Flight Plan

STS-80

(Rotated FRR Cycle Trajectory)

Mission Operations Directorate
Operations Division

Final
September 30, 1996

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National Aeronautics and Space Administration
Lyndon B. Johnson Space Center
Houston, Texas
MISSION OPERATIONS DIRECTORATE

STS-80 FLIGHT PLAN

FINAL
September 30, 1996

PREPARED BY:

[Signature]
Fisher Reynolds
Book Manager

APPROVED BY:

[Signature]
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Lead, Flight Planning
and OPS Group

[Signature]
Larry Davis
Chief, Operations Division

[Signature]
Robert H. Nute
Chief, Flight Planning Branch

[Signature]
Brock R. Stone
Assistant Director, for Operations

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Exemption #: 82

**AREAS OF TECHNICAL RESPONSIBILITY**

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INTRODUCTION

The STS-80 Flight Plan is the Flight Data File article that contains the on-orbit timeline. It does not contain the detailed timelines that are covered in the Ascent, Post Insertion, Deorbit Prep, and Entry Checklists. For continuity, the summary level timeline includes the entire flight.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive, and the requirements of the STS-80 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the Flight Cycle version of the STS-80 Flight Initialization Data Pack.

The trajectory profile used for this Flight Plan is for a launch date of November 8, 1996, at 13:47 CST. Orbiter inertial attitudes are expressed relative to a mean of 1950 (M50) reference frame.

JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, Rev B, January 1992, has been used to build the timelines contained in this Flight Plan.

The timeline formats used in this Flight Plan are based on JSC-19933, Timeline Format Definitions and Standard Notes, Rev C, May 1990.
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- POST SLEEP
- OSYS PLB CAMR VIEWS

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- POST SLEEP

**MS1**
- SLEEP
- POST SLEEP

**MS2**
- SLEEP
- POST SLEEP

**MS3**
- SLEEP
- POST SLEEP

**NOTES:**
- @MANUAL
  @RMS HTR ACT/MCIU FILTER CK
  V UPDATE LOCKER STOW

- 2-3
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**Notes:**
- BIAS ZLV + YVV
- BIAS 50° - YLV + ZVV
- WSB CNTLR SNAP

**Day/Night:**
- 17: DAY
- 18: NIGHT
- 19: DAY
- 20: NIGHT
- 21: DAY
- 22: NIGHT
- 23: DAY
- 24: NIGHT
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| PLT         | SLEEP      | POST SLEEP  | MULT AXIS RCS BURN |
| MS1         | SLEEP      | POST SLEEP  | PREP FOC |
| MS2         | SLEEP      | POST SLEEP  | PREP FOC |
| MS3         | SLEEP      | POST SLEEP  | PREP FOC |

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- **Event:** Phase Event
- **Time:** 03:15:315 GMT
- **Activities:**
  - MEAL
  - WASTE DUMP MONITOR
  - EXERCISE

**PLT**
- **Event:** Phase Event
- **Time:** 03:15:315 GMT
- **Activities:**
  - MEAL
  - VIEW-CPL 03 S75
  - CMIX GROUP
  - EXERCISE

**MS1**
- **Event:** Phase Event
- **Time:** 03:15:315 GMT
- **Activities:**
  - MEAL
  - EXERCISE
  - VIEW-CPL 04 S65

**MS2**
- **Event:** Phase Event
- **Time:** 03:15:315 GMT
- **Activities:**
  - MEAL
  - WSF PREP
  - EXERCISE

**MS3**
- **Event:** Phase Event
- **Time:** 03:15:315 GMT
- **Activities:**
  - MEAL
  - WSF PREP

**Day/Night**
- **Orbit:** 32
- **Time:** 03:15:315 GMT

**DOS CVG**
- **Attitude:** 50 DEG -YLV +ZVV
- **Bias:** -YLV +ZVV

**Notes:**

**Edition:** FINAL
**Publication Date:** 09/30/96
**Flight:** STS 80
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### Diagram:

- **CDR**
  - PRE SLEEP
  - SLEEP
  - POST SLEEP

- **PLT**
  - PRE SLEEP
  - SLEEP
  - POST SLEEP

- **MS1**
  - PRE SLEEP
  - SLEEP
  - POST SLEEP

- **MS2**
  - PRE SLEEP
  - SLEEP
  - POST SLEEP

- **MS3**
  - PRE SLEEP
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### Notes:

- BIAS -XLV -YVV(GG)!
- OMS HTR ACT/MCIU FILTER CK
- FES OFF
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**CDR**
- WSF DPY OPS
- WSF DPY OPS
- MEAL
- EXERCISE

**PLT**
- WSF DPY OPS
- MEAL
- EXERCISE

**MS1**
- WSF DPY OPS
- MEAL
- EXERCISE

**MS2**
- WSF DPY OPS
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- EXERCISE

**MS3**
- WSF DPY OPS
- MEAL
- EXERCISE

**Notes:**
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**TDRS**

**ZOE CVG**

**WSF**

**ATTITUDE**

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**NOTES:**
- ZOE CVG
  - RUN 5
  - RUN 6 - YLV + ZV
  - RUN 7

**DAY/NIGHT**
- ORBIT: 72-79

**ZOE CVG**
- WSF
  - RUN 6
  - YLV + ZV

**ATTITUDE**
- FLG PLN/80/FIN

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**CDR**
- POST SLEEP
- POST SLEEP
- OFF DUTY
- MEAL
- EXERCISE

**PLT**
- POST SLEEP
- MULT AXIS RCS BURN
- OFF DUTY
- MEAL
- EXERCISE
- VIEW-CPL 07 535

**MS1**
- POST SLEEP
- OFF DUTY
- MEAL
- VIEW-CPL 06 540

**MS2**
- POST SLEEP
- OFF DUTY
- MEAL
- P/TVO6 SETUP

**MS3**
- POST SLEEP
- OFF DUTY
- MEAL
- WSF SK 2
- EXERCISE

**DAY/NIGHT ORBIT**
- 80
- 81
- 82
- 83
- 84
- 85
- 86
- 87

**TDRS**
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- N

**ZOE CVG**
- WSF

**ATTITUDE**
- YLV +ZVY

**NOTES:**
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- MULT AXIS RCS BURN
- EXERCISE
- FILTER CLEANING
- MEAL
- P/TVOR SETUP

**PLT**
- POST SLEEP
- MULT AXIS RCS BURN
- EXERCISE
- VIEW-CPL 09 PV-LOW
- VIEW-CPL 11 PVJUMP
- MEAL

**MS1**
- POST SLEEP
- OSVS P/V9B SETUP
- EXERCISE
- OSVS OPS
- MEAL
- VIEW-CPL 13 SC

**MS2**
- POST SLEEP
- OSVS P/V9B SETUP
- EXERCISE
- OSVS OPS
- MEAL
- EXERCISE

**MS3**
- POST SLEEP
- POST SLEEP
- EXERCISE
- MEAL

**NOTES:**
- RMS HTR ACT/MCIU FILTER CK
- 50 DEG -YLV +ZVV
- -XLV +ZVV
- XVL +YVV
- 50 DEG -YLV +ZVV
- RMS HTR ACT/MCIU FILTER CK

2-16
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- 10.2 DEPRESS2
- 12:00:00
- PRE SLEEP
- MEAL
- PRE SLEEP
- SLEEP

