

STS-118/13A.1

FD 09 Execute Package



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079A	---	FD08 MMT Summary (pdf - Electronic Only)
083	---	FD09 PAO Event Summary (pdf - Electronic Only)

Approved by FAO: Roger Smith

Last Updated: Aug 16 2007 10:26AM GMT

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

1 MSG INDEX

2

3 MSG NO. TITLE

4 075 HAM Pass for GMT 228: McCall-Donnelly School District, McCall, Idaho

5 076 FD09 Flight Plan Revision

6 077 FD09 Mission Summary

7 078 FD09 Transfer Message

8 079 FD08 MMT Summary

9 080 LHA R&R Procedure

10 081 13A.1 Tile Repair Stowage Matrix

11 082 EVA Training Package

12 083 FD09 PAO Event Summary

13 084 Middeck 5 MLE Bag Return Layouts

14 085 FD09 Water Ops Cue Card

15 086 Pre-EVA Repair Docked Audio Test

16 087 EMU Gloves Photo Message

17 088 Published TPS Repair Procedures

18 089 FD09 Big Picture Words for EVA TPS Repair

19 090 TPS EVA Detailed Procedures

20 091 TRAD IV Prep

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- 28 1. For today's cryo config, H2 Tanks 1 and 5 will be active with dual heaters, and O2 Tank
29 2 will be active using manual heater ops (single heater). Reference Message 032 for
30 O2 Tank 2 manual heater operations (MCC will TMBU O2 Tank 2 pressure limits).

31

32 **R1 CRYO O2, H2 MANF VLV TK1 (two) - OP (tb-OP)**
33 **O2 TK1 HTRS A,B (two) - OFF**
34 **TK2 HTRS A - ON**

35

36 **A11 CRYO TK4 HTRS O2 A - OFF**

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- 38 2. We just wanted to send another friendly reminder from DPS:

39

40 Please make sure that you leave IDPs ON for at least 20 seconds prior to powering
41 OFF. This is a lifetime issue for the heads on the hard drive of the IDP. Thanks.

42

- 43 3. There are no SPACEHAB viewport violations for FD09.

44

- 45 4. There are no exercise constraints for any of the activities on FD09.

46

- 47 5. Please update the participants for the education PAO event in MSG 072. Barbara and
48 Drew will be participating and Rick will not.

49

- 1 6. FYI for EVA: Today, Clay is scheduled to take pictures of both his and Dave's EVA
2 gloves for comparison purposes for the ground to analyze. Reference message 15-0956
3 (MSG 87) for more information.
4

5 Also, over the course of the flight, we have encountered problems with charging certain
6 PGT Batteries and have isolated the problem to Battery Charger 2, Channel 3 and
7 will not use that channel for the remainder of the mission. PGT battery s/n 1006, which
8 was in BC2 CH3 during yesterday's charge, did not charge properly. We would like to
9 attempt another charge of that battery today while charging the EMU batteries. Please
10 reference the Execute Notes in OSTPV for both the BSA Batt Term and the EMU Batt
11 Init Activities for the updated battery charge plan.
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- 14 7. REPLACE PAGES 2-28, 2-30, 2-32 and 3-90 THROUGH 3-99.
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GMT 08/15/07 (227)
 β = 21.28
 MET Day 007

23 01 08/16 02 01 03 02 04 03 05 04 06 05 07 06 08 07 09 08 10 09 11 10 12

		ISS EXTERNAL SURVEY											FD09	
S T S - 1 1 8	CDR/SUIT IV KELLY	POST EVA WH20 MTX	PRE SLEEP	PMC A/G	PRE SLEEP	SLEEP						POST SLEEP		
	PLT HOBAUGH	CXFC WFCE RA	PRE SLEEP			SLEEP						POST SLEEP		
	MS1/IV CALDWELL	MISE*	PRE SLEEP			SLEEP						POST SLEEP		
	MS2/EV1 MASTRACCHIO	POST EVA WH20 MTX	PRE SLEEP			SLEEP						POST SLEEP		
	MS3 WILLIAMS	POST EVA WH20 MTX	BSA INIT	PRE SLEEP			SLEEP						POST SLEEP	
	MS4 MORGAN	MISE*	XFA EG RUP	PRE SLEEP - SHAB			SLEEP						POST SLEEP - SHAB	
	MS5 DREW	*XFA EG RUP	XFER BRIEF	PRE SLEEP			SLEEP						POST SLEEP	
E X P 1 5	ISS CDR YURCHIKHIN	EXDL EVL DLDL	PSRL EEL EP	DPC	PRE SLEEP	SLEEP (8.5)						POST SLEEP		
	FE-1 KOTOV	PWR OR PK	PRE SLEEP	DPC	PRE SLEEP	SLEEP (8.5)						POST SLEEP		
	FE-2/EV3 ANDERSON	POST EVA WH20 MTX	DPC	PRE SLEEP	SLEEP (8.5)						POST SLEEP			
S T S	DAY/NIGHT ORBIT	[ORBIT TRACK]												
	TDRS	W -171	[TDRS TRACK]											
		E -46	[TDRS TRACK]											
	Z -275	[TDRS TRACK]												
	ORB ATT	BIAS -XLV -ZVV												
	SSRMS	WS4 PDGF2												
	NOTES	*PWR XFER (2) @CMS-RED+ACCES-INSPECT *Xfer												

GMT 08/16/07 (228)
 β = 8.77
 MET Day 007

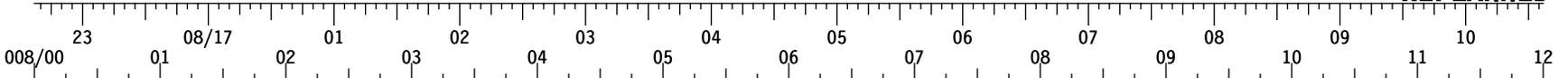
12 11 13 12 14 13 15 14 16 15 17 16 18 17 19 18 20 19 21 20 22 21 23 22 008/00

STS-118	FD09	CDR KELLY	POST SLEEP	EVA TRNG PKG & RVW										EVA TAGUP	MEAL	OFF DUTY					CDI BAWN TICI ML#6	EXERCISE	CTW CRM #6	CX FER	PWR #5 FILL	PX WFER	
		PLT HOBAUGH	POST SLEEP	02 RECONFIG TO XFER	02 ^	H/L AUD CK	EXERCISE			XFER		MEAL	OFF DUTY					PFC OCA	IFM LHA R&R			PC RLO ASE					
		MS1 CALDWELL	POST SLEEP	EVA TRNG PKG & RVW										EVA TAGUP	MEAL	OFF DUTY					W LES	XFER	PFCE OCAS	XFER	EXERCISE		
		MS2 MASTRACCHIO	POST SLEEP	EVA TRNG PKG & RVW										EVA TAGUP	MEAL	OFF DUTY					EVA TOOL GATHER			T-RAD & EWA PREP			
		MS3 WILLIAMS	POST SLEEP	EVA TRNG PKG & RVW										EVA TAGUP	MEAL	OFF DUTY					EVA TOOL GATHER			T-RAD & EWA PREP			
		MS4 MORGAN	POST SLEEP - SHAB	XUP FRD ATE T	SP LE ED	PE AD VE E ND D *	POST SLEEP	EXERCISE			PE AV OE NT	XFER	H A M	XFER	MEAL	OFF DUTY					XFER			XT FA EG RU P	XFER BRIEF		
	MS5 DREW	POST SLEEP	PTV 05 PAO SU	PE AD VE E ND D *	SP OL LP S PK	PTV 05 PAO SU	PLYBK OPS	PE AV OE NT	XFER			MEAL	OFF DUTY					XFER	EXERCISE	XT FA EG RU P	PRE SLEEP						
EXP 15	ISS CDR YURCHIKHIN	POST SLEEP	PREP WORK	BO K3	MC DIV NRS TL	EDB FILL	BO K3	COX MNT	IMV FLOW MEASR	BO K3	XFER		MIDDAY-MEAL	SODF WARN	EXERCISE TVIS		EXERCISE VELO+RED	XFER	PW RO ER PK	DPC	PW RO ER PK						
	FE-1 KOTOV	POST SLEEP	PREP WORK	S U	DPC	IMS EDIT	OP GR #	S U	EXERCISE VELO+RED		EXERCISE TVIS		OP R K E W S	MIDDAY-MEAL	Φ-CB-BT7-MNT		B O 5	Γ A H K	P50 3-2 MSR	PW RO ER PK	DPC	PW RO ER PK					
	FE-2 ANDERSON	POST SLEEP	GLOVE PHOTO	DPC	PREP WORK	SE ED	02 RECONFIG TO XFER	02 ^	PH LA UD CK	M E T X #	B S A *	EMU BATT RCHG INIT	PMC	J R N L	MIDDAY-MEAL	OFF DUTY		EXERCISE CEVIS		EXERCISE RED	EX P R O P K	DPC	PW RO ER PK				
STS	DAY/NIGHT ORBIT																										
	TDRS																										
ORB ATT																											
NOTES	*PREP WORK ^RECONNECT ^INIT *TERM *CONFIG *STOW #XFER TO STS #INIT *TERM BIAS -XLV -ZVV *DISABLE *ENABLE ^FILTER CK																										

GMT 08/16/07 (228)

