STS-134/ULF6

FD 13 Execute Package

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134	4 - 15	FD13 Flight Plan Revision
135	16	FD13 Mission Summary
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137A	---	FD13 PAO Event Summary - Tucson Civic Event
138	---	FD13 PAO Event Summary - Gannett/KPRC-TV/Voice of America
139	21	FD13 Crew Choice Downlink Opportunities
140	22 - 34	CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) - Part 2
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149A	54	FD12 MMT Summary

Close Enough…

Approved by FAO: *M. Scheib*
Approved by OpsPlan: *K. Howell*

Michael Scheib

Last Updated: May 24 2011 11:28 PM GMT
JEDI *(**J**oint **E**xecute package **D**evelopment and **I**ntegration), v3.0*

REPLANNED

GMT 05/27/11 (147): 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 05/28 11, 12

MET Day 011: 011/00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12

STS 134

FD12

Crew	Activities
CDR MARK	PRE SLP / POST EVA / TAGUP / PRE SLP / PFC ISS OCA / PRE SLP / PMC A/G / PRE SLEEP / SLEEP / FD13 POST SLEEP
PLT BOX	O2 / RECONFIG / TO XFER / O2 INIT / PRE SLEEP / OMS^ / PRE SLEEP / SLEEP / MYCO / SAMPLE / POST SLEEP
MS1 SPANKY	PRE SLEEP / POST EVA / TAGUP / PRE SLEEP / SLEEP / ASPRN / POST SLEEP
MS2 ROBERTO	PRE SLEEP / SLEEP / LOG / POST SLEEP
MS3 DREW	POST EVA / W/H2O / PRE SLEEP / POST EVA / TAGUP / STORRM / PRE SLEEP / SLEEP / POST SLEEP
MS4 TAZ	O2 / RECONFIG / TO XFER / O2 INIT / POST EVA / TAGUP / PRE SLEEP / SLEEP / LOG / ASPRN / POST SLEEP

NO EXERCISE

DAY/NIGHT

ORBIT									
	174	175	176	177	178	179	180	181	182

TDRS: W, E, Z

ISS TDRS AVAIL

ORB ATT: BIAS -XLV -ZVV

NOTES: ^ACCUM REPRESS

REPLANNED

GMT 05/28/11 (148) — 01 02 03 04 05 06 07 08 09 10 11 12

MET Day 011 — 12 13 14 15 16 17 18 19 20 21 22 23 012/00

FD13

STS 134

CDR MARK: POST SLEEP | PAO EVENT | POST SLEEP | O2 INIT | POST EVA EMU RECONFG | EXERCISE | MEAL | SPINAL S/U | CWC #11 | INIT | CWC #11 | TERM | CWC XFER | SPINAL | OPR | SPINAL | SPINAL H/W STOW

PLT BOX: POST SLEEP | O2-I | POST SLEEP | O2-T | PST SLP | PAO EVENT | POST SLEEP | VIDS/U | IAPE | EXERCISE | O2-I | MHA IFM | O2-T | IMU | GLACR | P/TV | MEAL | SPINAL S/U | FILTER INSPECT | PLYBK | OPS | SPINAL | SPINAL | OPR | H2O* | PIN | AUDIT | PRE SLP | PAO

MS1 SPANKY: POST SLEEP | O2 INIT | CDRA BED R&R | MEAL | FRAME INSTALL | EXERCISE

MS2 ROBERTO: POST SLEEP | MDDK# | XFER | UPDAT | VIDS/U | IAPE | EXERCISE | MHA IFM | GLACIER TRANSFER | MEAL | MDDK XFER | XFR BRF | PREP | XFER BRIEF | MDDK#

MS3 DREW: POST SLEEP | STORRM | DRU3 C/O | POST EVA EMU RECONFG | DRU3 C/O | MEAL | MDDK XFER | PRE SLEEP

MS4 TAZ: POST SLEEP | PLYBK | POST SLEEP | CDRA BED R&R | MEAL | T2 ALIGN | FRAME INSTALL | T2 ALIGN | CUBE 7 XFER | PRE SLEEP | EXERCISE

EXERCISE: NO T2 EXERCISE [A]

DAY/NIGHT

ORBIT: 182 183 184 185 186 187 188 189 190

TDRS: W E Z

ISS TDRS AVAIL

ORB ATT: BIAS -XLV -ZVV

NOTES: #STATUS CHECK — NOMINAL* CONFIG — STATUS# CHECK

[A] NO T2 EXERCISE [ALIGNMENT GUIDES INSTALLED]

REPLANNED

GMT 05/28/11 (148) 13 14 15 16 17 18 19 20 21 22 23 05/29

MET Day 012 012/00 01 02 03 04 05 06 07 08 09 10 11 12

STS 134 3

	FD13						FD14
CDR MARK	PRE SLEEP	PMC A/G	OMS^	PRE SLEEP	SLEEP		POST SLEEP
PLT BOX	PAO	O2 TERM	PRE SLEEP		SLEEP	LOG	POST SLEEP
MS1 SPANKY	EXERCISE	O2 TERM	PRE SLEEP		SLEEP		POST SLEEP
MS2 ROBERTO	PRE SLEEP				SLEEP	LOG	POST SLEEP
MS3 DREW	PRE SLEEP	EXERCISE	PRE SLEEP		SLEEP		POST SLEEP
MS4 TAZ	EXERCISE	PRE SLEEP			SLEEP	LOG	POST SLEEP

EXERCISE

DAY/NIGHT

ORBIT 190 191 192 193 194 195 196 197 198

TDRS W E Z

ISS TDRS AVAIL

ORB ATT BIAS -XLV -ZVV

NOTES ^ACCUM REPRESS

MSG INDEX

1. Post-Sleep Cryo Config

   For today's post-sleep cryo config, O2 tanks 1, 3, & 4, and H2 tanks 1 & 4 will be active.

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

   A11 CRYO TK4 HTR O2 A - AUTO

   A15 CRYO TK5 HTR O2 A - OFF

2. Pre-Sleep Cryo Config

   √MCC for deltas prior to configuring for pre-sleep.

   For tonight's pre-sleep cryo config, manifold 1 will be closed with O2 tanks 1 & 5 active and H2 tanks 1 & 4 active.

   A15 CRYO TK5 HTR O2 A - AUTO

   A11 CRYO TK4 HTR O2 A - OFF

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

3. CDRA Bed R&R
   Spanky, Taz, We have made some slight changes to Part 2 of CDRA Bed R&R in 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack). The new procedure can be printed hardcopy on the Shuttle and has been uplinked as JEDI 28-0054 (MSG 140) CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack) - PART 2 ONLY. The revision was required to accommodate accessing and removing all 1.5” diameter sock filters. Words related to activities already performed have been removed. No additional figures or tables were added; the hardcopy version of 25-0311 CDRA Desiccant/Sorbent Bed 201 R&R NOD3A4 - Appendix can be used as flown.

4. EMU Reconfiguration
   Mark, Drew, Mike, and Greg, Thanks again for the great work on all 4 EVAs! We have updates to the EMU reconfig today in msg 134-142 (28-0069) STS-134 Post EVA EMU Reconfiguration. Also we appreciate the work on the BRTs, and we look forward to your post flight inputs on improving that procedure. For now, we are unclear on the final config for the BRTs. Please let us know the total turn adjustment on each of the 3 BRTs.

5. For Roberto: Regarding your question about scheduling for ATV Stowage Ops, we will work to get some time on FD 14. Since we will be starting with the Temporary Stowage Rack deploy, we need to schedule time on two crew members simultaneouly in order to continue with ATV Stowage Ops.

6. For Box: We have uplinked 27-0070 (MSG 141): MPLM Pivot Pin Brackets Audit. This message will ask you to search an ISS locker location for some brackets needed for transfer operations during the STS-135 mission.

7. STORRM
   Today you will conduct a Checkout of DRU 3 using MSG 144 - MODIFIED STORRM TOOLS CHECKOUT. You'll leave the PGSC on at the end of the procedure so the ground can downlink the data files. Approximately 3 hours later, on MCC GO, we'll have you power down the PGSC. We've provided a summary of the STORRM results and upcoming activities in MSG 143 - STORRM SUMMARY.

8. Spinal Elongation
   Mark and Box, today you will be performing Spinal Elongation. Spinal measurements are timelined such that they are not within an hour of compression exercise/countermeasures, so please make sure to keep these constraints in mind if you're getting ahead of the timeline. Please refer to Spinal Elongation Overview Message in MSG 145 for additional information regarding today's operations.

9. Window 4 Playback
   The imagery team did not receive the first 70 sec of the Window 4 playback. We scheduled time in Post Sleep for Taz to attempt to play the first portion of the Window 4 video to complete ascent debris analysis before Entry.

10. Replace pages 3-138 thru 3-147.

REPLANNED

STS-134/ULF6 FD13

GMT Date 05/27 (147) | W | TDRS E | Z | D/N | ORB | MET Day 011 | ATT | CDR MARK | PLT BOX | MS1 SPANKY | NOTES

GMT: 21:00, 22:00, 23:00, 00:00

MET: 08:00, 09:00, 10:00, 11:00, 12:00

ORB: 179, 180, 181, 182

ATT: BIAS -XLV -ZVV

CDR MARK: SLEEP

PLT BOX: SLEEP

MS1 SPANKY: SLEEP

FD13 EZ ACTIVITIES:
√MDDK Duct Screen
TEPC Status Check:
Verify display is backlit
HARD REBOOT: STS-2(WINDECOM), STS-8(KFX) & STS-4(RPOP)

CDR MARK (11:00):
POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

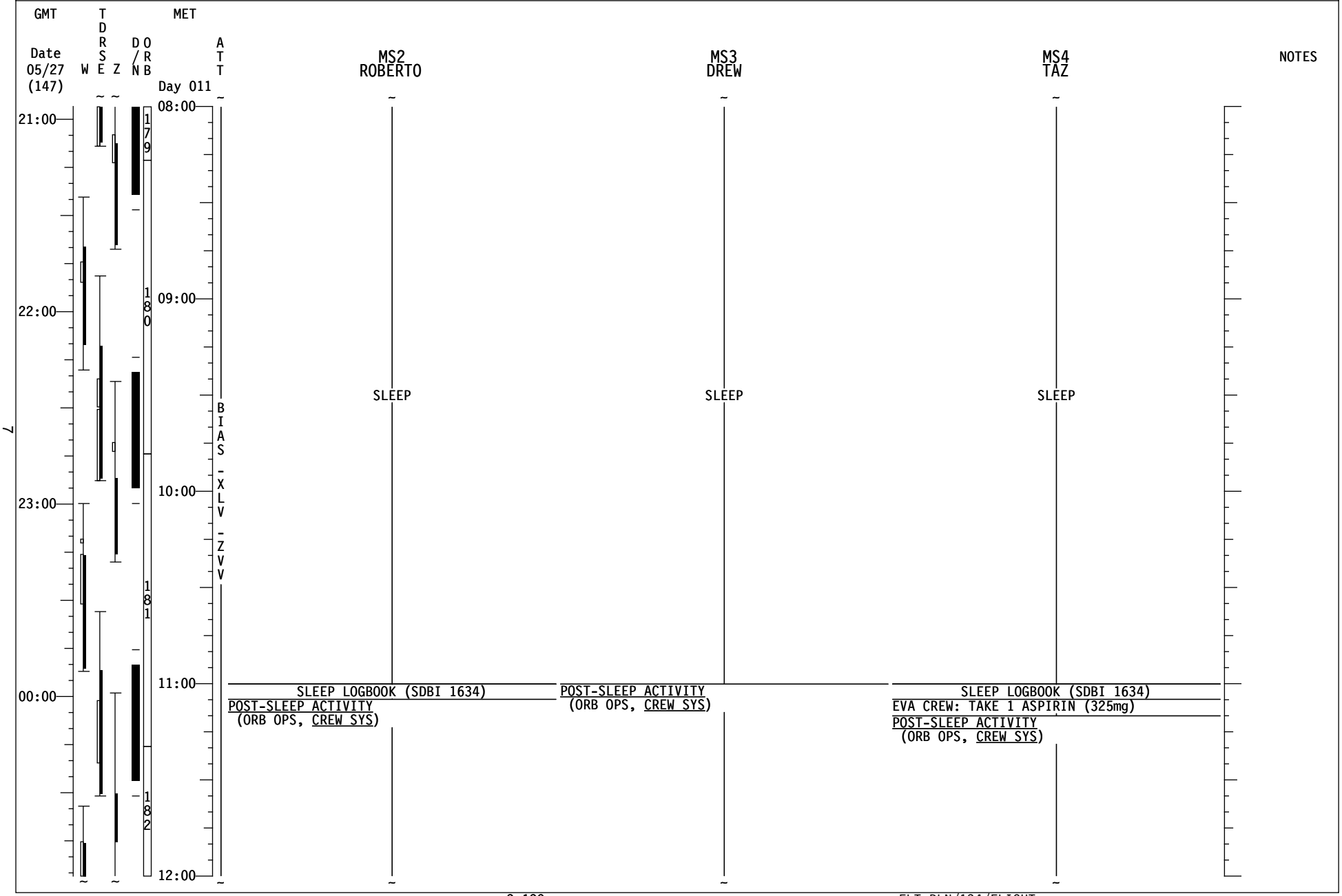
PLT BOX (11:00):
MYCO BODY SAMPLE COLLECTION (ASSY OPS, P/L)
At step 6.1, hand Myco Kit to Ron for MELFI insertion

