

FLIGHT DATA FILE

Flight Plan

STS-72

(FRR Trajectory)

**Mission Operations Directorate
Operations Division**

**Final, Rev A
December 7, 1995**

<u>EVENT</u>	<u>CST</u>		
Launch	03:18	Thursday	January 11
SFU Grapple	03:53	Saturday	January 13
OAST-Flyer Release	05:43	Sunday	January 14
EVA 1 Start	23:03	Sunday	January 14
OAST-Flyer Grapple	03:50	Tuesday	January 16
EVA 2 Start	22:33	Tuesday	January 16
KSC Landing	01:54	Saturday	January 20

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

MISCELLANEOUS
BRANCH CHIEF
R.H. NUTE
DO4
BOND

1




MISSION OPERATIONS DIRECTORATE

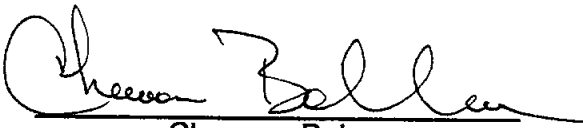
STS-72 FLIGHT PLAN

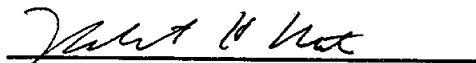
FINAL, REVISION A
December 7, 1995

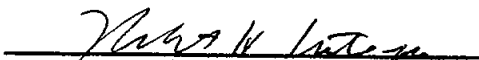
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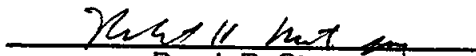

Mary Anne Plaza
Book Manager

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Incorporates the following:	
482#:	FLT PLN-1783A MULTI-1222 MULTI-1213A
Exemption #: 74	

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager/Lead FAO	DO4/M. Plaza	244-1048
Lead Timeliner	DO4/R. Hayhurst	244-1027
Lead Pointer	DO4/K. Lawson	244-1222

FLIGHT PLAN
STS-72

LIST OF EFFECTIVE PAGES

FINAL 10/27/95

REV A 12/07/95

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iv	* 72/FIN	3-16	72/FIN
v	* 72/FIN	3-17	72/FIN
vi	* 72/FIN	3-18	72/FIN
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* - Omit from flight book

STS-72 FLIGHT PLAN FABRICATED ITEMS

<u>Title</u>	<u>Ref. Page</u>	<u>Item No.</u>
DAP A, DAP B TOC	7-2	FLT PLN-1a/72/O/B
(Blank)	7-2	FLT PLN-1b/72/O/A
DAP A	7-3	FLT PLN-2a/72/O/A
DAP A1	7-3	FLT PLN-2b/72/O/A
A1	7-3	FLT PLN-3a/72/O/A
DAP A2	7-3	FLT PLN-3b/72/O/A
A2	7-4	FLT PLN-4a/72/O/A
DAP A3	7-4	FLT PLN-4b/72/O/A
A3	7-4	FLT PLN-5a/72/O/A
DAP A4	7-4	FLT PLN-5b/72/O/A
A4	7-5	FLT PLN-6a/72/O/A
DAP A5	7-5	FLT PLN-6b/72/O/A
A5	7-5	FLT PLN-7a/72/O/A
DAP A6	7-5	FLT PLN-7b/72/O/A
A6	7-6	FLT PLN-8a/72/O/A
DAP A7	7-6	FLT PLN-8b/72/O/A
A7	7-6	FLT PLN-9a/72/O/A
DAP A8	7-6	FLT PLN-9b/72/O/A
A8	7-7	FLT PLN-10a/72/O/A
DAP A9	7-7	FLT PLN-10b/72/O/A
A9	7-7	FLT PLN-11a/72/O/A
DAP A10	7-7	FLT PLN-11b/72/O/A
A10	7-8	FLT PLN-12a/72/O/A
DAP A11	7-8	FLT PLN-12b/72/O/A
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DAP A12	7-8	FLT PLN-13b/72/O/A
A12	7-9	FLT PLN-14a/72/O/A
DAP A13	7-9	FLT PLN-14b/72/O/A
A13	7-9	FLT PLN-15a/72/O/B
DAP A15	7-9	FLT PLN-15b/72/O/B
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B1	7-11	FLT PLN-17a/72/O/A
DAP B2	7-11	FLT PLN-17b/72/O/A
B2	7-11	FLT PLN-18a/72/O/A
DAP B3	7-11	FLT PLN-18b/72/O/A
B3	7-12	FLT PLN-19a/72/O/A
DAP B4	7-12	FLT PLN-19b/72/O/A
B4	7-12	FLT PLN-20a/72/O/A
DAP B5	7-12	FLT PLN-20b/72/O/A
B5	7-13	FLT PLN-21a/72/O/A
DAP B7	7-13	FLT PLN-21b/72/O/A
B7	7-13	FLT PLN-22a/72/O/A
DAP B8	7-13	FLT PLN-22b/72/O/A
B8	7-14	FLT PLN-23a/72/O/A
DAP B9	7-14	FLT PLN-23b/72/O/A
B9	7-14	FLT PLN-24a/72/O/A
DAP B10	7-14	FLT PLN-24b/72/O/A
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DAP B13	7-15	FLT PLN-25b/72/O/B
B13	7-15	FLT PLN-26a/72/O/B

STS-72 FLIGHT PLAN FABRICATED ITEMS

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UNIV PTG	7-17	FLT PLN-27/72/O/A

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INTRODUCTION

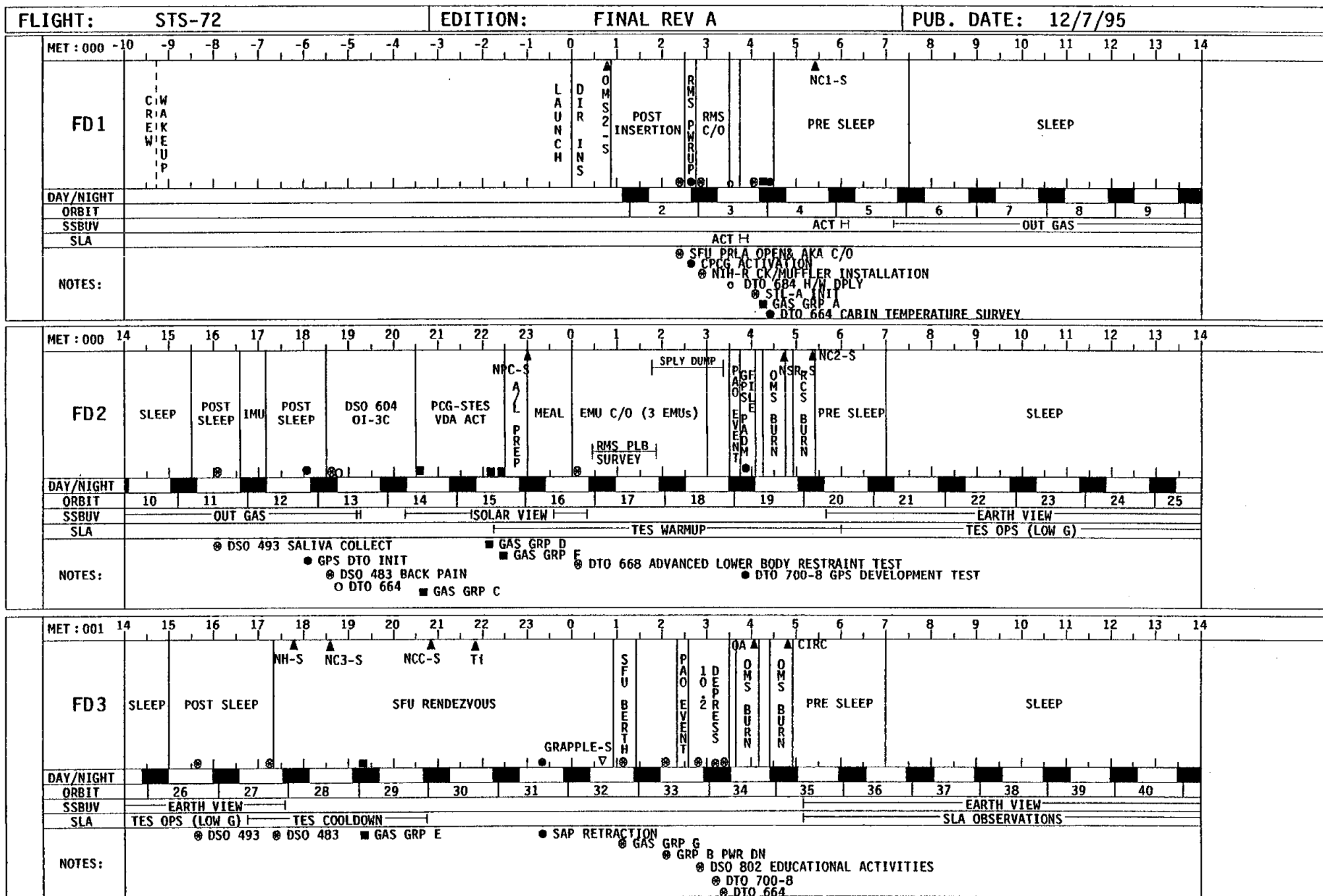
The STS-72 Flight Plan is the Flight Data File article that contains the on-orbit timeline. It does not contain the detailed timelines that are covered in the Ascent, Post Insertion, EVA, Rendezvous, Deorbit Prep, and Entry Checklists. The detailed rendezvous timelines and procedures for the SFU are contained in the Rendezvous Checklist, Volume A. The detailed rendezvous and deploy timelines and procedures for OAST-Flyer are in the Rendezvous Checklist, Volume B. The detailed EVA timelines and procedures are in the EVA Checklist. For continuity, the summary level timeline includes the entire flight.

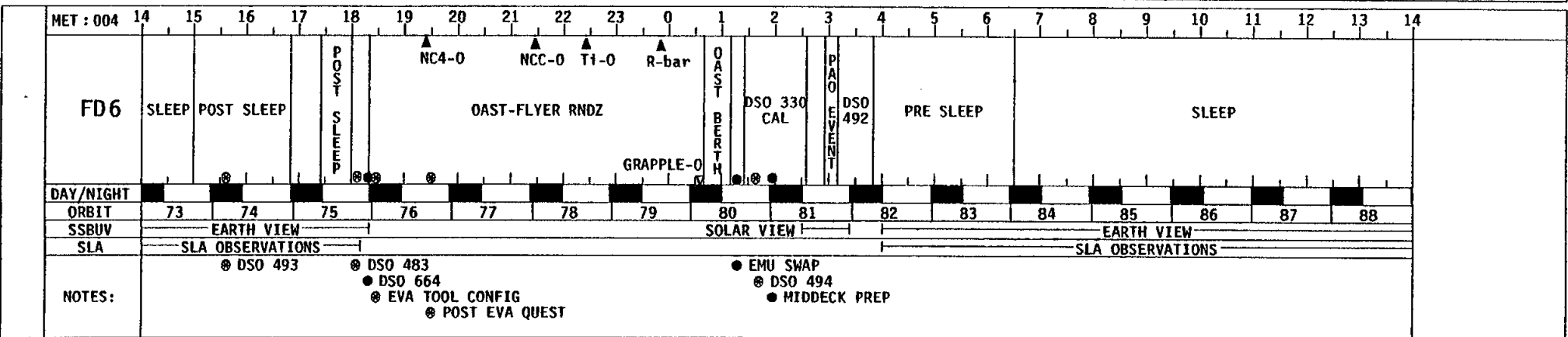
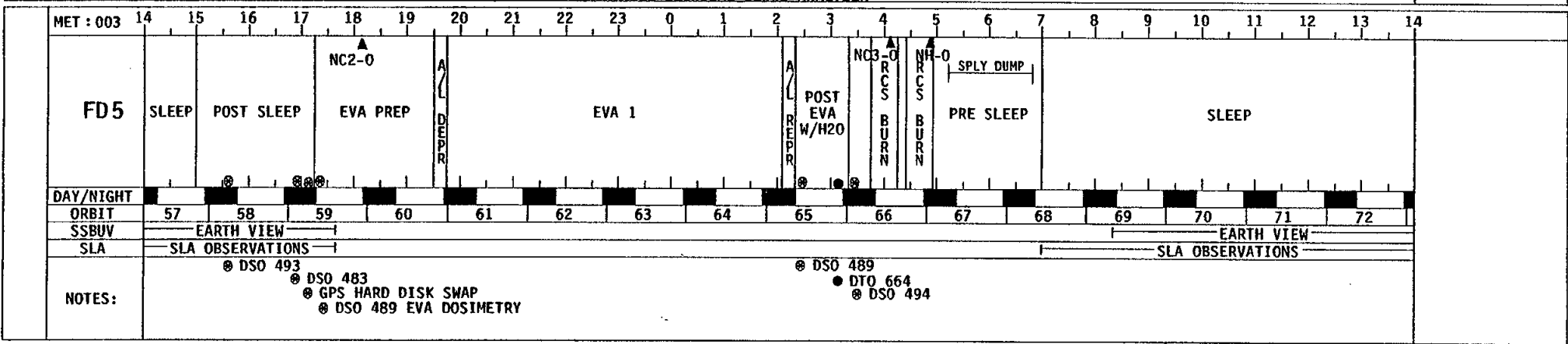
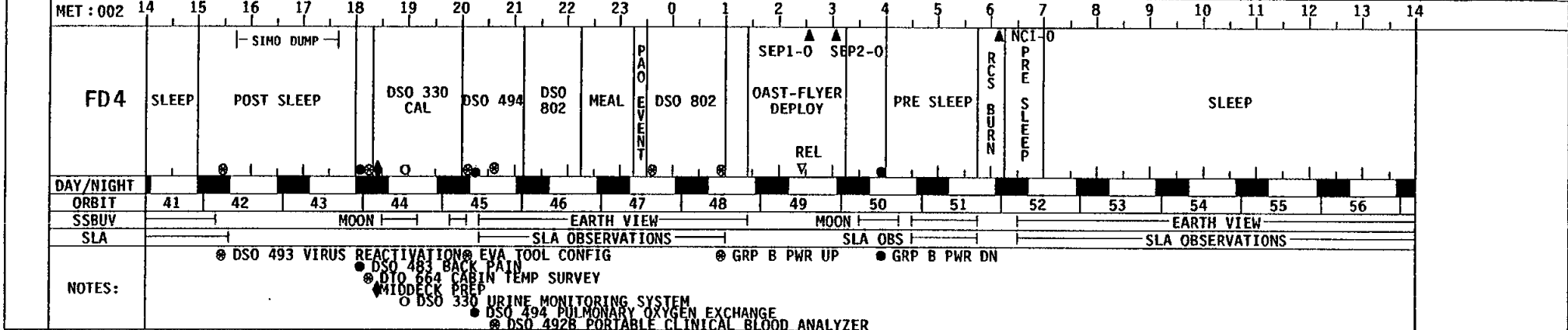
This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive, and the requirements of the STS-72 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the STS-72 Flight Initialization Data Pack.

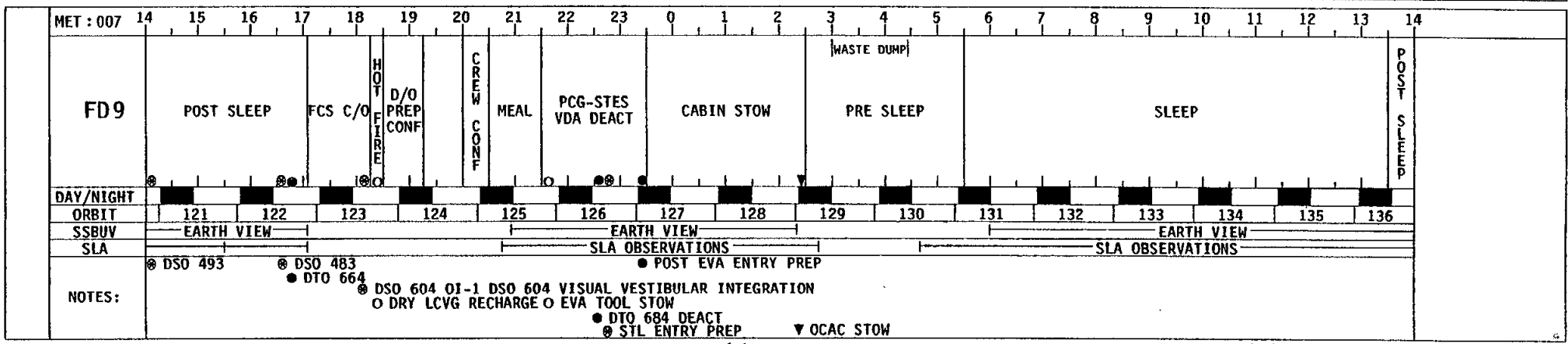
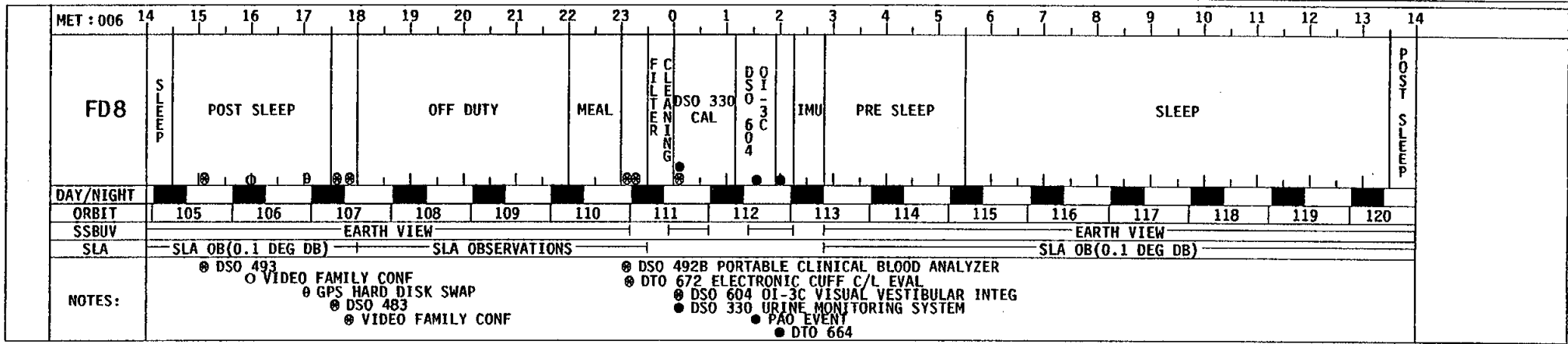
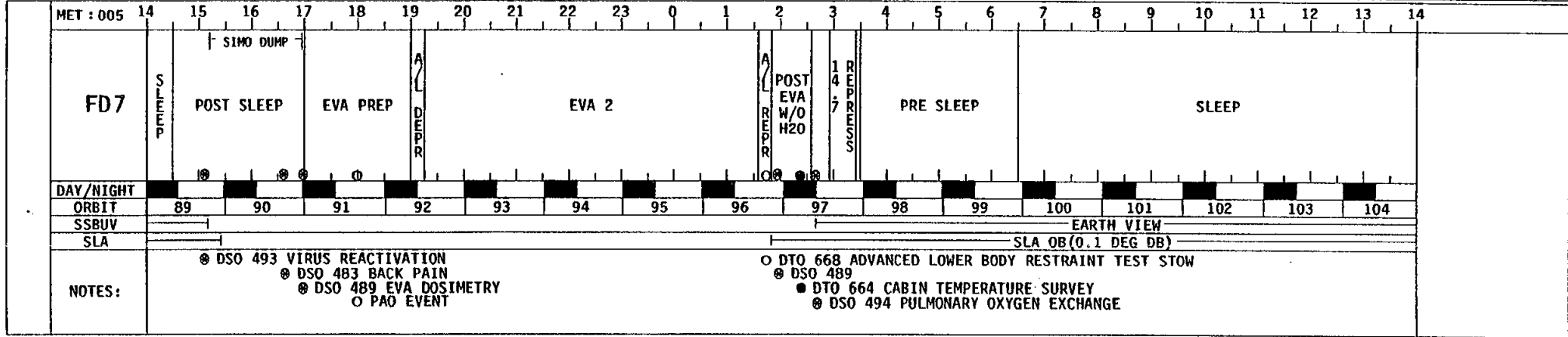
The STS-72 Flight Readiness Review (FRR) Cycle was used for the timeline trajectory. The flight profile used in this Flight Plan is for a launch date of January 11, 1996 at 9:18 GMT. Orbiter inertial attitudes are expressed relative to a Mean of 1950 (M50) reference frame.

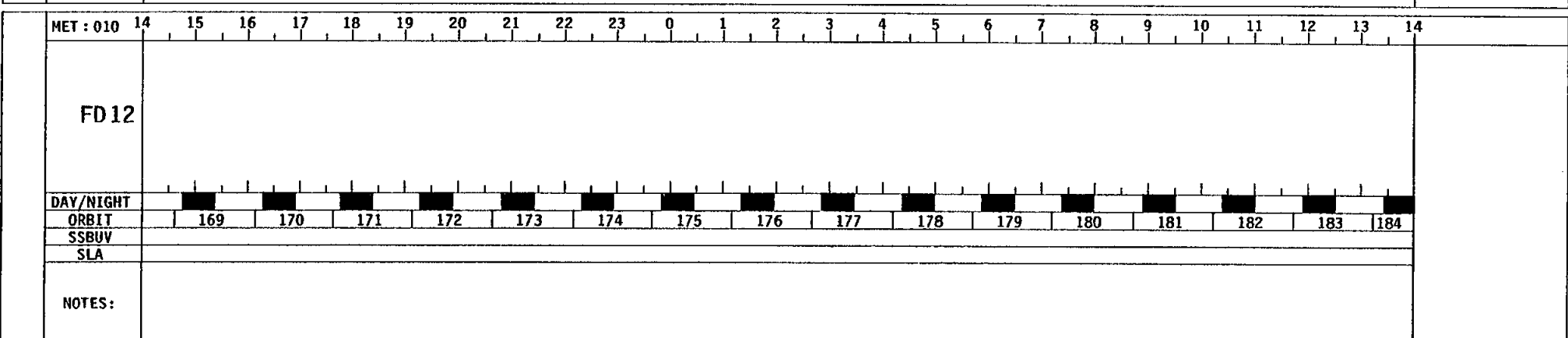
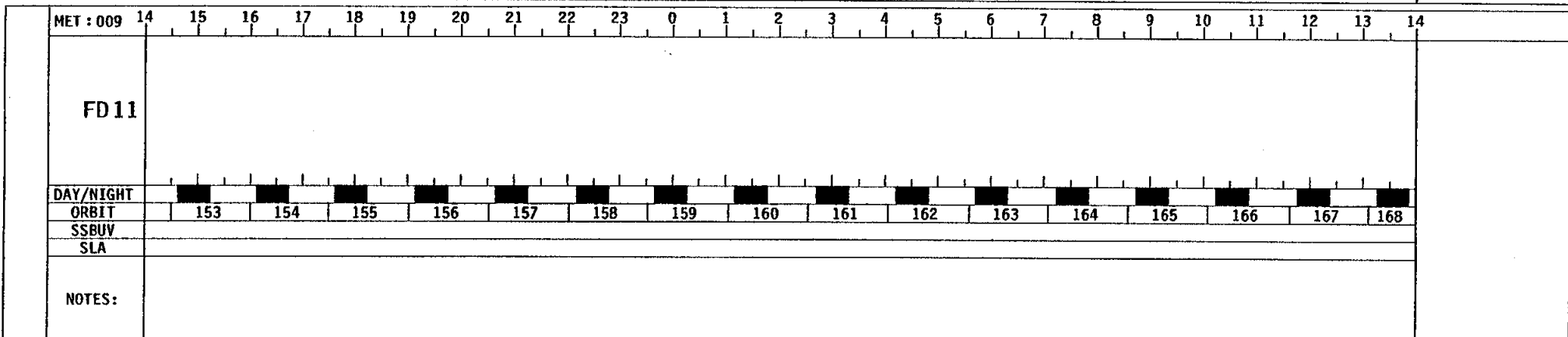
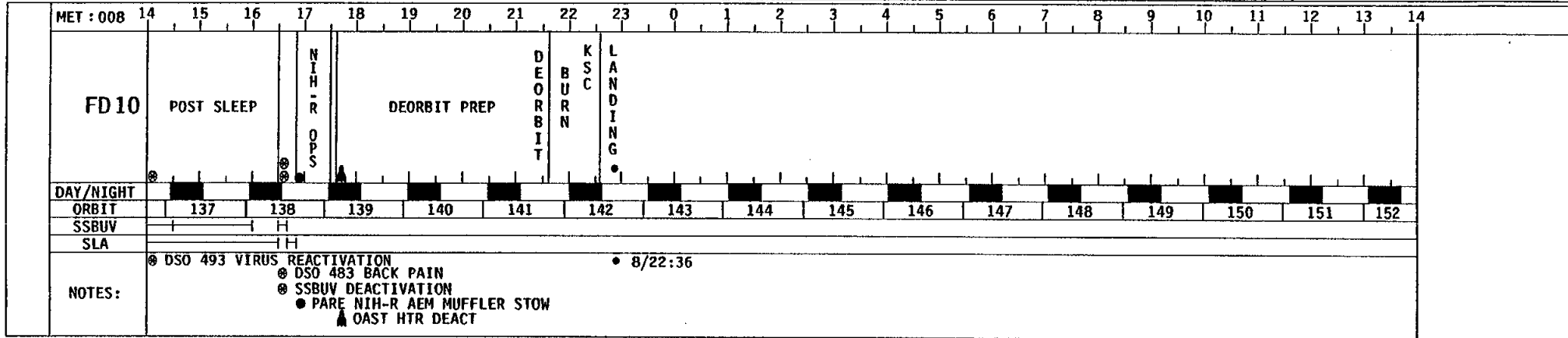
JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, Rev B, January 1992, has been used to build the timelines contained in this Flight Plan. Crew awake time prior to launch has been increased (launch - 9 hours 18 minutes) to accommodate crewmembers' circadian rhythm and on-orbit sleep cycles. Appendix K Exemption #74 has been approved for this mission to allow crew off-duty time to be delayed to Flight Day 8 (EOM-2) in order to accomplish all major mission objectives prior to scheduling the crew for off-duty time.

STS-72 OVERVIEW









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SUMMARY TIMELINE

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GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
011:09:18/ 011:21:18	000:00:00/ 000:12:00	011:03:18/ 011:15:18	01/011 CST	-10.8		JANUARY 11, 1996	STS-72	FINAL REV A	12/7/95
CST :011 FD :001 MET :000									
CDR DUFFY									
PLT JETT									
MS1 CHIAO									
MS2 SCOTT									
MS3 WAKATA									
MS4 BARRY									
DAY/NIGHT ORBIT									
GSTDN COVERAGE									
TDRS									
ATTITUDE									
SSBUV									
SLA									
NOTES:									


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE						
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CST :011 FD :001 MET :000	12	13	14	15	16	17	18	19	20	21	22	23	0	MET:001	
CDR DUFFY	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP
PLT JETT	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP
MS1 CHIAO	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP
MS2 SCOTT	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP
MS3 WAKATA	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP
MS4 BARRY	SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP	POST SLEEP
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TDRS															
ATTITUDE															
SSBUV SLA															
NOTES:															


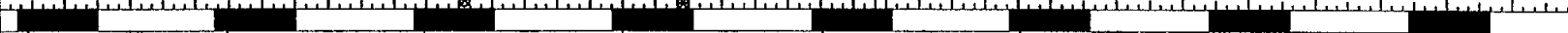



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CST :012 FD :002 MET :001										
CDR DUFFY	MEAL -ZLVR MNLVR P/TVO2 P/TVO3	P/TVO2 OPS P/TVO3	P/TVO3 OPS (MDDK)	EVENT PREP SPLD	NSR-S OMS BURN PSR NC2-S RCS BURN -ZLVR MNLVR MPR C/NF	PRE SLEEP	SLEEP			
PLT JETT	SFT TLE ETM SRP /C K	RMS PLB SURVEY	RNDZ TOOLS SETUP	EXERCISE	EVENT PREP SPLD	OMS BURN RCS BURN	PRE SLEEP	SLEEP		
MS1 CHIAO	EMU 1,3 C/O	EMU SWAP	EMU 2 C/O	ECC C/O	EVENT PREP SPLD	PRE SLEEP	SLEEP			
MS2 SCOTT	EMU 1,3 C/O	EMU SWAP	EMU 2 C/O	P/TVO2	EVENT PREP SPLD	PRE SLEEP	SLEEP			
MS3 WAKATA	DSET TOP 6	RMS PLB SURVEY	EXERCISE	DSO 604 01-1	SFT TLE ETM SRP /C K	PRE SLEEP	SLEEP			
MS4 BARRY	EMU 1,3 C/O	EMU SWAP	EMU 2 C/O	EXERCISE		PRE SLEEP	SLEEP			
DAY/NIGHT										
ORBIT	16	17	18	19	20	21	22	23	24	
GSTDN COVERAGE	DGS -CAN	-BDA -MLX -VAN -DKR -GDS -GDX -MIL	-GDX -GDS -MIL -MLX -BDA -VAN -DKR	-DGS -MIL -GDX -GDS -MIL -MLX	-MIL -VAN -GDX -GDS -MIL -MLX	-DGS -OTD -KSC -VAN -GDX	-GDS -IOS -DGS -OTD -KSC -VAN	-IOS -DGS -OTD -KSC -AGO	-IOS -DGS -OTD -KSC -AGO -IOS	
TDRS	E									W
ATTITUDE										
SSBUV										
SLA	TES WARMUP									
SLA	EARTH VIEW									
SLA	TES OPS (LOW G)									
NOTES:	@DTO 668 ADVANCED LOWER BODY RESTRAINT TEST @DTO 700-8 GPS DEVELOPMENT FLIGHT TEST @-ZLV, +YVV o SPLY DUMP INIT @-ZLV, -XVV @DSO 604 VISUAL VESTIBULAR INTEGRATION o SPLY DUMP TERM									


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																	
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CST :012 FD :002 MET :001	12	16	13	17	14	15	19	FD:00316	17	18	21	22	19	20	21	22	23	0	CST:013	1	2	3	0	MET:002		
CDR DUFFY	SLEEP	POST SLEEP	DSO 483	NH-S	NC3-S	NCC-S	T1	SFU RNDZ																		
PLT JETT	SLEEP	POST SLEEP	DSO 483					SFU RNDZ																		
MS1 CHIAO	SLEEP	POST SLEEP	DSO 483	CT PE CL GP				SFU RNDZ																		
MS2 SCOTT	SLEEP	POST SLEEP	DSO 483	STH	EXERCISE			SFU RNDZ																		
MS3 WAKATA	SLEEP	POST SLEEP	DSO 483	MFR CLM ITS UR	SFT TLE ETM SRP / C K			SFU RNDZ																		
MS4 BARRY	SLEEP	POST SLEEP	DSO 483	SALIVA COLLECT	NH-R DAILY CK	PSET / TV03 OPS		SFU RNDZ																		
DAY/NIGHT ORBIT	24	25	26	27	28	29	30	31																		
GSTDN COVERAGE	KSC -AGO -DKR	-DKR -OTD	-AGO -DKR -MAD	-CAN	-DKR -MAD -DGS	-CAN -BDA -DKR -MAD	-MIL -MLX -DGS -CAN	-MIL -BDA -DKR -GDX -DGS -MLX																		
TDRS	E W																									
ATTITUDE	-ZLV -XVV		BIAS -ZLV -YVV	NH-S	INC3-S		TGT TRK	+ZLV +XVV																		
SSBUV SLA		EARTH VIEW																								
NOTES:																										


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																									
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CST :013																																		
FD :003																																		
MET :002																																		
CDR DUFFY	SFU RNDZ	EXERCISE	FES ON PG WRPO EVENT 1P OR 2P 10.2 DEPRESSZ 100N DTO 664 OA OMS BURN CIRC OMS BURN ZLV PRIV MED				PRE SLEEP		SLEEP																									
PLT JETT	SFU RNDZ	SFU BERTH	ZLV MNV SFTLE ETM SRP CK	EXERCISE	FILE PADM		OMS BURN		OMS BURN	PRE SLEEP		SLEEP																						
MS1 CHIAO	SFU RNDZ	VTR ACT	PLAYBACK				PRE SLEEP			SLEEP																								
MS2 SCOTT	SFU RNDZ			EXERCISE	FILE PADM		PRE SLEEP			SLEEP																								
MS3 WAKATA	SFU RNDZ	SFU BERTH	RWRDN P/TV02 SETUP EVENT	P/TV11 OPS (EDUC)			PRE SLEEP			SLEEP																								
MS4 BARRY	SFU RNDZ	P/TV11 SETUP		EXERCISE			P/TV11 OPS (EDUC)			PRE SLEEP		SLEEP																						
DAY/NIGHT																																		
ORBIT																																		
GSTDN COVERAGE	<table border="0"> <tr> <td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td> </tr> <tr> <td>-VAN -DKR -GDS -IOS -GDX -DGS</td> <td>-MIL -MLX -BDA</td> <td>-GDS -GDX -MIL -MLX</td> <td>-GDX -GDS</td> <td>-IOS -DGS</td> <td>-OTD -KSC</td> <td>-AGO</td> <td>-OTD -KSC</td> </tr> <tr> <td>-MIL -BDA -MLX</td> <td>-VAN -DKR -GDX -DGS</td> <td>-VAN</td> <td>-DGS</td> <td>-VAN</td> <td>-KSC</td> <td>-AGO</td> <td>-IOS -KSC</td> </tr> </table>										32	33	34	35	36	37	38	39	-VAN -DKR -GDS -IOS -GDX -DGS	-MIL -MLX -BDA	-GDS -GDX -MIL -MLX	-GDX -GDS	-IOS -DGS	-OTD -KSC	-AGO	-OTD -KSC	-MIL -BDA -MLX	-VAN -DKR -GDX -DGS	-VAN	-DGS	-VAN	-KSC	-AGO	-IOS -KSC
32	33	34	35	36	37	38	39																											
-VAN -DKR -GDS -IOS -GDX -DGS	-MIL -MLX -BDA	-GDS -GDX -MIL -MLX	-GDX -GDS	-IOS -DGS	-OTD -KSC	-AGO	-OTD -KSC																											
-MIL -BDA -MLX	-VAN -DKR -GDX -DGS	-VAN	-DGS	-VAN	-KSC	-AGO	-IOS -KSC																											
TDRS																																		
ATTITUDE																																		
SSBUV																																		
SLA																																		
NOTES:	SFU GRAPPLE (2/00:35) @-ZLV, -XVV DSO 802 EDUCATIONAL ACTIVITIES @-ZLV, -XVV DTO 664 CABIN TEMPERATURE SURVEY @-ZLV, -XVV																																	


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE										
013:21:18/ 014:09:18	002:12:00/ 003:00:00	013:15:18/ 014:03:18	04/013 CST	-2.6		JANUARY 13, 1996	STS-72	FINAL REV A	12/7/95										
CST :013 FD :003 MET :002	12	13	14	15 FD:004	16	17	18	19	20	21	22	23	0	CST:014	1	2	3	MET:003	
CDR DUFFY	SLEEP			POST SLEEP		DSO 483 D TO 664 MVM DIN DEV NWR	DSO 330 SETUP	DSO 330 CAL		DSO 494	EXERCISE		P/TV02 SETUP	MEAL					
PLT JETT	SLEEP			POST SLEEP		DSO 483 PSL SET UP	P/TV10 SETUP	P/TV10 OPS (UMS)		DSO 494	DSO 492 OPER/SUBJ	EXERCISE		MEAL					SFT TLM SRP / CK
MS1 CHIAO	SLEEP			POST SLEEP		CT PER GP 483 D TO 483	M I D E P	DSO 494		EVA TOOL CONFIG				MEAL					
MS2 SCOTT	SLEEP			POST SLEEP		IM OAL 2N 483 SFT TLM SRP / CK	EXERCISE	NIH-R DAILY CK		P/TV03 OPS	AWR EAE MTF E1 RL			MEAL					OP EAR SEAT / AU CHD ATE
MS3 WAKATA	SLEEP			POST SLEEP		DSO 483 SFT TLM SRP / CK		EXERCISE			DSO 492	P/TV11 OPS (EDUC)		MEAL					P/TV11 OPS (EDUC)
MS4 BARRY	SLEEP			POST SLEEP		DSO 483 COLLECT	M I D E P	EXERCISE		EVA TOOL CONFIG	DSO 494	P/TV11 OPS (EDUC)		MEAL					P/TV11 OPS (EDUC)
DAY/NIGHT ORBIT	[Bar chart showing day/night and orbit status]																		
SAA	[Bar chart showing SAA status]																		
MOON UP/DOWN	[Bar chart showing moon up/down status]																		
TDRS	[Bar chart showing TDRS status]																		
ATTITUDE	-ZLV -XVV BIAS -ZLV +YVV MOON VIEW -ZLV -XVV																		
SSBUV	EARTH VIEW MOON MOON EARTH VIEW																		
SLA	SLA OBSERVATIONS SLA OBSERVATIONS																		
NOTES:	<ul style="list-style-type: none"> o BIAS -ZLV +YVV o DSO 493 VIRUS REACTIVATION o SIMO DUMP INIT o SIMO DUMP TERM o DSO 483 BACK PAIN o DTO 664 CABIN TEMPERATURE SURVEY o DSO 330 URINE MONITORING SYSTEM o DSO 494 PULMONARY OXYGEN EXCHANGE o DSO 494 PULMONARY OXYGEN EXCHANGE o -ZLV, -XVV o DSO 492B PORTABLE CLINICAL BLOOD ANALYZER o DSO 802 EDUCATIONAL ACTIVITIES o DSO 802 EDUCATIONAL ACTIVITIES 																		

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE						
014:09:18/ 014:21:18	003:00:00/ 003:12:00	014:03:18/ 014:15:18	04/014 CST	-1.1		JANUARY 14, 1996	STS-72	FINAL REV A	12/7/95						
CST :014	FD :004	MET :003	0	1	2	3	4	5	6	7	8	9	10	11	12
CDR DUFFY	FILTER CLEANING	PG MR RP U PB	SEP1-0 SEP2-0	OAST-FLYER DEPLOY	MVM OIN DEW NR	FES	IMP DRV TRP	CON FZ LVR	PRE SLEEP	NC1-0	RCS BURN	ZLV	MND VRF UT	SLEEP	
PLT JETT		SD TR ASAS BLE	REL	OAST-FLYER DEPLOY	RMS	SENA BLE			PRE SLEEP	RCS BURN	PRE SLEEP			SLEEP	
MS1 CHIAO	EXERCISE			OAST-FLYER DEPLOY			CT PE CM GP		PRE SLEEP					SLEEP	
MS2 SCOTT	STATUS	AT CI SM E SR		OAST-FLYER DEPLOY	P/T V O 3	SETUP	POT PL T V O 3		PRE SLEEP					SLEEP	
MS3 WAKATA	P/TV11 OPS (EDUC)	RMS		OAST-FLYER DEPLOY	RMS	P/T V O 4	SFT L E T M SRP / CK		PRE SLEEP					SLEEP	
MS4 BARRY	P/TV11 OPS (EDUC)	P/TV09 SETUP		OAST-FLYER DEPLOY	P/T V O 4	SETUP	P/P S		PRE SLEEP					SLEEP	
DAY/NIGHT															
ORBIT	48	49	50	51	52	53	54	55							
SAA															
MOON UP/DOWN															
TDRS															
ATTITUDE	-ZLV -XVV		SEP		BIAS -ZLV -YVV		-ZLV -XVV								
SSBUV	EARTH VIEW		OAST RELEASE		MOON VIEW		EARTH VIEW								
SLA					SLA OBS										
NOTES:	@RMS HTR ACT @DSO 802 EDUCATIONAL ACTIVITIES @DUAL G2 ▶ OAST STBY		▲ OAST FLYER DEPLOY (3/02:25)		@BIAS -ZLV -YVV		@-ZLV, -XVV								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE									
014:21:18/ 015:09:18	003:12:00/ 004:00:00	014:15:18/ 015:03:18	05/014 CST	0.3		JANUARY 14, 1996	STS-72	FINAL REV A	12/7/95									
CST :014 FD :004 MET :003	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	0	MET:004
CDR DUFFY	SLEEP																	EVA 1 (P/TV)
PLT JETT	SLEEP																	EVA 1 (RMS B/U)
MS1 CHIAO	SLEEP																	EVA 1
MS2 SCOTT	SLEEP																	EVA 1 (IV)
MS3 WAKATA	SLEEP																	EVA 1 (RMS)
MS4 BARRY	SLEEP																	EVA 1
DAY/NIGHT																		
ORBIT																		
MOON UP/DOWN																		
TDRS																		
ATTITUDE	-ZLV -XVV BIAS -ZLV -YVV NC2-0 -YLV -XVV																	
SSBUV	EARTH VIEW																	
SLA	SLA OBSERVATIONS																	
NOTES:	<p>▲ PRELOADED BIAS -ZLV -YVV INIT ◎DSO 493 VIRUS REACTIVATION ◎DSO 483 BACK PAIN ◎DSO 489 DOSIMETER DON ◎-YLV -XVV ◎RMS HTR ACT</p>																	


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
015:09:18/ 015:21:18	004:00:00/ 004:12:00	015:03:18/ 015:15:18	05/015 CST	1.6		JANUARY 15, 1996	STS-72	FINAL REV A	12/7/95
CST :015 FD :005 MET :004									
CDR DUFFY	EVA 1 (P/TV)	EXERCISE	NC3-0 RCS BURN	NH-0 RCS BURN	PRE SLEEP			SLEEP	
PLT JETT	EVA 1 (RMS B/U)	RNDZ TOOLS SETUP	RCS BURN	RCS BURN	PRE SLEEP			SLEEP	
MS1 CHIAO	EVA 1	POST EVA W/H2O	DSO 494 EMU LION C/O		PRE SLEEP			SLEEP	
MS2 SCOTT	EVA 1 (IV)	POST EVA W/H2O			PRE SLEEP			SLEEP	
MS3 WAKATA	EVA 1 (RMS)	EXERCISE	SFT TLE ETM SRP / C/K	DTO 664	PRE SLEEP			SLEEP	
MS4 BARRY	EVA 1	POST EVA W/H2O	EMU LION C/O DSO 494		PRE SLEEP			SLEEP	
DAY/NIGHT ORBIT	[Day/Night Cycle Bar]								
MOON UP/DOWN	[Moon Cycle Bar]								
TDRS	[TDRS Cycle Bar]								
ATTITUDE	-YLV -XVV NC3-0 INH-01 -ZLV -XVV								
SSBUV	[SSBUV Cycle Bar]								
SLA	[SLA Cycle Bar]								
NOTES:	@DSO 494 PULMONARY OXYGEN EXCHANGE o SPLY DUMP TERM @DSO 489 EVA DOSIMETRY @-ZLV, -XVV @DTO 664 CABIN TEMPERATURE SURVEY Δ EMU BATT RCHG INIT @BIAS -ZLV +YVV o SPLY DUMP INIT								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
015:21:18/ 016:09:18	004:12:00/ 005:00:00	015:15:18/ 016:03:18	06/015 CST	2.8		JANUARY 15, 1996	STS-72	FINAL REV A	12/7/95
CST :015 FD :005 MET :004	12 13 14 15 16 17 18 19 20 21 22 23 0	12 13 14 15 16 17 18 19 20 21 22 23 0	FD:00616	17 18 19 20 21 22 23 0					MET:005
CDR DUFFY	SLEEP	POST SLEEP			DSO 483	NC4-0	OAST-FLYER RNDZ	Ti-0	R-bar
PLT JETT	SLEEP	POST SLEEP			DSO 483		OAST-FLYER RNDZ		
MS1 CHIAO	SLEEP	POST SLEEP			ACT PWRUP GRP B-TRIPLE G2 CONFIG	EVA TOOL CONFIG	POST EVA QUEST		OAST-FLYER RNDZ
MS2 SCOTT	SLEEP	POST SLEEP			INITIAL ZONE TIME	EVA TOOL CONFIG			OAST-FLYER RNDZ
MS3 WAKATA	SLEEP	POST SLEEP			MF CLITUR	SFT TLE SRP / CK			OAST-FLYER RNDZ
MS4 BARRY	SLEEP	POST SLEEP			COLLECT	NIN-R DAILY CK	P/TV03 OPS	AWR EAE MTF EIRL	POST EVA QUEST
DAY/NIGHT ORBIT	[Orbit diagram showing day/night cycles from orbit 71 to 79]								
MOON UP/DOWN	[Moon phase diagram showing up/down cycles from orbit 71 to 79]								
TDRS	[TDRS mission timeline diagram]								
ATTITUDE	-ZLV -XVV NC4-0 TGT TRK +ZLV +XVV								
SSBUV	EARTH VIEW								
SLA	SLA OBSERVATIONS								
NOTES:	@DSO 493 VIRUS REACTIVATION @DSO 483 BACK PAIN @DTO 664 CABIN TEMPERATURE SURVEY @PWRUP GRP B-TRIPLE G2 CONFIG								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
016:09:18/ 016:21:18	005:00:00/ 005:12:00	016:03:18/ 016:15:18	06/016 CST	4.0		JANUARY 16, 1996	STS-72	FINAL REV A	12/7/95
CST :016 FD :006 MET :005									
CDR DUFFY	OAST-FLYER	DSO 330 CAL							
PLT JETT	OAST BERTH	P/TV10 OPS (UMS)							
MS1 CHIAO		DSO 494							
MS2 SCOTT	GRAPPLE	EMU SWAP							
MS3 WAKATA	OAST BERTH	EXERCISE							
MS4 BARRY		EMU SWAP							
DAY/NIGHT	[Day/Night Cycle Bar]								
ORBIT	[Orbit Cycle Bar]								
MOON UP/DOWN	[Moon Cycle Bar]								
TDRS	[TDRS Cycle Bar]								
ATTITUDE	[Attitude Cycle Bar]								
SSBUV	[SSBUV Cycle Bar]								
SLA	[SLA Cycle Bar]								
NOTES:	<ul style="list-style-type: none"> o OAST-FLYER RNDZ ▲ OAST-FLYER GRAPPLE (5/00:32) ◆ EMU BATT RECG TERM ▶ POST RECOVERY CNFG ◎ DSO 494 PULMONARY OXYGEN EXCHANGE ◎ DSO 330 URINE MONITORING SYSTEM ◎ CABIN TEMP CNTL RECONFIG o HTR CONFIG ◎ DSO 492B PORTABLE CLINICAL BLOOD ANALYZER ◎ -ZLV, -XVV 								


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
016:21:18/ 017:09:18	005:12:00/ 006:00:00	016:15:18/ 017:03:18	07/016 CST	4.9		JANUARY 16, 1996	STS-72	FINAL REV A	12/7/95
CST :016	16	17	18	19	20	21	22	23	0
FD :006	12	13	14	15	16	17	18	19	20
MET :005	12	13	14	15	16	17	18	19	20
			FD:00715						
									MET:006
CDR DUFFY	SLEEP	POST SLEEP							EVA 2 (P/TV)
PLT JETT	SLEEP	POST SLEEP							EVA 2 (RMS B/U)
MS1 CHIAO	SLEEP	POST SLEEP							EVA 2
MS2 SCOTT	SLEEP	POST SLEEP							EVA 2
MS3 WAKATA	SLEEP	POST SLEEP							EVA 2 (RMS)
MS4 BARRY	SLEEP	POST SLEEP							EVA 2 (IV)
DAY/NIGHT	[Day/Night Cycle]								
ORBIT	87	88	89	90	91	92	93	94	95
MOON UP/DOWN	[Moon Cycle]								
TDRS	[TDRS Events]								
ATTITUDE	-ZLV -XVV								
SSBUV	EARTH VIEW								
SLA	SLA OBSERVATIONS								
NOTES:	@DSO 493 VIRUS REACTIVATION @RMS HTR ACT @BIAS -ZLV +YVV o SIMO DUMP INIT @DSO 483 BACK PAIN @DSO 489 DOSIMETER DON o SIMO DUMP TERM @TAIL SUN MNVR @INIT ORB RATE ROTOR @BIAS -ZLV -XVV MNVR								

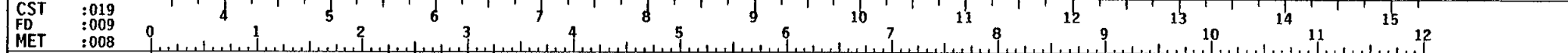
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
017:09:18/ 017:21:18	006:00:00/ 006:12:00	017:03:18/ 017:15:18	07/017 CST	5.8		JANUARY 17, 1996	STS-72	FINAL REV A	12/7/95	
CST :017 FD :007 MET :006	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 12									
CDR DUFFY	EVA 2 (P/TV)	CT SAFE SOCM BTGP W V U W K C	EXERCISE	1 4 7 R E P R E S E N S E S	PRE SLEEP	PRE SLEEP	SLEEP			
PLT JETT	EVA 2 (RMS B/U)	S I A Z B L V E R M N R V N	DS SE OT U 4 P S R P C K 4	SFT TLE ETM SRP C K 4	DS ST OO W A 4 A	PG WR U P B S	PRE SLEEP	SLEEP		
MS1 CHIAO	EVA 2	A I R I N G S U M M E R S	POST EVA W/O H2O	DSO 494	EVA TOOL STOW		PRE SLEEP	SLEEP		
MS2 SCOTT	EVA 2	A I R I N G S U M M E R S	POST EVA W/O H2O		EVA TOOL STOW		PRE SLEEP	SLEEP		
MS3 WAKATA	EVA 2 (RMS)	DTO 668 STOW	EXERCISE	OD T O 6 P O S T C O N F I G			PRE SLEEP	SLEEP		
MS4 BARRY	EVA 2 (IV)	A I R I N G S U M M E R S	POST EVA W/O H2O	1 4 7 R E P R E S E N S E S			PRE SLEEP	SLEEP		
DAY/NIGHT										
ORBIT	95	96	97	98	99	100	101	102	103	
MOON UP/DOWN										
TDRS										
ATTITUDE	BIAS -ZLV -XVV -ZLV -XVV									
SSBUV	EARTH VIEW									
SLA	SLA QB(0.1 DEG DB)									
NOTES:	◎DTO 668 ADVANCED LOWER BODY RESTRAINT TEST ◎-ZLV, -XVV ◎DSO 489 EVA DOSIMETRY ◎DTO 664 CABIN TEMPERATURE SURVEY ◎DSO 494 PULMONARY OXYGEN EXCHANGE △ EMU BATT RCHG INIT ◎DUAL G2 ○ PCS CONFIG									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
017:21:18/ 018:09:18	006:12:00/ 007:00:00	017:15:18/ 018:03:18	08/017 CST	6.5		JANUARY 17, 1996	STS-72	FINAL REV A	12/7/95	
CST :017	16	17	18	19	20	21	22	23	0	
FD :007	12	13	14	15	16	17	18	19	20	
MET :006			FD:00815							
CDR DUFFY	SLEEP	POST SLEEP	VIDEO CONF	POST SLEEP	LOAD		OFF DUTY	MEAL	EXERCISE	
PLT JETT	SLEEP	POST SLEEP	VIDEO CONF	POST SLEEP	GDS PWSA KP HARD	DSO 483	OFF DUTY	MEAL	DSO 492 OPER/SUBJ	
MS1 CHIAO	SLEEP	POST SLEEP	VIDEO CONF	POST SLEEP	CTPE CM GP	DSO 483	OFF DUTY	MEAL	ECC UPDATE ECC POST UPDT EVAL	
MS2 SCOTT	SLEEP	POST SLEEP		POST SLEEP	SOILS TIE CK	DSO 483	OFF DUTY	MEAL	EXERCISE	
MS3 WAKATA	SLEEP	POST SLEEP		POST SLEEP		DSO 483	OFF DUTY	MEAL	P/T V 04 DSO 492 FILTR	
MS4 BARRY	SLEEP	POST SLEEP	SCOLLLECT	POST SLEEP	NIH-R DAILY CK	DSO 483	OFF DUTY	MEAL	AWR EAE MTF EIR L DSO 492 P/T V 04	
DAY/NIGHT	[Day/Night Cycle Diagram]									
ORBIT	[Orbit Cycle Diagram]									
MOON UP/DOWN	[Moon Phase Diagram]									
TDRS	[TDRS Cycle Diagram]									
ATTITUDE	-ZLV -XVV									
SSBUV	EARTH VIEW									
SLA	SLA OB(0.1 DEG DB) SLA OBSERVATIONS									
NOTES:	@DSO 493 VIRUS REACTIVATION @DSO 483 BACK PAIN @DSO 492B PORTABLE CLINICAL BLOOD ANALYZER @DTO 672 EMU ELECTRONIC CURF C/L ♦ EMU BATT RECG TERM ▲ PRELOADED -ZSI MNVR INIT									

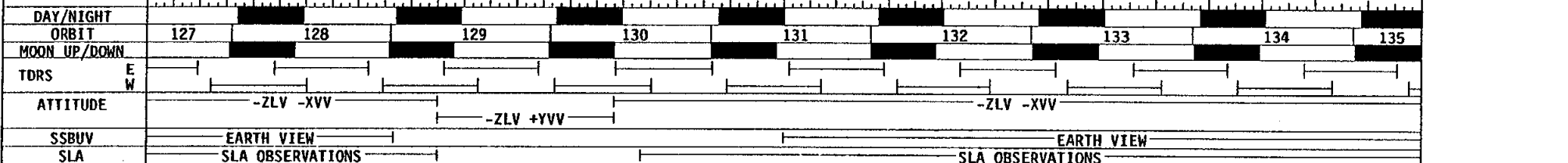
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
018:09:18/ 018:21:18	007:00:00/ 007:12:00	018:03:18/ 018:15:18	08/018 CST	7.1		JANUARY 18, 1996	STS-72	FINAL REV A	12/7/95	
CST :018 FD :008 MET :007	0 4 1 5 2 6 3 7 4 8 5 9 6 10 7 11 8 12 9 13 10 14 11 15 12									
CDR DUFFY	DSO 330 CAL	DSO 330 STON	PAVENT	DTOP	IMU	IZLV	MNVR	PRE SLEEP	PRE SLEEP	SLEEP
PLT JETT	DSO 604 01-3C	EXERCISE		PRE SLEEP		SLEEP				
MS1 CHIAO	POST EVA QUEST	EXERCISE	EVA TOOL STOW	PRE SLEEP		SLEEP				
MS2 SCOTT	POST EVA QUEST	P/TVO2	PAVENT	P/TVO3	P/TVO3 OPS	PRE SLEEP		SLEEP		
MS3 WAKATA	EXERCISE	PAVENT	SFT TLE SRP / CK	PRE SLEEP		SLEEP				
MS4 BARRY	DSO 604 01-3C	EXERCISE		PRE SLEEP		SLEEP				
DAY/NIGHT										
ORBIT	111	112	113	114	115	116	117	118	119	
MOON UP/DOWN										
TDRS										
ATTITUDE	-ZS1		IMU1		-ZLV -XVV					
SSBUV	-SOLAR-		-SOLAR-		EARTH VIEW					
SLA					-SLA 08(0.1 DEG DB)					
NOTES:	@DSO 330 URINE MONITORING SYSTEM A ECC POST UPDT EVAL @DSO 604 VISUAL VESTIBULAR INTEG @DSO 330 URINE MONITORING SYSTEM @DTC 664 CABIN TEMPERATURE SURVEY @-ZLV, -XVV									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
018:21:18/ 019:09:18	007:12:00/ 008:00:00	018:15:18/ 019:03:18	09/018 CST	7.6		JANUARY 18, 1996	STS-72	FINAL REV A	12/7/95
CST :018 FD :008 MET :007	12 16 17	13 15 16 17	18 19 20 21	22 23 24	25 26 27	28 29 30	01 02 03	04 05 06	MET:008
CDR DUFFY	SLEEP	POST SLEEP	POST SLEEP	FCS C/O	FCS HOT	CREW CONF PREP	MEAL	EXERCISE	
PLT JETT	SLEEP	POST SLEEP	POST SLEEP	FCS C/O	FCS HOT	CREW CONF PREP	MEAL	PCG-STES VDA DEACT	
MS1 CHIAO	SLEEP	POST SLEEP	POST SLEEP	EXERCISE	EXERCISE	CREW CONF PREP	MEAL	EVA TOOL STOW	POST EVA ENT PREP
MS2 SCOTT	SLEEP	POST SLEEP	POST SLEEP	EXERCISE	EXERCISE	CREW CONF PREP	MEAL	EVA TOOL STOW	POST EVA ENT PREP
MS3 WAKATA	SLEEP	POST SLEEP	POST SLEEP	EXERCISE	DSO 604 01-1	CREW CONF PREP	MEAL	PCG-STES VDA DEACT	
MS4 BARRY	SLEEP	POST SLEEP	POST SLEEP	EXERCISE	EXERCISE	CREW CONF PREP	MEAL	EXERCISE	POST EVA ENT PREP
DAY/NIGHT	[Day/Night Cycle]								
ORBIT	[Orbit Cycle]								
MOON UP/DOWN	[Moon Cycle]								
TDRS	[TDRS Cycle]								
ATTITUDE	[Attitude Profile]								
SSBUV	[SSBUV Profile]								
SLA	[SLA Profile]								
NOTES:	<p> @DSO 493 VIRUS REACTIVATION @BIAS -ZLV -YVV @DTO 664 CABIN TEMPERATURE SURVEY @DSO 483 BACK PAIN @DSO 604 VISUAL VESTIBULAR INTEGRATION APU HTR RECONFIG @DTO 700-8 GPS DEVELOPMENT FLIGHT TEST @-ZLV, -XVV @EAST COAST STL-A ENTRY PREP @DTO 684 RADIATION MEASUREMENTS @WEST COAST </p>								


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
019:09:18/ 019:21:18	008:00:00/ 008:12:00	019:03:18/ 019:15:18	09/019 CST	7.9		JANUARY 19, 1996	STS-72	FINAL REV A	12/7/95



CDR DUFFY	CABIN STOW		PROVISIONS CABIN STOW	CONF -ZLV	MAN -ZLV	MAINT -ZLV	PRE SLEEP	CONF -ZLV	MAN -ZLV	MAINT -ZLV	PRE SLEEP	SLEEP	
	EXERCISE	CABIN STOW		PRE SLEEP				SLEEP					
PLT JETT	CABIN STOW		PRE SLEEP				SLEEP						
MS1 CHIAO	CABIN STOW	ERGO STOW	CABIN STOW	PRE SLEEP				SLEEP					
MS2 SCOTT	CABIN STOW		PRE SLEEP				SLEEP						
MS3 WAKATA	CABIN STOW		PRE SLEEP				SLEEP						
MS4 BARRY	CABIN STOW	ERGO STOW	CABIN STOW	PRE SLEEP				SLEEP					



NOTES:
 o -ZLV, +YVV o WASTE DUMP TERM
 o -ZLV, -XVV

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE			
019:21:18/ 020:09:18	008:12:00/ 009:00:00	019:15:18/ 020:03:18	10/019 CST	8.1		JANUARY 19, 1996	STS-72	FINAL REV A	12/7/95			
CST :019	16	17	18	19	20	21	22	23	0			
FD :009	13	FD:01014	15	16	17	18	19	20	21			
MET :008	12								0			
									MET:009			
CDR DUFFY	SLEEP	POST SLEEP	CONTRIF. MIND	POST SLEEP	DSO 483	MNVR	DEORBIT PREP	IMU MNVR	IAP MLL UTB GDN OPS	DEORBIT PREP		
PLT JETT	SLEEP	POST SLEEP		POST SLEEP	SD SLASLE B L E	DSO 483	DEORBIT PREP		IAP MLL UTB GDN OPS	DEORBIT PREP		K S C
MS1 CHIAO	SLEEP	POST SLEEP		POST SLEEP	DSO 483					DEORBIT PREP		L A N D I N G *
MS2 SCOTT	SLEEP	POST SLEEP		POST SLEEP	DSO 483					DEORBIT PREP		B U R N *
MS3 WAKATA	SLEEP	POST SLEEP		POST SLEEP	DSO 483					DEORBIT PREP		
MS4 BARRY	SLEEP	POST SLEEP	SOLLECT	POST SLEEP	DSO 483	NIH-R OPS				DEORBIT PREP		
DAY/NIGHT												
ORBIT	135	136	137	138	139	140	141	142	143			
MOON UP/DOWN												
TDRS												
ATTITUDE			-ZLV -XV				IMU		D/O BURN		ENTRY	
SSBUV		EARTH VIEW		INTERNAL CAL		IDEACT						
SLA		SLA OBSERVATIONS										
NOTES:				DSO 493 VIRUS REACTIVATION		DSO 483 BACK PAIN		OAST HTR DEACT		BURN MNVR		
						AEM MUFFLER STOW						
											* DEORBIT BURN	* KSC LANDING
											08/21:36	08/22:36

DETAILED TIMELINE

DETAILED
TIMELINE

DETAILED TIMELINE

STS-72 (FD 01)

CDR

PLT

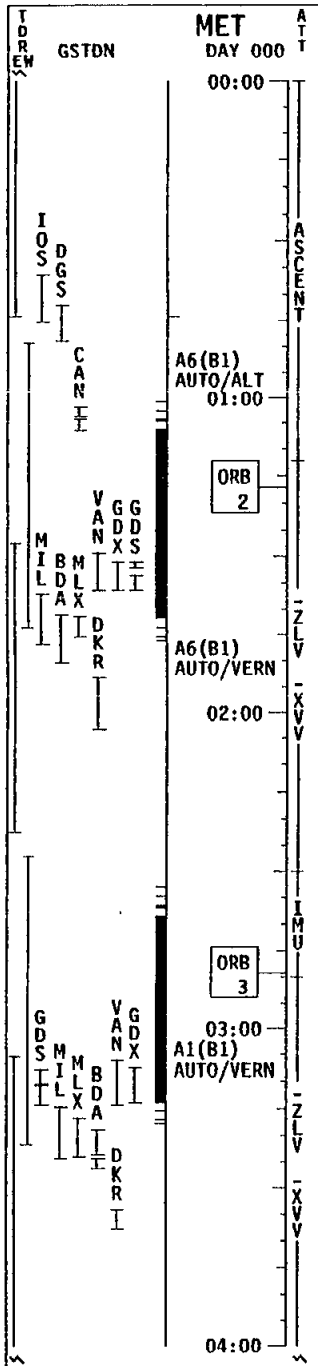
MS3

MCC

Activities prior to 0/02:30 MET are in the ASCENT and POST INSERTION Checklists. The Orbiter should be in -ZLV -XVV attitude upon entering this FLIGHT PLAN.

