STS-120 / 10A

FD 03 Execute Package

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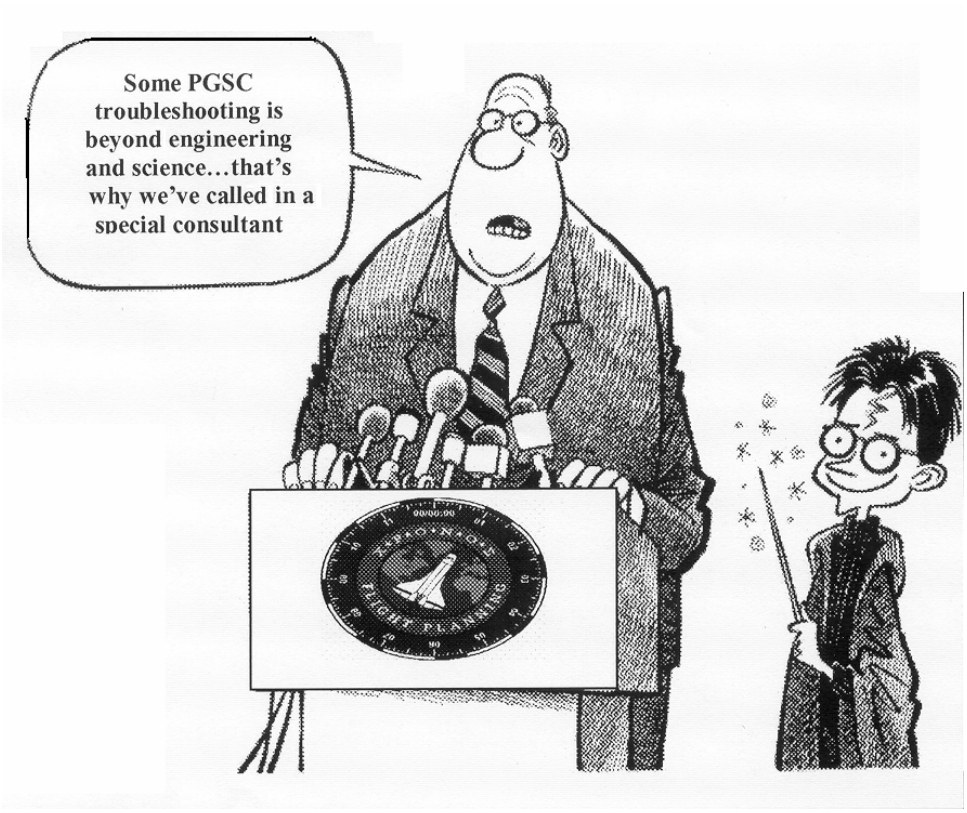
013	14 - 15	FD03 Mission Summary **(pdf)**
014	16 - 19	IWIS Installation Near Shuttle Ergometer **(pdf)**
016	20 – 22	FD03 Transfer Message **(pdf)**
018	23	Stowage Locations For IWIS Accelerometer Install **(pdf)**
019	---	FD02 MMT Summary **(pdf - Electronic Only)**
020A	24	FD03 EVA Deltas **(pdf)**
021	25 – 30	FD03 RELMO and Maneuver Pads **(pdf)**
023	31 - 32	TCS Troubleshooting Procedure **(pdf)**

Approved by FAO: *Roger Smith*

Last Updated: Oct 25 2007 4:13AM GMT
JEDI *(**J**oint **E**xecute package **D**evelopment and **I**ntegration), v2.04.0003*



MSG INDEX

MSG NO.	TITLE
012	FD03 Flight Plan Revision
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019	FD02 MMT Summary
020	FD03 EVA Deltas
021	FD03 RELMO and Maneuver Pads
022	SODF Transfer Activity
023	TCS Troubleshooting Procedures

1. At MET 01/14:30, perform a Simo Supply/Waste H2O Dump using SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS), p.5-2. MCC will TMBU limits in steps B and K.

   Supply Dump will be 15 minutes.

   Dump the waste tank to 5%. Nozzle open time will be approximately 25 minutes.

2. The table below summarizes the Shuttle and ISS exercise constraints for today. These constraints are also denoted in your timelines for your reference.

Activity	Exercise Constraints	
	Shuttle	ISS
OBSS HANDOFF	No exercise while both arms are grappled to OBSS	No exercise while both arms are grappled to OBSS
IWIS Thruster test (during sleep period)	No exercise during test	No exercise during test

3. REPLACE PAGES 2-6, 2-8, AND 3-20 THROUGH 3-29.

10/24/07 21:43:23 **REPLANNED**

GMT 10/25/07 (298) β = −49 MET Day 001

04 05 06 07 08 09 10 11 12 13 14 15 16 17 18 19 20 21 22 23 002/00

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

| | | |

10/24/07 21:43:23 **REPLANNED**

GMT 10/25/07 (298)
β = -51
MET Day 002

16 17 18 19 20 21 22 23 10/26 01 02 03
002/00 01 02 03 04 05 06 07 08 09 10 11 12

STS-120	FD03 **R2** CDR MELROY	UNBERTH	OPCU	ACTU	GRAPL	NODE 2 VIEW	BFAN*	EVA PROCEDURE REVIEW	PRE SLEEP	PMC A/G	PRE SLEEP	SLEEP						
STS-120	**R1** PLT ZAMKA	UNBERTH	GRAPL	NODE 2 VIEW	SODF XFER	EVA PROCEDURE REVIEW	PRE SLEEP	SLEEP										
STS-120	MS1 PARAZYNSKI	EVA XFER ISS	E/L PREP	REBA*	REBA C/O	PRE SLEEP	EVA PROCEDURE REVIEW	PRE SLEEP	MASK PB/TOOL CONFIG	PRE SLEEP	SLEEP (A/L)							
STS-120	**M1** MS2 WILSON	UNBERTH	MNVR H/O	UNGRP	ROBO EVA1 S/U	EVA PROCEDURE REVIEW	XFER BRIEF	PRE SLEEP	SLEEP									
STS-120	MS3 WHEELOCK	EVA XFER ISS	E/L PREP	REBA*	REBA C/O	PRE SLEEP	EVA PROCEDURE REVIEW	PRE SLEEP	MASK PB/TOOL CONFIG	PRE SLEEP	SLEEP (A/L)							
STS-120	MS4 NESPOLI	♣	SWAP EMU BATT	O2 P/B CONFIG	PRE SLEEP	EVA PROCEDURE REVIEW	PRE SLEEP	MASK PB/TOOL CONFIG	PRE SLEEP	SLEEP								
UP	FE-2 TANI	IELK INST & C/O	IELK STOW	PMC	PREP WORK	EVA PROCEDURE REVIEW	DPC	PRE SLEEP	SLEEP (8.5)									
EXP 16	ISS CDR WHITSON	EVA XFER ISS	E/L PREP	O2 P/B CONFIG	PREP WORK	SODF XFER	EVA PROCEDURE REVIEW	DPC	PRE SLEEP	SLEEP (8.5)								
EXP 16	FE-1 MALENCHENKO	IELK INST & C/O	COЖ MNT	ЭЛЕКТ	PREP WORK	EVA PROCEDURE REVIEW	DPC	PRE SLEEP	SLEEP (8.5)									
DN	**M2** FE-2 ANDERSON	UNBERTH	MNVR H/O	UNGRP	CHRG	PREP WORK	ROBO EVA1 S/U	EVA PROCEDURE REVIEW	DPC	PRE SLEEP	SLEEP (8.5)							

DAY/NIGHT

ORBIT: 32 33 34 35 36 37 38 39 40

TDRS: W -171, E -46, Z -275

ORB ATT: BIAS -XLV -ZVV

SSRMS: Lab

NOTES:
♣IWIS S/U *INSTALL *ACT
*ACT
*INSTALL
NO EX
No Exercise while both arms grappled

2-8

FLT PLN/120/FLIGHT

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 001 | STS ATI | CDR MELROY | PLT ZAMKA | MS1 PARAZYNSKI | Notes

12:00 – 04:00 – 05:00 – 06:00 – 07:00 – 13:00 – 14:00 – 15:00 – 16:00

24 – 25 – 26 – 27

-ZLV -XVV

-ZLV +YVV

SLEEP

SLEEP

SLEEP

FD03 EZ ACTIVITIES

OCAC Filter Inspect

	Parameter Name	C/W CH	Lower Limit
R13U	CAB PPO2 A	34	2.5 V/2.5 psia
	CAB PPO2 B	44	2.5 V/2.5 psia

Report to MCC when complete. MCC will TMBU FDA limits.

