

Orbit Operations Checklist

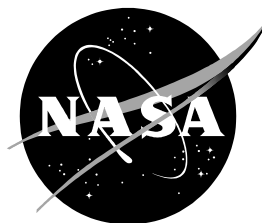
STS-118 Flight Supplement

**Mission Operations Directorate
Operations Division**

**Final
July 16, 2007**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



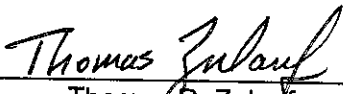
United Space Alliance

MISSION OPERATIONS DIRECTORATE

**ORBIT OPERATIONS CHECKLIST
STS-118 FLIGHT SUPPLEMENT**

FINAL
July 16, 2007

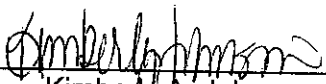
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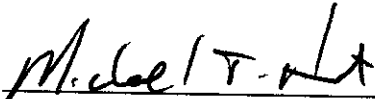
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Publication Manager

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| MAUI | DF6/R. Gonzalez | 281-483-0714 |

CUE CARDS:

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|--|-----------------|--------------|
| FLIGHT DAY 3 DOCKING ORBITER WITH ISS CO2 ABSORBER REPLACEMENT | DF8/K. Rogers | 281-483-1395 |
| ORBIT BURN MONITOR | DF6/L. Schmitt | 281-483-0694 |
| DAP TABLES | DF6/R. Gonzalez | 281-483-0714 |
| MAUI – RCS FIRING SEQUENCE | DF6/R. Gonzalez | 281-483-0714 |
| MIDODRINE PILL INGESTION | C. Hughes | 281-218-3313 |

ORBIT OPERATIONS CHECKLIST
STS-118 FLIGHT SUPPLEMENT

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FINAL 07/16/07

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* – Omit from flight book

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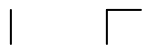
* – Omit from flight book

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COMM/INST

| | |
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| LOAD PCMMU FORMAT..... | FS 1-2 |
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**COMM/
INST**

COMM/
INST

LOAD PCMMU FORMAT

- C3 1. √OI PCMMU FORMAT – GPC
SM 62 PCMMU/PL COMM
- CRT 2. FORMAT:
SEL FXD – ITEM 1 EXEC (*)
SEL ID – ITEM 3 +X X X EXEC
3. √SM COMM BUF – RDY
LOAD – ITEM 4 EXEC
√LOAD, ITEM 4 – RUN,CPLT
- If LOAD – CPLT:
Repeat steps 2 and 3 for second ID
- * If LOAD – FAIL and ERR MSG – 'I/O ERR MMU 1(2)': *
 - * Go to 5.2a, 'I/O ERR MMU 1(2)' (MAL, *
* DPS) >> *
 - * If LOAD – FAIL and a first load attempt: *
 - * Repeat steps 1 and 2 for failed ID *
 - * If LOAD – FAIL and a subsequent load *
 - * attempt: *
 - * √MCC *
 - * OI PCMMU PWR – 2(1) *
 - * √ERR MSG – 'I/O ERR PCM' *
 - CRT * I/O RESET PCM – ITEM 5 EXEC (*) *
 - * Repeat steps 2 and 3 *
4. When final LOAD – CPLT:
SEL PGM – ITEM 2 EXEC (*)

| DNLIST COMPATIBILITY | PHASE | FORMAT ID 64/128 | CONFIG NO. |
|-------------------------|---|------------------------|---------------|
| G1,G3,BFS | (ASCENT) | 102/129 | – |
| G3,BFS | (ENTRY) | 102/166 | 756 |
| G2,G8,S2 | ORBIT/ORBIT BURN/FCS C/O | 103/161 | – |
| G2,S2,OPS 0 | OPS 0 | – /163 | – |
| G2,S2,P9 | MMU C/O | – /163 | – |
| G2,G8,S2 | ORBIT (SHAB/OIU/TCS/SSV) (PRIME) | 103/184 | 760 |
| G2,G8,S2 | ORBIT (SHAB/OIU/TCS/SSV) (B/U) | 103/205 | 767 |
| G2,G8,S2 | ISS INT CBM (LAB FWD) (SHAB/OIU) (PRIME) | 103/199 | 780 |
| G2,G8,S2 | ISS INT CBM (LAB FWD) (SHAB/OIU) (B/U) | 103/212 | 781 |
| G2,G8,S2 | RNDZ/UNDOCK (SHAB/OIU/TCS/SSV) (PRIME) | 103/192 | 763 |
| G2,G8,S2 | RNDZ/UNDOCK (SHAB/OIU/TCS/SSV) (B/U) | 103/211 | 770 |
| G2,G8,S2 | ISS NCS CBM (NODE 1) (SHAB/OIU) (B/U) | 103/208 | 769 |
| G2,G8,S2 | ISS NCS CBM (NODE 1) (SHAB/OIU) (PRIME) | 103/188 | 762 |

NOTE

LDR TFL may affect PCMMU BITE. If PCMMU or SM 2 GPC switched since last TFL, ID 64 and 128 will not reflect current state

LOAD PDI DECOM FORMAT

SM 62 PCMMU/PL COMM

```
1. PDI:
CRT  √I/O RESET – ITEM 8 (*)
      SEL DECOM – ITEM 9 +X EXEC
      SEL FMT   – ITEM 10 +X X X EXEC
      LOAD      – ITEM 11 EXEC

If LOAD – CPLT:
      SEL INPUT – ITEM 12 +X EXEC
      LOAD      – ITEM 13 EXEC
      Repeat step 1 for additional DECOMs/FPM

* If LOAD – FAIL and ERR MSG – 'I/O ERR *
* MMU 1(2)': *
* Go to 5.2a, 'I/O ERR MMU 1(2)' (MAL, *
* DPS) >> *
* *
* If LOAD – FAIL and a first load attempt: *
* Repeat step 1 *
* *
* If LOAD – FAIL and a subsequent load *
* attempt: *
* *
* NOTE *
* Power cycling PDI will cause PDI *
* to lose DFLs previously loaded *
* *
* √MCC *
A1L  * S-BD PL CNTL – PNL *
      * PL DATA INTLVR PWR – OFF,ON *
      * √ERR MSG – 'S62 BCE BYP PL' *
      * √'S62 BCE BYP PDI' *
      * S-BD PL CNTL – CMD *
      * *
      * PCM: *
CRT  * I/O RESET PCM – ITEM 5 EXEC (*) *
      * PDI: *
      * I/O RESET – ITEM 8 EXEC (*) *
      * Repeat step 1 for all of config (XXX) *
```

| CONFIG | DECOM | FMT | INPUT | USE |
|---|-------|-----|-------|------------------|
| 756 ENTRY TFL 166 | 1 | 2 | 3 | SHAB (2K) |
| | 2 | 3 | 3 | SHAB (2K) |
| | 3 | - | - | - |
| | 4 | - | - | - |
| | 5-FPM | 505 | | H-H-N/A * |
| 760 ORBIT (PRIME) TFL 184 | 1 | 27 | 3 | SHAB (8K) |
| | 2 | 5 | 1(2) | OIU255 (ONLY) ** |
| | 3 | 9 | 5 | TCS |
| | 4 | 4 | 4 | SSV (3) *** |
| | 5-FPM | 502 | | H-H-H * |
| 767 ORBIT (BACKUP) TFL 205 | 1 | 19 | 5 | TCS |
| | 2 | 29 | 3 | SHAB (8K) |
| | 3 | 14 | 4 | SSV (3) *** |
| | 4 | 15 | 1(2) | OIU255 (ONLY) ** |
| | 5-FPM | 506 | | H-H-H * |
| 780 ISS INT CBM (LAB FWD) (4BC) (PRIME) TFL 199 | 1 | 27 | 3 | SHAB (8K) |
| | 2 | - | - | - |
| | 3 | 7 | 1(2) | OIU9 (CCSH) ** |
| | 4 | - | - | - |
| | 5-FPM | 503 | | H-H-H * |
| 781 ISS INT CBM (LAB FWD) (4BC) (BACKUP) TFL 212 | 1 | - | - | - |
| | 2 | 29 | 3 | SHAB (8K) |
| | 3 | - | - | - |
| | 4 | 17 | 1(2) | OIU9 (CCSH) ** |
| | 5-FPM | 508 | | H-H-H * |
| 763 RNDZ/UNDOCK (PRIME) TFL 192 | 1 | 27 | 3 | SHAB (8K) |
| | 2 | 30 | 1(2) | OIU7 (CCSU) ** |
| | 3 | 9 | 5 | TCS |
| | 4 | 8 | 4 | SSV (2) *** |
| | 5-FPM | 501 | | H-H-H * |

* OI-GNC-SM, Orbiter Downlist Data Rates (High or Low)

** # in OIU# represents the OIU format;
(XXX) represents data type

*** # in SSV (#) represents the SSV Out Rate sw selection

Cont next page

FS 1-5

ORB OPS/118/FIN

| CONFIG | DECOM | FMT | INPUT | USE |
|--|---------------------------|-----------------------------|---------------------|--|
| 770 RNDZ/UNDOCK (BACKUP) TFL 211 | 1 2 3 4 5-FPM | 19 29 18 31 507 | 5 3 4 1(2) | TCS SHAB (8K) SSV (2) *** OIU7 (CCSU) ** H-H-H * |
| 762 ISS NCS CBM (NODE 1) (4AC) (PRIME) TFL 188 | 1 2 3 4 5-FPM | 27 - 6 - 503 | 3 - 1(2) - | SHAB (8K) - OIU9 (CCSH-A) ** - H-H-H * |
| 769 ISS NCS CBM (NODE 1) (4AC) (BACKUP) TFL 208 | 1 2 3 4 5-FPM | - 29 - 16 508 | - 3 - 1(2) | - SHAB (8K) - OIU9 (CCSH-A) ** H-H-H * |

* OI-GNC-SM, Orbiter Downlist Data Rates (High or Low)

** # in OIU# represents the OIU format;
(XXX) represents data type

*** # in SSV (#) represents the SSV Out Rate sw selection

LOAD OIU FORMAT/CONFIG

Determine which step is needed and complete all actions to obtain desired OIU configuration

NOTE

A corresponding TFL/DFL CONFIG is reqd for MCC to receive telemetry. Reference S62 PCMMU/PL COMM for the last loaded HDR TFL and perform LOAD PCMMU FORMAT/LOAD PDI DECOM FORMAT for the associated CONFIG

S212 OIU

1. GNC-1 PRIMARY ON LB-ORB N2-1 (OIU BUS 3)
LOAD FORMAT ITEM 1 +9 EXEC
GNC TO GNC 1 ITEM 18 +1 4 EXEC
GNC 1 TO BUS 3 ITEM 18 +1 6 EXEC
BUS 4 BC ITEM 15 EXEC (*)
BUS 3 RT ITEM 10 EXEC (*)
LOAD FORMAT ITEM 1 +9 EXEC >>
2. GNC-1 PRIMARY ON LB-ORB N2-2 (OIU BUS 4)
LOAD FORMAT ITEM 1 +9 EXEC
GNC TO GNC 1 ITEM 18 +1 4 EXEC
GNC 1 TO BUS 4 ITEM 18 +1 5 EXEC
BUS 3 BC ITEM 11 EXEC (*)
BUS 4 RT ITEM 14 EXEC (*)
LOAD FORMAT ITEM 1 +9 EXEC >>
3. GNC-2 PRIMARY ON LB-ORB N2-1 (OIU BUS 3)
LOAD FORMAT ITEM 1 +9 EXEC
GNC TO GNC 2 ITEM 18 +1 3 EXEC
GNC 2 TO BUS 3 ITEM 18 +1 8 EXEC
BUS 4 BC ITEM 15 EXEC (*)
BUS 3 RT ITEM 10 EXEC (*)
LOAD FORMAT ITEM 1 +9 EXEC >>
4. GNC-2 PRIMARY ON LB-ORB N2-2 (OIU BUS 4)
LOAD FORMAT ITEM 1 +9 EXEC
GNC TO GNC 2 ITEM 18 +1 3 EXEC
GNC 2 TO BUS 4 ITEM 18 +1 7 EXEC
BUS 3 BC ITEM 11 EXEC (*)
BUS 4 RT ITEM 14 EXEC (*)
LOAD FORMAT ITEM 1 +9 EXEC >>

Cont next page

5. MPLM (if flown)
LOAD FORMAT ITEM 1 +5 EXEC
BUS 2 BC ITEM 7 EXEC (*)
LOAD FORMAT ITEM 1 +5 EXEC >>
6. SSOR
LOAD FORMAT ITEM 1 +7 EXEC
BUS 1 BC ITEM 3 EXEC (*)
LOAD FORMAT ITEM 1 +7 EXEC >>

