

Flight Data File Crew Activity Plan STS-4

Flight Operations Directorate
Operations Division

Final
May 14, 1982



National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

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FLIGHT DATA FILE

CONTROL

- Ascent Checklist**
- Post Insertion Book
- Crew Activity Plan
- Deorbit Preparation Book
- Contingency Deorbit Preparation Book**
- Entry Checklist

SUPPORT

- Orbit Operations Checklist**
- Photo/TV Checklist
- Cue Cards**
- Flight Maps and Charts**

OFF-NOMINAL

- Ascent Pocket Checklist**
- Orbit Pocket Checklist**
- Entry Pocket Checklist**
- System Malfunction Procedures**
- EVA Checklist**
- EVA Operations Book**
- Medical Checklist, SOMS-A**
- In-Flight Maintenance Checklist**

REFERENCE

- Reference Data**
- Systems Data Book
- Data Processing System Dictionary

PAYLOADS RELATED*

- PDRS Operations Checklist**
- Payload Operations Checklist
- Payload Systems Data and Malfunction Procedures

*If required
**May have flight supplement

FLIGHT DATA FILE

CONTROL

Ascent Checklist**
Post Insertion Book
Crew Activity Plan
Deorbit Preparation Book
Contingency Deorbit Preparation Book**
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REFERENCE

Reference Data**
Systems Data Book
Data Processing System Dictionary

PAYLOADS RELATED*

PDRS Operations Checklist**
Payload Operations Checklist
Payload Systems Data and Malfunction Procedures

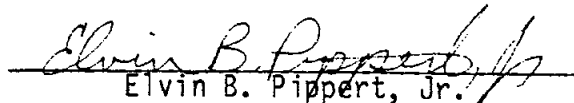
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FLIGHT OPERATIONS DIRECTORATE

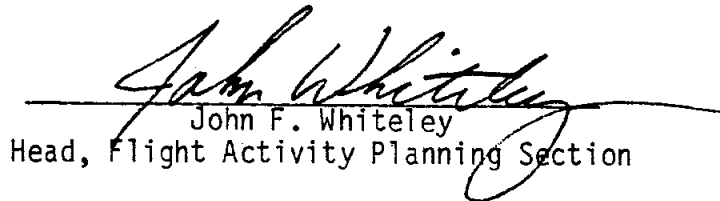
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FINAL
MAY 14, 1982

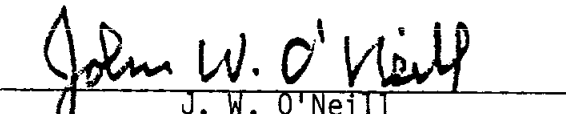
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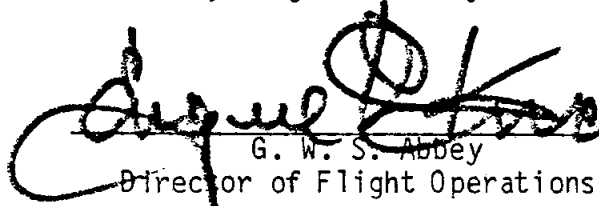

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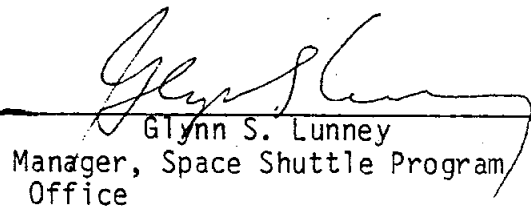
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CHANGE CONTROL RECORD

ORBITAL FLIGHT TEST: STS-4 Crew Activity Plan

CONTROL NO.	FDF EDITION INCORPORATED*		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
CAP(4)-1	BASIC	03/13/82	WITHDRAWN
CAP(4)-2	FINAL	05/14/82	
CAP(4)-3	FINAL	05/14/82	
CAP(4)-4A	FINAL	05/14/82	
CAP(4)-5	FINAL	05/14/82	
CAP(4)-6	FINAL	05/14/82	
CAP(4)-7	FINAL	05/14/82	
CAP(4)-8	FINAL	05/14/82	
CAP(4)-9	FINAL	05/14/82	
CAP(4)-10	FINAL	05/14/82	
CAP(4)-11	FINAL	05/14/82	
CAP(4)-12	FINAL	05/14/82	
CAP(4)-13	FINAL	05/14/82	
CAP(4)-17	FINAL	05/14/82	

*482 changes incorporated into current edition only are identified by change bars.

STS-4 CREW ACTIVITY PLAN

LIST OF EFFECTIVE PAGES

FINAL 05/14/82

i..... STS-4/FIN
 ii..... STS-4/FIN
 iii..... STS-4/FIN
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5-61.....	STS-4/FIN	7-3.....	STS-4/FIN
5-62.....	STS-4/FIN	7-4.....	STS-4/FIN
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5-66.....	STS-4/FIN	7-8.....	STS-4/FIN
5-67.....	STS-4/FIN	7-9.....	STS-4/FIN
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INTRODUCTION

The STS-4 Crew Activity Plan contains the on-orbit timeline, which is a flight data file article. It does not contain the detailed crew activities that will be covered in the STS-4 Ascent, Post Insertion, Deorbit Prep, or Entry checklists.

This on-orbit timeline satisfies the objectives specified in the STS-4 Flight Requirements Document (Final).

The flight profile (trajectory data) used for this Crew Activity Plan is from Ref. 2 which is for a June 27, 1982 launch date.

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TIMELINE FORMAT SYMBOL NOMENCLATURE

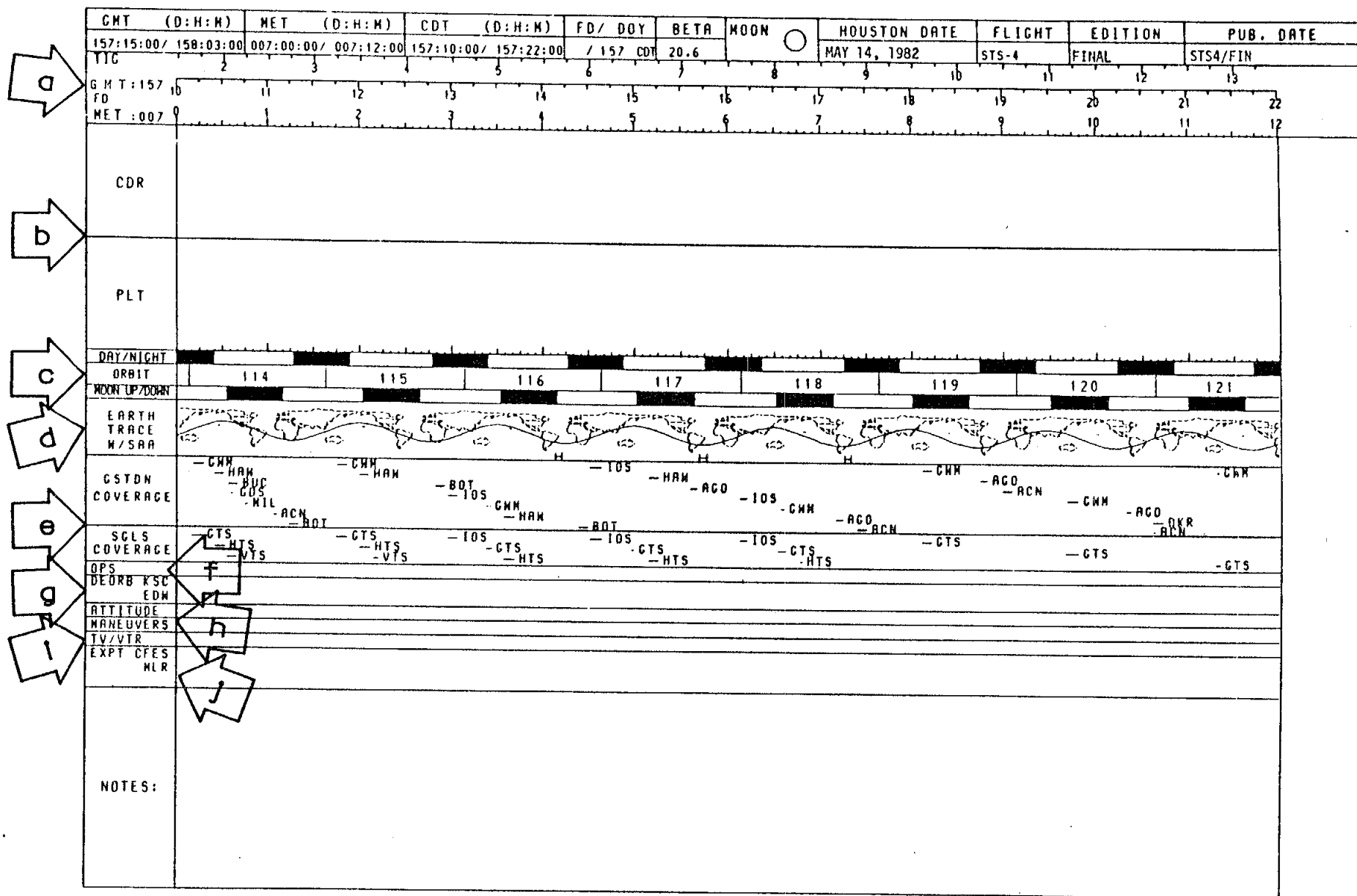


Figure 1-1

A. FORMAT SYMBOL NOMENCLATURE

1. Summary Level Timeline (12-Hr Timespan)

The following letters (a-j) refer to those highlighted in Figure 1-1.

- a. **TIMESCALES** - Three time references are presented in this section of the summary timeline format. The time references used are TIG Minus Time (TIG), Greenwich Mean Time (GMT), and Mission Elapsed Time (MET). MET is referenced to liftoff beginning at 00/00:00:00 (days, hours, minutes and seconds). TIG is referenced to the deorbit ignition time and counts down to 0/00:00:00 at ignition on the CRT timer. TIG is only used on the deorbit preparations on entry day.
- b. **CREWMEN (CDR & PLT)** - This is the crewmen column of the format where titles of scheduled activities are shown for the commander (CDR) and pilot (PLT) at the appropriate times in the flight.
- c. **DAY/NIGHT, ORBIT, MOON UP/DOWN**
 - 1) **Day/Night** - The orbital day/night intervals are delineated with black bars indicating when the Orbiter is in darkness.
 - 2) **Orbit** - Indicates which orbit the spacecraft is in by numerical sequence. The beginning of an orbit occurs when the Orbiter crosses the Earth's equator going from the southern to the northern hemisphere (ascending node). The succession of orbits is numbered in this column starting with Orbit 1 for launch.
 - 3) **Moon Up/Down** - The moon up/down intervals are delineated with black bars indicating when the moon is down.
- d. **EARTH TRACE W/SAA** - This is a display of the groundtrack of the Orbiter and when it passes over the South Atlantic Anomaly (SAA) (indicated by a '|—|').
- e. **GSTDN and SGLS COVERAGE** - The GSTDN and SGLS communication coverage periods are indicated in this area with a horizontal line indicating when communication is available; the GSTDN and SGLS site is identified to the right of the line.
- f. **OPS** - The GPC software configuration in use during the flight is indicated in this area.
- g. **DEORBIT KSC/EDW** - Times are identified in this area when deorbit burn opportunities exist for Edwards AFB (EDW) and Kennedy Space Center (KSC).
- h. **ATTITUDE and MANEUVERS**
 - 1) **Attitude** - The current attitude of the vehicle is identified in this area, i.e., PTC, IMU, -ZLV X-POP, -XSI.

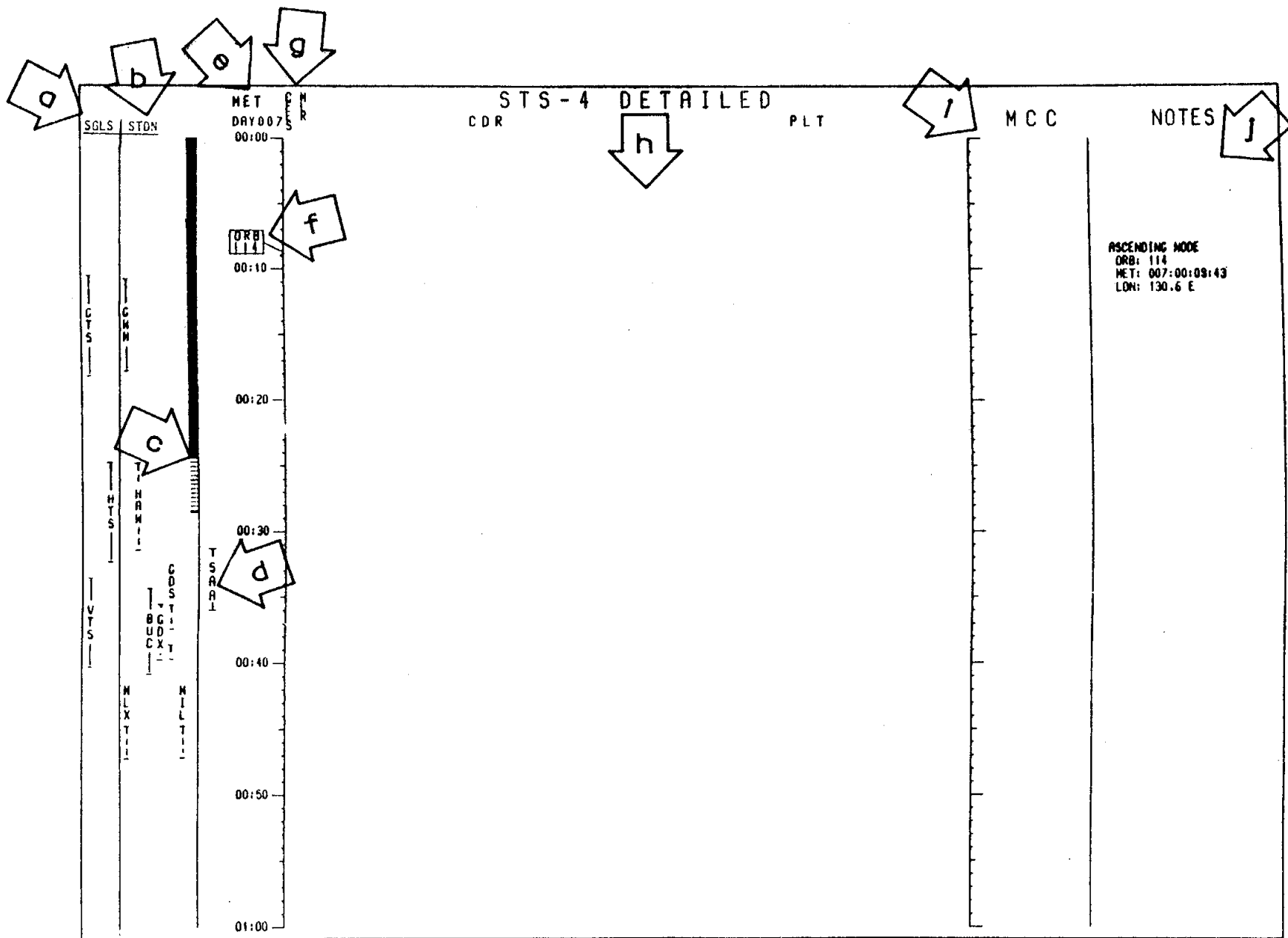


Figure 1-2

2) Maneuvers - An '†' is placed at the time an attitude maneuver occurs if the duration in attitude is to be greater than 15 minutes.

- i. TV/VTR - Live TV or recorded TV (VTR) is indicated in this area with a '|—|'.
- j. CFES/MLR - Payload operating periods are indicated with a '|—xxx—|'.

2. Detailed Level Timeline (1-Hr Timespan)

The following letters (a-j) refer to those highlighted in Figure 1-2.

- a. SGLS COVERAGE - In this column the SGLS sites and their acquisition periods are identified by a solid line. The sites are HTS, VTS, GTS, IOS, and NHS.
- b. GSTDN COVERAGE - In this column the GSTDN sites and their acquisition periods are identified. Each site acquisition period is annotated by a solid line, a dashed line or a dotted line. The different annotations indicate the following:
 -  A site that has S-Band, UHF voice and TV capabilities (GDS, HAW, MIL, MLX, GDX)
 -  A site with S-Band and UHF voice capabilities (BDA, GWM, ACN, BUC, DKR, MAD, MAX)
 -  A site with only S-Band (no UHF or TV) capabilities (AGO, ORR)
 -  A site with only UHF (no S-band or TV) capabilities (BOT, YAR, IOS)
- c. DAY/NIGHT CYCLE - In this column a solid bar indicates the period when the Orbiter and Earth are in darkness. A slashed line indicates when the Orbiter is in daylight but the Earth beneath the Orbiter is still in darkness (terminator).
- d. SOUTH ATLANTIC ANOMALY (SAA) - This bar defines those periods when the Orbiter passes through the SAA.
- e. MET TIMESCALE - This format is a one-hour format with minute tick marks on the vertical timescale referenced to Mission Elapsed Time (MET) with liftoff occurring at 0/00:00:00.
- f. ORBIT - Indicates which orbit the spacecraft is in by numerical sequence. Orbit 1 begins at liftoff with subsequent orbits starting when the Earth's equator is crossed (ascending node).

- g. ATTITUDE and PAYLOAD USER COLUMN (ATT/CFES/MLR) - Indicates Orbiter attitude and when CFES and MLR are in operation.
- h. CREWMAN COLUMNS - The activities for the CDR and PLT are scheduled in this area.
- i. MCC COLUMN - Any uplinks, commands or updates required are scheduled at the appropriate time in this column. A vertical line is also used to indicate TV coverage.
- j. NOTES - This area will be used for location of pads, times of star availability, time and longitude of the ascending node, TV and photography scenes, and any other supplemental information required.
- k. In the timescale a DAP A and DAP B CONFIG reference will be included. A number is associated with both DAPs A and B; each number indicates a particular DAP configuration for either DAP A or DAP B. The DAP reference without parentheses indicates the 'active' DAP for that time period on the page. Table 1-1 identifies the various configurations for DAP A and DAP B that are used in the STS-4 timeline.

DAP A CONFIGURATIONS

	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16
<u>TRANSLATION</u>																
PULSE ft/sec	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.14	0.1	0.1	0.1	0.1	0.1
<u>ROTATION</u>																
DSC RT NORM °/sec	0.2	0.2	2.0	0.2	1.0	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
VERN °/sec	0.2	0.4	0.2	0.2	0.2	0.2	0.2	0.5	0.007	0.2	0.2	0.2	0.2	0.2	0.2	0.2
PULSE NORM °/sec	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.28	0.6	1.0	0.1	0.3	0.1
VERN °/sec	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
COMP NORM °/sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VERN °/sec	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
<u>DEADBAND</u>																
ATT NORM°	5.0	5.0	1.0	5.0	5.0	3.0	3.0	5.0	5.0	1.0	5.0	5.0	5.0	5.0	5.0	0.1
VERN°	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	0.5	1.0	3.0	1.0	5.0	0.07	1.0	1.0
RATE NORM °/sec	0.2	0.2	0.02	0.2	0.2	0.2	0.2	0.2	0.02	0.2	0.2	0.2	0.2	0.2	0.2	0.2
VERN °/sec	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01	0.02	0.02
<u>JET OPT</u>																
P	1	1	3	3	3	3	3	1	1	1	2	3	1	1	3	1
Y	1	1	3	3	1	3	3	1	1	3	1	3	1	1	3	1
<u>CNTL ACCEL</u>																
	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

DAP B CONFIGURATIONS

	B1	B2	B3	B4	B5	B6
<u>TRANSLATION</u>						
PULSE ft/sec	0.02	0.02	0.02	0.02	0.02	0.1
<u>ROTATION</u>						
DSC RT NORM °/sec	0.5	0.5	0.5	0.2	0.5	0.5
VERN °/sec	0.2	0.2	0.2	0.2	0.2	0.3
PULSE NORM °/sec	0.04	0.04	0.04	0.04	0.28	0.04
VERN °/sec	0.002	0.002	0.002	0.002	0.002	0.001
COMP NORM °/sec	0.0	0.0	0.0	0.0	0.0	0.0
VERN °/sec	0.0	0.0	0.003	0.0	0.0	0.0
<u>DEADBAND</u>						
ATT NORM°	3.0	3.0	3.0	3.0	3.0	3.0
VERN°	1.0	0.1	1.0	1.0	1.0	3.0
RATE NORM °/sec	0.2	0.2	0.2	0.2	0.2	0.2
VERN °/sec	0.02	0.02	0.02	0.02	0.02	0.02
<u>JET OPT</u>						
P	1	1	1	3	3	1
Y	1	1	1	3	1	1
<u>CNTL ACCEL</u>						
	0	0	0	0	0	0

FD 8

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NP
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DT
M
UBURN
PREP

DEORBIT IGNITION (6/22:41:23)

ENTRY INTERFACE

LANDING (EDWARDS)

18 109 20 110 122 7/0 112 113 2 114 4 115 6 116 8 117 118 10 119 120 12 121 14 122 16 123 18 124

125 126 127 128 129 130 131 132 133 134 135 136 137 138 139 140

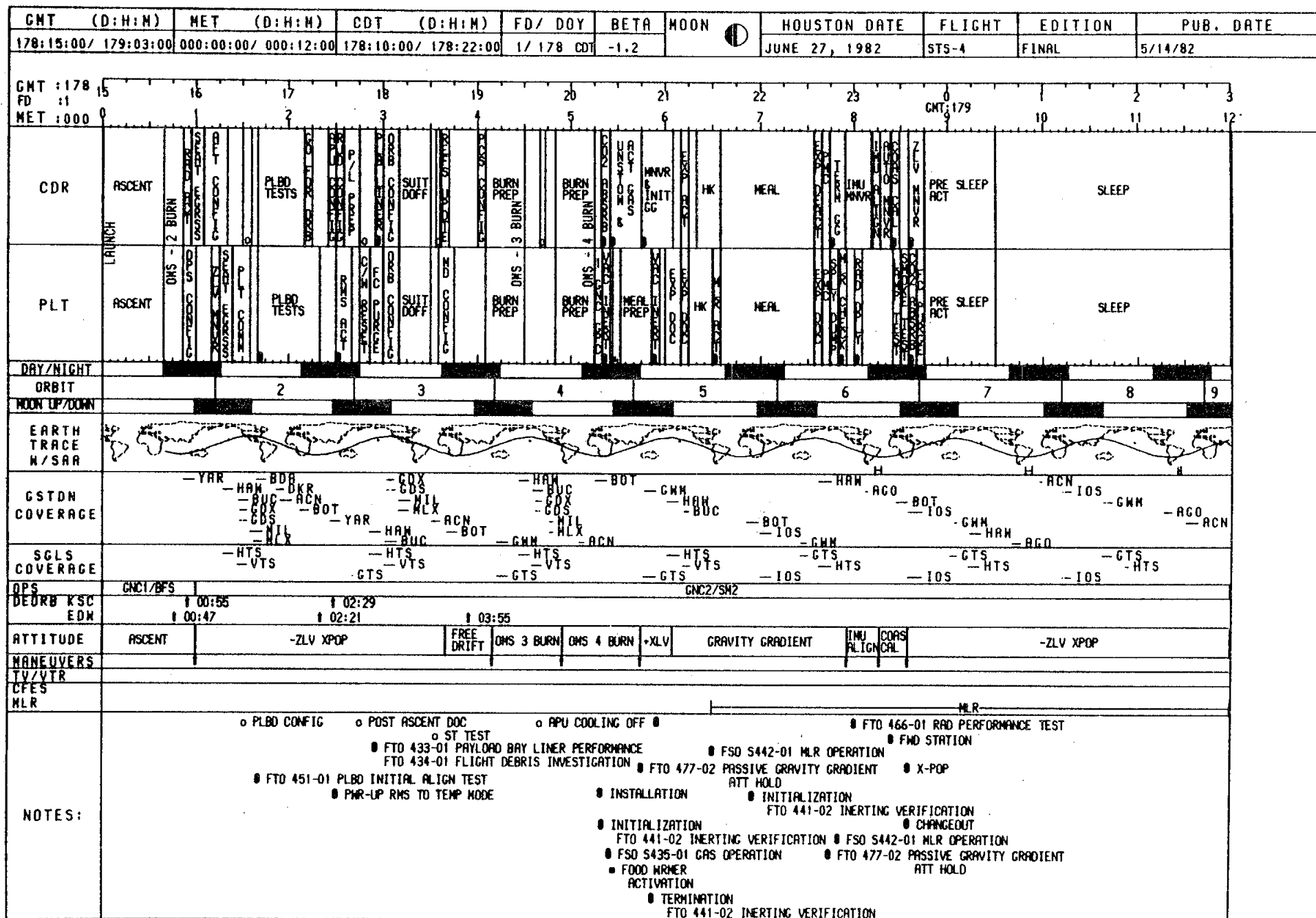
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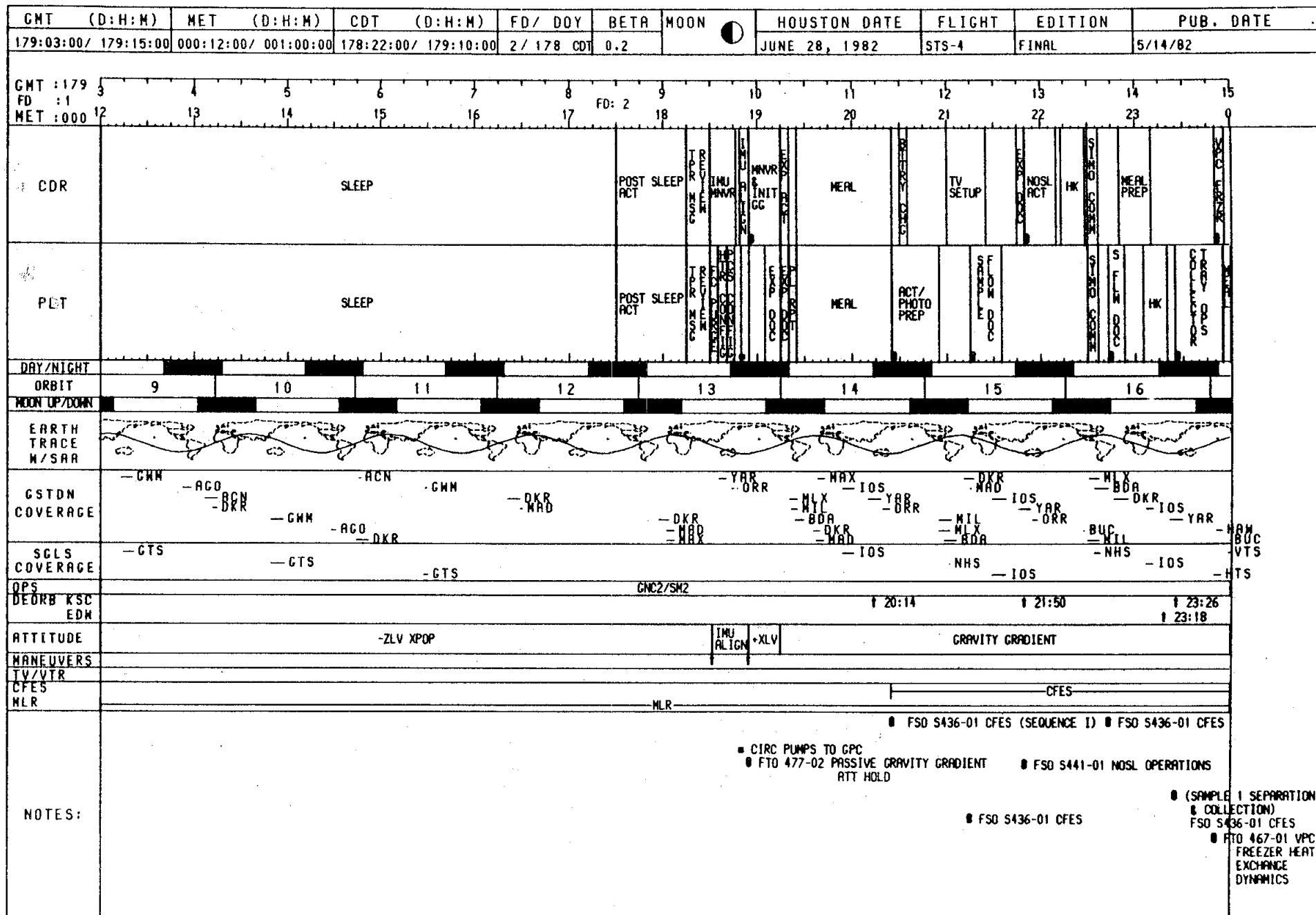
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SUMMARY TIMELINE

SUMMARY
TIMELINE

SUMMARY TIMELINE





GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
179:15:00/ 180:03:00	001:00:00/ 001:12:00	179:10:00/ 179:22:00	2 / 179 CDT	0.9		JUNE 28, 1982	STS-4	FINAL	5/14/82

GMT : 179

FD : 2

MET : 001

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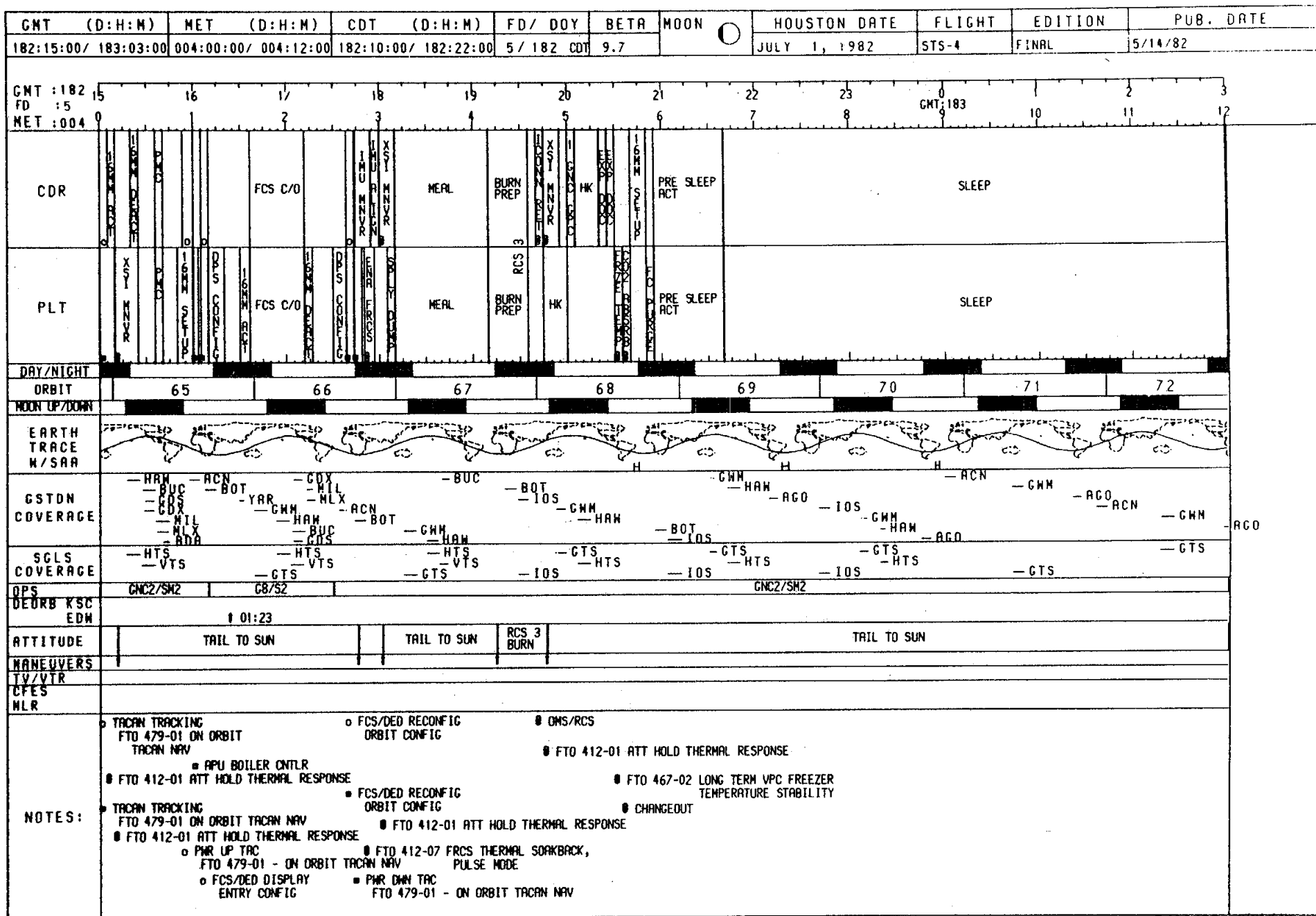
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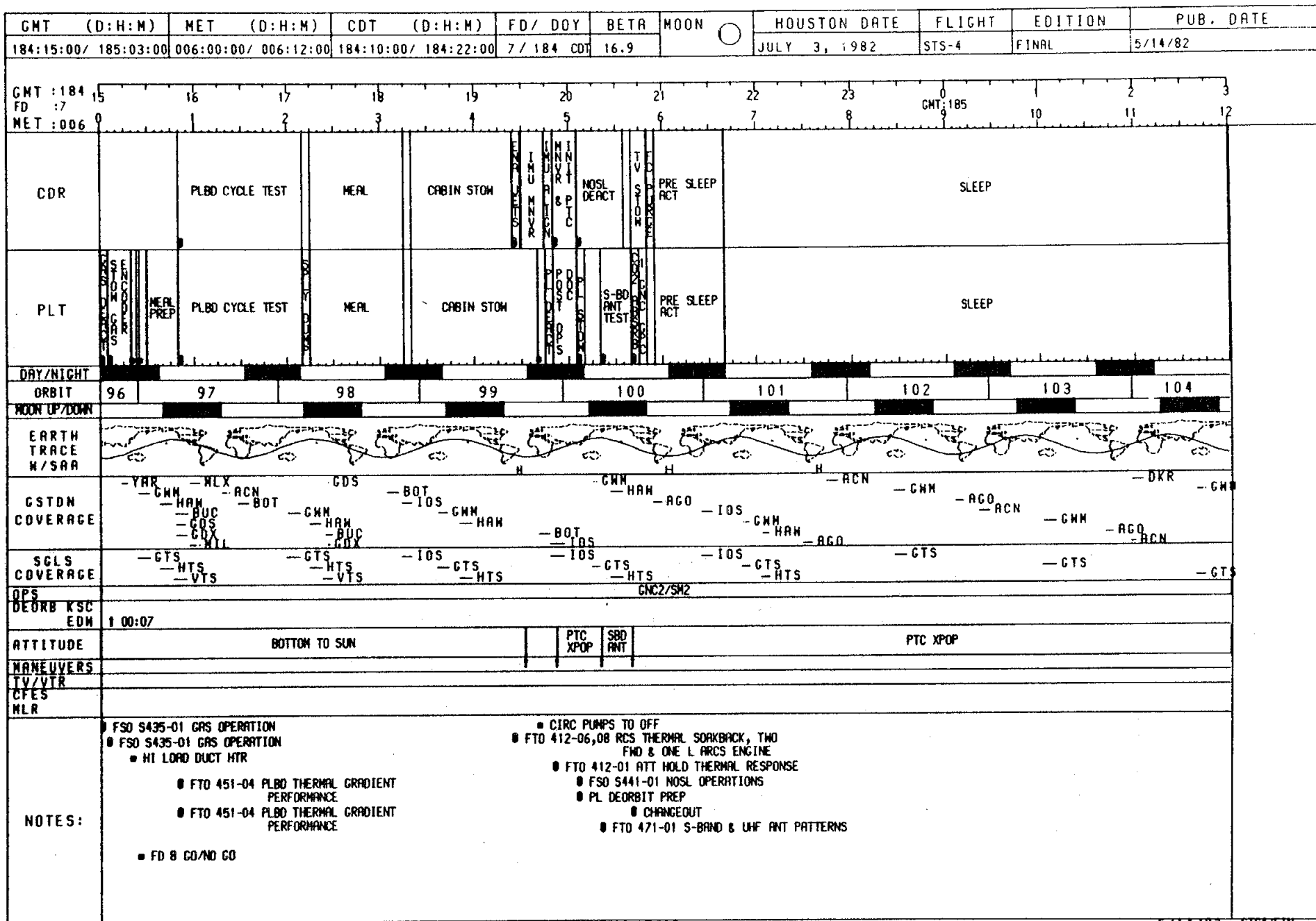
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CDR	MEAL	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV ACT	TV 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GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
181:03:00/ 181:15:00	002:12:00/ 003:00:00	180:22:00/ 181:10:00	4 / 180 CDT	4.9	☉	JUNE 30, 1982	STS-4	FINAL	5/14/82
GMT: 181 FD: 13 MET: 002	3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 0	13 14 15 16 17 18 19 20 21 22 23 0	FD: 4						
CDR	SLEEP	POST SLEEP ACT	MEAL	EXP DOC	EXERCISE	MEAL PREP	HK	MEAL	
PLT	SLEEP	POST SLEEP ACT	MEAL	ACT/PHOTO PREP	SAMPLE FLOW DOC	HK	MEAL		
DAY/NIGHT									
ORBIT	41	42	43	44	45	46	47	48	
MOON UP/DOWN									
EARTH TRACE W/SAR									
GSTDN COVERAGE	-GMM -AGO -DKR -ACN	-GMM -DKR -MAD	-DKR -MAD -MAX -YAR -ORR	-BDA -DKR -MAD -MAX -MLX -YAR -ORR	-MLX -YAR -ORR -BDA -DKR -MAD -MAX -MLX -YAR -ORR	-ORR -MLX -YAR -ORR -BDA -DKR -MAD -MAX -MLX -YAR -ORR	-ORR -MLX -YAR -ORR -BDA -DKR -MAD -MAX -MLX -YAR -ORR	-ORR -MLX -YAR -ORR -BDA -DKR -MAD -MAX -MLX -YAR -ORR	-ORR -MLX -YAR -ORR -BDA -DKR -MAD -MAX -MLX -YAR -ORR
SGLS COVERAGE	-CTS	-CTS							
OPS									
DEORB KSC EDM									
ATTITUDE									
MANEUVERS									
TV/VTR									
CFES									
MLR									
NOTES:									



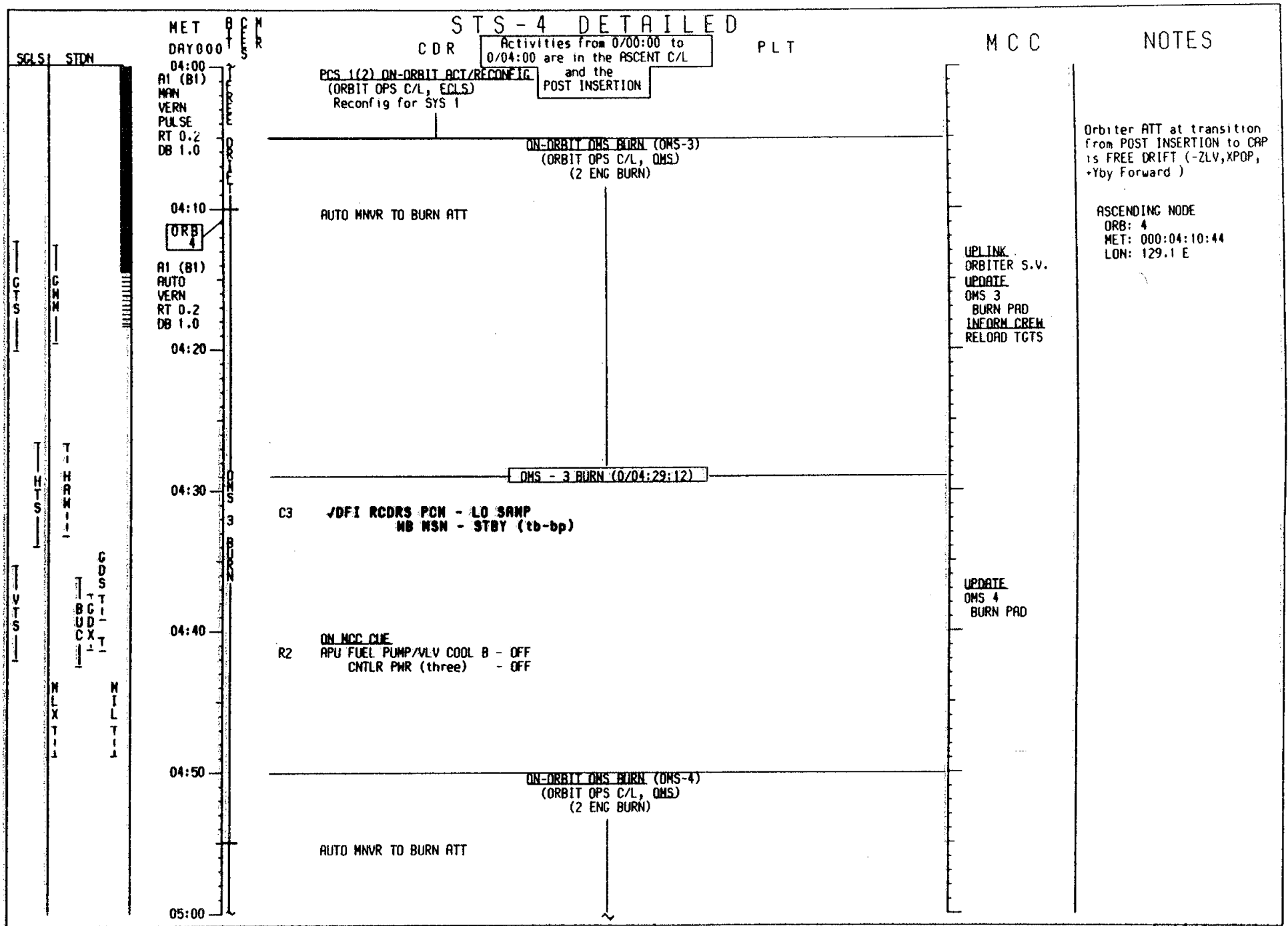
GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
184:03:00/ 184:15:00	005:12:00/ 006:00:00	183:22:00/ 184:10:00	7 / 183 CDT	15.0	○	JULY 3, 1982	STS-4	FINAL	5/14/82
GMT : 184 FD : 6 MET : 005									
CDR	SLEEP	POST SLEEP ACT	MEAL	EXERCISE	TV ACT	BU NAV	MEAL	MEAL	
PLT	SLEEP	POST SLEEP ACT	MEAL	EXERCISE	BU NAV	MEAL	MEAL	MEAL	
DAY/NIGHT									
ORBIT	89	90	91	92	93	94	95	96	
MOON UP/DOWN									
EARTH TRACE W/SAA									
GSTDN COVERAGE	-ACD -DKR	-DKR -MAX	-MAX -YAR -ORR	-MAX -YAR -ORR	-MAX -YAR -ORR	-MAX -YAR -ORR	-MAX -YAR -ORR	-MAX -YAR -ORR	-MAX -YAR -ORR
SGLS COVERAGE									
DPS									
DEORB KSC EDM									
ATTITUDE	BOTTOM TO SUN								
MANEUVERS									
TV/VTR									
CFES									
MLR									
NOTES:	• FTO 412-06,08 RCS THERMAL SOAKBACK, TWO FWD & ONE L ARCS ENGINE • GAS DEACT PREP • FSO 5435-01 GAS OPERATION • FTO 445-03 PRSD PERFORMANCE - 15% LEVEL • FTO 476-01 BU ORBITAL NAV • FTO 466-01 RAD PERFORMANCE TEST • FTO 412-01 ATT HOLD THERMAL RESPONSE • FTO 476-01 BU ORBITAL NAV • PRSD TEST POWER UP • FTO 445-03 PRSD STRATIFICATION, 15% LEVEL • OMS/RCS • PRSD PITCH UP/DOWN NAV • FTO 445-03 PRSD STRATIFICATION, 15% LEVEL • OMS/RCS • FTO 467-02 LONG TERM VPC FREEZER TEMPERATURE STABILITY • 2 FWD BURN (30 SEC) & 1 AFT BURN (100 SEC) • FTO 412-06,08 RCS THERMAL SOAKBACK, FWD & ONE L ARCS ENGINE • FTO 412-01 ATT HOLD THERMAL RESPONSE								

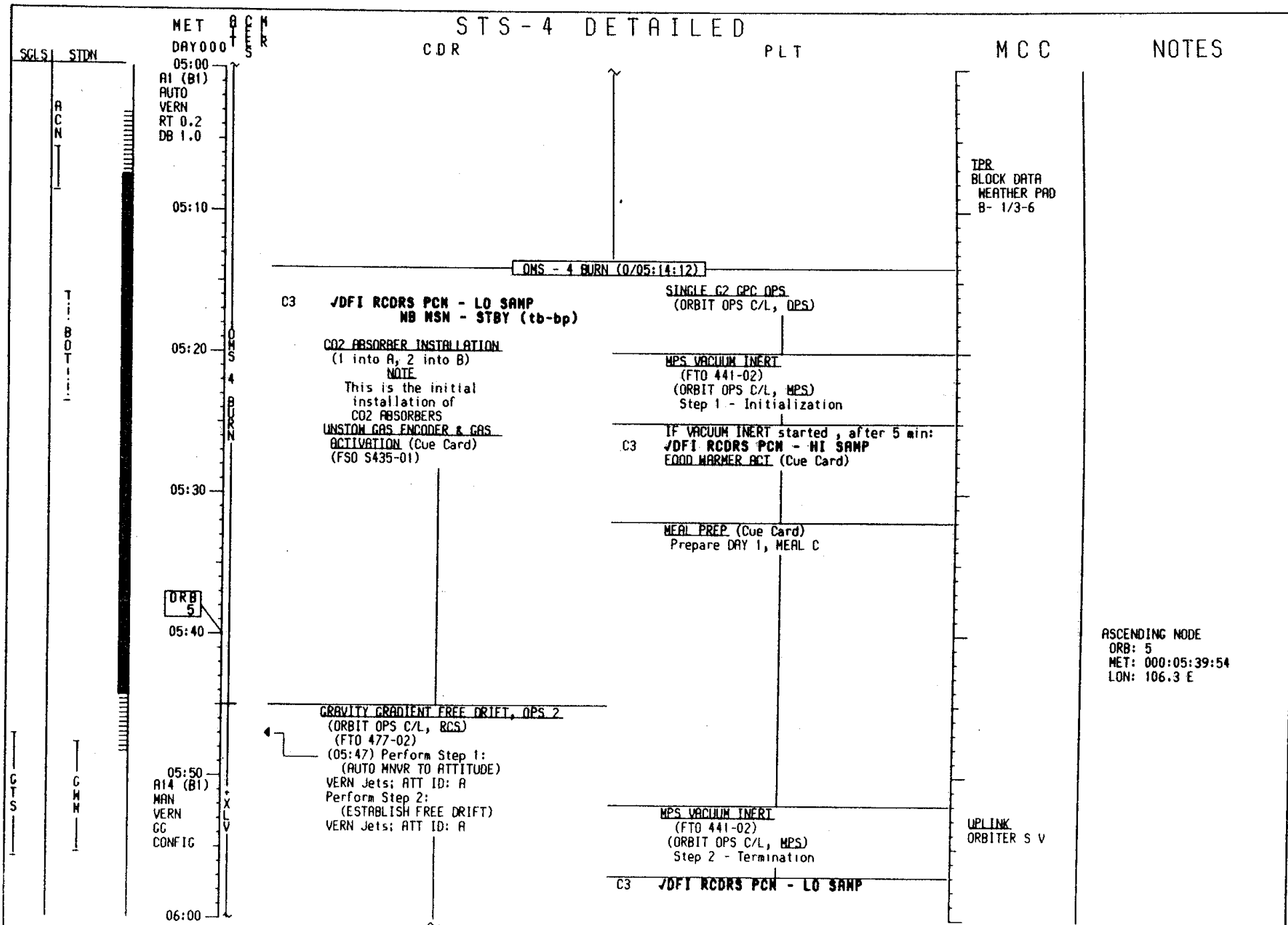


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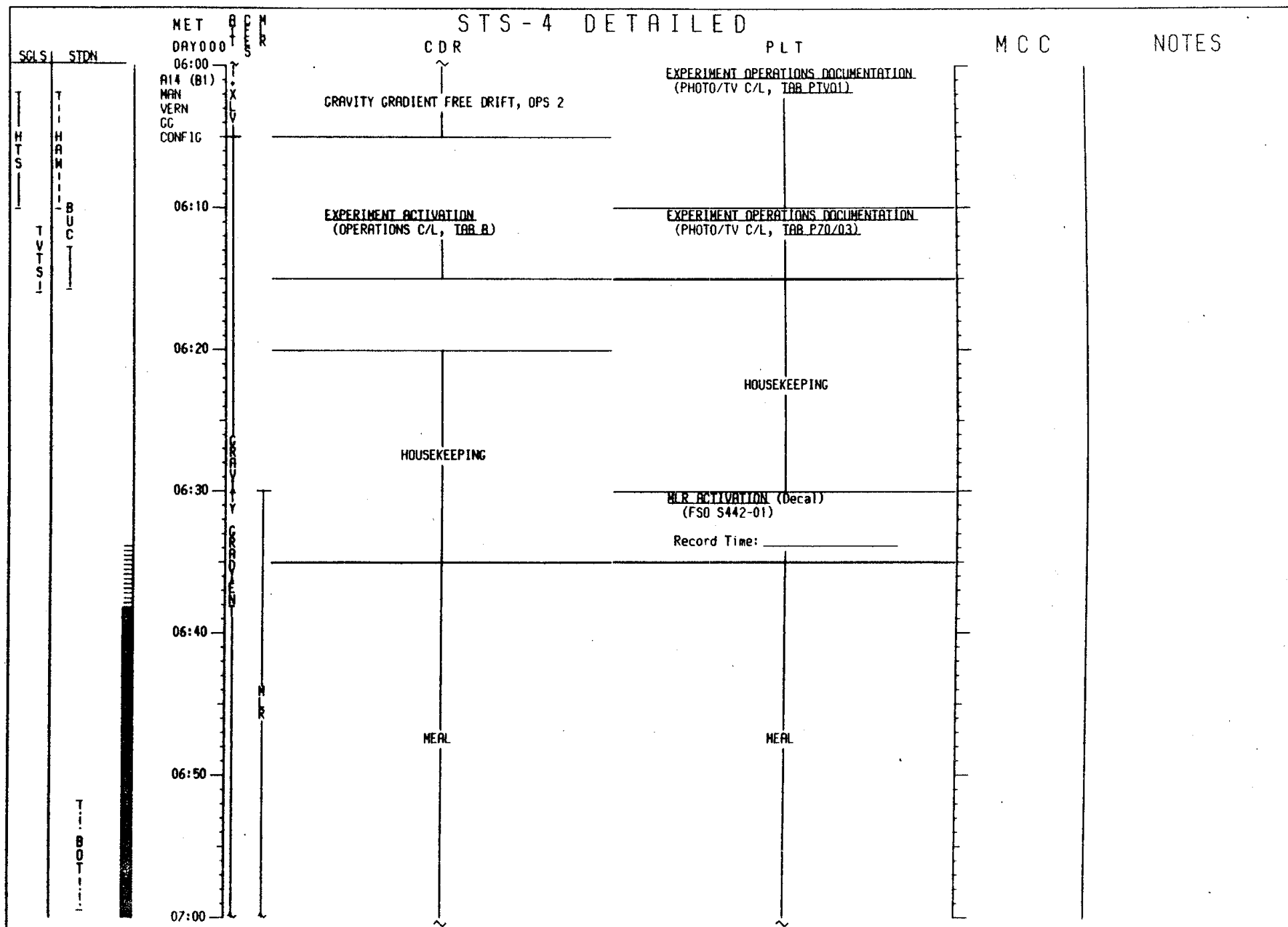
DETAILED TIMELINE

FLI DAY 1





ASCENDING NODE
 ORB: 5
 MET: 000:05:39:54
 LON: 106.3 E



STS-4 DETAILED

SCLS STON

MET DAY 000
07:00

CDR

PLT

MCC

NOTES

A14 (B1)
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VERN
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CONFIG

PAYLOAD STATUS REPORT
(If required)

RPT: P/L STATUS

07:10

ORB 6

MEAL

MEAL

07:20

07:30

EXPERIMENT DEACTIVATION
(OPERATIONS C/L, TAB C)

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P70/03)

07:40

PRIVATE MEDICAL COMMUNICATION

PRIVATE MEDICAL COMMUNICATION

GRAVITY GRADIENT FREE DRIFT, OPS 2
(ORBIT OPS C/L, RCS)
(FTO 477-02)
Perform Step 3:
(VEHICLE RECOVERY & FES RESTART)

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = QTY B =

07:50

MLR CHECK (Decal)
(FSD 5442-01)

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

AUTO MNVR TO IMU ALIGN ATT

MNVR OPTION: R + 250
P + 336.3
Y + 338.8

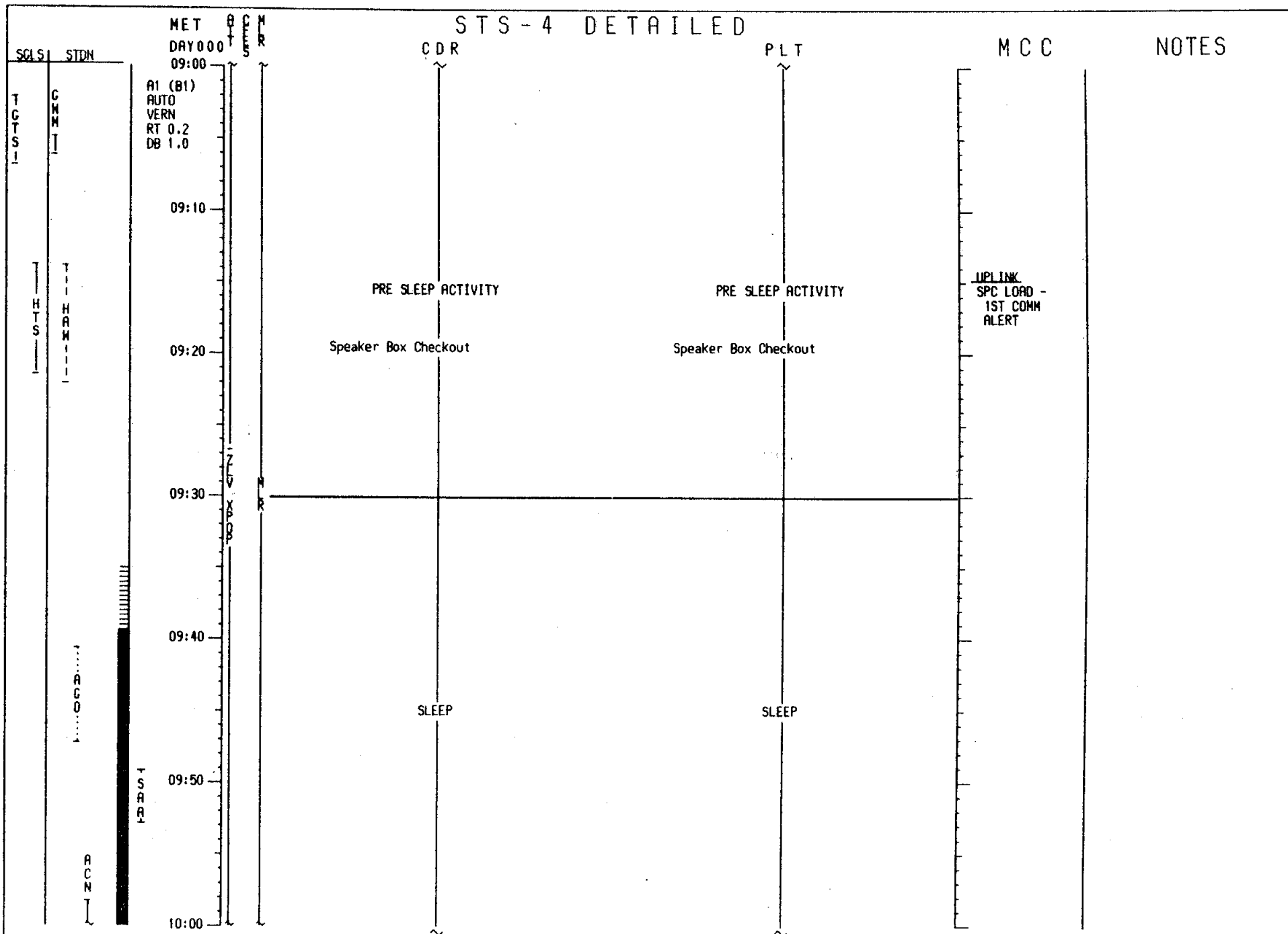
Record time:

DAP: A/AUTO/VERN
(07:56) Initiate MNVR

UPLINK
ORBITER S.V.
TPR
BLOCK DATA
WEATHER PAD
B- 2/7-11
UPDATE
H2O SPLY DUMP
QTY TK A & B

ASCENDING NODE
ORB: 6
MET: 000:07:11:06
LON: 82.9 E

STS-4 DETAILED		MCC		NOTES
SGLS	STDN	CDR	PLT	
MET DAY 000 08:00 R1 (B1) AUTO VERN RT 0.2 DB 1.0		RADIATORS STOW/DEPLOY (FTO 466-01) (ORBIT OPS C/L, PLAD FTOs) Perform Step 2 - DEPLOY RADIATORS		Stars 43 & 15 available from 0/08:05 to 0/08:41 Star 26 available from 0/08:14 to 0/09:02
08:10 AUTO MNVR TO IMU ALIGN ATT		01 JCOAS - OFF Unstow COAS, Fwd Adapter Brkt Mount FWD, plug in (01)		
08:20 IMU ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 43, RASALHAGUE -Z: 15, HADAR ANG DIF: 84.1 AUTO MNVR TO COAS CAL ATT MNVR OPTION: R + 253.2 P + 343.7 Y + 330.1 DAP: A/MAN/VERN		IMU ALIGN PAD TRK ID: _____, _____ ANG ERR _____ ANG 1 _____ 2 _____ 3 _____ Δ X _____ () _____ () _____ Δ Y _____ () _____ () _____ Δ Z _____ () _____ () _____ EXECUTION TIME: ____ / ____ : ____ : ____		
08:30 COAS CALIBRATION (ORBIT OPS C/L, GNC) STAR ID: +X: 26, FOHALHAUT		ANNUNCIATOR, C/M LAMP TEST (ORBIT OPS C/L, EPS)		RPT: IMU ALIGN and COAS CAL RESULTS
08:40 REPORT: IMU ALIGN/COAS CAL RESULTS		FIRE/SMOKE DETECT/SUPPRESS TEST (ORBIT OPS C/L, EPS)		
08:50 AUTO MNVR TO -ZLV ATT (X-POP, +Yby FWD) TGT ID + 2 (Earth) BODY VEC + 5 (Optional) P + 90 Y + 348 ON + 270 DAP: A/AUTO/VERN Initiate TRK		CO2 ABSORBER REPLACEMENT (3 into A) Rewrap 1 and stow		MCC ONLY COORD C&W/FDA LIMITS CLEANUP FOR CREW SLEEP
09:00 PRE SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)		PRE SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)		
09:00 COAS CALIBRATION PAD +X & BIAS _____ UPDATE TIME: ____ / ____ : ____ : ____				

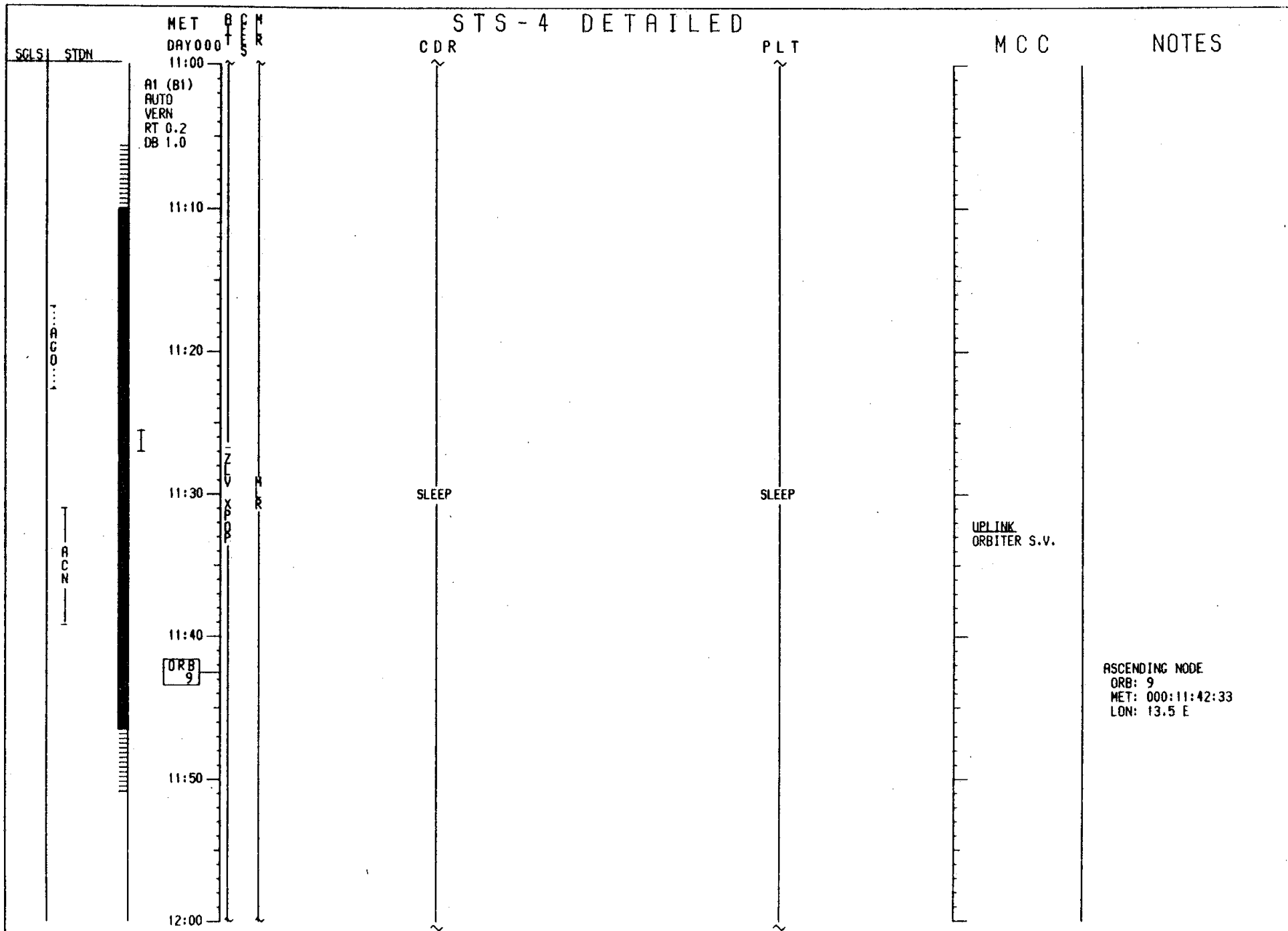


STS - 4 DETAILED

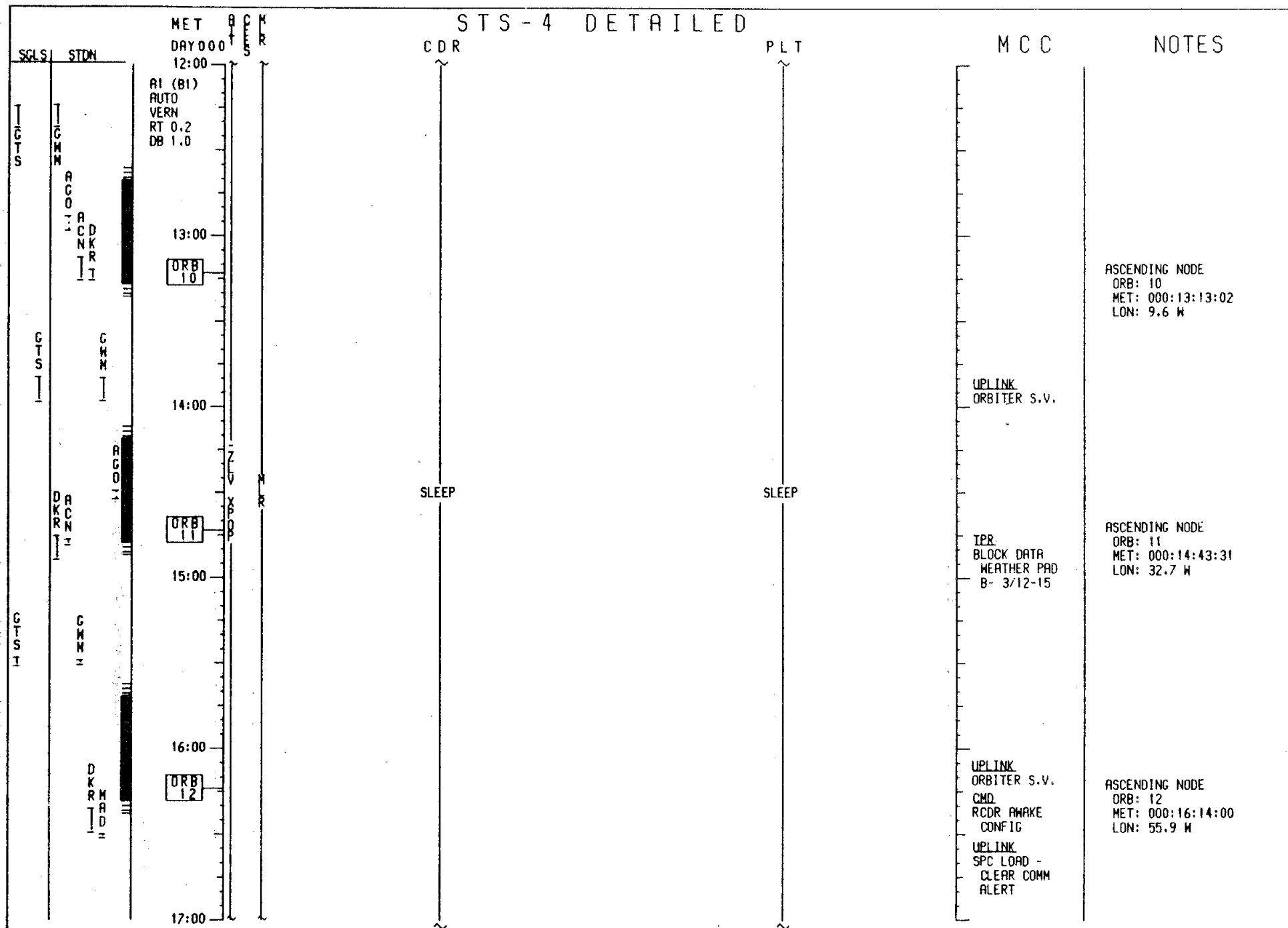
STS-4 DETAILED

SGLS	STDN	MET DAY 000	COR	PLT	MCC	NOTES
SCLS	STDN	10:00 R1 (B1) AUTO VERN RT 0.2 DB 1.0				
10:10	10:10	ORB 8				
10:20	10:20					
10:30	10:30		SLEEP	SLEEP		
10:40	10:40					
10:50	10:50					
11:00	11:00					

ASCENDING NODE
ORB: 8
MET: 000:10:12:04
LON: 36.6 E



STS-4 DETAILED

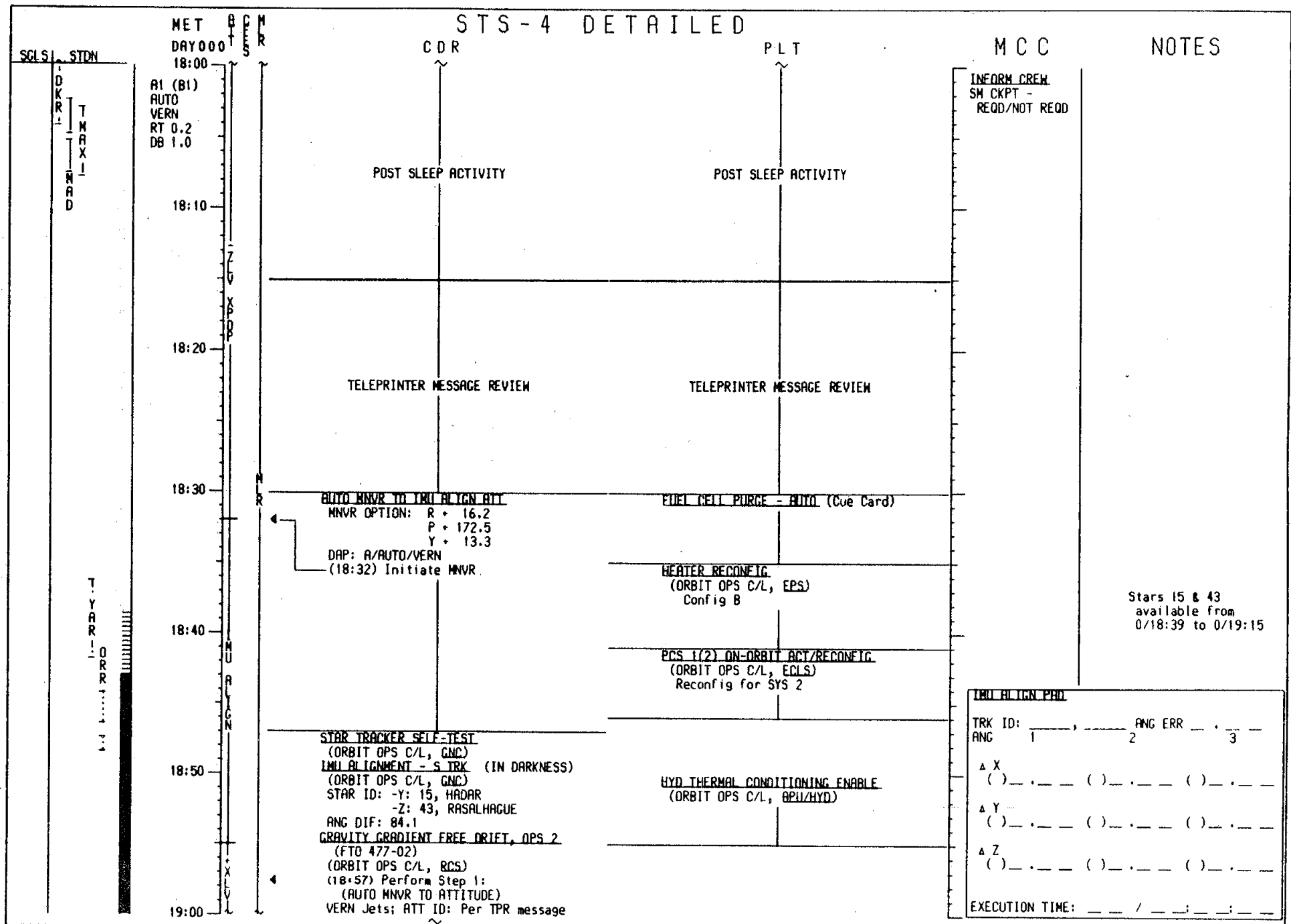


MET		STS-4 DETAILED		MCC		NOTES
SCLS	STDN	DAY 000	CDR	PLT		
		17:00				
		A1 (B1)				
		AUTO				
		VERN				
		RT 0.2				
		DB 1.0				
		17:10				
			SLEEP	SLEEP		
		17:20				
		17:30	POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)		
		17:40				
		ORB 13				
		17:50				
		18:00				
				SUPPLY WATER DUMP (ORBIT OPS C/L, ECLS) Dump TKS A & B Dump to: QTY A = _____ QTY B = _____		
					UPDATE H2O SPLY DUMP QTY TK A & B	

ASCENDING NODE
ORB: 13
MET: 000:17:44:29
LON: 79.0 W

ASCENDING NODE
ORB: 13
MET: 000:17:44:29
LON: 79.0 W

UPDATE
H2O SPLY DUMP
QTY TK A & B



STS-4 DETAILED

SGLS STDN

MET DAY000
19:00

CDR

PLT

MCC

NOTES

R1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

GRAVITY GRADIENT FREE DRIFT, OPS 2
Perform Step 2:
(ESTABLISH FREE DRIFT)
VERN Jets; ATT ID: Per TPR message

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB PTV01)

19:10

ORB
14

EXPERIMENT ACTIVATION
(OPERATIONS C/L, TAB B)

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P20/03)

19:20

R14 (B1)
MAN
VERN
CC
CONFIG

REPORT: IMU ALIGN RESULTS

PAYLOAD STATUS REPORT
(If required)

19:30

19:40

19:50

20:00

MEAL

MEAL

ASCENDING NODE
ORB: 14
MET: 000:19:14:57
LON: 102.2 W

RPT: P/L STATUS

RPT: IMU ALIGN RESULTS

STS-4 DETAILED

MET DAY 000

SCLS STDN

ORB 15

CDR MEAL PLT MEAL

CCES ACTIVATION/CONT SYS ZERO CK
(Cue Card)
(FSD S436-01)
Sequence I - Samples 1,2 & 3

Changeout wireless headset battery pack

ASCENDING NODE
ORB: 15
MET: 000:20:45:26
LON: 125.3 W

TPR BLOCK DATA WEATHER PAD 8- 4/16-19

NOTES

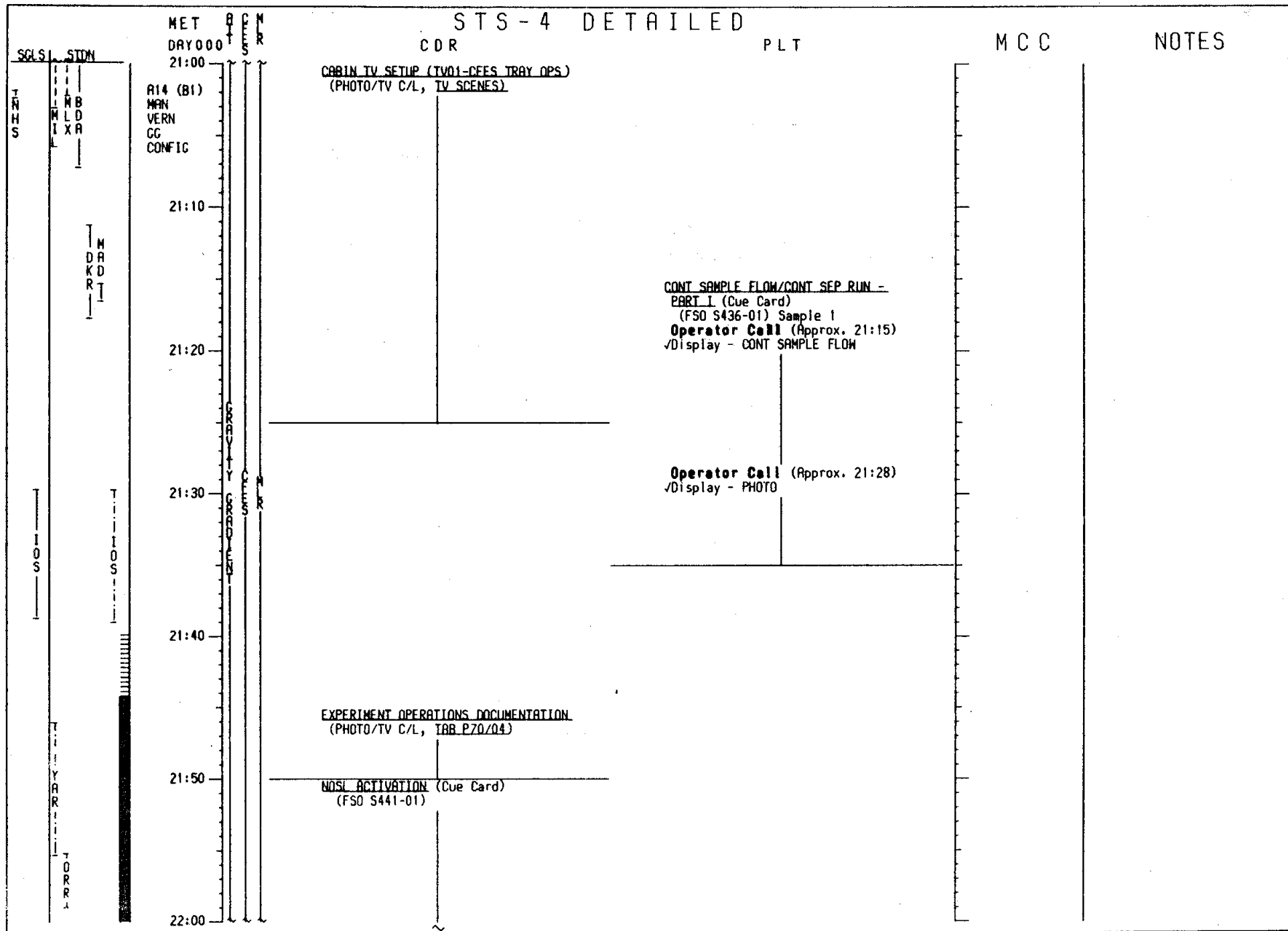
R14 (B1)
MAN
VERN
CG
CONFIG

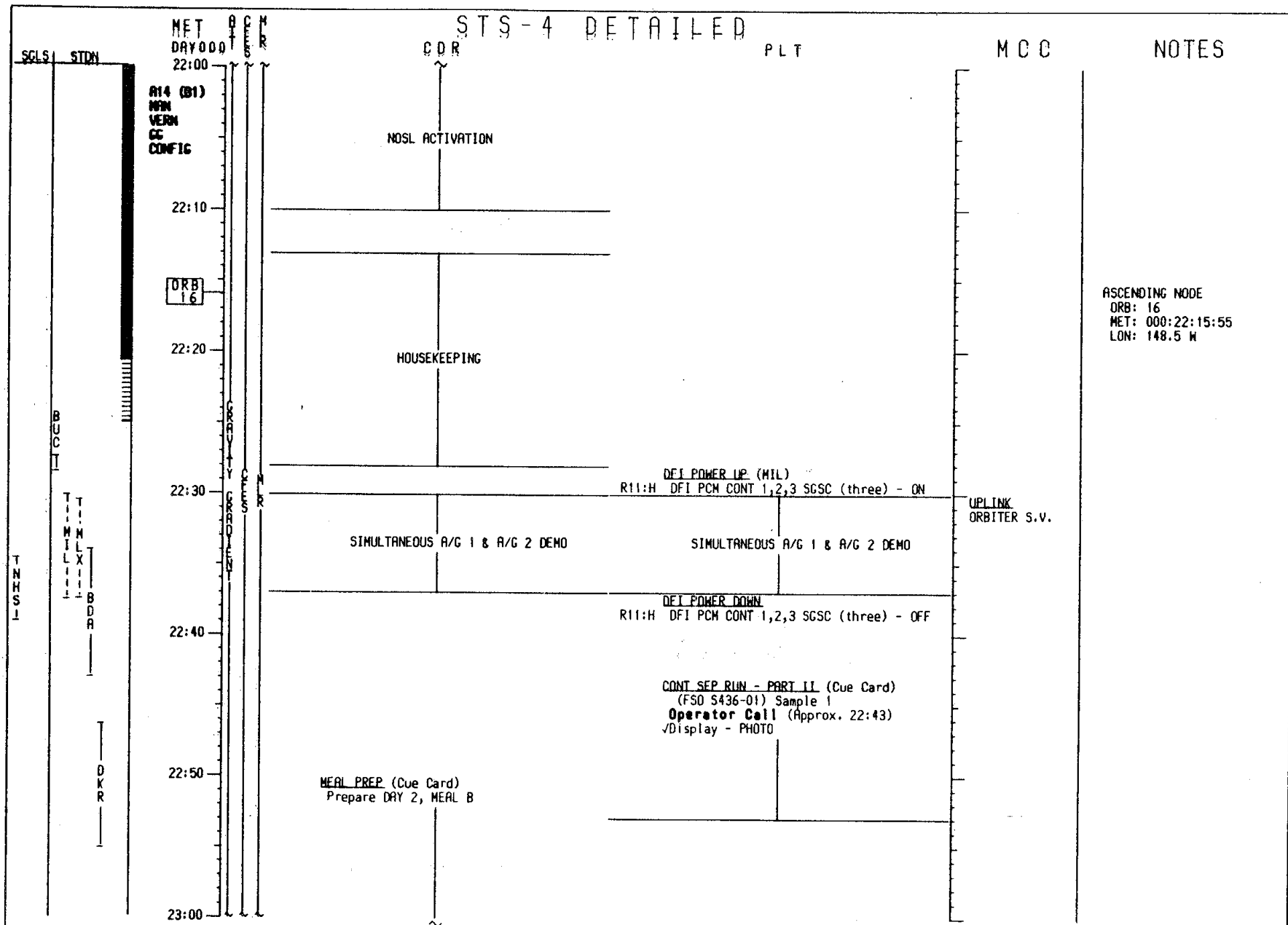
20:00
20:10
20:20
20:30
20:40
20:50
21:00

T T M L X B D A

ASCENDING NODE
ORB: 15
MET: 000:20:45:26
LON: 125.3 W

TPR
BLOCK DATA
WEATHER PAD
B- 4/16-19





ASCENDING NODE
 ORB: 16
 MET: 000:22:15:55
 LON: 148.5 W

STS - 4 DETAILED

CDR

PLT

M C C

NOTES

NET

DAY 000

23:00

A14 (B1)
MAN
VERN
GG
CONFIG

23:10

23:20

23:30

23:40 .