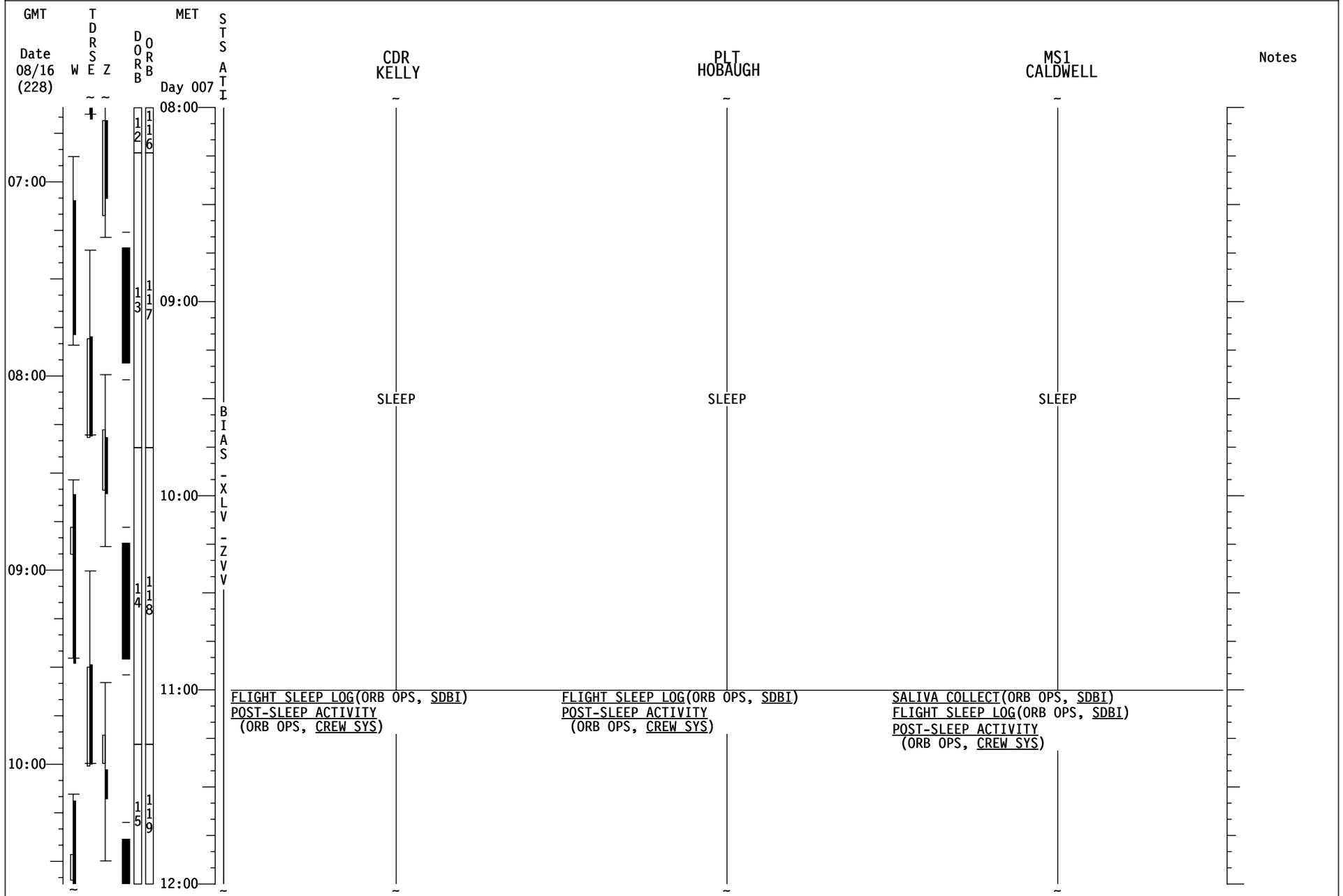
β=6.33

MET Day 008

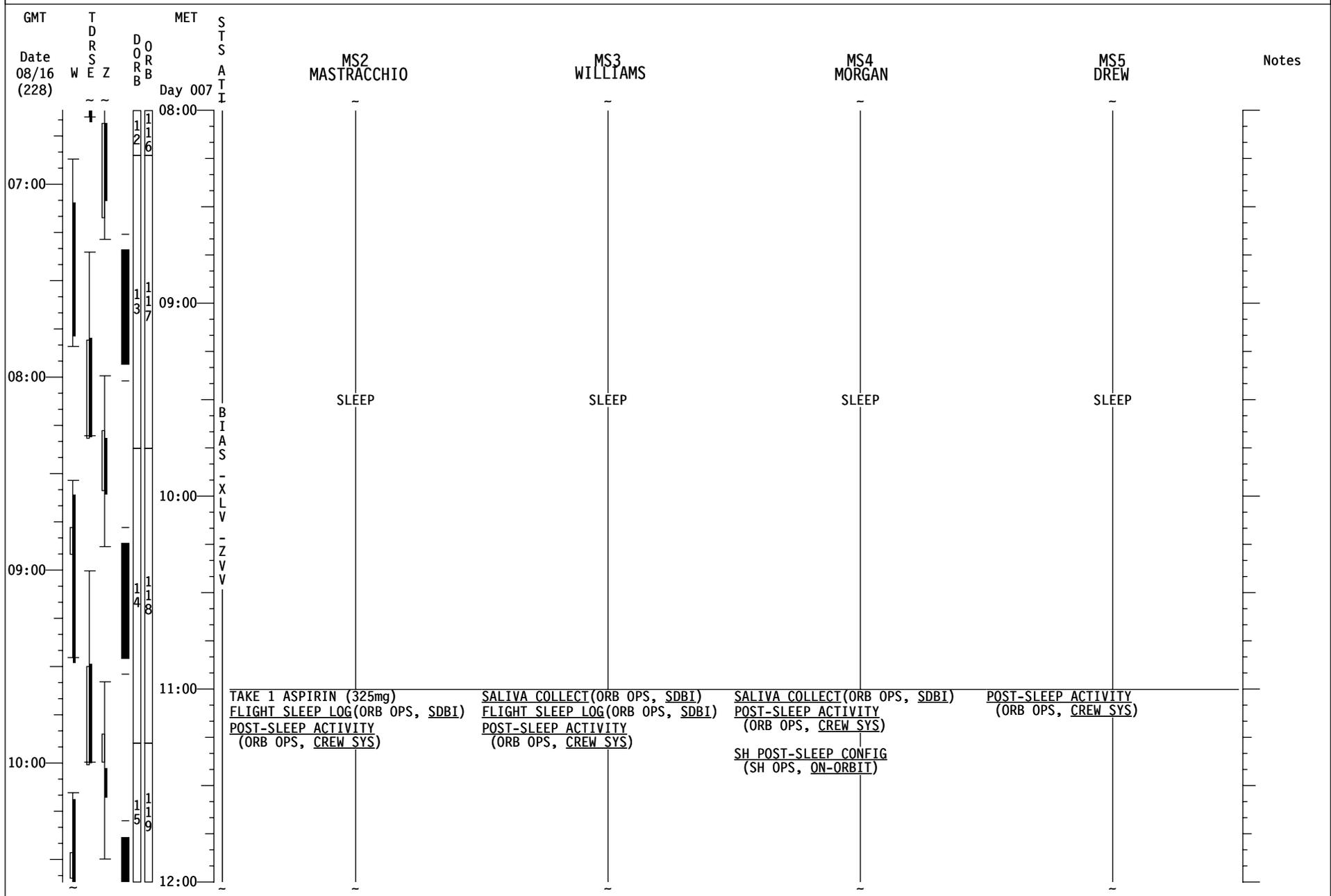


S T S - 1 1 8	FD09	CDR KELLY	PRE SLEEP	PMC A/G	PRE SLEEP	SLEEP					FD10	POST SLEEP
		PLT HOBAUGH	PRE SLEEP		SLEEP						POST SLEEP	
		MS1 CALDWELL	PRE SLEEP		SLEEP						POST SLEEP	
		MS2 MASTRACCHIO	PRE SLEEP		SLEEP						POST SLEEP	
		MS3 WILLIAMS	PRE SLEEP		SLEEP						POST SLEEP	
		MS4 MORGAN	PRE SLEEP - SHAB		SLEEP						POST SLEEP - SHAB	
		MS5 DREW	PRE SLEEP	PFC A/G	PRE SLEEP	SLEEP						POST SLEEP
E X P 1 5		ISS CDR YURCHIKHIN	PRE SLEEP		SLEEP (8.5)						POST SLEEP	
		FE-1 KOTOV	PRE SLEEP		SLEEP (8.5)						POST SLEEP	
		FE-2 ANDERSON	PRE SLEEP		SLEEP (8.5)					MO 9	POST SLEEP	
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]										
	ORB ATT	BIAS -XLV -ZVV										
	NOTES											

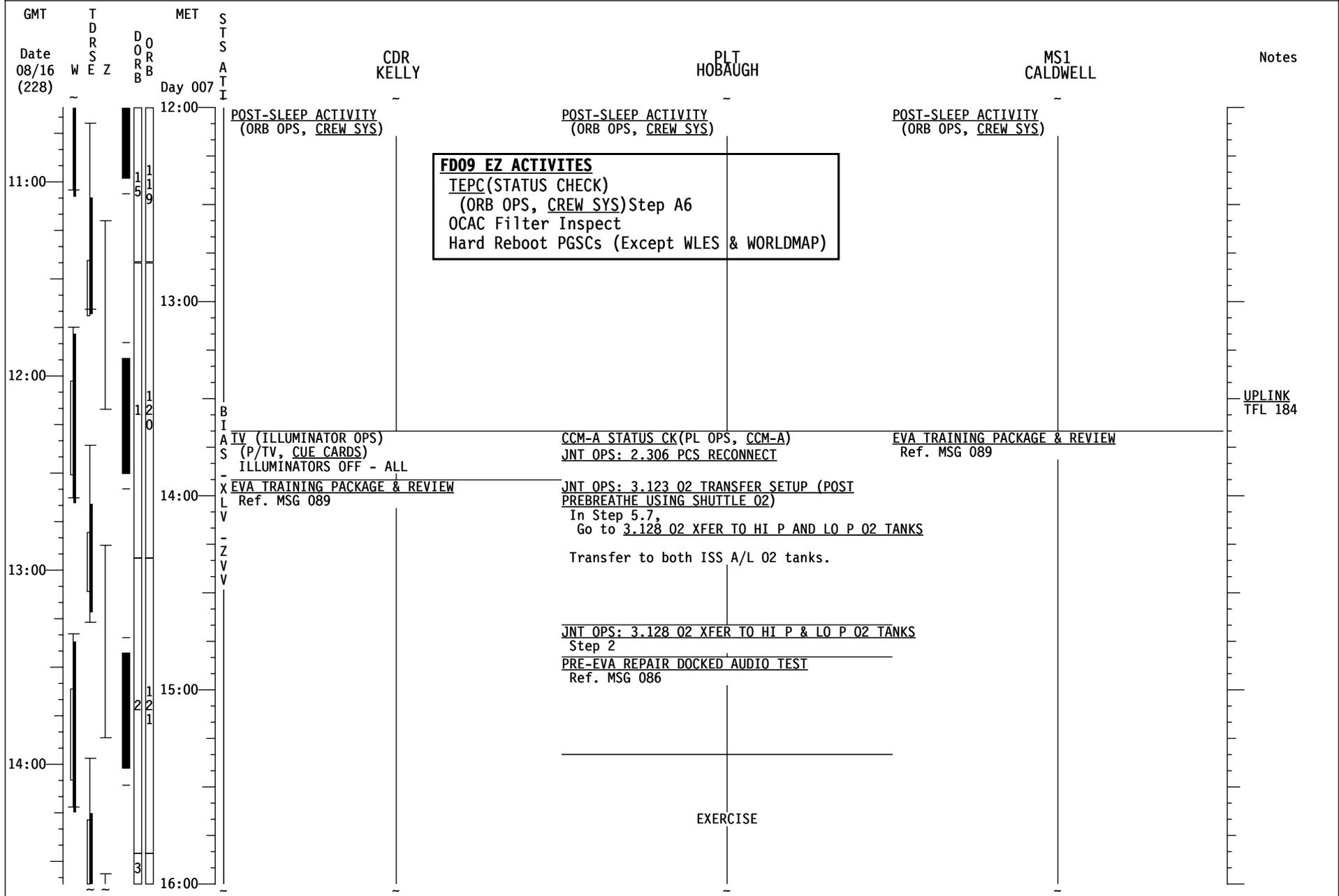
STS-118 FD09



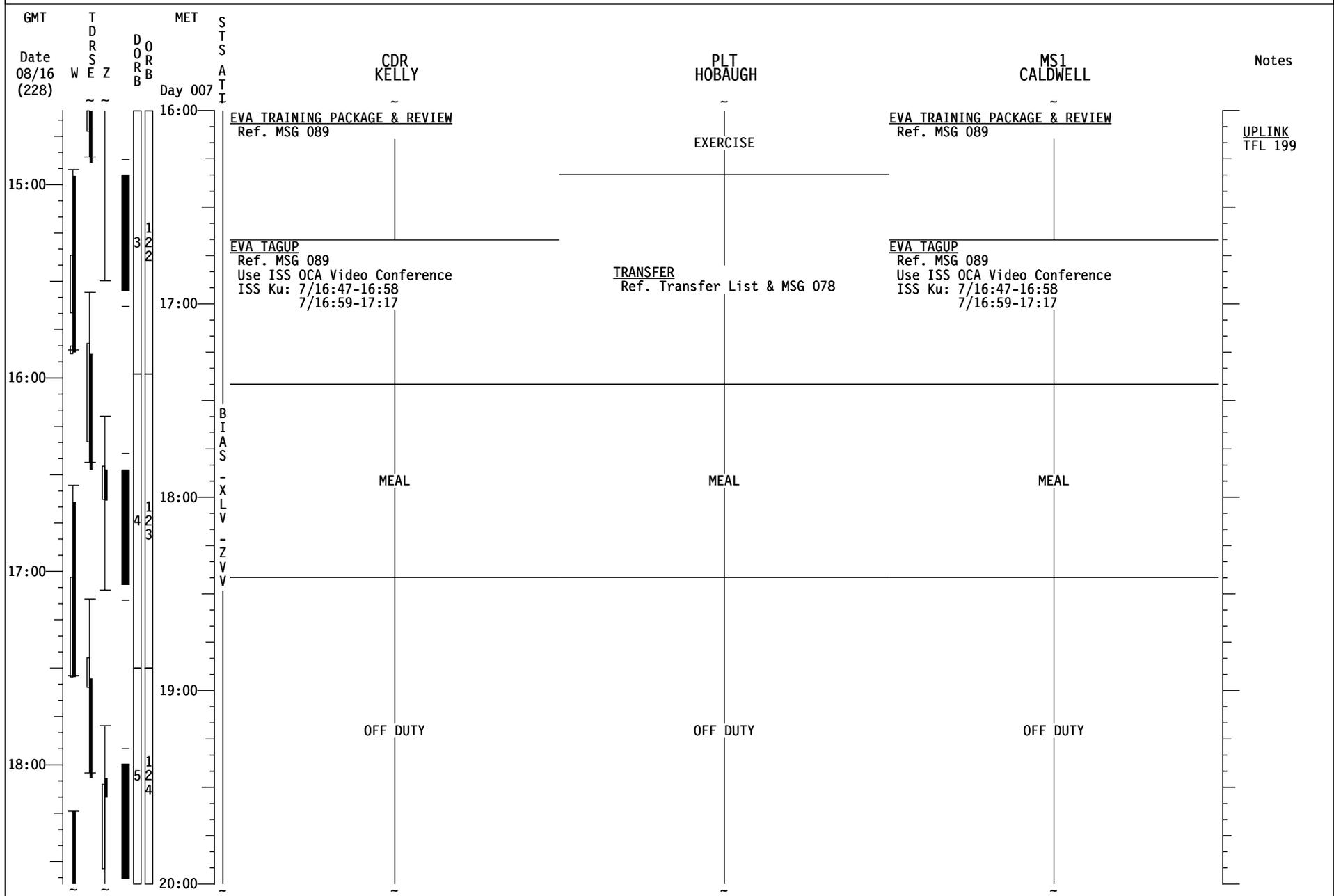
STS-118 FD09



STS-118 FD09



STS-118 FD09



STS-118 FD09

GMT	T D R S E Z	MET	S T S	MS2	MS3	MS4	MS5	Notes
Date	W	Day	A T I	MASTRACCHIO	WILLIAMS	MORGAN	DREW	
08/16		007						
(228)								
16:00				<u>EVA TRAINING PACKAGE & REVIEW</u> Ref. MSG 089	<u>EVA TRAINING PACKAGE & REVIEW</u> Ref. MSG 089	<u>TRANSFER</u> Ref. MDDK Xfer List: Items 424, 424.4, 701, 803 SH Xfer List: Items 405, 407, 429, 626, 631, 402, 418, 418.15, 728, 748, 418.16 Ref. MSG 078		
15:00				<u>EVA TAGUP</u> Ref. MSG 089 Use ISS OCA Video Conference ISS Ku: 7/16:47-16:58 7/16:59-17:17	<u>EVA TAGUP</u> Ref. MSG 089 Use ISS OCA Video Conference ISS Ku: 7/16:47-16:58 7/16:59-17:17	<u>HAM RADIO PASS</u> Ref. MSG 075 HAM Pass AOS: GMT 15:14:22	<u>TRANSFER</u> Ref. MDDK Xfer List: Items 424, 424.4, 701, 803 SH Xfer List: Items 405, 407, 429, 626, 631, 165-167, 753, 402, 418, 418.15, 728, 748, 418.16 Ref. MSG 078	
17:00						<u>TRANSFER</u> Ref. Transfer List & MSG 078		
16:00								
18:00				MEAL	MEAL	MEAL	MEAL	
17:00								
19:00				OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	
18:00								
20:00								

