

Shuttle

Flight Plan

STS-64

(FRR Cycle Trajectory)

Mission Operations Directorate
Operations Division

Final
July 25, 1994

<u>EVENT</u>	<u>CDT</u>		
Launch	03:30 p.m.	Friday	Sept 9
KSC Landing (9 + 1 day mission)	11:31 a.m.	Monday	Sept 19

National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas



MISSION OPERATIONS DIRECTORATE

STS-64 FLIGHT PLAN


FINAL
July 25, 1994

PREPARED BY:

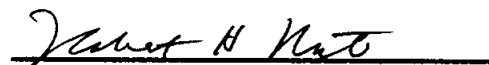


Gail A. Schneider
Book Manager


APPROVED BY:




Neil A. Woodbury
Acting Head, Flight Planning
and Operations Section



Robert H. Nute
Chief, Space Shuttle Flight
Planning Branch



Earl W. Thompson
Chief, Operations Division



Brock R. Stone
Assistant Director
Space Shuttle Operations

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	FLT PLN-1655	FLT PLN-1660A	FLT PLN-1670	MULTI-1052A
	FLT PLN-1656A	FLT PLN-1661	FLT PLN-1671	MULTI-1055
	FLT PLN-1657	FLT PLN-1662	FLT PLN-1672	

Exemption #: 62

AREAS OF TECHNICAL RESPONSIBILITY

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Lead Pointer	DO4/K. Lawson	244-1222

FLIGHT PLAN
STS-64

LIST OF EFFECTIVE PAGES

FINAL 07/25/94

Sign Off	* 64/FIN	3-20	64/FIN
ii	* 64/FIN	3-21	64/FIN
iii	* 64/FIN	3-22	64/FIN
iv	* 64/FIN	3-23	64/FIN
v	* 64/FIN	3-24	64/FIN
vi	* 64/FIN	3-25	64/FIN
vii	64/FIN	3-26	64/FIN
viii	64/FIN	3-27	64/FIN
1-1	64/FIN	3-28	64/FIN
1-2	64/FIN	3-29	64/FIN
1-3	64/FIN	3-30	64/FIN
1-4	64/FIN	3-31	64/FIN
2-1	64/FIN	3-32	64/FIN
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3-10	64/FIN	4A-1	64/FIN
3-11	64/FIN	4A-2	64/FIN
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3-17	64/FIN	5-2	64/FIN
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3-19	64/FIN	5-4	64/FIN

(*) - Omit from flight book

5-5	64/FIN
5-6	64/FIN
5-7	64/FIN
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6-2	Δ 64/FIN
7-i	* 64/FIN
7-ii	* 64/FIN
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8-3	* 64/FIN
8-4	* 64/FIN
8-5	* 64/FIN
8-6	* 64/FIN
8-7	* 64/FIN
8-8	* 64/FIN

- (Δ) - For Crew copies only, insert a copy of pages 11-5 and 11-6, PRIORITY PWRDN GROUP B from the ORB PKT C/L, PRIOR PWRDN behind tab
- (*) - Omit from flight book

STS-64 FLIGHT PLAN FABRICATED ITEMS

<u>Title</u>	<u>Ref. Page</u>	<u>Item No.</u>
DAP A, DAP B TOC	7-6	FLT PLN-1a/64/O/B
(Blank)	7-6	FLT PLN-1b/64/O/A
DAP A	7-7	FLT PLN-2a/64/O/A
DAP A1	7-7	FLT PLN-2b/64/O/A
A1	7-7	FLT PLN-3a/64/O/B
DAP A2	7-7	FLT PLN-3b/64/O/A
A2	7-8	FLT PLN-4a/64/O/B
DAP A3	7-8	FLT PLN-4b/64/O/A
A3	7-8	FLT PLN-5a/64/O/B
DAP A4	7-8	FLT PLN-5b/64/O/A
A4	7-9	FLT PLN-6a/64/O/B
DAP A5	7-9	FLT PLN-6b/64/O/A
A5	7-9	FLT PLN-7a/64/O/B
DAP A6	7-9	FLT PLN-7b/64/O/A
A6	7-10	FLT PLN-8a/64/O/B
DAP A7	7-10	FLT PLN-8b/64/O/A
A7	7-10	FLT PLN-9a/64/O/B
DAP A8	7-10	FLT PLN-9b/64/O/A
A8	7-11	FLT PLN-10a/64/O/B
DAP A9	7-11	FLT PLN-10b/64/O/B
A9	7-11	FLT PLN-11a/64/O/B
DAP A10	7-11	FLT PLN-11b/64/O/B
A10	7-12	FLT PLN-12a/64/O/B
DAP A11	7-12	FLT PLN-12b/64/O/B
A11	7-12	FLT PLN-13a/64/O/B
DAP A12	7-12	FLT PLN-13b/64/O/B
A12	7-13	FLT PLN-14a/64/O/B
DAP A13	7-13	FLT PLN-14b/64/O/A
A13	7-13	FLT PLN-15a/64/O/B
DAP A14	7-13	FLT PLN-15b/64/O/B
A14	7-14	FLT PLN-16a/64/O/A
(Blank)	7-14	FLT PLN-16b/64/O/A
DAP B	7-14	FLT PLN-17a/64/O/B
DAP B1	7-14	FLT PLN-17b/64/O/B
B1	7-15	FLT PLN-18a/64/O/B
DAP B2	7-15	FLT PLN-18b/64/O/B
B2	7-15	FLT PLN-19a/64/O/B
DAP B3	7-15	FLT PLN-19b/64/O/B
B3	7-16	FLT PLN-20a/64/O/B
DAP B4	7-16	FLT PLN-20b/64/O/B
B4	7-16	FLT PLN-21a/64/O/B
DAP B5	7-16	FLT PLN-21b/64/O/B
B5	7-17	FLT PLN-22a/64/O/B
DAP B6	7-17	FLT PLN-22b/64/O/B
B6	7-17	FLT PLN-23a/64/O/B
DAP B7	7-17	FLT PLN-23b/64/O/B
B7	7-18	FLT PLN-24a/64/O/B
DAP B8	7-18	FLT PLN-24b/64/O/B
B8	7-18	FLT PLN-25a/64/O/B
DAP B9	7-18	FLT PLN-25b/64/O/B
B9	7-19	FLT PLN-26a/64/O/B
DAP B10	7-19	FLT PLN-26b/64/O/B
B10	7-19	FLT PLN-27a/64/O/B
(Blank)	7-19	FLT PLN-27b/64/O/B
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INTRODUCTION

The STS-64 Flight Plan is the Flight Data File article that contains the on-orbit timeline. It does not contain the detailed timelines that are covered in the Ascent, Post Insertion, Deorbit Prep, and Entry Checklists. For continuity, the summary level timeline includes the entire flight.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive and the requirements of the STS-64 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the FRR Cycle version of the STS-64 Flight Initialization Data Pack.

The flight profile used for this Flight Plan is for a launch date of September 9, 1994, at 15:30 CDT. Orbiter inertial attitudes are expressed relative to a Mean of 1950 (M50) reference frame.

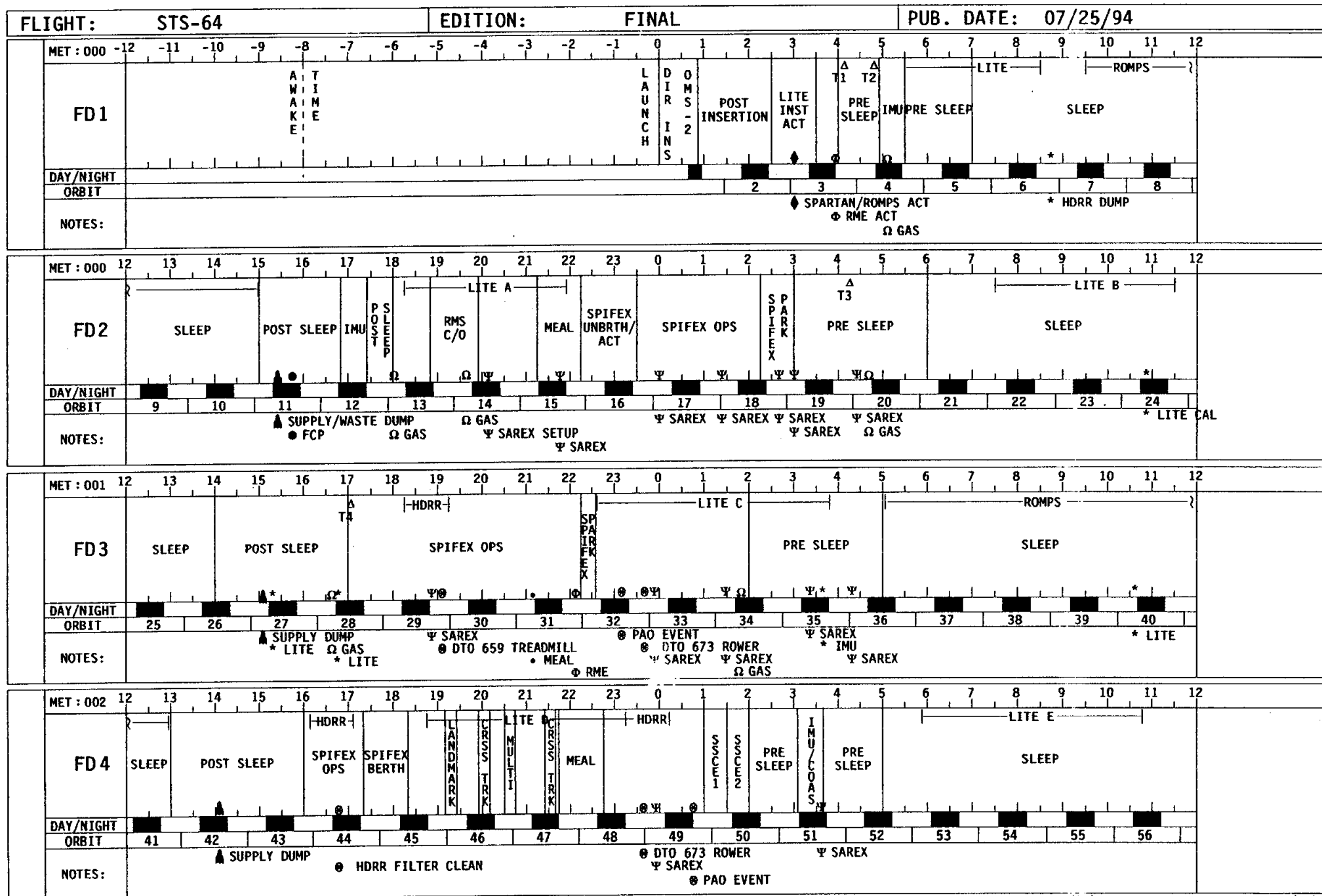
JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, Rev B, January 1992, has been used to build the timelines contained in this Flight Plan. The following Appendix K exemptions have been approved for STS-64:

- #62 - Allows an AMOS overflight opportunity to be scheduled in post sleep on FD5.

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

STS-64 OVERVIEW

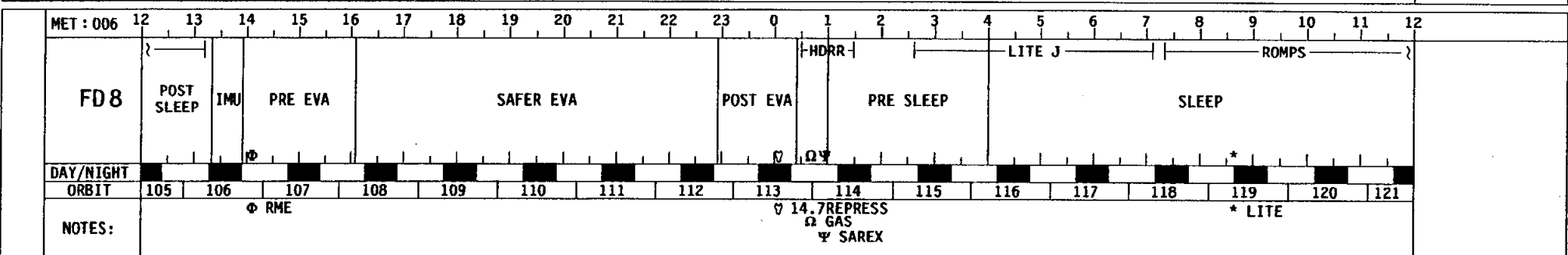
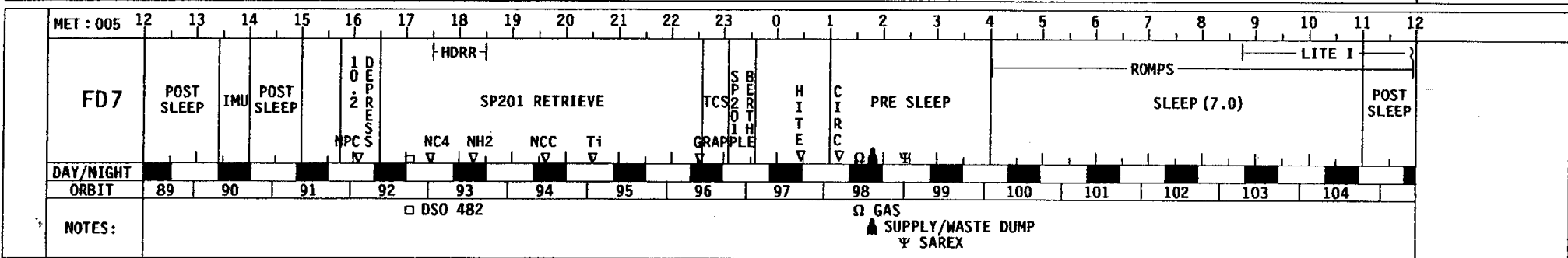
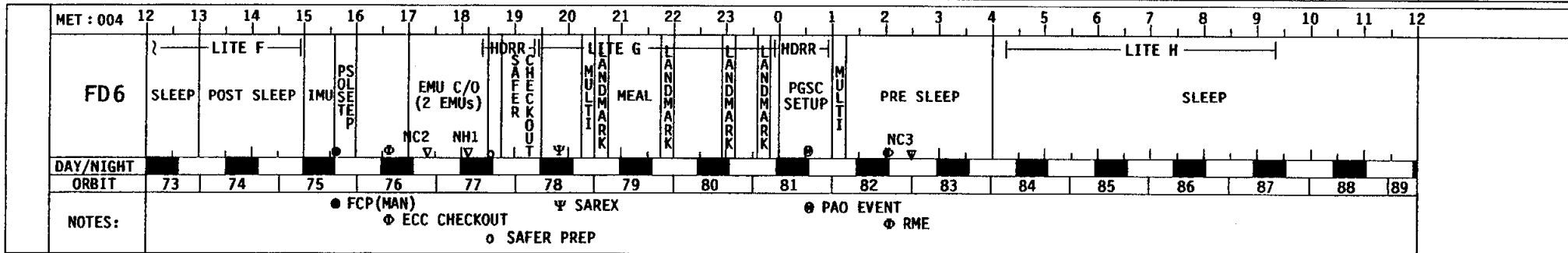
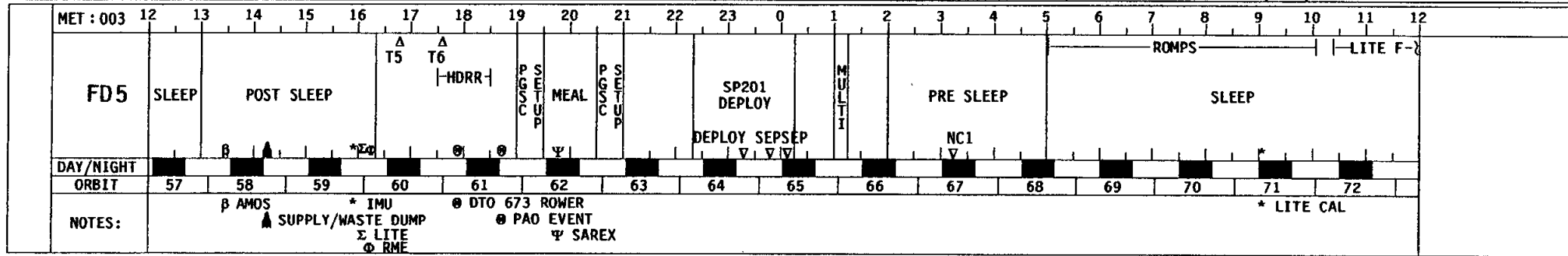
OVERVIEW



FLIGHT: STS-64

EDITION: FINAL

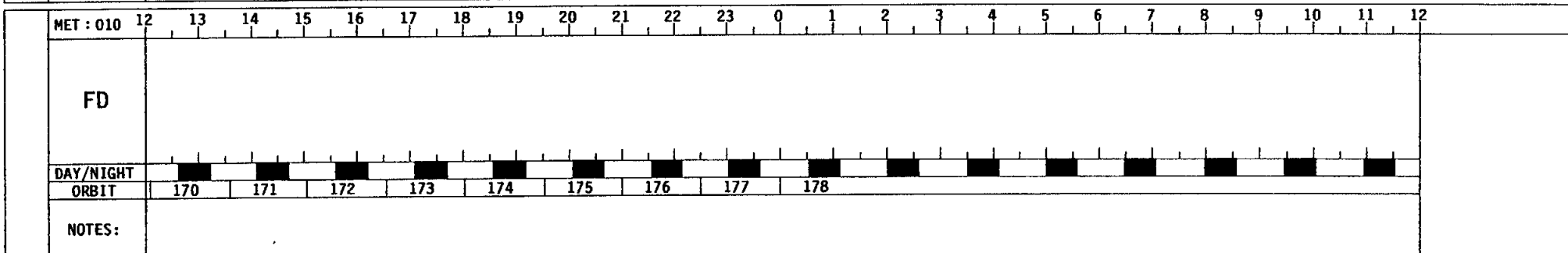
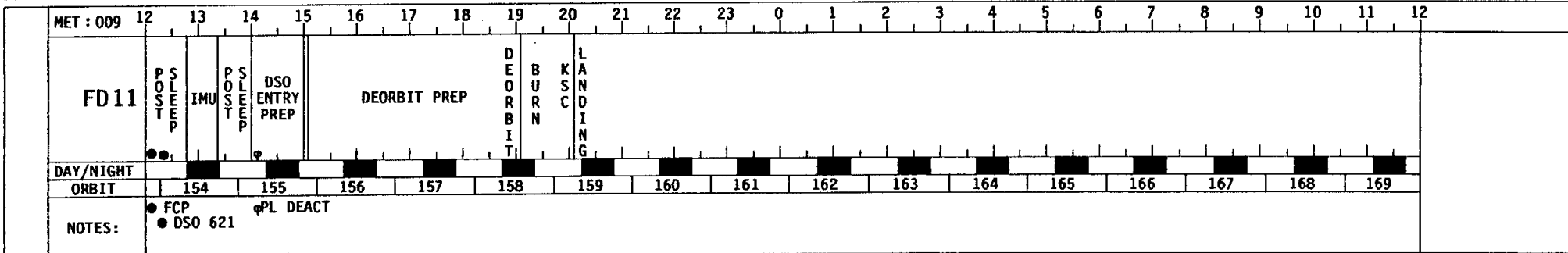
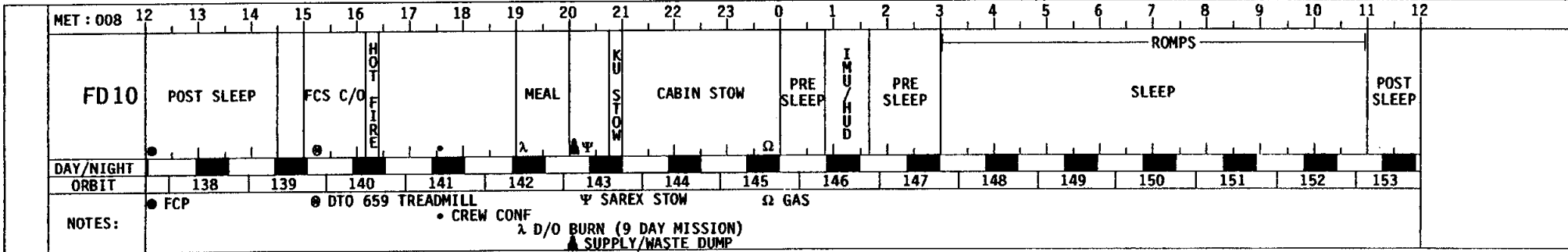
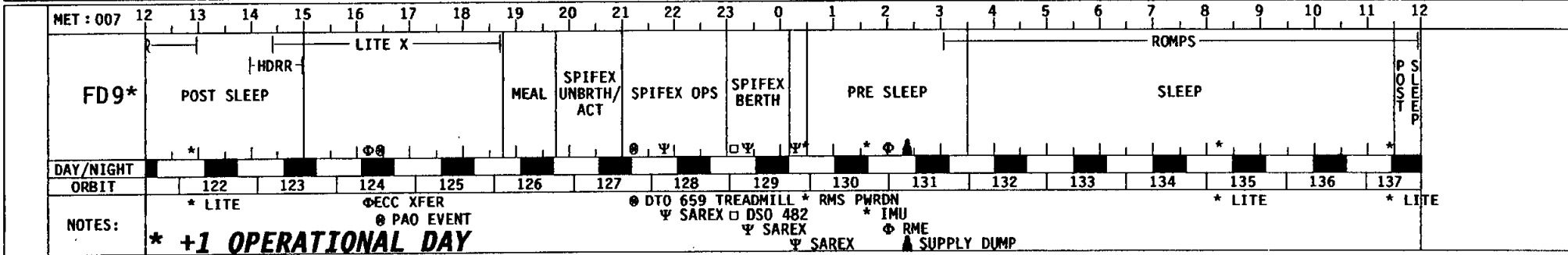
PUB. DATE: 07/25/94



FLIGHT: STS-64

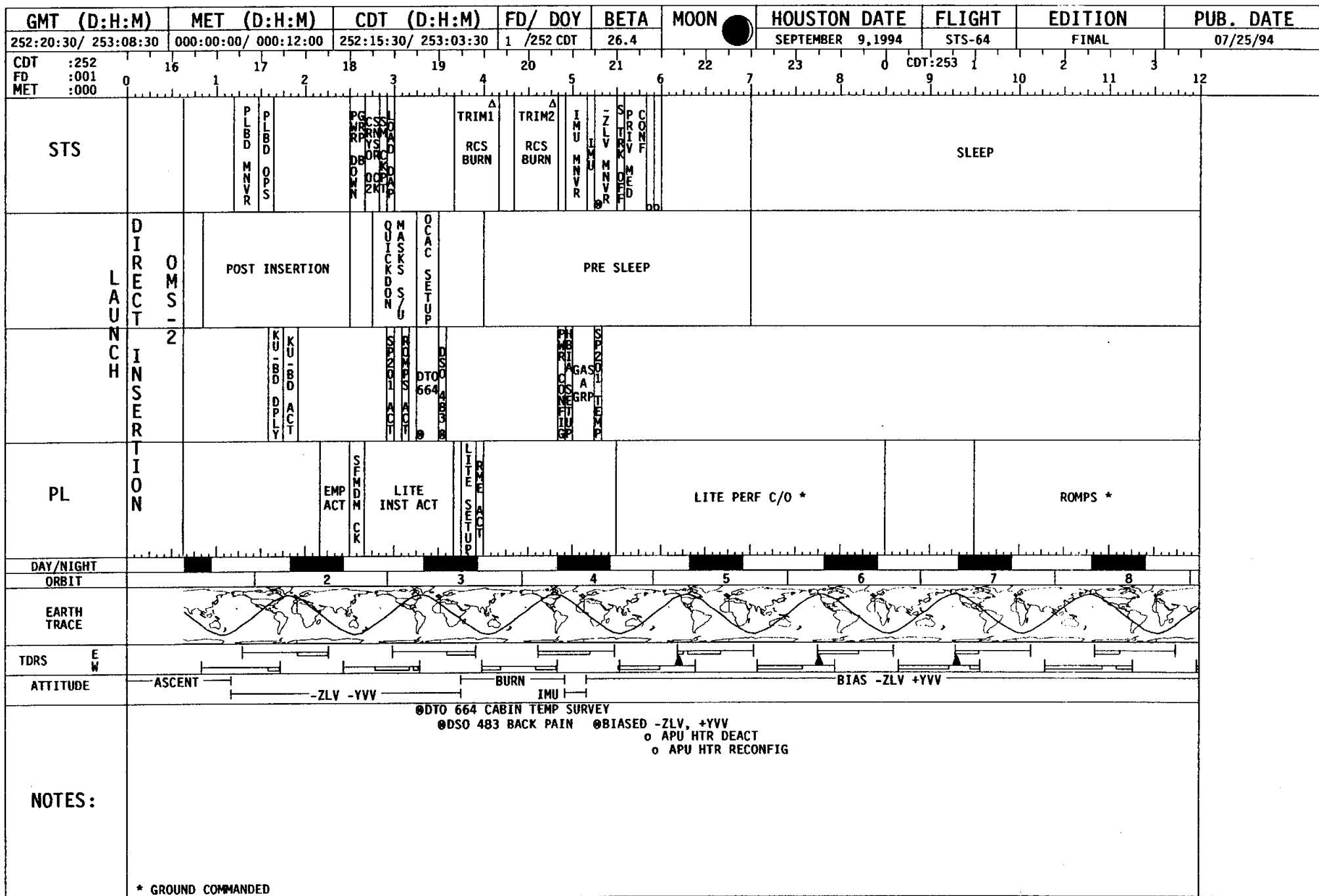
EDITION: FINAL

PUB. DATE: 07/25/94



SUMMARY TIMELINE

SUMMARY TIMELINE



GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE											
253:08:30/ 253:20:30	000:12:00/ 001:00:00	253:03:30/ 253:15:30	2 /253 CDT	24.1		SEPTEMBER 10, 1994	STS-64	FINAL	07/25/94											
CDT :253 FD :001 MET :000									MET:001											
STS	SLEEP		SD IUMM OP INIT	PADM SETUP	SD IUMM OP TERM	IMU MNV R	-ZLV MNV R	DEK OUT	RMS HTR	LOAD DAP		AFT CNTR	SAREX SETUP		MEAL	-ZLV MNV R	CPG ACT			
PL	ROMPS *																			
DAY/NIGHT																				
ORBIT																				
EARTH TRACE																				
TDRS																				
ATTITUDE	BIAS -ZLV +YVV IMU BIAS -ZLV +XVV -ZLV +YVV																			
NOTES:	@AUTO FC PURGE @DSO 483 BACK PAIN @BIASED -ZLV, +XVV @RMS HTR ACT @DTO 664 CABIN TEMP SURVEY @CPG HTR ACT @PERSONAL CONTACT/CHECK @-ZLV, +YVV @SPIFEX CPG TESTS @EISENHOWER MID SCHOOL, MD																			
	* GROUND COMMANDED																			

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
253:20:30 / 254:08:30	001:00:00 / 001:12:00	253:15:30 / 254:03:30	2 / 253 CDT	21.6		SEPTEMBER 10, 1994	STS-64	FINAL	07/25/94

CDT :253	16	17	18	19	20	21	22	23	0	CDT:254	1	2	3	12
FD :002	0	1	2	3	4	5	6	7	8	9	10	11		
MET :001														

STS	FILTER CLEANING	CPG DEACT	DTG 664	PADM SETUP	PRIV MED	CONF	TRIM3 MULT AXIS RCS BURN	DELTA	ZLV	MNV	SLEEP
-----	-----------------	-----------	---------	------------	----------	------	--------------------------	-------	-----	-----	-------

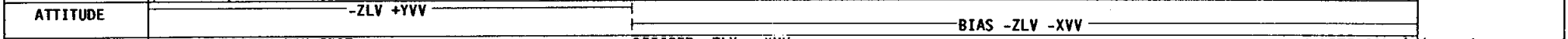
	SPIFEX OPS	SPIFEX PARK PREP	SPIFEX	FILE	PRE SLEEP
--	------------	------------------	--------	------	-----------

	SAREX	SAREX	SAREX	SAREX	AGAS C GRP
--	-------	-------	-------	-------	------------

PL	SAREX	LITE SETUP	SAREX	LITE B (DAY C/O) *
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DAY/NIGHT	[Day/Night Cycle]			
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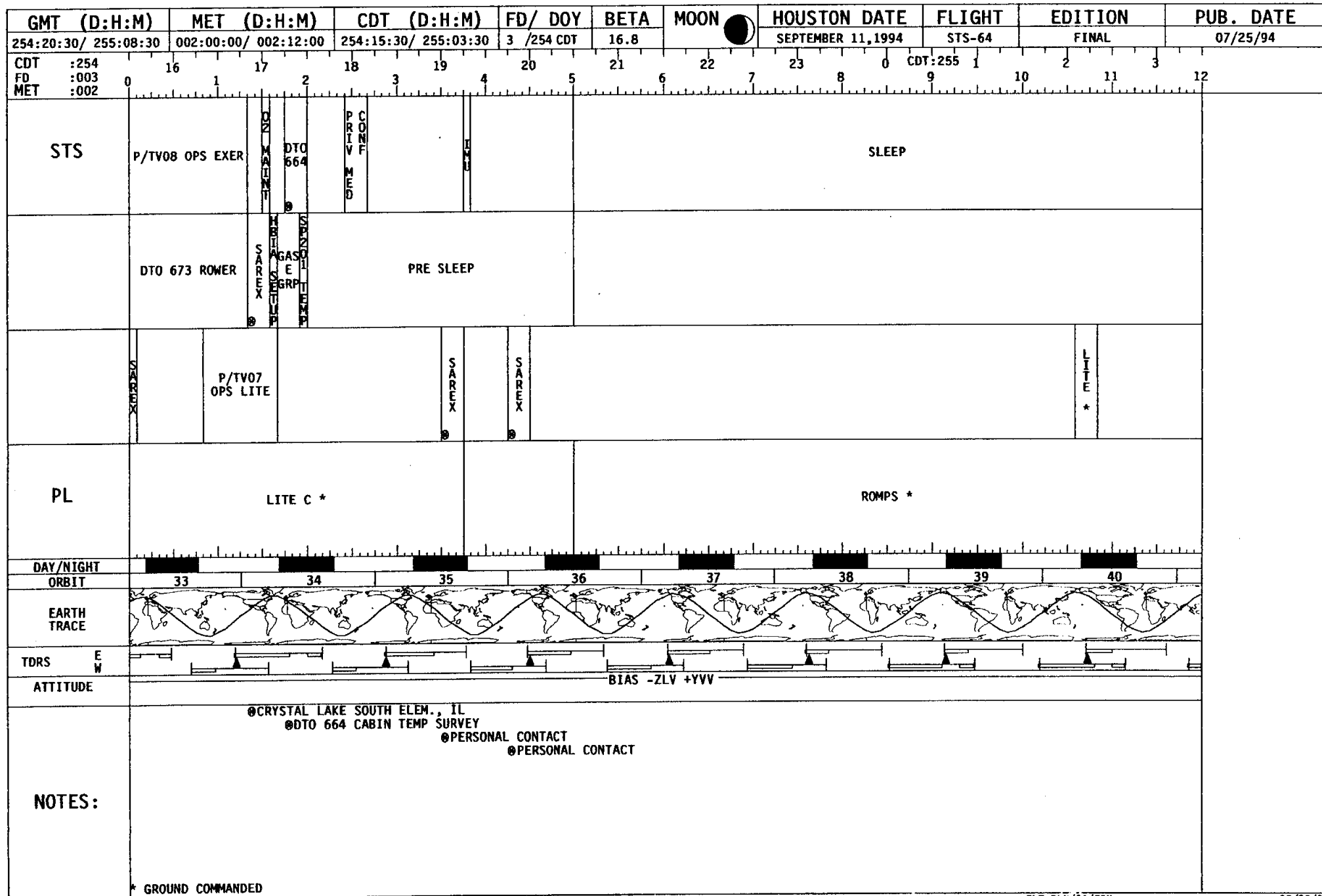
ORBIT	17	18	19	20	21	22	23	24
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@ SPIFEX F30 TEST
 @ HOWELL NORTH HIGH SCHOOL, MO
 @ DTO 664 CABIN TEMP SURVEY
 @ MIDDLETON GRANGE SCHOOL, NZ
 @ GRIZZLY HILL SCHOOL, CA
 @ PERSONAL CONTACT
 @ BIASED -ZLV, -XVV
 @ LITE CAL (1/10:52)

* GROUND COMMANDED
 2-4
 FLT PLN/64/FIM
 07/25/94

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE							
254:08:30/ 254:20:30	001:12:00/ 002:00:00	254:03:30/ 254:15:30	3 /254 CDT	19.2		SEPTEMBER 11, 1994	STS-64	FINAL	07/25/94							
CDT :254 FD :002 MET :001	12	13	14 FD03	15	16	17	18	19	20	21	22	23	15	0	MET:002	
STS	SLEEP			-ZLV MNV R	SD PULM YP INIT	TRIMA MULT AXIS RCS BURN		SAREX		MEAL		DTO 664	P/TV03 SETUP CABIN	PAC OPS	P/TV08 SETUP EXER	PO P/S V DE EX ER
			POST SLEEP				SPIFEX ACT					SPIFEX PARK PREP	SPIFEX	PADM SETUP		DR TO OM ER 7 3
				PADM SETUP		AGAS D GRP	MC CHECK OUT			DTO 659 TREADMILL		P/TV03 SETUP CABIN			P/TV07 OPS LITE	SAREX
PL			LITE *			LITE *	LITE TERM	P/TV08 SETUP EXER	HRRR C/O	P/TV08 SETUP EXER					LITE C *	
DAY/NIGHT																
ORBIT																
EARTH TRACE																
TDRS																
ATTITUDE	BIAS -ZLV -XVV															
	BIAS -ZLV +YVV															
NOTES:	<ul style="list-style-type: none"> ⊙BIASED -ZLV, +YVV ⊙DSO 483 BACK PAIN ⊙ SPIFEX L5L TESTS ⊙ SPIFEX F1F/F2F TESTS ⊙ SPIFEX F3U/L1U/R1U TESTS ⊙DTO 664 CABIN TEMP SURVEY ⊙CENTRAL SQUARE MIDDLE SCHOOL, NY 															
	* GROUND COMMANDED															



GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE								
255:08:30/ 255:20:30	002:12:00/ 003:00:00	255:03:30/ 255:15:30	4 /255 CDT	14.3		SEPTEMBER 12, 1994	STS-64	FINAL	07/25/94								
CDT :255 FD :003 MET :002	12	13 FD04	14	15	16	17	18	19	20	21	22	23	0	MET:003			
STS	SLEEP		SD PULM YP PADM SETUP		SD PULM YP PADM SETUP	DTO 664 P/TVO8 SPEIFEX								MEAL		DTO 673 ROWER	
			POST SLEEP			SPIFEX ACT	SPIFEX OPS	SPIFEX SPEIFEX SPEIFEX								P/TVO8 SETUP EXER	P/TVO8 OPS EXER
					MC CHUTE JUG & FILTER												
								P/TVO7 OPS LITE		P/TVO7 OPS LITE		P/TVO7 OPS LITE					HDRR C/O
PL	ROMPS *				LITE TERM									LITE D *			SAREX
DAY/NIGHT																	
ORBIT																	
EARTH TRACE																	
TDRS																	
ATTITUDE	BIAS -ZLV +YVW																
OFF DUTY	CDR & MS1 MS1 MS1 & MS3 MS3 CDR & MS3																
NOTES:	@DSO 483 BACK PAIN @DTO 664 CABIN TEMP SURVEY @ SPIFEX L2L TESTS																
	* GROUND COMMANDED																

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
255:20:30/ 256:08:30	003:00:00/ 003:12:00	255:15:30/ 256:03:30	4 /255 CDT	11.9		SEPTEMBER 12, 1994	STS-64	FINAL	07/25/94

CDT :255	16	17	18	19	20	21	22	23	0	CDT:256	1	2	3	12
FD :004	0	1	2	3	4	5	6	7	8	9	10	11		
MET :003														

STS	DTO 673 ROWER		PRIV NEED	COAS CAL	IMU/COAS	MNV R	ZLV MNV R							SLEEP
-----	------------------	--	--------------	-------------	----------	----------	-----------------	--	--	--	--	--	--	-------

	P/TV08 OPS EXER	P/TV03 OPS CABIN	DTO 664											PRE SLEEP
--	--------------------	------------------------	------------	--	--	--	--	--	--	--	--	--	--	-----------

		P/TV03 SETUP CABIN	SSCE 1	SSCE 2			S A R E X							
--	--	--------------------------	--------	--------	--	--	-----------------------	--	--	--	--	--	--	--

PL	P/TV03 SETUP CABIN	PAO OPS												LITE E *
----	--------------------------	------------	--	--	--	--	--	--	--	--	--	--	--	----------

DAY/NIGHT	[Day/Night Cycle Bar]													
ORBIT	49	50	51	52	53	54	55	56	57					



TDRS	E	W	[TDRS Coverage Bars]											
ATTITUDE	BIAS -ZLV +XVV				IMU/COAS				BIAS -ZLV -XVV					

OFF DUTY	[Off Duty Bar]													
----------	----------------	--	--	--	--	--	--	--	--	--	--	--	--	--

NOTES:

- ◎DTO 664 CABIN TEMP SURVEY
- ◎AFT STATION
- ◎PERSONAL CONTACT
- ◎BIASED -ZLV, -XVV

* GROUND COMMANDED

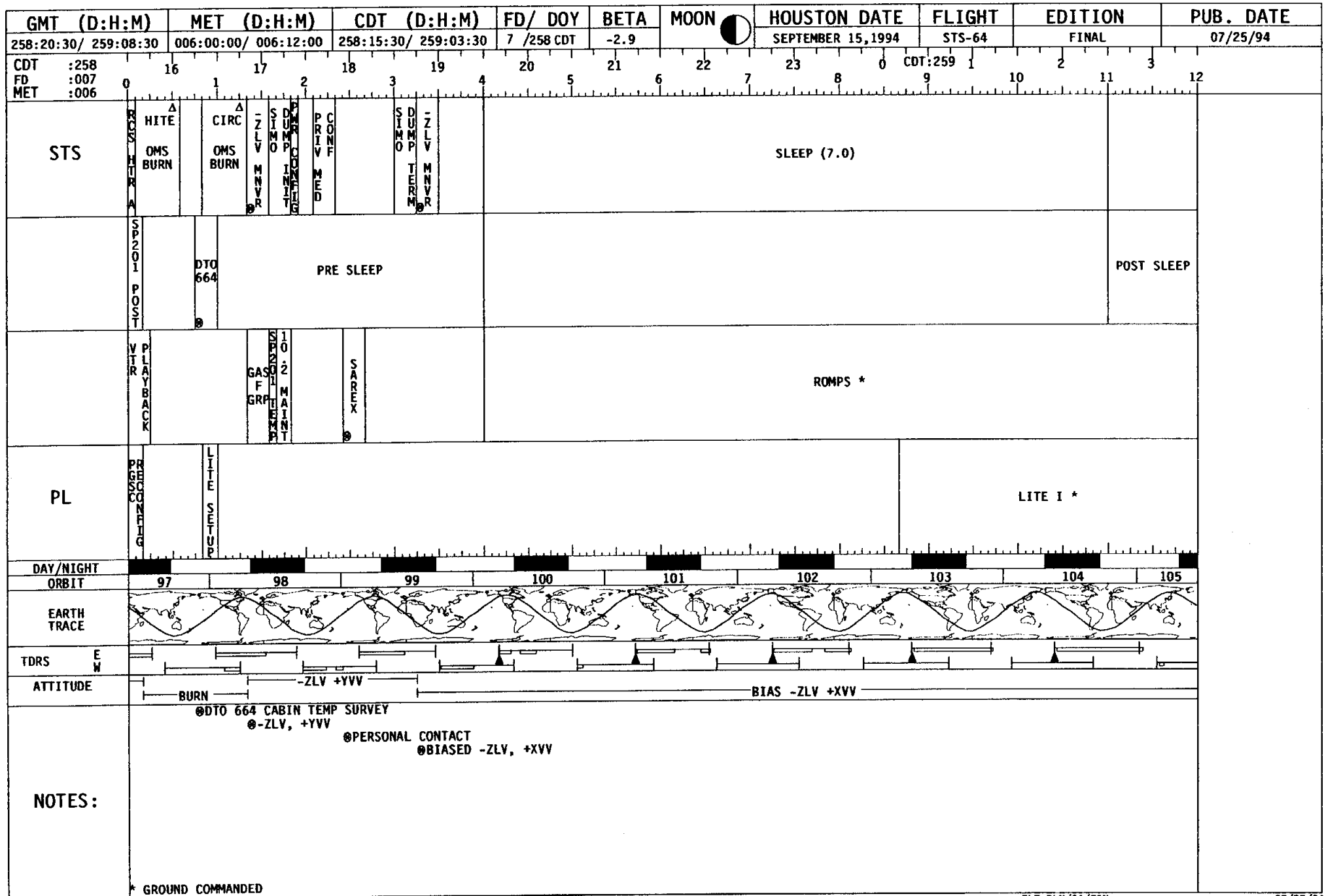
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CDT :256 FD :004 MET :003	MET:004														
STS	SLEEP	AMOS MNVR	ZLV MNVR	PADMM SETUP	TRIM5 MULT AXIS RCS BURN	TRIM6 MULT AXIS RCS BURN	P/TV03 SETUP CABIN	PAO OPS	MEAL	PGSC SETUP	STAT CK	PGSC SETUP	PWR CONFIG	SP201 DEPLOY	DEPLOY SEP2
				POST SLEEP		DTO 664	DTO 673 ROWER	PGSC SETUP	SAREX			RMS PWRUP	RNDZ TOOL CONFIG		TCS DEACT
							P/TV08 SETUP EXER	P/TV08 OPS EXER				P/TV02 SETUP RNDZ		P/TV02 OPS RNDZ	
PL		AMOS PRCS TEST			LITE*		HDRR C/O								
DAY/NIGHT															
ORBIT	57 58 59 60 61 62 63 64 65														
EARTH TRACE															
TDRS															
ATTITUDE	BIAS -ZLV -XVV AMOS -ZLV +YVV SP201 DPY														
OFF DUTY	MS2 & MS4														
NOTES:	@-ZLV, +YVV @DS0 483 BACK PAIN @DTO 664 CABIN TEMP SURVEY @PERSONAL CONTACT @RMS HTR ACT														
	* GROUND COMMANDED														




GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
256:20:30 / 257:08:30	004:00:00 / 004:12:00	256:15:30 / 257:03:30	5 / 256 CDT	6.9		SEPTEMBER 13, 1994	STS-64	FINAL	07/25/94
CDT :256 FD :005 MET :004	16 17 18 19 20 21 22 23 0		CDT:257 1 2 3 12						
STS	SEP P S 2 P 1 O I V	ZLV M N V R	P C O N F I G	V T R P L A Y B A C K	P R I V A T E M E D	F A M C O N F	Δ N C 1 M U L T A X I S R C S B U R N	SLEEP	
	R R S P P R D N			Δ T O 6 6 4	P R E S L E E P				
	P O P S O R D N Z	P R C O N F I G	P S E T T I N G O P T I M I Z E	P O P S L I T E			LITE *		
PL		L I T E M U L T I P L I C A T I O N	L I T E M U L T I P L I C A T I O N	L I T E *	R O M P S *		L I T E F *		
DAY/NIGHT ORBIT	65	66	67	68	69	70	71	72	73
EARTH TRACE									
TDRS									
ATTITUDE	BIAS -ZLV +XVV								
OFF DUTY									
NOTES:	⊙BIASED -ZLV, +XVV ⊙DTO 664 CABIN TEMP SURVEY						⊙ LITE CAL (4/09:06)		
* GROUND COMMANDED									


GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE					
257:08:30/ 257:20:30	004:12:00/ 005:00:00	257:03:30/ 257:15:30	6 /257 CDT	4.5		SEPTEMBER 14, 1994	STS-64	FINAL	07/25/94					
CDT :257 FD :005 MET :004	12	13	14	15	16	17	18	19	20	21	22	23	0	MET:005
STS	SLEEP		PADN SETUP	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG	HEK OPNNG
PL		LITE F *												
DAY/NIGHT														
ORBIT	73	74	75	76	77	78	79	80	81					
EARTH TRACE														
TDRS														
ATTITUDE	BIAS -ZLV +YVV IMU BIAS -ZLV +YVV LMT BIAS -ZLV +YVV													
OFF DUTY	PLT													
NOTES:	@DSO 483 BACK PAIN @BIASED -ZLV, +YVV @MANUAL @DTO 664 CABIN TEMP SURVEY @DTO 672 EMU CUFF C/L @CABIN TEMP CNTL RECONFIG @STAR/STEP, WA													
	* GROUND COMMANDED													

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE															
257:20:30 / 258:08:30	005:00:00 / 005:12:00	257:15:30 / 258:03:30	6 / 257 CDT	2.0		SEPTEMBER 14, 1994	STS-64	FINAL	07/25/94															
CDT :257	16	17	18	19	20	21	22	23	0	CDT:258	1	2	3	4	5	6	7	8	9	10	11	12	FD07	
FD :006	0	1	2	3	4	5	6	7	8	9	10	11	12											
MET :005																								
STS	ON	PCONF	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV	PRIV
	P/TV03 SETUP CABIN	PAODTO DPS664																						
	PGSC SETUP																							
PL	HDRR C/O																							
DAY/NIGHT																								
ORBIT	81	82	83	84	85	86	87	88	89															
EARTH TRACE																								
TDRS																								
ATTITUDE	BIAS -ZLV +YVV																							
OFF DUTY																								
NOTES:	<p>⊙DTO 664 CABIN TEMP SURVEY</p> <p>* GROUND COMMANDED</p>																							

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE										
258:08:30 / 258:20:30	005:12:00 / 006:00:00	258:03:30 / 258:15:30	7 / 258 CDT	-0.4		SEPTEMBER 15, 1994	STS-64	FINAL	07/25/94										
CDT :258 FD :007 MET :005	12	13	14	15	16	17	18	19	20	21	22	23	15	0	MET:006				
STS		PADM SETUP	IMU MNVR	ZLV MNVR	RNDZ PREP	DTO 664	PAR CONFIG	NPC MULT AXIS RCS BURN	PAR CONFIG	NC4	NH2	NCC	TI	VBAR	GRAPPLE	TCS	SP201 BERTH		
		POST SLEEP			RNDZ PREP	P/TV02 SETUP RNDZ	MASSK P/B												
					MANIT P/B	10.2 DEPRESS	10.2 DEPRESS												
PL					LITE TERM		HDRR C/O	DON HOLTER											
DAY/NIGHT																			
ORBIT	89	90	91	92	93	94	95	96	97										
EARTH TRACE																			
TDRS																			
ATTITUDE	BIAS -ZLV +YVV	IMU																	
NOTES:	@DSO 483 BACK PAIN @-ZLV, +YVV @DTO 664 CABIN TEMP SURVEY @DSO 482 CARDIAC RHYTHM DURING EVA @RMS HTR ACT																		
	* GROUND COMMANDED																		



GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																										
259:08:30/ 259:20:30	006:12:00/ 007:00:00	259:03:30/ 259:15:30	8 /259 CDT	-5.3		SEPTEMBER 16, 1994	STS-64	FINAL	07/25/94																										
CDT :259 FD :008 MET :006	<table border="1"> <tr> <td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td><td>21</td><td>22</td><td>23</td><td>15</td> </tr> <tr> <td></td><td>10 2 MAINT</td><td>PAD R SUIT UP S HIR IMU MNRV ZLV MNRV</td><td>ZLV MNRV</td><td>ROZ HIR RMS HIR</td><td>RMS HIR</td><td>P/RMS CONFIG PWRUP</td><td>THREES OK</td><td>-XLV MNRV -ZLV MNRV</td><td>-XLV MNRV -ZLV MNRV</td><td></td><td>THREES OK</td><td>RMS PWRDN PWR CONFIG</td> </tr> </table>								12	13	14	15	16	17	18	19	20	21	22	23	15		10 2 MAINT	PAD R SUIT UP S HIR IMU MNRV ZLV MNRV	ZLV MNRV	ROZ HIR RMS HIR	RMS HIR	P/RMS CONFIG PWRUP	THREES OK	-XLV MNRV -ZLV MNRV	-XLV MNRV -ZLV MNRV		THREES OK	RMS PWRDN PWR CONFIG	MET:007
12	13	14	15	16	17	18	19	20	21	22	23	15																							
	10 2 MAINT	PAD R SUIT UP S HIR IMU MNRV ZLV MNRV	ZLV MNRV	ROZ HIR RMS HIR	RMS HIR	P/RMS CONFIG PWRUP	THREES OK	-XLV MNRV -ZLV MNRV	-XLV MNRV -ZLV MNRV		THREES OK	RMS PWRDN PWR CONFIG																							
STS	POST SLEEP		EVA PREP		P/TV04 SETUP EVA		EVA SUPPORT				POST EVA SUPPORT																								
	DOFF HOLTER	EVA PREP		EMU PURGE/PB		SAFER EVA				POST EVA																									
PL	LITE I *	P/TV03 OPS CABIN		P/TV04 OPS EVA																															
DAY/NIGHT																																			
ORBIT	<table border="1"> <tr> <td>105</td><td>106</td><td>107</td><td>108</td><td>109</td><td>110</td><td>111</td><td>112</td><td>113</td> </tr> </table>												105	106	107	108	109	110	111	112	113														
105	106	107	108	109	110	111	112	113																											
EARTH TRACE																																			
TDRS	<table border="1"> <tr> <td>E</td><td>W</td> </tr> <tr> <td>▲</td><td>■</td> </tr> </table>												E	W	▲	■																			
E	W																																		
▲	■																																		
ATTITUDE	BIAS -ZLV +XVV IMU I -ZLV -YVV/EVA																																		
NOTES:	<p> @DSO 483 BACK PAIN @DSO 482 CARDIAC RHYTHM DURING EVA @-ZLV, -YVV @RMS HTR ACT/MCIU FILTER CK @DTO 664 CABIN TEMP SURVEY @ ECC DONNING @ SAFER DONNING(HAND CONT & PROP MOD) </p> <p> @BIASED -XLV -YVV @ PRECISION FLIGHT EVAL @-ZLV, -YVV </p> <p> @BIASED -XLV -YVV @ PRECISION FLIGHT EVAL @-ZLV, -YVV </p> <p> @ SAFER DOFFING(HAND CONT) @ SAFER DOFFING(PROP MOD) @ 14.7 REPRESS </p>																																		
	* GROUND COMMANDED																																		

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
259:20:30 / 260:08:30	007:00:00 / 007:12:00	259:15:30 / 260:03:30	8 / 259 CDT	-7.8		SEPTEMBER 16, 1994	STS-64	FINAL	07/25/94

CDT :259	16	17	18	19	20	21	22	23	0	CDT:260	1	2	3	
FD :008	0	1	2	3	4	5	6	7	8	9	10	11	12	
MET :007														

STS	147 REPRESS S	16 SAREX	17 PRIV MED	18 -ZLV MNV	SLEEP									
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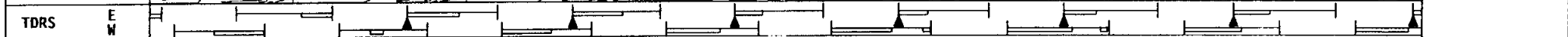
	POST EVA	EMU BATT	PRE SLEEP										
--	-------------	-------------	-----------	--	--	--	--	--	--	--	--	--	--

	POST EVA	AGAS G SEGR									LITE *			
--	-------------	-------------------	--	--	--	--	--	--	--	--	-----------	--	--	--

PL		HDRR C/O	DON HOLTER	LITE J *					ROMPS *				
----	--	-------------	---------------	----------	--	--	--	--	---------	--	--	--	--

DAY/NIGHT	[Day/Night Cycle Bar]													
-----------	-----------------------	--	--	--	--	--	--	--	--	--	--	--	--	--

ORBIT	113	114	115	116	117	118	119	120	121
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ATTITUDE	-ZLV -YVV/EVA				BIAS -ZLV +YVV									
----------	---------------	--	--	--	----------------	--	--	--	--	--	--	--	--	--

NOTES:


- BRANSON SCHOOL, CA
- DSO 482 CARDIAC RHYTHM DURING EVA
- BIASED -ZLV, +YVV

* GROUND COMMANDED





GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
260:08:30/ 260:20:30	007:12:00/ 008:00:00	260:03:30/ 260:15:30	9 /260 CDT	-10.3		SEPTEMBER 17, 1994	STS-64	FINAL	07/25/94
CDT :260 FD :009 MET :007									MET:008
STS									
PL									
DAY/NIGHT									
ORBIT									
EARTH TRACE									
TDRS									
ATTITUDE									
NOTES:									

+1 OPERATIONAL DAY

* GROUND COMMANDED

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE								
260:20:30 / 261:08:30	008:00:00 / 008:12:00	260:15:30 / 261:03:30	9 / 260 CDT	-12.7		SEPTEMBER 17, 1994	STS-64	FINAL	07/25/94								
CDT :260	16	17	18	19	20	21	22	23	0	CDT:261	1	2	3	FD10	12		
FD :009	0	1	2	3	4	5	6	7	8	9	10	11					
MET :008																	
STS	RMS PWRD N	RR CV M E D	P A D M S E T U P	R S D C P L M Y P	H I T T R A	I N I T	J U D	S D P L M Y P								SLEEP	
	L I T E S E T U P	H S B I Z A T I O N S														PRE SLEEP	POST SLEEP
	S P I E X	S P I E X	S P I E X														LITE *
PL	S A R E X																ROMPS *
DAY/NIGHT																	
ORBIT	129	130	131	132	133	134	135	136	137								
EARTH TRACE																	
TDRS	E															W	
ATTITUDE	BIAS -ZLV +YVV																
NOTES:	<p>⊙MIDDLETON GRANGE, NZ B/U</p> <p>+1 OPERATIONAL DAY</p> <p>* GROUND COMMANDED</p>																

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
261:08:30/ 261:20:30	008:12:00/ 009:00:00	261:03:30/ 261:15:30	10 /261 CDT	-15.1		SEPTEMBER 18, 1994	STS-64	FINAL	07/25/94	
CDT :261 FD :010 MET :008	12 13 14 15 16 17 18 19 20 21 22 23 0 MET:009									
STS	* POST SLEEP FCS C/O MEAL CABIN STOW CREW CONF DEORB PREP REVIEW SAREX STOW DUMP KUIB STOW DUMP TERM									
PL	P/TV06 SETUP CONF P/TV06 OPS CONF P/TV08 SETUP EXER P/TV08 OPS EXER DTO 659 TREADMILL POST EVA ENT PREP SAREX STOW DTO 664 GAS H GRP									
DAY/NIGHT										
ORBIT	137 138 139 140 141 142 143 144 145									
EARTH TRACE										
TDRS										
ATTITUDE	BIAS -ZLV +YVV BIAS -XLV -YVV BIAS -ZLV +YVV									
NOTES:	* AUTO FC PURGE @DSO 483 BACK PAIN o APU HTR ACT @BIASED -XLV, -YVV @DTO 664 CABIN TEMP SURVEY o APU HTR RECONFIG @BIASED -ZLV, +YVV @DTO 664 CABIN TEMP SURVEY * GROUND COMMANDED									

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE					
261:20:30 / 262:08:30	009:00:00 / 009:12:00	261:15:30 / 262:03:30	10/261 CDT	-17.6		SEPTEMBER 18, 1994	STS-64	FINAL	07/25/94					
CDT :261 FD :010 MET :009	16	17	18	19	20	21	22	23	0 CDT:262	1	2	3	11 FD11	12
STS	PRIV MEED	CON F	IMU ENV R	HUD CAL	ZLV MNR	ENV CAL	SLEEP							
	PRE SLEEP											POST SLEEP		
	ROMPS *													
PL	ROMPS *													
DAY/NIGHT														
ORBIT	145	146	147	148	149	150	151	152	153					
EARTH TRACE														
TDRS	E													
ATTITUDE	-ZLV +YVV													
NOTES:	IMU/HUD ⊗ -ZLV, +YVV													

* GROUND COMMANDED

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE						
262:08:30/ 262:20:30	009:12:00/ 010:00:00	262:03:30/ 262:15:30	11 /262 CDT	-20.0	☉	SEPTEMBER 19, 1994	STS-64	FINAL	07/25/94						
CDT :262 FD :011 MET :009	12	13	14	15	16	17	18	19	20	21	22	23	15	0	MET:010
STS		IMU MNV R	ZLV MNV R	PCONF MED	PGWRP UB P	XSI MNV R	IMU MNV R	IMU MNV R	PLUBD OPS	COMM MNV R					
	POST SLEEP			DSO ENTRY PREP	DEORBIT PREP			DEORBIT BURN	KSC LANDING						
PL				DTO 664											
					LITE DEACT										
DAY/NIGHT	[Day/Night Cycle]														
ORBIT	154 155 156 157 158 159 160 161														
EARTH TRACE	[Earth Trace Map]														
TDRS	[TDRS Coverage]														
ATTITUDE	IMU - ZLV +YVV IMU/VERIF -XSI COMM BURN ENTRY														
NOTES:	<p>* AUTO FC PURGE @DSO 483 BACK PAIN @-ZLV, +YVV @DSO 621 IN-FLIGHT USE OF FLORINEF(CDR,MS2,MS3) Δ ROMPS DEACT @DTO 664 CABIN TEMP SURVEY @DSO 603C ORTHOSTATIC FUNCTION</p> <p>* GROUND COMMANDED</p> <div style="display: flex; justify-content: space-around;"> <div style="border: 1px solid black; padding: 2px;">* DEORBIT BURN 9/19:06</div> <div style="border: 1px solid black; padding: 2px;">* KSC LANDING 9/20:01</div> </div>														

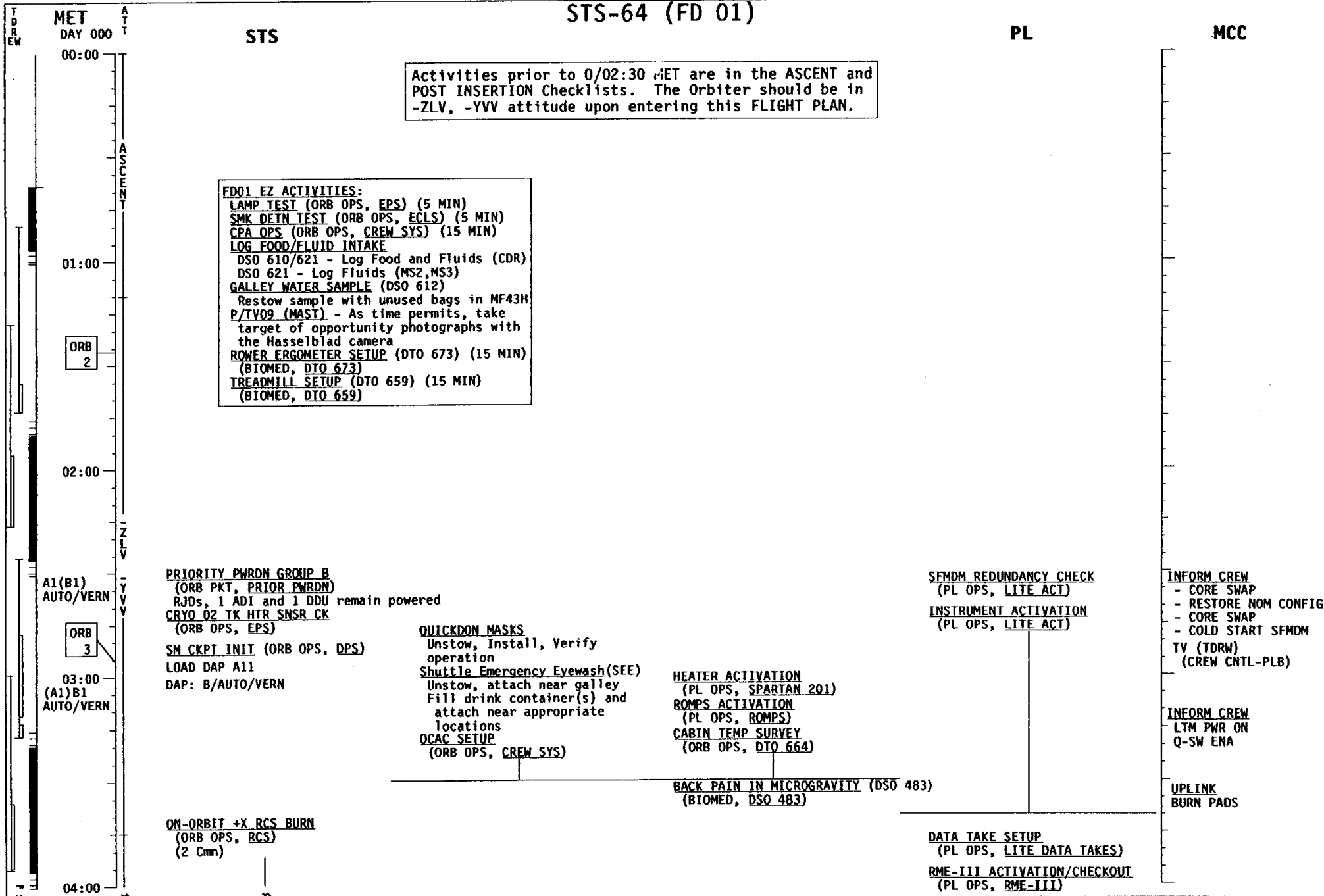
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DETAILED TIMELINE

DETAILED
TIMELINE

DETAILED TIMELINE

STS-64 (FD 01)



STS-64 (FD 01)

MET DAY 000
 04:00
 (A1)B1 INRTL/PRI
 ORB 4
 (A1)B1 LVLH/VERN
 B1/IN/PRI
 (A1)B1 AUTO/VERN
 05:00
 (A1)B1 AUTO/VERN
 A11(B1) AUTO/VERN
 ORB 5
 06:00
 BIAS
 -ZLV
 +YVV
 07:00
 ORB 6
 08:00

STS

ON-ORBIT +X RCS BURN
 TRIM 1 (04:06)
 DAP: B/LVLH/VERN
 ON-ORBIT +X RCS BURN
 (ORB OPS, RCS)
 (2 Cmn)
 TRIM 2 (04:48)
 DAP: B/AUTO/VERN
 MNVR IMU ALIGN ATI (SPECIAL)
 R=305.0 P=13.0 Y=11.0
 B/AUTO/VERN Init MNVR at SS
 IMU ALIGN - S TRK (ORB OPS)
 MNVR (TRK) BIASED -ZLV, +YVV
 TG=2 BV=5
 P=95.0 Y=0.0 OM=270.0
 B/AUTO/VERN Init TRK
 When in ATI: A11/AUTO/VERN
 06 S TRK PWR - Z - OFF
 06 UHF MODE - OFF
 PRIVATE MEDICAL CONFERENCE
 (ALL)
 APU STEAM VENT HTR DEACT
 R2 BLR PWR (three) - OFF
 A12 APU HTR GG/FU (three) - A AUTO

PRE-SLEEP ACTIVITY (ORB OPS, CREW SYS)

Do not perform
 SUPPLY WATER DUMP

AHM SEP FOR WATER
 ACCUMULATION

WCS VAC VLV - CL

INSTALL WINDOW SHADES ON W7-10

SLEEP

IMU ALIGN PAD
-Y 27, DENEK
-Z 36, KAUS AUSTRALIS

PWRDN RJDs, ADI, and DDU
 PGSC/HBIA SETUP
 (PL OPS, HBIA)
 GAS ACTIVITIES GROUP A
 (PL OPS, GAS)
 Perform Post-Burn
 SPARTAN TEMP CHECK
 (PL OPS, SPARTAN 201)

