A	EVA5 TOOL CONFG E_LK PREP	PRE SLEEP	EVA 5 PROC RVW	PRE SLEEP			
	MS3 DOI	POST SLEEP			STBD WING SRVY		MEAL		NOSE CAP SRVY	PORT WING SURVEY	C D M B A T T C H O U T	J L P C K	X F E R O P S	X T I X B F A F R E G E I R U R E P	PRE SLEEP	EVA 5 PROC RVW	PRE SLEEP			
	MS4 LINNEHAN	POST SLEEP	EVA PROC DELTA	EXERCISE		X F E R O P S		B S A - T	X F E R O P S	MEAL		X F E R O P S	P/TV 08 S/U	P T V 0 8 E X T S R V Y	PRE SLEEP	EVA 5 PROC RVW	PRE SLEEP			
D N	FE-2 EYHARTS	POST SLEEP	PREP WORK	OFF DUTY	HANDOVER		OFF DUTY	TVIS	RED		MEAL	C A P *	F S L M I L B U S J M P T R B L	F S L L A N R E P A I R	P H S W / B L D S /	PREP WORK	EVA 5 PROC RVW	PRE SLEEP I S S		
	ISS CDR WHITSON	POST SLEEP	PREP WORK	DCS	RED		EXPR3-RK-TRANSFER				MEAL		E R 3 U M B M A T E	EXERCISE CEVIS	D C S	R C N F G	P W R O P E R P K	EVA 5 PROC RVW	PRE SLEEP I S S	
E X P	FE-1 MALENCHENKO	POST SLEEP	PREP WORK	TEX-20 EXP INIT	TEX-20-EXP	T E X *	TEX-20 D/L	T O E F X 2 0	TVIS	I W I S		VELO	MEAL	I M P N T - 1	COX	OFF DUTY	PREP WORK	EVA 5 PROC RVW	PRE SLEEP I S S	
	FE-2 EXP16 REISMAN	POST SLEEP	PREP WORK	DCS	PIP PIN RTRVL	HANDOVER	A 1 *		EXPR3-RK-TRANSFER		MEAL		E R 3 U M B M A T E	RED	E X E R C I S E	PREP WORK	EVA 5 PROC RVW	PRE SLEEP I S S		
S T S	DAY/NIGHT	[Bar chart showing day/night cycle]																		
	ORBIT	[Bar chart showing orbit parameters]																		
	TDRS	W -171	[Bar chart showing TDRS parameters]																	
	E -46	[Bar chart showing TDRS parameters]																		
	Z -275	[Bar chart showing TDRS parameters]																		

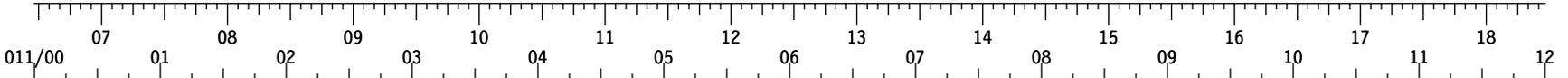
Page 4

ORB ATT BIAS -XLV -ZVV *20 EXP DSCNCT *CVR RMV BIAS -XLV +ZVV (svy) *RMVL *FILTER CK BIAS -XLV -ZVV *HTR RCNFG *PRE SLEEP

NOTES

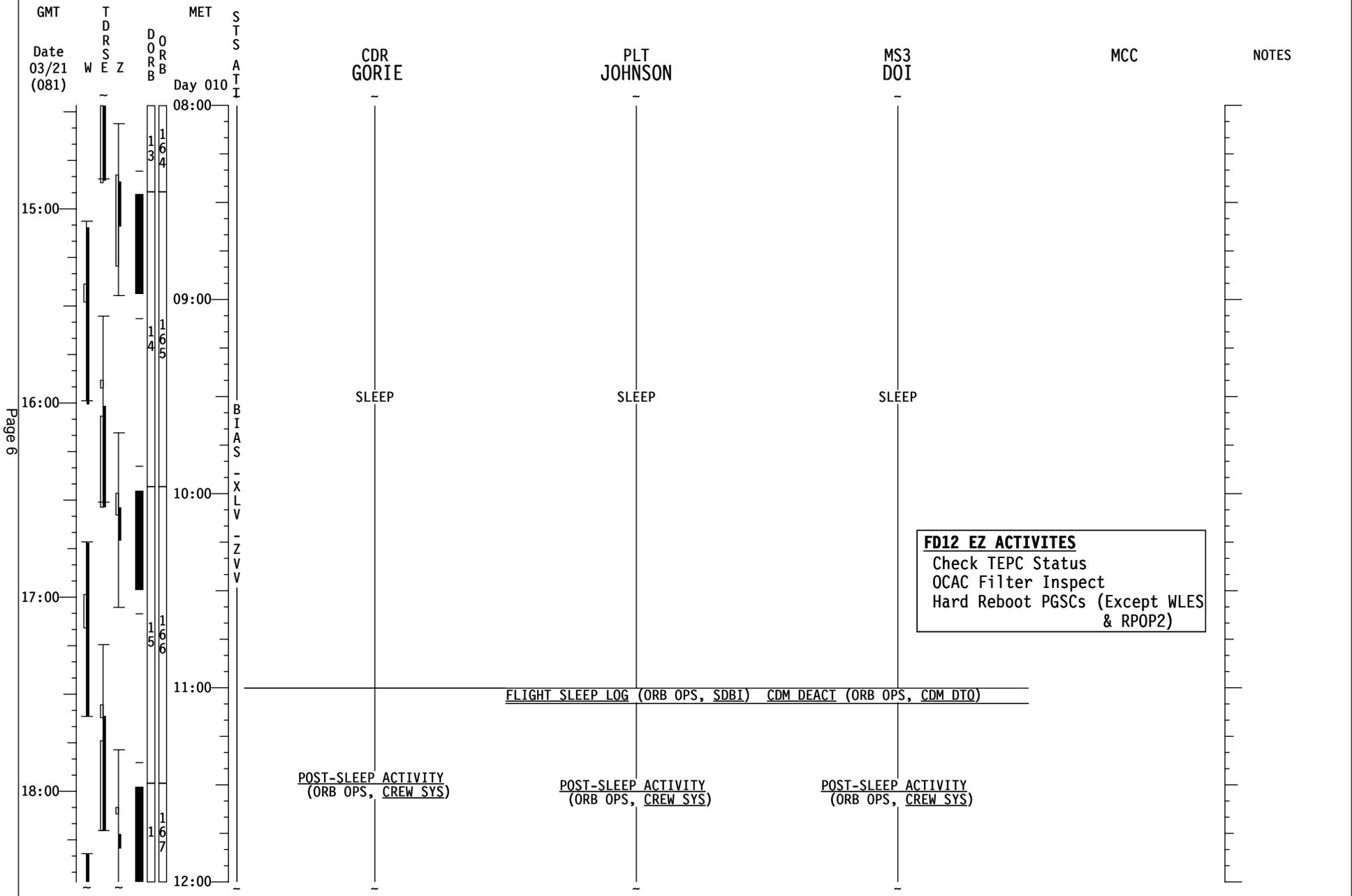
GMT 03/22/08 (082)

MET β=51 Day 011

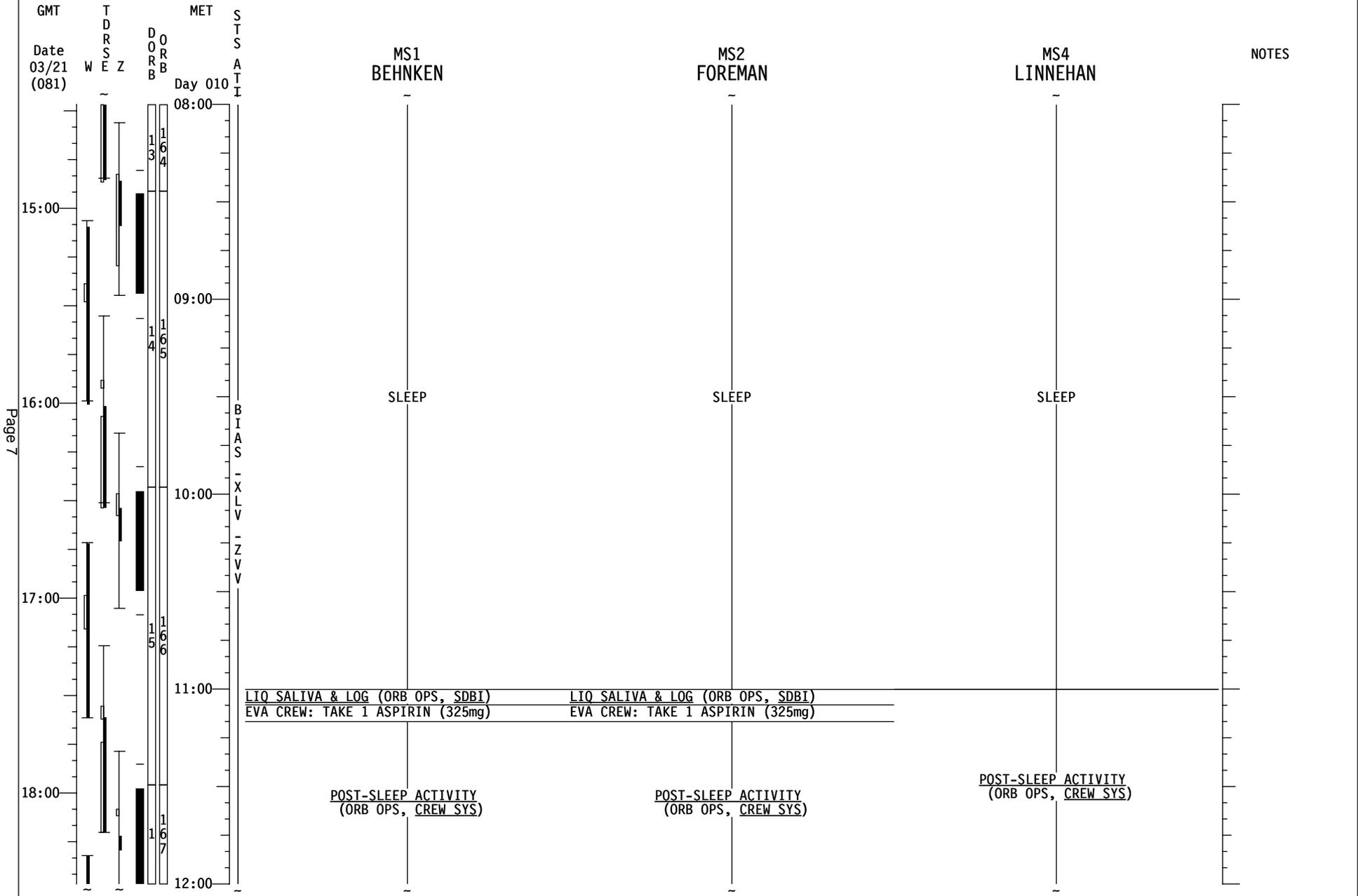


S T S - 1 2 3	FD12 CDR GORIE	PRE SLEEP	SLEEP				FD13	POST SLEEP	PMC A/G	POST SLEEP	
	PLT JOHNSON	PRE SLEEP	SLEEP				S L E E P	POST SLEEP			
	MS1 BEHNKEN	EV1 P S R L E E P M A S K P B/ T O O L C O N F I G	PRE SLEEP	SLEEP				POST SLEEP	HYG BRK/ PREBREATHE	*	
	MS2 FOREMAN	EV2 P S R L E E P M A S K P B/ T O O L C O N F I G	PRE SLEEP	SLEEP				POST SLEEP	A/L R E P 10.2 D P R S	⊕	
	MS3 DOI	PRE SLEEP	SLEEP				POST SLEEP				
	MS4 LINNEHAN	PRE SLEEP	SLEEP				POST SLEEP	HYG BRK/ HATCH CLS	♦		
D N	FE-2 EYHARTS	PRE SLEEP ISS	SLEEP (8.5)				PCBA S U B J	POST SLEEP	PREP W O R K		
E X P	ISS_CDR WHITSON	PRE SLEEP ISS	SLEEP (8.5)				POST SLEEP	HYG BRK/ HATCH CLS	♦		
	FE-1 MALENCHENKO	PRE SLEEP ISS	T E X *	SLEEP (8.5)				T E X * P O S T S L E E P	D P C P O S T S L E E P	H A M P D P R E P W O R K	
U P	FE-2 EXP16 REISMAN	PRE SLEEP ISS	SLEEP (8.5)				S A L V	POST SLEEP	PREP W O R K		
S T S	DAY/NIGHT ORBIT										
	TDRS	W -171									
		E -46									
	Z -275										
	ORB ATT	<p>*20 PUMP OFF</p> <p>BIAS -XLV -ZVV</p> <p>*20 PUMP ON</p>									
	NOTES	<p>2-44</p> <p>FLT PLN/123/FLIGHT</p>									

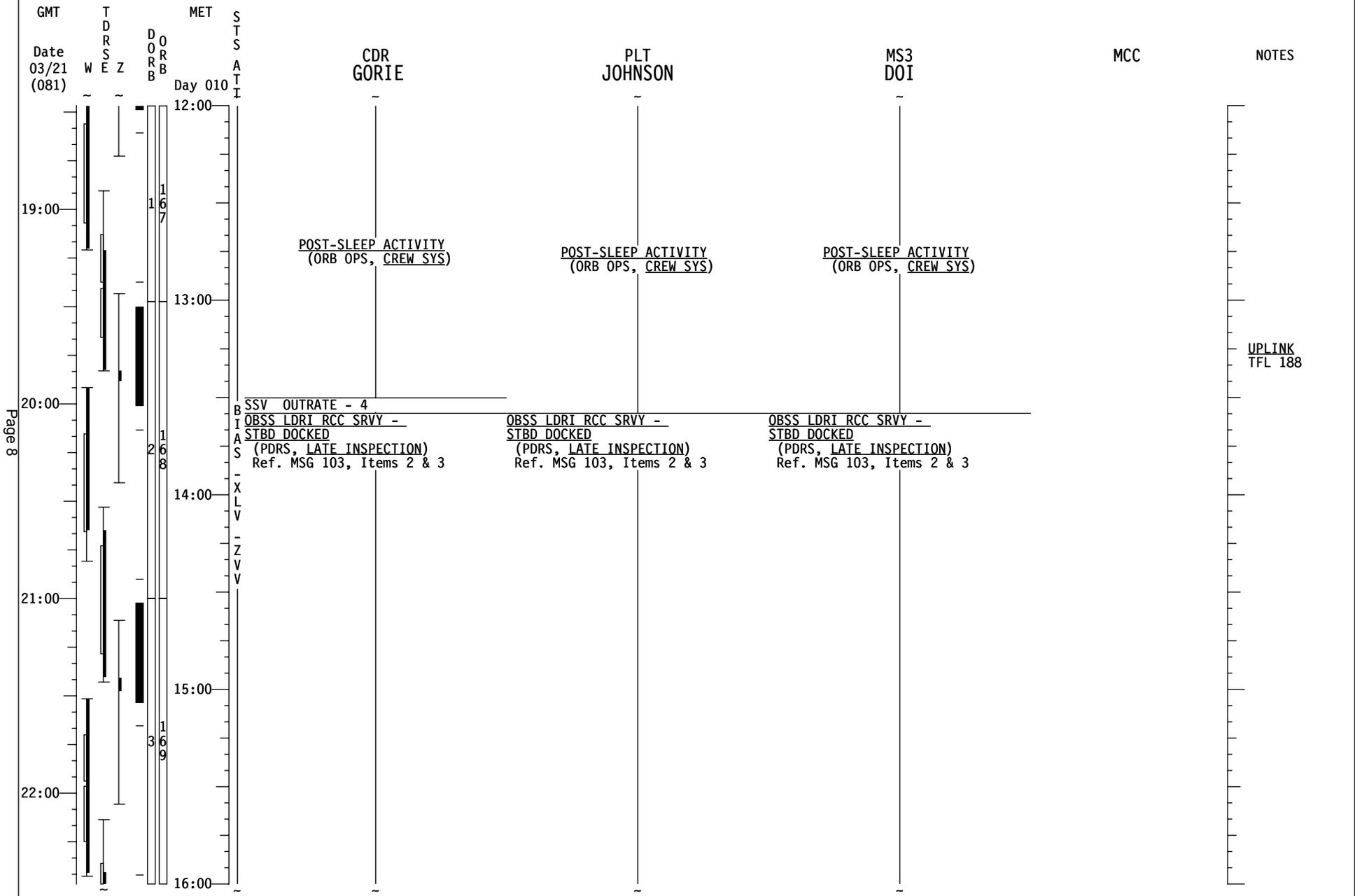
STS-123 (FD11)



STS-123 (FD11)

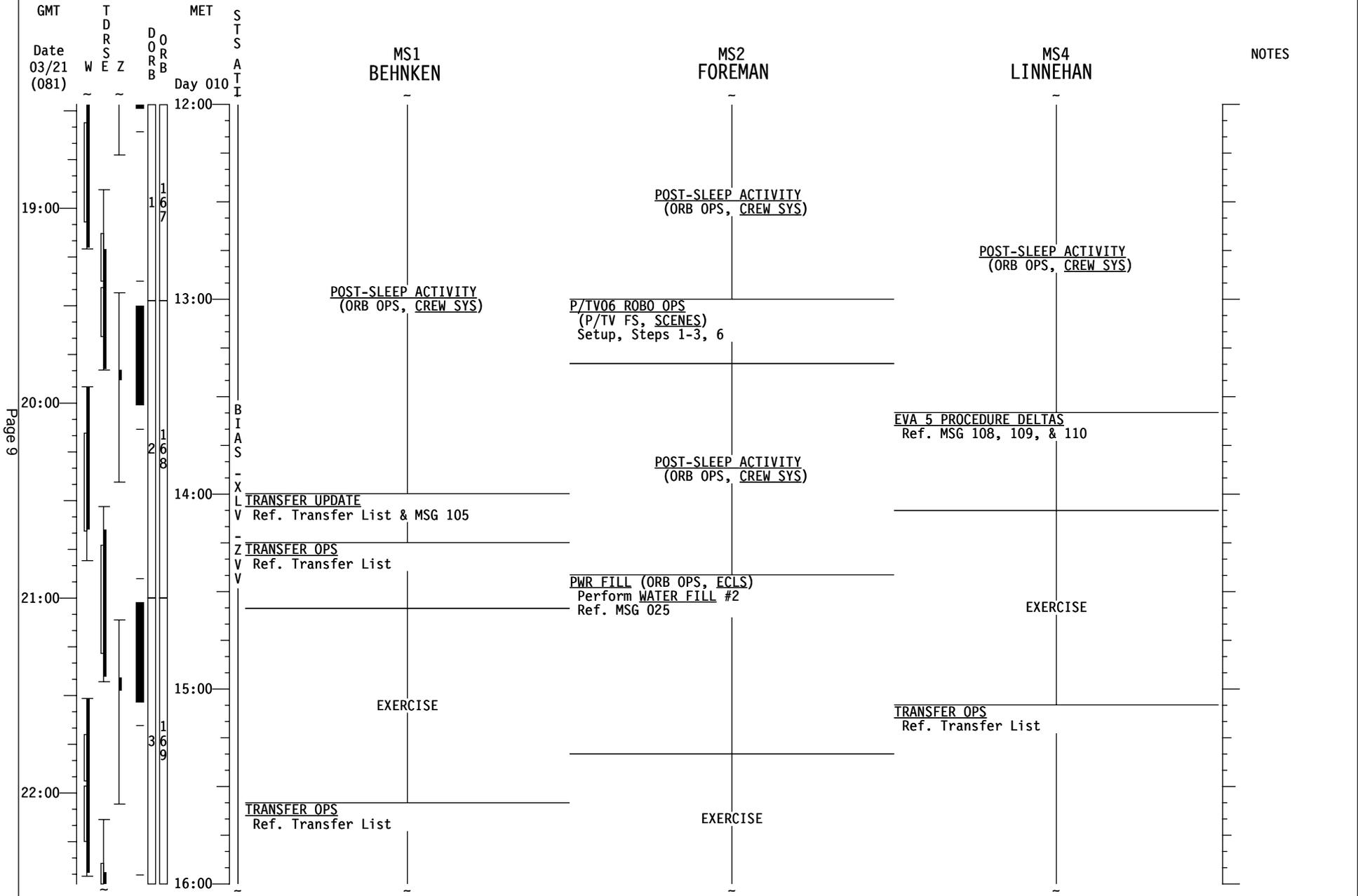


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STS-123 (FD12)



