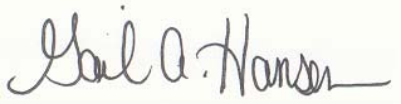
STS-129 / ULF3

FD 09 Execute Package

MSG	Page(s)	Title
078A	1 - 15	FD09 Flight Plan Revision
079	16 - 17	FD09 Mission Summary
080	18	FD08 MMT Summary
081	19 - 20	FD09 Transfer Message
082	21 - 26	2.100 ULF-3 Descent Sample Transfer From MELFI To GLACIER
084	27	FD09 Reboost Procedure
085	28	FD09 Crew Choice Downlink
086	29 - 43	OGS Water ORU Inlet Screen/Filter Conversion
087	44 - 48	Post EVA Transfer Deltas
088	49	FD09 EVA Deltas

Approved by FAO:
Gail Hansen



See Comedy on the back page

In dedication to Brian Smith's last shift

TOP 10 CAPTIONS FOR THE FOLLOWING PHOTO:

(20) So this pirate walks into a bar and says to the bartender …
(19) At least he doesn't have a cheesy mustache…
(18) The token chick
(17) Just standing here, I feel all buff … and much taller!!!
(16) Say "UPA"!
(15) And that's why I prefer Denta-Brite!
(14) Act normal and don't make any sudden movements … and you too can be an Astronaut!
(13) The new photo kiosk at Disney's "It's the Great Pumpkin Charlie Brown" ride
(12) Does my suit clash?
(11) One of these is NOT like the other… one of these is just not the same…
(10) So is this what it feels like to be inside a pumpkin?
(9) Dang it! I should have worn my heels… How do you like my lipstick?
(8) I bet I can beat Scorch in arm wrestling! Melvin, maybe not … but Scorch is a wuss!
(7) Hey, do you guys want to grab some Red Lobster after this photo thing???
(6) He clearly did NOT get the memo!
(5) It's amazing how a week in space with Scorch affected returning crewmember Nicole Stott
(4) Hey, what's with the orange suits? What do you mean "Ascent/Entry"?
(3) The impostor who tried to take Nicole's place on ISS made surprising progress toward launch before being discovered and detained…
(2) Thank you Mr. Smith. Your centered well… Now all I need is for you to stand up.

… and the #1 caption for the photo is…

(1) There is always ONE jackass… (straight from Mr. Smith's own quote list)

MSG INDEX

MSG NO.	TITLE
MSG078	FD09 Flight Plan Revision
MSG079	FD09 Mission Summary
MSG080	FD08 MMT Summary
MSG081	FD09 Transfer Message
MSG082	2.100 ULF-3 Descent Sample Transfer From MELFI To GLACIER
MSG083	FD09 PAO Event Summary- Crew Conference
MSG084	FD09 Reboost Procedure
MSG085	FD09 Crew Choice Downlink
MSG086	OGS Water ORU Inlet Screen/Filter Conversion
MSG087	Post EVA Transfer Deltas
MSG088	FD09 EVA Deltas

1. Post-Sleep Cryo Config

To avoid the effects of destratification resulting from the reboost this morning, O2 Tanks 1, 3, 4, and 5 and H2 Tanks 1 and 4 will be active. Following the reboost, there will be a callout in the timeline to deactivate O2 Tank 5.

R1 O2,H2 MANF VLV TK1 (two) - OP (tb-OP)
O2 TK3 HTR A - AUTO

A11 CRYO TK4 HTR O2 A - AUTO

Pre-Sleep Cryo Config

√MCC for deltas prior to configuring for Pre-Sleep. MCC may delay config for H2 Tank 4 depletion.

For tonight's Pre-Sleep cryo config, Manifold 1 will be closed with O2 Tanks 1 and 5 and H2 Tanks 1 and 3 active.

A15 CRYO TK5 HTR O2 A - AUTO

A11 CRYO TK4 HTR O2 A - OFF
HTRS H2 A,B (two) - OFF

R1 O2 TK3 HTR A - OFF
H2 TK3 HTRS A,B (two) - AUTO
O2,H2 MANF VLV TK1 (two) - CL (tb-CL)

2. PAYLOADS

MDS TRANSFER TO SHUTTLE

When MDS is initially powered up in the middeck, it has the potential to cause a startup transient that may cause an error on the GLACIER payload. We have words in the detail pages for you to verify the GLACIER status at the end of the MDS install.

Please make the following pen and ink changes to the procedure:

step 6.5

WAS

Slide MF28E locker into EXPRESS-4 Rack Locker 3 location.

IS

Slide MF28G locker into EXPRESS-4 Rack Locker 3 location.

step 6.7

WAS

Slide MF28G locker into EXPRESS-4 Rack Locker 4 location.

IS

Slide retrieved locker into EXPRESS-4 Rack Locker 4 location.

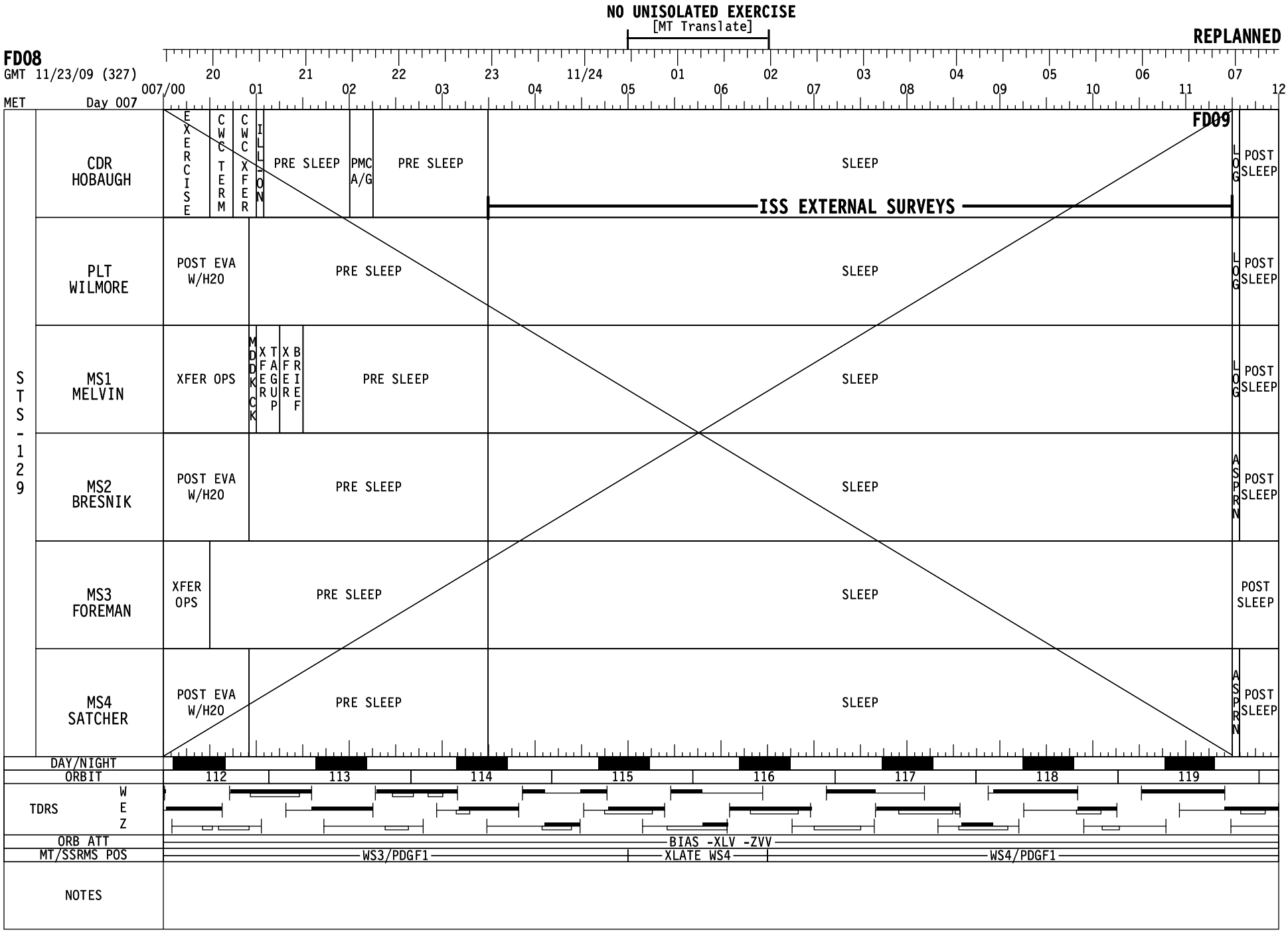
3. OGS ORU Filter Maintenance Big Picture Words for Mike

We have added activities to today's timeline to remove an OGS Water ORU Inlet Screen/Filter for return on ULF3. Bob will be performing the majority of the maintenance and other associated tasks. However, since the Manifold in the Water ORU provides structural support for rigid fluid lines, you have an activity on the timeline to help support those fluid lines during Manifold removal steps.

4. OUTLOOK File Sizes:

The size of your outlook files are approaching file size limitations. Please delete or move your sent mail into your personal folder. This will help us downlink your mail quicker after hatch closure.

5. REPLACE PAGES 2-28, 2-30 AND 2-32, 3-90 THROUGH 3-99.


NO UNISOLATED EXERCISE
[MT Translate]
REPLANNED
FD08
GMT 11/23/09 (327)
MET
Day 007
007/00
20
21
22
23
11/24
01
02
03
04
05
06
07
08
09
10
11
12
FD09
STS-129
CDR HOBAUGH
EXERCISE
CWC TERM
CWC XFER
ILL-ON
PRE SLEEP
PMC A/G
PRE SLEEP
SLEEP
LOG
POST SLEEP
ISS EXTERNAL SURVEYS
PLT WILMORE
POST EVA W/H2O
PRE SLEEP
SLEEP
LOG
POST SLEEP
MS1 MELVIN
XFER OPS
MDK CK
XFER TAG UP
XFER BRIEF
PRE SLEEP
SLEEP
LOG
POST SLEEP
MS2 BRESNIK
POST EVA W/H2O
PRE SLEEP
SLEEP
ASPRN
POST SLEEP
MS3 FOREMAN
XFER OPS
PRE SLEEP
SLEEP
POST SLEEP
MS4 SATCHER
POST EVA W/H2O
PRE SLEEP
SLEEP
ASPRN
POST SLEEP
DAY/NIGHT
ORBIT
112
113
114
115
116
117
118
119
TDRS
W
E
Z
ORB ATT
BIAS -XLV -ZVV
MT/SSRMS POS
WS3/PDGF1
XLATE WS4
WS4/PDGF1
NOTES

FD09 — **REPLANNED**

GMT 11/24/09 (328) — REBOOST

MET Day 007 — 008/00

STS-129

CDR HOBAUGH	POST SLEEP																																		
PLT WILMORE	POST SLEEP																																		
MS1 MELVIN	POST SLEEP																																		
MS2 BRESNIK	POST SLEEP																																		
MS3 FOREMAN	POST SLEEP																																		
MS4 SATCHER	POST SLEEP																																		

REPLANNED

FD09

GMT 11/24/09 (328) 20 21 22 23 11/25 01 02 03 04 05 06 07

MET Day 008 008/00 01 02 03 04 05 06 07 08 09 10 11 12

FD10

STS-129

CDR HOBAUGH	PMC A/G	EXERCISE	PRE SLEEP	SLEEP	LOG	POST SLEEP
PLT WILMORE	EXER CISE	PRE SLEEP	SLEEP	LOG	POST SLEEP
MS1 MELVIN	EXER CISE	PRE SLEEP	SLEEP	LOG	POST SLEEP
MS2 BRESNIK	PRE SLEEP	SLEEP	LOG	POST SLEEP
MS3 FOREMAN	PRE SLEEP	SLEEP	POST SLEEP
MS4 SATCHER	PRE SLEEP	SLEEP	LOG	POST SLEEP
MS5 STOTT	PRE SLEEP	SLEEP	LOG	POST SLEEP

DAY/NIGHT

ORBIT 128 129 130 131 132 133 134 135

TDRS W E Z

ATTITUDE BIAS -XLV -ZVV

NOTES

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | W | TDRS E | Z | D/N | ORB | MET Day 007 | ATT