PL

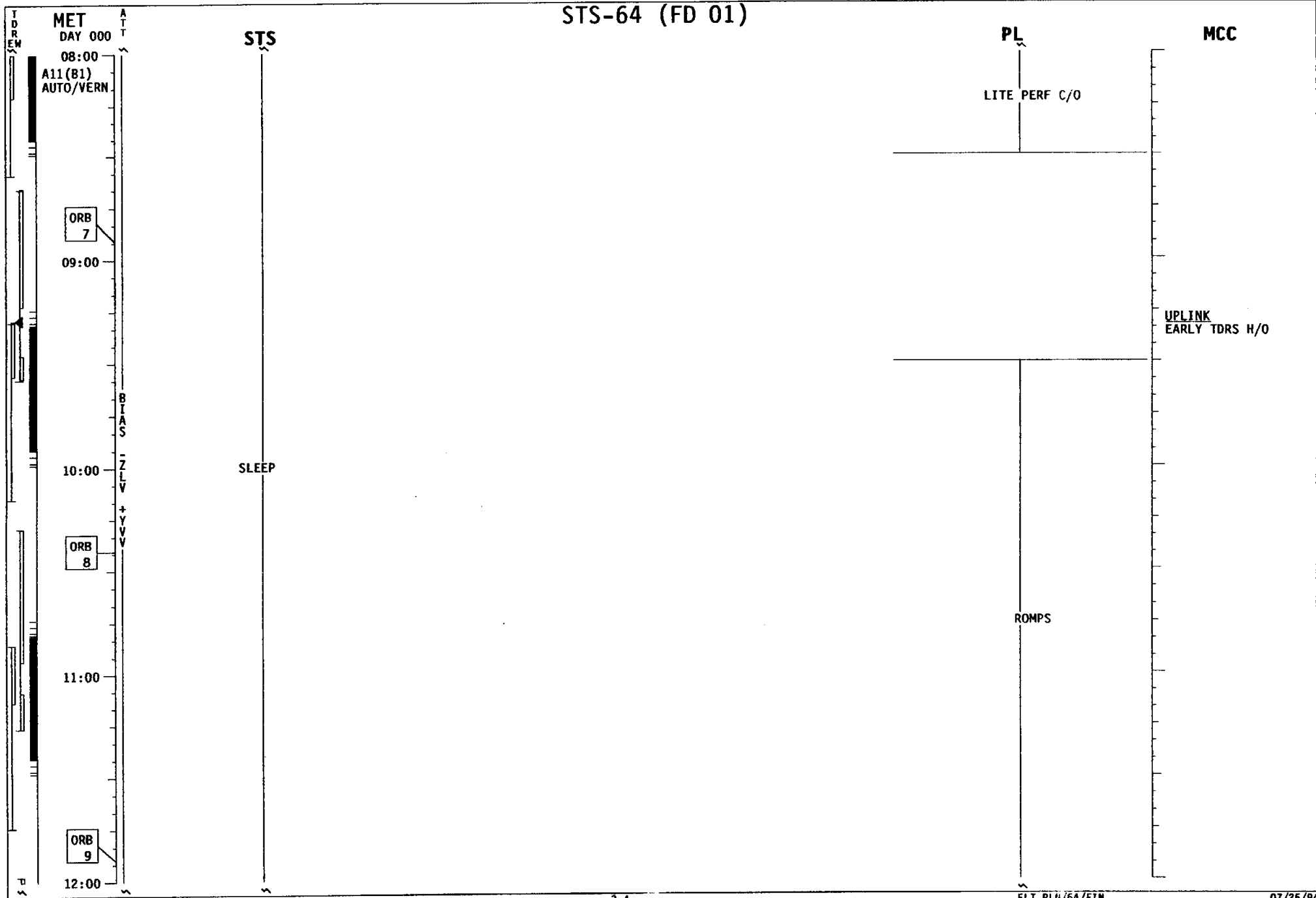
LITE PERF C/O

MCC

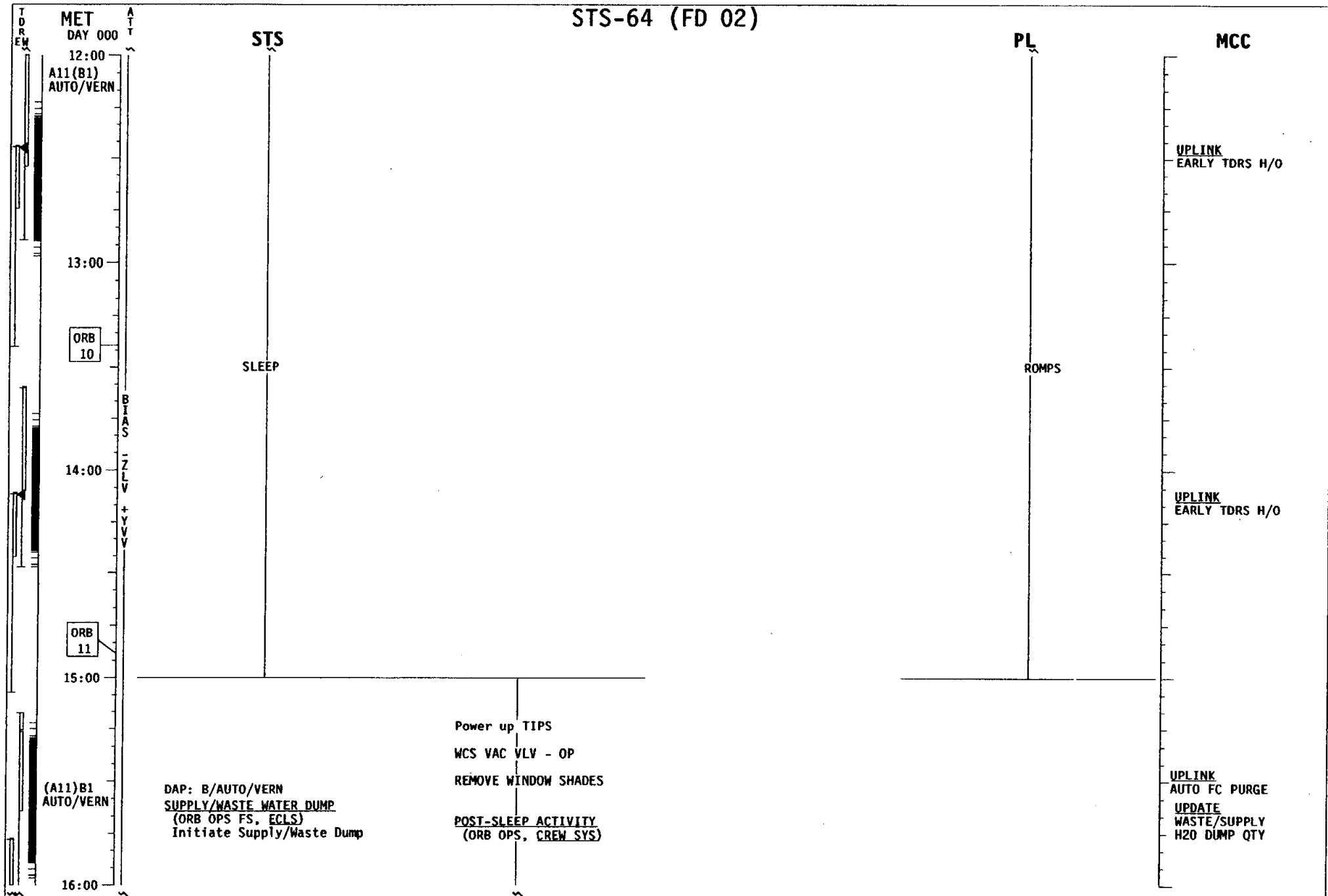
UPLINK
 EARLY TDRS H/O

UPLINK
 EARLY TDRS H/O

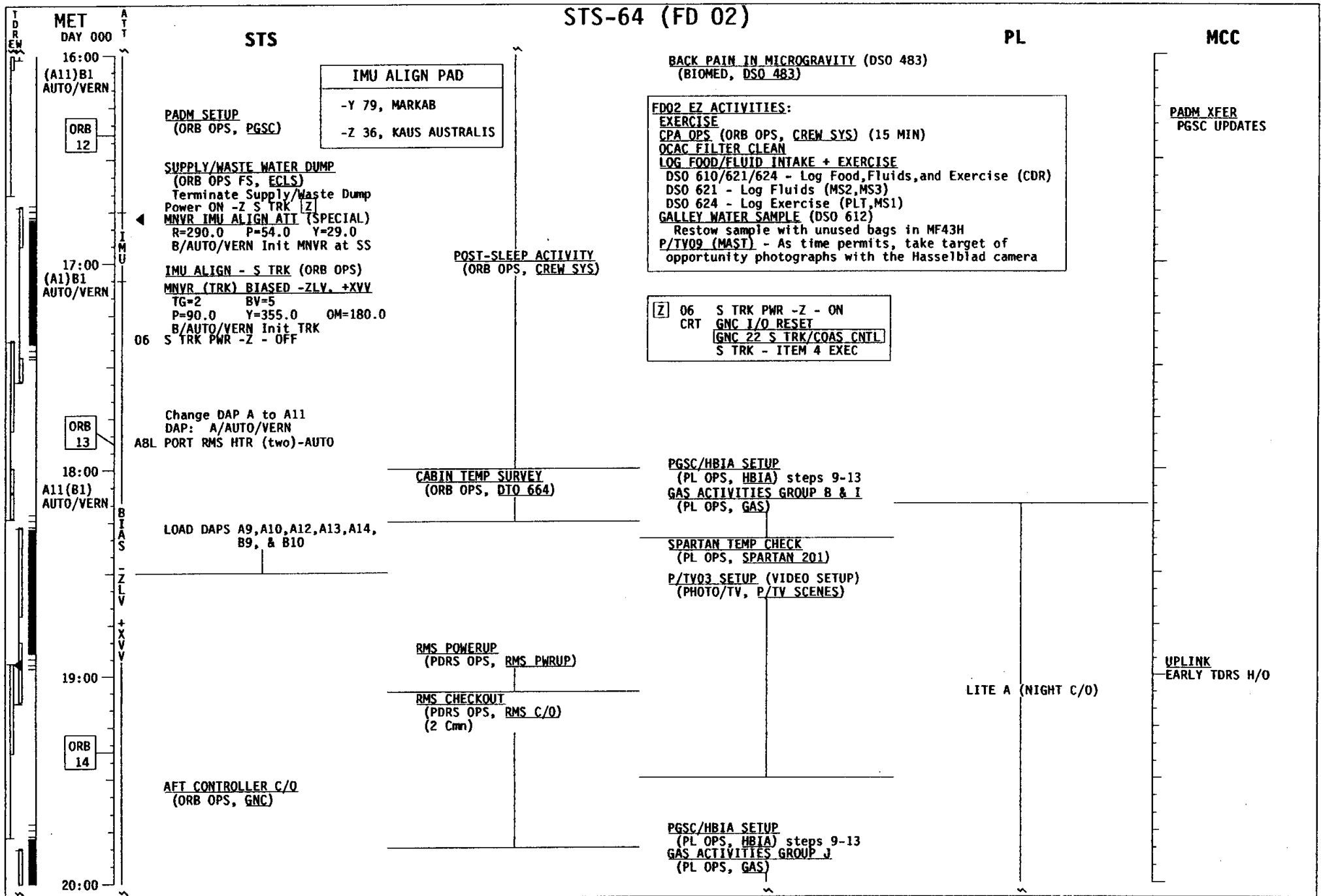
STS-64 (FD 01)



STS-64 (FD 02)



STS-64 (FD 02)



MET
DAY 000
16:00
(A11)B1
AUTO/VERN
ORB 12
17:00
(A1)B1
AUTO/VERN
ORB 13
18:00
A11(B1)
AUTO/VERN
19:00
ORB 14
20:00

STS

PL

MCC

IMU ALIGN PAD
-Y 79, MARKAB
-Z 36, KAUS AUSTRALIS

BACK PAIN IN MICROGRAVITY (DSO 483)
(BIOMED, DSO 483)

FD02 EZ ACTIVITIES:
EXERCISE
CPA OPS (ORB OPS, CREW SYS) (15 MIN)
OCAC FILTER CLEAN
LOG FOOD/FLUID INTAKE + EXERCISE
DSO 610/621/624 - Log Food, Fluids, and Exercise (CDR)
DSO 621 - Log Fluids (MS2, MS3)
DSO 624 - Log Exercise (PLT, MS1)
GALLEY WATER SAMPLE (DSO 612)
Restow sample with unused bags in MF43H
P/TV09 (MAST) - As time permits, take target of opportunity photographs with the Hasselblad camera

PADM XFER
PGSC UPDATES

PADM SETUP
(ORB OPS, PGSC)

SUPPLY/WASTE WATER DUMP
(ORB OPS FS, ECLS)
Terminate Supply/Waste Dump
Power ON -Z S TRK [Z]
MNVR IMU ALIGN ATT (SPECIAL)
R=290.0 P=54.0 Y=29.0
B/AUTO/VERN Init MNVR at SS

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) BIASED -ZLV, +XVY
TG=2 BV=5
P=90.0 Y=355.0 OM=180.0
B/AUTO/VERN Init TRK
06 S TRK PWR -Z - OFF

[Z] 06 S TRK PWR -Z - ON
CRT GNC I/O RESET
[GNC 22 S TRK/COAS CNTL
S TRK - ITEM 4 EXEC

Change DAP A to A11
DAP: A/AUTO/VERN
A8L PORT RMS HTR (two)-AUTO

CABIN TEMP SURVEY
(ORB OPS, DTO 664)

PGSC/HBIA SETUP
(PL OPS, HBIA) steps 9-13
GAS ACTIVITIES GROUP B & I
(PL OPS, GAS)

LOAD DAPS A9, A10, A12, A13, A14,
B9, & B10

SPARTAN TEMP CHECK
(PL OPS, SPARTAN 201)
P/TV03 SETUP (VIDEO SETUP)
(PHOTO/TV, P/TV SCENES)

RMS POWERUP
(PDRS OPS, RMS PWRUP)

LITE A (NIGHT C/O)

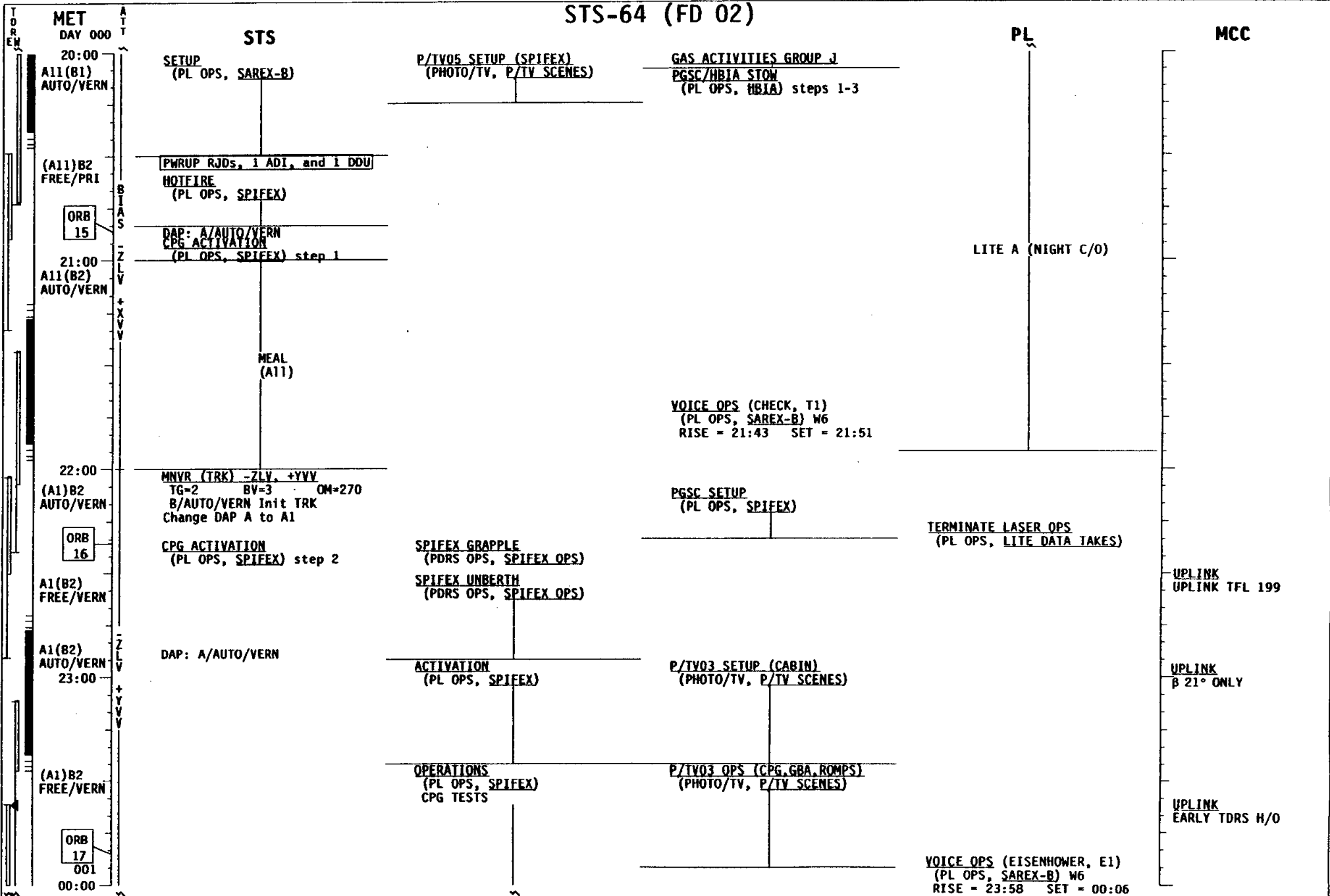
UPLINK
EARLY TDRS H/O

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

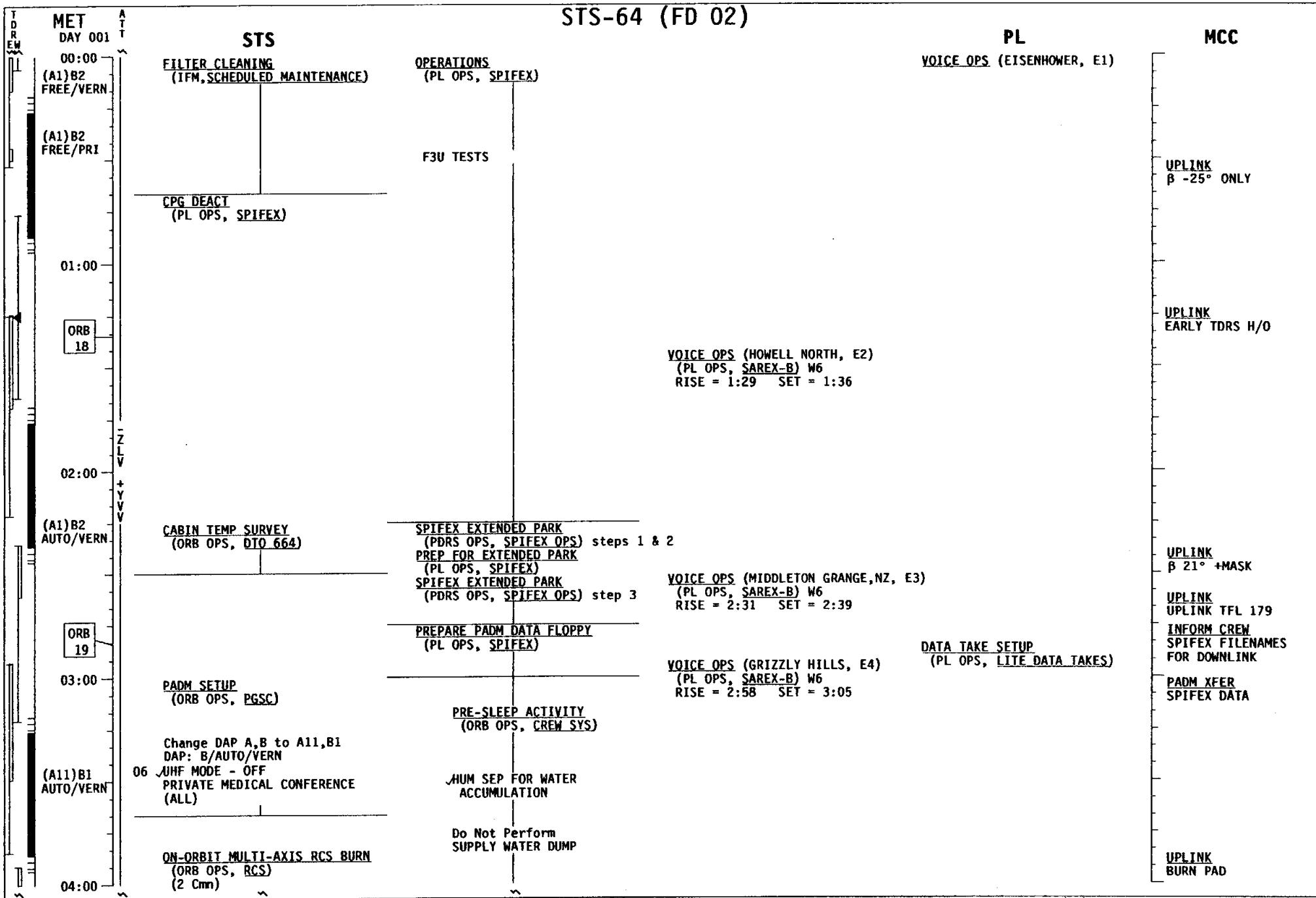
AFT CONTROLLER C/O
(ORB OPS, GNC)

PGSC/HBIA SETUP
(PL OPS, HBIA) steps 9-13
GAS ACTIVITIES GROUP J
(PL OPS, GAS)

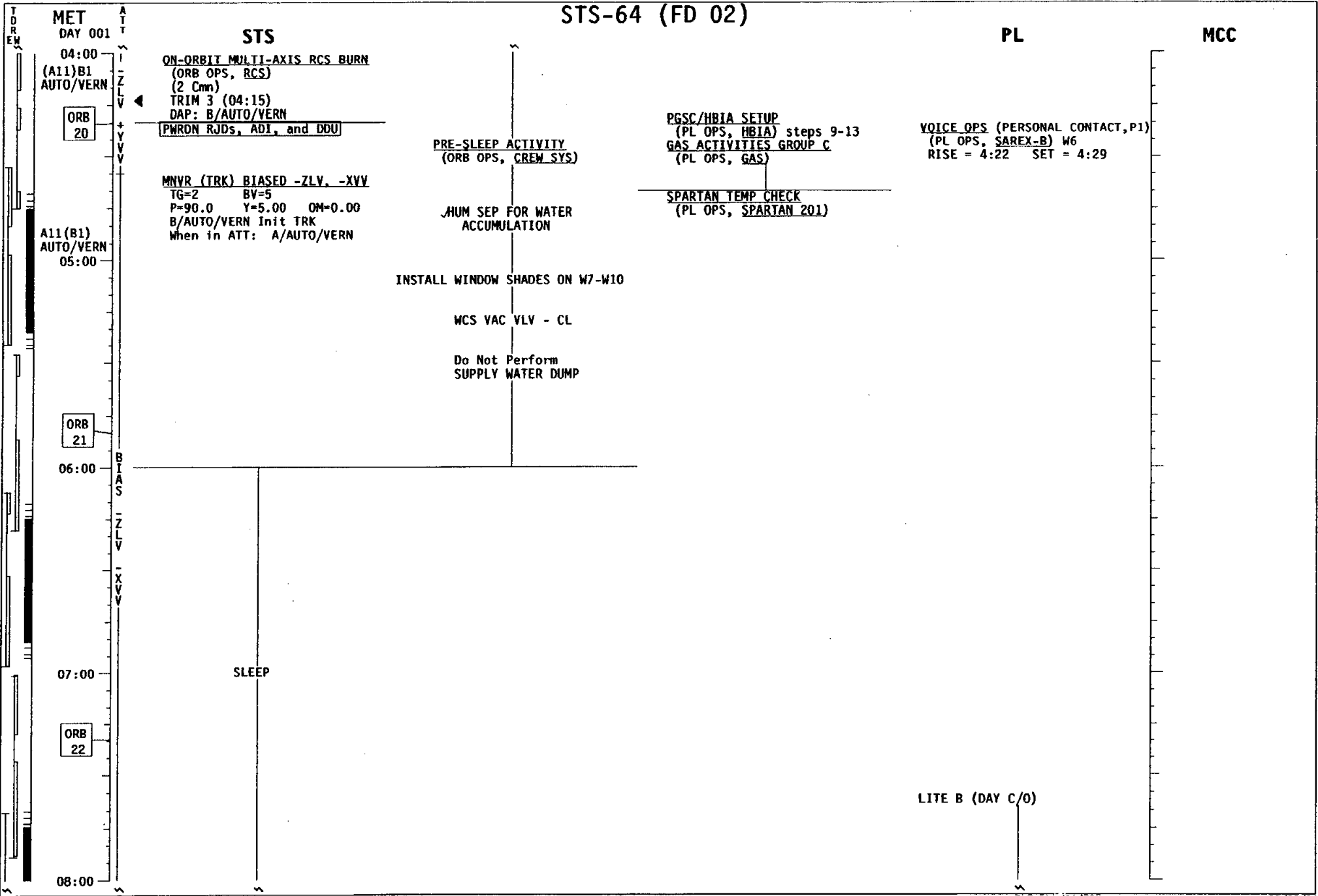
STS-64 (FD 02)



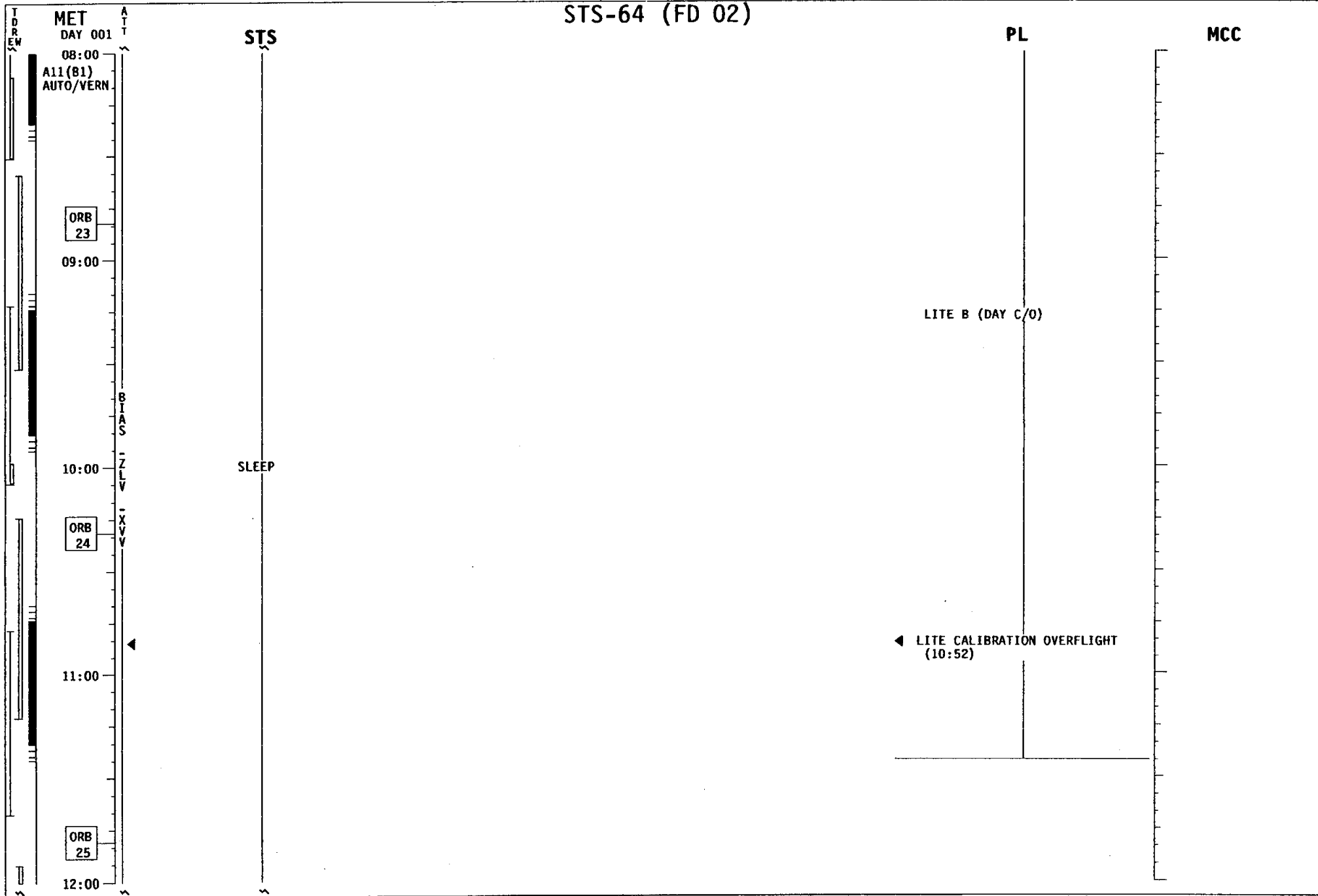
STS-64 (FD 02)



STS-64 (FD 02)



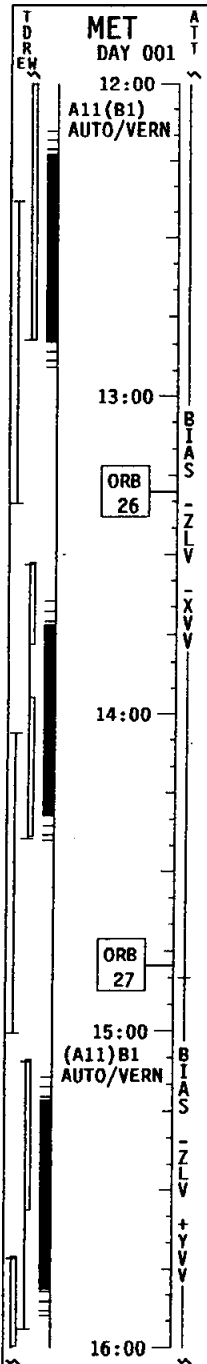
STS-64 (FD 02)



STS-64 (FD 03)

PL

MCC



STS

SLEEP

FD03 E7 ACTIVITIES:
EXERCISE
 CPA OPS (ORB OPS, CREW SYS) (15 MIN)
 OCAC FILTER CLEAN
LOG FOOD/FLUID INTAKE + EXERCISE
 DSO 610/621/624 - Log Food, Fluids, and Exercise (CDR)
 DSO 621 - Log Fluids (MS2, MS3)
 DSO 624 - Log Exercise (PLT, MS1)
COLLECT URINE VOIDS (BIOMED, DSO 610) (CDR)
 Starting with second void of the day, collect urine for 24 hr period.
GALLEY WATER SAMPLE (DSO 612)
 Restow sample with unused bags in MF43H
 P/IV09 (MAST) - As time permits, take target of opportunity photographs with the Hasselblad camera

MNVR (TRK) BIASED -ZLV, +YVY
 TG=2 BV=5
 P=95.0 Y=0.0 OM=270.0
 B/AUTO/VERN Init TRK
SUPPLY/WASTE WATER DUMP
 (ORB OPS FS, ECLS)
 Initiate Supply Dump

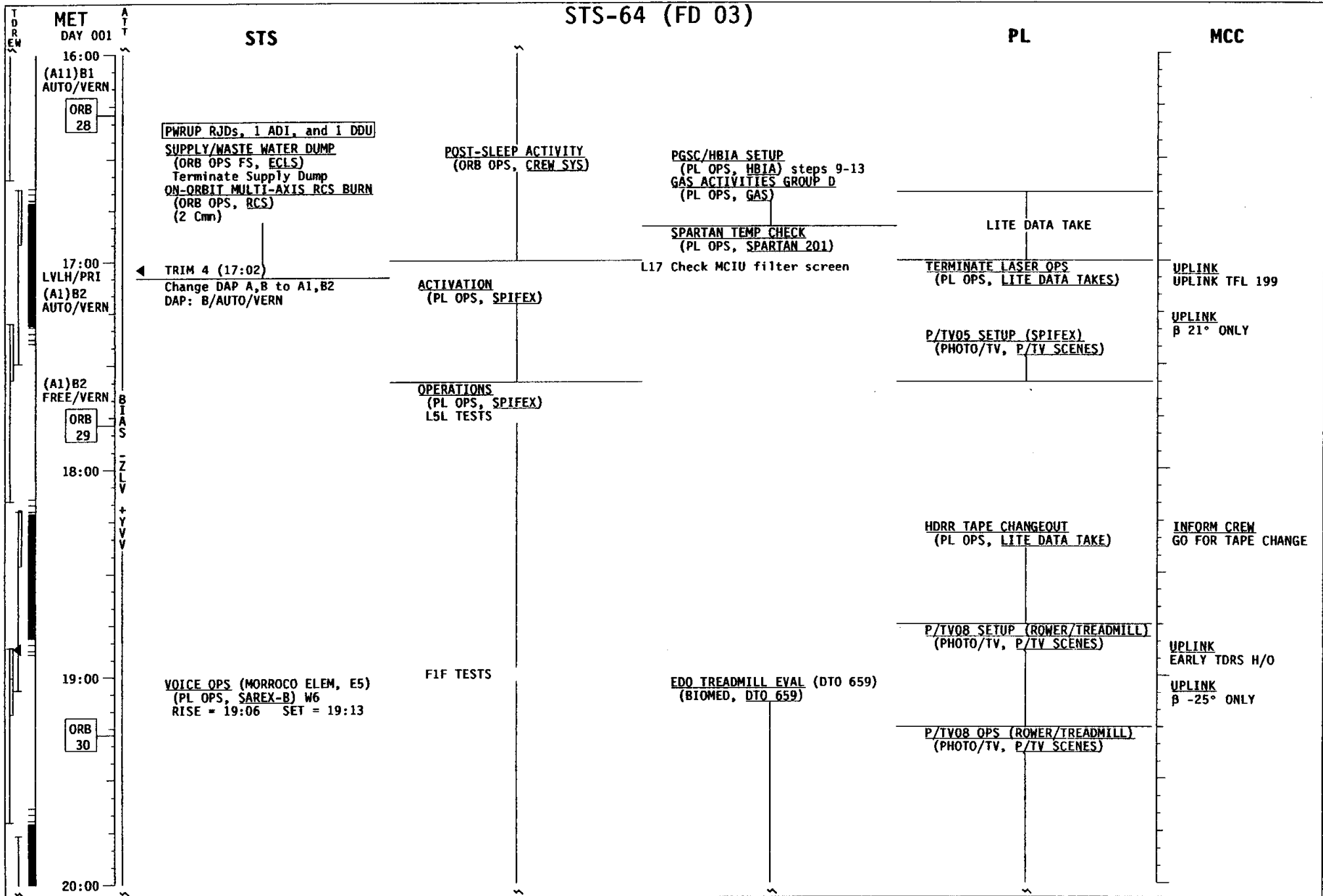
Power up TIPS
 WCS VAC VLV - OP
 REMOVE WINDOW SHADES
POST-SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

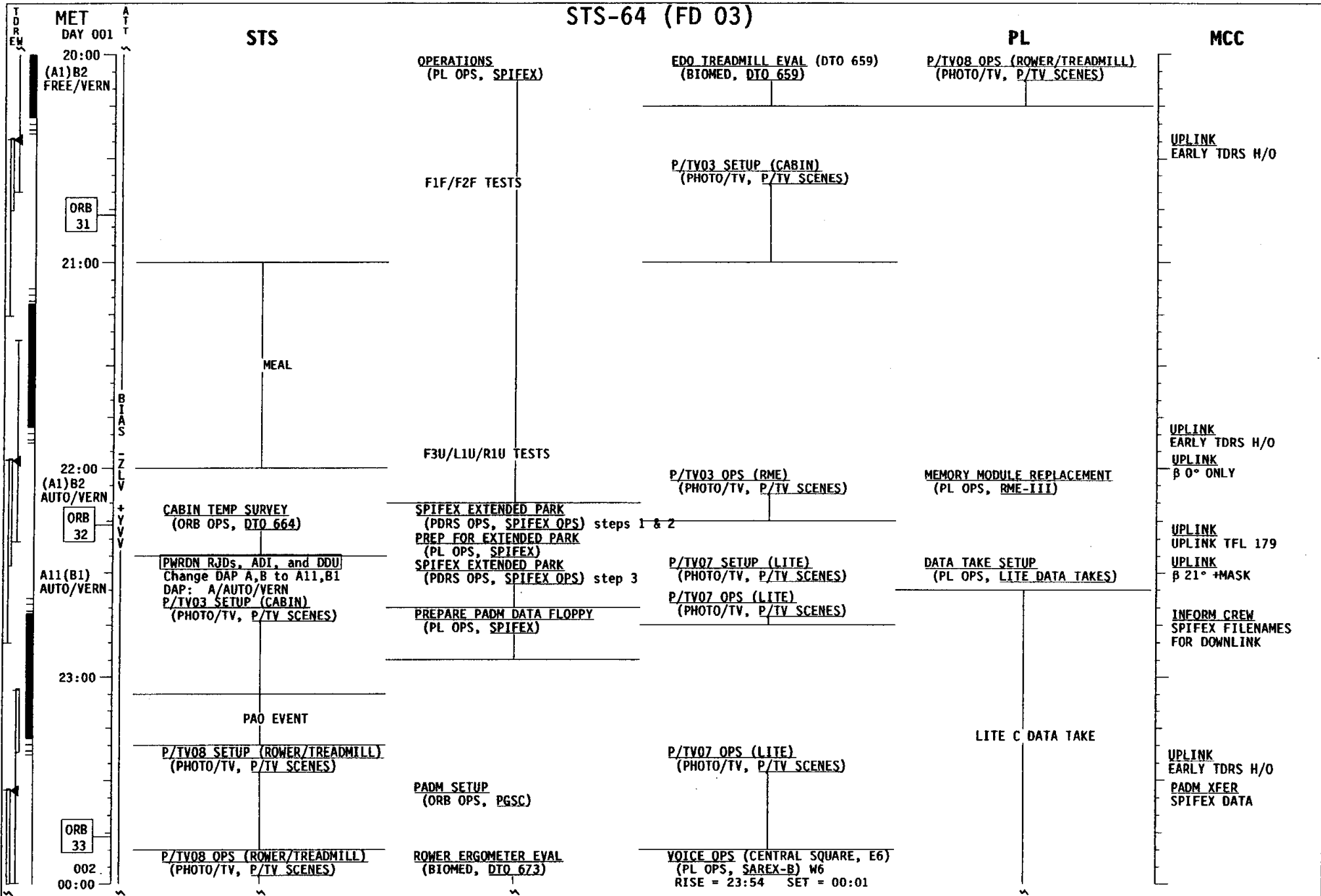
BACK PAIN IN MICROGRAVITY (DSO 483)
 (BIOMED, DSO 483)
PADM SETUP
 (ORB OPS, PGSC)