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STS-123 (FD12)

GMT	T D R S E Z	MET	S T S	MS1	MS2	MS4	NOTES
Date	W	Day	A T I	BEHNKEN	FOREMAN	LINNEHAN	
03/21 (081)		010					
16:00				TRANSFER OPS Ref. Transfer List PLAYBACK (DIGITAL) (P/TV FS, CUE CARD) LDRI OBSS SURVEYS KU TDRE (15:54-16:18)	EXERCISE	TRANSFER OPS Ref. Transfer List	
23:00				OBSS KA AVIONICS BOX SETUP & TRANSFER (EVA, TOOLS & STOWAGE) Ref. Transfer List: Item 38	OBSS KA AVIONICS BOX SETUP & TRANSFER (EVA, TOOLS & STOWAGE) Ref. Transfer List: Item 38		
17:00						EVA SYS: 1.605 BSA BATTERY RECHARGE (Term)	
00:00				EMU RELOCATE Swap EMUs between EDDAs	EMU RELOCATE Swap EMUs between EDDAs	TRANSFER OPS Ref. Transfer List	
01:00				EVA SYS: 1.515 EMU METOX/LIOH/ BATTERY REPLACEMENT REF: STS-123 CONSUMABLE TRACKING CC (EVA)	EVA SYS: 1.515 EMU METOX/LIOH/ BATTERY REPLACEMENT REF: STS-123 CONSUMABLE TRACKING CC (EVA)		
18:00				MEAL	MEAL	MEAL	
19:00					GAP ACTIVATION (GAPs 8,9,10,11) (ASSY OPS, GAP) PRE EVA 5 TOOL CONFIG Ref. MSGs 108 & 109	TRANSFER OPS Ref. Transfer List	
02:00							
20:00							

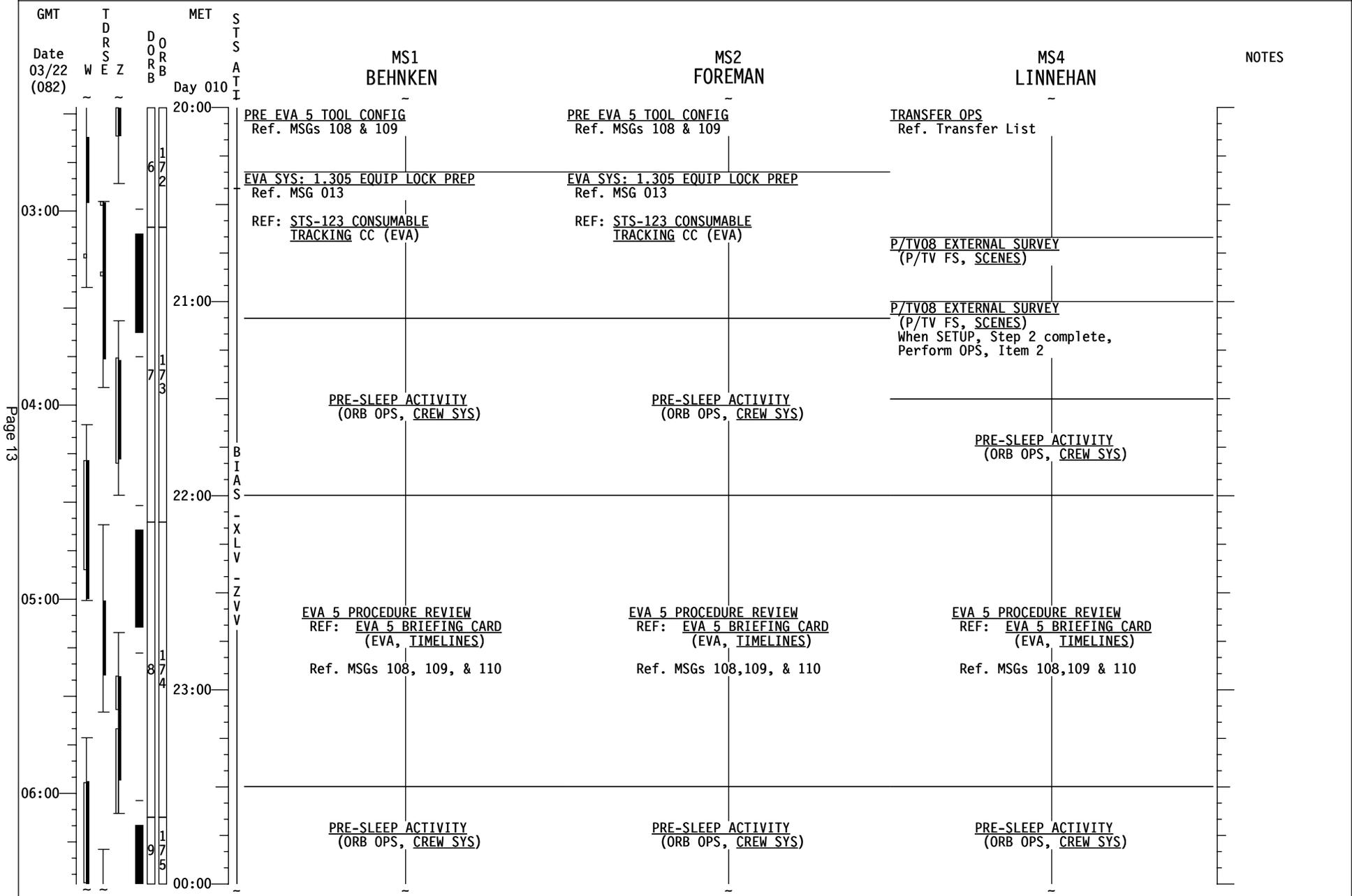
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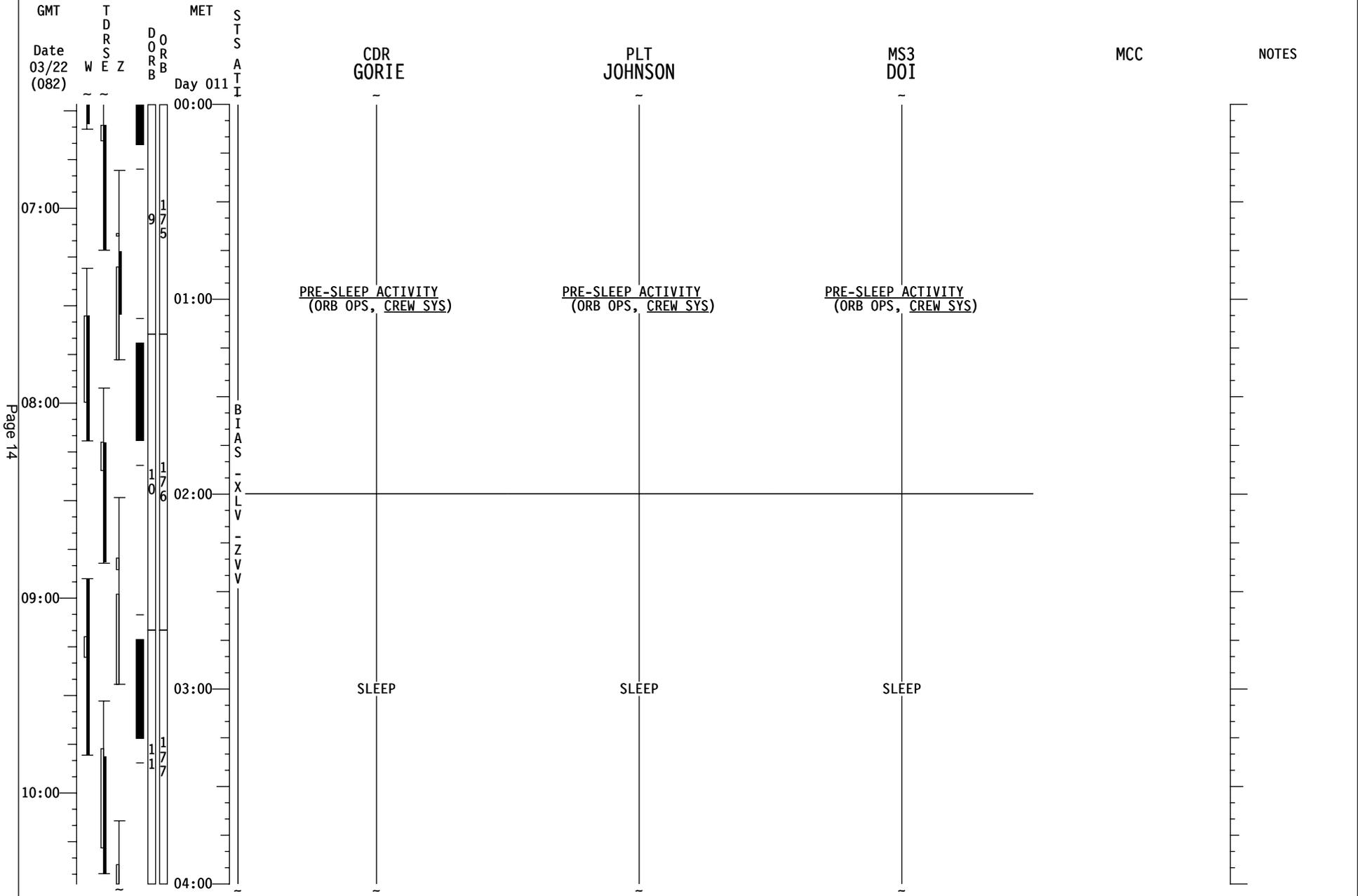
GMT	T D R S E Z	MET	S T S	CDR	PLT	MS3	MCC	NOTES
Date	W E Z	Day	010	GORIE	JOHNSON	DOI		
03/22 (082)		Day 010						
20:00				OBSS LDRI RCC SRVY - PORT (PDRS, LATE INSPECTION) Ref. MSG 103, Item 2 & 3 JOINT OPS: 3.110 H/O ATT CONTROL CMG TA to ORB	OBSS LDRI RCC SRVY - PORT (PDRS, LATE INSPECTION) Ref. MSG 103, Item 2 & 3 L17 Check MCIU filter screen	OBSS LDRI RCC SRVY - PORT (PDRS, LATE INSPECTION) Ref. MSG 103, Item 2 & 3 CDM SETUP & BATT CH OUT (ORB OPS, CDM DTO) Attach CDM in Location 5		UPLINK TFL 184
03:00				MNVR (TRK) TEA TG=2 BV=5 P=162 Y=355 OM=177 A/AUTO/VERN Init TRK	SSV OUTFATE - 2	ASSY OPS: 2.102 JLP HCTL STATUS & SHELL TEMP PERIODIC MONITOR - MKAM REF. MSG 031 & 041		
21:00				JOINT OPS: 3.111 H/O ATT CONTROL ORB to CMG TA	IMU STAR OF OPPTY ALIGN (ORB OPS) PWR FILL (ORB OPS, ECLS) Perform WATER FILL #3 Ref. MSG 025	TRANSFER OPS Ref. Transfer List		
04:00				A KU TDRW (23:29-23:59) Omit VLHS item in Step 1 Omit Step 3 Use A/G2 for Audio and KFX PGSC		TRANSFER TAGUP Coordinate with transfer counterpart		
22:00				PLAYBACK (DIGITAL) A (P/TV FS, CUE CARD) S LDRI OBSS SURVEYS KU TDRW (21:50-22:23)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)		
05:00					RCS/OMS HEATER RCNFG A14 RCS/OMS HTR R POD B - OFF A - AUTO			
23:00				EVA 5 PROCEDURE REVIEW REF: EVA 5 BRIEFING CARD (EVA, TIMELINES) Ref. MSGs 108, 109, & 110	EVA 5 PROCEDURE REVIEW REF: EVA 5 BRIEFING CARD (EVA, TIMELINES) Ref. MSGs 108, 109, & 110	EVA 5 PROCEDURE REVIEW REF: EVA 5 BRIEFING CARD (EVA, TIMELINES) Ref. MSGs 108, 109, & 110		
06:00				NETMEETING VIDEO CONFERENCING (ORB OPS, PGSC) Private Medical Conference A	PLAYBACK (DIGITAL) (P/TV FS, CUE CARD) LDRI OBSS SURVEYS KU TDRW (23:29-23:59)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)		OCA-PMC
00:00				PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)			

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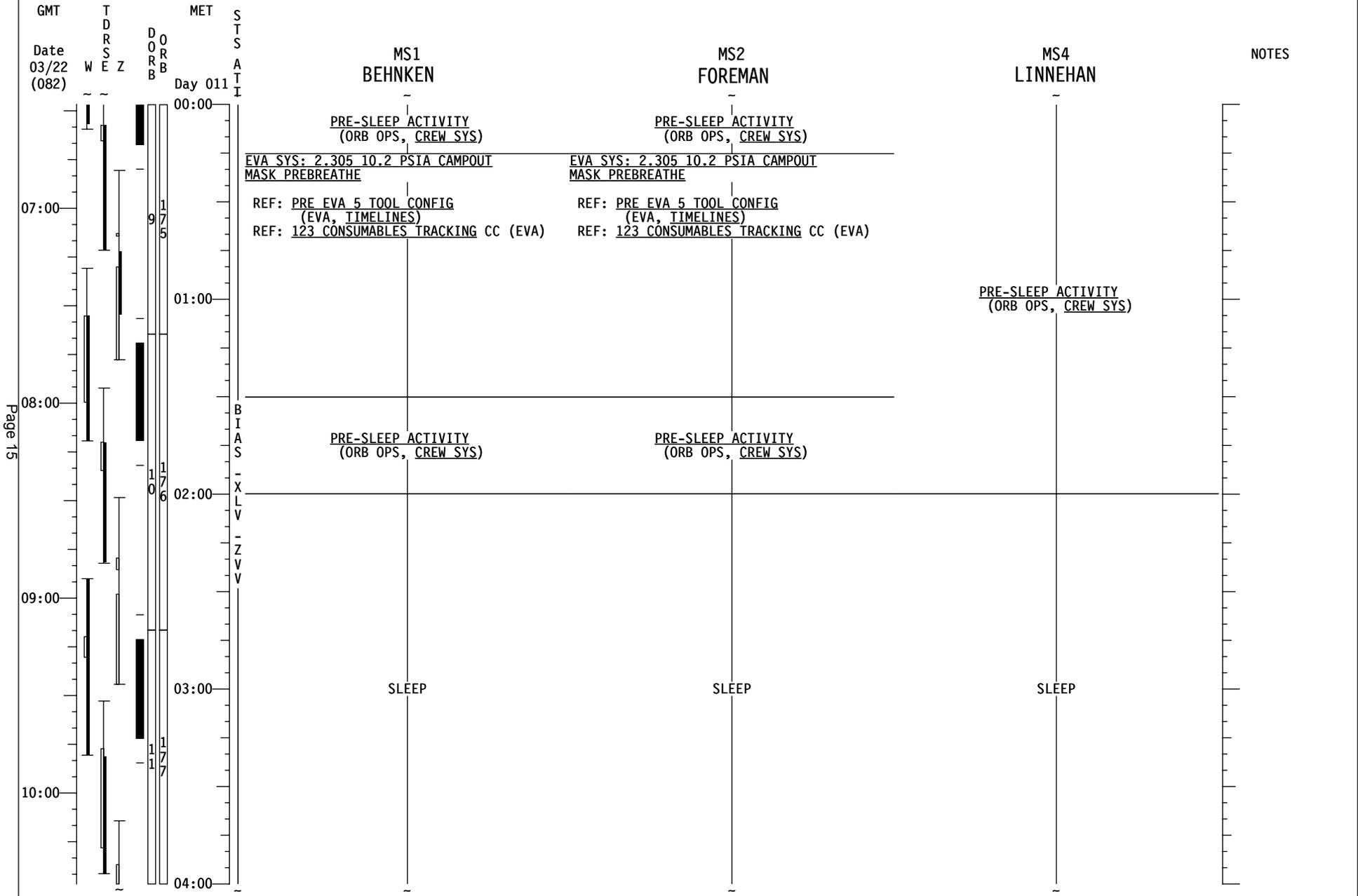
STS-123 (FD12)



STS-123 (FD12)



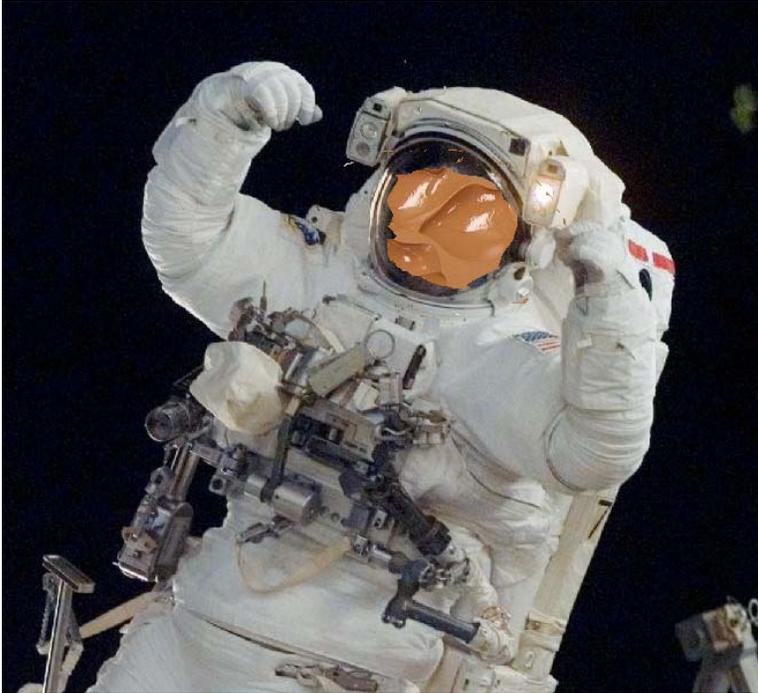
STS-123 (FD12)



MSG 104A - FD12 MISSION SUMMARY

1 Well we're just ecstatic about the success we had with the T-RAD DTO from yesterday. It's
2 kicked off a lot of brainstorming about potential spinoff applications. We may have some
3 follow-on testing, with your left-over STA-54, as a get ahead on tomorrow's EVA (See
4 illustration below). We'll let you flip for who is tester and who is subject.

