

FLIGHT DATA FILE

Flight Plan

STS-32

(Cycle 2 Trajectory)

Mission Operations Directorate
Operations Division

Basic
July 27, 1989

| EVENT | CST | | |
|----------------|-------|-----|--------|
| Launch | 13:17 | Mon | Nov 13 |
| SYNCOM Deploy | 13:48 | Tue | Nov 14 |
| LDEF Retrieval | 14:55 | Thu | Nov 16 |
| EDW Landing | 10:23 | Thu | Nov 23 |

95
6 ✓
3 ✓
5 ✓
4 ✓
32 ✓



National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

MISSION OPERATIONS DIRECTORATE

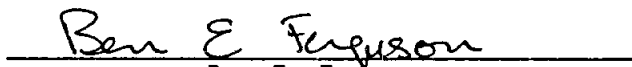
STS-32 FLIGHT PLAN

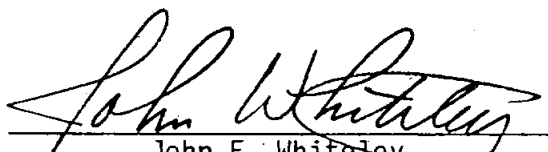
BASIC
July 27, 1989


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STS-32 FLT PLN CUE CARDS

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| DAP Book Front Cover.....* | 8-4 | FLT PLN/32/O/BAS |
| UNIV PTG (Back of DAP Book Front Cover).....* | 8-4 | FLT PLN/32/O/BAS |
| DAP A TOC.....* | 8-5 | FLT PLN/32/O/BAS |
| DAP A1.....* | 8-5 | FLT PLN/32/O/BAS |
| A1.....* | 8-5 | FLT PLN/32/O/BAS |
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| DAP A4.....* | 8-7 | FLT PLN/32/O/BAS |
| A4.....* | 8-7 | FLT PLN/32/O/BAS |
| DAP A5.....* | 8-7 | FLT PLN/32/O/BAS |
| A5.....* | 8-7 | FLT PLN/32/O/BAS |
| DAP A6.....* | 8-8 | FLT PLN/32/O/BAS |
| A6.....* | 8-8 | FLT PLN/32/O/BAS |
| DAP A7.....* | 8-8 | FLT PLN/32/O/BAS |
| A7.....* | 8-8 | FLT PLN/32/O/BAS |
| DAP A8.....* | 8-9 | FLT PLN/32/O/BAS |
| A8.....* | 8-9 | FLT PLN/32/O/BAS |
| DAP A9.....* | 8-9 | FLT PLN/32/O/BAS |
| A9.....* | 8-9 | FLT PLN/32/O/BAS |
| DAP A10.....* | 8-10 | FLT PLN/32/O/BAS |
| A10.....* | 8-10 | FLT PLN/32/O/BAS |
| DAP A11.....* | 8-10 | FLT PLN/32/O/BAS |
| A11.....* | 8-10 | FLT PLN/32/O/BAS |
| DAP A12.....* | 8-11 | FLT PLN/32/O/BAS |
| A12.....* | 8-11 | FLT PLN/32/O/BAS |
| DAP A13.....* | 8-11 | FLT PLN/32/O/BAS |
| A13.....* | 8-11 | FLT PLN/32/O/BAS |
| (Blank).....* | 8-12 | FLT PLN/32/O/BAS |
| DAP B TOC.....* | 8-12 | FLT PLN/32/O/BAS |
| DAP B1.....* | 8-12 | FLT PLN/32/O/BAS |
| B1.....* | 8-12 | FLT PLN/32/O/BAS |
| DAP B2.....* | 8-13 | FLT PLN/32/O/BAS |
| B2.....* | 8-13 | FLT PLN/32/O/BAS |
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| B5.....* | 8-14 | FLT PLN/32/O/BAS |
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| B6.....* | 8-15 | FLT PLN/32/O/BAS |
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| DAP Book (Back Cover).....* | 8-18 | FLT PLN/32/O/BAS |

(*) - Omit from flight book

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INTRODUCTION

The STS-32 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, Rendezvous, Deorbit Prep, and Entry Checklists. The detailed deploy procedures required during the deploy timeframe are in the SYNCOM Deploy Checklist. The detailed rendezvous timelines and procedures are in the Rendezvous Checklist. For continuity, the entire flight is shown in the summary level timeline.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive and the requirements of the STS-32 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the Cycle 2/Basic version of the STS-32 Flight Initialization Data Pack.

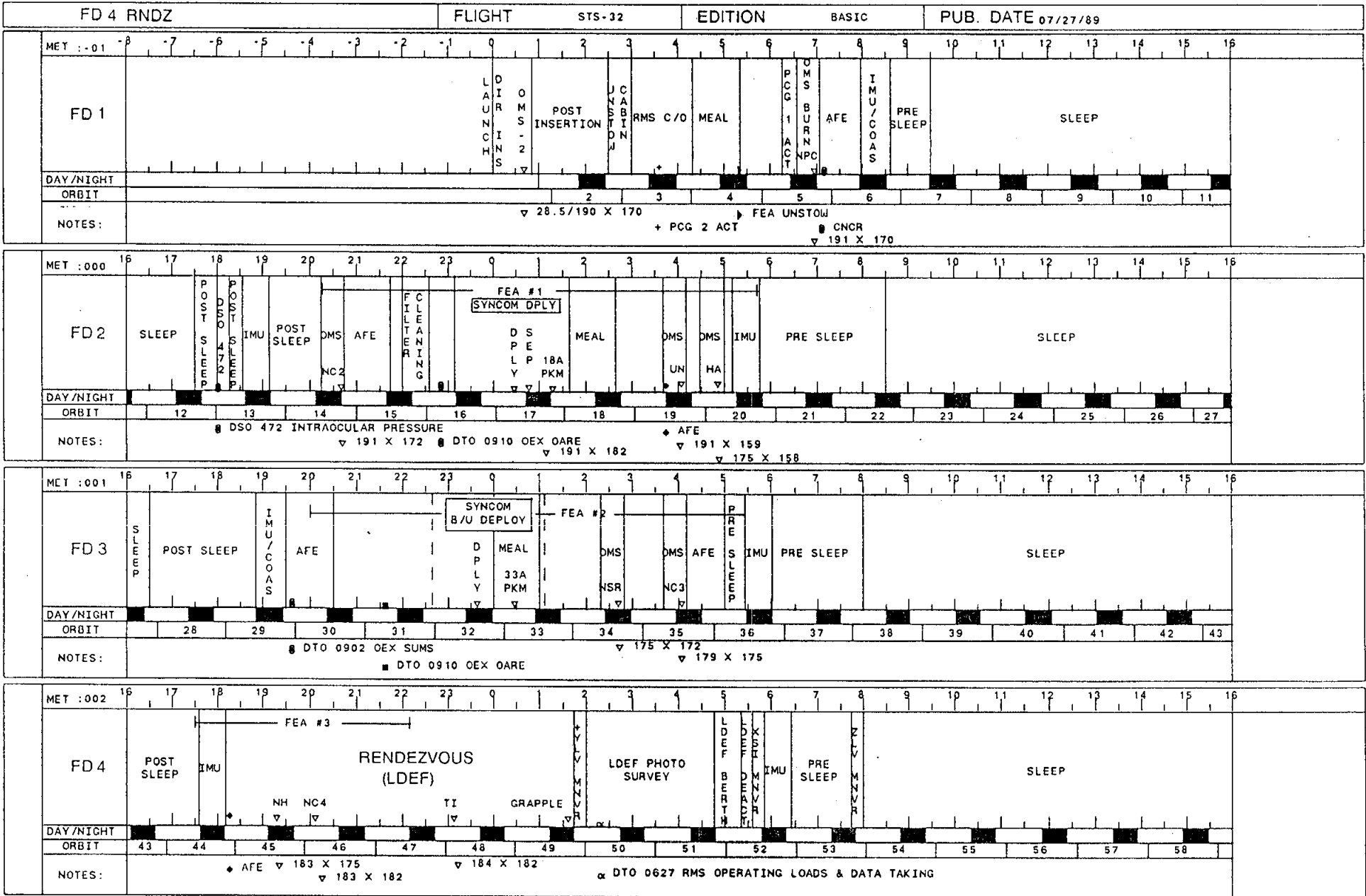
The flight profile used for this Flight Plan is for a launch date of November 13, 1989, at 13:17 CST. Orbiter inertial attitudes are expressed relative to a Mean of 1950 (M50) reference frame.

JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, March 1987, 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, Revision B, May 25, 1987.

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STS-32 OVERVIEW



| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----------------------------------|----|-----|------------|----------|-----------|----|------|----|----|--------|----|-----------|-----|-----------|-------|---|---|----|----|----|----|----|------------|----|--|--|--|
| MET :003 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD 5 | POST SLEEP | | IMU | POST SLEEP | LS SETUP | CREW CONF | | MEAL | | | FEA #5 | | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | POST SLEEP | | | | |
| DAY/NIGHT | [Pattern of black and white bars] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | | | | | | | | | | | | |
| NOTES: | ◆ AFE | | | | | | | | | | | | | | | | | | | | | | | | | | | |

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|-----------|-----------------------------------|-----|------------|-----|----|--------|--------------|------|----|----|-----|-----------|-----|-----------|-------|----|---|---|----|----|----|----|------------|-----|----|--|--|--|
| MET :004 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD 6 | POST SLEEP | IMU | POST SLEEP | AFE | | FEA #4 | FILE TANNING | MEAL | | | AFE | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | POST SLEEP | IMU | | | | |
| DAY/NIGHT | [Pattern of black and white bars] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|-----|---------|---------|-----|-----|------|---------|---------|-----|-----|-----|-----------|-------|-----|-----|---|---|----|----|----|------------|----|----|----|--|--|--|
| MET :005 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD 7 | POST SLEEP | IMU | DSO 478 | DSO 478 | MLE | MLE | MEAL | DSO 478 | DSO 478 | | AFE | IMU | PRE SLEEP | SLEEP | | | | | | | | POST SLEEP | | | | | | |
| DAY/NIGHT | [Pattern of black and white bars] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | | | | | | | | | | | | |
| NOTES: | ■ LBNP (MS1) ■ LBNP (MS1) ■ LBNP (MS3) *MLE *MLE ■ WASTE H2O DUMP | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-----------------------------------|----------------|-----|-----|-----|------|-----|-----|--------|-----|-----------|-----|-----------|-------|-----|---|---|---|----|----|----|------------|-----|------------|----|--|--|--|
| MET :006 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD 8 | IMU | DSO 478 (SOAK) | | | | MEAL | | | FEA #7 | AFE | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | POST SLEEP | IMU | POST SLEEP | | | | |
| DAY/NIGHT | [Pattern of black and white bars] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | | | | | | | | | | | | | |
| NOTES: | ■ LBNP (MS1) | | | | | | | | | | | | | | | | | | | | | | | | | | | |

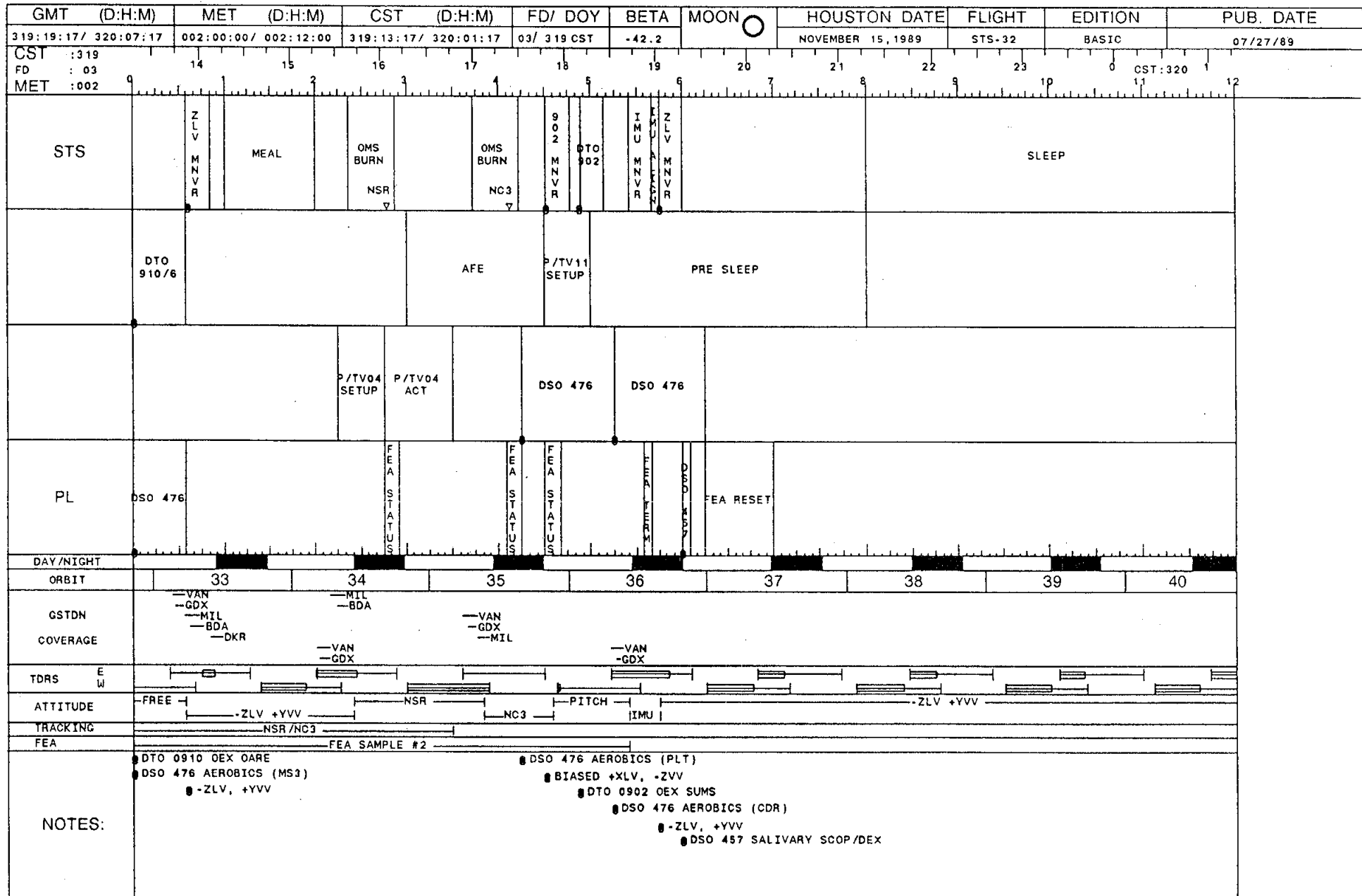
| FD4 RNDZ | | | FLIGHT STS-32 | | | EDITION BASIC | | | PUB. DATE 07/27/89 | | | | | | | | | | | | | | | | | | | |
|-----------|---|----------------|---------------|-----|---------|---------------|------------|---------|--------------------|-----------|-----------|-----------|-------|-----|-----|-----|---|---|----|----|----|------------|------------|------------|----|--|--|--|
| MET :007 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD9 | DSO 478 | DSO 478 (SOAK) | | | | MEAL | | DSO 473 | AFE | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | | | POST SLEEP | IMU | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | | | | | | | | | | | | |
| NOTES: | LBNP (MS1) FEA STOW LBNP (MS3) DSO 473 DELAYED TYPE HYPERSENSITIVITY | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :008 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD10 | FCS C/O | HOT FIRE | DSO 478 | AFE | MEAL | PCG 1 DEACT | CABIN STOW | | | IMU | PRE SLEEP | SLEEP | | | | | | | | | | POST SLEEP | IMU | POST SLEEP | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | | | | | | | | | | | | |
| NOTES: | LBNP (MS3) AFE STOW IMAX STOW L3 STOW PCC2 DEACT | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :009 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | |
| FD11 | DEORBIT PREP | | | | DEORBIT | | LANDING | | | | | | | | | | | | | | | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

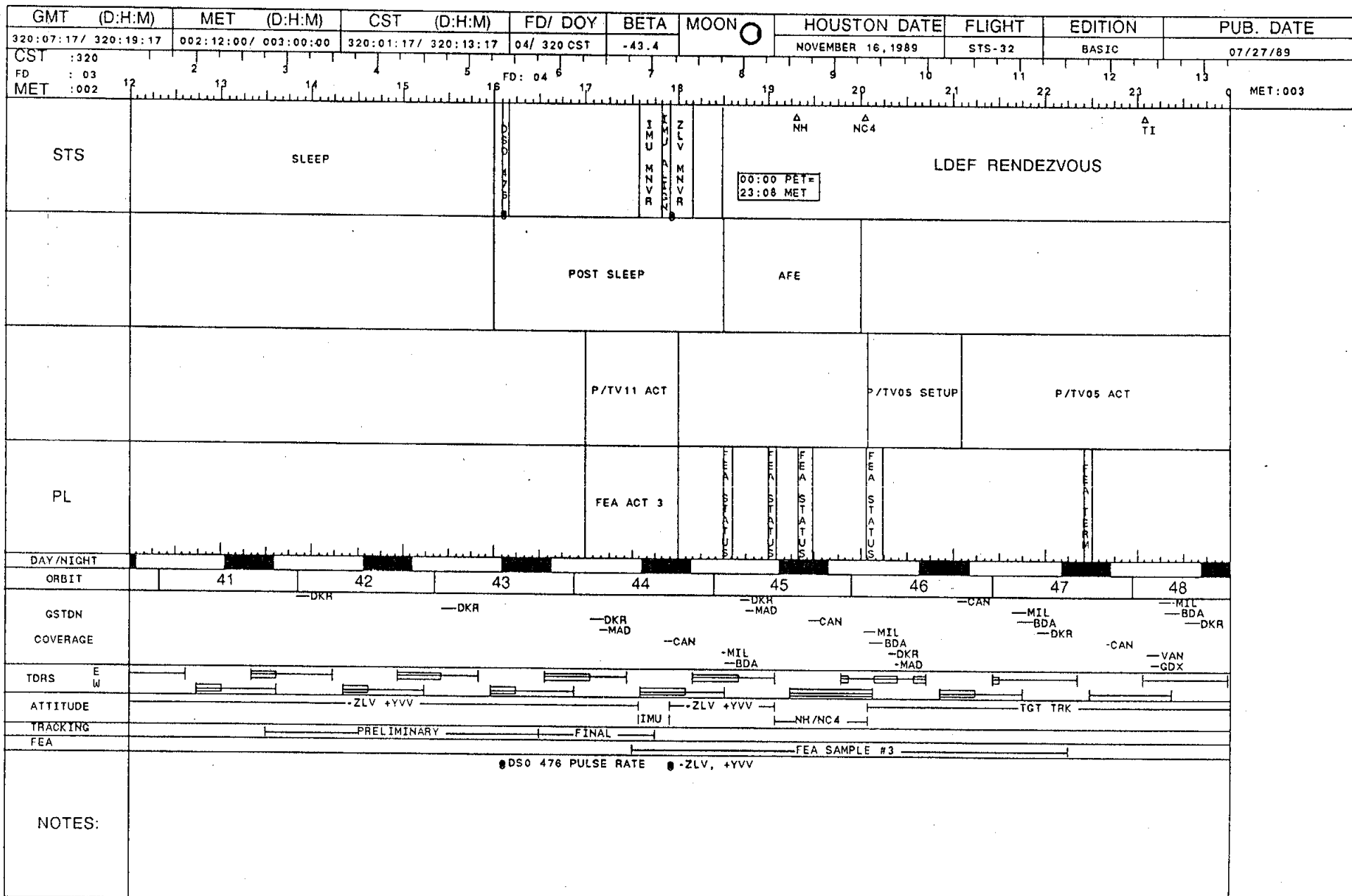
SUMMARY TIMELINE

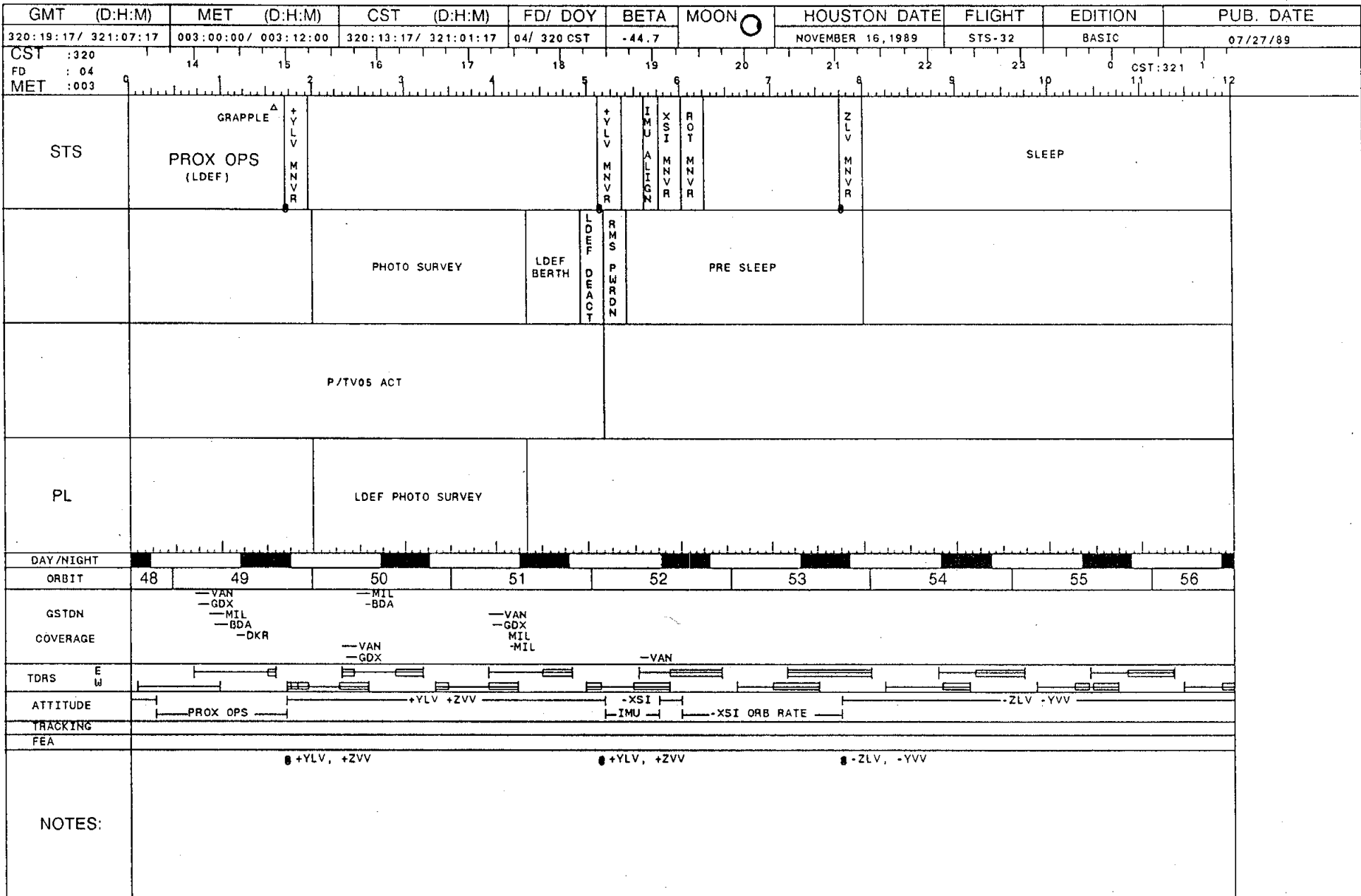
| GMT (D:H:M) | | MET (D:H:M) | | CST (D:H:M) | | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------|---|-----------------------|--|-----------------------|--|--------------|-------|--------|-------------------|--------|---------|-----------|--|
| 318:07:17 / 318:19:17 | | 000:12:00 / 001:00:00 | | 318:01:17 / 318:13:17 | | 02 / 318 CST | -37.3 | ☉ | NOVEMBER 14, 1989 | STS-32 | BASIC | 07/27/89 | |
| CST : 318 | | | | | | | | FD: 02 | | | MET:001 | | |
| FD : 01 | | | | | | | | | | | | | |
| MET : 000 | | | | | | | | | | | | | |
| STS | SLEEP | | | | | | | | | | | | |
| | POST SLEEP | | | | | | | | | | | | |
| | AFE | | | | | | | | | | | | |
| | FILTER CLEANING | | | | | | | | | | | | |
| | DTO 910/5 | | | | | | | | | | | | |
| | P/TV02 SETUP | | | | | | | | | | | | |
| | P/TV02 | | | | | | | | | | | | |
| | P/TV11 SETUP | | | | | | | | | | | | |
| | P/TV11 ACT | | | | | | | | | | | | |
| | DSO 472 | | | | | | | | | | | | |
| PL | FEA ACT 1 | | | | | | | | | | | | |
| DAY/NIGHT | ORBIT | | | | | | | | | | | | |
| ORBIT | 9 10 11 12 13 14 15 16 | | | | | | | | | | | | |
| GSTDN COVERAGE | -DKR -DKR -DKR -MAD -CAN -MIL -BDA -DKR -CAN | | | | | | | | | | | | |
| TDRS | E W | | | | | | | | | | | | |
| ATTITUDE | -ZLV +YVV | | | | | | | | | | | | |
| TRACKING | NC2 IMU INC2 -ZLV +XVV -FREE | | | | | | | | | | | | |
| FEA | PRELIMINARY FINAL FEA SAMPLE #1 | | | | | | | | | | | | |
| NOTES: | ● DSO 476 PULSE RATE ● DSO 471 APC (AIR SAMPLER) ● DTO 0910 OEX OARE ● DSO 457 SALIVARY SCOP/DEX ● -ZLV, +XVV ● DSO 472 INTRAOCULAR PRESSURE ● -ZLV, +YVV | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|-------------|-------|------|-------------------|--------|---------|-----------|
| 318:19:17 / 319:07:17 | 001:00:00 / 001:12:00 | 318:13:17 / 319:01:17 | 02/ 318 CST | -39.0 | ☉ | NOVEMBER 14, 1989 | STS-32 | BASIC | 07/27/89 |
| CST :318 | | | | | | | | | |
| FD :02 | | | | | | | | | |
| MET :001 | | | | | | | | | |
| STS | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | | | | | | | | | |
| GSTDN COVERAGE | | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| TRACKING | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | <p> ● DSO 457 SALIVARY SCOP/DEX ● -ZLV, +YVV ● DSO 476 AEROBICS (MS3) ● DSO 476 AEROBICS (PLT) ● -ZLV, +YVV ● DSO 476 AEROBICS (CDR) </p> | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|----------------------|--|----------------------|-------------|-----------|------|---------------------|--------|---------------------|-----------|
| 319:07:17/ 319:19:17 | 001:12:00/ 002:00:00 | 319:01:17/ 319:13:17 | 03/ 319 CST | -40.7 | ☉ | NOVEMBER 15, 1989 | STS-32 | BASIC | 07/27/89 |
| CST :319 | | | | | | | | | |
| FD : 02 | | | | | | | | | |
| MET :001 | | | | FD: 03 | | | | | MET:002 |
| STS | SLEEP | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | |
| GSTDN | | -DKR | -DKR | | | | | | |
| COVERAGE | | | | -DKR -MAD | CAN | -MIL -BDA -DKR -MAD | -CAN | -VAN -MIL -BDA -DKR | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| TRACKING | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | ● DSO 476 PULSE RATE ● FWD STATION ● -ZLV, +XVV ● -ZLV, +XVV ● DSO 457 SALIVARY SCOP/DEX ● DTO 0910 OEX OARE (PITCH) ● BIASED +XLV, +ZVV ● DTO 0910 OEX OARE (YAW) ● DTO 0902 OEX SUMS ● DTO 0910 OEX OARE (ROLL) ● -ZLV, +XVV ● +XLV, +ZVV ● DTO 0910 OEX OARE ● DSO 476 AEROBICS (MS) | | | | | | | | |







| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | |
|----------------------|---|----------------------|-------------|---------|----------|-------------------|---------------------|----------------|------------|--------------|--------------------------|--------|--------------|------|
| 321:07:17/ 321:19:17 | 003:12:00/ 004:00:00 | 321:01:17/ 321:13:17 | 05/ 321 CST | -45.8 | ☉ | NOVEMBER 17, 1989 | STS-32 | BASIC | 07/27/89 | | | | | |
| CST :321 | | | | | | | | | | | | | | |
| FD :04 | | | | | | | | | | | | | | |
| MET :003 | | | | | | | | | MET:004 | | | | | |
| STS | SLEEP | | DSO 476 | RAOS HI | IMU MNRV | IMU ALIGN | ZLV MNRV | L3 SETUP | SV UPDATE | L3 OBS | CREW CONL | L3 OBS | DSO 476 | MEAL |
| PL | POST SLEEP | | | | | | | P/TV13 SETUP | P/TV13 ACT | | | | DSO 476 | |
| DAY/NIGHT | | | | | | | | AFE | VTR SETUP | VTR PLAYBACK | | | P/TV11 SETUP | |
| ORBIT | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | | | | | |
| GSTDN COVERAGE | -DKR | -DKR | -DKR -MAD | -CAN | -MAD | -CAN | -MIL -BDA -DKR -MAD | -MIL -BDA -DKR | -DKR | | | | | -DKR |
| TDRS E W | | | | | | | | | | | | | | |
| ATTITUDE | | | -ZLV -YVV | | | | | | | | | | | |
| TRACKING | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | |
| NOTES: | ● DSO 476 PULSE RATE ● -ZLV, -YVV ● DSO 457 SALIVARY SCOP/DEX | | | | | | | | | | ● DSO 476 AEROBICS (MS3) | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|--------------|-------|------|-------------------|--------|---------|-----------|
| 321:19:17 / 322:07:17 | 004:00:00 / 004:12:00 | 321:13:17 / 322:01:17 | 05 / 321 CST | -46.6 | ☉ | NOVEMBER 17, 1989 | STS-32 | BASIC | 07/27/89 |
| CST :321 | | | | | | | | | |
| FD : 05 | | | | | | | | | |
| MET :004 | | | | | | | | | |
| STS | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| GSTDN COVERAGE | | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| TRACKING | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | <p>● DSO 457 SALIVARY SCOP/DEX ● DSO 476 AEROBICS (PLT) ● DSO 476 AEROBICS (CDR)</p> | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|-----------------------|-----------------------|--------------|-------|------|-------------------|--------|-----------------|-----------|
| 322:07:17 / 322:19:17 | 004:12:00 / 005:00:00 | 322:01:17 / 322:13:17 | 06 / 322 CST | -47.3 | | NOVEMBER 18, 1989 | STS-32 | BASIC | 07/27/89 |
| CST : 322 | | | | | | | | | |
| FD : 05 | | | | | | | | | |
| MET : 004 | | | | | | | | | MET:005 |
| STS | SLEEP | | | | | | | | |
| | | | POST SLEEP | | | AFE | | FILTER CLEANING | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| GSTDN | | | | | | | | | |
| COVERAGE | | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| TRACKING | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------------|---|----------------------|-------------|-----------|----------|-------------------|----------|---------|-----------|--|
| 322:19:17/ 323:07:17 | 005:00:00/ 005:12:00 | 322:13:17/ 323:01:17 | 06/ 322 CST | -47.7 | ☾ | NOVEMBER 18, 1989 | STS-32 | BASIC | 07/27/89 | |
| CST :322 :06 MET :005 | | | | | | | | | | |
| STS | L3 OBS | | L3 OBS | L3 OBS | IMU MNVR | IMU ALIGN | ZLV MNVR | SLEEP | | |
| | DSO 476 | | FEA RESET | PRE SLEEP | | | | | | |
| | PSET/TV04 | | P/TV04 ACT | | | | | | | |
| PL | AFE | | DSO 476 | | | | | | | |
| DAY/NIGHT | | | | | | | | | | |
| ORBIT | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | | |
| GSTDN COVERAGE | | | | | | | | | | |
| TORS | | | | | | | | | | |
| ATTITUDE | | | | | | | | | | |
| TRACKING | | | | | | | | | | |
| FEA | | | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● -ZLV, -YVV ● DSO 476 AEROBICS (PLT) ● DSO 457 SALIVARY SCOP/DEX | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|-----------------------|-----------------------|--------------|-------|------|-------------------|--------|---------|-----------|
| 323:07:17 / 323:19:17 | 005:12:00 / 006:00:00 | 323:01:17 / 323:13:17 | 07 / 323 CST | -48.0 | ☾ | NOVEMBER 19, 1989 | STS-32 | BASIC | 07/27/89 |
| CST : 323 | | | | | | | | | |
| FD : 06 | | | | | | | | | |
| MET : 005 | | | | | | | | | |
| STS | SLEEP | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | |
| GSTDN | | | | | | | | | |
| COVERAGE | | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| TRACKING | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------|--|-----------------------|--------------|-------------|-----------|-------------------|--------|---------|-----------|--|
| 323:19:17 / 324:07:17 | 006:00:00 / 006:12:00 | 323:13:17 / 324:01:17 | 07 / 323 CST | -48.0 | | NOVEMBER 19, 1989 | STS-32 | BASIC | 07/27/89 | |
| CST :323 | | | | | | | | | | |
| FD : 07 | | | | | | | | | | |
| MET :006 | | | | | | | | | | |
| STS | L3 OBS | L3 OBS | L3 OBS | IMU M N V R | IMU ALIGN | ZLV M N V R | SLEEP | | | |
| | AFE | DSO 476 | PRE SLEEP | | | | | | | |
| | P/TV11 SETUP | P/TV11 ACT | | | | | | | | |
| PL | DSO 476 | FEA ACT 6 | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | |
| ORBIT | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | | |
| GSTDN COVERAGE | -VAN -GD -MIL -BDA | | -VAN | | | | | | -DKR | |
| TDRS | | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | IMU | | -ZLV -YVV | | | | | |
| TRACKING | | | | | | | | | | |
| FEA | -FEA SAMPLE #6- | | | | | | | | | |
| NOTES: | <ul style="list-style-type: none"> ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | | | |
|----------------------|---|----------------------|--------------|--------------|----------------------|-------------------|---------------|------------------------------|--------------------------------------|----------------------|--------------|-----------|-----------------|------------|---------------|-----------|---------------|--|
| 324:07:17/ 324:19:17 | 006:12:00/ 007:00:00 | 324:01:17/ 324:13:17 | 08/ 324 CST | -47.9 | | NOVEMBER 20, 1989 | STS-32 | BASIC | 07/27/89 | | | | | | | | | |
| CST :324 | | | | | | | | | | | | | | | | | | |
| FD :07 | | | | | | | | | | | | | | | | | | |
| MET :006 | | | | | | | | | MET:007 | | | | | | | | | |
| STS | SLEEP | DUMP MNV R | WASTE DUMP | IMU MNV R | IMU ALIGN | ZLV MNV R | SV UPDATE | L3 OBS | L3 OBS | RADS NORM | L3 OBS | L3 OBS | MEAL | AS MNTN | L3 OBS | L3 OBS | | |
| | | | POST SLEEP | | | P/TV08 SETUP | P/TV08 ACT | | | P/TV08 ACT | | | P/TV08 ACT | | | | | |
| | | | | | | P/TV04 SETUP | P/TV04 ACT | | | FEA RESET | | | P/TV11 SETUP | | P/TV11 ACT | | AFE | |
| PL | | | | | | | | | | | | | | | | | FEA STATUS | |
| | | | | | | | | | | | | | | | | | | |
| DAY/NIGHT | █ | | █ | | █ | | █ | | █ | | █ | | █ | | █ | | █ | |
| ORBIT | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | | | | | | | | | | |
| GSTDN COVERAGE | -DKR | -DKR -MAD | -DKR -MAD | -CAN -MIL | -BDA -DKR -MAD | -MAD | -CAN | -VAN -MIL -BDA -DKR | -VAN -GDX -MIL -BDA -DKR | -MIL -BDA -DKR | -VAN -GDX | | | | | | | |
| TDRS E W | | | | | | | | | | | | | | | | | | |
| ATTITUDE | | | | | | | | | | | | | | | | | | |
| TRACKING | | | | | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | | | | | |
| NOTES: | <ul style="list-style-type: none"> ● DSO 476 PULSE RATE ● WASTE DUMP MNVR ● DSO 471 APC (AIR SAMPLER) ● -ZLV, -YVV ● DSO 478 LBNP (MS1) — FEA SAMPLE #7 — | | | | | | | | | | | | | | | | | |

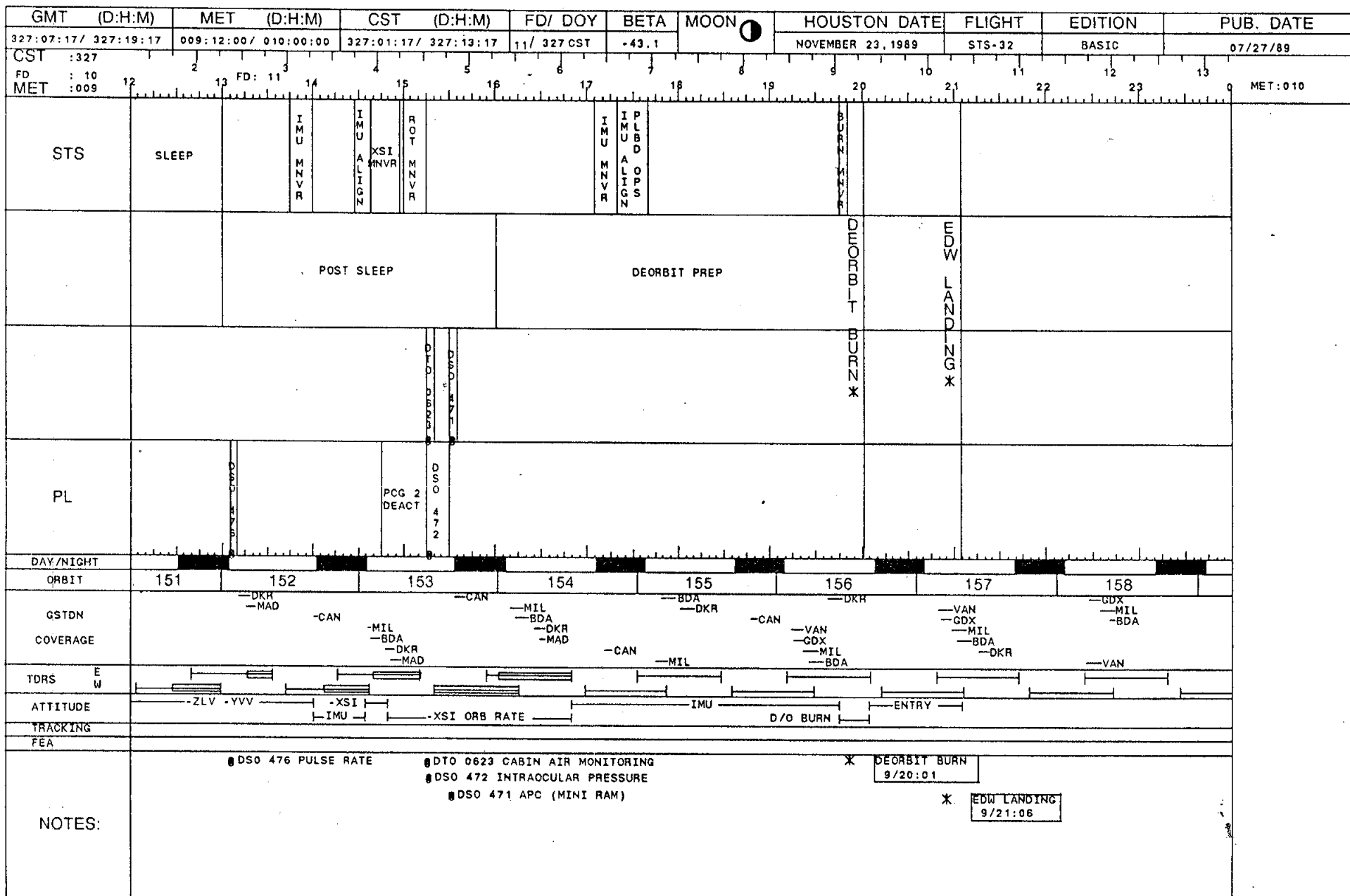
| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|-----------------|--------------|-----------------|-------------------|--------|---------|-----------|
| 324:19:17 / 325:07:17 | 007:00:00 / 007:12:00 | 324:13:17 / 325:01:17 | 08/ 324 CST | -47.5 | | NOVEMBER 20, 1989 | STS-32 | BASIC | 07/27/89 |
| CST :324 | | | | | | | | | |
| FD : 08 | | | | | | | | | |
| MET :007 | | | | | | | | | |
| STS | L3 OBS | L3 OBS | IMU MNV R | IMU ALIGN | ZLV MNV R | | | | SLEEP |
| | DSO 476 | | | | | | | | PRE SLEEP |
| | AFE | | | | | | | | DSO 476 |
| PL | FEA STATUS | FEA STATUS | FEA STATUS | FEA TERM | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | |
| GSTDN COVERAGE | -VAN -GD -MIL | | -VAN -GD | | -VAN | | | | -DKR |
| TDRS E W | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | IMU | | | -ZLV -YVV | | | |
| TRACKING | | | | | | | | | |
| FEA | FEA SAMPLE #7 | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------|-----------------------|-----------------------|----------------|--------------------|------|---------------------|----------------|---------|---------------------|----------------|
| 325:07:17 / 325:19:17 | 007:12:00 / 008:00:00 | 325:01:17 / 325:13:17 | 09 / 325 CST | -47.1 | | NOVEMBER 21, 1989 | STS-32 | BASIC | 07/27/89 | |
| CST :325 | | | | | | | | | | |
| FD : 08 | | | | | | | | | | |
| MET :007 | | | | | | | | | MET:008 | |
| STS | SLEEP | POST SLEEP | FEA RESET | FEA STOW | | | MEAL | DSO 473 | AFE | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| PL | | | DSO 478 (RAMP) | | | | DSO 478 (SOAK) | | | |
| DAY/NIGHT | | | | | | | | | | |
| ORBIT | 19 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | |
| GSTDN COVERAGE | -DKR | -DKR -MAD | -CAN | -BDA -DKR -MAD | -CAN | -MIL -BDA -DKR -MAD | -BDA -DKR | -CAN | -VAN -GDX -MIL -BDA | -GDX -MIL -BDA |
| TDRS | | | | | | | | | | |
| ATTITUDE | | | | | | | | | | |
| TRACKING | | | | | | | | | | |
| FEA | | | | | | | | | | |
| NOTES: | | DSO 476 PULSE RATE | | DSO 478 LBNP (MS1) | | DSO 478 LBNP (MS3) | | | DSO 473 SKIN TEST | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------|--|-----------------------|--------------------------------------|-----------|------|-------------------|--------|---------|-----------|--|
| 325:19:17 / 326:07:17 | 008:00:00 / 008:12:00 | 325:13:17 / 326:01:17 | 09 / 325 CST | -46.4 | | NOVEMBER 21, 1989 | STS-32 | BASIC | 07/27/89 | |
| CST :325 | | | | | | | | | | |
| FD :009 | | | | | | | | | | |
| MET :008 | | | | | | | | | | |
| STS | L 3 O B S | C L E A R | I M U A L I G N | SLEEP | | | | | | |
| | AFE | | | PRE SLEEP | | | | | | |
| | DSO 476 | DSO 476 | | | | | | | | |
| PL | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | |
| ORBIT | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | |
| GSTDN COVERAGE | | -VAN -GDX -MIL | -VAN | | | | | -DKR | -DKR | |
| TDRS E W | | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | | | | | | | | |
| TRACKING | | | | | | | | | | |
| FEA | | | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | |
|-----------------------|-----------------------|-----------------------|--------------|--------------|------|------------------------------|--|---------|----------------------|----|----|----|----|----|---|---------|
| 326:07:17 / 326:19:17 | 008:12:00 / 009:00:00 | 326:01:17 / 326:13:17 | 10 / 326 CST | -45.3 | ☉ | NOVEMBER 22, 1989 | STS-32 | BASIC | 07/27/89 | | | | | | | |
| CST :326 | FD :009 | MET :008 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | MET:009 |
| STS | SLEEP | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| PL | | | | | | | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | |
| ORBIT | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | | | | | | | |
| GSTDN COVERAGE | -DKR -MAD | | | -DKR -MAD | -CAN | -MIL -BDA -DKR -MAD | -CAN -VAN -GDX -MIL -BDA -DKR | | -MIL -BDA -DKR | | | | | | | |
| TDRS | | | | | | | | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | | | | | | | | | | | | | | |
| TRACKING | | | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|-----------------------|-----------------------|--------------|-----------------|------|-------------------|--------|---------|-----------|
| 326:19:17 / 327:07:17 | 009:00:00 / 009:12:00 | 326:13:17 / 327:01:17 | 10 / 326 CST | -44.3 | ☾ | NOVEMBER 22, 1989 | STS-32 | BASIC | 07/27/89 |
| CST :326 | | | | | | | | | |
| FD :010 | | | | | | | | | |
| MET :009 | | | | | | | | | |
| STS | | IMU MNV RVN | | ZLV MNV R | | | | SLEEP | |
| | CABIN STOW | | | PRE SLEEP | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 |
| GSTDN COVERAGE | | -VAN -GDX | | | | | | -DKR | -DKR |
| TDRS E W | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | | | | | | | |
| TRACKING | -IMU - | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | -ZLV, -YVV | | | | | | | | |

