STS-127 / 2JA

FD 12 Execute Package

MSG	Page(s)	Title
104B	1 - 18	FD12 Flight Plan Revision **(pdf)**
105	19 - 20	FD12 Mission Summary **(pdf)**
106A	21 - 22	FD12 Transfer Message **(pdf – Changeout Pages Electronic Only)**
107	23 - 31	Station Lab and Shuttle Printer Exchange **(pdf)**
109	32	FD12 EVA Deltas **(pdf)**
110	33 - 34	FD12 - EVA4 Deconfig/EVA5 Config **(pdf)**
111	35 - 66	EVA 5 Preliminary Detailed Timeline **(pdf)**
101	---	PAO Event Summary Message - Joint Crew News Conference **(pdf - Electronic Only)**
108	---	Printer Swap Confidential Message **(pdf - Crew Confidential)**

Approved by FAO: *Tobin Melroy*

Last Updated: Jul 26 2009 7:37AM GMT
JEDI *(**J**oint **E**xecute package **D**evelopment and **I**ntegration), v2.04.0003*

MSG INDEX

MSG NO.	TITLE
101	PAO Event Summary Message: Joint News Conference (20-0596)
104B	FD12 Flight Plan Revision
105	FD12 Mission Summary
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107	Station Lab and Shuttle Printer Exchange (20-0542)
108	Printer Swap Confidential Message (20-0541)
109	FD12 EVA Deltas (20-0603)
110	FD12 EVA 4 Deconfig/EVA Config (20-0604)
111	EVA 5 Preliminary Detailed Timeline (20-0601)

1. POST SLEEP CRYO CONFIG

For today's cryo config, O2 tanks 2, 3, and 4, and H2 tanks 2 and 4 will be active.

R1 O2,H2 MANF VLV TK2 (two) - OP (tb-OP)
O2 TK3 HTR B - AUTO

A11 CRYO TK4 HTR O2 B - AUTO

A15 CRYO TK5 HTR O2 A - OFF

2. MIDDAY LIOH EXCHANGE:

a. Transfer 2 Mesh Bags from ISS LAB1O3 to Shuttle containing the following 10 LiOH cans:
STS-126 Cans 32 & 33
STS-126 Cans 35 thru 42
Reference Transfer List Return Item 722.

b. Remove the following cans from the Shuttle LiOH Volume and transfer to ISS NOD1S4_D2. Verify that all of the cans to be transferred back to ISS have LiOH socks (blue covers) installed.
STS-127 Cans 11 thru 13 (can 11 needs a LiOH sock taken from STS-126 can 31)
STS-124 Cans 27 & 28
STS-126 Cans 24 thru 28
Reference Transfer List Resupply Item 11.

3. LIOH CHANGEOUT

The table below is your new LiOH changeout plan for FD12. The MID FD12 changeout should be performed per your FD12 timeline. Depending on CDRA performance and CO2 trends, the midday changeout may be deleted real-time.

FLIGHT DAY	POS A	POS B	CK CMPLT
POST FD12	"	STS-126_____	
MID FD12	STS-126_____	"	
PRE FD12	"	STS-126_____	

4. H2O OPS CUE CARD UPDATE

Due to the deletion of the FD12 dump, the PWRs will not be dumped and will contain residual water. EECOM will provide fill durations to account for this residual water.

Make the following pen and ink changes to your H2O Ops Cue Card (Msg. 57):

Replace the PWR Fill #4 details with the following:

PWR S/N: 1026
Stowage Location: A/L1D1_A2
Actions: Fill and return to A/L1D1_A2

5. SSRMS SAFING DURING JLE DEMATE

Just a reminder that SSRMS safing may occur during the partial derigidization in step 5 of robotics procedure 4.201 JLE Retrieve. If this occurs, the ground will verify that the signature matches what we saw during JEF and JLE install ops. If it does, the recovery steps will be to cancel safing, release brakes, and limp all joints before picking up with nominal demate operations.

6. REPLACE PAGES 2-40 THROUGH 2-45 AND 3-126 THROUGH 3-135.

FD11 FD12

GMT 07/25/09 (206)

MET Day 010

		010/00	23 01	07/26 02	01 03	02 04	03 05	04 06	05 07	06 08	07 09	08 10	09 11	10 12
STS-127	CDR POLANSKY	PRE SLEEP				SLEEP							POST SLEEP	
	PLT HURLEY	PRE SLEEP				SLEEP							POST SLEEP	
	MS1 CASSIDY	PRE SLEEP				SLEEP						LOG	POST SLEEP	
	MS2 PAYETTE	PRE SLEEP				SLEEP							POST SLEEP	
	MS3 MARSHBURN	PRE SLEEP				SLEEP						LOG	POST SLEEP	
	MS4 WOLF	PRE SLEEP				SLEEP							POST SLEEP	
DAY/NIGHT														
ORBIT		159	160		161	162		163	164		165		166	167
TDRS	W													
	E													
	Z													
ORB ATT		BIAS -XLV -ZVV												
SSRMS POS		MBS PDGF3 @ WS8												
NOTES														

3

REPLANNED

FD11 — **FD12**

GMT 07/25/09 (206)

MET Day 010

010/00 23 01 07/26 02 01 03 02 04 03 05 04 06 05 07 06 08 07 09 08 10 09 11 10 12

ISS TDRS AVAIL

DN	FE-2 WAKATA	PRE SLEEP	SLEEP	POST SLEEP; S/U; PREP; JAXA; PAO; EVENT; POST SLEEP
EXP 19	ISS CDR PADALKA	PRE SLEEP	SLEEP	POST SLEEP; PFC; PREP; JAXA; PAO; EVENT; POST SLEEP
	FE-1 BARRATT	PRE SLEEP	SLEEP	SALIV; SLEEP; POST SLEEP; PW
UP	FE-2 EXP20 KOPRA	PRE SLEEP	SLEEP	SALIV; SLEEP; POST SLEEP; PW
EXP 20	FE-3 ROMANENKO	PRE SLEEP	SLEEP	POST SLEEP; PFC; PW
	FE-4 THIRSK	PRE SLEEP	SLEEP	SALIV; SLEEP; POST SLEEP; PW
	FE-5 DE WINNE	PRE SLEEP	SLEEP	SALIV; SLEEP; POST SLEEP; PW; VTR; VCR

DAY/NIGHT

ORBIT: 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167

SSRMS POS: MBS PDGF3 @ WS8

NOTES

FD12
GMT 07/26/09 (207)

REPLANNED

NO UNISOLATED EXERCISE [EFU 10] | NO EXERCISE [DUAL ARM OPS] | NO UNISOLATED EXERCISE [MT XLATE]

MET Day 010 — 12 13 14 15 16 17 18 19 20 21 22 23 011/00

STS-127		
CDR	POLANSKY	POST SLEEP; EXERCISE; XFR; UPDAT; N2*; PTVO6; RMS JLE GRPL; RMS JLE BERTH; PTV6&; O2-T; O2 P/B CONFIG; MEAL; N2*; CWC#6; INIT; FILTER CLEAN; XFER; TAEG; CWC; TERM; CREW CONF; CREW; PHOTO; EVA 5 PROC RVW; MUS; PRE; SLEEP; BRIEF; PRE SLEEP; PMC OCA; PRESLP
PLT	HURLEY	POST SLEEP; JLE; GRPL; JLE UINSTL; JLE RLS; EXERCISE; SSRMS; MNVR; PARK; CWC#5; INIT; MEAL; CWC; TERM; XFER OPS; IMU; CREW CONF; CREW; PHOTO; EVA 5 PROC RVW; MUS; CWC XFER; PRE SLEEP
MS1	CASSIDY	POST SLEEP; EVA 5 TOOL CONFG; EMU SWAP EVA5; BATTX/; MENTXL; E-LK PREP; MEAL; LIOH EXCHG; LIOH; C/O; EVA CONF; EXERCISE; CREW CONF; CREW; PHOTO; EVA 5 PROC RVW; PRE SLEEP; A/L&
MS2	PAYETTE	POST SLEEP; EFU10; RMS JLE GRPL; RMS JLE BERTH; PRLA; CLOSE; XFER OPS; PRNTR SWAP; MEAL; XFER OPS; CREW CONF; CREW; PHOTO; EVA 5 PROC RVW; MUS; EXERCISE; PRE SLEEP
MS3	MARSHBURN	POST SLEEP; EVA 5 TOOL CONFG; EMU SWAP EVA5; BATTX/; MENTXL; E-LK PREP; MEAL; EXERCISE; EVA CONF; XFER OPS; MUS; CREW CONF; CREW; PHOTO; EVA 5 PROC RVW; PRE SLEEP; A/L&
MS4	WOLF	EXERCISE; POST SLEEP; MDK#; EVA 5 TOOL CONFG; PWR FILL #1; XFER OPS; MEAL; EVA CONF; XFER; TAEG; CREW CONF; CREW; PHOTO; EVA 5 PROC RVW; MDK#; PRE SLEEP

DAY/NIGHT

ORBIT: 167 | 168 | 169 | 170 | 171 | 172 | 173 | 174

TDRS: W, E, Z

ORB ATT: BIAS -XLV -ZVV

SSRMS POS: MBS PDGF3 @ WS8 — MT XLATE — MBS PDGF3 @ WS4 — W/O — NODE2 PDGF @ WS4

NOTES: *RPRS INIT; #STATUS CHECK; &DEACT; *RPRS TERM; #STATUS CHECK; &MASK PB/TOOL CNFG

FD12
GMT 07/26/09 (207)
MET Day 010

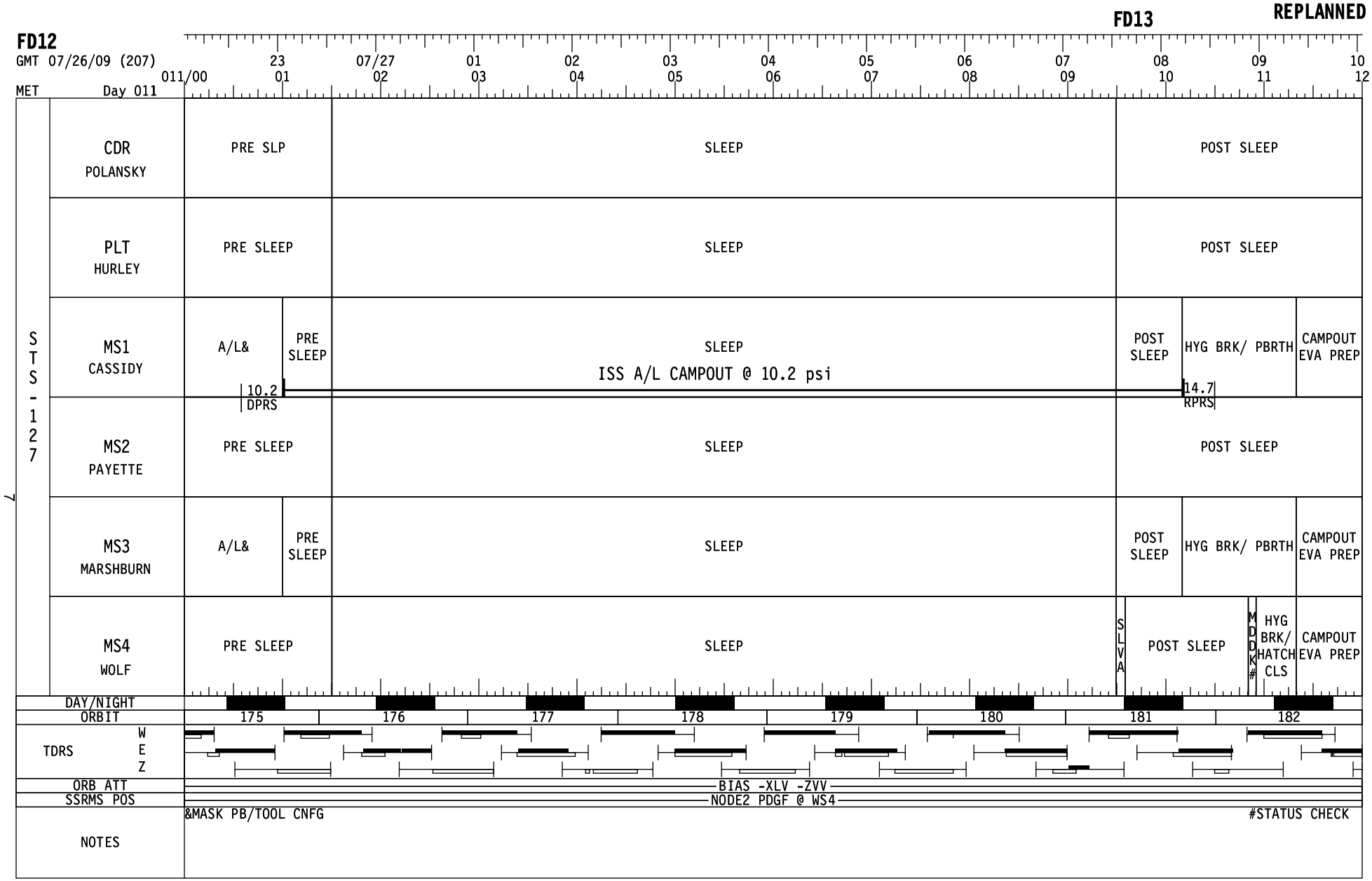
NO UNISOLATED EXERCISE [EFU 10] | NO EXERCISE [DUAL ARM OPS] | NO UNISOLATED EXERCISE [MT XLATE] | REPLANNED

12 13 14 15 16 17 18 19 20 21 22 23 011/00

ISS TDRS AVAIL

DN	FE-2 WAKATA	DPC; PW; MACT; EXERCISE TVIS; EXERCISE ARED; DPRP; MIDDAY-MEAL; GND STRP RTRV; S/U; HAND OVER; PREP; CREW CONF; CREW PHOTO; EVA 5 PROC RVW; PW; DPC; PRE SLEEP
EXP19	ISS CDR PADALKA	DPC; EXERCISE TVIS; TVIS HYG; PAO; СИ СОЖ АК 1М ИПД INV; MIDDAY-MEAL; KU SCH TEST; ГФИ 8 OBS; СОЖ MNT; VELO; PREP; CREW CONF; CREW PHOTO; EVA 5 PROC RVW; IMS; DPC; PRE SLEEP
EXP19	FE-1 BARRATT	DPC; D2XS; CMRS C/O; EXERCISE ARED; PTV KU INST; EVA TOOL STOW; D2XS; MIDDAY-MEAL; KU SCH TEST; PLCK; CSA CP Z CAL; D2XS CAMR; EXERCISE TVIS; PREP; CREW CONF; CREW PHOTO; EVA 5 PROC RVW; PW; DPC; PRE SLEEP
UP	FE-2 EXP20 KOPRA	DPC; CDE; CMRS C/O; JLE; GRPL; JLE UINSTL; JLE RLS; EXERCISE CEVIS; SSRMS; MNVR; PARK; O2-T; O2 P/B CONFIG; MIDDAY-MEAL; HAND OVER; PREP; CREW CONF; CREW PHOTO; EVA 5 PROC RVW; PW; DPC; PRE SLEEP; PFC; PRE; SLEEP
EXP20	FE-3 ROMANENKO	DPC; PAO; EXERCISE TVIS; TVIS HYG; MIDDAY-MEAL; PREP; CREW CONF; CREW PHOTO; VELO; ИП-1; DPC; PRE SLEEP
EXP20	FE-4 THIRSK	DPC; EXERCISE CEVIS; LPT; NES-EEG-S/U; MLT HD INST; NES; PHOTO; PFC; PRNTR SWAP; MIDDAY-MEAL; EXERCISE ARED; PREP; CREW CONF; CREW PHOTO; EVA 5 PROC RVW; PW; DPC; HAM; PRE SLEEP
EXP20	FE-5 DE WINNE	DPC; EXERCISE ARED; EQP S/U; NES-EEG-S/U; NES-EXP-EXECUTE; NES; PHOTO; STOW; MIDDAY-MEAL; BLB-LAP CMOS-XCHG; ♣; ⊕; EXERCISE CEVIS; PREP; CREW CONF; CREW PHOTO; EVA 5 PROC RVW; PW; DPC; PRE SLEEP

DAY/NIGHT	
ORBIT	167; 168; 169; 170; 171; 172; 173; 174
SSRMS POS	MBS PDGF3 @ WS8; MT XLATE; MBS PDGF3 @ WS4; W/O; NODE2 PDGF @ WS4
NOTES	♣BLB-LAP-CMOS-FLASH ⊕BLB-LAP FUN-TST


FD12
FD13
REPLANNED
GMT 07/26/09 (207)
MET Day 011
011/00 23 01 07/27 02 01 03 02 04 03 05 04 06 05 07 06 08 07 09 08 10 09 11 10 12
STS-127
CDR POLANSKY
PRE SLP
SLEEP
POST SLEEP
PLT HURLEY
PRE SLEEP
SLEEP
POST SLEEP
MS1 CASSIDY
A/L&
PRE SLEEP
SLEEP
ISS A/L CAMPOUT @ 10.2 psi
POST SLEEP
HYG BRK/ PBRTH
CAMPOUT EVA PREP
10.2 DPRS
14.7 RPRS
MS2 PAYETTE
PRE SLEEP
SLEEP
POST SLEEP
MS3 MARSHBURN
A/L&
PRE SLEEP
SLEEP
POST SLEEP
HYG BRK/ PBRTH
CAMPOUT EVA PREP
MS4 WOLF
PRE SLEEP
SLEEP
SLVA
POST SLEEP
MDDK#
HYG BRK/ HATCH CLS
CAMPOUT EVA PREP
DAY/NIGHT
ORBIT
175
176
177
178
179
180
181
182
TDRS
W
E
Z
ORB ATT
BIAS -XLV -ZVV
SSRMS POS
NODE2 PDGF @ WS4
NOTES
&MASK PB/TOOL CNFG
#STATUS CHECK

FD12 | **FD13** | **REPLANNED**

GMT 07/26/09 (207)

MET Day 011

011/00 23 01 07/27 02 01 03 02 04 03 05 04 06 05 07 06 08 07 09 08 10 09 11 10 12

ISS TDRS AVAIL

DN	FE-2 WAKATA	PRE SLEEP; SLEEP; PS; MO-9; POST SLEEP; HYG BRK/ HATCH CLS; CAMPOUT EVA PREP
EXP 19	ISS CDR PADALKA	PRE SLEEP; KIT-2; SLEEP; POST SLEEP; PW; DPC
EXP 19	FE-1 BARRATT	PRE SLEEP; PFC; PRE SLEEP; SLEEP; DRY; SLEEP; PS; MO-9; POST SLEEP; JPM; PW; DPC; TEST; PHS S/U
UP	FE-2 EXP20 KOPRA	PRE SLEEP; SLEEP; DRY; POST SLEEP; HYG BRK/ HATCH CLS; CAMPOUT EVA PREP
EXP 20	FE-3 ROMANENKO	PRE SLEEP; SLEEP; POST SLEEP; POST SLEEP; PW; DPC
EXP 20	FE-4 THIRSK	PRE SLEEP; SLEEP; DRY; SLEEP; POST SLEEP; MO-9; POST SLEEP; PW; DPC
EXP 20	FE-5 DE WINNE	PRE SLEEP; SLEEP; DRY; SLEEP; POST SLEEP; MO-9; POST SLEEP; PW; DPC; ♣

DAY/NIGHT

ORBIT: 175 | 176 | 177 | 178 | 179 | 180 | 181 | 182

SSRMS POS: NODE2 PDGF @ WS4

NOTES: ♣EXERCISE A

8

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATI

CDR POLANSKY | PLT HURLEY | MS2 PAYETTE | NOTES

13 14 15 1 | 164 165 166 167

07:00 08:00 09:00 10:00

08:00 09:00 10:00 11:00 12:00

BIAS-XLV-ZVV

SLEEP | SLEEP | SLEEP

FD12 EZ ACTIVITES:
TEPC (ORB OPS, CREW SYS)
CHECK STATUS
√OCAC FILTER & MDDK DUCT SCREEN
HARD REBOOT ALL PGSCs EXCEPT:
STS-7(WLES),STS-6(RPOP2),
& OCA ROUTER.