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

<MNVR -ZLV +YVV

A14 RCS/OMS HTR L POD -B OFF
-A AUTO
R POD -B OFF
-A AUTO

IMU STAR OF OPPTY ALIGN (ORB OPS, GNC)

PRIOR PWRUP GRP B (OPCL, PRIOR PWRDN)
Steps 12,10,9,6,5
(In step 12, Recover IMU 1)
(In step 6, Triple G2)

RENDEZVOUS TIMELINE (RNDZ, RENDEZVOUS T/L)

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

PRIOR PWRUP GRP B (OPCL, PRIOR PWRDN)
Steps 12,10,9,6,5
(In step 12, Recover IMU 1)
(In step 6, Triple G2)

RENDEZVOUS TIMELINE (RNDZ, RENDEZVOUS T/L)

FLIGHT SLEEP LOG (ORB OPS, SDBI)

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

TCS TROUBLESHOOTING
Ref: MSG 023

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

UPLINK
TFL 192

< NH (15:48)

RNDZ PET 00:00 (Ti)
AT MET 01/18:17

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 001 | STS ATI

MS2 WILSON	MS3 WHEELOCK	MS4 NESPOLI	FE-2 UP TANI	Notes
SLEEP	SLEEP	SLEEP	SLEEP	
FLIGHT SLEEP LOG (ORB OPS, SDBI)	FLIGHT SLEEP LOG (ORB OPS, SDBI)	FLIGHT SLEEP LOG (ORB OPS, SDBI)	FLIGHT SLEEP LOG (ORB OPS, SDBI)	
POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	LIQ SALIVA SAMPLE (ORB OPS, SDBI)	POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
		CDM DEACT (ORB OPS, CDM DTO)		
		POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)		
SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS) Initiate Simo Dump Ref: Msg 012 Item 1		TCS TROUBLESHOOTING Ref: MSG 023		UPDATE H2O SPLY & WASTE DUMP QTY
POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)				
		POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)		
SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS) Terminate Simo Dump				
POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)				

3-21 FLT PLN/120/FLIGHT

6

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRS E | Z | ORB | MET Day 001 | STS ATI

CDR MELROY | PLT ZAMKA | MS1 PARAZYNSKI | Notes

08:00 — 09:00 — 10:00 — 11:00

27 — 28 — 29 — 30

16:00 — 17:00 — 18:00 — 19:00 — 20:00

RNDZ

< NC4 (16:36)

< Ti (18:17)

RENDEZVOUS TIMELINE (RNDZ, RENDEZVOUS T/L)

RENDEZVOUS TIMELINE (RNDZ, RENDEZVOUS T/L)

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

RENDEZVOUS TIMELINE (RNDZ, RENDEZVOUS T/L)

APPROACH (CUE CARD, RNDZ)

APPROACH (CUE CARD, RNDZ)

APPROACH (CUE CARD, RNDZ)

UPLINK
β21 Only +
Box B1

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 001 | STS ATI | MS2 WILSON | MS3 WHEELOCK | MS4 NESPOLI | FE-2 UP TANI | Notes

08:00 — 27

09:00 — 28

10:00 — 29

11:00 — 30

16:00 — 17:00 — 18:00 — 19:00 — 20:00

RNDZ

MS2 WILSON

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SHUTTLE CONDENSATE COLLECTION
(ORB OPS, ECLS)
Perform SETUP
Use CWC s/n 5104

L17 Check MCIU filter screen

TRANSFER UPDATE
Ref: MSG 016

EXERCISE

APPROACH
(CUE CARD, RNDZ)

MS3 WHEELOCK

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SSV OUTRATE - 3
SSP1 OIU PWR - OIU 1 ON, √tb-UP

GALLEY OVERNIGHT CONFIG
(ORB OPS, ECLS)

DIDB FILL
Fill 10 Drink Bags from Galley.
Remove gas. Place DIDBs
in EVA Systems 1 mesh bag.

GALLEY MORNING CONFIG
(ORB OPS,ECLS)

EMU REMOVAL
(EVA, AIRLOCK CONFIG)

EXERCISE

APPROACH
(CUE CARD, RNDZ)

MS4 NESPOLI

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

RENDEZVOUS TIMELINE
(RNDZ, RENDEZVOUS T/L)

APPROACH
(CUE CARD, RNDZ)

FE-2 UP TANI

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

DIDB FILL
Fill 10 Drink Bags from Galley.
Remove gas. Place DIDBs
in EVA Systems 1 mesh bag.

EMU REMOVAL
(EVA, AIRLOCK CONFIG)

P/TVO2 DOCK
(PHOTO/TV, SCENES)
Perform SETUP

P/TVO2 DOCK
(PHOTO/TV, SCENES)
Perform OPS

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 001 | STS ATI

R2 CDR MELROY | **R1** PLT ZAMKA | MS1 PARAZYNSKI | Notes

20:00 — RNDZ

APPROACH (CUE CARD, RNDZ)

APPROACH (CUE CARD, RNDZ)

APPROACH (CUE CARD, RNDZ)

12:00 — 30

UPLINK β21 Only + Boxes C1,C2,C3

21:00 — DOCK

< DOCKING (1/20:55)

SSV OUTRATE - 2

M069M LEH O2 8 vlv - CL

13:00

POST DOCKING HATCH LEAK CHECK (RNDZ, APDS)

MNVR (TRK) BIAS -XLV -ZVV (ISS -XVV TEA)
TG=2 BV=5 P=152 Y=358 OM=180
Init TRK then DAP:FREE>2 sec
DAP: A12/AUTO/VERN

POST RNDZ PGSC CONFIG
Configure PGSCs per EVA/RMS Usage Chart.
Launch WLES on RPOP 2

PRIOR PWRDN GRP B (OPCL, PRIOR PWRDN)
Steps 6 & 12 (In step 6, Single G2)
(In step 12,IMU 1 STBY - ITEM 21 EXEC)
06 S TRK PWR-Z-OFF

A/L PREP FOR INGRS-BYPASS CONFG (RNDZ, APDS)

JOINT OPS: 6.107 PCS SETUP-SHUTTLE

22:00 — 31

H/O ATT CNTRL TO ISS On MCC Go, DAP: FREE

P/TV04 INGRESS/EGRESS (PHOTO/TV, SCENES)
Perform SETUP

JOINT OPS: 2.106 HATCH OPEN AND DUCT INSTALL (BYPASS CONFIG)
Steps 2-11, Verify MCC-H complete with Step 1

14:00 — BIAS -XLV -ZVV

P/TV04 INGRESS/EGRESS (PHOTO/TV, SCENES)
Perform Ops

UPLINK TFL 184

WELCOME | WELCOME | WELCOME

23:00

SAFETY BRIEF | SAFETY BRIEF | SAFETY BRIEF

15:00 — 32

SSPTS ODS CONNECTOR VERIF
A15 ODS MATE X1,X2 (two) - ON
√MCC then - OFF

EVA TRANSFER TO ISS (EVA, AIRLOCK CONFIG)
Ref: PRE EVA 1 TOOL CONFIG (EVA, TIMELINES)
Ref: MSG 020

UPLINK β0 Only + Boxes C1,C2,C3,D1

OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 1-2

OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 1-2

00:00

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | TDRS W E Z | ORB 30 31 32 | MET Day 001 | STS ATI