CDR HOBAUGH | PLT WILMORE | MS1 MELVIN | NOTES

08:00 — 09:00 — 10:00 — 11:00 — 12:00

04:00 — 05:00 — 06:00 — 07:00

117 — 118 — 119

BIAS-XLV-ZVV

SLEEP | SLEEP | SLEEP

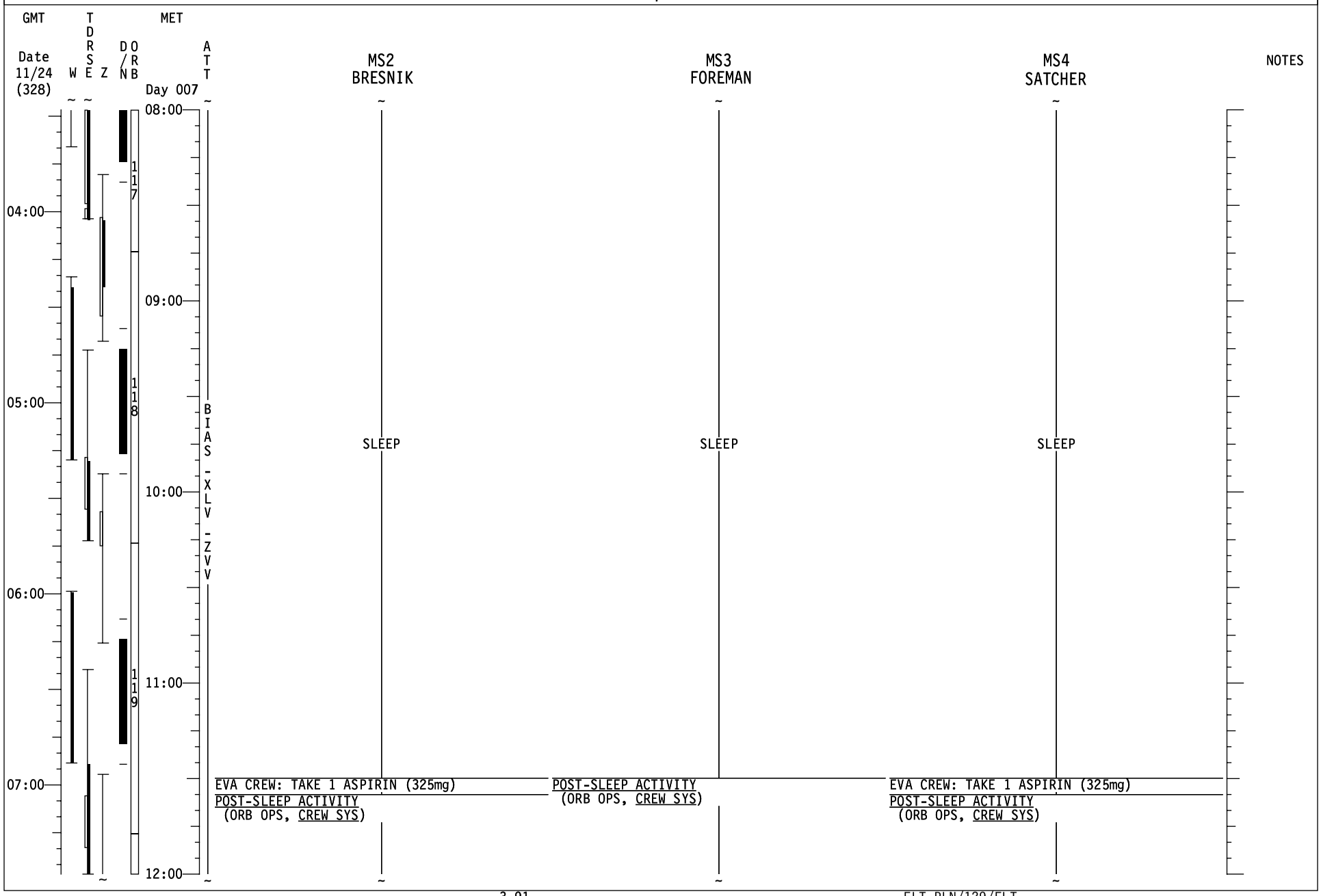
FD09 EZ ACTIVITIES:
√OCAC FILTER & MDDK DUCT SCREEN
TEPC (STATUS CHECK)
(ORB OPS, CREW SYS)
HARD REBOOT ALL PGSCs EXCEPT:
STS-1(OCA ROUTER), STS-5(RPOP2),
AND STS-6(WLES)

SLEEP LOGBOOK (SDBI 1634) | SLEEP LOGBOOK (SDBI 1634) | SLEEP LOGBOOK (SDBI 1634)

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS) | POST-SLEEP ACTIVITY (ORB OPS, CREW SYS) | POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

STS-129/ULF3 FD09

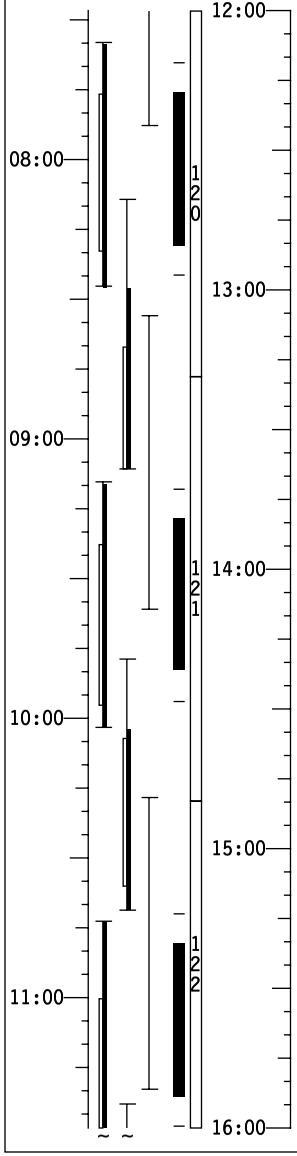
REPLANNED



STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | TDRS W E Z | DO/NB | MET Day 007 | ATT



CDR HOBAUGH

12:00 — POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

BIAS -XLV -ZVV

13:00 — A When ISS is Free Drift, DAP:LVLH When jet activity stopped for >5 sec, DAP: FREE >2 sec, Then DAP: AUTO

B TG=2 BV=5 P=176 Y=0 OM=176 A12/AUTO/VERN Init TRK

C N2 REPRESS USING PAYLOAD N2 VALVES (ORB OPS, ECLS) Perform REPRESS SETUP AND INIT Steps 3-7 MCC will TMBU S/W FDA. H/W already INH.

14:00 — TV (ILLUMINATOR OPS)(P/TV, CC)ILL OFF - A,D

H/O ATTITUDE CONTROL CMGTA to ORBITER A

MNVR TO REBOOST B

AUTO REBOOST (INIT) Ref. MSG 084 Steps 1-3

REBOOST

15:00 — AUTO REBOOST (Term) Ref. MSG 084 Step 4 Only

MNVR (TRK) BIAS -XLV -ZVV TG=2 BV=5 P=162.71 Y=359.52 OM=167.27 A12/AUTO/VERN Init TRK

On MCC Go: A15 CRYO TK5 HTR O2 A-OFF

When ISS is GO for deadband collapse,DAP:B13

JOINT OPS: 3.122 PREBREATHE USING SHUTTLE O2 TEARDOWN Steps 2-7 MCC-H will perform Step 2.4 & 5.5

16:00

PLT WILMORE

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

IMU STAR OF OPPTY ALIGN (ORB OPS, GNC)

SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) INIT FILL #14 Ref. MSG 017

AUTO REBOOST (INIT) Ref. MSG 084 Steps 1-3

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

N2 REPRESS USING PAYLOAD N2 VLVS C

AUTO REBOOST (Term) Ref. MSG 084 Step 4 Only

SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) Perform FILL TERMINATION

CWC TRANSFER Transfer 1 CWC to ISS

L17 Check MCIU filter screen

When ISS is Go for att. control, DAP:FREE Then select DAP A, DAP:A12/FREE/VERN

MS1 MELVIN

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

CGBA and ABRS STATUS CK(CUE CARD) CGBA only

GLACIER RECORD QUICK DIAGNOSTIC DATA(Nominal)

DAILY TRANSFER LIST UPDATE Ref. Transfer List & MSG 081

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

SAMPLE TRANSFER REVIEW Ref. MSG 082

ULF-3 DESCENT SAMPLE TRANSFER FROM MELFI TO GLACIER Ref. Transfer List: Items 720, 721, 726, 727, 728, 734, 735, 736, 737, 901, and MSG 082

TRANSFER OPS Ref. Transfer List & MSG 081

GLACIER RECORD QUICK DIAGNOSTIC DATA(Nominal)

NOTES

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | W | T D R S E Z | D O / R N B | MET Day 007 | ATT

MS2 BRESNIK

12:00 — POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

13:00 — POST EVA EMU RECONFIGURATION (Part II) (EVA, AIRLOCK CONFIG) Ref. MSG 087

14:00 — EVA TRANSFER TO SHUTTLE (EVA, AIRLOCK CONFIG) Ref. Transfer List: Items 717, 718, 719, 722, 723, 724, 725, and MSG 087

15:00 — TRANSFER OPS Ref. Transfer List & MSG 081

16:00

MS3 FOREMAN

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

POST EVA EMU RECONFIGURATION (Part II) (EVA, AIRLOCK CONFIG) Ref. MSG 087

EVA TRANSFER TO SHUTTLE (EVA, AIRLOCK CONFIG) Ref. Transfer List: Items 717, 718, 719, 722, 723, 724, 725, and MSG 087

TRANSFER OPS Ref. Transfer List & MSG 081

OGS WATER ORU INLET SCREEN/FILTER CONVERSION Ref. Transfer List:Item 913, MSG 078,Item 3 and MSG 086, Steps 4-6

MS4 SATCHER

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

POST EVA EMU RECONFIGURATION (Part II) (EVA, AIRLOCK CONFIG) Ref. MSG 087

EXERCISE

NOTES

08:00 — 09:00 — 10:00 — 11:00

120 — 121 — 122

BIAS-XLV-ZVV — REBOOST

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | TDRS W E Z | DO/RNB | MET Day 007 | ATT

CDR HOBAUGH

JOINT OPS: 3.122 PREBREATHE USING SHUTTLE O2 TEARDOWN
Steps 2-7
MCC-H will perform Step 2.4 & 5.5

TRANSFER OPS
Ref. Transfer List & MSG 081

CREW CONFERENCE
ISS KU AVAIL: 17:33 - 18:11
20 second LOS @ 17:45

CREW PHOTO

MEAL

SHUTTLE CONDENSATE COLLECTION
(ORB OPS, ECLS) Perform CHANGEOUT
Use CWC S/N 6008 temp stowed on shuttle.
Stow ISS CWC S/N 1062 in NOD202.
Notify MCC when complete.

PLT WILMORE

I'CNCT TK SWITCH:
FROM R TO L OMS FEED (OPCL, RCS)
N2 REPRESS USING PAYLOAD N2 VLVS [D]
TRANSFER OPS
Ref. Transfer List & MSG 081

[D] N2 REPRESS USING PAYLOAD N2 VALVES
(ORB OPS, ECLS)
Perform REPRESS TERM AND RECONFIG
Steps 8-12
MCC will TMBU S/W FDA. Do not ENA H/W.

CREW CONFERENCE
ISS KU AVAIL: 17:33 - 18:11
20 second LOS @ 17:45

CREW PHOTO

MEAL

P/TV05 ISS INTERNAL OPS
(PHOTO/TV, SCENES)
Perform DEACTIVATION

P/TV04 INGRESS/EGRESS
(PHOTO/TV, SCENES)
Setup

MS1 MELVIN

TRANSFER OPS
Ref. Transfer List & MSG 081

MDS TRANSFER TO SHUTTLE (ASSY OPS, PAYLOADS)
Ref. Transfer List: Items 52, 53, 400, 400.1, 400.2, & 730. After MDS installed, verify Glacier STATUS LED-Green. Verify no error messages on Glacier display
D2Xs SETUP (CUE CARD)
Perform D2Xs PROGRAM in cabin
Document MDS in final installed location

CREW CONFERENCE
ISS KU AVAIL: 17:33 - 18:11
20 second LOS @ 17:45

CREW PHOTO

MEAL

TRANSFER TAGUP
Coordinate with transfer counterparts

TRANSFER BRIEF
Call down status to MCC

NOTES

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | W | TDRS E | Z | DON/RB | MET Day 007 | ATT

MS2 BRESNIK	MS3 FOREMAN	MS4 SATCHER	NOTES
	OGS WATER ORU INLET SCREEN/FILTER CONVERSION Ref. Transfer List:Item 913, MSG 078,Item 3 and MSG 086, Steps 4-6 TRANSFER OPS Ref. Transfer List & MSG 081	NLP ACTIVATION (ASSY OPS, PAYLOADS) Activate GAPs 15-16 (Cells 2) in MA16D Steps 2,6,11 TRANSFER OPS Ref. Transfer List & MSG 081	
EXERCISE			
TRANSFER OPS Ref. Transfer List & MSG 081	EXERCISE		
CREW CONFERENCE ISS KU AVAIL: 17:33 - 18:11 20 second LOS @ 17:45	CREW CONFERENCE ISS KU AVAIL: 17:33 - 18:11 20 second LOS @ 17:45	CREW CONFERENCE ISS KU AVAIL: 17:33 - 18:11 20 second LOS @ 17:45	
CREW PHOTO	CREW PHOTO	CREW PHOTO	
MEAL	MEAL	MEAL	
GREASE GUN CLEANUP (EVA, TOOLS & STOWAGE)		JOINT OPS: 2.303 PCS DEACTIVATION Ref. Transfer List: Items 67, 67.1, 67.1.1, 68, & 69	