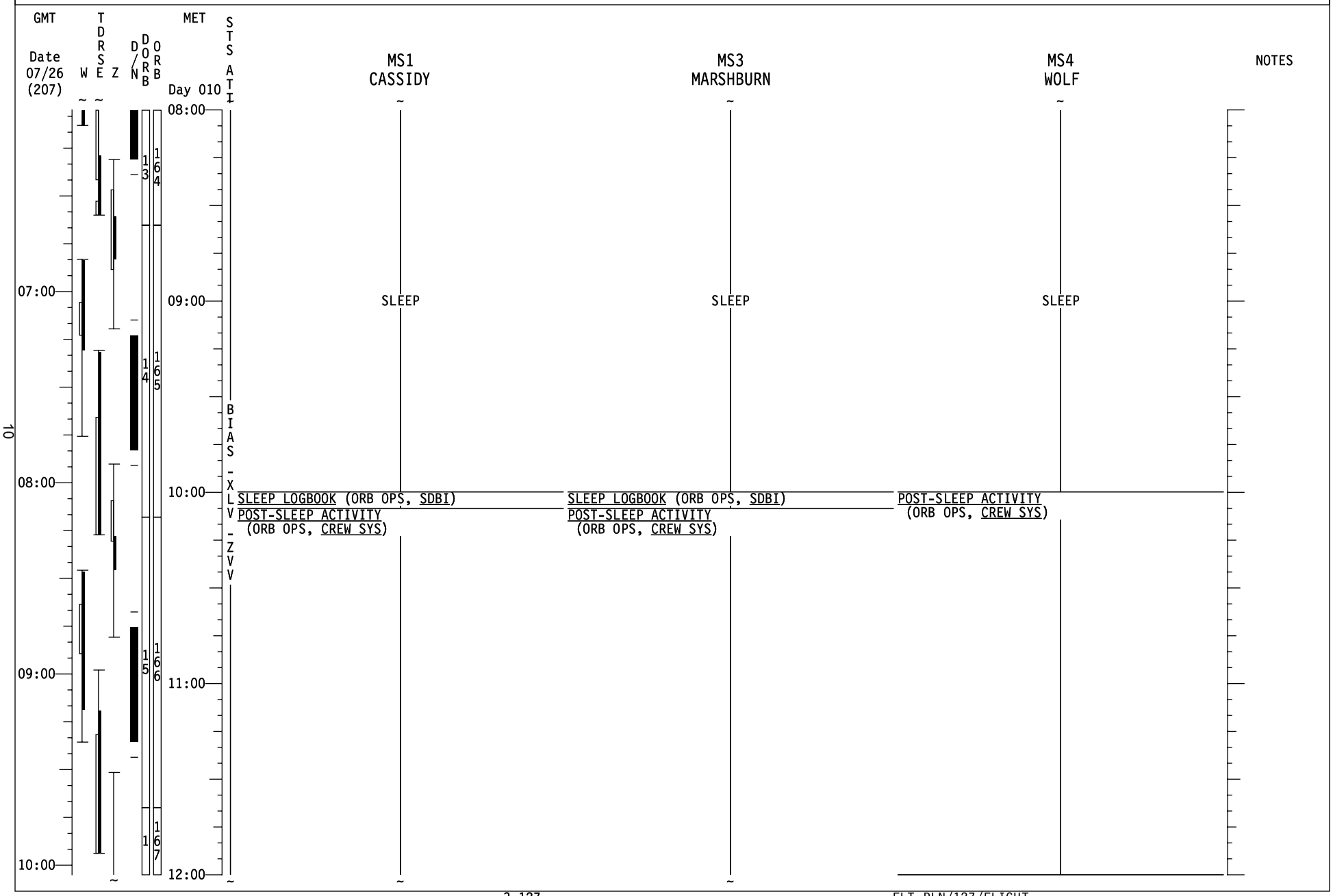
POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)
√HUM SEP for H2O Accumulation

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

REPLANNED

STS-127 FD (12)



REPLANNED

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATT

CDR POLANSKY	PLT HURLEY	MS2 PAYETTE	NOTES
POST-SLEEP ACTIVITY (ORB OPS, CREW SYS) √HUM SEP for H2O Accumulation	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
EXERCISE	ROBO: 4.201 JLE RETRIEVE Steps 1-5 Ref. MSG 104, item 5	J-S&M: 1.302 EFU10(9) OPS FOR JLE UNBERTHING - SLT/PCS (ASSY OPS, ACT & C/O) Steps 5-8 for EFU10 using EDU a EXERCISE CONSTRAINT	NO UNISOL EXERCISE [EFU 10]
DAILY TRANSFER LIST UPDATE Ref. Transfer List & MSG 106	ROBO: 4.201 JLE RETRIEVE Steps 6-8		
N2 REPRESS USING PAYLOAD N2 VLVS [A]			
P/TV06 ROBOTICS OPERATIONS [B]			
JLE GRAPPLE FROM SSRMS (PDRS, JLE NOMINAL) EXERCISE CONSTRAINT	[A] N2 REPRESS USING PAYLOAD N2 VLVS (ORB OPS, ECLS) Steps 3-7	JLE GRAPPLE FROM SSRMS (PDRS, JLE NOMINAL) EXERCISE CONSTRAINT	NO EXERCISE [FROM RMS GRAPPLE TO SSRMS RELEASE]
	ROBO: 4.201 JLE RETRIEVE Steps 9-11 EXERCISE CONSTRAINT		
JLE BERTH IN PLB (PDRS, JLE NOMINAL)	[B] KEEL 1 PWR(ICC) - ON √1 ILL PWR(ICC) - ON 2 PWR(JLE) - ON √2 ILL PWR(JLE) - ON	JLE BERTH IN PLB (PDRS, JLE NOMINAL)	
	EXERCISE		
P/TV06 ROBOTICS OPERATIONS (PHOTO/TV, SCENES) DEACTIVATION	ROBOTICS: 4.301 WS8-WS4 XLATE CNFG	PRLA CLOSE (ORB OPS, PRLA)	UPLINK β21 + Mask Box 2,4,9

BIAS-XLV-ZVV

Day 010: 12:00, 13:00, 14:00, 15:00, 16:00

11:00, 12:00, 13:00, 14:00

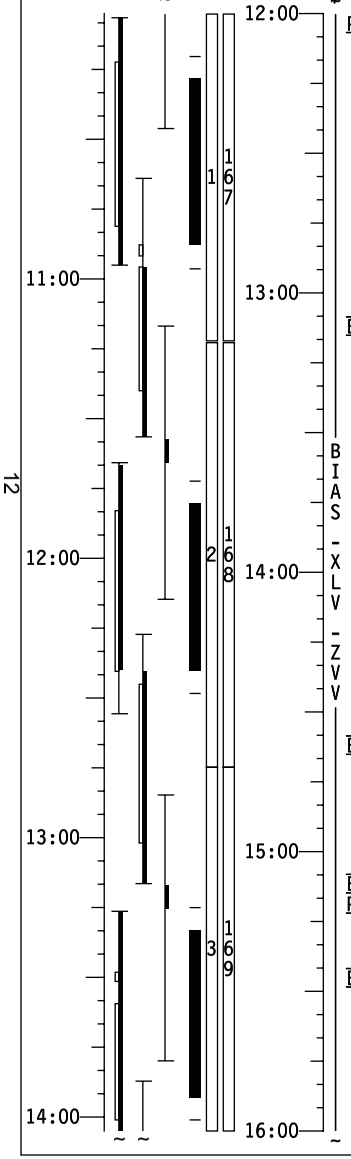
3-128

FLT PLN/127/FLIGHT

11

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATT



BIAS - XLV - ZVV

MS1 CASSIDY	MS3 MARSHBURN	MS4 WOLF	NOTES
POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	EXERCISE	
EVA 5 TOOL CONFIG Ref. MSG 109, 110 & 111	EVA 5 TOOL CONFIG Ref. MSG 109, 110 & 111	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	NO UNISOL EXERCISE [EFU 10]
		MDDK STATUS CHECK (ASSY OPS, P/L) Step 1	
		EVA 5 TOOL CONFIG Ref. MSG 109, 110 & 111	NO EXERCISE [FROM RMS GRAPPLE TO SSRMS RELEASE]
EMU SWAP FOR EVA 5 Swap EMUs btwn EDDAs	EMU SWAP FOR EVA 5 Swap EMUs btwn EDDAs	PWR FILL (ORB OPS, ECLS) Perform Water Fill #1 Fill dur. ~25 min Ref. MSG 104, item 4 & MSG 057	
EVA SYS: 1.515 EMU METOX/LIOH/BATTERY REPLACEMENT Ref: 127 EMU CTCC Stow used LiOH from EVA 4 in EVA Sys xfer bag	EVA SYS: 1.515 EMU METOX/LIOH/BATTERY REPLACEMENT Ref: 127 EMU CTCC Stow used LiOH from EVA 4 in EVA Sys xfer bag	TRANSFER OPS Ref. Transfer List & MSG 106	
EVA SYS: 1.305 EQUIPMENT LK PREP Steps 1-3 not req'd, In Step 27, use Vacuum Manometer s/n 05 Ref: 127 EMU CTCC	EVA SYS: 1.305 EQUIPMENT LK PREP Steps 1-3 not req'd, In Step 27, use Vacuum Manometer s/n 05 Ref: 127 EMU CTCC		

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATT

CDR POLANSKY	PLT HURLEY	MS2 PAYETTE	NOTES
	ROBOTICS: 4.301 WS8-WS4 XLATE CNFG	PRLA CLOSE (ORB OPS, PRLA)	
JOINT OPS:3.116 HIGH PRESS TANK O2 XFER Step 3.2-3.3		TRANSFER OPS Ref. Transfer List & MSG 106	NO UNISOL EXERCISE [DURING MT XLATE]
JOINT OPS: 3.128 O2 TRANSFER TO HI P AND LO P O2 TANKS Steps 3.2-3.4 & 3.6 MCC-H will perform Step 3.5			
		STS/LAB PRINTER SWAP Ref. MSG 107, Parts B,C,D & MSG 108 Ref. Transfer List: Resupply item 801 & Return item 909	
	SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) Init Fill #5, Ref. MSG 057		
MEAL	MEAL	MEAL	
C N2 REPRESS USING PAYLOAD N2 VLVS (ORB OPS, ECLS) Steps 8-12			
N2 REPRESS USING PAYLOAD N2 VLVS C	SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) FILL TERM	TRANSFER OPS Ref. Transfer List & MSG 106	
SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) Init Fill #6, Ref. MSG 057	TRANSFER OPS Ref. Transfer List & MSG 106		
FILTER CLEANING (IFM, SCHEDULED MAINTENANCE)			
TRANSFER TAGUP Coordinate with xfer counterpart			

Time scale: 15:00, 16:00, 17:00, 18:00 (GMT); 16:00, 17:00, 18:00, 19:00, 20:00 (MET)

STS ATT: BIAS - XLV - ZVV

DORB: 3, 4, 5, 6; ORB: 169, 170, 171, 172

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATT

MS1 CASSIDY	MS3 MARSHBURN	MS4 WOLF	NOTES
EVA SYS: 1.305 EQUIPMENT LK PREP Steps 1-3 not req'd, In Step 27, use Vacuum Manometer s/n 05 Ref: 127 EMU CTCC	EVA SYS: 1.305 EQUIPMENT LK PREP Steps 1-3 not req'd, In Step 27, use Vacuum Manometer s/n 05 Ref: 127 EMU CTCC	TRANSFER OPS Ref. Transfer List & MSG 106	NO UNISOL EXERCISE [DURING MT XLATE]
MEAL	MEAL		
LiOH EXCHANGE PART B Ref. MSG 104, item 2 Ref. Transfer List: Resupply item 11 & Return item 722			
LIOH CHANGEOUT On MCC-H Go, perform mid FD12 LiOH Changeout Ref. MSG 104, item 3	EXERCISE	MEAL	
EVA CONFERENCE ISS KU AVAIL 18:37-19:06 Ref. MSG 109 & MSG 111	EVA CONFERENCE ISS KU AVAIL 18:37-19:06 Ref. MSG 109 & MSG 111	EVA CONFERENCE ISS KU AVAIL 18:37-19:06 Ref. MSG 109 & MSG 111	
	TRANSFER OPS Ref. Transfer List & MSG 106		
EXERCISE		TRANSFER TAGUP Coordinate with xfer counterpart	

Time scale: 15:00, 16:00, 17:00, 18:00 (GMT); 16:00, 17:00, 18:00, 19:00, 20:00 (MET)

BIAS-XLV-ZVV

3-131

FLT PLN/127/FLIGHT

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATT

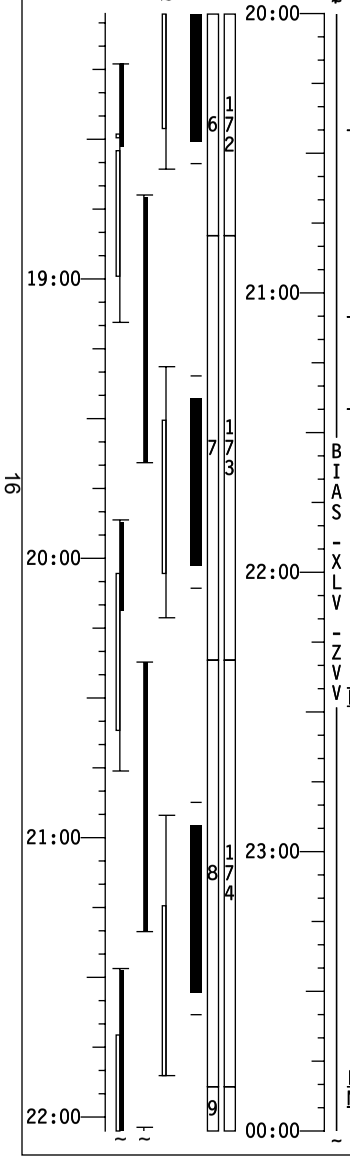
CDR POLANSKY	PLT HURLEY	MS2 PAYETTE	NOTES
TRANSFER TAGUP Coordinate with xfer counterpart			
SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) FILL TERM			
	IMU STAR OF OPPTY ALIGN (ORB OPS, GNC)		
CREW CONFERENCE ISS KU AVAIL: 20:15-21:23 TDRS Handover at 20:45 Ref. MSG 101	CREW CONFERENCE ISS KU AVAIL: 20:15-21:23 TDRS Handover at 20:45 Ref. MSG 101	CREW CONFERENCE ISS KU AVAIL: 20:15-21:23 TDRS Handover at 20:45 Ref. MSG 101	
CREW PHOTO	CREW PHOTO	CREW PHOTO	
EVA 5 PROCEDURE REVIEW	EVA 5 PROCEDURE REVIEW	EVA 5 PROCEDURE REVIEW	
LOW BACK PAIN QUEST (ASSY OPS, PAYLOADS)	LOW BACK PAIN QUEST (ASSY OPS, PAYLOADS)	LOW BACK PAIN QUEST (ASSY OPS, PAYLOADS)	
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	CWC TRANSFER Transfer 2 CWCs to ISS		
TRANSFER BRIEF Call down status to MCC			
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	EXERCISE	
		PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
NETMEETING VIDEO CONFERENCING (ORB OPS, PGSC)Private Medical Conference KU TDRW (23:40-00:10)			
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)			

Time scale: 19:00, 20:00, 21:00, 22:00; Day 010: 20:00, 21:00, 22:00, 23:00, 00:00