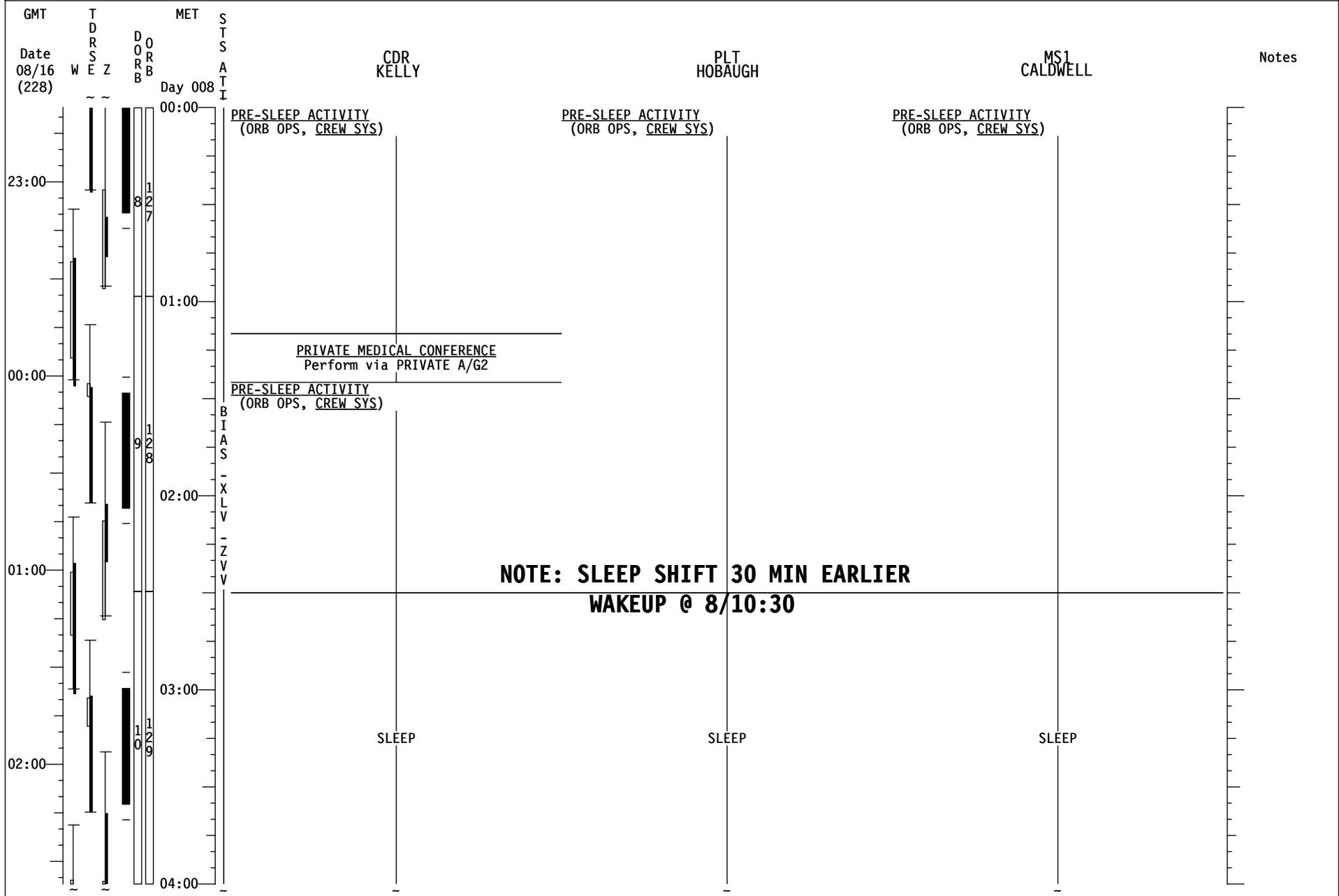
STS-118 FD09

GMT	TDRSEZ	MET	STS	Notes		
Date 08/16 (228)	W E Z	Day 007	A T I			
			CDR KELLY			
			PLT HOBAUGH			
			MS1 CALDWELL			
19:00			OFF DUTY			
20:00			OFF DUTY			
21:00			OFF DUTY			
20:00			<p><u>CBTM STATUS CHECK</u> (PL OPS, CBTM)</p> <p><u>STS/ISS H2O CNTR FILL</u> (ORB OPS, ECLS) Init CWC FILL#6 Duration ~50min, Ref. MSG 085</p>	<p>PFC:NETMEETING VID CONF(ORB OPS, PGSC) Omit VLHS item - Step 1, Omit Step 3 Use A/G2 for audio & KFX PGSC Ku Avail: 21:05-21:30</p> <p><u>IFM LAMP HOUSING ASSEMBLY R&R</u> Verify MCC-H has safed LHAs for maintenance.</p> <p>Repair and Replace Two LHAs (LAB10P1 and LAB10S5)</p> <p>Execute MSG 080, Steps 2.2-5.2 Ref. Transfer List: Items 418.16</p>	<p><u>DISABLE WLES FILE B/U(ORB OPS,WLE SENSORS)</u></p> <p><u>TRANSFER</u> Ref. Transfer List & MSG 078</p>	OCA-PFC
22:00			EXERCISE			
21:00						
22:00						
23:00						
22:00						
00:00						
			<p><u>PWR FILL</u> (ORB OPS, ECLS) Perform <u>WATER FILL</u> #5 Ref. MSG 085, S/N 1013</p> <p><u>PWR TRANSFER</u> Transfer 1 PWR to ISS Ref. MSG 085</p>	<p><u>PFC:NETMEETING VID CONF(ORB OPS, PGSC)</u> Omit VLHS item - Step 1, Omit Step 3 Use A/G2 for audio & KFX PGSC Ku Avail: 21:46-22:02</p> <p><u>ENABLE WLES FILE B/U(ORB OPS,WLE SENSORS)</u></p> <p><u>TRANSFER</u> Ref. Transfer List & MSG 078</p> <p>EXERCISE</p>		
			<p><u>CCM-A STATUS CK(PL OPS, CCM-A)</u></p>	L17 Check MCIU filter screen		

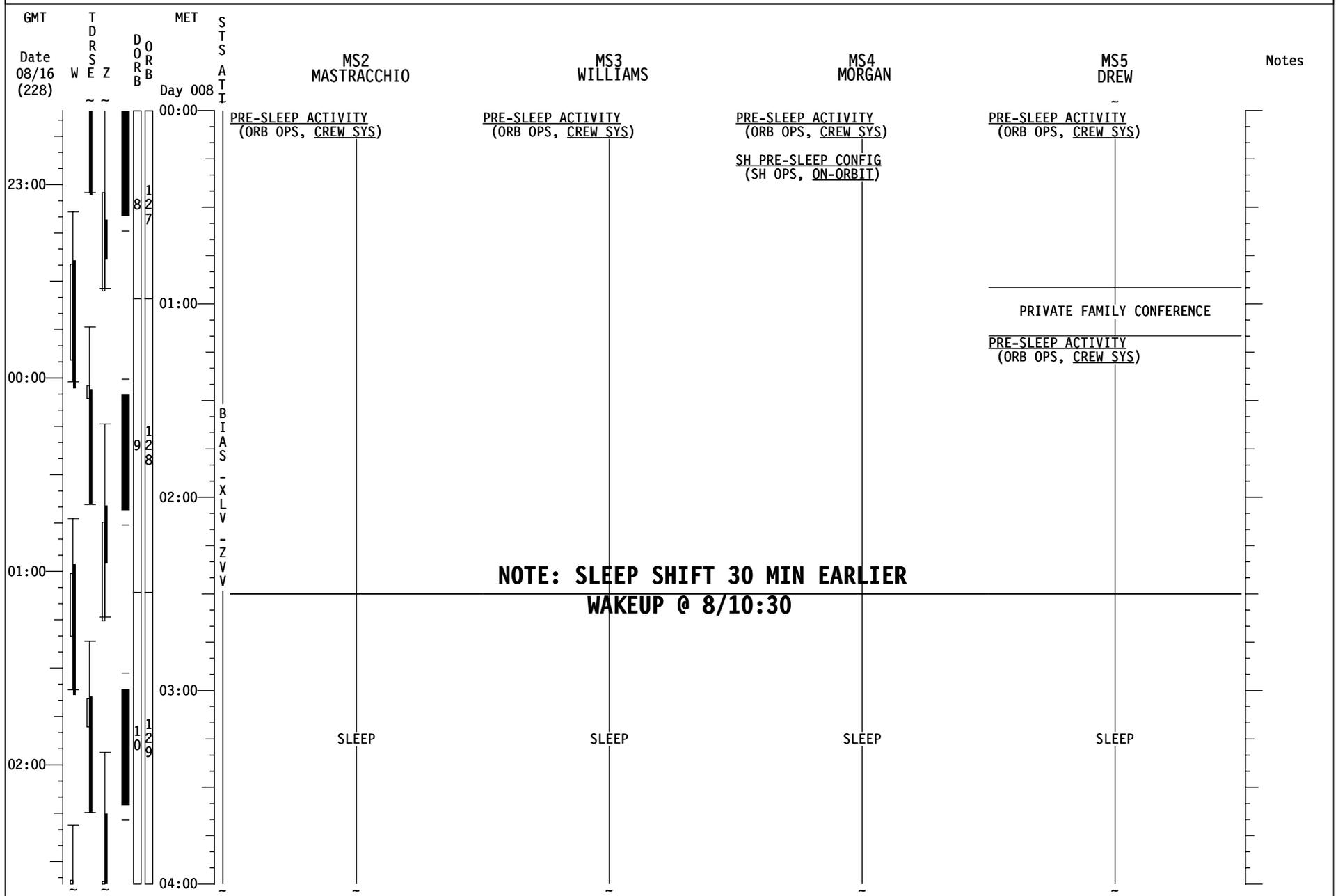
STS-118 FD09

GMT Date 08/16 (228)	T D R S E Z	MET Day 007	STS A T T I	MS2 MASTRACCHIO	MS3 WILLIAMS	MS4 MORGAN	MS5 DREW	Notes
		20:00		OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	
		21:00		<u>EVA TOOL GATHER</u> Ref. MSG 081	<u>EVA TOOL GATHER</u> Ref. MSG 081			
		22:00				<u>TRANSFER</u> Ref. Transfer List & MSG 078		
		21:00				<u>TRANSFER</u> Ref. Transfer List & MSG 078		
		23:00		<u>T-RAD & EWA PREP</u> Ref. MSG 091	<u>T-RAD & EWA PREP</u> Ref. MSG 091			
		22:00				DAILY STS/ISS CREW TRANSFER TAGUP	DAILY STS/ISS CREW TRANSFER TAGUP	
		00:00				DAILY TRANSFER BRIEFING	<u>PRE-SLEEP ACTIVITY</u> (ORB OPS, CREW SYS)	
							EXERCISE	

STS-118 FD09



STS-118 FD09



MSG 077 (15-0946) - FD09 MISSION SUMMARY

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Good Morning Crew!