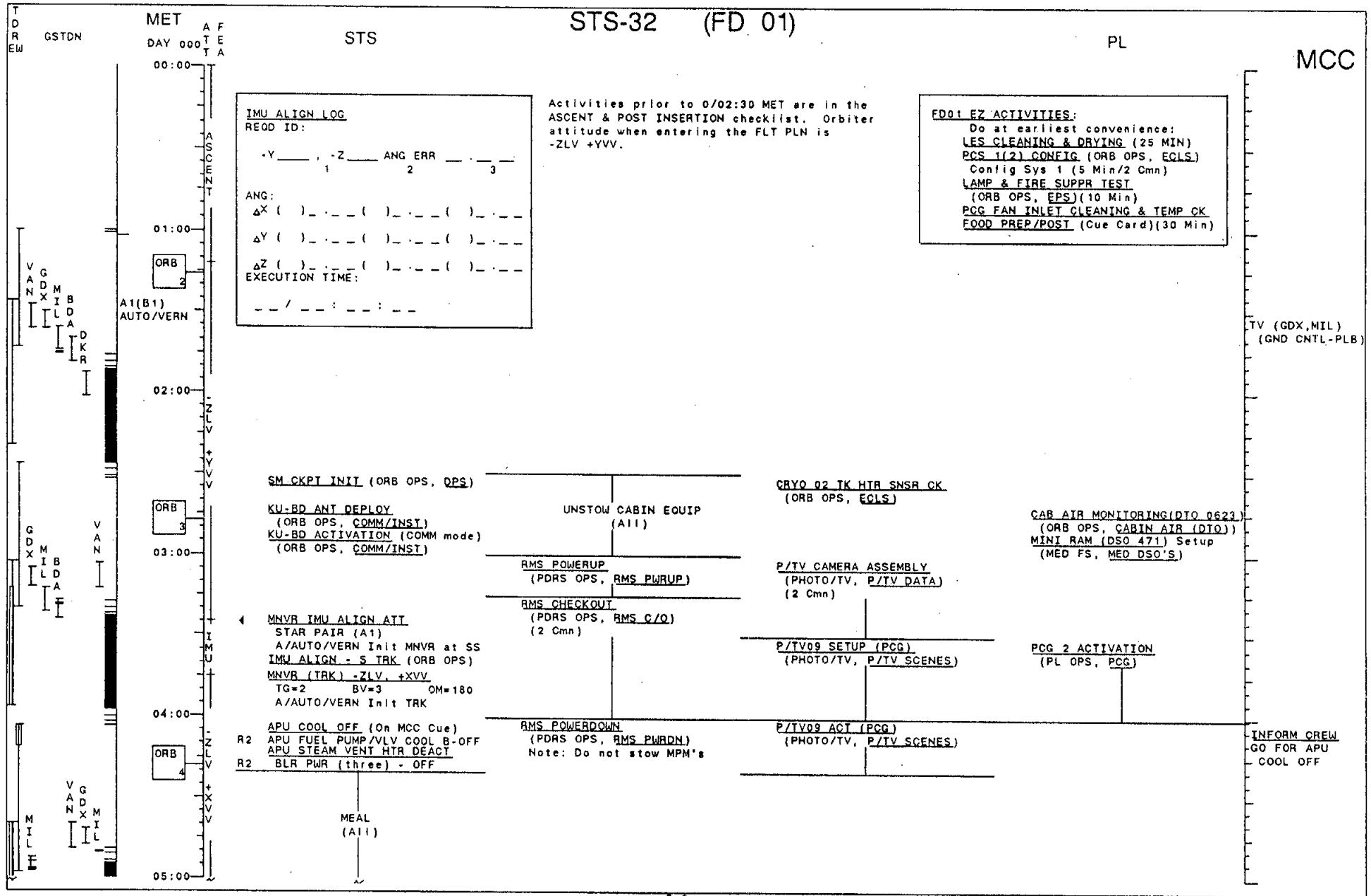


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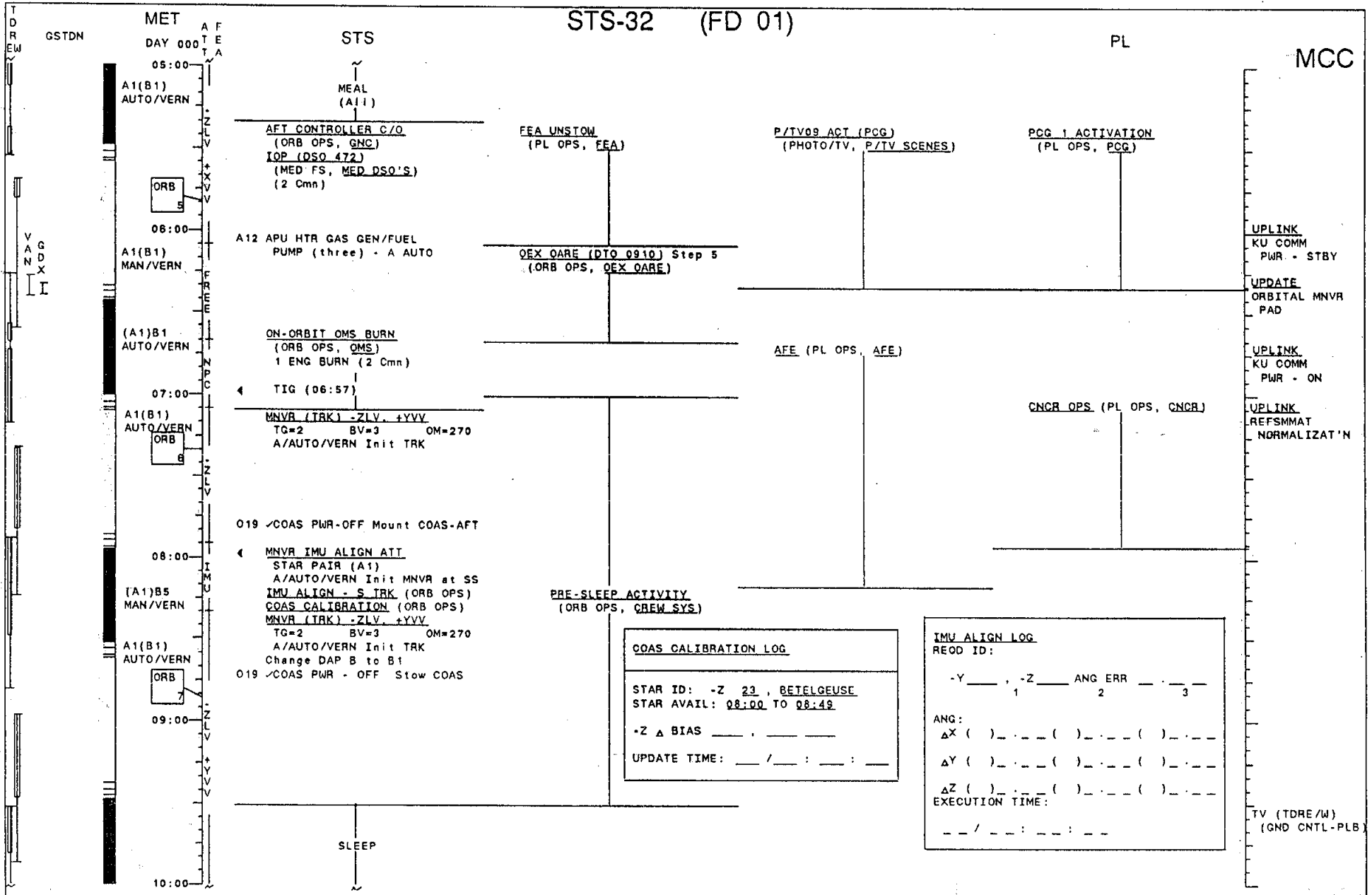
DETAILED TIMELINE

DETAILED
TIMELINE

DETAILED TIMELINE



STS-32 (FD 01)



STS-32 (FD 01)

T D R A F
E W

GSTDN

MET DAY 000

A1(B1)
AUTO/VERN

ORB 8

ORB 9

ORB 10

ORB 11

10:00

11:00

12:00

13:00

14:00

15:00

A F T E T A

N Z V V Y Y V

D E R N

STS

SLEEP

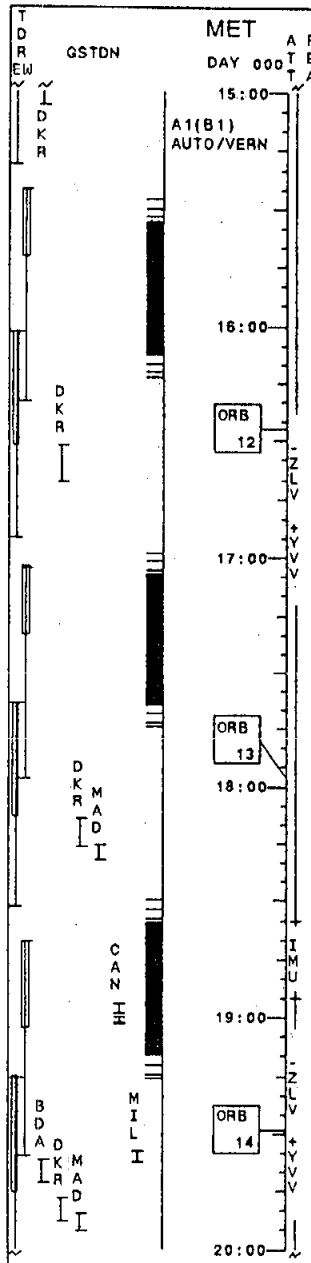
PL

MCC

STS-32 (FD 02)

PL

MCC



STS

SLEEP

IMU ALIGN LOG
REOD ID:

-Y _____ -Z _____ ANG ERR _____
 1 2 3

ANG:
ΔX () _ _ _ _ () _ _ _ _ () _ _ _ _
ΔY () _ _ _ _ () _ _ _ _ () _ _ _ _
ΔZ () _ _ _ _ () _ _ _ _ () _ _ _ _

EXECUTION TIME:
_ _ / _ _ : _ _ : _ _

FD02 EZ ACTIVITIES:
FOOD PREP/POST (Cue Card)(30 Min)
PCG FAN INLET CLEANING & TEMP CK

AEROBICS (DSO 476) Pulse Rt
(MED FS, MED DSO'S)
(ALL)

ORB 13

IOP (DSO 472)
(MED FS, MED DSO'S)
(2 Cmn)

SCOP-DEX (DSO 457) Dose
(MED FS, MED DSO'S)

◀ MNVR IMU ALIGN ATT
STAR PAIR (A1)
A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, +YVV
TG=2 BV=3 OM=270
A/AUTO/VERN Init TRK

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SCOP-DEX (DSO 457) Sample
(MED FS, MED DSO'S)

P/TV11 SETUP (FEA)
(PHOTO/TV, P/TV SCENES)

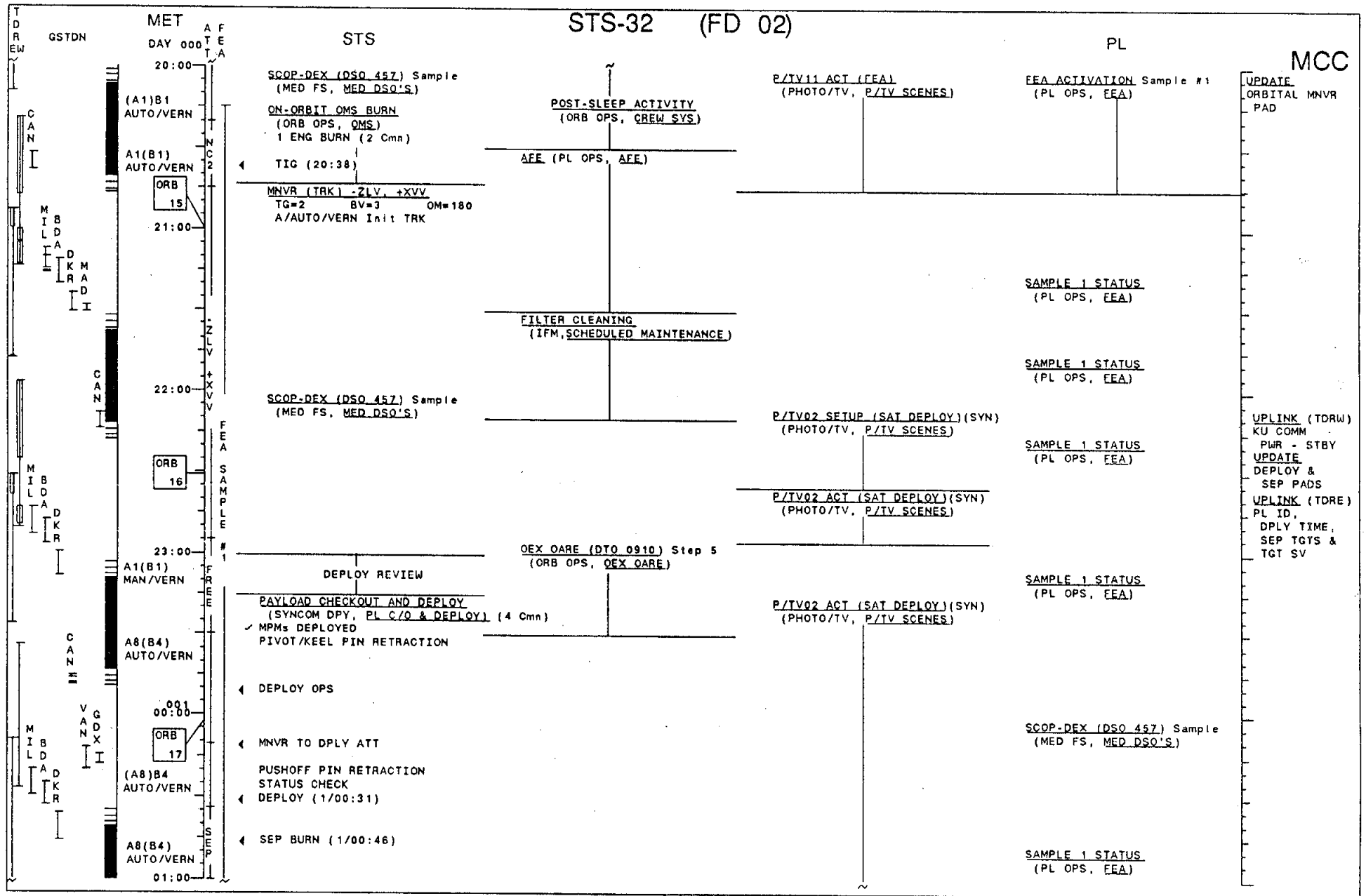
SCOP-DEX (DSO 457) Sample
(MED FS, MED DSO'S)

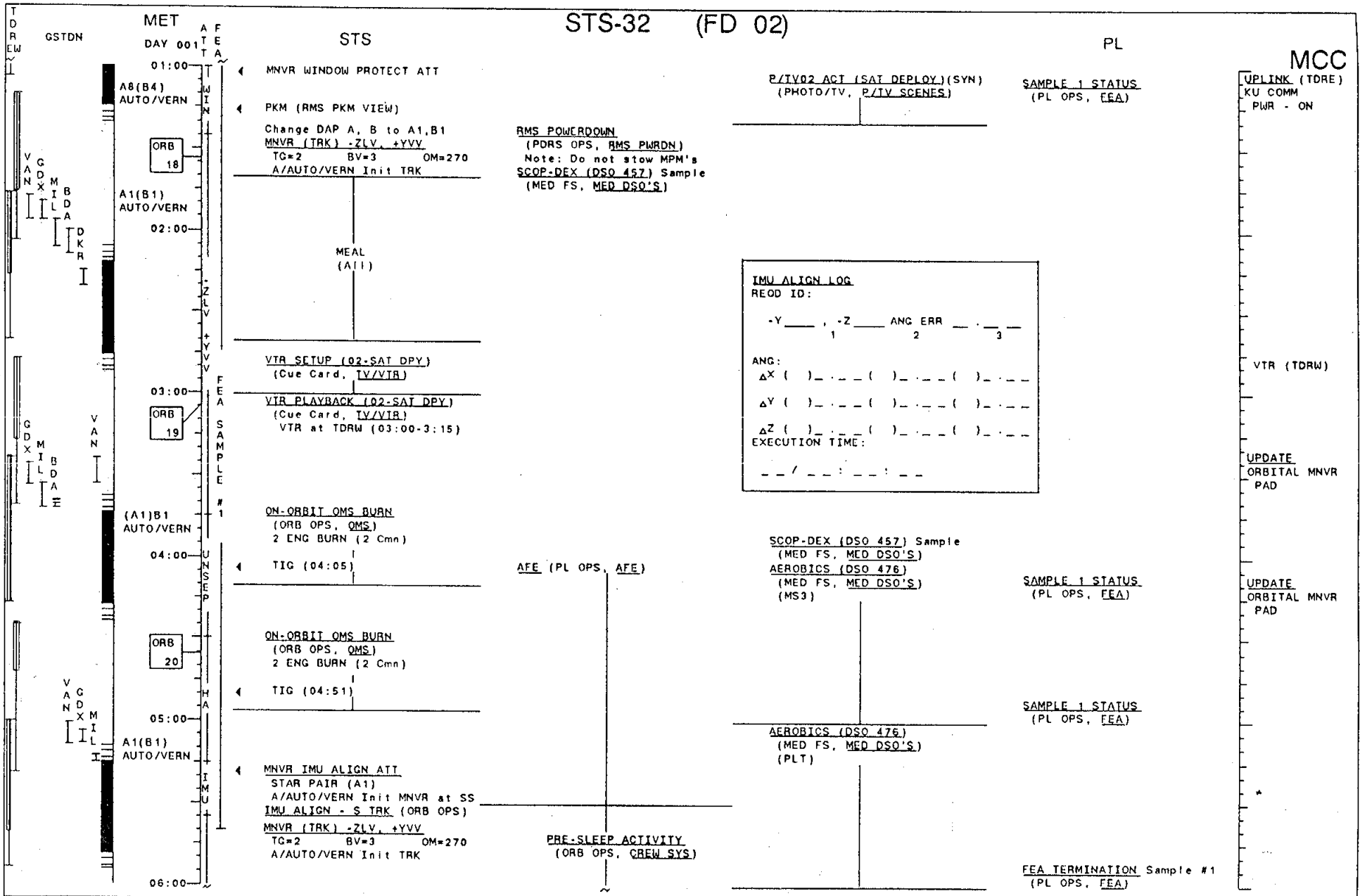
ORB 14

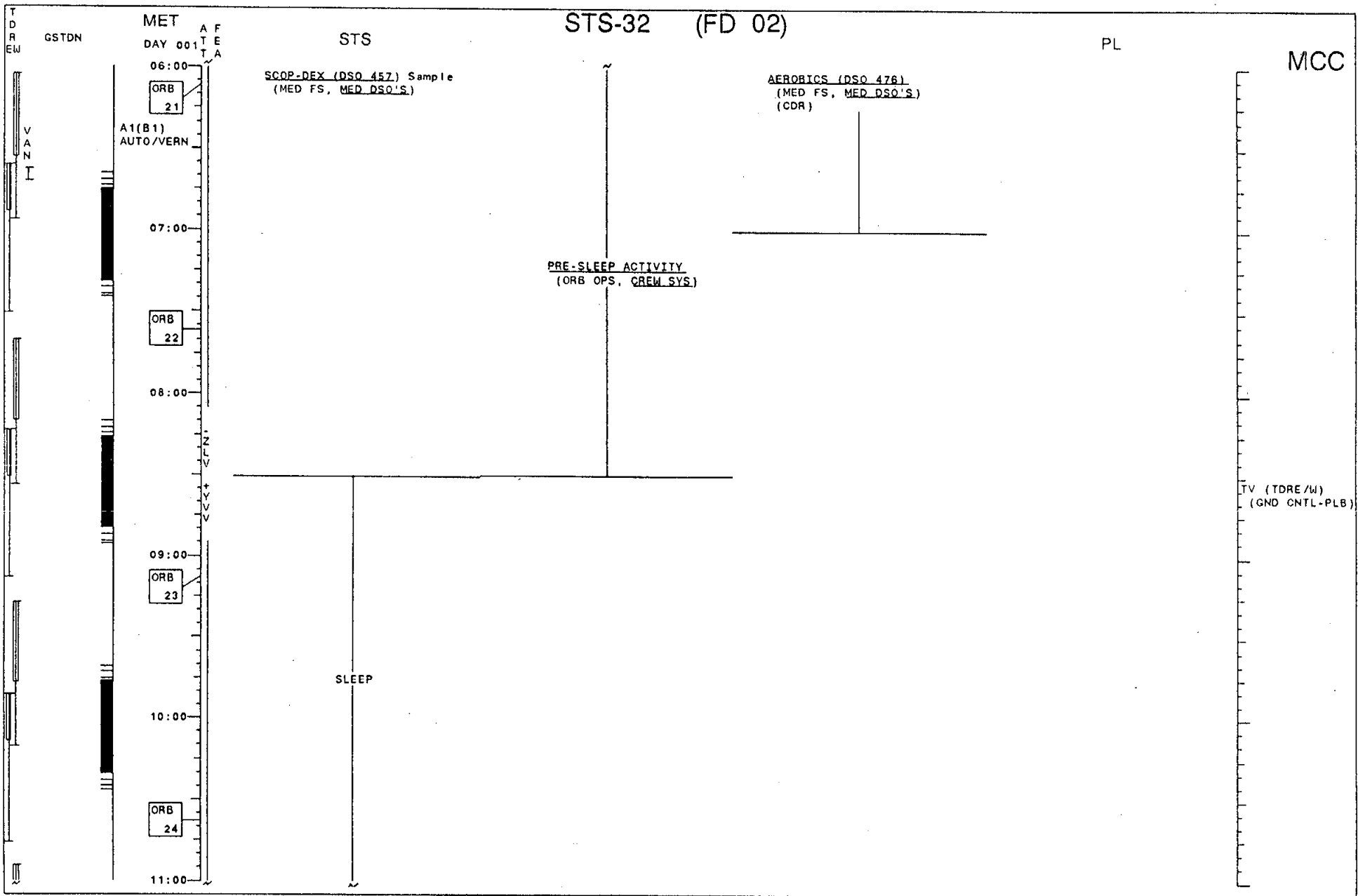
AIR SAMPLER (DSO 471)
(MED FS, MED DSO'S)

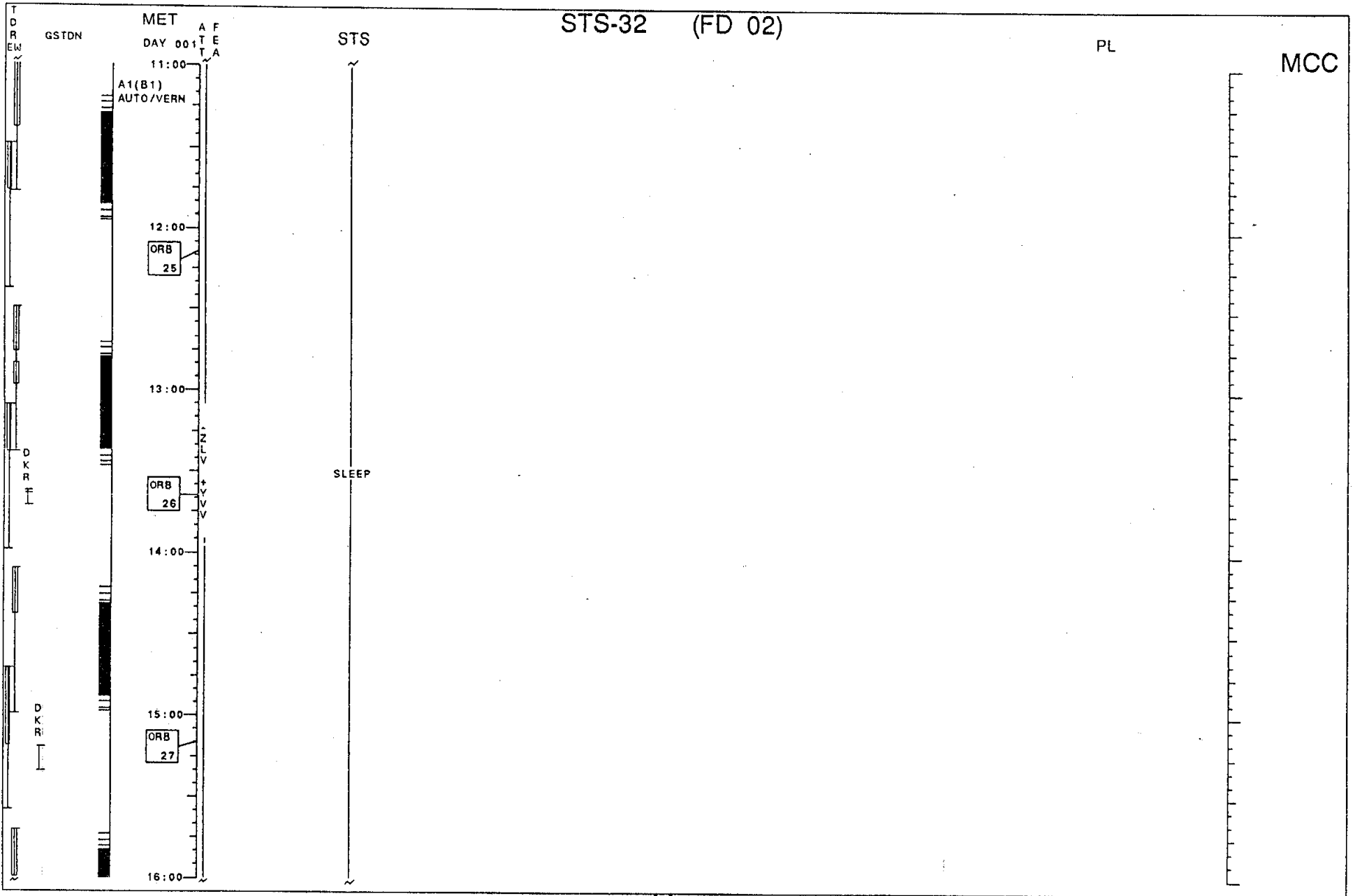
P/TV11 ACT (FEA)
(PHOTO/TV, P/TV SCENES)

FEA ACTIVATION Sample #1
(PL OPS, FEA)

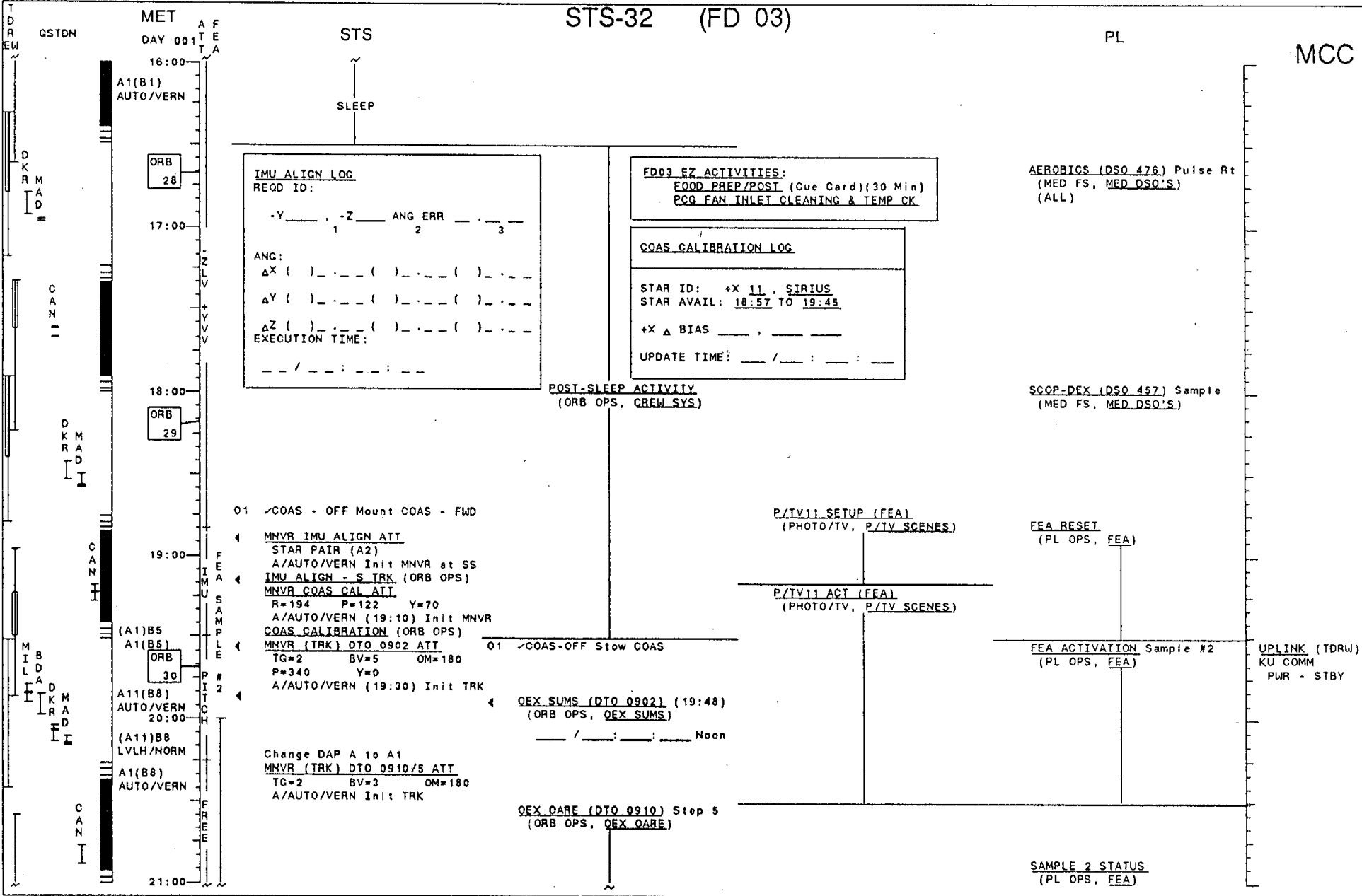








STS-32 (FD 03)



IMU ALIGN LOG
 REOD ID:
 -Y ____ , -Z ____ ANG ERR ____
 1 2 3
 ANG:
 ΔX () () ()
 ΔY () () ()
 ΔZ () () ()
 EXECUTION TIME:
 ____ / ____ : ____ : ____

FD03 EZ ACTIVITIES:
 FOOD PREP/POST (Cue Card)(30 Min)
 PCG FAN INLET CLEANING & TEMP CK

COAS CALIBRATION LOG
 STAR ID: +X 11, SIRIUS
 STAR AVAIL: 18:57 TO 19:45
 +X Δ BIAS ____ , ____
 UPDATE TIME: ____ / ____ : ____ : ____

POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

AEROBICS (DSO 476) Pulse Rt
 (MED FS, MED DSO'S)
 (ALL)

SCOP-DEX (DSO 457) Sample
 (MED FS, MED DSO'S)

P/TV11 SETUP (FEA)
 (PHOTO/TV, P/TV SCENES)

FEA RESET
 (PL OPS, FEA)

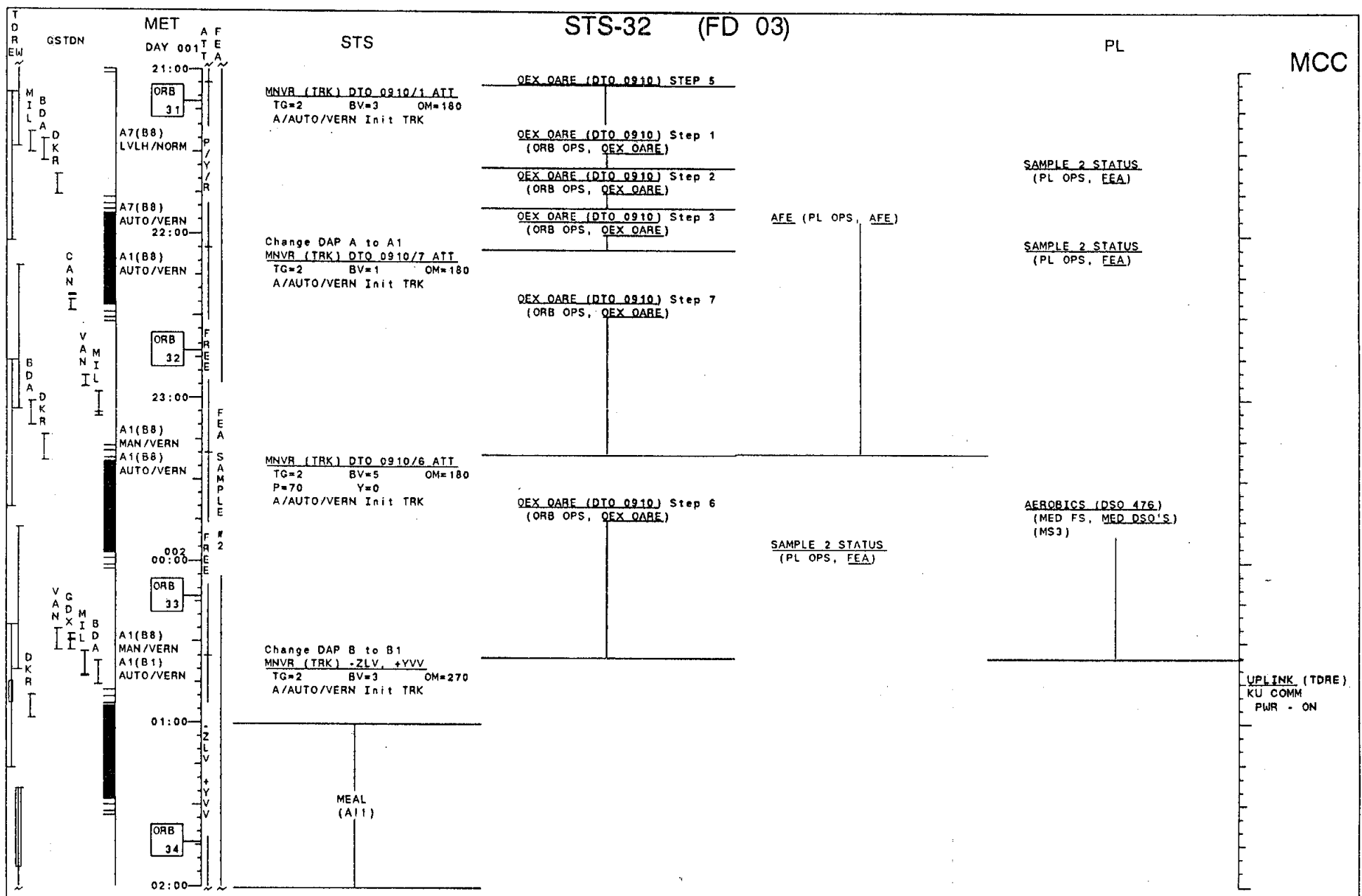
P/TV11 ACT (FEA)
 (PHOTO/TV, P/TV SCENES)

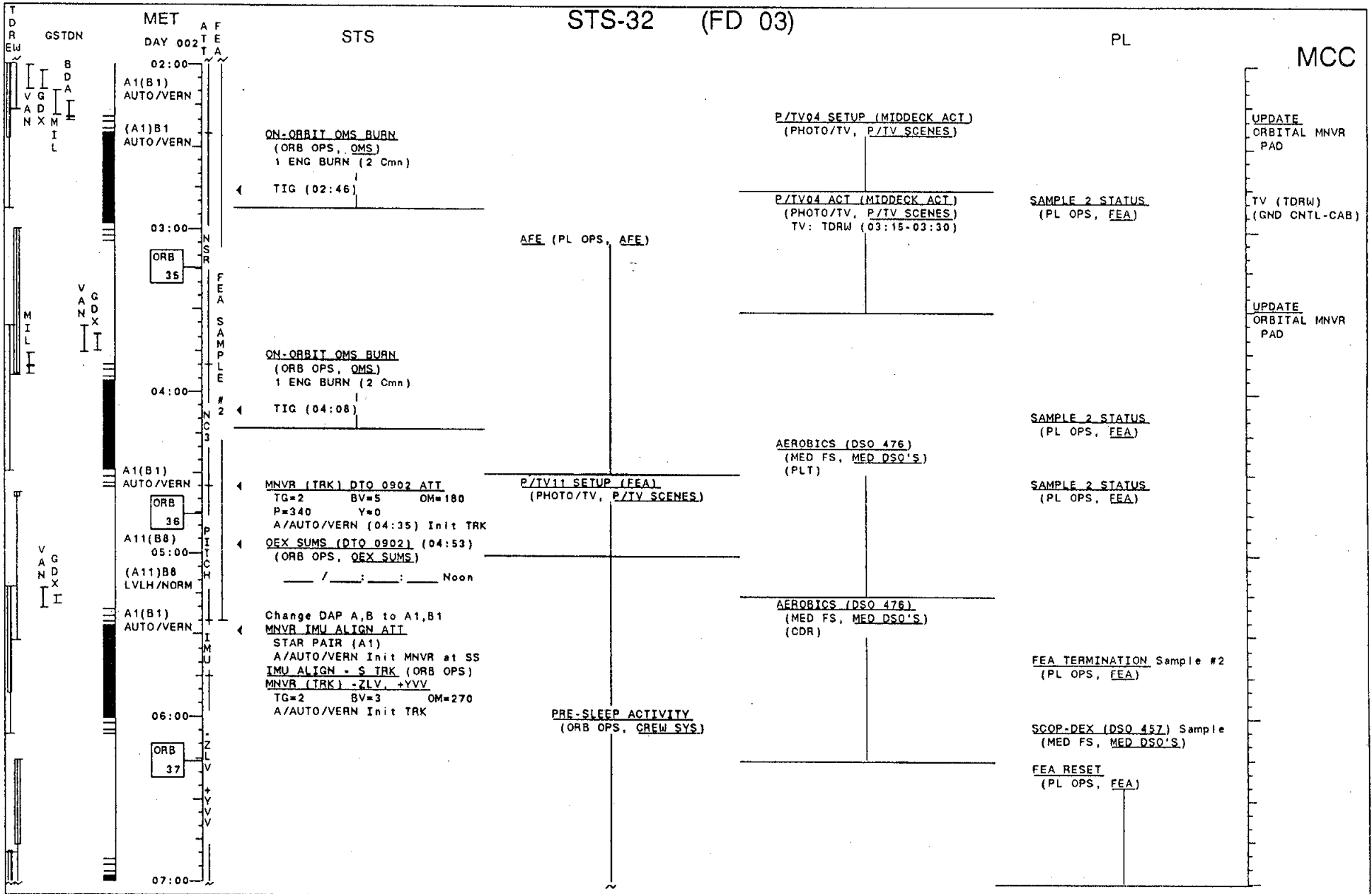
FEA ACTIVATION Sample #2
 (PL OPS, FEA)

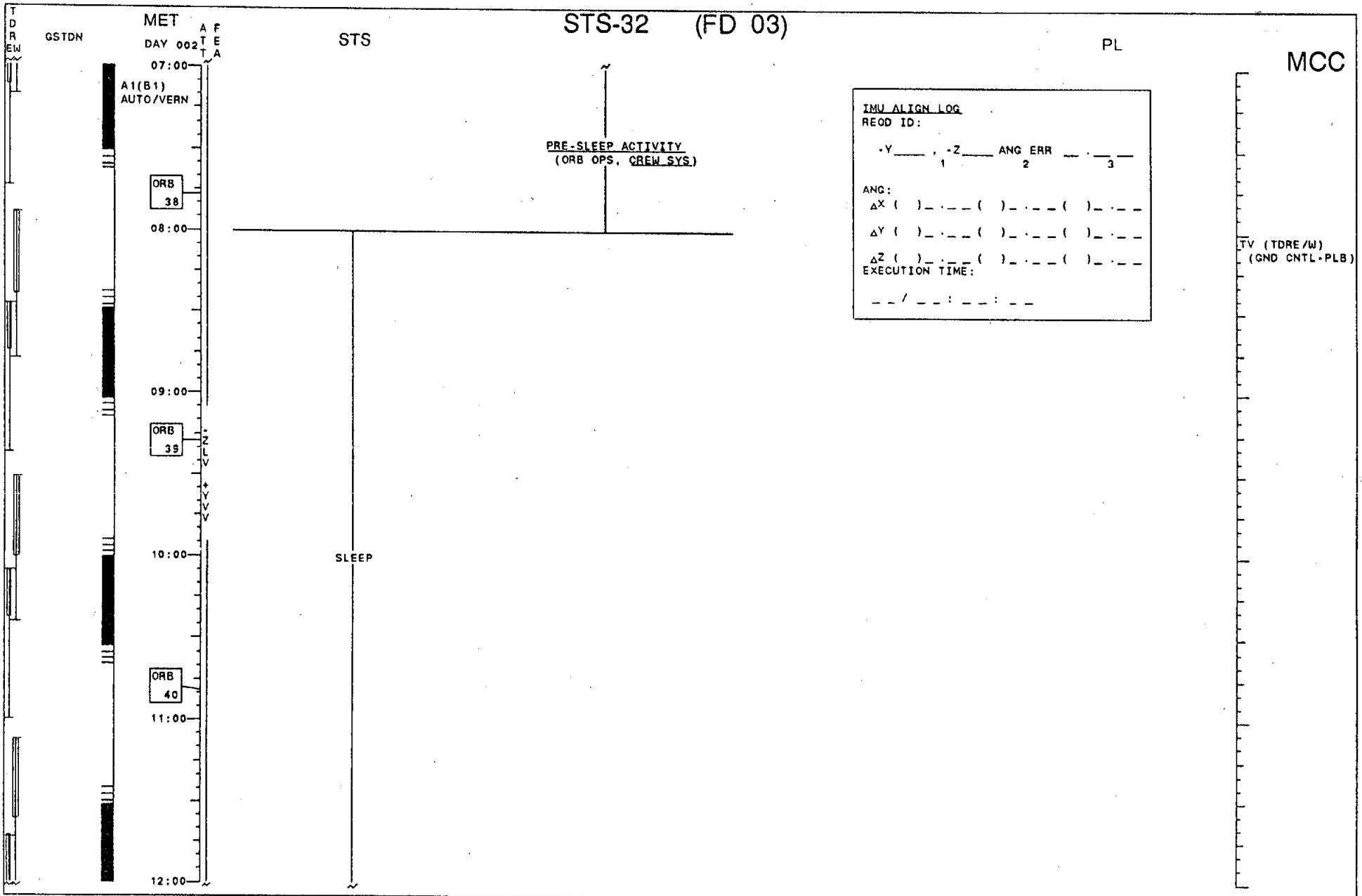
UPLINK (TDRW)
 KU COMM
 PWR - STBY

MCC

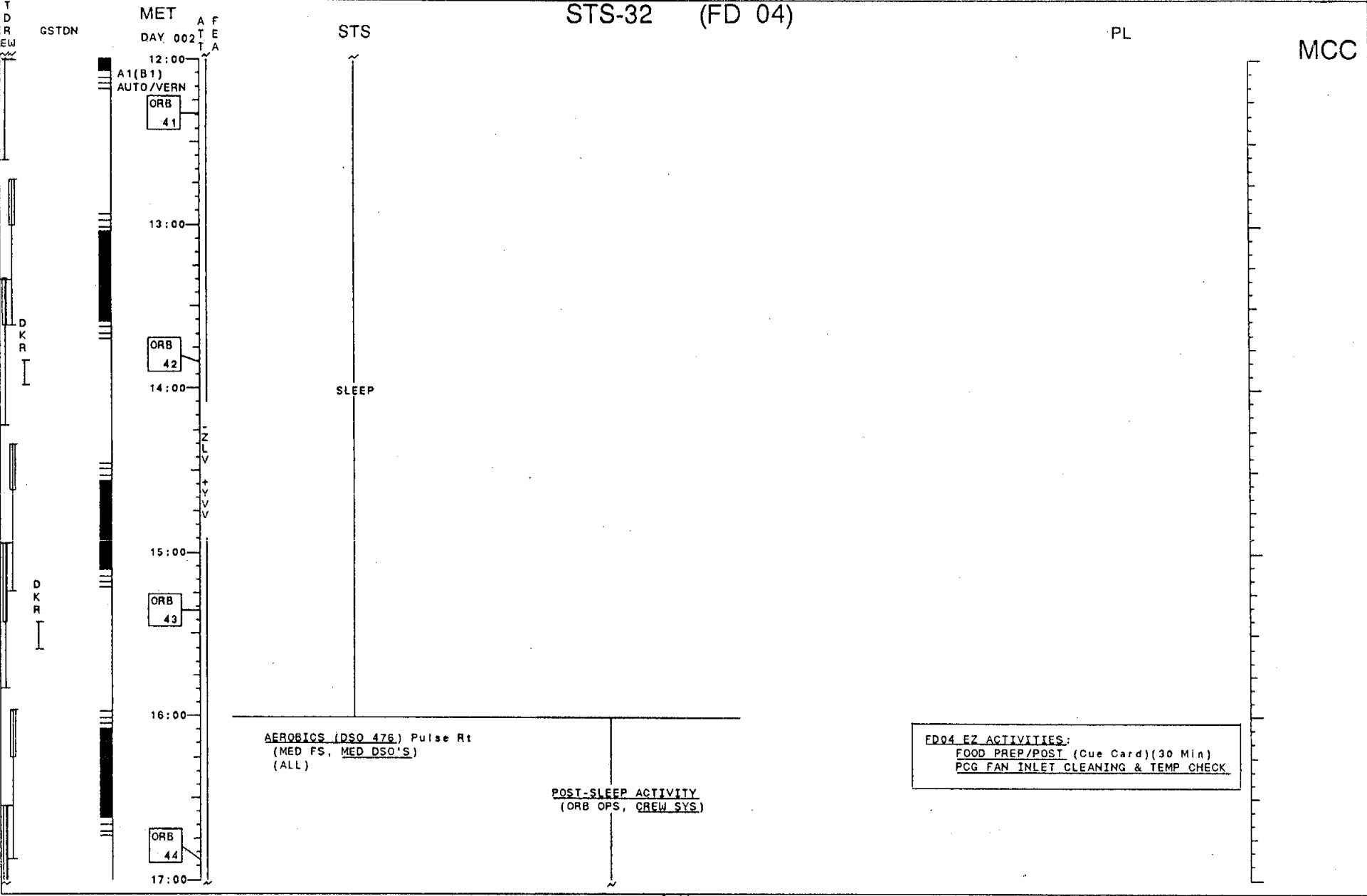
STS-32 (FD 03)