Z: 6, 7, 8, 9; ORB: 172, 173, 174; STS ATT: BIAS-XLV-ZVV

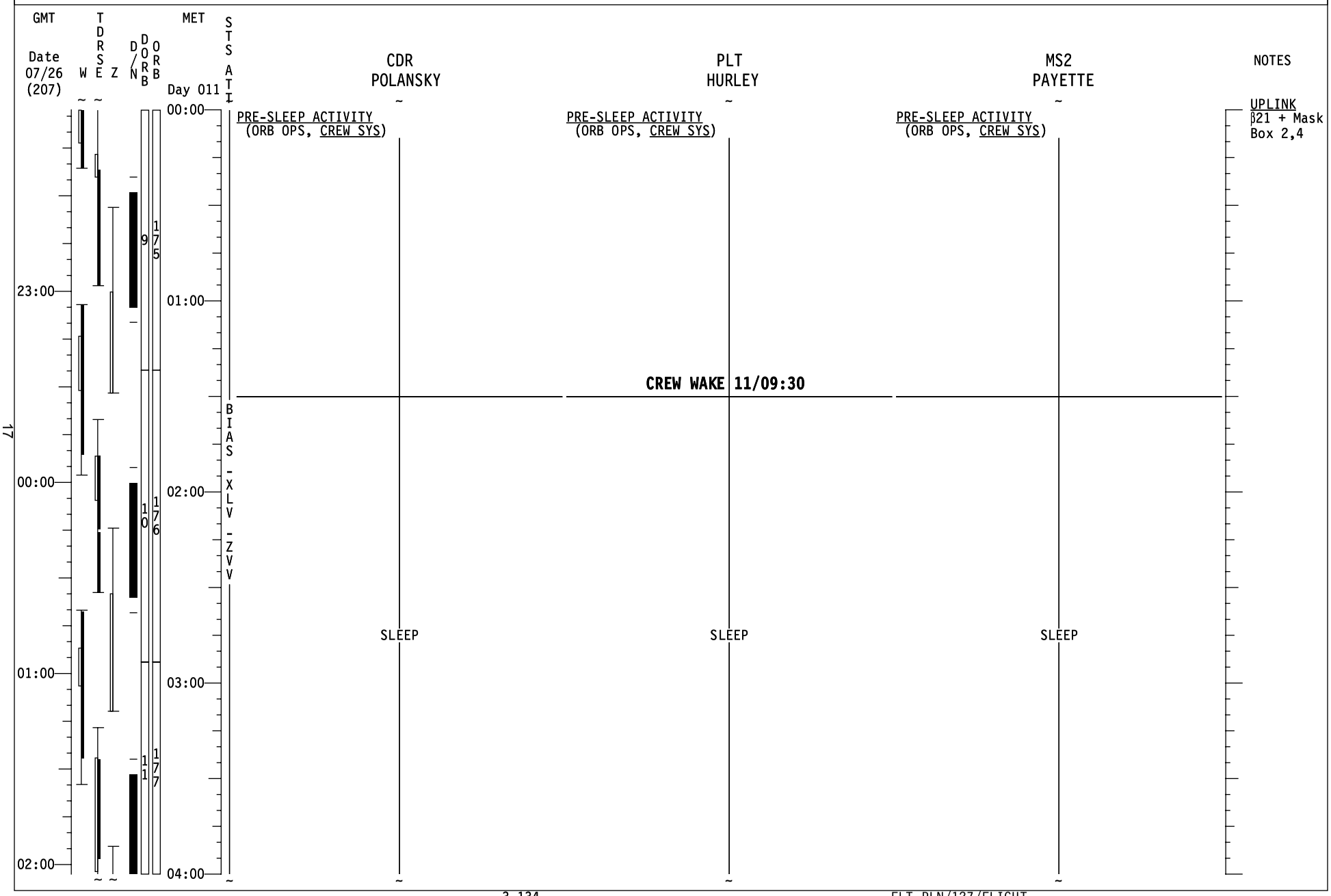
STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRSE | Z | D/N | DORB | ORB | MET Day 010 | STS ATT



MS1 CASSIDY	MS3 MARSHBURN	MS4 WOLF	NOTES
		TRANSFER TAGUP Coordinate with xfer counterpart	
EXERCISE	LOW BACK PAIN QUEST (ASSY OPS, PAYLOADS)		
CREW CONFERENCE ISS KU AVAIL: 20:15-21:23 TDRS Handover at 20:45 Ref. MSG 101	CREW CONFERENCE ISS KU AVAIL: 20:15-21:23 TDRS Handover at 20:45 Ref. MSG 101	CREW CONFERENCE ISS KU AVAIL: 20:15-21:23 TDRS Handover at 20:45 Ref. MSG 101	
CREW PHOTO	CREW PHOTO	CREW PHOTO	
EVA 5 PROCEDURE REVIEW	EVA 5 PROCEDURE REVIEW	EVA 5 PROCEDURE REVIEW	
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	MDDK STATUS CHECK (ASSY OPS, P/L) Step 1 PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
EVA SYS: 1.206 10.2 PSIA CAMPOUT MASK PREBREATHE Ref: 127 EVA 5 TOOL CONFIG (EVA, TIMELINES) Ref: 127 EMU CTCC	EVA SYS: 1.206 10.2 PSIA CAMPOUT MASK PREBREATHE Ref: 127 EVA 5 TOOL CONFIG (EVA, TIMELINES) Ref: 127 EMU CTCC		

STS-127 FD (12)


GMT
Date 07/26 (207)
W
TDRSE
Z
D/N
DORB
ORB
MET
Day 011
STS ATT
BIAS -XLV -ZVV
CDR POLANSKY
PLT HURLEY
MS2 PAYETTE
NOTES
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
UPLINK
β21 + Mask
Box 2,4
CREW WAKE 11/09:30
SLEEP
SLEEP
SLEEP
23:00
00:00
01:00
02:00
00:00
01:00
02:00
03:00
04:00
9
10
11
175
176
177

STS-127 FD (12)

GMT Date 07/26 (207) | W | TDRS E | Z | D/N | DORB 9 10 11 | ORB 175 176 177 | MET Day 011 | STS ATT BIAS -XLV -ZVV

MET	MS1 CASSIDY	MS3 MARSHBURN	MS4 WOLF	NOTES
00:00	EVA SYS: 1.206 10.2 PSIA CAMPOUT MASK PREBREATHE Ref: 127 EVA 5 TOOL CONFIG (EVA, TIMELINES) Ref: 127 EMU CTCC	EVA SYS: 1.206 10.2 PSIA CAMPOUT MASK PREBREATHE Ref: 127 EVA 5 TOOL CONFIG (EVA, TIMELINES) Ref: 127 EMU CTCC	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
01:00	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)		
		CREW WAKE 11/09:30		
02:00	SLEEP	SLEEP	SLEEP	
03:00				
04:00				

MSG 105 - FD12 MISSION SUMMARY

Good morning, Endeavour!

We hope you had a chance to enjoy some restful quality time yesterday.

Today you'll be returning to the whirlwind of activity that is customary for docked ops, with plenty of transfer, robotics, and preparation for the fifth and final spacewalk of the flight. We wish you all the best luck and success on this challenging day, and are eagerly standing by to support you!

YOUR CURRENT ORBIT IS: 188 X 186 NM

NOTAMS:

NOTAMS – NO CHANGES

EDW - EDW IN USE. EDT ELS DAY / VFR ONLY.
EDW - LAKEBED RWY 15/33 - GREEN. RWY 18L - UNUSABLE.
NOR - LAKEBED RUNWAYS GREEN.
FMH - RWY 05/23 CLOSED.
GUA - RWY 24R END LIGHTS OTS.
GUA - RWY 06R/24L CLOSED.
INN - CLOSED.
AMB - CLOSED.
ESN - RWY 03R/21L CLOSED.
IKF - NOT USABLE. NO AGREEMENT.
BEN - NOT RECOMMENDED/NOT SUPPORTED.

NEXT 2 PLS OPPORTUNITIES:

EDW22	ORB 173 – 10/21:40	SCT200	7	220/08P15	(ORB 174: 220/13P22)
EDW22	ORB 188 – 11/20:30	FEW080 SCT200	7	220/08P13	(ORB 189: 220/11P21)

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

OMS QUANTITIES(%)

Subtract interconnect counter for current OMS quantities.

L OMS OX = 39.5 R OMS OX = 39.7
FU = 39.1 FU = 39.4

END OF PAGE 1 OF 2, MSG 105

MSG 105 - FD12 MISSION SUMMARY

DELTA V AVAILABLE:

OMS	395 FPS
ARCS (TOTAL ABOVE QTY1)	42 FPS
TOTAL IN THE AFT	437 FPS
ARCS (TOTAL ABOVE QTY2)	74 FPS
FRCS (ABOVE QTY 1)	28 FPS
AFT QTY 1	81 %
AFT QTY 2	43 %

THERE ARE NO FAILURE/IMPACT/WORK AROUNDS FOR TODAY.

END OF PAGE 2 OF 2, MSG 105

Mark, Tom, and Dave,

Welcome to another day of transfer after a few days of busy EVA ops. You're now approaching the home stretch, with not too many items remaining.

Transfer Notes

- **Return Sort** – Now that you are well into packing for return, we have uplinked return location sort pages for you to use as desired to validate your completed return configurations.

- **Return Bag B** – We noticed in downlink imagery that Bag B (Return Item 608) has already been strapped to the ceiling in the middeck. We have marked this complete on your transfer list, since it is already on the shuttle side of the hatch.

- **5 MLE Return Capability** – Just to reiterate what we discussed a couple days ago, we are expecting many of your 5 MLE bags to look somewhat empty for return since they are mass-limited this flight. Therefore, unfortunately we will not be able to accommodate a 0.5 CTB of Thirsk preference items that he requested us to assess a while back, in addition to most of the empty 0.5 CTBs and empty food containers.

- **EVA WPA Samples** – The five EVA WPA Samples (Return Item 716), to be taken on FD14, will need to return in food lockers for protection. Please consolidate your individual menu food as necessary to accommodate these samples in two empty lockers.

Transfer Questions

- **Shuttle Food** – The ISS Program would like you to transfer some Shuttle menu food to ISS. Please assess and let us know how much food you would be comfortable with transferring to ISS. Remember to ensure a +2-day contingency landing capability for the remaining food.

- **"Wakata Clothes"** – Can you please verify that the "Wakata Clothes" stowed in MF14O is actually the "Wakata Misc." ziplock, return item 904?

The Transfer List Excel file, FD12_Transfer_List_STS127.xls, locations are:

- Shuttle: **C:\OCA-up\transfer** (KFX machine)
- Station: **K:\OCA-up\transfer**

FD12 Transfer Choreography (items that should be completed today)

- Return Items 910 and 911 – Please transfer the Metox canisters to shuttle to protect for emergency undock
- Resupply Items 11 and 801
- Return Items 722, 905, 906, and 909

Please update Transfer List book as follows:

In the **RESUPPLY** tab:
Pen & Ink on page Resupply-3:
Item 11 – update notes as follows:
WAS: Swap on FD11 per LIOH EXCHANGE PART B
IS: Swap on FD**12** ~~11~~ per LIOH EXCHANGE PART B

Replace the following pages:
Resupply-12 and -13

In the **RETURN** tab:
Pen & Ink on page Return-1:
Item 402.4 – update quantity in Item Name field:
WAS: qty 24
IS: qty 23

Pen & Ink on page Return-13:
Item 722 – update notes as follows:
WAS: Swap on FD11 per LIOH EXCHANGE PART B activity
IS: Swap on FD**12** ~~11~~ per LIOH EXCHANGE PART B activity

Pen & Ink on page Return-14:
Items 725 & 726 – update Stowage at Undock location as follows:
WAS: MF14E & MF14G
IS: MF14O

Replace the following pages:
Return-6, 15, and 16

In the **RETURN SORT** tab:
Add the following pages:
Return Sort-1 thru 8

Have a great day!

- The 2J/A Transfer Team

20-0542 (MSG 107) STATION LAB AND SHUTTLE PRINTER EXCHANGE

OBJECTIVE

Procedure deactivates shuttle and station printers, transfers the printers with attached input and output paper trays, installs them in their new locations, then configures them for use on their new networks.

NOTE
The procedure may be performed by one or two crewmembers (CM). If one: crew member performs as written. If two: station crew performs parts A, E, and F, and shuttle crew performs parts B, C, and D in parallel.

ISS PARTS

Printer Epson SEZ39134666-307, S/N 6005 - LAB1S6
Printer Input Tray SEZ39134666-701 - Installed on ISS Printer
Printer Output Tray SEZ39134666-702 - Installed on ISS Printer
Printer Swap Confidential Message

STS PARTS

Printer Epson SEZ39134666-307, S/N 5009 - Shuttle Middeck
Printer Input Tray SEZ39134666-701 - Installed on Shuttle Printer
Printer Output Tray SEZ39134666-702 - Installed on Shuttle Printer
Printer Swap Confidential Message

DURATION

70 minutes for one CM including transfer or
35 minutes each for one STS and one ISS CM, including transfer

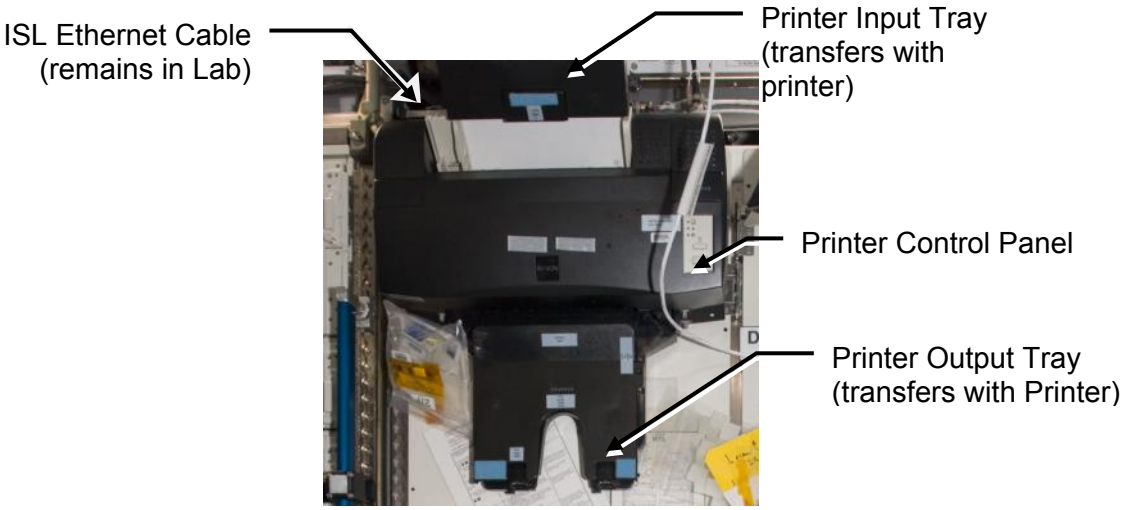


Figure 1.- Printer Installed at LAB1S6.

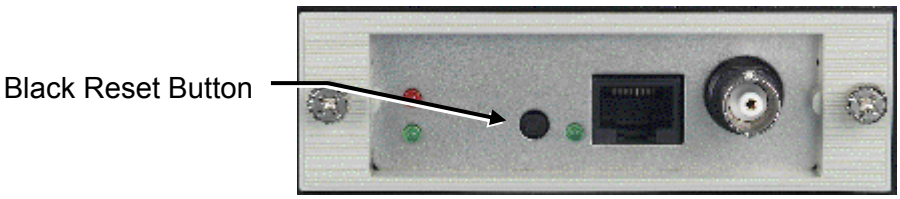


Figure 2.- Rear View of Printer Showing Network Card.

PART A: DEACTIVATING ISS LAB PRINTER (S/N 6005)

NOTE
1. The Printer Power Button is not turned off so that it will be in the correct position for the IP Address Reset upon reactivation.
2. Only the printer and attached input/output trays transfer. Power and network cables remain in place.

LAB UOP2-J3

1. sw PS-120 Junction Box-SW2 → Off (LED – ■)

Printer (S/N 6005)

2. Printer Epson ←|→ US DC Power Cable, 10 ft
3. Printer Epson ←|→ ISL Ethernet Cable
4. Remove paper from input tray, restrain and temp stow near printer location. Refer to Figure 1.
5. Transfer Printer (S/N 6005) (with attached input and output paper trays) to shuttle middeck.
   Refer to Transfer List for details.

PART B: DEACTIVATING STS PRINTER (S/N 5009)

Middeck

6. √Printer Epson Power Button – ON (Power Indicator Light – □ steady green).

NOTE
1. The Printer Power Button is not turned off so that it will be in the correct position for the IP Address Reset upon reactivation.
2. Only the printer and attached input/output trays transfer. Power and network cables remain in place.

ML85E

7. AC S1 → OFF

Printer (S/N 5009)

8. Printer Epson ←|→ 20’ AC Extension Cable
9. Printer Epson ←|→ Ethernet Cable
10. Remove paper from input tray, restrain and temp stow near printer location
11. Transfer Printer (S/N 5009) (with attached input and output paper trays) to ISS LAB1S6.
    Refer to Transfer List for details.

PART C: CONNECTING ISS PRINTER (S/N 6005) ON PGSC NETWORK

Once Printer Epson (S/N 6005) has been transferred to shuttle middeck:

Middeck 12. Temporarily relocate Printer near MUP to permit holding Black Reset Button while powering on printer, Refer to Figure 2.

ML85E 13. √AC S1 - OFF

Printer (S/N 6005) 14. Printer Epson →|← 20' AC Extension Cable

15. Adjust Printer Input Tray to fit paper, load shuttle printer paper into Printer Input Tray.

PART D: RECONFIGURING ISS PRINTER (S/N 6005) WITH PGSC NETWORK IP ADDRESS

NOTE

1. The printer IP Address Reset sets the printer IP Address to the default value of 11.22.33.44.

2. Printer IP Address Reset requires pressing the Black Reset Button on the printer network card while printer power is applied. The Black Reset Button must remain pressed until the Power Indicator Light (LED) begins flashing.

16. √Printer Epson Power Button – On (depressed, LED – ■)

17. Press and hold Black Reset Button on back of printer. Refer to Figure 2. Hold button until prompted in step 19.

ML85E 18. AC S1 → ON

Printer (S/N 6005) 19. √Power Indicator Light (LED) – ◘ (flashing)

Release Black Reset Button.

If no LED activity

√Printer Epson Power Button – depressed (√LED – ON, steady green).

ML85E AC S1 → OFF

Repeat steps 17 to 19 once.

If no joy, √**MCC-H**.

20. √Printer head stops moving

√ Power Indicator Light (LED) stops flashing and remains steady (~20 to 60 seconds)

Printer ready when Power Indicator Light – □ (steady green).

21. If Printer located adjacent to MUP per step 12
    Relocate to final location.

Printer (S/N 6005)

22. Printer Epson →|← Ethernet Cable

PGSC (A31p)

23. From an active PGSC
    Double-click 'Command Prompt' on Desktop

NOTE
1.The following command prompt entry maps the node number of the new printer with its new IP Address.
2. The Shuttle printer IP Address numbers must be separated with periods
3. The Node Number Address number must be separated with dashes not colons.
4. All underlined spaces "__" are input as a <space> on the keyboard

Command Prompt

24. input A R P _ – S _ X X X . X X X . X . X X _ Y Y – Y Y – Y Y – Y Y – Y Y – Y Y – Y Y where [xxx.xxx.x.xx] indicates the Shuttle Printer IP Address which may be found in Printer Swap Confidential Message

    and

    where [yy-yy-yy-yy-yy-yy] indicates the Printer S/N 6005 Node Number which may be found in Printer Swap Confidential Message

25. sel [Enter]

26. Verify no error messages.

    If error messages
    Repeat steps 24 to 26; press up arrow to display last entered command.

27. Wait ~20 seconds for network settings to take effect.

28. To verify successful IP Address mapping
    Input P I N G __ X X X . X X X . X . X X
    where [xxx.xxx.x.xx] is the Shuttle Printer IP Address found in Printer Swap Confidential Message

29. sel [Enter]

30. Verify ping results contained "Reply from xxx.xxx.x.xx" (four times).

If ping did not contain "Reply from xxx.xxx.x.xx"
- Verify Printer network connections.