M1 MS2 WILSON | MS3 WHEELOCK | MS4 NESPOLI | FE-2 UP TANI | Notes

20:00 — RNDZ

APPROACH (CUE CARD, RNDZ)

APPROACH (CUE CARD, RNDZ)

APPROACH (CUE CARD, RNDZ)

P/TV02 DOCK (PHOTO/TV, SCENES) Perform OPS

12:00

21:00 — DOCK

< DOCKING (1/20:55)

13:00

POST DOCKING HATCH LEAK CHECK (RNDZ, APDS)

A/L PREP FOR INGRS-BYPASS CONFG (RNDZ, APDS)

CDM SETUP AND BATTERY CHANGEOUT (ORB OPS, CDM DTO) Attach CDM in Location 2

22:00 — BIAS-XLV-ZVV

JOINT OPS: 2.106 HATCH OPEN AND DUCT INSTALL (BYPASS CONFIG) Steps 2-11, Verify MCC-H complete with Step 1

TRANSFER Crew Care Pack Ref: MSG 016

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

14:00

JNT OPS: 6.109 H/L ICOM AUDIO Steps 1,5 & 6

PLAYBACK (DIGITAL) (PHOTO/TV, CUE CARD) DOCKING KU TDRW (22:28-23:00)

WELCOME | WELCOME | WELCOME | WELCOME

23:00

SAFETY BRIEF | SAFETY BRIEF | SAFETY BRIEF | SAFETY BRIEF

15:00

ROBO: 1.110 OBSS UNBERTH AND HANDOFF Steps 1-4

EVA TRANSFER TO ISS (EVA, AIRLOCK CONFIG) Ref: PRE EVA 1 TOOL CONFIG (EVA, TIMELINES) Ref: MSG 020

IWIS SETUP Ref: MSG 014,Steps 1-8, & MSG 018 for ISS stowage locations

IELK REMOVAL & TRANSFER

IELK INSTALL & C/O Ref. RODF

00:00

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 002 | STS ATI

R2 CDR MELROY	R1 PLT ZAMKA	MS1 PARAZYNSKI	Notes
OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 3-5	OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 3-5	EVA TRANSFER TO ISS (EVA, AIRLOCK CONFIG) Ref: PRE EVA 1 TOOL CONFIG (EVA, TIMELINES) Ref: MSG 020	
	A SSPTS OPCU ACT On MCC Go: Activate OPCU 1 and 2 In Step 3: For OPCU 1 and 2 adjust voltage 17 increments UP for both	EVA SYS: 1.305 EQUIPMENT LOCK PREP Steps:3-19,24-25,29-34 Ref: CONSUMABLES TRACKING CC	
SSPTS OPCU ACT (ORB OPS, EPS) A R1 MN BUS TIE A - ON (tb-ON) C - ON (tb-ON)			
OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 6-7	OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 6-7	EVA SYS: 1.307 REBA INSTALL Ref: CONSUMABLES TRACKING CC EVA SYS: 1.403 REBA POWERED HARDWARE CHECKOUT	No Exercise when both arms grappled
		PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	
OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 8-9	OBSS HANDOFF FROM SSRMS TO SRMS (PDRS, OBSS HANDOFF) Steps 8-9		
JNT OPS: 2.107 SHUTTLE A/L TUNNEL FAN ACT Step 2, On MCC GO Steps 4-9	SODF TRANSFER Ref: MSGs 016 & 022 Items 132 & 137		
EVA PROCEDURE REVIEW REF: EVA 1 PREBRIEF (EVA, TIMELINES)	EVA PROCEDURE REVIEW REF: EVA 1 PREBRIEF (EVA, TIMELINES)	EVA PROCEDURE REVIEW REF: EVA 1 PREBRIEF (EVA, TIMELINES)	UPLINK β21 Only + Boxes C1,C2,C3
PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	

Time scale: 16:00, 17:00, 18:00, 19:00; 00:00, 01:00, 02:00, 03:00, 04:00

BIAS-XLV-ZVV

3-26 FLT PLN/120/FLIGHT

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 002 | STS ATI | M1 | MS2 WILSON | MS3 WHEELOCK | MS4 NESPOLI | FE-2 UP TANI | Notes

16:00 | 17:00 | 18:00 | 19:00

00:00 | 01:00 | 02:00 | 03:00 | 04:00

32 | 33 | 34 | 35

BIAS-XLV-ZVV

MS2 WILSON

ROBO: 1.110 OBSS UNBERTH AND HANDOFF
Steps 5-8

ROBO: 1.110 OBSS UNBERTH AND HANDOFF
Steps 9-13

ROBO:1.111 OBSS UNGRAPPLE AT HANDOFF

ROBO: 1.210 SETUP FOR EVA1

EVA PROCEDURE REVIEW
REF: EVA 1 PREBRIEF (EVA, TIMELINES)

TRANSFER BRIEF:
CALL DOWN STATUS TO MCC
Ref: MSG 016

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

MS3 WHEELOCK

EVA TRANSFER TO ISS
(EVA, AIRLOCK CONFIG)
Ref: PRE EVA 1 TOOL CONFIG (EVA, TIMELINES)
Ref: MSG 020

EVA SYS: 1.305 EQUIPMENT LOCK PREP
Steps:3-19,24-25,29-34
Ref: CONSUMABLES TRACKING CC
Ref: MSG 020

EVA SYS: 1.307 REBA INSTALL
Ref: CONSUMABLES TRACKING CC

EVA SYS: 1.403 REBA POWERED HARDWARE CHECKOUT

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

EVA PROCEDURE REVIEW
REF: EVA 1 PREBRIEF (EVA, TIMELINES)

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

MS4 NESPOLI

IWIS SETUP
Ref: MSG 014,Steps 1-8, & MSG 018 for ISS stowage locations

EVA SYS: 1.515 EMU METOX/LIOH/ BATTERY REPLACEMENT
Swap EMU Batt
Ref: CONSUMABLES TRACKING CC
Ref: MSG 020

JOINT OPS: 3.120 PREBREATHE USING SHUTTLE O2 SETUP
In Step 7.3 do not reattach panel A/L10A2

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

EVA PROCEDURE REVIEW
REF: EVA 1 PREBRIEF (EVA, TIMELINES)

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

FE-2 UP TANI

IELK INSTALL & C/O
Ref. RODF

IELK TEMP STOW
Temp Stow in ISS

PRIVATE MEDICAL CONFERENCE ISS

PREP WORK

EVA PROCEDURE REVIEW
REF: EVA 1 PREBRIEF (EVA, TIMELINES)

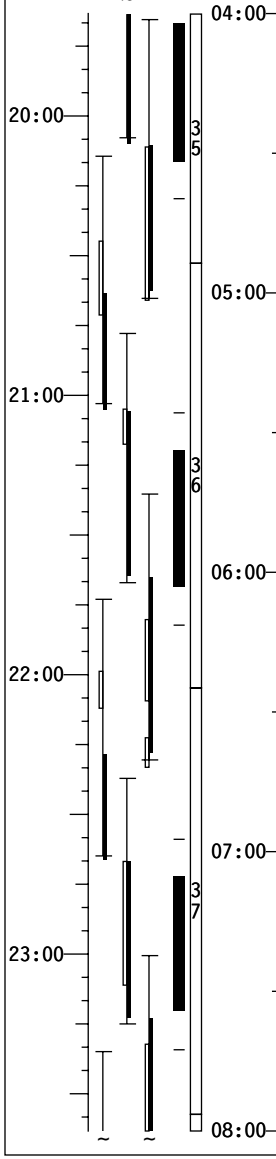
DAILY PLANNING CONFERENCE

PRE SLEEP

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | TDRSE | Z | ORB | MET Day 002 | STS ATI | CDR MELROY | PLT ZAMKA | MS1 PARAZYNSKI | Notes



