

Pink

Flight Plan

STS-90

(FRR Cycle Trajectory)

Mission Operations Directorate
Operations Division

Final
February 13, 1998

<u>EVENT</u>			
Launch	12:19 CST	Thur	April 2
KSC Landing	11:09 CDT	Sat	April 18

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



MISSION OPERATIONS DIRECTORATE

STS-90 FLIGHT PLAN

FINAL
February 13, 1998

PREPARED BY:

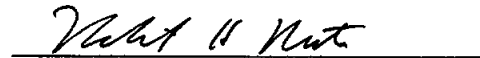


Linda P. DeLapp
Book Manager

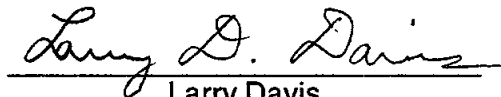
APPROVED BY:



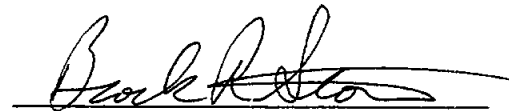
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FLIGHT PLAN
STS-90

LIST OF EFFECTIVE PAGES

FINAL 02/13/98

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6-2	* 90/FIN
6-3	* 90/FIN
6-4	* 90/FIN
6-5	* 90/FIN
6-6	* 90/FIN

* – Omit from flight book

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INTRODUCTION

The STS-90 Flight Plan is the Flight Data File article that contains the on-orbit timeline. It does not contain the detailed timelines that are covered in the Ascent, Post Insertion, Deorbit Prep, and Entry Checklists.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive and the requirements of the STS-90 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the FRR Cycle version of the STS-90 Flight Initialization Data Pack.

The flight profile used for this Flight Plan is for a launch date of April 2, 1998, at 12:19 CST. Orbiter inertial attitudes are expressed relative to a Mean of 1950 (M50) reference frame.

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

The following Appendix K Exemptions are pending approval for STS-90:

- #87 - Exercise for Microneurography Subjects.
- #88 - Presleep Reduction for Launch Hold.
- #89 - Use of the First and Last Hour of PSA.

The timeline formats used in the Flight Plan are based on JSC-19933, Timeline Format Definitions and Standard Notes, Rev C, May 1990.

OVERVIEW TIMELINE

STS-90 TIMELINE OVERVIEW

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10							
MET		0/0															1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
FD 1																	asct	PI / SL ACT	SL OPS	SLEEP												
ATT																	IMU	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10							
MET	0/ 16	17	18	19	20	21	22	23	1/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
FD 2																	SL OPS	imu	SL OPS	SLEEP												
ATT		25° ROLL BIAS -ZLV -XVV															IMU	-ZLV -XVV (GAS Attitude)														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10								
MET	1/ 16	17	18	19	20	21	22	23	2/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
FD 3																	SL OPS	SUPLY	SLEEP														
ATT		-ZLV -XVV															-YLV -XVV	H2O	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10							
MET	2/ 16	17	18	19	20	21	22	23	3/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
FD 4																	SL OPS	WASTE	imu	SLEEP												
ATT		25° ROLL BIAS -ZLV -XVV															H2O	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10							
MET	3/ 16	17	18	19	20	21	22	23	4/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
FD 5																	SL OPS	SUPLY	OFF-DUTY	SLEEP												
ATT		25° ROLL BIAS -ZLV -XVV															H2O	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10									
MET	4/ 16	17	18	19	20	21	22	23	5/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15										
FD 6																	SL OPS	OAI	SL OPS	imu	SLEEP													
ATT		25° ROLL BIAS -ZLV -XVV															OA	25° BIAS -ZLV	IMU	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10								
MET	5/ 16	17	18	19	20	21	22	23	6/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
FD 7																	SL OPS	SIMO	SL OPS	SLEEP													
ATT		25° ROLL BIAS -ZLV -XVV															-YLV -XVV	H2O	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10								
MET	6/ 16	17	18	19	20	21	22	23	7/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
FD 8																	SL OPS	imu*	SLEEP														
ATT		25° ROLL BIAS -ZLV -XVV															-YLV -XVV	IMU	25° ROLL BIAS -ZLV -XVV														

* HUD Cal

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10								
MET	7/ 16	17	18	19	20	21	22	23	8/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									
FD 9																	SL OPS	SPEY	SLEEP														
ATT		25° BIAS -ZLV -XVV															-YLV -XVV	H2O	25° ROLL BIAS -ZLV -XVV														

GMT		11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10							
MET	8/ 16	17	18	19	20	21	22	23	9/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15								
FD 10																	SL OPS	waste	imu	OFF-DUTY	SLEEP											
ATT		25° ROLL BIAS -ZLV -XVV															H2O	25° ROLL BIAS -ZLV -XVV														

STS-90 TIMELINE OVERVIEW

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	
MET 9/ 16	17	18	19	20	21	22	23	10/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	
FD 11		SPLY								SL OPS													SLEEP
ATT		H2O		KU					25° BIAS -ZLV		OA												25° ROLL BIAS -ZLV -XVV

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8		
MET 10/ 16	17	18	19	20	21	22	23	11/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
FD 12																							SLEEP	
ATT										25° BIAS -ZLV													IMU	25° ROLL BIAS -ZLV -XVV

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8		
MET 11/ 16	17	18	19	20	21	22	23	12/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
FD 13																							SLEEP	
ATT										25° BIAS -ZLV													SIMO	25° ROLL BIAS -ZLV -XVV

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8		
MET 12/ 16	17	18	19	20	21	22	23	13/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
FD 14																							SLEEP	
ATT																							IMU	25° ROLL BIAS -ZLV -XVV

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8		
MET 13/ 16	17	18	19	20	21	22	23	14/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
FD 15																							SLEEP	
ATT										25° BIAS -ZLV													H2O	25° ROLL BIAS -ZLV -XVV

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8			
MET 14/ 16	17	18	19	20	21	22	23	15/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14			
FD 16																							SLEEP		
ATT																							WASTE	IMU	25° ROLL BIAS -ZLV -XVV

GMT	11	12	13	14	15	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8		
MET 15/ 16	17	18	19	20	21	22	23	16/0	1	2	3	4	5	6	7	8	9	10	11	12	13	14		
FD 17	*																							
ATT																								

* SL FINAL DEACT LDG KSC: 15/21:50

Legend

- Pre Sleep/ Post Sleep

- Sleep

H2O - water dump attitude, -ZLV +YVV

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SUMMARY TIMELINE

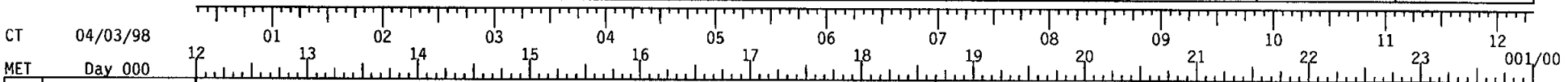
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93/06:19	93/00:19	000/12:00						

CT 04/02/98 000/00 13 01 14 02 15 03 16 04 17 05 18 06 19 07 20 08 21 09 22 10 23 11 04/03 12
MET Day 000

ORBITER	ACTIVITY	01	02	03	04	05	06	07	08	09	10	11	12		
ORBITER	CDR SEARFOSS	POST INSERTION		IMNVR 25BTAS MNVVR	SEE	GIRA INSTALL		MEAL	ELEV PK GR PR DN	SL AIR	D/P	PRE SLEEP	PRE SLEEP	SLEEP	
	PLT ALTMAN	POST INSERTION		EDO ACT	TV102 *		TV106	MEAL	V	R/F SERV	PLACT	PRE SLEEP		SLEEP	
	MS2 HIRE	POST INSERTION		BDS ACT	KDA UP BY &	VFECK VFEUE	OC SET UP		MEAL	CBS CO	AEM-CK	VT FA EUE	PRE SLEEP	SLEEP	
SL CREW	MS1 LINNEHAN	POST INSERT	SL ACTIVATION		INGRSS	SL ACTIVATION		MEAL	AEM-CK	PRE SLEEP	SITE-SB	SITE-OP	PRE SLEEP	SLEEP	
	MS3 WILLIAMS	POST INSERT	SL ACTIVATION		INGRSS	SL ACTIVATION		MEAL	SITE-SB	VVIS SET		PRE SLEEP		SLEEP	
	PS1 BUCKEY	POST INSERT	POST INSERTION		BOTEX XFR		SITE-OP	SITE-SB	MEAL	VVIS SET	D/P	PRE SLEEP		SLEEP	
	PS2 PAWELCZYK	POST INSERT	POST INSERTION		PLACT	RAHF3 CK	PLACT	RAHF7 CK	MEAL	SITE-SB	D/P	PRE SLEEP		SLEEP	
DAY/NIGHT ORBIT		2		3		4		5		6		7		8	
TDRS		-ZLV -XVV		IMU		+TV107-S1		VAPU HTR DEACT		APU HTR RECONFIG					
ATT								25 BIAS							
NOTES															

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
93/06:19	93/00:19	000/12:00	93 CT	-14.78		03 Apr 1998	FINAL	02/13/98
93/18:19	93/12:19	001/00:00						



O R B I T E R	CDR SEARFOSS	SLEEP	FD 2	POST SLEEP	D/P	PREP RAY	ERGO SETUP	ALLOP	FILTER CLEANING	
	PLT ALTMAN	SLEEP		POST SLEEP	T V 1 1 1	R C A K H F 3	R C A K H F 7	ERGO SETUP	EXERCISE	
	MS2 HIRE	SLEEP		POST SLEEP	O C A D/L	V T F E E	C G - X F R	P U P D S C A T E	N S E T U P W O R K	C G - X C H
S L C R E W	MS1 LINNEHAN	SLEEP		POST SLEEP	D/P	R C A K H F 3	R C A K H F 7		A/E-SB	
	MS3 WILLIAMS	SLEEP		POST SLEEP		GPWS SET	DS1R		DS1R	D I S T R
	PS1 BUCKEY	SLEEP		POST SLEEP		GPWS SET	DS1R		DS1R	D I S T R
	PS2 PAWELCZYK	SLEEP		POST SLEEP		D/P	A / E - O P	A/E-SB		E X E R
DAY/NIGHT										
ORBIT										
TDRS										
ATT		25 BIAS -ZLV -XVV								
NOTES										

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
93/18:19	93/12:19	001/00:00	93 CT	-16.69		03 Apr 1998	FINAL	02/13/98
94/06:19	94/00:19	001/12:00						

CT	04/03/98	13	14	15	16	17	18	19	20	21	22	23	11	12	04/04			
MET	Day 001	001/00	01	02	03	04	05	06	07	08	09	10	11	12				
ORBITER	CDR SEARFOSS	FD 2	AEM-CK	EXERCISE	IMNVR	MZLV	MEAL		DTO 667 PILOT		PRE SLEEP		SLEEP					
	PLT ALTMAN	WSB SWP	CRYO 02 SRSR CK	FC PURG	SSV ACT	TV106	MEAL	PGSSC	GAS #1	GAS #2	VVIS-OP	VVIS-OP	DTO 667 PILOT	R/F SERV	VVIS-OP	GAS #3	PRE SLEEP	SLEEP
	MS2 HIRE		CG-XFR	P/TV04 SETUP	PEAVENT		VFEU ACCEL	MEAL		EXERCISE		PRE SLEEP	OCA D/L	PRE SLEEP	SLEEP			
	MS1 LINNEHAN	A/E-SB	EXERCISE	GPWS STOW		MEAL		VVIS-SB		VVIS-OP	VVIS-OP	PRE SLEEP		SLEEP				
	MS3 WILLIAMS	DS1R	DS1R		A/E-SB	MEAL		VVIS-SB	A/E-OP	EXERCISE		PRE SLEEP		SLEEP				
	PS1 BUCKEY	DS1R	DS1R	GPWS STOW		MEAL		A/E-SB	EXERCISE	VVIS-SB		PRE SLEEP		SLEEP				
PS2 PAWELCZYK	EXER		PEAVENT	VVIS SET	MEAL		VVIS-OP	VVIS-OP	VVIS-SB		PRE SLEEP		SLEEP					
DAY/NIGHT		[Day/Night Cycle Bar]																
ORBIT		[Orbit Cycle Bar]																
TDRS		[TDRS Cycle Bar]																
ATT		25 BIAS -ZLV -XVV IMU -ZLV -XVV (GAS ATT)																
NOTES		-ZLV, -XVV																

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
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94/18:19	94/12:19	002/00:00						

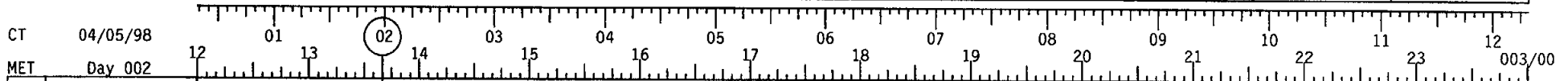
CT 04/04/98 12 01 13 02 14 03 15 04 16 05 17 06 18 07 19 08 20 09 21 10 22 11 23 12 002/00
MET Day 001

ORBITER	Crew Member	Activity	FD 3		D/P	MNVRR	P/TVO4 SETUP	PEVENT
			SLEEP	POST SLEEP				
ORBITER	CDR SEARFOSS	SLEEP	POST SLEEP					
	PLT ALTMAN	SLEEP	POST SLEEP					
	MS2 HIRE	SLEEP	POST SLEEP	OCA D/L	POST SLEEP	EXERCISE	BDS OPS	AEMH20
	MS1 LINNEHAN	SLEEP	POST SLEEP			AEMXFR	BCO AAP LCH	BCO AAP LCH
SLCREW	MS3 WILLIAMS	SLEEP	POST SLEEP			BALL CATCH OP	BALL CATCH SB	EXERCISE
	PS1 BUCKEY	SLEEP	POST SLEEP			GPWS SET	BALL CATCH SB	
	PS2 PAWELCZYK	SLEEP	POST SLEEP			GPWS SET	INJIM	INJIM
	DAY/NIGHT ORBIT							
TDRS								
ATT								
NOTES	-ZLV -XVV (GAS ATT) ⊗BALL OPS MAX KU -YLV -XVV							

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
94/18:19	94/12:19	002/00:00	94 CT	-20.26		04 Apr 1998	FINAL	02/13/98
95/06:19	95/01:19	002/12:00						

CT	04/04/98																								04/05			
MET	Day 002																								12			
	002/00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24			
ORBITER	CDR SEARFOSS	MEAL		EXERCISE		UNMPLY	MSIPLY	INVT	STPLM	25BTRIAS	MNV	D/P	PSLEEPE	PMCOCA	PRE SLEEP		SLEEP											
	PLT ALTMAN	GAS #3	FCMS OPS		EXERCISE		MEAL		TV108		GAS #4	R/F SERV	PRE SLEEP		SLEEP													
	MS2 HIRE	AEM-CK	MEAL		WDMS OPS		VFEU H2O		VTFAPEUE		PRE SLEEP	OCA D/L	PRE SLEEP		SLEEP													
	MS1 LINNEHAN	BALL CATCH SB	EXERCISE		MEAL		BCO AALCH		OBJ RECOG		GPWS STOW	AEMXFR	D/P	PRE SLEEP		SL DON	SLEEP											
S CREW	MS3 WILLIAMS	BCO AALCH	VEG	OBJ RECOG		MEAL		INJIM	INJIM	DS1M	DS1M	GPWS STOW	GPWS STOW	GASOPS	GASCK	GASOPS	D/P	PRE SLEEP		SL DON	SLEEP							
	PS1 BUCKEY	INJIM	DS1M	DS1M	DS1M	DS1M	DS1M	MEAL		OBJ RECOG		EXERCISE		PRE SLEEP		SLEEP												
	PS2 PAWELCZYK	INJIM	INJIM	INJIM	INJIM	MEAL		BALL CATCH SB	BCO AALCH	EXERCISE		OBJ RECOG		VEG	PRE SLEEP		SLEEP											
DAY/NIGHT	ORBIT																											
TDRS	E W																											
ATT	MAX KU -YLV -XVV																											
NOTES	♦EXERCISE																											

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
95/06:19	95/01:19	002/12:00	95 CT	-21.91		05 Apr 1998	FINAL	02/13/98
95/18:19	95/13:19	003/00:00						



O R B I T E R	CDR SEARFOSS	SLEEP	FD 4	POST SLEEP	D/P	EXERCISE	DTO 667 PILOT	
	PLT ALTMAN	SLEEP		POST SLEEP	TV 1112 TV 1110 PS/TV 110 P/TV 110	EXERCISE	DTO 667 PILOT	
	MS2 HIRE	SLEEP		POST SLEEP	OCA D/L VT FA PE	RAHF7 H20		
S L C R E W	MS1 LINNEHAN	SLEEP		POST SLEEP	S L D O F F S O O S O	POST SLEEP	A E M X F R PFT EXERCISE	
	MS3 WILLIAMS	SLEEP		POST SLEEP	S L D O F F	GPWS SET ESCHR RNDT EXERCISE ROOM VECTION		
	PS1 BUCKEY	SLEEP		POST SLEEP	D/P	VEG ROOM VECTION PFT		
	PS2 PAWELCZYK	SLEEP		POST SLEEP	D/P	GPWS SET ESCHR RNDT		
DAY/NIGHT ORBIT								
TDRS E W								
ATT		25 BIAS -ZLV -XVV						
NOTES								

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
95/18:19	95/13:19	003/00:00	95 CT	-23.45		05 Apr 1998	FINAL	02/13/98
96/06:19	96/01:19	003/12:00						

CT	04/05/98	14	15	16	17	18	19	20	21	22	23	04/06	01	12
MET	Day 003	003/00	01	02	03	04	05	06	07	08	09	10	11	
O R B I T E R	FD 4 CDR SEARFOSS	MEAL		AEM-CK	DUMP PR	WASTE	DUMP MONITOR	WASTE	2M NV R	PMC-OCA	PRE SLEEP		SLEEP	
	PLT ALTMAN	MEAL		P/TV04 SETUP			EXERCISE	D/P	R/F SERV		PRE SLEEP		SLEEP	
	MS2 HIRE	MEAL		PWR TEFM	PEAVOENT		EXERCISE	VTFAPEUE		PRE SLEEP	OCA D/L	PRE SLEEP		SLEEP
	MS1 LINNEHAN	MEAL	ROOM VECTION		PEAVOENT	AEMXFR	COG		D/P		PRE SLEEP	SL DON		SLEEP
S L C R E W	MS3 WILLIAMS	ROOM VECTION	MEAL	ESCHR RNDT		PFT	BAGDRY	COG	D/P		PRE SLEEP	SL DON		SLEEP
	PS1 BUCKEY	PFT	EXERCISE	MEAL	ESCHR RNDT		GPWS STOW				PRE SLEEP			SLEEP
	PS2 PAWELCZYK		PFT	MEAL		EXERCISE	ROOM VECTION	VEG			PRE SLEEP			SLEEP
	DAY/NIGHT ORBIT		49	50	51	52	53	54	55	56	57			
TDRS														
ATT				25 BIAS -ZLV -XVV								25 BIAS -ZLV -XVV		
NOTES			EXERCISE											PRE SLEEP

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
96/06:19 96/18:19	96/01:19 96/13:19	003/12:00 004/00:00	96 CT	-24.88		06 Apr 1998	FINAL	02/13/98

CT 04/06/98
 MET Day 003
 12 13 14 15 16 17 18 19 20 21 22 23 004/00

O R B I T E R	CDR SEARFOSS	SLEEP	FD 5	POST SLEEP	D/P	FILTER CLEANING	EXERCISE	DM UNM V PR Δ
	PLT ALTMAN	SLEEP		POST SLEEP	EXERCISE	VVIS-OP	TV110	VVIS-OP
	MS2 HIRE	SLEEP		POST SLEEP	OCA D/LUE		RAHF3 H20	
S L C R E W	MS1 LINNEHAN	SLEEP	S L D O F F	POST SLEEP	D/P	EXERCISE		VVIS-SB
	MS3 WILLIAMS	SLEEP	S L D O F F	POST SLEEP	D/P		VVIS-OP	VVIS-SB
	PS1 BUCKEY	SLEEP		POST SLEEP		VVIS-SB		EXERCISE
	PS2 PAWELCZYK	SLEEP		POST SLEEP	VVIS SET	VVIS-OP	VVIS-SB	EXERCISE

DAY/NIGHT ORBIT
 TDRS E W
 ATT -25 BIAS -ZLV -XVV
 NOTES -ZLV +YVV ΔPLY I

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
96/18:19	96/13:19	004/00:00	96 CT	-26.18		06 Apr 1998	FINAL	02/13/98
97/06:19	97/01:19	004/12:00						

CT	04/06/98	14	15	16	17	18	19	20	21	22	23	04/07	01	12
MET	Day 004	004/00	01	02	03	04	05	06	07	08	09	10	11	12
ORBITER	CDR SEARFOSS	AEM-CK	MEAL	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
	PLT ALTMAN	MEAL	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
	MS2 HIRE	OFF DUTY	MEAL	OFF DUTY	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
S CREW	MS1 LINNEHAN	MEAL	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
	MS3 WILLIAMS	OFF DUTY	MEAL	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	OFF DUTY (EXERCISE)	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
	PS1 BUCKEY	MEAL	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
	PS2 PAWELCZYK	EXER	MEAL	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	OFF DUTY	PRE SLEEP	PRE SLEEP	PRE SLEEP	SLEEP		
DAY/NIGHT														
ORBIT														
TDRS														
ATT														
NOTES														

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
97/06:19 97/18:19	97/01:19 97/13:19	004/12:00 005/00:00	97 CT	-27.34		07 Apr 1998	FINAL	02/13/98

CT 04/07/98
 MET Day 004

12 13 14 15 16 17 18 19 20 21 22 23 005/00

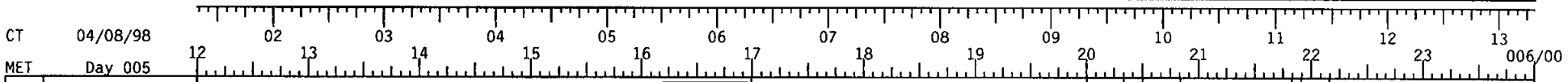
ORBITER	CDR SEARFOSS	SLEEP		POST SLEEP		D/P	SL CNDS TK DUMP			
		FD 6				TV 112	TV 110			
S/CREW	PLT ALTMAN	SLEEP		POST SLEEP		EXERCISE	CCD/PHOTO W/ICE			
							BAG C/O			
	MS2 HIRE	SLEEP		POST SLEEP	OCA D/L	POST SLEEP	BDS OPS			
	MS1 LINNEHAN	SLEEP		POST SLEEP		GPWS SET	TIS-M			
	MS3 WILLIAMS	SLEEP		POST SLEEP		GPWS SET	AEMXFR			
							DS2M			
	PS1 BUCKEY	SLEEP		POST SLEEP	POST SLEEP	D/P	PFT			
							EXERCISE			
	PS2 PAWELCZYK	SLEEP		POST SLEEP		D/P	PFT			
DAY/NIGHT ORBIT		73	74	75	76	77	78	79	80	81
TDRS E W		[TDRS E W schedule bars]								
ATT		25 BIAS -ZLV -XVV								
NOTES		øGPWS SET								

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
97/18:19	97/13:19	005/00:00	97 CT	-28.35		07 Apr 1998	FINAL	02/13/98
98/06:19	98/01:19	005/12:00						

CT 04/07/98 005/00 14 01 02 03 04 05 06 07 08 09 10 11 12
MET Day 005

ORBITER	CDR SEARFOSS	FD 6	+X RCS BURN	MEAL	25 NVR BIAS	DSO 667 PILOT	LBNPST	EXERCISE	IMNVR	25 NVR BIAS	PMCOCA	PRE SLEEP	SLEEP
	PLT ALTMAN	AEMH20	+X RCS BURN	MEAL	DSO 904 S/U	P/T V11	DSO 667 PILOT	DSO 904 S/U	P/T V11	R/F SERV		PRE SLEEP	SLEEP
	MS2 HIRE	VFEU H20		MEAL	P/T V04 SETUP	PEAVENT	CG-XFR	EXERCISE	CG-XFR	VFEU ACCEL	VTAPE	PRE SLEEP	SLEEP
SL CREW	MS1 LINNEHAN	DS2M	GPWS STOW	MEAL			PFT			EXERCISE	D/P	PRE SLEEP	SLEEP
	MS3 WILLIAMS	EXER	GPWS STOW	MEAL		PEAVENT	LBNPST			PFT	BAGDRY	PRE SLEEP	SLEEP
	PS1 BUCKEY	AEM-CK		MEAL	DEX-NEO	DEX-NEO	DEX-NEO	DEX-NEO	GPWS STOW	COG		PRE SLEEP	SL DON
	PS2 PAWELCZYK	EXER		MEAL	AEMXFR	AEMXFR	LBNPST	A/M-OA		COG		PRE SLEEP	SL DON
DAY/NIGHT	81 82 83 84 85 86 87 88 89												
ORBIT	81 82 83 84 85 86 87 88 89												
TDRS	E W												
ATT	OA-1 25 BIAS -ZLV -XVV IMU 25 BIAS -ZLV -XVV												
NOTES	*OA1 (05/01:19)												

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
98/06:19	98/01:19	005/12:00	98 CT	-29.21		08 Apr 1998	FINAL	02/13/98
98/18:19	98/13:19	006/00:00						



Crew Member	Activity	Orbit 89		Orbit 90		Orbit 91		Orbit 92		Orbit 93		Orbit 94		Orbit 95		Orbit 96		Orbit 97	
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End
ORBITER	CDR SEARFOSS																		
	PLT ALTMAN																		
	MS2 HIRE																		
SL CREW	MS1 LINNEHAN																		
	MS3 WILLIAMS																		
	PS1 BUCKEY																		
	PS2 PAWELCZYK																		
DAY/NIGHT ORBIT		89		90		91		92		93		94		95		96		97	
TDRS		E		W															
ATT								25 BIAS -ZLV -XVV											
NOTES								VPOST SLEEP										•VVIS S	

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
98/18:19	98/13:19	006/00:00	98 CT	-29.91		08 Apr 1998	FINAL	02/13/98
99/06:19	99/01:19	006/12:00						

CT 04/08/98 14 15 16 17 18 19 20 21 22 23 04/09 01 12
MET Day 006 006/00 01 02 03 04 05 06 07 08 09 10 11

ORBITER	Crew Member	Activity		MEAL	AEM-CK	SITE-SB	EXERCISE	GPWS SET	COG	EXERCISE	PRE SLEEP	SLEEP
		EXER	CT RBLD									
ORBITER	CDR SEARFOSS	MEAL	DUMP MONITOR								PRE SLEEP	SLEEP
	PLT ALTMAN	MEAL	P/TV04 SETUP								PRE SLEEP	SLEEP
	MS2 HIRE	EXER	AEM-CK								PRE SLEEP	SLEEP
SL CREW	MS1 LINNEHAN		MEAL								PRE SLEEP	SLEEP
	MS3 WILLIAMS	MEAL	SITE-SB								PRE SLEEP	SLEEP
	PS1 BUCKEY	A/M-OP	MEAL								PRE SLEEP (EXERCISE)	SLEEP
	PS2 PAWELCZYK	A/M-SB	MEAL	SITE-SB							PRE SLEEP	SLEEP
DAY/NIGHT ORBIT		97 98 99 100 101 102 103 104 105										
TDRS		E W										
ATT		-ZLV +YVV 25 BIAS -ZLV -XVV										
NOTES		@VVIS STOW *TV107-SI *PRE SLEEP										

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
99/06:19	99/01:19	006/12:00	99 CT	-30.44	☉	09 Apr 1998	FINAL	02/13/98
99/18:19	99/13:19	007/00:00						

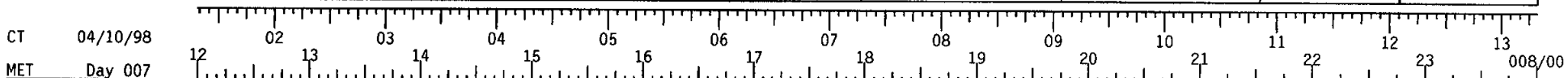
CT	04/09/98	02	03	04	05	06	07	08	09	10	11	12	13	007/00
MET	Day 006	12	13	14	15	16	17	18	19	20	21	22	23	
ORBITER	CDR SEARFOSS	SLEEP				FD 8	POST SLEEP			D/P		EXERCISE	DTO 667 PILOT	
	PLT ALTMAN	SLEEP					POST SLEEP			T V 1 1 1	CG-XFR	CG-XFR	DSIN	DTO 667 PILOT
	MS2 HIRE	SLEEP					POST SLEEP	OCA D/L	POST SLEEP	V T F A E P U		EXERCISE	CTRBLD	
SLCREW	MS1 LINNEHAN	SLEEP				ACTICOC	POST SLEEP			D/P	GLBNPST	A/M-SB	EXER	
	MS3 WILLIAMS	SLEEP				ACTICOC	POST SLEEP			GPWS SET		DSIN	GPWS STOW	
	PS1 BUCKEY	SLEEP				ACTICOC	POST SLEEP			GPWS SET		DSIN	GPWS STOW	
	PS2 PAWELCZYK	SLEEP				ACTICOC	POST SLEEP			D/P	ATOBLD	A/M-OP	ATOBLD	EXERCISE
DAY/NIGHT	[Day/Night Cycle]													
ORBIT	[Orbit Data]													
TDRS	[TDRS Data]													
ATT	25 BIAS -ZLV -XVV													
NOTES	♦RCRS RECONFIG													

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
99/18:19 100/06:19	99/13:19 100/01:19	007/00:00 007/12:00	99 CT	-30.78		09 Apr 1998	FINAL	02/13/98

CT 04/09/98 14 15 16 17 18 19 20 21 22 23 04/10 01 12
MET Day 007 007/00 01 02 03 04 05 06 07 08 09 10 11 12

ORBITER	CDR SEARFOSS	MEAL		FILTER CLEANING		25 BIAS	D/P	P M C - O C A	PRE SLEEP	SLEEP	
	PLT ALTMAN	MEAL	SP/TV04 SETUP	PEVENT	EXERCISE	IMNU	HUD R/F	SERV	PRE SLEEP	SLEEP	
	MS2 HIRE	MEAL	AEM-CK			CT R B L D	V F A P U	P S L E E P O C A D / L	PRE SLEEP	SLEEP	
SL CREW	MS1 LINNEHAN	EXER	MEAL	PEVENT		CORE DUMP	L B N P S W	D / P	PRE SLEEP	SLEEP	
	MS3 WILLIAMS	GPWS STOW	T I S - N	MEAL	T I S - N	EXERCISE	L B N P S W	T I S - M	PRE SLEEP	SLEEP	
	PS1 BUCKEY	GPWS STOW	MEAL		A/M-SB		EXERCISE		PRE SLEEP	SLEEP	
	PS2 PAWELCZYK		MEAL	A T O B L D	A/M-OP	A T O B L D	A / M - O P	L B N P S W	D / P	PRE SLEEP	SLEEP
DAY/NIGHT											
ORBIT											
TDRS											
ATT											
NOTES		@HTR RECONFIG IMU 25 BIAS -ZLV -XVV ^GPWS STOW									

GMT	CT	MET	DOY	BETA	MOON		HOUSTON DATE		EDITION	PUB. DATE
100/06:19	100/01:19	007/12:00	100 CT	-30.95	○		10 Apr 1998		FINAL	02/13/98
100/18:19	100/13:19	008/00:00								



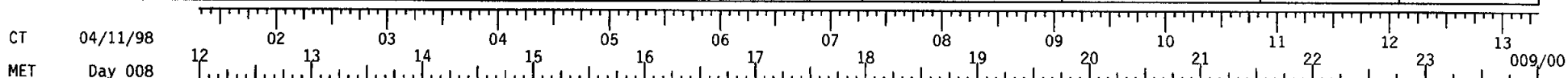
ORBITER	CDR SEARFOSS	SLEEP	FD 9	POST SLEEP	D/O/P 623 RAHF3 RAHF7 MANXRU	RAHF3 RAHF7 MANXRU		PEAVOENT WCOMPACT	RAHF7 FEED	
	PLT ALTMAN	SLEEP		POST SLEEP	TV1105 TV1110	EXERCISE	P/TV04 SETUP	TV1116		
	MS2 HIRE	SLEEP		POST SLEEP	OCA D/L VT FA FE E	RAHF3 RAHF7		VFEU ACCEL	VFEU H2O	
SL CREW	MS1 LINNEHAN	SLEEP		POST SLEEP	D/O/P A T O B L D	A E M X F R	B C O A P L C H	EXERCISE	PEAVOENT RAHF7 FEED	
	MS3 WILLIAMS	SLEEP		POST SLEEP		BALL CATCH OP	BALL CATCH SB	B C O A P L C H	EXERCISE PAO-UNI	
	PS1 BUCKEY	SLEEP		POST SLEEP	GPWS SET	TIS-N	GPWS SET	ESCHR RNDT	BALL CATCH SB	PEAVOENT EXERCISE
	PS2 PAWELCZYK	SLEEP		POST SLEEP	D/O/P	GPWS SET	ESCHR RNDT			
DAY/NIGHT ORBIT										
TDRS										
ATT										
NOTES										

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
100/18:19	100/13:19	008/00:00	100 CT	-30.93	☉	10 Apr 1998	FINAL	02/13/98
101/06:19	101/01:19	008/12:00						

CT 04/10/98 008/00 14 15 16 17 18 19 20 21 22 23 10 04/11 01 12
MET Day 008 01 02 03 04 05 06 07 08 09 10 11

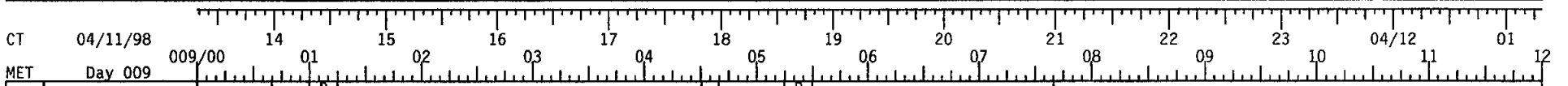
ORBITER	CDR SEARFOSS	MEAL	RAHF3 FEED	AEMH20	EXERCISE	D/P	DUNMP	MSPLY	INLIT	PMCOCA	PRE SLEEP	STPERLYM	2M5NVR	PRE SLEEP	SLEEP
	PLT ALTMAN	MEAL	BOCCTEX	PZTVIO	PZTVIO						PRE SLEEP			PRE SLEEP	SLEEP
	MS2 HIRE	MEAL	BDS OPS	EXERCISE		R/F SERV	VFAPE				PRE SLEEP		OCAPRE SLEEP	D/L	SLEEP
SL CREW	MS1 LINNEHAN	MEAL	RAHF3 FEED	BALL CATCH SB	AEMXFR	D/P					PRE SLEEP			PRE SLEEP	SLEEP
	MS3 WILLIAMS	MEAL	AEM-CK	BCO AATLCH	BCO AATLCH						PRE SLEEP			PRE SLEEP	SLEEP
	PS1 BUCKEY	MEAL	ESCHR RNDT	GPWS STOW	GPWS STOW	D/P					PRE SLEEP			PRE SLEEP	SLEEP
	PS2 PAWELCZYK	MEAL	ESCHR RNDT	EXERCISE	BALL CATCH SB	BCO AATLCH					PRE SLEEP			PRE SLEEP	SLEEP
DAY/NIGHT ORBIT															
TDRS															
ATT															
NOTES															

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
101/06:19	101/01:19	008/12:00	101 CT	-30.72	☉	11 Apr 1998	FINAL	02/13/98
101/18:19	101/13:19	009/00:00						



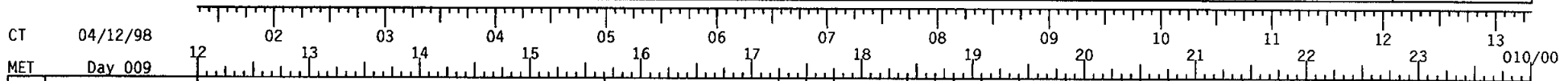
O R B I T E R	CDR SEARFOSS	SLEEP	FD 10	POST SLEEP	D/P	EXERCISE	DTO 667 PILOT	DUMP MONITOR	WTAS	25 N	MEAL
	PLT ALTMAN	SLEEP		POST SLEEP	T/V 106	VVIS-OP	VVIS-OP	AEM-CK	EXERCISE	DTO 667 PILOT	MEAL
	MS2 HIRE	SLEEP		POST SLEEP	V T F A P E D/L	EXERCISE		VVIS-OP	VVIS-OP	C B S M E A L	
S L C R E W	MS1 LINNEHAN	SLEEP		POST SLEEP	D/P	BAG C/O	VVIS-OP	VVIS-SB	EXERCISE		M E A L
	MS3 WILLIAMS	SLEEP		POST SLEEP		EXERCISE		VVIS-OP	VVIS-SB		M E A L
	PS1 BUCKEY	SLEEP		POST SLEEP	D/P	VVIS-SB	EXERCISE		VVIS-OP	V S T I O S W	M E A L
	PS2 PAWELCZYK	SLEEP		POST SLEEP	VVIS SET	VVIS-OP	VVIS-SB	EXERCISE			M E A L
DAY/NIGHT ORBIT											
TDRS											
ATT											
NOTES											

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
101/18:19	101/13:19	009/00:00	101 CT	-30.34	☉	11 Apr 1998	FINAL	02/13/98
102/06:19	102/01:19	009/12:00						



ORBITER	NAME	MEAL	OFF DUTY	PFC-OCA	OFF DUTY	D/P	PRE SLEEP	PFC-OCA	PRE SLEEP	SLEEP	
											OFF R/F DUTY SERV
S/CREW	FD 10 CDR SEARFOSS										
	PLT ALTMAN										
	MS2 HIRE										
	MS1 LINNEHAN										
	MS3 WILLIAMS										
PS1 BUCKEY											
PS2 PAWELCZYK											
DAY/NIGHT		[Timeline with day/night indicators]									
ORBIT		[Timeline with orbit parameters]									
TDRS		[Timeline with TDRS events]									
ATT		25 BIAS -ZLV -XVV									
NOTES											

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
102/06:19	102/01:19	009/12:00	102 CT	-29.77	☉	12 Apr 1998	FINAL	02/13/98
102/18:19	102/13:19	010/00:00						



ORBITER	NAME	SLEEP		POST SLEEP		DMS I UNPN MVL I P R Y T		POST SLEEP		S T P E R L Y M		D / P		F M U N T V R		CREW PHOTO		CREW CONF		2 M 5 N V B I A S		SL CNDS TK DUMP		MEAL			
		Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End	Start	End		
ORBITER	CDR SEARFOSS	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
	PLT ALTMAN	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
	MS2 HIRE	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
S L C R E W	MS1 LINNEHAN	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
	MS3 WILLIAMS	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
	PS1 BUCKEY	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
	PS2 PAWELCZYK	12:00	14:00	14:00	16:00	16:00	17:00	17:00	18:00	18:00	19:00	19:00	19:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	20:00	
DAY/NIGHT		DAY		NIGHT		DAY		NIGHT		DAY		NIGHT		DAY		NIGHT		DAY		NIGHT		DAY		NIGHT		DAY	
ORBIT		153	154	155	156	157	158	159	160	161																	
TDRS		E		W		E		W		E		W		E		W		E		W		E		W		E	
ATT				-25 BIAS -ZLV -XVV				-ZLV +YVV				KU COMM				-25 BIAS -ZLV -XVV											
NOTES																											

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
102/18:19	102/13:19	010/00:00	102 CT	-29.02	☉	12 Apr 1998	FINAL	02/13/98
103/06:19	103/01:19	010/12:00						

CT 04/12/98 14 15 16 17 18 19 20 21 22 23 04/13 01 12
MET Day 010 010/00 01 02 03 04 05 06 07 08 09 10 11

ORBITER	NAME	MEAL		ACTIVITY		SLEEP		
		MEAL	ACTIVITY	ACTIVITY	SLEEP	SLEEP	SLEEP	
ORBITER	CDR SEARFOSS	MEAL	+X RCS BURN	RAHF3 H2O	EXERCISE	PRE SLEEP	PRE SLEEP	SLEEP
	PLT ALTMAN	DSO 904 S/U	+X RCS BURN	P/T V 1104	TV 1116	R/F SERV	PRE SLEEP	SLEEP
	MS2 HIRE	MEAL		CG - XFR	CG - XFR	VT F A P E	PRE SLEEP	PRE SLEEP
SL CREW	MS1 LINNEHAN	A E M X F R		A E M X F R	PFT	B A G D R Y	PRE SLEEP	SLEEP
	MS3 WILLIAMS	D E X - N E O	DEX-NEO	DEX-NEO	DEX-NEO	GPWS STOW	PRE SLEEP	SLEEP
	PS1 BUCKEY	MEAL		PFT	EXERCISE	A A / L L - O S P B	PRE SLEEP	SLEEP
	PS2 PAWELCZYK	MEAL	A / L - O P	EXERCISE	P A O - U N T	A A / L L - O S P B	PRE SLEEP	SLEEP
DAY/NIGHT ORBIT		161 162 163 164 165 166 167 168 169						
TDRS E W		161 162 163 164 165 166 167 168 169						
ATT		OA-2 25 BIAS -ZLV -XV						
NOTES		*OA2 (10/01:02)						

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
103/06:19	103/01:19	010/12:00	103 CT	-28.10		13 Apr 1998	FINAL	02/13/98
103/18:19	103/13:19	011/00:00						

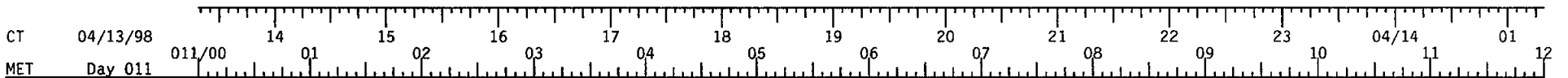
CT 04/13/98
 MET Day 010

12 13 14 15 16 17 18 19 20 21 22 23 011/00

ORBITER	NAME	SLEEP	POST SLEEP	D/P		MANNXVRKU	FILTER CLEANING	EXERCISE	MEAL	
				TV106	TV111					VVIS-OP
S/CREW	CDR SEARFOSS	SLEEP	POST SLEEP							
	PLT ALTMAN	SLEEP	POST SLEEP							
	MS2 HIRE	SLEEP	POST SLEEP	OCA D/L			EXERCISE		MEAL	
	MS1 LINNEHAN	SLEEP	POST SLEEP			VVIS SET	VVIS-OP	VVIS-SB	AEMH20 AEM-CK	MEAL
S/CREW	MS3 WILLIAMS	SLEEP	POST SLEEP			D/P	VVIS-SB	VVIS-OP	VSTIOW	MEAL
	PS1 BUCKEY	SLEEP	POST SLEEP			D/P	A/L-SB			MEAL
	PS2 PAWELCZYK	SLEEP	POST SLEEP				ATOBLD	A/L-OP	ATOBLD	A/L-OP

DAY/NIGHT	ORBIT	169	170	171	172	173	174	175	176	177	
TDRS	E W	[Timeline bars for TDRS]									
ATT		25 BIAS -ZLV -XVV					MAX KU -YLV -XVV				
NOTES											

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
103/18:19	103/13:19	011/00:00	103 CT	-27.02	☉	13 Apr 1998	FINAL	02/13/98
104/06:19	104/01:19	011/12:00						



ORBITER	CDR SEARFOSS		DTO 667 PILOT		PEVENT		IMNVR		25 MNRV/D/P		PRE SLEEP		PMC-OCA		SLEEP				
	PLT ALTMAN		B O T E X DTO 667 PILOT P/TV04 SETUP		EXERCISE		TV 116		R/F SERV		PRE SLEEP		SLEEP						
CREW	MS2 HIRE		BDS OPS		A L L O P		C T R B L D		V T F A P U E		PRE SLEEP		O C A D / L		PRE SLEEP		SLEEP		
	MS1 LINNEHAN		EXERCISE		P A O - U N I		D S 2 R		PRE SLEEP		S L D O N		SLEEP						
	MS3 WILLIAMS		VFEU H2O		PEVENT		EXERCISE		PRE SLEEP		S L D O N		SLEEP						
	PS1 BUCKEY		A T O B L D		A/L-OP		A T O B L D		A/L-OP		D/P		PRE SLEEP		SLEEP				
	PS2 PAWELCZYK		A/L-SB		G A S S		D/P		PRE SLEEP		SLEEP								
DAY/NIGHT		[Day/Night Cycle]																	
ORBIT		[Orbit Parameters]																	
TDRS		[TDRS Parameters]																	
ATT		[ATT Parameters]																	
NOTES		[Notes]																	

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
104/06:19	104/01:19	011/12:00	104 CT	-25.79	☉	14 Apr 1998	FINAL	02/13/98
104/18:19	104/13:19	012/00:00						

CT 04/14/98
MET Day 011

	12	13	14	15	16	17	18	19	20	21	22	23	012/00	
ORBITER	CDR SEARFOSS	SLEEP			FD 13	POST SLEEP		D/P	MMANVRRKU	FILTER CLEANING	EXERCISE	MEAL		
	PLT ALTMAN	SLEEP			POST SLEEP		TV111	CG-XFR		CG-XFR	P/TV04 SETUP	PEVENT	MEAL	CCD/REOLICE
	MS2 HIRE	SLEEP			POST SLEEP	OCA D/L	POST SLEEP	VTFAPEUE	DTOG23	EXERCISE	A/L-OP	CTRBLD	MEAL	CCD/REOLICE
S/CREW	MS1 LINNEHAN	SLEEP			S/D OFF	POST SLEEP		D/P	A/L-SB			MEAL		
	MS3 WILLIAMS	SLEEP			S/D OFF	POST SLEEP		GAS OPS	A/TOBLD		PEVENT	MEAL	A/L-SB	
	PS1 BUCKEY	SLEEP			POST SLEEP		D/P	GPWS STOW	INJ NEO	GPWS STOW	PEVENT	MEAL	A/TOBLD	
	PS2 PAWELCZYK	SLEEP			POST SLEEP		A/L-OP			ATOBLD	A/L-OP	MEAL	A/L-OP	
DAY/NIGHT	[Day/Night Cycle Diagram]													
ORBIT	[Orbit Diagram]													
TDRS	[TDRS Diagram]													
ATT	25 BIAS -ZLV -XVV													
NOTES	MAX KU -YLV -XVV													

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
104/18:19	104/13:19	012/00:00	104 CT	-24.42		14 Apr 1998	FINAL	02/13/98
105/06:19	105/01:19	012/12:00						

CT 04/14/98 14 15 16 17 18 19 20 21 22 23 04/15 01 12
MET Day 012 012/00 01 02 03 04 05 06 07 08 09 10 11

ORBITER	CDR SEARFOSS	FD 13		DUMP MONITOR	STEIRIAS	PRE SLEEP	PRE SLEEP	SLEEP		
	PLT ALTMAN		EXERCISE	D/P	R/F SERV		PRE SLEEP	SLEEP		
	MS2 HIRE	A/L-OP	CT RBLD	VT FAPEUE		PRE SLEEP	OCA D/L	PRE SLEEP	SLEEP	
SL CREW	MS1 LINNEHAN		AEM-CK	COG	D/P	PRE SLEEP	SL DON	SLEEP		
	MS3 WILLIAMS	A/L-SB	LB NPSW	COG		PRE SLEEP	SL DON	SLEEP		
	PS1 BUCKEY	EXERCISE	LB NPSW	A/L-OP	GA SOPS	D/P	PRE SLEEP	SLEEP		
	PS2 PAWELCZYK	A/L-OP	ATOBLD	A/L-OP	LB NPSW	EXERCISE	PRE SLEEP	SLEEP		
DAY/NIGHT ORBIT		193	194	195	196	197	198	199	200	201
TDRS		MAX KU -YLV -XVV		-ZLV +YVV		25 BIAS -ZLV -XVV				
ATT		MAX KU -YLV -XVV		-ZLV +YVV		25 BIAS -ZLV -XVV				
NOTES										

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
105/06:19	105/01:19	012/12:00	105 CT	-22.90		15 Apr 1998	FINAL	02/13/98
105/18:19	105/13:19	013/00:00						

CT 04/15/98
MET Day 012

ORBITER	CDR SEARFOSS	SLEEP	FD 14	POST SLEEP	D/P	RAHF3			EXERCISE	MEAL		AEM-CK	
	PLT ALTMAN	SLEEP		POST SLEEP	CG-XFR	DSO 904 S/U	TV110	CG-XCH	MEAL	CG-XCH		DT0 667 PILOT	
	MS2 HIRE	SLEEP		POST SLEEP	OCA D/L	POST SLEEP	VFAPEU	RAHF3	RAHF3 H20	MEAL		BDS OPS	
SLCREW	MS1 LINNEHAN	SLEEP	S L D O F F	POST SLEEP	GPWS SET	DS2R	DS2R	DS2R	DS2R	MEAL	SITE-SB	DSO 904	
	MS3 WILLIAMS	SLEEP	S L D O F F	POST SLEEP	D/P	EXERCISE		SITE-SB	MEAL	DS2R	DS2R	DS2R	
	PS1 BUCKEY	SLEEP		POST SLEEP	GPWS SET	DS2R	DS2R	DS2R	DS2R	MEAL		SITE-SB	
	PS2 PAWELCZYK	SLEEP		POST SLEEP	D/P	SITE-SB		EXERCISE	MEAL	DS2R	DS2R	DS2R	
DAY/NIGHT		[Timeline with day/night indicators]											
ORBIT		[Timeline with orbit parameters]											
TDRS		[Timeline with TDRS events]											
ATT		25 BIAS -ZLV -XVV											
NOTES		▲TV107-S1											

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
105/18:19	105/13:19	013/00:00	105 CT	-21.27		15 Apr 1998	FINAL	02/13/98
106/06:19	106/01:19	013/12:00						

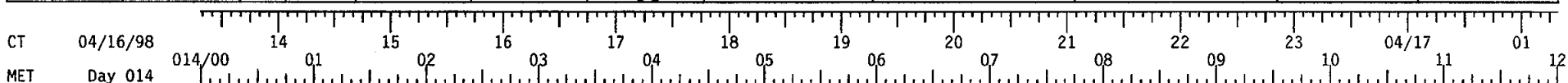
CT 04/15/98 013/00 14 15 16 17 18 19 20 21 22 23 04/16 01 12
 MET Day 013 01 02 03 04 05 06 07 08 09 10 11

ORBITER	FD 14		AEM-CK	WC	COMPACT	DT0 667 PILOT	PEAVENT	IMNVR	IMNVR	25NVR	D/P	PSLEEPP	PMCOCA	PRE SLEEP	SLEEP	
	CDR SEARFOSS															
ORBITER	PLT ALTMAN		CG-XCH	LIT-BOX		P/TV04 SETUP	CG-XFR			EXERCISE	R/F SERV			PRE SLEEP	SLEEP	
	MS2 HIRE		BDS OPS			EXERCISE		BAG C/O			VTFAEUE	PRE SLEEP	OCA D/L	PRE SLEEP	SLEEP	
	MS1 LINNEHAN		EXER			PEAVENT		COG	CORDON	ATOBLD				PRE SLEEP	SLEEP	
SL CREW	MS3 WILLIAMS		DS2R	DS2R	DS2R	DS2R	GPWS	STOW	STOW	D/P	COG	CORDON		PRE SLEEP	SLEEP	
	PS1 BUCKEY		SITE-SB	SITE-OP	DO	SUE	ST	EXERCISE		CORDON				PRE SLEEP	SL DON	SLEEP
	PS2 PAWELCZYK		DS2R	DS2R	DS2R	GPWS	STOW		D/P	CORDON				PRE SLEEP	SL DON	SLEEP
	DAY/NIGHT ORBIT		209	210	211	212	213	214	215	216	217					
TDRS																
ATT																
NOTES																

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
106/06:19	106/01:19	013/12:00	106 CT	-19.52		16 Apr 1998	FINAL	02/13/98
106/18:19	106/13:19	014/00:00						

CT	04/16/98	02	03	04	05	06	07	08	09	10	11	12	13	14/00				
MET	Day 013	12	13	14	15	16	17	18	19	20	21	22	23	014/00				
ORBITER	CDR SEARFOSS	SLEEP	FD 15	POST SLEEP					MANXVR	EXERCISE	AEM-CK	AEMH20	DTO 667 PILOT	MEAL	FILTER CLEANING	RAHF3		
	PLT ALTMAN	SLEEP	POST SLEEP				TV112	CG-XFR	CG-XFR		TV105	DS2N	TV110	DTO 667 PILOT		BO TEX	EXER	
	MS2 HIRE	SLEEP	POST SLEEP				OCA D/L	VFAPE		EXERCISE		RAHF7 H20	DTO 667 PILOT	MEAL	CG-XFR	RAHF3		
	MS1 LINNEHAN	SLEEP	POST SLEEP				POST SLEEP	PFT			DS2N	GPWS STOW	MEAL		BCO APLCH			
SL CREW	MS3 WILLIAMS	SLEEP	POST SLEEP				GPWS SET			DS2N	GPWS STOW	TIS-N	MEAL		BALL CATCH SB			
	PS1 BUCKEY	SLEEP	POST SLEEP				D/P	EXERCISE		BALL CATCH	BALL CATCH SB	BCO APLCH	PFT	MEAL		DEX-N EO	DEX-N EO	
	PS2 PAWELCZYK	SLEEP	POST SLEEP				D/P	GPWS SET		DS2N	BCO APLCH	BALL CATCH SB	EXERCISE	MEAL		TIS-N	DSOEST 904	PFT
	DAY/NIGHT ORBIT	217	218	219	220	221	222	223	224	225								
TDRS	E	W																
ATT				25 BIAS -ZLV -XVV														
NOTES										ΦBALL OPS								

