

# STS-126/ULF2

## FD 04 Execute Package



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021A	1 - 13	<a href="#">FD04 Flight Plan Revision</a> (pdf)
022	14 - 15	<a href="#">FD04 Mission Summary</a> (pdf)
023	---	<a href="#">FD04 Transfer Message</a> (pdf - Electronic Only)
024	16	<a href="#">FD03 MMT Summary</a> (pdf)
025A	17	<a href="#">FD04 EVA Deltas</a> (pdf)
026	18 - 19	<a href="#">STS-126 Consumables Cue Card</a> (pdf)
027A	---	<a href="#">FD04 PAO Event Summary</a> (pdf - Electronic Only)
028	20 - 29	<a href="#">ZSR Rack Deploy in JPM and JLP</a> (pdf)
029	30	<a href="#">STS-126 H2O Ops Cue Card</a> (pdf)
030	---	<a href="#">Stowage Locations for FD04 (GMT 322)</a> (pdf - Electronic Only)
031A	---	<a href="#">Emergency Equipment Shuffle for ULF-2</a> (pdf - Electronic Only)
032A	---	<a href="#">ULF-2/STS-126 Emergency Hardware Location Management</a> (pdf - Electronic Only)

Approved by FAO: M. Blanton

Last Updated: Nov 17 2008 2:00PM GMT  
 JEDI (Joint Execute package Development and Integration), v2.04.0003

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MSG 021A - FD04 FLIGHT PLAN REVISION

1 MSG INDEX

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3 <u>MSG NO.</u>	<u>TITLE</u>
4 021	FD04 Flight Plan Revision
5 022	FD04 Mission Summary
6 023	FD04 Transfer Message (18-0232)
7 024	FD03 MMT Summary
8 025	FD04 EVA Deltas
9 026	STS-126 Consumables Cue Card (18-0228)
10 027	FD04 PAO Event Summary (18-0228)
11 028	ZSR Rack Deploy in JPM and JLP (18-0193)
12 029	STS-126 H2O Ops Cue Card
13 030	Stowage Locations for FD04 (GMT 322) (18-0234)
14 031	Emergency Equipment Shuffle for ULF-2 (18-0150A)
15 032	ULF-2/STS-126 Emergency Hardware Location Management (18-0151A)

16

- 17 1. For today's cryo config O2 tanks 2, 3 and 4 will be active with dual heaters, and H2 tanks  
18 2 and 4 will also be active with dual heaters.

19

20 R1 O2,H2 MANF VLV TK2 (two) - OP (tb-OP)  
21 O2 TK3 HTRS A,B (two) - AUTO

22

23 A11 CRYO TK4 HTRS O2 A,B (two) - AUTO

24

25 A15 CRYO TK5 HTRS O2 A,B (two) - OFF

26

- 27
- 28 2. **Sandy and Shane:** Overnight, OSO performed Node 2 Nadir CBM Prep for Mate  
29 nominally. Additionally, both the Node 2 Nadir Active CBM Inspection and the MPLM  
30 Passive CBM Inspection were completed with no anomalies noted.

- 31
- 32 3. **Don:** We have uplinked an updated procedure to deploy the new ZSRs in the JLP and  
33 JPM. If you get ahead this evening and decide to move the ZSRs early, the deploy  
34 procedure can be found in IPV; Uplinked Procedures; US SODF; Assembly Ops; 18-  
35 0193 or Shuttle MSG 028. Feel free to print this procedure at your discretion.

- 36
- 37 4. REPLACE PAGES 3-32 THROUGH 3-41.
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NO EXERCISE (MPLM)

REPLANNED

FD04

GMT 11/17/08 (322)

MET Day\_002

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

003/00

S	CDR FERGUSON	SLEEP	POST SLEEP	PTV06 OPS	EXERCISE	MEAL	MPLM VEST PRESS	MPLM VEST INGRS CNFG	MPLM ACT PART 1
	R1 PLT BOE	SLEEP	POST SLEEP	PTV06 OPS	MEAL	MEAL	EXERCISE	PAO EVENT #2	MDDK XFER
T	R3/M1 MS1 PETTIT	SLEEP	POST SLEEP	MPLM INSTL GRPL	MPLM UNBERTH-INSTALL	MEAL	MPLM VEST PRESS	MPLM VEST INGRS CNFG	MPLM-VEST CPA-RMV
	E/2 MS2 BOWEN	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	MEAL	MEAL	GREASE GUN PREP	EXERCISE
2	E/1 MS3 PIPER	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	MEAL	MEAL	P/TV 05 S/U	02 RCNFG
	R2/M2 MS4 KIMBROUGH	SLEEP	POST SLEEP	MPLM INSTL GRPL	MPLM UNBERTH-INSTALL	MEAL	MEAL	GREASE GUN PREP	EXERCISE
D	FE-2 CHAMITOFF	SLEEP	POST SLEEP	PW	PW	MDDK XFER	MIDDAY-MEAL	HANDOVER	EXERCISE CEVIS
	ISS CDR FINCKE	SLEEP	POST SLEEP	PW	PW	MDDK XFER	MIDDAY-MEAL	CCRI EVA CAMR	02 RCNFG
S	FE-1 LONCHAKOV	SLEEP	POST SLEEP	PW	PW	MDDK XFER	MIDDAY-MEAL	CCRI EVA CAMR	02 RCNFG
	FE-2 EXP18 MAGNUS	SLEEP	POST SLEEP	PW	PW	MDDK XFER	MIDDAY-MEAL	CCRI EVA CAMR	02 RCNFG

DAY/NIGHT	ORBIT	41	42	43	44	45	46	47	48
W	-171.0								
E	-46.0								
Z	-275.0								
ORB ATT									
NOTES	*ACT *DEACT#STATUS CHECK *INSTALL *INSTALL *T-GLOVES-DRY *BIAS -XLV -ZVV *FILTER CHECK *INSTALL								

REPLANNED

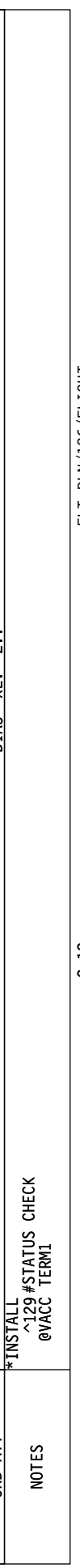
FD04

GMT 11/18/08 (323)

