



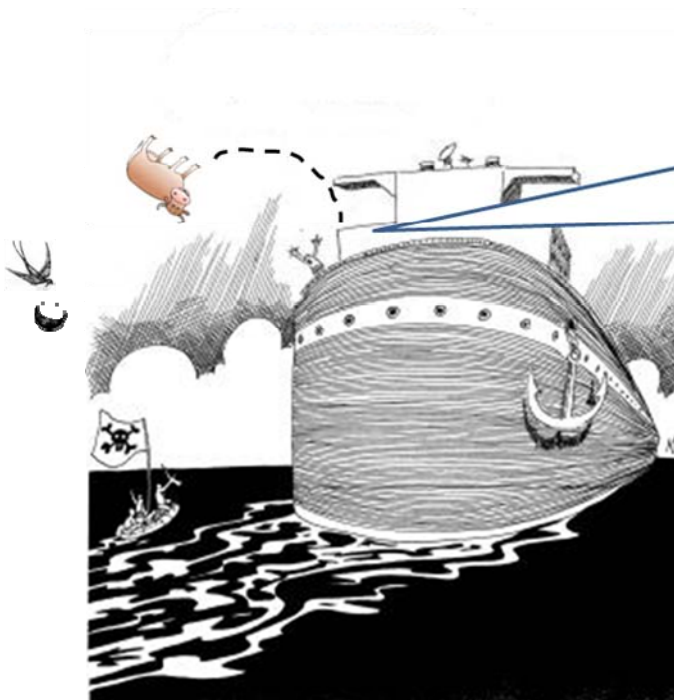
STS-129/ULF3

FD 05 Execute Package

MSG	Page(s)	Title
029A	1 - 14	FD05 Flight Plan Revision
030	15 - 16	FD05 Mission Summary
031	17	FD04 MMT Summary
032	18 - 19	FD05 Transfer Message
033	20 - 22	OCA 48 Mbps Troubleshooting Procedure
034	23	FD05 Crew Choice Downlink
039	24	FD05 EVA Deltas
040	25	FD05 LiOH Swap
041	26 - 44	4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

Approved by FAO:

Gail Hansen



You ... cheesy mustache faced Flight Director pirate wanna-be. Now go away or I shall taunt you a second time!!!

Thwarted again, Sarafin goes back to his day job.

MSG 029A - FD05 FLIGHT PLAN REVISION

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MSG INDEX

<u>MSG NO.</u>	<u>TITLE</u>
MSG029	FD05 Flight Plan Revision
MSG030	FD05 Mission Summary
MSG031	FD04 MMT Summary
MSG032	FD05 Transfer Message
MSG033	OCA 48 Mbps Troubleshooting Procedure
MSG034	FD05 Crew Choice Downlink
MSG035	FD05 PAO Event Summary-CBS News / WTVF-TV, Nashville, TN / Fox News Radio
MSG036	FD05 PAO Event Summary-Tom Joyner Syndicated Radio Show
MSG037	FD05 PAO Event Summary-ESPN SportsCenter / BET News / WRIC-TV, Richmond, VA
MSG039	FD05 EVA Deltas
MSG040	FD05 LiOH Swap
MSG041	4.007 HRF Ultrasound Board Replacement and Test

1. Post-Sleep Cryo Config

For today's Post-Sleep cryo config, O2 Tanks 1 and 2 and H2 Tanks 1 and 5 will be active.

**R1 O2,H2 MANF VLV TK1 (two) - OP (tb-OP)
O2 TK2 HTRS A,B (two) - AUTO**

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

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 and H2 Tanks 1 and 5 active.

A15 CRYO TK5 HTR O2 A - AUTO

**R1 O2 TK2 HTRS A,B (two) - OFF
O2,H2 MANF VLV TK1 (two) - CL (tb-CL)**

MSG 029A - FD05 FLIGHT PLAN REVISION

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2. Shortly after the completion of the EVA today we lost the SSV video. To troubleshoot the loss of SSV video to the ground, request the crew check the following configuration and setting on the SSV machine. These steps can be found in the Photo/TV Flight Supplement book, page FS 1-9 under the Config SSV settings.

IN SEL - NTSC
Mode - 3
OUTRATE - 2
SSV Pwr - on
Check Pwr LED illum
Check ENC DATA LED flickering
Check FRM DATA LED flickering
Check FILL FRM pulsing

3. Reminder- Please make sure that you leave IDPs powered ON for at least 30 seconds prior to powering OFF. This is a lifetime issue for the heads on the hard drive of the IDP.

4. Payload Updates:

ABRS

Pen & Ink ASSY OPS with the following (2 location updates):

ABRS ASCENT FILTER CHANGEOUT, pg. 139, MATERIALS

WAS:

6x6 Ziplock Bag P/N 528-50000-2

IS:

6x6 Ziplock Bag P/N 528-50000-2 (located in ABRS Stowage Bag, MF28G)

ABRS TRANSFER MDDK TO ISS, pg 145, PARTS

WAS:

EXPRESS RACK Data Cable (38") (683-44267-2) (JPM1F6_F1)

IS:

EXPRESS RACK Data Cable (38") (683-44267-2) (LAB102_M1)

SPINAL

During data collection it is helpful to raise the seat pan of the CDR seat slightly above the center console. For consistency between subjects, the lap belt should be tight enough to ensure contact with the seat, though subjects may not feel good contact.

HRF Ultrasound Board

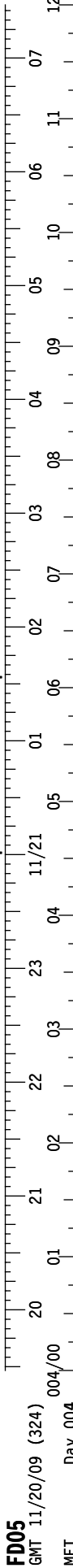
Scorch, today you will be performing the HRF Ultrasound Board Replacement activity. Reference JEDI **MSG 041: 4.007 HRF ULTRASOUND BOARD**

REPLACEMENT AND TEST on ISS. Reminder, please be mindful of Electrostatic Discharge when handling electronic components.

5. REPLACE PAGES 2-14 AND 2-16, 3-44 THROUGH 3-53.

NO UNISOLATED EXERCISE
[MT Translate]

REPLANNED

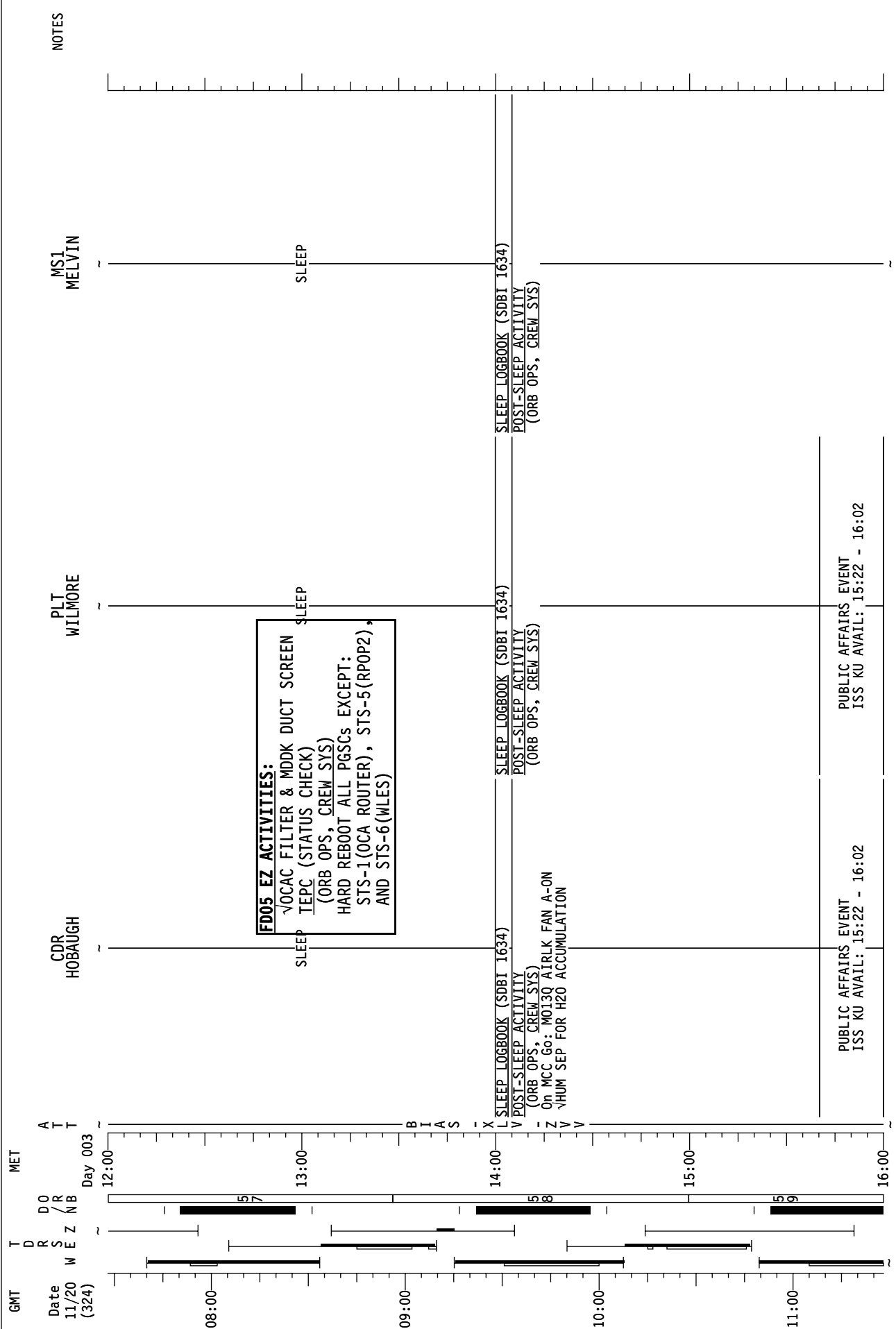


CDR HOBGAUGH	REMLSCG2 RPL	EVA PROC REVIEW	PRE SLEEP PMC A/G	PRE SLEEP	SLEEP			
PLT WILMORE	EXERCISE	EVA PROC REVIEW	PRE SLEEP	PRE SLEEP	SLEEP			
MS1 MELVIN	REMXTXB MLDFAFR SCDFEIT G2KREI RCPK	EVA PROC REVIEW	PRE SLEEP	PRE SLEEP	SLEEP			
MS2 BRESNIK	EVA TOOL CONFIG	EVA PROC REVIEW	PRE SLEEP	MASK PB/TOOL CONFIG 10.2 DPRS	SLEEP			
MS3 FOREMAN	EVA TOOL CONFIG	EVA PROC REVIEW	PRE SLEEP	MASK PB/TOOL CONFIG	SLEEP			
MS4 SATCER	EXERCISE	EVA PROC REVIEW	PRE SLEEP	PRE SLEEP	SLEEP			
DAY/NIGHT ORBIT	65	66	67	68	69	70	71	72
TDRS WEZ								
ORB ATT MT/SSRMS POS								
NOTES								