- [A] WATER LOOP 1 GPC CYCLE**
- CRT X 1. SM, OPS 000 PRO
 2. SM, OPS 201 PRO
- X: SM 1 DPS UTILITY
3. CHECKPT RETRY ENA - ITEM 12 EXEC (*)
 4. UL CNTL AUTO - ITEM 35 EXEC (*)
- X: 62 PCMMU/PL COMM
5. PSP 1(2) I/O RESET - ITEM 6(7) EXEC (*)
 6. RESUME OR
- X: SM ANTENNA

- FD01 EZ ACTIVITIES:**
- PCS 1(2) CONFIG (ORB OPS, ECLS)
 Config Sys 1 (5 Min/2 Cmn)
 LAMP TEST (ORB OPS, ECLS) (5 Min)
 SMK DETN CKT TEST
 (ORB OPS, ECLS) (5 min)
 CPA OPS (ORB OPS, CREW SYS) (15 Min)



Change DAP A to A1
 MNVR IMU ALIGN ATT
 STAR PAIR (A2)
 A/AUTO/VERN (02:30) Init MNVR

IMU ALIGN - S TRK (ORB OPS)
 MNVR (TRK) -ZLV, -XVV
 TG=2 BV=3 OM=0
 A/AUTO/VERN Init TRK

CABIN UNSTOW

SM CKPT INIT (ORB OPS, OPS)
 WATER LOOP 1 GPC CYCLE [A]
 AFT CONTROLLER C/O
 (ORB OPS, GNC)

QUICKDON MASKS
 Unstow, Install, Verify
 operation

RMS POWERUP
 (PDRS OPS, RMS PWRUP)

RMS CHECKOUT
 (PDRS OPS, RMS C/O)
 (2 Cmn)

RMS POWERDOWN
 (PDRS OPS, RMS PWRDN)
 Note: Do not stow MPM's

SLA ACTIVATION
 (PL OPS, SLA)

CRYO O2 TK HTR SNSR CK
 (ORB OPS, EPS)

RMS POWERUP
 (PDRS OPS, RMS PWRUP)

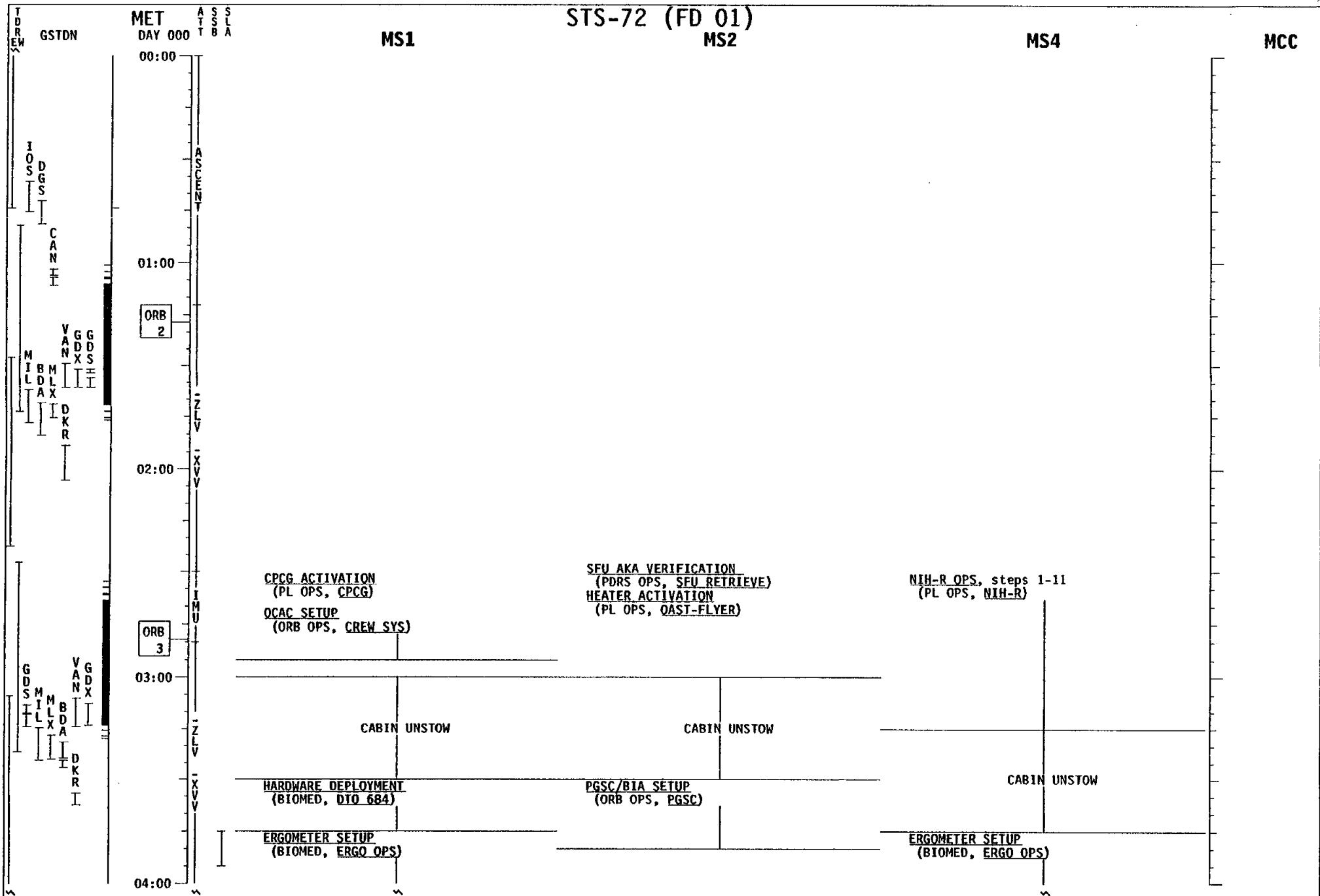
RMS CHECKOUT
 (PDRS OPS, RMS C/O)
 (2 Cmn)

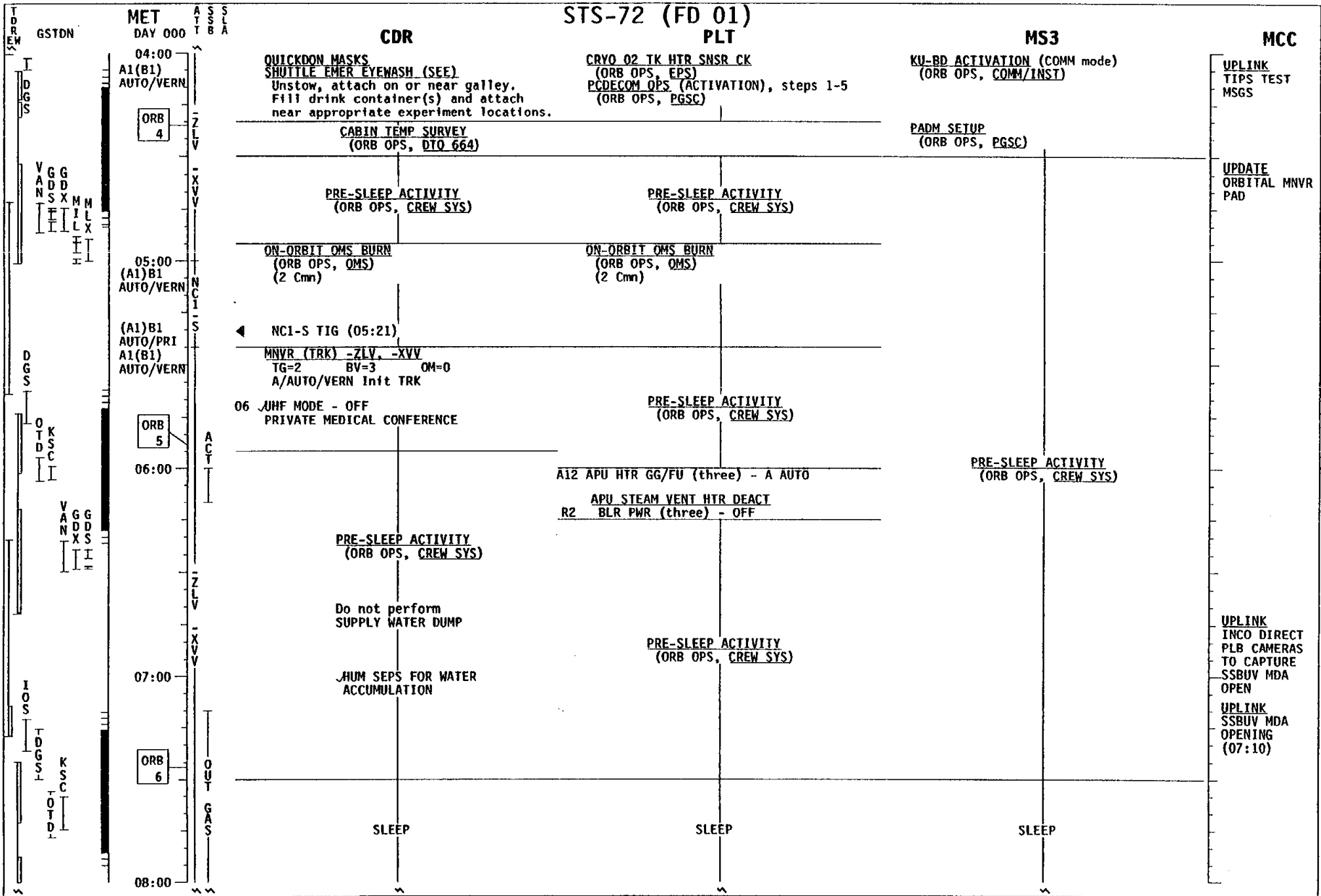
RMS POWERDOWN
 (PDRS OPS, RMS PWRDN)
 Note: Do not stow MPM's

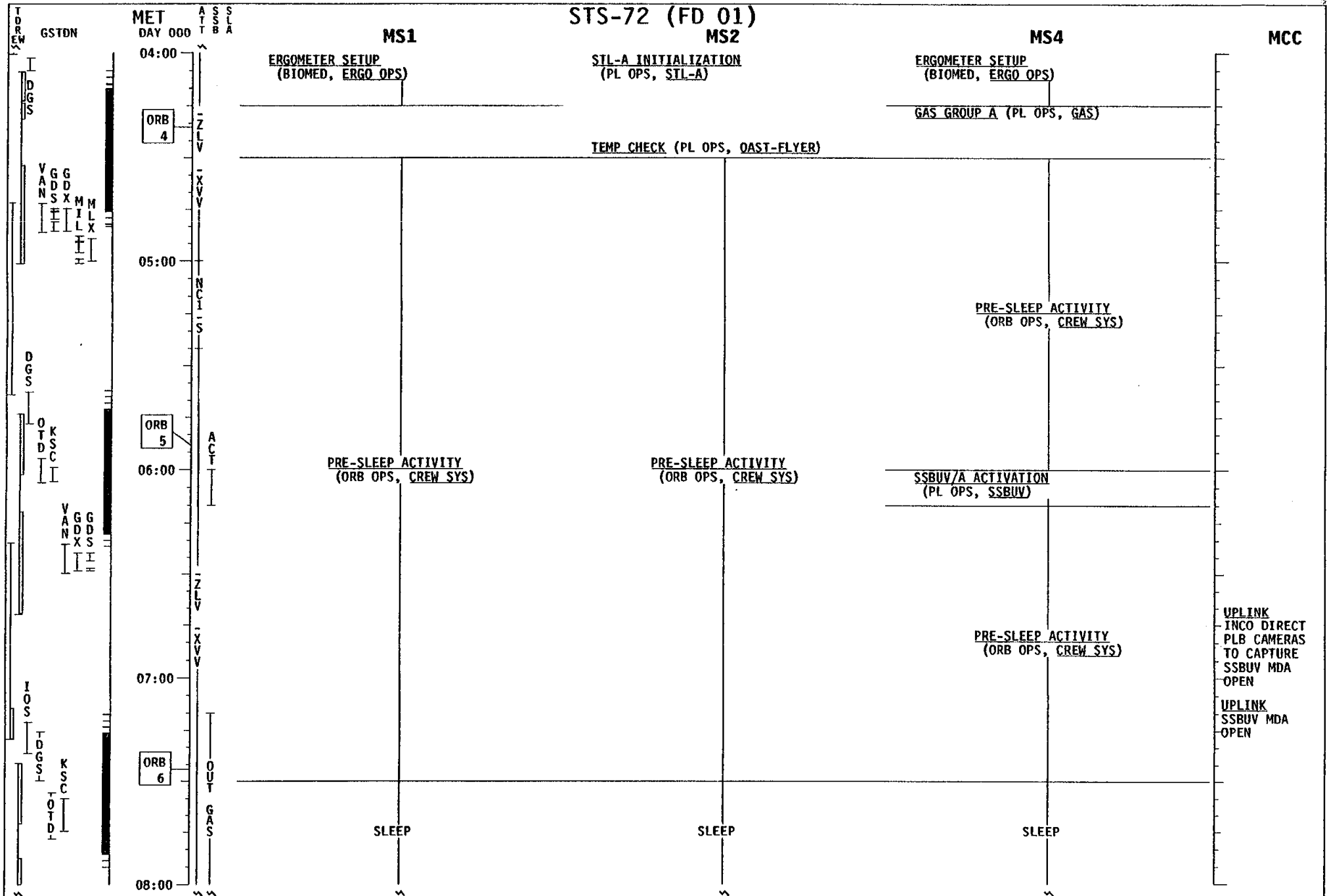
KU-BD ANT DEPLOY
 (ORB OPS, COMM/INST)

KU-BD ACTIVATION (COMM mode)
 (ORB OPS, COMM/INST)

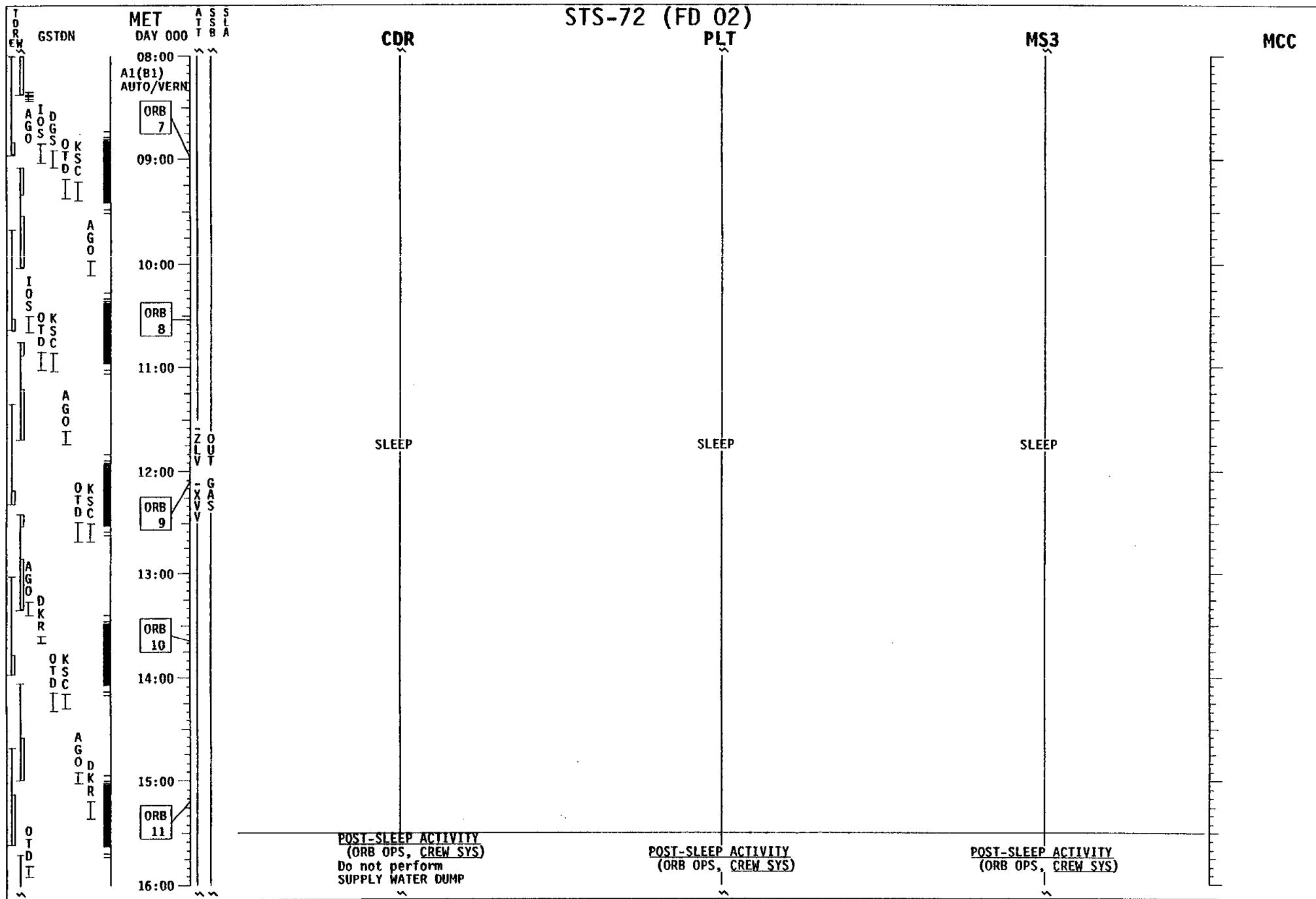
UPLINK
 TFL 192
 CONFIG 763

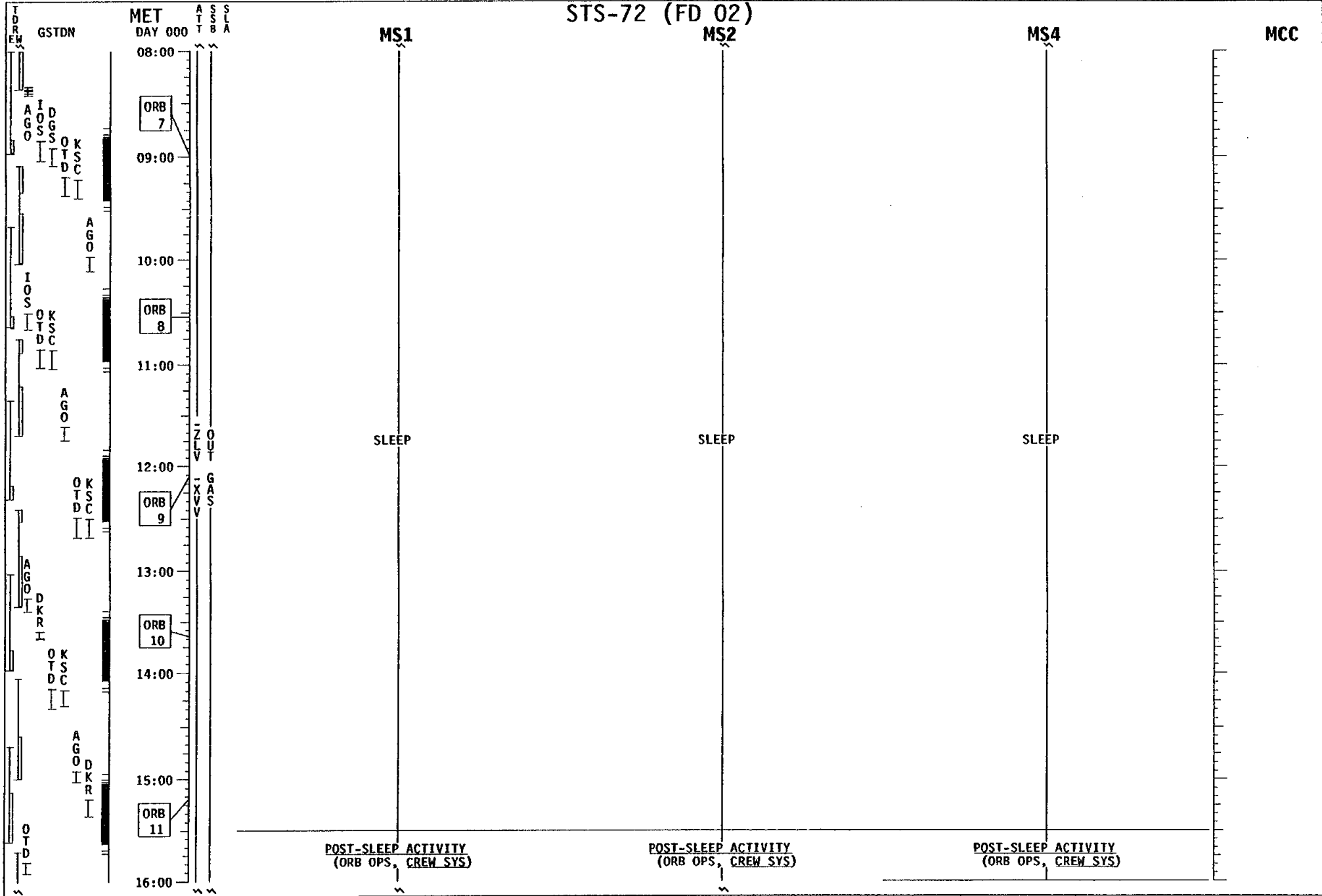


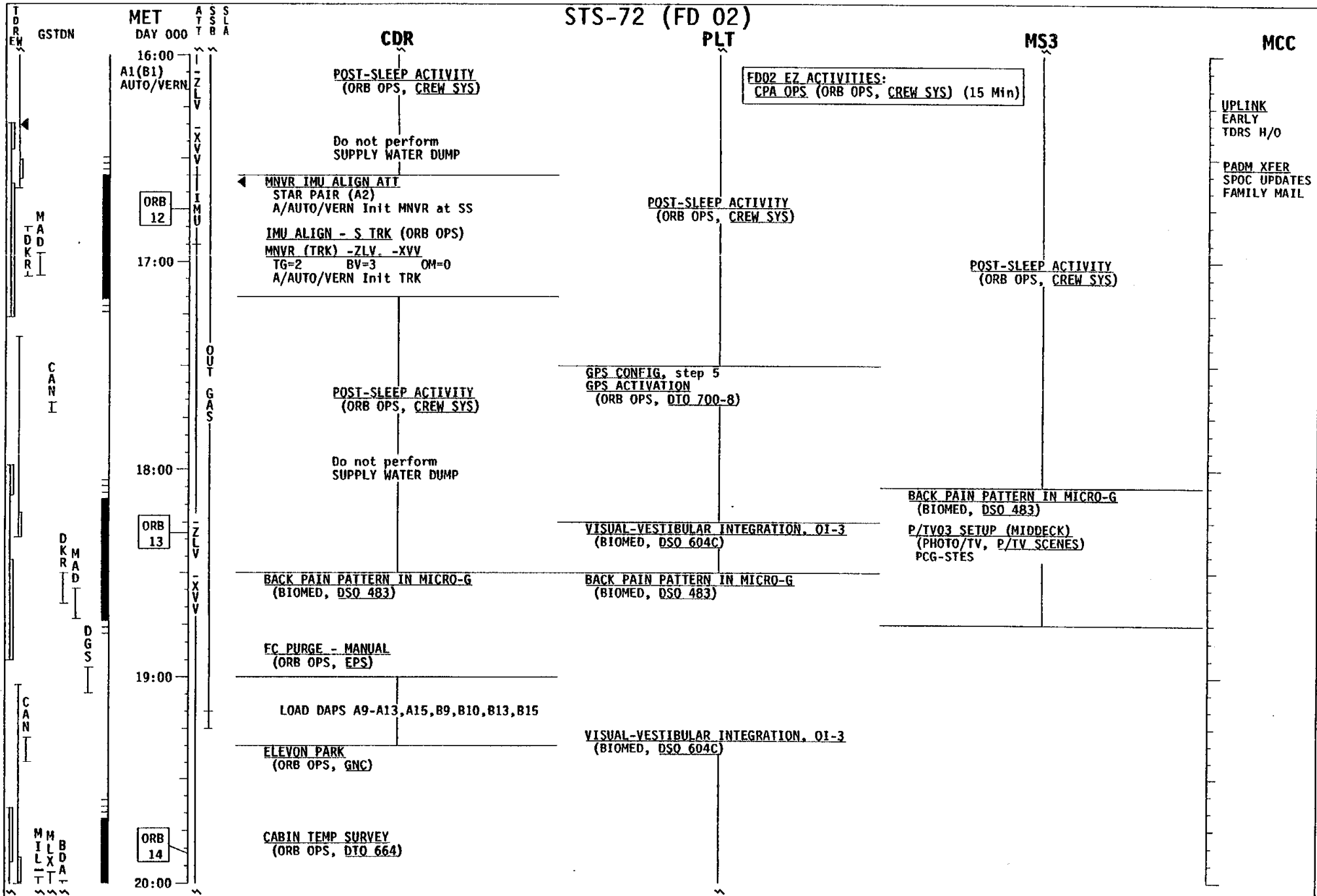


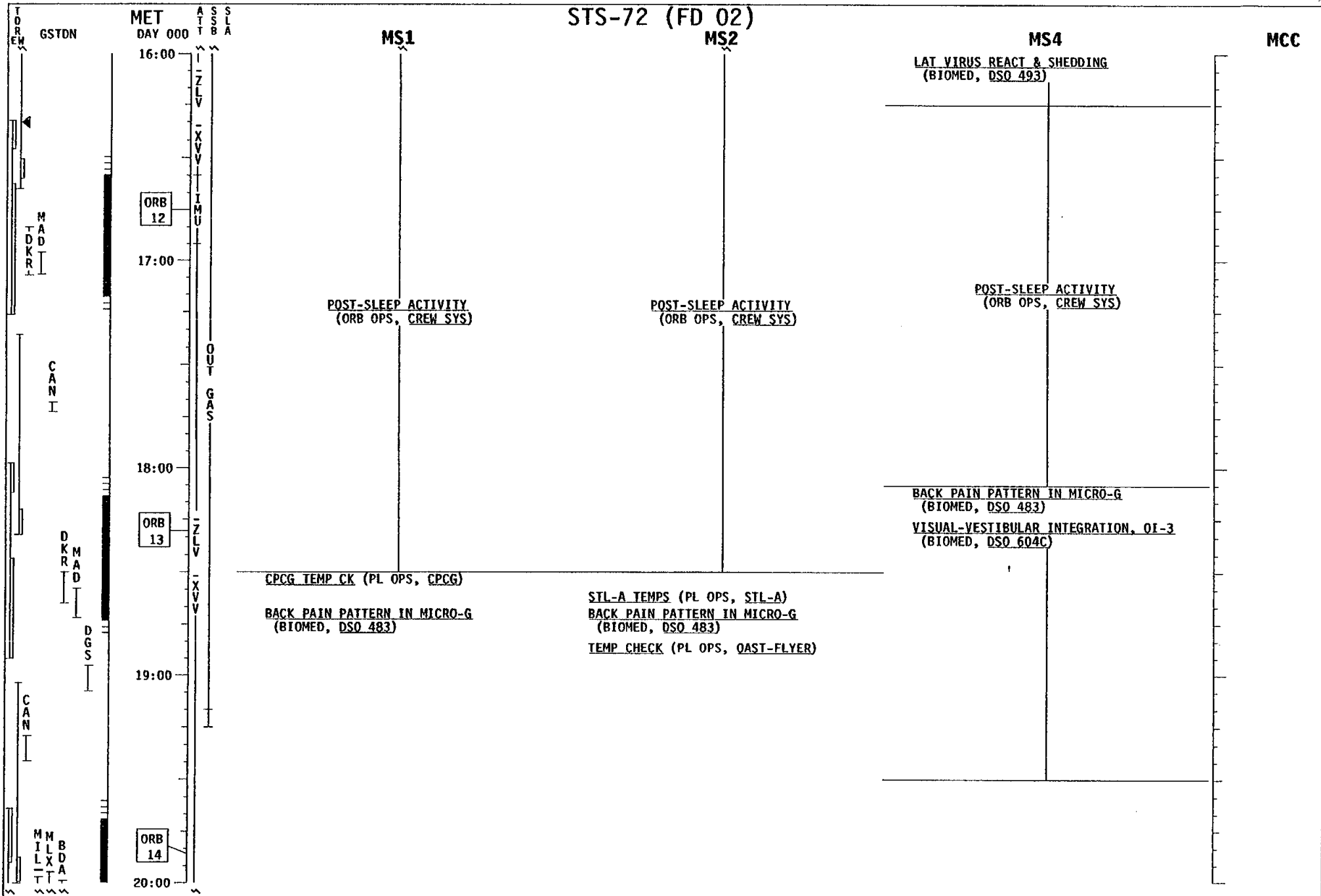


STS-72 (FD 02)









STS-72 (FD 02) PLT

CDR

MS3

MCC

MET
DAY 000

20:00
A1(B1)
AUTO/VERN

EXERCISE

VISUAL-VESTIBULAR INTEGRATION, 01-3
(BIOMED, DSO 604C)

VDA ACTIVATION
(PL OPS, PCG-STES)

VDA ACTIVATION
(PL OPS, PCG-STES)

21:00

FILTER CLEANING
(IFM, SCHEDULED MAINTENANCE)

ORB
15

UPLINK
EARLY TDORS
H/O

22:00

ON-ORBIT +X RCS BURN
(ORB OPS, RCS)
(2 Cmn)

ON-ORBIT +X RCS BURN
(ORB OPS, RCS)
(2 Cmn)

(A1)B1
AUTO/VERN

ORB
16

INRT/PRI
23:00
A1(B1)
AUTO/VERN

← NPC-S TIG (22:59)

← MNVR (TRK) -ZSI ATT
TG-4 BV-3 OM=290
A/AUTO/VERN (23:05) Init TRK

ABL PORT RMS HTR (two)-AUTO

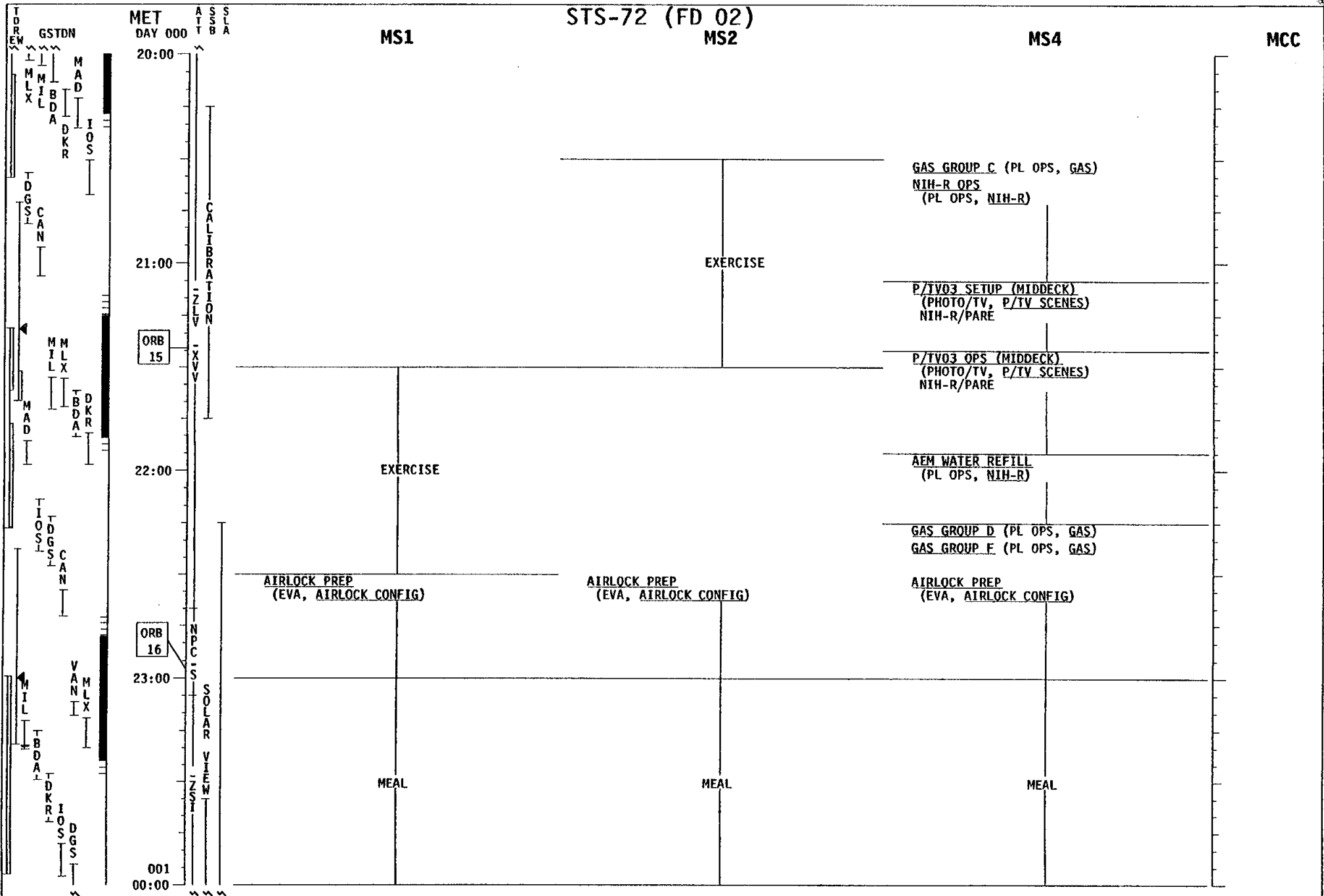
UPLINK
EARLY TDORS
H/O

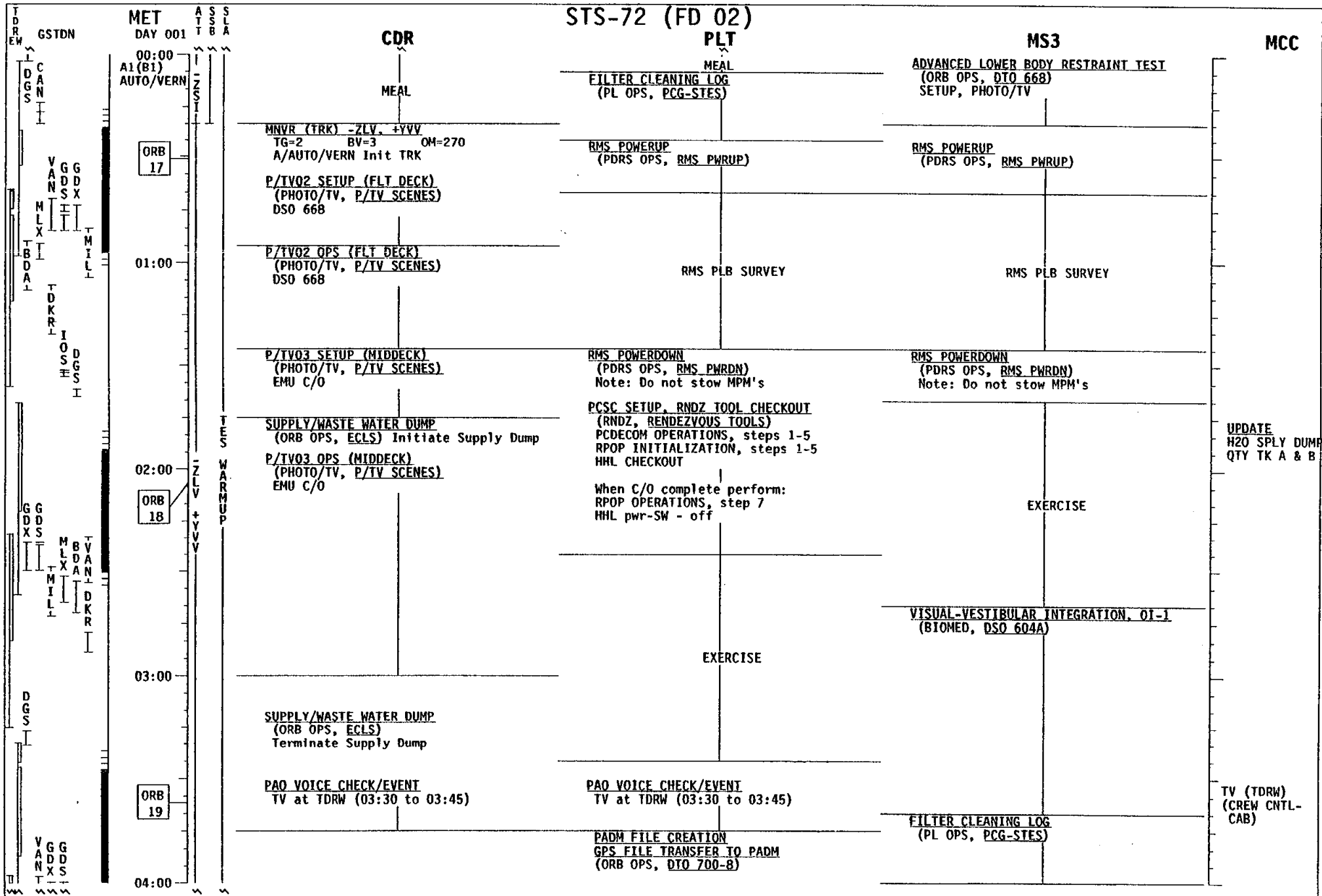
MEAL

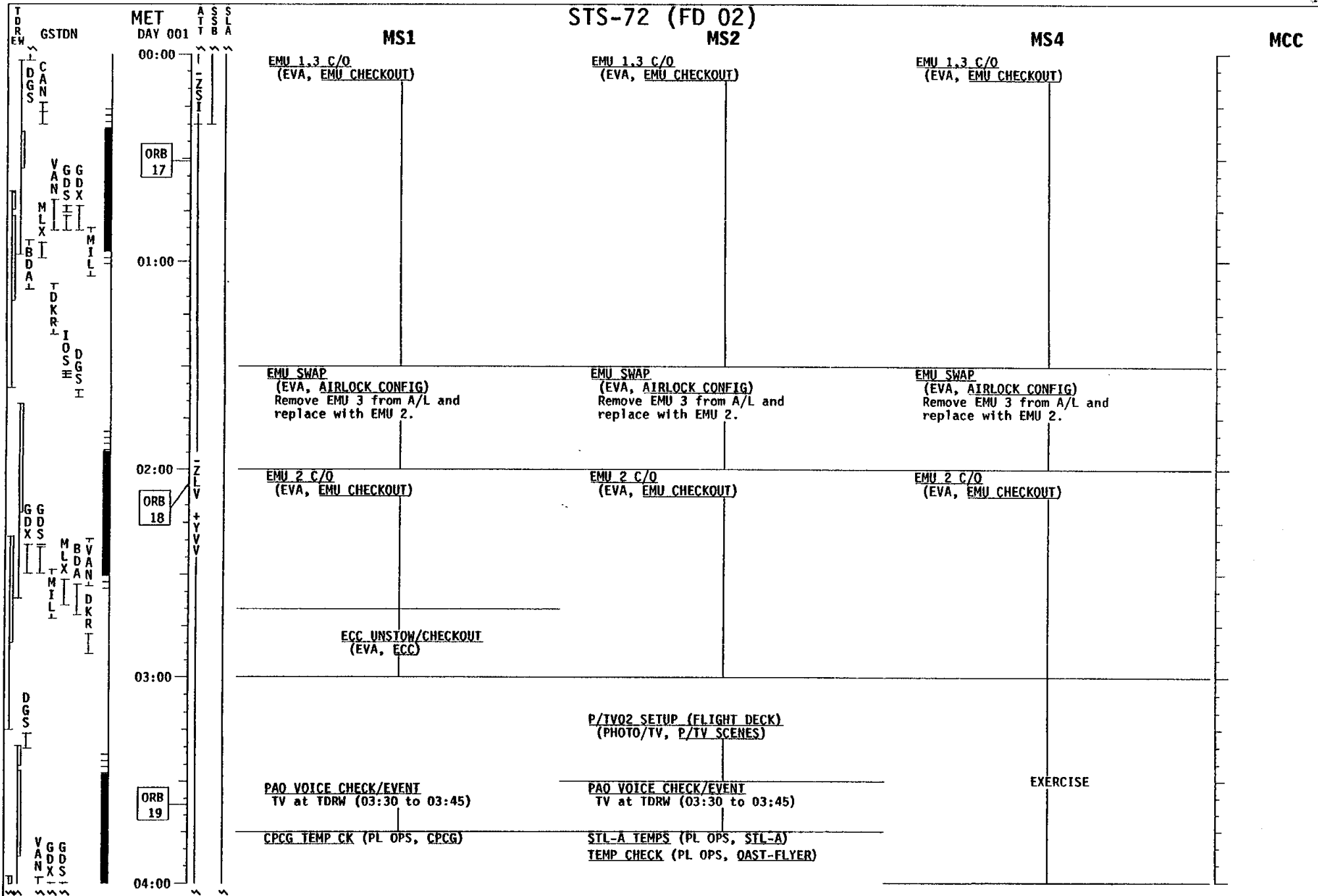
MEAL

MEAL

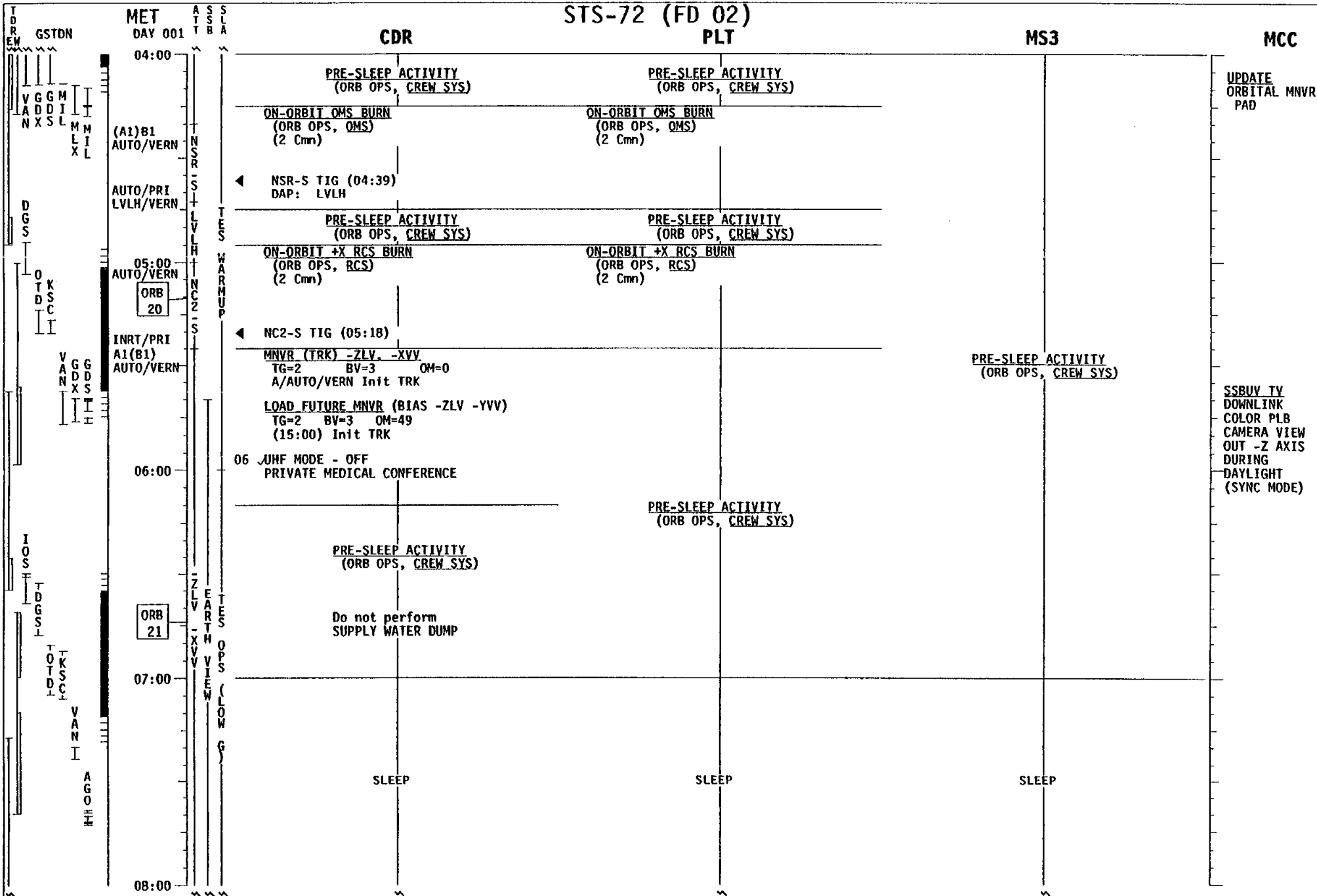
001
00:00







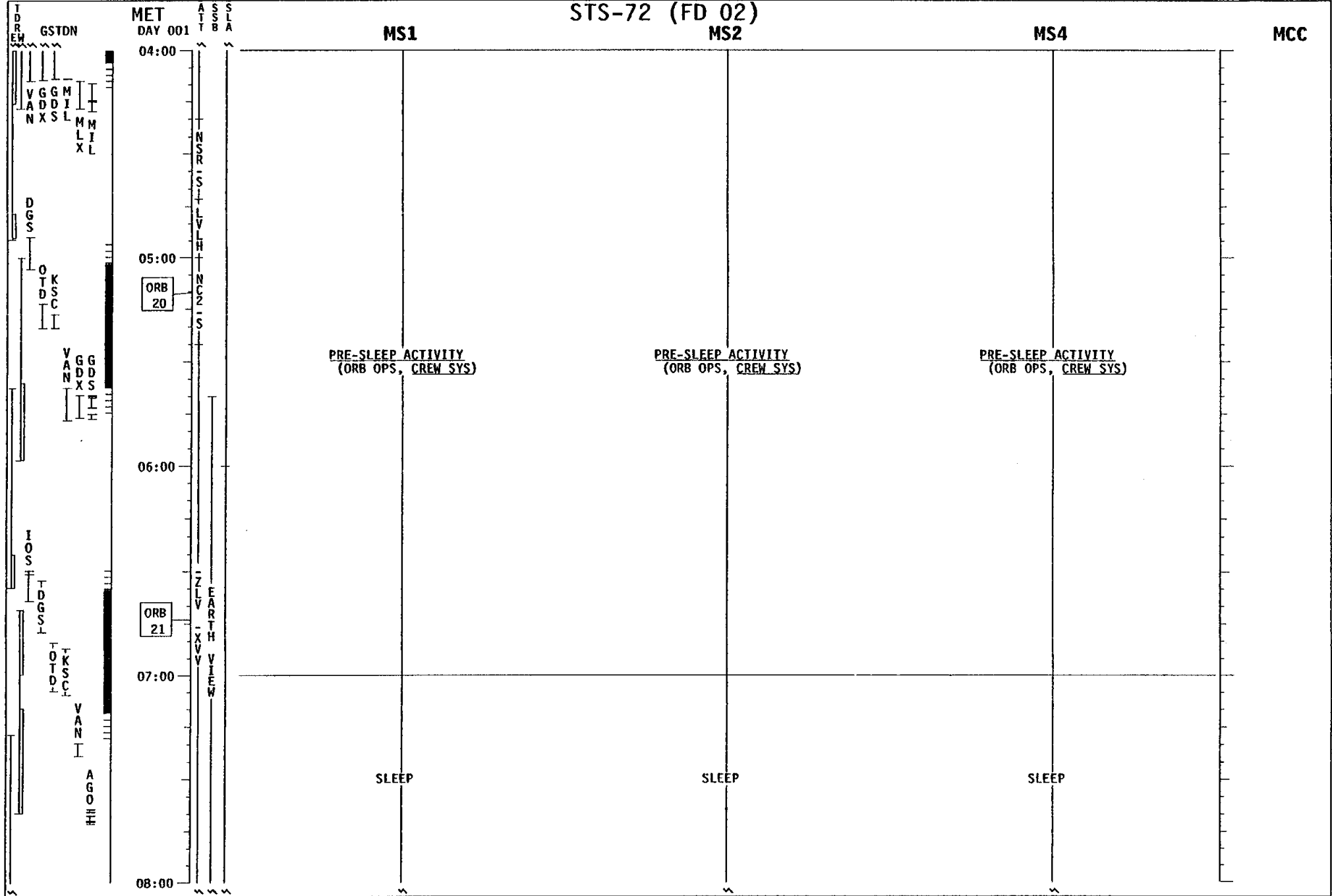
STS-72 (FD 02)



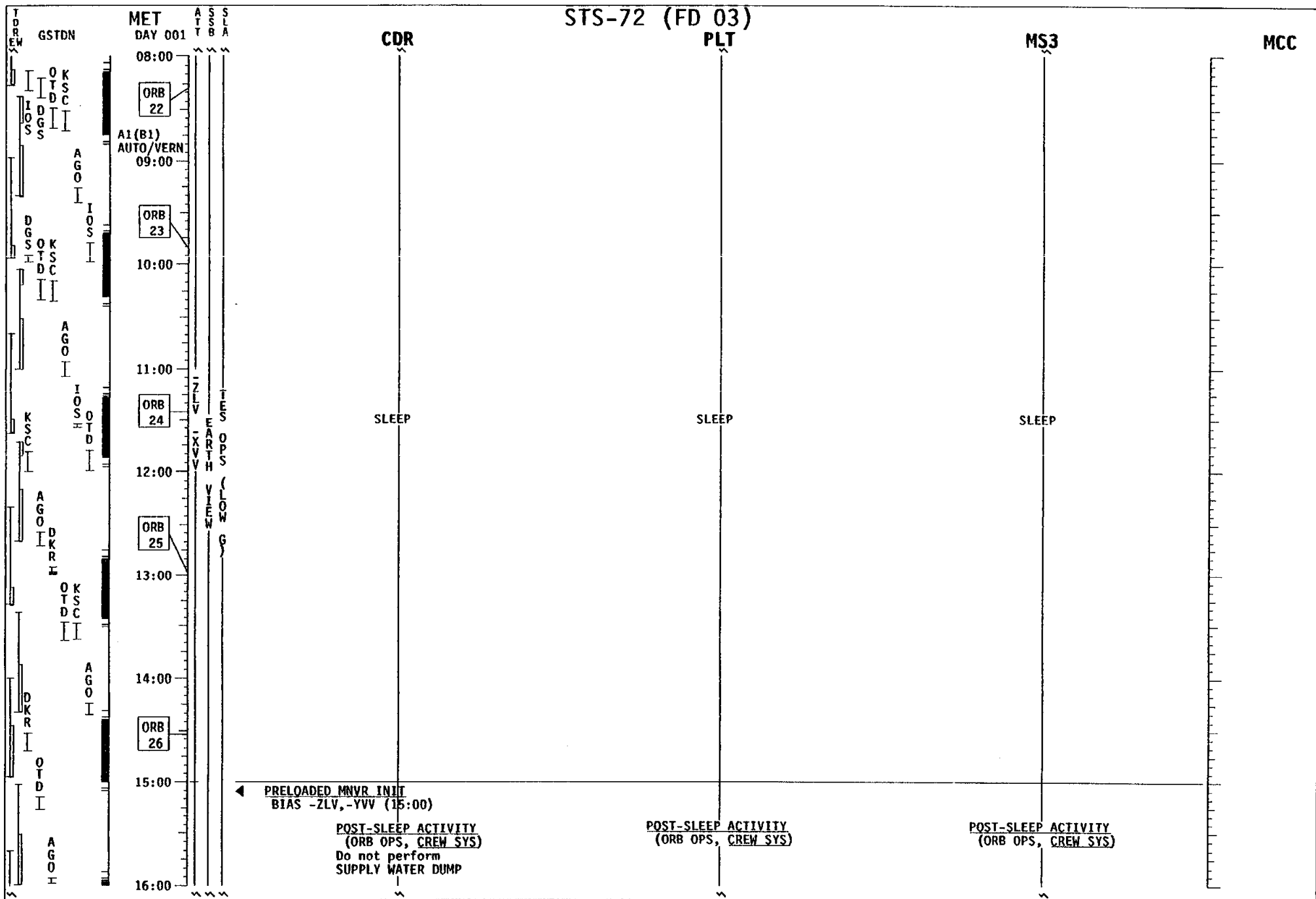
UPDATE ORBITAL MNVR PAD

SSBUY TV
DOWNLINK
COLOR PLB
CAMERA VIEW
OUT -Z AXIS
DURING
DAYLIGHT
(SYNC MODE)