PTG

STAR PAIRS PAD FS 2-2
PAIRS..... FS 2-3

PTG

FS 2-1

ORB OPS/118/FIN

PTG

| STAR PAIRS PAD | | | | | | | | | |
|----------------|---------|---------------------------------------|----------------------------|----------------------------------|--|----------------------------|----------------------------------|--------------|----|
| | | ATT SET 1 | | | | ATT SET 2 | | | |
| PAIR | ANG SEP | DUAL S TRK | | SINGLE S TRK | | DUAL S TRK | | SINGLE S TRK | |
| | | | | -Z | -Y | | | -Z | -Y |
| A | 88.6 | -Y:28 R+ 72 -Z:52 P+ 311 Y+ 308 | R+ 320 P+ 283 Y+ 296 | -Y:52 R+ 149 P+ 299 Y+ 316 | -Y:52 R+ 229 -Z:28 P+ 96 Y+ 61 | R+ 115 P+ 127 Y+ 61 | -Y:28 R+ 313 P+ 101 Y+ 46 | | |
| B | 90.3 | -Y:34 R+ 102 -Z:39 P+ 23 Y+ 16 | R+ 15 P+ 17 Y+ 2 | -Y:39 R+ 195 P+ 8 Y+ 22 | -Y:39 R+ 167 -Z:34 P+ 193 Y+ 359 | R+ 80 P+ 204 Y+ 348 | R+ 254 -Y:34 P+ 182 Y+ 349 | | |
| C | 88.5 | -Y:39 R+ 199 -Z:29 P+ 318 Y+ 6 | R+ 111 P+ 333 Y+ 2 | -Y:29 R+ 286 P+ 314 Y+ 352 | -Y:29 R+ 73 -Z:39 P+ 154 Y+ 2 | R+ 345 P+ 143 Y+ 352 | R+ 161 -Y:39 P+ 145 Y+ 14 | | |
| D | 83.9 | -Y:48 R+ 12 -Z:44 P+ 146 Y+ 29 | R+ 296 P+ 129 Y+ 34 | -Y:44 R+ 92 P+ 154 Y+ 42 | -Y:44 R+ 249 -Z:48 P+ 307 Y+ 322 | R+ 171 P+ 320 Y+ 331 | R+ 342 -Y:48 P+ 319 Y+ 310 | | |

STAR PAIRS PAD

FS 2-2

ORB OPS/18/FIN

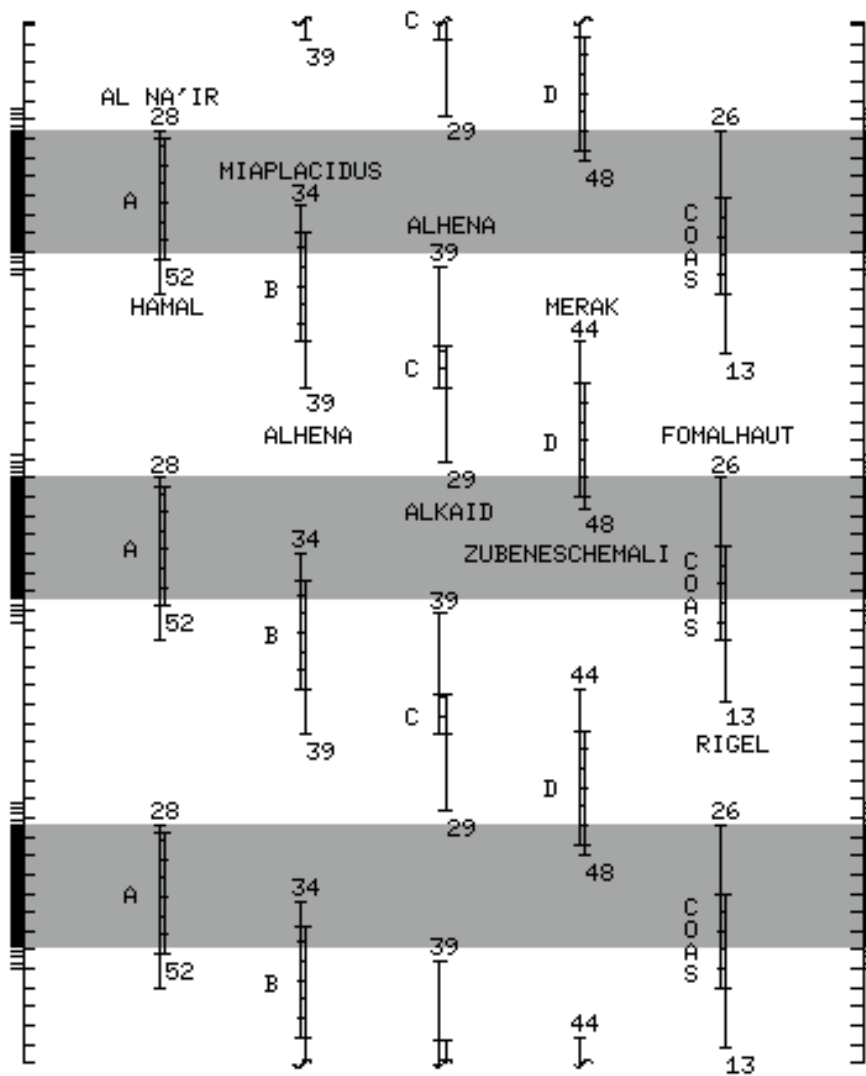
| PAIR | COAS ALIGN ATTITUDE 1 | ANG SEP | COAS ALIGN ATTITUDE 2 |
|------------------|-----------------------|-----------------------------|-----------------------------|
| C O A S | +X COAS | 26 R+ 89 P+ 31 Y+ 346 | 13 R+ 86 P+ 35 Y+ 75 |
| | -Z COAS | 26 R+ 266 P+ 35 Y+ 76 | 13 R+ 91 P+ 211 Y+ 14 |

SINGLE S TRK MIN MNVR OPT
TGT ID = 11-110 NAV STAR #
BODY VECTOR = 5

| | -Z S TRK | -Y S TRK |
|---|----------|----------|
| P | 87.7 | 0 |
| Y | 358 | 280.6 |

MET Applicable: Post OMS-2 - FD 15
Date L/O: 08/09/07
GMT L/O: 221/22:05:54

STAR PAIRS



MET Applicable: Post OMS-2 - FD 15
 Date L/O: 08/09/07
 GMT L/O: 221/22:05:54



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DAP TABLES

| | |
|-----------------------------------|--------|
| DAP OVERVIEW | FS 3-2 |
| UNIV PTG | FS 3-3 |
| STS-118 DAP A CONFIGURATIONS..... | FS 3-4 |
| B CONFIGURATIONS..... | FS 3-6 |

**DAP
TABLES**

DAP TABLES

DAP Overview

| DAP – Purpose | DAP – Purpose |
|-------------------------------|------------------------------------|
| A1 – Nominal | B1 – OMS & RCS Burns (ORB OPS) |
| A2 – PTC | B2 – Loss of VERN (Tail Only) |
| A3 – GG | B3 – Loss of VERN (All) |
| A4 – Pre/Post Deploy | B4 – |
| A5 – Loss of VERN (All) | B5 – COAS/HUD CAL |
| A6 – Loss of VERN (Tail Only) | B6 – |
| A7 – Rendezvous | B7 – Rendezvous |
| A8 – Terminal Phase | B8 – Terminal Phase |
| A9 – PROX OPS/Flyaround | B9 – PROX OPS/Flyaround |
| A10 – Docking | B10 – Docking |
| A11 – Auto Reboost | B11 – |
| A12 – Mated MNVRS (VRCS) | B12 – Mated MNVRS & Att Hold (ALT) |
| A13 – A/L Depress (VRCS) | B13 – A/L Depress (ALT) |
| A14 – Orbiter Alone SRMS/OBSS | B14 – |
| A15 – Mated Att Hold (VRCS) | B15 – |

| | | | |
|----------|---|---|---|
| CNTL ACC | = | 0 | Orbiter alone with unloaded RMS |
| | = | 1 | Mated Control - VRCS - Maneuvers (with Progress on SM aft port) |
| | = | 2 | Mated Control - ALT - Maneuvers and Attitude Hold (with Progress on SM aft port) |
| | = | 3 | Mated Control - VRCS - Attitude Hold (with Progress on SM aft port) |
| | = | 4 | Mated Control - VRCS - Maneuvers (with No Progress on SM aft port) |
| | = | 5 | Mated Control - ALT - Maneuvers and Attitude Hold (with No Progress on SM aft port) |
| | = | 6 | Mated Control - VRCS - Attitude Hold (with No Progress on SM aft port) |
| | = | 7 | not used |
| | = | 8 | not used |
| | = | 9 | Orbiter Alone SRMS/OBSS |

DAPs for mated operations are based on analysis from GNC, PDRS, and C. S. Draper Labs

FS 3-2

ORB OPS/18/FIN

UNIV PTG

| |
|--|
| TGT ID = 1 Orbiting Vehicle = 2 Earth Center = 3 Earth Target Input LAT (± 90) LON (± 180 , + = East) ALT (-3444.0 to 20000.0 nm) = 4 Sun Center = 5 Celestial Target Input RA (0-359.99) DEC (± 90) = 11-110 Nav Stars |
| BODY VECTOR = 1 +X* = 2 -X* = 3 -Z* = 4 -Y Star Tracker* = 5 Selectable Input P (0-359.99) Y (270-359.99, 0-90) *Input OM \rightarrow OM (0-359.99) |
| MON AXIS = 1 +X = 2 -X |

FS 3-3

ORB OPS/18/FIN

STS-118 DAP A1 -- A8 CONFIGURATIONS

| | ITEM # | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 |
|-------------|---------|---------|--------|--------|--------------------|-----------------------|--------------------------------|--------|-------------------|
| PRI | | | | | | | | | |
| ROT RATE | 10 (50) | 0.2000 | 0.4000 | 0.2000 | 0.5000 | 0.2000 | 0.2000 | 0.2000 | 0.0500 |
| ATT DB | 11 (51) | 5.00 | 1.00 | 0.30 | 3.00 | 5.00 | 5.00 | 2.00 | 2.00 |
| RATE DB | 12 (52) | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 13 (53) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| COMP | 14 (54) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 15 (55) | ALL | ALL | ALL | ALL | ALL | TAIL | ALL | ALL |
| Y OPTION | 16 (56) | ALL | ALL | TAIL | ALL | ALL | TAIL | ALL | ALL |
| TRAN PLS | 17 (57) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| ALT | | | | | | | | | |
| RATE DB | 18 (58) | 0.200 | 0.200 | 0.070 | 0.200 | 0.070 | 0.070 | 0.100 | 0.100 |
| JET OPT | 19 (59) | ALL | ALL | ALL | ALL | ALL | TAIL | ALL | ALL |
| # JETS | 20 (60) | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| ON TIME | 21 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 22 (62) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| VERN | | | | | | | | | |
| ROT RATE | 23 (63) | 0.2000 | 0.4000 | 0.0080 | 0.2000 | 0.0500 | 0.0500 | 0.0160 | 0.0500 |
| ATT DB | 24 (64) | 1.000 | 1.000 | 0.070 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| RATE DB | 25 (65) | .020 | .020 | .010 | .020 | .020 | .020 | .020 | .020 |
| ROT PLS | 26 (66) | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.050 |
| COMP | 27 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 28 (68) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PURPOSE | | NOMINAL | PTC | GG | PRE/POST DEPLOY | LOSS OF VERN (ALL) | LOSS OF VERN (TAIL ONLY) | RNDZ | TERMINAL PHASE |

FS 3-4

ORB OPS/18/FIN

STS-118 DAP A9 -- A15 CONFIGURATIONS

| | ITEM # | A9 | A10 | A11 | A12 | A13 | A14 | A15 |
|-------------|---------|-----------------------|---------|-----------------|--------------------------|--------------------------|-------------------------------|----------------------------------|
| PRI | | | | | | | | |
| ROT RATE | 10 (50) | 0.1300 | 0.0500 | 0.0500 | 0.0500 | 0.0500 | 0.2000 | 0.1000 |
| ATT DB | 11 (51) | 2.00 | 0.60 | 10.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| RATE DB | 12 (52) | 0.10 | 0.10 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 13 (53) | 0.100 | 0.100 | 0.040 | 0.040 | 0.040 | 0.100 | 0.040 |
| COMP | 14 (54) | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 15 (55) | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL |
| Y OPTION | 16 (56) | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL |
| TRAN PLS | 17 (57) | 0.050 | 0.050 | 0.100 | 0.010 | 0.010 | 0.100 | 0.010 |
| ALT | | | | | | | | |
| RATE DB | 18 (58) | 0.100 | 0.100 | 0.050 | 0.050 | 0.050 | 0.200 | 0.070 |
| JET OPT | 19 (59) | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL |
| # JETS | 20 (60) | 2 | 2 | 3 | 3 | 3 | 1 | 3 |
| ON TIME | 21 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 22 (62) | 0.00 | 0.00 | 12.00 | 11.04 | 11.04 | 6.00 | 11.04 |
| VERN | | | | | | | | |
| ROT RATE | 23 (63) | 0.1300 | 0.0500 | 0.1000 | 0.1000 | 0.1000 | 0.2000 | 0.1000 |
| ATT DB | 24 (64) | 1.000 | 0.500 | 5.000 | 3.000 | 3.000 | 3.000 | 3.000 |
| RATE DB | 25 (65) | .020 | .020 | .050 | .050 | .050 | .200 | .080 |
| ROT PLS | 26 (66) | 0.050 | 0.050 | 0.010 | 0.001 | 0.001 | 0.010 | 0.001 |
| COMP | 27 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 28 (68) | 0 | 0 | 1(2)* | 1 | 1 | 9 | 3 |
| PURPOSE | | PROX/OPS FLYAROUND | DOCKING | AUTO REBOOST | MATED MNVRS (VRCS) | A/L DEPRESS (VRCS) | ORBITER ALONE SRMS/OBSS | MATED ATTITUDE HOLD (VRCS) |

BOLD/ITALIC indicates change from I-Load.