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
106/18:19	106/13:19	014/00:00	106 CT	-17.66		16 Apr 1998	FINAL	02/13/98
107/06:19	107/01:19	014/12:00						



ORBITER	CDR SEARFOSS		RAHF3 FEED		DMS UNMVT		SPN IRT		D/P		PRE SLEEP		STPEZML		MZNLRV		PRE SLEEP		SLEEP	
	PLT ALTMAN		EXER		GAS #6		BISAS		DEACT		R/F SERV		PRE SLEEP		PRE SLEEP		SLEEP			
SLEW	MS2 HIRE		RAHF3 FEED		CGXFR		BDEACT		VFEU H2O		VFAPEU		PRE SLEEP		OCA D/L		PRE SLEEP		SLEEP	
	MS1 LINNEHAN		EXERCISE		BALL CATCH SB		D/P		PRE SLEEP		PRE SLEEP		SLEEP							
SLEW	MS3 WILLIAMS		PFT		EXERCISE		D/P		PRE SLEEP		PRE SLEEP		SLEEP							
	PS1 BUCKEY		DEX-NEO		GPWS STOW		COG		PRE SLEEP		SL DON		SLEEP							
SLEW	PS2 PAWELCZYK		PFT		COG		BCO ALTLCH		PRE SLEEP		SL DON		SLEEP							
	DAY/NIGHT ORBIT		225		226		227		228		229		230		231		232		233	
TDRS		E		W		MAX KU -YLV -XVV		-ZLV +YVV		-ZLV -XVV										
ATT																				
NOTES								•BALL CATCH OP		▽BALL OPS										

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
107/06:19	107/01:19	014/12:00	107 CT	-15.71		17 Apr. 1998	FINAL	02/13/98
107/18:19	107/13:19	015/00:00						

CT 04/17/98
 MET Day 014

CT	04/17/98	02	03	04	05	06	07	08	09	10	11	12	13	015/00			
ORBITER	CDR SEARFOSS	SLEEP	FD 16	POST SLEEP	+MZN SVIR	POST SLEEP	RFCSR HOT	FCS C/O	EXERCISE	AEM-CK	DTO 667 PILOT	CABIN STOW	MEAL	D/O BRIEF	ERGO STOW		
	PLT ALTMAN	SLEEP		POST SLEEP (EXERCISE)	APU HTR ACT	POST SLEEP	RFCSR HOT	FCS C/O	PTE W R FM	P/TV08 SETUP	DTO 667 PILOT	CABIN STOW	L-1 COMM CK	CS AT BOW IN	MEAL	D/O BRIEF	ERGO STOW
	MS2 HIRE	SLEEP		POST SLEEP	OCA D/L	POST SLEEP (EXERCISE)	RFCSR HOT	FCS C/O			DTO 667 PILOT	CABIN STOW	MEAL	D/O BRIEF	CS AT BOW IN		
SL CREW	MS1 LINNEHAN	SLEEP		POST SLEEP			D/P	RAHF3 H20		VVIS-OP	VVIS-OP	EXERCISE	KSTU-BWD	P TV ACT	MEAL	D/O BRIEF	CS AT BOW IN
	MS3 WILLIAMS	SLEEP		POST SLEEP			D/P	VFAPE	P XFER	VVIS-OP	VVIS-SB	TV106	EXERCISE	MEAL	D/O BRIEF	CS AT BOW IN	
	PS1 BUCKEY	SLEEP		POST SLEEP				EXERCISE	VVIS-OP	VVIS-OP	VVIS-SB	VVIS STOW	COG	MEAL	D/O BRIEF	CS AT BOW IN	
	PS2 PAWELCZYK	SLEEP		POST SLEEP				VVIS SET	VVIS-SB	EXERCISE	VVIS-OP	PFTSTW	COG	R/F SERV	MEAL	D/O BRIEF	PDL ACT
DAY/NIGHT																	
ORBIT	233	234	235	236	237	238	239	240	241								
TDRS	E																
ATT			-ZLV	-XVV													
NOTES				POST SLEEP	*POST SLEEP												

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
107/18:19	107/13:19	015/00:00	107 CT	-13.68		17 Apr 1998	FINAL	02/13/98
108/06:19	108/01:19	015/12:00						

CT 04/17/98 14 15 16 17 18 19 20 21 22 23 04/18 01 12
 MET Day 015 015/00 01 02 03 04 05 06 07 08 09 10 11

ORBITER	CDR SEARFOSS	EST GO W	CABIN STOW	PS RT W R A D	DM UN M V P R	W I A N S I T T E	DUMP MONITOR	W T A E I S R M T M U E	PRE SLEEP	SLEEP
	PLT ALTMAN	EST GO W	CABIN STOW			O S T A O C W			PRE SLEEP	SLEEP
	MS2 HIRE		CABIN STOW			V T F A E P E			PRE SLEEP	SLEEP
S L C R E W	MS1 LINNEHAN	* SL PARTIAL DEACT	CABIN STOW						PRE SLEEP	SLEEP
	MS3 WILLIAMS	⊕ SL PARTIAL DEACT	CABIN STOW						PRE SLEEP	SLEEP
	PS1 BUCKEY		CABIN STOW			D / P			PRE SLEEP	SLEEP
	PS2 PAWELCZYK	♦	CABIN STOW	BOTEX XFR		D / P			PRE SLEEP	SLEEP
DAY/NIGHT ORBIT										
TDRS	E W									
ATT										
NOTES	*CABIN STOW ⊕CABIN STOW ♦PL DEACT									

GMT	CT	MET	DOY	BETA	MOON	HOUSTON DATE	EDITION	PUB. DATE
108/06:19	108/01:19	015/12:00	108 CT	-11.57		18 Apr 1998	FINAL	02/13/98
108/18:19	108/13:19	016/00:00						

CT 04/18/98 02 03 04 05 06 07 08 09 10 11 12 13 016/00
MET Day 015 12 13 14 15 16 17 18 19 20 21 22 23

ORBITER	Crew/Role	Activity		Event	Phase	Notes
		SLEEP	POST SLEEP			
ORBITER	CDR SEARFOSS	FD 17	POST SLEEP	DSO 331 DEGRESS LOC	POST SLEEP	DEORBIT PREP
	PLT ALTMAN	SLEEP	POST SLEEP	DSO 331 DEGRESS LOC	POST SLEEP	DEORBIT PREP
	MS2 HIRE	SLEEP	POST SLEEP			DEORBIT PREP
SL CREW	MS1 LINNEHAN	SLEEP	POST SLEEP	EGRESS	SL FINAL DEACT	DEORBIT PREP
	MS3 WILLIAMS	SLEEP	POST SLEEP	EGRESS	SL FINAL DEACT	DEORBIT PREP
	PS1 BUCKEY	SLEEP	POST SLEEP			DEORBIT PREP
	PS2 PAWELCZYK	SLEEP	POST SLEEP			DEORBIT PREP

DEORBIT
BURN
*
KSC
LANDING
*

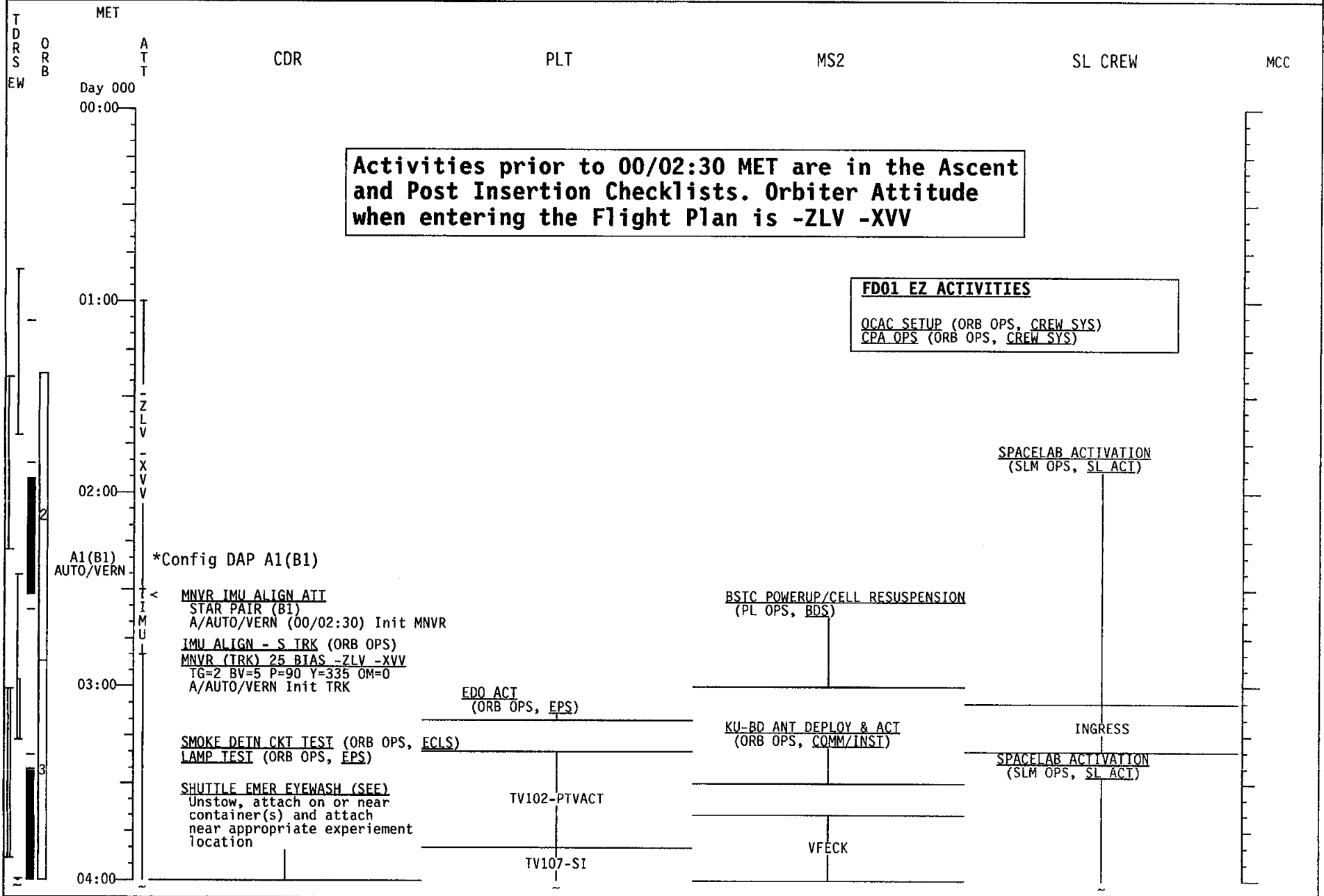
DAY/NIGHT	[Day/Night Cycle Bar]							
ORBIT	250	251	252	253	254	255	256	257
TDRS	[TDRS Coverage Bar]							
ATT	-ZLV +YVV							
	-XSI IMU COMM D/O BURN ENTRY							
NOTES						*D/O TIG 15/20:52	*KSC LAND 15/21:50	

DETAILED TIMELINE

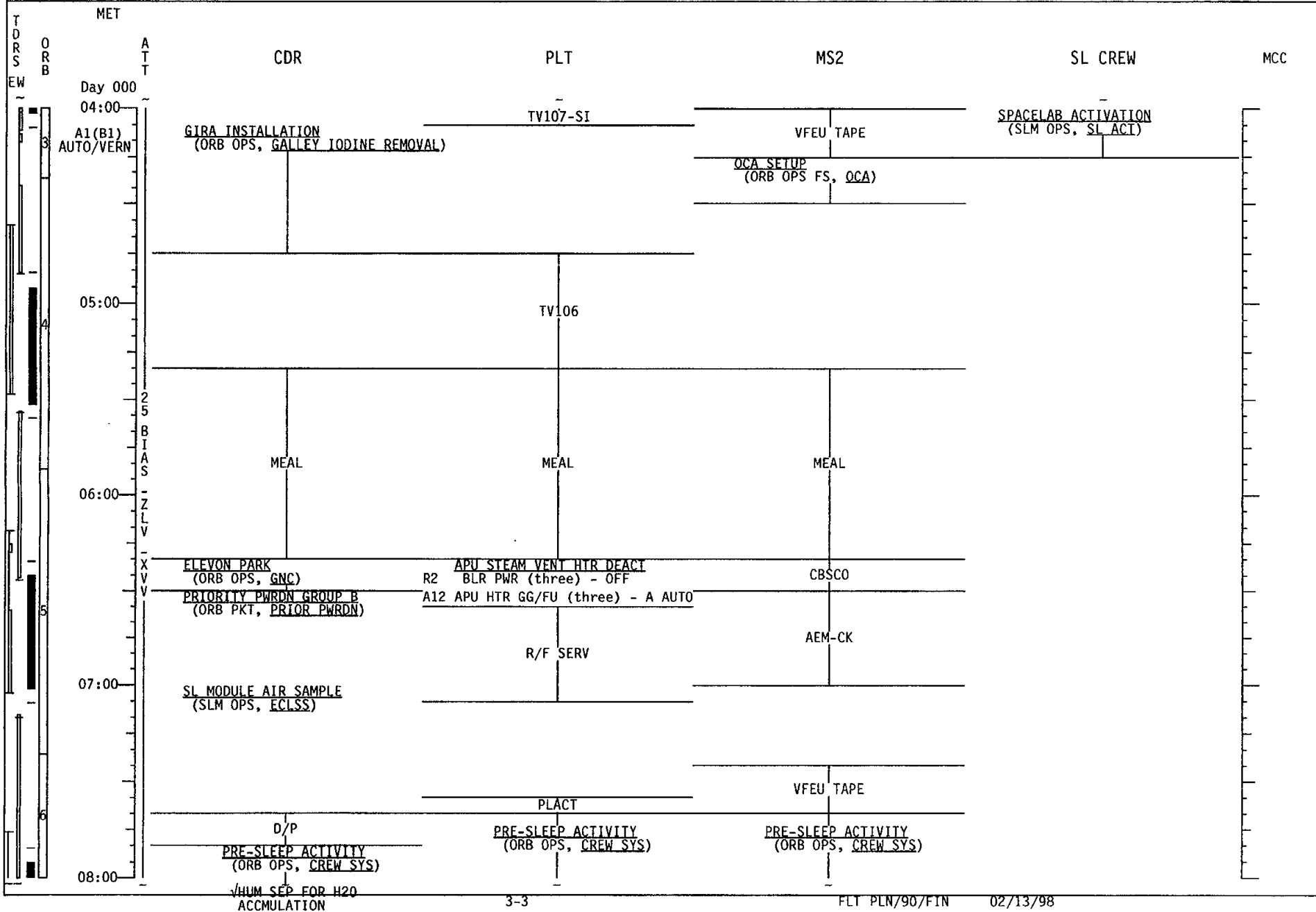
DETAILED
TIMELINE

DETAILED TIMELINE

STS-90 (FD 01)

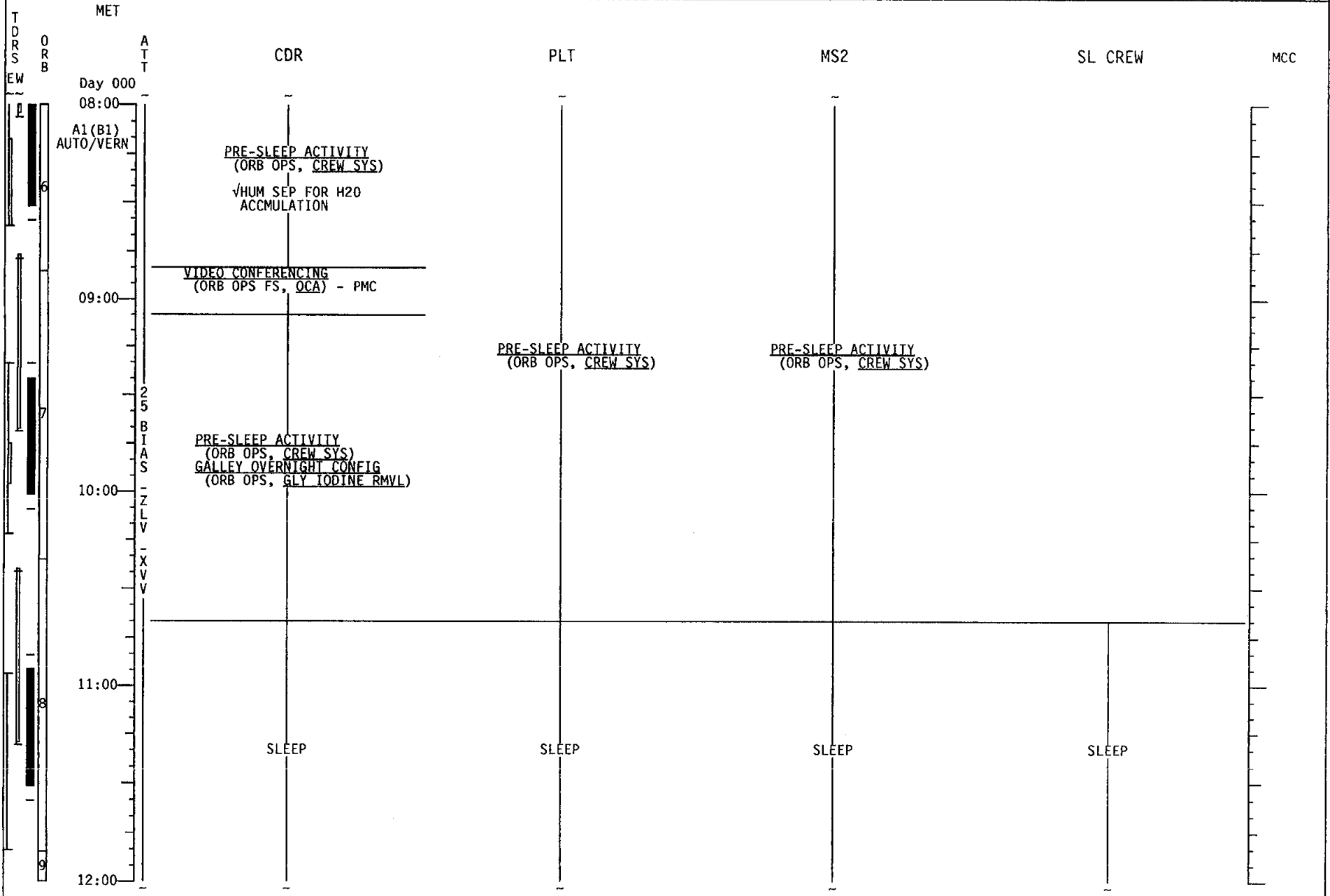


STS-90 (FD 01)

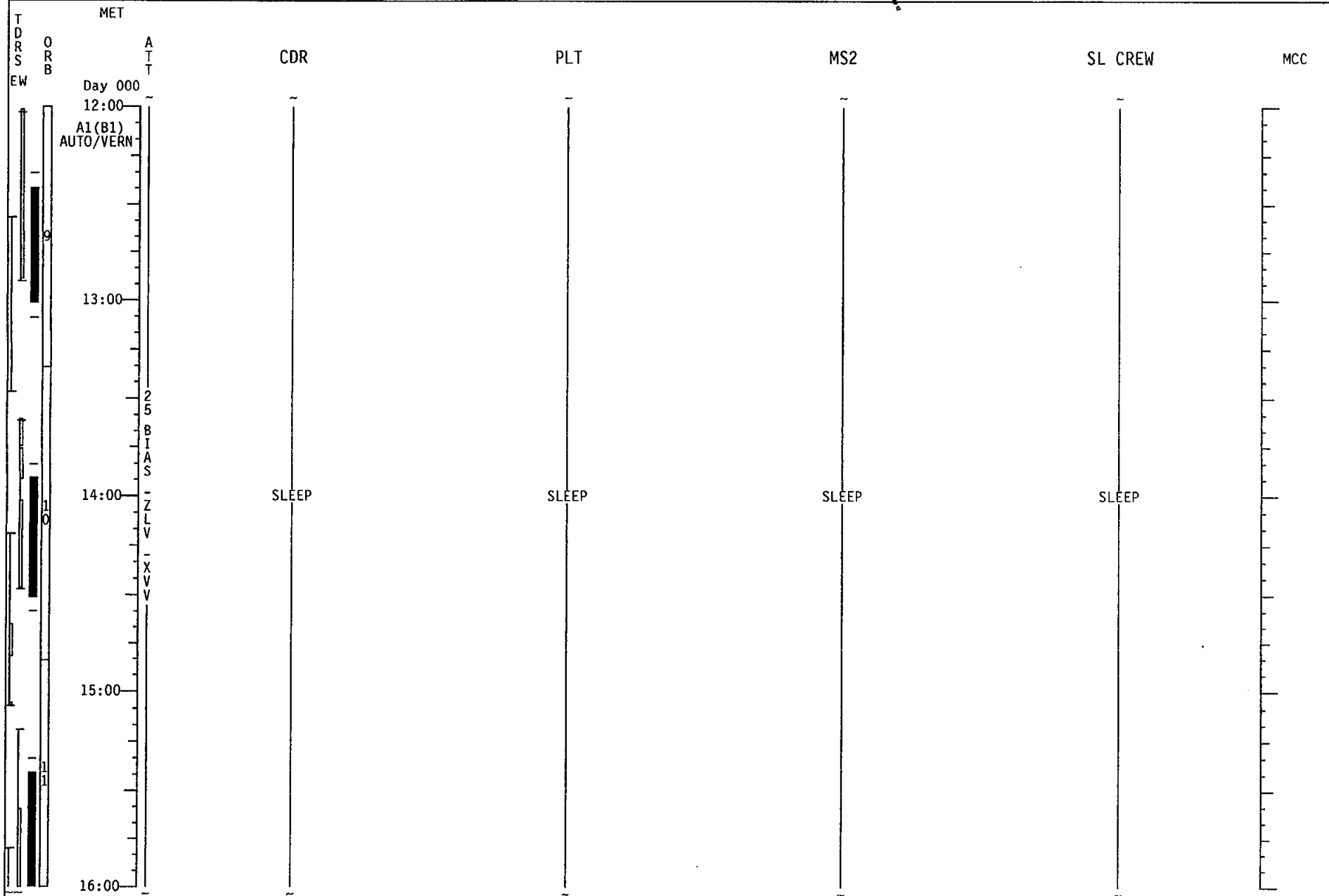


HUM SEP FOR H2O ACCUMULATION

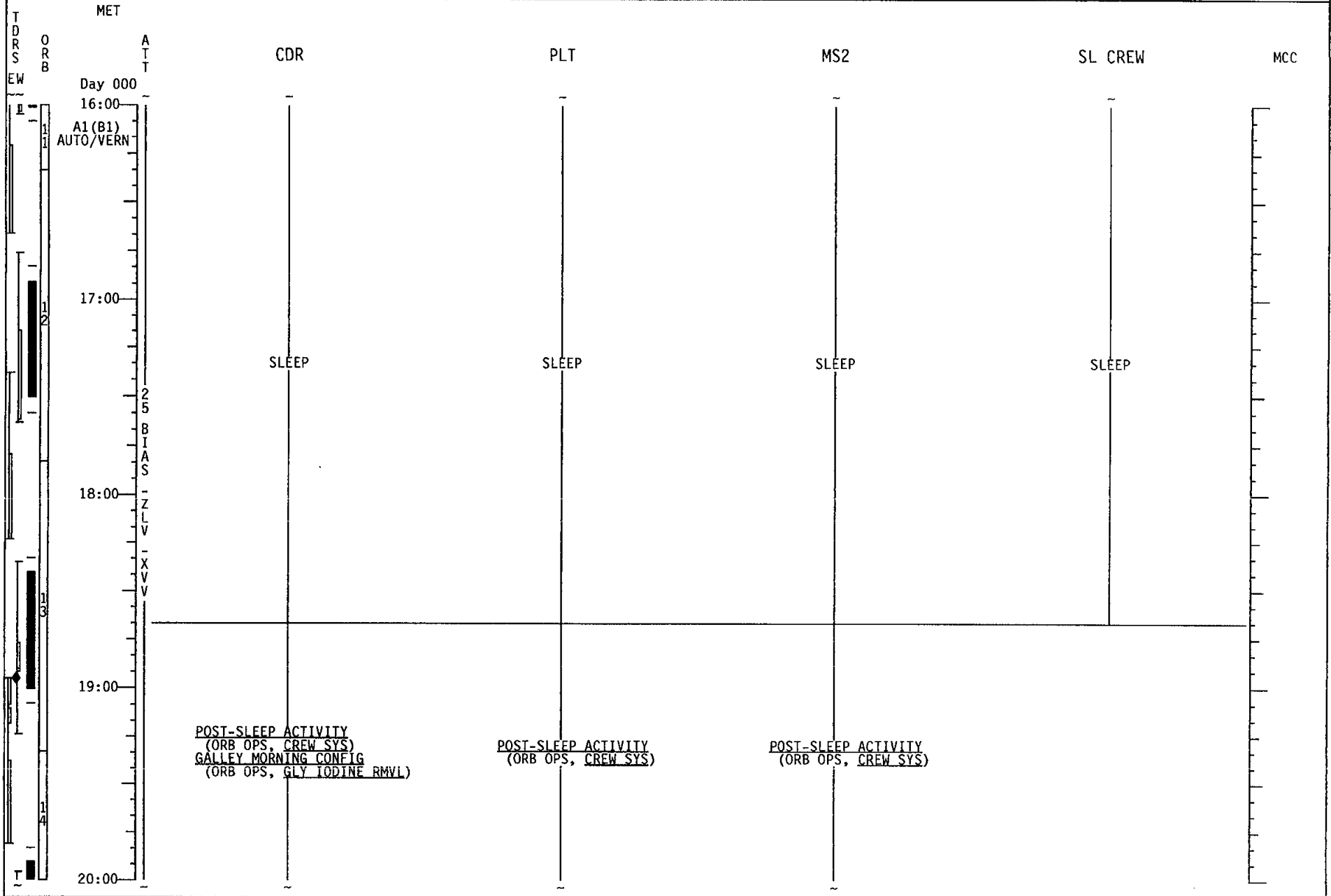
STS-90 (FD 01)



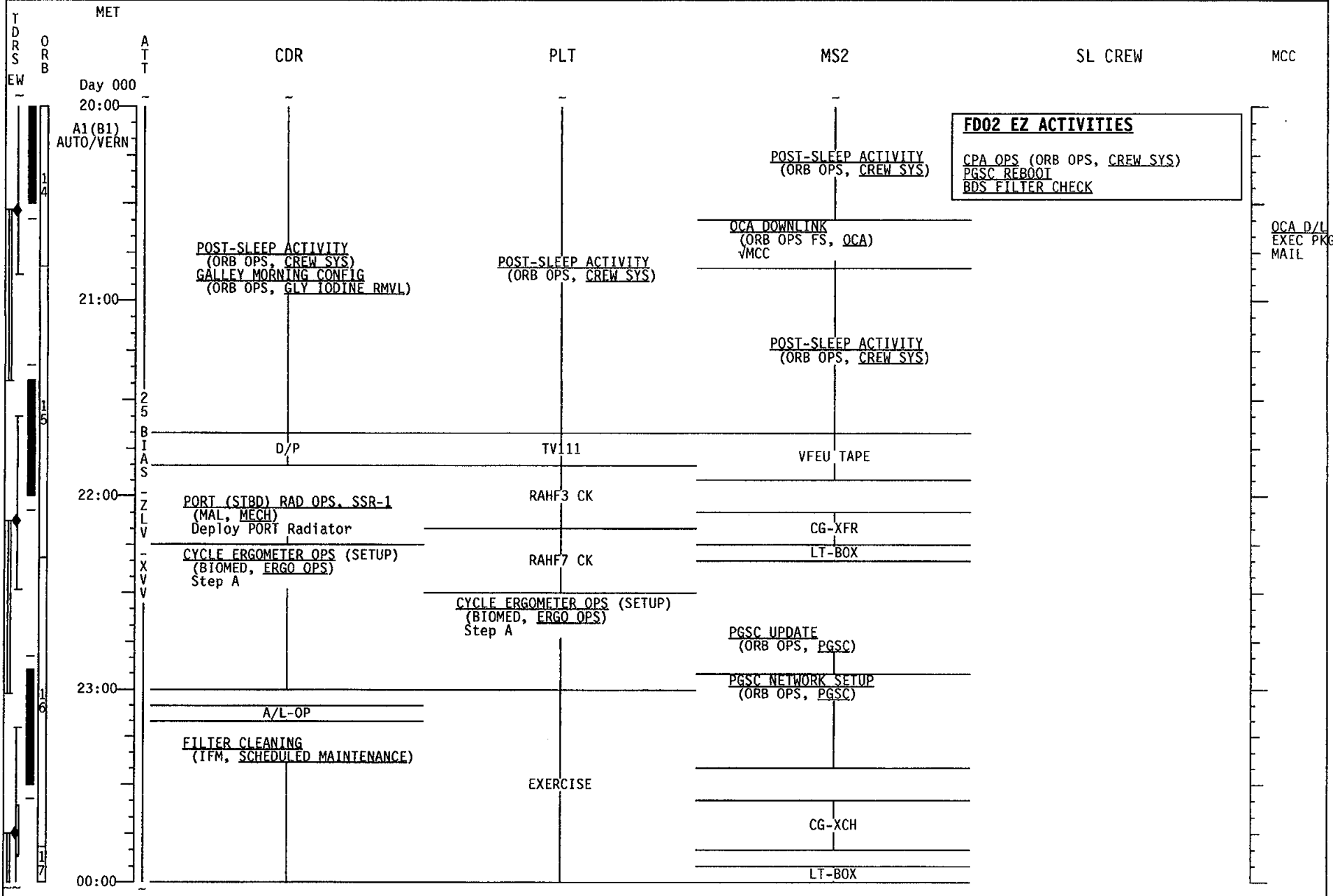
STS-90 (FD 01)



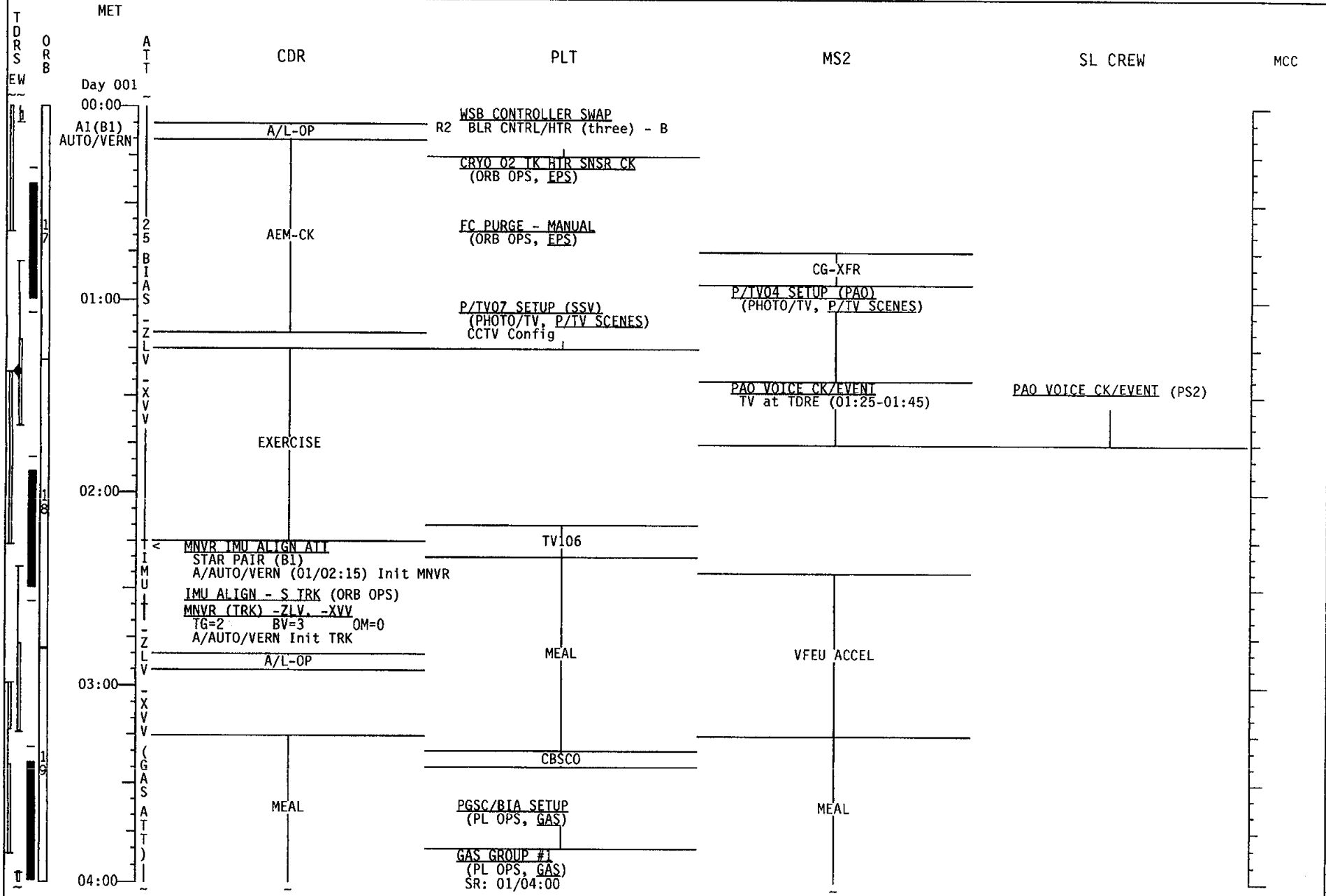
STS-90 (FD 01)



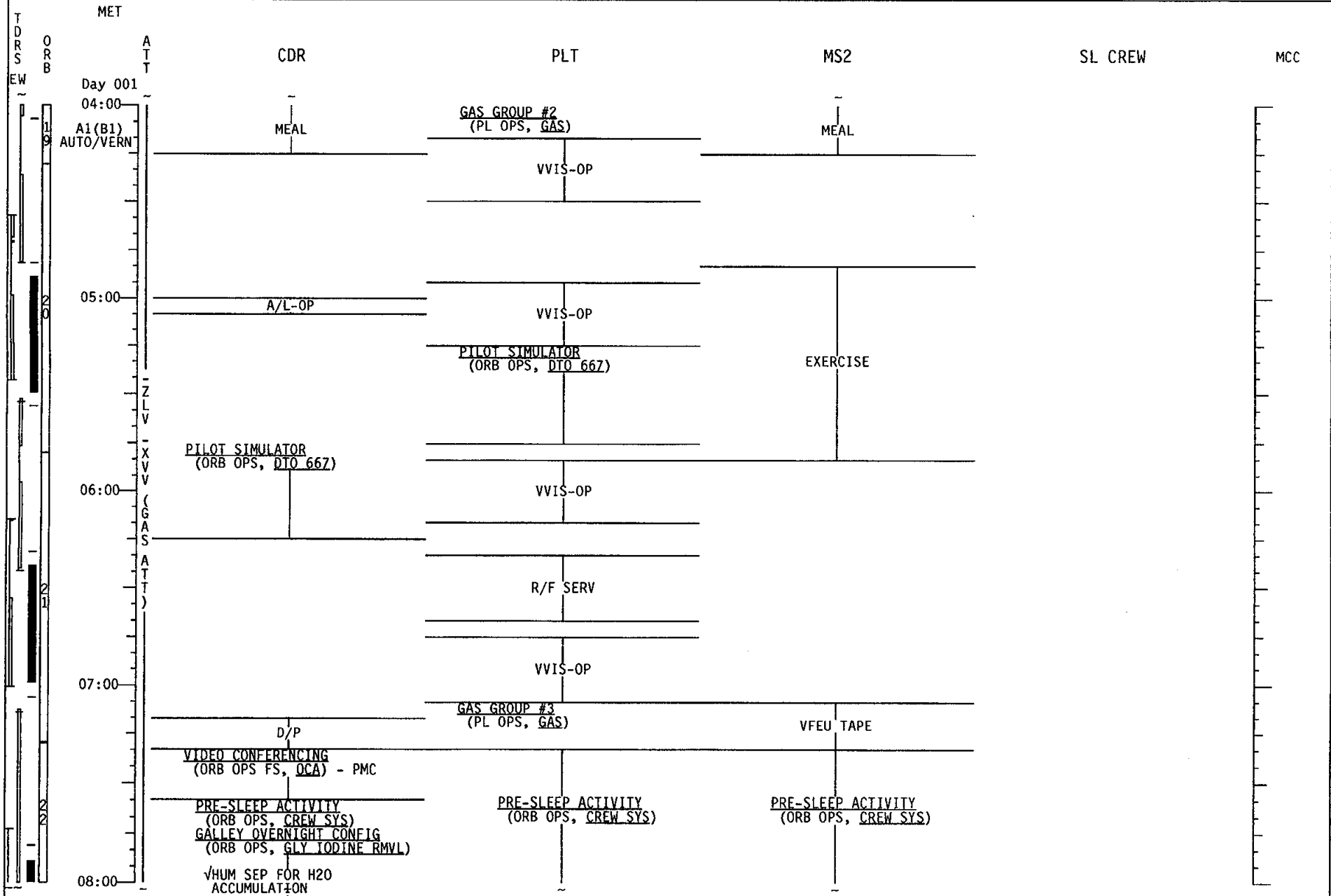
STS-90 (FD 02)



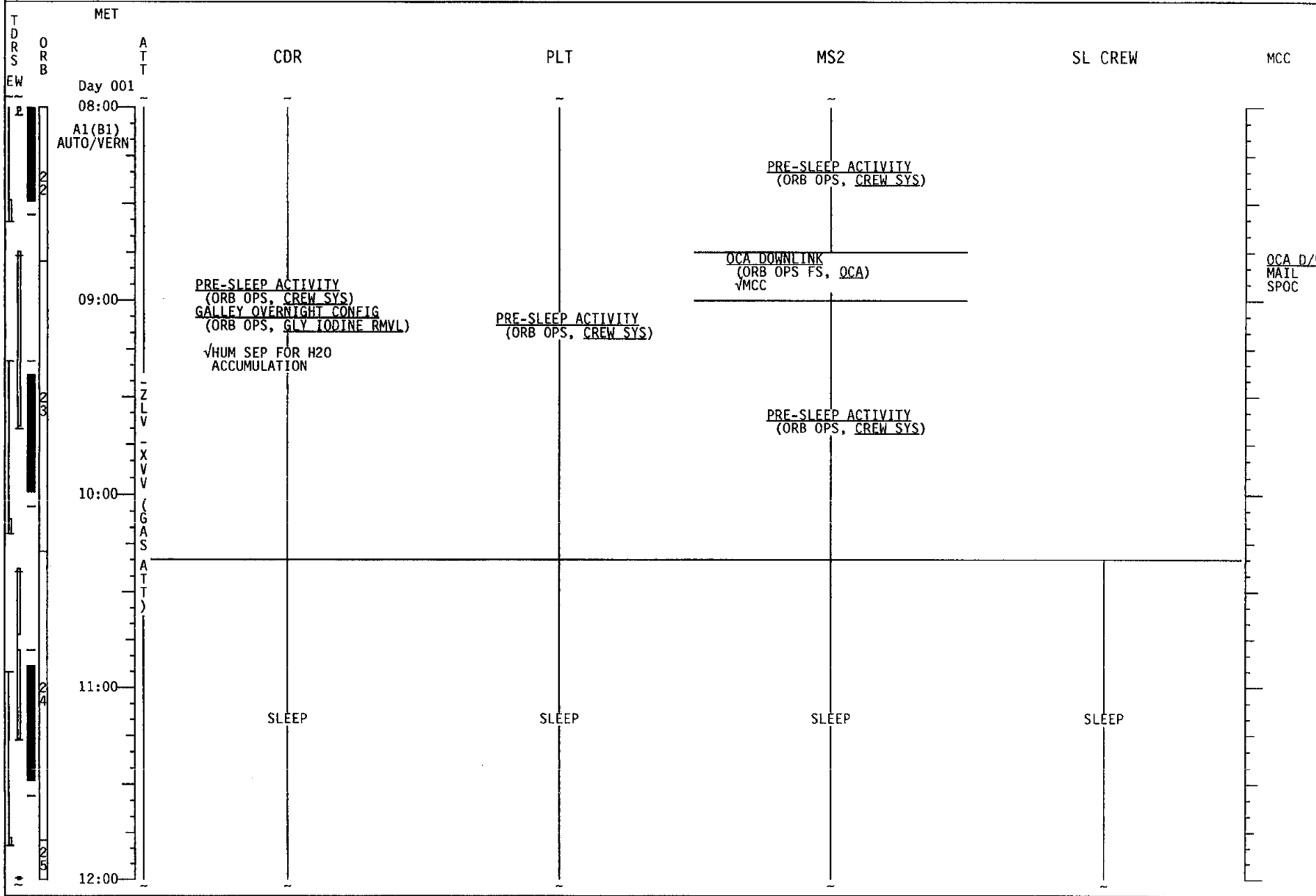
STS-90 (FD 02)



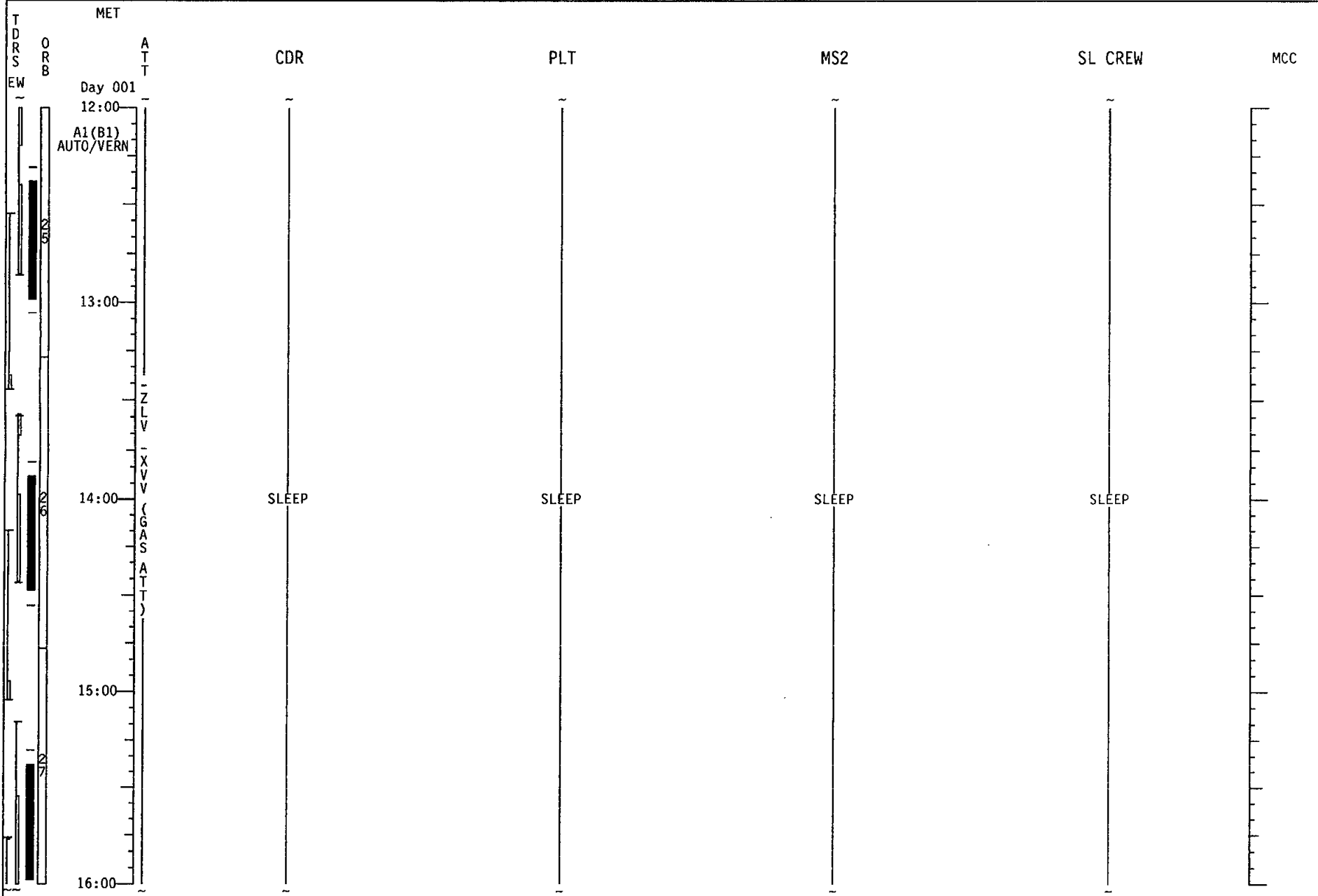
STS-90 (FD 02)



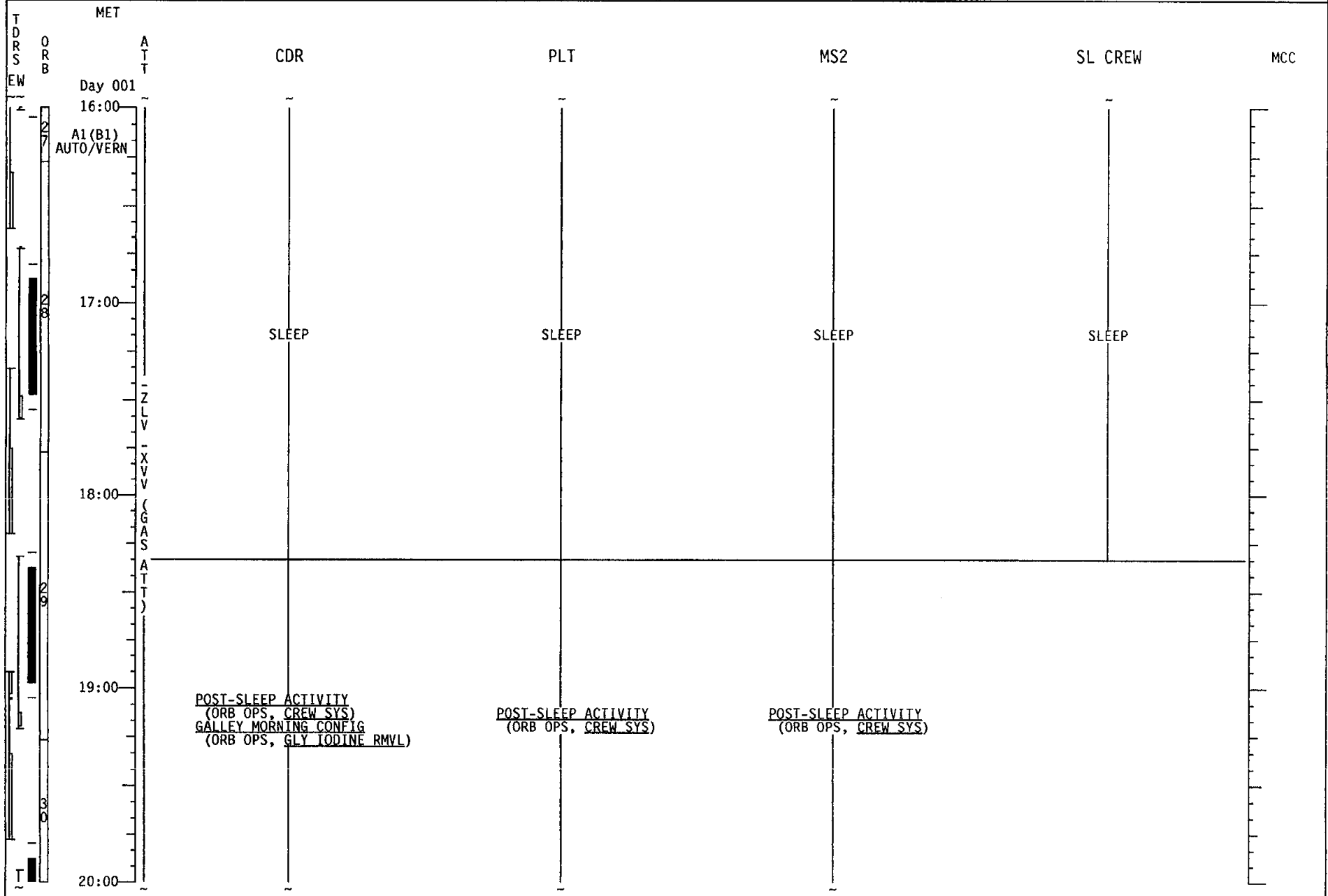
STS-90 (FD 02)



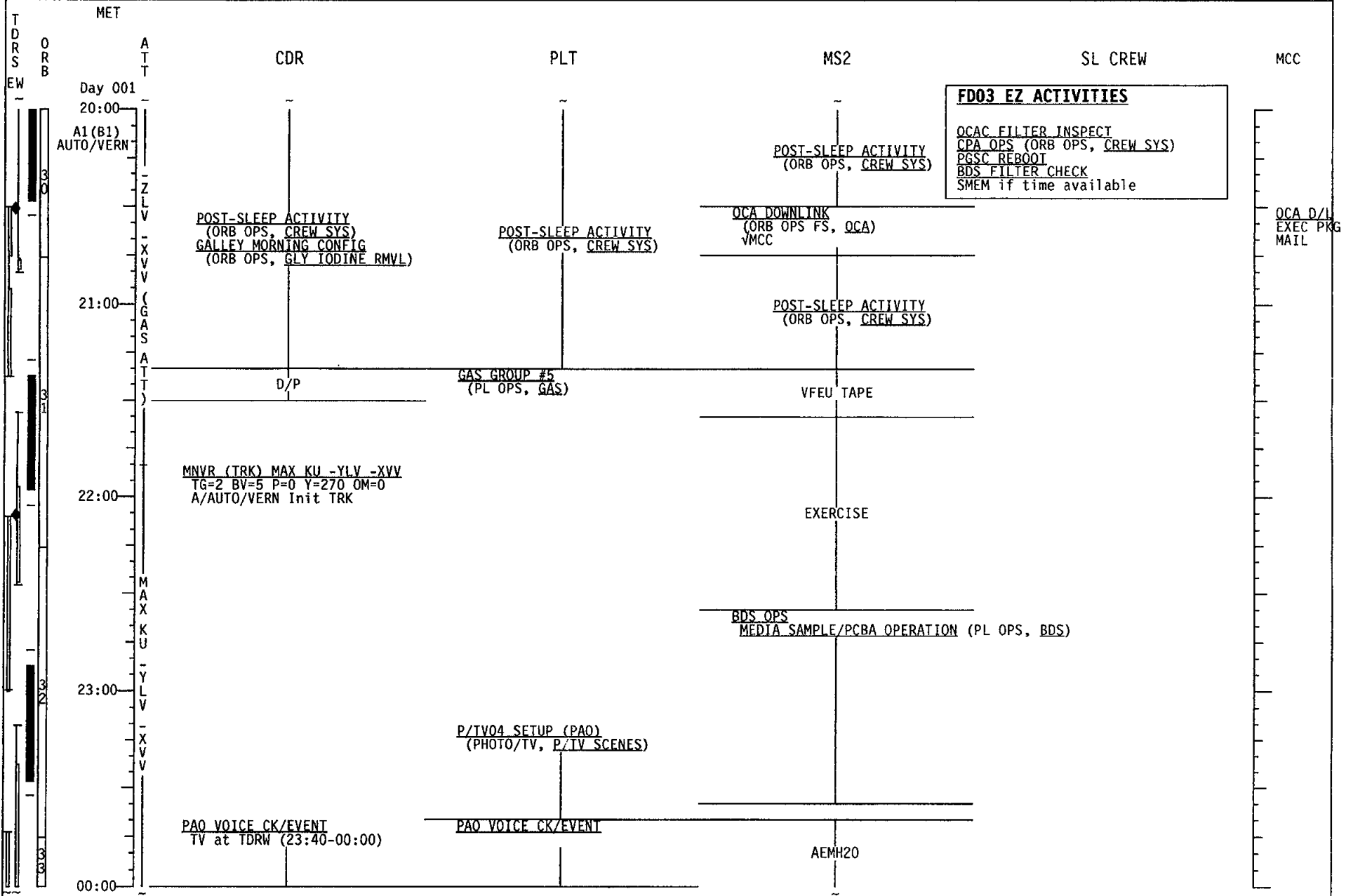
STS-90 (FD 02)