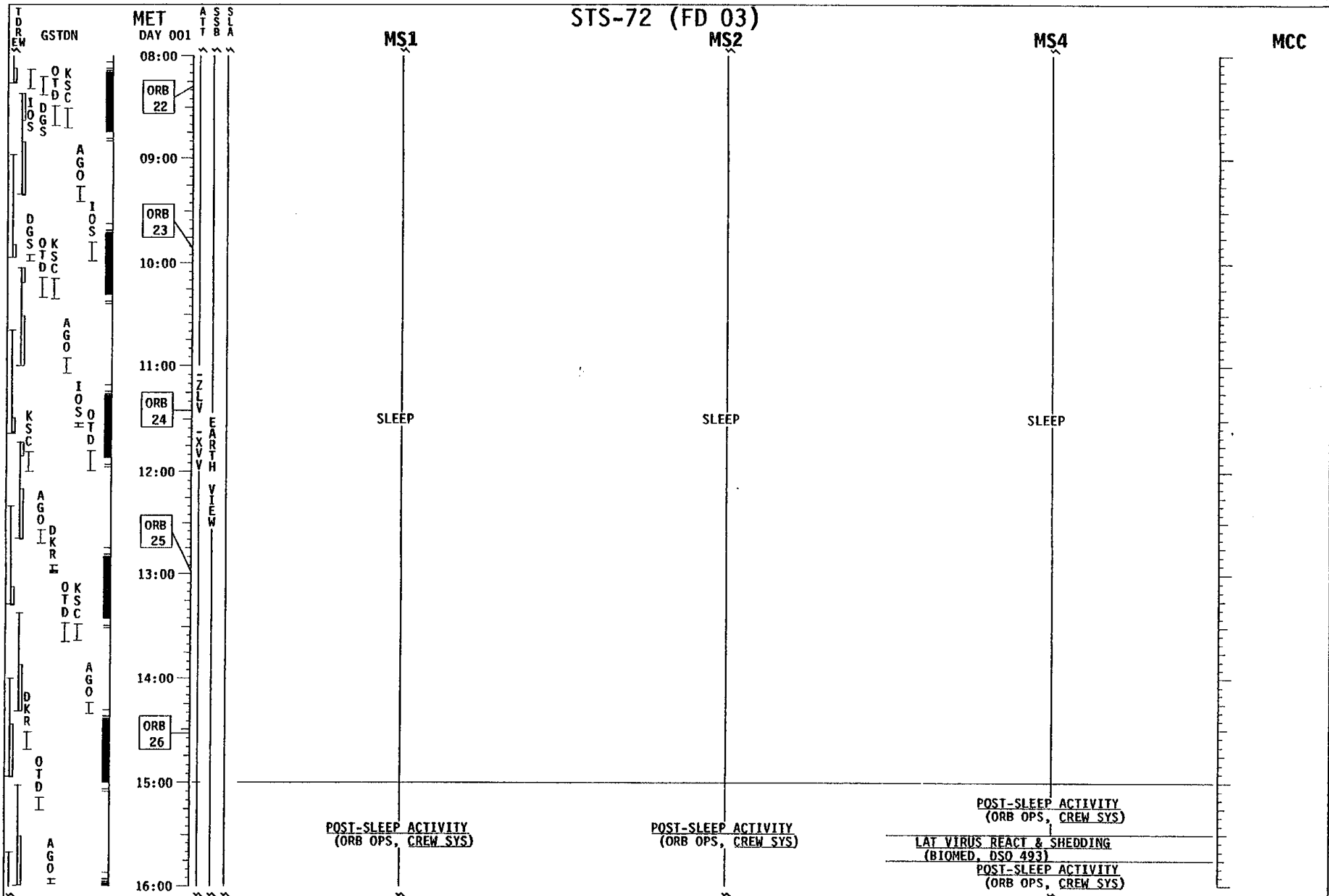
STS-72 (FD 02)



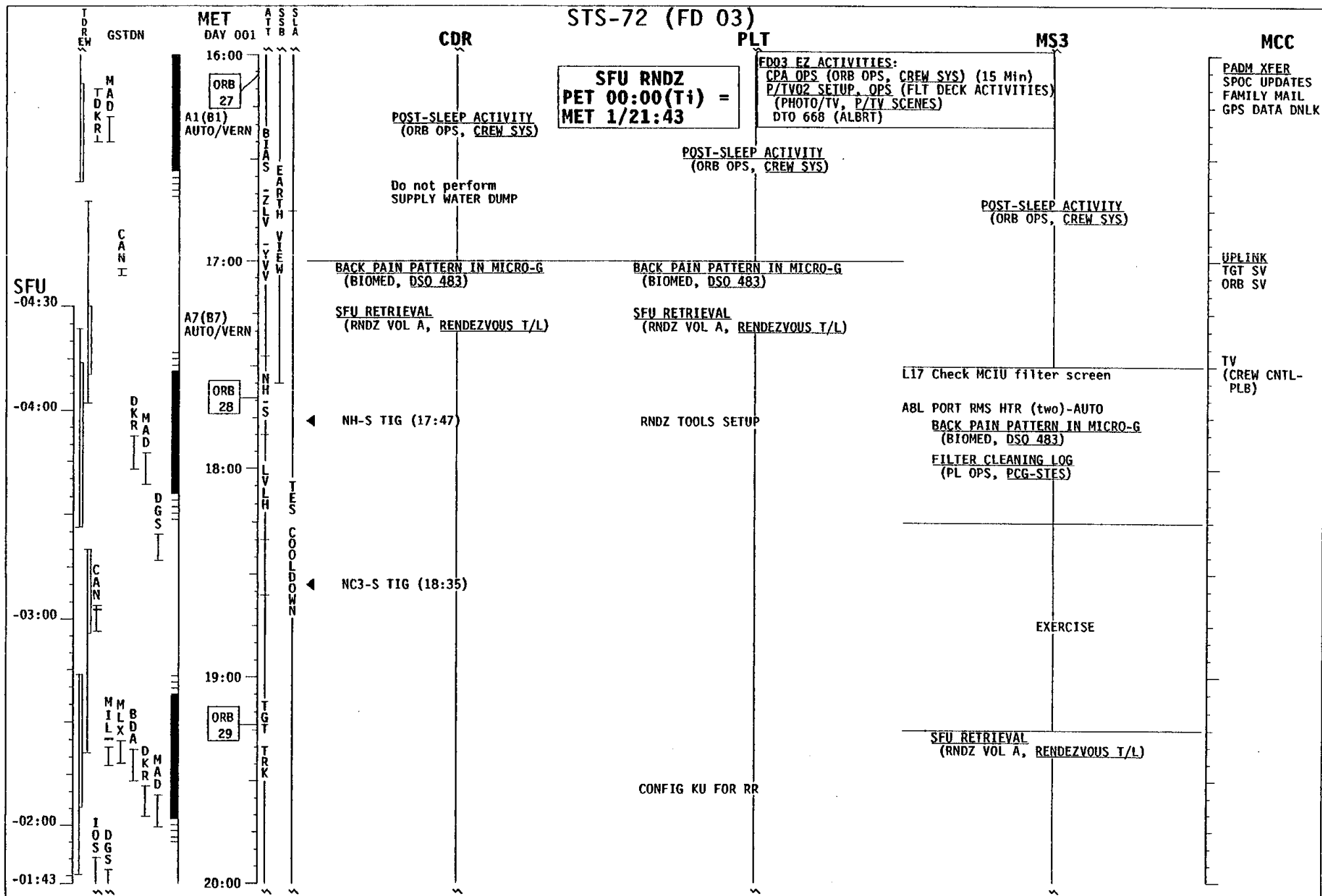
STS-72 (FD 03)



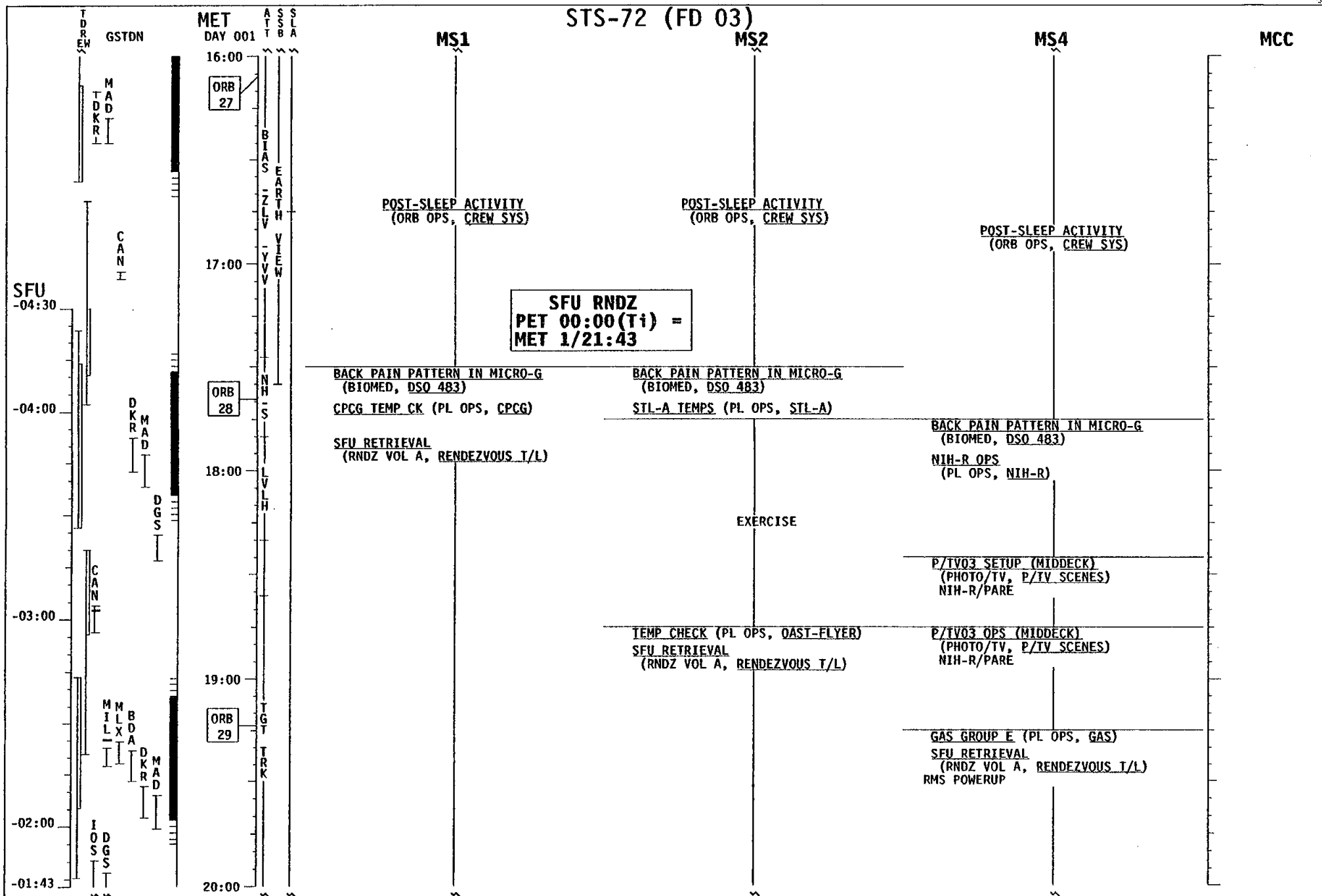
STS-72 (FD 03)



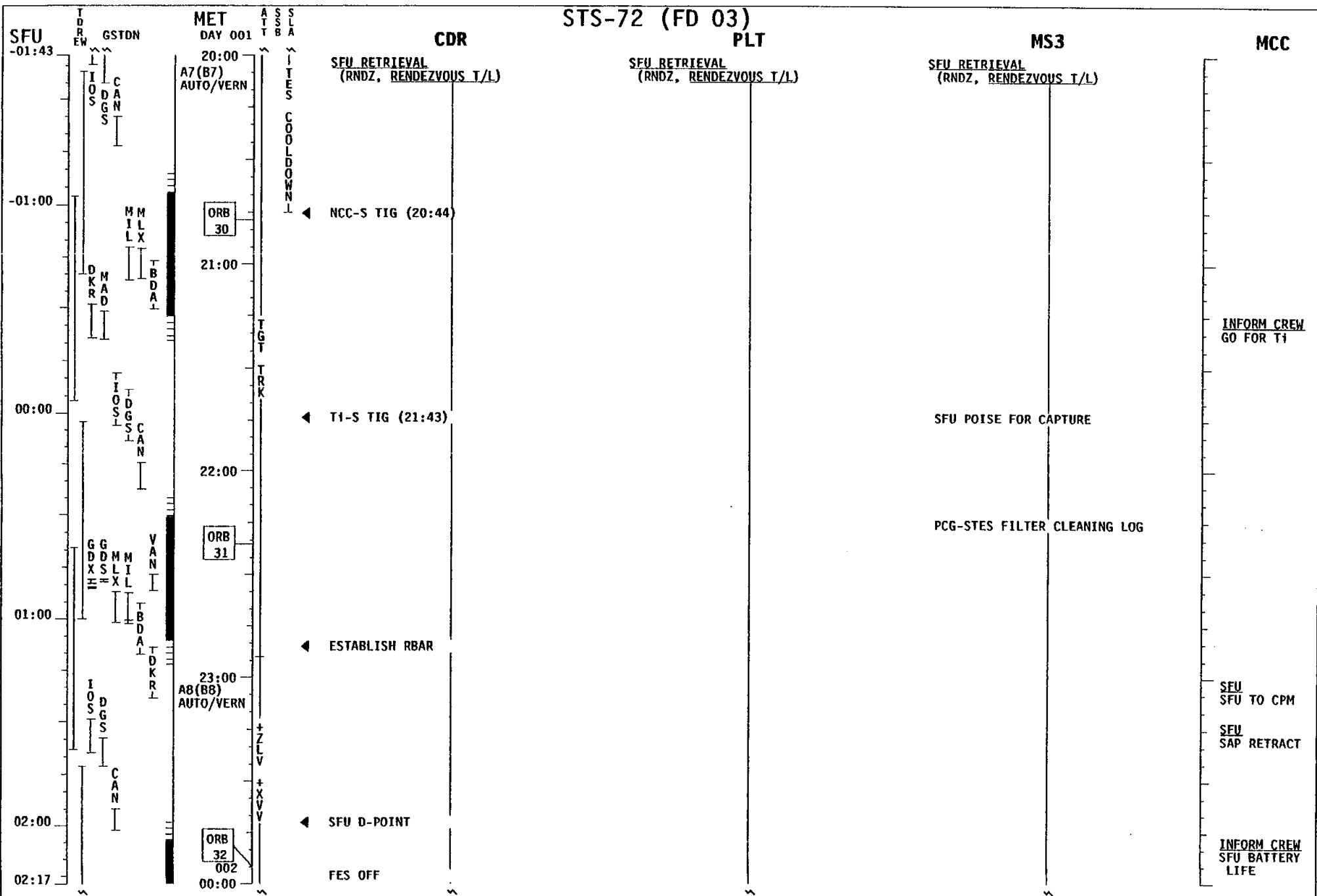
STS-72 (FD 03)



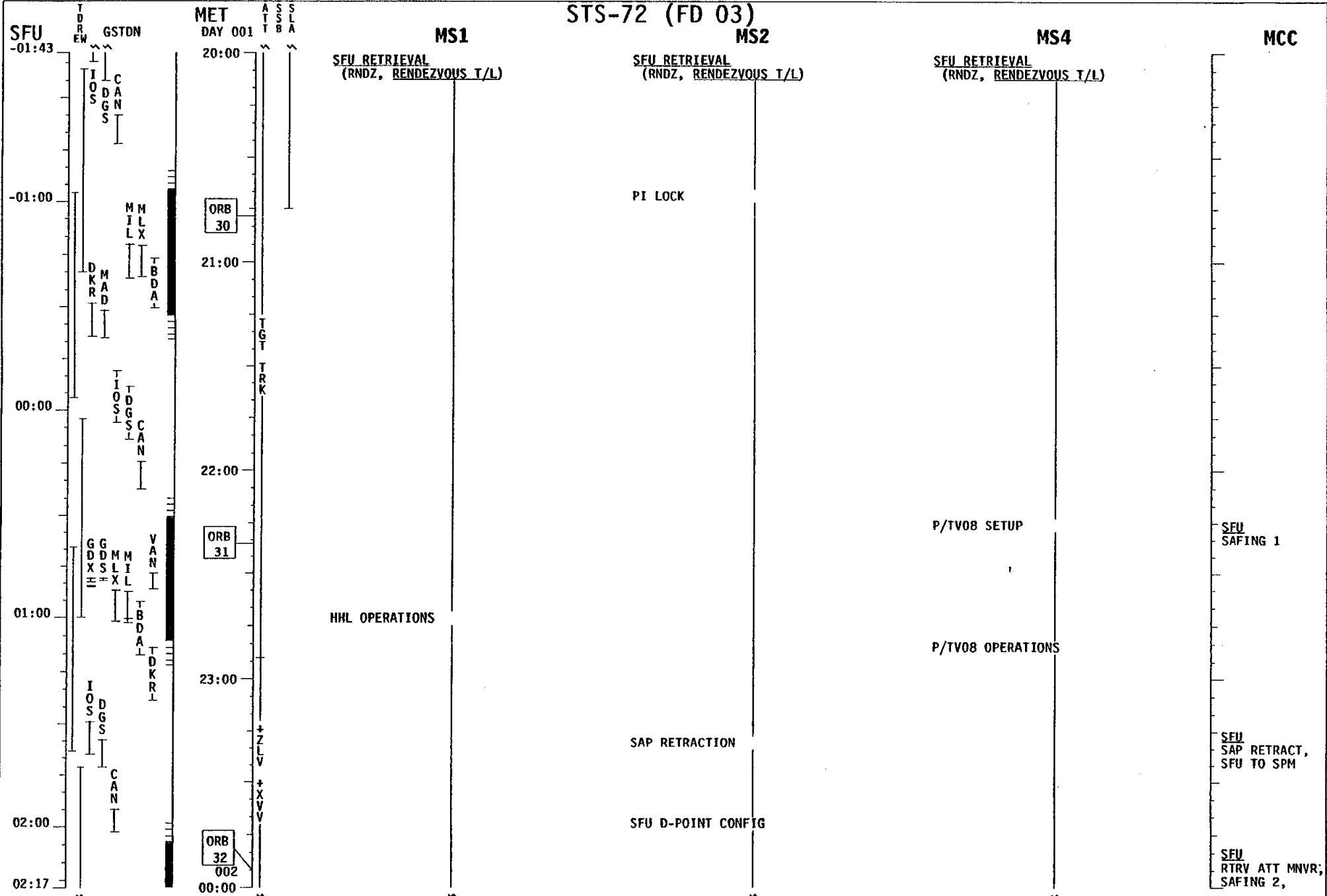
STS-72 (FD 03)

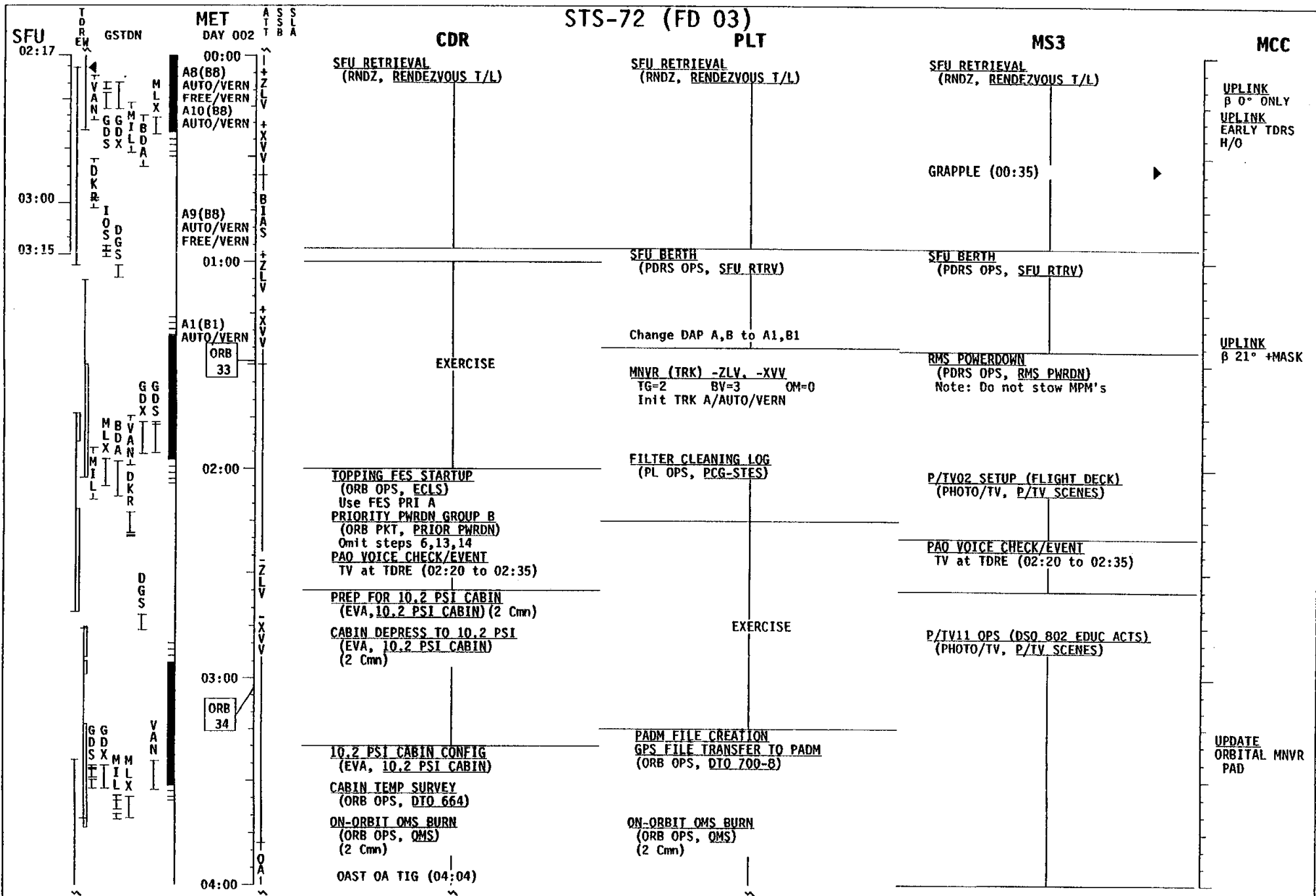


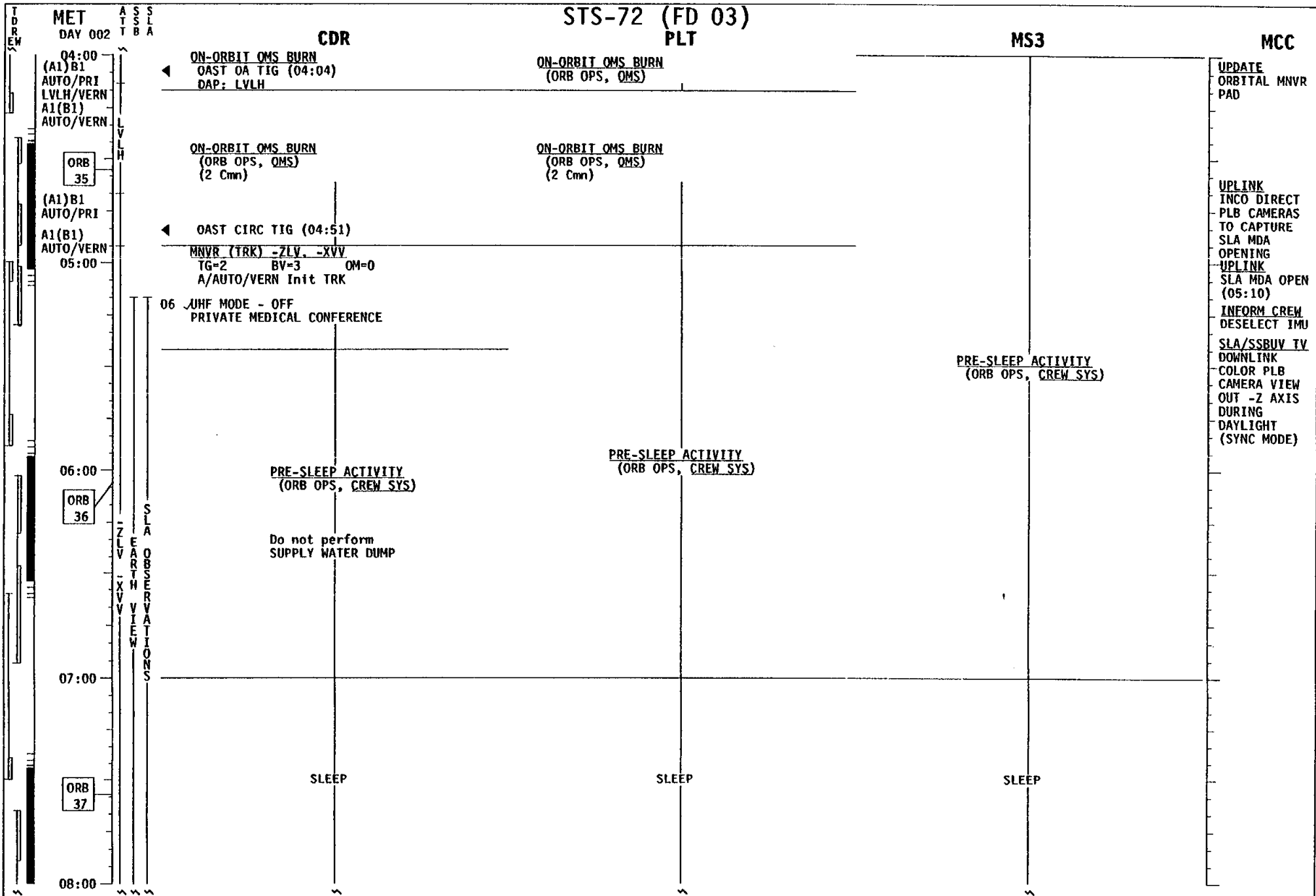
STS-72 (FD 03)

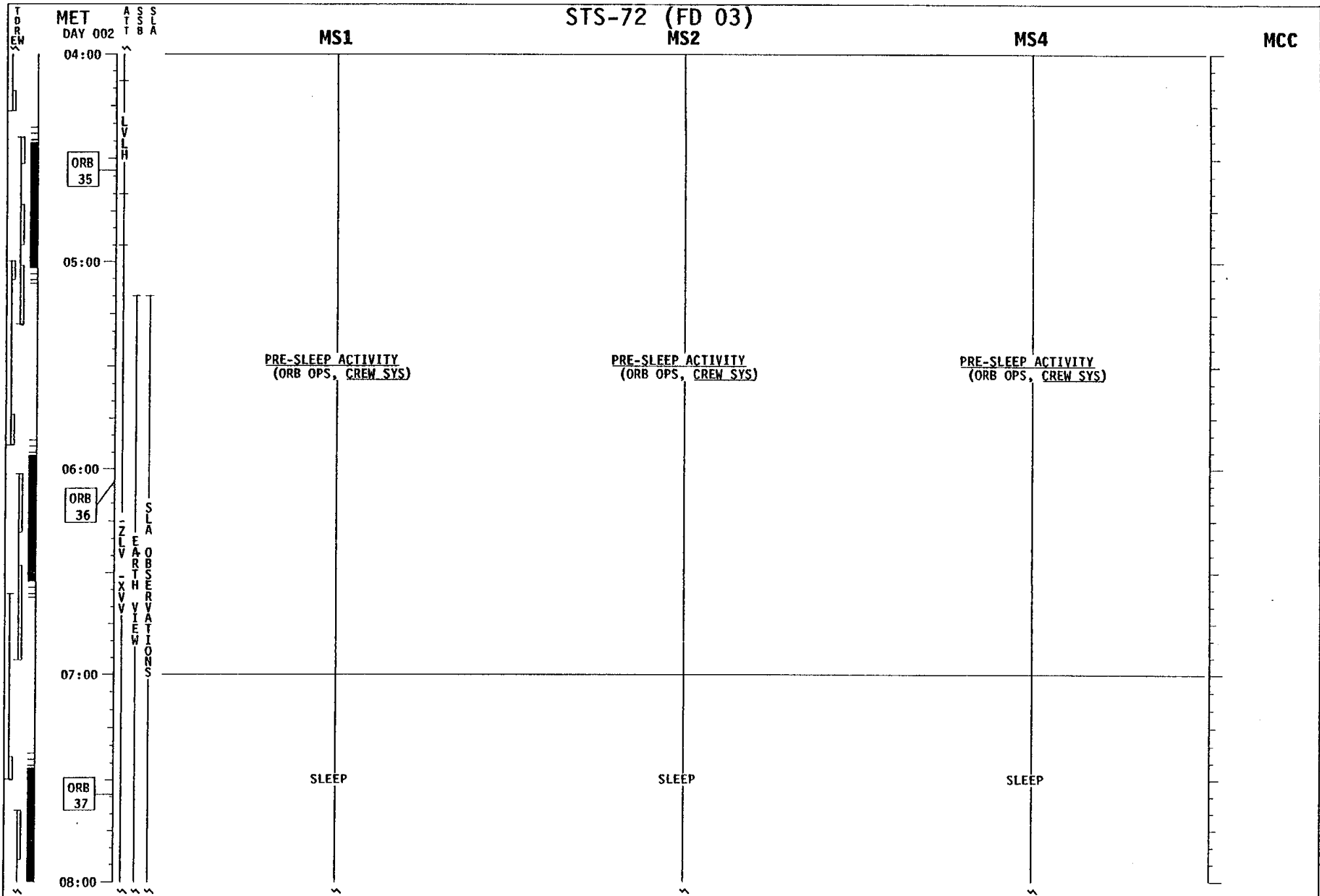


STS-72 (FD 03)

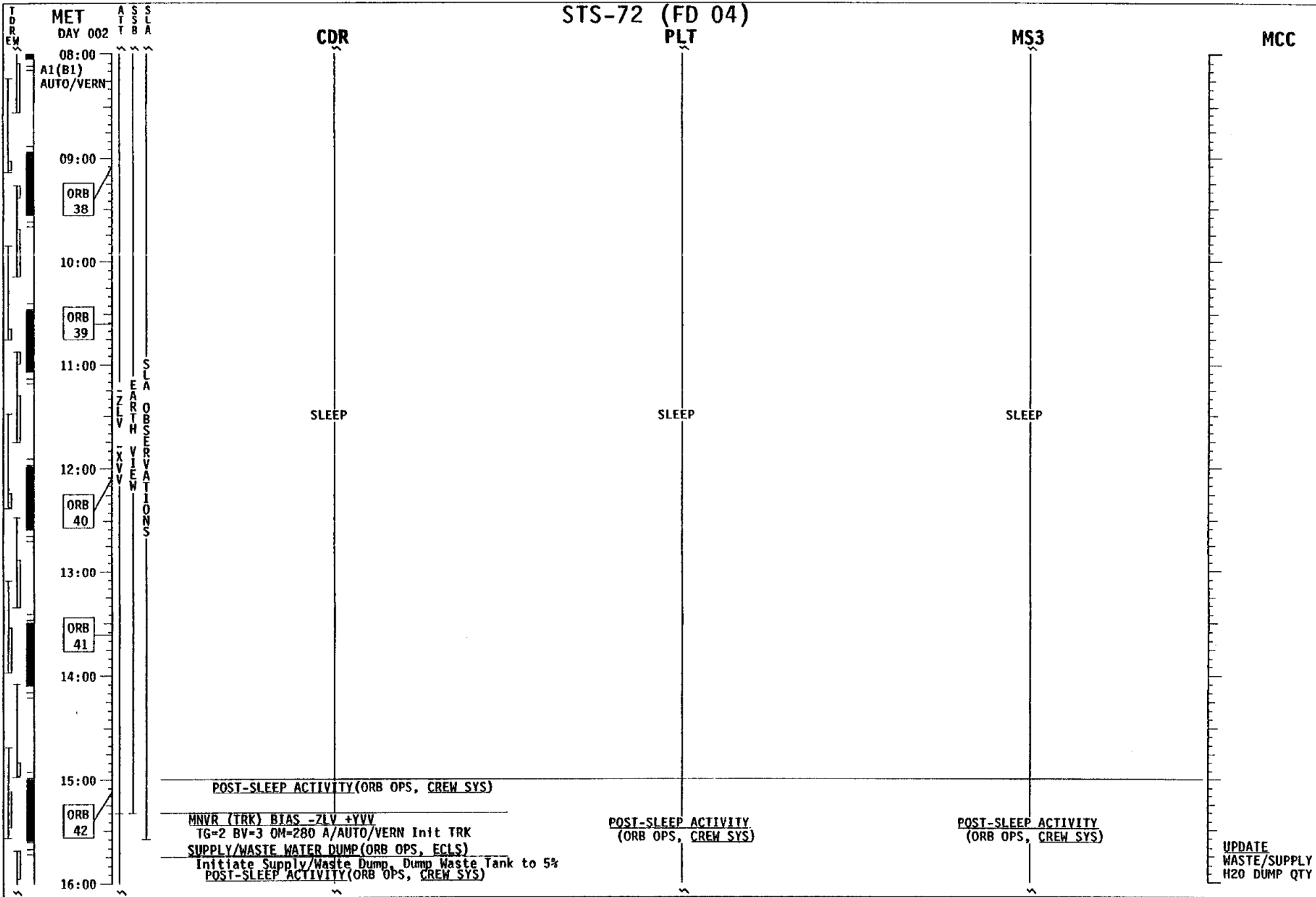


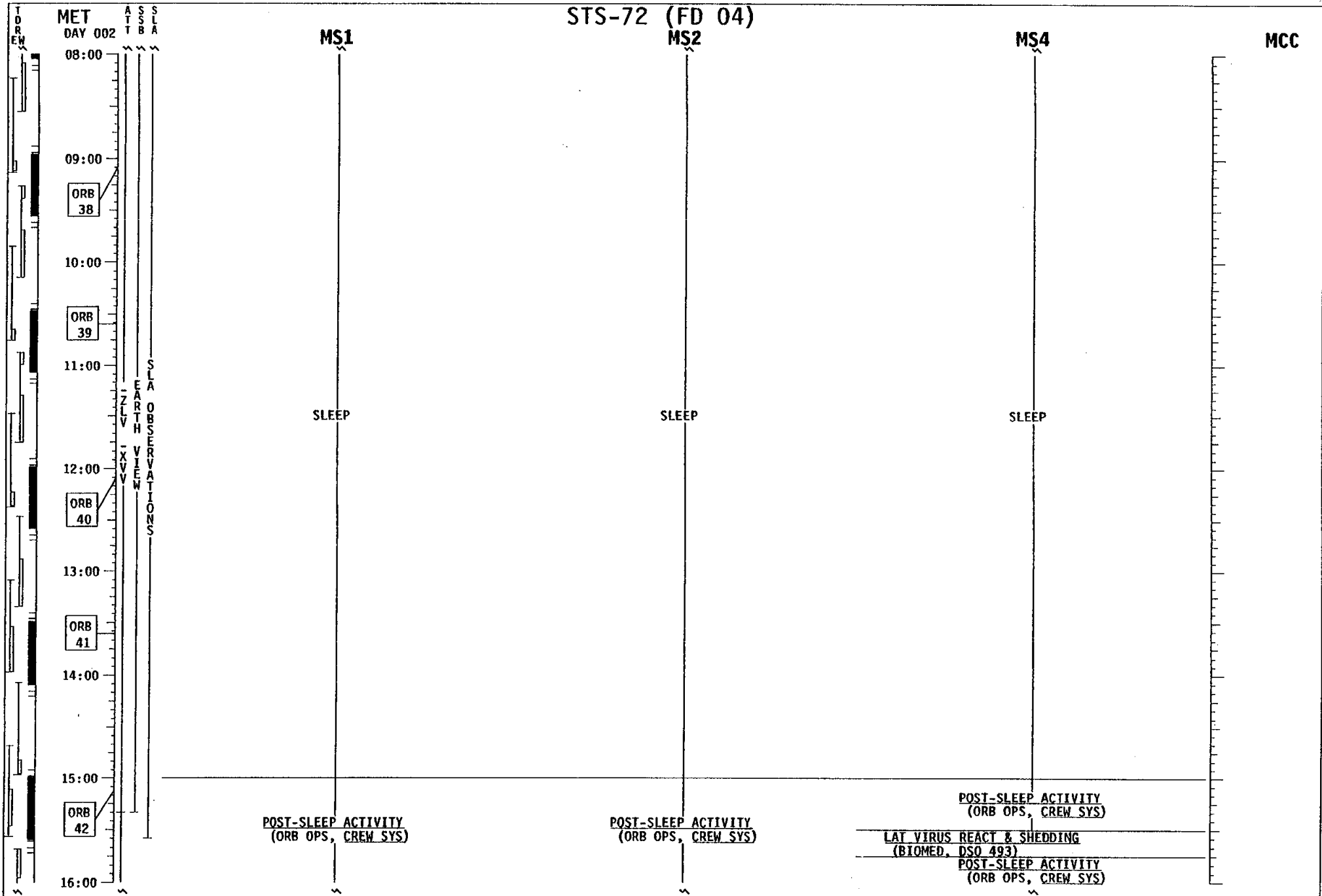


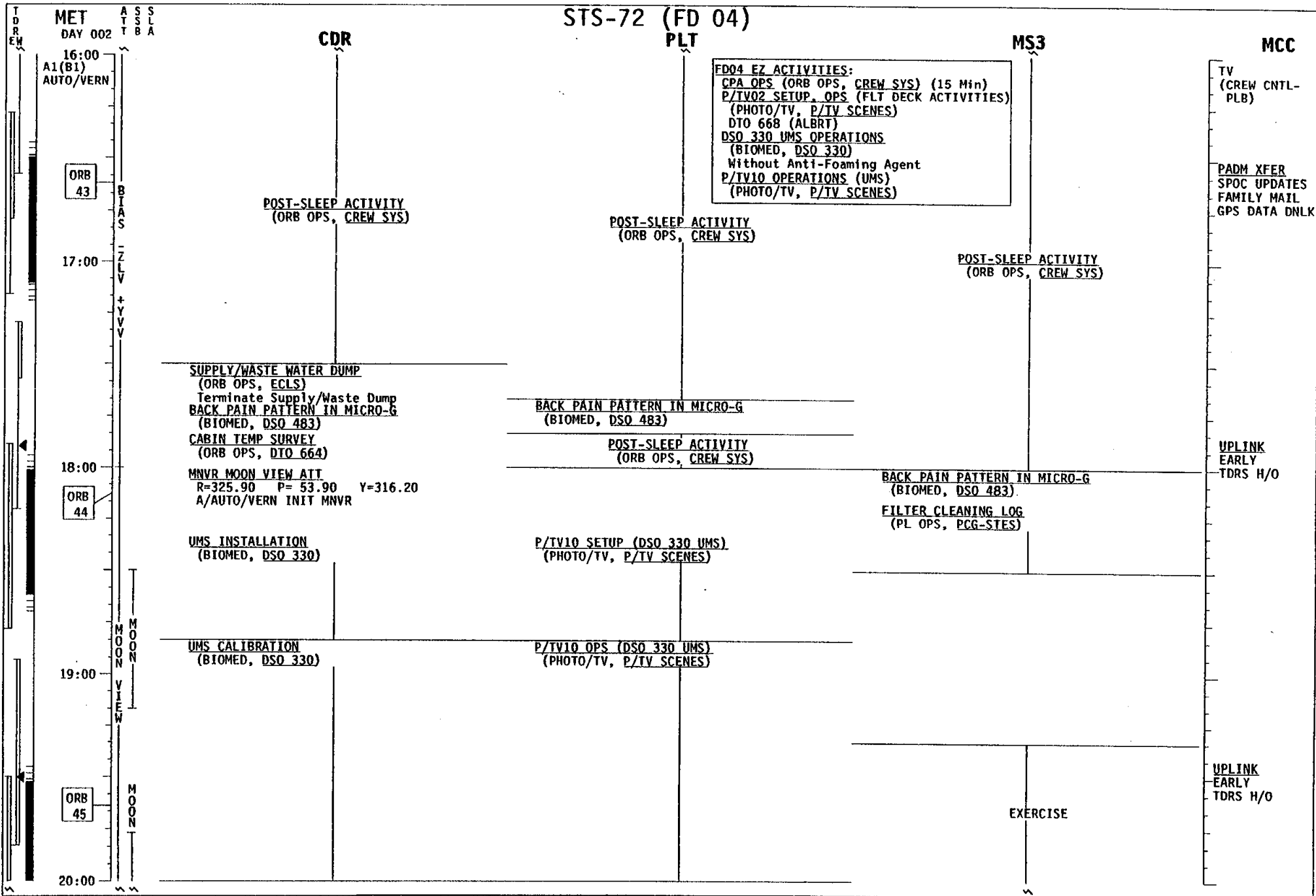


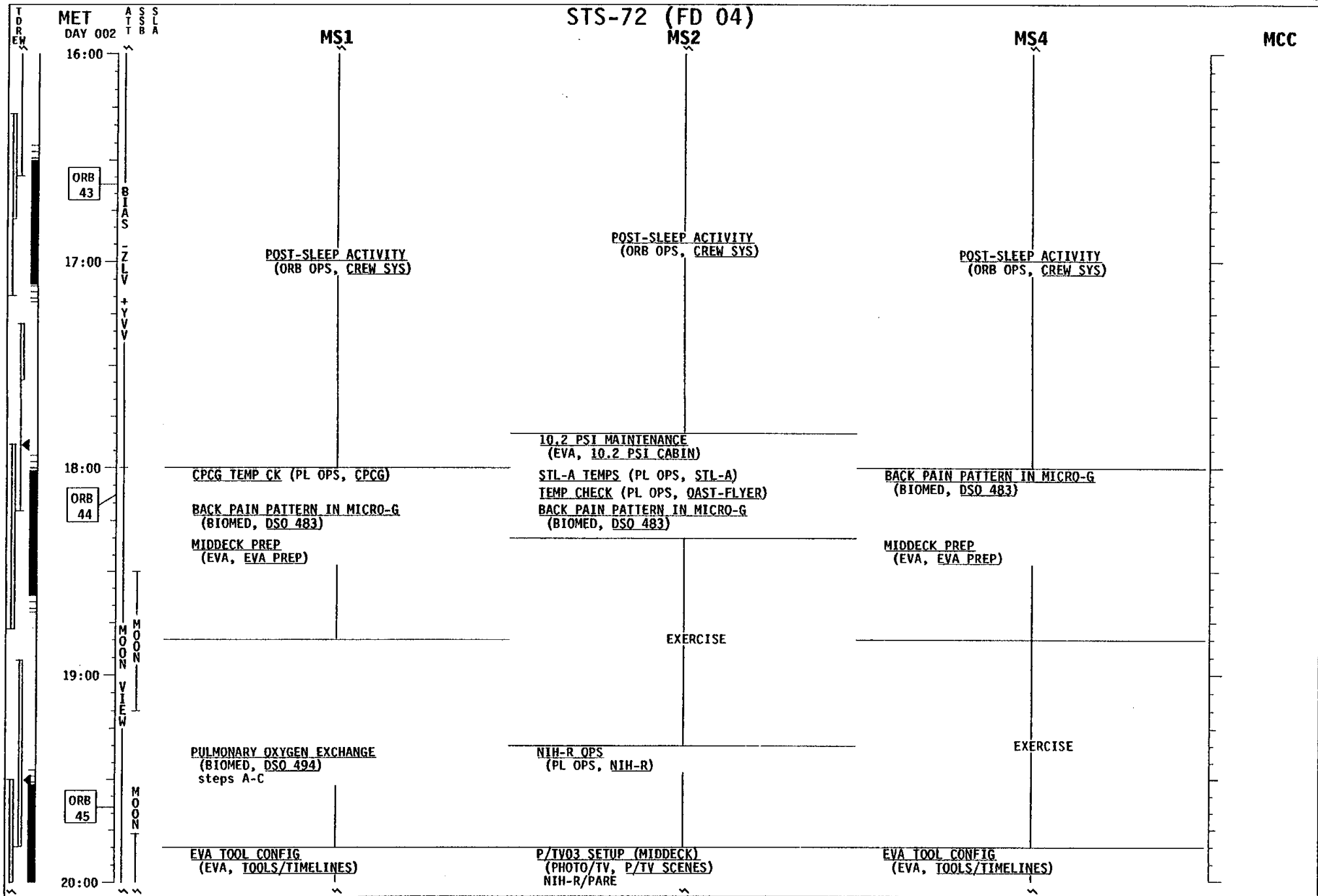


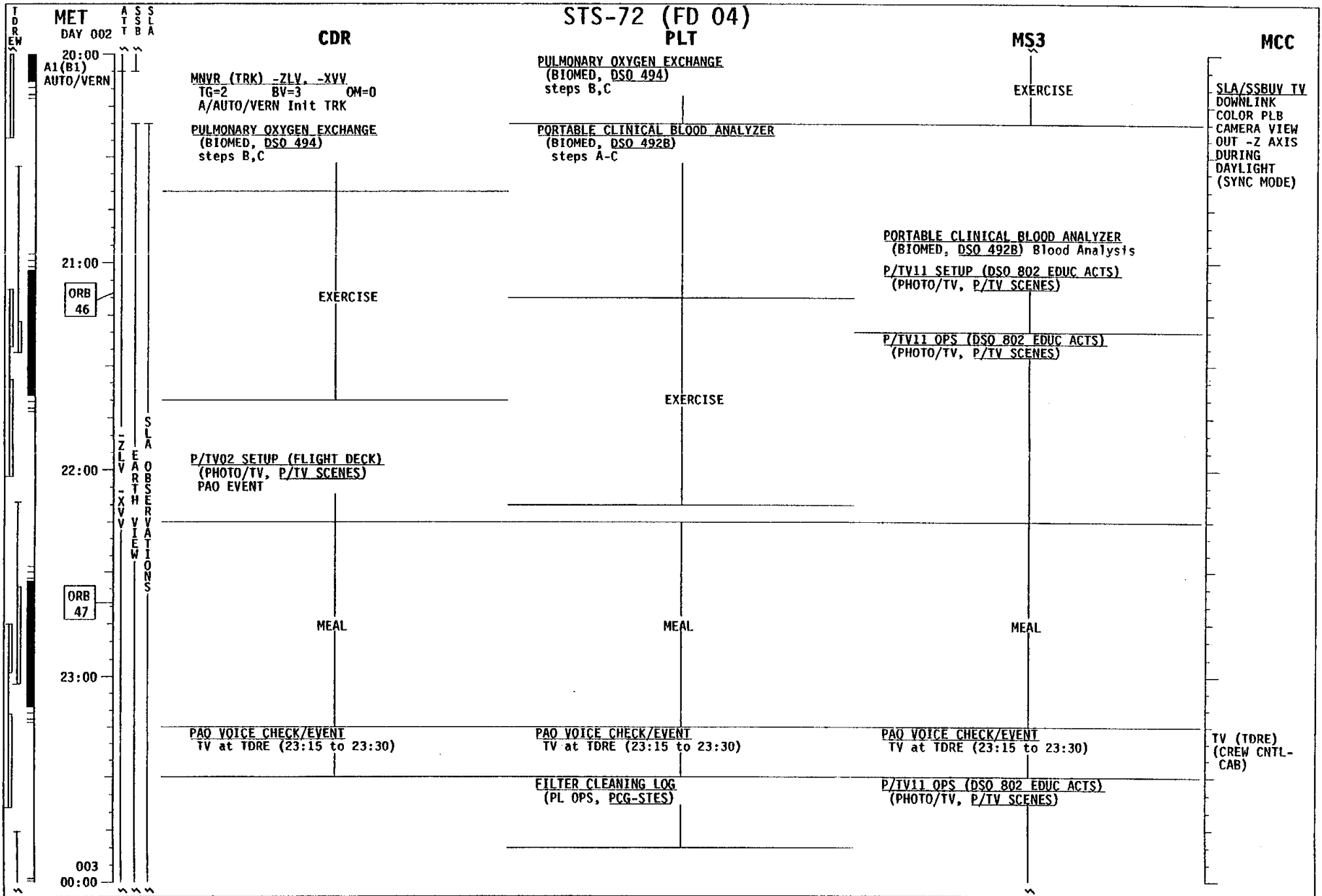
STS-72 (FD 04)