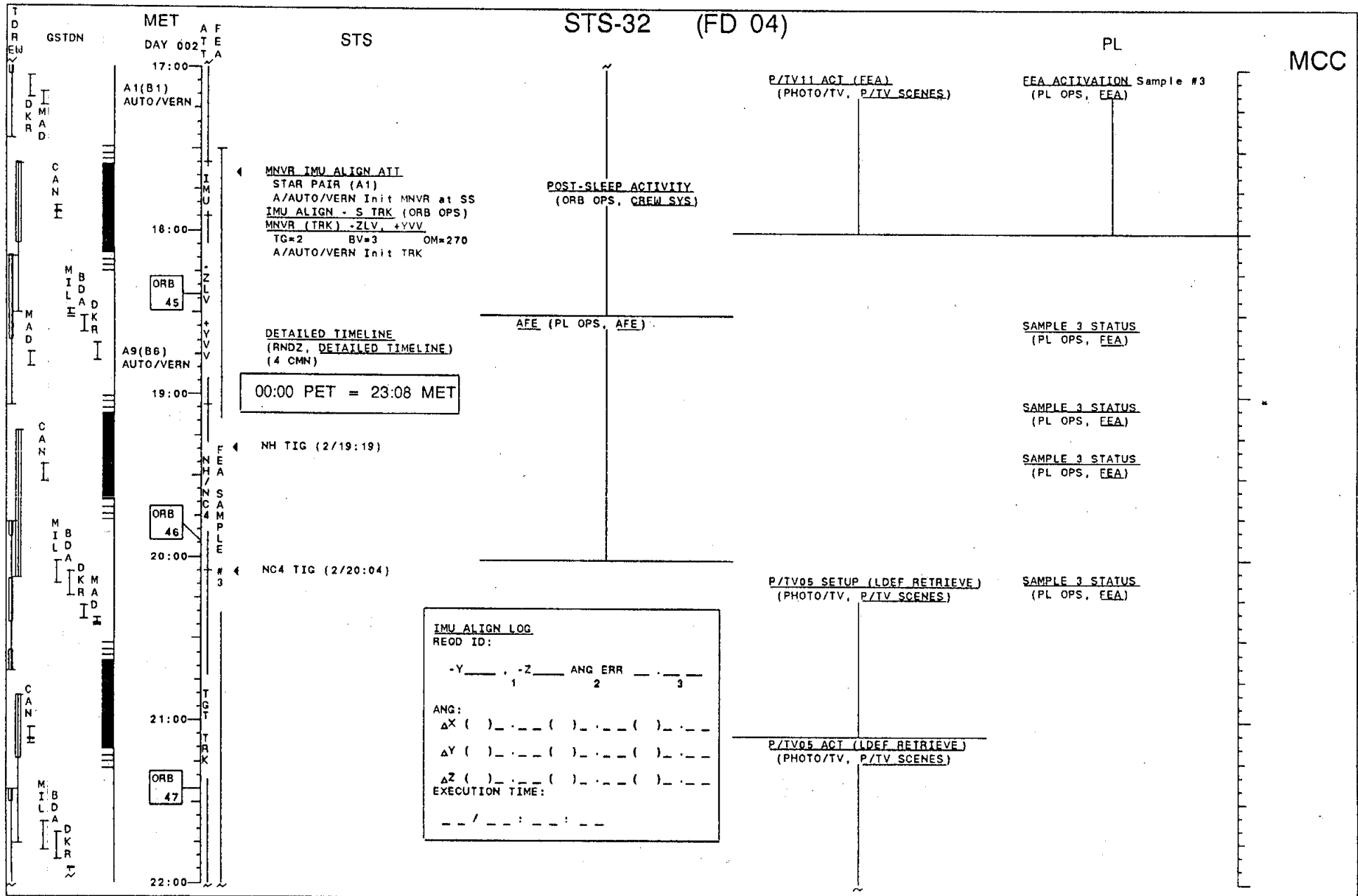




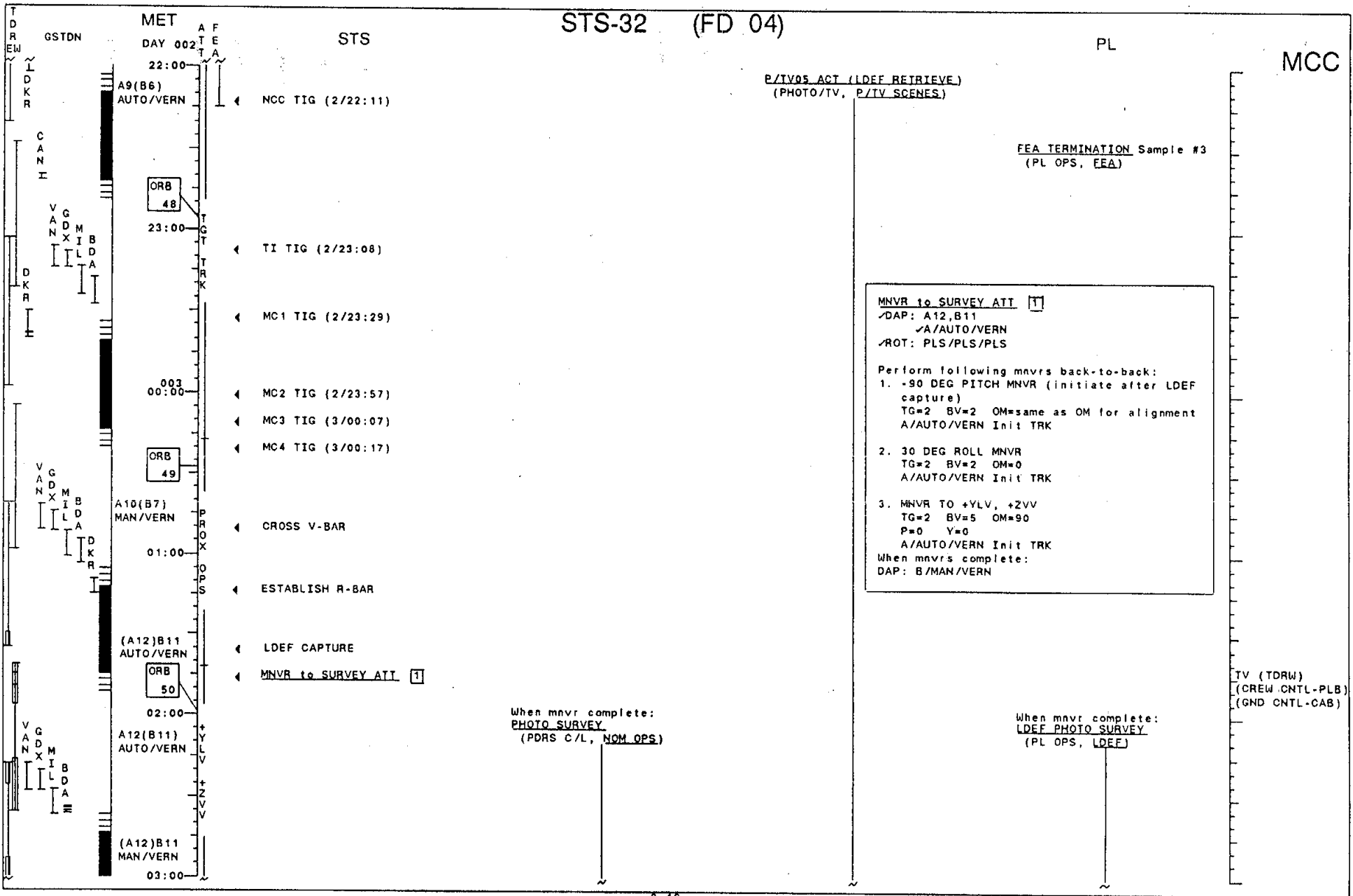
STS-32 (FD 04)



STS-32 (FD 04)



STS-32 (FD 04)



MET

STS

PL

MCC

DAY 002

22:00

A9(B6)
AUTO/VERN

NCC TIG (2/22:11)

ORB
48

23:00

TI TIG (2/23:08)

MC1 TIG (2/23:29)

003
00:00

MC2 TIG (2/23:57)

MC3 TIG (3/00:07)

MC4 TIG (3/00:17)

ORB
49

A10(B7)
MAN/VERN

CROSS V-BAR

01:00

ESTABLISH R-BAR

(A12)B11
AUTO/VERN

LDEF CAPTURE

ORB
50

MNVR to SURVEY ATT [1]

02:00

A12(B11)
AUTO/VERN

When mnvr complete:
PHOTO SURVEY
(PDRS C/L, NOM OPS)

(A12)B11
MAN/VERN

03:00

P/TV05 ACT (LDEF RETRIEVE)
(PHOTO/TV, P/TV SCENES)

FEA TERMINATION Sample #3
(PL OPS, FEA)

MNVR to SURVEY ATT [1]

✓DAP: A12,B11
✓A/AUTO/VERN
✓ROT: PLS/PLS/PLS

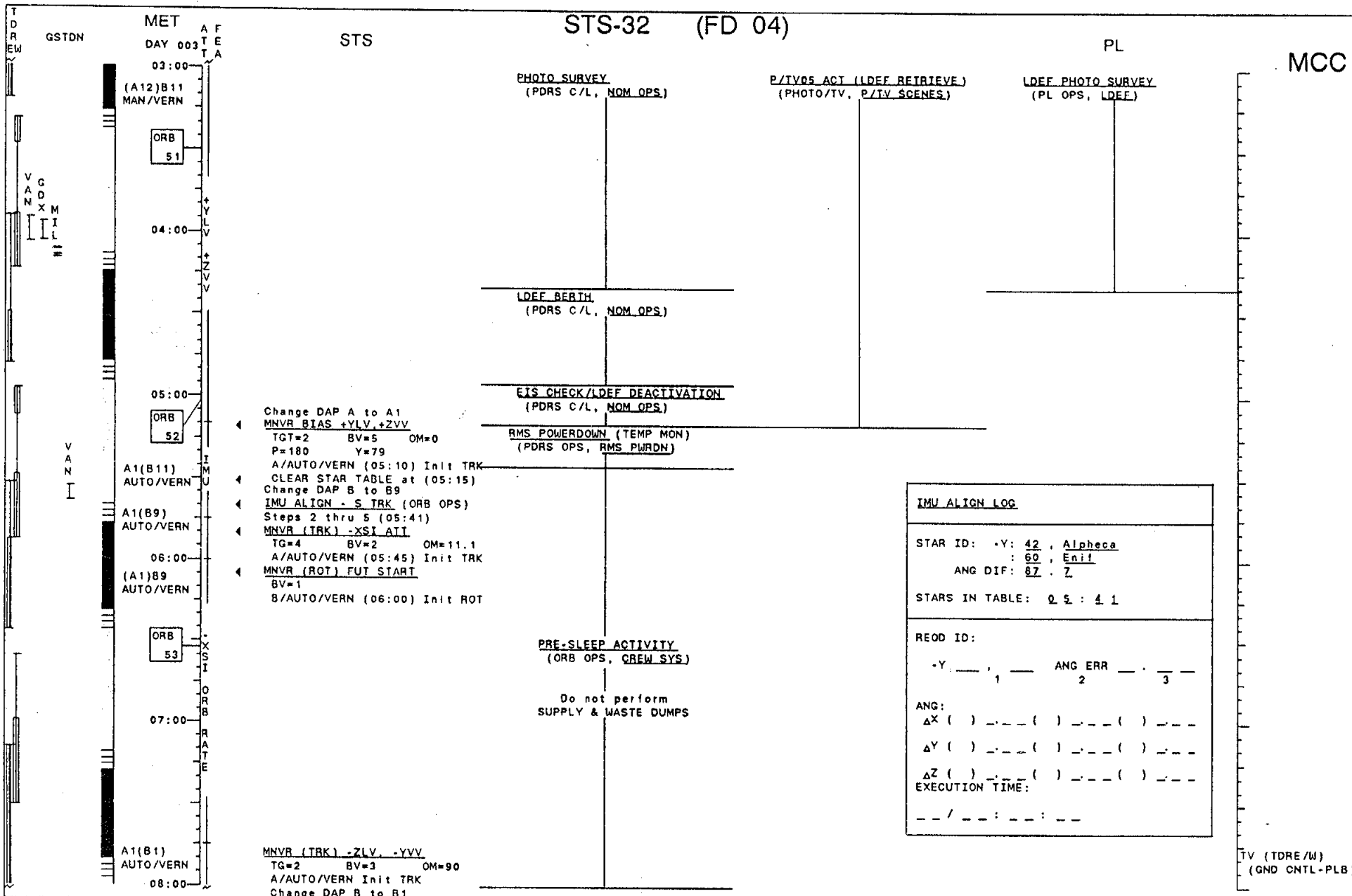
Perform following mnvrs back-to-back:

1. -90 DEG PITCH MNVR (initiate after LDEF capture)
TG=2 BV=2 OM=same as OM for alignment
A/AUTO/VERN Init TRK
 2. 30 DEG ROLL MNVR
TG=2 BV=2 OM=0
A/AUTO/VERN Init TRK
 3. MNVR TO +VLV, +2VV
TG=2 BV=5 OM=90
P=0 Y=0
A/AUTO/VERN Init TRK
- When mnvrs complete:
DAP: B/MAN/VERN

TV (TORW)
(CREW CNTL-PLB)
(GND CNTL-CAB)

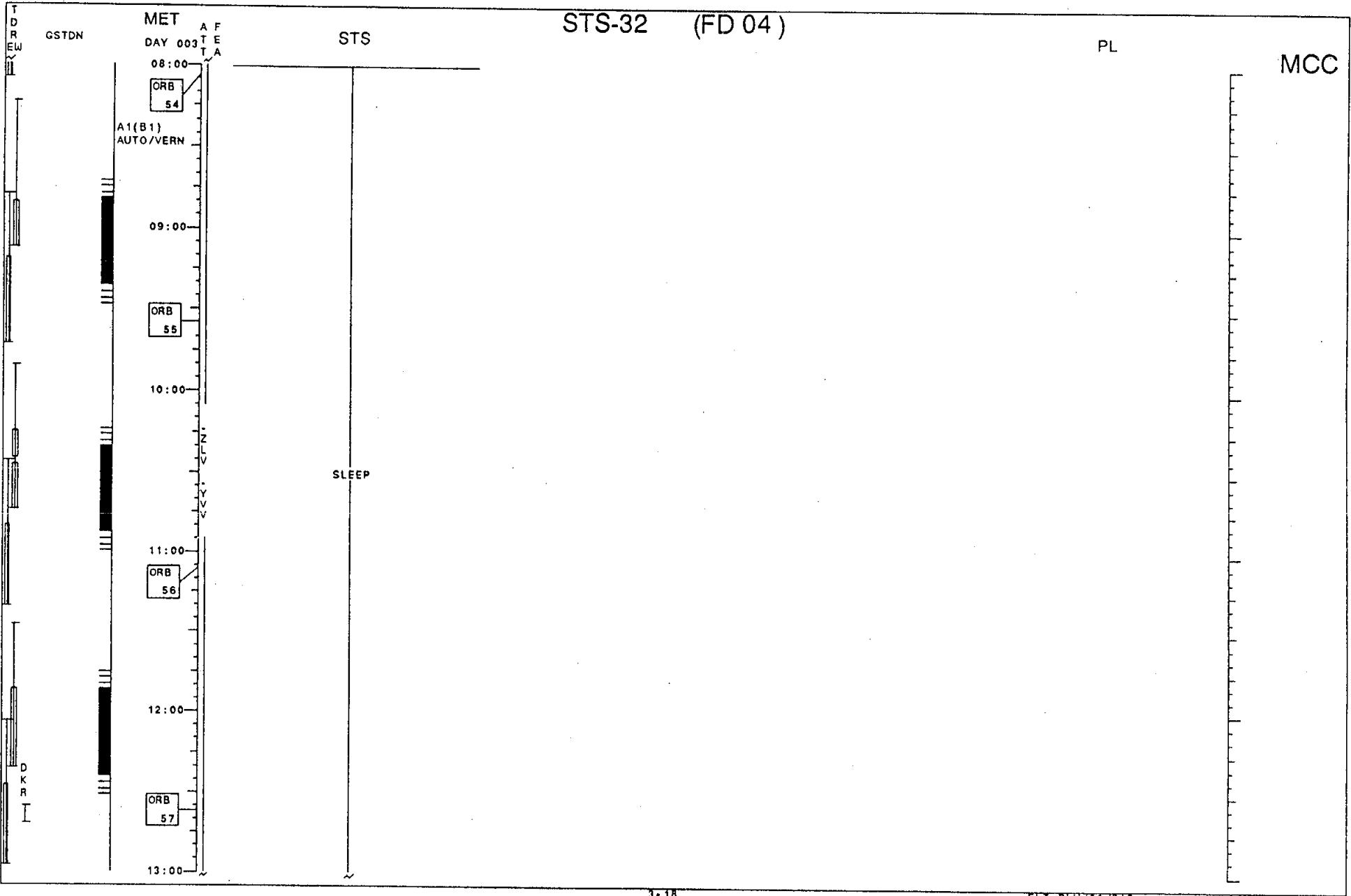
When mnvr complete:
LDEF PHOTO SURVEY
(PL OPS, LDEF)

STS-32 (FD 04)

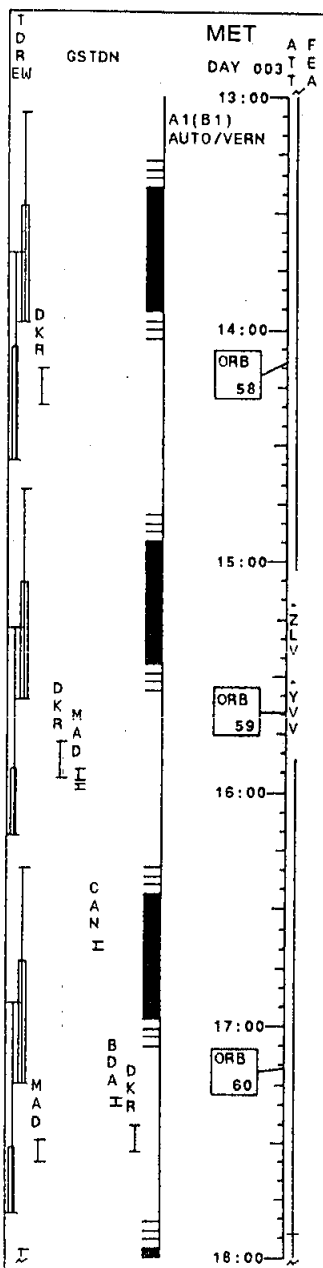


| IMU ALIGN LOG | |
|-----------------|-----------------------|
| STAR ID: | -Y: 42, Alpha |
| | : 60, Enif |
| | ANG DIF: 87.7 |
| STARS IN TABLE: | 0 5 : 4 1 |
| READ ID: | |
| -Y: | 1 ANG ERR 2 3 |
| ANG: | |
| ΔX | () () () () |
| ΔY | () () () () |
| ΔZ | () () () () |
| EXECUTION TIME: | --- / --- : --- : --- |

TV (TDRE/W)
(GND CNTL-PLB)



STS-32 (FD 05)



STS

SLEEP

PL

MCC

| IMU ALIGN LOG | | | |
|---------------------------|------------|---------|---------|
| STAR ID: | -Y: | 89 | Arneb |
| | : | 87 | Zozca |
| | ANG DIF: | 92 | 0 |
| STARS IN TABLE: 1 8 : 2 3 | | | |
| REOD ID: | | | |
| -Y | 1 | ANG ERR | 2 3 |
| ANG: | ΔX | () | () () |
| | ΔY | () | () () |
| | ΔZ | () | () () |
| EXECUTION TIME: | | | |
| -- / -- : -- : -- | | | |

AEROBICS (DSO 476) Pulse Rt
(MED FS, MED DSO'S)
(ALL)

FD05 EZ ACTIVITIES:
FOOD PREP/POST (Cue Card)(30 Min)
PCG FAN INLET CLEANING & TEMP CK

SCOP-DEX (DSO 457) Dose
(MED FS, MED DSO'S)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

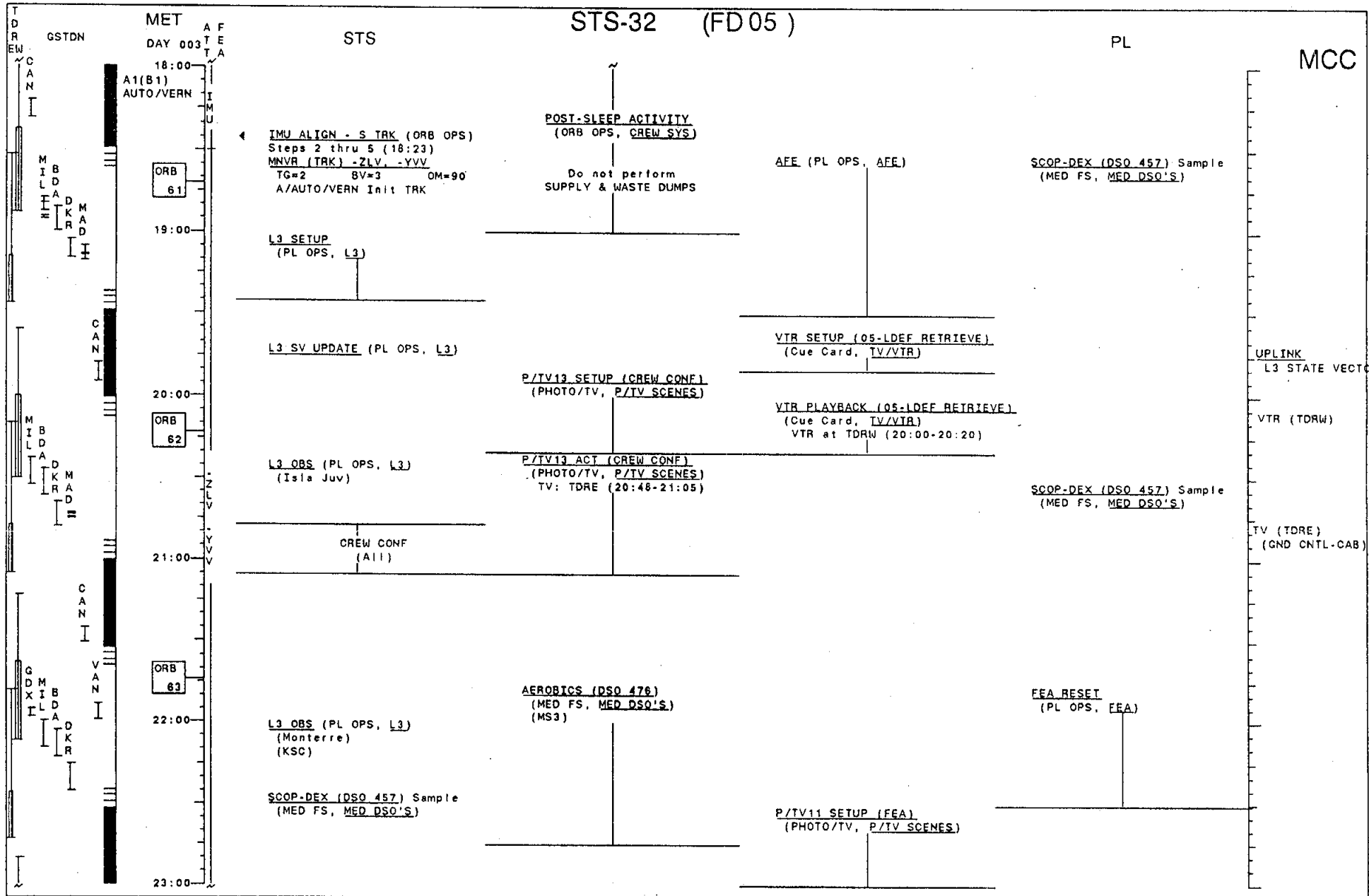
Do not perform
SUPPLY & WASTE DUMPS

SCOP-DEX (DSO 457) Sample
(MED FS, MED DSO'S)

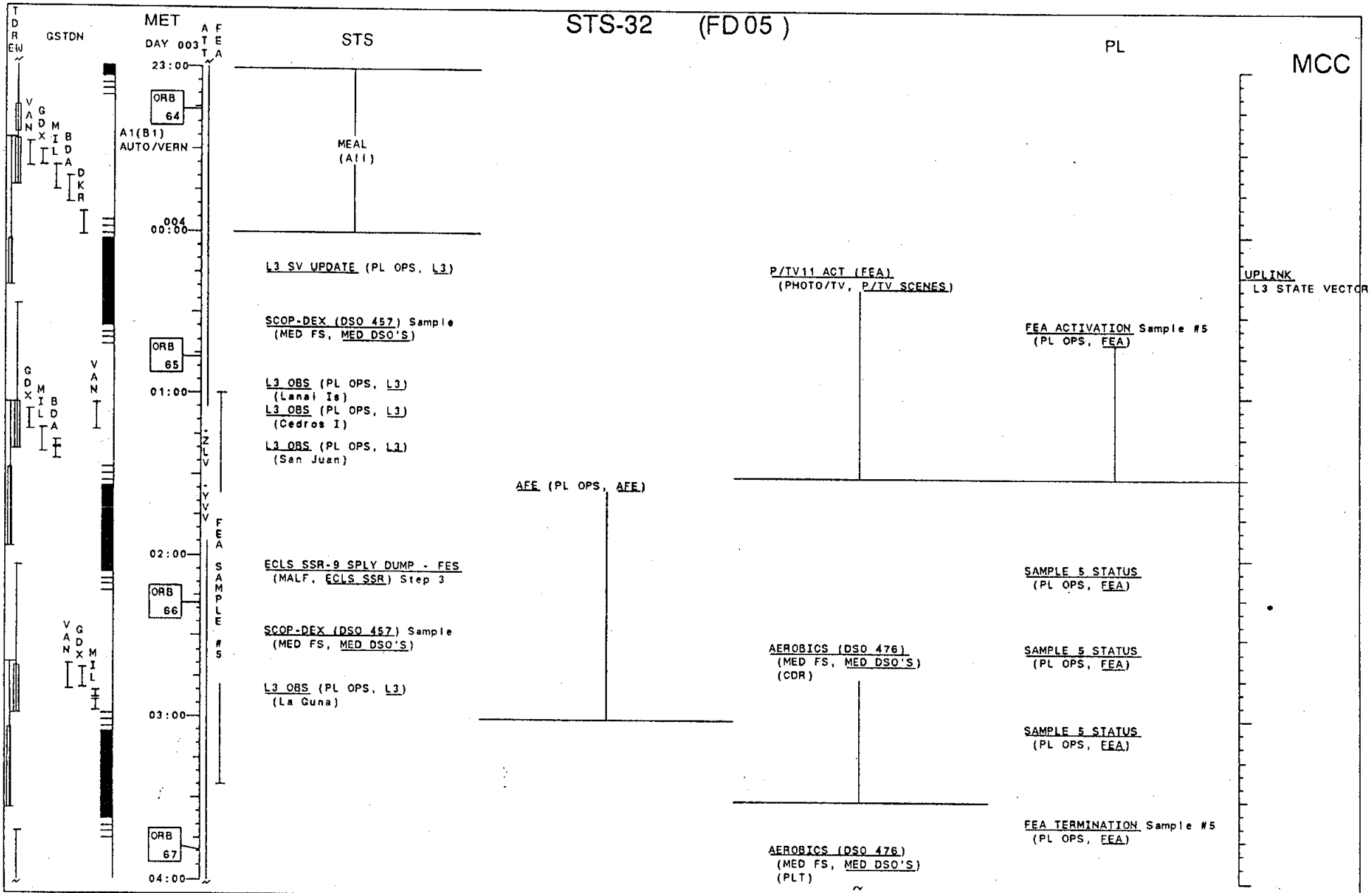
ECLS SSR-9 SPLY DUMP - FES
(MALF, ECLS SSR) Steps 1&2
Tank C&D dump not req'd

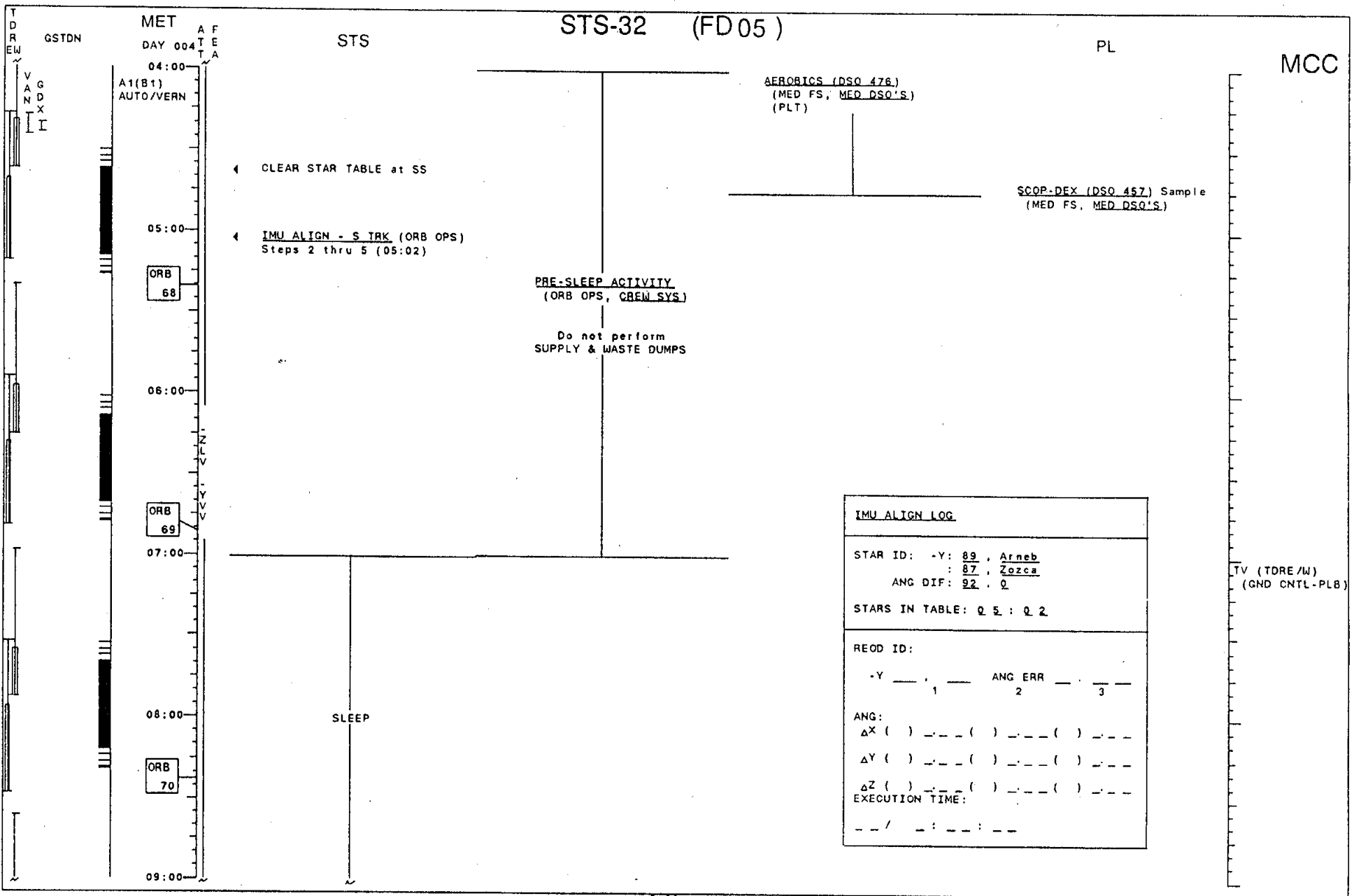
SCOP-DEX (DSO 457) Sample
(MED FS, MED DSO'S)

◀ MNVR (TRK) BIAS -ZLV, -YVY
TC=2 BV=3 OM=89
A/AUTO/VERN (17:54) Init TRK
◀ CLEAR STAR TABLE at (17:55)

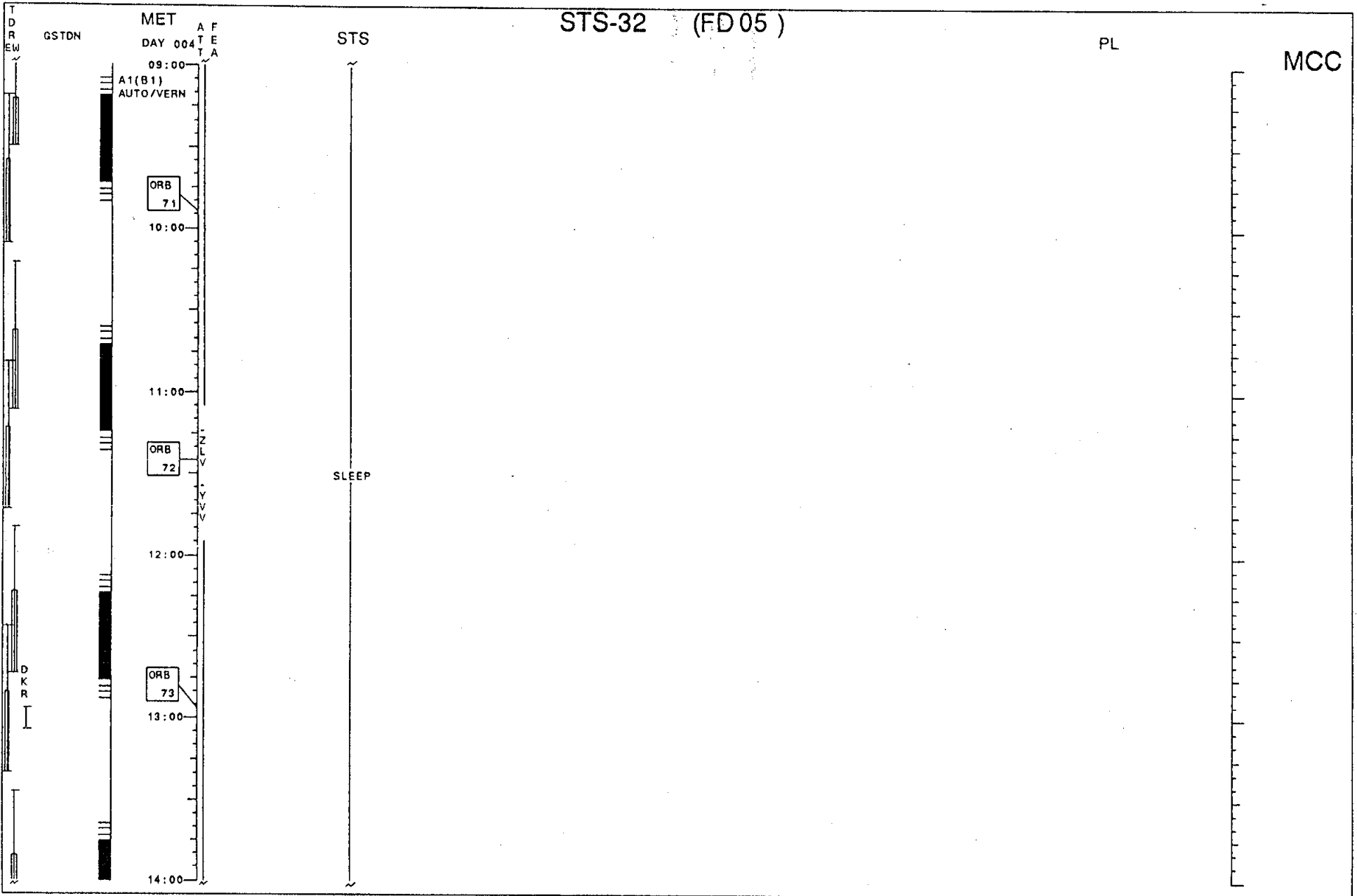


STS-32 (FD05)





STS-32 (FD 05)



STS-32 (FD06)

PL

MCC

T D R E W
 GSTDN
 MET
 DAY 004
 A F T E A
 14:00
 A1(B1)
 AUTO/VERN
 ORB 74
 15:00
 ORB 75
 16:00
 Z L V
 Y V V
 17:00
 ORB 76
 18:00
 19:00
 C A N I
 M I L I
 B D A I
 D K R R M A D I
 D K R R M A D I
 C A N I

STS

SLEEP

FD06 EZ ACTIVITIES:
FOOD PREP/POST (Cue Card)(30 Min)
PCG FAN INLET CLEANING & TEMP CK

AEROBICS (DSO 478) Pulse Rt
(MED FS, MED DSO'S)
(ALL)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
 SUPPLY & WASTE DUMPS

◀ CLEAR STAR TABLE at (16:45)

◀ IMU ALIGN - S TRK (ORB OPS)
Steps 2 thru 5 (17:12)

FC PURGE - MANUAL (Cue Card)

HEATER RECONFIG-B (ORB OPS)

PCS 1(2) CONFIG(ORB OPS)(2 Omn)

ECLSS REDUND COMPONENT C/O
(ORB OPS, ECLS)

L3 SV UPDATE, (PL OPS, L3)

AFE (PL OPS, AFE)

RCS REGULATOR RECONFIGURE
 07/08 HE PRESS A(three)-CL(tb-CL)
 B(three)-GPC(tb-OP)

CABIN TEMP CNTL RECONFIG
 MD44F Pin CAB TEMP CNTL actuator
 linkage to actuator 2
 L1 CABIN TEMP CNTLR - 2

HUMIDITY SEP RECONFIG
 L1 HUMIDITY SEP B - OFF
 A - ON

SCOP-DEX (DSO 457) Sample
(MED FS, MED DSO'S)

FEA RESET
(PL OPS, FEA)

IMU ALIGN LOG

STAR ID: -Y: 89, Arneb
 : 87, Zozca
 ANG DIF: 92.0

STARS IN TABLE: 1 2 : 1 2

REOD ID:

-Y , ANG ERR

ANG:
 ΔX () () ()

ΔY () () ()

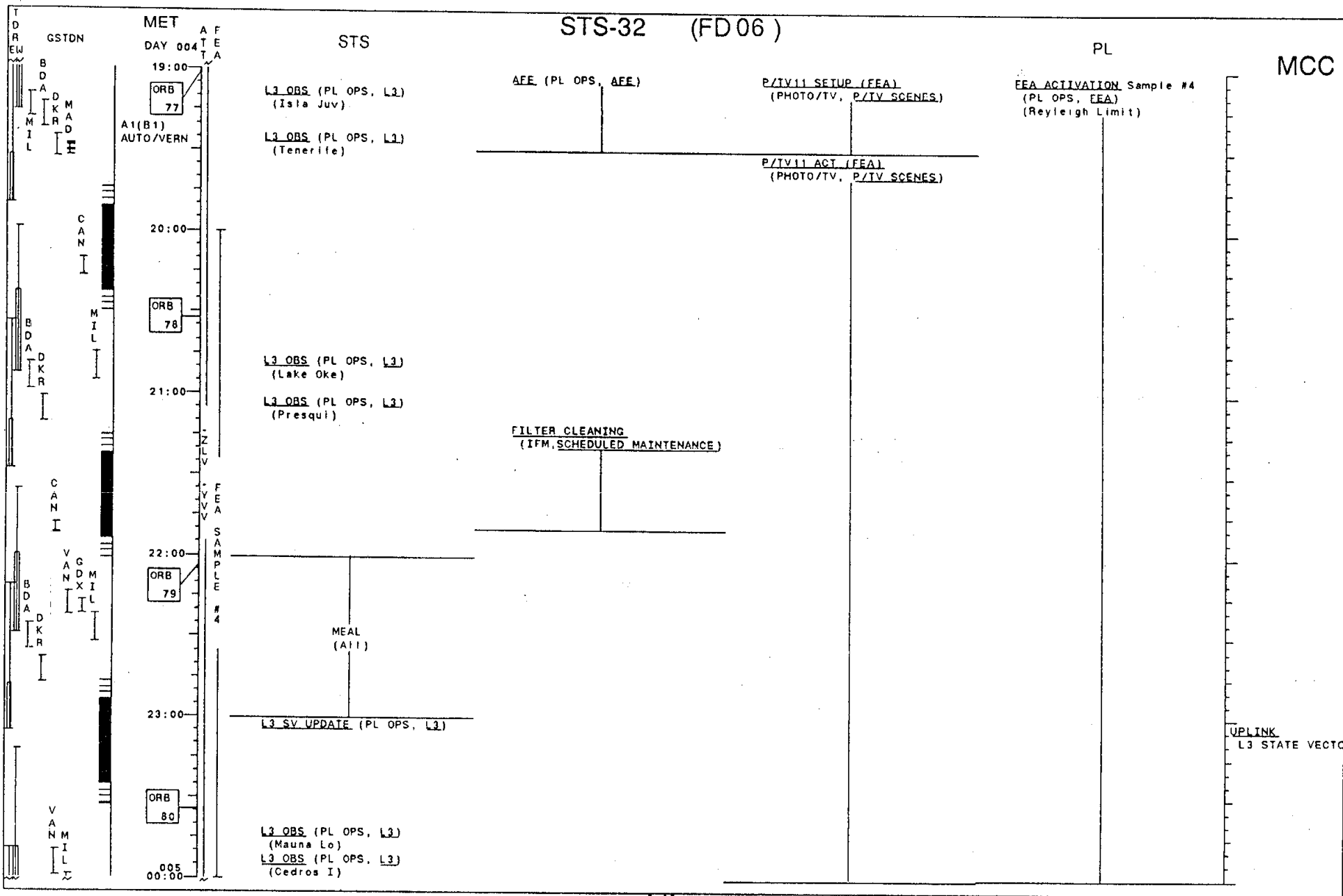
ΔZ () () ()

EXECUTION TIME:

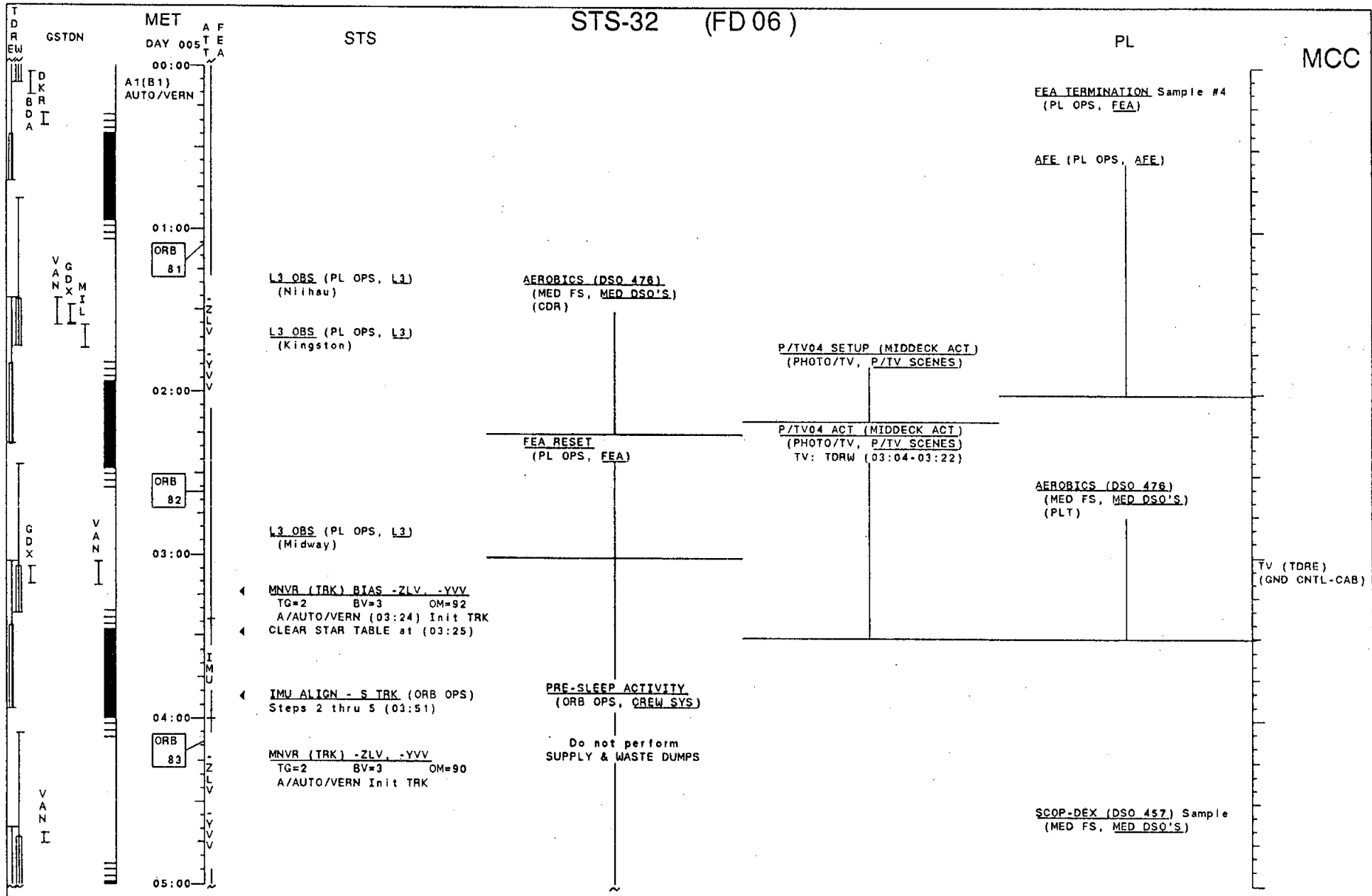
 / : :

JPLINK
L3 STATE VECTOR

STS-32 (FD 06)



STS-32 (FD 06)



STS-32 (FD06)