S T S - 1 2 9

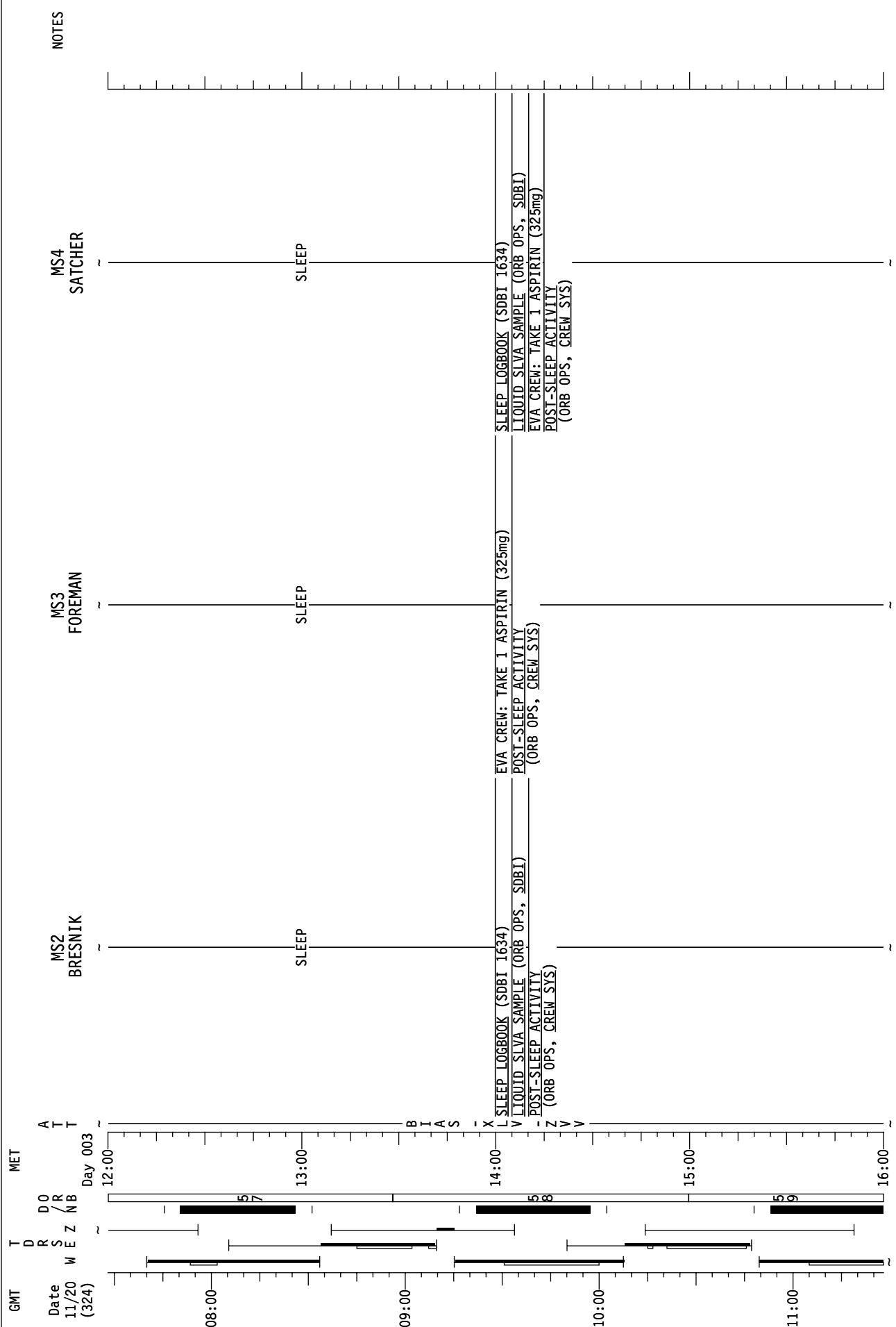
STS-129/U/LF3 FD05

REPLANNED



STS-129/U/LF3 FD05

REPLANNED



STS-129/ULF3 FD05

REPLANNED

GMT	Date 11/20 (324)	T D R S W E Z	MET Day 003	CDR HOBAUGH	PLT WILMORE	MS1 MELVIN	NOTES
16:00				POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
17:00				TMU STAR OF OPPTY ALIGN (ORB OPS, SNC) SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) INIT FILL #5 Ref. MSG 017 LIQH SWAP Ref. Transfer List: Items 9,10,17, 18, 729, 729A, & MSG 040	TRANSFER OPS Ref. Transfer List & MSG 032	DAILY TRANSFER LIST UPDATE Ref. Transfer List & MSG 032	
18:00				X SPINAL ELONGATION STND HEIGHT LOG (CC) SUBJ TRANSFER OPS Ref. Transfer List & MSG 032	TRANSFER OPS Ref. Transfer List & MSG 032	TRANSFER OPS Ref. Transfer List & MSG 032	
19:00				N2 REPRESS USING PAYLOAD N2 VLVS A HRF USND-ULTRASOUND: 4.007 ULTRASOUND CHANNEL BOARD REPLACEMENT AND TEST Perform Steps 1.3-1.17 Ref. Resupply Xfer List; Item 59 Ref. MSG 029, Item 4 & Ref. MSG 041	TRANSFER OPS Ref. Transfer List & MSG 032	TRANSFER OPS Ref. Transfer List & MSG 032	
20:00				SHUTTLE/ISS H2O CNTR FILL (ORB OPS, ECLS) INIT FILL #6 Ref. MSG 017	TRANSFER OPS Ref. Transfer List & MSG 032	TRANSFER OPS Ref. Transfer List & MSG 032	

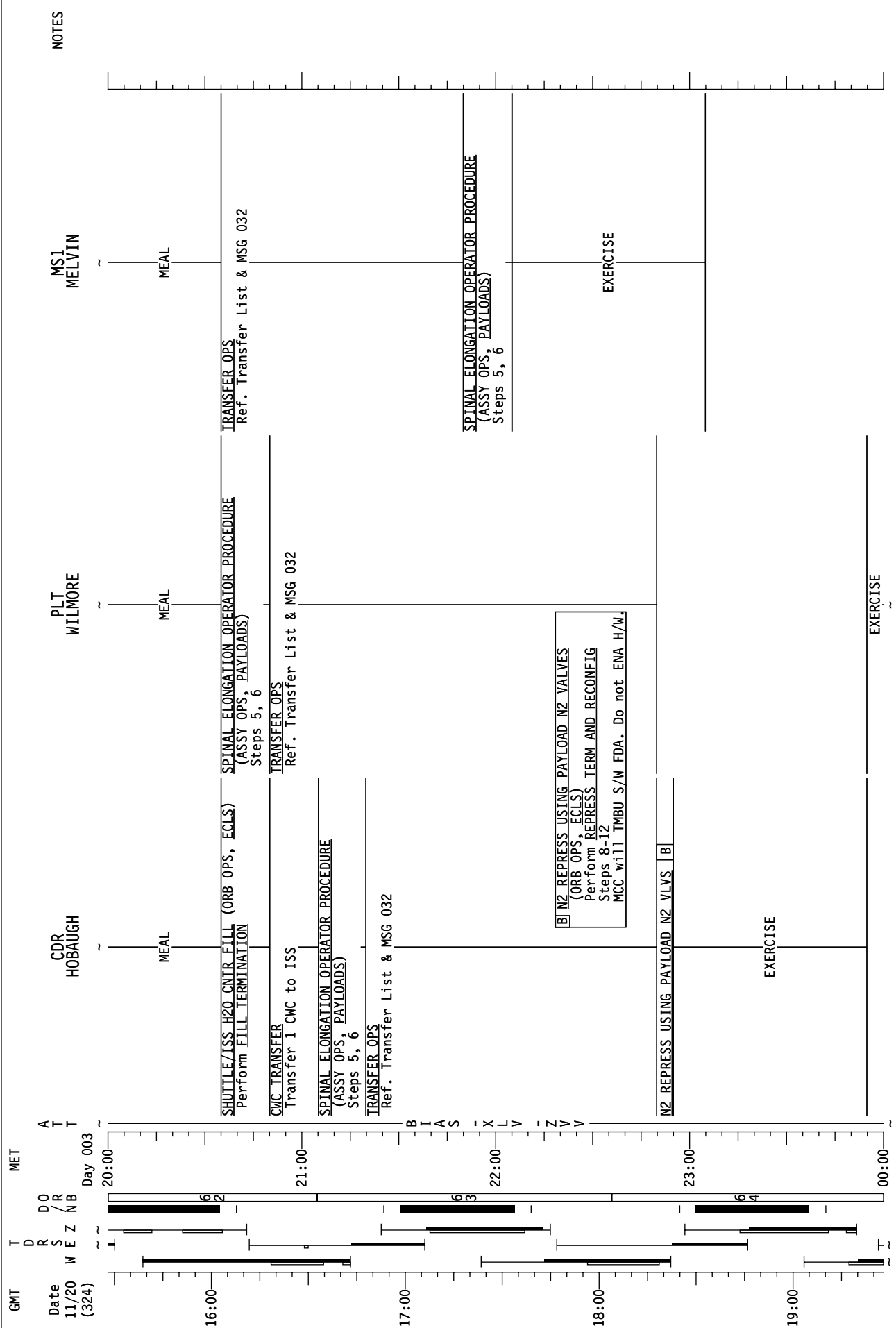
STS-129/ULF3 FD05

REPLANNED

GMT	MET	Date 11/20 (324)	T D R S W E Z	DO /R NB	A T T	MS2 BRESNIK	MS3 FOREMAN	MS4 SATCHER	NOTES
16:00	Day 003					POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
17:00						TRANSFER OPS Ref. Transfer List & MSG 032	SPINAL ELONGATION STND HEIGHT LOG (CC) SUBJ POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	SPINAL ELONGATION HEIGHT LOG (CC) OPS	
18:00						SPINAL ELONGATION STND HEIGHT LOG (CC) SUBJ TRANSFER OPS Ref. Transfer List & MSG 032	SPINAL ELONGATION HEIGHT LOG (ASSY OPS, CUE CARD) Perform OPS	PUBLIC AFFAIRS EVENT ISS KU AVAIL: 16:59 - 17:36	
19:00						EXERCISE	EXERCISE	ROBOTICS: 1.173 JEMRMS MNVR TO STOWED POSN AFTER EE LUBE	
20:00						EXERCISE	POST-EVA CONFERENCE Media Format: Crew Preference Discuss EVA and Future Impacts	ROBOTICS: 1.109 JEMRMS DEACTIVATION PREP	
						MEAL	MEAL	TRANSFER OPS Ref. Transfer List & MSG 032	
						MEAL	MEAL	MEAL	