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

MS1 SPANKY (11:00):
EVA CREW: TAKE 1 ASPIRIN (325mg)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

STS-134/ULF6 FD13



STS-134/ULF6 FD13

GMT Date 05/28 (148) | MET Day 011 | TDRS W E Z | D/N | ORB 182 183 184 | ATT BIAS -XLV -ZVV

CDR MARK

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

PUBLIC AFFAIRS EVENT
ISS S & KU AVAIL: 13:17-13:52
JPM: Mark/Box/Ron
Ref. MSG 137

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

JOINT OPS: 3.128 O2 TRANSFER TO HI P AND LO P O2 TANKS Step 2.1-2.8

STS-134 POST EVA EMU RECONFIGURATION
Ref. MSG 142

B C5 DIRECT O2 vlv - CL
OCAC PWR - ON
On MCC GO, perform the following H/W C&W actions for PPO2 A and B:

CH	LIMIT	VALUE
R13U O34, O44 (two)	UL	3.80 V (3.8 psi)

Set both H/W C&W parameters - ENA
MCC will TMBU all S/W limits

PLT BOX

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

O2 REPRESS INIT A

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

O2 REPRESS TERM B

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

PUBLIC AFFAIRS EVENT
ISS S & KU AVAIL: 13:17-13:52
JPM: Mark/Box/Ron
Ref. MSG 137

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

P/TV09 MIDDECK PAYLOADS
(PHOTO/TV, SCENES) SETUP Item 5

IAPE OPERATIONS
(ASSY OPS, PAYLOADS)

EXERCISE

MS1 SPANKY

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

A OCAC PWR - OFF
C5 DIRECT O2 vlv - OP
Perform the following H/W C&W Actions to inhibit PPO2 A and B:
R13U H/W C&W CH O34,O44 (two) - INH
MCC will TMBU all S/W limits

JOINT OPS: 3.128 O2 TRANSFER TO HI P AND LO P O2 TANKS Step 2.1-2.8

CDRA DESICCANT/SORBENT BED 2O1 (NOD3A4 ARS RACK) - PART 2
Steps 11-21
Ref. MSG 140
Secure CDRA Frame for Meal at your discretion.
Do not leave free floating.
Ref. Transfer List: Resupply Item 27.1
Return Item 709
As required, reference:
CDRA DESICCANT/SORBENT BED 2O1 R&R NOD3A4 - APPENDIX
(CDRA Book, 25-0311)

NOTES

STS-134/ULF6 FD13

GMT Date 05/28 (148) | MET Day 011 | TDRS W E Z | D/N | ORB 182 183 184 | ATT BIAS-XLV -ZVV

	MS2 ROBERTO	MS3 DREW	MS4 TAZ	NOTES
12:00	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
13:00			WINDOW 4 MINICAM PLAYBACK C POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
14:00	CGBA STATUS CHK; GLACIER STATUS CHK (CC) DAILY TRANSFER LIST UPDATE Ref. Transfer List & MSG 136	C DIGITAL VIA VTR (CUE CARD, DIGITAL PLAYBACK) Window 4 Minicam, Ref. MSG 134 Item 9 KU TDRE (12:32-13:02) MODIFIED STORRM TOOLS CHECKOUT Ref. MSG 144, Steps 1-27 STS-134 POST EVA EMU RECONFIGURATION Ref. MSG 142	CDRA DESICCANT/SORBENT BED 201 (NOD3A4 ARS RACK) - PART 2 Steps 11-21 Ref. MSG 140 Secure CDRA Frame for Meal at your discretion. Do not leave free floating. Ref. Transfer List: Resupply Item 27.1 Return Item 709 As required, reference: CDRA DESICCANT/SORBENT BED 201 R&R NOD3A4 - APPENDIX (CDRA Book, 25-0311)	
15:00	P/TV09 MIDDECK PAYLOADS (PHOTO/TV, SCENES) SETUP Item 5 IAPE OPERATIONS (ASSY OPS, PAYLOADS)			
16:00	EXERCISE			

STS-134/ULF6 FD13

GMT Date 05/28 (148) | MET Day 011 | TDRS W E Z | D/N | ORB 185 186 187 | ATT BIAS-XLV-ZVV

16:00	CDR MARK	PLT BOX	MS1 SPANKY	NOTES
	STS-134 POST EVA EMU RECONFIGURATION Ref. MSG 142	EXERCISE	CDRA DESICCANT/SORBENT BED 2O1 (NOD3A4 ARS RACK) - PART 2 Steps 11-21 Ref. MSG 140 Secure CDRA Frame for Meal at your discretion. Do not leave free floating. Ref. Transfer List: Resupply Item 27.1 Return Item 709 As required, reference: CDRA DESICCANT/SORBENT BED 2O1 R&R NOD3A4 - APPENDIX (CDRA Book, 25-0311)	
		O2 REPRESS INIT [A]		
17:00	[A] OCAC PWR - OFF C5 DIRECT O2 vlv - OP Perform the following H/W C&W Actions to inhibit PPO2 A and B: R13U H/W C&W CH 034,044 (two) - INH MCC will TMBU all S/W limits	MHA INSTALL IN MIDDECK Ref. MSG 147		
		O2 REPRESS TERM (On MCC GO) [D]		
		IMU STAR OF OPPORTUNITY ALIGN (ORB OPS,GNC)		
	EXERCISE			
18:00		P/TVO9 MIDDECK PAYLOADS (PHOTO/TV, SCENES) Perform SETUP, OPS Item 1		
		[D] C5 DIRECT O2 vlv - CL OCAC PWR - ON On MCC GO, perform the following H/W C&W actions to re-enable PPO2 A and B: R13U H/W C&W CH 034,044 (two) - ENA MCC will TMBU all S/W limits		
	MEAL	MEAL	MEAL	
19:00	SPINAL ELONGATION OPERATOR PROCEDURE (ASSY OPS, PAYLOADS) Steps 1-4 H/W stowed in JPM1F6_B1 Ref. MSG 145	SPINAL ELONGATION OPERATOR PROCEDURE (ASSY OPS, PAYLOADS) Steps 1-4 H/W stowed in JPM1F6_B1 Ref. MSG 145	CDRA DESICCANT/SORBENT BED 2O1 (NOD3A4 ARS RACK) (CDRA Book, 27-0387) Steps 22-28 As required, reference: CDRA DESICCANT/SORBENT BED 2O1 R&R NOD3A4 - APPENDIX (CDRA Book, 27-0311)	NO T2 EXERCISE [ALIGNMENT GUIDES INSTALLED]
20:00				

STS-134/ULF6 FD13

GMT Date 05/28 (148) — TDRS W E Z — D/N — ORB — MET Day 011 — ATT

GMT: 05:00, 06:00, 07:00, 08:00
MET: 16:00, 17:00, 18:00, 19:00, 20:00
ORB: 185, 186, 187
ATT: BIAS -XLV -ZVV

MS2 ROBERTO

EXERCISE

MHA INSTALL IN MIDDECK
Ref. MSG 147

GLACIER SWAP - SHUTTLE
(ASSY OPS, TRANSFER)
Ref. Transfer List: Resupply Item 6
Return Item 724

MEAL

TRANSFER OPS
Ref. Transfer List & MSG 136

MS3 DREW

STS-134 POST EVA EMU RECONFIGURATION
Ref. MSG 142

On MCC GO: Power off STORRM PGSC

MEAL

TRANSFER OPS
Ref. Transfer List & MSG 136

MS4 TAZ

CDRA DESICCANT/SORBENT BED 201
(NOD3A4 ARS RACK) - PART 2
Steps 11-21
Ref. MSG 140
Secure CDRA Frame for Meal at your discretion.
Do not leave free floating.
Ref. Transfer List: Resupply Item 27.1
Return Item 709
As required, reference:
CDRA DESICCANT/SORBENT BED 201 R&R
NOD3A4 - APPENDIX
(CDRA Book, 25-0311)

MEAL

Install orange Snubber Alignment Guides (four) on T2
CDRA DESICCANT/SORBENT BED 201
(NOD3A4 ARS RACK)
(CDRA Book, 27-0387)
Steps 22-28

NOTES

NO T2 EXERCISE [ALIGNMENT GUIDES INSTALLED]

STS-134/ULF6 FD13

GMT Date 05/28 (148) | MET Day 011

CDR MARK

20:00 SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS) Steps 1-4
H/W stowed in JPM1F6_B1
Ref. MSG 145

SHUTTLE/ISS H2O CONTAINER FILL (HC)
(ORB OPS, ECLS) Perform CWC FILL #11
Ref. MSG 030

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

Transfer CWC to ISS

SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS) Steps 5-6, Height log in manila folder in back of ASSY OPS

SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS)

SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS) Steps 7-8
Ref. Transfer List: Return Item 737

PLT BOX

SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS) Steps 1-4
H/W stowed in JPM1F6_B1
Ref. MSG 145

FILTER CLEANING
(IFM, SCHEDULED MAINTENANCE)
Inspect filters and clean as necessary

DIGITAL VIA VTR
(CUE CARD, DIGITAL PLAYBACK)
Glacier Transfer
KU TDRW 21:41-22:13

SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS)

SPINAL ELONGATION OPERATOR PROCEDURE
(ASSY OPS, PAYLOADS) Steps 5-6, Height log in manila folder in back of ASSY OPS

NOMINAL H2O CONFIG (ORB OPS, ECLS)
√MCC for FES PRI A

MPLM PIVOT PIN BRACKETS AUDIT
Ref. MSG 141

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

PUBLIC AFFAIRS EVENT
ISS S & KU AVAIL: 23:47-00:28
JPM: Box, Ref. MSG 138

MS1 SPANKY

CDRA DESICCANT/SORBENT BED 201 (NOD3A4 ARS RACK)
(CDRA Book, 27-0387)
Steps 22-28
As required, reference:
CDRA DESICCANT/SORBENT BED 201 R&R NOD3A4 - APPENDIX
(CDRA Book, 27-0311)

EXERCISE

NOTES

NO T2 EXERCISE [ALIGNMENT GUIDES INSTALLED]

ATT: BIAS -XLV -ZVV

ORB: 187, 188, 189, 190

GMT: 09:00, 10:00, 11:00, 12:00 | MET: 20:00, 21:00, 22:00, 23:00, 00:00

STS-134/ULF6 FD13

GMT Date 05/28 (148) | TDRS W E Z | D/N | ORB 187, 188, 189, 190 | MET Day 011 | ATT: BIAS -XLV -ZVV

Times: GMT 09:00, 10:00, 11:00, 12:00; MET 20:00, 21:00, 22:00, 23:00, 00:00

MS2 ROBERTO

TRANSFER OPS
 Ref. Transfer List & MSG 136

TRANSFER BRIEF PREP
 Coordinate with transfer counterparts

TRANSFER BRIEF
 Call down status to MCC via A/G2

CGBA STATUS CHK; GLACIER STATUS CHK (CC)

MS3 DREW

TRANSFER OPS
 Ref. Transfer List & MSG 136

PRE-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

MS4 TAZ

CDRA DESICCANT/SORBENT BED 201 (NOD3A4 ARS RACK)
 (CDRA Book, 27-0387)
 Steps 22-28
 As required, reference:
 CDRA DESICCANT/SORBENT BED 201 R&R NOD3A4 - APPENDIX
 (CDRA Book, 27-0311)

Remove orange Snubber Alignment Guides (four) on T2

2.110 CUBE LAB MODULE-7 TRANSFER TO ISS
 (ASSY OPS, TRANSFER)
 Ref. Transfer List: Resupply Item 13

PRE-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

EXERCISE

NOTES

NO T2 EXERCISE [ALIGNMENT GUIDES INSTALLED]

STS-134/ULF6 FD13

GMT Date 05/28 (148) | TDRS W E Z | D/N | ORB | MET Day 012 | ATT

GMT times: 13:00, 14:00, 15:00, 16:00
MET times: 00:00, 01:00, 02:00, 03:00, 04:00
ORB: 190, 191, 192
ATT: BIAS -XLV -ZVV