LITE DATA TAKE

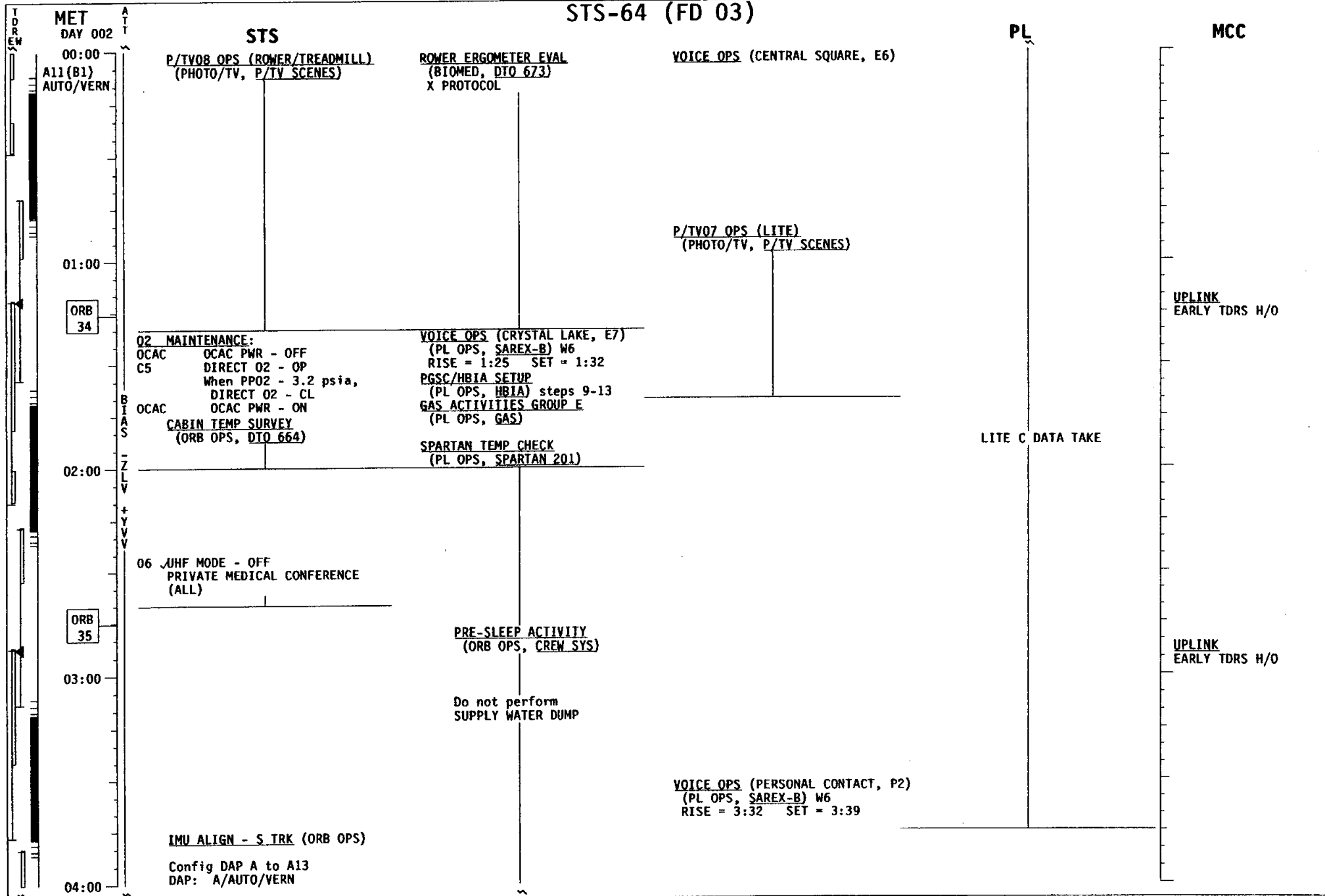
PADM XFER
 PGSC UPDATES
UPDATE
 H2O SPLY DUMP
 QTY TK A & B

STS-64 (FD 03)

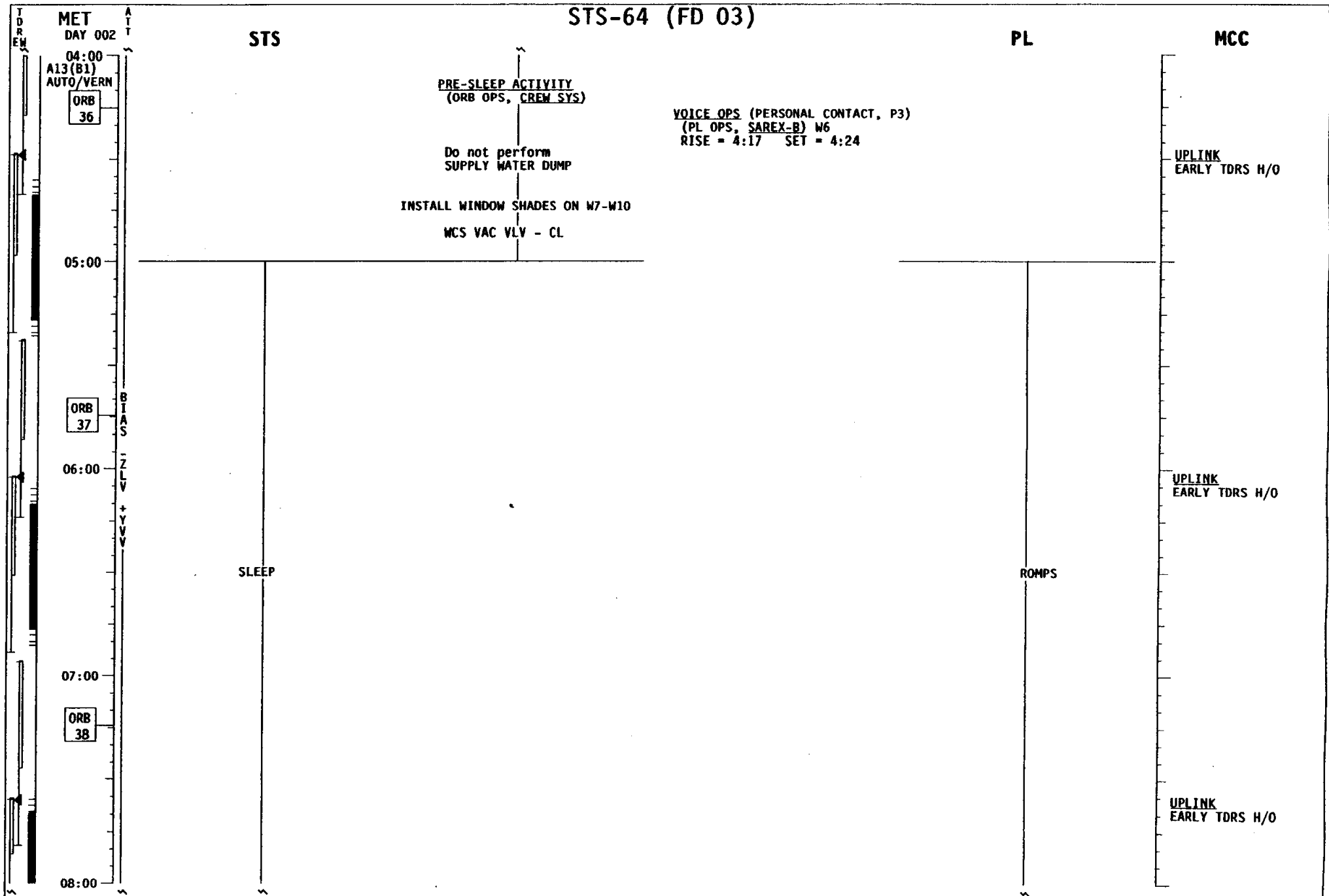




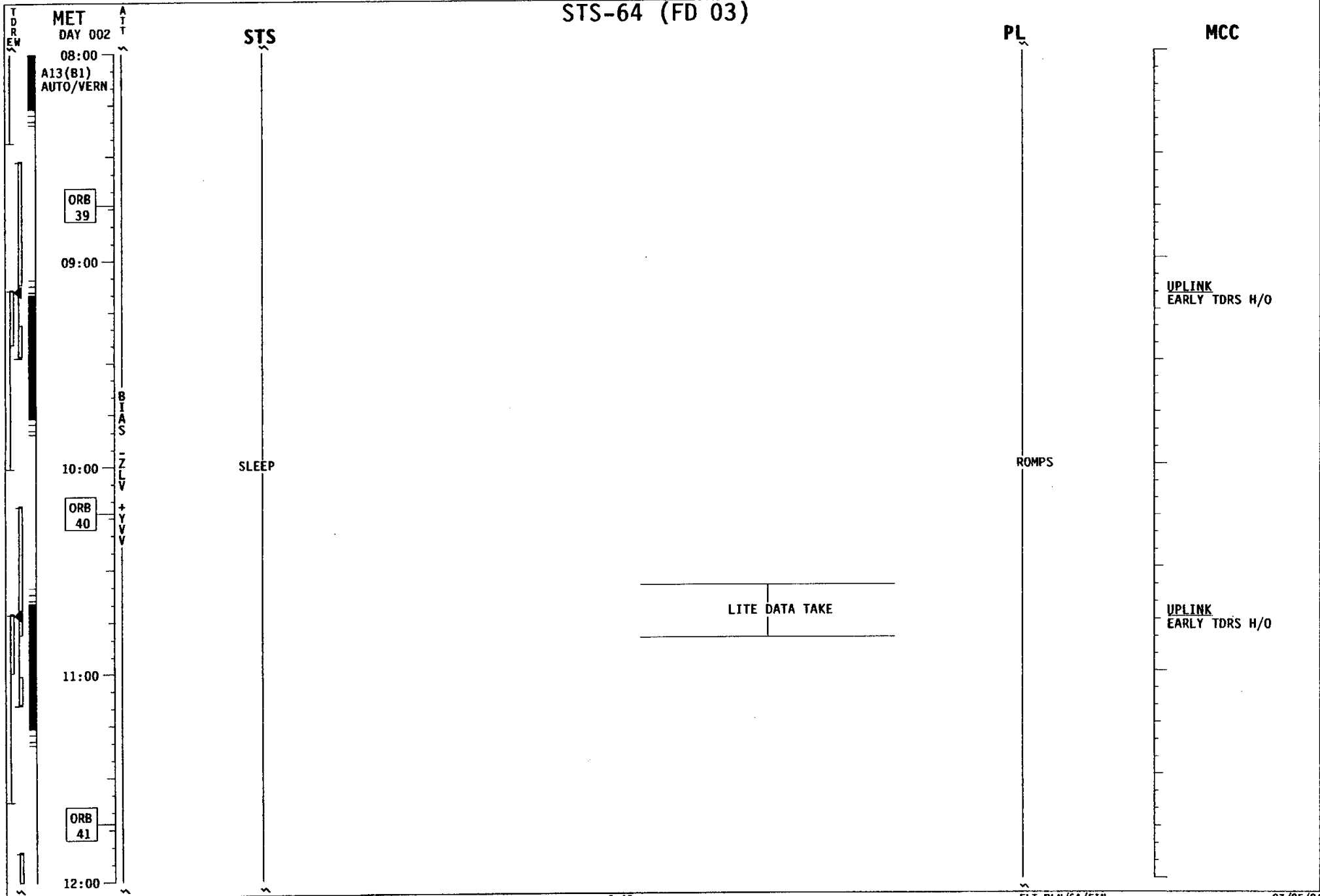
STS-64 (FD 03)



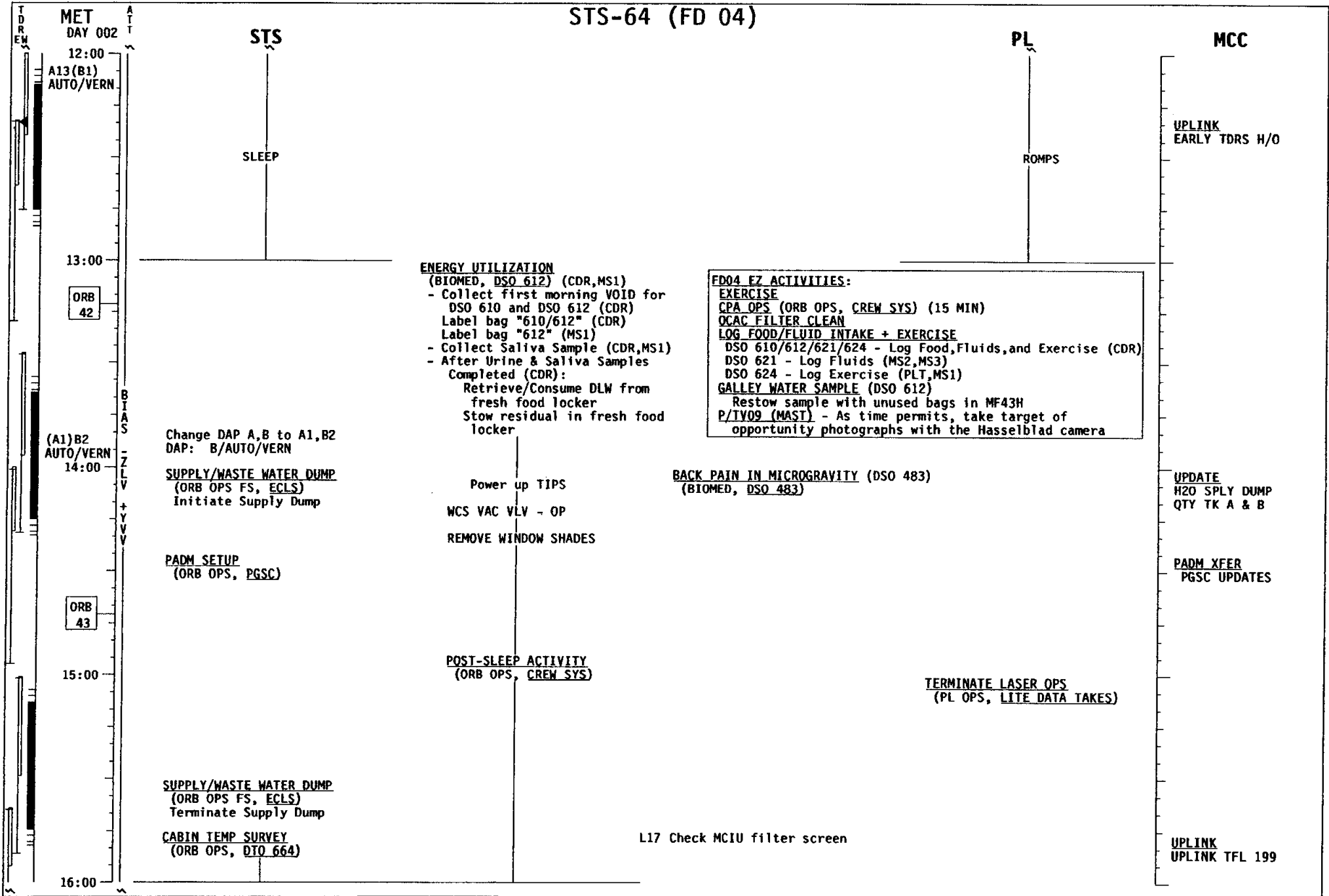
STS-64 (FD 03)



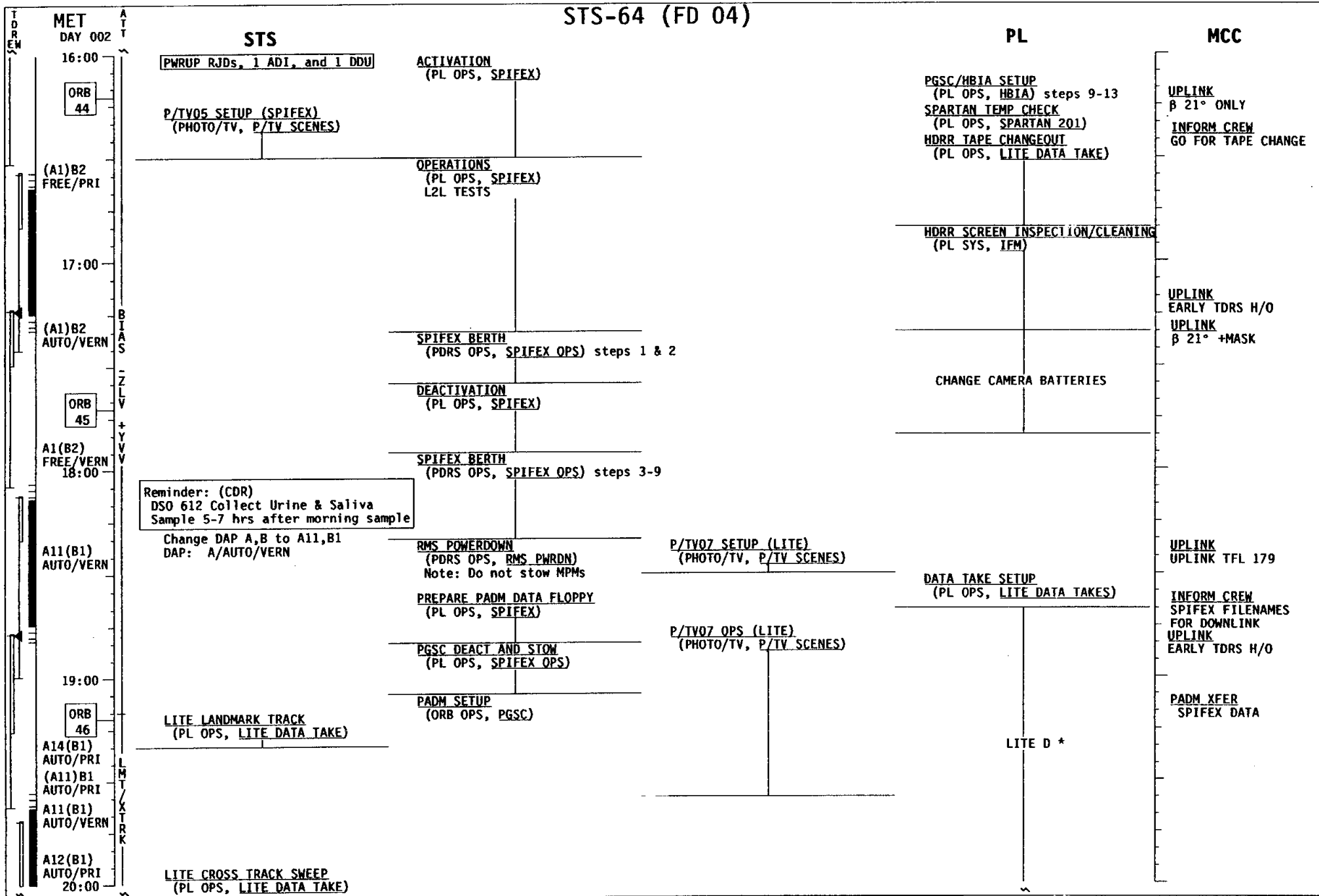
STS-64 (FD 03)



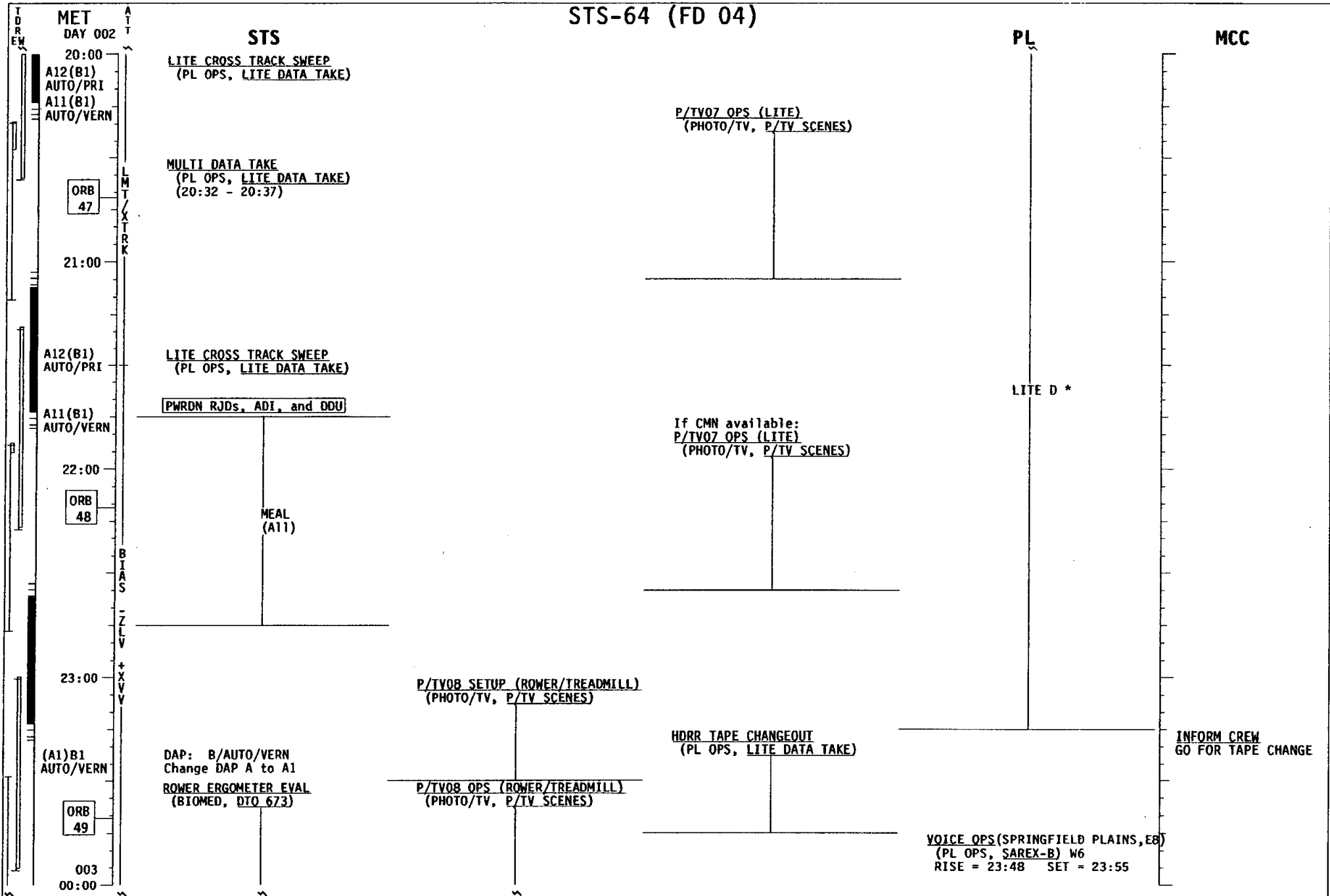
STS-64 (FD 04)



STS-64 (FD 04)



STS-64 (FD 04)



STS-64 (FD 04)

MET
DAY 003

STS

PL

MCC

00:00

(A1)B1
AUTO/VERN

ROWER ERGOMETER EVAL
(BIOMED, DTO 673)
X PROTOCOL

P/TV08 OPS (ROWER/TREADMILL)
(PHOTO/TV, P/TV SCENES)

P/TV03 SETUP (CABIN)
(PHOTO/TV, P/TV SCENES)

01:00

ORB
50

(A1)B1
FREE/VERN
AUTO/VERN

P/TV03 OPS (SSCE, BRIC)
(PHOTO/TV, P/TV SCENES)

P/TV03 SETUP (CABIN)
(PHOTO/TV, P/TV SCENES)

SSCE BURN 1
(PL OPS, SSCE)

PAO EVENT

INFORM CREW
COMM STATUS
FOR SSCE

FREE/VERN

02:00

(A1)B1
AUTO/VERN

06 UHF MODE - OFF
PRIVATE MEDICAL CONFERENCE
(ALL)

PGSC/HBIA SETUP
(PL OPS, HBIA) steps 9-13
SPARTAN TEMP CHECK
(PL OPS, SPARTAN 201)
CABIN TEMP SURVEY
(ORB OPS, DTO 664)

DAP: B/AUTO/VERN

SSCE BURN 2
(PL OPS, SSCE)

DAP: B/AUTO/VERN

[Z] 06	S TRK PWR -Z - ON
CRT	GNC I/O RESET
	GNC 22 S TRK/COAS CNTL
	S TRK - ITEM 4 EXEC

ORB
51

Power ON -Z S TRK [Z]
[PWRUP I ADI and I DDU]

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

IMU/COAS CALIBRATION LOG

IMU STAR PAIR: -Z 18, CAPELLA
 -Y 54, DIPHDA
STAR ID: -Z 18, CAPELLA
STAR AVAIL: 03:07 TO 03:42

-Z Δ BIAS , ,

UPDATE TIME: / : :

03:00

(A1)B5
INRTL/VERN
A1(B5)
AUTO/VERN

019 COAS PWR-OFF Mount COAS-AFT
MNVR IMU ALIGN/COAS CAL ATI (SPECIAL)
R=113.0 P=312.0 Y=319.0
B/AUTO/VERN Init MNVR at 02:55

Do not perform
SUPPLY WATER DUMP

IMU ALIGN - S TRK (ORB OPS)
COAS CALIBRATION (ORB OPS)

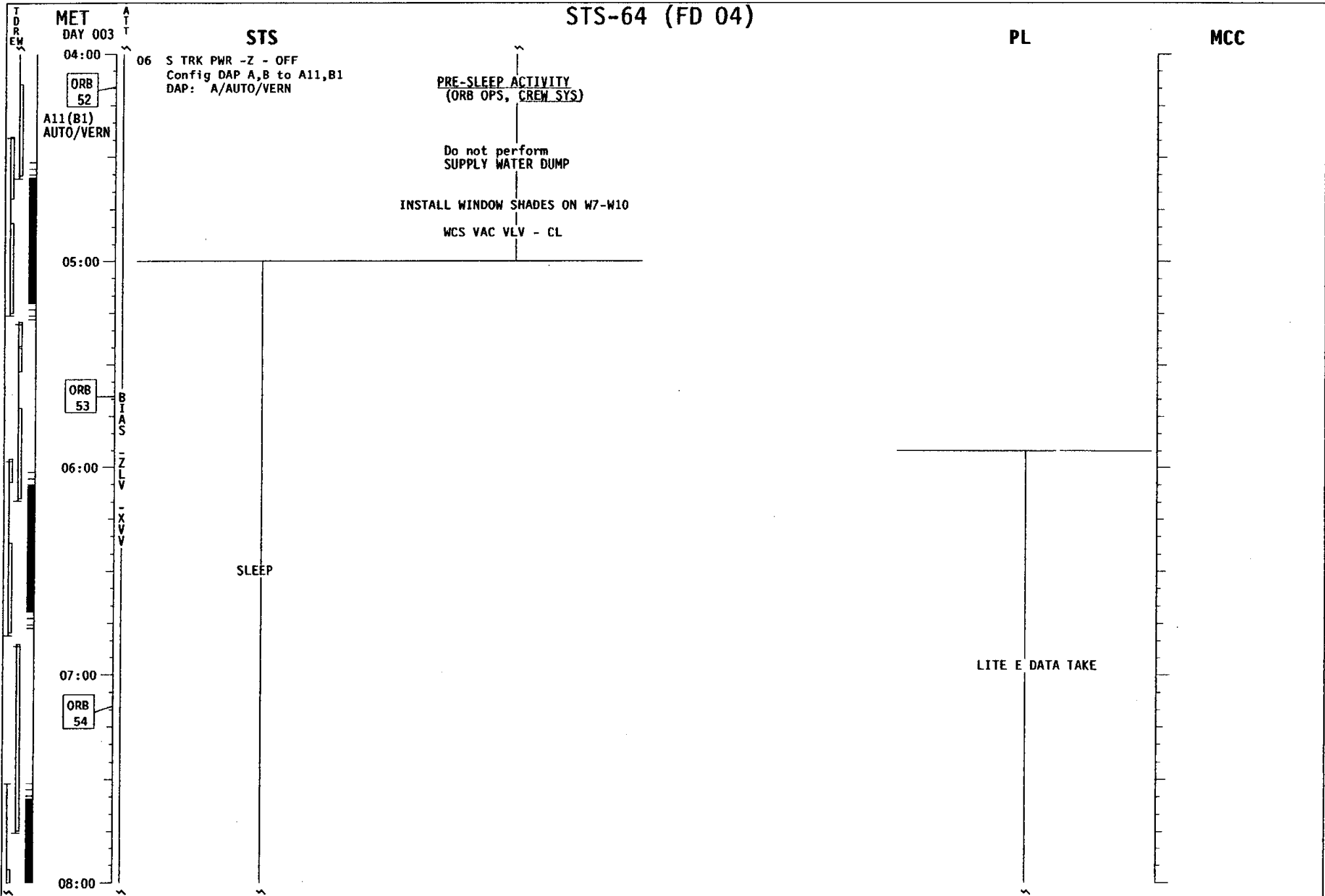
VOICE OPS (PERSONAL CONTACT, P4)
(PL OPS, SAREX-B) W6
RISE = 3:27 SET = 3:34

04:00

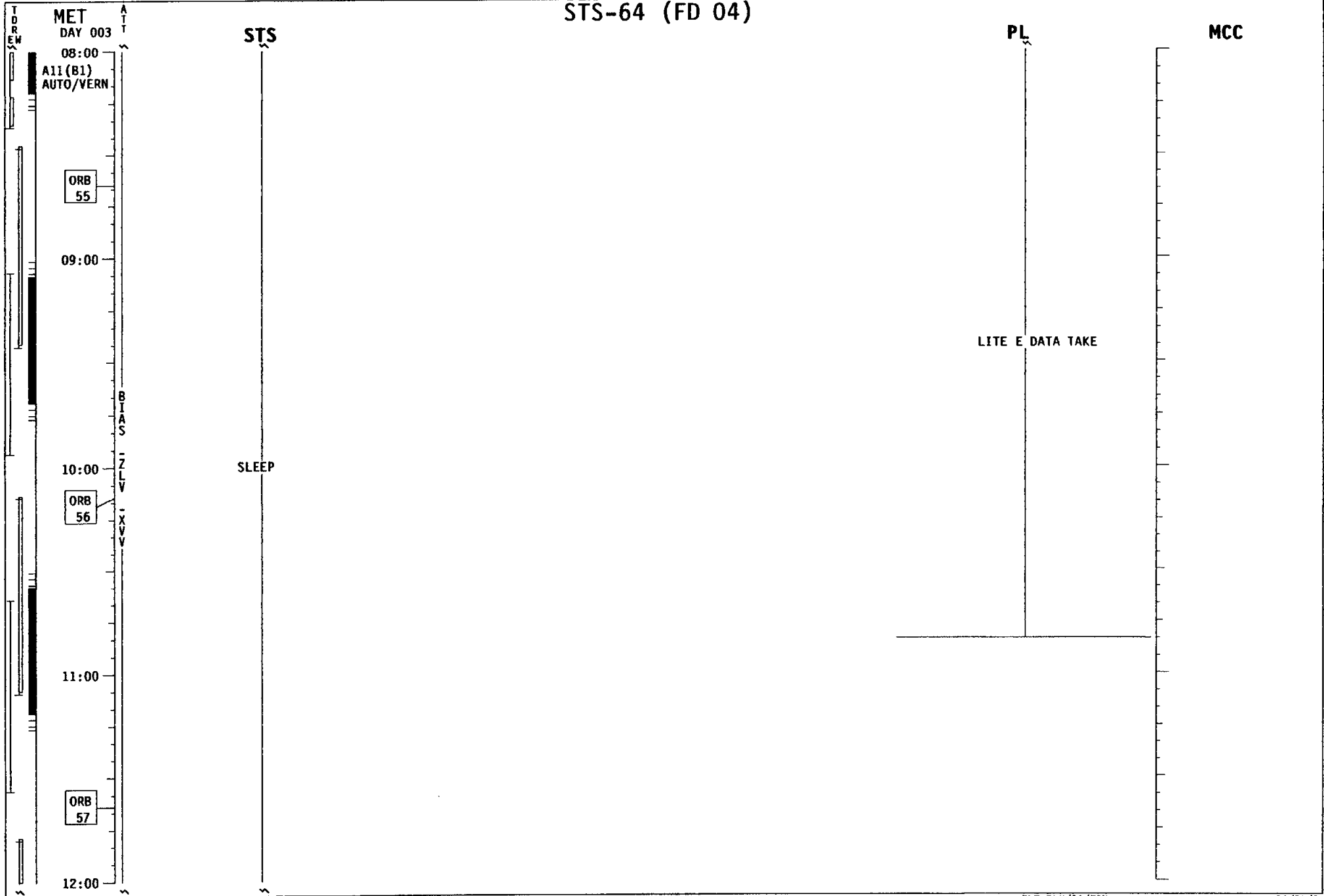
MNVR (TRK) BIASED -ZLV, -XVY
TG=2 BV=5
P=90.0 Y=355.0 OM=0.0
A/AUTO/VERN Init TRK
019 COAS PWR - OFF Stow COAS
[PWRDN ADI and DDU]

UPLINK
REFSMAT
NORMALIZATION

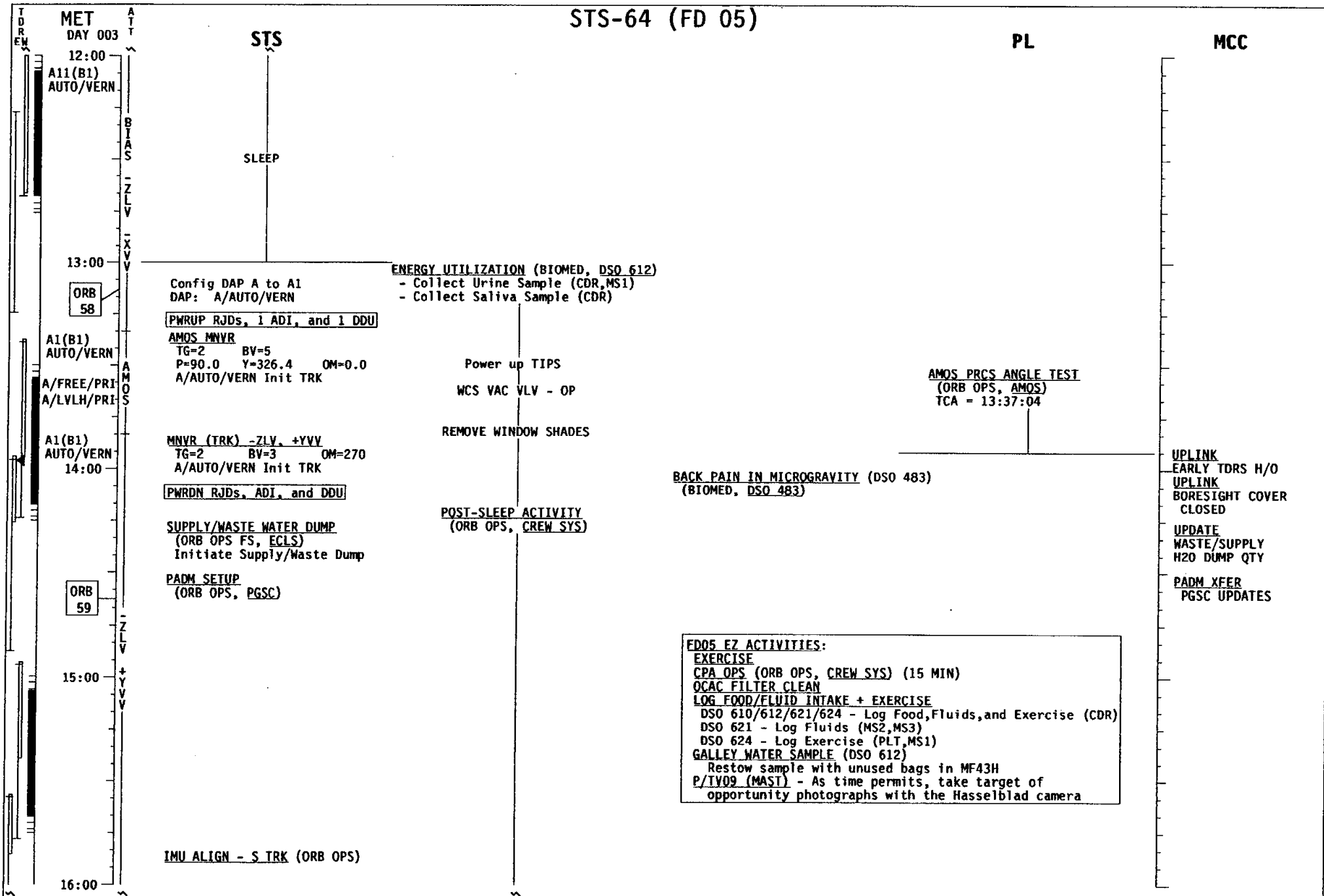
STS-64 (FD 04)