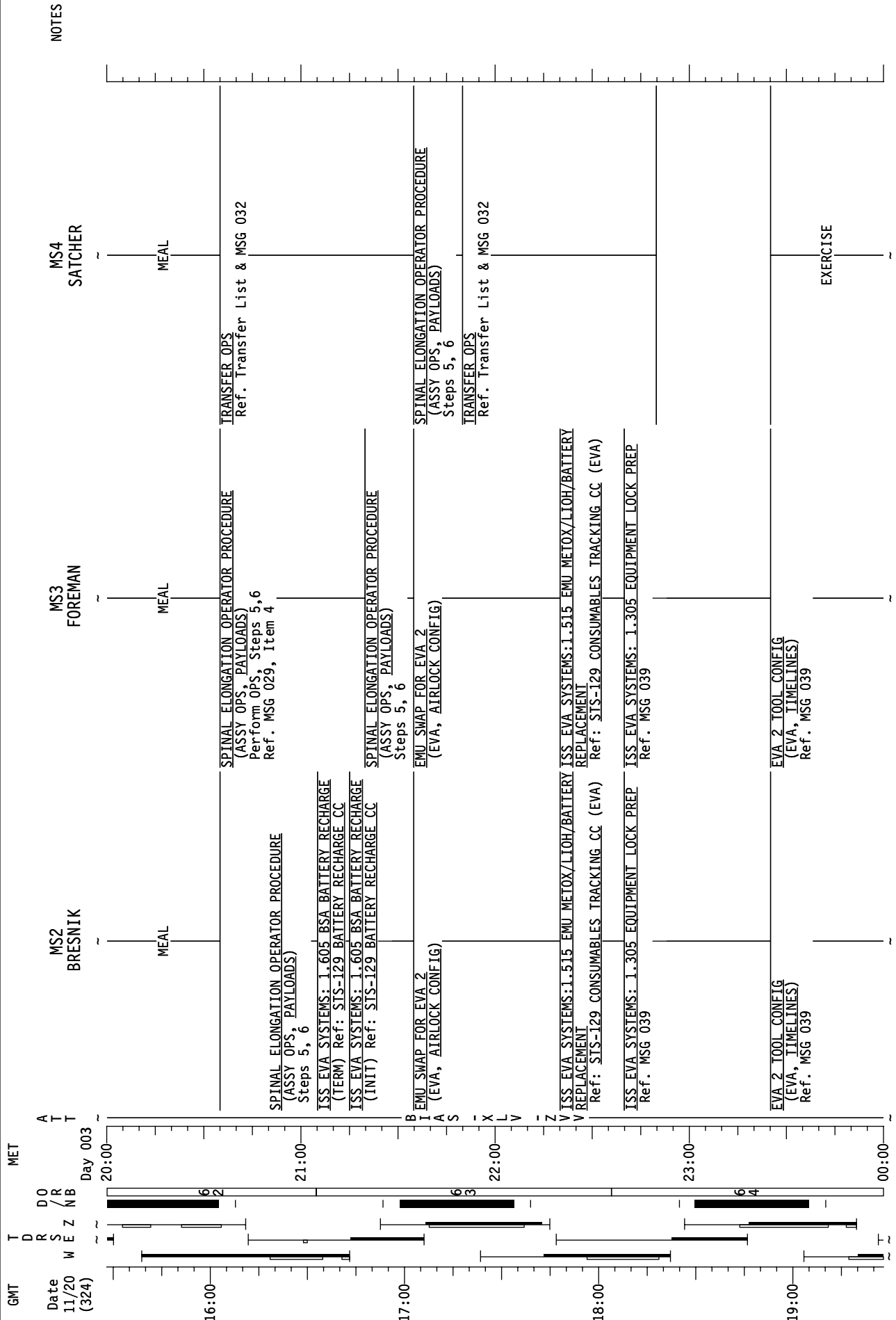
STS-129/U/LF3 FD05

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STS-129/U/LF3 FD05

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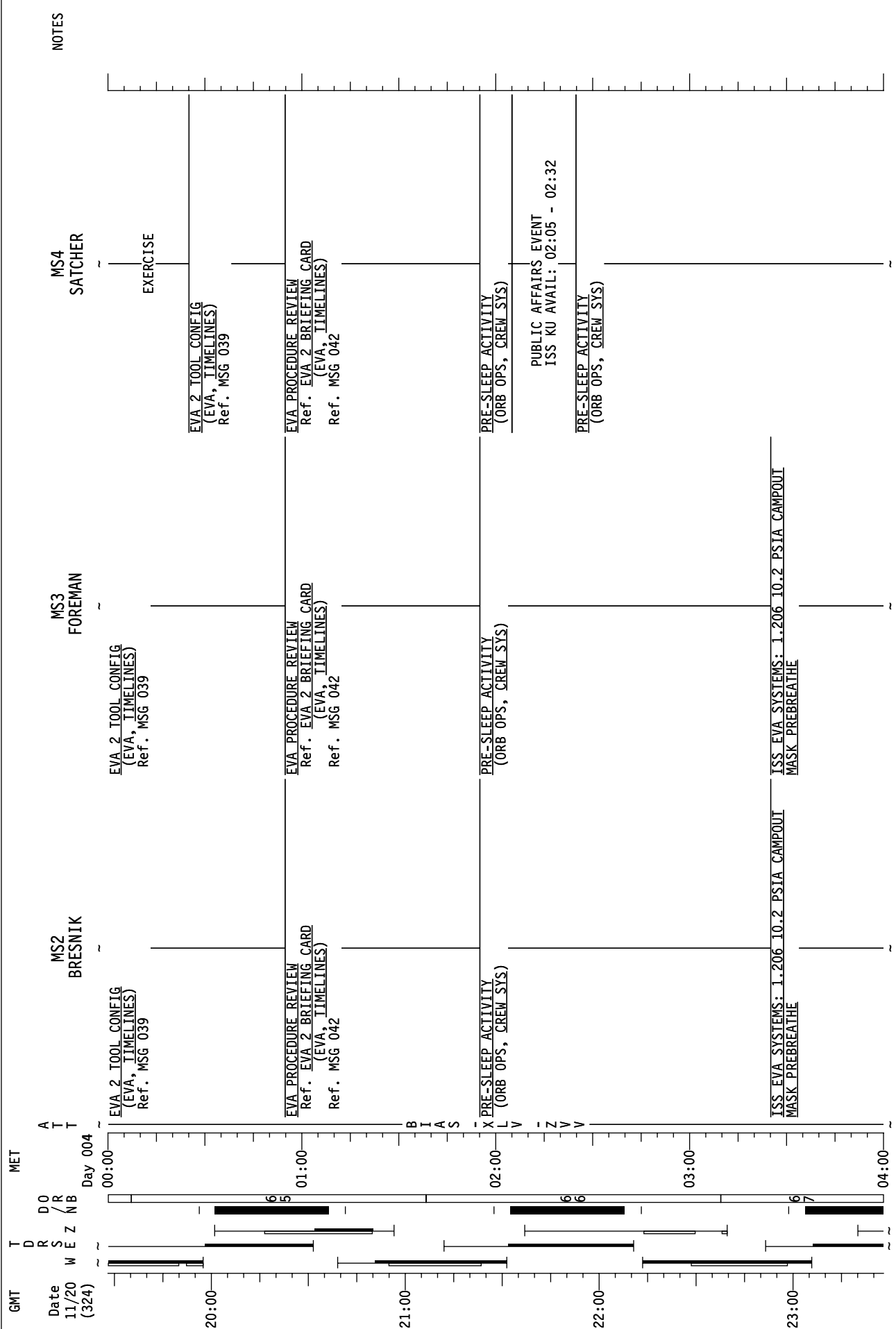
STS-129/ULF3 FD05

REPLANNED

GMT	Date 11/20 (324)	DRS W E Z NB	MS1 MELVIN	PLT WILMORE	CDR HOBAUGH	NOTES
20:00						<p>ELC 2 GRAPPLE (PDRS, ELC NOMINAL OPS)</p> <p>CGBA and ABRIS STATUS CK (Cue Card) CGBA only TRANSFER TAGUP Coordinate with transfer counterparts</p> <p>TRANSFER BRIEF Call down status to MCC</p>
21:00						<p>EVA PROCEDURE REVIEW Ref. EVA 2 BRIEFING CARD (EVA, TIMELINES) Ref. MSG 042</p> <p>EVA PROCEDURE REVIEW Ref. EVA 2 BRIEFING CARD (EVA, TIMELINES) Ref. MSG 042</p>
22:00						<p>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</p> <p>PUBLIC AFFAIRS EVENT ISS KU AVAIL: 02:05 - 02:32</p> <p>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</p>
23:00						<p>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</p> <p>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</p> <p>PRIVATE MEDICAL CONFERENCE L9 PAYLOAD STATION A/G(two) - OFF Perform via A/G 2</p> <p>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</p>

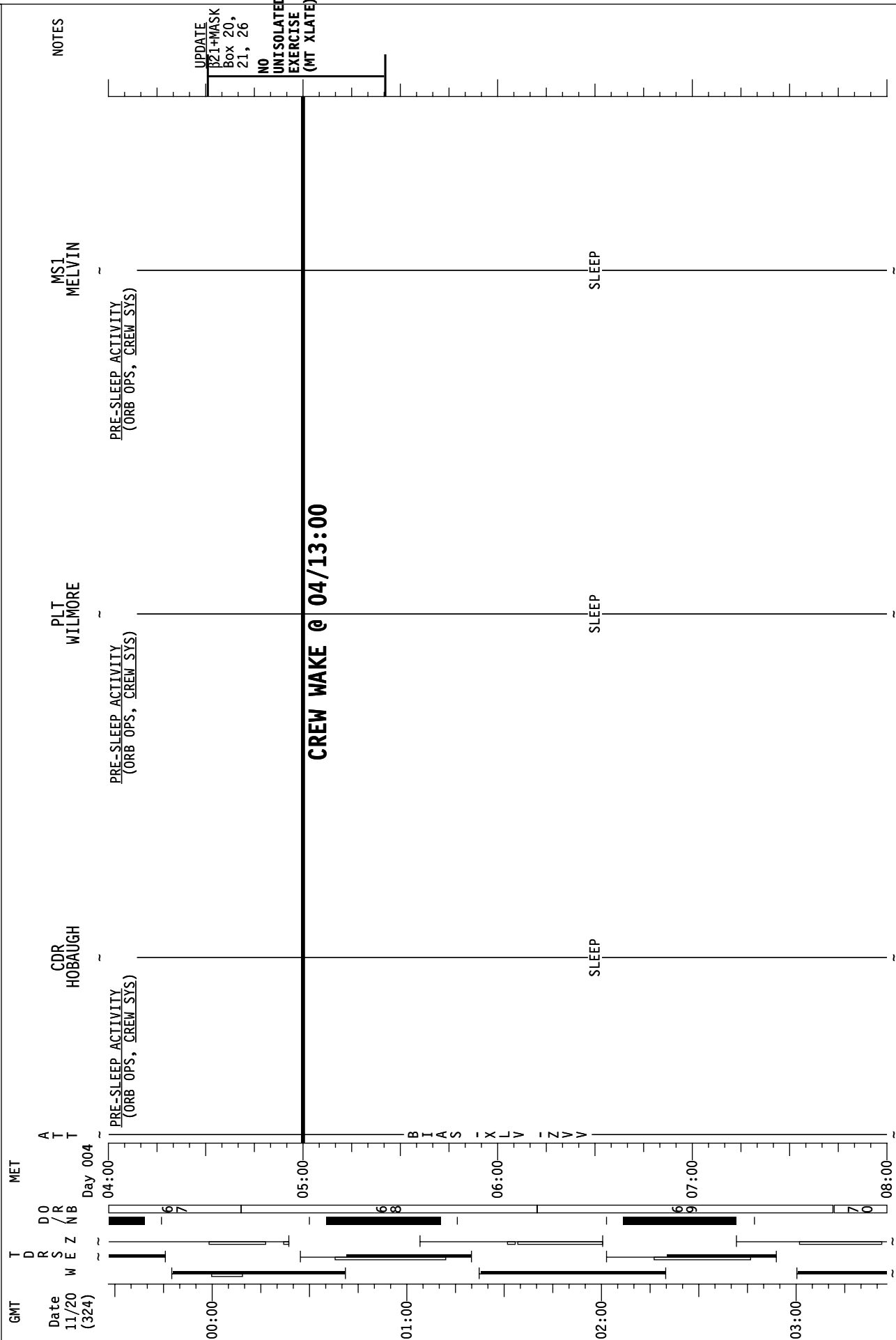
STS-129/ULF3 FD05

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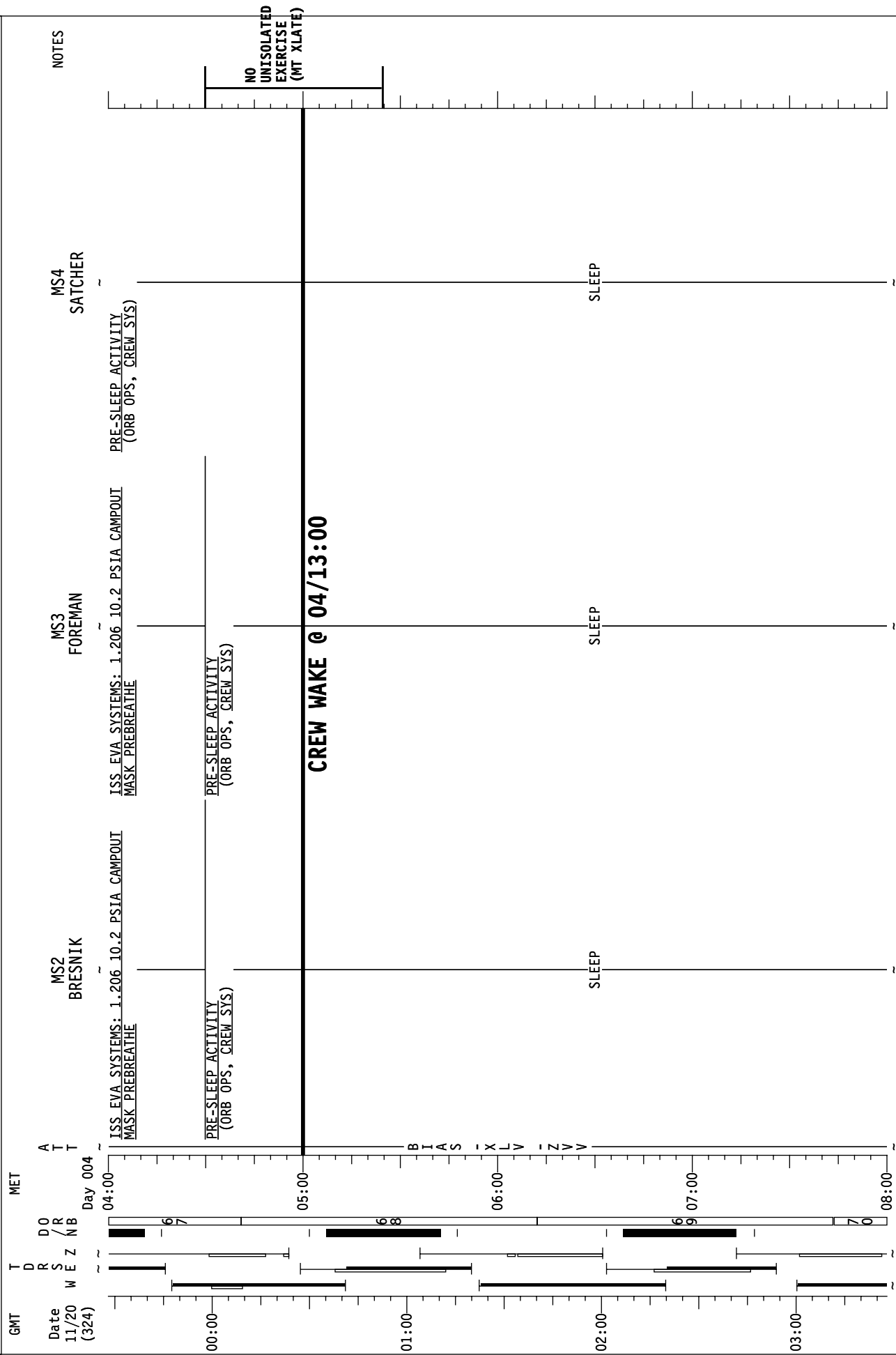
STS-129/ULF3 FD05

REPLANNED



STS-129/U/LF3 FD05

REPLANNED



MSG 030 - FD05 MISSION SUMMARY

1
2 Good morning Atlantis! Great work on EVA1 yesterday. Hope you have a wonderful day of
3 transfer and no FI!