CDR MARK

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

L9 PS AUD A/G 1,2 (two) - OFF
PRIVATE MEDICAL CONFERENCE, via A/G 2

L OMS ACCUMULATOR REPRESS E

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

E C3 OMS ENG LEFT - ARM/PRESS (Wait 5 Seconds)
- OFF

SLEEP

PLT BOX

PUBLIC AFFAIRS EVENT
ISS S & KU AVAIL: 23:47-00:28
JPM: Box, Ref. MSG 138

JOINT OPS: 3.128 O2 TRANSFER TO HI P AND LO P O2 TANKS Steps 3.1-3.5

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SLEEP

MS1 SPANKY

EXERCISE

JOINT OPS: 3.128 O2 TRANSFER TO HI P AND LO P O2 TANKS Steps 3.1-3.5

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

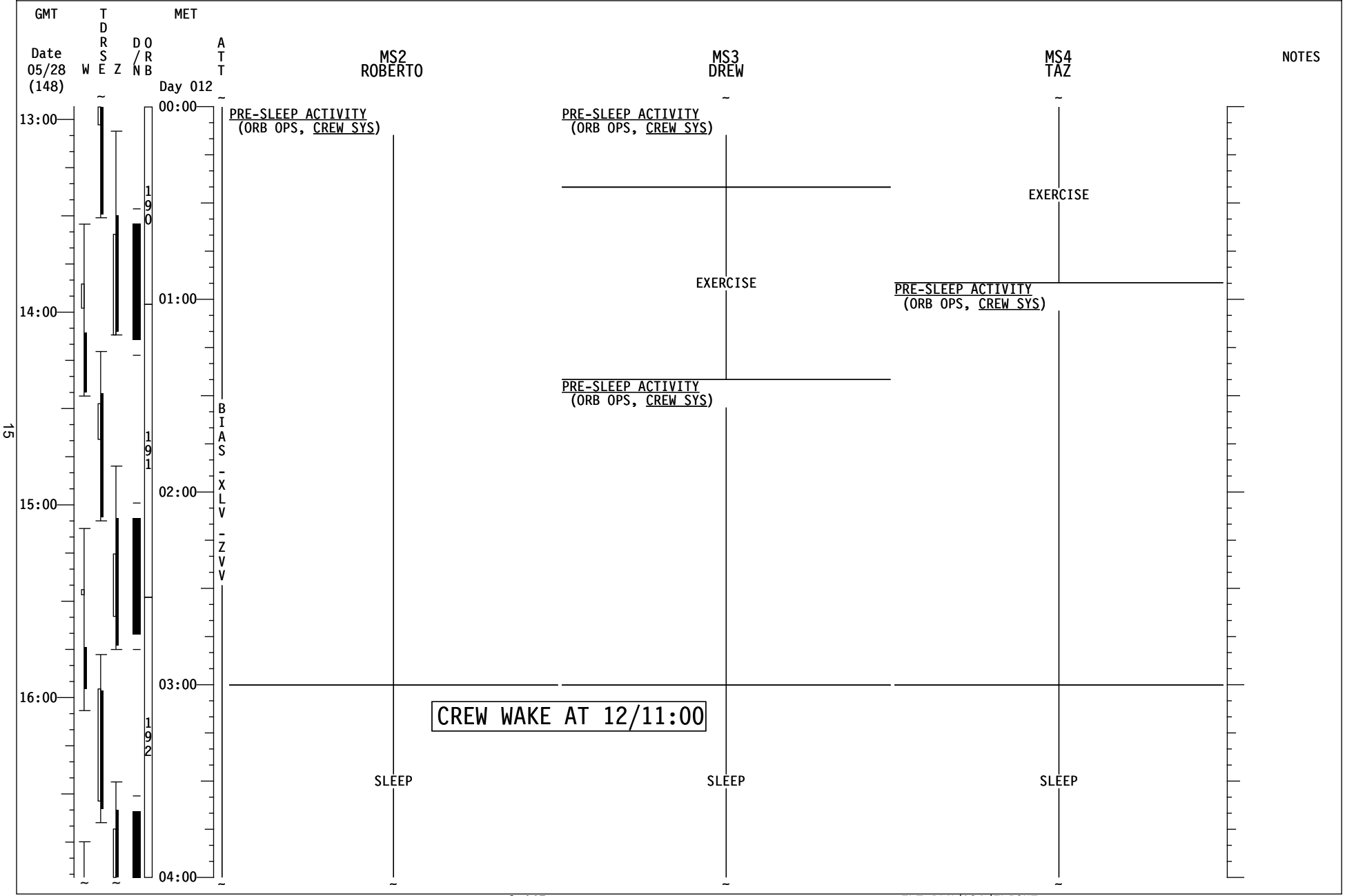
SLEEP

NOTES

CREW WAKE AT 12/11:00

14

STS-134/ULF6 FD13



MSG 135 - FD13 MISSION SUMMARY

Good Morning Endeavour!!!! Congratulations on your fourth outstanding EVA!
Now that the planned EVA's are finished for this flight, you can bask in the glow of a job well done!!!! Enjoy your R&R and transfer work today!

YOUR CURRENT ORBIT IS: 187 X 182 NM

NOTAMS -

EDW -	EDW 22L/04R IN USE. EDT 22R/04L EMERGENCY DAY USE ONLY.
EDW -	LAKEBED RWYS RED.
NOR -	LAKEBED RWYS GREEN.
FMH -	UNDERRUNS/OVERRUNS NOT AVAILABLE.
EDF -	RWY 06/24 CLSD.
NTU -	RWY 05R/23L CLSD.
FFA -	NOT USABLE. IN CARETAKER STATUS.
LAJ -	RWY WIDTH REDUCED TO 154' - EAST SIDE OF RWY CLSD.
BEN -	NOT USABLE. NOT SUPPORTED.
IKF -	NOT USABLE. NO AGREEMENT.

NEXT 2 PLS OPPORTUNITIES:

NOR23	ORB 187 – 11/19:46	SKC	7	270/6P9
NOR23	ORB 203 – 12/20:10	FEW120	7	240/6P9

OMS TANK FAIL CAPABILITY:

NO

LEAKING OMS PRPLT BURN:

L or R OMS LEAK: ALWAYS BURN RETROGRADE

OMS QUANTITIES(%)

L OMS	OX = 33.23	R OMS OX = 34.28	
	FU = 33.24		FU = 33.95

FOR CURRENT QTYS, SUBTRACT INCN'T COUNTER

DELTA V AVAILABLE:

OMS	348 FPS
ARCS (TOTAL ABOVE QTY1)	46 FPS
TOTAL IN THE AFT	394 FPS
ARCS (TOTAL ABOVE QTY2)	79 FPS
FRCS (ABOVE QTY 1)	32 FPS
AFT QTY 1	82 %
AFT QTY 2	44 %

END OF PAGE 1 OF 1, MSG 135

MSG 136A (28-0077A) - FD13 TRANSFER MESSAGE

Good morning Roberto and Drew!
Welcome to Transfer Ops, Drew! We know you'll love it. Today we have some fun challenges for you. Mark reported on FD11 that he was not able to find some of the items in our Real Time Additions Return list. We have some Scavenger Hunt suggestions listed below that we hope will help you guys.
Drew, for you today, we have some EVA swaps lined up. You'll see the item numbers listed in the choreography section.
Roberto, if you finish Transfer activities ahead of schedule, feel free to finish up those ATV activities you mentioned yesterday.
We are sending up the Return Location Sort for you to use as a reference, if you want to verify all contents per location.
The Transfer List Excel file, FD13_Transfer_List_STS134.xls, is located on the KFX machine in **C:\OCA-up\transfer** (and available via the **PGSC homepage**).

For ISS, the Transfer List Excel file, FD13_Transfer_List_STS134.xls, is located in **K:\OCA-up\transfer**.

Transfer Notes

- Since the CWC fills will be complete today, Items 22 and 736 are ready for transfer.
- Just a reminder that the Worklights (Items 15 & 738) can be swapped at any time.
- We noticed un-nomexed gray foam in the PMM Endcone in downlink photos. That foam is not approved for life on station or return in ATV, so we'll need to have you move that foam to the empty 5-MLE bag that launched on top of the A/L FLOOR bag. It will return in that bag (with some empty food lockers) behind the retention net.
- Can you please tell us about how many food lockers you think will be empty by the time you undock? Tomorrow, we may have you move some of these empty lockers to the 5-MLE bag mentioned in the bullet above so we can return heavier items in hard lockers.
- Can you please confirm that the CSA-CPs (Items 710 & 711) were wrapped in bubblewrap in MF71C? If they do not fit into MF71C when they're wrapped, you can stow those in Bag H instead.

Scavenger Hunt Suggestions:

- Note for PMM: we know that the labels in the PMM are confusing, and we're really sorry about that. Please ensure that you are looking in the ACTUAL location for this scavenger hunt, rather than going by the rack label.
- Item 905 (HEPA Filter) (see picture below):
    - We did some more research and realized that, though these are frequently called HEPA Filters, the label actually says BACTERIA FILTER ELEMENT ORU. There are two cushions in this location, each of which contains several of these filters. The G location is at the bottom of the locker and is sometimes called the "pizza box" (see picture below). We have a note in IMS that says that the cushion that houses these items is "stowed below the rack because the foam that encases them is too large to pass through the zipper of the G location". Our highest priority for return are Serial Numbers 48, 49, and 50. Next highest priority have Serial Numbers XSR 16 or XSR17. If you can find any of those, pick one and let us know which one you chose.

Item 905: HEPA FILTER/BACTERIA FILTER ELEMENT ORU

ZSR G location

- Items 906, 907.1, 907.2, 907.3:
  - Item 906: This 0.5 CTB (s/n 1378) contains two pairs of EMU Gloves (s/n 6193 and 6288) and a T61p Battery. According to IMS, it was moved from NOD2D2 to the PMM1S3_C2 location on GMT 119 (29 April). It's possible the bag never moved from the NOD2D2 location.
  - 907.1, 907.2: We thought these were stowed in Scott Kelly's (KS) ECOK in NOD2P1. It's possible they were accidently put in another ECOK. We suggest looking in the other ECOKs, located at PMM1P3.
  - 907.3: The best we can tell you is to re-check in 0.5 CTB s/n 1086 in NOD1P4_A1. There should be two other EMU 3-Micron Filters in that bag (s/n 1034 and 1036). We do NOT want those to return. The returning 3-Micron Filters are s/n 1026 and 1028.

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- Item 908 and 909 are actually all in one 24x24 ziplock labeled "BXF TAPES RETURN TO MSFC/MSG USED TAPES - DO NOT REUSE." We have updated the Transfer List to reflect that clarification. We suggest re-looking in COL1O3_C1 and also trying COL1F2_C1 and COL1F2_C2. It's also possible that these tapes were put into Return Bag 406, in MF57C. If they are found in MF57C, you're GO to leave them there, but please let us know you found them there.

FD13 Choreography

- **Drew: Resupply Item 19 and Return Item 723** (EMU Servicing Kit swap)
- **Drew: Resupply Items 32.6-32.9, Return Items 706.1-706.4** (Bag I swaps)
- **Taz: Resupply Item 13** (Cube Lab 7 LMA Pack 2) (timelined)
- **Spanky & Taz: Resupply Item 27.1 and Return Item 709** (CDRA Swap) (timelined)
- **Mark: Return Item 737** (Spinal Hardware) (timelined)
- **Roberto & Ron: Resupply Item 6 & Return Item 724** (Glacier) (timelined)

Change Pages

Please incorporate changes as follows:

In the Transfer List **RESUPPLY** tab

Replace page 12

In the Transfer List **RETURN** tab

Replace pages 4, 9 & 10

Add page 11

In the Transfer List **RETURN LOCATION SORT** tab

Add pages 1-6

MSG 136A (28-0077A) - FD13 TRANSFER MESSAGE

Change Details

Resupply Item 806: New Item

Resupply Item 807: New Item

Return Item 708: Changed Activity Name

Return Item 905: Clarified Item Name

Return Item 908 & 909: deleted 909 and combined with 908 to better reflect that this is just one ziplock bag that you'll transfer.

Return Item 911: New Item

Return Item 912: New Item

Return Item 913: New Item

MSG 139 - FD13 Crew Choice Downlink Opportunities

Please allow 1-2 min to lock up on K-Band. Check with MCC before starting playback.

Post-Sleep Morning of FD13

TDRS	AOS	LOS	Delta (min)	Notes
E-TDS	11/11:06	11/11:24	18	
W-171	11/11:50	11/12:23	33	
E-TDS	11/12:32	11/13:02	30	Overlaps Window 4 Playback
W-171	11/13:28	11/13:57	29	Overlaps PAO Event. PAO event uses ISS comm
E-TDS	11/14:04	11/14:37	33	

Pre-Sleep Evening of FD13

TDRS	AOS	LOS	Delta (min)	Notes
W-171	11/23:14	11/23:34	20	
E-TDS	12/00:00	12/00:05	5	Overlaps PAO Event. PAO event uses ISS comm
E-TDS	12/01:33	12/01:43	10	

END OF PAGE 1 OF 1, MSG 139

28-0054 (MSG 140) CDRA DESICCANT/SORBENT BED 201 (NOD3A4 ARS RACK) - PART 2

OBJECTIVE:

Remove 3 component groups from the CDRA frame, remove and replace CDRA Desiccant/Sorbent Bed 201 (back bed), and replace all 3 component groups to a nominal configuration. This procedure replaces Part 2 of 27-0387 CDRA Desiccant/Sorbent Bed 201 (NOD3A4 ARS Rack). As required, reference 25-0311 CDRA Desiccant/Sorbent Bed 201 R&R NOD3A4 - Appendix.