**PLT**
- 12:00:00
- 10.2 DEPRESS2
- 12:00:00
- PRE SLEEP
- MEAL
- PRE SLEEP
- SLEEP

**MS1**
- VIEW-CPL
- 14 CV
- PRE SLEEP
- MEAL
- PRE SLEEP
- SLEEP

**MS2**
- PRIV FAN
- PRE SLEEP
- MEAL
- PRE SLEEP
- SLEEP

**MS3**
- P/TV S/U CREW
- COUNTERS
- PRE SLEEP
- MEAL
- PRE SLEEP
- PRE SLEEP
- SLEEP

**NOTES:**
- 2-17 FLTR PLN/80/FIN 09/30/96

**ATTITUDE:**
- 50 DEG -YLV +ZVV

**ORMIT:**
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- Meal
- Pre Sleep
- Sleep

#### PLT
- Exercise
- Meal
- Pre Sleep
- Sleep

#### MS1
- Exercise
- Meal
- Pre Sleep
- Sleep

#### MS2
- Exercise
- Meal
- Pre Sleep
- Sleep

#### MS3
- Exercise
- Meal
- Pre Sleep
- Sleep

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- 50 Deg - YLV + ZVV
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**ATTITUDE**

50 DEG -Y:LV +Z:VV

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<td>ATTITUDE</td>
<td>IMU</td>
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<tr>
<td>@BAS 50° -YLV +ZVV</td>
<td>@RMS HTR ACT/NCU FILTER CK</td>
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NOTES:
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<th>MET (D:H:M)</th>
<th>CST (D:H:M)</th>
<th>FD/DOY</th>
<th>BETA</th>
<th>MOON</th>
<th>HOUSTON DATE</th>
<th>FLIGHT</th>
<th>EDITION</th>
<th>PUB. DATE</th>
</tr>
</thead>
</table>

**CDR**
- 1:30 - 8:00: FILTER CLEANING
- 8:00: CABIN STOW
- 8:00: MEAL
- 8:00: PRE SLEEP
- 8:00: SLEEP

**PLT**
- 1:30 - 8:00: CABIN STOW
- 8:00: ERG STOW
- 8:00: MEAL
- 8:00: PRE SLEEP
- 8:00: SLEEP

**MS1**
- 1:30 - 8:00: EXERCISE
- 8:00: CABIN STOW
- 8:00: MEAL
- 8:00: PRE SLEEP
- 8:00: SLEEP

**MS2**
- 1:30 - 8:00: EXERCISE
- 8:00: CABIN STOW
- 8:00: MEAL
- 8:00: PRE SLEEP
- 8:00: SLEEP

**MS3**
- 1:30 - 8:00: CABIN STOW
- 8:00: EXERCISE
- 8:00: CABIN STOW
- 8:00: MEAL
- 8:00: PRE SLEEP
- 8:00: SLEEP

**NOTES:**
- 2-31

**DAY/NIGHT**

**ORBIT**
- MIL

**GSTM COVERAGE**
- MIL

**TDNS**
- EW

**ATTITUDE**
- ZLV +YVV

**NOTES:**
- FLT PLAN/80/FIN
- 09/30/96
<table>
<thead>
<tr>
<th>GMT (D:H:M)</th>
<th>MET (D:H:M)</th>
<th>CST (D:H:M)</th>
<th>FD/DOY</th>
<th>BETA</th>
<th>MOON</th>
<th>HOUSTON DATE</th>
<th>FLIGHT</th>
<th>EDITION</th>
<th>PUB. DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>329:07:47/329:19:47</td>
<td>015:12:00/016:00:00</td>
<td>329:01:47/329:13:47</td>
<td>16/329 GMT</td>
<td>-19.3</td>
<td>O</td>
<td>NOVEMBER 24, 1996</td>
<td>STS 80</td>
<td>FINAL</td>
<td>09/30/96</td>
</tr>
</tbody>
</table>

| CDR | DEORBIT PREP | LDG |
| PLT | DEORBIT PREP | DEORBIT BURN | LDG | KSC |
| MS1 | DEORBIT PREP | LANDING |
| MS2 | DEORBIT PREP | LDG |
| MS3 | DEORBIT PREP | LDG |

**DAY/NIGHT**

<table>
<thead>
<tr>
<th>ORBIT</th>
<th>245</th>
<th>246</th>
<th>247</th>
<th>248</th>
<th>249</th>
<th>250</th>
<th>251</th>
<th>252</th>
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</table>

**TDRS**

<table>
<thead>
<tr>
<th>ZOE CVG</th>
<th>ATITUDE</th>
<th>COMM</th>
<th>D/O BURN</th>
</tr>
</thead>
<tbody>
<tr>
<td>E</td>
<td>XSI</td>
<td>IMU</td>
<td></td>
</tr>
</tbody>
</table>

**NOTES:**

* DEORBIT BURN 15/15:44
* KSC LANDING 15/16:44
DETAILED TIMELINE
FD 01 E2 ACTIVITIES
PCS 1(2) CONFIG (ORB OPS, ECLS)
Config Sys 1 (15 min/2 cm)
CPA OPS (ORB OPS, CREW SYS) (15 min)

CMIX HEATER ACTIVATION
A
OFF
Open CRIM-2 door
Temp stow CRIM inner door
HEAT-ON
LED-ON
Replace CRIM inner door
Close CRIM-2 door

Change DAP A to A1
MNVR (TRK) - YLV +ZVV
TG=2 BV=5
P=0 Y=270 OM=90
A/AUTO/VERN Init TRK

AFT CONTROLLER C/O
(ORB OPS, GNC)

LOAD FLT SPEC DAPS
(FLT PLAN, DAP TABLES)
A9,A10,B6,B9,B10

RMS POWERUP
(PDRS OPS, RMS PWRUP)

RMS CHECKOUT
(PDRS OPS, RMS C/O)

RMS CHECKOUT
(PDRS OPS, RMS C/O)

CCM-A INIT (PL OPS, CCM-A)
CARRIER ACTIVATION
(PL OPS, WSS SYSTEM)

KU-BD ANT DEPLOY
(ORB OPS, COMM/INSI)

ML/AL/AL
01:00

02:00

03:00

09/30/96
STS-80 (FD 01)

09:00
A6(B1)
AUTO/VERN

06
UHF MODE - OFF
PRIVATE MEDICAL CONFERENCE

10:00
PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)
HUM SEP FOR WATER ACCUMULATION

11:00
SLEEP

12:00
SLEEP

ORB B

OSYS TV
DOWNLINK
PLB CAMR VIEWS

ORB B
UL CNL AUTO-ITEM 35 EXEC

MET DAY 000 09/30/96
}
STS-80 (FD 02)

CDR | PLT | MS1 | MS2 | MS3 | MCC

19:00
A6(B1)
AUTO/VERN

20:00
POST-SLEEP ACTIVITY
(ORB OPS, CREW_SYS)

21:00
VTR SETUP
(Cue Card, TV/VIR)

22:00
CYCLE ERGOMETER OPS
(ORB OPS FS, ERGO OPS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW_SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW_SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW_SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW_SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW_SYS)

VTR OPS-PLBK (ASOT, SPAS DPY)
(Cue Card, TV/VIR)
VTR at TCRE (21:27-21:55)

Cycle Ergometer Setup

FLTR PLN/85/FIN
09/30/94
STS-80 (FD 02)

01:00
A6(BI) AUTO/VERN

02:00
MNVR (TRK) BIAS -7LV +YV
TG=2 EV=3 OM=310
A/AUTO/VERN Init TRK

TEST PREPARATION
(PL OPS, VIEWS-CPL)