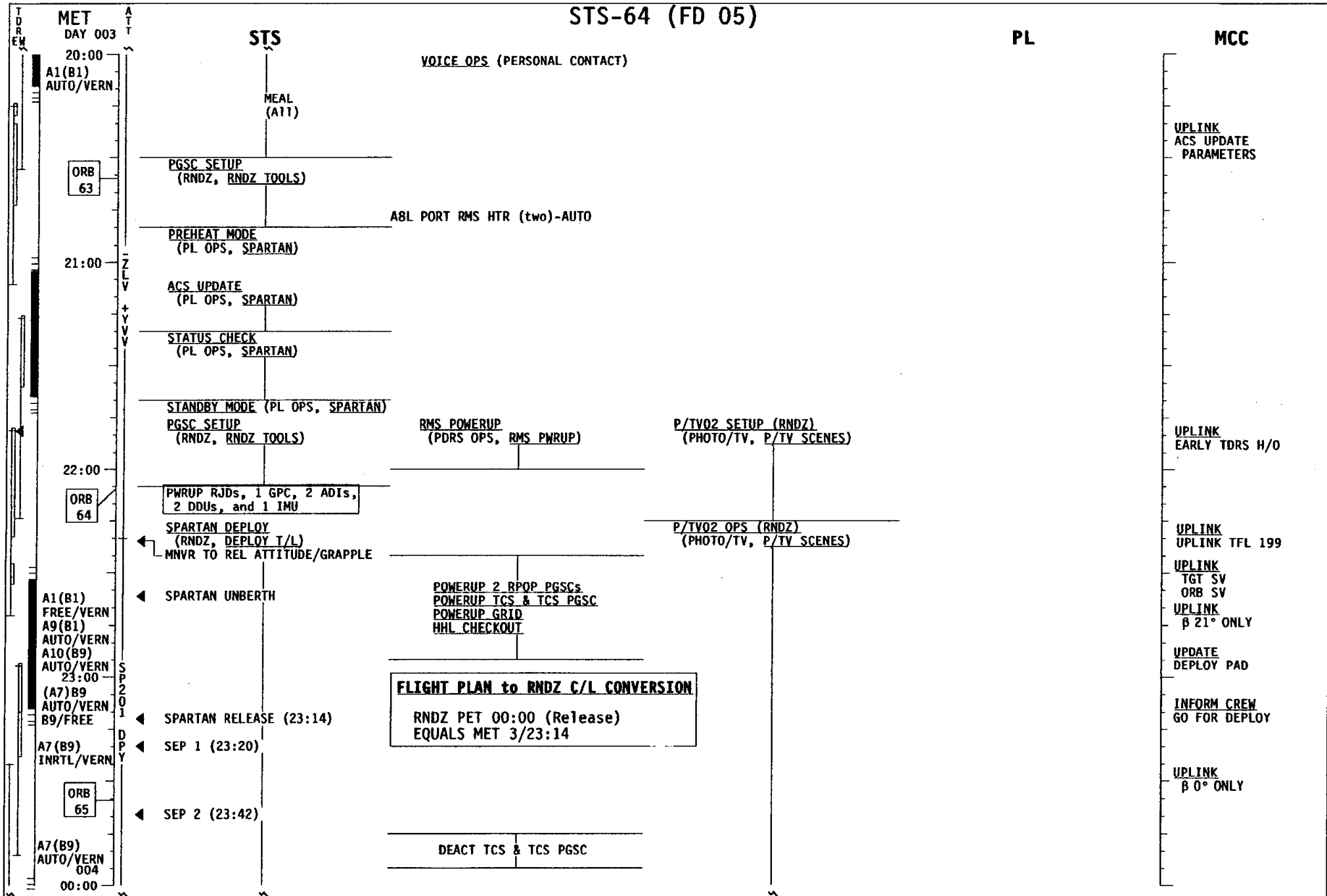
STS-64 (FD 04)



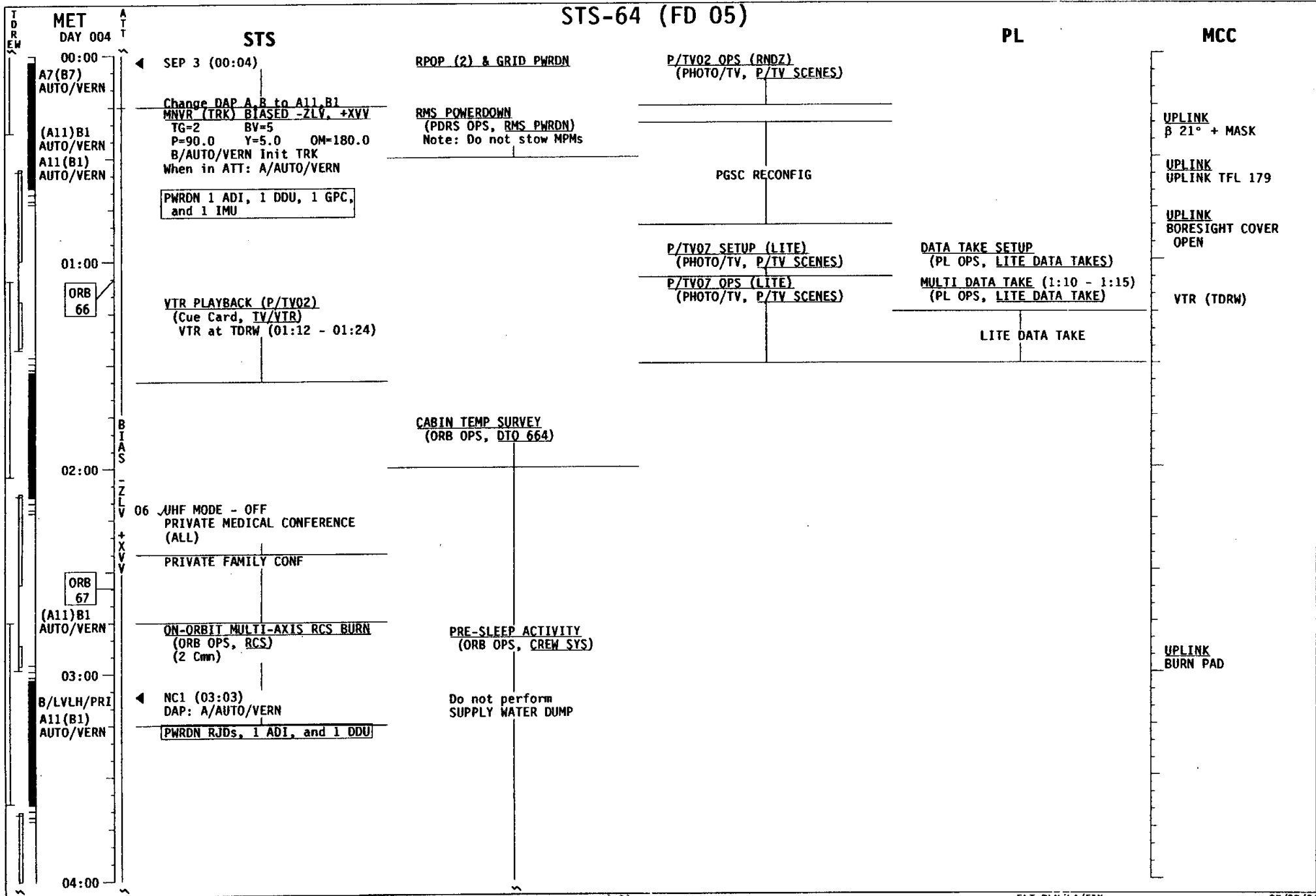
STS-64 (FD 05)



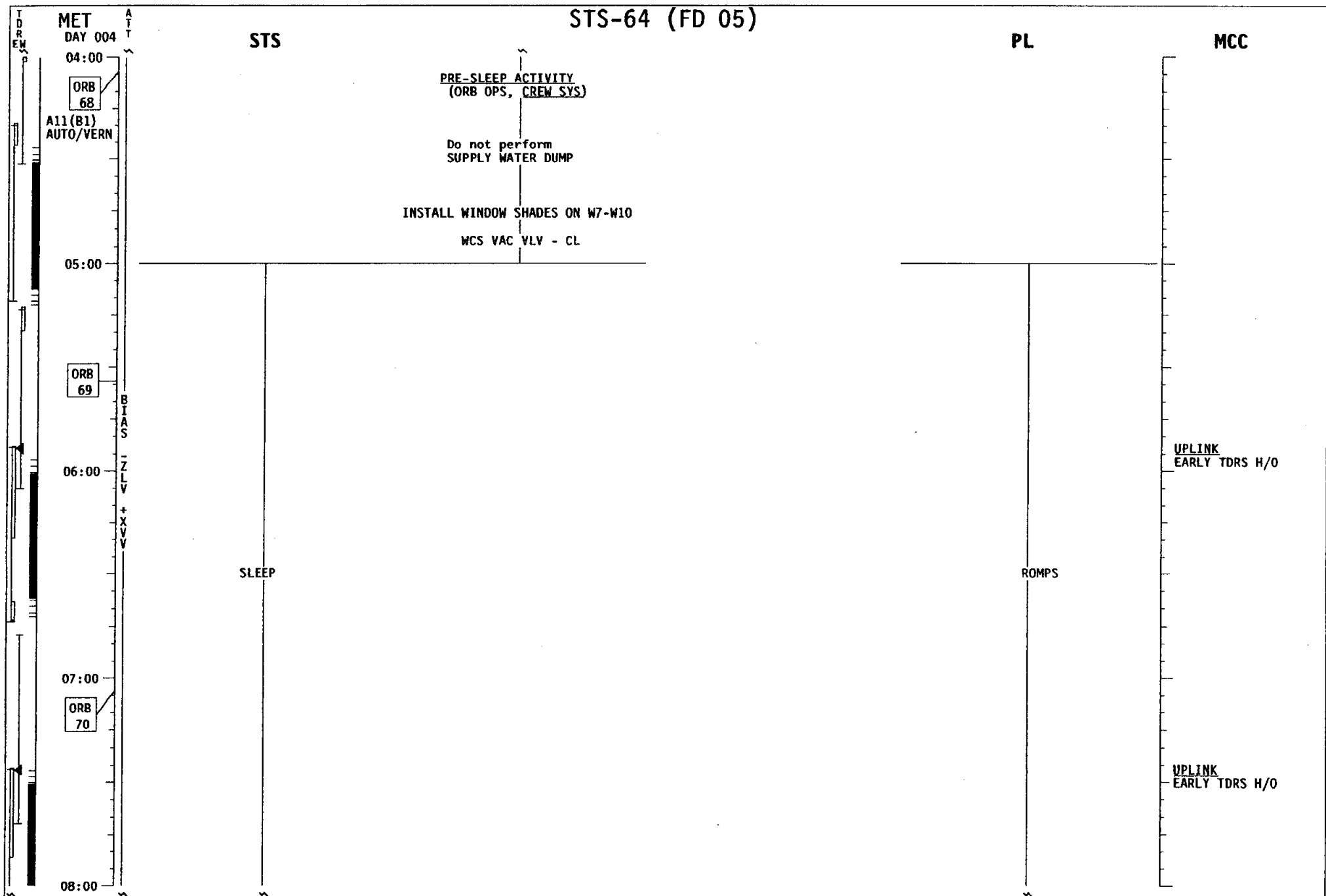
STS-64 (FD 05)



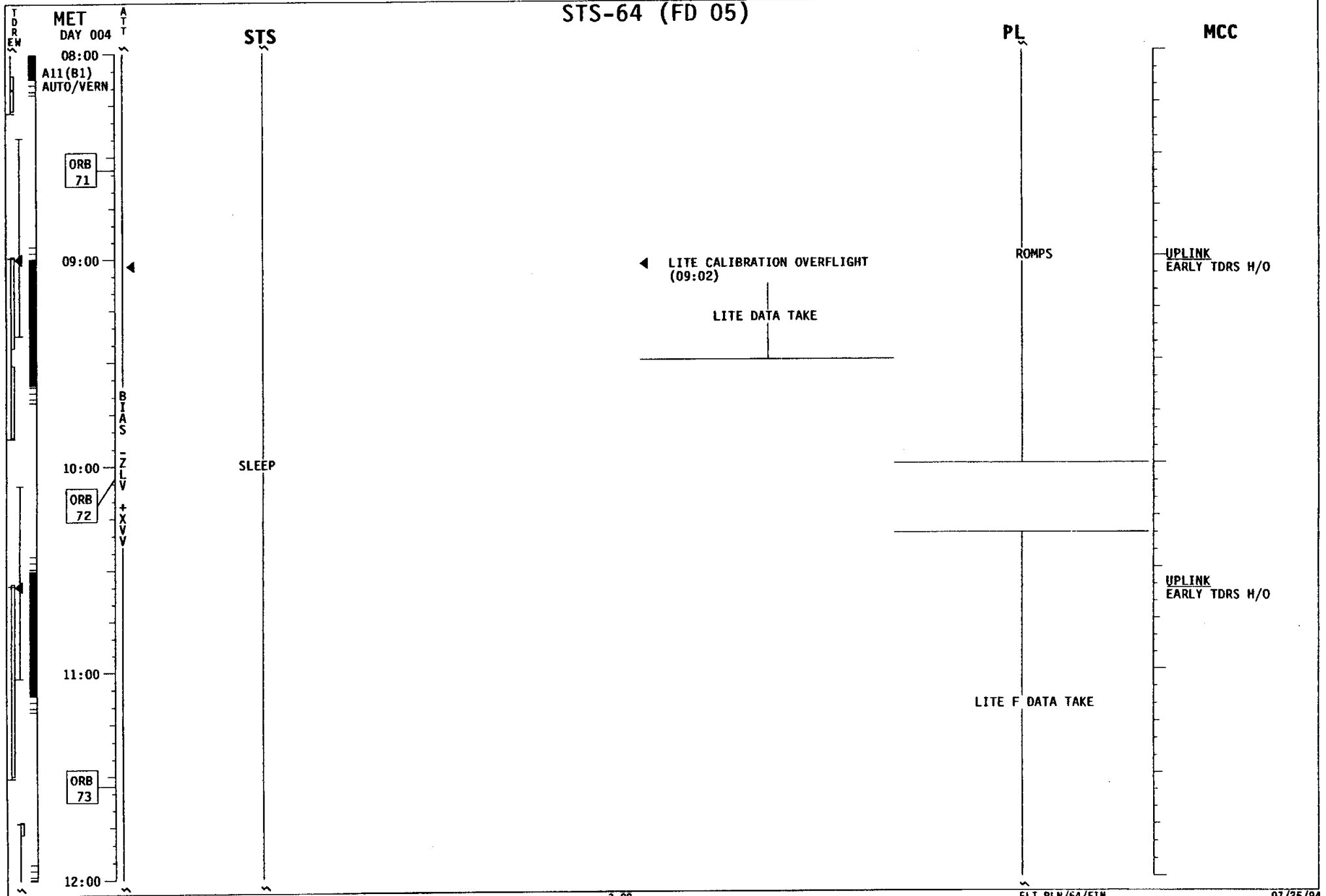
STS-64 (FD 05)



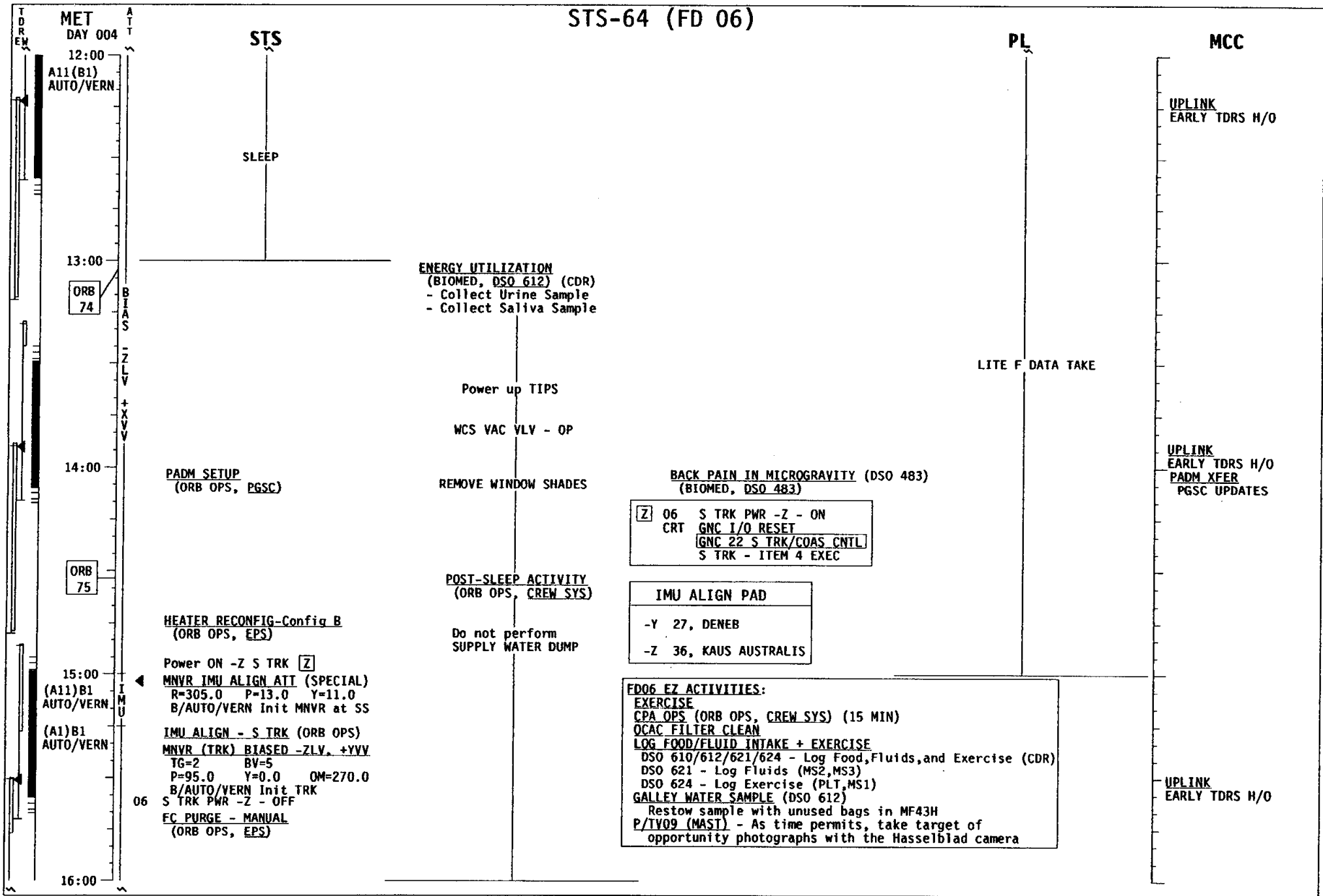
STS-64 (FD 05)

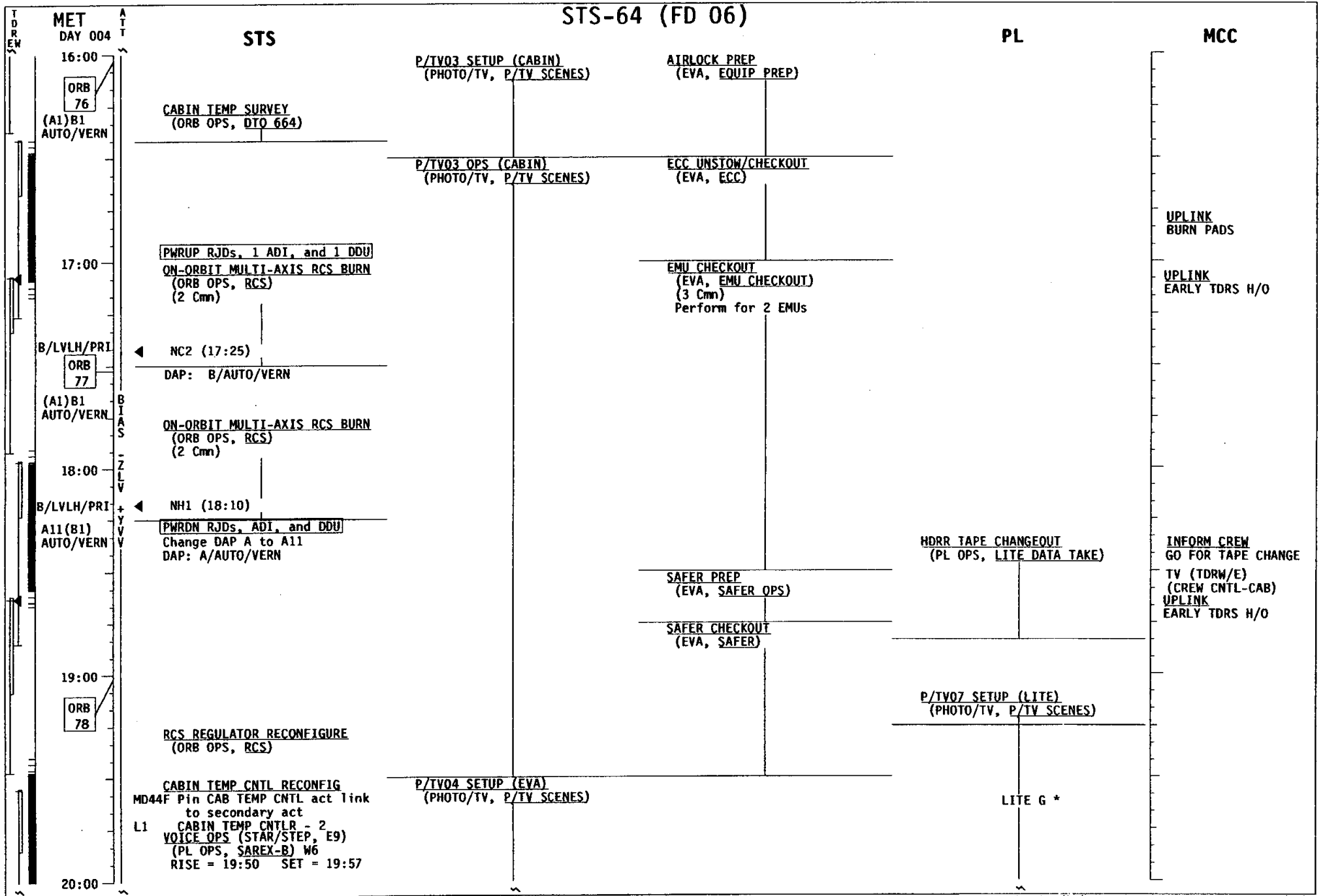


STS-64 (FD 05)

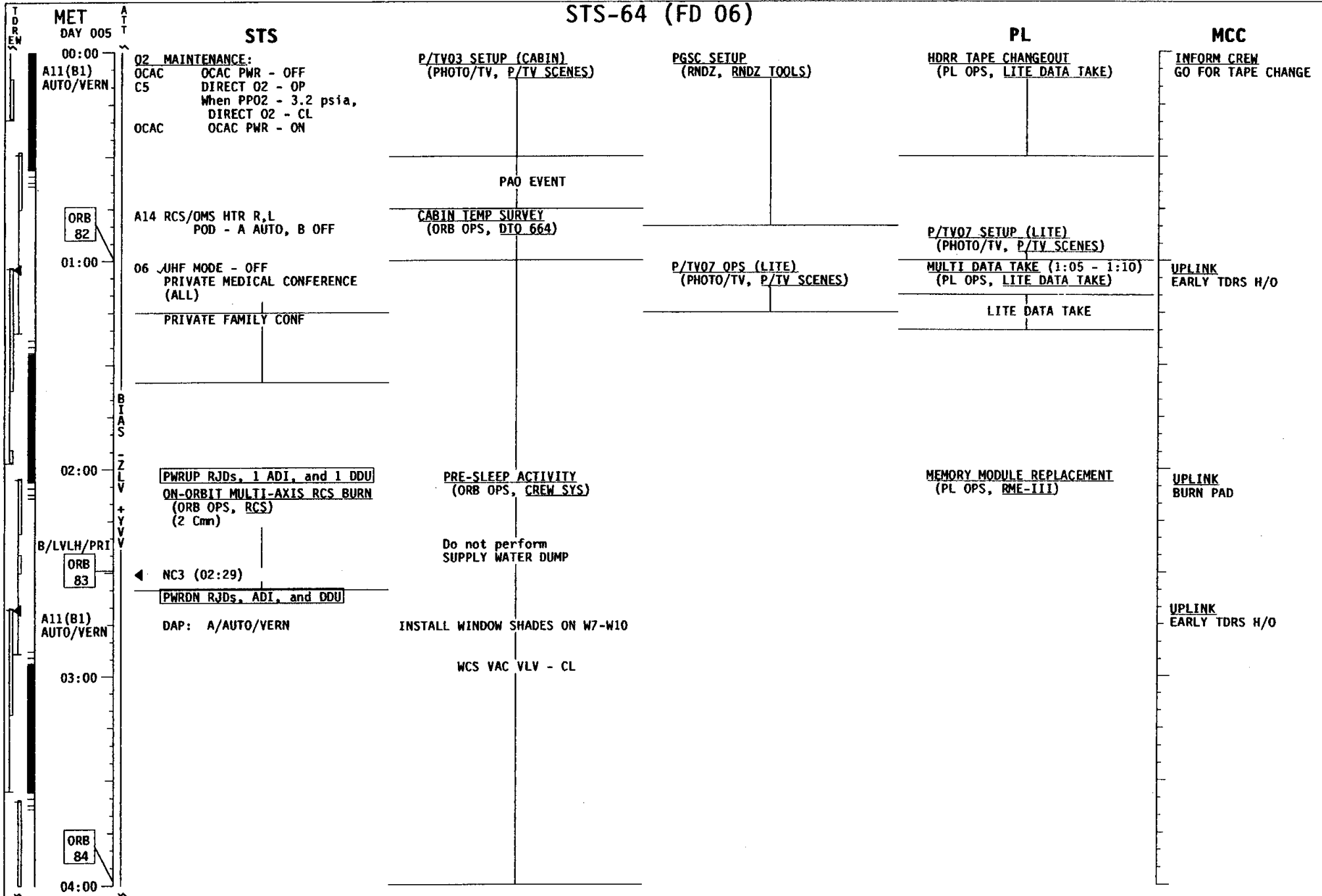


STS-64 (FD 06)

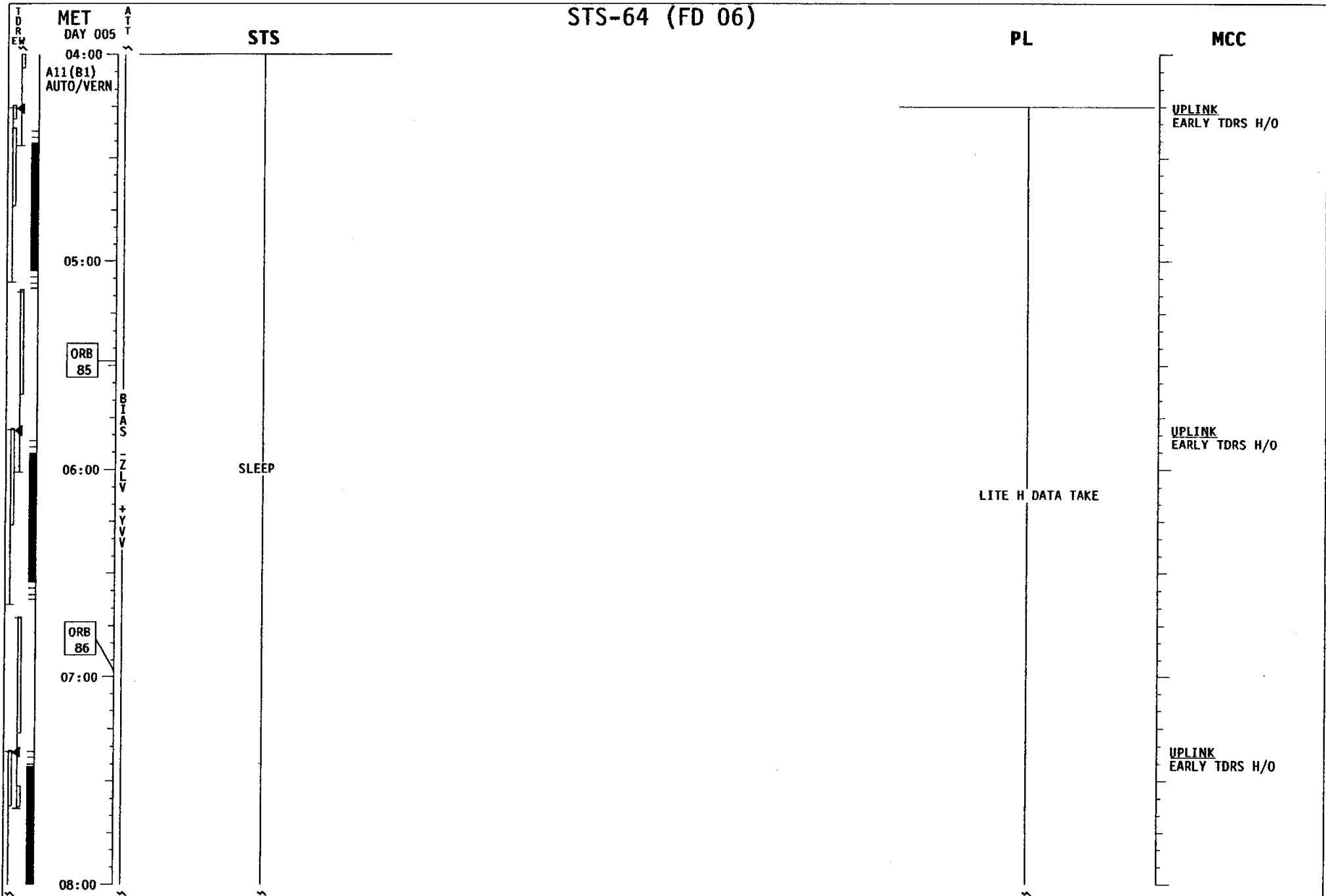




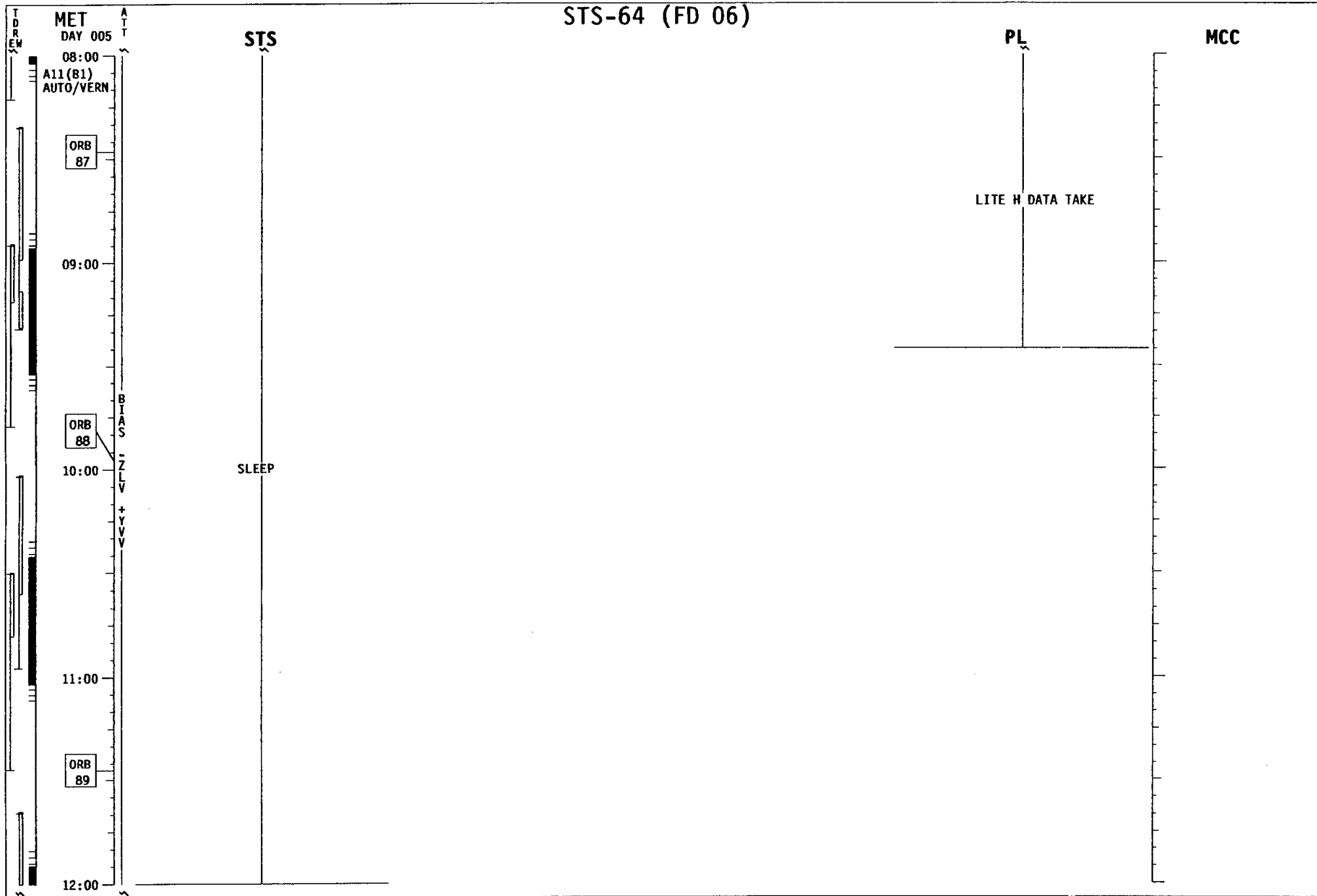
STS-64 (FD 06)