4
5 YOUR CURRENT ORBIT IS: 187 X 180 NM

6
7 **NOTAMS: TWO CHANGES (ADDED HNL & KKI)**

8
9 EDW - LAKEBED RWY 15/33 GREEN - ELS ONLY. RWY 18L - UNUSABLE.
10 NOR - LAKEBED RUNWAYS GREEN.
11 NTU - RWYS 05R/23L CLOSED.
12 YQX - TACAN YQX CH74 OTS.
13 LAJ - TACAN LAJ45 OTS.
14 PTN - AIRFIELD CLOSED.
15 **HNL- TACAN HNL CH95 OTS.**
16 GUA - RWY 06R/24L CLOSED. RWY 06L REIL OTS.
17 **KKI- RWY 15R/33L CLOSED. 15L/33R USABLE.**
18 IKF - NOT USABLE. NO AGREEMENT.
19 BEN - NOT RECOMMENDED/NOT SUPPORTED

20
21 **NEXT 2 PLS OPPORTUNITIES:**

22
23 EDW22 ORB 64 – 3/23:26 SCT250 7 230/09P14
24 EDW22 ORB 80 – 4/23:49 FEW300 7 280/09P15

25
26 **OMS TANK FAIL CAPABILITY:**

27
28 L OMS FAILS: NO
29 R OMS FAILS: NO

30
31 **LEAKING OMS PRPLT BURN:**

32
33 L OMS LEAK: ALWAYS BURN RETROGRADE
34 R OMS LEAK: ALWAYS BURN RETROGRADE

35
36 **OMS QUANTITIES(%)**

37
38 L OMS OX = 38.5 R OMS OX = 38.8
39 FU = 38.5 FU = 38.4

40
41 Subtract interconnect counter for current OMS quantities.
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MSG 030 - FD05 MISSION SUMMARY

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DELTA V AVAILABLE:

OMS	382 FPS
<u>ARCS (TOTAL ABOVE QTY1)</u>	<u>35 FPS</u>

TOTAL IN THE AFT 417 FPS

ARCS (TOTAL ABOVE QTY2)	66 FPS
FRCS (ABOVE QTY 1)	38 FPS

AFT QTY 1 85 %

AFT QTY 2 47 %

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

MSG 031 (21-0448) - FD04 MMT SUMMARY

Page 1 of 1

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The MMT met today to review mission progress, orbiter systems and TPS assessments. The mission is progressing per the nominal timeline and EVA 1 was underway during the MMT. Atlantis and her crew are doing great and no new system anomalies were discussed.

Damage Assessment Team: The DAT provided their final summary to the team, and the MMT concurred with the DAT's unanimous recommendation to clear the TPS for entry. All of the imagery and inspection imagery has been fully analyzed. The RCC had a typical number of interesting RCC features to review, and that review has concluded that the RCC is in great shape. For the TPS, only four areas required further analysis. These four areas were all very minor and cleared with standard analysis techniques. See Figure 1 for a summary of these four areas. Additionally, the lighting for the Starboard ET door 800 mm pictures was marginal. However, additional analysis with the 400 mm pictures confirmed that the door is completely closed.

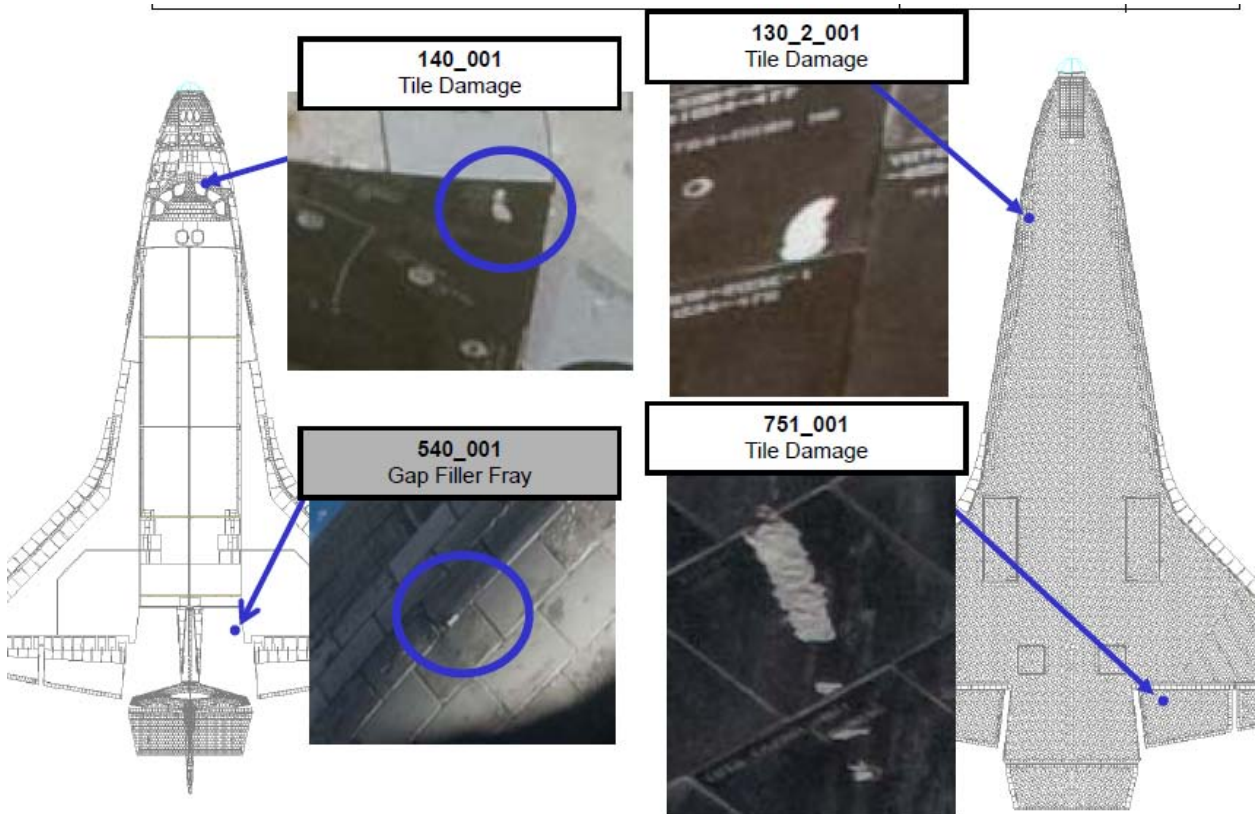


Figure 1 - TPS Damage Summary

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MSG 032 (21-0449) - FD05 TRANSFER MESSAGE

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Good Morning Leland and Mike,

After yesterday's amazing bit of transfer, you are now 29% complete! Today you have about 13hrs of transfer scheduled and the timed transfers for today include the NOD1 Midbay Outfitting items, the ABRS and support equipment and the LiOH swap.

Transfer Notes

- **Item 401:** Leland, you reported return bag 401 as complete but you did not mention the sub items that should have been stowed inside the bag. Please confirm that the four sub items (401.1 thru 401.4) are packed inside this bag for return.
- **Item 421:** Leland, you called down last night during the brief that bag 421 would not fit into the Middeck Locker location. Our records show that there is only an EDSU in the CTB and the dimensions given to us show the EDSU being smaller than a CTB. When either of you have time can you look in the bag and let us know what else is packed in there? We currently do not have room to put CTB 421 into any 5 MLE bag locations.

The Transfer List Excel file, FD05_Transfer_List_STS129.xls, locations are:

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

FD05 Choreography

- **Items 51 & 52.1:** Transfer ABRS locker and a CTB per ABRS TRANSFER activity
- **Items 9, 10, 17, 18, 729, & 729A:** Transfer LiOH per LIOH SWAP activity
- **Item 25:** Transfer KFTs per ABRS SAMPLE RETRIEVE activity
- **Items 31, 32, 33, 34, 35, 36, & 37:** Transfer MIDBAY items for FD05 OUTFITTING activities

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

Replace the following pages:
Resupply 6, 7, 9, 10 and 11

In the Transfer List **RETURN** tab

Add the following pages:
Return 11

MSG 032 (21-0449) - FD05 TRANSFER MESSAGE

Page 2 of 8

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Changes to the Transfer List are detailed below:

MIDDECK RESUPPLY

Items 29.1 - 29.6 - added temp stow location

Items 30.1 - 30.9 - added temp stow location

Items 39.1 - 39.6 - added temp stow location

MIDDECK RETURN

Item 900 - new item

FD06 Choreography

- **Generic Transfer Ops**

Have a fantastic day and let us know if you have any questions!

- The STS-129 Transfer Team

OCA 48 Mbps Troubleshooting

Figure 2 is a diagram of the OCA connections to the DTV MUX.

1 - 48 Mbps Test with Ground

On MCC GO, perform

“RECONFIGURE OCA DOWNLINK RATE (ORB OPS, PGSC), Part C - 48 Mbps” (page 12-20) with the following notes/deltas:

- A. In step 1.4, a reminder that the BYPASS switch is a 3 position switch
- B. Do not perform step 1.5 (do not turn MUX/VTR/CC - OFF)
- C. In step 3, after setting the OCA rate, verify on the OCA Control Panel App, bottom left side, that “Local OCA / Xmt (bps)” displays “48,000,000” (ref figure 1)

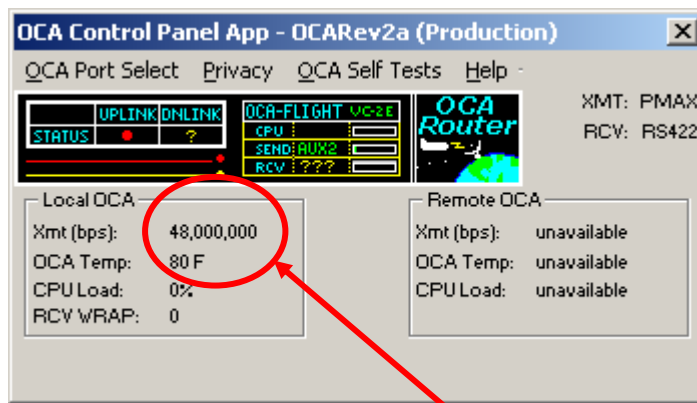


Figure 1

- D. Do perform step 4 (Boot up 48 Mbps)

Notify MCC when setup is complete

When AOS Ku, MCC will attempt to lock on OCA 48 Mbps downlink.

2 - Router Reboot

If MCC cannot lock on OCA 48 Mbps downlink, restart (reboot) the OCA Router.

After reboot, verify OCA Xmt rate is still 48,000,000 (ref figure 1).

When AOS Ku, MCC will attempt to lock on OCA 48 Mbps downlink.

3 - Cable Loopback Test

If MCC cannot lock on OCA 48 Mbps downlink, perform

“OCA LOOPBACK TEST (ORB OPS, PGSC), step 4.1” (page 12-23).

Notify MCC of results of loopback test.

If loopback test passes, perform step 4.2 to end the test and reconnect the P3, P4 cables to the MUX. Problem lies downstream of OCA connection to the MUX.

