

Orbit Operations Checklist

STS-117 Flight Supplement

**Mission Operations Directorate
Operations Division**

**Final
February 16, 2007**

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



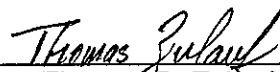
United Space Alliance

MISSION OPERATIONS DIRECTORATE

**ORBIT OPERATIONS CHECKLIST
STS-117 FLIGHT SUPPLEMENT**

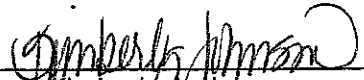
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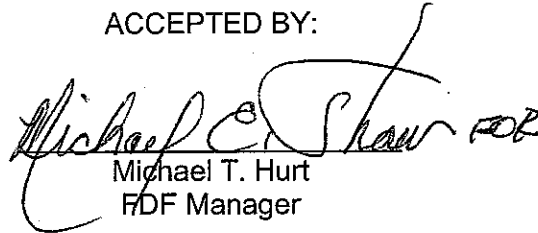
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|-----------------------------|-----------------|-----------------|
| 482#: | ORB OPS_FS-0002 | ORB OPS_FS-0007 |
| | ORB OPS_FS-0003 | ORB OPS_FS-0008 |
| | ORB OPS_FS-0004 | ORB OPS_FS-0009 |
| | ORB OPS_FS-0005 | ORB OPS_FS-0010 |
| | ORB OPS_FS-0006 | |

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| MAUI | DF6/M. Hamilton | 281-483-0944 |

CUE CARDS:

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| FLIGHT DAY 3 DOCKING ORBITER WITH ISS CO2 ABSORBER REPLACEMENT | DF8/P. Bolton | 281-244-1176 |
| ORBIT BURN MONITOR | DF6/A. Marasia | 281-483-0257 |
| DAP TABLES | DF6/M. Hamilton | 281-483-0944 |
| DAP BOOK | DF6/M. Hamilton | 281-483-0944 |
| MAUI – RCS FIRING SEQUENCE | DF6/M. Hamilton | 281-483-0944 |
| MIDODRINE PILL INGESTION | SK/S. Irwin | 281-483-5089 |

ORBIT OPERATIONS CHECKLIST
STS-117 FLIGHT SUPPLEMENT

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* - Omit from flight book

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* – Omit from flight book

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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 *
- C3 * OI PCMMU PWR – 2(1) *
- CRT * √ERR MSG – 'I/O ERR PCM' *
- * 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/FXD | – |
| G3,BFS | (ENTRY) | 102/164 | – |
| 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 | – |
| G9 | Prelaunch PL C/O | 103/180 | 758 |
| G2,G8,S2 | RNDZ w/UHF FMT CCSU (SSOR/SSV/TCS) (PRIME) | 103/192 | 763 |
| G2,G8,S2 | RNDZ w/UHF FMT CCSU (SSOR/SSV/TCS) (B/U) | 103/211 | 770 |
| G2,G8,S2 | DOCKED ISS FMT CCSH (OIU/SSV) (PRIME) | 103/184 | 760 |
| G2,G8,S2 | DOCKED ISS FMT CCSH (OIU/SSV) (B/U) | 103/205 | 767 |
| G2,G8,S2 | DOCKED ISS FMT CCSH-A (OIU/SSV) (PRIME) | 103/199 | 780 |
| G2,G8,S2 | DOCKED ISS FMT CCSH-A (OIU/SSV) (B/U) | 103/212 | 781 |
| G2,G8,S2 | OIU C/O AND SSV RATE 4 (PRIME) | 103/188 | 762 |
| G2,G8,S2 | OIU C/O AND SSV RATE 5 (B/U) | 103/203 | 765 |

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 |
|--|---------------------------|----------------------------|--------------------|--|
| 763 RNDZ w/UHF FMT CCSU (PRIME) TFL 192 | 1 2 3 4 5-FPM | 30 - 9 4 503 | 1,2 - 5 4 | OIU7 (CCSU) ** - TCS SSV (3) *** H-H-H * |
| 770 RNDZ w/UHF FMT CCSU (BACKUP) TFL 211 | 1 2 3 4 5-FPM | 14 31 - 19 502 | 4 1,2 - 5 | SSV (3) *** OIU7 (CCSU) ** - TCS H-H-H * |
| 760 DOCKED FMT CCSH (PRIME) TFL 184 | 1 2 3 4 5-FPM | 7 - - 27 501 | 1,2 - - 4 | OIU9 (CCSH) ** - - SSV (2) *** H-H-H * |
| 767 DOCKED FMT CCSH (BACKUP) TFL 205 | 1 2 3 4 5-FPM | - 17 29 - 506 | - 1,2 4 - | - OIU9 (CCSH) ** SSV (2) *** - H-H-H * |
| 780 DOCKED FMT CCSH-A (PRIME) TFL 199 | 1 2 3 4 5-FPM | 6 - - 27 501 | 1,2 - - 4 | OIU9 (CCSH-A) ** - - SSV (2) *** H-H-H * |
| 781 DOCKED FMT CCSH-A (BACKUP) TFL 212 | 1 2 3 4 5-FPM | - 16 29 - 506 | - 1,2 4 - | - OIU9 (CCSH-A) ** SSV (2) *** - H-H-H * |

* OI-GNC-SM, Orbiter Downlist Data Rates (High or Low)
** # in OIU (#) represents the OIU format and data type
*** # in SSV (#) represents the SSV Out Rate sw selection

Cont next page

FS 1-5

ORB OPS/117/FIN

| CONFIG | DECOM | FMT | INPUT | USE |
|-----------------------------|------------------|--------------------|----------------------|------------------------------------|
| 762 SSV RATE 4 | 1 2 3 4 | 5 - - 1 | 1,2 - - 4 | OIU255 ** - - SSV (4) *** |
| (PRIME) TFL 188 | 5-FPM | 505 | | H-H-H * |
| 765 SSV RATE 5 | 1 2 3 4 | - 15 11 - | - 1,2 4 - | - OIU255 ** SSV (5) *** - |
| (BACKUP) TFL 203 | 5-FPM | 507 | | L-H-H * |
| 758 Pre-Launch PL C/O | 1 2 3 4 | 28 15 9 - | 1,2 1,2 5 - | OIU253 ** OIU255 ** TCS - |
| (PRIME) TFL 180 | 5-FPM | 504 | | H-H-H * |

* OI-GNC-SM, Orbiter Downlist Data Rates (High or Low)
 ** # in OIU (#) represents the OIU format and 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 + <u>9</u> EXEC |
| GNC TO GNC 1 | ITEM 18 + <u>1</u> <u>4</u> EXEC |
| GNC 1 TO BUS 3 | ITEM 18 + <u>1</u> <u>6</u> EXEC |
| BUS 4 BC | ITEM 15 EXEC (*) |
| BUS 3 RT | ITEM 10 EXEC (*) |
| LOAD FORMAT | ITEM 1 + <u>9</u> EXEC >> |

2. GNC-1 PRIMARY ON LB-ORB N2-2 (OIU BUS 4)

| | |
|----------------|----------------------------------|
| LOAD FORMAT | ITEM 1 + <u>9</u> EXEC |
| GNC TO GNC 1 | ITEM 18 + <u>1</u> <u>4</u> EXEC |
| GNC 1 TO BUS 4 | ITEM 18 + <u>1</u> <u>5</u> EXEC |
| BUS 3 BC | ITEM 11 EXEC (*) |
| BUS 4 RT | ITEM 14 EXEC (*) |
| LOAD FORMAT | ITEM 1 + <u>9</u> EXEC >> |

3. GNC-2 PRIMARY ON LB-ORB N2-1 (OIU BUS 3)

| | |
|----------------|----------------------------------|
| LOAD FORMAT | ITEM 1 + <u>9</u> EXEC |
| GNC TO GNC 2 | ITEM 18 + <u>1</u> <u>3</u> EXEC |
| GNC 2 TO BUS 3 | ITEM 18 + <u>1</u> <u>8</u> EXEC |
| BUS 4 BC | ITEM 15 EXEC (*) |
| BUS 3 RT | ITEM 10 EXEC (*) |
| LOAD FORMAT | ITEM 1 + <u>9</u> EXEC >> |

4. GNC-2 PRIMARY ON LB-ORB N2-2 (OIU BUS 4)

| | |
|----------------|----------------------------------|
| LOAD FORMAT | ITEM 1 + <u>9</u> EXEC |
| GNC TO GNC 2 | ITEM 18 + <u>1</u> <u>3</u> EXEC |
| GNC 2 TO BUS 4 | ITEM 18 + <u>1</u> <u>7</u> EXEC |
| BUS 3 BC | ITEM 11 EXEC (*) |
| BUS 4 RT | ITEM 14 EXEC (*) |
| LOAD FORMAT | ITEM 1 + <u>9</u> 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/117/FIN

PTG

FS 2-2

ORB OPS/117/FIN

| 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 | 87.5 | -Y:75 R+ 3 -Z:46 P+ 146 Y+ 13 | R+ 280 -Z:75 P+ 132 Y+ 20 | R+ 86 -Y:46 P+ 155 Y+ 25 | -Y:46 R+ 264 -Z:75 P+ 312 Y+ 335 | R+ 180 -Z:46 P+ 321 Y+ 347 | R+ 357 -Y:75 P+ 325 Y+ 326 | | |
| B | 86.4 | -Y:22 R+ 27 -Z:97 P+ 235 Y+ 340 | R+ 296 -Z:22 P+ 220 Y+ 342 | R+ 114 -Y:97 P+ 238 Y+ 354 | -Y:97 R+ 249 -Z:22 P+ 38 Y+ 14 | R+ 159 -Z:97 P+ 51 Y+ 22 | R+ 334 -Y:22 P+ 46 Y+ 1 | | |
| C | 85.9 | -Y:99 R+ 48 -Z:92 P+ 277 Y+ 293 | R+ 287 -Z:99 P+ 239 Y+ 294 | R+ 130 -Y:92 P+ 272 Y+ 307 | -Y:92 R+ 260 -Z:99 P+ 56 Y+ 62 | R+ 146 -Z:92 P+ 87 Y+ 70 | R+ 333 -Y:99 P+ 72 Y+ 50 | | |
| D | 84.1 | -Y:34 R+ 101 -Z:23 P+ 26 Y+ 4 | R+ 16 -Z:34 P+ 20 Y+ 351 | R+ 188 -Y:23 P+ 12 Y+ 10 | -Y:23 R+ 170 -Z:34 P+ 195 Y+ 11 | R+ 84 -Z:23 P+ 206 Y+ 1 | R+ 256 -Y:34 P+ 185 Y+ 0 | | |

STAR PAIRS PAD

| PAIR | COAS ALIGN | ANG SEP | COAS ALIGN |
|--------|------------|-------------------------------|-------------------------------|
| | ATTITUDE 1 | | ATTITUDE 2 |
| C O | +X COAS | 29 R+ 194 P+ 233 Y+ 343 | 19 R+ 172 P+ 168 Y+ 340 |
| | | 29 R+ 343 P+ 138 Y+ 346 | 19 R+ 340 P+ 81 Y+ 8 |
| A S | -Z COAS | | |