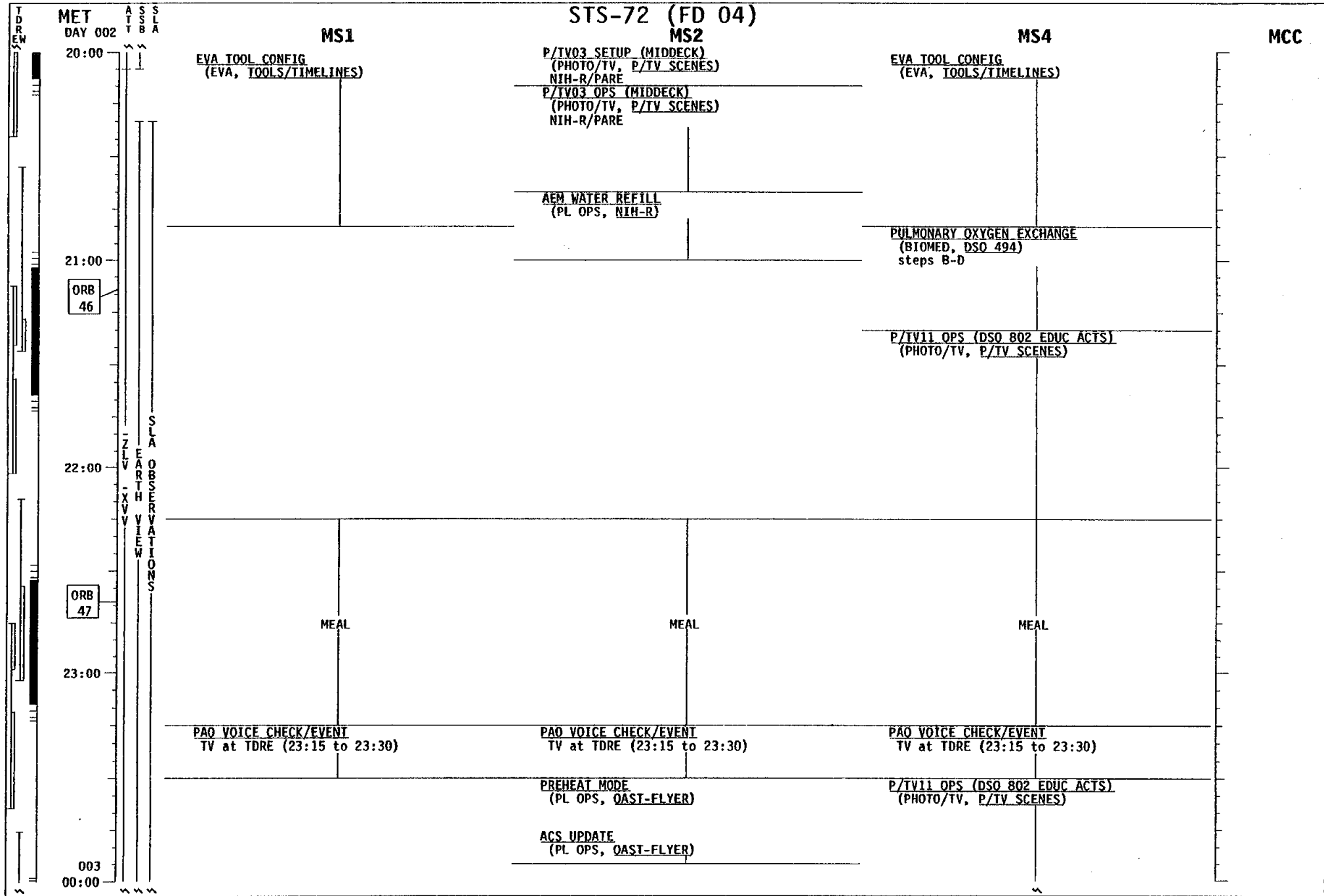


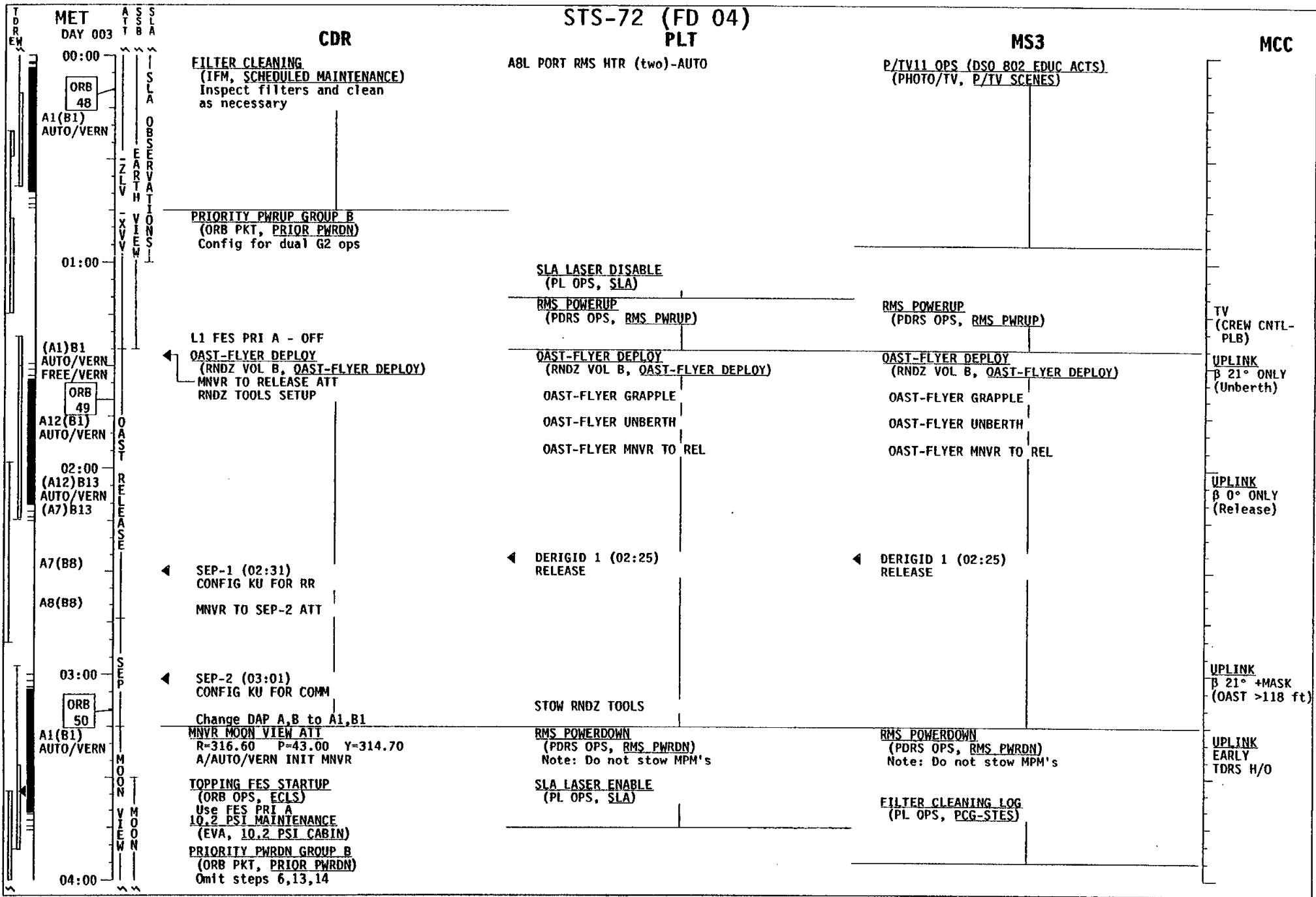


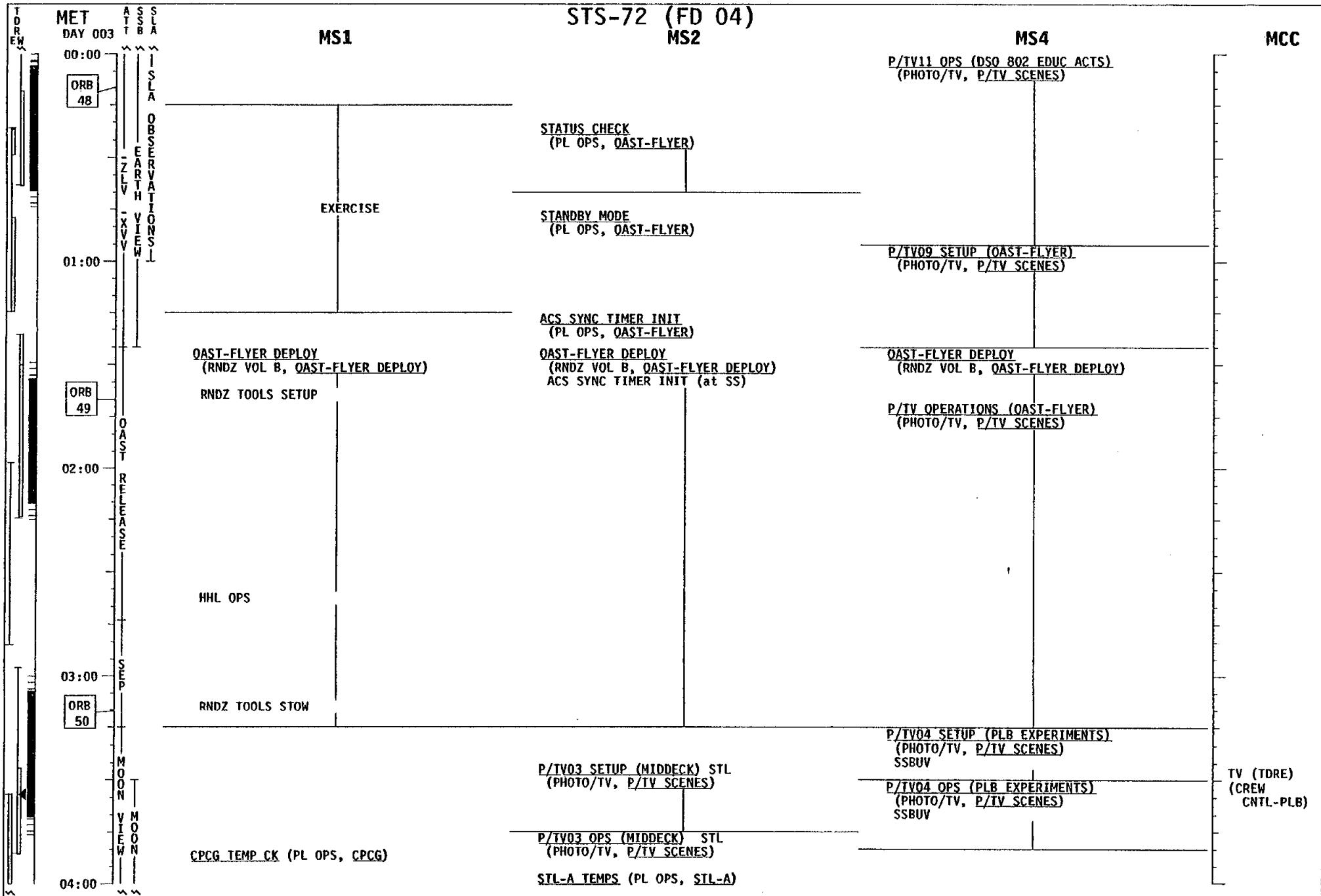


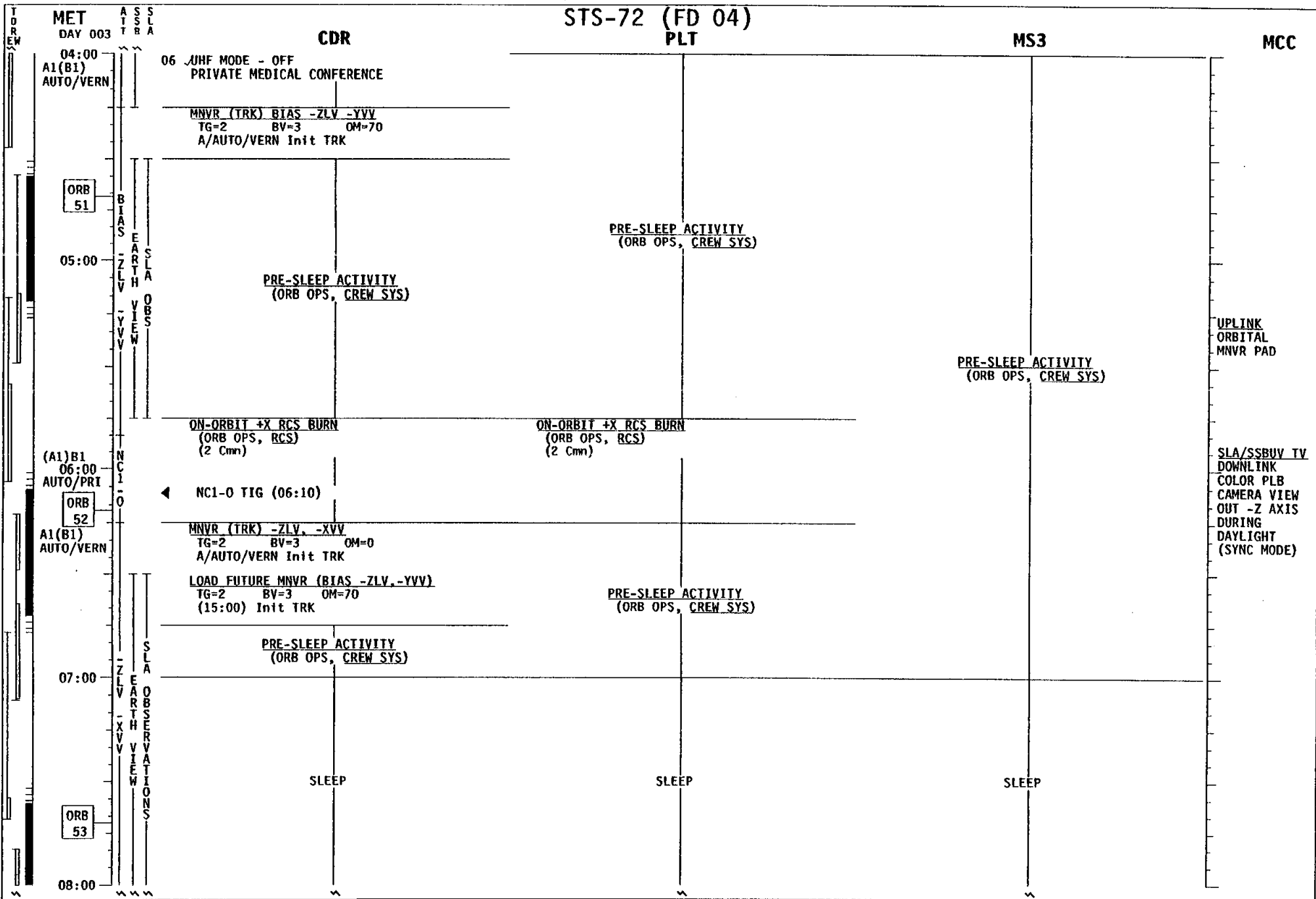


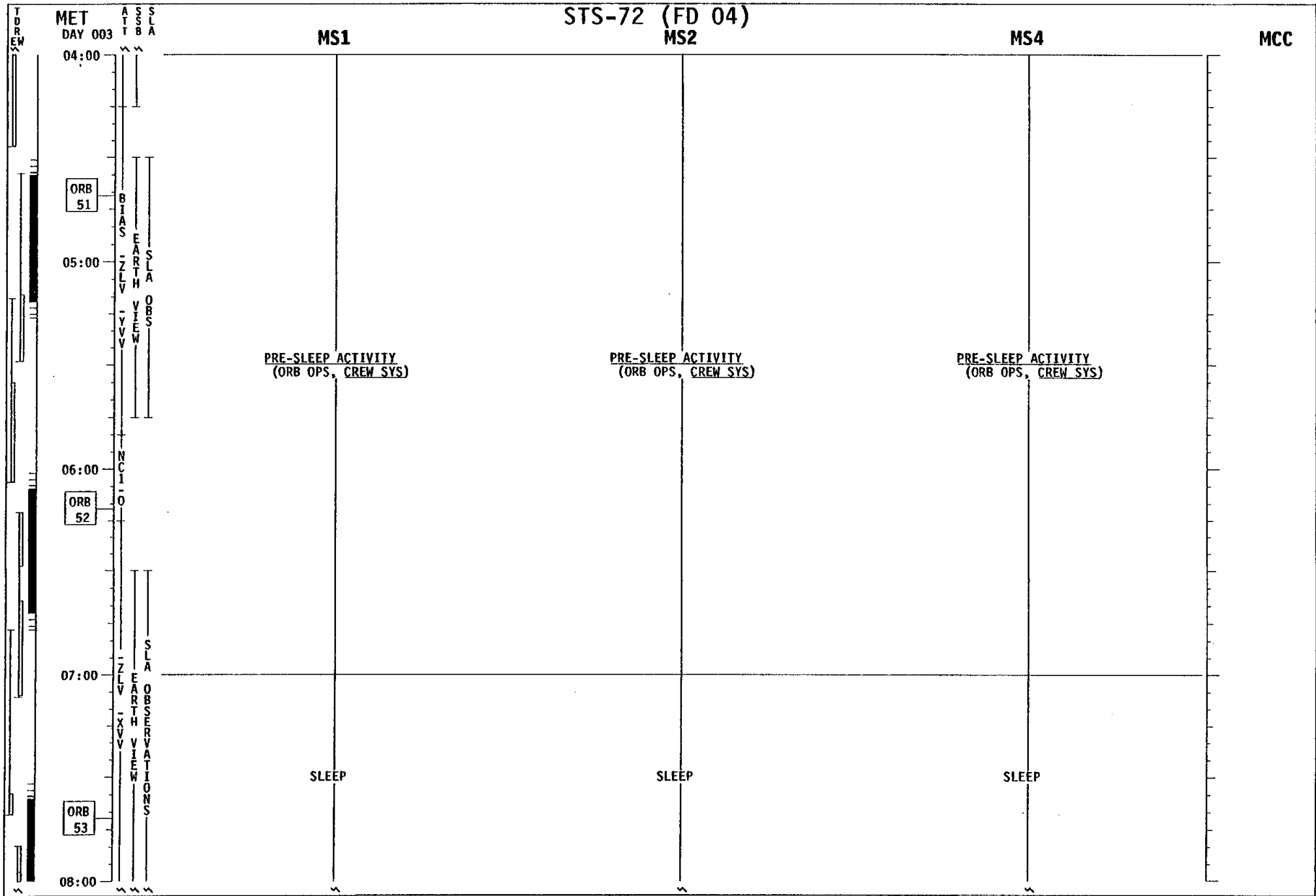


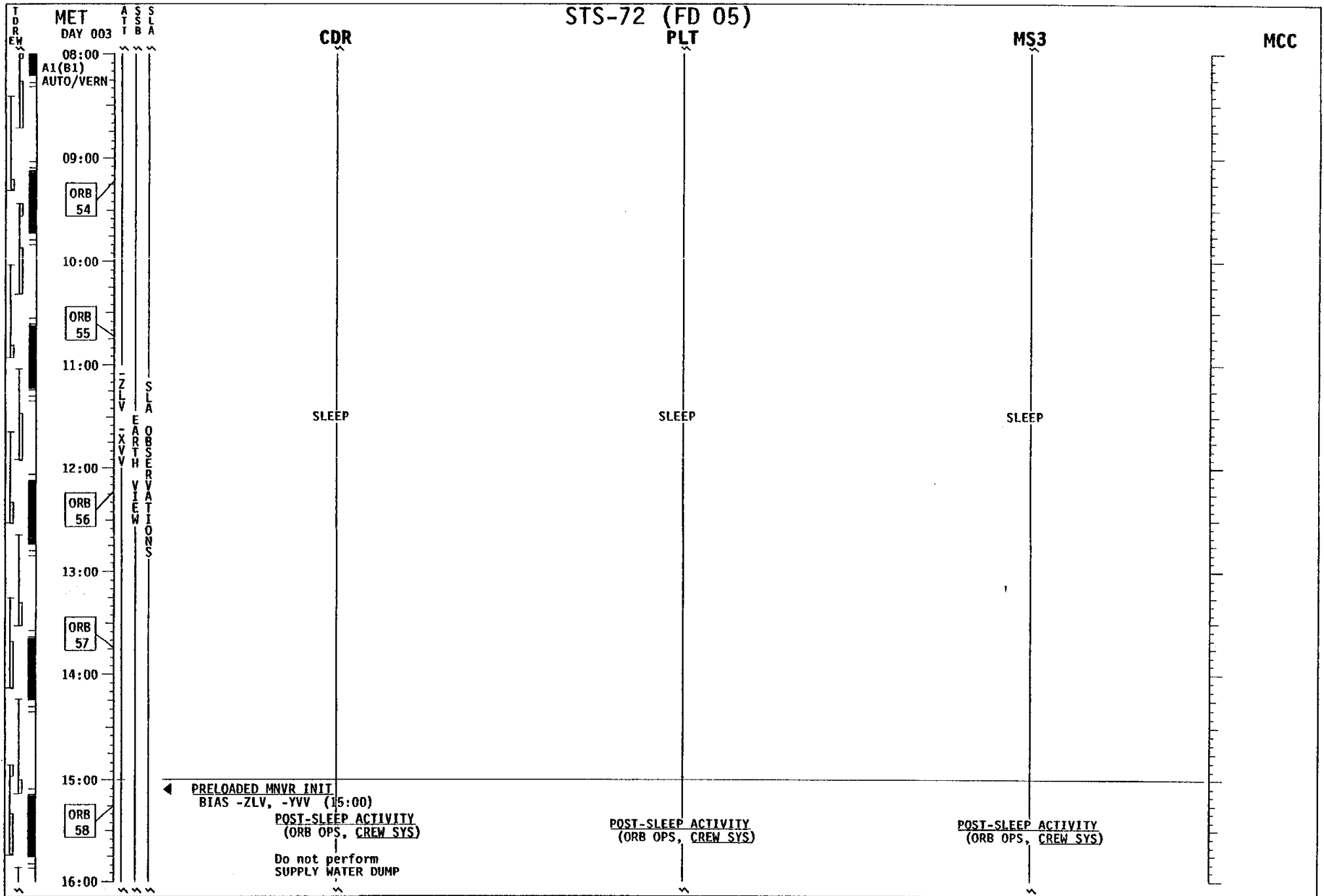




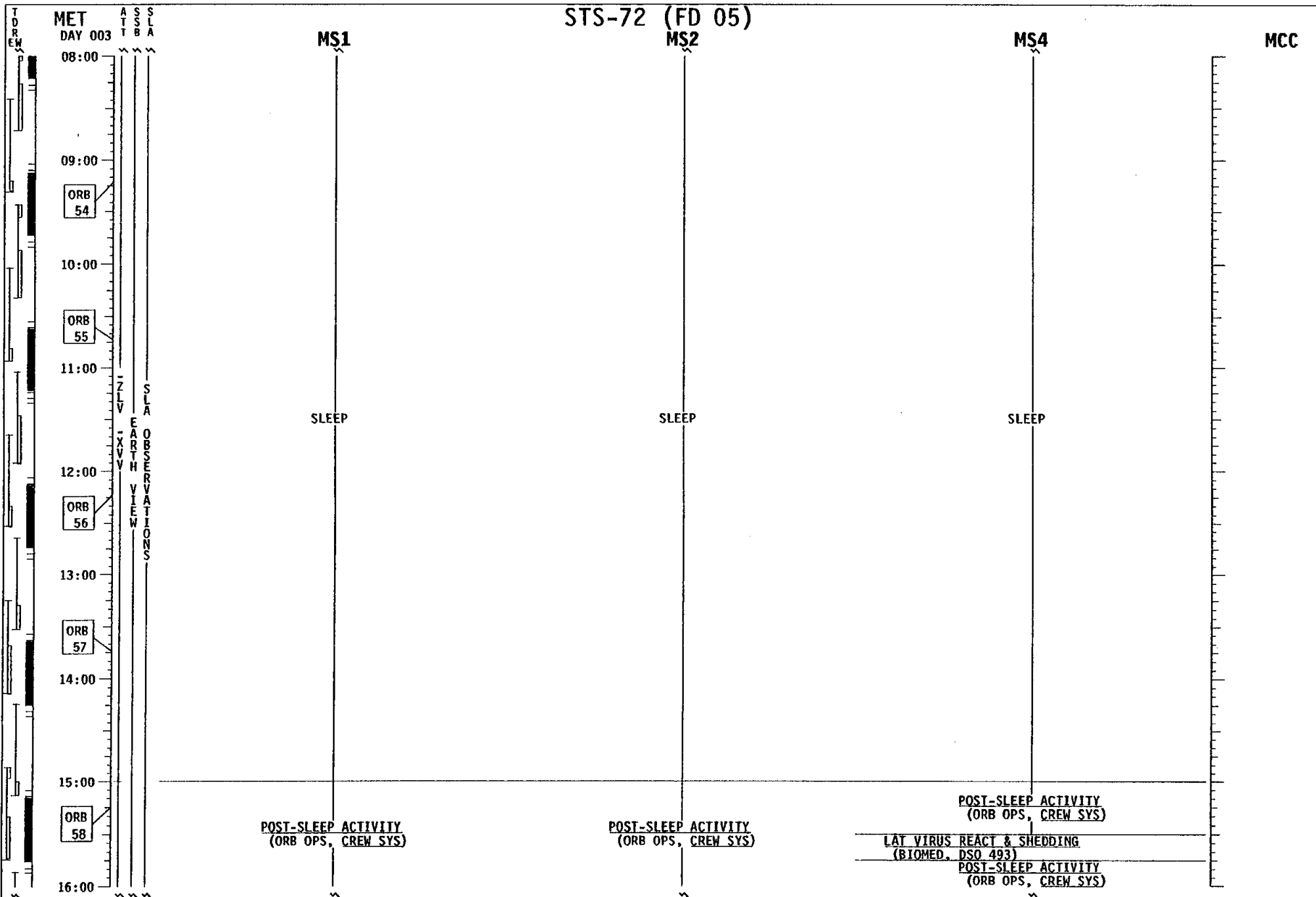








STS-72 (FD 05)



STS-72 (FD 05)

CDR

PLT

MS3

MCC

FD05 EZ ACTIVITIES:
 CPA OPS (ORB OPS, CREW SYS) (15 Min)
 P/TV02 SETUP, OPS (FLT DECK ACTIVITIES)
 (PHOTO/TV, P/TV SCENES)
 DTO 668 (ALBRT)
 DSO 330 UMS OPERATIONS
 (BIOMED, DSO 330)
 Without Anti-Foaming Agent

POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

Do not perform
 SUPPLY WATER DUMP

POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

BACK PAIN PATTERN IN MICRO-G
 (BIOMED, DSO 483)

Exit GPS program: Press [ESC]. Highlight
 EXIT using arrow keys. Press [ENTER].
 THINKPAD PGSC (486) HARD DISK SWAP
 (ORB OPS, PGSC) Serial #1002 (large capacity)
 GPS ACTIVATION, steps 8-15
 (ORB OPS, DTO 700-8)

TV
 (CREW CNTL-
 PLB)

10.2 PSI MAINTENANCE
 (EVA, 10.2 PSI CABIN)

BACK PAIN PATTERN IN MICRO-G
 (BIOMED, DSO 483)

BACK PAIN PATTERN IN MICRO-G
 (BIOMED, DSO 483)

POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

ON-ORBIT +X RCS BURN
 (ORB OPS, RCS)
 (2 Cmn)

ON-ORBIT +X RCS BURN
 (ORB OPS, RCS)
 (2 Cmn)

INFORM CREW
 RESELECT IMU

◀ NC2-0 TIG (18:03)

UPLINK
 EARLY
 TDRS H/O

MNVR (TRK) -YLV, -XVV
 TG=2 BV=5
 P=0 Y=270 OM=0
 A/AUTO/VERN Init TRK

SLA LASER DISABLE
 (PL OPS, SLA)

ABL PORT RMS HTR (two)-AUTO
 L17 Check MCIU filter screen

STL-A TEMPS (PL OPS, STL-A)
 CPCG TEMP CK (PL OPS, CPCG)

FILTER CLEANING LOG
 (PL OPS, PCG-STES)

SSBUV/A DEACT
 (PL OPS, SSBUV)

P/TV07 SETUP (EVA)
 (PHOTO/TV, P/TV SCENES)

NIH-R OPS
 (PL OPS, NIH-R)

EXERCISE

EVA DTO1
PET 00:00 = 3/19:40 MET

RMS POWERUP
 (PDRS OPS, RMS PWRUP)

014,15, Pri RJD DRIVER, LOGIC (sixteen)-ON
 16:F

EGRESS VIEWING
 (PDRS OPS, PWP OPS)

EGRESS VIEWING
 (PDRS OPS, PWP OPS)

UPLINK
 β 0° ONLY

Config DAPs A,B to A7,B7

EVA DTO 1
 (EVA, EVA DTO1)

EVA DTO 1
 (EVA, EVA DTO1)

EVA DTO 1
 (EVA, EVA DTO1)

P/TV07 OPS (EVA) (PHOTO/TV, P/TV SCENES)

RMS SUPPORT

MET
 DAY 003

16:00
 A1(B1)
 AUTO/VERN

ORB
 59

17:00

18:00
 (A1)B1
 INRT/PRI

ORB
 60

A1(B1)
 AUTO/VERN

19:00

EVA1

-00:10

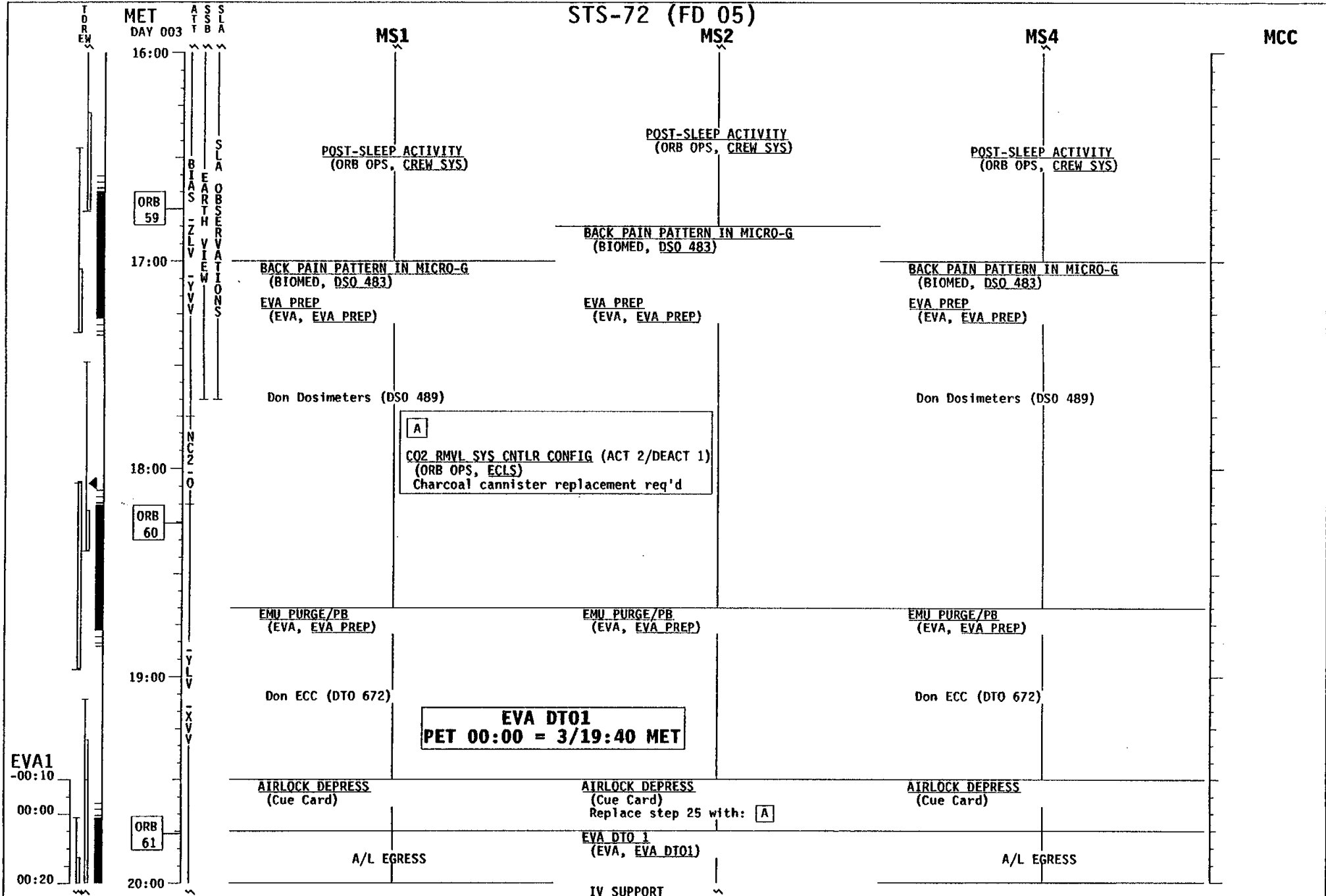
00:00

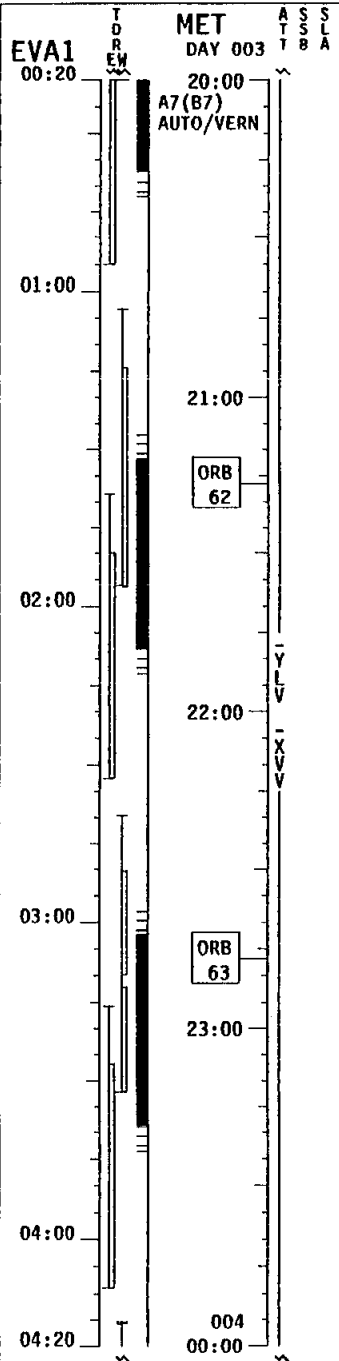
00:20

A7(B7)
 AUTO/VERN

ORB
 61

20:00





CDR

EVA DTO 1
(EVA, EVA DTO1)

P/IV07 OPS (EVA)
(PHOTO/TV, P/TV SCENES)

STS-72 (FD 05)
PLT

EVA DTO 1
(EVA, EVA DTO1)

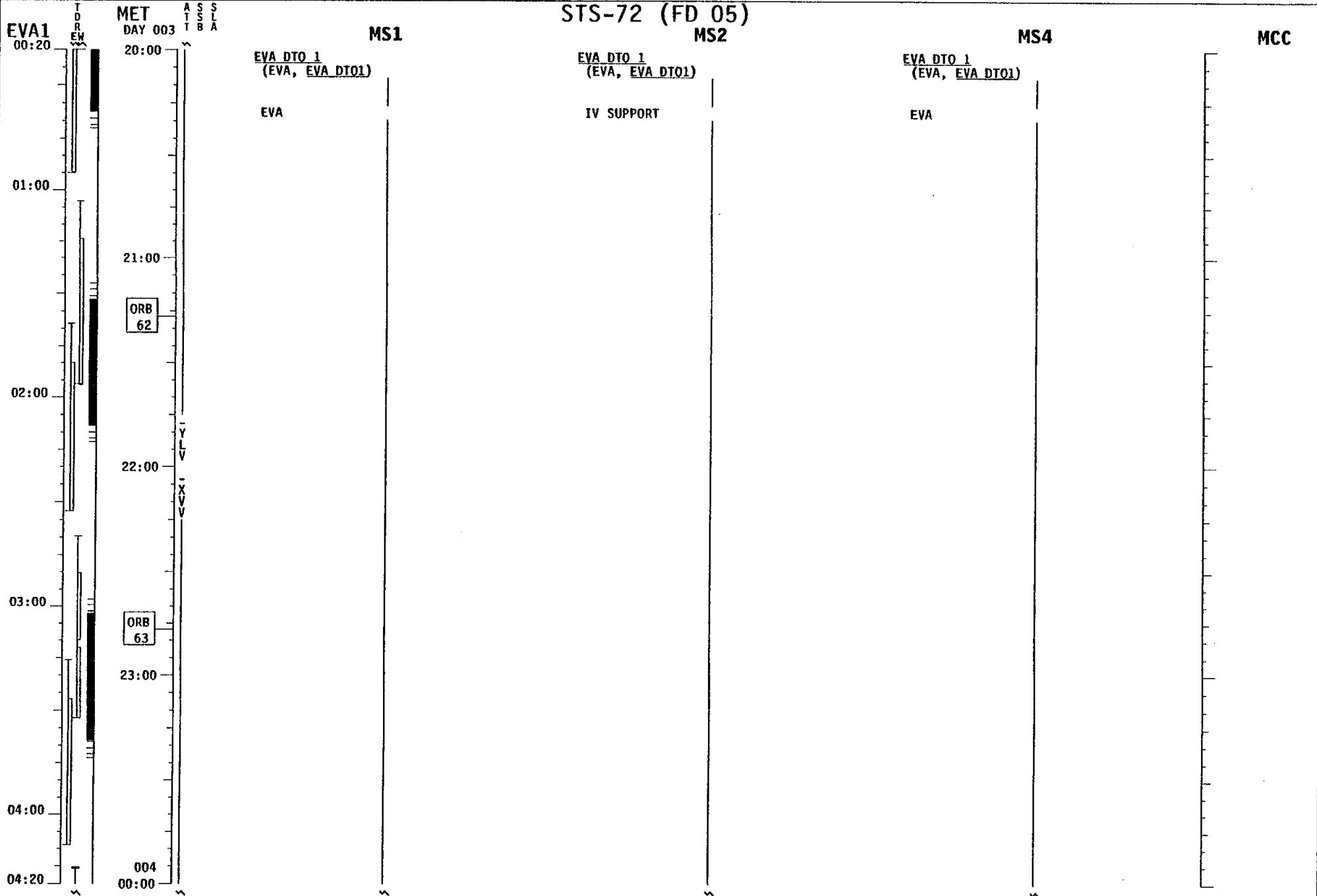
RMS SUPPORT

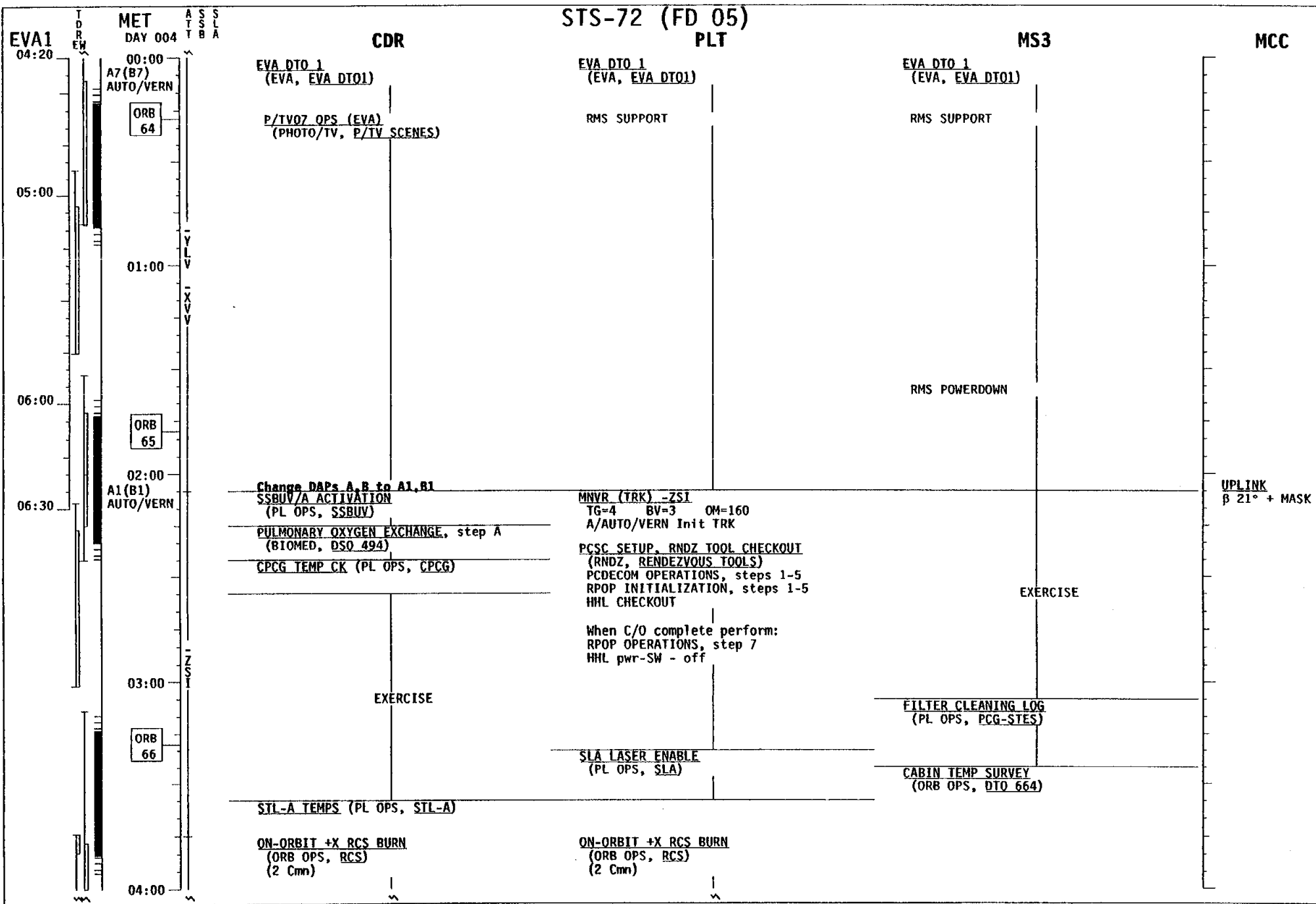
MS3

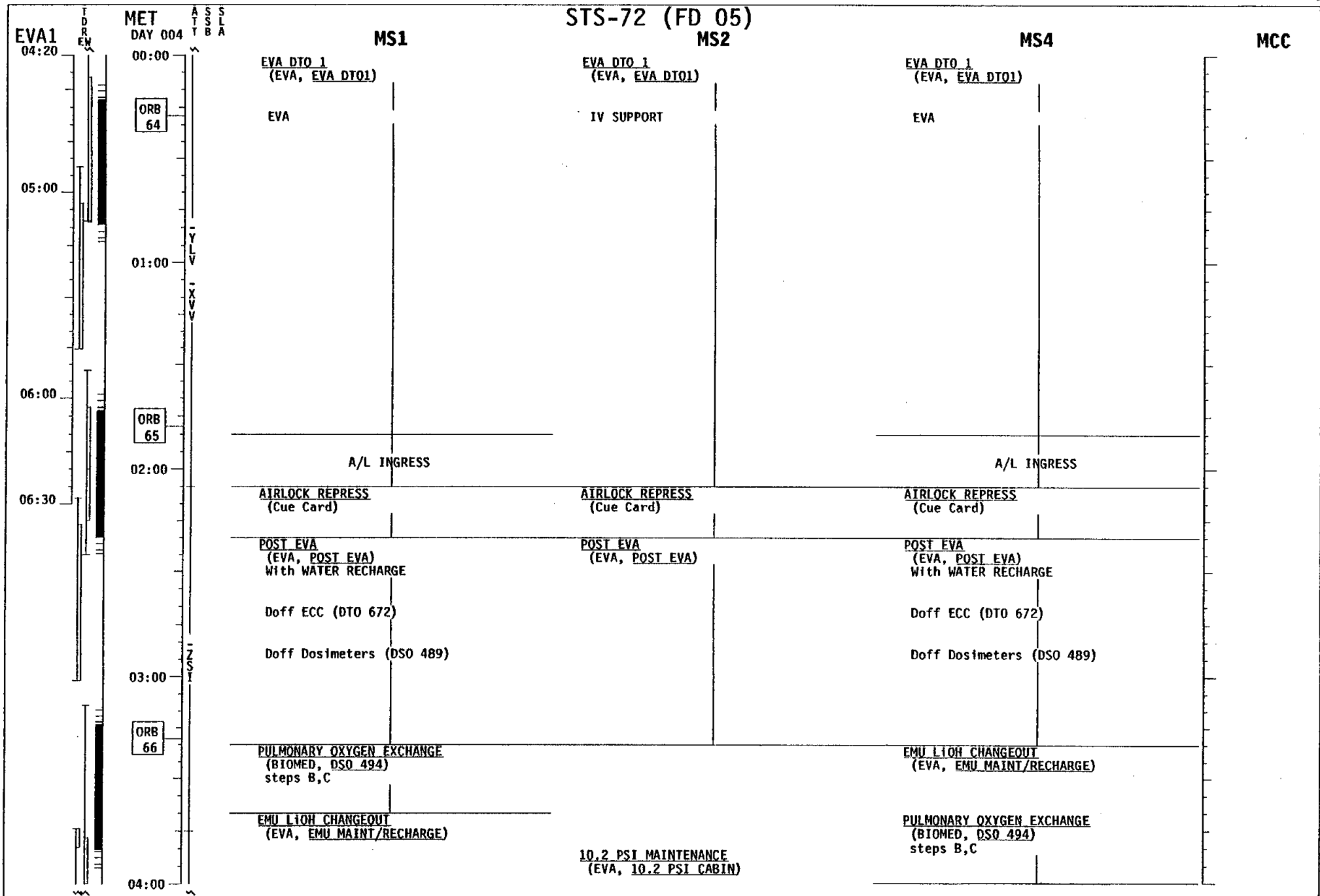
EVA DTO 1
(EVA, EVA DTO1)

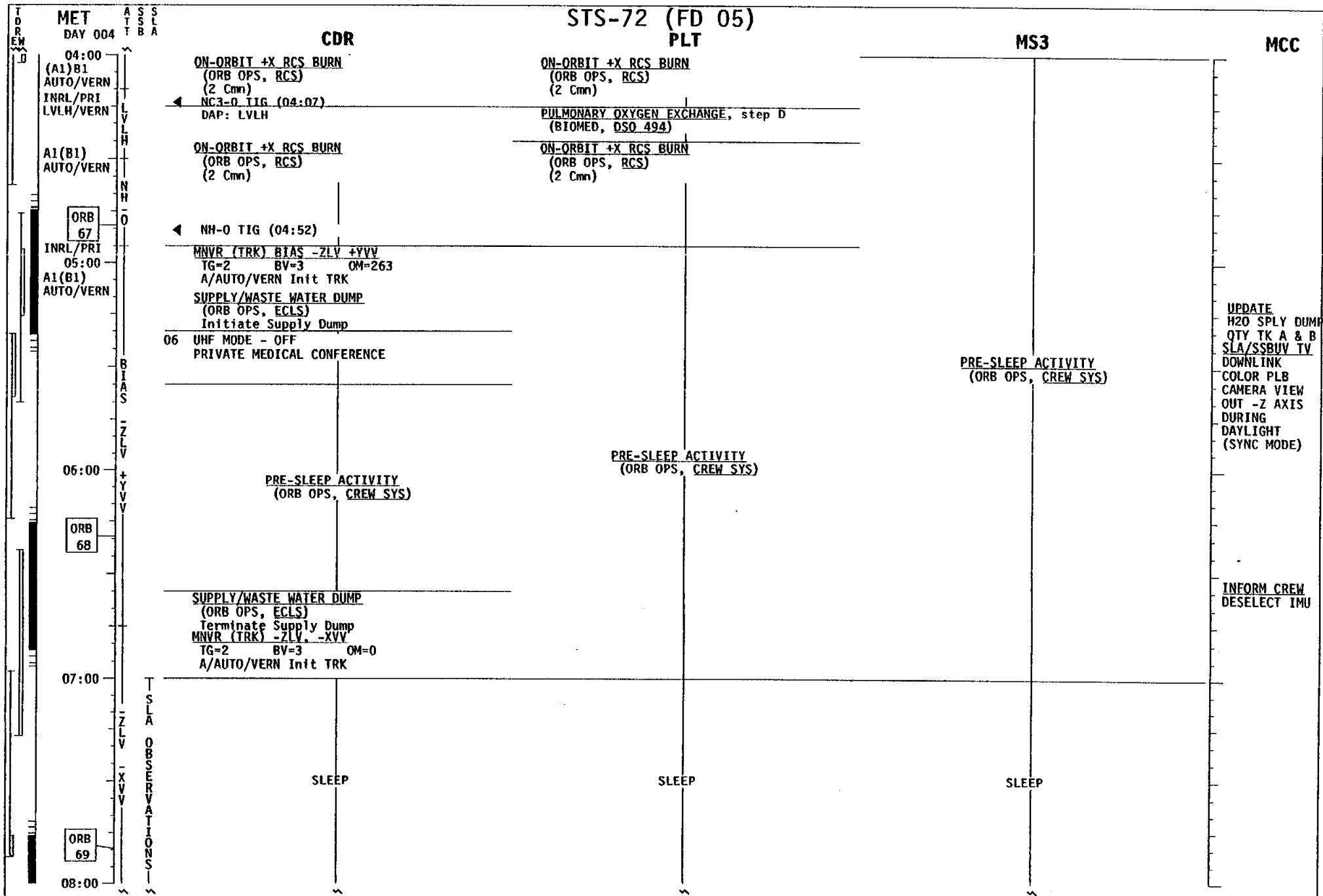
RMS SUPPORT

MCC



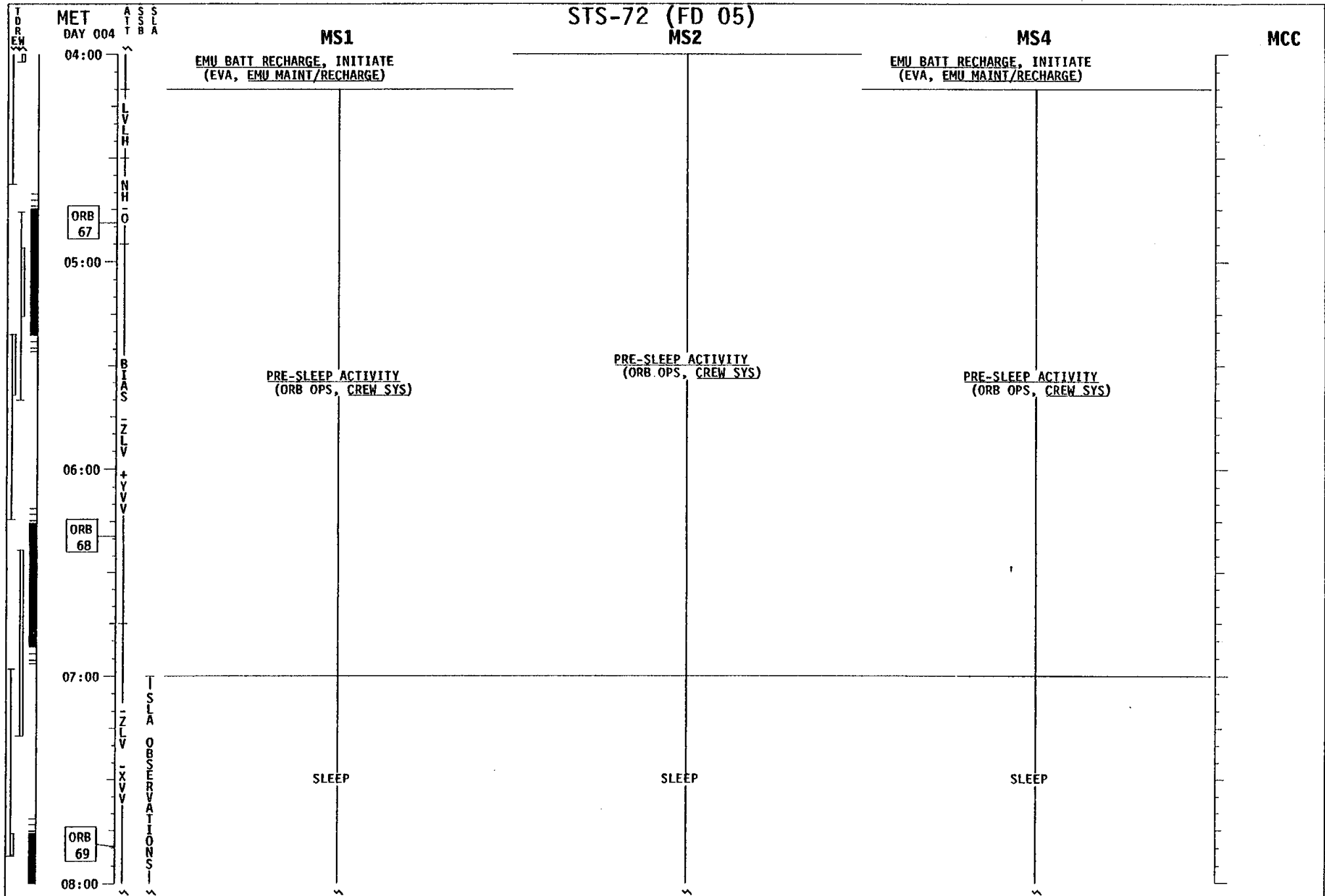


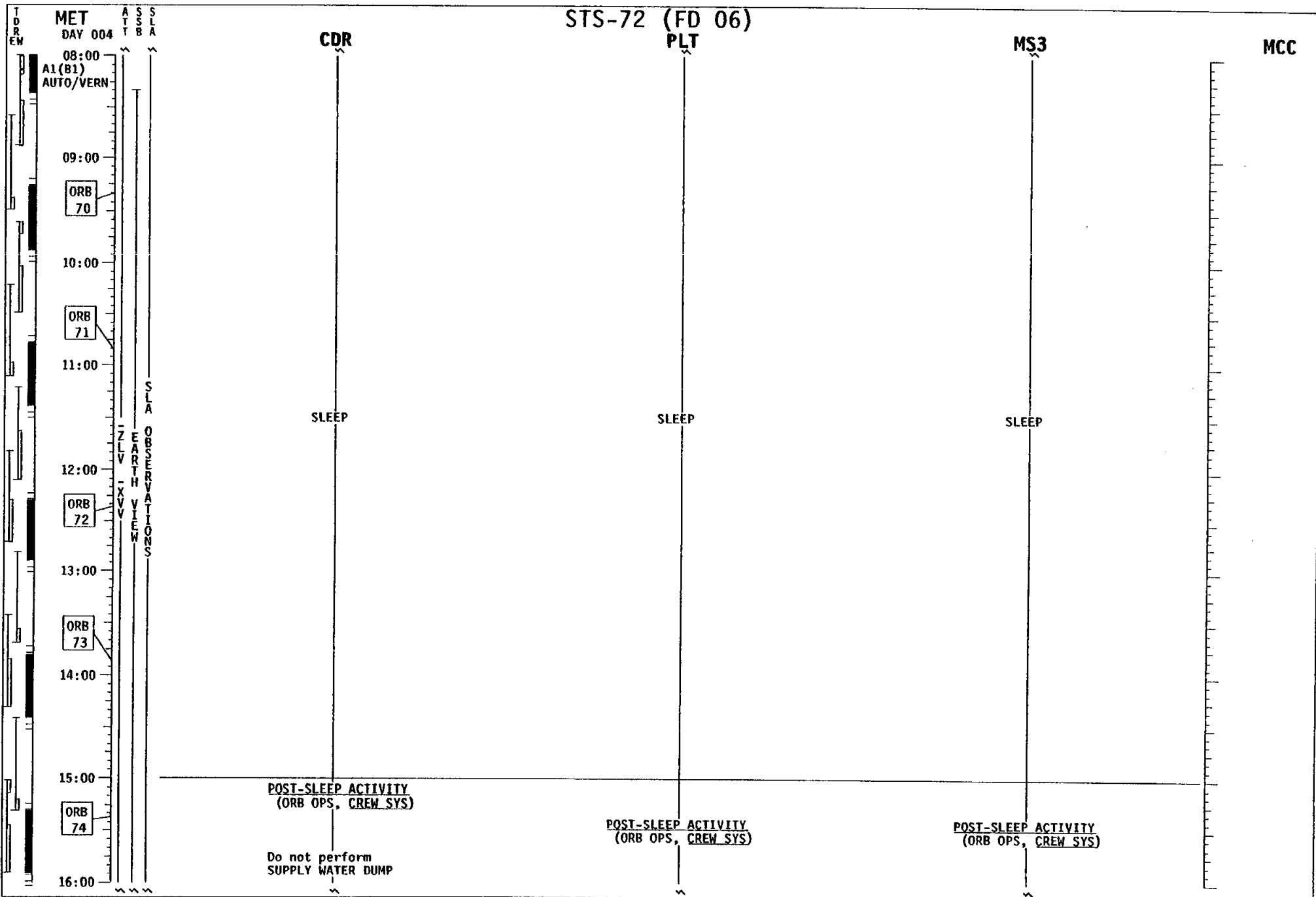


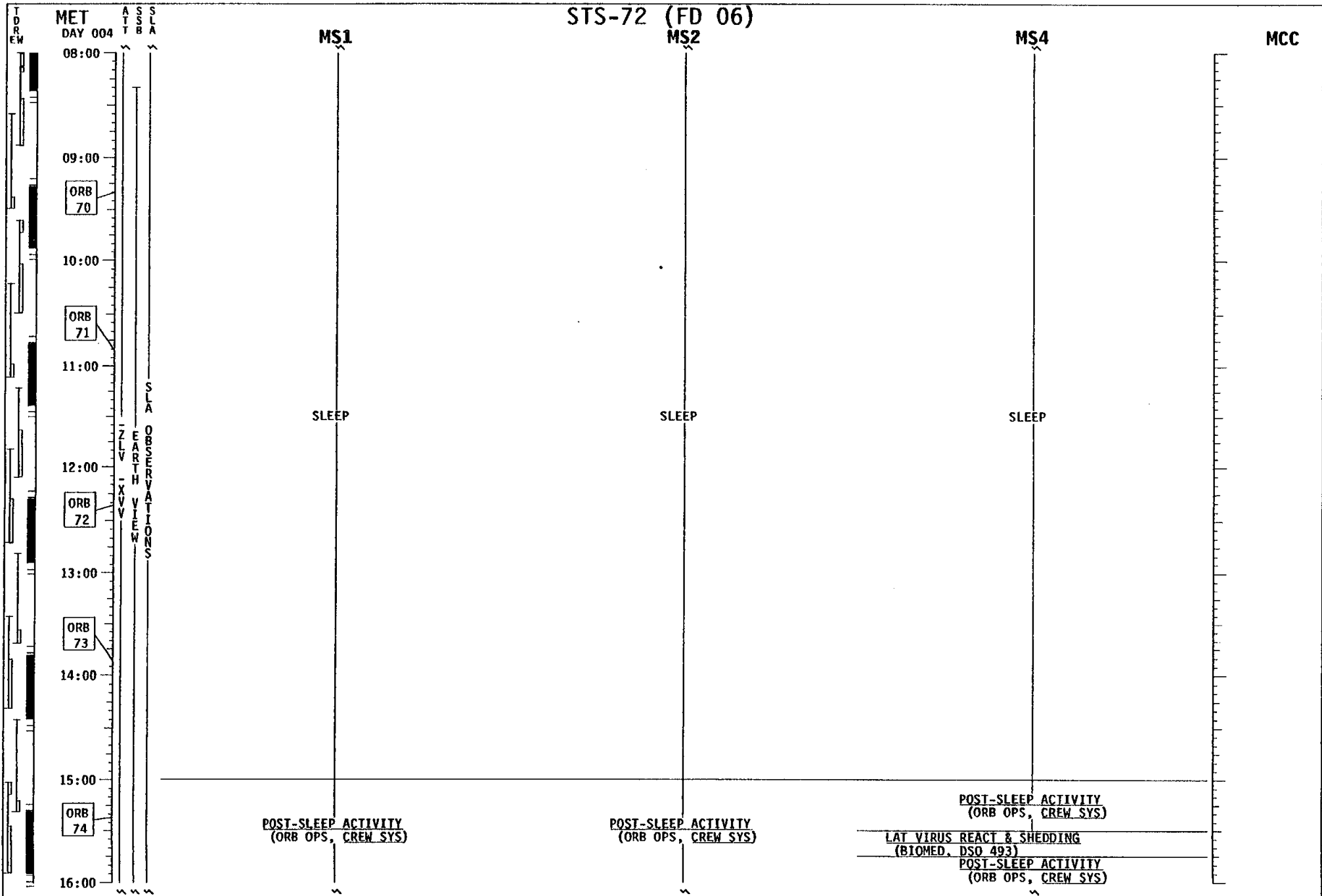


UPDATE
H2O SPLY DUMP
QTY TK A & B
SLA/SSBUV TV
DOWNLINK
COLOR PLB
CAMERA VIEW
OUT -Z AXIS
DURING
DAYLIGHT
(SYNC MODE)