STS-64 (FD 06)



STS-64 (FD 06)



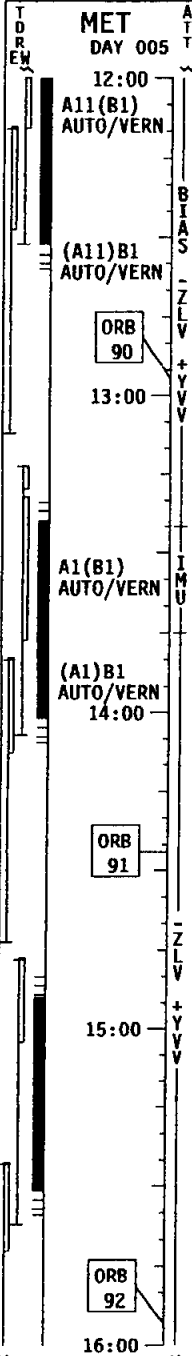
STS-64 (FD 07)

STS

PL

MCC

MET
DAY 005



ENERGY UTILIZATION
(BIOMED, DSO 612) (CDR)
- Collect Urine Sample
- Collect Saliva Sample

FD07 EZ ACTIVITIES:
EXERCISE
CPA OPS (ORB OPS, CREW SYS) (15 MIN)
QCAC FILTER CLEAN
LOG FOOD/FLUID INTAKE + EXERCISE
DSO 482 - Log Significant Activity (MS3,MS4)
DSO 610/612/621/624 - Log Food, Fluids, and Exercise (CDR)
DSO 621 - Log Fluids (MS2,MS3)
DSO 624 - Log Exercise (PLT,MS1)
GALLEY WATER SAMPLE (DSO 612)
Restow sample with unused bags in MF43H
P/TV09 (MAST) - As time permits, take target of opportunity photographs with the Hasselblad camera

DAP: B/AUTO/VERN

Power up TIPS
WCS VAC VLV - OP
REMOVE WINDOW SHADES

PADM SETUP
(ORB OPS, PGSC)

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

BACK PAIN IN MICROGRAVITY (DSO 483)
(BIOMED, DSO 483)

PADM XFER
PGSC UPDATES

Power ON -Z S TRK
MNVR IMU ALIGN ATT (SPECIAL)
R=305.0 P=13.0 Y=11.0
B/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, +YVV
TG=2 BV=3 OM=270
B/AUTO/VERN Init TRK

Do not perform
SUPPLY WATER DUMP

06 S TRK PWR -Z - ON
CRT GNC I/O RESET
GNC 22 S TRK/COAS CNTL
S TRK - ITEM 4 EXEC

IMU ALIGN PAD
-Y 27, DENEK
-Z 36, KAUS AUSTRALIS

EVA ASPIRIN PROTOCOL
(EVA, NOMINAL PROCS)

A14 RCS/OMS HTR R,L
POD - A OFF, B AUTO

UPLINK
BURN PAD

CABIN TEMP SURVEY
(ORB OPS, DTQ 664)

L17 Check MCIU filter screen

MASK PREBREATHE INITIATE
(EVA, 10.2 PSI CABIN)
(2 Cmn)

TERMINATE LASER OPS
(PL OPS, LITE DATA TAKES)

RNDZ REVIEW

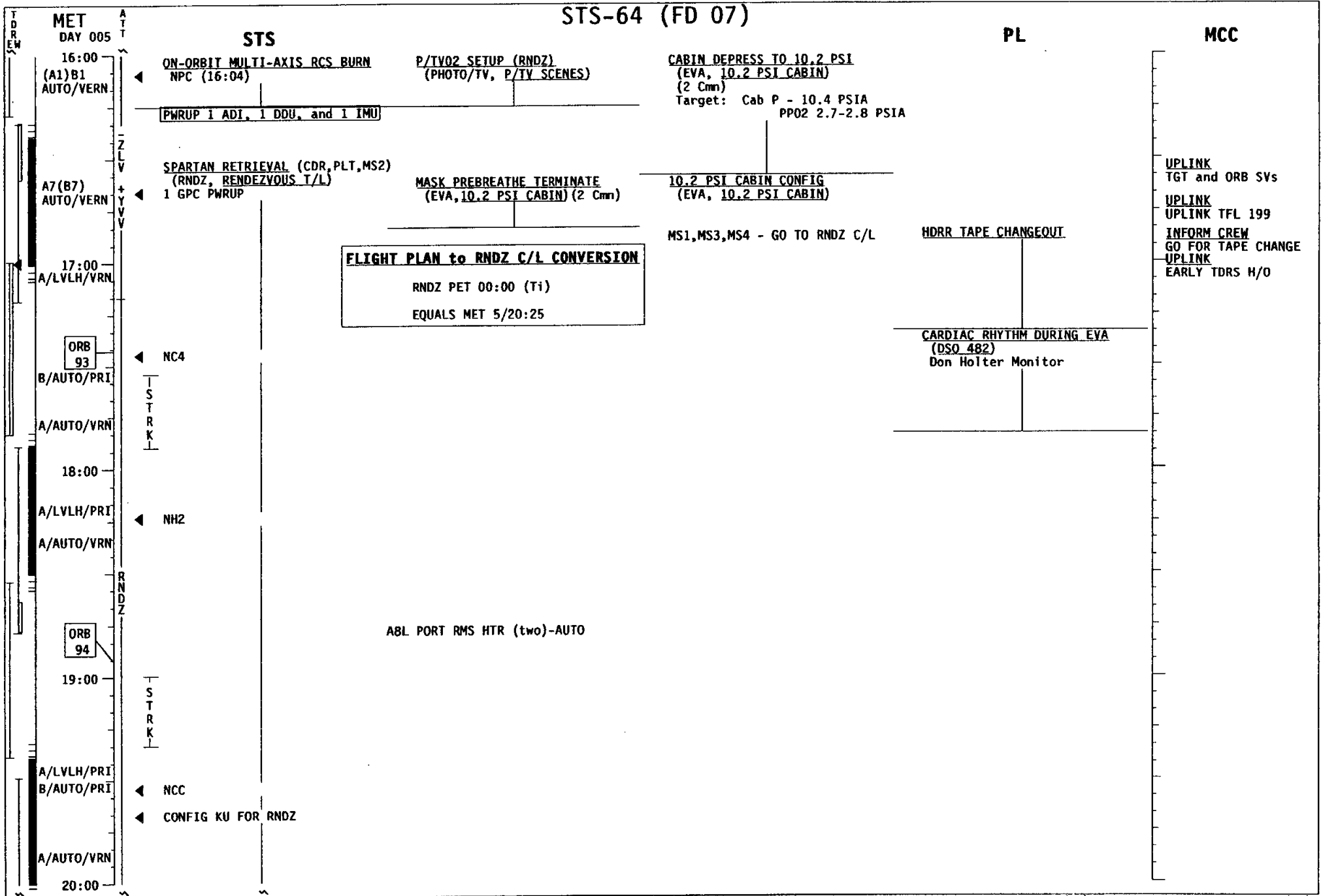
PWRUP RJDs, 1 ADI, and 1 DDU
ON-ORBIT MULTI-AXIS RCS BURN
(ORB OPS, RCS)
(2 Cmn)

P/TV02 SETUP (RNDZ)
(PHOTO/TV, P/TV SCENES)

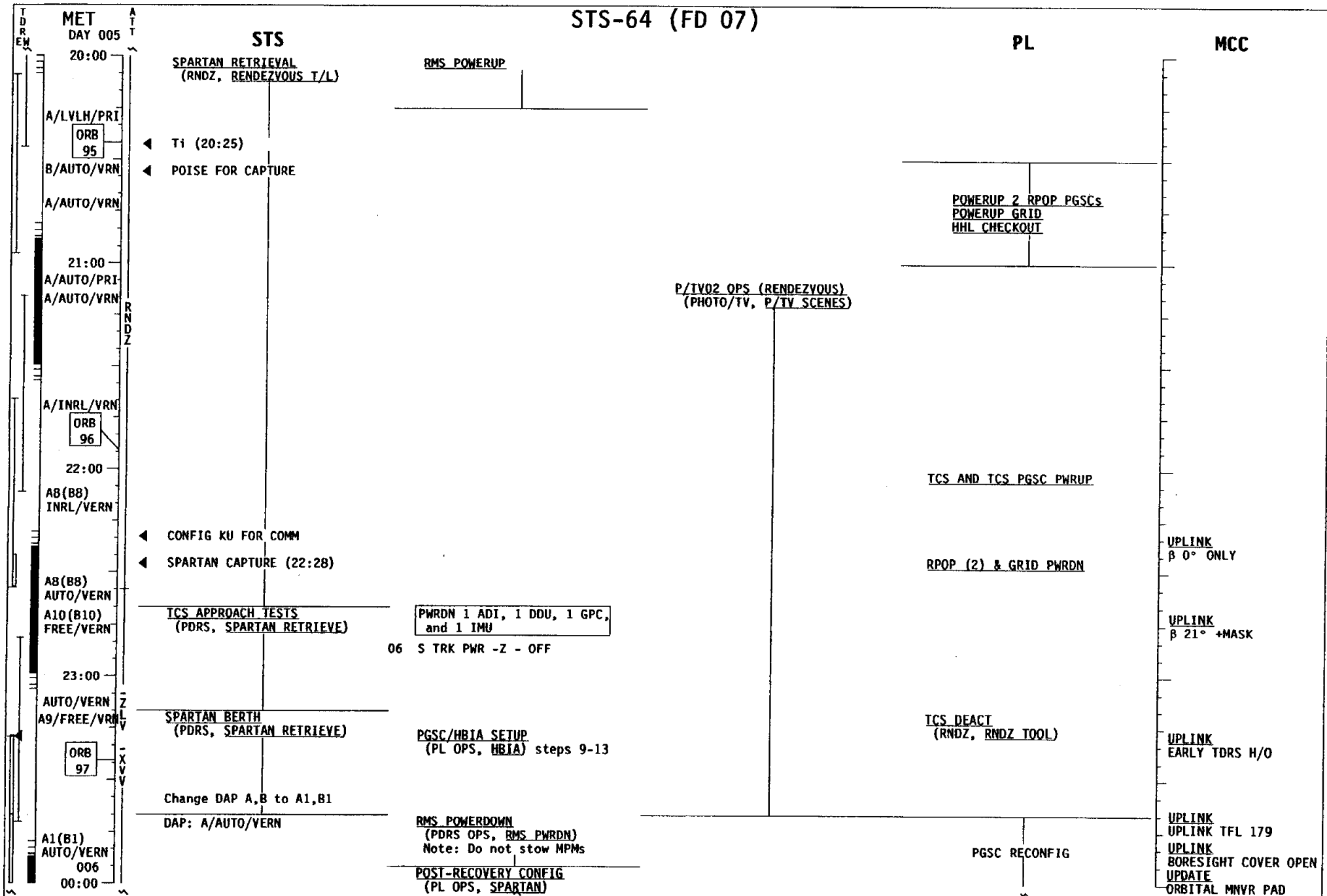
PREP FOR 10.2 PSI CABIN
(EVA, 10.2 PSI CABIN) (2 Cmn)

UPLINK
BORESIGHT COVER
CLOSE

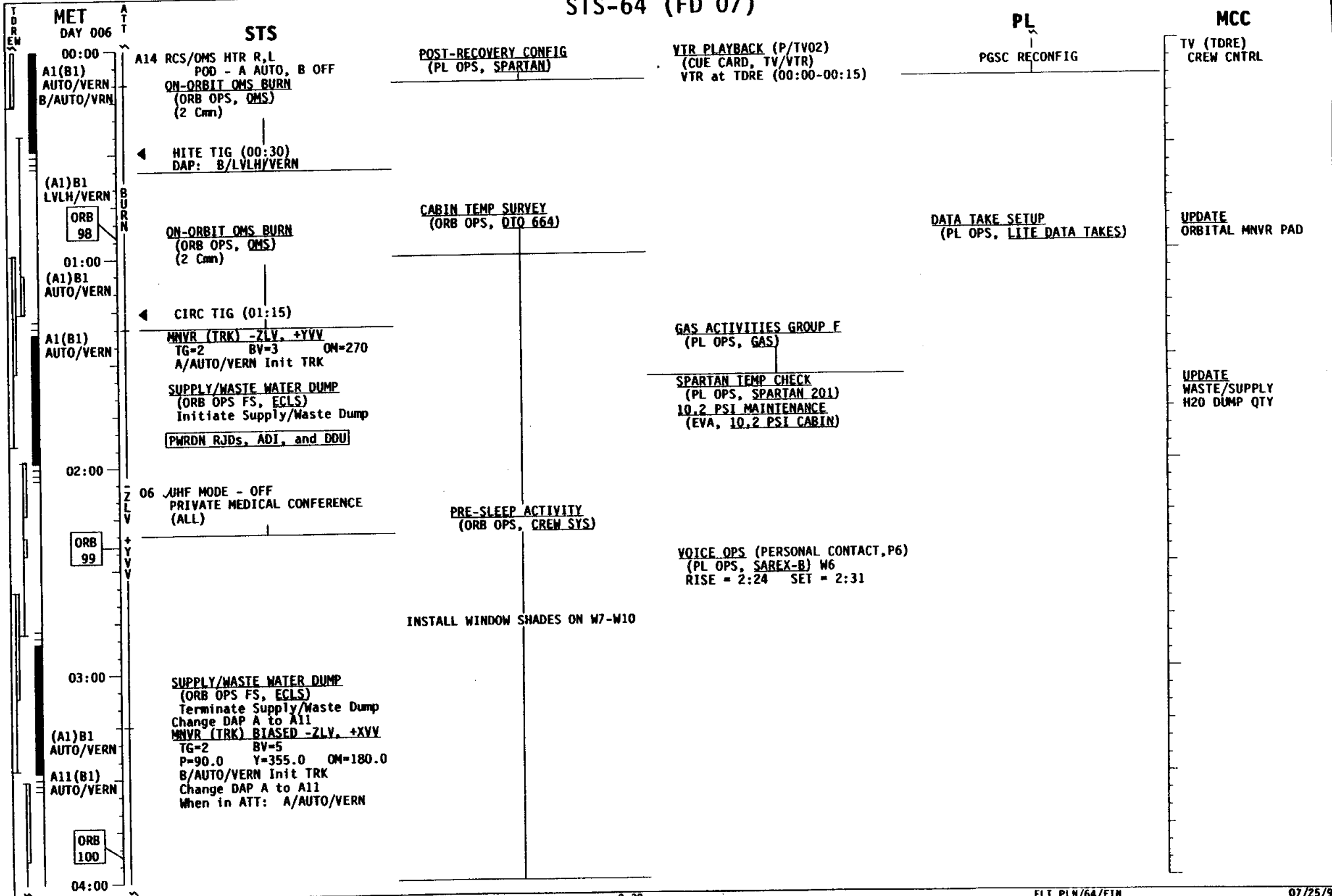
STS-64 (FD 07)



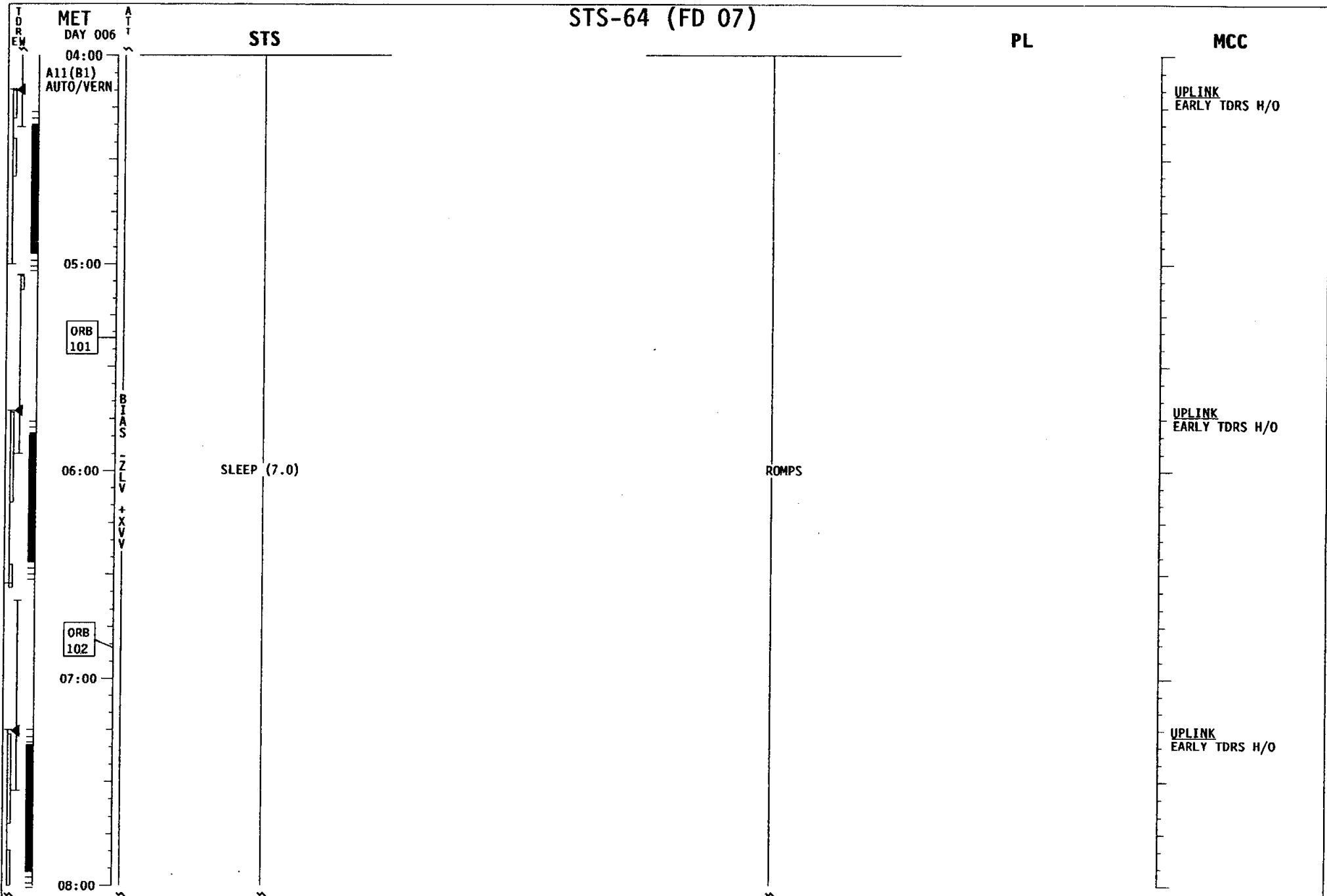
STS-64 (FD 07)



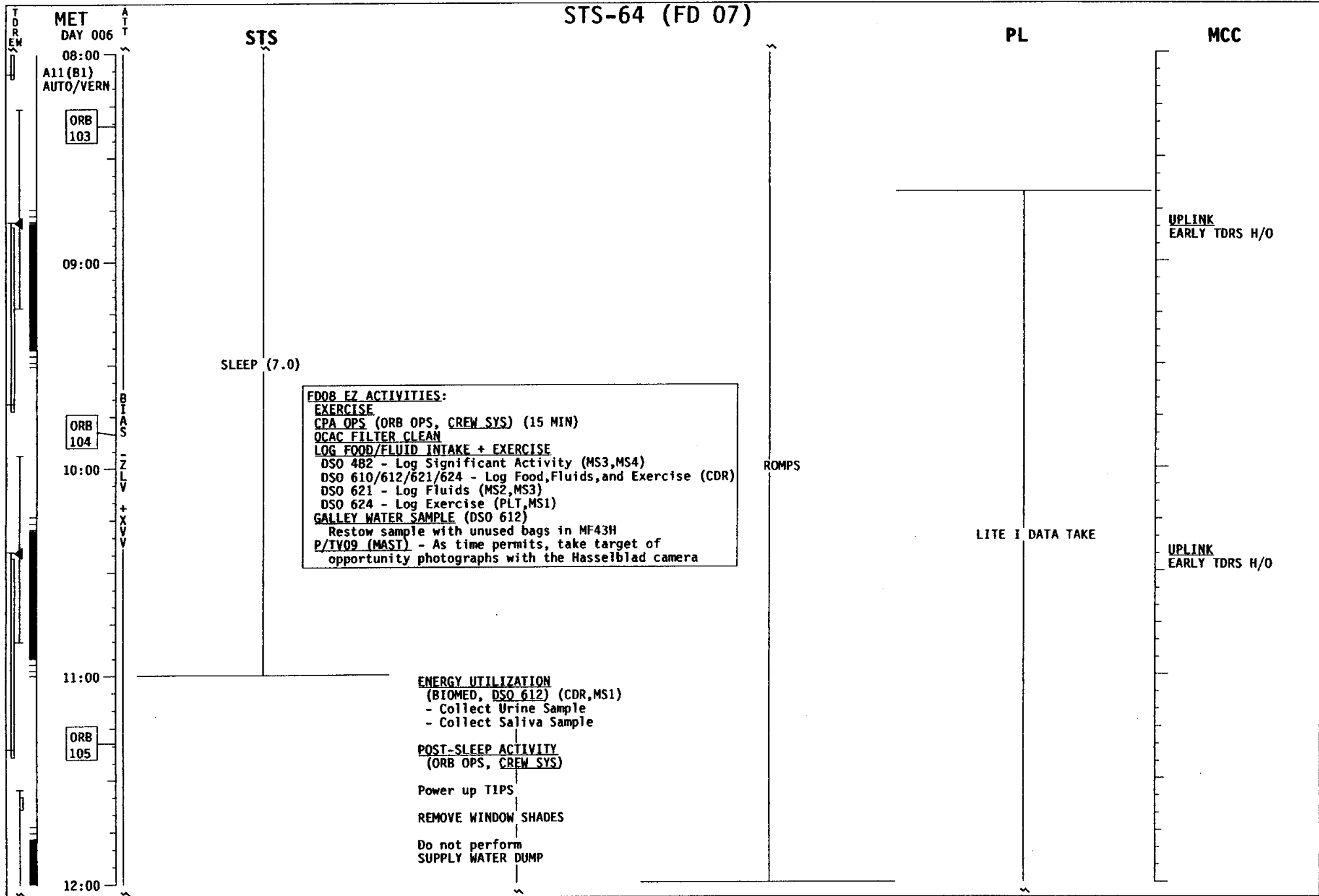
STS-64 (FD 07)



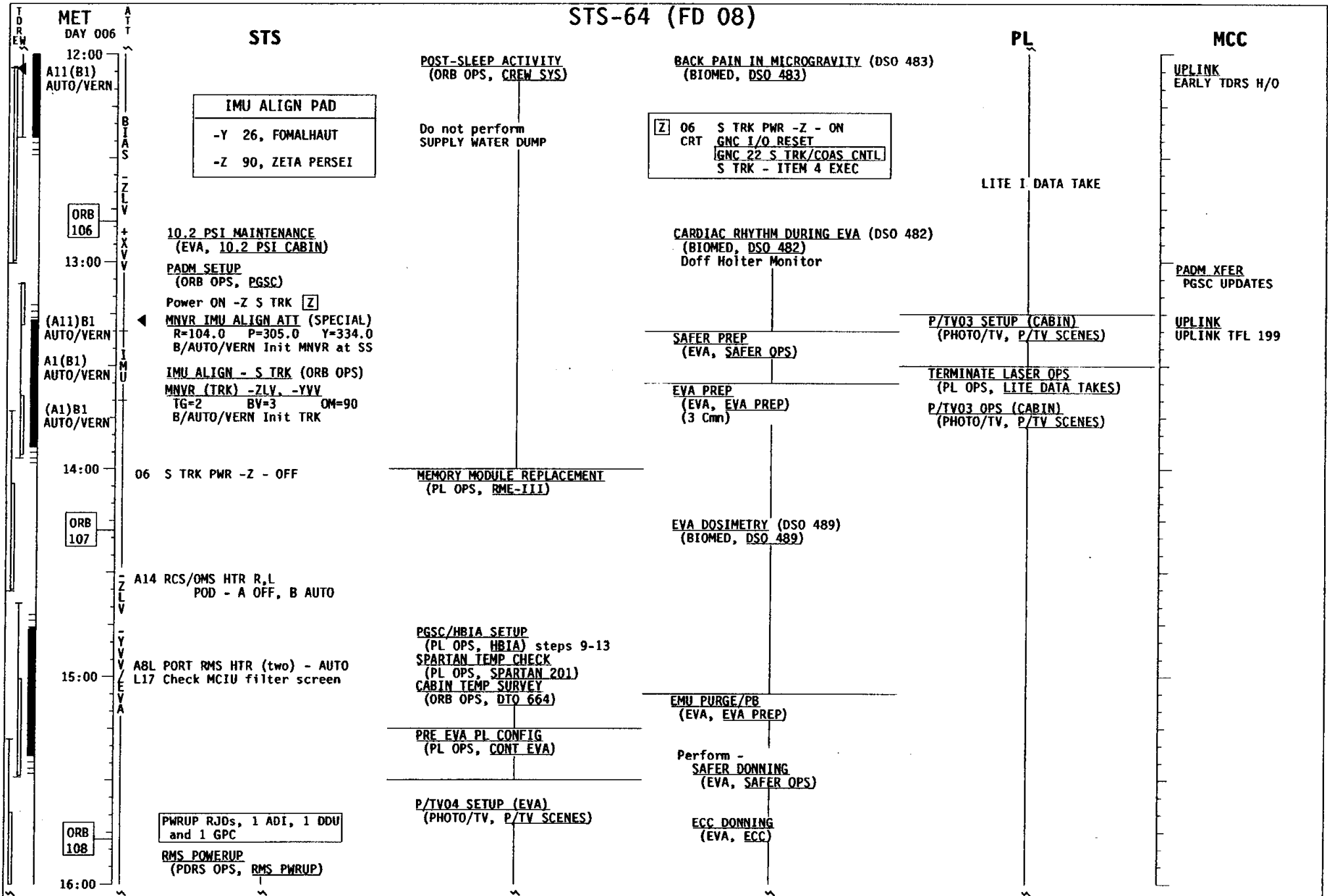
STS-64 (FD 07)



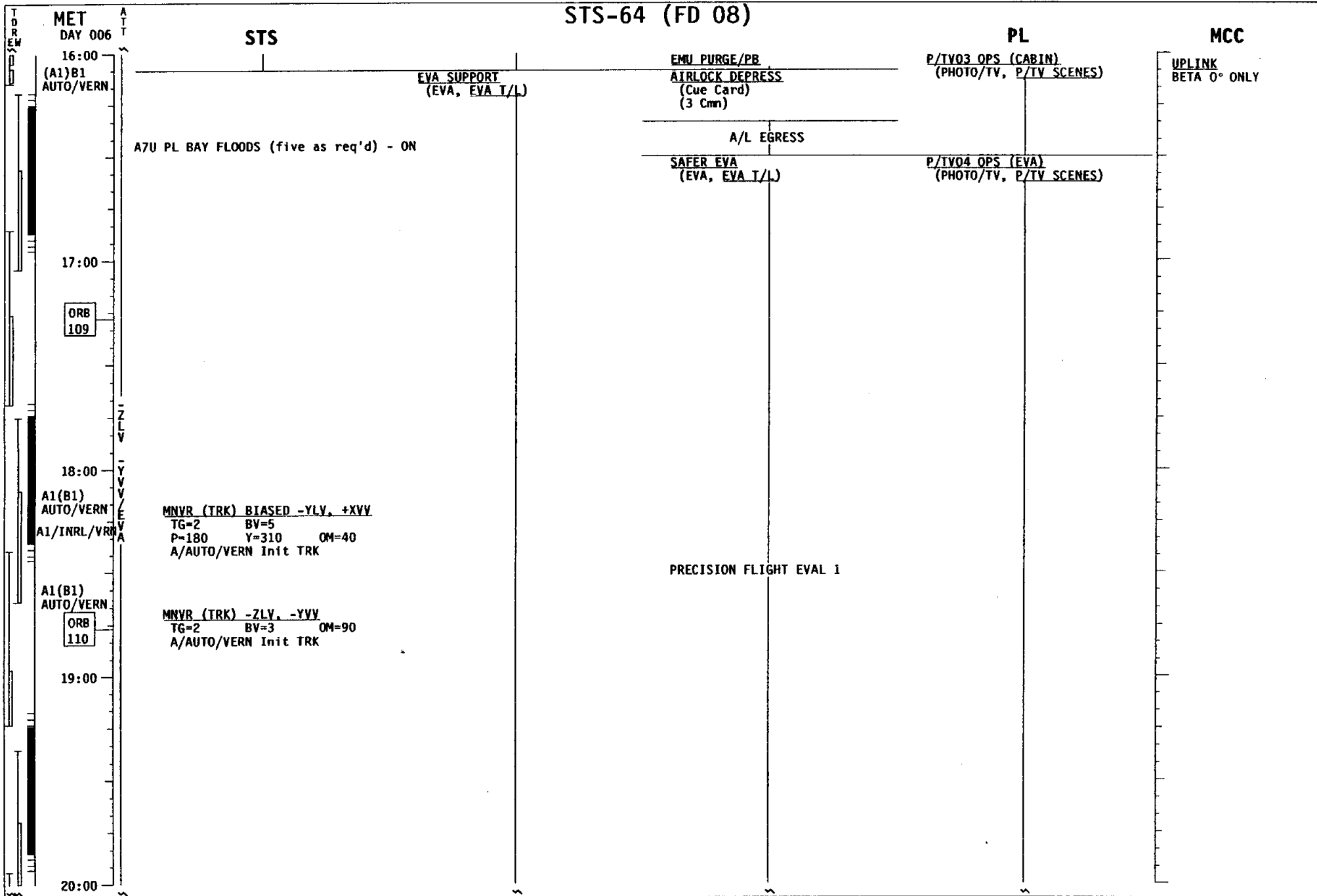
STS-64 (FD 07)



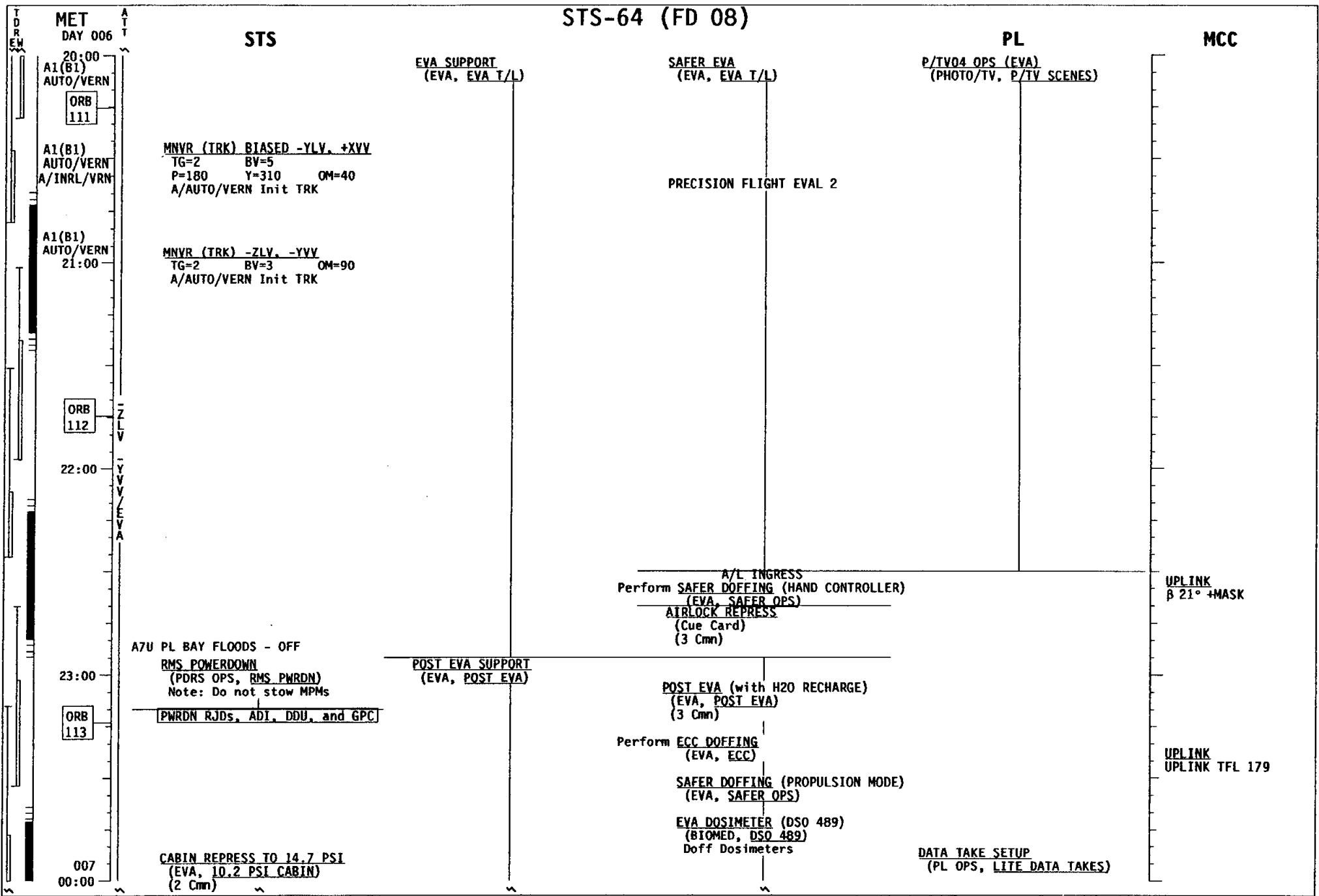
STS-64 (FD 08)