5
6 Survey and EXPRESS Rack transfer on the dance card for today -- Git'r done!
7



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YOUR CURRENT ORBIT IS: 186 X 181 NM

NOTAMS:

- EDW – LAKEBED RUNWAYS RED.
- NOR – LAKEBED RUNWAYS GREEN.
- HAW – RWY 31 CLOSED. RWY 13 TODA 8,994'.
- WAK – CLOSED. NOT USABLE.
- IKF – NO AGREEMENT. NOT USABLE.
- BEN – POLITICALLY NOT RECOMMENDED/NOT SUPPORTED.
- ZZA – FIRST 600M (~2,000') OF RWY 30L NOT AVAILABLE. 10,200' REMAINING.
- GUA - RWY 06L BARRIER UP 1565' FROM THRESHOLD.
RWY 24R BARRIER UP 1785' FROM THRESHOLD
- BEJ – CLOSED.
- FMI – CLOSED.
- JDG – CLOSED.
- NKT – CLOSED.

MSG 104A - FD12 MISSION SUMMARY

1 NEXT 2 PLS OPPORTUNITIES:

2
3 EDW22 ORB 173 – 10/21:29 (SKC 250/06P11)
4 EDW22 ORB 188 – 11/20:17 (SKC 270/04P06)

5
6
7 OMS TANK FAIL CAPABILITY:

8
9 L OMS FAIL: NO R OMS FAIL: NO

10
11 LEAKING OMS PRPLT BURN:

12
13 L OMS LEAK: ALWAYS BURN RETROGRADE
14 R OMS LEAK: ALWAYS BURN RETROGRADE

15
16 OMS QUANTITIES(%)

17
18 L OMS OX = 34.7 R OMS OX = 33.8
19 FU = 34.3 FU = 33.6

20
21 SUBTRACT I'CNCT COUNTER FOR CURRENT OMS QUANTITIES

22
23 DELTA V AVAILABLE:

24
25 OMS 335 FPS
26 ARCS (TOTAL ABOVE QTY 1) 42 FPS
27 TOTAL IN THE AFT 377 FPS

28
29 ARCS (TOTAL ABOVE QTY 2) 75 FPS
30 FRCS (ABOVE QTY 1) 15 FPS

31
32 AFT QTY 1 76 %
33 AFT QTY 2 38 %

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37
38 THERE ARE NO FAILURE/IMPACT/WORK AROUNDS FOR TODAY.
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MSG 105 (16-1405) - FD12 TRANSFER MESSAGE

Page 1 of 2

1 Greetings Takao and Bob!

2 Additional Return Items

- 3 • Item 904 (ESA MEDIA KIT) and Item 905 (ERB Hard Disk): Used items are ready
4 for transfer per Leo's discretion.
5

6 Q & A

7 Answers:

- 8 1. Item 611 (Returning A31p LAPTOP): You stowed item 611 in the LW MAR and
9 asked if there is enough room to stow 1 additional laptop there. Per the current
10 laptop plan, all of the laptop slots in the LW MAR will be filled. This is because the
11 STS-7 / WLES laptop (Item 802) will be transferred FD15, which makes room for
12 item 611 and the remaining PGSCs on the Shuttle.
13
- 14 2. 5MLE Bag Layouts: We will uplink the remaining return layouts tomorrow for Bags
15 F, C, and I (Ext A/L Floor Bag). We will also uplink a revision to Bag E with the
16 addition of Item 900 (Bacteria Filters).
17

18
19 For STS, the Transfer List Excel file, FD12_TransferList_STS123.xls, is located on the KFX
20 machine in **C:\OCA-up\transfer**.

21
22 For ISS, the Transfer List Excel file, FD12_TransferList_STS123.xls, is located in
23 **K:\OCA-up\transfer**.

24 Choreography

- 25 – Item 720 (Bob): Transfer RPCM removed during EVA 4 to STS for return.
- 26 – Transfer the following return items:
 - 27 – Return Bag 603: Ready for transfer
 - 28 – Return Item 607 [BRIEF/ WAIST ASSEMBLY]: Ready for transfer
 - 29 – Item 701 [CDMK]: Please confirm transferred FD05 after JLP ingress.
 - 30 – Item 712 [GSC]: Please confirm transferred FD05 after JLP ingress.
 - 31 – Item 900 [Bacteria Filter]: Ready for transfer

32 Crewmembers Scheduled for Generic Xfer Ops

- 33 • Bob – 0:50
- 34 • Doi-san – 0:45
- 35 • Linnehan – 4:20

36 Please update the Transfer List as follows:

37 In **RETURN** tab,

38 Make Pen and Ink change to Return Page 12:

39 Item 721: In PROCEDURES/Constraints/ **Comments column, strikethrough "~~On~~
40 ~~hatch closure day~~" and after "activities" add "on FD14 per IMMN-1JA SALIVA-XFER"

41 Replace Return Page 14

42 Please call us with questions.

43 - The Transfer Team

44
45
46
47
48
49
50

STS-123/1JA Return Transfer List

CHNG	<input checked="" type="checkbox"/>	FD	Initials	Item #	Item Name	Qty	Initial Stowage	Temp Stowage	Stowage at Undock	Wt (lbs)	PROCEDURES/Constraints/ **Comments
Return Realtime Additions											
				900	Bacteria Filter [s/n's 0100 & 0132]	2	NOD2O5_D		MD FLOOR PORT 2 (Bag E)	8.94	**Stow on top of CTBs and in the center of the 5MLE bag.
	<input checked="" type="checkbox"/>	11		901	Broken Protective Cap [Electrical Plug] [From JLP Bulkhead Connector J7081]	1 Ziplock	NOD2D2 (in ziplock, in 1.0 CTB, s/n 1260 VOK CTB)		MD FLOOR STBD 1 (Bag C)	0.11	**Remove broken cap pieces (5) from ziplock in VOK CTB. Reference the Transfer Book, REFERENCE tab, page REF-4 for instruction on which caps to remove. Stow broken cap pieces (5) in another ziplock for return. **Stow in foam cut out where OHTs launched. Ref picture decal on 5MLE bag for launch location of OHTs.
				902	Return Ziplock Bag with ITCS Fluid Sample [Columbus sample]	1	Columbus		MF14E	0.18	**Sample taken FD13 per TCS-FLUID-SMPL.
	<input checked="" type="checkbox"/>	11		903	180mm EVA Lens [with lens sleeve assembly] [s/n 1002]	1	LAB1D3		MA9L	1.9	**Verify lens sleeve assembly is installed on lens.
X				<u>904</u>	<u>ESA MEDIA KIT</u> <u>[b/c 00001151E]</u>	1	<u>in-use by Leo</u>		<u>MF43K</u>	<u>1.39</u>	Return only used items in this kit. <u>**Leo is preparing this kit for return.</u>
X				<u>905</u>	<u>ERB Hard Disk</u> <u>[b/c 00039962R and 00039963R]</u>	<u>up to 2</u>	<u>in-use by Leo</u>		<u>MF43K</u>	<u>0.44</u>	Return only used ERB Hard Disks. <u>**Ask Leo which ones are used.</u> <u>**RECORD quantity transferred: _____</u> <u>Report to MCC.</u>

16-1402 (MSG 108) – FD12 EVA Deltas
Page 1 of 2

1 Rick, Mike and Bob,

2 Four down, one to go! Great job on yesterday's EVA. You have really made the TPS
3 Repair Team ecstatic with how well you performed the DTO. As you know the EVA 5
4 timeline has been changed to accommodate the MISSE 6 install task. A summary of
5 all changes is outlined below.

6
7 1) We have uplinked a Briefing Package 16-1404 (MSG110) and the final EVA 5
8 procedures 16-1403 (MSG109). The procedures have been printed onboard; we did
9 not uplink the task data pages since there was no change.

- 10 ➤ In the Final EVA Procedures, all changes are highlighted in **yellow**,
- 11 except on the Notes, Cautions & Warnings page the changed item is
- 12 highlighted in **green**.
- 13 ➤ FYI – Remove pages 7-142 through 7-164 from the bound FDF book
- 14 to be replaced by the onboard printed version.

15
16 2) Rick – we have added time in the morning for you to incorporate these new
17 procedures into your checklist; activity titled "EVA PROC DELTAS" and you will have
18 an additional 30 min during your procedure review

19
20 3) Mike and Bob – you will have an additional 30 min each during the procedure
21 review and 15 min each during tool config. The extra tool config time is to prep the
22 CBM PIP pins (pg 4 of the Briefing Package).

23
24 4) Mike and Bob – during tool config we would like you to practice using the Long
25 Duration Tie Down Tethers (LDTDT) since this is not a commonly used tool nor is it
26 user friendly.

27
28 5) There have been changes to the Metox Regen plan. As you know, the Metox
29 Regen was deleted Post EVA 4 and it will also be deleted Post EVA 5. Please,
30 make the following pen and ink changes to the **STS-123 Consumables Tracking**
31 **Cue Card:**

- 32 a. Post EVA 4, line out "Regen Metox 0015, 0016"
- 33 b. For Pre-EVA 5 Campout, replace Metox s/n "0015, 0016" with "0017, 0019"
- 34 c. For Post EVA 5, line out "Regen Metox 0012, 0013"
- 35 d. For FD 15, line out "Regen Metox 0020, 0021"

36
37
38 6) EVA 4 EMU Gloves and Overgloves:

39 **Overgloves:** The EMU Overgloves you used for EVA 4 have been cleared
40 for use on EVA5.

41
42 **Bob:** The EMU Glove Team has taken a look at the photos you sent down
43 and we seem to be missing the photos of your right hand thumb. When you
44 get a chance, please take some photos for us. We will need to see those
45 before we can clear your prime right glove for EVA 5. Your prime left glove
46 has been cleared for use.

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Mike: We have all the photos of your gloves but the EMU Glove team has an area of concern that they would like to take a closer look at. We would like to get 3 or 4 additional close-up photos of the area outlined in the photo below. Try and pinch the seam when you snap the photos. We need these photos before we can clear your backup right glove. Your backup left glove has already been cleared for use. We are trying to keep from having you go to contingency backup gloves. We want those in reserve for any return contingencies. Please let us know when all the photos are ready for downlink.



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STS-123 (1JA) EVA 5 TIMELINE

TIME (HR : MIN)	IV/SSRMS	1JA EVA 5 EV1 – Be (FF)	EV2 – Fm (FF)
00:00		POST DEPRESS (00:05) A/L EGRESS AND SETUP (00:40)	POST DEPRESS (00:05) A/L EGRESS AND SETUP (00:40)
01:00	<ul style="list-style-type: none"> SRMS ungrapple OBSS 	OBSS KEEP-ALIVE UMBILICAL INSTALL (01:35) <ul style="list-style-type: none"> Install Stanchion/avionics box 	OBSS KEEP-ALIVE UMBILICAL INSTALL (01:35) <ul style="list-style-type: none"> APFR setup Install Stanchion/avionics box Mate W22/W23 connectors to A114 Monitor OBSS clearance Mate W21 connectors to avionics box
02:00	<ul style="list-style-type: none"> SSRMS mnvr to UMBILICAL INSTALL SSRMS mnvr to PITCH posn Power up OBSS KA SSRMS: MNVR TO EVA HANDOFF posn SSRMS: SEMI-MANUAL RELEASE 	<ul style="list-style-type: none"> Install KAD Install P411 connector Verify P411 connector illuminated 	
03:00		OBSS STOW (01:15) <ul style="list-style-type: none"> Capture OBSS inboard striker bar Route W21 harness OBSS stow cleanup 	OBSS STOW (01:15) <ul style="list-style-type: none"> Capture OBSS outboard striker bar Install OBSS cover OBSS stow cleanup
04:00		MISSE 6 PEC INSTALL/DEPLOY (02:10) <ul style="list-style-type: none"> Retrieve MISSE 6 tools from A/L Tether swap to Node 2 endcone Retrieve bent PEC (fwd) Install bent PEC on LWAPA (stbd) Retrieve straight PEC (aft) Install straight PEC on LWAPA (port) Mate connectors Deploy PECs Photograph PECs Tether swap 	STBD SARJ INSPECTION (02:10) <ul style="list-style-type: none"> Datum-A "divot" inspection (cover 18) Single Cover Inspection (cover 16) Single Cover Inspection (cover 6) Single Cover Inspection (cover 8) Single Cover Inspections (9 & 11)
05:00			
06:00		CLEANUP AND INGRESS (00:40)	CLEANUP AND INGRESS (00:40)
		PRE REPRESS (00:05)	PRE REPRESS (00:05)

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PRE EVA 5 TOOL CONFIG

Page 23

EV1

- MWS
- BRT (L)
- RET (eq-eq)
- Wire Tie (3, 2 with 1 loop flattened)
- T-Bar
- RET (eq-eq)
- RET (eq-eq) w/PIP pin
- Adj Equip Tether (2)
- Wire Tie (2)
- ISS Small Trash Bag
- Swing Arm (R)
- PGT [B3 18.4ft-lb, CAL, MTL 30.5] s/n _____
- PGT Battery s/n _____
- 7/16 (wobble) socket-6 ext
- RET (eq-eq)
- Waist Tether (2)
- D-ring Extender (2)
- Safety Tether (85 ft)
- SAFER
- WVS
- Overgloves (2) donned

EV2

- MWS
- BRT (L)
- RET (eq-eq)
- Wire Tie
- T-Bar
- RETs (eq-eq)
- RET (eq-eq) w/PIP pin
- Adj Equip Tether
- Wire Tie (2)
- 760 digital camera and mount (tie wrapped)
- ISS Small Trash Bag
- Adj Eq Tether (clove-hitched, hooks in bag)
- Swing Arm (R)
- RET (eq-eq)
- Waist Tether (2) (L – D-ring, R – extender)
- D-ring Extender (2)
- Safety Tether (85 ft)
- SAFER
- WVS
- Overgloves (2) donned

Tether Count

RET (eq-eq) – 15 (+1 outside) RET (eq-eq) w/PIP Pin – 3
RET (lg-eq) – 6 Adj Eq Tether – 14

AIRLOCK CONFIG

- Staging Bag
- Fuse Tether
- PGT
- PGT Battery
- Wire Tie Caddy
- RAD
- Connector Cleaner Tool Kit
- Probe
- Prybar
- Connector Pin Straightener
- Velcro/Tape Caddy
- RET (eq-eq) (2) – to fuse tether strap
- GP Cutters (-303 version)
- RET (Lg-eq) (2) – to fuse tether strap
- Ratchet Wrench w/palm wheel (2) (s/n 1011,1012)
- LDTD Tether
- IV Bag
- Towels (2)
- Contamination Detection Kit
- GP Caddy (2)
- Adj Thermal Mittens (2)
- Socket Caddy (hatch cont) w/RET (eq-eq)
- 1/2 Socket-8 ext
- 7/16 (wobble) Socket-6 ext (spare)
- DCM Plug (SAFER Hardmount) (2)
- Large ORU Bag**
- OBSS stanchion/avionics box
- W22/W23 (1 tie-down strap, in clamp)
- RET (eq-eq) (2) (for caps)
- W21 (in TA clamp, strapped to box HH)
- Tie-down straps (6 short, 2 long) (on W21)
- Velcro strap from caddy below TA clamp
- KAD (J225->P225, J226->P226, in TA clamps)
- Adj Equip Tether
- P411 connector (tether to T-handle)
- RET (eq-eq)
- OBSS thermal cover
- RET (eq-eq)
- RET (eq-eq)
- Adj Eq Tether (on RET for overgloves)
- RET (eq-eq) (outside of bag)
- Adj Eq Tether (outside of bag)
- RET (lg-eq) (outside of bag)

AIRLOCK CONFIG (Cont)

EVA Crewlock Bag #4

- Kapton tape strips on door (8)
- Adj Eq Tether (clove hitched to int tether point)
- EVA Wipes (2)
- Inspection mirror
- EVA Wipes (2)
- Digital camera w/flash and mount (35 mm lens)
- Adj Eq Tether (securing camera to outside of bag)
- Adj Eq Tether (to secure covers)
- 85-ft safety tether on HH
- RET (lg-eq) (outside of bag)
- (TBAs and 1 RET deleted from original config)

RET (lg-eq)

- PGT [A6 18.4 ft-lb, CAL, MTL 30.5] s/n _____
- PGT Battery s/n _____
- 7-16 (wobble) socket-6 ext

EVA Crewlock Bag #2

- CBM PIP pins with pre-integrated short wire ties (4)
- Adj Eq Tether (clove hitched to int tether point)
- CBM PIP pins (2)
- Adj Eq Tether (clove hitched to int tether point)
- EVA Hammer
- Compound Cutters
- Adj Eq Tether (2)
- LDTD (2)
- RET (eq-eq) (for digital camera)
- 85-ft safety tether on HH

AIRLOCK EXTERIOR – ESP2

- APFR w/ingres aid, WIF 2

Prior to EVA, perform the following hardware inspections:

1. RET cords for fraying
 2. No red line visible on safety and waist tether load
Alleviation straps
 3. Inspect STS trash bags for deformation/damage
 4. Inspect EMU gloves for damage
 5. Check MWS Baseplate for loose screws on toggle levers
- Use Red RETs only**

EVA 5 INHIBIT PAD

Orbiter

TCS
 L12 1. √TCS POWER – OFF

KU-BAND ANTENNA
 MCC-H 1. √KU-BAND Mask – active
 2. √KU-BAND EVA Protect Box – active

RCS
 If EV crew < 27 ft from FRCS:
 IV 1. √DAP: VERN, FREE, LO Z
 O14,15,16 2. √RJDF F1, F2, F3, F4 MANF DRIVER (four) – OFF
 LOGIC (four) – OFF
 MCC-H 3. √Above RCS config
 IV 4. √RCS F – ITEM 1 EXEC (*)
 √JET DES F1U – ITEM 17 (*)
 F3U – ITEM 19 (*)
 F2U – ITEM 21 (*)

S-BAND ANTENNAS

NOTE
 Possible loss of comm when forced LL FWD antenna

 IV If EV crew < 2 ft from S-Band antenna:
 A1R 1. S-BAND FM ANT – XMIT LOWER/RCVR UPPER
 2. √MCC, lower antenna selected
 If no comm, or on MCC GO:
 C3 3. S-BAND PM ANT – LL FWD
 When EVA crewmember at least 2 ft away from all S-Band upper antennas:
 C3 4. S-BAND PM ANT – GPC

Ground

Ground Radar
 MCC-H 1. √TOPO console, ground radar restrictions in place for EVA

USOS

PCU

NOTE
 PCUs may require up to 1 hr warm-up period before they are operational

 MCC-H 1. √PCUs (two) operational in discharge mode and one of the following:
 a. CCS PCU EVA hazard control FDIR enabled
 b. No more than two arrays unshunted and oriented < 105° from the velocity vector
 If one or both PCUs failed:
 2. No more than two arrays unshunted and oriented < 105° from velocity vector

Lab Window (Not Planned)
 IV If EV crew less than 10 ft from window or in window FOV, close window shutter

S-BAND (SASA) ANTENNAS
 MCC-H 1. P1 SASA – Active
 2. S1 SASA – Powered down

STBD TRRJ
 MCC-H 1. √DLA (1) – LOCKED at 0 or 60 deg

FPMU
 MCC-H 1. FPMU power – Off

CP4 – J2, J3
 MCC-H 1. √RPCM s11a-b RPC 1 – Open, close cmd inh
 √RPCM s11a-b RPC 13 – Open, close cmd inh
 2. √RPCM s12b-b RPC 2 – Open, close cmd inh
 √RPCM s12b-b RPC 12 – Open, close cmd inh

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EVA 5 INHIBIT PAD (Cont)

USOS (Cont)