* 1 for Config 3&4, 2 for Config 1&2

FS 3-5

ORB OPS/18/FIN

STS-118 DAP B1 -- B8 CONFIGURATIONS

| | ITEM # | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
|-------------|---------|-------------------------------|--------------------------------|--------------------------------|--------|-----------------|--------|--------|-------------------|
| PRI | | | | | | | | | |
| ROT RATE | 30 (50) | 0.5000 | 0.2000 | 0.2000 | 0.2000 | 0.2000 | 0.5000 | 0.5000 | 0.0500 |
| ATT DB | 31 (51) | 3.00 | 3.00 | 3.00 | 0.30 | 3.00 | 3.00 | 2.00 | 2.00 |
| RATE DB | 32 (52) | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 33 (53) | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 |
| COMP | 34 (54) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 35 (55) | ALL | TAIL | ALL | TAIL | TAIL | ALL | ALL | ALL |
| Y OPTION | 36 (56) | ALL | TAIL | ALL | TAIL | TAIL | ALL | ALL | ALL |
| TRAN PLS | 37 (57) | 0.100 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.050 | 0.050 |
| ALT | | | | | | | | | |
| RATE DB | 38 (58) | 0.200 | 0.070 | 0.070 | 0.100 | 0.200 | 0.200 | 0.100 | 0.100 |
| JET OPT | 39 (59) | ALL | TAIL | ALL | ALL | ALL | ALL | ALL | ALL |
| # JETS | 40 (60) | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| ON TIME | 41 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 42 (62) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| VERN | | | | | | | | | |
| ROT RATE | 43 (63) | 0.2000 | 0.2000 | 0.2000 | 0.0080 | 0.0160 | 0.2000 | 0.2000 | 0.0500 |
| ATT DB | 44 (64) | 1.000 | 1.000 | 1.000 | 0.100 | 0.033 | 1.000 | 1.000 | 1.000 |
| RATE DB | 45 (65) | .020 | .020 | .020 | .010 | .020 | .020 | .020 | .020 |
| ROT PLS | 46 (66) | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.020 |
| COMP | 47 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 48 (68) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PURPOSE | | NOMINAL OMS & RCS BURNS | LOSS OF VERN (TAIL ONLY) | LOSS OF VERN (NOSE/TAIL) | | COAS/HUD CAL | | RNDZ | TERMINAL PHASE |

FS 3-6

ORB OPS/18/FIN

STS-118 DAP B9 -- B13 CONFIGURATIONS

| | ITEM # | B9 | B10 | B11 | B12 | B13 |
|-------------|---------|------------------------|---------|--------|--------------------------------|-------------------------|
| PRI | | | | | | |
| ROT RATE | 30 (50) | 0.1300 | 0.0500 | 0.5000 | 0.0500 | 0.0500 |
| ATT DB | 31 (51) | 2.00 | 0.60 | 3.00 | 5.00 | 5.00 |
| RATE DB | 32 (52) | 0.10 | 0.10 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 33 (53) | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 |
| COMP | 34 (54) | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 35 (55) | TAIL | TAIL | ALL | TAIL | TAIL |
| Y OPTION | 36 (56) | TAIL | TAIL | ALL | TAIL | TAIL |
| TRAN PLS | 37 (57) | 0.010 | 0.010 | 0.020 | 0.010 | 0.010 |
| ALT | | | | | | |
| RATE DB | 38 (58) | 0.100 | 0.100 | 0.200 | 0.050 | 0.050 |
| JET OPT | 39 (59) | TAIL | TAIL | ALL | TAIL | TAIL |
| # JETS | 40 (60) | 2 | 2 | 2 | 3 | 3 |
| ON TIME | 41 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 42 (62) | 10.00 | 0.00 | 0.00 | 11.04 | 11.04 |
| VERN | | | | | | |
| ROT RATE | 43 (63) | 0.1300 | 0.0500 | 0.2000 | 0.1000 | 0.1000 |
| ATT DB | 44 (64) | 1.000 | 0.500 | 1.000 | 3.000 | 3.000 |
| RATE DB | 45 (65) | .020 | .020 | .020 | .050 | .050 |
| ROT PLS | 46 (66) | 0.020 | 0.020 | 0.002 | 0.001 | 0.001 |
| COMP | 47 (67) | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 48 (68) | 0 | 0 | 0 | 2 | 2 |
| PURPOSE | | PROX OPS/ FLYAROUND | DOCKING | | MATED MNVRS & HOLD (ALT) | A/L DEPRESS (ALT) |

BOLD/ITALIC indicates change from I-Load.

FS 3-7

ORB OPS/18/FIN



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REBOOST/DAP

| | |
|--|--------|
| AUTO REBOOST..... | FS 4-2 |
| ATTITUDE REFERENCE..... | FS 4-4 |
| DOCKED CONFIGURATION DAP REFERENCE | FS 4-5 |

**REBOOST/
DAP**

AUTO REBOOST

NOTE

Allow 5 min between establishing reboost attitude and reboost start time for DAP accelerations to converge

REBOOST/
DAP

- O14:F,
O15:F,
O16:F
1. If PRCS required:
RJDA 1A L2/R2 DRIVER – OFF
RJD MANF L5/F5/R5 DRIVER – OFF
Pri RJD LOGIC (eight) – ON

√MCC for GO to power up Pri Drivers
RJD MANF L5/F5/R5 DRIVER – ON
Pri RJD DRIVER (eight) – ON

2. Select Reboost Configuration

GNC 20 DAP CONFIG
REBOOST CFG – ITEM 8 +_ EXEC
INTVL – ITEM 9 +_ EXEC

3. Set up Future Reboost

GNC UNIV PTG
DURATION – ITEM 27 +_ +_ +_ EXEC
START TIME – ITEM 1 +_ . . . +_ +_ +_ EXEC
RBST – ITEM 25 EXEC (FUT – *)

- C3
4. Select appropriate Reboost Rotation DAP
When in attitude and prior to START TIME,
DAP: A11/AUTO/VERN(ALT)

Cont next page

FS 4-2

ORB OPS/118/FIN

If using Config 1(2):

GNC 20 DAP CONFIG

√X JETS ROT ENA – ITEM 7 EXEC (*)

Deselect Forward Firing Jets:

GNC 23 RCS

√RCS FWD – ITEM 1 EXEC (*)

√JET DES F1F – ITEM 31 (*)

√F2F – ITEM 35 (*)

F3F – ITEM 33 EXEC (*)

NOTE

Reboost can be aborted with an item 26 on UNIV PTG or by selecting FREE on the DAP

5. Post Reboost Configuration

If using Config 1(2):

GNC 23 RCS

√RCS FWD – ITEM 1 EXEC (*)

JET DES F3F – ITEM 33 EXEC (no *)

Return to FLIGHT PLAN Attitude

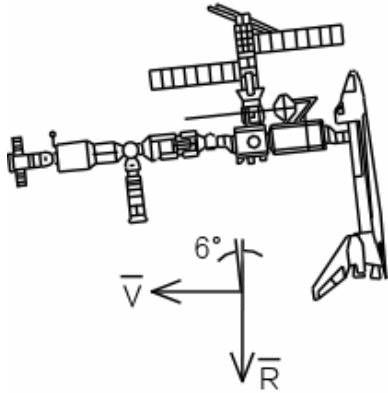
DAP: as reqd

Pri RJD LOGIC, DRIVER (sixteen) – as reqd

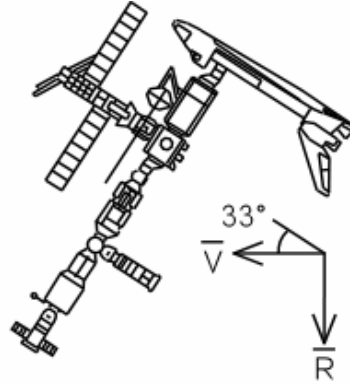
C3
O14,
O15,
O16

AUTO REBOOST ATTITUDE REFERENCE

VRCS ATTITUDE HOLD CONFIGURATIONS:

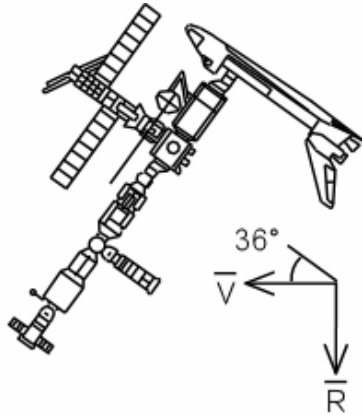


Earth
Nose up, Config 3 (VRCS)

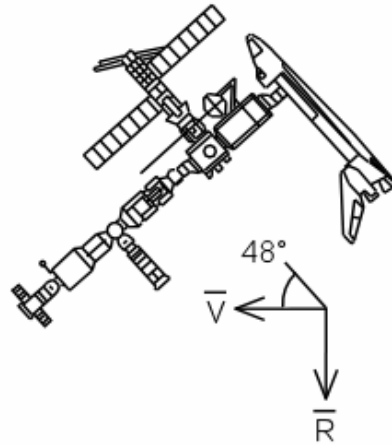


Earth
Nose up, Config 4 (+X, VRCS)

ALT ATTITUDE HOLD CONFIGURATIONS:



Earth
Nose up, Config 1 (+X, -pitch)



Earth
Nose up, Config 2 (+X)

DOCKED CONFIGURATION DAP REFERENCE

SHUTTLE AIRLOCK

PRESS (≥ 3.45 psia) DEPRESS (< 3.45 psia)

| | | |
|--------------|---|------------------------|
| VERN | MNVR – A12 (CA: 1) | MNVR – A13 (CA: 1) |
| | ATT HOLD – A15 (CA: 3) | ATT HOLD – A15 (CA: 3) |
| ALT | B12 (CA: 2) | B13 (CA: 2) |
| RATE DAMPING | LVLH(INRTL), when rates damped, FREE > 2 sec, AUTO | |
| RATE > 0.20 | LVLH(INRTL) 6 min max FREE, LVLH(INRTL) | |

1. When shuttle airlock pressurized, select DAP:
 A12/VERN for attitude maneuvering
 A15/VERN for attitude hold
 (B12/ALT) for attitude hold or maneuvering
2. When shuttle airlock depressurized, select DAP:
 A13/VERN for attitude maneuvering
 A15/VERN for attitude hold
 (B13/ALT) for attitude hold or maneuvering
3. When rate damping, select DAP: AUTO when desired rates are below rate deadband and jet activity stopped



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OIU PROCEDURES

| | |
|----------------------|--------|
| OIU ACTIVATION | FS 5-2 |
| DEACTIVATION | FS 5-2 |

OIU

OIU ACTIVATION

NOTE

√MCC that steps 1 and 2 may not be reqd

1. Load PCMMU/PDI (config 760) for OIU
2. Power on PSP 1(2)

A1L √S-BD PL CNTL – CMD
 PWR SYS – 1(2)
 √SEL – PSP
 √PSP CMD OUTPUT – PL UMB
 CNTL – PNL,CMD

SM 62 PCMMU/PL COMM

I/O RESET PSP 1(2) – ITEM 6(7) EXEC (*)

3. Power on OIU 1(2)

SSP1 OIU PWR – OIU 1(2) ON
 √tb – UP(DN)

OIU DEACTIVATION

OIU

NOTE

√MCC for OIU ops complete

1. Possible 'S62 PDI DECOM FAIL' msg

SSP1 OIU PWR – OFF
 √tb – bp

2. MCC will config PCMMU and PDI as reqd

PRLA

PRLA CLOSE..... FS 6-2

PRLA

FS 6-1

ORB OPS/118/FIN

PRLA CLOSE

1. If Docked and OBSS NOT grappled:

NOTE

When MCA LOGIC switches taken OFF, KU will mode to standby.
MPM and MRL tbs – bp

MA73C:A MCA LOGIC MNC MID 2 – OFF
 :B MNB MID 4 – OFF

- A6U 2. √PL RETEN PL SEL – 3
 √LAT 1,2,3,4 (four) – OFF (tb-REL)

SM 97 PL RETENTION

CRT √PL SEL 3 LAT 1,2,3,4 (eight) – ‘0’

* If any LAT msw shows ‘1’, drive *
* for single motor time (60 sec) *

- R13L 3. PL BAY MECH PWR SYS 1,2 (two) – ON
A6U RETEN LOGIC PWR SYS 1,2 (two) – ON

NOTE

Any single motor times (>30 sec)

4. PL RETEN LAT 1,2 (two) – LAT
 (tb-LAT, 60 sec max)
 – OFF
5. 3,4 (two) – LAT
 (tb-LAT, 60 sec max)
 – OFF

- R13L 6. PL RETEN LOGIC PWR SYS 1,2 (two) – OFF
 BAY MECH PWR SYS 1,2 (two) – OFF

PRLA

Cont next page

A6U 7. PL RETEN PL SEL – 1
√LAT 1,2,3,4,5 (five) – OFF (tb-REL)

SM 97 PL RETENTION

CRT √PL SEL 1 LAT 1,2,3,4 (eight) – ‘0’

- * If any LAT msw shows ‘1’, drive *
- * for single motor time (60 sec) *

R13L 8. PL BAY MECH PWR SYS 1,2 (two) – ON
A6U RETEN LOGIC PWR SYS 1,2 (two) – ON

NOTE

Any single motor times (>30 sec)

9. PL RETEN LAT 1,2 (two) – LAT
(tb-LAT, 60 sec max)
– OFF

10. 3,4 (two) – LAT
(tb-LAT, 60 sec max)
– OFF

R13L 11. PL RETEN LOGIC PWR SYS 1,2 (two) – OFF
BAY MECH PWR SYS 1,2 (two) – OFF

A6U 12. PL RETEN PL SEL – MON

MA73C:A 13. If MCA LOGIC switches taken OFF in step 1:
MCA LOGIC MNC MID 2 – ON
:B MNB MID 4 – ON



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SHORT DURATION BIOASTRONAUTICS
INVESTIGATION (SDBI)

SDBI 1490 (PROTOCOL B), BIOAVAILABILITY
& PERFORMANCE EFFECTS OF
PROMETHAZINE (PMZ) DURING SPACE FLIGHT;
SDBI 1634, SLEEP-WAKE ACTIGRAPHY FS 7-2
SDBI 1493, MONITORING LATENT VIRUS
REACTIVATION AND SHEDDING FS 7-6
SALIVA COLLECTION (ALL FLIGHT DAYS) FS 7-6

SDBI

FS 7-1

ORB OPS/118/FIN

SDBI 1490 (PROTOCOL B), BIOAVAILABILITY & PERFORMANCE EFFECTS OF PROMETHAZINE (PMZ) DURING SPACE FLIGHT; SDBI 1634, SLEEP-WAKE ACTIGRAPHY