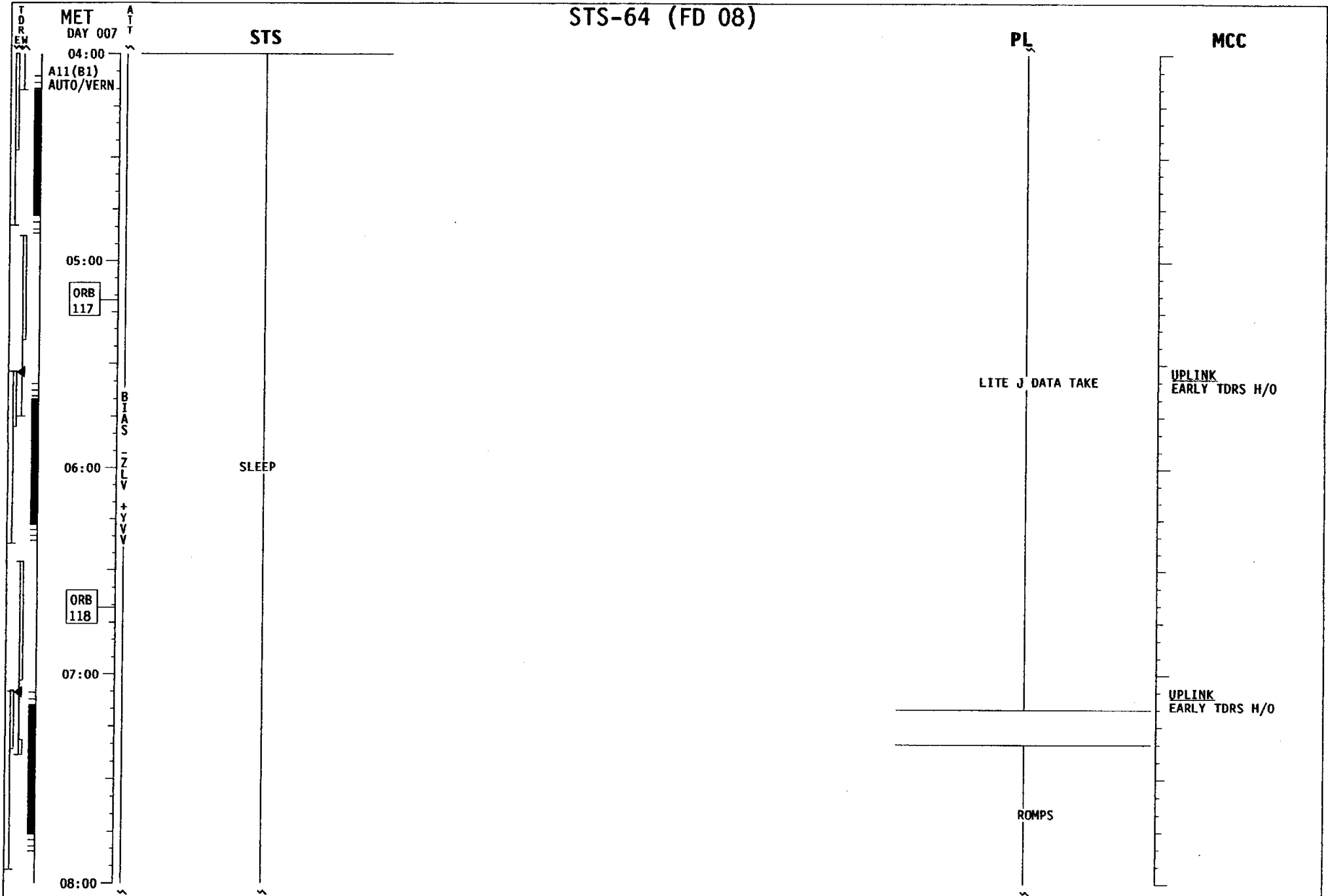
STS-64 (FD 08)



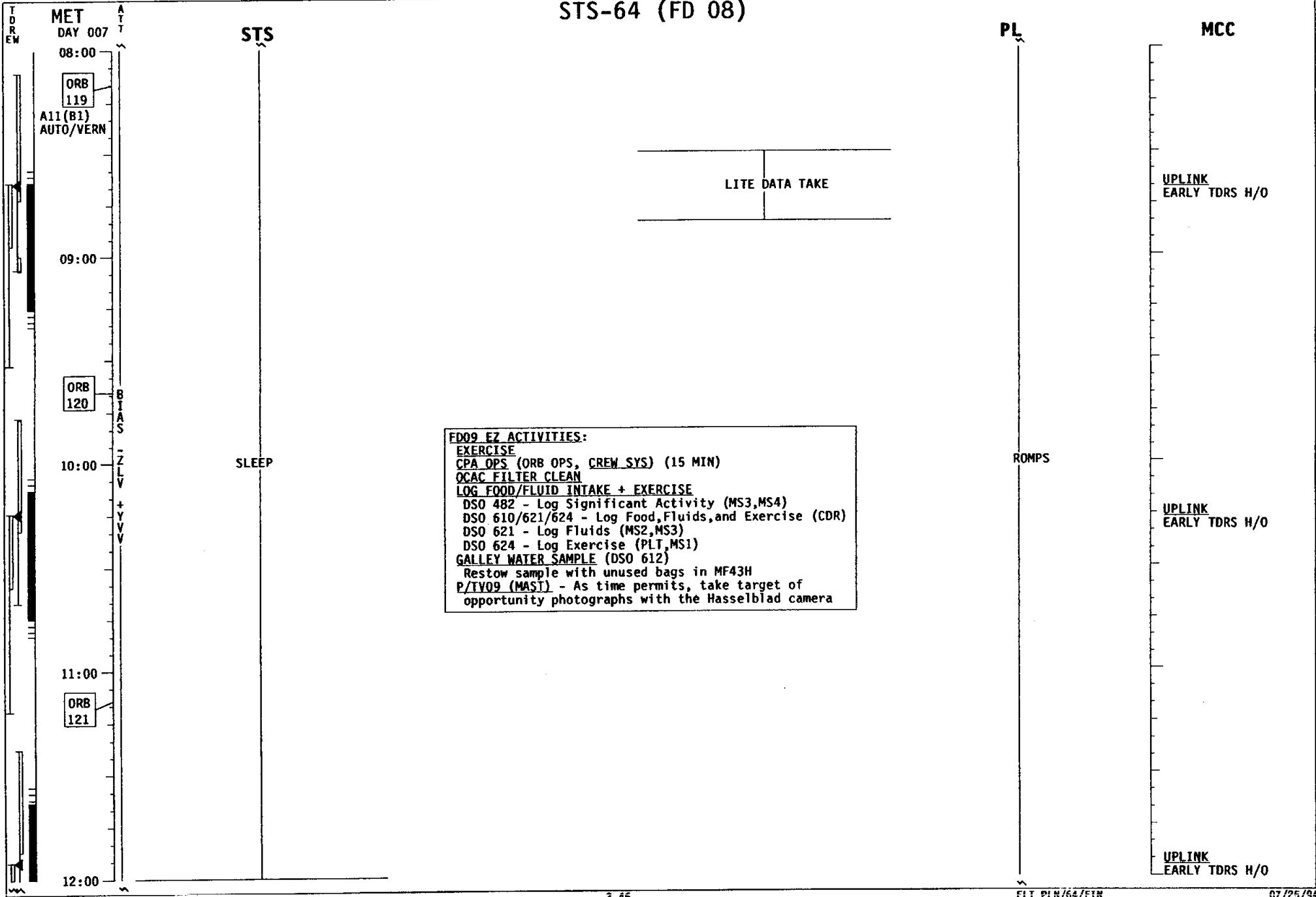
STS-64 (FD 08)

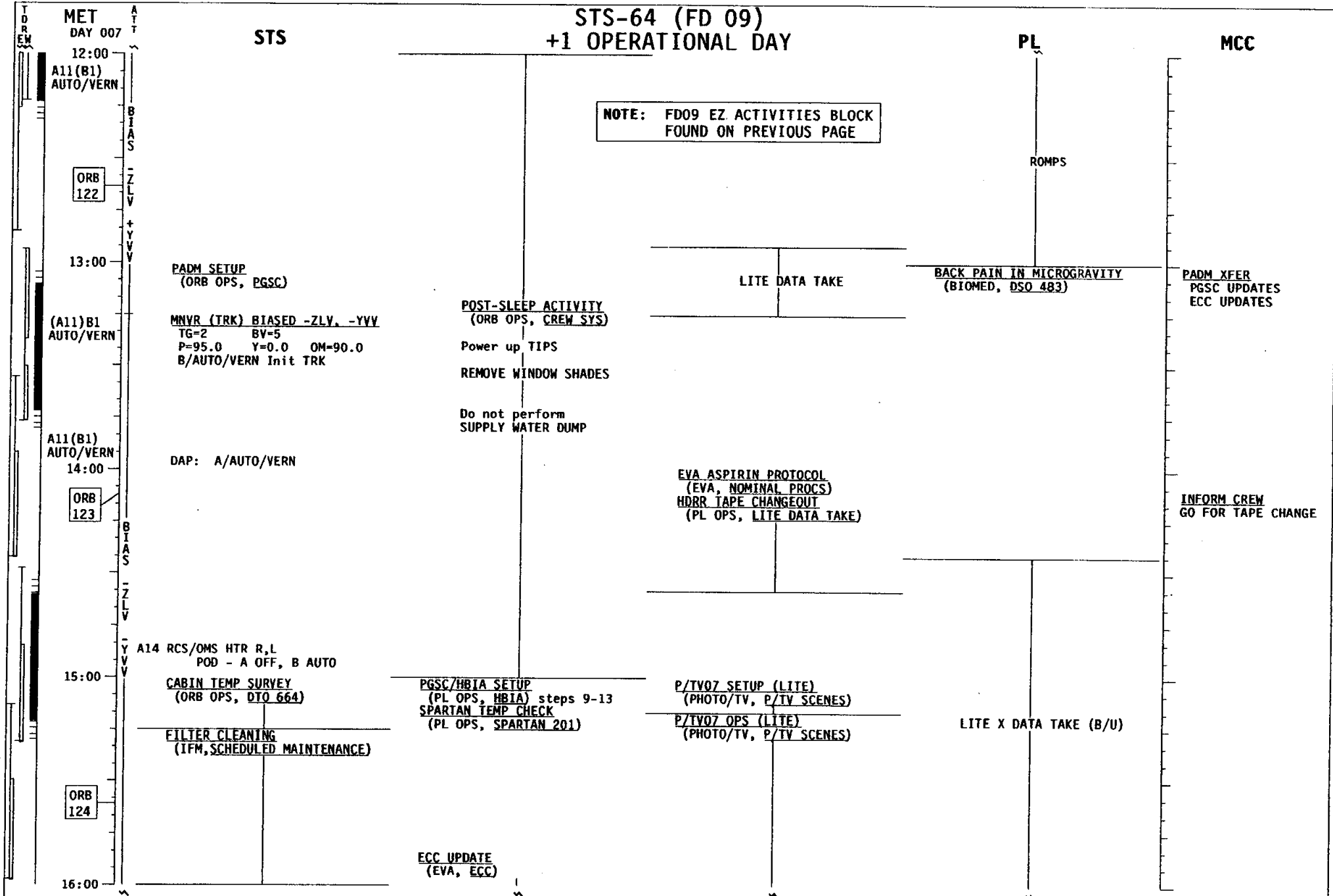


STS-64 (FD 08)

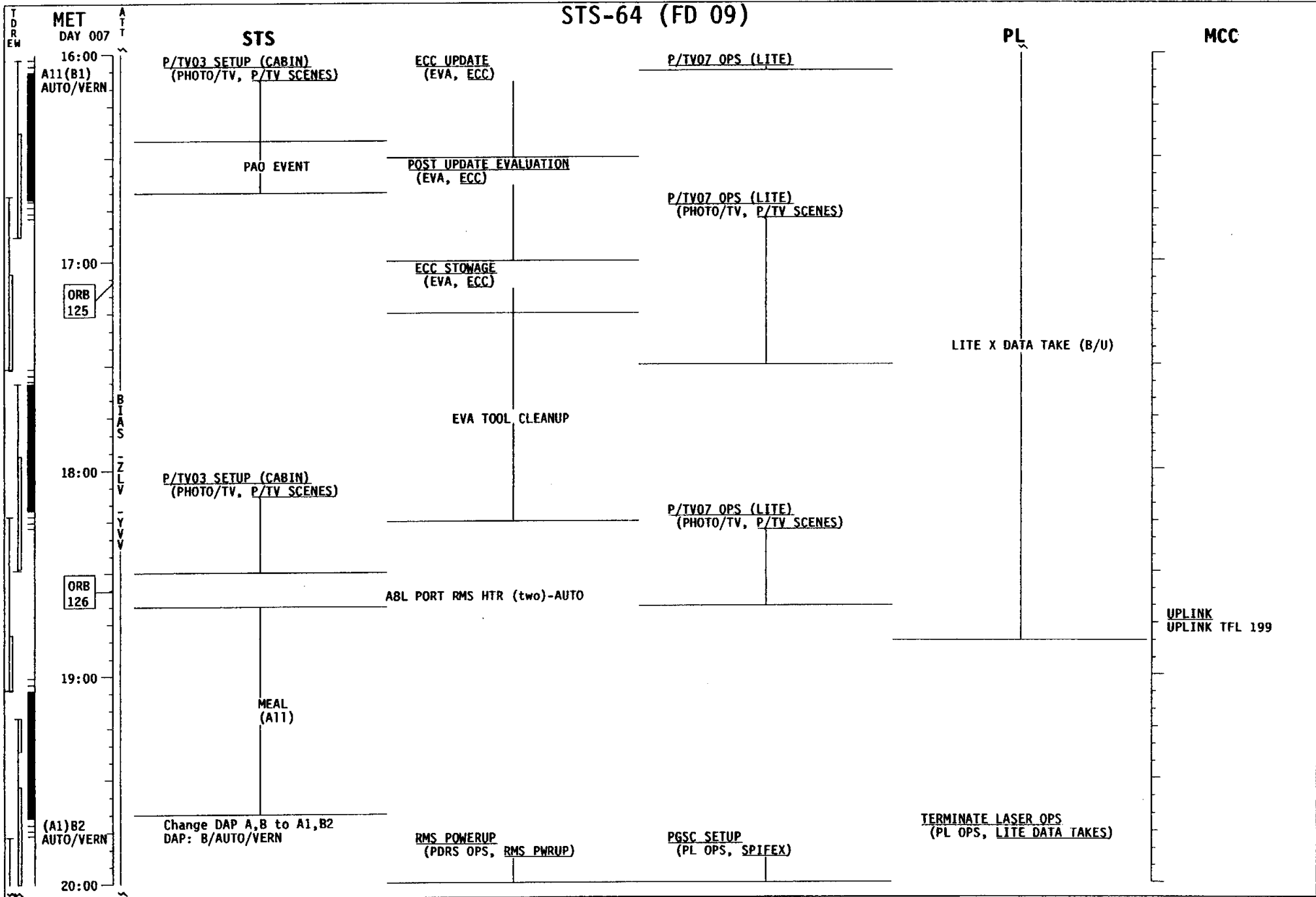


STS-64 (FD 08)

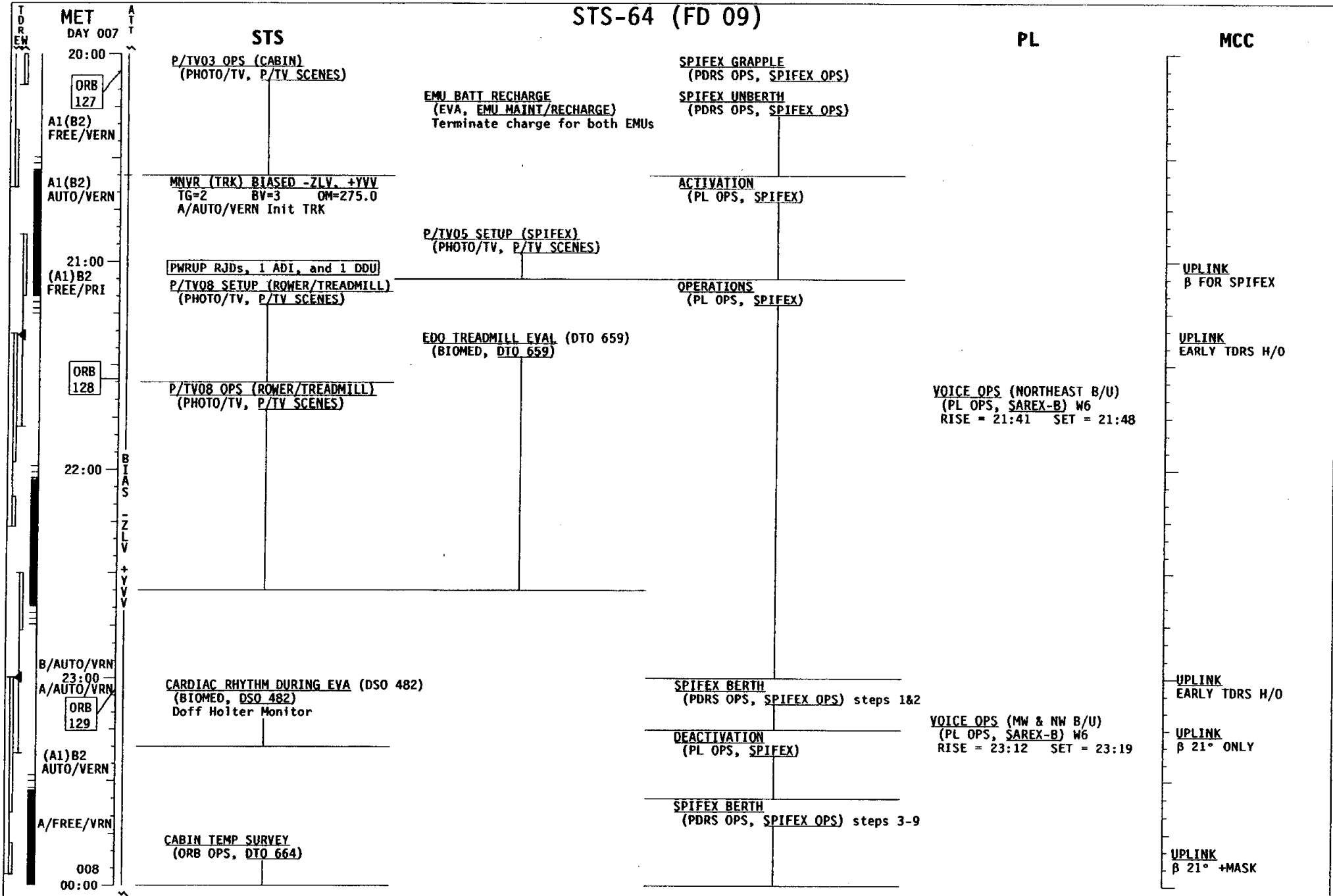




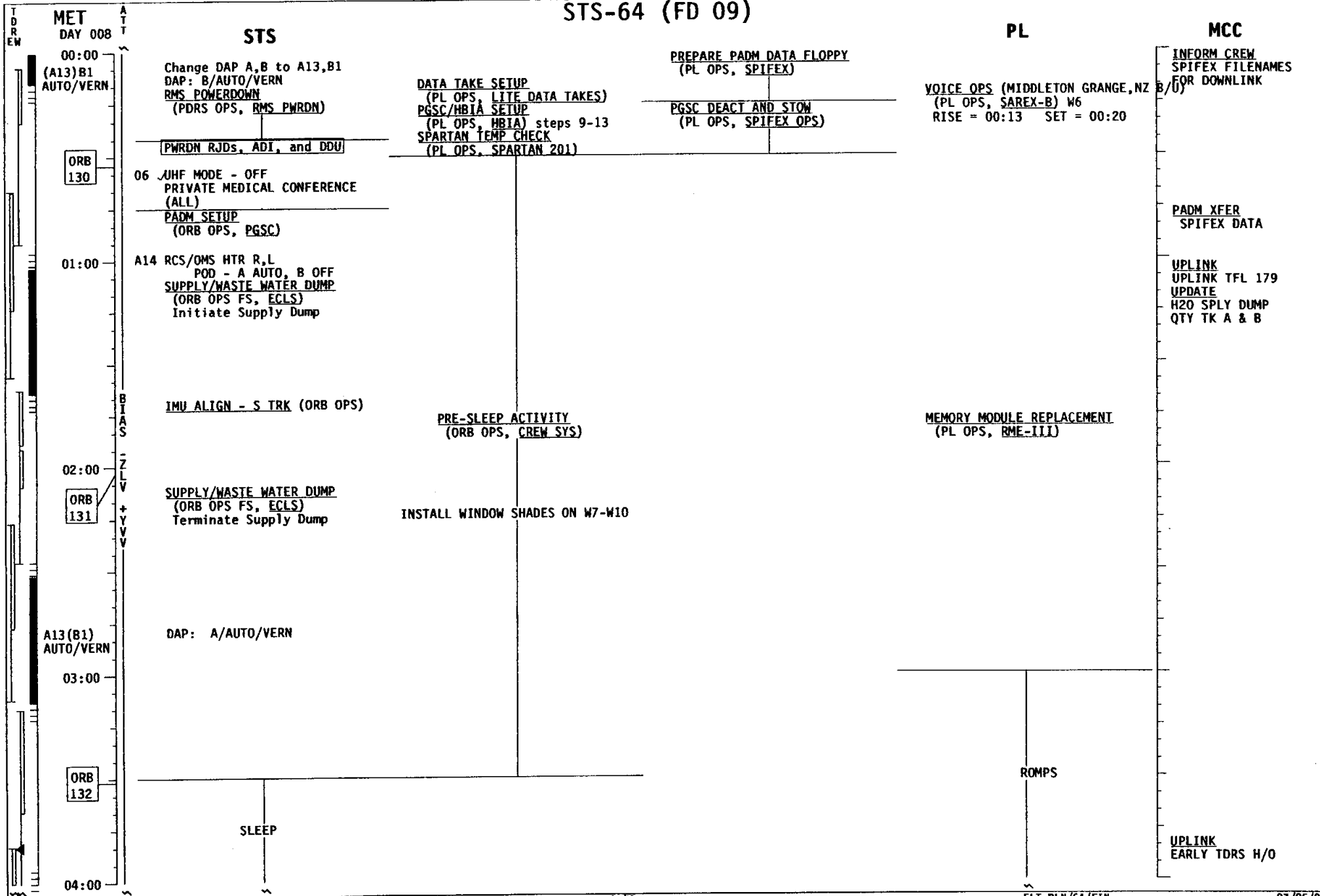
STS-64 (FD 09)



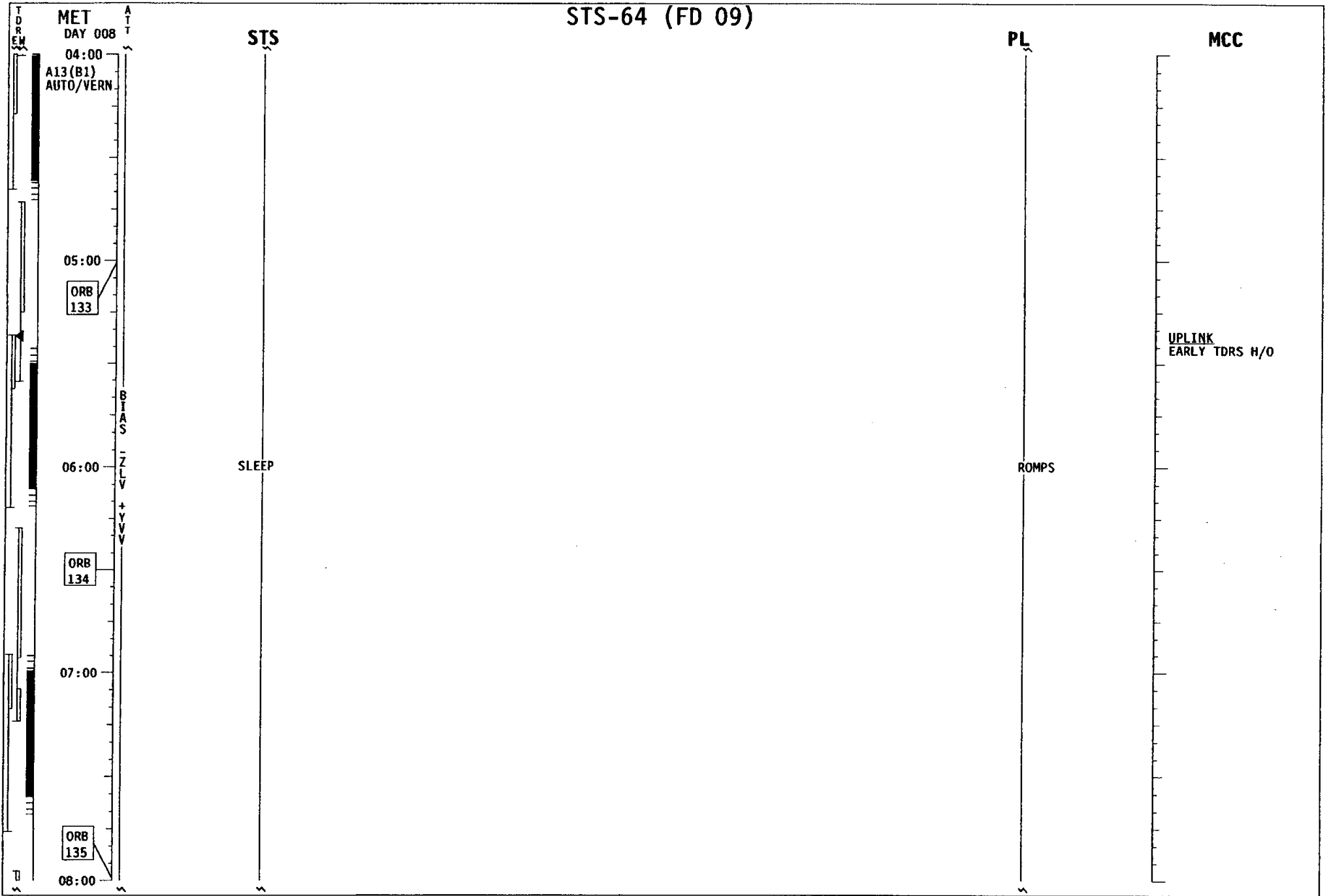
STS-64 (FD 09)



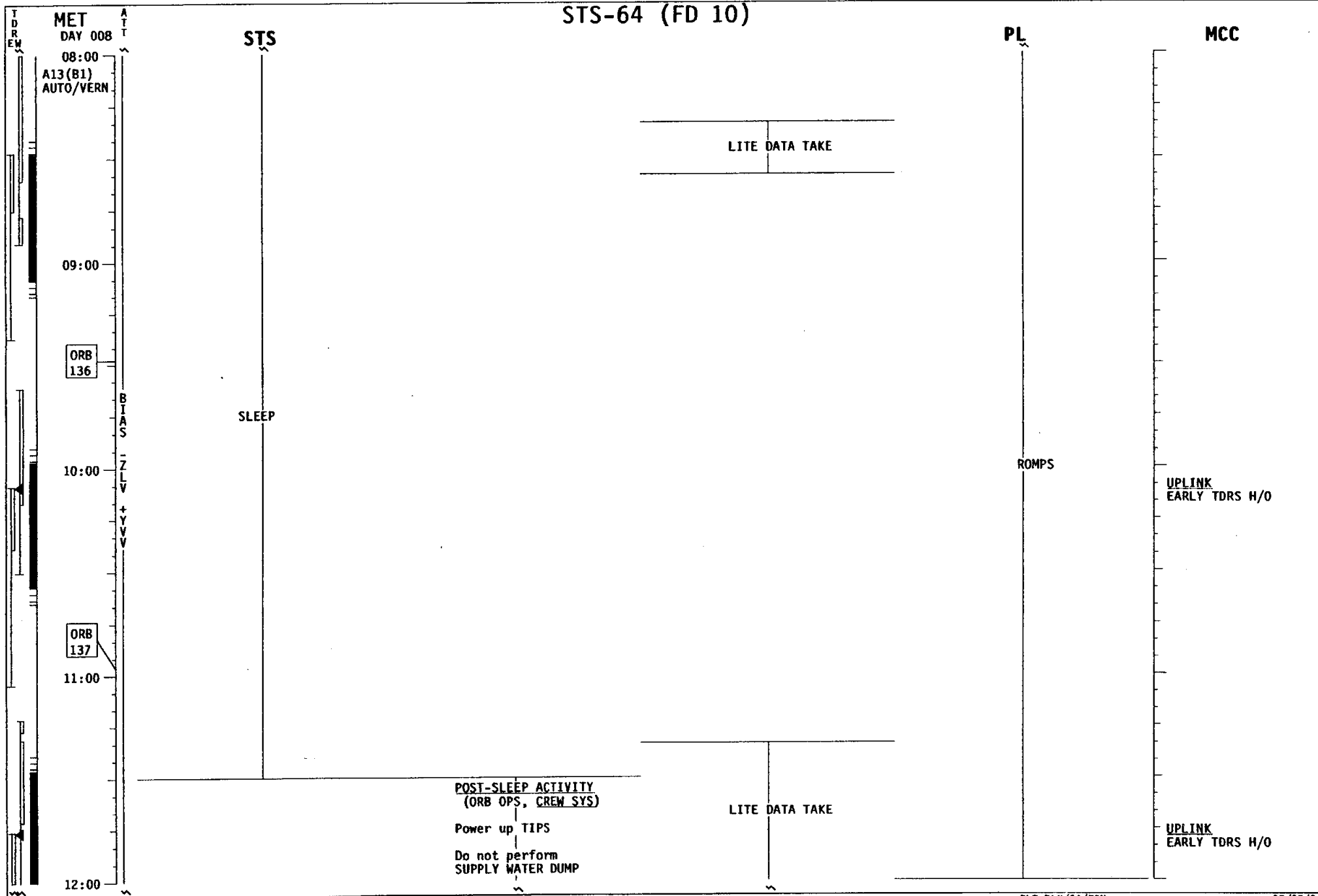
STS-64 (FD 09)



STS-64 (FD 09)



STS-64 (FD 10)



STS-64 (FD 10)

STS

PL

MCC

LITE DATA TAKE

TDRM

MET DAY 008

12:00

A13(B1) AUTO/VERN

ORB 138

(A1)B1 AUTO/VERN

13:00

ORB 139

14:00

A1(B1) AUTO/VERN

15:00

ORB 140

A/FREE/VRN A1(B1) AUTO/VERN

16:00

DAP: B/AUTO/VERN
Change DAP A to A1

BACK PAIN IN MICROGRAVITY (DSO 483)
(BIOMED, DSO 483)

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

MNVR (TRK) BIASED -XLV, -YV
TG=2 BV=2 OM=85.0
A/AUTO/VERN Init TRK

A14 RCS/OMS HTR R,L
POD - A OFF, B AUTO

PWRUP RJDs, 2 ADIs, and 2 DDUs

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

REMOVE WINDOW SHADES

POST-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY WATER DUMP

CABIN TEMP SURVEY
(ORB OPS, DTO 664)

L17 Check MCIU filter screen

PADM SETUP
(ORB OPS, PGSC)

FD10 E7 ACTIVITIES:

EXERCISE

CPA OPS (ORB OPS, CREW SYS) (15 MIN)

OCAC FILTER CLEAN

LOG FOOD/FLUID INTAKE + EXERCISE

DSO 610/621/624 - Log Food, Fluids, and Exercise (CDR)

DSO 621 - Log Fluids (MS2, MS3)

DSO 624 - Log Exercise (PLT, MS1)

DRINK EXTRA FLUID WITH MEALS (DSO 621) (CDR, MS2, MS3)

COLLECT URINE VOIDS (BIOMED, DSO 610) (CDR)

Starting with second void of the day,
collect urine for 24 hr period.