Time scale: 12:00, 13:00, 14:00, 15:00; MET 16:00, 17:00, 18:00, 19:00, 20:00

DON/RB: 122, 123, 124, 125

ATT: BIAS-XLV, -ZVV

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | W | TDRS E | TDRS Z | DON | ORB | MET Day 007 | ATT

CDR HOBAUGH

- 20:00 – 21:00: OFF DUTY
- 21:00 – 22:00: FAREWELL
- 22:00 – 23:00: JOINT OPS: 4.102 SHUTTLE/ISS DUCT REMOVAL & HATCH CLOSING
  MCC-H can perform steps 2 & 3 on crew request
- 23:00 – 00:00: C/L CAMR INSTALL (PHOTO/TV, REF PROC) Perform step 1 only
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
- On MCC Go: PCS ACTIVATION [E]
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

PLT WILMORE

- 20:00 – 21:00: OFF DUTY
- 21:00 – 22:00: FAREWELL
- P/TV09 GLACIER (PHOTO/TV, SCENES) Perform Video, Photos
- RNDZ TOOLS CHECKOUT (RNDZ, RNDZ TOOLS)
- [E] PCS ACTIVATION
  MO10W 14.7 CAB REG INLET SYS 1 VLV - OP
  Avoid WCS use during high N2 flow.
  Expect possible 'S66 CAB N2(O2) FLO 1' msgs
- 23:00 – 00:00: EXERCISE

MS1 MELVIN

- 20:00 – 21:00: OFF DUTY
- 21:00 – 22:00: FAREWELL
- NOMINAL H2O CONFIG (ORB OPS, ECLS) √MCC for FES PRI A
- CGBA and ABRS STATUS CK (CUE CARD) CGBA only
- GLACIER STATUS CHECK (CUE CARD)
- C/L CAMR INSTALL (PHOTO/TV, REF PROC) Perform step 1 only
- 23:00 – 00:00: EXERCISE

NOTES

- UPDATE TFL 192
- UPDATE TFL 184

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | MET Day 007

W | T D R S E Z | D/N | O R B 125 126 127 | ATT BIAS-XLV-ZVV

20:00	21:00	22:00	23:00	00:00

MS2 BRESNIK	MS3 FOREMAN	MS4 SATCHER	MS5 STOTT	NOTES
OFF DUTY	OFF DUTY	OFF DUTY		
FAREWELL	FAREWELL	FAREWELL	FAREWELL	
JOINT OPS: 4.102 SHUTTLE/ISS DUCT REMOVAL & HATCH CLOSING MCC-H can perform steps 2 & 3 on crew request	P/TV03 UNDOCK (PHOTO/TV, SCENES) Setup			
JOINT OPS: 4.104 ODS VEST/PMA DPRS & HATCH LEAK CHECK	JOINT OPS: 4.104 ODS VEST/PMA DPRS & HATCH LEAK CHECK	RNDZ TOOLS CHECKOUT (RNDZ, RNDZ TOOLS)		

STS-129/ULF3 FD09

REPLANNED

GMT Date 11/24 (328) | W | TDRS E | Z | DON/ORB | MET Day 008 | ATT

CDR HOBAUGH | PLT WILMORE | MS1 MELVIN | NOTES

00:00

PRIVATE MEDICAL CONFERENCE
L9 PAYLOAD STATION A/G(two) - OFF
Perform via A/G 2

EXERCISE

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

20:00

128

01:00

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

21:00

BIAS-XLV-ZVV

02:00

129

22:00

03:00

CREW WAKE @ 08/11:00

23:00

130

SLEEP

04:00

EXERCISE

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

EXERCISE

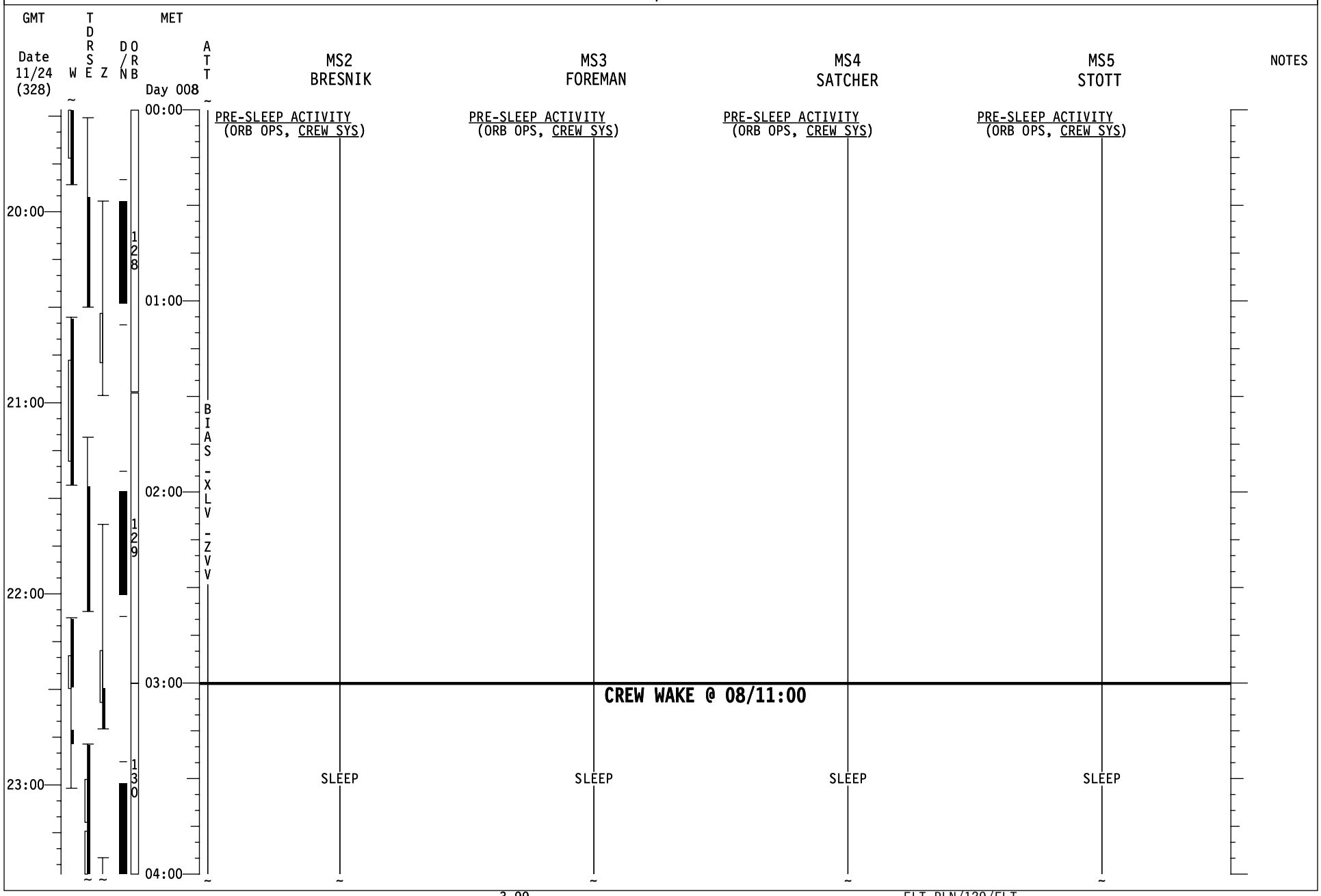
PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SLEEP

SLEEP

STS-129/ULF3 FD09

REPLANNED



Nothing like ending your EVAs strong! Even a late start and a shorter timeline can't slow you down, all objectives and all get ahead tasks complete. Nice job!

YOUR CURRENT ORBIT IS: 188 X 179 NM

NOTAMS: **TWO CHANGES (ADDED DOV & GUA REIL BACK IN SERVICE)**

EDW -	LAKEBED RWY 15/33 GREEN - ELS ONLY. RWY 18L - UNUSABLE.
NOR -	LAKEBED RUNWAYS GREEN.
DOV -	**RWY 01/19 CLOSED.**
YQX -	TACAN YQX CH74 OTS.
LAJ -	TACAN LAJ45 OTS.
PTN **-**	AIRFIELD CLOSED.
GUA -	RWY 06R/24L CLOSED.
KKI-	RWY 15R/33L CLOSED. 15L/33R USABLE.
IKF -	NOT USABLE. NO AGREEMENT.
BEN -	NOT RECOMMENDED/NOT SUPPORTED

NEXT 2 PLS OPPORTUNITIES:

EDW04 ORB126 – 7/21:45 FEW250 7 040/08P13
EDW04 ORB142 – 8/22:08 SKC 7 040/10P16

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(%)

L OMS OX = 38.5 R OMS OX = 38.8
FU = 38.5 FU = 38.4

Subtract interconnect counter for current OMS quantities.

END OF PAGE 1 OF 2, MSG 079

DELTA V AVAILABLE:

OMS	381 FPS
ARCS (TOTAL ABOVE QTY1)	54 FPS
TOTAL IN THE AFT	435 FPS
ARCS (TOTAL ABOVE QTY2)	87 FPS
FRCS (ABOVE QTY 1)	16 FPS
AFT QTY 1	77 %
AFT QTY 2	39 %

SYSTEM	FAILURE	IMPACT	WORK AROUND
EPS	Mid Starboard Payload Bay Floodlight has failed.	The Mid Starboard Payload Bay Floodlight (A7U) will be left OFF resulting in reduced illumination in the Payload Bay.	Other Payload Bay Floodlights are still available for use.

END OF PAGE 2 OF 2, MSG 079

The MMT met to review mission progress and orbiter systems. EVA 3 was wrapping up as the MMT was meeting. Atlantis is in great shape with no new anomalies discussed. The team received post flight summaries from the MSFC Propulsion elements (RSRM, RSRB, ET and SSME), all which performed nominally throughout ascent.

With the completion of the remaining, nominally timelined activities, the MMT is GO for undocking.

Good Morning Leland and Mike,

This will be your last transfer message from us (awww, ☹). You are now 82% complete with transfer. You went from being 5 hours down to getting back on schedule, thanks for your hard work on this yesterday. We just want to remind you that today is going to be a very busy day, you have a lot of generic transfer ops scheduled as well as many timelined transfers. The light at the end of the tunnel is that this is your final day of transfer. Thanks again for the great work throughout the mission and let us know if you have a problem with item 914.

Transfer Notes

- **BCM Item 709:** There has been some question on the ground concerning what you actually transferred for Item 709 yesterday. We were under the impression that Item 709 is installed and would not be ready for transfer until after the BCM R&R activity today. The installed BCM is S/N 1006 and that is the BCM approved for return and needs to be packed in Bag I. For your information, the two BCMs that were brought up on ULF3 (Resupply Items 29.4 and 29.5) are being installed today and they have serial numbers 1001 and 1003. Please verify that these are not in Bag I.

The Transfer List Excel file, FD09_Transfer_List_STS129.xls, locations are:

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

FD09 Choreography

- **Items 720, 721, 726, 727, 728, 734, 735, 736, 737, & 901:** Transfer Glacier Samples items per MELFI/GLACIER TRANSFER activity
- **Items 717, 718, 719, 722, 723, 724, & 725:** Transfer EVA items per EVA XFER TO STS activity
- **Items 29.4, 29.5 & 709:** Transfer BCMs for BCM R&R activity
- **Items 52, 53 & 730:** Transfer adapter plate, locker and MDS per MDS TRANSFER activity
- **Items 400, 400.1, & 400.2:** Transfer prepack bag 400 and Food Envelope Assemblies after MDS TRANSFER activity.
- **Item 913:** Transfer Water ORU Inlet Screen after OGS-ORU FLTR-CNVRT activity.
- **Items 67, 67.1, 67.1.1, 68, & 69:** Transfer Laptop items per PCS-DEACT & XFER activity
- **Items 715, 715.1, 715.2, 716, 716.1, & 716.2:** Transfer DCB and samples per DCB XFER activity.
- **Item 66:** Transfer G1 Camcorder
- **Items 706 & 708:** Transfer 5MLE Bags D and F.
- **Item 906:** Transfer EDV-U after EDV-U PACK activity.
- Transfer all remaining items!!
    - **Resupply Items:** 803, 806
    - **Return Items:** 418, 419, 420, 602, 607, 608, 900, 906, 909, 910, 911, 912, and 914.

Please incorporate uplink pages as follows (we've listed the updates in the order they printed out for you):

In the Transfer List **RESUPPLY** tab
Add the following page:
Resupply 18

In the Transfer List **RETURN** tab
Pen and Ink on the following pages:
Return 5
Item 418 and 419: Add **temp stow** location - Top of **MF28G**
Item 420: Add **temp stow** location - **MF14H**

Replace the following pages:
Return 8, 9, 12, and 14

Add the following page:
Return 15

Changes to the Transfer List are detailed below:

MIDDECK RESUPPLY
Item 806 - new item

MIDDECK RETURN
Item 709 - updated item name with S/N
Item 720 - updated quantity
Item 734 - updated quantity
Item 906 - updated quantity, initial and final stowage location
Item 908 - deleted
Item 909 thru 914 - new items

Have an out of this world day and let us know if you have any questions!