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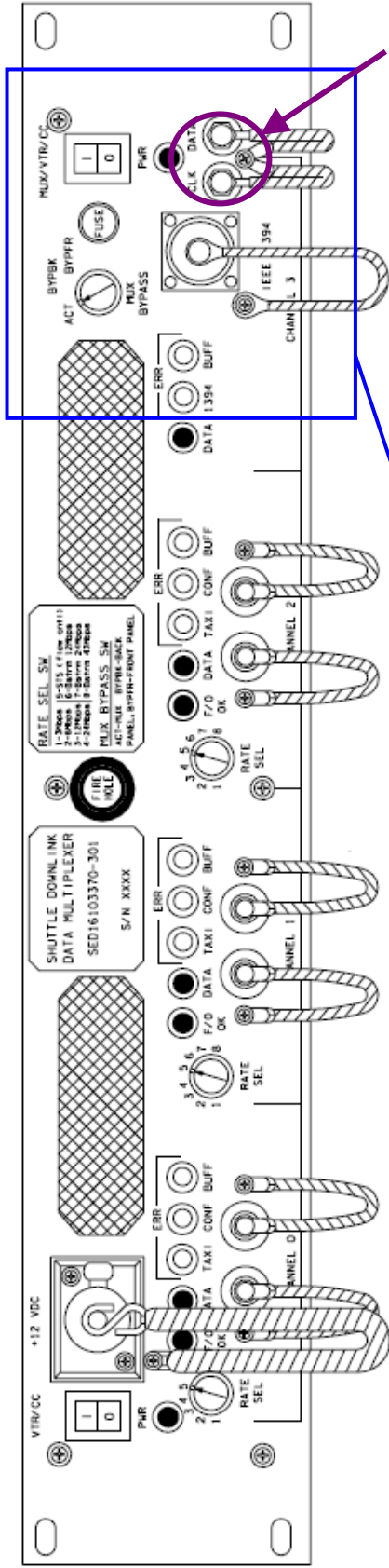
If loopback fails, the P3 or P4 legs of the OCA cable or the hi rate pins in the P1 connector are suspect. Perform the 1st step in 4.2 to end the test. √MCC to determine if spare OCA cable should be installed.

4 - Reconfigure OCA to 2 Mbps

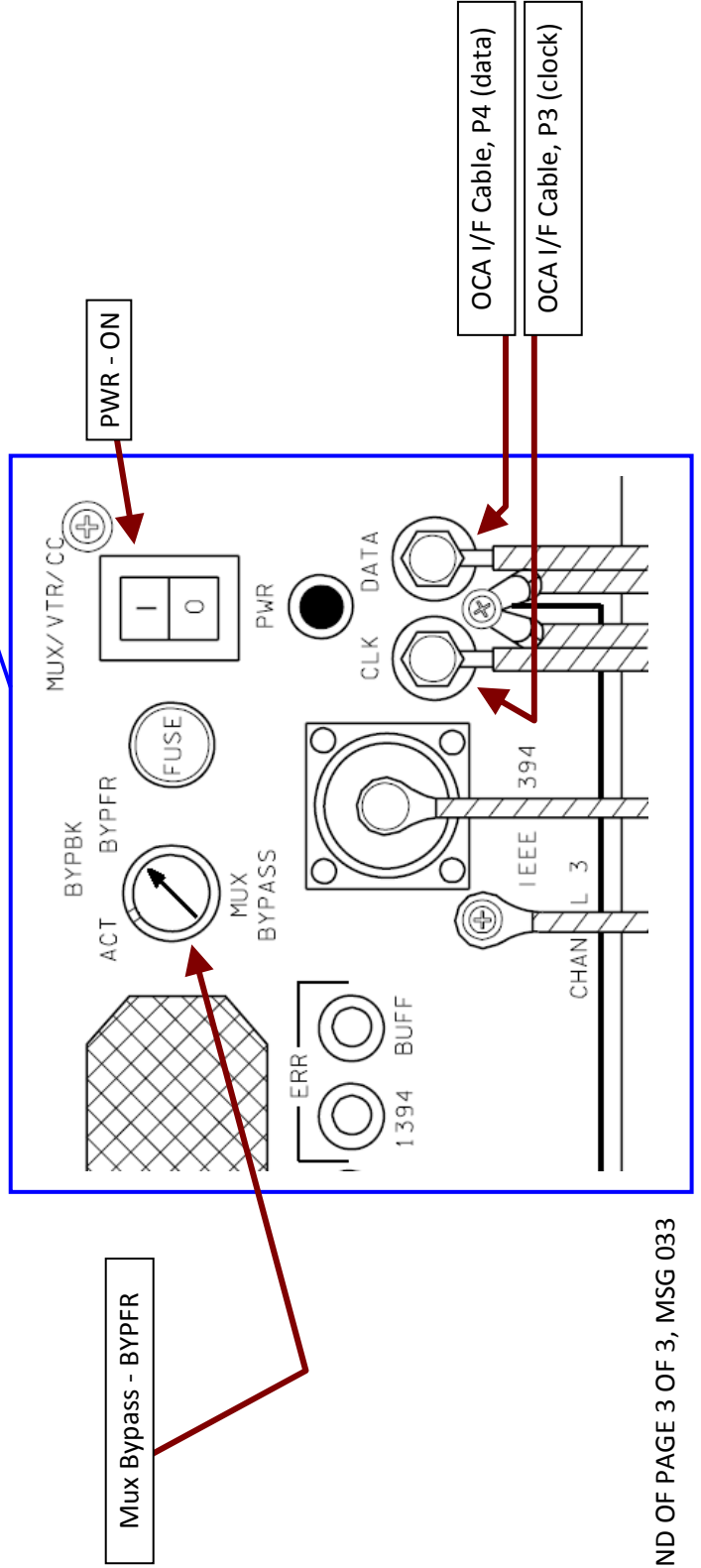
On MCC Go,
RECONFIGURE OCA DOWNLINK RATE
(ORB OPS, PGSC)
Part D then A, (including step 4)
Notify MCC when complete

- 1
- 2
- 3
- 4
- 5

Figure 2 - DTV MUX Connection



OCA PL MAX Clock &
Data lines plug in here



Mux Bypass - BYPFR

PWR - ON

OCA I/F Cable, P4 (data)

OCA I/F Cable, P3 (clock)

MSG 034 - FD05 CREW CHOICE DOWNLINK

1

TDRS	AOS	LOS	Delta (min)	Notes
W	04/03:01	04/03:30	29	
W	04/04:32	04/04:41	9	

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

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END OF PAGE 1 OF 1, MSG 034

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Mike, four things:

1. Comm Cap

We suspect, just as you did, the comm issue during EVA 1 was due to the partially peeled back MBED which allowed some moisture to get into the ear canal and affect comm. From previous experience, this moisture should dry out and your prime comm cap will be go for EVA 2. There is already a call out in E-Lk Prep, step 7, for you to inspect MBEDs and replace if necessary. Spare MBEDs are in the EMU Servicing Kit. We would like you to replace both of the MBEDs in your prime comm cap to ensure we keep moisture out of both ear canals. After removing the old MBEDs, you can clean the area with a damp cloth, dry with a dry cloth, make sure completely dry, and then apply new MBEDs. Your back up comm cap is in your ECOK which should be in the A/L during EVA Prep. You can swap to your back up in the event there is a comm issue with your prime comm cap.

2. As a reminder, please isolate the three adjustable tethers from the MMOD shield task and the wipes used during the lubing tasks yesterday. The adjustable tethers (S/N 1009, 1032, 1034) will eventually need to go to the EVA Tools Transfer Bag during EVA Transfer to Shuttle on FD 9. Any unused wipes can go in the “done” mesh bag. Any used wipes should be placed in a ziplock bag and then placed in shuttle dry trash.

3. We will have further details on EVA 2 for you later in the day, but, big picture, we will not be performing the Node 2 zenith CBCS flap closure and we will now be deploying the S3 zenith inboard PAS during EVA 2.

4. WVS issues during EVA 1

It appears that Mike’s WVS power button may have been bumped by his PGT during the PAS deploy task. This coincides with when his WVS began to have issues. Photo TV has confirmed that if the power button on the WVS is pressed on the edge of the button rather than the center, or if it is partially depressed, it can cause the noisy video reception experienced during the EVA. This was also seen on STS-122, and power cycling the WVS cleared the issue. When cycling the WVS power button be sure to press firmly in the center of the button. The power cycle of Mike’s WVS at the end of EVA 1 did not appear to clear the issue. Photo TV will be reviewing the video from EVA 1 today to ensure there is not a more serious switch issue. There is no spare on board ISS to swap to, so the plan is to use this same unit for the remaining EVAs. Both WVS units will be replaced on STS-131.

MSG 040 (21-0457) - FD05 LIOH SWAP

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FD5 LiOH Swap

Today, you will swap 18 LiOH cans from the Shuttle (8 used, 10 unused) with 16 unused LiOH cans from the ISS stockpile. Transfer details are provided below.

Details:

- Retrieve STS-126 cans 18-23, STS-119 cans 35-39 and STS-127 cans 27-31 (total 16) pregathered at ISS NOD2D2 and transfer them to Shuttle middeck.
- Remove STS-129 cans 1-8 (used) from the LiOH Box. Install socks from any 8 ISS stockpile cans coming to Shuttle.
- Remove STS-129 cans 24-31 from the LiOH Box (socks already installed).
- Place the 16 cans from ISS in the LiOH Box.
- Remove STS-129 cans 32, 33 from External Airlock Floor Bag (socks already installed).
- Transfer STS-129 cans 1-8 and 24-33 (total 18) to ISS NOD1S4_D2.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

OBJECTIVE:

Ultrasound (USND). The purpose of this procedure is to replace the Control Board, Analog Board, and all of the eight Channel Boards in the HRF Ultrasound unit one or more of which may be malfunctioning. Crew will then activate the unit, and run tests to determine the operational status of the HRF Ultrasound unit.

PARTS:

- ESD Bubble Wrap Bag (containing HRF Ultrasound boards) (ten)
- Ultrasound Keyboard
- HRF Ultrasound Keyboard Cable
- HRF Ultrasound Monitor Cable
- Multi-Use Bracket (two)
- Laptop Desk (two)
- HRF FSD (Flat Screen Display)
- HRF Common Cables Kit
 - HRF Common Power 28 VDC Cable
- HRF Ultrasound L12-5 Scanhead
 - L12-5 Scanhead Transducer Cover
 - L12-5 Scanhead Connector Cover
- Static Wrist Tether

TOOLS:

- Kit N: Limited Area Tool Kit
 - #6 Short Torq Bit
- Tool Bag 2
 - 6" Extension 3/8" Drive
- Tool Page Case
 - Ratchet, 3/8" Drive

1. CHANNEL BOARD REPLACEMENT

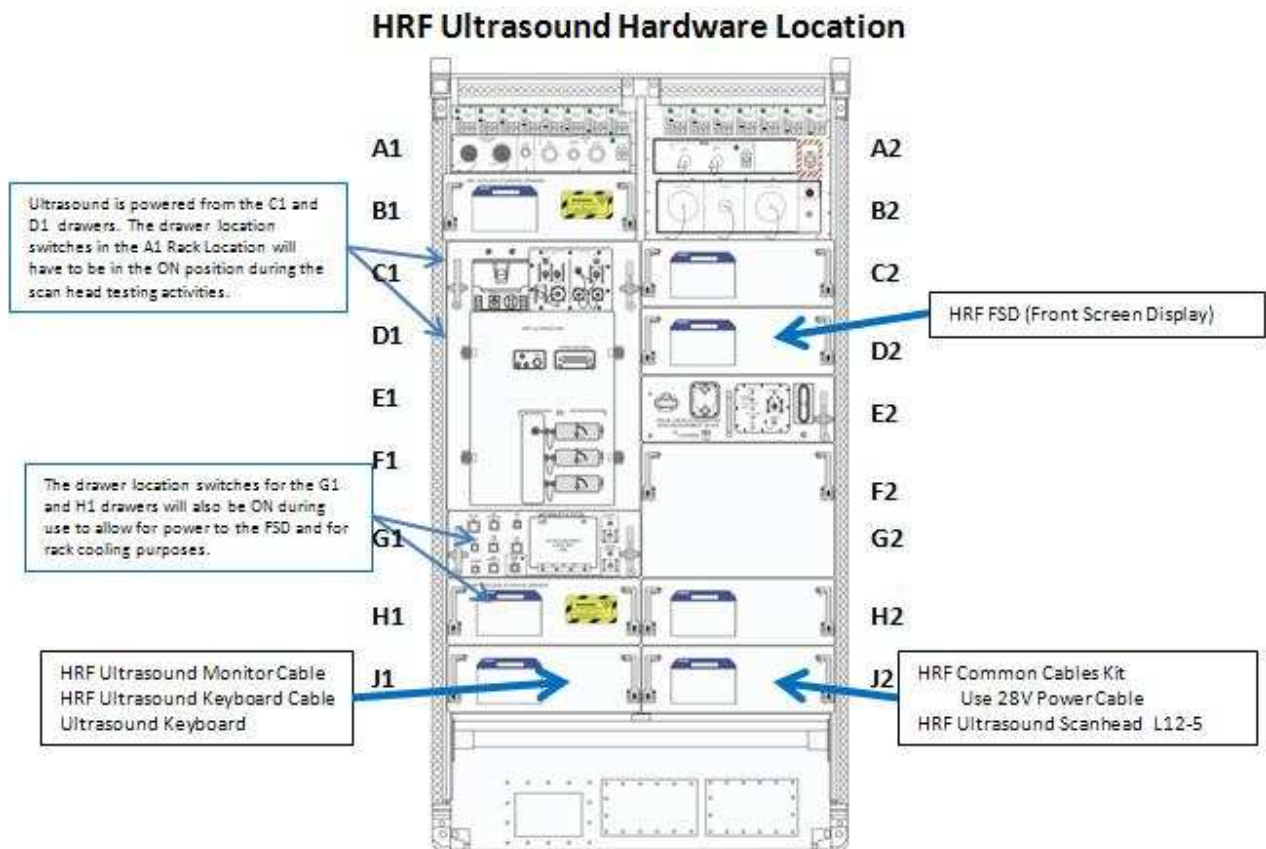


Figure 1. - HRF Rack 1 with HRF Ultrasound Hardware Stowage Locations.