MET Day\_003

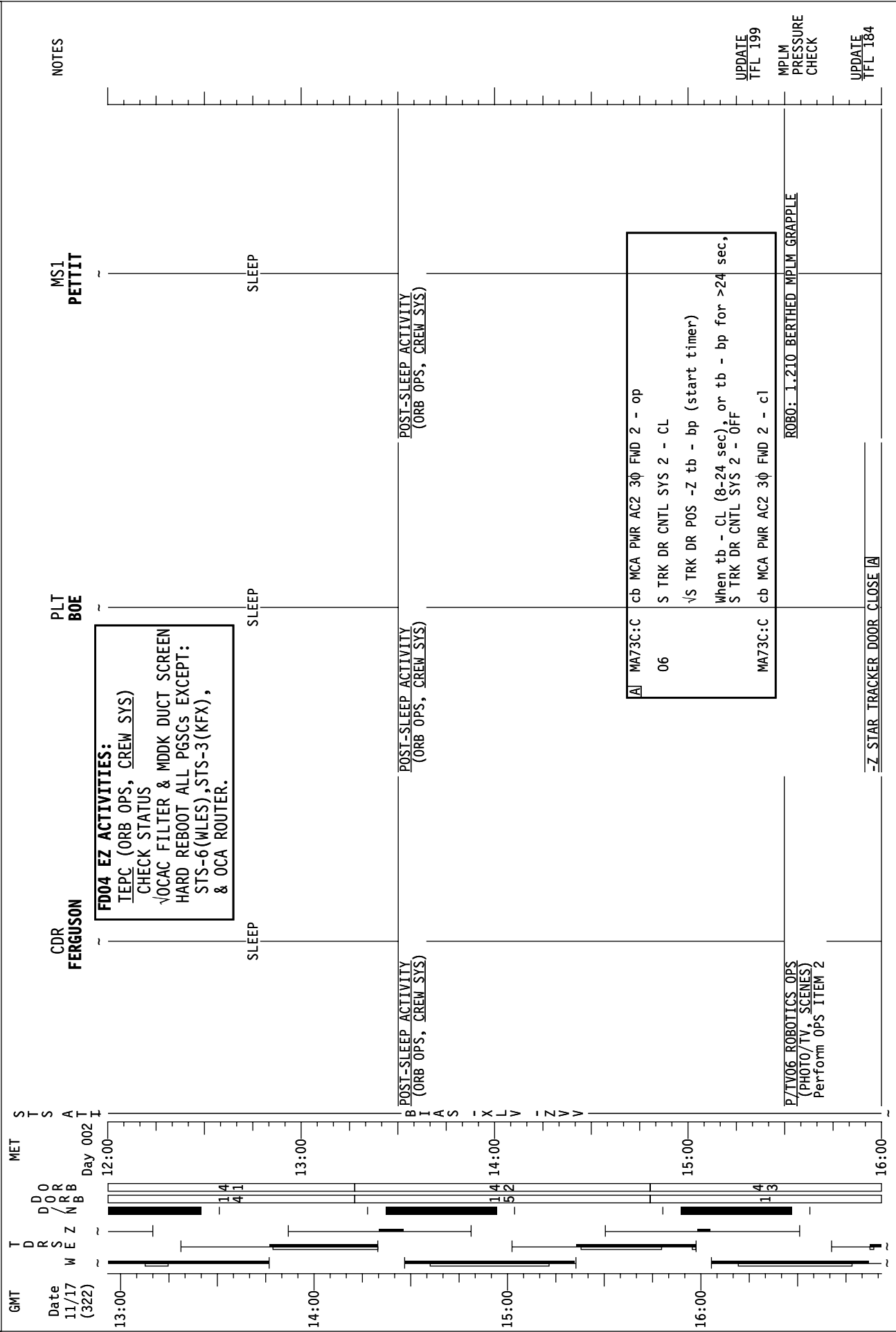
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003/00

CDR <b>FERGUSON</b>	IMV* MPLM ACT LG II MR	EVA1 PROC RVW	PRE SLEEP PMC A/G	PRE SLEEP	SLEEP
R1 PLT <b>BOE</b>	MUTXT NPIFF VDLE RAWR T	EVA1 PROC RVW	PRE SLEEP	PRE SLEEP	SLEEP
R3 MS1 <b>PETTIT</b>	VCOMI ELUPN TSLG TSMR	EVA1 PROC RVW	PRE SLEEP	PRE SLEEP	SLEEP
EVA2 MS2 <b>BOWEN</b>	E-LK PREP O P	EVA1 PROC RVW	PRE SLEEP	MASK PB/TOOL CONFIG 10.2 PRE SLEEP	SLEEP ISS A/L CAMPOUT @10.2 PSI
EVA1 MS3 <b>PIPER</b>	E-LK PREP O P	EVA1 PROC RVW	PRE SLEEP	MASK PB/TOOL CONFIG 10.2 PRE SLEEP	SLEEP
R2/EV3 MS4 <b>KIMBROUGH</b>	MXNXT DFLFA DEP KRI@R	EVA1 PROC RVW	PRE SLEEP	PRE SLEEP	SLEEP
FE-2 <b>CHAMITOFF</b>	RED CCK SK	EVA1 PROC RVW	DPC PW	PRE SLEEP-ISS	SLEEP
ISS CDR <b>FINCKE</b>	CEVIS	EVA1 PROC RVW	DPC PW	PRE SLEEP-ISS	SLEEP
FE-1 <b>LONCHAKOV</b>	TVIS	EVA1 PROC RVW	DPC PW	PRE SLEEP-ISS	SLEEP
FE-2 EXP18 <b>MAGNUS</b>	SPT SA PW	EVA1 PROC RVW	DPC PW	PRE SLEEP-ISS	SLEEP
DAY/NIGHT ORBIT	BD UE -C T				
TDRS W -171.0 E -46.0 Z -275.0					
ORB ATT					
NOTES	*INSTALL ^129 #STATUS CHECK @VACC TERM1				



# STS-126 FD (04)

**REPLANNED**



# STS-126 FD (04)

**REPLANNED**

GMT	MET	D O R / R B S Z N B	T D S / R B W E Z N B	Day 002 I	MS2 <b>BOWEN</b>	MS3 <b>PIPER</b>	MS4 <b>KIMBROUGH</b>	NOTES
13:00				12:00	SLEEP	SLEEP	SLEEP	
14:00				13:00	SLEEP	SLEEP	SLEEP	
15:00				14:00	FLIGHT SLEEP LOG (ORB OPS, SDBI) LIQUID SILVA SAMPLE (ORB OPS, SDBL) POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	FLIGHT SLEEP LOG (ORB OPS, SDBI) LIQUID SILVA SAMPLE (ORB OPS, SDBL) POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
16:00				15:00	A15 APCU 1 OUTPUT - ON POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)			
				16:00	ON MCC GO: A15 APCU 1 OUTPUT - OFF POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)			ROBO: 1.210 BERTHED MPLM GRAPPLE

STS-126 FD (04)