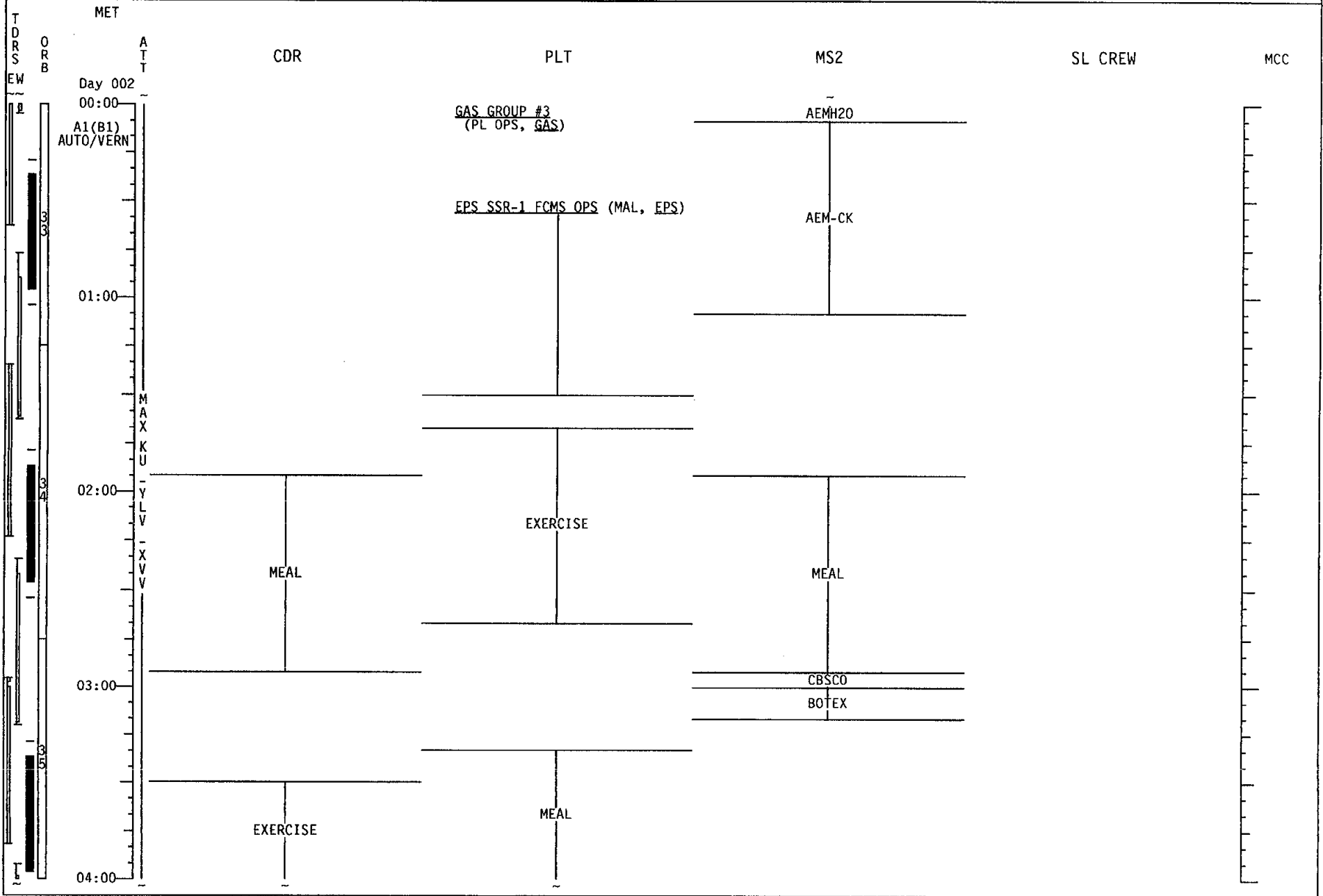
STS-90 (FD 02)



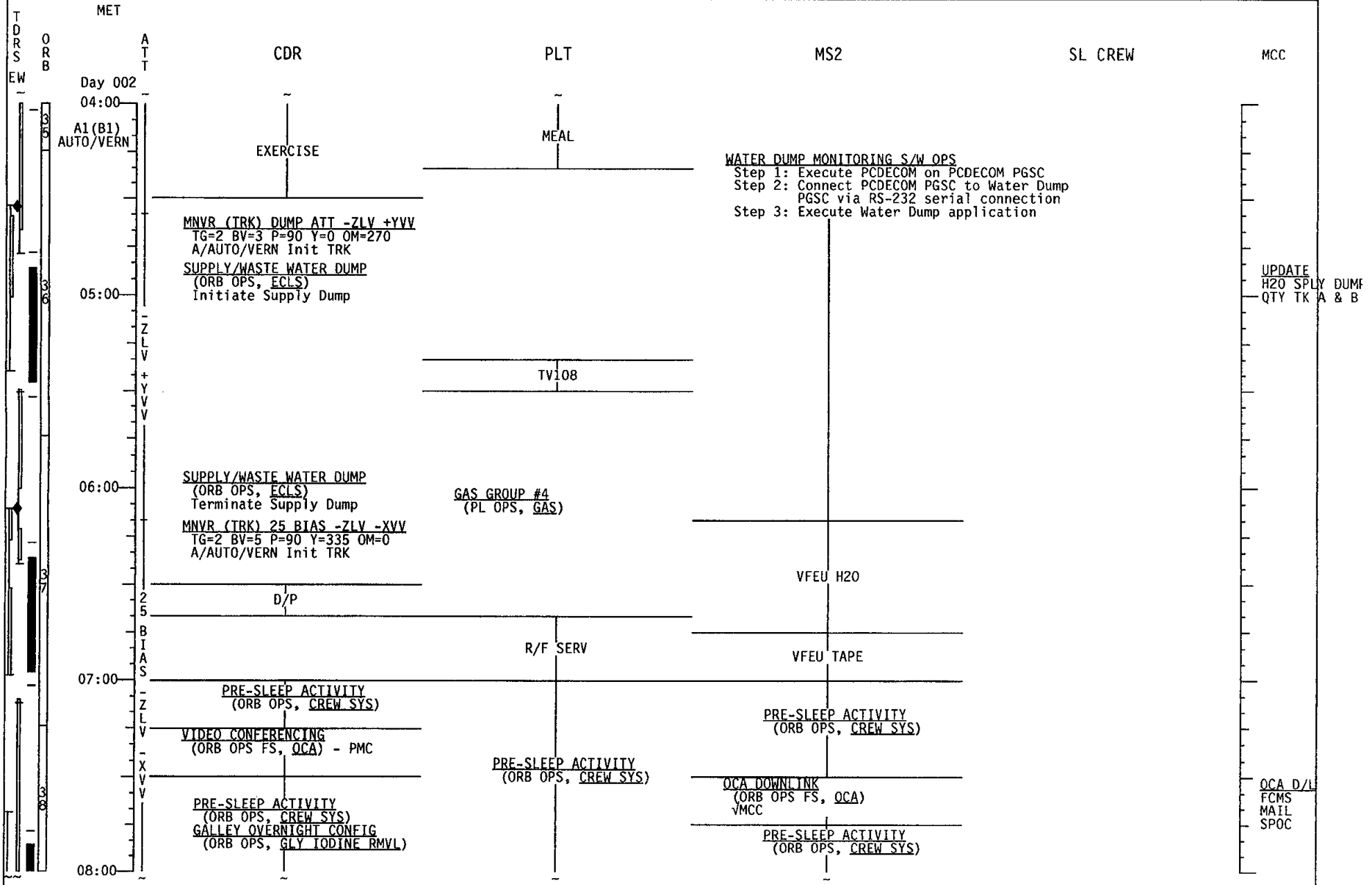
STS-90 (FD 03)



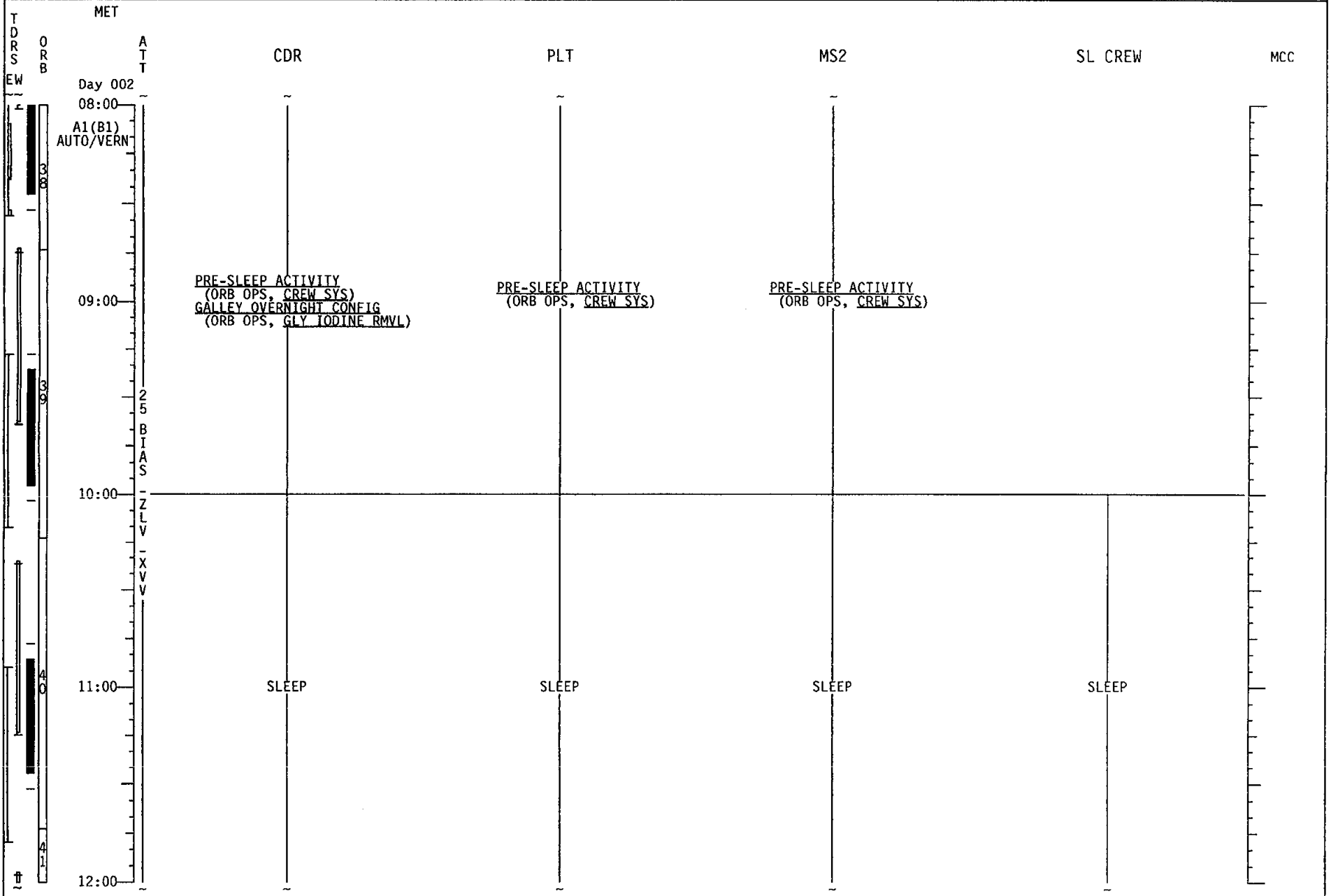
STS-90 (FD 03)



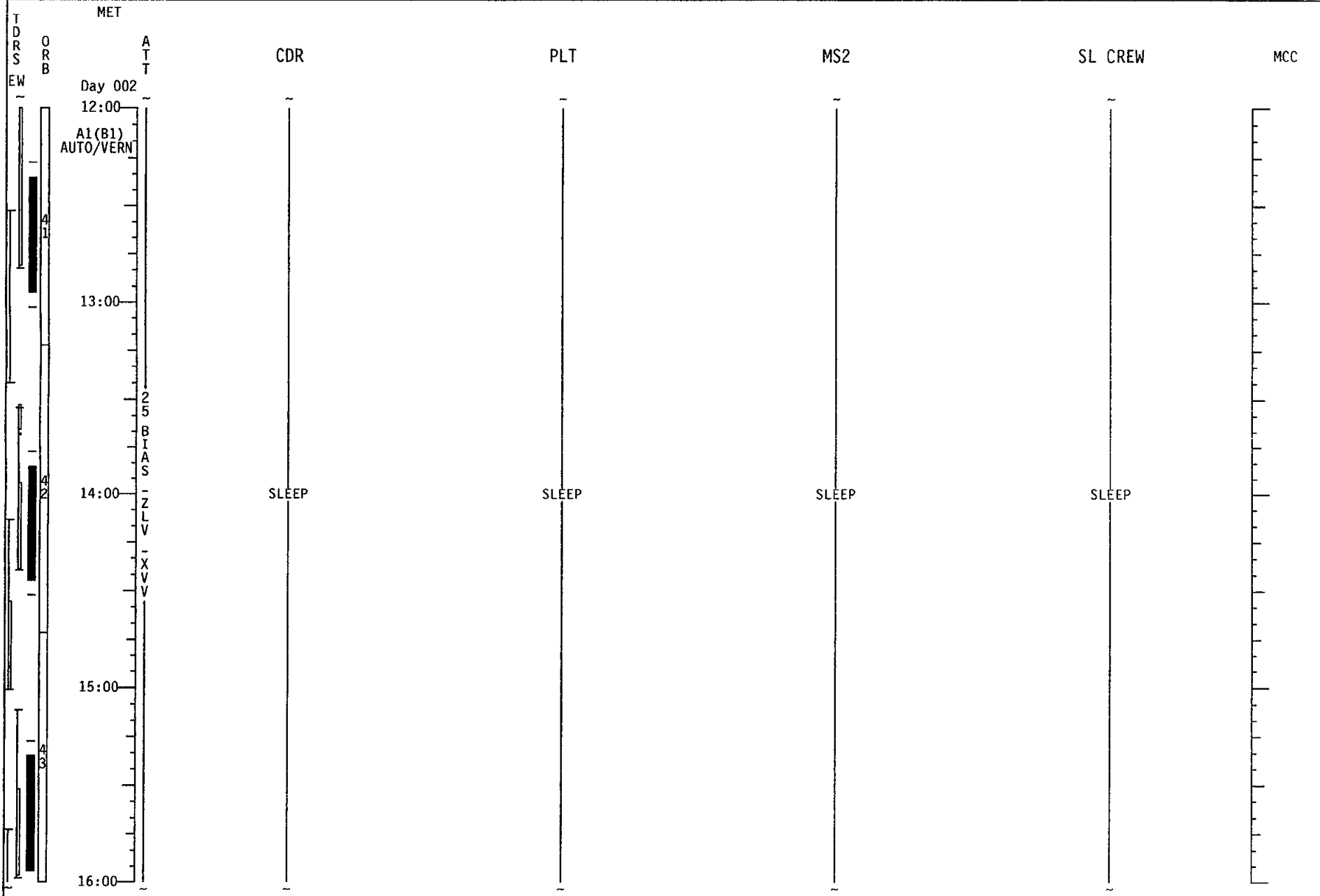
STS-90 (FD 03)



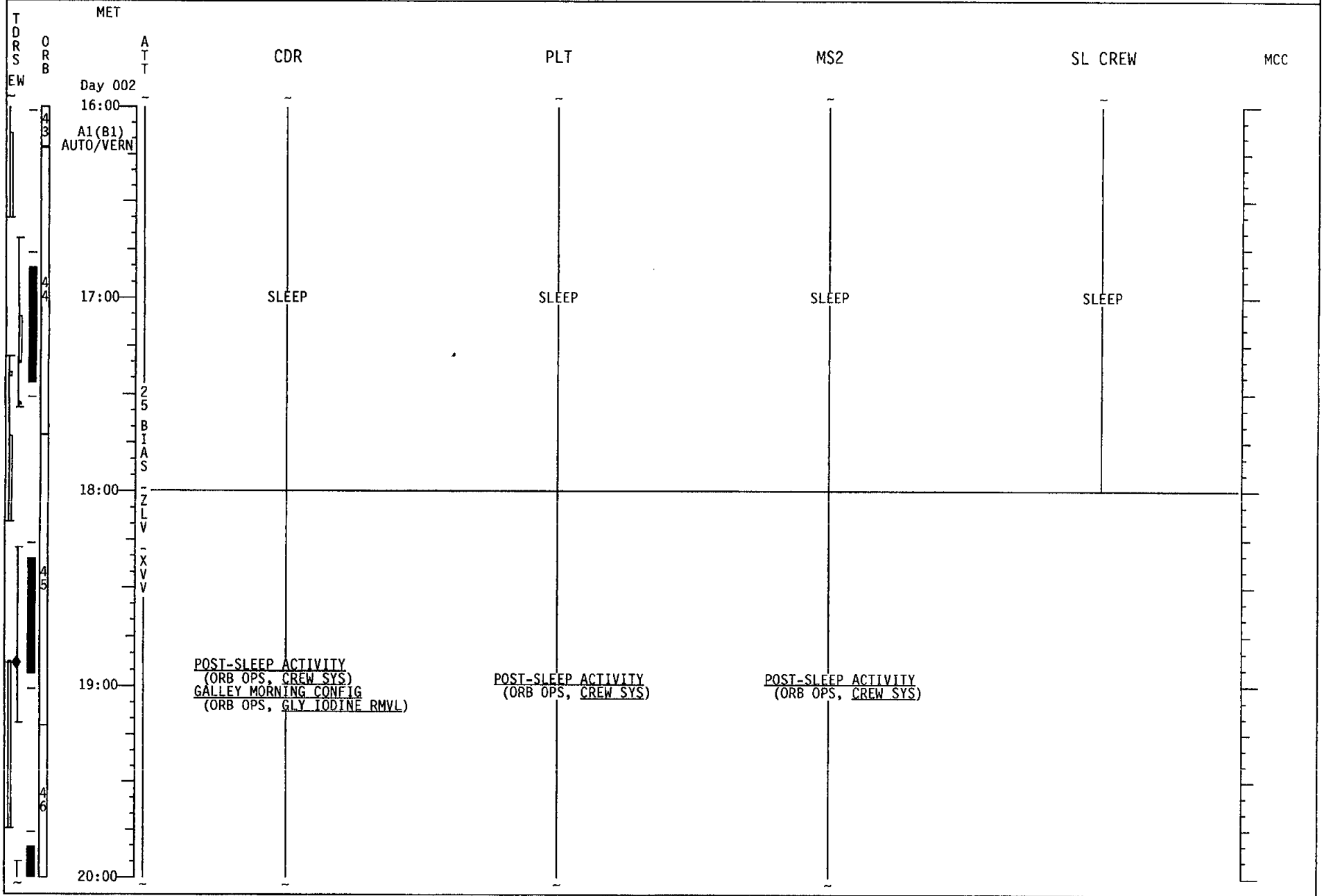
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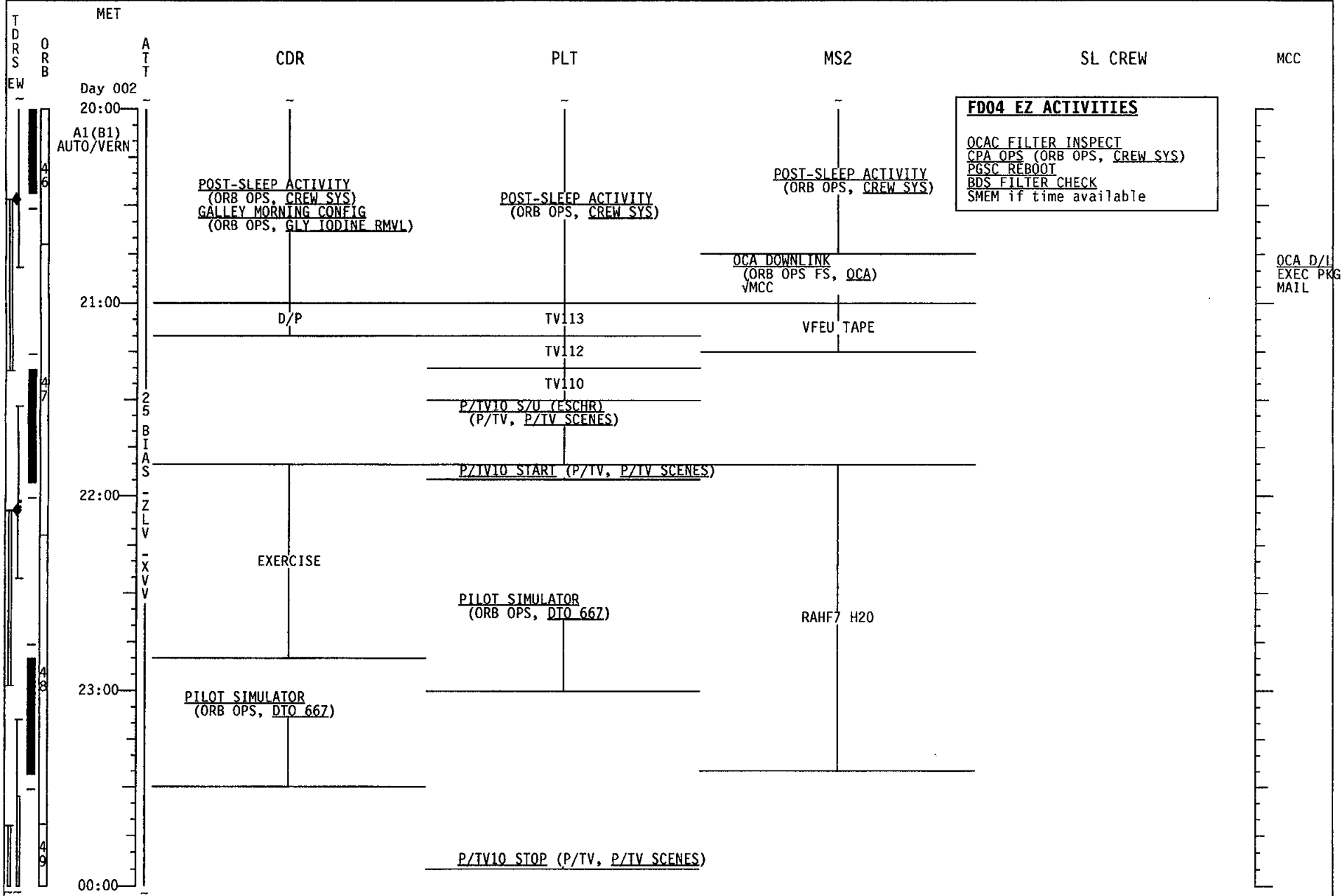
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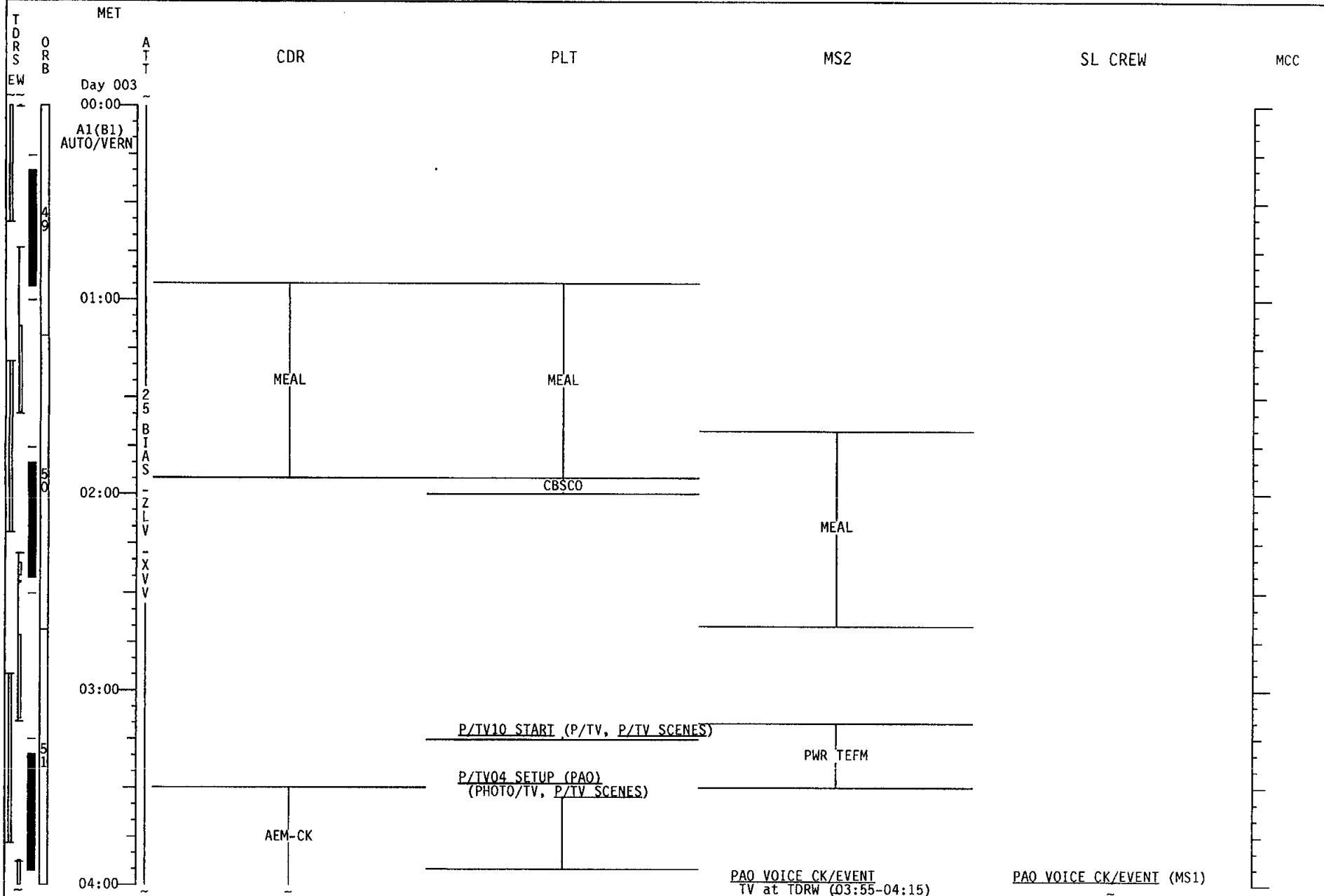
STS-90 (FD 03)



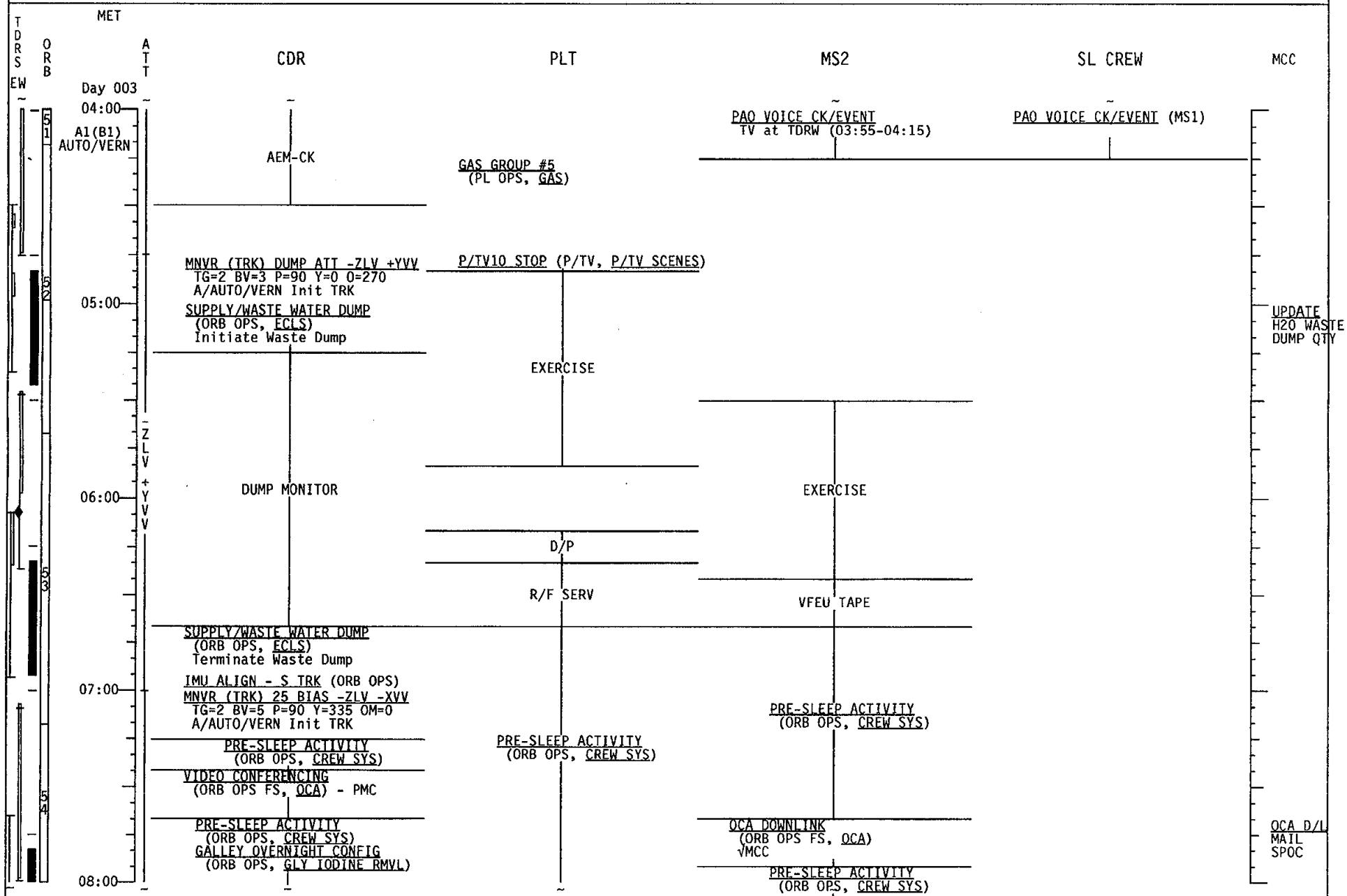
STS-90 (FD 04)



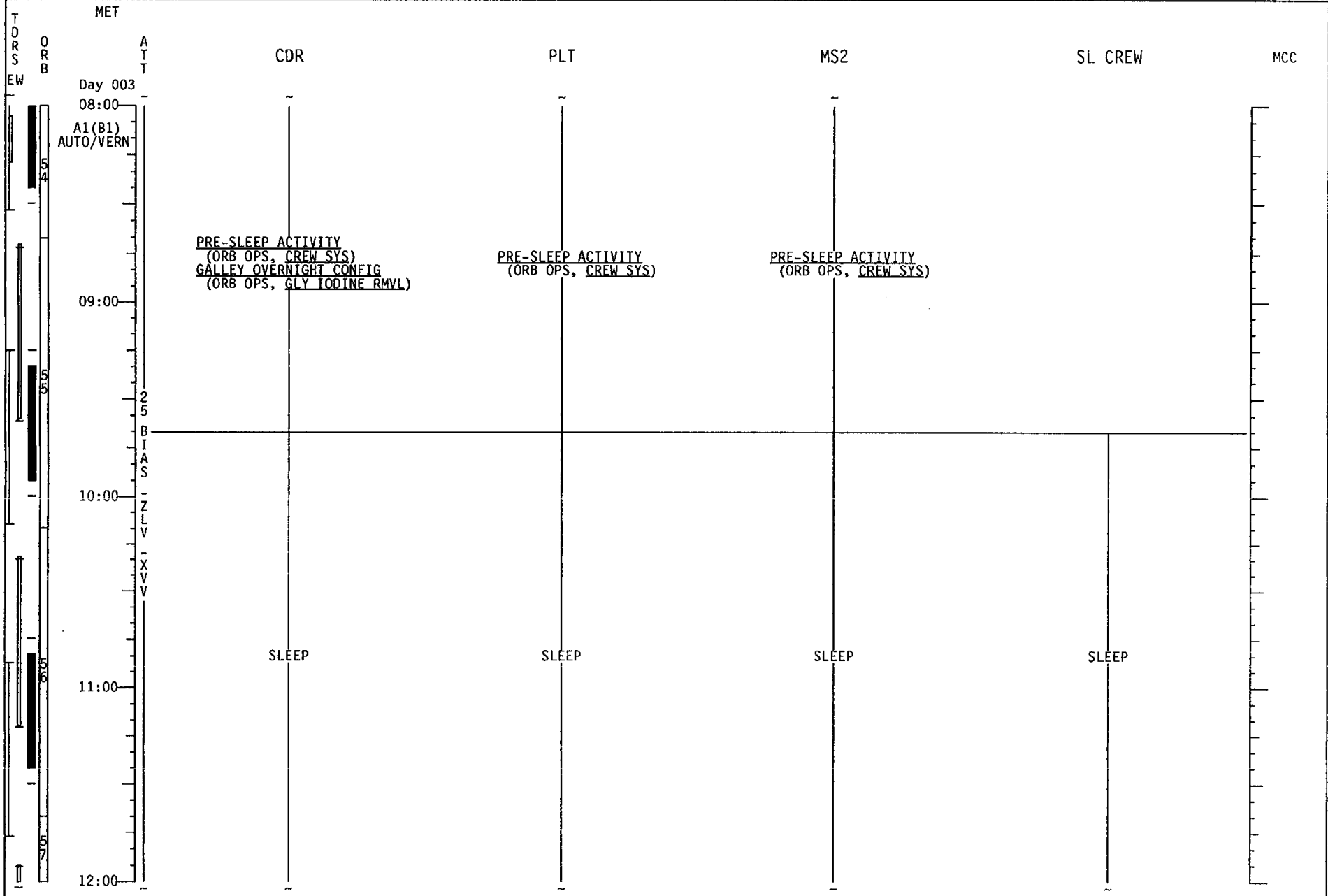
STS-90 (FD 04)



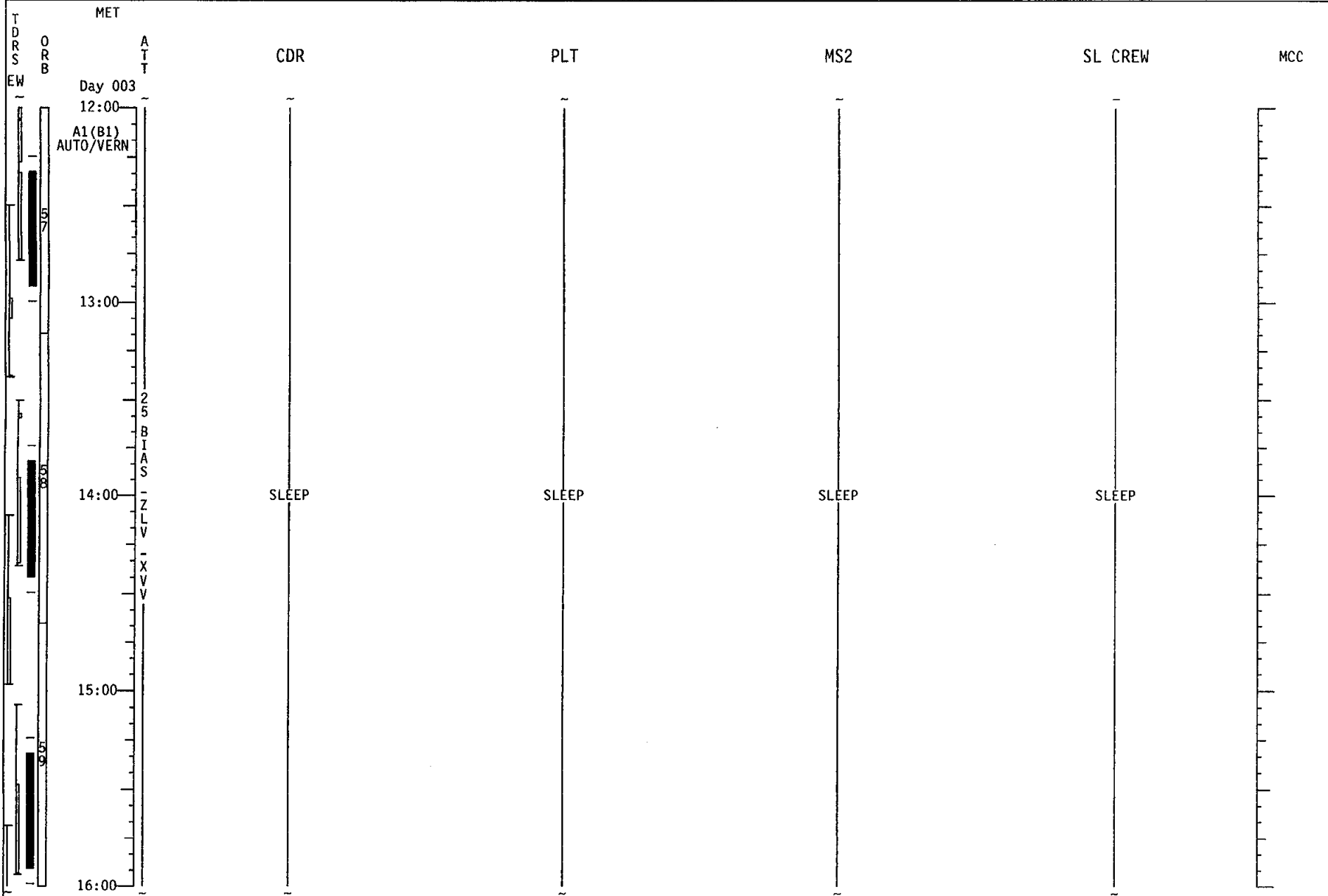
STS-90 (FD 04)



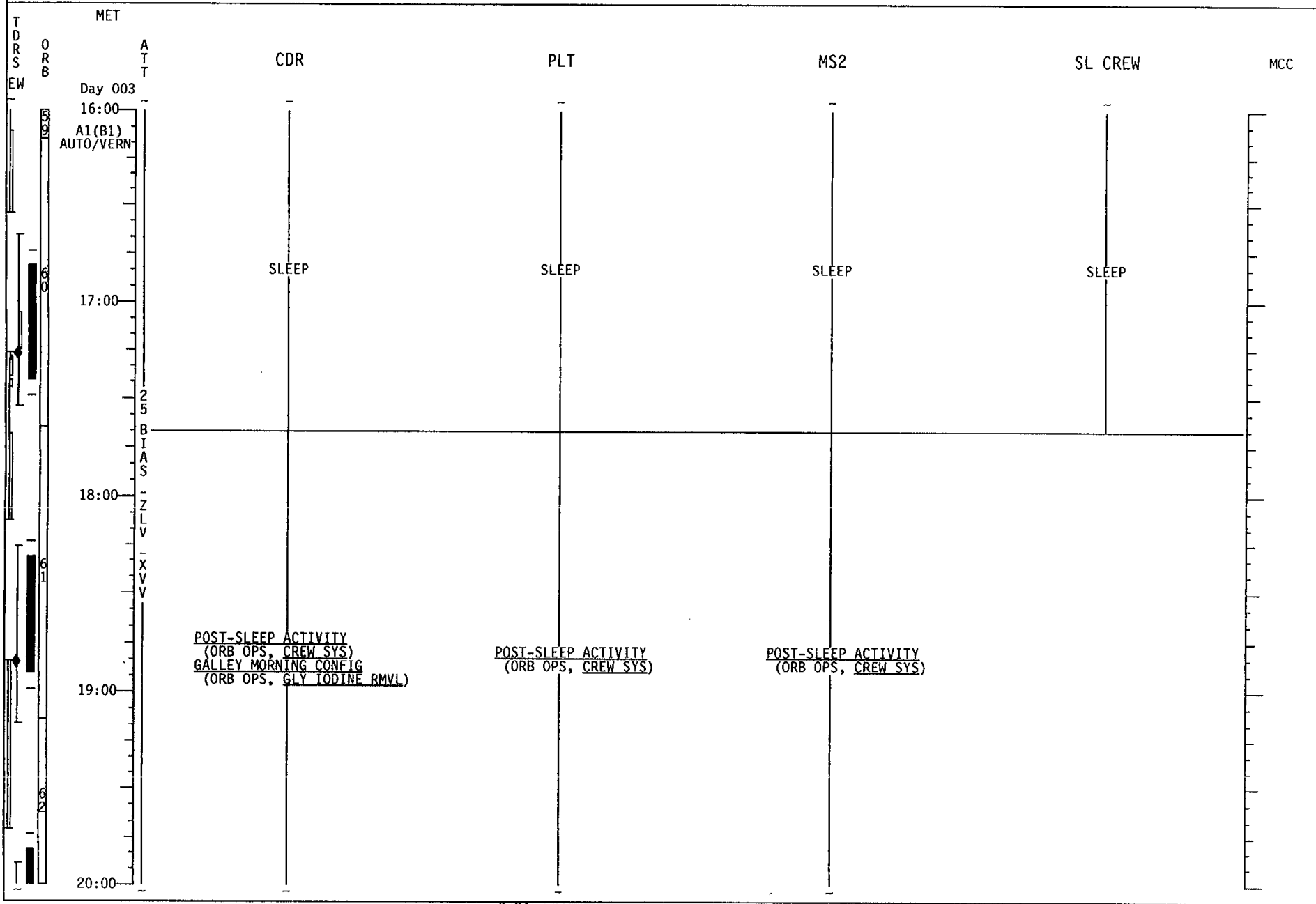
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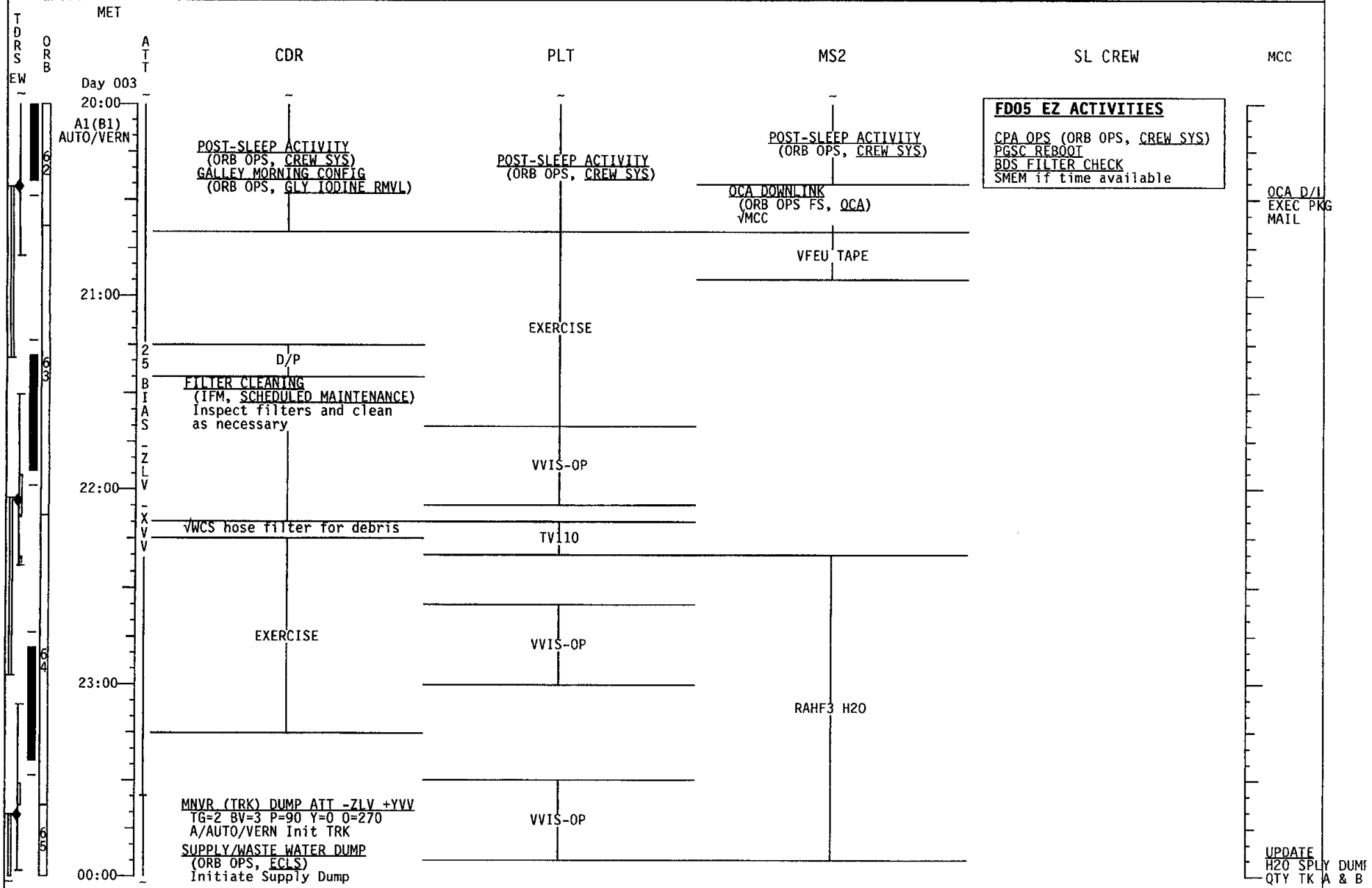
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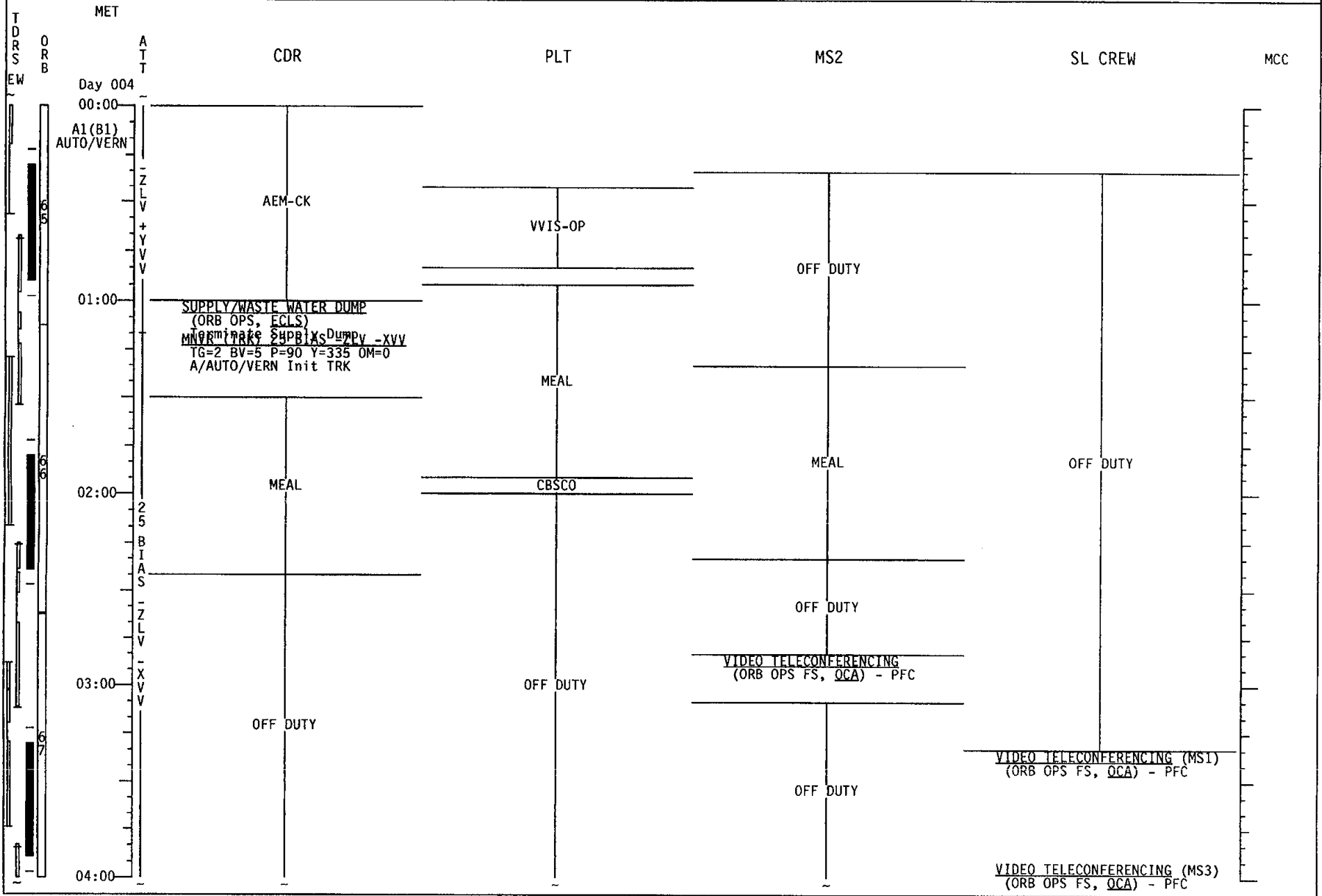
STS-90 (FD 04)



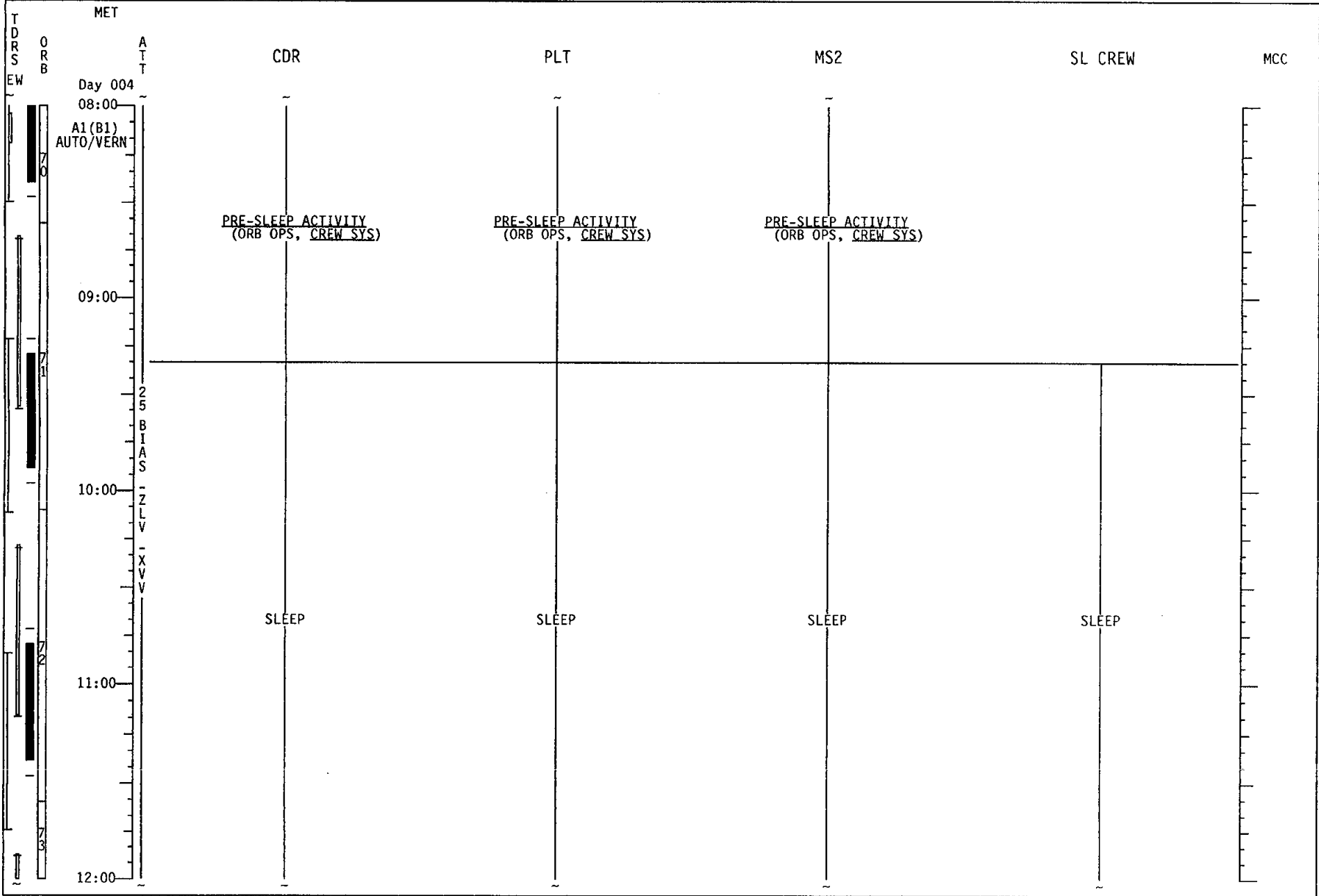
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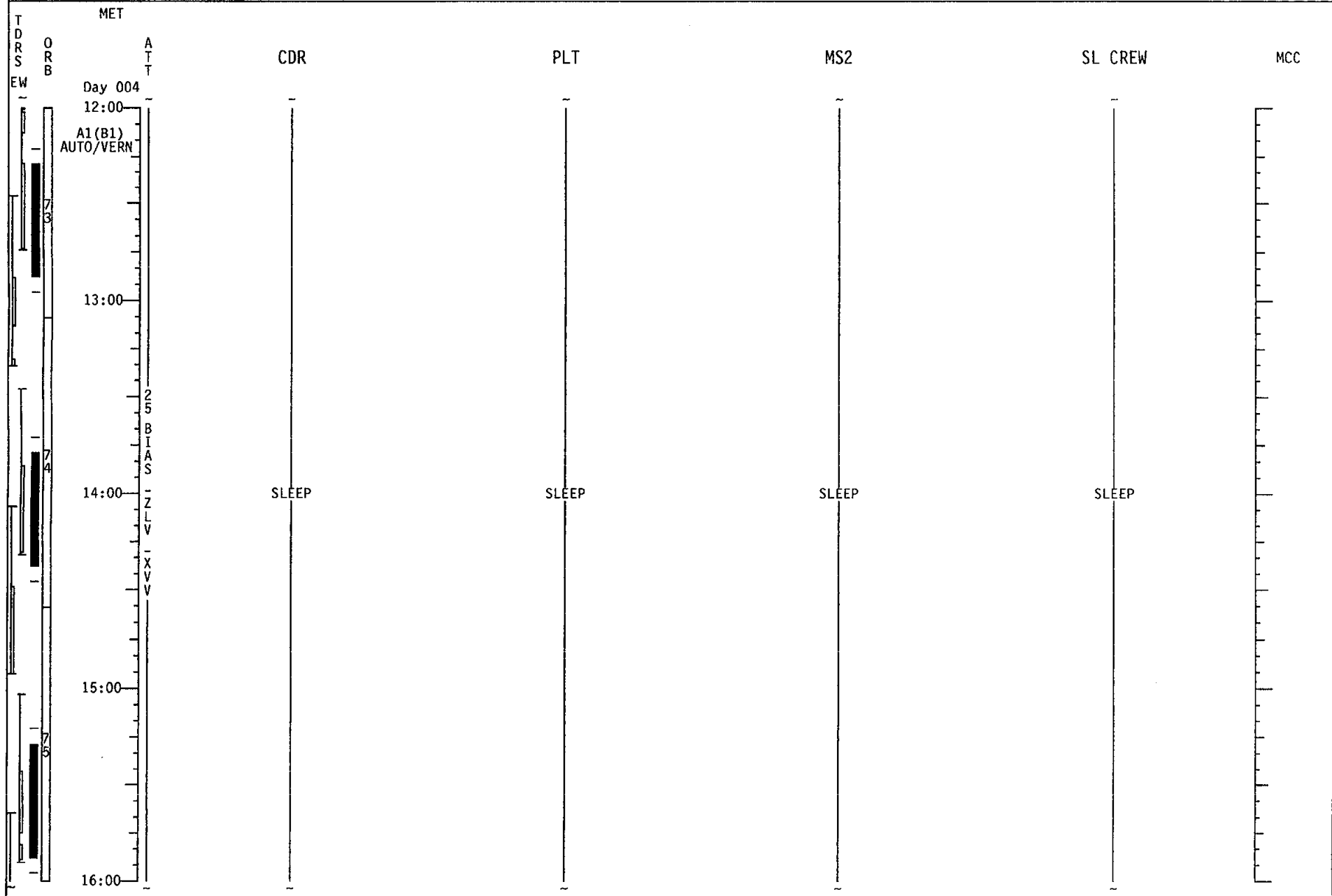
STS-90 (FD 05)