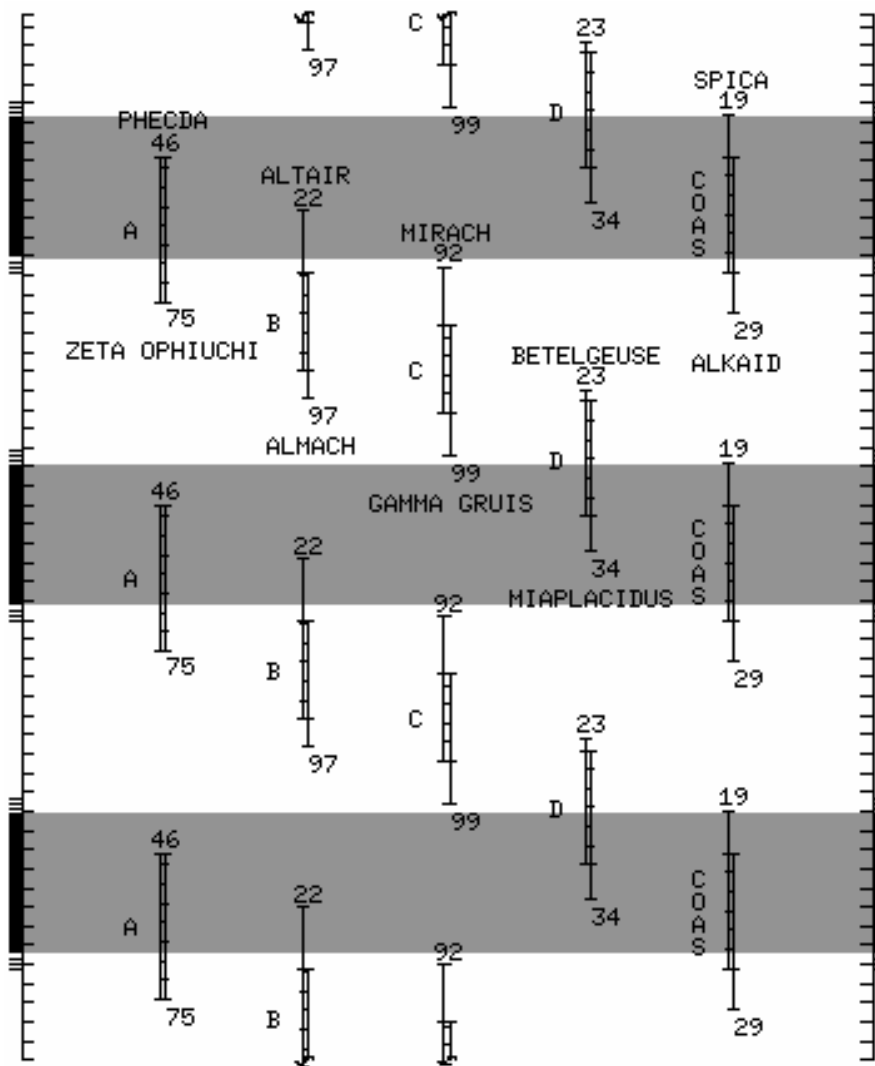
NOSE
UP
61
TRAIL
UP

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 OMS2 - 014/12:00
Date L/O: 03/16/07
GMT L/O: 075/10:12:04

STAR PAIRS



MET Applicable: Post OMS2 - 014/12:00
 Date L/O: 03/16/07
 GMT L/O: 075/10:12:04



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DAP TABLES

| | |
|-----------------------------------|--------|
| DAP OVERVIEW | FS 3-2 |
| UNIV PTG | FS 3-3 |
| STS-117 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 Stack (VERN) | B12 – Mated Stack (ALT) |
| A13 – Shuttle Airlock Depress - Contingency (VERN) | B13 – |
| A14 – Orbiter alone SRMS/OBSS Ops | B14 – |
| A15 – Mated Stack RMS Ops (VERN) | B15 – |

- CNTL ACC = 0 Orbiter alone with unloaded RMS
- = 1 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 Berthed, at Tilt and High Hover positions
 - = 2 Mated - ALT and Shuttle Airlock Pressurized with S3/S4 Berthed
 - = 3 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 at Capture Complete to Installed
 - = 4 Mated - ALT and Shuttle Airlock Pressurized with S3/S4 Installed
 - = 5 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 at Handoff and Auto Sequence Start positions
 - = 6 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 at Preinstall position
 - = 7 Not used
 - = 8 Not used
 - = 9 Orbiter alone SRMS/OBSS Ops

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

FS 3-2

ORB OPS/17/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 |

STS-117 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 |

BOLD/ITALIC indicates change from I-Load.

FS 3-4

ORB OPS/17/FIN

STS-117 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 | 0.0500 |
| 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 | 0.100 | 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 | 0.035 | 0.035 | 0.035 | 0.200 | 0.035 |
| 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 | .050 |
| ROT PLS | 26 (66) | 0.050 | 0.050 | 0.010 | 0.002 | 0.002 | 0.010 | 0.002 |
| COMP | 27 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 28 (68) | 0 | 0 | 1(3)(2)(4) ¹ | 1(3) ² | 1(3) ² | 9 | 5(6) ³ |
| PURPOSE | | PROX/OPS FLYAROUND | DOCKING | AUTO REBOOST | MATED STACK (VERN) | A/L DEPRESS CONTINGENCY (VERN) | ORBITER ALONE SRMS/OBSS | MATED STACK RMS OPS (VERN) |

BOLD/ITALIC indicates change from I-Load.

¹ For Reboost Config 3 & 4: 1 for S3/S4 Berthed, 3 for S3/S4 Installed;

For Reboost Config 1 & 2: 2 for S3/S4 Berthed, 4 for S3/S4 Installed

² 1 for S3/S4 Berthed, Tilt, and High Hover; 3 for S3/S4 at Capture Complete to Installed

³ 5 for S3/S4 at Handoff and Auto Sequence Start; 6 for S3/S4 at Preinstall

FS 3-5

ORB OPS/17/FIN

STS-117 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 | | OMS & RCS Burns (ORB OPS) | Loss of VERN (Tail Only) | Loss of VERN (All) | | COAS/HUD CAL | | RNDZ | TERMINAL PHASE |

BOLD/ITALIC indicates change from I-Load.

FS 3-6

ORB OPS/17/FIN

STS-117 DAP B9 -- B12 CONFIGURATIONS

| | ITEM # | B9 | B10 | B12 |
|-------------|---------|------------------------|---------|-------------------------|
| PRI | | | | |
| ROT RATE | 30 (50) | 0.1300 | 0.0500 | 0.0500 |
| ATT DB | 31 (51) | 2.00 | 0.60 | 5.00 |
| RATE DB | 32 (52) | 0.10 | 0.10 | 0.20 |
| ROT PLS | 33 (53) | 0.040 | 0.040 | 0.040 |
| COMP | 34 (54) | .000 | .000 | .000 |
| P OPTION | 35 (55) | TAIL | TAIL | TAIL |
| Y OPTION | 36 (56) | TAIL | TAIL | TAIL |
| TRAN PLS | 37 (57) | 0.010 | 0.010 | 0.010 |
| ALT | | | | |
| RATE DB | 38 (58) | 0.100 | 0.100 | 0.035 |
| JET OPT | 39 (59) | TAIL | TAIL | TAIL |
| # JETS | 40 (60) | 2 | 2 | 3 |
| ON TIME | 41 (61) | 0.08 | 0.08 | 0.08 |
| DELAY | 42 (62) | 10.00 | 0.00 | 11.04 |
| VERN | | | | |
| ROT RATE | 43 (63) | 0.1300 | 0.0500 | 0.1000 |
| ATT DB | 44 (64) | 1.000 | 0.500 | 3.000 |
| RATE DB | 45 (65) | .020 | .020 | .050 |
| ROT PLS | 46 (66) | 0.020 | 0.020 | 0.002 |
| COMP | 47 (67) | .000 | .000 | .000 |
| CNTL ACC | 48 (68) | 0 | 0 | 2(4)⁴ |
| PURPOSE | | PROX OPS/ FLYAROUND | DOCKING | MATED STACK (ALT) |

BOLD/ITALIC indicates change from I-Load.

⁴ 2 for S3/S4 Berthed, 4 for S3/S4 Installed

FS 3-7

ORB OPS/117/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

1. If PRCS required:

O14:F, RJDA 1A L2/R2 DRIVER – OFF
O15:F, RJD MANF L5/F5/R5 DRIVER – OFF
O16:F, 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-*)

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

C3

If using Config 1(2):

GNC 20 DAP CONFIG
Disable X JETS ROT – ITEM 7 EXEC (no *)

Cont next page

FS 4-2

ORB OPS/117/FIN

REBOOST/
DAP

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 20 DAP CONFIG

Enable X JETS ROT – ITEM 7 EXEC (*)

Return to FLIGHT PLAN Attitude

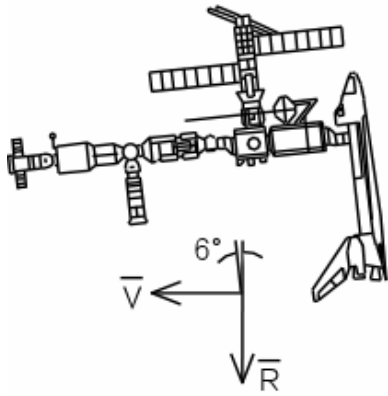
DAP: as reqd

Pri RJD LOGIC,DRIVER (sixteen) – as reqd

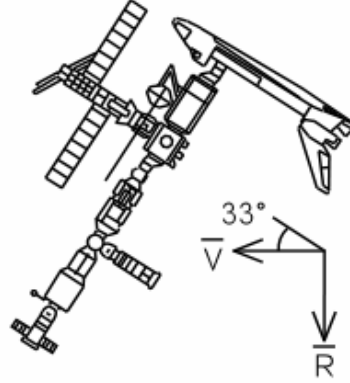
C3
O14,
O15,
O16

AUTO REBOOST ATTITUDE REFERENCE

VRCS ATTITUDE HOLD CONFIGURATIONS:

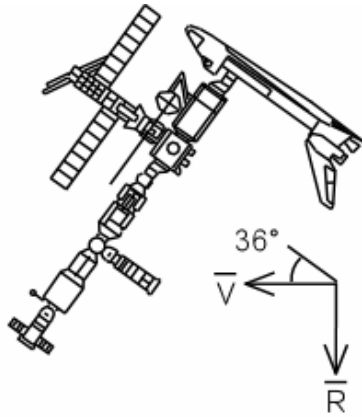


Earth
Nose up, Config 3 (VRCS)

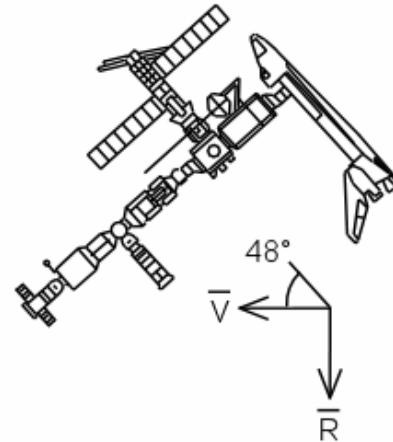


Earth
Nose up, Config 4 (+X, VRCS)

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) |
| | non-RMS | RMS | All Configs |
| VERN | A12 (CA: 1,3) | A12/A15 (CA: 1,5,6) | Not Certified |
| ALT | B12 (CA: 2,4) | Not Certified | Not Certified |
| 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 (NON-RMS OPS),
select DAP: A12/VERN or B12/ALT
Pre-S3/S4 INSTALL: CA1 for VERN
CA2 for ALT
Post-S3/S4 INSTALL: CA3 for VERN
CA4 for ALT
All can be used for attitude maintenance or
maneuvering