STS

PL

MCC

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY & WASTE DUMPS

| IMU ALIGN LOG | |
|---------------------------|--------------------|
| STAR ID: -Y: | 82, <u>Arneb</u> |
| | : 87, <u>Zozca</u> |
| ANG DIF: | 92, 0 |
| STARS IN TABLE: 0 3 : 5 1 | |
| READ ID: | |
| -Y | ANG ERR |
| 1 | 2 3 |
| ANG: | |
| ΔX () | () () () |
| ΔY () | () () () |
| ΔZ () | () () () |
| EXECUTION TIME: | |
| - / - : - : - | |

TV (TDRE/W)
(GND CNTL-PLB)

T D R E W

GSTDN

MET DAY 005

A F T E T A

05:00

A1(B1)
AUTO/VERN

ORB 84

06:00

07:00

ORB 85

Z L V

08:00

SLEEP

ORB 86

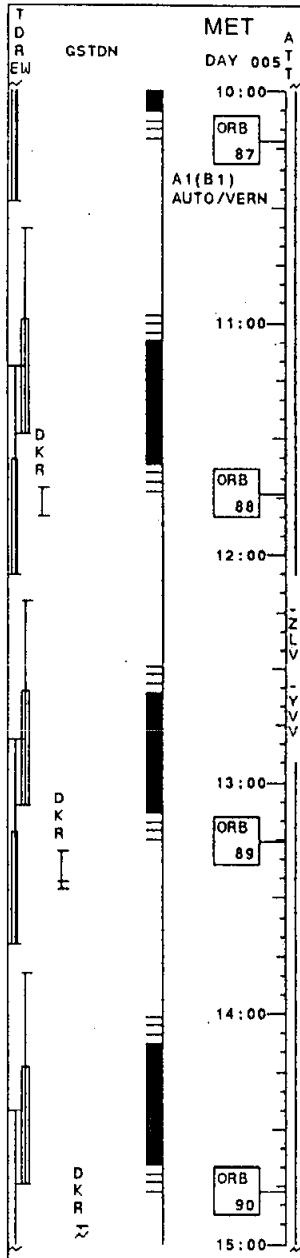
09:00

10:00

STS-32 (FD07)

PL

MCC



STS

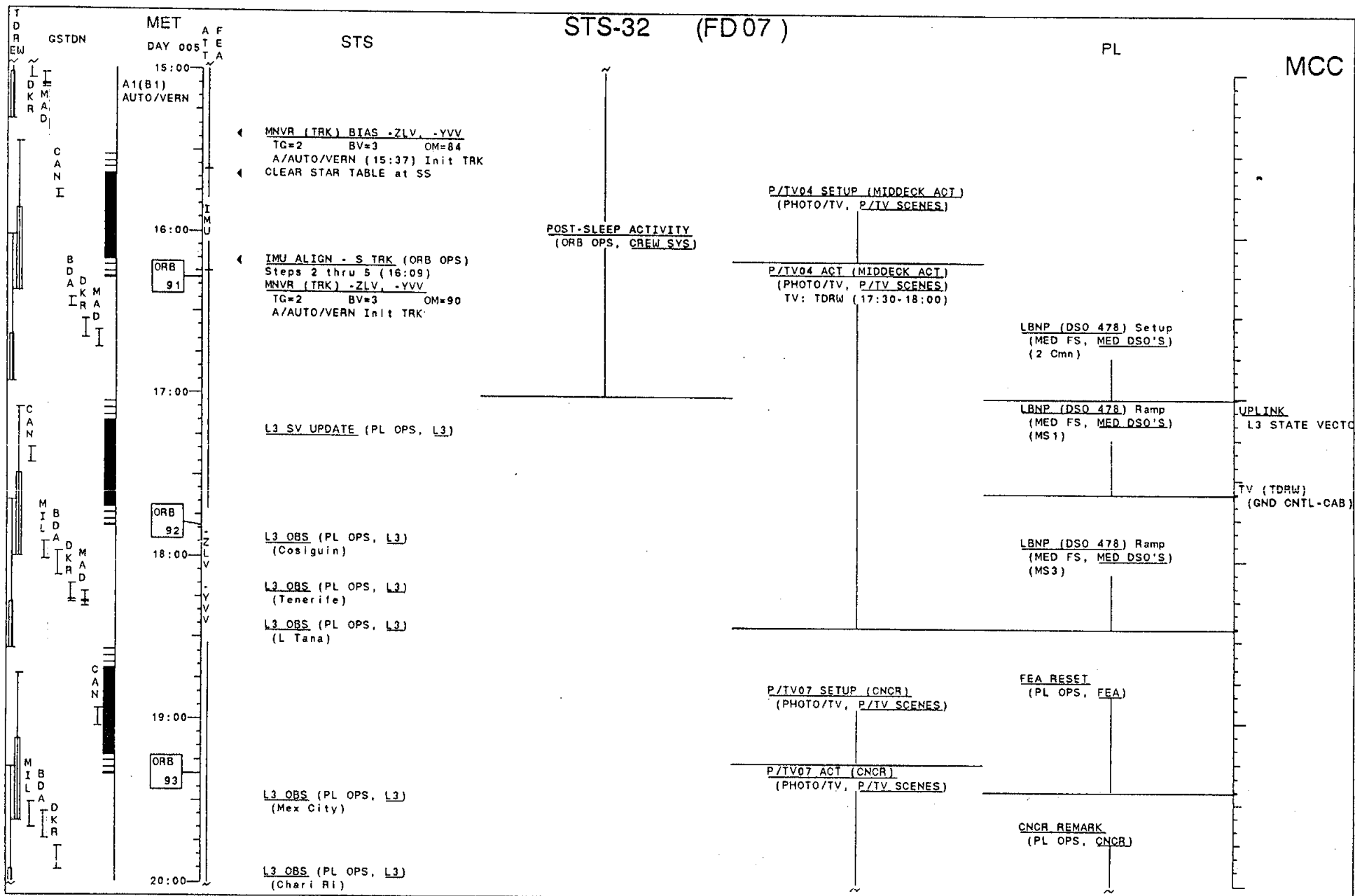
SLEEP

AEROBICS (DSO 476) Pulse Rt
(MED FS, MED DSO'S)
(ALL)

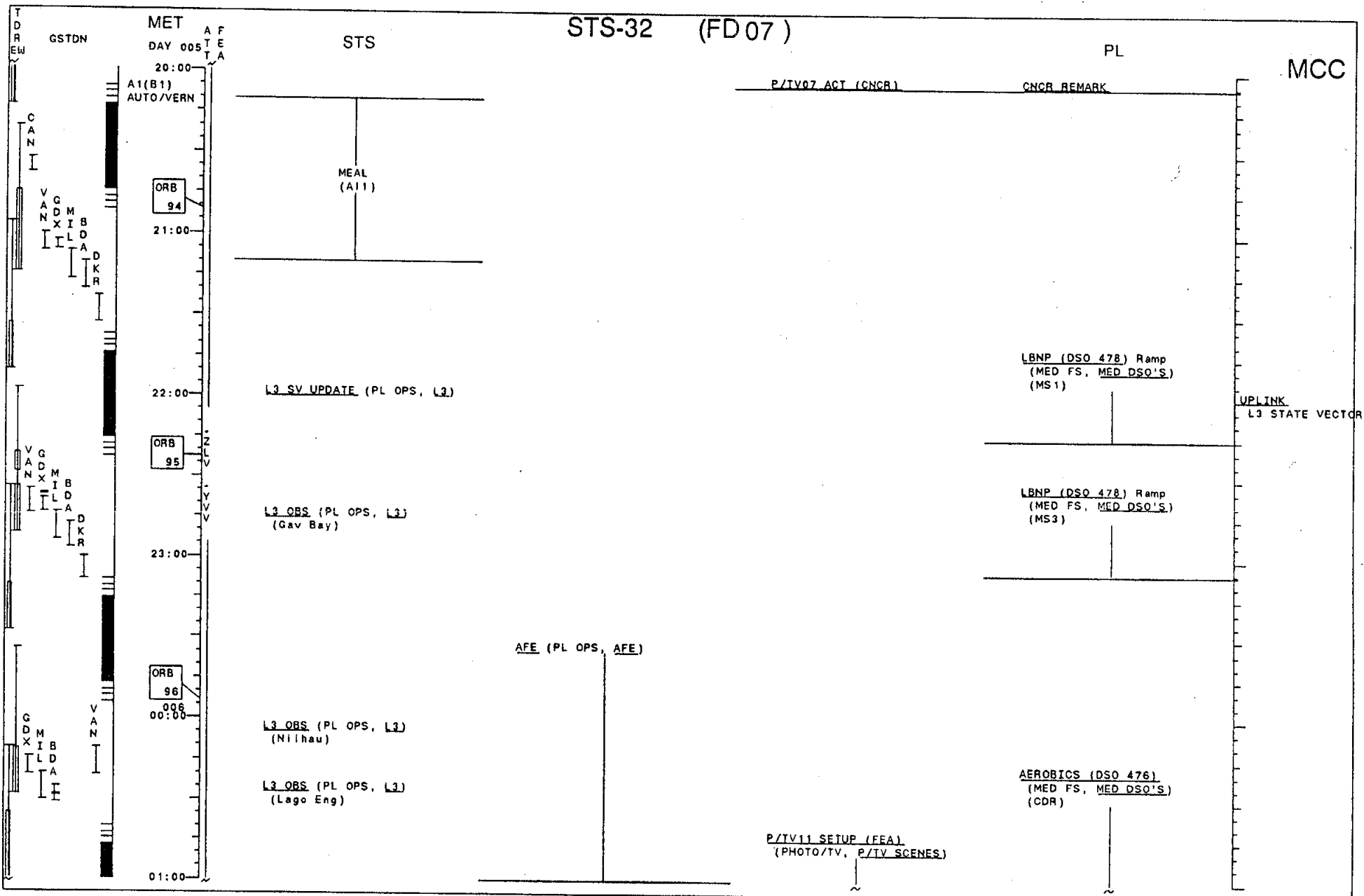
POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

| IMU ALIGN LOG | | | |
|---------------------------|----------|---------|------------|
| STAR ID: | -Y: | 21 | Procyon |
| | : | 94 | Cor Caroli |
| | ANG DIF: | 78 | 2 |
| STARS IN TABLE: 1 6 : 0 9 | | | |
| REOD ID: | | | |
| -Y | 1 | ANG ERR | 2 3 |
| ANG: | | | |
| ΔX | () | () | () |
| ΔY | () | () | () |
| ΔZ | () | () | () |
| EXECUTION TIME: | | | |
| / : : : | | | |

FD07 EZ ACTIVITIES:
FOOD PREP/POST (Cue Card)(30 Min)
PCG FAN INLET CLEANING & TEMP CK



STS-32 (FD 07)



STS-32 (FD07)

MET

DAY 006

STS

PL

MCC

01:00

A1(B1)
AUTO/VERN

ORB
97

P/TV11 SETUP (FEA)
(PHOTO/TV, P/TV SCENES)
P/TV11 ACT (FEA)
(PHOTO/TV, P/TV SCENES)

AEROBICS (DSO 476)
(MED FS, MED DSO'S)
(CDR)

AEROBICS (DSO 476)
(MED FS, MED DSO'S)
(PLT)

FEA ACTIVATION Sample #6
(PL OPS, FEA)

02:00

L3 ORS (PL OPS, L3)
(Laguna)

MNVR (TRK) BIAS -ZLV, -YVV
TG=2 BV=3 OM=85
A/AUTO/VERN (02:17) Init TRK
CLEAR STAR TABLE at SS

03:00

ORB
98

IMU ALIGN - S TRK (ORB OPS)
Steps 2 thru 5 (02:48)
MNVR (TRK) -ZLV, -YVV
TG=2 BV=3 OM=90
A/AUTO/VERN Init TRK

IMU ALIGN LOG

STAR ID: -Y: 21, Procyon
 : 94, Cor Caroli
ANG DIF: 78, 3

STARS IN TABLE: 0 2 : 4 8

REOD ID:

-Y ___ , ___ ANG ERR ___ . ___
 1 2 3

ANG:

ΔX () ___ () ___ () ___

ΔY () ___ () ___ () ___

ΔZ () ___ () ___ () ___

EXECUTION TIME:

___ / ___ : ___ : ___

FEA TERMINATION Sample #6
(PL OPS, FEA)

04:00

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY & WASTE DUMPS

05:00

ORB
99

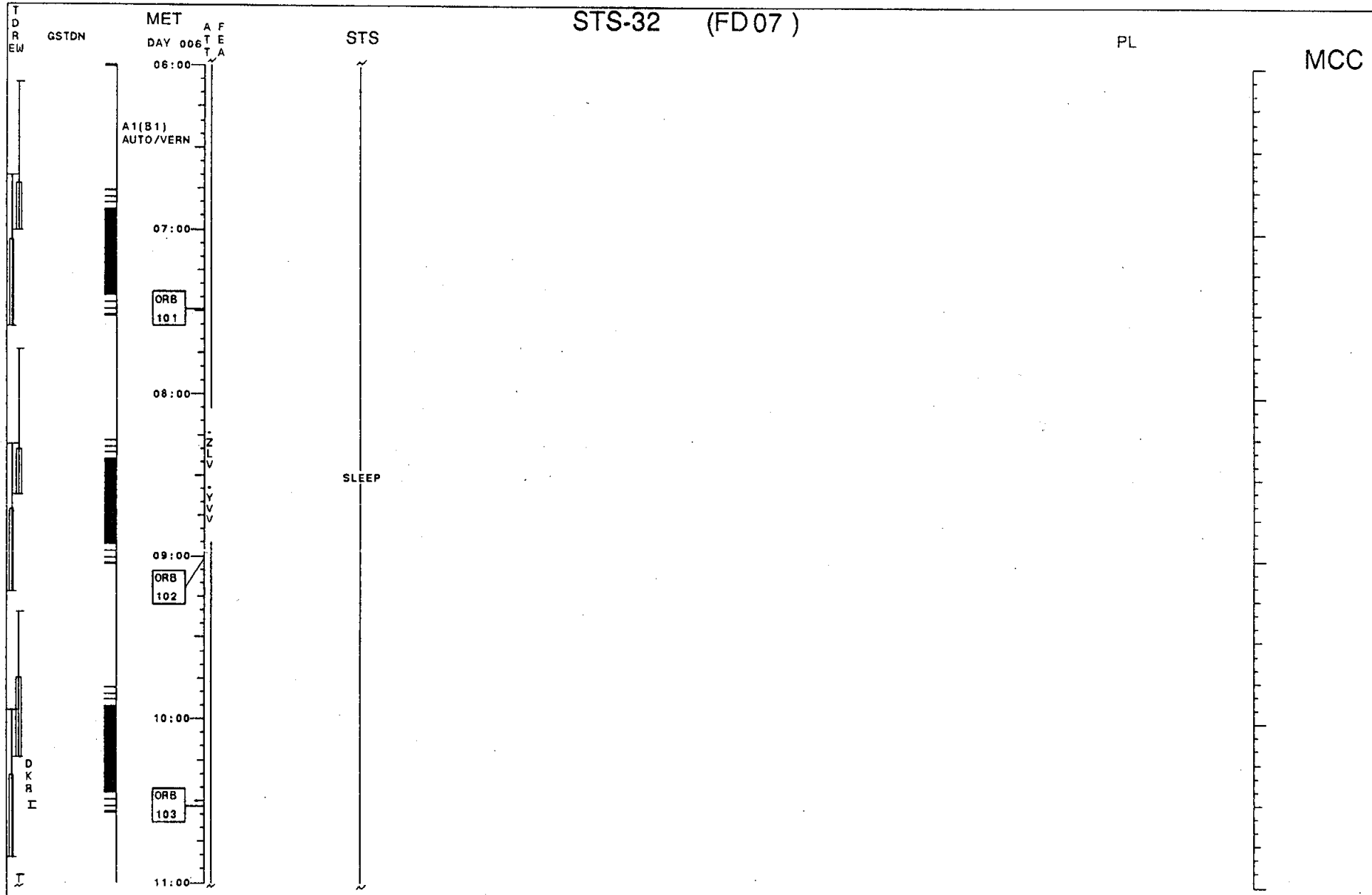
06:00

ORB
100

SLEEP

TV (TDRE/W)
(GND CNTL-PLB)

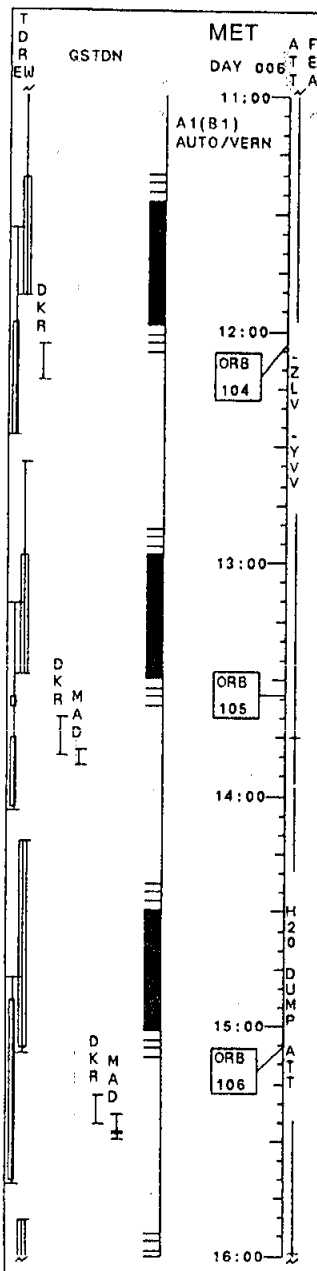
STS-32 (FD07)



STS-32 (FD08)

PL

MCC



STS

SLEEP

AEROBICS (DSO 476) Pulse Rt
(MED FS, MED DSO'S)
(ALL)
← MNVR (TRK) WASTE DUMP ATT
TG=2 BV=5
P=270 Y=310 OM=270
A/AUTO/VERN Init TRK
WASTE WATER DUMP
(ORB OPS, ECLS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY DUMP

ECLS SSR-9 SPLY DUMP - FES
(MALF, ECLS SSR) Steps 1&2
Tank C&D dump not req'd

← MNVR (TRK) BIAS -ZLV, -YVV
TG=2 BV=3 OM=86
A/AUTO/VERN (15:59) Init TRK
← CLEAR STAR TABLE at SS

IMU ALIGN LOG

STAR ID: -Y: 21, Procyon
 : 94, Cor Caroli
 ANG DIF: 78.2

STARS IN TABLE: 1 6 : 2 9

REGD ID:

-Y , ANG ERR , ,

 1 2 3

ANG:

ΔX () () () ()

ΔY () () () ()

ΔZ () () () ()

EXECUTION TIME:

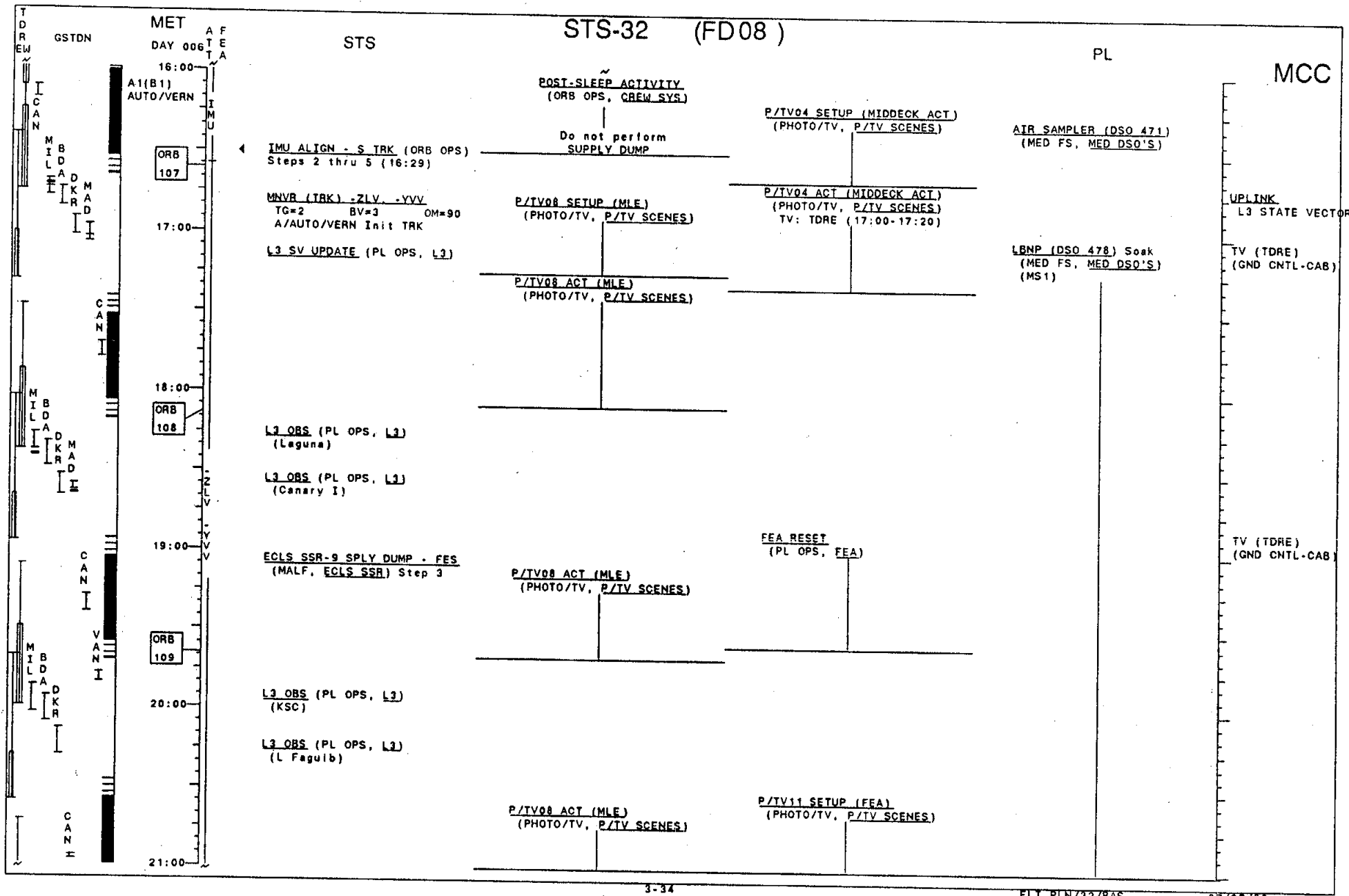
 / : :

FD08 EZ ACTIVITIES:

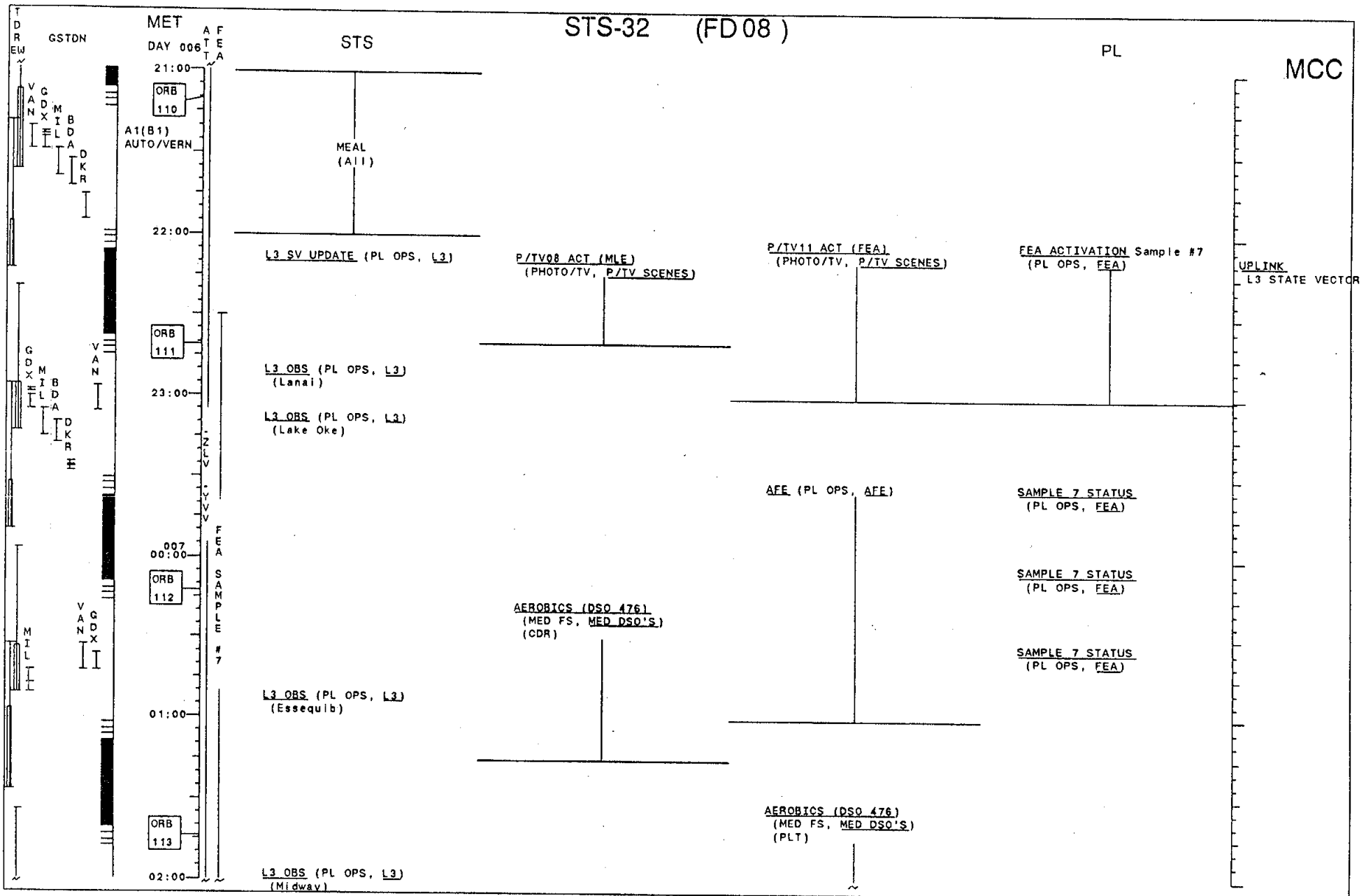
FOOD PREP/POST (Cue Card)(30 Min)

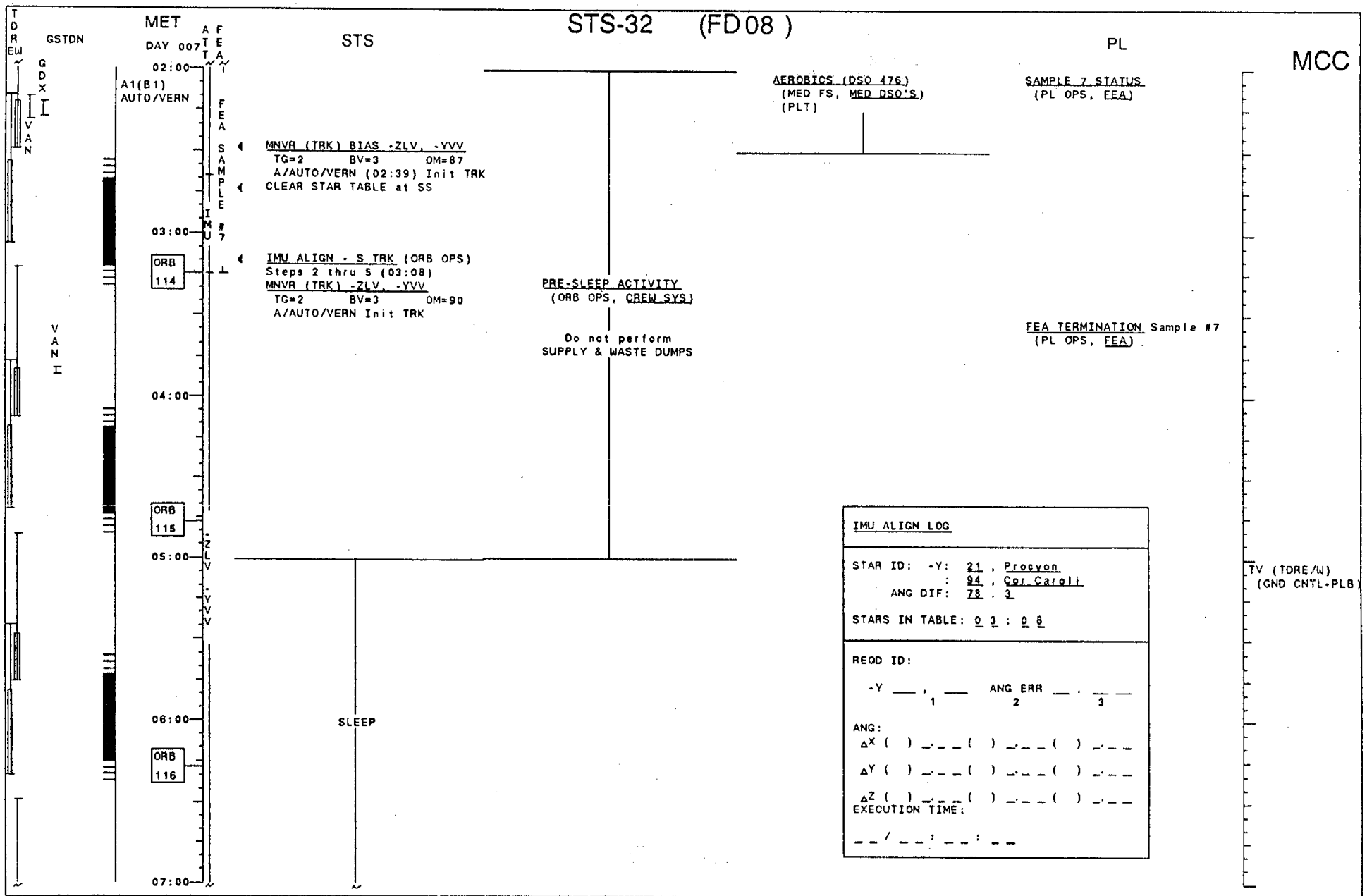
PCG FAN INLET CLEANING & TEMP CK

UPDATE
H2O WASTE
DUMP QTY



STS-32 (FD08)

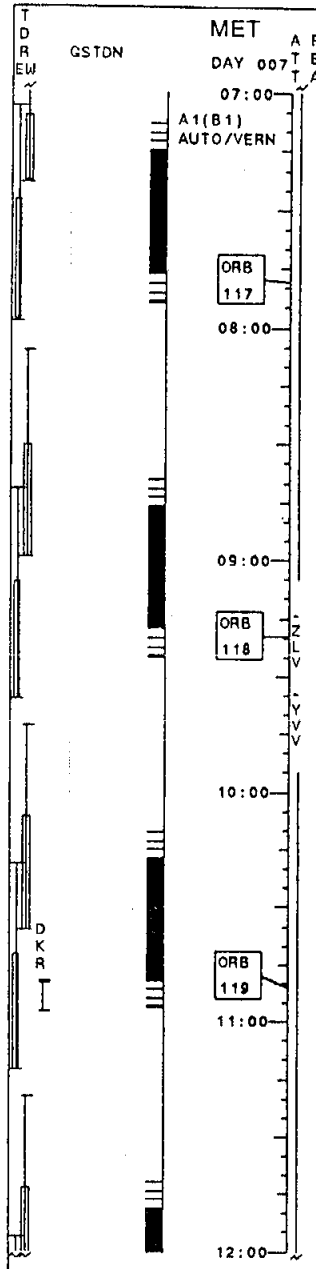




STS-32 (FD08)

PL

MCC



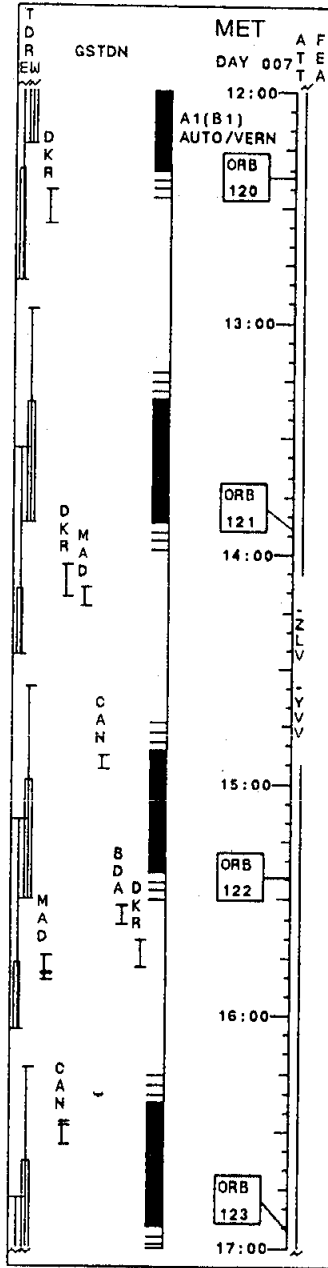
STS

SLEEP

STS-32 (FD09)

PL

MCC



STS
SLEEP

AEROBICS (DSO 476) Pulse Rt
(MED FS, MED DSO'S)
(ALL)

FD09 EZ ACTIVITIES:
FOOD PREP/POST (Cue Card)(30 min)
PCG FAN INLET CLEANING & TEMP CK

| IMU ALIGN LOG | | |
|---------------------------|----------|----------------|
| STAR ID: | -Y: | 21, Procyon |
| | : | 94, Cor Caroli |
| | ANG DIF: | 78.3 |
| STARS IN TABLE: 1 5 : 1 8 | | |
| REOD ID: | | |
| -Y | ANG ERR | |
| 1 | 2 | 3 |
| ANG: | | |
| ΔX | () | () () |
| ΔY | () | () () |
| ΔZ | () | () () |
| EXECUTION TIME: | | |
| - - / - - : - - : - - | | |

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY & WASTE DUMPS

L3 SV UPDATE (PL OPS, L3)
← CLEAR STAR TABLE at SS

← IMU ALIGN - S TRK (ORB OPS)
Steps 2 thru 5 (15:18)

L3 OBS (PL OPS, L3)
(Socotra)

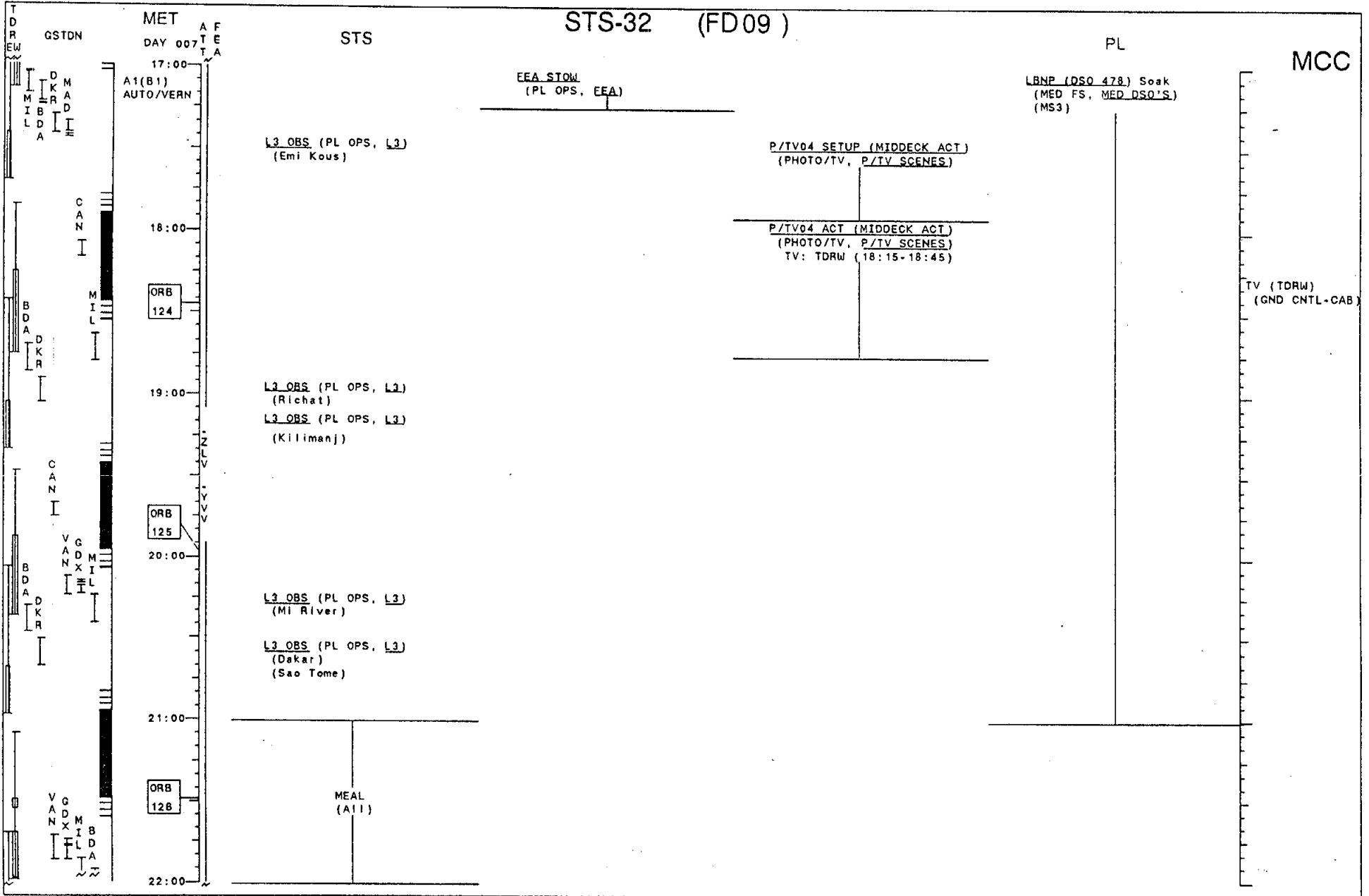
EEA RESET
(PL OPS, EEA)

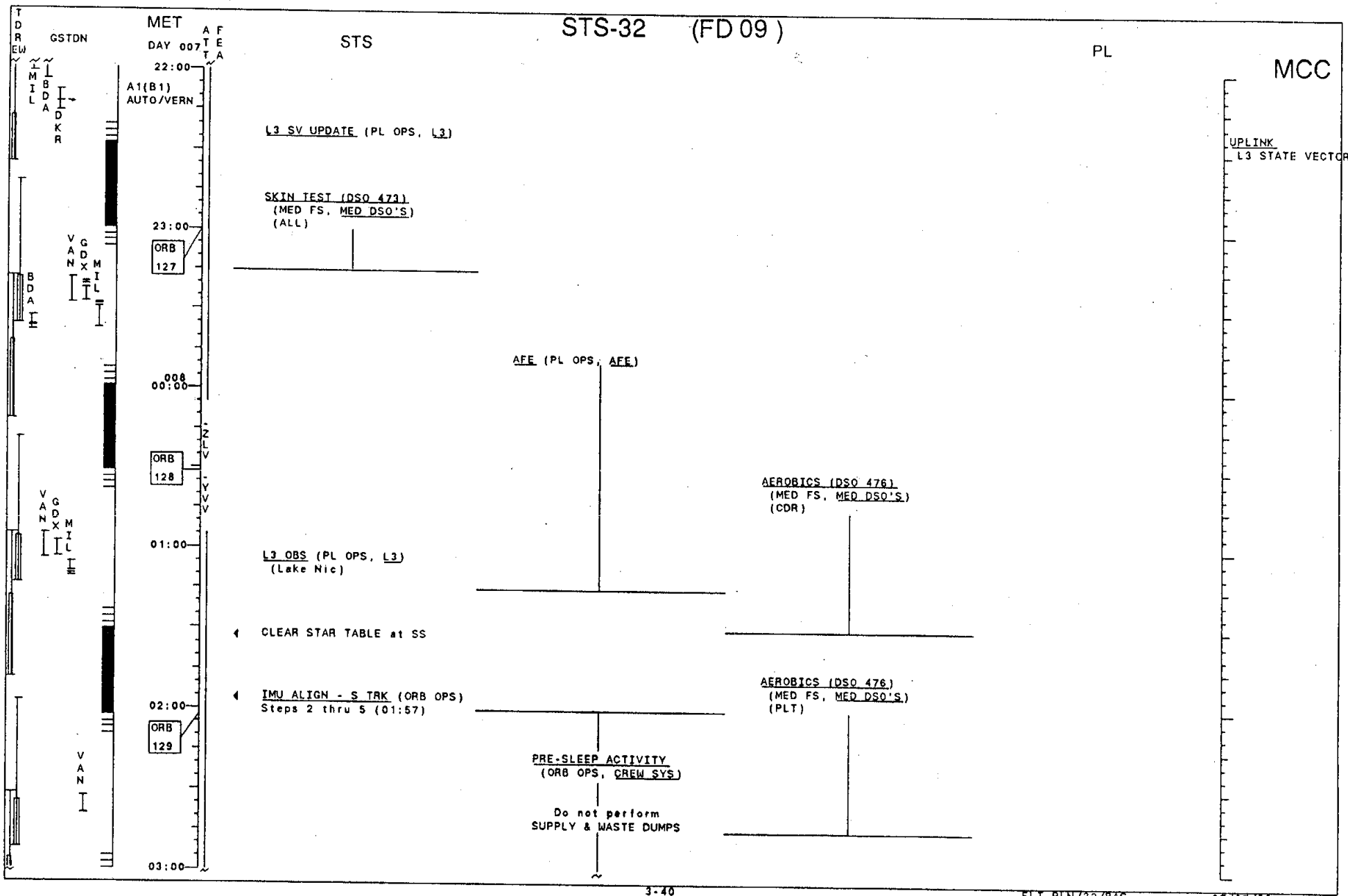
EEA STOW
(PL OPS, EEA)

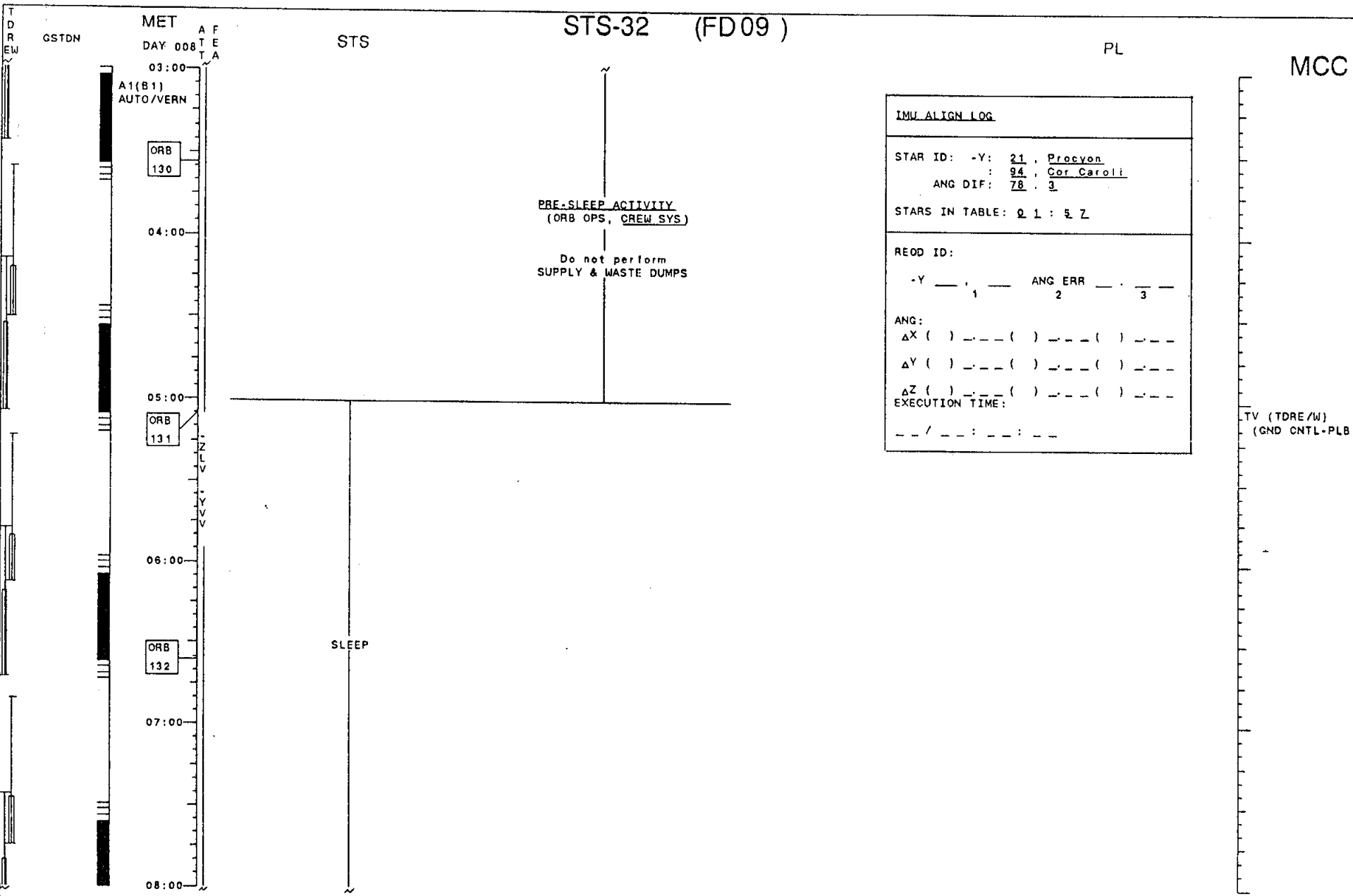
LBNP (DSO 478) Ramp
(MED FS, MED DSO'S)
(MS1)