- The STS-129 Transfer Team

21-0505 (MSG 82) 2.100 ULF-3 DESCENT SAMPLE TRANSFER FROM MELFI TO GLACIER

(ASSY OPS/ULF3/FIN 1/HC) Page 1 of 6 pages

OBJECTIVE:

This procedure will be used to transfer the frozen HRP Blood vial bags, HRP Urine bags, Rad Silk Egg Cases, Lada VPU samples, SOLO and CARD science samples, and MDS expired mice from ISS MELFI to Glacier using a Double Coldbag and two Icepac Belts in preparation for Glacier's descent on ULF-3. This activity is performed by ISS and shuttle crewmembers. The Glacier door will be locked after sample transfer is complete.

IFM Tool Locker (MF28K):

3/16" Hex Head, 3/8" Drive
1/4" - 3/8" adapter
4" Extension, 1/4" Drive
Trq Wrench 1/4" Drive (40 to 200 in-lbs)

PARTS:

Double Coldbag S/N 1015
Light Duty Cryo Gloves (from ISS)
Small Coldplate/Wiretray Cover P/N SEG33111361-301

ITEMS TO UNSTOW WITHIN PROCEDURE:

Icepac Belt -32°C (two)
HRP Urine (thirteen wraps)
HRP Blood (twenty-two vial bags)
Rad Silk (three egg cases, two Ziplocks)
SOLO (two vial bags, two Ziplocks)
CARD (two mesh bags, two Ziplocks)
LADA VPU (two Ziplocks)
MDS samples (three Ziplocks)

MELFI 1. PACKING MELFI SAMPLES INTO DOUBLE COLDBAG

WARNING
Protective Gloves must be worn when manipulating MELFI trays or samples to prevent injury to exposed skin.

CAUTION
1. Minimize exposure of MELFI trays, frozen Icepacs, and samples to ambient air to prevent increased sample temperatures.
2. Double Coldbag lid should remain closed when the internal volume is not being accessed.

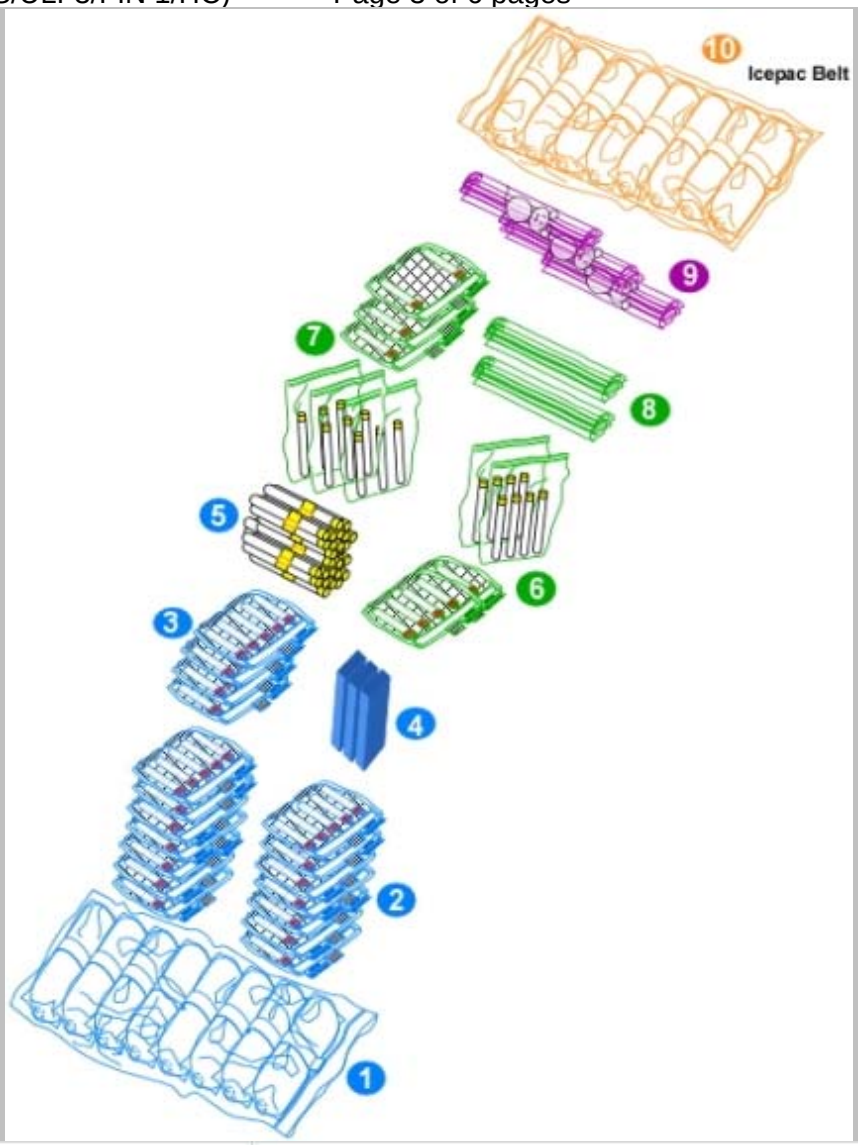
NOTE

60 seconds & 45 minute MELFI Dewar opening rules do not apply during packing of the Coldbag.

1.1 Don Light Duty Cryo Gloves (from ISS).

1.2 Perform Double Coldbag packing per Figure 1.

```
*******************************************************************************
*  If Tray is stuck,
*  |  Insert Small Coldplate/Wireway Cover completely between Tray
*  |    and Dewar wall.
*  |  Firmly holding both Small Coldplate/Wireway Cover and Tray
*  |    Handle, remove Tray from Dewar.
*  |  Reference: 4.010 MELFI REMOVAL OF A STUCK TRAY, (US
*       PODF: MELFI) if needed
*******************************************************************************
```



Step	From MELFI Location*		Description
1	MELFI-1	1-A-1	Insert Icepac Belt -32C (pink) on bottom
2	MELFI-1	1-B-1,2	Insert HRP blood (eighteen vial bags)
3	MELFI-1	1-C-1	Insert HRP blood (four vial bags)
4	MELFI-1	1-C-2,3	Insert Rad Silk (three cases in two ziplocks)
5	MELFI-1	1-C-4	Insert HRP urine (thirteen wraps)
6	MELFI-1	2-D-2	Insert SOLO samples (two vial bags, two ziplocks)
7	MELFI-1	2-D-2	Insert CARD samples (two mesh bags in two ziplocks)
8	MELFI-1	2-B-2,3	Insert LADA VPU (two ziplocks)
9	MELFI-1	3-A-1	Insert MDS samples (three ziplocks)
10	MELFI-1	1-A-2	Insert Icepac Belt -32C (pink) on top

* Dewar-Tray-Tray Section (3-A-1 = Dewar 3, Tray A, Tray Section 1)

Figure 1.- Samples in Double Coldbag.

2. TRANSFERRING DOUBLE COLDBAG FROM ISS TO SHUTTLE
   2.1 Transfer Double Coldbag to Glacier.

MA16F/G (GLACIER) 3. INSERTING SAMPLES INTO GLACIER

WARNING
Protective gloves must be worn when handling frozen samples or manipulating inner doors, cold trays or samples in Glacier to prevent injury to exposed skin.

CAUTION
1. Minimize exposure of Glacier trays and samples to ambient air to prevent increased sample temperatures.
2. Glacier inner doors should remain closed when the internal volume is not being accessed.

3.1 Don Light Duty Cryo Gloves (from ISS).

3.2 Open Glacier.

3.3 Insert into Tray D: MDS samples (three Ziplocks) and LADA VPU samples (two Ziplocks)

3.4 Insert into Tray C: SOLO samples (two vial bags, two Ziplocks), CARD samples (two mesh bags, two Ziplocks), and HRP Urine (thirteen wraps)

3.5 Insert into Tray B: HRP Blood (four vial bags), and Rad Silk (three cases in two Ziplocks)

3.6 Insert into Tray A: HRP Blood (eighteen vial bags)

4. LOCK GLACIER DOOR

4.1 √Glacier door is closed.

```
*************************************************************************
*  If Outer Door does not close,
*  |  Press on top left corner and bottom left corner of door to
*  |    assist with closure.
*************************************************************************
```

4.2 √Door Latch – Locked (Finger latches fully spread apart and locking flap positioned between finger latches.)

WARNING
Glacier Door Captive Locks (two) must be torqued to 75 in-lbs to prevent door opening during entry.

4.3 Fasten Glacier Door Captive Locks (two), torque to 75 in-lbs using 3/16" Hex Head, 3/8" Drive, 1/4" - 3/8" adapter, 4" Extension, 1/4" Drive, (40 to 200 in-lbs.) Trq Wrench 1/4" Drive. See Figure 2.

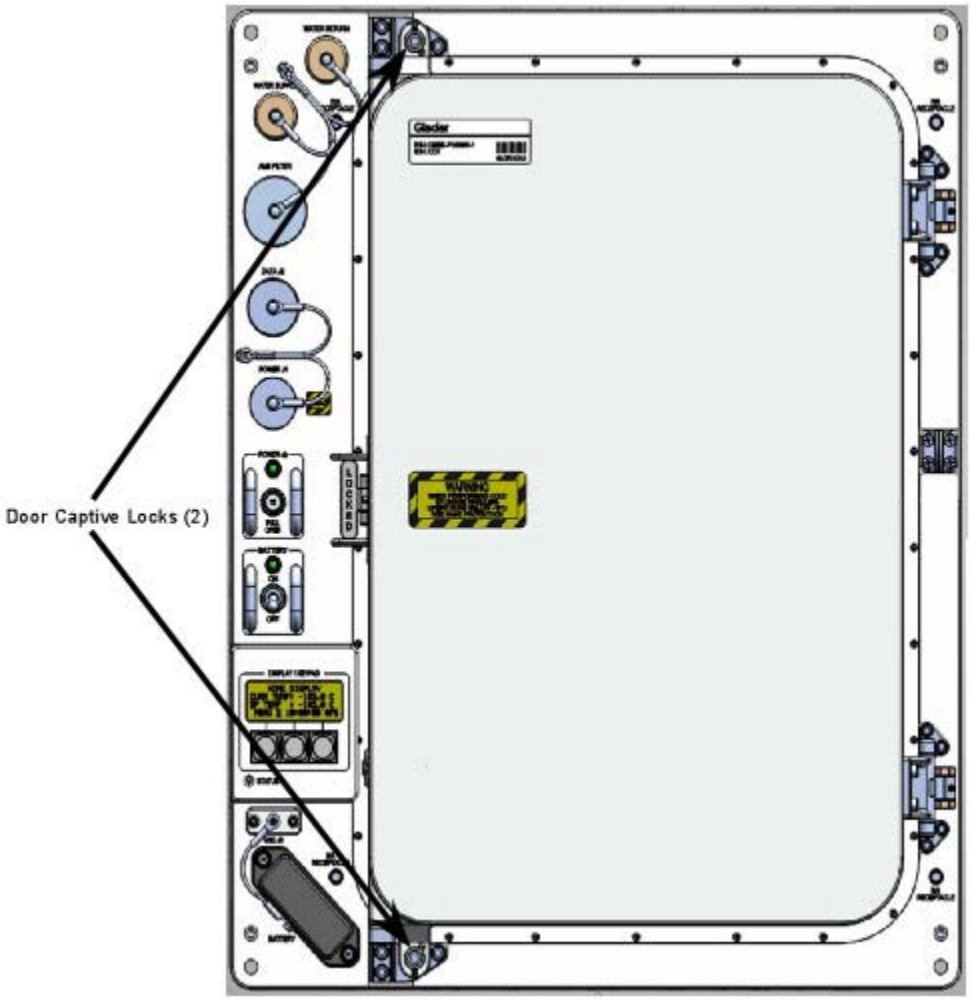


Figure 2.- Glacier Configuration.

MF28K 4.4 Stow tools.

5. TEMPORARY STOW DOUBLE COLDBAG

5.1 Transfer Double Coldbag to location that allows temporary stowage for dry out (lid open) and protection from kick loads.

5.2 Remove Icepac Belt -32°C (two) from Double Coldbag and place in temporary stowage location to air dry.

5.3 Return Light Duty Cryo Gloves to original location on ISS.

5.4 Notify **MCC-H** that transfer activities are complete and the Glacier Door Captive Locks are fastened. Provide the temporary stowage locations for Double Coldbag and Icepacs.

6. GROUND UPDATES FOR IMS (GROUND-ONLY)
   HRP Urine (thirteen wraps) TO: Glacier (step 3.4)
   HRP Blood (twenty-two vial bags) TO: Glacier (steps 3.5 and 3.6)
   Rad Silk (three egg cases) TO: Glacier (step 3.5)
   SOLO (two vial bags, two Ziplocks) TO: Glacier (step 3.4)
   CARD (two mesh bags, two Ziplocks) TO: Glacier (step 3.4)
   LADA VPU (two Ziplocks) TO: Glacier (step 3.3)
   MDS samples (three Ziplocks) TO: Glacier (step 3.3)
   Double Coldbag S/N 1015 TO: Stow (step 5.1)
   Icepac Belt -32°C (two) TO: Stow (step 5.2)

FD9 REBOOST - VRCS, CONFIG 3

NOTE
Allow 5 min between establishing reboost attitude and reboost start time for DAP accelerations to converge. Steps 1-2 may be performed prior to completion of maneuver to reboost attitude.