SSPTS

- MCC If EV crew < 2 ft from ungrounded SSPTS connector (not planned):
1. RPCM LA2A3B_D RPC 1 – Open, Close Cmd Inhibit
 2. RPCM Z13B_A RPC 2 – Open, Close Cmd Inhibit
 3. RPCM LA1A4A_D RPC 3 – Open, Close Cmd Inhibit
 4. RPCM Z14B_A RPC 2 – Open, Close Cmd Inhibit

S3 SARJ (Locked at 300 deg)

- MCC
1. √DLA 1(2) – LOCKED
 2. All motor setpoints set to zero
 3. All motors deselected
- OR
4. Both DLAs – LOCKED

- | | | |
|--------|-----|---|
| IV | PWS | 1. √PDU 1,2 Outlet 3 SSPC 1, 2, 3, 4 (four) Pwr – OFF
Verify Current < 0.1 A |
| | | 2. √SSPC 1, 2, 3, 4 (four) Sys Bus Cntl Stat – DISABLED |
| COL1SC | | 3. √PPSB PL DN 1, 2 (two) sw – DISCHARGE |

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RSOS

SM Antennas

- IV
1. GTS – Deactivate
 2. ARISS (Ham Radio) – Deactivate or VHF (144-146 MHz) TX only

NOTES, CAUTIONS, AND WARNINGS

NOTES

1. Bolt install: report torque and turns
2. Bolt release: report torque and turns if different from published range
3. EVA connectors: after disconnection and prior to connection; verify pin and EMI band integrity; verify connector free of FOD
4. Inspect QDs for damage prior to mating
5. Toolbox doors must be closed with one latch per door when EV crew not in immediate vicinity
6. Avoid contact with OBSS striker bars (Vitrolube coating)

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CAUTION

ISS Constraints

- A. Avoid inadvertent contact with
1. Grapple fixture shafts (drylube)
 2. PIP pins
 3. EVA Crane [PMA 1]
 4. TCS Reflectors [PMA 2,PMA 3]
 5. APAS hardware [PMA 2,PMA 3]
 6. CETA Lights (Z-93 paint) [LAB,S1,Node 1]
 7. Deployed MISSEs (Columbus EPF)
 8. Passive UMAs
 9. MBS VDU, MCU, CRPCMs, and Cameras (taped radiative surfaces, silver Teflon)
 10. Deployed TUS cable [Nadir CETA rail]
 11. S0 aft face Radiator
 12. GPS Antennas (S13 paint) [S0]
 13. UHF Antennas [LAB,P1]
 14. ETCS Radiator flexhoses and panels [S1,P1]
 15. EETCS/PV Radiator flexhoses, bellows and panels [P6,P4,S4,S6]
 16. SASA RF Group [S1,P1]
 17. Heat pipe radiators [Z1]
 18. PCU cathode and HCA ports [Z1]
 19. Ku-Band Antenna (SGANT) dish [Z1]
 20. CMG cover/shells [Z1]
 21. SSRMS/SPDM Cameras
 22. SPDM SJEU, EP, OTCM Radiator surfaces
 23. Open CBM petal covers and LAB window shutter
 24. FPMU [S1]
 25. OTSD
 26. Columbus HAM radio antennas

CAUTION

ISS Constraints (Cont)

- B. Electrical Cables
1. Avoid bend radii < 10 times cable diameter
- C. Fiber Optic Cables
1. Avoid bend radii < 10 times cable diameter
 2. Avoid pulling on cable during mate/demate
- D. Fluid line flex hoses and QDs
1. Avoid bend radii < 5 in for hoses with diameter < 1 in on LAB, S0, S1, P1, and 10-in for hoses with diameter < 1-in on all other elements
 2. Avoid bend radii < 14 in for hoses with a diameter ≥ 1 in
 3. Additional care should be taken to not exceed bend radii when applying loads at the flexible hose to rigid tube stub interfaces
 4. Ensure fluid QD booties are fully closed prior to leaving worksite; wire tie if reqd
- E. For structural reasons
1. Avoid vigorous body motions, quick grabs and kickoffs against tether restraints
 2. Avoid performing shaking motions (sinusoidal functions) more than four cycles
 3. Avoid kicking S1/P1 radiator beam. If any of these occur, wait 2 to 5 min to allow structural response to dissipate
 4. Do not apply more than 33 lbf to OBSS while grappled by SSRMS

NOTES, CAUTIONS, AND WARNINGS (Cont)

CAUTION (Cont)

ISS Constraints (Cont)

F. Other

1. ITT Cannon connector: On demated connectors, do not rotate collar or manipulate cable/connector using collar or connector tool
2. WIS Antennas: do not use as handholds [Node 1,Lab,P6,Z1]
3. Lubricant from Ku-Band SGANT gimbals [Z1], CMGs [Z1], and RTAs Ground Strap fasteners [P6,P4,S4,S6] can contaminate EMU
4. MLI handholds are not rated for crewmember translation loads
5. CBM petal covers may not be used as handholds unless both launch restraint pins are engaged
6. Prevent inadvertent contact of the tether shuttle with ETRS when the P3/S3 Tether Shuttle Stop is raised away from the rail

CAUTION (Cont)

Shuttle Constraints

G. Avoid inadvertent contact with

1. OBSS and SRMS Composite Sections and Cable Harnesses
2. LCS (silver Teflon) and LDRI (silver Teflon) and ITVC (gold foil) [OBSS]
3. WVS Antenna [ODS Truss & PLB Sill]
4. Payload Bay wire harnesses, cables, and connectors

H. No Touch

1. LDRI diffuser [OBSS]
2. OBSS saddle contacts (when OBSS unberthed) [OBSS]
3. Monkey fur [PLB]
4. Cameras: metallic surfaces [PLB]
5. Ku-Band Antenna black dish and gold thermal blankets [PLB]

NOTES, CAUTIONS, AND WARNINGS (Cont)

WARNING

ISS Constraints

- A. Avoid inadvertent contact with
1. Grapple fixture targets and target pins
 2. SSU, ECU, beta gimbal platform, mast canister, SAW blanket boxes unless the beta gimbal is locked and the motor is turned off
 3. Stay inboard of SARJ when active
 4. Stay 2 ft from S1/P1 radiator beam rotational envelope when beam is free to rotate
 5. Stay 5 ft from moving MT on face 1
- B. Handrails
1. Handrails previously used for MISSE attachment may not be used as a safety tether point [A/L endcone 564 & 566, A/L Tank 2 nad/fwd & port/fwd, P6 5389]
- C. Pinch
1. NZGL connector linkage. Use caution when mating/locking
 2. ITT Cannon Connector rotating housing
 3. EV side of IV Hatch during Hatch operation (also snag hazard) [A/L]
 4. LAB window shutter and CBM petal cover linkages during operation
- D. QDs
1. If QD is in FID when valve is opened (bail fwd), QD will leak and fluid line may whip
 2. Do not rotate if in mated/valve open config

WARNING (Cont)

ISS Constraints (Cont)

- E. RF Radiation Exposure
1. Stay 3.6 ft from S-Band (SASA) high gain Antenna when powered [S1,P1]
 2. Stay 1.3 ft from S-Band (SASA) low gain Antenna when powered [S1,P1]
 3. Stay 1 ft from UHF Antenna when powered [LAB,P1]
- F. Sharp Edges
1. Inner edges of WIF sockets
 2. APFR active WIF probes
 3. Mating surfaces of EVA connectors. Avoid side loads during connector mating
 4. Back side of MMOD shield fasteners
 5. Spring loaded captive EVA fasteners (e.g., 6B-boxes, BMRRM, RTAS, SARJ covers); the end of the spring may protrude
 6. PMA umbilical launch restraints-exposed bolt threads
 7. Adjustable Fuse Tether (Fish Stringer) buckles stowed in Node Bag
 8. Nickel coated braided copper Ground Straps may contain frayed wires [P6,P4,S4,S6]
 9. Z1 handrail 6061 by the Ku-Band boom launch restraint [Z1]
 10. Solar Array Blanket Box [P6,S6]
 11. Keep hands away from SSRMS, SPDM, POA LEE opening, and snares
 12. Fastener threads on back of Z1 U-jumper male FQD panel, if nutplate cap missing
 13. Lifting lug near P6 handrail 5333 and gap spanner

WARNING (Cont)

ISS Constraints (Cont)

- F. Sharp Edges (Cont)
14. SPDM OTCM Gripper Jaws
 15. SOLAR and EuTEF
 16. Port/Aft portion of A/L circular HH
- G. Thermal
1. EVA connectors with booties may become hot if left uncovered. Handling may need to be limited.
 2. PMA handrails may be hot. Handling may need to be limited
 3. Turn off glove heaters when comfortable temp reached to prevent bladder damage. Do not pull fingers out of gloves when heaters are on
 4. Uncovered trunnion pins may be hot
 5. SSRMS/SPDM/MBS operating Cameras and lights may radiate large amounts of heat
 6. Stay ≥ 1 ft away from PMAs and MMOD shields > 270 degF if EMU sun visor up; limit time to 15 min or less if > 300 degF
 7. Stay at least 0.5 ft away from PMA and MMOD shields > 325 degF
 8. Do not touch EMU protective visor if temp has been < -134 degF for > 15 min
 9. No EMU TMG contact with PMAs and MMOD shields > 320 degF
 10. No EMU boot contact with foot restraint when temp < -120 or > 200 degF

NOTES, CAUTIONS, AND WARNINGS (Cont)

WARNING (Cont)

ISS Constraints (Cont)

H. Electrical Shock

1. Stay \geq 2 ft from ungrounded floating connectors if not unpowered:
 - SSPTS connectors [NOD1 Stbd/Fwd HR 0130, LAB Stbd/Fwd HR 0273, PMA 2 Stbd & Port]
 - MBS Cross-Connect jumpers (translate past these using UMA handrails)
 - S0 EVA Power Cables [inside S0 Bay 00 Face 4, Bay 01 Face 3]
 - ESP2 jumper [inside S0 Bay 03 Face 4]

WARNING (Cont)

Shuttle Constraints

I. Arcing/Molten Debris

1. Stay \geq 2 ft from exposed EFGF connector when OBSS berthed, powered, and EFGF not grappled [PLB]
2. Stay \geq 2 ft from exposed Stbd Fwd MPM contacts [PLB]
3. Stay above PLB sill when within 1 ft of powered ROEU connector [PLB]

J. Pinch

1. PRLA operation [PLB]

K. RF Radiation Exposure

1. Stay 3.28 ft from S-Band Antenna when powered
2. Stay 1 ft from top and side of UHF PLB Antenna radome surface when in high powered mode [ODS truss]
3. Stay 0.33 ft from top and side of UHF PLB Antenna radome surface when in low powered mode [ODS truss]
4. Remain below the level of the PLB door mold line for first 20 in Aft of Fwd bulkhead when S-Band Antenna powered [PLB]
5. Remain on the inboard side of the Stbd slidewire (sill handrails if slidewire not installed) for first 20 ft Aft of Fwd bulkhead when Ku-Band Antenna powered [PLB]

WARNING (Cont)

Shuttle Constraints (Cont)

L. Sharp Edges

1. PRLA grounding wipers [PLB]
2. LDRI baffles (Also an entrapment hazard) [OBSS]
3. Keep hands away from SRMS EE opening and snares
4. TCS connector backshells have exposed threads [ODS]

M. Thermal

1. Illuminated PLB lights; do not touch
2. OBSS grapple fixture shafts/cams may be hot. Limit handling if required
3. Stay 27 ft from PRCS when powered
4. Stay 3 ft from VRCS when powered
5. Stay 3 ft from APU when operating

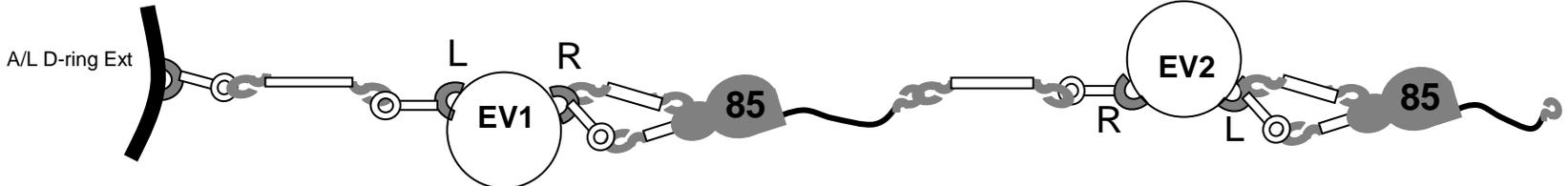
N. Contamination

1. Stay out of the immediate vicinity of leaking jet or APU

O. Lasers

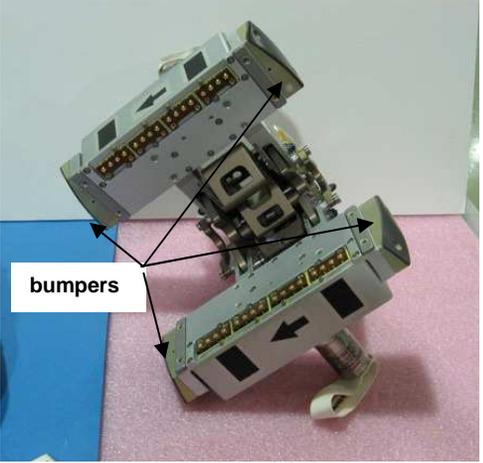
1. Do not look at LDRI diffuser or LCS laser aperture window

A/L EGRESS/SETUP (00:40)

IV/SSRMS	EV1 – Be (FF)	EV2 – Fm (FF)
	<p>Initial Condition: Waist Tether (L) to A/L D-ring extender, Waist tether (R) to EV1 85-ft safety tether ERCM. EV1 safety tether LAS hook to D-ring extender (R), safety tether large hook to EV2 waist tether (R). Verify hooks locked; overgloves donned</p>	<p>Initial Condition: Waist Tether (R) to EV1 85-ft safety tether large hook; Waist tether (L) to EV2 85-ft safety tether ERCM. EV2 safety tether LAS hook to D-ring extender (L); stow EV2 safety tether large hook on MWS. Verify hooks locked; overgloves donned</p>
<p>1. SSRMS Grapple OBSS</p> <p>2. WVS Software: Select page – RF camera Sel 'Advanced Controls' S-Band Level (two) – Max (required after EV1 and EV2 egress Airlock) Verify good video</p> <p>3. SRMS ungrapple OBSS</p> <p>4. SSRMS mnvr to UMBILICAL INSTALL SETUP</p>	<p>EGRESS (00:15)</p> <ol style="list-style-type: none"> On EV2 GO, release Waist Tether (L) from A/L D-ring extender <u>Transfer spare 85-ft safety tether to EV2</u> <u>Transfer C/Lk bag #4 (SARJ tools) to EV2;</u> leave A/L RET on D-ring ext <u>Transfer Lq ORU bag to EV2 (on EV1 BRT RET);</u> leave A/L RET on D-ring ext Egress A/L √SAFER man isol vlv – open (down) √SAFER HCM – closed (down) Close A/L thermal cover Give SRMS GO for OBSS ungrapple <p>SETUP (00:25)</p> <ol style="list-style-type: none"> Translate to CP4 (S1 zenith) via CETA spur and Face 4 <u>Fairlead with Adj Eq Tether at HH 3290</u> 	<p>EGRESS (00:15)</p> <ol style="list-style-type: none"> Open A/L thermal cover Egress Airlock Attach EV2 85-ft safety tether large hook to aft A/L D-ring <ul style="list-style-type: none"> □ Verify hook locked, reel unlocked Remove EV1 85-ft safety tether large hook from EV2 waist tether (R), attach to fwd A/L D-ring <ul style="list-style-type: none"> □ Verify hook locked, reel unlocked Give EV1 GO to release Waist Tether (L) <u>Stow spare 85-ft safety tether on A/L toolbox</u> <u>Stow C/Lk bag #4 (SARJ tools) on ESP-2 HH 8002</u> <u>Stow Lq ORU bag on EV1 BRT</u> Stay aft of hatch opening; fairlead to provide EV1 path to CETA spur √SAFER man isol vlv – open (down) √SAFER HCM – closed (down) <p>SETUP (00:25)</p> <ol style="list-style-type: none"> Translate to ESP2 <u>RET/BRT to APFR (,TT,H,12)/Ingress Aid from ESP2 WIF 2</u> Translate to inboard OBSS stand via CETA spur and Face 4 Fairlead using EV1 Adj Eq Tether at HH 3290

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OBSS KEEP-ALIVE UMBILICAL INSTALL (01:35)

IV/SSRMS	EV1 – Be (FF)	EV2 – Fm (FF)
<p>Stanchion install – torque, turns: _____ (18.4 ft-lb) _____ (26 turns)</p>  <p>KAD</p>	<p>INSTALL STANCHION/AVIONICS BOX (00:15)</p> <ol style="list-style-type: none"> 1. Inspect gloves; remove overgloves and stow on ORU bag 2. Tether and stow ORU bag on S1 HH 3289 (RET) and S0 HH 3425 (adjustable) – flap opens from ISS aft 3. Retrieve stanchion/avionics box <ol style="list-style-type: none"> 4. Soft dock stanchion/avionics box to CP-4 (HH outboard) 5. Transfer PGT to EV2 (on EV1 RET) <ol style="list-style-type: none"> 6. Receive PGT <p>MATE CONNECTORS (00:05)</p> <ol style="list-style-type: none"> 7. Assist EV2 as reqd <p>KAD/P411 INSTALL (01:15)</p> <ol style="list-style-type: none"> 8. Tether and retrieve P411 connector from ORU bag; stow on MWS 9. Retrieve W21 harness/KAD from ORU bag (attached to avionics box) 10. Route KAD/W21 FWD of SASA; transfer to EV2 11. Transfer OBSS cover to EV2 12. Perform ORU bag inventory; close ORU bag 	<p>INSTALL APFR (00:07)</p> <ol style="list-style-type: none"> 1. Install APFR/Ingress aid in S1 WIF 05 (10.TT.H.12) <ul style="list-style-type: none"> <input type="checkbox"/> Pull test <input type="checkbox"/> Verify lock collar black on black <input type="checkbox"/> Release RET 2. Inspect gloves; remove overgloves <p>INSTALL STANCHION/AVIONICS BOX (00:08)</p> <ol style="list-style-type: none"> 3. Soft dock stanchion/avionics box to CP-4 (HH outboard) 4. BRT to HH 3290 5. Receive PGT (on EV1 RET) 6. PGT [B3 18.4 ft-lb, CW2 30 RPM, MTL 30.5]-6 ext 7/16 <ul style="list-style-type: none"> <input type="checkbox"/> Tighten stanchion bolt 10 turns, until it drops out of launch position (do not allow socket to come off bolt head) <input type="checkbox"/> Tighten stanchion bolt to hard stop, ~16.5 additional turns (26.5 turns total) 7. Transfer PGT to EV1 <p>MATE CONNECTORS (00:10)</p> <ol style="list-style-type: none"> 8. Perform the following demates from S1 PNL A114 and stow caps in ORU bag (use 2 RETs from stanchion to bag, BRT to 3290): <ul style="list-style-type: none"> <input type="checkbox"/> P2 – Deadface connector <input type="checkbox"/> P3 – Deadface connector 9. Open captive socks covering W22/P2 and W23/P3 10. Mate W22/W23 cable harness connectors to S1 PNL A114: <ul style="list-style-type: none"> <input type="checkbox"/> W22/P2 to J2 <input type="checkbox"/> W23/P3 to J3 11. Secure W22/W23 to S1 HH 3289 w/integral cable tie, as reqd
<p>NOTE Do not handle or open KAD via the connectors</p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: auto;"> <p>CAUTION Avoid contact with the dry lube on the KAD bumpers Do not apply more than 33 lbf to OBSS while grappled by SSRMS</p> </div>		