UPLINK
L3 STATE VECTOR

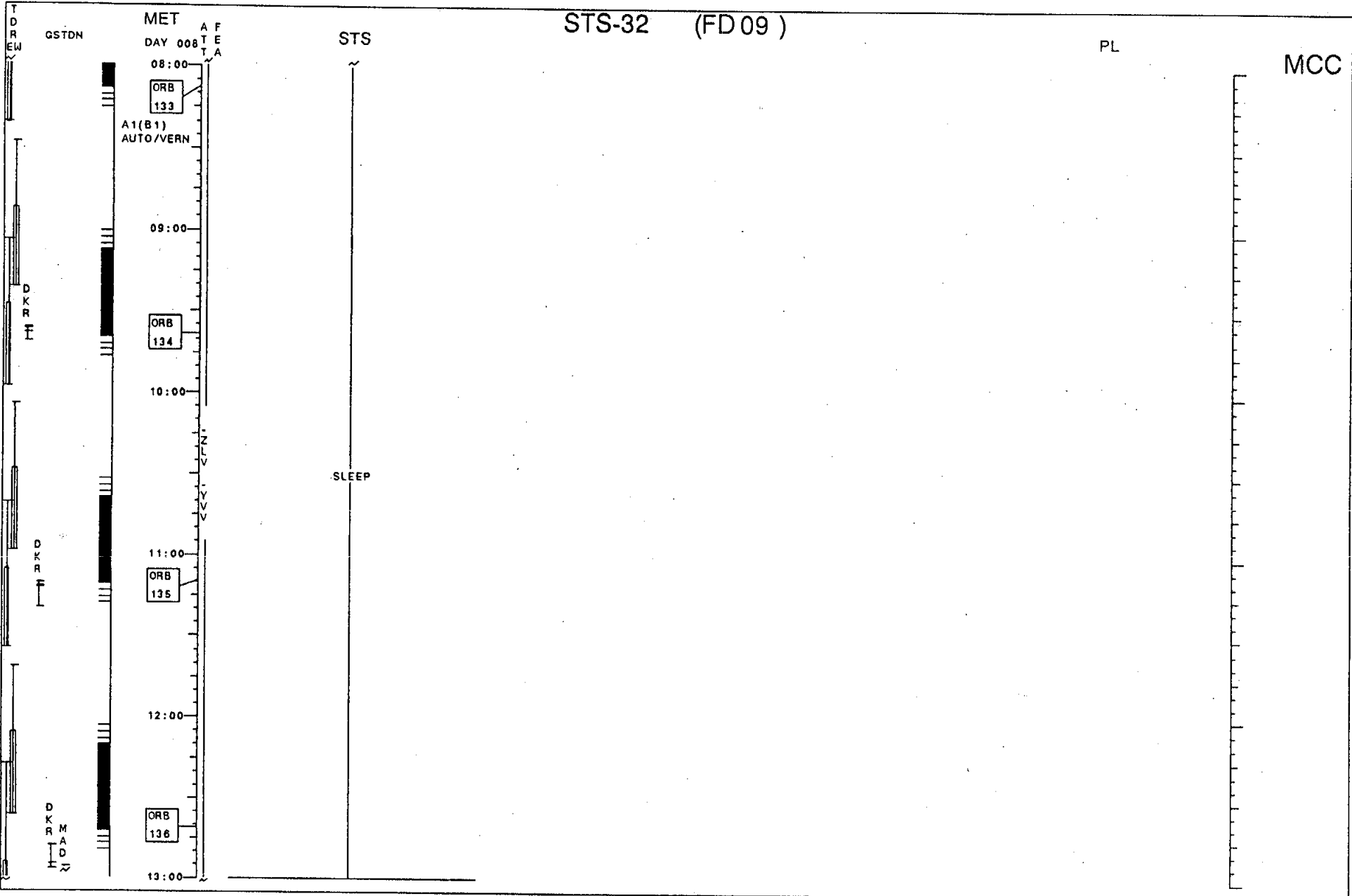
STS-32 (FD09)







STS-32 (FD09)



STS-32 (FD 10)

MET

DAY 008

STS

PL

MCC

13:00
A1(B1)
AUTO/VERN

14:00
ORB
137

15:00

16:00
ORB
138

17:00
ORB
139

18:00
A3(B1)
MAN/VERN
A1(B1)
AUTO/VERN

AEROBICS (DSO 476) Pulse Rt
(MED FS, MED DSO'S)
(ALL)

FD10 EZ ACTIVITIES:
FOOD PREP/POST (Cue Card)(30 Min)
PCG FAN INLET CLEANING & TEMP CK

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY & WASTE DUMPS

← MNVR (TRK) BIAS -ZLV, -YVV
TG=2 BV=3 OM=91
A/AUTO/VERN (15:12) Init TRK
← CLEAR STAR TABLE at SS

R2 APU STEAM VENT HTR ACT
BLR CNTLR/HTR(three) -B
PWR (three) -ON

← IMU ALIGN - S TRK (ORB OPS)
Steps 2 thru 5 (15:38)
MNVR (TRK) -ZLV, -YVV
TG=2 BV=3 OM=90
A/AUTO/VERN Init TRK

FCS CHECKOUT
(ORB OPS, GNC)
(2 Cmn)

LRNP (DSO 478) Ramp
(MED FS, MED DSO'S)
(MS3)

RCS HOT FIRE TEST
(ORB OPS, RCS) (2 Cmn)

Config DAP: A1/AUTO/VERN

AEE (PL OPS, AEE)

IMU ALIGN LOG

STAR ID: -Y: 21, Procyon
 : 94, Cor Caroli
 ANG DIF: 78.3

STARS IN TABLE: 1 2 3

REOD ID:

-Y , ANG ERR

 1 2 3

ANG:

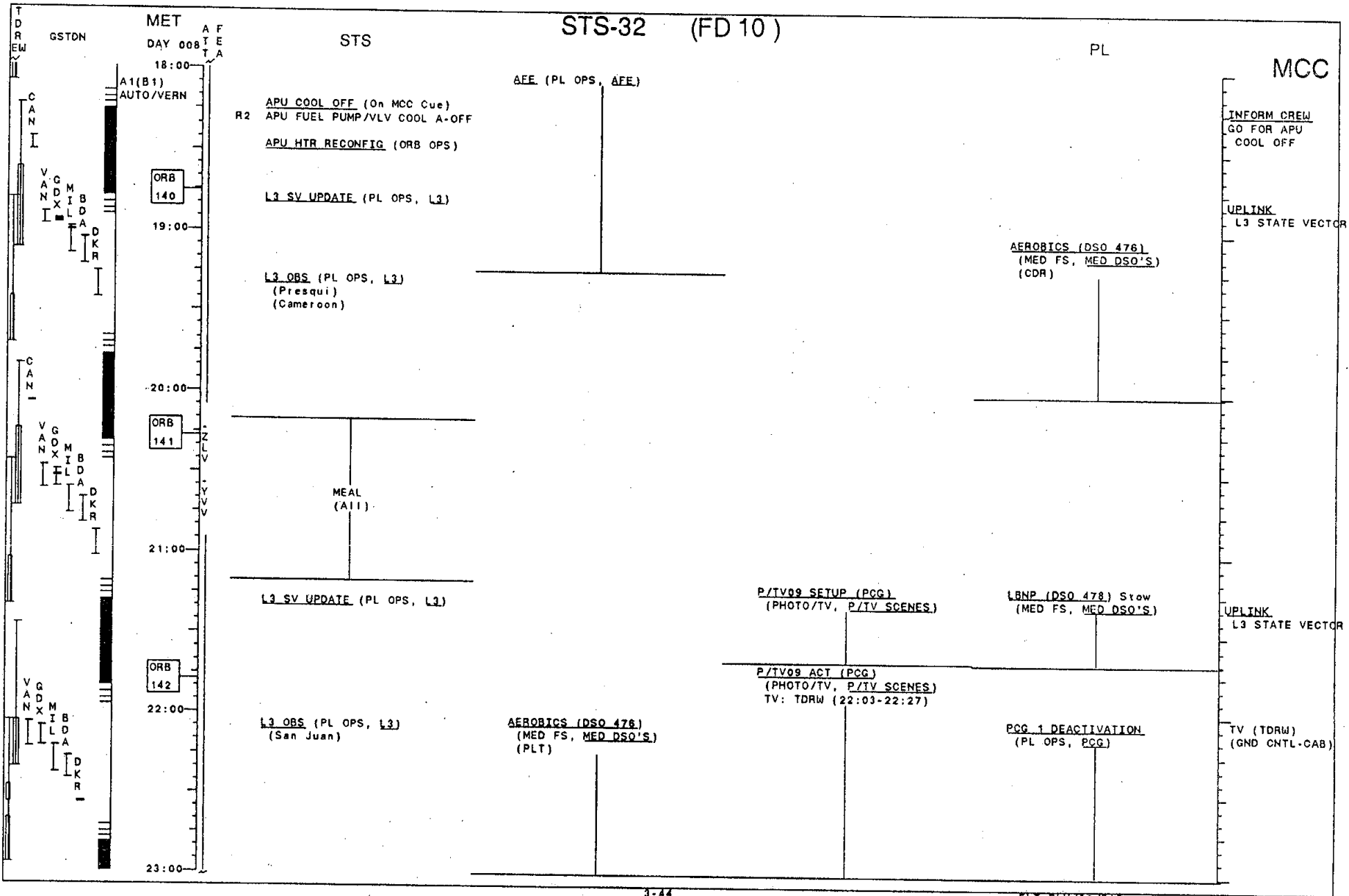
ΔX () () () ()

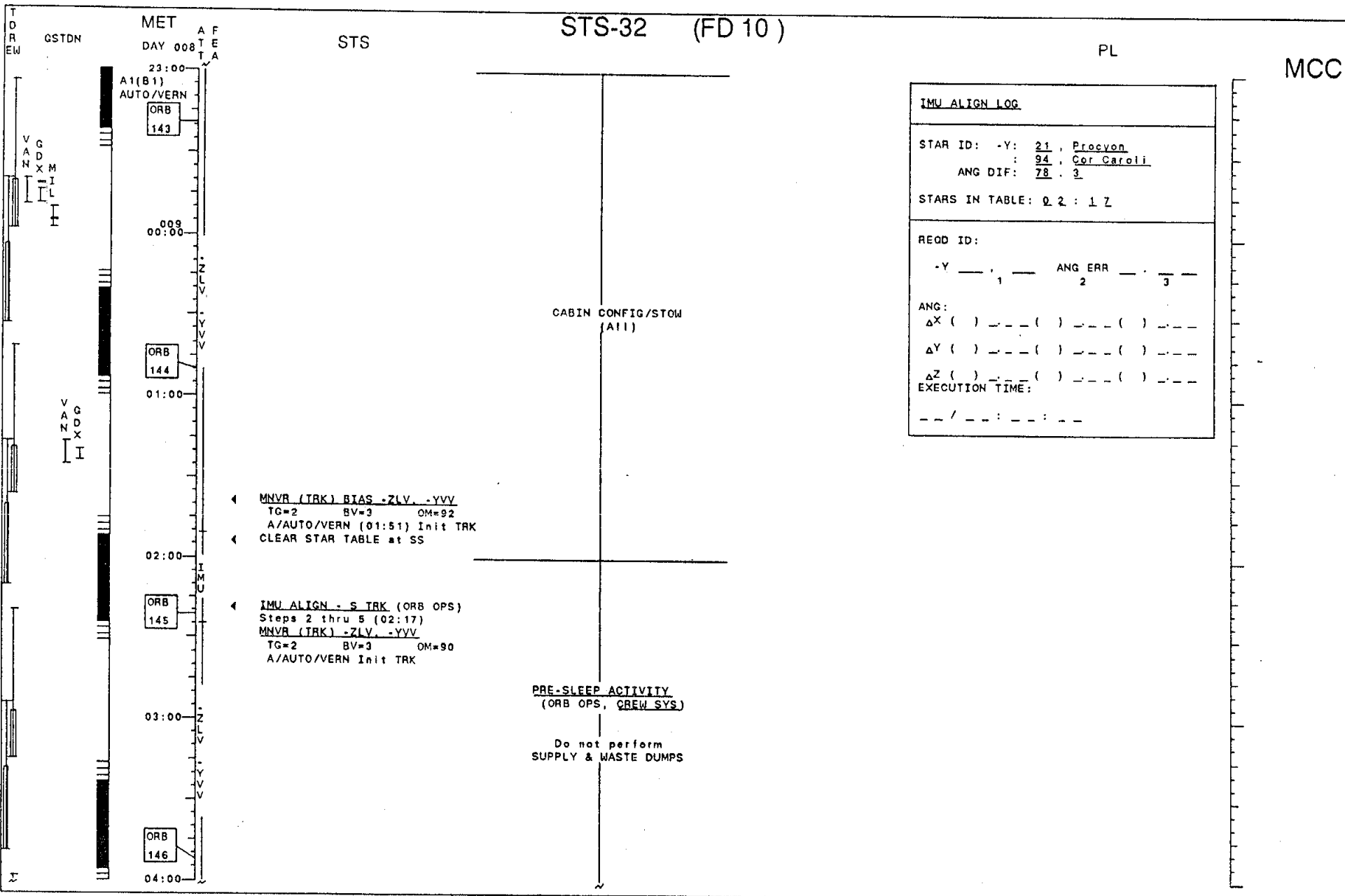
ΔY () () () ()

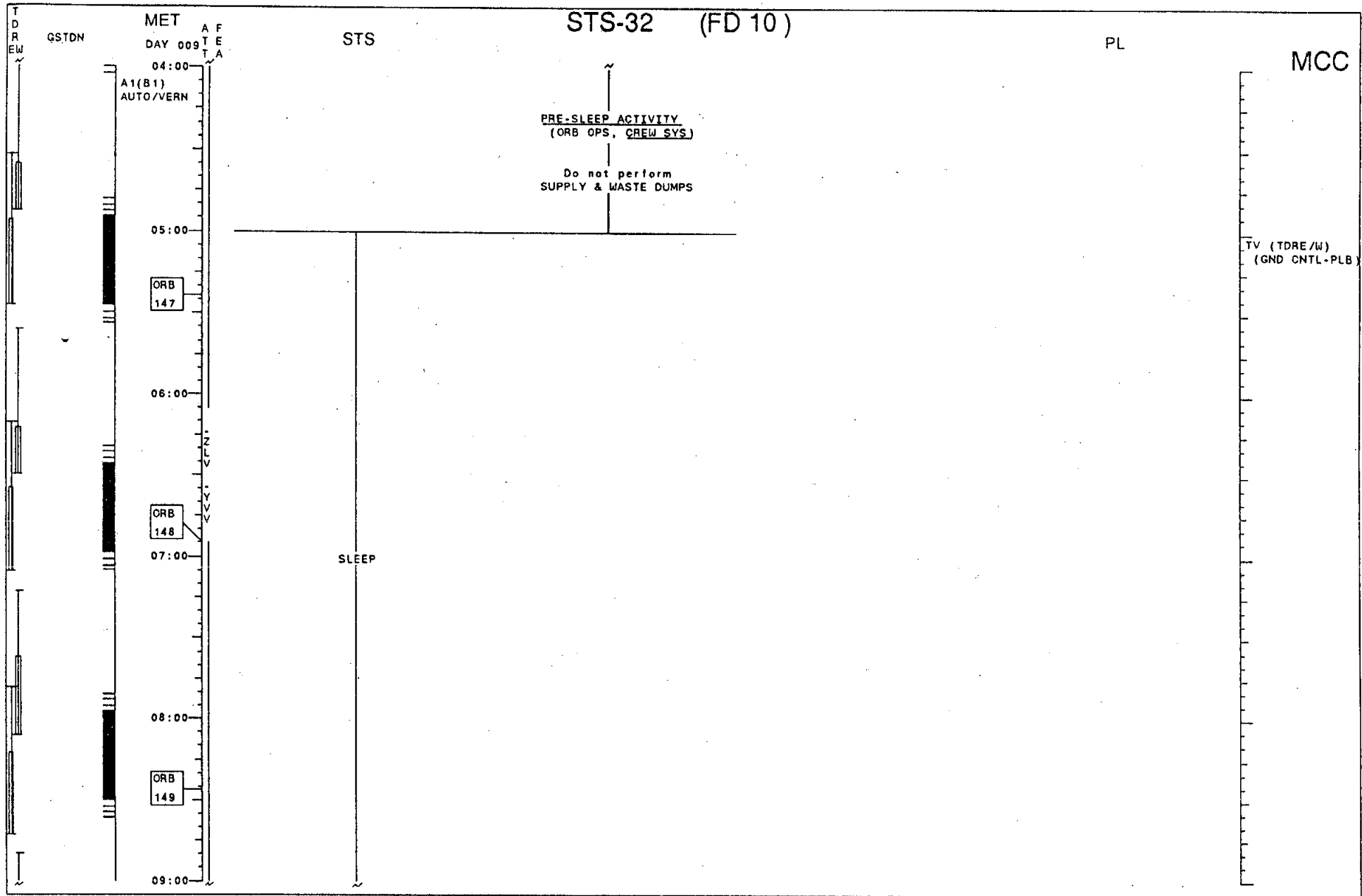
ΔZ () () () ()

EXECUTION TIME:

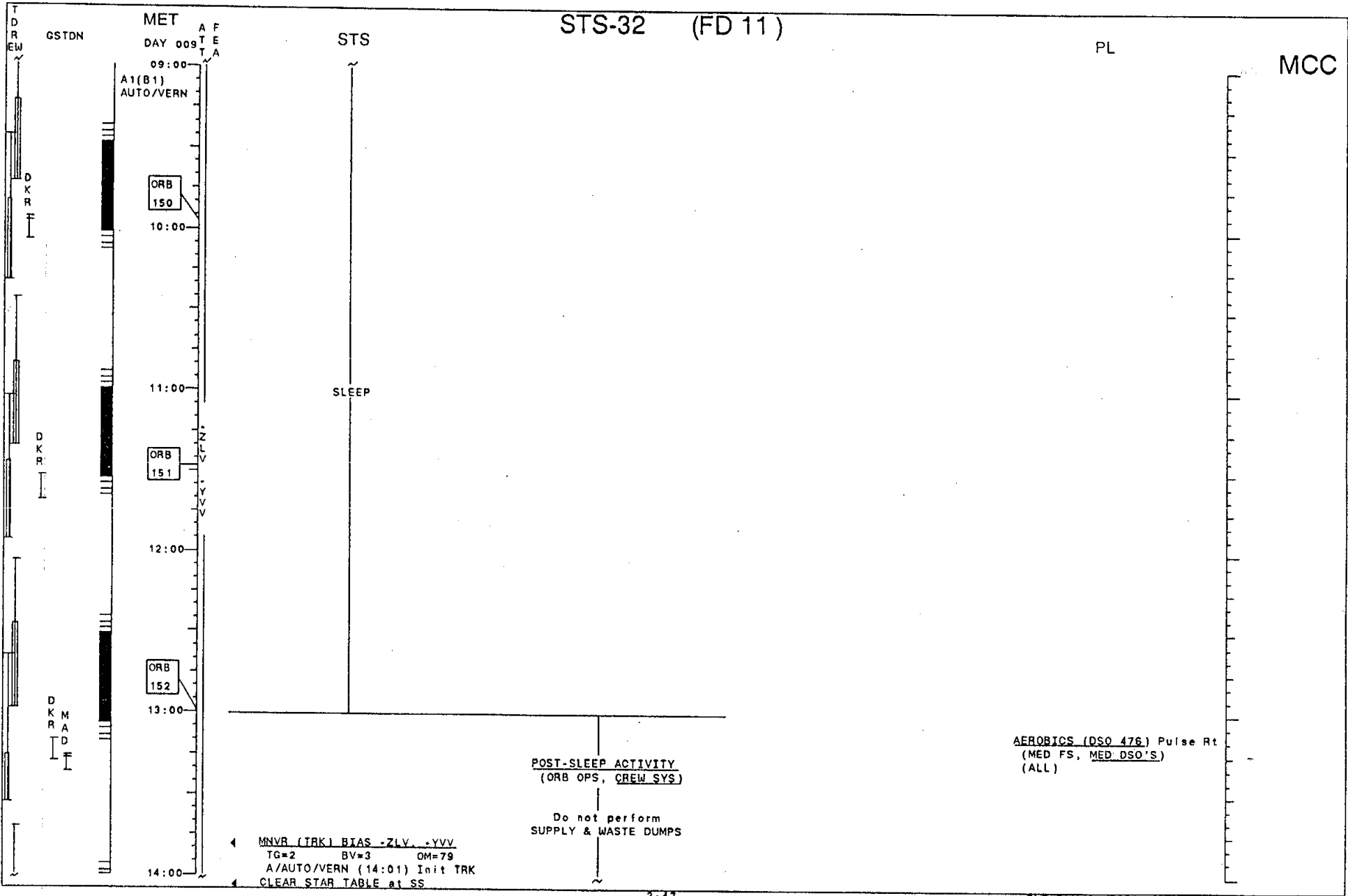
 / : :



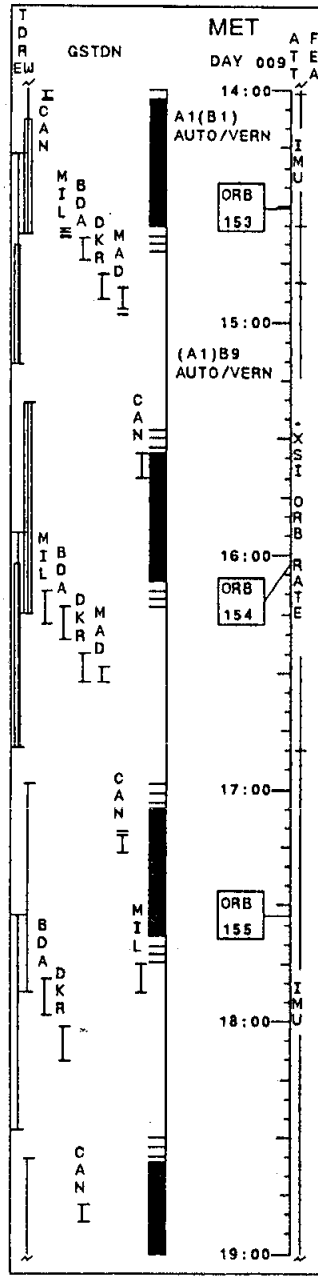




STS-32 (FD 11)



STS-32 (FD 11)



STS

PL

MCC

Change DAP B to B9
IMU ALIGN - S TRK (ORB OPS)
 Steps 2 thru 5 (14:30)
MNVR (TRK) - XSI ATT
 TG=4 BV=5
 P=184 Y=0 OM=239.2
 A/AUTO/VERN (14:35) Init TRK
MNVR (ROT) FUT START
 BV=5 P=4 Y=0
 B/AUTO/VERN (14:50) Init ROT

POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

Do not perform
 SUPPLY & WASTE DUMPS

PCG 2 DEACTIVATION
 (PL OPS, PCG)

CAB AIR MONITORING (DIO 0623)
 (ORB OPS, CABIN AIR (DIO))

IOP (DSO 472)
 (MED FS, MED DSO'S)
 (2 Cmn)

MINI RAM (DSO 471) Deact
 (MED FS, MED DSO'S)

Update: CRT TIMER SETUP PAD
 in NOMINAL DEORBIT PREP

UPDATE
 CRT TIMER
 SETUP PAD

Go to DEORBIT PREP at 9/16:01 MET

| IMU ALIGN LOG | |
|-----------------|--|
| STAR ID: | -Y: 29, <u>Alhena</u> : 29, <u>Alkaid</u> ANG DIF: <u>88.5</u> |
| STARS IN TABLE: | 1 4 : 2 0 |
| REOD ID: | |
| -Y | 1 2 3 |
| ANG: | |
| ΔX () | () () () |
| ΔY () | () () () |
| ΔZ () | () () () |
| EXECUTION TIME: | --- / --- : --- : --- |

| EZ ACTIVITIES BEFORE LEAVING FLT PLN: |
|--|
| <u>AIR SAMPLE</u> |
| Red MET on bottle |
| <u>FLUID LOADING PREP</u> |
| Fill 4 drink containers with 8 oz H2O each (per person) |

CONTINGENCY TIMELINES

CONTINGENCY
TIMELINES

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JOINT TIMELINE
TIMELINES

FLIGHT DAY 5 RENDEZVOUS

The Flight Day 5 Rendezvous Timeline is designed to accommodate delaying LDEF Retrieval to the fifth flight day. In order to maximize the accomplishment of mission objectives, the flight plan will, in general, undergo changes. This timeline assumes the decision to delay to flight day 5 was made at launch. The timeline is based on the nominal Cycle 2 trajectory.

END

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-------------------|-----|------------|-------------------|----|----|----|---------|-------------------|----------|----------|-----------|-----|-----------|-------|----|---|---|----|----|------------|----|----|----|----|--|
| MET :003 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 5 | POST SLEEP | IMU | POST SLEEP | RENDEZVOUS (LDEF) | | | | GRAPPLE | LDEF PHOTO SURVEY | LOW BURN | LOW BURN | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | POST SLEEP | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | | | | | | | | | | |
| NOTES: | FEA #3 | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-------------------|-----|-------------|-----|-----------|------|----|----|----|-----|-----------|-----|-----------|-------|----|----|---|---|----|------------|-----|----|----|----|----|--|
| MET :004 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 6 | POST SLEEP | IMU | FILE REPAIR | AFE | CREW CONF | MEAL | | | | AFE | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | POST SLEEP | IMU | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | | | | | | | | | | |
| NOTES: | FEA #5 | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-------------------|---------|---------|------|------|---------|---------|-----|----|-----|-----|-----|-----------|-------|-----|-----|---|---|----|------------|----|----|----|----|----|--|
| MET :005 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 7 | POST SLEEP | DSO 478 | DSO 478 | CNCR | MEAL | DSO 478 | DSO 478 | AFE | | | | IMU | PRE SLEEP | SLEEP | | | | | | POST SLEEP | | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | | | | | | | | | | |
| NOTES: | FEA #6 | | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|-------------------|----------------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----------|-----|-----------|-------|---|---|---|----|----|------------|-----|------------|----|----|--|
| MET :006 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 8 | IMU | DSO 478 (SOAK) | | | | MEAL | MLE | AFE | | | | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | POST SLEEP | IMU | POST SLEEP | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | | | | | | | | | | | |
| NOTES: | FEA #7 | | | | | | | | | | | | | | | | | | | | | | | | | |

| FD5 RNDZ | | | | FLIGHT STS-32 | | | | EDITION BASIC | | | | PUB. DATE 7/27/89 | | | | | | | | | | | | | | |
|-----------|---|----------------|---------|---------------|---------|-------------|------------|---------------|-----|-----|-----------|-------------------|-----|-----|-------|-------|---|---|------------|------------|------------|------------|------------|----|----|--|
| MET :007 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD9 | DSO 478 | DSO 478 (SOAK) | | | | MEAL | | DSO 473 | AFE | IMU | PRE SLEEP | | | | SLEEP | | | | POST SLEEP | IMU | POST SLEEP | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | | | | | | | | | | |
| NOTES: | LBNP (MS1) LBNP (MS3) FEA STOW DSO 473 DELAYED TYPE HYPERSENSITIVITY | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :008 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD10 | FCS C/O | HOT FIRE | DSO 478 | AFE | MEAL | PCG 1 DEACT | CABIN STOW | | | | IMU | PRE SLEEP | | | | SLEEP | | | | POST SLEEP | IMU | POST SLEEP | POST SLEEP | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | | | | | | | | | | |
| NOTES: | LBNP (MS3) AFE STOW IMAX STOW L3 STOW PCG2 DEACT | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :009 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD11 | DEORBIT PREP | | | | DEORBIT | | LANDING | | | | | | | | | | | | | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|-----------------------|-----------------------|-------------|-------|------|-------------------|--------|---------|-----------|
| 317:19:17 / 318:07:17 | 000:00:00 / 000:12:00 | 317:13:17 / 318:01:17 | 01/ 317 CST | -35.6 | ☉ | NOVEMBER 13, 1989 | STS-32 | BASIC | 7/27/89 |
| CST : 317 | | | | | | | | | |
| FD : 01 | | | | | | | | | |
| MET : 000 | | | | | | | | | |
| STS | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | | | | | | | | | |
| GSTDN | | | | | | | | | |
| COVERAGE | | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|--------------|-------|------|-------------------|--------|---------|-----------|
| 318:07:17 / 318:19:17 | 000:12:00 / 001:00:00 | 318:01:17 / 318:13:17 | 02 / 318 CST | -37.3 | ☉ | NOVEMBER 14, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :318 | | | | | | | | | |
| FD : 01 | | | | | | | | | |
| MET :000 | | | | | | | | | MET:001 |
| STS | SLEEP | | | | | | | | |
| | POST SLEEP | | | | | | | | |
| | AFE | | | | | | | | |
| | FILTER CLEANING | | | | | | | | |
| | P/TV02 SETUP | | | | | | | | |
| | P/TV02 ACT | | | | | | | | |
| | P/TV11 SETUP | | | | | | | | |
| | P/TV11 ACT | | | | | | | | |
| | DSO 472 | | | | | | | | |
| PL | FEA ACT 1 | | | | | | | | |
| DAY/NIGHT | ORBIT | | | | | | | | |
| ORBIT | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| GSTDN COVERAGE | -DKR | | | | | | | | |
| TDRS | -MIL -BDA -DKR -MAD | | | | | | | | |
| ATTITUDE | -ZLV +YVV | | | | | | | | |
| FEA | FEA SAMPLE #1 | | | | | | | | |
| NOTES: | ● DSO 476 PULSE RATE ● DSO 471 APC (AIR SAMPLER) ● DTO 0910 OEX ● DSO 457 SALIVARY SCOP/DEX ● -ZLV, +XVV ● DSO 472 INTRAOCULAR PRESSURE ● -ZLV, +YVV | | | | | | | | |

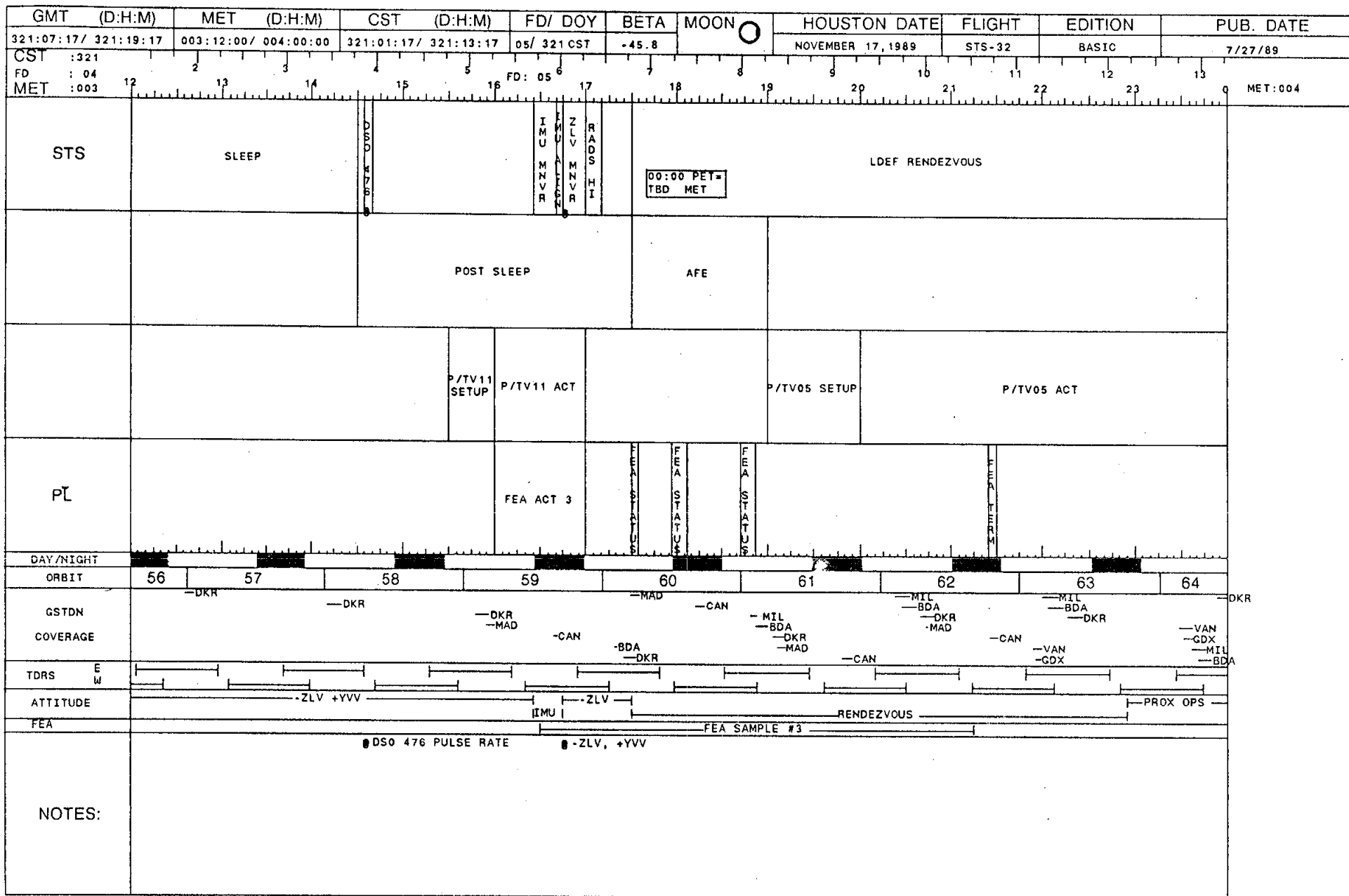
| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | | | | | | | | | |
|-----------------------|-----------------------|-----------------------|----------------------|--------------------|---------------------|-------------------|--------------|-------------------|-------------------|------------|------------|-------------|---|---|---|---|---|---|---|---|----|----|----|--|
| 318:19:17 / 319:07:17 | 001:00:00 / 001:12:00 | 318:13:17 / 319:01:17 | 02 / 318 CST | -39.0 | ☉ | NOVEMBER 14, 1989 | STS-32 | BASIC | 7/27/89 | | | | | | | | | | | | | | | |
| CST :318 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| FD :02 | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :001 | | | | | | | | | | | | | | | | | | | | | | | | |
| STS | DPLY ATT | OMS SEP | WINN DOE P | APKM ZLV MNV | MEAL | VTR SMT VTR | PLAY BACK | OMS BURN | OMS BURN | IMU MNV | ZLV MNV | OMS BURN | | | | | | | | | | | | |
| | MNV | BURN | RO MNV | RR S Z P | | | | AFE | | | PRE SLEEP | | | | | | | | | | | | | |
| | ← SYNCOM → | | | | | | | | | | | | | | | | | | | | | | | |
| | STAT US | SPIN UP | | | | | | DSO 476 | DSO 476 | DSO 476 | | | | | | | | | | | | | | |
| PL | CHECK | DE LOY | | | | | | FEA STAT US | FEA STAT US | | | | | | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | | | | | | | | | | | | | | | |
| GSTDN | -VAN -GD | | -MIL -BDA -DKR | | -VAN -GD -MIL | | | | | | | | | | | | | | | | | | | |
| COVERAGE | | | | | | | | | | | | | | | | | | | | | | | | |
| TDRS | E W | | | | | | | | | | | | | | | | | | | | | | | |
| ATTITUDE | | -SEP | | | | | | | | | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | | | | | | |
|----------------------|----------------------|----------------------|-------------|-------|------|-------------------|--------|---------|-----------|----|---------------------|---------------------------|----------------|-------------------|-------------------|---------------------|---------------------------|-------------------------|--------------------------|---------------------|-----------------------|
| 319:07:17/ 319:19:17 | 001:12:00/ 002:00:00 | 319:01:17/ 319:13:17 | 03/ 319 CST | -40.7 | ☉ | NOVEMBER 15, 1989 | STS-32 | BASIC | 7/27/89 | | | | | | | | | | | | |
| CST :319 | FD :02 | MET :001 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | MET:002 | | | | | |
| STS | SLEEP | | | | | | | | | | IMU MNV R | COOAS MNV R | 902 MNV R | 910/5 MNV R | 910/1 MNV R | 910/7 MNV R | 910/6 MNV R | | | | |
| | POST SLEEP | | | | | | | | | | 902 D T O | 910/5 D T O | 910/1 D T O | 910/2 D T O | 910/3 D T O | 910/7 D T O | 910/6 D T O | | | | |
| | | | | | | | | | | | P S E T T V U P 1 1 | P/TV11 ACT | | AFE | | | FEA STATUS | | | | |
| PL | | | | | | | | | | | FEA RESET | FEA ACT 2 | | FEA STATUS | FEA STATUS | FEA STATUS | DSO 476 | | | | |
| DAY/NIGHT | ORBIT | | | | | | | | | | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | | | |
| GSTDN COVERAGE | | | | | | | | | | | -DKR | -DKR | -DKR -MAD | -CAN | -DKR -MAD | -MIL -BDA -DKR -MAD | -CAN | -BDA -DKR | -CAN | -VAN -MIL -BDA -DKR | |
| TDRS | | | | | | | | | | | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | -ZLV +YVV | | |
| ATTITUDE | | | | | | | | | | | IMU | PITCH | FREE | P/Y/R | FREE | FREE | FREE | FREE | | | |
| FEA | | | | | | | | | | | FEA SAMPLE #2 | | | | | | | | | | |
| NOTES: | | | | | | | | | | | DSO 476 PULSE RATE | DSO 457 SALIVARY SCOP/DEX | FWD STATION | BIASED +XLV, -ZVV | DTO 0902 OEX SUMS | -ZLV, +XVV | DTO 0910 OEX OARE (PITCH) | DTO 0910 OEX OARE (YAW) | DTO 0910 OEX OARE (ROLL) | +XLV, +ZVV | DSO 476 AEROBICS (MS) |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|----------------------|--|----------------------|---------------------|-----------------|-------------|-------------------|-----------------|---------|-----------|
| 319:19:17/ 320:07:17 | 002:00:00/ 002:12:00 | 319:13:17/ 320:01:17 | 03/ 319 CST | -42.2 | ○ | NOVEMBER 15, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :319 | | | | | | | | | CST:320 |
| FD : 03 | | | | | | | | | |
| MET :002 | | | | | | | | | |
| STS | ZLV MNV R | MEAL | OMS BURN | 902 MNV R | OTO 902 | I MU MNV R | ZLV MNV R | | SLEEP |
| | DTO 910/6 | | AFE | | | PRE SLEEP | | | |
| | | P/TV04 SETUP | P/TV04 ACT | | DSO 476 | DSO 476 | | | |
| PL | DSO 476 | | FEA STATUS | FEA STATUS | | FEA TERM | DDO HEAD | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 | |
| GSTDN COVERAGE | -VAN -GD -MIL -BDA -DKR | -MIL -BDA | -VAN -GD -MIL | | -VAN -GD | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | FREE | -ZLV +YVV | OMS +XLV | PITCH I IMU | | | -ZLV +YVV | | |
| FEA | FEA SAMPLE #2 | | | | | | | | |
| NOTES: | <ul style="list-style-type: none"> • DTO 0910 OEX OARE • DSO 476 AEROBICS (MS3) <ul style="list-style-type: none"> • -ZLV, +YVV • DSO 476 AEROBICS (PLT) <ul style="list-style-type: none"> • BIASED +XLV, -ZVV • DTO 0902 OEX SUMS • DSO 476 AEROBICS (CDR) <ul style="list-style-type: none"> • -ZLV, +YVV • DSO 457 SALIVARY SCOP/DEX | | | | | | | | |