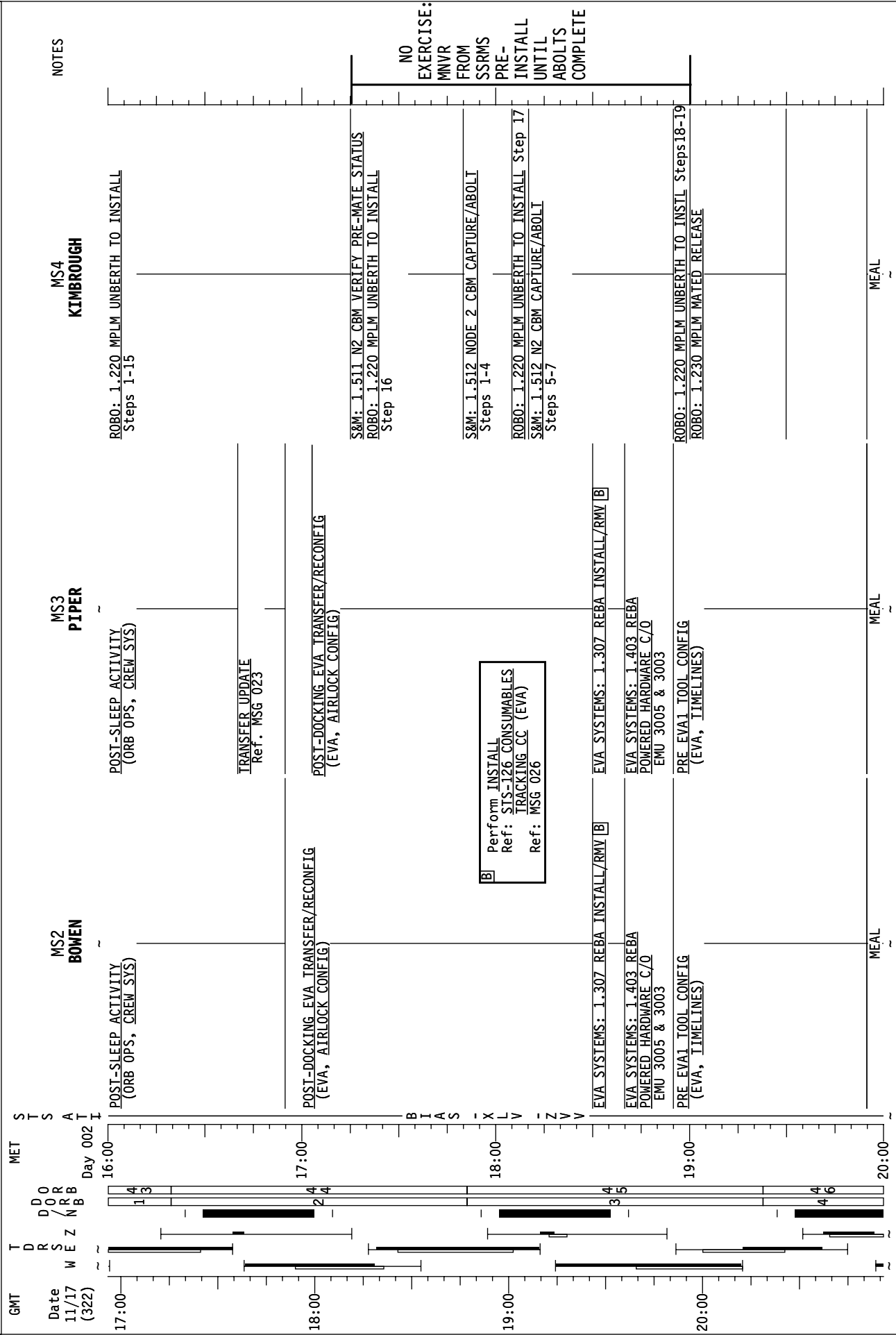
REPLANNED

GMT	Date 11/17 (322)	DRS W E Z	MTS D O R / R B	MET Day 002	CDR <b>FERGUSON</b>	PLT <b>BOE</b>	MS1 <b>PETTIT</b>	NOTES
17:00		13	4	16:00	ROBO: 1.220 MPLM UNBERTH TO INSTALL Steps 4-8	ROBO: 1.220 MPLM UNBERTH TO INSTALL Steps 4-8	ROBO: 1.220 MPLM UNBERTH TO INSTALL Steps 1-15	
18:00		24	4	17:00	MDBK STATUS CHECK (ASSY OPS, P/L) P/TV06 ROBOTICS OPS (PHOTO/TV, SCENES) ITEM 2 EXERCISE IMU STAR OF OPPTY ALIGN (ORB OPS, GNC) MIDDECK XFER Ref. MSG 023 Ref. Middeck Transfer List: B Items 7,46.1,46.2,100,101,102, I 103,439,1,440,440.1,440.2, A 440.3,717,731			
19:00		35	4	18:00	MEAL	MEAL	MEAL	NO EXERCISE: MNVR FROM SSRMS PRE- INSTALL UNTIL ABOLTS COMPLETE
20:00		46	4	19:00	MEAL	MEAL		
				20:00	MPLM: 1.113 N2 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK Verify CBM bolt loading complete prior to step 5. Leave ISA/VAJ connected in step 9.	SHUTTLE/ISS_H2O_CNTR_FILL (ORB OPS, ECLS) INIT FILL #1 Ref. MSG 029	MPLM: 1.113 N2 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK Verify CBM bolt loading complete prior to step 5. Leave ISA/VAJ connected in step 9.	



# STS-126 FD (04)

**REPLANNED**



STS-126 FD (04)

REPLANNED

GMT	Date 11/17 (322)	T D S W	R O R E Z	M E T	S T S A T I	CDR <b>FERGUSON</b>	PLT <b>BOE</b>	MS1 <b>PETTIT</b>	NOTES
21:00				Day 002 I		MPLM: 1.113 N2 TO MPLM VESTIBULE PRESSURIZATION AND LEAK CHECK Verify CBM bolt loading complete prior to step 5. Leave ISA/VAJ connected in step 9.			
22:00						1.102 ULF2 MPLM VESTIBULE- CONFIGURE FOR INGRESS (ASSY OPS, ACT & C/O) Steps 2-7	SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) Perform FILL TERMINATION	1.102 ULF2 MPLM VESTIBULE- CONFIGURE FOR INGRESS (ASSY OPS, ACT & C/O) Steps 2-7	
23:00							PUBLIC AFFAIRS EVENT Ref. MSG 027 STS KU TDRZ (21:19-21:55)		
00:00							SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) INIT FILL #2 Ref. MSG 029 MIDDECK XFEER Ref. Middeck Transfer List	1.102 ULF2 MPLM VESTIBULE- CONFIGURE FOR INGRESS (ASSY OPS, ACT & C/O) Step 8	
01:00							SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) Perform FILL TERMINATION CWC TRANSFER Transfer 2 CWCs to ISS		
02:00								1.102 ULF2 MPLM VESTIBULE- CONFIGURE FOR INGRESS (ASSY OPS, ACT & C/O) Steps 9-10	

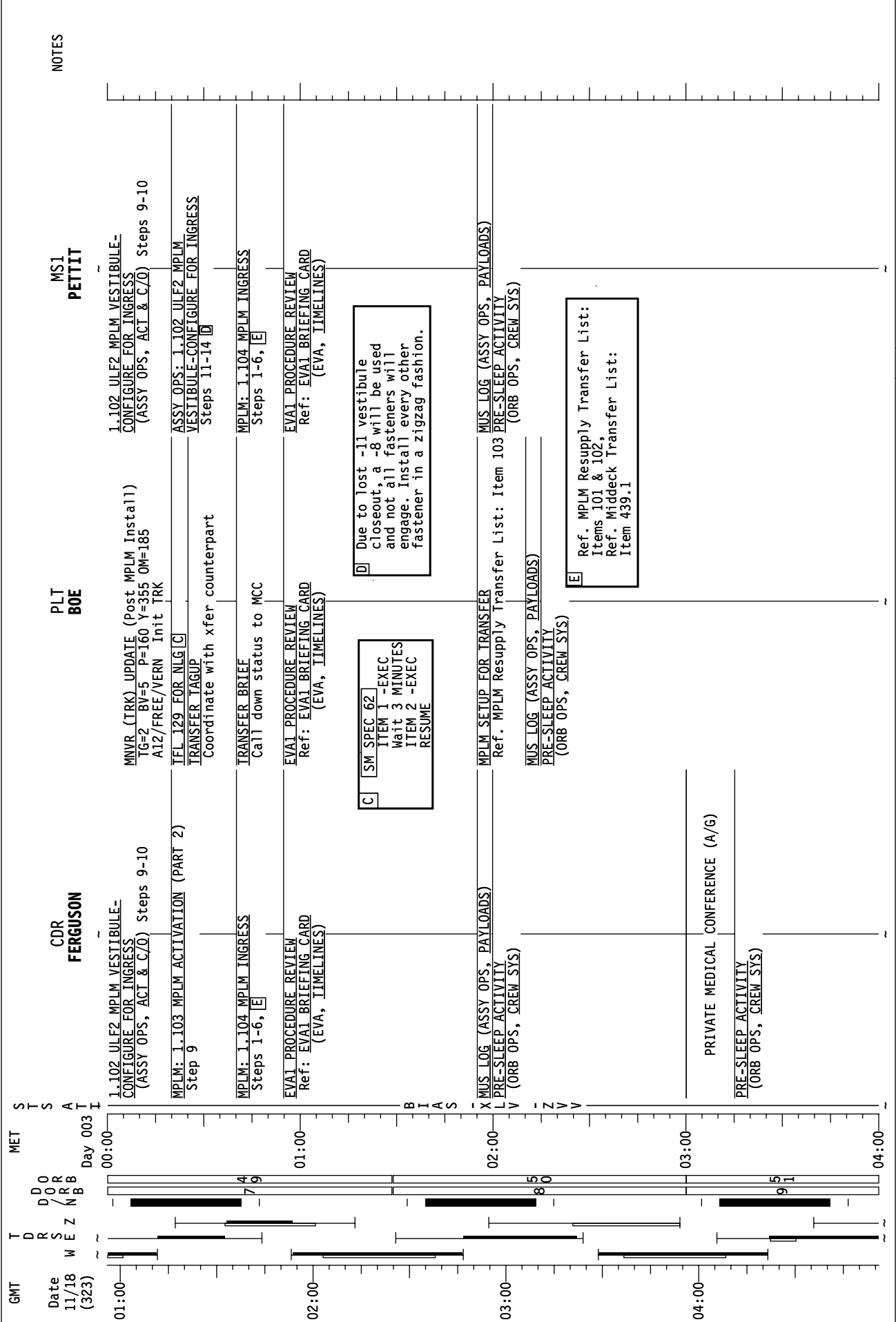
STS-126 FD (04)