The EVA machine is well-oiled now. Rick and Clay, your efficiency on EVA 3 kept you well ahead of the timeline and minimized the impact of the glove tear. Thanks for the highly detailed, well-focused and well exposed photos of the damage...your photo-TV instructor is smiling.

We're looking forward to another great educational PAO opportunity today. Also, as you can see, you've also earned some much deserved time off later in the day's schedule. Take time and enjoy yourself.

The MMT summary has the details, but the short story on damage assessment is that the Arc Jet tests are thus-far supporting the CFD analysis and indicate that a repair may not be necessary. An additional arc jet test was conducted last night and these results along with the peer review of the CFD analysis and QA of the model will be the final determining factor.

We have tried to leave as much flexibility in today's Flight Plan as possible by deferring the actual retrieval of the repair tools until after lunch. The idea, of course, is to avoid gathering items we will only have to re-stow if the repair is not required. We're hoping for a lunch-time decision, but in the event it is delayed we will have to begin opening bags.

Your lengthy repair EVA training package is available for your review.

Have yet another great day in space!

YOUR CURRENT ORBIT IS: 186 x 184 NM

NOTAMS:

EDW – EDWARDS: RWY 15/33 ELS ONLY. RWY 18L NOT USABLE

NOR – NORTHROP: RWY 17 GREEN. RWY23 STILL RED - WET.

ZZA – ZARAGOZA: FIRST 600 METERS OF RWY 30L NOT AVAILABLE 0600Z-1800Z DAILY.

YHZ – HALIFAX: RWY 14/32 CLOSED DAILY 1130Z-2100Z 13 AUG TO 17 AUG.

RWY 23 THDL DISPLACED 1,200' 1130Z-2100Z 13 AUG TO 17 AUG.

MRN – MORON: CLOSED TO DOD OPERATIONS 1900Z TO 0259Z DAILY

NKT – CHERRY POINT: RWY 14R/32L CLOSED 13 AUG TO 16 SEP.

HNL – HONOLULU: CAUTION FOR POSSIBLE TROPICAL CYCLONE WINDS TIL 16 AUG 2359Z.

WAK – WAKE ISLAND: CLOSED DUE TO RECONSTRUCTION.

YYR – GOOSE BAY: RWY 08/26 CLOSED. 16/34 AVAILABLE.

IKF – KEFLAVIK: NO AGREEMENT FOR USE.

AWG – RIO GALLEGOS: NO AGREEMENT FOR USE.

MSG 077 (15-0946) - FD09 MISSION SUMMARY

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NEXT 2 PLS OPPORTUNITIES:

EDW22 ORB 126 – 7/22:49 (SCT120 SCT220 230/14P22)
EDW22 ORB 141 – 8/21:36 (SCT120 SCT220 230/15P24)

OMS TANK FAIL CAPABILITY:

L OMS FAIL: NO
R OMS FAIL: NO

LEAKING OMS PRPLT BURN:

L OMS LEAK: ALWAYS BURN RETROGRADE
R OMS LEAK: ALWAYS BURN RETROGRADE

OMS QUANTITIES(%)

L OMS OX = 45.9 R OMS OX = 44.9
 FU = 46.0 FU = 44.9

SUBTRACT I'CNCT COUNTER FOR CURRENT OMS QUANTITIES

DELTA V AVAILABLE:

OMS	382 FPS
<u>ARCS (TOTAL ABOVE QTY1)</u>	<u>39 FPS</u>
TOTAL IN THE AFT	421 FPS
ARCS (TOTAL ABOVE QTY2)	69 FPS
FRCS (ABOVE QTY 1)	32 FPS
AFT QTY 1	83 %
AFT QTY 2	45 %

<u>SYSTEM</u>	<u>FAILURE</u>	<u>IMPACT</u>	<u>WORK AROUND</u>
OMS	LOMS N2 Tank is experiencing pressure decay at a rate of approximately 0.55 psi/hr.	At the current leak rate there is no impact to operations. If the leak rate increases, a single start still remains in the accumulator.	No action required.

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MSG 078 (15-0947) - FD09 TRANSFER MESSAGE

Page 1 of 12

1 Good morning Barb, Al & Dave,

2

3 You continue to impress us. With the early termination of the EVA yesterday, you gained an
4 additional ~4 hours of transfer. Even so, you completed approximately 50% more than we
5 expected yesterday. Please remember how you did this, so we can learn your secrets when
6 you return. You are now approximately 69% complete with SH transfers and 72% complete
7 with MDDK transfers.

8

9 There are a few updates to the Transfer List books. We've added a new CWC (item 803) for
10 return in the MDDK on FD11 after the ISS Crew transfers water out of this CWC. We've
11 added a CSA-CP Battery Pack (424.4) to Return Bag 424 per Clay's request. We've also
12 added 2 LHAs (418.16) for return in SH after Scorch R&R's them today.

13

14 For STS, the Transfer List Excel file, FD09_TransferList_STS118.xls, is located on the KFX
15 machine in **C:\OCA-up\transfer**.

16

17 For ISS, the Transfer List Excel file, FD09_TransferList_STS118.xls, is located in **K:\OCA-**
18 **up\transfer**.

19

20 **Q&As:**

21 **Q1: Item 716 (old multimeter):** Al thought the returning multimeter was s/n 1017. IMS
22 indicates that the s/n of the multimeter kit is s/n 1017 and the multimeter itself is s/n 1005.
23 The kit is to remain on ISS inside 0.5 CTB s/n 1202 at NOD1O4_D1. Please confirm the s/n
24 of the returning multimeter.

25

26 **Q2 : Item 753 (3 empty 0.5 CTBs from STS food):** Barb told us yesterday that there was
27 lots of room in SF01, but you did not call 753 as complete. Please verify if these empties
28 are stowed in SF01 and also if you still think there is enough room in this location for an
29 additional bundle of empty food containers.

30

31 **Q3: Item 144 (1.0 CTB from FP10):** Please verify if this item has been transferred. You
32 told us a few days ago you think this happened on FD3, but wanted to verify. Thanks.

33

34 **Q4: Closed out SF rack bays:** Al called soft stowage rack bays 5, 8 and 12 as closed out,
35 but we still show the following items open: item 407 in bay 5; item 405 in bay 8 and item
36 429 in bay 12. Please confirm if these items are complete.

37

38 **A1: MDDK 5MLE Bag Return Layouts:** Reference MSG 84 from MMACS for updated
39 return layouts for Bag A, Bag H and Bag C.

40

41 **A2: Bananas:** Thanks very much for the question. We are considering our options. ☺

42

43 **A3: (Item 718) STS-114 LiOH can #12:** We have one more suggestion on where to locate
44 this can. We remember seeing a can used for a PAO event on FD07 in the LAB. Can you
45 verify there is not still a can in the LAB and also that it's not the missing can? As we
46 discussed yesterday, if you cannot find this missing can, please select any STS-121 can
47 with decal # 32-41. Please tell us which can you end up taking to MDDK per item 718 in
48 place of can #12.

49

50 **A4: Items 409, 430 (3.0 CTBs of KURS):** Just a reminder to check that the 'oval eyes' are
51 facing either the port or starboard wall.

MSG 078 (15-0947) - FD09 TRANSFER MESSAGE

Page 2 of 12

1 **For today – FD09 Choreography**

2 Middeck

- 3 – Items 424, 701, 803: Pack up 5MLE bags in MDDK

4

5

6 Spacehab

- 7 – Items 405, 407, 429, 626, 631: Continue packing return items in SF Rack

- 8 – Items 165-167, 753 (AI): Empty STS food CTBs into MDDK locker(s); stow empty
9 0.5 CTBs in SH for return.

- 10 – Install SF rack front trays (60 min)

- 11 – Items 402, 418, 418.15, 728, 748: Begin packing items on SF rack front

- 12 – Items 418.16: (PLT) Return LHAs after Lamp Housing Assy R&R; add to 418

13

14

15

16 **Please update the Middeck Transfer List as follows:**

17

18 In **LAYOUTS** tab:

19 Make Pen and Ink changes to Page ML-2:

20 Delete “Foam/tape” from Bag G

21 Add “Item 803 (CWC)” to Bag H

22

23 In **RETURN** tab:

24 Replace Return Page 2

25 Replace Return Page 6

26

27 In **MDD RTN REALTIME ADDITIONS** tab:

28 Replace Return Page 7

29

30

31 **Please update the Spacehab Transfer List as follows:**

32

33 In **LAYOUTS** tab:

34 Make Pen and Ink changes

35 Page SL-6:

36 Add “Return item 802 (1.0 CTB)” to AC05

37 Delete “Return Item 744” from AC17

38 Add “Return Item 744” to AS01

39 Page SL-7:

40 At SF01, change Return Item 623 from ‘0.5 CTB’ to ‘1 bundle’

41 Add “Return item 418.16 (LHAs)” to SF18

42 Page SL-8:

43 Correct BBA item number from “425.1” to “425.13”

44 Page SL-10:

45 Delete “Return item 744” from AC17 3.0 CTB

46 Page SL-13:

47 Add “Return item 744” to AS01 5MLE bag

48

49 In **SWAP** tab:

50 Replace Swap Page 8

51

MSG 078 (15-0947) - FD09 TRANSFER MESSAGE

Page 3 of 12

1 In **RETURN** tab:

2 Replace Return Page 9

3 Replace Return Page 23

4

5

6 **For tomorrow - FD10 Choreography**

7 Middeck

8 - Continue MDDK return transfers

9

10

11 Spacehab

12 - Transfer return bags/items into SH aft and fwd bulkhead

13

14

15

16 Please call us with questions.

17 - The Transfer Team

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MSG 080 (15-0950) - LAMP HOUSING ASSEMBLY R&R

Page 1 of 7

OBJECTIVE:

Remove and replace a failed Lamp Housing Assembly (LHA) to repair the General Luminaire Assembly (GLA).

LOCATION:

Stowed: 2 LHAs in NOD1O1 {3.0 CTB: NODE2 VEST OUTFIT/ALIGN GUIDES/LHAs, S/N 1120 (Inside Foam Cushion Part 2 or 3)}

Installed:

LAB1OP 1
LAB1OS 5

DURATION:

30 minutes

15 minutes for safing and gathering tools

CREW:

One

PARTS:

Lamp Housing Assembly P/N 219010

MATERIALS:

Sharpie
Gray Tape
Kapton Tape
Ziplock Bag

TOOLS:

Vacuum Cleaner Assembly and Attachments P/N SEG39125637-301
DCS 760 Camera
Goggles

ISS IVA Toolbox:

Drawer 2:

1/8" Hex Head, 1/4" Drive
Driver Handle, 1/4" Drive

Drawer 5:

Static Wrist Tether

REFERENCED PROCEDURE(S):

1.226 ARIS/SAMS MOUNTING BRACKET REMOVE AND REPLACE

MSG 080 (15-0950) - LAMP HOUSING ASSEMBLY R&R

Page 2 of 7

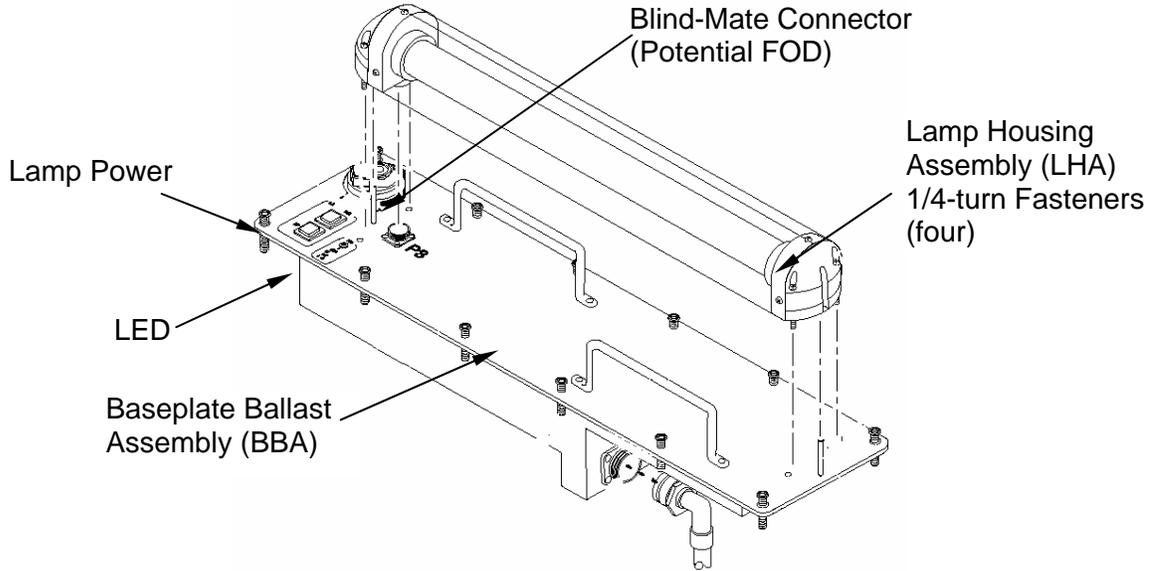


Figure 1.- General Luminaire Assembly (GLA).