2. When shuttle airlock pressurized and loaded
SRMS/SSRMS select,
DAP: A12/VERN and CA1 with S3/S4 at Tilt and
High Hover
DAP: A15/VERN and CA5 with S3/S4 at Handoff
and Auto Sequence Start
DAP: A15/VERN and CA6 with S3/S4 at Preinstall

All can be used for attitude maintenance or
maneuvering on VERN only

3. When rate damping, select DAP: AUTO when 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 CNTL | – PL UMB – 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

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

OIU

PRLA

PRLA CLOSE..... FS 6-2

PRLA

FS 6-1

ORB OPS/117/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 – 1
√LAT 1,2,3,4 (four) – 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 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

A6U 7. PL RETEN PL SEL – MON

MA73C:A 8. If MCA LOGIC switches taken OFF in step 1:
:B MCA LOGIC MNC MID 2 – ON
MNB MID 4 – ON

PRLA

WING LEADING EDGE SENSORS (WLES) PROCEDURES

| | |
|--|---------|
| ACTIVATION AND CHECKOUT | FS 7-2 |
| DEACTIVATION AND TEARDOWN | FS 7-9 |
| WLE LAPTOP RECEIVER UNIT (LRU) R&R | FS 7-11 |
| CONFIGURE DATA FILE BACKUP PATH | FS 7-14 |
| DECONFIGURE DATA FILE BACKUP PATH | FS 7-14 |
| PREP WLES LAPTOPS FOR TRANSFER..... | FS 7-15 |
| FOR RNDZ TOOLS CHECKOUT | FS 7-17 |
| WLES RECONFIG POST DOCK/UNDOCK | FS 7-17 |
| DISABLE WLES FILE BACKUP | FS 7-18 |
| ENABLE WLES FILE BACKUP | FS 7-18 |

**WLE
SENSORS**

ACTIVATION AND CHECKOUT

1. UNSTOW EQUIPMENT

NOTE

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

| | | |
|------|--|--|
| MA9G | Unstow: | |
| | Laptop Receiver Units (2) | |
| | Cabin Relay Units (2) (S/N 2432, 2496) | |
| | A31p STS6 RPOP2 laptop | |
| MA9J | Unstow: A31p STS7 WLES laptop | |

2. SETUP WLE RELAY UNITS

| | |
|-----|--|
| A13 | Retrieve WLE SYSTEM CABLE coiled on panel A6 Connect to MICRO WIS SYSTEM A – J7 (see fig 7-1) |
| W7 | Connect to J1 on Cabin Relay Unit S/N 2432 and secure to STBD side of aft cabin with Velcro (see fig 7-2) Verify terminator connected to J2 |
| A13 | Retrieve WLE SYSTEM CABLE coiled on panel A9 Connect to MICRO WIS SYSTEM B – J8 (see fig 7-1) |
| A4 | Connect to J1 on Cabin Relay Unit S/N 2496 and secure to PORT side of aft cabin with Velcro (see fig 7-3) 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 7-2

ORB OPS/117/FIN

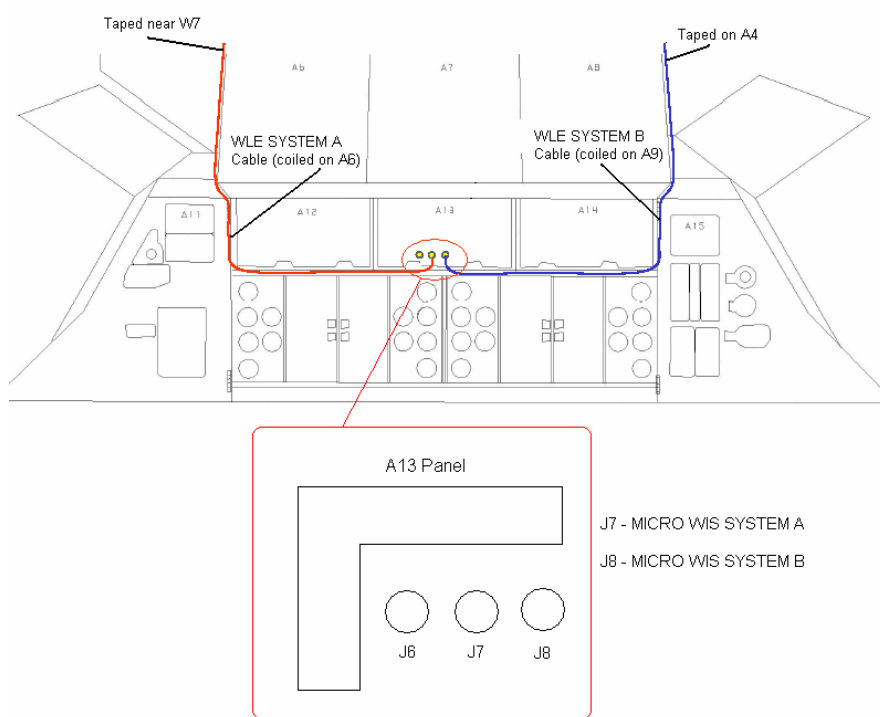


Figure 7-1.- A13 panel.

Cont next page

FS 7-3

ORB OPS/117/FIN

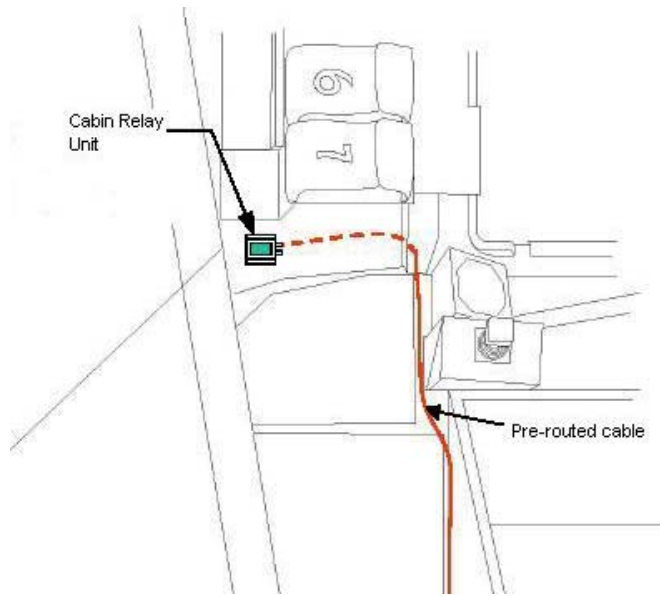


Figure 7-2.- Aft STBD location.

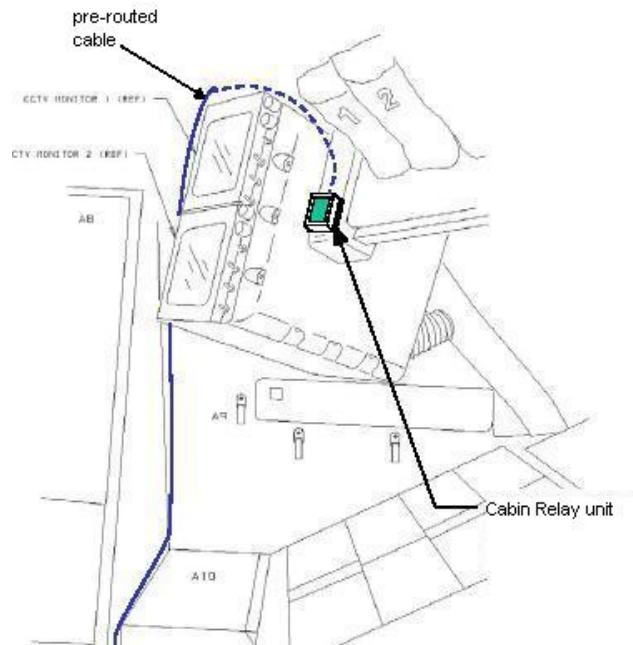


Figure 7-3.- Aft PORT location.

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 7-4)

Connect Laptop Receiver Unit to A31p Serial port using thumbscrews (see fig 7-5)

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 7-4)

Connect Laptop Receiver Unit to A31p Serial port (see fig 7-5)

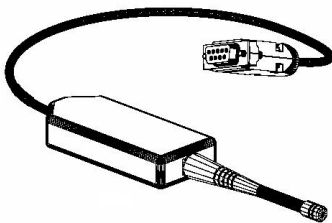


Figure 7-4.- Laptop Receiver Unit.



Figure 7-5.- A31p ports.

Cont next page

FS 7-5

ORB OPS/117/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 7-6

ORB OPS/117/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 2432 and 2496 (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 (expected to be the "S" drive)

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

Click 'OK'

Cont next page

FS 7-7

ORB OPS/117/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 7-6 and fig 7-7)

Disconnect Cabin Relay Units from pre-routed
cables

Coil cables, stow in launch location

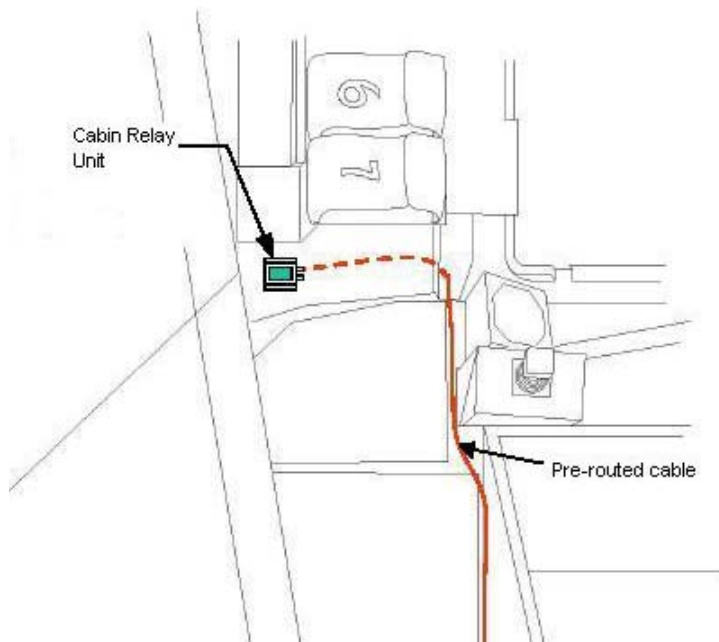


Figure 7-6.- Aft STBD location.

Cont next page

FS 7-9

ORB OPS/117/FIN

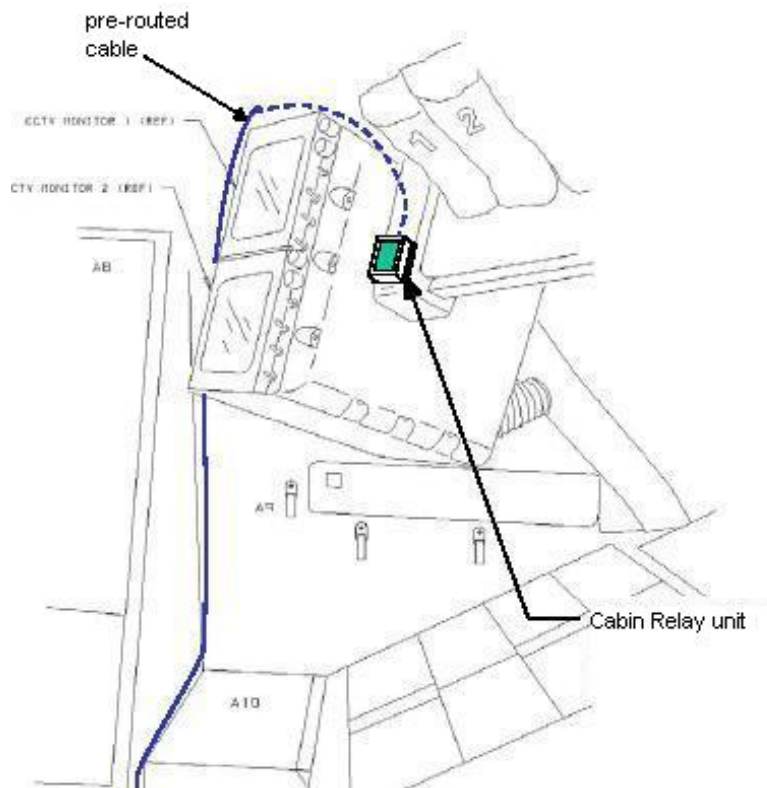


Figure 7-7.- Aft PORT location.