SUPPLY/WASTE WATER DUMP
(ORB OPS, ECLS)
initiate Supply Dump
[SMI OPS UTILITY]
UL CNTRL ERA-ITEM 36 EXEC

PRESSURE PRIME
(PL OPS, VIEWS-CPL)
Wait period start

PLB SURVEY
PLB SURVEY

03:00

RMS POWERDOWN
(PDRS OPS, RMS PHRON)
Note: Do not stow MPH's

04:00

MEAL

OSYS POWERDOWN
(PDRS OPS FS, OSYS OPS)

Wait period stop
04:00
A6(B1)
AUTO/VERN

05:00

06:00
ORB 21

07:00

STANDARD TIME (ADST)

CDR
PLT
MS1
MS2
MS3
MCC

SUPPLY/WASTE WATER DUMP
CMIX GROUP C (DEACT)
(ORB OPS, ECLS)
Terminate Supply Dump
Ref CMIX Event T/L

MVNR (TRK) - YLV + ZVV
TG=2
BV=5
P=0
Y=270
OM=90
A/AUTO/VERN Init TRK

IMU ALIGN - S TRK (ORB OPS)

MVNR/TRK) BIAS 50° - YLV + ZVV
TEST PREPARATION
TG=2
BV=5
P=90
Y=320
OM=90
A/AUTO/VERN Init TRK

TEST 1540
(PLOPS, VIEW-CPL)

FILTER CLEANING
(IFM, SCHEDULED MAINTENANCE)
Downlink desired

Cool down start

R2 BLR CNTLR/NTR (three) - B

EXERCISE

TEST PREPARATION
(PL OPS, VIEW-CPL)

TEST 525
(PL OPS, VIEW-CPL)

Downlink desired

Cool down stop

EXERCISE
06:00
JOIN MODE - OFF
PRIVATE MEDICAL CONFERENCE

11:00
PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

12:00
PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

13:00
PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Crew members are scheduled for sleep during this period.
<table>
<thead>
<tr>
<th>TIME</th>
<th>CDR</th>
<th>PLT</th>
<th>MS1</th>
<th>MS2</th>
<th>MS3</th>
<th>MCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>20:00</td>
<td>AG(B1)</td>
<td>AUTO/VERN</td>
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<tr>
<td>21:00</td>
<td>ORB 31</td>
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<tr>
<td>22:00</td>
<td>ORB 32</td>
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<td>23:00</td>
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</tbody>
</table>

**MNRV(TRK):** BIAS 50° -YLV +ZVV
TG=2 BV=S
P=90 Y=320 QM=90
A/AUTO/VERN Init TRK

**POST-SLEEP ACTIVITY**
- ORB OPS, CREW SYS
- ORB OPS, CREW SYS
- ORB OPS, CREW SYS

**OCA DOWNL (RFX)**
- ORB OPS FS, OCA
- KU-HDR

**OCA DATA XFER**
- SPOC DATA 1
- FAMILY MAIL 1

**FLIGHT PLN/LOG/FIN** 09/30/96
WASTE DUMP MONITOR as req'd

SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS)
Terminate Supply/Waste Dump

MVVR (TRK) - YLV +ZVV
Tg=2 BV=5
P=0 Y=270 OM=90
A/AUTO/VERN Init TRK

Cooldown start

EXERCISE
Ku avail TRK (08:32-09:10)

Cooldown stop

P/TV68 SETUP (WSF DPY)
(P/TV, P/TV SCENES)

ERPCL STATUS CHECK (PL OPS, SPAS)
SECONDARY PL TAGUP

P/TV68 OPS-DEACT
(P/TV, P/TV SCENES)

MEAL
MEAL
MEAL
MEAL

A6(B1)
AUTO/VERN

08:00
09:00
10:00
11:00
A CO2 RMVL SYS ACT

Perform CO2 RMVL SYS CNTLR CONFIG
ACT 1/DEACT 2 (ORB OPS, ECLS) and modify CHARCOAL CANISTER REPLACEMENT as follows:

- Remove two LIOH canisters, rebag and stow for later use
- Reinstall used LIOH canister #1 in slot A
- Unbag, reinstall used charcoal canister in slot B

WCS WCS VAC VALV - OP

MMRR (TRK) YLV +ZVV
TG=2 BV=5
P=0 Y=270 OM=90
A/AUTO/VERN Init TRK

ON-ORB MULT-AXIS RCS BURN ON-ORB MULT-AXIS RCS BURN
(ORB OPS, RCS) (ORB OPS, RCS)

NC-7 TIG (10:52)

CO2 RMVL SYS ACT (A)

SECONDARY PL TAGUP
(ORB OPS, ECLS)

UPPERING FES STARTUP
(ORB OPS, ECLS)

MEAL MEAL MEAL MEAL MEAL

05/30/96
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>12:00</td>
<td>SM1 OPS UTILITY</td>
</tr>
<tr>
<td></td>
<td>UL CNTRL AUTO-ITEM 35 EXEC</td>
</tr>
<tr>
<td></td>
<td>06 JUNF MODE - OFF</td>
</tr>
<tr>
<td></td>
<td>PRIVATE MEDICAL CONFERENCE</td>
</tr>
<tr>
<td>13:00</td>
<td>PRE-SLEEP ACTIVITY</td>
</tr>
<tr>
<td></td>
<td>(ORB OPS, CREW SYS)</td>
</tr>
<tr>
<td>14:00</td>
<td>PRE-SLEEP ACTIVITY</td>
</tr>
<tr>
<td></td>
<td>(ORB OPS, CREW SYS)</td>
</tr>
<tr>
<td>15:00</td>
<td>SLEEP</td>
</tr>
</tbody>
</table>

**Notes:**
- FLIGHT PLAN 80/FM
- 09/30/96
TEST PREPARATION
(PL OPS, VIEW-CPL)

TEST-PV-GRAB
(PL OPS, VIEW-CPL)

Cool down start

EXERCISE

Cool down stop

TEST PREPARATION
(PL OPS, VIEW-CPL)

TEST-SS25
(PL OPS, VIEW-CPL)

P/TV S/U CREW CHOICE D/L
06 JUHF MODE - OFF
PRIVATE MEDICAL CONFERENCE.

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

OCA DOWNLINK (Ku-HDR)

OCA DATA XFER
FAMILY MAIL

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SLEEP

SLEEP

SLEEP

SLEEP

SLEEP
POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SUPPLY WATER DUMP USING FES
(ORB OPS, ECLS) step 1

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

IMU ALIGN - S TRK (ORB OPS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

OCA DOWNLINK (KFS)
(ORB OPS FS, OCA)
.Ku-HDR

OCA DATA XFER
SPOC DATA T
FAMILY MAIL T
MET 880 MS1 MS2 MS3 MCC

ST5-80 (FD 06)

CDR PLT

11:00
A6(81) AUTO/VERN

SUPPLY WATER DUMP USING FES
(ORB OPS, ECLS)
Perform Step 2 w/FES reqd

Cooldown start

TEST-S35

CREW CHOICE D/L

NiN-R OPS
(PL OPS, NiN-R)

Cooldown stop

ON-ORB MULT-AXIS RCS BURN
(ORB OPS, RCS)

ON-ORB MULT-AXIS RCS BURN
(ORB OPS, RCS)

EXERCISE

EXERCISE

EXERCISE

NC-11 TIG (12:39)

SECONDARY PL TAGUP

MEAL

MEAL

MEAL

MEAL

MEAL

ERPCL STATUS CHECK
(PL OPS, SPAS)