  Repeat steps 24 to 30 once.

  If no joy,

ML85E
- AC S1 → OFF

  Repeat steps 16 to 21, 23 to 30 once .

  If no joy, √**MCC-H** for additional troubleshooting.

Command Prompt

PGSC (A31p)

31. Close Command Prompt window.

32. Print uplink message in blue for verification. (Reference message FD05_ColorTimeline_Test.pdf, located in C:\oca-up\other on the KFX PGSC.)

33. Notify **MCC-H**, "Shuttle printer setup complete."

PART E: CONNECTING STS PRINTER (S/N 5009) ON ISS OPS LAN

When Printer Epson (S/N 5009) has been transferred to LAB1S6:

LAB UOP2-J3

34. √PS-120 Junction Box-SW2 → Off (LED – ■)

LAB1S6

35. Printer Epson (S/N 5009) →|← US DC Power Cable, 10 ft

Printer (S/N 5009)

36. Adjust Printer Input Tray to fit paper, load ISS printer paper into Printer Input Tray

PART F: RECONFIGURING PRINTER (S/N 5009) WITH OPS LAN IP ADDRESS

NOTE

1. The Printer IP Address Reset, sets the printer IP Address to the default value of 11.22.33.44.
2. Printer IP Address Reset requires pressing the Black Reset Button on the printer network card while printer power is applied. The Black Reset Button must remain pressed until the Power Indicator Light (LED) begins flashing.

37. Verify ability to reach Black Reset Button and PS-120 Junction Box simultaneously from installed printer location.

If unable to reach both simultaneously
Remove Printer Epson from LAB1P6 with US DC Power Cable, 10 ft attached and relocate adjacent to PS-120 Junction Box.

38. √Printer Epson Power Button – On (depressed, LED – ■)

39. pb Black Reset Button → Press and hold. Refer to Figure 2.
Hold button until prompted in step 41.

LAB UOP2-J3

40. sw PS-120 Junction Box-SW2 → On (LED – □).

Printer (S/N 5009)

41. √Power Indicator Light (LED) – ◪ (flashing).

Release Black Reset Button.

If no LED activity

LAB UOP2-J3

√Printer Epson Power Button – depressed (√LED – □, steady green).

sw PS-120 Junction Box-SW2 → Off (LED – ■).

Repeat steps 39 to 41 once.

If no joy, √**MCC-H** for additional troubleshooting steps.

42. √Printer head stops moving.
√Power Indicator Light (LED) stops flashing and remains steady (~20 to 60 seconds).

Printer ready when Power Indicator Light – □ (steady green).

43. pb Printer Black Reset Button → Press once to print Network Configuration Page.

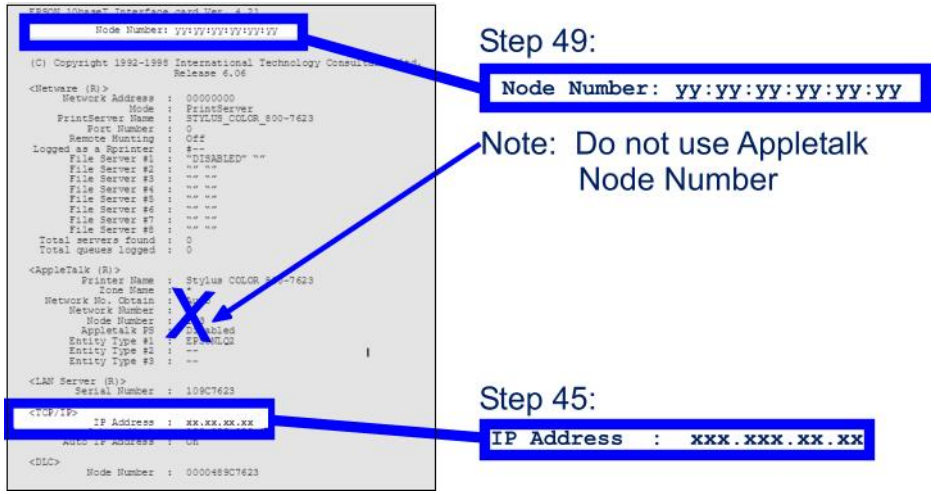


Figure 3. – Network Configuration Page (Example).

44. Circle Node Number on Network Configuration Page.
Refer to Figure 3.

LAB1S6 45. Verify IP Address is 11.22.33.44 from bottom Network Configuration Page. Refer to Figure 3.

If IP Address is not 11.22.33.44

Printer (S/N 5009) LAB UOP2

√Printer Power Button - depressed (√LED – □, steady green)

sw PS-120 Junction Box-SW2 → Off

Repeat steps 39 to 45 once.

If no joy, √**MCC-H**.

Printer (S/N 5009) 46. If Printer located adjacent to PS-120 Junction Box
Relocate to final location.

47. Printer Epson (S/N 5009) →|← ISL Ethernet Cable

SSC 48. From an active SSC Client on the network
sel Start ▶ Programs ▶ Command Prompt

NOTE
1.The following command prompt entry maps the node number of the new printer with its new IP Address. 2. The Lab printer IP Address numbers must be separated with periods 3. The Node Number Address number must be separated with dashes not colons. 4. All underlined spaces "__" are input as a <space> on the keyboard

Command Prompt

49. input A R P __ – S _ X X X . X X X . X X . X X __ Y Y – Y Y – Y Y – Y Y – Y Y – Y Y – Y Y where [xxx.xxx.xx.xx] indicates the Lab Printer IP Address from Printer Swap Confidential Message

and

where [yy-yy-yy-yy-yy-yy] indicates the Node Number (refer to Network Configuration Page generated in step 43).

50. sel [Enter]

51. Verify no error messages.

If any error messages exist

Repeat steps 47 to 49; press up arrow to display last entered command.

52. Wait ~20 seconds for network settings to take effect.

53. To verify successful IP Address mapping

    input P I N G _ X X X . X X X . X X . X X
    where [xxx.xxx.xx.xx] is the Lab Printer IP Address from Printer Swap Confidential Message

54. sel [Enter]

55. Verify ping results contained “Reply from xxx.xxx.xx.xx” four times.

    If ping did not contain “Reply from xxx.xxx.xx.xx”
    > Verify Printer network connections.
    >
    > Repeat steps 49 to 55 once.
    >
    > If no joy, √**MCC-H**.

    Command Prompt

SSC 56. Close Command Prompt window.

57. sel Start ▶ Settings ▶ Printers

    Printers

58. Right Click on “ISL EPSON 2”

59. sel Properties

    ISL EPSON 2 Properties

60. sel Print Test Page

61. Verify test page prints.

    ISL EPSON 2

62. sel OK

    ISL EPSON 2 Properties

63. sel OK

    Printers

64. Close Printers window.

65. Notify **MCC-H**, “ISS Printer setup complete.”

PART G: CONTINGENCY - RESTORING PRINTER (S/N 6005) FROM STS TO ISS

Printer (S/N 6005) **On MCC-H GO**

66. Perform Part B (all) and Part E (all)

67. Perform Part F (all); in step 49, use Printer S/N 6005 Node number from Printer Swap confidential message

PART H: CONTINGENCY - RESTORING PRINTER (S/N 5009) FROM ISS TO STS

Printer (S/N 5009) **On MCC-H GO**

68. Perform Part A (all), Part C (all)

69. Perform Part D (steps 16 to 23)

70. pb Black Reset Button → Press once to print Network Configuration Page.

71. Circle Node Number on Network Configuration Page.
    Refer to Figure 3.

72. Perform Part D (steps 24 to 33); in step 24 use Node Number from Network Configuration Page in step 71.

Tom, Chris and Dave,

We have put together a preliminary detailed timeline in message 20-0601 (111) based on our discussions yesterday for you to review. We will have the final version for your procedure review later today. A couple of thinking points for how we combined the tasks:

1. PGT sockets - Since Chris needs a 2” socket for the PAS deploy, we have written the VE camera to configure Chris’s PGT with a RAD for the launch locks and leave Tom’s (already configured with a 6”)for the VE installation bolts. This will require you to swap PGT’s for the installations but will save sockets swaps between the installations. When you clean up the VE task you will swap the 2” socket onto Chris’s PGT. We put a 6” ext on Chris’s PGT for his initial configuration in case Tom gets to the VE camera first. This allows for his PGT to be configured with the RAD and then Chris’s is ready for the installation bolts. We tried to build as much flexibility as possible into the plan.
2. Since we didn’t get to tag back up with you on the bag plan for the VE, we wrote the timeline with the two crewlock bag option. Let us know if you prefer another option.
3. We put the MLI bag retrieval during the STP retrieval. Instead of having Tom go wait by his anchor hook, we send him to waist tether by the MLI bag and work on retrieving it while Chris is relocating his anchor. Let us know your thoughts on this.

We have also included the EVA4 Deconfig/EVA5 Config procedures in message 20-0604 (110) for your Tool Config activity.

Flight Day 11 – EVA 4 Tool Deconfig/EVA 5 Tool Config

1. Remove string FOD from EV2 small trash bag.
   □ Photograph the string, then discard
   □√ zipper closed

2. Report the following s/n's to MCC-H:
   □ RET attached to handle of B bag
   □ RET from ballstack in B bag
   □ AET from ballstack in B bag
   □ Ballstack in B bag
   □ MUT EE (qty 2) in B bag

3. Deconfigure the following:

J Bag:

Item removed	QTY	Stowage
MUT EE	☐ 1	ISS temp stow
Ballstack	☐ 1	ISS temp stow
Camera w/bracket and sm-sm RET	☐ 1	M bag; Battery charging

B Bag:

Item removed	QTY	Stowage
Sq scoops	☐☐ 2	ISS temp stow
MUT EE	☐☐ 2	ISS temp stow
Ballstack	☐ 1	ISS temp stow
Small trash bag	☐ 1	EV1 MMWS
Sm-sm RET (on ballstack)	☐ 1	Ziplock labeled NOGO in ISS temp stow

V Bag:

Item removed	QTY	Stowage
Torque multiplier w/Rec socket	☐ 1	ISS temp stow
Sq scoops	☐☐ 2	ISS temp stow
Ratchet w/6" ext	☐ 1	Ratchet to J bag int RET; 6" ext to EV1 PGT

4. Retrieve EVA 4 bag and distribute as follows:

Item retrieved	QTY	Stowage
RAD	☐ 1	J bag on socket caddy
VE #17 cap	☐ 1	J bag on int RET
Round Scoop	☐ 1	J bag on int RET
2" ext	☐ 1	J bag on Ratchet

5. Retrieve EVA 5 bag and distribute as follows:

Item retrieved	QTY	Stowage
Lg-sm AET	☐ 1	M bag ext D-ring
Lg-sm AET	☐ 1	V bag int RET
GP Caddy w/ Compound cutter & Vice grips	☐ 1	EV2 MMWS
DRT	☐ ☐ 2	V bag int RET

- ❑ Perform DRT prep
  - o Cycle DRT knob in/out once
  - o Verify knob to full cw to hardstop prior to stowing in bag

6. Retrieve EVA Task Transfer Bag and distribute as follows:

Item retrieved	QTY	Stowage
VE #17 cap	☐ 1	B bag int RET

8. Retrieve ISS Temp Stow bag and distribute as follows:

Item retrieved	QTY	Stowage
Socket Caddy w/ RAD	☐ 1	Staging Bag
Socket Caddy	☐ 1	J bag int RET
2” ext	☐ 1	J bag on RAD

9. Retrieve 6” ext socket from spare PGT in Staging bag and install on RAD in Staging bag.

10. Perform EVA5 TOOL CONFIG in EVA5 Timeline in MSG 20-0601 (111)
    - ❑ Stow/retrieve tethers on tether wall as needed

EVA 5

EVA 5 TOOL CONFIG (Cont)

PET TIME (HR : MIN)	EVA 5		
	IV/SSRMS	**EV1 – Marshburn (FF)**	**EV2 – Cassidy (FF)**
00:00	**(00:00-00:45)**	**EGRESS/SETUP** (00:45) ■ Post Depress and Egress (00:15) ■ Setup (00:15) ■ STP shuffle to S0 (00:15)	**EGRESS/SETUP** (00:45) ■ Post Depress and Egress (00:15) ■ Setup (00:15) ■ STP Relocate to S0 (00:15)
01:00	**(00:45-01:45)**	**SPDM COVERS** (01:00)	**Z1 PATCH PANEL** (01:00)
02:00 03:00	**(01:45-03:15)**	**FWD INSTALLED VE** (01:30)	**FWD INSTALLED VE** (01:30)
04:00	**(03:15-04:30)**	**AFT INSTALLED VE/LTA RECONFIG** (01:15)	**AFT INSTALLED VE/LTA RECONFIG** (01:15)
05:00	**(04:30-05:30)**	**S3 ZENITH OUTBOARD PAS** (time permitting)	**S3 ZENITH OUTBOARD PAS** (time permitting)
06:00	**(05:30-06:30)**	**CLEANUP/INGRESS/STP RETRIEVE** (01:00) ■ STP retrieve ■ MLI bag retrieve ■ Cleanup ■ Ingress and Pre Repress	**CLEANUP/INGRESS/STP RETRIEVE** (01:00) ■ STP retrieve ■ MLI bag retrieve ■ Cleanup ■ Ingress and Pre Repress
	EVA PET 6:30		

Get Aheads:

1. JPM OIH&OIW Installation pg. 25
2. NOD2 Gap spanner install pg. 26
3. Lab cable tie down pg. 26
4. Retrieve 55' safety tethers from S0

PRELIMINARY

EVA 5 TOOL CONFIG (Cont)

EV1
EMU D-rings
- ❑❑ Ext on left side
- ❑❑ Ext on right side
- ❑❑ Waist Tethers (right EXT, √locked)

MWS
- ❑❑ Small Trash Bag
  - ❑❑ EVA OVERRIDE cap/pip pins (3)
  - ❑❑ Wire Tie
- ❑❑ 2 – Wire ties as tether loops
- ❑❑ RET (with PIP pin)
- ❑❑ RET sm-sm
- ❑❑ 2 – AETs
- ❑❑ Swing Arm (right side)
  - ❑❑ RET sm-sm (Attach to PGT)
    - ❑❑ PGT s/n _____
    - ❑❑ 6-in ext
- ❑❑ BRT (left side)
  - ❑❑ RET sm-sm
    - ❑❑ V bag
  - ❑❑ wire ties – 1 long, 1 short

- ❑❑ RET Lg-sm (A/L stowage)
- ❑❑ **C/L Bag – PAS Bag (M)**
  - ❑❑ AET (ext D-ring)
  - ❑❑ AET lg-sm (ext D-ring)
  - ❑❑ RET sm-sm (int D-ring #1 to door handle)
  - ❑❑ RET sm-sm (int D-ring #2 to door handle)
  - ❑❑ RET sm-sm (int D-ring #3 to door handle)
  - ❑❑ Camera w/bracket (int RET #1)
    - ❑❑ RET sm-sm
- ❑❑ **C/L Bag – DR Tools Bag (V) strap to M bag**
  - ❑❑ AET (ext D-ring)
  - ❑❑ RET sm-sm (int D-ring #1 to door handle)
  - ❑❑ DRT #1(int RET #1)
  - ❑❑ DRT #2 (int RET #2)
  - ❑❑ AET lg-sm (int RET #3)
  - ❑❑ Wire ties Long (2) (ext D-rings across back of bag)
  - ❑❑ Stow clevis bracket

EV2
EMU D-rings
- ❑❑ Ext on left side
- ❑❑ Ext on right side
- ❑❑ Waist Tethers (right Ext to MWS, √locked)

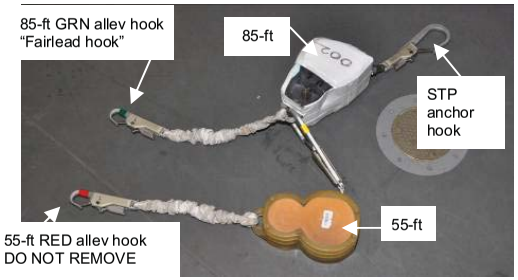
MWS
- ❑❑ Small Trash Bag
  - ❑❑ EVA OVERRIDE cap/pip pins (3)
  - ❑❑ Wire Tie
- ❑❑ AET
- ❑❑ GP caddy
  - ❑❑ Compound cutter
  - ❑❑ Vice grips
- ❑❑ RET w/PIP pin (R D-ring)
- ❑❑ RET (L D-ring)
- ❑❑ Swing Arm (right side)
  - ❑❑ RET sm-sm (Attach to PGT)
    - ❑❑ PGT s/n _____
    - ❑❑ 2-in ext
    - ❑❑ 6-in ext
- ❑❑ BRT (left side)
  - ❑❑ RET sm-sm
  - ❑❑ 2 – wire ties
  - ❑❑ AET at base
  - ❑❑ AET at base (moved from caddy)

ISS Configuration

MT @ WS4 CETA 1 STBD, CETA 2 PORT
ICC-VLD in PLB
JEF installed on JPM
JLE in PLB
SSRMS based on NOD2

Safety Tether config (STP = safety tether pack, 55+85)

EV1 ST pack (55+85) **GRN** anchor at S0 HR 3650
EV2 ST pack (55+85) **GRN** anchor at S0 HR 3651
EV2 Fairlead (AET) at A/L HR 058



Review PGT ops
- Report "green light" (for torque down ops)
- Report torque and turns
- Expect LOTORQ fault msg, Fault LED and Red LED for bolt release ops

Record:
EV1 PGT (serial _____, bat # _____)
EV2 PGT (serial _____, bat # _____)
Spare PGT (serial _____, bat # _____)

Prior to EVA, perform the following inspections:
1. RET cords for fraying
2. Safety and waist tether load alleviation straps for damage/discoloration, verify no red line visible
3. Inspect ISS trash bags for deformation/damage
4. Inspect EMU gloves for damage
5. Inspect BRTs and ballstacks for loose fittings/screws
6. **Use Blue RETs only**

PRELIMINARY

EVA 5 TOOL CONFIG (Cont)