3. STOW EQUIPMENT

MA9G

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 7-8)
Remove Backup LRU from Velcro on Backup A31p
(see fig 7-9)

NOTE

Laptop can now be restarted for use



Figure 7-8.- 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

Disconnect Prime LRU from Prime A31p Serial port
(see fig 7-8)
Remove LRU from Velcro on A31p

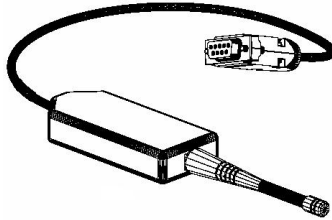


Figure 7-9.- Laptop Receiver Unit.

A31p

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’

Click ‘Unit List’ (left side of display)
√Cabin Relay Units Unit ID 2432 and 2496 (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 7-12

ORB OPS/117/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'

- MA9G 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 (expected to be the "S" 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 2432 and 2496 (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-WLEFlight'

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)

MAUI ANALYSIS OF UPPER-ATMOSPHERIC
INJECTIONS (MAUI)

MAUI PROCEDURE FS 8-2

MAUI

MAUI

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 8-2

ORB OPS/117/FIN

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 8-3

ORB OPS/117/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, <u>MAUI</u>) |

Cont next page

FS 8-4

ORB OPS/117/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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CUE
CARDS

CUE CARD CONFIGURATION



NOT FLOWN

FS 9-1

ORB OPS/117/FIN



CUE
CARDS

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NOT FLOWN

FS 9-2

ORB OPS/117/FIN

TOP

HOOK
VELCRO

**FLIGHT DAY 3 DOCKING
ORBITER WITH ISS
CO2 ABSORBER REPLACEMENT**
(6 crewmembers/Single Shift/FD 1-15)

| FLIGHT DAY | POS A | POS B | CK CMPLT |
|------------|-------|-------|--------------|
| LAUNCH | 1 * | 2 * | |
| PRE FD01 | " | " | |
| POST FD02 | 3 | 4 | |
| PRE FD02 | " | 5 | |
| POST FD03 | 6 | " | DOCKING |
| PRE FD03 | " | 7 | |
| POST FD04 | " | " | EVA 1 |
| PRE FD04 | 8 | " | |
| POST FD05 | " | " | |
| PRE FD05 | " | 9 | |
| POST FD06 | " | " | EVA 2 |
| PRE FD06 | 10 | " | |
| POST FD07 | " | " | |
| PRE FD07 | " | 11 | |
| POST FD08 | " | " | EVA 3 |
| PRE FD08 | 12 | " | |
| POST FD09 | " | " | |
| MID FD09 | 13 * | 14 * | ODS HATCH CL |
| PRE FD09 | " | " | |
| POST FD10 | 15 | 16 | UNDOCK |
| PRE FD10 | " | 17 * | |
| POST FD11 | 18 | 19 | |
| PRE FD11 | 20 * | " | |
| POST FD12 | 21 | 22 | EOM |
| PRE FD12 | " | 23 * | |
| POST FD13 | 24 | 25 | EOM+1 |
| PRE FD13 | 26 * | " | |
| POST FD14 | 27 | 28 | EOM+2 |
| PRE FD14 | " | 29 | |
| POST FD15 | 30 | " | EOM+3 |

*Re-bag and seal LiOH cans w/Gray Tape and stow.
(Locations of canisters on back)

ORB OPS-29a/nonRCRS/117/O/B

NOTE

This card is specifically used for the STS-117 mission with the orbiter conducting single shift ops with a crew size of 6. Changeout scheme reflects FD3 docking with ISS, Vozdukh and CDRA (activated in dual-bed mode) during docked ops, and undocking on FD10. ODS hatch closure will be worked the night before undocking

(reduced copy)

FAB USE ONLY

FS CC 9-3

ORB OPS/117/FIN

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

HOOK
VELCRO

LiOH CANISTER STOWAGE LOCATIONS

Ascent Stowage Locations

Orbiter:

MD52M (LiOH Box): cans 1-31 *

Entry (EOM) Stowage Locations

Orbiter:

MD52M (LiOH Box): cans 1-31 *

* 2 LiOH cans installed in LiOH slots A and B

ORB OPS-29b/nonRCRS/117/O/B

(reduced copy)

FAB USE ONLY

FS CC 9-4

ORB OPS/117/FIN

TOP

HOOK
VELCRO

HOOK
VELCRO

ORBIT BURN MONITOR

| | | | | | | | | | | | |
|--|--|--|---|---|-----------|-----|-----|---|-----|-----|---|
| OMS TEMP* | <table border="1"> <tr> <td></td> <td>L</td> <td>R</td> </tr> <tr> <td>FU IN P ≥</td> <td>230</td> <td>230</td> </tr> <tr> <td>≤</td> <td>214</td> <td>212</td> </tr> </table> | | L | R | FU IN P ≥ | 230 | 230 | ≤ | 214 | 212 | OMS ENG FAIL ----- OMS PRPLT FAIL |
| | L | R | | | | | | | | | |
| FU IN P ≥ | 230 | 230 | | | | | | | | | |
| ≤ | 214 | 212 | | | | | | | | | |
| or No FU IN P | | | | | | | | | | | |
| OMS PC* & OMS ↓ | ENG VLV 1 or 2 < 70 ----- or OX IN P > 227 ----- OX IN P ≤ 227 ----- or No OX IN P | OMS ENG FAIL ----- OMS PRPLT FAIL | | | | | | | | | |
| 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 (√OMS/MPS) | | At N2 TK P < 470: OMS ENG – ARM | | | | | | | | | |
| OMS GMBL | PRI fail ----- SEC fail | L(R) OMS GMBL – SEC (twice) 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 ----- 2 FAs lost | If high RCS usage: OMS ENG FAIL ----- √MAN SHUTDN | | | | | | | | | |
| I/O ERROR FA | 1(4) | L(R) OMS GMBL – SEC ----- I/O RESET | | | | | | | | | |
| | 2 FAs lost | If high RCS usage: OMS ENG FAIL ----- √MAN SHUTDN | | | | | | | | | |
| BCE STRG D | 1(4) | I/O RESET (if recov: >>) ----- If high RCS usage: L(R) OMS GMBL – SEC (twice) | | | | | | | | | |
| GPC SET SPLIT | Non-crit burn ----- Crit burn | STOP BURN: OMS ENG(s) – OFF ----- Go to "GPC" above | | | | | | | | | |
| I/O ERROR PCM BCE BYP OA | | OI PCMMU PWR – 2(1) SM I/O RESET | | | | | | | | | |

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

ORB OPS-31a/117/O/A

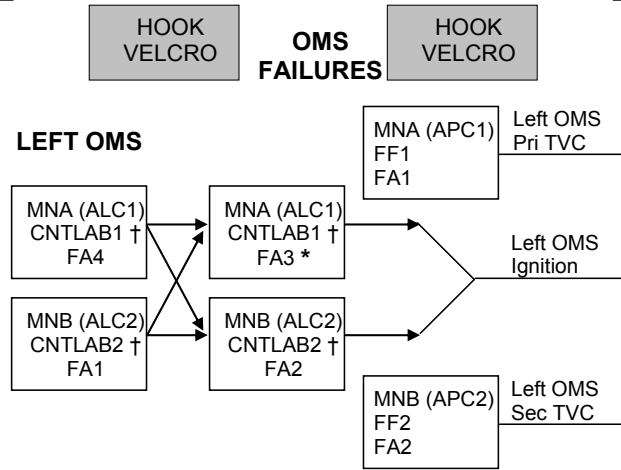
(reduced copy)

FAB USE ONLY

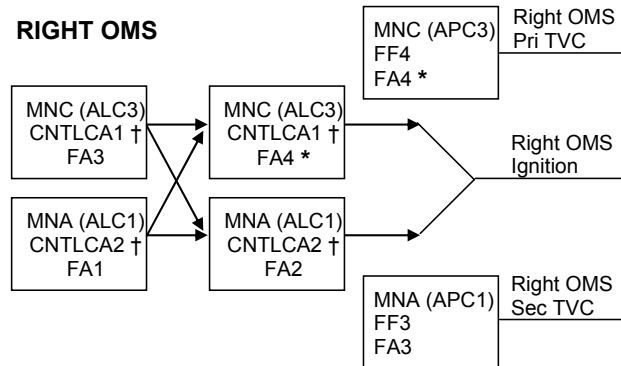
FS CC 9-5

ORB OPS/117/FIN

TOP
BACK OF 'ORBIT BURN MONITOR'



† 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)



| 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/117/O/A

(reduced copy)

FAB USE ONLY

FS CC 9-6

ORB OPS/117/FIN

FAB USE ONLY

FS CC 9-7

ORB OPS/117/FIN

(reduced copy)

TOP

PILE
VELCRO

ORB OPS-41a/117/O/A

PILE
VELCRO

STS-117 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 |

BOLD/ITALIC indicates change from I-Load.

HINGE

FAB USE ONLY

FS CC 9-8

ORB OPS/117/FIN

(reduced copy)

TOP
HINGED AT BOTTOM OF
'STS-117 DAP A1 – A8 CONFIGURATIONS'
HINGE

STS-117 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 | | OMS & RCS Burns (ORB OPS) | Loss of VERN (Tail Only) | Loss of VERN (All) | | COASHUD CAL | | RNDZ | TERMINAL PHASE |

BOLD/ITALIC indicates change from I-Load.

HOOK
VELCRO

ORB OPS-41aa/117/O/A

HOOK
VELCRO

FAB USE ONLY

FS CC 9-9

ORB OPS/117/FIN

(reduced copy)

TOP
BACK OF 'STS-117 DAP A1 – A8 CONFIGURATIONS'

PILE
VELCRO

ORB OPS-41b/117/O/B

PILE
VELCRO

STS-117 DAP A9 – DAP 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 | 0.0500 |
| 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 | 0.100 | 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 | 0.035 | 0.035 | 0.035 | 0.200 | 0.035 |
| 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 | .050 |
| ROT PLS | 26 (66) | 0.050 | 0.050 | 0.010 | 0.002 | 0.002 | 0.010 | 0.002 |
| COMP | 27 (67) | .000 | .000 | .000 | .000 | .000 | .000 | .000 |
| CNTL ACC | 28 (68) | 0 | 0 | 1(3)(2)(4) ¹ | 1(3) ² | 1(3) ² | 9 | 5(6) ³ |
| PURPOSE | | PROX/OPS FLYAROUND | DOCKING | AUTO REBOOST | MATED STACK (VERN) | A/L DEPRESS CONTINGENCY (VERN) | ORBITER ALONE SRMS/OBSS | MATED STACK RMS OPS (VERN) |

BOLD/ITALIC indicates change from I-Load.