LOCATION:

NOD3A4 - NOD3A4 ARS Rack

CREW:

Two

DURATION:

PART 2

04:00 total

- 01:10 Removing Component Groups (steps 11-14)
- 00:30 R&R CDRA Desiccant/Sorbent Bed 201 (steps 15-16)
- 00:40 Replacing Component Group 3 (steps 17-18)
- 00:40 Replacing Component Group 2 (step 19)
- 00:50 Replacing Component Group 1 (step 20)
- 00:10 Closeout (step 21)

PARTS - PART 2:

CDRA Desiccant/Sorbent Bed (P/N 2352540-1-3)

MATERIALS - PART 2:

Disposable Gloves
Sharpie
Gray Tape
Ziplock Bags
Braycote
8.5" Handrail

TOOLS - PART 2:

Digital Camera
ISS Vacuum Cleaner
Flex Hose Crevice Tool

ISS IVA Toolbox:

Drawer 2:

- Ratchet, 1/4" Drive
- Ratchet, 3/8” Drive
- 4" Ext, 1/4" Drive
- 6" Ext, 1/4" Drive
- 10" Ext, 1/4" Drive
- Universal Joint, 1/4" Drive
- 3/8” Socket, 1/4” Drive
- 5/16" Socket, 1/4" Drive
- 9/16" Socket, 1/4" Drive
- 3/8” to 1/4” Adapter
- (10-50 in-lbs) Trq Wrench, 1/4" Drive
- (40-200 in-lbs) Trq Wrench, 1/4" Drive

Drawer 3:
2" Crowfoot, 3/8" Drive
(200-1000 in-lbs) Trq Wrench, 3/8" Drive
Drawer 4:
Needle Nose Pliers (if required)

1-10. STEPS 1-10 HAVE BEEN PERFORMED, PROCEED TO STEP 11.

PART 2

11. COMPONENT GROUP REMOVAL NOTES

11.1 To gain access to Desiccant/Sorbent Bed 201, various CDRA components will be removed in groups. Crew can work simultaneously on components groups, but groups must be removed/replaced in order.

11.2 All cables disconnected will remain with core CDRA structure.

11.3 Many CDRA components are covered with insulation. Label and remove insulation as required, stow in empty single CTB.
Refer to Table 2 for insulation reference.

12. COMPONENT GROUP 1 (GREEN IN FIGURE 12)
Refer to Figures 12, 13 for all of Step 12.

12.1 Demate Selector Valve 101 Electrical Connectors (two)
2365455-P1 ←|→ J1
2365456-P1 ←|→ J2

12.2 Demate Selector Valve 102 Electrical Connectors (two)
2365455-P2 ←|→ J1
2365456-P2 ←|→ J2

12.3 Electrical Connector (one) 2365458-P5 ←|→ J1 Temperature Sensor 501

12.4 Remove insulation from Component Group 1.
If debris is created by insulation removal, clean as required (Vacuum Cleaner).
Refer to Table 3.

12.5 Remove Two Stage Pump top Insulation (P/N 2352847-12).
Temporarily stow.
Refer to Figure 7.

12.6 Remove Two Stage Pump TCS Coolant IN QD insulation sleeve.
Pull back QD collar, disconnect QD by hand.
Refer to Figure 13.

NOTE
The CDRA Low Temp TCS Supply/Return Lines have two non-captive washers. One washer is on the front side of TCS Interface Bracket and the other washer is on the rear of the TCS Interface Bracket.

12.7 Remove jam nuts (one each line), washers (two each line) securing CDRA Coolant Supply/Return Lines to TCS Interface Bracket (Ratchet, 3/8" Drive; 2" Crowfoot).
Temporarily stow jams nuts (two), washers (four) in Ziplock Bag.

12.8 Remove U-shaped Insulation (two) from CDRA Coolant Supply/Return Lines located on CDRA side of TCS Interface Bracket.
Refer to Table 3.
Temporarily stow in CTB.

12.9 To provide access, remove CDRA Supply/Return Coolant Lines from TCS Interface Bracket.
Temporarily restrain.

NOTE
When removing the Air Inlet/Outlet Ducts from the TCS Interface Bracket, tolerances between the Hydraflow body coupling and the TCS Interface Bracket are close. Carefully work the Hydraflow body coupling out of the TCS Interface Bracket. One hand should be used to lift and twist ducting and the other hand to push the Air Inlet/Outlet Duct at the Hydraflow body coupling.

12.10 Release Air lnlet Duct (shaded orange in Figure 13), disconnect couplings (two) between Selector Valves 101, 102.
Inspect couplings for white Zeolite debris, clean as required (Vacuum Cleaner).

12.11 To provide access, remove Air Inlet Duct from TCS Interface Bracket.
Temporarily stow.

12.12 Disconnect Selector Valve 101 rear coupling from Air Outlet Duct.

12.13 Release Selector Valve 101 with bracket attached.
Loosen fasteners (four) (Ratchet, 1/4" Drive; Universal Joint; 10" Ext; 5/16" Socket).

NOTE

Sock Filters have been installed to prevent Zeolite Debris from damaging CDRA pump and Selector Valves. Filters are delicate cone screens fitted inside the Hydraflow coupling. The CDRA contains filters of two different diameters, 0.5” and 1.5”. Five filters will be exposed during this maintenance procedure and only 0.5” Diameter filters will be re-installed.

1. CDRA Valve 201 to Bed 201 Filter (1.5" diameter, 8" long) - Leave Out
2. CDRA Pump Filter (0.5" diameter, 1.5" long) - Re-install
3. CDRA Valve 103 to Bed 201 Filter (1.5" diameter, 3" long) - Leave Out
4. CDRA Valve 103 to Bed 202 Filter (1.5” diameter, 3” long) - Leave Out
5. CDRA Valve 104 Filter (0.5" diameter, 1.5" long) - Re-install.

12.14 Release duct from Desiccant/Sorbent Bed 201 (below Selector Valve 101, shaded gray in Figure 13), disconnect coupling (shaded purple).
Remove CDRA Bed 201 Filter (1.5" X 8") from Bed 201 coupling.

12.15 Stow in Ziplock Bag; label, “N3 CDRA Filters - GMT XXX” (Sharpie)

12.16 Remove Selector Valve 101, bracket, duct from CDRA (shaded gray in Figure 13).
Temporarily stow.

12.17 Release duct between Selector Valve 102, Sorbent Bed 202 (shaded green in Figure 13).
Disconnect couplings (two).

12.18 Remove CDRA duct (shaded Green in Figure 13).
Temporarily stow.

12.19 Release Dual Flip Lock Clamp (Ratchet, 1/4" Drive; 4" Ext; 3/8" Socket).

12.20 Release Air Outlet Duct (shaded yellow in Figure 13), disconnect Valve 102 front coupling.

12.21 Disconnect Y-coupling.
Remove Sock Filter (0.5" X 1.5") from duct going to the pump.

NOTE

Agitating CDRA Sock Filters in a Ziplock Bag with a water bath has been found to be a good alternative to vacuuming, if the vacuum can not adequately clean the Filter.

12.22 As required, inspect and clean Filter, (Vacuum Cleaner).

****
* If vacuuming Filter does not work, give Filter
* a water bath in a Ziplock Bag then pat dry.
****

12.23 Stow in Ziplock Bag and label “CDRA Pump Filter” (Sharpie).

12.24 Remove Air Outlet Duct from TCS Interface Bracket.
Temporarily stow.

NOTE
All of component Group 1 is now removed from CDRA

12.25 Verify all open interfaces are covered (Ziplock Bags, Kapton Tape)

12.26 Stow all of Component Group 1 together:
Air Inlet Duct (Orange)
Air Outlet Duct (Yellow)
Selector Valve 101 and adjacent duct (Gray)
CDRA duct from Valve 102 to Bed 202 (Green)
CDRA Pump Filter (0.5” x 1.5”)

13. COMPONENT GROUP 2 (YELLOW IN FIGURE 12)
Refer to Figure 14 for all of Step 13.

13.1 If not done in Step 9.3, demate Selector Valve 104 Electrical Connectors (two)
2365455-P4 ←|→ J1
2365456-P4 ←|→ J2

13.2 Demate Selector Valve 103 Electrical Connectors (two)
2365455-P3 ←|→ J1
2365456-P3 ←|→ J2

13.3 Remove insulation from Component Group 2
Refer to Table 3.

13.4 Electrical Connector 2365458-P4 ←|→ J1 of Differential Pressure Sensor

13.5 Electrical Connector 2365453-P2 ←|→ J2 of Blower Motor

13.6 Electrical Connector 2365458-P7 ←|→ J1 of Temperature Sensor 503

13.7 Electrical Connector 2365458-P6 ←|→ J2 of Temperature Sensor 502

13.8 Removing Selector Valve 103 Filters

13.8.1 Disconnect middle hydraflow coupling on Desiccant/Sorbent Bed 201 from duct leading to Selector Valve 103.
Remove 1.5” x 3” filter from duct.
Stow in Ziplock Bag “N3 CDRA Filters - GMT XXX”
Refer to Figure 18.

13.8.2 Disconnect middle hydraflow coupling on Desiccant/Sorbent Bed 202 from duct leading to Selector Valve 103.
Remove 1.5” x 3” filter from duct.
Stow in Ziplock Bag “N3 CDRA Filters - GMT XXX”

13.9 Disconnect 0.5” coupling (one) from the rear duct of Selector Valve 104
Remove Sock Filter (0.5" X 1.5") from duct going to Valve 105.

13.10 Repeat 12.22 for Filter cleaning.
Stow in Ziplock Bag; label, “CDRA Valve 104 Filter.” (Sharpie)

13.11 Disconnect Selector Valve 105 front Coupling (one)

13.12 Disconnect Selector Valve 104 Duct Couplings (two) from the top of Desiccant/Sorbent Beds (201, 202)

13.13 Release Selector Valves (103, 104) with bracket attached.
Loosen fasteners (four each) (Ratchet, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket).

13.14 Release Blower/Precooler with bracket attached.
Loosen fasteners (four) (Ratchet, 1/4" Drive; 10" Ext; 3/8" Socket).

13.15 Remove Component Group 2 away from CDRA.
Temporarily stow.

13.16 STEP DELETED

13.17 STEP DELETED

NOTE
All of component Group 2 is now removed from CDRA

13.18 Verify all open interfaces are covered (Ziplock Bags, Kapton Tape).

13.19 Stow all Component Group 2 together:
Selector Valve 104 - Blower/Precooler - Selector Valve 103
CDRA Valve 104 Filter (0.5” x 1.5”)

14. COMPONENT GROUP 3 (ORANGE IN FIGURE 12)
Refer to Figures 15, 16 for all of Step 14.

14.1 Demate Selector Valve 105 Electrical Connectors (two)
2365455-P5 ←|→ J1
2365456-P5 ←|→ J2

14.2 Demate Selector Valve 106 Electrical Connectors (two)
2365455-P6 ←|→ J1
2365456-P6 ←|→ J2

14.3 Electrical Connector 2365458-P3 ←|→ J1 of Absolute Pressure Sensor

14.4 Loosen Absolute Pressure Sensor P-clamp fastener (one) (Ratchet, 1/4" Drive; 3/8" Socket).
Release Absolute Pressure Sensor from P-clamp.

14.5 Disconnect Selector Valve 106 rear coupling.

14.6 Release Selector Valves (105, 106) with bracket attached.
Loosen fasteners (four each) (Ratchet, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket).

14.7 Remove Component Group 3 away from CDRA.
Temporarily stow.
Verify all open interfaces are covered (Ziplock Bags, Kapton Tape).

15. DESICCANT/SORBENT BED 201 REMOVAL (REFER TO FIGURE 17)

15.1 Demate Electrical Connectors (two) from Desiccant/Sorbent Bed 201

2365462-2-P2 ←|→ J2

2365459-2-P2 ←|→ J1

Visually inspect pins and sockets on CDRA Bed and wire harness for bent pins and FOD.
If damage is found, photo document and notify **MCC-H** (Digital Camera).

CAUTION
Use care when loosening fasteners on Pin Assemblies. The retaining rings making them captive are fragile.

NOTE
Each Pin Assembly is also an alignment guide for the Desiccant/Sorbent Bed.

15.2 Loosen fasteners (three) on each Pin Assembly (four) on upper plate (Ratchet, 1/4" Drive; 6" Ext; 5/16" Socket).
If Pin Assembly fastener breaks:
Inspect the threads on the fastener and notify **MCC-H** of the results.
Temporarily stow noncaptive components (Ziplock Bag).
Pull Alignment Pin Assemblies from Desiccant/Sorbent Bed.