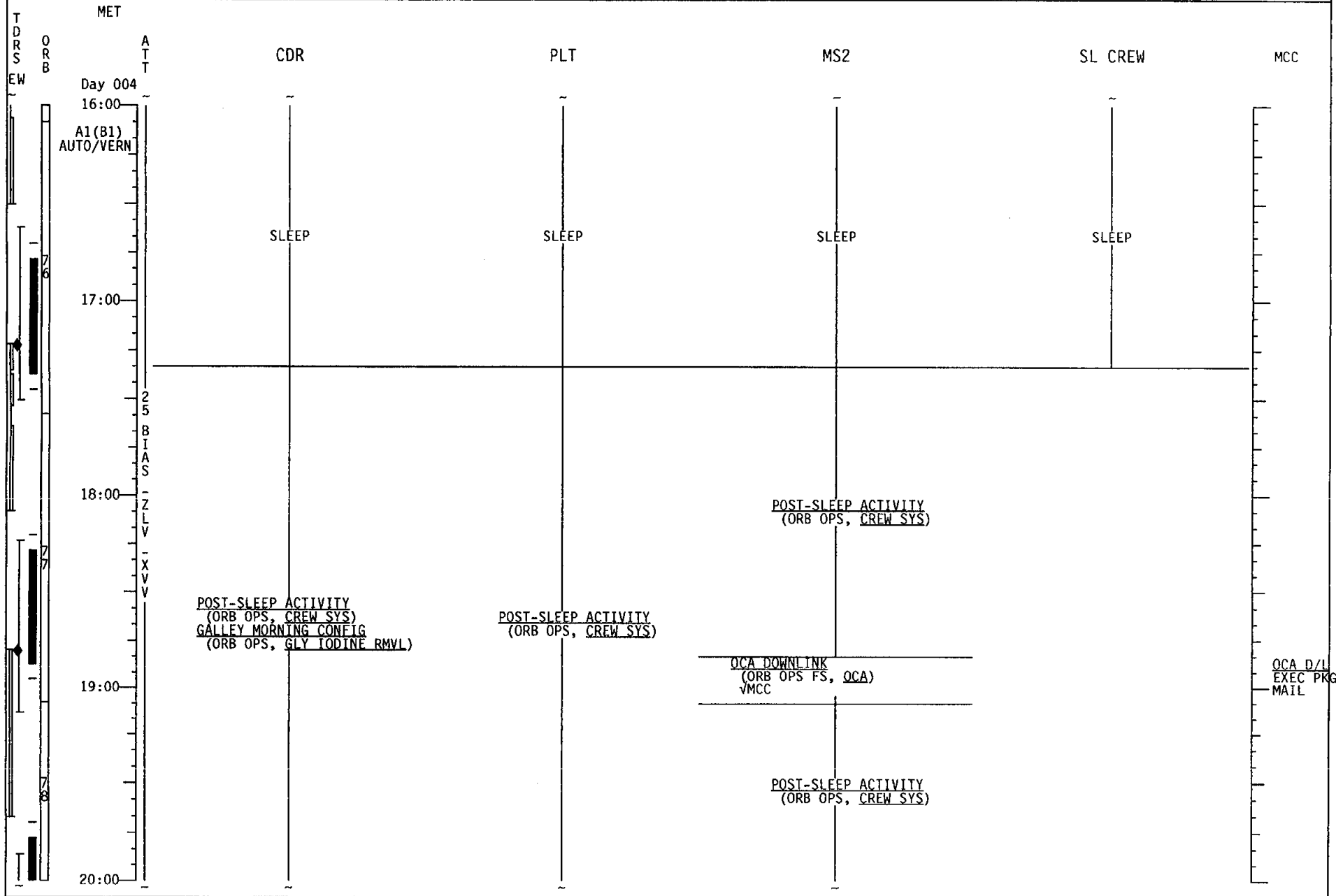
STS-90 (FD 05)



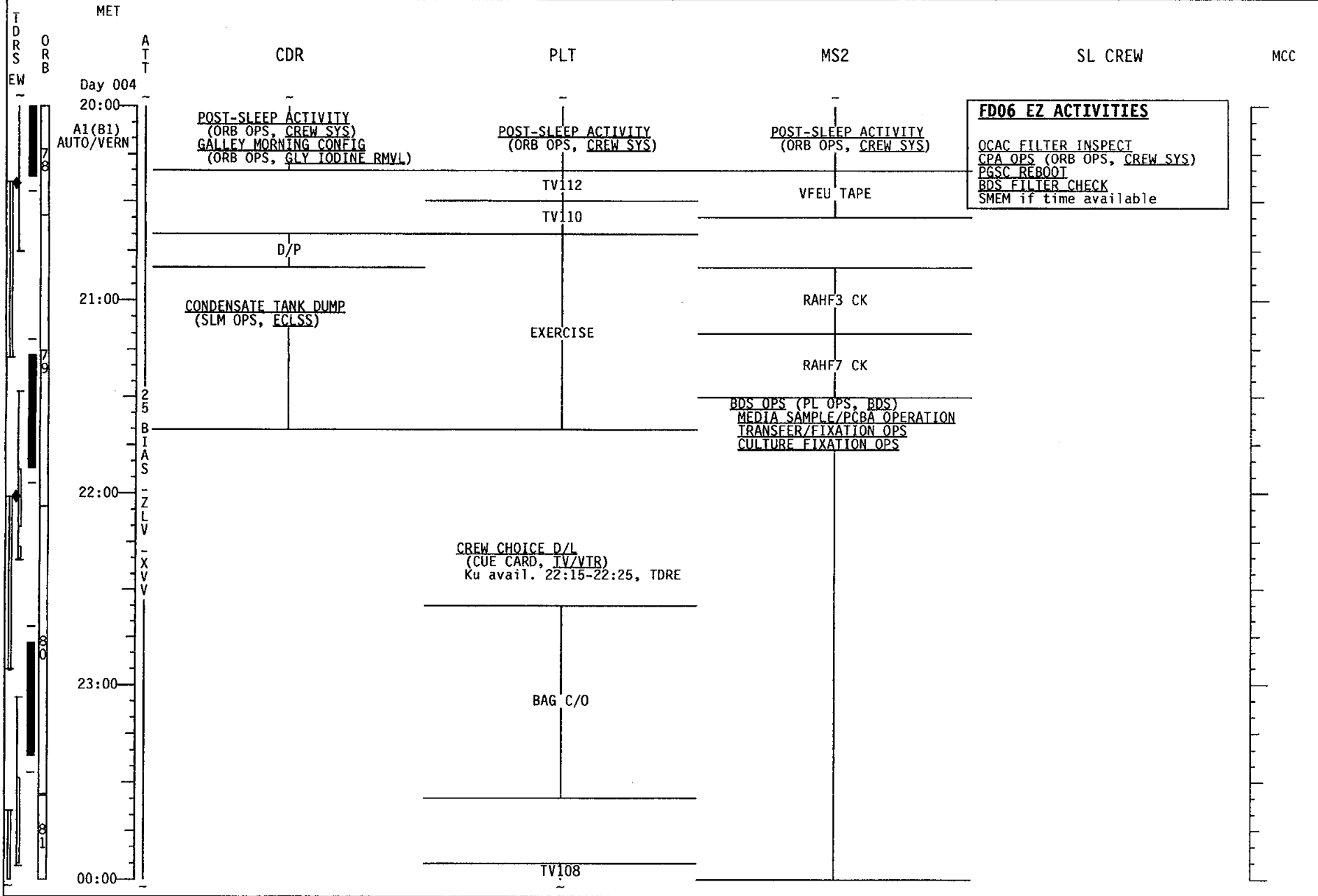
STS-90 (FD 05)



STS-90 (FD 05)



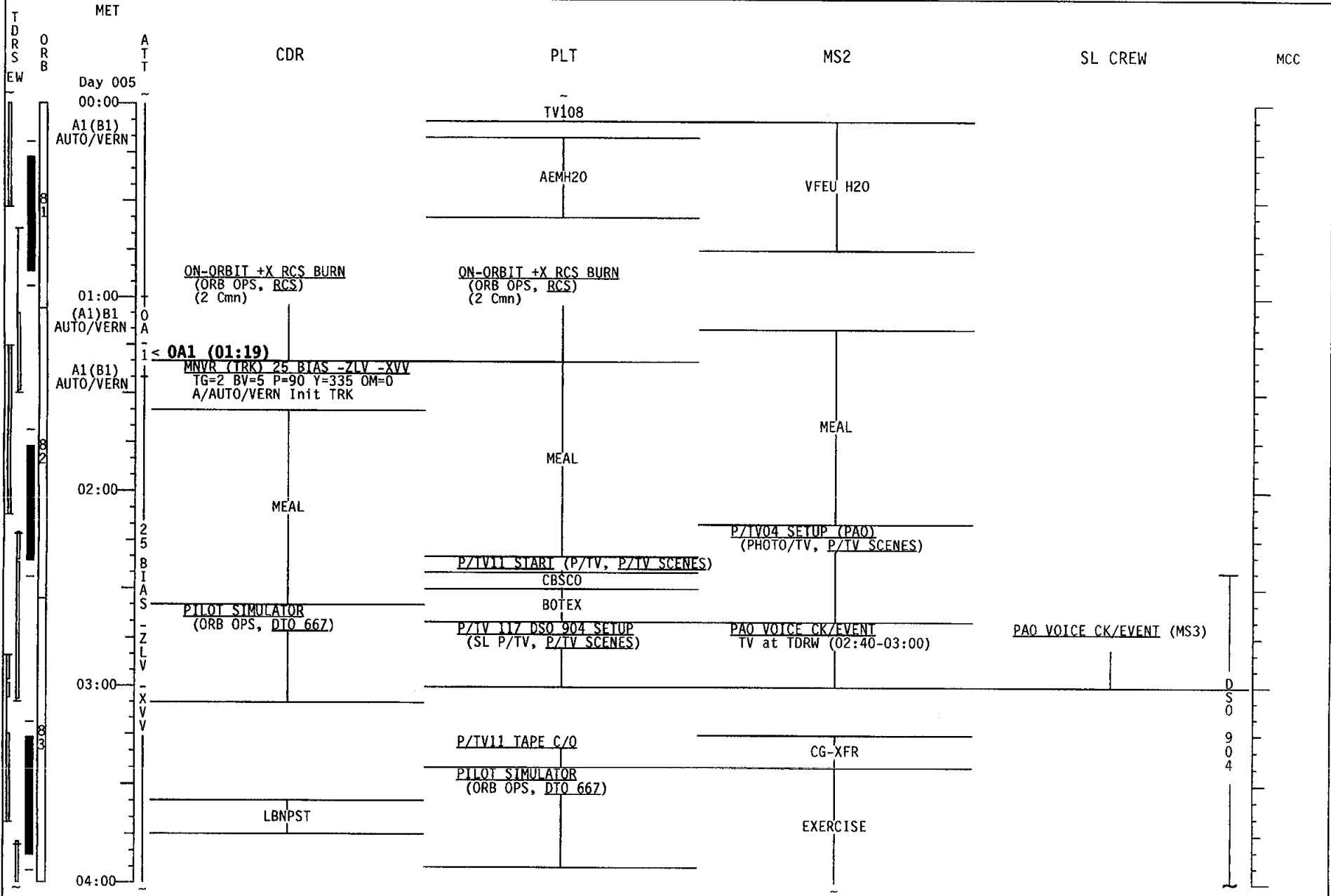
STS-90 (FD 06)



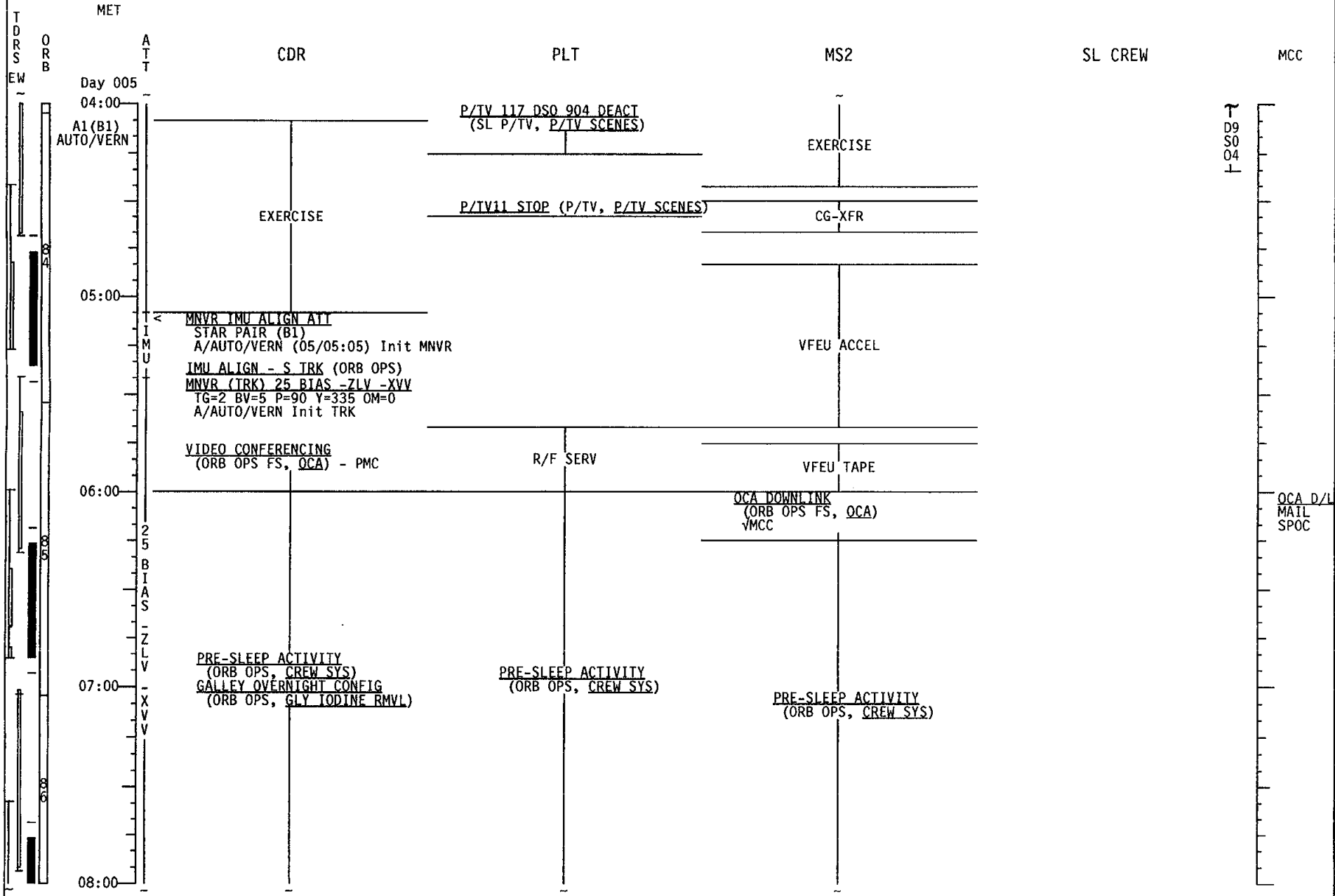
FD06 EZ ACTIVITIES

QCAC FILTER INSPECT
 CPA OPS (ORB OPS, CREW SYS)
 PGSC REBOOT
 BDS FILTER CHECK
 SMEM if time available

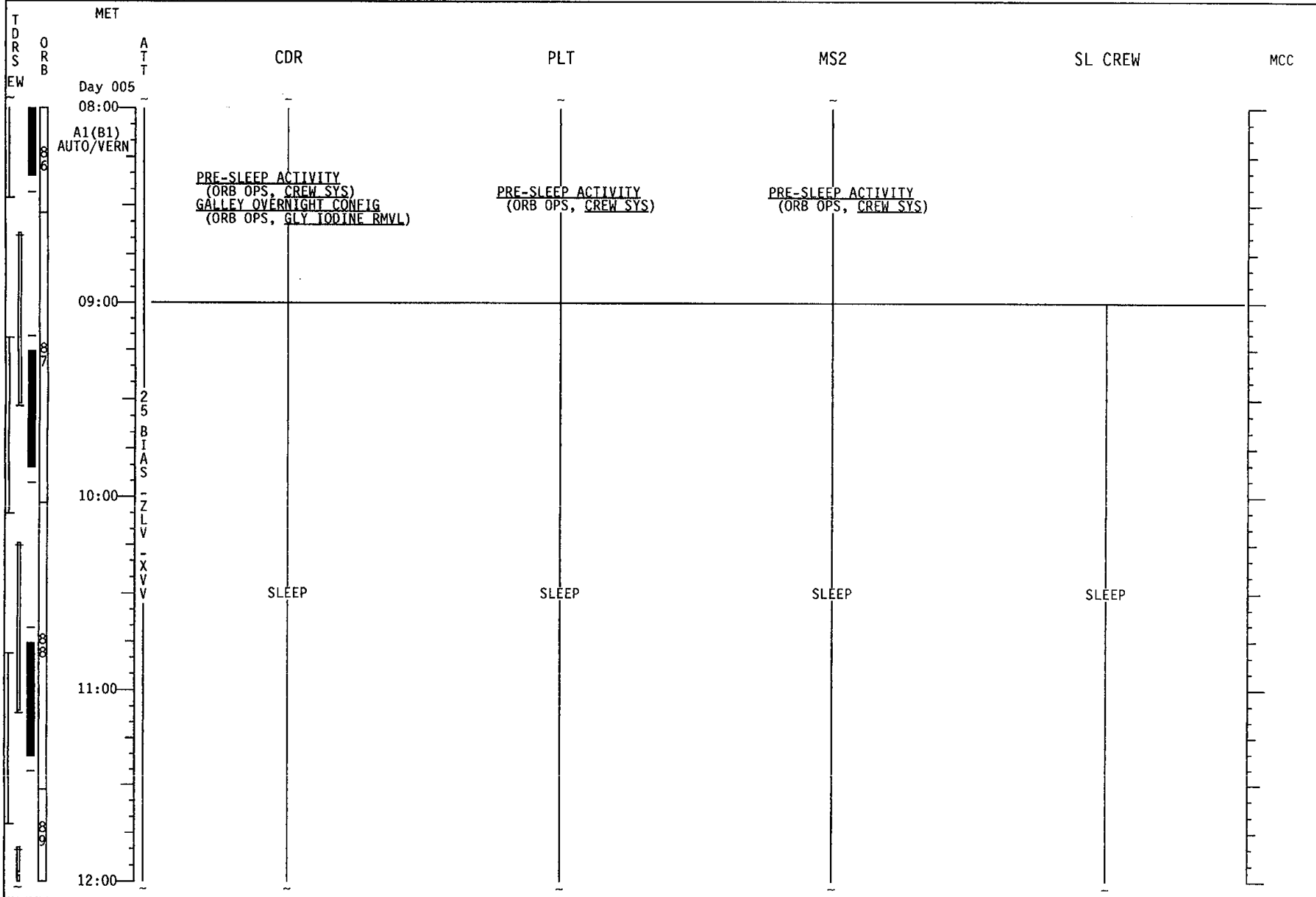
STS-90 (FD 06)



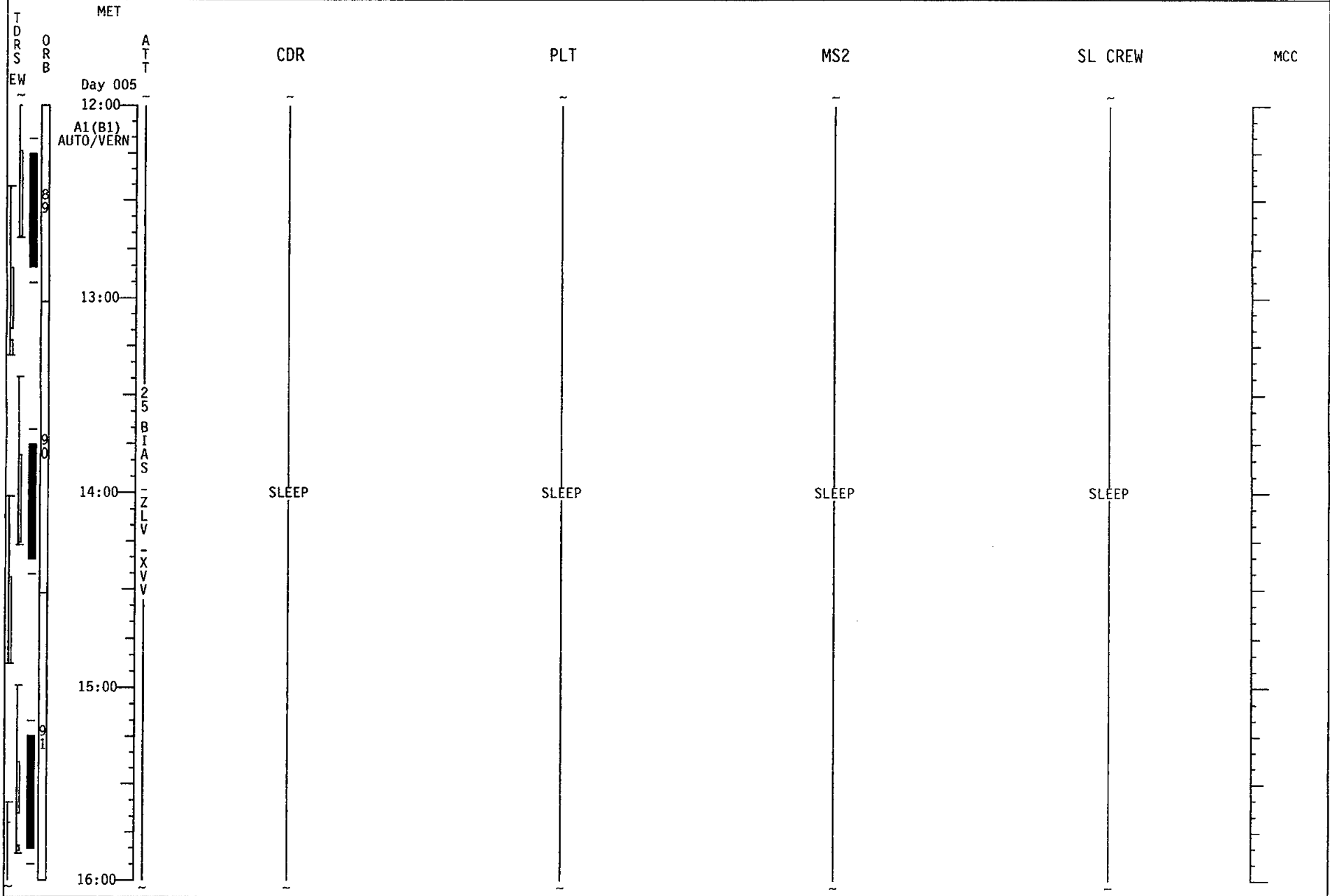
STS-90 (FD 06)



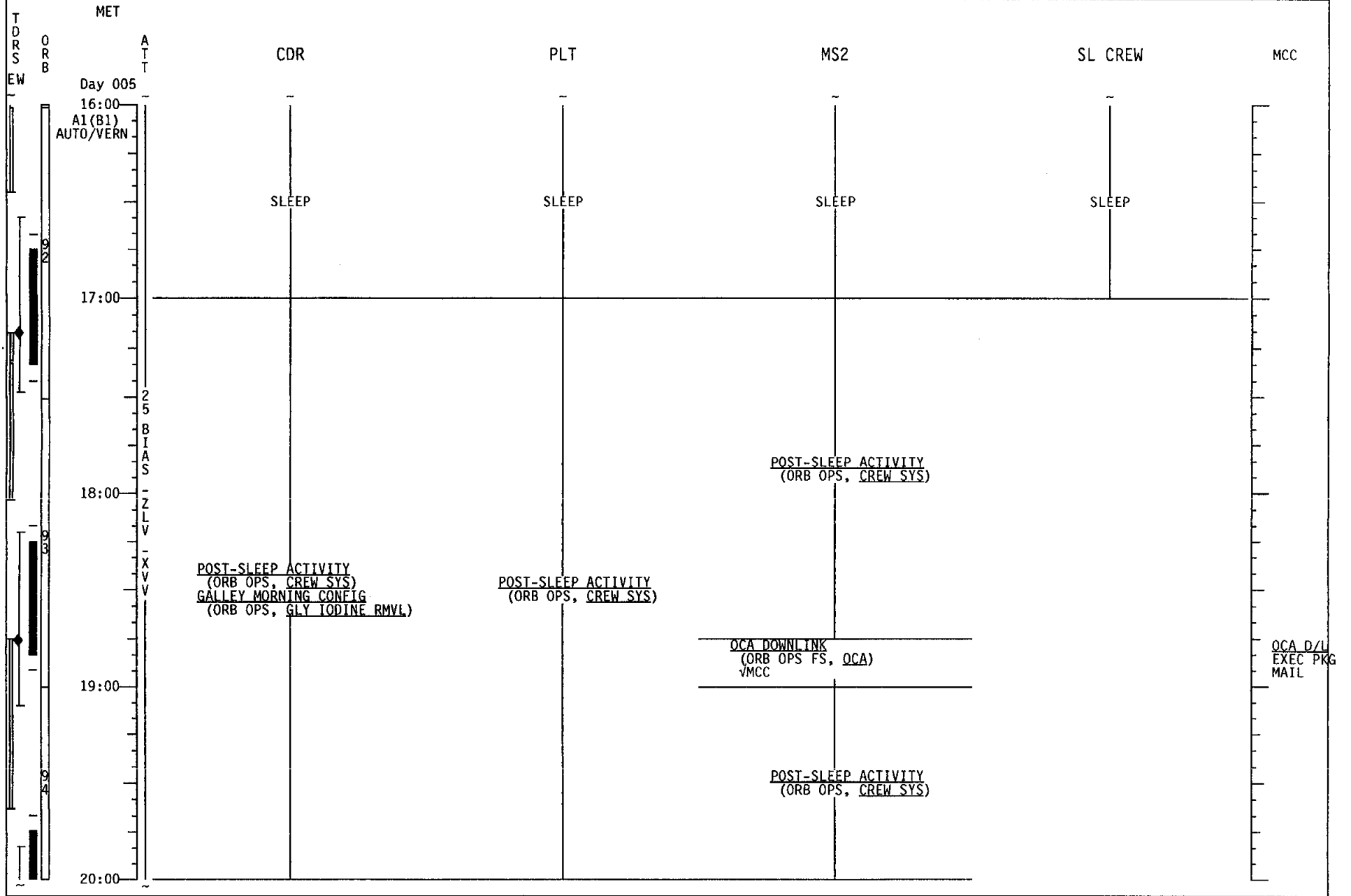
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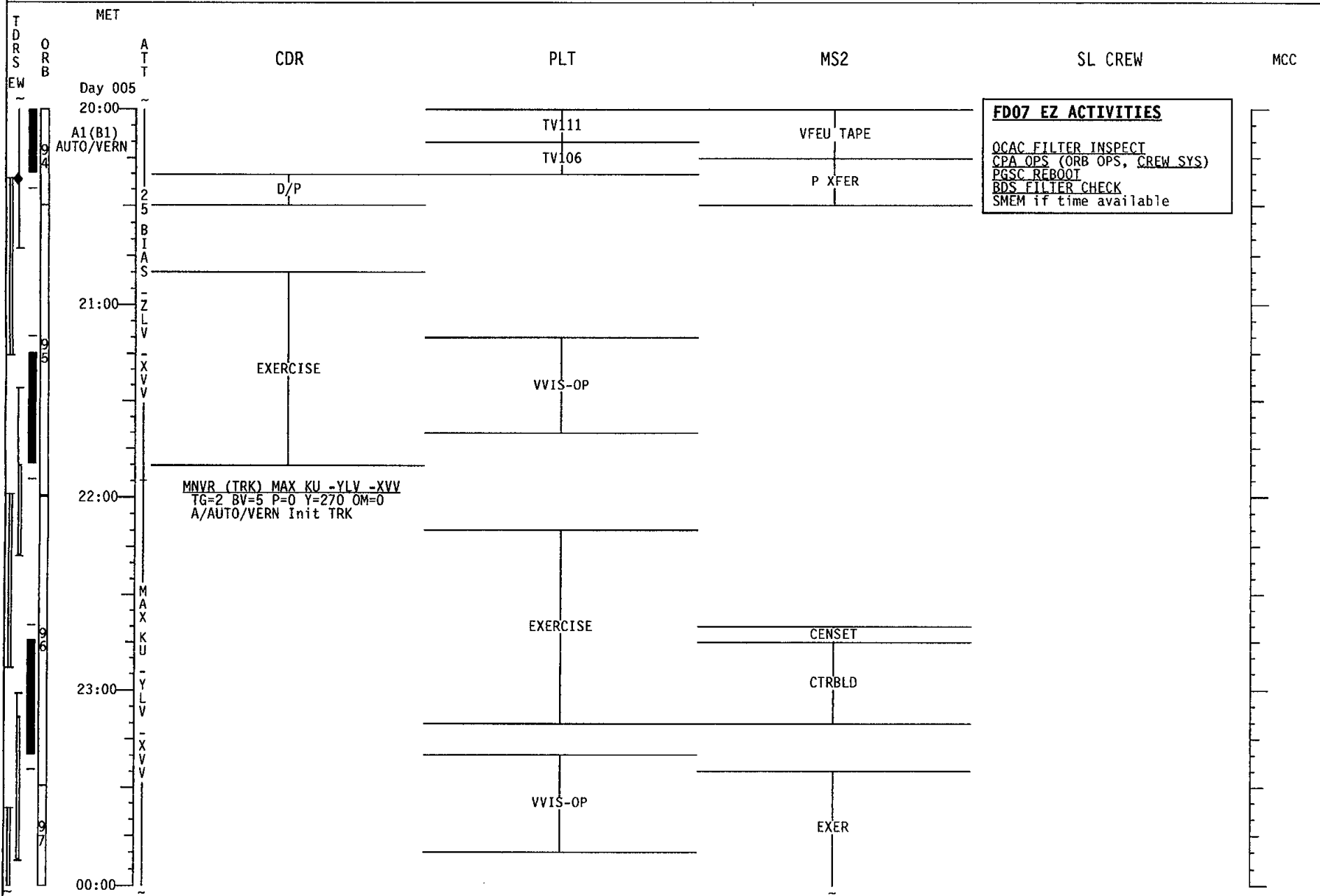
STS-90 (FD 06)



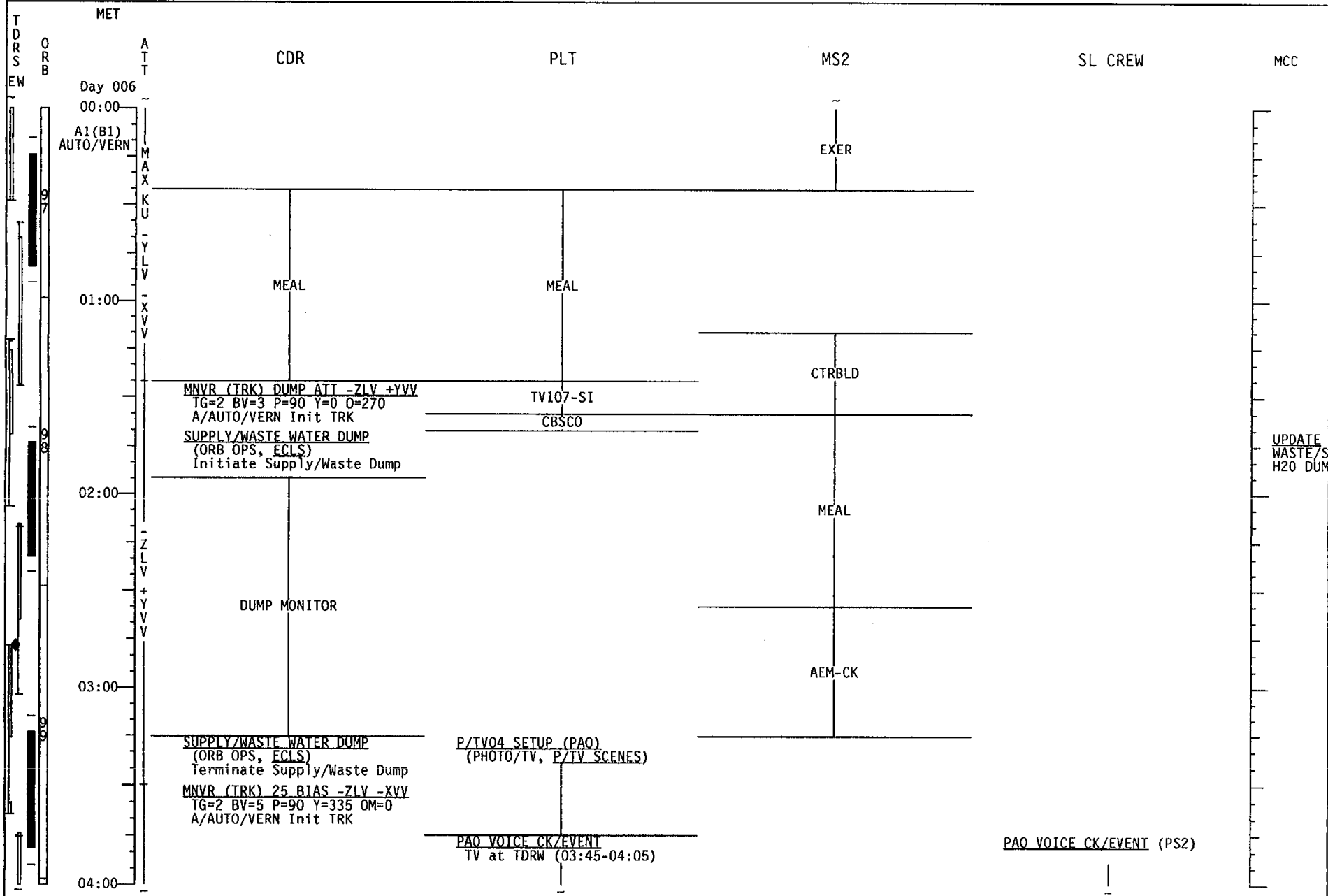
STS-90 (FD 06)



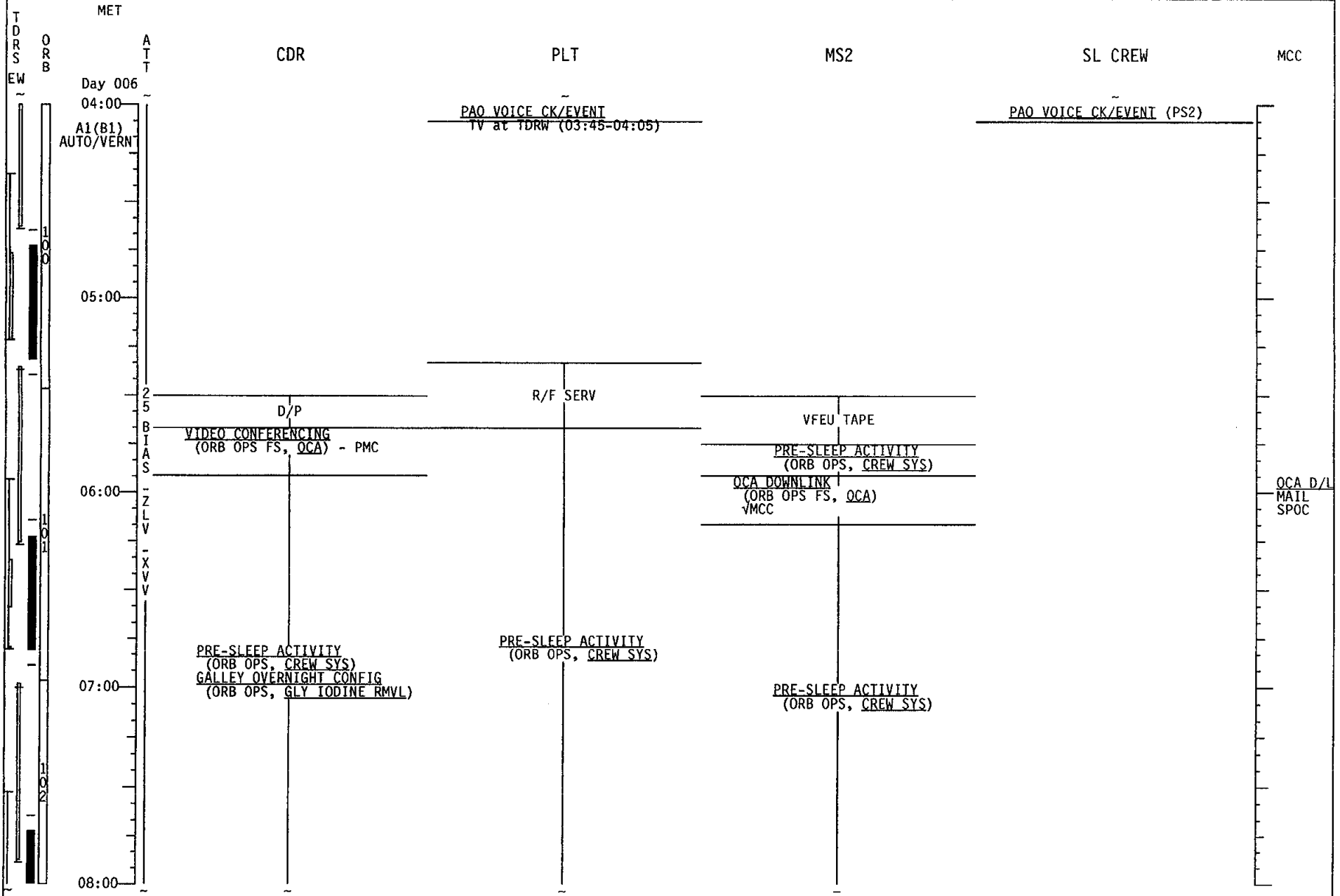
STS-90 (FD 07)



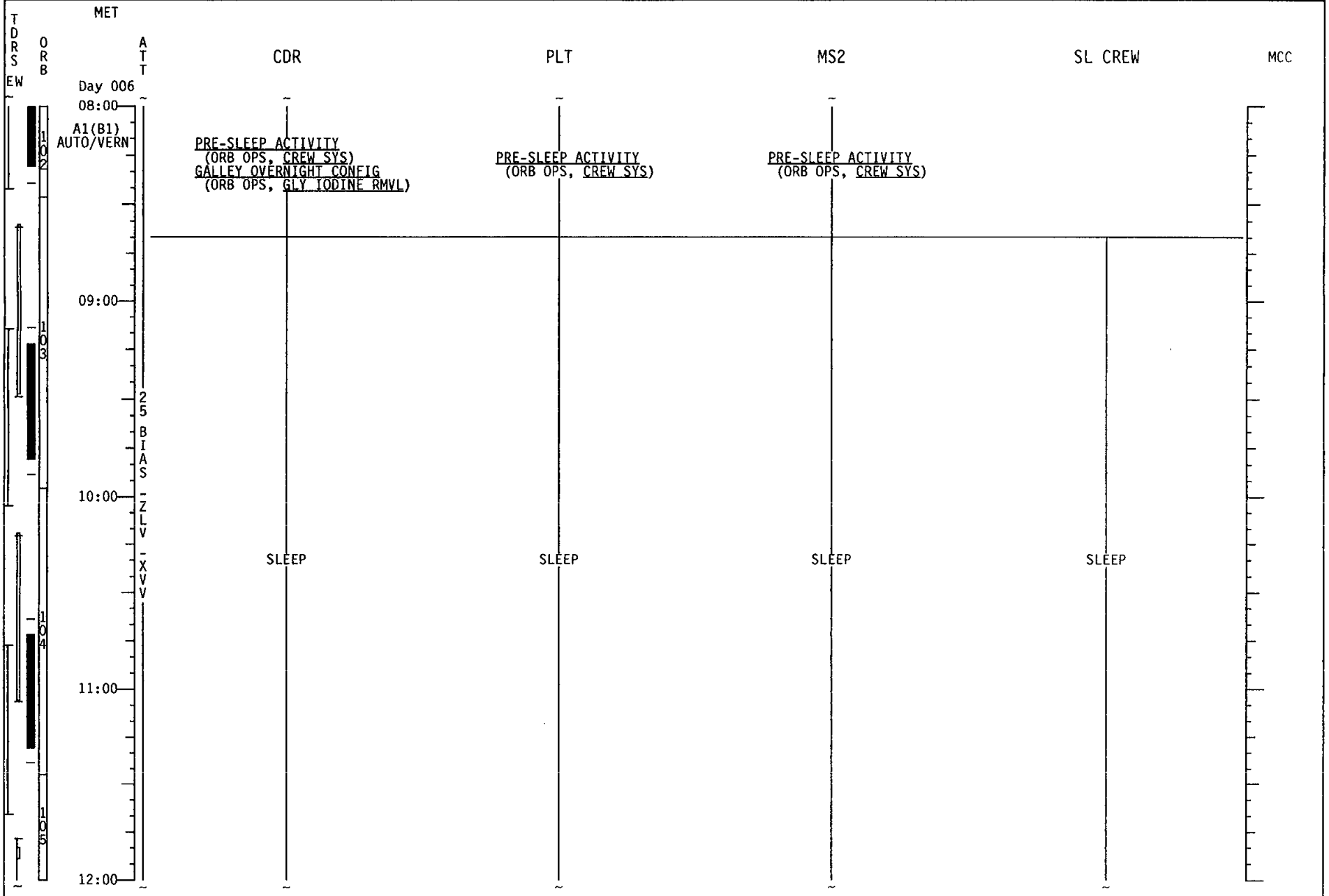
STS-90 (FD 07)



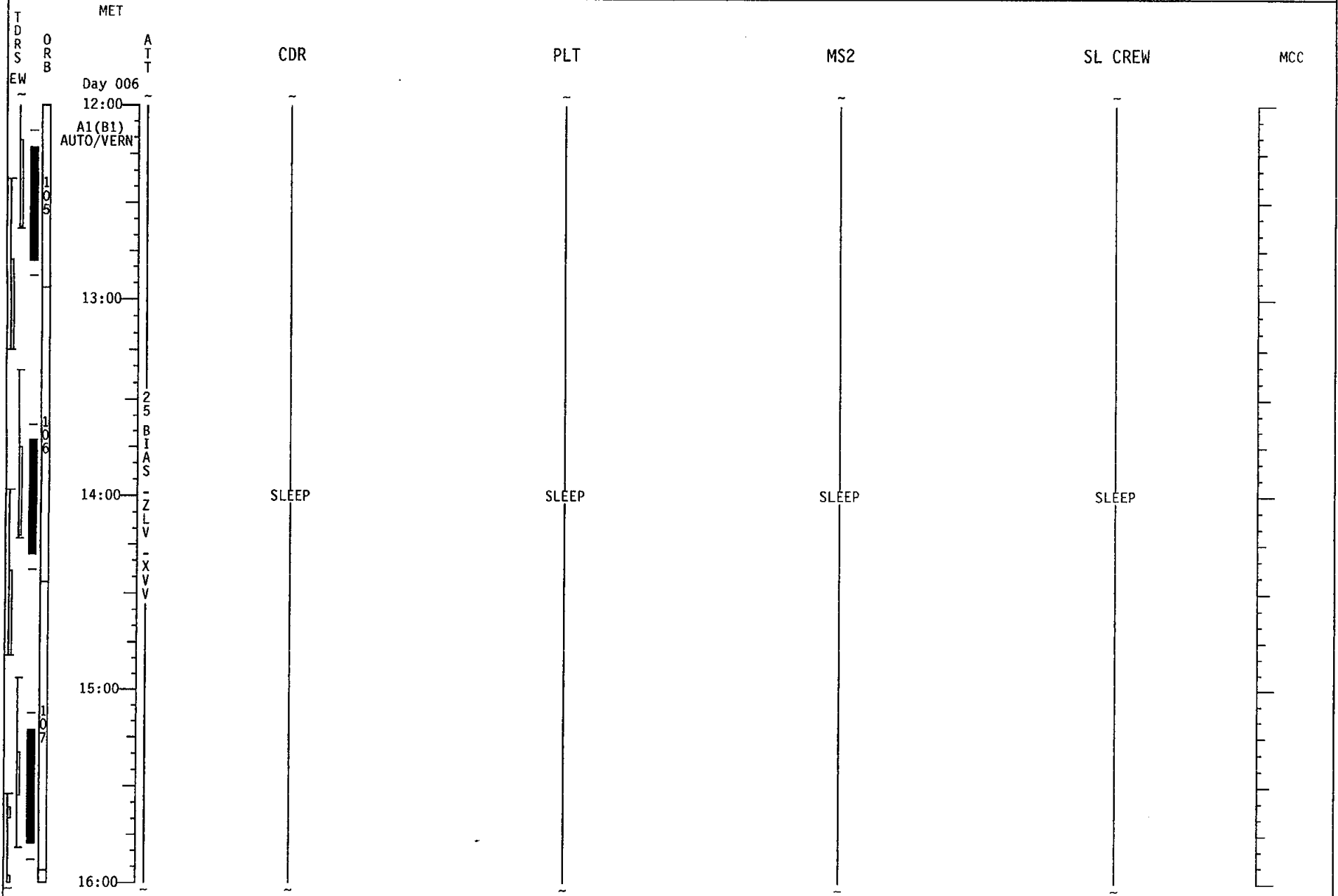
STS-90 (FD 07)



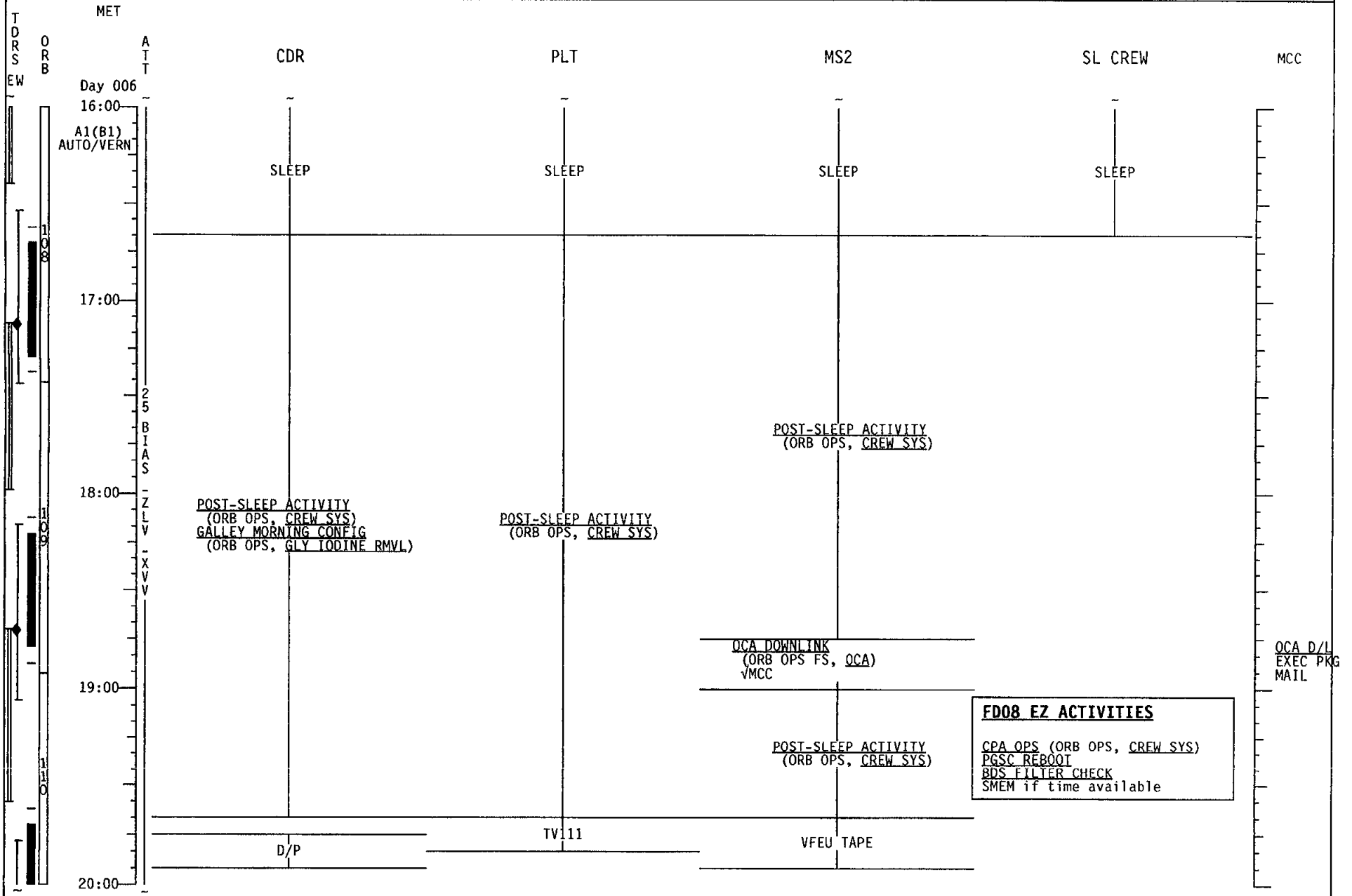
STS-90 (FD 07)



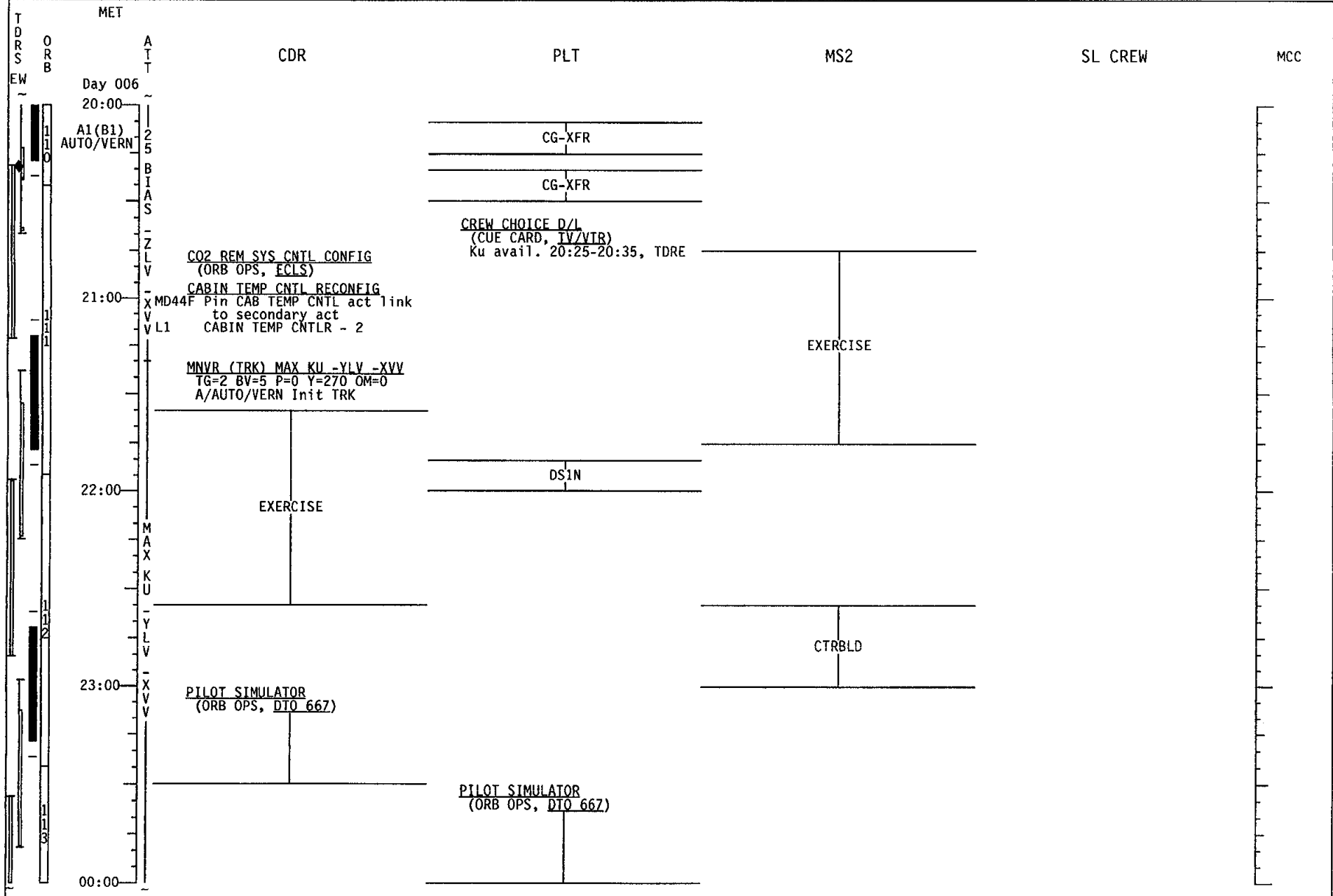
STS-90 (FD 07)