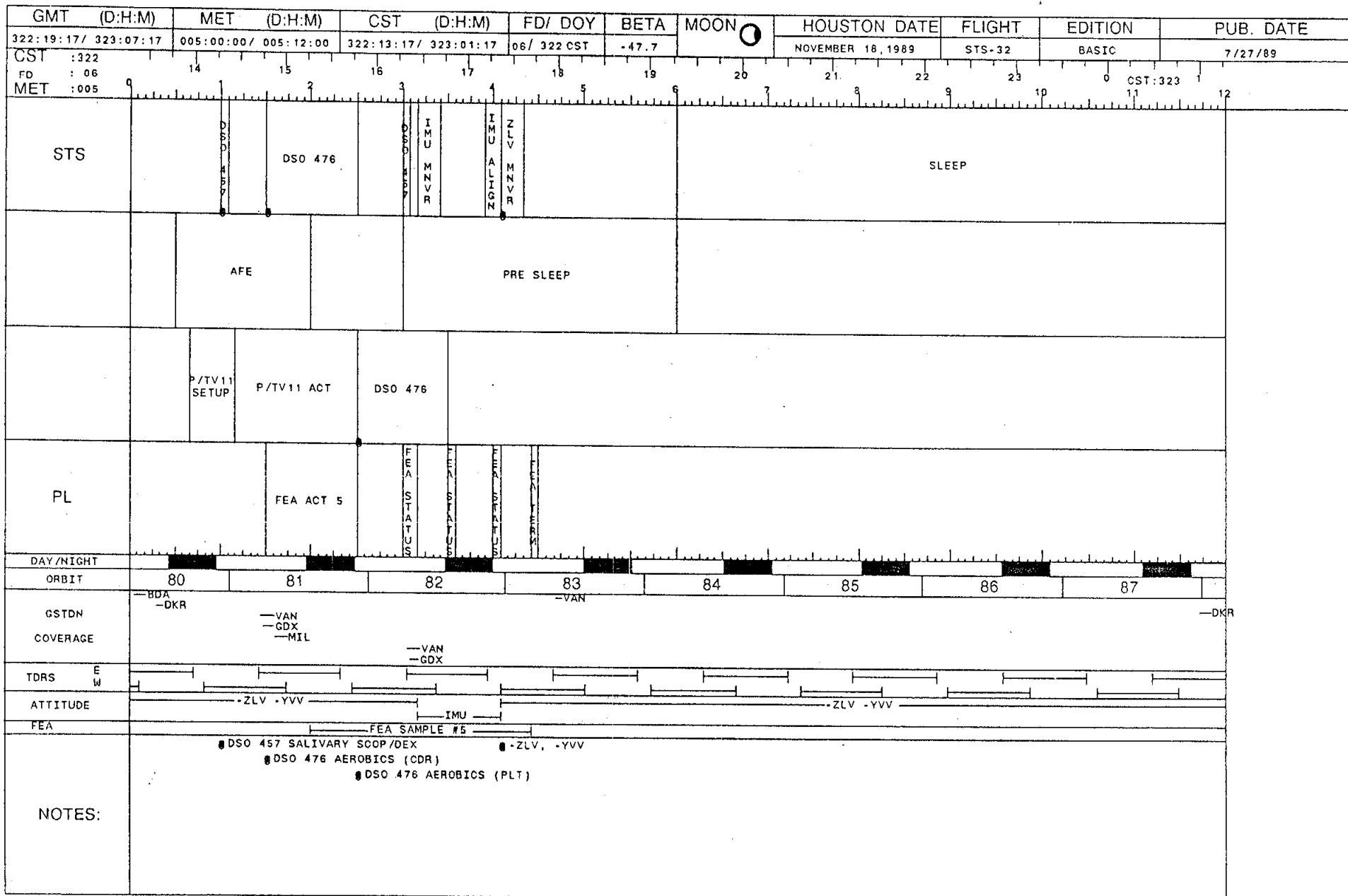
| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|----------------------|--|----------------------|-------------|-----------|--------------|-------------------|--------|---------|-----------|
| 320:07:17/ 320:19:17 | 002:12:00/ 003:00:00 | 320:01:17/ 320:13:17 | 04/ 320 CST | -43.4 | ☉ | NOVEMBER 16, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :320 | FD : 03 | MET :002 | FD: 04 | | | | | | MET:003 |
| STS | SLEEP | POST SLEEP | DSO 476 | AFE | P/TV11 SETUP | P/TV11 ACT | MEAL | | |
| PL | | | | FEA RESET | | FEA ACT 4 | | | |
| DAY/NIGHT | [Day/Night Cycle Bar] | | | | | | | | |
| ORBIT | 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | |
| GSTDN COVERAGE | [Coverage Legend: -DKR, -MAD, -CAN, -MIL, -BDA, -VAN, -GDX] | | | | | | | | |
| TDRS E W | [TDRS Coverage Bars] | | | | | | | | |
| ATTITUDE | [Attitude Control: -ZLV +YVV, IMU, GRAVITY GRADIENT] | | | | | | | | |
| FEA | [FEA Sample #4] | | | | | | | | |
| NOTES: | ● DSO 476 PULSE RATE ● DTO 0816 GRAVITY GRADIENT ATTITUDE CONTROL ● DSO 476 AEROBICS (MS3) | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|--------------|----------|------|-------------------|--------|---------|-----------|
| 320:19:17 / 321:07:17 | 003:00:00 / 003:12:00 | 320:13:17 / 321:01:17 | 04 / 320 CST | -44.7 | ○ | NOVEMBER 16, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :320 | | | | | | | | | CST:321 |
| FD :04 | | | | | | | | | |
| MET :003 | | | | | | | | | |
| STS | | TERM GCG | OMS BURN | OMS BURN | IMU | ZLV | | | SLEEP |
| | DSO 476 | | | | | | | | PRE SLEEP |
| | AFE | | | DSO 476 | | | | | |
| PL | | FEA RESET | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle Bar] | | | | | | | | |
| ORBIT | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| GSTDN COVERAGE | [Coverage Legend: -VAN, -GD, -MIL, -BDA, -DKR, -VAN, -GD, -MIL, -VAN] | | | | | | | | |
| TDRS | [TDRS Legend: -VAN, -GD, -VAN] | | | | | | | | |
| ATTITUDE | [Attitude Legend: GRAVITY GRADIENT, OMS, IMU, -ZLV, +YVV] | | | | | | | | |
| FEA | [FEA Legend: DSO 476 AEROBICS (PLT), DSO 476 AEROBICS (CDR), -ZLV, +YVV] | | | | | | | | |
| NOTES: | | | | | | | | | |



| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|------------------------------|-----------------------|----------------------|--------------|--------------|-------------------|-------------|-------------|-----------|
| 321:19:17 / 322:07:17 | 004:00:00 / 004:12:00 | 321:13:17 / 322:01:17 | 05/ 321 CST | -46.6 | ☉ | NOVEMBER 17, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :321 | | | | | | | | | |
| FD : 05 | | | | | | | | | |
| MET :004 | | | | | | | | | |
| STS | +YLV M N V R | | RADS NORM | +YLV M N V R | IMU ALIGN | XSI M N V R | ROT M N V R | ZLV M N V R | SLEEP |
| | PHOTO SURVEY | | LDEF BERTH | LDEF DEACT | RMS PWRDN | PRE SLEEP | | | |
| | P/TV05 ACT | | | | | | | | |
| PL | LDEF PHOTO SURVEY | | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle Diagram] | | | | | | | | |
| ORBIT | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| GSTDN COVERAGE | -VAN -GDX -MIL -BDA | | -VAN -GDX -MIL | | -VAN -GDX | | | | |
| TDRS E W | [TDRS Coverage Diagram] | | | | | | | | |
| ATTITUDE | +YLV +ZVV | | | -XSI | | -ZLV -YVV | | | |
| FEA | ● +YLV, +ZVV | | | ● +YLV, +ZVV | | ● -ZLV, -YVV | | | |
| NOTES: | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | |
|----------------------|---|----------------------|--------------|--------------|--------------|--------------------|-------------|---------------|--------------|--------------------|-------------|--|
| 322:07:17/ 322:19:17 | 004:12:00/ 005:00:00 | 322:01:17/ 322:13:17 | 06 / 322 CST | -47.3 | ☉ | NOVEMBER 18, 1989 | STS-32 | BASIC | 7/27/89 | | | |
| CST :322 | FD :05 | MET :004 | FD: 06 | | | | | | MET:005 | | | |
| STS | SLEEP | | IMU MNV R | IMU ALIGN | ZLV MNV R | FCR PURGE | PCDS CDD | ECSS C/O | CREW CONF | MEAL | L3 SETUP | |
| | | POST SLEEP | | AFE | | P SETUP TV13 | | P/TV13 ACT | | FILTER CLEANING | | |
| | | | | | | VTR SETUP | | PLAY BACK | DSO 476 | FEA RESET | | |
| PL | | | | | | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | |
| ORBIT | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | | | |
| GSTDN COVERAGE | -DKR, -MAD, -BDA, -CAN, -MIL, -BDA, -DKR, -VAN, -MIL, -BDA, -DKR, -CAN, -VAN | | | | | | | | | | | |
| TDRS | [TDRS Coverage] | | | | | | | | | | | |
| ATTITUDE | -ZLV -YVV, IMU | | | | | | | | | | | |
| FEA | | | | | | | | | | | | |
| NOTES: | ● DSO 476 PULSE RATE ● DSO 457 SALIVARY SCOP/DEX ● -ZLV, -YVV ● CABIN TEMP CNTL RECONFIG ● MANUAL ● DSO 476 AEROBICS (MS3) | | | | | | | | | | | |



| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------|-----------------------|-----------------------|---------------------------|-----------------------|--------------------|--------------------------------------|----------------|-------------------|------------------------------|--------------------------------------|
| 323:07:17 / 323:19:17 | 005:12:00 / 006:00:00 | 323:01:17 / 323:13:17 | 07 / 323 CST | -48.0 | | NOVEMBER 19, 1989 | STS-32 | BASIC | 7/27/89 | |
| CST :323 | | | FD: 07 | | | | | | MET:006 | |
| FD :06 | | | | | | | | | | |
| MET :005 | | | | | | | | | | |
| STS | SLEEP | | IMU MNV R | IMU ALIGN MNV R | | | MEAL | | AFE | |
| | | POST SLEEP | | | | | CNCR REMARK | | | |
| | | | P/TV04 SETUP | P/TV04 ACT | | P S E T T U V U O P 7 | P/TV07 ACT | | | |
| PL | | | | DSO 478 SETUP | DSO 478 (RAMP) | DSO 478 (RAMP) | FEA RESET | DSO 478 (RAMP) | DSO 478 (RAMP) | |
| DAY/NIGHT | | | | | | | | | | |
| ORBIT | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | | |
| GSTDN COVERAGE | | -DKR | -DKR -MAD | -CAN | -CAN | -MIL -BDA -DKR -MAD | -BDA -DKR | -CAN | -VAN -GDY -MIL -BDA | -VAN -GDY -MIL -BDA -DKR |
| TDRS E W | | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | IMU | | | -ZLV -YVV | | | |
| FEA | | | | | | | | | | |
| NOTES: | | DSO 476 PULSE RATE | DSO 457 SALIVARY SCOP/DEX | -ZLV, -YVV | DSO 478 LBNP (MS1) | DSO 478 LBNP (MS3) | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|---|-----------------------|------------------------|------------------------|------|-------------------|-----------|---------|-----------|
| 323:19:17 / 324:07:17 | 006:00:00 / 006:12:00 | 323:13:17 / 324:01:17 | 07 / 323 CST | -48.0 | ☉ | NOVEMBER 19, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :323 | | | | | | | | | |
| FD : 07 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| MET :006 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| STS | AFE | | IMU MNV R | IMU ZLV MNV R | | | | | SLEEP |
| | | DSO 476 | | PRE SLEEP | | | | | |
| | | P/TV11 SETUP | P/TV11 ACT | | | | | | |
| PL | DSO 476 | FEA ACT 6 | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | |
| GSTDN COVERAGE | --VAN --GD --MIL --BDA | | --VAN --GD --MIL | | | | | | -DKR |
| TDRS | E W | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | IMU | | | -ZLV -YVV | | |
| FEA | | | | FEA SAMPLE #6 | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV ● DSO 457 SALIVARY SCOP/DEX | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | |
|-----------------------|--|-----------------------|--------------|----------------|--------------|-------------------|----------|---------------------|-----------|----------------|----------------|
| 324:07:17 / 324:19:17 | 006:12:00 / 007:00:00 | 324:01:17 / 324:13:17 | 08 / 324 CST | -47.9 | | NOVEMBER 20, 1989 | STS-32 | BASIC | 7/27/89 | | |
| CST :324 | | | | | | | | | | | |
| FD :07 | | | | | | | | | | | |
| MET :006 | | | | | | | | | MET:007 | | |
| STS | SLEEP | DUMP ATT | WASTE DUMP | IMU MNR | IMU ALIGN | ZLV MNR | SVU DATE | RADS NORM | MEAL | SVU DATE | |
| | | | POST SLEEP | | P/TV08 SETUP | P/TV08 ACT | | P/TV08 ACT | | P/TV08 ACT | |
| | | RADS HI | | P/TV04 SETUP | P/TV04 ACT | FEA RESET | | P/TV11 SETUP | | P/TV11 ACT | AFE |
| PL | | | | DSO 478 (SOAK) | | | | | | FEA ACT 7 | FEA STATUS |
| DAY/NIGHT | | | | | | | | | | | |
| ORBIT | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | | | |
| GSTDN COVERAGE | -DKR | -DKR -MAD | -DKR -MAD | -BDA -DKR -MAD | -CAN | -MIL -BDA -DKR | -CAN | -VAN -MIL -BDA -DKR | -CAN | -VAN -BDA -DKR | -MIL -BDA -DKR |
| TDRS E W | | | | | | | | | | | |
| ATTITUDE | | | | | | | | | | | |
| FEA | | | | | | | | | | | |
| NOTES: | <p>DSO 476 PULSE RATE</p> <p>DSO 471 APC (AIR SAMPLER)</p> <p>ZLV, -YVV</p> <p>DSO 478 LBNP (MS1)</p> <p>FEA SAMPLE #7</p> | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|---------------|---------------|------|-------------------|--------|---------|-----------|
| 324:19:17 / 325:07:17 | 007:00:00 / 007:12:00 | 324:13:17 / 325:01:17 | 08 / 324 CST | -47.5 | | NOVEMBER 20, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :324 | | | | | | | | | |
| FD :08 | | | | | | | | | |
| MET :007 | | | | | | | | | |
| STS | | IMU MNV R | IMU ALIGN | ZLV MNV R | | | | | SLEEP |
| | DSO 476 | | | | | | | | PRE SLEEP |
| | AFE | | DSO 476 | | | | | | |
| PL | FEA STATUS | FEA STATUS | FEA STATUS | FEA STATUS | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | |
| GSTDN COVERAGE | -VAN -GDX -MIL | | -VAN -GDX | | -VAN | | | | |
| TDRS E W | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| FEA | FEA SAMPLE #7 | | | | | | | | |
| NOTES: | <ul style="list-style-type: none"> ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|-----------------------|-----------------------|----------------|--------------------|---------------------|-------------------|-------------------------------|--------------------------|-------------------|
| 325:07:17 / 325:19:17 | 007:12:00 / 008:00:00 | 325:01:17 / 325:13:17 | 09 / 325 CST | -47.1 | | NOVEMBER 21, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :325 | FD :08 | MET :007 | FD: 09 | | | | | | MET:008 |
| STS | SLEEP | | | | | | MEAL | | AFE |
| | | POST SLEEP | | | | | | DSO 473 | |
| | | | FEA STOW | | | | | | |
| PL | | | DSO 478 (RAMP) | | | DSO 478 (SOAK) | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 19 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 |
| GSTDN COVERAGE | -DKR | -DKR -MAD | -CAN | -BDA -DKR -MAD | -MIL -BDA -DKR -MAD | -CAN -BDA -DKR | -CAN -VAN -GDY -MIL -BDA -DKR | -VAN -GDY -MIL -BDA -DKR | -GDY -MIL -BDA |
| TDRS | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | | | | -ZLV -YVV | | |
| FEA | | | | | | | | | |
| NOTES: | | DSO 476 PULSE RATE | | DSO 478 LBNP (MS1) | | | | | DSO 473 SKIN TEST |
| | | | | DSO 478 LBNP (MS3) | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|---------------------|-------|------|-------------------|-----------|---------|-----------|
| 325:19:17 / 326:07:17 | 008:00:00 / 008:12:00 | 325:13:17 / 326:01:17 | 09 / 325 CST | -46.4 | ☾ | NOVEMBER 21, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :325 | | | | | | | | | |
| FD :009 | | | | | | | | | |
| MET :008 | | | | | | | | | |
| STS | AFE | IMU MNV R | IMU ZLV MNV R | | | | SLEEP | | |
| | | | | | | | PRE SLEEP | | |
| PL | DSO 476 | DSO 476 | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 |
| GSTDN COVERAGE | | -VAN -GDX -MIL | -VAN | | | | | -DKR | -DKR |
| TDRS E W | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | | | | -ZLV -YVV | | | |
| FEA | | IMU | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | | | |
|-----------------------|-----------------------|-----------------------|--------------|---------------|--------|--------------------------|--------------|--------------------------|-----------------|----------------------|----|----|------|-----------------|---------|---------------|-----------------|-------------|
| 326:07:17 / 326:19:17 | 008:12:00 / 009:00:00 | 326:01:17 / 326:13:17 | 10 / 326 CST | -45.3 | ☾ | NOVEMBER 22, 1989 | STS-32 | BASIC | 7/27/89 | | | | | | | | | |
| CST :326 | FD :009 | MET :008 | 12 | 13 | FD: 10 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | MET:009 | |
| STS | SLEEP | | | IMU MNV R | | IMU MNV R | ZLV | FCS C/O | REG TOE FIRE | | | | MEAL | | | | | |
| | | POST SLEEP | | | | | | DSO 478 (RAMP) | | AFE | | | | | DSO 476 | CABIN STOW | | |
| | | | | | | | | | | | | | | P/TV09 SETUP | | P/TV09 ACT | | |
| PL | | | | | | | | | | | | | | | DSO 476 | | DSO 478 STOW | PCG 1 DEACT |
| DAY/NIGHT | | | | | | | | | | | | | | | | | | |
| ORBIT | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | | | | | | | | | |
| GSTDN COVERAGE | | -DKR -MAD | | -DKR -MAD | -CAN | -VAN -GDX | -VAN -GDX | -MIL -BDA -DKR | | -MIL -BDA -DKR | | | | | | | | |
| TDRS E W | | | | | | | | | | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | | | | | |
| NOTES: | | ● DSO 476 PULSE RATE | | ▲ APU HTR ACT | | ● DSO 478 LBNP (MS3) | | ● DSO 476 AEROBICS (PLT) | | | | | | | | | | |
| | | | | ● -ZLV, -YVV | | ○ APU HTR RECONFIG | | | | | | | | | | | | |
| | | | | | | ■ DSO 476 AEROBICS (CDR) | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | |
|-----------------------|-----------------------|-----------------------|--------------|-----------------|------|-------------------|--------|---------|-----------|----|---|---|-------------------|
| 326:19:17 / 327:07:17 | 009:00:00 / 009:12:00 | 326:13:17 / 327:01:17 | 10 / 326 CST | -44.3 | ☉ | NOVEMBER 22, 1989 | STS-32 | BASIC | 7/27/89 | | | | |
| CST :326 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 |
| FD :010 | | | | | | | | | | | | | |
| MET :009 | | | | | | | | | | | | | |
| STS | | IMU MNV R | IMU ALIGN | ZLV MNV R | | | | | | | | | SLEEP |
| | CABIN STOW | | | | | | | | | | | | PRE SLEEP |
| PL | | | | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | |
| ORBIT | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | | | | |
| CSTDN | | -VAN -GDx | | | | | | | | | | | |
| COVERAGE | | | | | | | | | | | | | -DKR -DKR |
| TORS | | | | | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | | | | | | | | | | -ZLV -YVV |
| FEA | | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | IMU -ZLV, -YVV |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | |
|-----------------------|--|-----------------------|------------------------------|----------------|------------------------------|-------------------|--------------------------------------|-------------------------|-----------|---------|-------------|----|----|----|---|---------|
| 327:07:17 / 327:19:17 | 009:12:00 / 010:00:00 | 327:01:17 / 327:13:17 | 11 / 327 CST | -43.1 | | NOVEMBER 23, 1989 | STS-32 | BASIC | 7/27/89 | | | | | | | |
| CST :327 | FD :10 | MET :009 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | MET:010 |
| STS | SLEEP | IMU MNV R | IMU MNV R | XSI MNV R | RO T MNV R | IMU MNV R | IMU MNV R | PLB D O P S | BURN | | | | | | | |
| | | POST SLEEP | | | | DEORBIT PREP | | | | DEORBIT | EDW LANDING | | | | | |
| | | | | | | | | | BURN | | | | | | | |
| PL | | | | PCG 2 DEACT | | | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | |
| ORBIT | 151 | 152 | 153 | 154 | 155 | 156 | 157 | 158 | | | | | | | | |
| GSTDN COVERAGE | -DKR -MAD | -CAN | -MIL -BDA -DKR -MAD | -CAN | -MIL -BDA -DKR -MAD | -CAN | -VAN -GDX -MIL -BDA -DKR | -GUX -MIL -BDA | | | | | | | | |
| TDRS E W | | | | | | | | | | | | | | | | |
| ATTITUDE | | | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | | | |
| NOTES: | <p> ● DSO 476 PULSE RATE ● DSO 472 INTRAOCULAR PRESSURE ● DTO 0623 CABIN AIR MONITORING * DEORBIT BURN 9/20:01 ● DSO 471 APC (MINI RAM) </p> <p style="text-align: right;">* EDW LANDING 9/21:06</p> | | | | | | | | | | | | | | | |

FLIGHT DAY 6 RENDEZVOUS

The Flight Day 6 Rendezvous Timeline is designed to accommodate LDEF retrieval to the sixth flight day. In order to maximize the accomplishment of mission objectives, the flight plan will, in general, undergo changes. The timeline assumes the decision to delay to flight day 6 was made at launch. The timeline is based on the nominal Cycle 2 trajectory.

ED6

| FD 6 RNDZ | | | FLIGHT STS-32 | | | EDITION BASIC | | | PUB. DATE 7/27/89 | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|------------|---------------|----------|------------|---------------|-----|-----------|-------------------|-------------------|----------------|--------|-----------|------|-----------|----------|-----------|----------|-----------|----|----|----|----|-------|----|----|----|----|----|--|----|--|----|
| MET :-01 | -8 | -7 | -6 | -5 | -4 | -3 | -2 | -1 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | |
| FD 1 | | | | | | | | | LAUNCH | OMS - 2 | POST INSERTION | JCABIN | RMS C/O | MEAL | PCG 1 ACT | OMS BURN | AFE | IMU/COAS | PRE SLEEP | | | | | SLEEP | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | | | | | | | | | | 2 | | 3 | | 4 | | 5 | | 6 | | 7 | | 8 | | 9 | | 10 | | 11 | | | | | |
| NOTES: | + PCG2 ACT ▶ FEA UNSTOW ● CNCR | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :000 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | |
| FD 2 | SLEEP | | POST SLEEP | IMU | POST SLEEP | OMS | AFE | FILE TENG | FEA #1 | DS | MEAL | OMS | OMS | IMU | PRE SLEEP | | | | | | | | | SLEEP | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | | | 12 | | 13 | | 14 | | 15 | | 16 | | 17 | | 18 | | 19 | | 20 | | 21 | | 22 | | 23 | | 24 | | 25 | | 26 | | 27 |
| NOTES: | ● DSO 472 INTRAOCULAR PRESSURE ● DTO 0910 OEX OARE ● AFE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :001 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | |
| FD 3 | SLEEP | | POST SLEEP | IMU/COAS | AFE | | | | FEA #2 | SYNCOM B/U DEPLOY | D | MEAL | AFE | OMS | PRE SLEEP | IMU | PRE SLEEP | | | | | | | SLEEP | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | | | 28 | | 29 | | 30 | | 31 | | 32 | | 33 | | 34 | | 35 | | 36 | | 37 | | 38 | | 39 | | 40 | | 41 | | 42 | | 43 |
| NOTES: | ■ DTO 0902 OEX SUMS ● DTO 0910 OEX OARE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :002 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | | | | | | | | |
| FD 4 | MIN/IMU | POST SLEEP | AFE | | | | | | FEA #4 | MEAL | AFE | ARCS | PRE SLEEP | IMU | PRE SLEEP | | | | | | | | | SLEEP | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 43 | | 44 | | 45 | | 46 | | 47 | | 48 | | 49 | | 50 | | 51 | | 52 | | 53 | | 54 | | 55 | | 56 | | 57 | | 58 | | |
| NOTES: | ⊕ DTO 0816 GRAVITY GRADIENT ATTITUDE CONTROL ● DTO 0816 GRAVITY GRADIENT ATTITUDE CONTROL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| FD 6 RNDZ | | | | FLIGHT STS-32 | | | | EDITION BASIC | | | | PUB. DATE 7/27/89 | | | | | | | | | | | | | | |
|-----------|--|----------------|---------|---------------|------|---------|-------------------|---------------|--------|---------|-------------------|-------------------|-----------|-----------|-----------|-------|---|---|----|----|----|----|----|------------|------------|------------|
| MET :003 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 5 | POST SLEEP | AFE | FEA #5 | | | MEAL | FILE TENDING | AFE | OMS | OMS | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | | | POST SLEEP | IMU | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 59 | 60 | 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 | 73 | 74 | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :004 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 6 | POST SLEEP | FEA #3 | | | | | RENDEZVOUS (LDEF) | | | GRAPPLE | LDEF PHOTO SURVEY | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | | | POST SLEEP | IMU |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 | | | | | | | | | | |
| NOTES: | α DTO 0627 RMS OPERATING LOADS & DATA TAKES | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :005 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 7 | POST SLEEP | DSO 478 | DSO 478 | CREW CONT | MEAL | DSO 478 | DSO 478 | AFE | FEA #6 | | | | PRE SLEEP | IMU | PRE SLEEP | SLEEP | | | | | | | | | | POST SLEEP |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 | 101 | 102 | 103 | 104 | 105 | 106 | | | | | | | | | | |
| NOTES: | ● LBNP (MS1) ● LBNP (MS3) ● LBNP (MS1) ● LBNP (MS3) ● WASTE H2O DUMP | | | | | | | | | | | | | | | | | | | | | | | | | |
| MET :006 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| FD 8 | IMU | DSO 478 (SOAK) | | | | MEAL | FEA #7 | | | | AFE | IMU | PRE SLEEP | SLEEP | | | | | | | | | | POST SLEEP | IMU | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 107 | 108 | 109 | 110 | 111 | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | 120 | 121 | | | | | | | | | | | |
| NOTES: | ● LBNP (MS1) | | | | | | | | | | | | | | | | | | | | | | | | | |

FD6 RNDZ FLIGHT STS-32 EDITION BASIC PUB. DATE 7/27/89

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|-----|----------------|-----|-----|-----|------|---------|-----|-----|-----|-----|-----------|-----|-----|-----|---|-------|----|----|----|----|----|------------|-----|
| MET :007 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| FD9 | DSO 478 | | DSO 478 (SOAK) | | | | MEAL | DSO 473 | | AFE | IMU | | PRE SLEEP | | | | | SLEEP | | | | | | POST SLEEP | IMU |
| DAY/NIGHT | [Pattern of day/night bars] | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 122 | 123 | 124 | 125 | 126 | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 | 136 | 137 | | | | | | | | | |
| NOTES: | ● LBNP (MS1) ▶ FEA STOW ● LBNP (MS3) | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|----------|---------|-----|------|-----|-------------|-----|------------|-----|-----|-----------|-----|-----|-----|-----|---|-------|----|----|----|----|------------|-----|------------|
| MET :008 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| FD10 | FCS C/O | HOT FILE | DSO 478 | AFE | MEAL | | PCG 1 DEACT | | CABIN STOW | IMU | | PRE SLEEP | | | | | | SLEEP | | | | | POST SLEEP | IMU | POST SLEEP |
| DAY/NIGHT | [Pattern of day/night bars] | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 138 | 139 | 140 | 141 | 142 | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | 152 | 153 | | | | | | | | | |
| NOTES: | ● LBNP (MS3) * IMAX STOW + PCG2 DEACT ● AFE STOW ● L3 STOW | | | | | | | | | | | | | | | | | | | | | | | | |

| | | | | | | | | | | | | | | | | | | | | | | | | | |
|-----------|--|-----|-----|-----|--------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|---|----|----|----|----|----|----|----|
| MET :009 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
| FD11 | | | | | DEORBIT PREP | | | | | | | | | | | | | | | | | | | | |
| DAY/NIGHT | [Pattern of day/night bars] | | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 154 | 155 | 156 | 157 | 158 | 159 | 160 | 161 | 162 | 163 | 164 | 165 | 166 | 167 | 168 | 169 | | | | | | | | | |
| NOTES: | D E O R B I T L A N D I N G | | | | | | | | | | | | | | | | | | | | | | | | |

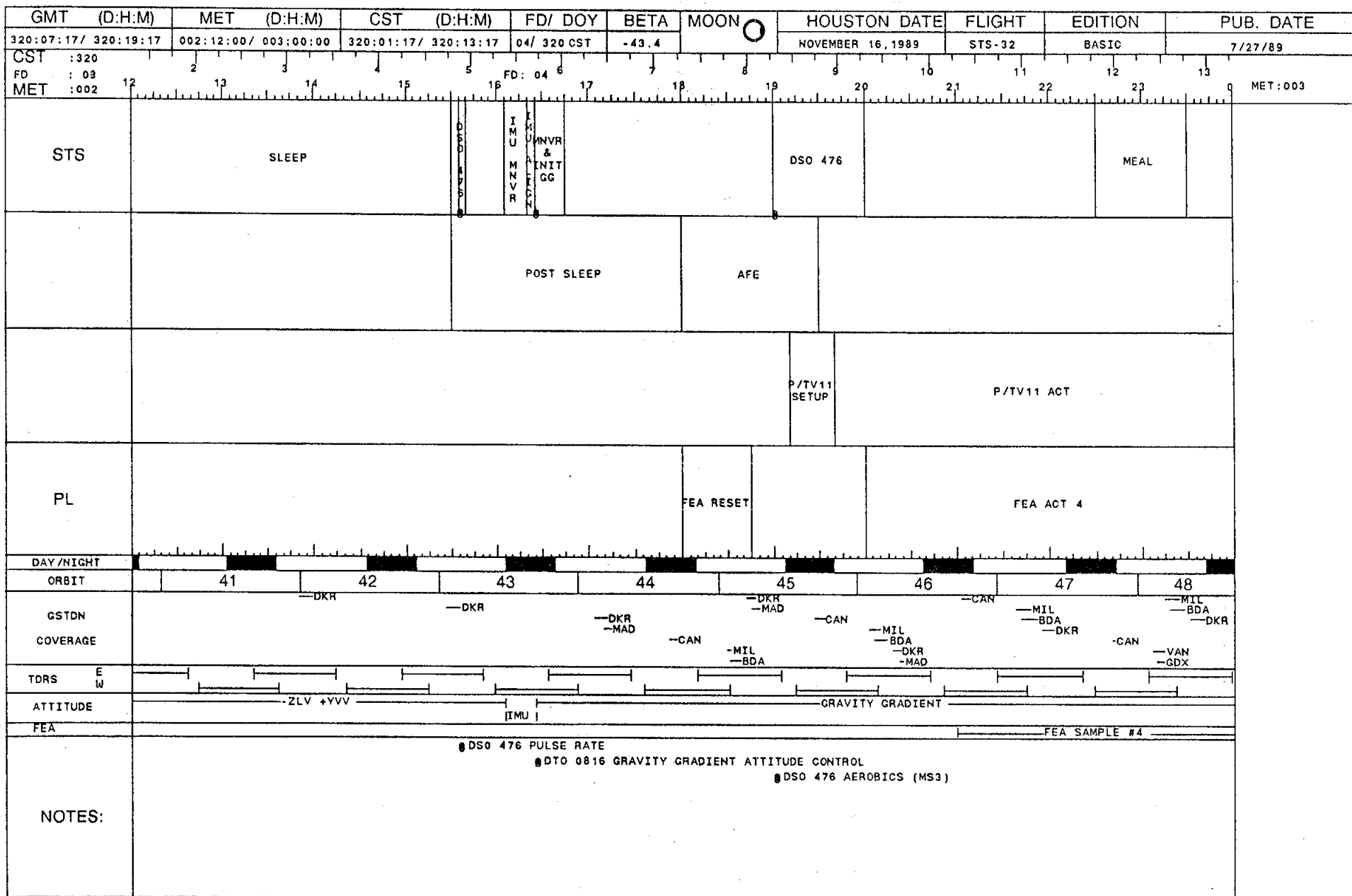
| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | |
|----------------------------|-----------------------------------|-------------------------------------|---------------------------------|---------------------------------|-----------------------------|----------------------|--------|----------------------------------|------------------|------------------|------------------|------------------|-----------|
| 3 17: 19: 17/ 3 18: 07: 17 | 000:00:00/ 000:12:00 | 3 17: 13: 17/ 3 18: 01: 17 | 01/ 317 CST | -35.6 | ○ | NOVEMBER 13, 1989 | STS-32 | BASIC | 7/27/89 | | | | |
| CST : 317 | | | | | | | | | | | | | |
| FD : 01 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | CST: 318 | 1 |
| MET : 000 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
| STS | | P L B B L L M N V R | P L B B D O S | K U O U D O P P L Y A C T | I M U M N V R | Z L V M N V R | MEAL | A F T C N T R D S O 472 | O M S B U R N | Z L V M N V R | I M U M N V R | Z L V M N V R | SLEEP |
| | DETECH L A C C H O S I 2 | POST INSERTION | UNSTOW CABIN | R M S P E R U P | R M S C / O | R M S P W R R D X | | FEA UNSTOW | DTO 910/5 | | PRE SLEEP | | |
| | | | C S R N Y S O R D C K | C A S E R M B L Y | P / T V 0 9 S E T U P | P / T V 0 9 A C T | | P / T V 0 9 A C T | | AFE | | | |
| PL | | S T A T U S C K | | | P C G 2 A C T | | | P C G 1 A C T | | C N C R | | | |
| DAY/NIGHT | | 2 | 3 | 4 | 5 | 6 | 7 | 8 | | | | | |
| ORBIT | | | | | | | | | | | | | |
| GSTDN COVERAGE | | -VAN -GD -MIL -BDA -DKR | -MIL -BDA | | -VAN -GD -MIL -MIL | | -GD | | | | | | |
| TDRS | | | -VAN -GD | | | | -VAN | | | | | | |
| ATTITUDE | -ASCENT | | | IMU | | | | FREE | | ZLV +YVV | | | |
| FEA | | -ZLV +YVV | | | -ZLV +XVV | | | OMS | | IMU | | | -ZLV +YVV |
| NOTES: | | ▶ S/C HTR ACT | ▶ DSO 0623 CABIN AIR MONITORING | ▶ DSO 472 INTRAOCULAR PRESSURE | ▶ AFT STATION | | | | | | | | |
| | | | ▶ DSO 471 APC (MINI RAM) | ○ APU HTR RECONFIG | ▶ -ZLV, +YVV | | | | | | | | |
| | | | ▶ -ZLV, +XVV | ▶ DTO 0910 OEX OARE | | | | | | | | | |
| | | | ○ APU HTR DEACT | ▶ -ZLV, +YVV | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|---|-----------------------|--------------|-------|------------|-------------------|--------|--------------------------|-------------------|
| 318:07:17 / 318:19:17 | 000:12:00 / 001:00:00 | 318:01:17 / 318:13:17 | 02 / 318 CST | -37.3 | ☉ | NOVEMBER 14, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :318 | | | | | | | | | |
| FD :01 | | | | | | | | | |
| MET :000 | | | | | | | | | MET:001 |
| STS | SLEEP | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | |
| GSTDN COVERAGE | | | DKR | DKR | DKR MAD | DKR MAD | CAN | MIL BDA DKR MAD | MIL BDA DKR |
| TDRS | | | | | | | | | |
| ATTITUDE | | | ZLV +YVV | | IMU | ZLV +YVV | OMS | ZLV +YVV | FREE |
| FEA | | | | | | | | FEA SAMPLE #1 | |
| NOTES: | <ul style="list-style-type: none"> ● DSO 476 PULSE RATE ● -ZLV, +XVV ● DTO 0910 OEX OARE ● DSO 457 SALIVARY SCOP/DEX ● DSO 472 INTRAOCULAR PRESSURE ● -ZLV, +YVV ● DSO 471 APC (AIR SAMPLER) | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | |
|-----------------------|---|------------------------------|--------------|--------------|------------|-------------------|--------------|--------------|-------------------|-------------------|------------|------------|------------|-------|
| 318:19:17 / 319:07:17 | 001:00:00 / 001:12:00 | 318:13:17 / 319:01:17 | 02 / 318 CST | -39.0 | ☉ | NOVEMBER 14, 1989 | STS-32 | BASIC | 7/27/89 | | | | | |
| CST :318 | | | | | | | | | CST:319 | | | | | |
| FD :02 | | | | | | | | | | | | | | |
| MET :001 | | | | | | | | | | | | | | |
| STS | DPLY ATT | OMS SEP | WIND DOW | APKM | ZLV MNV | MEAL | VTR SETUP | PLAY BACK | OMS BURN | OMS BURN | IMU MNV | ZLV MNV | DSO 476 | SLEEP |
| | MNV | OMS BURN | ROOM MNV | RMS PWRDN | | | | | AFE | | | | PRE SLEEP | |
| | ← SYNCOM → | | | | | | | | | | | | | |
| | STAT US | OMN IS P AINN | | | | | | | DSO 476 | DSO 476 | DSO 476 | | | |
| PL | DSO CHECK | OMN IS P AINN UP | | | | | | | FEA STAT US | FEA STAT US | | | | |
| DAY/NIGHT | [Day/Night Cycle: 17 (Night), 18 (Night), 19 (Night), 20 (Night), 21 (Night), 22 (Night), 23 (Night), 24 (Night)] | | | | | | | | | | | | | |
| ORBIT | [Orbit Data] | | | | | | | | | | | | | |
| GSTDN COVERAGE | --VAN --GDX --MIL --BDA --DKR --VAN --GDX --VAN --GDX --MIL --BDA --VAN --VAN --GDX --MIL --BDA --VAN | | | | | | | | | | | | | |
| TDRS | [TDRS Data] | | | | | | | | | | | | | |
| ATTITUDE | [SEP] [WIN] [-ZLV +YVV] [UNSEP] [HA] [IMU] [-ZLV +YVV] | | | | | | | | | | | | | |
| FEA | [FEA SAMPLE #1] | | | | | | | | | | | | | |
| NOTES: | DSO 457 SALIVARY SCOP/DEX -ZLV, +YVV DSO 476 AEROBICS (MS3) DSO 476 AEROBICS (PLT) -ZLV, +YVV DSO 476 AEROBICS (CDR) | | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|----------------------|--|----------------------|-------------|-------|------|-------------------|--------|---------|-----------|
| 319:07:17/ 319:19:17 | 001:12:00/ 002:00:00 | 319:01:17/ 319:13:17 | 03/ 319 CST | -40.7 | ☉ | NOVEMBER 15, 1989 | STS-32 | BASIC | 7/27/89 |
| CST : 319 | | | | | | | | | |
| FD : 02 | | | | | | | | | |
| MET : 001 | | | | | | | | | MET:002 |
| STS | SLEEP | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | |
| GSTDN COVERAGE | | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | <ul style="list-style-type: none"> ● DSO 476 PULSE RATE ● DSO 457 SALIVARY SCOP/DEX ● FWD STATION ● BIASED +XLV, -ZVV ● DTO 0902 OEX SUMS ● -ZLV, +XVV ● -ZLV, +XVV ● DTO 0910 OEX OARE (PITCH) ● DTO 0910 OEX OARE (YAW) ● DTO 0910 OEX OARE (ROLL) | | | | | | | | |

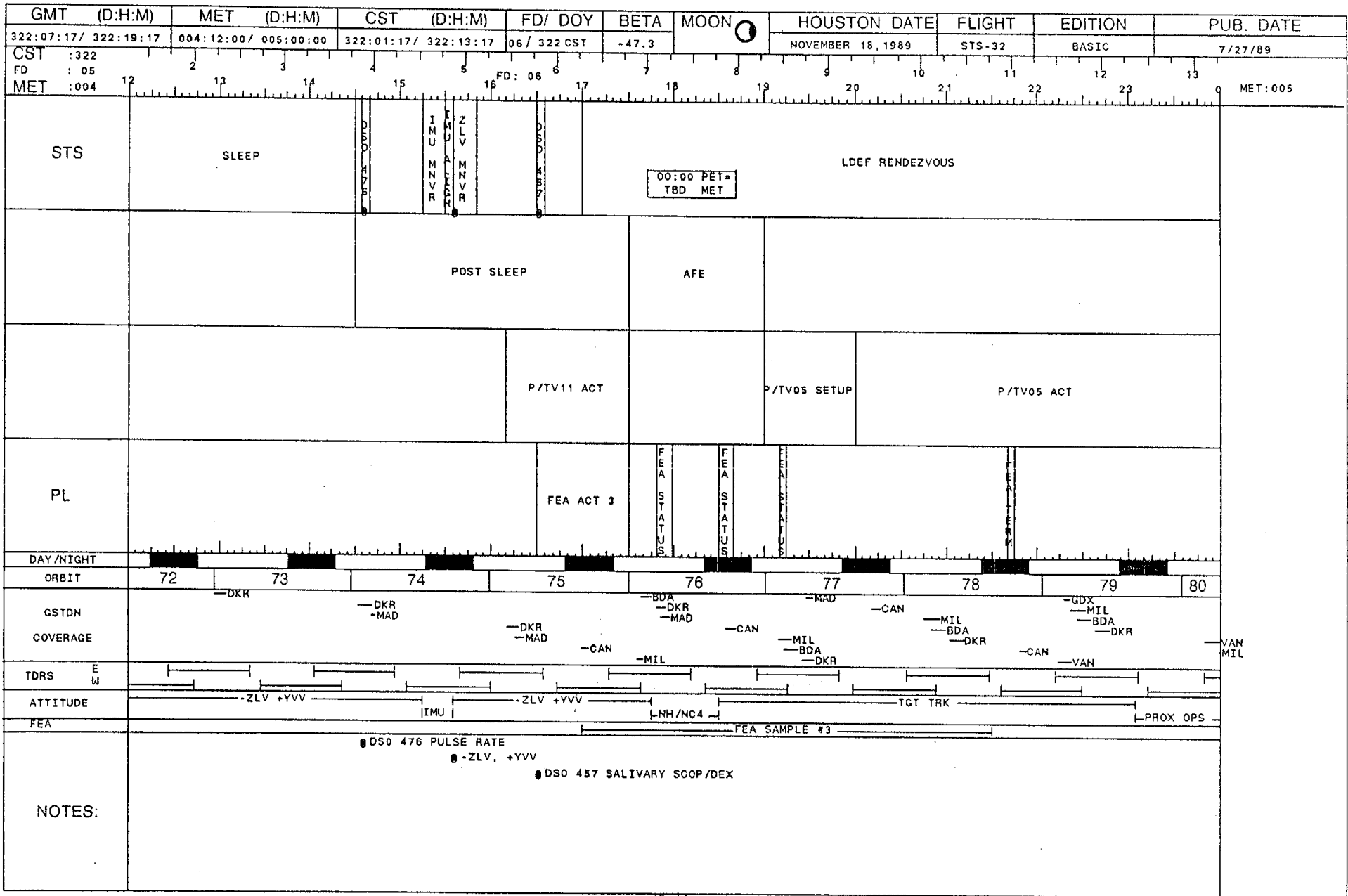
| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | | | | | | | | | |
|-----------------------|--|-----------------------|--------------|-----------------|-------------------|-------------------|----------------------|-----------------|-----------------|--------------|---|---|--------------|---|---|--------------|---|---|--------------|---|----|--------------|----|--|
| 319:19:17 / 320:07:17 | 002:00:00 / 002:12:00 | 319:13:17 / 320:01:17 | 03 / 319 CST | -42.2 | ○ | NOVEMBER 15, 1989 | STS-32 | BASIC | 7/27/89 | | | | | | | | | | | | | | | |
| CST : 319 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | |
| FD : 03 | | | | | | | | | | | | | | | | | | | | | | | | |
| MET : 002 | | | | | | | | | | | | | | | | | | | | | | | | |
| STS | ZLV MNV R | MEAL | | | OMS BURN | 902 MNV R | 902 MNV R | IMU MNV R | ZLV MNV R | | | | | | | | | | | | | | | |
| | DTO 910/6 | P/TV04 SETUP | | | AFE | | | | PRE SLEEP | | | | | | | | | | | | | | | |
| | | | | P/TV04 SETUP | P/TV04 ACT | | DSO 476 | DSO 476 | | | | | | | | | | | | | | | | |
| PL | DSO 476 | | | | FEA STAT US | FEA STAT US | | IMU MNV R | DSO 457 | | | | | | | | | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle: Night from 0000 to 0600, Day from 0600 to 1800, Night from 1800 to 0000] | | | | | | | | | | | | | | | | | | | | | | | |
| ORBIT | 33 | | | 34 | | | 35 | | | 36 | | | 37 | | | 38 | | | 39 | | | 40 | | |
| GSTDN COVERAGE | -VAN -GDX -MIL -BDA -DKR | | | -MIL -BDA | | | -VAN -GDX -MIL | | | -VAN -GDX | | | -VAN -GDX | | | -VAN -GDX | | | -VAN -GDX | | | -VAN -GDX | | |
| TDRS | [Timeline of TDRS events] | | | | | | | | | | | | | | | | | | | | | | | |
| ATTITUDE | -FREE -ZLV +YVV OMS PITCH IMU -ZLV +YVV | | | | | | | | | | | | | | | | | | | | | | | |
| FEA | FEA SAMPLE #2 | | | | | | | | | | | | | | | | | | | | | | | |
| NOTES: | <ul style="list-style-type: none"> ● DTO 0910 OEX OARE ● DSO 476 AEROBICS (MS3) <ul style="list-style-type: none"> ● -ZLV, +YVV ● DSO 476 AEROBICS (PLT) <ul style="list-style-type: none"> ● BIASED +XLV, -ZVV ● DTO 0902 OEX SUMS ● DSO 476 AEROBICS (CDR) <ul style="list-style-type: none"> ● -ZLV, +YVV ● DSO 457 SALIVARY SCOP/DEX | | | | | | | | | | | | | | | | | | | | | | | |



| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|-------------|-------------|-----------------------------|-------------------|-----------|---------|-----------|
| 320:19:17 / 321:07:17 | 003:00:00 / 003:12:00 | 320:13:17 / 321:01:17 | 04/ 320 CST | -44.7 | ☉ | NOVEMBER 16, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :320 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
| FD :04 | | | | | | | | | |
| MET :003 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
| STS | TERM G G | | OMS BURN | ZLV M N V R | IMU M N V R | ZLV M N V R | SLEEP | | |
| | AFE | | PRE SLEEP | | | | | | |
| | P/TV11 ACT | | | | | | | | |
| PL | FEA ACT 4 | DSO 476 | DSO 476 | | | | | | |
| DAY/NIGHT | [Day/Night Cycle] | | | | | | | | |
| ORBIT | 48 | 49 | 50 | 51 | 52 | 53 | 54 | 55 | 56 |
| GSTDN COVERAGE | -VAN -GD -MIL -BDA -DKR | | -VAN -GD | | -VAN -GD -MIL -MIL | | -VAN | | |
| TORS | [TORS] | | [TORS] | | [TORS] | | [TORS] | | |
| ATTITUDE | GRAVITY GRADIENT | | LOMS | | -ZLV +YVV | | -ZLV +YVV | | |
| FEA | | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (PLT) ● -ZLV, +YVV ● DSO 476 AEROBICS (CDR) ● -ZLV, +YVV | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|-----------------------|-----------------------|-----------------------|--|-------|---------------------|---------------------|------------------------|---------------------|-------------------|------|
| 321:07:17 / 321:19:17 | 003:12:00 / 004:00:00 | 321:01:17 / 321:13:17 | 05 / 321 CST | -45.8 | ☉ | NOVEMBER 17, 1989 | STS-32 | BASIC | 7/27/89 | |
| CST :321 | | | FD: 05 | | | | | | MET:004 | |
| FD : 04 | | | | | | | | | | |
| MET :003 | | | | | | | | | | |
| STS | SLEEP | | | | | | | MEAL | | |
| | | | POST SLEEP | | AFE | | DSO 476 | | FILTER CLEANING | |
| | | | | | | P/TV11 SETUP | P/TV11 ACT | | P/TV10 SETUP | |
| | | | | | | | | | P / T V 1 0 A C T | |
| PL | | | | | FEA RESET | | FEA ACT 5 | | | |
| DAY/NIGHT | | | | | | | | | | |
| ORBIT | 56 | 57 | 58 | 59 | 60 | 61 | 62 | 63 | 64 | |
| GSTDN COVERAGE | -DKR | -DKR | -DKR -MAD | -CAN | -MIL -BDA -DKR -MAD | -MIL -BDA -DKR -MAD | -CAN | -VAN -GDX -MIL -BDA | -DKR | -DKR |
| TDRS | | | | | | | | | | |
| ATTITUDE | | -ZLV +YVV | | | | GRAVITY GRADIENT | | | | |
| FEA | | | IMU | | | | FEA SAMPLE #5 | | | |
| NOTES: | | | DSO 476 PULSE RATE | | | | DSO 476 AEROBICS (MS3) | | | |
| | | | DTO 0616 GRAVITY GRADIENT ATTITUDE CONTROL | | | | | | | |
| | | | DSO 457 SALIVARY SCOP/DEX | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|---|-----------------------|--------------|----------|---------|-------------------|---------|-----------|-----------|
| 321:19:17 / 322:07:17 | 004:00:00 / 004:12:00 | 321:13:17 / 322:01:17 | 05/ 321 CST | -46.6 | ☉ | NOVEMBER 17, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :321 | | | | | | | | | |
| FD :05 | | | | | | | | | |
| MET :004 | | | | | | | | | |
| STS | DSO 476 | TERM GR | OMS BURN | OMS BURN | ZLV MNR | IMU MNR | ZLV MNR | SLEEP | |
| AFE | | RADS NORM | | | | | | PRE SLEEP | |
| P/TV10 ACT | | | P/TV11 SETUP | DSO 476 | | | | | |
| PL | | FEA RESET | | | | | | | |
| DAY/NIGHT | [Day/Night Cycle Bar] | | | | | | | | |
| ORBIT | 64 | 65 | 66 | 67 | 68 | 69 | 70 | 71 | 72 |
| GSTDN COVERAGE | --VAN --GDY --MIL --BDA --VAN --GDY --MIL | | | | | | | | |
| TDRS | [TDRS Bar] | | | | | | | | |
| ATTITUDE | GRAVITY GRADIENT | | | | | | | | |
| FEA | OMS -ZLV +YVV IMU -ZLV +YVV | | | | | | | | |
| NOTES: | ● DSO 457 SALIVARY SCOP/DEX ● DSO 476 AEROBICS (PLT) ● -ZLV, +YVV ● DSO 476 AEROBICS (CDR) ● -ZLV, +YVV | | | | | | | | |



| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|----------------------|--------------------------|----------------------|---------------|------------------------------|--------------|-----------------------------|--------------|---------|--------------|
| 322:19:17/ 323:07:17 | 005:00:00/ 005:12:00 | 322:13:17/ 323:01:17 | 06/ 322 CST | -47.7 | ☾ | NOVEMBER 18, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :322 | :06 | | | | | | | | |
| MET :005 | | | | | | | | | |
| STS | GRAPPLE +YLV MNVVR | | +YLV MNVVR | IMU ALIGN XSI MNVVR | ROT MNVVR | | ZLV MNVVR | | SLEEP |
| | | PHOTO SURVEY | LDEF BERTH | RMS PWR DOR | | | | | PRE SLEEP |
| | | P/TV05 ACT | | | | | | | |
| PL | | LDEF PHOTO SURVEY | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 80 | 81 | 82 | 83 | 84 | 85 | 86 | 87 | |
| GSTDN COVERAGE | -BDA -DKR | | | -VAN | | | | | -DKR |
| | | -VAN -GDX -MIL | | -VAN -GDX | | | | | |
| TDRS | E W | | | | | | | | |
| ATTITUDE | | | | IMU | -XSI | ORB RATE | | | |
| FEA | | +YLV +ZVV | | -XSI | | | | | -ZLV -YVV |
| NOTES: | | • +YLV, +ZVV | | • +YLV, +ZVV | | • DSO 457 SALIVARY SCOP/DEX | | | • -ZLV, -YVV |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|-----------------------|-----------------------|-------------|-------|----------------|---------------------|----------------|--------------------------|-----------|
| 323:07:17 / 323:19:17 | 005:12:00 / 006:00:00 | 323:01:17 / 323:13:17 | 07/ 323 CST | -48.0 | ☉ | NOVEMBER 19, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :323 | | | | | | | | | |
| FD :06 | | | | | | | | | |
| MET :005 | | | FD: 07 | | | | | | MET:006 |
| STS | SLEEP | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 88 | 89 | 90 | 91 | 92 | 93 | 94 | 95 | |
| GSTDN COVERAGE | | -DKR | -DKR -MAD | -CAN | -BDA -DKR -MAD | -MIL -BDA -DKR -MAD | -CAN -BDA -DKR | -VAN -GDX -MIL -BDA -DKR | |
| TDRS | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | IMU | | | -ZLV -YVV | | |
| FEA | | | | | | | | | |
| NOTES: | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | |
|--|----------------------------------|-----------------------|--------------------------|--------------|--------------|-------------------|--------|---------|-----------|--|
| 323:19:17 / 324:07:17 | 006:00:00 / 006:12:00 | 323:13:17 / 324:01:17 | 07/ 323 CST | -48.0 | ☉ | NOVEMBER 19, 1989 | STS-32 | BASIC | 7/27/89 | |
| CST :323 14 15 16 17 18 19 20 21 22 23 0 CST:324 1 12 MET :006 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 | | | | | | | | | | |
| STS | DSO 476 | | IMU MNV R | IMU ALIGN | ZLV MNV R | SLEEP | | | | |
| | AFE | DSO 476 | PRE SLEEP | | | | | | | |
| | P/TV07 ACT | P/TV11 SETUP | P/TV11 ACT | | | | | | | |
| PL | CNCR | FEA RESET | FEA ACT 6 | | FEA PERM | | | | | |
| DAY/NIGHT | 96 | | 97 | | 98 | | 99 | | 100 | |
| ORBIT | 96 | | 97 | | 98 | | 99 | | 100 | |
| GSTDN COVERAGE | --VAN --GDX --MIL --BDA | | --VAN --GDX --MIL | | --VAN | | --DKR | | | |
| TDRS | E | | W | | E | | W | | E | |
| ATTITUDE | -ZLV -YVV | | IMU | | -ZLV -YVV | | | | | |
| FEA | FEA SAMPLE #6 | | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) | | ● DSO 476 AEROBICS (PLT) | | ● -ZLV, -YVV | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | |
|-----------------------|---|-----------------------|--------------|--------------|----------|----------------------|--------------|--------------------------------------|--------------------------------------|----------------------|----|--------------|---------------|
| 324:07:17 / 324:19:17 | 006:12:00 / 007:00:00 | 324:01:17 / 324:13:17 | 08 / 324 CST | -47.9 | | NOVEMBER 20, 1989 | STS-32 | BASIC | 7/27/89 | | | | |
| CST : 324 | | | FD: 08 | | | | | | MET: 007 | | | | |
| FD : 07 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 |
| MET : 006 | | | | | | | | | | | | | |
| STS | SLEEP | | DUMP ATT | WASTE DUMP | IMU MNVR | IMU ALIGN | ZLV MNVR | SV UPDATE | | RADS NORM | | MEAL | SV UPDATE |
| | | | | POST SLEEP | | | P/TV08 SETUP | P/TV08 ACT | | P/TV08 ACT | | P/TV08 ACT | P/TV08 ACT |
| | | | RADS HI | | | P/TV04 SETUP | P/TV04 ACT | | | FEA RESET | | P/TV11 SETUP | P/TV11 ACT |
| PL | | | | | | | | | | DSO 478 (SOAK) | | | FEA ACT 7 |
| DAY/NIGHT | | | | | | | | | | | | | |
| ORBIT | 104 | 105 | 106 | 107 | 108 | 109 | 110 | 111 | | | | | |
| GSTDN COVERAGE | -DKR | -DKR -MAD | -DKR -MAD | -DKR -MAD | -CAN | -MIL -BDA -DKR | -CAN | -VAN -GDX -MIL -BDA -DKR | -VAN -GDX -MIL -BDA -DKR | -MIL -BDA -DKR | | | |
| TDRS E W | | | | | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | H2O DUMP ATT | IMU | | | | | | | | | |
| FEA | | | | | | | | | | | | | FEA SAMPLE #7 |
| NOTES: | • DSO 476 PULSE RATE • -ZLV, -YVV • DSO 471 APC (AIR SAMPLER) • DSO 478 LBNP (MS1) | | | | | | | | | | | | |