15.3 Loosen fasteners (four) on lower plate (Ratchet, 1/4" Drive; 4" Ext; 9/16" Socket).

NOTE
1. Seat track buttons on CDRA beds are too close together to fit the 8.5” Handrail. One side of the handrail may be installed to one seat track button to assist crew in Desiccant/Sorbent Bed removal and replacement. Bed seat track buttons are covered by insulation flaps. 2. Desiccant/Sorbent Beds are covered with insulation. This often causes a tight fit in the CDRA frame. Insulation is plyable and can be pushed or deformed in order to remove the bed.

15.4 As required, install 8.5” Handrail.

15.5 Remove CDRA Desiccant/Sorbent Bed 201.

15.6 Label, “Removed GMT XXX” (Kapton Tape, Sharpie).
Record removed Desiccant/Sorbent Bed P/N: _____
Record removed Desiccant/Sorbent Bed S/N: _____
Temporarily stow.

NOTE
RTV compound used to cover sharp edges is a likely source of FOD upon Desiccant/Sorbent Bed removal.

15.7 If required, clean any FOD generated by removing Desiccant/Sorbent Bed (Vacuum Cleaner).

15.8 Photo document current configuration of CDRA (Digital Camera).

16. DESICCANT/SORBENT BED 201 REPLACEMENT (REFER TO FIGURE 17)

16.1 Record replacement Desiccant/Sorbent Bed P/N: _____
Record replacement Desiccant/Sorbent Bed S/N: _____

16.2 Manuever Bed 201 into CDRA, align with lower plate fasteners (four).

16.3 Tighten fasteners (four) (Ratchet, 1/4" Drive; 4" Ext; 9/16" Socket).

16.4 Align upper plate alignment guides from each Pin Assembly (four) into Desiccant/Sorbent Bed, snug fasteners (three each pin) (Ratchet, 1/4" Drive; 6" Ext; 5/16" Socket).

16.5 Torque fasteners (four) on lower plate to 220 in-lbs [(200-1000 in-lbs) Trq Wrench, 3/8" Drive; 3/8” to 1/4” Adapter; 4" Ext, 1/4” Drive; 9/16" Socket, 1/4” Drive].

16.6 Torque fasteners (three) each Pin Assembly (four) to 22 in-lbs [(10-50 in-lbs) Trq Wrench, 1/4" Drive; 6" Ext; 5/16" Socket].

16.7 Remove protective caps from Electrical Connectors J1, J2.
Transfer caps to removed CDRA Desiccant/Sorbent Bed.

16.8 Cover open Hydraflow couplings on removed CDRA Desiccant/Sorbet Bed (Ziplock Bag, Kapton Tape).

16.9 Mate Electrical Connectors (two) to Desiccant/Sorbent Bed 201
2365462-2-P2 →|←J2
2365459-2-P2 →|←J1

16.10 Replace insulation sleeves for J1, J2 connectors.
Refer to Table 3.

17. REPLACING COMPONENT GROUP 3 (ORANGE IN FIGURE 12)
Refer to Figures 15, 16 for all of step 17.

CAUTION
1. Verify fasteners on CDRA components recessed before installing to prevent damage to the fasteners
2. Inspect all couplings for debris/FOD before reconnecting

NOTE
Insulation with the same part number is interchangeable for different components. Refer to Table 3.

17.1 For all replacement steps, remove Ziplock Bags, Kapton Tape covering open interfaces as requried.
Covers on Hydraflow couplings of replacement CDRA Desiccant/Sorbent Bed 201 should be removed,discarded as required.

17.2 Align Component Group 3 within CDRA.
Position all cables, connectors, ducting per Figure 15.

17.3 Secure Selector Valves (105, 106) to CDRA.
Snug fasteners (four each) in a star pattern (Ratchet, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket).

NOTE
Loosely assemble couplings, to facilitate alignment. Tighten couplings after alignment is achieved. Repeat for all component groups.

17.4 Connect Selector Valve 106 rear coupling.

17.5 Secure Absolute Pressure Sensor, tighten P-clamp fastener (one) (Ratchet, 1/4" Drive; 3/8" Socket).

17.6 Electrical Connector 2365458-P3 →|← J1 of Absolute Pressure Sensor

17.7 Mate Selector Valve 105 Electrical Connectors (two)
2365455-P5 →|← J1
2365456-P5 →|← J2

17.8 Mate Selector Valve 106 Electrical Connectors (two)
2365455-P6 →|← J1
2365456-P6 →|← J2

17.9 Torque fasteners for Selector Valves (105, 106) to 24 in-lbs [(10-50 in-lbs) Trq Wrench, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket].

18. STEP 18 HAS BEEN DELETED - PROCEED TO STEP 19

19. REPLACING COMPONENT GROUP 2 (YELLOW IN FIGURE 12)
Refer to Figure 14.

19.1 Align Component Group 2 (Yellow in Figure 12) within CDRA.
Position all cables, connectors, ducting per Figure 14.

19.2 Secure Blower/Precooler to CDRA.
Snug fasteners (four) in a star pattern (Ratchet, 1/4" Drive; 10" Ext; 3/8" Socket).

19.3 Secure Selector Valves (103, 104) to CDRA.
Snug fasteners (four each) in a star pattern (Ratchet, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket).

19.4 Connect Selector Valve 104 Duct Couplings (two) to the top of Desiccant/Sorbent Beds (201, 202).

19.5 Connect Selector Valve 103 front duct to middle hydraflow coupling on Desiccant/Sorbent Bed 202.
Connect Selector Valve 103 rear duct to middle hydraflow coupling on Desiccant/Sorbent Bed 201.

19.6 Installing 0.5" Filter between Selector Valves 105 and 104
Reference Figures 19 and 20.

19.6.1 Push back male and female couplings to expose o-rings.
Inspect plumbing for Zeolite debris, obstructions, clean as required (Vacuum Cleaner, Dry Wipes).

19.6.2 Don Disposable Gloves.

19.6.3 Apply small drop of Braycote to index finger.
Create a thin film between index finger and thumb.
Using finger, apply thin film of Braycote to both O-Rings on each of the Hydraflow Couplings.
Doff Disposable Gloves.

CAUTION
CDRA Filters deform easily. Deformed CDRA Filters may restrict flow in CDRA.

NOTE
CDRA Filters will not lock into place. Once inserted, filters will spring out of installed location due to natural spring back force on the filter assembly.

19.6.4 Maneuver male coupling of duct over O-Ring and insert Filter.

19.6.5 Push filter into the duct until the spring is fully compressed.

CAUTION
Sock Filter installation is known to cause the female coupling snap ring to pop off and seat over the O-Ring creating a leak. If filter installation seems especially difficult, demate coupling and repeat installation steps. Correct snap ring position if required.

19.6.6 Center male coupling over female coupling.
Compress Filter spring using duct assembly until flush with female coupling.

19.7 Connect female coupling to male with Filter installed.
Replace insulation sleeve (P/N 2352847-22).

19.8 Electrical Connector 2365458-P4 →|← J1 of Differential Pressure Sensor

19.9 Electrical Connector 2365453-P2 →|← J2 of Blower Motor

19.10 Electrical Connector 2365458-P7 →|← J1 of Temperature Sensor 503

19.11 Electrical Connector 2365458-P6 →|← J2 of Temperature Sensor 502

19.12 Torque fasteners for Selector Valves (103, 104) to 24 in-lbs [(10-50 in-lbs) Trq Wrench, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket].

19.13 Torque Blower/Precooler fasteners to 95 in-lbs [(40-200 in-lbs) Trq Wrench, 1/4" Drive; 10" Ext; 3/8" Socket].
Replace insulation over fasteners.

19.14 Verify all couplings are tight.

```
**********************************************************
*  If Selector Valve 104 insulation had to be
*  | removed to slide CDRA out of rack in step
*  | 9.3:
*  |     Do not replace Selector Valve 104
*  |         insulation in step 19.15.
*  |    Skip step 19.16.
**********************************************************
```

19.15 Replace Insulation for Component Group 2.
Refer to Table 3 and Figure 12.

19.16 Mate Selector Valve 104 Electrical Connectors (two)
2365455-P4 →|← J1
2365456-P4→|←J2

19.17 Mate Selector Valve 103 Electrical Connectors (two)
2365455-P3 →|← J1
2365456-P3 →|← J2

20. REPLACING COMPONENT GROUP 1 (GREEN IN FIGURE 12)

20.1 Replace Air Outlet Duct (shaded yellow), slide into respective position in TCS Interface Bracket.
Connect Selector Valve 102 front coupling.
Refer to Figure 13.

20.2 Repeat Filter installation step 19.6 for the 0.5”CDRA Pump Filter installed at Y-Coupling (near rear of Valve 101).

20.3 Connect female coupling to male between Selector Valve 102, CDRA Bed 202
Connect second coupling to Selector Valve 102.
Replace insulation sleeve (P/N 2352847-24).

20.4 Align Selector Valve 101, duct to Sorbent Bed 201 onto CDRA.
Position all cables, connectors, ducting per Figure 13.

20.5 Secure Selector Valve 101 to CDRA.
Snug fasteners (four) in a star pattern (Ratchet, 1/4" Drive; Universal Joint; 10" Ext; 5/16" Socket).

20. 6 Connect female coupling to male between Selector Valve 101, CDRA Bed 201.
Replace insulation sleeve (P/N 2352847-24).

20.7 Replace Air lnlet Duct (shaded orange), slide into respective position in TCS Interface Bracket.
Connect couplings (two) between Selector Valves 101, 102

20.8 Connect Two Stage Pump TCS Coolant IN QD
Replace insulation sleeve.
Refer to Figure 14.

20.9 Replace Two Stage Pump top Insulation (P/N 2352847-12).

NOTE

1. The CDRA Coolant Supply/Return Lines have two washers. One washer is on front side of TCS Interface Bracket and the other washer is on the back of the TCS Interface Bracket.

2. TCS bracket washers are keyed. Verify keying matches before tightening.

20.10 Replace the TCS Supply Line.
Install back side washer.
Slide into respective position in TCS Interface Bracket.
Install front side washer, engage jam nut.

20.11 Hand tighten noncaptive jam nut (one), washers (two).
√One washer on each side of TCS Interface Bracket
√Washer keys aligned

20.12 Tighten additional 1/8 to 1/4 turns (Ratchet, 3/8" Drive; 2" Crowfoot).

20.13 Repeat steps 20.10 to 20.12 for TCS Return Line to TCS Interface Bracket.

20.14 Install U-shaped TCS bracket insulation (two) around Supply/Return Coolant Lines.
Refer to Table 3.

20.15 Electrical Connector (one) 2365458-P5 →|← J1 Temperature Sensor 501

20.16 Torque fasteners for Selector Valve 101 to 24 in-lbs [(10-50 in-lbs) Trq Wrench, 1/4" Drive; Universal Joint; 4" Ext; 5/16" Socket].

20.17 Verify all couplings are tight.

20.18 Engage Dual Flip Lock Clamp (Ratchet, 1/4" Drive; 4" Ext; 3/8" Socket).

****
*If Dual Flip Lock Clamp failed to engage
*| Check nut on bottom of fastener to see if nut is jammed on
*| fastener threads
*| If necessary, free nut and threads by holding nut with Needle
*| Nose Pliers and rotating fastener with 3/8" Socket.
****

20.19 Replace insulation for Group 1.
Refer to Table 3 and Figure 12.

20.20 Mate Selector Valve 101 Electrical Connectors (two)
2365455-P1 →|← J1
2365456-P1 →|← J2

20.21 Mate Selector Valve 102 Electrical Connectors (two)
2365455-P2 →|← J1
2365456-P2 →|← J2

21. CLOSEOUT PART 2

21.1 Photo document installed Desiccant/Sorbent Bed 201 from several angles (Digital Camera).

21.2 Stow tools, removed Desiccant/Sorbent Bed 201.
Update IMS.

21.3 Notify **MCC-H**: Complete with Part 2.

Overview: MCC-H needs to know the quantity of Pivot Pin Brackets, P/N 1600P051-402, on ISS. At least 3 will be needed for rack rotations during the STS-135/ULF7 mission. IMS shows two, but we think that there may be at least one additional bracket left there from 19A (for a total of three or more).

Goal: To verify the quantity of MPLM Pivot Pin Brackets

Duration: 15 minutes

Procedure:

1. Go to PMM1P1_A2 (not inside of a CTB) and retrieve ziplock labeled “MPLM Pivot Pin”.
2. Report quantity of Pivot Pin Brackets (P/N 1600P051-402) to MCC-H via calldown or crew note.

Note: There are other pivot pins in this ziplock, but we do not need you to count them. See Photo 1 below for a picture of a bracket with the same P/N.