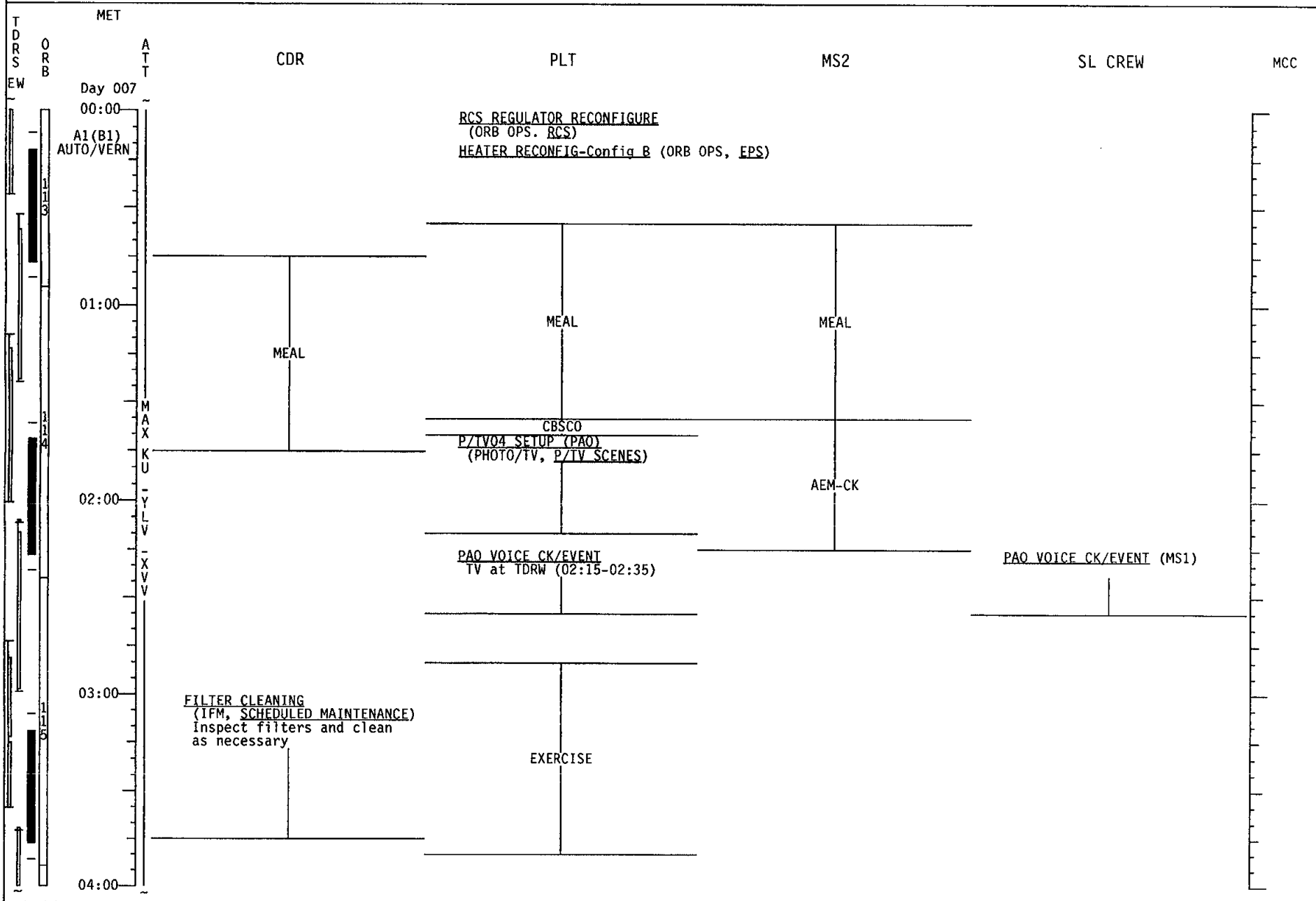
STS-90 (FD 07)



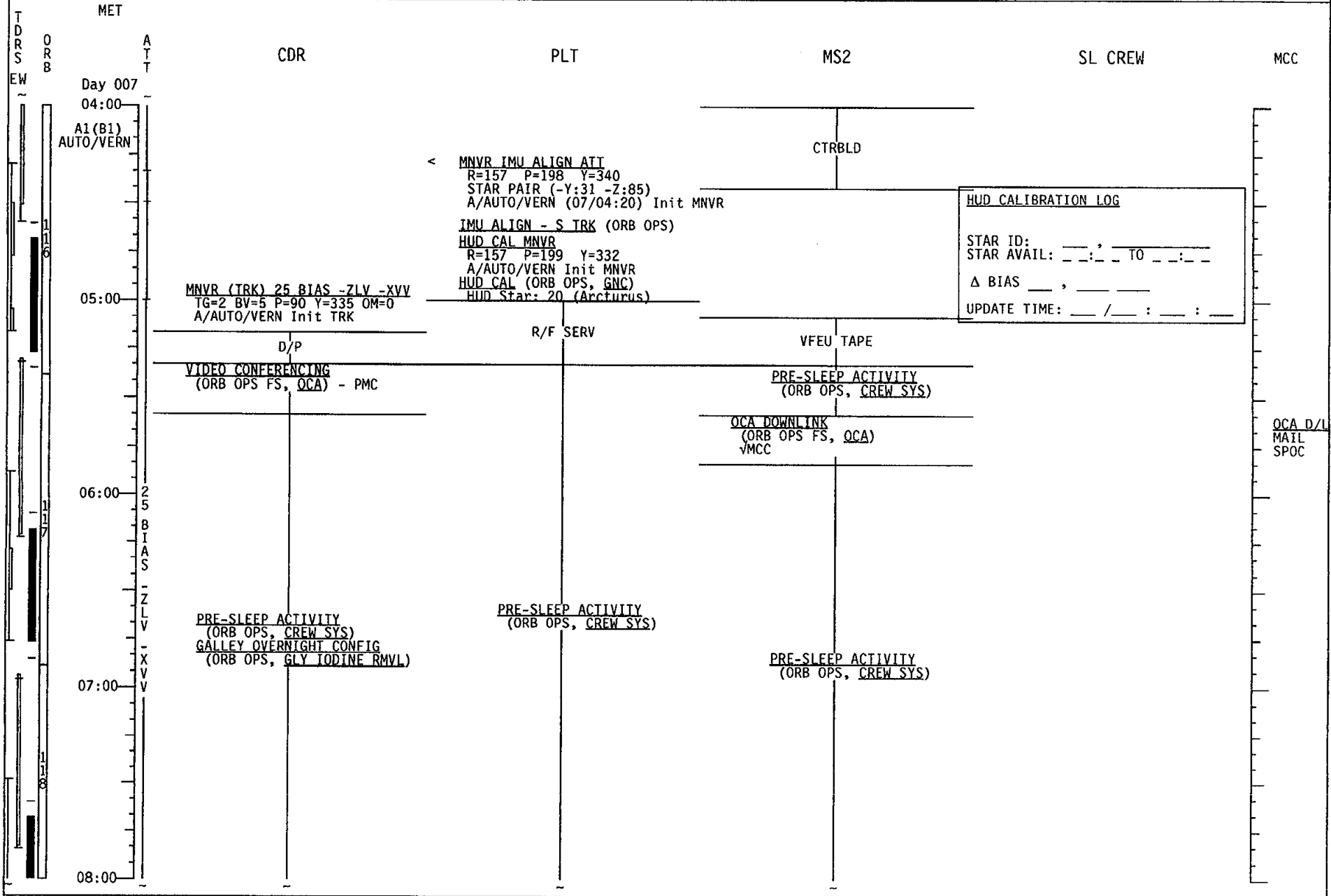
STS-90 (FD 08)



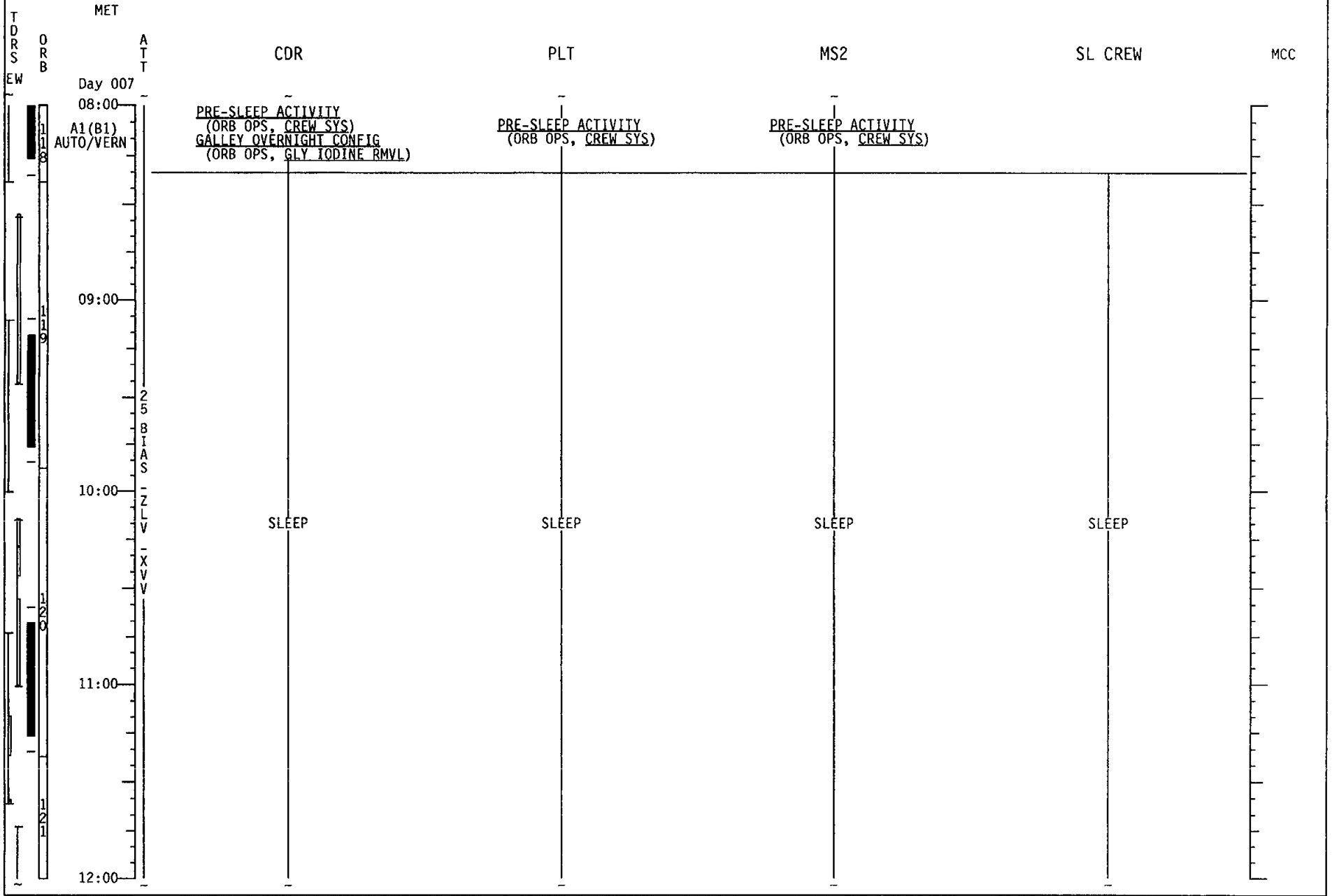
STS-90 (FD 08)



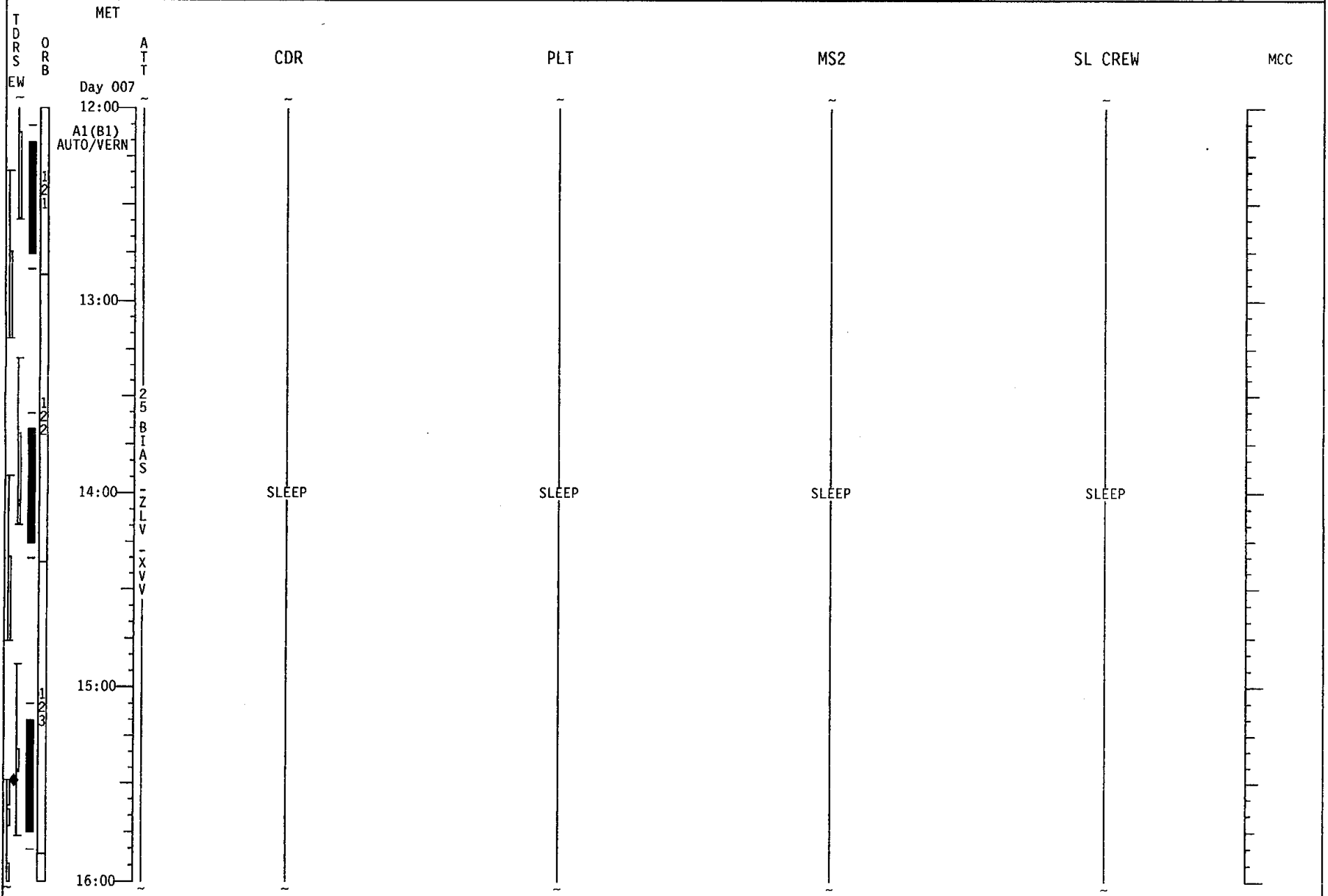
STS-90 (FD 08)



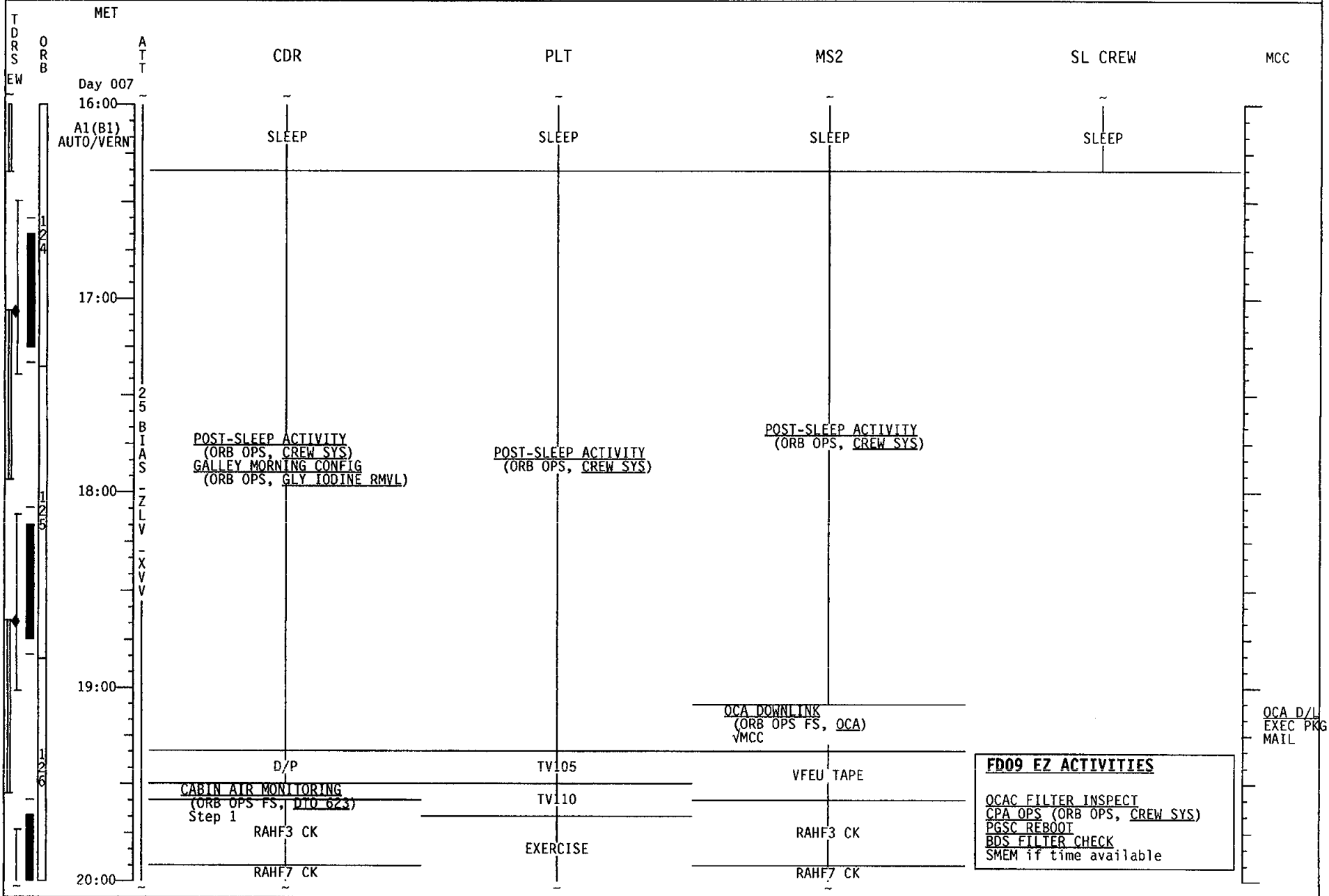
STS-90 (FD 08)



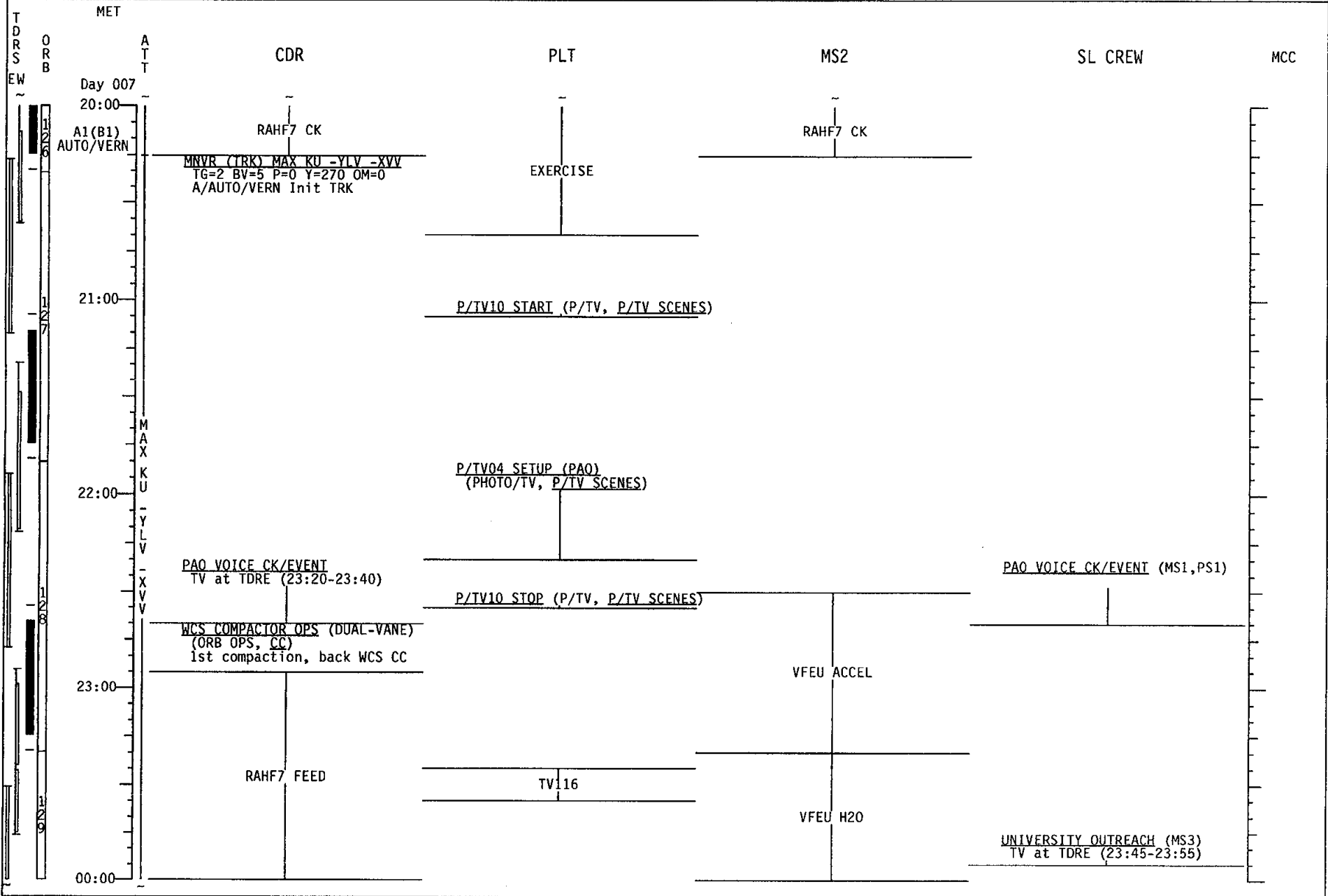
STS-90 (FD 08)



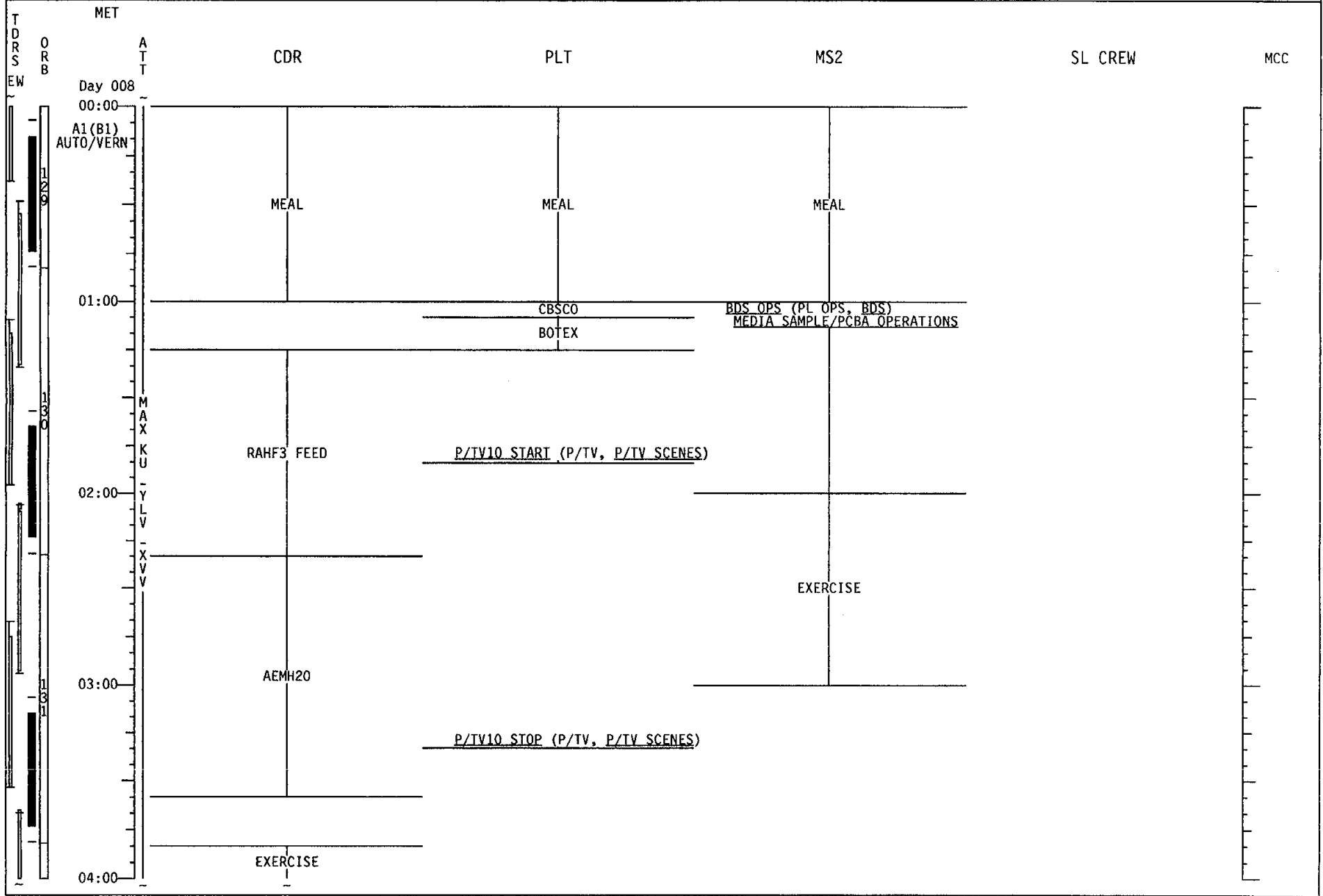
STS-90 (FD 08)



STS-90 (FD 09)



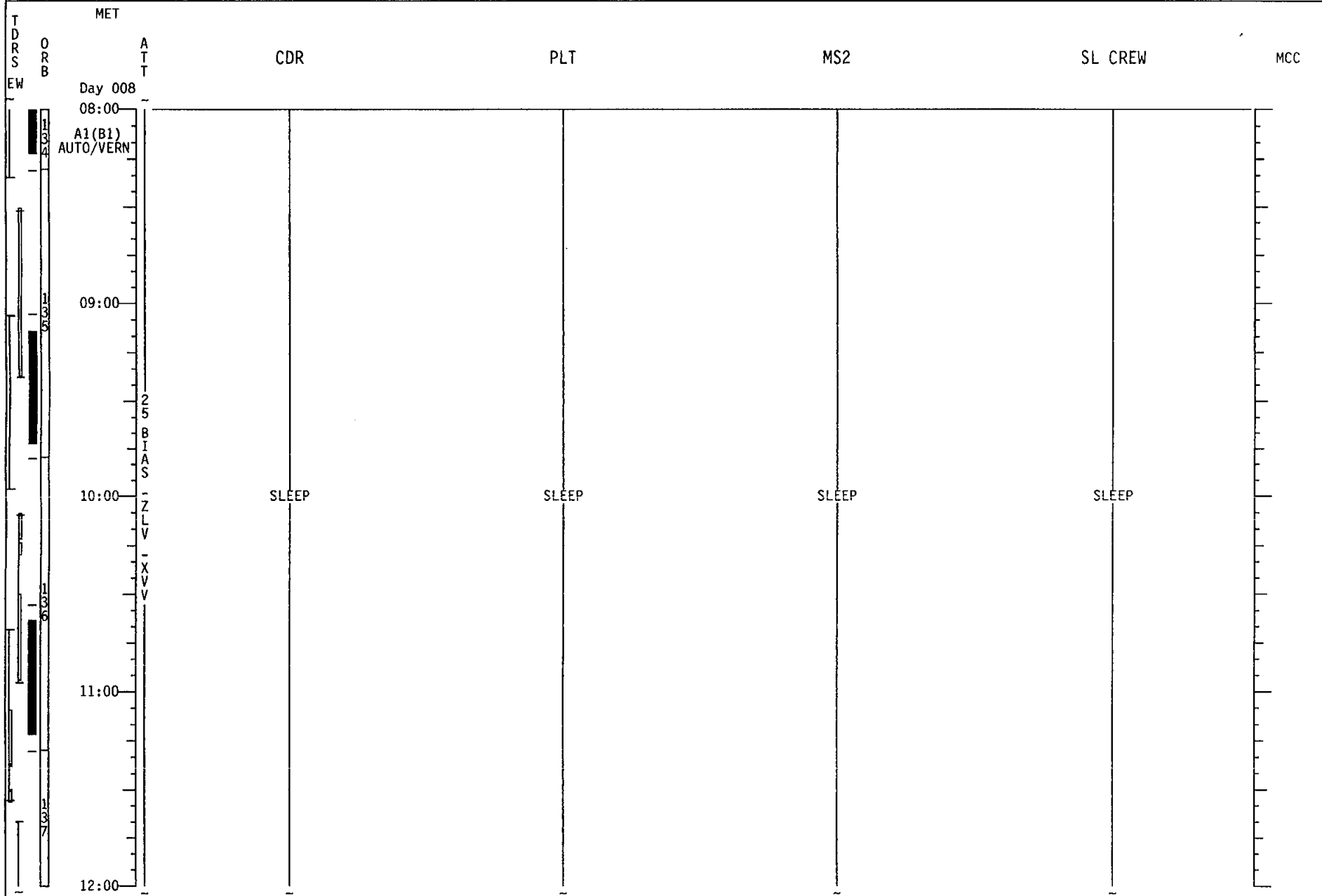
STS-90 (FD 09)



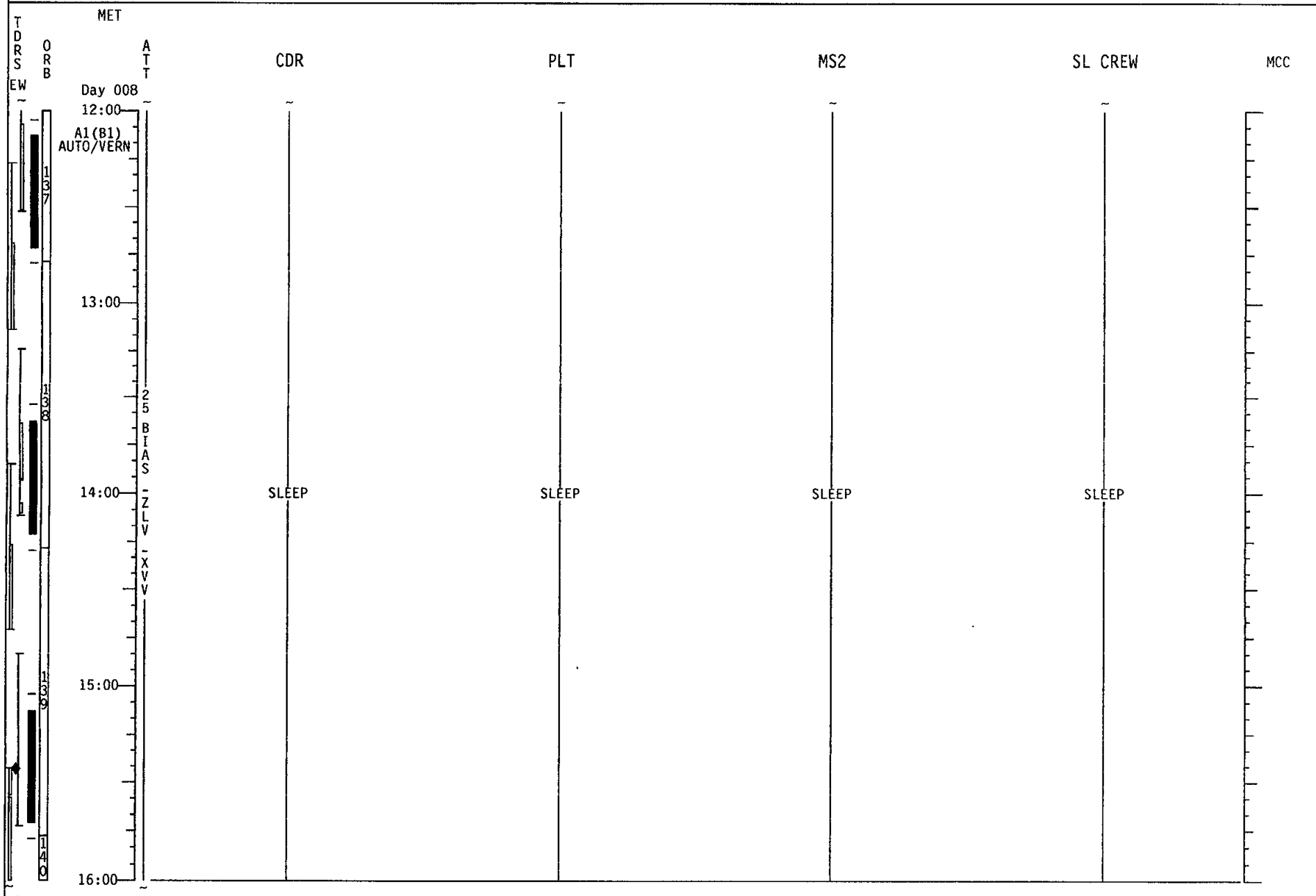
STS-90 (FD 09)

	MET	CDR	PLT	MS2	SL CREW	MCC
TDRS ORBS EW Day 008 04:00 A1(B1) AUTO/VERN 133 134 08:00	AIT ZLV +YVV BIAS ZLV -XVV	EXERCISE D/P MNVR (TRK) DUMP ATT -ZLV +YVV TG=2 BV=3 P=90 Y=0 O=270 A/AUTO/VERN Init TRK SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS) Initiate Supply Dump VIDEO CONFERENCING (ORB OPS FS, OCA) - PMC PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS) SUPPLY/WASTE WATER DUMP (ORB OPS, ECLS) Terminate Supply Dump MNVR (TRK) 25 BIAS -ZLV -XVV TG=2 BV=5 P=90 Y=335 OM=0 A/AUTO/VERN Init TRK PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS) GALLEY OVERNIGHT CONFIG (ORB OPS, GLY IODINE RMVL)	PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	R/F SERV VFEU TAPE OCA DOWNLINK (ORB OPS FS, OCA) √MCC PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)	UPDATE H2O SPLY DUMF QTY TK A & B OCA D/L MAIL SPOC	

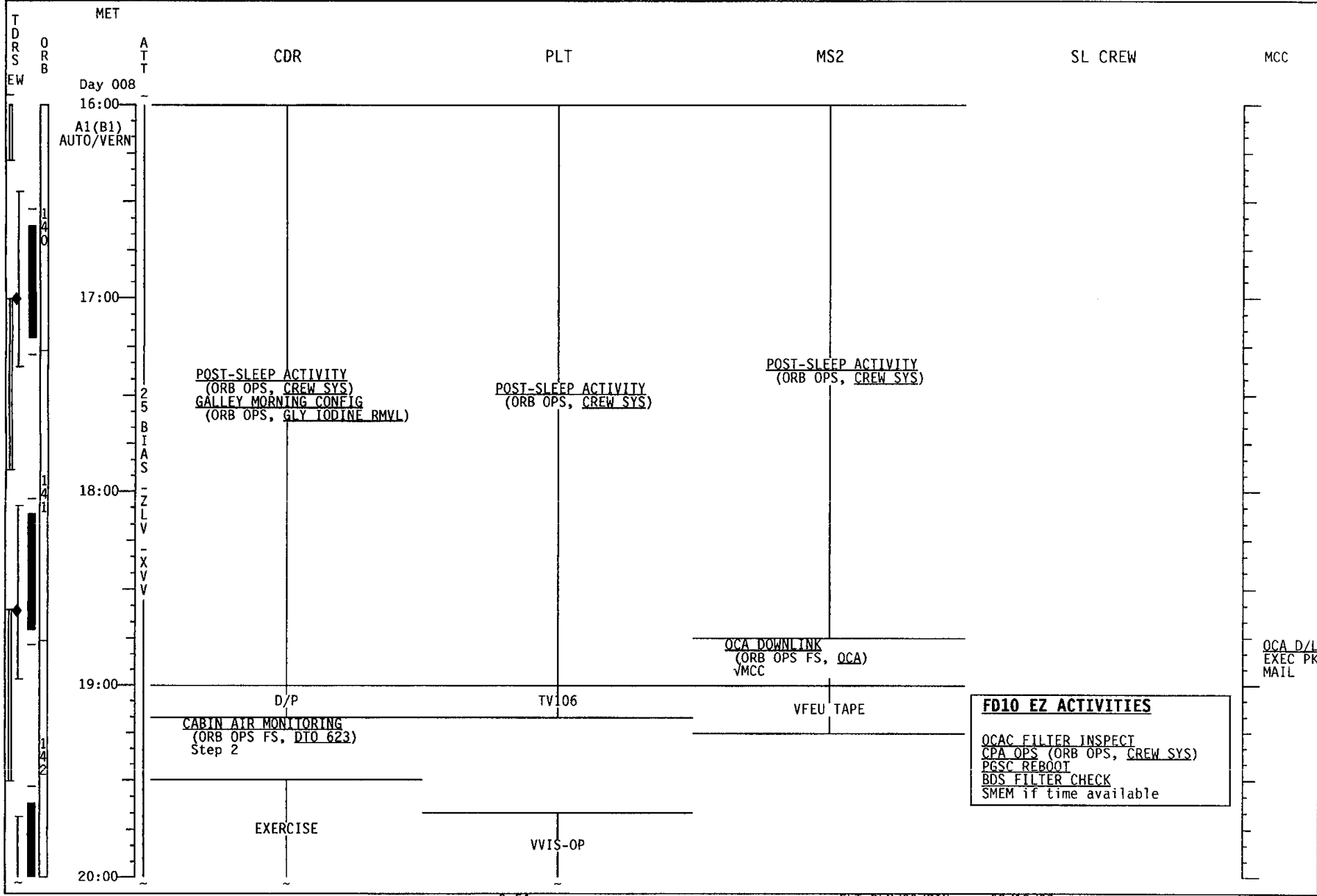
STS-90 (FD 09)



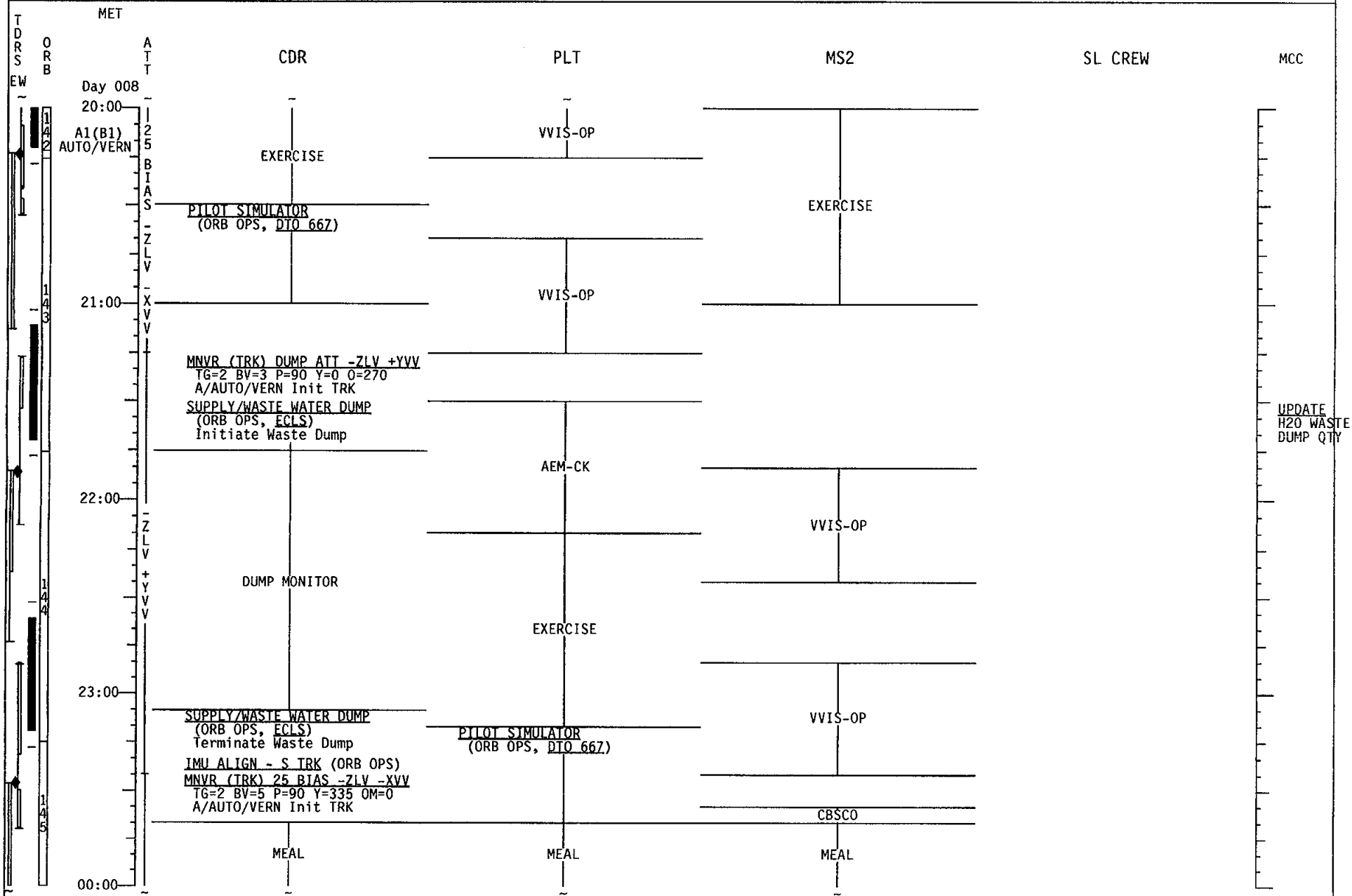
STS-90 (FD 09)



STS-90 (FD 10)

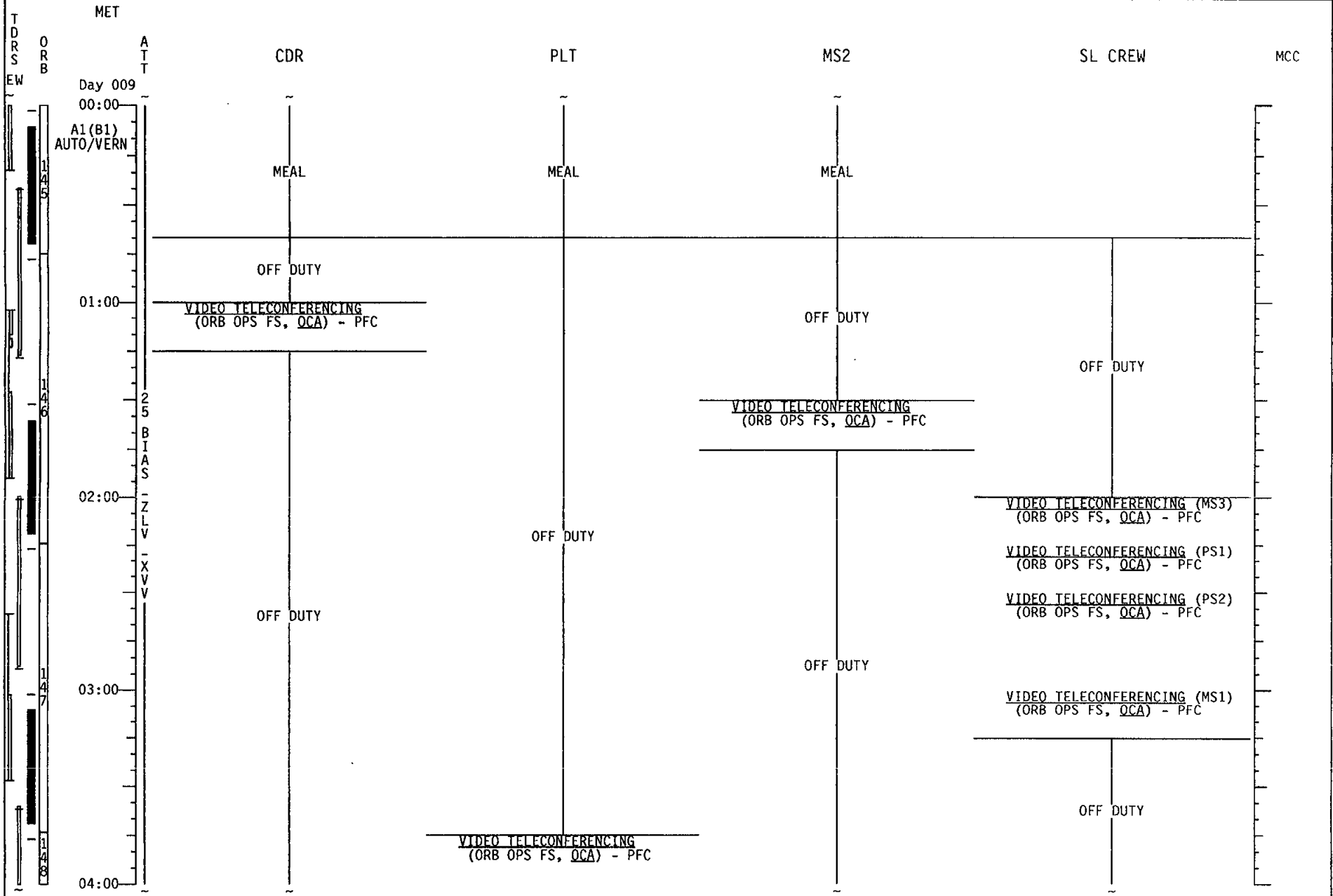


STS-90 (FD 10)

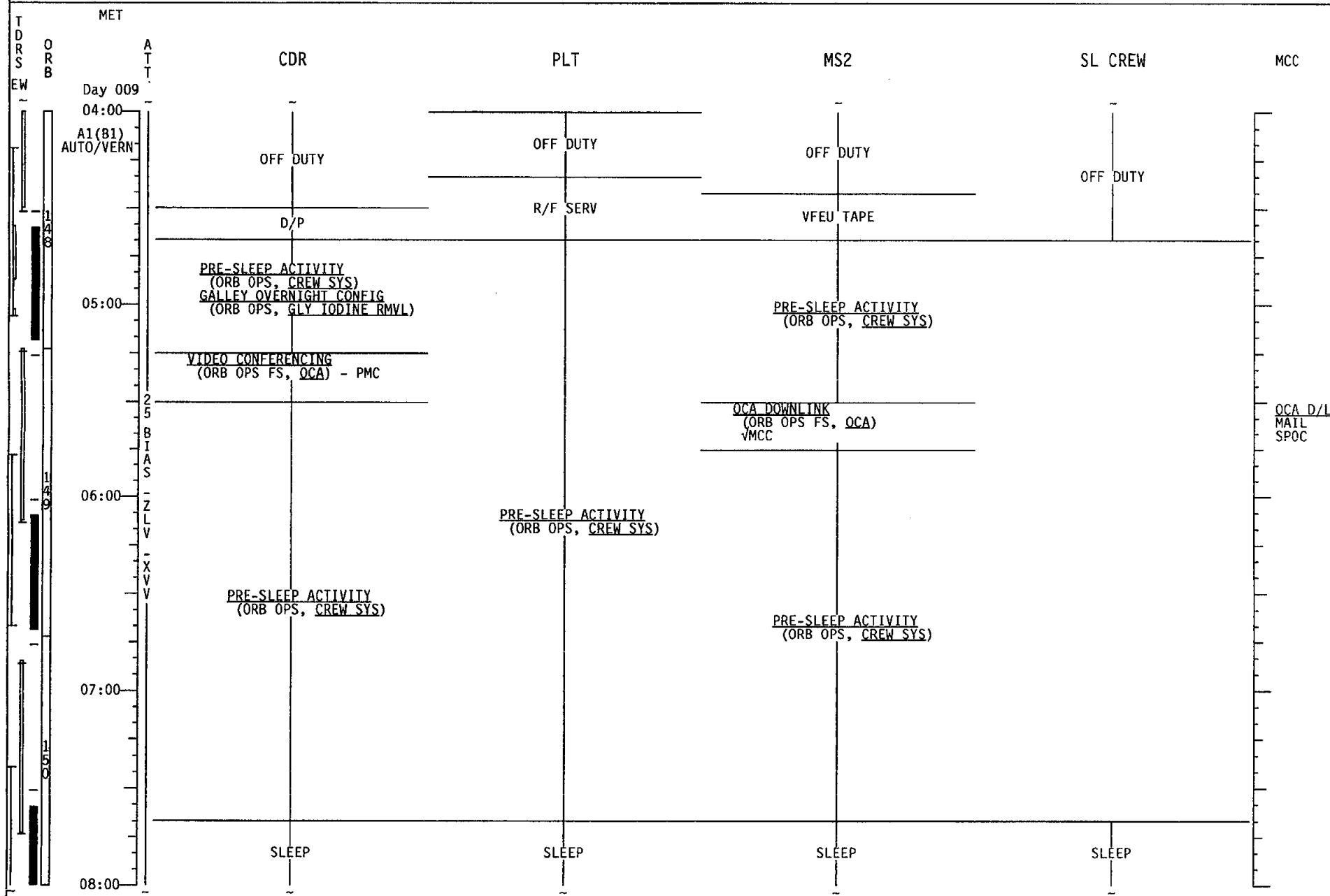


UPDATE
H2O WASTE
DUMP QTY

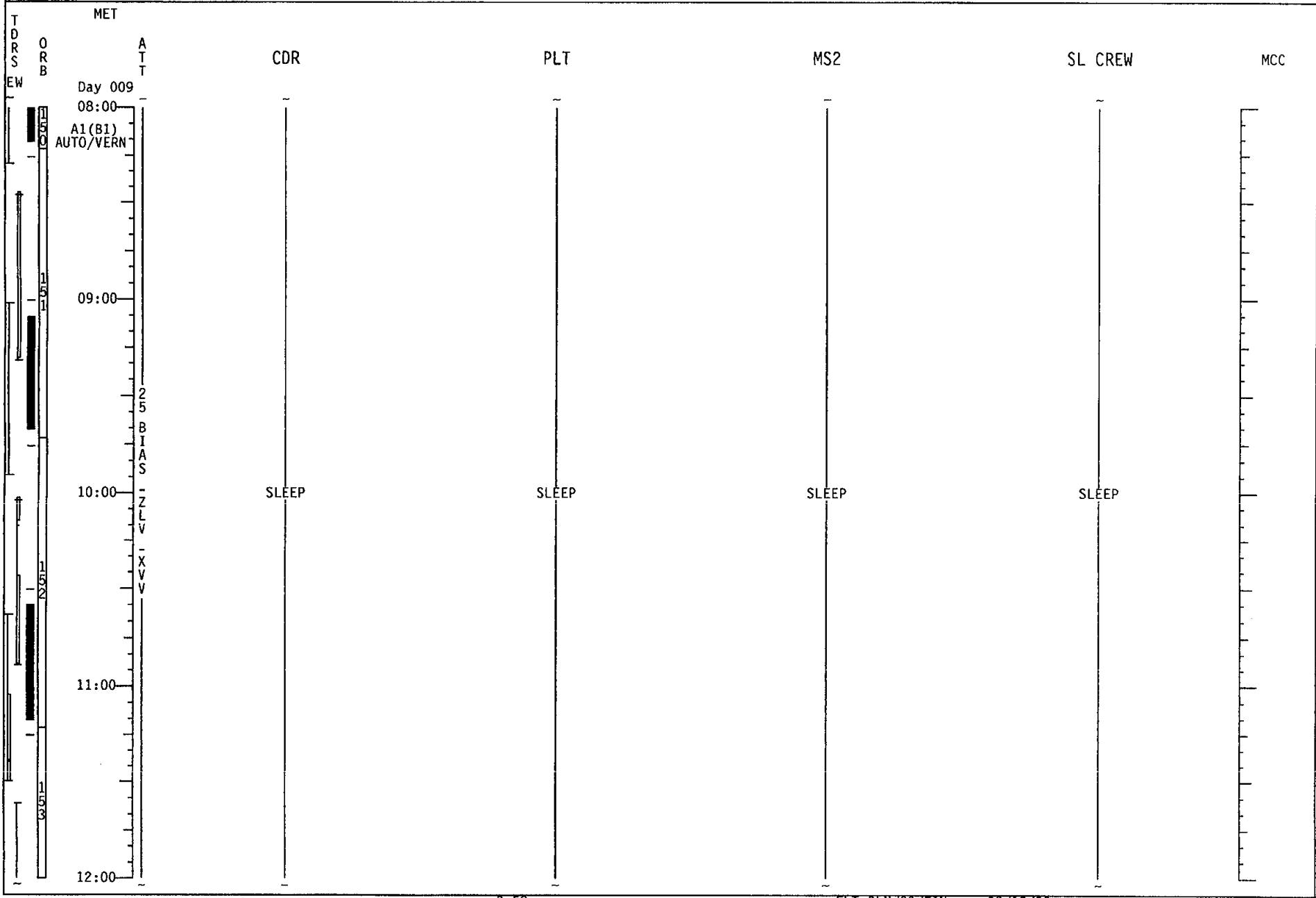
STS-90 (FD 10)