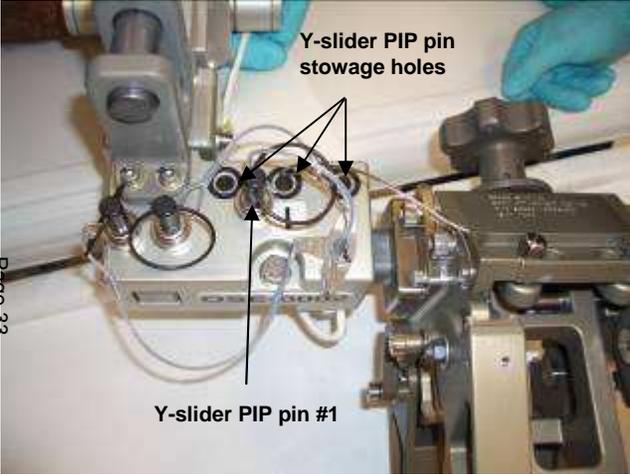
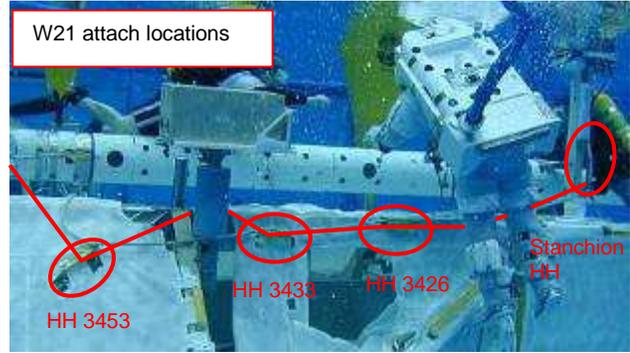
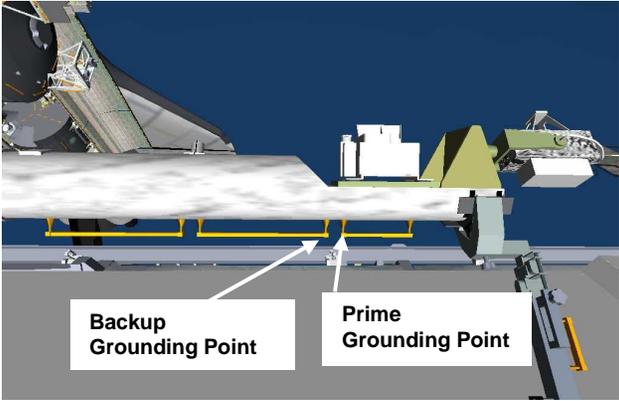
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OBSS KEEP-ALIVE UMBILICAL INSTALL (01:35) (Cont)

IV/SSRMS	EV1 – Be (FF)	EV2 – Fm (FF)
<p><input type="checkbox"/> Large ORU Transfer Bag</p> <p><input type="checkbox"/> Connector caps (2)</p> <p><input type="checkbox"/> RET (eq-eq) (2)</p> <p><input type="checkbox"/> RET (eq-eq) (2) (from OBSS cover and P411)</p> <p><input type="checkbox"/> Adj Eq Tether (outside of bag)</p> <p><input type="checkbox"/> RET (eq-eq) (outside of bag)</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> Adj Eq Tether (on RET for overgloves)</p> <p>1. SSRMS: MNVR TO UMBILICAL INSTALL</p> <p>2. SSRMS: GCA for KAD install</p> <p>3. SSRMS: √Brakes on, give GO for KAD install</p> <p>4. Upon completion of KAD install, give EV2 GO to mate W21 to avionics box</p> <p>5. SSRMS: MnvR to PITCH posn (hold until LED√)</p> <p>6. SSRMS: GCA for P411 connector install</p> <p>7. SSRMS: √Brakes on, give GO for P411 install</p> <p>8. MCC: On EV GO, power up CP-4 (SSRMS holds in PITCH posn); notify crew just before to power up</p> <p>9. IV: If LOS, perform CP-4 power up steps</p> <p>PCS S1: EPS: RPCM S11A B</p> <p>RPCM S11A B – sel RPC 1</p> <p>RPCM S11A B RPC 1 – cmd RPC Close Cmd – Ena (√Ena) RPC Position – Close (√Cl)</p> <p>RPCM S11A B – sel RPC 13</p> <p>RPCM S11A B RPC 13 – cmd RPC Close Cmd – Ena (√Ena) RPC Position – Close (√Cl)</p> <p>PCS S1: EPS: RPCM S12B B</p> <p>RPCM S12B B – sel RPC 2</p> <p>RPCM S12B B RPC 2 – cmd RPC Close Cmd – Ena (√Ena) RPC Position – Close (√Cl)</p> <p>RPCM S12B B – sel RPC 12</p> <p>RPCM S12B B RPC 12 – cmd RPC Close Cmd – Ena (√Ena) RPC Position – Close (√Cl)</p>	<p>13. Translate to inboard OBSS stand</p> <p>14. Open SSBAD (PAD on stand) feet √Status indicator in SD (soft dock)</p> <p>15. Local tether to stand; ingress APFR</p> <p>16. Inspect gloves</p> <p>17. √Safety tether on top of W21 harness</p> <p>18. √KAD in SD</p> <p>19. Give SSRMS GO for MNVR TO UMBILICAL INSTALL</p> <p>20. GCA SSRMS for KAD install</p> <p>21. On IV GO, capture KAD to striker bar (KAD tether – ISS port)</p> <p>22. Rotate KAD knob cw to CL (closed), lock knob</p> <p>23. √Indicator in CL (anywhere in black CL region)</p> <p>24. <u>Remove Adj Eq Tether from KAD; stow on MWS</u></p> <p>25. SSRMS mnvr to PITCH posn for P411 install</p> <p>26. Tend W21 slack</p> <p>27. GCA for P411 connector install</p> <p>28. On IV GO, <u>install P411 connector; insert PIP pin</u> (hold EFGF lobes and temporarily egress APFR as reqd)</p> <p>29. Give MCC GO for CP4 power up (watch for OFF->ON transition)</p> <p>30. On IV/MCC GO, verify P411 LEDs (2) are illuminated</p> <p>31. Ingress APFR</p>	<p>15. BRT to HH 3236</p> <p>16.  Photograph EV1 and OBSS mnvr w/digital camera</p> <p>17. Monitor OBSS clearance from HH 3236 or outboard OBSS stand</p> <p>18. <u>Tether and temp stow digital camera on HH 3232</u></p> <p>19. Translate to avionics box (after KAD GCA complete)</p> <p>20. On IV GO, remove dummy caps from J223 and J224 (captive)</p> <p>21. Mate W21 harness connectors to avionics box (align red stripe on connector wing with arrow on avionics box, rotate CW 90 deg)</p> <p><input type="checkbox"/> W21/P223 to J223</p> <p><input type="checkbox"/> W21/P224 to J224</p> <p><input type="checkbox"/> √Red ring on both connectors NOT visible</p> <p>22. Secure dummy connectors via Velcro strap below TA clamp</p> <p>23. Translate to outboard stanchion</p> <p>24. Monitor clearance during GCA</p>

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OBSS STOW (01:15)

IV	EV1 – Be (FF)	EV2 – Fm (FF)
<p>1. SSRMS: Mnvtr to EVA Handoff posn</p> <p>2. Give SSRMS GO for OBSS SEMI-MANUAL RELEASE</p>  	<p>OBSS CAPTURE (00:35)</p> <ol style="list-style-type: none"> 1. Give GO for SSRMS mnvtr to EVA Handoff posn; tend W21 slack 2. <u>Attach RET to OBSS HH (after GCA complete)</u> 3. Give SSRMS GO for OBSS SEMI-MANUAL RELEASE 4. Soft capture OBSS striker bar to inboard SSBAD 5. <u>Release RET from OBSS HH</u> 6. Egress APFR <p>RELEASE 1st JOINT CONSTRAINT (inboard) (00:05)</p> <ol style="list-style-type: none"> 7. Release Slider Knob PIP pin 8. Reposition Slider knob to position 2; re-install PIP pin in knob 9. Rotate SSBAD knob cw to CL (closed), lock knob 10. ✓Indicator in CL (anywhere in black CL region) <p>RELEASE REMAINING JOINT CONSTRAINTS (inboard) (00:05)</p> <ol style="list-style-type: none"> 11. Release Slider knob PIP pin 12. Reposition Slider knob to position 4; re-install PIP pin in knob 13. Give EV2 GO to dock outboard end of Boom <p>ROUTE W21 HARNESS (00:15)</p> <ol style="list-style-type: none"> 14. Route W21 harness fwd of CPDS (Charged Particle Directional Spectrometer); attach integrated cable ties to, HH 3426, HH 3433 (local tether to 3427) 15. Secure W21 harness slack to HH 3453 with integral cable ties (Keep cable bend radius > 5-in) 	<p>OBSS CAPTURE (00:40)</p> <ol style="list-style-type: none"> 1. Translate onto outboard OBSS stand; attach local tether 2. Open SSBAD feet <ul style="list-style-type: none"> □ Status indicator in SD (soft dock) 3. <u>Attach RET to OBSS HH (after GCA complete)</u> <ol style="list-style-type: none"> 4. On EV1 GO, soft capture OBSS striker bar to outboard SSBAD 5. <u>Release RET from OBSS</u> <p>RELEASE JOINT CONSTRAINT (outboard) (00:08)</p> <ol style="list-style-type: none"> 6. Release slider knob PIP pin 7. Reposition Slider knob to position 4; re-install PIP pin in knob 8. Rotate SSBAD knob cw to CL (closed), lock knob 9. ✓Indicator in CL (anywhere in black CL region) <p>OUTBOARD Y-SLIDER RELEASE (00:02)</p> <ol style="list-style-type: none"> 10. Release Y-slider PIP pin #1 and stow in any black ring stowage hole <p>OBSS COVER INSTALL (00:10)</p> <ol style="list-style-type: none"> 11. Retrieve OBSS cover (HH 3231); slide over SP1 12. <u>Attach fixed length strap to zenith SP2 T-handle</u> 13. Cinch drawstring, attach to port/zenith SP2 tether point 14. Install Velcro flap over SP2 15. Retrieve grounding strap from pouch; route cable through equipment hook gate on T-handle 16. Insert grounding PIP pin in outboard-most OBSS HH (port standoff) (backup – stbd standoff on adjacent HH) 17. Verify PIP pin clocked to clear HH (grounding strap in line with HH) and fully inserted

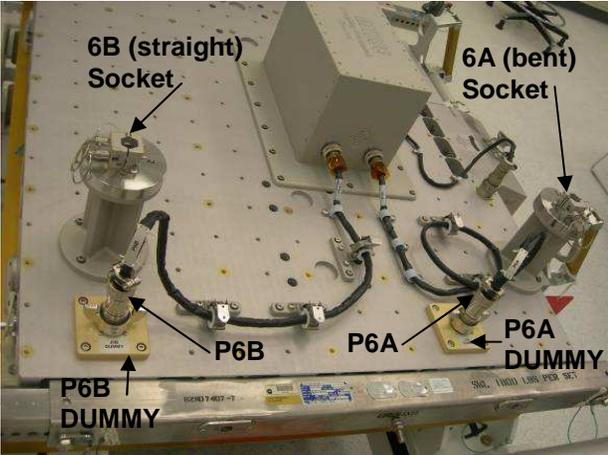
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OBSS STOW (01:15) (Cont)

IV	EV1 – Be (FF)	EV2 – Fm (FF)
	<p>CLEANUP (00:15)</p> <p>16. Transfer PGT to EV2</p> <p>17. Receive digital camera; stow on swing arm</p> <p>18. Inspect gloves; don overgloves (on ORU bag)</p> <p>19. Retrieve Lg ORU Bag from S1 HH 3289 and S0 HH 3425; Stow on BRT</p> <p>20. Translate to A/L</p> <p>21. Stow Lg ORU bag in A/L on D-ring extender RET</p> <p>22. Stow digital camera in C/Lk bag #2 (MISSE tools)</p> <p>23. RET to PGT; stow on swing arm (for sidewall carrier latch contingencies)</p> <p>24. RET/BRT to C/Lk bag #2 (MISSE tools, 85-ft safety tether)</p> <p>25. Close A/L thermal cover</p>	<p>CLEANUP (00:15)</p> <p>18. Retrieve digital camera (HH 3232); tether and stow on MWS</p> <p>19. Tether and relocate APFR to S1 WIF 1 (10,TT,H,12)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Pull test <input type="checkbox"/> Verify lock collar black on black <input type="checkbox"/> Release RET <p>20. Receive PGT; stow on swing arm</p> <p>21. Transfer digital camera to EV1</p> <p>22. Inspect gloves; don overgloves</p> <p>23. Release both safety tether from fairlead (HH 3290); stow Adj Eq Tether on MWS</p> <p>24. Translate to ESP-2; retrieve C/Lk bag #4 (SARJ tools, 85-ft safety tether, camera)</p>

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MISSE 6 PEC INSTALL/DEPLOY (02:10)

IV	EV1 – Be (FF)
<p>1. √MCC for SCU connect and cleanup times</p>  <p>MISSE 6 LWAPA</p>	<p>MISSE 6 SETUP (00:15)</p> <ol style="list-style-type: none"> 1. Translate to Node 2 HH 0310 (zenith translation path on Lab/Node 2) 2. Tether swap to 85-ft safety tether on Node 2 HH 0310 <ul style="list-style-type: none"> ☐ Verify hook locked, reel unlocked <p>REMOVE BENT PEC FROM SIDEWALL CARRIER (00:20)</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">WARNING</p> <p>Sidewall carrier clamp are a pinch point. Use caution during actuation</p> <p>Avoid contact with SSPTS cable connectors (2-ft Keep-out Zone)</p> <p>Socket housing/PIP pin interface may have burrs or generate debris</p> <p>Any cut lanyard wires have sharp edges</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0; text-align: center;"> <p>CAUTION</p> <p>Cutting PIP pin lanyard may create FOD</p> </div> <p style="text-align: center;">NOTE</p> <p>PEC 6B has straight stem, PEC 6A has bent stem</p> <ol style="list-style-type: none"> 3. Translate to MISSE 6A bent PEC (fwd) 4. Inspect gloves 5. Attach C/L bag #2 to PEC 6A 6. Tether to PEC with BRT RET 7. Remove PIP pins (2) from PEC sidewall carrier clamps 8. Open sidewall carrier clamps (2) 9. Remove PEC from sidewall carrier; stow on BRT 10. Close clamp (2) for landing; re-insert PIP pins (2) 11. Translate to Columbus Nadir platform (around Node 2 fwd/stbd endcone to zenith HH path on Columbus) 12. Remove C/L bag #2 from PEC and temp stow on LWAPA FSE HH <p>INSTALL BENT PEC ON LWAPA (00:20)</p> <ol style="list-style-type: none"> 13. Disengage probe PIP pins (2) on LWAPA stbd socket 14. Install bent PEC in socket; align single black lines on probe and socket (probe pitched ISS stbd) 15. Re-engage PIP pins (2), √probe secure in clamp, use twisting motion 16. If reqd, use gentle hammer taps to install PIP pin(s) 17. Use table below to determine if wire-ties or CBM PIP pins are reqd

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MISSE 6 PEC INSTALL/DEPLOY (02:10) (Cont)

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IV	EV1 – Be (FF)		
	1st PIP Pin status:	2nd PIP Pin status:	Required Action
A	Installed → ball sets visible on back side of socket	Installed → ball sets visible on back side of socket	None
B	Installed → ball sets visible on back side of socket OR Partially Installed → tip protruding but ball sets not visible	Partially Installed or Not Installed → any state other than Installed	Wire Tie 1st PIP pin (wire tying of 2nd PIP pin with the same wire tie is optional)
C	Not Installed → tip not protruding	Not Installed → tip not protruding	<ol style="list-style-type: none"> 1. Remove MISSE PIP pins (using CBM PIP pin and hammer if reqd) 2. Cut lanyard using compound cutters 3. Place PIP pins, lanyards, and any spare CBM PIP pins used for pin extraction in small trash bag 4. Install 2 new CBM PIP pins and individually wire-tie each pin in place 5. If nojoy, tie-down MISSE w/ Adj or LDTD Tether

REMOVE STRAIGHT PEC FROM SIDEWALL CARRIER (00:20)

18. Translate to straight PEC (aft)
19. Inspect gloves
20. Tether to PEC with BRT RET
21. Remove PIP pins (2) from PEC sidewall carrier clamps
22. Open sidewall carrier clamps (2)
23. Remove PEC from sidewall carrier; stow on BRT
24. Close clamp (2) for landing; re-insert PIP pins (2)
25. Translate to Columbus Nadir platform (around Node 2 fwd/stbd endcone to zenith HH path on Columbus)

INSTALL STRAIGHT PEC ON LWAPA (00:20)

26. Disengage probe PIP pins (2) on LWAPA port socket
27. Install straight PEC in socket; align single black lines on probe and socket
28. Re-engage PIP pins (2), √probe secure in clamp, use twisting motion
29. If reqd, use gentle hammer taps to install PIP pin(s)
30. Use table above to determine if wire-ties or CBM PIP pins are reqd

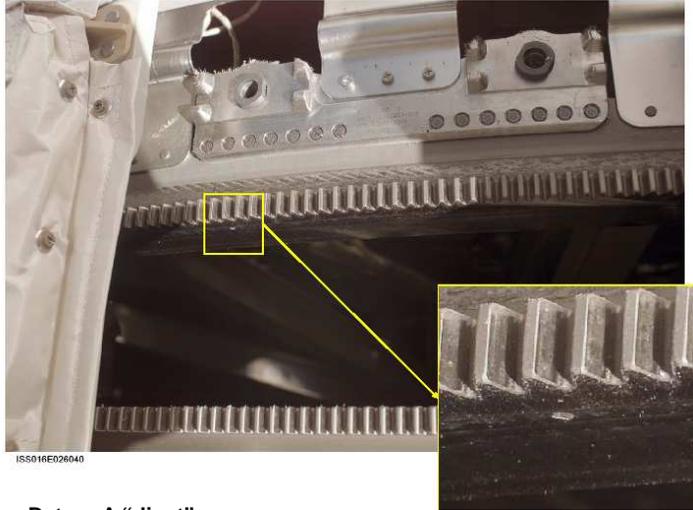
MISSE 6 PEC INSTALL/DEPLOY (02:10) (Cont)