REPLANNED

GMT	Date 11/17 (322)	DRS W E Z	TDRS M E Z	MET Day 002 I	STSAI	MS2 BOWEN	MS3 PIPER	MS4 KIMBROUGH	NOTES
21:00				20:00		MEAL	MEAL		
22:00				21:00		ULF2 J NOZZLE GREASE GUN PREP FOR EVA 1 (EVA, TOOLS & STOWAGE)	P/TV05 ISS INTERNAL OPS (PHOTO/TV, SCENES) SETUP PAO EVENT	ULF2 J NOZZLE GREASE GUN PREP FOR EVA 1 (EVA, TOOLS & STOWAGE)	
23:00				22:00		PUBLIC AFFAIRS EVENT Ref. MSG 027 STS KU TDRZ (21:19-21:55)	EXERCISE	PUBLIC AFFAIRS EVENT Ref. MSG 027 STS KU TDRZ (21:19-21:55)	
00:00				23:00		EXERCISE	JOINT OPS: 3.120 PREBREATHE USING SHUTTLE O2 SETUP Steps 2-6	EXERCISE	
				00:00		MIDDECK XFER Ref. Middeck Transfer List	MIDDECK XFER Ref. Middeck Transfer List	MIDDECK XFER Ref. Middeck Transfer List	

STS-126 FD (04)

REPLANNED



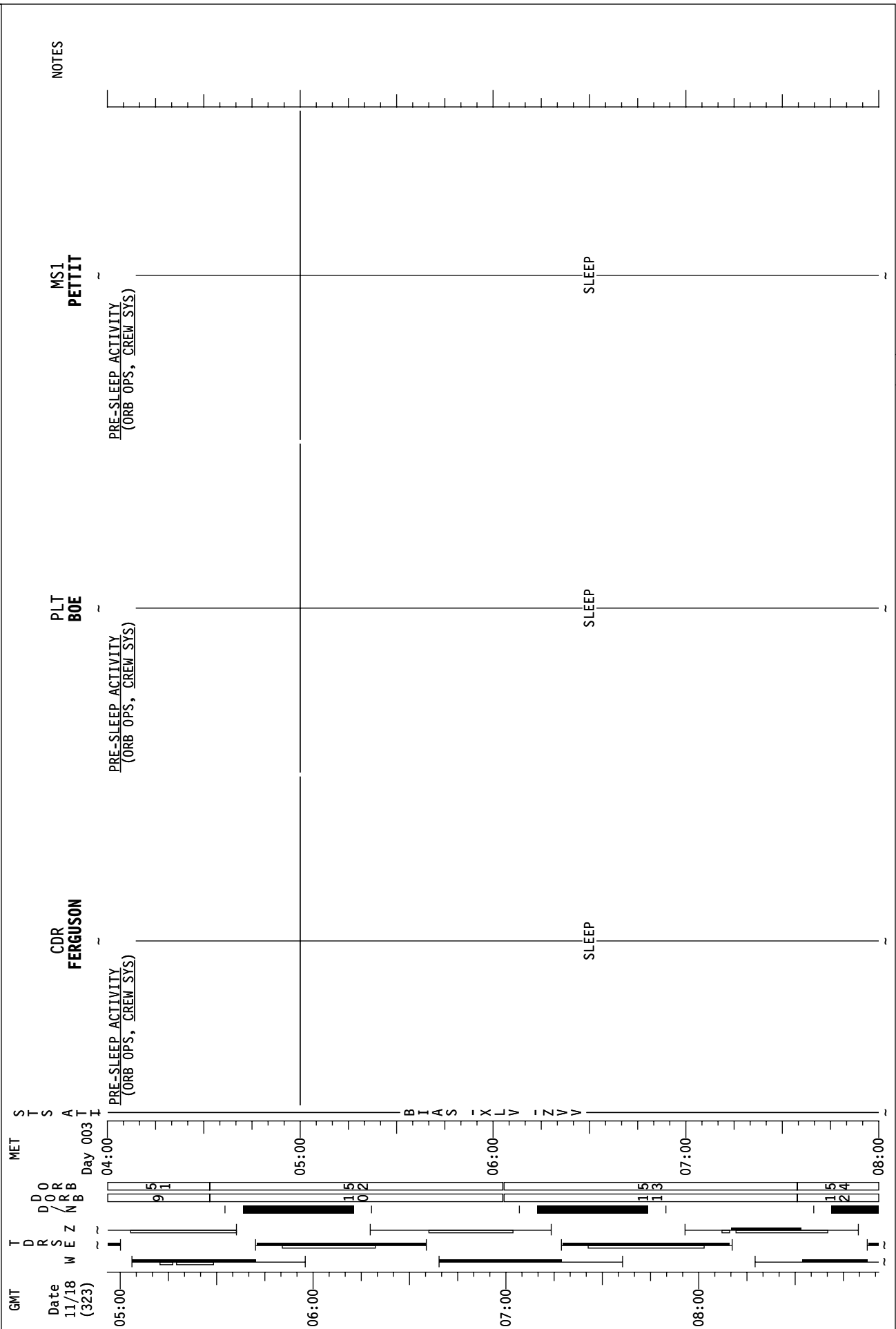
# STS-126 FD (04)

## REPLANNED

GMT	Date 11/18 (323)	MET Day 003	T D O R S W E Z	D O R N B	S A T	MS2 <b>BOWEN</b>	MS3 <b>PIPER</b>	MS4 <b>KIMBROUGH</b>	NOTES
01:00		00:00				EVA SYSTEMS: 1.305 EQUIPMENT LOCK PREP Steps 1-3 not req'd Ref. STS-126 CONSUMABLES TRACKING CC (EVA) Ref. MSG 026	EVA SYSTEMS: 1.305 EQUIPMENT LOCK PREP Steps 1-3 not req'd Ref. STS-126 CONSUMABLES TRACKING CC (EVA) Ref. MSG 026	MIDDECK XFER Ref. Middeck Transfer List  NLP TERMINATION (ASSY OPS, PAYLOADS) Term GAPS A-E TRANSFER TAGUP Coordinate with xfer counterpart  MDDK STATUS CHECK (ASSY OPS, P/L) MOP QUESTIONNAIRE (ASSY OPS, PAYLOADS) EVAL PROCEDURE REVIEW Ref: EVAL BRIEFING CARD (EVA, TIMELINES)	
02:00		01:00				MOP QUESTIONNAIRE (ASSY OPS, PAYLOADS) EVAL PROCEDURE REVIEW Ref: EVAL BRIEFING CARD (EVA, TIMELINES)	MOP QUESTIONNAIRE (ASSY OPS, PAYLOADS) EVAL PROCEDURE REVIEW Ref: EVAL BRIEFING CARD (EVA, TIMELINES)		
03:00		02:00				PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	MUS LOG (ASSY OPS, PAYLOADS) PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
04:00		03:00				EVA SYSTEMS: 1.206 10.2 PSIA CAMPOUT MASK PREBREATHE Ref. PRE EVA 1 TOOL CONFIG (EVA, TIMELINES) Ref. STS-126 CONSUMABLES TRACKING CC (EVA) Ref. MSG 026	EVA SYSTEMS: 1.206 10.2 PSIA CAMPOUT MASK PREBREATHE Ref. PRE EVA 1 TOOL CONFIG (EVA, TIMELINES) Ref. STS-126 CONSUMABLES TRACKING CC (EVA) Ref. MSG 026		

STS-126 FD (04)