¹ For Reboost Config 3 & 4: 1 for S3/S4 Berthed, 3 for S3/S4 Installed;

For Reboost Config 1 & 2: 2 for S3/S4 Berthed, 4 for S3/S4 Installed

² 1 for S3/S4 Berthed, Tilt, and High Hover; 3 for S3/S4 at Capture Complete to Installed

³ 5 for S3/S4 at Handoff and Auto Sequence Start; 6 for S3/S4 at Preinstall

HINGE

FAB USE ONLY

FS CC 9-10

ORB OPS/117/FIN

(reduced copy)

TOP
 BACK OF 'STS-117 DAP B1 – B8 CONFIGURATIONS'
 HINGED AT BOTTOM OF 'STS-117 DAP A9 – A15 CONFIGURATIONS'
 HINGE

STS-117 DAP B9 – DAP B12 CONFIGURATIONS

| | ITEM # | B9 | B10 | B12 |
|-------------|---------|------------------------|---------|-------------------------|
| PRI | | | | |
| ROT RATE | 30 (50) | 0.1300 | 0.0500 | 0.0500 |
| ATT DB | 31 (51) | 2.00 | 0.60 | 5.00 |
| RATE DB | 32 (52) | 0.10 | 0.10 | 0.20 |
| ROT PLS | 33 (53) | 0.040 | 0.040 | 0.040 |
| COMP | 34 (54) | .000 | .000 | .000 |
| P OPTION | 35 (55) | TAIL | TAIL | TAIL |
| Y OPTION | 36 (56) | TAIL | TAIL | TAIL |
| TRAN PLS | 37 (57) | 0.010 | 0.010 | 0.010 |
| ALT | | | | |
| RATE DB | 38 (58) | 0.100 | 0.100 | 0.035 |
| JET OPT | 39 (59) | TAIL | TAIL | TAIL |
| # JETS | 40 (60) | 2 | 2 | 3 |
| ON TIME | 41 (61) | 0.08 | 0.08 | 0.08 |
| DELAY | 42 (62) | 10.00 | 0.00 | 11.04 |
| VERN | | | | |
| ROT RATE | 43 (63) | 0.1300 | 0.0500 | 0.1000 |
| ATT DB | 44 (64) | 1.000 | 0.500 | 3.000 |
| RATE DB | 45 (65) | .020 | .020 | .050 |
| ROT PLS | 46 (66) | 0.020 | 0.020 | 0.002 |
| COMP | 47 (67) | .000 | .000 | .000 |
| CNTL ACC | 48 (68) | 0 | 0 | 2(4)⁴ |
| PURPOSE | | PROX OPS/ FLYAROUND | DOCKING | MATED STACK (ALT) |

BOLD/ITALIC indicates change from I-Load.
⁴ 2 for S3/S4 Berthed, 4 for S3/S4 Installed

HOOK
VELCRO

ORB OPS-41bb/117/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 deselects | Configure initial setup [GNC 23 RCS] Left RCS page – ITEM 2 EXEC On CDR "GO", proceed NOTE 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 (*) NOTE 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/117/O/A

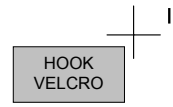
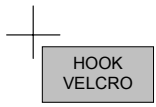
(reduced copy)

FS CC 9-11

ORB OPS/117/FIN

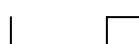


TOP
BACK OF 'MAUI - RCS FIRING SEQUENCE'



ORB OPS-42b/117/O/A

(reduced copy)



FS CC 9-12

ORB OPS/117/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/117/O,E/A

FABRICATION NOTES

- 1) Fabricate as a kneeboard card

(reduced copy)

FS CC 9-13

ORB OPS/117/FIN

TOP

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

- CNTL ACC = 0 Orbiter alone with unloaded RMS
 = 1 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 Berthed, at Tilt and High Hover positions
 = 2 Mated - ALT and Shuttle Airlock Pressurized with S3/S4 Berthed
 = 3 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 at Capture Complete to Installed
 = 4 Mated - ALT and Shuttle Airlock Pressurized with S3/S4 Installed
 = 5 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 at Handoff and Auto Sequence Start positions
 = 6 Mated - VERN and Shuttle Airlock Pressurized with S3/S4 at Preinstall position
 = 7 Not used
 = 8 Not used
 = 9 Orbiter alone SRMS/OBSS Ops

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

ORB OPS-46a/117/O/A

TOP
 BACK 'DAP A, DAP B TOC'

ORB OPS-46b/117/O/A

(reduced copy)

FAB USE ONLY

FS CC 9-14

ORB OPS/117/FIN

TOP
 TOP
 BACK OF 'DAP A'

DAP A DAP A1

PURPOSE:
 NOMINAL

ORB OPS-47a/117/O/A ORB OPS-47b/117/O/A

A1 TOP
 TOP TOP
 BACK OF 'A1'

A1 DAP A2

| | | |
|-----------|-------|----------|
| DAP A 0 1 | 1 | PRI |
| 0.2 0 0 0 | 10/50 | ROT RATE |
| - 5.0 0 | 11/51 | ATT DB |
| 0.2 0 | 12/52 | RATE DB |
| 0.1 0 0 | 13/53 | ROT PLS |
| .0 0 0 | 14/54 | COMP |
| ALL | 15/55 | P OPTION |
| ALL | 16/56 | Y OPTION |
| 0.1 0 0 | 17/57 | TRAN PLS |
| | | ALT |
| 0.2 0 0 | 18/58 | RATE DB |
| ALL | 19/59 | JET OPT |
| 2 | 20/60 | #JETS |
| 0.0 8 | 21/61 | ON TIME |
| - 0.0 0 | 22/62 | DELAY |
| | | VERN |
| 0.2 0 0 0 | 23/63 | ROT RATE |
| - 1.0 0 0 | 24/64 | ATT DB |
| .0 2 0 | 25/65 | RATE DB |
| 0.0 1 0 | 26/66 | ROT PLS |
| .0 0 0 | 27/67 | COMP |
| 0 | 28/68 | CNTL ACC |

PURPOSE:
 PTC

ORB OPS-48a/117/O/A ORB OPS-48b/117/O/A

A2

(reduced copy)

FAB USE ONLY FS CC 9-15 ORB OPS/117/FIN

TOP
BACK OF 'A2'
A2

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|-----------|----------|----------|---------|-------|--------|-------|-------|---------|---------|-------|---------|-------|-------|------|-----|-------|----------|-----|-------|----------|---------|-------|----------|--|--|-----|---------|-------|---------|-----|-------|---------|---|-------|-------|-------|-------|---------|---------|-------|-------|--|--|------|-----------|-------|----------|-----------|-------|--------|-------|-------|---------|---------|-------|---------|-------|-------|------|---|-------|----------|--|
| <p style="text-align: center;">A2</p> <p>DAP A 0 2 1 PRI</p> <table border="0" style="width: 100%;"> <tr><td>0.4 0 0 0</td><td>10/50</td><td>ROT RATE</td></tr> <tr><td>- 1.0 0</td><td>11/51</td><td>ATT DB</td></tr> <tr><td> 0.2 0</td><td>12/52</td><td>RATE DB</td></tr> <tr><td>0.1 0 0</td><td>13/53</td><td>ROT PLS</td></tr> <tr><td> 0.0 0</td><td>14/54</td><td>COMP</td></tr> <tr><td> ALL</td><td>15/55</td><td>P OPTION</td></tr> <tr><td> ALL</td><td>16/56</td><td>Y OPTION</td></tr> <tr><td>0.1 0 0</td><td>17/57</td><td>TRAN PLS</td></tr> <tr><td> </td><td></td><td>ALT</td></tr> <tr><td>0.2 0 0</td><td>18/58</td><td>RATE DB</td></tr> <tr><td> ALL</td><td>19/59</td><td>JET OPT</td></tr> <tr><td> 2</td><td>20/60</td><td>#JETS</td></tr> <tr><td> 0.0 8</td><td>21/61</td><td>ON TIME</td></tr> <tr><td>- 0.0 0</td><td>22/62</td><td>DELAY</td></tr> <tr><td> </td><td></td><td>VERN</td></tr> <tr><td>0.4 0 0 0</td><td>23/63</td><td>ROT RATE</td></tr> <tr><td>- 1.0 0 0</td><td>24/64</td><td>ATT DB</td></tr> <tr><td> 0.2 0</td><td>25/65</td><td>RATE DB</td></tr> <tr><td>0.0 1 0</td><td>26/66</td><td>ROT PLS</td></tr> <tr><td> 0.0 0</td><td>27/67</td><td>COMP</td></tr> <tr><td> 0</td><td>28/68</td><td>CNTL ACC</td></tr> </table> <p>ORB OPS-49a/117/O/A</p> | 0.4 0 0 0 | 10/50 | ROT RATE | - 1.0 0 | 11/51 | ATT DB | 0.2 0 | 12/52 | RATE DB | 0.1 0 0 | 13/53 | ROT PLS | 0.0 0 | 14/54 | COMP | ALL | 15/55 | P OPTION | ALL | 16/56 | Y OPTION | 0.1 0 0 | 17/57 | TRAN PLS | | | ALT | 0.2 0 0 | 18/58 | RATE DB | ALL | 19/59 | JET OPT | 2 | 20/60 | #JETS | 0.0 8 | 21/61 | ON TIME | - 0.0 0 | 22/62 | DELAY | | | VERN | 0.4 0 0 0 | 23/63 | ROT RATE | - 1.0 0 0 | 24/64 | ATT DB | 0.2 0 | 25/65 | RATE DB | 0.0 1 0 | 26/66 | ROT PLS | 0.0 0 | 27/67 | COMP | 0 | 28/68 | CNTL ACC | <p>PURPOSE:</p> <p>GG</p> <p>ORB OPS-49b/117/O/A</p> |
| 0.4 0 0 0 | 10/50 | ROT RATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 1.0 0 | 11/51 | ATT DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.2 0 | 12/52 | RATE DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.1 0 0 | 13/53 | ROT PLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 0 | 14/54 | COMP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL | 15/55 | P OPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL | 16/56 | Y OPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.1 0 0 | 17/57 | TRAN PLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | ALT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.2 0 0 | 18/58 | RATE DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL | 19/59 | JET OPT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 | 20/60 | #JETS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 8 | 21/61 | ON TIME | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 0.0 0 | 22/62 | DELAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | VERN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.4 0 0 0 | 23/63 | ROT RATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 1.0 0 0 | 24/64 | ATT DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.2 0 | 25/65 | RATE DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 1 0 | 26/66 | ROT PLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 0 | 27/67 | COMP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 28/68 | CNTL ACC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