NOTE
 Figure 1 is a Crew Requested HRF Rack 1 Stowage Overview and can be used for familiarization with hardware locations.

- 1.1 Locate three ziplock bags (3 X 5 acceptable). Label one ziplock bag 'Bolt A, the next 'Bolt B', the last 'Bolt C.'

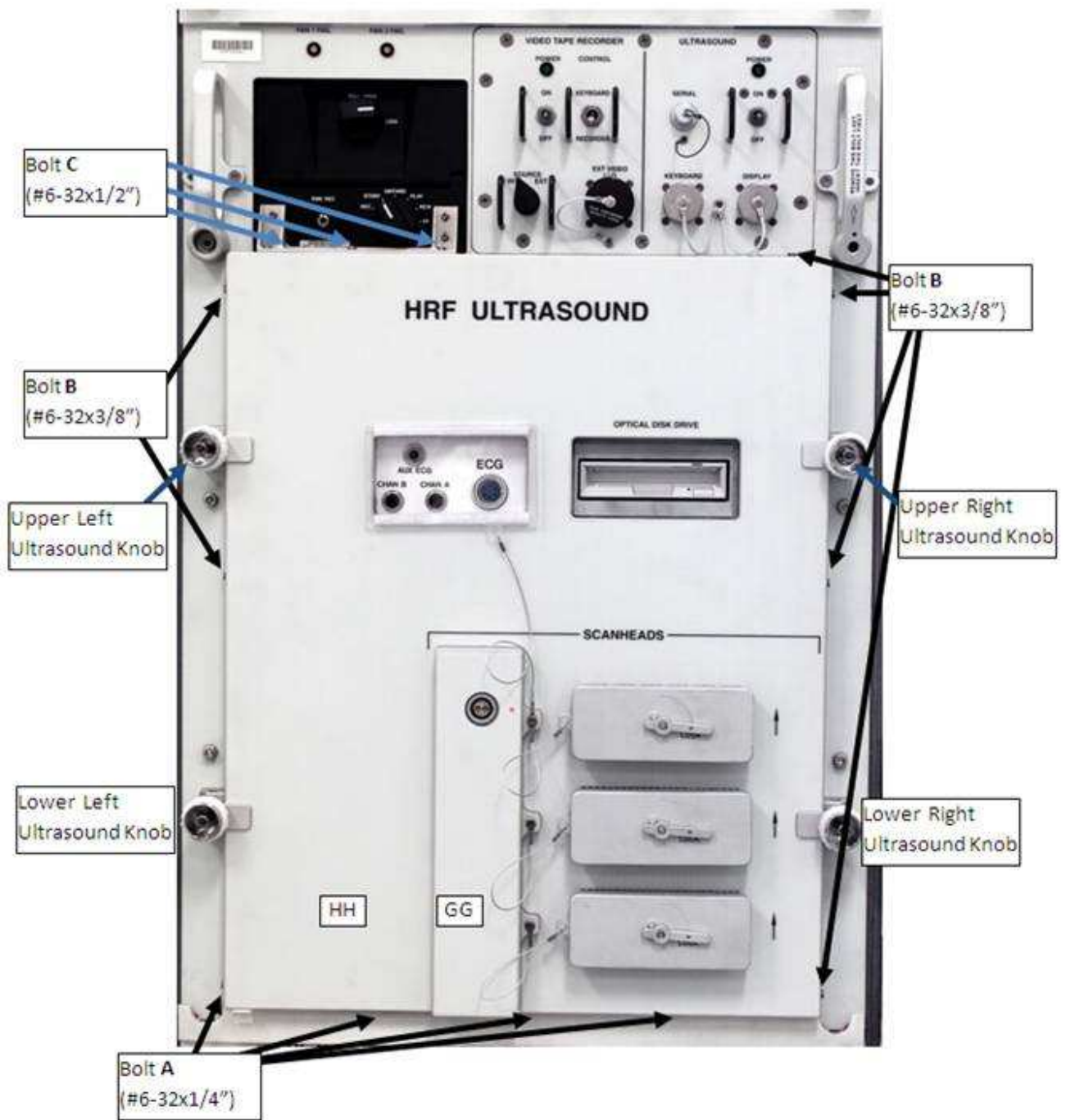


Figure 2. - HRF Ultrasound Front Panel Bolt Reference Guide.

CAUTION

All bolts must be properly stored in the correct ziplock bag for reuse later. Mixing of bolts resulting in incorrect bolt installation into HRF Ultrasound could damage both bolt and HRF Ultrasound front panel.

1.2 Using Figure 2 as a guide for bolt location identification and tmpry stowage location into each labeled ziplock bag,

HRF Ultrasound Remove four non-captive bolts and washers (designated Bolt A) at bottom of HRF Ultrasound front panel using #6 Short Torq Bit with Ratchet, 3/8" Drive and 6" Extension 3/8" Drive. Stow bolts and washers in ziplock bag labeled 'Bolt A.'

Remove six non-captive bolts and washers (designated Bolt B) on sides of HRF Ultrasound front panel using #6 Short Torq Bit with Ratchet, 3/8" Drive and 6" Extension 3/8" Drive. Stow bolts and washers in ziplock bag labeled 'Bolt B.'

Remove three non-captive bolts and washers (designated Bolt C) at top of HRF Ultrasound front panel using #6 Short Torq Bit with Ratchet, 3/8" Drive and 6" Extension 3/8" Drive. Stow bolts and washers in ziplock bag labeled 'Bolt C.'

 *
 * If any bolts or washers are lost,
 * | ✓POIC

Using Grey Tape, attach three ziplock bags labeled 'Bolt A', 'Bolt B' and 'Bolt C' to HRF Ultrasound front panel.

If three ziplock bags labeled 'Bolt A', 'Bolt B' and 'Bolt C' are tmpry
 ↳ stowed anywhere else other than HRF Ultrasound front panel,
 ✓POIC
 τ

1.3 Setup G1 Camera on HRF Ultrasound front panel FOV (field of view).

HRF Rack 1_A1 1.4 ✓sw DRAWER C1 POWER – Off
 ✓DRAWER C1 POWER Lt – Off
 ✓sw DRAWER D1 POWER – Off
 ✓DRAWER D1 POWER Lt – Off

HRF Ultrasound 1.5 ✓sw Ultrasound POWER – Off
 ✓Ultrasound POWER Lt – Off

Ultrasound Front Panel Removal

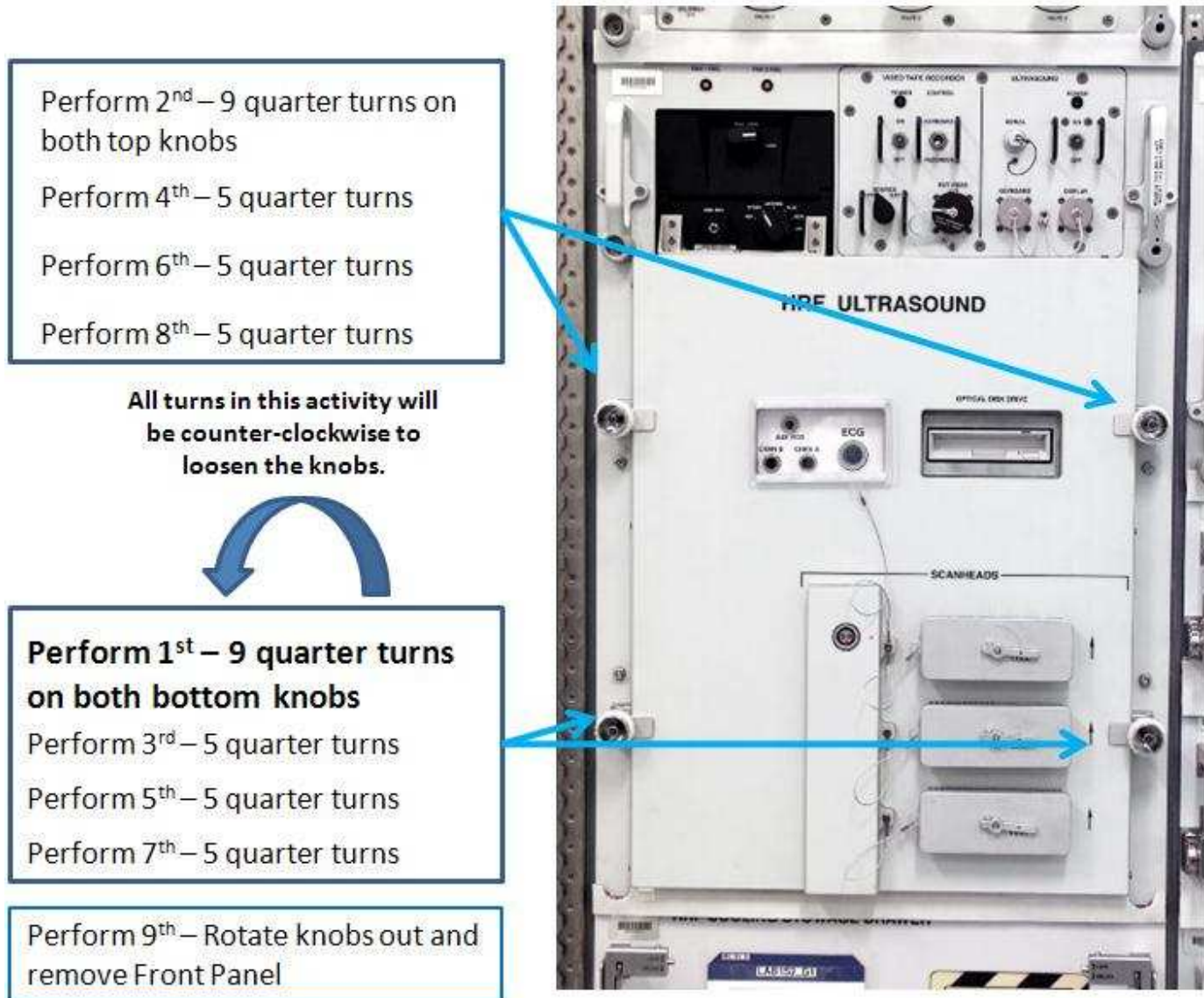


Figure 3. - HRF Ultrasound Front Panel Removal Guide.

- 1.6 Loosen HRF Ultrasound front panel knobs in this order as follows (see Figure 3 for further guidance if necessary):

Turn lower left and right knobs (two) together counterclockwise nine quarter turns.

Turn upper left and right knobs (two) together counterclockwise nine quarter turns.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

Return to lower left and right knobs (two) and turn together counterclockwise five quarter turns.

Return to upper left and right knobs (two) and turn together counterclockwise five quarter turns.

Return to lower left and right knobs (two) and turn together counterclockwise five quarter turns.

Return to upper left and right knobs (two) and turn together counterclockwise five quarter turns.

Return to lower left and right knobs (two) and turn together counterclockwise five quarter turns.

Return to upper left and right knobs (two) and turn together counterclockwise five quarter turns.

- HRF Rack 1_D2 1.7 Open HRF Standard Stowage Drawer until it extends approximately six inches out of HRF Rack 1.

WARNING

Failure to ensure that all power is removed from the Ultrasound prior to removal of boards could result in electric shock.

- HRF Ultrasound 1.8 Rotate all four knobs 90 degrees to unlock HRF Ultrasound front panel.
- 1.9 Slide HRF Ultrasound front panel out and tmpy stow.