1. SAFING

Record P/N of replacement LHA: _____

Record S/N of replacement LHA: _____

WARNING
Failure to remove power can result in electrical shock hazard.

1.1 pb LAMP POWER → Off
Refer to Figure 1.

1.2 Verify LED not illuminated

Table 1. Node 1 GLAs

GLA	Location	RPCM [Y]	RPC [Z]
Lt Int NOD1OP4	NOD1OP4	RPCM N14B C	RPC 2
Lt Int NOD1OS4	NOD1OS4	RPCM N13B A	RPC 5
Lt Int NOD1PD2	NOD1PD2	RPCM N13B B	RPC 1
Lt Int NOD1SD2	NOD1SD2	RPCM N14B B	RPC 1
Lt Int NOD1OP2-1	NOD1OP2 (Fwd)	RPCM N14B C	RPC 15
Lt Int NOD1OS2-1	NOD1OS2 (Fwd)	RPCM N13B C	RPC 1
Lt Int NOD1OP2-2	NOD1OP2 (Aft)	RPCM N14B C	RPC 16
Lt Int NOD1OS2-2	NOD1OS2 (Aft)	RPCM N13B A	RPC 13

Table 2. LAB GLAs

GLA	Location	RPCM [Y]	RPC [Z]
Lt Int LAB1OS1	LAB1OS1	RPCM LA1B F	RPC 1
Lt Int LAB1OS2	LAB1OS2	RPCM LA2B B	RPC 5
Lt Int LAB1OS3	LAB1OS3	RPCM LA1B F	RPC 2
Lt Int LAB1OS4	LAB1OS4	RPCM LA2B B	RPC 6
Lt Int LAB1OS5	LAB1OS5	RPCM LA1B F	RPC 3
Lt Int LAB1OS6	LAB1OS6	RPCM LA2B B	RPC 7
Lt Int LABOP1	LAB1OP1	RPCM LA2B A	RPC 1
Lt Int LABOP2	LAB1OP2	RPCM LA1B A	RPC 1
Lt Int LABOP3	LAB1OP3	RPCM LA2B A	RPC 2
Lt Int LABOP4	LAB1OP4	RPCM LA1B A	RPC 2
Lt Int LABOP5	LAB1OP5	RPCM LA2B A	RPC 3
Lt Int LABOP6	LAB1OP6	RPCM LA1B A	RPC 3

Table 3. Airlock GLAs

GLA	Location	RPCM [Y]	RPC [Z]
Lt Int AIR1OF1	A/L1OF1	RPCM AL2A3B A	RPC 4
Lt Int AIR1OA1	A/L1OA1	RPCM AL2A3B B	RPC 9
Lt Int AIR1F3	Crewlock Fwd	RPCM AL2A3B A	RPC 12
Lt Int AIR1A3	Crewlock Aft	RPCM AL2A3B A	RPC 13

Table 4. MPLM GLAs

GLA	Location	PDB Details[Y]	RPC [Z]
Lt Int MPL1PA4(#8)	MPL1PA4	PDB	RPC 09
Lt Int MPL1PF4(#4)	MPL1PF4	PDB	RPC 05
Lt Int MPL1PA3(#7)	MPL1PA3	PDB	RPC 08
Lt Int MPL1PF3(#3)	MPL1PF3	PDB	RPC 04
Lt Int MPL1PA2(#6)	MPL1PA2	PDB	RPC 07
Lt Int MPL1PF2(#2)	MPL1PF2	PDB	RPC 03
Lt Int MPL1PA1(#5)	MPL1PA1	PDB	RPC 06
Lt Int MPL1PF1(#1)	MPL1PF1	PDB	RPC 02

1.3 Opening GLA RPCs

Refer to Tables 1, 2, 3, 4

NOTE

[X] refers to individual elements (i.e., NODE 1, LAB1, AIRLOCK, or MPLM)

MSG 080 (15-0950) - LAMP HOUSING ASSEMBLY R&R

Page 4 of 7

PCS

[X]: EPS

If [X] = LAB

sel Lights

Lab_Lights

sel [Y][Z]

[Y][Z]

cmd RPC Position – Open (Verify – Op)

cmd Close Cmd – Inhibit (Verify – Inh)

If [X] = MPLM

sel PDB Details

PDB Details

[Z]

cmd RPC Position – Open (Verify – Op)

If [X] = others

sel RPCM [Y]

[Y]

sel RPC [Z]

[Y][Z]

cmd RPC Position – Open (Verify – Op)

cmd Close Cmd – Inhibit (Verify – Inh)

NOTE

If removing LHA in the LAB1OS1 location, the SAMS Payload Sensor will have to be removed.

2. REMOVAL

- 2.1 If removing LHA in LABOS1 location, perform {1.226 ARIS/SAMS MOUNTING BRACKET REMOVE AND REPLACE} (US_SODF: S&M: NOMINAL: RACK)

WARNING

FOD hazard could cause possible crew eye injury during removal of LHA at blind mate connectors. Crew should don eye protection and use Vacuum Cleaner to remove debris found during removal of LHA.

MSG 080 (15-0950) - LAMP HOUSING ASSEMBLY R&R

Page 5 of 7

- 2.2 Setup Vacuum Cleaner for use at LHA worksite.

CAUTION

BBA parts are sensitive to damage from Electrostatic Discharge (ESD).

- 2.3 Don Goggles, Static Wrist Tether.

NOTE

The bottom of LHA has four non-captive screws, which could come loose, and should be captured (vacuumed). ISS ↓ **MCC-H** at the end of task if any screws were missing and/or captured.



Figure 2.- View of Bottom (Flat Side) of LHA, Indicating Four Screw Locations.

- 2.4 Loosen LHA quarter-turn fasteners (four) from BBA (Driver Handle 1/4" Drive; 1/8" Hex Head).
Refer to Figure 1.
- 2.5 Grasp LHA in middle, pull straight out from BBA.
Refer to Figure 1.
- 2.6 Remove any debris found at LHA, BBA blind mate connectors (Vacuum Cleaner).
- 2.7 Inspect bottom of LHA for missing non-captive screws (four).
Place Tape over all screws, screw holes (if screws missing) (Gray Tape).
Refer to Figure 2.
- 2.8 Record P/N of removed LHA: _____
Record S/N of removed LHA: _____
Record S/N of installed BBA: _____
- 2.9 If LHA failed
| Place tape over LHA connector (Kapton Tape).
| Label LHA, "Failed" (Gray Tape; Sharpie).
| Temporarily stow.

MSG 080 (15-0950) - LAMP HOUSING ASSEMBLY R&R

Page 6 of 7

- 2.10 If LHA being stowed as spare
 - Place Ziplock bag over LHA connector secure with Kapton Tape.
 - Label LHA, "Spare" (Gray Tape; Sharpie)
 - Temporarily stow.

3. REPLACEMENT

- 3.1 Inspect replacement LHA for missing screws (four).
Place Tape over all screws, screw holes (if any screw missing) (Gray Tape).
Refer to Figure 2.
- 3.2 If required, remove any Ziplock Bag and Kapton Tape over LHA connector.
- 3.3 Push LHA straight in until LHA blind-mate connector fully engages BBA.
- 3.4 Tighten LHA to BBA quarter-turn fasteners (four) (Driver Handle, 1/4" Drive; 1/8" Hex Head).
- 3.5 If replacing LHA in LABOS1 location, perform {1.226 ARIS/SAMS MOUNTING BRACKET REMOVE AND REPLACE}, all (US_SODF: S&M: NOMINAL: RACKS)
- 3.6 Photo document final configuration prior to closeout (DCS 760 Camera).
- 3.7 Check for FOD around area within 3' radius.
- 3.8 Doff Goggles, Static Wrist Tether.

4. CHECKOUT

- 4.1 Closing GLA RPCs
Refer to Tables 1, 2, 3, 4.

PCS

[X]: EPS

If [X] = LAB

sel Lights

[Lab Lights]

sel [Y][Z]

[Y][Z]

cmd Close Cmd – Enable (Verify – Ena)

cmd RPC Position – Close (Verify – Cl)

If [X] = MPLM

sel PDB Details

PDB Details

'[Z]'

cmd RPC [Z] Position – Close (Verify – CI)

If [X] = others

sel RPCM [Y]

[Y]

sel RPC [Z]

[Y][Z]

cmd Close Cmd – Enable (Verify – Ena)

cmd RPC Position – Close (Verify – CI)

4.2 pb LAMP POWER → On

4.3 √Lamp is lit, LED is not illuminated

5. POST MAINTENANCE

5.1 ISS ↓ **MCC-H** of task completion along with S/Ns of LHAs installed at LAB1OP1 and LAB1OS5 to MCC-H.

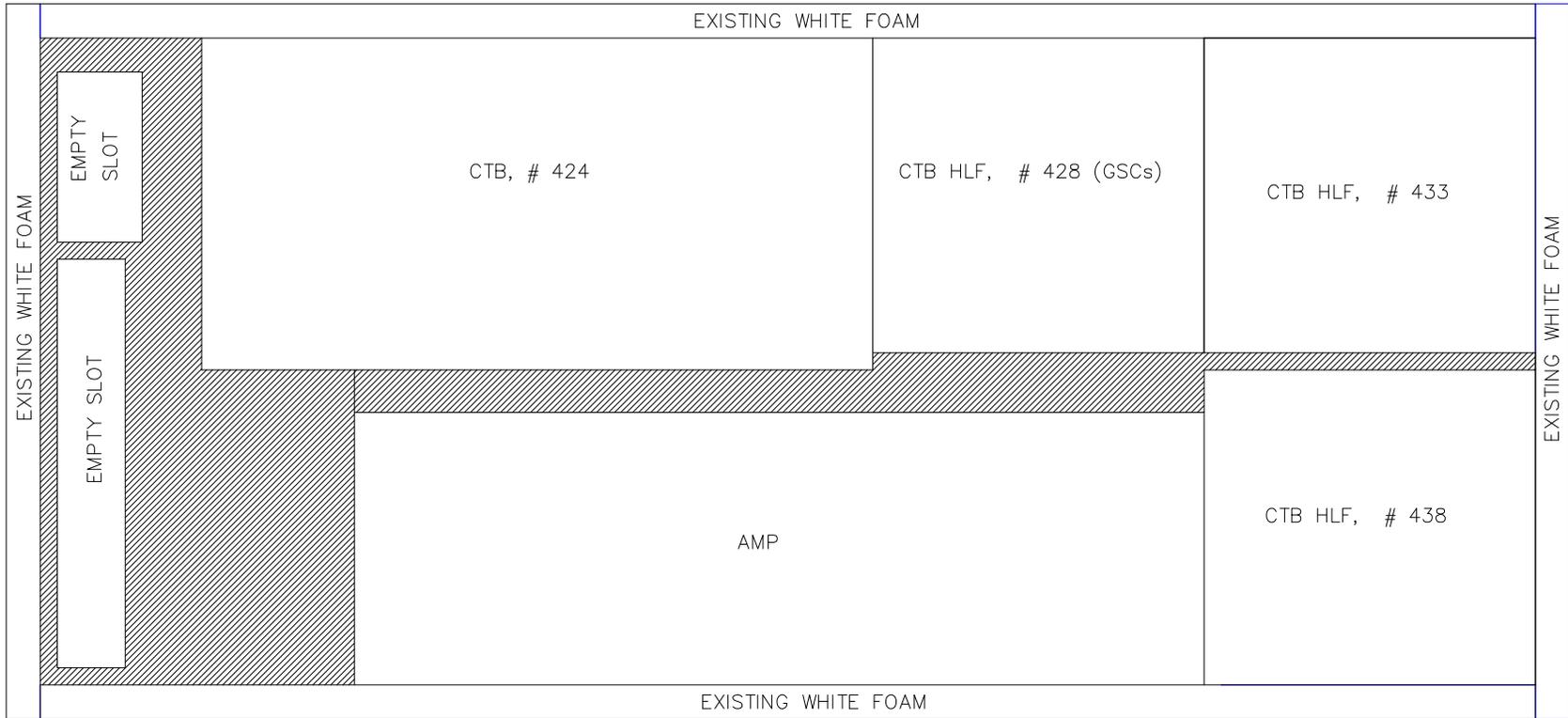
State the number of screws missing or captured from underneath the LHAs.