12:00

(A6)81

ORB 89

13:00

A6(81) AUTO/VERN

14:00

ORB 89

3-40
FLY PLN/80/FIN

09/30/96
<table>
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<th>Time</th>
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<th>MS1</th>
<th>MS2</th>
<th>MS3</th>
<th>MCC</th>
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<td>01:00</td>
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<tr>
<td>02:00</td>
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<tr>
<td>03:00</td>
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</table>

**POST-SLEEP ACTIVITY**
(ORB OPS, CREW_SYS)

**PRIORITY PWRUP GROUP B**
(ORB PKT, PRIOR PWRDN)

Quit step B
(GS set expansion will be done in WSF rndz c/1)

**IMU ALIGN - S TRK** (ORB OPS)

**POST-SLEEP ACTIVITY**
(ORB OPS, CREW_SYS)

**QCA DOWNLINK (KFB)**
(ORB OPS FS, QCA)

**Ku-HDR**

**FAMILY MAIL**

**QCA DATA XFER**

**SPOC DATA**

**POST-SLEEP ACTIVITY**
(ORB OPS, CREW_SYS)
FD 07 EZ ACTIVITIES
CPA OPS
(ORB OPS, CREW SYS)
(15 min)
QCAC FILTER INSPECT
CMIX DAILY CHECK Log
temps and inspect
filter twice daily

NC-12 (03:54)

NH-WSF (04:41)

WSF RNDZ
(RNDZ VOL B, RNDZ T/L)

WSF RNDZ
(RNDZ VOL B, RNDZ T/L)

AOI PORT RMS HTR (two) - AUTO
L17 Check MC18 filter screen

EXERCISE

P/TV09A SETUP/OPS (WSF RETRV)
(P/TV, P/TV SCENES)

RMS POWERUP
(PDRS OPS, RMS PWRUP)

WSF RNDZ
(RNDZ VOL B, RNDZ T/L)

WSF RNDZ
(RNDZ VOL B, RNDZ T/L)
<table>
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<th>Time</th>
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<th>MS2</th>
<th>MS3</th>
<th>MCC</th>
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</thead>
<tbody>
<tr>
<td>04:00</td>
<td>10.2 PSI MAINTENANCE (EVA, 10.2 PSI CABIN)</td>
<td></td>
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<tr>
<td></td>
<td>ON-ORB MULT-Axis RCS BURN (ORB OPS, RCS)</td>
<td>ON-ORB MULT-Axis RCS BURN (ORB OPS, RCS)</td>
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<tr>
<td>05:00</td>
<td>WCS COMPACTOR OPS (DUAL VANE) (ORB OPS, CC)</td>
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<td>First Compaction, back of MS CC</td>
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<tr>
<td>06:00</td>
<td>MNVR (TRK) BIAS - ZLV +VVV</td>
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<tr>
<td></td>
<td>TG=2 BY=3 OM=310</td>
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<tr>
<td></td>
<td>A/AUTO/VERN Init TRK</td>
<td></td>
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<tr>
<td>07:00</td>
<td>SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS)</td>
<td></td>
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<tr>
<td></td>
<td>Initiate Supply/Waste Dump</td>
<td></td>
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<tr>
<td></td>
<td>L17 Check MCIU filter screen</td>
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</tbody>
</table>

**Activities:***
- 10.2 PSI MAINTENANCE (EVA, 10.2 PSI CABIN)
- ON-ORB MULT-Axis RCS BURN (ORB OPS, RCS)
- WCS COMPACTOR OPS (DUAL VANE)
- MNVR (TRK) BIAS - ZLV +VVV
- SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS)
- L17 Check MCIU filter screen
13:00
A6(B1) AUTO/VERN

14:00
ORB 136 (A6) B1

15:00
UHF MODE - OFF
PRIVATE MEDICAL CONFERENCE

16:00
ORB 137
STS-80 (FD 09)

CDR

PLT

MS1

MS2

MS3

MCC

00:00

ORB 143

21:00

ORB 141

22:00

SLEEP

SLEEP

SLEEP

SLEEP

01:00

ORB 142

00:00

ORB 141

19:00

A6(B1)

AUTO/VERN.
FD 10 EZ ACTIVITIES
CPA OPS
(orb ops, crew sys)
(15 min)
OCAC FILTER INSPECT
CNX DAILY CHECK Log
temps and inspect
filter twice daily

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

ON-ORB MULTI-AXIS RCS BURN
(ORB OPS, RCS)

NC-18 TUG (03:32)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

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(ORB OPS, CREW SYS)

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(ORB OPS, CREW SYS)

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(ORB OPS, CREW SYS)

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(ORB OPS, CREW SYS)

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(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
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(ORBOPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORBOPS, CREW SYS)
CABIN REPRESS TO 14.7 PSI
(EVA, 10.2 PSI CABIN)

PRIORITY PMRUP GROUP B
(ORB PKT, PRIOR PWAIN)
Omit step B
( Remain single G2 until SPAS rndz)

ORB 100

10:00

MEAL

11:00
**STS-80 (FD 12)**

**CDR**
- 11:00
  - NIH-R OPS (PL OPS, NIH-R)
- 12:00
  - Exercise
- 13:00
  - FILTER CLEANING (IFM, SCHEDULED MAINTENANCE)
    - Inspect filters and clean as necessary
  - RMS POWERDOWN (PLS OPS, RMS POWER)
    - Note: Do not rotate MPM's

**PLT**
- 11:00
  - EVA DTO 2 (RMS SUPPORT)
- 12:00
  - EVA DTO 2
- 13:00
  - EVA DTO 2

**MS1**
- 11:00
  - EVA DTO 2
- 12:00
  - EVA DTO 2
- 13:00
  - EVA DTO 2 (EVA SUPPORT)

**MS2**
- 11:00
  - EVA DTO 2
- 12:00
  - EVA DTO 2
- 13:00
  - EVA DTO 2

**MS3**
- 11:00
  - EVA DTO 2
- 12:00
  - EVA DTO 2
- 13:00
  - EVA DTO 2

**MCC**
- 14:00
  - Change DAP A to A6
  - AUTO/VERN
  - Change DAP B to B1

**UPLINK (Ingress)**
- 14:00
  - INGRESS
  - AIRLOCK REPRESS (CUE CARD)
  - AIRLOCK REPRESS (CUE CARD)
  - AIRLOCK REPRESS (CUE CARD)
  - POST EVA (EVA, POST EVA)
    - W/O WATER RECHARGE
  - POST EVA (EVA, POST EVA)
    - W/O WATER RECHARGE
  - POST EVA (EVA, POST EVA)
    - W/O WATER RECHARGE
<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>03:00</td>
<td>AUTO/VERN</td>
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<tr>
<td>04:00</td>
<td>POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
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<tr>
<td>05:00</td>
<td>POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
</tr>
<tr>
<td>06:00</td>
<td>POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
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**Notes:**
- OCA DOWNLINK (KUX)
- ORB OPS FS, OCA
- OCA DATA XFER
- SPOC DATA
- PVR TOOL FILES
- FAMILY MAIL
<table>
<thead>
<tr>
<th>Time</th>
<th>CDR</th>
<th>PLT</th>
<th>MS1</th>
<th>MS2</th>
<th>MS3</th>
<th>MCC</th>
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<td>15:00</td>
<td>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
<td>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
<td>EXERCISE</td>
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<td>ON-ORB MULTI-AXIS RCS BURN (ORB OPS, RCS)</td>
<td>ON-ORB MULTI-AXIS RCS BURN (ORB OPS, RCS)</td>
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<td>NC-25 TIG (15:39)</td>
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<tr>
<td>16:00</td>
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<tr>
<td>17:00</td>
<td>JHF MODE OFF PRIVATE MEDICAL CONFERENCE</td>
<td>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
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<tr>
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<td>FAMILY CONFERENCE</td>
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<td>18:00</td>
<td>PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
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Notes:
- ORB 201
- AUTO/VERN
- OCA DATA XFER
- PWR TOOL DATA 1
- FAMILY MAIL 11
STS-80 (FD 14)