REPLANNED

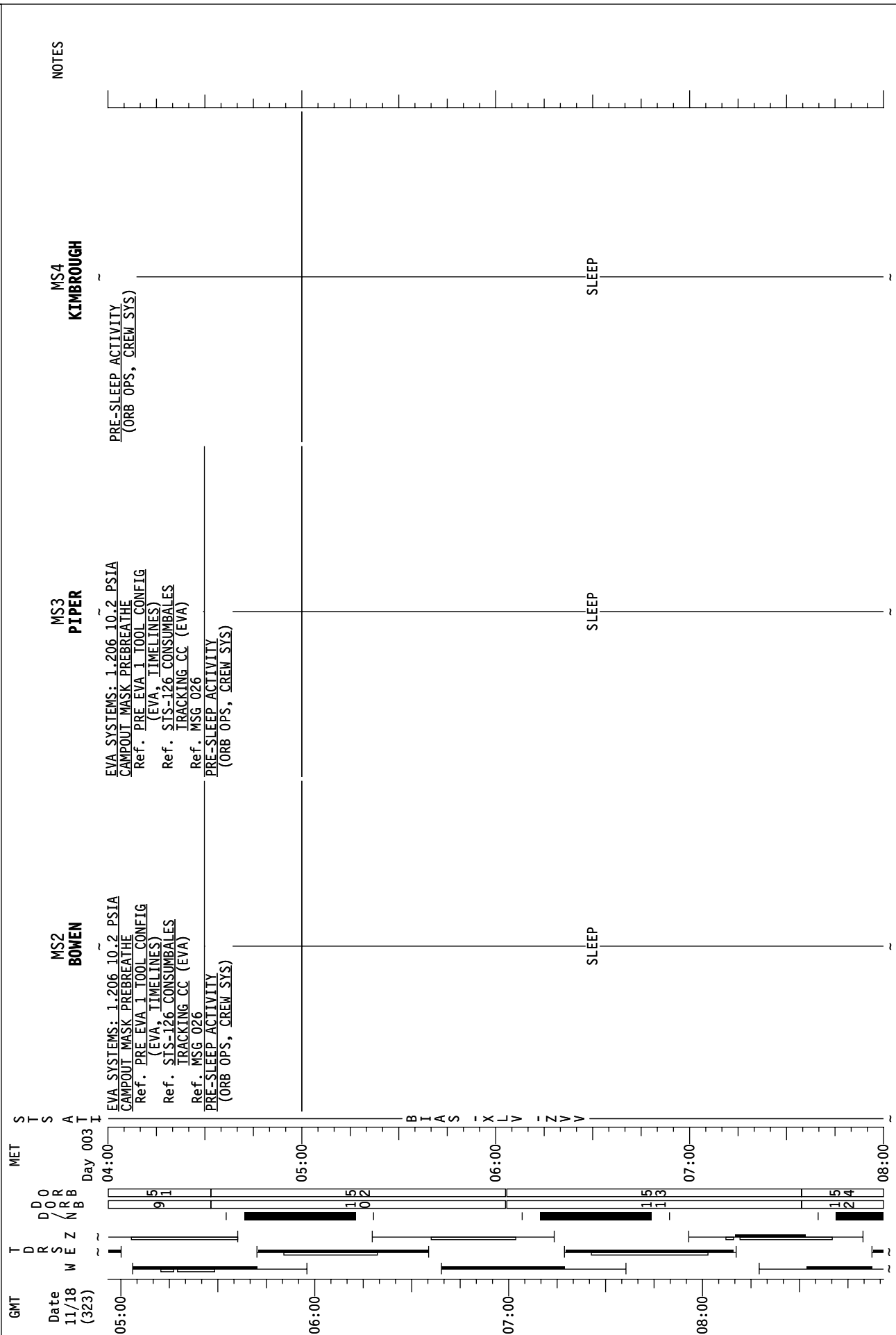


FLT PLN/126/FLIGHT

3-40

# STS-126 FD (04)

**REPLANNED**



MSG 022 - FD04 MISSION SUMMARY

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Good Morning Endeavour!!!

What a perfect rendezvous and docking you had yesterday!

Greg, good to have you as part of the shuttle crew!

YOUR CURRENT ORBIT IS: 193 X 186 NM

NOTAMS:

**NOTAMS - NO CHANGE**

- EDW – EDT IN USE FOR STS-126. EDW ELS DAY / VFR ONLY.
- EDW – LAKEBED RUNWAY 15/33 ELS ONLY. OTHER LAKEBED RWYS RED.
- NOR – LAKEBED RUNWAYS GREEN.
- DOV – RWY 14/32 CLOSED.
- HAW – RWY 13 THLD DISPLACED, 9,019' USABLE.
- AMB – RWY 15/33 CLOSED.
- ILM – RWY 06/24 CLOSED.
- YHZ – RWY 05/23 CLOSED.
- YYT – RWY 16/34 CLOSED.
- IKF – NOT USABLE. NO AGREEMENT.
- BEN – NOT RECOMMENDED/NOT SUPPORTED.
- ZZA – FIRST 600M (~2,000') OF RWY 30L NOT AVAILABLE. 10,200' REMAINING.

NEXT 2 PLS OPPORTUNITIES:

- EDT04L ORB 49 – 3/00:50 SKC 7 040/07P9
- EDT04L ORB 64 – 3/23:41 SKC 7 040/02P5

OMS TANK FAIL CAPABILITY:

- L OMS FAILS: NO
- R OMS FAILS: NO

LEAKING OMS PRPLT BURN:

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

END OF PAGE 1 OF 2, MSG 022



MSG 022 - FD04 MISSION SUMMARY

OMS QUANTITIES(%)

L OMS OX = 33.6    R OMS OX = 34.0  
 FU = 33.3            FU = 33.8  
 Subtract interconnect counter for current OMS quantities.

DELTA V AVAILABLE:

OMS	353 FPS
<u>ARCS (TOTAL ABOVE QTY1)</u>	<u>32 FPS</u>
TOTAL IN THE AFT	385 FPS
ARCS (TOTAL ABOVE QTY2)	65 FPS
FRCS (ABOVE QTY 1)	45 FPS
AFT QTY 1	87 %
AFT QTY 2	49 %

<u>SYSTEM</u>	<u>FAILURE</u>	<u>IMPACT</u>	<u>WORK AROUND</u>
GNC	TCS Shutter failed to close during TCS Deactivation; shutter appeared closed on camera. Shutter was commanded closed per starred block and microswitch indicated closed.	None	None - TCS steps for undocking will be run as written.

END OF PAGE 2 OF 2, MSG 022

## MSG 024 - FD03 MMT SUMMARY

1 Congratulations on an excellent rendezvous and docking!!!

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3 The FD03 MMT met to review orbiter systems and mission progress. Additionally, the MMT  
4 reviewed the ascent trajectory and propulsion systems performance both of which were  
5 nominal.

6  
7 **Orbiter Systems** - Endeavour continues to perform well with only a few anomalies  
8 discussed. Here's a short summary of the relevant anomalies:

- 9 • SM GPC GCIL Command - A review of the SM command anomalies has determined  
10 that the command words associated with the S-band/Ku-band automatic handovers  
11 and the Payload Signal Processor automatic port moding are not being successfully  
12 processed by the GCIL. The team has determined that only these commands are  
13 affected. This issue will have minimal mission impact since the MCC will uplink the  
14 necessary S-band/Ku-band handover commands. Also, PSP port modes are not  
15 required for the remainder of the mission, but workarounds are available if required.
- 16 • OMS Crossfeed A Heater - After yesterday's test, the affected heater on the A string  
17 is considered failed. The B crossfeed heater continues to operate nominally. A  
18 thermal analysis was performed assuming the next worst failure to the B crossfeed  
19 heater and demonstrates that the affected region will be well above SODB limits and  
20 therefore no mission impact even in that case.
- 21 • SRMS Elbow Camera Automatic Lighting Control - This anomaly was reviewed and  
22 will have no mission impact.
- 23 • MPS Helium Pneumatic pressure decay - During post launch data review, it has  
24 been determined that there was a larger than expected pressure decay in the MPS  
25 pneumatic tank during powered flight. This is not expected to pose any problem for  
26 the remainder of the flight.