5.2 Stow removed LHAs S/Ns 0182 & 0177 per 13A.1 Transfer List Return Item 418.16.

Stow tools, materials, Vacuum Cleaner.

MSG 084 - MIDDECK 5 MLE BAG RETURN LAYOUTS

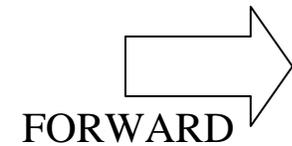
TOP VIEW OF 5 MLE BAG



NOTES:

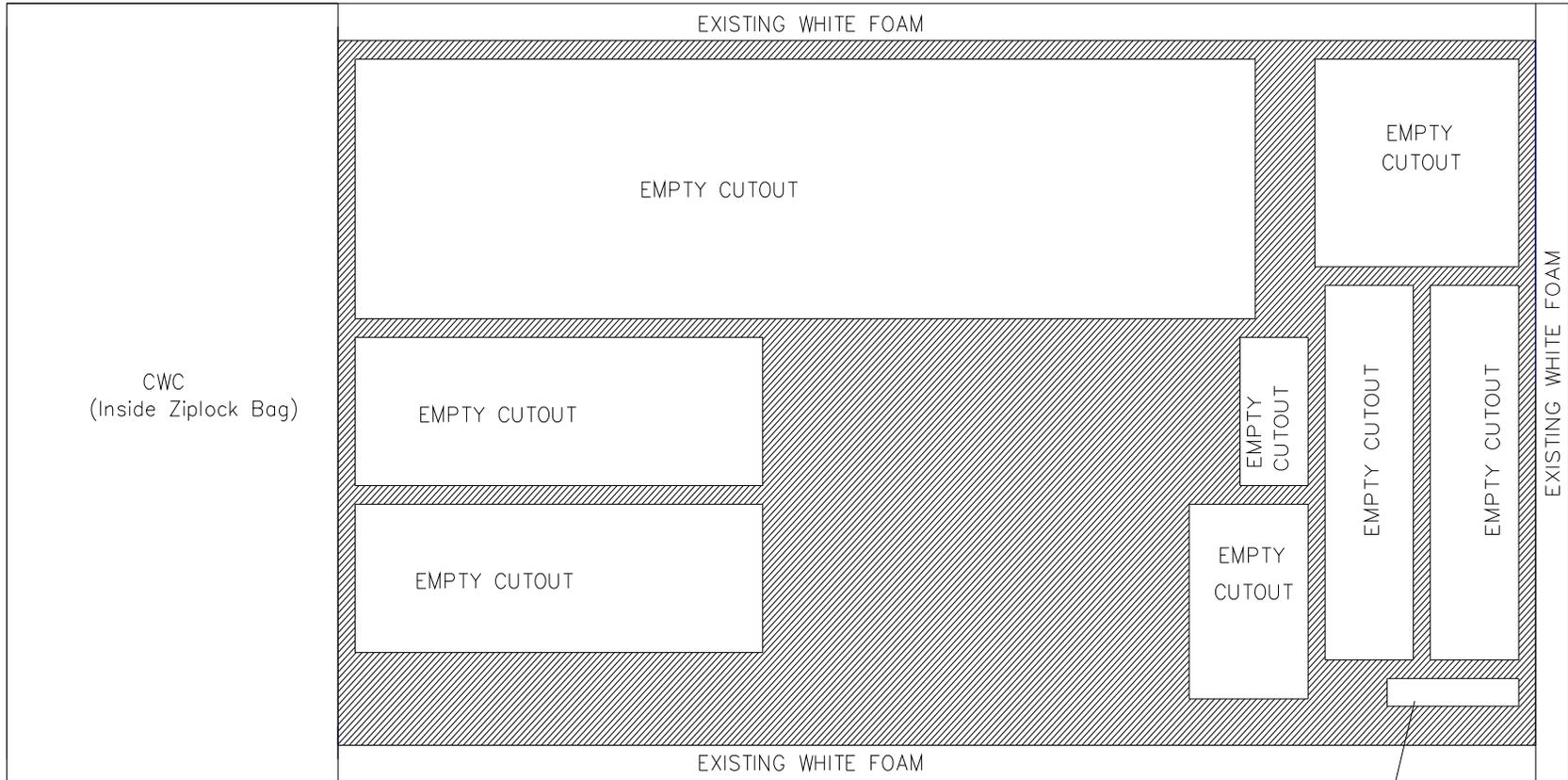
- 1. Hatched area represents existing cushion.

**MD FLOOR PORT 1 (BAG A)
(RETURN LAYOUT)**



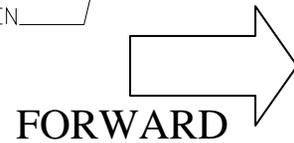
MSG 084 - MIDDECK 5 MLE BAG RETURN LAYOUTS

TOP VIEW OF 5 MLE BAG



NOTE:
HATCHED AREA REPRESENTS EXISITING CUSHION.

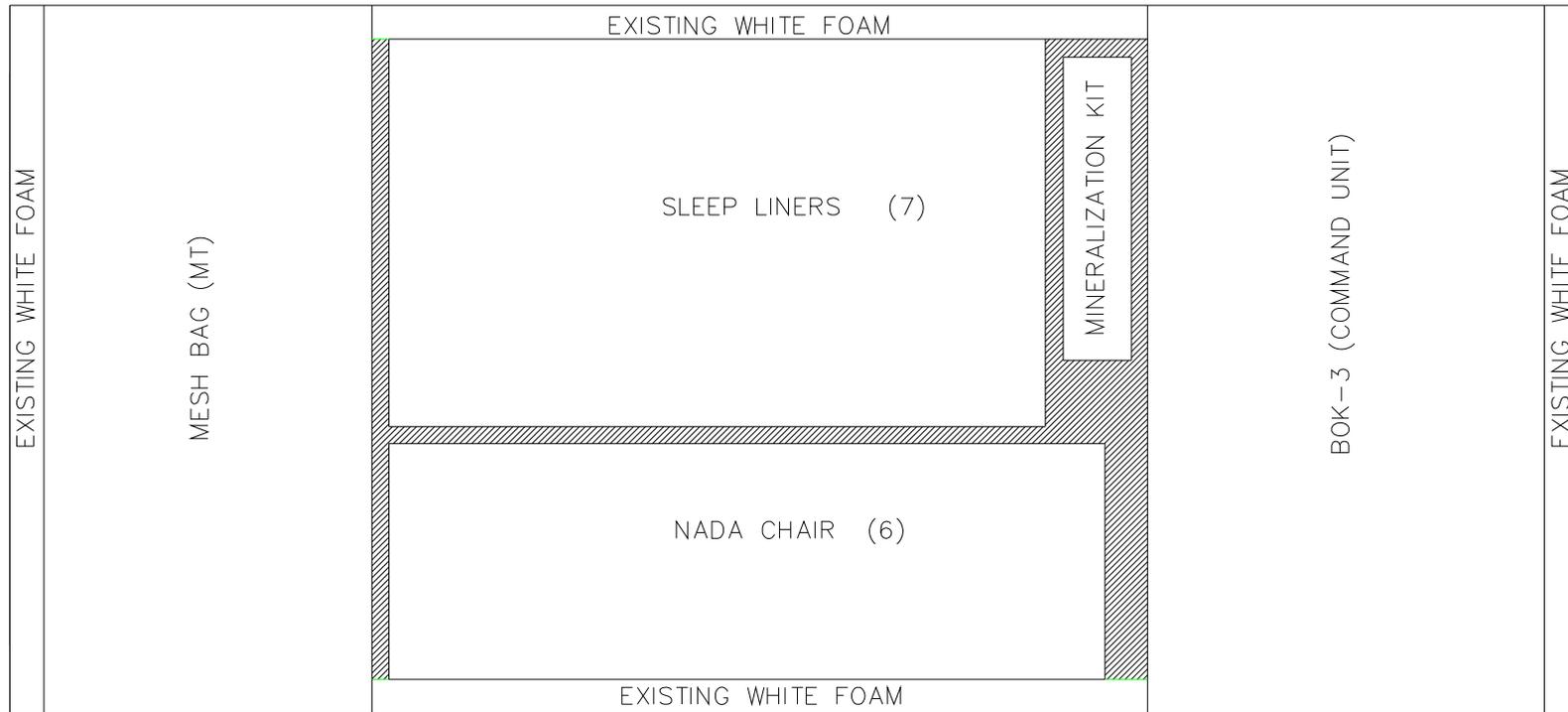
1/4" and 1/2" ALLEN
WRENCH ASSY



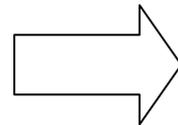
**MD FLOOR PORT 2 (BAG H)
(RETURN LAYOUT)**

MSG 084 - MIDDECK 5 MLE BAG RETURN LAYOUTS

TOP VIEW OF 5 MLE BAG



NOTE:
1. HATCHED AREA REPRESENTS EXISTING FOAM



FORWARD

**MD FLOOR STBD 1 (BAG C)
(RETURN LAYOUT)**

STS-118 Water Ops Cue Card

FLIGHT DAY 9	
CWC Fill #6 - Technical (Green Label)	PWR Fill #5 (White Label)
Use CWC S/N 1074 in ISS NOD1P2 Mesh Bag	PWR S/N 1013 temp stowed on Middeck following FD7 Water Dump
Use Biocide Kit S/N 1001 in ISS NOD1P2 Mesh Bag	<input type="checkbox"/> Verify White Label in PWR window
<input type="checkbox"/> Biocide Only	<input type="checkbox"/> Transfer to ISS A/L1D1_A2
<input type="checkbox"/> Sample Req'd, Stow sample in MF28M	
<input type="checkbox"/> Report S/N to MCC	
<input type="checkbox"/> Verify Green label in CWC window	
<input type="checkbox"/> Verify Green decal to CWC end	
<input type="checkbox"/> Verify CWC S/N on end decal	
<input type="checkbox"/> Temp stow Biocide Kit in NOD1P2 Mesh Bag	
<input type="checkbox"/> Transfer to NOD1P2 (Water Wall)	

PWR Fill Notes:
 - Do not pull drink water from Galley during PWR Fill.
 - Do not detach PWR (EMU H2O Recharge Bag) QD restraint during PWR operations.
 - Do not overfill as the PWR could leak.

Stowage
 Technical CWC's available in ISS NOD1P2 Mesh Bag
 1074
 PWR's available on ISS for EVA
 1013

Water Kits:	Current Location
Biocide Kit S/N 1001	NOD1P2 Mesh Bag
Sample/Purge Kit S/N 1005	MF28M

COLOR LEGEND
 Green CWC Technical Water
 White PWR Water for ISS EVA

MSG 086 (15-0954) - PRE-EVA REPAIR DOCKED AUDIO TEST

Page 1 of 2

1 Team 4 is requesting a brief test to determine if the hard line audio on A/G1, A/A and
2 ICOMA is functioning between the Shuttle and Station. This test will aid in determining the
3 options to provide DIRECT voice comm between both EV crewmen and the Shuttle Aft
4 Flight Deck during the TPS repair EVA, should it be required. Due to the worksite location,
5 direct voice comm is not expected to/from the Orbiter UHF assets and is extremely desirable
6 between the RMS operator and the EV crew.

7
8 Perform the following steps to determine these docked audio capabilities:

9
10 NOTE : The following procedure will temporarily interrupt Big Loop and ICOM A operations...

11 12 **1. DOCKED ICOMA VERIFICATION**

13 Docked ICOMA was configured shortly after docking. Have the shuttle crew verify with MCC
14 that docked ICOMA has been functional from both Shuttle to Station and Station to Shuttle
15 up until the present time.
16

17 **2. DOCKED A/A VERIFICATION**

18 Shuttle Crew

19 Configure and Verify Panel Config:

20
21 A1R AUD CTR UHF A/G 1 - OFF
22 AUD CTR SL ICOM A - OFF
23 AUD CTR SL A/G 1 - OFF
24 AUD CTR SL A/A - ON
25

26 MCC-H (ISS)

27 Command DAA into Public Call 1

28 Remove UHF1 from Public Call 1

29 Remove UHF3 from Public Call 1
30

31 Shuttle Crew

32 Configure CDR ATU for only A/A in T/R. All other loops OFF.

33 Perform voice check with ISS Crew on A/A and verify good 2-way comm.
34
35

36 **3. DOCKED A/G1 VERIFICATION**

37 38 Shuttle Crew

39 Configure and Verify Panel Config:

40
41 A1R AUD CTR UHF A/G 1 - OFF
42 AUD CTR SL ICOM A - OFF
43 AUD CTR SL A/G 1 - ON
44 AUD CTR SL A/A - OFF
45
46
47
48

MSG 086 (15-0954) - PRE-EVA REPAIR DOCKED AUDIO TEST

Page 2 of 2

1 MCC-H (ISS)

2 Command DAG1 into Public Call 1

3 Remove DAA1 from Public Call 1

4

5 MCC (Shuttle)

6 Shuttle CapCom perform voice check with Station (FE2 on ISS) on A/G1. This will verify big
7 loop comm from Shuttle to Station.