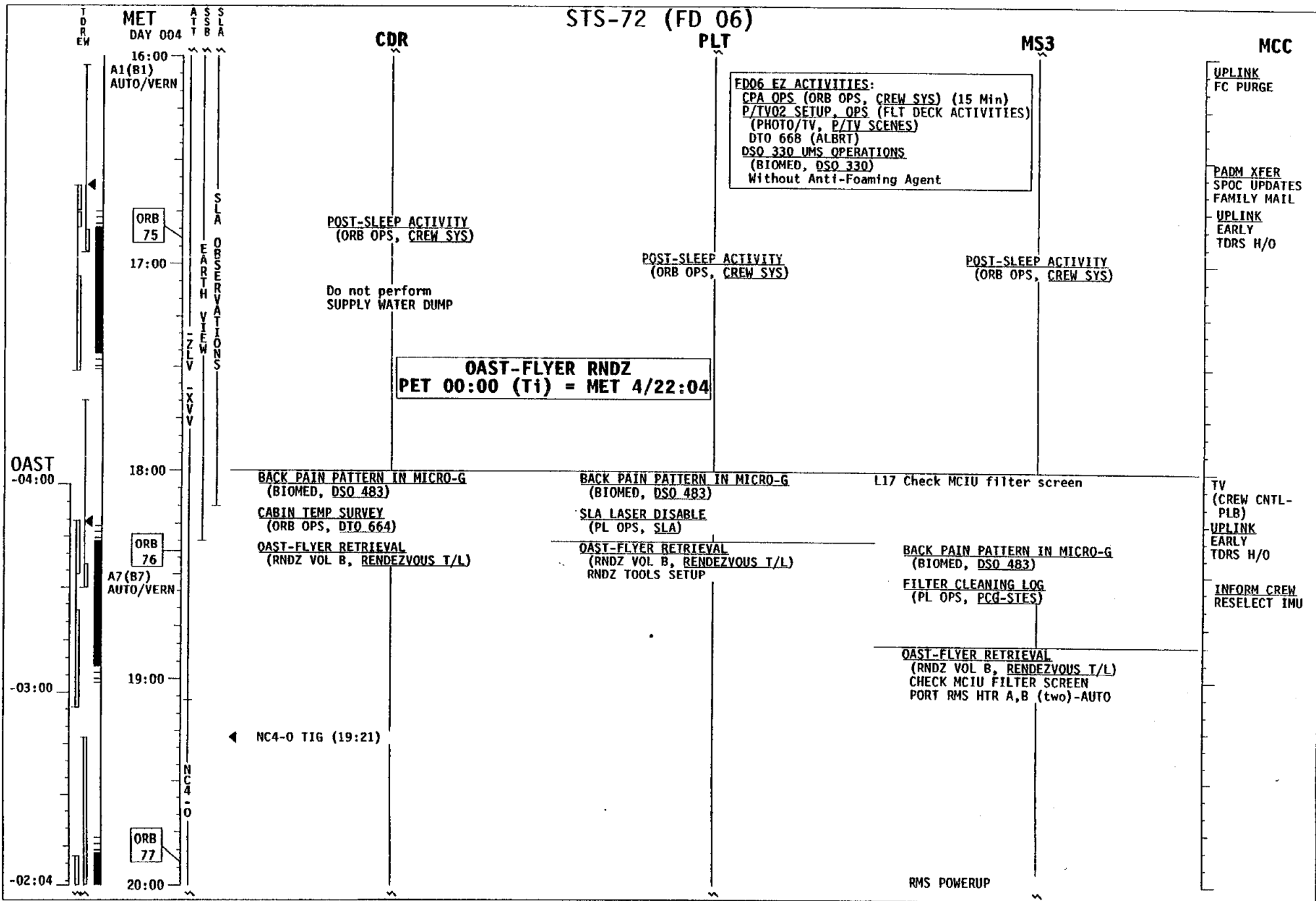
INFORM CREW
DESELECT IMU

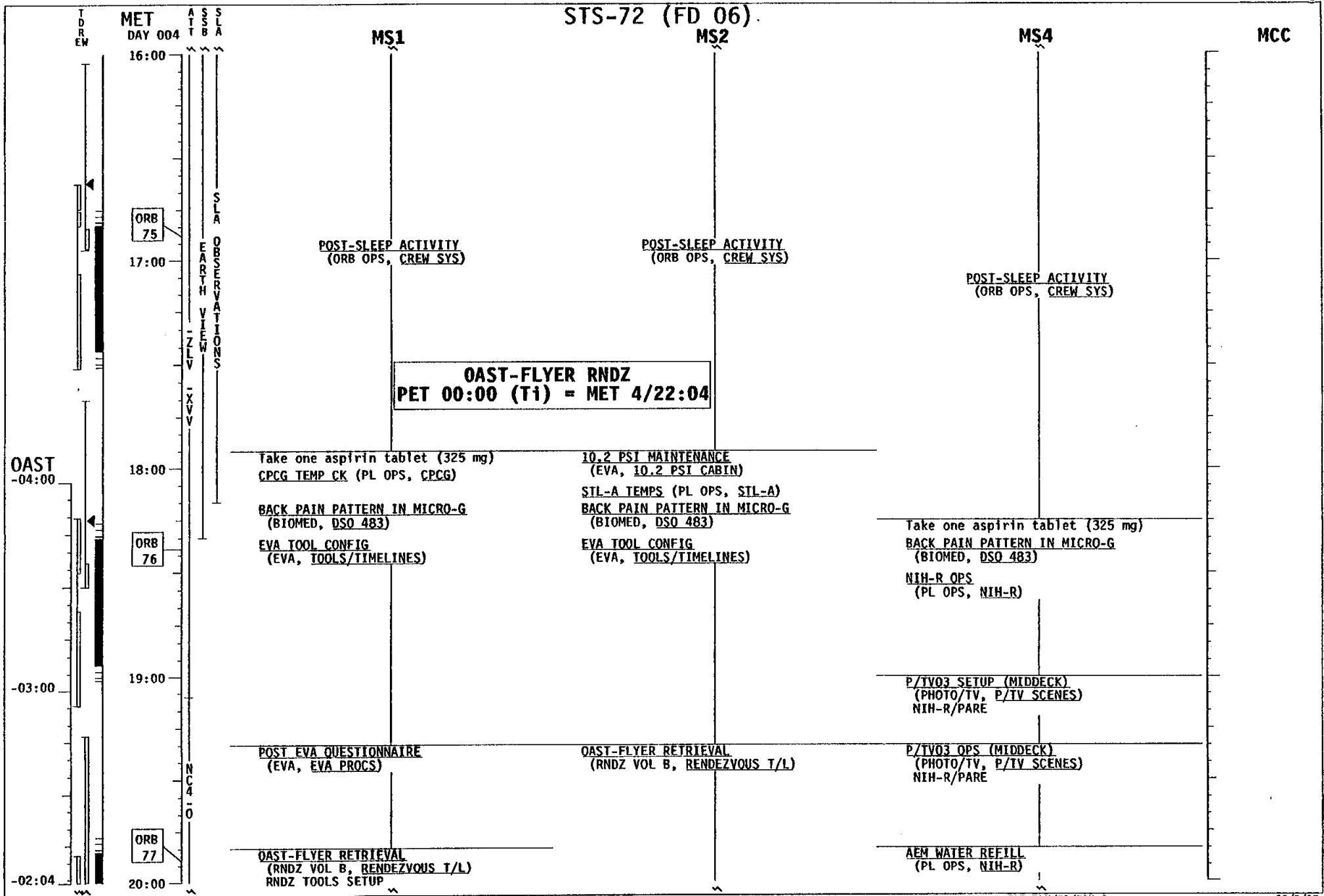


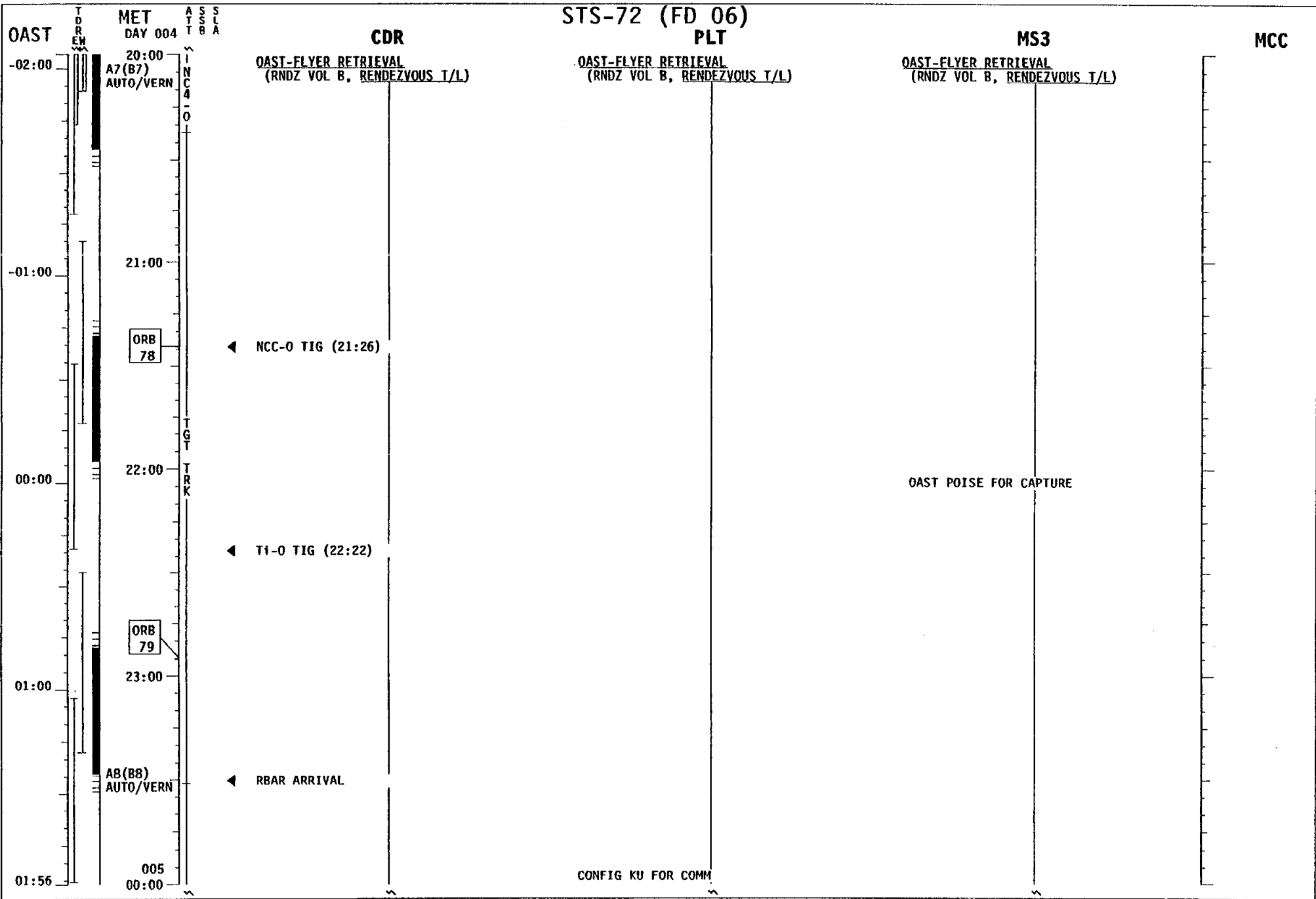


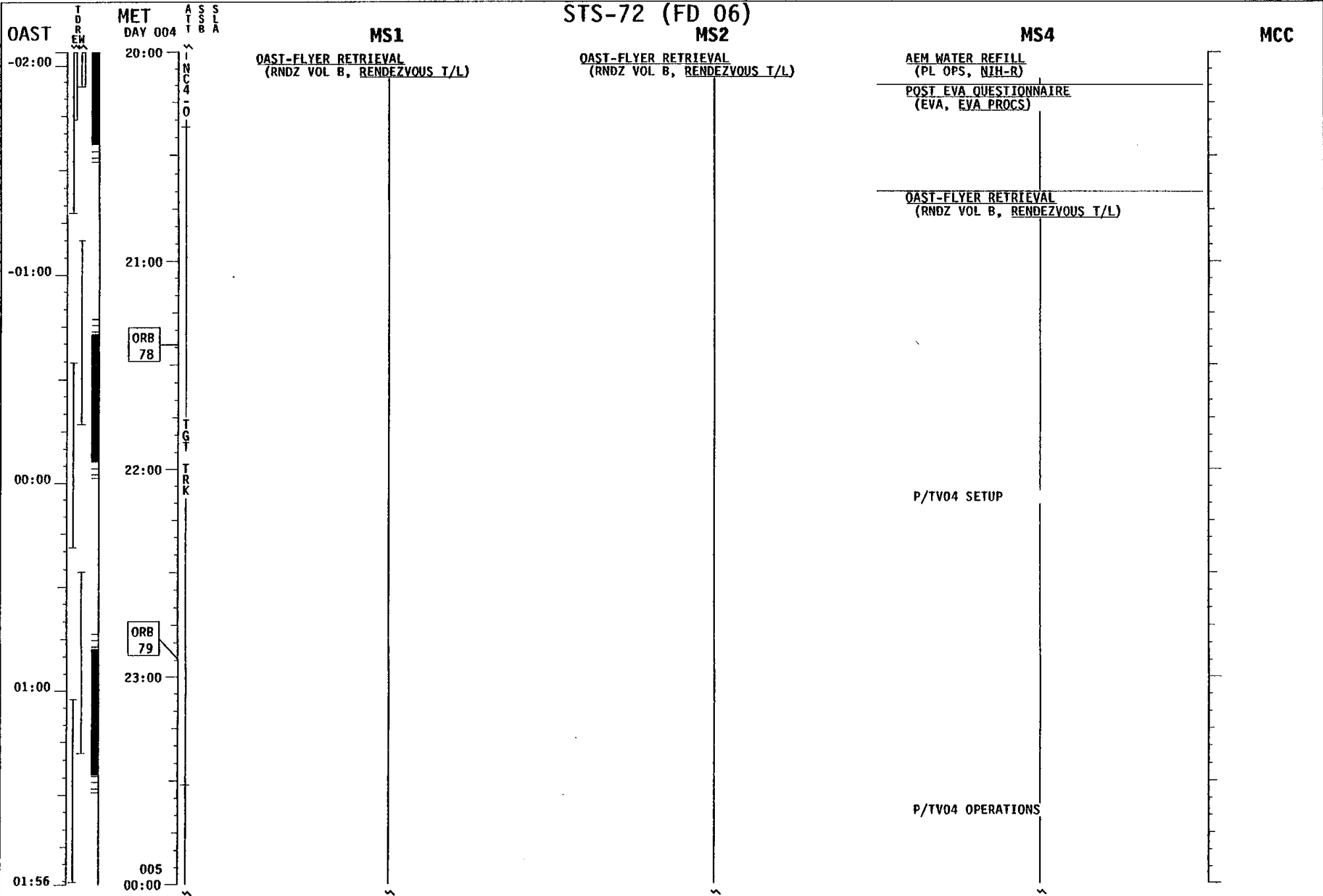


STS-72 (FD 06)

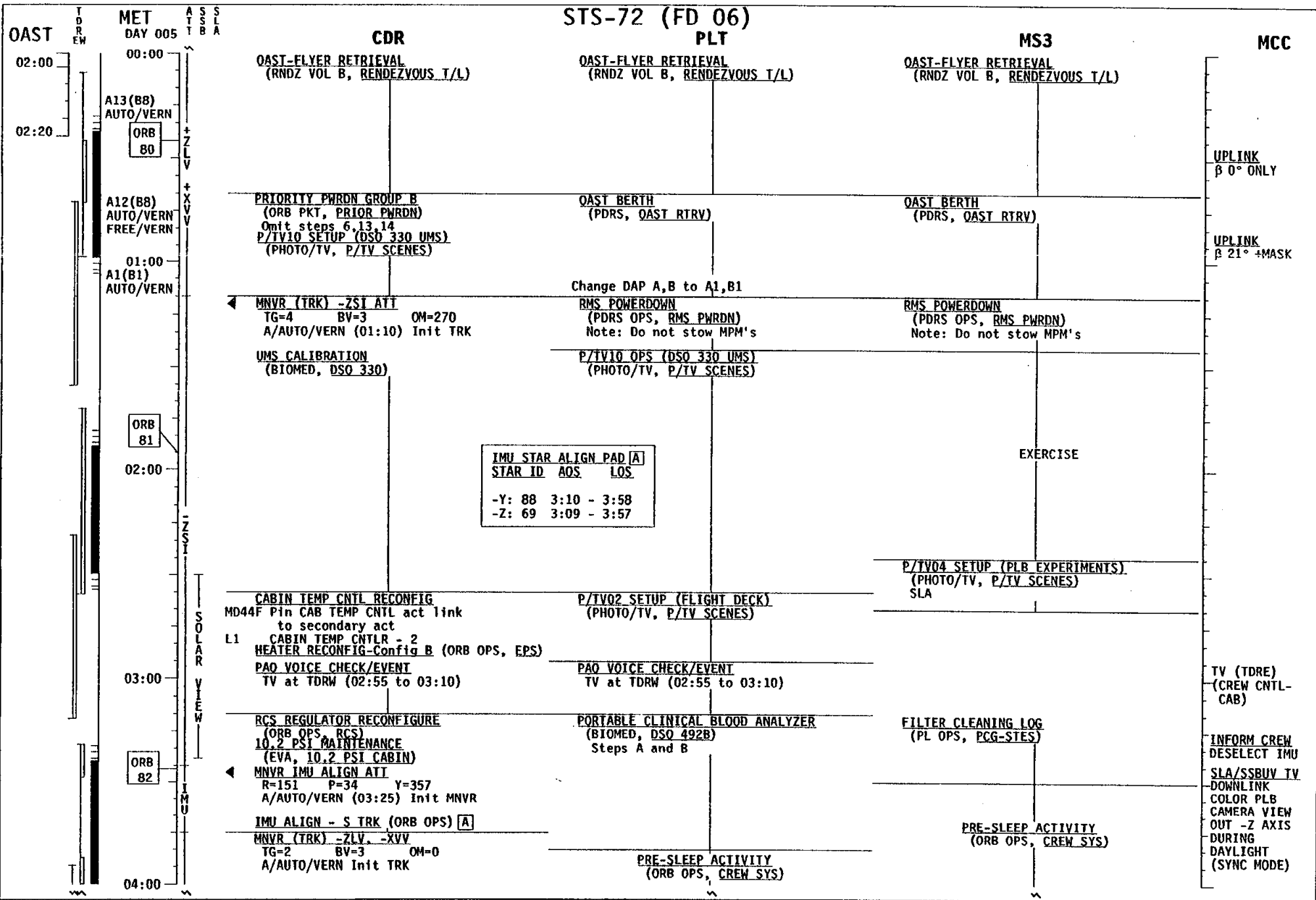




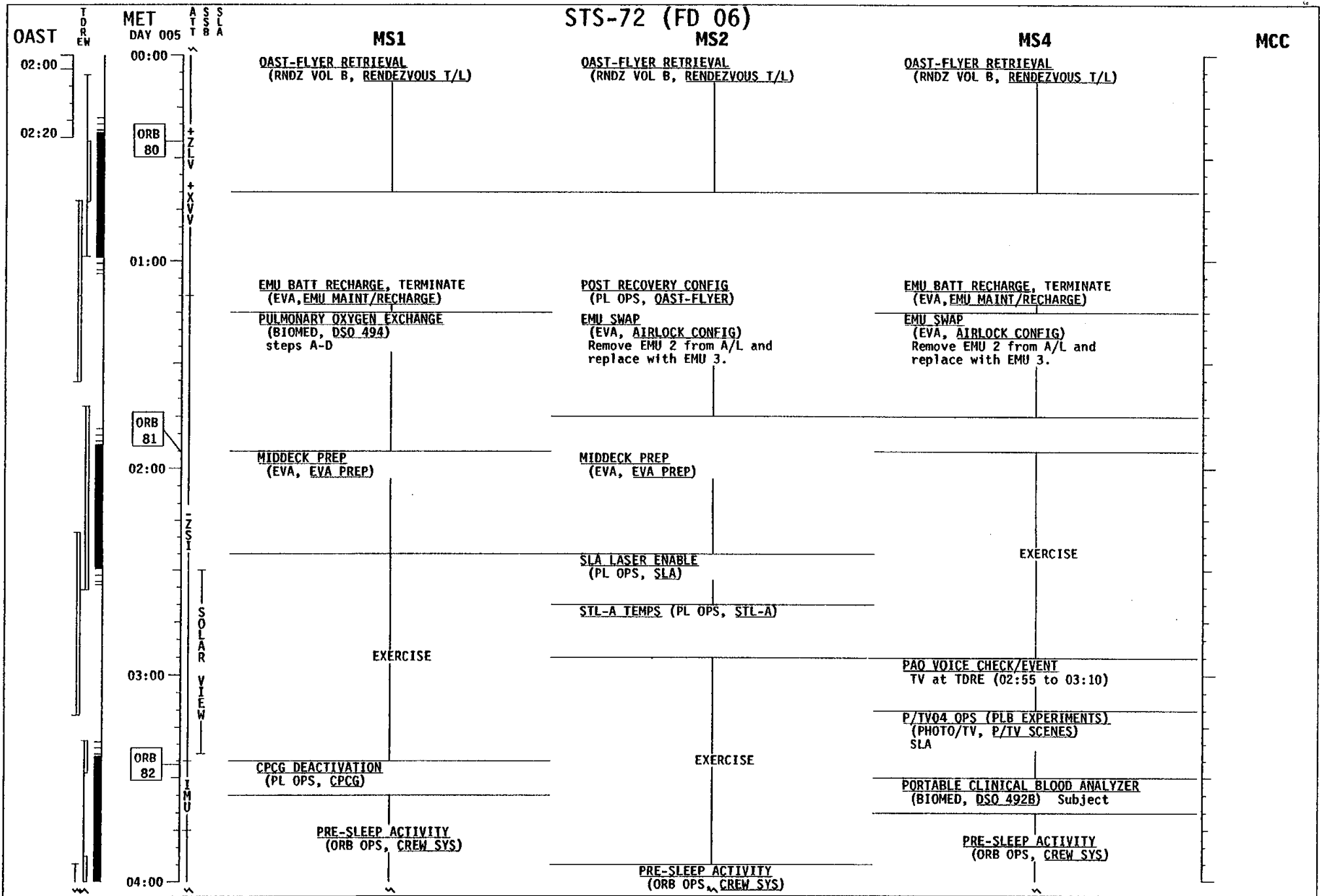


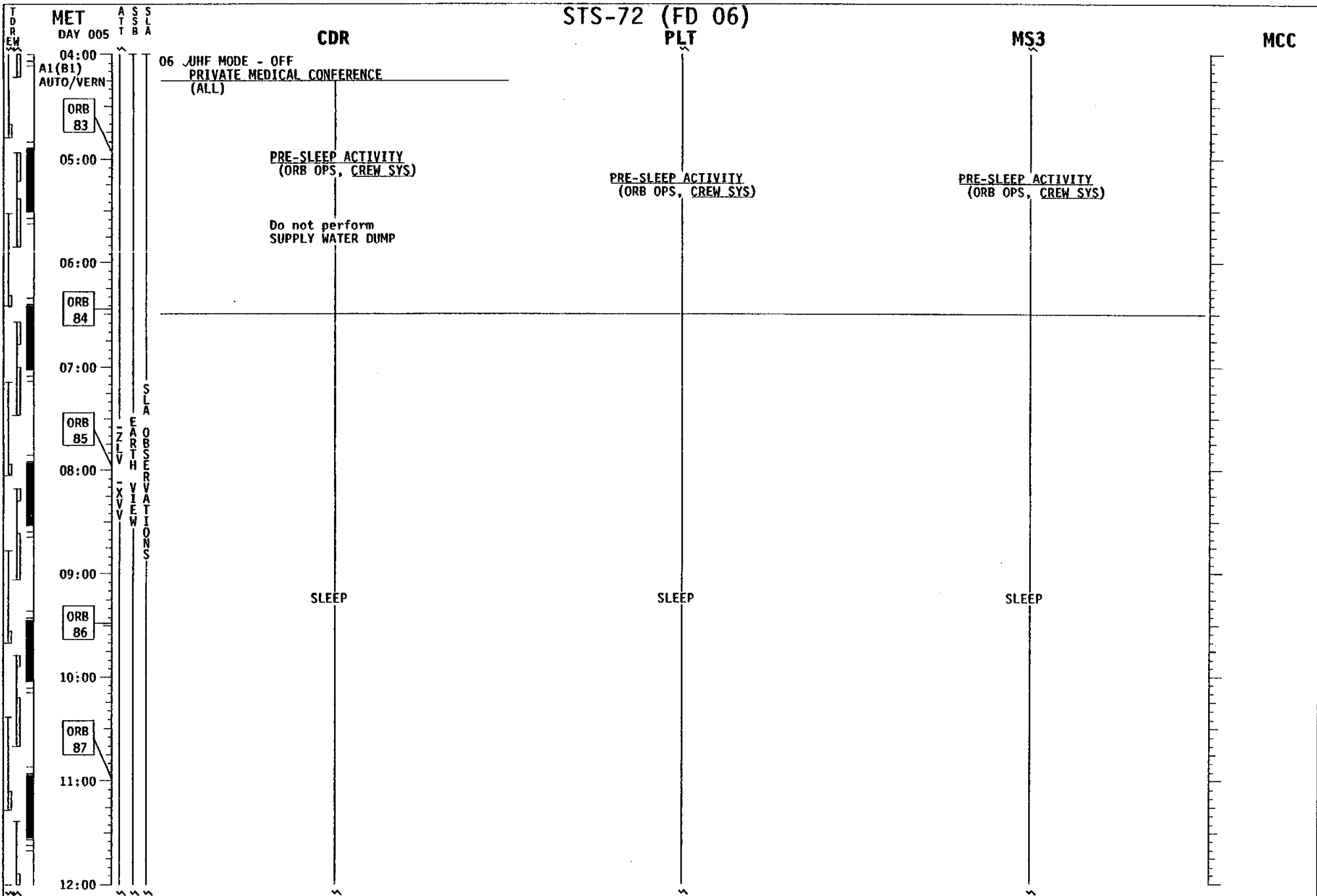


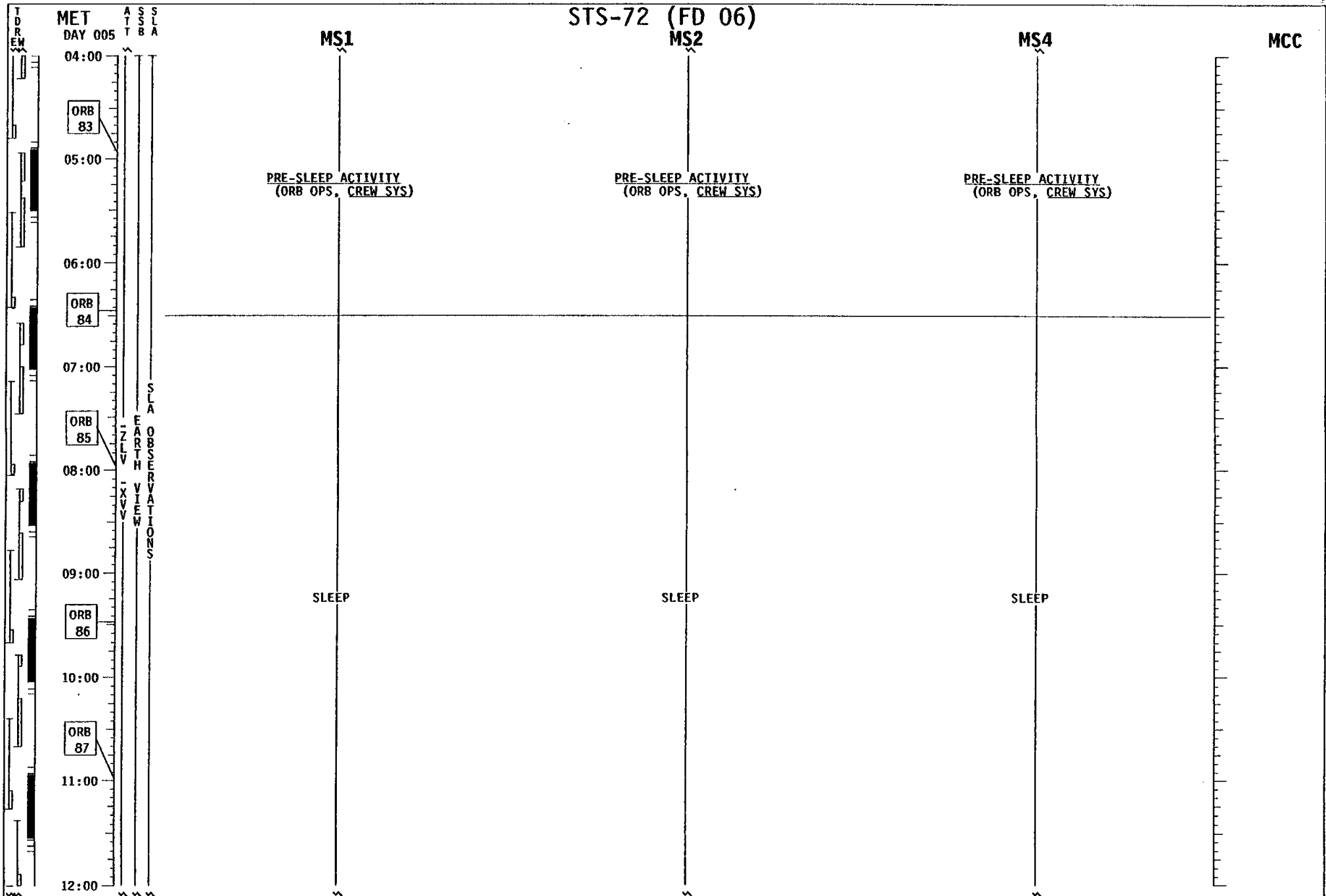
STS-72 (FD 06)



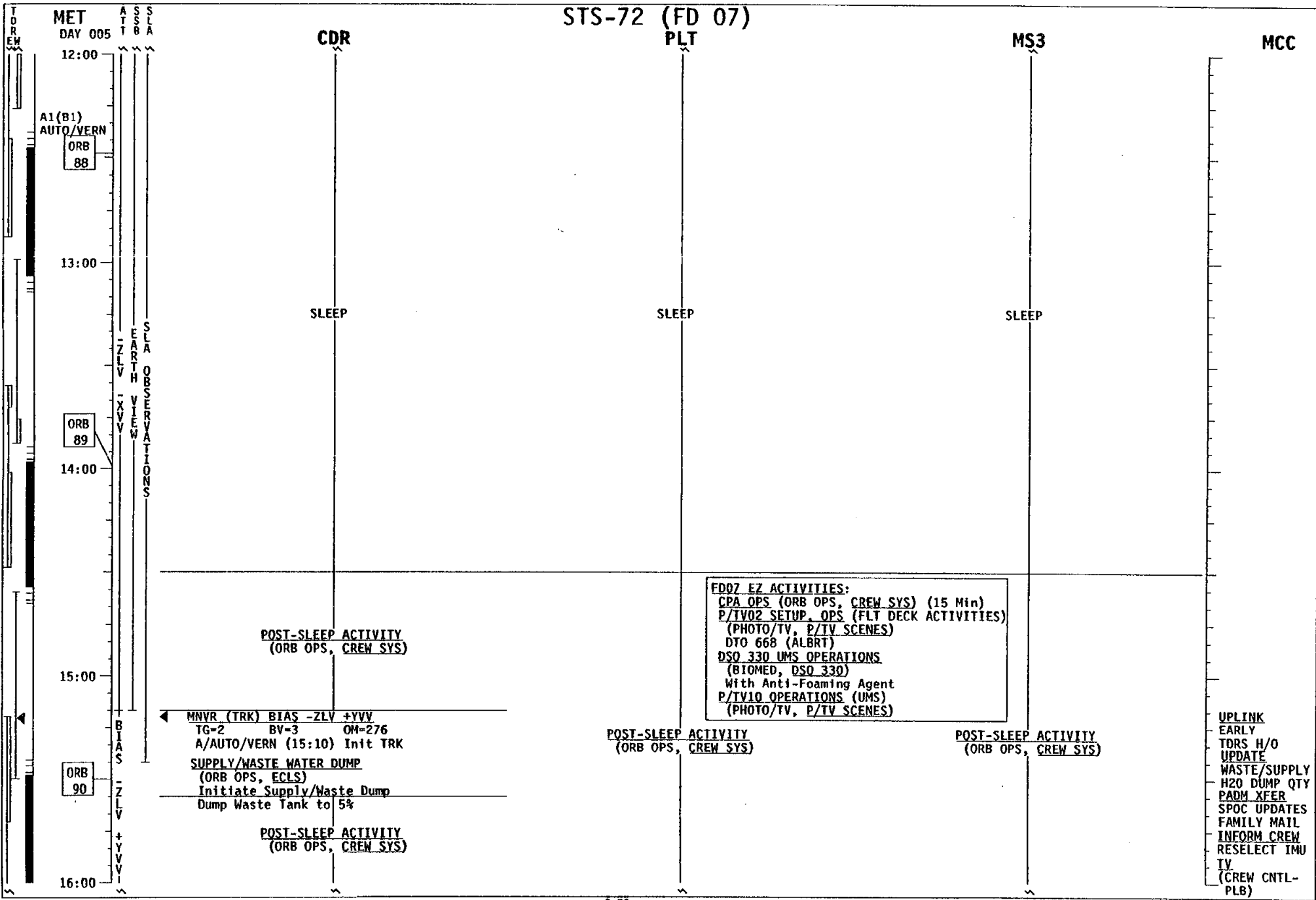
IMU STAR ALIGN PAD [A]		
STAR ID	AOS	LOS
-Y: 88	3:10	3:58
-Z: 69	3:09	3:57

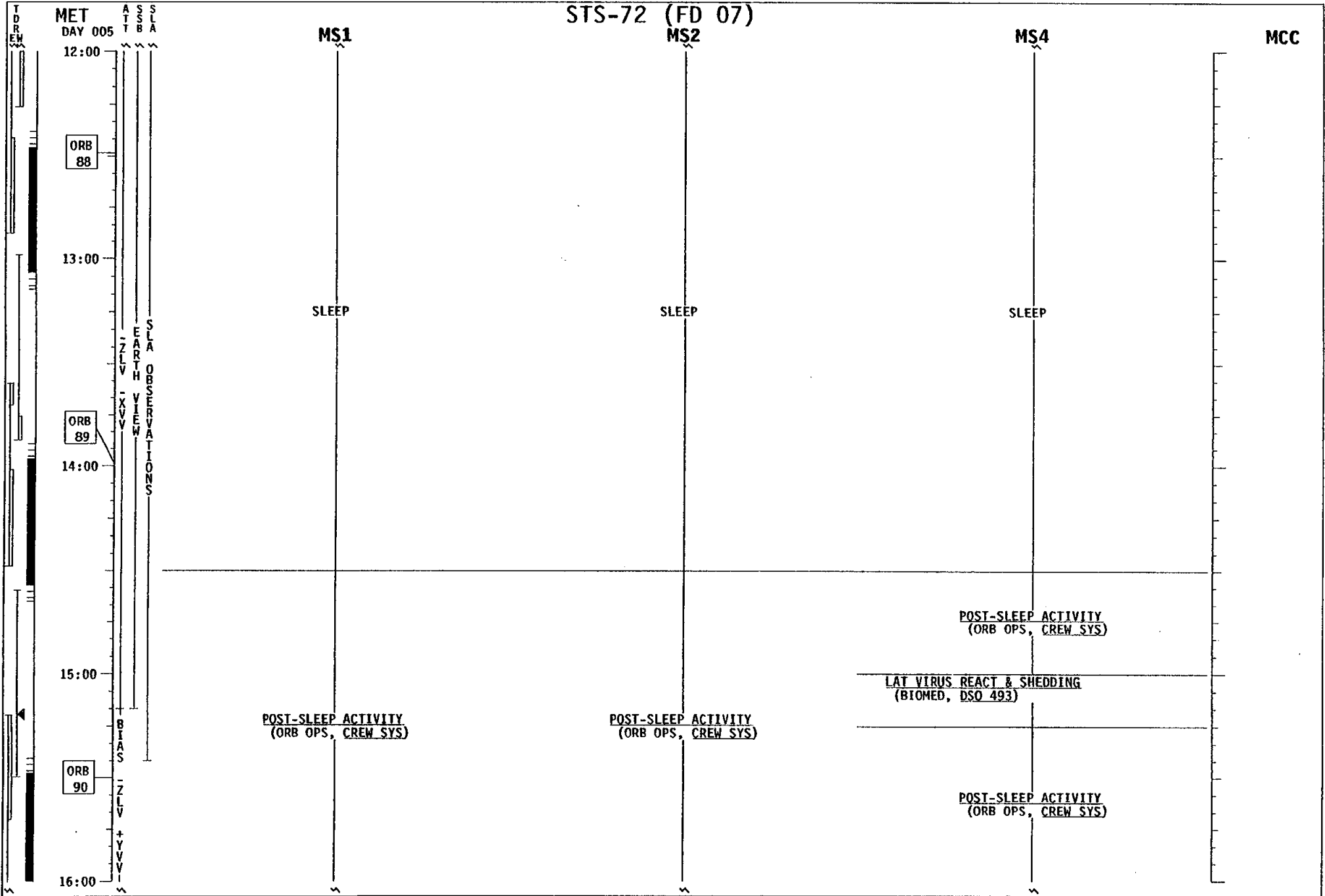




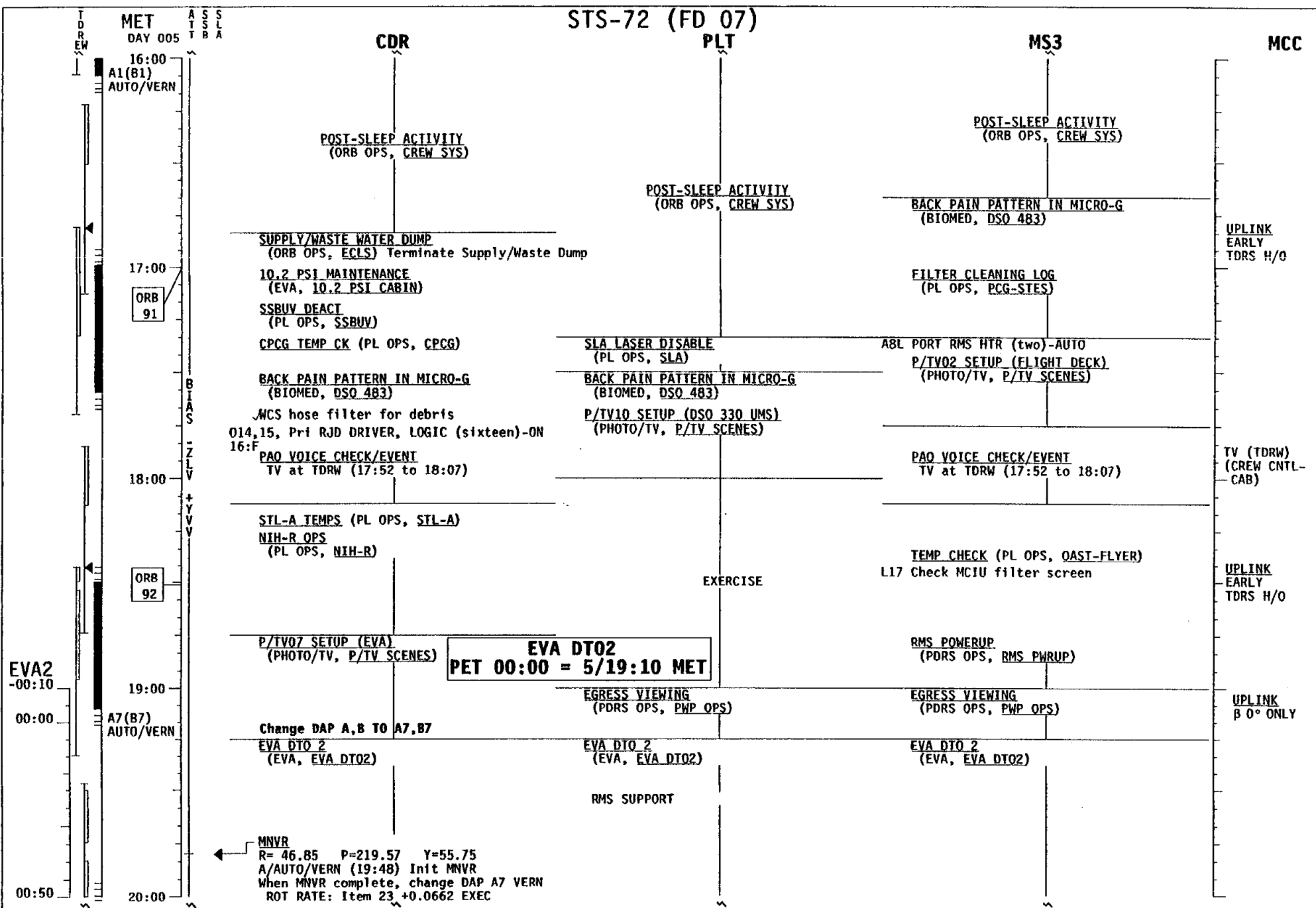


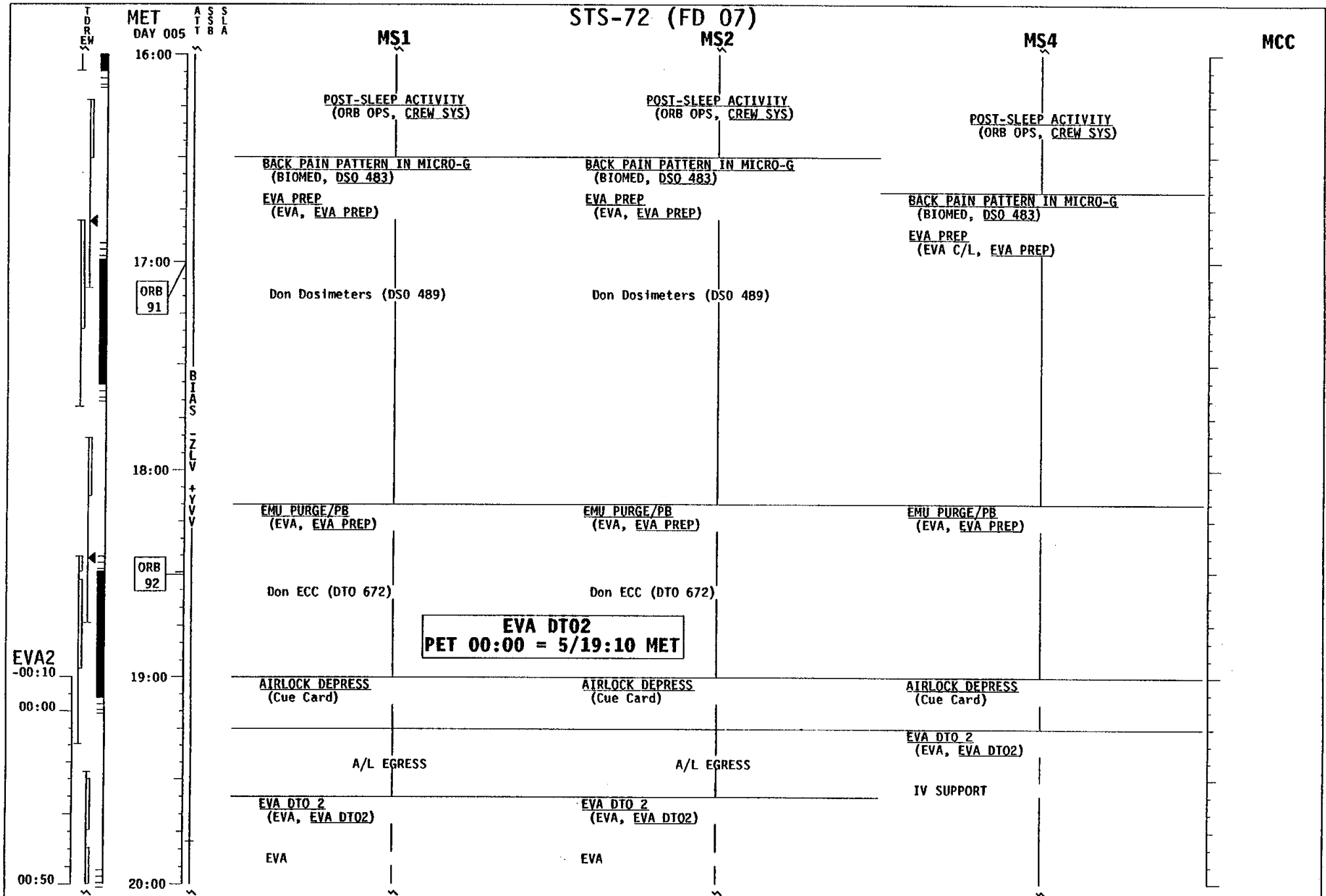
STS-72 (FD 07)

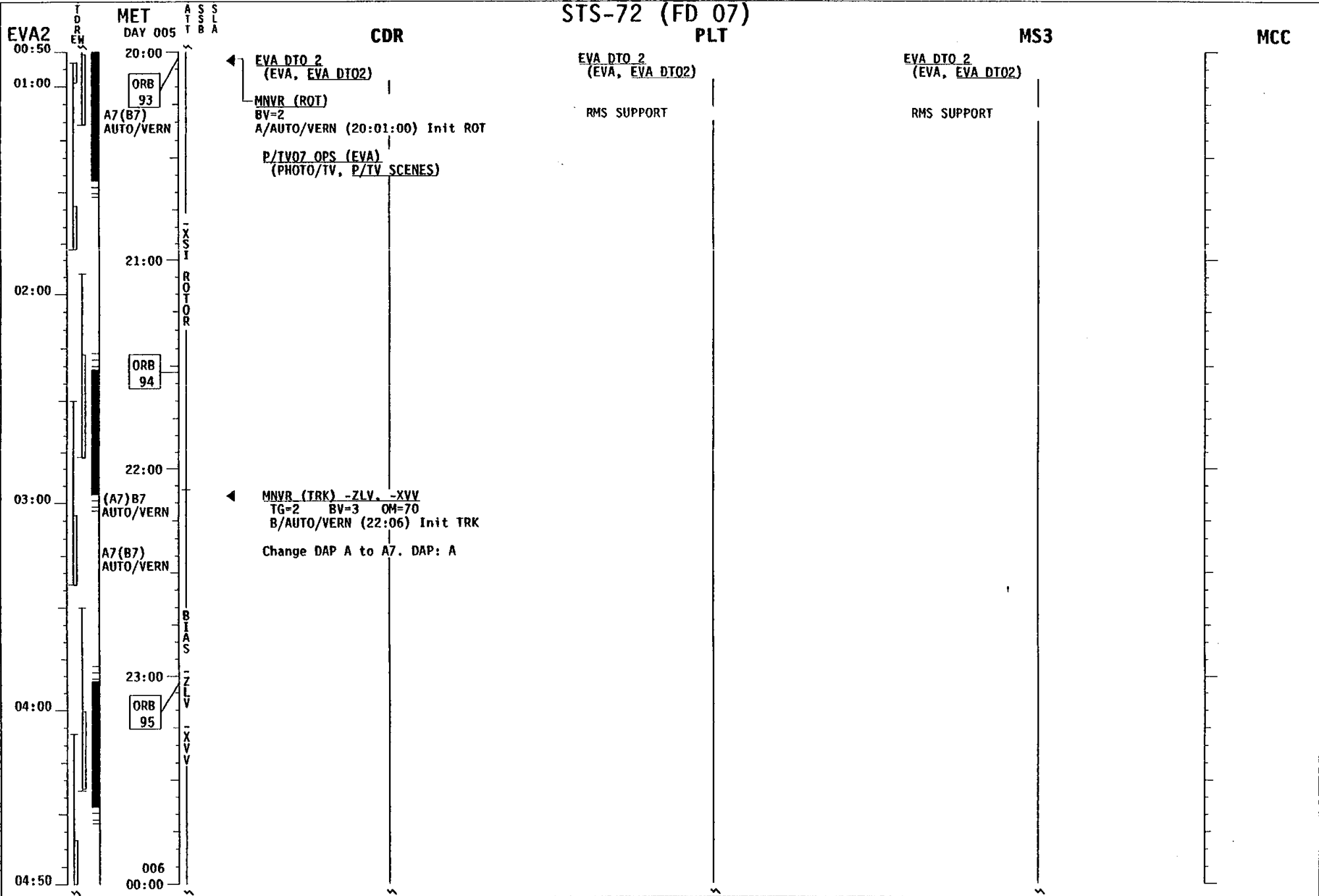


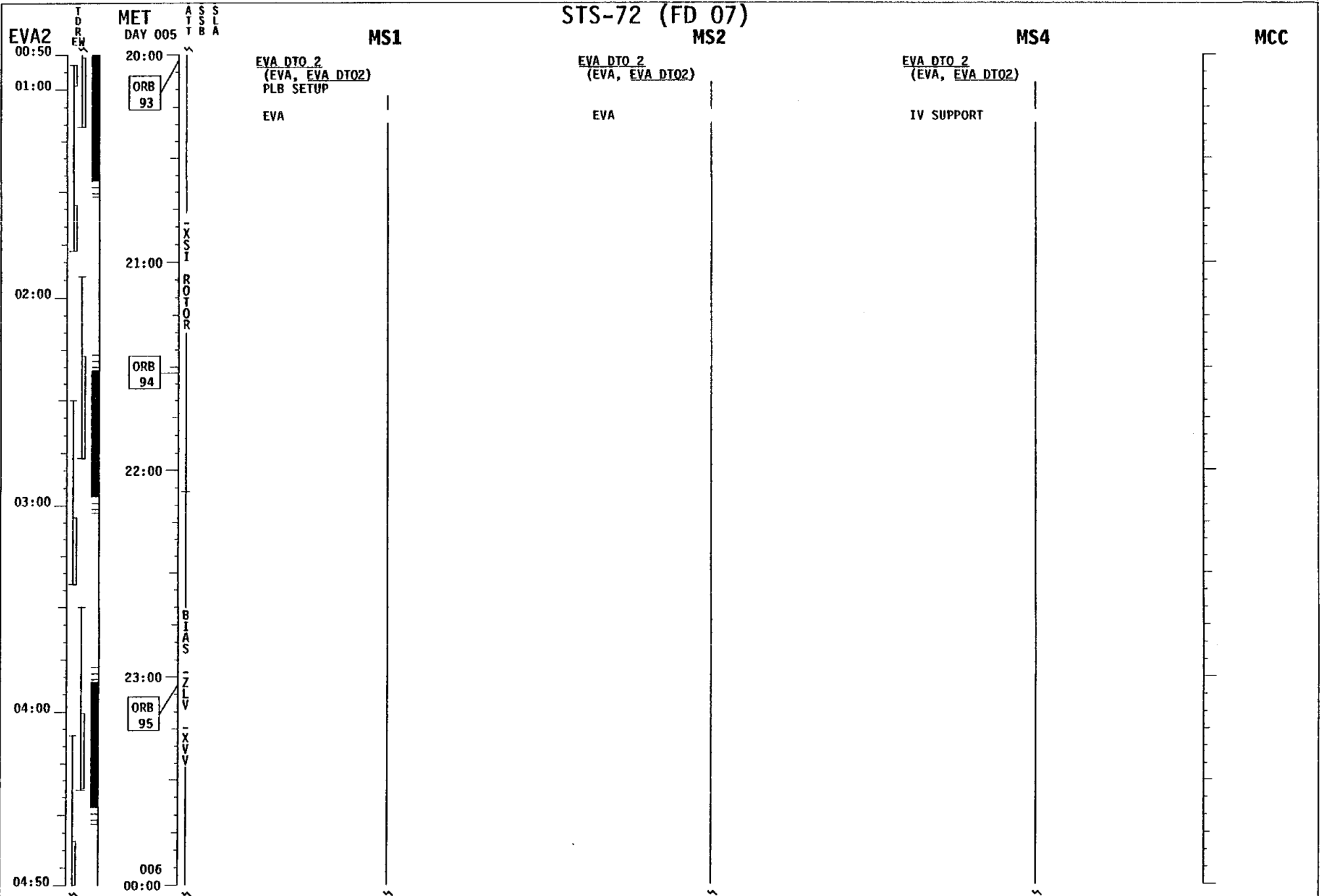


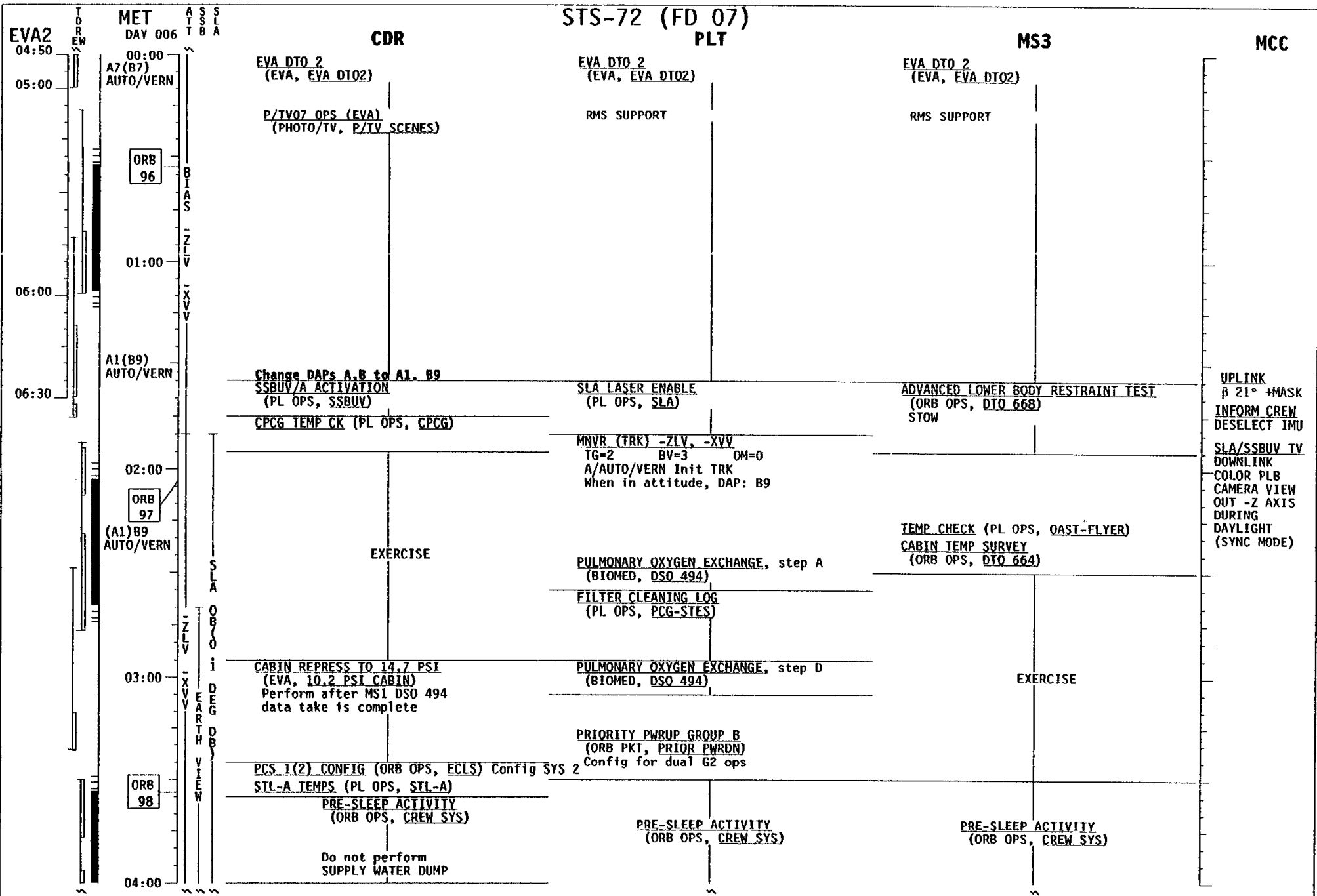
STS-72 (FD 07)