04:00 — PRIVATE MEDICAL CONFERENCE

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
√HUM SEPs for H2O Accumulation

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

EVA SYS: 2.305 10.2 PSIA CAMPOUT MASK PREBREATHE

Ref: PRE EVA 1 TOOL CONFIG CONSUMABLES TRACKING CC
Ref: MSG 020

05:00

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

06:00

BIAS - XLV - ZVV

07:00 — SLEEP | SLEEP | SLEEP (A/L)

08:00

STS-120 FD03

REPLANNED

GMT Date 10/25 (298) | W | T D R S E | Z | O R B | MET Day 002 | S T S A T I

MS2 WILSON | MS3 WHEELOCK | MS4 NESPOLI | FE-2 UP TANI | Notes

04:00 — 05:00 — 06:00 — 07:00 — 08:00

20:00 — 21:00 — 22:00 — 23:00

35 — 36 — 37

BIAS -XLV -ZVV

MS2 WILSON

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

SLEEP

MS3 WHEELOCK

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

EVA SYS: 2.305 10.2 PSIA CAMPOUT MASK PREBREATHE

Ref: PRE EVA 1 TOOL CONFIG CONSUMABLES TRACKING CC

Ref: MSG 020

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

SLEEP (A/L)

MS4 NESPOLI

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

EVA SYS: 2.305 10.2 PSIA CAMPOUT MASK PREBREATHE

Ref: PRE EVA 1 TOOL CONFIG CONSUMABLES TRACKING CC

Ref: MSG 020

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

SLEEP

FE-2 UP TANI

PRE SLEEP

SLEEP (8.5)

Good Morning Discovery!!!

Thank you for the great job that you did with the inspection yesterday! Thank you for your patience in all the PGSC troubleshooting. We know how frustrating that can be.

Have a great rendezvous day!

YOUR CURRENT ORBIT IS: 172 X 171 NM

NOTAMS:

EDW – RWY 15/33 ELS ONLY. RWY 18L – CLOSED.
NOR – GREEN.
NTU - RWY 05R/23L CLOSED.
WAL – RWY 04/22 CLOSED.
FFA - ASCENT ONLY.
ZZA - FIRST 600M OF RWY 30L NOT AVAILABLE. 10,200' REMAINING.
WAK - UNUSABLE
AMB - UNUSABLE
JDG – DIEGO GARCIA: CLOSED 1800 - 0100Z.
IKF – NO AGREEMENT FOR USE
AWG – NO AGREEMENT FOR USE.
HAO – DME OUT
BEN – POLITICALLY NOT RECOMMENDED/NOT SUPPORTED.

NEXT 2 PLS OPPORTUNITIES:

EDW22 ORB 33 – 2/01:12 (SCT250 080/04p07)
EDW22 ORB 48 – 3/00:00 (SKC 230/05P10)

OMS TANK FAIL CAPABILITY:

L OMS FAIL: NO (POST NH) R OMS FAIL: NO (POST NH)

LEAKING OMS PRPLT BURN:

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

OMS QUANTITIES(%)

L OMS OX = 33.5 R OMS OX = 33.4
FU = 33.0 FU = 33.4

SUBTRACT I'CNCT COUNTER FOR CURRENT OMS QUANTITIES

DELTA V AVAILABLE:

OMS	301 FPS
ARCS (TOTAL ABOVE QTY1)	35 FPS
TOTAL IN THE AFT	336 FPS
ARCS (TOTAL ABOVE QTY2)	63 FPS
FRCS (ABOVE QTY 1)	28 FPS
AFT QTY 1	82 %
AFT QTY 2	44 %

SYSTEM	FAILURE	IMPACT	WORK AROUND
APU	APU 2 EGT 2 (B/U EGT) was erratic during ascent.	None; all FDAs have been inhibited. The parameter is displayed on SPEC 86 and BFS SM SYS SUMM 2.	APU 2 EGT 1 is available on SPEC 86 (APU 2 EGT) and BFS SM SYS SUMM 2 (APU 2 TEMP EGT).

END OF PAGE 2 OF 2, MSG 013

16-0035 (MSG 014) IWIS INSTALLATION NEAR SHUTTLE ERGOMETER

OBJECTIVE:
Install IWIS Accelerometer near the Shuttle Ergometer.

LOCATION:
Installed:
Stowed: √Inventory Management System (IMS)

PARTS:
IWIS CTB:
Accelerometer (P/N 0060-04-012)
Accelerometer Interface Plate (P/N 0060-04-015)
Accelerometer Cable Assy 25 ft. (P/N 0060-04-013)

MATERIALS:
Dry Wipes
Gray Tape
Velcro Ties

DURATION:
45 minutes

REFERENCED PROCEDURES:
None

INSTALLING IWIS ACCELEROMETER NEAR SHUTTLE ERGOMETER FRAME

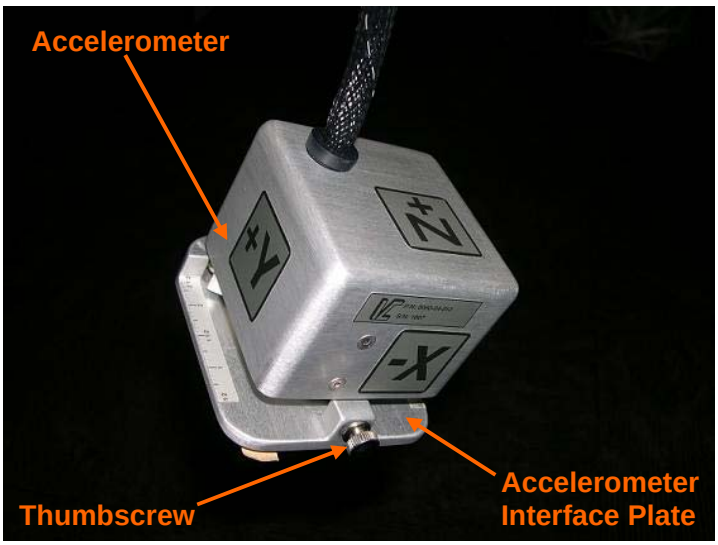


Figure 1.- IWIS Accelerometer attached to Interface Plate.

1. Retrieve IWIS accelerometer, Interface Plate from stowage.
   Loosen thumbscrew and detach accelerometer from Interface Plate.
   Refer to Figure 1.