8

9 MCC-H (ISS)

10 Station CapCom perform voice check with Shuttle (PLT on STS) on S/G1. This will verify
11 big loop comm from Station to Shuttle.

12

13

14 IF big loop was verified functional via hard line A/G1, perform the following actions:

15

16 O6 UHF MODE sel - OFF

17 A1R AUD CTR SL ICOM A - ON

18

19 Big Loop comm now via hardline, in addition to ICOM A.

20

21 ELSE

22

23 If big loop not functioning both ways via hardline A/G1, perform the following actions to go
24 back to UHF big loop comm:

25

26 MCC-H (ISS)

27 Command DAG1 out of Public Call 1

28 Command UHF3 into Public Call 1

29 Command UHF1 from Public Call 1

30

31 Shuttle Crew

32 A1R AUD CTR SL ICOM A - ON

33 AUD CTR SL A/G 1 - OFF

34 AUD CTR SL A/A - OFF

35 AUD CTR UHF A/G 1 - T/R

36

37 Ground perform voice checks to verify Big Loop via UHF is restored. Crew verify
38 hardline ICOM A is restored.

39

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15-0956 (MSG 087) – EMU Gloves Photo Message

Page 1 of 1

1 Clay,

2 In order to exonerate the EMU Gloves for the remaining EVAs this mission we are
3 requesting additional glove photos. This will help the ground to compare EVA
4 wear with what was seen on Rick's prime gloves.

5

6 Perform US_SODF; ISS P/TV; 2. Kodak 760: 2.312 760 Special Shots - Macro
7 Photography

8 Please take detailed photos of all prime gloves that have been used so far this mission,
9 specifically:

10 William's (S/N 6262) right and left

11 Anderson's (S/N 6264) right and left

12

13 Photos should detail palms, fingers, and the crotch between the index and thumb. Please
14 take the photos at the highest possible resolution. Please focus on areas exhibiting signs of
15 degradation, manipulating suspect areas as necessary to reveal underlying vectran
16 damage. Please include labels in the photos indicating which gloves are pictured to enable
17 ground comparison of glove wear. Rick or Dave should be able to assist you with the
18 photos.

EWA MATERIAL MIXING (00:10)

CAUTION

1. Do not touch foam tip and minimize exposure time (cover open). This prevents foam tip contamination
2. Do not open main valve. This prevents air ingestion (material foaming)
3. Do not rotate EWA preload knob

1. Unstow EWA caddy
2. Remove EWA from caddy; record S/N _____

CAUTION

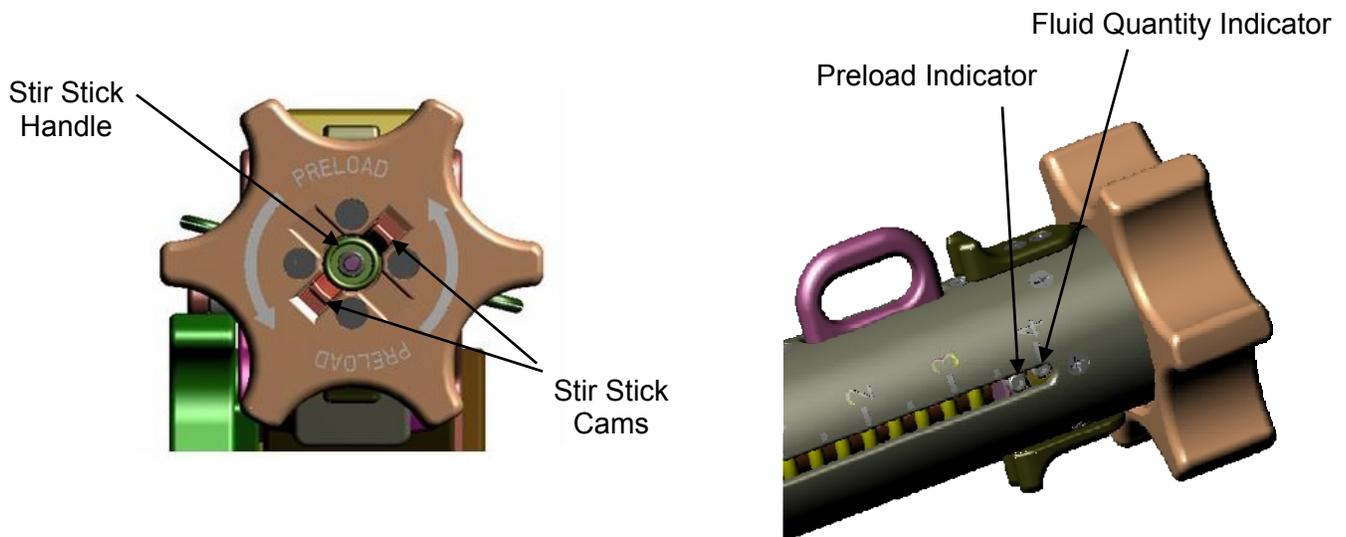
Do not side load stir stick handle during mixing

3. Release stir stick cams in preload knob; pull out stir stick handle
4. Pump stir stick vigorously 20 full cycles
5. Reseat stir stick handle in preload knob
6. ✓Stir stick cams re-engaged
7. ✓Trigger safety locked

NOTE

With rigid tip cover open, risk of bumping main valve open is increased

8. Open tip cover, secure in detents
9. Inspect foam tip for debris or tearing
10. Close tip cover
11. Record fluid quantity _____
12. ✓Fluid quantity and preload indicators touching (no preload)
13. Stow EWA in caddy
14. ✓Integral RET connected to EWA tether point
15. Temp stow EWA caddy
16. Report EWA S/N, fluid quantity and any anomalies



TPS REPAIR CAUTIONS AND WARNINGS

CAUTION

1. Avoid TPS contact when possible to prevent TPS damage, but if contact is required or incidental:
 - a. Damaged tile RCG can cut glove RTV; it does not damage underlying protective layers
 - b. If touching the tile is required to react loads, use a light touch with the glove knuckles or a distributed finger load (several fingers, so all the load isn't carried through a single finger)
 - c. Report inadvertent TPS contact and give MCC a report on the new status of the TPS (and EMU fingertips, if required)
2. To prevent TPS damage while protecting for case of 'popping out' of a foot restraint:
 - a. Install local tether (e.g., waist tether) to foot restraint in case of inadvertent boot release from foot restraint
 - b. When possible, get confirmation from assisting crewmember that EV boots are secure in APFR
 - c. EV in foot restraint should remember to maintain outboard heel pressure, especially during maneuvers and body rotations
 - d. Unless based on boom, avoid the ingress aid (ingress aid might be required for boom operations due to higher likelihood of inadvertent boot release from APFR)
 - e. If boots come free, do not attempt re-ingress near TPS; ingress away from structure with an ingress aid or tether, or perform assisted ingress at structure
3. Two handed operations require EV to be very close to TPS – assisting EV, if nearby, should watch clearances closely

WARNING

1. TPS component powder and fibers (from tile, gap fillers, RCC) are a skin irritant in smaller quantities and an inhalant irritant in large quantities. Wipe known or suspected contaminants from gloves
2. Loss of UHF communication between EV and IV may occur, esp. under PLB doors and in some areas close to Orbiter belly
 - a. Even with analysis showing complete comm coverage through a particular trajectory, establish strict comm protocol with RMS operator near TPS (e.g., 'continue, continue') to ensure RMS operator can identify loss of comm. Consider using body coordinates for GCA close to the worksite due to the limited directional cues
 - b. EV should be prepared to give ALL STOP hand signals in WVS or other camera if voice comm lost
 - c. MCC may issue ALL STOP if EMU biomed signal lost
3. If EMU cooling is lost and the crewmember is in a remote location on the boom or arm (might not make it back to the airlock within 30 min), periodically close the DCM purge valve and open the helmet purge valve to conserve O2. For every two minutes that the helmet purge valve is open instead of the DCM valve, the 30-min limit can be increased by 1 min
4. Avoid EMU MLI contact with RCC when temperatures are predicted to be out of limits to avoid MLI and bladder damage (glove contact is okay)
5. See GENERIC NOTES, CAUTIONS, & WARNINGS (FLIGHT SPECIFIC REFERENCE) and EVA TPS INSPECTION/REPAIR INHIBIT PAD (TPS REPAIR)

TPS REPAIR NOTES

1. If the task is based on the SRMS or SSRMS, the preference for TPS repair is a single crewmember (when possible) due to concerns with incidental TPS contact. If task is based on the boom, the preference for TPS repair is both EV crewmembers on the boom to allow for better frequency response from the arm/boom system (makes the task easier and might reduce incidental contact with TPS)
2. Arm and EMU position should be optimized to prevent tool and EMU contact (esp. helmet contact) with the TPS, per PREFERRED EMU POSITIONING FOR TPS REPAIR (TPS REPAIR). OBSS or SRMS/SSRMS may provide IV with some assisting views
3. To avoid inadvertent tool/EMU contact with the TPS:
 - a. Minimize the quantity of tools taken to worksite, keeping MWS as clean as possible
 - b. Separate tools to avoid tether tangles
 - c. MWS T-bar should be snug to DCM (STS-114 gap filler pull task used T-bar)
 - d. MWS swing arm(s) should be checked prior to proximity to TPS to verify they are in the correct position; consider swingarm actuation only when backed away from TPS
 - e. If camera taken on BRT, consider having assisting EV verify BRT tightness, while ensuring EV1's capability to access camera. BRT operations are more safely accomplished when backed away from TPS
 - f. Suggested safety tether routing is between EMU legs (such that the tether is 'trapped' behind legs) with reel unlocked
 - g. Two-handed operations require EV to be very close to TPS - assisting EV must watch clearances closely
4. Consider the following for airlock or worksite tools:
 - a. EWA kit with EVA wipes if inadvertent tile damage possible
 - b. As required, practice use with MWS key w/ tether point (in case T-bar remove and re-install is required to clear work envelope)
 - c. As required, practice reach to EVA scissors in LTA
5. For Orbiter belly repairs, WVS from Shuttle might be limited, although some areas may be covered from ISS. Consider pre-configuring WVS prior to maneuvering under the Orbiter
6. EHIP and camera lighting should give sufficient EV task lighting, but IV should verify adequate views prior to GCA
7. Although small RCG cracks and chips are generally not considered critical, allowable depression (e.g., tool/EMU impact depression) can be small. For the acreage tile on STS-114 near the protruding gap fillers (not the worst case), the allowable missing RCG was 2-inch x 1.5-inch, but the allowable depression was only 0.1-inch

BOOM OPERATIONAL WARNINGS

WARNING

1. Inspection and repair operations that impart greater loads into boom/RMS system should be accomplished with RMS brakes ON
2. Minimize boom loads. Larger loads can cause RMS joint brake slip and RMS joint backdrive, possibly allowing contact between EMU and structure or between RMS/boom/APFR and structure
 - a. When possible, have assisting EV react loads during PAD install, APFR install, APFR reconfiguration, ingress and egress
 - b. Tool and/or bag config should be performed prior to APFR ingress when practical
 - c. Move slowly when performing operations, including tool retrieval
 - d. Perform soft APFR ingress and egress
 - e. Avoid quick grabs for loose tools
 - f. If large deflections occur during APFR reconfig or ingress aid operations, maneuver boom to structure and perform action while assisted
3. To avoid increasing boom/RMS system motion:
 - a. Avoid imparting a load when motion is at a peak ('pushing a swing'); if in doubt as to whether it is near the peak, do not impart load
 - b. Avoid sinusoidal motion (repetitive motion) at frequencies near the natural frequency of the RMS/OBSS system
 - c. When possible, allow damping between loading events (insert wait times occasionally)
 - d. Do not attempt to actively damp system using legs/feet if motion is increasing
 - e. If oscillating toward structure, lightly stop motion using light gloved hand contact, but do not push away to actively counter motion
4. If brake slip occurs, allow IV to assess location before proceeding with GCA
5. For boom hardware, see GENERIC NOTES, CAUTIONS, & WARNINGS (FLIGHT SPECIFIC REFERENCE)