A3

TOP
BACK OF 'A3'
A3

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|-----------|----------|----------|---------|-------|--------|-------|-------|---------|---------|-------|---------|-------|-------|------|-----|-------|----------|------|-------|----------|---------|-------|----------|--|--|-----|---------|-------|---------|-----|-------|---------|---|-------|-------|-------|-------|---------|---------|-------|-------|--|--|------|-----------|-------|----------|-----------|-------|--------|-------|-------|---------|---------|-------|---------|-------|-------|------|---|-------|----------|---|
| <p style="text-align: center;">A3</p> <p>DAP A 0 3 1 PRI</p> <table border="0" style="width: 100%;"> <tr><td>0.2 0 0 0</td><td>10/50</td><td>ROT RATE</td></tr> <tr><td>- 0.3 0</td><td>11/51</td><td>ATT DB</td></tr> <tr><td> 0.2 0</td><td>12/52</td><td>RATE DB</td></tr> <tr><td>0.1 0 0</td><td>13/53</td><td>ROT PLS</td></tr> <tr><td> 0.0 0</td><td>14/54</td><td>COMP</td></tr> <tr><td> ALL</td><td>15/55</td><td>P OPTION</td></tr> <tr><td> TAIL</td><td>16/56</td><td>Y OPTION</td></tr> <tr><td>0.1 0 0</td><td>17/57</td><td>TRAN PLS</td></tr> <tr><td> </td><td></td><td>ALT</td></tr> <tr><td>0.0 7 0</td><td>18/58</td><td>RATE DB</td></tr> <tr><td> ALL</td><td>19/59</td><td>JET OPT</td></tr> <tr><td> 1</td><td>20/60</td><td>#JETS</td></tr> <tr><td> 0.0 8</td><td>21/61</td><td>ON TIME</td></tr> <tr><td>- 0.0 0</td><td>22/62</td><td>DELAY</td></tr> <tr><td> </td><td></td><td>VERN</td></tr> <tr><td>0.0 0 8 0</td><td>23/63</td><td>ROT RATE</td></tr> <tr><td>- 0.0 7 0</td><td>24/64</td><td>ATT DB</td></tr> <tr><td> 0.1 0</td><td>25/65</td><td>RATE DB</td></tr> <tr><td>0.0 1 0</td><td>26/66</td><td>ROT PLS</td></tr> <tr><td> 0.0 0</td><td>27/67</td><td>COMP</td></tr> <tr><td> 0</td><td>28/68</td><td>CNTL ACC</td></tr> </table> <p>ORB OPS-50a/117/O/A</p> | 0.2 0 0 0 | 10/50 | ROT RATE | - 0.3 0 | 11/51 | ATT DB | 0.2 0 | 12/52 | RATE DB | 0.1 0 0 | 13/53 | ROT PLS | 0.0 0 | 14/54 | COMP | ALL | 15/55 | P OPTION | TAIL | 16/56 | Y OPTION | 0.1 0 0 | 17/57 | TRAN PLS | | | ALT | 0.0 7 0 | 18/58 | RATE DB | ALL | 19/59 | JET OPT | 1 | 20/60 | #JETS | 0.0 8 | 21/61 | ON TIME | - 0.0 0 | 22/62 | DELAY | | | VERN | 0.0 0 8 0 | 23/63 | ROT RATE | - 0.0 7 0 | 24/64 | ATT DB | 0.1 0 | 25/65 | RATE DB | 0.0 1 0 | 26/66 | ROT PLS | 0.0 0 | 27/67 | COMP | 0 | 28/68 | CNTL ACC | <p>PURPOSE:</p> <p>PRE/POST DEPLOY</p> <p>ORB OPS-50b/117/O/A</p> |
| 0.2 0 0 0 | 10/50 | ROT RATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 0.3 0 | 11/51 | ATT DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.2 0 | 12/52 | RATE DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.1 0 0 | 13/53 | ROT PLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 0 | 14/54 | COMP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL | 15/55 | P OPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TAIL | 16/56 | Y OPTION | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.1 0 0 | 17/57 | TRAN PLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | ALT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 7 0 | 18/58 | RATE DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ALL | 19/59 | JET OPT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 | 20/60 | #JETS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 8 | 21/61 | ON TIME | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 0.0 0 | 22/62 | DELAY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | VERN | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 0 8 0 | 23/63 | ROT RATE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| - 0.0 7 0 | 24/64 | ATT DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.1 0 | 25/65 | RATE DB | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 1 0 | 26/66 | ROT PLS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0.0 0 | 27/67 | COMP | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 0 | 28/68 | CNTL ACC | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

A4

(reduced copy)

TOP
BACK OF 'A4'
A4

A4 DAP A5

| DAP A 0 4 | 1 | PRI | PURPOSE: |
|-------------|-------|----------|--------------------|
| 0.5 0 0 0 | 10/50 | ROT RATE | LOSS OF VERN (ALL) |
| - 3.0 0 0 | 11/51 | ATT DB | |
| 0.2 0 0 | 12/52 | RATE DB | |
| 0.1 0 0 0 | 13/53 | ROT PLS | |
| .0 0 0 0 | 14/54 | COMP | |
| ALL | 15/55 | P OPTION | |
| ALL | 16/56 | Y OPTION | |
| 0.1 0 0 0 | 17/57 | TRAN PLS | |
| | | ALT | |
| 0.2 0 0 0 | 18/58 | RATE DB | |
| ALL | 19/59 | JET OPT | |
| 2 | 20/60 | #JETS | |
| 0.0 8 | 21/61 | ON TIME | |
| - 0.0 0 | 22/62 | DELAY | |
| | | VERN | |
| 0.2 0 0 0 | 23/63 | ROT RATE | |
| - 1.0 0 0 0 | 24/64 | ATT DB | |
| .0 2 0 | 25/65 | RATE DB | |
| 0.0 1 0 | 26/66 | ROT PLS | |
| .0 0 0 | 27/67 | COMP | |
| 0 | 28/68 | CNTL ACC | |

ORB OPS-51a/117/O/A ORB OPS-51b/117/O/A

TOP
BACK OF 'A5'
A5

A5 DAP A6

| DAP A 0 5 | 1 | PRI | PURPOSE: |
|-------------|-------|----------|--------------------------|
| 0.2 0 0 0 | 10/50 | ROT RATE | LOSS OF VERN (TAIL ONLY) |
| - 5.0 0 0 | 11/51 | ATT DB | |
| 0.2 0 0 | 12/52 | RATE DB | |
| 0.1 0 0 0 | 13/53 | ROT PLS | |
| .0 0 0 0 | 14/54 | COMP | |
| ALL | 15/55 | P OPTION | |
| ALL | 16/56 | Y OPTION | |
| 0.1 0 0 0 | 17/57 | TRAN PLS | |
| | | ALT | |
| 0.0 7 0 | 18/58 | RATE DB | |
| ALL | 19/59 | JET OPT | |
| 1 | 20/60 | #JETS | |
| 0.0 8 | 21/61 | ON TIME | |
| - 0.0 0 | 22/62 | DELAY | |
| | | VERN | |
| 0.0 5 0 0 | 23/63 | ROT RATE | |
| - 1.0 0 0 0 | 24/64 | ATT DB | |
| .0 2 0 | 25/65 | RATE DB | |
| 0.0 1 0 | 26/66 | ROT PLS | |
| .0 0 0 | 27/67 | COMP | |
| 0 | 28/68 | CNTL ACC | |

ORB OPS-52a/117/O/A ORB OPS-52b/117/O/A

(reduced copy)

FAB USE ONLY FS CC 9-17 ORB OPS/117/FIN

TOP
TOP
BACK OF 'A6'

A6

| | |
|--|---|
| <p style="text-align: center;">A6</p> <p>DAP A 0 6 1 PRI</p> <p>0.2 0 0 0 10/50 ROT RATE</p> <p>- 5.0 0 11/51 ATT DB</p> <p> 0.2 0 12/52 RATE DB</p> <p>0.1 0 0 0 13/53 ROT PLS</p> <p> 0.0 0 14/54 COMP</p> <p> TAIL 15/55 P OPTION</p> <p> TAIL 16/56 Y OPTION</p> <p>0.1 0 0 0 17/57 TRAN PLS</p> <p> ALT</p> <p>0.0 7 0 18/58 RATE DB</p> <p> TAIL 19/59 JET OPT</p> <p> 1 20/60 #JETS</p> <p> 0.0 8 21/61 ON TIME</p> <p>- 0.0 0 22/62 DELAY</p> <p> VERN</p> <p>0.0 5 0 0 23/63 ROT RATE</p> <p>- 1.0 0 0 0 24/64 ATT DB</p> <p> 0.2 0 25/65 RATE DB</p> <p>0.0 1 0 0 26/66 ROT PLS</p> <p> 0.0 0 27/67 COMP</p> <p> 0 28/68 CNTL ACC</p> <p>ORB OPS-53a/117/O/A</p> | <p style="text-align: center;">DAP A7</p> <p>PURPOSE:</p> <p style="text-align: center;">RENDEZVOUS</p> <p style="text-align: center;">ORB OPS-53b/117/O/A</p> |
|--|---|

A7

TOP
TOP
BACK OF 'A7'

A7

| | |
|--|---|
| <p style="text-align: center;">A7</p> <p>DAP A 0 Z 1 PRI</p> <p>0.2 0 0 0 0 10/50 ROT RATE</p> <p>- 2.0 0 11/51 ATT DB</p> <p> 0.2 0 12/52 RATE DB</p> <p>0.1 0 0 0 13/53 ROT PLS</p> <p> 0.0 0 14/54 COMP</p> <p> ALL 15/55 P OPTION</p> <p> ALL 16/56 Y OPTION</p> <p>0.1 0 0 0 17/57 TRAN PLS</p> <p> ALT</p> <p>0.1 0 0 0 18/58 RATE DB</p> <p> ALL 19/59 JET OPT</p> <p> 2 20/60 #JETS</p> <p> 0.0 8 21/61 ON TIME</p> <p>- 0.0 0 22/62 DELAY</p> <p> VERN</p> <p>0.0 1 6 0 23/63 ROT RATE</p> <p>- 1.0 0 0 0 24/64 ATT DB</p> <p> 0.2 0 25/65 RATE DB</p> <p>0.0 1 0 0 26/66 ROT PLS</p> <p> 0.0 0 27/67 COMP</p> <p> 0 28/68 CNTL ACC</p> <p>ORB OPS-54a/117/O/A</p> | <p style="text-align: center;">DAP A8</p> <p>PURPOSE:</p> <p style="text-align: center;">TERMINAL PHASE</p> <p style="text-align: center;">ORB OPS-54b/117/O/A</p> |
|--|---|

A8

(reduced copy)

FAB USE ONLY FS CC 9-18 ORB OPS/117/FIN

TOP
BACK OF 'A8'
A8

| | |
|--|---|
| <p style="text-align: center;">A8</p> <p>DAP A 0 8 1 PRI</p> <p>0.0 5 0 0 10/50 ROT RATE</p> <p> - 2.0 0 11/51 ATT DB</p> <p> 0.2 0 12/52 RATE DB</p> <p> 0.1 0 0 13/53 ROT PLS</p> <p> .0 0 0 14/54 COMP</p> <p> ALL 15/55 P OPTION</p> <p> ALL 16/56 Y OPTION</p> <p> 0.1 0 0 17/57 TRAN PLS</p> <p> ALT</p> <p> 0.1 0 0 18/58 RATE DB</p> <p> ALL 19/59 JET OPT</p> <p> 2 20/60 #JETS</p> <p> 0.0 8 21/61 ON TIME</p> <p> - 0.0 0 22/62 DELAY</p> <p> VERN</p> <p> 0.0 5 0 0 23/63 ROT RATE</p> <p> - 1.0 0 0 24/64 ATT DB</p> <p> .0 2 0 25/65 RATE DB</p> <p> 0.0 5 0 26/66 ROT PLS</p> <p> .0 0 0 27/67 COMP</p> <p> 0 28/68 CNTL ACC</p> <p>ORB OPS-55a/117/O/A</p> | <p style="text-align: center;">DAP A9</p> <p>PURPOSE:</p> <p>PROX OPS/FLYAROUND</p> <p>ORB OPS-55b/117/O/A</p> |
|--|---|