ASAP after entry into orbit:

A. DON ACTIWATCH

- MA16N 1. Unstow: Actiwatch
FLIGHT SLEEP LOG

NOTE

If necessary to remove Actiwatch, record doff/don time on FLIGHT SLEEP LOG

2. Don Actiwatch on non-dominant arm and wear continuously throughout mission
3. Deploy FLIGHT SLEEP LOG and record required information daily (within 15 min after waking)

NOTE

Perform B. PMZ PROTOCOL if SMS is experienced. If unable to collect saliva sample before taking PMZ dose, collect saliva sample at some other drug-free time during mission

B. PMZ PROTOCOL

- MA16N 1. Unstow: Saliva Sample Kit
SALIVA/KSS LOG
2. Temp stow SALIVA/KSS LOG w/Saliva Sample Kit

SDBI

Cont next page

FS 7-2

ORB OPS/118/FIN

3. Collect Baseline saliva sample:
 - a. Unstow appropriate saliva tube

NOTE

Do not touch cotton w/fingers.
Do not bite/chew cotton

- b. Place small cotton roll in mouth and lightly roll w/tongue ~2 min
 - c. Replace saturated cotton roll into tube
 - d. Tighten cap
 - e. Record MET on tube and on SALIVA/KSS LOG
 - f. Record additional information required on SALIVA/KSS LOG
 - g. Stow tube in Saliva Sample Kit
 - h. Temp stow Saliva Sample Kit
4. Take PMZ

If PMZ dose taken less than 8 hrs prior to sleep but before pre-sleep:

5. Collect saliva samples per SALIVA/KSS LOG until sleep time, then pick up with next sample (24 hrs) following wakeup
6. Collect remaining saliva samples per SALIVA/KSS LOG following steps 3a-h

If PMZ dose is taken during pre-sleep:

7. Collect saliva samples pre-dose (Baseline sample) just before sleep, immediately upon wakeup, 1 hr after wakeup, and at 24,36, and 48 hrs post-dose

If second PMZ dose is taken within 48 hrs:

8. Begin PMZ protocol again; record MET in second column of SALIVA/KSS LOG

MA16N

9. If last saliva sample, stow Saliva Sample Kit |

Cont next page

FS 7-3

ORB OPS/118/FIN

C. DOFFING ACTIWATCH

On final day of orbit:

MA16N

1. Remove Actiwatch, stow

NOTE

If mission length extended, continue to wear Actiwatch and complete FLIGHT SLEEP LOG as timeline permits

FLIGHT SLEEP LOG (example below) is used with both SDBI 1490B and SDBI 1634:

FLIGHT SLEEP LOG

Crew ID: _____ Actiwatch Dot Color: _____

Current Time: _____ [ddd:hh:mm (MET)]

Lights Out: _____ [ddd:hh:mm (MET)]

Lights On: _____ [ddd:hh:mm (MET)]

1. How long did you take to fall asleep last night? _____ (hrs) _____ (mins)
2. How long did you sleep last night? _____ (hrs) _____ (mins)
3. How many times did you awaken during the night? _____
4. After the end of your sleep period, how long did you remain in bed before getting up?
_____ (hrs) _____ (mins)
5. Where did you sleep last night? [Flight deck / Middeck / Spacehab / Sleepstation]
6. Was your sleep disturbed: [Yes / No] (If Yes, check all that apply)
 shuttle noise mission duties voids, # of voids: _____ other crew
 physical discomfort too hot too cold other _____
7. How did you sleep last night?
poorly _____ great _____
8. How do you feel right now?
sleepy _____ alert _____
9. Did you have any caffeine yesterday? [Yes / No] (If Yes, indicate how much)
coffee _____ (cups) caffeine pills _____ (100mg) _____ (200mg)
tea _____ (cups) caffeinated soft drinks _____ (glasses)
Indicate how long before bed your last caffeine intake was: _____ (hrs) _____ (mins)
10. Did you take any medications yesterday? [Yes / No / Decline] (If Yes, list all)

Comments:

SALIVA/KSS LOG (example below) is used with SDBI 1490B:

| | | | | |
|---|---|---|------------------------------------|--|
| Crew Member _____ | Circle dosage form: 25mg Tablet 50mg Injectable 25mg Suppository | SALIVA / KSS LOG Note: To be used only if PMZ is taken. | | |
| | PMZ Dose One | PMZ Dose Two | | |
| Activity Time (hr) Post-PMZ Dose | KSS | Saliva Sample MET | KSS | Saliva Sample MET |
| Baseline | | | | |
| 1 | | | | |
| 2 | | | | |
| 4 | | | | |
| 8 | | | | |
| 24 | | | | |
| 36 | | | | |
| 48 | | | | |
| (1) Rate sleepiness during last 5 mins using key (2) Record saliva collection MET KSS KEY | | | | |
| 1 | 2 | 3 | 4 | 5 |
| 6 | 7 | 8 | 9 | |
| very alert SDD46108178-601 | alert normal level | neutral neither alert/sleepy | sleepy, no effort to stay awake | very sleepy, great effort to stay awake |

**SDBI 1493, MONITORING LATENT VIRUS REACTIVATION
AND SHEDDING**

SALIVA COLLECTION (ALL FLIGHT DAYS)

MA16N Immediately post-sleep (before brushing teeth):
1. Unstow: Saliva Kit Assy

NOTE

DO NOT touch cotton w/fingers.

DO NOT bite down or chew cotton

2. Remove Salivette Bag Assy w/cotton rolls from 'UNUSED' pocket
3. Open Salivette Bag Assy w/cotton rolls and remove a cotton roll using fingers on the outside of the bag
4. Lightly roll cotton in mouth w/tongue until saturated (2 min max)
5. Replace Salivette Bag Assy w/cotton rolls in 'UNUSED' pocket
6. Place cotton roll in Collection Bag Assy by guiding w/tongue
7. Close seal on Collection Bag Assy, remove clamp, mix preservative w/cotton roll
8. Reclamp across top of Collection Bag Assy
9. Write the FD or MET on Collection Bag Assy using a Sharpie
10. Stow Collection Bag Assy in 'USED' pocket
11. Temp stow Saliva Kit
- MA16N 12. If last FD, stow Saliva Kit

NOTE

If mission length extended, as timeline permits, continue collecting saliva samples to end of mission or until sample Collection Bags are depleted

WING LEADING EDGE SENSORS (WLES) PROCEDURES

| | |
|--|---------|
| ACTIVATION AND CHECKOUT | FS 8-2 |
| DEACTIVATION AND TEARDOWN | FS 8-9 |
| WLE LAPTOP RECEIVER UNIT (LRU) R&R | FS 8-11 |
| CONFIGURE DATA FILE BACKUP PATH | FS 8-14 |
| DECONFIGURE DATA FILE BACKUP PATH | FS 8-14 |
| PREP WLES LAPTOPS FOR TRANSFER..... | FS 8-15 |
| FOR RNDZ TOOLS CHECKOUT | FS 8-17 |
| WLES RECONFIG POST DOCK/UNDOCK | FS 8-17 |
| DISABLE WLES FILE BACKUP | FS 8-18 |
| ENABLE WLES FILE BACKUP | FS 8-18 |

**WLE
SENSORS**

**WLE
SENSORS**

ACTIVATION AND CHECKOUT

1. UNSTOW EQUIPMENT

NOTE

A31p laptops may already be unstowed as part of orbiter laptop network setup

MA16F Unstow:
 Laptop Receiver Units (2)
 Cabin Relay Units (2) (S/N 1920, 1984)
 STS-7 A31p laptop

MA16G Unstow:
 STS-4 A31p laptop

2. SETUP WLE RELAY UNITS

A13 Retrieve WLE SYSTEM CABLE coiled on panel A6
 Connect to MICRO WIS SYSTEM A – J7 (see
 fig 8-1)

W7 Connect to J1 on Cabin Relay Unit S/N 1920 and
 secure to STBD side of aft cabin with Velcro (see
 fig 8-2)
 Verify terminator connected to J2

A13 Retrieve WLE SYSTEM CABLE coiled on panel A9
 Connect to MICRO WIS SYSTEM B – J8 (see
 fig 8-1)

A4 Connect to J1 on Cabin Relay Unit S/N 1984 and
 secure to PORT side of aft cabin with Velcro (see
 fig 8-3)
 Verify terminator connected to J2

NOTE

Green patch on Cabin Relay Unit is antenna and must face into cabin.
Software is configured to communicate with specific Relay Units on specific buses

Cont next page

FS 8-2

ORB OPS/118/FIN

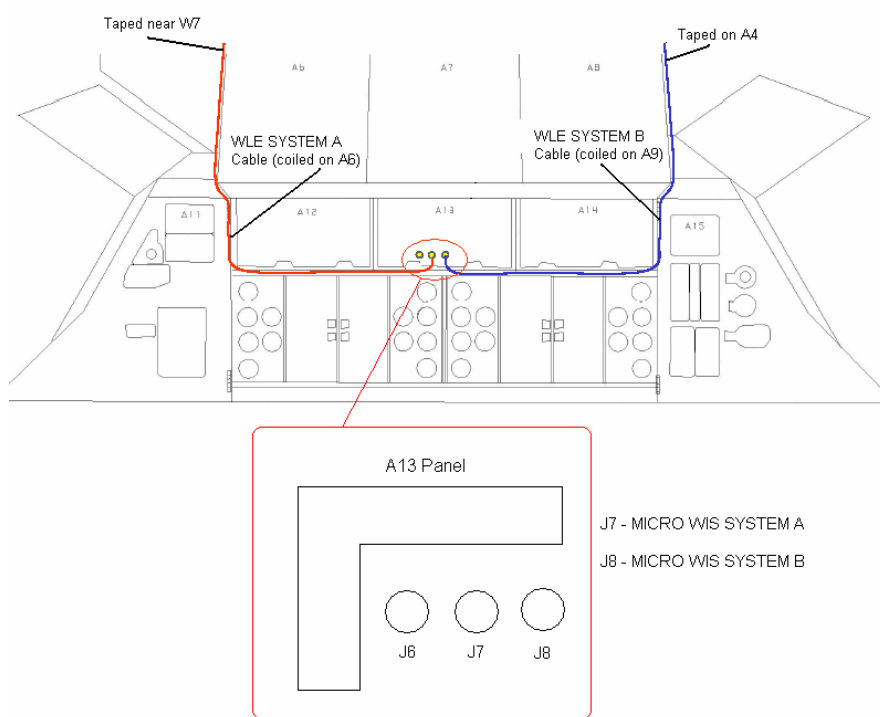


Figure 8-1.- A13 panel.

Cont next page

FS 8-3

ORB OPS/118/FIN

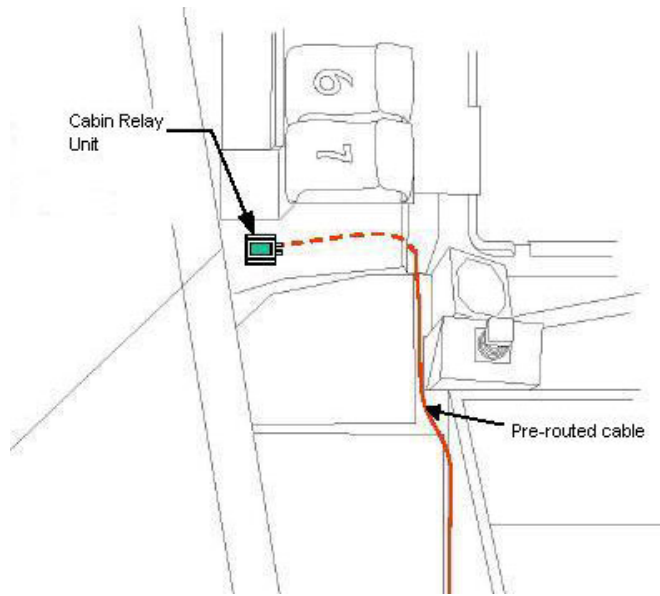


Figure 8-2.- Aft STBD location.

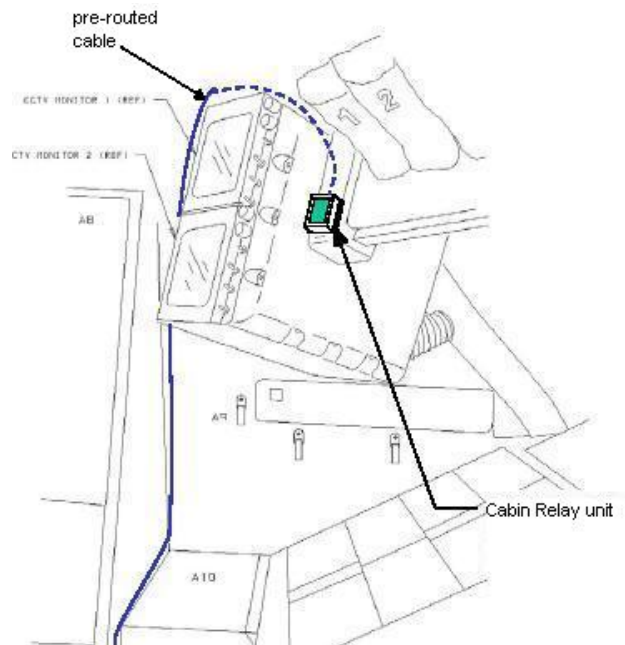


Figure 8-3.- Aft PORT location.