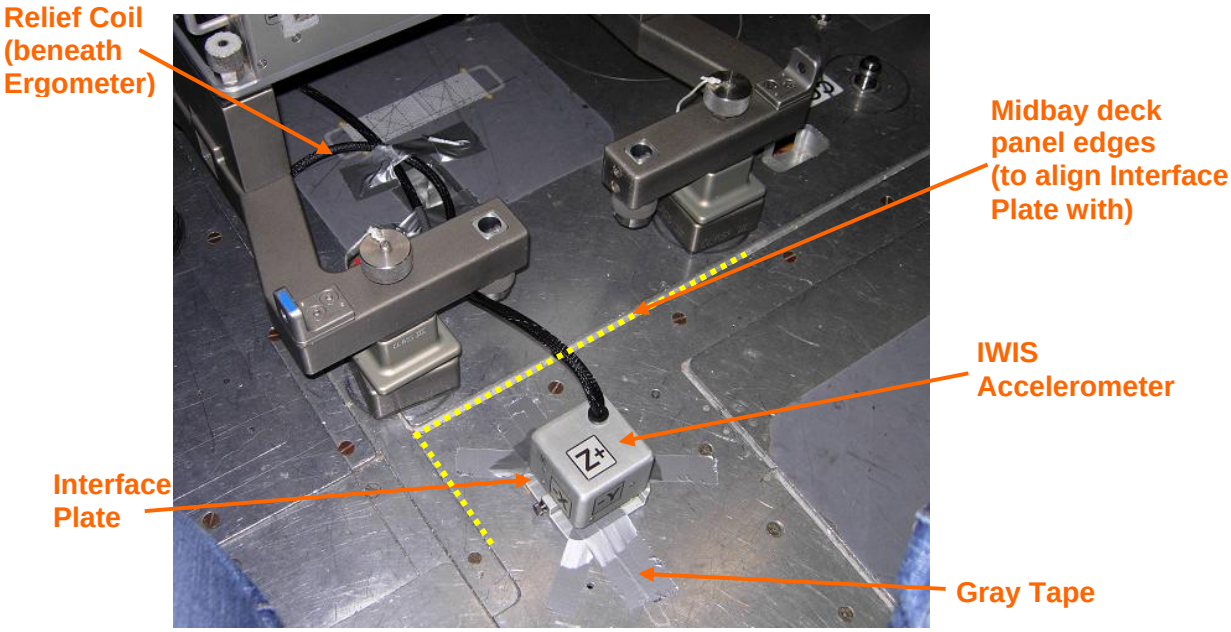


Figure 2.- Installation Location of IWIS Accelerometer on Shuttle Middeck near Ergometer Frame.

2. Locate Installation Area.
   Refer to Figure 2.
   Clean area with Dry Wipe.

3. Seat Interface Plate on installation area with edges orthogonal to panels on deck.
   Secure Interface Plate to deck (Gray Tape).
   Refer to Figure 2.

4. Install Accelerometer onto Interface Plate, tighten thumbscrew firmly with fingers while holding accelerometer with other hand.

NOTE
Bend radius of coil in accelerometer cable not to be less that 0.9 inches.

5. Secure a section of cable ~10 inches long to the deck beneath the Ergometer as a relief coil (Gray Tape).
   Refer to Figure 2.

6. Mate connectors:
   Accelerometer Cable →|← Accelerometer Cable Assy 25 ft.

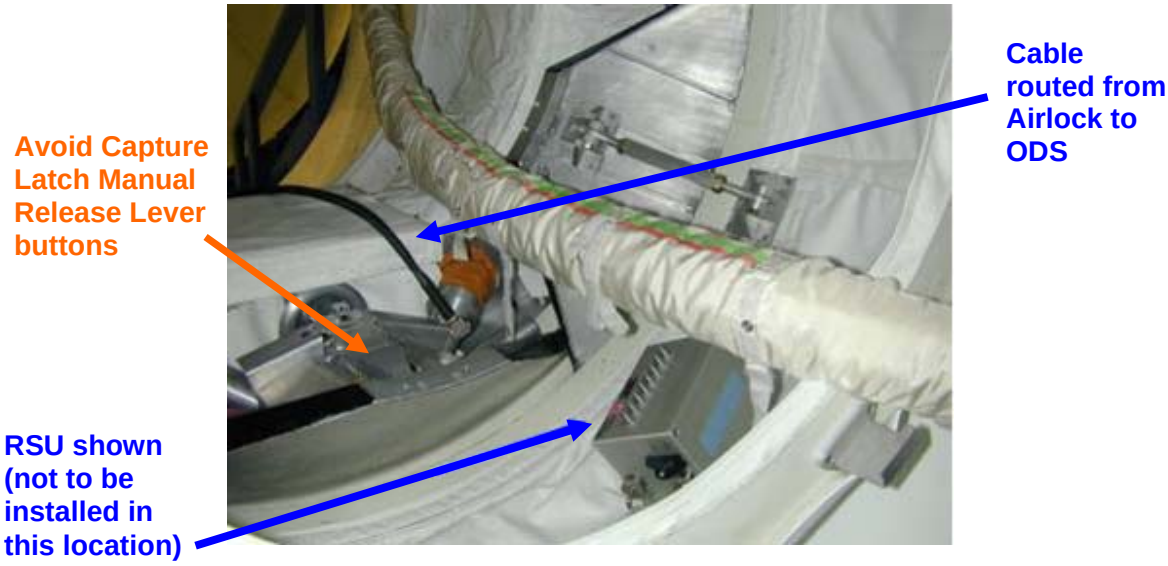


Figure 3.- Cable Routing in ODS Vestibule w/ Capture Latch Manual Release Lever Shown

CAUTION
Avoid areas of ODS Capture Latch Manual Release Levers (three locations) to prevent inadvertent configuration changes.

7. Route Accelerometer Cable, 25' Ext. Cable from Ergometer location through ODS vestibule into ISS LAB Forward Endcone area, avoiding ODS Capture Latch Manual Release Levers.
   Refer to Figure 3.
   Secure as necessary, coiling extra length (Gray Tape, Velcro Ties).

NOTE
RSU is not certified for use in the Shuttle. Take steps to ensure placement in ISS.

8. Connect RSU located in LAB Forward Endcone area.
   Accelerometer Cable Assy 25 ft. →|← RSU

REMOVING IWIS ACCELEROMETER AND CABLES

9. Disconnect RSU located in LAB Forward Endcone area.
   Accelerometer Cable Assy 25 ft. ←|→ RSU

10. Deroute Accelerometer Cable and Accelerometer Cable Assy 25 ft. Cable from ODS vestibule, removing any Gray Tape, Velcro Ties as necessary.

11. Demate connectors:
    Accelerometer Cable ←|→ Accelerometer Cable Assy 25 ft.

12. Remove Gray Tape securing Accelerometer relief coil.
    Refer to Figure 2.

13. Loosen thumbscrew on Interface Plate, remove Accelerometer from Interface Plate.

14. Remove Gray Tape securing Interface Plate to deck.

15. Stow Accelerometer, Interface Plate, Accelerometer Cable Assy 25 FT., Velcro Ties in IWIS CTB.

Good morning Doug, Stephanie, and Dan,

Today is your first transfer list uplink. To help incorporate the quantity of page changes needed, there is a block of time called 'XFER UPDATE' scheduled for Stephanie. On the RESUPPLY and SWAP tabs, new and/or changed items are identified by the 'X' in the 'CHNG' column. However, due to software issues, we had to adjust the page breaks for the RESUPPLY tab, and therefore you will need to swap out the entire set of Resupply pages currently in your Transfer book. We apologize for this inconvenience.

We are also uplinking all the RETURN tab pages today. Please note that these will not have any 'change flags' since these are all new pages to your transfer book. Below, you'll find an outline of the changes by 'Tab' for which pages will need to be changed out or added.

We've also uplinked updated Ascent and Descent Layouts, as well as an updated Choreography for inclusion in your transfer book.

Stephanie will conduct the first 'Transfer Brief' with the ground today. We'll be waiting for your call A/G2.

The Transfer List Excel file, FD03_TransferList_STS120.xls, is located on the KFX machine in **C:\OCA-up\transfer**.

For ISS, the Transfer List Excel file, FD03_TransferList_STS120.xls, is located in **K:\OCA-up\transfer**.

Questions/Answers for the crew

- **Q:** During the PGSC troubleshooting on FD01 it was reported that A31P Power cable S/N 1006 was failed. We expected cable S/N 1006 to be packed in transfer item 108, the Ziplock with the A31P Docking Station w/ OCA2A Card. When you transfer item 108, please report the S/N of the A31P Docking Station Power cable.