23:50 .

00:00

MEAL PREP

HOUSEKEEPING

8/INSERT NEW COLLECTOR (Cue Card)
(FSO S436-01) Sample 1
Operator Call (Approx. 23:25)
✓Display - PHOTO

Operator Call (Approx. 23:43)
✓Display - PHOTO

VPC FREEZER SETUP (FTO 467-01)
Remove food from locker and
store on food tray
FREEZER PWR - OFF

Record time (Cue Card)

HEAL

ASCENDING NODE
ORB: 17
MET: 000:23:46:24
LON: 171.6 W

STS-4 DETAILED

CDR

PLT

MCC

NOTES

SCLS STDN

MET
DAY 001
00:00

A14 (B1)
MAN
VERN
GC
CONFIG

00:10

00:20

00:30

00:40

00:50

01:00

RUN 2 CONT OR FLUSH OR END

(Cue Card)

(FSD 5436-01) Sample 2

Operator Call (Approx. 00:15)

✓Display - RUN 2 CONT OR
FLUSH OR END

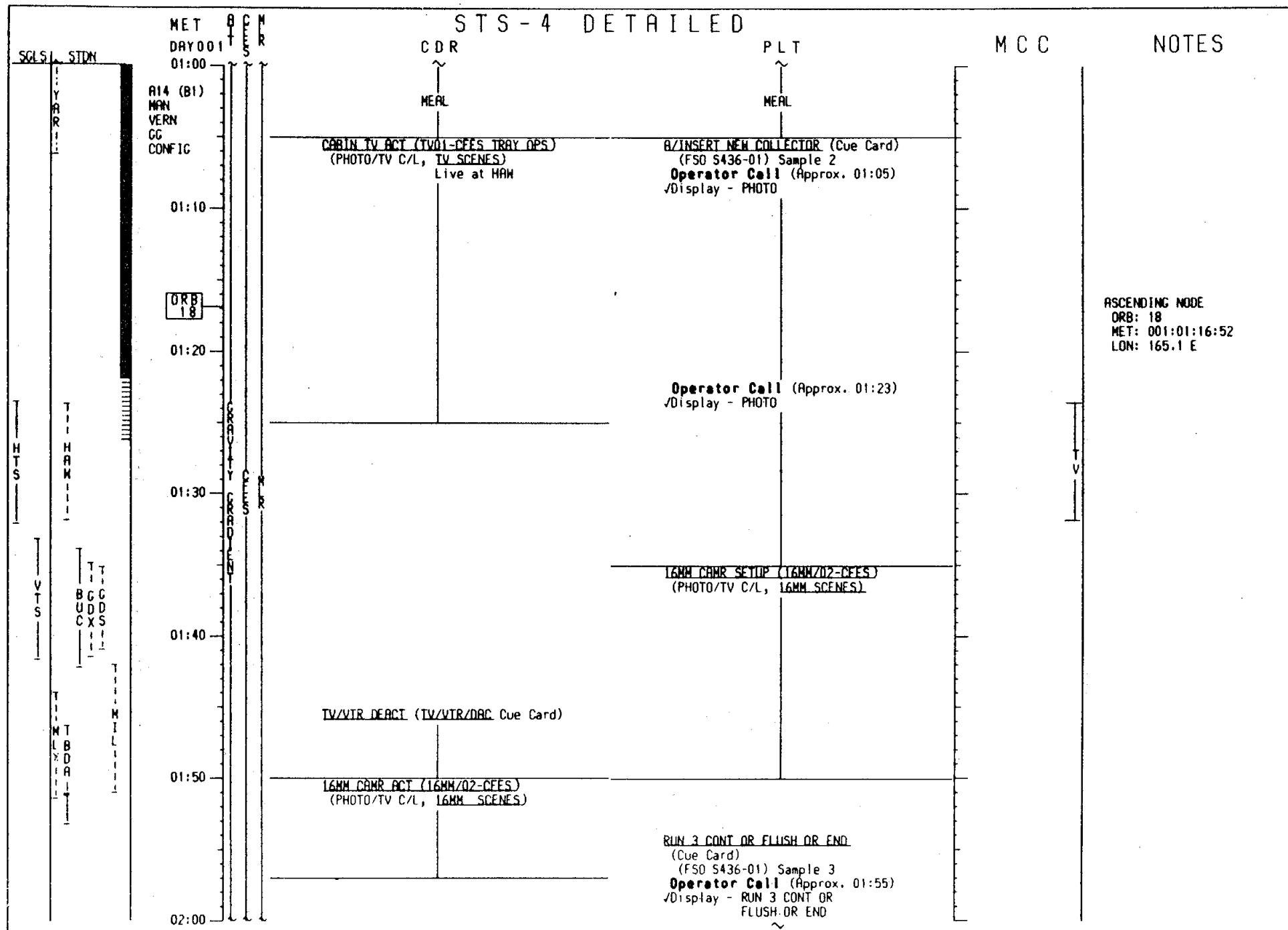
Operator Call (Approx. 00:22)

✓Display - PHOTO

MEAL

MEAL

MEAL



STS-4 DETAILED		PLT	MCC	NOTES
SGLS	STDN	CDR		
MET DAY001 02:00 R14 (B1) MAN VERN CC CONFIG		RUN 3 CONT OR FLUSH OR END Operator Call (Approx. 02:02) ✓Display - PHOTO		
02:10		MLR DEACTIVATION (Decal) (FSO 442-01) Record Time: _____		
02:20				
02:30				
02:40				
02:50 ORB 19		8/INSERT NEW COLLECTOR (Cue Card) (FSO 5436-01) Sample 3 Operator Call (Approx. 02:45) ✓Display - PHOTO	TPR BLOCK DATA WEATHER PAD B- 5/20-23	ASCENDING NODE ORB: 19 MET: 001:02:47:21 LON: 142.0 E
03:00				

STS-4 DETAILED

CDR

PLT

MCC

NOTES

SCLSI STDN

HTS

VTS

ACN

T-BOT

GOSTTICDX

T-MILX

MET

DAY 001

03:00

R14 (B1)
MAN
VERN
CG
CONFIG

03:10

03:20

03:30

03:40

03:50

04:00

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P70/08)

A/INSERT NEW COLLECTOR
Operator Call (Approx. 03:03)
√Display - PHOTO

CMD
OEX RCDR - ON

4 R11 OEX PWR - ON (Before MIL AOS)
DFI WB MSN PWR - ON

ACIP QUIESCENT ON-ORBIT DATA
(FSO S433-02)

ON MCC CUE (MIL)

C3 DFI RCDRS WB MSN - CONT RCD

Wait 30 sec

C3 DFI RCDRS WB MSN - STBY

ON MCC CUE

R11 OEX PWR - OFF

DFI WB MSN PWR - OFF

INFORM CREW
DFI WB -
CONT RCD

CMD
OEX RCDR - OFF

INFORM CREW
PWR OFF RCDRS

RUN 4 CONT OR FLUSH OR END -

PART I (Cue Card)

(FSO S436-01)

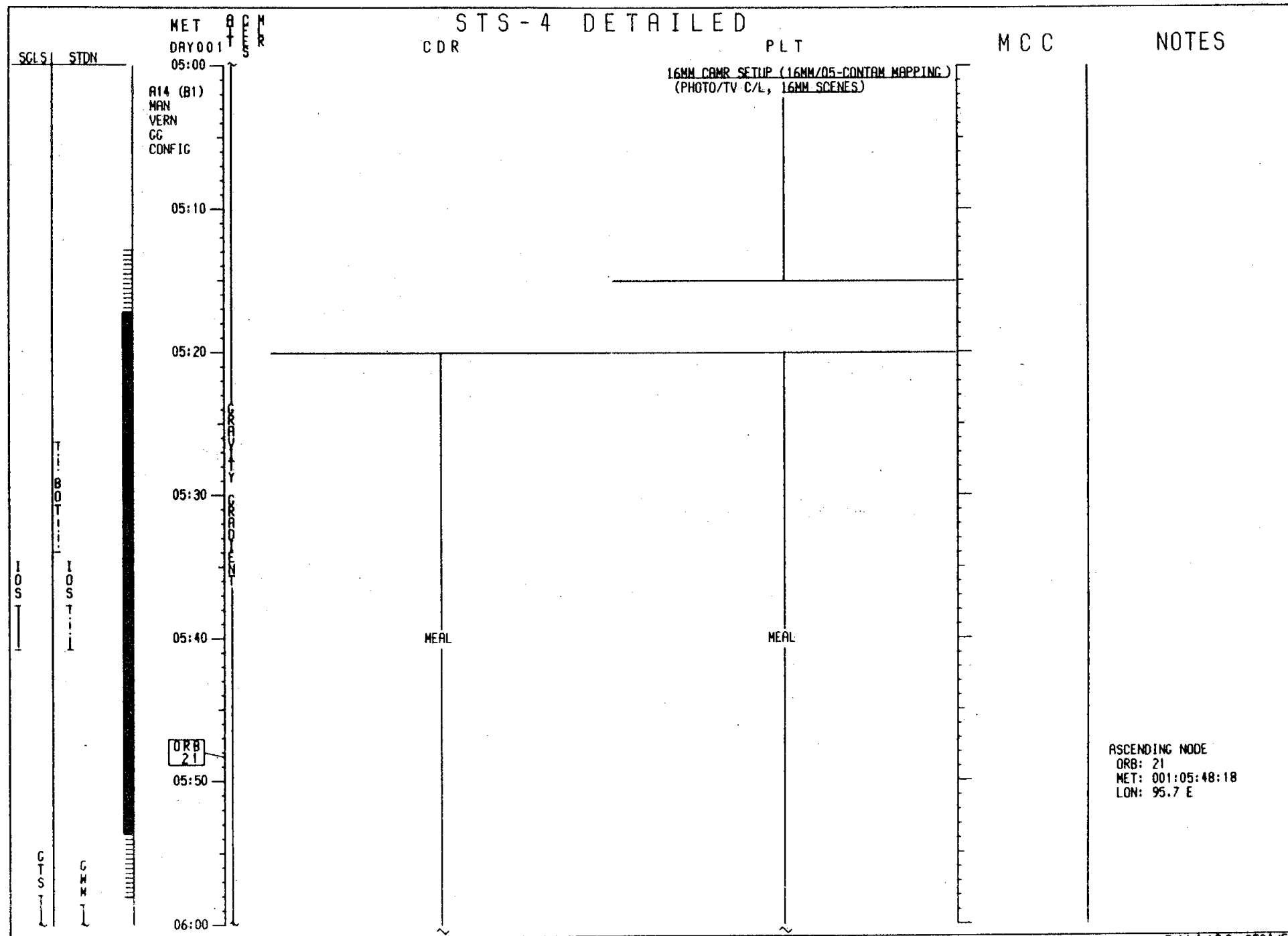
Operator Call (Approx. 03:35)

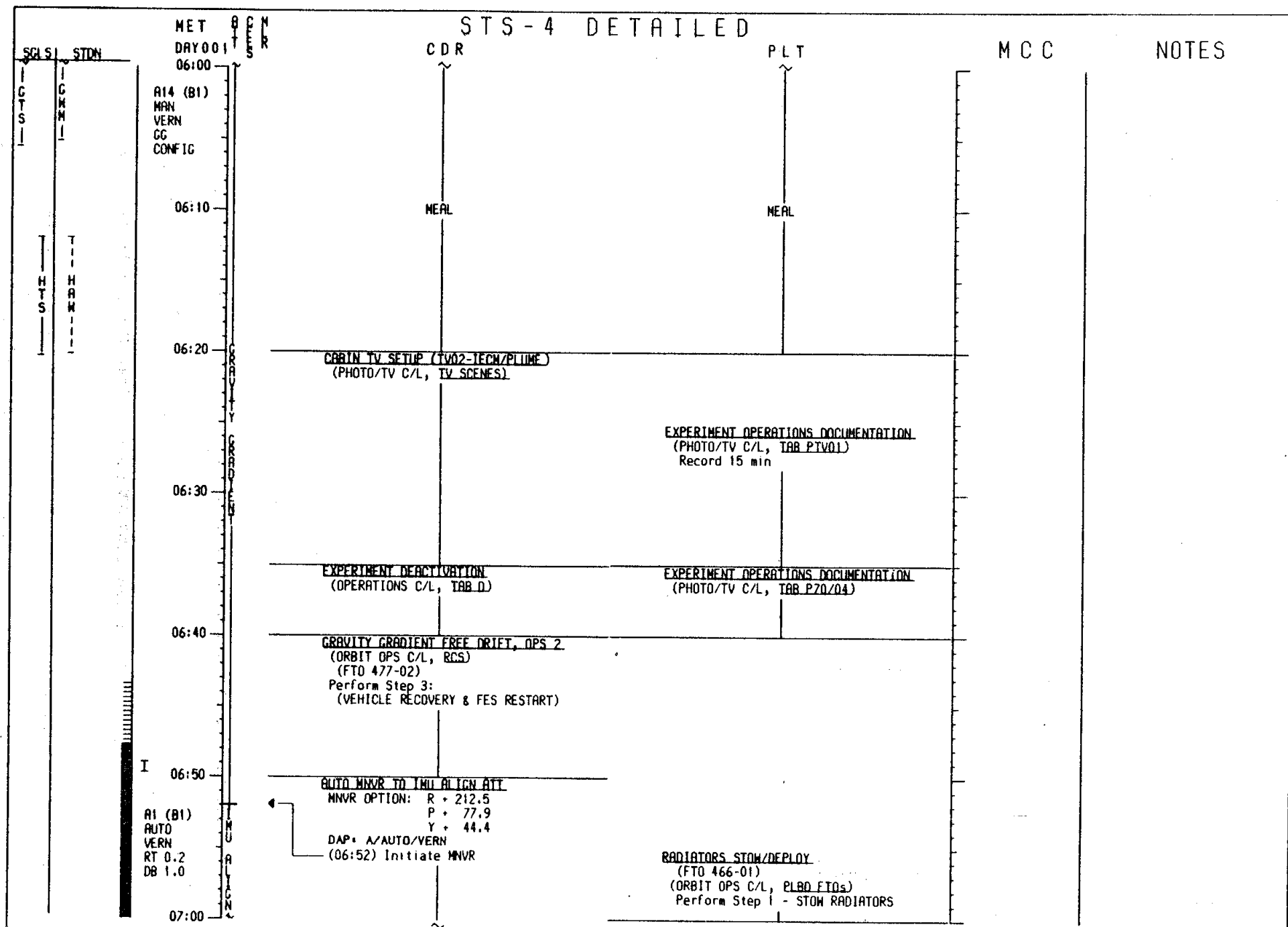
√Display - RUN 4 CONT OR
FLUSH OR END

UPLINK
ORBITER S.V.

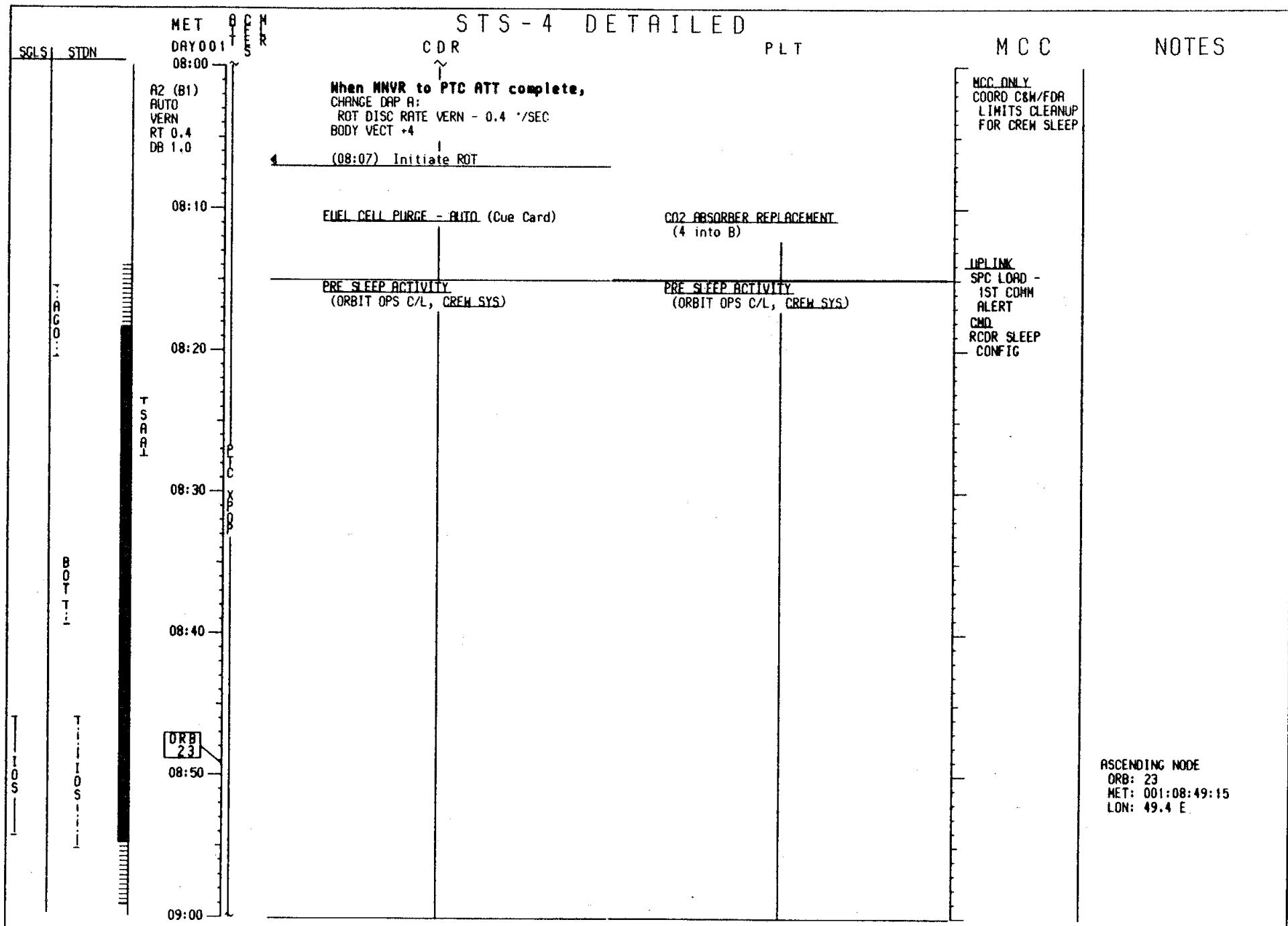
STS-4 DETAILED		CDR	PLT	MCC	NOTES
SCLS	STON	MET DAY 001 04:00			
R14 (B1) MAN VERN CC CONFIG					
04:10		RUN 4 CONT OR FLUSH OR END - PART II (Cue Card) (FSO S436-01) Operator Call (Approx. 04:05) Display - CLOSEOUT PROC			
04:20		16MM CAMR DEACT (16MM/02-CEES) (PHOTO/TV C/L, 16MM SCENES)			
04:30		DEF POWER UP (GWH) R11:H DEF PCM CONT 1,2,3 SCSC (three) - ON			
04:40		PRIVATE MEDICAL COMMUNICATION			
04:50		DEF POWER DOWN R11:H DEF PCM CONT 1,2,3 SCSC (three) - OFF			
05:00		MEAL PREP (Cue Card) Prepare DAY 2, MEAL C			
		HOUSEKEEPING			

ASCENDING NODE
 ORB: 20
 MET: 001:04:17:50
 LON: 118.8 E

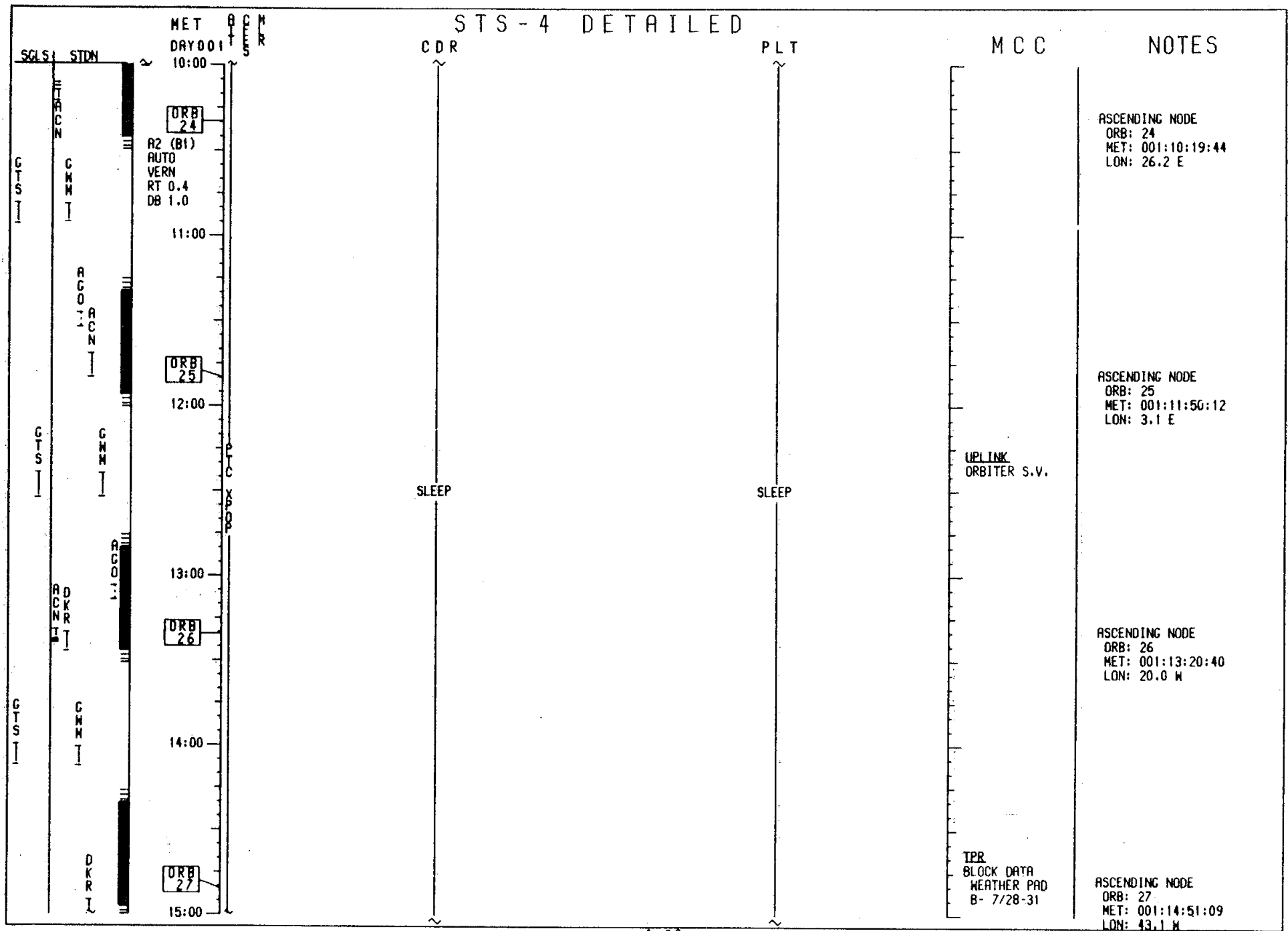




SCLS		STDN	MET	STS-4 DETAILED	PLT	MCC	NOTES
SCLS		STDN	DAY 001 07:00	CDR AUTO MNVR TO IMU ALIGN ATT			
T I O S		T I O S	AI (B1) AUTO VERN RT 0.2 DB 1.0		HOUSEKEEPING	UPDATE H2O SPLY DUMP QTY TK A & B	Stars 27 & 54 available from 1/07:01 to 1/07:44
T I O S		T I O S	07:10	IMU ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 27, DENEK -Z: 54, DIPHDA ANG DIF: 83.7 REPORT: IMU ALIGN RESULTS			RPT: IMU ALIGN RESULTS
T I O S		T I O S	07:20	S TRK OPS DURING H2O DUMP (FTO 473-01) (ORBIT OPS C/L, GNC FTO's)	SUPPLY WATER DUMP (ORBIT OPS C/L, ECLS) Dump TKS A & B Dump to: QTY A = QTY B =	IMU ALIGN PAD TRK ID: , ANG ERR . ANG 1 2 3	ASCENDING NODE ORB: 22 MET: 001:07:18:47 LON: 72.5 E
T I O S		T I O S	07:30		VPC FREEZER TEST (FTO 467-01) Record elapsed time indicator reading (Cue Card) FREEZER PWR - ON Record time, freezer temp, condenser temp (Cue Card) Repeat once per minute for 15 minutes or until temp stabilizes	Δ X () . () . () . Δ Y () . () . () . Δ Z () . () . () .	
T I O S		T I O S	07:40			EXECUTION TIME: / : :	
T I O S		T I O S	07:50	0.4 DEG/SEC PTC, XPOP - INITIATE (FTO 412-01) MNVR OPTION: R + 132.8 P + 236 Y + 60.1 DAP: A/AUTO/VERN (07:49) Initiate MNVR	WATER SAMPLE FREEZING (FTO 467-03) Unstow H2O used drink container and fill with H2O Insert container into freezer RECORD TIME / :	UPLINK ORBITER S.V. TPR BLOCK DATA WEATHER PAD B- 6/24-27	
T I O S		T I O S	08:00				



SCLS		STDN	MET	STS-4 DETAILED	CDR	PLT	MCC	NOTES
			DAY 001					
			09:00					
			A2 (B1)					
			AUTO					
			VERN					
			RT 0.4					
			DB 1.0					
			09:10					
			09:20					
			09:30		SLEEP	SLEEP		
			09:40					
			09:50					
			10:00					



STS - 4 DETAILED

CDR

PLT

M C C

NOTES

SGLS STDN

MET
DAY 001
15:00

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

15:10.

15:20 .

15:30 .

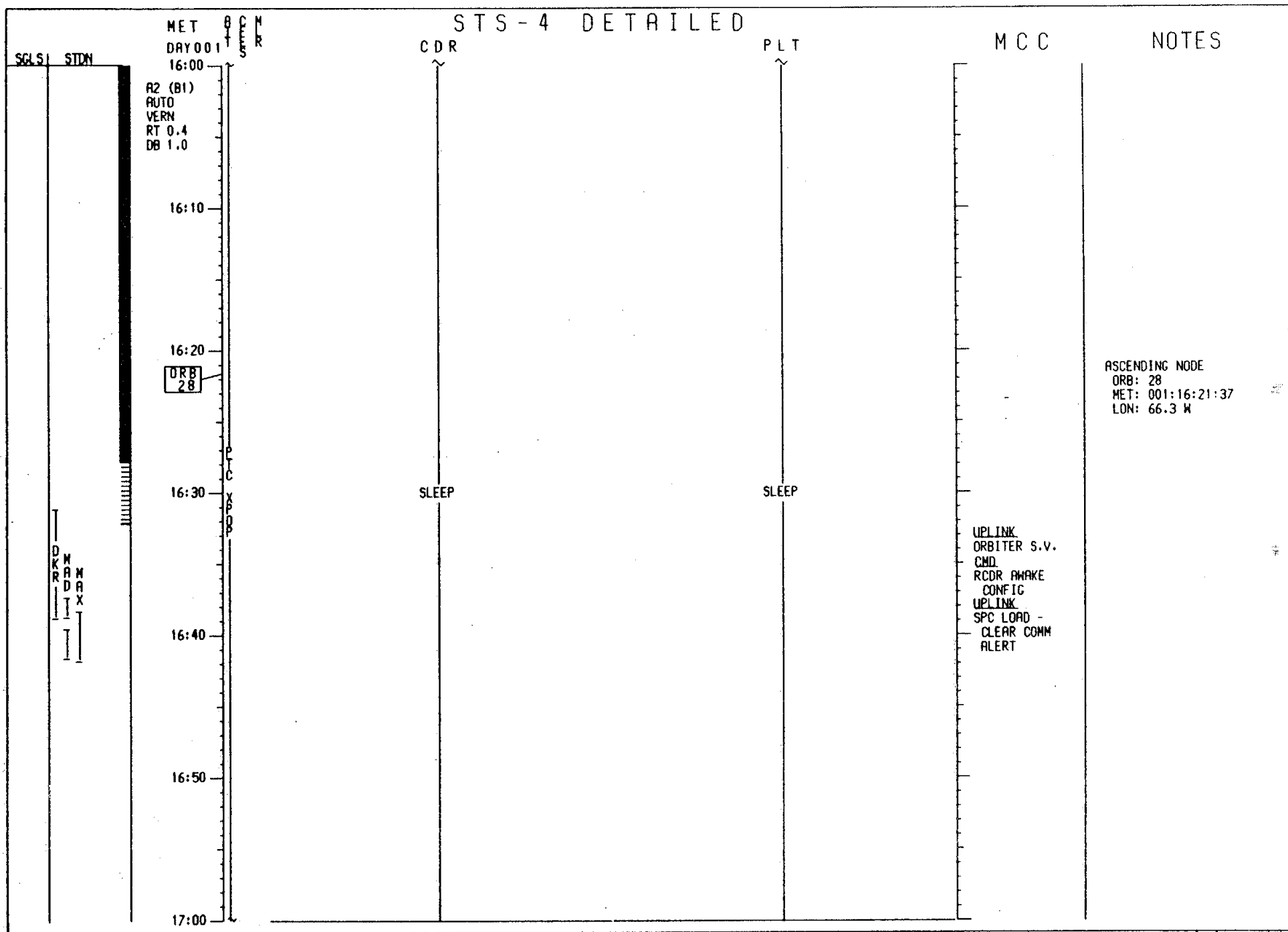
15:40

15:50 .

16:00.

SLEEP

SLEEP



NOTES

SGLS | STDN

NET 8 C M
DAY 001 T S R

18:00
R2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

FUEL CELL PURGE - AUTO (Cue Card)

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = _____ QTY B = _____

UPDATE
H2O SPLY DUMP
QTY TK A & B
INFORM CREW
SM CKPT -
REQD/NOT REQD

UPDATE
OMS/RCS
ICONNECT
CONFIG

18:10 -

18:20 .

18:30 -

18:40 -

18:50 -

19:00 -

NEAL

MEAL

STS-4 DETAILED

SCLS/ STDN

MET
DAY 001

CDR

PLT

MCC

NOTES

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

19:10

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

19:20

ORB
30

19:30

A8 (B1)
AUTO
VERN
RT 0.5
DB 1.0

19:50

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

20:00

MEAL

MEAL

HK

CONNECT: 1 (R) DMS to RCS
(ORBIT PKT C/L, RCS)

AUTO MNVR TO NAV BASE STAB ATT #1
MNVR OPTION: R + 221.4
P + 128.1
Y + 3.5

Change DAP A: ROT DISC RATE VERN - 0.2°/sec
DAP: A/AUTO/VERN
(19:12) Initiate MNVR

Changeout wireless
headset battery pack

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
NAV BASE STABILITY
(FTO 474-01)
(ORBIT OPS C/L, GNC FTOs)
ATT #1 STARS
STAR ID: -Y: 40, MIRFAK
-Z: 57, ACAMAR
ANG DIF: 90.3

MNVR TO 2ND ATT
MNVR OPTION: R + 50.5
P + 326.1
Y + 357.9
DAP: A/AUTO/VERN
Initiate MNVR

ATT #2 STARS
STAR ID: -Y: 57, ACAMAR
-Z: 40, MIRFAK
ANG DIF: 90.3

✓ DAP A: ROT DISC RATE VERN - .2°/sec

AUTO MNVR TO -ZSI ATT
TGT ID + 4 (Sun)
BODY VECTOR + 3 (-Z Axis)
OM + 90
DAP: A/AUTO/VERN
(19:53) Initiate TRK

DEFI POWER UP (MIL)
R11:H DEFI PCM CONT 1,2,3 SGSC (three) - ON

DEFI POWER DOWN
R11:H DEFI PCM CONT 1,2,3 SGSC (three) - OFF

RMS POWERUP/CHECKOUT
(PDRS OPS C/L, RMS PWRUP)

ASCENDING NODE
ORB: 30
MET: 001:19:22:33
LON: 112.6 W

Stars 40 & 57
available from
1/19:19 to 1/20:03

STS-4 DETAILED

SCLS | STDN | MET DAY001 | CDR | PLT | MCC | NOTES

20:00
A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

20:10
HK

20:20
(A1) B6
CONTAM
SURVEY

20:30

20:40
IECM CONTAMINATION SURVEY
(FTO 453-01)
(PDRS OPS C/L, CONTAM SURVEY)

20:50

21:00

RMS POWERUP/CHECKOUT

IECM UNBERTH
(PDRS OPS C/L, IECM UNBERTH)

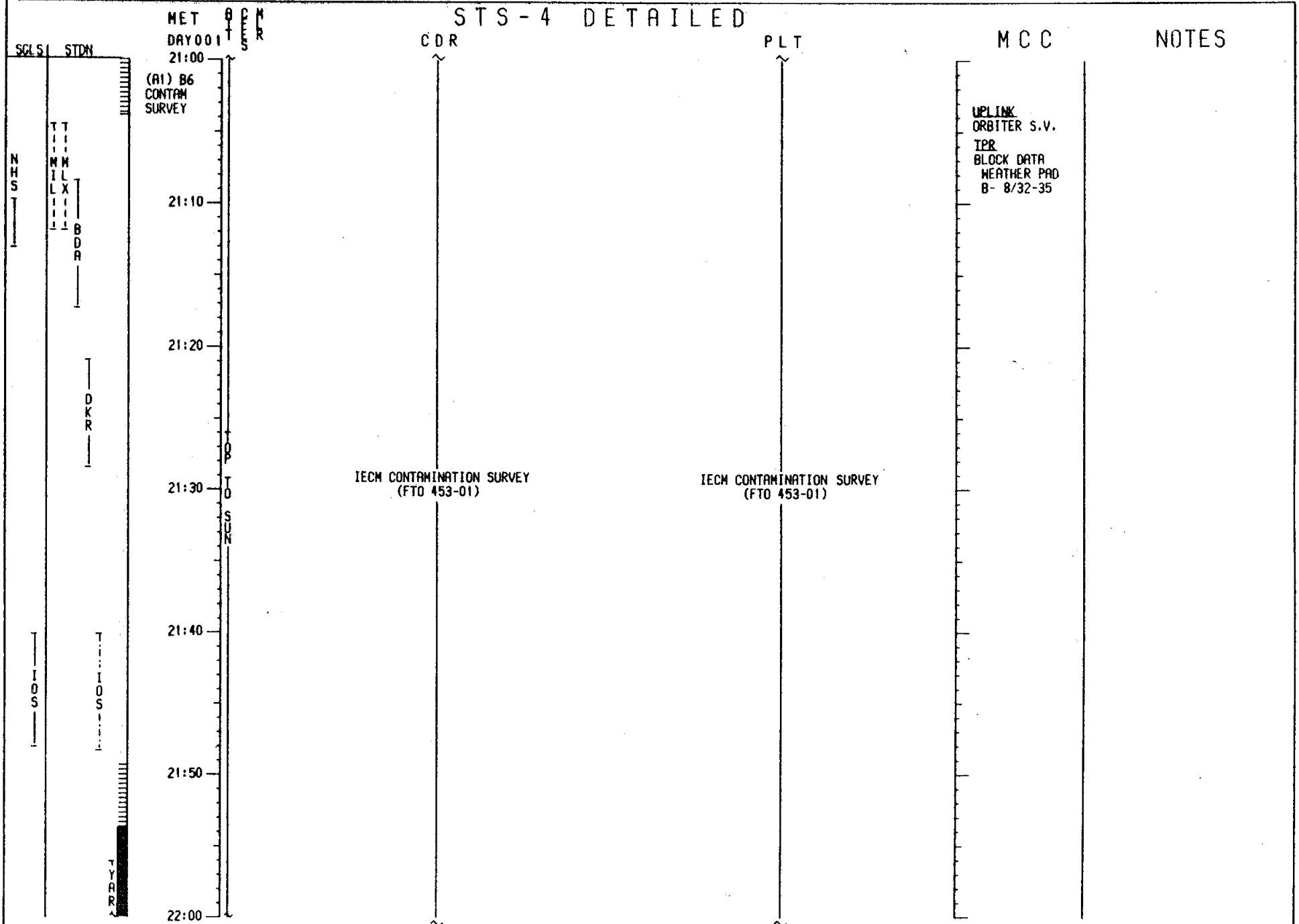
IECM CONTAMINATION SURVEY
(FTO 453-01)
(PDRS OPS C/L, CONTAM SURVEY)

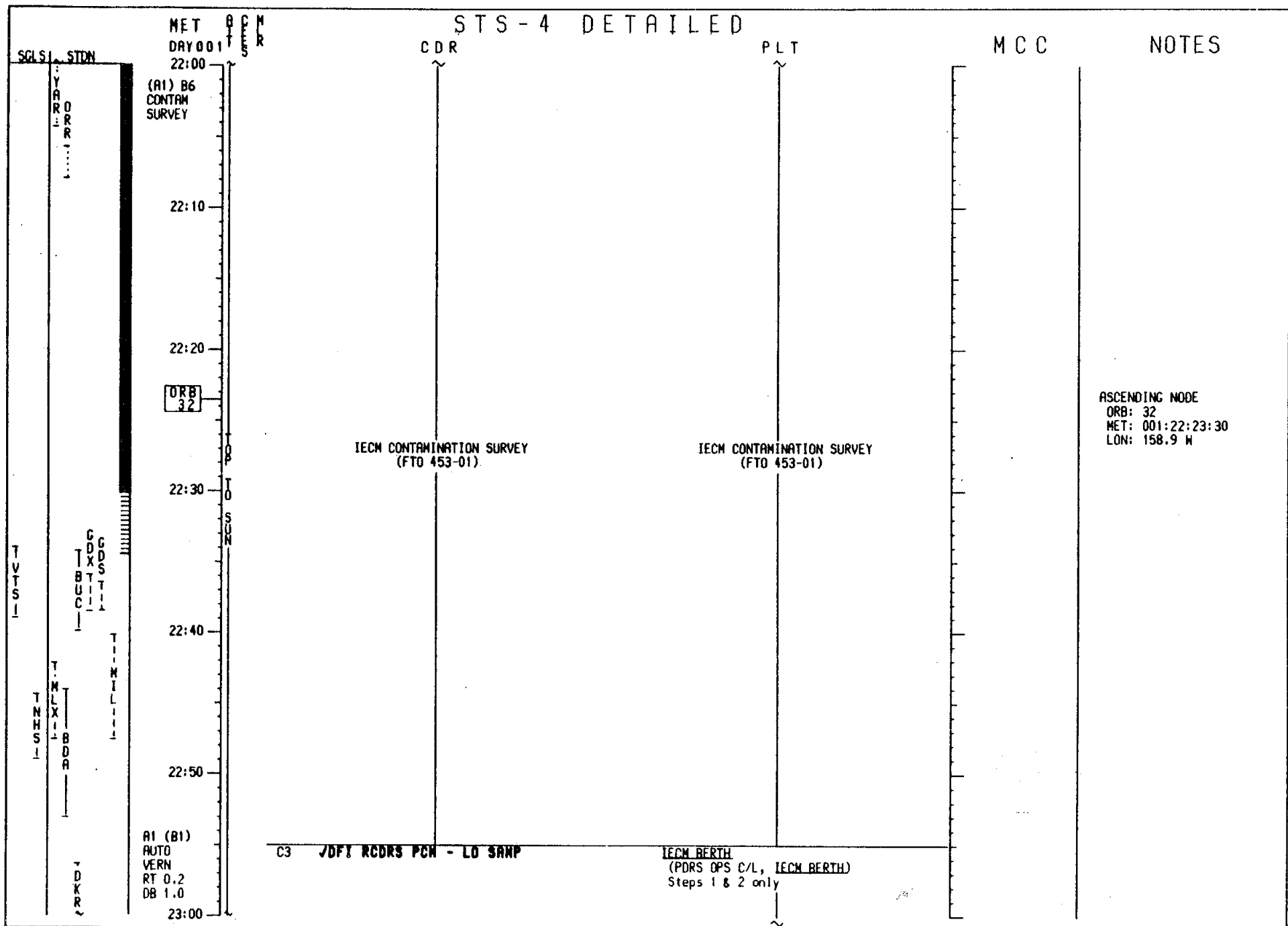
ORB
31

ASCENDING NODE
ORB: 31
MET: 001:20:53:02
LON: 135.7 W

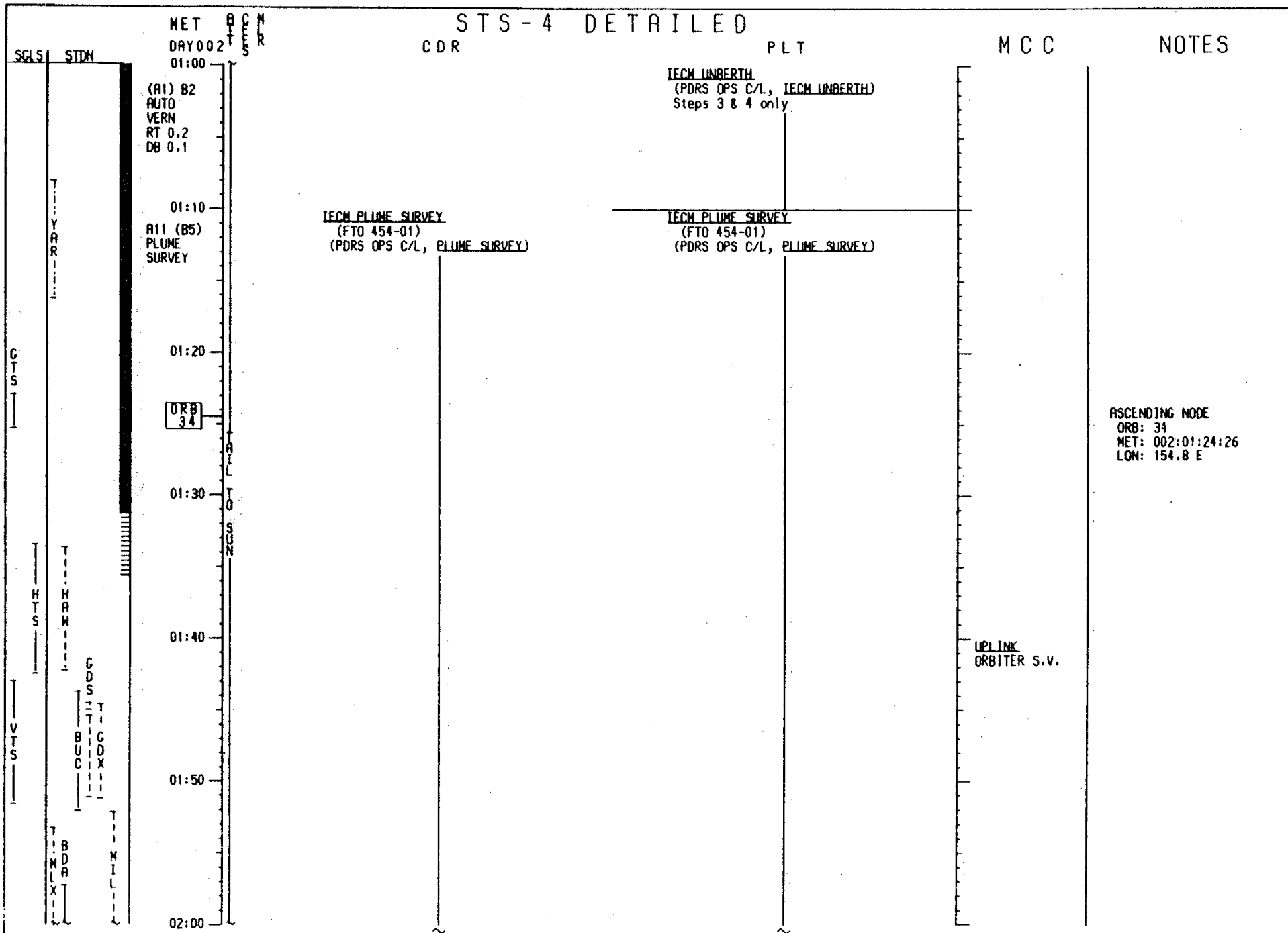
ASCENDING NODE
ORB: 31
MET: 001:20:53:02
LON: 135.7 W

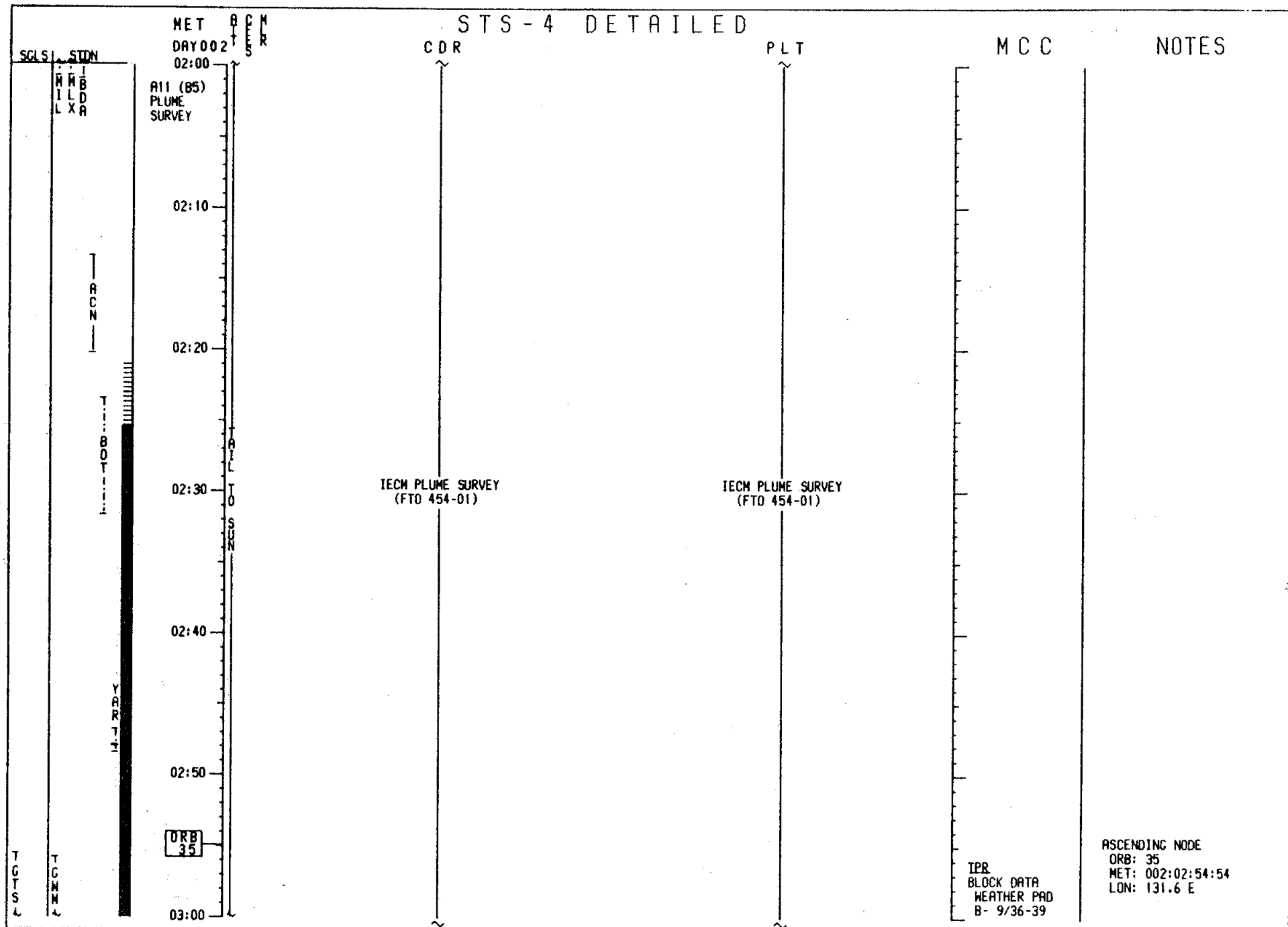
STS-4 DETAILED

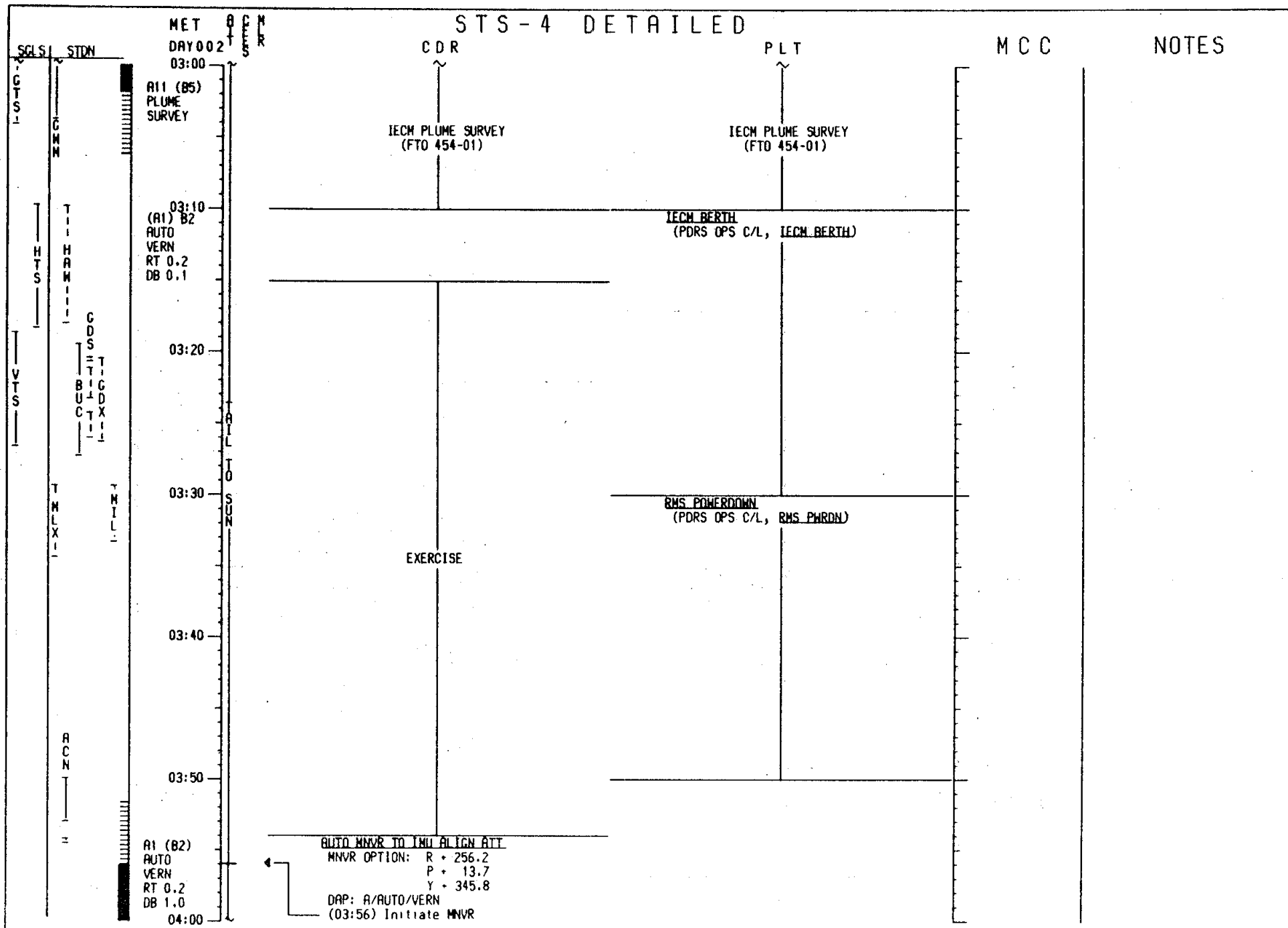




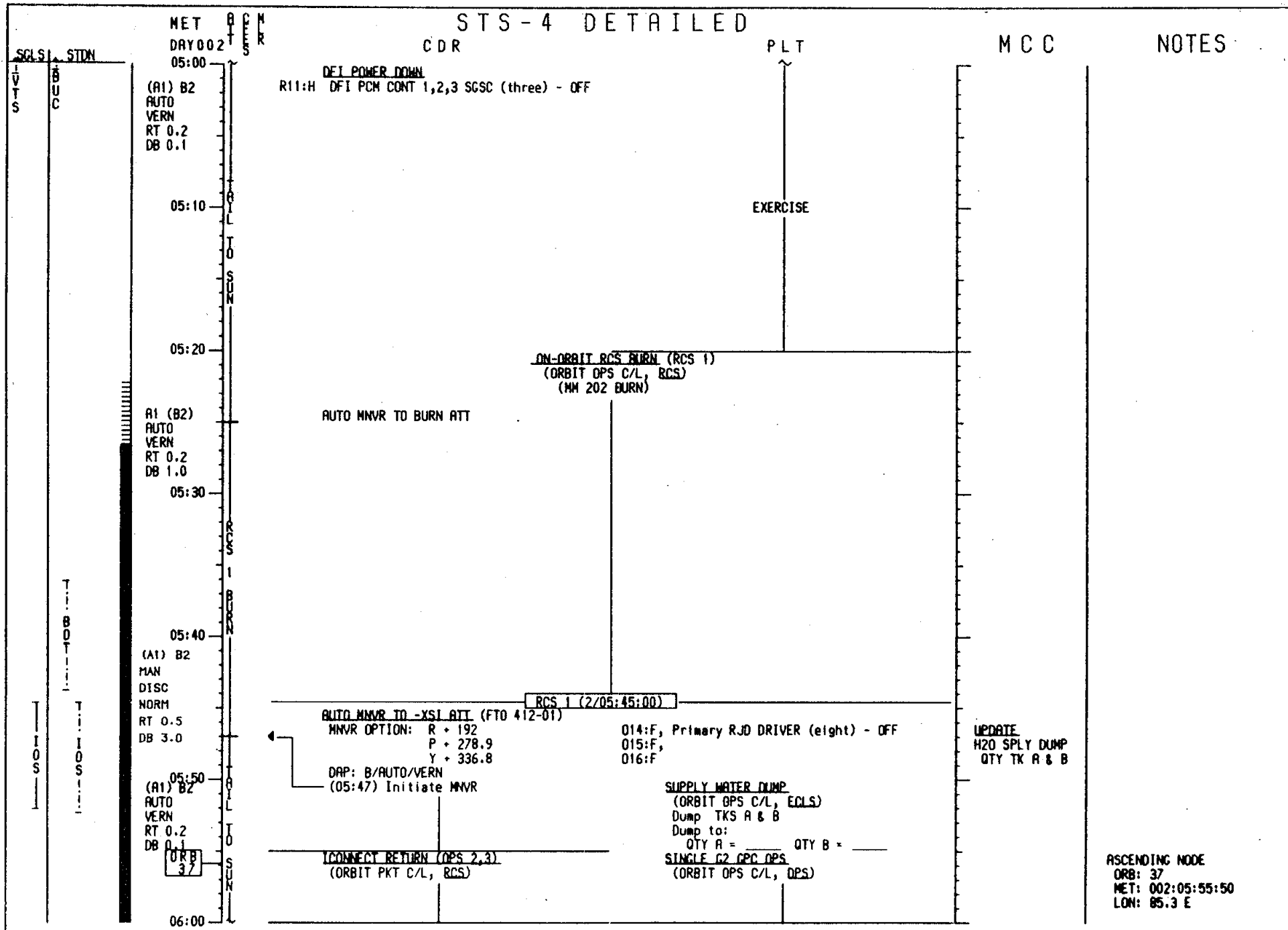
MET		STS-4 DETAILED		MCC		NOTES	
DAY 002		CDR	PLT				
SCLS STDN HTS HAN VTS NHS BDR DRR ACH T-BOTT (A1) 82 AUTO VERN RT 0.2 DB 0.1		00:00 00:10 00:20 00:30 00:40 00:50 01:00 MEAL MEAL					







STS-4 DETAILED		PLT	MCC	NOTES
CDR AUTO MNVR TO IMU ALIGN ATT IMU ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 22, ALTAIR -Z: 51, ATRIA ANG DIF: 84.0 STAR TRACKER COLD SOAK THERMAL RESPONSE (FTO 412-02) 06 STAR TRKR PWR (two) - OFF Record MET ____ / ____ : AUTO MNVR TO -XSL ATT (FTO 412-01) MNVR OPTION: R + 192 P + 278.9 Y + 336.8 DAP: B/AUTO/VERN (04:22) Initiate MNVR HOUSEKEEPING REPORT: IMU ALIGN RESULTS DEFI POWER UP (BUC) R11:H DEFI PCM CONT 1,2,3 SCSC (three) - ON		HOUSEKEEPING MEAL PREP (Cue Card) Prepare DAY 3, MEAL C EXERCISE	IMU ALIGN PAD TRK ID: _____, _____ ANG ERR _____ ANG 1 _____ 2 _____ 3 _____ Δ X _____ () _____ () _____ () _____ Δ Y _____ () _____ () _____ () _____ Δ Z _____ () _____ () _____ () _____ EXECUTION TIME: ____ / ____ : ____ : ____ UPLINK ORBITER S.V. UPDATE RCS 1 BURN PAD	Stars 22 & 51 available from 2/03:57 to 2/04:32 ASCENDING NODE ORB: 36 MET: 002:04:25:22 LON: 108.5 E RPT: IMU ALIGN RESULTS _____
SCLS STDN AI (B2) AUTO VERN RT 0.2 DB 1.0 04:00 04:10 04:20 04:30 04:40 04:50 05:00 ORB 36 (A1) B2 AUTO VERN RT 0.2 DB 0.1 HTS CHN TVTS CUCC	MET DAY 002 04:00 04:10 04:20 04:30 04:40 04:50 05:00			



MET		STS-4 DETAILED			MCC		NOTES
SGLS	STON	CDR	PLT				
DAY 002 06:00 (A1) B2 AUTO VERN RT 0.2 DB 0.1							
06:10							
06:20							
06:30		MEAL	MEAL				
06:40							
06:50							
07:00							

STS-4 DETAILED

CDR

PLT

MCC

NOTES

SCLS STDN

MET
DAY 002
07:00

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

07:10

07:20

07:30

07:40

07:50

08:00

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB PTV02)

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P70/06)

MCC ONLY
COORD C&M/FDA
LIMITS CLEANUP
FOR CREW SLEEP

FUEL CELL PURGE - AUTO (Cue Card)

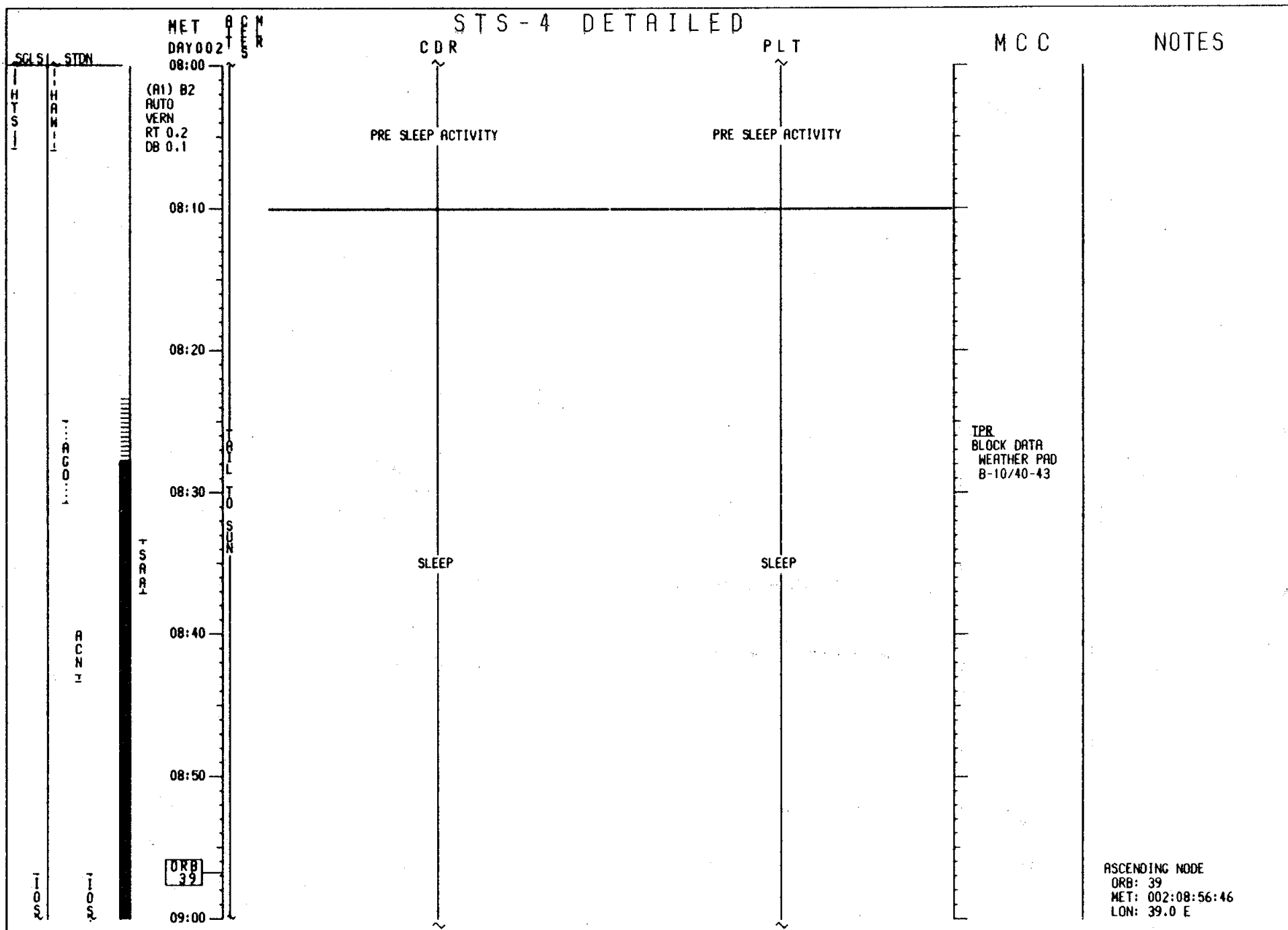
CO2 ABSORBER REPLACEMENT
(5 into A)

PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

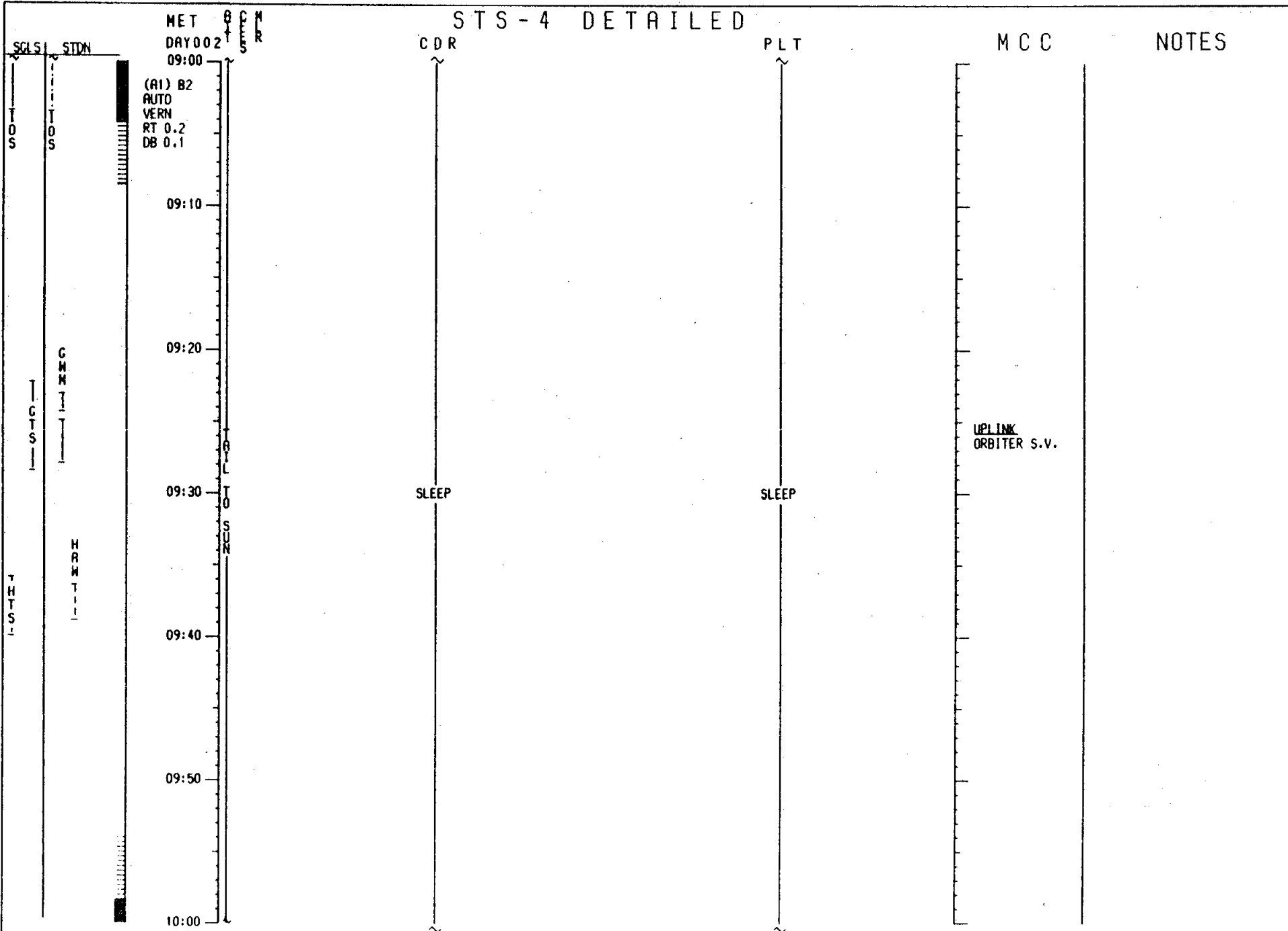
PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

ASCENDING NODE
ORB: 38
MET: 002:07:26:18
LON: 62.2 E

UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG



STS-4 DETAILED



STS - 4 DETAILED

MET DAY 002
10:00

ORB 40
(A1) B2
AUTO VERN
RT 0.2
DB 0.1
11:00

ORB 41
12:00

ORB 42
13:00

ORB 43
14:00

15:00

SUN

ACOL
GTS
CMM
ACOL
ACNR
DKNR
ACOL
DKNR
GTS
CMM
ACOL
DKNR
GTS
CMM

CDR

SLEEP

PLT

SLEEP

M C C

NOTES

ASCENDING NODE
ORB: 40
MET: 002:10:27:14
LON: 15.9 E

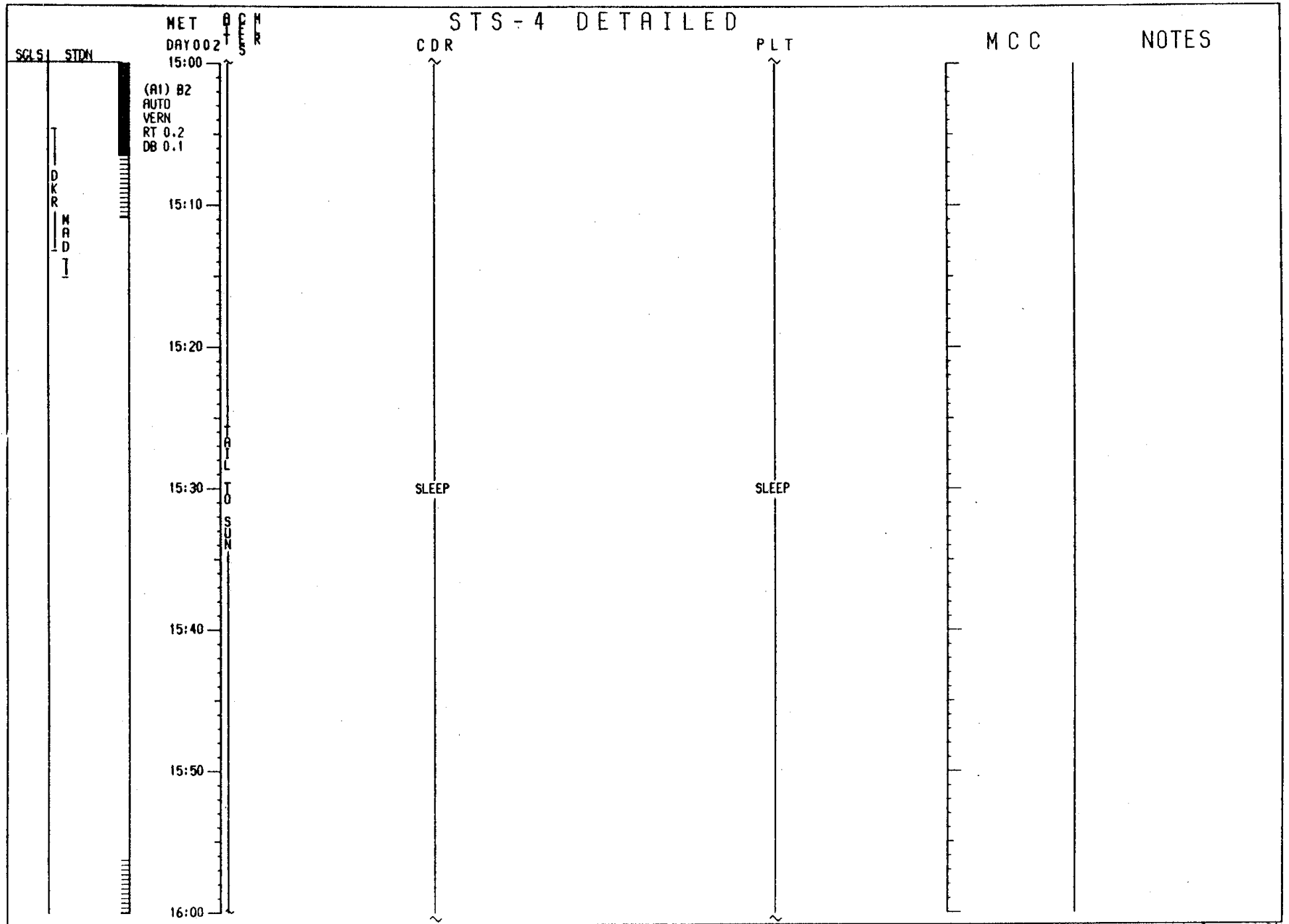
ASCENDING NODE
ORB: 41
MET: 002:11:57:41
LON: 7.2 W

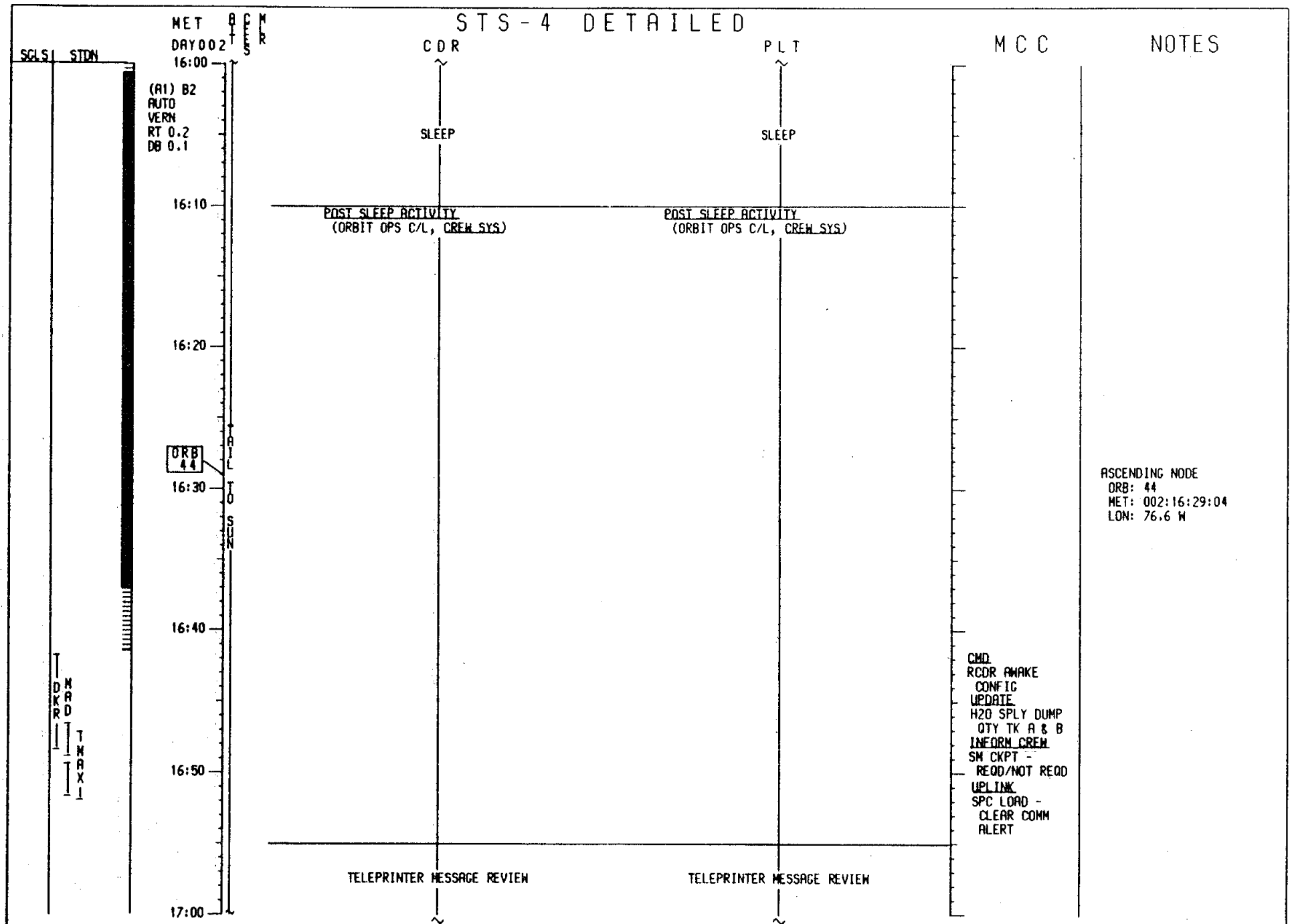
ASCENDING NODE
ORB: 42
MET: 002:13:28:09
LON: 30.3 W

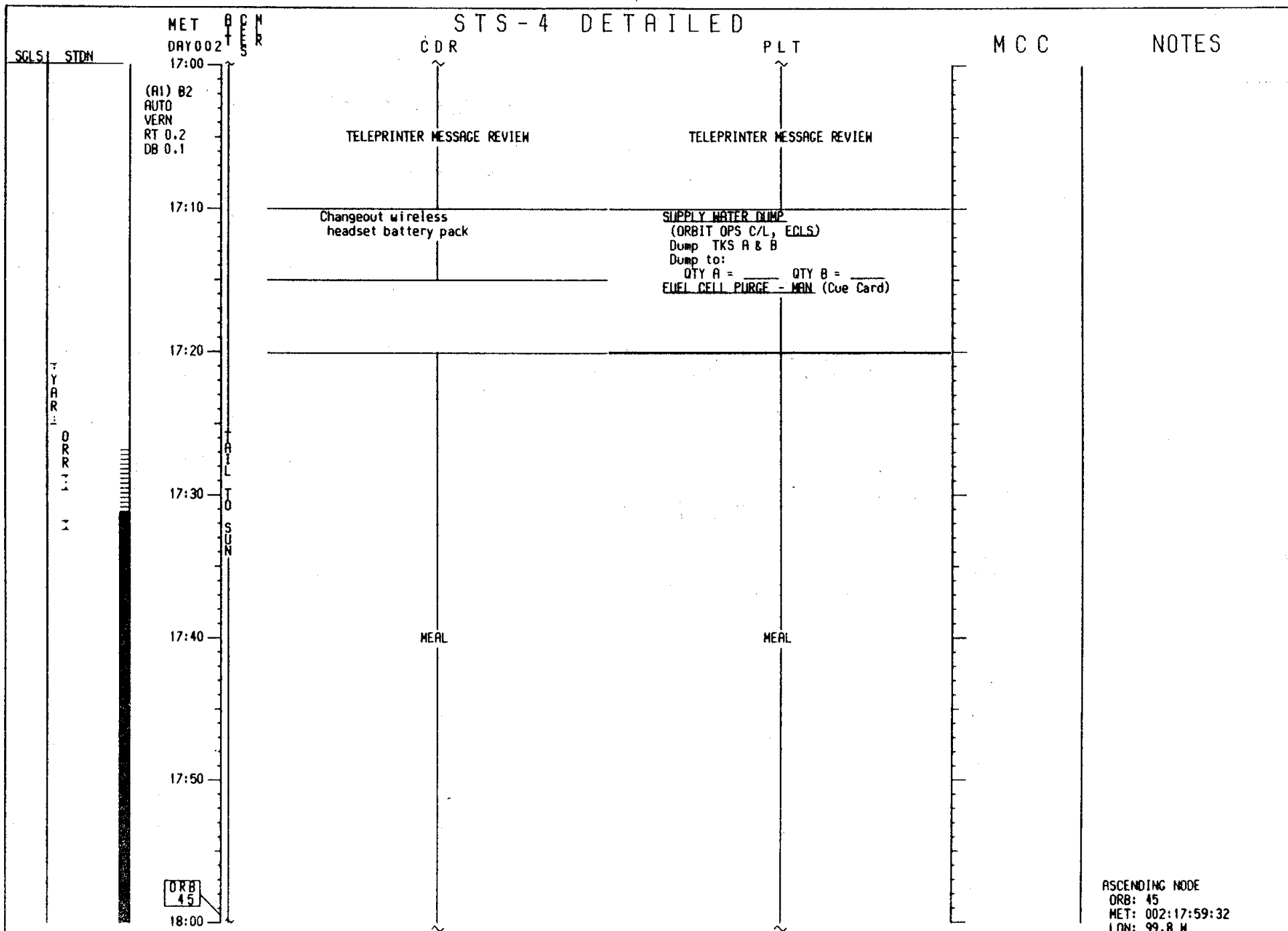
ASCENDING NODE
ORB: 43
MET: 002:14:58:37
LON: 53.5 M

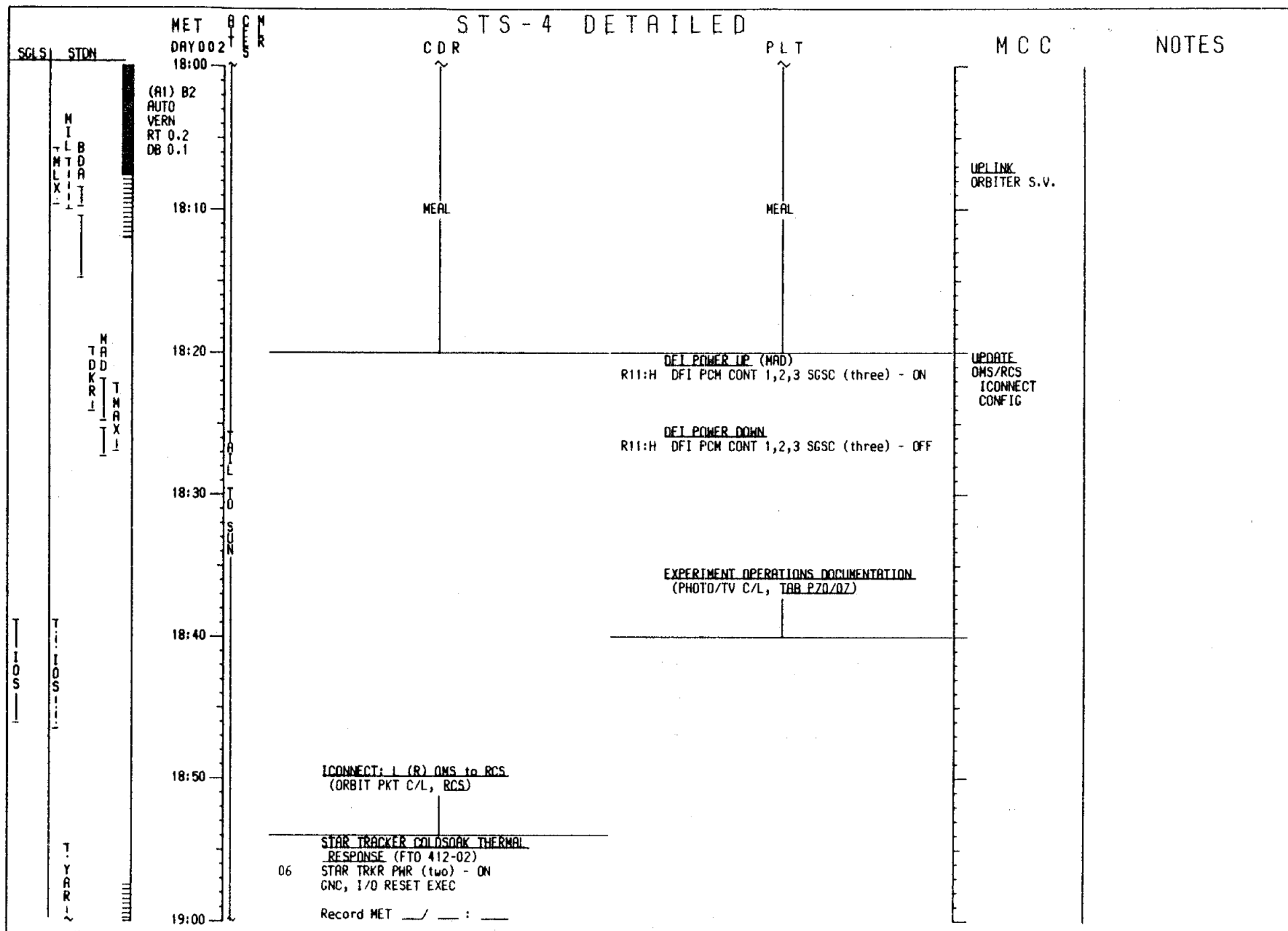
UPLINK
ORBITER S.V.