CAUTION

Ultrasound contains parts sensitive to damage by electrostatic discharge (ESD).

- 1.10 Retrieve and don Static Wrist Tether and attach to unpainted surface on HRF Rack 1.

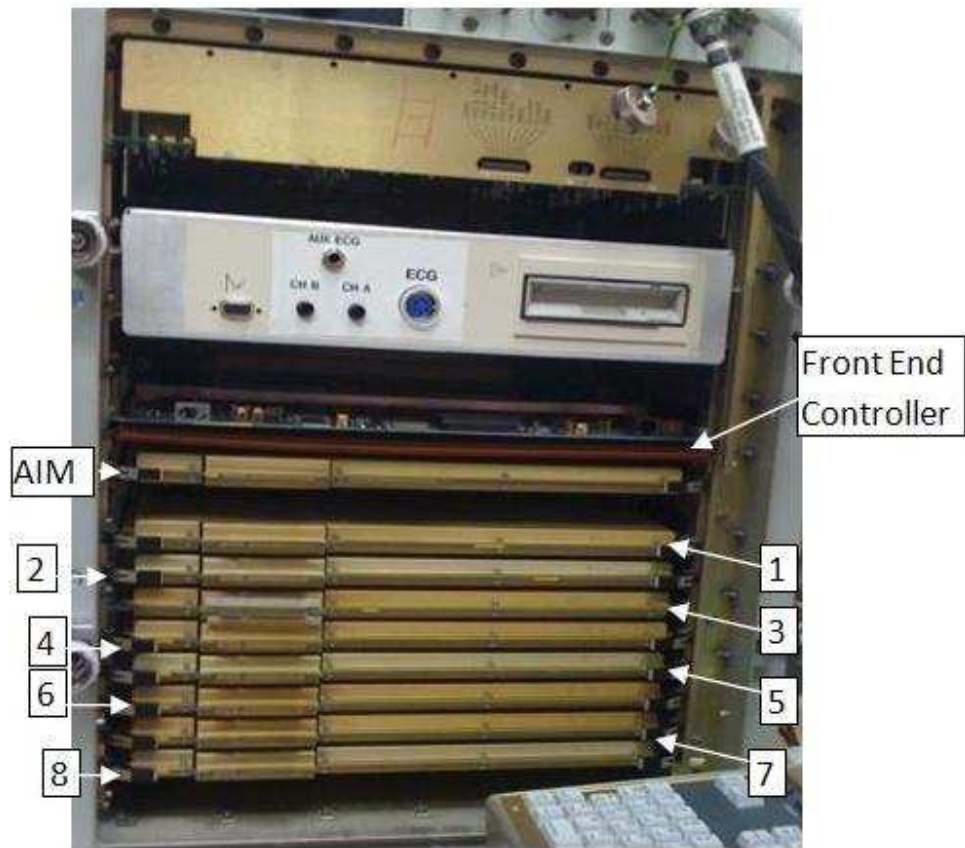


Figure 4. - Board Locations Inside HRF Ultrasound.

WARNING

Printed Circuit Boards (PCB) contain sharp pins, sharp edges, and burrs. The PCBs must be handled by the edges and by using the extractor levers.

NOTE

Board levers are similar to Workstation 2 SCSI Hard Drive levers. Reference figure [5.003 FIGURE 6. WORKSTATION 2 SCSI HARD DRIVE INSTRUCTION](#) can be used for a view of similar levers and functionality.

1.11 Using Figure 4 as a guide for board identification and location,

Using Fine Point Sharpie, label each channel board inside HRF Ultrasound with the location designation given in Figure 4 (for example, channel board at location 1 will be labeled as '1', channel board at location 2 will be labeled as '2', etc) for all channel boards in unit (label can be on any clear space of plastic on channel board).

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Remove top two boards identified as Front End Controller and AIM in Figure 4 by pulling both levers simultaneously on each and sliding one board then the other out of HRF Ultrasound.

Temporarily stow two boards.

- 1.12 Retrieve ESD Bubble Wrap Bags (containing HRF Ultrasound boards) (ten).

ESD Bubble Wrap Bag Unstow Control Board (ESD Bubble Wrap Bag will have PN SDG46114579-802 label and may also have label saying 'Front End Controller').

HRF Ultrasound Install Control Board into location identified as Front End Controller in Figure 4 by sliding into HRF Ultrasound (ensure levers are unlocked for installation). Once Control Board is fully seated turn levers 90 degrees to lock.

ESD Bubble Wrap Bag Unstow Analog Board (ESD Bubble Wrap Bag will have PN SDG46114580-801 label and second label saying 'Analog Board').

HRF Ultrasound Install Analog Board into location identified as AIM in Figure 4 by sliding into HRF Ultrasound (ensure levers are unlocked for installation). Once Analog Board is fully seated turn levers 90 degrees to lock.

- 1.13 Remove channel board (starting with channel board identified as 1 in Figure 4) by pulling both levers of each simultaneously and sliding channel board out of HRF Ultrasound.

As each channel board is removed, unstow one new channel board from ESD Bubble Wrap Bag (all remaining ESD Bubble Wrap Bags will have PN SDG46114581-801 label and label saying 'Channel Board') and install into location of old channel board occupied by sliding into HRF Ultrasound (ensure levers are unlocked for installation). Once channel board is fully seated turn levers 90 degrees to lock. Stow old channel board into ESD Bubble Wrap Bag previously occupied by new channel board (swap one for one).

Repeat this step for all remaining channel boards (2 through 8).

When swap is complete, temporarily stow all ten ESD Bubble Wrap Bags.

- 1.14 Remove Static Wrist Tether.



Correct Ultrasound Knob Lock

Incorrect Ultrasound Knob Lock

Figure 5. - HRF Ultrasound Front Panel Knob Orientation Guide.

1.15 Retrieve HRF Ultrasound front panel from tmpy stow.

Install HRF Ultrasound front panel onto HRF Ultrasound.

Rotate all four knobs 90 degrees to lock HRF Ultrasound front panel.
Ensure knobs are holding HRF Ultrasound front panel in correct orientation (see Figure 5 for reference).

HRF Rack 1_D2 1.16 Close HRF Standard Stowage Drawer.

CAUTION	
	1. Failure to install HRF Ultrasound front panel correctly will result in broken channel boards.
	2. The lower left knob on HRF Ultrasound is the most critical to ensuring HRF Ultrasound front panel aligns properly.

Replace Ultrasound Front Panel

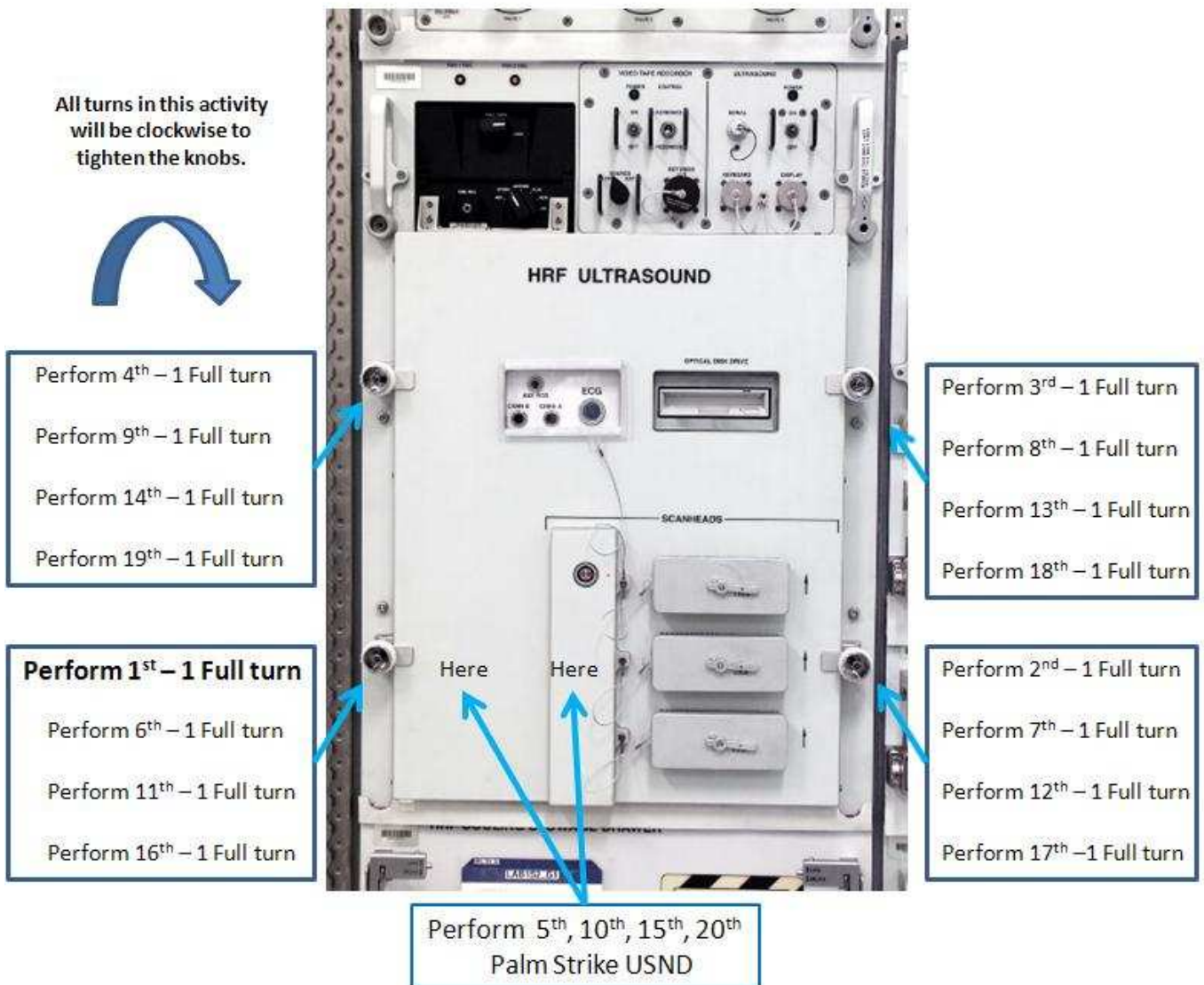


Figure 6. - HRF Ultrasound Front Panel Replacement Guide.

HRF Ultrasound 1.17 Tighten HRF Ultrasound front panel upper and lower knobs in this order as follows (ensure gap is symmetric when progressing from knob to knob) (See Figure 6 for general guide to front panel replacement and Figure 7 for illustration of gap):

Turn lower left knob one full turn clockwise.

Going from lower left knob to lower right knob in counterclockwise pattern, turn lower right knob one full turn clockwise.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

Going from lower right knob to upper right knob in counterclockwise pattern, turn upper right knob one full turn clockwise.

Going from upper right knob to upper left knob in counterclockwise pattern, turn upper left knob one full turn clockwise.

Palm strike HRF Ultrasound front panel in areas identified in Figure 6 above.

Turn knobs in fashion identified above (counterclockwise pattern, lower left knob, lower right knob, upper right knob, upper left knob then palm strike) until bottom section of HRF Ultrasound front panel is fully seated.

If at any time lower left knob gets too tight and is difficult to turn,
| Palm strike HRF Ultrasound front panel in areas identified in
| Figure 6 above.

Once HRF Ultrasound front panel is determined to be seated properly, tighten upper left and upper right knobs to fully seat HRF Ultrasound front panel.

Ensure all four knobs are hand tight.



Figure 7. - Illustration of Symmetrical Gap When Reinstalling HRF Ultrasound Front Panel.

2. [SETTING UP HRF ULTRASOUND SYSTEM](#)

- HRF Ultrasound 2.1 ✓sw ULTRASOUND POWER – OFF
✓ULTRASOUND POWER Lt – Off
- ✓sw VIDEO TAPE RECORDER POWER – OFF
✓VIDEO TAPE RECORDER POWER Lt – Off
- 2.2 Attach Multi-Use Bracket to left seat track of HRF Rack 1 at drawer level E.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

Secure Laptop Desk to Multi-Use Bracket.

Attach HRF FSD (Flat Screen Display) to upper Laptop Desk.

2.3 Attach Multi-Use Bracket to left side of HRF Rack 1 using fasteners provided at drawer level F.

2.4 Secure Laptop Desk to Multi-Use Bracket.
Place Ultrasound Keyboard on Laptop Desk.

If Multi-Use Bracket and Laptop Desk are in use

Unstow and attach Velcro (crew preference) to front, right side of HRF Rack 1.