Figure 1. Pivot Pin Bracket, P/N 1600P051-402

28-0069 (MSG 142) STS-134 POST EVA EMU RECONFIGURATION (180 min)

NOTE

This procedure assumes the following procedures have been completed following EVA 4: {1.240 POST EVA} (SODF: ISS EVA SYS: EVA PREP/POST)

PRE-GATHER:

2 empty mesh bags: 1 for Pre-gather, 1 for ISS Stow

Retrieve the following and stow in "Pre-Gather" mesh bag:

A/L1O1, M-02 Bag s/n 1010
- ☐ Waist Brief SZ 01 s/n 2075/029 (for 3004 return)
- ☐☐ Lower Arms SZ 03 s/n 377, 378 (for 3010 install)

2.0 CTB s/n 1082
- ☐☐ Leg Assemblies SZ 03 s/n 243,244 (for 3010 install)

A/L1D0_Behind Closeout, 1.0 CTB s/n 1163
- ☐☐ 0.5" Arm sizing rings s/n 142, 158 (for 3010 install)
- ☐☐ 0.5" Leg sizing rings s/n 115, 116 (for 3010 install)

CONFIGURE EMU 3005 TO STAY ON ISS

EMU 3005

1. Remove following:
   - ☐ HL Batteries, stow in M-02 Bag s/n 1038
   - ☐ Helmet Light Assembly, ERCA, stow in E-Lk
   - ☐ REBA, stow in M-02 Bag s/n 1038
   - ☐ LiOH, install caps and stow in SYSTEMS TRANSFER Bag
   - ☐ Li-Ion EMU Battery, stow in M-02 Bag s/n 1038, 0.5 CTB s/n 1205
   - ☐ EMU Gloves CF1, install protective covers and stow in CF ECOK
   - ☐☐ Wrist mirrors (2), stow in Outer Pocket M-02 Bag s/n 1010
   - ☐ EV3 ISS Cuff C/L (cut out FS pages), stow in EMU Equipment Bag
   - ☐ Patches, Stripes, American Flag, stow in CF ECOK
   - ☐ Comm cap CF1, stow in CF ECOK
   - ☐☐ Fresnel Lenses (2), stow in CF ECOK
   - ☐ Valsalva, use gray tape to remove adhesive
   - ☐ Pigtail Adapter, stow in EMU Servicing Kit s/n 5005 for return on Shuttle
   - ☐ Remove ISS tethers and tools, stow in A/L1D2 Tether staging area
2. Perform the following:
   - ☐ Install Protective Arm Covers from EMU Equipment Bag
   - ☐ Install Vent Port Plugs from EMU Equipment Bag
   - ☐ Verify Sunshades down, Cover installed on Helmet
3. Remove from Aft EDDA and stow in PMM Endcone

EMU 3010

4. Retrieve from PMM endcone and stow in Airlock

CONFIGURE EMUs 3004, 3018 FOR RETURN

EMU 3004 5. Install in Aft EDDA

EMUs 3004/3018 6. Remove following:

- ☐☐ HL Batteries, stow in M-02 Bag s/n 1038
- ☐ Remove Helmet Light Assembly, ERCA, stow in E-Lk
- ☐☐ REBAs, stow in M-02 Bag s/n 1038
- ☐ Li-Ion EMU Battery, stow in M-02 Bag s/n 1038, 0.5 CTB s/n 1205
- ☐☐ EV1, EV2 ISS Cuff C/Ls (cut out FS pages), stow in EMU Equipment Bag
- ☐☐ Remove ISS tethers and tools, stow in A/L1D2 Tether staging area
- ☐☐ Patches, Stripes, American Flags, stow in respective ECOKs
- ☐☐ Remove comm caps FT1, FN1, stow in respective ECOKs
- ☐ Pigtail Adapter, stow in EMU Servicing Kit s/n 5005 for return on Shuttle

7. Reference STS-134 NOMINAL EMU SIZING {FS 12-27 & FS 12-28} (EMU CONTINGENCY PROCS) for EMU 3004 and EMU 3018; and figure 1, EMU 3010 – Initial Configuration and figure 2, EMU 3010 – Final Configuration

NOTE

1. Reference {1.550 EMU RESIZE} (SODF: ISS EVA SYS: EMU MAINTENANCE) for component changeout steps
2. Reference {5.116 EMU SERIAL NUMBER LOCATION REFERENCE} (SODF: ISS EVA SYS: REFERENCE) for serial number locations
3. All stowed hardware requires a pouch OR cover installed. You can retrieve/stow any needed/extra pouches from A/L1D0 1.0 CTB: EMU Covers, Various Sizes S/N 1163, B/C 004157J
4. Reference {1.330 LTA RESTRAINT INSTALLATION/REMOVAL} (SODF: ISS EVA SYS: AIRLOCK CONFIG) for LTA Restraint Bag and Restraint Strap removal and installation steps

EMUs 3004/3010 8. Swap helmets

- ☐☐ Remove valsalva, use gray tape to remove adhesive
- ☐☐ Verify sunshades down, cover installed

EMU 3004 9. Remove as complete units [Leg Assemblies/Leg Sizing Ring/Boots] and temp stow

10. Remove Size 01 Waist Brief 052, s/n 2094 and temp stow.

11. Install Size 01 Waist Brief 029, s/n 2075 and set waist sizing cams (4) to Short/Short

12. Install protective covers from Pre-Gathered Waist Brief onto Waist Brief 052 and stow in “ISS Stow” mesh bag

13. Re-install [Leg Assemblies/Leg Sizing Rings/Boots]

14. Remove from Aft EDDA and temp stow in Node 1 for transfer to Shuttle

EMU 3010 15. Install on Aft EDDA

16. If boots installed, remove boots, verify no BSI installed and temp stow.
    Report size and s/n to **MCC-H**.
        If Boots are size 02, will be re-installed in step 24.
        If Boots are size 01, install covers, stow in “ISS Stow” mesh bag
    If no boots installed, remove protective covers from Leg Assemblies and temp stow

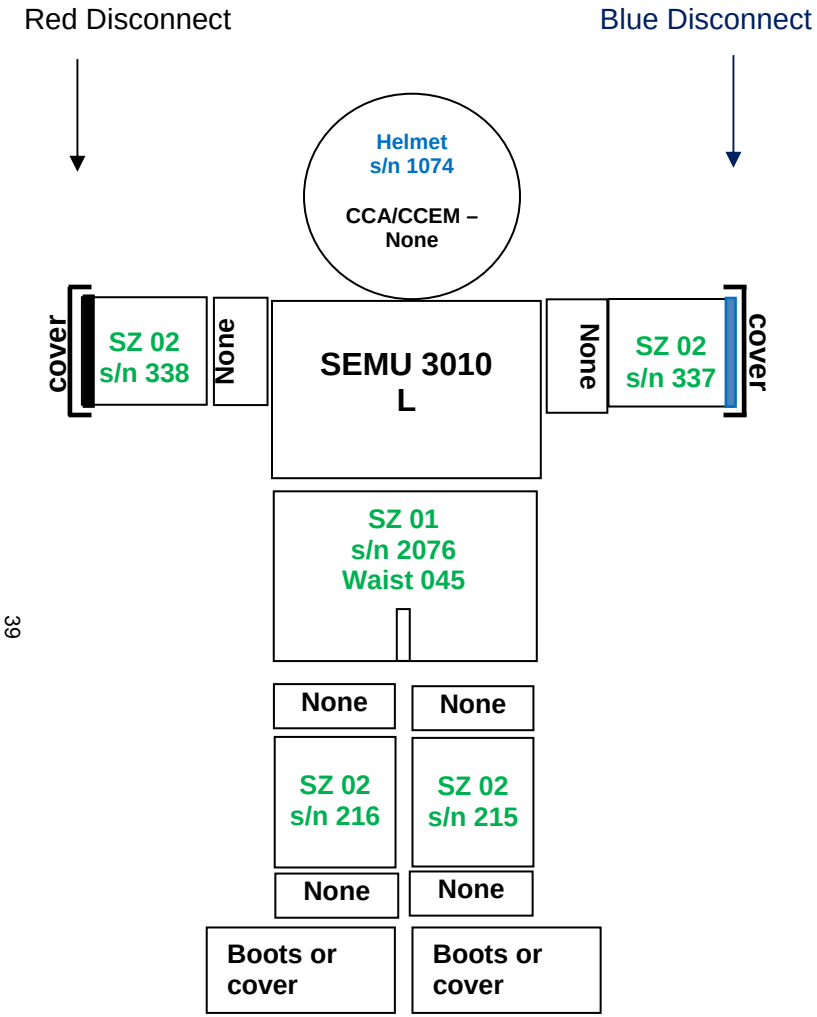


Figure 1 – EMU 3010 – Initial Configuration

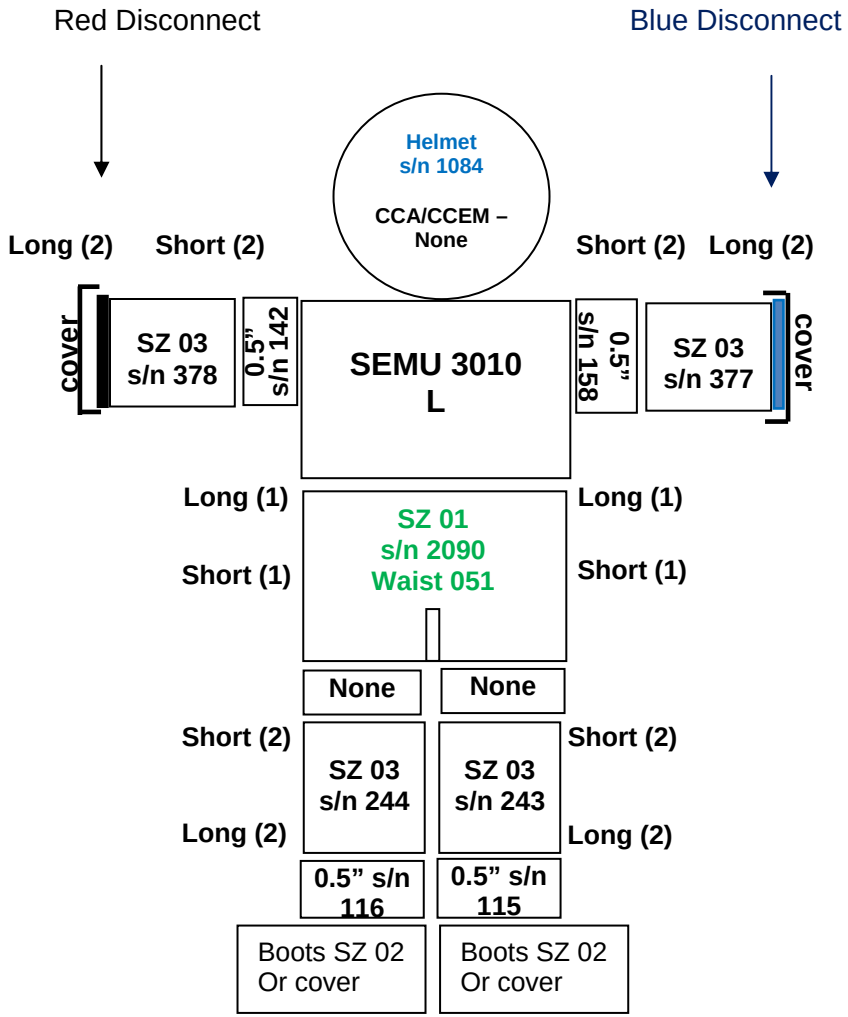


Figure 2 – EMU 3010 – Final Configuration

Blue Font – Indicates component to be swapped with EMU 3004
Green Font – Indicates components to be swapped with EMU 3018
Black Font – Indicates hardware remaining on EMU 3010

Blue Font – Indicates component swapped from EMU 3004
Green Font – Indicates components to be swapped with EMU 3018
Black Font – Indicates hardware already on EMU 3010 or from ISS Pantry

EMU 3018

17. Remove [0.5" Leg Sizing Rings s/n 132,133/Boots s/n 240] and install on EMU 3010

18. Remove Leg Assemblies s/n 277,278
    - Install protective covers
    - Stow in “ISS Stow” mesh bag

19. Remove Waist Brief s/n 051, and temp stow for install on EMU 3010

EMU 3010

20. Remove [Waist Brief s/n 045/Leg Assemblies s/n 215,216/0.5" Leg Sizing Rings s/n 132,133/Boots s/n 240] and install on EMU 3018

21. Install Waist Brief s/n 051 and set cams (4) Long/Short

22. Install Leg assemblies 243, 244 and set cams (8) Short/Long.

23. Install 0.5” Leg sizing rings s/n 115, 116.

24. If boots from step 16 are size 02, reinstall.
    If no boots or boots were size 01, install protective covers

25. Remove Lower Arms s/n 337, 338 and temp stow for install on EMU 3018
    - Remove protective covers

26. Install 0.5” Arm sizing rings s/n 142, 158

27. Install Lower Arms s/n 377, 378 and set cams (8) to Short/Long

EMU 3018

28. Remove EMU Gloves FN1 and temp stow

29. Remove Lower Arms s/n 433, 434
    - Install protective covers
    - Stow in “ISS Stow” mesh bag

30. Install Lower Arms s/n 337,338 and set sizing cams (8) to Short/Long

31. Install EMU Gloves FN1

32. Verify waist cams (4) are Short/Short and leg sizing cams (8) are Short/Long (per FD9 pen and ink to bubble people on FS 12-28)