IV	EV1 – Be (FF)
<p>2. Give MCC GO to restore power to Columbus nadir platform</p>	<p><u>MATE MISSE 6 CONNECTORS</u> (00:10) 31. Release TA clamps for P6A (2) and P6B (3) connector cables 32. <u>Remove green connector cover from straight PEC</u> 33. Remove P6B from J6B DUMMY 34. Mate P6B to straight PEC connector (J6B) 35. <u>Mate green connector cover to J6B DUMMY</u> 36. <u>Remove red connector cover from bent PEC</u> 37. Remove P6A from J6A DUMMY 38. Mate P6A to bent PEC connector (J6A) 39. <u>Mate red connector cover to J6A DUMMY</u></p> <p><u>OPEN BENT PEC (6A)</u> (00:05) 40. Release bent PEC PIP pin securing MISSE closed (2) and PIP pins for securing MISSE open (2) 41. Open bent PEC; reinsert PIP pins (2) to restrain open</p> <p><u>OPEN STRAIGHT PEC (6B)</u> (00:05) 42. Release straight PEC PIP pin securing MISSE closed (2) <u>and</u> PIP pins for securing MISSE open (2) 43. Open straight PEC; reinsert PIP pins (2) to restrain open 44. Give MCC GO to restore power to Columbus nadir stowage platform</p> <p><u>PHOTOGRAPH PECs</u> (00:05) 45. <input type="checkbox"/> Photograph deployed PECs with digital camera (normal, ~2 ft from PEC) (no WVS reqd) 46. <u>Photograph socket PIP pins and lanyards, if not in nominal config</u> 47. Inspect gloves</p> <p><u>MISSE 6 CLEANUP</u> (00:10) 48. <u>RET/BRT to C/L bag #2</u> 49. <input type="checkbox"/> Photograph SOLAR and EuTEF, as time permits 50. Translate to JLP HH1260 (stbd-nadir) 51. If time permits, perform JLP TRUNNION/KEEL COVER INSTALL Get-Ahead (FS 7-186) 52. <u>Attach C/L bag #1 to C/L bag #2 using integral tethers</u> 53. <u>Tether swap to S0 85-ft safety tether at Node 2 HH 0310</u> <input type="checkbox"/> Verify hook locked, reel unlocked 54. Stow 85-ft safety tether on MWS</p>

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SARJ INSPECTION (02:10)

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IV	EV2 – FM (FF)
 <p data-bbox="121 1068 294 1091">Datum-A "divot"</p>	<p data-bbox="1255 311 1327 334" style="text-align: center;"><u>NOTE</u></p> <ul data-bbox="949 337 1638 539" style="list-style-type: none"> • First priority: Datum A divot inspection (divot is expected to be under cover 18) • Second priority: covers 16, 9, 8, 6 • Third priority: cover 11 • Cover 18 is a double wide cover (6 inboard bolts) • Covers 6, 8, 9, 11, 16 are single wide covers (4 inboard bolts) • Only use digital camera flash during night pass • Any thermal constraints will be uplinked real time <p data-bbox="814 591 949 613">SARJ SETUP</p> <ol data-bbox="814 617 1386 737" style="list-style-type: none"> 1. Translate up CETA spur to S1 HH 3239 (face 1) 2. Tether swap to spare 85-ft safety tether on S1 HH 3239 <ul data-bbox="882 665 1239 688" style="list-style-type: none"> ☐ Verify hook locked, reel unlocked 3. Fairlead safety tether w/Adj Eq Tether at HH 3061 4. Translate to SARJ cover 18 <p data-bbox="814 760 1302 782">DATUM-A OUTBOARD RACE RING INSPECTION</p> <ol data-bbox="814 786 1906 1221" style="list-style-type: none"> 5. PGT[A6 8.3, CCW2, 30.5] 6-Ext 7/16 release inboard cover fasteners (6), 9 turns only (add single turns incrementally as required for release) 6. Remove MLI cover 18; temp stow w/RET and Adj Eq Tether on adjacent cover 7. Inspect backside of cover, both MLI and frame 8. Perform search on outboard race ring for Datum A 'divot' 9. Perform visual inspection of the 'divot' and report conditions 10. Attempt to remove debris from Datum A with EVA wipe 11. Report success of debris removal 12. If debris can be removed, stow Wipe with debris in C/Lk bag #4 (inside-out and rolled up) 13. If debris cannot be removed or damage is observed, retrieve digital camera w/flash 14. Take images of the damage area w/digital camera <ul data-bbox="949 1062 1612 1149" style="list-style-type: none"> • Focus only on the Datum A surface • Attempt 6-8 photos • Take photos at multiple angles (focused only on datum-A target) 15. Retrieve cover from temp stow location and re-install 16. PGT[A1 2.5, CW2, 30.5] 6-Ext 7/16 drive inboard cover fasteners (6), ~8 turns. (Partially engage all MLI cover fasteners prior to final torque)

SARJ INSPECTION (02:10) (Cont)

Cover remove and inspection order

Double Cover 18 (Datum-A divot)

Single Cover 16

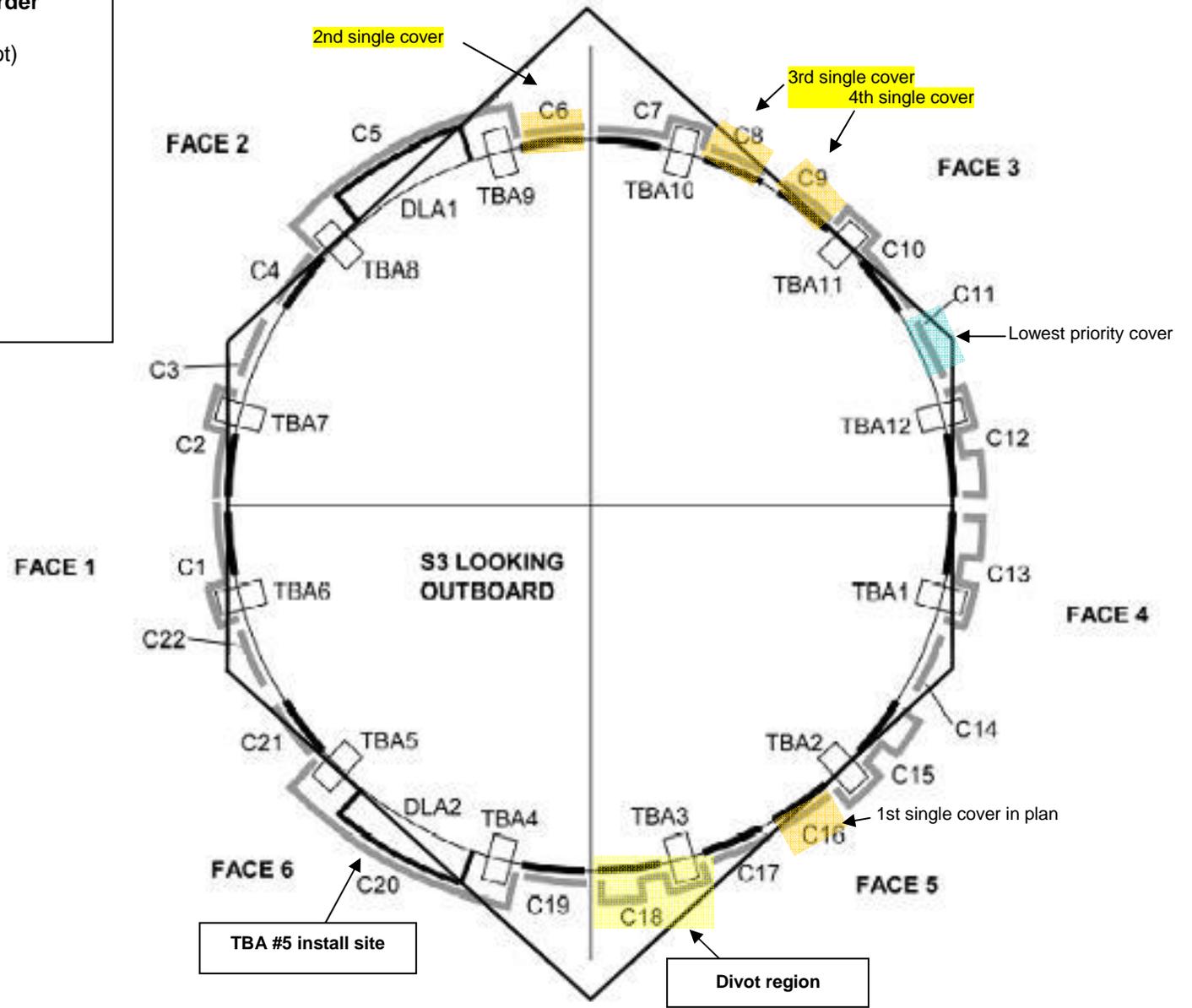
Single Cover 6

Single Cover 8

Single Cover 9

Single Cover 11

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SARJ INSPECTION (02:10) (Cont)

IV	EV2 Fm (FF)
<p>1. √MCC for SCU connect and cleanup times</p> <ul style="list-style-type: none"> <input type="checkbox"/> Cover 16 <input type="checkbox"/> Cover 6 <input type="checkbox"/> Cover 8 <input type="checkbox"/> Cover 9 <input type="checkbox"/> Cover 11 <p>CREWLOCK BAG INVENTORY</p> <ul style="list-style-type: none"> <input type="checkbox"/> Digital camera (35 mm) w/flash and mount <input type="checkbox"/> Adj Eq Tether for digital camera <input type="checkbox"/> 4 EVA wipes <input type="checkbox"/> Adj Equip Tether – clove hitched for 2 wipes <input type="checkbox"/> Inspection mirror <input type="checkbox"/> Adj Eq Tether 	<p>SARJ SINGLE COVER INSPECTION Perform following steps for covers 16, 6, 8, 9, 11 as time permits:</p> <p style="text-align: center;">NOTE: After completing cover #16, translate around the front face to access covers 6, 8, 9, 11</p> <ol style="list-style-type: none"> 1. RET cover to adjacent cover 2. PGT[A6 (8.3), CCW2, 30.5] 6-Ext 7/16 release inboard cover fasteners (4), 9 turns only (add single turns incrementally as required for release) 3. Remove MLI cover; temp stow w/previously attached RET and Adj Eq Tether on adjacent cover <ul style="list-style-type: none"> <input type="checkbox"/> Inspect backside of cover, both MLI and frame 4. √ w/MCC - If time permits, take images of outboard race ring Datum A surface w/digital camera: <ul style="list-style-type: none"> • Take 4-6 close photos of each surface to capture entire surface once photos are combined 5. If outboard race ring surface has unusual characteristics, perform the following steps: <ul style="list-style-type: none"> <input type="checkbox"/> Retrieve tape strips from crewlock bag as reqd <input type="checkbox"/> Notify IV which # tape strips are used for SARJ hardware <div style="border: 1px solid black; padding: 5px; margin: 10px 0; text-align: center;"> <p>CAUTION Avoid contacting Inboard race ring bearing surfaces with Kapton tape</p> </div> <ul style="list-style-type: none"> <input type="checkbox"/> Collect tape samples from a single location on the outer canted surface of the outboard race ring <input type="checkbox"/> Fold used tape samples in half (sticky side to sticky side) and stow in trash bag 6. Retrieve SARJ cover from temp stow location and install 7. PGT[A1 (2.5), CW2, 30.5] 6-Ext 7/16 drive inboard cover fasteners (4), ~8 turns. (Partially engage all MLI cover fasteners prior to final torque) <p>SARJ CLEANUP</p> <ol style="list-style-type: none"> 8. Attach digital camera with flash to crewlock bag 9. Retrieve C/Lk bag #4; perform tool inventory 10. Release SARJ fairlead; stow Adj tether on MWS 11. Translate to A/L 85-ft safety tether (S1 HH 3239) 12. Tether swap to A/L safety tether; stow spare on MWS <ul style="list-style-type: none"> <input type="checkbox"/> Verify hook locked, reel unlocked 13. Don overgloves

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SARJ INSPECTION (02:10) (Cont)

		Cover:	18 (divot)	16	6	8	9	11
Back side of MLI cover and frame								
General Condition								
Outboard Race Ring Debris Inspection	Outer Canted		Tape strip #:					
	Datum A	Photos (4-8)	Photos (4-6)	Photos (4-6)	Photos (4-6)	Photos (4-6)	Photos (4-6)	Photos (4-6)
MLI Cover (torque/turns) Rem: A6, CCW2, 30.5 Inst: A1, CW2, 30.5								

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EVA 5 CLEANUP/INGRESS (00:40)

IV	EV1 – Be (FF)	EV2 – Fm (FF)
<p>1. Perform WVS PWRDN (P/TV, <u>WVS</u> Cue Card)</p> <p>2. Prior to hatch opening, retrieve surgical masks and goggles from LAB1D4_A1 and don for Post EVA until SARJ sample sealed in ziplock</p>	<p>CLEANUP (00:25)</p> <ol style="list-style-type: none"> 1. Perform tool inventory 2. Inspect EV2 for Debris 3. Translate to Airlock <p>INGRESS (00:15)</p> <ol style="list-style-type: none"> 4. Open A/L Thermal Cover 5. Ingress A/L 6. Attach Waist Tether (R) to UIA D-ring <ul style="list-style-type: none"> ☐ Verify hook locked, reel unlocked 7. <u>Tether C/Lk bag #1/2 in A/L</u> 8. <u>Tether and stow C/Lk bag #4 in A/L; release EV2 BRT RET</u> 9. Give EV2 GO for EV1 Safety Tether release; stow lg hook on MWS 10. Remove SCU from stowage pouch 11. Remove DCM cover, Velcro to DCM 12. Connect SCU DCM, √SCU locked 13. Water – OFF (fwd); expect H2O IS OFF msg 	<p>CLEANUP (00:25)</p> <ol style="list-style-type: none"> 1. Perform tool inventory 2. Translate to Airlock <p>INGRESS (00:15)</p> <ol style="list-style-type: none"> 3. <u>Transfer C/Lk bag #4 to EV1 (on BRT RET)</u> 4. Attach Waist tether to A/L D-ring extender, verify hook locked 5. On EV1 GO, release EV1 Safety tether lg hook from fwd tether point; pass hook to EV1 6. Release EV2 85-ft Safety Tether lg hook from aft tether point; stow on MWS 7. Ingress A/L 8. Close thermal cover, attach Velcro strap 9. Remove SCU from stowage pouch 10. Remove DCM cover, Velcro to DCM 11. Connect SCU DCM, √SCU locked 12. Water – OFF (fwd); expect H2O IS OFF msg <div style="border: 1px solid black; padding: 5px; text-align: center;"> <p>CAUTION Do not close hatch until EMU water off for 2 min</p> </div> <ol style="list-style-type: none"> 13. Verify no hardware blocking hatch 14. EV Hatch Handle – Preclose (black pie region) 15. EV Hatch – close and lock 16. Go to <u>PRE-REPRESS</u> Cue Card

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POST EVA 5 TOOL CONFIG

- | | |
|--|--|
| <p>EV1</p> <p><input type="checkbox"/> MWS</p> <p><input type="checkbox"/> BRT (L)</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> Wire Tie</p> <p><input type="checkbox"/> T-Bar</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> RET (eq-eq) w/PIP pin</p> <p><input type="checkbox"/> Adj Equip Tether (2) (1 from KAD)</p> <p><input type="checkbox"/> Wire Tie (2)</p> <p><input type="checkbox"/> ISS Small Trash Bag</p> <p><input type="checkbox"/> Spare 85-ft safety tether</p> <p><input type="checkbox"/> Swing Arm (R)</p> <p><input type="checkbox"/> PGT</p> <p><input type="checkbox"/> 7/16 (wobble) socket-6 ext</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> Waist Tether (2)</p> <p><input type="checkbox"/> D-ring Extender (2)</p> <p><input type="checkbox"/> Safety Tether (85 ft)</p> <p><input type="checkbox"/> SAFER</p> <p><input type="checkbox"/> WVS</p> <p><input type="checkbox"/> Overgloves (2) donned</p> | <p>EV2</p> <p><input type="checkbox"/> MWS</p> <p><input type="checkbox"/> BRT (L)</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> Wire Tie</p> <p><input type="checkbox"/> T-Bar</p> <p><input type="checkbox"/> RETs (eq-eq)</p> <p><input type="checkbox"/> RET (eq-eq) w/PIP pin</p> <p><input type="checkbox"/> Adj Equip Tether (2) (1 from fairlead)</p> <p><input type="checkbox"/> Wire Tie (3)</p> <p><input type="checkbox"/> ISS Small Trash Bag</p> <p><input type="checkbox"/> Adj Eq Tether (clove-hitched, hooks in bag)</p> <p><input type="checkbox"/> Spare 85-ft safety tether</p> <p><input type="checkbox"/> Swing Arm (R)</p> <p><input type="checkbox"/> PGT</p> <p><input type="checkbox"/> 7/16 (wobble) socket-6 ext</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> Waist Tether (2) (L – D-ring, R – extender)</p> <p><input type="checkbox"/> D-ring Extender (2)</p> <p><input type="checkbox"/> Safety Tether (85 ft)</p> <p><input type="checkbox"/> SAFER</p> <p><input type="checkbox"/> WVS</p> <p><input type="checkbox"/> Overgloves (2) donned</p> |
|--|--|

AIRLOCK CONFIG

- | |
|--|
| <p><input type="checkbox"/> RET (lg-eq)</p> <p><input type="checkbox"/> Large ORU Bag</p> <p><input type="checkbox"/> Connector caps (2)</p> <p><input type="checkbox"/> RET (eq-eq) (2)</p> <p><input type="checkbox"/> RET (eq-eq) (2) (from OBSS cover and P411)</p> <p><input type="checkbox"/> Adj Eq Tether (outside of bag)</p> <p><input type="checkbox"/> RET (eq-eq) (outside of bag)</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> Adj Eq Tether (on RET for overgloves)</p> <p><input type="checkbox"/> EVA Crewlock Bag #4</p> <p><input type="checkbox"/> Kapton tape strips on door (8, may be in trash bag)</p> <p><input type="checkbox"/> Adj Eq Tether (clove hitched to int tether point)</p> <p><input type="checkbox"/> EVA Wipes (4)</p> <p><input type="checkbox"/> Inspection mirror</p> <p><input type="checkbox"/> Digital camera w/flash and mount (35 mm lens)</p> <p><input type="checkbox"/> Adj Eq Tether (securing camera to outside of bag)</p> <p><input type="checkbox"/> Adj Eq tether</p> <p><input type="checkbox"/> EVA Crewlock Bag #1</p> <p><input type="checkbox"/> Any Remaining JLP Trunnion covers</p> <p><input type="checkbox"/> RET (eq-eq)</p> <p><input type="checkbox"/> EVA Crewlock Bag #2</p> <p><input type="checkbox"/> CBM PIP pins with pre-integrated short wire ties (4)</p> <p><input type="checkbox"/> Adj Eq Tether (clove hitched to int tether point)</p> <p><input type="checkbox"/> CBM PIP pins (2)</p> <p><input type="checkbox"/> Adj Eq Tether (clove hitched to int tether point)</p> <p><input type="checkbox"/> EVA Hammer</p> <p><input type="checkbox"/> Compund Cutters</p> <p><input type="checkbox"/> Adj Eq Tether (2)</p> <p><input type="checkbox"/> LDTDT (2)</p> <p><input type="checkbox"/> 760 digital camera and mount (tie wrapped)</p> <p><input type="checkbox"/> RET (eq-eq) (for digital camera)</p> |
|--|

AIRLOCK EXTERIOR

- | |
|---|
| <p><input type="checkbox"/> S1</p> <p>APFR (10,TT,H,12) w/ingress aid, WIF 1</p> |
|---|

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MISSE 6 Plan For EVA 5

1. Retrieve and Install PEC 6A, then PEC 6B
2. Attempt to install one PIP pin at a time to minimize the effects of tolerance stack-up
3. If any of the PIP pins cannot be inserted by hand: Tap MISSE PIP pins in using EVA hammer (hammer swings should be no more than 6 inches). The table on the following page describes the actions that need to be taken for various levels of PIP pin engagement
4. If these options are not successful then the MISSE PECs will be tethered in place on the LWAPA (see last few slides)