Cont next page

3. SETUP PRIME WLE LAPTOP

A31p

Verify laptop physically connected to network before proceeding with setup

If necessary, close all applications, exit Windows

Click 'Start'>'Shutdown'

Secure Laptop Receiver Unit to A31p with Velcro (see fig 8-4)

Connect Laptop Receiver Unit to A31p Serial port using thumbscrews (see fig 8-5)

4. SETUP BACKUP WLE LAPTOP

A31p

Verify laptop physically connected to network before proceeding with setup

If necessary, close all applications, exit Windows

Click 'Start'>'Shutdown'

Secure Laptop Receiver Unit to A31p with Velcro (see fig 8-4)

Connect Laptop Receiver Unit to A31p Serial port (see fig 8-5)

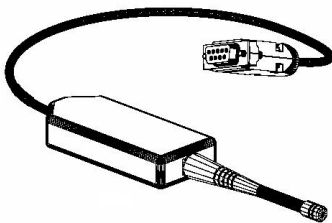


Figure 8-4.- Laptop Receiver Unit.



Figure 8-5.- A31p ports.

Cont next page

FS 8-5

ORB OPS/118/FIN

5. LAUNCH WLE SOFTWARE

Perform for both laptops:

A31p pwr – On

Select clock from system tray

Verify time is set to GMT (Casablanca,
Monrovia), adjust if necessary

Click 'OK'

Double click 'Shuttle Apps'>'EWBMTAU-
WLEFlight'

'Backup Mode Selection'

If setting up one A31p, select 'Standard'

If setting up two A31p laptops:

For prime laptop, select 'Primary'

For backup laptop, select 'Secondary'

NOTE

The secondary laptop lid may be closed at this time, if no longer needed for other applications. The laptops are configured so that they do not enter 'standby' or 'hibernate' mode when the lids are closed. However, due to cooling concerns, fully closing the lid is not recommended

Cont next page

FS 8-6

ORB OPS/118/FIN

6. VERIFY COMM WITH RELAY UNITS

Use prime WLES laptop

'Main'

Click 'Unit List' (left side of display)

NOTE

Each Cabin Relay Unit is identified with a unique serial number; this number appears as 'Unit ID' in the software

√Cabin Relay Units Unit ID 1920 and 1984 (2) present |
on display in first column; scroll down as necessary

For each Cabin Relay Unit:

√Unit ID present

√Type: 'Relay-GL'

√Last Update: time is updating

√Via: 'RF'

√Mode: 'Idle'

NOTE

'Last Update' times nominally
update every 5 to 15 sec

If no time updates after 2 min, contact MCC-H

7. ENABLE DATA FILE BACKUP

Use prime WLES laptop

'Main'

Click 'System Settings' (left side of display)

'Directories'

At the line 'Backup Directory' click 'Browse...'

Navigate to the mapped drive for the backup WLES
laptop ("Q" drive)

Navigate to 'Program Files'>'Invocon'>'EWBMTAU-
WLEFlight'

Click 'OK'

Cont next page

FS 8-7

ORB OPS/118/FIN

‘Backup Interval’
Using drop-down list, select 30 minutes
Click ‘Status’ (left side of display)

8. INITIATE COMMANDING

NOTE

The first time a user navigates to ‘Program Files’ folder, display may show information saying the program files are hidden. To view the contents of the folder, select ‘display files’ in the left-hand portion of the Windows Explorer window

Using Windows Explorer, navigate to
‘My Computer’>‘C:’>‘Program Files’>
‘Invocon’>‘EWBMTAU-WLEFlight’>‘Command’

NOTE

Deleting ‘BLOCK.xml’ file initiates command execution. Command files disappear from this folder as they are executed

Delete file labeled ‘BLOCK.xml’

NOTE

Files appearing in the ‘Data’ folder verifies two-way communication with the Sensor Units in the orbiter wing. You may view this by using Windows Explorer to navigate to: ‘My Computer’>‘C:’>‘Program Files’>‘Invocon’>‘EWBMTAU-WLEFlight’>‘Data’

Notify MCC-H: “WLES setup complete”

NOTE

The laptop lid may be closed at this time, if no longer needed for other applications. The laptops are configured so that they do not enter ‘standby’ or ‘hibernate’ mode when the lids are closed. However, due to cooling concerns, fully closing the lid is not recommended

DEACTIVATION AND TEARDOWN

A31p 1. DEACTIVATE WLE SENSORS LAPTOP 'Enhanced Wideband MicroTAU – WLEFlight 2.2'

For each WLES A31p:

Click 'Exit'

At prompt 'Are you sure you want to exit?'

click 'Yes'

Click 'Start'>'Shutdown'

Disconnect Laptop Receiver Unit from A31p

Serial port

Remove Laptop Receiver Unit from Velcro on
A31p

2. REMOVE WLE SENSOR RELAY UNITS

Remove Cabin Relay Units (2) from aft cabin (see
fig 8-6 and fig 8-7)

Disconnect Cabin Relay Units from pre-routed
cables

Coil cables, stow in launch location

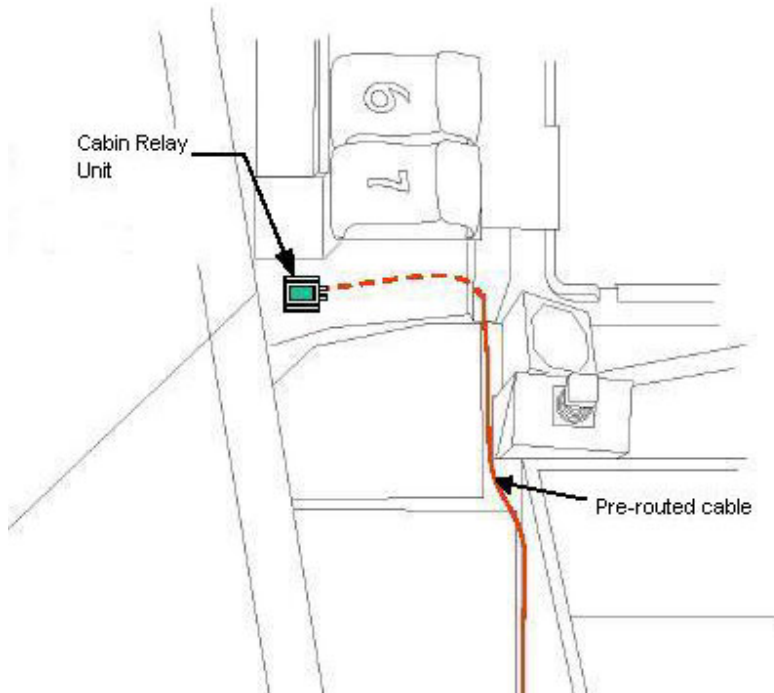


Figure 8-6.- Aft STBD location.

Cont next page

FS 8-9

ORB OPS/118/FIN

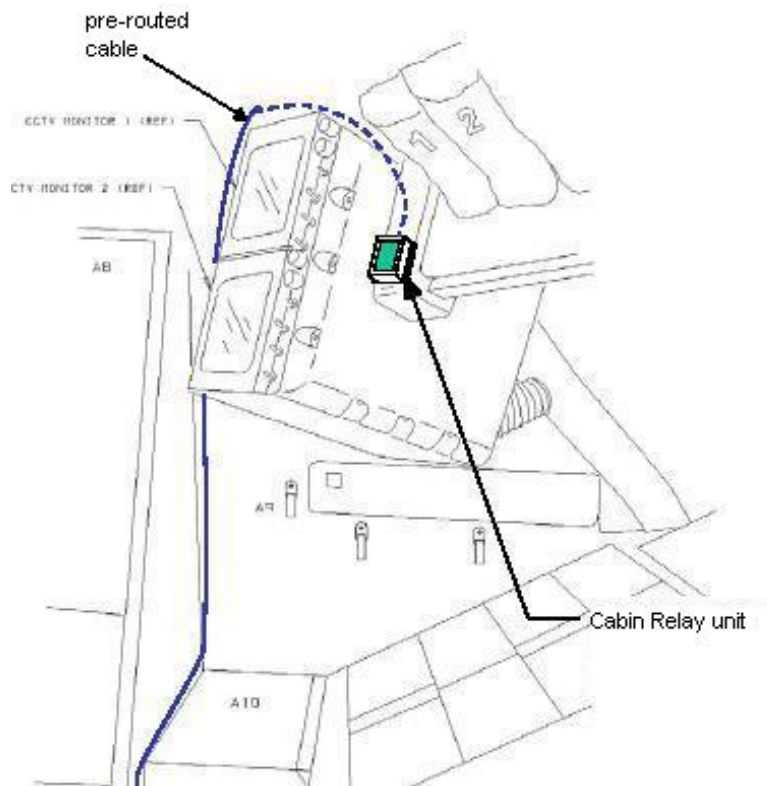


Figure 8-7.- Aft PORT location.

3. STOW EQUIPMENT

MA16F

Stow:

Laptop Receiver Units (2)

Cabin Relay Units (2)

Notify MCC-H: "WLES Teardown Complete"

WLE LAPTOP RECEIVER UNIT (LRU) R&R

- A31p
1. DISCONNECT BACKUP LRU FROM LAPTOP
'Enhanced Wideband MicroTAU – WLEFlight 2.2'
Click 'Exit'
At prompt 'Are you sure you want to exit?'
click 'Yes'
Close other software applications
Click 'Start'>'Shutdown'
Disconnect Backup LRU from Backup A31p Serial
port (see fig 8-8)
Remove Backup LRU from Velcro on Backup A31p
(see fig 8-9)

NOTE

Laptop can now be restarted for use



Figure 8-8.- A31p ports.

- A31p
2. DISCONNECT PRIME LRU FROM LAPTOP
'Enhanced Wideband MicroTAU – WLEFlight 2.2'
Click 'Exit'
At prompt 'Are you sure you want to exit?',
click 'Yes'
Close other software applications
Click 'Start'>'Shutdown'

Cont next page

FS 8-11

ORB OPS/118/FIN

Disconnect Prime LRU from Prime A31p Serial port
(see fig 8-8)
Remove LRU from Velcro on A31p

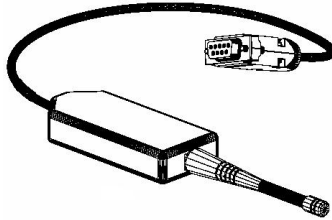


Figure 8-9.- Laptop Receiver Unit.

3. CONNECT BACKUP LRU
Connect Backup LRU to Prime WLES A31p Serial port
Secure LRU to A31p with Velcro
4. LAUNCH WLE SOFTWARE
Pwr – On
Double click ‘Shuttle Apps’>‘EWBMTAU-WLEFlight’

‘Backup Mode Selection’
Select ‘Standard’
5. VERIFY COMM WITH RELAY UNITS
‘Main’

A31p

Click ‘Unit List’ (left side of display)
√Cabin Relay Units Unit ID 1920 and 1984 (2) present |
on display in first column; scroll down as necessary
For each Cabin Relay Unit:
√Unit ID present
√Type: ‘Relay-GL’
√Last Update: time is updating
√Via: ‘RF’
√Mode: ‘Idle’

Cont next page

FS 8-12

ORB OPS/118/FIN

NOTE

'Last Update' times nominally
update every 5 to 15 sec

If no time updates after 2 min, contact MCC-H

Click 'Status' (left side of display)

Notify MCC-H: "WLES LRU R&R complete", mark
failed LRU as 'failed'

- MA16F 6. STOW EQUIPMENT
Stow:
Prime (failed) LRU

CONFIGURE DATA FILE BACKUP PATH

A31p Use prime WLES laptop

 'Main'
 Click 'System Settings' (left side of display)

 'Directories'
 At the line 'Backup Directory' click 'Browse...'

 Navigate to the mapped drive for the backup WLES
 laptop ("Q" drive)

 Navigate to 'Program Files'>'Invocon'>'EWBMTAU-
 WLEFlight'

 Click 'OK'

 'Backup Interval'
 Verify interval is set for 30 minutes

 Click 'Status' (left side of display)

DECONFIGURE DATA FILE BACKUP PATH

A31p Use prime WLES laptop

 'Main'
 Click 'System Settings' (left side of display)

 'Directories'
 At the line 'Backup Directory' click 'Browse...'

 Navigate to the 'C' drive of the Prime WLES laptop

 Navigate to 'Program Files'>'Invocon'

 Click 'OK'

 'Backup Interval'
 Verify interval is set for 30 minutes

 Click 'Status' (left side of display)

PREP WLES LAPTOPS FOR TRANSFER

- A31p 1. DEACTIVATE WLE SENSORS LAPTOP(S)
'Enhanced Wideband MicroTAU – WLEFlight 2.2'

For each WLES A31p in use:

Click 'Exit'

At prompt 'Are you sure you want to exit?'

click 'Yes'

Click 'Start'>'Shutdown'

Disconnect Laptop Receiver Unit from A31p

Serial port

Remove Laptop Receiver Unit from Velcro on

A31p

- _____ 2. CONNECT LRU TO 'NEW' PRIME WLES LAPTOP

√MCC-H for which laptop to use

Click 'Start'>'Shutdown'

Connect LRU to A31p Serial port

Secure LRU to A31p with Velcro

- _____ 3. CONNECT LRU TO 'NEW' BACKUP WLES LAPTOP

√MCC-H for which laptop to use

Click 'Start'>'Shutdown'

Connect LRU to A31p Serial port

Secure LRU to A31p with Velcro

4. LAUNCH WLE SOFTWARE

Perform for both laptops:

A31p pwr – On

Select clock from system tray

Verify time is set to GMT (Casablanca,
Monrovia), adjust if necessary

Click 'OK'

Double click 'Shuttle Apps'>'EWBMTAU-
WLEFlight'

'Backup Mode Selection'

For prime laptop, select 'Primary'

For backup laptop, select 'Secondary'

Cont next page

5. VERIFY COMM WITH RELAY UNITS

'Main'

Click 'Unit List' (left side of display)

√Cabin Relay Units Unit ID 1920 and 1984 (2) present
on display in first column; scroll down as necessary

For each Cabin Relay Unit:

√Unit ID present

√Type: 'Relay-GL'

√Last Update: time is updating

√Via: 'RF'

√Mode: 'Idle'

NOTE

'Last Update' times nominally
update every 5 to 15 sec

If no time updates after 2 min, contact MCC-H

Click 'Status' (left side of display)

6. ENABLE DATA FILE BACKUP

Use prime WLES laptop

'Main'

Click 'System Settings' (left side of display)

'Directories'

At the line 'Backup Directory' click 'Browse...'