A9

TOP
BACK OF 'A9'
A9

| | |
|---|---|
| <p style="text-align: center;">A9</p> <p>DAP A 0 9 1 PRI</p> <p>0.1 3 0 0 10/50 ROT RATE</p> <p> - 2.0 0 11/51 ATT DB</p> <p> 0.1 0 12/52 RATE DB</p> <p> 0.1 0 0 13/53 ROT PLS</p> <p> .0 0 0 14/54 COMP</p> <p> TAIL 15/55 P OPTION</p> <p> TAIL 16/56 Y OPTION</p> <p> 0.0 5 0 17/57 TRAN PLS</p> <p> ALT</p> <p> 0.1 0 0 18/58 RATE DB</p> <p> TAIL 19/59 JET OPT</p> <p> 2 20/60 #JETS</p> <p> 0.0 8 21/61 ON TIME</p> <p> - 0.0 0 22/62 DELAY</p> <p> VERN</p> <p> 0.1 3 0 0 23/63 ROT RATE</p> <p> - 1.0 0 0 24/64 ATT DB</p> <p> .0 2 0 25/65 RATE DB</p> <p> 0.0 5 0 26/66 ROT PLS</p> <p> .0 0 0 27/67 COMP</p> <p> 0 28/68 CNTL ACC</p> <p>ORB OPS-56a/117/O/A</p> | <p style="text-align: center;">DAP A10</p> <p>PURPOSE:</p> <p>DOCKING</p> <p>ORB OPS-56b/117/O/A</p> |
|---|---|

A10
(reduced copy)

TOP
BACK OF 'A10'
A10

| A10 | | | | | | | | | |
|---------------------|-------|----------|--|--|---------------------|--|--|--|--|
| DAP A 1 0 | 1 | | | | | | | | |
| <u>0.0 5 0 0</u> | 10/50 | ROT RATE | | | | | | | |
| <u>- 0.6 0</u> | 11/51 | ATT DB | | | | | | | |
| <u>0.1 0</u> | 12/52 | RATE DB | | | | | | | |
| <u>0.1 0 0</u> | 13/53 | ROT PLS | | | | | | | |
| <u>0.0 0</u> | 14/54 | COMP | | | | | | | |
| <u>TAIL</u> | 15/55 | P OPTION | | | | | | | |
| <u>TAIL</u> | 16/56 | Y OPTION | | | | | | | |
| <u>0.0 5 0</u> | 17/57 | TRAN PLS | | | | | | | |
| | | ALT | | | | | | | |
| <u>0.1 0 0</u> | 18/58 | RATE DB | | | | | | | |
| <u>TAIL</u> | 19/59 | JET OPT | | | | | | | |
| <u>2</u> | 20/60 | #JETS | | | | | | | |
| <u>0.0 8</u> | 21/61 | ON TIME | | | | | | | |
| <u>- 0.0 0</u> | 22/62 | DELAY | | | | | | | |
| | | VERN | | | | | | | |
| <u>0.0 5 0 0</u> | 23/63 | ROT RATE | | | | | | | |
| <u>- 0.5 0 0</u> | 24/64 | ATT DB | | | | | | | |
| <u>.0 2 0</u> | 25/65 | RATE DB | | | | | | | |
| <u>0.0 5 0</u> | 26/66 | ROT PLS | | | | | | | |
| <u>.0 0 0</u> | 27/67 | COMP | | | | | | | |
| <u>0</u> | 28/68 | CNTL ACC | | | | | | | |
| ORB OPS-57a/117/O/A | | | | | ORB OPS-57b/117/O/A | | | | |

PURPOSE:
AUTO REBOOST
BOLD/ITALIC indicates change from I-Load
¹For Reboost Config 3 & 4:
1 for S3/S4 Berthed, 3 for S3/S4 Installed
For Reboost Config 1 & 2:
2 for S3/S4 Berthed, 4 for S3/S4 Installed

A11

TOP
BACK OF 'A11'
A11

| A11 | | | | | | | | | |
|-------------------------------|-------|----------|--|--|---------------------|--|--|--|--|
| DAP A 1 1 | 1 | | | | | | | | |
| <u>0.0 5 0 0</u> | 10/50 | ROT RATE | | | | | | | |
| <u>1.0 0 0</u> | 11/51 | ATT DB | | | | | | | |
| <u>0.2 0</u> | 12/52 | RATE DB | | | | | | | |
| <u>0.1 0 0</u> | 13/53 | ROT PLS | | | | | | | |
| <u>.0 0 0</u> | 14/54 | COMP | | | | | | | |
| <u>TAIL</u> | 15/55 | P OPTION | | | | | | | |
| <u>TAIL</u> | 16/56 | Y OPTION | | | | | | | |
| <u>0.1 0 0</u> | 17/57 | TRAN PLS | | | | | | | |
| | | ALT | | | | | | | |
| <u>0.0 3 5</u> | 18/58 | RATE DB | | | | | | | |
| <u>TAIL</u> | 19/59 | JET OPT | | | | | | | |
| <u>3</u> | 20/60 | #JETS | | | | | | | |
| <u>0.0 8</u> | 21/61 | ON TIME | | | | | | | |
| <u>1.2 0 0</u> | 22/62 | DELAY | | | | | | | |
| | | VERN | | | | | | | |
| <u>0.1 0 0 0</u> | 23/63 | ROT RATE | | | | | | | |
| <u>- 5.0 0 0</u> | 24/64 | ATT DB | | | | | | | |
| <u>.0 5 0</u> | 25/65 | RATE DB | | | | | | | |
| <u>0.0 1 0</u> | 26/66 | ROT PLS | | | | | | | |
| <u>.0 0 0</u> | 27/67 | COMP | | | | | | | |
| <u>1(3)(2)(4)¹</u> | 28/68 | CNTL ACC | | | | | | | |
| ORB OPS-58a/117/O/A | | | | | ORB OPS-58b/117/O/A | | | | |

PURPOSE:
MATED STACK (VERN)
BOLD/ITALIC indicates change from I-Load
²1 for S3/S4 Berthed, Tilt, and High Hover
³ for S3/S4 at Capture Complete to Installed

A12

(reduced copy)

TOP
BACK OF 'A12'

A12

A12

| | | |
|-------------------------|-------|----------|
| DAP A 1 2 | 1 | PRI |
| 0.0 5 0 0 | 10/50 | ROT RATE |
| <u>- 5.0 0</u> | 11/51 | ATT DB |
| <u>0.2 0</u> | 12/52 | RATE DB |
| 0.0 4 0 | 13/53 | ROT PLS |
| <u>.0 0 0</u> | 14/54 | COMP |
| TAIL | 15/55 | P OPTION |
| TAIL | 16/56 | Y OPTION |
| 0.0 1 0 | 17/57 | TRAN PLS |
| | | ALT |
| 0.0 3 5 | 18/58 | RATE DB |
| TAIL | 19/59 | JET OPT |
| 3 | 20/60 | #JETS |
| <u>0.0 8</u> | 21/61 | ON TIME |
| 1 1.0 4 | 22/62 | DELAY |
| | | VERN |
| 0.1 0 0 0 | 23/63 | ROT RATE |
| <u>- 3.0 0 0</u> | 24/64 | ATT DB |
| <u>.0 5 0</u> | 25/65 | RATE DB |
| 0.0 0 2 | 26/66 | ROT PLS |
| <u>.0 0 0</u> | 27/67 | COMP |
| 1(3)² | 28/68 | CNTL ACC |

ORB OPS-59a/117/O/A

PURPOSE:
SHUTTLE AIRLOCK
DEPRESS -
CONTINGENCY (VERN)

ORB OPS-59b/117/O/A

A13

TOP
BACK OF 'A13'

A13

A13

| | | |
|-------------------------|-------|----------|
| DAP A 1 3 | 1 | PRI |
| 0.0 5 0 0 | 10/50 | ROT RATE |
| <u>- 5.0 0</u> | 11/51 | ATT DB |
| <u>0.2 0</u> | 12/52 | RATE DB |
| 0.0 4 0 | 13/53 | ROT PLS |
| <u>.0 0 0</u> | 14/54 | COMP |
| TAIL | 15/55 | P OPTION |
| TAIL | 16/56 | Y OPTION |
| 0.0 1 0 | 17/57 | TRAN PLS |
| | | ALT |
| 0.0 3 5 | 18/58 | RATE DB |
| TAIL | 19/59 | JET OPT |
| 3 | 20/60 | #JETS |
| <u>0.0 8</u> | 21/61 | ON TIME |
| 1 1.0 4 | 22/62 | DELAY |
| | | VERN |
| 0.1 0 0 0 | 23/63 | ROT RATE |
| <u>- 3.0 0 0</u> | 24/64 | ATT DB |
| <u>.0 5 0</u> | 25/65 | RATE DB |
| 0.0 0 2 | 26/66 | ROT PLS |
| <u>.0 0 0</u> | 27/67 | COMP |
| 1(3)² | 28/68 | CNTL ACC |

ORB OPS-60a/117/O/A

PURPOSE:
ORBITER ALONE
SRMS/OBSS
BOLD/ITALIC indicates change
from I-Load

ORB OPS-60b/117/O/A

A14

(reduced copy)

FAB USE ONLY

FS CC 9-21

ORB OPS/117/FIN

TOP
BACK OF 'A14'
A14

A14

| | | |
|------------------|-------|----------|
| DAP A 1 4 | 1 | PRI |
| <u>0.2 0 0 0</u> | 10/50 | ROT RATE |
| <u>- 5.0 0 0</u> | 11/51 | ATT DB |
| <u>0.2 0</u> | 12/52 | RATE DB |
| <u>0.1 0 0 0</u> | 13/53 | ROT PLS |
| <u>.0 0 0</u> | 14/54 | COMP |
| TAIL | 15/55 | P OPTION |
| TAIL | 16/56 | Y OPTION |
| <u>0.1 0 0</u> | 17/57 | TRAN PLS |
| | | ALT |
| <u>0.2 0 0</u> | 18/58 | RATE DB |
| TAIL | 19/59 | JET OPT |
| <u>1</u> | 20/60 | #JETS |
| <u>0.0 8</u> | 21/61 | ON TIME |
| <u>- 6.0 0</u> | 22/62 | DELAY |
| | | VERN |
| <u>0.2 0 0 0</u> | 23/63 | ROT RATE |
| <u>- 3.0 0 0</u> | 24/64 | ATT DB |
| <u>.2 0 0</u> | 25/65 | RATE DB |
| <u>0.0 1 0</u> | 26/66 | ROT PLS |
| <u>.0 0 0</u> | 27/67 | COMP |
| <u>9</u> | 28/68 | CNTL ACC |

ORB OPS-61a/117/O/A

PURPOSE:
MATED STACK RMS OPS
(VERN)
BOLD/ITALIC indicates change
from I-Load
³⁵ for S3/S4 at Handoff and
Auto Sequence Start
6 for S3/S4 at Preinstall

ORB OPS-61b/117/O/A

A15

TOP
BACK OF 'A15'
A15

A15

| | | |
|-------------------------|-------|----------|
| DAP A 1 5 | 1 | PRI |
| <u>0.0 5 0 0</u> | 10/50 | ROT RATE |
| <u>- 5.0 0 0</u> | 11/51 | ATT DB |
| <u>0.2 0</u> | 12/52 | RATE DB |
| <u>0.0 4 0</u> | 13/53 | ROT PLS |
| <u>.0 0 0</u> | 14/54 | COMP |
| TAIL | 15/55 | P OPTION |
| TAIL | 16/56 | Y OPTION |
| <u>0.0 1 0</u> | 17/57 | TRAN PLS |
| | | ALT |
| <u>0.0 3 5</u> | 18/58 | RATE DB |
| TAIL | 19/59 | JET OPT |
| <u>3</u> | 20/60 | #JETS |
| <u>0.0 8</u> | 21/61 | ON TIME |
| <u>1 1.0 4</u> | 22/62 | DELAY |
| | | VERN |
| <u>0.1 0 0 0</u> | 23/63 | ROT RATE |
| <u>- 3.0 0 0</u> | 24/64 | ATT DB |
| <u>.0 5 0</u> | 25/65 | RATE DB |
| <u>0.0 0 2</u> | 26/66 | ROT PLS |
| <u>.0 0 0</u> | 27/67 | COMP |
| <u>5(6)³</u> | 28/68 | CNTL ACC |