**05:00**
- ORFEUS-SPAS RNDZ
- NC-26 (05:24)

**06:00**
- NH-SPAS (06:09)

**07:00**
- NCC-SPAS (07:29)

**07:00 - 08:00**
- FD 14 EZ ACTIVITIES
  - CPA OPS (ORB OPS, CREW SYS) (15 min)
  - QCAC FILTER INSPECT
  - CMIX DAILY CHECK (log temps and inspect filter twice daily)
  - ABL PORT RMS HTR (two) - AUTO
  - L17 Check MCIU filter screen

**08:00**
- ORFEUS-SPAS RNDZ

**09:00**
- EXERCISE

**10:00**
- RMS POWERUP (PDPS OPS, RMS_PWRUP)

**11:00**
- ORFEUS-SPAS RNDZ (RNDZ VOL A, RNDZ)

**12:00**
- ORFEUS-SPAS RNDZ (RNDZ VOL A, RNDZ)

**13:00**
- EXERCISE

**14:00**
- F/TV SETUP/OPS (SPAS RETRV)
  - (P/TV, P/TV SCENES)

**15:00**
- ORFEUS-SPAS RNDZ (RNDZ VOL A, RNDZ)

**16:00**
- ORFEUS-SPAS RNDZ (RNDZ VOL A, RNDZ)
14:00
PILOT SIMULATOR
(ORB OPS FS, U01_662)
EXERCISE

SECONDARY FL TAGUP
P/TV/3D SETUP PD (PAC EVENTS)
(ORB OPS FS, UTV, P/TV, P/TV SCENES)

Change DAP A,B to A1, B1
A/AUTO/VERN
SUPPLY/WASTE WATER DUMP
(ORB OPS, ECLS)
Initiate Supply Dump

15:00

16:00
SUPPLY/WASTE WATER DUMP
(ORB OPS, ECLS)
Terminate Supply Dump

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)
06:00 J/TV MODE OFF
PRIVATE MEDICAL CONFERENCE

17:00
PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)
03:00
AO (61) AUTO/VERN

04:00
ORB 224

05:00
(A1) BS

06:00
ORB 225

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

MNVR, IMU ALIGN ATT
R=259 P=113 Y=66
A/AUTO/VERN (14/04:30) Init MNVR
Starts: 54,51 (4:25-5:01)

IMU ALIGN - S TRK (ORB OPS)
HAD CAL (ORB OPS, GNC)
Star: 11 (4:46-5:34)

MNVR (TRK) 71V,YVV
R=2 B=3 OM=270
A/AUTO/VERN Init TRK
Change DAP B to B1

POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)

FN 13 EZ ACTIVITIES

CDA OPS
(ORB OPS, CREW SYS)
(15 min)
CMIX DAILY CHECK Log
temps and inspect
filter twice daily

MS1
MS2
MS3
MCC

SUPPLY/WASTE WATER DUMP
(ORB OPS, ECLS)
Initiate Supply/Waste Dump

WASTE DUMP MONITOR
as req'd

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SUPPLY/WASTE WATER DUMP
(ORB OPS, ECLS)
Terminate Supply/Waste Dump

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

QCA DOWNLINK (KFX)
(ORB OPS FS, QCA)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

QCA DATA XFER
SPAC DATA T
FAMILY MAIL T

05/30/96
STS-80 (FD 15)

CDR

PLT

MS1

MS2

MS3

MCC

06:00

MNVR TO COMM AIT

POST-SLEEP ACTIVITY

POST-SLEEP ACTIVITY

POST-SLEEP ACTIVITY

POST-SLEEP ACTIVITY

06:00

A1(01)

AUTO/VERN

CREW CONF

TV at TDRE

(06:05-06:35)

CREW CONF

CREW CONF

CREW CONF

CREW CONF

MNVR (THR) - ZLV + VVV

TV=2 BV=3 OM=270

A/AUTO/VERN Init TRK

P/TV12 SETUP (PPOV/MINICAM)

(P/TV, P/TV SCENES)

CCM-A TEMP CHK (Cue Card)

PPOV cam
dlnk video c/o

Setup for FM downlink

07:00

08:00

ORB 227

PILOT SIMULATOR

(ORB OPS FS, DTO 667)

SEM DEACTIVATION

(PL OPS, SEM)

PILOT SIMULATOR

(ORB OPS FS, DTO 667)

09:00

EXERCISE

EXERCISE

SYS SION

09:00

ORB 226
<table>
<thead>
<tr>
<th>Time</th>
<th>Event Description</th>
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<tbody>
<tr>
<td>12:00</td>
<td>NIH-R OPS (PL OPS, NIH-R)</td>
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<tr>
<td>13:00</td>
<td>FILTER CLEANING (IFM, SCHEDULED MAINTENANCE)</td>
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<td></td>
<td>CABIN CONFIG/STOW (A11)</td>
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<td>CABIN CONFIG/STOW (A11)</td>
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<td>CABIN CONFIG/STOW (A11)</td>
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<td></td>
<td>SEAT INSTALLATION</td>
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<td></td>
<td>CYCLE ERGOMETER OPS (ORB OPS FS, ERLG OPS)</td>
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<td>CYCLE ERGOMETER OPS (ORB OPS FS, ERLG OPS)</td>
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<td>15:00</td>
<td>MEAL</td>
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</table>

**STS-80 (FD 15)**

**PRE-DEORBITEE PREP ACTIVITIES**

- **AIRLOCK CLOSEOUT**
  - Remove loose items stored in Airlock
  - Perform AIRLOCK ENT & SW VERIF (DEORBITEE PREP, ENT SW LIST/VERIF)

**UPDATING**

- SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS)
  - Initiate Supply Dump
STS-80 (FD 15)

CDR

15:00
- AI(B1), AUTO/VERN
- MEAL
- LANDING-1 COMM C/O (ORB OPS, COMM/INST)
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
- LANDING-1 COMM C/O (BACKUP) (ORB OPS, COMM/INST)
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

PLT

- MEAL
- MEAL
- MEAL

MS1

- MEAL

MS2

- MEAL

MS3

- MEAL

MCC

- SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS)
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
- PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)
- OCA DOWNLINK (MPX) (ORB OPS FS, OCA)
- OCA DATA XFER FAMILY MAIL (ORB OPS, CREW SYS)

FLN/80/09 09/30/96
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<td>POST-SLEEP ACTIVITY (ORB OPS, CREW SYS)</td>
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**Note:** The diagram represents a crew schedule for STS-80 (FD 16).
ST5-80 (FD 16)

SUPPLY/WASTE WATER DUMP
(ORB OPS, ECLS)
Terminate Supply Dump

EZ ACTIVITIES BEFORE LEAVING FLT PLN
AIR SAMPLE
Rcd MET and location on bottle
FLUID LOADING PREP
Fill drink containers per MCC

EDO PALLET DEACTIVATION
(ORB OPS, EPS)