Navigate to the mapped drive for the backup WLES
laptop (recorded in step 3 above)

Navigate to 'Program Files'>'Invocon'>'EWBMTAU

Click 'OK'

Notify MCC-H: "WLES laptop prep for transfer
complete"

PREP WLES FOR RNDZ TOOLS CHECKOUT

- A31p
1. DEACTIVATE BACKUP WLES LAPTOP
On backup WLES laptop:
 'Enhanced Wideband MicroTAU – WLEFlight 2.2'
 Click 'Exit'
 At prompt 'Are you sure you want to exit?'
 click 'Yes'
 Disconnect Laptop Receiver Unit from A31p
 Serial port
 Leave attached to laptop with Velcro on A31p
 2. DEACTIVATE WLES FILE BACKUP
On prime WLES laptop:
 'Main'
 Click 'System Settings' (left side of display)
 'Backup Mode'
 Click 'Standard'
 Click 'Status' (left side of display)

WLES RECONFIG POST DOCK/UNDOCK

- A31p
1. RECOVER BACKUP WLES LAPTOP
On backup WLES laptop:
 If necessary, close all applications, exit Windows
 Click 'Start'>'Shutdown'
 Connect Laptop Receiver Unit to A31p Serial port
 A31p pwr – On
 Double click 'Shuttle Apps'>'EWBMTAU-
 WLEFlight'
 'Backup Mode Selection'
 Click 'Secondary'
 2. REACTIVATE WLES FILE BACKUP
On prime WLES laptop:
 'Main'
 Click 'System Settings' (left side of display)
 'Backup Mode'
 Click 'Primary'
 Click 'Status' (left side of display)

DISABLE WLES FILE BACKUP

- A31p 1. DISABLE WLES FILE BACKUP
On prime WLES laptop:

'Main'
Click 'System Settings' (left side of display)

'Backup Mode'
Click 'Standard'
Click 'Status' (left side of display)

ENABLE WLES FILE BACKUP

- A31p 1. ENABLE WLES FILE BACKUP
On prime WLES laptop:

'Main'
Click 'System Settings' (left side of display)

'Backup Mode'
Click 'Primary'
Click 'Status' (left side of display)

FRED

| | |
|------------------|--------|
| FRED SETUP | FS 9-2 |
| STOWAGE | FS 9-2 |

FRED

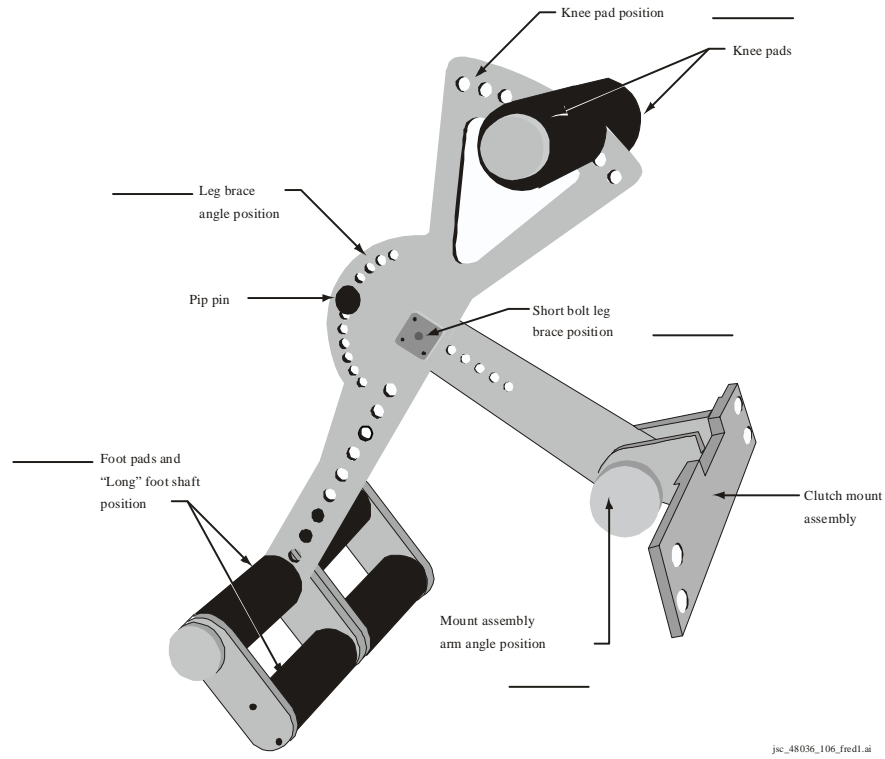
FS 9-1

ORB OPS/118/FIN

FRED

FRED SETUP

1. Unstow FRED tray and FRED leg brace
- A8L 2. Attach clutch bracket mount assy below aft panel A8 with captive fasteners (four)
3. Assemble FRED as shown and adjust to desired position. Note positions



FRED STOWAGE

1. Disassemble FRED and set clutch bracket mount assy to #8 angle position
2. Stow FRED in locker tray cushion. Re-adjust clutch bracket mount assy as required
3. Stow leg brace

MAUI ANALYSIS OF UPPER-ATMOSPHERIC
INJECTIONS (MAUI)

MAUI PROCEDURE FS 10-2

MAUI

FS 10-1

ORB OPS/118/FIN

MAUI PROCEDURE

- 15:00 or earlier 1. MANEUVER TO START ATTITUDE
(BIASED +ZLV +YVV)

Deploy MAUI – RCS FIRING SEQUENCE
(Cue Card)

GNC 20 DAP CONFIG

√DAP A1, B1 loaded

UNIV PTG

TGT ID – ITEM 8 +2 EXEC
BODY VECT – ITEM 14 +5 EXEC
P – ITEM 15 +2 7 0 EXEC
Y – ITEM 16 +3 5 0 EXEC
OM – ITEM 17 +2 7 0 EXEC

TRK – ITEM 19 EXEC (CUR - *)

2. INITIATE TIMER

√MCC for start time

GNC 2 TIME

Set count down/count up timer per MCC

√MET – ITEM 2 EXEC (*)

CRT TIMER COUNT TO – ITEM 17 + + +
EXEC

3. SETUP

O14:E, cb DDU L (two) – cl
O15:E

O14:F, Pri RJD LOGIC, DRIVER (sixteen) – ON
O15:F,
O16:F

GNC 20 DAP CONFIG

DAP A PRI P OPTION – ITEM 15 EXEC (NOSE)

TRAN PLS – ITEM 17 +0.7 3 EXEC

VERN ROT PLS – ITEM 26 +0.1 5 3 EXEC

Cont next page

FS 10-2

ORB OPS/118/FIN

MAUI

GNC 23 RCS

Deselect Jets:

Forward RCS page – ITEM 1 EXEC

JET DES F1D – ITEM 23 EXEC (*)

F2D – ITEM 27 EXEC (*)

C3 √DAP: A/AUTO/VERN

√DAP TRANS: PULSE/PULSE/PULSE

DAP ROT: PULSE/PULSE/PULSE

-05:00 4. VERIFY ATTITUDE
Verify in attitude

NOTE

For the following RCS firing sequence
(step 5):

- A. Expect total orbiter body rates (RSS) to exceed 1 deg/sec
- B. Possible loss of comm due to orbiter body rates and attitude excursions
- C. For any jet fail OFF, continue with firing sequence
- D. Requirement is for a particular jet group, not a specific jet
- E. The table in step 5 is also provided as a cue card

Cont next page

FS 10-3

ORB OPS/118/FIN

5. RCS FIRING SEQUENCE

NOTE

Use the table below or the cue card

MAUI – RCS FIRING SEQUENCE

| Timer | Jets Fired | CDR | PLT |
|--------|------------|--|---|
| -03:00 | | Body rates: $+0.047 \leq \text{roll} \leq +0.087$ $-0.020 \leq \text{pitch} \leq +0.020$ $-0.020 \leq \text{yaw} \leq +0.020$ DAP: FREE DAP: A/PRI Inform PLT "GO" for jet deselection | Configure initial setup GNC 23 RCS Left RCS page – ITEM 2 EXEC On CDR "GO", proceed <u>NOTE</u> Expect DAP RECONF msgs in following actions Deselect jets: JET DES L5L – ITEM 37 EXEC (*) Right RCS page – ITEM 3 EXEC JET DES R5D – ITEM 39 EXEC (*) Forward RCS page – ITEM 1 EXEC JET DES F5L – ITEM 37 EXEC (*) <u>NOTE</u> Queue the following ITEM entry on the scratch pad. Do not perform the EXEC until specified at 35 sec JET DES F3D – ITEM 25 |
| -00:30 | | FLT CNTRL PWR – ON | |
| 00:00 | RXA, LXA | THC +X (in) (3 sec firing) | |
| 00:15 | FXL, LXL | THC +Y (right) (3 sec firing) | |
| 00:30 | FXR, RXR | THC -Y (left) (3 sec firing) | |
| 00:35 | | | When jets stop firing: GNC 23 RCS EXEC [JET DES F3D – ITEM 25 (*)] |
| 00:45 | F4D | RHC +pitch (hard stop, hold 3 sec) | |
| 00:48 | | RHC release | |
| 00:50 | | | DAP: VERN |
| 01:00 | R5R | RHC +yaw (10 sec firing) | |
| 01:20 | L5D | RHC -pitch (12 sec firing) | |
| 01:40 | F5R | RHC +pitch (12 sec firing) | |
| | | FLT CNTRL PWR – OFF | Return to MAUI PROCEDURE, step 6, (ORB OPS FS, MAUI) |

Cont next page

FS 10-4

ORB OPS/118/FIN

6. CLEANUP
F6 √FLT CNTRL PWR – OFF

GNC 23 RCS

√Forward RCS page – ITEM 1 EXEC

Reselect Jets:

JET DES F1D – ITEM 23 EXEC (no *)
F3D – ITEM 25 EXEC (no *)
F2D – ITEM 27 EXEC (no *)
F5L – ITEM 37 EXEC (no *)

Left RCS page – ITEM 2 EXEC
JET DES L5L – ITEM 37 EXEC (no *)

Right RCS page – ITEM 3 EXEC
JET DES R5D – ITEM 39 EXEC (no *)

GNC 20 DAP CONFIG

DAP A1 – ITEM 1 + 1 EXEC

7. SNAP LVLH ATTITUDE AND NULL RATES

When time \geq +03:30:

DAP: A/PRI
DAP: LVLH

When rates stable:

DAP: VERN

Return to FLT PLN attitude

8. RECONFIGURE TO GROUP B POWERDOWN

√MCC

O14:E, cb DDU L (two) – op
O15:E

O14:F, Pri RJD LOGIC,DRIVER (sixteen) – OFF
O15:F, RJDA 1A L2/R2 MANF DRIVER – ON
O16:F



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CARBON DIOXIDE MONITORING (CDM) DEVELOPMENT
TEST OBJECTIVE (DTO) PROCEDURES

| | |
|---------------------------------------|---------|
| CDM SETUP AND BATTERY CHANGEOUT | FS 11-2 |
| ACTIVATION | FS 11-5 |
| DEACTIVATION | FS 11-6 |
| DTO COMPLETION..... | FS 11-6 |

CDM DTO

CDM SETUP AND BATTERY CHANGEOUT

NOTE

CDM will operate for approx 10 hr before Batt Pack is discharged. CDM will emit a short beep once every 15 sec to indicate a low battery condition with 3 to 8 hr remaining. This alarm cannot be disabled. Kapton tape over the alarm outlet will muffle the sound

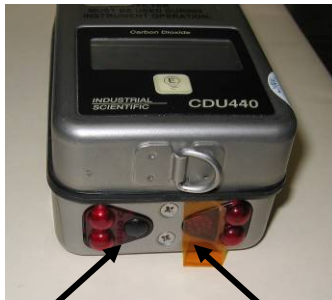
When battery has insufficient charge to operate CDM, 'BATTERY FAIL' is displayed and a short beep is emitted every sec. Battery should be replaced immediately

When in normal operation (CO2 concentration displayed), battery status can be accessed by pressing MODE pb once. After 15 sec, display will revert back to normal viewing mode

CDM DTO

MF28G
MF43H

1. Unstow:
 - Kapton Tape (for initial setup only)
 - CDM (for initial setup only)
 - Clean Filter Assy (for initial setup only)
 - New Batt Pack
 - Sharpie
2. If initial use of CDM:
 - Mate CDM QD and Filter Assy
 - Attach Velcro tether
 - Cover speaker outlet on bottom of CDM with Kapton tape as shown



MODE pb

Alarm speaker outlet w/ Kapton tape

Cont next page

FS 11-2

ORB OPS/118/FIN

3. If CDM activated, deactivate:
Press, hold MODE pb until 'RELEASE' displayed
√CDM – OFF
4. Turn fasteners (two) on back panel ¼ turn ccw
5. Remove, temp stow back panel
6. Grasp Batt Pack pull tab, remove pack

NOTE

Stored data is maintained for a max of 30 min without battery installed. All data will be lost if battery installation is delayed more than 30 min

7. For initial battery changeout, mark old Batt Pack as "SPARE." Mark all Batt Packs on subsequent changeouts as "DISCHARGED"
8. Install replacement Batt Pack, press firmly to seat electrodes
9. Replace back panel, press firmly, turn fasteners (two) ¼ turn cw to lock