1. Select Reboost Configuration

GNC 20 DAP CONFIG

REBOOST CFG – ITEM 8 + 3 EXEC
INTVL – ITEM 9 + 2 . 0 0 EXEC

2. Set up Future Reboost

GNC UNIV PTG

DURATION – ITEM 27 + 0 + 2 7 + 0 0 . 0 0 EXEC
START TIME – ITEM 1 + 0 7 + 1 4 + 3 9 + 0 0 EXEC

RBST – ITEM 25 EXEC (FUT-*****)

3. Select appropriate Reboost Rotation DAP

When in attitude and prior to START TIME
C3 DAP: A11/AUTO/VERN

NOTE
Reboost can be aborted with an Item 26 on UNIV PTG or by Selecting FREE on the DAP

4. Post Reboost Configuration

C3 DAP: A12/AUTO/VERN

END OF PAGE 1 OF 1, MSG 084

TDRS	AOS	LOS	Delta (min)	Notes
W	07/23:45	08/00:15	30	
W	08/01:19	08/01:50	31	
W	08/02:52	08/03:01	9	

Note: Please notify MCC-H 10 minutes prior to the event to allow for ground network configuration.

END OF PAGE 1 OF 1, MSG 085

21-0512 (MSG 086) OGS WATER ORU INLET SCREEN/FILTER CONVERSION

OBJECTIVE

Remove the Water ORU Inlet Screen from behind the ORU Manifold and install Pump ORU Filter at a QD interface on the front of the ORU Manifold. This will involve releasing the Manifold from the ORU, removing one QD, and cleaning of all components prior to reassembly.

LOCATION

MWA

DURATION

3 hours, 15 minutes
- 30 minutes worksite prep
- 60 minutes QD and Manifold Removal
- 60 minutes Manifold Replace
- 30 minutes Filter and QD Installation
- 15 minutes Post-Maintenance

CREW

One
Second crew assist with Manifold Removal and Replace

PARTS

Water ORU P/N SV827690
Pump ORU Filter P/N SV828518-1
Small O-Ring P/N STSV570AC013 (Qty 1 for step 1.3, up to Qty 2 if required for step 7.2)
Medium O-Ring P/N STSV570AC112 (Qty 2 if required steps 5.3, 5.5)
Large O-Ring P/N STSV570AC908 (Qty 1 for step 1.3, up to Qty 4 if required for steps 5.3, 5.5, 7.2)
MCV O-Ring P/N STSV570AC012 (Qty 1 if required for step 4.7)

MATERIALS

Sharpie
Braycote
Drink Bag (new)
Ziplock Bag, size crew preference [Qty. 9]
Ziplock Bag 24”x24” [Qty 2]
Dry Wipes
Towel/Washcloth [Qty 5]
New/clean Washcloth [Qty 1]
Flashlight/Work Light
Kapton Tape
Clean Room Tape
Clean Room Gloves [Qty 10 plus additional as needed for Braycote application]
Dust Mask [Qty 2]
Safety Goggles [Qty 2]
Timer

TOOLS:

Digital camera
Teflon Pick

ISS IVA Toolbox:

Drawer 1:
- 3/4” Crowfoot, 3/8” Drive

Drawer 2:
- Ratchet, 3/8” Drive
- Ratchet, 1/4” Drive
- Flex Handle Ratchet, 1/4” Drive
- 1/4” to 3/8” Adapter
- 6” Ext, 1/4” Drive
- 6” Long, Flex Extension, 1/4” Drive
- 9/64” Hex Head, 1/4” Drive
- 7/32" Socket, 1/4" Drive
- (10-50 in-lbs) Trq Wrench, 1/4” Drive
- (40-200 in-lbs) Trq Wrench, 3/8” Drive

Drawer 3:
- 5” Long, 5/32” Ball Tip Hex Head, 3/8” Drive

Drawer 5:
- Static Wrist Tether
- Magnifying Glass (7X)

REFERENCES:

A.2.6 MAINTENANCE WORK AREA (MWA) INSTALLATION

1. SETUP

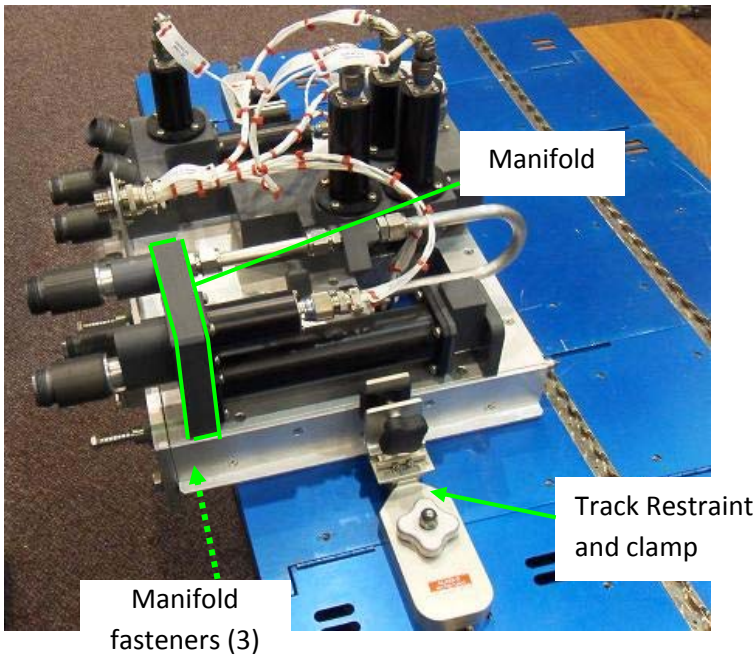


Figure 1- MWA Setup

NOTE
Placement of Water ORU on Work Surface Area should have ~3” of overhang to allow for access to bottom-side Manifold fasteners.

1.1 Secure Water ORU to Maintenance Work Area such that the Manifold hangs over the edge of the Work Surface Area (Track Restraints, Clamps).
Refer to {A.2.6 MAINTENANCE WORK AREA (MWA) INSTALLATION} as needed (US SODF: IFM: Reference: Appendix A: ISS IVA Tools).
Refer to Figure 1.

1.2 Fill Drink Bag at PWD, position Drink Bag near ORU.
Place one Ziplock inside another.
Fill Ziplocks for Water ORU Inlet Screen capture partially full with water (Drink Bag). Temporarily stow at worksite.
Position towels, clean Washcloth and 9 ziplock bags within reach of the Water ORU.

1.3 <u>Preparing Pump ORU Filter for Installation</u>

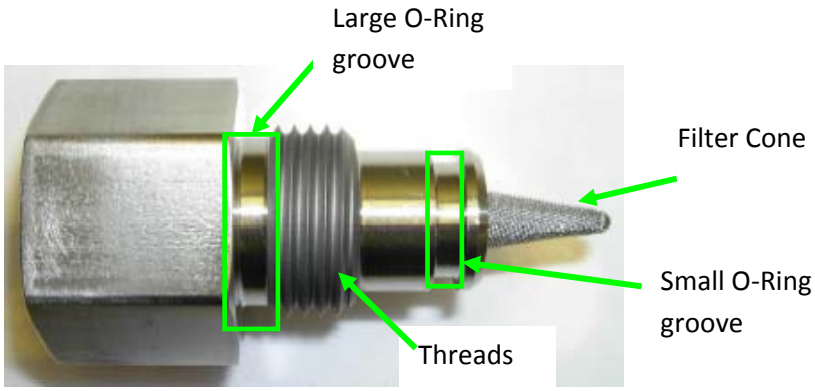


Figure 2.-Pump ORU Filter without O-Rings installed.

1.3.1 Don Clean Room Gloves.

1.3.2 Retrieve new Small O-Ring (qty 1) and new Large O-Ring (qty 1).
Inspect new O-Rings for nicks, gouges, or scratches at 4X magnification [Magnifying Glass (7X)].

CAUTION
Threaded surface may cause damage to O-Rings during installation.

1.3.3 Lubricate Small O-Ring, Large O-Ring with water (Drink Bag).

1.3.4 Install O-Rings into grooves on Pump Filter.
Inspect O-Rings for nicks, gouges or scratches at 4X magnification [Magnifying Glass (7X)].
Verify O-Rings properly seated into grooves.
Refer to Figure 2.

1.3.5 Apply small amount of Braycote to fingertip.

Work Braycote between fingertips until a very thin film is achieved with no visible white pieces of Braycote present.

CAUTION
Braycote can clog Pump ORU Filter if it comes in contact with the cone filter surface.

1.3.6 Ensuring that cone of Pump Filter does not come into contact with Braycote, lubricate Pump Filter threads.

1.3.7 Doff Clean Room Gloves, discard.

2. REMOVING DIW WL QD FROM MANIFOLD

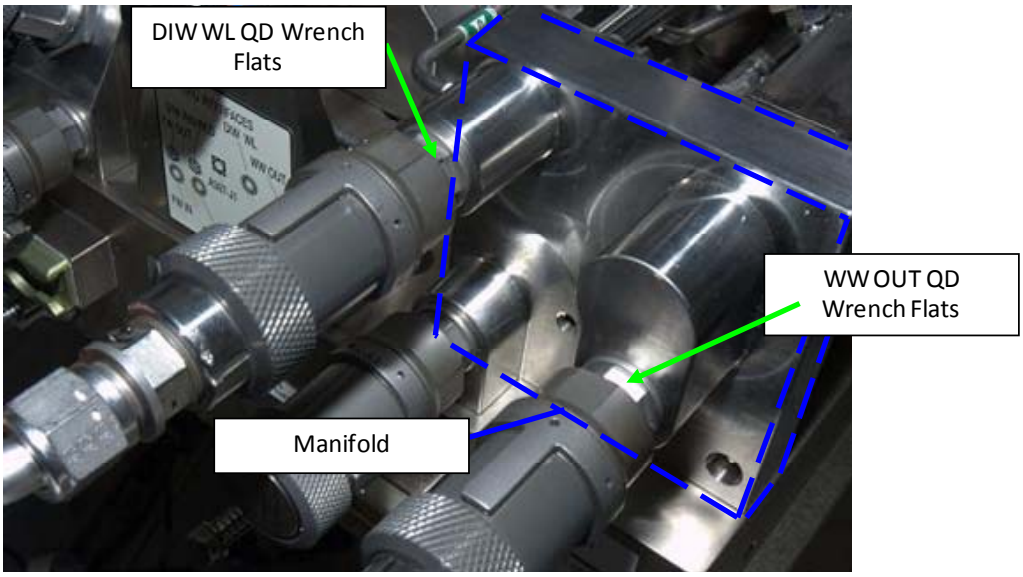


Figure 3.- DIW WL QD and Manifold

2.1 Don Safety Goggles, Clean Room Gloves, Dust Mask.
Don Static Wrist Tether, secure to unpainted, unanodized metal surface.

2.2 Demating OGS Water ORU Return Hose C

2.2.1 OGS Water ORU Return Hose C ←|→ DIW WL

2.2.2 Place Clean Room Glove over DIW WL QD, secure with Clean Room Tape.

2.2.3 Place Clean Room Glove over Return Hose C QD, secure with Clean Room Tape.

2.2.4 Temporarily stow Return Hose C.

2.3 Removing DIW WL QD from Manifold

2.3.1 Loosen, remove DIW WL QD from Manifold (Ratchet, 3/8” Drive; 6” Ext, 3/8” Drive; 3/4” Crowfoot, 3/8” Drive).

Refer to Figure 3.