- ❑❑ RET Lg-sm (A/L stowage)
  - ❑❑ **C\L Bag – JEF VE Bag (J)**
    - ❑❑ AET (ext D-ring)
    - ❑❑ VE Cap – Size 17 (1) (int RET #1)
    - ❑❑ LTA ISS2 Cap (int RET #1)
    - ❑❑ Ratchet (int RET #2)
      - ❑❑ 2" ext
    - ❑❑ Socket caddy (int RET #3)
      - ❑❑ Right Angle Drive
        - ❑❑ 2" ext
      - ❑❑ 6" ext
    - ❑❑ Round Scoop (int RET #4)
    - ❑❑ RET sm-sm (int D-ring #1 to door handle)
      - ❑❑ VE I/F cable
    - ❑❑ RET sm-sm (int D-ring #2 to door handle)
      - ❑❑ VE Launch Lock
    - ❑❑ RET sm-sm (int D-ring #3 to door handle)
      - ❑❑ VE MLI (upper)
    - ❑❑ RET sm-sm (int D-ring #4 to door handle)
      - ❑❑ VE MLI (lower)
- ❑❑ RET Lg-sm (A/L stowage)
  - ❑❑ **C\L Bag – Backup JEF bag (B) strap to J bag**
    - ❑❑ AET (ext D-ring)
    - ❑❑ VE Cap – Size 17 (1) (int RET #1)
    - ❑❑ GP caddy (int RET #2) (from EV2)
      - ❑❑ Compound cutter
      - ❑❑ Vice grips
    - ❑❑ RET sm-sm (int D-ring #1 to door handle)
      - ❑❑ VE I/F cable
    - ❑❑ RET sm-sm (int D-ring #2 to door handle)
      - ❑❑ VE Launch Lock
    - ❑❑ RET sm-sm (int D-ring #3 to door handle)
      - ❑❑ VE MLI (upper)
    - ❑❑ RET sm-sm (int D-ring #4 to door handle)
      - ❑❑ VE MLI (lower)

Staging Bag
- ❑❑ Fish Stringer #1
  - ❑❑ Wire Tie Caddy (hook #1)
    - ❑❑ 9 wire ties
  - ❑❑ Velcro/Tape Caddy (hook #2)
  - ❑❑ PGT (hook #3) s/n _____
    - ❑❑ PGT Battery s/n _____
    - ❑❑ 7/16-in (wobble) Socket – 6 ext
  - ❑❑ Ratchet Wrench (hook #5)
    - ❑❑ 7/16-in (rigid) Socket – 9 ext
  - ❑❑ Cheater Bar (hook #6)
  - ❑❑ Hammer (hook #7)
- ❑❑ Fish Stringer #2
  - ❑❑ Spare Torque Wrench w/MLI (hook #1)
  - ❑❑ Connector Cleaner Tool Kit (hook #2)
  - ❑❑ Pin Straightener Assy (hook #3)
  - ❑❑ Probe w/BRS Pin Tool Sheath (hook #4)
  - ❑❑ Prybar (hook #5)
  - ❑❑ Needlenose Pliers (hook #6)
  - ❑❑ **socket caddy (hook #7)**
    - ❑❑ **RAD**
    - ❑❑ **6" ext**
  - ❑❑ MWS Key Strap Assy (on wire tie, to strap)

Crewlock Zenith Handrail
- ❑❑ Spare STP

IV Bag
- ❑❑ 2 – Towel
- ❑❑ Contamination Detection Kit
- ❑❑ 2 – GP Caddy
  - ❑❑ Thermal Mittens (1 pair)
- ❑❑ RET (sm-sm) (Black)
  - ❑❑ Socket Caddy
    - ❑❑ 1/2-in (wobble) Socket – 8 ext
    - ❑❑ 7/16-in (wobble) Socket – 6 ext
- ❑❑ 2 – DCM Plug (SAFER Hardmount)
- ❑❑ 2 – RET (sm-sm, black)

Tether counts:	**used**	**available**
RET sm-sm -381	14	16
RET lg-sm -385	5	8
RET sm-sm pp -383	2	5
AET sm-sm	13	8 ISS/8 STS
AET lg-sm	2	2

ISS EXTERNAL

JPM
- ❑❑ **MLI Bag (Lg ORU)**
  - ❑❑ AET ext
  - ❑❑ AET ext
  - ❑❑ Fish stringer #1 (empty)
  - ❑❑ Fish stringer #2 (outside bag, under flap)
    - ❑❑ Wire tie caddy w/long wire ties (9)
  - ❑❑ Fish stringer #3
    - ❑❑ JPM OIH 1116
    - ❑❑ JPM OIH 1204
    - ❑❑ JPM OIH 1206
    - ❑❑ JPM OIW 43
    - ❑❑ JPM OIW 36
    - ❑❑ Gap spanner (72") – split across two hooks

PRELIMINARY

EVA 5 INHIBIT PAD

Orbiter (1)

ALL EVAs

TCS
L12 1. √TCS POWER – OFF

KU-Band Antenna (performed during egress)
MCC-H 1. √KU-BAND Mask – active
2. √KU-BAND EVA Protect Box – active

RCS (on call, crew not expected in area)
If EV crew < 27 ft from FRCS
IV 1. √DAP: VERN, FREE, LO Z (flt specific check with GNC)
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 (*)

Ground

ALL EVAs

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

LOCATION DEPENDENT INHIBITS

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

USOS (1)

ALL EVAs

PCU

NOTE
PCUs may require up to a 1-hr warmup 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 deg from velocity vector
If one or both PCUs failed
2. No more than two arrays unshunted and oriented < 105 deg from velocity vector

LOCATION DEPENDENT INHIBITS

Lab Window (on call, crew not expected in area)
IV If EV crew less than 10 ft from window or in window FOV, close window shutter

KU-Band (SGANT Antenna) (on call, crew not expected in area)
MCC-H If EV crew < 3.3 ft from KU-BAND antenna
1. Park KU-BAND
1.1 Pointing Mode – Inhibit
1.2 PLC – Reset
1.3 Autotrack Continuous Retry – Inhibit

S-Band (SASA) Antennas (on call, crew not expected in area)
MCC-H If EV crew < 3.6 ft from S1 SASA [P1 SASA]
1. P1 SASA (S1 SASA) – Active
2. S1 SASA [P1 SASA] – Powered down

Mobile Transporter
MCC-H If EV crew < 1.5 meters from MT
1. √MT latched

PRELIMINARY

EVA 5 INHIBIT PAD (Cont)

USOS (2)

LOCATION DEPENDENT INHIBITS

SARJ (S3 at egress, P3 not expected)
MCC-H If EV crew working within 2 ft or outboard of SARJ
1. √DLA (1) – LOCKED
2. All motor setpoints set to zero
3. All motors deselected

TRRJ (S1 at egress, P1 not expected)
MCC-H If EV crew working within 2 ft of P1 TRRJ rotation envelope
1. √DLA (1) – LOCKED
MCC-H If EV crew working within 2 ft of S1 TRRJ rotation envelope
1. √DLA (1) – LOCKED

FPMU (not expected)
MCC-H If EV crew working within 5 ft of Floating Potential Measurement Unit
1. FPMU power – Off

SSPTS (Reqd if FPP sleeves not installed)
MCC-H If EV crew working within 2 ft of SSPTS cables
1. RPCM LA1A4A D RPC 3 – Open, Close Cmd Inhibit
2. RPCM LA2A3B D RPC 1 – Open, Close Cmd Inhibit
3. RPCM Z14B A RPC 2 – Open, Close Cmd Inhibit
4. RPCM Z13B A RPC 2 – Open, Close Cmd Inhibit

Z1 Patch Panel (at egress)
MCC-H
1. RPCM Z13B B RPC 18 – Open, Close Cmd Inhibit
2. RPCM S02B D RPC 17 – Open, Close Cmd Inhibit

S3 Zenith Outboard PAS (PAS 1) (egress)
MCC-H
1. RPCM S31A A RPC 12

COL (1)

ALL EVAs

EuTEF
COL-CC 1. √PLEGpay Power Status (ETF_PLEGPAY_Pwr_Stat) – OFF

JEM (1)

LOCATION DEPENDENT INHIBITS

JPM Windows (on call, MLI bag retrieval)
IV JPM port end cone AFT window shutter closed
If crew within 3 ft of FWD window, close shutter

JEMRMS (VE camera install)
SSIPC If EV crew working within 5' of JEMRMS
1. RIP MA Brake – ON
2. MDP Main Mode – Stby Mode
or
1. JEMRMS Rack – OFF

JPM PROX Antenna (on call, not expected)
SSIPC If EV crew working within 0.3 ft JPM PROX Antenna
1. TRX Power – OFF
2. TX Power – OFF
or
1. JPM PROX Antennas – OFF

JPM Aft JTVE (VE camera install)
SSIPC PDB b2 RPC 4 Open

PRELIMINARY

EVA 5 INHIBIT PAD (Cont)

JEM (2)

JEF FWD/AFT VE (VE camera install, prior to task)
SSIPC JEF PDB b RPC26 – Open
JEF PDB b RPC22 – Open
JEF PDB b RPC23 – Open
JEF PDB a RPC5 – Open
JEF PDB a RPC6 – Open
JEF HCE a sw9 – Open
JEF HCE a sw11 – Open
JEF HCE b sw65 – Open
JEF HCE b sw67 – Open

JEF LTA (VE install, prior to task)
SSIPC JEF PDB b RPC18 – Open
JEF PDB b RPC25 – Open
JEF PDB b RPC26 – Open

ICS-EF Antenna (at egress)
SSIPC ICS MOD Off
ICS UPC Off
ICS HPA Off

SEDA-AP Mast, PLAM-S (VE camera install)
SSIPC JEF PDB a RPC17 – Open

EFU (VE camera install)
SSIPC JEF PDB a RPC03 – Op
JEF PDB b RPC20 – Op
EFU[X] Sel Status – not selected [X=1 to 12]
EEU Mode – EFU stop

SSE SLM (VE camera install)
SSIPC SSE SLM Ops Ena/Inh Status 1 – Inhibit
SSE SLM Ops Ena/Inh Status 2 – Inhibit

RSOS (1)

ALL EVAs

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

IMPULSE
MCC-M
1. IMPULSE (ИПИ-100) – Deactivate

EVAs ON PMA1 OR RSOS (LOCATION DEPENDENT) (not expected)

FGB Thrusters
MCC-M
1. √FGB MCS unpowered
2. √All FGB Attitude Control Thruster Valves (eighty) – closed
3. √FGB Attitude Control Manifold Valves – closed
КШК1, КШК2, КШК4, КШК5, КШК9,ОКО3, ОКГ3, ОКО6, ОКГ6, ОКО7, ОКГ 7, ОКО8, ОКГ8

Soyuz Thrusters
MCC-M
1. √Soyuz manifolds (four) – closed
ЭКО1, ЭКО2, ЭКГ1, ЭКГ2
2. √Soyuz MCS unpowered
3. √Soyuz Attitude Control Thruster Valves (fifty-two) – closed
4. √Soyuz Main Engine Valves (K1, K2, K3, K4, K5, K6) – closed

FGB Antennas
MCC-M
1. √FGB KURS P [КУРС P] – Deactivated

Soyuz Antennas
MCC-M
1. √Soyuz KURS A [КУРС A] – Deactivated

PRELIMINARY

EVA 5 NOTES/CAUTIONS/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)
7. 85-ft safety tether retract force may affect body positioning

CAUTION

ISS Constraints

A. Avoid inadvertent contact with
   1. Grapple fixture shafts (drylube)
   2. PIP pins
   3. EVA Crane [PMA1]
   4. TCS Reflectors [PMA2,PMA3]
   5. APAS hardware [PMA2,PMA3]
   6. CETA Lights (Z-93 paint) [LAB,S1, Node 1]
   7. Deployed MISSEs [Columbus EPF]
   8. Passive UMAs
   9. MBS/SSRMS/SPDM/JEMRMS taped radiative surfaces: VDU, ACU, JEU, LEU, MCU, CRPCMs, and Cameras
   10. Deployed TUS cable [Nadir CETA rail]
   11. S0 aft face Radiator
   12. GPS Antennas (S13 paint) [S0,JLP]
   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. SPDM SJEU, EP, OTCM, LEU, and LEE VDU Radiator surfaces
   22. Open CBM petal covers, LAB window shutter, and JPM window shutter
   23. FPMU [S1]
   24. OTSD
   25. COL HAM radio antennas [COL-Nadir]
   26. JTVE, WVE/EVE, JEF VE Cameras [JEM]
   27. JEM A/L Target and Pins
   28. S0/Node 2 Fluid Tray Hardlines at Node 2 end are limited to 25 lb
   29. JEF ORUs and EFU (paint, lubricant)
   30. MAXI front and top panel (paint)
   31. SEDA-AP sensors (HIT, SDOM, AOM) and MPAC & SEED

CAUTION

ISS Constraints (Cont)

A. Inadvertent contact (Cont)
   32. Con'PIU, Trunnions and UCM (paint, lubricant) [ICS-EF,MAXI,SEDA-AP]
   33. JLE – PIU, Alignment guide and UCM (paint, lubricant)
   34. Ka-Band Antenna (ICS-EF) dish [JEM]

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. Avoid tool impact on ICS-EF sensor
   5. Avoid kicking MMOD Shield between JLP and JPM

PRELIMINARY

EVA 5 NOTES/CAUTIONS/WARNINGS (Cont)

CAUTION

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 Tether Shuttle Stop is raised away from the rail

CAUTION

Shuttle Constraints

G. Avoid inadvertent contact with
1. OBSS and SRMS Composite Sections Joint Torque Arms, Grapple Fixture Shafts, 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 and Camera wire harnesses, cables, cable guides, 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]

CAUTION

HTV/HTV EP Constraints

A. Avoid inadvertent contact with
1. EVA Cover [HTV] (does not meet EVA kick loads)
2. Wheel guide [HTV] (snag hazard)
3. HBCS (berthing camera) [HTV EP]
4. HCSM (solid lubricant) [HTV EP]
5. HCAM (solid lubricant) [HTV EP]
6. EP PIU (solid lubricant and Black/White Paint) [HTV EP]

PRELIMINARY

EVA 5 NOTES/CAUTIONS/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
6. SOLAR and EuTEF [COL EPF]
7. ICS-EF sensors

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 and JPM window shutter linkages during operation
5. JEMRMS HRM capture latches
6. JEM Cameras (JVTEs, EVE, WVE, JEF VE)
7. JEM EFBM capture latches
8. JEM EFU latching arms
9. JEF SSE latch
10. ICS-EF antenna boom
11. SEDA-AP Mast
12. JLE SLM latch

WARNING

ISS Constraints (Cont)

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

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]
4. Stay 0.3 ft from fwd/aft JPM PROX antenna
5. Stay 246 ft from ICS-EF if powered

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. SPDM OTCM gripper jaws

WARNING

ISS Constraints (Cont)

F. Sharp Edges (Cont)
10. Solar Array Blanket Box [P6,S6]
11. Keep hands away from SSRMS LEE/POA/SPDM LEE/JEMRMS EE opening, snares, and PDGF curvic coupling (teeth)
12. Fastener threads on back of Z1 U-jumper male FQD panel, if nutplate cap missing
13. Outboard MT rail attachment lug near P6 handrail 5333 and gap spanner
14. P2 connector on EWIS box TAA-06 [Zenith/Forward Corner 1 of P5 – SARJ at 0 deg]
15. Port/Aft portion of A/L circular HR [HR 0506]
16. Interior of JEMRMS HRMs
17. JEM A/L hatch corners
18. ICS-EF AHM gears
19. MAXI Visual Star Camera
20. PIU springs [ICS-EF,MAXI, SEDA-AP,JLE]

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/MBS/SPDM/JEMRMS/JTVE/ JEF VE operating cameras and lights may radiate large amounts of heat

PRELIMINARY

EVA 5 NOTES/CAUTIONS/WARNINGS (Cont)

WARNING

ISS Constraints (Cont)

G. Thermal (Cont)
   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 degF or > 200 degF
   11. Columbus end cones may violate touch temperature constraints when $-75 \leq \beta \leq -60$ or $60 \leq \beta \leq 75$V
   12. PDGF surfaces may not meet touch temperature requirements for unlimited contact when $\beta \leq -70$ or $\beta \geq 70$
   13. JPM port end cones and JLP port nadir may violate touch temperature constraints when $\beta > 60$ deg

H. Electrical Shock
   1. Stay ≥ 2 ft from ungrounded floating connectors if powered
      - SSPTS connectors include NOD1 Stbd/Fwd HR 0130, LAB Stbd/Fwd HR 0273, PMA2 Stbd and Port

WARNING

ISS Constraints (Cont)

H. Electrical Shock (Cont)
   - MBS Cross-Connect jumpers (translate past these using UMA handrails) include S0 EVA Power Cables (inside S0 Bay 00 Face 4, Bay 01 Face 3) ESP2 jumper (inside S0 Bay 03 Face 4)
   2. Do not touch SPDM CLPA 1 electrical connector prior to camera installation

WARNING

Shuttle Constraints

A. Arcing/Molten Debris
   1. Stay ≥ 2 ft from exposed EFGF connector when OBSS berthed, powered, and EFGF not grappled [PLB]
   2. Stay ≥ 2 ft from exposed Stbd Fwd MPM contacts [PLB]
   3. Stay above PLB sill when within 1 ft of powered ROEU connector [PLB]

B. Pinch
   1. PRLA operation [PLB]

C. 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]

PRELIMINARY

EVA 5 NOTES/CAUTIONS/WARNINGS (Cont)

WARNING

Shuttle Constraints (Cont)

D. 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]

E. 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

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

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

WARNING

HTV/HTV EP Constraints

A. Avoid inadvertent contact with
1. HTV solar array panels (kick loads can shatter panel and generate sharp edges) [HTV]
2. HTV fwd RCS thrusters [HTV]

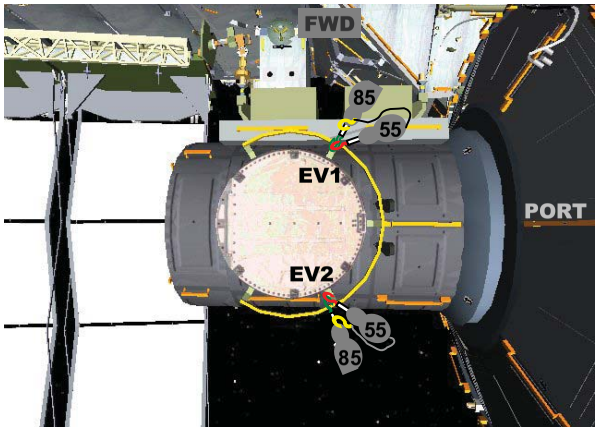
B. Pinch
1. HSM connector moving parts (pinch hazard and dry film lube) [HTV EP]
2. EP wheels (pinch point) [HTV EP]

C. RF radiation exposure
1. Stay 0.7 ft from IOS-N antenna [HTV]
2. Stay 0.7 ft from IOS-Z antenna [HTV]
3. Stay 0.3 ft from PLS-Z antenna [HTV]

D. Thermal
1. EP handrails may be hot. Handling may need to be limited

PRELIMINARY

EGRESS/SETUP/STP RELOCATE (00:45)