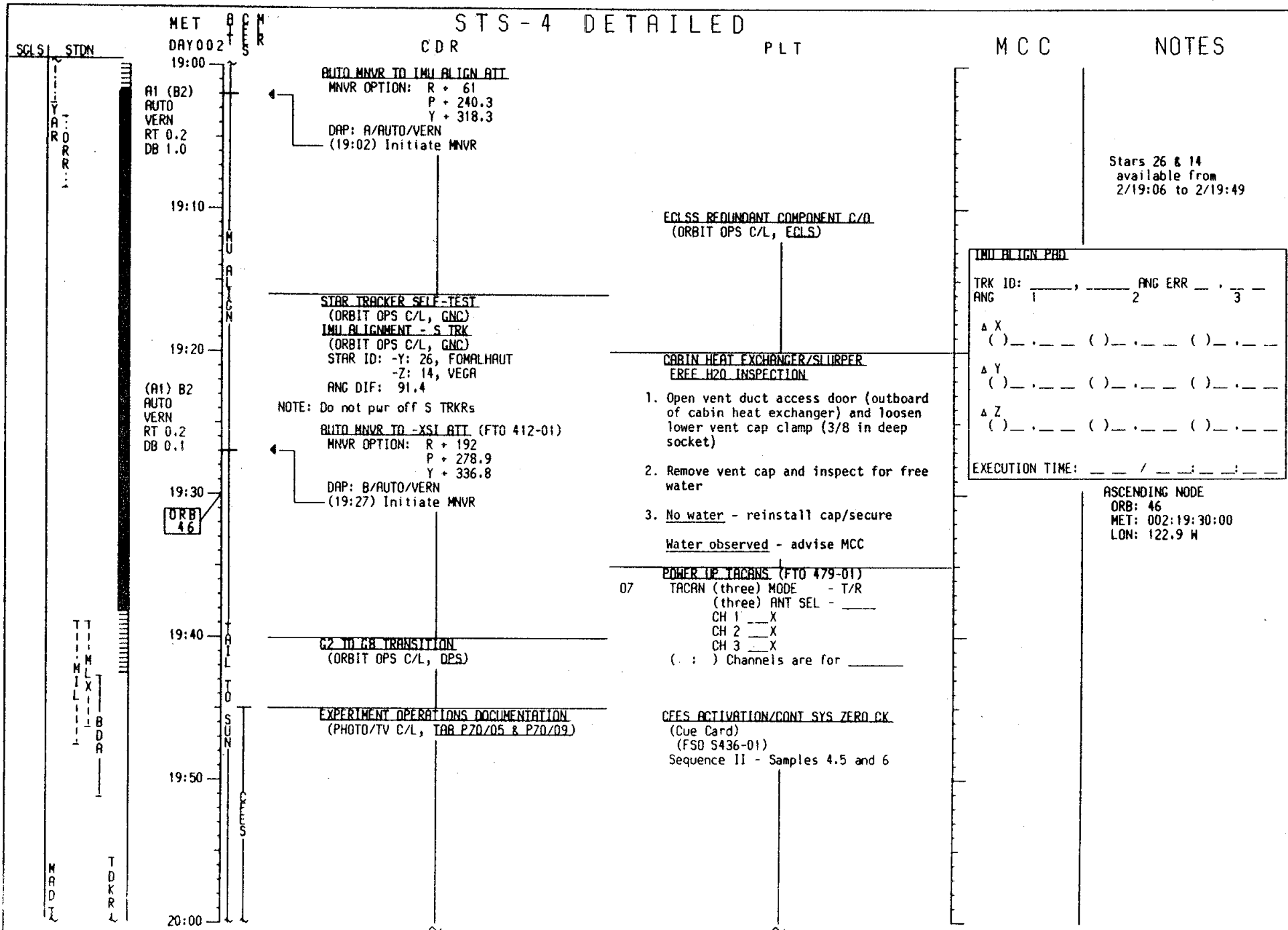
TPR
BLOCK DATA
WEATHER PAD
B-11/44-47

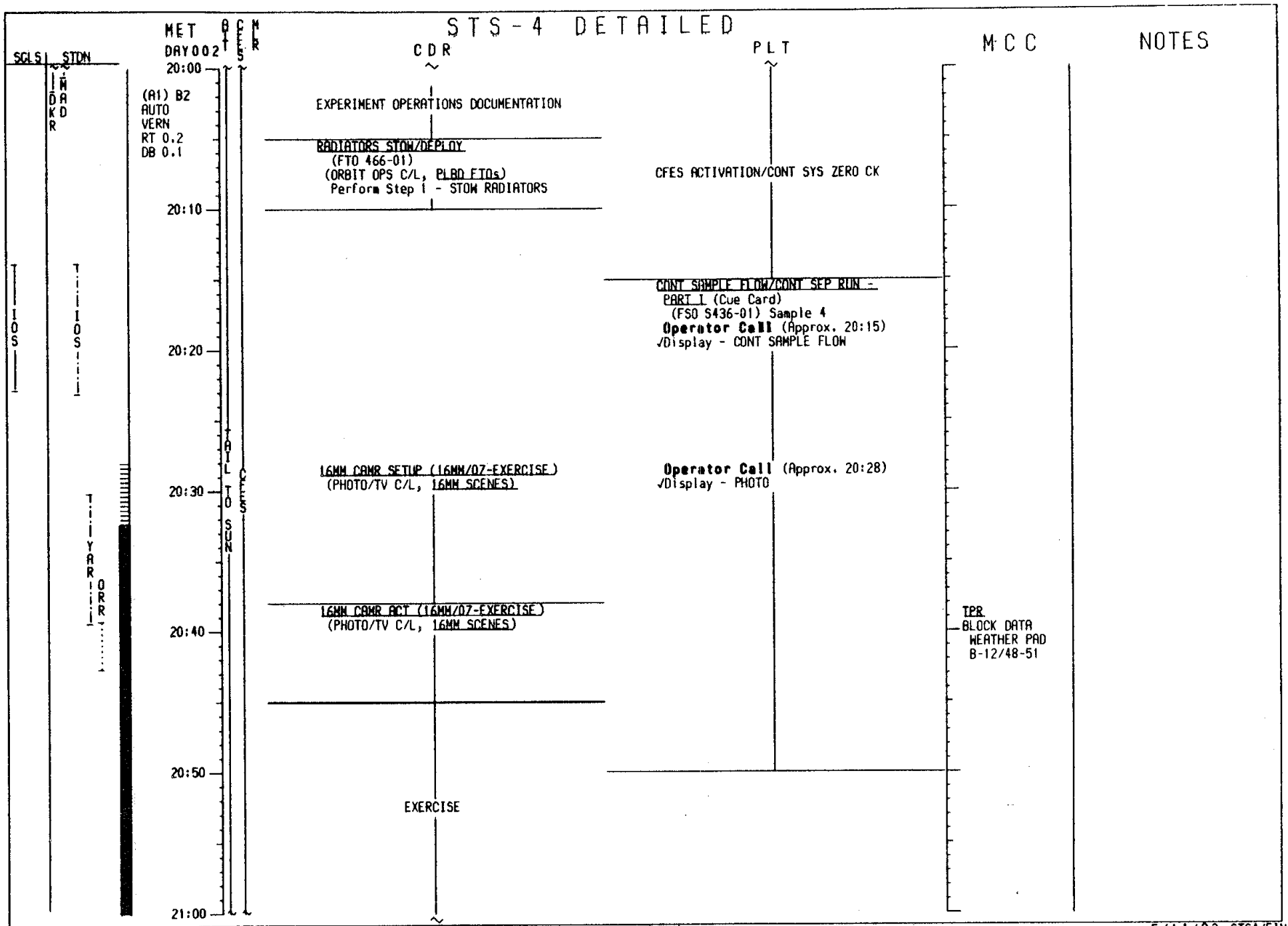












STS-4 DETAILED

MCC **PLT** **NOTES**

ASCENDING NODE
ORB: 47
MET: 002:21:00:27
LON: 146.0 W

MET DAY 002
21:00
ORB 47
(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

CDR

EXERCISE

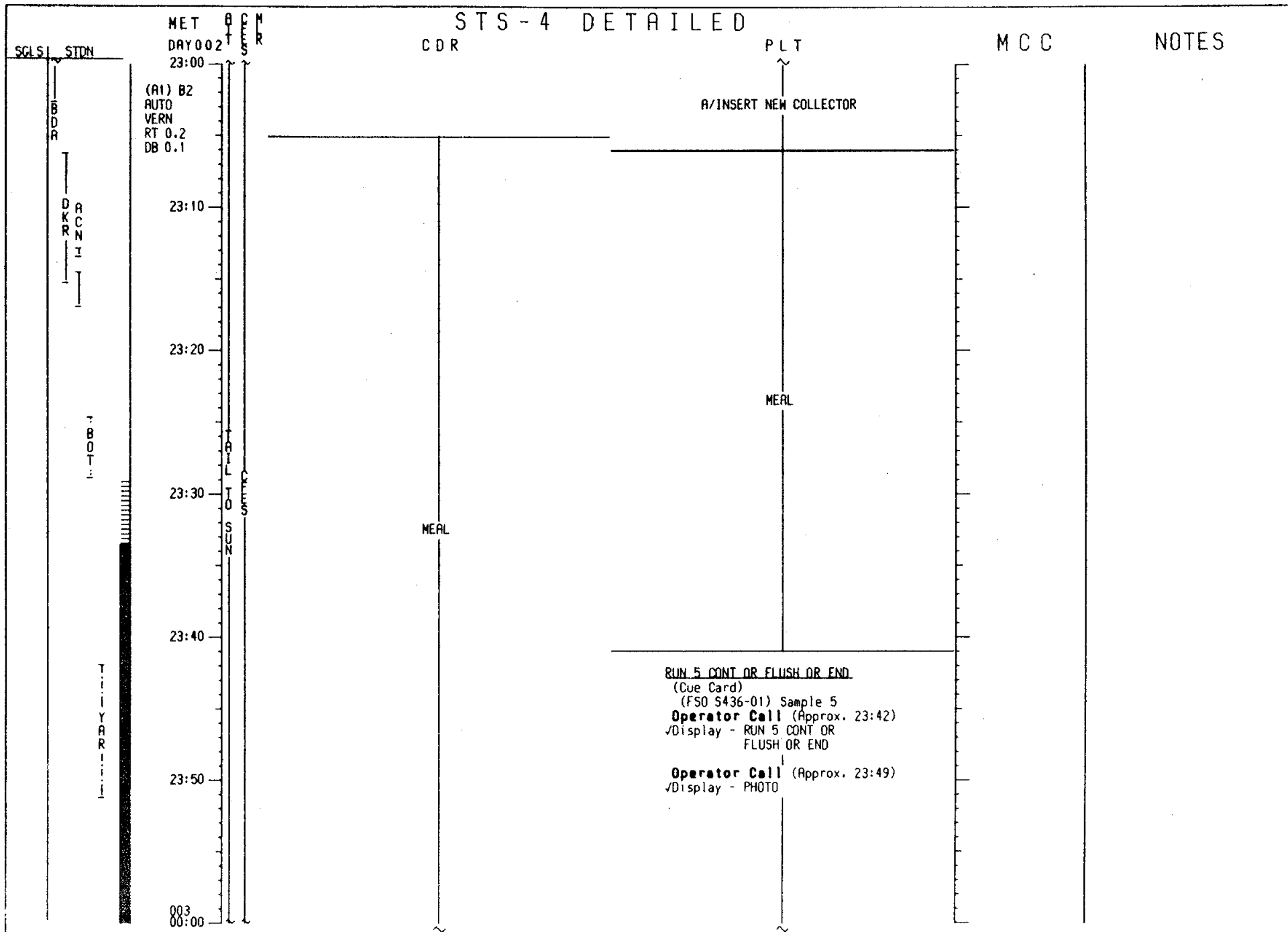
HOUSEKEEPING

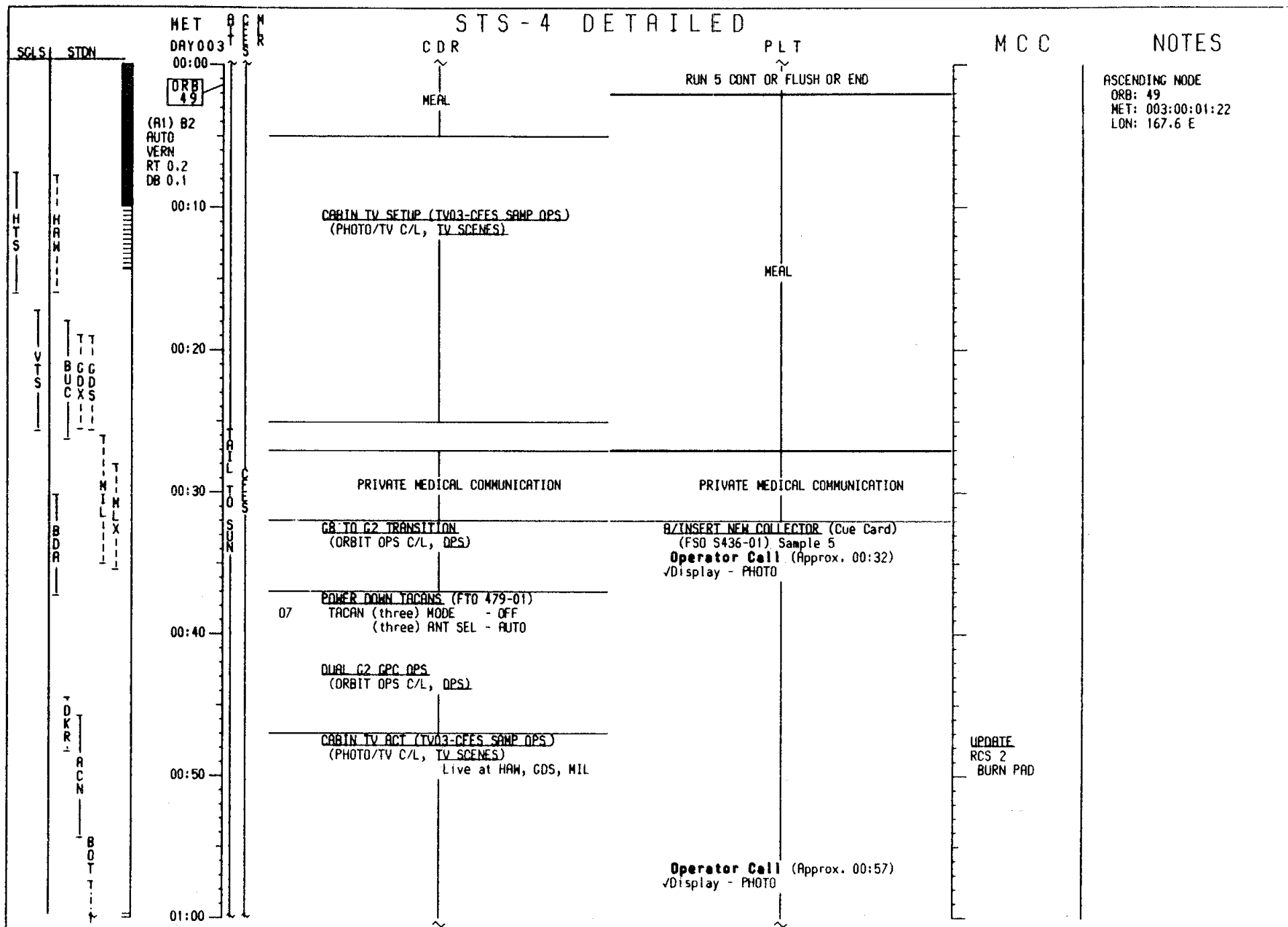
CONT SEP RUN - PART II (Cue Card)
(FSO S436-01) Sample 4
Operator Cell (Approx. 21:44)
√Display - PHOTO

TNHSI
BDA
DKR
DS
IOS

TIME
21:10
21:20
21:30
21:40
21:50
22:00

ASCENDING NODE
ORB: 47
MET: 002:21:00:27
LON: 146.0 W





STS-4 DETAILED

MCC

NOTES

SCLS STDN

MET

DAY 003

01:00

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

CDR

CABIN TV ACT
Live at HAM, GDS, MIL

PLT

A/INSERT NEW COLLECTOR

01:10

A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0

AUTO MNVR TO BURN ATT

ON-ORBIT RCS BURN (RCS 2)
(ORBIT OPS C/L, RCS)
(HM 202 BURN)

01:20

A1 (B2)
AUTO
NORM
RT 0.2
DB 5.0

01:30

ORB
50

A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0

014:F, Primary RJO DRIVER (eight) - OFF
015:F,
016:F

AUTO MNVR TO POST BURN ATT
(Use PAD ATT)
DAP: A/AUTO/VERN
Initiate MNVR

RCS 2 (3/01:32:00)

SINGLE G2 OPC OPS
(ORBIT OPS C/L, OPS)

01:40

RUN 6 CONT OR FLUSH OR END

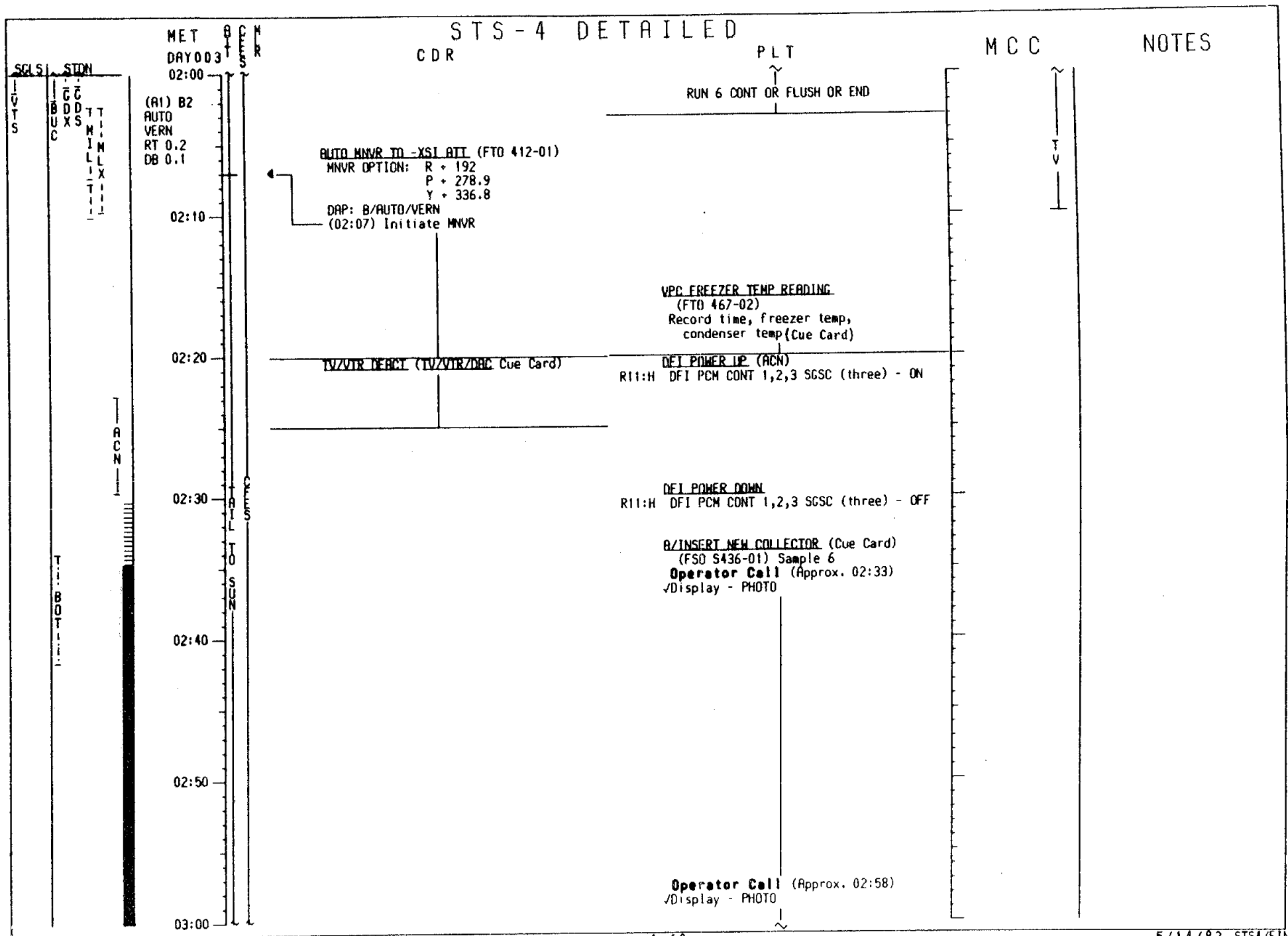
(Cue Card)
(FSO 5436-01) Sample 6
Operator Call (Approx. 01:43)
√Display - RUN 6 CONT OR
FLUSH OR END

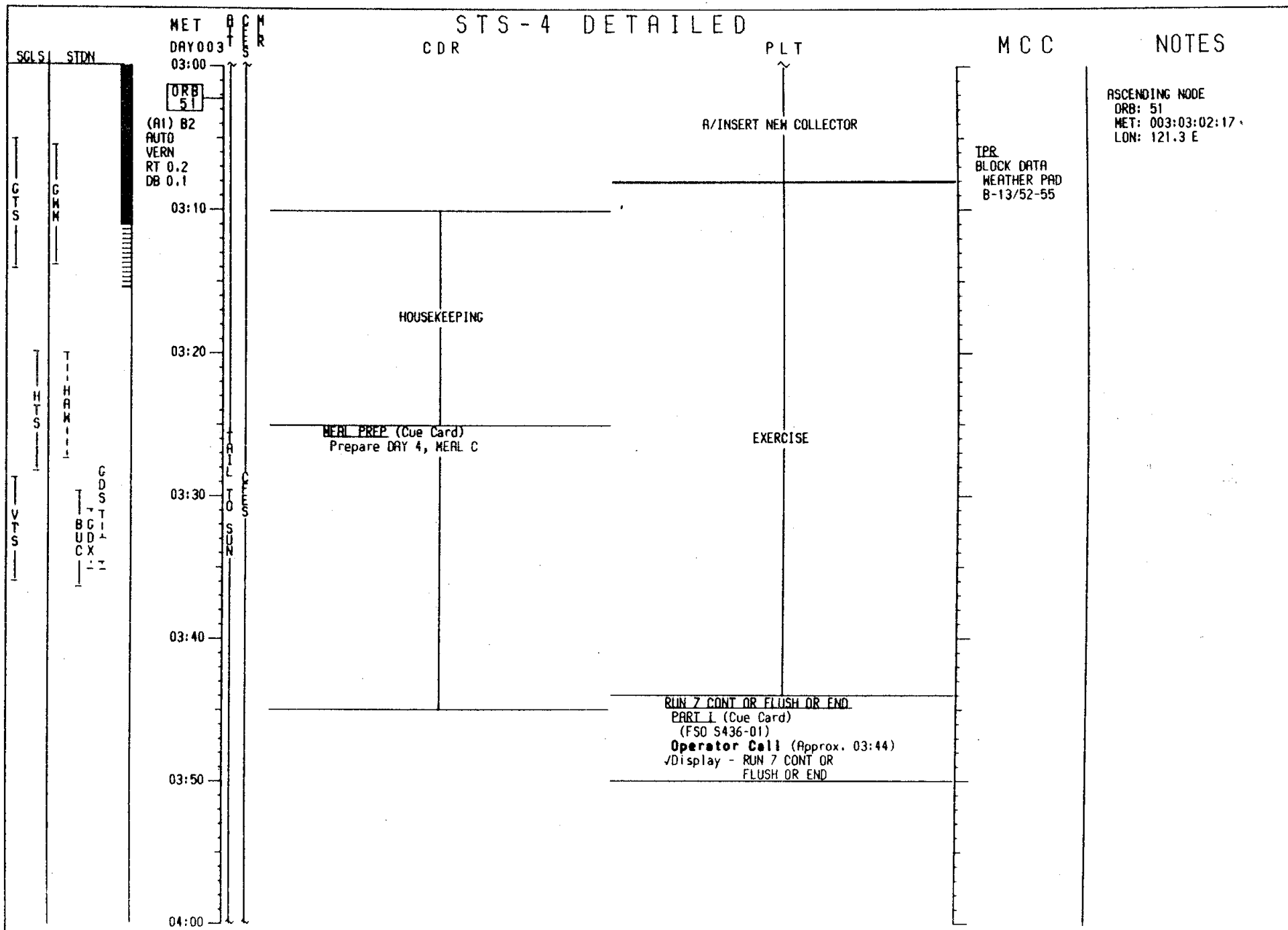
01:50

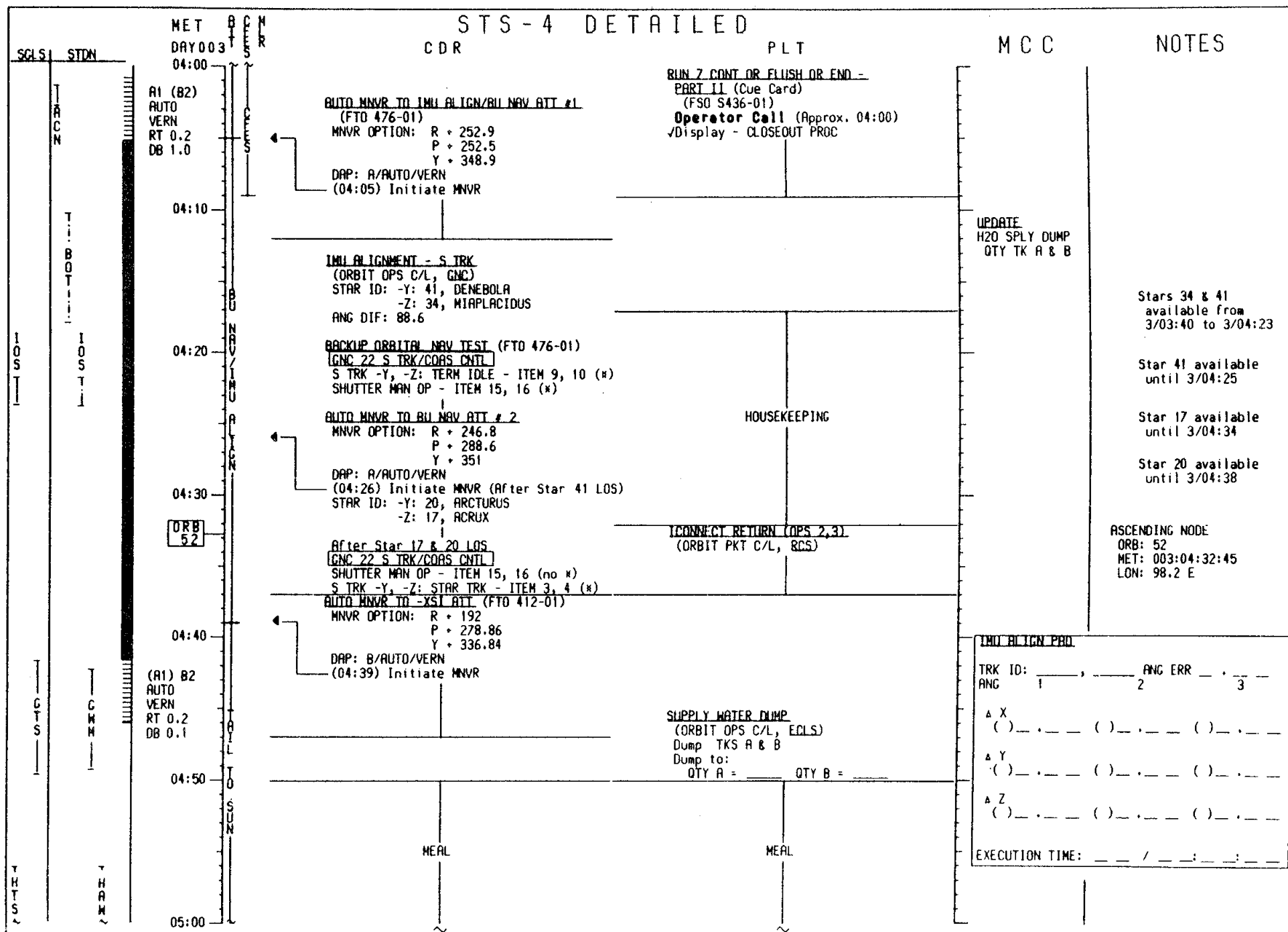
Operator Call (Approx. 01:50)
√Display - PHOTO

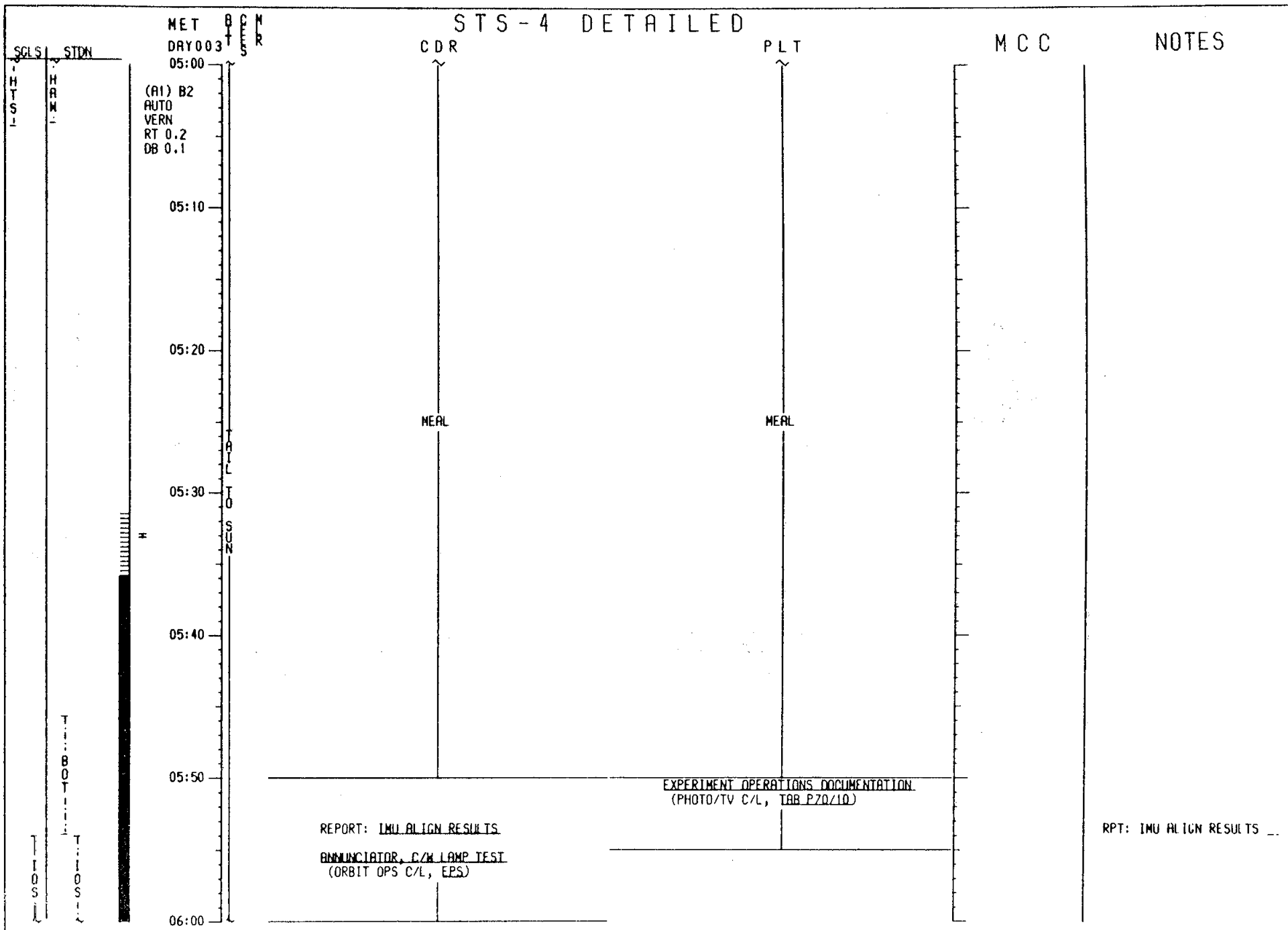
02:00

ASCENDING NODE
ORB: 50
MET: 003:01:31:50
LON: 144.4 E









STS-4 DETAILED		MCC	NOTES
CDR		PLT	
FIRE/SMOKE DETECT/SUPPRESS TEST (ORBIT OPS C/L, EPS)		CO2 ABSORBER REPLACEMENT (6 into B)	
FUEL CELL PURGE - AUTO (Cue Card)		MCC ONLY COORD C&W/FDA LIMITS CLEANUP FOR CREW SLEEP	
PRE SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)		PRE SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	
UP LINK SPC LOAD - 1ST COMM ALERT		CMD RCDR SLEEP CONFIG	

STS-4 DETAILED

SGLS STDN

MET DAY 003
07:00

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

T S A R A I

07:10

07:20

07:30

07:40

07:50

08:00

CDR

PLT

MCC

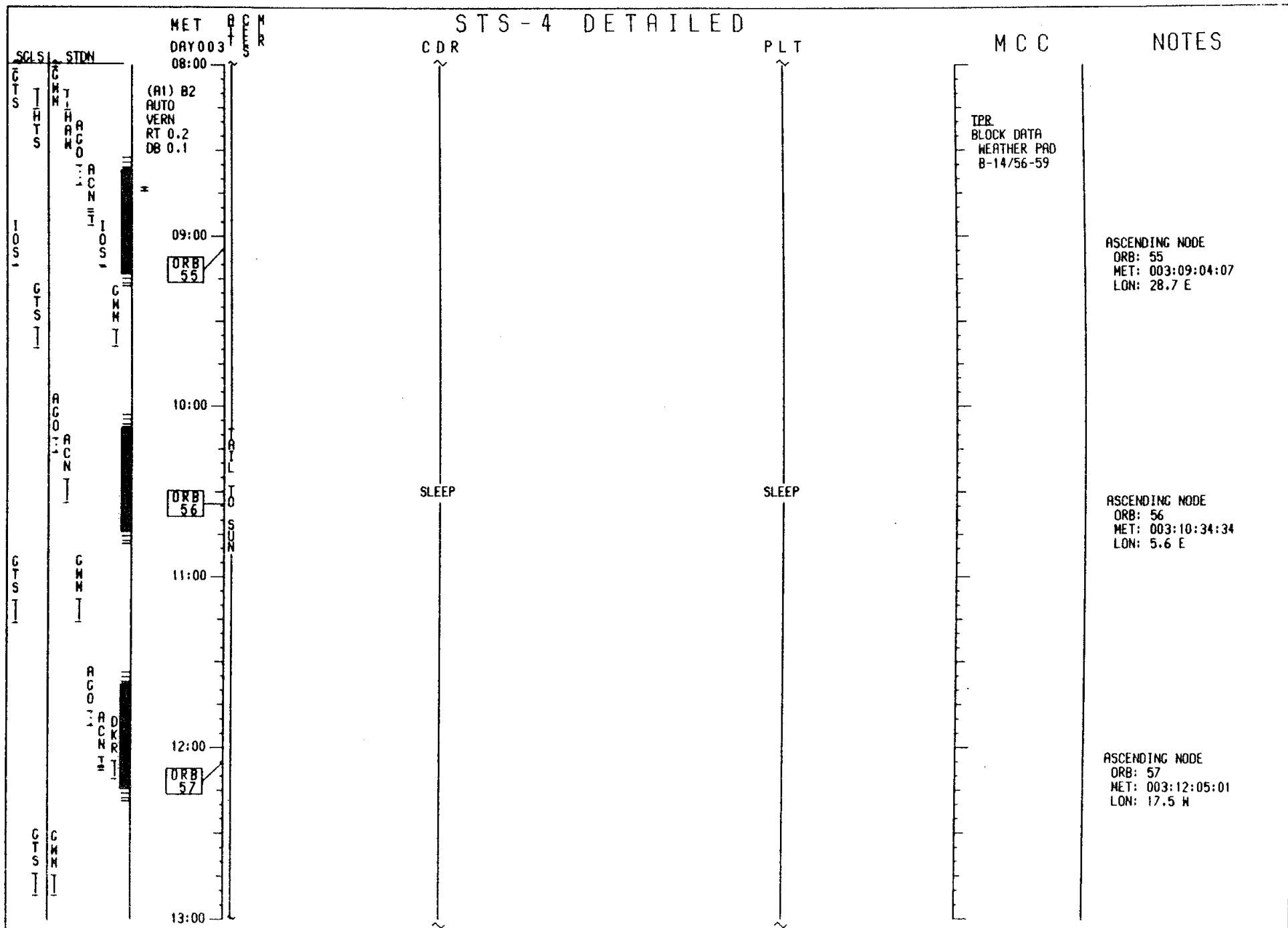
NOTES

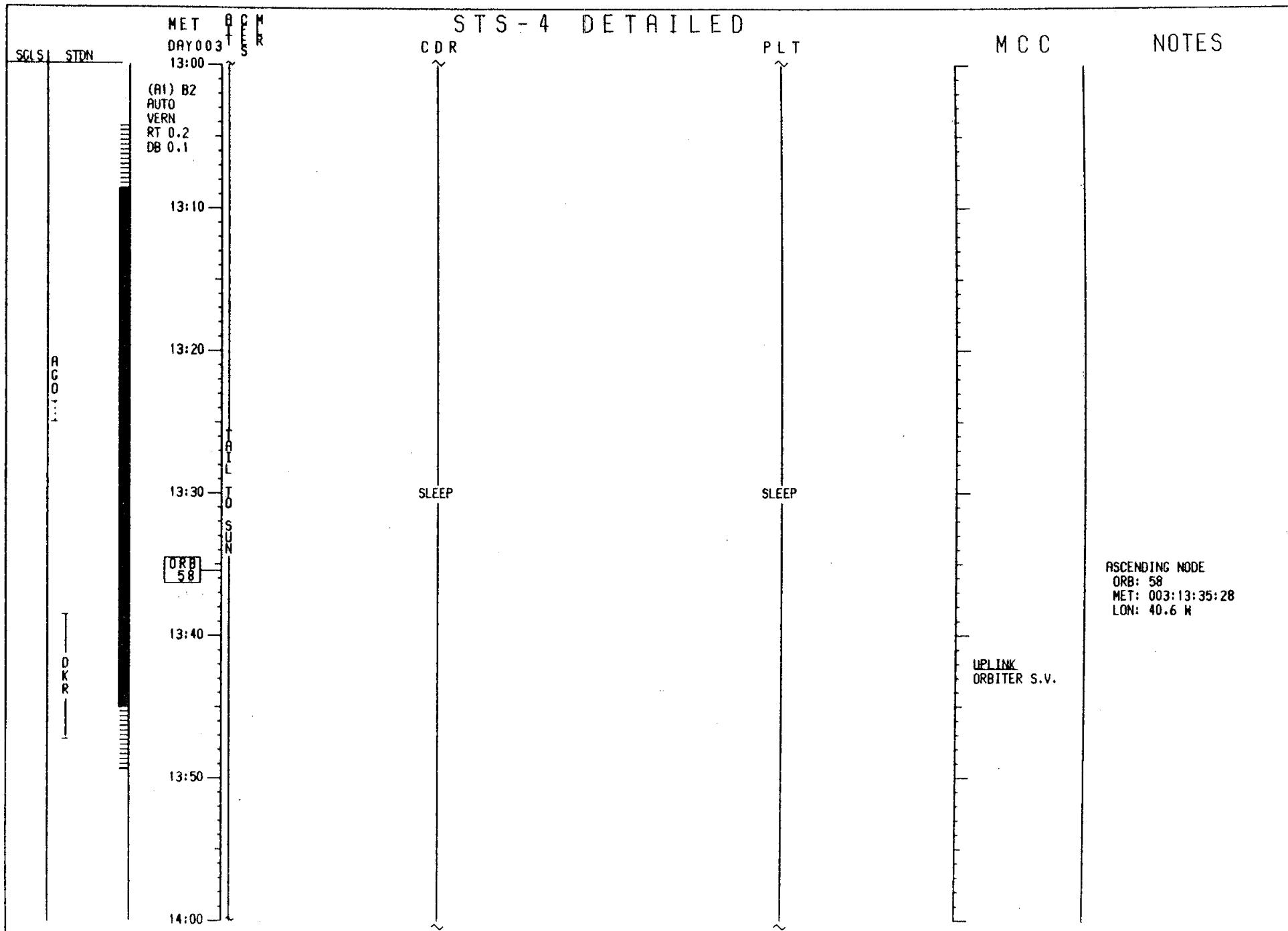
SLEEP

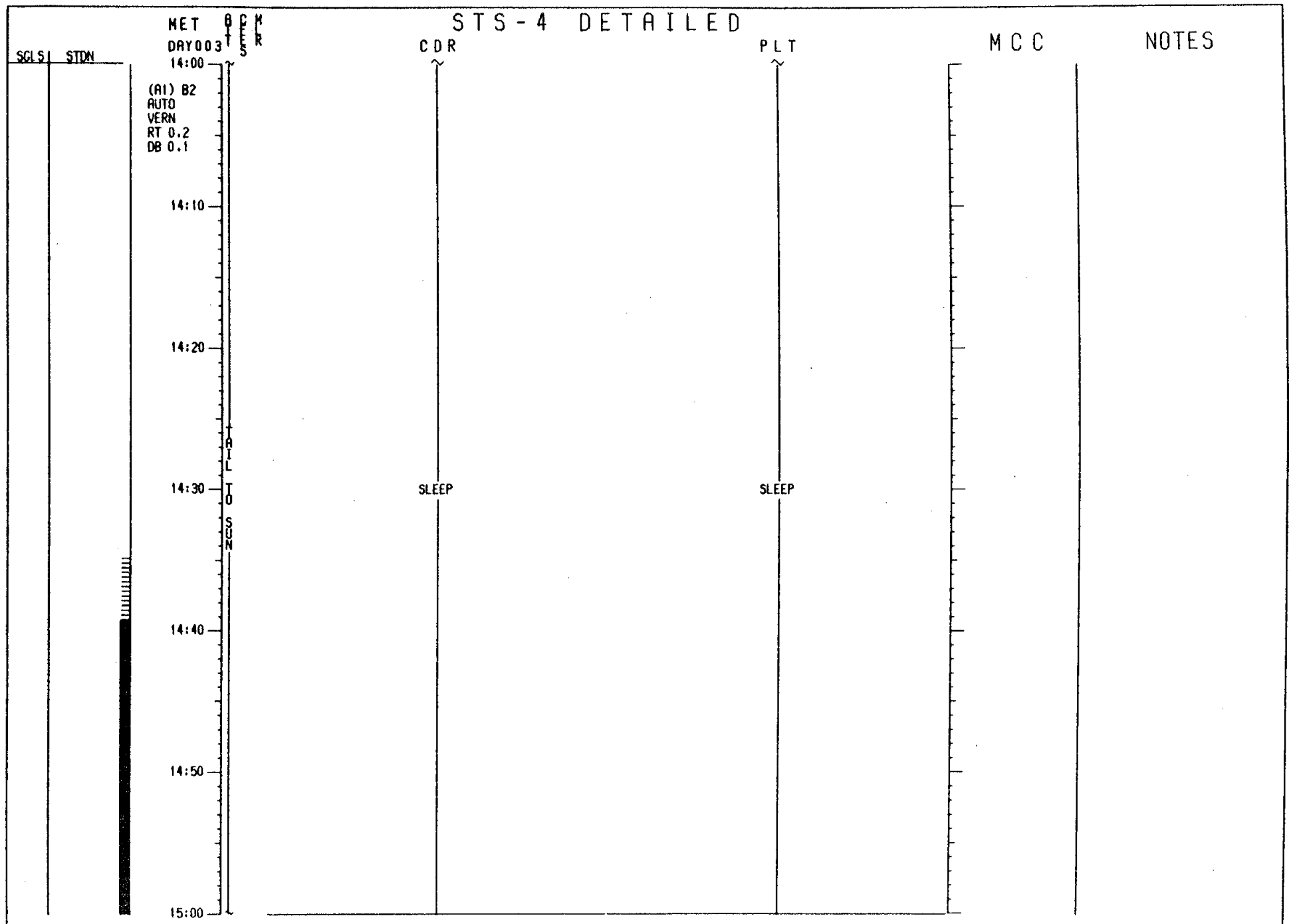
SLEEP

ASCENDING NODE
ORB: 54
MET: 003:07:33:39
LON: 51.9 E

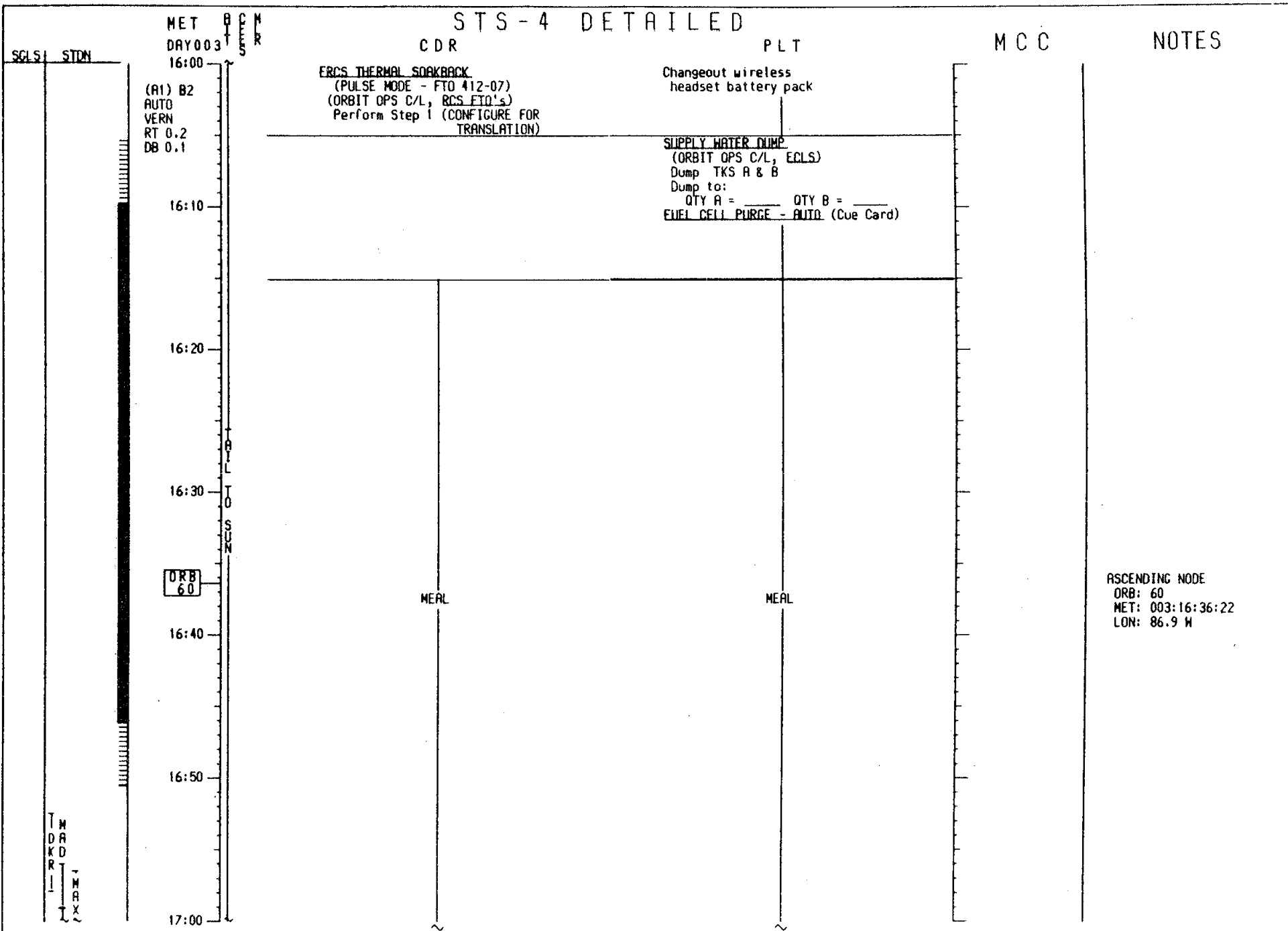
UPLINK
ORBITER S.V.







5/14/82 STS4/FIN



STS-4 DETAILED

MET DAY003 17:00

CDR PLT MCC NOTES

MEAL MEAL

EXPERIMENT OPERATIONS DOCUMENTATION (PHOTO/TV C/L, TAB P20/11)

UPDATE OMS/RCS ICONNECT CONFIG

ICONECT: I (R) OMS to RCS (ORBIT PKT C/L, RCS)

AUTO MNVR TO IMU ALIGN ATT
MNVR OPTION: R + 241.7
P + 307.6
Y + 353.1
DAP: A/AUTO/VERN
(17:37) Initiate MNVR

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 42, ALPHECCA
-Z: 15, HADAR
ANG DIF: 89.1

Stars 42 & 15 available from 3/17:30 to 3/18:10

IMU ALIGN PRO

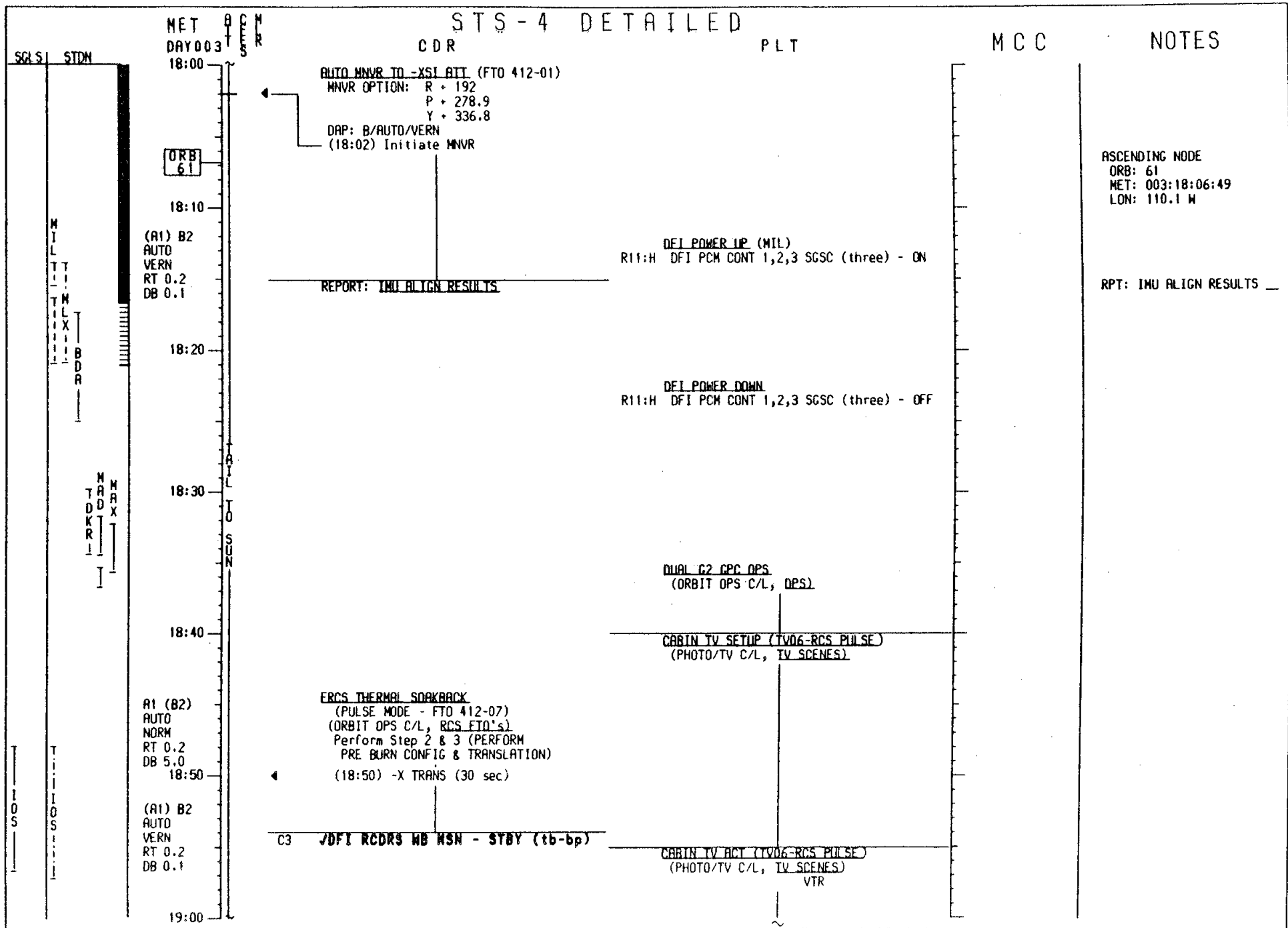
TRK ID: 1, 2, 3 ANG ERR

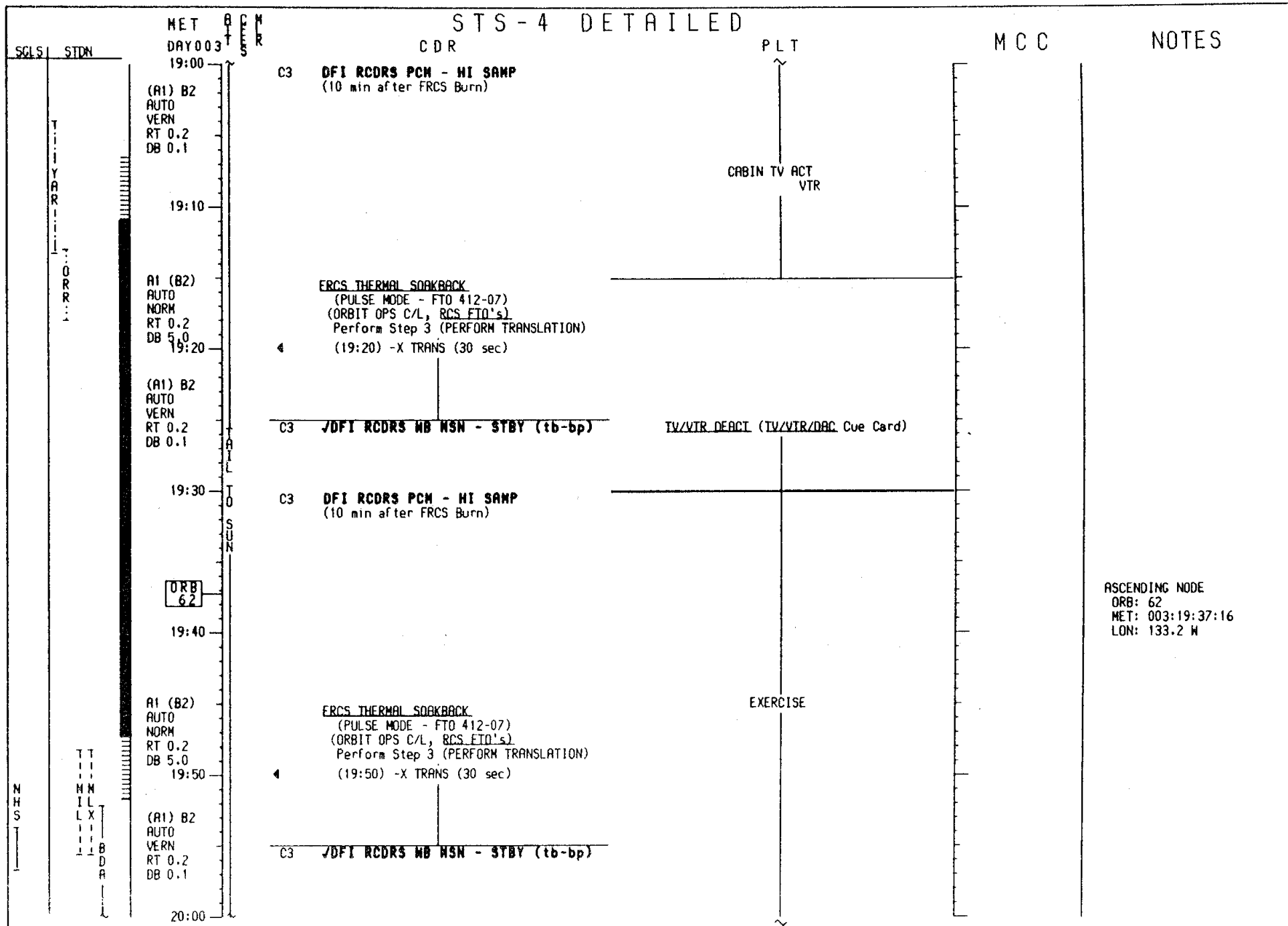
Δ X () () ()

Δ Y () () ()

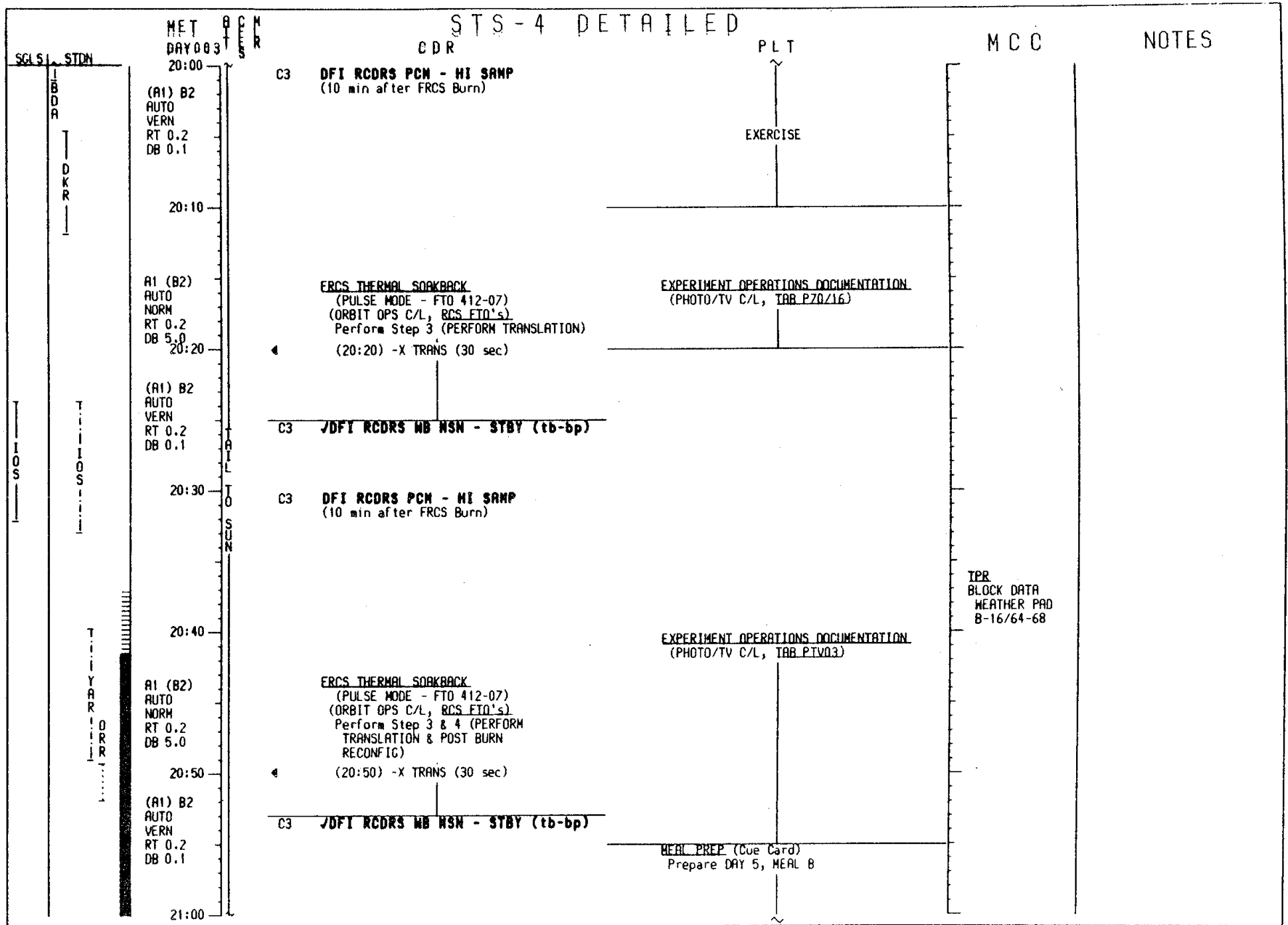
Δ Z () () ()

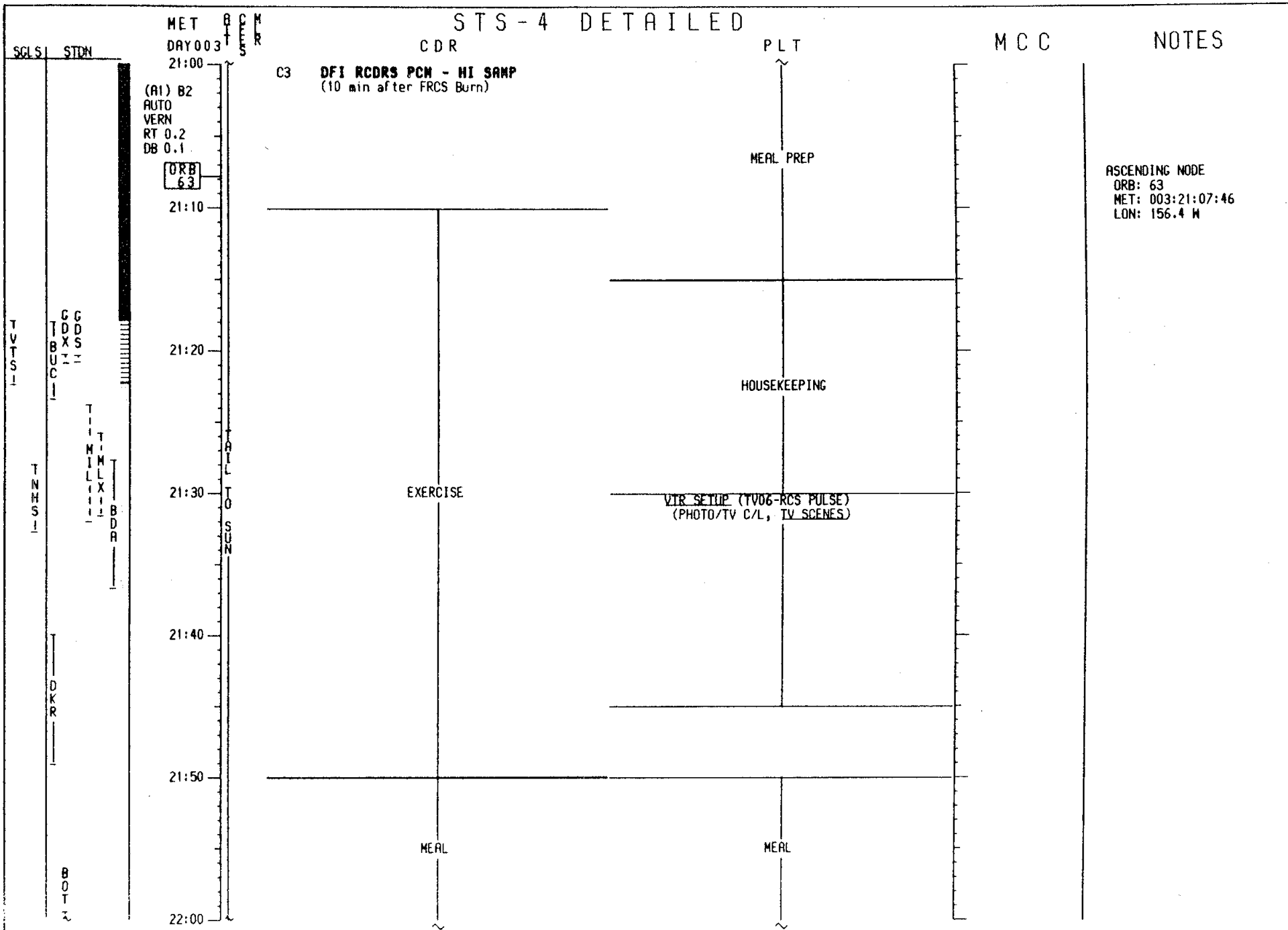
EXECUTION TIME: / : :





ASCENDING NODE
ORB: 62
MET: 003:19:37:16
LON: 133.2 W





STS-4 DETAILED

MET DAY 003	CDR	PLT	MCC	NOTES
22:00	(R1) B2 AUTO VERN RT 0.2 DB 0.1			
22:10				
22:20				
22:30	MEAL	MEAL		
22:40				ASCENDING NODE ORB: 64 MET: 003:22:38:13 LON: 179.5 W
22:50	HOUSEKEEPING	VTR PLAYBACK (TV06-RCS PULSE) (PHOTO/TV C/L, TV SCENES) VTR at MIL (23:00-23:09)	UPLINK ORBITER S.V.	
23:00				

ASCENDING NODE
ORB: 64
MET: 003:22:38:13
LON: 179.5 W

UPLINK
ORBITER S.V.