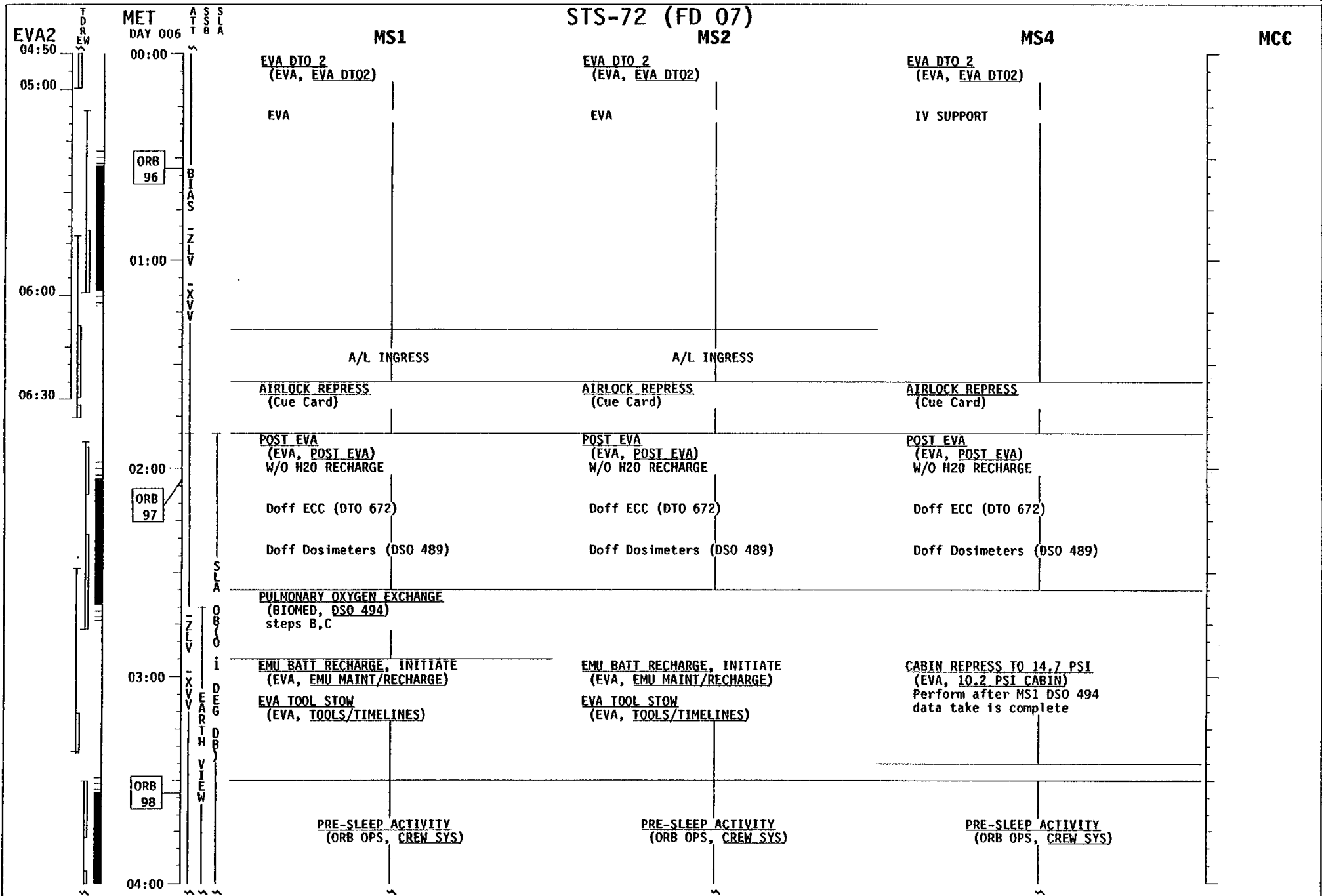


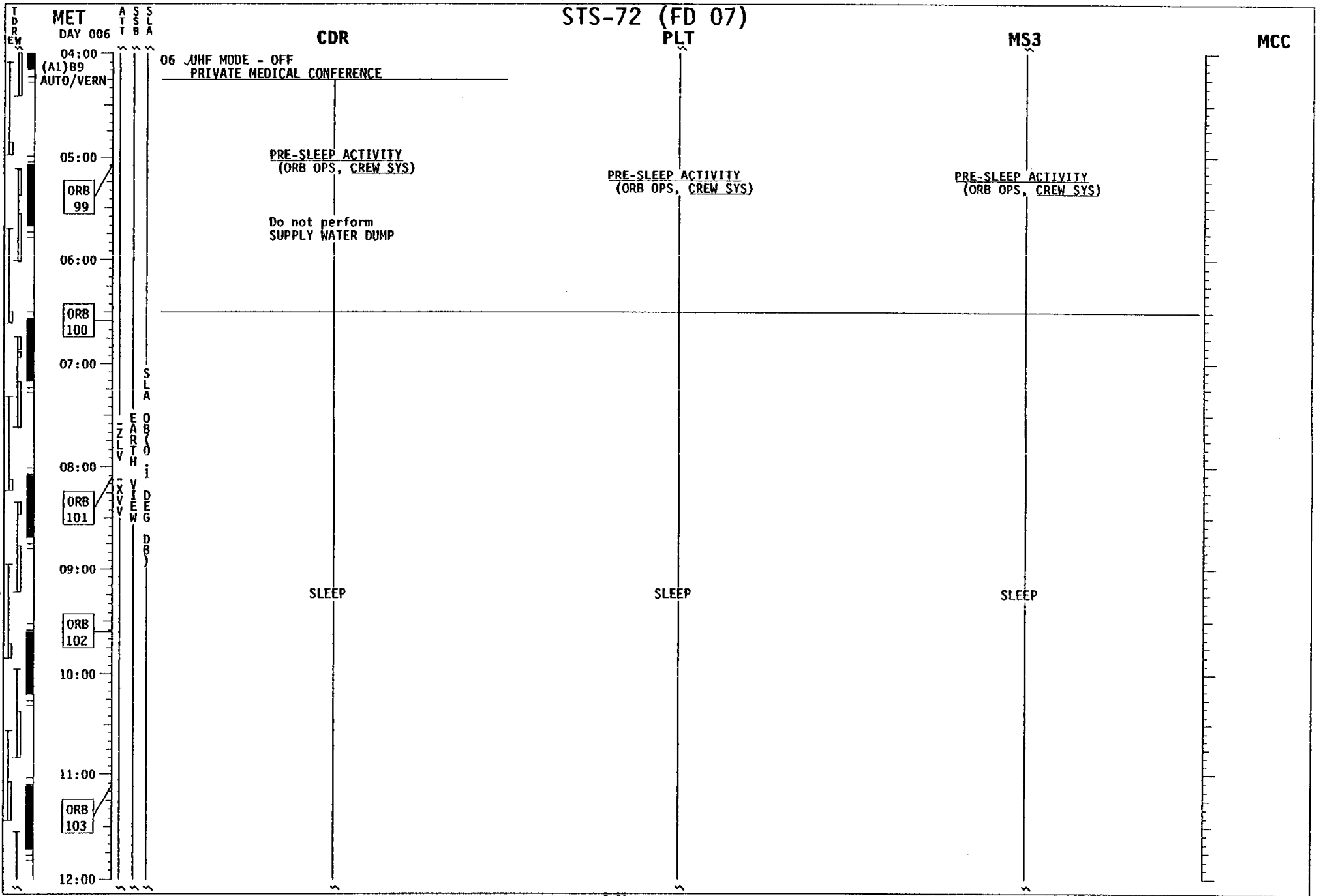




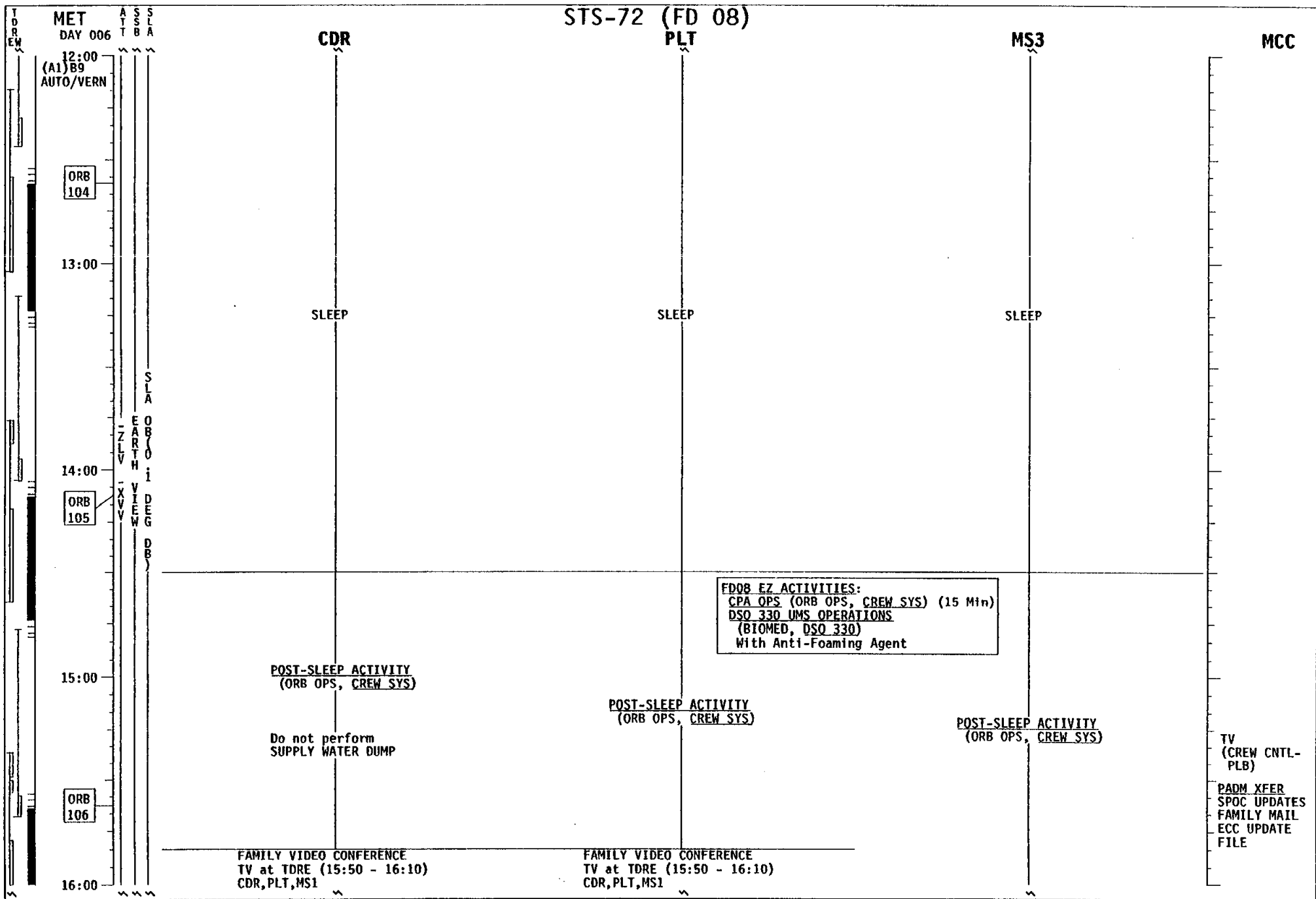


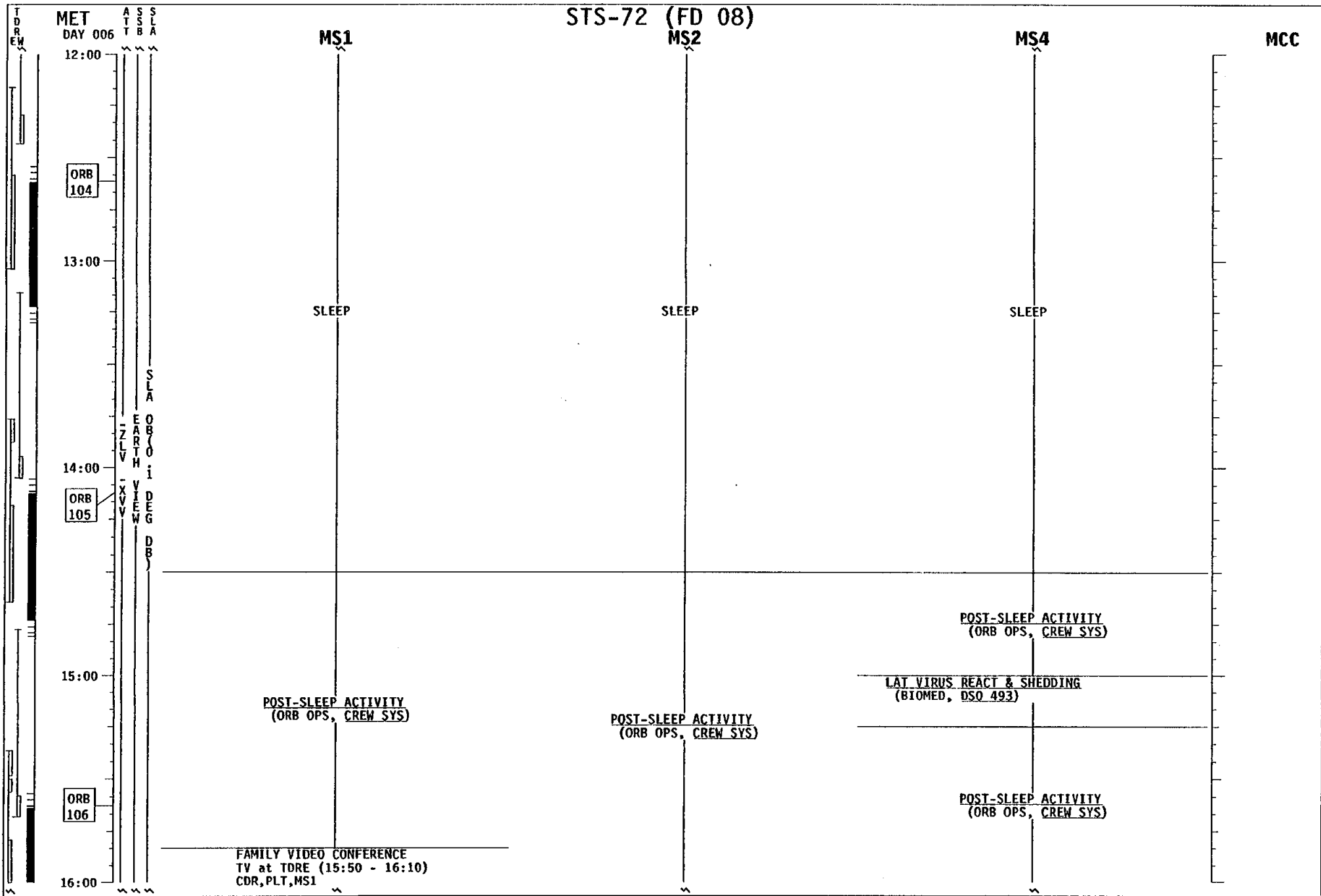


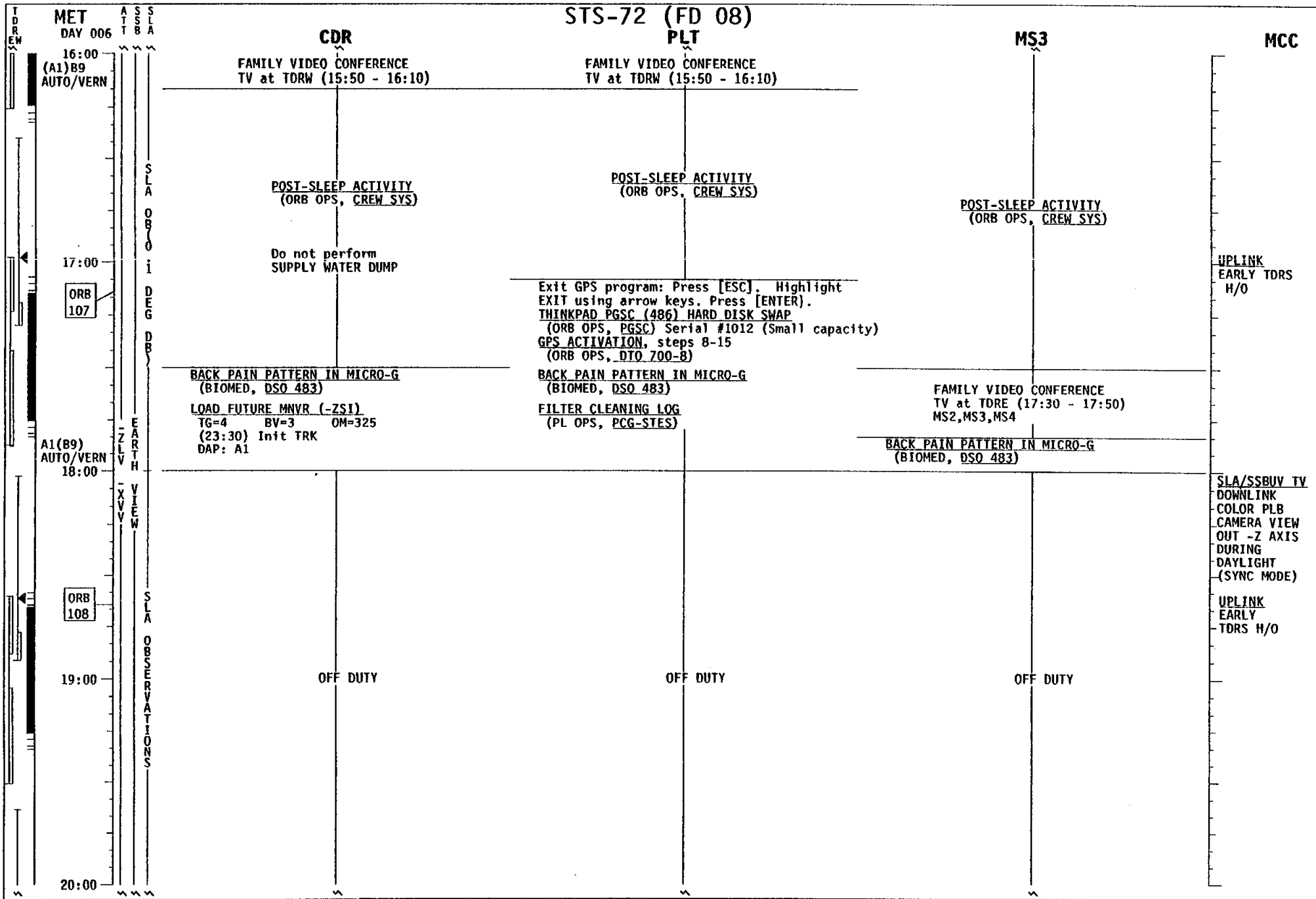


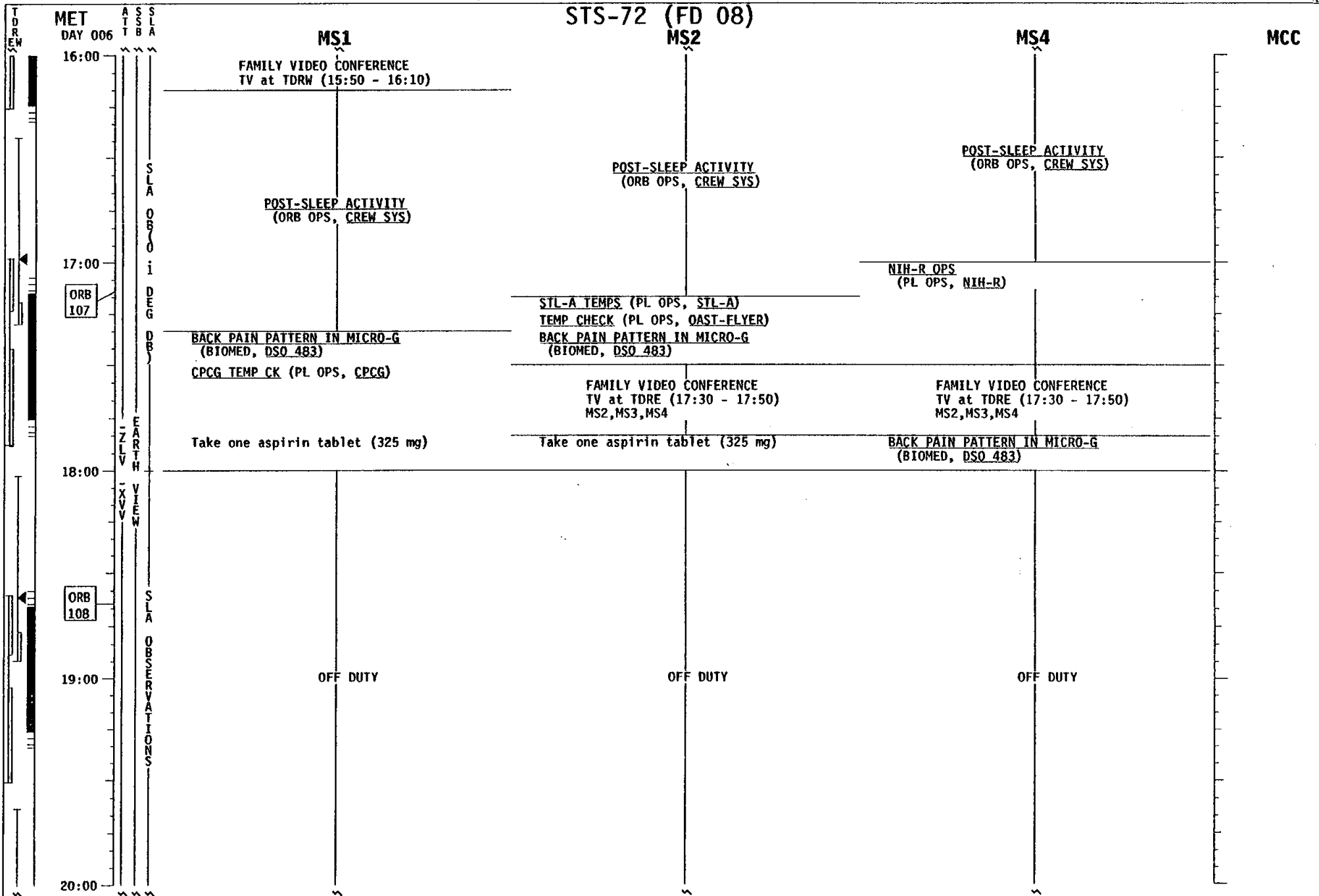


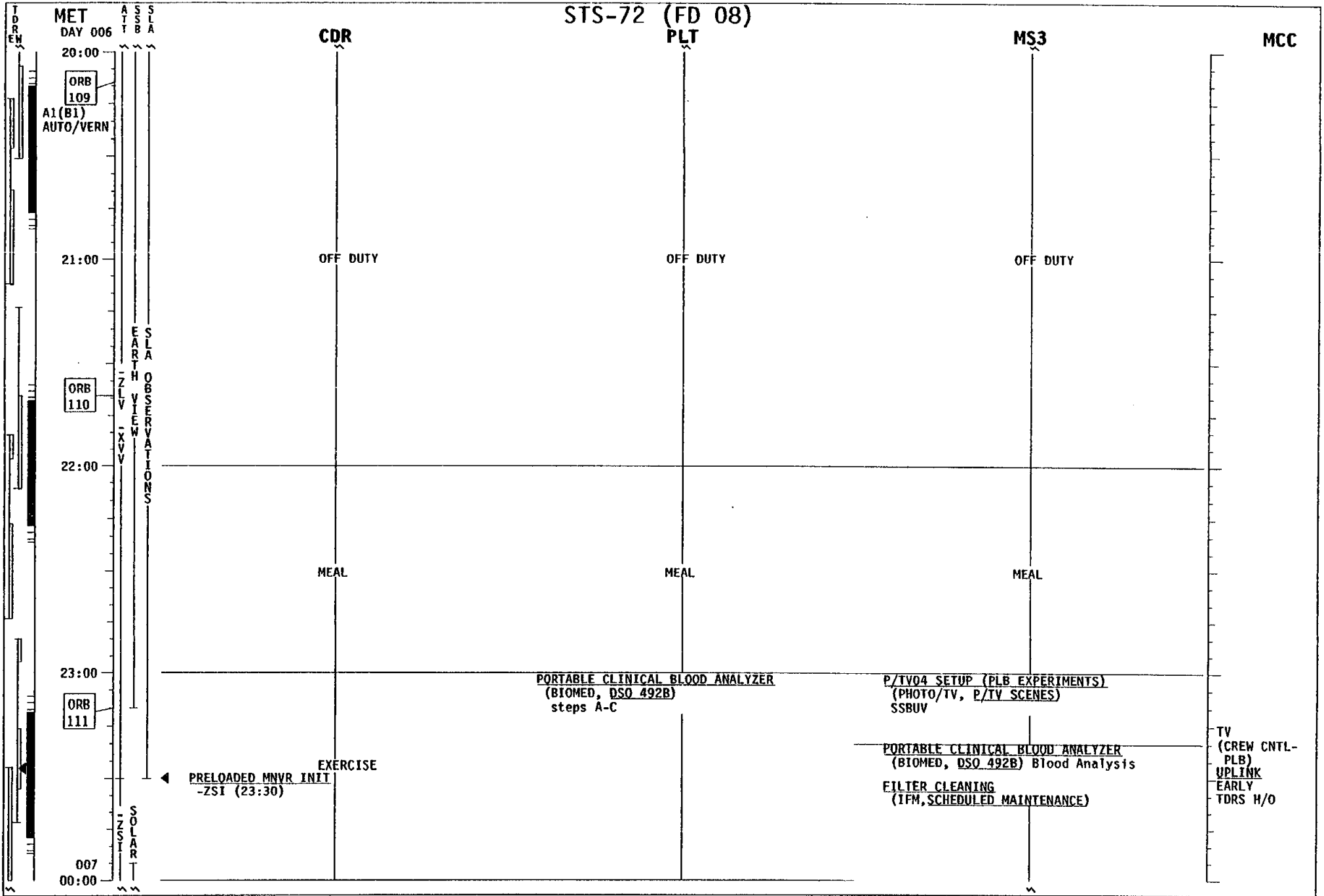
STS-72 (FD 08)

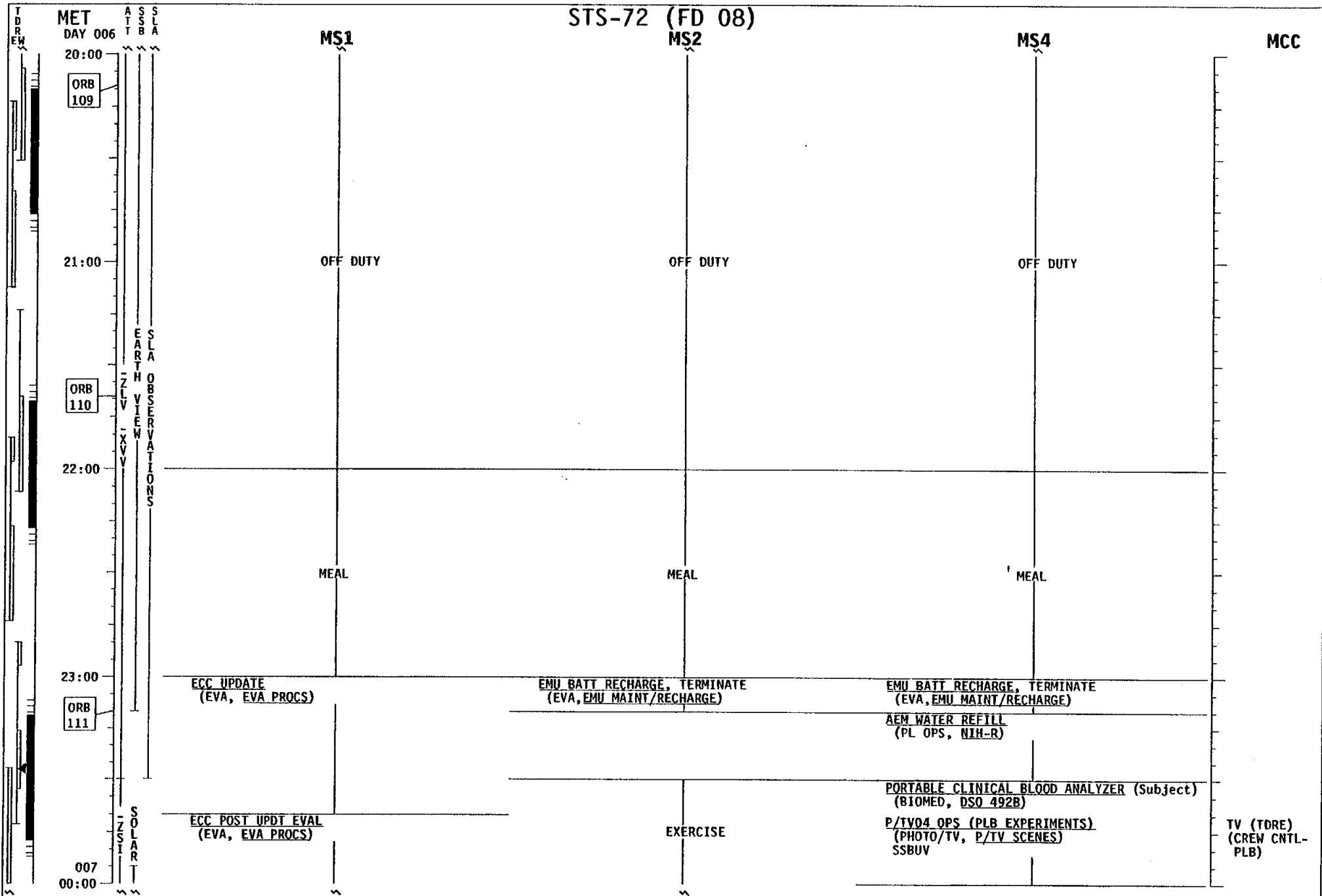




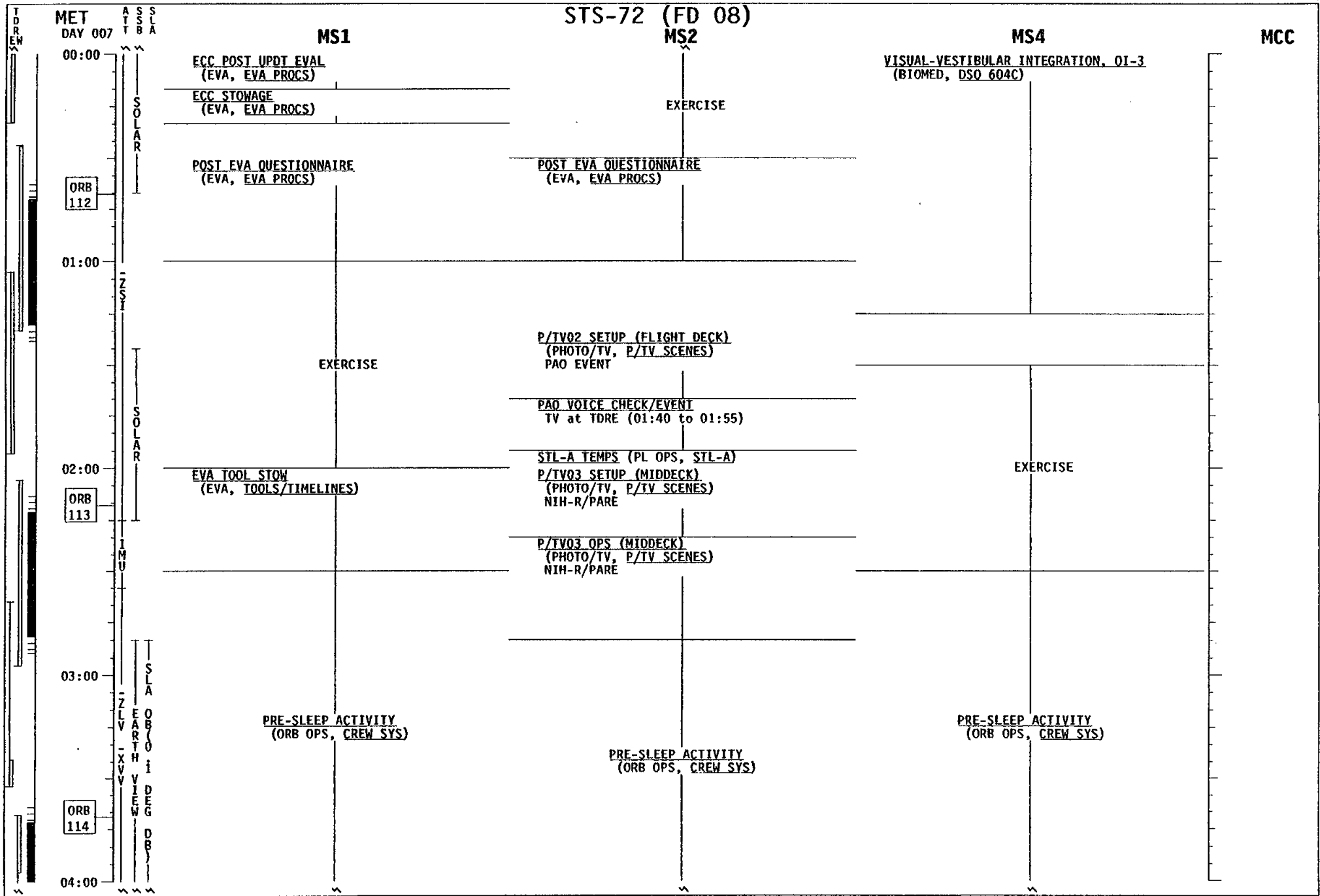


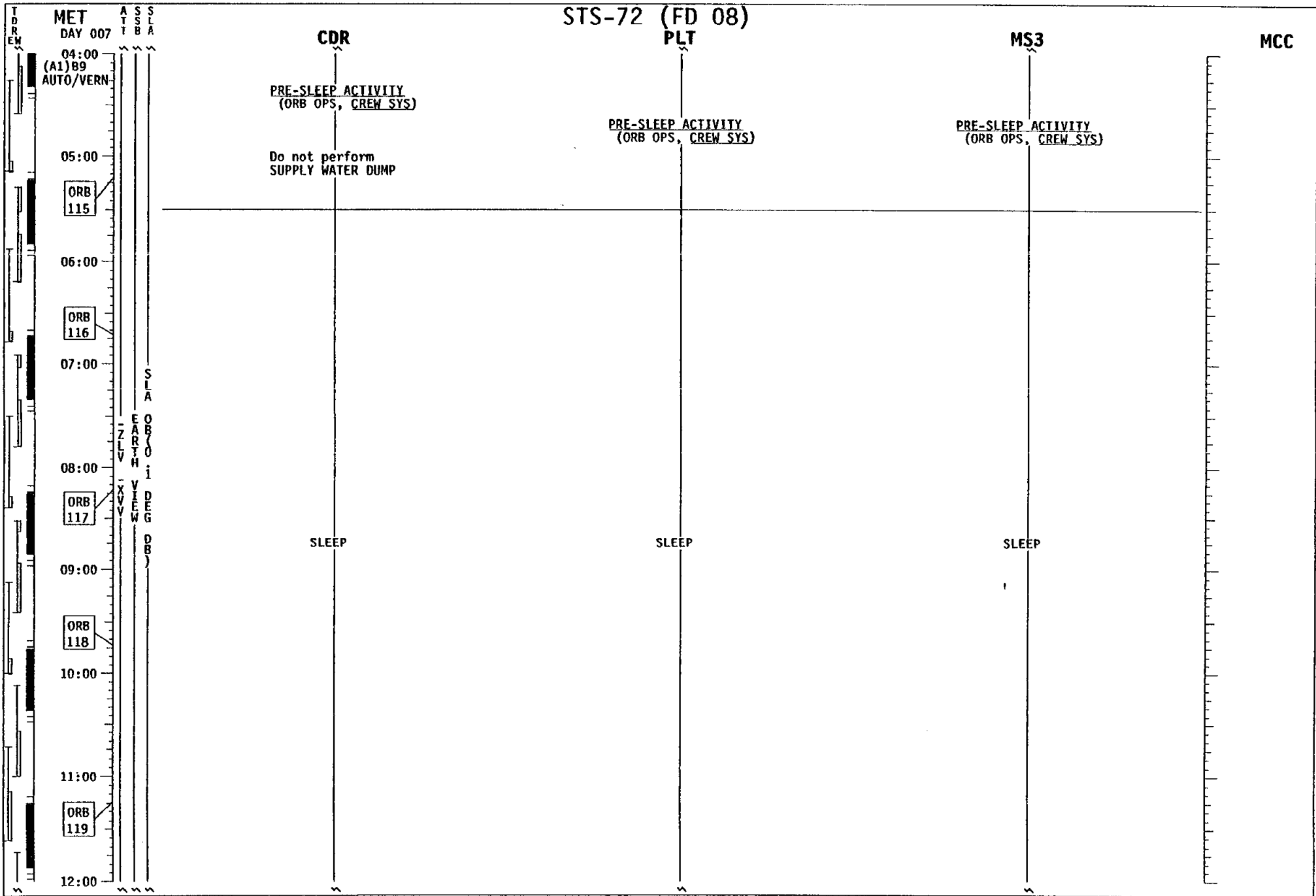


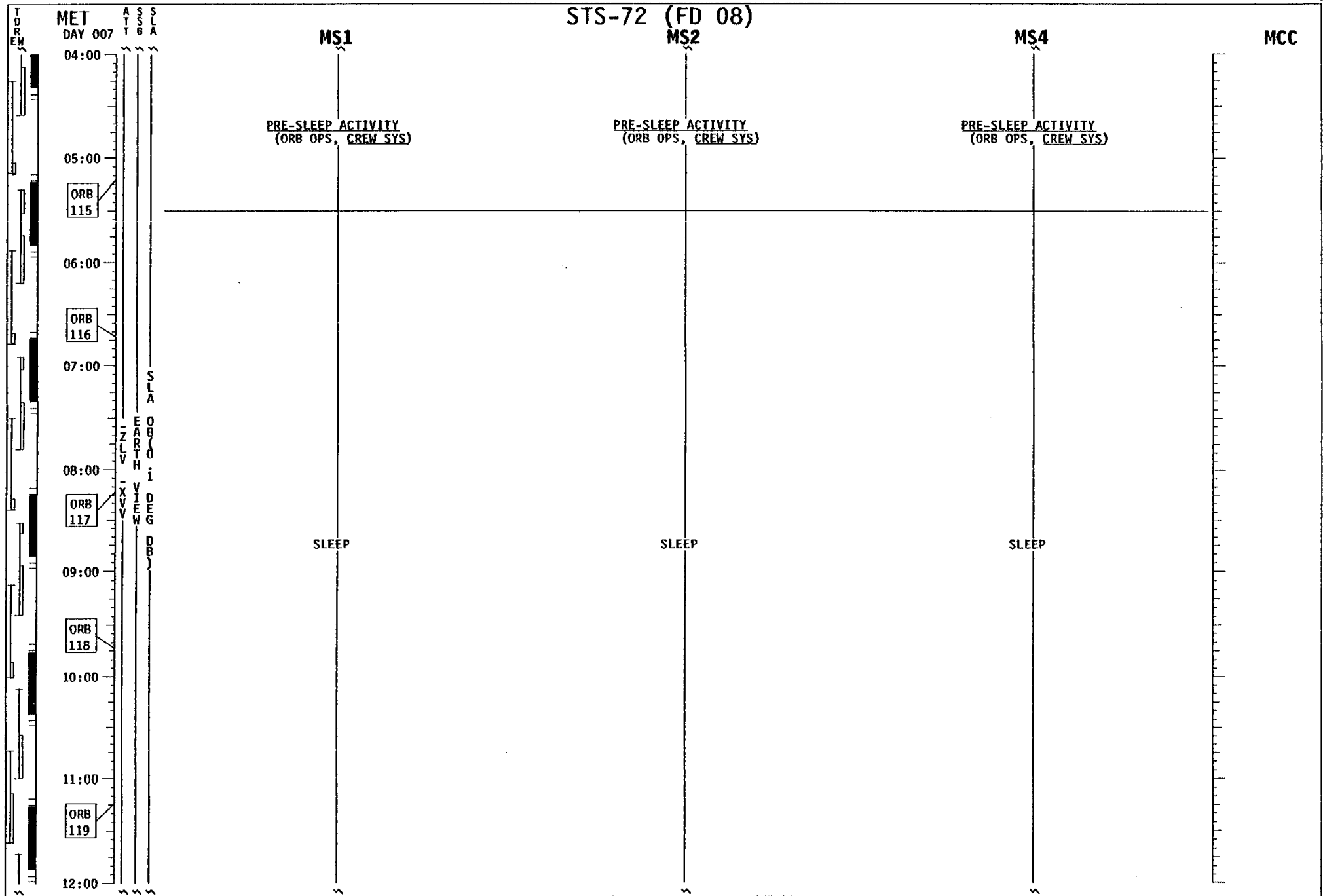




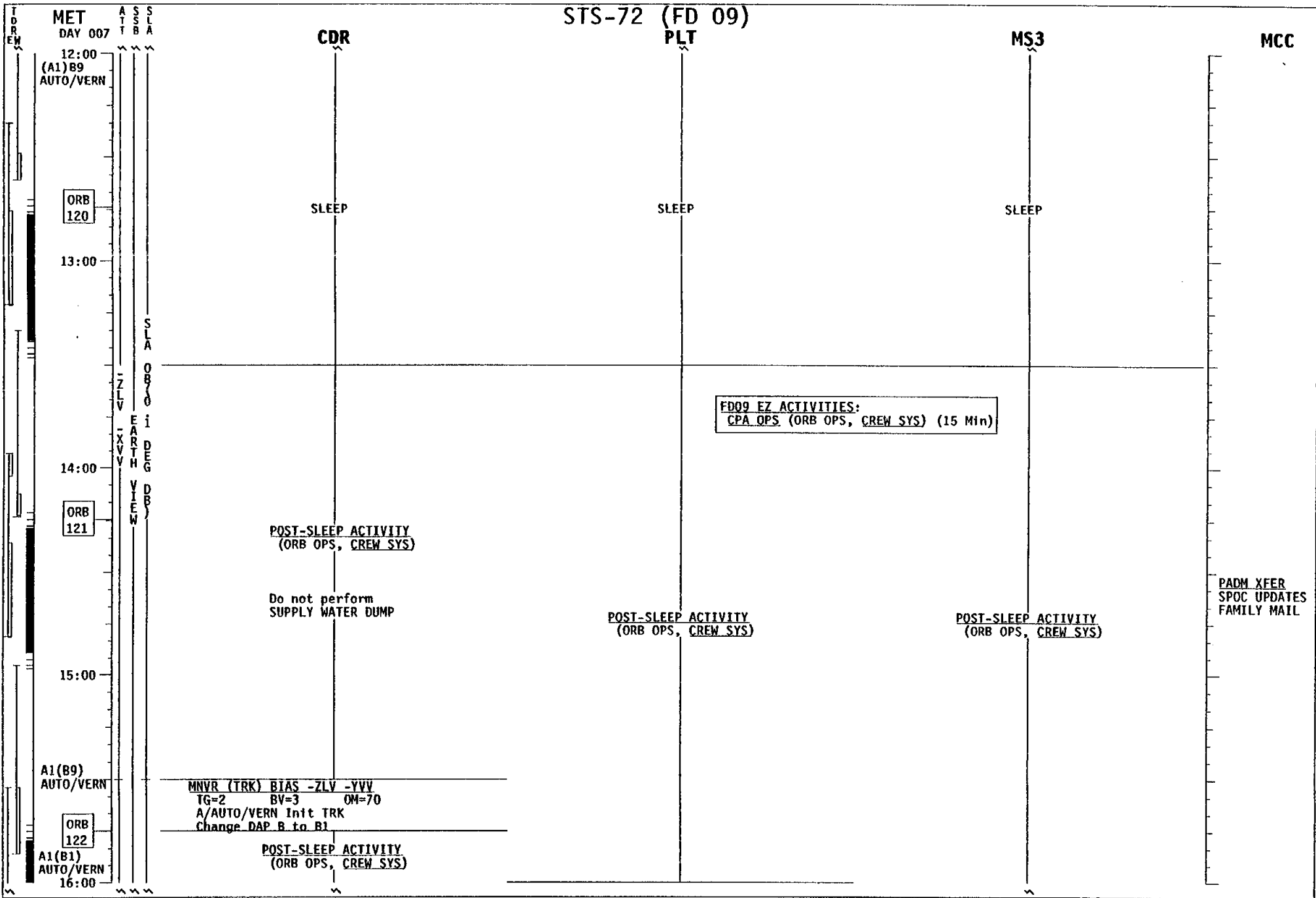
MET DAY 007		CDR	STS-72 (FD 08) PLT	MS3	MCC
00:00	A1(B1) AUTO/VERN	UMS CALIBRATION (BIOMED, DSO 330)	VISUAL-VESTIBULAR INTEGRATION, 01-3 (BIOMED, DSO 604C)	FILTER CLEANING (IFM, SCHEDULED MAINTENANCE)	
01:00	ORB 112	UMS STOW (BIOMED, DSO 330)	VISUAL-VESTIBULAR INTEGRATION, 01-3 (BIOMED, DSO 604C)	EXERCISE	
02:00	ORB 113	PAO VOICE CHECK/EVENT TV at TDRE (01:40 to 01:55)		PAO VOICE CHECK/EVENT TV at TDRE (01:40 to 01:55)	TV (TDRE) (CREW CNTL-CAB)
		CABIN TEMP SURVEY (ORB OPS, DTO 664)		TEMP CHECK (PL OPS, OAST-FLYER)	
		CPCG TEMP CK (PL OPS, CPCG)		FILTER CLEANING LOG (PL OPS, PCG-STES)	
	(A1)B9 AUTO/VERN	◀ MNVR IMU ALIGN ATT STAR PAIR (A1) A/AUTO/VERN Init MNVR at SS		EXERCISE	
03:00		IMU ALIGN - S TRK (ORB OPS)			
		MNVR (TRK) -ZLV, -XV TG=2 BV=3 OM=0 A/AUTO/VERN Init TRK When in attitude, DAP: B9			
		PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)		PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	SLA/SSBUV TV DOWNLINK COLOR PLB CAMERA VIEW OUT -Z AXIS DURING DAYLIGHT (SYNC MODE)
		Do not perform SUPPLY WATER DUMP			
		06 JHF MODE - OFF PRIVATE MEDICAL CONFERENCE	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)		
04:00	ORB 114	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)			

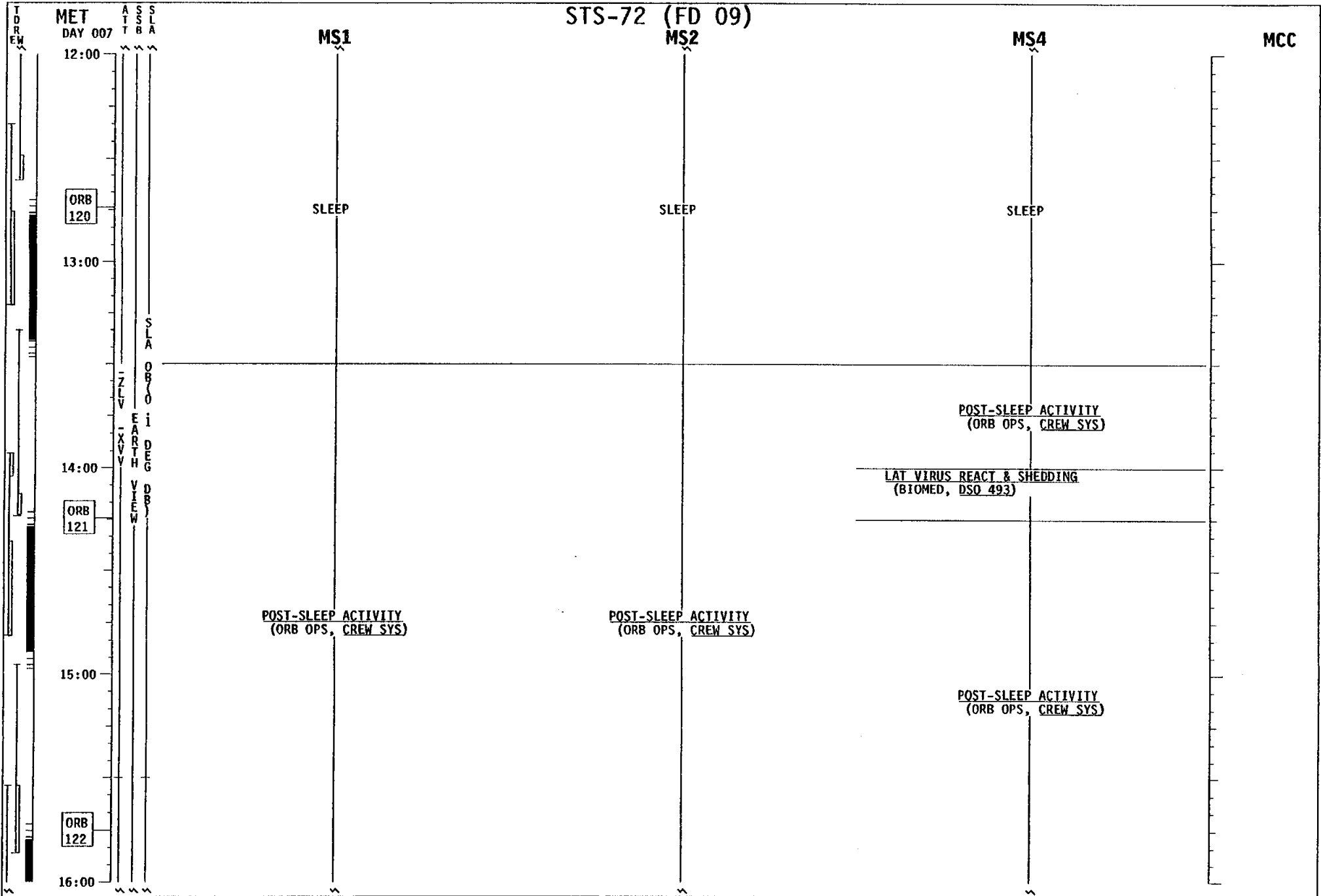


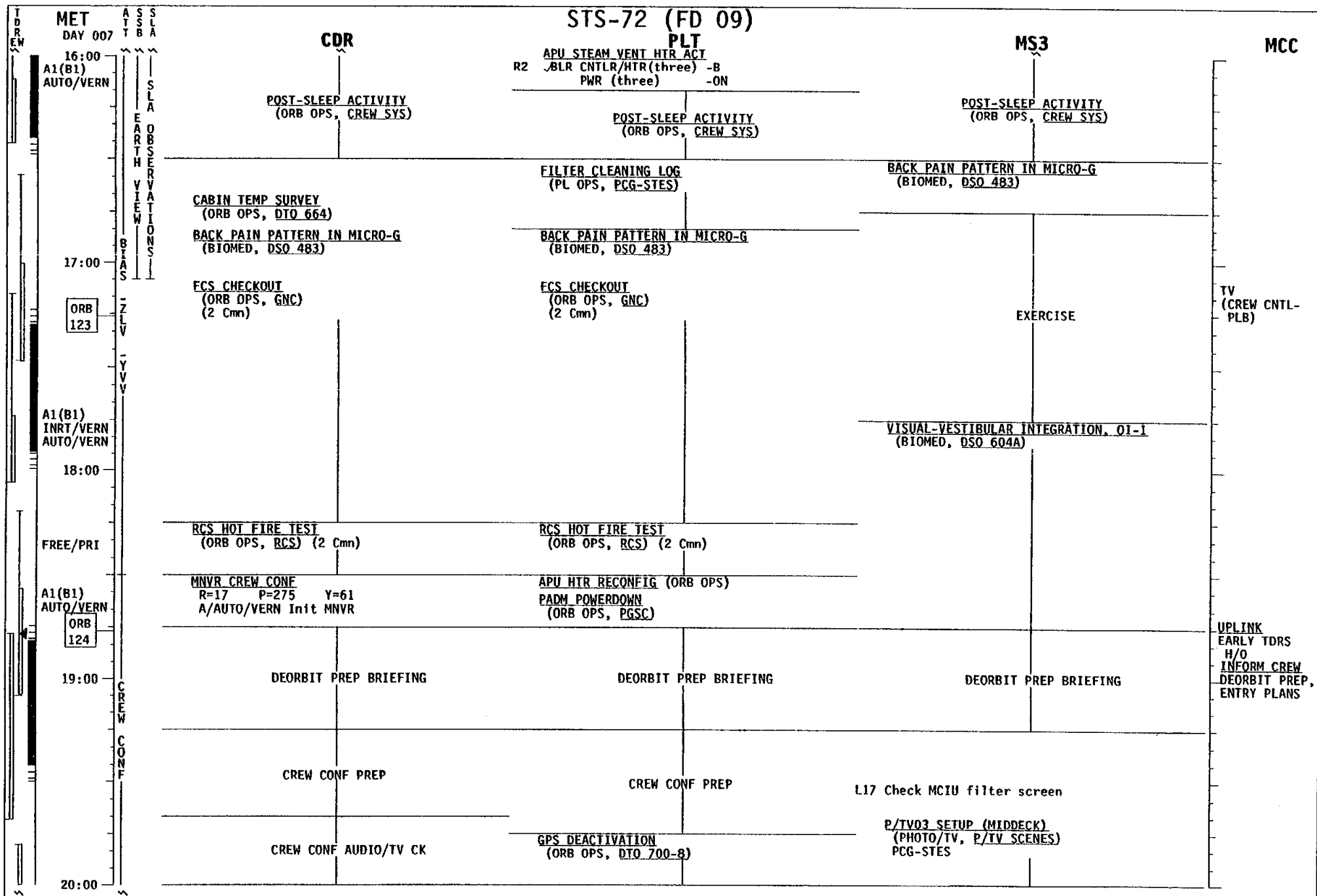


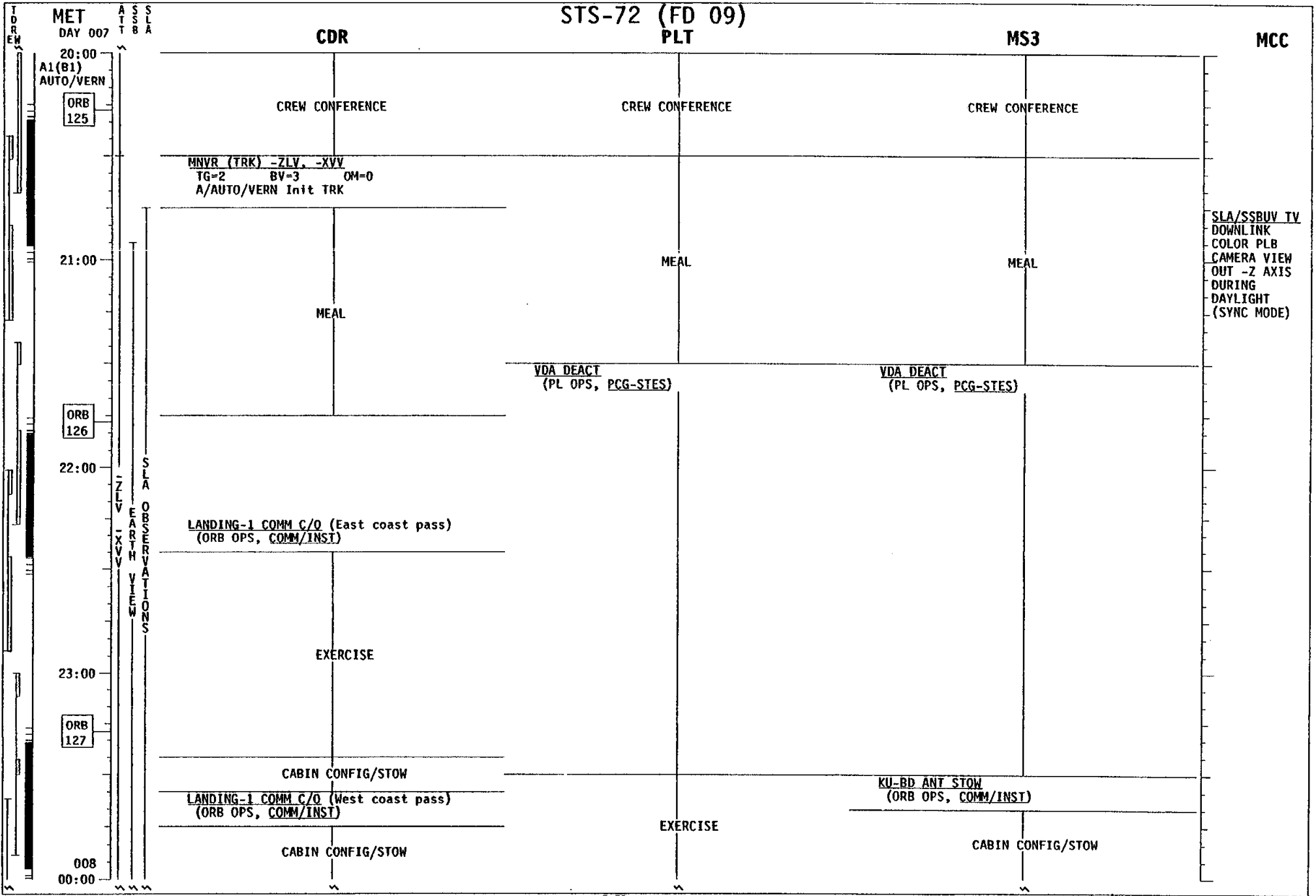


STS-72 (FD 09)

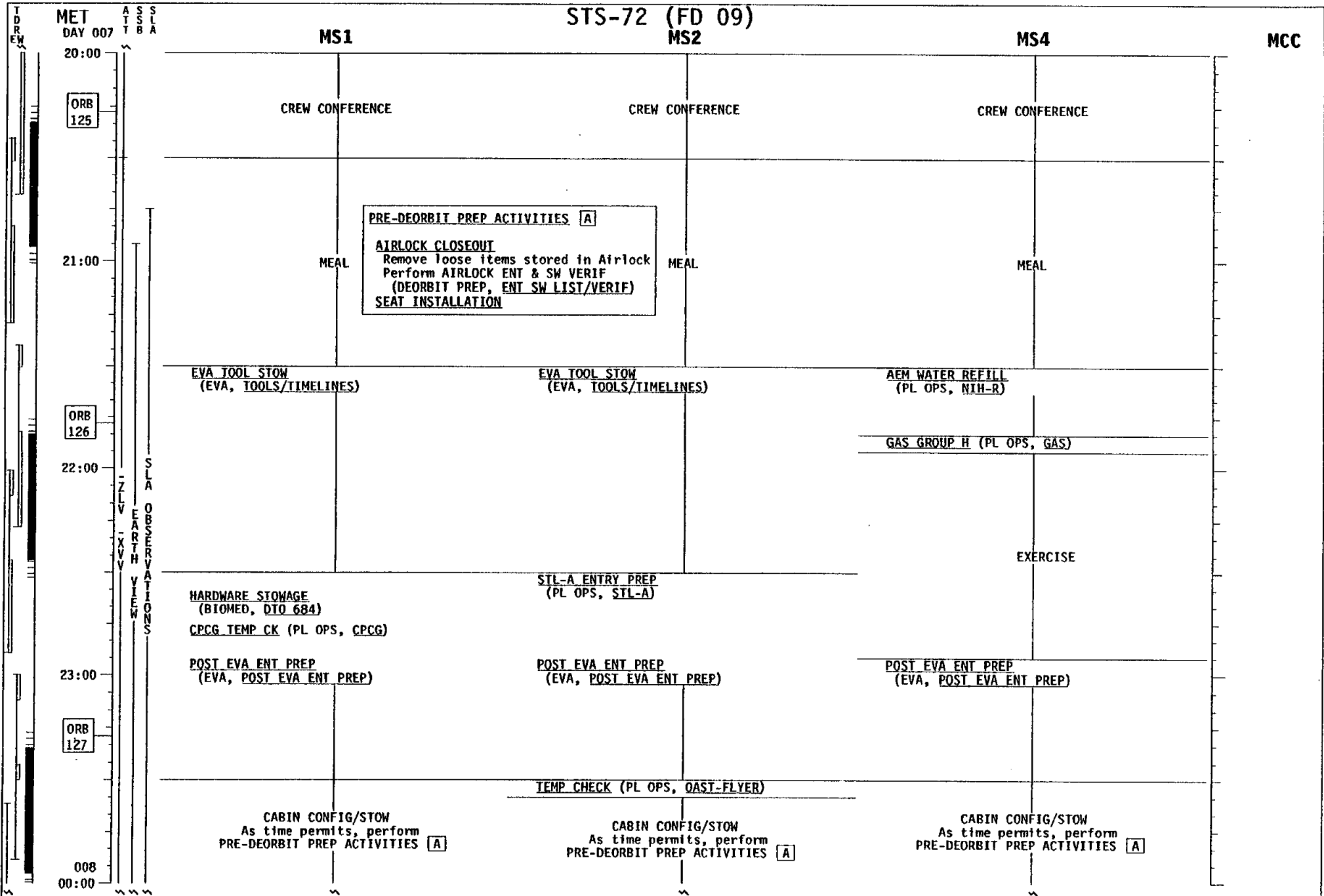


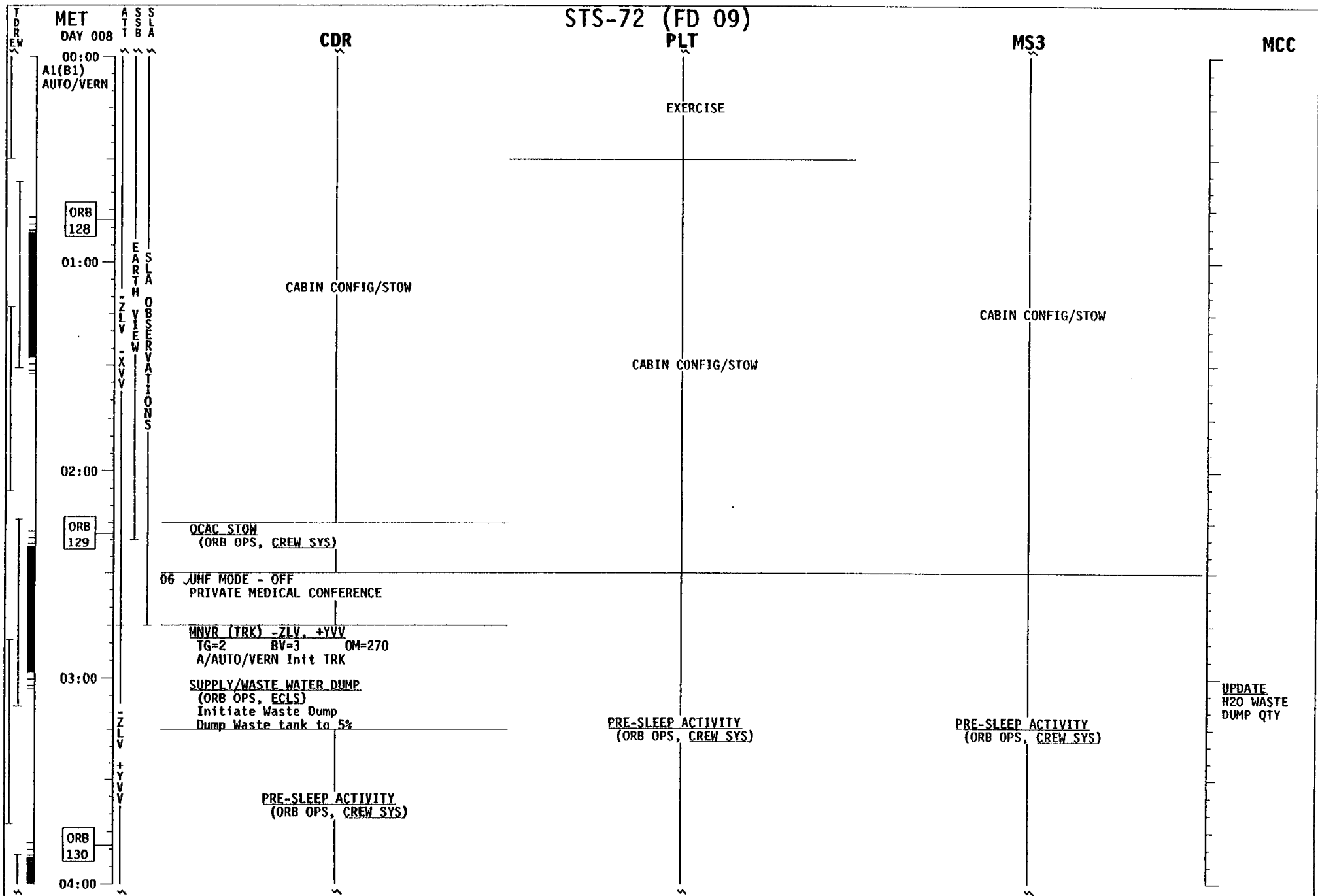


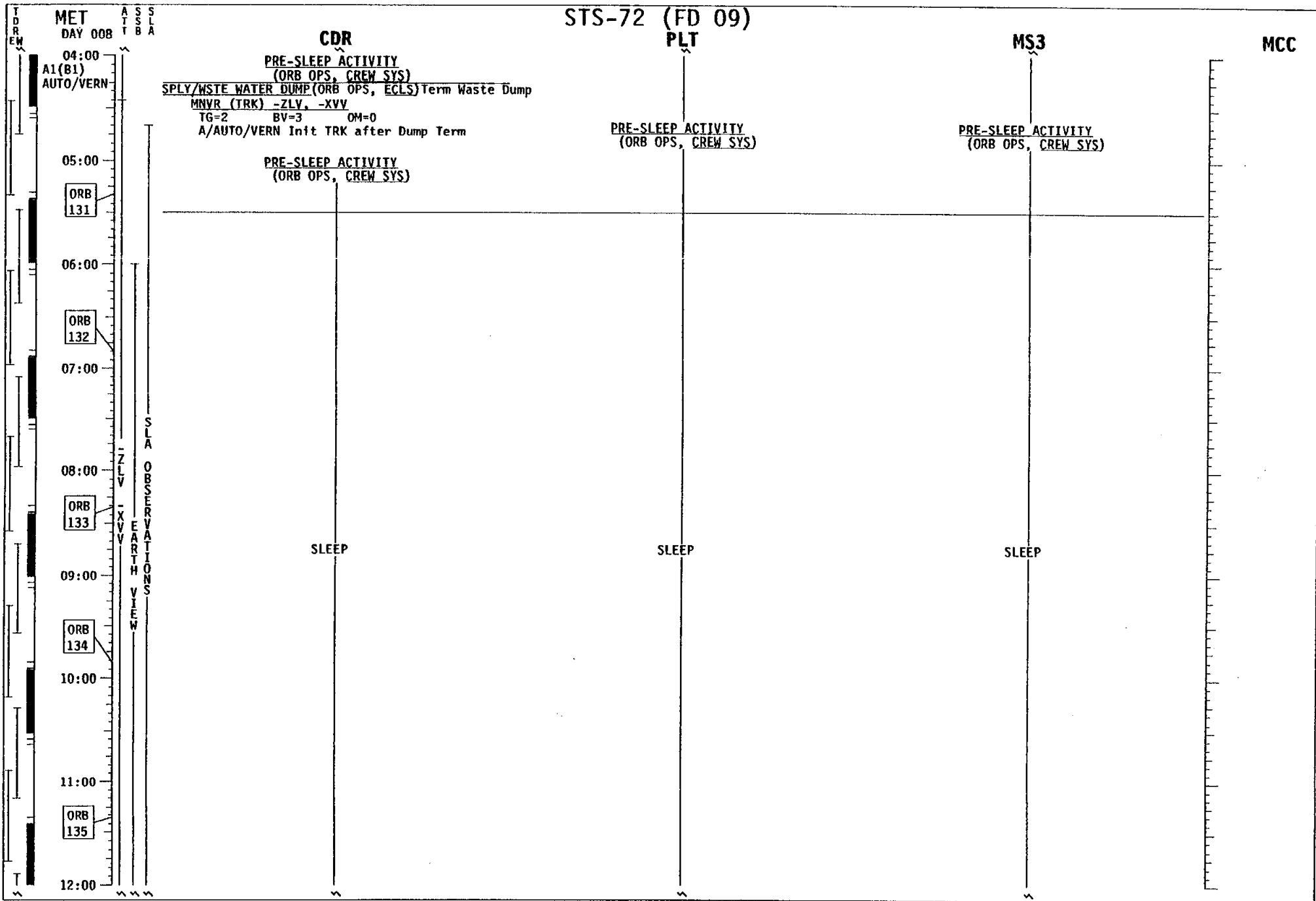


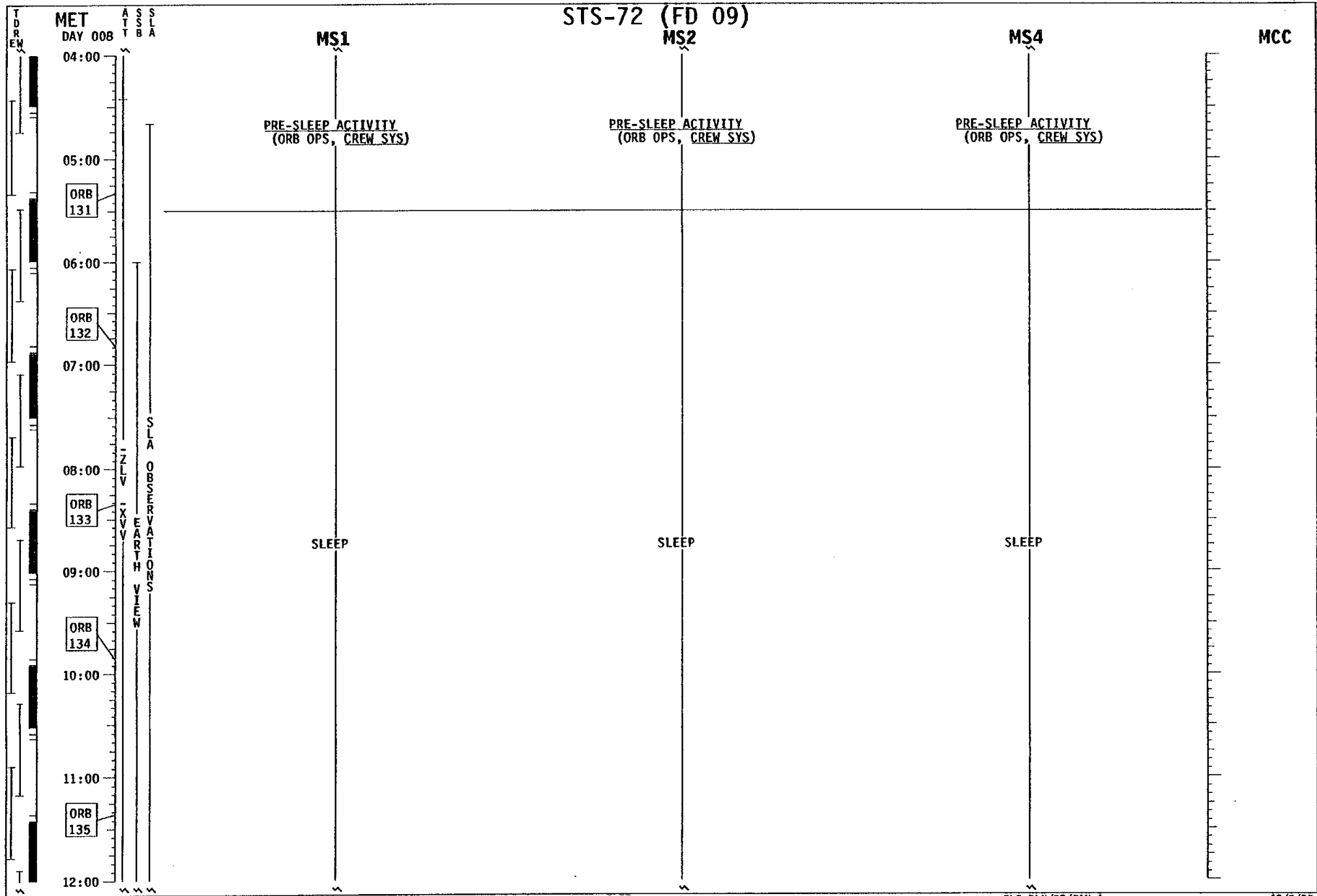


SLA/SSBUV TV
 DOWNLINK
 COLOR PLB
 CAMERA VIEW
 OUT -Z AXIS
 DURING
 DAYLIGHT
 (SYNC MODE)