STS-90 (FD 10)



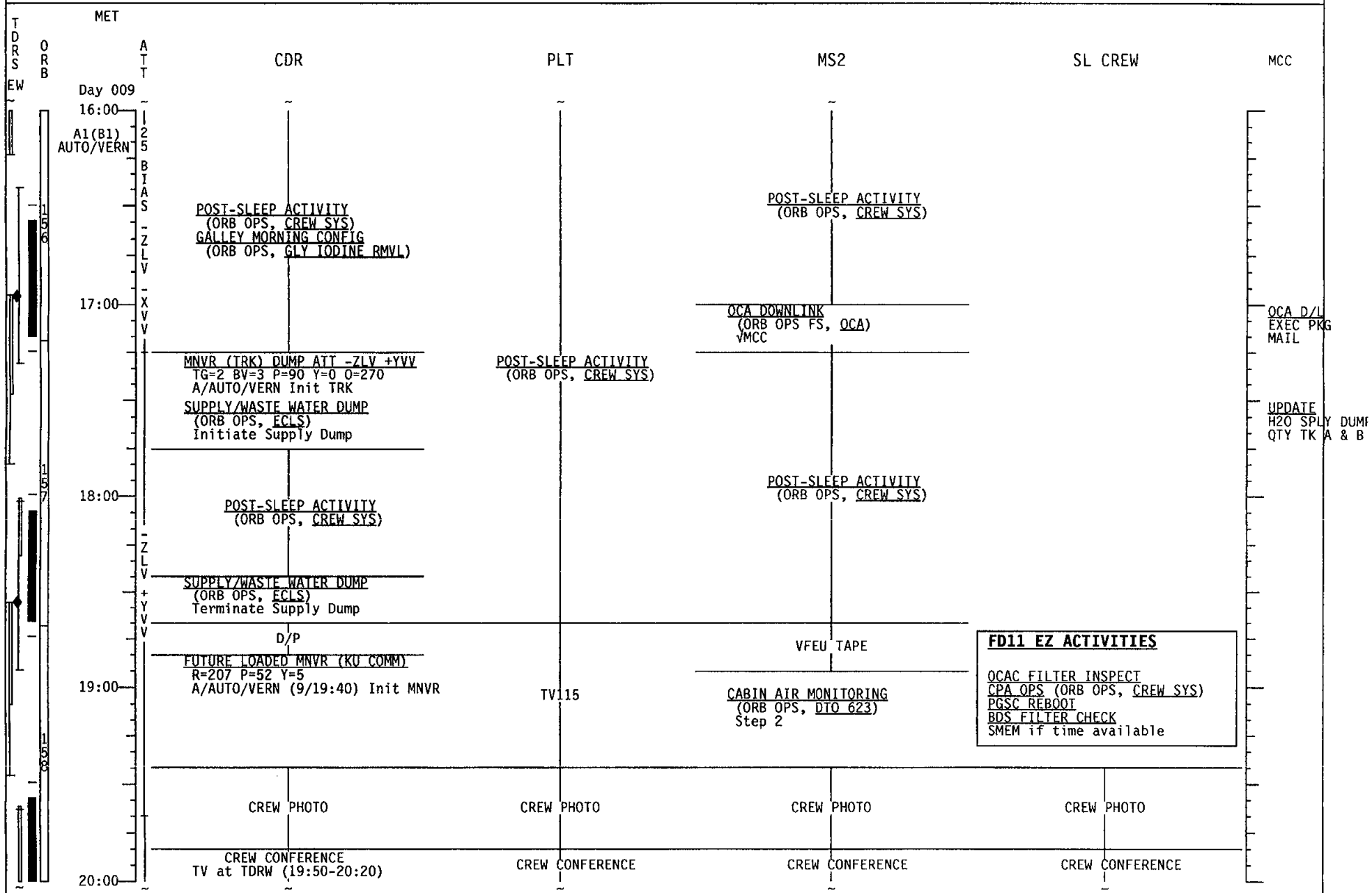
STS-90 (FD 10)



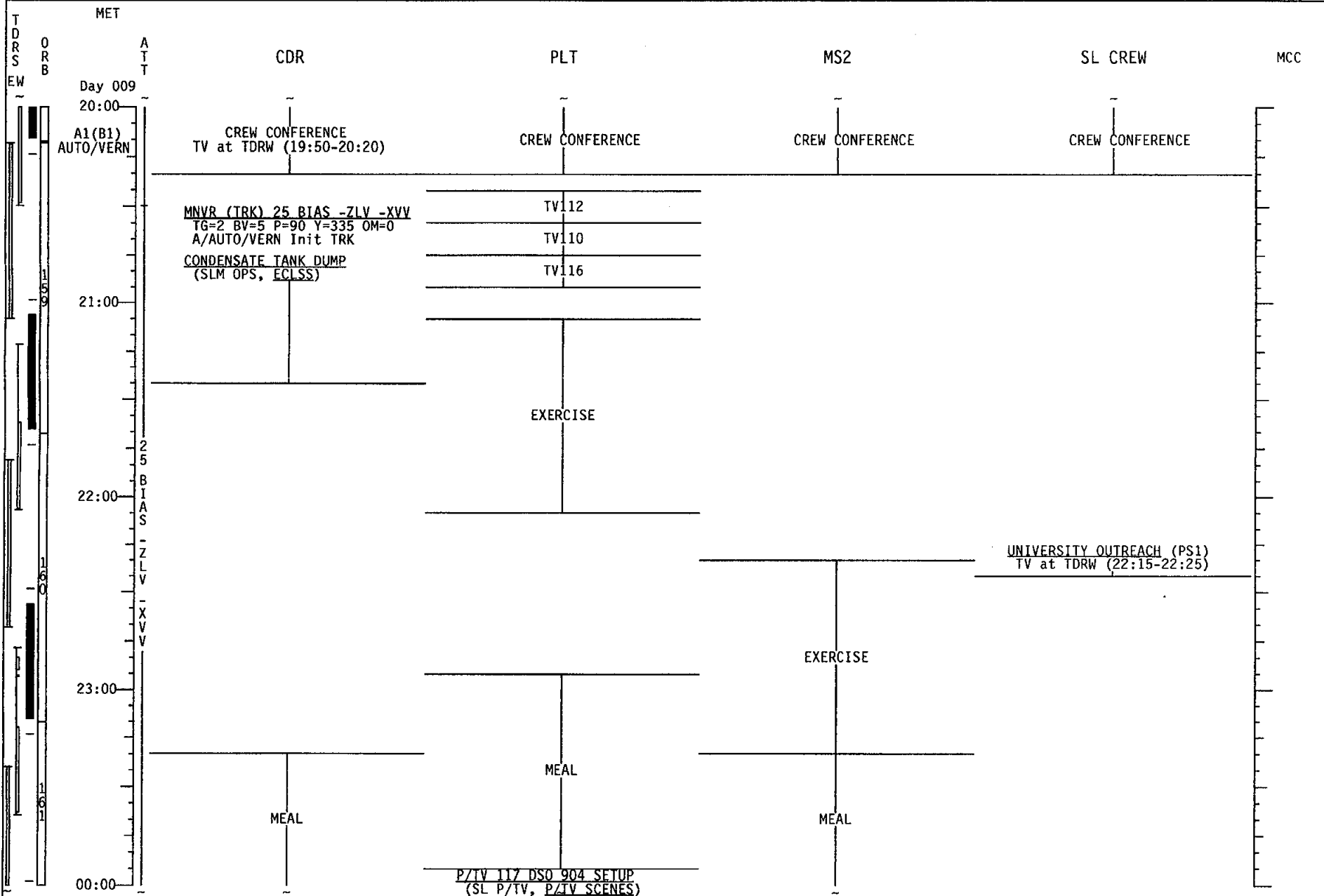
STS-90 (FD 10)



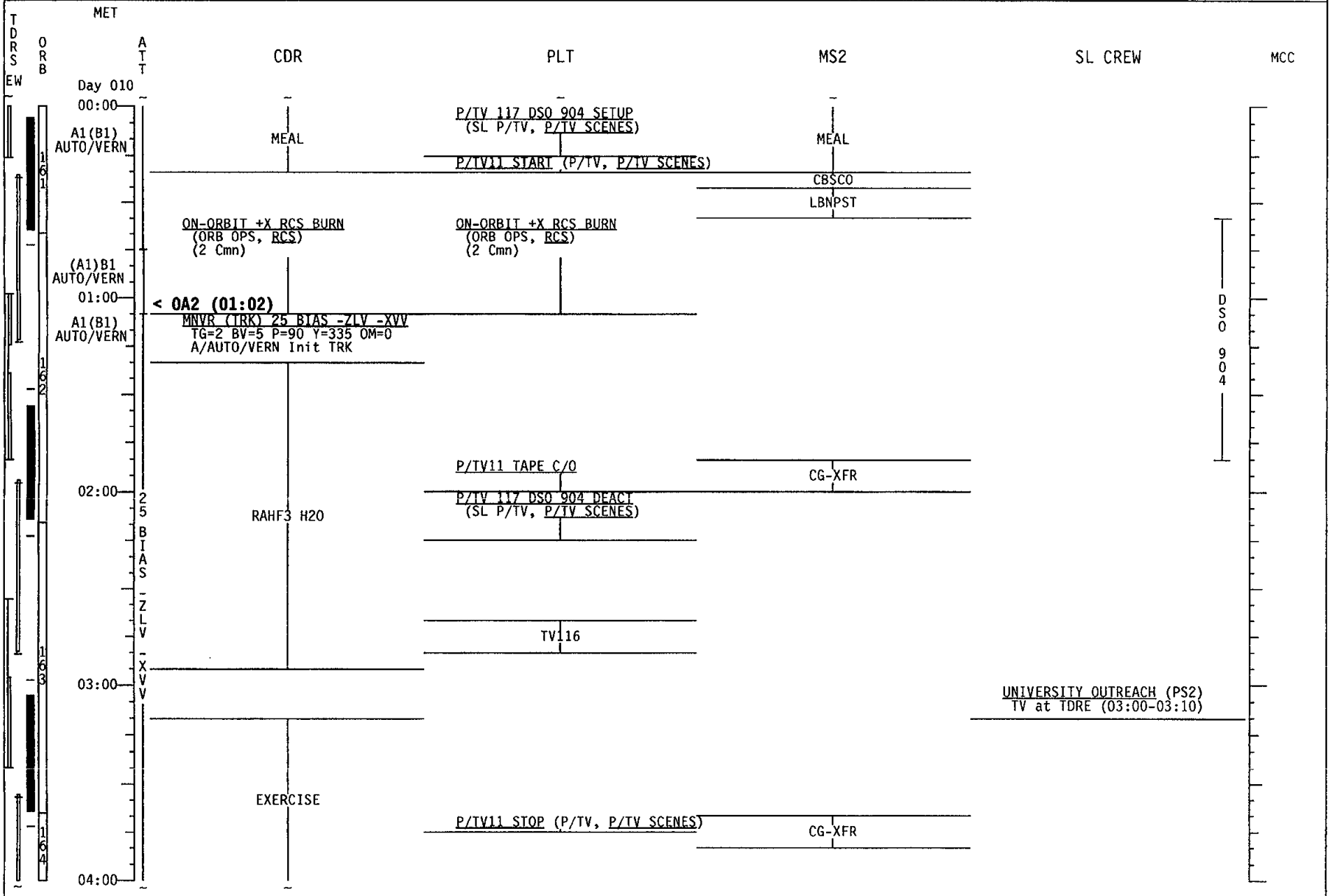
STS-90 (FD 11)



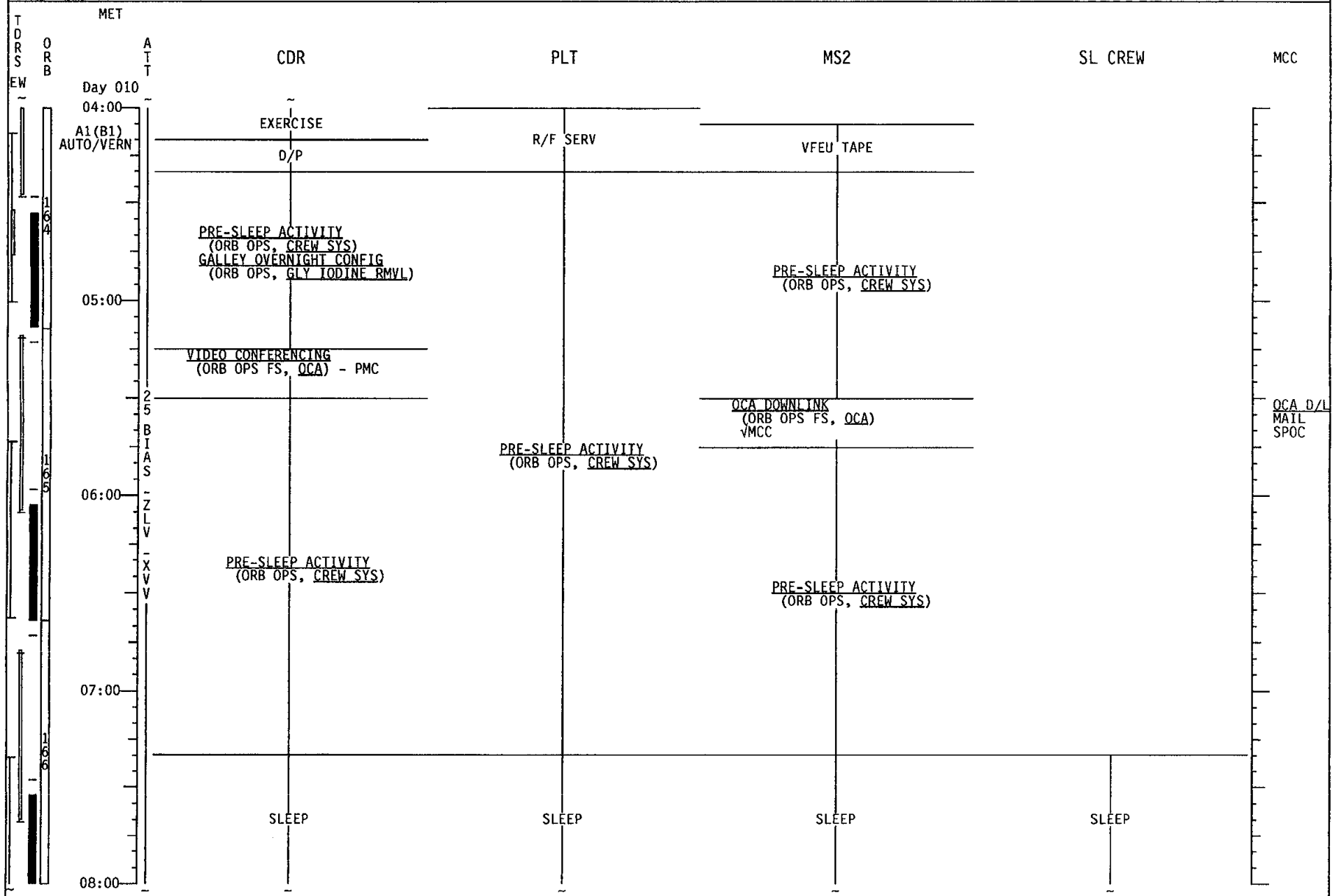
STS-90 (FD 11)



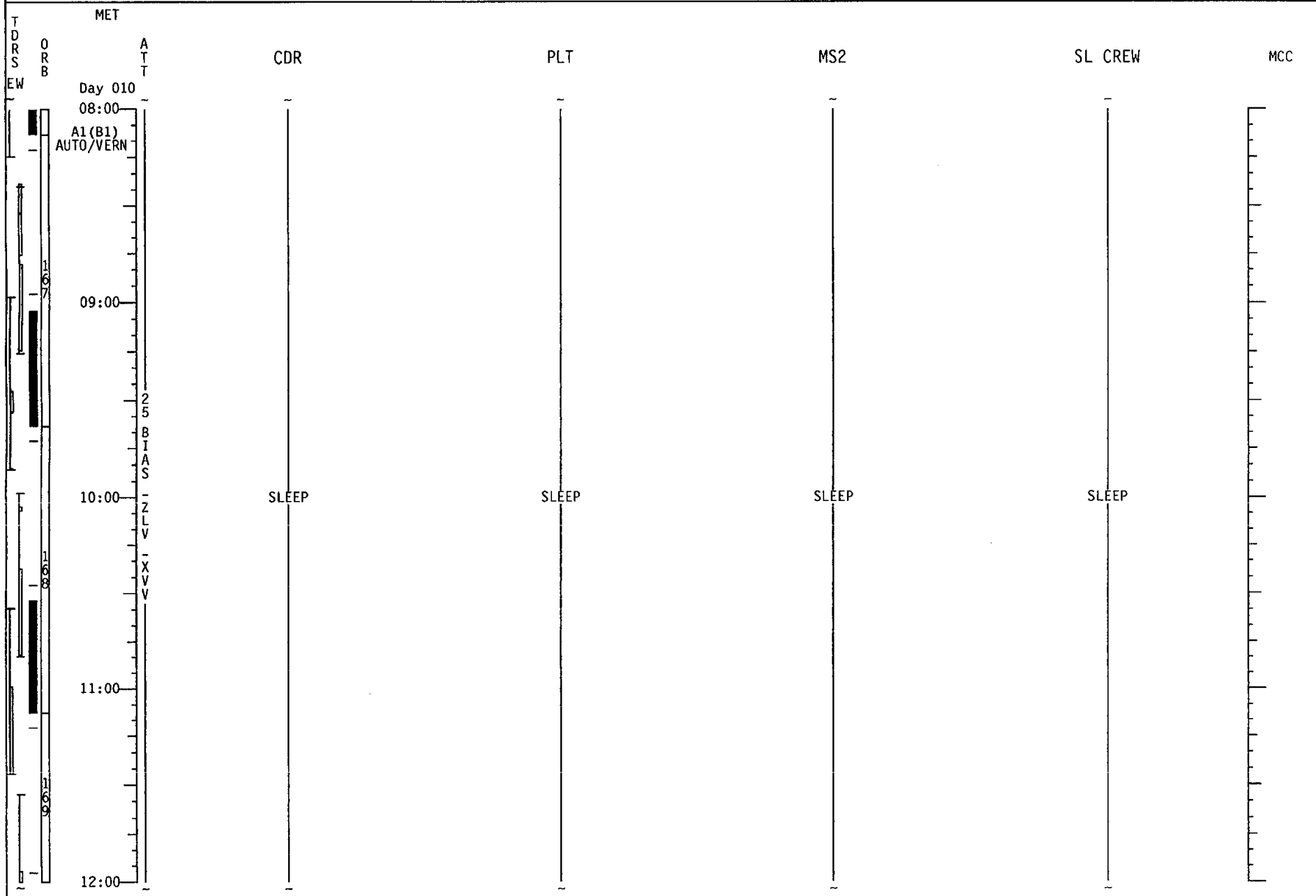
STS-90 (FD 11)



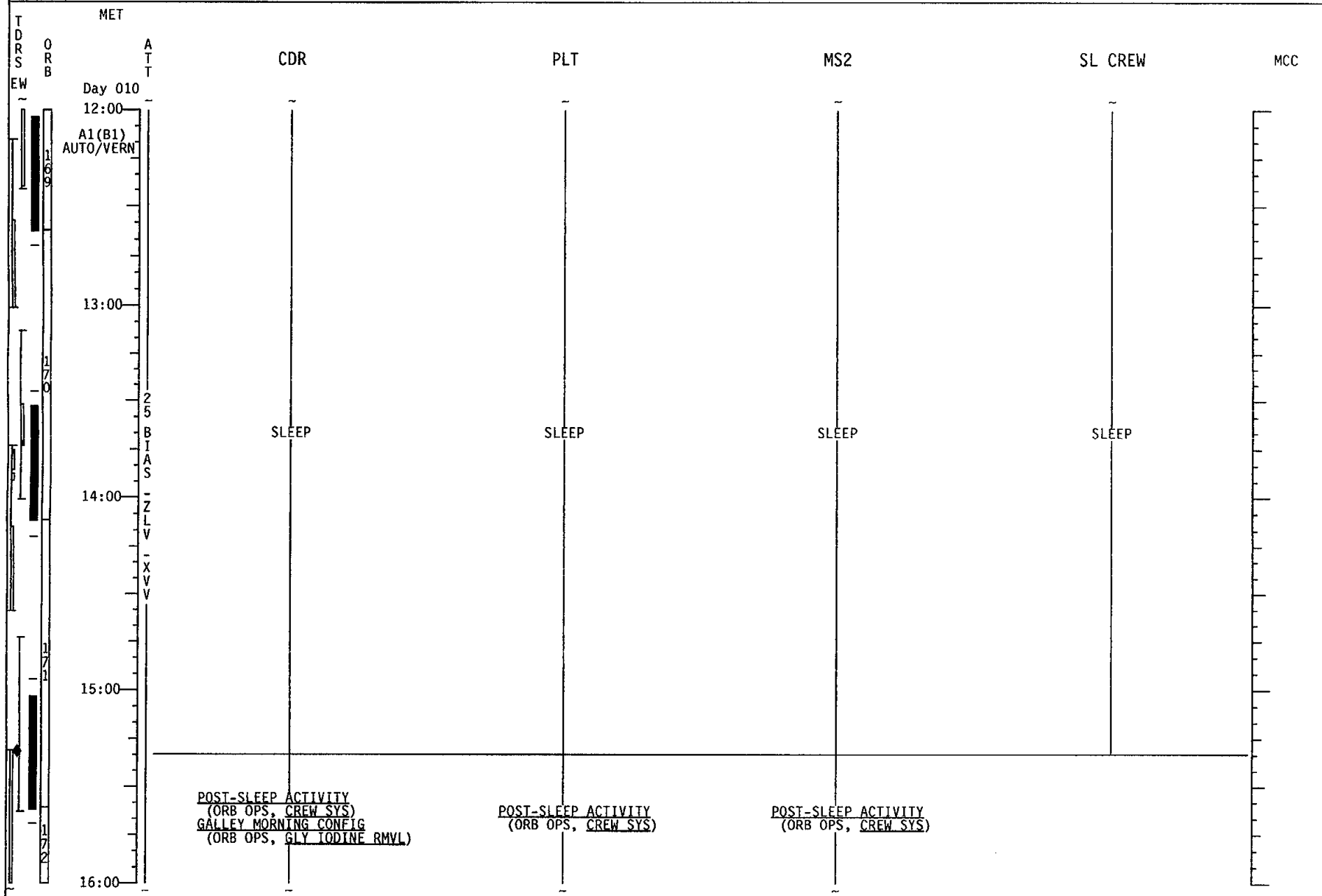
STS-90 (FD 11)



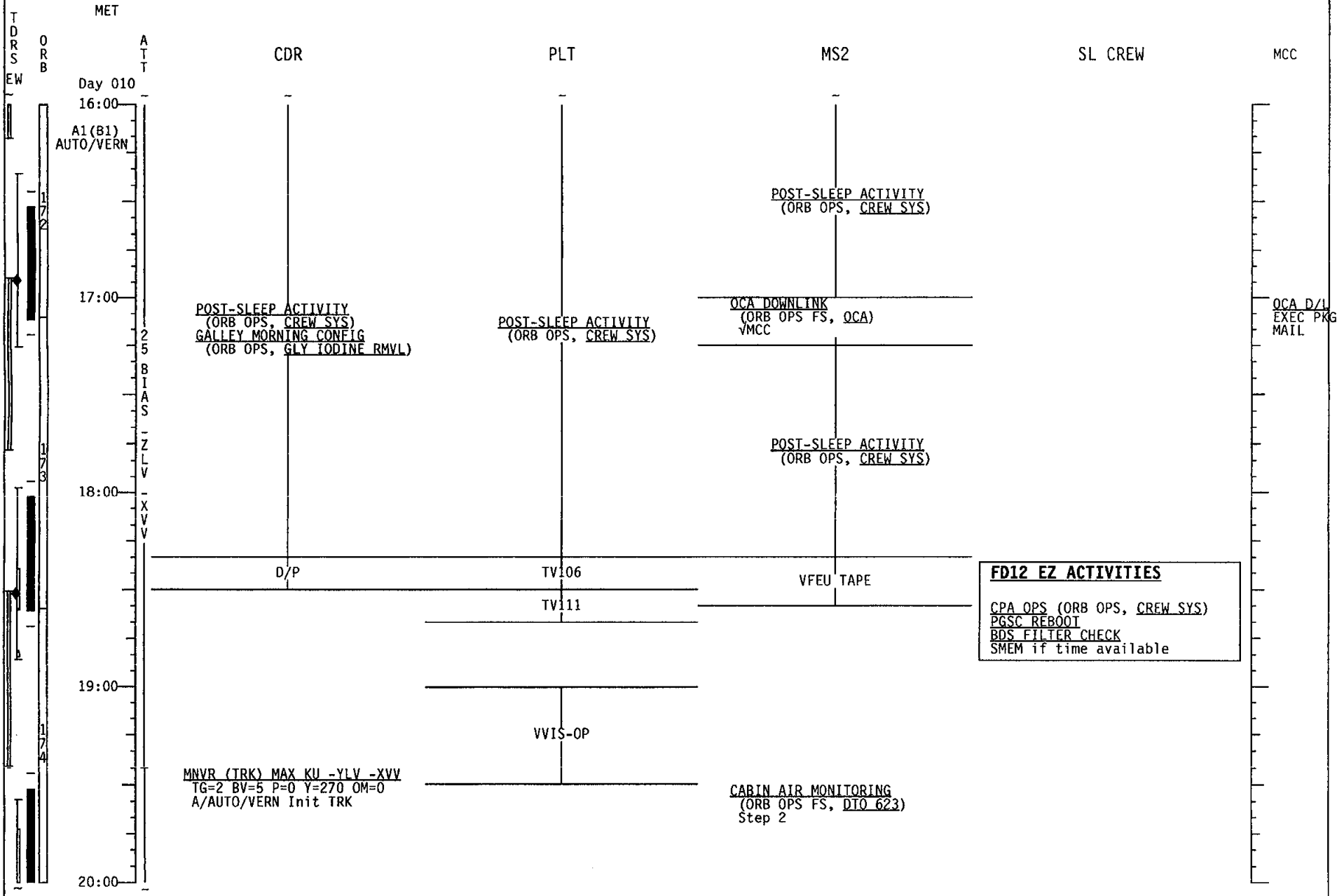
STS-90 (FD 11)



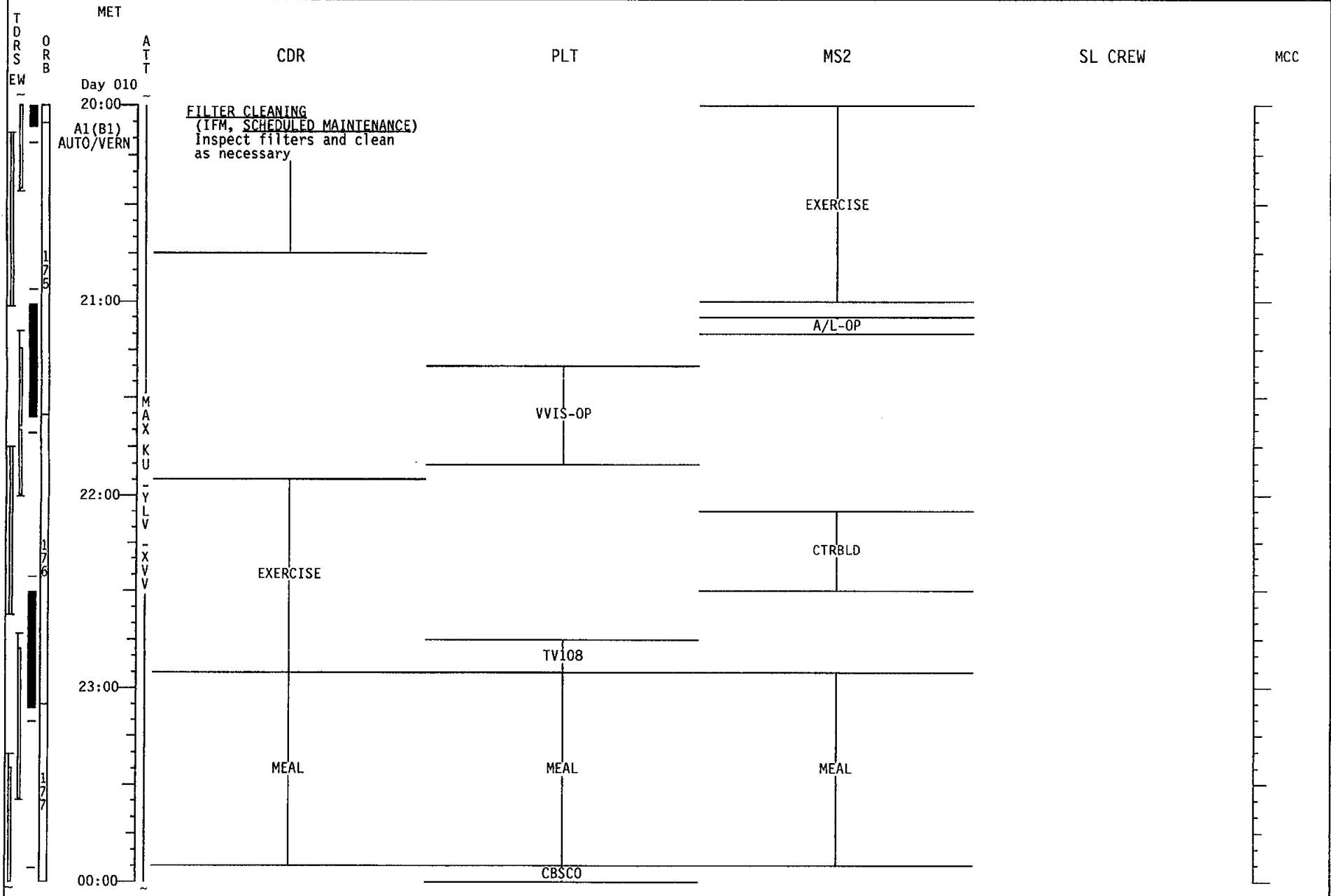
STS-90 (FD 11)



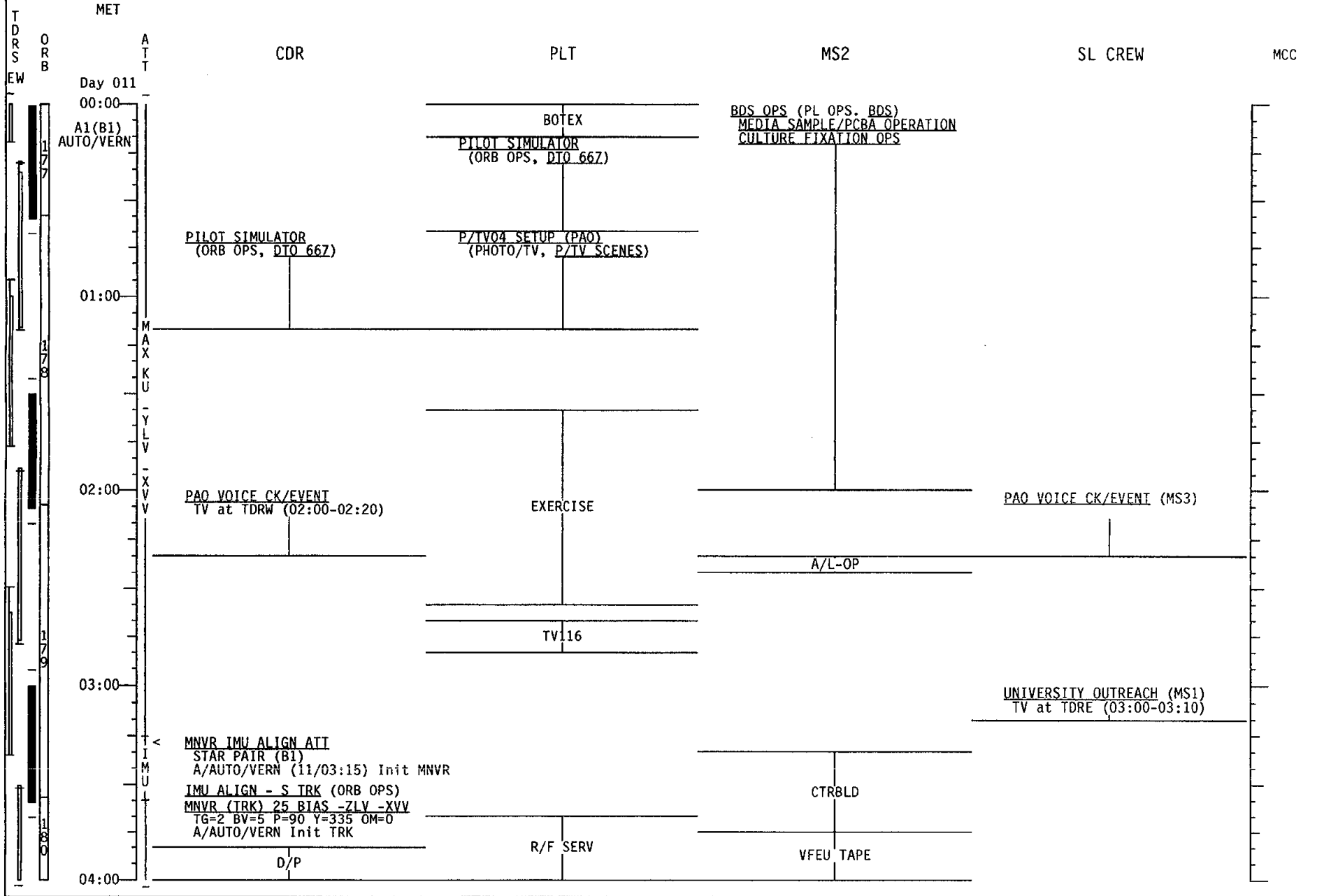
STS-90 (FD 12)



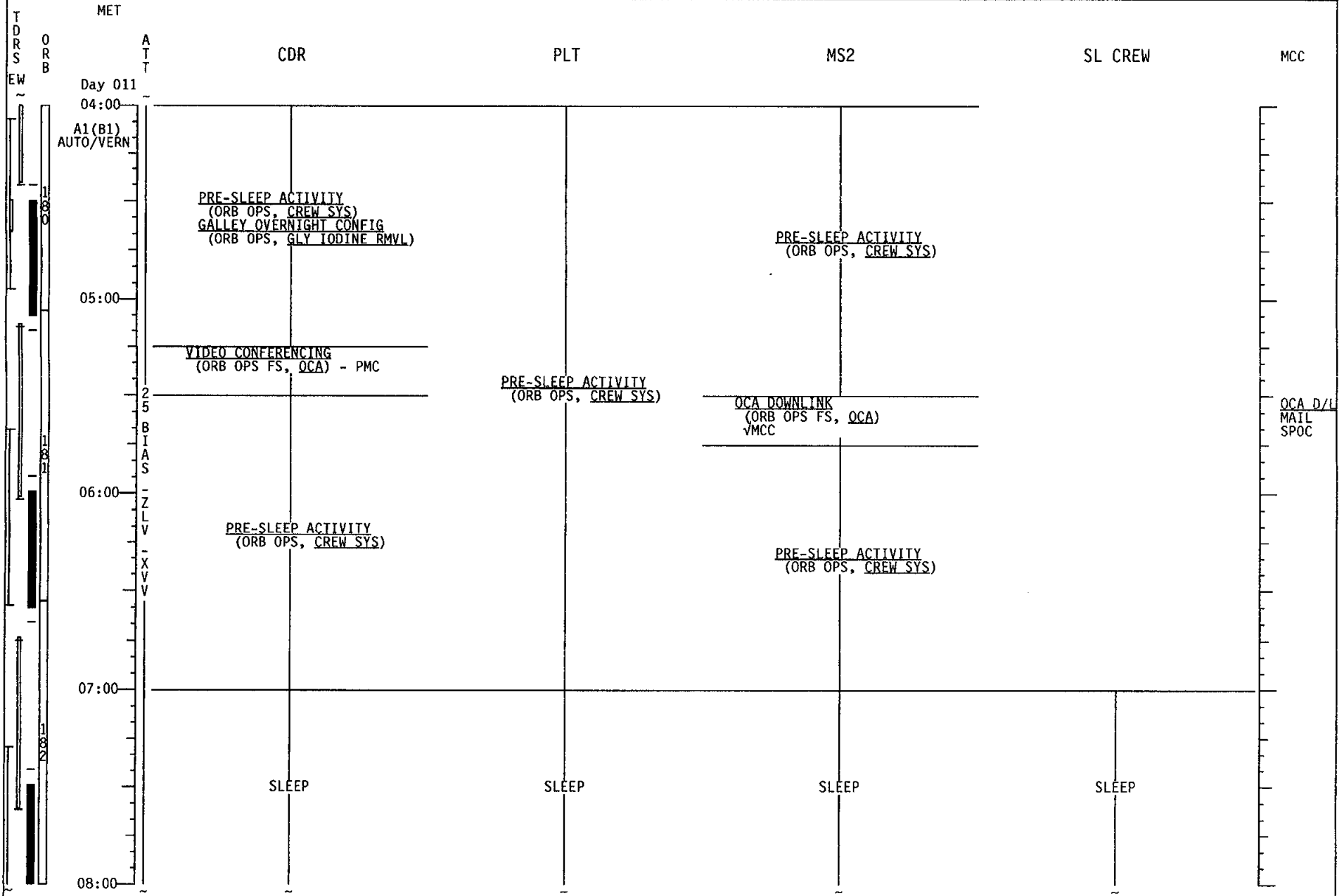
STS-90 (FD 12)



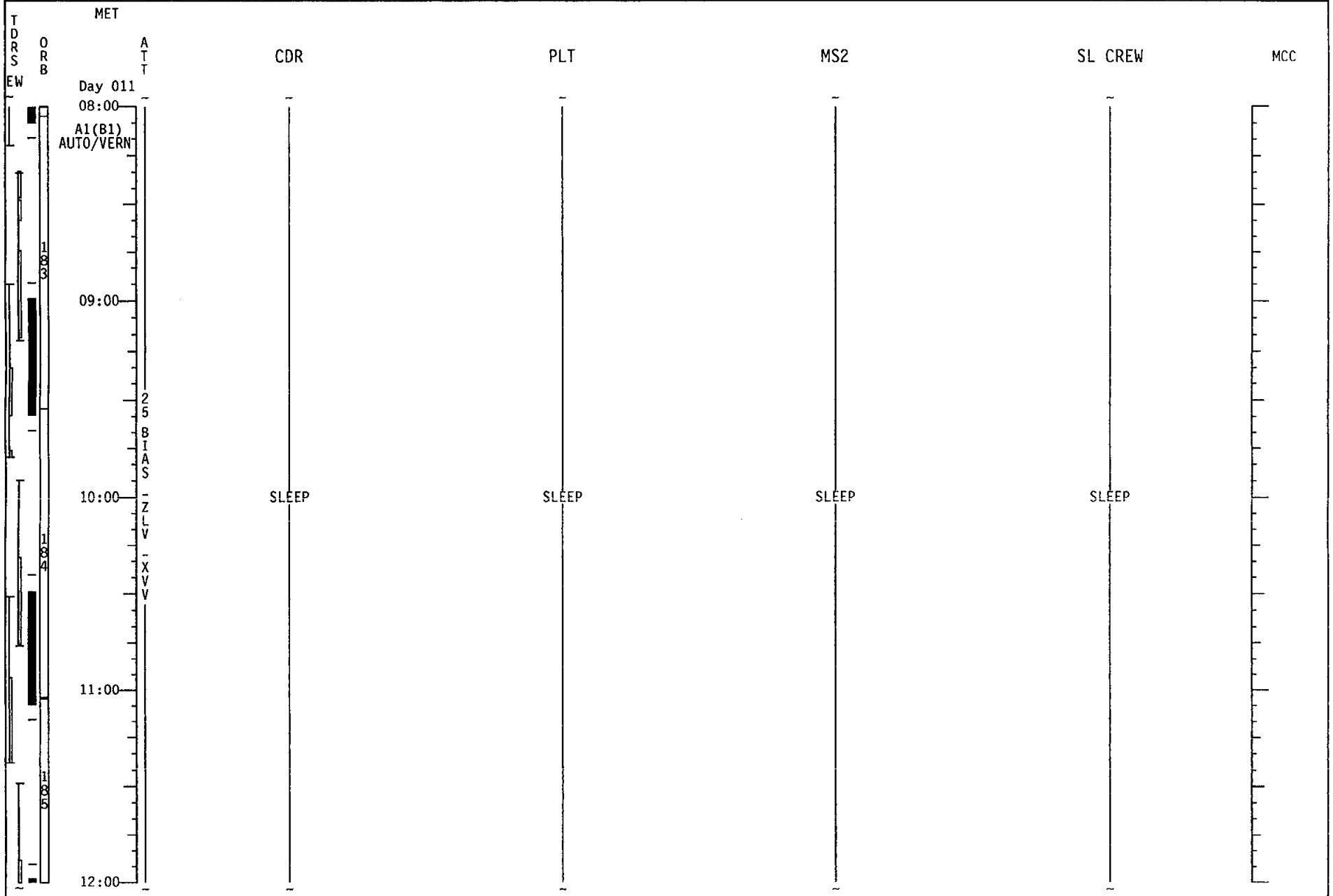
STS-90 (FD 12)



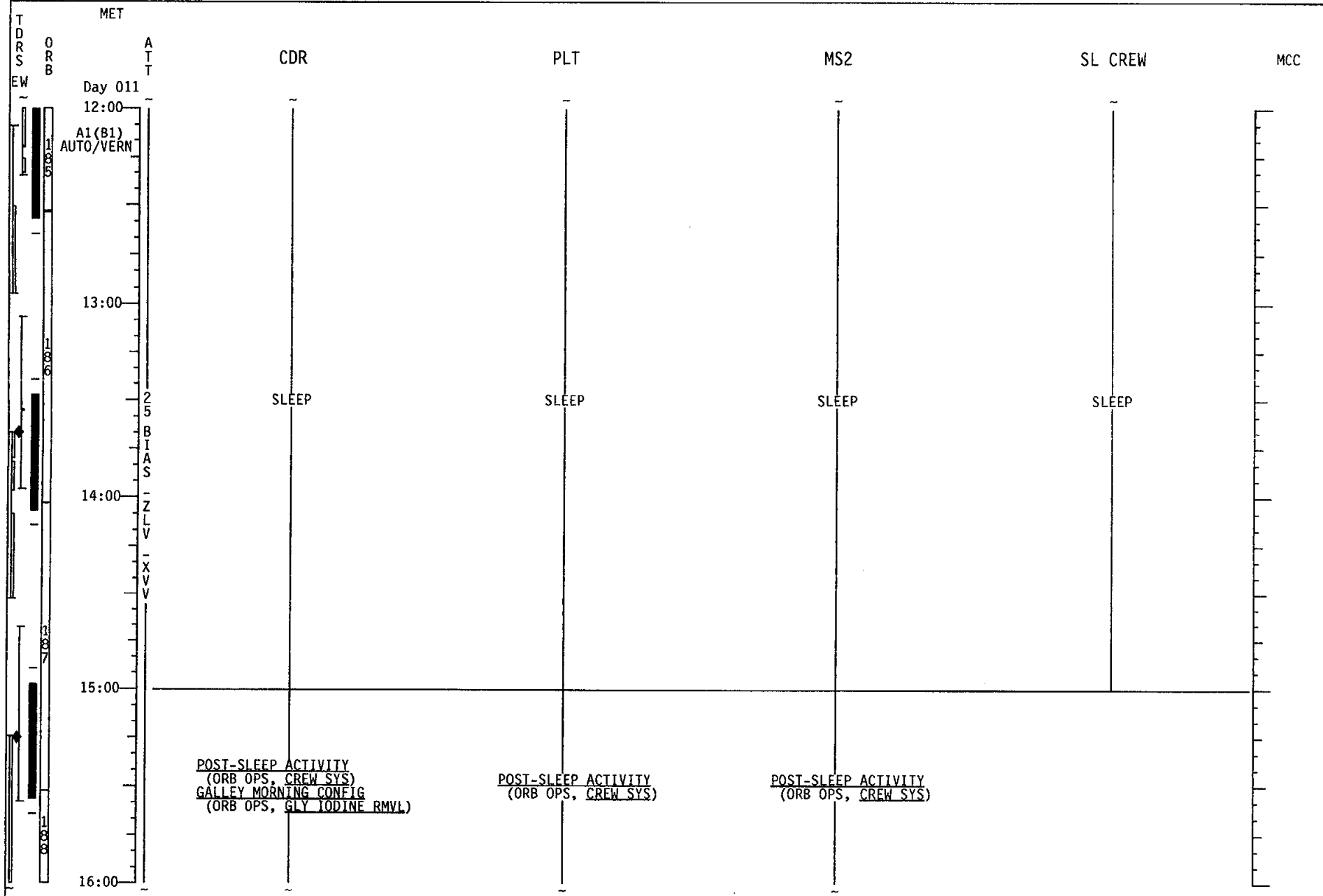
STS-90 (FD 12)



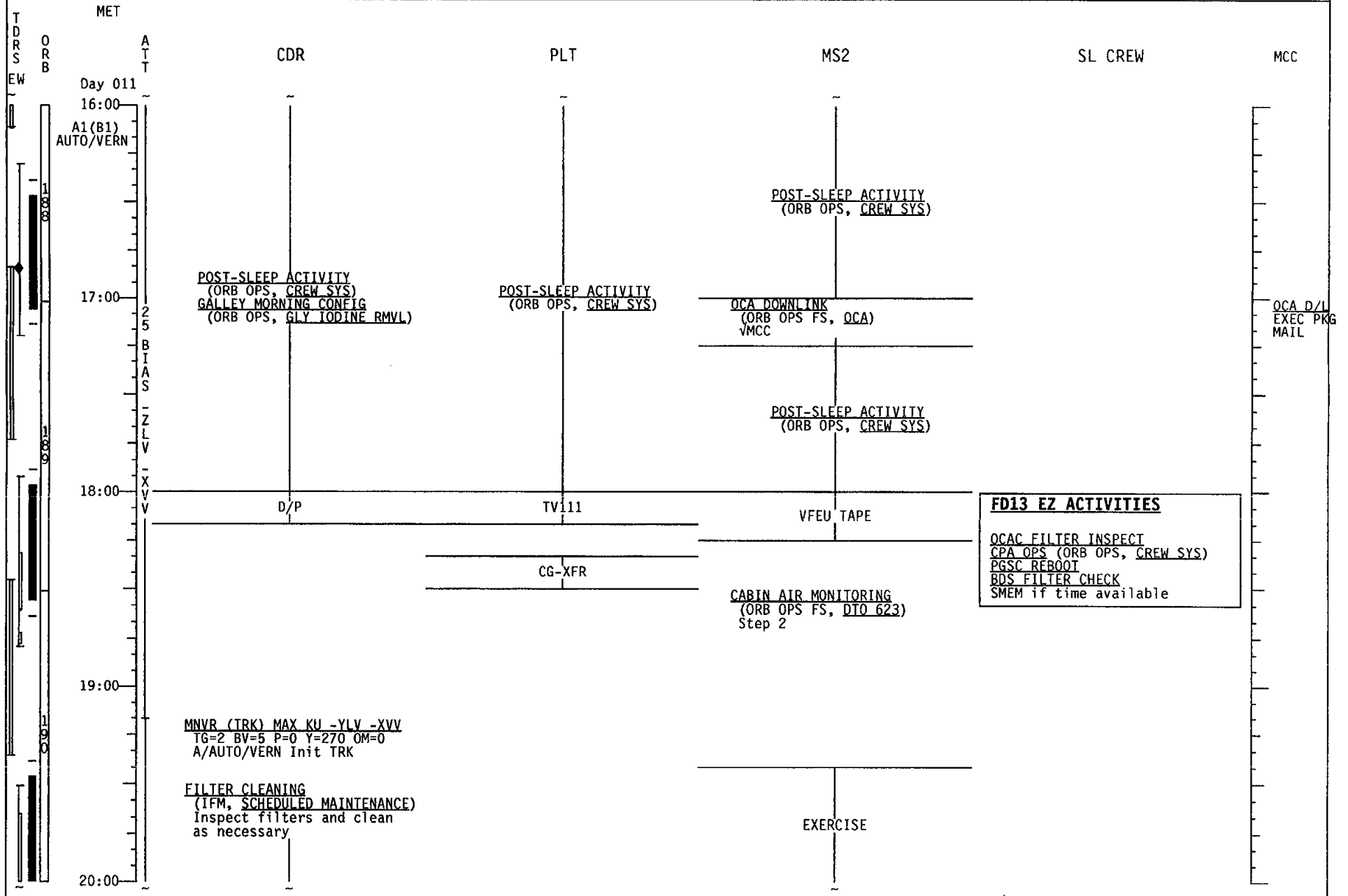
STS-90 (FD 12)



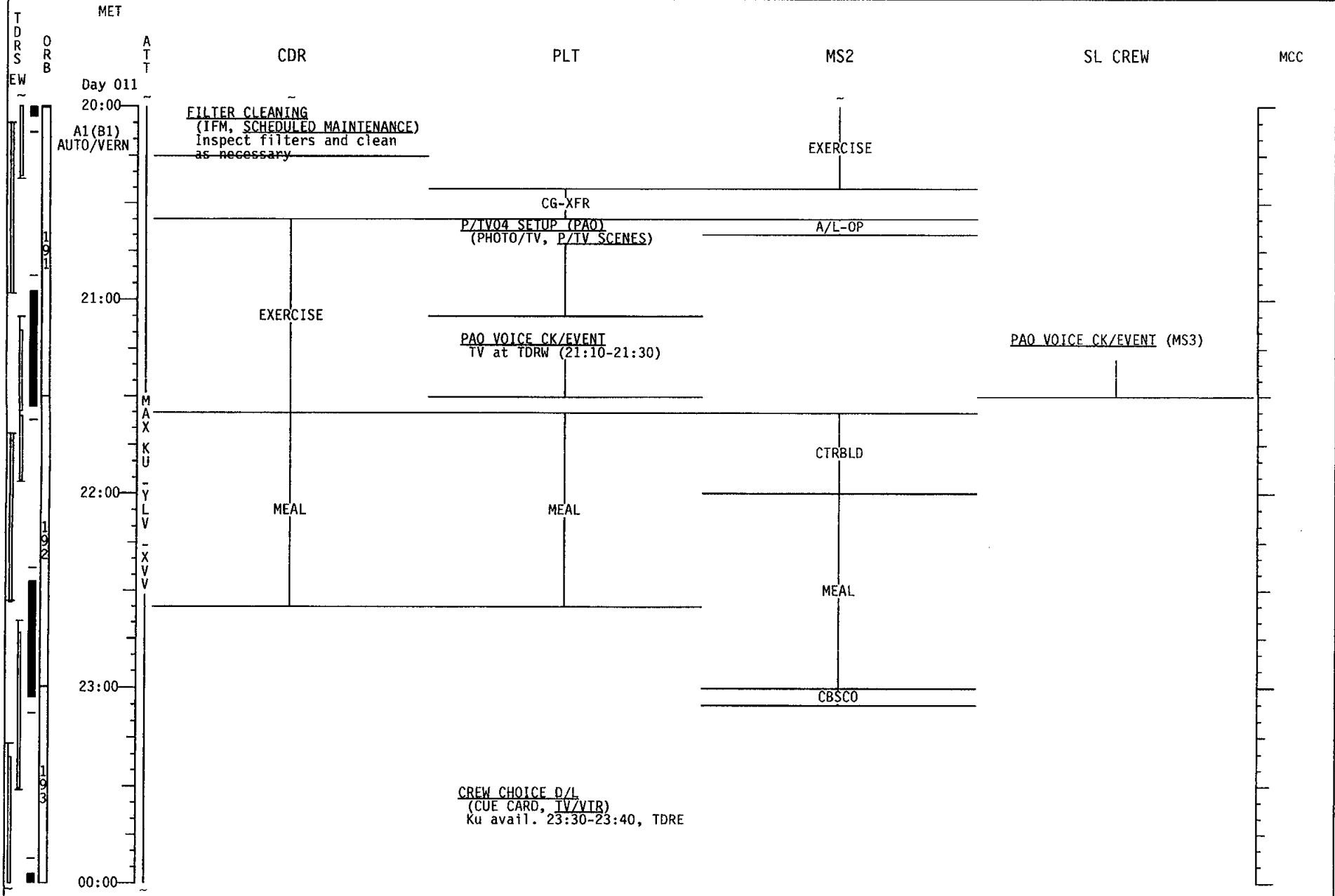
STS-90 (FD 12)