STS-4 DETAILED

MET
DAY 003

CDR

PLT

MCC

NOTES

23:00

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

HOUSEKEEPING

VTR PLAYBACK
VTR at MIL

23:10

TV/VTR DEACT (TV/VTR/DAC Cue Card)

23:20

A16 (B2)
AUTO
NORM
RT 0.2
DB 0.1

PRCS ATT HOLD TEST (ACN)
(FTO 477-01)
(ORBIT OPS C/L, GNC FTO's)

UPDATE
TACAN DATA

23:30

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

23:40

TACAN TRACKING
(FTO 479-01)
(ORBIT OPS C/L, GNC FTO's)

A1 (B2)
AUTO
NORM
RT 0.2
DB 5.0

G2 TO G8 TRANSITION

23:50

16MM CAMR SETUP (16MM/08-AUTO MNVR)
(PHOTO/TV C/L, 16MM SCENES)

TRACK TACAN SITE

004
00:00

MET
DAY 004
00:00

STS-4 DETAILED

PLT

MCC

NOTES

R1 (B2)
AUTO
VERN
RT 0.2
DB 1.0

ORB
65

(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

00:10

00:20

00:30

00:40

00:50

01:00

16MM CAMR ACT (16MM/08-AUTO MNVR)
(PHOTO/TV C/L, 16MM SCENES)

G8 TO G2 TRANSITION

TACAN TRACKING

AUTO MNVR TO -XST ATT (FTO 412-01)

MNVR OPTION: R + 192
P + 278.9
Y + 336.8

DAP: B/AUTO/VERN
(00:12) Initiate MNVR

16MM CAMR DEACT (16MM/08-AUTO MNVR)
(PHOTO/TV C/L, 16MM SCENES)

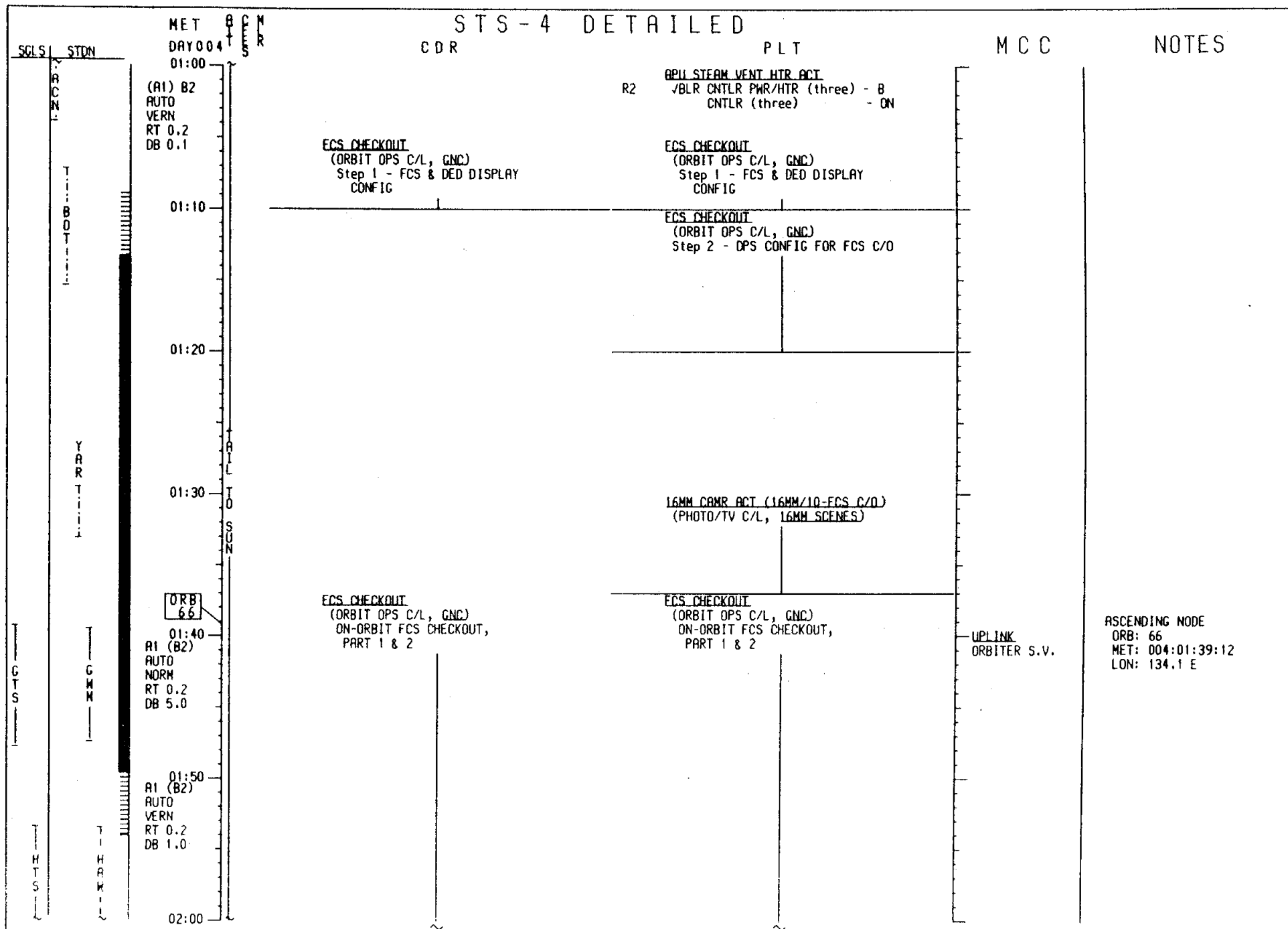
PRIVATE MEDICAL COMMUNICATION

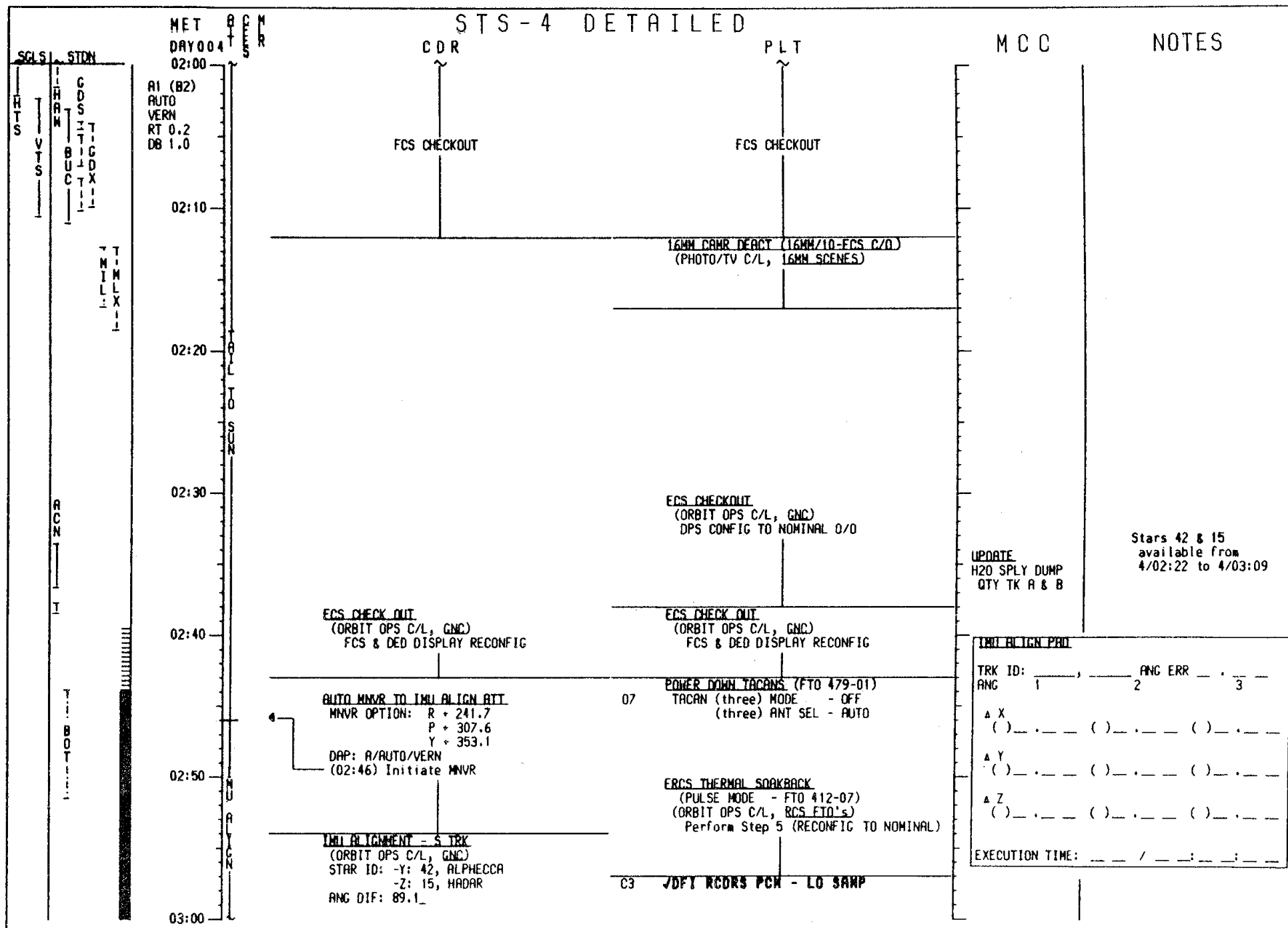
PRIVATE MEDICAL COMMUNICATION

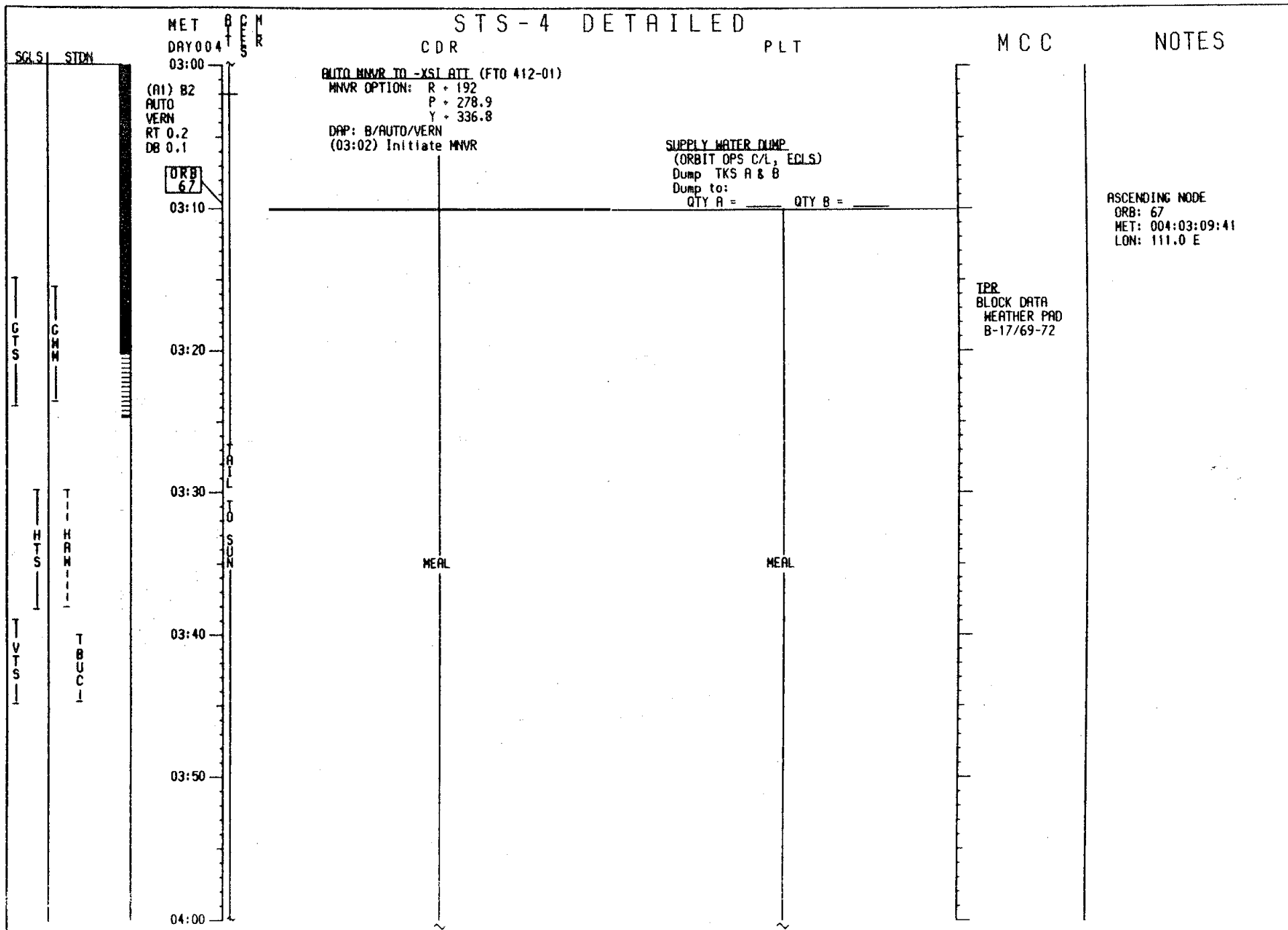
16MM CAMR SETUP (16MM/10-ECS C/O)
(PHOTO/TV C/L, 16MM SCENES)

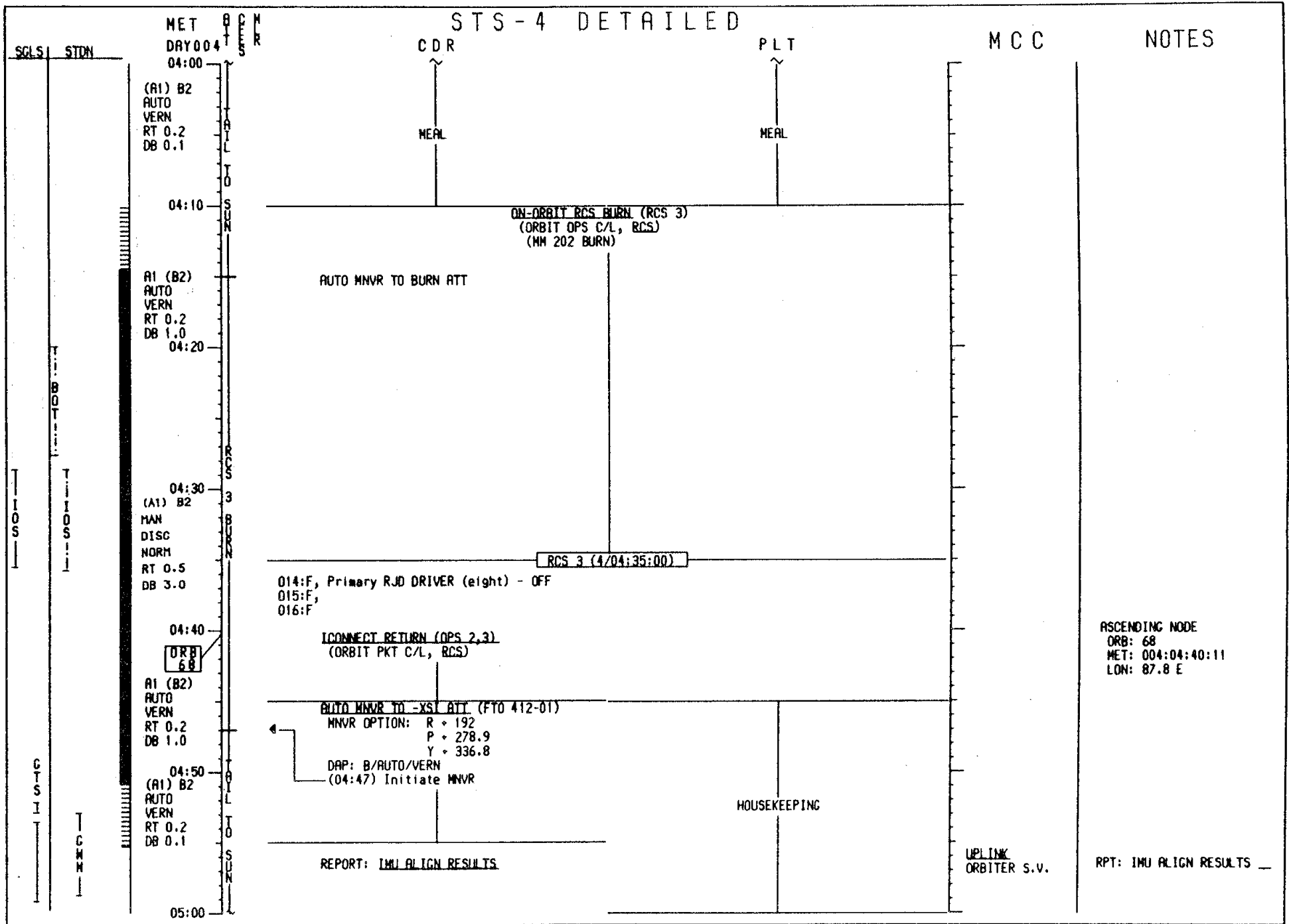
07 POWER UP TACANS (FTO 479-01)
TACAN (three) MODE - T/R
(three) ANT SEL - ____
CH 1 ____X
CH 2 ____X
CH 3 ____X
(:) Channels are for ____

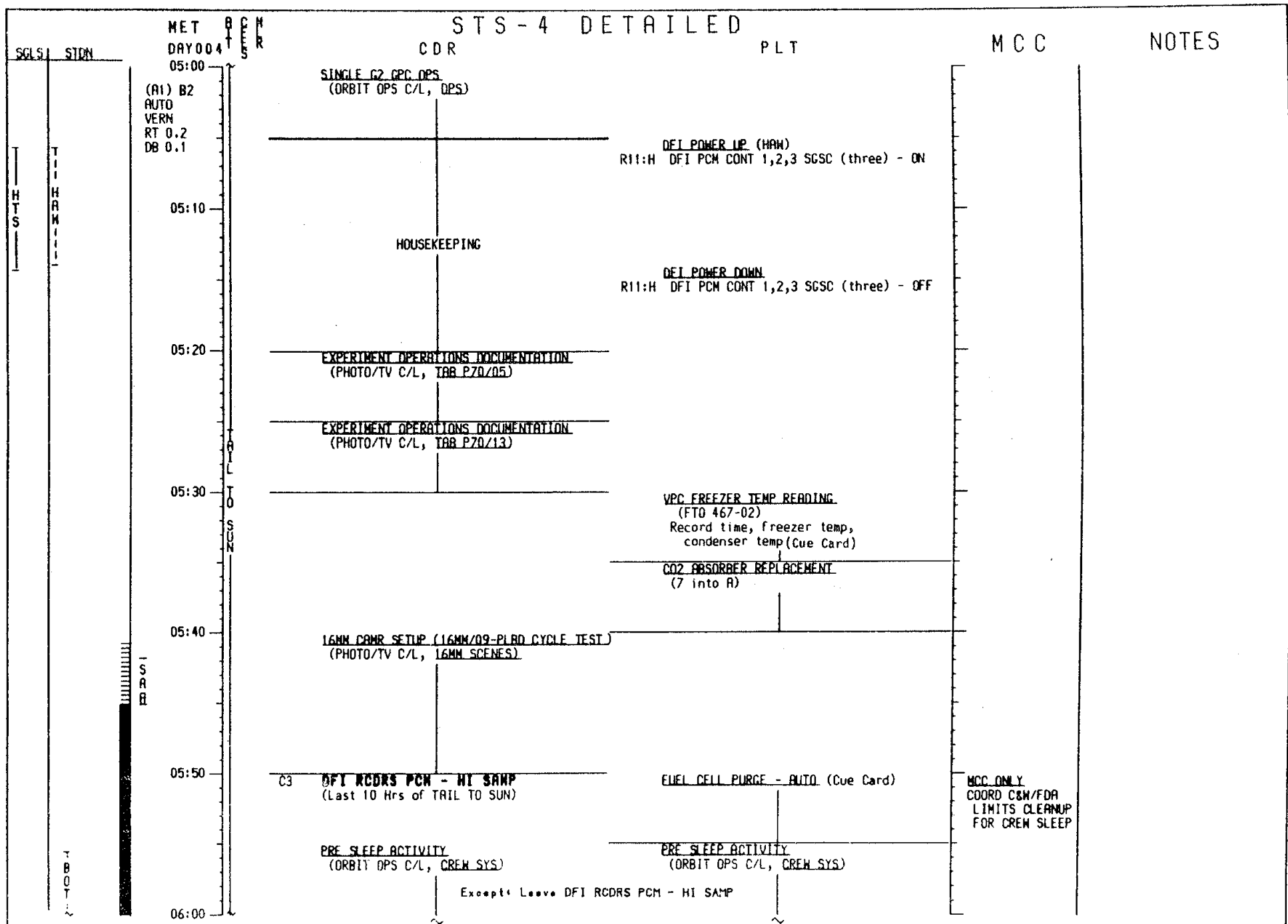
ASCENDING NODE
ORB: 65
MET: 004:00:08:43
LON: 157.3 E











STS - 4 DETAILED

M C C

NOTES

ASCENDING NODE
ORB: 69
MET: 004:06:10:40
LON: 64.7 E

UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG

CDR

PLT

PRE SLEEP ACTIVITY

PRE SLEEP ACTIVITY

SLEEP

SLEEP

MET 06:00
DAY 004
(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

06:10 -

URB
69

06:20 —

06:30 —

06:40 —

06:50 —

07:00 —

STS-4 DETAILED

SGLS STDW

MET DAY 004
07:00

(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

07:10

07:20

07:30

07:40

07:50

08:00

CDR

SLEEP

PLT

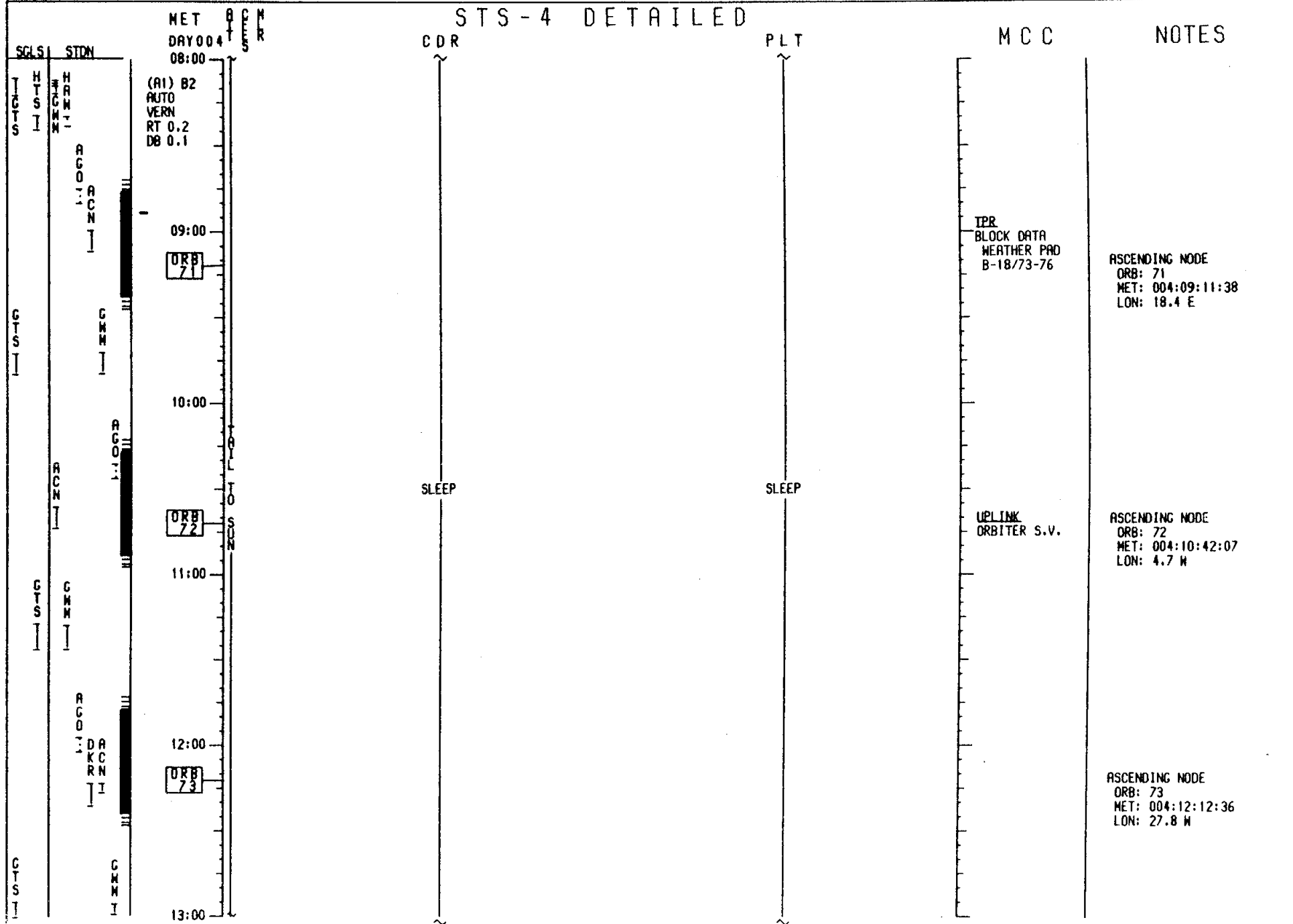
SLEEP

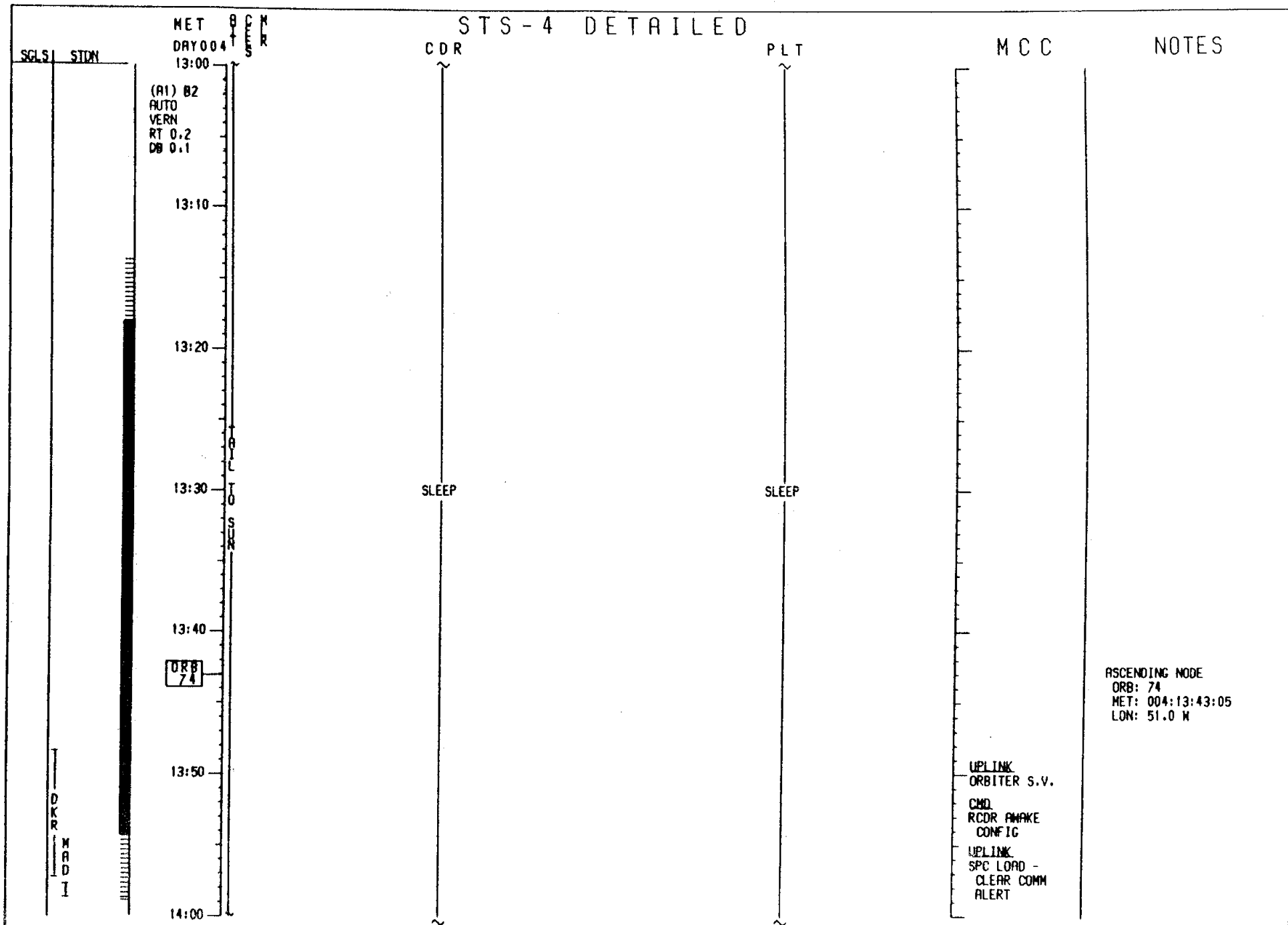
MCC

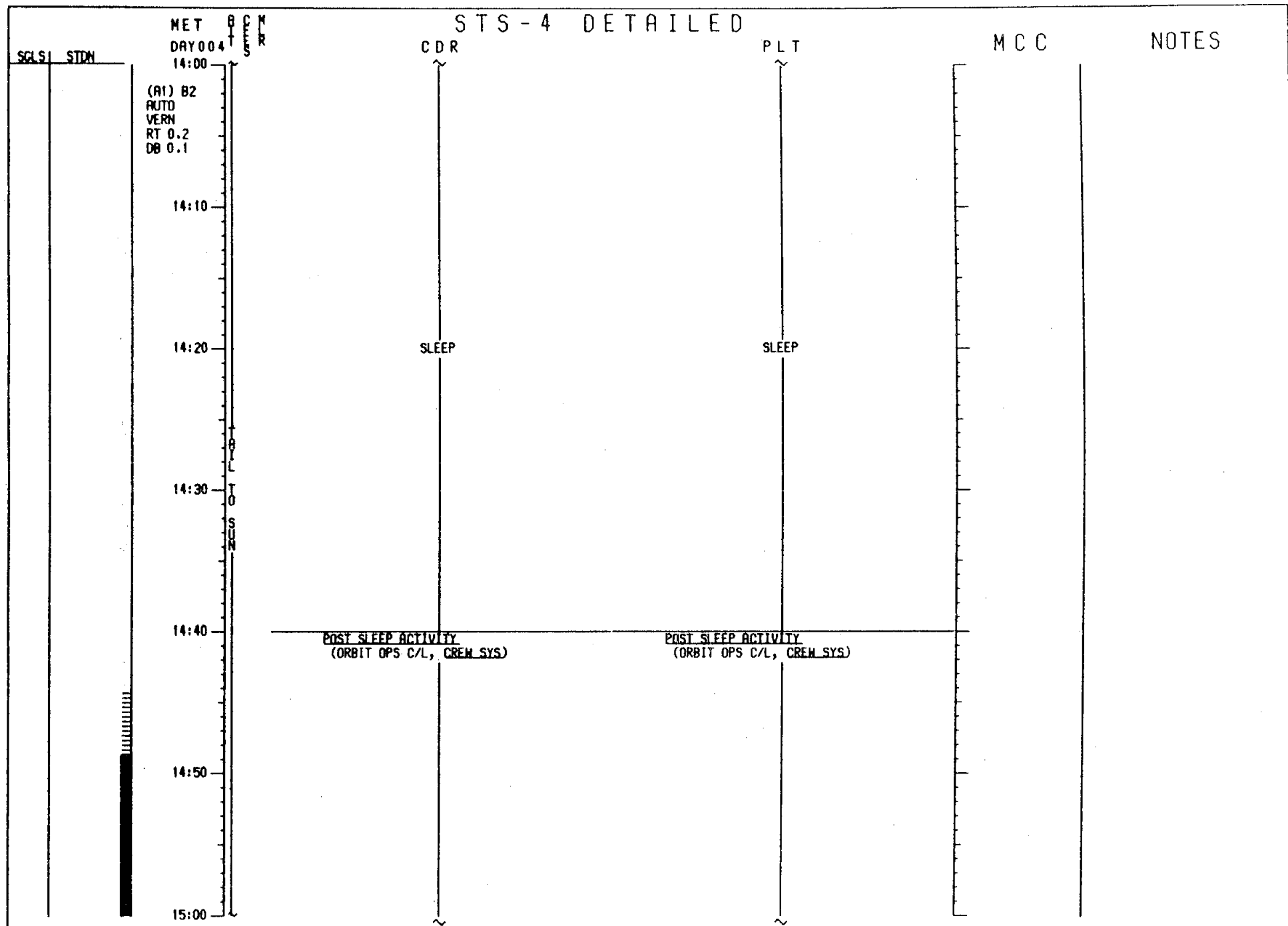
NOTES

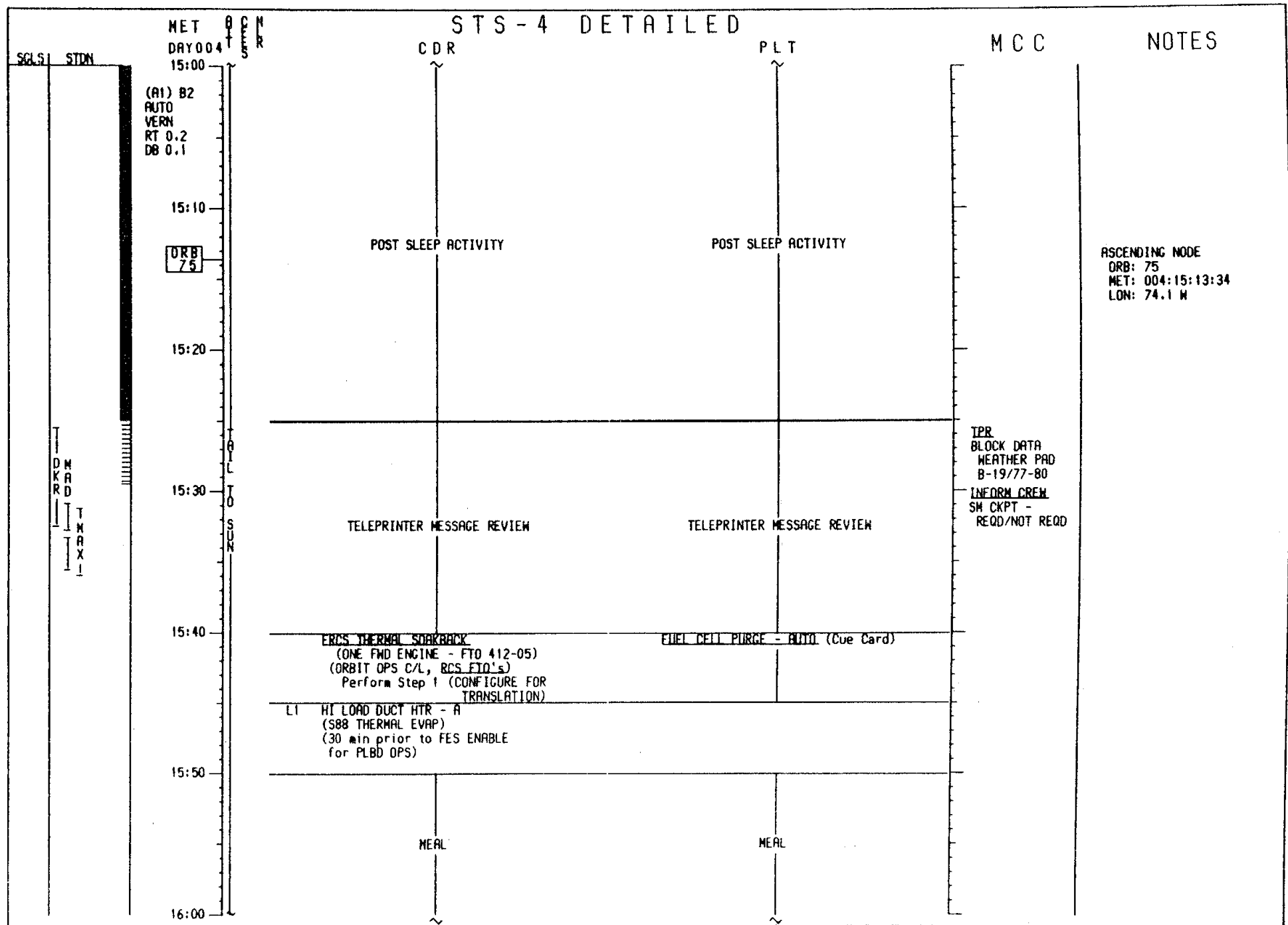
ASCENDING NODE
ORB: 70
MET: 004:07:41:09
LON: 41.5 E

STS-4 DETAILED









STS-4 DETAILED

SCLS STDN

YART

ORR

MM LXLTTTIA

BDAI

MET DAY004

16:00

(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

16:10

16:20

16:30

ORB 76

16:40

16:50

17:00

CDR

PLT

MCC

NOTES

MEAL

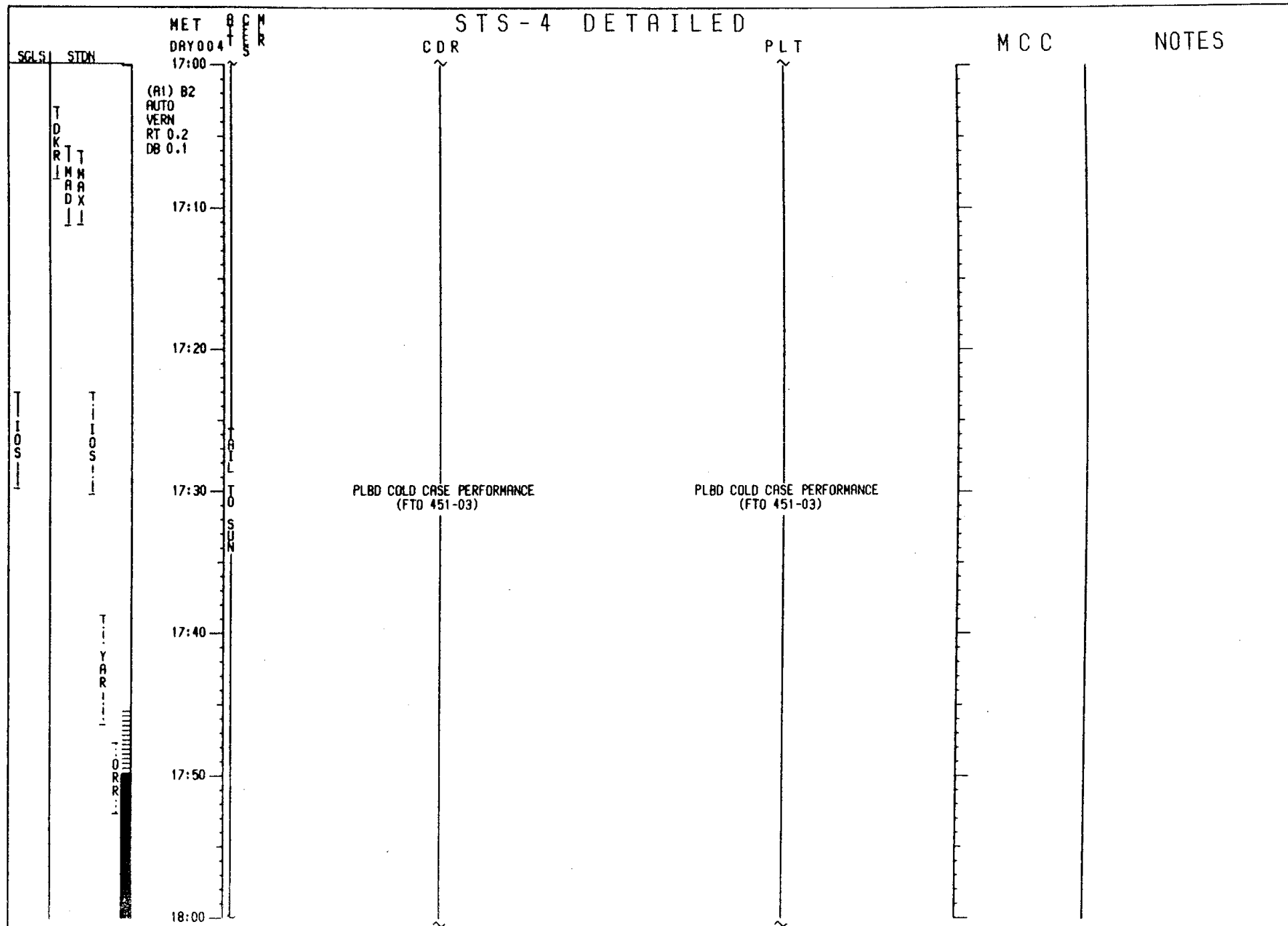
MEAL

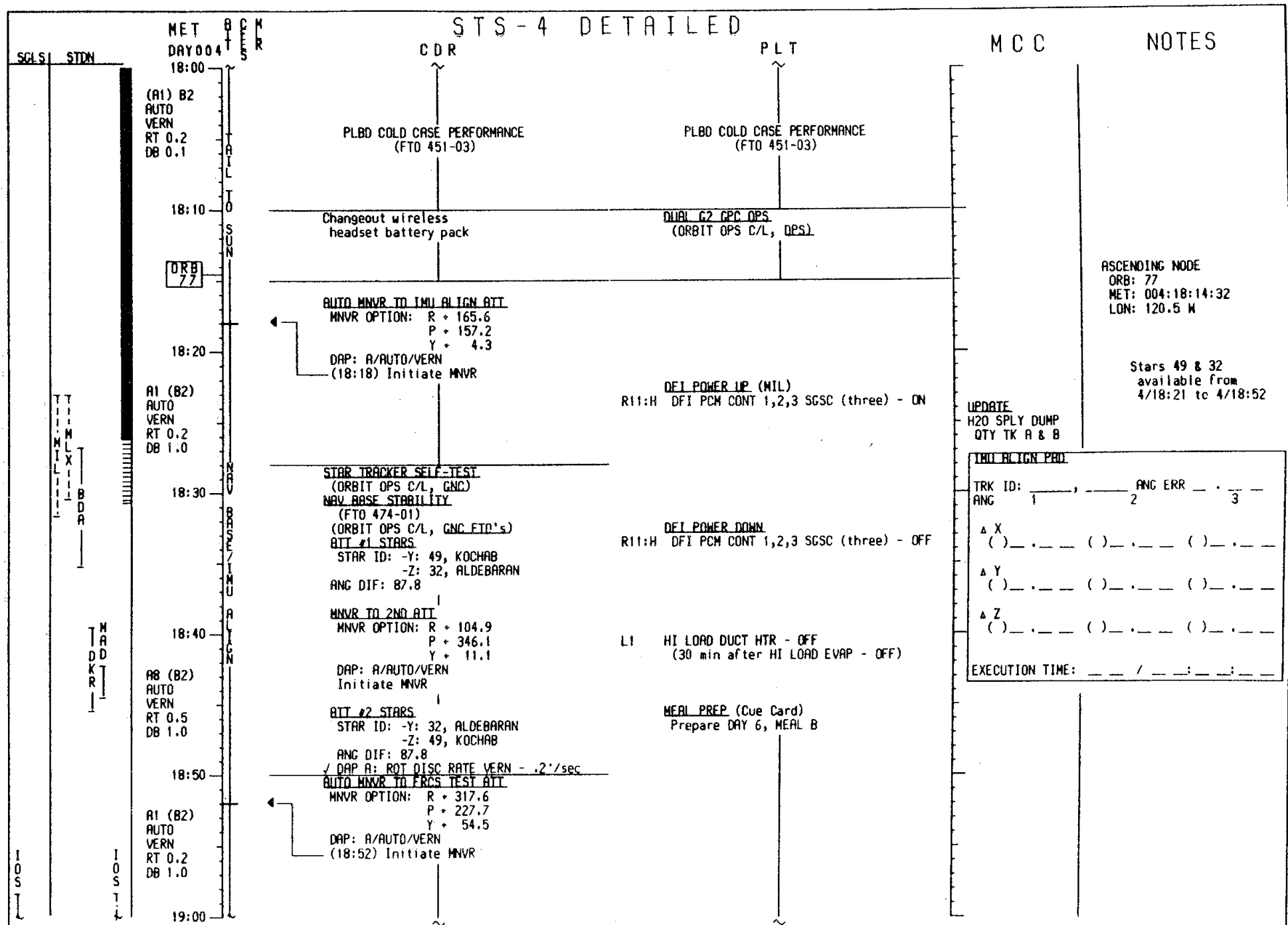
PLBD PERFORMANCE
(PLBD COLD CASE - FTO 451-03)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations

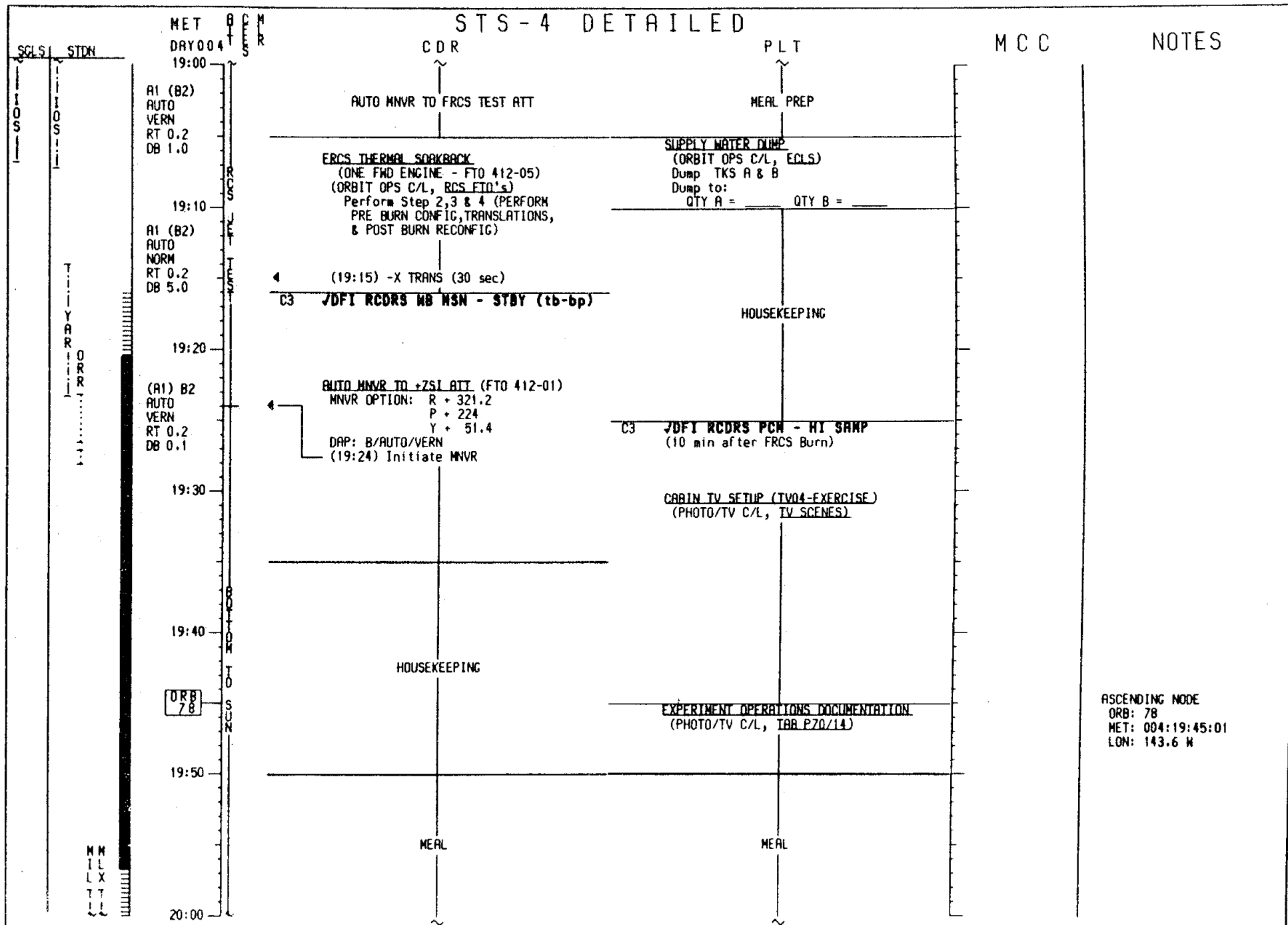
PLBD PERFORMANCE
(PLBD COLD CASE - FTO 451-03)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations

ASCENDING NODE
ORB: 76
MET: 004:16:44:03
LON: 97.3 W

ASCENDING NODE
ORB: 76
MET: 004:16:44:03
LON: 97.3 W







ASCENDING NODE
ORB: 78
MET: 004:19:45:01
LON: 143.6 W

STS-4 DETAILED

NET 8 C M
DAY 004 5

SGLS STON

CDR

PLT

M C C

NOTES

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

20:10

20:20

20:30

20:40.

20:50 -

A1 (B2)
 AUTO
 VERN
 RT 0.2
 DB 1.0

21:00 -

MEAL

NEAL

ON ORBIT RCS BURN (RCS 4)
(ORBIT OPS C/L, RCS)
(MM 202 BURN)

AUTO MNVR TO BURN ATT

STS-4 DETAILED

CDR

PLT

MCC

NOTES

SCLS STON

MET

DAY 004

21:00

AI (B2)
AUTO
VERN
RT 0.2
DB 1.0

(A121B20

MAN
NORM
RT 0.5
DB 1.0

AI (B2)
AUTO
VERN
RT 0.2
DB 1.0

21:30

21:40

21:50

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

22:00

HTS

HANT

VTS

BCDXT

CDST

TNHS

TM

BD

DKRACN

RCS 4 (4/21:15:00)

014:F, Primary RJD DRIVER (eight) - OFF
015:F,
016:F

AUTO MNVR TO POST BURN ATT
(Use PAD ATT)
DAP: A/AUTO/VERN
Initiate MNVR

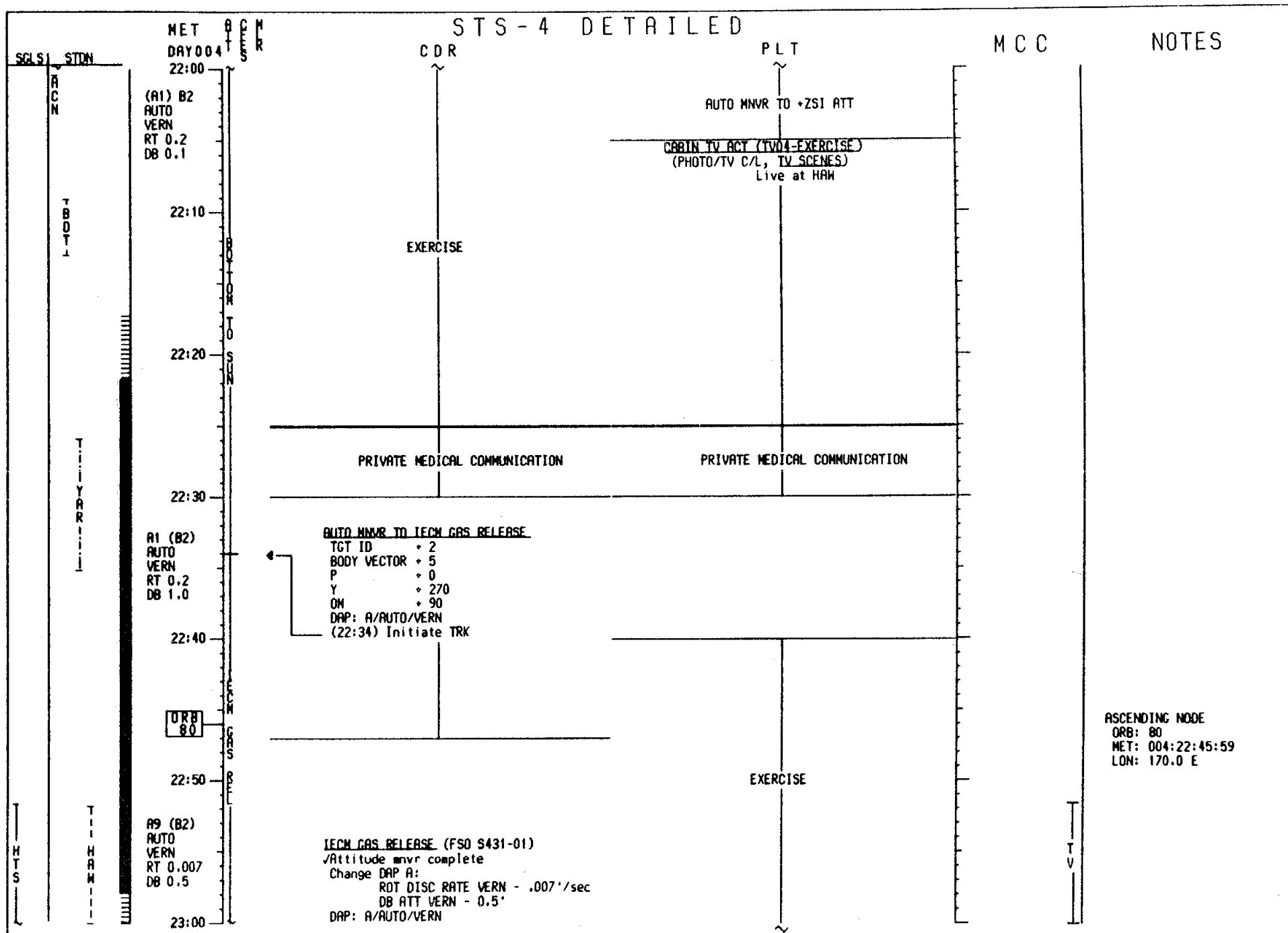
SINGLE G2 GPC OPS
(ORBIT OPS C/L, QPS)

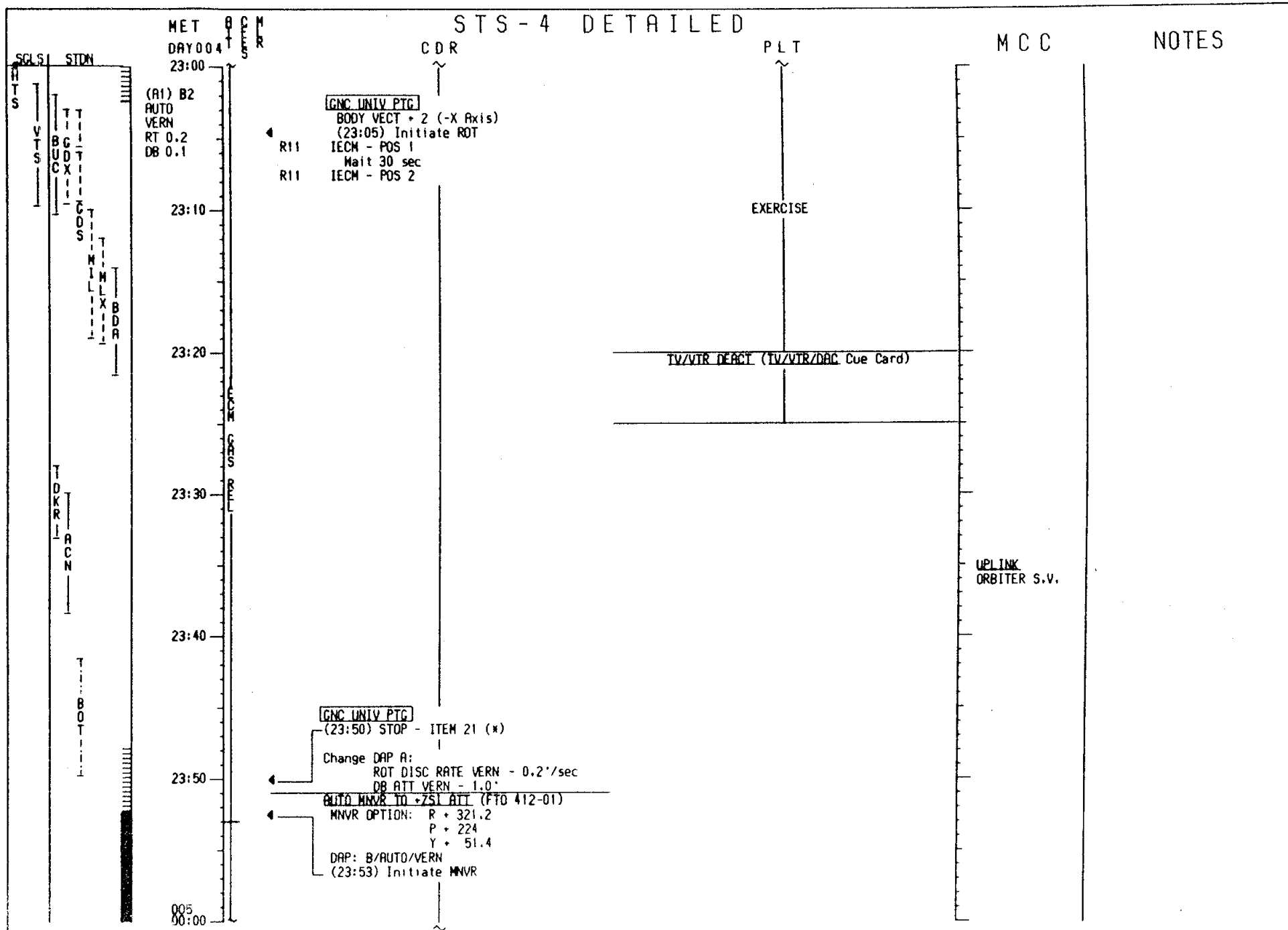
AUTO MNVR TO +ZSI ATT (FTO 412-01)
MNVR OPTION: R + 321.2
P + 224
Y + 51.4
DAP: B/AUTO/VERN
(21:52) Initiate MNVR

EXERCISE

TPR
BLOCK DATA
WEATHER PAD
B-20/81-84

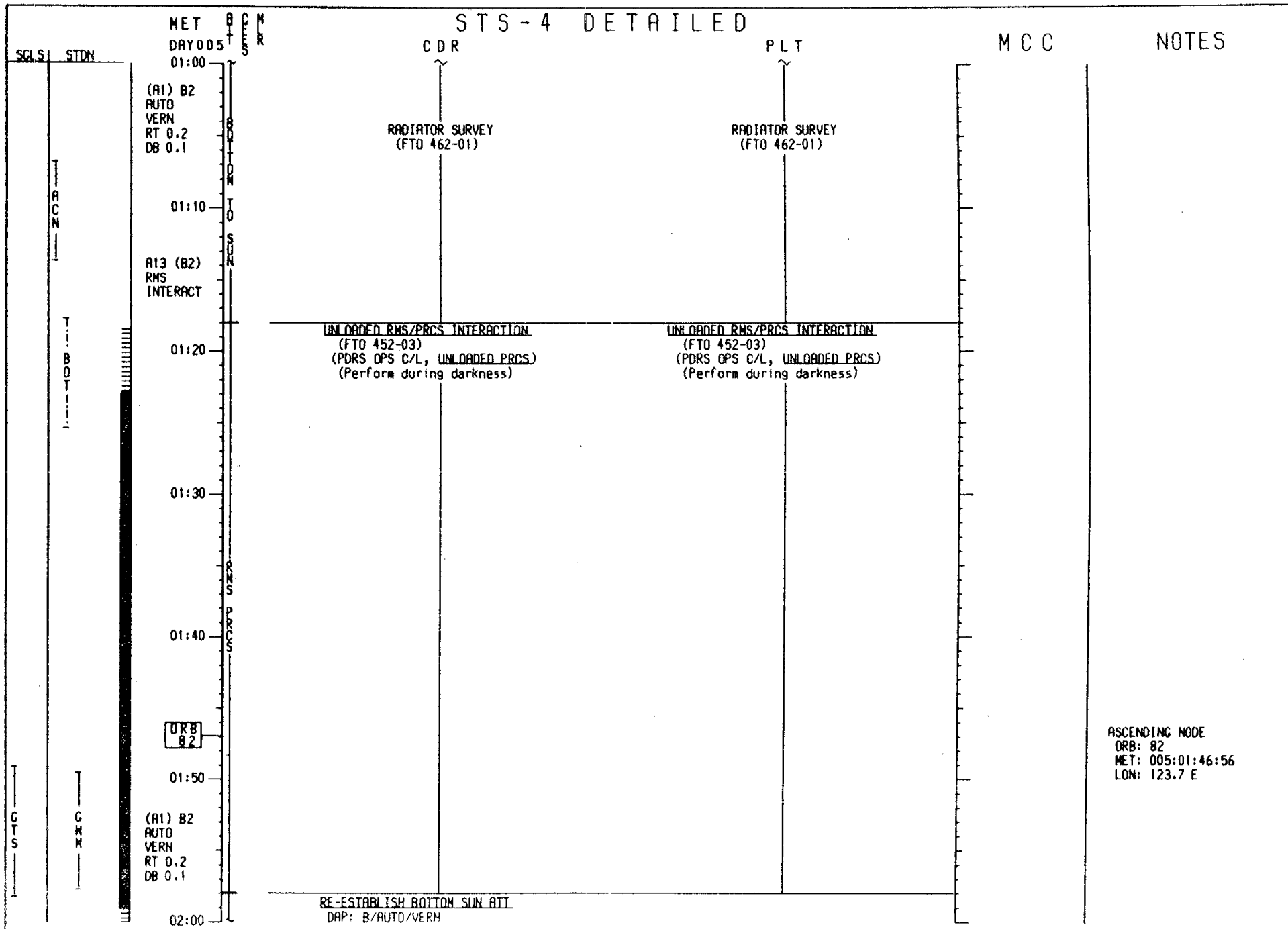
ASCENDING NODE
ORB: 79
MET: 004:21:15:30
LON: 166.7 W

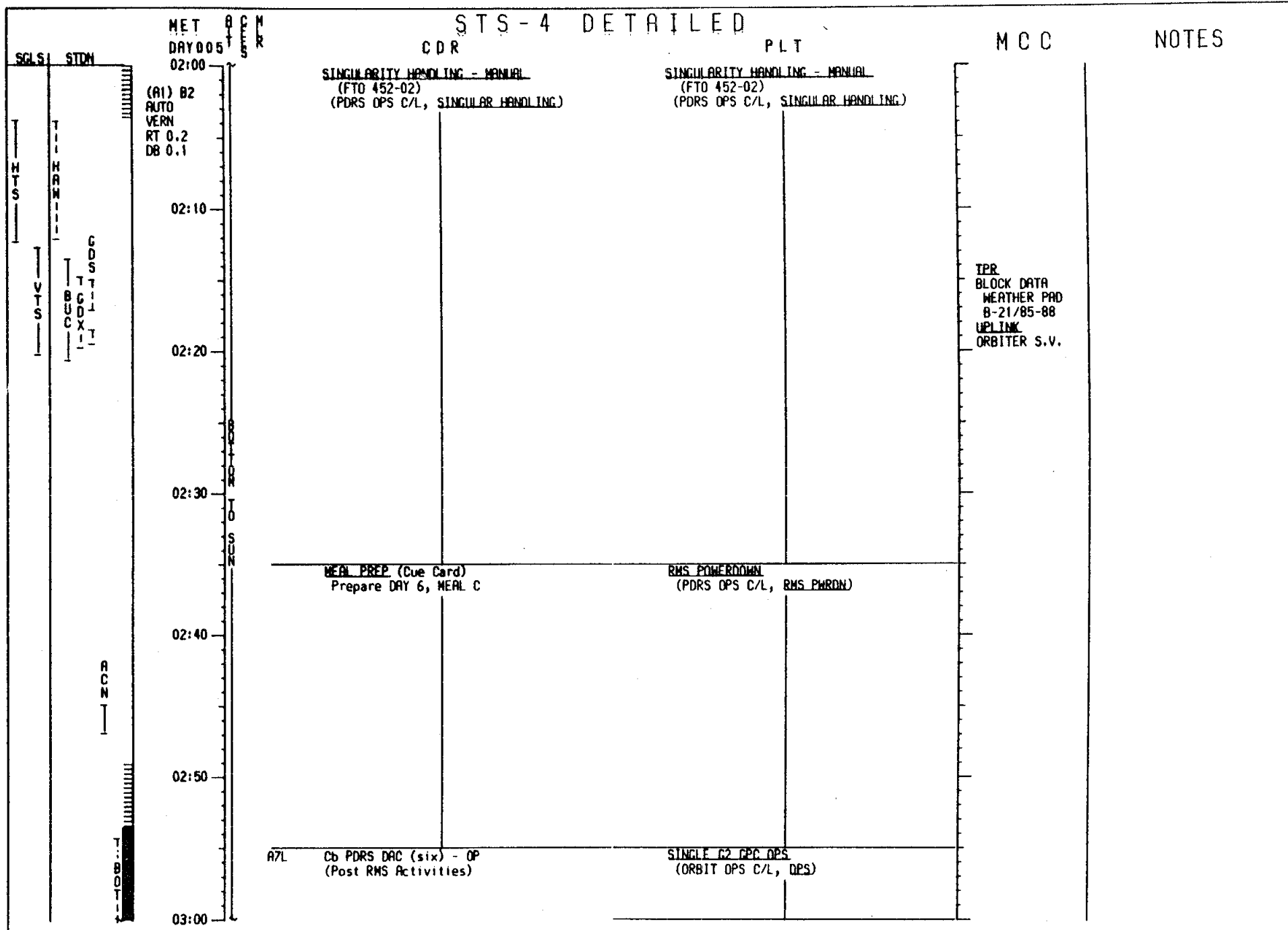




SGLS		STDN	MET	STS-4 DETAILED	PLT	MCC	NOTES
			DAY 005	CDR			
			00:00	AUTO MNVR TO +ZSI ATT (FTO 412-01)			
				DUAL C2 OPC OPS (ORBIT OPS C/L, OPS)			
			00:10	FRCS THERMAL SOAKBACK (ONE FWD ENGINE - FTO 412-05) (ORBIT OPS C/L, RCS FTO's) Perform Step 5 (RECONFIG TO NOMINAL)			
				C3 JDFI RCDMS PCH - LO SHWP			
			00:20	RMS POWERUP/CHECKOUT (PDRS OPS C/L, RMS PWRUP)			
			00:30				
			00:40				
			00:50	RADIATOR SURVEY (FTO 462-01) (PDRS OPS C/L RAD SURVEY)			
			01:00				
							ASCENDING NODE ORB: 81 MET: 005:00:16:27 LON: 146.9 E

ASCENDING NODE
ORB: 81
MET: 005:00:16:27
LON: 146.9 E





STS-4 DETAILED

CDR

PLT

MCC

NOTES

SGLS STDN

MET B C M

DAY 005 T S R

03:00

(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB P70/15)

UPDATE
H2O SPLY DUMP
QTY TK A & B

03:10

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = QTY B =

ORB
83

03:20

03:30

03:40

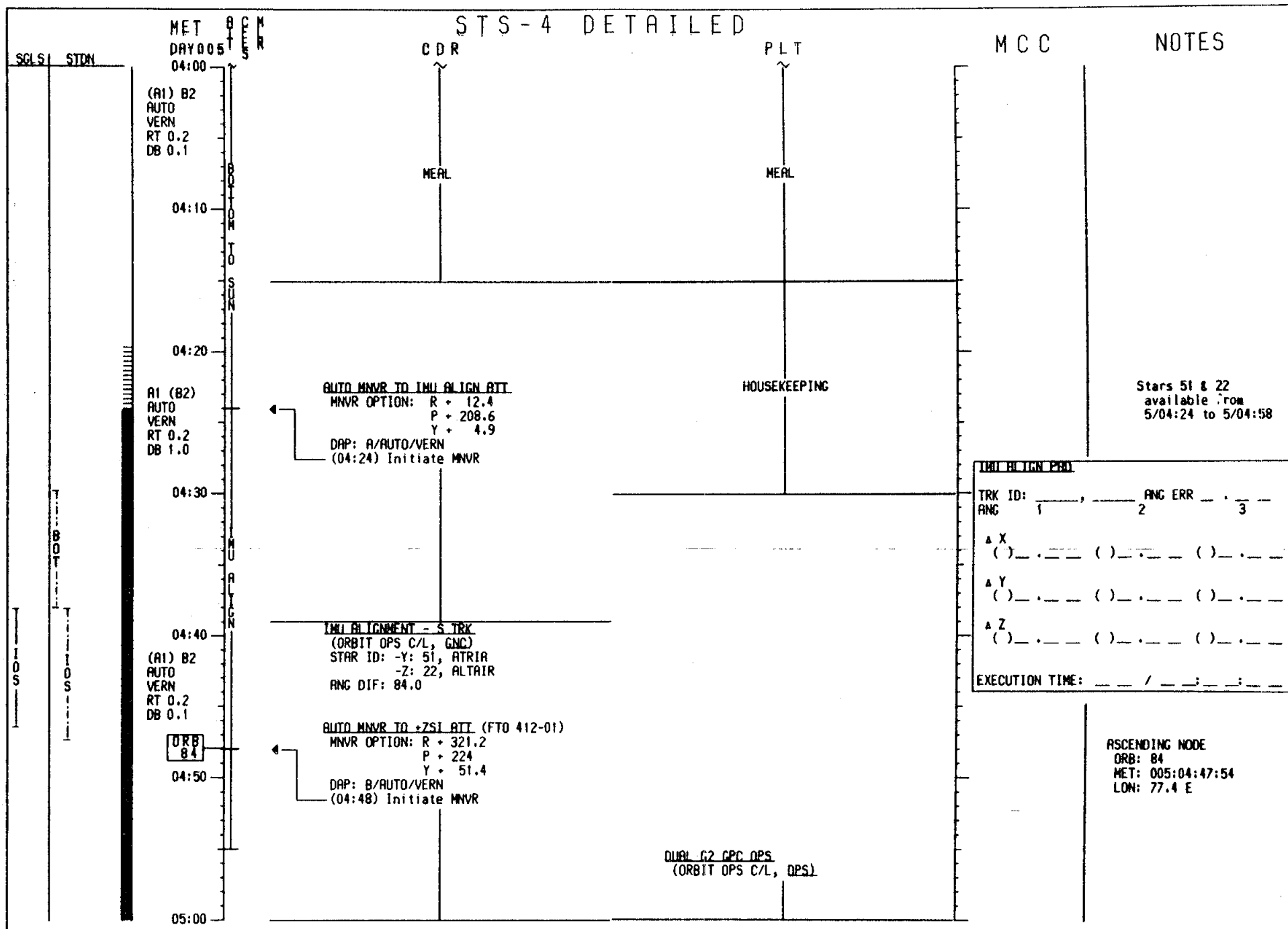
03:50

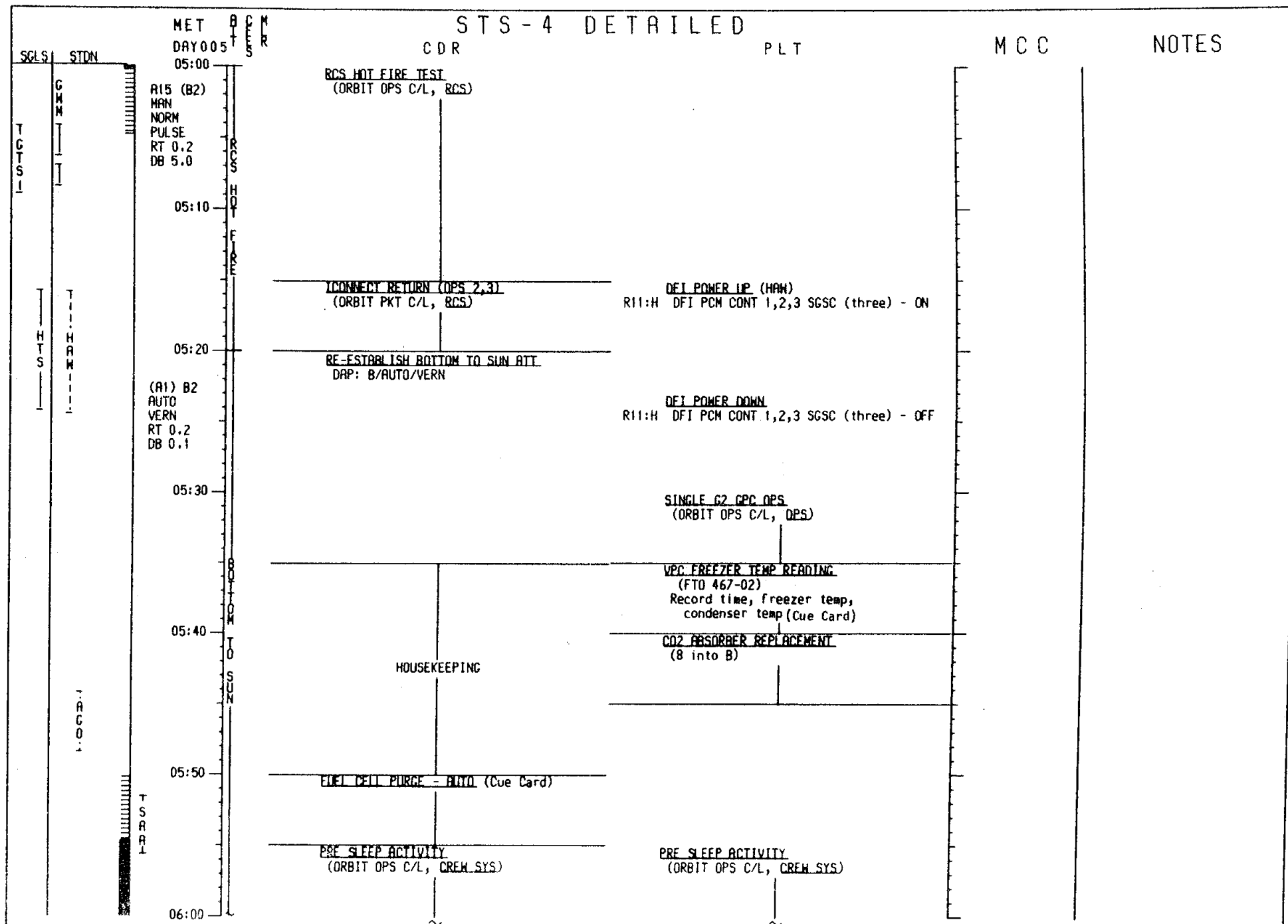
04:00

MEAL

MEAL

ASCENDING NODE
ORB: 83
MET: 005:03:17:25
LON: 100.6 E





[illegible]

ASCENDING NODE
ORB: 85
MET: 005:06:18:22
LON: 54.3 E

MCC ONLY
COORD C&H/FDA
LIMITS CLEANUP
FOR CREW SLEEP

UPLINK --
SPC LOAD -
1ST COMM
ALERT
CMD
RCDR SLEEP
CONFIG

STS-4 DETAILED

SCLS STDN

MET B C M

DAY 005

07:00

(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

07:10

07:20

07:30

07:40

07:50

08:00

CDR

SLEEP

PLT

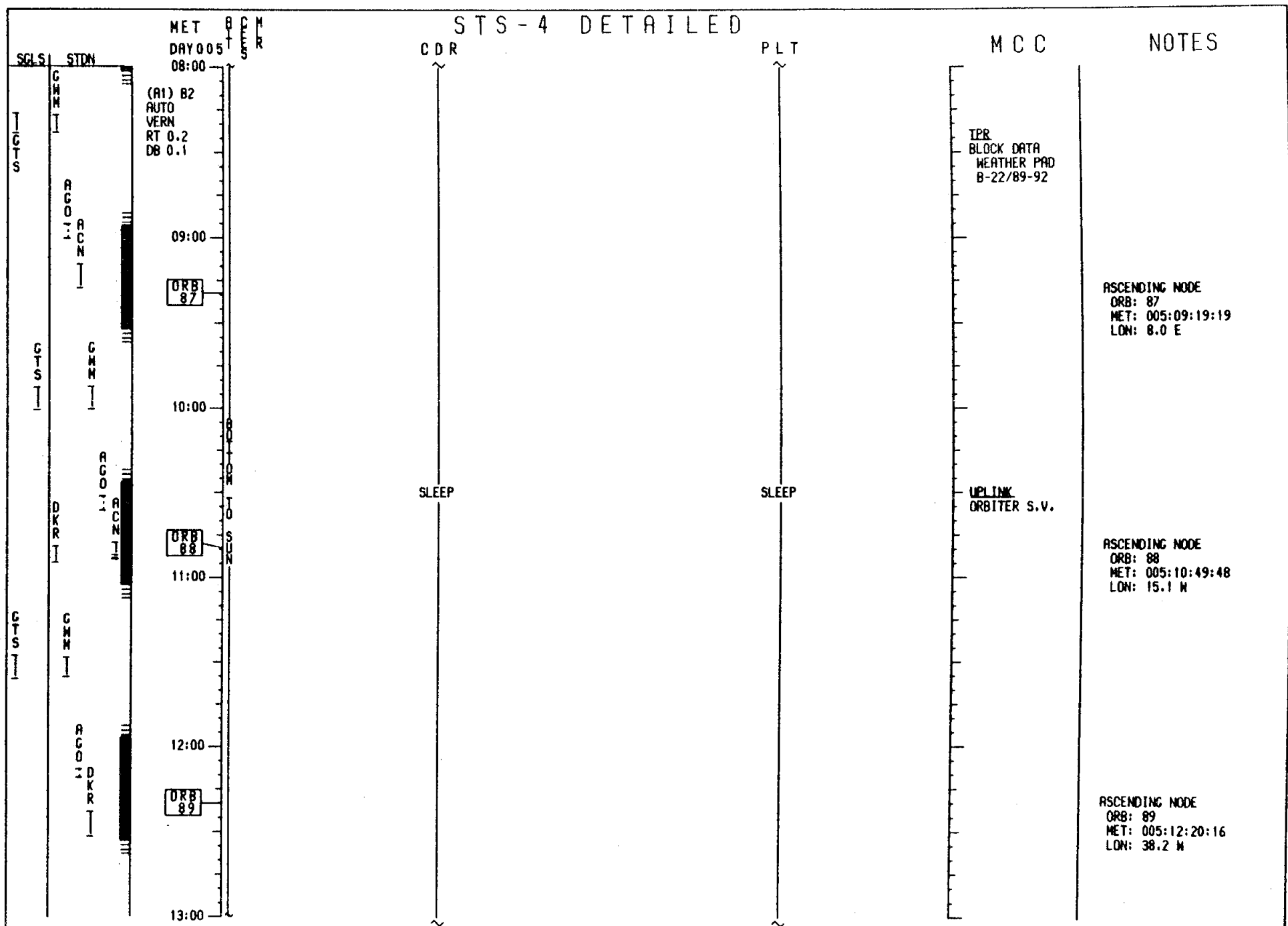
SLEEP

MCC

NOTES

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 86
MET: 005:07:48:51
LON: 31.1 E



STS-4 DETAILED

SGLS1 STDN

MET DAY005
13:00

(R1) B2
AUTO
VERN
RT 0.2
DB 0.1

13:10

13:20

13:30

13:40

13:50

14:00

ORB
90

CDR

SLEEP

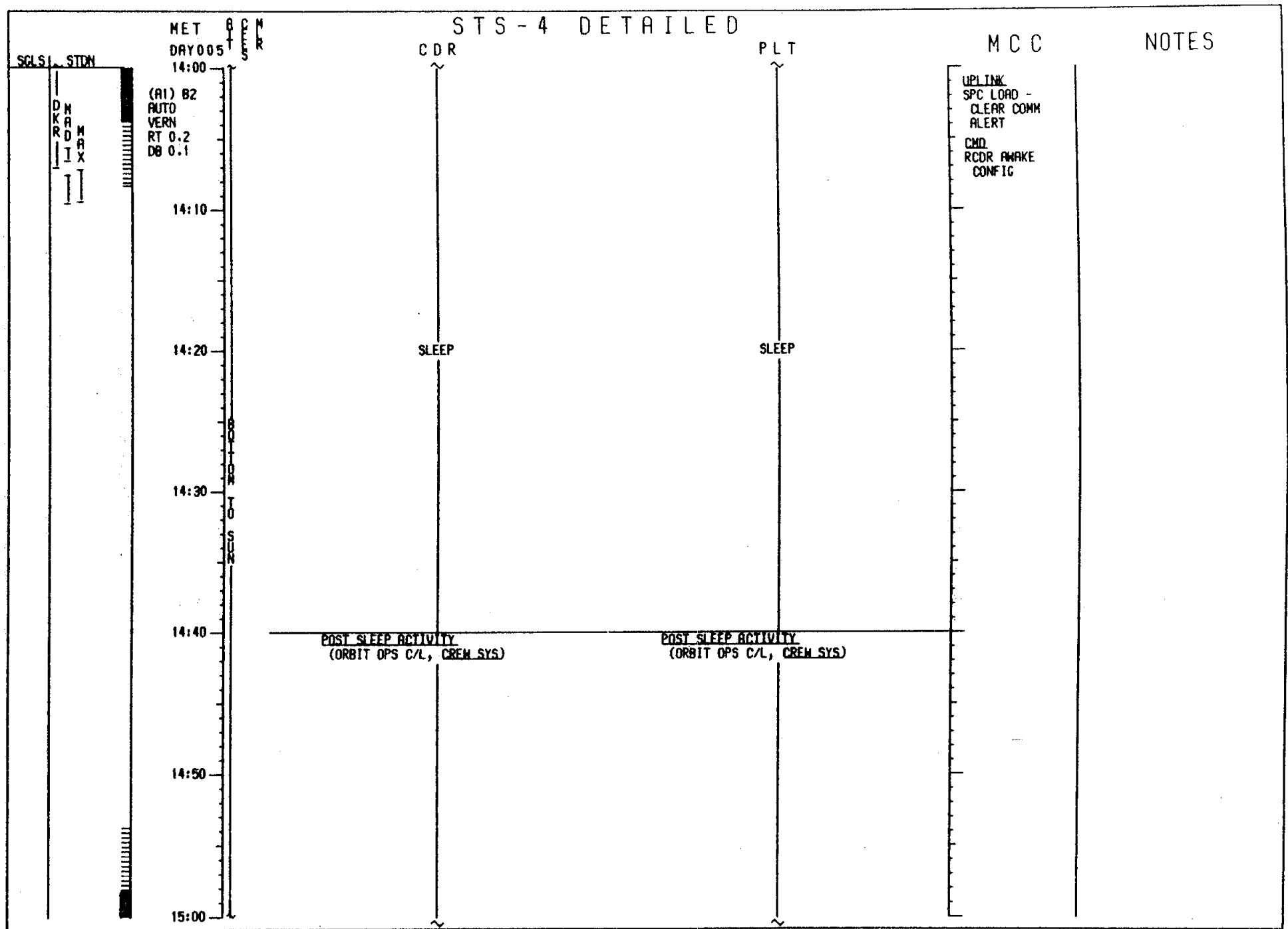
PLT

SLEEP

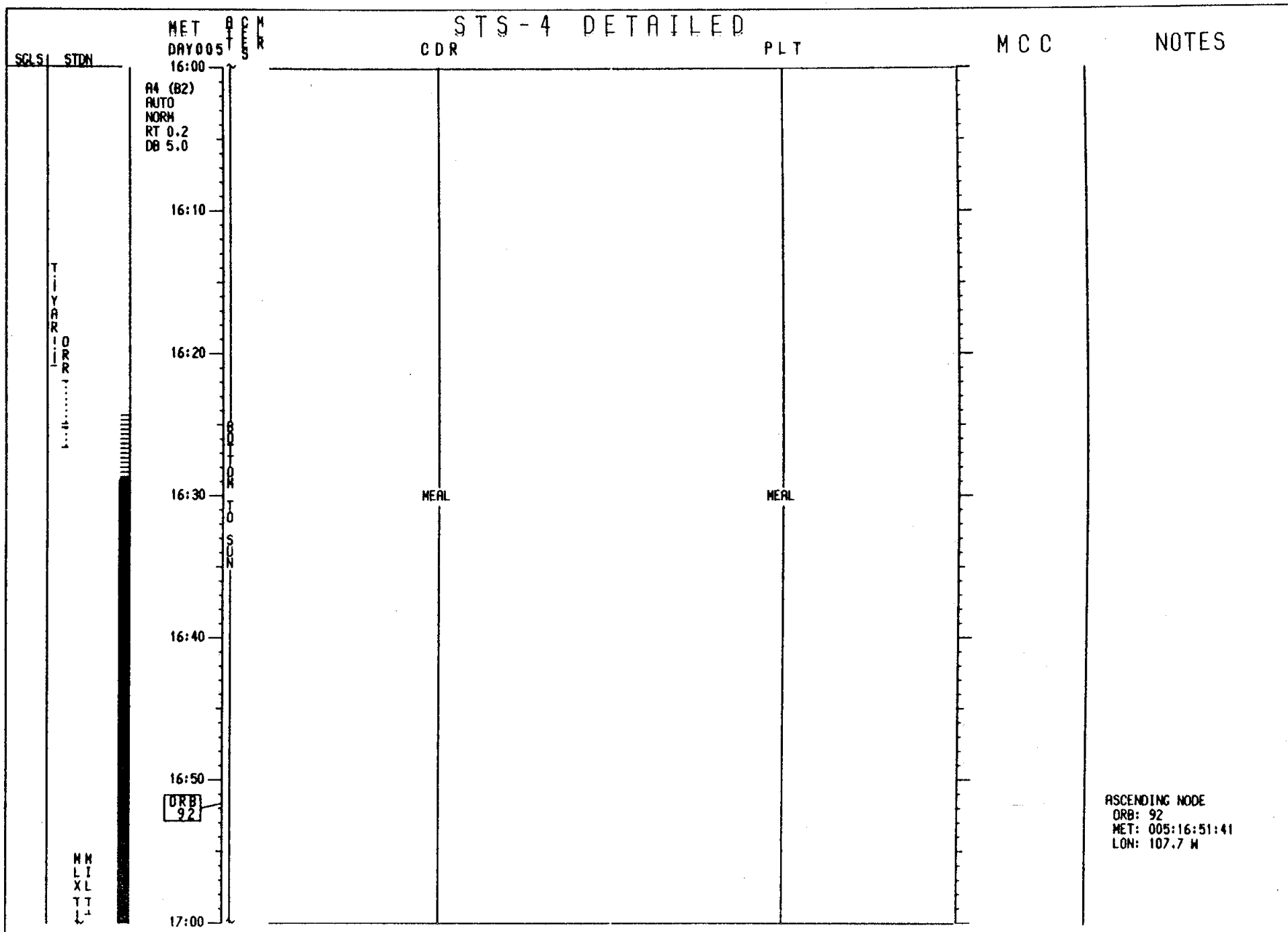
MCC

NOTES

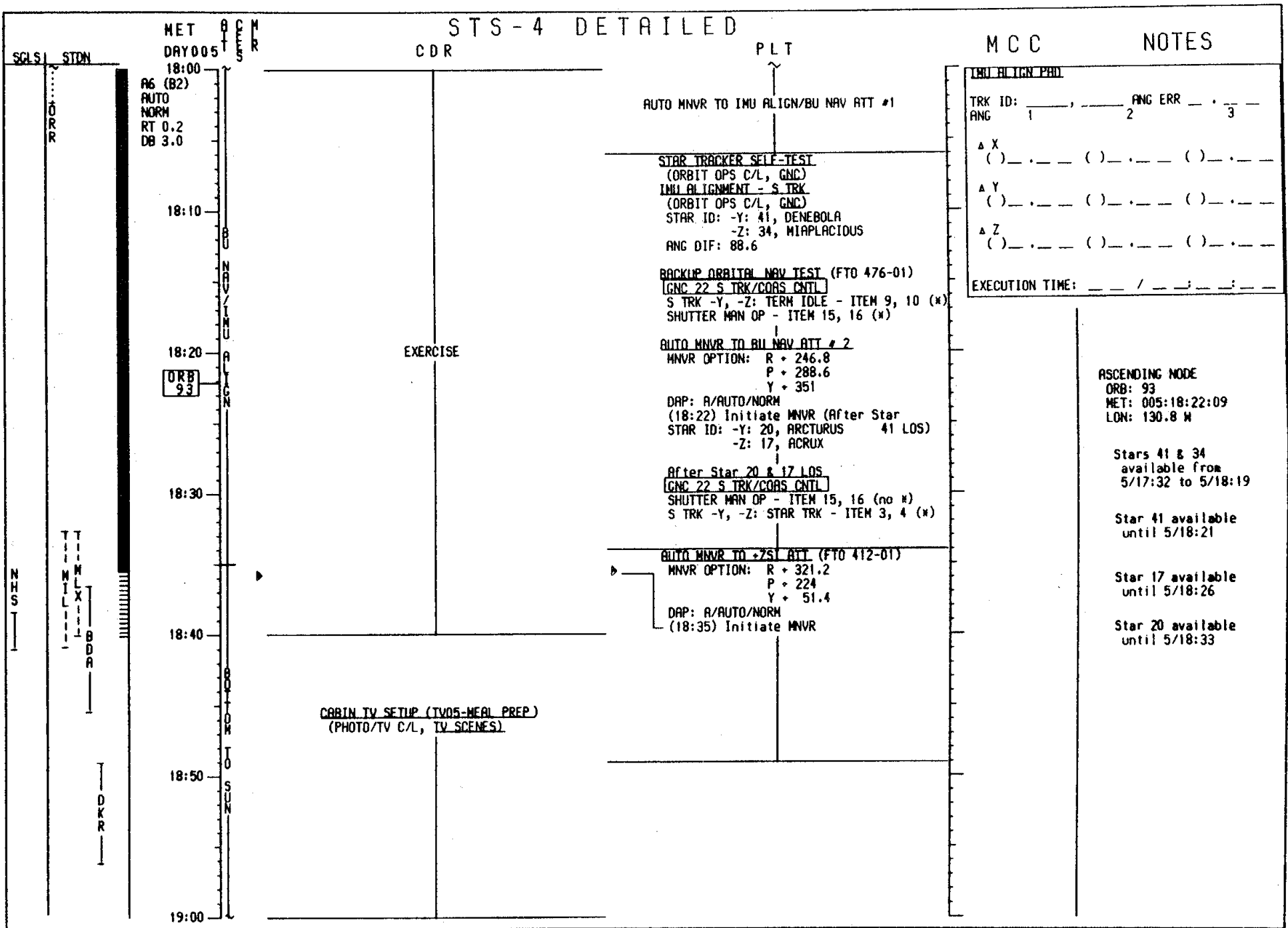
ASCENDING NODE
ORB: 90
MET: 005:13:50:45
LON: 61.4 W



STS-4 DETAILED		MCC	NOTES
SGLS	STON	CDR	PLT
MET DAY 005 15:00 (A1) B2 AUTO VERN RT 0.2 DB 0.1		POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	
15:10 15:20 15:30 15:40 15:50 16:00		POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	
ORB 91		TELEPRINTER MESSAGE REVIEW	
A4 (B2) AUTO NORM RT 0.2 DB 5.0		TELEPRINTER MESSAGE REVIEW	
T D A K D T M A X I		FRC'S/BRCS THERMAL SOAKBACK (2 FWD/1 AFT RCS ENG - FTO 412-06,08) (ORBIT OPS C/L, RCS FTO's) Perform Step 1 (CONFIGURE FOR TRANSLATION)	
		Changeout wireless headset battery pack	
		FUEL CELL PURGE - AUTO (Cue Card)	
		GAS DEACTIVATION PREP (Cue Card) (FSO S435-01)	
		PRSD PERFORMANCE PREP ①	
		DUAL G2 CPC OPS (ORBIT OPS C/L, OPS)	
		SUPPLY WATER DUMP (ORBIT OPS C/L, ECLS) Dump TKS A & B Dump to: QTY A = _____ QTY B = _____	
		EXPERIMENT OPERATIONS DOCUMENTATION (PHOTO/TV C/L, TAB P20/12)	
		PRSD PERFORMANCE PREP ① CRYO 02 TK1, 2, 3, 4 HTRS (ALL) - OFF CRYO H2 TK1, 2, 3, 4 HTRS (ALL) - OFF until 02 PRESS = 700 PSIA or H2 PRESS = 180 PSIA or PRSD PERFORMANCE on pg 4-113 Crew may reset SM alert limits to annunciate end of depressurization, if desired	
		ASCENDING NODE ORB: 91 MET: 005:15:21:13 LON: 84.5 W	
		UPLINK ORBITER S.V. TPR BLOCK DATA WEATHER PAD B-23/93-96	
		INFORM CREW SM CKPT - READ/NOT READ	
		UPDATE H2O SPLY DUMP QTY TK A & B	



STS-4 DETAILED		PLT	MCC	NOTES
SCLS STDN 17:00 A4 (B2) AUTO NORM RT 0.2 DB 5.0 17:10 17:20 17:30 17:40 17:50 18:00 A6 (B2) AUTO NORM RT 0.2 DB 3.0	CDR <u>FIRE/SMOKE DETECT/SUPPRESS TEST</u> (ORBIT OPS C/L, EPS) <u>ANNUNCIATOR, C/W LAMP TEST</u> (ORBIT OPS C/L, EPS) <u>DEFI POWER UP (BDA)</u> R11:H DEFI PCM CONT 1,2,3 SGSC (three) - ON <u>DEFI POWER DOWN</u> R11:H DEFI PCM CONT 1,2,3 SGSC (three) - OFF <u>CABIN HEAT EXCHANGER/SLURPER</u> <u>FREE H2O INSPECTION</u> 1. Open vent duct access door (outboard of cabin heat exchanger) and loosen lower vent cap clamp (3/8 in deep socket) 2. Remove vent cap and inspect for free water 3. <u>No water</u> - reinstall cap/secure <u>Water observed</u> - advise MCC <u>ICONNECT: L (R) OMS to RCS</u> (ORBIT PKT C/L, RCS) <u>CHANGE DAP A: DB ATT NORM - 3'</u> <u>AUTO MNVR TO IMU ALIGN/BU NAV ATT #1</u> MNVR OPTION: R + 252.9 P + 252.5 Y + 348.9 DAP: A/AUTO/NORM (17:57) Initiate MNVR	UPDATE OMS/RCS ICONNECT CONFIG		



STS - 4 DETAILED

CDR

PLT

M C C

NOTES

NET

DAY 005

A6 (B2)
AUTO
NORM
RT 0.2
DB 3.0

19:10.