Secure HRF PC 1 to Velcro (crew preference) (location on HRF Rack 1 is per crew discretion to avoid cable, handle, and drawer blockage).

Ultrasound Keyboard 2.5 ✓sw KEYBOARD POWER (right side) – STBY

CAUTION

Male end of both HRF Ultrasound Keyboard Cable and HRF Ultrasound Monitor Cable can be inadvertently mated to another male connector resulting in pin-to-pin damage.

NOTE

Cabling Diagram below (Figure 8) can be referenced for the following steps.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

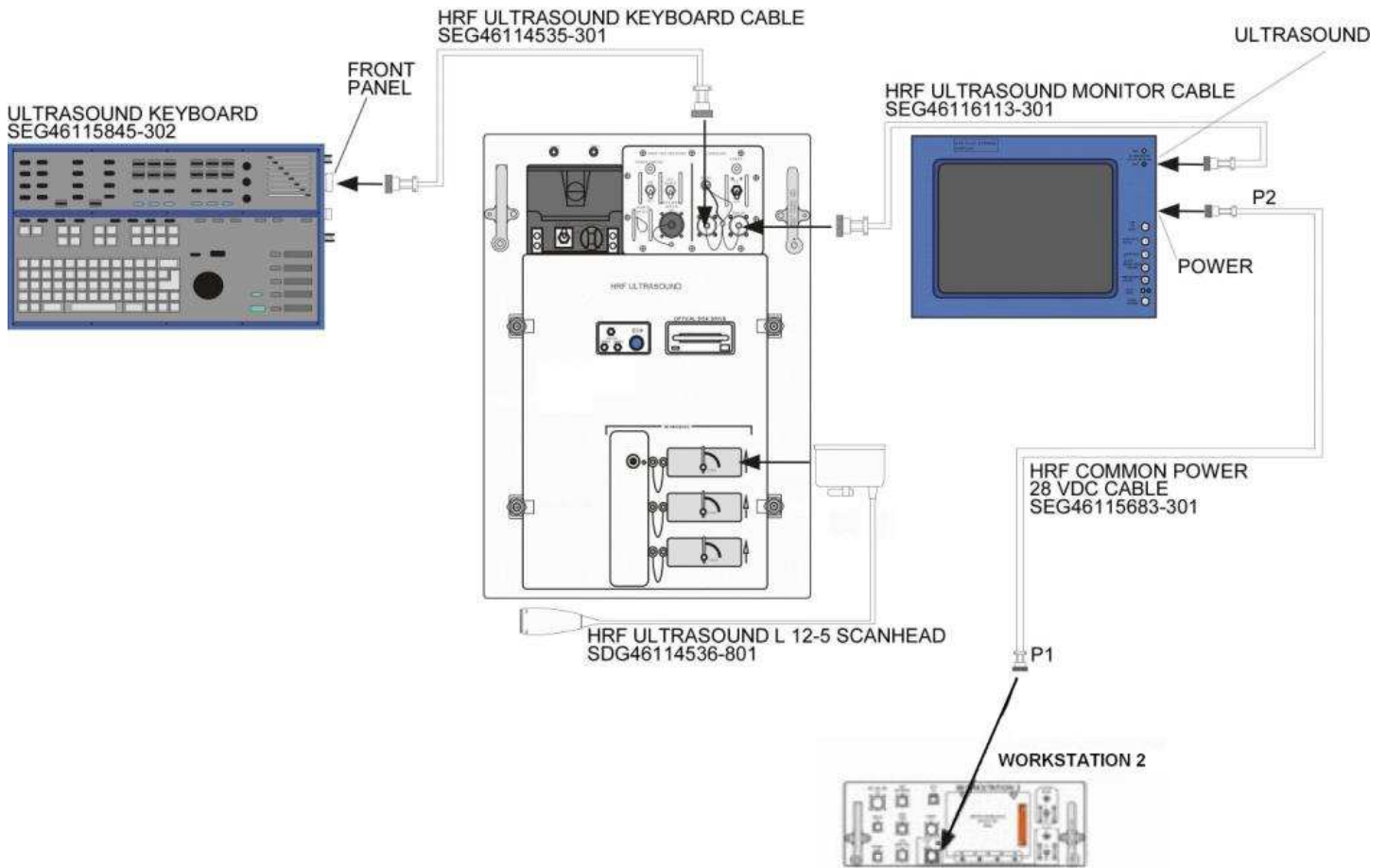


Figure 8. - Ultrasound Cabling Diagram.

- HRF Ultrasound 2.6 HRF Ultrasound Keyboard Cable →|← Keyboard
- Ultrasound Keyboard HRF Ultrasound Keyboard Cable →|← Front Panel (right side)
- HRF Workstation 2 2.7 ✓sw POWER 28VDC – OFF
✓POWER 28VDC Lt – Off
- HRF Ultrasound 2.8 HRF Ultrasound Monitor Cable →|← Display
- HRF FSD HRF Ultrasound Monitor Cable →|← Ultrasound (right side)
- HRF Workstation 2 2.9 HRF Common Power 28 VDC Cable (P1) →|← J11 28VDC
- HRF FSD 2.10 HRF Common Power 28 VDC Cable (P2) →|← POWER
- HRF Ultrasound L12-5 Scanhead 2.11 Remove L12-5 Scanhead Connector Cover and Tmpy stow.
Rotate HRF Ultrasound L12-5 Scanhead connector knob ↻

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

HRF Ultrasound 2.12 Remove Scanhead top port cover.

Turn lever ↻, remove

HRF Ultrasound L12-5 Scanhead connector end →|← Scanhead (top port)

Turn connector knob ↻ to secure HRF Ultrasound L12-5 Scanhead connector end

Temporarily pry HRF Ultrasound L12-5 Scanhead Transducer with cover on.

3. ACTIVATING HRF ULTRASOUND SYSTEM

- HRF Rack 1_A1 3.1 sw DRAWER C1 POWER → ON
- ✓DRAWER C1 POWER Lt – On
- sw DRAWER D1 POWER → ON
- ✓DRAWER D1 POWER Lt – On
- sw DRAWER G1 POWER → ON
- ✓DRAWER G1 POWER Lt – On
- ✓sw DRAWER H1 POWER – ON
- ✓DRAWER H1 POWER Lt – On

CAUTION

Workstation 2 POWER MAIN switch should remain off for this activity. If POWER MAIN switch is turned on, Workstation 2 may malfunction.

- HRF Workstation 2 3.2 sw POWER 28 VDC → ON
- ✓POWER 28 VDC Lt – On

* If Workstation 2 POWER MAIN switch is accidentally turned

* on, wait a minimum of 5 minutes before turning it off to allow

* the Workstation 2 to reach the appropriate operational state.

*

HRF Ultrasound 3.3 ✓All lights (four) – Off
(two green, two yellow, at top of unit)

HRF FSD 3.4 ✓sw (right side) – US LIVE (middle position)
sw SYSTEM POWER (right side) → ON

NOTE

Upon power up of HRF FSD, a yellow light will blink momentarily and can easily be missed. Crew viewing of this light is not required.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

- 3.5 pb PANEL POWER (front of HRF FSD) → Press and Hold (until green light illuminates)
✓STBY PWR light – On (green)

* If error banner appears at any time during HRF Ultrasound
* operations
* Hold down Superkey (Ultrasound Reference Picture,
* Section F, next to space bar) while pressing 3D key
* (Ultrasound Reference Picture, Section F, top row).
* Repeat until all banners close.
*

NOTE
ULTRASOUND POWER Lt will not come on until step 3.8.

- HRF Ultrasound 3.6 sw ULTRASOUND POWER → ON
Wait 15 seconds.
- Ultrasound Keyboard 3.7 sw KEYBOARD POWER (right side) → ON
- HRF Ultrasound 3.8 ✓ULTRASOUND POWER Lt – On
- HRF FSD 3.9 Confirm active clock and date appear on screen (will take approximately one minute).
- Ultrasound Keyboard 3.10 ✓all Gain slider bars are centered (Ultrasound Reference Picture, Section D)
- Ultrasound Keyboard 3.11 Hold down Superkey (Ultrasound Reference Picture, Section F, next to space bar) while pressing <0> (zero) key.
- HRF FSD 3.12 **Machine Diagnostics**
input in 'User' field – m f g (must be lower case)

* If zeroes exist in front of 'mfg', delete them.
*

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

Press Return.

input in 'Password' field – u s e r (must be lower case)

- 3.13 sel OK
- sel Configuration
- sel Save Installed as Expected
- sel OK
- sel OK

4. CHECK HRF ULTRASOUND L12-5 SCANHEAD

Ultrasound Keyboard 4.1 pb SCANHEAD → Press (Ultrasound Reference Picture, Section F, second row)

HRF FSD Scanhead

sel L12-5

Tissue Specific Presets

sel Generic (left column)

sel General (right column)

4.2 ✓Scanhead initiates.

*
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If L12-5 Scanhead does not initiate,
 Proceed through error banners by holding down
 Superkey (Ultrasound Reference Picture, Section F,
 next to space bar) while pressing 3D key. (Ultrasound
 Reference Picture, Section F, Top Row).
 Repeat until all banners close.
 Continue to next step.

5. HRF ULTRASOUND SYSTEM SHUTDOWN

<p>NOTE A temporary window, Message, will appear: 'Initiating power-down Will power down when finished saving files.'</p>
--

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

5.1 On POIC GO

- Ultrasound Keyboard sw KEYBOARD POWER (right side) → STBY
Wait until blue screen appears on HRF FSD.
- HRF Ultrasound 5.2 ✓ULTRASOUND POWER Lt – Off (after a delay)
sw ULTRASOUND POWER → OFF
- HRF FSD 5.3 pb PANEL POWER (in front) → Press and Hold
✓STBY PWR lights – Off
sw SYSTEM POWER (right side) → OFF
- HRF Workstation2 5.4 sw POWER 28VDC → OFF
✓POWER 28VDC Lt – Off
- HRF Rack 1_A1 5.5 sw DRAWER C1 POWER → OFF
✓DRAWER C1 POWER Lt – Off
sw DRAWER D1 POWER → OFF
✓DRAWER D1 POWER Lt – Off
sw DRAWER G1 POWER → OFF
✓DRAWER G1 POWER Lt – Off
✓sw DRAWER H1 POWER – ON
✓DRAWER H1 POWER Lt – On
- HRF Ultrasound 5.6 Turn HRF Ultrasound L12-5 Scanhead connector knob ↻, detach
Replace SCANHEADS top port cover: turn lever ↻, replace
- 5.7 Retrieve L12-5 Scanhead Connector Cover from temporary stow.
Replace L12-5 Scanhead Connector Cover.
6. [STOW HRF ULTRASOUND SCANHEAD, CABLES, AND INSTALL FRONT PANEL](#)
- HRF Workstation 2 6.1 HRF Common Power 28 VDC Cable (P1) ←|→ J11 28VDC
- HRF FSD 6.2 HRF Common Power 28 VDC Cable (P2) ←|→ POWER (right side)
- HRF Ultrasound 6.3 HRF Ultrasound Monitor Cable ←|→ Display
- HRF FSD HRF Ultrasound Monitor Cable ←|→ Ultrasound (right side)
- HRF Ultrasound 6.4 HRF Ultrasound Keyboard Cable ←|→ Keyboard
- Ultrasound Keyboard HRF Ultrasound Keyboard Cable ←|→ Front Panel (right side)
- 6.5 Disconnect Ultrasound Keyboard from Laptop Desk.

MSG 041 - 4.007 HRF ULTRASOUND BOARD REPLACEMENT AND TEST

6.6 Disconnect HRF FSD from Laptop Desk.

6.7 Using Figure 4 as a guide for bolt location identification,

Unstow four non-captive bolts and washers from ziplock bag labeled 'Bolt A' and install at bottom of HRF Ultrasound front panel using #6 Short Torq Bit with Ratchet, 3/8" Drive and 6" Extension 3/8" Drive (in locations designated Bolt A). Tighten bolts to hand tight.

Unstow six non-captive bolts and washers from ziplock bag labeled 'Bolt B' and install on sides of HRF Ultrasound front panel using #6 Short Torq Bit with Ratchet, 3/8" Drive and 6" Extension 3/8" Drive (in locations designated Bolt B). Tighten bolts to hand tight.

Unstow three non-captive bolts and washers from ziplock bag labeled 'Bolt C' and install at top of HRF Ultrasound front panel using #6 Short Torq Bit with Ratchet, 3/8" Drive and 6" Extension 3/8" Drive (in locations designated Bolt C). Tighten bolts to hand tight.

6.8 Restow tools, parts, materials as required to original locations.

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