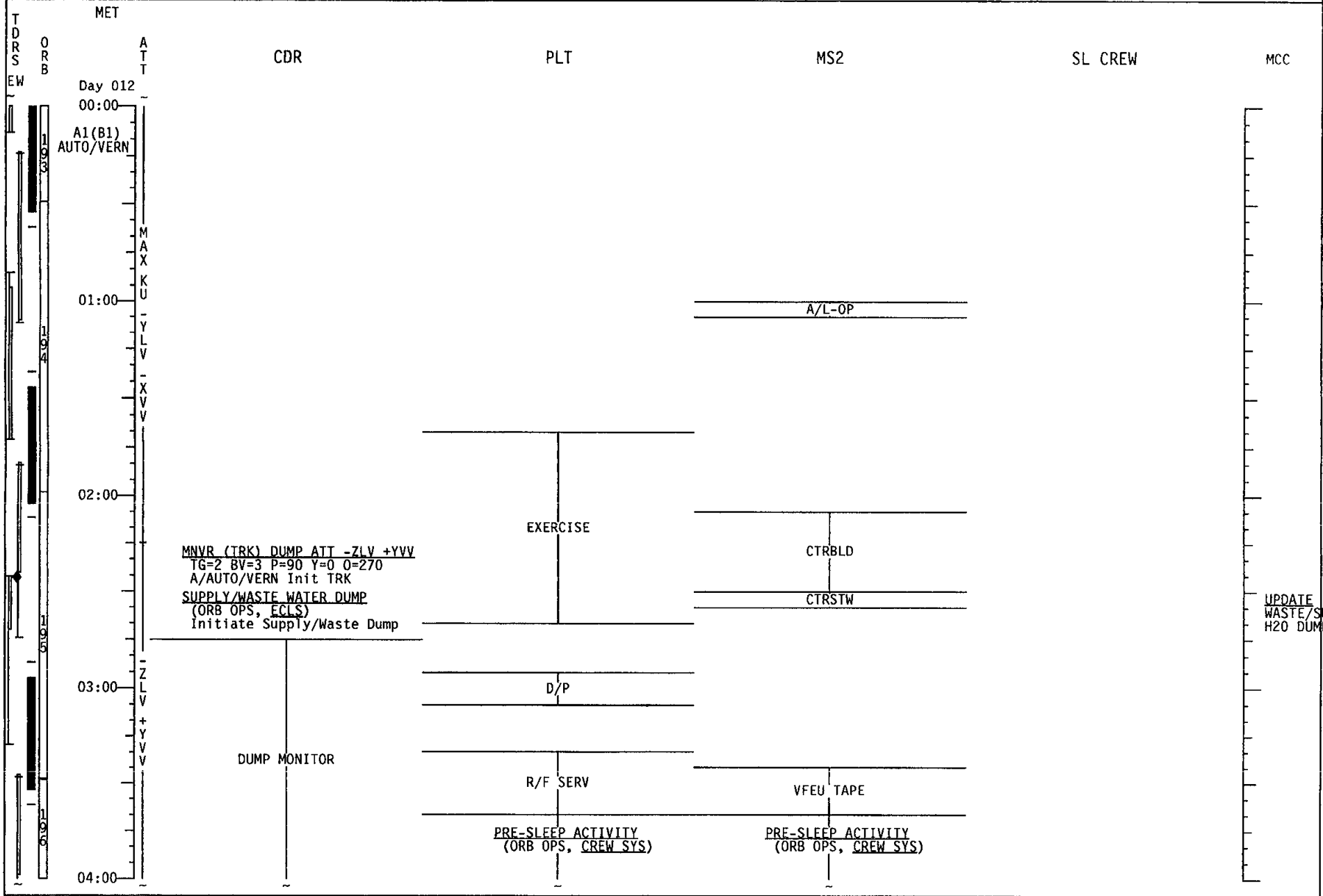
STS-90 (FD 13)



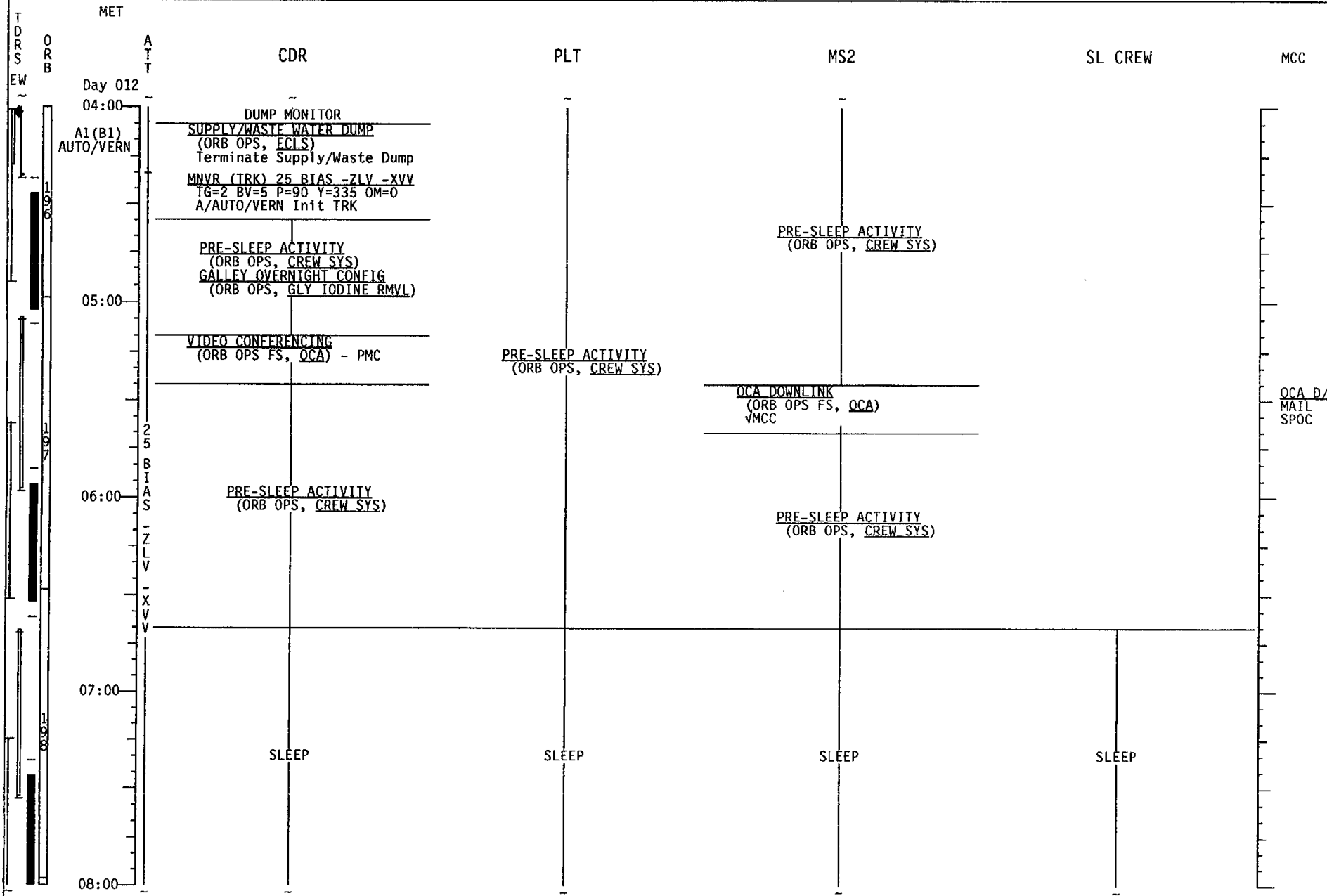
STS-90 (FD 13)



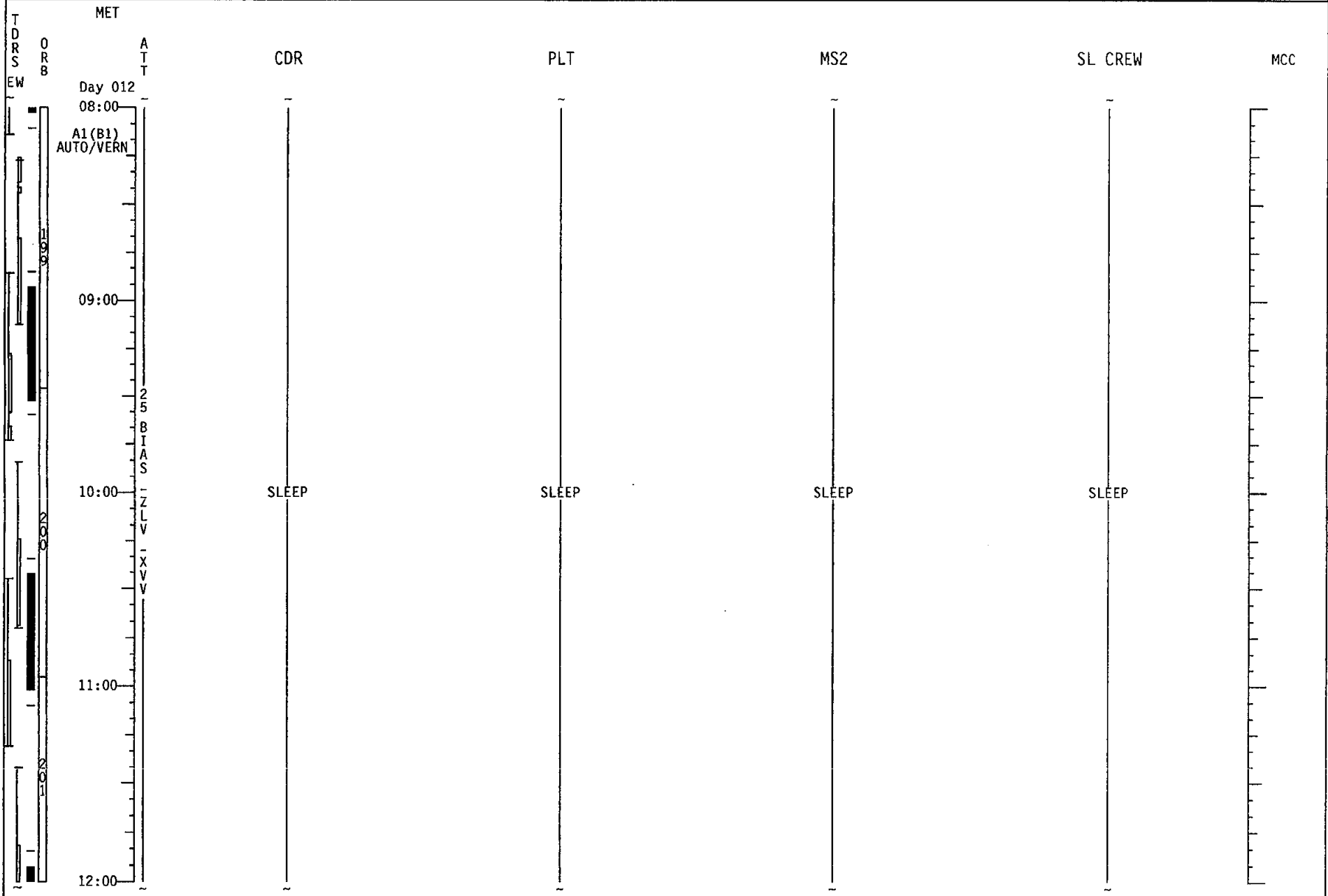
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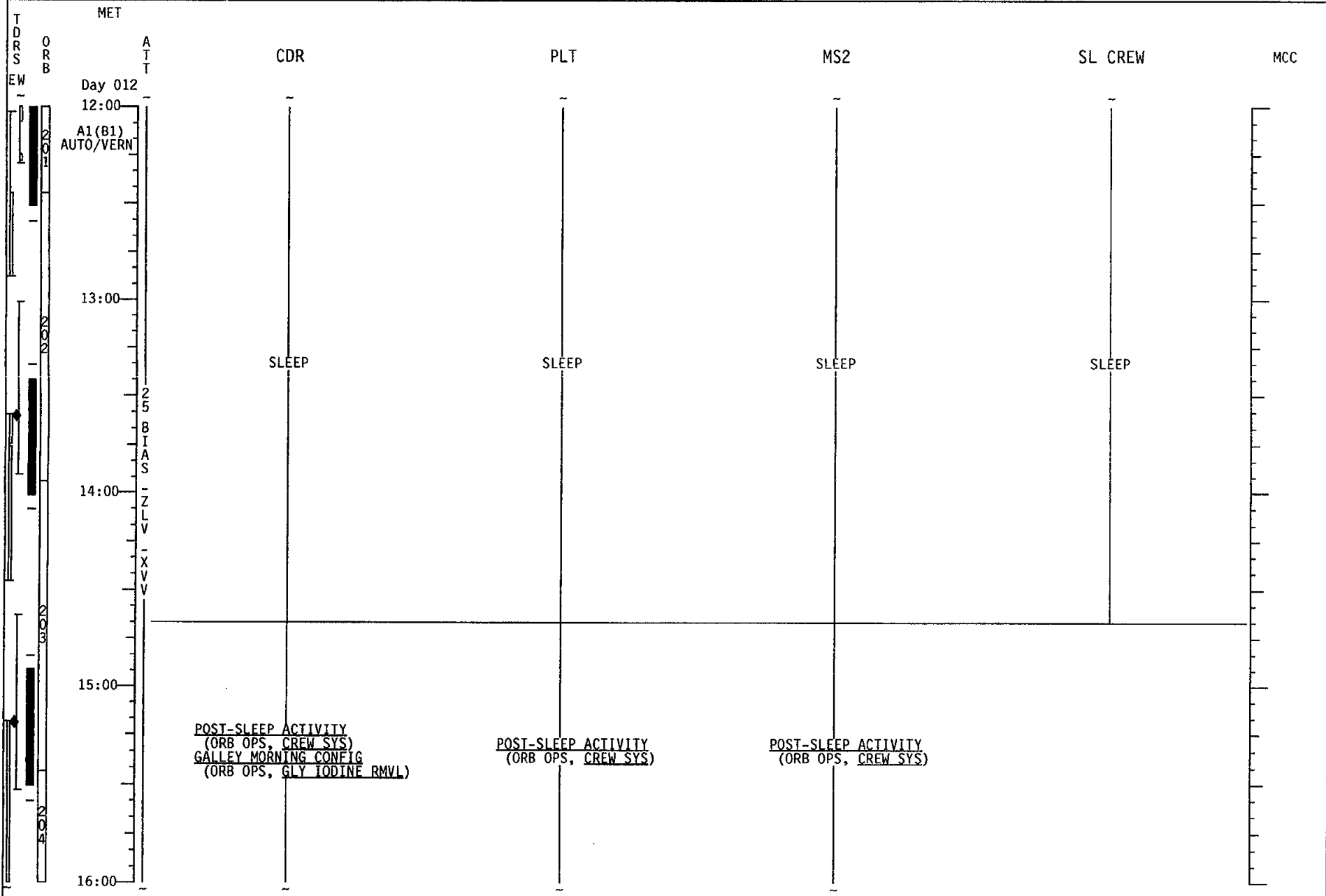
STS-90 (FD 13)



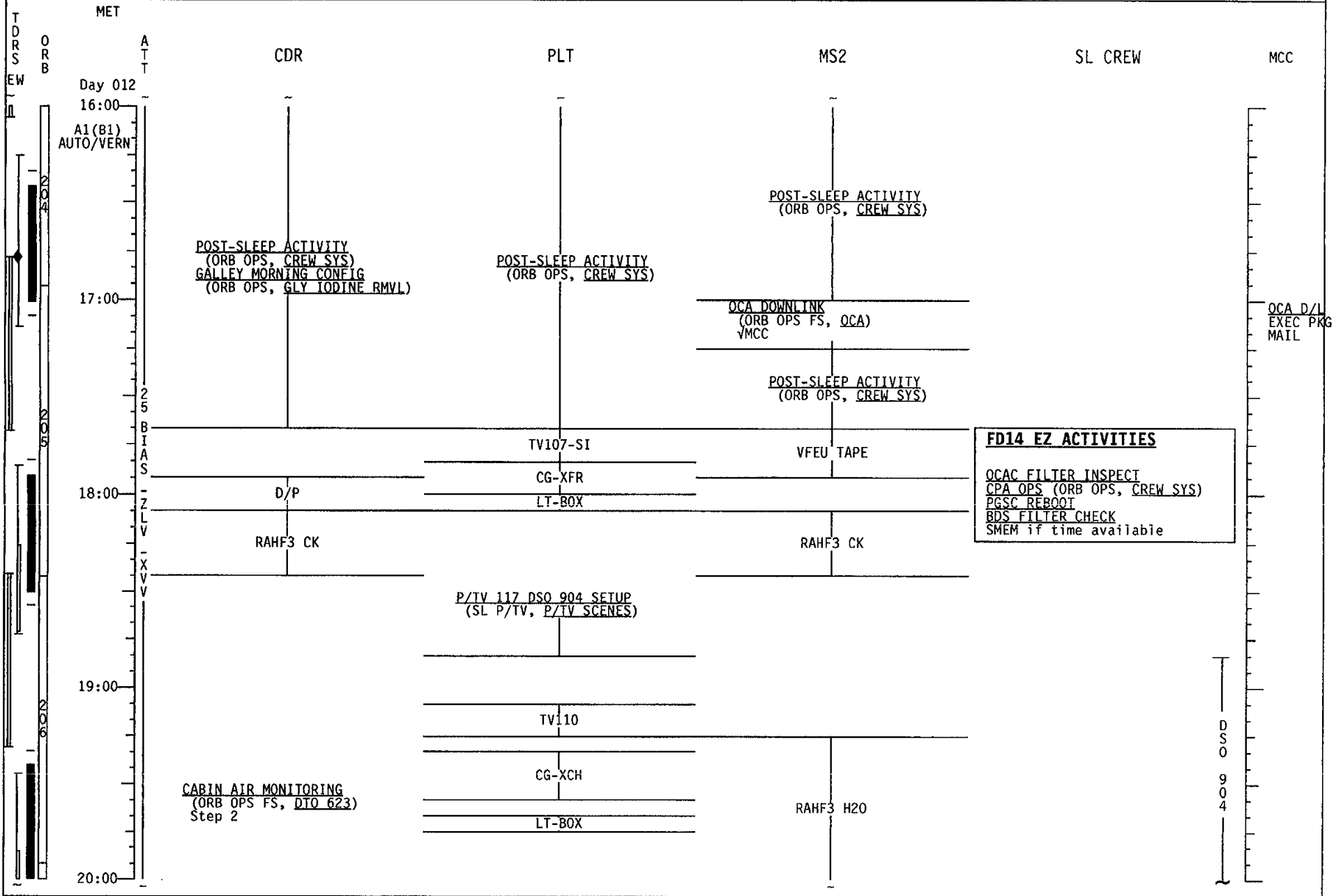
STS-90 (FD 13)



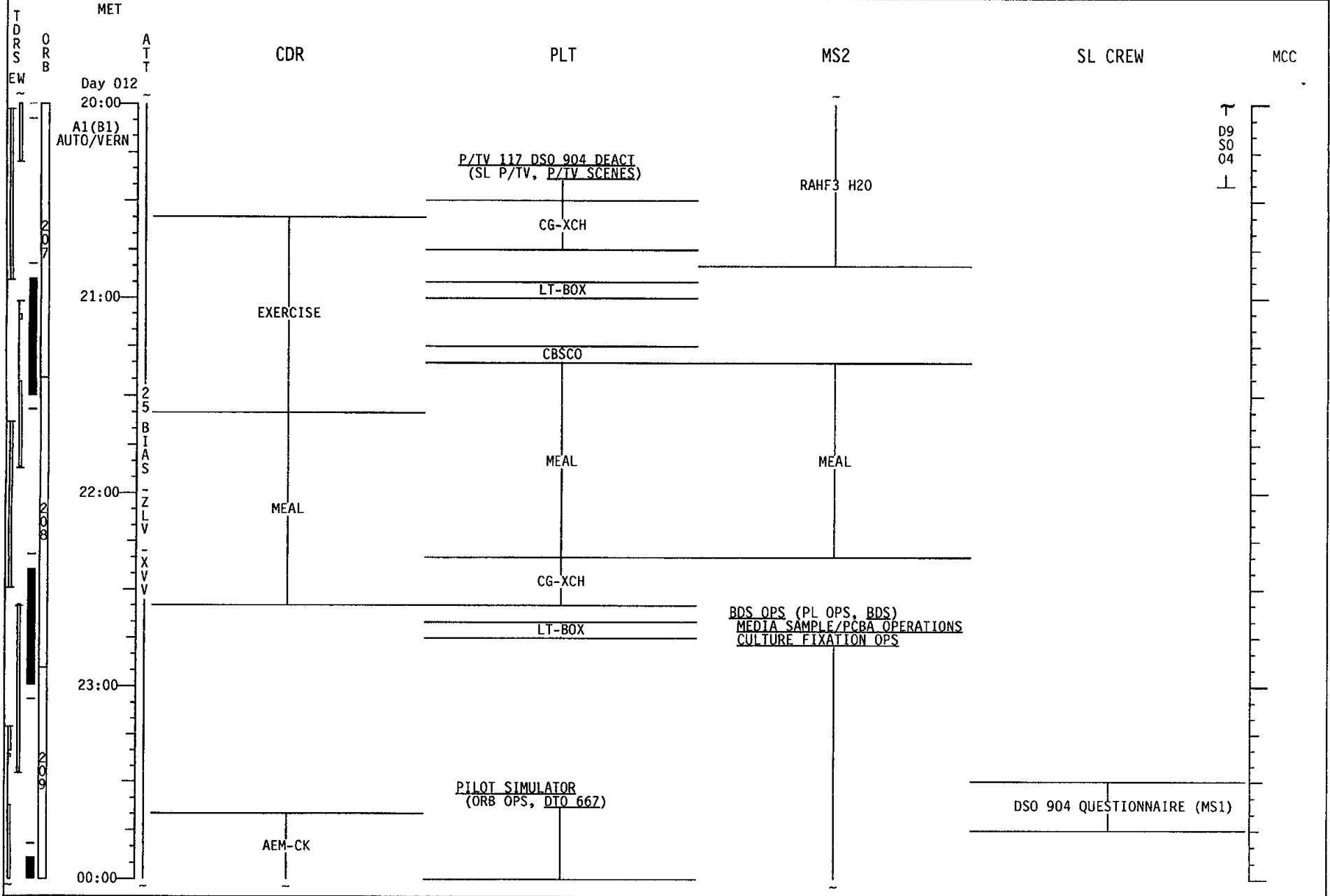
STS-90 (FD 13)



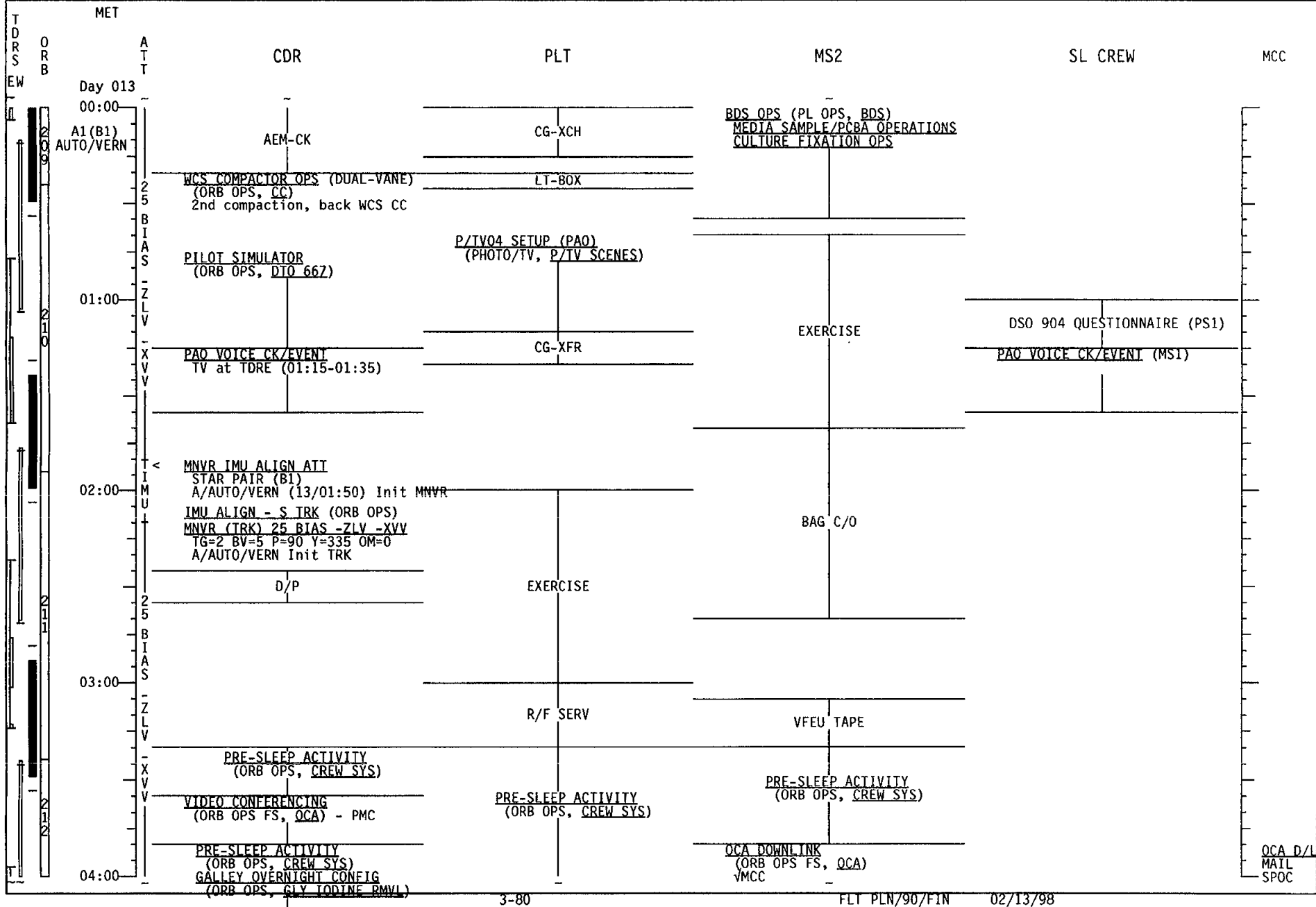
STS-90 (FD 14)



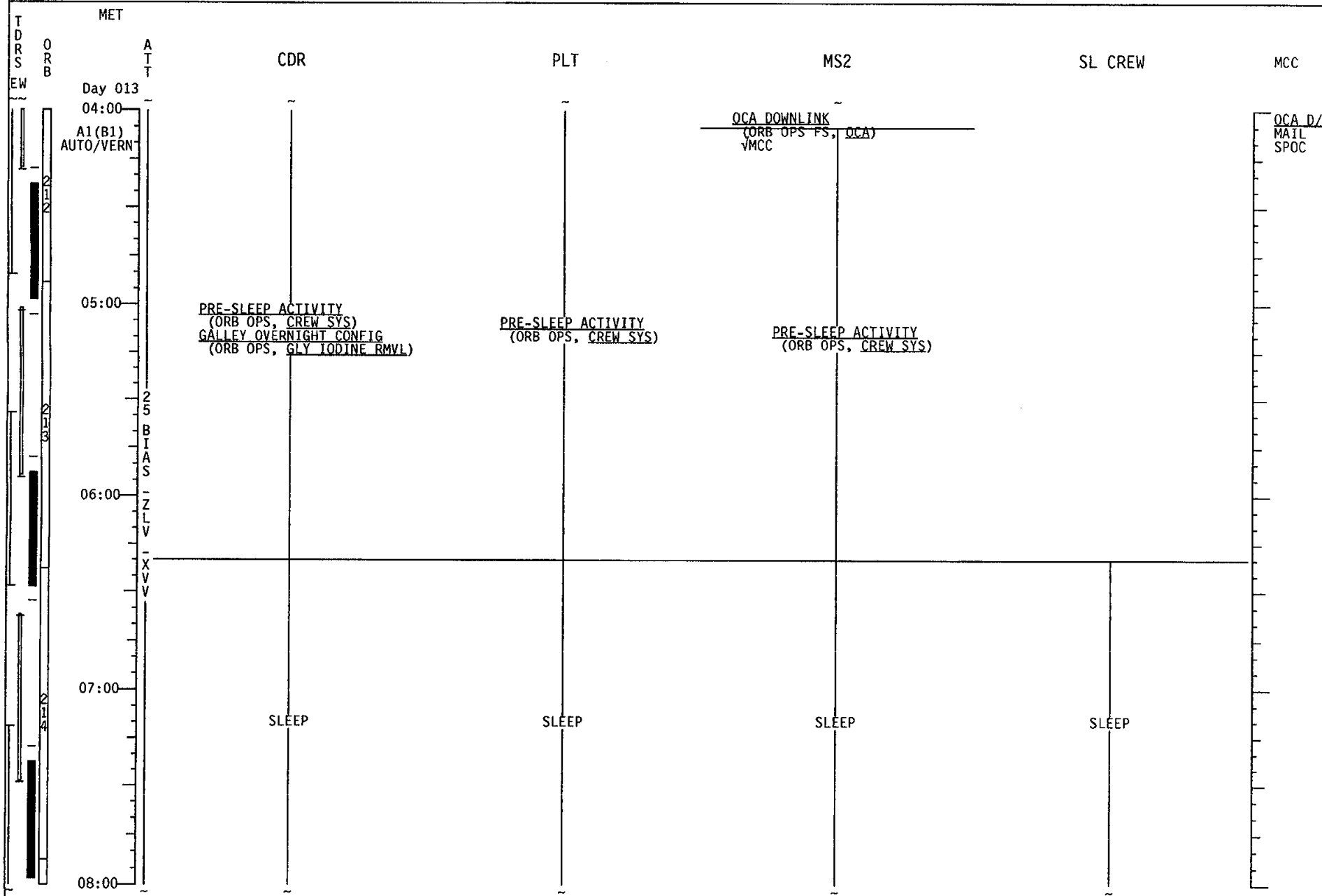
STS-90 (FD 14)



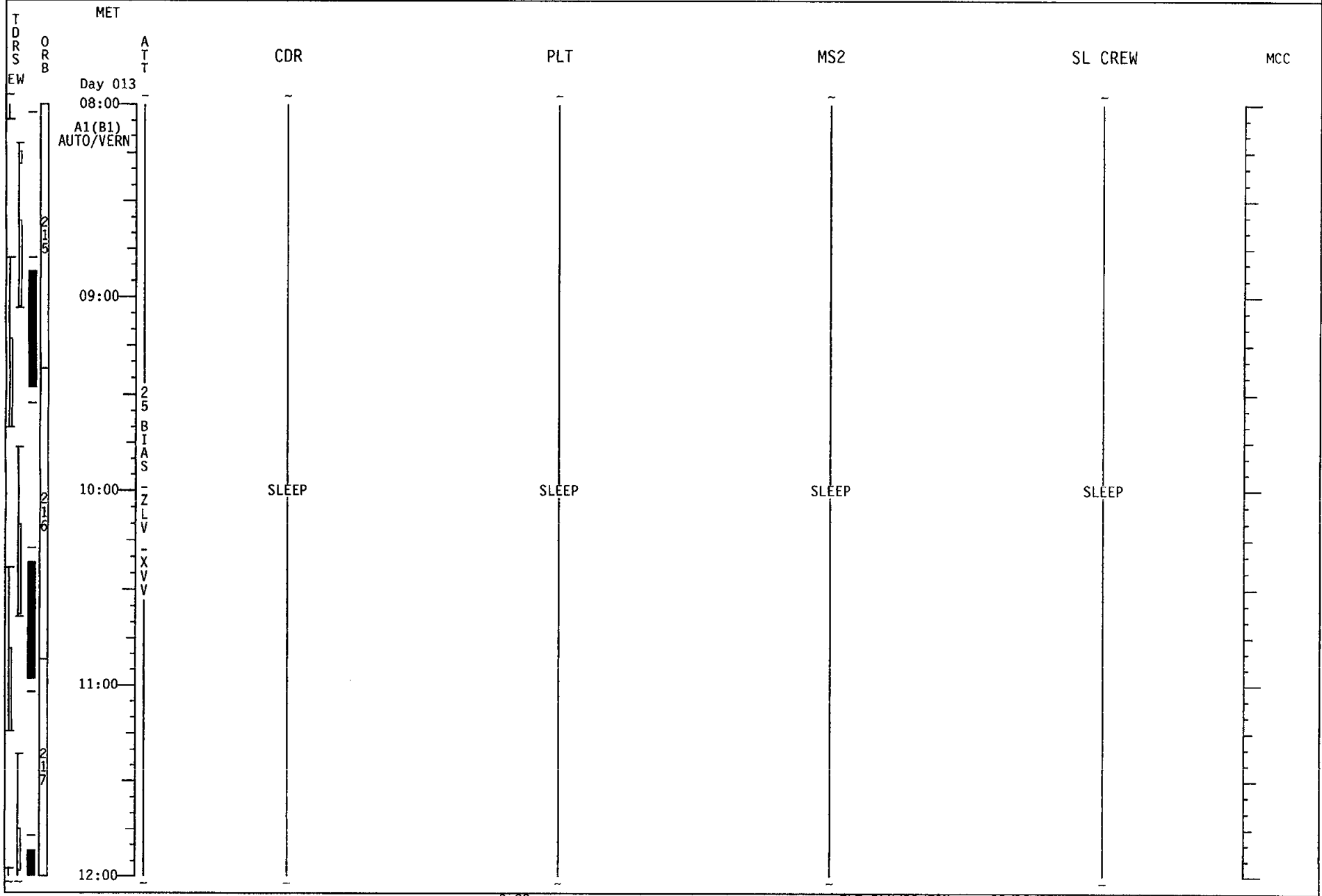
STS-90 (FD 14)



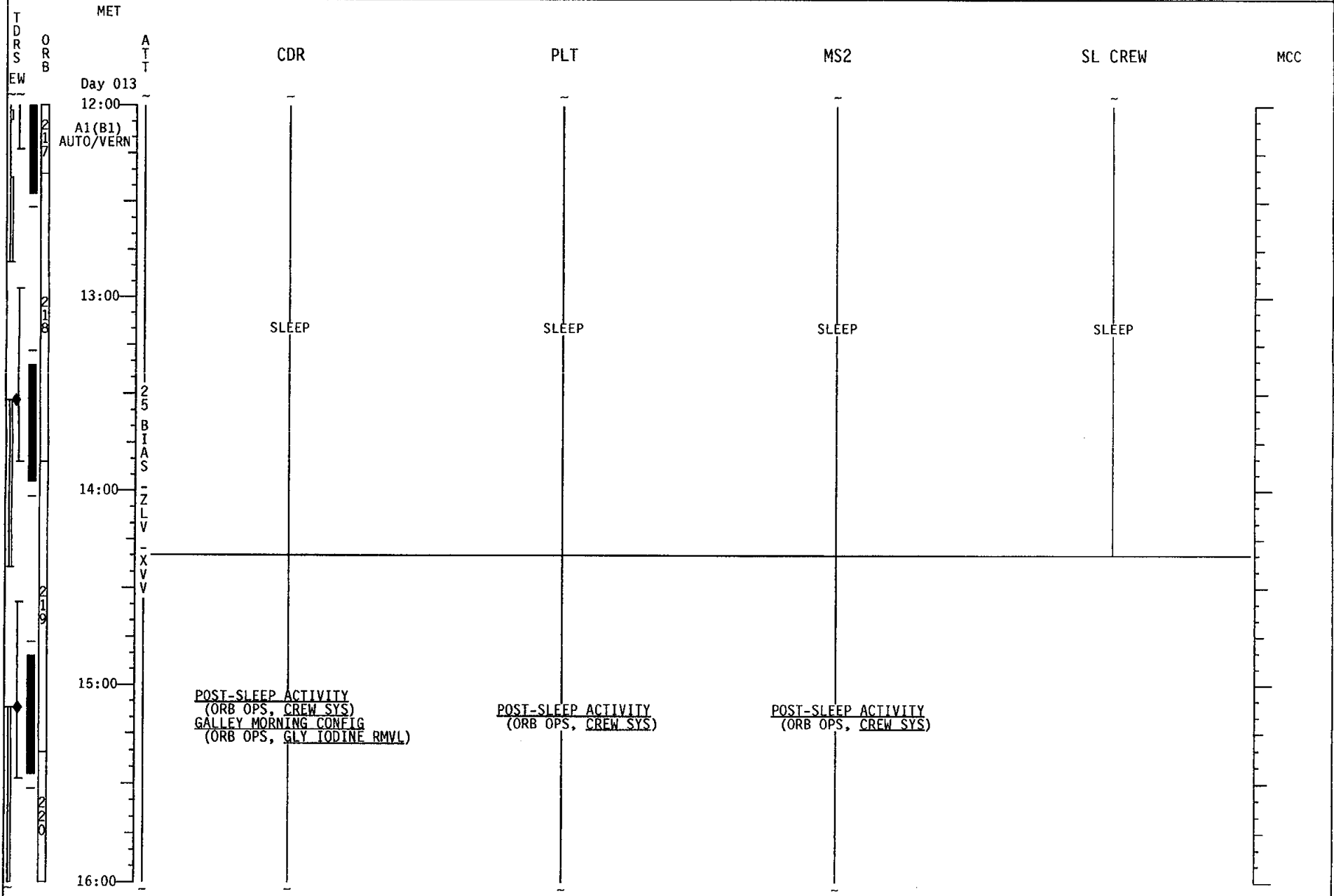
STS-90 (FD 14)



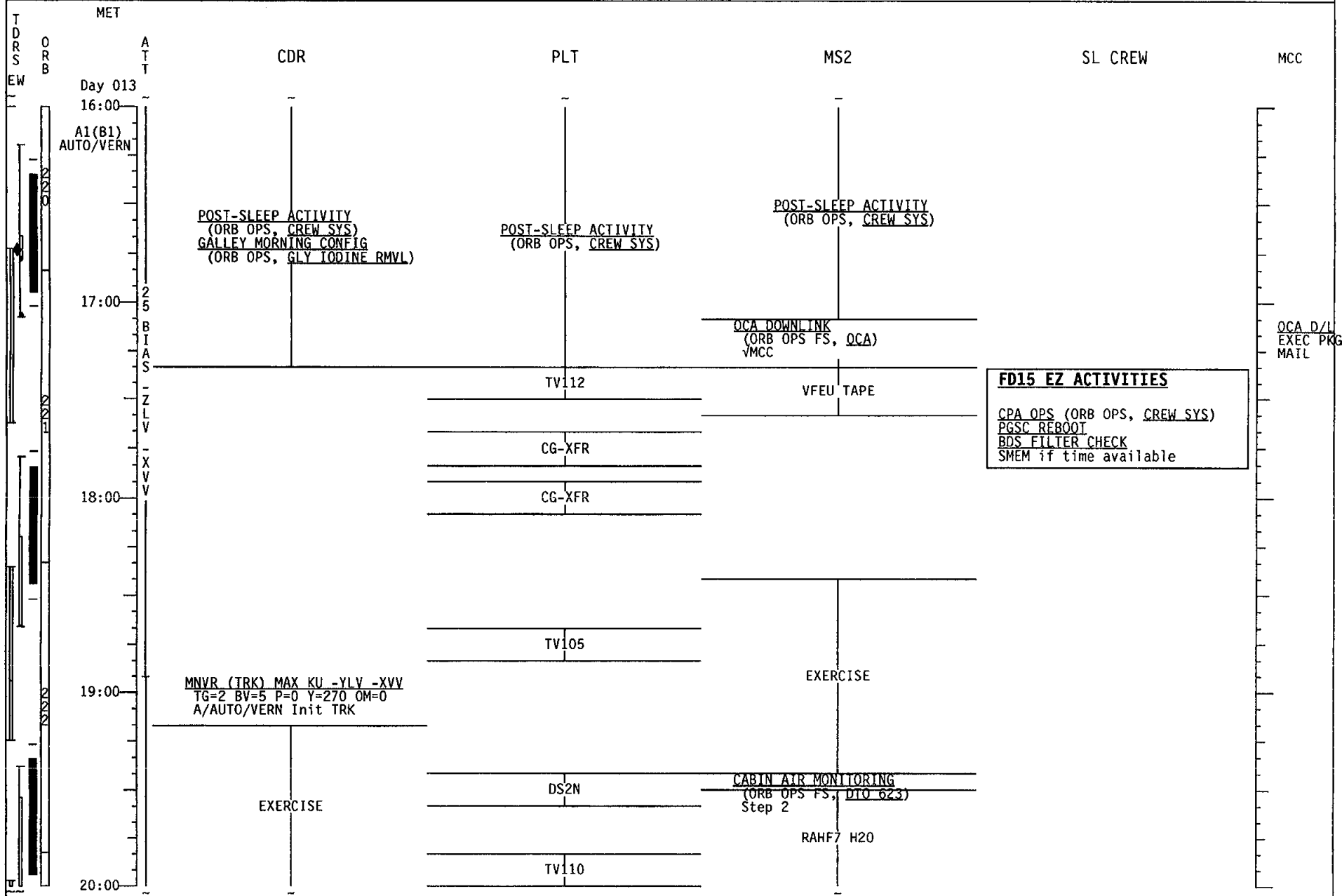
STS-90 (FD 14)



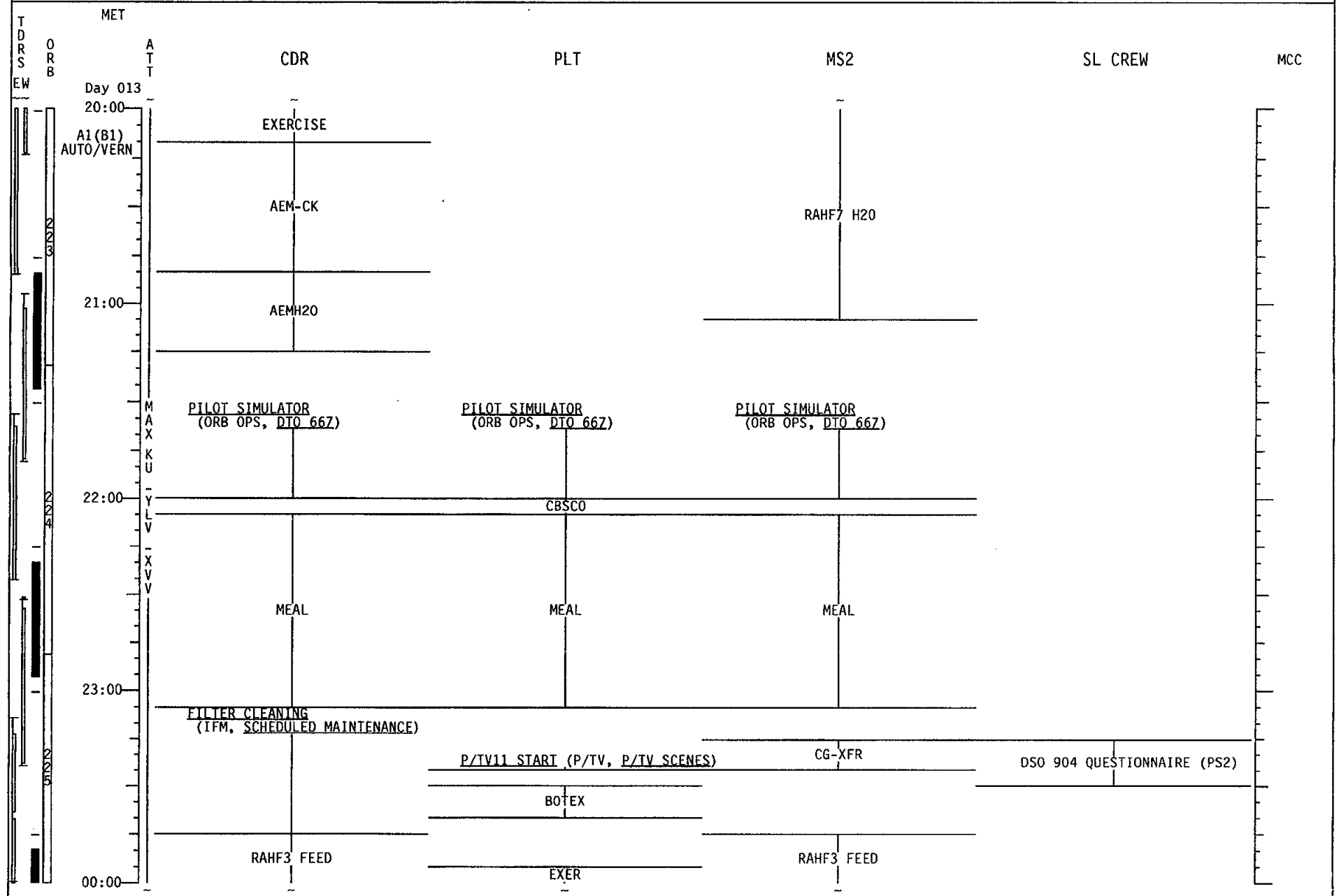
STS-90 (FD 14)



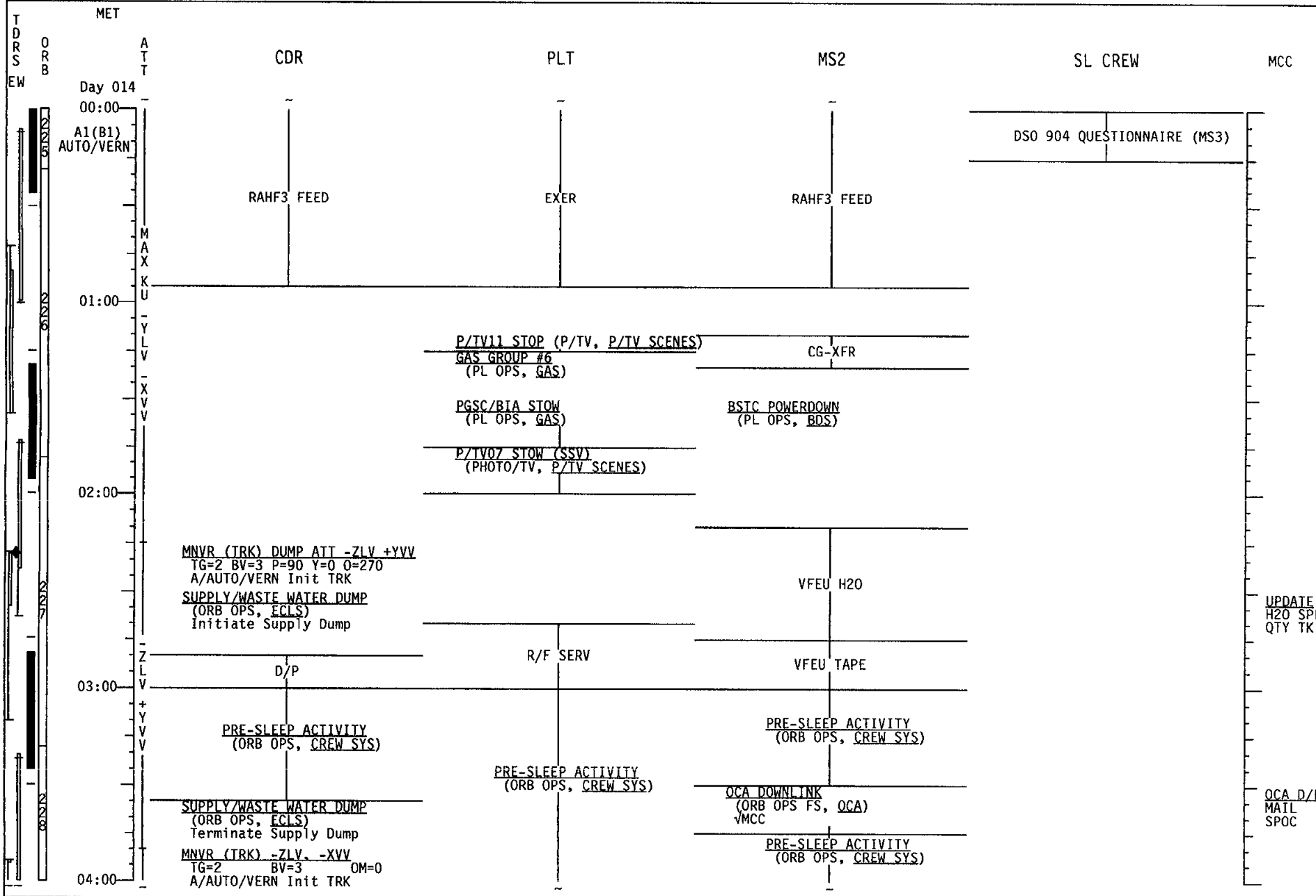
STS-90 (FD 15)



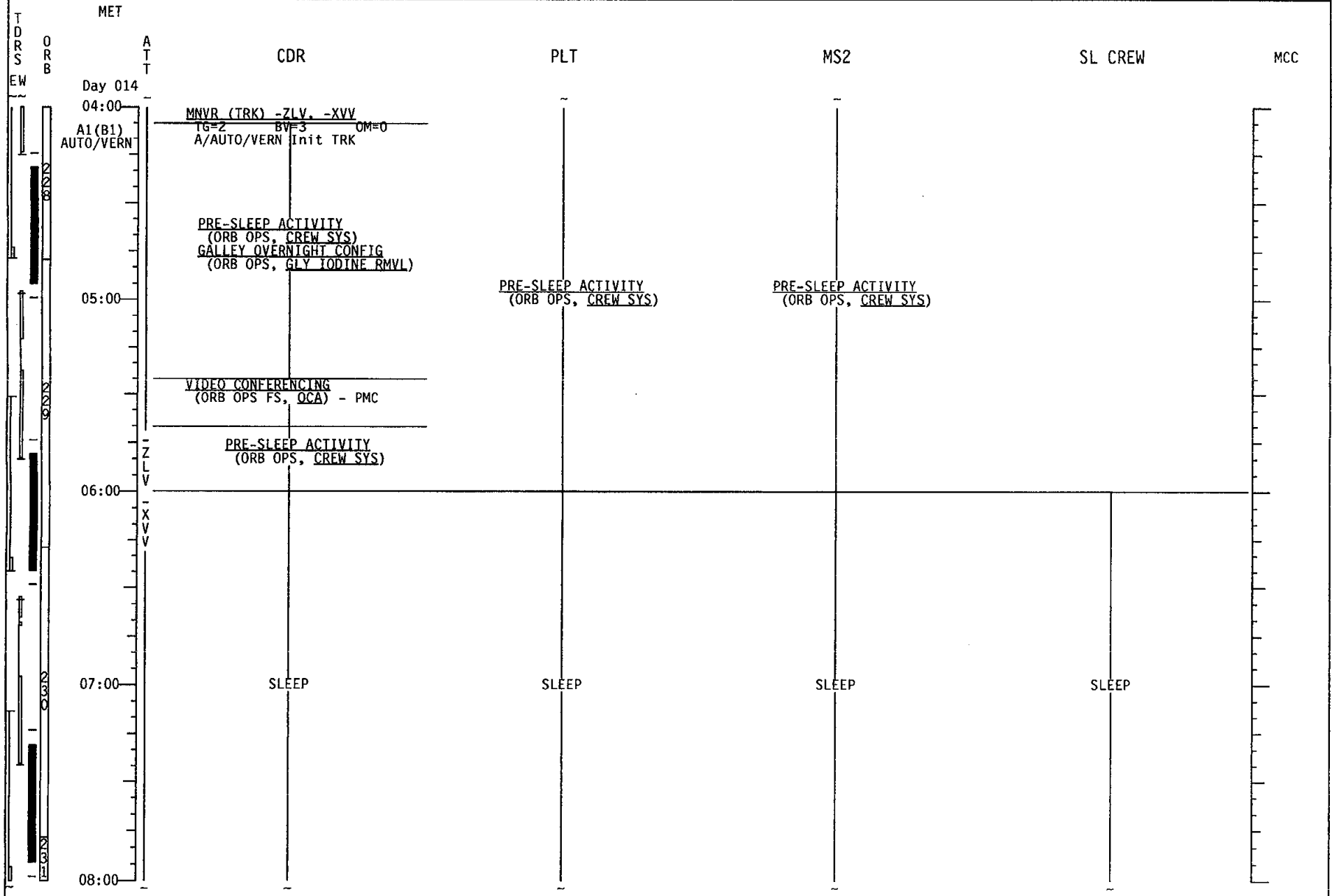
STS-90 (FD 15)