19:20.

19:30 -

19:40 -

19:50 -

ORB
94

20:00

CABIN TV ACT (TV05-MEAL PREP)
(PHOTO/TV C/L, TV SCENES)
Live at MIL

AUTO MNVR TO BACKUP NAV ATT #1

MNVR OPTION: R + 255
P + 255.8
Y + 0.6

DAP: A/AUTO/NORM
(19:30) Initiate MNVR

BACKUP ORBITAL NAV TEST (FTO 476-01)

GNC 22 S TRK/COAS CNTL

S. TRK -Y, -Z: TERM IDLE - ITEM 9, 10 (x)

SHUTTER MAN OP - ITEM 15, 16 (X)

STAR ID: -Y: 41, DENEBO LA

AUTO MNVR TO BU NAV ATT # 2

MNVR OPTION: R + 246.8
P + 288.6
Y + 351

DAP: A/AUTO/NORM
(19:52) Initiate MNVR (After Star 41 LOS)

STAR ID: -Y: 20, ARCTURUS
-Z: 17, ACRUX

CRYO 02 H2 TK 4 HTRS A (two) - AUTO
(Before PRSD PERFORMANCE)

PRSD PERFORMANCE

(15% LEVEL - FTO 445-03)

(ORBIT OPS C/L, EPS ETO)
Perform Step 1 - POWERUP

Star 41 available
until 5/19:51

Star 17 available
until 5/19:57

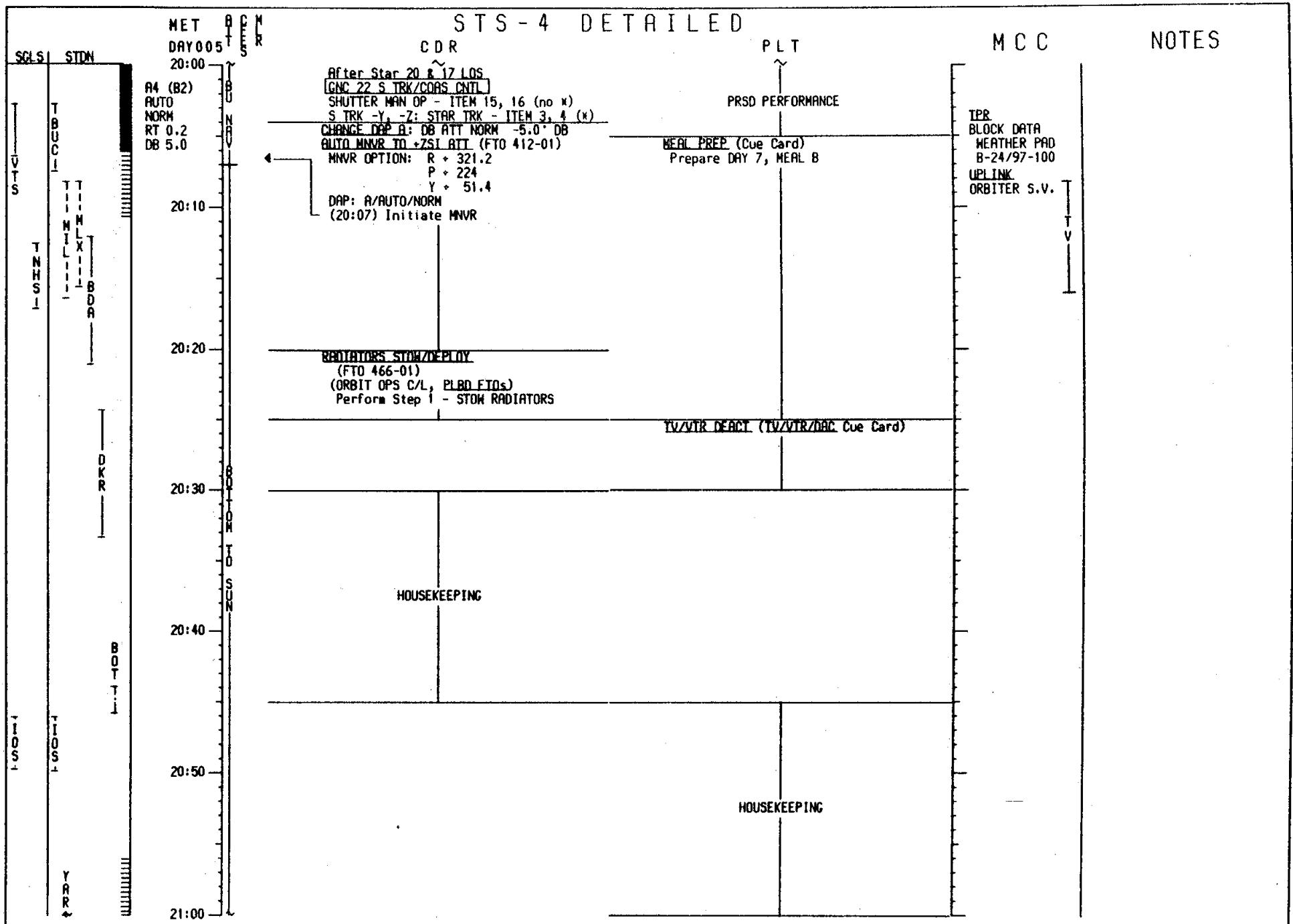
Star 20 available
until 5/20:04

ASCENDING NODE

ORB: 94

NET: 005:19:52:38

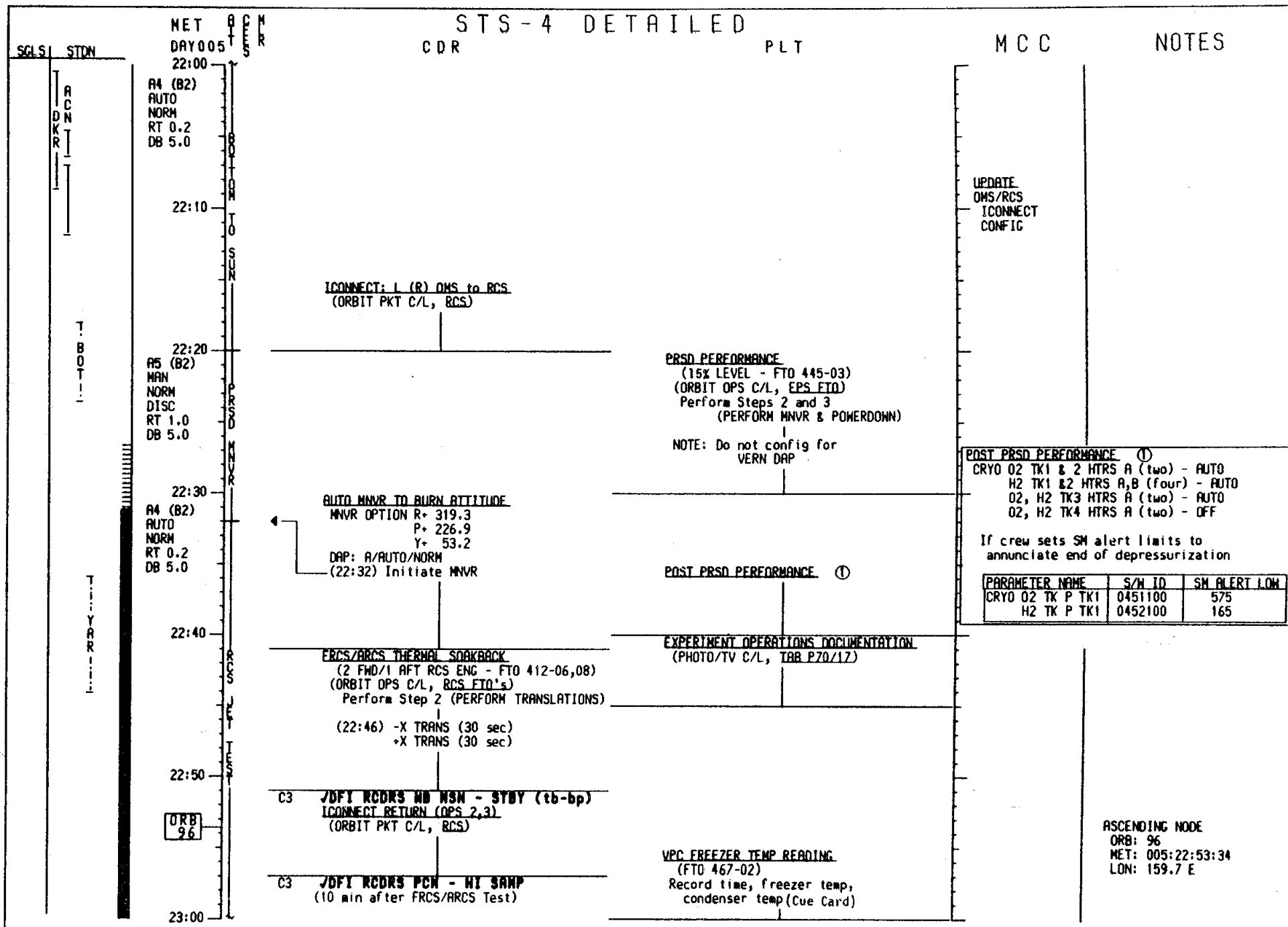
LON: 154.0 N



STS-4 DETAILED						MCC	NOTES
SCLS	STDN	MET DAY005	CDR	PLT			
		21:00					
		R4 (B2)					
		AUTO					
		NORM					
		RT 0.2					
		DB 5.0					
		21:10					
		21:20					
		ORB 95					
		21:30	MEAL	MEAL			
		21:40					
		21:50					
		22:00					

ASCENDING NODE
 ORB: 95
 MET: 005:21:23:06
 LON: 177.1 W

ASCENDING NODE
ORB: 95
MET: 005:21:23:06
LON: 177.1 W



STS-4 DETAILED		CDR	PLT	MCC	NOTES
SGLS	STDN	MET DAY 005			
HTS	HA	23:00	AUTO MNVR TO +ZSI ATT (FTO 412-01) MNVR OPTION: R + 321.2 P + 224 Y + 51.4 DAP: A/AUTO/NORM (23:02) Initiate MNVR		
VTS	BUCX	23:10			
TBD	TGDS	23:20	PRIVATE MEDICAL COMMUNICATION		
ACN	TMLX	23:30	PRIVATE MEDICAL COMMUNICATION		
BOT		23:40			
		23:50			
		00:00			

SGLS		STDN	MET	CDR	STS-4 DETAILED	PLT	MCC	NOTES
R4 (B2)			DAY 006			GAS DEACTIVATION (Cue Card)		
AUTO			00:00			(FSO S435-01)		
NORM								
RT 0.2								
DB 5.0								
			00:10					
			00:20					
			00:30					
			00:40					
			00:50					
			01:00					

DEF POWER UP (GWH)
R11:H DFI PCM CONT 1,2,3 SCSC (three) - ON

DEF POWER DOWN
R11:H DFI PCM CONT 1,2,3 SCSC (three) - OFF

PLBD PERFORMANCE
(THERMAL GRADIENT - FTO 451-04)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations

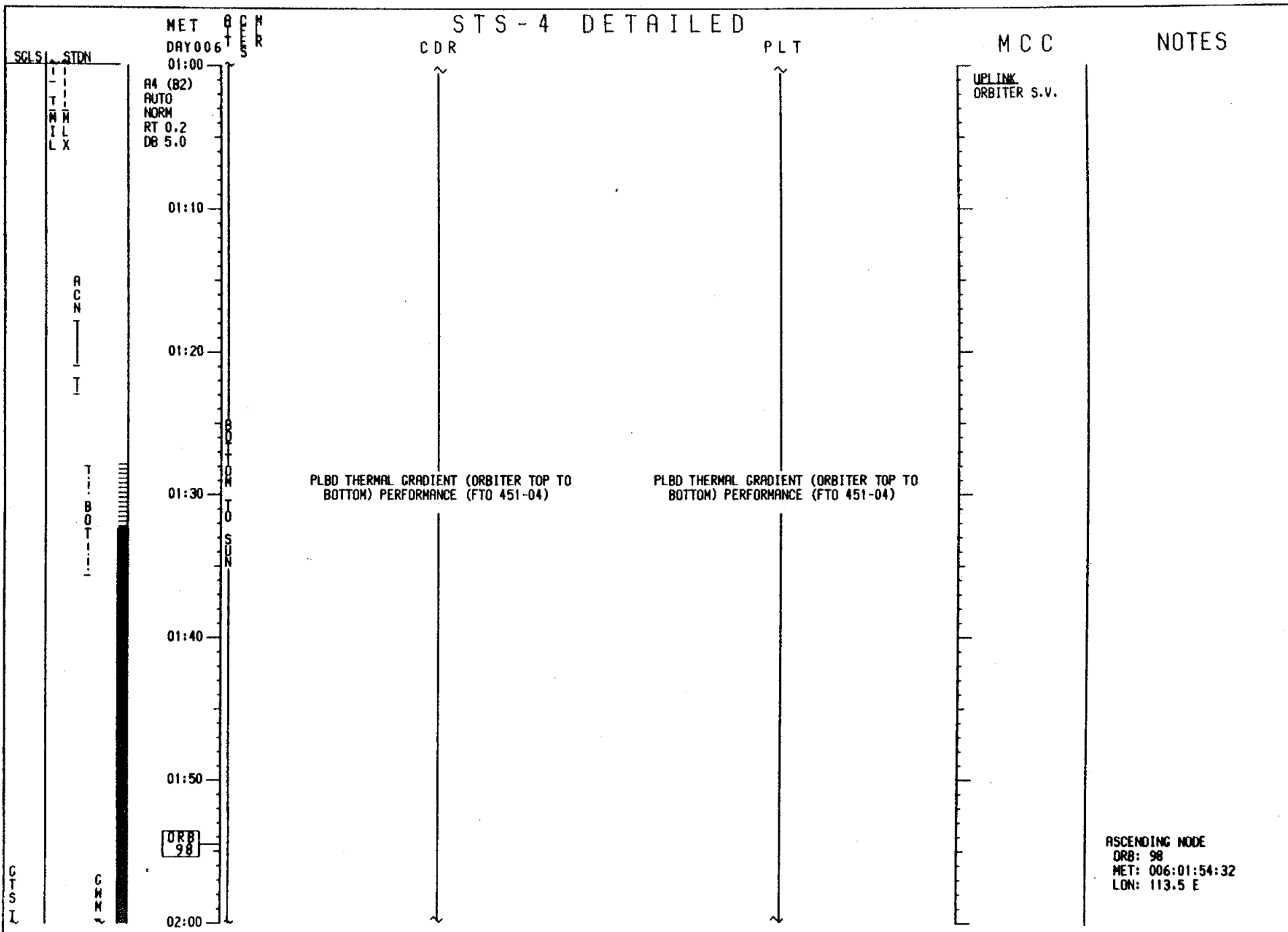
LI HI LOW DUCT HTR - H
(S88 THERMAL EVAP)
(30 min prior to FES ENABLE
for PLBD OPS)

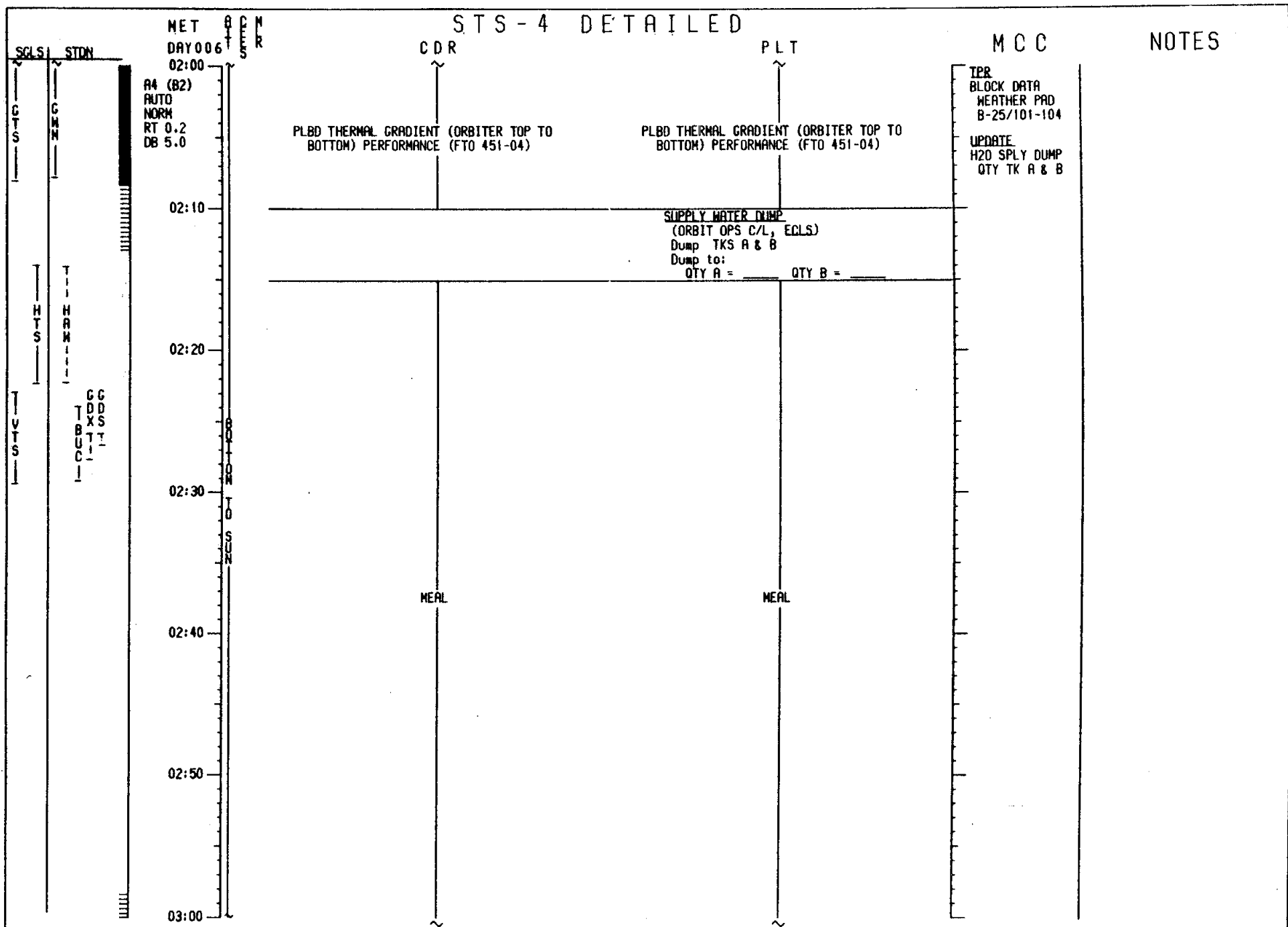
FD 8 GO/NO GO

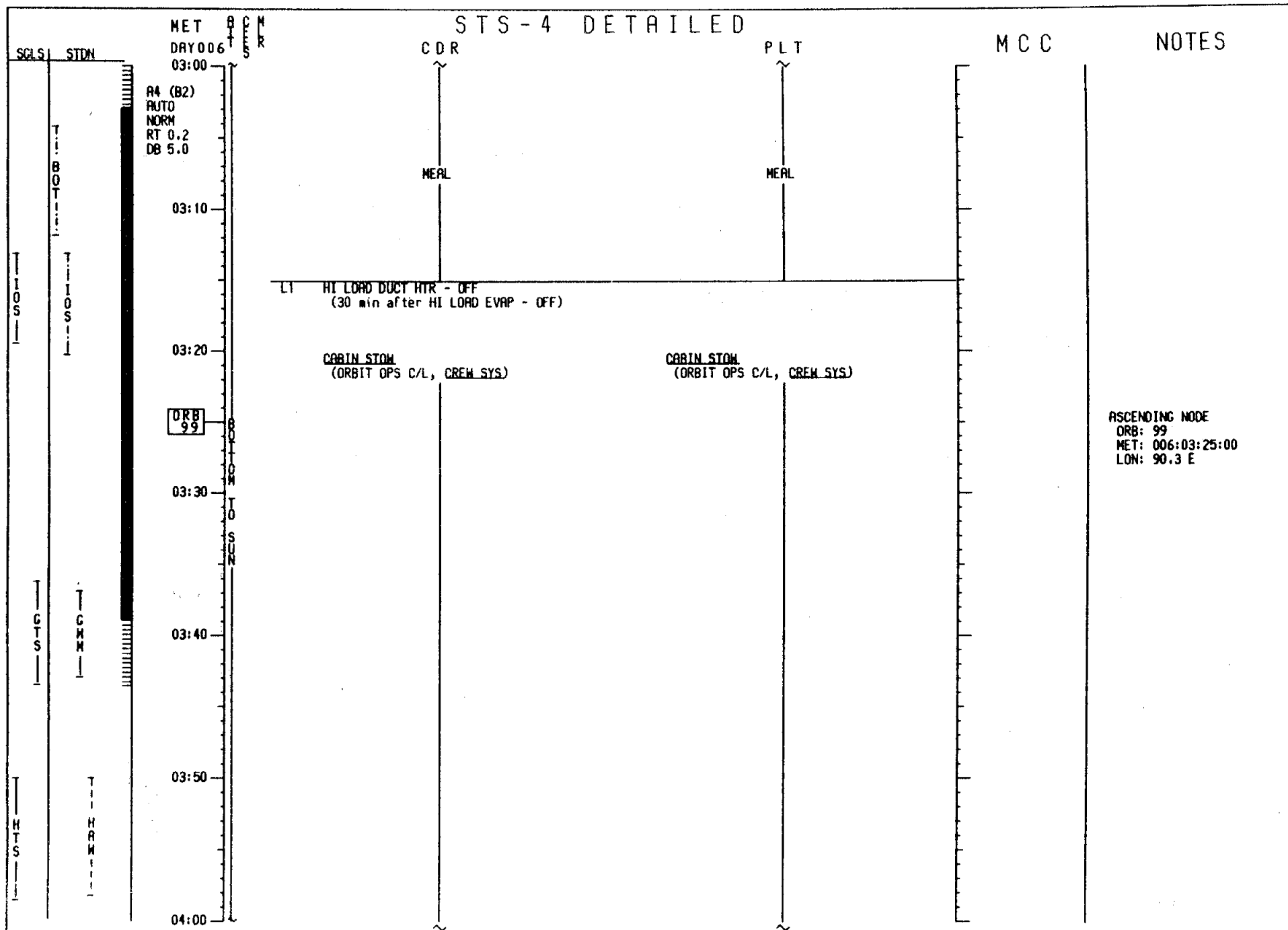
MEAL PREP (Cue Card)
Prepare DAY 7, MEAL C

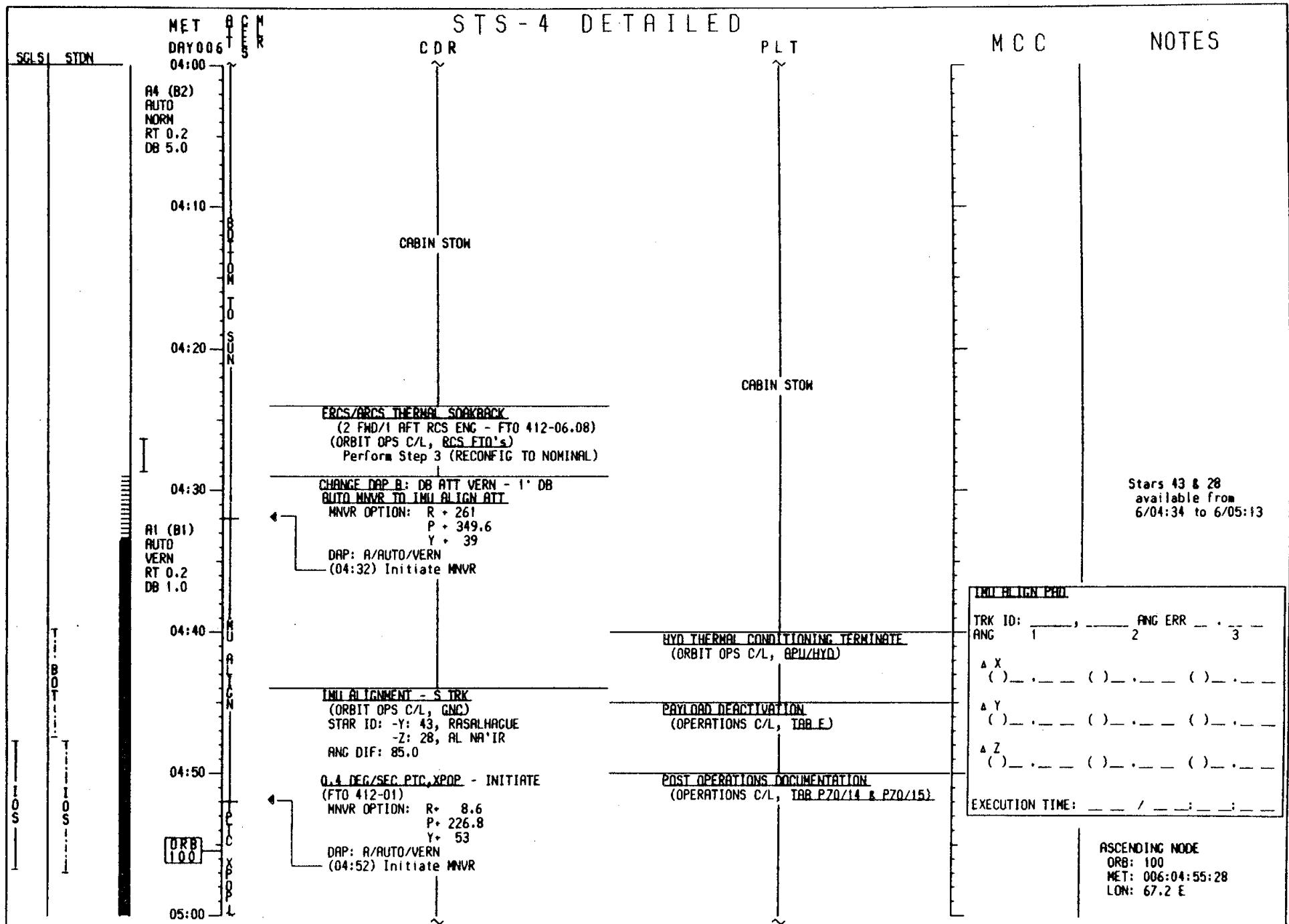
PLBD PERFORMANCE
(THERMAL GRADIENT - FTO 451-04)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations

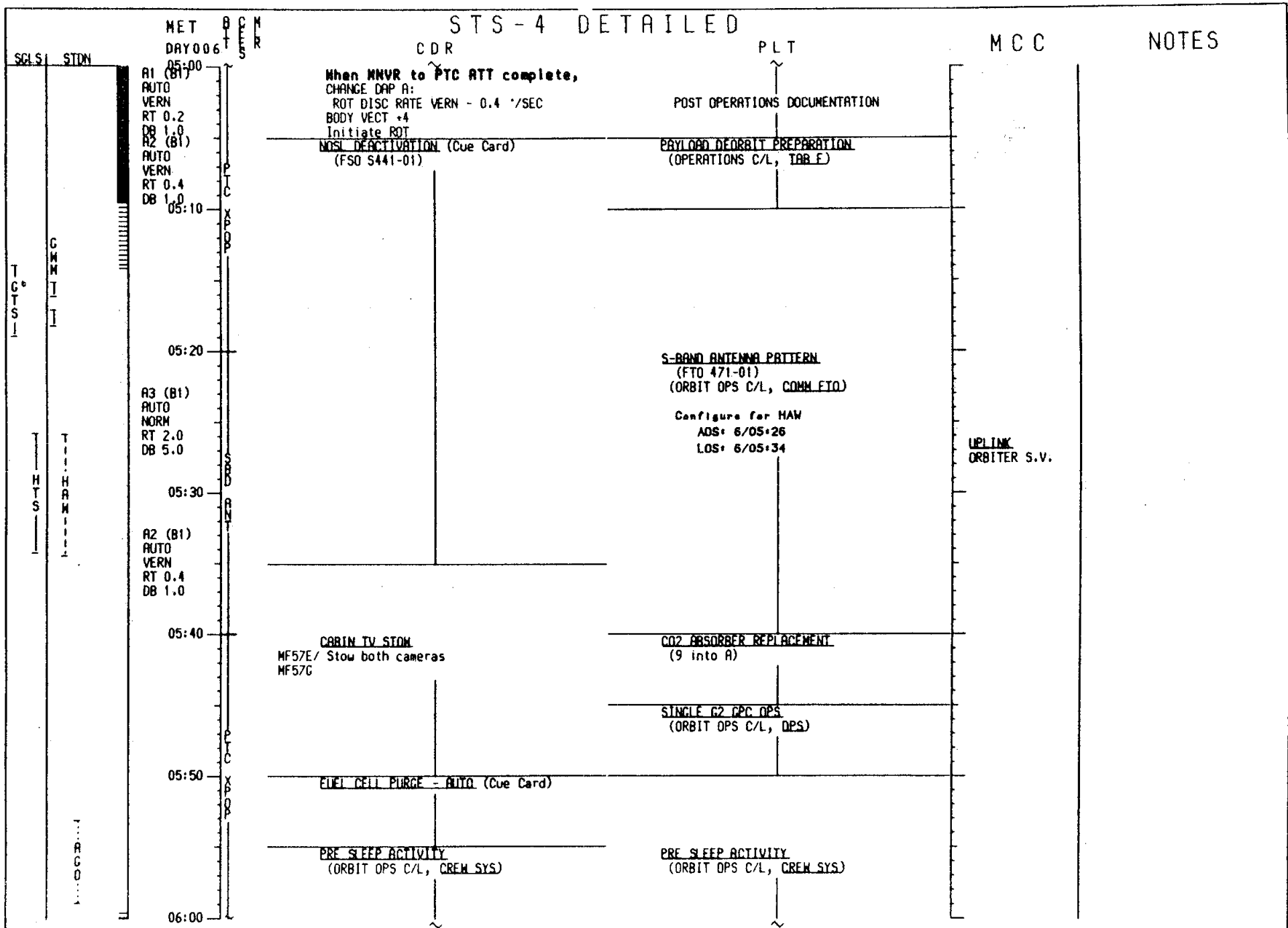
ASCENDING NODE
ORB: 97
MET: 006:00:24:04
LON: 136.6 E

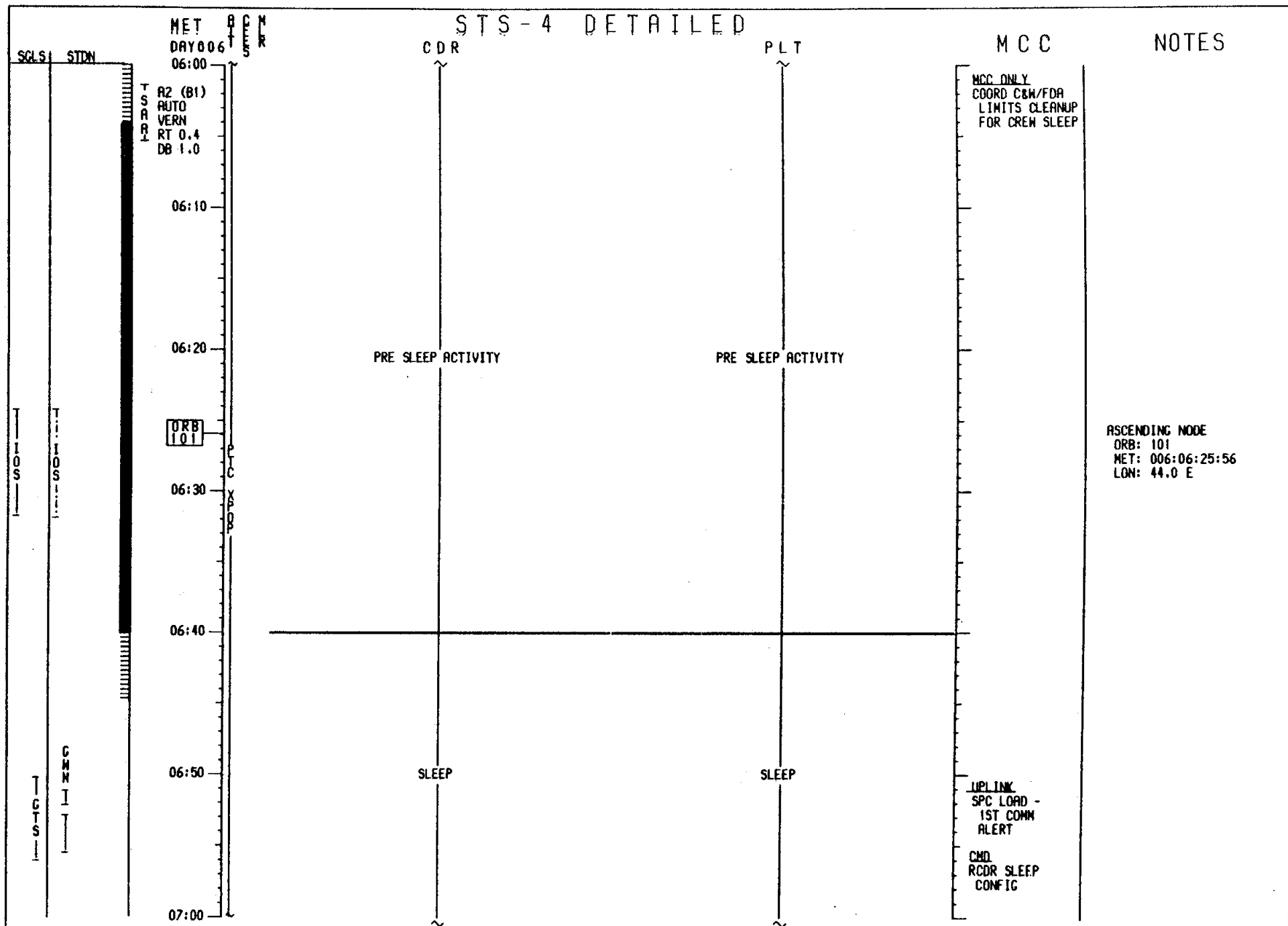


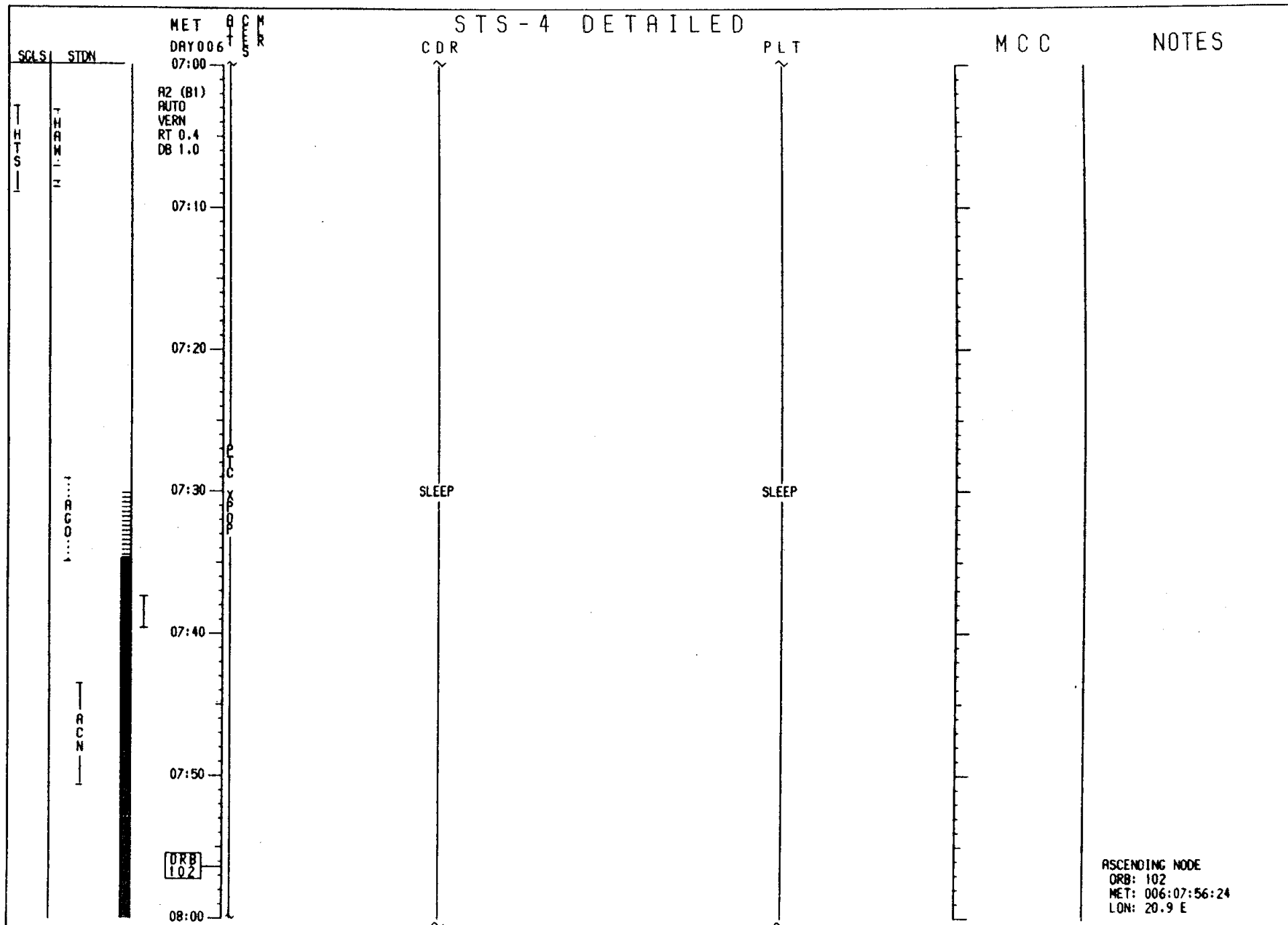


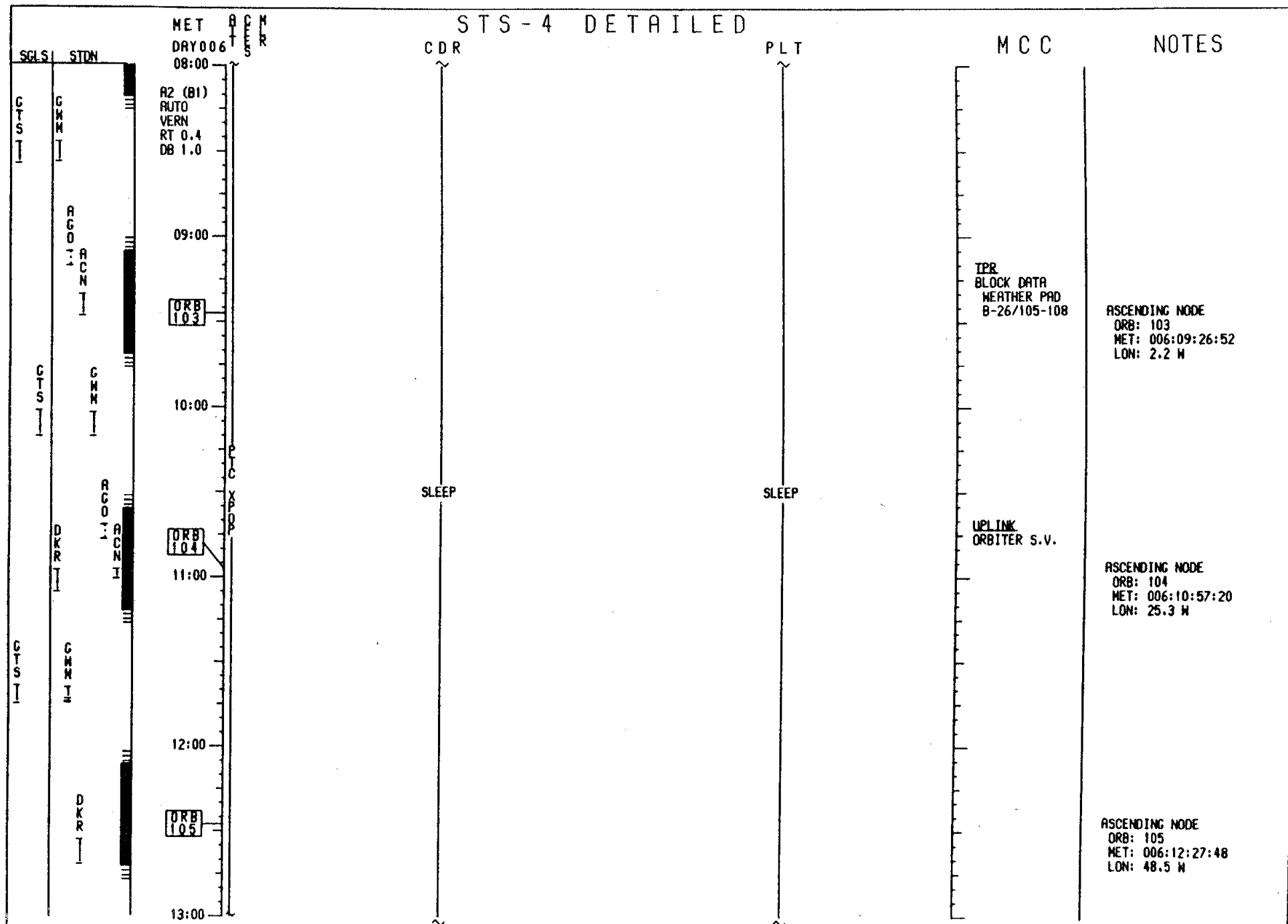


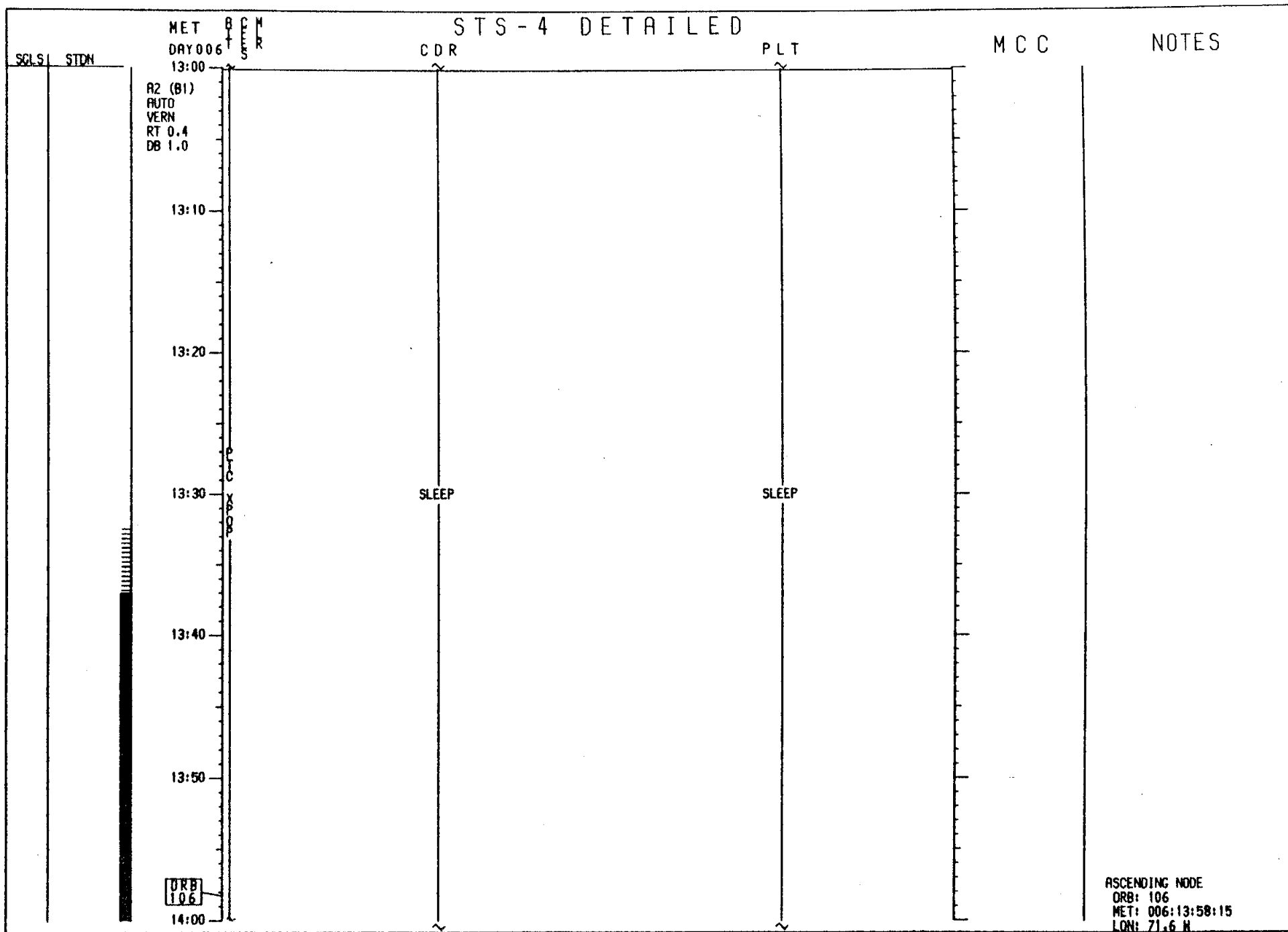


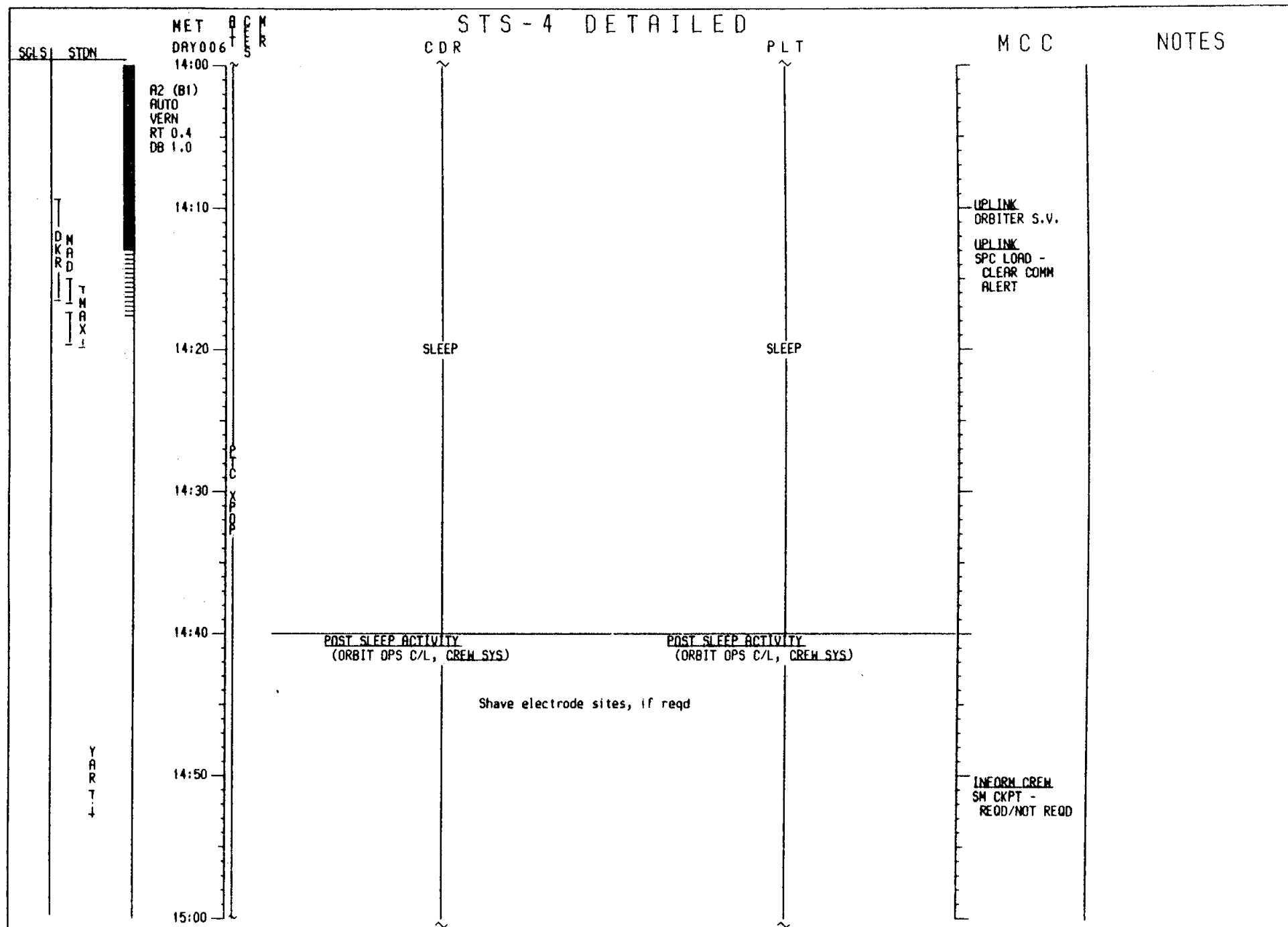


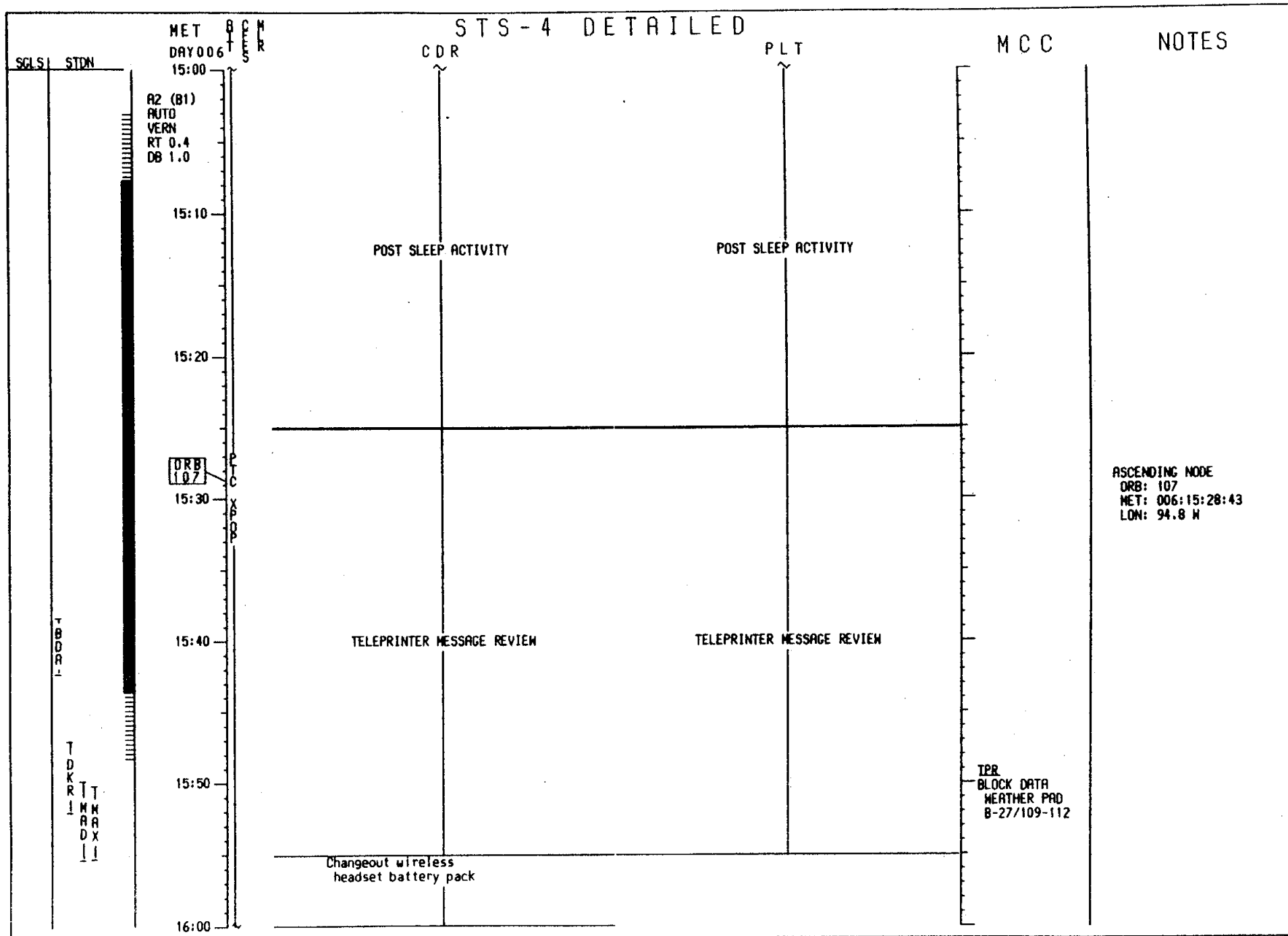








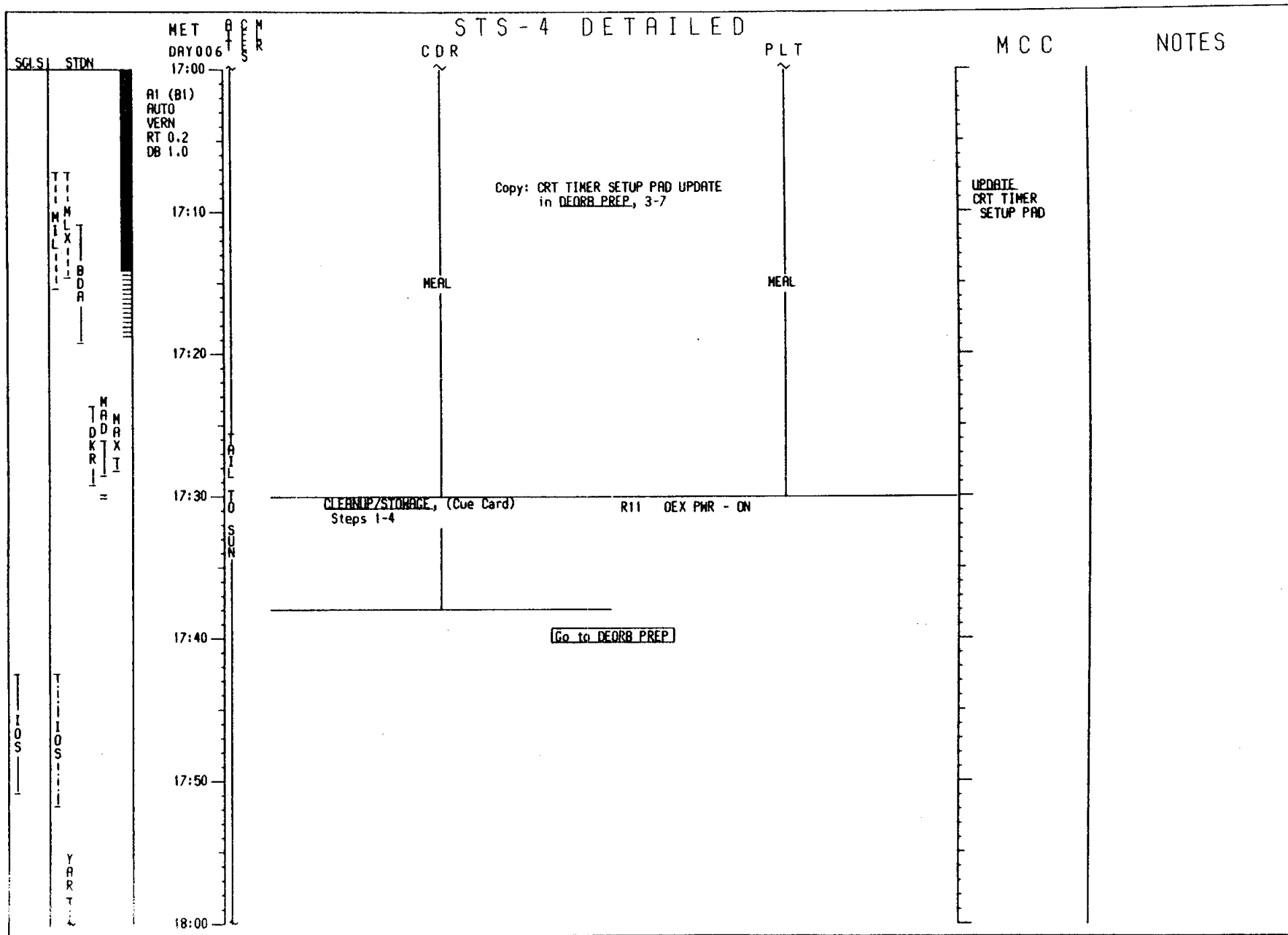




NOTES

5/14/82 STS4/FIN

4-130



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CONTINGENCY TIMELINES

HIGH PRIORITY MISSION..... 5-3
ONE-DAY EXTENSION..... 5-55
24 HOURS AFTER EXTENSION DAY..... 5-93

HIGH PRIORITY
MISSION

HIGH PRIORITY
MISSION

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HIGH PRIORITY MISSION

The High Priority Mission (HPM) is designed as a 74.3 hour flight lasting 3.5 flight days (FD). To enter HPM, complete the nominal FD 1 through 0/17:30. Begin HPM at 0/17:30.

HPM ACTIVITIES

FLIGHT DAY 1 - NOMINAL CAP FD 1 THROUGH SLEEP TO 0/17:30.

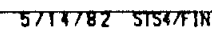
FLIGHT DAY 2 - BEGIN HPM SECTION AT 0/17:30. ACTIVITIES ARE SIMILAR TO NOMINAL CAP UNTIL 1/00:15 WHEN CFES SAMPLE 6 IS RUN.

- o ATTITUDES
 - o GRAVITY GRADIENT (8 HRS vs 12 HRS)
 - o BOTTOM SUN (26 HRS vs 33 HRS)
- o IECM CONTAMINATION SURVEY (1 HR) SCHEDULED WITH TOP SUN FOR WARM THERMAL ENVIRONMENT
- o IECM PLUME SURVEY (1 HR) IN BOTTOM SUN
- o HOT FIRE TEST
- o MLR DEACTIVATION (19.5 HRS)

- FLIGHT DAY 3 -
- o FRCS THERMAL SOAKBACK, PULSE MODE - F3F
 - o IECM GAS RELEASE
 - o FRCS THERMAL SOAKBACK, TWO FORWARD ENGINES - F2F, F3F
 - o FCS CHECKOUT, PART 1 AND 2. STAY ON TAIL ONLY JETS SO NO PRCS FIRINGS IN FORWARD POD. (REQUIREMENT OF FRCS THERMAL SOAKBACK TESTS)
 - o RADIATOR PERFORMANCE TEST. STOW RADIATORS 3 HRS PRIOR TO PLBD CYCLE TEST, THEN DEPLOY AFTER PLBDs OPENED
 - o PLBD CYCLE TEST AT THE END OF BOTTOM SUN THERMAL TEST
 - o PTC FOR SLEEP

- FLIGHT DAY 4 -
- o TAIL SUN AFTER MORNING IMU ALIGN
 - o NOMINAL DEORBIT PREP (5 HRS)

MET-6 -5 -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17

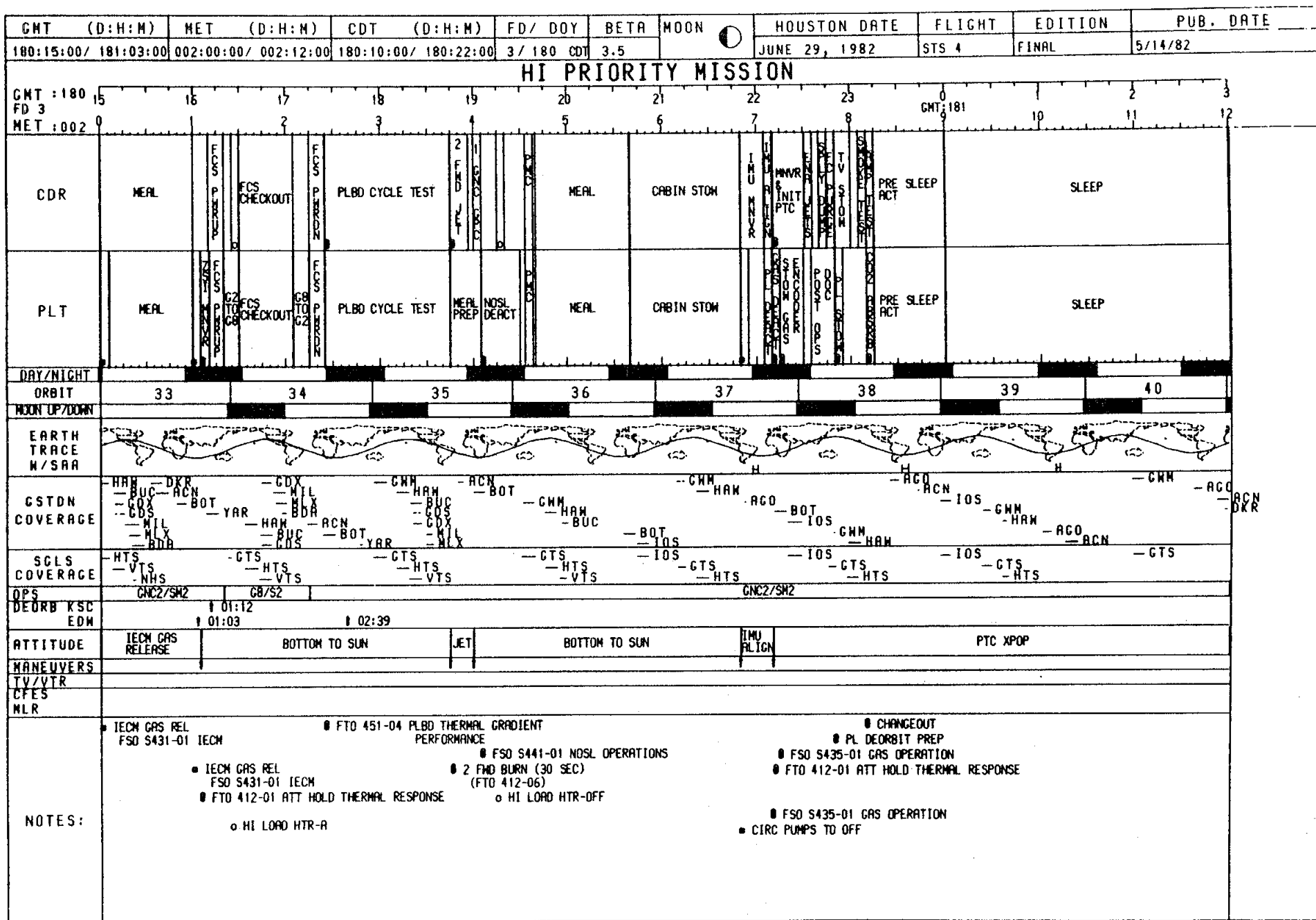


GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
178:15:00/ 179:03:00	000:00:00/ 000:12:00	178:10:00/ 178:22:00	1/ 178 CDT	-1.2		JUNE 27, 1982	STS-4	FINAL	5/14/82

HI PRIORITY MISSION

GMT : 178 FD : 11 MET : 000	15	16	17	18	19	20	21	22	23	0	1	2	3
										GMT: 179	10	11	12
CDR	ASCENT	PLBO TESTS	SUIT DOFF	BURN PREP	BURN PREP	MEAL	MEAL	PRE SLEEP	SLEEP				
PLT	ASCENT	PLBO TESTS	SUIT DOFF	BURN PREP	BURN PREP	MEAL	MEAL	PRE SLEEP	SLEEP				
DAY/NIGHT													
ORBIT		2	3	4	5	6	7	8	9				
EARTH TRACE W/SAA													
GSTDN COVERAGE	-YAR -HAK -BDH -ACN -BOT -GWM -HAK -AGO -BOT -IOS -GWM -AGO -ACN												
SCLS COVERAGE	-HTS -VTS -GTS -HTS -VTS -GTS												

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
179:15:00/ 180:03:00	001:00:00/ 001:12:00	179:10:00/ 179:22:00	2 / 179 CDT	0.9		JUNE 28, 1982	STS 4	FINAL	5/14/82
HI PRIORITY MISSION									
GMT: 179 FD 2 MET: 001									3
CDR									
PLT									
DAY/NIGHT									
ORBIT									
MOON UP/DOWN									
EARTH TRACE M/SAA									
GSTDN COVERAGE									
SCLS COVERAGE									
OPS									
DEGRB KSC EDM									
ATTITUDE									
MANEUVERS									
TV/VTR									
CFES									
MLR									
NOTES:	● INSERT SAMPLE 6 ● SAMPLE 6 SEPARATION & COLLECTION ● FSO 5433-02 ACIP ON-ORBIT DATA ● FSO 5442-01 MLR OPERATION ● FSO 5436-01 CFES ● FTO 454-01 RCS PLUME FLOW FIELD MEASUREMENT ● FTO 412-01 ATT HOLD THERMAL RESPONSE ● FTO 477-02 PASSIVE GRAVITY GRADIENT ATT HOLD ● FTO 453-01 CONTAMINATION MAPPING ● FTO 453-01 CONTAMINATION MAPPING ● FSO 5436-01 CFES ● FTO 477-01 PRCS NARROW DB ATT HOLD ● FTO 467-02 WATER SAMPLE FREEZING ● CHANGEOUT ● FTO 412-01 ATT HOLD THERMAL RESPONSE ● FTO 467-01 VPC FREEZER HEAT EXCHANGE DYNAMICS								

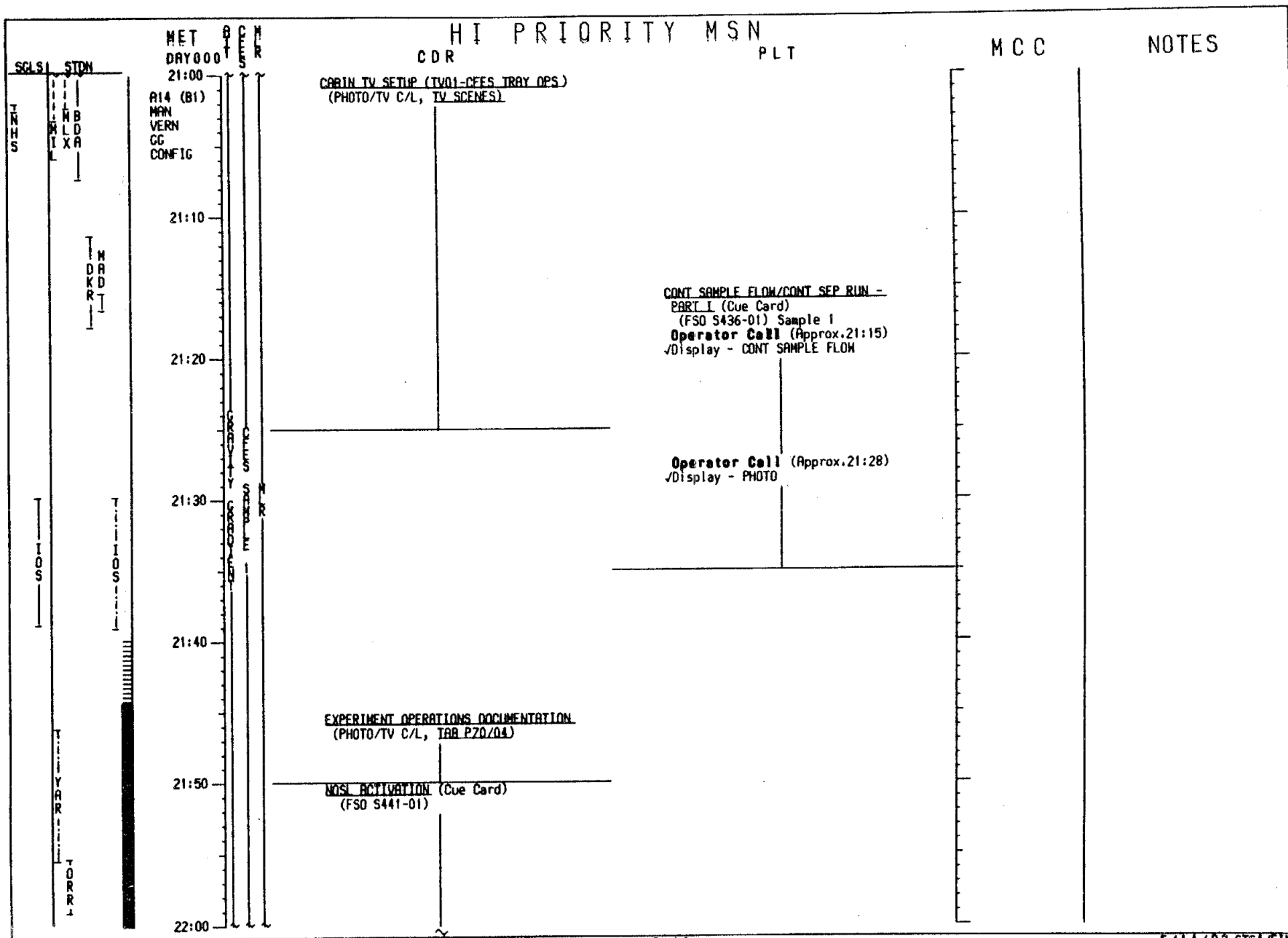


GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
181:03:00/ 181:15:00	002:12:00/ 003:00:00	180:22:00/ 181:10:00	4/ 180 CDT	4.9		JUNE 30, 1982	STS 4	FINAL	5/14/82				
TTC													
HI PRIORITY MISSION													
GMT :181	3	4	5	6	7	8	9	10	11	12	13	14	15
FD 3													
MET :002	12	13	14	15	16	17	18	19	20	21	22	23	0
CDR	SLEEP					POST SLEEP ACT	TPR MSG INJ REVIEW	MEAL		SUIT DOWN	PC CLOSING	ENT SW	
PLT	SLEEP					POST SLEEP ACT	TPR MSG REVIEW	MEAL		SUIT DOWN	PLBD CLOSING	ENT SW LIST/VER	
DAY/NIGHT	[Day/Night Cycle]												
ORBIT	[Orbit Data]												
WIND UP/DOWN	[Wind Data]												
EARTH TRACE M/SAR	[Earth Trace]												
GSTDN COVERAGE	[Coverage Data]												
SGLS COVERAGE	[Coverage Data]												
OPS	[Operations Data]												
DEORB KSC EDM	[Deorbit Data]												
ATTITUDE	[Attitude Data]												
MANEUVERS	[Maneuvers Data]												
TV/VTR	[TV/VTR Data]												
CFES	[CFES Data]												
MLR	[MLR Data]												
NOTES:	o LAST MEAL CLEANUP o BATT CHNG o ENTRY CONFIG o MD SW LIST/VER												

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
181:15:00/ 182:03:00	003:00:00/ 003:12:00	181:10:00/ 181:22:00	4 / 181 CDT	6.4	☉	JUNE 30, 1982	STS 4	FINAL	5/14/82
TIC HI PRIORITY MISSION GMT: 181 15 16 17 18 19 20 21 22 23 00 01 02 03 FD 4 MET: 003 0 1 2 3 4 5 6 7 8 9 10 11 12									
CDR	BURN PREP	ENTRY							
PLT	BURN PREP	ENTRY							
DAY/NIGHT									
ORBIT	49	50	51	52	53	54	55	56	
MOON UP/DOWN									
EARTH TRACE H/SAA									
GSTDN COVERAGE	-HAM -DKR -CDS -HAM -GMM -BOT -IOS -GMM -AGO -ACN -GMM -AGO -BUC -ACN -BOT -YAR -NIX -BUC -CDS -BQT -IOS -GMM -HAM -AGO -ACN -IOS -CDS -NIX -BUC -HAM -ACN -BOT -GMM -ACN -BOT -IOS -GMM -HAM -AGO -ACN -IOS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS								
SGLS COVERAGE	-HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS -HTS -VTS								
OPS	CNC37/BFS								
DEORB KSC	↑ 01:22								
EDM	↑ 01:13 ↑ 02:49								
ATTITUDE	TOP TO SUN	DEORB	EI-5	ENTRY					
MANEUVERS									
TV/VTR									
CFES									
MLR									
NOTES:									

MET		HI PRIORITY MSN		MCC		NOTES
DAY 000	TIME	CDR	PLT			
18:00	AI (B1) AUTO VERN RT 0.2 DB 1.0	POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	INFORM CREW SM CKPT - REQD/NOT REQD		
18:10						
18:20		TELEPRINTER MESSAGE REVIEW	TELEPRINTER MESSAGE REVIEW			
18:30		AUTO MNVR TO IMI ALIGN ATT MNVR OPTION: R + 16.2 P + 172.5 Y + 13.5 DAP: A/AUTO/VERN (18:32) Initiate MNVR	FUEL CELL PURGE - AUTO (Cue Card)			
18:40			HEATER RECONNECT (ORBIT OPS C/L, EPS) Config B			
			PCS 1(2) ON-ORBIT ACT/RECONNECT (ORBIT OPS C/L, ECLS) Reconfig for SYS 2			
18:50		STAR TRACKER SELF-TEST (ORBIT OPS C/L, GNC) IMI ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 15, HADAR -Z: 43, RASALHAGUE ANG DIF: 84.1 GRAVITY GRADIENT FREE DRIET, OPS 2 (FTO 477-02) (ORBIT OPS C/L, RCS) (18:57) Perform step 1: (AUTO MNVR TO ATTITUDE) VERN Jets: ATT ID: Per TPR message	HYD THERMAL CONDITIONING ENABLE (ORBIT OPS C/L, APLI/HYD)	IMI ALIGN PAD TRK ID _____, ANG ERR _____ ANG 1 _____ 2 _____ 3 _____ A X _____ () _____ () _____ A Y _____ () _____ () _____ A Z _____ () _____ () _____		Stars 15 & 43 available from 0/18:39 to 0/19:15
19:00				EXECUTION TIME: ____ / ____ : ____ : ____		

SGLS STDN		MET DAY 000	HI PRIORITY MSN	PLT	MCC	NOTES
19:00		A14(B1) AUTO VERN RT 0.2 DB 1.0	CDR ~			
			GRAVITY GRADIENT FREE DRIFT, OPS 2 Perform Step 2: (ESTABLISH FREE DRIFT) VERN Jets; ATT ID: Per TPR message	EXPERIMENT OPERATIONS DOCUMENTATION (PHOTO/TV C/L, TAB PTV01)		
19:10						
ORB 14			EXPERIMENT ACTIVATION (OPERATIONS C/L, TAB A)	EXPERIMENT OPERATIONS DOCUMENTATION (PHOTO/TV C/L, TAB P70/03)		ASCENDING NODE ORB: 14 MET: 000:19:14:57 LON: 102.2 W
19:20		A14 (B1) MAN VERN GC CONFIG		PAYLOAD STATUS REPORT (If reqd)		RPT: P/L STATUS ____
			REPORT: IMU ALIGN RESULTS			RPT: IMU ALIGN RESULTS ____
19:30						
19:40			MEAL	MEAL		
19:50						
20:00						



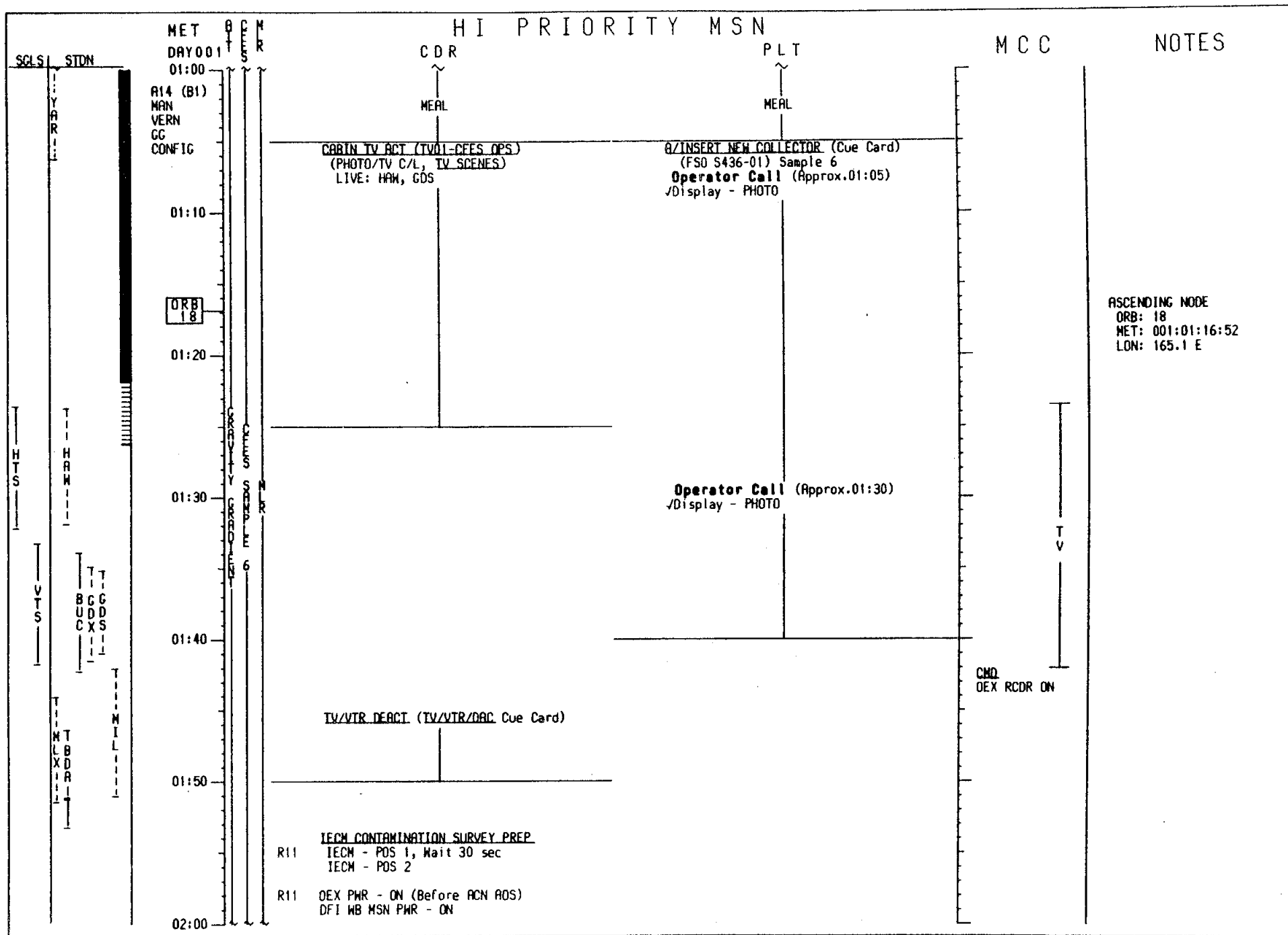
SCLS		STDN	MET DAY 000	B C M	HI PRIORITY MSN	PLT	MCC	NOTES
			22:00		CDR			
					NOSL ACTIVATION (Cue Card) (FSO S441-01)			
			22:10					
					HOUSEKEEPING			
			22:20					
			22:30					
					SIMULTANEOUS A/G 1 & A/G 2 DEMO			
			22:40					
			22:50					
					MEAL PREP (Cue Card) Prepare DAY 2, MEAL B			
			23:00					

ASCENDING NODE
ORB: 16
MET: 000:22:15:55
LON: 148.5 W

UPLINK
ORBITER S.V.