2.3.2 Place DIW WL QD in ziplock bag, temporarily stow.

2.3.3 Cover Manifold cavity with towel for containment purposes, secure with Clean Room Tape.

2.4 Use towel to wick water away from Manifold cavity.

3. PREPARING FOR MANIFOLD REMOVAL

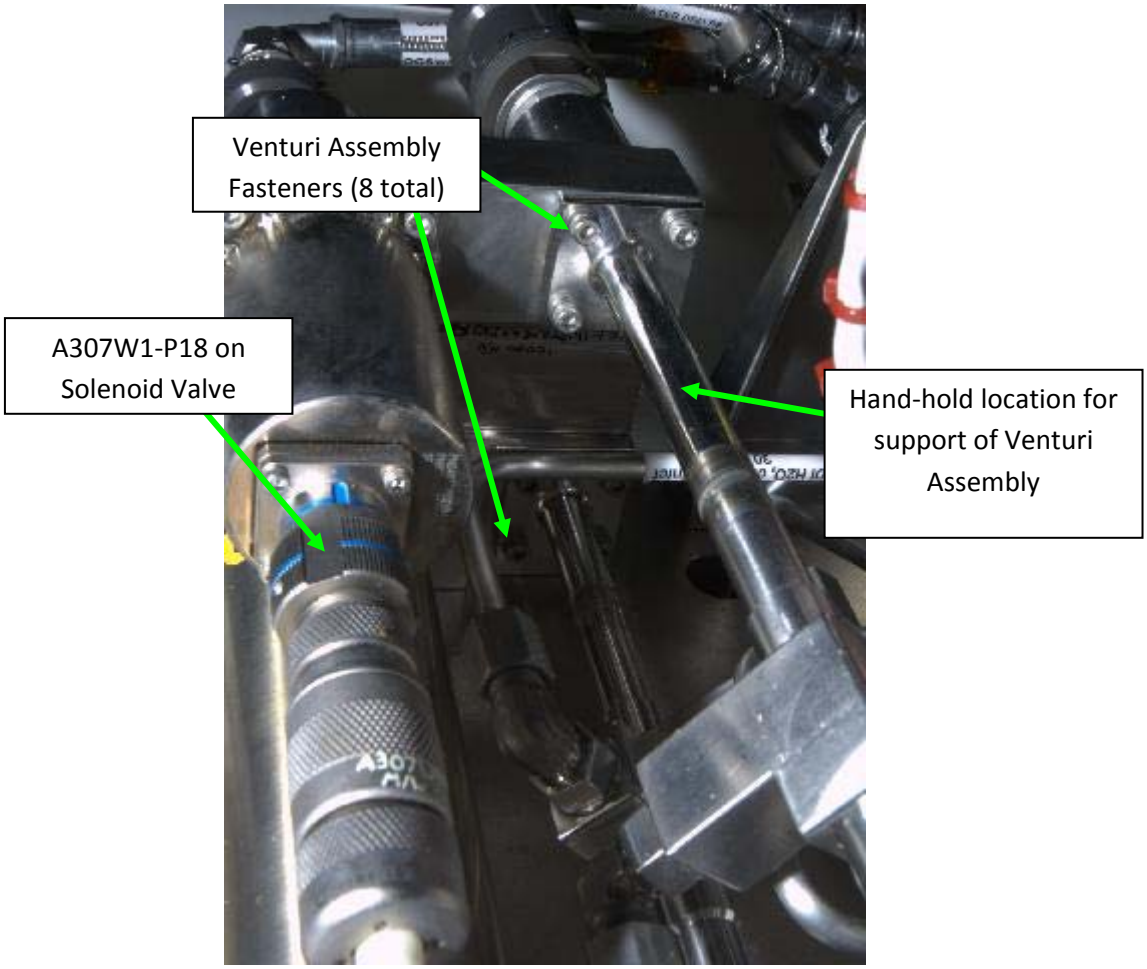


Figure 4.- Venturi Fasteners and Electrical Connector

3.1 Don Static Wrist Tether.
Solenoid Valve 0581 ←|→ A307W1-P18
Refer to Figure 4.
Cover electrical connectors (Kapton Tape). Avoid contact between Kapton Tape and pins/sockets.
Doff Static Wrist Tether.

3.2 Remove non-captive fasteners (8), non-captive washers (8) securing Venturi Tubing to Manifold (Ratchet, 1/4" Drive; Flex Handle Ratchet, 1/4" Drive;6" Ext; 10" Ext; 6" Long, Flex Extension; 9/64" Hex Head).
Refer to Figure 4.
Temporarily stow fasteners, washers in a ziplock bag. Label ziplock bag "Venturi" (Sharpie).

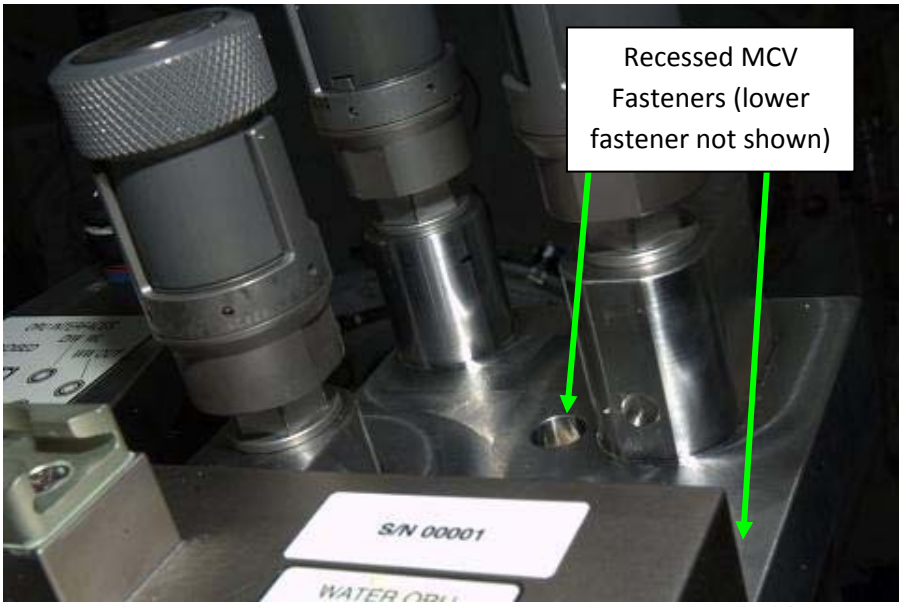


Figure 5.- View of MCV fasteners on front of Manifold

3.3 Remove non-captive fasteners (2), non-captive washers (2) securing MCV to Manifold (Ratchet, 1/4" Drive; 6" Ext; 7/32" Socket).
Refer to Figure 5.
Temporarily stow fasteners in a ziplock bag. Label ziplock bag "MCV" (Sharpie).

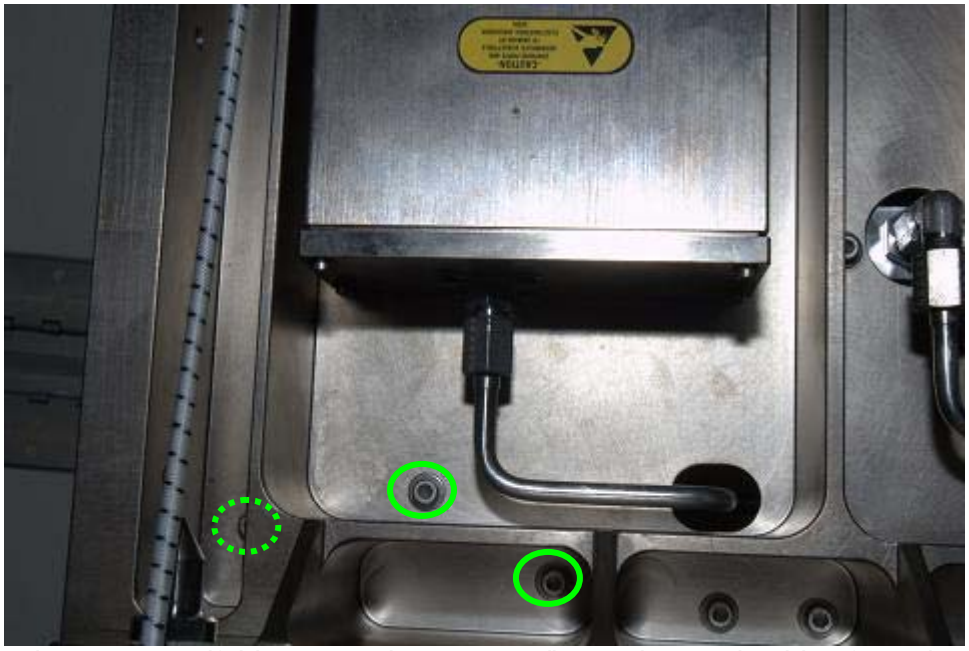


Figure 6.- Manifold Structural Fasteners (located on underside of ORU).

3.4 Remove non-captive fasteners (3), non-captive washers (3) attaching Manifold to ORU Frame (5” Long, 5/32” Ball Tip Hex Head, 3/8” Drive; Ratchet, 3/8” Drive).
Refer to Figure 6.
Temporarily stow fasteners in a ziplock bag. Label ziplock bag “Manifold” (Sharpie).

4. REMOVING MANIFOLD FROM ORU FRAME

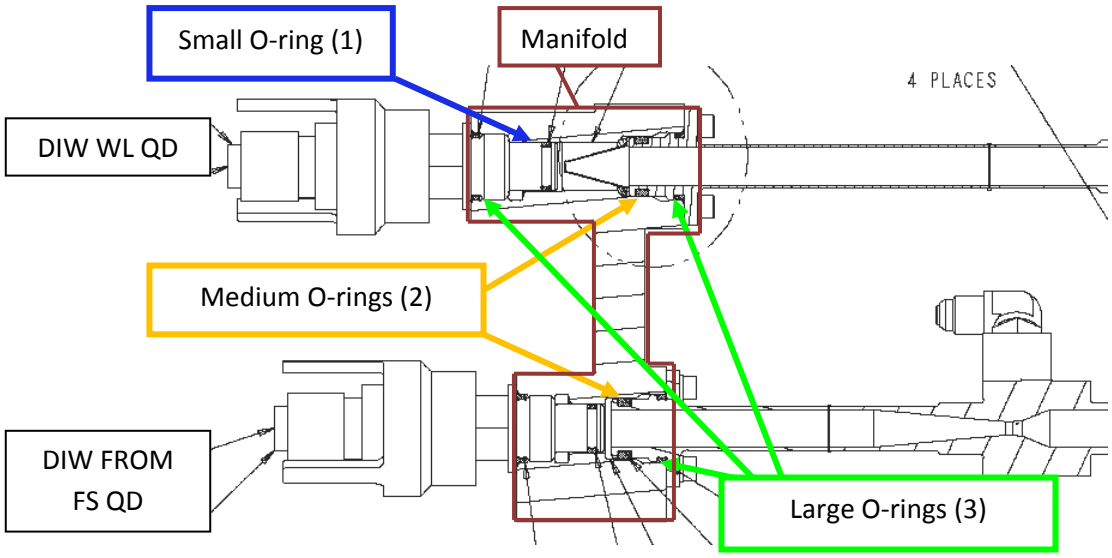


Figure 7.- Venturi Assembly O-ring Locations

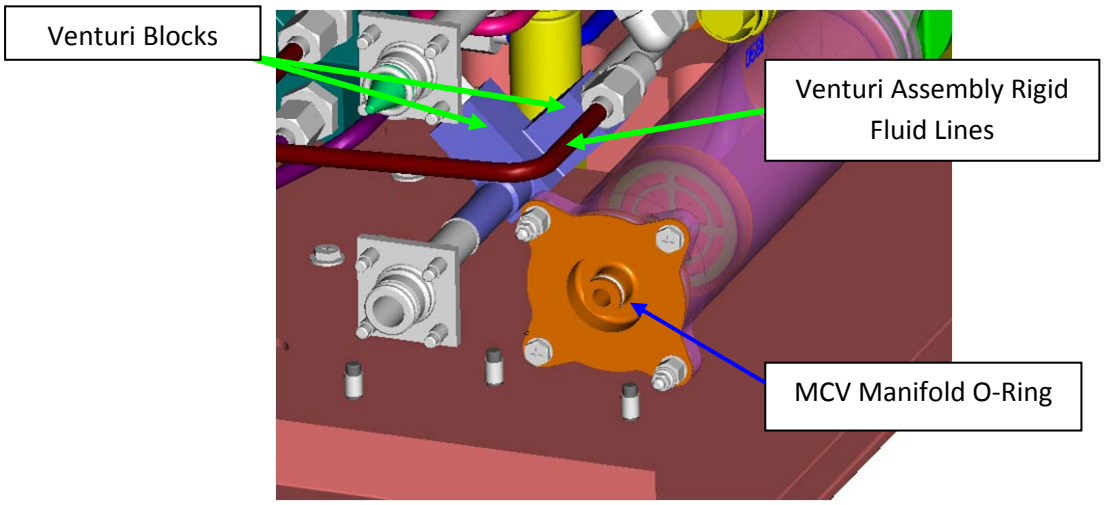


Figure 8.- Venturi Assembly and MCV O-Ring (with Manifold Removed)

NOTE

1. The Manifold provides structural support for the Venturi Assembly. Removing Manifold transfers any structural support to the two rigid fluid lines connected to both Venturi blocks. Crew member assistance will be needed to support Venturi Tubing during Manifold Removal to prevent negative structural impacts. Refer to Figure 8.

2. There are two O-rings at either end of the Venturi Assembly and one in the MCV. These O-rings and the locked water volumes behind may provide resistance to Manifold removal. Refer to Figures 7, 8.

3. It is uncertain whether the Water ORU Inlet Screen will remain in Manifold or become free-floating upon Manifold removal.

4. It is desired to maintain Water ORU Inlet Screen in undisturbed condition, without contamination from gloves, other ORU parts, etc. to assist in ground fault analysis.

4.1 Wet clean Washcloth with water (Drink Bag).

4.2 Removing Manifold from Venturi Assembly and MCV

4.2.1 Don new Clean Room Gloves.

4.2.2 While the second crewmember holds the Venturi Assembly on upper branch of tubing near manifold with towel ready to cover exposed Venturi Assembly plates, slowly pull Manifold away from Venturi Assembly and MCV.