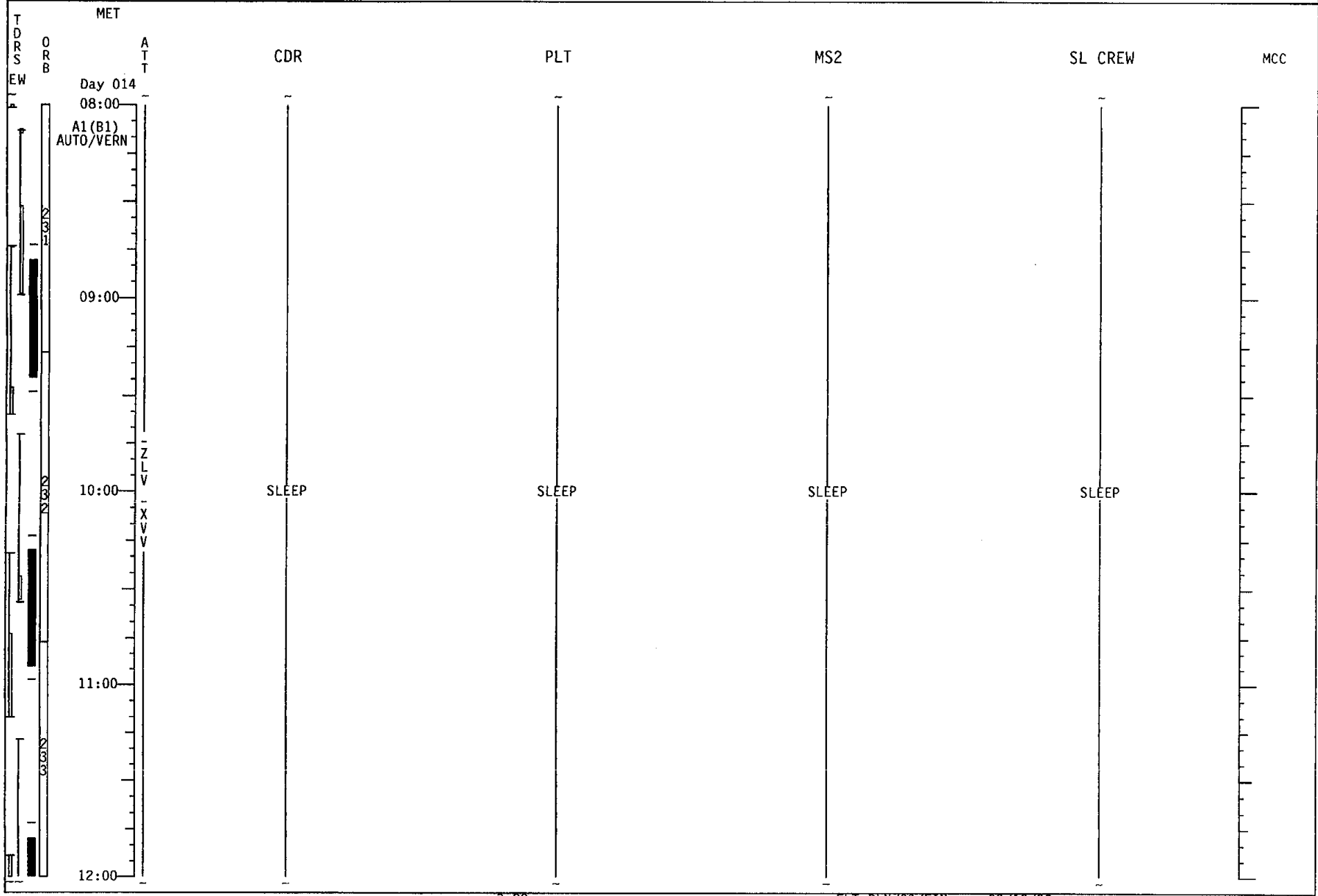
STS-90 (FD 15)



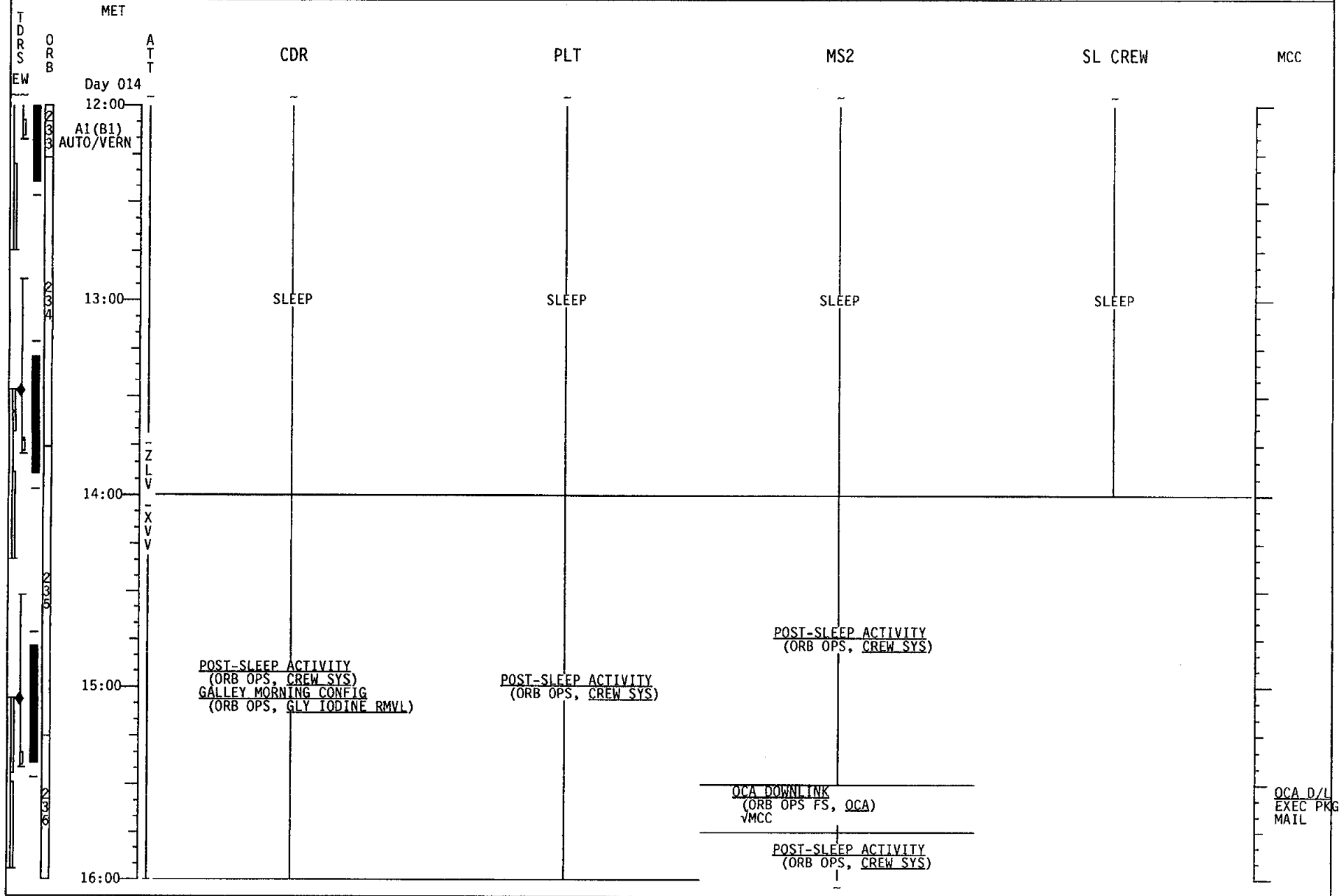
STS-90 (FD 15)



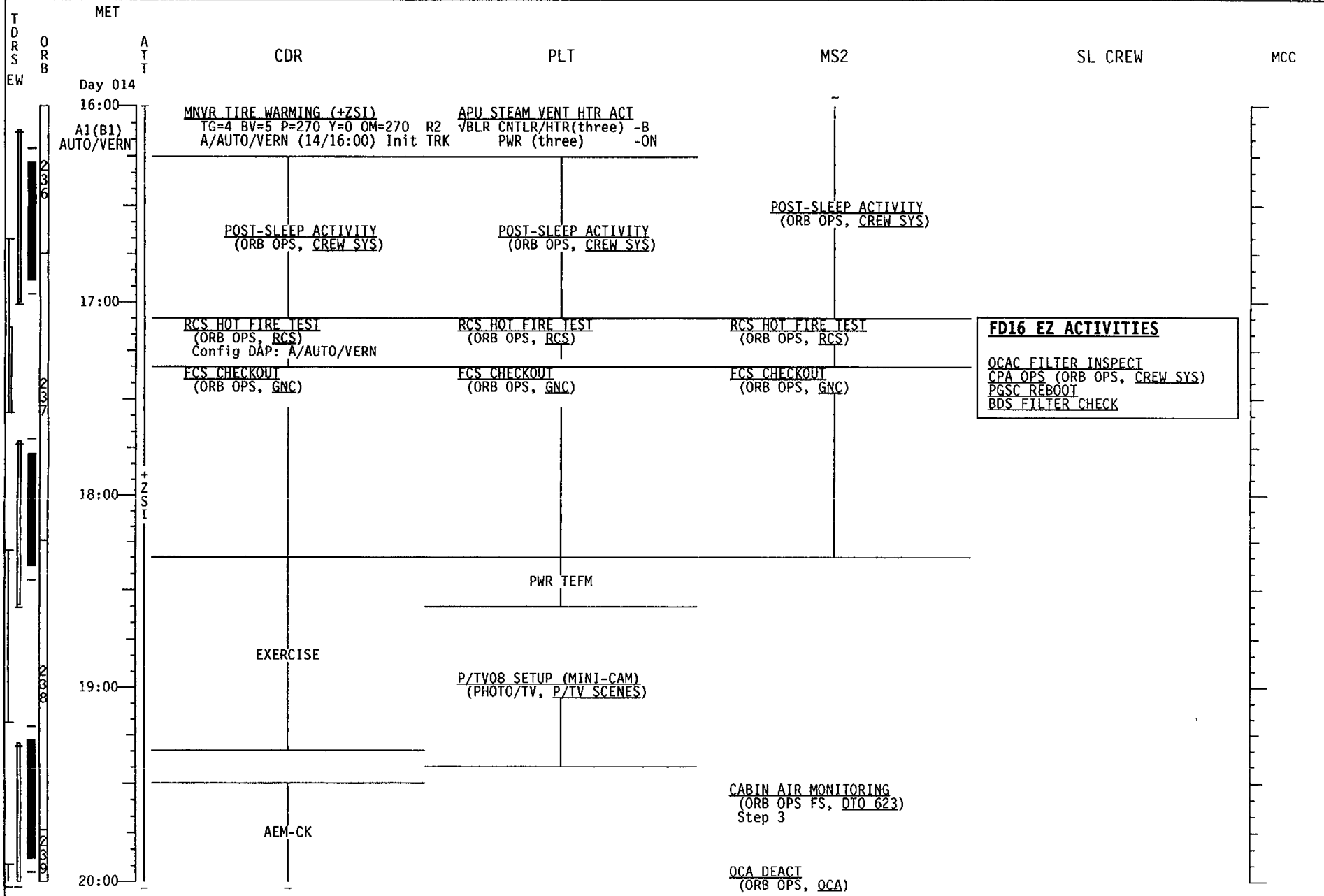
STS-90 (FD 15)



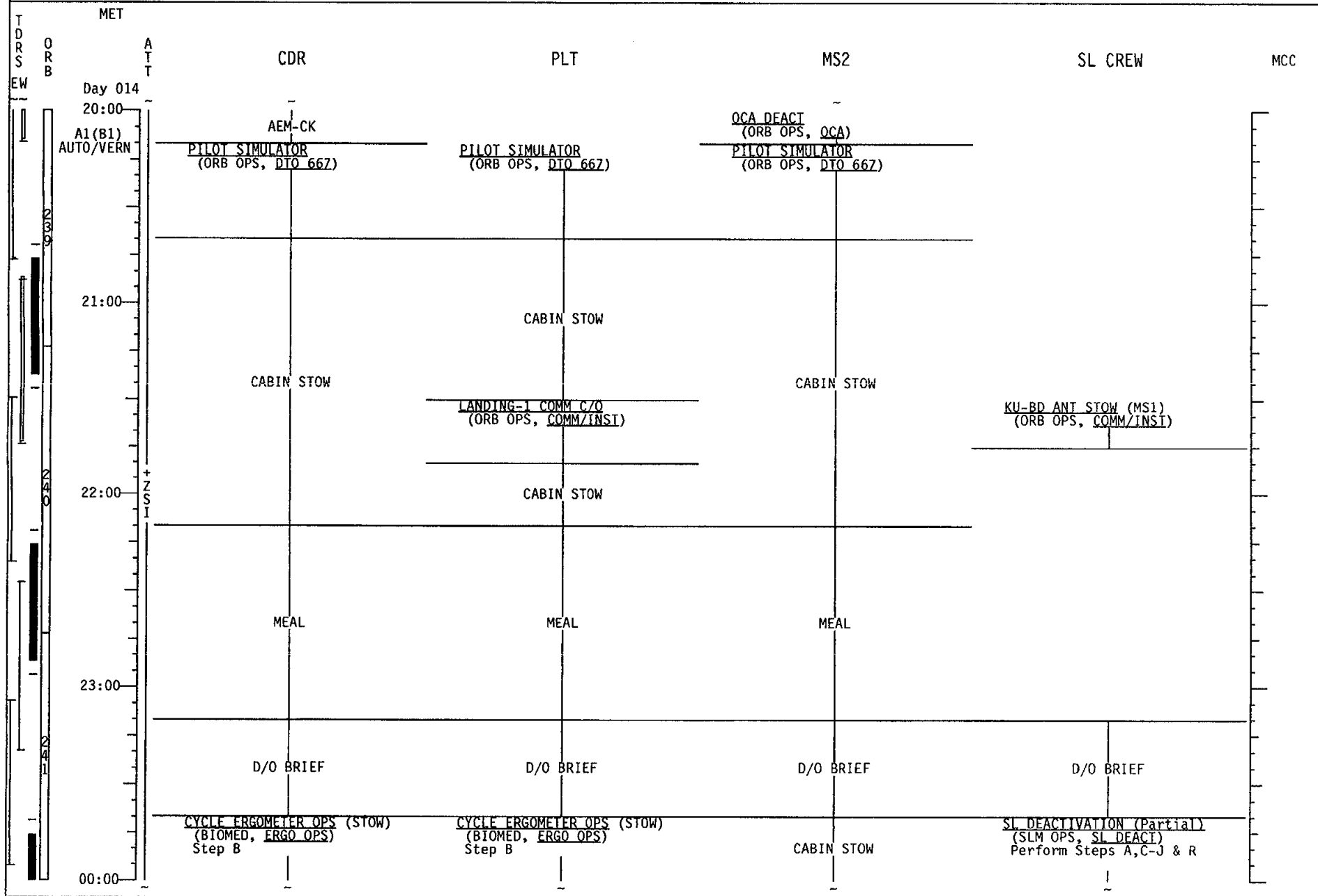
STS-90 (FD 15)



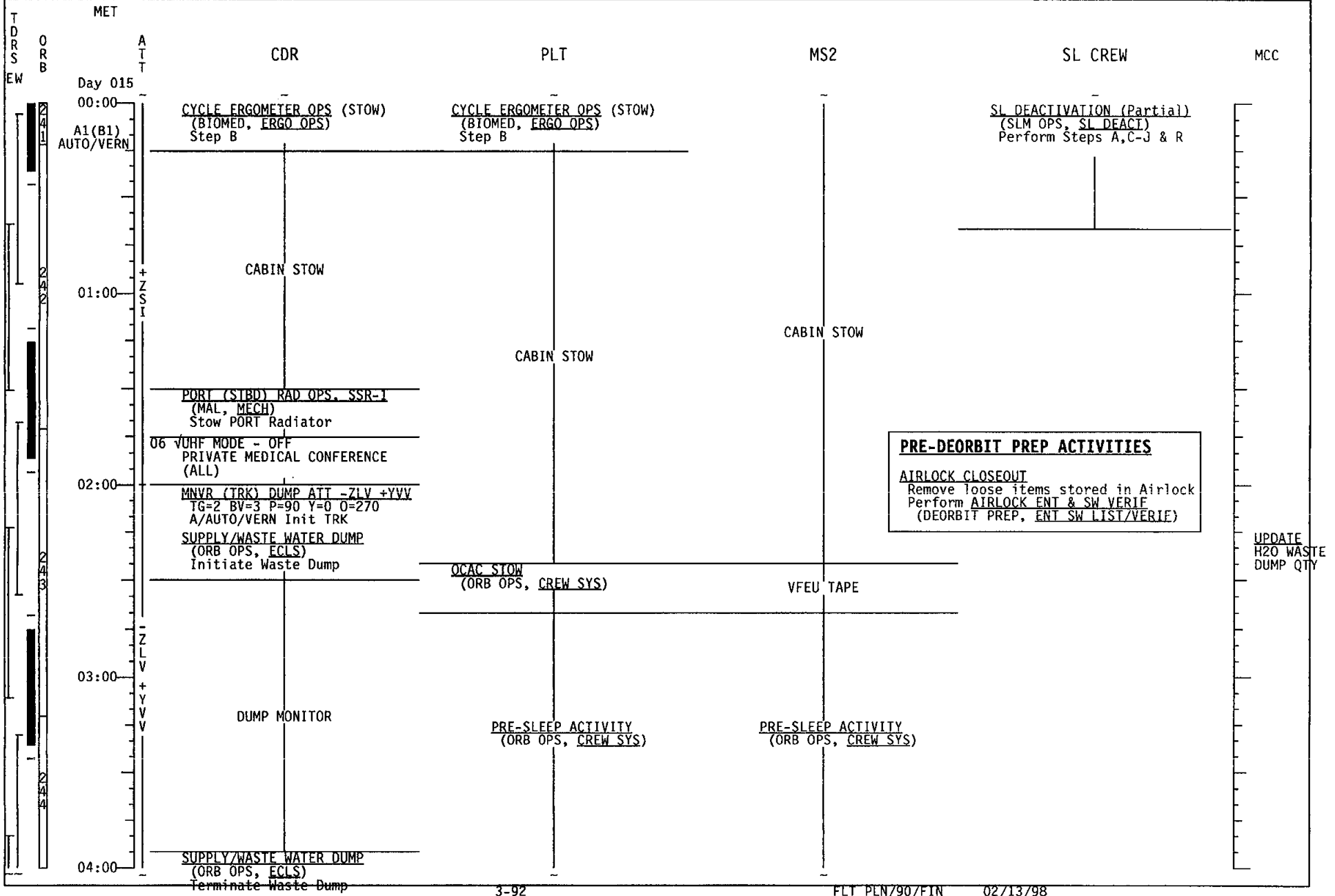
STS-90 (FD 16)



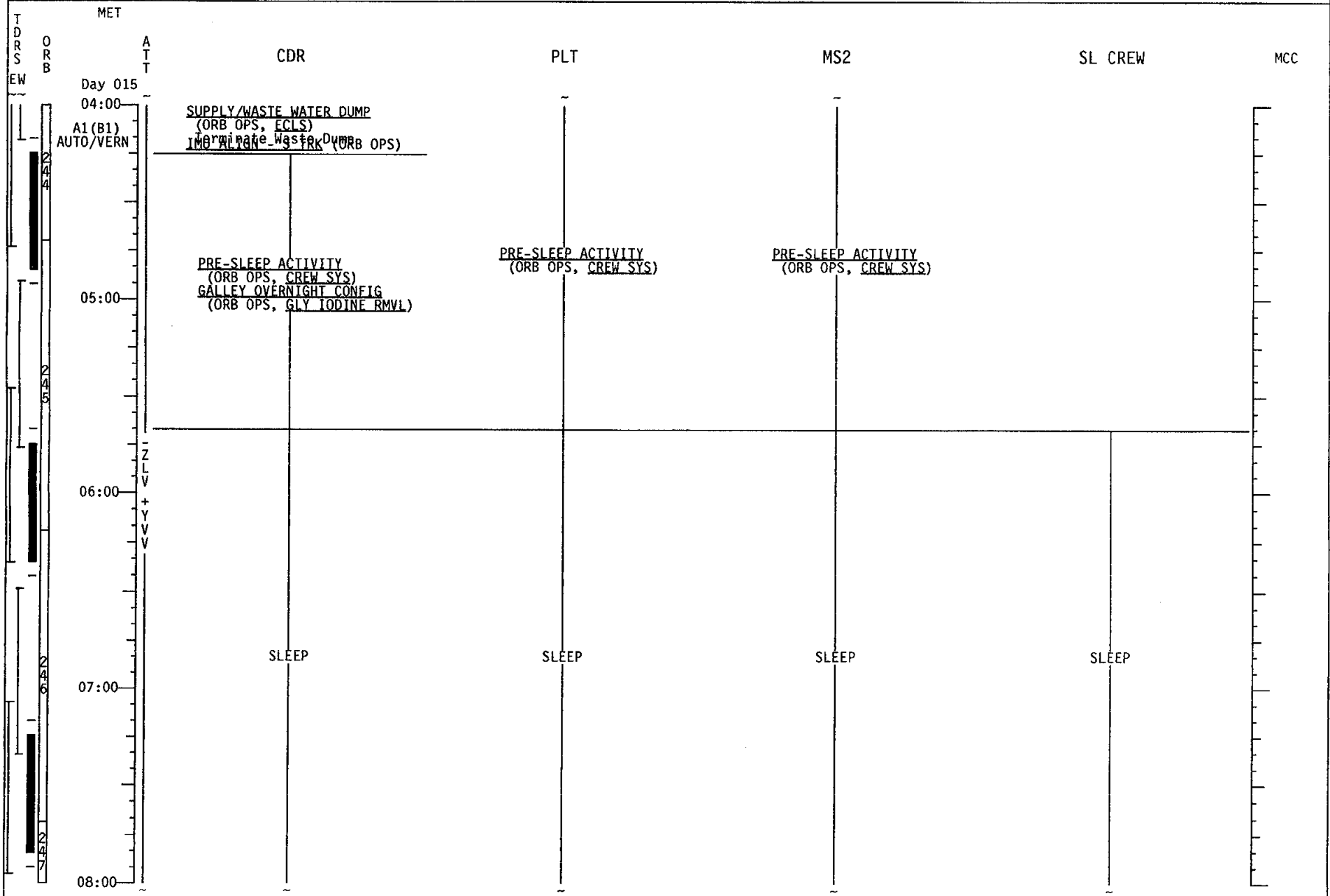
STS-90 (FD 16)



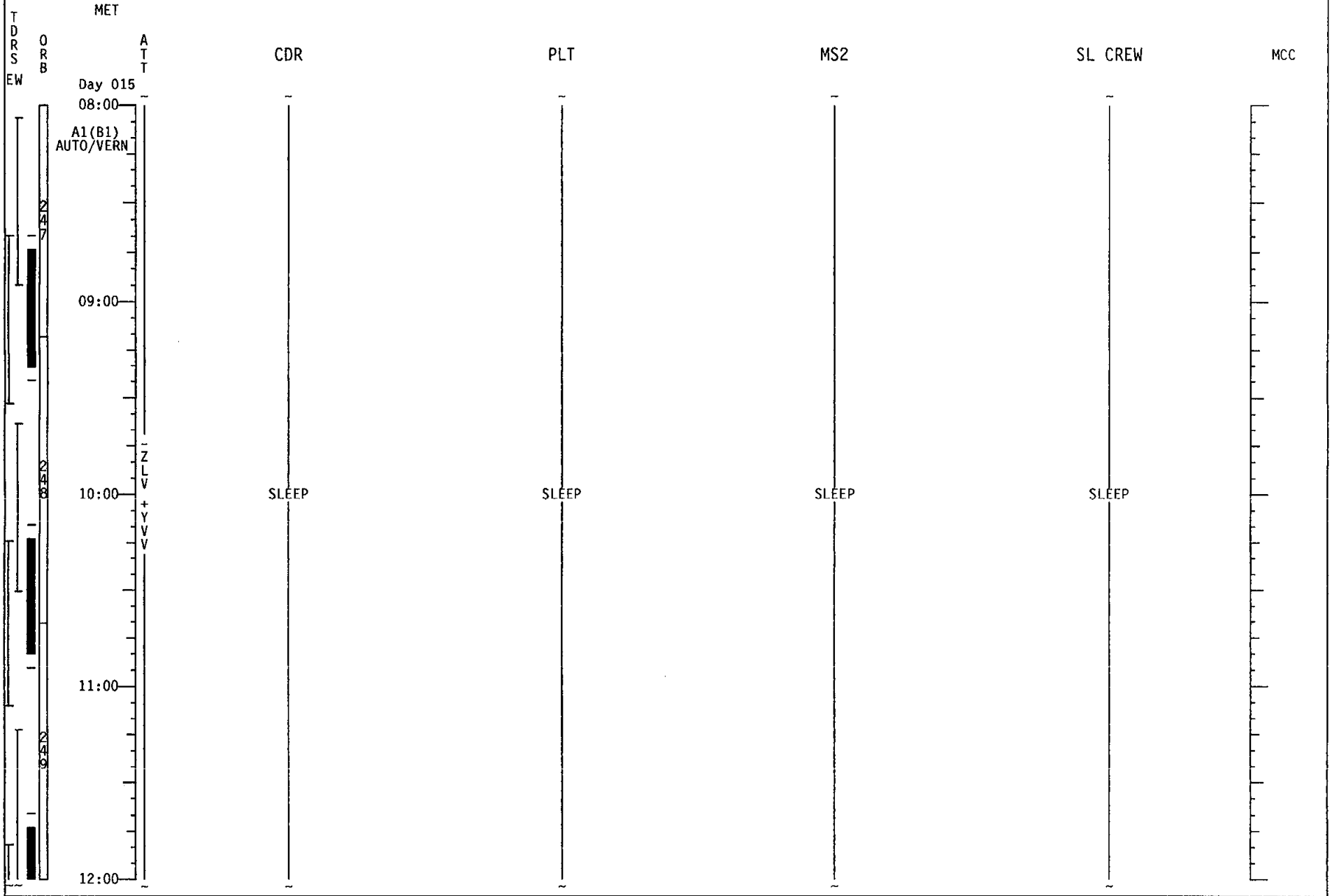
STS-90 (FD 16)



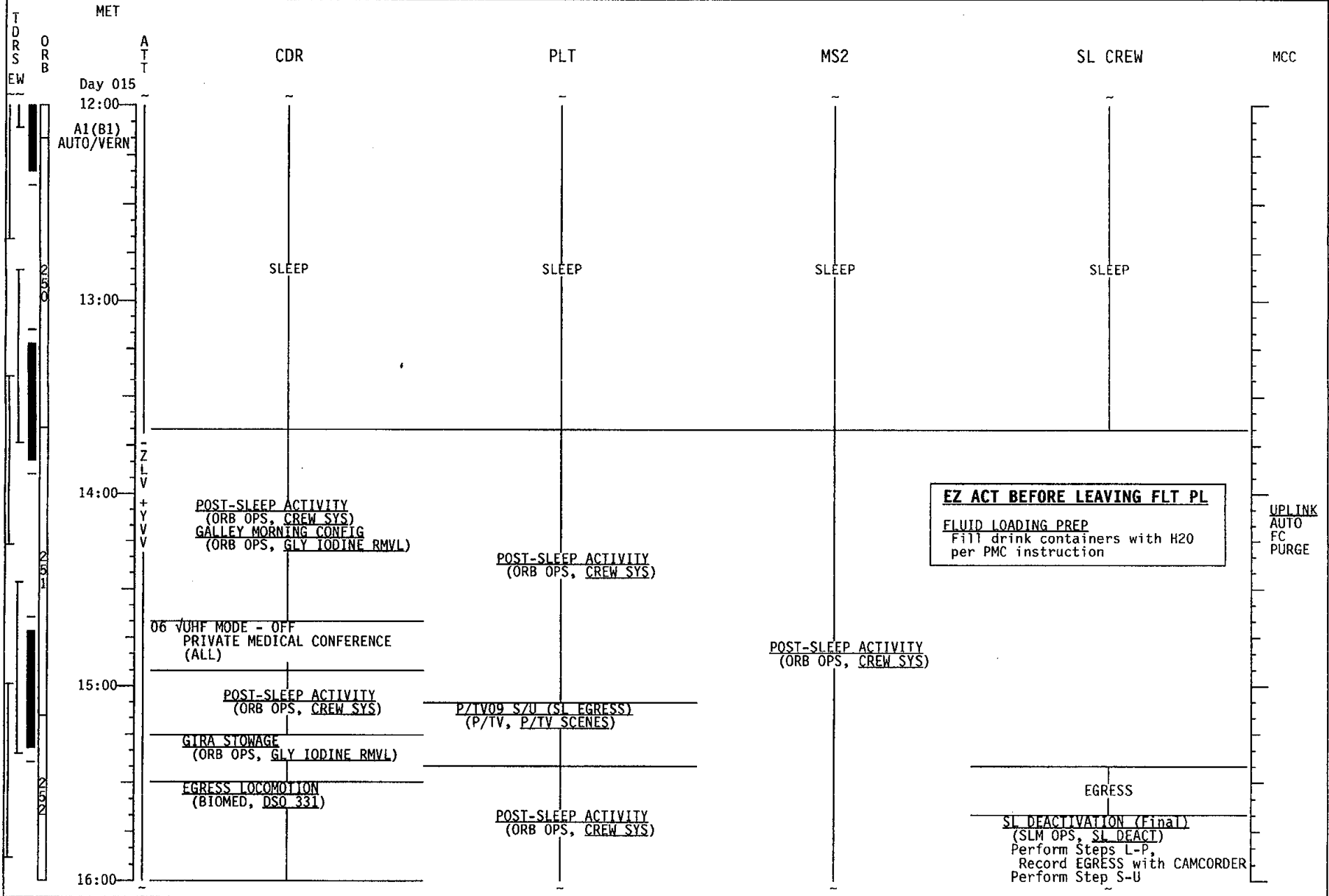
STS-90 (FD 16)



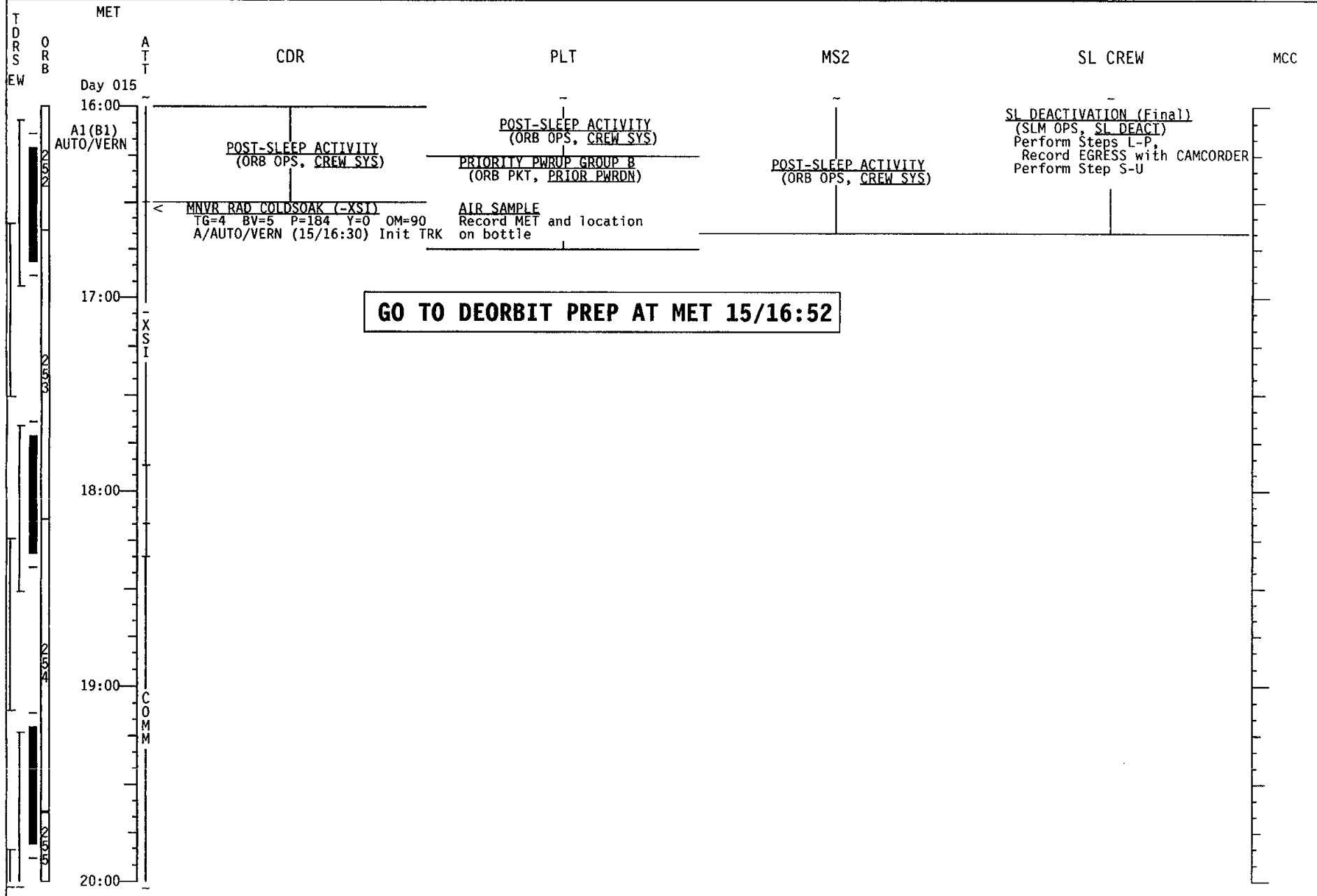
STS-90 (FD 16)



STS-90 (FD 16)



STS-90 (FD 17)



DAP TABLE

DAP TABLE

DAP TABLE

<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 VERN (TAIL ONLY)
A4	PRE/POST DEPLOY	B3	LOSS OF VERN (NOSE & TAIL)
A5	LOSS OF VERN (NOSE & TAIL)	B4	SSUS DEPLOY
A6	LOSS OF VERN (TAIL ONLY)	B5	COAS CAL
A7	RENDEZVOUS	B7	RENDEZVOUS
A8	PROX OPS	B8	PROX OPS

CNT ACC = 0 UNLOADED RMS
 = 1-5 NOT USED

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	

STS-90 GENERIC DAP A CONFIGURATIONS

	ITEM #	A1	A2	A3	A4	A5	A6	A7	A8
PRI									
ROT RATE	10	0.2000	0.4000	0.2000	0.5000	0.2000	0.2000	0.2000	0.2000
ATT DB	11	5.00	1.00	1.00	3.00	5.00	5.00	2.00	2.00
RATE DB	12	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
ROT PLS	13	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
COMP	14	.000	.000	.000	.000	.000	.000	.000	.000
P OPTION	15	ALL	ALL	ALL	ALL	ALL	TAIL	ALL	ALL
Y OPTION	16	ALL	ALL	TAIL	ALL	ALL	TAIL	ALL	ALL
TRAN PLS	17	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05
ALT									
RATE DB	18	0.200	0.200	0.200	0.200	0.070	0.070	0.200	0.200
JET OPT	19	ALL	ALL	ALL	ALL	ALL	TAIL	ALL	ALL
# JETS	20	2	2	2	2	1	1	2	2
ON TIME	21	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
DELAY	22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VERN									
ROT RATE	23	0.2000	0.4000	0.0080	0.2000	0.2000	0.2000	0.2000	0.2000
ATT DB	24	1.000	1.000	0.070	1.000	1.000	1.000	1.000	1.000
RATE DB	25	.020	.020	.010	.020	.020	.020	.020	.020
ROT PLS	26	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
COMP	27	.000	.000	.000	.000	.000	.000	.000	.000
CNTL ACC	28	0	0	0	0	0	0	0	0
PURPOSE		NOMINAL	PTC	GG	PRE/ POST DEPLOY	LOSS OF VERN (N/T)	LOSS OF VERN (TAIL ONLY)	RNDZ	PROX OPS

STS-90 GENERIC DAP B CONFIGURATIONS

	ITEM #	B1	B2	B3	B4	B5	B7	B8
PRI								
ROT RATE	30	0.5000	0.2000	0.2000	0.2000	0.2000	0.5000	0.2000
ATT DB	31	3.00	3.00	3.00	0.30	3.00	2.00	2.00
RATE DB	32	0.20	0.20	0.20	0.20	0.20	0.20	0.20
ROT PLS	33	0.04	0.04	0.04	0.04	0.04	0.04	0.04
COMP	34	.000	.000	.000	.000	.000	.000	.000
P OPTION	35	ALL	TAIL	ALL	TAIL	TAIL	ALL	ALL
Y OPTION	36	ALL	TAIL	ALL	TAIL	TAIL	ALL	ALL
TRAN PLS	37	0.10	0.02	0.02	0.02	0.02	0.05	0.01
ALT								
RATE DB	38	0.200	0.070	0.070	0.200	0.200	0.200	0.200
JET OPT	39	ALL	TAIL	ALL	ALL	ALL	ALL	ALL
# JETS	40	2	1	1	2	2	2	2
ON TIME	41	0.08	0.08	0.08	0.08	0.08	0.08	0.08
DELAY	42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
VERN								
ROT RATE	43	0.2000	0.2000	0.2000	0.0080	0.0160	0.2000	0.2000
ATT DB	44	1.000	1.000	1.000	0.100	0.033	1.000	1.000
RATE DB	45	.020	.020	.020	.010	.020	.020	.020
ROT PLS	46	0.002	0.002	0.002	0.002	0.002	0.002	0.002
COMP	47	.000	.000	.000	.000	.000	.000	.000
CNTL ACC	48	0	0	0	0	0	0	0
PURPOSE		NOM OMS RCS BURNS	LOSS OF VERN (TAIL ONLY)	LOSS OF VERN (N/T)	SSUS DEPLOY	COAS CAL	RNDZ	PROX OPS

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ATTITUDE TIMELINE

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Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 000/01:00:00 MET 07:20 092/19:19:00 GMT 26:20	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 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	PI PLBD Config Verns 2:05
2 000/02:30:00 MET 40:51 092/20:49:00 GMT 59:51	INRTL R=282.00 MNVR P=119.00 Y=320.00 Config in Flt Pln A1(B1)	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 272 P 123	Star Pair B1 -Y:26 -Z:14	IMU ALIGN PAIR AOS 2:21 LOS 3:06
3 000/02:50:00 MET 03:01:17 092/21:09:00 GMT 20:17	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
4 001/02:15:00 MET 28:50 093/20:34:00 GMT 47:50	INRTL R=282.00 MNVR P=119.00 Y=320.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 271 P 124	Star Pair B1 -Y: 26 -Z: 14	IMU Align AOS: 2:19 LOS: 3:04
5 001/02:35:00 MET 45:14 093/20:54:00 GMT 21:04:14	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	Gas Can G-744 -ZLV -XV G-744
6 001/21:50:00 MET 57:30 094/16:09:00 GMT 16:30	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XV MAX KU
7 002/04:35:00 MET 45:00 094/22:54:00 GMT 23:04:00	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 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV +YV Supply Dump
8 002/06:10:00 MET 17:43 095/00:29:00 GMT 36:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
9 003/04:45:00 MET 52:43 095/23:04:00 GMT 11:43	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 +YV Waste Dump
10 003/07:00:00 MET 07:43 096/01:19:00 GMT 26:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
11 003/23:35:00 MET 42:43 096/17:54:00 GMT 18:01:43	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 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV +YV Supply Dump
12 004/01:10:00 MET 17:43 096/19:29:00 GMT 36:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV

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

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
13 005/01:00:00 MET 09:46 097/19:19:00 GMT 28:46	INRTL R=345.00 MNVR P=255.00 Y= 65.00	B1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 29 P 79	+X RCS Posigrade TVR 0	Orbit Adjust-1 TIG 005/01:19
14 005/01:25:00 MET 37:03 097/19:44:00 GMT 56:03	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XVV
15 005/05:05:00 MET 19:30 097/23:24:00 GMT 38:30	INRTL R=282.00 MNVR P=119.00 Y=320.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 269 P 128	Star Pair B1 -Y: 26 -Z: 14	IMU Align AOS: 5:07 LOS: 5:55
16 005/05:25:00 MET 38:24 097/23:44:00 GMT 57:24	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XVV
17 005/21:55:00 MET 22:00:25 098/16:14:00 GMT 19:25	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XVV MAX KU
18 006/01:25:00 MET 35:00 098/19:44:00 GMT 54:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV +YVV Simo Dump
19 006/03:30:00 MET 37:43 098/21:49:00 GMT 56:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XVV
20 006/21:20:00 MET 25:25 099/15:39:00 GMT 44:25	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XVV MAX KU
21 007/04:20:00 MET 31:07 099/22:39:00 GMT 50:07	INRTL R=157.00 MNVR P=198.00 Y=340.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 202 P 155	-Y: 31 -Z: 85	IMU Align AOS: 4:31 LOS: 4:59
22 007/04:40:00 MET 40 099/22:59:00 GMT 40	INRTL R=157.00 MNVR P=199.00 Y=332.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 186 P 153	HUD Star: 20 Arcturus	HUD CAL AOS: 4:42 LOS: 5:25 SS: 4:41
23 007/05:00:00 MET 10:27 099/23:19:00 GMT 29:27	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XVV
24 007/20:15:00 MET 20:25 100/14:34:00 GMT 39:25	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XVV MAX KU

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

Attitude Timeline

MET/GMT	MNVR OPTION	DAP		E/S	REF ATT/REMARKS	EVENT
25 008/05:00:00 MET 10:00 100/23:19:00 GMT 29:00	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 +YV Supply Dump
26 008/06:30:00 MET 37:43 101/00:49:00 GMT 56:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
27 008/21:15:00 MET 22:43 101/15:34:00 GMT 41:43	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 +YV Waste Dump
28 008/23:25:00 MET 32:43 101/17:44:00 GMT 51:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
29 009/17:15:00 MET 22:43 102/11:34:00 GMT 41:43	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 +YV Supply Dump
30 009/19:40:00 MET 02 102/13:59:00 GMT 02	INRTL R=207.00 MNVR P= 52.00 Y= 5.00 FUTURE LOADED	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 313 P 61		MNVR for KU Com @ CREW CONF
31 009/20:30:00 MET 44:42 102/14:49:00 GMT 15:03:42	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
32 010/00:45:00 MET 55:26 102/19:04:00 GMT 14:26	INRTL R=298.00 MNVR P=294.00 Y= 81.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 32 P 65	+X RCS Posigrade TVR 0	Orbit Adjust-2 TIG 010/01:02
33 010/01:05:00 MET 18:01 102/19:24:00 GMT 37:01	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV
34 010/19:25:00 MET 30:25 103/13:44:00 GMT 49:25	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XV MAX KU
35 011/03:15:00 MET 20:09 103/21:34:00 GMT 39:09	INRTL R=302.00 MNVR P=344.00 Y= 49.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 341 P 28	Star Pair B1 -Y: 91 -Z: 58	IMU Align AOS: 3:26 LOS: 4:04
36 011/03:35:00 MET 46:21 103/21:54:00 GMT 22:05:21	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XV

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

Attitude Timeline

MET/GMT	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
37 011/19:10:00 MET 15:25 104/13:29:00 GMT 34:25	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XVV MAX KU
38 012/02:15:00 MET 25:00 104/20:34:00 GMT 44:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV +YVV Simo Dump
39 012/04:20:00 MET 27:43 104/22:39:00 GMT 46:43	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XVV
40 013/01:50:00 MET 58:53 105/20:09:00 GMT 17:53	INRTL R=302.00 MNVR P=344.00 Y= 49.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 339 P 27	Star Pair B1 -Y: 91 -Z: 58	IMU Align AOS: 1:47 LOS: 2:28
41 013/02:10:00 MET 24:42 105/20:29:00 GMT 43:42	TGT=2 BV=5 P= 90.00 Y=335.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 335 P 90	LVLH R= 25.00 P=180.00 Y= 0.00	Neurolab 25 deg BIAS -ZLV -XVV
42 013/18:55:00 MET 19:00:25 106/13:14:00 GMT 19:25	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 270 P 90	LVLH R= 90.00 P=180.00 Y= 0.00	Neurolab -YLV -XVV MAX KU
43 014/02:15:00 MET 25:00 106/20:34:00 GMT 44:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV +YVV Simo Dump
44 014/03:50:00 MET 57:30 106/22:09:00 GMT 16:30	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV
45 014/16:00:00 MET 07:43 107/10:19:00 GMT 26:43	TGT=4 BV=5 P=270.00 Y= 0.00 OM=270.00 RA= 24.616 DEC= 10.241N	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 180 P 90	INRTL R=206.36 P=247.99 Y= 22.58	+ZSI EOM Tire Warming
46 015/02:00:00 MET 14:20 107/20:19:00 GMT 33:20	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV +YVV Thermal Cond./ Tire Warming Attitude
47 015/16:30:00 MET 44:47 108/10:49:00 GMT 11:03:47	TGT=4 BV=5 P=184.00 Y= 0.00 OM= 90.00 RA= 25.562 DEC= 10.601N	A1 RATE 0.2000 AUTO DB AT 1.000 VERN DB RT 0.020	SUN R 180 P 176	INRTL R= 25.71 P=164.30 Y=333.11	-XSI Rad Cold Soak
48 015/17:52:00 MET 55:04 108/12:11:00 GMT 14:04	INRTL R=345.00 MNVR P=133.00 Y=324.00	A1 RATE 0.2000 AUTO DB AT 5.00 PRI DB RT 0.20	SUN R 205 P 148	IMU Pair -Y: 22 -Z: 29	D/O IMU Align AOS: TIG-2:55 LOS: TIG-2:18

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

Attitude Timeline

MET/GMT	MNVR OPTION	DAF	E/S	REF ATT/REMARKS	EVENT
49 015/18:10:00 MET 12:27	INRTL R= 25.00 MNVR P=230.00 Y=295.00	B1 RATE 0.5000 AUTO DB AT 3.00 PRI DB RT 0.20	SUN R 320 P 124	VERIF Pair -Y: 58 -Z: 38	D/O Verif Align AOS: TIG-2:41 LOS: TIG-2:01
108/12:29:00 GMT 31:27					
50 015/18:20:00 MET 24:32	INRTL R= 73.00 MNVR P=136.00 Y=341.00	B1 RATE 0.5000 AUTO DB AT 3.00 PRI DB RT 0.20	SUN R 89 P 150		COMM ATT
108/12:39:00 GMT 43:32					
51 015/20:30:00 MET 34:19	INRTL R=219.00 MNVR P= 14.00 Y= 64.00	TRN RATE 0.5000 AUTO DB AT 3.50 PRI DB RT 0.20	SUN R 15 P 42	TIG 15/20:52:00	Deorbit Burn TVR 180
108/14:49:00 GMT 53:19					

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

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FLIGHT PLAN NOTES

FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

FLIGHT PLAN
NOTES

A. FLIGHT DESCRIPTION

Orbiter: OV102/Columbia
 Inclination: 39°
 Insertion Altitude: 154 X 137 nm
 Duration: 16+(1)+2 days

B. MAJOR EVENTS

<u>EVENT</u>	<u>MET</u>	<u>DATE</u>	<u>CST/CDT</u>	<u>GMT</u>	<u>ΔV</u>	<u>HA/HP</u>
Launch	00/00:00	04/02/98	12:19 CST	18:19	--	--
OMS-2 C/O	00/00:43	04/02/98	13:02 CST	19:02	171.0	137/154
Post Trim #1	05/01:19	04/07/98	14:38 CDT	19:38	2.6	135/152
Post Trim #2	10/01:02	04/12/98	14:21 CDT	19:21	0.0	133/151
Deorbit	15/20:52	04/18/98	10:11 CDT	15:11	231.0	--
Landing	15/21:50	04/18/98	11:09 CDT	16:09	--	--

C. LANDING OPPORTUNITIES

		<u>Landing Orbit No.</u>	<u>Site</u>	<u>Local Time</u>	<u>MET</u>
Nominal	Primary	256	KSC	12:09 EDT	15/21:50
	1 Rev Late	257	KSC	13:43 EDT	15/23:24
	Weather Alt	258	EDW	12:09 PDT	16/00:50
1 Day Late	Primary	272	KSC	12:04 EDT	16/21:45
	1 Rev Late	273	KSC	13:38 EDT	16/23:19
	Weather Alt	274	EDW	12:04 PDT	17/00:45
2 Days Late	Primary	288	KSC	12:00 EDT	17/21:41
	1 Rev Late	289	KSC	13:34 EDT	17/23:15
	Weather Alt	290	EDW	12:00 PDT	18/00:41
3 Days Late	Primary	303	KSC	10:20 EDT	18/20:01
	1 Rev Late	304	KSC	11:55 EDT	18/21:36
	Weather Alt	305	EDW	10:21 PDT	18/23:02

D. CREW

CDR - Rick Searfoss
 PLT - Scott Altman
 MS1 - Rick Linnehan
 MS2 - Kay Hire
 MS3 - Dave Williams
 PS1 - Jay Buckey
 PS2 - Jim Pawelczyk

E. COMMUNICATIONS

SHUTTLE

TDRS Support: East (41° W), West (174° W), Spare (49° W), 171 (171° W)

Backup Real-time TV: Goldstone – GDS(GDX), and Merritt Island – MIL(MLX)

Contingency GSTDN: Goldstone – GDS(GDX), Merritt Island – MIL(MLX),
Dryden (DFRC), Bermuda – BDA(BDX), and
Wallops (WLP)

Contingency RTS: Hawaii (HTS), Guam (GTS), Vandenberg (VTS),
Indian Ocean (IOS), Colorado (CTS),
Diego Garcia (DGS), Oak Hanger (OTS), and
New Hampshire (NHS)

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

F. PAYLOADS

1. Neurolab

The Neurolab payload consists of human and nonhuman scientific experiments and associated hardware in a Spacelab long module and the orbiter middeck. The experiment disciplines are primarily involved with life science investigations utilizing human subjects and laboratory animals. There are two NASA project centers: Ames Research Center (ARC) conducting animal research and Johnson Space Center (JSC) conducting human research. The types of research include the following:

ARC: – Adult Neuronal Plasticity
– Mammalian Development
– Aquatic
– Neurobiology

JSC: – Autonomic Nervous System
– Sensory Motor and Performance
– Sleep
– Vestibular

2. Bioreactor Demonstration Test-04 (BDS-04)

The BDS-04/Biotechnology Specimen Temperature Controller (BSTC) is a multichamber, temperature-controlled, static tissue culture apparatus. It contains four insulated incubation/refrigeration modules with each module holding up to three tissue culture bags containing media and cells.

3. Shuttle Vibration Forces (SVF)

The SVF experiment will provide flight measurements of the vibratory forces acting between an aerospace payload and its mounting structure. The payload uses triaxial force transducers and three Stand-Alone Acceleration Measurement Devices (SAAMD) which will be incorporated into four custom brackets used to attach the standard Get Away Special (GAS) canister to the sidewall GAS adapter beam.

4. Get Away Special (GAS) Payload – 197 (G–197)

The primary objective of the GAS payload G–197 is to determine the on–orbit performance of a low power miniature two–stage orifice pulse tube cryocooler operating in a microgravity environment. G–197 will test a spaceflight prototype cooler for planetary mission instrument cooling and other applications which require efficient low power cooling and minimal vibration.

5. Get Away Special (GAS) Payload – 744 (G–744)

The objective of the GAS payload G–744 is to take measurements of the Earth's upper atmosphere in the Ultraviolet (UV) 200 nanometer to 400 nanometer spectral range using a Charged Coupled Device (CCD)–based spectrometer. A CCD photographic camera will also fly as part of the experiment and provide target verification for the spectrometer.

6. Get Away Special (GAS) Payload (G–772)

The objective of the GAS payload G–772 the Collisions Into Dust Experiment (COLLIDE), is to understand the release of dust from the surfaces of small particles in planetary rings and protoplanetary disks by spring–launching teflon spheres into trays of powdered basaltic rock. The experiment performs six impacts of small spheres into trays of lunar regolith at velocities from 1 centimeter/ seconds to 100 centimeter/seconds. The ejecta from these impacts are measured with video camcorders for quantity, launch angle, and velocity distribution.

G. ON–ORBIT DTOs

1. Cabin Air Monitoring (DTO 623)

DTO 623 will use the solid sorbent sampler to continuously sample the orbiter atmosphere throughout the flight.

2. Portable In–FLight Landing Operations Trainer (PILOT) (DTO 667)

DTO 667 consists of a laptop PC with landing software and a spare RHC (essentially a landing simulator). The DTO will attempt to verify that the simulator will assist the CDR and PLT in maintaining a high level of proficiency for approach and landing on EDO missions.

3. S–Band Sequential Still Video (SSV) Demonstration (DTO 700–16)

DTO 700–16 will demonstrate a new capability of downlinking video using the shuttle S–band system. This DTO will verify that there are no engineering anomalies produced by integrating this new capability into the existing system. It will also solicit feedback from the shuttle program, operations, crew and payload users as to the usefulness of this new capability.

H. ON–ORBIT DSOs

1. Interaction of the Space Shuttle Launch and Entry Suit and Sustained Weightlessness on Egress Locomotion (DSO 331)

DSO 331 will identify the impact of the Launch Entry Suit/Advanced Crew Escape Suit (LES/ACES) and sustained weightlessness on egress locomotion mechanical efficiency as measured by oxygen consumption and gait alteration.

2. Assessment of Human Factors (Ergonomic Evaluation of Gloveboxes) (DSO 904)

DSO 904 will assess the ergonomics of various crew restraints for workstations/gloveboxes utilized during Neurolab science operations. In-flight, the crew will be video taped performing tasks at the various workstations and will complete a questionnaire evaluating the ergonomics of the different types of restraints.

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