EMU 3004/
3018 DCMs

33. √O2 ACT – OFF
    √PWR – SCU
    √DCM Purge vlv – Op (up)
    √WATER – OFF, Switch Guard installed

34. Verify/reconfigure EMUs and ECOK per the following table:

EMU 3004 (FT↓)	**EMU 3018 (FN↓)**
☐ LiOH (any used) ☐ Helmet, sunshades down, cover installed ☐ LTA ☐ EMU Gloves FT1 ☐ Wrist Mirrors (2) [swap to worst]	☐ LiOH (any used) ☐ Helmet, sunshades down, cover installed ☐ LTA ☐ EMU Gloves FN1 ☐ Wrist Mirrors (2) [swap to worst]
EMU Crew Options Kit (ECOK) (FT)	**EMU Crew Options Kit (ECOK) (FN)**
☐ FT EVA 1, 2, & 3 Ziplock Bags ☐☐☐ TCUs (top, bottom) ☐☐☐ Socks ☐☐☐ Wristlets ☐☐☐ Comfort Gloves ☐☐☐ Moleskin ☐☐☐ Patch, Stripes, American Flag ☐ LCVG FT1 (w/biomed sternal harness and signal conditioner) ☐ EMU Gloves FT2 ☐☐ Comm caps FT1 & FT2	☐ FN EVA 2, 3 & 4 Ziplock Bags ☐☐☐ TCUs (top, bottom) ☐☐☐ Socks ☐☐☐ Wristlets ☐☐☐ Comfort Gloves ☐☐☐ Patch, Stripes, American Flag ☐ LCVG FN1 (w/biomed sternal harness and signal conditioner) ☐ EMU Gloves FN2 ☐☐ Comm caps FN1 & FN2
EMU Crew Options Kit (ECOK) (CF) ☐ CF EVA 1 & 4 Ziplock Bags ☐☐ TCUs (top, bottom) ☐☐ Socks ☐☐ Wristlets ☐☐ Comfort Gloves ☐☐ Mole Skin ☐☐ Patch, Stripes, American Flag ☐ X Valsalva/Lens Template ☐☐ Fresnel Lenses (2) ☐ LCVG CF1 (w/biomed sternal harness and signal conditioner) ☐☐ EMU Gloves CF1 & CF2 ☐☐Comm caps CF1 & CF2	

SODF LOCKER MF71G — 35. Retrieve new ISS EVA Systems Checklist (white) from STS; deploy in C-Lk

A/L1O1, M-02 Bag s/n 1038 Green Mesh Bag — 36. Retrieve PGT Battery s/n 1004, wrap in bubble wrap, and stow in TOOLS TRANSFER Bag

SYSTEMS TRANSFER Bag

37. Configure/verify contents of SYSTEMS TRANSFER Bag per following table:

SYSTEMS TRANSFER Bag
Verify already in Bag: ☐☐☐ ISS Cuff Checklists (3) (old) ☐☐ CREWLOCK DEPRESS/REPRESS Cue Card (2) old ☐ STS-133 ISS EVA Systems Checklist (old) ☐☐☐☐☐☐ EMU LiOH (6) (used)
Configure: ☐ STS-134 CONSUMABLES TRACKING/BATTERY RECHARGE PLAN CUE CARD ☐ EMERGENCY UNDOCKING/EVA TRANSFER CUE CARD ☐ CREWLOCK DEPRESS/REPRESS CUE CARD – Mark's ☐ ISLE PREBREATHE Cue Card with Data from EVA #3 ☐ STS-134 ISS EVA Systems Checklist (Brown stripe) (Brown stripe copy bring back to STS; leave white copy*****) ☐☐ STS-134 EVA CHECKLIST (2) (SPARE and MASTER)

*****Retrieve white copy from MF71G

38. Stow the following ISS equipment

ISS STOW:

A/L1O1, M-02 Bag s/n 1010	☐ Waist Brief SZ 01 s/n 2094/052 (from EMU 3004)
	☐☐ Lower Arms SZ 02 s/n 433, 434 (from EMU 3018)
	☐☐ Boots size 01 if they were installed on EMU 3010 (step 16)
2.0 CTB s/n 1082	☐☐ Leg Assemblies SZ 02 s/n 277, 278 (from EMU 3018)
A/L1D0_Behind Closeout, 1.0 CTB s/n 1163	☐☐ Sizing Ring pouches (2)

Stow H2O Recharge Bag, Miscellaneous ULF6 Pre-gather

NOD2O2	☐ CWC s/n 1059
NOD1P4_A1 0.5 CTB EMU Water Processing Kit, s/n 1086	☐ Shuttle Blue/Blue Hose s/n 5010
	☐☐ Red/Yellow QD Adapter (2)
Temp Stow	☐☐ PWRs s/n 1007, 1026 Will be filled on Shuttle on FD14 by Mark
PMM_Endcone 0.5 CTB s/n 1258	☐ Helmet Light Assembly s/n 1008 (originally in EVA Systems 2 mesh bag, was not used)

MSG 143 - STORRM Summary

STORRM sensors performed phenomenally during rendezvous and docking! Due to your quick actions, STORRM experienced minimal impacts due to the funnies we encountered. Preliminary analysis shows VNS acquisition near the 5.7 km maximum capability of the VNS, greatly exceeding the requirement of 5.0 km. STORRM also collected beautiful images with the docking camera, including views of the Earth, ISS, and stars from about 60km through docking. We retrieved sufficient data during docked ops to determine what configuration file changes are needed to support Undock and Re-RNDZ. Photogrammetry images met STORRM needs as well. We plan to uplink a STORRM Undock/Re-rendezvous message prior to undocking that will give you more details on any procedure/timeline changes that will be needed for STORRM on undock day.

Background on a few STORRM issues encountered during rendezvous and docking ops:

- Starting around 300 feet, the DRU3 write rate changed to higher than expected– We have added a DRU3 Checkout activity to today (FD13) to assess the current state of the write process. We expect this checkout to confirm that the problem is now corrected due to power cycles of the system. We have adjusted configuration file settings to accommodate the impact for UNDOCK/RE-RNDZ. If the problem persists, it will require actions from you during UNDOCK/RE-RNDZ/SEP. For the DRU3 checkout activity, we'll have you perform a modified STORRM Tools Checkout procedure that is Msg 144. We'll also use this modified Tools Checkout procedure for the STORRM Tools Checkout on FD14.
- STORRM Application did not switch to TCS for range source during rendezvous– Root cause has been determined and will not cause an issue during UNDOCK or SEP phases. If the issue recurs during RE-RNDZ, it is OK to stay on SV since we are not proceeding inside 600 feet.
- The STORRM Docking Camera did not mode properly when the active command was sent from the software - we saw this phenomenon sporadically during pre-flight testing during the commands in the initialization sequence. We don't expect this to happen again since in our experience it did not happen regularly, however; we will be watching carefully and will ask you to send the Docking Camera the manual command to ACTIVE if necessary as you did during rendezvous.
- DRU temperature – The DRU temperatures are not behaving as predicted. Due to things running hot, there will be a small operational change between UNDOCK and RE-RNDZ phases to help cool things down. We'll have you exit the software after 19,000 ft which will cause the AEA to power off and we'll then have you re-start the software right after the MC5 burn.
- DRU3 had a reset during Data Retrieval - We experienced intermittently throughout the STORRM pre-flight testing. This was one of the failures we threw you during the STORRM Demo in Boulder - you did a great job bringing the system back up both times!
- During Data Retrieval on the day after the STORRM AP swap - we had intermittent interruptions to our DRU Ethernet communication. The STORRM CABLE TROUBLESHOOTING procedure that Mark performed for us looks like it recovered the Ethernet.
- PDU alert during rendezvous - a PDU current limit was set too low in the STORRM Application. We changed the limit in the configuration file so this alert will not persist during future operations.
- The blank screen you experienced when you opened the STORRM PGSC - this will happen if the lid is closed while Windows is booting up so we recommend not closing the lid until after that process completes.

END OF PAGE 1 OF 1, MSG 143

MSG 144 - Modified STORRM Tools Checkout

SSP2 1. STORRM AVIONICS PWR - ON (tb-gray)
2. STORRM SNSR PWR - ON (tb-gray)
3. STORRM LASER - ON (tb-gray)

4. Verify S-Video connection to AVIU. If disconnected, reconnect followed by pwr cycle of PGSC before proceeding.

PGSC 5. Start STORRM App
5.1. Select Shuttle Apps icon
5.2. Select STORRM folder
5.3. Select STORRM icon

6. √System Mode = Initialization, then Idle (approx. 2 min.)

NOTE
STORRM application window must be selected in order for the function keys to operate correctly

7. Select STORRM application window

NOTE
PGSC Alert is expected during periods the Rndz Nav software is disabled.

8. Verify proper STORRM operation
8.1 √DRU1 Powered - green lt on
8.2 √DRU3 Powered - green lt on

If DRU3 C/O (FD13):
8.3 √Range source lamp - red lt on
If STORRM TOOLS C/O (FD14):
8.3 √Range source lamp - green lt on

8.4 Select [F4] DRU 1 Sub-System Alerts screen
√ DRU 1 status mode = 1
8.5 Select [F5] DRU 3 Sub-System Alerts screen
√DRU 3 status mode is 1
8.6 Select [F9] Sensor Enclosure Sub-System Alerts screen
√Temp08_SE_1: +5.0° < T < 42°C
√Temp09_SE_2: +5.0° < T < 42°C
8.7 Select [F1] Main Screen

If DRU3 C/O (FD13):
8.8 √Only PGSC alert on the Alerts Bar
If STORRM TOOLS C/O (FD14):
8.8 √ No Alerts on Alerts Bar

* If any above indications not seen, Notify MCC *
* Select [F2] Alerts Page *
* Check cable connections but do not disconnect *
* Select [Clear All] to clear alerts *
* Wait 1 min *
* If alert still present, √MCC *
* Select [F1] Main Screen *
* *

END OF PAGE 1 OF 3, MSG 144

9. Phase Select → 01-TOOLS-CHECKOUT

00:00 10. MODE Select → DATA COLLECTION → Accept MODE

11. Verify 01-TOOLS-CHECKOUT box checked and System Mode = Data Collection

12. Select [F4] DRU 1 Sub-System Alerts screen
    Verify DRU1 Communications Status TLM Counter - incrementing

13. Select [F5] DRU 3 Sub-System Alerts screen
    Verify DRU3 Communications Status TLM Counter - incrementing

14. Select [F1] Main Screen

NOTE

Ignore DC ALERT during this process.

After initiating the DATA COLLECTION mode command, a 14 minute automated process begins. For the first 10 minutes of this process the VNS is warming up and the System Busy light will be on. Then the DC will perform a Built In Test (BIT) and go to standby. Also the VNS will become active and collect data for 2 minutes. During this 2 minutes, the DC and VNS age counters will become active (increment and reset to zero) and the DC image will appear as shown in Figure 1 below. During the last 2 minutes of this process the VNS remains active and the DC becomes active so the DC image will go live. After 14 minutes, the automatic process will shut off the VNS and DC. The images on the screen will go black until the application is commanded to IDLE.