Choreography (items for transfer today)

- **Item 107 -** Ziplock of miscellaneous hardware from Bag E
- **Item 108 -** OCA Docking Station and OCA card
- **Item 110, 111 and 715 -** Tani's IELK, Clay's IELK, Tani's athletic shoes
- **Item 119 -** Ziplock of IMV hardware
- **Item 120 -** Photo TV Resupply bag
- **Item 132 and 137 -** SODF Ziplock and SODF 1.0 CTB
- **Item 138 -** CHeCS EHS/CMS Hardware
- **Item 140 -** Crew Care Package
- **Item 144 - 155 -** EVA hardware
- **Item 151 -** Jettison Stowage Bag of Integrated Immune hardware
- **Item 152 and 153 -** EMUs

<u>Please incorporate uplink pages as follows:</u>

In **LAYOUTS** Tab
Replace Page:
    Layouts – 1
Add Page:
    Layouts – 2

In **RESUPPLY** Tab
Replace **ALL** Pages:
    Resupply 1 – Resupply 16

In **RSPLY REALTIME ADDITIONS** Tab
Add Page:
    Resupply - 17

In **SWAP** Tab
Replace Pages:
    Swap – 1 through Swap - 7

In **RETURN** tab
Add Page(s):
    Return – 1 through Return - 15

In **RTN REALTIME ADDITIONS** Tab
Add Page:
    Return – 16

In **REFERENCES** Tab
Replace Page:
    Choreography – 1 through Choreography – 3

Changes to the Transfer List are detailed below.

<u>RESUPPLY</u>
Item 107: Updated Item name
Item 108: Updated Stowage at Undock, added constraint
Item 110: Corrected Typo
Item 112: Corrected Typo, Updated Initial Stowage
Item 113: Updated Initial Stowage
Item 122: Updated Stowage at Undock, Updated constraints
Item 125: Updated Stowage at Undock, Updated constraints
Item 131: Updated Stowage at Undock
Item 132: Updated Stowage at Undock
Item 135: Updated Stowage at Undock, Updated constraints
Item 137: Updated Stowage at Undock
Item 139: Added Serial Number, Updated Initial Stowage
Item 145: Corrected Typo
Item 151: Updated Stowage at Undock

RSP REAL TIME ADDITIONS
Item 801: New Item
Item 802: New Item
Item 803: New Item

SWAP
Item 708: Corrected Typo
Item 103: Updated Constraints
Item 721: Updated Constraints
Item 715: Updated Item Number, Updated Constraints
Item 126: Updated Constraints
Item 803: New Item
Item 804: New Item
Item 127: Updated Comments
Item 718: Updated Initial Location
Item 139: Updated Item Name, Initial Location, Stowage at Undock, and Constraints
Item 400.1: Added Serial Number
Item 143: Updated Quantity
Item 707: Updated Quantity, Updated Comments

RETURN
Item 400 through 412: New Items
Item 600 through 613: New Items
Item 700 through 723: New Items

RTN REAL TIME ADDITIONS
Item 804: New Item

Call us with any questions and have a great day!

- The Transfer Team

Excerpt from ISS Message 16-0040: STOWAGE LOCATIONS FOR THURSDAY PLAN (GMT 298, FD03):

16-0035 (MSG 14) IWIS INSTALLATION NEAR SHUTTLE ERGOMETER						
#	**LOCATION**	**ITEM NAME**	**P/N**	**S/N**	**B/C**	**Notes**
1	**LAB1P5_A1** 0.5 CTB: IWIS CTB, S/N 1188, B/C 006637J	IWIS Accelerometer Interface Plate	0060-04-015	1013	-	
2		→ IWIS Triaxial Accelerometer Assembly	0060-04-012	1005	WISTAA05J	
3		WIS Accelerometer Cable Assembly (25')	0060-04-013	1004	00079720J	
4	**LAB1 Deployed**	DCS 760 Camera	Crew Pref	Crew Pref	Crew Pref	
5	**NOD1O4_B1** 0.5 CTB: Office Supply Pantry – 3, S/N 1178, B/C 006627J	Velcro Ties	SEG46116003-301	-	-	
6		Gray Tape	Any	-	-	
7	**PMA1** 0.5 CTB: SANITARY HYGIENE PANTRY – 3, S/N 1256, B/C 010437J	Dry Wipe (ZIPLOCK)	SEZ33114924-301	-	-	
8		→Dry Wipes	SEZ33114924-301	-	-	

Good morning from the D-EVAs! Great job yesterday – you have 2 good suits, mesh bags with transfer items ready to go, and you even successfully dealt with some Chica math! A few minor changes for the plan today:

EVA, TIMELINES, FS 7-16, PRE EVA 1 TOOL CONFIG:

To make things easier for stowage, Clay and Peggy left your MWS gear installed on the old baseplates. As part of your PRE EVA 1 TOOL CONFIG after docking, you'll need to transfer your T-bar, swing arm and BRT to the new baseplates you're bringing over in the EVA TOOLS A bag. EV1's baseplate S/N 1023 can be put in the DONE mesh bag (it stays on ISS) and EV2's baseplate S/N 1008 needs to go to Return bag 404 (it comes home). Also during EVA Tool Config, as you are configuring the 6-72" gap spanners in the small trash bag, give us a heads up if you can't fit all 6. If that's the case, put 4 in there and we'll work out a new plan on the ground.

STS-120/10A Consumables Tracking Cue Card - Pen and Ink changes

We would like you to update the Consumables Tracking Cue Card with the same information that you called down yesterday. Here is how we filled in the blanks on our copy:

Row: **Launched / Landing**
EV1: s/n 2002 (LiOH)
EV2: s/n 2004 (LiOH)

Row: **EVA 1 – FD 4**
EV1: s/n 2002 (LiOH) – Launched
EV2: s/n 2004 (LiOH) – Launched

Row: **EVA 3 – FD 8**
EV1: s/n 2023 (LiOH)
EV2: s/n 2025 (LiOH)

We also have one typo that can be fixed on the back side of the same cue card under the "**LiOH/Metox (s/n)**" column. In the "**EVA 5 – FD 11**" row, the EV3 should be EV4 and the EV4 should be EV5.

Additionally, we noticed that the Node 2 Starboard (fwd on 10A) CBCS flap has opened during launch. We will have you resecure the flap during EVA 2 when you are near that worksite. We will provide more information prior to your EVA procedure review.