27  
28 **Ascent Debris Review** - Collection and review of the ascent, FD2 inspection and RPM data  
29 continues. The team reviewed the excellent imagery you acquired of the T0 LH2 area  
30 yesterday and believe the FRSI to be intact. Review of imagery taken from inside the Tail  
31 Service Mast has identified some ice build up at the T0 LH2 umbilical and it is believed the  
32 liberated debris was ice.

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END OF PAGE 1 OF 1, MSG 024

**18-0227 (MSG 025) – FD04 EVA Deltas**

Page 1 of 1

1 **FD4 EVA Checklist Deltas**

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3 The capacities of the EMU Batteries charged earlier this week have been calculated.  
4 The EMU battery usage plan has been rearranged to maximize battery capacity for  
5 EVA 3. See message 18-0228 (026) for updated Consumables Tracking and  
6 Battery Recharge Cue Cards. Red indicates changes made. Also, please make the  
7 following pen and ink additions:

8

9 **Post Docking EVA Transfer and Reconfig, EVA Checklist, FS 2-9**

10

a. Step 2, last line,

11

WAS: EMU Battery → M-02 s/n 1038, EVA Prep and Ops

12

IS: EMU Battery → Temp stow for installation into EMU 3003.

13

b. Step 5.

14

WAS: Confirm REBA and Metox per STS-126 Consumables Tracking  
Cue Card.

15

16

IS: Replace EMU battery s/n 2073 with s/n 2037; stow s/n 2073 in M-  
02 s/n 1038 for use on EVA 2. Confirm REBA and Metox per STS-126  
Consumables Tracking Cue Card.

17

18

19

20 **EMU Swap for EVA 3, EVA Checklist, FS 2-13**

21

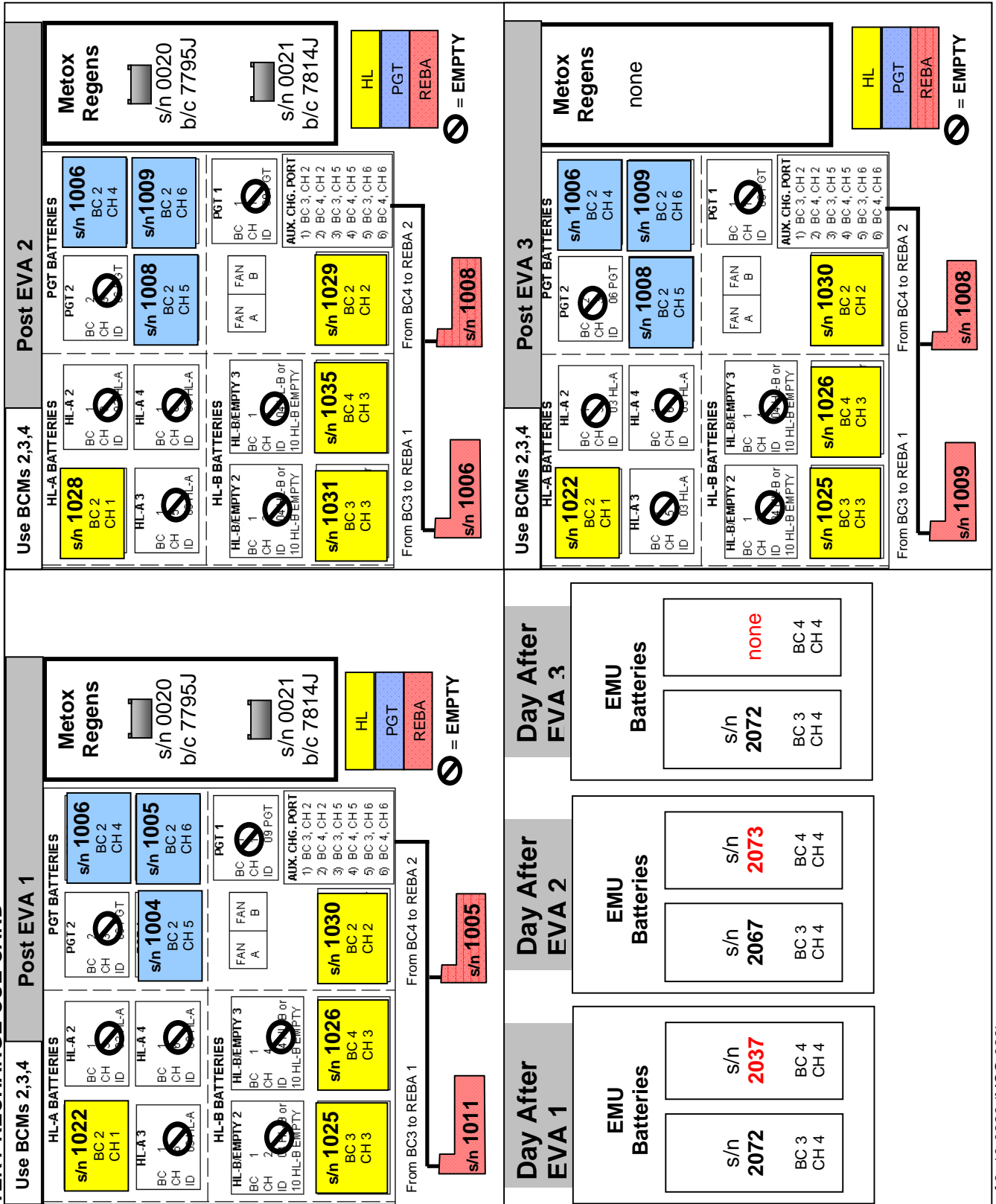
a. ADD: Step 3a. EMU 3003: Remove EMU Battery for Battery Recharge  
Init.

22

**CONSUMABLES TRACKING CUE CARD**

SAFER usage s/n 1004 & 1007			EMU TV: ID 16 & 18			Dump CWC s/n 1059		
EMU	LiOH (s/n) (B/C)	METOX (s/n) (B/C)	EMU Battery	REBA (s/n)	HL Battery (s/n)	PGT Battery (s/n)	PGT Battery Spare (s/n)	PWR (s/n)
<b>Camp</b>	<b>Resize</b>	<b>0020/0021</b>						
<b>EVA 1</b>	<b>EV1 – Pp</b> EMU 3005	0015 7686J	2072	1005	1022/1025	1004	1006	
	<b>EV2 – Bw</b> EMU 3003	0016 7796J	2037	1011	1026/1030	1005		
<b>Post</b>		<b>Regen Camp</b>		<b>Recharge</b>	<b>Recharge</b>	<b>Recharge</b>	<b>Recharge</b>	<b>1024</b>
<b>Between</b>	<b>Swap</b>		<b>Recharge</b>					
<b>Camp</b>		<b>0020/0021</b>						
<b>EVA 2</b>	<b>EV1 – Pp</b> EMU 3005	0017 7811J	2073	1005	1028/1029	1009	1006	
	<b>EV3 – Kb</b> EMU 3018	0019 7807J	2067	1003	1031/1035	1008		
<b>Post</b>		<b>Regen Camp</b>		<b>Charge</b> <b>1006 &amp; 1008</b>	<b>Recharge</b>	<b>Recharge</b>	<b>Recharge</b>	<b>1024/1025</b>
<b>Between</b>	<b>Swap</b>		<b>Recharge</b>					
<b>Camp</b>		<b>0020/0021</b>						
<b>EVA 3</b>	<b>EV1 – Pp (fwd)</b> EMU 3005	N/A	2072	1008	1022/1025	1009	1006	
	<b>EV2 – Bw (aft)</b> EMU 3003	2002	2037	1011	1026/1030	1008		
<b>Post</b>				<b>Recharge</b> <b>1008 &amp; 1009</b>	<b>Recharge</b>	<b>Recharge</b>	<b>Recharge</b>	<b>1025/1026</b>
<b>Between</b>	<b>Swap</b>	<b>Cap/Tape</b>	<b>Recharge</b>					
<b>Camp</b>		<b>0011/0012</b>						
<b>EVA 4</b>	<b>EV2 – Bw (fwd)</b> EMU 3003	N/A	2074	1009	1028/1029	1009	1006	
	<b>EV3 – Kb (aft)</b> EMU 3018	N/A	2075	1006	1031/1035	1008		
<b>Post</b>								<b>1026</b>
<b>Return</b>	<b>EV1 – Pp</b> EMU 3018	2002	2072					
	<b>EV2 – Bw</b> EMU 3003	2003	2073					

**BATTERY RECHARGE CUE CARD**



## 18-0193 (MSG 028) ZSR RACK DEPLOY IN JPM AND JLP

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### OBJECTIVE:

Deploy Zero-G Soft Rack (ZSR) at JLP1P2(JPM1A1). This activity modifies the rear of the ZSR to mitigate interference with the JEM Shell Heaters.