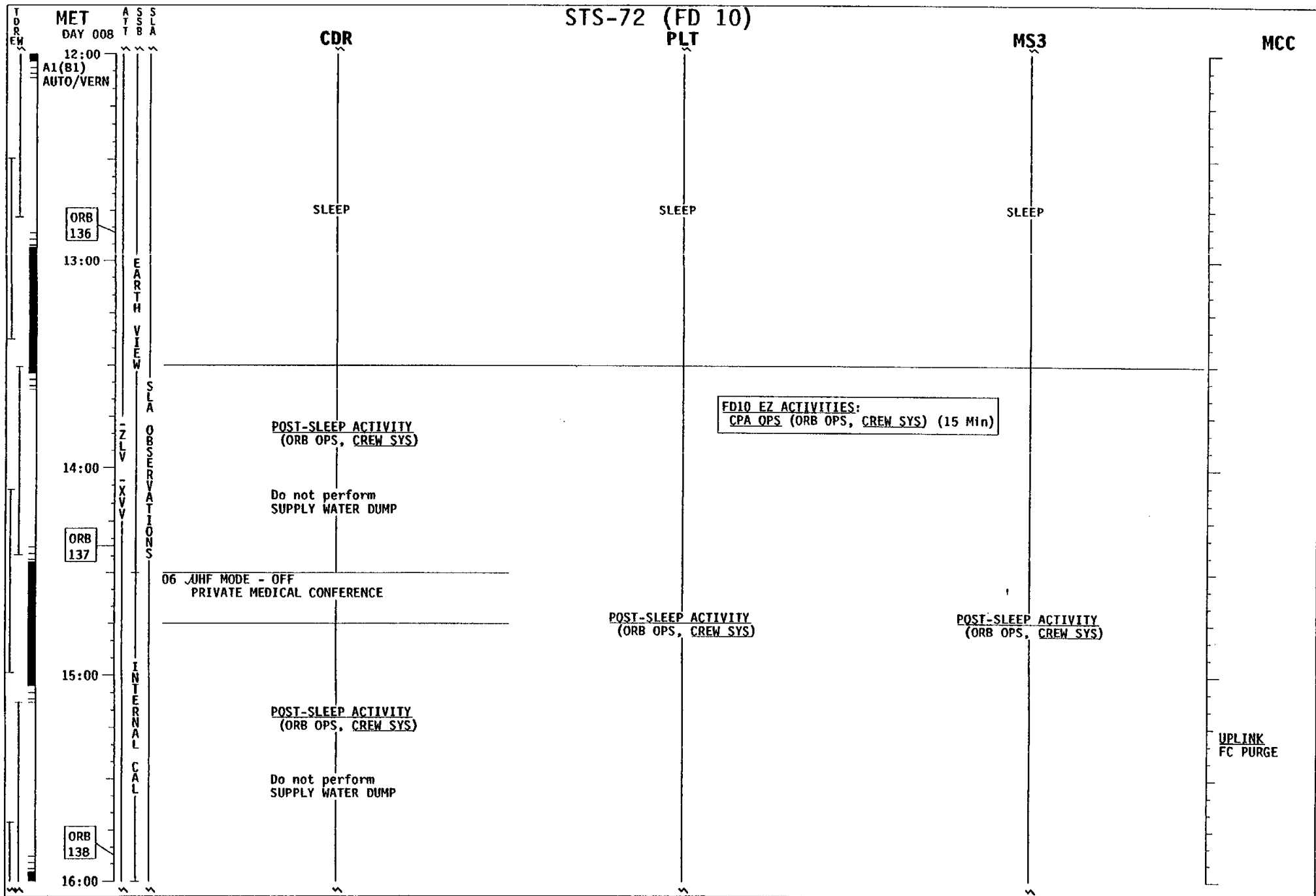


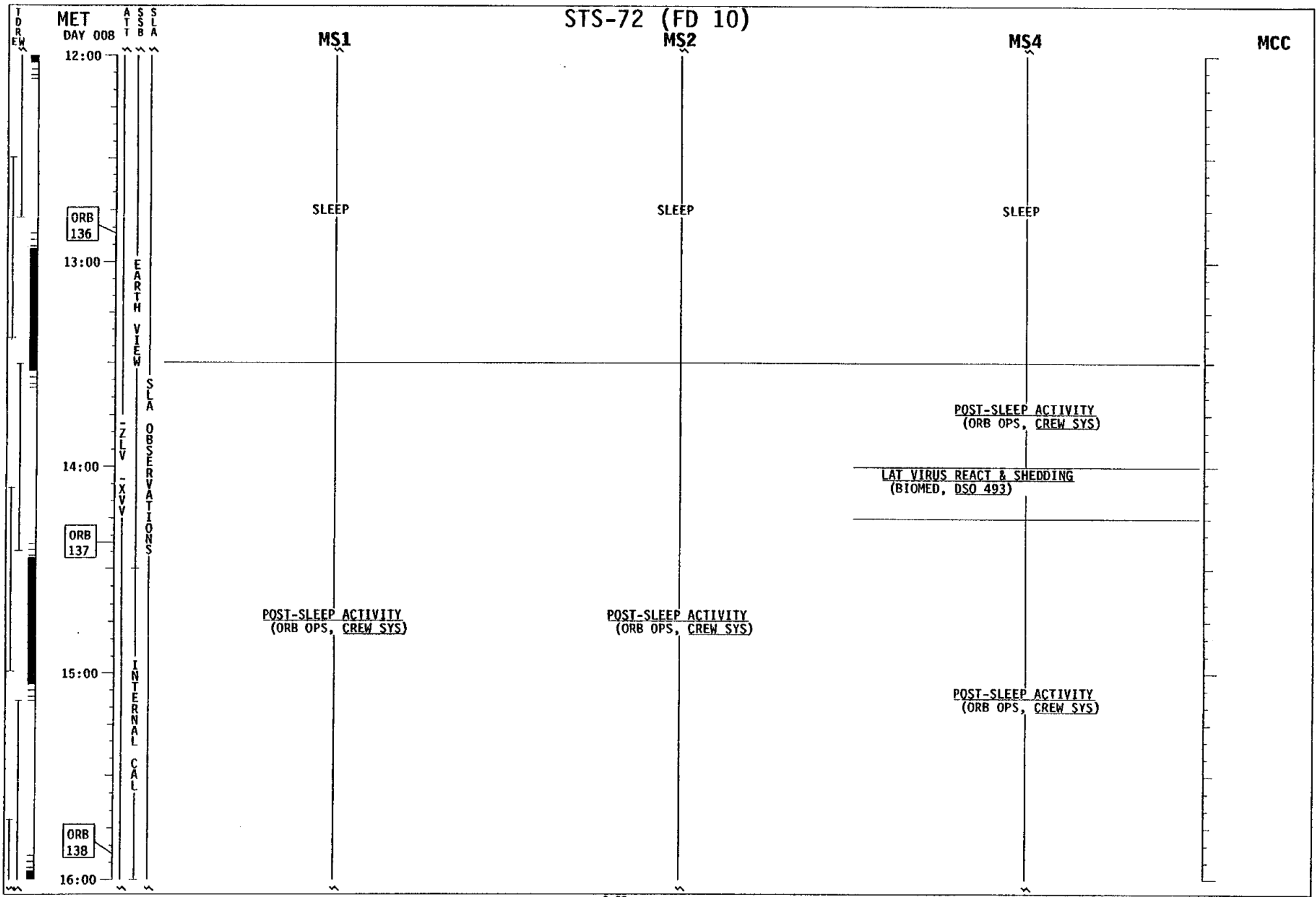






STS-72 (FD 10)





STS-72 (FD 10)

MET DAY 008

CDR

PLT

MS3

MCC

16:00
A1(B1)
AUTO/VERN

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY WATER DUMP

SLA LASER DISABLE
(PL OPS, SLA)

SLA DEACT
(PL OPS, SLA)

BACK PAIN PATTERN IN MICRO-G
(BIOMED, DSO 483)

BACK PAIN PATTERN IN MICRO-G
(BIOMED, DSO 483)

BACK PAIN PATTERN IN MICRO-G
(BIOMED, DSO 483)

EZ ACTIVITIES BEFORE LEAVING FLT PLN:
AIR SAMPLE
Rcd MET on bottle
FLUID LOADING PREP
Fill 6 drink containers with
8 oz H2O each (per person)

INFORM CREW
RESELECT IMU

◀ MNVR (TRK) -XSI ATT
TG=4 BV=5
P=184 Y=0 OM=270
A/AUTO/VERN (17:23) Init TRK

Go to DEORBIT PREP at 8/17:36 MET

17:00

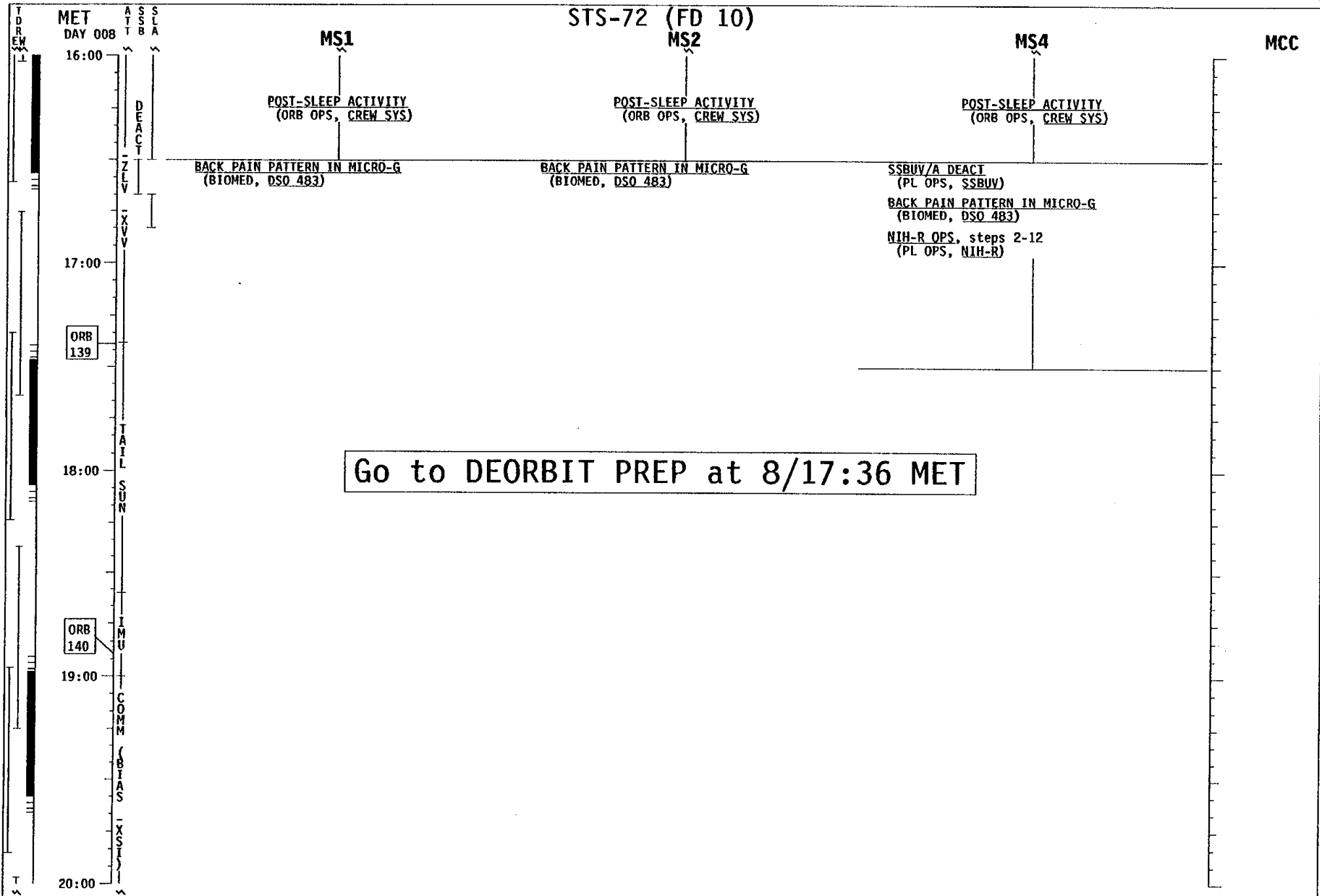
ORB
139

18:00

ORB
140

19:00

20:00



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MINIMUM DURATION FLIGHT TIMELINE

**MDF
TIMELINE**

MINIMUM DURATION FLIGHT TIMELINE

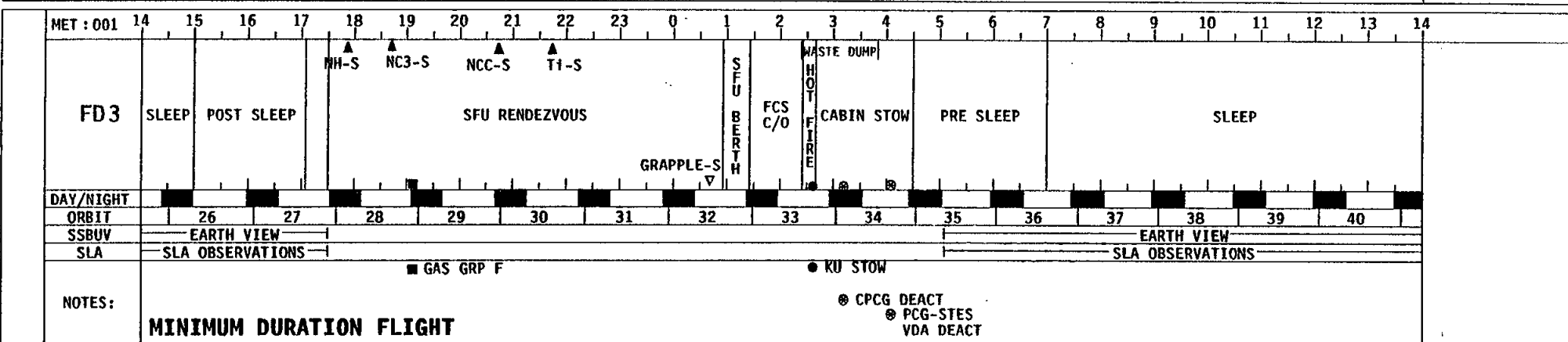
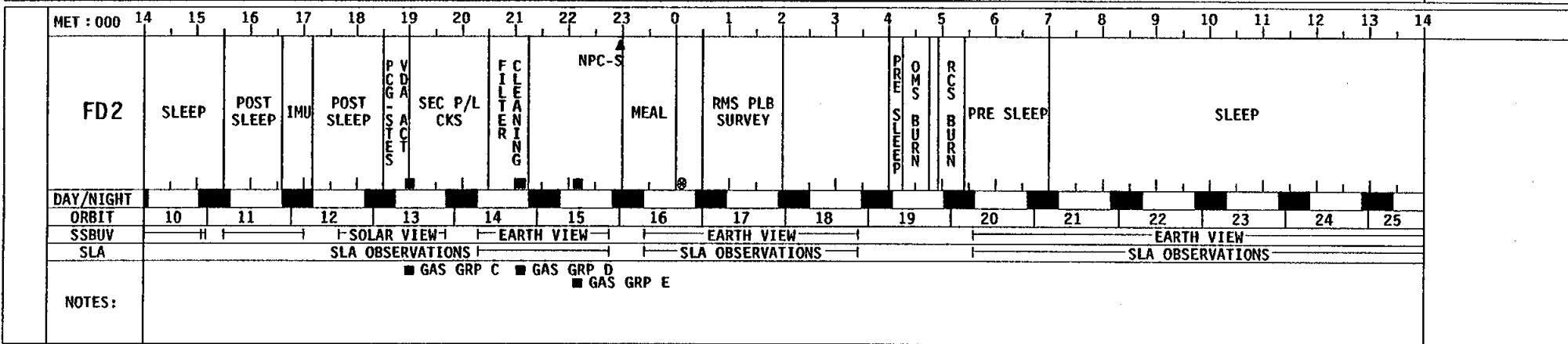
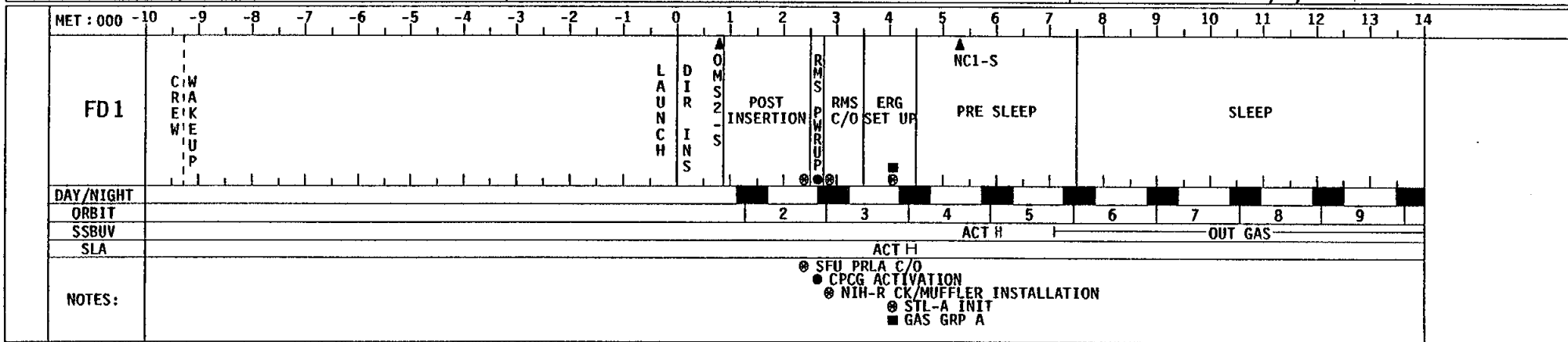
The STS-72 MDF timeline assumes that the MDF decision is made no later than 0/18:00 MET. Flight Rule A2-11 defines MDF. The landing time used in this trajectory is approximate as the trajectory used also includes burns to lower the orbit for the OAST deploy, and this timeline does not incorporate those burns. There is an additional KSC landing opportunity available after the landing time used in this timeline.

The highest payload mission priority, the SFU retrieval, is performed. Mission priorities are defined in Flight Rule A2-10. The OAST deploy and the scheduled EVAs are not performed. The DSOs/DTOs were removed from the timeline, but some could be added back on a priority/time available basis. Minimum mission operations requirements were met for most secondaries, with all secondary photo/TV operations deleted. Secondaries performed were CPCG, NIH-PARE, MPNE, STL-A, and PCG-STES. Approximately 22 orbits of data were achieved for SSBUV (minimum desired was 24), and SLA has approximately 31 hours of operating time scheduled which satisfies their minimum required operating time of 30 hours. However, SLA will be operating at a higher orbit than desired and will begin operations earlier than desired. All GAS activities (groups A, C, D, E, F, and G) were performed.

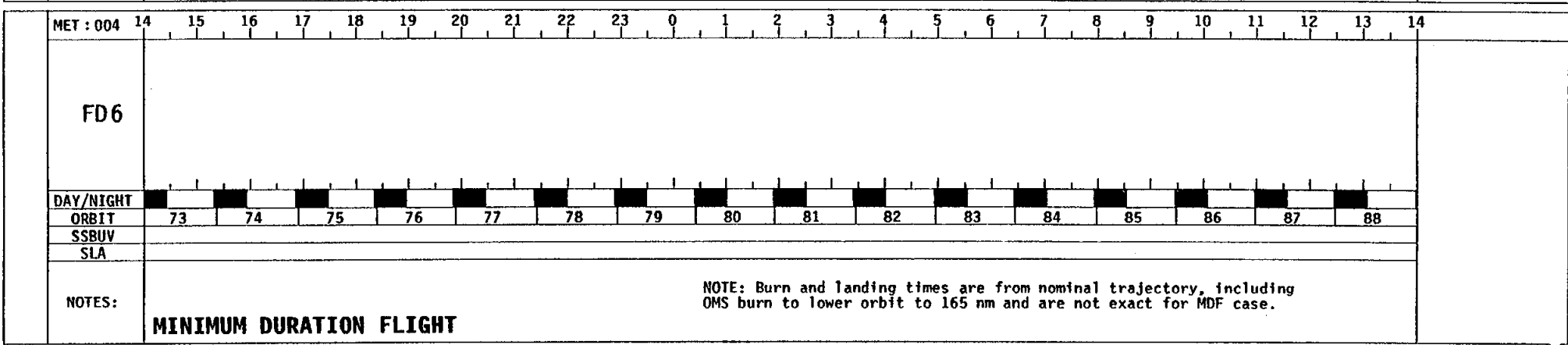
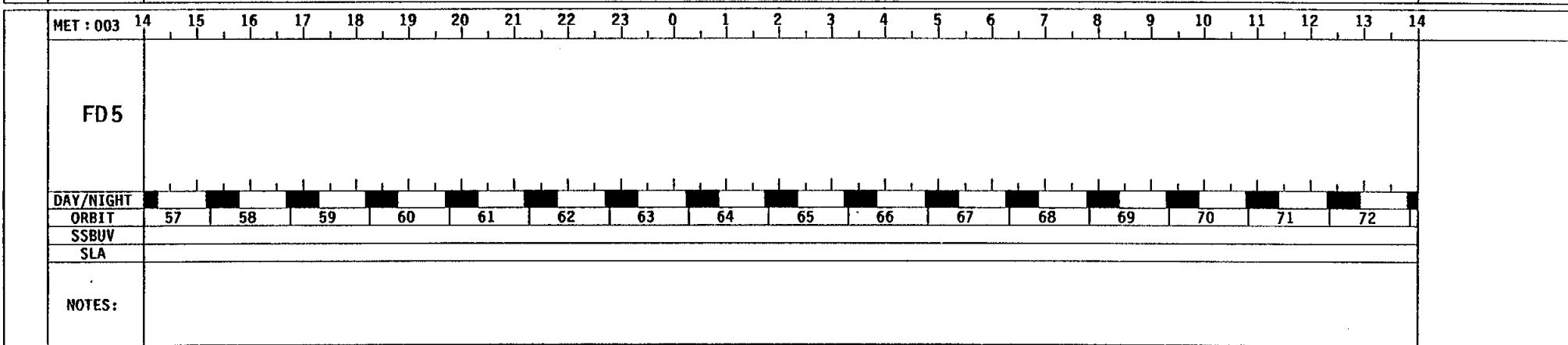
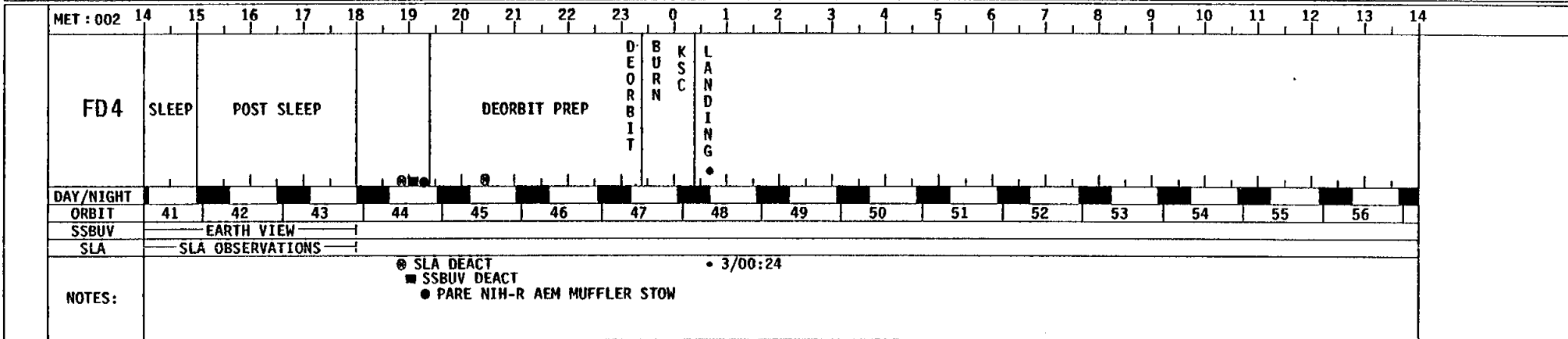
FLIGHT: STS-72

EDITION: FINAL REV A

PUB. DATE: 12/7/95



MINIMUM DURATION FLIGHT



SFU UNSCHEDULED PRLA LATCH EVA TIMELINE

SFU PRLA LAT
EVA TIMELINE

SFU UNSCHEDULED PRLA LATCH EVA TIMELINE

This timeline depicts the scenario in which the SFU has been successfully grappled and berthed on FD3, but a primary PRLA failed to latch following the berthing. In the nominal timeline, two orbit lowering OMS burns are scheduled following the SFU berthing. These OMS burns must be delayed until the PRLA can be latched, as defined in Flight Rule A2-50. The SFU will remain berthed in the payload bay although the mating of the ROEU is not permitted with one of the primary PRLAs unlatched, per Flight Rule A2-53. Since the ROEU is not available to provide power to the SFU heaters, the orbiter must fly a safe attitude profile until the ROEU is mated and power can be supplied to the SFU heaters. This safe SFU attitude profile consists of 6 orbits of bias -ZSI attitude, followed by 3 orbits at -ZLV. These attitudes will be repeated until SFU heaters are operating. Flight Rule A2-14 defines this safe attitude profile. Due to this SFU attitude requirement, the simo waste and supply water dump scheduled in postsleep will be delayed about 12 hours until presleep, since the dump requires an incompatible attitude. After some amount of troubleshooting the PRLA problem, the decision is made to perform an EVA on FD4 to manually close the unlatched PRLA. Per Flight Rule A2-32, this PRLA is required to be latched for entry or SFU cannot be returned. The EVA task to latch the PRLA requires approximately 1 hour. The EVA will be dedicated to the task of latching this PRLA and no additional objectives, such as EDFT tasks, will be performed during the EVA. Flight Rule A2-86 defines this decision to not add DTO tasks to contingency EVAs. Once the PRLA has been successfully latched via EVA, the orbit lowering burns can be performed. These burns will lower the orbit to meet the OAST-FLYER altitude requirement as defined in Flight Rule A2-13B. Once the OAST-FLYER orbit is achieved, the crew can return to the nominal timeline and proceed with OAST-FLYER release at the nominally scheduled orbit 49.

This contingency timeline is built to support the requirements of primary payloads. A number of secondary payloads, DSOs, DTOs, and other activities are impacted by this contingency scenario and some activities have been deleted. The compact scheduling of the remaining days of the timeline will allow little to no rescheduling of most of these lost activities. The following activities have been deleted:

- A PAO event nominally scheduled at the end of FD3
- DSO 330 initial setup, calibration and P/TV
- First four data takes for DSO 494
- First two blood samples for DSO 492B
- P/TV for NIH-R on FD4
- 2 hours of nominal EVA tool config
- SSBUV and SLA Earth view observations during -ZSI attitude
- 2 hours of DSO 802 (educational activities)

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
013:09:18/ 013:21:18	002:00:00/ 002:12:00	013:03:18/ 013:15:18	03/013 CST	-4.2		JANUARY 13, 1996	STS-72	FINAL REV A	12/7/95
CST :013 FD :003 MET :002	0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 12								
CDR DUFFY	SFU RNDZ	EXERCISE	FEES ON PG WRIT 10.2 E DEPRESS	10.2 E DEPRESS	10.2 E DEPRESS	PRE SLEEP	PRE SLEEP	SLEEP	
PLT JETT	SFU RNDZ	SFU BERTH	EXERCISE	EXERCISE	EXERCISE	PRE SLEEP	PRE SLEEP	SLEEP	
MS1 CHIAO	SFU RNDZ	SFU BERTH	EXERCISE	EXERCISE	EXERCISE	PRE SLEEP	PRE SLEEP	SLEEP	
MS2 SCOTT	SFU RNDZ	SFU BERTH	EXERCISE	EXERCISE	EXERCISE	PRE SLEEP	PRE SLEEP	SLEEP	
MS3 WAKATA	SFU RNDZ	SFU BERTH	EXERCISE	EXERCISE	EXERCISE	PRE SLEEP	PRE SLEEP	SLEEP	
MS4 BARRY	SFU RNDZ	SFU BERTH	EXERCISE	EXERCISE	EXERCISE	PRE SLEEP	PRE SLEEP	SLEEP	
DAY/NIGHT	ORBIT								
GSTDN COVERAGE	32 33 34 35 36 37 38 39 -VAN -DKR -MIL -GDS -GDX -IOS -OTD -GDS -IOS -MLX -GDX -GDS -DGS -KSC -GDX -DGS -BDA -MIL -IOS -DGS -OTD -AGO -MIL -VAN -DKR -DGS -MLX -DGS -KSC -BDA -GDX -GDS -VAN -DGS -VAN -KSC -AGO -MLX -GDS -VAN -DGS -VAN -KSC -AGO -IOS -AGO								
TDRS	E W								
ATTITUDE	+ZLV -BIAS -ZSI -ZLV -XV								
SSBUV	SLA								
NOTES:	▼ SFU GRAPPLE (2/00:35) @MASK PREBREATHE TERMINATE (EVA, 10.2 PSI CABIN) @MASK PREBREATHE INITIATE (EVA, 10.2 PSI CABIN) @OTO 664 CABIN TEMPERATURE SURVEY								

SFU UNSCHEDULED PRLA LATCH EVA

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
013:21:18 / 014:09:18		002:12:00 / 003:00:00		013:15:18 / 014:03:18		04/013 CST	-2.6		JANUARY 13, 1996	STS-72	FINAL REV A	12/7/95				
CST :013	16	17	18	19	20	21	22	23	0	CST:014	1	2	3	0	MET:003	
FD :003	12	13	14	15	16	17	18	19	20	21	22	23	0			
MET :002				FD:004												
CDR DUFFY	SLEEP			POST SLEEP			DSO 483	NIH-R DAILY CK	EXERCISE	CT PE CM GP	CONTINGENCY EVA		OMS BURN	OMS BURN	RETURNS TO NOMINAL TIMELINE	
PLT JETT	SLEEP			POST SLEEP			DSO 483	EXERCISE	PRE EVA PL CONFIG	RMS HTR	SFT TLE TM SRP	CONTINGENCY EVA		OMS BURN	OMS BURN	
MS1 CHIAO	SLEEP			POST SLEEP			DSO 483	EVA PREP	EMU PURGE/PB	A/D I/O	EVA	POST EVA	EMU H/C/D			
MS2 SCOTT	SLEEP			POST SLEEP			DSO 483	EVA PREP	EMU PURGE/PB	A/D I/O	EVA SUPPORT	POST EVA				
MS3 WAKATA	SLEEP			POST SLEEP			DSO 483	SFT TLE TM SRP	AWR EAE MTF ETR L	EXERCISE	RMS HTR	CONTINGENCY EVA		OP REHEAT	AUCSD STATE	
MS4 BARRY	SLEEP			POST SLEEP	POST SLEEP			DSO 483	EVA PREP	EMU PURGE/PB	A/D I/O	EVA	POST EVA	EMU H/C/D		
DAY/NIGHT ORBIT	40		41		42		43		44		45		46		47	
SAA																
MOON UP/DOWN																
TDRS																
ATTITUDE	-ZLV -XVV															
SSBUV																
SLA																
NOTES:	@DSO 493 VIRUS REACTIVATION @DSO 483 BACK PAIN @DSO 489 EVA DOSIMETRY @DSO 489 DOSIMETER DON @RMS HTR ACT SFU UNSCHEDULED PRLA LATCH EVA															

STS-72 DAP TABLE

STS-72 DAP A - GENERIC

	ITEM #	A1	A2	A3	A4	A5	A6	A7	A8
PRI									
ROT RATE	10 (50)	0.2000	0.4000	0.2000	0.5000	0.2000	0.2000	0.2000	0.2000
ATT DB	11 (51)	5.00	1.00	1.00	3.00	5.00	5.00	2.00	2.00
RATE DB	12 (52)	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
ROT PLS	13 (53)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
COMP	14 (54)	.000	.000	.000	.000	.000	.000	.000	.000
P OPTION	15 (55)	ALL	ALL	ALL	ALL	ALL	TAIL	ALL	ALL
Y OPTION	16 (56)	ALL	ALL	TAIL	ALL	ALL	TAIL	ALL	ALL
TRAN PLS	17 (57)	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05
ALT									
RATE DB	18 (58)	0.200	0.200	0.200	0.200	0.070	0.070	0.200	0.200
JET OPT	19 (59)	ALL	ALL	ALL	ALL	ALL	TAIL	ALL	ALL
# JETS	20 (60)	2	2	2	2	1	1	2	2
ON TIME	21 (61)	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
DELAY	22 (62)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VERN									
ROT RATE	23 (63)	0.2000	0.4000	0.0080	0.2000	0.2000	0.2000	0.2000	0.2000
ATT DB	24 (64)	1.000	1.000	0.070	1.000	1.000	1.000	1.000	1.000
RATE DB	25 (65)	.020	.020	.010	.020	.020	.020	.020	.020
ROT PLS	26 (66)	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
COMP	27 (67)	.000	.000	.000	.000	.000	.000	.000	.000
CNTL ACC	28 (68)	0	0	0	0	0	0	0	0
PURPOSE		NOMINAL	PTC	GG	PRE/POST DEPLOY	LOSS OF VERNS (NOSE & TAIL)	LOSS OF VERNS (TAIL ONLY)	RNDZ	PROX OPS

5-2

FLT PLN/72/FIN A

STS-72 DAP A CONFIGURATION

	ITEM #	A9	A10	A11	A12	A13	A15
PRI							
ROT RATE	10 (50)	0.1000	0.1000	0.1000	0.1000	0.1000	0.0650
ATT DB	11 (51)	3.00	3.00	3.00	3.00	3.00	2.00
RATE DB	12 (52)	0.20	0.20	0.20	0.20	0.20	0.20
ROT PLS	13 (53)	0.04	0.04	0.04	0.04	0.04	0.10
COMP	14 (54)	.000	.000	.000	.000	.000	.000
P OPTION	15 (55)	ALL	ALL	ALL	ALL	ALL	ALL
Y OPTION	16 (56)	ALL	ALL	ALL	ALL	ALL	ALL
TRAN PLS	17 (57)	0.05	0.05	0.05	0.05	0.05	0.10
ALT							
RATE DB	18 (58)	0.200	0.200	0.200	0.200	0.200	0.200
JET OPT	19 (59)	ALL	ALL	ALL	ALL	ALL	ALL
# JETS	20 (60)	2	2	2	2	2	2
ON TIME	21 (61)	0.08	0.08	0.08	0.08	0.08	0.08
DELAY	22 (62)	8.00	8.00	8.00	3.10	4.90	0.00
VERN							
ROT RATE	23 (63)	0.2000	0.2000	0.2000	0.2000	0.2000	0.0650
ATT DB	24 (64)	3.000	3.000	3.000	3.000	3.000	1.000
RATE DB	25 (65)	.200	.200	.200	.200	.200	.020
ROT PLS	26 (66)	0.010	0.010	0.010	0.010	0.010	0.010
COMP	27 (67)	.000	.000	.000	.000	.000	.000
CNTL ACC	28 (68)	1	2	3	1	1	0
		SFU			OAST		
PURPOSE		LOW HOVER	CAPTURE	SJ CAPTURE RELEASE	LOW HOVER EXTENDED PARK	RELEASE CAPTURE	RBAR APPROACH

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

STS-72 DAP B - GENERIC

	ITEM #	B1	B2	B3	B4	B5	B7	B8
PRI								
ROT RATE	30 (50)	0.5000	0.2000	0.2000	0.2000	0.2000	0.5000	0.2000
ATT DB	31 (51)	3.00	3.00	3.00	0.30	3.00	2.00	2.00
RATE DB	32 (52)	0.20	0.20	0.20	0.20	0.20	0.20	0.20
ROT PLS	33 (53)	0.04	0.04	0.04	0.04	0.04	0.04	0.04
COMP	34 (54)	.000	.000	.000	.000	.000	.000	.000
P OPTION	35 (55)	ALL	TAIL	ALL	TAIL	TAIL	ALL	ALL
Y OPTION	36 (56)	ALL	TAIL	ALL	TAIL	TAIL	ALL	ALL
TRAN PLS	37 (57)	0.10	0.02	0.02	0.02	0.02	0.05	0.01
ALT								
RATE DB	38 (58)	0.200	0.070	0.070	0.200	0.200	0.200	0.200
JET OPT	39 (59)	ALL	TAIL	ALL	ALL	ALL	ALL	ALL
# JETS	40 (60)	2	1	1	2	2	2	2
ON TIME	41 (61)	0.08	0.08	0.08	0.08	0.08	0.08	0.08
DELAY	42 (62)	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VERN								
ROT RATE	43 (63)	0.2000	0.2000	0.2000	0.0080	0.0160	0.2000	0.2000
ATT DB	44 (64)	1.000	1.000	1.000	0.100	0.033	1.000	1.000
RATE DB	45 (65)	.020	.020	.020	.010	.020	.020	.020
ROT PLS	46 (66)	0.002	0.002	0.002	0.002	0.002	0.002	0.002
COMP	47 (67)	.000	.000	.000	.000	.000	.000	.000
CNTL ACC	48 (68)	0	0	0	0	0	0	0
PURPOSE		NOM OMS & RCS BURNS	LOSS OF VERNS (TAIL ONLY)	LOSS OF VERNS (NOSE & TAIL)	SSUS DEPLOY	COAS CAL	RNDZ	PROX OPS

STS-72 DAP B CONFIGURATION

	ITEM #	B9	B10	B13	B15
PRI					
ROT RATE	30 (50)	0.0500	0.1000	0.0500	0.0650
ATT DB	31 (51)	1.00	3.00	1.00	2.00
RATE DB	32 (52)	0.20	0.20	0.20	0.20
ROT PLS	33 (53)	0.04	0.04	0.04	0.04
COMP	34 (54)	.000	.000	.000	.000
P OPTION	35 (55)	TAIL	ALL	ALL	ALL
Y OPTION	36 (56)	TAIL	ALL	ALL	ALL
TRAN PLS	37 (57)	0.02	0.02	0.02	0.05
ALT					
RATE DB	38 (58)	0.070	0.200	0.100	0.200
JET OPT	39 (59)	ALL	ALL	ALL	ALL
# JETS	40 (60)	1	2	2	2
ON TIME	41 (61)	0.08	0.08	0.08	0.08
DELAY	42 (62)	0.00	6.90	4.90	0.00
VERN					
ROT RATE	43 (63)	0.0500	0.2000	0.1000	0.0650
ATT DB	44 (64)	0.100	3.000	1.000	1.000
RATE DB	45 (65)	.020	.200	.020	.020
ROT PLS	46 (66)	0.002	0.002	0.002	0.002
COMP	47 (67)	.000	.000	.000	.000
CNTL ACC	48 (68)	0	2	1	0
			SFU	OAST	
PURPOSE		SLA TIGHT DEADBAND	B/U ATT CAPTURE	DEADBAND COLLAPSE FOR REL (PH & BO)	RBAR APPROACH

Note: **BOLD/ITALICS** indicates a change from the I-load

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ATTITUDE TIMELINE

ATTITUDE
TIMELINE

Attitude Timeline

MET/GMT	MNVR OPTION	DAF	E/S	REF ATT/REMARKS	EVENT	
1 000/01:12:00 MET 24:39 011/10:30:00 GMT 42:39	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A6 AUTO ALT	RATE 0.2000 DB AT 5.00 DB RT 0.070	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	Post Insertion Note: Not Req for PLBD open
2 000/02:30:00 MET 39:57 011/11:48:00 GMT 57:57	INRTL R= 86.00 MNVR P=192.00 Y= 11.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 163 P 125	Star Pair A2 -Y: 45 -Z: 24	IMU Align
3 000/02:50:00 MET 03:03:38 011/12:08:00 GMT 21:38	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV Tail Fwd
4 000/05:00:00 MET 14:35 011/14:18:00 GMT 32:35	INRTL R= 78.00 MNVR P= 42.00 Y= 55.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 195 P 115	Posigrage L OMS TV Roll 180	NC1-S TIG: 0/05:21
5 000/05:25:00 MET 39:25 011/14:43:00 GMT 57:25	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV Earth -ZLV Tail Fwd
6 000/16:35:00 MET 47:32 012/01:53:00 GMT 02:05:32 Init at Sunset	INRTL R= 86.00 MNVR P=192.00 Y= 11.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 163 P 125	Star Pair A2 -Y: 45 -Z: 24	IMU Align
7 000/16:55:00 MET 17:06:05 012/02:13:00 GMT 24:05	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV -ZLV Tail Fwd
8 000/22:40:00 MET 48:50 012/07:58:00 GMT 08:06:50	INRTL R=267.00 MNVR P=118.00 Y=352.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 332 P 74	Posi +X TV Roll 180	NPC-S TIG: 0/22:59
9 000/23:05:00 MET 08:07 012/08:23:00 GMT 26:07	TGT=4 BV=3 P= 90.00 Y= 0.00 OM=290.00 RA= 292.453 DEC= -21.842S	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 360 P 90	INRTL R=244.19 P=104.31 Y= 17.65	SSBUV Solar Cal Vbar AOS 23:38 Mnvr LOS 00:20 Vbar LOS 00:24
10 001/00:20:00 MET 26:17 012/09:38:00 GMT 44:17	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV Vose South H2O Dump
11 001/04:20:00 MET 29:40 012/13:38:00 GMT 47:40	INRTL R= 96.00 MNVR P= 23.00 Y= 66.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 188 P 126	Posi Both OMS TV Roll 180	NSR-S TIG: 1/04:39
12 001/04:43:00 MET 012/14:01:00 GMT		A1 LVLH VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 94	LVLH R=179.88 HOLD P= 3.69 Y=359.96	LVLH between burns

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
13 001/05:00:00 MET 06:54 012/14:18:00 GMT 24:54	INRTL R=267.00 MNVR P=207.00 Y=326.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 353 P 86	Posi +X TV Roll 180	NC2-S TIG: 1/05:18
14 001/05:25:00 MET 40:00 012/14:43:00 GMT 58:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV EARTH -ZLV TAIL FWD
15 001/15:00:00 MET 04:05 013/00:18:00 GMT 22:05	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 49.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=311.00	SOPA Stars -Y: 108 (15:35) -Y: 49 (16:10)
16 001/17:27:00 MET 37:02 013/02:45:00 GMT 55:02	INRTL R= 86.00 MNVR P=208.00 Y=350.00	A7 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 175 P 110	Posi +X RCS TV Roll 0	NH-S TIG: 1/17:47
17 001/17:50:00 MET 013/03:08:00 GMT		A7 LVLH VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 180 P 113	LVLH R= 0.23 HOLD P= 22.57 Y=359.69	LVLH between burns
18 001/18:20:00 MET 23:22 013/03:38:00 GMT 41:22	INRTL R=302.00 MNVR P= 24.00 Y=330.00	A7 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 349 P 32	Posi +X RCS TV Roll 0	NC3-S TIG: 1/18:35
19 001/18:36:00 MET 40:57 013/03:54:00 GMT 58:57	TGT=2 BV=1 P= 0.00 Y= 0.00 OM= 0.00	B7 AUTO PRI RATE 0.5000 DB AT 2.00 DB RT 0.20	EARTH R 256 P 0	LVLH R= 0.00 P=270.00 Y= 0.00	-Z Target Track Ti TIG: 1/21:43
20 001/22:03:00 MET 22:36 013/07:21:00 GMT 40:36	TGT=2 BV=5 P=340.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0170 DB AT 1.000 DB RT 0.020	EARTH R 180 P 20	LVLH R= 0.00 P=290.00 Y= 0.00	-Z Target Track
21 001/22:23:00 MET 32:25 013/07:41:00 GMT 50:25	TGT=2 BV=5 P=327.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0230 DB AT 1.000 DB RT 0.020	EARTH R 180 P 33	LVLH R= 0.00 P=303.00 Y= 0.00	-Z Target Track
22 001/22:35:00 MET 44:27 013/07:53:00 GMT 08:02:27	TGT=2 BV=5 P=310.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0300 DB AT 1.000 DB RT 0.020	EARTH R 180 P 50	LVLH R= 0.00 P=320.00 Y= 0.00	-Z Target Track
23 001/22:45:00 MET 53:41 013/08:03:00 GMT 11:41	TGT=2 BV=5 P=285.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0480 DB AT 1.000 DB RT 0.020	EARTH R 180 P 75	LVLH R= 0.00 P=345.00 Y= 0.00	-Z Target Track
24 001/22:54:00 MET 56:00 013/08:12:00 GMT 14:00	TGT=2 BV=5 P=270.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.1250 DB AT 1.000 DB RT 0.020	EARTH R 180 P 90	LVLH R= 0.00 P= 0.00 Y= 0.00	+ZLV on Rbar

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

Attitude Timeline

MET/GMT	MNVR OPTION	DAF	E/S	REF ATT/REMARKS	EVENT	
25 002/00:35:00 MET 38:45 013/09:53:00 GMT 56:45	TGT=2 BV=5 P=270.00 Y= 0.00 OM= 45.00	A8 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 180 P 90	LVLH R= 0.00 P= 0.00 Y= 45.00	SFU Grapple
26 002/01:30:00 MET 45:00 013/10:48:00 GMT 11:03:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV Tail Fwd
27 002/03:48:00 MET 56:24 013/13:06:00 GMT 14:24	INRTL R= 2.00 MNVR P=217.00 Y=316.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 264 P 78	Retro Both OMS TV Roll 90	OAST OA TIG: 2/04:04
28 002/04:08:00 MET 013/13:26:00 GMT		A1 LVLH DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 95 P 65	LVLH R=269.94 HOLD P=205.18 Y=349.76	LVLH + SOPA Stars -Y: 26 (04:15) -Y: 24 (04:40)
29 002/04:40:00 MET 43:45 013/13:58:00 GMT 14:01:45	INRTL R=193.00 MNVR P= 29.00 Y=306.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 134 P 10	Retro Both OMS TV Roll 90	OAST CIRC TIG: 2/04:51
30 002/04:55:00 MET 05:07:04 013/14:13:00 GMT 25:04	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV + SLA -ZLV Tail Fwd
31 002/15:25:00 MET 31:40 014/00:43:00 GMT 49:40	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=280.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 80.00	H20 + SOPA Stars -Y: 26 (16:35) -Y: 24 (17:00)
32 002/18:00:00 MET 06:13 014/03:18:00 GMT 24:13	INRTL R=325.90 MNVR P= 53.90 Y=316.20	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 283 P 15	Moon Vbar AOS: 18:25 Horz LOS: 19:10 Vbar AOS: 19:56	SSBUV Moon View
33 002/20:05:00 MET 17:07 014/05:23:00 GMT 35:07	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV + SLA -ZLV Tail Fwd
34 003/01:25:00 MET 30:41 014/10:43:00 GMT 48:41	INRTL R= 18.20 MNVR P=107.30 Y=339.80	B1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 218 P 59	Release Window Open: 3/02:25 Close: 02:51	OAST Release SEP 1 in Att TIG: Rel+06:30
35 003/02:44:30 MET 54:06 014/12:02:30 GMT 12:06	TGT=2 BV=5 P= 80.00 Y= 0.00 OM=180.00	A7 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 80	LVLH R=180.00 P=350.00 Y= 0.00	SEP 2 +X RCS TIG: 3/03:01:00
36 003/03:15:00 MET 29:09 014/12:33:00 GMT 47:09	INRTL R=316.60 MNVR P= 43.00 Y=314.70	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 314 P 12	Moon Vbar AOS: 3:30 Horz LOS: 4:15	SSBUV Moon View

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
37 003/04:15:00 MET 24:36 014/13:33:00 GMT 42:36	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 70.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=290.00	SOPA Stars -Y: 66 (04:25) -Y: 110 (05:00)
38 003/05:50:00 MET 58:28 014/15:08:00 GMT 16:28	INRTL R=280.00 MNVR P= 31.00 Y=336.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	SUN R 1 P 35	Posi +X TV Roll 180	NC1-0 TIG: 3/06:10
39 003/06:15:00 MET 16:41 014/15:33:00 GMT 34:41	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV + SLA -ZLV Tail Fwd
40 003/15:00:00 MET 05:50 015/00:18:00 GMT 23:50	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 70.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=290.00	SOPA Stars -Y: 44 (15:15) -Y: 104 (15:45)
41 003/17:45:00 MET 53:02 015/03:03:00 GMT 11:02	INRTL R=300.00 MNVR P= 55.00 Y=292.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	SUN R 184 P 12	Posi +X TV Roll 180	NC2-0 TIG: 3/18:03
42 003/18:10:00 MET 17:48 015/03:28:00 GMT 35:48	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	EVA Thermal -YLV Tail Fwd
43 004/02:05:00 MET 19:36 015/11:23:00 GMT 37:36	TGT=4 BV=3 P= 90.00 Y= 0.00 OM=160.00 RA= 295.832 DEC= -21.3245	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	SUN R 0 P 90	INRTL R=270.25 P=222.31 Y=326.98	-ZSI SFU Therm Recovery
44 004/03:45:00 MET 59:13 015/13:03:00 GMT 17:13	INRTL R= 77.00 MNVR P=208.00 Y= 10.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	SUN R 183 P 132	Posi +X TV Roll 180	NC3-0 TIG: 4/04:07
45 004/04:10:00 MET 015/13:28:00 GMT		A1 LVLH DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 0 P 78	LVLH R=359.53 HOLD P=191.59 Y= 0.30	LVLH between burns
46 004/04:30:00 MET 44:57 015/13:48:00 GMT 14:02:57	INRTL R=257.50 MNVR P=205.98 Y=359.67	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	SUN R 3 P 121	Posi +X RCS TV Roll 180	NH-0 TIG: 4/04:52
47 004/04:55:00 MET 05:01:55 015/14:13:00 GMT 19:55	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=263.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 83.00	-ZLV H2O + SOPA Stars -Y: 95 (06:20) -Y: 13 (06:44)
48 004/06:45:00 MET 53:05 015/16:03:00 GMT 11:05	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV + SLA -ZLV Tail Fwd