SGLS		STDN	MET DAY 000	HI PRIORITY MSN	CDR	PLT	MCC	NOTES
TOS		TOS	23:00	MEAL PREP (Cue Card)				
TOS		TOS	23:10			HOUSEKEEPING		
TOS		TOS	23:20					
TOS		TOS	23:30			B/INSERT NEW COLLECTOR (Cue Card) (FSD 5436-01) Sample 1 Operator Call (Approx. 23:25) /Display - PHOTO		
TOS		TOS	23:40			Operator Call (Approx. 23:43) /Display - PHOTO		
TOS		TOS	23:50	VPC FREEZER SETUP (FTD 467-01) MA79 Remove food from locker and store on food tray FREEZER PWR - OFF				
TOS		TOS	00:00	Record time / :		MEAL		

ASCENDING NODE
 ORB: 17
 MET: 000:23:46:24
 LON: 171.6 W



SCLS		STDN	MET	CDR	PLT	MCC	NOTES
A14 (B1)		MAN	VERN	CC	CONFIC		
02:00							
02:10							
02:20							
02:30							
02:40							
02:50							
03:00							

HI PRIORITY MSN

ACIP QUIESCENT ON-ORBIT DATA
(FSO 5433-02)
ON MCC CUE (ACN)
C3 **DFI RCDRS MB MSN - CONT RCD**
Wait 30 sec
C3 **DFI RCDRS MB MSN - STBY**
ON MCC CUE
R11 OEX PWR - OFF
DFI MB MSN PWR - OFF

MLR DEACTIVATION (Decal)
(FSO 442-01)
Record Time: 1

RUN 7 CONT OR FLUSH OR END
PART I (Cue Card)
(FSO 5436-01)
Operator Call (Approx.02:16)
✓Display - RUN 7 CONT OR
FLUSH OR END

RUN 7 CONT OR FLUSH OR END -
PART II (Cue Card)
(FSO 5436-01)
Operator Call (Approx.02:31)
✓Display - CLOSEOUT PROC

DUAL G2 GPC OPS
(ORBIT OPS C/L, OPS)

RMS POWERUP/CHECKOUT
(PDRS OPS C/L, RMS PWRUP)

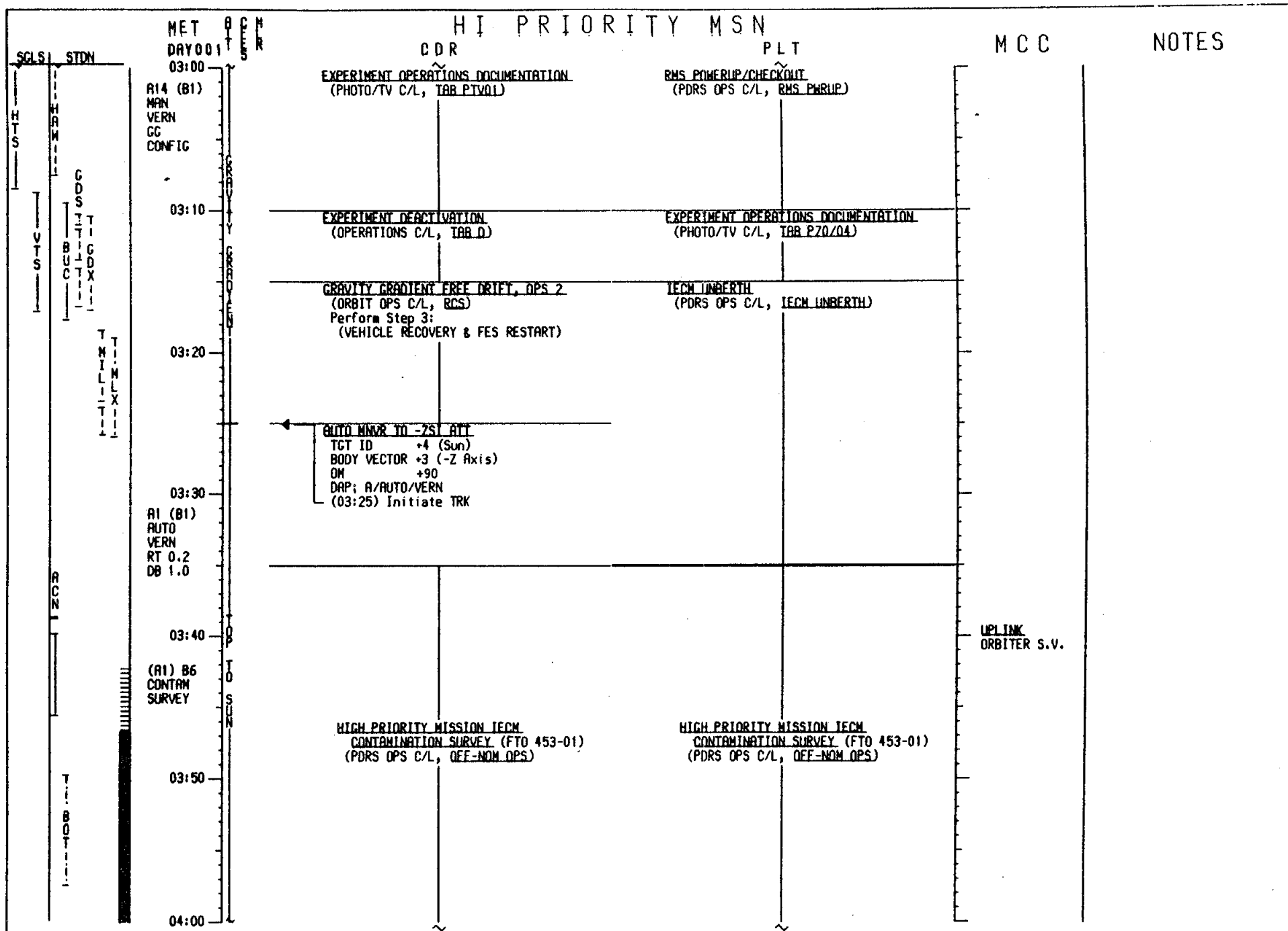
ORB
19

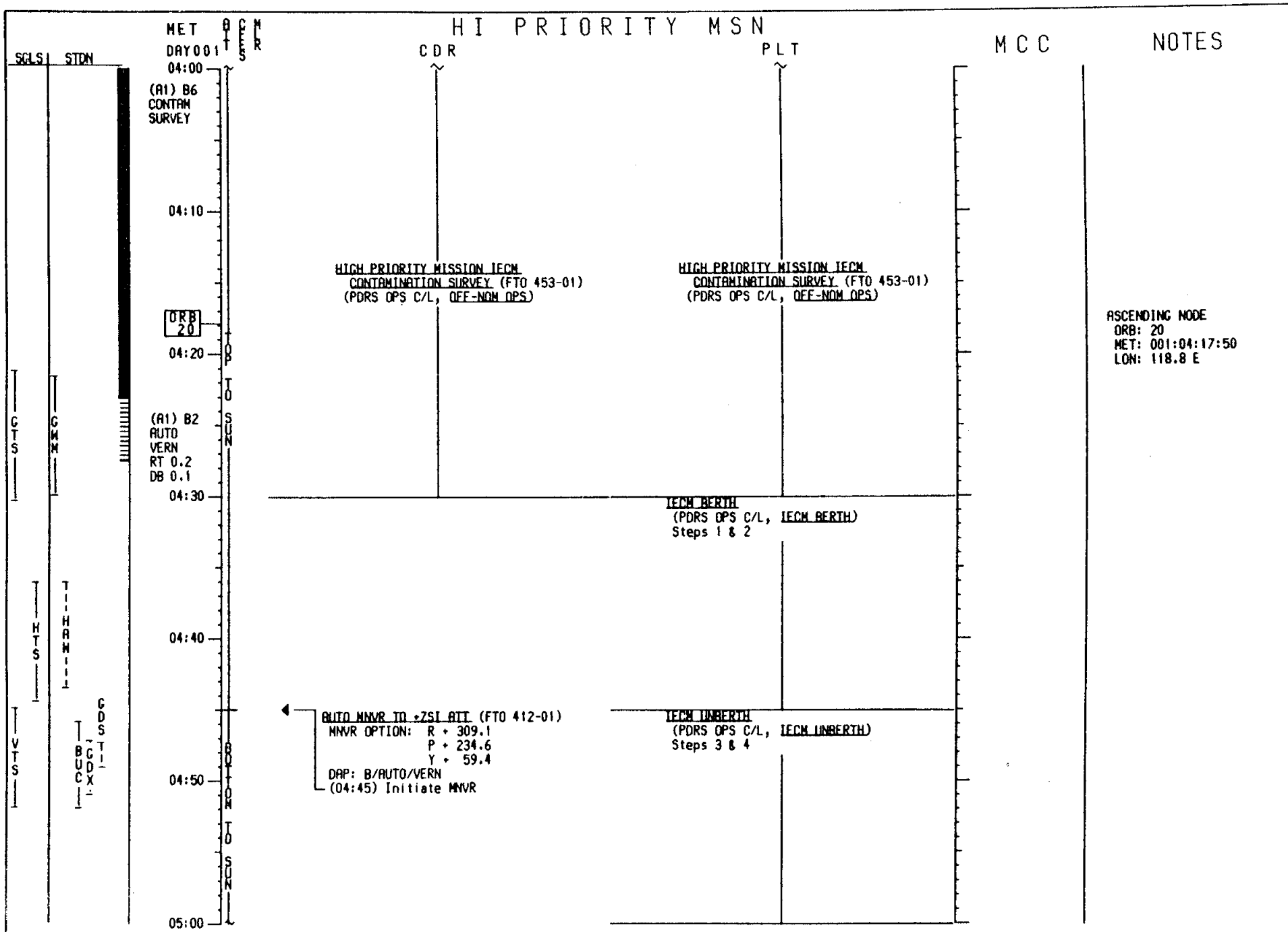
EXPERIMENT OPERATIONS DOCUMENTATION
(PHOTO/TV C/L, TAB PTV01)
Record 15 min

INFORM CREW
DFI MB-CONT RCD
CMD
OEX RCDR OFF
INFORM CREW
PWR OFF RCDRS

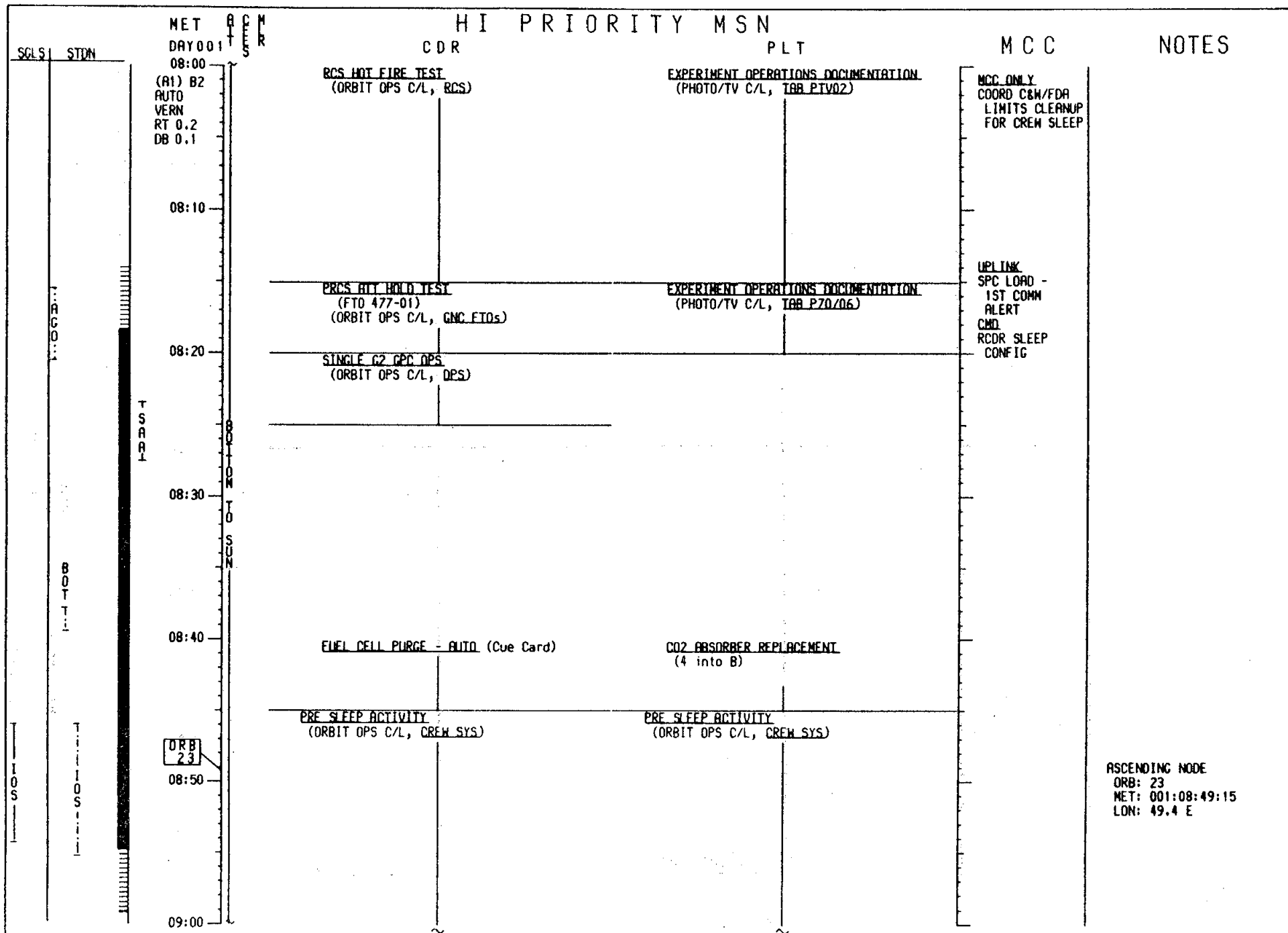
TPR
BLOCK DATA
WEATHER PAD
B- 5/20-23

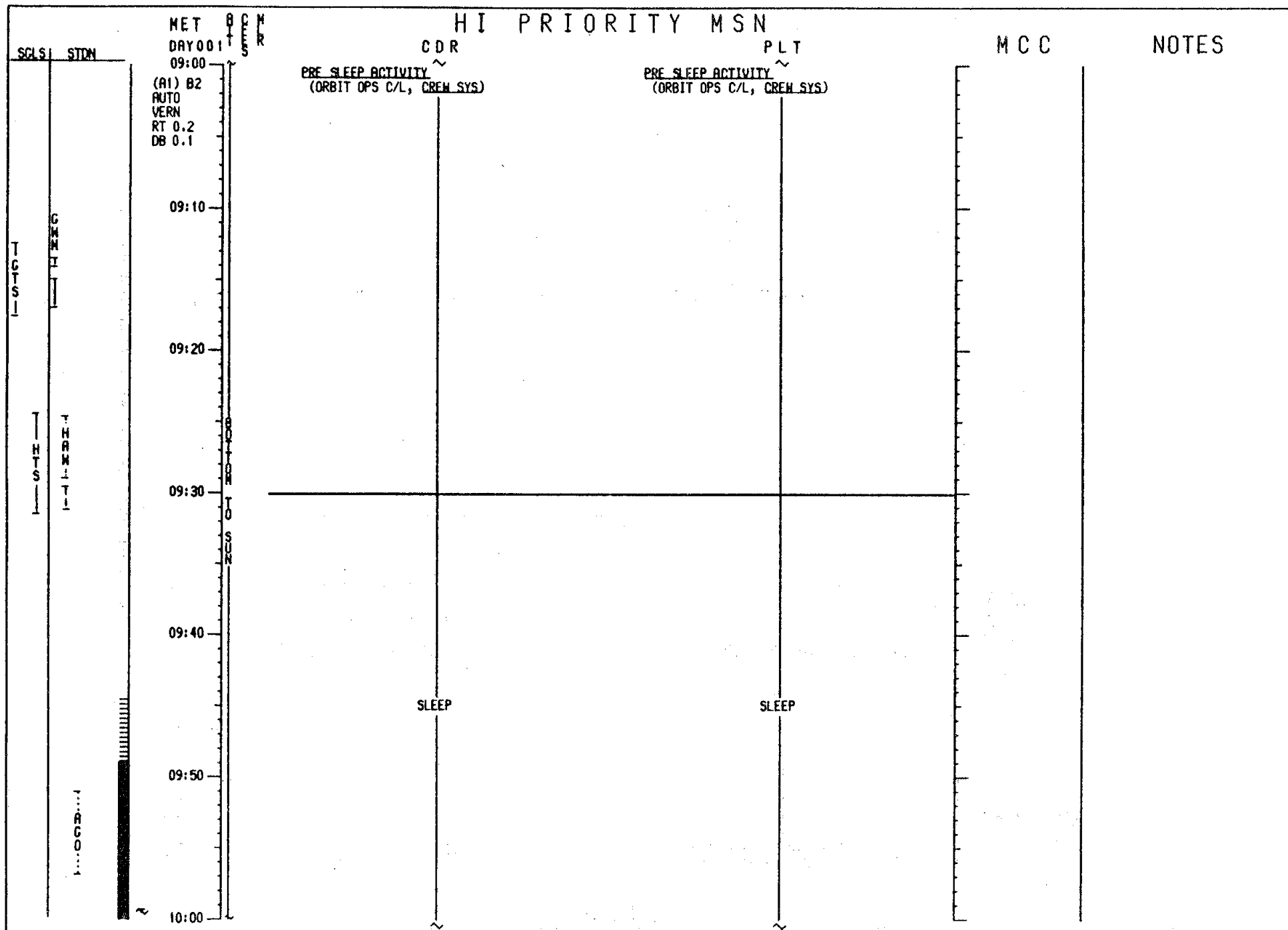
ASCENDING NODE
ORB: 19
MET: 001:02:47:21
LON: 142.0 E



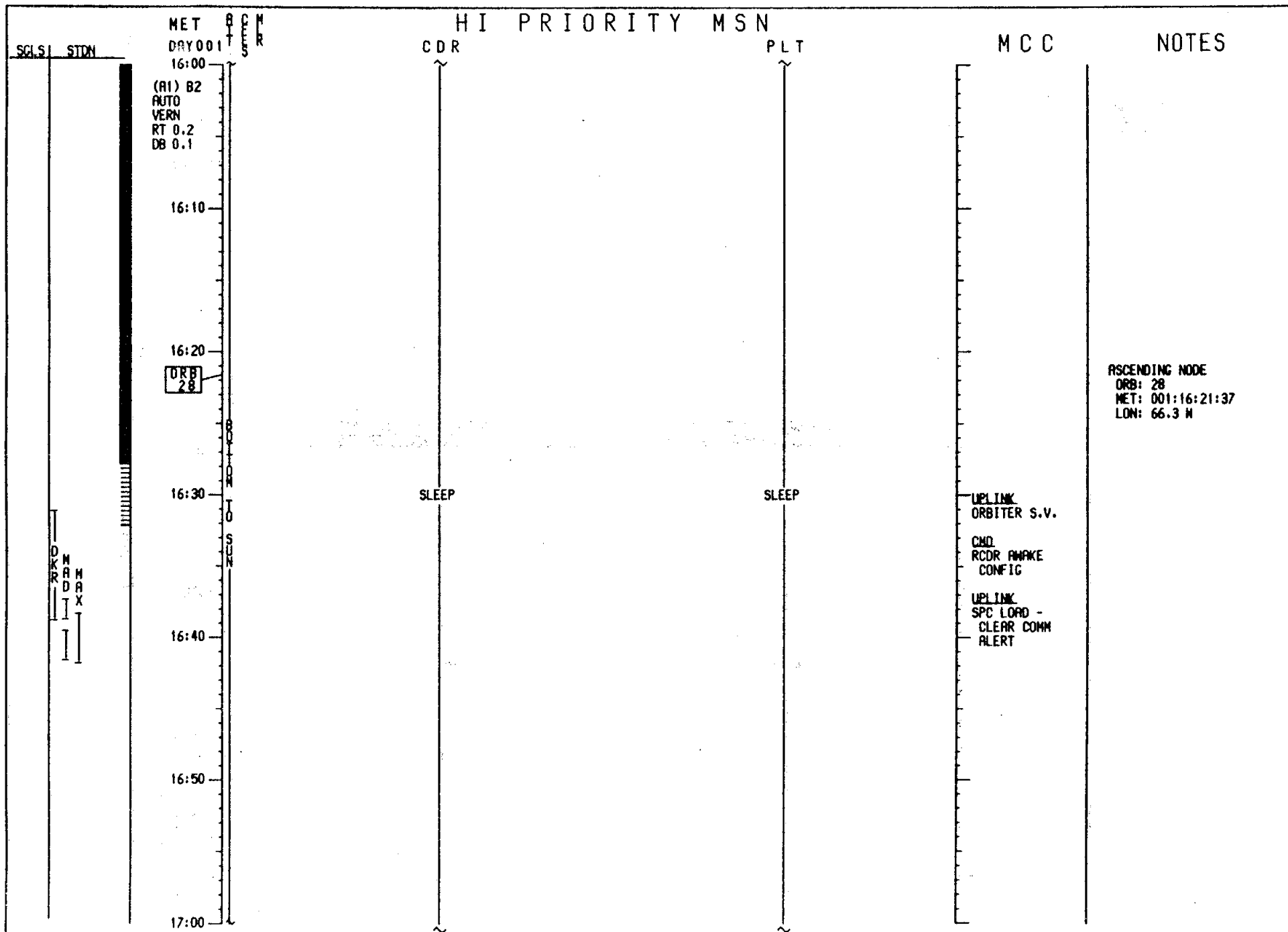


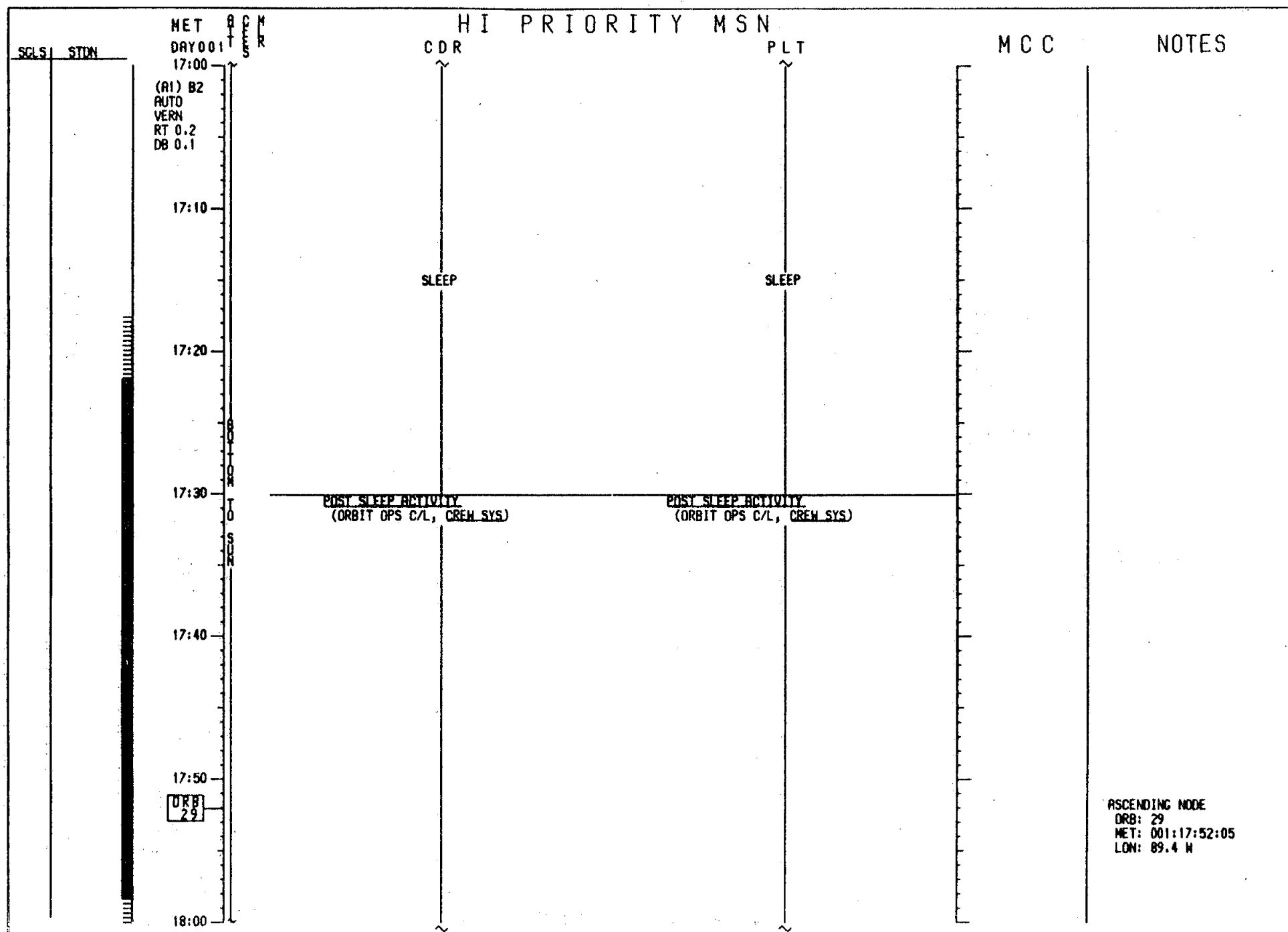
MET		HI PRIORITY MSN		MCC		NOTES
DAY 001	06:00	CDR	PLT			
(A1) B2 AUTO VERN RT 0.2 DB 0.1	06:00	IECM BERTH (PDRS OPS C/L, IECM BERTH)				
	06:10	RMS POWERDOWN (PDRS OPS C/L, RMS PHRON)		UPDATE H2O SPLY DUMP QTY TK A & B		
	06:20	HOUSEKEEPING				
A1 (B2) AUTO VERN RT 0.2 DB 1.0	06:30	AUTO MNVR TO IMU ALIGN ATT MNVR OPTION: R + 241.7 P + 307.6 Y + 353.1 DAP: A/AUTO/VERN (06:40) Initiate MNVR		MEAL PREP (Cue Card) Prepare DAY 2, MEAL C		Stars 42 & 15 available from 1/06:34 to 1/07:20
	06:40	IMU ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 42, ALPHECCA -Z: 15, HADAR ANG DIF: 89.1				
(A1) B2 AUTO VERN RT 0.2 DB 0.1	06:50	AUTO MNVR TO +ZSI ATT (FTO 412-01) MNVR OPTION: R + 309.1 P + 234.6 Y + 59.4 DAP: B/AUTO/VERN (06:55) Initiate MNVR		SUPPLY WATER DUMP (ORBIT OPS C/L, ECLS) Dump TKS A & B Dump to: QTY A = QTY B =		
	07:00			IMU ALIGN PAD TRK ID , ANG ERR . . ANG 1 2 3 Δ X () () () Δ Y () () () Δ Z () () () EXECUTION TIME: / : .		





SCLS		STDN	MET	HI PRIORITY MSN		MCC	NOTES
			DAY 001	CDR	PLT		
			15:00				
			(R1) B2				
			AUTO				
			VERN				
			RT 0.2				
			DB 0.1				
			15:10				
			15:20				
			15:30	SLEEP	SLEEP		
			15:40				
			15:50				
			16:00				





MET		HI PRIORITY MSN		MCC		NOTES
DAY	TIME	CDR	PLT			
DAY 001	18:00	POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)	POST SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)			
(A1) B2 AUTO VERN RT 0.2 DB 0.1	18:10			UPDATE H2O SPLY DUMP QTY TK A & B		
	18:20	TELEPRINTER MESSAGE REVIEW	TELEPRINTER MESSAGE REVIEW			
	18:30					
	18:40	DUAL G2 OPC OPS (ORBIT OPS C/L, OPS)				
	18:50	ERCS THERMAL SOAKBACK (PULSE MODE - FTO 412-07) (ORBIT OPS C/L, RCS FTO's) Perform Step 1 (CONFIGURE FOR TRANSLATION)	VPC FREEZER TEST (FTO 467-01) HA79 Record elapsed time indicator reading			
	19:00	AUTO MNVR TO IMU ALIGN ATT MNVR OPTION: R + 12.4 P + 208.6 Y + 4.9 DAP: A/AUTO/VERN (18:50) Initiate MNVR	FREEZER PHR - ON Record time, freezer temp, condenser temp Repeat once per minute for 15 minutes or until temp stabilizes			Stars 51 & 22 available from 1/18:52 to 1/19:29

SCLS STDN

MET

DAY 001

19:00

A1 (B2)
AUTO
VERN
RT 0.2
DB 1.0

19:10

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

19:20

ORB
30

19:30

19:40

19:50

20:00

CDR

PLT

HI PRIORITY MSN

STAR TRACKER SELF-TEST

(ORBIT OPS C/L, GNC)

IMU ALIGNMENT - S TRK

(ORBIT OPS C/L, GNC)

STAR ID: -Y: 51, ATRIA

-Z: 22, ALTAIR

RNG DIF: 84.0

AUTO MNVR TO +7SL ATT (FTO 412-01)

MNVR OPTION: R + 309.1

P + 234.6

Y + 59.4

DAP: B/AUTO/VERN

(19:10) Initiate MNVR

VPC FREEZER TEST (FTO 467-01)

WATER SAMPLE FREEZING

Mxxx Unstow H2O sample container
and fill with H2O

MA96 Insert container into freezer,

Record time ____ / ____ : ____

Changeout wireless
headset battery pack

EC PURGE - MANUAL (Cue Card)

SUPPLY WATER DUMP

(ORBIT OPS C/L, ECLS)

Dump TKS A & B

Dump to:

QTY A = QTY B =

REPORT: IMU ALIGN RESULTS

MEAL

MEAL

MCC

NOTES

IMU ALIGN PAD

TRK ID _____, _____, _____
RNG 1 2 3

A X
() () ()

A Y
() () ()

A Z
() () ()

EXECUTION TIME: ____ / ____ : ____

ASCENDING NODE

ORB: 30

MET: 001:19:22:33

LON: 112.6 W

RPT: IMU ALIGN RESULTS

SGLS STDM

MET

DAY 00

21:00

A1 (B2)

AUTO

NORM

RT 0.2

DB 5.0

21:10

(A1) B2

AUTO

VERN

RT 0.2

DB 0.1

21:20

21:30

A1 (B2)

AUTO

NORM

RT 0.2

DB 5.0

21:40

(A1) B2

AUTO

VERN

RT 0.2

DB 0.1

21:50

22:00

HI PRIORITY MSN

CDR

PLT

MCC

NOTES

CABIN STOW

UPLINK
ORBITER S.V.TPR
BLOCK DATA
WEATHER PAD
B- 8/32-35ERCS THERMAL SOAKBACK

(PULSE MODE - FTO 412-07)

(ORBIT OPS C/L, RCS FTO's)

Perform Step 3 (PERFORM TRANSLATION)

(21:10) -X TRANS (30 sec)

C3 JDFI RCDRS MB MSN - STBY (tb-bp)

C3 JDFI RCDRS PCN - HI SAMP

ERCS THERMAL SOAKBACK

(PULSE MODE - FTO 412-07)

(ORBIT OPS C/L, RCS FTO's)

Perform Step 3 (PERFORM TRANSLATION)

(21:40) -X TRANS (30 sec)

C3 JDFI RCDRS MB MSN - STBY (tb-bp)

C3 JDFI RCDRS PCN - HI SAMP

MET DAY 001		HI PRIORITY MSN		MCC		NOTES	
SCS	STDN	CDR	PLT				
22:00	A1 (B2) AUTO NORM RT 0.2 DB 5.0	ERCS THERMAL SOAKBACK (PULSE MODE - FTO 412-07) (ORBIT OPS C/L, RCS ETO's) Perform Step 3 (PERFORM TRANSLATION)					
22:10		4	(22:10) -X TRANS (30 sec)				
	(A1) B2 AUTO VERN RT 0.2 DB 0.1	C3	✓DFI RCDRS NB MSN - STBY (tb-bp)				
22:20		C3	✓DFI RCDRS PCM - HI SAMP				
	ORB 32						
22:30							
	A1 (B2) AUTO NORM RT 0.2 DB 5.0	ERCS THERMAL SOAKBACK (PULSE MODE - FTO 412-07) (ORBIT OPS C/L, RCS ETO's) Perform Step 3 & 4 (PERFORM TRANSLATION & POST BURN RECONFIG)					
22:40		4	(22 40) -X TRANS (30 sec)	DEFI POWER UP (MIL) R11:H DFI PCM CONT 1,2,3 SGSC (three) - ON			
	(A1) B2 AUTO VERN RT 0.2 DB 0.1	C3	✓DFI RCDRS NB MSN - STBY (tb-bp)				
22:50		C3	✓DFI RCDRS PCM - HI SAMP	DEFI POWER DOWN R11:H DFI PCM CONT 1,2,3 SGSC (three) - OFF			
23:00							

ASCENDING NODE
ORB: 32
MET: 001:22:23:30
LON: 158.9 W

GAS DEACTIVATION PREP (Cue Card)
(FSO S435-01)

MEAL PREP (Cue Card)
Prepare DAY 3, MEAL B

CABIN STOW
(ORBIT OPS C/L, CREW SYS)

RADIATORS STOW/DEPLOY
(FTO 466-01)
(ORBIT OPS C/L, PLAD FTO's)
Perform Step 1 - STOW RADIATORS

AUTO MNR TO TECH GAS RELEASE

TGT ID	2
BODY VECTOR	5
P	0
Y	270
OH	90

DAP: A/AUTO/VERN
(23:40) Initiate TRK

1
IFCM GAS RELEASE (FSO S431-01)
✓Attitude mnvr complete
Change DAP A:
ROT DISC RATE VERN - .007"/sec
DB ATT VERN - 0.5°
DAP: A/AUTO/VERN

HOUSEKEEPING

ASCENDING NODE
ORB: 33
MET: 001:23:53:58
LON: 177.9 E

HI PRIORITY MSN

CDR

PLT

MCC

NOTES

MET
DAY 002

00:00
A9 (B2)
AUTO
VERN
RT 0.007
DB 0.5

SCLS STON

HTS
VTS
NHS
BDR
DKR
ACN
T-BOTT

00:10

00:20

00:30

00:40

00:50

01:00

IECM GAS RELEASE (FSO 5431-01)

GNC UNIV PTC

BODY VECT +2 (-X Axis)

(00:07) Initiate ROT

IECM - POS 1, Wait 30 sec

IECM - POS 2

R11

MEAL

MEAL

NOTES

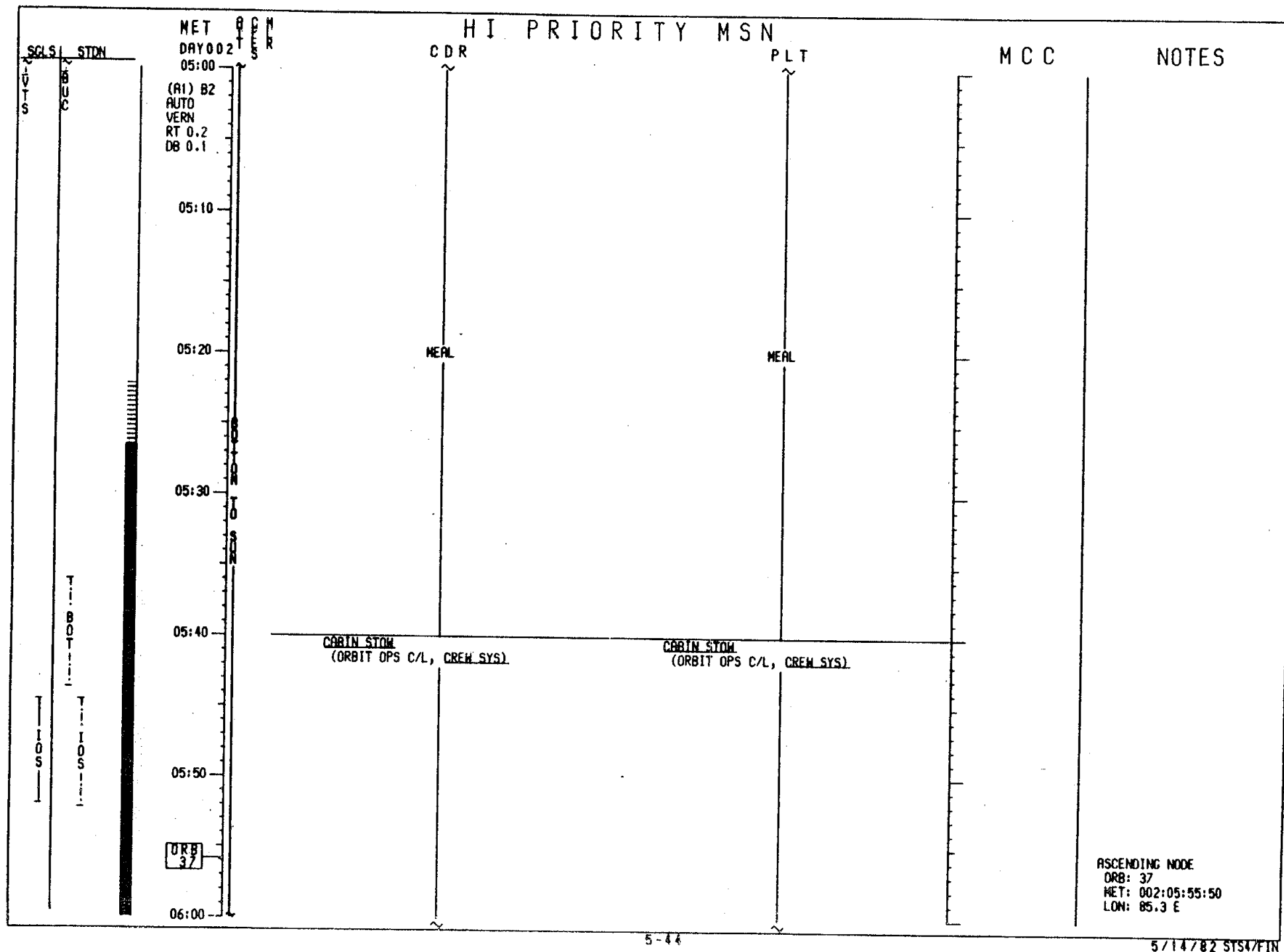
5/14/82 STS47FIN

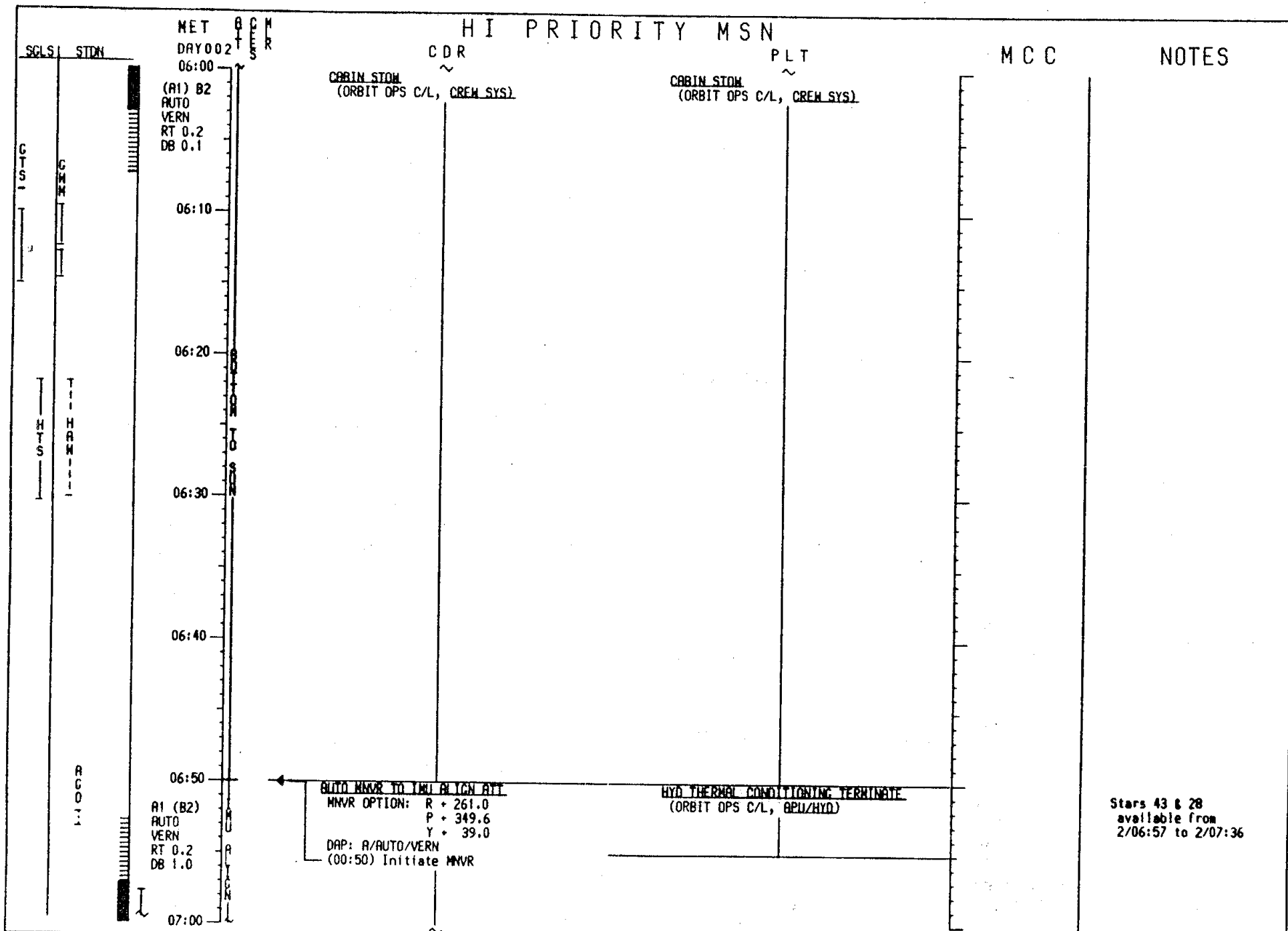
MET		HI PRIORITY MSN		MCC		NOTES	
DAY 002		CDR		PLT			
03:00		PLBD PERFORMANCE (THERMAL GRADIENT - FTO 451-04)		PLBD PERFORMANCE (THERMAL GRADIENT - FTO 451-04)			
(A1) B2 AUTO VERN RT 0.2 DB 0.1							
03:10							
03:20							
03:30							
03:40							
03:50		JNC 23 RCS JET DES F2F - ITEM 23 EXEC (no x) PRIMARY RJD DRIVER (eight) - ON ERCS THERMAL SOAKBACK (FTO 412-06) (ORBIT OPS C/L, RCS FTO's) Perform Step 2 (PERFORM TRANSLATIONS) Omit THC *X mvr (03:50) -X TRANS (30 sec)		MEAL PREP (Cue Card) Prepare DAY 3, MEAL C			
04:00		C3 JDFI RCDRS MB MSN - STBY (tb-bp) DAP: B/AUTO/VERN PRIMARY RJD DRIVER (eight) - OFF C3 JDFI RCDRS PCH - MI SANP					

SGLS		STDM	MET	CDR	PLT	MCC	NOTES
			DAY 002				
			04:00	SINGLE C2 GPC OPS (ORBIT OPS C/L, OPS)	MEAL PREP		
			(A1) 82 AUTO VERN RT 0.2 DB 0.1				
			04:10				
			04:20	L1 HI LOAD DUCT HTR - OFF (30 min after HI LOAD EVAP - OFF)			
			04:30				
			04:40	PRIVATE MEDICAL COMMUNICATION (If Required)	PRIVATE MEDICAL COMMUNICATION (If Required)		
			04:50	MEAL	MEAL		
			05:00				

ASCENDING NODE
ORB: 36
MET: 002:04:25:22
LON: 108.5 E

UPLINK
ORBITER S.V.





Stars 43 & 28
available from
2/06:57 to 2/07:36

SCLS STON		MET DAY 002	HI PRIORITY MSN	CDR	PLT	MCC	NOTES
07:00	A1 (B2)	AUTO	RT 0.2	DB 1.0	IMU ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 43, RASALHAGUE -Z: 28, AL NA'IR	PAYLOAD DEACTIVATION (OPERATIONS C/L, TAB E)	IMU ALIGN PAD TRK ID _____, ANG ERR _____ ANG 1 2 3 Δ X _____ Δ Y _____ Δ Z _____ EXECUTION TIME: ____ / ____ : ____
07:10	A2 (B1)	AUTO	RT 0.4	DB 1.0	ANG DIF: 85.0 REPORT: IMU ALIGN RESULTS 0.4 DEG/SEC PTC, XPOP - INITIATE (FTO 412-01) MNVR OPTION: R+ 165.8 P+ 232.6 Y+ 58.3 DAP: A/AUTO/VERN (07:10) Initiate MNVR	GAS DEACTIVATION (Cue Card) (FSO 5435-01)	UPDATE H2O SPLY DUMP QTY TK A & B
07:20	A2 (B1)	AUTO	RT 0.4	DB 1.0	When MNVR to PTC ATT complete, CHANGE DAP A: ROT DISC RATE VERN - 0.4 /SEC CHANGE DAP B: DB ATT VERN - 1.0 BODY VECT +4 (07:30) Initiate ROT	STOW GAS ENCODER (Cue Card)	RPT: IMU ALIGN RESULTS
07:30					FRCS/ARCS THERMAL SOAKBACK (FTO 412-06) (ORBIT OPS C/L, RCS FTO's) Perform Step 3 (RECONFIG TO NOMINAL)		ASCENDING NODE ORB: 38 MET: 002:07:26:18 LON: 62.2 E
07:40					SUPPLY WATER DUMP (ORBIT OPS C/L, ECLS) Dump TKS A & B Dump to: QTY A = _____ QTY B = _____ FUEL CELL PURGE - AUTO (Cue Card)	POST OPERATIONS DOCUMENTATION (OPERATIONS C/L, TAB P70/14 & P70/15)	
07:50					CABIN TV STOW MF57E/ Stow both cameras MF57G	PAYLOAD DEACTIVITY PREPARATION (OPERATIONS C/L, TAB E)	MCC ONLY COORD C&M/FDA LIMITS CLEANUP FOR CREW SLEEP
08:00							UPLINK SPC LOAD - 1ST COMM ALERT CMD RCDR SLEEP CONFIG

MET		HI PRIORITY MSN		MCC		NOTES
DAY 002	08:00	CDR	PLT			
08:00	A2 (B1)	FIRE/SMOKE DETECT/SUPPRESS TEST (ORBIT OPS C/L, EPS)				
08:10	AUTO	ANNUNCIATOR, C/W LAMP TEST (ORBIT OPS C/L, EPS)		CO2 ABSORBER REPLACEMENT (5 into A)		
08:20	VERN	PRE SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)		PRE SLEEP ACTIVITY (ORBIT OPS C/L, CREW SYS)		
08:30	RT 0.4					TPR BLOCK DATA WEATHER PAD 8- 10/40-43
08:40	DB 1.0					
08:50						
09:00		C3 JDFI RCDRS PCM - LO SAMP				ASCENDING NODE ORB: 39 MET: 002:08:56:46 LON: 39.0 E

MET		HI PRIORITY MSN			MCC		NOTES
DAY 002	09:00	C D-R	PLT				
SCLS STDN A2 (B1) AUTO VERN RT 0.4 DB 1.0 09:10 09:20 09:30 09:40 09:50 10:00	TOS TOS GTS GTS HRTS HRTS	SLEEP	SLEEP	UPLINK ORBITER S.V.			

SCLS/ STDN

MET B C M
DAY 002 S E R

HI PRIORITY MSN

PLT

MCC

NOTES

15:00
R2 (B1)
AUTO
VERN
RT 0.4
DB 1.0
15:10
15:20
15:30
15:40
15:50
16:00

OKR
MADDI

CDR

SLEEP

SLEEP

SGLS STON

MET 0 C M
DAY 002

HI PRIORITY MSN

CDR

PLT

MCC

NOTES

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

Shave electrode sites, if reqd

UPDATE
H2O SPLY DUMP
QTY TK A & B

INFORM CREW
SW CKPT -
REQD/NOT REQD

17:10

17:20

17:30

17:40

17:50

18:00

TELEPRINTER MESSAGE REVIEW

TELEPRINTER MESSAGE REVIEW

ORB
45

ASCENDING NODE
ORB: 45
MET: 002:17:59:32
LON: 99.8 W

HI PRIORITY MSN

SGLS! STDN

MET DAY 002
18:00

CDR

PLT

MCC

NOTES

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

TELEPRINTER MESSAGE REVIEW

TELEPRINTER MESSAGE REVIEW

UPLINK
ORBITER S.V.

18:10

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

AUTO MNVR TO IMU ALIGN ATT
MNVR OPTION: R + 165.8
P + 252.3
Y + 49.1
CHANGE DAP A: ROT DISC RATE VERN - 0.2"/sec
DAP: A/AUTO/VERN
(18:15) Initiate MNVR

Stars 40 & 25
available from
2/18:25 to 2/18:45

18:20

18:30

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 40, MIRFAK
-Z: 25, REGULUS

ML31C VAC VENT NOZ HTR - OFF
R5/C6 Unstow DEORBIT PDP (2)

18:40

ANG DIF: 87.5
REPORT: IMU ALIGN RESULTS
AUTO MNVR TO -XSI ATT
MNVR OPTION: R + 162.4
P + 283.2
Y + 335.6
DAP: A/AUTO/VERN
(18:40) Initiate MNVR

FUEL CELL PURGE - AUTO (Cue Card)

IMU ALIGN PAD

TRK ID _____, _____ ANG ERR _____
ANG 1 _____ 2 _____ 3 _____

Δ X _____ () _____ () _____
Δ Y _____ () _____ () _____
Δ Z _____ () _____ () _____

18:50

Changeout wireless
headset battery pack

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to: _____
QTY A = _____ QTY B = _____

EXECUTION TIME: ____ / ____ : ____ : ____

RPT: IMU ALIGN RESULTS ____

MEAL

MEAL

19:00

MET DAY 002		HI PRIORITY MSN		MCC		NOTES	
SGLS	STDN	CDR	PLT				
19:00							
19:10							
19:20							
19:30		MEAL	MEAL				
19:40							
19:50		CLEANUP/STOWAGE (Cue Card) Steps 1-4					
20:00		R11 OEX PWR - ON					
		Copy: CRT TIMER SETUP PAD UPDATE in DEORBIT PREP, 3-7					
		Go to DEORBIT PREP					
				IER BLOCK DATA WEATHER PAD 8- 12/48-51		ASCENDING NODE ORB: 46 MET: 002:19:30:00 LON: 122.9 W	
				UPDATE CRT TIMER SETUP PAD			

ONE-DAY EXTENSION

The STS-4 Extension Timeline is designed to follow a nominal flight up to the decision point for the 24 hour extension. This GO/NO GO decision point occurs at MET 6/00:25, prior to entry-related activities for the nominal flight.

Also, this timeline may be used after the D/O PREP BACKOUT has been executed on FD 8.

24 HOUR EXTENSION CASE:

- o Execute detailed timeline pages from 6/00:00 to Deorbit Prep on FD 9
- o A period of time with no scheduled activities is provided immediately following the GO/NO GO to allow preparations for the extension of the flight.

AFTER DEORBIT PREP BACKOUT CASE:

Begin timeline at 7/00:30 with the following changes:

- o CDR - MCC will modify PTC to -ZLV as required (5-83); omit CABIN TV STOW at 7/04:15 MET
- o PLT - Omit all activities between MET 7/02:10 and 7/04:20 (i.e., P/L DEACT, CABIN STOW, CO₂ ABSORBER REPLACEMENT)

ONE-DAY
EXTENSION

5-56

05/14/82 STS4/FIN

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
185:03:00/ 185:15:00	006:12:00/ 007:00:00	184:22:00/ 185:10:00	7/ 184 CDT	18.8	☉	JULY 4, 1982	STS-4	FINAL	05/14/82

GMT : 185 FD 7 MET : 006	3	4	5	6	7	8	9	10	11	12	13	14	15
	12	13	14	15	16	17	18	19	20	21	22	23	0

CDR	SLEEP	POST SLEEP ACT	TPR RUC MUSC	MEAL	PLBD CYCLE TEST	IMU MNR INIT PTC	MEAL PREP	HK	MEAL	EQUIP PREP	EVA PREP	EMU/ AIRLOCK EVAL	EMU/ LCH CART REPLACE	POST EVA PREP
PLT	SLEEP	POST SLEEP ACT	TPR RUC MUSC	MEAL	PLBD CYCLE TEST	EXERCISE	TV SETUP	TV ACT	MEAL	S-BD ANT TEST	EVA SUPPORT			
DAY/NIGHT														
ORBIT	104	105	106	107	108	109	110	111	112					
MOON UP/DOWN														
EARTH TRACE N/SAR														
GSTDN COVERAGE	-DKR	-DKR -HAD -MAX	-YAR	-HAD -MAX -IOS -YAR -ORR	-BDR -DKR -HAD -MAX -IOS -YAR -ORR	-MIL -MLX -BDR -DKR -IOS -YAR -ORR	-BUC -ACN -BOT -YAR -HAD -DKR -BUC -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX	-CWN -HAD -BDR -ACN -BOT -YAR -MIL -MLX
SGLS COVERAGE				-IOS	-IOS	-IOS	-IOS	-NHS	-HTS -VTS	-HTS -VTS	-HTS -VTS	-GTS -VTS	-GTS -VTS	-GTS -VTS
OPS														
DEORB KSC EDW					16:27	18:03		19:39	21:15	22:50				
ATTITUDE								19:31	21:06	22:42				
MANEUVERS														
TV/VTR														
CFES														
MLR														

• FTO 451-03 PLBD COLD CASE PERFORMANCE

• FTO 471-01 S-BAND & UHF ANT PATTERNS

• FTO 412-01 ATT HOLD THERMAL RESPONSE

• STRKR SELF TEST

NOTES:

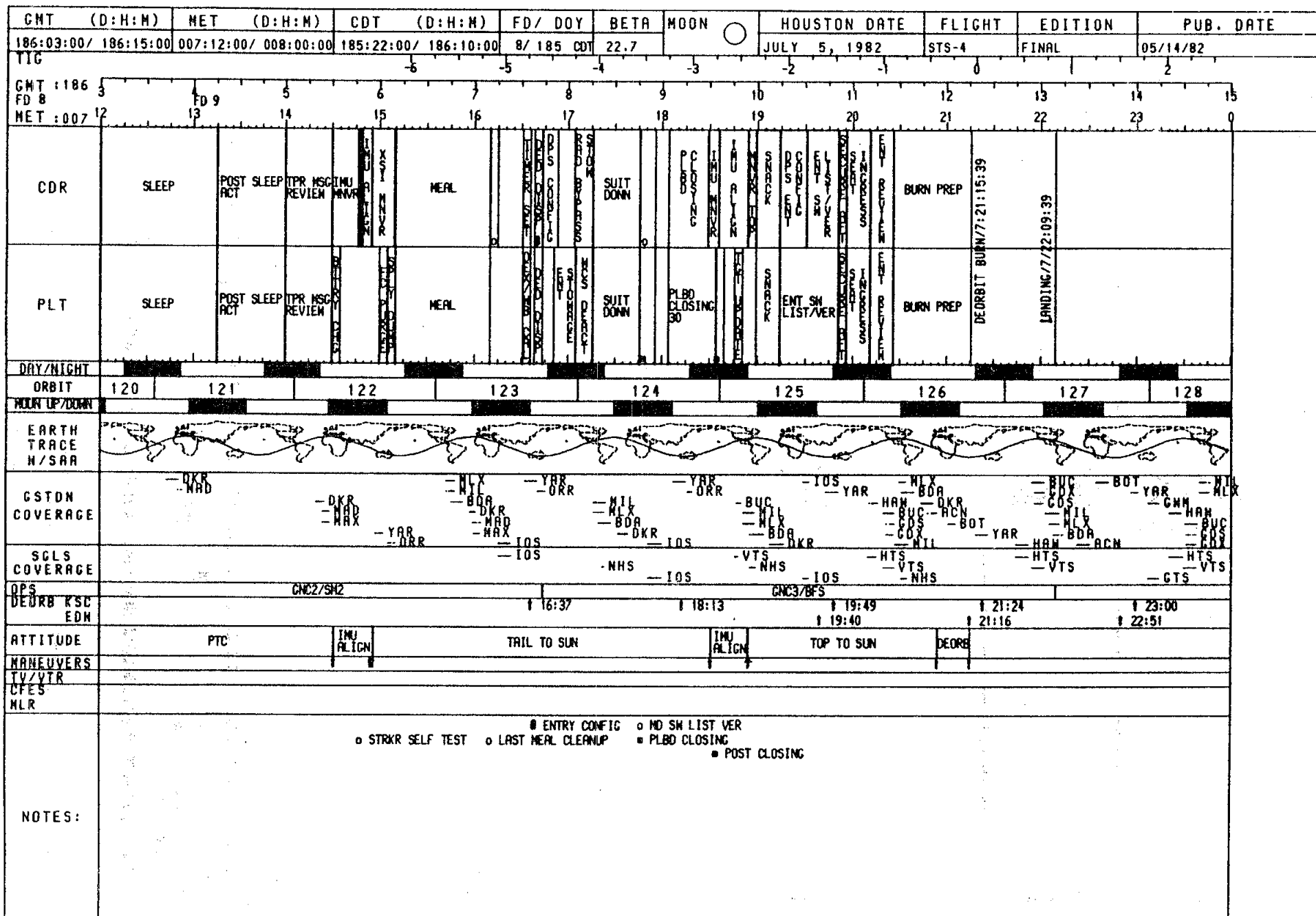
• FTO 451-03 PLBD COLD CASE PERFORMANCE

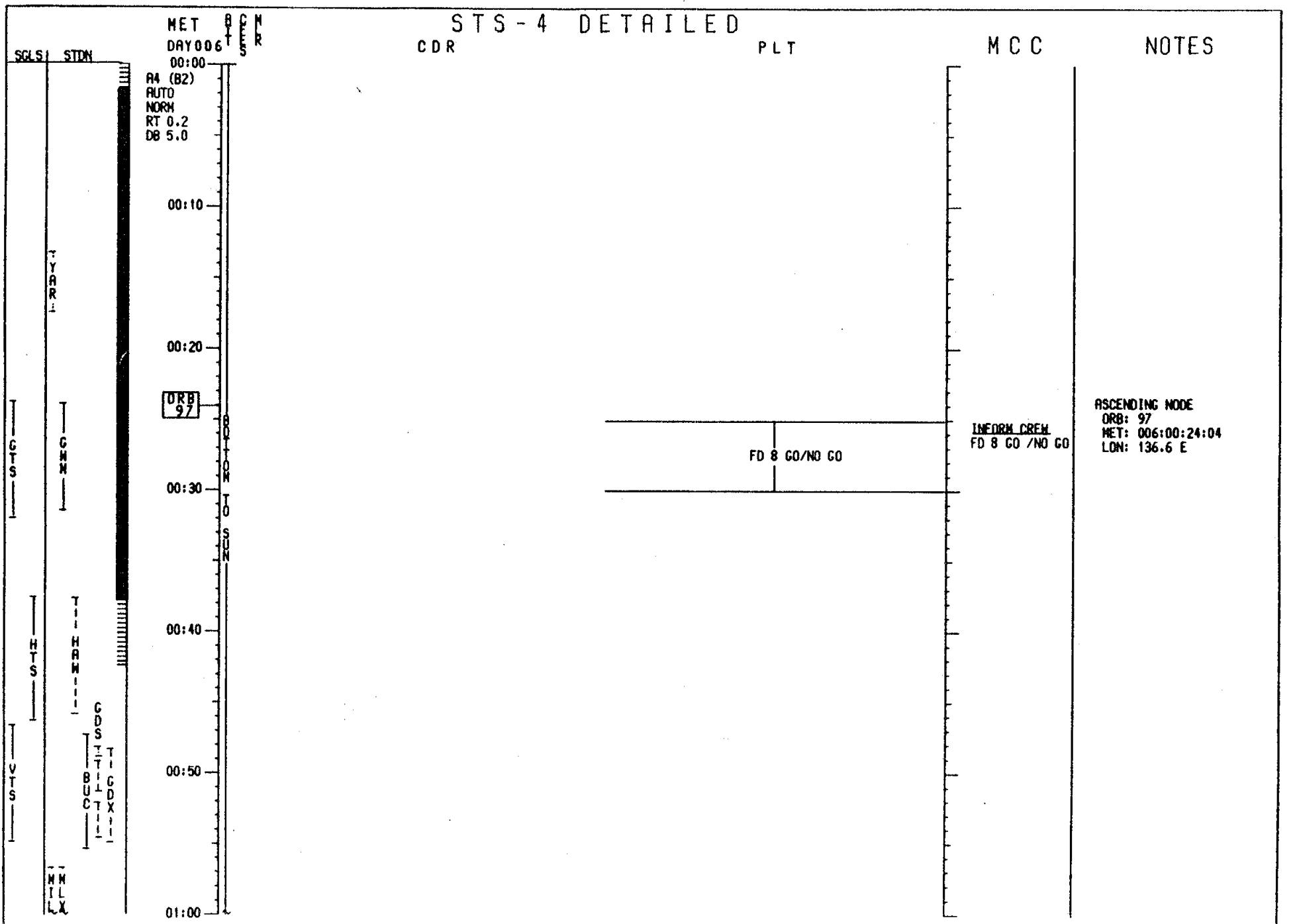
• FTO 412-01 ATT HOLD THERMAL RESPONSE

• STRKR SELF TEST

• FTO 471-01 S-BAND & UHF ANT PATTERNS

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
185:15:00/ 186:03:00	007:00:00/ 007:12:00	185:10:00/ 185:22:00	/ 185 CDT	20.7	○	JULY 4, 1982	STS-4	FINAL	05/14/82
GMT: 185 15 16 17 18 19 20 21 22 23 0 1 2 3 FD 8 MET: 007 0 2 3 4 5 6 7 8 9 10 11 12									
CDR	NOSL DEACT	HK	MEAL	CABIN STOW	IMU NVR INIT PTC	PRE SLEEP	SLEEP		
PLT	MEAL PREP	HK	MEAL	CABIN STOW	PRE SLEEP	SLEEP			
DAY/NIGHT									
ORBIT	112	113	114	115	116	117	118	119	120
MOON UP/DOWN									
EARTH TRACE N/SAR									
GSTDN COVERAGE	-BOT -GMM -WLX -ACN -BOT -GMM -HAM -AGO -BOT -GMM -HAM -AGO -ACN -IOS -GMM -AGO -ACN -DKR -GMM -AGO -DKR								
SCLS COVERAGE	-GTS -HTS -VTS -GTS -HTS -VTS -GTS -HTS -VTS -GTS -HTS -VTS -GTS -HTS -VTS -GTS -HTS -VTS -GTS								
DPS									
DEORB KSC EDM	00:17								
ATTITUDE	PTC XPOP			IMU ALIGN		PTC			
MANEUVERS									
TV/VTR									
CFES									
MLR									
NOTES:	FSO 5441-01 NOSL OPERATIONS • PL DEORBIT PREP • CHANCEOUT								





SGLS1 STDN

MET
DAY 006

STS-4 DETAILED

PLT

MCC

NOTES

01:00
R4 (B2)
AUTO
NORM
RT 0.2
DB 5.0

01:10

01:20

01:30

01:40

01:50

02:00

RCN
I

T
BOT

ORB
98

ASCENDING NODE
ORB: 98
MET: 006:01:54:32
LON: 113.5 E

STS-4 DETAILED

CDR

PLT

MCC

NOTES

MET		CM	
DAY 006		S	
02:00	A4 (B2)	SCLSI	STDN
	AUTO		
	NORM		
	RT 0.2		
	DB 5.0		
02:10			
02:20			
02:30			
02:40			
02:50			
03:00			

TPR
BLOCK DATA
WEATHER PAD
B-25/101-104

NEAL PREP (Cue Card)
Prepare DRY 7, NEAL C

STS-4 DETAILED

CDR

PLT

MCC

NOTES

SGLS STDN

MET 03:00
DAY 006

R4 (B2)
AUTO
NORM
RT 0.2
DB 5.0

03:10

03:20

03:30

03:40

03:50

04:00

ORB 99

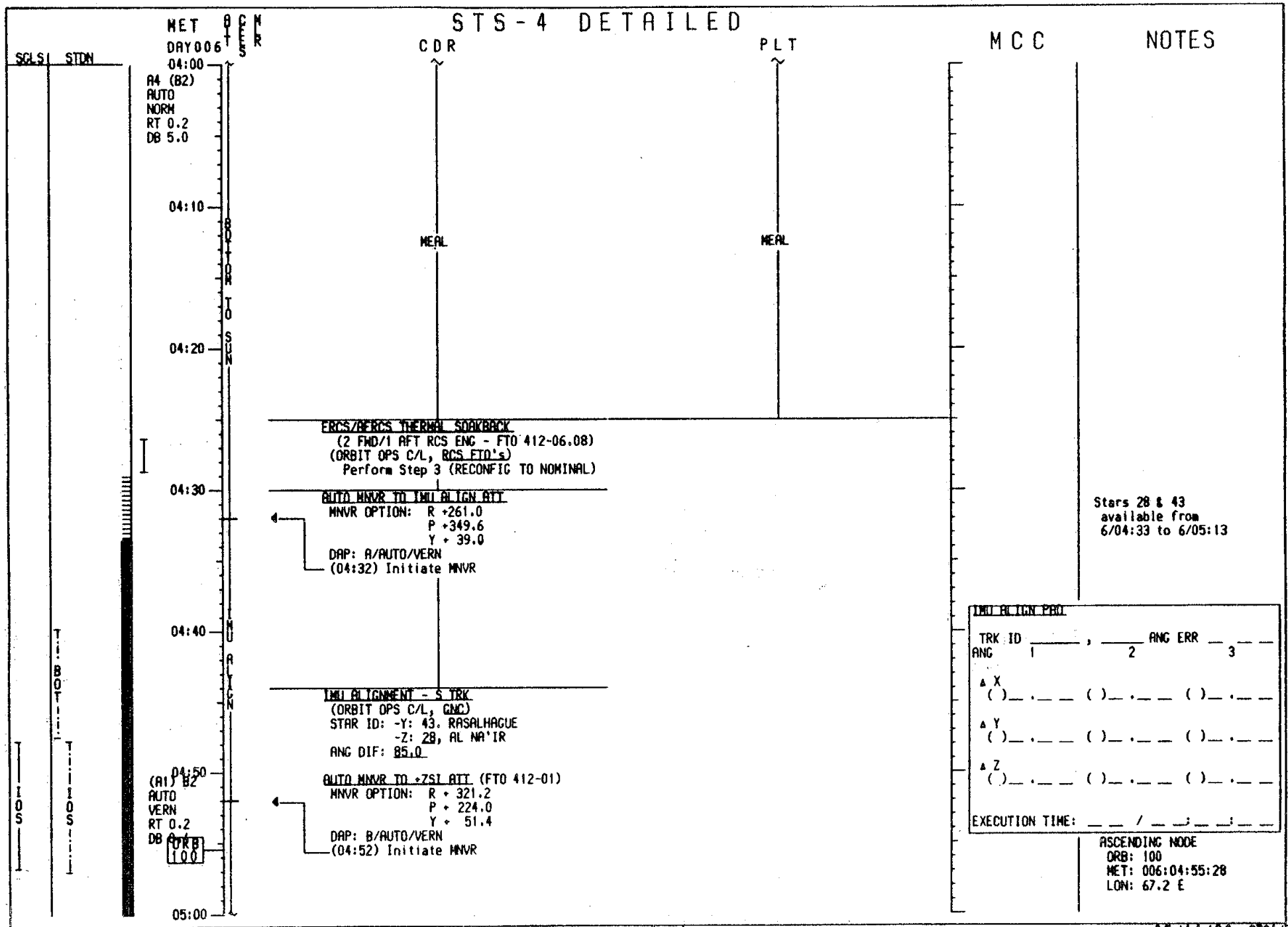
SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = QTY B =