### LOCATION:

Installed: JLP1P2(JPM1A1)

### DURATION:

30 minutes per Rack

### CREW:

One

### MATERIALS:

Velcro Straps (two)

Zipties (four)

Kapton Tape

### TOOLS:

Digital camera

Leatherman Tool SLZ 33112269

### ISS Toolbox:

Drawer 2:

Ratchet, 3/8" Drive

5/32" Hex Head, 3/8" Drive

Drawer 4:

Wire Cutters 184BCP

### REFERENCED PROCEDURE(S):

None

### NOTE

All directional references (up, down, left, right) are with respect to front face of Rack, as you face Rack, with feet oriented towards the pivot point.



Figure 1. - Pip Pins on Upper Latches.

# 18-0193 (MSG 028) ZSR RACK DEPLOY IN JPM AND JLP

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## 1. ZSR ROTATION

- 1.1 Remove PIP Pins (two).  
Temporarily stow.  
Refer to Figure 1.
- 1.2 K-BAR Thumb Latches (two) → down position  
√Rack rotation path unobstructed  
Rotate ZSR down to a controlled stop.

## 2. MODIFYING ZSR TO PREVENT INTERFERENCE WITH JLP AND JPM SHELL HEATERS



Figure 2. - ZSR Folded.



Figure 3. - Strap with Velcro and Zip Tie.

- 2.1 Cut Zip Ties (six) with Wire Cutters or Leatherman Tool and release Launch Restraint Straps on back of fabric envelope, securing strap ends to side panel Velcro.  
Refer to Figures 2, 3.

## 18-0193 (MSG 028) ZSR RACK DEPLOY IN JPM AND JLP

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Figure 4. - Back Panel (Open).

- 2.2 Unzip back panels.  
Refer to Figure 4.



Figure 5. - One Petal Pushed Into Position.

- 2.3 Push petal back and to the sides until they rest against fabric envelope.  
Refer to Figure 5.

### NOTE

There are three Rear Lateral Struts on a ZSR. The center strut will not be installed to avoid contact with the JEM shell heaters.



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Figure 6. - Top and Bottom Strut and Socket.

- 2.4 Insert each end of the Rear Lateral Struts (two) into corresponding sockets at rear edge of petal.  
Refer to Figure 6.



Figure 7. - ZSR to Insert Tab.



Figure 8. - Tabs Between Insert.

- 2.5 Match and secure tabs (red in top and bottom of ZSR and blue in center).  
Refer to Figures 7, 8.

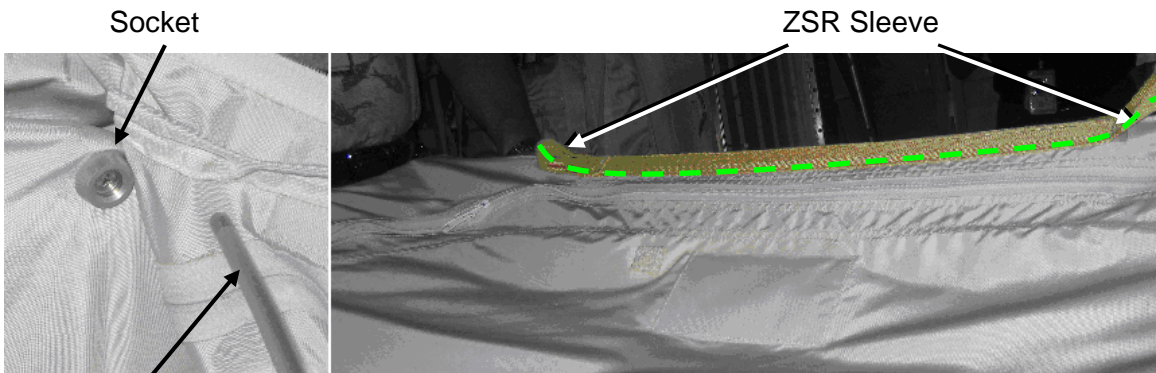
**18-0193 (MSG 028) ZSR RACK DEPLOY IN JPM AND JLP**

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Figure 9. - ZSR to Insert Zipper.

- 2.6 Connect rear zippers for both top and bottom inserts. Refer to Figure 9.



Center  
Rear  
Lateral  
Strut

Figure 10.- ZSR Center Rear Lateral Strut, Socket, and ZSR Sleeve

**18-0193 (MSG 028) ZSR RACK DEPLOY IN JPM AND JLP**

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Ziptie through zipper and Lower/Upper  
Launch Restraint Loop



Figure 11.- ZSR Rear Stowage Volumes (empty, unzipped, in stowed configuration)



Figure 12.- ZSR Rear Launch Restraint Loops Restrained with Velcro Straps

- 2.7 Roll up inward, and secure rear ZSR stowage volumes with Zipties. Refer to Figure 11.
- 2.8 Restrain rear ZSR straps (Velcro Straps). Refer to Figure 12.



ISS017E019836

Figure 13.- ZSR Zipper and Cloth Tab improperly contacting JEM shell heater.

- 2.9 Restrain zippers and cloth zipper tabs to ZSR to prevent contact with JEM shell heaters (Kapton Tape). Refer to Figure 13.
- 2.10 Photo document ZSR modifications (digital camera).

### 3. INSTALLING ZSR

- 3.1 √ZSR rotation path unobstructed

#### NOTE

When rotating ZSR up, the N-Braces at JLP1P2 and the ARIS Pushrod Fitting on standoff at JPM1A1 may interfere with the top of the ZSR. The top and side petals of the ZSR can be pressed down to clear the N-Braces and ARIS Pushrod Fitting.

- 3.2 ZSR K-BAR Thumb Latches (two) → up position  
Tuck both upper rear corners of ZSR into ZSR volume while slowly rotating Rack up to a controlled stop to prevent impingement of ZSR onto GLA, N-Brace, or ARIS Pushrod Fitting.  
Engage ZSR K-BAR Thumb Latches (two) into K-BAR Capture Mechanisms.

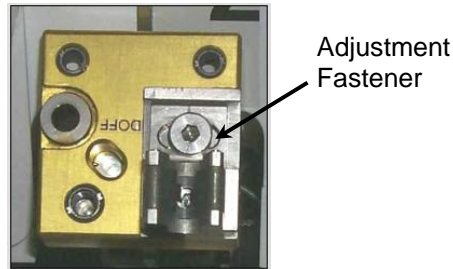


Figure 14.- K-BAR Capture Mechanism, Located on JEM Standoff.