MEAL MEAL MEAL MEAL MEAL
Go to DEORBIT PREP C/L at 15/11:44
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### DAP TABLE

<table>
<thead>
<tr>
<th>DAP</th>
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<tbody>
<tr>
<td>A1</td>
<td>NOMINAL</td>
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<td>A2</td>
<td>PTC</td>
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<td>A3</td>
<td>GG</td>
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<tr>
<td>A4</td>
<td>EDFT-05</td>
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<td></td>
<td>EVA</td>
</tr>
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<td></td>
<td>LOADED RMS</td>
</tr>
<tr>
<td>A5</td>
<td>LOSS OF VERN (NOSE &amp; TAIL)</td>
</tr>
<tr>
<td>A6</td>
<td>LOSS OF VERN (TAIL ONLY)</td>
</tr>
<tr>
<td>A7</td>
<td>RENDEZVOUS</td>
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<tr>
<td>A8</td>
<td>PROX OPS</td>
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<tr>
<td>A9</td>
<td>ORFEUS-SPAS LOW HOVER</td>
</tr>
<tr>
<td>A10</td>
<td>ORFEUS-SPAS RELEASE CAPTURE (NOM &amp; SJ)</td>
</tr>
<tr>
<td></td>
<td>RGPS HIGH</td>
</tr>
<tr>
<td>A11</td>
<td>ORFEUS-SPAS</td>
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<tr>
<td>A12</td>
<td>WSF LOW HOVER NOMINAL CAPTURE</td>
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<tr>
<td>A13</td>
<td>WSF RAM CLEAN AOPROC CLEAN AOPROC</td>
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<td>A14</td>
<td>WSF SVS TOP</td>
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<tr>
<td>A15</td>
<td>RNDZ TRANSITION TO RBAR</td>
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<tr>
<td>B1</td>
<td>NOMINAL</td>
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<td>B2</td>
<td>LOSS OF VERN (TAIL ONLY)</td>
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<tr>
<td>B3</td>
<td>LOSS OF VERN (NOSE &amp; TAIL)</td>
</tr>
<tr>
<td>B4</td>
<td>SSUS DEPLOY</td>
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<td>COAS CAL</td>
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<td>B6</td>
<td>PREDEPLOY SPAS GYRO CALIBRATION</td>
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<td>RENDEZVOUS</td>
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<td>PROX OPS</td>
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<td>B9</td>
<td>ORFEUS-SPAS DB COLLAPSE</td>
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<td>W/O POSN HOLD RMS BO</td>
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<td>ORFEUS-SPAS NOMINAL DB COLLAPSE</td>
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<td>RMS PH</td>
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<td>B11</td>
<td>ORFEUS-SPAS RGPS HIGH</td>
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<td>ORFEUS-SPAS CONT EVA</td>
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<td>EVA HOVER WORKSITE #1</td>
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<td>WORKSITE #2</td>
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<td>WSF RELEASE STATIONARY RMS</td>
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<td>B14</td>
<td>WSF SINGLE JOINT CAPTURE</td>
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<td>SVS SIDE</td>
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<td>RNDZ TRANSITION TO RBAR</td>
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<td>Earth tgt</td>
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<td>Input LAT (± 90)</td>
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<td>LON (± 180, + = East)</td>
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<td>ALT (−3444.0 to 20000.0 nm)</td>
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<td>Sun ctr</td>
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<td>DEC (± 90)</td>
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<td>11-110 Nav Stars</td>
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### PURPOSE

- **EDFT-05**
  - LOADED RMS
- **LOW HOVER**
- **RELEASE**
  - CAPTURE (NOM & SJ)
  - RGPS HIGH
- **ALL SVS**
- **LOW HOVER**
- **CAPTURE**
- **RAM CLEAN**
- **AOPROC**
- **CANCLE**
- **AOPROC**
- **SVS TOP**

### NOTE: **BOLD/ITALICS** indicate a change from the I-load

1. Mod in procedure - CNTL ACC (ITEM 28) = 3 for ADACS C/O
2. Mod in procedure - VERN ATT DB (ITEM 24) = 30° for AOPROC
## STS-80 GENERIC DAP B CONFIGURATIONS

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*** ALL ATTITUDES IN MEAN OF 1950 ***

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*** ALL ATTITUDES IN MEAN OF 1950 ***

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*** ALL ATTITUDES IN MEAN OF 1950 ***
*** FYR RULER SEQUENCE ***

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*** ALL ATTITUDES IN MEAN OF 1950 ***

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*** ALL ATTITUDES IN MEAN OF 1950 ***

*** PYR EULER SEQUENCE ***
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<tr>
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<td>LOSS OF VERN (TAIL ONLY)</td>
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<td>A7</td>
<td>RENDEZVOUS</td>
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<tr>
<td>A8</td>
<td>PROX OPS</td>
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<td>A9</td>
<td>ORFEUS-SPAS LOW HOVER</td>
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<td>A10</td>
<td>ORFEUS-SPAS RELEASE CAPTURE (NOM &amp; SJ)</td>
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<td>ALL SVS</td>
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<td>A12</td>
<td>WSF LOW HOVER NOMINAL CAPTURE</td>
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<td>A13</td>
<td>WSF RAM CLEAN AOPROC CLEAN AOPROC</td>
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<td>A14</td>
<td>WSF SVS TOP RNDZ TRANSITION TO RBAR</td>
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<td>ORFEUS-SPAS RGPS LOW</td>
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<td>WSF SINGLE JOINT CAPTURE SVS SIDE</td>
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<td>RNDZ TRANSITION TO RBAR</td>
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FLT PLN-1a/80/O/B

CNTL ACC = 0 UNLOADED RMS
= 1 WSF LOW HOVER, NOMINAL CAPTURE
= 2 WSF RAM CLEAN, AOPROC
= 3 WSF ADACS C/O
= 4 WSF RELEASE, WSF SVS
= 5 ORFEUS-SPAS LOW HOVER, RGPS LOW AND CONTINGENCY EVA
= 6 ORFEUS-SPAS RELEASE, CAPTURE
= 7 NOT USED
= 8 ORFEUS-SPAS SVS
= 9 LOADER RMS EVA

FLT PLN-1b/80/O/B
Purpose:

A2

DAP A 0 2

0.4 0 0 0

10  ROT RATE

0.4 0 0 0

11  ATT DB

0.2 0 0

12  RATE DB

0.1 0

13  ROT PLS

0.0 0 0

14  COMP

0.2 0 0

15  P OPTION

0.1 0

16  Y OPTION

0.1 0

17  TRAN PLS

ALT

0.2 0 0

18  RATE DB

ALL

19  JET OPT

2 20  #JETS

0.0 0

21  ON TIME

0.0 0

22  DELAY

VERN

0.4 0 0 0

23  ROT RATE

0.1 0 0 0

24  ATT DB

0.2 0 0

25  RATE DB

0.0 1 0

26  ROT PLS

0.0 0 0

27  COMP

0

28  CNTL ACC

FLT PLN-4a/80/O/A

A3

DAP A 0 3

0.2 0 0 0

10  ROT RATE

0.1 0 0

11  ATT DB

0.2 0 0

12  RATE DB

0.1 0

13  ROT PLS

0.0 0 0

14  COMP

0.2 0 0

15  P OPTION

T A I L

16  Y OPTION

0.1 0

17  TRAN PLS

ALT

0.2 0 0

18  RATE DB

ALL

19  JET OPT

2 20  #JETS

0.0 0

21  ON TIME

0.0 0

22  DELAY

VERN

0.0 0 0 0

23  ROT RATE

0.0 0 0

24  ATT DB

0.0 1 0

25  RATE DB

0.0 1 0

26  ROT PLS

0.0 0 0

27  COMP

0 0 28

C N T L  A C C

FLT PLN-5a/80/O/A

A4

DAP A 0 4

0.2 0 0 0

10  ROT RATE

0.1 0 0

11  ATT DB

0.2 0 0

12  RATE DB

0.1 0

13  ROT PLS

0.0 0 0

14  COMP

0.2 0 0

15  P OPTION

0.1 0

16  Y OPTION

0.1 0

17  TRAN PLS

ALT

0.2 0 0

18  RATE DB

ALL

19  JET OPT

2 20  #JETS

0.0 0

21  ON TIME

0.0 0

22  DELAY

VERN

0.0 0 0 0

23  ROT RATE

0.0 0 0

24  ATT DB

0.0 1 0

25  RATE DB

0.0 1 0

26  ROT PLS

0.0 0 0

27  COMP

0 0 28

C N T L  A C C

FLT PLN-5b/80/O/A

(reduced copy)