10. Stow:
MF28G Kapton Tape (for initial setup only)
MF43H Used Batt Pack
Sharpie

Cont next page

NOTE

Due to changes in on-orbit stowage configuration between missions, a general location for CDM placement is identified. The CDM should be placed as near to the specified location as possible and should not be placed directly in front of air diffusers

11. Attach CDM to a surface near the Attachment Location specified in Flight Plan and check complete

| | Attachment Location | CK CMPLT |
|------------|--------------------------------|-----------------|
| Location 1 | Middeck Forward Starboard | |
| Location 2 | Middeck Aft Starboard | |
| Location 3 | Middeck Aft Hatch "ditch" area | |
| Location 4 | Middeck Forward Port | |
| Location 5 | Middeck Aft Port | |

NOTE

When taking photo, back away as far as possible so the camera's field of view includes the CDM and other equipment in the vicinity

12. Record CDM monitoring location using DCS 760 digital camera:
Lens – 17-35 mm, zoom to 17 mm
Set camera to nominal in-cabin setup
If required, perform SETUP, 760 Program w/Flash (PHOTO/TV, DCS 760), then:
Record one photo showing location of CDM in relation to surroundings

CDM ACTIVATION

NOTE

Audible beeps occur when MODE pb is pressed during unit activation

A single beep occurs when self-check routine is complete (~1 min)

1. Press, hold MODE pb until 'RELEASE' displayed
2. When self-check routine countdown is complete, verify display shows CO2 reading

NOTE

Battery status should be taken after self-check routine, when pump has started and CDM begins displaying CO2 concentrations

The operating mode will revert to the nominal display after 15 seconds

3. Press MODE pb once, until battery status is displayed
4. Verify battery status indicates 'OK'

NOTE

Disabling the CDM alarm function will remove aural and visual annunciation if the preset CO2 threshold concentration is exceeded

In the alarm on/off mode, pressing the 'E' pb will toggle the switch between alarm off and alarm on

5. From the CO2 concentration display, press MODE pb six times, until alarm status is displayed

If initial use of CDM or 'ALM ON' is displayed:

6. Press E pb once to switch alarm off
7. Verify display indicates 'ALM OFF'

CDM DEACTIVATION

NOTE

If 'BATTERY FAIL' message is displayed, replace battery immediately to maintain logged data and notify MCC

1. Press, hold MODE pb until 'RELEASE' displayed
2. √CDM – OFF

DTO COMPLETION

NOTE

Stored data is maintained for a max of 30 min without battery installed. All data will be lost if battery installation is delayed more than 30 min

1. Unstow:
MF43H Batt Pack from initial changeout (marked "SPARE")
Sharpie
2. Turn fasteners (two) on back panel ¼ turn ccw
3. Remove, temp stow back panel
4. Grasp Batt Pack pull tab, remove pack
5. Mark old Batt Pack as "DISCHARGED"
6. Install Batt Pack marked "SPARE" from initial changeout, press firmly to seat electrodes
7. Replace back panel, press firmly, turn fasteners (two) ¼ turn cw to lock
8. Demate filter assembly from CDM QD
- MF43H 9. Stow CDM, used Batt Pack, and filter assembly

CUE CARD CONFIGURATION

FLIGHT DAY 3 DOCKING ORBITER WITH ISS
CO2 ABSORBER REPLACEMENT (Front) FS CC 12-3
LiOH CANISTER STOWAGE LOCATIONS
AND LiOH EXCHANGE PLAN (Back) FS CC 12-4
ORBIT BURN MONITOR (Front) FS CC 12-5
OMS FAILURES (Back) FS CC 12-6
STS-118 DAP CONFIGURATIONS
(Front/Top) FS CC 12-7
(Front/Bottom) FS CC 12-8
(Back/Top)..... FS CC 12-9
(Back/Bottom) FS CC 12-10
MAUI – RCS FIRING SEQUENCE (Front) FS CC 12-11
(Back)..... FS CC 12-12
MIDODRINE PILL INGESTION (Front)..... FS CC 12-13

CUE
CARDS

NOT FLOWN

FS 12-1

ORB OPS/118/FIN



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**CUE
CARDS**



NOT FLOWN

FS 12-2

ORB OPS/118/FIN



TOP

HOOK
VELCRO

**FLIGHT DAY 3 DOCKING
ORBITER WITH ISS
CO2 ABSORBER REPLACEMENT**
(7 Crewmembers/Single Shift/FD 1-18)

| FLIGHT DAY | POS A | POS B | CK CMLPT |
|------------|------------|------------|---------------|
| LAUNCH | 1 | 2 | |
| PRE FD1 | " | " | |
| POST FD2 | 3 | 4 | |
| PRE FD2 | 5 * | 6 | |
| POST FD3 | 7 | " | DOCKING |
| PRE FD3 | " | 8 | |
| POST FD4 | " | " | |
| PRE FD4 | 9 | " | |
| POST FD5 | " | " | |
| PRE FD5 | " | 10 | |
| POST FD6 | " | " | |
| PRE FD6 | 11 | " | |
| POST FD7 | " | " | |
| PRE FD7 | " | 12 | |
| POST FD8 | " | " | |
| PRE FD8 | 13 | " | |
| POST FD9 | " | " | w SSPTS |
| PRE FD9 | " | STS-114 9 | |
| POST FD10 | " | " | w SSPTS |
| PRE FD10 | STS-114 13 | " | |
| POST FD11 | " | " | w SSPTS |
| PRE FD11 | " | STS-114 14 | |
| POST FD12 | " | " | |
| MID FD12 | STS-114 15 | STS-114 16 | HATCH CLOSURE |
| PRE FD12 | STS-114 17 | " | |
| POST FD13 | STS-114 18 | STS-114 19 | |
| PRE FD13 | STS-114 20 | 14 | |
| POST FD14 | 15 | 16 | |
| PRE FD14 | 17 * | 18 * | |
| POST FD15 | 19 | 20 | EOM |
| PRE FD15 | 21 * | 22 * | |
| POST FD16 | 23 | 24 | EOM+1 |
| PRE FD16 | 25 * | 26 * | |
| POST FD17 | 27 | 28 | EOM+2 |
| PRE FD17 | " | 29 | |
| POST FD18 | 30 | 31 | EOM+3 |

*Reseal LiOH cans w/Gray Tape and stow
(Locations of canisters on back)

ORB OPS-29a/nonRCRS/118/O/C

NOTE

This card is specifically used for the STS-118 mission with the orbiter conducting single shift operations with a crew size of 7. This changeout scheme reflects FD3 docking with ISS and CDRA dual bed and Vozdukh operation. The double lined box around FD9 through FD11 represents the +3 days that are dependent upon successful SSPTS operation

(reduced copy)

FAB USE ONLY

FS CC 12-3

ORB OPS/118/FIN

TOP
BACK OF 'FLIGHT DAY 3 DOCKING
ORBITER WITH ISS
CO2 ABSORBER REPLACEMENT'

HOOK
VELCRO

**LiOH CANISTER STOWAGE LOCATIONS
AND LiOH EXCHANGE PLAN**

Ascent LiOH Locations

Orbiter:

MD52M (LiOH): Cans 3-31 *

* 2 LiOH cans installed in LiOH slots
A and B

Spacehab:

SF12: STS-118 cans 32-34

SF11: STS-118 cans 35-37

SF06b: STS-118 cans 38-40

SF09b: STS-118 cans 41-43

SF08a: STS-118 can 44

SF09a: STS-118 can 45

SF01a: STS-118 can 46

SF06a: STS-118 can 47

SF10a: STS-118 can 48

AC14: STS-118 cans 49-51

FS01: STS-118 cans 52-54

SF24: STS-118 cans 55-57

FC13: STS-118 can 58

FS07: STS-118 can 59

FS03: STS-118 cans 60-61

ISS:

NOD1S4D2: STS-114 cans 9, 13-20

STS-117 cans 1-3

ORB OPS-29b/nonRCRS/118/O/C

(reduced copy)

FAB USE ONLY

FS CC 12-4

ORB OPS/118/FIN

TOP

HOOK
VELCRO

HOOK
VELCRO

ORBIT BURN MONITOR

| | | |
|-----------------------------------|--|--|
| OMS TEMP* | L R | |
| FU IN P ≥ | 219 220 | OMS ENG FAIL |
| ≤ | 201 208 | OMS PRPLT FAIL |
| or No FU IN P | | |
| OMS PC* & OMS ↓ | | |
| ENG VLV 1 or 2 < 70 | | OMS ENG FAIL |
| or OX IN P > 227 | | |
| OX IN P ≤ 227 | | OMS PRPLT FAIL |
| or No OX IN P | | |
| OMS OX/FU TK P (√ENG IN P) | | |
| OX/FU LOW | | He PRESS/VAP ISOL (two) – OP If aff TK P not incr: OMS PRPLT FAIL |
| OX & FU HIGH | | He PRESS/VAP ISOL (two) – CL Cycle He A(B) to maintain TK P 234-284 |
| OMS N2 REG P HIGH or LOW | | OMS ENG – ARM |
| OMS N2 TK P LOW | | At N2 TK P < 470: OMS ENG – ARM |
| (√OMS/MPS) | | |
| OMS GMBL | PRI fail | L(R) OMS GMBL – SEC (twice) |
| | SEC fail | If high RCS usage: OMS ENG FAIL |
| GPC | <input type="checkbox"/> (<input type="checkbox"/>) & Burning OMS aff | aff GPC PWR – OFF If SEC GMBL avail: aff MDM FF 1(4) – OFF,ON L(R) OMS GMBL – SEC (twice) |
| | SEC GMBL lost | If high RCS usage: OMS ENG FAIL |
| | 2 FAs lost | √MAN SHUTDN |
| I/O ERROR FA | 1(4) | L(R) OMS GMBL – SEC I/O RESET If high RCS usage: OMS ENG FAIL |
| | 2 FAs lost | √MAN SHUTDN |
| BCE STRG D | | I/O RESET (if recov: >>) |
| | 1(4) | If high RCS usage: L(R) OMS GMBL – SEC (twice) |
| GPC SET SPLIT | Non-crit burn | STOP BURN: OMS ENG(s) – OFF |
| | Crit burn | Go to "GPC" above |
| I/O ERROR PCM | | OI PCMMU PWR – 2(1) |
| BCE BYP OA | | SM I/O RESET |

*If XFD, BLDN, or sensor fail, monitor ENG IN P for off-nominal performance

ORB OPS-31a/118/O/B

(reduced copy)

FAB USE ONLY

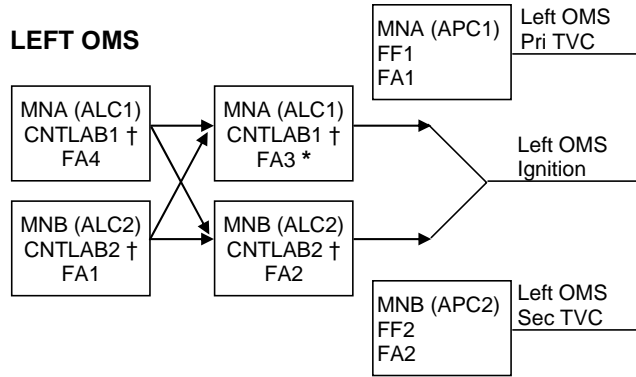
FS CC 12-5

ORB OPS/118/FIN

TOP
BACK OF 'ORBIT BURN MONITOR'



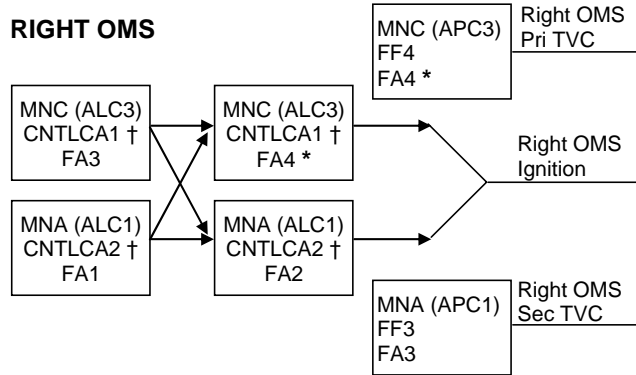
LEFT OMS



† If CNTL AB1 or AB2 (CA1 or CA2) failed and ign path still exists at OMS fail, assume L(R) OMS ↓ is PRPLT FAIL

* If L(R) Pc failed high during burn or FA3(4) failed, at L(R) OMS fail, no guidance downmode after L(R) OMS ENG switch OFF (TGO slow, ADI needles in error, 6 ft/s underburn)

RIGHT OMS



| If two FA MDMs lost | | |
|---------------------|-----------------------|----------------------------|
| MDMs | Preburn: ENG – OFF | During burn: MAN SHUTDN |
| 1,2 | LEFT (TVC) | BOTH |
| 1,3 | RIGHT (IGN) | LEFT |
| 1,4 | LEFT (IGN) | RIGHT |
| 2,3 | LEFT (IGN) | RIGHT |
| 2,4 | RIGHT (IGN) | LEFT |
| 3,4 | RIGHT (TVC) | BOTH |

ORB OPS-31b/118/O/A

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FAB USE ONLY

FS CC 12-6

ORB OPS/118/FIN

FAB USE ONLY

FS CC 12-7

ORB OPS/118/FIN

(reduced copy)