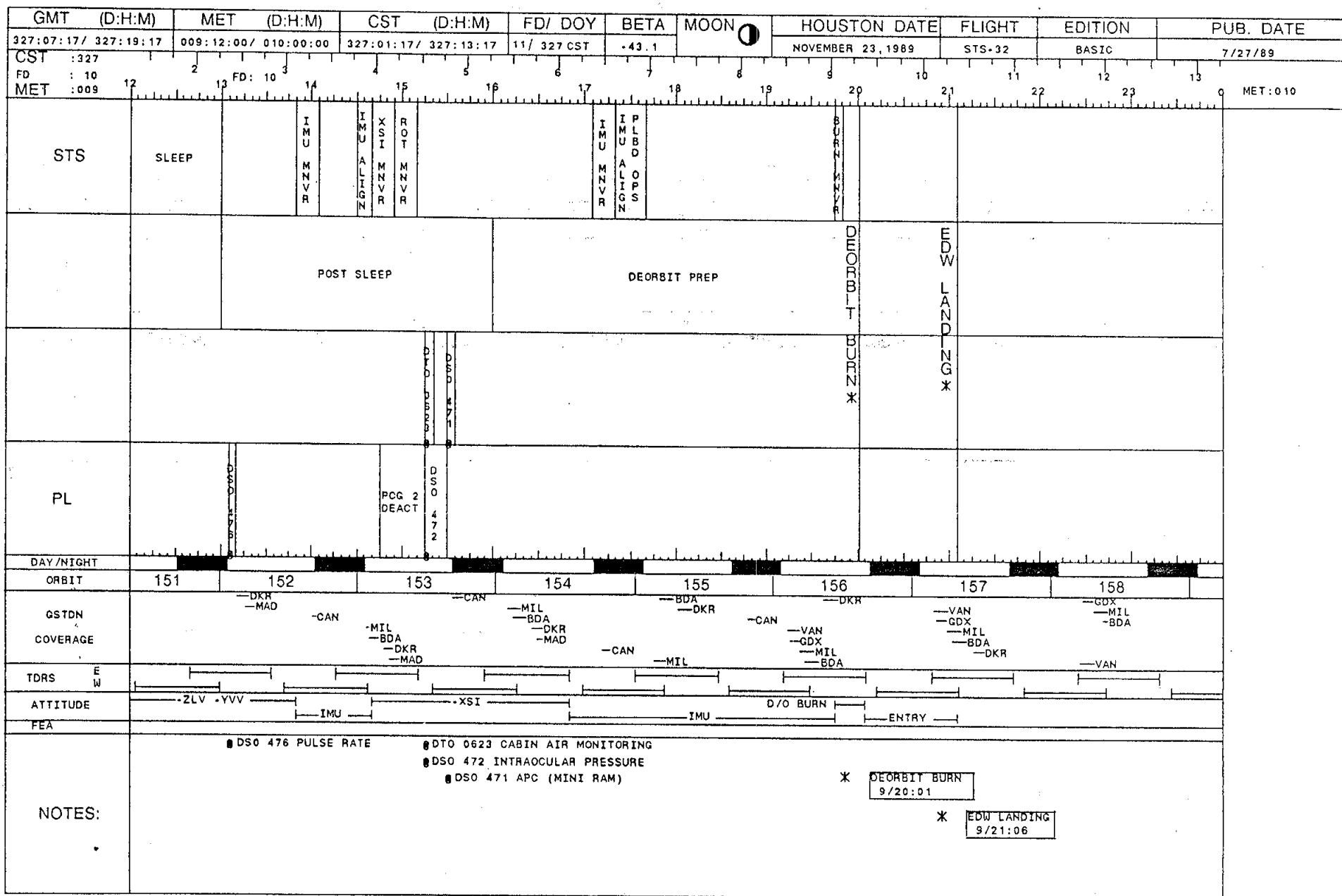
| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|--------------|-------|------|-------------------|--------|---------|-----------|
| 324:19:17 / 325:07:17 | 007:00:00 / 007:12:00 | 324:13:17 / 325:01:17 | 08 / 324 CST | -47.5 | ☾ | NOVEMBER 20, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :324 | | | | | | | | | |
| FD : 08 | | | | | | | | | |
| MET :007 | | | | | | | | | |
| STS | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 112 | 113 | 114 | 115 | 116 | 117 | 118 | 119 | |
| GSTDN COVERAGE | -VAN -GDX -MIL | | | | | | | | |
| TDRS | | | | | | | | | |
| ATTITUDE | | | | | | | | | |
| FEA | | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | |
|-----------------------|---|-----------------------------------|--------------|--------------|-------------------|------------------------------|----------|----------------|-----------|------|--------------------------------------|--------------------|----------------------|
| 325:07:17 / 325:19:17 | 007:12:00 / 008:00:00 | 325:01:17 / 325:13:17 | 09 / 325 CST | +47.1 | ☾ | NOVEMBER 21, 1989 | STS-32 | BASIC | 7/27/89 | | | | |
| CST :325 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | |
| FD :08 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 |
| MET :007 | | FD: 09 | | | | | | | | | | | MET:008 |
| STS | SLEEP | DSO 476 HYB | RADS HI | IMU MNV R | IMU ALG ZLV | MNV R | | | | | MEAL | DSO 473 UP DATE | AFE |
| | | POST SLEEP | | | | | | | | | | | |
| | | | | | | FEA RESET | FEA STOW | | | | | | |
| PL | | | | | | DSO 478 (RAMP) | | DSO 478 (SOAK) | | | | | |
| DAY/NIGHT | [Day/Night Cycle: 19 (Night), 20 (Day), 21 (Night), 22 (Day), 23 (Night), 24 (Day), 25 (Night), 26 (Day), 27 (Night), 28 (Day)] | | | | | | | | | | | | |
| ORBIT | 19 | 120 | 121 | 122 | 123 | 124 | 125 | 126 | 127 | | | | |
| GSTDN COVERAGE | -DKR | | -DKR -MAD | -CAN | | -MIL -BDA -DKR -MAD | -CAN | -BDA -DKR | | -CAN | -VAN -GDG -MIL -BDA -DKR | | -GDG -MIL -BDA |
| TDRS | | | | | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | IMU | | | | -ZLV -YVV | | | | | |
| FEA | | | | | | | | | | | | | |
| NOTES: | | DSO 476 PULSE RATE •-ZLV, -YVV | | | | | | | | | | DSO 473 SKIN TEST | |
| | | | | | | DSO 478 LBNP (MS1) | | | | | | | |
| | | | | | | DSO 478 LBNP (MS3) | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE |
|-----------------------|--|-----------------------|--------------|--------------|--------------|-------------------|--------|---------|-----------|
| 325:19:17 / 326:07:17 | 008:00:00 / 008:12:00 | 325:13:17 / 326:01:17 | 09 / 325 CST | -46.4 | ☾ | NOVEMBER 21, 1989 | STS-32 | BASIC | 7/27/89 |
| CST :325 | | | | | | | | | |
| FD :009 | | | | | | | | | |
| MET :008 | | | | | | | | | |
| STS | AFE | IMU MNV R | IMU ALIGN | ZLV MNV R | RADS NORM | SLEEP | | | |
| | | | | | | PRE SLEEP | | | |
| | | DSO 476 | DSO 476 | | | | | | |
| PL | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | |
| ORBIT | 127 | 128 | 129 | 130 | 131 | 132 | 133 | 134 | 135 |
| GSTDN COVERAGE | | -VAN -GDY -MIL | | -VAN | | | | -DKR | -DKR |
| TDRS | | | | | | | | | |
| ATTITUDE | -ZLV -YVV | | | | | | | | |
| FEA | IMU | | | | | | | | |
| NOTES: | ● DSO 476 AEROBICS (CDR) ● DSO 476 AEROBICS (PLT) ● -ZLV, -YVV | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | | | | |
|-----------------------|-----------------------|-----------------------|--------------|-------|--------|-------------------|--------|---------|-----------|----|----|----|----|----|----|---|---------|
| 326:07:17 / 326:19:17 | 008:12:00 / 009:00:00 | 326:01:17 / 326:13:17 | 10 / 326 CST | -45.3 | ☾ | NOVEMBER 22, 1989 | STS-32 | BASIC | 7/27/89 | | | | | | | | |
| CST :326 | FD :009 | MET :008 | 12 | 13 | FD: 10 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | MET:009 |
| STS | SLEEP | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| PL | | | | | | | | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | | | | |
| ORBIT | 135 | 136 | 137 | 138 | 139 | 140 | 141 | 142 | 143 | | | | | | | | |
| GSTDN | | | | | | | | | | | | | | | | | |
| COVERAGE | | | | | | | | | | | | | | | | | |
| TDRS | | | | | | | | | | | | | | | | | |
| ATTITUDE | | | | | | | | | | | | | | | | | |
| FEA | | | | | | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | | | | |

| GMT (D:H:M) | MET (D:H:M) | CST (D:H:M) | FD/ DOY | BETA | MOON | HOUSTON DATE | FLIGHT | EDITION | PUB. DATE | | | | | |
|-----------------------|-----------------------|-----------------------|------------------------------|-----------|------|-------------------|--------|---------|-----------|------|---|---------|------|-----------|
| 326:19:17 / 327:07:17 | 009:00:00 / 009:12:00 | 326:13:17 / 327:01:17 | 10 / 326 CST | -44.3 | ☾ | NOVEMBER 22, 1989 | STS-32 | BASIC | 7/27/89 | | | | | |
| CST :326 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 0 | CST:327 | 1 | 2 |
| FD :010 | | | | | | | | | | | | | | |
| MET :009 | | | | | | | | | | | | | | |
| STS | | IMU MNV R | IMU ALICZ ZLV MNV R | | | | | | | | | | | SLEEP |
| | CABIN STOW | | | PRE SLEEP | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |
| PL | | | | | | | | | | | | | | |
| DAY/NIGHT | | | | | | | | | | | | | | |
| ORBIT | 143 | 144 | 145 | 146 | 147 | 148 | 149 | 150 | 151 | | | | | |
| GSTDN | | -VAN -GDY | | | | | | | | | | | | |
| COVERAGE | | | | | | | | | | -DKR | | | -DKR | |
| TDRS | E W | | | | | | | | | | | | | |
| ATTITUDE | | -ZLV -YVV | | IMU | | | | | | | | | | -ZLV -YVV |
| FEA | | | | | | | | | | | | | | |
| NOTES: | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | |



IMAX OPPORTUNITIES
(TBS)

IMAX

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CONSUMABLES CURVES
(TBS)

CONSUMABLES
CURVES

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The sections following this divider page
will not be included in flight copies.

STS-32
FLIGHT PLAN NOTES

FLT PLN NOTES

FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

The STS-32 (OV-102) launch from KSC on November 13, 1989 (Cycle 2) will be into a 190 x 170 nm orbit at an inclination of 28.5 degrees. The mission duration will be 9 days, 21 hours. Nominal landing occurs at EDW on November 23, 1989.

Landing opportunities are:

| | | <u>Landing Orbit No.</u> | <u>Site</u> | <u>Landing Site Time</u> |
|-------------|--------------|------------------------------|-------------|------------------------------|
| Nominal | Primary | 157 | EDW | 08:23 PST |
| | Backup | 158 | EDW | 09:59 PST |
| | Weather Alt. | 157 | NOR | 09:26 MST |
| 1 Day Late | Primary | 173 | EDW | 08:45 PST |
| | Backup | 174 | EDW | 10:21 PST |
| | Weather Alt. | 172 | NOR | 09:47 MST |
| 2 Days Late | Primary | 188 | EDW | 07:30 PST |
| | Backup | 189 | EDW | 09:06 PST |
| | Weather Alt. | 187 | NOR | 08:32 MST |

MAJOR EVENTS

LAUNCH (KSC) November 13, 1989
MET (DD/HH:MM:SS) 0/00:00:00
Day of year 317
CST/GMT 13:17/19:17

OMS-2
MET (DD/HH:MM:SS) 0/00:40:38
DV (fps) 243.9
DT (MM:SS) 02:34
ORBIT ha/hp (nm) 190 X 170

NPC
MET (DD/HH:MM:SS) 0/06:57:00
DV (fps) 1.2
DT (MM:SS) 00:03
ORBIT ha/hp (nm) 191 X 169

NC2
MET (DD/HH:MM:SS) 0/20:38:00
DV (fps) 4.6
DT (MM:SS) 00:05
ORBIT ha/hp (nm) 191 X 172

SYNCOM DEPLOY
MET (DD/HH:MM) 01/00:31:16

OMS SEPARATION BURN
MET (DD/HH:MM:SS) 01/00:46:16
DV (fps) 18.0
DT (MM:SS) 00:13
ORBIT ha/hp (nm) 191 x 182

MAJOR EVENTS (Continued)

UNSEP
 MET (DD/HH:MM:SS) 01/04:05:00
 DV (fps) 40.6
 DT (MM:SS) 00:26
 ORBIT ha/hp (nm) 191 x 159

HA
 MET (DD/HH:MM:SS) 01/04:51:00
 DV (fps) 27.6
 DT (MM:SS) 00:18
 ORBIT ha/hp (nm) 175 x 159

NSR
 MET (DD/HH:MM:SS) 02/02:46:00
 DV (fps) 23.2
 DT (MM:SS) 00:16
 ORBIT ha/hp (nm) 175 x 171

NC3
 MET (DD/HH:MM:SS) 02/04:08:00
 DV (fps) 11.0
 DT (MM:SS) 00:09
 ORBIT ha/hp (nm) 178 x 174

NH
 MET (DD/HH:MM:SS) 02/19:19:00
 DV (fps) 8.2
 DT (MM:SS) 00:07
 ORBIT ha/hp (nm) 183 X 175

NC4
 MET (DD/HH:MM:SS) 02/20:04:00
 DV (fps) 13.7
 DT (MM:SS) 00:10
 ORBIT ha/hp (nm) 183 X 182

TI
 MET (DD/HH:MM:SS) 02/23:07:00
 DV (fps) 1.9
 DT (MM:SS) 00:04
 ORBIT ha/hp (nm) 184 X 182

LDEF RETRIEVE
 MET (DD/HH:MM:SS) 03/01:38:00

DEORBIT BURN
 MET (DD/HH:MM:SS) 09/20:00:00
 DV (fps) 297.0

LANDING (EDW)
 MET (DD/HH:MM:SS) 09/21:06:00
 Day of year 327
 CST/GMT 10:32/16:23

B. CREW

1. The 5 crewmembers flying this mission are:

CDR - Daniel C. Brandenstein
PLT - James D. Wetherbee
MS1 - Bonnie J. Dunbar
MS2 - Marsha S. Ivins
MS3 - David G. Low

2. The crewmembers responsible for performing an EVA, should one become necessary, are: MS1 will be EV1, MS3 will be EV2, and CDR will be IV1.

C. ORBITER SYSTEMS

1. Communications and Instrumentation

- a. The Operational Instrumentation (OI) system will nominally be managed from the ground through uplink real-time commands (RTCs) coordinated with the crew.
- b. TDRS coverage is supported by TDRS-E (41 degrees W) and TDRS-W (171 degrees W) and is the prime mode of communication coverage.
- c. TDRS Ku-Band is the prime mode for real-time TV. There are also 3 GSTDN sites available as backup for TV (90 minute lead time required): GDX(GDS), MIL(MLX), and VAN.
- d. TDRS-E and TDRS-W are available to support Ku-Band text uplink (e.g., TAGS).
- e. HDR text uplink (e.g., Teleprinter) is available through S-band TDRS-E and TDRS-W.
- f. GSTDN sites available during the first 25 minutes of the mission are MIL(MLX), BDA, and IOS. IOS can be used for UHF voice during ascent.
- g. There are eight GSTDN sites available on a 90 minute call-up on-orbit and also for deorbit: VAN, GDX(GDS), MIL(MLX), BDA(BDX), CAN, MAD, DKR, and DFR. (Note: DFR is not shown in the FLT PLN).

2. Guidance and Navigation

- a. The orbiter state vector must be uplinked whenever downtrack error in the on-board vector becomes greater than 20 nm, but is usually uplinked when errors are greater than 5 nm. These are real-time calls. In addition, state vectors must be uplinked for specified targets when utilizing an orbiting vehicle as a TGT ID with Universal Pointing. State vector updates are required every 4 hours when using the L3 payload.
- b. IMU alignments occur approximately every 12 hours (in the pre-sleep and post-sleep activities) and prior to major events requiring low navigation uncertainty.

3. Environmental Control and Life Support Subsystem (ECLSS)

- a. Two CO2 absorbers are installed prior to launch. On-orbit, the canisters are alternately replaced as required per the cue card.
- b. There are four supply water tanks and one waste water tank which are loaded for launch with volumes sufficient to meet a launch day deorbit opportunity with payload bay doors (PLBDs) failed closed. Tanks A and B will be managed to a level that will allow the tanks to be full prior to the next daily group of deorbit opportunities. After LDEF is retrieved, the FES will be used to exhaust supply water so that these tanks will not need to be dumped. It is anticipated that the waste water tank will be dumped only once while LDEF is in the payload bay.

4. Utility Power Usage

The following tables are the DC and AC Utility Power Outlet Schedules. These tables show the times of outlet reconfiguration during the mission.

STS-32 DC UTILITY POWER OUTLET SCHEDULE

| MET | | PRELAUNCH | POST INSERTION | ON-ORBIT | DEORBIT PREP |
|------------------|---------------------|-------------------------|-------------------|-----------------|-------------------------|
| OUTLET | | | 0/1:46 | | |
| MNA | 019 M052J | PLT* MS3* | -- PCG1,PCG2 | -- PCG1,PCG2 | PLT* MS3* |
| MNB | F1 M013Q | -- PCG1,PCG2 | -- -- | -- -- | -- PCG1,PCG2 |
| MNC | A11 A15 M030F | MS1*,MS2* CDR* -- | -- TPR -- | -- TPR -- | MS1*,MS2* CDR* -- |
| MNA or MNB | L15 | -- | -- | IMAX | -- |

NOTES: * Crewmember suit fan

STS-32 AC UTILITY POWER OUTLET SCHEDULE

| MET | | PRELAUNCH | POST INSERTION | ON-ORBIT | DEORBIT PREP |
|--------|--------------|-----------|-------------------|-------------|-----------------|
| OUTLET | | | 0/1:12 | | |
| AC1 | M052J F1 | -- -- | -- SPOC | FEA SPOC | -- -- |
| MNB | M013Q A15 | -- -- | -- -- | AFE L3 | -- -- |

NOTE: Intermittent AC outlets needed for vacuum cleaner and photo floodlight

D. TEXT UPLINK SYSTEM

1. The Text and Graphics System (TAGS) is a high-resolution facsimile system that scans text or graphics material and converts the analog SCAN data into serial digital data. This data is transmitted via a telemetry link to the cathode-ray tube hardcopier. Transmission time for an 8-1/2 by 11-inch page can vary from just over 1 minute to just over 16 minutes depending on the hardcopy resolution desired. The TAGS can only uplink images using Ku-Band. This Flight Plan assumes Ku-Band forward link is available for both TDRS-E and TDRS-W, and TAGS is the primary mode of text uplink. Instrumentation has the capability to uplink onboard hardcopier control commands via S-Band or Ku-Band for power on, advance, ready, standby, and off.
2. The teleprinter (TPR) will provide a backup on-orbit capability to receive and reproduce text-only data from MCC. The TPR uses S-Band and is not dependent on TDRS Ku-Band. TPR requires 1 to 2.5 minutes per message, depending on the number of lines (up to 66).

E. TELEVISION/PHOTOGRAPHY

1. The CCTV system provides two color, wide-angle cameras for in-cabin coverage. There will also be four PLB TV cameras and 2 RMS cameras. There are three different lens assemblies for the PLB cameras (color lens assembly, monochrome lens assembly, and wide-angle lens assembly). The type of lens assembly for each PLB camera is documented in the Flight Requirements Document.
2. There is a video tape recorder available with 30-minute cassettes.
3. Three camera systems are available: 35mm, 16mm, and 70mm.
4. The Camcorder has been included in the manifest for test purposes. See DTO 630, Camcorder Demonstration.

F. PAYLOADS

1. Long Duration Exposure Facility (LDEF)

LDEF is a free-flying passive spacecraft that provides accommodations for experiments which require long-term exposure to the space environment. Deployment was performed during mission STS 41-C (April, 1984) and LDEF is approaching the end of its orbital lifetime. Retrieval is scheduled using a ground up rendezvous on flight days 4, 5 or 6 and proximity operations to approach the LDEF so that capture with the RMS can be performed. The LDEF spacecraft has been in orbit in a gravity gradient stabilized attitude for 5 years and many of the requirements for handling of the spacecraft during retrieval have maintenance of LDEF's condition as the primary objective.

2. SYNCOM IV-5

The last SYNCOM spacecraft of the series of 5 communications satellites is the SYNCOM IV-5. As in past flights, the SYNCOM will be deployed from the orbiter payload bay so that its own third stage PKM and multi-use LAM motors can be used to elevate the satellite to geosynchronous orbit. This SYNCOM has been modified to allow PKM firing via ground command so that the mission may be accomplished even when launch occurs outside its RAAN limits. In these cases PKM firing is delayed until nodal regression allows continuation of the mission. Deployment is scheduled on orbit 17 with a backup on orbit 32.

3. American Flight Echocardiograph (AFE)

The subject's heart will be scanned using a hand-held ultrasonic transducer. The scan is displayed as a video image by the apparatus which is fitted into a middeck locker. Data is output in standard video format and is recorded on the CCTV Video Tape Recorder (VTR) or Camcorder. AFE recordings are taken daily for crewmembers involved in the data taking which investigates affects on the heart in zero-g. The AFE will also be used to support DSO 478, Lower Body Negative Pressure.

4. Characterization of Neurospora Circadian Rhythms (CNCR)

The CNCR payload consists of several specimen race tubes, six gas sampling syringes and a temperature recorder stowed in three foam packages in a middeck locker. The specimen consists of Neurospora Crassa (bread molds) which are exposed to various timed light levels and microgravity to examine the effect on circadian rhythms and metabolic rates.

5. Latitude/Longitude Locator (L3)

A 70mm Hasselblad camera is modified with a fixed and moving reticle for sighting on targets and taking angle marks (as well as photographs). A Camera-Computer Interface Unit (CCIU) connects the camera to a GRID compass computer. The collection of marks are reduced to longitude/latitude for each of the targets on which the marks are taken. The objective of the L3 mission is to evaluate the accuracy and usability of the instrument by viewing and marking on known earth ground sites during the flight.

6. FEA (Fluids Experiment Apparatus)

The FEA payload is a middeck experiment examining the application of floating zone processes and their effects on crystal quality. The apparatus is the size of one middeck locker. Ancillary FEA hardware includes a computer, Super 8mm camera, test samples, space parts, and 8mm and 35mm film. The apparatus consists of a heating element that moves along a track to melt and recrystallize the sample which is sealed in a pyrex tube. The Super 8mm camera and computer provide in-flight monitoring and postflight analysis of each test.

7. MLE (Mesoscale Lightning Experiment)

The MLE payload consists of the standard orbiter cargo bay Television (TV) camera system (with no restrictions on the Closed Circuit Television (CCTV) camera lens configuration) and a dedicated STS standard orbiter 35mm camera body with hr-min-sec data back and 85mm lens. The MLE camera will share lenses from the standard onboard orbiter complement. The TV system is shared on a noninterference basis with primary mission objectives. The MLE objectives are to observe and record the visual characteristics of large scale lightning as seen from space using the onboard cargo bay TV and 35mm cameras and to develop a better understanding of this type of lightning.

8. AMOS (Air Force Maui Optical Site)

The primary objective of the AMOS activity is to use the orbiter during cooperative overflights of Maui to obtain imagery and/or signature data to support the calibration of the AMOS ground-based sensors and to observe plume phenomenology. No unique onboard hardware is associated with the AMOS tests; crew and orbiter participation are required to establish the controlled conditions for the Maui cooperative overflight.

9. PCG (Protein Crystal Growth)

The PCG payload is designed to conduct experiments which will supply information on the scientific methods and commercial potential for growing large, high-quality protein crystals in microgravity. The PCG will be installed and operated on the orbiter middeck. Two PCG experiments will be flown on STS-32.

10. IMAX

The IMAX payload is a 70mm motion picture camera system. The camera and supporting equipment are stowed in the middeck and are for in-cabin use. On this flight, a large percentage of the scenes for the IMAX camera will be Earth-viewing. Scene opportunities will be provided to the crew pre-flight and in real-time. In addition, a few opportunities utilizing special orbiter attitudes/maneuvers may be scheduled in this Flight Plan.

G. ON-ORBIT DTOs

1. Cabin Air Monitoring (DTO 623)

This DTO will use the solid sorbent sampler to continuously sample the orbiter atmosphere throughout the flight. The solid sorbent sampler is to be flown on first flights of a new vehicle or after extensive non-metallic materials refurbishment in the orbiter cabin.

2. RMS Operating Loads and Data During LDEF Retrieve (DTO 627)

Advantage of the weight and size of LDEF is taken to collect, unique and extreme combinations of forces on the RMS subsystem. Data will be collected during the loaded RMS operations with the LDEF payload. A special format (26) will be required for the strain gauge data.

3. 8mm Camcorder Demonstration (DTO 0630)

The DTO will perform documentary cabin and exterior television. The equipment will be evaluated as possible future enhancement to orbiter cabin television equipment.

4. TDRS to TDRS Handover Demonstration (DTO 703)

The DTO will perform demonstrations of S-Band and Ku-Band TDRS to TDRS handover capability. Ku-Band handovers will involve the return link only.

5. Gravity Gradient Attitude Control (DTO 816)

Data collected during this DTO will help refine the computer models used to predict stable gravity gradient attitudes. On STS-32, only long duration tests (8-12 hours) will be done. The long duration tests will help determine the amplitude of steady state attitude oscillations and the sensitivity of these oscillations to attitude and rate errors at attitude initiation.

6. Additional Stowage Evaluation for Extended Duration Orbiter (DTO 823)

Several provisions for additional stowage are being tested in this DTO for ultimate use on extended duration orbiter (EDO) missions.

7. OEX Shuttle Upper Atmosphere Mass Spectrometer (SUMS) (DTO 902)

The SUMS experiment will measure constituents in the upper atmosphere where free translational flow phenomena predominate and where current analytical and experimental techniques are inadequate for accurately predicting vehicle flight performance. Equipment includes a mass spectrometer mounted in the orbiter nose wheel well, ACIP and HIRAP accelerometer packages, OEX recorder and a System Control Module. Data is collected at several altitudes during the flight.

8. OEX Orbital Acceleration Research Experiment (OARE) (DTO 910)

Measurement of orbiter aerodynamic acceleration are recorded in the nano-g range along the principal axes in the free molecular flow regime at orbital altitudes through the transition regime during re-entry. Orbiter maneuvers about principal axes are performed as well as center-of-gravity measuring free drift periods to record aerodynamic accelerations at very sensitive levels.

H. ON-ORBIT DSOs

1. Inflight Salivary Pharmacokinetics of Scopolamine and Dextroamphetamine (DSO 475)

The purpose of this DSO is to investigate the pharmacokinetics of anti-motion sickness agents during space flight and predict the resultant therapeutic consequences. The crewmember will take the drug after an 8-hour fast, and take salivary samples at required intervals during the flight day.

2. Characterization of Airborne Particulate Matter in Shuttle Atmospheres (DSO 471)

Airborne particles and floating debris have been reported as the cause of eye and respiratory tract irritation by crewmembers. Some instrument failure has also been attributed to airborne particulates. The Airborne Particulate Sampler will be used to characterize the type and amount of debris in the cabin atmosphere. Samples will be analyzed to determine the health and safety consequences of airborne matter and to identify sources of contamination.

3. Intraocular Pressure (DTO 472)

Pressure measurements 20-25% above normal/preflight levels were observed in bedrest studies, during 0-G on the KC-135, and on the D-1 shuttle mission. The possible deleterious effects of sustained deviations in intraocular pressure are difficult to predict since no statistically valid in-flight data exists. Even though a few days or weeks of elevated intraocular pressure would be harmless, months or years of sustained high pressure, due to microgravity, could cause ocular disturbances. Significant baseline data is needed to define normal intraocular pressure ranges in microgravity and to determine the magnitude of pressure rises to be expected in crewmembers. A tonopener is used to measure IOP among the STS-32 crewmembers.

4. Delayed-type Hypersensitivity (DSO 473)

The purpose of this DSO is to detect immunological alterations in the human system resulting from spaceflight. Delayed-Type Hypersensitivity will also assess the impairment of in-vivo cell mediated immunity and the medical significance of immune dysfunction events.

5. Inflight Aerobic Exercise (DSO 476)

Daily inflight aerobic exercise will 1) inhibit the decrease in cardiac dimensions observed during space flight and thus improve postflight orthostatic tolerance, and 2) minimize the loss of aerobic capacity after flight. The STS-32 crew is divided into two groups (exercisers and non-exercisers) which participate in daily measurements of resting heart rate. The exercisers will conduct detailed test protocols of aerobic exercise while measurement of ECG and heart rate are recorded. This research hopes to develop counter measures that will provide complete prevention of post-space flight orthostatic intolerance.

6. Inflight Lower Body Negative Pressure (LBNP) (DSO 478)

Fluid loading via ingestion of salt tablets and water in association with lower body negative pressure (LBNP) treatment will protect tolerance to orthostasis (simulated inflight by LBNP). The objective of this study is to evaluate the effectiveness of fluid loading during LBNP in improving tolerance of a LBNP stress protocol.

7. Documentary Television (DSO 901)

This DSO requires live television transmission or VTR dumps of crew activities and spacecraft functions which include: Payload Bay Views, SYNCOM Predeploy, Deploy and Separation Activities, views of SYNCOM PKM firing, views of LDEF during capture through berthing, In-Flight Crew Conference, views of AFE Sessions, and unscheduled TV Activities.

8. Documentary Motion Picture Photography (DSO 902)

This DSO requires documentary and public affair motion picture photography of significant activities which best depicts the basic capabilities of the Space Shuttle and key objectives. This DSO includes motion picture photography of SYNCOM Predeploy and Deploy Activities, Flight Deck Activities, Middeck Activities, and any unscheduled Motion Picture Photography.

9. Documentary Still Photography (DSO 903)

This DSO requires still photography of crew activities in the orbiter, spacecraft accommodations and mission related scenes of general public and historical interest. Still photography with 70mm format for exterior photography and 35mm format for interior photography is required.

I. TIMELINE FORMATS

The timeline formats used in this Flight Plan are based on JSC document 19933: Timeline Format Definitions and Standard Notes, Revision B, May 25, 1987.

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STS-32 DAP BOOK

DAP A CONFIGURATIONS

| | A1* | A2 | A3 | A4 | A5 | A6 | A7 | A8 | A9 | A10 | A11 | A12 | A13 |
|--------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|----------|-----|
| <u>TRANSLATION</u> | | | | | | | | | | | | | |
| PULSE ft/sec | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.05 | 0.10 | 0.10 | |
| <u>ROTATION</u> | | | | | | | | | | | | | |
| DSC RT NORM °/sec | 0.200 | 0.400 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.500 | 0.200 | 0.200 | 0.500 | 0.200 | |
| VERN °/sec | 0.200 | 0.400 | 0.200 | 0.008 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.200 | 0.500 | 0.200 | |
| PULSE NORM °/sec | 0.10 | 0.10 | 0.30 | 0.10 | 0.10 | 0.10 | 0.89 | 0.10 | 0.10 | 0.10 | 0.10 | 0.04 | |
| VERN °/sec | 0.010 | 0.010 | 0.010 | 0.010 | 0.050 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.010 | 0.05 | |
| COMP NORM °/sec | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| VERN °/sec | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |
| <u>DEADBAND</u> | | | | | | | | | | | | | |
| ATT NORM (deg) | 5.00 | 1.00 | 5.00 | 1.00 | 5.00 | 5.00 | 3.00 | 3.00 | 2.00 | 2.00 | 0.50 | 2.00 | |
| VERN (deg) | 1.000 | 1.000 | 1.000 | 0.070 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 1.000 | 0.500 | 1.000 | |
| RATE NORM °/sec | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | |
| VERN °/sec | .020 | .020 | .020 | .010 | .020 | .020 | .020 | .020 | .020 | .020 | .020 | .100 | |
| <u>JET OPT</u> | | | | | | | | | | | | | |
| P | 1 | 1 | 3 | 1 | 1 | 3 | 3 | 1 | 1 | 1 | 3 | 1 or 3 | |
| Y | 1 | 1 | 3 | 3 | 1 | 3 | 3 | 1 | 1 | 1 | 3 | 1 or 3 | |
| <u>CNTL ACCEL</u> | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 thru 5 | |

*I-LOADED OPS-2 DAP Configuration

DAP B CONFIGURATIONS

| | B1* | B2 | B3 | B4 | B5 | B6 | B7 | B8 | B9 | B10 | B11 | B12 |
|--------------------|-------|-------|-------|-------|-------|-------|-------|--------|-------|-------|----------|-----|
| <u>TRANSLATION</u> | | | | | | | | | | | | |
| PULSE ft/sec | 0.02 | 0.02 | 0.02 | 0.02 | 0.02 | 0.05 | 0.01 | 0.02 | 0.02 | 0.02 | 0.10 | |
| <u>ROTATION</u> | | | | | | | | | | | | |
| DSC RT NORM °/sec | 0.500 | 0.200 | 0.200 | 0.200 | 0.200 | 0.500 | 0.200 | 0.500 | 0.066 | 0.500 | 0.200 | |
| VERN °/sec | 0.200 | 0.200 | 0.200 | 0.008 | 0.016 | 0.200 | 0.200 | 0.500 | 0.066 | 0.200 | 0.200 | |
| PULSE NORM °/sec | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | 0.04 | .04 | 0.04 | 0.77 | 0.04 | |
| VERN °/sec | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.002 | 0.01 | |
| COMP NORM °/sec | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| VERN °/sec | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | .000 | |
| <u>DEADBAND</u> | | | | | | | | | | | | |
| ATT NORM (deg) | 3.00 | 3.00 | 3.00 | 0.30 | 3.00 | 2.00 | 2.00 | 10.000 | 5.000 | 2.00 | 2.00 | |
| VERN (deg) | 1.000 | 1.000 | 1.000 | 0.100 | 0.033 | 1.000 | 1.000 | 10.000 | 1.000 | 1.000 | 1.000 | |
| RATE NORM °/sec | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.20 | 0.50 | 0.20 | 0.20 | 0.20 | |
| VERN °/sec | .020 | .020 | .020 | .010 | .020 | .020 | .020 | 0.500 | 0.020 | 0.020 | .100 | |
| <u>JET OPT</u> | | | | | | | | | | | | |
| P | 1 | 3 | 1 | 3 | 3 | 1 | 1 | 3 | 3 | 1 | 1 or 3 | |
| Y | 1 | 3 | 1 | 3 | 3 | 1 | 1 | 3 | 3 | 1 | 1 or 3 | |
| CNTL ACCEL | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 thru 5 | |

*I-LOADED OPS-2 DAP Configuration

DAP BOOK



FLT PLN/32/0/BAS

| 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 | PTC ($\sim 2^\circ$ below +X)* |
| = 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/32/0/BAS

| G20 DAP CONFIG | |
|----------------|---------------------|
| CNTL ACCEL = 0 | Orbiter alone |
| = 1 | thru 5 orbiter/LDEF |
| JET OPT = 1 | Normal |
| = 2 | Nose only |
| = 3 | Tail only |

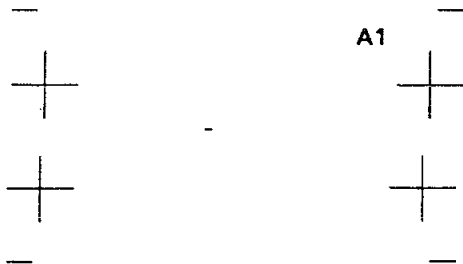
TOP



DAP PURPOSE

- A1 - NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)
- A2 - PTC
- A3 - RCS HOT FIRE
- A4 - GG
- A5 - IMU ROTATION
- A6 - LOSS OF VERN
(TAIL ONLY)
- A7 - DTO 910
- A8 - PRE/POST DEPLOY
- A9 - RENDEZVOUS
- A10 - PROX OPS
- A11 - DTO 902
- A12 - LDEF MNVR
(LOADED RMS)
- A13 - Blank

FLT PLN/32/0/BAS



A1

TOP

DAP A1

PURPOSE:

NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)

| | | |
|---------|----|-------------------------|
| 0.1 0 | 1 | TRANSLATION PULSE |
| 0.2 0 0 | 2 | ROTATION DSC RT NORM |
| 0.2 0 0 | 3 | VERN |
| 0.1 0 | 4 | PULSE NORM |
| 0.0 1 0 | 5 | VERN |
| .0 0 0 | 6 | COMP NORM |
| .0 0 0 | 7 | VERN |
| 5.0 0 | 8 | DEADBAND ATT NORM |
| 1.0 0 0 | 9 | VERN |
| 0.2 0 | 10 | RATE NORM |
| .0 2 0 | 11 | VERN |
| 1 | 12 | JET OPT P |
| 1 | 13 | Y |
| 0 | 14 | CNTL ACCEL |

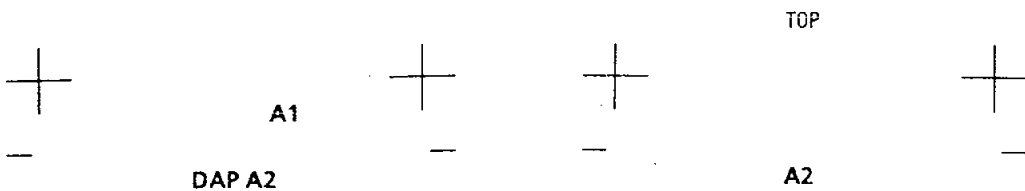
FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



A2

TOP

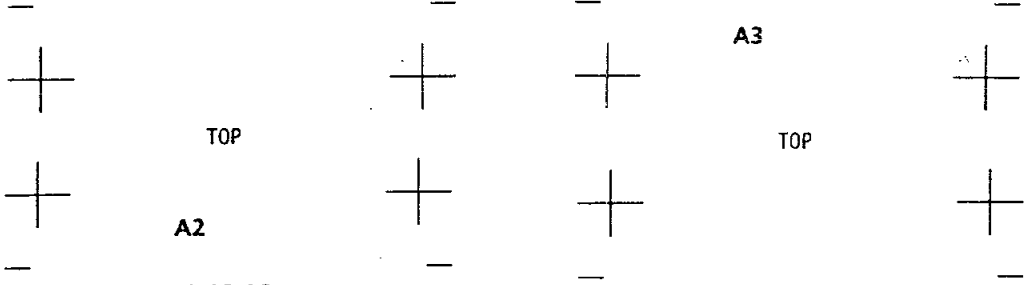


PURPOSE:
PTC

0.1 0 1 TRANSLATION PULSE
 0.4 0 0 2 ROTATION DSC RT NORM
 0.4 0 0 3 VERN
 0.1 0 0 4 PULSE NORM
 0.0 1 0 5 VERN
 .0 0 0 6 COMP NORM
 .0 0 0 7 VERN
 1.0 0 8 DEADBAND ATT NORM
 1.0 0 0 9 VERN
 0.2 0 10 RATE NORM
 .0 2 0 11 VERN
 1 12 JET OPT P
 1 13 Y
 0 14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

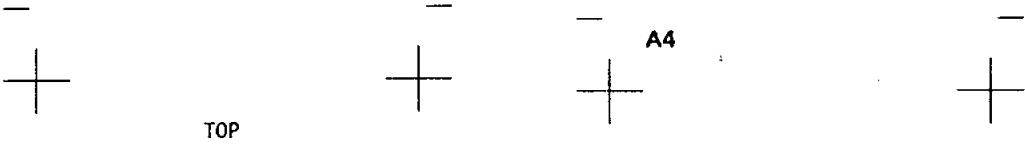


PURPOSE:
RCS HOT FIRE

0.1 0 1 TRANSLATION PULSE
 0.2 0 0 2 ROTATION DSC RT NORM
 0.2 0 0 3 VERN
 0.3 0 0 4 PULSE NORM
 0.0 1 0 5 VERN
 .0 0 0 6 COMP NORM
 .0 0 0 7 VERN
 5.0 0 8 DEADBAND ATT NORM
 1.0 0 0 9 VERN
 0.2 0 10 RATE NORM
 .0 2 0 11 VERN
 3 12 JET OPT P
 3 13 Y
 0 14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS





A3



TOP



DAP A4

A4

PURPOSE:

GG

0.1 0

1 TRANSLATION PULSE

0.2 0 0

2 ROTATION DSC RT NORM

0.0 0 8

3 VERN

0.1 0

4 PULSE NORM

0.0 1 0

5 VERN

.0 0 0

6 COMP NORM

.0 0 0

7 VERN

DEADBAND

1.0 0

8 ATT NORM

0.0 7 0

9 VERN

0.2 0

10 RATE NORM

.0 1 0

11 VERN

1

12 JET OPT P

3

13 Y

0

14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP



A5



DAP A5

A4



TOP



PURPOSE:

IMU ROTATION

0.1 0

1 TRANSLATION PULSE

0.2 0 0

2 ROTATION DSC RT NORM

0.2 0 0

3 VERN

0.1 0

4 PULSE NORM

0.0 5 0

5 VERN

.0 0 0

6 COMP NORM

.0 0 0

7 VERN

DEADBAND

5.0 0

8 ATT NORM

1.0 0 0

9 VERN

0.2 0

10 RATE NORM

.0 2 0

11 VERN

1

12 JET OPT P

1

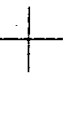
13 Y

0

14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP



A6





A5

DAP A6

PURPOSE:
LOSS OF VERN
(TAIL ONLY)

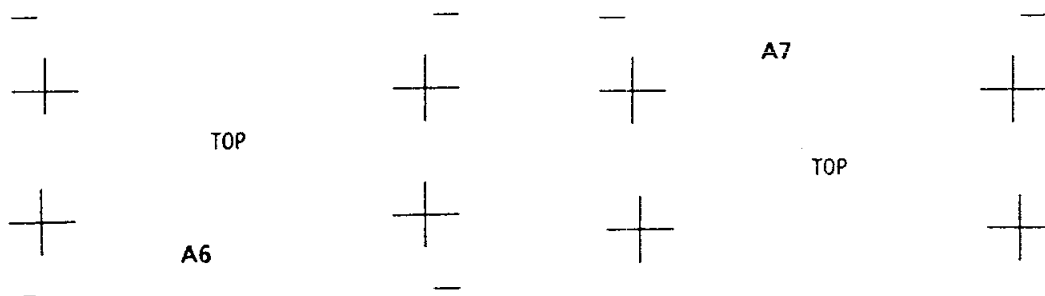
TOP

A6

| | | | |
|----------|----|-------------|------|
| 0.1 0 | 1 | TRANSLATION | |
| | | PULSE | |
| ROTATION | | | |
| 0.2 0 0 | 2 | DSC RT | NORM |
| 0.2 0 0 | 3 | VERN | |
| 0.1 0 | 4 | PULSE | NORM |
| 0.0 1 0 | 5 | VERN | |
| .0 0 0 | 6 | COMP | NORM |
| .0 0 0 | 7 | VERN | |
| DEADBAND | | | |
| 5.0 0 | 8 | ATT | NORM |
| 1.0 0 0 | 9 | | VERN |
| 0.2 0 | 10 | RATE | NORM |
| .0 2 0 | 11 | | VERN |
| 3 | 12 | JET OPT | P |
| 3 | 13 | | Y |
| 0 | 14 | CNTL ACCEL | |

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP

A6

DAP A7

PURPOSE: DTO 910

A7

TOP

| | | | |
|----------|----|-------------|------|
| 0.1 0 | 1 | TRANSLATION | |
| | | PULSE | |
| ROTATION | | | |
| 0.2 0 0 | 2 | DSC RT | NORM |
| 0.2 0 0 | 3 | VERN | |
| 0.8 9 | 4 | PULSE | NORM |
| 0.0 1 0 | 5 | VERN | |
| .0 0 0 | 6 | COMP | NORM |
| .0 0 0 | 7 | VERN | |
| DEADBAND | | | |
| 3.0 0 | 8 | ATT | NORM |
| 1.0 0 0 | 9 | | VERN |
| 0.2 0 | 10 | RATE | NORM |
| .0 2 0 | 11 | | VERN |
| 3 | 12 | JET OPT | P |
| 3 | 13 | | Y |
| 0 | 14 | CNTL ACCEL | |

FLT PLN/32/0/BAS





FLT PLN/32/0/BAS











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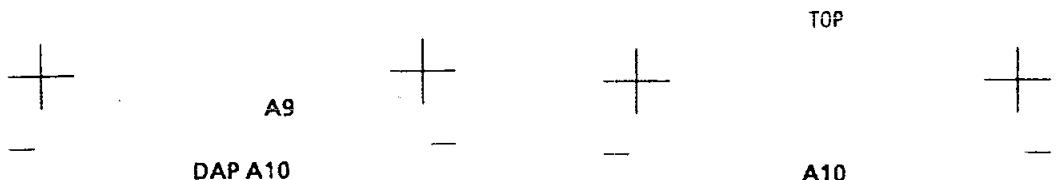
A8

TOP

| | | | |
|--|---|---|---|
|  A7 |  |  |  |
| DAP A8 | | A8 | |
| PURPOSE: | | | |
| PRE/POST DEPLOY | | | |
| | | 0.1 0 | 1 TRANSLATION PULSE |
| | | 0.5 0 0 | 2 ROTATION DSC RT NORM |
| | | 0.2 0 0 0 | 3 VERN |
| | | 0.1 0 0 | 4 PULSE NORM |
| | | 0.0 1 0 0 | 5 VERN |
| | | .0 0 0 | 6 COMP NORM |
| | | .0 0 0 | 7 VERN |
| | | DEADBAND | |
| | | 3.0 0 0 | 8 ATT NORM |
| | | 1.0 0 0 | 9 VERN |
| | | 0.2 0 0 | 10 RATE NORM |
| | | .0 2 0 | 11 VERN |
| | | 1 | 12 JET OPT P |
| | | 1 | 13 Y |
| | | 0 | 14 CNTL ACCEL |
| FLT PLN/32/0/BAS | | FLT PLN/32/0/BAS | |

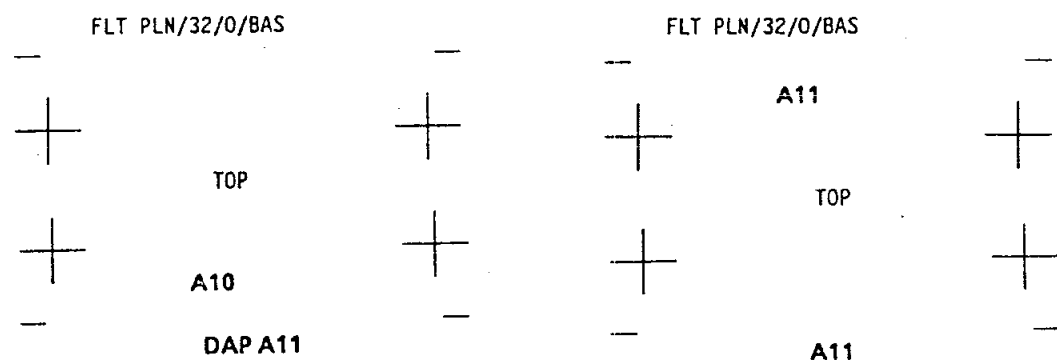
| | | | |
|---|--|--|---|
|  TOP |  |  |  A9 |
| DAP A9 | | A9 | |
| PURPOSE: | | | |
| RENDEZVOUS | | | |
| | | 0.1 0 | 1 TRANSLATION PULSE |
| | | 0.2 0 0 | 2 ROTATION DSC RT NORM |
| | | 0.2 0 0 0 | 3 VERN |
| | | 0.1 0 0 | 4 PULSE NORM |
| | | 0.0 1 0 0 | 5 VERN |
| | | .0 0 0 | 6 COMP NORM |
| | | .0 0 0 | 7 VERN |
| | | DEADBAND | |
| | | 2.0 0 0 | 8 ATT NORM |
| | | 1.0 0 0 | 9 VERN |
| | | 0.2 0 0 | 10 RATE NORM |
| | | .0 2 0 | 11 VERN |
| | | 1 | 12 JET OPT P |
| | | 1 | 13 Y |
| | | 0 | 14 CNTL ACCEL |
| FLT PLN/32/0/BAS | | FLT PLN/32/0/BAS | |

| | | | |
|--|---|---|---|
|  TOP |  |  |  A10 |
| DAP A9 | | A9 | |
| PURPOSE: | | | |
| RENDEZVOUS | | | |
| | | 0.1 0 | 1 TRANSLATION PULSE |
| | | 0.2 0 0 | 2 ROTATION DSC RT NORM |
| | | 0.2 0 0 0 | 3 VERN |
| | | 0.1 0 0 | 4 PULSE NORM |
| | | 0.0 1 0 0 | 5 VERN |
| | | .0 0 0 | 6 COMP NORM |
| | | .0 0 0 | 7 VERN |
| | | DEADBAND | |
| | | 2.0 0 0 | 8 ATT NORM |
| | | 1.0 0 0 | 9 VERN |
| | | 0.2 0 0 | 10 RATE NORM |
| | | .0 2 0 | 11 VERN |
| | | 1 | 12 JET OPT P |
| | | 1 | 13 Y |
| | | 0 | 14 CNTL ACCEL |
| FLT PLN/32/0/BAS | | FLT PLN/32/0/BAS | |



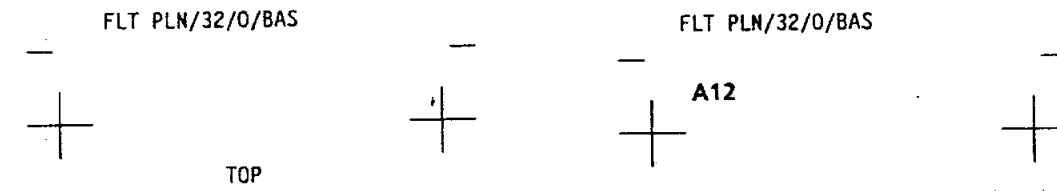
PURPOSE:
PROX OPS

- 0.0 5 1 TRANSLATION PULSE
- 0.2 0 0 2 ROTATION DSC RT NORM
- 0.2 0 0 3 VERN
- 0.1 0 0 4 PULSE NORM
- 0.0 1 0 5 VERN
- .0 0 0 6 COMP NORM
- .0 0 0 7 VERN
- 2.0 0 8 DEADBAND ATT NORM
- 1.0 0 0 9 VERN
- 0.2 0 10 RATE NORM
- .0 2 0 11 VERN
- 1 12 JET OPT P
- 1 13 Y
- 0 14 CNTL ACCEL



PURPOSE:
OTO 902

- 0.1 0 1 TRANSLATION PULSE
- 0.5 0 0 2 ROTATION DSC RT NORM
- 0.5 0 0 3 VERN
- 0.1 0 0 4 PULSE NORM
- 0.0 1 0 5 VERN
- .0 0 0 6 COMP NORM
- .0 0 0 7 VERN
- 0.5 0 8 DEADBAND ATT NORM
- 0.5 0 0 9 VERN
- 0.2 0 10 RATE NORM
- .0 2 0 11 VERN
- 3 12 JET OPT P
- 3 13 Y
- 0 14 CNTL ACCEL





A11



TOP



DAP A12

PURPOSE: LDEF MNVR
(LOADED RMS)

A12

- 0.1 0 1 TRANSLATION PULSE
- 0.2 0 0 2 ROTATION DSC RT NORM
- 0.2 0 0 3 VERN
- 0.0 4 4 PULSE NORM
- 0.0 5 5 VERN
- 0.0 6 6 COMP NORM
- 0.0 0 7 VERN
- 2.0 0 8 DEADBAND ATT NORM
- 1.0 0 0 9 VERN
- 0.2 0 10 RATE NORM
- 1 0 0 11 VERN
- 1 or 3 12 JET OPT P
- 1 or 3 13 Y
- 1 thru 5 14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP



A13



A12



TOP



DAP A13

PURPOSE: (Blank)

A13

- 1 TRANSLATION PULSE
- 2 ROTATION DSC RT NORM
- 3 VERN
- 4 PULSE NORM
- 5 VERN
- 6 COMP NORM
- 7 VERN
- 8 DEADBAND ATT NORM
- 9 VERN
- 10 RATE NORM
- 11 VERN
- 12 JET OPT P
- 13 Y
- 14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP



TOP



A13



DAP PURPOSE

- B1 - NOMINAL
PRCS IMU ALIGN
OMS & RCS BURNS
- B2 - LOSS OF VERN
(TAIL ONLY)
- B3 - LOSS OF VERN
(NOSE & TAIL)
GG MNVR
- B4 - SYNCOM DEPLOY
- B5 - COAS CAL
- B6 - RENDEZVOUS
- B7 - PROX OPS
- B8 - DTO 902, 910
- B9 - ORB RATE ROTATION
- B10 - IMAX
- B11 - LDEF MNVR
(LOADED RMS)
- B12 - Blank

FLT PLN/32/0/BAS



B1



TOP

TOP



DAP B1

B1

PURPOSE:

NOMINAL
PRCS IMU ALIGN
OMS & RCS BURNS

TRANSLATION
PULSE 15 0.0 2

ROTATION
DSC RT NORM 16 0.5 0 0
VERN 17 0.2 0 0
PULSE NORM 18 0.0 4
VERN 19 0.0 0 2
COMP NORM 20 .0 0 0
VERN 21 .0 0 0

DEADBAND
ATT NORM 22 3.0 0
VERN 23 1.0 0 0

RATE NORM 24 0.2 0
VERN 25 .0 2 0

JET OPT P 26 1
Y 27 1

CNTL ACCEL 28 0

FLT PLN/32/0/BAS



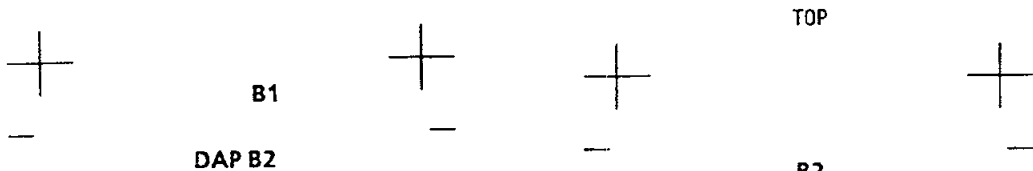
B2



TOP

FLT PLN/32/BAS

(reduced copy)

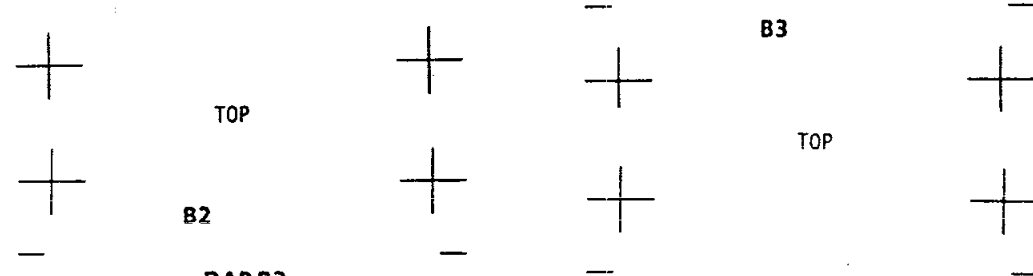


B1

DAP B2

PURPOSE:
LOSS OF VERN
(TAIL ONLY)

FLT PLN/32/0/BAS



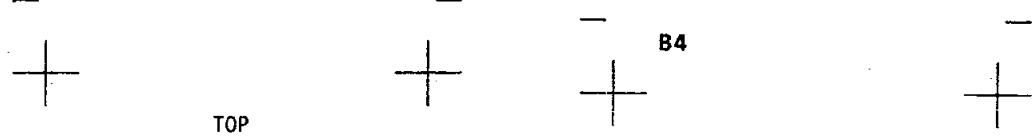
TOP

B2

DAP B3

PURPOSE:
LOSS OF VERN
(NOSE & TAIL)
GG MNVR

FLT PLN/32/0/BAS



TOP

TOP

B2

| | | | |
|------------------|---------|-----|-----|
| TRANSLATION | | | |
| PULSE | 15 | 0.0 | 2 |
| ROTATION | | | |
| DSC RT | NORM 16 | 0.2 | 0 0 |
| | VERN 17 | 0.2 | 0 0 |
| PULSE | NORM 18 | 0.0 | 4 |
| | VERN 19 | 0.0 | 2 |
| COMP | NORM 20 | .0 | 0 |
| | VERN 21 | .0 | 0 |
| DEADBAND | | | |
| ATT | NORM 22 | 3.0 | 0 |
| | VERN 23 | 1.0 | 0 |
| RATE | NORM 24 | 0.2 | 0 |
| | VERN 25 | .0 | 2 |
| JET OPT | P 26 | | 3 |
| | Y 27 | | 3 |
| CNTL ACCEL | 28 | | 0 |
| FLT PLN/32/0/BAS | | | |

B3

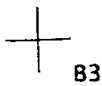
TOP

B3

| | | | |
|------------------|---------|-----|-----|
| TRANSLATION | | | |
| PULSE | 15 | 0.0 | 2 |
| ROTATION | | | |
| DSC RT | NORM 16 | 0.2 | 0 0 |
| | VERN 17 | 0.2 | 0 0 |
| PULSE | NORM 18 | 0.0 | 4 |
| | VERN 19 | 0.0 | 2 |
| COMP | NORM 20 | .0 | 0 |
| | VERN 21 | .0 | 0 |
| DEADBAND | | | |
| ATT | NORM 22 | 3.0 | 0 |
| | VERN 23 | 1.0 | 0 |
| RATE | NORM 24 | 0.2 | 0 |
| | VERN 25 | .0 | 2 |
| JET OPT | P 26 | | 1 |
| | Y 27 | | 1 |
| CNTL ACCEL | 28 | | 0 |
| FLT PLN/32/0/BAS | | | |

B4

FLT PLN/32/BAS



B3

DAP B4

PURPOSE:
SYNCOM DEPLOY

FLT PLN/32/0/BAS



TOP



DAP B5

PURPOSE:
COAS CAL

FLT PLN/32/0/BAS



TOP



TOP



B4

| | | | | |
|------------------|----|-----|---|---|
| TRANSLATION | | | | |
| PULSE | 15 | 0.0 | 2 | |
| ROTATION | | | | |
| DSC RT NORM | 16 | 0.2 | 0 | 0 |
| VERN | 17 | 0.0 | 0 | 8 |
| PULSE NORM | 18 | 0.0 | 4 | |
| VERN | 19 | 0.0 | 0 | 2 |
| COMP NORM | 20 | .0 | 0 | |
| VERN | 21 | .0 | 0 | 0 |
| DEADBAND | | | | |
| ATT NORM | 22 | 0.3 | 0 | |
| VERN | 23 | 0.1 | 0 | 0 |
| RATE | | | | |
| NORM | 24 | 0.2 | 0 | |
| VERN | 25 | 0.0 | 1 | 0 |
| JET OPT | | | | |
| P | 26 | | 3 | |
| Y | 27 | | 3 | |
| CNTL ACCEL | 28 | | 0 | |
| FLT PLN/32/0/BAS | | | | |

B4



TOP



B5

| | | | | |
|------------------|----|-----|---|---|
| TRANSLATION | | | | |
| PULSE | 15 | 0.0 | 2 | |
| ROTATION | | | | |
| DSC RT NORM | 16 | 0.2 | 0 | 0 |
| VERN | 17 | 0.0 | 1 | 6 |
| PULSE NORM | 18 | 0.0 | 4 | |
| VERN | 19 | 0.0 | 0 | 2 |
| COMP NORM | 20 | .0 | 0 | |
| VERN | 21 | .0 | 0 | 0 |
| DEADBAND | | | | |
| ATT NORM | 22 | 3.0 | 0 | |
| VERN | 23 | 0.0 | 3 | 3 |
| RATE | | | | |
| NORM | 24 | 0.2 | 0 | |
| VERN | 25 | 0.0 | 2 | 0 |
| JET OPT | | | | |
| P | 26 | | 3 | |
| Y | 27 | | 3 | |
| CNTL ACCEL | 28 | | 0 | |
| FLT PLN/32/0/BAS | | | | |

B5

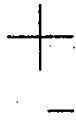


B6





B5



TOP



DAP B6

PURPOSE:

RENDEZVOUS

B6

| | | | |
|-------------|----|-----|---|
| TRANSLATION | | | |
| PULSE | 15 | 0.0 | 5 |

| | | | |
|----------|------|----|---------|
| ROTATION | | | |
| DSC RT | NORM | 16 | 0.5 0 0 |
| | VERN | 17 | 0.2 0 0 |
| PULSE | NORM | 18 | 0.0 4 |
| | VERN | 19 | 0.0 0 2 |
| COMP | NORM | 20 | .0 0 0 |
| | VERN | 21 | .0 0 0 |

| | | | |
|----------|------|----|---------|
| DEADBAND | | | |
| ATT | NORM | 22 | 2.0 0 |
| | VERN | 23 | 1.0 0 0 |

| | | | |
|------|------|----|--------|
| RATE | NORM | 24 | 0.2 0 |
| | VERN | 25 | .0 2 0 |

| | | | |
|---------|---|----|---|
| JET OPT | P | 26 | 1 |
| | Y | 27 | 1 |

CNTL ACCEL 28 0

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP



B7



TOP

B6

DAP B7

PURPOSE:

PROX OPS

B7

| | | | |
|-------------|----|-----|---|
| TRANSLATION | | | |
| PULSE | 15 | 0.0 | 1 |

| | | | |
|----------|------|----|---------|
| ROTATION | | | |
| DSC RT | NORM | 16 | 0.2 0 0 |
| | VERN | 17 | 0.2 0 0 |
| PULSE | NORM | 18 | 0.0 4 |
| | VERN | 19 | 0.0 0 2 |
| COMP | NORM | 20 | .0 0 0 |
| | VERN | 21 | .0 0 0 |

| | | | |
|----------|------|----|---------|
| DEADBAND | | | |
| ATT | NORM | 22 | 2.0 0 |
| | VERN | 23 | 1.0 0 0 |

| | | | |
|------|------|----|--------|
| RATE | NORM | 24 | 0.2 0 |
| | VERN | 25 | .0 2 0 |

| | | | |
|---------|---|----|---|
| JET OPT | P | 26 | 1 |
| | Y | 27 | 1 |

CNTL ACCEL 28 0

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS



TOP



B8



TOP

B7

DAP B8

PURPOSE: DTO 902, 910

B8

TRANSLATION
PULSE 15 0.0 2

ROTATION
DSC RT NORM 16 0.5 0 0
VERN 17 0.5 0 0
PULSE NORM 18 0.0 4
VERN 19 0.0 0 2
COMP NORM 20 .0 0 0
VERN 21 .0 0 0

DEADBAND
ATT NORM 22 1 0.0 0 0
VERN 23 1 0.0 0 0

RATE NORM 24 0.5 0
VERN 25 0.5 0 0

JET OPT P 26 3
Y 27 3

CNTL ACCEL 28 0

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

TOP

B8

DAP B9

PURPOSE: ORB RATE ROTATION

B9

TOP

B9

TRANSLATION
PULSE 15 0.0 2

ROTATION
DSC RT NORM 16 0.0 6 6
VERN 17 0.0 6 6
PULSE NORM 18 0.0 4
VERN 19 0.0 0 2
COMP NORM 20 .0 0 0
VERN 21 -0 0 0

DEADBAND
ATT NORM 22 -5.0 0 0
VERN 23 -1.0 0 0

RATE NORM 24 0.2 0
VERN 25 0.0 2 0

JET OPT P 26 3
Y 27 3

CNTL ACCEL 28 0

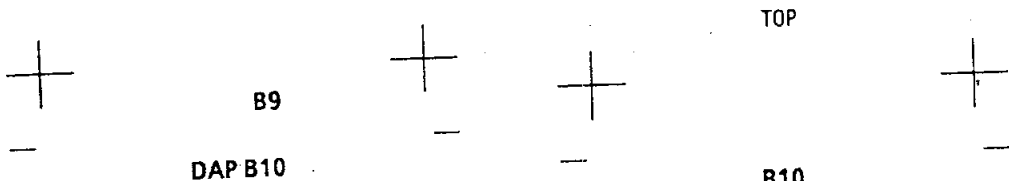
FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

TOP

B10

FLT PLN/32/BAS



B9

DAP B10

PURPOSE: IMAX

TOP

B10

TRANSLATION
PULSE 15 0.0 2

ROTATION
DSC RT NORM 16 0.5 0 0
VERN 17 0.2 0 0
PULSE NORM 18 0.7 7
VERN 19 0.0 0 2
COMP NORM 20 .0 0 0
VERN 21 .0 0 0

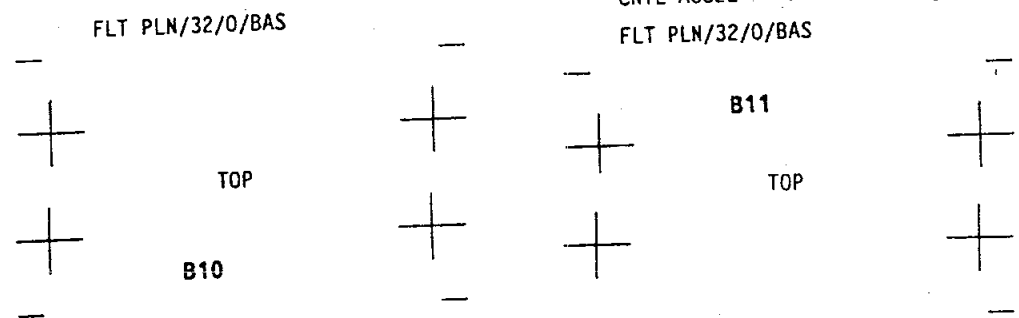
DEADBAND
ATT NORM 22 2.0 0
VERN 23 1.0 0 0

RATE NORM 24 0.2 0
VERN 25 0.0 2 0

JET OPT P 26 1
Y 27 1

CNTL ACCEL 28 0

FLT PLN/32/0/BAS



FLT PLN/32/0/BAS

TOP

B10

DAP B11

PURPOSE: LDEF MNVR
(LOADED RMS)

B11

TOP

B11

TRANSLATION
PULSE 15 0.1 0

ROTATION
DSC RT NORM 16 0.2 0 0
VERN 17 0.2 0 0
PULSE NORM 18 0.0 4
VERN 19 0.0 1
COMP NORM 20 .0 0 0
VERN 21 .0 0 0

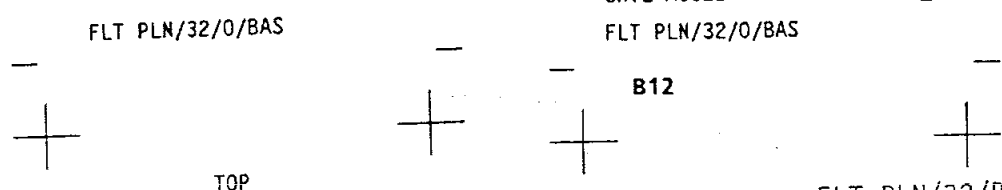
DEADBAND
ATT NORM 22 2.0 0
VERN 23 1.0 0 0

RATE NORM 24 0.2 0
VERN 25 0.1 0 0

JET OPT P 26 1 or 3
Y 27 1 or 3

CNTL ACCEL 28 1 thru 5

FLT PLN/32/0/BAS



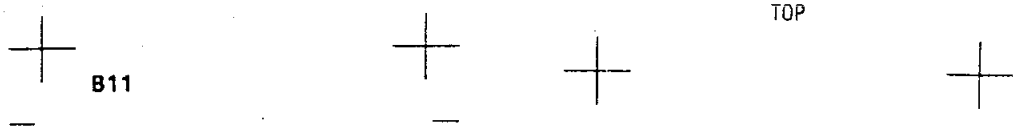
FLT PLN/32/0/BAS

TOP

B12

(reduced copy)

FLT PLN/32/BAS



B11

DAP B12

PURPOSE: (Blank)

TOP

B12

TRANSLATION
PULSE 15

ROTATION
DSC RT NORM 16
VERN 17
PULSE NORM 18
VERN 19
COMP NORM 20
VERN 21

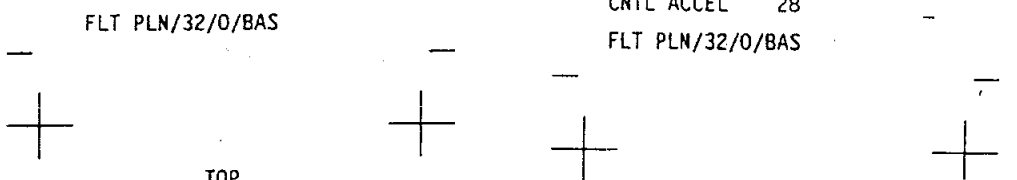
DEADBAND
ATT NORM 22
VERN 23

RATE NORM 24
VERN 25

JET OPT P 26
Y 27

CNTL ACCEL 28

FLT PLN/32/0/BAS

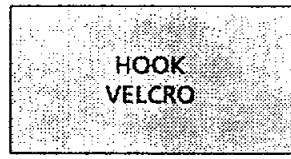


FLT PLN/32/0/BAS

TOP

TOP
BACK COVER 'DAP BOOK'

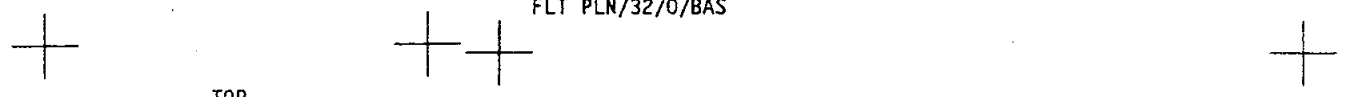
B12



FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

TOP



STS-32
ATTITUDE TIMELINE

ATTITUDE
TIMELINE

Attitude Timeline

| MET | MNVR OPTION | DAP | E/S | REMARKS | EVENT |
|--|---|--|-----------------------|--------------------------------------|-------------------------------------|
| 1 0/01:12:00 22:37 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 5.00 NORM DB RT .20 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH PLBD OPENING |
| 2 0/03:25:00 34:08 | MNVR R+ 16.00 P+336.00 Y+345.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 119 P 256 | STAR PR A1 -Y ST: 16 -Z ST: 23 | IMU ALIGN |
| 3 0/03:45:00 59:25 | TRK TGT=2 BV=3(90.00, .00) OM=180.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | -ZLV NOSE FWD DTO 0910 STEP 5 |
| 4 0/06:40:00 49:41 | MNVR R+272.00 P+269.00 Y+ 12.00 | B1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 116 P 314 | TIG: 0/06:57:05 | NPC BURN |
| 5 0/07:05:00 19:37 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 6 0/07:55:00 08:03:51 | MNVR R+ 16.00 P+336.00 Y+345.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 119 P 256 | STAR PR A1 -Z COAS: 23 | IMU ALIGN COAS CAL |
| 7 0/08:20:00 32:38 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 8 0/18:35:00 44:08 | MNVR R+ 16.00 P+336.00 Y+345.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 118 P 256 | STAR PR A1 | IMU ALIGN |
| 9 0/18:55:00 19:07:07 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 10 0/20:20:00 29:56 | MNVR R+300.00 P+191.00 Y+343.00 | B1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 43 P 292 | TIG: 0/20:38:16 | NC2 BURN |
| 11 0/20:45:00 45:53 | TRK TGT=2 BV=3(90.00, .00) OM=180.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | -ZLV NOSE FWD DTO 0910 STEP 5 |
| 12 1/00:11:16 26:13 DPLY -20:00 | MNVR R+120.00 P+193.00 Y+340.00 | A8 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 42 P 109 | DEPLOY: 1/00:31:16 | SYNCOM DEPLOY ATTITUDE |

ATTITUDE
TIMELINE

Attitude Timeline

| MET | MNVR OPTION | DAP | E/S | REMARKS | EVENT |
|---|---|--|------------------------|-------------------------------|--------------------------------|
| 1 1/00:34:16 40:16 DPLY +03:00 | MNVR R+ 13.00 P+ 77.00 Y+ 61.00 | A8 DSC .500 AUTO DB AT 3.00 NORM DB RT .20 | SUN T 124 P 310 | TIG: 1/00:46:16 | SEP BURN |
| 2 1/00:49:16 50:14 DPLY +18:00 | TRK TGT=2 BV=3(90.00, .00) OM=180.00 | A8 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | -ZLV NOSE FWD |
| 3 1/01:00:16 15:13 DPLY +29:00 | TRK TGT=1 BV=5(310.00, .00) OM= .00 | A8 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | | | WINDOW PROTECT |
| 4 1/01:16:16 DPLY +45:00 | CANCEL | A8 DSC .200 MAN DB AT 1.00 VERN DB RT .02 | SUN T 50 P 57 | INRTL R+150 P+236 Y+304 | INRTL HOLD |
| 5 1/01:25:00 39:06 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 6 1/03:45:00 53:35 | MNVR R+224.00 P+325.00 Y+312.00 | B1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 85 P 41 | TIG: 1/04:04:47 | UNSEP BURN |
| 7 1/04:30:00 44:25 | MNVR R+131.00 P+152.00 Y+ 43.00 | B1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 90 P 139 | TIG: 1/04:50:22 | HA BURN |
| 8 1/05:15:00 28:12 | MNVR R+ 16.00 P+336.00 Y+345.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 118 P 257 | STAR PR A1 | IMU ALIGN |
| 9 1/05:35:00 47:29 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 10 1/18:50:00 19:01:48 | MNVR R+172.00 P+151.00 Y+ 16.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 63 P 99 | STAR PR A2 | IMU ALIGN |
| 11 1/19:10:00 14:44 | MNVR R+194.00 P+122.00 Y+ 70.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 119 P 99 | +X COAS: 11 | COAS CAL |
| 12 1/19:30:00 43:01 | TRK TGT=2 BV=5(340.00, .00) OM=180.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 20 P 180 | LVLH R+180 P+250 Y+ 0 | BIAS +XLV, +ZVV DTO 0902 |

Attitude Timeline

| MET | MNVR OPTION | DAP | E/S | REMARKS | EVENT | |
|--------------------------------|---|---------------------|--------------------------------------|-----------------------|---------------------------------------|---|
| 1 1/19:57:00 NOON +04:00 | ROT BV=5(.00,270.00) | A11 AUTO NORM | DSC .500 DB AT .50 DB RT .20 | | ROT R+ 28 START P+ 62 ATT Y+ 58 | DTO 0902 ROTATION |
| 2 1/20:02:53 NOON~+10:00 | LVLH | B8 LVLH NORM | DSC .500 DB AT10.00 DB RT .50 | EARTH T 180 P 8 | LVLH R+180 P+ 90 Y+360 | LVLH HOLD |
| 3 1/20:15:00 22:30 | TRK TGT=2 BV=3(90.00, .00) OM=180.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | -ZLV NOSE FWD DTO 0910 STEP 5 |
| 4 1/21:05:00 | TRK TGT=2 BV=3(90.00, .00) OM=180.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | -ZLV NOSE FWD DTO 0910 |
| 5 1/21:20:00 | LVLH ROT FREE ROTATION ABOUT +Y AXIS RATE=1.000 | A7 LVLH NORM | DSC 1.000 DB AT 3.00 DB RT .20 | | LVLH R+180 P+ 0 Y+ 0 | DTO 0910 STEP 1 |
| 6 1/21:26:00 | LVLH | B8 AUTO NORM | DSC .500 DB AT10.00 DB RT .50 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | LVLH HOLD |
| 7 1/21:35:00 | LVLH ROT FREE ROTATION ABOUT +Z AXIS RATE=1.000 | A7 LVLH NORM | DSC 1.000 DB AT 3.00 DB RT .20 | | LVLH R+180 P+ 0 Y+ 0 | DTO 0910 STEP 2 |
| 8 1/21:41:00 | LVLH | B8 AUTO NORM | DSC .500 DB AT10.00 DB RT .50 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | LVLH HOLD |
| 9 1/21:50:00 | LVLH ROT FREE ROTATION ABOUT +X AXIS RATE=1.000 | A7 LVLH NORM | DSC 1.000 DB AT 3.00 DB RT .20 | | LVLH R+180 P+ 0 Y+ 0 | DTO 0910 STEP 3 |
| 10 1/21:56:00 | LVLH | B8 AUTO NORM | DSC .500 DB AT10.00 DB RT .50 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 0 | LVLH HOLD |
| 11 1/22:05:00 12:30 | TRK TGT=2 BV=1(.00, .00) OM=180.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 0 P 180 | LVLH R+180 P+270 Y+ 0 | +XLV, +ZVV DTO 0910 STEP 7 |
| 12 1/23:20:00 25:50 | TRK TGT=2 BV=5(70.00, .00) OM=180.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 70 P 0 | LVLH R+180 P+340 Y+ 0 | BIAS -ZLV NOSE FWD DTO 0910 STEP 6 |

ALL ATTITUDES IN MEAN OF 1950

Attitude Timeline

| MET | MNVR OPTION | DAP | E/S | REMARKS | EVENT |
|--------------------------------|---|--|------------------------|---------------------------------------|--------------------------------|
| 1 2/00:35:00 42:39 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 2 2/02:25:00 34:46 | MNVR R+302.00 P+170.00 Y+ 27.00 | B1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 76 P 315 | TIG: 2/02:46:24 | NSR BURN |
| 3 2/03:50:00 51:56 | MNVR R+312.00 P+153.00 Y+ 46.00 | B1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 94 P 317 | TIG: 2/04:07:34 | NC3 BURN |
| 4 2/04:35:00 48:07 | TRK TGT=2 BV=5(340.00, .00) OM=180.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 20 P 130 | LVLH R+180 P+250 Y+ 0 | BIAS +XLV, +ZVV DTC 0902 |
| 5 2/05:02:00 NOON +04:00 | ROT BV=5(.00,270.00) | All DSC .500 AUTO DB AT .50 NORM DB RT .20 | | ROT R+ 26 START P+ 66 ATT Y+ 59 | DTC 0902 ROTATION |
| 6 2/05:07:53 NOON++10:00 | LVLH | B8 DSC .500 LVLH DB AT10.00 NORM DB RT .50 | EARTH T 180 P 1 | LVLH R+180 P+ 90 Y+360 | LVLH HOLD |
| 7 2/05:25:00 28:25 | MNVR R+ 16.00 P+336.00 Y+345.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 117 P 257 | STAR PR A1 | IMU ALIGN |
| 8 2/05:45:00 57:26 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 9 2/17:35:00 44:53 | MNVR R+ 16.00 P+336.00 Y+345.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 117 P 258 | STAR PR A1 | IMU ALIGN |
| 10 2/17:55:00 18:07:51 | TRK TGT=2 BV=3(90.00, .00) OM=270.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+ 90 | -ZLV NOSE SOUTH |
| 11 2/19:04:19 13:32 | MNVR R+310.00 P+158.00 Y+ 44.00 | B6 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 92 P 315 | TIG: 2/19:18:39 | NH BURN |
| 12 2/19:49:19 20:04:17 | MNVR R+ 50.00 P+339.00 Y+316.00 | B6 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 88 P 225 | TIG: 2/20:04:19 | NC4 BURN |

Attitude Timeline

| MET | MNVR OPTION | DAP | E/S | REMARKS | EVENT |
|---------------------------|---|---|------------------------|---------------------------------------|------------------------------|
| 1 2/20:05:19 11:18 | TRK TGT=1 BV=3(90.00, .00) OM= .00 | B6 DSC .500 AUTO DB AT 2.00 NORM DB RT .20 | EARTH T 0 P 0 | LVLH R+ 0 P+270 Y+ 0 | -Z TARGET TRK |
| 2 3/00:17:19 | CANCEL | A9 DSC .200 MAN DB AT 2.00 NORM DB RT .20 | SUN T 82 P 46 | INRTL R+225 P+331 Y+310 | INRTL HOLD |
| 3 3/01:09:19 14:43 | TRK TGT=2 BV=3(90.00, .00) OM= .00 | A10 DSC .200 AUTO DB AT 2.00 NORM DB RT .20 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+ 0 | -RBRAR APPROACH |
| 4 3/01:11:19 13:49 | TRK TGT=2 BV=3(90.00, .00) OM=330.00 | B7 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+ 30 | ALIGN GRAPPLE FIXTURE |
| 5 3/01:42:00 49:30 | TRK TGT=2 BV=2(180.00, .00) OM=330.00 | A12 DSC .200 AUTO DB AT 1.00 VERN DB RT .10 | EARTH T 180 P 0 | LVLH R+ 30 P+ 90 Y+ 0 | -90 DEGREE PITCH |
| 6 3/01:49:30 52:00 | TRK TGT=2 BV=2(180.00, .00) OM= .00 | A12 DSC .200 AUTO DB AT 1.00 VERN DB RT .10 | EARTH T 180 P 0 | LVLH R+ 0 P+ 90 Y+ 0 | -30 DEGREE ROLL |
| 7 3/01:52:00 59:30 | TRK TGT=2 BV=5(.00, 90.00) OM= 90.00 | A12 DSC .200 AUTO DB AT 1.00 VERN DB RT .10 | EARTH T 90 P 90 | LVLH R+ 0 P+ 90 Y+ 90 | +YLV, +ZVV PHOTO SURVEY |
| 8 3/05:10:00 10:55 | TRK TGT=2 BV=5(180.00, 79.00) OM= .00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 101 P 90 | LVLH R+ 0 P+ 90 Y+ 79 | IMU ALIGN -Y ST: 42 60 |
| 9 3/05:45:00 56:26 | TRK TGT=4 BV=2(180.00, .00) OM= 11.10 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | SUN T 179 P 25 | INRTL R+269 P+331 Y+ 48 | -XSI |
| 10 3/06:00:00 | ROT BV=1(.00, .00) | B9 DSC .066 AUTO DB AT 1.00 VERN DB RT .02 | | ROT R+269 START P+331 ATT Y+ 48 | -XSI ROTOR |
| 11 3/07:45:00 53:22 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 12 3/17:54:00 54:05 | TRK TGT=2 BV=3(90.00, .00) OM= 89.00 | A1 DSC .200 AUTO DB AT 1.00 VERN DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+271 | IMU ALIGN -Y ST: 89 87 |

ALL ATTITUDES IN MEAN OF 1950

Attitude Timeline

| MET | MNVR OPTION | | DAP | E/S | REMARKS | EVENT |
|-----------------------------|---|--------------------|-------------------------------------|------------------------|-----------------------------|------------------------------|
| 1 3/18:30:00 30:05 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 2 5/03:24:00 24:10 | TRK TGT=2 BV=3(90.00, .00) OM= 92.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+272 | IMU ALIGN -Y ST: 89 87 |
| 3 5/04:00:00 00:10 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 4 5/15:37:00 37:30 | TRK TGT=2 BV=3(90.00, .00) OM= 84.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+276 | IMU ALIGN -Y ST: 21 94 |
| 5 5/16:15:00 15:30 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 6 6/02:17:00 17:25 | TRK TGT=2 BV=3(90.00, .00) OM= 85.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+275 | IMU ALIGN -Y ST: 21 94 |
| 7 6/02:55:00 55:25 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 8 6/13:45:00 55:50 | TRK TGT=2 BV=5(270.00,310.00) OM=270.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 230 | LVLH R+310 P+ 0 Y+270 | WATER DUMP ATTITUDE |
| 9 6/15:59:00 16:09:50 | TRK TGT=2 BV=3(90.00, .00) OM= 86.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+274 | IMU ALIGN -Y ST: 21 94 |
| 10 6/16:35:00 35:20 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 11 7/02:39:00 39:15 | TRK TGT=2 BV=3(90.00, .00) OM= 87.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+273 | IMU ALIGN -Y ST: 21 94 |
| 12 7/03:15:00 15:15 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |

ALL ATTITUDES IN MEAN OF 1950

Attitude Timeline

| MET | MNVR OPTION | | DAP | E/S | REMARKS | EVENT |
|---|---|--------------------|---------------------------------------|-----------------------|---------------------------------------|------------------------------|
| 1 8/15:12:00 12:05 | TRK TGT=2 BV=3(90.00, .00) OM= 91.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+271 | IMU ALIGN -Y ST: 21 94 |
| 2 8/15:45:00 45:05 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 3 9/01:51:00 51:10 | TRK TGT=2 BV=3(90.00, .00) OM= 92.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+272 | IMU ALIGN -Y ST: 21 94 |
| 4 9/02:25:00 25:10 | TRK TGT=2 BV=3(90.00, .00) OM= 90.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+180 P+ 0 Y+270 | -ZLV NOSE NORTH |
| 5 9/14:01:00 01:55 | TRK TGT=2 BV=3(90.00, .00) OM= 79.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | EARTH T 90 P 0 | LVLH R+ 0 P+180 Y+281 | IMU ALIGN -Y ST: 39 29 |
| 6 9/14:35:00 47:19 | TRK TGT=4 BV=5(184.00, .00) OM=239.20 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | SUN T 176 P 175 | INRTL R+ 83 P+323 Y+ 50 | TAIL SUN COLDSOAK |
| 7 9/14:50:00 | ROT BV=5(4.00, .00) | B9 AUTO VERN | DSC .066 DB AT 1.00 DB RT .02 | | ROT R+ 83 START P+323 ATT Y+ 50 | TAIL SUN ROTOR |
| 8 9/16:15:00 | CANCEL | B9 AUTO VERN | DSC .066 DB AT 1.00 DB RT .02 | SUN T 176 P 174 | INRTL R+ 62 P+321 Y+ 50 | INRTL HOLD |
| 9 9/16:50:00 17:00:01 | MNVR R+172.00 P+151.00 Y+ 16.00 | A1 AUTO VERN | DSC .200 DB AT 1.00 DB RT .02 | SUN T 70 P 94 | -Y ST: 23 -Z ST: 16 | D/O IMU ALIGN |
| 10 9/17:10:00 11:45 | MNVR R+154.00 P+189.00 Y+344.00 | B1 AUTO NORM | DSC .500 DB AT 3.00 DB RT .20 | SUN T 51 P 83 | -Y ST: 31 -Z ST: 50 | IMU VERIF |
| 11 9/19:45:40 49:02 TIG -15:00 | MNVR R+ 26.00 P+127.00 Y+299.00 | * MAN * | DSC 0.500 DB AT 3.50 DB RT 0.30 | SUN T 12 P 6 | TIG: 9/20:00:40 | DEORBIT ATT |

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