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**Purpose:**
- LOSS OF VERN (NOSE & TAIL)
- LOSS OF VERN (TAIL ONLY)
### DAP A12

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### DAP A13

**PURPOSE:**
WSF RAM CLEAN
AOPROC CLEAN
AOPROC

**NOTE:**
Change CNTL ACC to 3 for ADACS C/O

### DAP A14

**PURPOSE:**
WSF SVS TOP

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### FLT PLN-14a/80/O/B

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### FLT PLN-14b/80/O/B

### FLT PLN-15a/80/O/B

### FLT PLN-15b/80/O/B

### FLT PLN-80/Fin

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DAP B3

PURPOSE:
LOSS OF VERN
(NOSE & TAIL)

DAP B4

PURPOSE:
SSUS DEPLOY

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36  TAIL
37  .0.2
38  .0.70
39  TAIL
40  1
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42  .0.0
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46  .0.02
47  .0.0
48  1

FLT PLN-20a/80/C/A

B3

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FLT PLN-21a/80/C/A

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FLT PLN-25a/80/O/A

(reduced copy)
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- DB COLLAPSE W/O
- POSN HOLD
- RMS BO

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**FLT PLN-26a/80/O/A**

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- ORFEUS-SPAS
- NOMINAL
- DB COLLAPSE
- RMS PH

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<td>0.0</td>
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<td>48/68</td>
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FLT PLN-29b/80/O/B

(reduced copy)

7-16
B12

DAP B13
PURPOSE:
WSF RELEASE
STATIONARY RMS

FLT PLN-30a/80/O/B

B13

DAP B14
PURPOSE:
WSF SINGLE JOINT
CAPTURE
SVS SIDE

FLT PLN-31a/80/O/B

(reduced copy)
B14

2/4  DAP B 14
30/50  0.1 0 0 0
31/51  3.0 0
32/52  0.2 0
33/53  0.0 4
34/54  0.0 0
35/55  ALL
36/56  ALL
37/57  0.0 2
38/58  0.2 0 0
39/59  ALL
40/60  2
41/61  0.0 8
42/62  5.0 2
43/63  0.2 0 0
44/64  3.0 0 0
45/65  0.0 0
46/66  0.0 0 2
47/67  0.0 0
48/68  1

FLT PLN-32a/80/O/B

B15

2/4  DAP B 15
30/50  0.0 6 5 0
31/51  2.0 0
32/52  0.2 8
33/53  0.0 4
34/54  0.0 0
35/55  ALL
36/56  ALL
37/57  0.0 5
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 6 5 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

FLT PLN-33a/80/O/B

(reduced copy)

FLT PLN-32b/80/O/B

2/4  DAP B 15
30/50  0.1 0 0 0
31/51  3.0 0
32/52  0.2 0
33/53  0.0 4
34/54  0.0 0
35/55  ALL
36/56  ALL
37/57  0.0 2
38/58  0.2 0 0
39/59  ALL
40/60  2
41/61  0.0 8
42/62  5.0 2
43/63  0.2 0 0
44/64  3.0 0 0
45/65  0.0 0
46/66  0.0 0 2
47/67  0.0 0
48/68  4

FLT PLN-33b/80/O/A

FLT PLN/80/FIN
### UNIV PTG

**TGT ID**
- 1 Orbiting Vehicle
- 2 Earth ctr
- 3 Earth tgt
  - Input LAT (±90)
  - LON (±180, + = East)
  - ALT (−3444.0 to 20000.0 nm)
- 4 Sun ctr
- 5 Celestial tgt
  - Input RA (0–359.99)
  - DEC (±90)
- 11–110 Nav Stars

**BODY VECT**
- 1 +X*
- 2 −X*
- 3 −Z*
- 4 −Y Star Tracker*
- 5 Optional
  - Input P (0–359.99)
  - Y (270–359.99, 0–90)
- *Input OM →
  - OM (0–359.99)

**MON AXIS**
- 1 +X
- 2 −X

---

**FLT PLN–35/80/O/A**

FLT PLN–35/80/O/A is mounted on the back of the DAP Book

(reduced copy)

7–19

FLT PLN/80/FIN
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FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

Orbiter: OV102/Columbia
Inclination: 28.5°
Insertion Altitude: 190 nm
Duration: 16 + 2 days

B. MAJOR EVENTS

<table>
<thead>
<tr>
<th>EVENT</th>
<th>MET</th>
<th>DATE</th>
<th>CST</th>
<th>GMT</th>
<th>ΔV</th>
<th>HA/HP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Launch</td>
<td>00/00:00</td>
<td>11/08/96</td>
<td>13:47</td>
<td>312/19:47</td>
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<td>--</td>
</tr>
<tr>
<td>OMS-2</td>
<td>00/00:43</td>
<td>11/08/96</td>
<td>14:30</td>
<td>312/20:30</td>
<td>277</td>
<td>190/191</td>
</tr>
<tr>
<td>SPAS Deploy</td>
<td>00/07:00</td>
<td>11/08/96</td>
<td>20:47</td>
<td>313/02:47</td>
<td>--</td>
<td>190/192</td>
</tr>
<tr>
<td>WSF Deploy</td>
<td>03/05:15</td>
<td>11/11/96</td>
<td>19:02</td>
<td>316/01:02</td>
<td>--</td>
<td>189/192</td>
</tr>
<tr>
<td>WSF Grapple</td>
<td>06/09:17</td>
<td>11/14/96</td>
<td>23:04</td>
<td>319/05:04</td>
<td>--</td>
<td>188/193</td>
</tr>
<tr>
<td>EVA 1</td>
<td>09/06:30</td>
<td>11/17/96</td>
<td>20:17</td>
<td>322/02:17</td>
<td>--</td>
<td>--</td>
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<tr>
<td>EVA 2</td>
<td>11/07:00</td>
<td>11/19/96</td>
<td>20:47</td>
<td>324/02:47</td>
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<td>--</td>
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<tr>
<td>SPAS Grapple</td>
<td>13/10:35</td>
<td>11/22/96</td>
<td>00:22</td>
<td>326/06:22</td>
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<td>186/193</td>
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<tr>
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<td>15/15:44</td>
<td>11/24/96</td>
<td>05:31</td>
<td>328/11:31</td>
<td>304</td>
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<tr>
<td>Landing</td>
<td>15/16:44</td>
<td>11/24/96</td>
<td>06:31</td>
<td>328/12:31</td>
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C. LANDING OPPORTUNITIES