IV/RMS	EV1 MARSHBURN (FF)	EV2 CASSIDY (FF)
 1. Post crew egress: WVS Software: Select page – RF camera Sel 'Advanced Controls' S-Band Level (two) – Max √Verify good WVS video from both EV's	**Initial Configuration:** 1. Waist tether to UIA D-ring ❑ √Gate closed ❑ √Hook locked EGRESS/INITIAL SETUP 2. On EV2 GO, release EV2 waist tether from A/L D-ring 3. Transfer M/V bag pack to EV2 4. Transfer J/B bag pack to EV2 5. Retrieve waist tether from UIA 6. Egress crewlock 7. Retrieve J/B bagpack; stow on BRT 8. Verify SAFER config ❑ √L handle down (MAN ISO Vlv-Open) ❑ √R handle down (HCM-Closed)	**Initial Configuration:** 1. Waist tether to A/L D-ring ❑ √Gate closed ❑ √Hook locked EGRESS/INITIAL SETUP 2. Open hatch thermal cover 3. Egress airlock **4.** Attach AFT 55-ft **RED** alleviator hook to D-ring EXT (L) ❑ √Gate closed ❑ √Hook locked ❑ √Reel unlocked ❑ Inspect LAS for damage 5. Attach AFT 85-ft **GRN** alleviator hook to D-ring EXT (L) 6. Verify 55-ft **YEL** anchor hook to 85-ft ERCM ❑ √Gate closed ❑ √Hook locked ❑ √Reel unlocked ❑ Inspect LAS for damage 7. Receive M/V bag pack; temp stow at A/L 8. Receive J/B bag pack; temp stow at A/L **9.** Attach FWD 55-ft **RED** alleviator hook to EV1's D-ring EXT (L) ❑ √Gate closed ❑ √Hook locked ❑ √Reel unlocked ❑ Inspect LAS for damage 10. Attach FWD 85-ft **GRN** alleviator hook to EV1's D-ring EXT (L) 11. Verify 55-ft **YEL** anchor hook to 85-ft ERCM ❑ √Gate closed ❑ √Hook locked ❑ √Reel unlocked ❑ Inspect LAS for damage 12. Close thermal hatch cover 13. Verify SAFER config ❑ √L handle down (MAN ISO Vlv-Open) ❑ √R handle down (HCM-Closed)

PRELIMINARY

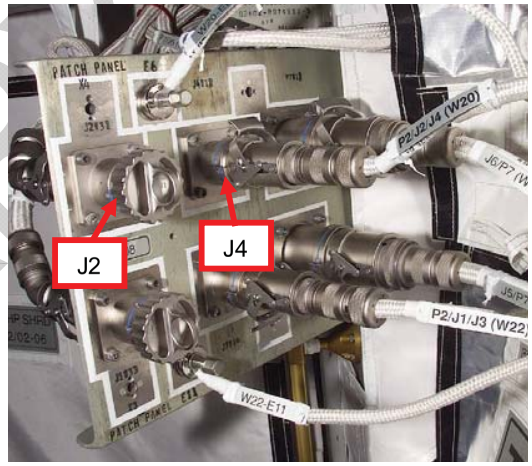
EGRESS/SETUP/STP RELOCATE (00:45)

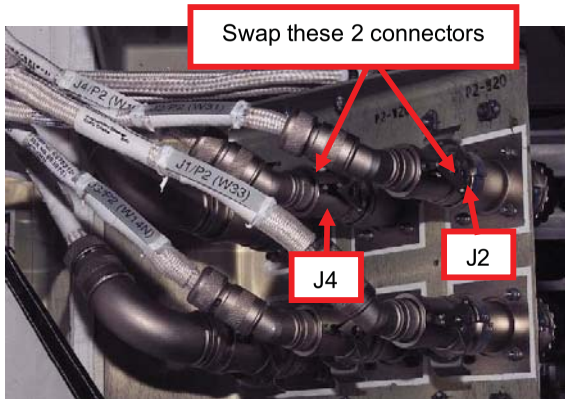
IV/RMS	EV1 MARSHBURN (FF)	EV2 CASSIDY (FF)
	MOVE STP ANCHORS TO S0 9. Xlate to P1 **3651** (EV2's anchor point) 10. Attach waist tether ❑ √Gate closed (structure) ❑ √Hook locked (structure) ❑ √Gate closed (D-ring ext) ❑ √Hook locked (D-ring ext) 11. Give EV2 GO to release EV1's 85-ft anchor hook 12. On EV2 GO, release waist tether 13. On EV2 GO, retrieve EV2 **85-ft** anchor hook from HR 3651; stow on NOT YEL ERCM 14. Xlate to S0 HR 3483 (EV2's new anchor point) 15. Attach EV2 **85-ft** anchor hook at S0 HR 3483 ❑ √Gate closed ❑ √Hook locked 16. Glove inspection 17. Xlate to LAB/SPDM	MOVE STP ANCHORS TO S0 14. Xlate to P1 **3650** (EV1's anchor point) 15. On EV1 GO, retrieve EV1 **85-ft** anchor hook; stow on NOT YEL ERCM 16. Xlate to S0 3516 (EV1's new anchor point) 17. Attach EV1 **85-ft** anchor hook ❑ √Gate closed ❑ √Hook locked 18. Give EV1 GO to release waist tether 19. Xlate STBD past S0 HR 3483 (EV2's new anchor point) 20. Attach Waist tether ❑ √Gate closed (structure) ❑ √Hook locked (structure) ❑ √Gate closed (D-ring ext) ❑ √Hook locked (D-ring ext) 21. Give EV1 GO to release EV2's 85-ft anchor hook 22. On EV1 GO, release waist tether 23. Glove inspection 24. Xlate to Z1 patch panel

PRELIMINARY

Z1 PATCH PANEL (01:00)

IV	EV2 CASSIDY (FF)
1. √**MCC-H**: Patch panel inhibits in place: √RPCM Z13B B RPC 18 – Open, close cmd inh √RPCM S02B D RPC 17 – Open, close cmd inh 2. Give EV GO for patch panel reconfig APFR Setting if reqd: Z1 WIF 04 [10,PP,B,12] 3. Give GO to **MCC-H** for patch panel power up	TRANSLATE TO Z1 PATCH PANEL CAUTION Avoid inadvertent contact with heat pipe radiators NOTE √No FOD, No bent pins, Good EMI band. Connectors J2 and J4 are restrained by tie-wrap and may prevent mating of connectors. Tie-wrap may be cut if required 1. On IV GO, on Front Panel: ❑ Remove dust cap on J2 (upper left) 2. On IV GO, on Back Panel: ❑ Demate connector J2 from Upper Right receptacle ❑ Cut tie wraps as required ❑ Assess clearance, mobility, and operation of the cable ❑ Report findings to MCC-H 3. Front Panel Reconfig ❑ Xlate to front panel ❑ Move bail on J4 (upper middle) fully aft ❑ Assess bail stiffness, maneuverability ❑ Report findings to MCC-H ❑ Leave bail open 4. Back Panel Reconfig ❑ Xlate to back panel ❑ Demate connector J4 from Upper Middle receptacle ❑ Cut tie wraps as required ❑ Assess clearance, mobility, and operation of the cable ❑ Report findings to MCC-H ❑ Inspect and Mate J2 to Upper Middle receptacle (Back Panel) ❑ Inspect and Mate J4 to Upper Right receptacle (Back Panel) 5. Front panel cleanup ❑ Push bail of J4 fwd to mate connector (Front Panel) ❑ Install dust cap on J2 (Front Panel) 6. Give GO to IV for patch panel power up 7. Glove inspection





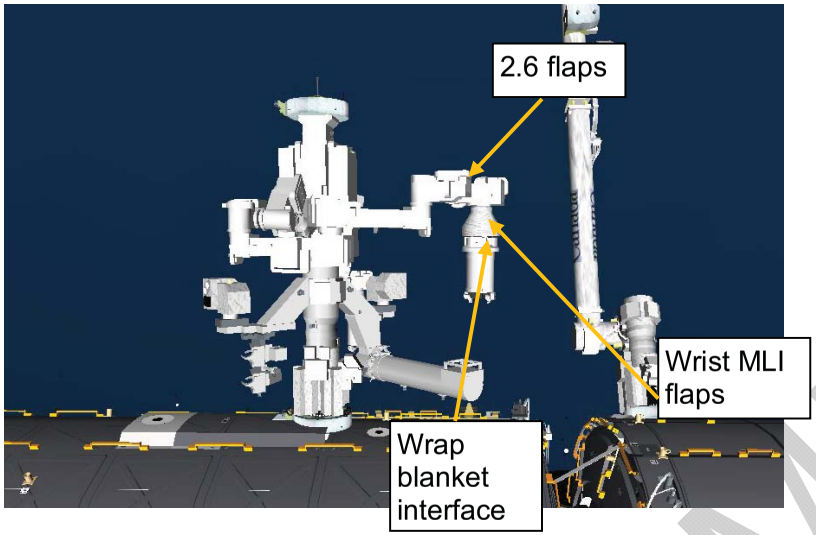
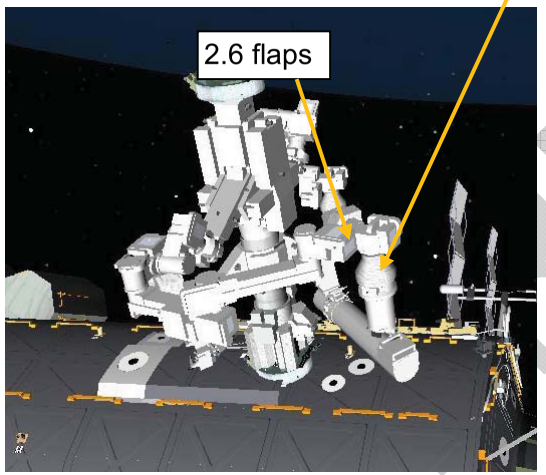
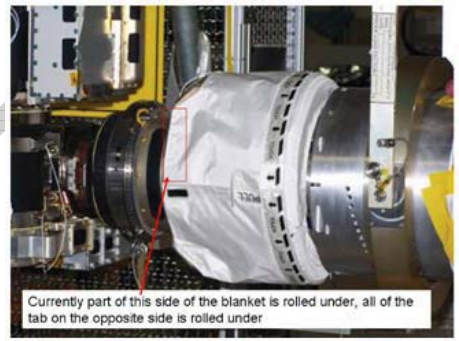
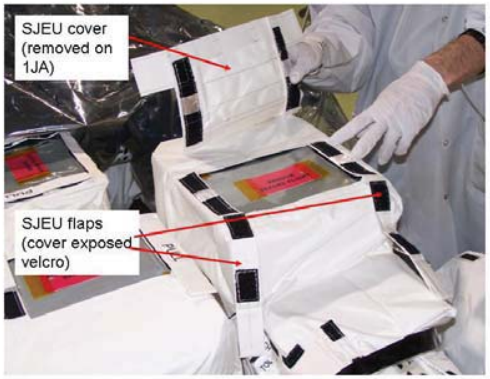
PRELIMINARY

Z1 PATCH PANEL (01:00) (Cont)

IV	EV2 CASSIDY (FF)
	8. Xlate to JEF

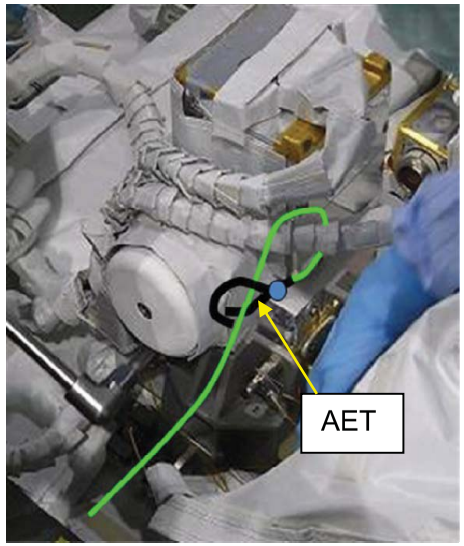
PRELIMINARY

SPDM COVERS (01:00)

IV/SSRMS	EV1 MARSHBURN (FF)
  Wrap Blanket – Detail 1 	OTCM COVER RECONFIGURATION 1. Temp stow J/B bag pack 2. Adjust MWS down (increase clearance with SPDM), as reqd 3. Adjust MLI as required ❑ 2.6 Flaps mated to corresponding Velcro patches ❑ Wrist roll flaps ❑ Wrist blanket 4. Retrieve J/B bag pack 5. Xlate to JEF 2.6 Flaps (SJEU) – Detail 

PRE' IMINARY

FWD JEF VE INSTALL (01:30)

IV/RMS	EV 1/2
1. IV: √Verify JPM Aft window closed for translation **2. IV: √Verify VE and LTAB inhibits in place** JEF FWD/AFT VE **SSIPC** JEF PDB b RPC26 – Open JEF PDB b RPC22 – Open JEF PDB b RPC23 – Open JEF PDB a RPC5 – Open JEF PDB a RPC6 – Open JEF HCE a sw9 – Open JEF HCE a sw11 – Open JEF HCE b sw65 – Open JEF HCE b sw67 – Open JEF LTA **SSIPC** JEF PDB b RPC18 – Open JEF PDB b RPC25 – Open JEF PDB b RPC26 – Open	CAUTION White paint on DCU is a no touch area Once MLI removed, PTU becomes pinch point 1. Xlate to JEF AFT VE launch location 2. Temp stow J bag HR 7037 (b/w R-ORU &DCU plate) 3. Temp stow B bag 4. EV2 - stow GP caddy in B bag MLI/LAUNCH LOCK RETRIEVE (EV1) 5. Attach 2-RETs to VE MLI 6. Open MLI 7. Retrieve RAD w/2-in ext from J bag; install on (EV2's) PGT 8. Stow 6-in on socket caddy (as reqd) 9. **PGT [B5, CCW2, 30.5] RAD, 2"-ext 7/16;** Release upper Launch Lock bolts (2) 16 turns (at socket) ❑ Bolt 1 ❑ Bolt 2 10. Release MLI grounding wires 11. Remove upper & lower VE MLI; stow outside J bag 12. RET from J Bag to Launch Lock 13. **PGT [B5, CCW2, 30.5] RAD, 2"-ext 7/16;** Release lower Launch Lock bolts (2) 16 turns (at socket) ❑ Bolt 3 ❑ Bolt 4 14. Stow launch lock in J bag CABLE DISCONNECT (EV2) 15. On IV GO, disconnect VE I/F cable ❑ J007 JEF Deck/P007 bootie ❑ P004 VE bootie 16. Stow cable in J bag 17. Retrieve connector cap; install on JEF Deck J007 18. Xfer PGT with 6" ext to EV1 (as req'd) STANCHION BOLT RETRIEVE (EV1) 19. Tether VE w/AET on VE Cable (alternate tether point method) 20. **PGT [B5, CCW2, 30.5] RAD w/2 ext 7/16;** Release EVA stanchion bolts (2);15 turns (at socket) ❑ Port ❑ Stbd  AET alternate tether point (wrap around VE cable and back onto tether strap)

PRELIMINARY

FWD JEF VE INSTALL (01:30)

IV/RMS	EV 1/2
	21. Stow PGT on R-ORU 22. Remove VE 23. Install Scoop to VE 24. RET to Scoop 25. Remove AET alt tether point <u>INSTALL IN FWD LOCATION (EXT-A) (EV1)</u> 26. Receive VE from EV2 27. Install VE; soft dock 10.5 lb (47 N) 28. Verify position indicator; black not visible 29. **PGT [B4, CW2, 30.5] 6 ext 7/16;** Install EVA bolts (2);15 turns ❑ Bolt 1 ❑ Bolt 2 30. Open cable MLI 31. On IV GO, perform connector reconfig ❑ Demate P009 from dummy jack J009 ❑ Inspect for FOD or damage, bent pins ❑ Verify EMI band present ❑ Mate P009 to VE J004 32. Replace cable MLI; verify tab secured

VE Install Bolts	Torque	Turns
Bolt 1		
Bolt 2		

PRELIMINARY

AFT JEF VE INSTALL (01:15)

IV/RMS	EV1/2
1. √**Stbd SARJ and TRRJ locked for PAS deploy**	CAUTION White paint on DCU is a no touch area Once MLI removed, PTU becomes pinch point MLI/LAUNCH LOCK REMOVAL (EV2) 1. Retrieve B bag; postion as needed 2. Attach 2 – RETs to VE MLI (from B bag) 3. Open MLI 4. **PGT [B5** (22 ft-lb), **CCW2, 30.5]** RAD, 2"-ext 7/16 Release Launch Lock bolts (2) 16 turns (at socket) ❑ Bolt 1 ❑ Bolt 2 5. Release MLI grounding wires 6. Remove upper & lower VE MLI; stow outside J bag 7. RET from B Bag to Launch Lock 8. **PGT [B5** (22 ft-lb), **CCW2, 30.5]** RAD, 2"-ext 7/16 Release Launch Lock bolts (2) 16 turns (at socket) ❑ Bolt 3 ❑ Bolt 4 9. Stow launch lock in B bag CABLE DISCONNECT (EV2) 10. Retrieve connector cap from J bag 11. Connect RET from B bag to VE I/F cable 12. Disconnect VE I/F cable ❑ J005 JEF Deck/P005 bootie ❑ P006 VE bootie 13. Stow cable in B bag 14. Retrieve connector cap; install on JEF Deck J005 15. Xfer PGT with 6" ext to EV2 (as req'd) STANCHION BOLT REMOVAL (EV1) 16. **PGT [B5** (22 ft-lb), **CCW2, 30.5]** RAD, 2"-ext 7/16 Loosen EVA stanchion bolts (2); 15 turns (at socket) ❑ Port ❑ Install rd scoop ❑ Stbd 17. Remove VE

PRELIMINARY

AFT JEF VE INSTALL (01:15)

IV/RMS

2. EV2 – Position at camera with feet pointing Port

VE bolt	Torque	Turns
FWD		
AFT		

- ❑ **C\L Bag – JEF VE Bag (J)**
  - ❑ AET (ext D-ring)
  - ❑ LTA ISS2 Cap (int RET #1)
  - ❑ Ratchet (int RET #2)
    - ❑ 2" ext
  - ❑ Socket caddy (int RET #3)
    - ❑ Right Angle Drive
    - ❑ 6" ext
  - ❑ Round Scoop (int RET #4)
  - ❑ RET sm-sm (int D-ring #1)
    - ❑ VE I/F cable
  - ❑❑ RET sm-sm (int D-ring #2)
    - ❑ VE Launch Lock
  - ❑❑ RET sm-sm (int D-ring #3)
    - ❑ VE MLI (upper)
  - ❑❑ RET sm-sm (int D-ring #4)
    - ❑ VE MLI (lower)
- ❑ **C\L Bag – Backup JEF bag (B) strap to J bag**
  - ❑ AET (ext D-ring)
  - ❑ GP caddy (int RET #2) (from EV2)
    - ❑ Compound cutter
    - ❑ Vice grips
  - ❑ RET sm-sm (int D-ring #1)
    - ❑ VE I/F cable
  - ❑ RET sm-sm (int D-ring #2)
    - ❑ VE Launch Lock
  - ❑ RET sm-sm (int D-ring #3)
    - ❑ VE MLI (upper)
  - ❑ RET sm-sm (int D-ring #4)
    - ❑ VE MLI (lower)