****
* If Manifold is too difficult to remove:
*

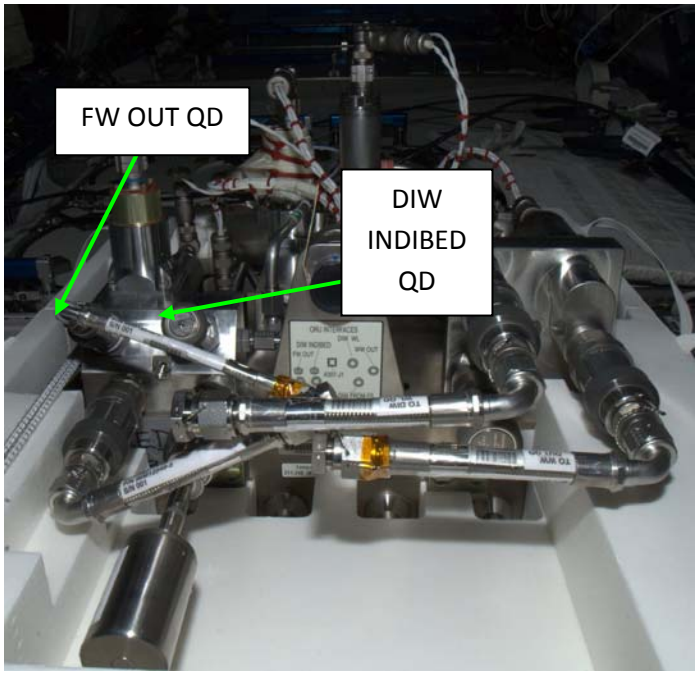


Figure 9.- Return Hose A Connection points

NOTE
Due to thermal constraints within a closed volume, the OGS Water Return Hose A should be demated from the FW OUT QD no longer than 10 minutes. If Manifold is not separated (completion of step 4.2) by the expiration of this time limit, step 4.3 should be executed to remate OGS Water Return Hose A to the FW OUT QD.

Set Timer to 10:00.
Start Timer.

Cap ←|→ DIW INDIBED
OGS Water ORU Return Hose A ←|→ FW OUT
OGS Water ORU Return Hose A →|← DIW INDIBED
Cap →|← FW OUT
Refer to Figure 9.

* Then, repeat step 4.2.
*
* Notify **MCC-H** that star block has been executed.
****

4.2.3 If Water ORU Inlet Screen and O-Ring release, capture in clean Washcloth and place in double bagged Ziplocks partially filled with water.
If possible to separate O-Ring from Water ORU Inlet Screen without disturbing any contaminants, place O-Ring in separate Ziplock Bag.
Seal double bagged Ziplocks.
Capture any loose water with towel.

4.2.4 Second crewmember replace towel covering Venturi Assembly plates with Clean Room Glove, secure with Clean Room Tape.

4.2.5 Dry any water present at MCV, place Clean Room Glove over MCV, secure with Clean Room Tape.
Refer to Figures 4,7,8.

4.3 If Return Hose A relocated in star block of step 4.2:
Cap ←|→ FW OUT
OGS Water ORU Return Hose A ←|→ DIW INDIBED
OGS Water ORU Return Hose A →|← FW OUT
Cap →|← DIW INDIBED

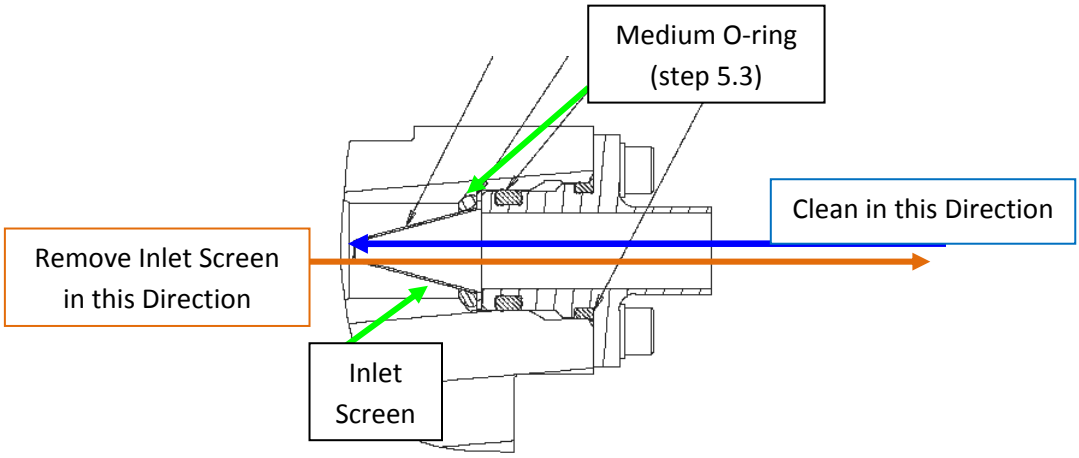


Figure 10.- Inlet Screen Cut-away

4.4 <u>Removing Water ORU Inlet Screen, If Required</u>
4.4.1 Don new Clean Room Gloves.

4.4.2 If not already free of Manifold, remove Water ORU Inlet Screen from Manifold by pushing the tip of the screen from the QD side of Manifold (Teflon Pick).
Refer to Figure 10.

4.4.3 Capture Water ORU Inlet Screen in clean Washcloth and place in double bagged Ziplocks partially filled with water.
Seal container.

4.5 If not already free, remove Medium O-Ring from Manifold from rear of Manifold (Teflon Pick).
Stow Medium O-Ring in Ziplock Bag,
Refer to Figure 10.

4.6 Temporarily secure Manifold (24”x24” Ziplock Bag).

4.7 Stow double bagged Ziplocks and Ziplock Bag containing Medium O-Ring in larger Ziplock Bag, label “OGS Water ORU Inlet Screen and O-Ring, Removed GMT XXX” (Sharpie).

5. RE-ASSEMBLING COMPONENTS

5.1 Remove, discard Clean Room Glove from top Venturi Assembly plate.

5.2 Inspect opening of top Venturi tube.
If FOD, inform **MCC-H**.

5.3 Inspect existing Venturi Assembly O-rings at 4X magnification (1 Medium and 1 Large) [Magnifying Glass (7X)].
If FOD present, remove.
Refer to Figure 6.

```
*****************************************************************************
*  If existing O-Ring(s) damaged, inform MCC-H:
*
*    Remove damaged O-Ring(s), discard (Teflon Pick).
*    Retrieve replacement O-Rings (1 Medium, 1 Large).
*    Inspect O-Rings,  If no damage, apply small amount of water
*     (Drink Bag).
*    Install replacement O-Rings on Venturi Assembly
*    Inspect newly installed O-Rings [Magnifying Glass (4X)].
*
*****************************************************************************
```

If there is no damage, apply small amount of water (Drink Bag) to O-Rings.

5.4 Install new Clean Room Glove over top Venturi Assembly plate, secure with Clean Room Tape.

5.5 Repeat steps 5.1 - 5.4 for bottom Venturi Assembly plate.

5.6 Remove, discard Clean Room Glove from MCV.

5.7 Inspect MCV Manifold O-Ring (1) at 4X magnification [Magnifying Glass (7X)].
If FOD present, remove.
Refer to Figure 8.

```
* ************************************************************************
* If existing O-Ring damaged, inform MCC-H:
*
*  Remove damaged O-Ring, discard (Teflon Pick).
*  Retrieve replacement O-Ring (1MCV O-Ring).
*  Inspect O-Rings,  If no damage, apply small amount of water
*    (Drink Bag).
*  Install replacement O-Ring on Venturi Assembly
*  Inspect newly installed O-Ring [Magnifying Glass (4X)].

* ************************************************************************
```

If there is no damage, apply small amount of water (Drink Bag).

5.8 Retrieve, clean Manifold:
Swab cavity from Venturi Assembly side toward QD side (Towel, Dry Wipes, Drink Bag).
Refer to Figure 10.
Photo document (digital camera).
Temporarily secure manifold.

5.9 Ensure clean Clean Room Gloves.

6. REASSEMBLING MANIFOLD

6.1 Remove, discard Clean Room Gloves from Venturi Assembly plates and MCV.

6.2 While second crewmember supports Venturi Assembly, slowly replace Manifold to align with fluid lines and ORU base.
Refer to Figures 3,4.

6.3 Installing Manifold to MCV
6.3.1 Retrieve temporarily stowed “MCV” fasteners, washers.

6.3.2 Install fasteners (2), washers (2) securing MCV to Manifold (Ratchet, 1/4” Drive; 6” Ext; 7/32” Socket).
Ensure MCV end cap is seated flush inside Manifold.
Refer to Figure 5.

6.4 Installing Manifold to Water ORU
6.4.1 Retrieve temporarily stowed “Manifold” fasteners, washers.

6.4.2 Install fasteners (3), washers (3) securing Manifold to Water ORU, engage only 2-3 threads to allow for compliance during Venturi Assembly reinstallation.

6.5 Securing Venturi Assembly Plates to Manifold
6.5.1 Retrieve temporarily stowed “Venturi” fasteners, washers.

6.5.2 Install fasteners (2), washers (2) securing top Venturi Assembly plate to Manifold.
Refer to Figure 4.

6.5.3 Install fasteners (2), washers (2) securing bottom Venturi Assembly plate to Manifold.

6.5.4 Install remaining fasteners (2), remaining washers (2) securing top Venturi Assembly plate to Manifold.

6.5.5 Install remaining fasteners (2), remaining washers (2) securing bottom Venturi Assembly plate to Manifold

6.6 Torquing Manifold Interfaces

6.6.1 Tighten, torque fasteners (2) securing MCV to Manifold to 20 in-lbs. [Ratchet, 1/4” Drive; 6” Ext; 7/32” Socket; (10-50 in-lbs) Trq Wrench, 1/4” Drive].

6.6.2 Tighten, torque fasteners (8) securing Venturi Assembly plates to Manifold to 20 in-lbs (Ratchet, 1/4” Drive; Flex Handle Ratchet, 1/4” Drive;6” Ext; 10” Ext; 6” Long, Flex Extension; 9/64” Hex Head; (10-50 in-lbs) Trq Wrench, 1/4” Drive).

6.6.3 Tighten, torque fasteners (3) securing Manifold to Water ORU Frame to 30 in-lbs. [Ratchet, 3/8” Drive; 5” Long, 5/32” Ball Tip Hex Head, 3/8” Drive; 1/4” to 3/8” Adapter; (10-50 in-lbs) Trq Wrench, 1/4” Drive).
Refer to Figure 6.

6.7 Don Static Wrist Tether.
Remove Kapton Tape from electrical connectors on Solenoid Valve.
Solenoid Valve 0581 →|← A307W1-P18
Doff Static Wrist Tether.

7. INSTALLING PUMP ORU FILTER

7.1 Retrieve DIW WL QD from Ziplock Bag,
Remove O-Rings, temporarily stow (Teflon Pick).
Clean external surface of QD, internal cavity (Dry Wipes, Drink Bag).

7.2 Inspect existing DIW WL QD O-Rings at 4X magnification [Magnifying Glass (7X)].
If FOD present, remove.

```
*  ************************************************************************
*  If existing QD O-Ring(s) damaged, inform MCC-H:
*  |
*.  |  Remove damaged O-Ring(s), discard  (Teflon Pick).
*  |  Retrieve replacement O-Ring(s) (1 Large, 1 Small).
*  |  Inspect O-Ring(s),  If no damage, lubricate with small amount
*  |    of water (Drink Bag).
*  |  Install replacement O-Ring(s) on DIW WL QD.
*  |  Inspect newly installed O-Ring(s) at 4X magnification
*  |    [Magnifying Glass (7X)].
*
*  ************************************************************************
```

If no damage, lubricate existing O-Rings with small amount of water (Drink Bag).
Reinstall O-Rings.
Inspect newly installed O-Rings at 4X magnification [Magnifying Glass (7X)].
Refer to Figure 7.