- \*\*\*\*\*
- \* If K-BAR does not align with Capture Mechanism:
  - \* | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex
  - \* | Head).
  - \* | Slide capture clip left/right, as required to engage K-BAR.
  - \* | Once K-BAR engaged, re-tighten Adjustment Fastener
  - \* | (Ratchet, 3/8" Drive; 5/32" Hex Head).
  - \* | Refer to Figure 14.
- \*\*\*\*\*

CAUTION
Shell heaters and their wire harness are mounted on JEM Shell behind ZSRs, therefore the clearance between ZSR Rear and JEM Shell should be controlled properly to avoid damage to harness and heaters due to rubbing.

- 3.3 Verify ZSR Rear is kept away from the heaters and the harnesses on JEM Shell and over Longeron at ZSR rear bottom. Notify **SSIPC** of result.

#### 4. [REMOVING FSE BRACKETS FROM ZSR](#)

NOTE
The seat track attachment plates are noncaptive and will come off the brackets if the knobs are loosened more than approximately six turns.

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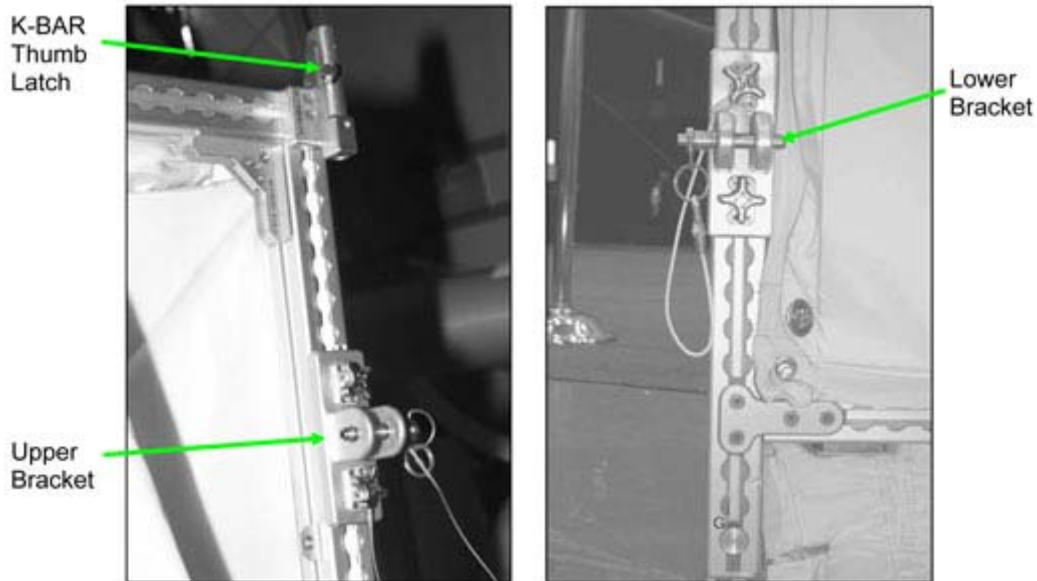


Figure 15.- ZSR with Upper Right K-BAR, Upper Bracket, and Lower Bracket.

- 4.1 Remove ZSR right brackets (upper and lower) from the right side of the ZSR and ZSR left brackets (upper and lower) from the left side of the ZSR (knobs).  
Temporarily stow.  
Refer to Figure 15.

### 5. SHELF DEPLOY



Figure 16. - Open ZSR Doors.

- 5.1 Open door(s) as required to unroll shelf from rear wall.  
Align and zip from front to back.  
Refer to Figure 16.

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5.2 Separate doors as required stowing door connector flap by snapping to back of door

### 6. CLOSEOUT

6.1 Photo document overview of the installed ZSRs (digital camera).

6.2 ISS ↓ **MCC-H** of task completion.  
Stow tools, materials.

**CWC FILLS**

CWC No.	Record S/N Used	Sample Kit Ref: Kit Table	Ag Biocide Kit Ref: Kit Table	CWC Label	CWC Launch Location
<input type="checkbox"/> 1	1071	S/N 1002 (Note A)	S/N 1005	Green (Tech)	Clean CWC. To be filled first.
<input type="checkbox"/> 2		S/N 1002 (Note A)	S/N 1005	Green (Tech)	In pregathered mesh bag (Note D).
<input type="checkbox"/> 3		S/N 1002 (Note A)	S/N 1005	Green (Tech)	CWCs of unknown status. These 5 should be filled after S/N 1071 and before the S/Ns w/ <i>Wautersia</i> . They can be filled in any order.
<input type="checkbox"/> 4		S/N 1002 (Note A)	S/N 1005	Green (Tech)	In pregathered mesh bag (Note D); Available Technical S/Ns: 1043 <input type="checkbox"/> 1053 <input type="checkbox"/> 1072 <input type="checkbox"/> 1075 <input type="checkbox"/> 1076 <input type="checkbox"/>
<input type="checkbox"/> 5		S/N 1002 (Note A)	S/N 1005	Green (Tech)	
<input type="checkbox"/> 6		S/N 1002 (Note A)	S/N 1005	Green (Tech)	CWCs w/ <i>Wautersia</i> . These 5 should be filled last. They can be filled in any order.
<input type="checkbox"/> 7		S/N 1002 (Note A)	S/N 1005	Green (Tech)	
<input type="checkbox"/> 8		S/N 1002 (Note A)	S/N 1005	Green (Tech)	
<input type="checkbox"/> 9		S/N 1002 (Note A)	S/N 1005	Green (Tech)	In pregathered mesh bag (Note D); Available Technical S/Ns: 1065 <input type="checkbox"/> 1066 <input type="checkbox"/> 1068 <input type="checkbox"/> 1073 <input type="checkbox"/> 1077 <input type="checkbox"/>
<input type="checkbox"/> 10		S/N 1002 (Note A)	S/N 1003	Green (Tech)	
<input type="checkbox"/> 11		Sample Not Req'd	S/N 1003	Green (Tech)	

**Pre-Fill Checklist:**

- 1  2  3  4  5  6  7  8  9  10  11
  - Disinfect CWC QD and Transfer Hose QD
- Post-Fill Checklist:**
- 1  2  3  4  5  6  7  8  9  10  11
  - Take Sample, filling Sample Bag nearly full
  - Check correct label is in CWC window
  - Check correct decal on CWC end
  - Check correct CWC S/N on end decal
  - Report S/N to MCC
  - Transfer CWC to NOD1D2
  - Cap Transfer Hose QD between each fill

**CWC Fill Notes:**

- A. Slow filled sample bags and purge bag (only one purge is done during the flight, at CWC Fill setup) in MF14E
- B. Rough handling may cause leakage
- C. Fill each CWC for 52 min or Term CWC Fill on MCC call
- D. Pregathered mesh bag originally located in NOD2D2 (M-02 Bag, S/N 1026). Some CWCs may still contain residual water (~ 10 lb/bag) and will be located outside the mesh bag. Prior to filling, report if bag has a significant amount of residual water.

**Kit Table**

Kit	S/N	Storage Location	Undock Location
Ag Biocide Kit	1005	Pregathered Mesh Bag (Note D)	MF28K
Sample/Purge Kit	1002	MF28K	MF28K
Ag Biocide Kit	1003	MF28K	NOD2D2 (M-02 Bag, S/N 1026)

**PWR OPS**

PWR No.	PWR S/N	Storage Location	Actions
<input type="checkbox"/> 1	1003	Launched in MPL1 S4_K2	Fill and transfer to A/L1D1
<input type="checkbox"/> 2	1015		Fill and transfer to A/L1D1
<input type="checkbox"/> 3	1023	A/L1D1_B2	Dump, fill and return to A/L1D1_B2
<input type="checkbox"/> 4	1007	A/L1D1_B2	Dump, fill and return to A/L1D1_B2
<input type="checkbox"/> 5	2003 (OGS)	A/L1D1_B2	Dump, fill and return to A/L1D1_B2
<input type="checkbox"/> 6	1024	A/L1D1	Post EVA2, dump, fill and transfer to A/L1D1

**PWR Fill Notes:**

- Do not detach PWR (EMU H2O Recharge Bag) QD restraint during PWR ops
- PWR's will be dumped using the Supply Water Dump system