~10:00

15. √VNS Range Age counter is incrementing (0 to 30)
16. √R (VNS Est) is between 4700 and 5400 ft
17. Verify Docking Camera test image is as shown in Figure 1 below or is a live image

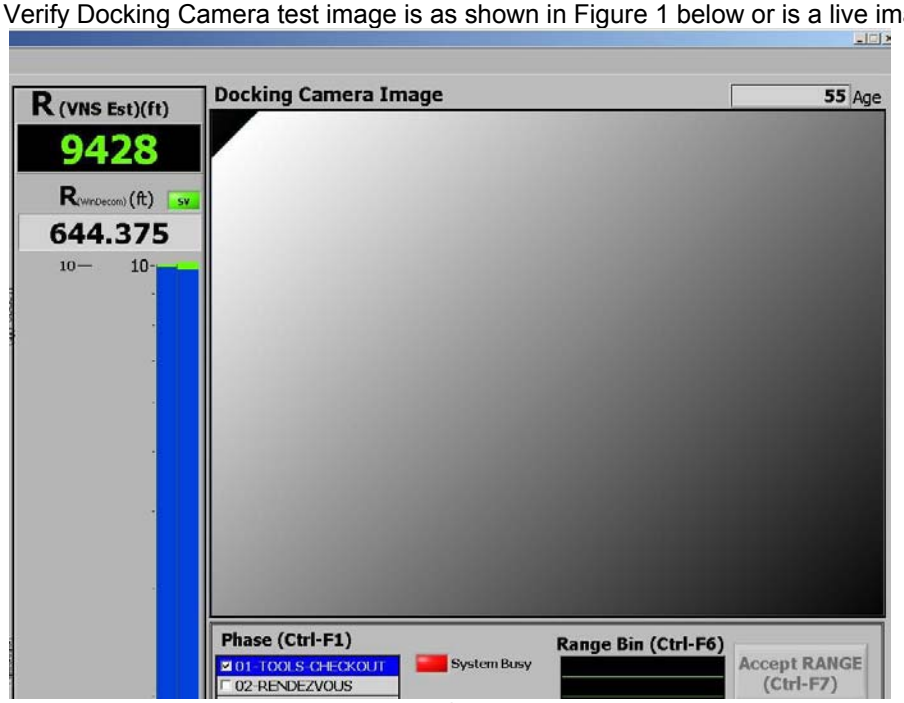


Figure 1 - Docking Camera Test Image

If DRU3 C/O (FD13):
  18. √Range Source lamp is lit red and R(WinDecom) is red text
If STORRM TOOLS C/O (FD14):
  18. √Range Source lamp is lit green and R(WinDecom) is black text

+14:00

19. Verify proper STORRM operation
  19.1 √System Busy - red lt off
  19.2 √VNS Powered - green lt off
  19.3 √DC Powered - green lt off
  19.4 √DRU1 Powered - green lt on
  19.5 √DRU3 Powered - green lt on

* If any above indications not seen, Notify MCC *
* Select [F2] Alerts Page *
* Check cable connections but do not disconnect *
* Select [Clear All] to clear alerts *
* Wait 1 min *
* If alert still present, √MCC *
* Select [F1] Main Screen *
* *

20. Mode Select → IDLE → Accept MODE
21. √System Mode = Idle

22. Shutdown STORRM application [Ctrl-Shift-F12]
23. √System Mode = Termination
24. √STORRM application window closed

SSP2 25. STORRM LASER PWR - OFF (tb-bp)
26. STORRM SNSR PWR - OFF (tb-bp)
27. STORRM AVIONICS PWR - OFF (tb-bp)

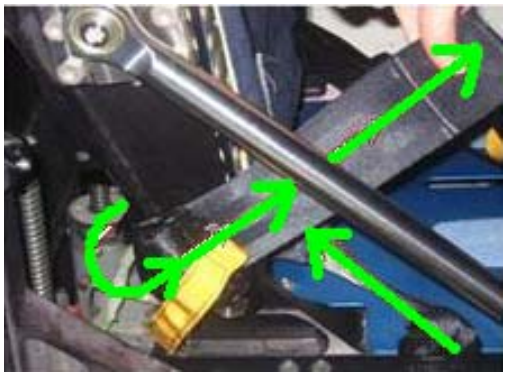
On MCC GO,
  28. STORRM PGSC pwr - off

MSG 145 - Spinal Elongation Overview

CDR Kelly and PLT Box, these are intended to provide a brief overview and emphasize the important parts of the procedure to ensure successful data collection.

Operational Overview

- The Spinal hardware is unstowed from ISS and installed on the CDR seat.
  - The CDR seat is configured high enough and all the way forward to ensure consistency between measurements and to ensure proper subject placement.
  - The lap belts of the CDR seat should be wrapped around the joint to ensure the subject is properly restrained in the seat and that the lap belt adjustment is accessible.



  - The Anthropometer is mounted such that the head rest pin in the seat aligns with the hole in the leg of the Anthropometer Base and that all the numbers on the Slider Post and Head Bar face the camera.

- A camera is mounted on a multi-use arm and installed in the R6 camera shoe.
- A test photograph is taken and downlinked for the experiment team to verify the initial set-up configuration.
  - In this picture we are ensuring the view is directly orthogonal with the CDR seat and that the seat pan, seat back and top of the anthropometer are visible. Focus should be on the side of the CDR seat. Data is captured from the pictures and a straight orthogonal view will provide the best data. Example pictures are available in the procedure.
- Once the configuration is verified, the subject is positioned and fastened in the seat.
- Spinal Log is in manilla envelope inside back cover of ASSY OPS.
- Data collection is taken for each subject.
  - One session includes two measurements each from the Anthropometer and pictures. Subjects should stretch in between each set of measurements by unbuckling the lap belt, float away/stretch, and repositioning for the second set of measurements.
  - Make sure to keep the camera parallel to the R6 wall and not pitched to deck or overhead for a direct orthogonal view.
  - The measurement number might differ between the two measurements. It is more important to have the subject positioned the same for both trials, even though the numbers might vary.
  - Ignore sensation of not feeling contact with the seat, as long as restrained tightly with the correct method you will be in contact with the seat (if additional data points are attempted please record on log and note how the data point was different from nominal procedures).
- The data collection images are downlinked.
- The Spinal hardware is disassembled, CDR seat reconfigured, and hardware stowed per Return Item 737.

END OF PAGE 1 OF 1, MSG 145

ULF6 FD 13 Stowage Notes

MYCO-STS SAMPLE-CLCT (PLT) - 147/23:56

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**Distributed to crew on FD12**	Myco Kit	MK-1	021	MYC01021N	
Type: Restow						
2	**JPM1_Deployed**	Myco Kit	MK-1	021	MYC01021N	Used for MYCO-ULF6-MELFI INS.

CDRA-BED-R&R (MS1/MS4) - 148/03:06

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**Crew Preference**	Disposable Gloves				NOD1O4_C1 - Glove Pantry
2		Digital Camera				Deployed
3		Dry Wipes				PMA1 - USOS Hygiene Resupply
4		Kapton Tape				NOD1O4_B1 - Tape Pantry
5		Sharpie				NOD1O4_C1 - Office Supply Pantry
6		Ziplock Bag				NOD2O1 - Ziplock Pantry
7		Braycote				NOD1O4_A2 - 12x12 Ziplock Bag

8	**NOD1D4_G2** Drawer 2	Ratchet, 1/4" Drive	SKG33117562-939			
9		Ratchet, 3/8" Drive	SKG33117562-938			
10		3/8" to 1/4" Adapter	TM1			
11		(10-50 in-lbs) Trq Wrench, 1/4" Drive	SEG33112395-301	M206422		
12		(40-200 in-lbs) Trq Wrench, 1/4" Drive	SEG33112394-301	M206421		
13		3/8" Socket, 1/4" Drive	SKG33117562-699			
14		5/16" Socket, 1/4" Drive	SKG33117562-697			
15		9/16" SOCKET, 1/4" DRIVE	TMD18			
16		4" Ext, 1/4" Drive	SKG33117562-764			
17		6" Ext, 1/4" Drive	SKG33117562-765			
18		10" Ext, 1/4" Drive	SKG33117562-766			
19		Universal Joint, 1/4" Drive	SKG33117562-010			
20	**NOD1D4_G2** Drawer 3	(200-1000 in-lbs) Trq Wrench, 3/8" Drive	SEG33117289-303	M213579		
21		2" Crowsfoot, 3/8" Drive	SEG33114127-303			
22	**NOD1D4_G2** Drawer 4	Small Needle Nose Pliers	SKG33117562-770			If required.

23	**NOD3_Deployed**	8.5" Handrail	SEG33117290-301	1033		
24	**NOD3F5**	Wet/Dry Vacuum Cleaner	SEG39125637-303	1009	BCC00374J	
25	**PMM1P1_A2** 0.5 CTB S/N 1265 Vacuum Acc./Hair Cuts	Tool Pouch Assembly		1004		
26		Crevis Tool	SDG39125646-001			
27	**JPM1F2** 5 MLE Stowage Bag: Bag C	CDRA Desiccant/Sorbent Bed	2352540-1-3	D0002	00143836J	Resupply Item 27.1
Type: Restow						
28	**Ref. Transfer List Return Item #709**	CDRA Desiccant/Sorbent Bed	2352540-1-3	D0003		

SPINAL-H/W-SETUP (CDR) - 148/08:06

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**JPM1F6_B1**	Spinal Elongation Kit	SJG46121776-301	1004	HRF09342J	

SPINAL-H/W-SETUP (PLT) - 148/08:06

#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**JPM1F6_B1**	Spinal Elongation Kit	SJG46121776-301	1004	HRF09342J	

CDRA-FRAME-INSTALL (MS1/MS4) - 148/08:11						
#	Location	Item Name	P/N	S/N	B/C	Notes
Type: Standard						
1	**Crew Preference**	Digital Camera				Deployed
2		Dry Wipes				PMA1 - USOS Hygiene Resupply
3		Velcro Strap				NOD1O4_B1 - Tape Pantry
4		Kapton Tape				NOD1O4_B1 - Tape Pantry
5		Gray Tape				PMM1P1_D - Tape Pantry
6		Sharpie				NOD1O4_C1 - Office Supply Pantry
7		Ziplock Bag				NOD2O1 - Ziplock Pantry
8	**JLP1P1_G** G, B/C BOE430J	Coldplate/Wireway Covers Kit (Cookie Sheets)	SJG33111361-301			If required.
9	**NOD1D4_B1** Misc Strap Ziplock	Adjustable Length Tether	G11F5140-1	024		
10	**NOD1D4_G2** Drawer 2	Ratchet, 1/4" Drive	SKG33117562-939			
11		4" Ext, 1/4" Drive	SKG33117562-764			
12		5/32" Hex Head, 1/4" Drive	SKG33117562-742			
13		(40-200 in-lbs) Trq Wrench, 1/4" Drive	SEG33112394-301	M206421		
14		9/16" SOCKET, 1/4" DRIVE	TMD18			
15	**NOD1D4_G2**	Static Wrist Tether	SKG33117562-			

	Drawer 5		335			
SPINAL-H/W-STOW (CDR) - 148/12:11						
#	**Location**	**Item Name**	**P/N**	**S/N**	**B/C**	**Notes**
Type: Restow						
1	**Ref. Transfer List Return Item #737**	Spinal Elongation Kit	SJG46121776-301	1004	HRF09342J	

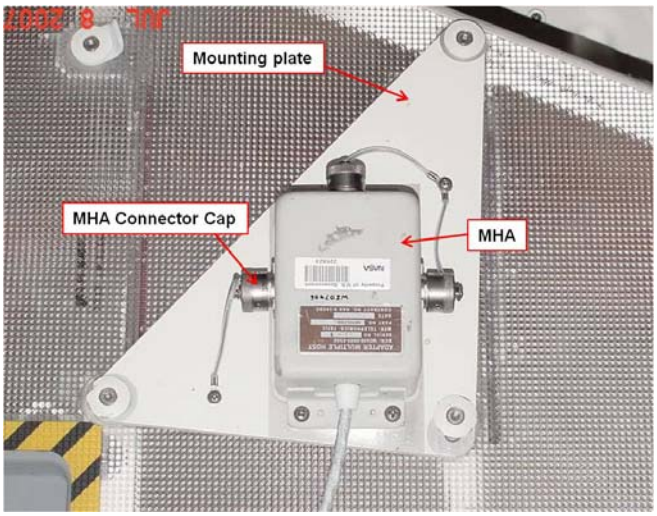
MSG 147 - MHA Installation in Middeck Ceiling

OBJECTIVE: Install MHA to Middeck Ceiling

LOCATIONS: Middeck ceiling near airlock

TOOLS REQD:

MA16D 1/8" Allen Driver
3/16"socket
1/4" Driver Handle
#8 Torque-tip screwdriver



1. Retrieve MHA, mounting plate, screws and locking nuts from crew temp stow location
2. Install MHA to mounting plate (four torque-tip screws, four self-locking nuts, #8 Torque-tip screwdriver, 3/16" socket). Hand-tighten MHA screws

* If torque-tip screws do not engage *
* nuts sufficiently, remove velcro from *
* back of MHA, and re-install screws *

3. Install MHA and mounting plate to middeck ceiling (three fasteners, 1/8" Allen Driver). Hand-tighten fasteners

MO39M

4. √ MID DECK COMM CCU PWR - OFF
5. Mate MHA cable to MO39M
6. MID DECK COMM CCU PWR - ON
7. Perform comm check with QDMs, verifying J1, J2, and J3 ports
8. MID DECK COMM CCU PWR - OFF
9. Connect QDM/HHM connections as required, report config to MCC
10. MID DECK COMM CCU PWR - ON (as required)
11. Stow tools

END OF PAGE 1 OF 1, MSG 147

FD12 MMT Summary

The MMT met today to review orbiter systems and mission progress. The mission is proceeding very well including the successful completion of EVA 4.

RCC is cleared for entry. OPO provided a summary of the assessments and there were no concerns noted.

During EVA 4 debris was noted floating when the crew was on the P3 truss segment near the SARJ. Preliminary assessment indicates that it was likely a label and is not considered a concern.

Great job executing 4 fantastic EVAs!

Cryo margins above a 16+0+2 mission: 1 day 13 hours non-SSPTS; 3 days 3 hours SSPTS.