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
49 004/19:06:00 MET 20:24 016/04:24:00 GMT 38:24	INRTL R=306.00 MNVR P= 18.00 Y=324.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 354 P 26	Posi +X RCS TV Roll 0	NC4-0 TIG: 4/19:21
50 004/20:22:00 MET 25:17 016/05:40:00 GMT 43:17	TGT=2 BV=1 P= 0.00 Y= 0.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 260 P 0	LVLH R= 0.00 P=270.00 Y= 0.00	-Z Target Track Ti TIG: 4/22:22
51 004/22:42:00 MET 23:01:36 016/08:00:00 GMT 19:36	TGT=2 BV=5 P=340.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0170 DB AT 1.000 DB RT 0.020	EARTH R 180 P 20	LVLH R= 0.00 P=290.00 Y= 0.00	-Z Target Track
52 004/23:02:00 MET 11:25 016/08:20:00 GMT 29:25	TGT=2 BV=5 P=327.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0230 DB AT 1.000 DB RT 0.020	EARTH R 180 P 33	LVLH R= 0.00 P=303.00 Y= 0.00	-Z Target Track
53 004/23:12:00 MET 21:27 016/08:30:00 GMT 39:27	TGT=2 BV=5 P=310.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0300 DB AT 1.000 DB RT 0.020	EARTH R 180 P 50	LVLH R= 0.00 P=320.00 Y= 0.00	-Z Target Track
54 004/23:22:00 MET 30:41 016/08:40:00 GMT 48:41	TGT=2 BV=5 P=285.00 Y= 0.00 OM= 0.00	A7 AUTO VERN RATE 0.0480 DB AT 1.000 DB RT 0.020	EARTH R 180 P 75	LVLH R= 0.00 P=345.00 Y= 0.00	-Z Target Track
55 004/23:31:00 MET 32:15 016/08:49:00 GMT 50:15	TGT=2 BV=5 P=270.00 Y= 0.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 180 P 90	LVLH R= 0.00 P= 0.00 Y= 0.00	+ZLV on Rbar
56 005/01:10:00 MET 18:42 016/10:28:00 GMT 36:42	TGT=4 BV=3 P= 90.00 Y= 0.00 OM=270.00 RA= 296.866 DEC= -21.151S	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 360 P 90	INRTL R=238.18 P=112.42 Y= 11.73	SSBUV Solar Cal Vbar AOS 01:12 Horz LOS 01:53 Vbar AOS 02:43
57 005/03:25:00 MET 34:44 016/12:43:00 GMT 52:44 Sunset @ 03:23	INRTL R=151.00 MNVR P= 34.00 Y=357.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 123 P 53	Special Star Pr -Y: 88 -Z: 69	IMU Align
58 005/03:45:00 MET 56:21 016/13:03:00 GMT 14:21	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV Tail Fwd SSBUV + SLA
59 005/15:10:00 MET 17:00 017/00:28:00 GMT 35:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=276.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 84.00	H2O + SOPA Stars -Y: 26 (15:35) -Y: 24 (16:00)
60 005/19:48:00 MET 59:50 017/05:06:00 GMT 17:50	INRTL R= 46.85 MNVR P=219.57 Y= 55.75	A7 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 352 P 180		Bay Coldsoak Tail Sun Bottom Earth

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
61 005/20:01:00 MET 017/05:19:00 GMT	INRTL BV=2 ROTR P=180.00 Y= 0.00	A7 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.0662 DB AT 1.000 DB RT 0.020		INRTL R= 46.85 P=219.57 Y= 55.75	EVA EMU Eval Tail Sun Orb Rate Rotor
62 005/20:31:00 MET 017/05:49:00 GMT				Night Pass Sunset: 5/21:31 Rise: 22:07	EMU Thermal Evaluation	
63 005/22:06:00 MET 18:26 017/07:24:00 GMT 36:26	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 70.00	B7 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=290.00	SOPA + Comm Stars -Y: 80 (00:17) -Y: 29 (00:45)
64 006/01:50:00 MET 55:50 017/11:08:00 GMT 13:50	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV Tail Fwd SSBUV + SLA
65 006/23:30:00 MET 32:59 018/08:48:00 GMT 50:59	TGT=4 RA= 298.936 BV=3 DEC= -20.785S P= 90.00 Y= 0.00 OM=325.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 360 P 90	INRTL R=263.80 P= 48.93 Y= 34.61	SSBUV Solar Cal Vbar AOS 00:01 Horz LOS 00:41 Vbar AOS 01:32
66 007/02:15:00 MET 26:20 018/11:33:00 GMT 44:20 Sunset @ 02:12	INRTL R= 86.00 MNVR P=192.00 Y= 11.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 164 P 132	STAR PAIR A2 -Y: 45 -Z: 24	IMU Align
67 007/02:35:00 MET 45:04 018/11:53:00 GMT 12:03:04	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	SSBUV + SLA -ZLV Tail Fwd
68 007/15:30:00 MET 35:50 019/00:48:00 GMT 53:50	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 70.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=290.00	SOPA + FCS C/O Stars -Y: 44 (15:50) -Y: 43 (16:18)
69 007/17:48:00 MET 019/03:06:00 GMT		A1 INRT DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 315 P 97	INRTL R=349.85 HOLD P=291.91 Y=357.18	FCS C/O Pt 2
70 007/17:58:00 MET 18:01:19 019/03:16:00 GMT 19:19	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 70.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=290.00	DAP: AUTO Complete FCS CO -ZLV Nose North
71 007/18:15:00 MET 019/03:33:00 GMT		A1 INRT DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 209 P 92	INRTL R= 87.72 HOLD P=266.43 Y=336.79	RCS Hot Fire
72 007/18:30:00 MET 38:39 019/03:48:00 GMT 56:39	INRTL R= 17.00 MNVR P=275.00 Y= 61.00	A1 AUTO DB AT 1.000 VERN DB RT 0.020	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 329 P 149	Special Star Pr -Y: 86 -Z: 54	Crew Conf + IMU

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
73 007/20:30:00 MET 37:50 019/05:48:00 GMT 55:50	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV Tail Fwd SSBUV + SLA
74 008/02:45:00 MET 52:30 019/12:03:00 GMT 10:30	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	H2O +SOPA Stars -Y: 26 (04:00) -Y: 24 (04:28)
75 008/04:25:00 MET 32:30 019/13:43:00 GMT 50:30	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV Tail Fwd SSBUV + SLA
76 008/17:23:00 MET 37:53 020/02:41:00 GMT 55:53	TGT=4 BV=5 P=184.00 Y= 0.00 OM=270.00 RA= 300.797 DEC= -20.4325	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 180 P 176	INRTL R=144.75 P=221.55 Y= 51.42	Rad Coldsoak
77 008/18:36:00 MET 40:59 020/03:54:00 GMT 58:59	INRTL R= 26.00 MNVR P=307.10 Y= 64.40	A1 AUTO PRI RATE 0.2000 DB AT 5.00 DB RT 0.20	SUN R 303 P 136	Star Pair -Y: 59 -Z: 16	D-O IMU Align
78 008/18:51:00 MET 53:29 020/04:09:00 GMT 11:29	INRTL R= 92.50 MNVR P=218.00 Y= 17.00	B1 AUTO PRI RATE 0.5000 DB AT 3.00 DB RT 0.20	SUN R 180 P 143	Star Pair -Y: 38 -Z: 13	D-O IMU Verif
79 008/19:00:00 MET 02:08 020/04:18:00 GMT 20:08	INRTL R=145.00 MNVR P=222.00 Y= 51.00	B1 AUTO PRI RATE 0.5000 DB AT 3.00 DB RT 0.20	SUN R 178 P 176		D-O Therm/Comm Biased -XSI Bay Space @Noon
80 008/21:16:00 MET 19:35 020/06:34:00 GMT 37:35	INRTL R=132.00 MNVR P=339.28 Y= 51.22	B1 AUTO PRI RATE 0.5000 DB AT 3.00 DB RT 0.20	SUN R 171 P 115		D-O Burn tig: 21:36

*** ALL ATTITUDES IN MEAN OF 1950 ***
*** PYR EULER SEQUENCE ***

STS-72 DAP BOOK

<u>DAP</u>	<u>PURPOSE</u>	<u>DAP</u>	<u>PURPOSE</u>
A1	- NOMINAL	B1	- NOMINAL
A2	- PTC		OMS & RCS BURNS
A3	- GG	B2	- LOSS OF VERNIS
A4	- PRE/POST DEPLOY		(TAIL ONLY)
A5	- LOSS OF VERNIS	B3	- LOSS OF VERNIS
	(NOSE & TAIL)		(NOSE & TAIL)
A6	- LOSS OF VERNIS	B4	- SSUS DEPLOY
	(TAIL ONLY)	B5	- COAS CAL
A7	- RENDEZVOUS	B7	- RENDEZVOUS
A8	- PROX OPS	B8	- PROX OPS
A9	- SFU LOW HOVER	B9	- SLA TIGHT
A10	- SFU CAPTURE		DEADBAND
A11	- SFU SJ CAPTURE	B10	- SFU B/U ATT
	SFU RELEASE		CAPTURE
A12	- OAST LOW HOVER	B13	- OAST DEADBAND
	OAST EXTENDED		COLLAPSE FOR
	PARK		REL (PH & BO)
A13	- OAST RELEASE	B15	- RELEASE
	OAST CAPTURE		APPROACH
A15	- RELEASE		
	APPROACH		

CNT ACC = 0 UNLOADED RMS
 = 1 ALL OAST RMS POSN &
 SFU LOW HOVER
 = 2 SFU CAPTURE
 = 3 SFU RELEASE
 SFU SJ CAPTURE
 = 4-5 NOT USED

FLT PLN-1a/72/O/B

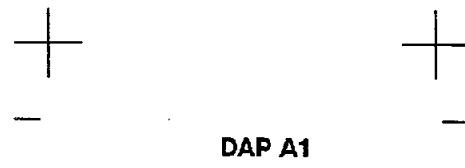
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FLT PLN-1b/72/O/A

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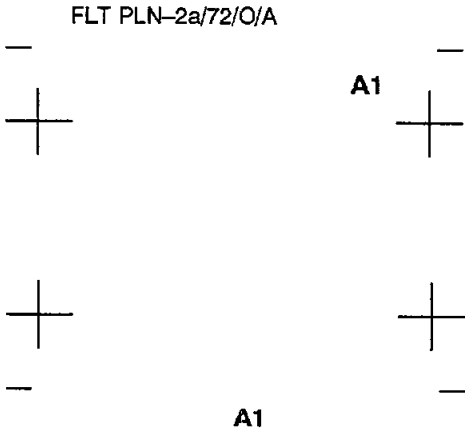


DAP A



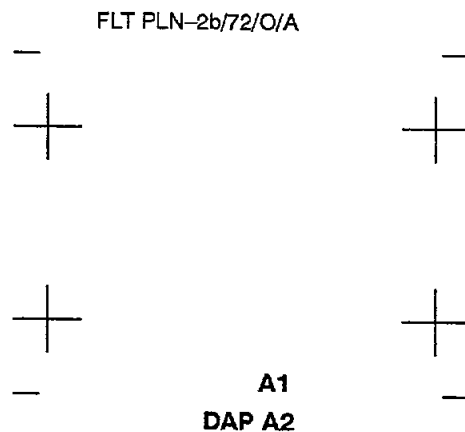
DAP A1

PURPOSE:
NOMINAL



FLT PLN-2a/72/O/A

A1



FLT PLN-2b/72/O/A

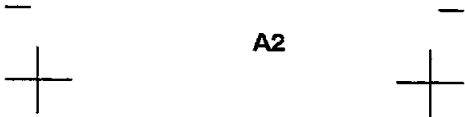
A1

DAP A2

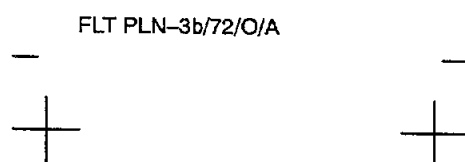
PURPOSE:
PTC

DAP A 01	1	PRI
<u>0.2 0 0 0</u>	10	ROT RATE
<u>- 5.0 0</u>	11	ATT DB
<u>0.2 0</u>	12	RATE DB
<u>0.1 0</u>	13	ROT PLS
<u>0.0 0</u>	14	COMP
ALL	15	P OPTION
ALL	16	Y OPTION
<u>0.1 0</u>	17	TRAN PLS
		ALT
<u>0.2 0 0</u>	18	RATE DB
ALL	19	JET OPT
2	20	#JETS
<u>0.0 8</u>	21	ON TIME
<u>- 0.0 0</u>	22	DELAY
		VERN
<u>0.2 0 0 0</u>	23	ROT RATE
<u>- 1.0 0 0</u>	24	ATT DB
<u>0.2 0</u>	25	RATE DB
<u>0.0 1 0</u>	26	ROT PLS
<u>0.0 0</u>	27	COMP
0	28	CNTL ACC

FLT PLN-3a/72/O/A



A2



FLT PLN-3b/72/O/A

(reduced copy)

A2			
DAP A 0 2	1	PRI	
0.4 0 0 0	10	ROT RATE	
- 1.0 0	11	ATT DB	
0.2 0	12	RATE DB	
0.1 0	13	ROT PLS	
.0 0 0	14	COMP	
ALL	15	P OPTION	
ALL	16	Y OPTION	
0.1 0	17	TRAN PLS	
		ALT	
0.2 0 0	18	RATE DB	
ALL	19	JET OPT	
2	20	#JETS	
0.0 8	21	ON TIME	
- 0.0 0	22	DELAY	
		VERN	
0.4 0 0 0	23	ROT RATE	
- 1.0 0 0	24	ATT DB	
0.2 0	25	RATE DB	
0.0 1 0	26	ROT PLS	
0.0 0	27	COMP	
0	28	CNTL ACC	

FLT PLN-4a/72/O/A

A2

DAP A3

PURPOSE:

GG

FLT PLN-4b/72/O/A

A3			
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A3

A3			
DAP A 0 3	1	PRI	
0.2 0 0 0	10	ROT RATE	
- 1.0 0	11	ATT DB	
0.2 0	12	RATE DB	
0.1 0	13	ROT PLS	
.0 0 0	14	COMP	
ALL	15	P OPTION	
TAIL	16	Y OPTION	
0.1 0	17	TRAN PLS	
		ALT	
0.2 0 0	18	RATE DB	
ALL	19	JET OPT	
2	20	#JETS	
- 0.0 8	21	ON TIME	
- 0.0 0	22	DELAY	
		VERN	
0.0 0 8 0	23	ROT RATE	
- 0.0 7 0	24	ATT DB	
0.1 0	25		
0.0 1 0	26	ROT PLS	
0.0 0	27	COMP	
0	28	CNTL ACC	

FLT PLN-5a/72/O/A

DAP A4

PURPOSE:

PRE/POST DEPLOY

FLT PLN-5b/72/O/A

A4			
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(reduced copy)



A4

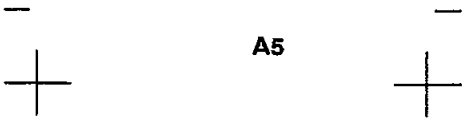
**A4
DAP A5**

DAP A 0 4	1	PRI
<u>0.5 0 0 0</u>	10	ROT RATE
<u>- 3.0 0</u>	11	ATT DB
<u>0.2 0</u>	12	RATE DB
<u>0.1 0</u>	13	ROT PLS
<u>.0 0 0</u>	14	COMP
ALL	15	P OPTION
ALL	16	Y OPTION
<u>0.1 0</u>	17	TRAN PLS
		ALT
<u>0.2 0 0</u>	18	RATE DB
ALL	19	JET OPT
<u>2</u>	20	#JETS
<u>0.0 8</u>	21	ON TIME
<u>- 0.0 0</u>	22	DELAY
		VERN
<u>0.2 0 0 0</u>	23	ROT RATE
<u>- 1.0 0 0</u>	24	ATT DB
<u>.0 2 0</u>	25	RATE DB
<u>0.0 1 0</u>	26	ROT PLS
<u>.0 0 0</u>	27	COMP
<u>0</u>	28	CNTL ACC

PURPOSE:
LOSS OF VERN
(NOSE & TAIL)

FLT PLN-6a/72/O/A

FLT PLN-6b/72/O/A



A5



A5

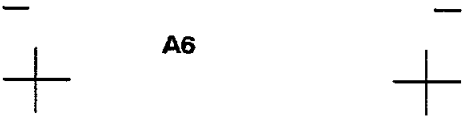
DAP A 0 5	1	PRI
<u>0.2 0 0 0</u>	10	ROT RATE
<u>- 5.0 0</u>	11	ATT DB
<u>0.2 0</u>	12	RATE DB
<u>0.1 0</u>	13	ROT PLS
<u>.0 0 0</u>	14	COMP
ALL	15	P OPTION
ALL	16	Y OPTION
<u>0.1 0</u>	17	TRAN PLS
		ALT
<u>0.0 7 0</u>	18	RATE DB
ALL	19	JET OPT
<u>1</u>	20	#JETS
<u>0.0 8</u>	21	ON TIME
<u>- 0.0 0</u>	22	DELAY
		VERN
<u>0.2 0 0 0</u>	23	ROT RATE
<u>- 1.0 0 0</u>	24	ATT DB
<u>.0 2 0</u>	25	RATE DB
<u>0.0 1 0</u>	26	ROT PLS
<u>.0 0 0</u>	27	COMP
<u>0</u>	28	CNTL ACC

**A5
DAP A6**

PURPOSE:
LOSS OF VERN
(TAIL ONLY)

FLT PLN-7a/72/O/A

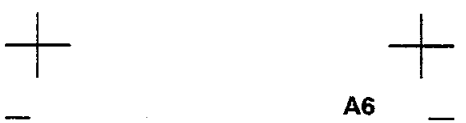
FLT PLN-7b/72/O/A



A6



(reduced copy)



A6

DAP A7

A6

DAP A 0 6	1	PRI
0.2 0 0 0	10	ROT RATE
- 5.0 0	11	ATT DB
0.2 0	12	RATE DB
0.1 0	13	ROT PLS
.0 0 0	14	COMP
TAIL	15	P OPTION
TAIL	16	Y OPTION
0.1 0	17	TRAN PLS
		ALT
0.0 7 0	18	RATE DB
TAIL	19	JET OPT
1	20	#JETS
0.0 8	21	ON TIME
- 0.0 0	22	DELAY
		VERN
0.2 0 0 0	23	ROT RATE
- 1.0 0 0	24	ATT DB
.0 2 0	25	RATE DB
0.0 1 0	26	ROT PLS
.0 0 0	27	COMP
0	28	CNTL ACC

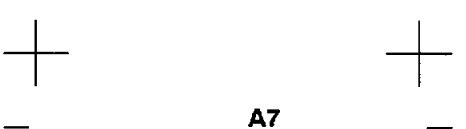
PURPOSE:
RENDEZVOUS

FLT PLN-8a/72/O/A

FLT PLN-8b/72/O/A



A7



A7

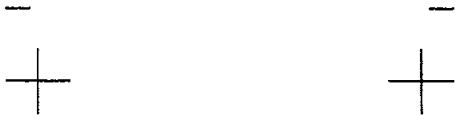
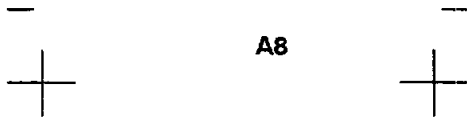
A7
DAP A8

DAP A 0 7	1	PRI
0.2 0 0 0	10	ROT RATE
- 2.0 0	11	ATT DB
0.2 0	12	RATE DB
0.1 0	13	ROT PLS
.0 0 0	14	COMP
ALL	15	P OPTION
ALL	16	Y OPTION
0.1 0	17	TRAN PLS
		ALT
0.2 0 0	18	RATE DB
ALL	19	JET OPT
2	20	#JETS
0.0 8	21	ON TIME
- 0.0 0	22	DELAY
		VERN
0.2 0 0 0	23	ROT RATE
- 1.0 0 0	24	ATT DB
.0 2 0	25	RATE DB
0.0 1 0	26	ROT PLS
.0 0 0	27	COMP
0	28	CNTL ACC

PURPOSE:
PROX OPS

FLT PLN-9a/72/O/A

FLT PLN-9b/72/O/A



A8

(reduced copy)



A8

DAP A 0 8	1	PRI
0.2 0 0 0	10	ROT RATE
- 2.0 0	11	ATT DB
0.2 0	12	RATE DB
0.1 0	13	ROT PLS
0.0 0	14	COMP
ALL	15	P OPTION
ALL	16	Y OPTION
0.0 5	17	TRAN PLS
		ALT
0.2 0 0	18	RATE DB
ALL	19	JET OPT
2	20	#JETS
0.0 8	21	ON TIME
- 0.0 0	22	DELAY
		VERN
0.2 0 0 0	23	ROT RATE
- 1.0 0 0	24	ATT DB
0.2 0	25	RATE DB
0.0 1 0	26	ROT PLS
0.0 0	27	COMP
0	28	CNTL ACC

FLT PLN-10a/72/O/A

A8

DAP A9

PURPOSE:
SFU LOW HOVER

FLT PLN-10b/72/O/A



A9



A9

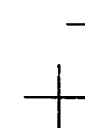
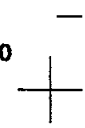
DAP A 0 9	1/3	PRI
0.1 0 0 0	10/50	ROT RATE
- 3.0 0	11/51	ATT DB
0.2 0	12/52	RATE DB
0.0 4	13/53	ROT PLS
0.0 0	14/54	COMP
ALL	15/55	P OPTION
ALL	16/56	Y OPTION
0.0 5	17/57	TRAN PLS
		ALT
0.2 0 0	18/58	RATE DB
ALL	19/59	JET OPT
2	20/60	#JETS
0.0 8	21/61	ON TIME
- 8.0 0	22/62	DELAY
		VERN
0.2 0 0 0	23/63	ROT RATE
- 3.0 0 0	24/64	ATT DB
2.0 0	25/65	RATE DB
0.0 1 0	26/66	ROT PLS
0.0 0	27/67	COMP
1	28/68	CNTL ACC

FLT PLN-11a/72/O/A

DAP A10

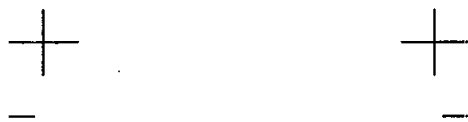
PURPOSE:
SFU CAPTURE

FLT PLN-11b/72/O/A



A10

(reduced copy)



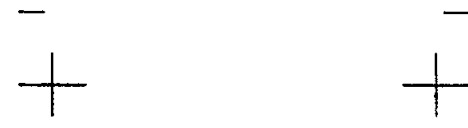
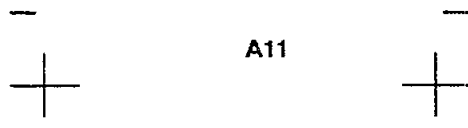
A10

A10
DAP A11

DAP A 1 0 1/3 PRI
0.1 0 0 0 10/50 ROT RATE
- 3.0 0 11/51 ATT DB
0.2 0 12/52 RATE DB
0.0 4 13/53 ROT PLS
.0 0 0 14/54 COMP
 ALL 15/55 P OPTION
 ALL 16/56 Y OPTION
0.0 5 17/57 TRAN PLS
 ALT
0.2 0 0 18/58 RATE DB
 ALL 19/59 JET OPT
 2 20/60 #JETS
0.0 8 21/61 ON TIME
- 8.0 0 22/62 DELAY
 VERN
0.2 0 0 0 23/63 ROT RATE
- 3.0 0 0 24/64 ATT DB
.2 0 0 25/65 RATE DB
0.0 1 0 26/66 ROT PLS
.0 0 0 27/67 COMP
 2 28/68 CNTL ACC
 FLT PLN-12a/72/O/A

PURPOSE:
 SFU SJ CAPTURE
 SFU RELEASE

FLT PLN-12b/72/O/A



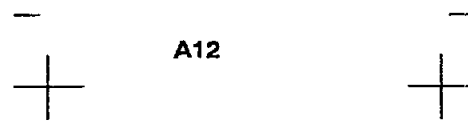
A11

A11
DAP A12

DAP A 1 1 1/3 PRI
0.1 0 0 0 10/50 ROT RATE
- 3.0 0 11/51 ATT DB
0.2 0 12/52 RATE DB
0.0 4 13/53 ROT PLS
.0 0 0 14/54 COMP
 ALL 15/55 P OPTION
 ALL 16/56 Y OPTION
0.0 5 17/57 TRAN PLS
 ALT
0.2 0 0 18/58 RATE DB
 ALL 19/59 JET OPT
 2 20/60 #JETS
0.0 8 21/61 ON TIME
- 8.0 0 22/62 DELAY
 VERN
0.2 0 0 0 23/63 ROT RATE
- 3.0 0 0 24/64 ATT DB
.2 0 0 25/65 RATE DB
0.0 1 0 26/66 ROT PLS
.0 0 0 27/67 COMP
 3 28/68 CNTL ACC
 FLT PLN-13a/72/O/A

PURPOSE:
 OAST LOW HOVER
 OAST EXTENDED PARK

FLT PLN-13b/72/O/A



A12

(reduced copy)



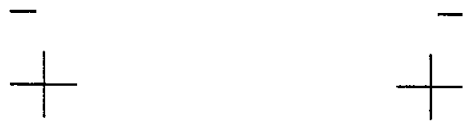
A12

DAP A13

DAP A 1 2 1/3 PRI
0.1 0 0 0 10/50 ROT RATE
 - 3.0 0 11/51 ATT DB
 - 0.2 0 12/52 RATE DB
0.0 4 13/53 ROT PLS
 - 0 0 0 14/54 COMP
 ALL 15/55 P OPTION
 ALL 16/56 Y OPTION
0.0 5 17/57 TRAN PLS
 ALT
0.2 0 0 18/58 RATE DB
 ALL 19/59 JET OPT
2 20/60 #JETS
 - 0.0 8 21/61 ON TIME
 - 3.1 0 22/62 DELAY
 VERN
0.2 0 0 0 23/63 ROT RATE
 - 3.0 0 0 24/64 ATT DB
 - 2 0 0 25/65
 - 0.0 1 0 26/66 ROT PLS
 - 0 0 0 27/67 COMP
 1 28/68 CNTL ACC
 FLT PLN-14a/72/O/A

PURPOSE:
 OAST RELEASE
 OAST CAPTURE

FLT PLN-14b/72/O/A



A13



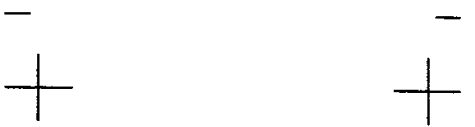
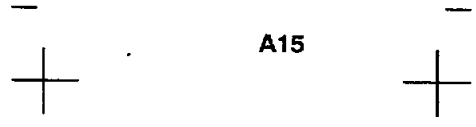
A13

A13
DAP A15

DAP A 1 3 1/3 PRI
0.1 0 0 0 1/50 ROT RATE
 - 3.0 0 11/51 ATT DB
 - 0.2 0 12/52 RATE DB
0.0 4 13/53 ROT PLS
 - 0 0 0 14/54 COMP
 ALL 15/55 P OPTION
 ALL 16/56 Y OPTION
0.0 5 17/57 TRAN PLS
 ALT
0.2 0 0 18/58 RATE DB
 ALL 19/59 JET OPT
2 20/60 #JETS
0.0 8 21/61 ON TIME
 - 4.9 0 22/62 DELAY
 VERN
0.2 0 0 0 23/63 ROT RATE
 - 3.0 0 0 24/64 ATT DB
 - 2 0 0 25/65 RATE DB
0.0 1 0 26/66 ROT PLS
 - 0 0 0 27/67 COMP
 1 28/68 CNTL ACC
 FLT PLN-15a/72/O/B

PURPOSE:
 RBAR
 APPROACH

FLT PLN-15b/72/O/B



A15

(reduced copy)



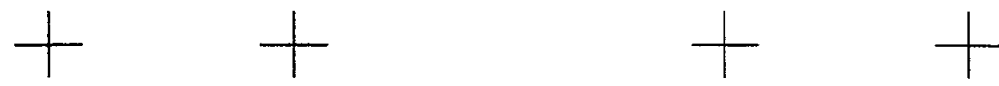
A15

A15

DAP A 1 5	1/3	PRI
0.0 6 5 0	1/50	ROT RATE
- 2.0 0	11/51	ATT DB
0.2 0	12/52	RATE DB
0.1 0	13/53	ROT PLS
.0 0 0	14/54	COMP
ALL	15/55	P OPTION
ALL	16/56	Y OPTION
0.1 0	17/57	TRAN PLS
		ALT
0.2 0 0	18/58	RATE DB
ALL	19/59	JET OPT
2	20/60	#JETS
0.0 8	21/61	ON TIME
- 0.0 0	22/62	DELAY
		VERN
0.0 6 5 0	23/63	ROT RATE
- 1.0 0 0	24/64	ATT DB
.0 2 0	25/65	RATE DB
0.0 1 0	26/66	ROT PLS
.0 0 0	27/67	COMP
0	28/68	CNTL ACC

FLT PLN-28a/72/O/B

FLT PLN-28b/72/O/A



DAP B

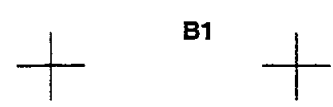
DAP B1

PURPOSE:

NOMINAL; OMS &
RCS BURNS

FLT PLN-16a/72/O/A

FLT PLN-16b/72/O/A



B1



(reduced copy)

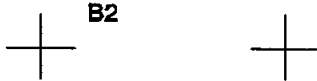
FLT PLN/72/FIN A



B1

2	DAP B 0 1
30	<u>0.5 0 0 0</u>
31	<u>- 3.0 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	ALL
36	ALL
37	<u>0.1 0</u>
38	<u>0.2 0 0</u>
39	ALL
40	2
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.2 0 0 0</u>
44	<u>- 1.0 0 0</u>
45	<u>.0 2 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	0

FLT PLN-17a/72/O/A



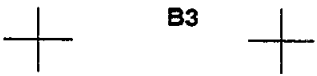
B2



B2

2	DAP B 0 2
30	<u>0.2 0 0 0</u>
31	<u>- 3.0 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	TAIL
36	TAIL
37	<u>0.0 2</u>
38	<u>0.0 7 0</u>
39	TAIL
40	1
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.2 0 0 0</u>
44	<u>- 1.0 0 0</u>
45	<u>.0 2 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	0

FLT PLN-18a/72/O/A



B3



B1

DAP B2

PURPOSE:
LOSS OF VERNIS
(TAIL ONLY)

FLT PLN-17b/72/O/A



B2

DAP B3

PURPOSE:
LOSS OF VERNIS
(NOSE & TAIL)

FLT PLN-18b/72/O/A



(reduced copy)



B3

2	DAP B 0 3
30	<u>0.2 0 0 0</u>
31	<u>- 3.0 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	ALL
36	ALL
37	<u>0.0 2</u>
38	<u>0.0 7 0</u>
39	ALL
40	<u>1</u>
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.2 0 0 0</u>
44	<u>- 1.0 0 0</u>
45	<u>.0 2 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	<u>0</u>

FLT PLN-19a/72/O/A



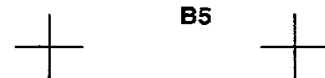
B4



B4

2	DAP B 0 4
30	<u>0.2 0 0 0</u>
31	<u>- 0.3 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	TAIL
36	TAIL
37	<u>0.0 2</u>
38	<u>0.2 0 0</u>
39	ALL
40	<u>2</u>
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.0 0 8 0</u>
44	<u>- 0.1 0 0</u>
45	<u>.0 1 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	<u>0</u>

FLT PLN-20a/72/O/A



B5



B3

DAP B4

PURPOSE:

SSUS DEPLOY

FLT PLN-19b/72/O/A



B4

DAP B5

PURPOSE:

COAS CAL

FLT PLN-20b/72/O/A



(reduced copy)



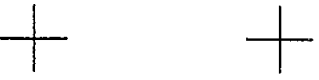
B5

2	DAP B 0 5
30	<u>0.2 0 0 0</u>
31	<u>- 3.0 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	TAIL
36	TAIL
37	<u>0.0 2</u>
38	<u>0.2 0 0</u>
39	ALL
40	2
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.0 1 6 0</u>
44	<u>- 0.0 3 3</u>
45	<u>.0 2 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	0

FLT PLN-21a/72/O/A



B7



B7

2	DAP B 0 7
30	<u>0.5 0 0 0</u>
31	<u>- 2.0 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	ALL
36	ALL
37	<u>0.0 5</u>
38	<u>0.2 0 0</u>
39	ALL
40	2
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.2 0 0 0</u>
44	<u>- 1.0 0 0</u>
45	<u>.0 2 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	0

FLT PLN-22a/72/O/A



B8



B5

DAP B7

PURPOSE:

RENDEZVOUS

FLT PLN-21b/72/O/A



B7

DAP B8

PURPOSE:

PROX OPS

FLT PLN-22b/72/O/A



(reduced copy)



B8

2	DAP B 0 8
30	<u>0.2 0 0 0</u>
31	<u>- 2.0 0</u>
32	<u>0.2 0</u>
33	<u>0.0 4</u>
34	<u>.0 0 0</u>
35	ALL
36	ALL
37	<u>0.0 1</u>
38	<u>0.2 0 0</u>
39	ALL
40	<u>2</u>
41	<u>0.0 8</u>
42	<u>- 0.0 0</u>
43	<u>0.2 0 0 0</u>
44	<u>- 1.0 0 0</u>
45	<u>.0 2 0</u>
46	<u>0.0 0 2</u>
47	<u>.0 0 0</u>
48	<u>0</u>

FLT PLN-23a/72/O/A



B9



B9

2/4	DAP B 0 9
30/50	<u>0.0 5 0 0</u>
31/51	<u>- 1.0 0</u>
32/52	<u>0.2 0</u>
33/53	<u>0.0 4</u>
34/54	<u>.0 0 0</u>
35/55	TAIL
36/56	TAIL
37/57	<u>0.0 2</u>
38/58	<u>0.0 7 0</u>
39/59	ALL
40/60	<u>1</u>
41/61	<u>0.0 8</u>
42/62	<u>- 0.0 0</u>
43/63	<u>0.0 5 0 0</u>
44/64	<u>- 0.1 0 0</u>
45/65	<u>.0 2 0</u>
46/66	<u>0.0 0 2</u>
47/67	<u>.0 0 0</u>
48/68	<u>0</u>

FLT PLN-24a/72/O/A



B10



B8

DAP B9

PURPOSE:

SLA TIGHT
DEADBAND

FLT PLN-23b/72/O/A



B9

DAP B10

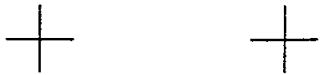
PURPOSE:

SFU B/U ATT
CAPTURE

FLT PLN-24b/72/O/A



(reduced copy)



B10

2/4	DAP B 1 0
30/50	<u>0.1 0 0 0</u>
31/51	<u>0 3.0 0</u>
32/52	<u>0.2 0</u>
33/53	<u>0.0 4</u>
34/54	<u>.0 0 0</u>
35/55	ALL
36/56	ALL
37/57	<u>0.0 2</u>
38/58	<u>0.2 0 0</u>
39/59	ALL
40/60	2
41/61	<u>0.0 8</u>
42/62	<u>- 6.9 0</u>
43/63	<u>0.2 0 0 0</u>
44/64	<u>0 3.0 0 0</u>
45/65	<u>.2 0 0</u>
46/66	<u>0.0 0 2</u>
47/67	<u>.0 0 0</u>
48/68	<u>2</u>

FLT PLN-25a/72/O/B



B13



B13

2/4	DAP B 1 3
30/50	<u>0.0 5 0 0</u>
31/51	<u>- 1.0 0</u>
32/52	<u>0.2 0</u>
33/53	<u>0.0 4</u>
34/54	<u>.0 0 0</u>
35/55	ALL
36/56	ALL
37/57	<u>0.0 2</u>
38/58	<u>0.1 0 0</u>
39/59	ALL
40/60	2
41/61	<u>0.0 8</u>
42/62	<u>- 4.9 0</u>
43/63	<u>0.1 0 0 0</u>
44/64	<u>- 1.0 0 0</u>
45/65	<u>.0 2 0</u>
46/66	<u>0.0 0 2</u>
47/67	<u>.0 0 0</u>
48/68	<u>1</u>

FLT PLN-26a/72/O/B



B15



B10

DAP B13

PURPOSE:

OAST DEADBAND
COLLAPSE FOR
REL (PH & BO)

FLT PLN-25b/72/O/B



B13

DAP B15

PURPOSE:

RBAR
APPROACH

FLT PLN-26b/72/O/B



(reduced copy)



B15

B15

2/4	DAP B 1 5
30/50	<u>0.0 6 5 0</u>
31/51	- <u>2.0 0</u>
32/52	<u>0.2 0</u>
33/53	<u>0.0 4</u>
34/54	<u>.0 0 0</u>
35/55	ALL
36/56	ALL
37/57	<u>0.0 5</u>
38/58	<u>0.2 0 0</u>
39/59	ALL
40/60	<u>2</u>
41/61	<u>0.0 8</u>
42/62	- <u>0.0 0</u>
43/63	<u>0.0 6 5 0</u>
44/64	- <u>1.0 0 0</u>
45/65	<u>.0 2 0</u>
46/66	<u>0.0 0 2</u>
47/67	<u>.0 0 0</u>
48/68	<u>0</u>

FLT PLN-29a/72/O/A

FLT PLN-29b/72/O/A



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

FLT PLN-27/72/O/A

FLT PLN-27/72/O/A is mounted on the back of the DAP Book

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STS-72
FLIGHT PLAN NOTES

FLIGHT PLAN
NOTES

FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

Orbiter: OV105/Endeavour
 Inclination: 28.45°
 Insertion Altitude: 250/124nm
 Duration: 9 + 2
 Launch Window: 60 min, moves 31 min earlier per day

B. MAJOR EVENTS

An 'S' will denote SFU events; and 'O' will denote OAST-FLYER events.

<u>EVENT</u>	<u>MET</u>	<u>DATE</u>	<u>CST</u>	<u>GMT</u>	<u>ΔV</u>	<u>ORBIT</u>
Launch	00/00:00	01/11/96	03:18	09:18	--	--
OMS-2	00/00:44	01/11/96	04:02	10:02	224.6	250/160
NC1-S	00/05:21	01/11/96	08:39	14:39	101.5	250/219
NPC-S	00/22:58	01/12/96	02:17	08:17	0.5	250/219
NSR-S	01/04:38	01/12/96	07:56	13:56	41.4	251/242
NC2-S	01/05:18	01/12/96	08:36	14:36	4	252/243
NH-S	01/17:47	01/13/96	21:05	03:05	13.7	260/244
NC3-S	01/18:35	01/13/96	21:53	03:53	11.3	260/250
NCC-S	01/20:44	01/13/96	00:02	06:02	0.0	260/250
Ti-S	01/21:43	01/13/96	01:01	07:01	3.0	260/250
SFU Grapple	02/00:35	01/13/96	03:53	09:53	--	260/251
OA	02/04:04	01/13/96	07:22	13:22	168.0	255/165
CIRC-O	02/04:51	01/13/96	08:09	14:09	154.8	165/165
OAST Release	03/02:25	01/14/96	05:43	11:43	--	165/165
SEP1-O	03/02:31	01/14/96	05:49	11:49	1.0	166/165
SEP2-O	03/03:01	01/14/96	06:19	12:19	1.0	166/165
NC1-O	03/04:32	01/14/96	07:50	13:50	0.9	167/165
NC2-O	03/18:03	01/15/96	21:21	03:21	2.7	166/165
NC3-O	04/04:06	01/15/96	07:24	13:24	1.7	166/164
NH-O	04/04:52	01/15/96	08:10	14:10	0.6	166/164
NC4-O	04/19:21	01/16/96	22:39	04:39	4.8	166/160
NCC-O	04/21:26	01/16/96	00:44	06:44	0.0	166/160
Ti-O	04/22:22	01/16/96	01:40	07:40	3.1	166/162
OAST Grapple	05/00:32	01/16/96	03:50	09:50	--	166/164
D/O Burn	08/21:36	01/20/96	00:54	06:54	271.0	--
Landing	08/22:36	01/20/96	01:54	07:54	--	--

C. LANDING OPPORTUNITIES

		<u>Landing Orbit</u>	<u>Site</u>	<u>Local Time</u>	<u>MET</u>
		<u>No.</u>			
Nominal	Primary	142	KSC	02:54 EST	08/22:36
	1 Rev Late	143	KSC	04:30 EST	09/00:12
1 Day Late	Primary	157	KSC	01:28 EST	09/21:10
	1 Rev Late	158	KSC	03:04 EST	09/22:46
2 Days Late	Primary	173	KSC	01:38 EST	10/21:20
	1 Rev Late	174	KSC	03:14 EST	10/22:56

FLIGHT PLAN NOTES

D. CREW

CDR - Brian Duffy
PLT - Brent W. Jett (backup RMS)
MS1 - Leroy Chiao (EVA)
MS2 - Winston E. Scott (EVA)
MS3 - Koichi Wakata (RMS)
MS4 - Daniel T. Barry (EVA)

E. COMMUNICATIONS

SHUTTLE

TDRS Support: East (41° W), West (174° W)
Backup Real-Time TV: GDS(GDX), MIL(MLX)
Contingency GSTDN: DFR*, MIL(MLX)*, BDA(BDX)*, GDS(GDX) and WLP
Contingency RTS: HTS, GTS, VTS, IOS*, CTS, DGS, OTS*, and NHS

*UHF capability

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

F. PAYLOADS

1. Space Flyer Unit (SFU)

The primary payload activity of STS-72 will be to retrieve the Japanese Space Flyer Unit. The SFU payload is a free-flying experiment carrier which was launched on March 18, 1995 by an H-II Expendable Launch Vehicle (ELV) from the Tanegashima launch site located in Japan and will operate on-orbit approximately nine months.

At a distance of 110 ft (33.5 m), hydrazine thrusters will be safed and, following Remote Manipulator System (RMS) capture, the payload's reaction wheels will be turned off and the payload will be configured for berthing. Postberthing, the batteries will be disconnected, and orbiter bus power will be provided to the payload in the cargo bay for Reaction Control System (RCS) and Orbit Change Thrusters (OCT) heater operation. The payload will then be placed in a semiquiescent (all experiments and unnecessary components will be turned off) mode for the remainder of the mission.

The SFU payload contains three automated laboratories:

a. Science and Technology Experiments

The science and technology experiments consist of an infrared telescope, a two-dimensional solar array generating high voltage output, an electric propulsion system, material experiments, space biology experiments, and a space plasma diagnostic package.

b. Exposed Facility

The exposed facility is a component of the Japanese Experimental Module to be integrated in the International Space Station.

c. **Materials processing**

The materials processing laboratories are comprised of a temperature–gradient furnace, a mirror–heating furnace, and an isothermal–heating furnace. A Control and Data Management System (CDMS) provides payload system control and monitoring for on–board experiments.

2. **OAST–FLYER**

The OAST–FLYER is the sixth in a series of missions using the SPARTAN carrier. Prior to deployment and while still attached to the Spartan Flight Servicing Structure (SFSS) via the Release/Engage Mechanism (REM), a crewmember will activate, update, and check out the OAST–FLYER through the use of the PGSC/BIA interface. After checkout, the OAST–FLYER will be grappled, released from the REM, and then deployed by the Remote Manipulator System (RMS). The OAST–FLYER will operate in the free–flyer mode for approximately 40 to 50 hours. All science and housekeeping data will be recorded on board the deploy hardware. After completion of detached operations, the OAST–FLYER will be retrieved and reberthed in the orbiter.

The objective of the OAST–FLYER is to provide a platform for technology experiments. The OAST–FLYER payload consists of four experiments.

a. **Return Flux Experiment (REFLEX)**

REFLEX is a Goddard Space flight Center (GSFC) experiment which will characterize return flux contamination phenomenon to validate contamination prediction models. The primary objective of this experiment is to identify and quantify the molecular species that evolve from a surface and then return to the surface after interacting with contaminants from other surfaces and the natural environment. This ‘return flux’ is believed to be one of the major sources of error in the analytical models used to predict the contamination environment surrounding an instrument or spacecraft. A secondary objective is to study the erosion of coatings as a result of reaction with atomic oxygen.

b. **GPS Attitude Determination and Control System (GADACS)**

The GADACS experiment will provide an on–orbit calibration of spacecraft attitude using the constellation of Global Positioning System satellites and a specially designed GPS receiver and antenna system. The GADACS experiment is expected to provide very precise calibrations of the GPS attitude sensor using the SPARTAN resident sensors and a high precision DRIRU–II Gyro. In addition, the OAST–FLYER attitude will be controlled exclusively using the GADACS hardware for some portions of the mission.

c. **Solar Exposure to Laser Ordnance Device (SELODE)**

The SELODE experiment will enable a better understanding of the reliability and safety of laser powered pyrotechnic initiators and detonators. The major objectives are to determine if natural low orbit solar energy can inadvertently fire laser pyrotechnics, and determine the effects of exposure to low earth orbit environments on the reliability and/or performance of the pyrotechnics.

d. SPARTAN Packet Radio Experiment (SPRE)

The Spartan Packet Radio Experiment (SPRE) is an amateur radio (HAM radio) communications experiment with the following objectives:

1. Test packet radio protocol enhancements of Low Earth Orbit (LEO) satellite communications
2. Test a GPS and packet radio based tracking system
3. Provide telemetry for the REFLEX experiment with a command uplink capability

SPRE uses GPS information provided by the GADACS experiment to test packet radio protocol enhancements for space communications. SPRE will test a method to better utilize a channel. The spacecraft will be able to determine when a ground station is out of range and terminate that link to reuse the channel.

Telemetry from the REFLEX is transmitted to Earth by the SPRE. This telemetry will be used by the REFLEX experimenters to provide feedback on how well their experiment is performing. SPRE also provides an encrypted command uplink capability to be able to adjust REFLEX if required.

3. EVA Development Flight Test-03 (EDFT-03)

The EDFT-03 consists of DTOs 671, 672, 833, and 1210. The main objective is to assess EVA tools and support equipment functionality and usage techniques that are critical to the International Space Station (ISS) assembly and maintenance. Another objective is to expand the EVA experience base for the ground and flight crews. EDFT-03 hardware is mounted in bays 1 through 4 on both the starboard and port sides of the payload bay.

a. EVA hardware for future scheduled EVA missions (Test 11) (DTO 671)

The primary objective of this DTO is to test, in the space environment, vehicle interfaces for EVA hardware and techniques for future EVA activity. Crew activities involve the evaluation of the portable work platform (PWP), rigid umbilical, and truss-to-truss utility boxes.

b. EMU Electronic Cuff Checklist (ECC) (DTO 672)

This DTO flight tests an electronic version of the EVA cuff checklist. The unit provides a high resolution display that will allow EVA crewmembers access to a larger amount of information than is possible with the current paper version. Crew activities include wearing the electronic cuff checklist during the scheduled EVA, then evaluating its overall performance and usability. Following the completion of both EVAs, new data will be uplinked and transferred to the unit to test the update capability.

c. EMU Thermal Comfort Evaluations (DTO 833)

Thermal modifications and potential modifications to the Extravehicular Mobility Unit (EMU) will be evaluated in a cold attitude during the planned EVA using orbit temperature data gathering devices. A secondary objective is to support development of an improved thermal model of the EMU.

d. EVA Operations Procedures/Training (DTO 1210)

Differences between training facilities/techniques and the actual EVA environment will be captured and applied with this DTO by performing dedicated EVAs with special scenarios and equipment. EVA activity will evaluate thermal effects on task performance, ECC, and improved EVA hardware.

4. Shuttle Solar Backscatter Ultraviolet (SSBUV/A)

The SSBUV program is designed to provide more accurate and reliable readings of global ozone to aid in the calibration of backscatter ultraviolet (UV) instruments flown concurrently on free-flying satellites. The payload consists of an SSBUV spectrometer with five supporting optical sensors and command, data, and power systems mounted in two Get-Away-Special (GAS) canisters in bays 6 and 7 on the starboard side of the payload bay. The instrument views downward to measure ozone by comparing scattered UV sunlight with that coming directly from the Sun. The instrument also measures the solar spectrum in the UV range. Payload operations are controlled via ground commands.

5. Shuttle Laser Altimeter-01/Get-Away-Special (SLA-01/GAS)

The SLA payload will acquire samples of land topography and vegetation data in order to demonstrate laser altimeter operation in Earth orbit. The payload will also attempt to provide an in-space engineering test bed for laser altimeter sensors and measure cloud top-height, cloud structure and aerosol layering. Laser altimeter measurement of surface elevation and surface structure by the SLA result from timing and digitization of short pulses of laser radiation that are sent by a laser transmitter and detected by an optical receiver after scattering from the Earth's surface or atmosphere.

The five GAS payloads consist of self-contained experiments which are integrated into customer-provided standard canisters. Each GAS payload will have its own internal support system. The GAS payloads are mounted on the aft portion of the HH-M bridge. The GAS payloads are controlled by a crewmember through the use of the Bus Interface Adapter (BIA) connected to a Payload and General Support Computer (PGSC).

The GAS payloads and payloads using GAS cans include:

- Thermal Energy Storage-2 (TES-2)
- GAS Ballast Payload-1/Sample Return Experiment (GBP-1/SRE)
- GAS-342 (Measurement of the dynamics of a vibrating beam)
- GAS-459 (Protein crystallization in microgravity)
- GAS-740 (Heat flux detection in liquid subcooling)

6. **Physiological & Anatomical Rodent Experiment/National Institute of Health-Rodents (PARE/NIH-R)**

The PARE/NIH-R is a series of experiments designed to determine whether exposure to microgravity results in physiological or anatomical changes in rodents. The experiments consists of rodents contained within three Animal Enclosure Modules (AEMs), each of which will occupy one middeck locker with a modified locker door. Additional locker volume for the water refill line and AEM mufflers is also required (approximately 1/4 locker volume). The AEMs are designed such that the flight crew will not come into direct contact with the animals.

The crew will perform daily observations during AEM lighted cycles and housekeeping of the payload. Housekeeping tasks will include verifying the AEM fans are operating, checking that the air inlet slot screens are unobstructed, and checking the lights. If the light timer fails, crew activity will be required to manually override the light cycle. In-flight data operations will consist of a log of daily animal health observations. The crew will also be required to replenish the water reservoir in each AEM. Photographic documentation is also required. The payload/experiment shall be deactivated and/or stowed by the crew at the end of operations.

7. **Space Tissue Loss - A (STL-A)**

The STL is an experimental payload designed to validate models of muscle, bone, and endothelial cell biochemical and functional loss induced by microgravity stress and to evaluate cytoskeleton, metabolism, membrane integrity, and protease activity in target cells, and testing tissue loss pharmaceuticals for efficacy. The STL experimental objectives require implementation of two fully independent, complimentary analytical configurations to address the full spectrum of data from micromolecular level responses (STL-A) to macromorphological alterations (STL-B). The STL-A configuration will be flown on STS-72.

8. **Protein Crystal Growth - Single Thermal Enclosure System Block I (PCG-STES Block I)**

The PCG-STES payload is designed to conduct experiments which will supply information on the scientific methods and dynamics of growing large high-quality protein crystals in microgravity. The PCG-STES will be installed and operated in the orbiter middeck. The STES is a refrigeration and incubation module for conducting microgravity and biotechnology research in the orbiter crew compartment middeck. The temperature of the STES internal volume can be controlled to any desired temperature between 4 and 40 degrees C. PCG-STES Block I requires 2 hours each for activation and deactivation with photography and video also required. STES also requires multiple daily temperature and fan checks.

9. **Commercial Protein Crystal Growth Block II (CPCG Block II)**

The CPCG payload is designed to conduct experiments which will supply information on the scientific methods and commercial potential for growing large high-quality protein crystals in microgravity. The CPCG will be installed and operated in the orbiter middeck. The experiment apparatus contained inside the Commercial Refrigeration and Incubation Module (CRIM) is known as the Protein Crystallization Facility (PCF) which consists of four different sized containers with fluid product. A crewmember will start the CRIM temperature profile software and check the status of the CRIM internal temperature daily.

G. ON-ORBIT DTOs

1. Water Spray Boiler Electrical Heater Capability (DTO 415)

This DTO will collect data to verify performance of WSB APU water feedline heater modification. The data will also be used to verify and enhance WSB models. No crew activity is required.

2. Cabin Temperature Survey (DTO 664)

The purpose of this DTO is to compile a temperature profile of the crew cabin in a variety of orbiter attitudes and configurations and to correlate these readings with the cabin temperature sensor reading. A crewmember will take cabin temperature readings approximately once per day. The readings should be scheduled in a variety of attitudes under day light and night conditions to the extent possible.

3. Advanced Lower Body Restraint Test (DTO 668)

This DTO is to provide on-orbit evaluation of an advanced lower body (legs and feet) restraint which provides variability in positioning, adjustable lower body flexibility/rigidity, and upper body movement/reach envelope. Flight crew evaluations and photo/TV documentation will be used as design data to support restraint development. Requires crew involvement during AFD/RMS operations.

4. Radiation Measurements In Shuttle Crew Compartment (DTO 684)

The purpose of this DTO is to measure the linear energy transfer spectrum of the complex space radiation in the shuttle crew compartment, to provide an accurate measurement of biologically effective dose equivalent and to evaluate risk of single event upsets (SEUs) in shuttle avionics.

5. Global Positioning System Development Flight Test (Configuration 1 and 2) (DTO 700-8)

This DTO will demonstrate the performance and operation of the Global Positioning System (GPS) during orbiter ascent, on-orbit, entry, and landing phases. The GPS will estimate the orbiter position, velocity, measurement discretizes and attitude. GPS data will be recorded on a 486 PGSC hard drive. The OAST-FLYER and SLA customers have also requested that the GPS data collected during the time frame of OAST-FLYER and SLA operations be provided to them postflight.

H. ON-ORBIT DSOs

1. In-flight Evaluation of the Urine Monitoring System (DSO 330)

The objective of this DSO is to evaluate the Urine Monitoring System (UMS) design modifications. This will be done through in-flight calibration and sample collection to quantify accuracy, dilution, and cross-contamination parameters. The crew will videotape inflight function for analysis of fluid dynamics, including phase separation and dead volume. The UMS operations must occur on 5 consecutive flight days. On STS-72, UMS operations are scheduled on Flight Days 4 through 8. In addition, three 70-minute calibration sessions are required with photo/TV during two of them.

2. **Back Pain Pattern In Microgravity (DSO 483)**

Back pain is a common symptom experienced by astronauts during space flight. The objective of this DSO is to collect back pain and height change information on a daily basis.

3. **Immunological Assessment of Crewmembers (DSO 487)**

As shuttle mission durations increase, the potential development of infectious illness in crewmembers during flight also increases. This study will improve the understanding of the potential impacts of space flight induced immunological alterations on crewmember health and performance. There are no on-orbit crew activities associated with the DSO.

4. **EVA Dosimetry Evaluation (DSO 489)**

Since the current location of the Crew Passive Dosimeter (CPD) in the EMU may be shielded by the upper torso portion of the Liquid Cooling and Ventilation Garment (LCVG) and may not give accurate exposure measurements, this investigation places dosimeters in other areas of the body to determine the reliability of the CPD measurements. The placement of these dosimeters will be referenced from the EVA prep procedure in the EVA Checklist.

5. **Characterization of Microbial Transfer Among Crewmembers During Space Flight (DSO 491)**

In order to minimize the spread of infectious agents during space flight, a better understanding of microbial dissemination within the shuttle environment is necessary. The dissemination of normal crew microbiota will be studied by tracking a specific target organism through samples obtained preflight and post flight from participating crewmembers. No in-flight crew activities are required.

6. **Portable Clinical Blood Analyzer (DSO 492B)**

The purpose of this DSO is to validate the Portable Clinical Blood Analyzer's (PCBA) ability to function and measure certain clinical parameters accurately in microgravity. The DSO requires an operator to set up and process blood samples from himself and the other two subjects on one early flight day and one late flight day (FDs 3 & 8 are preferred).

7. **Monitoring Latent Virus Reactivation and Shedding in Astronauts (DSO 493)**

The purpose of this DSO is to determine the frequency of induced reactivation of herpes viruses, herpes virus shedding, and clinical disease after exposure to physical, physiological, and psychological stresses associated with space flight. One crewmember will perform saliva collection each flight day during post sleep.

8. **Influence of Microgravity and EVA on Pulmonary Oxygen Exchange (DSO 494)**

Russian studies suggest that microgravity impairs pulmonary oxygen exchange. EVA may be a compounding factor. This DSO seeks to determine if an operationally significant impairment is present. The subject crewmembers will breathe 10.2 psia cabin air through a tube into a Pulse Oximeter/ Capnograph System, which will record test data. The participating EVA crewmembers perform this DSO the day prior to EVA and shortly after EVA is complete. Non-EVA subjects perform this DSO once, on any flight day.

9. **Visual-Vestibular Integration as a Function of Adaptation (DSO 604 OI-1 and OI-3C)**

The objective of this DSO is to investigate visual-vestibular and perceptual adaptive responses as a function of longer missions and to determine the operational impact on performance of entry, landing, and egress procedures. Crewmembers perform head and eye movements while looking at visual targets in the middeck. These movements are measured by special instrumentation. There are two subjects for the OI-3C protocol and one subject for the OI-1 protocol. The OI-3C protocol requires that the majority of the middeck be clear of activity during data takes.

10. **Educational Activities (DSO 802)**

The purpose of this DSO is to use the attraction of space flight to capture the interest of students and motivate them toward careers in science, engineering, and mathematics. The primary subject of the DSO will be MS3, with MS4 as the director.

11. **Documentary Television (DSO 901)**

The purpose of this DSO is to provide live television or Video Tape Recorder (VTR) dumps of crew activities, orbiter operations, payload deployment/retrieval, Earth views, and rendezvous and proximity operations.

12. **Documentary Motion Picture (DSO 902)**

The purpose of this DSO is to provide documentary and public affair motion picture photography of the orbiter's basic capabilities and key flight objectives. Documentation shall include launch, crew activities, payload deployment/retrieval, landing, and unscheduled activities of special interest.

13. **Documentary Still Photography (DSO 903)**

The purpose of DSO 903 is to provide still photography of crew activities, orbiter operations, payload deployment/retrieval and operations, Earth views, and unscheduled items of interest.

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