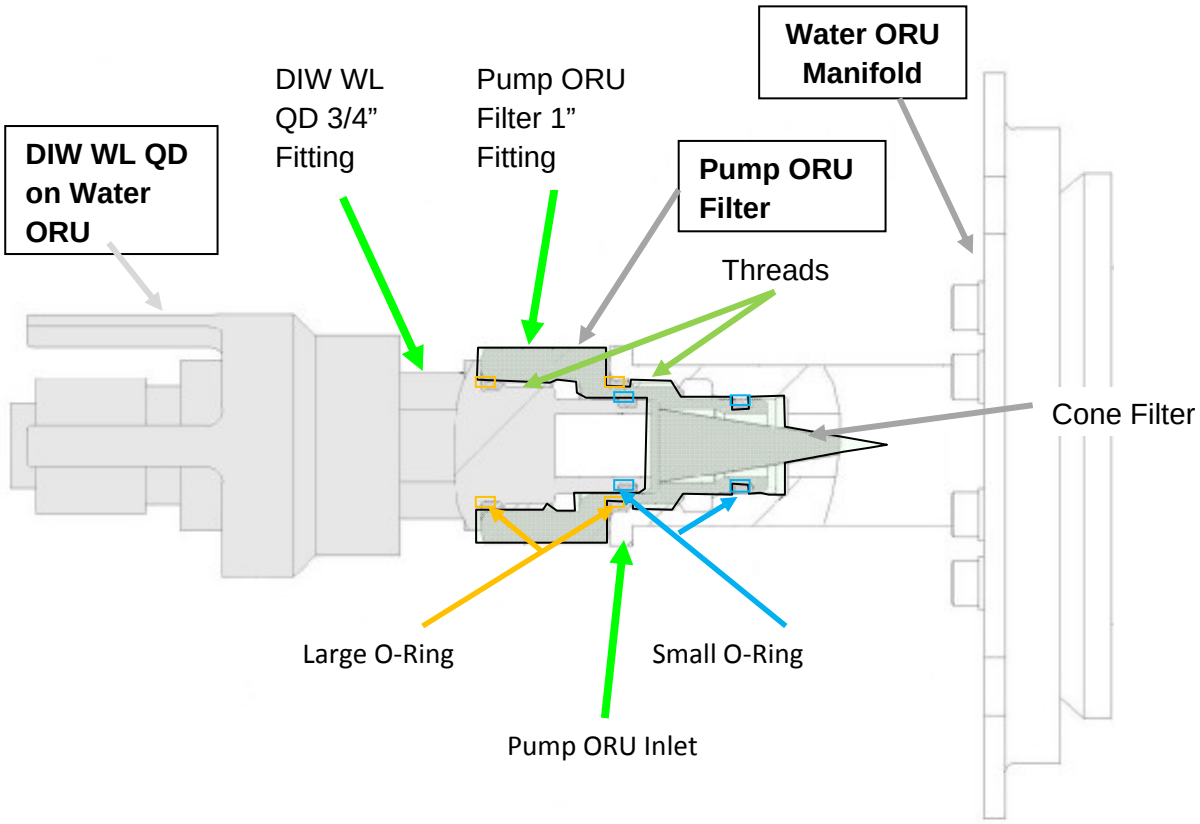


Figure 11.- Filter and DIW WL QD interface.

7.3 <u>Installing DIW WL QD to Pump ORU Filter</u>
Retrieve Pump Filter with installed O-Rings from step 1.2.
Install, hand-tighten DIW WL QD to Pump ORU Filter.
Refer to Figure 11.

7.4 Installing QD/Filter Stackup to Manifold
Install, hand-tighten DIW WL QD and Pump ORU Filter to Manifold.

7.5 Torquing Pump ORU Filter to Manifold
Tighten, torque Pump ORU Filter to Manifold to 200 in-lbs. [(40-200 in-lbs) Trq Wrench, 3/8" Drive; 6" Ext; 1" Crowfoot].

7.6 Torquing DIW WL QD to Pump ORU Filter
Tighten, torque DIW WL QD to Pump Filter to 200 in-lbs. [(40-200 in-lbs) Trq Wrench, 3/8" Drive; 6" Ext; 3/4" Crowfoot].

7.7 Remating OGS Water ORU Return Hose C
Remove Clean Room Gloves from OGS Water ORU Return Hose C and DIW WL QD, discard.
OGS Water ORU Return Hose C →|← DIW WL QD

7.8 Doff Clean Room gloves, Safety Goggles, and Dust Mask.

8. POST MAINTENANCE

8.1 Check for FOD around work area within 3' radius.

8.2 Inspect Manifold fluid connections and Venturi Assembly interfaces to Manifold to ensure all interfaces are flush with Manifold.
Photo document final configuration (digital camera).

8.3 Place all materials and parts that were exposed to internal Water ORU debris and water into Ziplock Bag.

Potentially removed/contaminated equipment:
- Any removed O-Rings
- Dry Wipes used to clean Water ORU connection interfaces
- Towels used to clean connection interfaces or equipment
- Clean Room Gloves used for cleaning

Place this Ziplock Bag and Ziplock Bag labeled "OGS Water ORU Inlet Screen and O-Ring, Removed GMT XXX" into larger Ziplock Bag.
Label large Ziplock Bag "OGS Water ORU IFM, GMT XXX" (Sharpie).

8.4 Inform **MCC-H** of maintenance completion. Re-stow Water ORU, tools.

POST EVA EMU RECONFIGURATION (90 min)

Part II (90 min)

Part II assumes the following procedures have been completed following EVA 3:
{1.240 POST EVA} (SODF: ISS EVA SYS: EVA PREP/POST)

CONFIGURE EMUs (3006) FOR RETURN

17. As reqd, reference STS-129 NOMINAL EMU SIZING (EMU CONTINGENCY PROCS) (P. 12-28)

EMU 3010/3006
18. Remove arms (including arm sizing rings) and LTAs, swap, and connect

EMU 3010
19. Remove helmet, temp stow
20. Remove CCA SA1 stow in EVA Systems Transfer Bag
21. Install helmet

Both EMUs
22. Remove following
    - ☐ REBAs and stow in MO-2 (s/n 1038)
    - ☐ HL Batteries and stow in MO-2 (s/n 1038)
    - ☐ EMU Batteries and stow in MO-2 (s/n 1038)
    - ☐ Cuff C/Ls (cut out FS pages), stow in EMU Equipment Bag
    - ☐ Patches, Stripes, National Flag, stow in respective ECOKs

EMU 3010
23. Remove LiOH, stow in EVA Systems Transfer Bag
24. Install vent port plugs from EMU Equipment Bag

EMU 3006
25. Install EMU battery s/n 2081 from MO-2 (s/n 1038)
26. Remove Helmet Lights/EMU TV assembly, and temp stow
27. Check Satcher (SA) cam configuration and confirm serial numbers per STS-129 NOMINAL EMU SIZING (EMU CONTINGENCY PROCS) (P. 12-28)

Both EMUs
28. √O2 ACT – OFF

DCM
√PWR – SCU
√DCM Purge vlv – Op (up)
√WATER – OFF, Switch Guard installed

29. Verify/reconfigure EMUs and ECOK per the following table

POST EVA EMU RECONFIGURATION (90 min) (Cont)

EMU 3011 (FM↓)	EMU 3006 (SA↓)
☐ EMU Battery s/n 2082 ☐ LiOH (used) ☐ Helmet s/n 1068, cover installed ☐ FM ECOK ☐ LTA ☐ Gloves (FM) ☐ Wrist Mirrors (2) [swap to old]	☐ EMU Battery s/n 2081 ☐ LiOH (used) ☐ Helmet s/n 1074, cover installed ☐ SA ECOK ☐ LTA ☐ Gloves (SA) ☐ Wrist Mirrors (2) [swap to old]
EMU Crew Options Kit (FM)	**EMU Crew Options Kit (SA)**
☐ FM EVA 1 & 2 Ziplock Bags ☐☐ MAGs ☐☐ TCUs (top, bottom) ☐☐ Socks ☐☐ Wristlets ☐☐ Comfort Gloves ☐☐ Moleskin ☐☐ Patch, Stripes, National Flag ☐ LCVG FM1 (w/biomed sternal harness and signal conditioner)	☐ SA EVA 1 & 3 Ziplock Bags ☐☐ MAGs ☐☐ TCUs (top, bottom) ☐☐ Socks ☐☐ Wristlets ☐☐ Comfort Gloves ☐☐ Moleskin ☐☐ Patch, Stripes, National Flag ☐ LCVG SA1 (w/biomed sternal harness and signal conditioner) ☐ DIDB from EVA #3 (Doubled bagged, vented (corner cut))
EMU Crew Options Kit (BR)	
☐ BR EVA 2 & 3 Ziplock Bags ☐☐ MAGs ☐☐ TCUs (top, bottom) ☐☐ Socks ☐☐ Wristlets ☐☐ Comfort Gloves ☐☐ Patch, Stripes, National Flag ☐☐ Mole Skin ☐ CCA BR1 ☐ LCVG BR1 (w/biomed sternal harness and signal conditioner) ☐ BR Gloves	

EVA Systems Transfer Bag

2. Retrieve new ISS EVA Systems Checklist (white) from STS; deploy in C-Lk
3. Stow EMU Servicing Kit 5004 (Yellow Tag) on E-Lk Wall
32. Retrieve EMU Servicing Kit 5002 for return
33. Unstow signal conditioner s/n 101 from EMU Servicing Kit 5004. Add to zip locked bag with signal conditioners in EMU Servicing Kit 5002.
34. Confirm signal conditioners (5) s/n 101, 118, 122, 123, & 125

EMU 3006/ 3011

35. Verify no ISS tools, tethers, or D-ring extenders on EMUs

36. Configure/verify contents of EVA Systems Transfer Bag per following table

EVA Systems Transfer Bag

From "EVA Systems Pre-gather" bag:
☐ Bends Treatment Adapter (BTA) s/n 1004
☐ Helmet Light Assembly s/n 1007
☐ ISS Cuff Checklist (3 of 3) (old)
☐ ISS EVA Systems Checklist (20 JULY 09, old)

From Airlock:
☐ EMU Servicing Kit s/n 5002
☐ STS-129 CONSUMABLES TRACKING CUE CARD
☐ EMERGENCY UNDOCKING EVA TRANSFER CUE CARD
☐ Joint Emergency Egress CC
☐ Ammonia Contamination CC (old)
☐ STS-129 ISS EVA Systems Checklist (yellow)
(Yellow copy, bring back to STS; leave white copy)
☐ STS-129 EVA Checklist
☐ EMU Battery s/n 2080 from M-02 1038
☐ Helmet Light Assembly s/n 1010 (cracked) from M-02 1010

From SA ECOK:
☐ FM2 CCA

Verify:
☐ CWC s/n 5096
☐ EMU LiOH (4)
☐ FM1 CCA
☐ SA1 CCA

EVA TRANSFER TO SHUTTLE (15 min)

1. Configure/verify contents of EVA Tools Transfer Bag per following table

EVA Tools Transfer Bag

☐ 85-ft Safety Tether s/n 1008 (#28)
☐ Adjustable Equipment Tethers (3) s/n 1009, 1032, 1034
☐ Blue RETs
  ☐ sm-sm (16)
  ☐ Lg-sm (8)
  ☐ w/PIP pin (5)

2. Transfer items in table below; report status to **MCC-H** when complete

TRANSFER TO SHUTTLE

Item	Destination	Transfer Status
EMU 3011 (FM↓) with ECOK	Temp stow Middeck	
EMU 3006 (SA↓) with ECOK	Temp stow Middeck	
BR ECOK	Temp stow Middeck	
EVA Systems Transfer Bag	Temp stow Middeck	
EVA Tools Transfer Bag	Temp stow Middeck	

TRANSFER TO ISS

Item	Stowed in	Destination
EHIP s/n 1011	STS Vol H OBD	A/L M-O2 1010

EVA UNPACK AND STOW (90 min)

1. Unpack and stow items per table below; report status to **MCC-H** when complete

EVA SYSTEMS TRANSFER BAG UNPACK AND STOW

Item	**Final Location**
EMU 3011 (FM↓)	Ext A/L (Stbd AAP)
EMU 3006 (SA↓)	Ext A/L (Port AAP)
BR ECOK; unpack to fit ☐ ECOK ☐ CCA BR1 ☐ LCVG BR1 ☐ BR Gloves	MD Bag D
EVA Systems Transfer Bag	
☐ STS-129 CONSUMABLES TRACKING CUE CARD ☐ EMERGENCY UNDOCKING EVA TRANSFER CUE CARD ☐ STS-129 EVA Checklist	FDF Locker
☐ STS-129 ISS EVA Systems Checklists (yellow) ☐ ISS EVA Systems Checklists (20 JULY 09, old) ☐ ISS Cuff Checklist (3) (old) ☐ Joint Emergency Egress CC ☐ Ammonia Decontamination CC (old)	SODF Locker
☐ CWC s/n 5096	MF71M
☐ Bends Treatment Adapter (BTA) s/n 1004	MF71O
☐ EMU LiOH (4) ☐ EMU Battery s/n 2080	MD Bag C
☐ EMU Servicing Kit s/n 5002 ☐ Helmet Light Assembly s/n 1007 ☐ Helmet Light Assembly s/n 1010	Vol H (INBD) Vol H (OBD)

EVA TOOLS TRANSFER BAG UNPACK AND STOW

Item	**Final Location**
☐ 85-ft Safety Tether s/n 1008 (#28) ☐ Adjustable Equipment Tethers (3) s/n 1009, 1032, 1034	MD Bag D
☐ Blue RETs ☐ sm-sm (16) ☐ Lg-sm (8) ☐ w/PIP pin (5)	MD Bag C

EVA Systems Transfer Bag

2. Remove CCAs install in respective LTA Restraint Bag Pouches

FD09 EVA Deltas

Great work on EVA 3!

As a result of your efficient work on this mission, we were able to add the GREASE GUN CLEANUP procedure (EVA, TOOLS & STOWAGE, FS 8-19) for Randy today.

To aid in our hardware tracking, we would also like to know the serial number of the loose BRT used by Randy during EVA 3. Please let us know if this is the same BRT used by Bobby on EVA 1.

Also we have a few updates for Post EVA EMU Reconfiguration, EVA Transfer to Shuttle, and EVA Unpack and Stow. Use the procedures in message 21-0515 (129-087) instead of those in your FDF books. Updates are in blue.

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