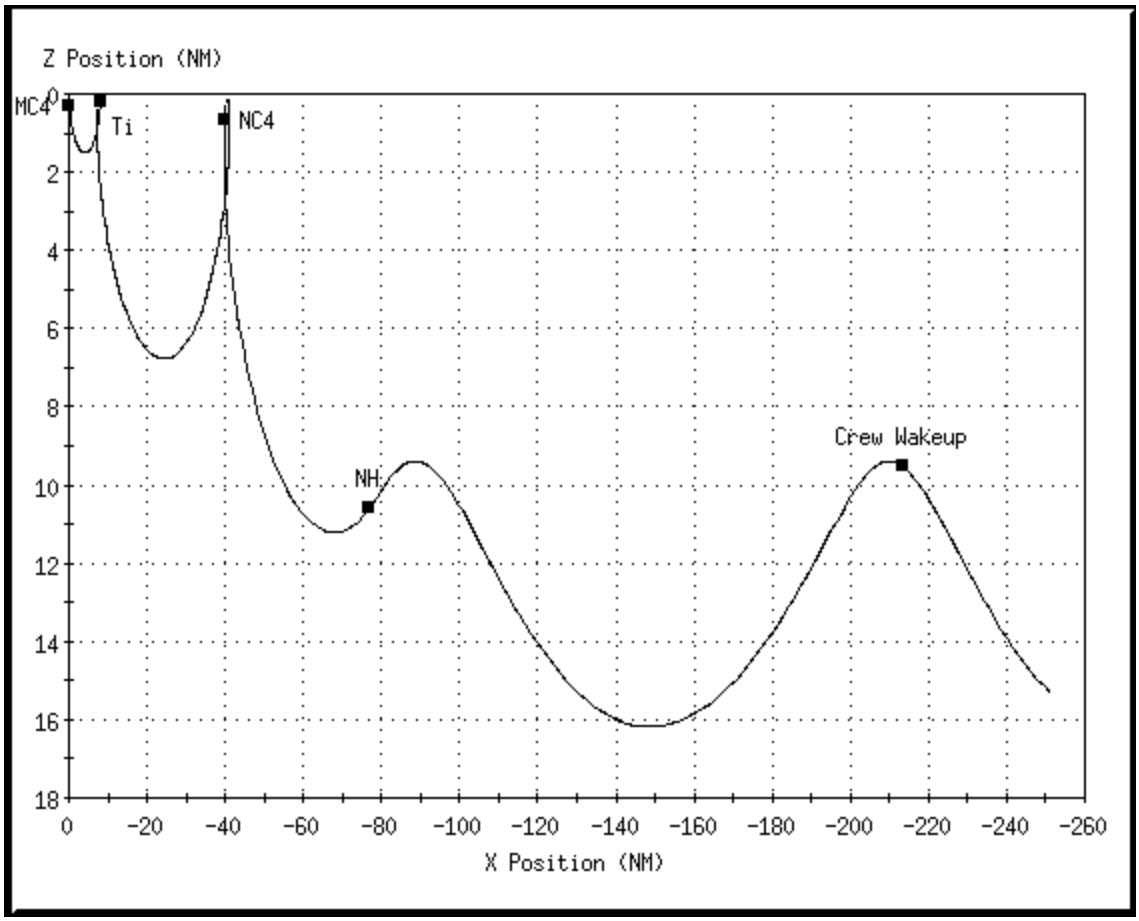
END OF PAGE 1 OF 1, MSG 020A

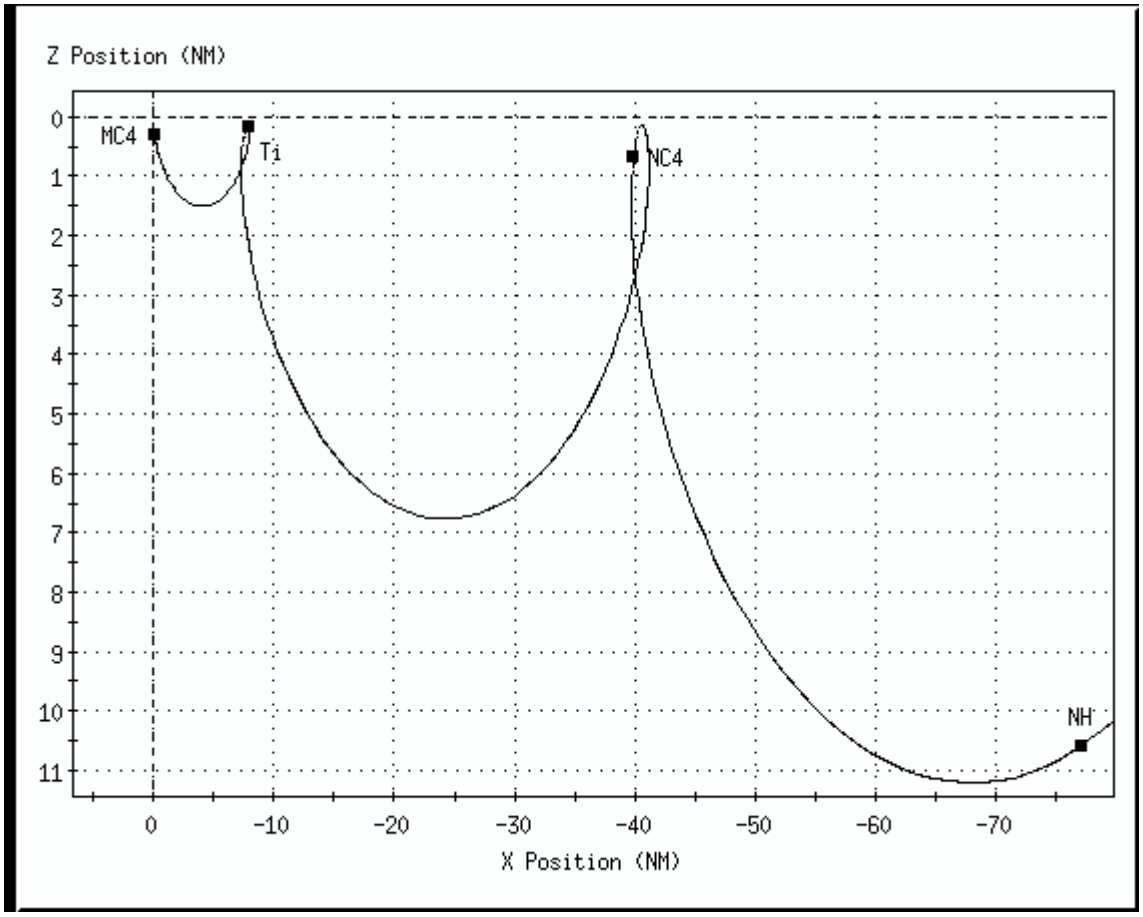
FLIGHT NOTE

TO: FD, CAPCOM, FAO, RENDEZVOUS, PROP, GC
FROM: FDO
SUBJECT: MANEUVER TIGS

COPIES: 1

	MET	
NH	001:15:48:30.000	
NC4	001:16:36:23.000	
NCC	001:17:19:24.000	
TI	001:18:17:06.000	PET = 0:0 ; SS - 36 MIN
MC1	001:18:37:06.000	
MC2	001:19:07:00.000	ET = 0:0
MC3	001:19:24:00.000	MC2 + 17 MIN
MC4	001:19:34:00.000	MC2 + 27 MIN
DOCK	001:20:55:00.000	


Z Position (NM)
MC4
Ti
NC4
NH
Crew Wakeup
0
2
4
6
8
10
12
14
16
18
0
-20
-40
-60
-80
-100
-120
-140
-160
-180
-200
-220
-240
-260
X Position (NM)


Z Position (NM)
0
1
2
3
4
5
6
7
8
9
10
11
MC4
Ti
NC4
NH
0
-10
-20
-30
-40
-50
-60
-70
X Position (NM)

PRELIMINARY ORBIT MANEUVER PAD FOR NH (RNDZ p 3-2)

OMS BOTH 1	X	
L 2		
R 3		
RCS SEL 4		+X / -X / MULTI-AXIS
TV ROLL 5	000	
TRIM LOAD P 6	(+)0.5	
LY 7	(-)5.7	
RY 8	(+)5.7	
WT 9	248683	
TIG 10	01/15:48:30.9	
TGT PEG 7 ΔVX 19	(+)024.5	
ΔVY 20	(+)000.0	
ΔVZ 21	(+)000.3	

BURN ATT R 24	226
P 25	030
Y 26	359

ΔVTOT	024.5
TGO	00:16
VGO X	(+)023.6
VGO Y	(+)000.0
VGO Z	(+)006.5

	HA	HP
TGT	186	(+)171

NOTES

OMS GMBL CK:

	PRE	POST-BURN
L PRI		X
L SEC		
R PRI		X
R SEC		
NONE	X	

RCS I'CNCT:

- [ ] L OMS → RCS
- [ ] R OMS → RCS
- [X] NONE

DOWN MODE OPTIONS:

- [X] 2 OMS → 1 OMS
- [ ] 1 OMS → RCS
- [ ] NONE

OMS HE REG TEST: [ ] NONE

	L GPC	L OP	L CL	R GPC	R OP	R CL
A	X			X		
B		X			X	

-X RCS BURNS:

	BURN ATT		LVLH ATT
P 15	N/A	R	N/A
Y 16	N/A	P	N/A
OM 17	N/A	Y	N/A

ORBIT BURN MONITOR

GPC FILL-INS 1 (3)

- [X] CRIT BURN
- [ ] NON-CRIT BURN

MAX TIG SLIP ___ MIN.

- [ ] DO NOT UPDATE TIG
- [ ] UPDATE TIG AFTER ___ MIN.

NOTES

Treat GPC3 fail as second gimbal fail on right.