BOOM OPERATIONAL NOTES

BOOM/RMS SYSTEM BEHAVIOR

1. Boom/RMS deflections are primarily attributed to EV inertia/cg motion, with higher load/deflection scenarios occurring during ingress/egress and laybacks
2. Motion (prior to brake slip) comes from joint slop, joint flex, and boom flex (most deflection is from joint flex)
3. Counter-intuitive motion is expected, and it varies based on RMS configuration (if a force is put into the system one direction, some boom resultant motion could occur in different directions)
4. More motion will result from the boom/SRMS system than with the boom/SSRMS system
5. Brake slip should be anticipated for higher loading events with EV on boom
6. As seen during the EVA Boom DTO on STS-121, the boom natural frequency can be expected to be ~ 6 seconds, typical displacements are 7-24 inches, and damping times are ~ 1 minute or less
7. Boom/RMS system moves at a frequency similar to that which can cause seasickness

BOOM OPERATIONAL CONSIDERATIONS

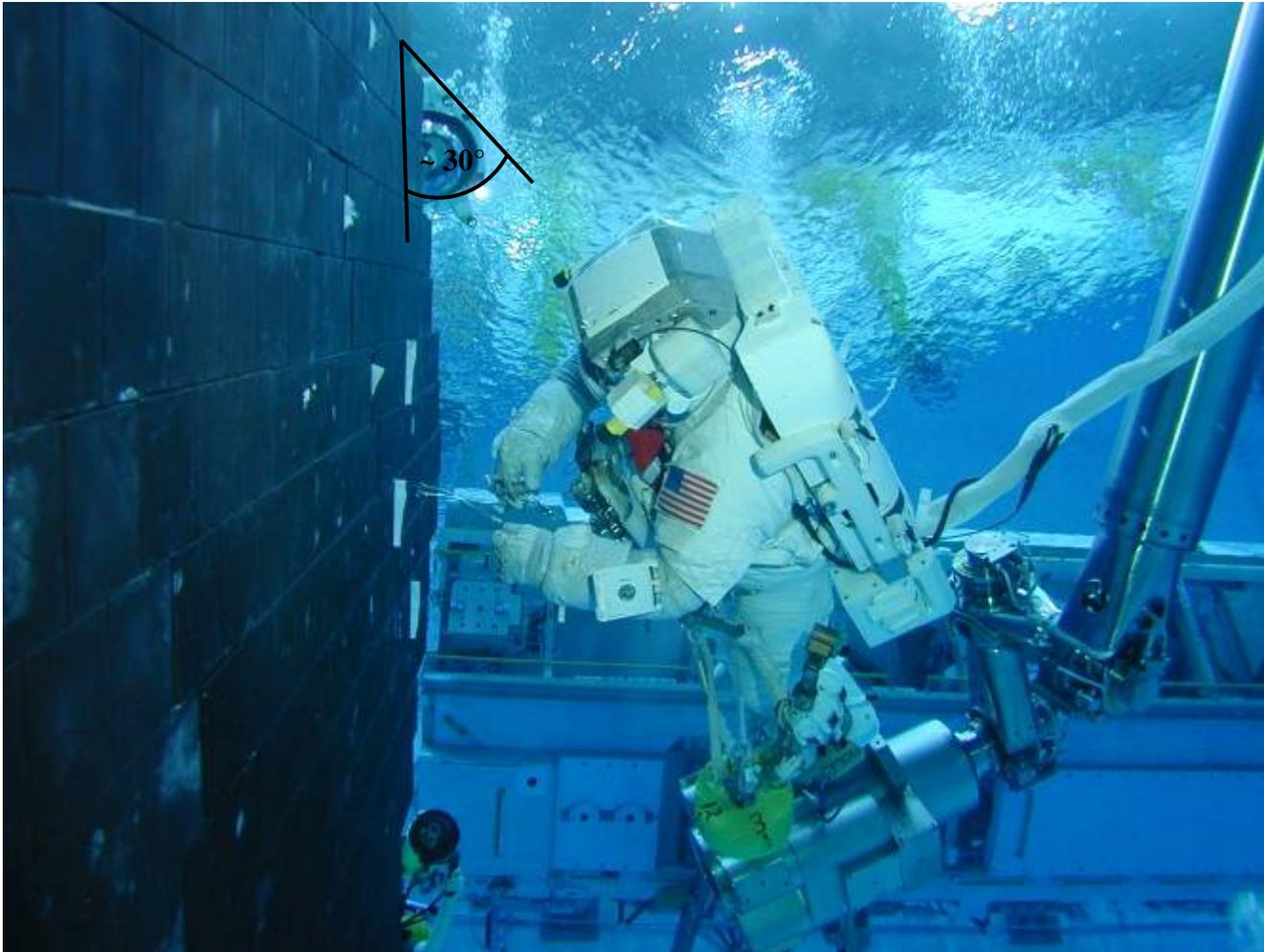
1. A practice session should be considered (where EV can perform layback, forward lean, and tool configurations) away from structure but when RMS nearly into final position
2. It is likely difficult to damp motion in free space (without a handrail/structure)
3. Grasping handrails/structure to 'muscle' the boom for damping might not be as effective as light fingertip contact
4. EV might have difficulty sensing small deflections without a visual reference
5. EV might not be able to feel brake slip
6. Longer forces (over time) cause more deflection than the same force performed more quickly (as an impulse) - deflection is driven by energy input (load + duration)
7. Due to boom motion, heels could be more likely to release from foot restraint; configure local tether at APFR and keep outboard heel pressure
8. In some arm configurations, system can be lightly 'preloaded' using gloved hand (primary EV or assisting EV) to steady boom for operations; in addition, a larger loading event can be mitigated by pressing with one hand lightly until loading event start and then releasing (transfer load from one hand to the other)
9. Move boom and EVs away from structure (~ 10 feet) if a major reconfiguration of tools or an APFR is required to avoid inadvertent impacts with structure
10. Effect of EV2 moving should be evaluated prior to repair. If movement poses a problem for repair, EV2 should remain stationary and tool retrievals or handoffs should be performed away from vehicle

BOOM/RMS HARDWARE

1. See GENERIC NOTES, CAUTIONS, & WARNINGS (FLIGHT SPECIFIC REFERENCE)

PREFERRED EMU POSITIONING FOR TPS REPAIR

Preferred positioning for TPS repair is ~ 30 degrees pitched heads down, relative to TPS and EMU PLSS. A more drastic pitch brings the helmet closer to the TPS and decreases EV crewmember ability to see helmet proximity. Less pitch causes the MWS T-bar (if used), MWS swingarms (if used), and tethers to be in close proximity to TPS



MSG 089 (15-0958) - FD09 BIG PICTURE WORDS FOR EVA TPS REPAIR

Page 1 of 2

1 Rick, Dave, Tracy and Scott,

2

3 Big Picture on Repair:

4 If performed, the FD 11 EVA repair will employ the use of both EWA and TRAD. EWA will be
5 used as a primer, and TRAD (STA-54) will be used to fill the damage cavity. Rick and Dave
6 will be working together off the tip of the Boom, with Rick being primary for the repair. Using
7 the tool stanchion, Dave will assist Rick at the worksite. Tracy will be the SRMS
8 operator and Scott will be IV.

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10 We have filled your plate today with TPS Prep activities and wanted to give you a brief
11 introduction to the current tile repair plan. Per the FD 9 Replanned Timeline, you have time
12 scheduled for EVA Training Package and Review, EVA Tagup, and later in the afternoon,
13 EVA Tool Gather and TRAD & EWA Prep.

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15 The PDRS procedure will be in your FD 10 execute package, and a DOUG review will also
16 be scheduled on FD 10 after the OBSS handoff operations are complete. We will uplink a
17 DOUG target and mlc files for your DOUG review.

18

19 You will receive all of this information in several separate messages. Below is a list of each
20 message with a brief description of content and location within the timeline:

21

- 22 1. Tile Repair Overview Package (msg082 (15-0952)): The overview package includes
23 both a high level overview and details regarding the damage cavity, repair tools, and
24 repair techniques. In addition, Boom setup and cleanup positions, as well as body
25 positioning at the worksite are included. The Overview Package should be reviewed
26 during EVA TRNG PKG & RVW in the Replanned FD 9 timeline. Due to the large
27 size of the file, you can decide if you want to print these procedures on board, print
28 selective pages, or just view them electronically.
- 29 2. TPS EVA Detailed Procedures (msg090 (15-0959)): The detailed procedures include
30 Boom setup, EWA priming, TRAD fill, and Boom cleanup. The Detailed
31 Procedures should be reviewed during EVA TRNG PKG & RVW in the Replanned
32 FD 9 timeline.
- 33 3. 13A.1 Tile Repair Stowage Matrix (msg081 (15-0951)): The stowage matrix includes
34 all of the required tools needed for the repair, as well as their stowage locations.
35 The Stowage Matrix should be reviewed during EVA TOOL GATHER in the
36 Replanned FD 9 timeline.
- 37 4. TRAD IV Prep (msg091 (15-0960)): The TRAD IV Prep procedure lists the required
38 steps to get TRAD prepped for use. The IV Prep Procedure should be reviewed
39 during T-RAD & EWA PREP in the Replanned FD 9 timeline. **This procedure shall**
40 **only be performed on MCC GO to avoid premature activation of the STA-54**
41 **material.**

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MSG 089 (15-0958) - FD09 BIG PICTURE WORDS FOR EVA TPS REPAIR

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1 Also, the following additional procedures will need to be referenced in prep for the EVA
2 Repair. These procedures can be found electronically in MSG 88 (15-0957).

- 3 • EWA Mixing: This procedure shall only be performed on MCC GO to avoid
4 premature activation of the emittance wash material.
- 5 • TPS Repair Cautions and Warnings
- 6 • TPS Repair Notes
- 7 • Boom Operation Warnings
- 8 • Boom Operation Notes
- 9 • Preferred EMU Position for TPS Repair

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15-0951 (MSG 081): 13A.1 Tile Repair Stowage Matrix

OVERVIEW: Table A has you gather items needed for the tile repair. Gather these items in an empty mesh bag and they will be configured during the EVA Tool Config activity.

Table A: Gather the following items

Item #	<input checked="" type="checkbox"/>	Location	Item	QTY	P/N	S/N	B/C	Notes
1		A/L100	ORU Transfer Bag, Large	1	SEG33114494-307	1002	00008707J	
2		Deployed in A/L1	ORU Transfer Bag, Medium	1	SEG33114494-309	1004	00008694J	
3		A/L100	PFR Attachment Device	1	10159-10053-03	1001	-	
4		1.0 CTB, S/N 1075, B/C 004069J	Worksite Interface Adapter	1	SEG33106863-309	1015	-	
5		A/L1D2 Tether Staging Area	Adjustable Fuse Tether AKA Fish Stringer	1	SED39127200-705	1030	-	
6		NOD1P4_D	Type A Durometer	1	SED33116957-301	1002	-	
7		1.0 CTB: RCC PLUG	3" Scraper	1	SED33117195-301	1004	-	
8		TOOLS, S/N 1237, B/C	T-RAD Holster	1	SED33116759-301	-	-	
9		010573J	O2 Actuator Cover	2	SEZ13101999-701	1002 1006	EMUG22J EMUA62J	
10		NOD1O4_C1 (Ziplock Pantry)	Ziplock Bag	1	Crew Pref	-	-	
11		NOD1D2 0.5 CTB, S/N 1353, B/C 010534J	MWS Tool Stowage Caddy AKA Broom Clip Caddy	1	GD2051000-301	1007	-	This is 13A.1 return bag #419. If it is not found it may have already been transferred to FS05 .
12		NOD1S1 1.0 CTB: CIPAA, S/N 1074, B/C 004068J	EVA Gap Gauge Assembly (10/20) EVA Gap Gauge Assembly (30/35) AKA RCC Plug Feeler Gauge	2	SED33118505-301 SED33118505-302	1001 1004	-	
13			EVA Wipes	6	-	-	-	
14		ФГБ1ПГО_1_102	EVA Transfer Bag Insert Assembly AKA Overlay Insert	1	SED33118866-302	1002	-	
15		MDDK ML60J	Tile Repair Ablator Dispenser AKA T-RAD	1	SGD39137698-401	1001	-	T-RAD stowage configuration has three levels of containment: one CIPAA sack, then installed into second CIPAA sack, then into the outer CIPAA containment bag.
16		MD PORT FLOOR 2 (Ziplock Bag) (Bag H)	Adjustable Tethers (sm-sm)	6	SEG33106945-307	-	-	Five of these tethers must stay with medium ORU bag and T-Rad config
17		MD CEIL PORT 1	Gel Brush Kit	1	SJD33117200-305	-	-	
18		(Bag E)	Gel and Brush Kit	1	SJD33117200-303	-	-	
19			EWA Kit	2	SJD33116880-302	-	-	