MISSE 6 Install Success Criteria

	<u>1st PIP Pin status:</u>	<u>2nd PIP Pin status:</u>	<u>Required Action</u>
A	Installed → ball sets visible on back side of socket	Installed → ball sets visible on back side of socket	None
B	Installed → ball sets visible on back side of socket OR Partially Installed → tip protruding but ball sets not visible	Partially Installed or Not Installed → any state other than Installed	Wire Tie 1 st PIP pin (wire tying of 2 nd PIP pin with the same wire tie is optional)
C	Not Installed → tip not protruding	Not Installed → tip not protruding	<ol style="list-style-type: none"> 1. Remove MISSE PIP pins (using CBM PIP pin and hammer if reqd) 2. Cut lanyard using compound cutters 3. Place PIP pins and lanyards in small trash bag 4. Install 2 new CBM PIP pins and individually wire-tie each pin in place

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MISSE 6 Tool Config

Crewlock bag

- CBM PIP pins with pre-integrated short wire ties (4) (on integral RETs) *see following page for details*
- Adj Eq tether (clove hitched to inside of bag)
 - EVA Hammer
 - Compound Cutters
- Adj Eq tether (clove hitched to inside of bag)
 - Spare CBM PIP pins (2)
- LDTDT (Long Duration Tie Down Tether) (2, for tie-down)
- Adj Eq tether (2, for tie-down)

EV1 needs 2 additional wire ties on BRT for Scenario B

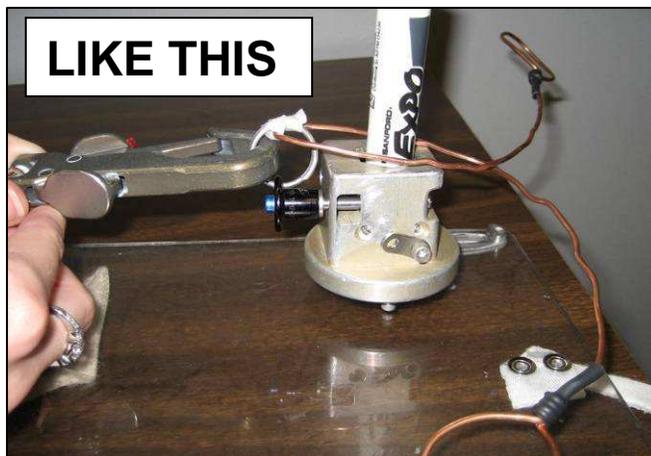
Note: CBM PIP pins can be found in CL Bag #2 in Ziploc bag after 81:20:03

MISSE 6 Tool Config (cont)

- Flatten end of wire tie enough to feed through CBM PIP pin tether ring – then reshape wire tie (re-expand tether loop)
- Using EVA Tape (P/N P-213), secure tether ring to middle of wire tie, taping on the side opposite the PIP pin (make best effort to cover ends of split ring w/ tape – not shown)

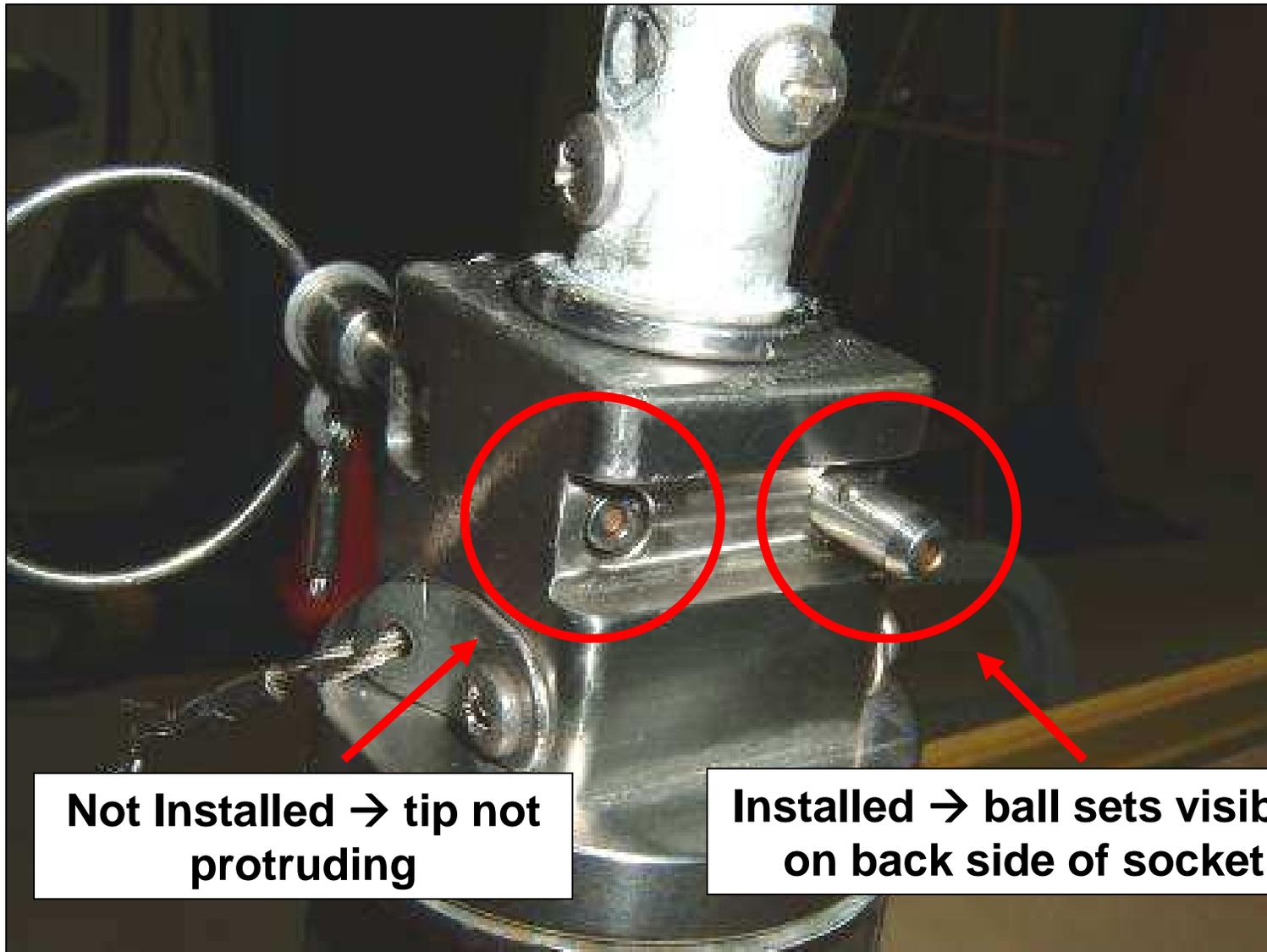


- Attach crewlock bag equipment hook to tether ring with hook on “button” side of PIP pin to avoid interference during PIP pin installation.



PIP pin States

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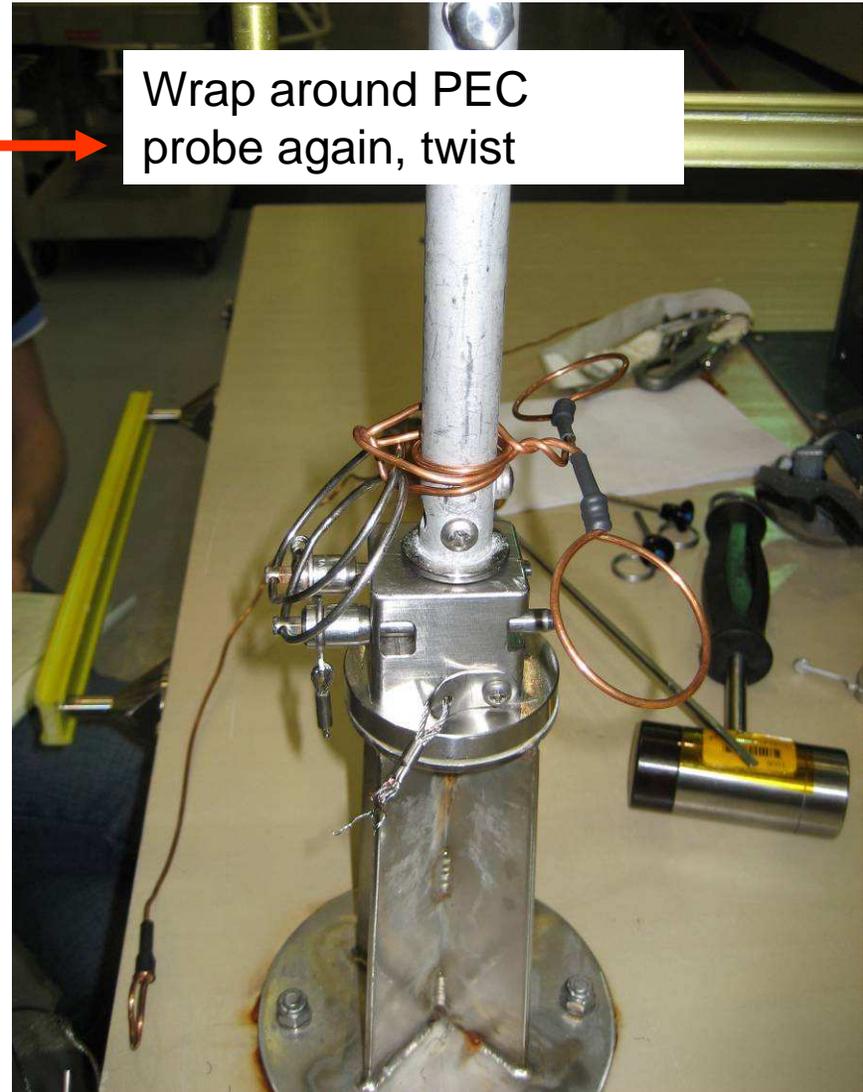
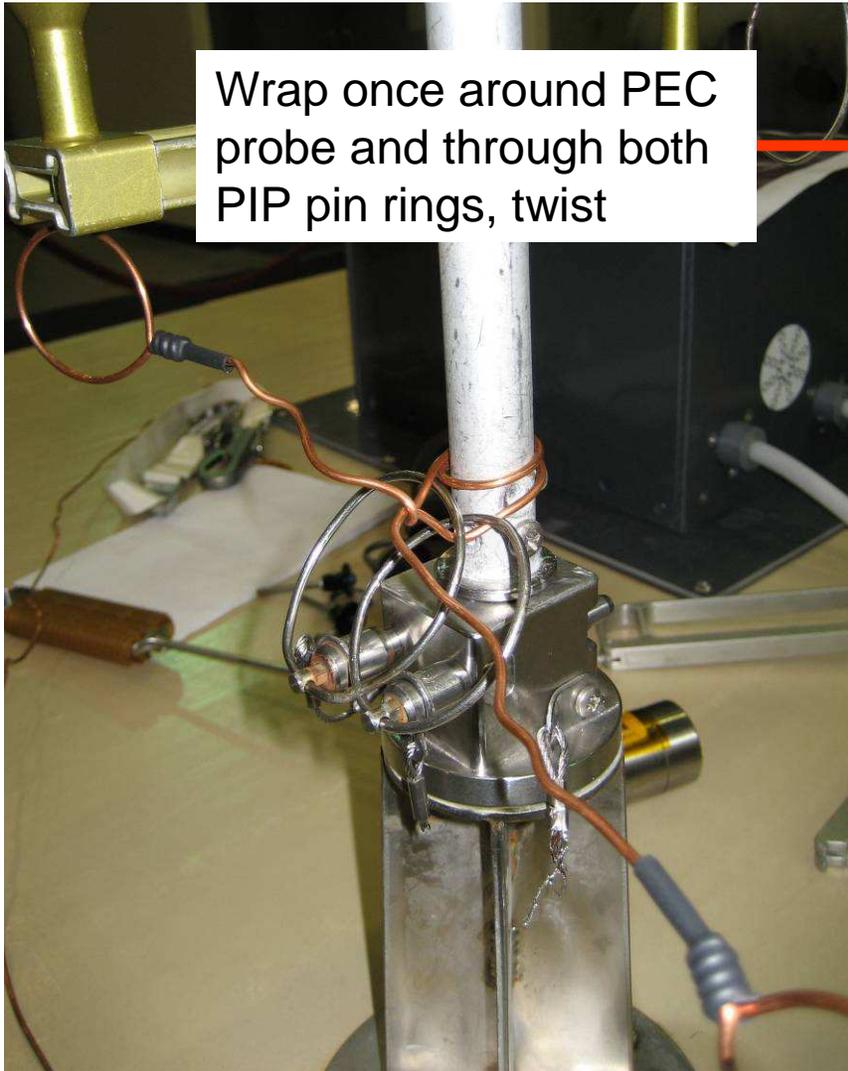


Not Installed → tip not protruding

Installed → ball sets visible on back side of socket

Scenario B:

Securing MISSE PIP Pins w/ Single Wire-tie



Scenario C

The CBM PIP pin can be used to drive the original pin back out. If the original pin is flush or close to the end of the mounting block, the IVA pin will have to be held in alignment with the original pin while tapping it with the hammer.



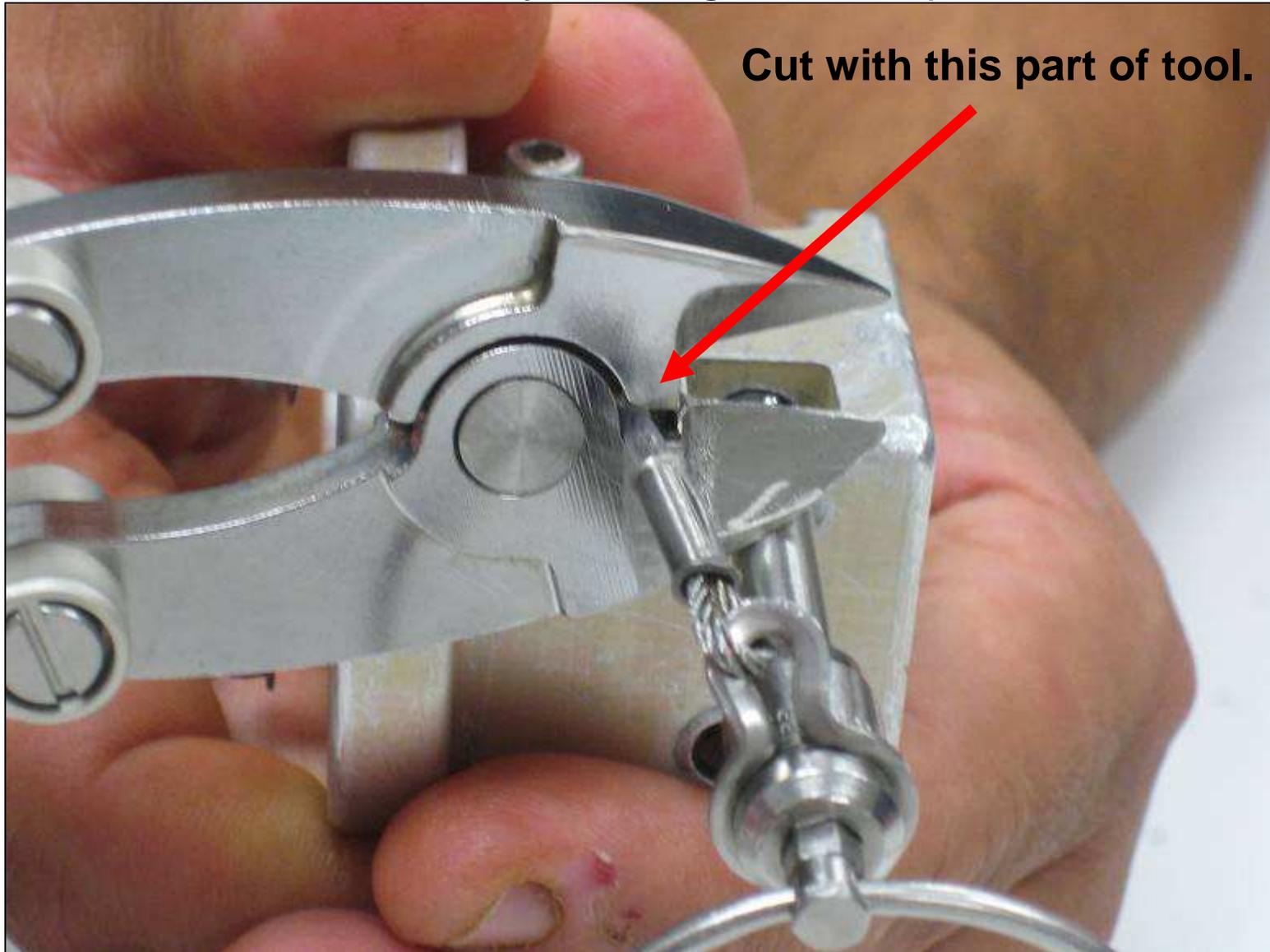
Scenario C (Cont)

If the original pin is wedged only part way, the pin hole can provide some restraint when holding pressure inward on the pin with the tether while tapping it with the hammer. If the hammer technique is used on a CBM PIP pin, the PIP pin should be stowed in a trash bag after use and red-tagged once inside.



Scenario C (Cont)

Cut the middle of the lanyard using the notch part of the tool.