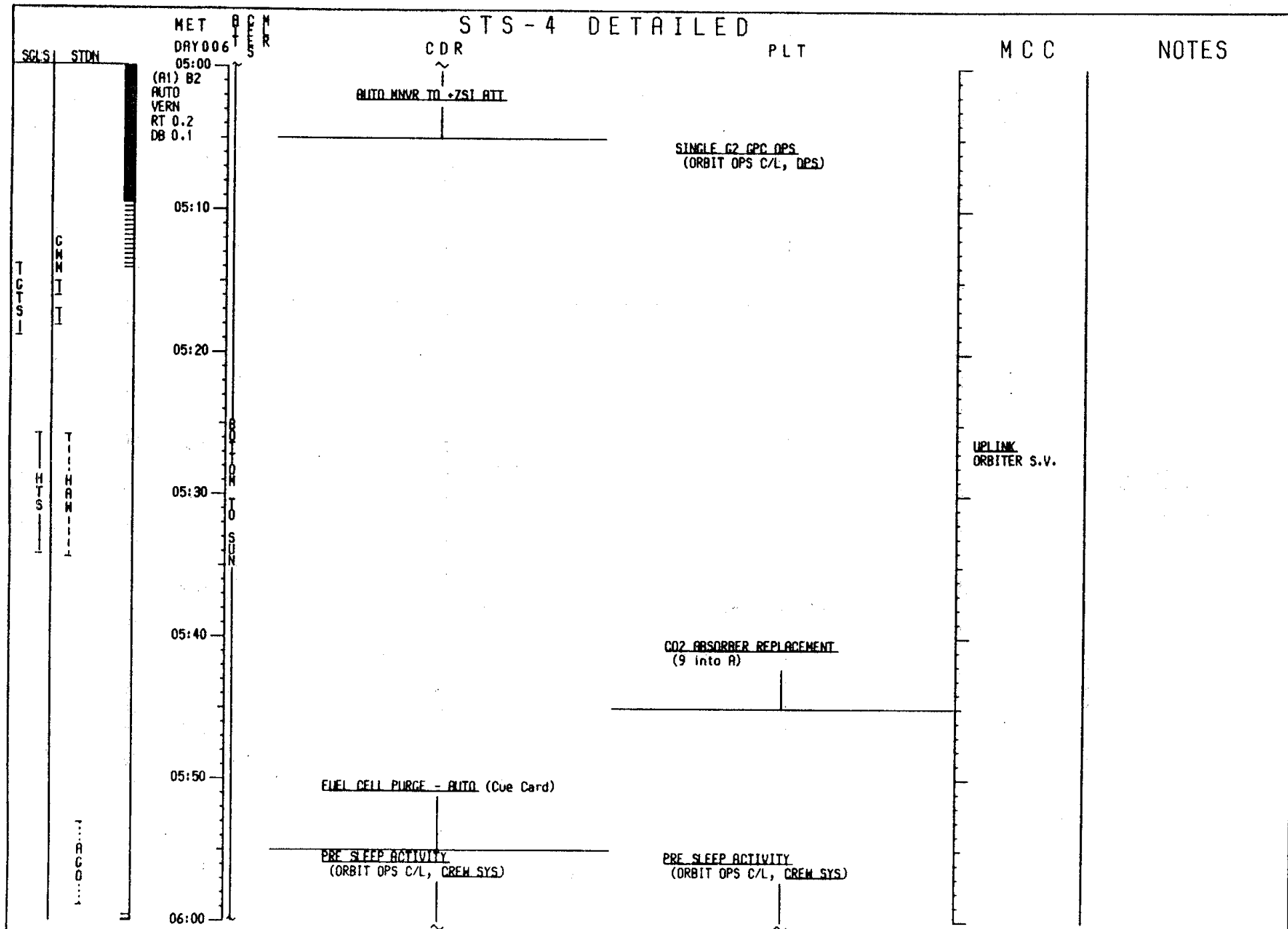
UPDATE
H2O SPLY DUMP
QTY TK A & B

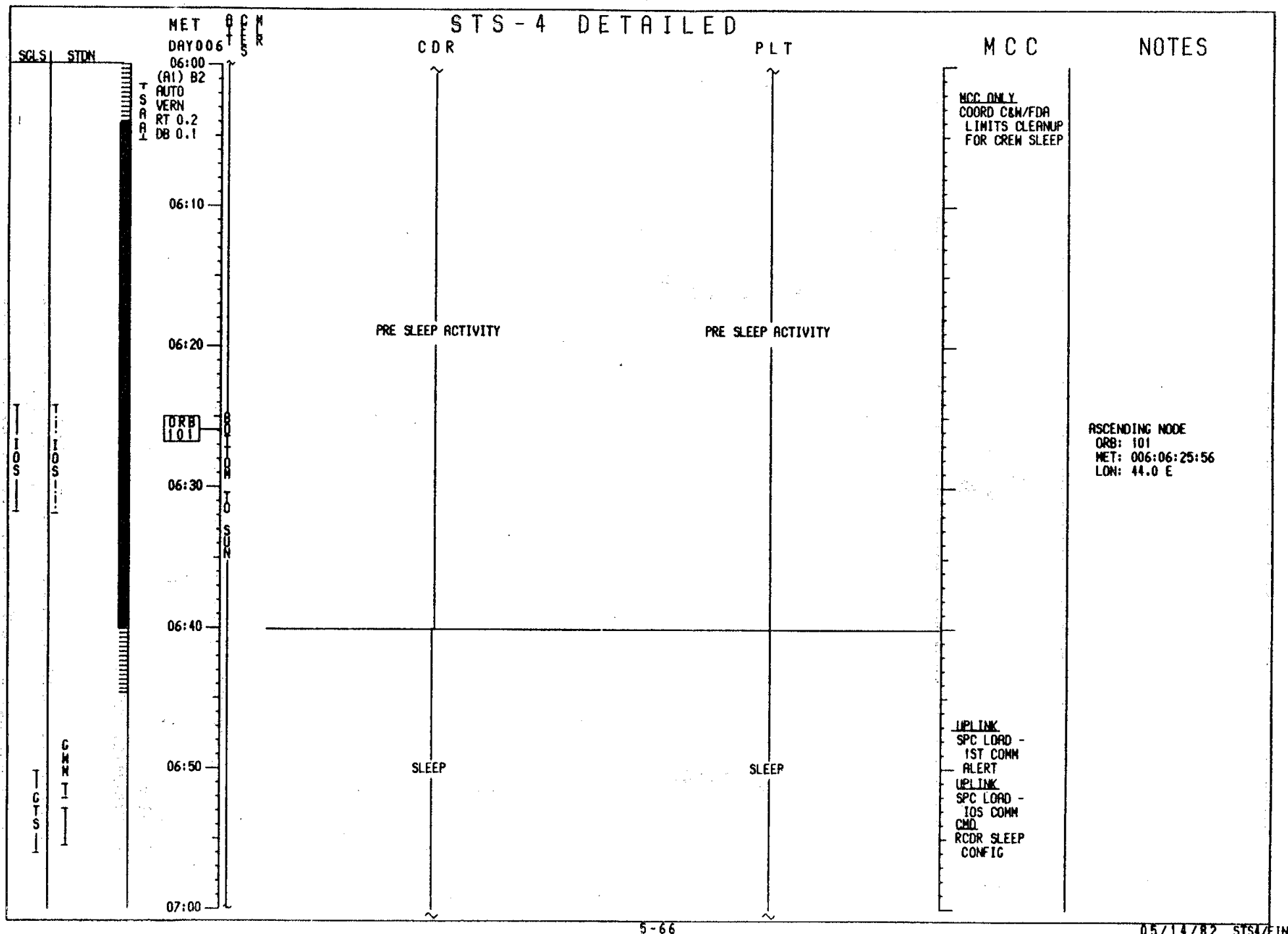
ASCENDING NODE
ORB: 99
MET: 006:03:25:00
LON: 90.3 E

MEAL

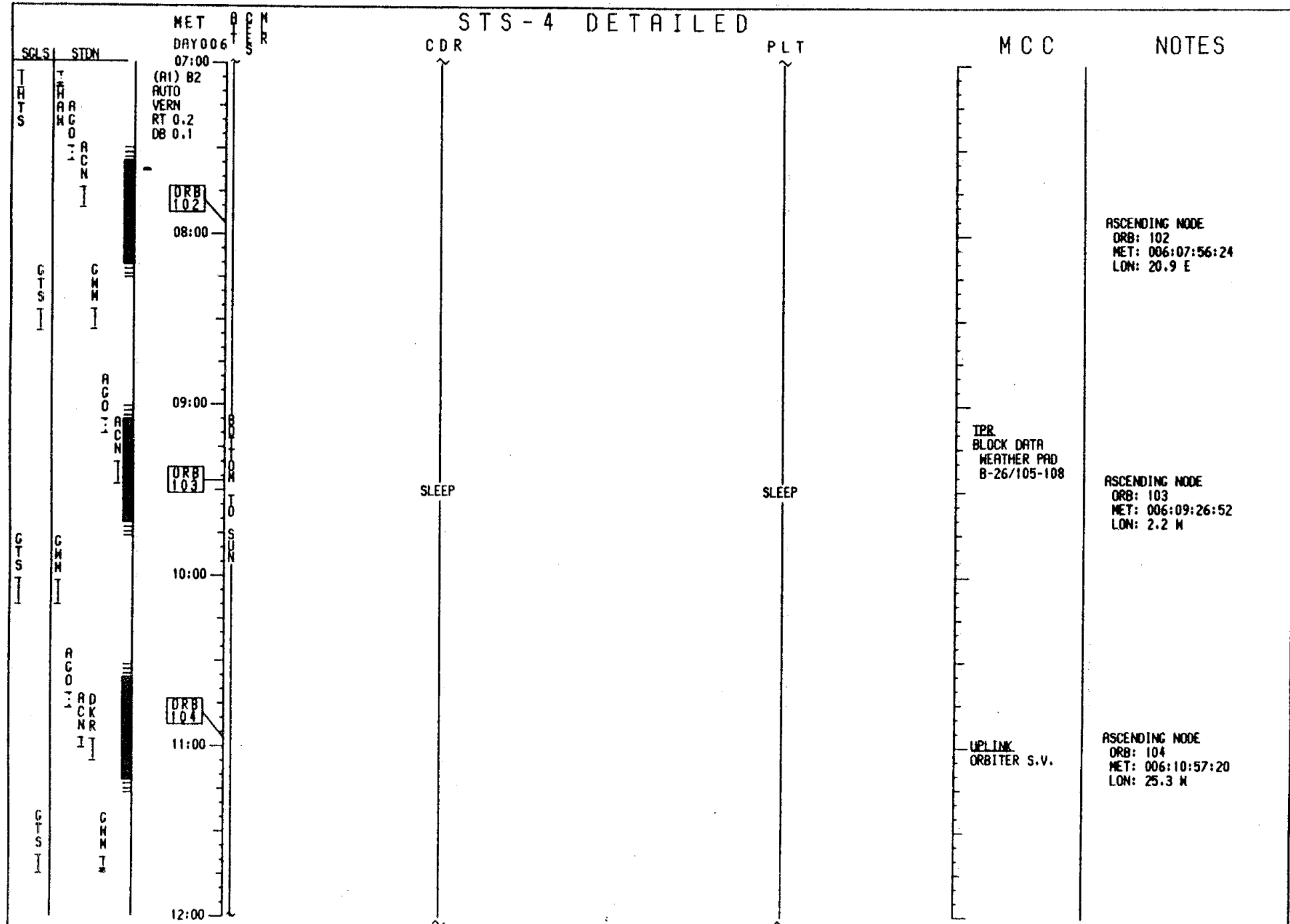
MEAL

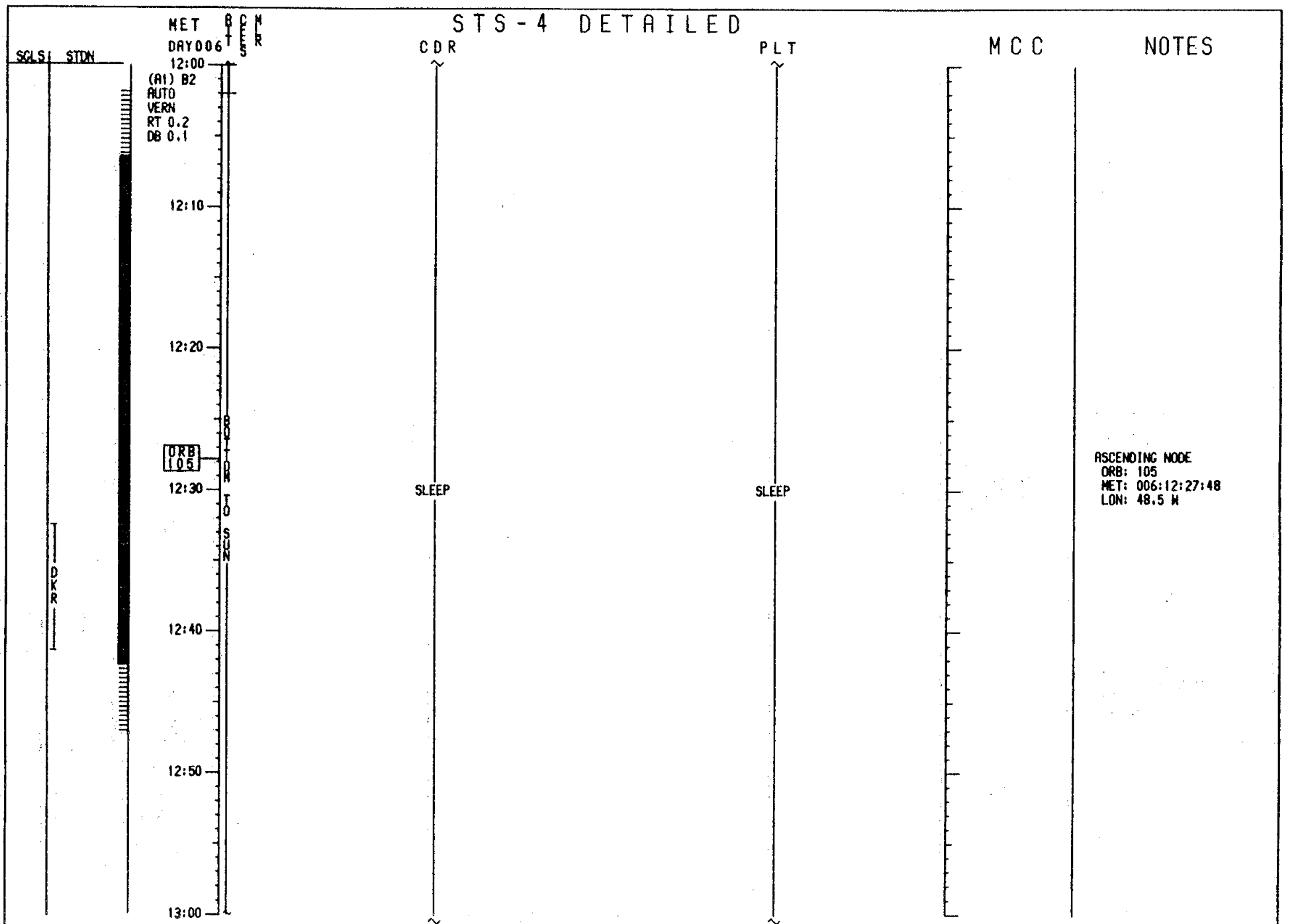


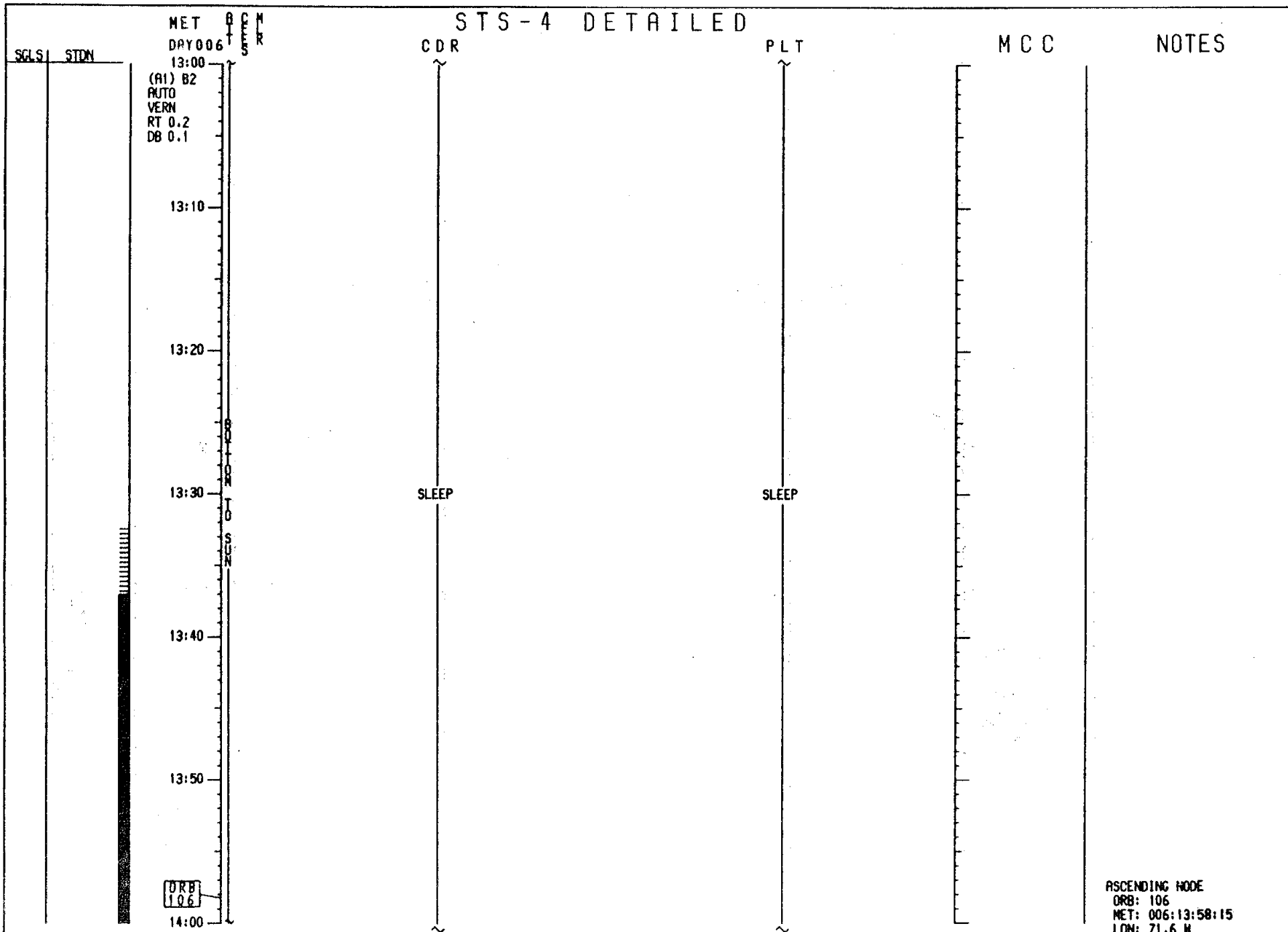


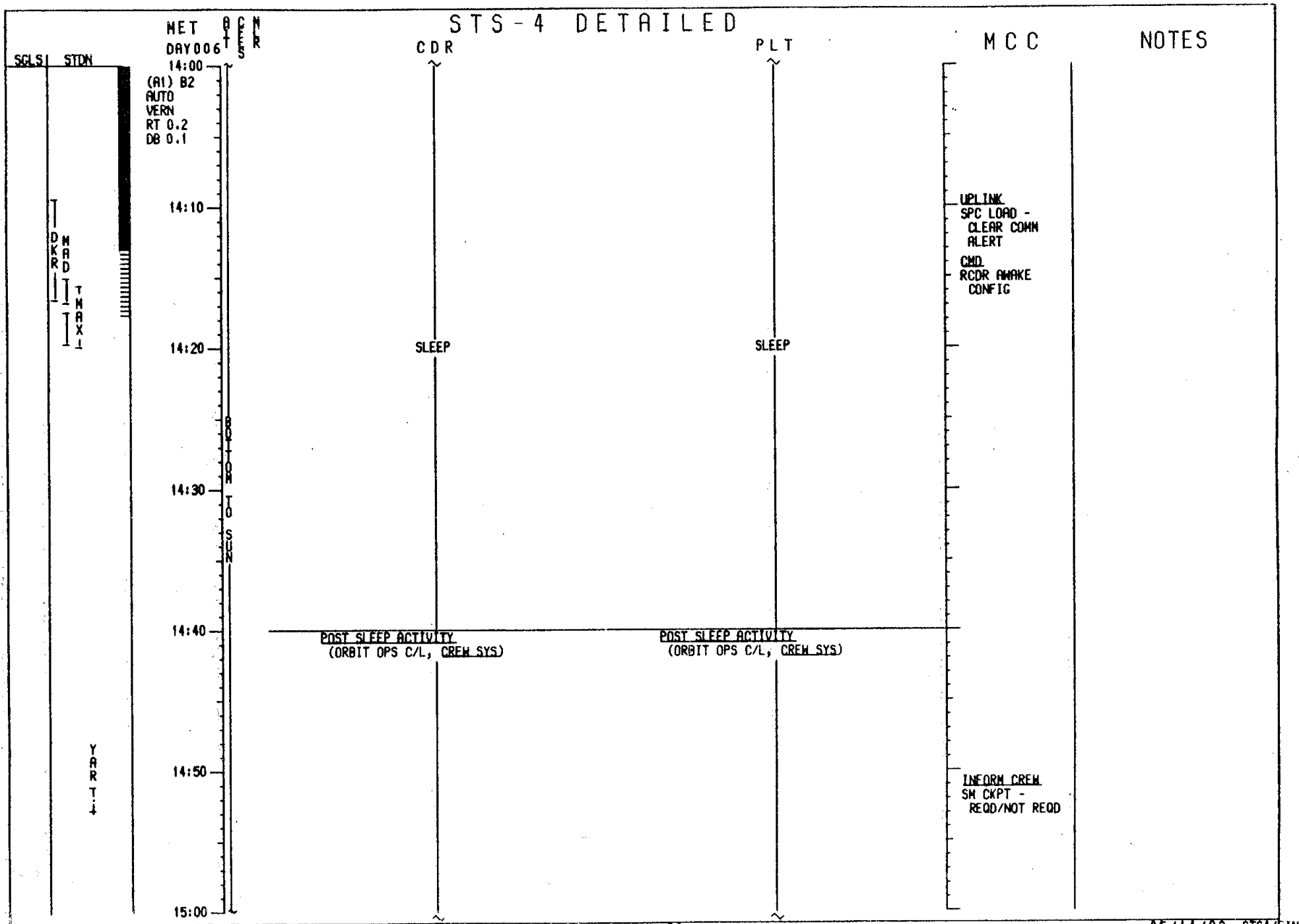


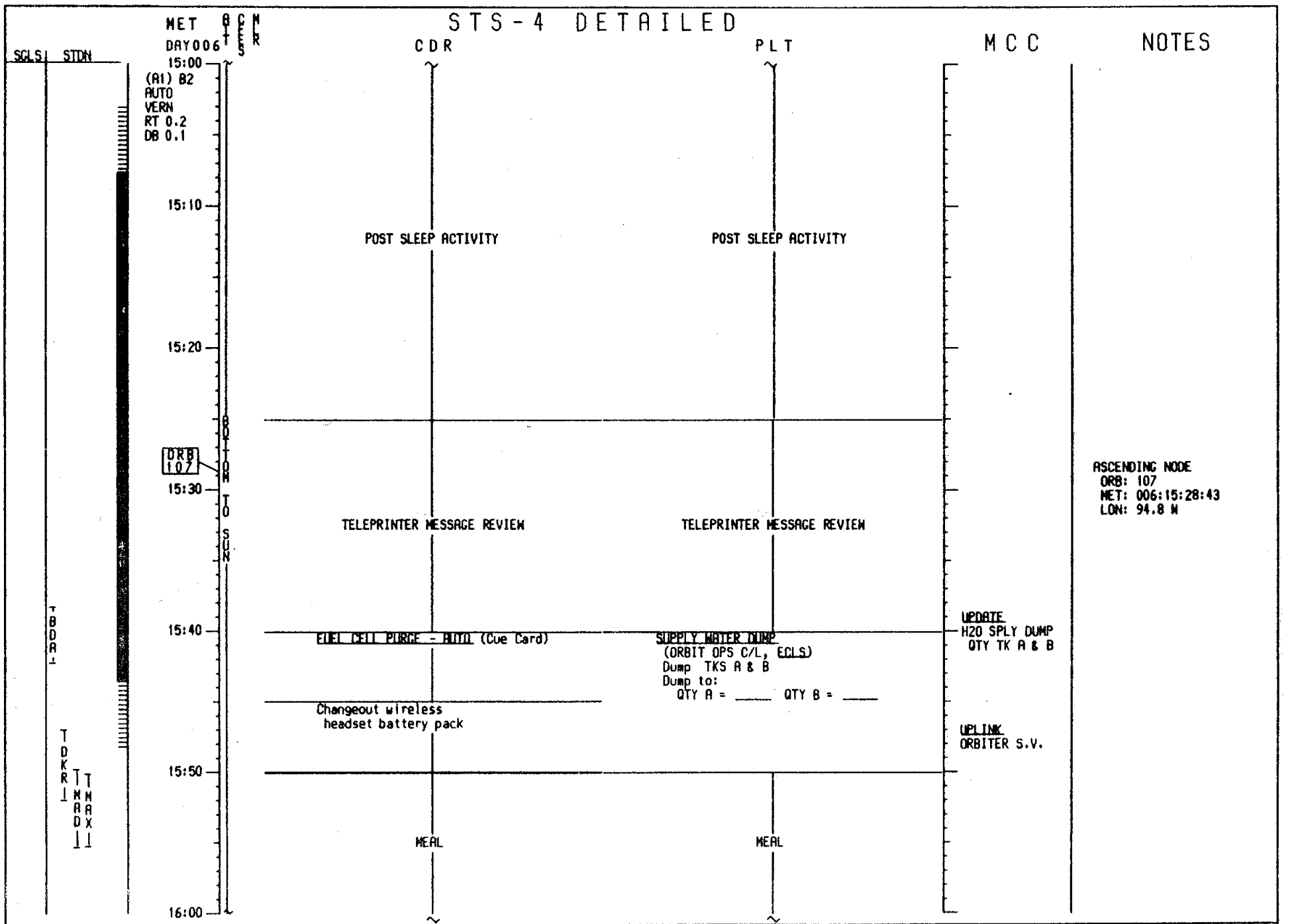
STS-4 DETAILED











STS-4 DETAILED

SGLS STDN

MET DAY 006

(A1) B2
AUTO
VERN
RT 0.2
DB 0.1

CDR

PLT

MCC

NOTES

16:10

16:20

16:30

16:40

16:50

17:00

MEAL

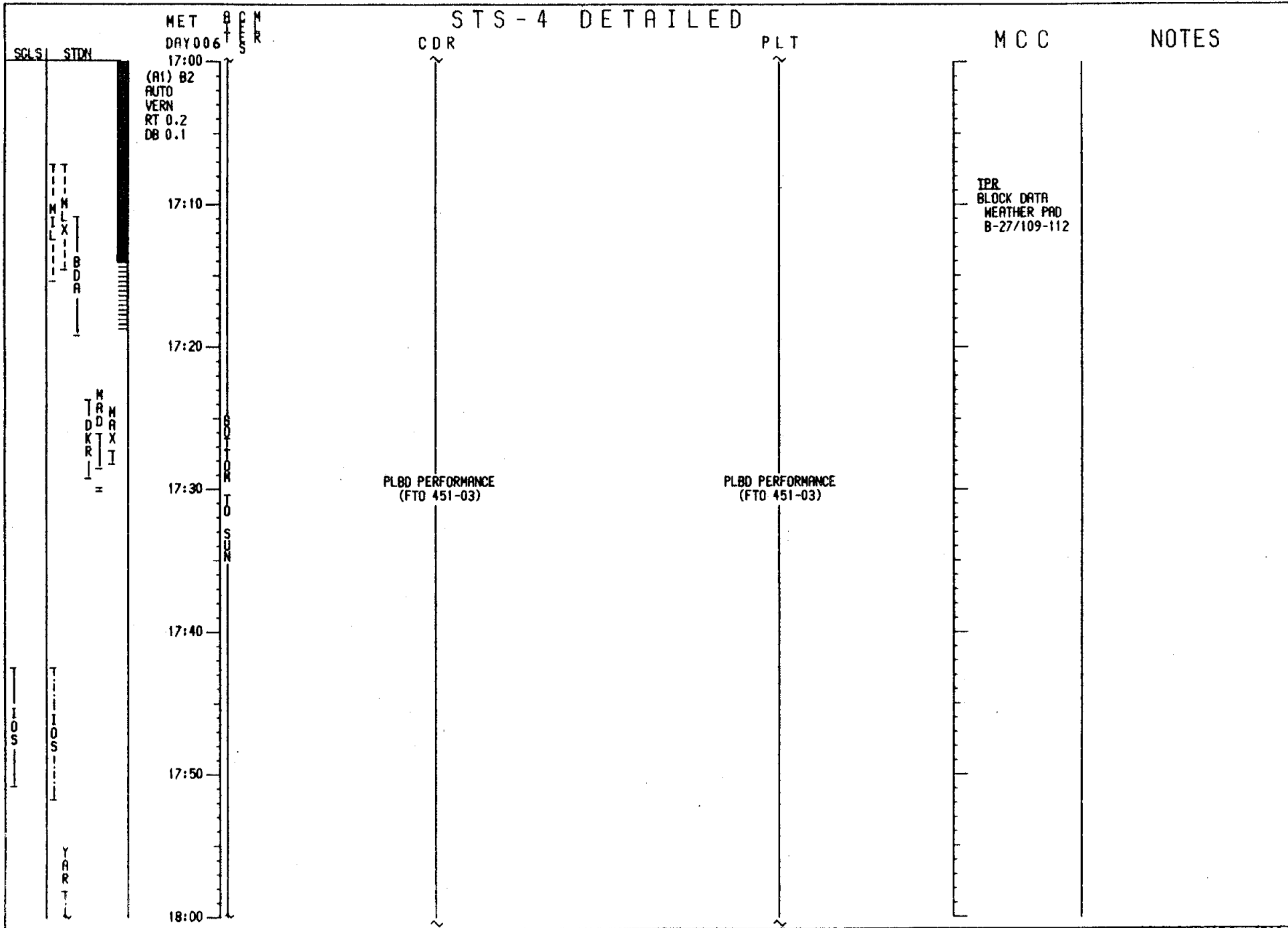
MEAL

PLBD PERFORMANCE
(PLBD COLD CASE - FTO 451-03)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations

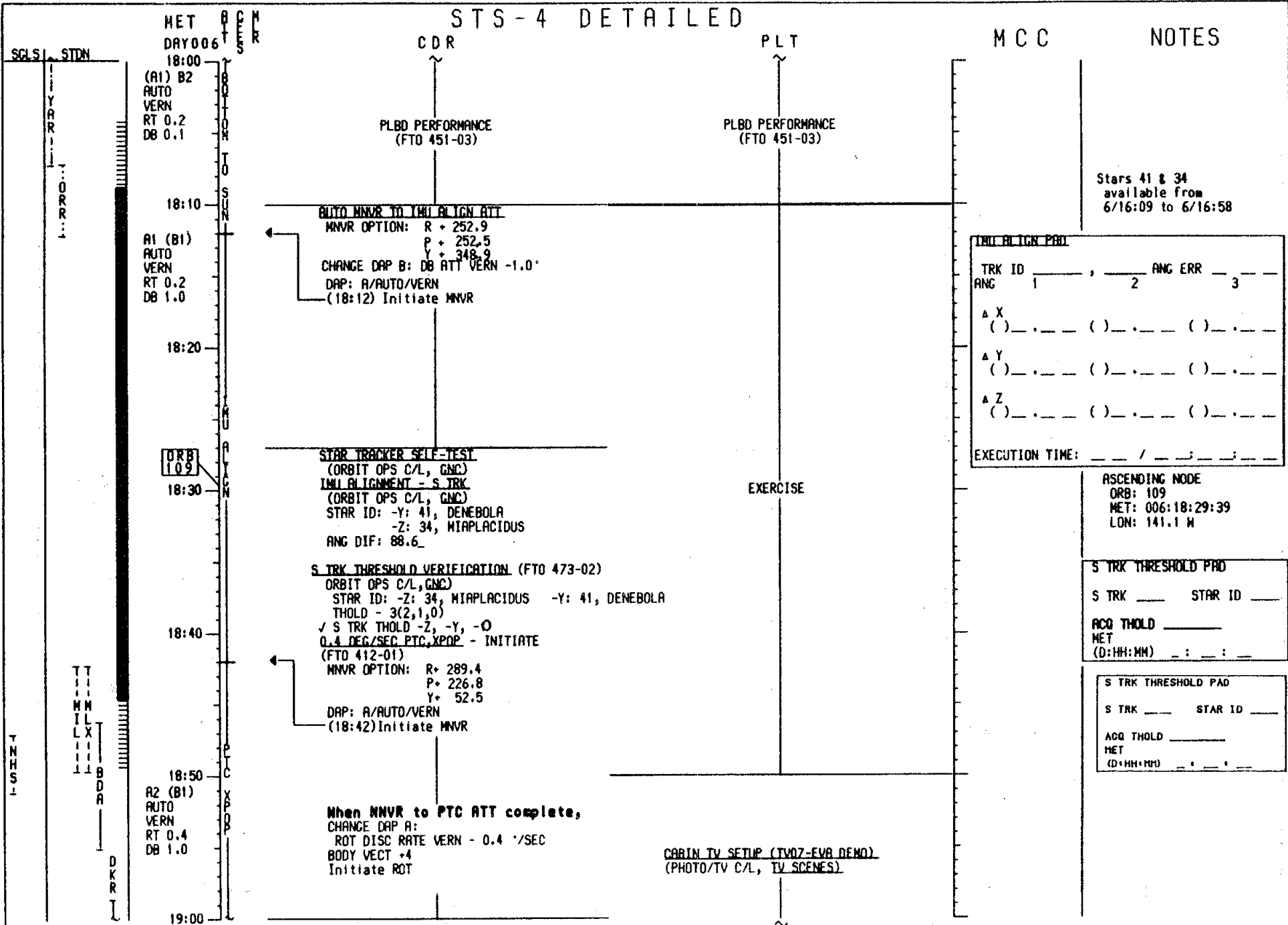
PLBD PERFORMANCE
(PLBD COLD CASE - FTO 451-03)
(ORBIT OPS C/L, PLBD FTO's)
Theodolite sightings
during PLBD operations

ORB
108

ASCENDING NODE
ORB: 108
MET: 006:16:59:11
LON: 117.9 W



STS-4 DETAILED



STS-4 DETAILED		PLT	MCC	NOTES
MET DAY 006 19:00 A2 (B1) AUTO VERN RT 0.4 DB 1.0		CDR MED. PREP (Cue Card)		
19:10		CABIN TV SETUP		
19:20		PRIVATE MEDICAL COMMUNICATION (If Required)		
19:30		AIRLOCK HATCH OPENING M013Q MIDDECK FLOODS AIRLOCK 2 - ON/OFF INNER EQUAL VLV CAPS (two) - Remove, stow HATCH EQUAL VLV (two) - OFF Open and stow HATCH Rotate VENT DUCT into airlock AW18A LTG FLOOD 1,3,4 - ON EMU's Remove lower torso restraint		
19:40		CABIN TV ACT (TV02-EVA DEMO) (PHOTO/TV C/L, TV SCENES) VTR		
19:50		HOUSEKEEPING		
20:00				

STS-4 DETAILED

PLT

MCC

NOTES

ASCENDING NODE
ORB: 110
MET: 006:20:00:06
LON: 164.2 W

MET 006
DAY 006
20:00

ORB
110

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

20:10

20:20

20:30

20:40

20:50

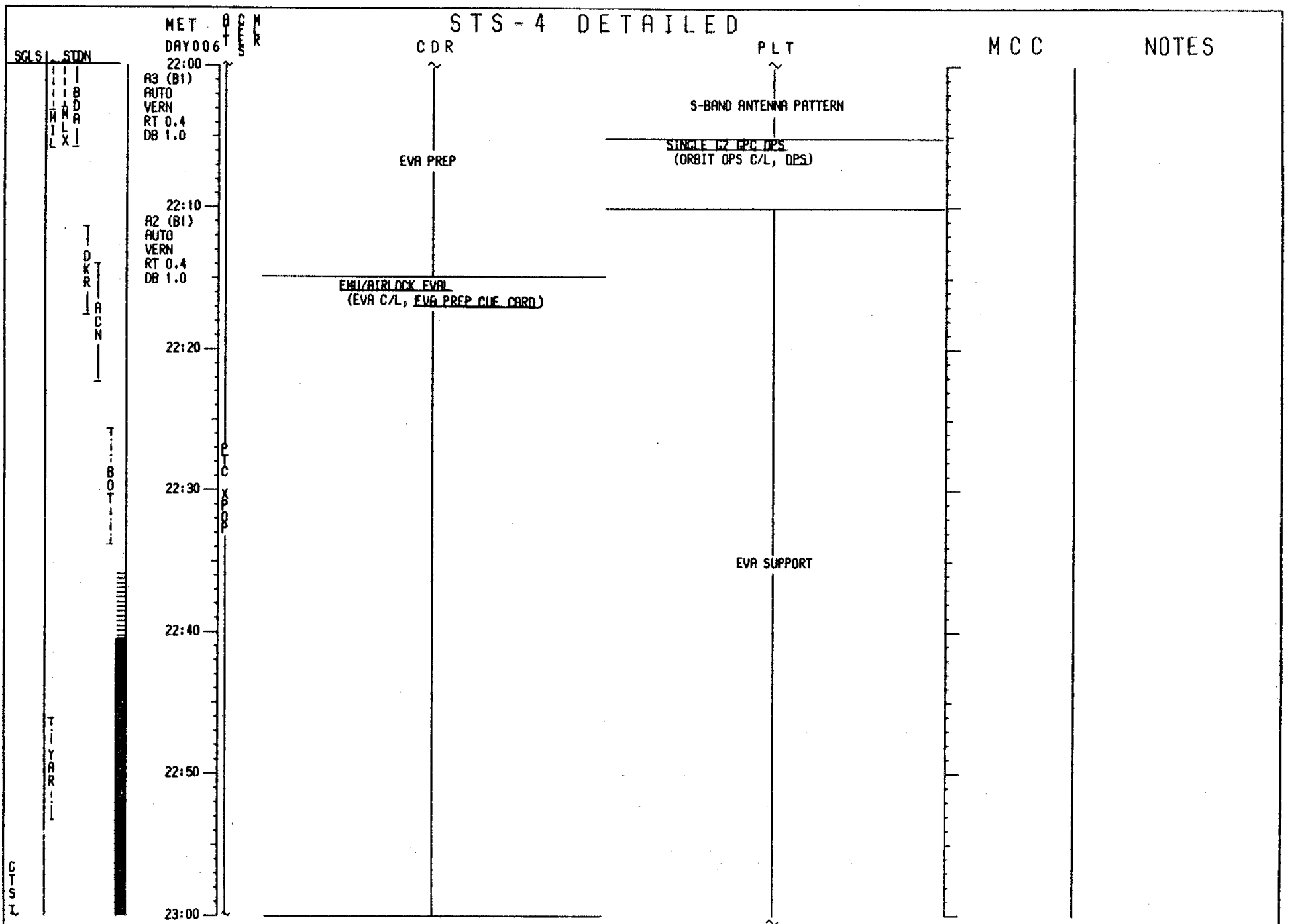
21:00

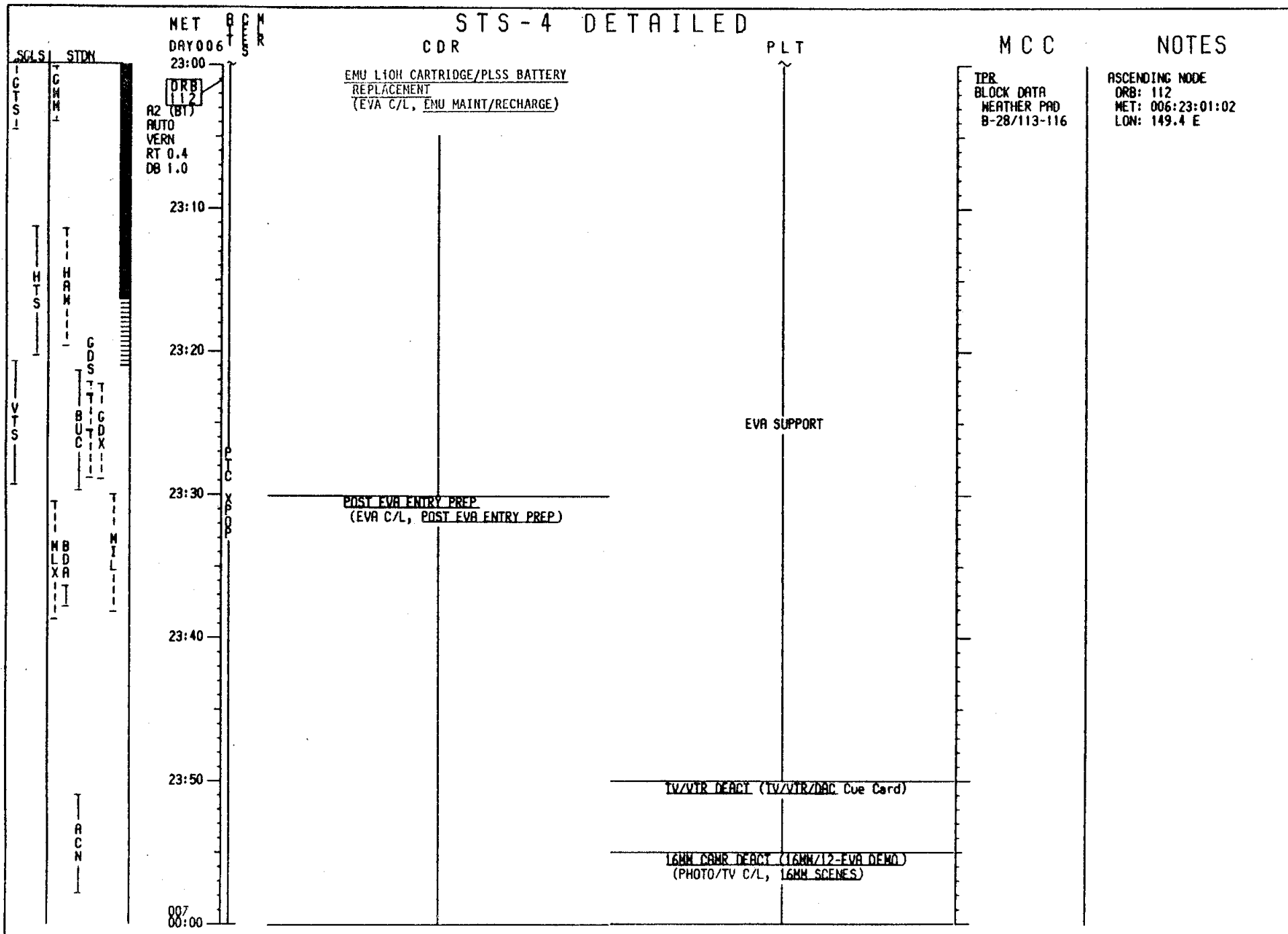
CDR

MEAL

MEAL

UPLINK
ORBITER S.V.





NOTES

SGLS/ STDN

MET AFK

DAY 007

02:00 -

URB
114

A2 (BT)
AUTO
VERN
RT 0.4
DB 1.0

02:10 -

02:20 -

02:30

02:40

02:50

03:00

CABIN STOW
(ORBIT OPS C/L, CREW SYSTEMS)

PAYLOAD DEACTIVATION
(OPERATIONS C/L, TABLE)

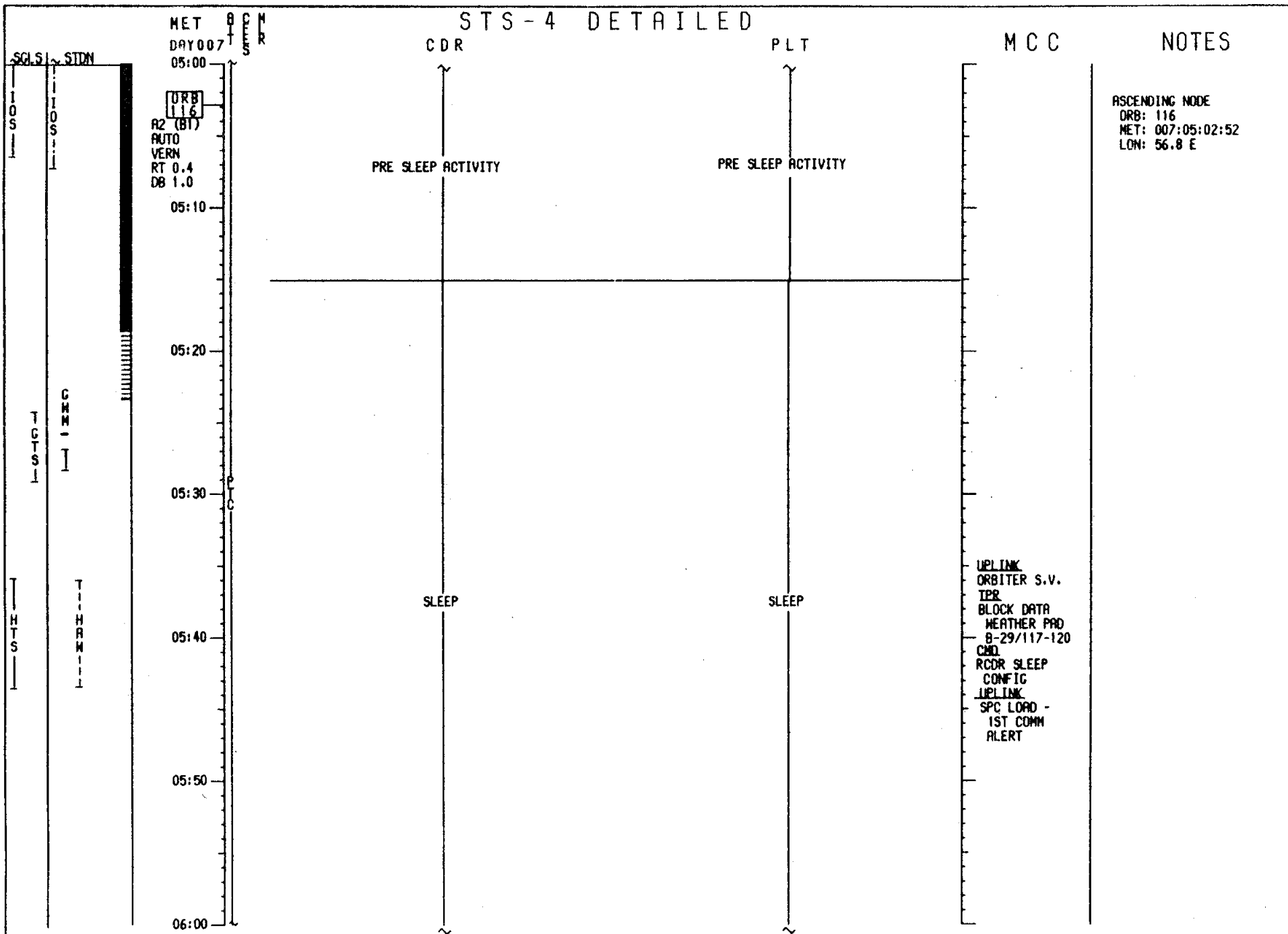
POST OPERATIONS DOCUMENTATION
(OPERATIONS C/L, TAB P70/14 & P70/15)

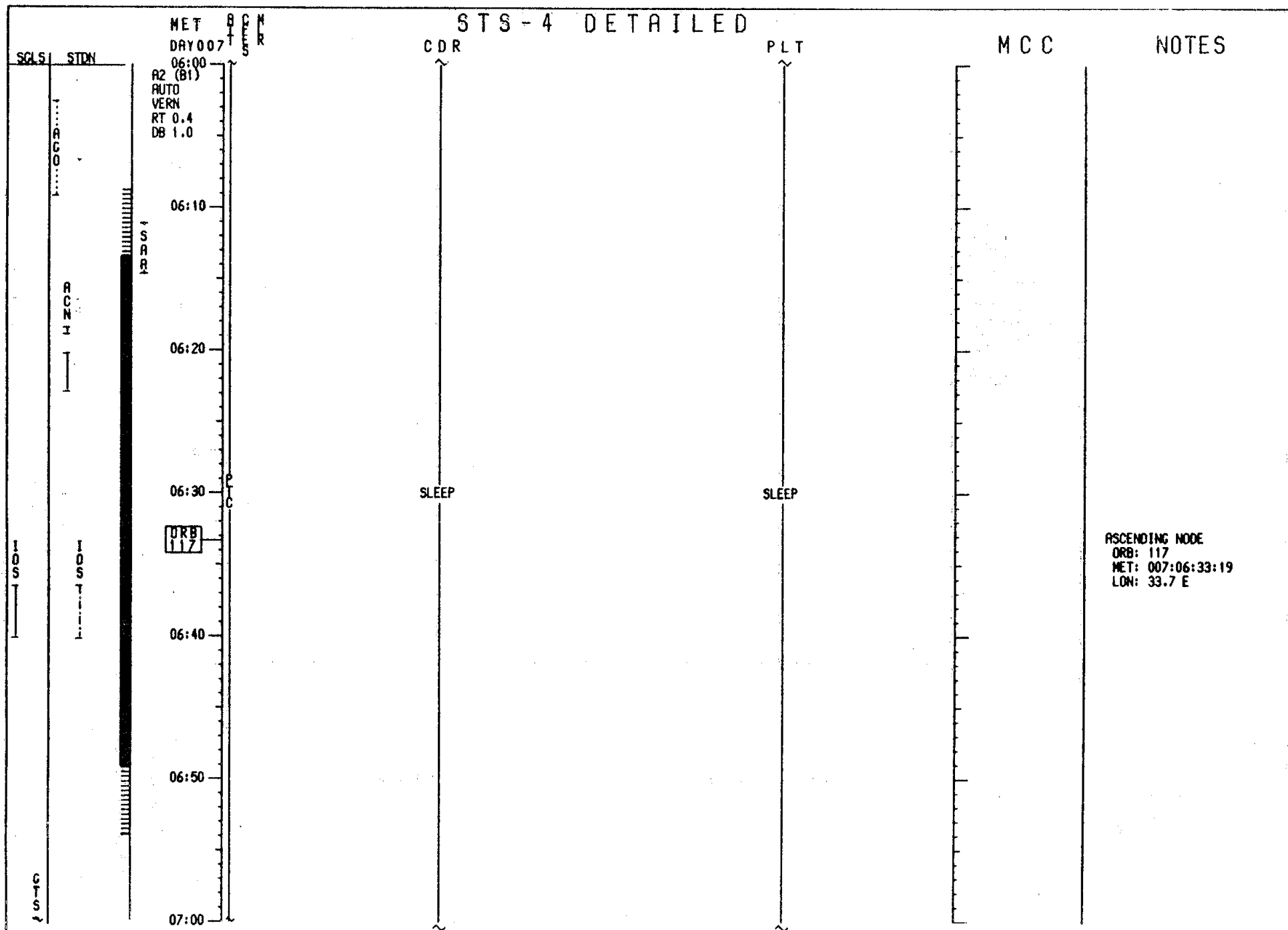
PAYROLL DEBIT PREPARATION
(OPERATIONS C/L; TAB E)

CARIN STOW
(ORBIT OPS C/L, CREW SYSTEMS)

ASCENDING NODE
ORB: 114
MET: 007:02:01:57
LON: 103.1 E

MET		STS-4 DETAILED		PLT	MCC	NOTES
SCLS	STON	DAY 007	CDR			
03:00 A2 (B1) AUTO VERN RT 0.4 DB 1.0		AUTO MNVR TO IMU ALIGN ATT MNVR OPTION: R + 340.0 P + 82.9 Y + 323.1 DAP: B/AUTO/VERN (03:02) Initiate MNVR				<u>IMU ALIGN PAD</u> TRK ID _____, ANG ERR _____ ANG 1 _____ 2 _____ 3 _____ Δ X _____ () _____ () _____ Δ Y _____ () _____ () _____ Δ Z _____ () _____ () _____ EXECUTION TIME: ____ / ____ : ____ : ____
03:10 (A2) B1 AUTO VERN RT 0.2 DB 1.0						
03:20 IMU ALIGNMENT - S TRK (ORBIT OPS C/L, GNC) STAR ID: -Y: 33, PERCCK -Z: 47, GIENAH ANG DIF: 91.6 REPORT: IMU ALIGN RESULTS S TRK THRESHOLD VERIFICATION (FTO 473-02) ORBIT OPS C/L, GNC, STAR ID: -Z: 47, GIENAH -Y: 33, PERCCK THOLD - 3(2,1,0) ✓ S TRK THOLD -Z, -Y, -O					Stars 47 & 33 available from 7/03:06 to 7/03:34 Star 47 available till 7/3:34 RPT: IMU ALIGN RESULTS ____	
03:30 ORB 115		0.4 DEG/SEC PTC, XPOP - INITIATE (FTO 412-01) MNVR OPTION: R+ 289.4 P+ 226.8 Y+ 52.5 DAP: B/AUTO/VERN (03:34) Initiate MNVR				
03:40 A2 (B1) AUTO VERN RT 0.4 DB 1.0		When MNVR to PTC ATT complete, DAP: A/AUTO/VERN BODY VECT +4 Initiate ROT		CABIN STOW		ASCENDING NODE ORB: 115 MET: 007:03:32:24 LON: 80.0 E <u>S TRK THRESHOLD PAD</u> S TRK _____ STAR ID _____ ACQ THOLD _____ MET (D:HH:MM) ____ : ____ : ____
03:50						<u>S TRK THRESHOLD PAD</u> S TRK _____ STAR ID _____ ACQ THOLD _____ MET (D:HH:MM) ____ : ____ : ____
04:00						





STS-4 DETAILED			
SCS	STDN	CDR	PLT
MET DAY 007 07:00 R2 (B1) AUTO VERN RT 0.4 DB 1.0			
08:00 ORB 118			
09:00 ORB 119		SLEEP	SLEEP
10:00			
11:00 ORB 120			
12:00			
			MCC
			NOTES ASCENDING NODE ORB: 118 MET: 007:08:03:47 LON: 10.6 E
			ASCENDING NODE ORB: 119 MET: 007:09:34:14 LON: 12.5 W
			ASCENDING NODE ORB: 120 MET: 007:11:04:41 LON: 35.6 W
			UPLINK ORBITER S.V.
			TPR BLOCK DATA WEATHER PAD B-30/121-124

05/14/82 STS47IN

STS-4 DETAILED

SCLS STDN

MET DAY 007

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

12:10

12:20

12:30

12:40

12:50

13:00

CDR

SLEEP

PLT

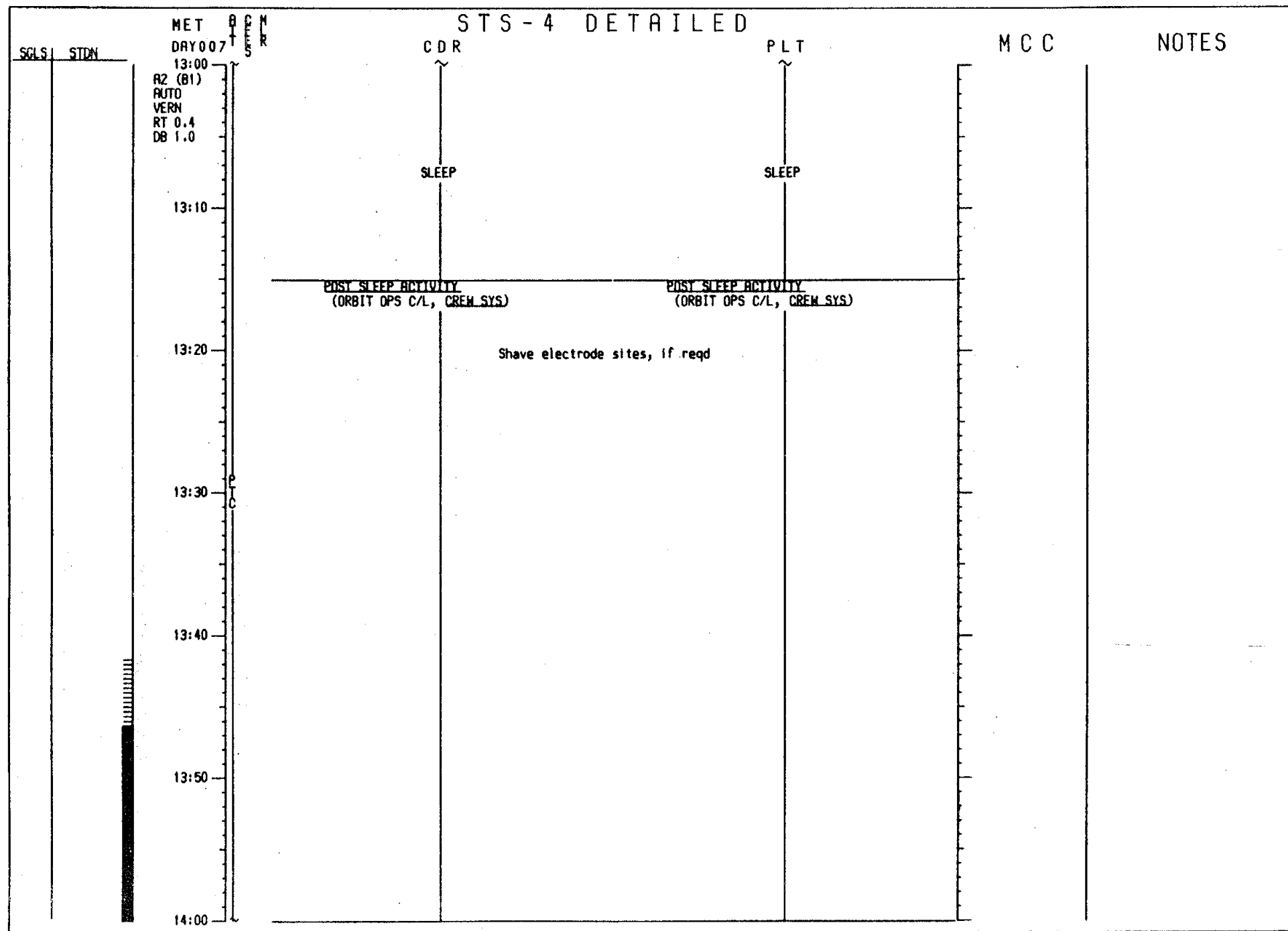
SLEEP

MCC

NOTES

ORB
121

ASCENDING NODE
ORB: 121
MET: 007:12:35:08
LON: 58.8 W



SGLS STDN

MET DAY 007
14:00

STS-4 DETAILED

CDR

PLT

MCC

NOTES

ORB
122

14:10
A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

TELEPRINTER MESSAGE REVIEW

TELEPRINTER MESSAGE REVIEW

14:20

14:30

A2 (B1)
AUTO
VERN
RT 0.4
DB 1.0

AUTO MNVR TO IMU ALIGN ATT

MNVR OPTION: R + 220.8
P + 140.6
Y + 349.0

DAP: A/AUTO/VERN
(14:32) Initiate MNVR

Changeout wireless
headset battery pack

ML31C VAC VENT NOZ HTR - OFF

14:40

14:50

STAR TRACKER SELF-TEST

(ORBIT OPS C/L, GNC)

IMU ALIGNMENT - S TRK

(ORBIT OPS C/L, GNC)

STAR ID: -Y: 18, CAPELLA

-Z: 57, ACAMAR

ANG DIF: 91.7

R5/C6 Unstow DEORBIT POP (2)

AUTO MNVR TO -XSI ATT (FTO 412-01)

MNVR OPTION: R + 258.3
P + 285.1
Y + 341.1

DAP: B/AUTO/VERN
(14:57) Initiate MNVR

ASCENDING NODE
ORB: 122
MET: 007:14:05:36
LON: 81.9 W

Stars 57 & 18
available from
7/14:22 to 7/15:02

IMU ALIGN PRO

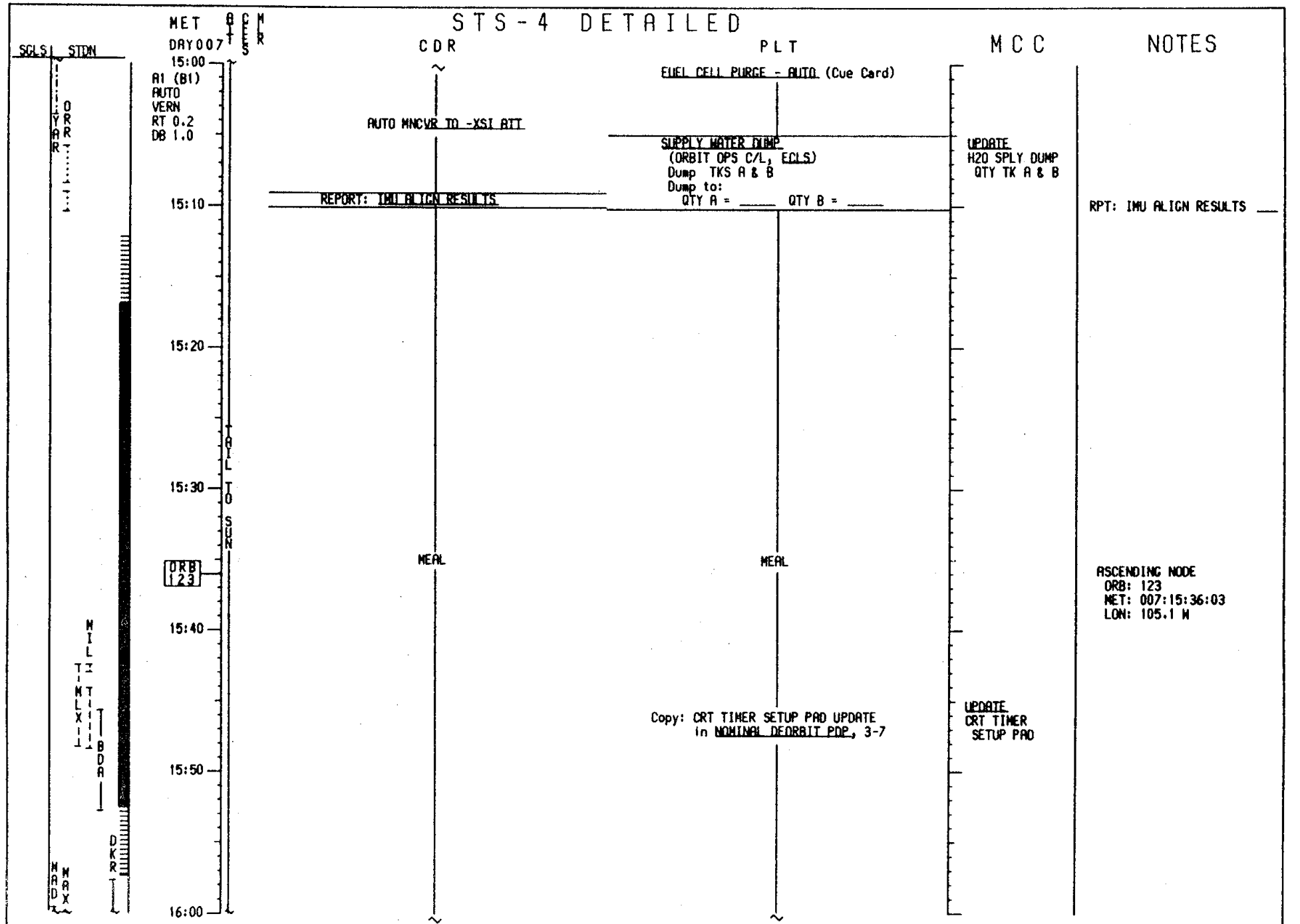
TRK ID _____, _____ ANG ERR _____
ANG 1 2 3

Δ X
() () ()

Δ Y
() () ()

Δ Z
() () ()

EXECUTION TIME: ____ / ____ / ____



24 HOURS AFTER EXTENSION DAY

The 24 Hours After Extension Day Timeline is designed to follow a Deorbit Prep Backout on Flight Day 9. It therefore assumes that the nominal timeline plus an extra day have already been accomplished.

Detailed timeline pages are provided from MET 7/22:00 until time for the Deorbit Prep.

To compute the MET time at which this timeline is entered, take the Deorbit Burn TIG time and add ~1 hr 50 min for Deorbit Prep Backout. Note that no activities are scheduled for the first hour and 15 minutes to allow extra time for reconfiguration or troubleshooting.

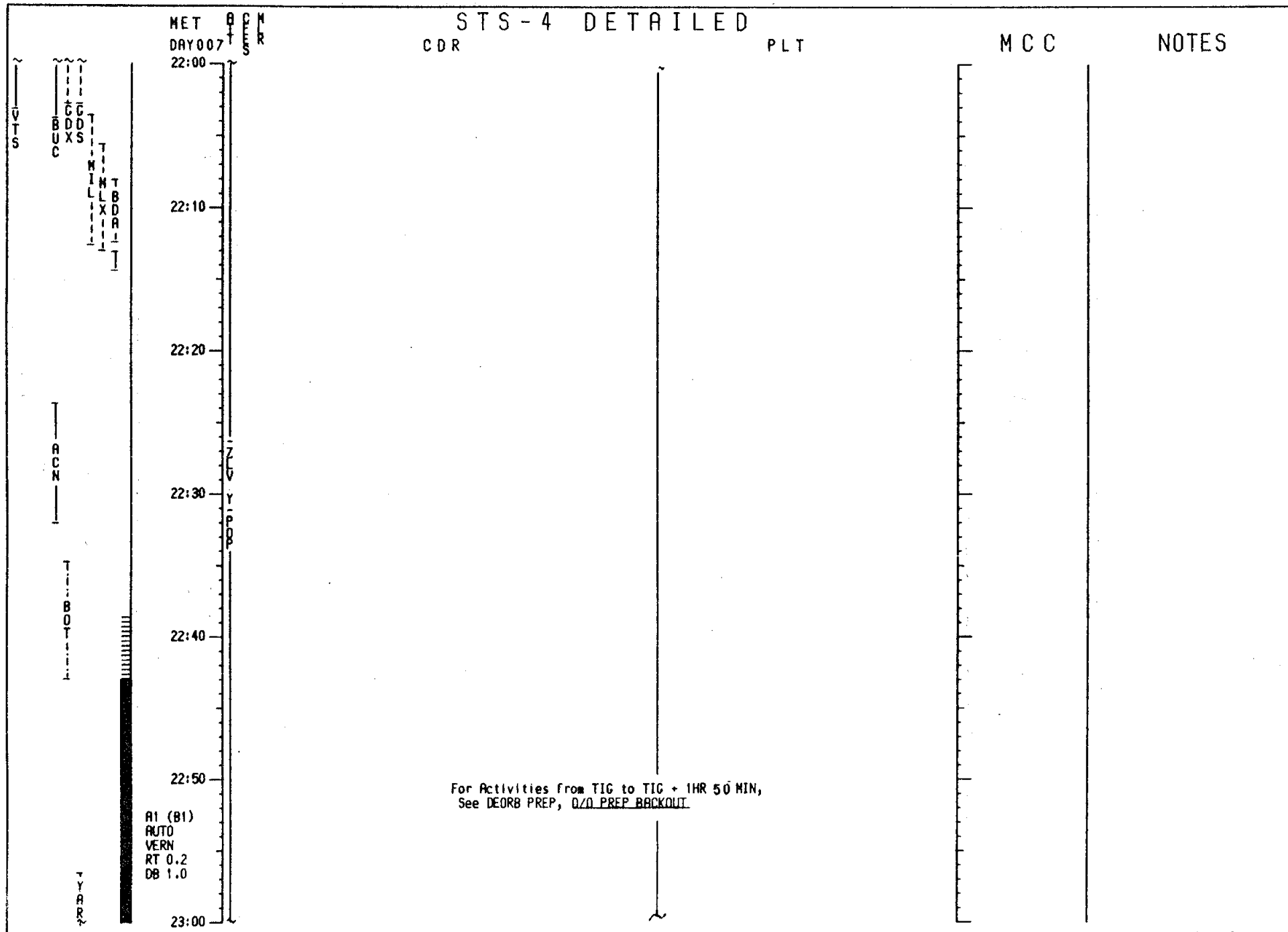
24 HRS AFTER
EXTENSION DAY

24 HRS AFTER EXTENSION DAY

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
186:03:00/ 186:15:00	007:12:00/ 008:00:00	185:22:00/ 186:10:00	FD5/ 185 CDT	22.7	○	JULY 5, 1982	STS-4	FINAL	5/14/82
GMT 186 FD 18 MET 007	3 4 5 6 7 8 9 10 11 12 13 14 15 12 13 14 15 16 17 18 19 20 21 22 23 24								
CDR	EXT MSN CAP 17:00-17:15:00 17:15:00-17:30:00 17:30:00-17:45:00 17:45:00-18:00:00 18:00:00-18:15:00 18:15:00-18:30:00 18:30:00-18:45:00 18:45:00-19:00:00 19:00:00-19:15:00 19:15:00-19:30:00 19:30:00-19:45:00 19:45:00-20:00:00 20:00:00-20:15:00 20:15:00-20:30:00 20:30:00-20:45:00 20:45:00-21:00:00 21:00:00-21:15:00 21:15:00-21:30:00 21:30:00-21:45:00 21:45:00-22:00:00 22:00:00-22:15:00 22:15:00-22:30:00 22:30:00-22:45:00 22:45:00-23:00:00 23:00:00-23:15:00 23:15:00-23:30:00 23:30:00-23:45:00 23:45:00-24:00:00								
PLT	EXT MSN CAP 17:00-17:15:00 17:15:00-17:30:00 17:30:00-17:45:00 17:45:00-18:00:00 18:00:00-18:15:00 18:15:00-18:30:00 18:30:00-18:45:00 18:45:00-19:00:00 19:00:00-19:15:00 19:15:00-19:30:00 19:30:00-19:45:00 19:45:00-20:00:00 20:00:00-20:15:00 20:15:00-20:30:00 20:30:00-20:45:00 20:45:00-21:00:00 21:00:00-21:15:00 21:15:00-21:30:00 21:30:00-21:45:00 21:45:00-22:00:00 22:00:00-22:15:00 22:15:00-22:30:00 22:30:00-22:45:00 22:45:00-23:00:00 23:00:00-23:15:00 23:15:00-23:30:00 23:30:00-23:45:00 23:45:00-24:00:00								
DAY/NIGHT	120 121 122 123 124 125 126 127 128								
ORBIT	120 121 122 123 124 125 126 127 128								
MOON UP/DOWN	120 121 122 123 124 125 126 127 128								
EARTH TRACE W/SAA	120 121 122 123 124 125 126 127 128								
OSTDN COVERAGE	120 121 122 123 124 125 126 127 128								
SGLS COVERAGE	120 121 122 123 124 125 126 127 128								
OPS	120 121 122 123 124 125 126 127 128								
DEORB KSC EDW	120 121 122 123 124 125 126 127 128								
ATTITUDE	120 121 122 123 124 125 126 127 128								
MANEUVERS	120 121 122 123 124 125 126 127 128								
TV/VTR	120 121 122 123 124 125 126 127 128								
OFES	120 121 122 123 124 125 126 127 128								
HLR	120 121 122 123 124 125 126 127 128								
NOTES:	120 121 122 123 124 125 126 127 128								

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
186:17:00/ 187:05:00	008:00:00/ 008:12:00	186:12:00/ 187:00:00	9 / 186 CDT	11.0	☉	JULY 5, 1982	STS-4	FINAL	5/14/82
GMT : 186 17 18 19 20 21 22 23 0 1 2 3 4 5 FD : 9 MET : 008 0 2 3 4 5 6 7 8 9 10 11 12 CMT: 187 DOY: 187									
CDR	EXERCISE MEAL IMU MEAL PRE SLEEP SLEEP ACT								
PLT	EXERCISE MEAL PREP MEAL CABIN STOW PRE SLEEP SLEEP ACT								
DAY/NIGHT									
ORBIT	128	129	130	131	132	133	134	135	136
MOON UP/DOWN									
EARTH TRACE W/SAA									
GSTDN COVERAGE	-ACH -BOT -GMM -HAM -IOS -GMM -HAM -BOT -IOS -GMM -HAM -ACH -AGO -IOS -GMM -HAM -ACH -AGO -ACN -GMM -AGO -ACN -GMM -DKR								
SCLS COVERAGE	-GTS -HTS -IOS -GTS -HTS -IOS -GTS -HTS -IOS -GTS -HTS -GTS -HTS -GTS -HTS -GTS								
OPS	OPS 2								
DEORB KSC EDH									
ATTITUDE	-ZLV Y-POP			IMU	-ZLV Y-POP				
MANEUVERS									
TV/VTR									
CFES									
MLR									
NOTES:	■ Y-POP (NOSE FWD) ■ OMS/RCS - IF REQD								

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																																																																																																																																																																																																																																														
187:05:00/ 187:17:00	008:12:00/ 009:00:00	187:00:00/ 187:12:00	10/ 187 CDT	12.7	○	JULY 6, 1982	STS-4	FINAL	5/14/82																																																																																																																																																																																																																																														
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STS-4 DETAILED

CDR

PLT

MCC

NOTES

MET
DAY 007
23:00

AI (B1)
AUTO
VERN
RT 0.2
DB 1.0

ORB
128

23:10

23:20

23:30

23:40

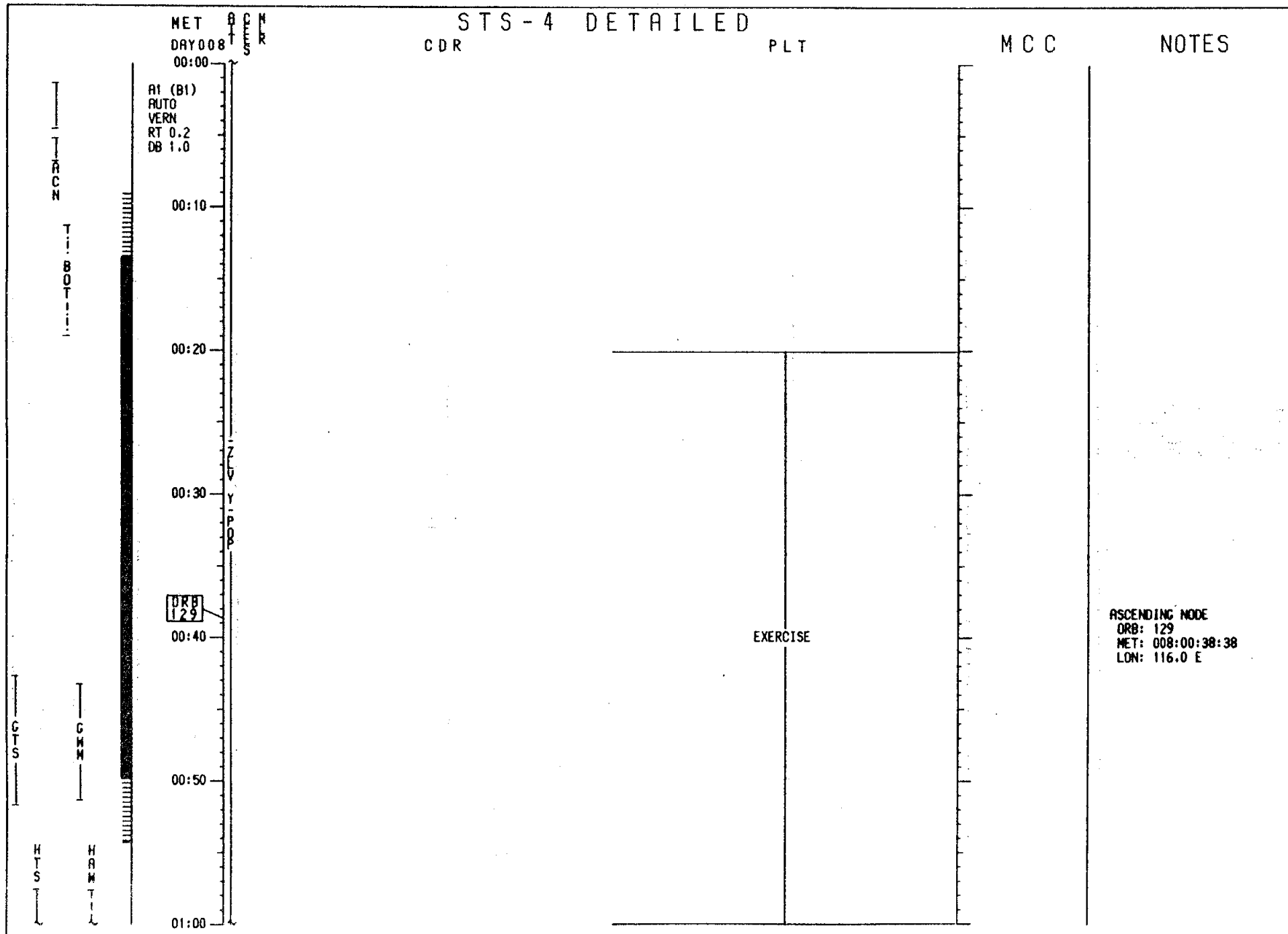
23:50

008
00:00

ASCENDING NODE
ORB: 128
MET: 007:23:08:11
LON: 139.1 E

TPR
BLOCK DATA
WEATHER PAD
B-32/129-132

UPLINK
ORBITER S.V.



STS-4 DETAILED

CDR

PLT

MCC

NOTES

MET

DAY 008

02:00

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

ORB
130

02:10

02:20

02:30

02:40

02:50

03:00

MEAL

MEAL

ASCENDING NODE
ORB: 130
MET: 008:02:09:05
LON: 92.9 E

MET DAY008
03:00

STS-4 DETAILED

CDR

PLT

MCC

NOTES

AI (B1)
AUTO
VERN
RT 0.2
DB 1.0

03:10

03:20

03:30

03:40

03:50

04:00

MEAL

MEAL

AUTO MNVR TO IMU ALIGN ATT

MNVR OPTION: R + 254 .7
P + 296 .7
Y + 12 .7

DAP: A/AUTO/VERN
(03:17) Initiate MNVR

CABIN STOW

(ORBIT OPS C/L, CREW SYS)

IMU ALIGNMENT - S TRK

(ORBIT OPS C/L, GNC)
STAR ID: -Y: 20 ARCTURUS
-Z: 51 ATRIA
ANG DIF: 92 .4

AUTO MNVR TO -ZLV ATT

(Y-POP, NOSE FWD)
TGT ID +2
BODY VECT +3
OM +180
DAP: A/AUTO/VERN
Initiate TRK

(CONNECT RETURN OPS 2,3) - IF RECD
(ORBIT PKT C/L, RCS)

REPORT: IMU ALIGN RESULTS

Stars 20 & 51
available from
8/03:06 to 8/03:53

IMU ALIGN PAD

RECD ID: -Y 1 -Z 2 ANG ERR 3

A X () () ()

A Y () () ()

A Z () () ()

EXECUTION TIME: / : :

ASCENDING NODE
ORB: 131
MET: 008:03:39:32
LON: 69.7 E

UPLINK
ORBITER S.V.