PRELIMINARY ORBIT MANEUVER PAD FOR NC-4 (RNDZ p 3-4)

OMS BOTH 1		
L 2		
R 3	X	
RCS SEL 4		+X / -X / MULTI-AXIS
TV ROLL 5	000	
TRIM LOAD P 6	(+)0.5	
LY 7	(+)4.8	
RY 8	(-)4.8	
WT 9	248085	
TIG 10	01/16:36:23.6	
TGT PEG 7 ΔVX 19	(+)008.1	
ΔVY 20	(+)000.0	
ΔVZ 21	(+)000.1	

BURN ATT		
R 24	130	
P 25	208	
Y 26	347	

ΔVTOT	008.1	
TGO	00:10	
VGO X	(+)007.7	
VGO Y	(-)001.6	
VGO Z	(+)002.1	
	HA	HP
TGT	186	(+)176

NOTES

OMS GMBL CK:

	PRE	POST-BURN
L PRI		X
L SEC		
R PRI		X
R SEC		
NONE	X	

RCS I'CNCT:

- [ ] L OMS → RCS
- [ ] R OMS → RCS
- [X] NONE

DOWN MODE OPTIONS:

- [ ] 2 OMS → 1 OMS
- [X] 1 OMS → RCS
- [ ] NONE

OMS HE REG TEST: [ ] NONE

	L GPC	L OP	L CL	R GPC	R OP	R CL
A					X	
B						X

-X RCS BURNS:

	BURN ATT		LVLH ATT
P 15	N/A	R	N/A
Y 16	N/A	P	N/A
OM 17	N/A	Y	N/A

ORBIT BURN MONITOR

GPC FILL-INS 1 (3)

- [X] CRIT BURN
- [ ] NON-CRIT BURN

MAX TIG SLIP ___ MIN.

- [ ] DO NOT UPDATE TIG
- [ ] UPDATE TIG AFTER ___ MIN.

NOTES

Load precautionary G2 NBAT of 1212 to protect for GPC3 fail pre Burn EXEC.
Post Burn EXEC, treat GPC3 fail as second gimbal fail on right.

PRELIMINARY ORBIT MANEUVER PAD FOR Ti (RNDZ p 3-6)

OMS BOTH	1	
L	2	X
R	3	
RCS SEL	4	
TV ROLL	5	000
TRIM LOAD P	6	(+)0.5
LY	7	(+)4.8
RY	8	(-)4.8
WT	9	247889
TIG	10	01/18:17:06.0
TGT PEG 7 ΔVX	19	(+)009.2
ΔVY	20	(-)000.5
ΔVZ	21	(-)000.2

RCS SEL:
- [ ] +X
- [ ] -X
- [ ] MULTI-AXIS

BURN ATT

R	24	150
P	25	253
Y	26	342

ΔVTOT	009.2
TGO	00:12
VGO X	(+)008.7
VGO Y	(+)001.8
VGO Z	(+)002.4

	HA	HP
TGT	189	(+)180

NOTES

OMS GMBL CK:

	PRE	POST-BURN
L PRI		
L SEC		
R PRI		
R SEC		
NONE	X	X

RCS I'CNCT:
- [ ] L OMS → RCS
- [ ] R OMS → RCS
- [X] NONE

DOWN MODE OPTIONS:
- [ ] 2 OMS → 1 OMS
- [X] 1 OMS → RCS
- [ ] NONE

OMS HE REG TEST:

[ ] NONE

	L GPC	L OP	L CL	R GPC	R OP	R CL
A		X				
B			X			

-X RCS BURNS:

	BURN ATT				LVLH ATT		
P	15	N	/	A	R	N	/	A
Y	16	N	/	A	P	N	/	A
OM	17	N	/	A	Y	N	/	A

ORBIT BURN MONITOR

GPC FILL-INS 1 (3)
- [X] CRIT BURN
- [ ] NON-CRIT BURN

TIG SLIP: If Ti not started by nominal TIG + ___ min go to Ti DELAY, 5-27

Max Ti DELAY TIG slip ___ min.
- [ ] DO NOT UPDATE TIG
- [ ] UPDATE TIG AFTER ___ MIN.

Ti DELAY

TGT PEG 7 ΔVX	19	(-)
ΔVY	20	(-)
ΔVZ	21	(-)

NEW Ti (BASETIME) 01/19:48:36.0

NOTES

Based on yesterday's TCS troubleshooting, we suspect the problem may have been caused by either a bad TCS data cable or an improper assignment of the COM Port within the Windows operating system. Prior to today's TCS troubleshooting, the MCC would like to downlink yesterday's TCS CAD log files from STS4. The MCC will also uplink a new TCS CAD shortcut to STS4 (The STS5 update is already complete). The current shortcut points to an incorrect TCS Unit ID number (7 instead of 8). This is not thought to be the root cause, but we would like to rule it out. To accomplish this, please connect STS4 to the network and power it up as soon as possible.

For your TCS troubleshooting actions, we would like to focus initially on replacing the pre-routed TCS data cable with the backup TCS data cable (if you have not done so already), and confirming that the STS4 ("RPOP") PGSC operating system has assigned the correct COM Port number to the Quatech card. These steps will be followed by the Rendezvous Tools Checkout. The backup RS-422 TCS Y data cable is located in locker ML60E (MAR), and the backup 10 ft extension (for the 6 ft leg) is located in locker MA16F.

TCS troubleshooting procedure:

1. On MCC GO, shut down STS1 ("Router"), STS2 ("WinDecom"), STS3 ("KFX"), STS4 ("RPOP") and STS5 ("RPOP2").

2. Connect the backup TCS data cable and 10 ft extension:

Connect the source end of the cable to L11 PDIP2

Connect the transmit/receive ("TX/RX") leg of the cable to STS4 ("RPOP") COM Port 2, with the RS-422 adapter ("Bubba") in place.

Connect the receive-only ("RX ONLY") leg of the cable (with 10 ft extension) to STS5 ("RPOP2") COM Port 2, with the RS-422 adapter ("Bubba") in place.

3. Power on STS1, STS3, STS4 and STS5. Do not start any applications on STS4 and STS5 until step 4 is complete. After these PGSCs have booted, power on STS2. This avoids the possible "jumping mouse" problem.

4. BEFORE starting any applications on STS4 ("RPOP"), perform the following procedure to confirm proper COM port settings:

a. Go to Start -> Settings -> Control Panel.
b. Open "System"
c. In the System control panel, select the "Hardware" tab, then click the "Device Manager" button.
d. In the resulting display, expand the "Ports" section, if it is not already expanded.
e. Examine the two entries labeled "Quatech" - they should be described as (COM2) and (COM4), and have no red "X"s or other status indicators.
f. Report findings to MCC.
g. If the two entries are correctly labeled (COM2) and (COM4), go to step 5.

**********COM Port Reconfiguration**********

h. To re-configure the ports to (COM2) and (COM4), right-click on the first Quatech port, and select “Properties”

i. On the resulting dialog, select “Port Settings”, and then click the “Advanced” button.

j. On the resulting dialog there is a drop-down list labeled “COM Port Assignment” which determines the number of the COM port. Select COM2, ignoring any “(in use)” designation. Click OK, and then click “Yes” to any dialog that warns of reassigning an “(in use)” COM port.

k. Click OK on all dialogs opened in steps h, i, and j.

l. Right-click on the second Quatech port, select Properties, and repeat steps h-k, this time selecting COM4 instead of COM2.

m. Finally, close the Device Manager and click OK on the System control panel.

n. Report status to MCC.

****

5. Perform RENDEZVOUS TOOLS CHECKOUT (RENDEZVOUS, RNDZ TOOLS), Steps 1 thru 5.

6. Report status to MCC

7. On MCC GO, perform TCS DEACTIVATION (RENDEZVOUS, RNDZ TOOLS)