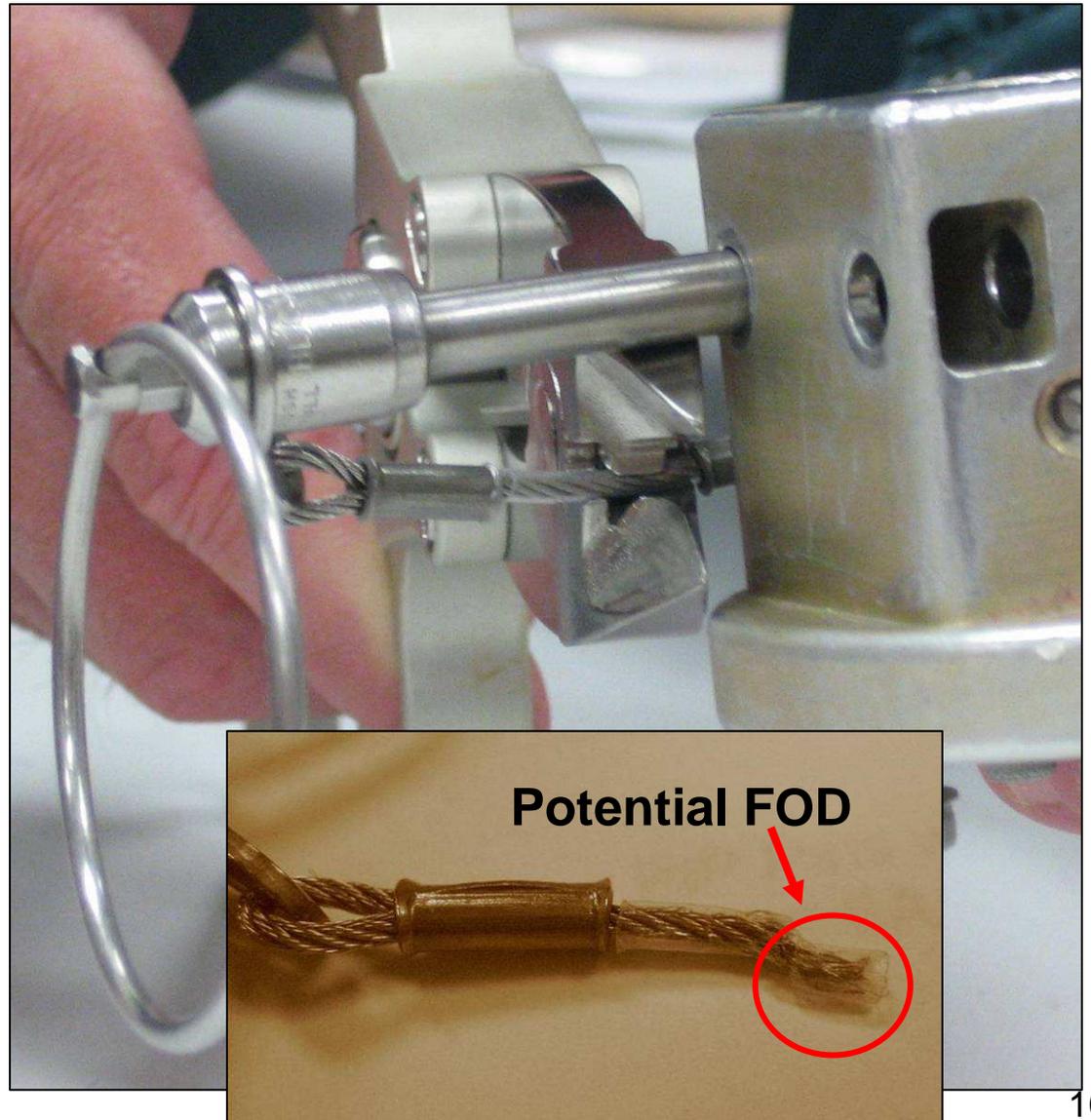


Scenario C (Cont)

Frayed Wire and Possible FOD

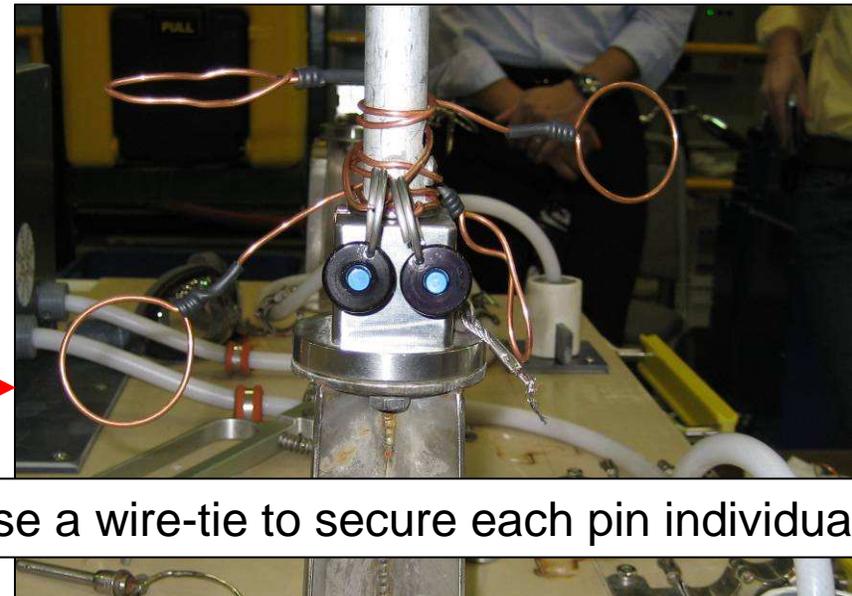
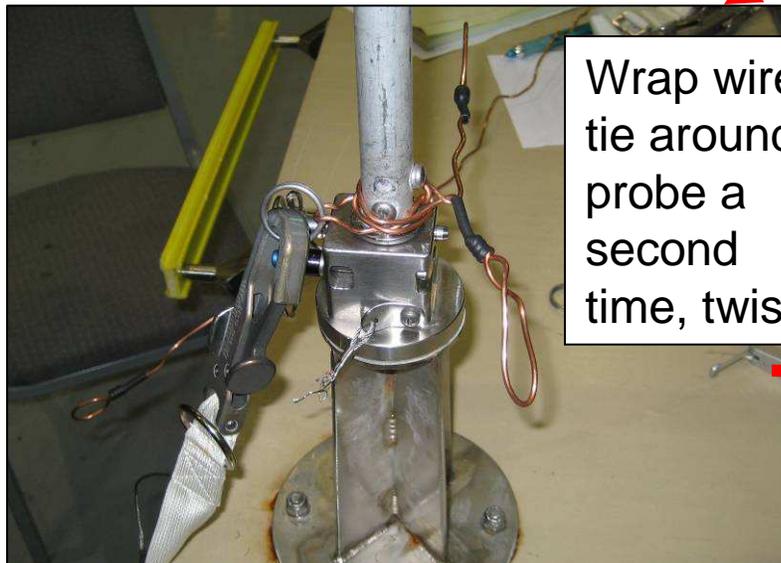
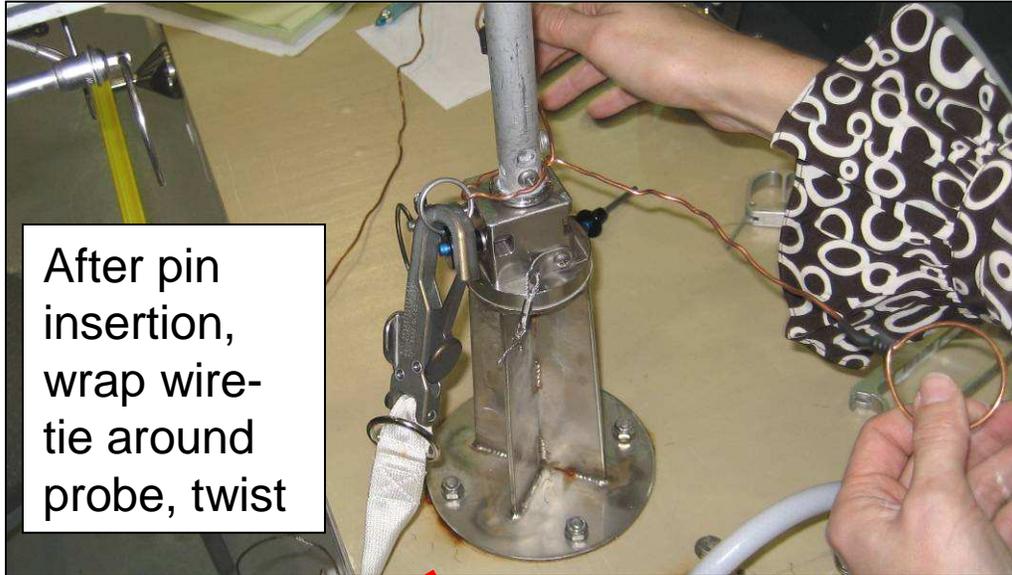
- It is possible, after vigorous swatch testing with the frayed wire, to create minor damage to RTV
- Incidental contact with the frayed wire will not cause glove damage
- Caution: The cutting may produce a small piece of wire FOD due to the way the compound cutters shear (2 cutting surfaces)
- The middle part of the lanyard is covered in a Nylon sheath

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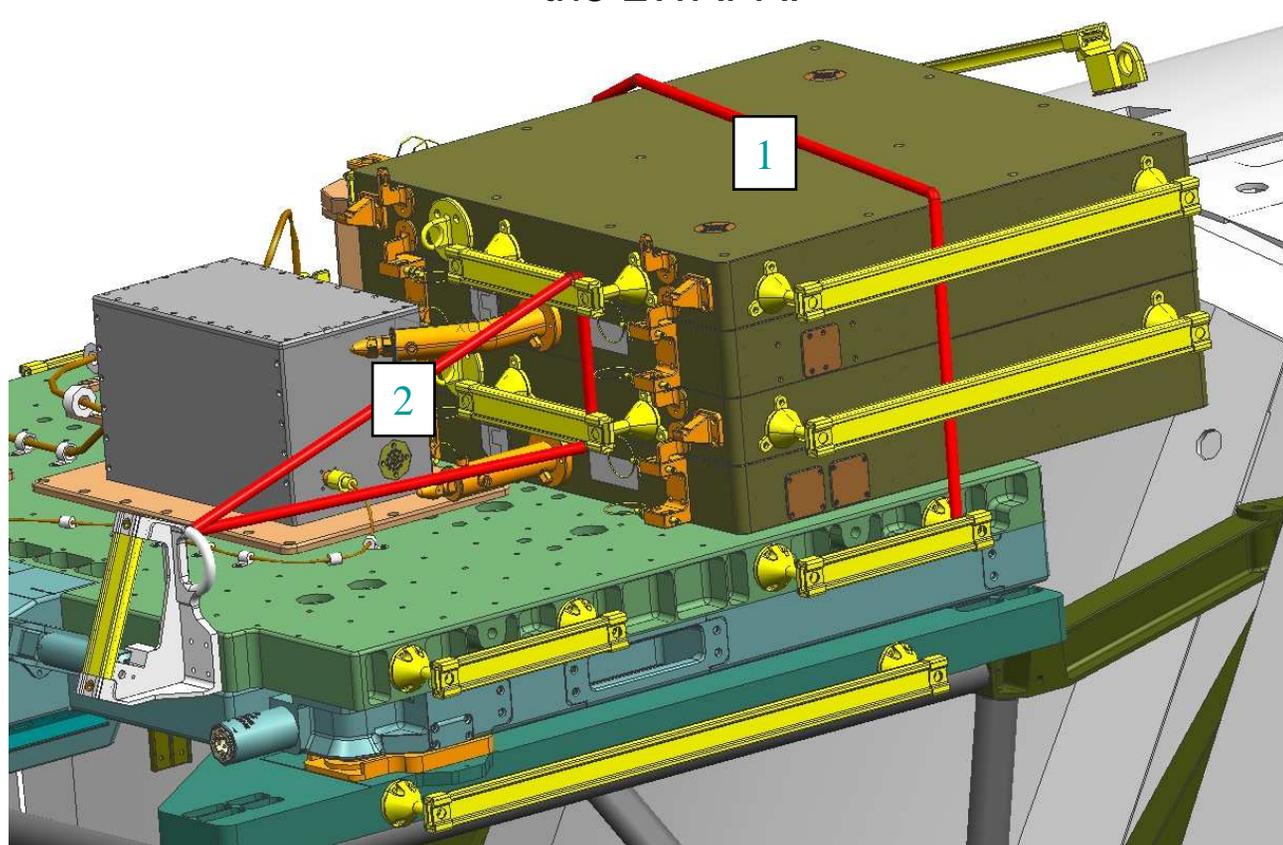
Scenario C (Cont)

Securing the CBM PIP pin w/ wire ties



Tie Down Plan

If MISSE PECs cannot be restrained with PIP pins, Long Duration Tie-Down Tethers should be used to secure them to the LWAPA:

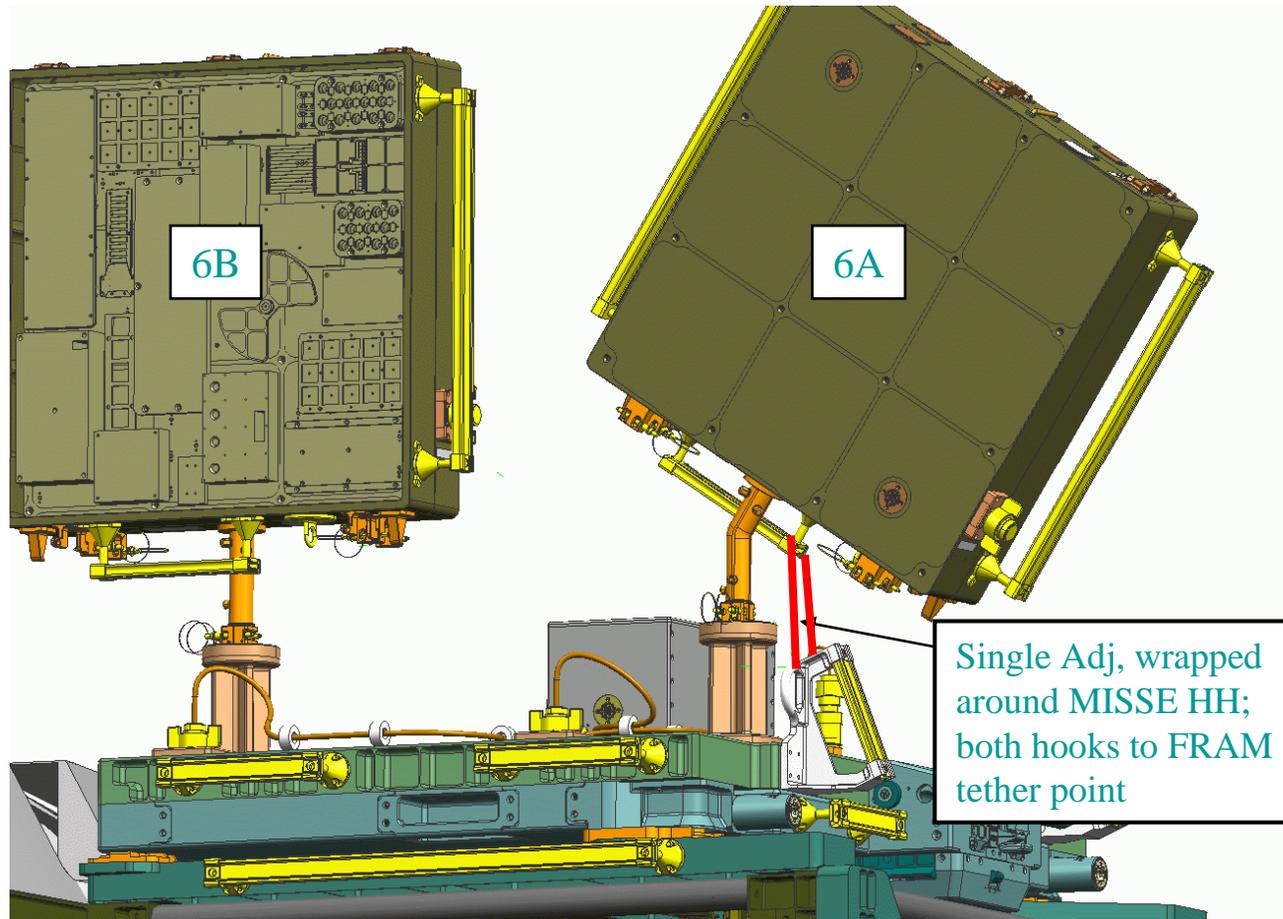


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Route LDTDT so that it goes through the MISSE PEC handrails on one side (LDTDT buckle prevents routing the tether under handrails on both sides)

Tie Down Plan

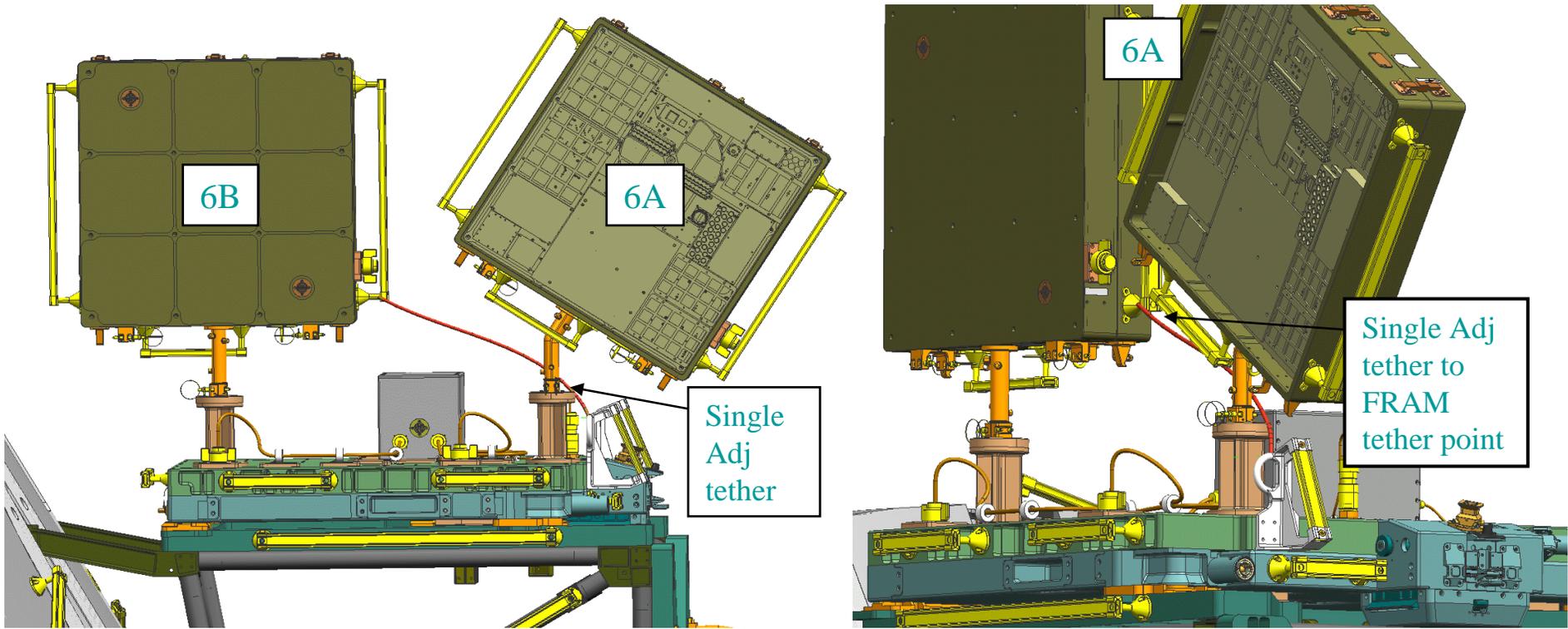
If time does not allow for the LDTD Tether option, The PECs can be restrained using 1 Adj Eq Tether per PEC



PEC A Tether Routing

Tie Down Plan

If time does not allow for the LDTD Tether option, The PECs can be restrained using 1 Adj Eq Tether per PEC



PEC B Tether Routing

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**FLIGHT DAY 3 DOCKING ORBITER WITH ISS
LIOH CHANGEOUT**

(7 crewmembers/Single Shift/FD 12-19)

MID FD12	STS-118-X	"	Late Inspection
PRE FD12	"	STS-118 - X	
POST FD13	"	"	EVA 5
PRE FD13	STS-118 - X	"	
POST FD14	"	"	
PRE FD14	"	STS-118 - X	
POST FD15	"	"	
MID FD15	STS-118 - X*	STS-118 - X	HATCH CLOSE
PRE FD15	STS-118 - X*	"	
POST FD16	STS-118 - X	STS-118 - X	
PRE FD16	STS-118 - X*	STS-118 - X*	
POST FD17	STS-118 - X	STS-118 - X	EOM
PRE FD17	STS-118 - X*	STS-118 - X*	
POST FD18	16	17	EOM+1
PRE FD18	18*	19*	
POST FD19	20	21	EOM+2

*Re-bag and seal LiOH cans w/Gray Tape and stow.

ENTRY LIOH CANISTER STOWAGE LOCATIONS	
MD52M (LIOH BOX)*:	STS-123 CANS 7-21, STS-118 CANS 32-46, 48
EXT A/L BAG I:	STS-123 CANS 1-3
MA9D/F:	STS-123 CANS 4-6
NOTE: LIOH COVERS INSTALLED ON STS-123 CANS 1-3	
*2 LIOH CANS INSTALLED IN LIOH SLOTS A AND B	

1 **FD11 MMT Summary**

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The MMT met briefly today to review mission progress. The mission is proceeding well, and the team is looking forward to the TRAD DTO. The EVA team has developed several options for installing MISSE during EVA 5, and those options will be provided in the FD12 Execute Package. Endeavour continues to perform well. The APU 1 GN2 leak has slowed a bit, and the team will continue to monitor that system. The team also continues to review the ppCO2 data, LiOH plans, and orbiter configuration.