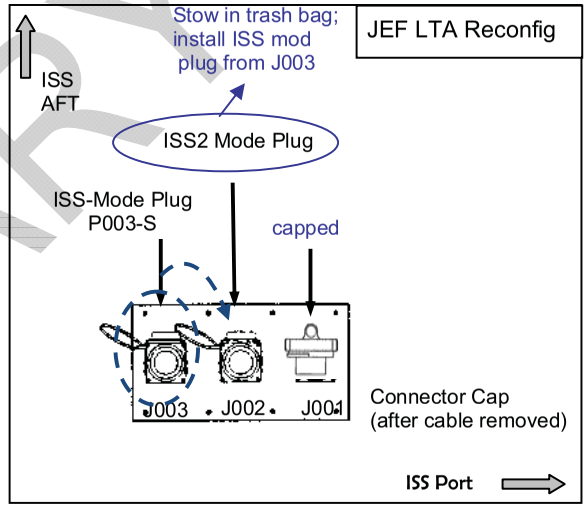
3. IV: Notify MCC-H VE installed, LTAB reconfig complete and GO for heater activation

4. IV: When EV clear of JPM AFT; give MCC-H GO to repower JTVE AFT

EV1/2

INSTALL IN AFT LOCATION (EF-A) (EV2)

18. Install VE; soft dock 10.5 lb (47 N)
19. Verify position indicator; black not visible
20. **PGT [B4 (16.0 ft lb), CW2, 30.5] 6 ext 7/16;** install EVA bolts (2); 15 turns
    - ❑ FWD
    - ❑ AFT
21. Open cable MLI
22. Perform connector reconfig
    - ❑ Release TA clamp
    - ❑ Demate P008 from dummy jack J008
    - ❑ Inspect for FOD, damage or bent pins
    - ❑ √Verify EMI band present
    - ❑ Mate P008 to VE J006
23. Replace cable MLI; verify tab secured



DCU MLI RECONFIG (EV2)

24. Xlate to J bag
25. Stow RAD w/2" on socket caddy
26. Remove 2" ext; install on PGT
    - ❒ EV1 PGT w/6" ext
    - ❒ EV2 PGT w/2" ext
27. Flip DCU MLI to cover plates; secure Velcro
28. Strap J/B bags together
29. Retrieve J/B bag pack; stow on BRT

LTAB RECONFIG

30. Xlate to JEF LTAB
31. Remove LTA MLI
32. On IV GO: Demate ISS2 mode plug from J002 (middle); stow in J bag
    - ❑ Inspect J002 for FOD or damage
33. On IV GO: Move ISS-Mode plug from J003 (Stbd) to J002
    - ❑ Inspect plug for FOD or damage prior to install
34. Reinstall MLI to align arrows (rotate 180 deg)
35. Glove inspection - both EV1 / EV2
36. Xlate to A/L
37. Temp stow J/B bag pack
38. Retrieve M/V bag pack
39. Xlate to S3
    - ❒ EV1 Zenith path
    - ❒ EV2 Nadir path
40. Temp stow M/V bag pack

PRELIMINARY

S3 NADIR OUTBOARD PAS (01:30)

IV/SSRMS	EV1 MARSHBURN (FF)	EV2 CASSIDY (FF)
	CAUTION • When attempting to remove the Yoke PIP pin and ADP, do not impart more than 10 lbf • Yoke ADP does not have a stowage hole. Do not close ADP lock bracket when ADP is not inserted in a stowage/clevis hole • Do not exceed 30 in between the yoke ADP and Deploy Clevis Bracket • Exceeding this could allow platform to enter detent position • Do not lift diagonal brace more than ~7 deg out of rotation plane to prevent damage to hinge end • Avoid inadvertent contact with grapple fixture shafts and target pins • When attempting to install the Yoke PIP pin and ADP, do not impart more than 10 lbf • EBCS target has finished surface that is susceptible to damage by contact. Do not remove MLI until all work inside truss is complete	
	HINGE LINE PREP 1. Remove hinge line ADPs (2) 2. Insert in stowage hole (toward station forward), ❑ √ADP closed: Inboard ❑ √ADP closed: Outboard REMOVE SARJ BRACES 3. Release SARJ Launch Bolt by hand, ~ 3 turns ccw 4. **PGT [B6** 24.0 ft-lb, **CCW3** 60 RPM, 30.5**]**-7/16-2-in ext Release SARJ Brace (cup-cone bolt), 35 turns, **Stop on turns; do not exceed 37 turns** REMOVE DIAGONAL BRACES 5. Attach SARJ Brace to Diagonal Strut, hand tighten SARJ Launch Bolt 1 turn cw 6. **PGT [B6** 24.0 ft-lb, **CCW3** 60 RPM, 30.5**]**-7/16-2-in ext Release Diagonal Brace (cup-cone bolt), **Stop on turns 35 (do not exceed 37 turns)** 7. Guide Diagonal Brace and temp stow with tether DEPLOY LG-SM AET 8. Deploy lg-sm AET DEPLOY PLATFORM 9. Monitor UMA to longeron clearance 10. Inform EV2 when UMA just clears the longeron 11. Assist EV2 as needed with yoke	REMOVE DEPLOY CLEVIS BRACKET 1. RET to Deploy Clevis Bracket **PGT [B7** 25.5 ft-lb, **CCW2** 30 RPM, 30.5**]**-7/16 6-in ext Release Deploy Clevis Bracket botls (4) 10 turns 2. Temp stow Deploy Clevis Bracket with RET RELEASE YOKE ADP AND PIP PIN 3. Release yoke PIP pin 4. Release yoke ADP 5. Tend platform “into” the truss REMOVE STOW CLEVIS BRACKET 6. RET to Stow Clevis Bracket 7. **PGT [B7** 25.5 ft-lb, **CCW2** 30 RPM, 30.5**]**-7/16-6-in ext Release Stow Clevis Bracket (4) 10 turns 8. Stow Clevis Bracket on M bag DEPLOY PLATFORM 9. Deploy platform out until UMA clears longeron 10. On EV1 GO, Rotate yoke from out to in 11. Attach lg hook of AET to ADP hole

PRELIMINARY

S3 ZENITH OUTBOARD PAS (01:30) (Cont)

IV/SSRMS

1. Brace Bolt Installation:

Bolt	SARJ Brace	Diagonal
Torque		
Turns		

2. Deploy Clevis Bracket Install:

Bolt #	1	2	3	4
Initial Torque				
Turns				
Final Torque				

3. Stow Clevis Bracket Install:

Bolt #	5	6	7	8
Initial Torque				
Turns				
Final Torque				

4. **IV: Give MCC-H GO to power up IMCA**
   √All tasks inside truss prior to UMA prep complete
   √Tools cleared from inside truss

5. **IV: Obtain GO from MCC-H for RTL Checkout**

RTL #	1	2	3
PIP Pin			
Test Complete			

EV1 MARSHBURN (FF)

REINSTALL DIAGONAL BRACES
12. Assist EV2 with brace installation
13. Release AET as needed for brace clearance
14. **PGT [B2** 16.0 ft-lb, **CW2** 30 RPM, 30.5**]**-7/16-2-in ext
    Engage Diagonal Brace (cup-cone bolt) to **hard stop**, ~ 35 turns

REINSTALL SARJ BRACES
15. Release SARJ Brace via SARJ Launch Bolt by hand, ~ 1 turn ccw
16. **PGT [B2** 16.0 ft-lb, **CW2** 30 RPM, 30.5**]**-7/16-2-in ext
    Engage SARJ Brace (Cup-Cone bolt) to **hard stop**, ~ 38 turns
17. Re-engage SARJ Launch Bolt bolt for temp stow; hand tighten cw 2-3 turns

REINSTALL STOW CLEVIS BRACKET (OPTIONAL)
18. Finger start Stow Clevis Bracket bolts (4), approx 1-2 turns
19. **PGT [B2** 16.0 ft-lb, **CW2** 30 RPM, 30.5]**-7/16-2-in ext**
    Engage Stow Clevis Bracket bolts (4) to hard stop, expect 10 turns
20. Retrieve RET from bracket

PREP UMA
21. Xlate under PAS UMA
22. Tether to hitch pin from EVA OVERRIDE anti-rotation cap, remove hitch pin
23. Remove anti-rotation cap and stow in trash bag

RTL CHECKOUT
24. Xlate to each Guide Vane (3) and perform:
    - ❑ Remove launch restraint PIP pin from guide vane; stow in trash bag
    - ❑ On **MCC-H** GO, depress and hold RTL lever for 15 sec, then release
    - ❑ Verify with **MCC-H** good checkout, move to next guide vane

EV2 CASSIDY (FF)

REINSTALL BRACES
12. Move Diagonal Brace into position for re-installation
13. Release AET as needed for brace clearance
14. Reinstall AET once brace is clear
15. Retrieve tether from brace temp stow location

REINSTALL DEPLOY CLEVIS BRACKET
16. Finger start Deploy Clevis Bracket bolts (4), 1-2 turn
17. **PGT [B5** 22.0 ft-lb, **CW2** 30 RPM, 30.5]-7/16-6-in ext
    Engage Deploy Clevis Bracket bolts (4) to hard stop, expect **10 turns**
18. **PGT [RCW**, **30.5**]-7/16-6-in ext, two clicks each bolt
    Apply final Torque to Deploy Clevis Bracket bolts (4) in Ratchet Mode
19. Retrieve RET from bracket
20. Stow in M bag

INSTALL YOKE
21. Disconnect AET
22. Install yoke in deploy clevis bracket
    - ❑ Release wire tie securing PIP pin and ADP to yoke
    - ❑ Install yoke ADP, √lock bracket engaged
    - ❑ Install yoke PIP Pin
23. Retrieve Lg-sm AET from HR; stow in M bag

PRELIMINARY

S3 ZENITH OUTBOARD PAS (01:30) (Cont)

IV/SSRMS	EV1 MARSHBURN (FF)	EV2 CASSIDY (FF)
6. Tool Config ❑ **C/L Bag – PAS Bag (M)** ❑ AET (ext D-ring) ❑ AET lg-sm (ext D-ring) ❑ RET sm-sm (int D-ring #1 to door handle) ❑ RET sm-sm (int D-ring #2 to door handle) ❑ RET sm-sm (int D-ring #3 to door handle) ❑ Camera w/bracket (int RET #1) ❑ RET sm-sm ❑ **C/L Bag – DR Tools Bag (V) strap to M bag** ❑ AET (ext D-ring) ❑ RET sm-sm (int D-ring #1 to door handle) ❑ DRT #1(int RET #1) ❑ DRT #2 (int RET #2) ❑ AET lg-sm (int RET #3) ❑ Wire ties Long (2) (ext D-rings across back of bag) ❑ Stow clevis bracket ❑ **EV1/2 trash bags** ❑ PIP pins (3) ❑ OVERRIDE cap in trash bag	EBCS TARGET PREP (AFTER RTL CHECKOUT) 25. Xlate to EBCS target and perform: ❑ Verify both EV clear of target area ❑ Remove target cover; stow on backside of target assy CLEANUP 26. Glove inspection 27. Verify SAFER config ❑ √L handle down (MAN ISO Vlv-Open) ❑ √R handle down (HCM-Closed) 28. Xlate to MLI bag\LAB	CLEANUP 24. Glove inspection 25. Verify SAFER config ❑ √L handle down (MAN ISO Vlv-Open) ❑ √R handle down (HCM-Closed) 26. Retrieve M/V bag pack 27. Tool inventory 28. Xlate to A\L

PRELIMINARY

EVA 5 STP RETRIEVE/ CLEANUP/A/L INGRESS (01:00)

IV/RMS	EV1 MARSHBURN (FF)	EV2 CASSIDY (FF)
1. Pre crew ingress For all lens (three) on each RF Camera Assy: PGSC Lens Iris Control – Close until view black Sel RF Camr 1,2 – None (black "OFF") V10 √Test Pattern displayed (color bars w/"No WVS Video") PGSC Select Page – XCVR Transceiver 1(2) CMD Pwr – Off (black CMD PWR:LVL-"OFF:Min") Sel File → Exit V10 STOP pb – push Mark, stow tapes PWR – OFF A7 WIRELESS VID PWR – OFF WIRELESS VID HTR – OFF	<u>RETRIEVE MLI BAG</u> 1. Xlate to LAB/MLI Bag <u>RETRIEVE EV1 ANCHOR HOOK</u> 2. Attach waist tether ❑ √Gate closed (structure) ❑ √Hook locked (structure) ❑ √Gate closed (D-ring ext) ❑ √Hook locked (D-ring ext) 3. Give EV2 GO to release EV1's 85-ft anchor hook 4. Retrieve MLI Bag; stow on BRT 5. On EV2 GO, release waist tether 6. Xlate to EV2's anchor point S0 HR 3483 <u>RETRIEVE EV2 ANCHOR HOOK</u> 7. On EV2 GO, release EV2's 85-ft anchor hook 8. Stow on NOT YEL 55-ft ERCM D-ring 9. Xlate to A/L 10. Retrieve AET FL from A/L HR 0538 11. Perform full tool inventory 12. Stow MLI bag 13. Ingress A/L 14. Receive V/M bag pack; stow	<u>RETRIEVE EV1 ANCHOR HOOK</u> 1. Xlate to S0 HR 3516 2. On EV1 GO, release EV1 anchor hook 3. Stow on NOT YEL 55-ft ERCM D-ring 4. Xlate to A/L 5. Open thermal cover 6. Ingress A/L 7. Anchor EV1 85-ft anchor hook to UIA D-ring ❑ √Gate closed ❑ √Hook locked 8. Give EV1 GO to release waist tether 9. Stow M/V bag pack 10. Attach waist tether to A/L int D-ring (ext) ❑ √Gate closed (structure) ❑ √Hook locked (structure) ❑ √Gate closed (D-ring ext) ❑ √Hook locked (D-ring ext) <u>RETRIEVE EV2 ANCHOR HOOK</u> 11. Give EV1 GO to release EV2's 85-ft anchor hook 12. Xfer V/M bag pack to EV1 13. Xfer MLI Bag to EV1 14. Perform full tool inventory 15. Ingress A/L 16. Close thermal cover

PRELIMINARY

EVA 5 CLEANUP AND A/L INGRESS (00:45) (Cont)

IV/RMS	EV1 MARSHBURN (FF)	EV2 CASSIDY (FF)
	PRE REPRESS 15. Remove SCU from stowage pouch 16. Remove DCM cover; Velcro to DCM 17. Connect SCU to DCM; √SCU Locked 18. WATER – OFF (fwd), expect H2O IS OFF msg Go to PRE-REPRESS (DEPRESS/REPRESS Cue Card)	PRE REPRESS 17. Remove SCU from stowage pouch 18. Remove DCM cover; Velcro to DCM 19. Connect SCU to DCM; √SCU Locked 20. WATER – OFF (fwd), expect H2O IS OFF msg 21. Close thermal cover; attach Velcro strap CAUTION Do not close hatch until EMU Water OFF for 2 min Verify outer hatch clear of hardware 22. Verify outer hatch clear of hardware 23. Verify handle position per hatch decal; close and lock hatch Go to PRE-REPRESS (DEPRESS/REPRESS Cue Card)

PRELIMINARY

GET-AHEADS: JPM OIH AND OIW INSTALL (00:30)

IV/RMS

1. IV verify Inhibits in place

JPM Windows
IV JPM port end cone window shutters closed

JEMRMS
SSIPC If EV crew working within vicinity of JEMRMS
1. RIP MA Brake – ON
2. MDP Main Mode – Stby Mode
or
1. JEMRMS Rack – OFF

JPM PROX Antenna
SSIPC If EV crew working within 0.3 ft JPM PROX Antenna
1. TRX Power – OFF
2. TX Power – OFF
or
1. JPM PROX Antennas – OFF

JPM Aft JTVE
SSIPC PDB b2 RPC 4 Open

EV

SETUP
1. Xlate to MLI bag (LAB Zenith)
2. Retrieve MLI bag; stow on BRT
3. Xlate to JEF
4. Stow bag on JEF HR 7011 (stbd edge by EFBM)

NOTE
Tether hook may become entrapped between OIH standoff point and pressurized module; ensure tether hook is above OIH interface on standoff point when installing to softdock.