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<th>Landing Orbit</th>
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<th>MET</th>
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<tr>
<td>Primary</td>
<td>248</td>
<td>KSC</td>
<td>07:31</td>
</tr>
<tr>
<td>1 Rev Late</td>
<td>249</td>
<td>KSC</td>
<td>09:08</td>
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<tr>
<td>1 Day Late</td>
<td>264</td>
<td>KSC</td>
<td>07:58</td>
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<td>KSC</td>
<td>09:34</td>
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<td>279</td>
<td>KSC</td>
<td>06:47</td>
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<tr>
<td>1 Rev Late</td>
<td>280</td>
<td>KSC</td>
<td>08:23</td>
</tr>
</tbody>
</table>

D. CREW

CDR - Ken Cockrell
PLT - Kent Rominger
MS1 - Tammy Jernigan (EV1)
MS2 - Tom Jones (EV2)
MS3 - Story Musgrave (IV)

E. COMMUNICATIONS

SHUTTLE
TDRS Support: East (41° W), West (174° W), Z (85° E)
Backup Realtime TV: GDS(GDX) and MIL(MLX)
Contingency GSTDN: DFR*, MIL(MLX)*, BDA(BDX), and GDS(GDX)
Contingency RTS: HTS, GTS, VTS, CTS, and DGS

*UHF capability

Lead time for site call-up: GSTDN - 2 hr, RTS - 4 hr
F. PAYLOADS

1. Orbiting Retrievable Far and Extreme Ultraviolet Spectrometer (ORFEUS) – Shuttle Pallet Satellite (SPAS) II

The ORFEUS/SPAS II is an RMS-deployable free flying payload. The payload will carry the ORFEUS telescope to observe targets in the far and extreme ultraviolet wavelengths, the Interstellar Medium Absorption Profile Spectograph (IMAPS) to study the properties of stars and the interstellar medium, the Passive Surface Effects Sample Monitor (SESAM) the Automated Rendezvous Preparatory Program GPS Receiver (ARP), and the Students' Experiment on ASTRO–SPAS (SEAS). Following deploy, the SPAS will be controlled by the ground through the orbiter payload interrogator (PI) and the extended range payload communications link (ERPCL).

2. Wake Shield Facility (WSF) – 3

The WSF payload consists of an RMS-deployable free flyer experiment platform, a cross-bay carrier structure, and four “smart” canisters mounted on the carrier. The WSF is controlled by the ground using the WSF provided communications link. As a backup to the ground, the crew may control the WSF using a PGSC. While deployed, the free flyer creates a wake which provides a high vacuum environment essential to Molecular Beam Epitaxy (MBE) and Chemical Beam Epitaxy (CBE) thin film growth. During free flight, WSF uses processing equipment to grow GaAs and GaAsSi thin films within this vacuum wake. The WSF MBE growths are extremely sensitive to contamination so they are scheduled after WSF has separated from the orbiter. Post-retrieval, the Atomic Oxygen Processor (AOPROC) test will be performed with the WSF free flyer on the RMS.

3. Commercial Materials Dispersion Apparatus Instrumentation Technology Associates Experiment (CMIX), Configuration B

The CMIX is a collection of experiments housed within a Commercial Refrigerator Incubator Module (CRIM), replacing a middeck locker. The CRIM contains several Materials Dispersion Apparatus (MDA) minilab units designed to mix a variety of fluids in the microgravity environment. In addition, the CMIX payload will contain several Bioprocessing Modules (BPMs) and Liquid Mixing Apparatuses (LMAs). The BPMs and LMAs are designed to mix fluids to perform various microgravity experiments.


The PARE/NIH–R is a series of experiments designed to determine whether exposure to microgravity results in physiological or anatomical changes in rodents. The experiment consists of rodents in two animal enclosure modules (AEMs) each of which will occupy one middeck locker. The crew will observe the health of the rodents daily and will refill the water reservoir as required.

5. Visualization in an Experimental Water Capillary Pumped Loop (VlEW–CPL)

This payload will investigate the operation of a capillary pumped loop (CPL) in a microgravity environment through the use of a capillary evaporator with a window for flow visualization.
6. Cell Culture Module, Configuration A (CCM-A)

The objective of CCM-A is to validate models of muscle, bone, and endothelial biochemical and functional loss induced by microgravity stress. The crew is required to activate a time tag at the beginning and end of the mission.

7. Biological Research in Canister (BRIC) block I

The BRIC payload is designed to investigate the effects of spaceflight on small plant specimens. There are no crew activities required for this payload.

8. Midcourse Space Experiment (MSX) – payload of opportunity

Orbiter thruster firings will be used as a sensor calibration and evaluation target for the space-based ultraviolet, infrared, and visible sensors on the MSX.

G. ON-ORBIT RMEs

GPS Relative Navigation Experiment (RGPS) (RME 1311)

The objectives of RME 1311 are to support validation of the GPS models in ESA's ATV ground verification facilities, to demonstrate the performance of real-time relative GPS using GPS data from the ORFEUS-SPAS and data from GPS hardware on the orbiter, to learn the effect of common satellite versus non-common satellite tracking between different GPS receivers, to gain experience in passing GPS data, to gain insight into the usable ranges for relative GPS, and to provide a relative GPS environment utilizing the planned ATV GPS receiver and a GPS receiver of measurement type and accuracy comparable to the planned ISS GPS receiver.

H. ON-ORBIT DTOs

1. ET TPS Performance, Method 1 (DTO 312)

Cameras located in the orbiter umbilical well will be used to obtain photographs of the ET after separation.

2. Portable In-Flight Landing Operations Trainer (PILOT) (DTO 667)

This DTO consists of a laptop PC with landing software and a spare rotational hand controller (essentially a landing simulator). The DTO will attempt to verify that the simulator can assist the CDR and PLT in maintaining a high level of proficiency for approach and landing on EDO missions.

*3. EVA Hardware for Future Scheduled EVA Missions, Test 13, End-to-End Maintenance & Assembly Evaluation (DTO 671)

The main objective of this DTO is to demonstrate International Space Station on-orbit, end-to-end EVA assembly, and maintenance operations.

4. Orbiter Space Vision System (OSVS) Flight Video Taping (DTO 700-10)

The purpose of this DTO is to record camera video of special targets under varying on-orbit conditions to support OSVS development.
5. Orbiter Space Vision System (OSVS) Flight Unit Testing (DTO 700-11)

The purpose of this DTO is to evaluate the operation and performance of OSVS in conjunction with the orbiter closed circuit television (CCTV) system and crew operations in the on-orbit environment. The OSVS will collect data during the payload unberth, deploy, retrieve, and berth operations.

*6. EMU Thermal Comfort & EVA Worksite Thermal Environment Evaluation (DTO 833)

The objective of this DTO is to support the development of an improved thermal model of the EMU.

7. Handheld Lidar (HHL) Procedures (DTO 840)

This DTO will use the handheld laser rangefinder to aid the crew during deploy and rendezvous phases.

*These DTOs comprise EDFT-05

I. ON-ORBIT DSOs

1. Inter-Mars Tissue Equivalent Proportional Counter (ITEPC) (DSO 482)

This DSO consists of two units, each consisting of a spectrometer, radiation detector, data storage board, and support electronics mounted on an adaptive payload carrier (APC) on the sidewall of the payload bay. The purpose of the experiment is to demonstrate the ability of the hardware to withstand the radiation environment for future EVAs, as well as single event upset data.
Total 411
(09/27/96 - CFERNAND)

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