RPT: IMU ALIGN RESULTS

STS-4 DETAILED

MET

DAY 008

04:00

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

04:10

04:20

04:30

04:40

04:50

05:00

CDR

FIRE/SMOKE DETECT/SUPPRESS TEST
(ORBIT OPS C/L, EPS)

ANNUNCIATOR, C/W LAMP TEST
(ORBIT OPS C/L, EPS)

FUEL CELL PURGE - AUTO (Cue Card)

PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

PLT

PRE SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

MCC

MCC ONLY
COORD C&M/FDA
LIMITS CLEANUP
FOR CREW SLEEP

TPR
BLOCK DATA
WEATHER PAD
B-33/133-136

NOTES

STS-4 DETAILED

NET DAY 008
05:00

CDR

PLT

MCC

NOTES

AI (B1)
AUTO
VERN
RT 0.2
DB 1.0

ORB
132

05:10

PRE SLEEP ACTIVITY

PRE SLEEP ACTIVITY

05:20

05:30

SLEEP

SLEEP

05:40

05:50

06:00

ASCENDING NODE
ORB: 132
NET: 008:05:09:59
LON: 46.6 E

UPLINK
SPC LOAD -
1ST COMM
ALERT
CMD
RCOR SLEEP
CONFIG

MET
DAY 008
06:00

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

06:10

06:20

06:30

06:40

ORB
133

06:50

07:00

STS-4 DETAILED

CDR

SLEEP

PLT

SLEEP

MCC

NOTES

ASCENDING NODE
ORB: 133
MET: 008:06:40:25
LON: 23.4 E

STS-4 DETAILED

MET 8
DAY 008
07:00

RI (B1)
AUTO
VERN
RT 0.2
DB 1.0

08:00

ORB
134

09:00

ORB
135

10:00

11:00

ORB
136

12:00

CDR

SLEEP

PLT

SLEEP

MCC

NOTES

ASCENDING NODE
ORB: 134
MET: 008:08:10:52
LON: 0.3 E

ASCENDING NODE
ORB: 135
MET: 008:09:41:18
LON: 22.8 W

TPR
BLOCK DATA
WEATHER PAD
B-34/137-140

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 136
MET: 008:11:11:45
LON: 45.9 W

MET
DAY 008
12:00

A1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

12:10

12:20

12:30

12:40

12:50

13:00

13:10

13:20

13:30

13:40

13:50

14:00

STS-4 DETAILED

CDR

SLEEP

PLT

SLEEP

MCC

NOTES

ASCENDING NODE
ORB: 137
MET: 008:12:42:11
LON: 69.0 W

UPLINK
SPC LOAD-
CLEAR COMM
ALERT

MET
DAY 008
13:00

R1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

HEAD
X
Y
D

STS-4 DETAILED

CDR

PLT

MCC

NOTES

SLEEP

SLEEP

POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

POST SLEEP ACTIVITY
(ORBIT OPS C/L, CREW SYS)

Shave electrode sites, if reqd

13:10

13:20

13:30

13:40

13:50

14:00

MET 008
DAY 008

STS-4 DETAILED

CDR

PLT

MCC

NOTES

R1 (B1)
AUTO
VERN
RT 0.2
DB 1.0

14:00

ORB
138

TELEPRINTER MESSAGE REVIEW

TELEPRINTER MESSAGE REVIEW

ASCENDING NODE
ORB: 138
MET: 008:14:12:38
LON: 92.2 W

14:20

14:30

AUTO MNVR TO IMU ALIGN ATT

MNVR OPTION: R + 46 .6
P + 339 .1
Y + 11 .9

DAP: A/AUTO/VERN
(14:32) Initiate MNVR

UPDATE
H2O SPLY DUMP
QTY TK A & B

Stars 57 & 18
available from
8/14:33 to 8/15:11

14:40

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, GNC)

IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, GNC)
STAR ID: -Y: 57, ACAMAR
-Z: 18, CAPELLA
ANG DIF: 91 .7

14:50

AUTO MNVR TO -XSI ATT
MNVR OPTION: R + 257 .9
P + 285 .9
Y + 341 .2

DAP: A/AUTO/VERN
(14:55) Initiate MNVR

FUEL CELL PURGE - AUTO (Cue Card)

<u>IMU ALIGN PRO</u>			
REQD ID: -Y	-Z	ANG ERR	
ANG 1	2	3	
Δ X	()	()	()
Δ Y	()	()	()
Δ Z	()	()	()
EXECUTION TIME: / /			

MET 008
DAY 008
15:00

STS-4 DETAILED

CDR

PLT

MCC

NOTES

AI (B1)
AUTO
VERN
RT 0.2
DB 1.0

SUPPLY WATER DUMP
(ORBIT OPS C/L, ECLS)
Dump TKS A & B
Dump to:
QTY A = QTY B =

REPORT: IMU ALIGN RESULTS

Changeout wireless
headset battery pack - if wireless
use planned

RPT: IMU ALIGN RESULTS

15:10

15:20

15:30

15:40

15:50

16:00

MEAL

MEAL

ORB
139

ASCENDING MODE
ORB: 139
MET: 008:15:43:04
LON: 115.3 W

MET DAY 008

AI (BI)
AUTO
VERN
RT 0.2
DB 1.0

16:10

16:20.

16:30 .

16:40 -

16:50 .

17:00 -

CDR

MEAL

PLT

NEAL

M C C

NOTES

UPDATE
CRT TIMER
SETUP PAD

CLEANUP/STORAGE, (Cue Card)
Steps 1-4

R11 DEX PWR - ON

GO TO DEORB PREP

5-111

5/14/82 STS4/FIN

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5-112

STS-4/FIN

CONSUMABLES CURVES

FWD RCS PROPELLANT & He PRESS..... TBS
AFT RCS PROPELLANT & He PRESS..... TBS
OMS PROPELLANT CURVE (R & L POD)..... TBS
OMS He PRESSURE (R & L POD)..... TBS
OMS N2 PRESSURE (R & L POD)..... TBS
SUPPLY WATER..... TBS
CRYO H2 CURVE..... TBS
CRYO O2 CURVE..... TBS

CONSUMABLES
CURVES

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

CREW ACTIVITY PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

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CREW ACTIVITY PLAN NOTES (CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION - MAJOR EVENTS

MISSION DURATION (day/hr:min:sec) - 6/23:37:57

<u>LAUNCH (KSC)</u>	June 27, 1982
MET (day/hr:min:sec)	0/00:00:00
Day of Year	178
CDT/GMT	10:00/15:00

<u>MECO</u>	
MET (day/hr:min:sec)	0/00:08:34.08
ORBIT ha/hp (nm)	87 x -10.3

<u>OMS-1</u>	
MET (day/hr:min:sec)	0/00:10:34
ΔV (fps)	162.
ΔT (min:sec)	01:38
ORBIT ha/hp (nm)	129.8 x 34

<u>OMS-2</u>	
MET (day/hr:min:sec)	0/00:37:39
ΔV (fps)	175
ΔT (min:sec)	01:44
ORBIT ha/hp (nm)	130.2 x 129.7

<u>OMS-3</u>	
MET (day/hr:min:sec)	0/04:29:11.6
ΔV (fps)	62.3
ΔT (min:sec)	0:36.7
ORBIT ha/hp (nm)	164.8 x 129.9

<u>OMS-4</u>	
MET (day/hr:min:sec)	0/05:14:12.5
ΔV (fps)	61.6
ΔT (min:sec)	0:36
ORBIT ha/hp (nm)	165.2 x 164.8

<u>DEORBIT</u>	
MET (day/hr:min:sec)	6/22:41:49
ΔV (fps)	315.2
ΔT (min:sec)	2:55
ORBIT ha/hp (nm)	162 x -5

<u>ENTRY INTERFACE</u>	
MET (day/hr:min:sec)	6/23:08:36

<u>LANDING (EDW)</u>	July 4, 1982
MET (day/hr:min:sec)	6/23:37:57
Day of year	185
CDT	09:24

B. CREW

1. Crew designations and responsibilities
 - a. Commander (CDR): Prime crewman for launch, entry, aborts and contingency EVA. Responsible for overall command of the vehicle including the safety of both vehicle and crew.
 - b. Pilot (PLT): Prime crewman for RMS operations and CFES activities. Responsible for on-orbit management of STS.
2. A typical crew day will be that specified in the STS Work Day Handbook (Ref. 3). The daily on-orbit STS activities and their scheduling constraints are identified in the referenced document.
3. The crew will wear Emergency Ejection Suits (EES) from launch through post-insertion and will don them again for entry. Whenever the EES is worn, OBS sensors are also worn. During the rest of the flight, in-flight garments are worn.
4. For crew sleep periods, the middeck and flight deck speaker boxes will be configured for air-to-ground voice and C&W tones. A level check of the speaker boxes is performed prior to the first sleep period. During sleep the WCCUs will be turned off and stowed.

C. ORBITER SYSTEMS

1. Electrical Power System
 - a. A crew-initiated automatic purge of the fuel cells will be scheduled approximately every 12 hours.
 - b. The fuel cell purge schedule is shown in Table 9-1.
2. Communications and Instrumentation
 - a. The Operational Instrumentation (OI) system will be managed from the ground through uplink commands coordinated with the crew. Exceptions to this would be the result of contingencies. Real-time OI data will be transmitted to MCC during each ground station pass via the S-Band PM downlink. In parallel with this, one of the two operations recorders will dump recorded OI data at a 5-to-1 or 8-to-1 playback-to-record ratio (depending upon whether or not voice is included in the recorded data). One OI recorder will be recording at all times, and the other will dump at every station pass via the S-Band FM downlink. Video downlink causes an exception to this recorder dump plan, but only during the station passes where TV is scheduled as a crew activity.

- b. The Development Flight Instrumentation (DFI) system will be crew controlled. The Wideband Ascent Recorder is not used on orbit. The PCM Recorder will be operated during the entire mission in one of three modes: CONTINUOUS RECORD, HI SAMPLE (a 10 second snapshot of data every 5 minutes) and LO SAMPLE (a 10 second snapshot of data every 10 minutes). The Wideband Mission Recorder will be operated in the continuous record mode with all tracks recording in parallel during OMS and RCS burns and as required for FTOs or FSOs. DFI data will be downlinked every ground station pass via a separate S-Band DFI FM downlink. This data will be recorded at the ground station for post-flight shipment to MCC. Recorded DFI data will not be dumped to ground stations during on-orbit operations.
- c. There are thirteen (13) GSTDN sites for on-orbit coverage: ORR, BUC, GDS, MIL, BDA, HAW, GWM, AGO, ACN, MAD, YAR, DKR, and BOT, and one (1) SGLS site, IOS. The BUC site does not support data dumps via S-band FM downlink. The IOS site will normally only support S-band PM downlink and down voice for this flight. The site will normally be supporting DOD requirements, but can be configured real time if required to support S-band up voice, PM uplink and FM downlink.
- d. Three (3) GSTDN sites can be used for real-time TV: GDS, MIL, and HAW.
- e. Nine (9) GSTDN sites and one (1) SGLS site have UHF voice capability: GDS, MIL, BDA, HAW, GWM, ACN, BUC, MAD, DKR, and IOS.
- f. Two (2) sites have only UHF voice capability: YAR, and BOT.
- g. There are five (5) SGLS sites available for on-orbit coverage: GTS, HTS, NHS, VTS, and IOS. IOS is the only site with voice capability and there is only voice via UHF while supporting DOD requirements.

3. Guidance and Navigation

- a. The Orbiter state vector is uplinked about once every three orbits.
- b. IMU alignments will be routinely scheduled approximately every twelve (12) hours.
- c. Both star trackers are left on continuously except for special tests. A self-test of the star tracker will be performed once a day, normally just prior to the IMU alignment scheduled after the sleep periods.

d. Each IMU will be aligned with different REFSMMATs to provide skewed platforms for enhancement of redundancy management at launch and entry. The launch REFSMMATs have a square root of five skewing and the preferred skew for entry is a square root of six. The REFSMMATs will be changed for entry normally at about 00/03:35 MET. In order to simplify recovery procedures for some contingency cases, one of the IMUs will have the same REFSMMAT for launch and entry. For the case where an IMU fails prior to the switch to the square root of six REFSMMATs, the IMU REFSMMATs, for entry, will be changed to a square root of two skewing to enhance the redundancy management during entry.

e. The on-orbit avionics configuration for STS-4 is listed below. GPC 3 (freeze dried) and GPC 5 (BFS) will be turned off at -0/01:00 MET.

GPCs - 2 RUN (1 GNC, 1 SM), 2 OFF, 1 INTERMITTENT (GNC)
IMUs - 3 OPERATE
STAR TRACKERS - 2 ON
MASS MEMORY UNITS - 2 ON
FLIGHT CRITICAL MDMs - 8 ON

f. The ADI RELMATs provide a means to change the reference system for presenting vehicle attitudes to the crew without having to reposition the IMU platforms. The RELMATs support specific flight phase requirements and are defined as listed below.

1) ASCENT (OPS 1 and 6)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 00, pitch 00, and yaw 00 when the vehicle is pointed at 00 Right Ascension, 00 Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

This will be a pad-oriented inertial RELMAT with the vehicle +X axis downrange along the first stage launch azimuth and the +Z towards the center of the earth along the launch pad radius vector at the time of lift off. This provides a +X sense ADI ball reading of roll 55.30 (launch azimuth), pitch 900, and yaw 00 at liftoff.

'LVLH' Position:

This RELMAT will provide for an unbiased LVLH frame in major modes 104, 105, and 106 (i.e., the bias matrix will be an identity matrix). In major modes 101, 102, 103 and 601, the LVIY reference frame will be used.

2) ON-ORBIT (OPS 2 and 8)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0^0 , pitch 0^0 , and yaw 0^0 when the vehicle +X axis is pointed at 0^0 Right Ascension, 0^0 Declination and the vehicle +Y axis is pointed at the celestial pole.

'REF' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0^0 , pitch 0^0 , and yaw 0^0 when the vehicle +X axis is in the direction of the velocity vector and the +Z axis is directed radially down to the center of the earth at the orbital noon time which is closest to the midway MET between TIG for nominal OMS-2 and TIG for nominal deorbit burn.

'LVLH' Position:

This RELMAT will provide for an unbiased LVLH frame (i.e., the bias matrix will be an identity matrix).

3) ENTRY (OPS 3)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0^0 , pitch 0^0 , and yaw 0^0 when the vehicle is pointed at 0^0 Right Ascension, 0^0 Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

Same as 'INRTL' position.

'LVLH' Position:

Unbiased.

- g. The OPS-2 I-loaded DAP configuration is currently planned to be:

	DAP A	DAP B
Translation Pulse	0.1	0.02
Rotation Discrete Rate - NORM	0.20/sec	0.50/sec
- VERNIERS	0.20/sec	0.20/sec
Rotation Pulse - NORM	0.1	0.04
- VERNIERS	0.01	0.002
Rotation Compensation - NORM	0.0	0.0
- VERNIERS	0.0	0.0
Attitude Deadband (R,P,Y axis)		
- NORM	5.00	3.00
- VERNIERS	1.00	1.00
Rate Deadband - NORM	0.20/sec	0.20/sec
- VERNIERS	0.020/sec	0.020/sec
Jet Opt Pitch	1	1
Yaw	1	1
Cntl Accel	0	0

- h. The OPS-3 Transition DAP configuration is:

Rotation Discrete Rate	0.20/sec
Attitude Deadband	3.50
Rate Deadband	0.30/sec

4. Propulsion

The major burns maneuver schedule for STS-4 is identified in Section 7.A, FLIGHT DESCRIPTION - MAJOR EVENTS.

5. Environmental Control and Life Support Subsystem (ECLS)

- a. The CO₂ absorbers are not installed for launch or entry. Both canisters are initially installed at approximately 0/05:20 MET and are then alternately replaced with new canisters within the required frequency of approximately every 24 hours. The canisters are both removed approximately 4 hours prior to the deorbit burn ignition during the deorbit preparations on entry day. The installation/replacement schedule is shown in Table 9-3.
- b. The waste water tank will be loaded to 40% at launch, with sufficient ullage volume to accommodate waste water accumulation during the flight. The tank will be as full as feasible at the planned end of the mission.
- c. The supply water tanks will be sufficiently loaded at launch so that planned launch day deorbit opportunities can be supported through the use of combined supply and waste water, without opening the payload bay doors. Thus all tanks will be full at launch except Tank A which will be 45% full. This allows sufficient ullage to handle fuel cell water production during the ascent phase. Potential supply water dumps are scheduled approximately every 12 hours in the Crew Activity Plan which may or may not be required. A real-time call will be made prior to each

scheduled dump to inform the crew if a dump is required and to what level. Tanks A & B will be dumped to a level that will allow the tanks to be full prior to the next daily group of EDW deorbit opportunities. The supply water dump schedule is shown in Table 9-2.

D. INTERIM TELEPRINTER SYSTEM (ITS)

1. The Interim Teleprinter System (ITS) will be used for STS-4. The system will provide an on-orbit capability to receive and reproduce text data (such as procedures and CAP updates or changes) from the MCC during routine and off-nominal situations.
2. The teleprinter is located on the middeck in a standard flight locker (MA9F) adjacent to Avionics Bay 3A. Foam insulation inside the locker is used to reduce the noise from the teleprinter during operation.

E. TELEVISION/PHOTOGRAPHY

1. The Closed Circuit Television (CCTV) system will be used for STS-4. This system provides two cameras for in-cabin coverage and two RMS and four payload bay TV cameras for coverage of payload bay activities. The system, after activation, can be managed by ground commands during live coverage passes. For TV coverage outside of STDN coverage, the crew must manage the CCTV system.
2. There is a video tape recorder (VTR) available to record video during periods when there is no STDN coverage. The video is recorded on 30-minute cassettes and will normally not be dumped to the ground. Recorded video can be dumped to the ground if desired since the VTR output (dump) currently is hooked to the PL1 video input, allowing recorded video to be played back into the Orbiter communication system as if it were a PL1 (Spacelab) TV camera input. VTR management must be performed by the crew.
3. 16mm, 35mm, and 70mm camera systems are available.

F. REMOTE MANIPULATOR SYSTEM (RMS)

1. OMS/RCS CONSTRAINTS

- a. VRCS - No constraints during RMS OPS
- b. PRCS - Constraints during Loaded and Unloaded RMS OPS:
 1. Usage not permitted under the following conditions:
 - a. RMS JOINT in a Singularity
 - b. RMS at a Reach Limit
 - c. RMS in Test Mode
 - d. During EE OPS
 - e. Loaded RMS/PRCS Interaction Test will be NO GO for Failed VRCS.
 2. Must be on Tail Only Jets with a 30° deadband when on AUTO DAP.

- c. OMS - Usage not permitted with RMS uncradled or attached to a berthed Payload.
- 2. No part of the RMS shall be positioned within the following distances of an RCS Thruster:
 - a. PRCS - 15 ft
 - b. VRCS - 3 ft
- 3. No part of the RMS/Payload/End Effector will be maneuvered outside the Crew/CCTV field of view, unless the joint angles and sequence to be maneuvered have been verified as acceptable.

G. PAYLOADS

- 1. IECM (Induced Environmental Contamination Monitor)

The crew will be required to operate the IECM switch on Panel R11 four times during the flight. These switch operations, which mode the IECM mass spectrometer, are performed after payload bay door openings, for plume impingement, contamination mapping, and gas release maneuver FTOs, per the STS-4 Flight Requirements Document (Ref. 1). The IECM mass spectrometer must be turned off when the payload bay doors are closed to prevent damage to the mass spectrometer by pressure buildup in the payload bay.

- 2. MLR (Monodisperse Latex Reactor)

The MLR is activated via a single switch prior to the first crew sleep period and runs continuously for 19.5 hours. The experiment occupies the space of three middeck lockers.

- 3. CFES (Continuous Flow Electrophoresis System)

The CFES provides a processing system which can segregate biological samples using a separation process based on the relative motion of charged particles through an electric field (electrophoresis). For STS-4, the crew will be required to operate the payload twice during the early portion of the flight. Each operating period lasts approximately eight hours. The PLT has been designated as the prime crewman for CFES operations. The CFES payload is located on the Orbiter middeck. A low acceleration level is desired during CFES operations.

- 4. GAS (Get-Away Special)

The GAS payload is a self-contained experiment package that requires minimal crew activity. After the crew is given approval for orbit operations, the crew unstows a handheld controller and activates the payload. Once activated, an internal controller sequentially initiates the biological, materials processing, and physical science experiments at the appropriate time. The experiments do not require any special attitudes during their operation. Deactivation and stowing of the handheld controller occur before deorbit preparation.

5. NOSL (Night/Day Optical Survey of Thunderstorm Lightning)

The NOSL experiment is performed in the Orbiter cabin. The experiment requires crew operations for unstowing and setting up in the aft flight deck, for on-orbit operations using targets of opportunity, and for stowage. A -ZLV attitude is desired for taking data.

ON-ORBIT CREW ACTIVITY
FUNCTIONAL TEST OBJECTIVES (FTOs),
FUNCTIONAL SUPPLEMENTARY OBJECTIVES (FSOs)

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FTOs/FSOs

INTRODUCTION

The following Table describes the scheduling data and rationale for on-orbit crew activity related FT0s/FS0s for STS-4. The current FRD (Ref. 1) was used for compiling this table.

FT0s/FS0s

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
401-01	Ascent Performance Data Collection	N/A	No crew interaction required except for DFI recorder configurations
402-01	SRB Performance Data Collection		
403-01	On-Orbit Performance Data Collection		
404-01	Entry/Approach and Landing Performance Data		
411-01	Structural Conditioning	PTC initiated at 06/04:52	Ground will provide go/no-go for crew thermal conditioning
412-01	Attitude Hold Thermal Response	1/07:49 - 1/19:12 1/23:18 - 4/18:18 4/19:24 - 6/04:32 6/04:52 - 6/16:02	PTC -XSI (Tail To Sun) +ZSI (Bottom to Sun) PTC
412-02	Startracker Coldsoak Thermal Response	2/04:15 - 2/18:54 2/18:54	Both startrackers powered off Both startrackers powered on Both startrackers powered off for ~12 hours followed by ~12 hours of both startrackers powered on. A startracker self-test and a normal IMU alignment will be performed between the two periods

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
412-03	Supply Water Dump Line and Nozzle Thermal Response		Has been deleted
412-04	Waste Water Dump Line and Nozzle Thermal Response		Has been deleted
412-05	FRCS Thermal Soakback, One Forward Engine	4/15:40 - 5/00:10	Performed after 20 hours of -XSI or anytime after start of +ZSI. Inhibit 3 FRCS engines for 5 hours; fire F3F for 30 seconds; inhibit all 3 engines for 5 hours
412-06	FRCS Thermal Soakback, Two Forward Engines	5/22:41 - 6/04:24	Performed no earlier than 20 hours after initiation of -XSI thermal test period. Requires inhibiting 3 FRCS engines for 5 hours, subsequent firing of 2 of the 3 engines for 30 seconds, and a final 5-hour period of inhibiting of all 3 engines prior to return to normal operations.
412-07	FRCS Thermal Soakback, Pulse Mode	3/16:00 - 4/02:50	Performed after 20 hours in either -XSI or +ZSI; inhibit 3 FRCS engines for 5 hours; perform five 30-second firings of F3F (each firing separated by 30 minutes); inhibit all 3 engines for 5 hours
412-08	ARCS Thermal Soakback, One Aft Engine	5/22:41 - 6/04:24	Performed after 20 hours of +ZSI; inhibit aft firing PRCS engines and VRCS engines in port pod; fire L1A for 100 seconds; inhibit engines involved for 5 hours

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
413-01	ET Passive Ablation Sensor Target Photography	8 seconds after ET SEP	
421-01	Early Entry Roll Characteristics	Q = 22.0 psf	Has been deleted
421-02	Aerothermodynamics/ Performance	V = 21,000 fps	
421-03	Aerothermodynamics/ Performance	V = 18,000 fps	
421-04	Aerothermodynamics/ Performance	V = 14,000 fps	
421-05	Aerothermodynamics/ Performance	V = 8,400 fps	
421-06	Supersonic Lateral Trim	M = 3.2	
421-07	Transonic Lateral/ Directional Stability		
421-08	Wing and Tail Excitation (Structural PTI)	M = 2.2	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
431-01	Window Observation and Reporting		Has been deleted
432-01	Ascent Wing and Tail Excitation	V = 460 fps	
433-01	Payload Bay Liner Performance	0/02:55	
434-01	Flight Debris Investigation	0/02:57	
441-01	Vacuum Inerting	Between OMS 1&2	The inerting is terminated prior to the OMS-2 burn
441-02	Inerting Verification	0/05:20 - 0/05:52	Between 6 and 12 hours after completion of FTO 441-01
442-01	Simulated OMS Engine Failure (OMS-3)		Has been deleted
444-01	Hydraulic System Warm-up	During FCS C/O on FD5	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
445-01	PRSD Stratification Test, 85% Level	Not Scheduled	Provide cryo supply with 15% density to all 3 FCPs. Configure electrical loads for 19.3 kW split among 3 FCPs and maintain for 2 hours. Plus and then minus pitch maneuvers of 175° at 1°/sec performed
445-02	PRSD Stratification Test, 50% Level	Not Scheduled	
445-03	PRSD Stratification Test, 15% Level	5/22:20 - 5/22:30	
451-01	PLBD Initial Alignment Test		Has been deleted
451-02	PLBD Final Alignment Test		Has been deleted
451-03	PLBD Cold Case Performance	4/16:50 - 4/18:10	Performed as near the end of the -XSI thermal test period as practicable based on operational requirements. Theodolite must be installed. Calibration sightings required during initial PLBD operations
451-04	PLBD Thermal Gradient Performance	6/00:50 - 6/02:10	Performed as near the end of the +ZSI thermal test period as practicable based on operational requirements

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
452-01	RMS Software Stop Performance		Has been deleted
452-02	Singularity Management	5/02:00 - 5/02:35	
452-03	Unloaded Arm Response to PRCS	5/01:18 - 5/01:58	
453-01	Contamination Mapping	1/20:20 - 1/22:50	IECM limited to 4 hours of operations after switching to internal battery power
454-01	RCS Plume Flow Field Measurement	2/01:10 - 2/03:10	IECM limited to 4 hours of operations after switching to internal battery power
455-01	Payload Deployment and Berthing Performance	1/20:10 - 1/23:15 2/01:00 - 2/03:30	
455-02	RMS/PRCS Interactions	Shopping List Item	
461-01	Whole Gas Samples	6/03:20	No crew interaction required
461-03	ATCO Performance Evaluation	N/A	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
462-01	Radiator Coating Bond Verification	5/00:48 - 5/01:18	
466-01	Radiator Performance Test	0/02:20 - 0/08:00 1/06:55 - 1/23:25 2/20:05 - 2/22:54 5/20:20 - 6/01:30	Desired to perform this test during the following attitudes: -ZLV; -ZSI; -XSI or +XSI; PTC; +ZSI; Gravity Gradient
467-01	VPC Freezer Heat Exchanger Dynamics	0/23:50 - 1/07:50	Freezer should have been off at least six (6) hours
467-02	Long Term VPC Freezer Temperature Stability	1/23:45 - 1/23:50 3/02:15 - 3/02:20 4/05:30 - 4/05:35 5/05:35 - 5/05:40 5/22:55 - 5/23:00	
467-03	Sample Freezing Storing and Return	1/07:50 - 1/07:56	
471-01	S-Band and UHF Antenna Patterns	6/05:20 - 6/05:40	FTO 467-01 must be accomplished before this FTO

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
472-01	Autoland Controlled Approach	N/A	
472-02	Crosswind Landing Performance	N/A	
473-01	Startracker Operation During Water Dumps	1/07:23 - 1/07:43	Daylight required
473-03	Forward Station COAS Calibration	0/08:24 - 0/08:29	
474-01	Navigation Base Stability	1/19:31 - 1/19:50 4/18:30 - 4/18:50	
475-01	Cold Case CCTV Evaluation, Non-Operating		Has been deleted
475-02	Cold Case CCTV Evaluation, Operating		Has been deleted
476-01	Backup Orbital Navigation	3/04:19 - 3/04:37 5/18:14 - 5/18:34 5/19:42 - 5/20:04	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FTO/FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
477-01	PRCS Narrow Deadband Attitude Hold Performance	3/23:20 - 3/23:25	
477-02	Passive Gravity Gradient Attitude Hold	0/06:05 - 0/07:56 0/19:15 - 1/06:52	
479-01	On-Orbit TACAN Nav Aid Capability	2/19:35 - 3/00:37 3/23:40 - 4:00:10 4/00:53 - 4/02:43	GPC must be in OPS 8 during data collection
S401-01	Tile Gap Heating Data Collection	N/A	
S402-01	Catalytic Surface Effects Data Collection	N/A	
S403-01	Dynamic, Acoustic and Thermal Environment Data	N/A	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S431-01	IECM Operation	Post Insertion 4/23:05 - 4/23:50 Deorbit Prep	IECM switch is in POS 2 at launch; at four (4) defined times during the flight, the crew places the IECM switch in POS 1 position for 30 $\pm$ 5 seconds and then back to POS 2 position
S432-01	Infrared Imagery of Shuttle	N/A	
S433-01	Prelaunch and Ascent ACIP Data Operation	Prelaunch & Ascent	Gravity gradient required
S433-02	Quiescent On-Orbit Data Collection	1/03:18 - 1/03:24	
S433-03	Deorbit Through Landing ACIP Data Collection	Deorbit and Entry	
S434-01	Deploy Radiation Dosimeter Pouches	N/A	
S434-02	Stow Radiation Dosimeter Pouches	N/A	

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S435-01	GAS Operation	0/05:25 - 6/00:00	
S436-01	CFES Operation	0/20:25 - 1/04:15 2/19:45 - 3/04:09	Experiment run #1 Experiment run #2
S441-01	NOSL Operations	0/21:50 - 6/05:05	
S442-01	MLR Operation	0/06:30 - 1/02:15	Low acceleration level desired for 19.5 hours
S443-01	In-flight Motion Sickness Data Collection	0/08:45 1/08:15 2/07:25 3/06:15 4/05:55 5/05:55 6/05:55	
S491-01	Crew Activities TV	1/01:24 - 1/01:32 3/01:40 - 3/02:10 3/19:15 - 3/19:25 4/22:51 - 4/23:00 5/20:07 - 5/20:16	Group 2

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S491-02	IECM Handling Demonstration TV	2/01:10 - 2/03:10	Group 2
S491-03	Activities of Opportunity TV	TBD	Group 2
S491-04	TV of the CDR	3/19:15 - 3/19:25	Group 1
S491-05	TV of the PLT	1/01:24 - 1/01:32 3/01:40 - 3/02:10 4/22:51 - 4/23:00 5/20:07 - 5/20:16	Group 1
S492-01	Launch Photography (16mm)	Ascent	Group 1
S492-02	Crew Activities (16mm)	1/01:50 - 1/04:15 2/02:38 - 2/21:25 4/00:11 - 4/00:16 4/01:30 - 4/02:12 4/16:50 - 4/18:10	Group 2
S492-03	Payload Bay Photography (16mm)	1/20:20 - 1/22:55	Group 1, associated with RMS/IECM OPS
S492-04	Unscheduled Photography (16mm)	TBD	Group 2

TABLE 8-1 - STS-4 ON-ORBIT CREW ACTIVITY RELATED FTOs/FSOs

FSO NUMBER	TITLE	SCHEDULED (D/HH:MM) (MET)	SCHEDULING REMARKS
S492-05	Approach and Landing Photography (16mm)	Entry	Group 1
S492-06	Photography of the CDR (16mm)	2/20:38 - 2/21:25	Group 2
S492-07	Photography of the PLT (16mm)	4/00:11 - 4/00:16	Group 2
S493-01	Crew Activity Photography (35mm)	TBD	Group 2
S493-02	Payload Bay Photography (35mm)	TBD	Group 2
S493-03	On-Orbit Photography (35mm)	TBD	Group 2
S493-04	Still Photography of the CDR (35mm)	TBD	
S493-05	Still Photography of the PLT (35mm)	TBD	

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TABLE 9-1
ORBITER FUEL CELL PURGES

APPROX MET (D/HH:MM)	FUEL CELL PURGE	
	NO.	Δt (HH:MM)
Post-Ins (0/02:52)	1	
0/08:40	2	04:48
0/18:30	3	09:50
1/08:10	4	13:40
1/18:00	5	09:50
2/07:15	6	13:15
2/17:15	7	10:00
3/06:05	8	12:50
3/16:10	9	10:05
4/05:50	10	13:40
4/15:40	11	09:50
5/05:50	12	14:10
5/15:45	13	09:55
6/05:50	14	14:05
6/16:20	15	10:30
Deorbit Prep (6/20:33)	16	05:53

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TABLE 9-2
ORBITER WATER DUMPS (SUPPLY)

APPROX MET (D/HH:MM)	SUPPLY H2O	
	NO.	Δt (HH:MM)
0/07:44	1	
0/17:55	2	10:11
1/07:24	3	13:29
1/18:00	4	10:36
2/05:50	5	11:50
2/17:10	6	11:20
3/04:45	7	11:35
3/16:05	8	11:20
4/03:05	9	11:00
4/19:05	10	16:00
5/03:10	11	08:05
5/15:55	12	12:45
6/02:10	13	10:15
6/16:25	14	14:15

TABLE 9-3
CO2 ABSORBER REPLACEMENT

APPROX MET (D/HH:MM)	CO2 ABSORBER REPLACEMENT			
	ABSORBER NO.	POSITION	POSITION A Δt (HH:MM)	POSITION B Δt (HH:MM)
* 0/05:20	1 & 2	A & B		
** 0/08:35	3	A	03:15	
1/08:10	4	B		26:50
2/07:20	5	A	46:45	
3/06:00	6	B		45:50
4/05:35	7	A	46:15	
5/05:40	8	B		47:40
6/05:40	9	A	48:05	
***6/17:50			13:50	37:15

*INITIAL INSTALLATION OF BOTH CO2 ABSORBERS

**CO2 ABSORBER NO 1 IS REWRAPPED AND SAVED FOR CONTINGENCY

***BOTH CO2 ABSORBERS REMOVED FOR ENTRY

TABLE 9-4
CRYO MANAGEMENT

	MET	O2/H2 TANK HTRS SWITCH CONFIGURATION
POST INSERTION	0/03:00 (STATUS AS OF)	O2 TK1 & 2 HTRS A,B (four) - AUTO H2 TK1 & 2 HTRS A,B (four) - AUTO O2 TK3 HTRS (two) - AUTO H2 TK3 HTRS (two) - AUTO O2 TK4 HTRS (two) - OFF H2 TK4 HTRS (two) - OFF
PREP (PRSD TEST)	5/15:50	O2 TK1,2,3,4 HTRS (all) - OFF H2 TK1,2,3,4 HTRS (all) - OFF
POWERUP (PRSD TEST)	5/19:53	O2,H2 TK4 HTRS A (two) - AUTO
PERFORMANCE (PRSD TEST)	5/22:20	
POST (PRSD TEST)	5/22:35	O2 TK1 & 2 HTRS A (two) - AUTO H2 TK1 & 2 HTRS A,B (four) - AUTO O2,H2 TK3 HTRS A (two) - AUTO O2,H2 TK4 HTRS A (two) - OFF

TABLE 9-5 - DFI WIDEBAND ASCENT RECORDER USAGE

APPROX MET (DD/HH:MM:SS)	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (MM:SS)	TAPE REMAINING (MM:SS)	P*
~-00/00:05:30	CONT	ON	--	00:00	32:00	T
00/00:13:00	STBY	ON	18:30	18:30	13:30	B
00/00:35:00	CONT	ON	00:00	18:30	13:30	S
00/00:39:00	STBY	ON	04:00	22:30	9:30	
00/01:05:00	STBY	OFF	04:00	22:30	9:30	

*Data Priority based from 10 down to 1 (OI Data is 10)

TABLE 9-6 - DFI WIDEBAND MISSION RECORDER USAGE

APPROX MET (DD/HH:MM)	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
-00/00:06	CONT	ON	--	00:00:00	02:00:00	LAUNCH THRU OMS 1	T B S
00/00:13	STBY	ON	19:00	00:19:00	01:41:00		
00/00:35	CONT	ON	00:00	00:19:00		OMS 2	
00/00:39	STBY	ON	04:00	00:23:00	01:37:00		
00/01:05	STBY	OFF					
00/04:27	CONT	ON	00:00	00:23:00		OMS 3	
00/04:31	STBY	OFF	04:00	00:27:00	01:33:00		
00/05:12	CONT	ON	00:00	00:27:00		OMS 4	
00/05:16	STBY	OFF	04:00	00:31:00	01:29:00		
01/03:16	STBY	ON	00:00	00:31:00	01:29:00		
01/03:20	CONT	ON	00:00	00:31:00	01:29:00	ACIP ON-ORBIT TEST	
01/03:21	STBY	ON	01:00	00:32:00	01:28:00		
01/03:26	STBY	OFF	00:00	00:32:00	01:28:00		
03/18:48	CONT	ON	00:00	00:31:00		F3F PULSE MODE TEST	
03/18:52	STBY	OFF	04:00	00:36:00	01:24:00		
03/19:18	CONT	ON	00:00	00:36:00		F3F PULSE MODE TEST	
03/19:22	STBY	OFF	04:00	00:40:00	01:20:00		
03/19:48	CONT	ON	00:00	00:40:00		F3F PULSE MODE TEST	
03/19:52	STBY	OFF	04:00	00:44:00	01:16:00		
03/20:18	CONT	ON	00:00	00:44:00		F3F PULSE MODE TEST	
03/20:22	STBY	OFF	04:00	00:48:00	01:12:00		
03/20:48	CONT	ON	00:00	00:48:00		F3F PULSE MODE TEST	
03/20:52	STBY	OFF	04:00	00:52:00	01:08:00		
04/19:13	CONT	ON	00:00	00:52:00		RCS TEST, 1 FWD ENG	
04/19:17	STBY	OFF	04:00	00:56:00	01:04:00		
05/22:44	CONT	ON	00:00	00:56:00		RCS TEST, 2 FWD/1 AFT ENG	

*Data Priority based from 10 down to 1 (OI Data is 10)

**Time of 2 min sample should correspond to the approximate time sleep station readings are taken

TABLE 9-6 - DFI WIDEBAND MISSION RECORDER USAGE (CONTINUED)

APPROX MET (DD/HH:MM)	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
05/22:48	STBY	OFF	04:00	01:00:00	01:00:00	WB CAL DEORBIT BURN EI-3 THRU ROLLOUT	
06/18:00	CONT	ON	00:00				
06/18:01	STBY	OFF	01:00	01:01:00	00:59:00		
06/22:40	CONT	ON	00:00	01:01:00			
06/22:46	STBY	OFF	06:00	01:07:00	00:53:00		
06/23:06	CONT	ON	00:00	01:07:00			
06/23:39	STBY	OFF	46:00	01:53:00	00:07:00		

*Data Priority based from 10 down to 1 (OI Data is 10)

**Time of 2 min sample should correspond to the approximate time sleep station readings are taken

TABLE 9-7 - DFI PCM RECORDER USAGE

APPROX MET (DD/HH:MM)	MODE	Δt (HH:MM)	Δt TAPE** USAGE (HH:MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE RE- MAINING (HH:MM:SS)	REASON	P*
-00/00:06	CONT	--	--	--	05:52:00	ASCENT THRU VAC INERT +5	T B S
00/00:23	HI SAMP	00:29	29:00	00:29:00	05:23:00	RA	
00/00:35	CONT	00:12	00:22	00:29:22	05:22:38	OMS 2	
00/00:39	LO SAMP	00:04	04:00	00:33:22	05:18:38		
00/01:59	CONT	01:20	01:17	00:34:39	05:17:21	PLBD OPENING	
00/02:02	LO SAMP	00:03	03:00	00:37:39	05:14:21	NOMINAL CONFIG	
00/04:27	CONT	02:25	02:34	00:40:13	05:11:47	OMS 3 BURN	
00/04:31	LO SAMP	00:04	04:00	00:44:13	05:07:47	NOMINAL CONFIG	
00/05:12	CONT	00:41	00:44	00:44:57	05:07:03	OMS 4 BURN	
00/05:16	LO SAMP	00:04	04:00	00:48:57	05:03:03	NOMINAL CONFIG	
00/05:22	CONT***	00:06	00:00	00:48:57	05:03:03	INERTING VERIFICATION	
00/05:27	HI SAMP***	00:05	05:00	00:53:57	04:58:03	INERTING VERIFICATION	
00/05:52	LO SAMP	00:25	00:44	00:54:41	04:57:19	NOMINAL CONFIG	
01/20:20	HI SAMP	38:28	41:26	01:36:07	04:15:53	IECM CONTAM MAPPING	
01/22:55	LO SAMP	02:35	05:19	01:41:26	04:10:34	NOMINAL CONFIG	
03/18:48	CONT	43:53	47:18	02:28:44	03:23:16	F3F PULSE MODE TEST	
03/19:00	HI SAMP	00:12	12:00	02:40:44	03:11:16	F3F PULSE MODE TEST	
03/19:18	CONT	00:18	00:33	02:41:17	03:10:43	F3F PULSE MODE TEST	
03/19:30	HI SAMP	00:12	12:00	02:53:17	02:58:43	F3F PULSE MODE TEST	
03/19:48	CONT	00:18	00:33	02:53:50	02:58:10	F3F PULSE MODE TEST	
03/20:00	HI SAMP	00:12	12:00	03:05:50	02:46:10	F3F PULSE MODE TEST	
03/20:18	CONT	00:18	00:33	03:06:23	02:45:37	F3F PULSE MODE TEST	
03/20:30	HI SAMP	00:12	12:00	03:18:23	02:33:37	F3F PULSE MODE TEST	

*Data Priority based from 10 to 1 (OI Data is 10)

**11 sec of tape used every 5 min 11 sec for HI SAMPLE and 10 min 11 sec for LOW SAMPLE

***If inerting verification is not required, recorder stays at LO SAMPLE

TABLE 9-7 - DFI PCM RECORDER USAGE (CONTINUED)

APPROX MET (DD/HH:MM)	MODE	Δt (HH:MM)	Δt TAPE** USAGE (HH:MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE RE- MAINING (HH:MM:SS)	REASON	P*
03/20:48	CONT	00:18	00:33	03:18:56	02:33:04	F3F PULSE MODE TEST	
03/21:00	HI SAMP	00:12	12:00	03:30:56	02:21:04	F3F PULSE MODE TEST	
04/01:43	CONT	04:43	09:54	03:40:50	02:11:10	FCS C/O	
04/01:49	LO SAMP	00:06	06:00	03:46:50	02:05:10	NOMINAL CONFIG	
04/05:50	HI SAMP	04:01	04:13	03:51:03	02:00:57	LAST 10 HRS OF -XSI	
04:19:13	CONT	13:23	28:14	04:19:17	01:32:43	RCS TEST, 1 FWD ENG	
04:19:25	HI SAMP	00:12	12:00	04:31:17	01:20:43	RCS TEST, 1 FWD ENG	
05:00:12	LO SAMP	04:47	10:05	04:41:22	01:10:38	NOMINAL CONFIG	
05:22:44	CONT	22:32	24:12	05:05:34	00:46:26	RCS TEST, 2 FWD/1 AFT ENG	
05:22:56	HI SAMP	00:12	12:00	05:17:34	00:34:26	RCS TEST, 2 FWD/1 AFT ENG	
06/04:26	LO SAMP	05:30	11:33	05:29:07	00:22:53	NOMINAL CONFIG	
06/18:31	HI SAMP	14:05	15:02	05:44:09	00:07:51	RADIATOR BYPASS/STOW RADIATORS	
06/19:20	HI SAMP	00:49			01:36:00	DFI PCM RCDR REWIND	
06/19:48	CONT		00:28			PLBD CLOSING/STRAIN GAUGE	
06/19:52	HI SAMP		00:04				
06/19:57	CONT					RADIATOR HEAT SINK	
06/20:02	HI SAMP		00:05				
06/22:36	CONT					TIG-4 MINUTES THRU POST LANDING	
~07/00:00	HI SAMP		01:24			POST ROLLOUT	

*Data Priority based from 10 to 1 (OI Data is 10)

**11 sec of tape used every 5 min 11 sec for HI SAMPLE and 10 min 11 sec for LOW SAMPLE

***If inerting verification is not required, recorder stays at LO SAMPLE

TABLE 9-8 - ATTITUDE AND EVENT TIMELINE

MET (0/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
0/00:08:34	MECO					3.5	0.3	0.2	*	AUTO	*					
0/00:08:49	ET SEP (4 fps, -Z)					3.5	0.3	0.2	*	AUTO	*					
0/00:09:30	INITIATE MANUAL MNVR TO OMS-1 BURN ATT	--	--	--	--	N/A	N/A	N/A	*	MAN ACCEL	*	--	--	--	--	
0/00:10:00	OMS-1 BURN ATT	337.2	190.5	346.5	INRTL	3.5	0.3	0.2	*	AUTO	*	69	359	99	181	
0/00:10:31.3	OMS-1 IGNITION					3.5	0.3	0.2	*	AUTO	*					162.1 fps ΔV
0/00:12:07.3	OMS-1 CUTOFF					3.5	0.3	0.2	*	AUTO	*					
0/00:13:21	MPS DUMP TERMINATED					3.5	0.3	0.2	*	AUTO	*					
0/00:20:00	INITIATE AUTO MNVR TO OMS-2 BURN ATT	--	--	--	--	3.5	0.3	0.2	*	AUTO	*	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 115
0/00:30:00	OMS-2 BURN ATT	19.1	312.6	342	INRTL	3.5	0.3	0.2	*	AUTO	*	36	16	146	356	
0/00:37:39.3	OMS-2 IGNITION					3.5	0.3	0.2	*	AUTO	*					174.8 fps ΔV
0/00:39:26.5	OMS-2 CUTOFF					3.5	0.3	0.2	*	AUTO	*					
0/00:55:00	DPS RECONFIG TO GNC 2 (OMS-2 ATT)					10.0	0.2	0.2	A	AUTO	NORM					
0/01:05:00	INITIATE -ZLV, XPOP +Yby FWD ATT MODE	--	--	--	--	10.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 103
0/01:14:00	-ZLV, XPOP ATT (PLBD OPENING) (12° ROLL BIAS)	0	192	90	LVLH	10.0	0.2	0.2	A	AUTO	NORM	90	348	89	54	P 90 Y 348 OM 270 TGT: EARTH
0/03:41:00	FREE DRIFT					N/A	N/A	N/A	A	MAN PULSE	VERN					
0/04:10:00	INITIATE AUTO MNVR TO OMS-3 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 11 MIN EIG ANG = 130

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
0/04:21:00	OMS-3 BURN ATT	331.6	153.4	359.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	40	0	60	181	
0/04:29:11.6	OMS-3 IGNITION					3.5	0.3	0.2	A	AUTO	NORM					62.3 fps ΔV
0/04:29:48.3	OMS-3 CUTOFF					1.0	0.02	0.2	A	AUTO	VERN					
0/04:55:00	INITIATE AUTO MNVR TO OMS-4 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 15 MIN EIG ANG = 180
0/05:10:00	OMS-4 BURN ATT	28.4	333.8	1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	56	0	119	359	
0/05:14:12.5	OMS-4 IGNITION					3.5	0.3	0.2	A	AUTO	NORM					61.6 fps ΔV
0/05:14:48.6	OMS-4 CUTOFF					1.0	0.02	0.2	A	AUTO	VERN					
0/05:47:00	INITIATE GRAVITY GRADIENT ATT MODE	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 14 MIN EIG ANG = 159
0/06:01:00	GRAVITY GRADIENT ATT (PLB TO NORTH)	249.2	268.2	358.1	LVLH	N/A	N/A	N/A	A	MAN PULSE	VERN	3	157	141	109	P 357.6 Y 1 TGT: EARTH OM 249.2
0/07:47:00	TERMINATE GRAVITY GRADIENT	92.7	298	345.6	INRTL	1.0	0.02	0.2	A	MAN DISC	VERN	3	157	158	294	
0/07:56:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 13 MIN EIG ANG = 147
0/08:09:00	IMU ALIGN ATT	250	336.3	338.8	INRTL	1.0	0.02	0.2	A	AUTO	VERN	58	154	125	124	-Y ST TO STAR #43 -Z ST TO STAR #15 ANG SEP = 84.1
0/08:17:00	INITIATE AUTO MNVR TO COAS CAL ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 11
0/08:18:00	COAS CAL ATT	253.2	343.7	330.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	90	140	120	118	+Xby TO STAR #26
0/08:24:00	+X COAS CAL					N/A	N/A	N/A	B	MAN PULSE	VERN					
0/08:29:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
0/08:35:00	INITIATE -ZLV, XPOP +Yby FWD ATT MODE	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 99
0/08:44:00	-ZLV, XPOP ATT (12° ROLL BIAS)	0	192	90	LVLH	1.0	0.02	0.2	A	AUTO	VERN	90	348	90	55	P 90 Y 348 TGT: EARTH OM 270
0/18:32:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 13 MIN EIG ANG = 146
0/18:45:00	IMU ALIGN ATT	16.2	172.5	13.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	131	114	72	143	-Y ST TO STAR #15 -Z ST TO STAR #43 ANG SEP = 84.1
0/18:57:00	INITIATE GRAVITY GRADIENT ATT MODE	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 86
0/19:05:00	GRAVITY GRADIENT ATT (PLB TO NORTH)	249.2	268.2	358.1	LVLH	N/A	N/A	N/A	A	MAN PULSE	VERN	3	157	16	115	P 357.6 Y 1 TGT: EARTH OM 249.2
1/06:43:00	TERMINATE GRAVITY GRADIENT	92.3	358.6	19.1	INRTL	1.0	0.02	0.2	A	MAN DISC	VERN	3	157	90	293	
1/06:52:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 15 MIN EIG ANG = 170
1/07:07:00	IMU ALIGN/STRK OPS DURING H2O DUMP ATT (FTO 473-01)	212.5	77.9	44.4	INRTL	1.0	0.02	0.2	A	AUTO	VERN	30	102	27	101	-Y ST TO STAR #27 -Z ST TO STAR #54 ANG SEP = 83.7
1/07:49:00	INITIATE AUTO MNVR TO PTC ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 100
1/07:58:00	PTC ATT	132.8	236	60.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	88	201	90	355	SUN IN YZby PLANE +X TOWARD H
1/08:07:00	START 0.4 °/SEC PTC ROTATION	132.8	236	60.1	ROTR	1.0	0.02	0.4	A	AUTO	VERN	89	236	90	355	EIGEN AXIS P 358 Y 0 ROT RATE = 0.4 °/SEC
1/19:12:00	INITIATE AUTO MNVR TO NAV BASE STA ATT #1	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 12 MIN EIG ANG = 134
1/19:24:00	NAV BASE STA ATT #1 (FTO 474-01)	221.4	128.1	3.5	INRTL	1.0	0.02	0.2	A	AUTO	VERN	18	119	35	282	-Y ST TO STAR #40 -Z ST TO STAR #57 ANG SEP = 90.4
1/19:35:00	INITIATE AUTO MNVR TO IMU ALIGN/NAV BASE STA ATT #2	--	--	--	--	1.0	0.02	0.5	A	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 180
1/19:41:00	IMU ALIGN/NAV BASE STA ATT #2	50.5	326.1	357.9	INRTL	1.0	0.02	0.5	A	AUTO	VERN	111	160	129	338	-Y ST TO STAR #57 -Z ST TO STAR #40 ANG SEP = 90.4

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
1/19:53:00	INITIATE AUTO MNVR TO -ZSI ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 95
1/20:01:00	-ZSI ATT	129.6	234.2	59.2	INRTL	1.0	0.02	0.2	A	AUTO	VERN	87	199	90	0	P 90 Y 0 OM 90 TGT: SUN
1/20:20:00	IECM CONTAMINATION SURVEY (FTO 453-01)					3.0	0.02	0.3	B	AUTO & MAN	VERN					
1/22:55:00	RE-ESTABLISH -ZSI ATT					1.0	0.02	0.2	A	AUTO	VERN					
1/23:18:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 116
1/23:28:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	121	187	179	171	
2/01:10:00	IECM PLUME SURVEY (FTO 454-01)					3.0	0.02	0.2	A	AUTO & MAN	NORM & VERN					
2/03:10:00	RE-ESTABLISH -XSI ATT					0.1	0.02	0.2	B	AUTO	VERN					
2/03:56:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92
2/04:04:00	IMU ALIGN ATT	256.2	13.7	345.8	INRTL	1.0	0.02	0.2	A	AUTO	VERN	57	153	91	128	-Y ST TO STAR #22 -Z ST TO STAR #51 ANG SEP = 84
2/04:22:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92
2/04:30:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	118	12	180	0	
2/05:25:00	INITIATE AUTO MNVR TO RCS BURN 1 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
2/05:40:00	RCS BURN 1 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
2/05:45:00	RCS BURN 1					3.0	0.2	0.5	B	MAN DISC	NORM					
2/05:46:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
2/05:47:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
2/06:02:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	113	12	180	0	
2/19:02:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 114
2/19:12:00	IMU ALIGN ATT	61	240.3	318.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	165	200	143	137	-Y ST TO STAR #26 -Z ST TO STAR #14 ANG SEP = 91.4
2/19:27:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 114
2/19:37:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	113	14	180	0	
3/01:12:00	INITIATE AUTO MNVR TO RCS BURN 2 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
3/01:27:00	RCS BURN 2 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TCD	TBD	TBD	
3/01:32:00	RCS BURN 2					3.0	0.2	0.5	B	MAN DISC	NORM					
3/01:33:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					
3/01:37:00	INITIATE AUTO MNVR TO POST BURN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
3/01:52:00	POST RCS BURN 2 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
3/02:07:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
3/02:22:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	57	196	180	0	
3/04:05:00	INITIATE AUTO MNVR TO IMU ALIGN/BACKUP NAV ATT #1	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 7 MIN EIG ANG = 74
3/04:12:00	IMU ALIGN/BACKUP NAV ATT #1 (FTO 476-01)	252.9	252.5	348.9	INRTL	1.0	0.02	0.2	A	AUTO	VERN	144	158	146	245	-Y ST TO STAR #41 -Z ST TO STAR #34 ANG SEP = 88.6

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	ϕ	θ	ϕ	
3/04:26:00	INITIATE AUTO MNVR TO BACKUP NAV ATT #2	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 38
3/04:30:00	BACKUP NAV ATT #2	246.8	288.6	351	INRTL	1.0	0.02	0.2	A	AUTO	VERN	169	311	163	173	-Y ST TO STAR #20 -Z ST TO STAR #17 ANG SEP = 85
3/04:39:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 55
3/04:44:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	98	13	179	353	
3/17:37:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53
3/17:42:00	IMU ALIGN ATT	241.7	307.6	353.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	82	148	149	153	-Y ST TO STAR #42 -Z ST TO STAR #15 ANG SEP = 89.1
3/18:02:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53
3/18:07:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	145	26	179	352	
3/18:45:00	PRE FRCS THERMAL SOAKBACK CONFIG					5.0	0.2	0.2	A	AUTO	NORM					
3/18:50:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/18:50:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/19:20:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/19:20:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/19:50:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/19:50:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/20:20:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
3/20:20:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/20:50:00	-X TRANS (FTO 412-07)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
3/20:53:00	POST FRCS THERMAL SOAKBACK CONFIG					0.1	0.02	0.2	B	AUTO	VERN					
3/23:18:00	PRCS ATT HOLD TEST (FTO 477-01)					0.1	0.2	0.2	A	AUTO	NORM					
3/23:18:30	ATTITUDE HOLD					0.1	0.02	0.2	B	AUTO	VERN					
3/23:41:00	INITIATE AUTO MNVR TO TACAN TRK ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	P,Y JET OPT=3(TAIL CNL) MNVR TIME = 14 MIN EIG ANG = 170
3/23:56:00	TACAN TRK ATT (FTO 479-01)	21.4	347.8	29.2	INRTL	5.0	0.2	0.2	A	AUTO	NORM	79	357	97	10	P 7.5 TGT: #3(KU) Y 0 LAT: -12.414 OM 180 LON: 130.883 EIGEN AXIS P 187.4 Y 276.8 ROT RATE = 0.323 °/SEC
3/23:56:30	INITIATE TACAN NAV ROT	21.4	347.8	29.2	ROTR	5.0	0.2	0.2	A	AUTO	NORM	81	357	97	10	
4/00:12:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 15 MIN EIG ANG = 178
4/00:27:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	76	12	179	352	
4/01:45:00	FCS CHECKOUT - APU START					5.0	0.2	0.2	A	AUTO	NORM					
4/01:53:00	APU SHUTDOWN					1.0	0.02	0.2	A	AUTO	VERN					
4/01:55:00	SENSOR TEST					N/A	N/A	N/A	A	MAN PULSE	VERN					
4/02:00:00	RE-ESTABLISH -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 3 MIN EIG ANG = 30
4/02:03:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	55	7	179	352	
4/02:46:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
4/02:51:00	IMU ALIGN ATT	241.7	307.6	353.1	INRTL	1.0	0.02	0.2	A	AUTO	VERN	104	145	149	153	-Y ST TO STAR #42 -Z ST TO STAR #15 ANG SEP = 89.1
4/03:02:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 53
4/03:07:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	157	39	179	352	
4/04:15:00	INITIATE AUTO MNVR TO RCS BURN 3 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
4/04:30:00	RCS BURN 3 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
4/04:36:00	RCS BURN 3					3.0	0.2	0.5	B	MAN DISC	NORM					
4/04:37:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					
4/04:47:00	INITIATE AUTO MNVR TO -XSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
4/05:02:00	-XSI ATT	192	278.9	336.8	INRTL	0.1	0.02	0.2	B	AUTO	VERN	63	9	179	352	
4/18:18:00	INITIATE AUTO MNVR TO IMU ALIGN/NAV BASE STA ATT #1	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 11 MIN EIG ANG = 121
4/18:29:00	IMU ALIGN/NAV BASE STA ATT #1 (FTO 474-01)	165.6	157.2	4.3	INRTL	1.0	0.02	0.2	A	AUTO	VERN	31	131	57	350	-Y ST TO STAR #49 -Z ST TO STAR #32 ANG SEP = 87.8
4/18:35:00	INITIATE AUTO MNVR TO IMU ALIGN/NAV BASE STA ATT Q2	--	--	--	--	1.0	0.02	0.5	A	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 180
4/18:41:00	IMU ALIGN/NAV BASE STA ATT #2 (FTO 474-01)	104.9	346.1	11.1	INRTL	1.0	0.02	0.5	A	AUTO	VERN	123	101	108	284	-Y ST TO STAR #32 -Z ST TO STAR #49 ANG SEP = 87.8
4/18:52:00	INITIATE AUTO MNVR TO FRCS THERMAL SOAKBACK ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 12 MIN EIG ANG = 144
4/19:04:00	FRCS THERMAL SOAKBACK ATT	317.6	227.7	54.5	INRTL	1.0	0.02	0.2	A	AUTO	VERN	81	42	90	180	+Z SI +X TOWARD R
4/19:13:00	FRCS THERMAL SOAKBACK CONFIG					5.0	0.2	0.2	A	AUTO	NORM					

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P, Y, R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
4/19:15:00	-X TRANS (FTO 412-05)					5.0	0.2	0.2	A	AUTO	NORM					30 SEC F3F BURN
4/19:18:00	POST FRCS THERMAL SOAKBACK CONFIG					0.1	0.02	0.2	B	AUTO	VERN					
4/19:24:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 10
4/19:25:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	101	124	90	179	P 270 Y 0 TGT: SUN OM 267
4/20:55:00	INITIATE AUTO MNVR TO RCS BURN 4 ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
4/21:10:00	RCS BURN 4 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
4/21:15:00	RCS BURN 4					3.0	0.2	0.5	B	MAN DISC	NORM					
4/21:16:00	ATTITUDE HOLD					1.0	0.02	0.2	A	AUTO	VERN					
4/21:20:00	INITIATE AUTO MNVR TO POST BURN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	
4/21:35:00	POST RCS BURN 4 ATT	TBD	TBD	TBD	INRTL	1.0	0.02	0.2	A	AUTO	VERN	TBD	TBD	TBD	TBD	
4/21:52:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	
4/22:07:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	84	50	90	180	P 270 Y 0 TGT: SUN OM 267
4/22:34:00	INITIATE AUTO MNVR TO IECM GAS RELEASE ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 10 MIN EIG ANG = 115
4/22:44:00	IECM GAS RELEASE ATT (FSO S431-01)	0	90	270	LVLH	1.0	0.02	0.2	A	AUTO	VERN	90	270	77	254	P 0 Y 270 TGT: EARTH OM 90
4/23:05:00	IECM GAS RELEASE ROTATION	345.4	206.5	61.7	ROTR	0.5	0.02	0.007	A	AUTO	VERN	90	270	77	170	EIGEN AXIS P 180 Y 0 ROT RATE = 0.007 °/SEC
4/23:50:00	STOP ROTATION/ATTITUDE HOLD	326.5	206.5	61.7	INRTL	1.0	0.02	0.2	A	AUTO	VERN	90	108	77	189	

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
4/23:53:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 2 MIN EIG ANG = 17
4/23:55:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	100	117	90	180	P 270 Y 0 OM 267 TGT: SUN
5/01:18:00	PRE RMS/PRCS INTERACTION CONFIG (FTO 452-03)					N/A	N/A	N/A	B	MAN PULSE	NORM					
5/01:58:00	POST RMS/PRCS INTERACTION CONFIG					0.1	0.02	0.2	B	AUTO	VERN					
5/04:24:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 64
5/04:30:00	IMU ALIGN ATT	12.4	208.6	4.9	INRTL	1.0	0.02	0.2	A	AUTO	VERN	144	104	104	142	-Y ST TO STAR #51 -Z ST TO STAR #22 ANG SEP = 84
5/04:48:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	0.1	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 6 MIN EIG ANG = 64
5/04:54:00	+ZSI ATT	321.2	224	51.4	INRTL	0.1	0.02	0.2	B	AUTO	VERN	97	227	90	180	P 270 Y 0 OM 267 TGT: SUN
5/05:05:00	RCS HOT FIRE TEST					N/A	N/A	N/A	A	MAN PULSE	NORM					
5/05:20:00	RE-ESTABLISH +ZSI ATT					0.1	0.02	0.2	B	AUTO	VERN					
5/15:45:00	FRCS/ARCS THERMAL SOAKBACK DAP CONFIG					5.0	0.2	0.2	A	AUTO	NORM					P,Y JET OPT = 3 (TAIL CNTL)
5/17:57:00	INITIATE AUTO MNVR TO IMU ALIGN/BACKUP NAV ATT 1	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 86
5/18:05:00	IMU ALIGN/BACKUP NAV ATT 1	252.9	252.5	348.9	INRTL	3.0	0.2	0.2	A	AUTO	NORM	150	141	149	260	-Y ST TO STAR #41 -Z ST TO STAR #34 ANG SEP = 88.6
5/18:22:00	INITIATE AUTO MNVR TO BACKUP NAV ATT 2	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 38
5/18:26:00	BACKUP NAV ATT 2	246.8	288.6	351	INRTL	3.0	0.2	0.2	A	AUTO	NORM	158	339	165	180	-Y ST TO STAR #20 -Z ST TO STAR #17
5/18:35:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
5/18:43:00	+ZSI ATT	321.2	224	51.4	INRTL	3.0	0.2	0.2	A	AUTO	NORM	84	281	90	180	P 270 Y 0 OM 267 TGT: SUN
5/19:30:00	INITIATE AUTO MNVR TO BACKUP NAV ATT 1	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 7 MIN EIG ANG = 75
5/19:37:00	BACKUP NAV ATT 1	255	255.8	0.6	INRTL	3.0	0.2	0.2	A	AUTO	NORM	145	153	145	241	-Y ST TO STAR #41
5/19:52:00	INITIATE AUTO MNVR TO BACKUP NAV ATT 2	--	--	--	--	3.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 3 MIN EIG ANG = 36
5/19:55:00	BACKUP NAV ATT 2	246.8	288.6	351	INRTL	3.0	0.2	0.2	A	AUTO	NORM	164	347	165	180	-Y ST TO STAR #20 -Z ST TO STAR #17
5/20:07:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 92
5/20:15:00	+ZSI ATT	321.2	224	51.4	INRTL	5.0	0.2	0.2	A	AUTO	NORM	83	286	90	180	P 270 Y 0 OM 267 TGT: SUN
5/22:22:00	PRSD +PITCH MNVR (FTO 445-01)	321.2	224	51.4	ROTR	5.0	0.2	1.0	A	MAN DISC	NORM	87	72	90	180	EIGEN AXIS P 0 Y 90 ROT RATE = 1.0 °/SEC
5/22:25:00	PDRS -PITCH MNVR (FTO 445-01)	38.8	44	308.6	ROTR	5.0	0.2	1.0	A	MAN DISC	NORM	89	96	90	0	EIGEN AXIS P 0 Y 270 ROT RATE = 1.0 °/SEC
5/22:28:00	+ZSI ATT	321.2	224	51.4	INRTL	5.0	0.2	0.2	A	AUTO	NORM	94	95	90	180	P 270 Y 0 OM 267 TGT: SUN
5/22:32:00	INITIATE AUTO MNVR TO FRCS/ARCS THERMAL SOAKBACK ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 3
5/22:33:00	FRCS/ARCS THERMAL SOAKBACK ATT	319.3	226.9	53.2	INRTL	5.0	0.2	0.2	A	AUTO	NORM	97	114	90	180	
5/22:46:00	FRCS THERMAL SOAKBACK BURN (FTO 412-06)					5.0	0.2	0.2	A	AUTO	NORM					F2F/F3F 30 SEC BURN
5/22:47:00	ARCS THERMAL SOAKBACK BURN (FTO 412-08)					5.0	0.2	0.2	A	AUTO	NORM					L1A 100 SEC BURN
5/22:49:00	ATTITUDE HOLD					5.0	0.2	0.2	A	AUTO	NORM					
5/23:02:00	INITIATE AUTO MNVR TO +ZSI ATT	--	--	--	--	5.0	0.2	0.2	A	AUTO	NORM	--	--	--	--	MNVR TIME = 1 MIN EIG ANG = 3

TABLE 9-8 Continued

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
5/23:03:00	+ZSI ATT	321.2	224	51.4	INRTL	5.0	0.2	0.2	A	AUTO	NORM	98	236	90	180	P 270 Y 0 OM 267 TGT: SUN
6/04:22:00	FRCS/ARCS THERMAL SOAKBACK RECONFIG					1.0	0.02	0.2	A	AUTO	VERN					
6/04:32:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 8 MIN EIG ANG = 90
6/04:40:00	IMU ALIGN ATT	261	349.6	39	INRTL	1.0	0.02	0.2	A	AUTO	VERN	51	101	92	131	-Y ST TO STAR #43 -Z ST TO STAR #28 ANG SEP = 85
6/04:52:00	INITIATE AUTO MNVR TO PTC ATT	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 7 MIN EIG ANG = 76
6/04:59:00	PTC ATT	8.6	226.8	53	INRTL	1.0	0.02	0.2	A	AUTO	VERN	106	161	90	131	SUN IN YZby PLANE +X TOWARD R
6/05:05:00	START 0.4 DEG/SEC PTC ROTATION	8.6	226.8	53	ROTR	1.0	0.02	0.4	A	AUTO	VERN	101	185	90	131	EIGEN AXIS P 358 Y 0 ROT RATE = 0.4°/SEC
6/05:25:00	S-BAND/UHF ANTENNA PATTERNS (FTO 471-01)	133	221.3	54.1	ROTR	5.0	0.2	2.0	A	AUTO	NORM	79	143	87	11	EIGEN AXIS P 358 Y 0 ROT RATE = 2.0°/SEC
6/05:35:00	RE-ESTABLISH PTC	252	222.5	50.8	ROTR	1.0	0.02	0.4	A	AUTO	VERN	72	64	89	251	EIGEN AXIS P 358 Y 0 ROT RATE = 0.4°/SEC
6/16:02:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	1.0	0.02	0.2	B	AUTO	VERN	--	--	--	--	MNVR TIME = 9 MIN EIG ANG = 105
6/16:11:00	IMU ALIGN ATT	248.2	248.9	339.4	INRTL	1.0	0.02	0.2	B	AUTO	VERN	28	141	148	281	-Y ST TO STAR #41 -Z ST TO STAR #50 ANG SEP = 85
6/16:22:00	INITIATE AUTO MNVR TO TAIL-TO- SUN	--	--	--	--	1.0	0.02	0.2	A	AUTO	VERN	--	--	--	--	MNVR TIME = 3 MIN EIG ANG = 34
6/16:25:00	TAIL-TO-SUN ATT	258.6	284.1	341	INRTL	1.0	0.02	0.2	A	AUTO	VERN	54	144	176	178	SUN 30° BELOW -Xby
6/18:05:00	CONFIG TO PRCS					3.0	0.2	0.5	B	AUTO	NORM					
6/19:54:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	--	--	--	--	3.0	0.2	0.5	B	AUTO	NORM	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 119
6/19:58:00	IMU ALIGN ATT	227	35.6	43.9	INRTL	3.0	0.2	0.5	B	AUTO	NORM	66	114	58	135	-Y ST TO STAR #14 -Z ST TO STAR #26 ANG SEP = 91.4

TABLE 9-8 Concluded

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ATT MODE	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH		SUN		REMARKS
		Roll	Pitch	Yaw		ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	θ	φ	θ	φ	
6/20:05:00	INITIATE AUTO MNVR TO IMU ALIGN VERIFICATION ATT	--	--	--	--	3.0	0.2	0.5	B	AUTO	NORM	--	--	--	--	MNVR TIME = 2 MIN EIG ANG = 48
6/20:07:00	IMU ALIGN VERIFICATION ATT	174.1	57.6	25.8	INRTL	3.0	0.2	0.5	B	AUTO	NORM	78	165	41	192	-Y ST TO STAR #49 -Z ST TO STAR #60 ANG SEP = 84.1
6/20:22:00	INITIATE AUTO MNVR TO TOP-TO- SUN ATT	--	--	--	--	3.0	0.2	0.5	B	AUTO	NORM	--	--	--	--	MNVR TIME = 4 MIN EIG ANG = 111
6/20:26:00	TOP-TO-SUN ATT	141.2	155.9	334.9	INRTL	3.0	0.2	0.5	B	AUTO	NORM	46	204	70	0	
6/21:09:00	CONFIG RJDs FOR ENTRY					3.0	0.2	0.5	B	AUTO	NORM					
6/21:11:00	DPS RECONFIG TO GNC 3					3.5	0.3	0.2	*	AUTO	*					
6/22:26:00	INITIATE AUTO MNVR TO DEORB BURN ATT	--	--	--	--	3.5	0.3	0.2	*	AUTO	*	--	--	--	--	MNVR TIME = 5 MIN EIG ANG = 51
6/22:31:00	DEORB BURN ATT	152	113	354	INRTL	3.5	0.3	0.2	*	AUTO	*	133	0	30	316	
6/22:40:00	ACTIVATE SINGLE APU					3.5	0.3	0.2	*	AUTO	*					
6/22:41:49	DEORB BURN IGNITION					3.5	0.3	0.2	*	AUTO	*					315.2 fps ΔV
6/22:44:44	DEORB BURN CUTOFF					3.5	0.3	0.2	*	AUTO	*					
6/22:46:00	INITIATE AUTO MNVR TO EI-5 ATT	--	--	--	--	3.5	0.3	0.2	*	AUTO	*	--	--	--	--	MNVR TIME = 11 MIN EIG ANG = 132
6/22:55:00	ACTIVATE REMAINING APUs					3.5	0.3	0.2	*	AUTO	*					
6/22:57:00	EI-5 ATT	196	339	26	INRTL	3.5	0.3	0.2	*	AUTO	*	103	179	107	201	
6/23:03:37	EI-5	1	39	359	LVLH	3.5	0.3	0.2	*	AUTO	*	129	180	107	201	

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ABBREVIATIONS/ACRONYMS

More complete compilations of abbreviations and acronyms are available in the Acronyms and Abbreviations Dictionary (Ref. 4).

ABBREVIATIONS/
ACRONYMS

ABBREVIATIONS/ACRONYMS

ACIP	AERODYNAMIC COEFFICIENTS IDENTIFICATION PACKAGE
ACN	ASCENSION ISLAND (STDN SITE)
ACT	ACTIVATE
ADI	ATTITUDE DIRECTION INDICATOR
AGO	SANTIAGO, CHILE (STDN SITE)
ANT	ANTENNA
AOA	ABORT ONCE AROUND
AOS	ACQUISITION OF SIGNAL
ATT	ATTITUDE
ATO	ABORT TO ORBIT
BDA	BERMUDA ISLAND, BWI (STDN SITE)
BOT	BOTSWANA (STDN SITE)
BUC	BUCKHORN, CALIFORNIA (STDN SITE)
CAL	CALIBRATION
CCTV	CLOSED CIRCUIT TV
CCU	CREWMAN COMMUNICATIONS UMBILICAL
CDR	COMMANDER
CDT	CENTRAL DAYLIGHT TIME
CFES	CONTINUOUS FLOW ELECTROPHORESIS SYSTEM
CHG	CHANGE
CL	CHECKLIST
COAS	CREWMAN OPTICAL ALIGNMENT SIGHT
C&W	CAUTION AND WARNING
DAP	DIGITAL AUTO PILOT
DB	DEADBAND
DEU	DISPLAY ELECTRONICS UNIT
DFI	DEVELOPMENT FLIGHT INSTRUMENTATION

DKR	DAKAR, SENEGAL (STDN SITE)
DTO	DETAILED TEST OBJECTIVE
ECLS	ENVIRONMENTAL CONTROL LIFE SUPPORT SYSTEM
EDW	EDWARDS AFB, CALIFORNIA (DEORB OPT SITE)
EES	EMERGENCY EJECTION SUITS
EET	EVENT ELAPSED TIME
EMU	EXTRAVEHICULAR MOBILITY UNIT
EVA	EXTRAVEHICULAR ACTIVITY
FC	FUEL CELL
FDF	FLIGHT DATA FILE
FM	FREQUENCY MODULATION
FRD	FLIGHT REQUIREMENTS DOCUMENT
FSO	FUNCTIONAL SUPPLEMENTARY OBJECTIVE
FTO	FUNCTIONAL TEST OBJECTIVE
FWD	FORWARD
GAS	GET-AWAY SPECIAL
GDS	GOLDSTONE, CALIFORNIA (STDN SITE, 1ST ANTENNA)
GDX	GOLDSTONE, CALIFORNIA (STDN SITE, 2ND ANTENNA)
GNC	GUIDANCE NAVIGATION AND CONTROL
GPC	GENERAL PURPOSE COMPUTER
GSTDN	GROUND SPACE TRACKING & DATA NETWORK
GTS	GUAM ISLAND, U.S. (SGLS SITE)
GWM	GUAM ISLAND, U.S. (STDN SITE)
HAW	HAWAII (KAUAI, STDN SITE)
HTS	HAWAII (SGLS SITE)
HYD	HYDRAULIC
IECM	INDUCED ENVIRONMENTAL CONTAMINATION MONITOR

IMU	INERTIAL MEASUREMENT UNIT
INRTL	INERTIAL
IOS	INDIAN OCEAN (SGLS SITE)
ITS	INTERIM TELEPRINTER SYSTEM
LOS	LOSS-OF-SIGNAL; LINE-OF-SIGHT
LVLH	LOCAL VERTICAL LOCAL HORIZONTAL
MAD	MADRID, SPAIN (STDN SITE, 1ST ANTENNA)
MAX	MADRID, SPAIN (STDN SITE, 2ND ANTENNA)
MCC	MISSION CONTROL CENTER
MDM	MULTIPLEXER/DEMULTIPLEXER
MECO	MAIN ENGINE CUTOFF
MET	MISSION ELAPSED TIME
MIL	MERRITT ISLAND, FLORIDA (STDN SITE)
MILA	MERRITT ISLAND LAUNCH AREA
MLR	MONODISPERSE LATEX REACTOR
MLX	MERRITT ISLAND, FLORIDA (STDN SITE, 2ND ANTENNA)
MNVR	MANEUVER
MPM	MANIPULATOR POSITION MECHANISM
MPS	MAIN PROPULSION SYSTEM
MRL	MANIPULATOR RETENTION LATCHES
MTVC	MANUAL THRUST VECTOR CONTROL
NHS	NEW HAMPSHIRE (SGLS SITE)
OBS	OPERATIONAL BIOMED SENSORS; OBSERVATIONS
OEX	ORBITER EXPERIMENTS
OI	OPERATIONAL INSTRUMENTATION
OMS	ORBITAL MANEUVERING SYSTEM
OPS	OPERATIONS; OPERATIONAL SEQUENCE

ORB	ORBITER
ORR	ORRORAL VALLEY, AUSTRALIA (STDN SITE)
PCM	PULSE-CODE MODULATION
PDRS	PAYLOAD DEPLOYMENT AND RETRIEVAL SYSTEM
PL	PAYLOAD
PLBD	PAYLOAD BAY DOORS
PLT	PILOT
PM	PHASE MODULATION
PMC	PRIVATE MEDICAL COMMUNICATION
PMP	PUMP
PRCS	PRIMARY RCS
PRO	PROCEED
PSA	PRE/POST SLEEP ACTIVITY
PTC	PASSIVE THERMAL CONTROL
RCS	REACTION CONTROL SYSTEM
REF	REFERENCE
REFSMAT	REFERENCE STABLE MEMBER MATRIX
RELMAT	RELATIVE MATRIX
RF	RADIO FREQUENCY
RMS	REMOTE MANIPULATOR SYSTEM
ROT	ROTATION
RTC	REAL TIME COMMAND
SAA	SOUTH ATLANTIC ANOMALY
S-BD	S-BAND
SEL	SELECT
SGLS	SPACE GROUND LINK SYSTEM/STATION (DOD)
SPC	STORED PROGRAM COMMAND
SSO	SUPPORT SYSTEM FOR THE OEX

ST	STAR TRACKER
STDN	SPACE TRACKING & DATA NETWORK
STS	SPACE TRANSPORTATION SYSTEM
TB	TALKBACK
TDRS	TRACKING AND DATA RELAY SATELLITE
TIG	TIME OF IGNITION
UHF	ULTRA HIGH FREQUENCY
VAC	VACUUM
VTR	VIDEO TAPE RECORDER
VTs	VANDENBERG TRACKING STATION (SGLS SITE)
WCCU	WIRELESS CREW COMMUNICATIONS UNIT
WCS	WASTE COLLECTION SYSTEM
WMC	WASTE MANAGEMENT COMPARTMENT
XFER	TRANSFER
X-POP	X BODY AXIS PERPENDICULAR TO ORBIT PLANE
-XSI	-X BODY AXIS TOWARDS SUN (TAIL TO SUN)
YAR	YARRAGADEE, AUSTRALIA (STDN SITE)
Y-POP	Y BODY AXIS PERPENDICULAR TO ORBIT PLANE
-ZLV	-Z LOCAL VERTICAL (-Z BODY AXIS TOWARDS EARTH)
+ZSI	+Z BODY AXIS TOWARDS SUN (BOTTOM TO SUN)

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