ORB OPS-62a/117/O/A

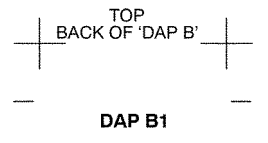
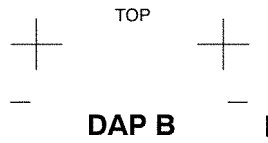
ORB OPS-62b/117/O/A

(reduced copy)

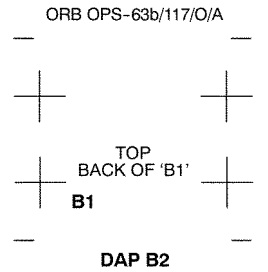
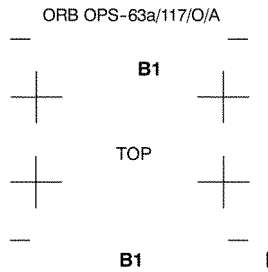
FAB USE ONLY

FS CC 9-22

ORB OPS/117/FIN

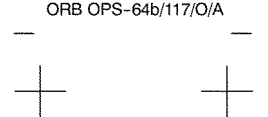
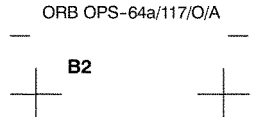


PURPOSE:
OMS & RCS BURNS
(ORB OPS)



PURPOSE:
LOSS OF VERN
(TAIL ONLY)

| | |
|-------|-----------|
| 2 | DAP B 0 1 |
| 30/50 | 0.5 0 0 0 |
| 31/51 | - 3.0 0 |
| 32/52 | 0.2 0 |
| 33/53 | 0.0 4 0 |
| 34/54 | .0 0 0 |
| 35/55 | ALL |
| 36/56 | ALL |
| 37/57 | 0.1 0 0 |
| 38/58 | 0.2 0 0 |
| 39/59 | ALL |
| 40/60 | 2 |
| 41/61 | 0.0 8 |
| 42/62 | - 0.0 0 |
| 43/63 | 0.2 0 0 0 |
| 44/64 | - 1.0 0 0 |
| 45/65 | .0 2 0 |
| 46/66 | 0.0 0 2 |
| 47/67 | .0 0 0 |
| 48/68 | 0 |



(reduced copy)

FAB USE ONLY

FS CC 9-23

ORB OPS/117/FIN

TOP

TOP
BACK OF 'B2'

B2

DAP B3

2 DAP B 0 2
 30/50 0.2 0 0 0
 31/51 - 3.0 0
 32/52 0.2 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 TAIL
 36/56 TAIL
 37/57 0.0 2 0

 38/58 0.0 7 0
 39/59 TAIL
 40/60 1
 41/61 0.0 8
 42/62 - 0.0 0

 43/63 0.2 0 0 0
 44/64 - 1.0 0 0
 45/65 .0 2 0
 46/66 0.0 0 2
 47/67 .0 0 0
 48/68 0

PURPOSE:
LOSS OF VERN
(ALL)

ORB OPS-65a/117/O/A

ORB OPS-65b/117/O/A

B3

TOP
BACK OF 'B3'

TOP

B3

B3

DAP B4

2 DAP B 0 3
 30/50 0.2 0 0 0
 31/51 - 3.0 0
 32/52 0.2 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 ALL
 36/56 ALL
 37/57 0.0 2 0

 38/58 0.0 7 0
 39/59 ALL
 40/60 1
 41/61 0.0 8
 42/62 - 0.0 0

 43/63 0.2 0 0 0
 44/64 - 1.0 0 0
 45/65 .0 2 0
 46/66 0.0 0 2
 47/67 .0 0 0
 48/68 0

PURPOSE:

ORB OPS-66a/117/O/A

ORB OPS-66b/117/O/A

B4

TOP
BACK OF 'B3'

(reduced copy)

FAB USE ONLY

FS CC 9-24

ORB OPS/117/FIN

TOP

TOP
BACK OF 'B4'

B4

DAP B5

2/4 DAP B 0 4
 30/50 0.2 0 0 0
 31/51 - 0.3 0
 32/52 0.2 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 TAIL
 36/56 TAIL
 37/57 0.0 2 0

 38/58 0.1 0 0
 39/59 ALL
 40/50 2
 41/61 0.0 8
 42/62 - 0.0 0

 43/63 0.0 0 8 0
 44/64 - 0.1 0 0
 45/65 .0 1 0
 46/66 0.0 0 2
 47/67 .0 0 0
 48/68 0

PURPOSE:
COAS/HUD CAL

ORB OPS-67a/117/O/A

ORB OPS-67b/117/O/A

B5

TOP
BACK OF 'B5'

TOP

TOP
BACK OF 'B5'

B5

DAP B6

2 DAP B 0 5
 30/50 0.2 0 0 0
 31/51 - 3.0 0
 32/52 0.2 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 TAIL
 36/56 TAIL
 37/57 0.0 2 0

 38/58 0.2 0 0
 39/59 ALL
 40/60 2
 41/61 0.0 8
 42/62 - 0.0 0

 43/63 0.0 1 6 0
 44/64 - 0.0 3 3
 45/65 .0 2 0
 46/66 0.0 0 2
 47/67 .0 0 0
 48/68 0

PURPOSE:

ORB OPS-68a/117/O/A

ORB OPS-68b/117/O/A

B6

TOP
BACK OF 'B6'

(reduced copy)

FAB USE ONLY

FS CC 9-25

ORB OPS/117/FIN

TOP
+ +
- -
B6

2/4 DAP B 0 6
30/50 0.5 0 0 0
31/51 - 3.0 0
32/52 0.2 0
33/53 0.0 4 0
34/54 .0 0 0
35/55 ALL
36/56 ALL
37/57 0.0 2 0

38/58 0.2 0 0
39/59 ALL
40/60 2
41/61 0.0 8
42/62 - 0.0 0

43/63 0.2 0 0 0
44/64 - 1.0 0 0
45/65 .0 2 0
46/66 0.0 0 2
47/67 .0 0 0
48/68 0

ORB OPS-69a/117/O/A

+ +
TOP
+ +

B7

2/4 DAP B 0 7
30/50 0.5 0 0 0
31/51 - 2.0 0
32/52 0.2 0
33/53 0.0 4 0
34/54 .0 0 0
35/55 ALL
36/56 ALL
37/57 0.0 5 0

38/58 0.1 0 0
39/59 ALL
40/60 2
41/61 0.0 8
42/62 - 0.0 0

43/63 0.2 0 0 0
44/64 - 1.0 0 0
45/65 .0 2 0
46/66 0.0 0 2
47/67 .0 0 0
48/68 0

ORB OPS-70a/117/O/A

+ +
B8
+ +

TOP
BACK OF 'B6'
+ +
- -
B6

DAP B7

PURPOSE:
RENDEZVOUS

ORB OPS-69b/117/O/A

+ +
TOP
BACK OF 'B7'
+ +
B7

DAP B8

PURPOSE:
TERMINAL PHASE

ORB OPS-70b/117/O/A

(reduced copy)

FAB USE ONLY

FS CC 9-26

ORB OPS/117/FIN

TOP

TOP
BACK OF 'B8'
B8

B8

DAP B9

2/4 DAP B 0 8
 30/50 0.0 5 0 0
 31/51 - 2.0 0
 32/52 0.2 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 ALL
 36/56 ALL
 37/57 0.0 5 0

 38/58 0.1 0 0
 39/59 ALL
 40/60 2
 41/61 0.0 8
 42/62 - 0.0 0

 43/63 0.0 5 0 0
 44/64 - 1.0 0 0
 45/65 .0 2 0
 46/66 0.0 2 0
 47/67 .0 0 0
 48/68 0

PURPOSE:
PROX OPS/
FLYAROUND

ORB OPS-71a/117/O/A

ORB OPS-71b/117/O/A

B9

TOP
BACK OF 'B9'
B9

B9

DAP B10

2/4 DAP B 0 9
 30/50 0.1 3 0 0
 31/51 - 2.0 0
 32/52 0.1 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 TAIL
 36/56 TAIL
 37/57 0.0 1 0

 38/58 0.1 0 0
 39/59 TAIL
 40/60 2
 41/61 0.0 8
 42/62 1.0 0 0

 43/63 0.1 3 0 0
 44/64 - 1.0 0 0
 45/65 .0 2 0
 46/66 0.0 2 0
 47/67 .0 0 0
 48/68 0

PURPOSE:
DOCKING

ORB OPS-72a/117/O/A

ORB OPS-72b/117/O/A

B10

(reduced copy)

FAB USE ONLY

FS CC 9-27

ORB OPS/117/FIN

TOP
+

TOP
BACK OF 'B10'
+

B10

DAP B12

2/4 DAP B 1 0
 30/50 0.0 5 0 0
 31/51 - 0.6 0
 32/52 0.1 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 TAIL
 36/56 TAIL
 37/57 0.0 1 0

 38/58 0.1 0 0
 39/59 TAIL
 40/60 2
 41/61 0.0 8
 42/62 - 0.0 0

 43/63 0.0 5 0 0
 44/64 - 0.5 0 0
 45/65 .0 2 0
 46/66 0.0 2 0
 47/67 .0 0 0
 48/68 0

PURPOSE:
 MATED STACK
 (ALT)
BOLD/ITALIC
 indicates change
 from I-Load
⁴2 for S3/S4 Berthed
 4 for S3/S4 Installed

ORB OPS-73a/117/O/A

ORB OPS-73b/117/O/A

+

+

B12

TOP
+

TOP
BACK OF 'B12'
+

B12

2/4 DAP B 1 2
 30/50 0.0 5 0 0
 31/51 - 5.0 0
 32/52 0.2 0
 33/53 0.0 4 0
 34/54 .0 0 0
 35/55 TAIL
 36/56 TAIL
 37/57 0.0 1 0

 38/58 0.0 3 5
 39/59 TAIL
 40/60 3
 41/61 0.0 8
 42/62 1 1.0 4

 43/63 0.1 0 0 0
 44/64 - 3.0 0 0
 45/65 .0 5 0
 46/66 0.0 0 2
 47/67 .0 0 0
 48/68 2(4)⁴

ORB OPS-74b/117/O/A

ORB OPS-74a/117/O/A

+

+

(reduced copy)

FAB USE ONLY

FS CC 9-28

ORB OPS/117/FIN

TOP

| 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) |
| TGT ID = | 4 Sun Center = 5 Celestial Target Input RA (0-359.99) DEC (± 90) = 11-110 Nav Stars |
| BODY VECT = | 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 |

ORB OPS-75/117/O/A

ORB OPS-75/117/O/A is mounted on the back of the DAP Book

FAB USE ONLY

FS CC 9-29

ORB OPS/117/FIN



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Space Shuttle Program
FLIGHT DATA FILE

JSC-48036-117
FINAL



ORBIT OPS CHECKLIST

STS
117

Flight Cover (trim bottom to expose tabs)