TOP

PILE
VELCRO

PILE
VELCRO

STS-118 DAP A1 – DAP A8 CONFIGURATIONS

| | ITEM # | A1 | A2 | A3 | A4 | A5 | A6 | A7 | A8 |
|-------------|---------|---------|--------|--------|--------------------|-----------------------|--------------------------------|--------|-------------------|
| PRI | | | | | | | | | |
| ROT RATE | 10 (50) | 0.2000 | 0.4000 | 0.2000 | 0.5000 | 0.2000 | 0.2000 | 0.2000 | 0.0500 |
| ATT DB | 11 (51) | 5.00 | 1.00 | 0.30 | 3.00 | 5.00 | 5.00 | 2.00 | 2.00 |
| RATE DB | 12 (52) | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 13 (53) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| COMP | 14 (54) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 15 (55) | ALL | ALL | ALL | ALL | ALL | TAIL | ALL | ALL |
| Y OPTION | 16 (56) | ALL | ALL | TAIL | ALL | ALL | TAIL | ALL | ALL |
| TRAN PLS | 17 (57) | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 | 0.100 |
| ALT | | | | | | | | | |
| RATE DB | 18 (58) | 0.200 | 0.200 | 0.070 | 0.200 | 0.070 | 0.070 | 0.100 | 0.100 |
| JET OPT | 19 (59) | ALL | ALL | ALL | ALL | ALL | TAIL | ALL | ALL |
| # JETS | 20 (60) | 2 | 2 | 1 | 2 | 1 | 1 | 2 | 2 |
| ON TIME | 21 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 22 (62) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| VERN | | | | | | | | | |
| ROT RATE | 23 (63) | 0.2000 | 0.4000 | 0.0080 | 0.2000 | 0.0500 | 0.0500 | 0.0160 | 0.0500 |
| ATT DB | 24 (64) | 1.000 | 1.000 | 0.070 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 |
| RATE DB | 25 (65) | .020 | .020 | .010 | .020 | .020 | .020 | .020 | .020 |
| ROT PLS | 26 (66) | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.050 |
| COMP | 27 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 28 (68) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PURPOSE | | NOMINAL | PTC | GG | PRE/POST DEPLOY | LOSS OF VERN (ALL) | LOSS OF VERN (TAIL ONLY) | RNDZ | TERMINAL PHASE |

ORB OPS-41a/118/O/A

HINGE

TOP
HINGED AT BOTTOM OF
'STS-118 DAP A1 – A8 CONFIGURATIONS'
HINGE

STS-118 DAP B1 – DAP B8 CONFIGURATIONS

| | ITEM # | B1 | B2 | B3 | B4 | B5 | B6 | B7 | B8 |
|-------------|---------|-------------------------------|--------------------------------|--------------------------------|--------|-----------------|--------|--------|-------------------|
| PRI | | | | | | | | | |
| ROT RATE | 30 (50) | 0.5000 | 0.2000 | 0.2000 | 0.2000 | 0.2000 | 0.5000 | 0.5000 | 0.0500 |
| ATT DB | 31 (51) | 3.00 | 3.00 | 3.00 | 0.30 | 3.00 | 3.00 | 2.00 | 2.00 |
| RATE DB | 32 (52) | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 33 (53) | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 |
| COMP | 34 (54) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 35 (55) | ALL | TAIL | ALL | TAIL | TAIL | ALL | ALL | ALL |
| Y OPTION | 36 (56) | ALL | TAIL | ALL | TAIL | TAIL | ALL | ALL | ALL |
| TRAN PLS | 37 (57) | 0.100 | 0.020 | 0.020 | 0.020 | 0.020 | 0.020 | 0.050 | 0.050 |
| ALT | | | | | | | | | |
| RATE DB | 38 (58) | 0.200 | 0.070 | 0.070 | 0.100 | 0.200 | 0.200 | 0.100 | 0.100 |
| JET OPT | 39 (59) | ALL | TAIL | ALL | ALL | ALL | ALL | ALL | ALL |
| # JETS | 40 (60) | 2 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |
| ON TIME | 41 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 42 (62) | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| VERN | | | | | | | | | |
| ROT RATE | 43 (63) | 0.2000 | 0.2000 | 0.2000 | 0.0080 | 0.0160 | 0.2000 | 0.2000 | 0.0500 |
| ATT DB | 44 (64) | 1.000 | 1.000 | 1.000 | 0.100 | 0.033 | 1.000 | 1.000 | 1.000 |
| RATE DB | 45 (65) | .020 | .020 | .020 | .010 | .020 | .020 | .020 | .020 |
| ROT PLS | 46 (66) | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.020 |
| COMP | 47 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 48 (68) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| PURPOSE | | NOMINAL OMS & RCS BURNS | LOSS OF VERN (TAIL ONLY) | LOSS OF VERN (NOSE/TAIL) | | COAS/HUD CAL | | RNDZ | TERMINAL PHASE |

HOOK
VELCRO

ORB OPS-41aa/118/O/A

HOOK
VELCRO

FAB USE ONLY

FS CC 12-8

ORB OPS/118/FIN

(reduced copy)

TOP
BACK OF 'STS-118 DAP A1 – A8 CONFIGURATIONS'

PILE
VELCRO

PILE
VELCRO

STS-118 DAP A9 – DAP A15 CONFIGURATIONS

| PRI | ITEM # | A9 | A10 | A11 | A12 | A13 | A14 | A15 |
|-------------|---------|-----------------------|---------|-----------------|--------------------------|-----------------------|-------------------------------|----------------------------------|
| PRI | | | | | | | | |
| ROT RATE | 10 (50) | 0.1300 | 0.0500 | 0.0500 | 0.0500 | 0.0500 | 0.2000 | 0.1000 |
| ATT DB | 11 (51) | 2.00 | 0.60 | 10.00 | 5.00 | 5.00 | 5.00 | 5.00 |
| RATE DB | 12 (52) | 0.10 | 0.10 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 13 (53) | 0.100 | 0.100 | 0.040 | 0.040 | 0.040 | 0.100 | 0.040 |
| COMP | 14 (54) | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 15 (55) | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL |
| Y OPTION | 16 (56) | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL |
| TRAN PLS | 17 (57) | 0.050 | 0.050 | 0.100 | 0.010 | 0.010 | 0.100 | 0.010 |
| ALT | | | | | | | | |
| RATE DB | 18 (58) | 0.100 | 0.100 | 0.050 | 0.050 | 0.050 | 0.200 | 0.070 |
| JET OPT | 19 (59) | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL | TAIL |
| # JETS | 20 (60) | 2 | 2 | 3 | 3 | 3 | 1 | 3 |
| ON TIME | 21 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 22 (62) | 0.00 | 0.00 | 12.00 | 11.04 | 11.04 | 6.00 | 11.04 |
| VERN | | | | | | | | |
| ROT RATE | 23 (63) | 0.1300 | 0.0500 | 0.1000 | 0.1000 | 0.1000 | 0.2000 | 0.1000 |
| ATT DB | 24 (64) | 1.000 | 0.500 | 5.000 | 3.000 | 3.000 | 3.000 | 3.000 |
| RATE DB | 25 (65) | .020 | .020 | .050 | .050 | .050 | .200 | .080 |
| ROT PLS | 26 (66) | 0.050 | 0.050 | 0.010 | 0.001 | 0.001 | 0.010 | 0.001 |
| COMP | 27 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 28 (68) | 0 | 0 | 1(2)* | 1 | 1 | 9 | 3 |
| PURPOSE | | PROX/OPS FLYAROUND | DOCKING | AUTO REBOOST | MATED MNVRS (VRCS) | A/L DEPRESS (VRCS) | ORBITER ALONE SRMS/OBSS | MATED ATTITUDE HOLD (VRCS) |

BOLD/ITALIC indicates change from I-Load.
* 1 for Config 3&4, 2 for Config 1&2

ORB OPS-41b/118/O/B

HINGE

FAB USE ONLY

FS CC 12-9

ORB OPS/118/FIN

(reduced copy)

FAB USE ONLY

FS CC 12-10

ORB OPS/118/FIN

(reduced copy)

TOP
 BACK OF 'STS-118 DAP B1 – B8 CONFIGURATIONS'
 HINGED AT BOTTOM OF 'STS-118 DAP A9 – A15 CONFIGURATIONS'
 HINGE

STS-118 DAP B9 – DAP B13 CONFIGURATIONS

| | ITEM # | B9 | B10 | B11 | B12 | B13 |
|-------------|---------|------------------------|---------|--------|--------------------------------|-------------------------|
| PRI | | | | | | |
| ROT RATE | 30 (50) | 0.1300 | 0.0500 | 0.5000 | 0.0500 | 0.0500 |
| ATT DB | 31 (51) | 2.00 | 0.60 | 3.00 | 5.00 | 5.00 |
| RATE DB | 32 (52) | 0.10 | 0.10 | 0.20 | 0.20 | 0.20 |
| ROT PLS | 33 (53) | 0.040 | 0.040 | 0.040 | 0.040 | 0.040 |
| COMP | 34 (54) | .000 | .000 | .000 | .000 | .000 |
| P OPTION | 35 (55) | TAIL | TAIL | ALL | TAIL | TAIL |
| Y OPTION | 36 (56) | TAIL | TAIL | ALL | TAIL | TAIL |
| TRAN PLS | 37 (57) | 0.010 | 0.010 | 0.020 | 0.010 | 0.010 |
| ALT | | | | | | |
| RATE DB | 38 (58) | 0.100 | 0.100 | 0.200 | 0.050 | 0.050 |
| JET OPT | 39 (59) | TAIL | TAIL | ALL | TAIL | TAIL |
| # JETS | 40 (60) | 2 | 2 | 2 | 3 | 3 |
| ON TIME | 41 (61) | 0.08 | 0.08 | 0.08 | 0.08 | 0.08 |
| DELAY | 42 (62) | 10.00 | 0.00 | 0.00 | 11.04 | 11.04 |
| VERN | | | | | | |
| ROT RATE | 43 (63) | 0.1300 | 0.0500 | 0.2000 | 0.1000 | 0.1000 |
| ATT DB | 44 (64) | 1.000 | 0.500 | 1.000 | 3.000 | 3.000 |
| RATE DB | 45 (65) | .020 | .020 | .020 | .050 | .050 |
| ROT PLS | 46 (66) | 0.020 | 0.020 | 0.002 | 0.001 | 0.001 |
| COMP | 47 (67) | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 48 (68) | 0 | 0 | 0 | 2 | 2 |
| PURPOSE | | PROX OPS/ FLYAROUND | DOCKING | | MATED MNVRS & HOLD (ALT) | A/L DEPRESS (ALT) |

BOLD/ITALIC indicates change from I-Load.

HOOK
VELCRO

ORB OPS-41bb/118/O/B

HOOK
VELCRO

TOP

MAUI – RCS FIRING SEQUENCE

| Timer | Jets Fired | CDR | PLT |
|--------|------------|--|---|
| -03:00 | | Body rates: $+0.047 \leq \text{roll} \leq +0.087$ $-0.020 \leq \text{pitch} \leq +0.020$ $-0.020 \leq \text{yaw} \leq +0.020$ DAP: FREE DAP: A/PRI Inform PLT "GO" for jet deselection | Configure initial setup GNC 23 RCS Left RCS page – ITEM 2 EXEC On CDR "GO", proceed <u>NOTE</u> Expect DAP RECONF msgs in following actions Deselect jets: JET DES L5L – ITEM 37 EXEC (*) Right RCS page – ITEM 3 EXEC JET DES R5D – ITEM 39 EXEC (*) Forward RCS page – ITEM 1 EXEC JET DES F5L – ITEM 37 EXEC (*) <u>NOTE</u> Queue the following ITEM entry on the scratch pad. Do not perform the EXEC until specified at 35 sec JET DES F3D – ITEM 25 |
| -00:30 | | FLT CNTRL PWR – ON | |
| 00:00 | RXA, LXA | THC +X (in) (3 sec firing) | |
| 00:15 | FXL, LXL | THC +Y (right) (3 sec firing) | |
| 00:30 | FXR, RXR | THC -Y (left) (3 sec firing) | |
| 00:35 | | | When jets stop firing: GNC 23 RCS EXEC [JET DES F3D – ITEM 25 (*)] |
| 00:45 | F4D | RHC +pitch (hard stop, hold 3 sec) | |
| 00:48 | | RHC release | |
| 00:50 | | | DAP: VERN |
| 01:00 | R5R | RHC +yaw (10 sec firing) | |
| 01:20 | L5D | RHC -pitch (12 sec firing) | |
| 01:40 | F5R | RHC +pitch (12 sec firing) | |
| | | FLT CNTRL PWR – OFF | Return to MAUI PROCEDURE, step 6, (ORB OPS FS, MAUI) |

ORB OPS-42a/118/O/A

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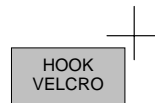
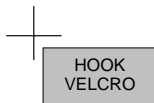
FAB USE ONLY

FS CC 12-11

ORB OPS/118/FIN



TOP
BACK OF 'MAUI - RCS FIRING SEQUENCE'



ORB OPS-42b/118/O/A



FAB USE ONLY

(reduced copy)
FS CC 12-12

ORB OPS/118/FIN

TOP

MIDODRINE PILL INGESTION

NO GO

If ANY of the conditions below are true, then you are NO GO for pill ingestion:

1. Midodrine PI/Crew Surgeon has given a "NO GO"
2. Taken promethazine/Phenergan or phenDex in the last 70 hrs.
3. Taken any medication that effects the autonomic nervous system within 24 hrs.
4. Performed maximum exercise in the last 24 hrs.
5. Taken nicotine, caffeine, or alcohol in the last 12 hrs.

GO

| LOCATION | STEP |
|-----------------------|--|
| Midodrine Pill Kit | Ingest 10 mg dose (1 tablet) of midodrine with liquid NOTE In the event the midodrine pill is lost, a backup dose is located beneath the first pill |
| | Record time of ingestion: <input type="checkbox"/> GMT <input type="checkbox"/> MET |
| ACES right leg pocket | Stow kit. |

ORB OPS-45a/118/O,E/B

FABRICATION NOTES

- 1) Fabricate as a kneeboard card

(reduced copy)

FAB USE ONLY

FS CC 12-13

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Space Shuttle Program
FLIGHT DATA FILE

JSC-48036-118
FINAL



ORBIT OPS CHECKLIST

STS
118

Flight Cover (trim bottom to expose tabs)