EV must be restrained during installation to avoid loads into OIH until both bolts secured

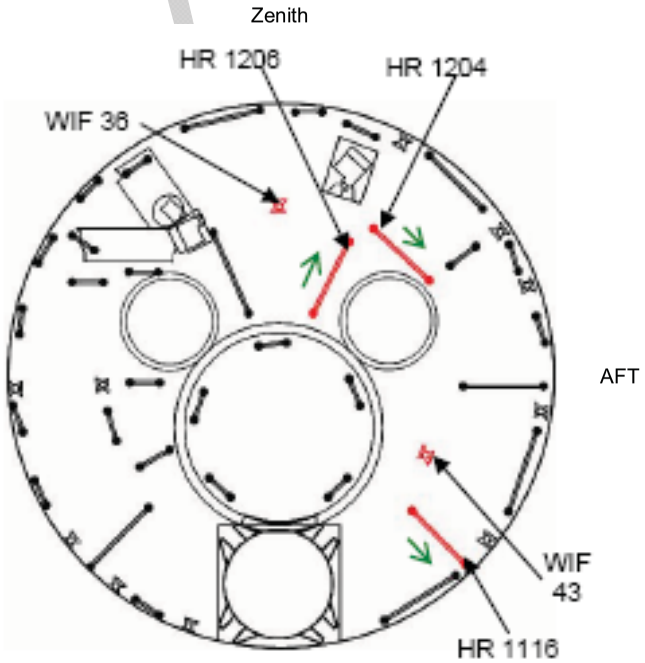
CAUTION
Avoid inadvertent contact with JEM Airlock target and pin

OIH
- ❑ 1204
- ❑ 1206
- ❑ 1116

OIW
- ❑ 43
- ❑ 36

WIF INSTALLATION
1. Pull up side lift-tabs on WIF
2. Slide WIF over dovetail on base
3. Release lift-tabs to engage locking pins in base receptacles
4. Verify wings down

HANDRAIL INSTALLATION
1. Arm HR soft dock (push both buttons)
2. Install HR to seat track direction arrow on bottom
3. **PGT [A2 (3.8 ft-lb), CW2, MTL 30.5], 6-ext 7/16**:
4. Engage handrail bolts (2) ~8 turns to torque
5. Report torque and turns to IV



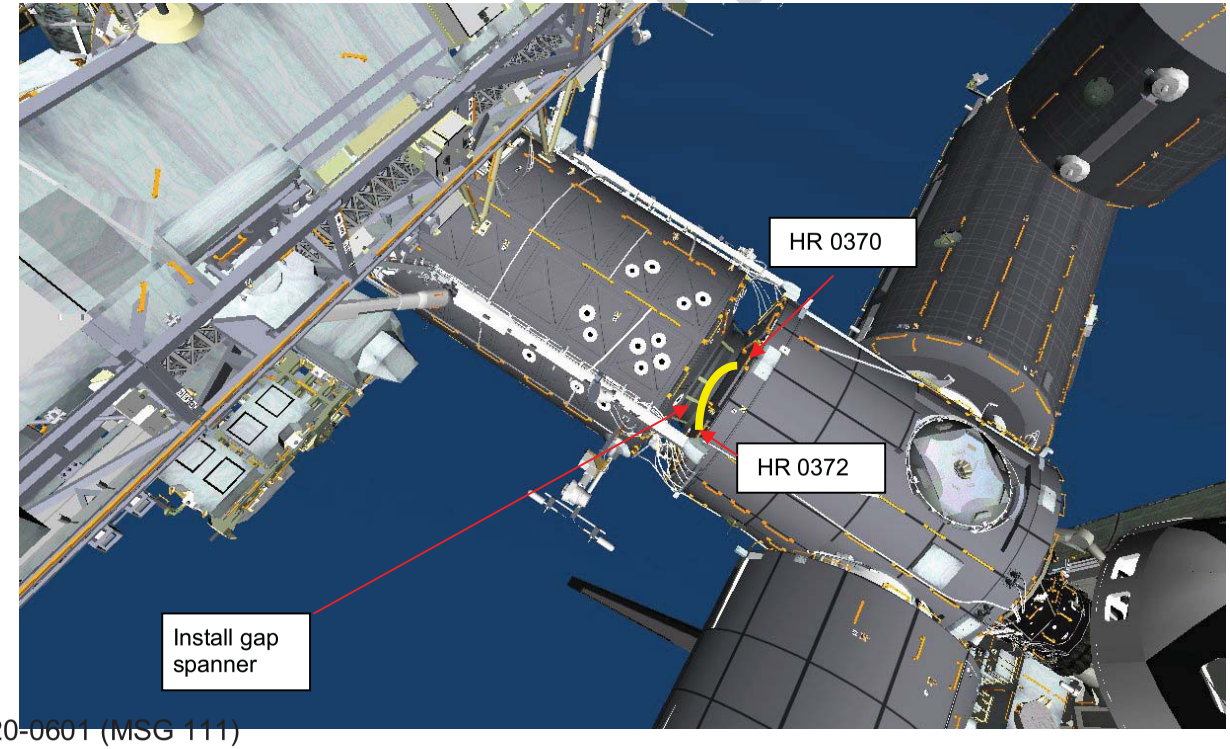
→ = Soft Dock Direction

HR	Mount bolt #		Torque	Turns
1116	6	Zenith		
	5	Nadir		
1204	4	Zenith		
	3	Nadir		
1206	2	Zenith		
	1	Nadir		

PRELIMINARY

NOD2 GAP SPANNER AND LAB CABLE TIE DOWN (00:45)

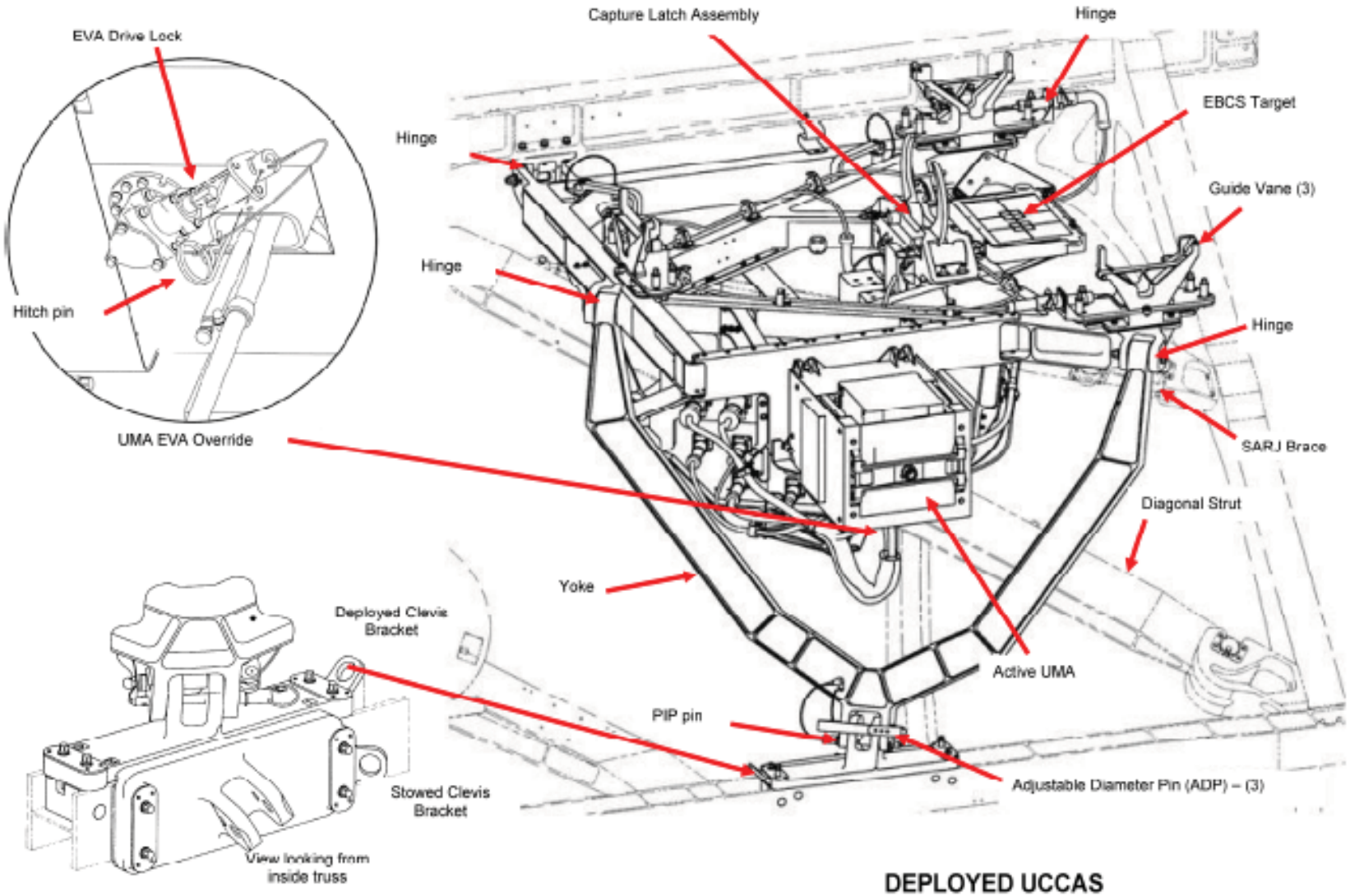
IV/RMS	EV
1. IV/MCC-H: Verify Inhibits are in place for lab cable tie down: ☐ LAB FWD/STB — √RPCM Z1 3B_A2, √RPCM Z1 4B_A2	LAB CABLE TIE DOWN (PORT/STBD) (00:30) 1. Xlate to MLI bag 2. Retrieve wire tie caddy; stow on MWS 3. On IV GO (inhibits complete) 4. Xlate to LAB FWD/STB 5. Tie down protruding LAB cables (STBD) ❑ Min bend radius 5 in 6. Xlate to FWD/PORT side of LAB 7. Tie down protruding LAB cables (PORT) ❑ Min bend radius 5 in NOD2 GAP SPANNER (00:15) 1. Xlate to MLI Bag 2. Retrieve gap spanner (72") from MLI bag 3. Xlate to NOD2 Zenith AFT endcone 4. Install gap spanner between HR 0372 and HR 0370 ❒ Rotate buckle 90° in plane



EVA/127/UPLINK

PRELIMINARY

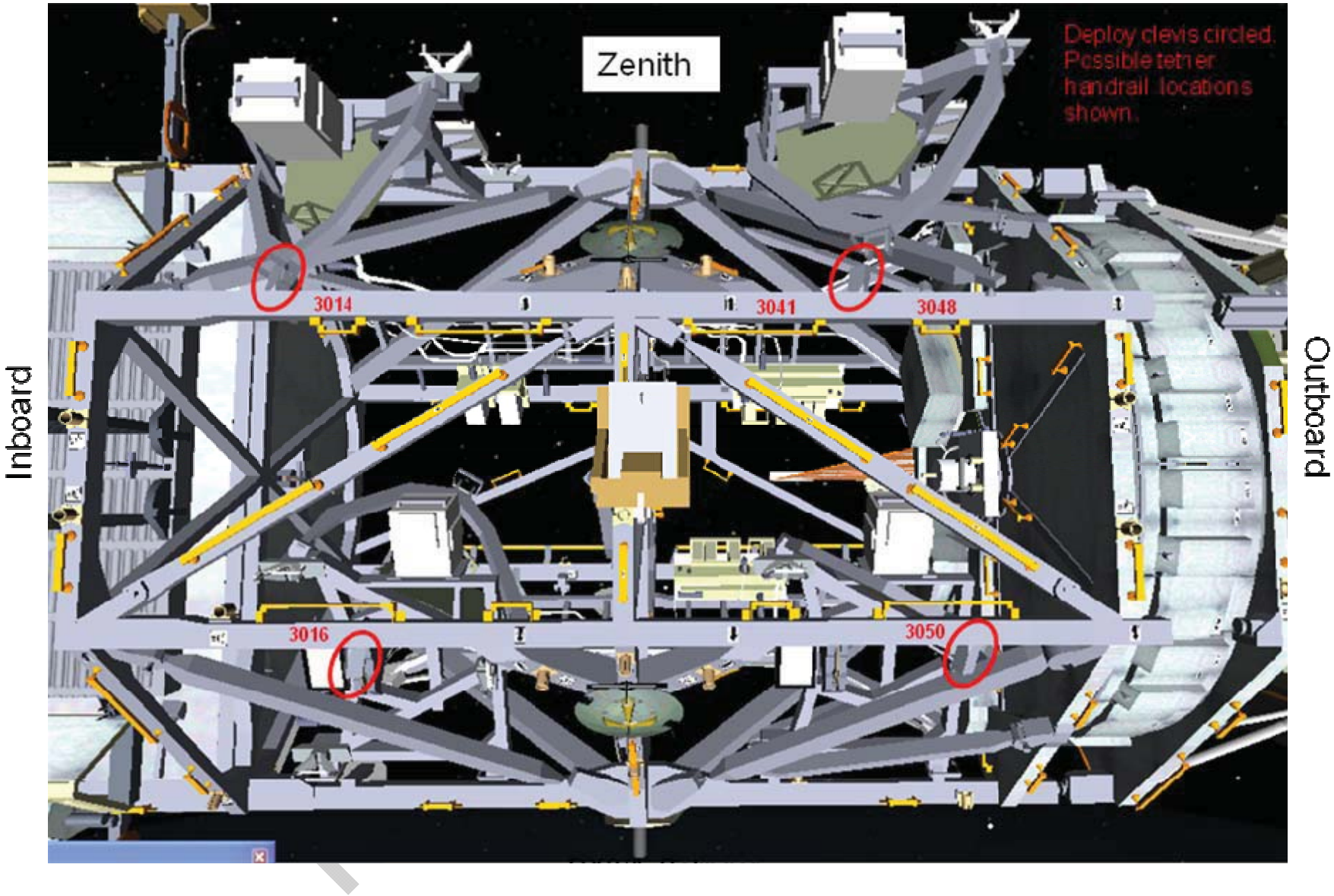
PAS TASK DATA



PAS TASK DATA (Cont)

HINGE LINE ADP ORIENTATION

PAS TASK DATA (Cont)



PAS TASK DATA (Cont)

Estimated Task Duration:

	Without SSRMS
One EV Crew	N/A
Two EV Crew	01:00

Tools:

EV1	EV3
PGT	PGT
7/16-6-in socket ext	7/16-6-in socket ext
	Adj – 45-72-in Gap Spanner (Large) – Adj

EVA Fasteners:

Fastener Name	Head Size	Qty	Install Torque (ft-lb)	Release Torque (ft-lb)	Failure Torque (ft-lb)	Turns
SARJ Brace Launch Lock Bolt	7/16	1	16.0	21.5	32.3	9-13.5
SARJ Brace cup/cone Bolt	7/16	1	16.0	28.8	14.0 and 31.6	35-37
Diagonal cup/cone bolt	7/16	1	16.0	22.7	14.0 and 31.6	35-37
Stowage Clevis	7/16	4	16.0	25.5	46.7	9-16.5
Deploy Clevis	7/16	4	30.5	25.5	106.6	7-10.5

Inhibits:

Inhibit
S3/S4 SARJ Locked

3. RPCM S32B_A RPC 15 – Open, Close Cmd Inhibit
4. RPCM S32B_A RPC 16 – Open, Close Cmd Inhibit

Timeline Considerations:
WETA thermal clock is 9 hr with thermal cover and 4 hr with no thermal cover
WETA thermal cover must be removed before WETA heater activation

Notes:
1. Dummy panel A296 is on bottom of VSSA mounting plate ~4 ft from
2. S3 face 4; S3 A78 is just inside S3 face 4

Cautions:
N/A

Foot Restraints (Contingency Yoke Alignment):

Task	WIF	APFR Setting
Zenith/Outboard PAS	S3-11	5, PP, G, 12
Zenith/Inboard PAS	S3-15	3, RR, F, 10
Nadir/Outboard PAS	S3-17	3, PP, F, 12
Nadir/Inboard PAS	S3-25	11, PP, F, 12
Nadir UCCAS	P3-11	3, PP, H, 12

Notes:
1. UMA EVA Override anti-rotation cap must be removed prior to first use of UMA on PAS
2. EBCS target cover must be removed prior to cargo attachment to PAS. Protects target from MMOD and inadvertent contact. Remove as last activity
3. RAD may be needed for re-install of deployed clevis bracket. It will likely exceed RAD limits and need to be returned for refurb

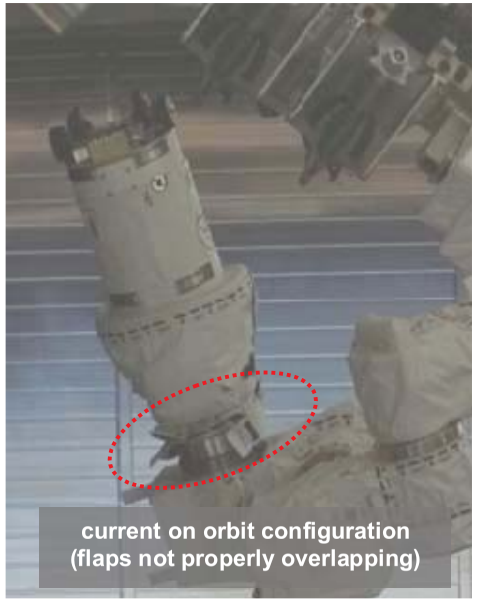
Cautions:
1. Do not lift diagonal brace greater than 7 deg out of rotation plane when rotating to temp stowage location so as to not bend hinge end
2. Do not close ADP lock bracket when ADP is not inserted in a stowage/clevis hole. The pin can fall apart
3. EBCS target has finished surface that is susceptible to damage by contact
4. Do not put platform into detent position

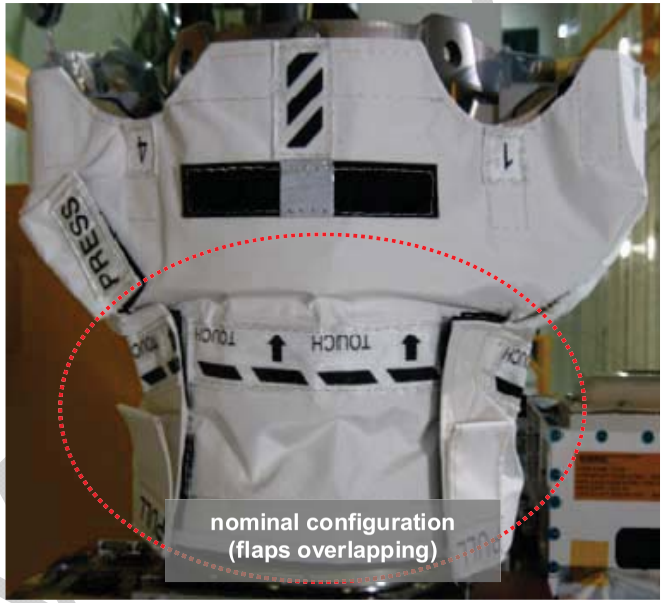
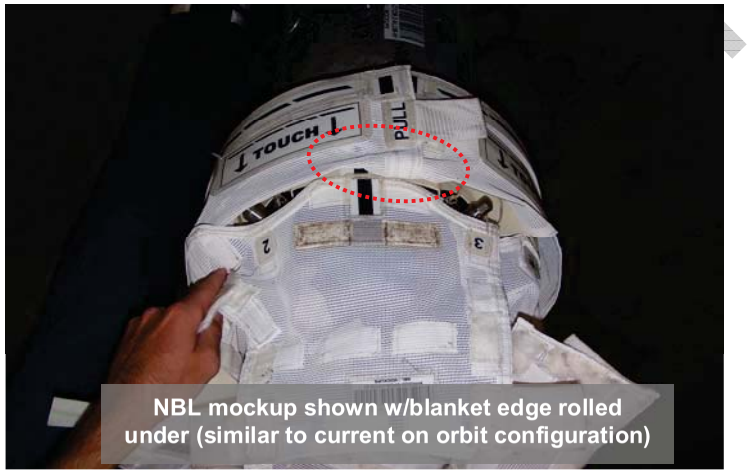
Warnings:

PRELIMINARY

SPDM COVERS TASK DATA

Wrist Roll Flaps – Detail





Wrap Blanket – Detail