GALLEY WATER SAMPLE (DSO 612)

Restow sample with unused bags in MF43H

P/TV09 (MAST) - As time permits, take target of
opportunity photographs with the Hasselblad camera

ROWER ERGOMETER STOW (DTO 673) (15 MIN)

(BIOMED, DTO 673)

TREADMILL STOW (DTO 659) (15 MIN)

(BIOMED, DTO 659)

PGSC/HBIA SETUP
(PL OPS, HBIA) steps 9-13
SPARTAN TEMP CHECK
(PL OPS, SPARTAN 201)

TERMINATE LASER OPS
(PL OPS, LITE DATA TAKES)

POST EVA ENT PREP
(EVA, POST EVA ENT PREP)
(2 Cmn)

P/TV08 SETUP (ROWER/TREADMILL)
(PHOTO/TV, P/TV SCENES)

EDO TREADMILL EVAL (DTO 659)
(BIOMED, DTO 659)

P/TV08 OPS (ROWER/TREADMILL)
(PHOTO/TV, P/TV SCENES)

UPLINK
AUTO FC PURGE

PADM XFERR
PGSC UPDATES

UPLINK
EARLY TDRS H/O

INFORM CREW
GO FOR APU START

UPLINK
BORESIGHT COVER
CLOSE

STS-64 (FD 10)

MET
DAY 008

STS

PL

MCC

P/TV08 OPS (ROWER/TREADMILL)
(PHOTO/TV, P/TV SCENES)

EDO TREADMILL EVAL (DTO 659)
(BIOMED, DTO 659)

FCS CHECKOUT

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

Config DAP: A/AUTO/VERN
A12 APU HTR GG/FU (three) - A AUTO
PWRDN RJDs, ADIs, and DDUs

A1(B1)
AUTO/VERN
FREE/PRI
A1(B1)
AUTO/VERN

ORB
141

P/TV06 SETUP (CREW CONF)
(PHOTO/TV, P/TV SCENES)

17:00

B
I
A
S
- X
L
V

- Y
V
V

CREW CONF AUDIO/TV CK

P/TV06 OPS (CREW CONF)
(PHOTO/TV, P/TV SCENES)

CREW CONF
(A11)

18:00

MNVR (TRK) BIASED -ZLV, +YVV
TG=2 BV=3 OM=275.0
A/AUTO/VERN Init TRK

ORB
142

B
I
A
S

DEORBIT PREP REVIEW

19:00

- Z
L
V

+ Y
V
V

MEAL
(A11)

ORB
143

20:00

TV (TDRW)
(CREW CNTL-
CAB)

STS-64 (FD 10)

MET
DAY 008

PL

MCC

20:00
A1(B1)
AUTO/VERN

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

Power ON -Z S TRK [Z]

[Z] 06 S TRK PWR -Z - ON
CRT GNC I/O RESET
GNC 22 S TRK/COAS CNTL
S TRK - ITEM 4 EXEC

STOW
(PL OPS, SAREX-B)

UPDATE
WASTE/SUPPLY
H2O DUMP QTY

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

CABIN TEMP SURVEY
(ORB OPS, DTO 664)

21:00

ORB
144

PRE-DEORBIT PREP ACTIVITIES [A]
AIRLOCK CLOSEOUT
Remove loose items stored in Airlock
Perform ENT SW VERIF
(DEORBIT PREP, ENT SW LIST/VERIF)
SEAT INSTALLATION

22:00

CABIN CONFIG/STOW

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

As time permits, perform
PRE-DEORBIT PREP ACTIVITIES [A]

ORB
145

23:00

PGSC/HBIA SETUP
(PL OPS, HBIA) steps 9-13
GAS ACTIVITIES GROUP H
(PL OPS, GAS)

SPARTAN TEMP CHECK
(PL OPS, SPARTAN 201)

009
00:00

STS-64 (FD 10)

MET
DAY 009

STS

PL

MCC

T
D
R
E
W

00:00
A1(B1)
AUTO/VERN

ORB
146

01:00
A1(B5)
INRL/VERN

A1(B5)
AUTO/VERN

A13(B1)
AUTO/VERN

ORB
147

02:00

ORB
148

03:00

04:00

ATT

BIAS

ZLV

+YVV

IMU

HUD

ZLV

+YVV

06 JHF MODE - OFF
PRIVATE MEDICAL CONFERENCE
(ALL)

PWRUP ADI and DDU

MNVR IMU ALIGN ATT

R=308.0 P=35.0 Y=355.0
A/AUTO/VERN Init MNVR at 00:40
IMU ALIGN - S TRK (ORB OPS)
HUD MNVR
R=308.0 P=33.0 Y=341.0
A/AUTO/VERN (01:10) Init MNVR
HUD CALIBRATION (ORB OPS)

A14 RCS/OMS HTR R,L
POD - A AUTO, B OFF

PRE-SLEEP ACTIVITY
(ORB OPS, CREW SYS)

Do not perform
SUPPLY WATER DUMP

MNVR (TRK) -ZLV, +YVV
TG=2 BV=3 OM=270
A/AUTO/VERN Init TRK
When in Attitude:
Config DAP A,B to A13,B1
A/AUTO/VERN

PWRDN ADI and DDU

IMU/HUD CALIBRATION LOG

IMU STAR PAIR: -Z 30, ANTARES
-Y 105, EPSILON CYGNI

HUD STAR ID: +X 26, FOMALHAUT
STAR AVAIL: 00:52 TO 01:35

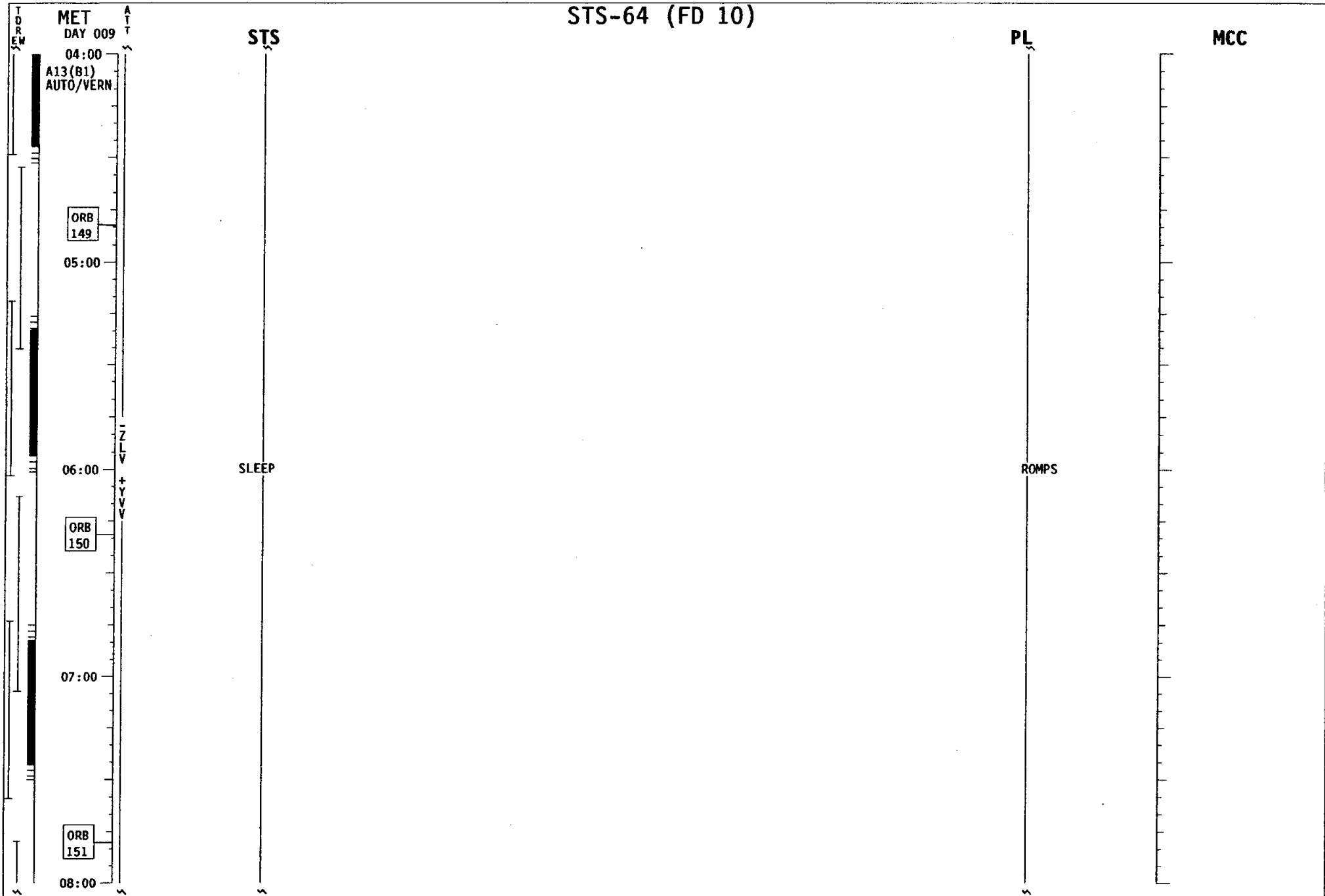
+X Δ BIAS _____ , _____

UPDATE TIME: ___ / ___ : ___ : ___

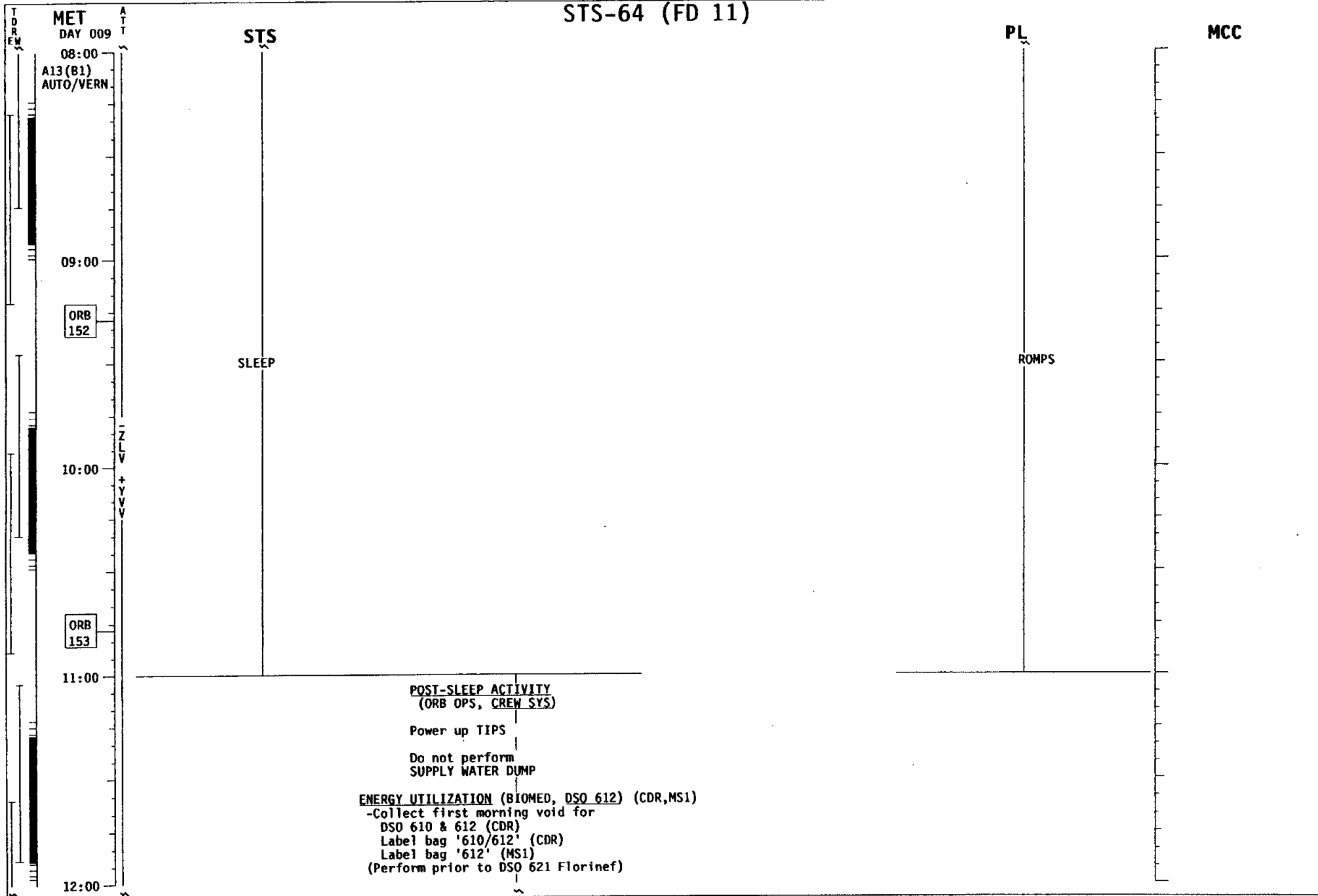
SLEEP

ROMPS

STS-64 (FD 10)



STS-64 (FD 11)



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CONTINGENCY TIMELINES

NINE-DAY PLAN 4A-1
STS-64 MDF 4B-1

CONTINGENCY
TIMELINES

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NINE-DAY PLAN

The Nine-Day Plan is included here for the case where the +1 operational day is deleted in real time. The most likely cause for the deletion will be that the power usage was higher than expected, and limited cryo margins drive a mission length of 9 days. For this case, flight day 9 becomes the day before entry with its requisite activities such as FCS C/O, RCS hot fire, and cabin stow. Landing will occur on flight day 10.

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
260:08:30/ 260:20:30	007:12:00/ 008:00:00	260:03:30/ 260:15:30	9 /260 CDT	-10.3		SEPTEMBER 17, 1994	STS-64	FINAL	7/25/94

CDT :260	12	13	14	15	16	17	18	19	20	21	22	23	15	0	MET:008
FD :009															
MET :007															

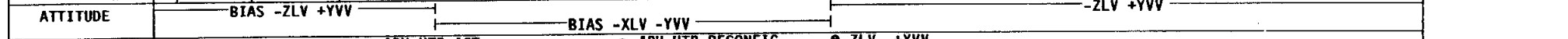
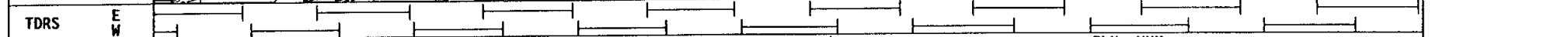
STS	PADM SETUP			ROZ MNR	FCS C/O	RCS HOT	CONF	CREW CONF	-ZLV MNR	MEAL	SDSU MITE IN NOT INC	DEORB PREP REVIEW	SDSU MITE		
-----	------------	--	--	---------	---------	---------	------	-----------	----------	------	----------------------	-------------------	-----------	--	--

	POST SLEEP			DTO 664			P/TVO6 SETUP CONF	P/TVO6 OPS CONF					CABIN STOW		
--	------------	--	--	---------	--	--	-------------------	-----------------	--	--	--	--	------------	--	--

	LITE *						FILTER CLEANING			SAREX STOW					
--	--------	--	--	--	--	--	-----------------	--	--	------------	--	--	--	--	--

PL	ROMPS *			ECC UPDATE	ECC EVAL	EVA TOOL CLEANUP				EHU BATT		POST EVA ENT PREP			
----	---------	--	--	------------	----------	------------------	--	--	--	----------	--	-------------------	--	--	--

DAY/NIGHT															
ORBIT	121	122	123	124	125	126	127	128	129						



o APU HTR ACT
 o DSO 483 BACK PAIN
 o -XLV, -YVV
 o DTO 664 CABIN TEMP SURVEY
 o APU HTR RECONFIG
 o -ZLV, +YVV

9 DAY PLAN ASSUMPTIONS

- SPIFEX will not be unberthed on FD9
- ROMPS will complete 42 hrs of experiment ops
- LITE Data take X and snapshots at 8/08:20 and 8/11:25 will not be performed
- MPMs will be rolled in after EVA
- DSO 659 ops will be performed as time permits

9 DAY PLAN

* GROUND COMMANDED

GMT (D:H:M)	MET (D:H:M)	CDT (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
261:08:30/ 261:20:30	008:12:00/ 009:00:00	261:03:30/ 261:15:30	10 /261 CDT	-15.1		SEPTEMBER 18, 1994	STS-64	FINAL	7/25/94

CDT :261	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	MET:009	
FD :010	12	13	14	15	16	17	18	19	20	21	22	23	0										
MET :008																							

STS		IMU MNV R	ZLV MNV R	PCONF MED		PGWRP UBP	-XSI MNV R		IMU MNV R	PLMBD ALIGN	COMM MNV R		BURN MNV R										
-----	--	--------------	--------------	--------------	--	--------------	---------------	--	--------------	----------------	---------------	--	---------------	--	--	--	--	--	--	--	--	--	--

	POST SLEEP			OTO 664	OCAC STOW	DEORBIT PREP					DEORBIT BURN	KSC LANDING	
--	------------	--	--	------------	--------------	--------------	--	--	--	--	-----------------	----------------	--

				DSO ENTRY PREP																			
--	--	--	--	-------------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

PL					LITE DEACT																		
----	--	--	--	--	---------------	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

DAY/NIGHT																							
ORBIT	137	138	139	140	141	142	143	144	145														



TDRS	E	W																					
ATTITUDE	-ZLV -YVV		-ZLV +YVV		IMU/VERIF		COMM/BURN			ENTRY													

NOTES:

- * AUTO FC PURGE
- ⊙ -ZLV, +YVV
- ⊙ DSO 483 BACK PAIN
- ⊙ DSO 621 IN-FLIGHT USE OF FLORINEF
- Δ ROMPS DEACT
- ⊙ DSO 603C ORTHOSTATIC FUNCTION
- ⊙ DTO 664 CABIN TEMP SURVEY

* DEORBIT BURN 8/19:14

* KSC LANDING 8/20:12

9 DAY PLAN

* GROUND COMMANDED

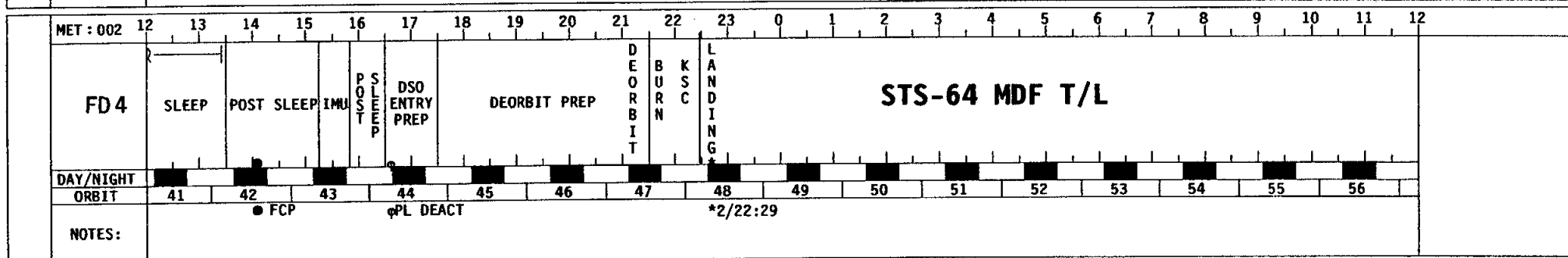
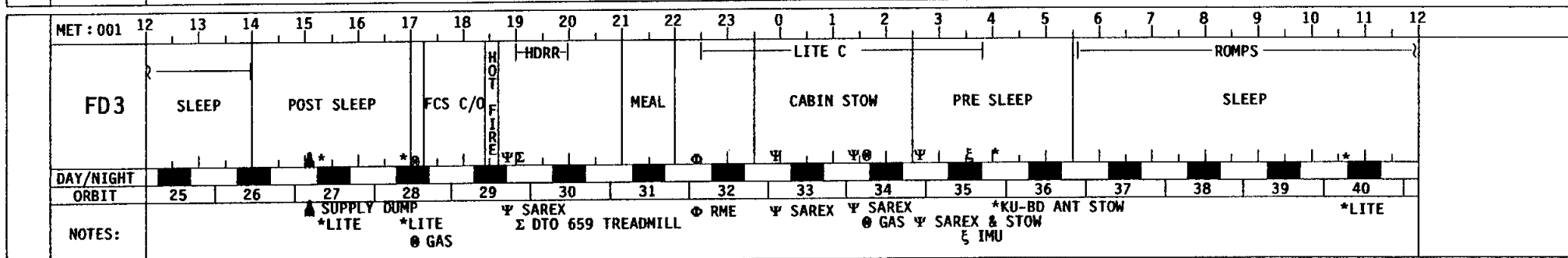
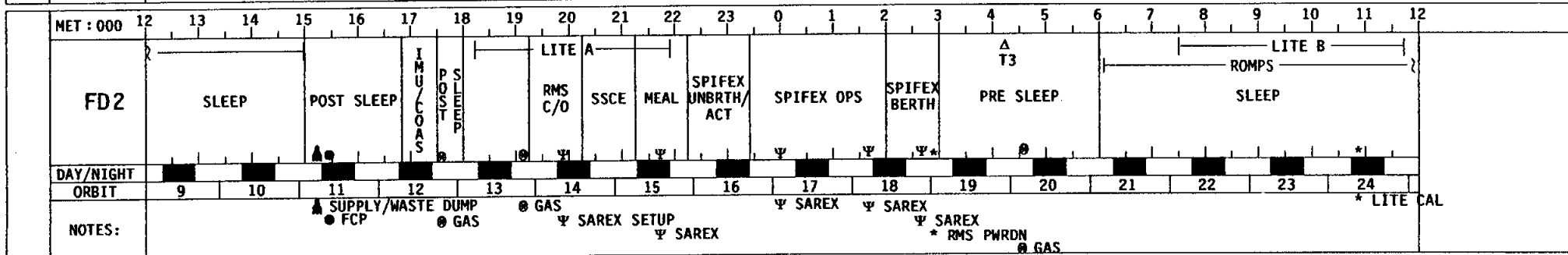
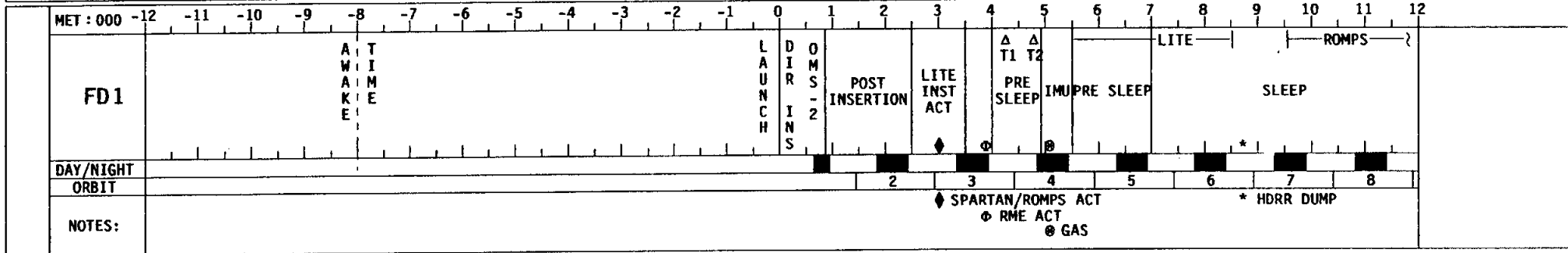
STS-64 MDF

If STS-64 becomes a Minimum Duration Flight with landing occurring on flight day 4, then time available on orbit becomes severely limited. The following timelines show the optimal availability because no time is allocated to troubleshooting the failure which caused the MDF. In reality, with the safe return of the crew and vehicle being the highest priority, even less time may be available for payload operations. Assumptions for this timeline include that the MDF was declared on flight day 1 and that Spartan 201 or EVA operations will not be attempted.

FLIGHT: STS-64

EDITION: MDF

PUB. DATE: 7/25/94



ATTITUDE TIMELINE

ATTITUDE
TIMELINE

Attitude Timeline

MET	MNVR OPTION	DAP	E/ZS	REF ATT/REMARKS	EVENT	
1 000/01:12:00 MET 22:44	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 90.00	A1 AUTO PRI	RATE 0.2000 DB AT 5.00 DB RT 0.20	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y=270.00	Post Insertion Required for PLBD Opening
2 000/03:46:00 MET 54:47	INRTL R=236.00 MNVR P=182.00 Y=326.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 209 P 47	+X RCS Posigrade TV Roll = 90	+X RCS Orb Trim TIG: 00/04:06
3 000/04:10:00 MET		B1 LVLH VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 86 P 105	LVLH R= 89.86 HOLD P= 15.85 Y= 15.08	LVLH Hold Between +X RCS Burns
4 000/04:28:00 MET 36:03	INRTL R=302.00 MNVR P= 9.00 Y= 3.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 135 P 164	+X RCS Posigrade TV Roll = 90	+X RCS Orb Circ TIG: 00/04:48
5 000/04:55:00 MET 48	INRTL R=305.00 MNVR P= 13.00 Y= 11.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 127 P 155	SPECIAL ST PR -Y: 27 -Z: 36	IMU Align
When burn cmplt						
6 000/05:15:00 MET 21:23	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Checkout Biased -ZLV Nose South
7 000/16:45:00 MET 57:08	INRTL R=290.00 MNVR P= 54.00 Y= 29.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 104 P 118	SPECIAL STAR PR -Y: 79 -Z: 36	IMU Align
Init at Sunset						
8 000/17:05:00 MET 12:18	TGT=2 BV=5 P= 90.00 Y=355.00 OM=180.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 355 P 90	LVLH R=185.00 P= 0.00 Y= 0.00	LITE Run A Biased -ZLV Nose Fwd
9 000/22:00:00 MET 07:31	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	B2 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	H2O Dump -ZLV Nose South
10 001/04:35:00 MET 42:31	TGT=2 BV=5 P= 90.00 Y= 5.00 OM= 0.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 5 P 90	LVLH R=355.00 P=180.00 Y= 0.00	LITE Run B Biased -ZLV Tail Fwd
11 001/14:50:00 MET 57:32	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Run C/D Biased -ZLV Nose South
12 002/19:12:00 MET 13:11	TGT=2 BV=5 P= 90.00 Y=325.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 325 P 90	LVLH R= 0.00 P=215.00 Y= 90.00	LMT Setup -Z 35 Fwd Nadir Nose South

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

Attitude Timeline

MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
13 002/19:16:00 MET 02	TGT=3 BV=5 P= 90.00 Y= 0.00 OM=270.00 LAT= 15.910N LON= -34.300W ALT= 0.0nm	A14 AUTO PRI	RATE 0.2000 DB AT 3.00 DB RT 0.20			LMT (Atlantic) Lat: 14N to 45N
14 002/19:17:00 MET 20:18	TGT=2 BV=5 P= 90.00 Y=355.00 OM=180.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 355 P 90	LVLH R=185.00 P= 0.00 Y= 0.00	Sweep Setup Biased -ZLV Nose Fwd
15 002/19:55:00 MET 13	TGT=2 BV=5 P= 90.00 Y=330.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 330 P 90	LVLH R=210.00 P= 0.00 Y= 0.00	Sweep Mnvr 1
16 002/19:55:13 MET 43	TGT=2 BV=5 P= 90.00 Y= 30.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 30 P 90	LVLH R=150.00 P= 0.00 Y= 0.00	Sweep Mnvr 2
17 002/19:55:43 MET 56:13	TGT=2 BV=5 P= 90.00 Y=330.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 330 P 90	LVLH R=210.00 P= 0.00 Y= 0.00	Sweep Mnvr 3
18 002/19:56:13 MET 26	TGT=2 BV=5 P= 90.00 Y=355.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 355 P 90	LVLH R=185.00 P= 0.00 Y= 0.00	Sweep Mnvr 4 Biased -ZLV Nose Fwd
19 002/21:25:00 MET 13	TGT=2 BV=5 P= 90.00 Y=330.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 330 P 90	LVLH R=210.00 P= 0.00 Y= 0.00	Sweep Mnvr 1
20 002/21:25:13 MET 43	TGT=2 BV=5 P= 90.00 Y= 30.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 30 P 90	LVLH R=150.00 P= 0.00 Y= 0.00	Sweep Mnvr 2
21 002/21:25:43 MET 26:13	TGT=2 BV=5 P= 90.00 Y=330.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 330 P 90	LVLH R=210.00 P= 0.00 Y= 0.00	Sweep Mnvr 3
22 002/21:26:13 MET 26	TGT=2 BV=5 P= 90.00 Y=355.00 OM=180.00	A12 AUTO PRI	RATE 2.0000 DB AT 3.00 DB RT 0.20	EARTH R 355 P 90	LVLH R=185.00 P= 0.00 Y= 0.00	Sweep Mnvr 4 Biased -ZLV Nose Fwd
23 003/02:55:00 MET 03:02:48	INRTL R=113.00 MNVR P=312.00 Y=319.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 86 P 124	SPECIAL STAR PR -Y: 54 -Z: 18	IMU -Z COAS COAS STAR: 18
24 003/03:35:00 MET 42:53	TGT=2 BV=5 P= 90.00 Y=355.00 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 355 P 90	LVLH R= 5.00 P=180.00 Y= 0.00	LITE Run E Biased -ZLV Tail Fwd

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

Attitude Timeline

MET	MNVR OPTION	DAF	E/S	REF ATT/REMARKS	EVENT	
25 003/13:20:00 MET 22:23	TGT=2 BV=5 P= 90.00 Y=326.40 OM= 0.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 326 P 90	LVLH R= 33.60 P=180.00 Y= 0.00	AMOS PRCS-ZERO -Y TO AMOS ATCA Tail Fwd
26 003/13:51:00 MET 58:54	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 Dump -ZLV Nose South
When test cmplt						
27 003/22:24:00 MET 38:50	INRTL R=318.80 MNVR P=209.90 Y= 43.19	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 270 P 41		SPARTAN Deploy Deploy Time: 03:23:13:33
28 003/23:30:00 MET 39:56	INRTL R=124.00 MNVR P= 11.00 Y= 22.00	A7 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 313 P 148		SEP 3 +X RCS TIG: 04/00:03
29 004/00:15:00 MET 23:10	TGT=2 BV=5 P= 90.00 Y= 5.00 OM=180.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 5 P 90	LVLH R=175.00 P= 0.00 Y= 0.00	LITE Run F Biased -ZLV Nose Fwd
30 004/14:59:00 MET 15:05:59	INRTL R=305.00 MNVR P= 13.00 Y= 11.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 119 P 158	SPECIAL STAR PR -Y: 27 -Z: 36	IMU Align
Init at Sunset						
31 004/15:20:00 MET 27:42	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Run G Biased -ZLV Nose South
32 004/20:31:00 MET 32:11	TGT=2 BV=5 P= 90.00 Y=325.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 325 P 90	LVLH R= 0.00 P=215.00 Y= 90.00	LMT Setup -Z 35 Fwd Nadir Nose South
33 004/20:35:00 MET 02	TGT=3 BV=5 P= 90.00 Y= 0.00 OM=270.00 LAT= 16.020N LON= -65.680W ALT= 0.0nm	A14 AUTO PRI	RATE 0.2000 DB AT 3.00 DB RT 0.20			LMT (Atlantic) Lat: 13N to 45N
34 004/20:36:00 MET 37:25	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 0 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Run G Biased -ZLV Nose South
35 004/21:50:00 MET 51:11	TGT=2 BV=5 P= 90.00 Y=325.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 325 P 90	LVLH R= 0.00 P=215.00 Y= 90.00	LMT Setup -Z 35 Fwd Nadir Nose South
36 004/21:54:00 MET 02	TGT=3 BV=5 P= 90.00 Y= 0.00 OM=270.00 LAT= -19.830S LON=-109.890W ALT= 0.0nm	A14 AUTO PRI	RATE 0.2000 DB AT 3.00 DB RT 0.20			LMT (Pacific) Lat: 20S to 11N

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

Attitude Timeline

MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
37 004/21:55:00 MET 56:25	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 0 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Run G Biased -ZLV Nose South
38 004/23:20:00 MET 21:11	TGT=2 BV=5 P= 90.00 Y=325.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 325 P 90	LVLH R= 0.00 P=215.00 Y= 90.00	LMT Setup -Z 35 Fwd Nadir Nose South
39 004/23:24:00 MET 02	TGT=3 BV=5 P= 90.00 Y= 0.00 OM=270.00 LAT= -18.710S LON=-131.910W ALT= 0.0nm	A14 AUTO PRI	RATE 0.2000 DB AT 3.00 DB RT 0.20			LMT (Pacific) Lat: 20S to 11N
40 004/23:25:00 MET 26:25	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 0 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Run G Biased -ZLV Nose South
41 004/23:39:00 MET 40:11	TGT=2 BV=5 P= 90.00 Y=325.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 325 P 90	LVLH R= 0.00 P=215.00 Y= 90.00	LMT Setup -Z 35 Fwd Nadir Nose South
42 004/23:43:03 MET 04	TGT=3 BV=5 P= 90.00 Y= 0.00 OM=270.00 LAT= 43.020N LON= -87.090W ALT= 0.0nm	A14 AUTO PRI	RATE 0.2000 DB AT 3.00 DB RT 0.20			LMT (Lk Mitch) Point Target
43 004/23:44:03 MET 45:27	TGT=2 BV=5 P= 95.00 Y= 0.00 OM=270.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	EARTH R 360 P 95	LVLH R= 90.00 P= 90.00 Y= 85.00	LITE Run G/H Biased -ZLV Nose South
44 005/13:24:00 MET 34:26 Init at Sunset	INRTL R=305.00 MNVR P= 13.00 Y= 11.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 117 P 159	SPECIAL STAR PR -Y: 27 -Z: 36	IMU Align
45 005/13:45:00 MET 53:25	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	B1 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 Nose South
46 005/17:07:00 MET 13:18	INRTL R=278.00 MNVR P= 93.00 Y= 19.00	A7 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 89 P 88	+X RCS Retrograde TV Roll = 270	+X RCS NC4 TIG: 05:17:27
47 005/17:31:00 MET 33:52	TGT=2 BV=5 P= 0.00 Y= 10.00 OM= 90.00	B7 AUTO PRI	RATE 0.5000 DB AT 2.00 DB RT 0.20	EARTH R 90 P 10	LVLH R= 90.00 P=280.00 Y= 0.00	-Y Tgt Track
48 005/19:33:00 MET 37:10 Ti - 55 min	TGT=2 BV=1 P= 0.00 Y= 0.00 OM=325.00	B7 AUTO PRI	RATE 0.5000 DB AT 2.00 DB RT 0.20	EARTH R 13 P 0	LVLH R=325.00 P=270.00 Y= 0.00	RADAR Tgt Track -Z Nth for LITE Beta Ang = -2

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

Attitude Timeline

MET	MNVR OPTION	DAF	E/S	REF ATT/REMARKS	EVENT	
49 005/20:32:00 MET 33:10	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 149 P 0	LVLH R= 0.00 P=270.00 Y= 0.00	Post Ti -Z Trk
50 005/21:05:00 MET 07:30	TGT=2 BV=5 P=330.00 Y= 0.00 OM= 0.00	A7 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 180 P 30	LVLH R= 0.00 P=300.00 Y= 0.00	-Z Target Track
51 005/21:08:00 MET 38:36	INRTL R=146.00 MNVR P=209.00 Y=353.00	A7 AUTO VERN	RATE 0.0390 DB AT 1.000 DB RT 0.020	SUN R 5 P 29		Inert Approach
52 005/22:35:00 MET 38:08	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	RATE 0.2000 DB AT 3.000 DB RT 0.200	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	Post Grapple -ZLV Tail Fwd
53 006/00:10:00 MET 15:58	INRTL R=210.00 MNVR P=347.00 Y=340.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 7 P 160	OMS Retrograde TV Roll = 180	OMS HITE TIG: 6/00:30
54 006/00:32:00 MET		B1 LVLH VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 359 P 73	LVLH R= 0.77 HOLD P=196.75 Y=359.69	LVLH Hold Between OMS Burns
55 006/01:00:00 MET 05:38	INRTL R=151.00 MNVR P=167.00 Y= 20.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 172 P 20	OMS Retrograde TV Roll = 180	OMS CIRC TIG: 6/01:15
56 006/01:20:00 MET 27:47	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 Dump -ZLV Nose South
57 006/03:15:00 MET 22:31	TGT=2 BV=5 P= 90.00 Y=355.00 OM=180.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 355 P 90	LVLH R=185.00 P= 0.00 Y= 0.00	LITE Run I Biased -ZLV Nose Fwd
58 006/13:19:00 MET 28:23	INRTL R=104.00 MNVR P=305.00 Y=334.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 85 P 122	SPECIAL STAR PR -Y: 26 -Z: 90	IMU Align
Init at Sunset						
59 006/13:39:00 MET 47:29	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 90.00	B1 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=270.00	SAFER -ZLV -ZLV Nose North
60 006/18:10:00 MET 17:30	TGT=2 BV=5 P=180.00 Y=310.00 OM= 40.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 270 P 130	LVLH R=307.45 P= 52.55 Y=324.07	Prec Flt Setup Biased -XLV Nose North/Fwd

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

Attitude Timeline

MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
61 006/18:20:00 MET		A1 INRT VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 218 P 82	INRTL R=137.56 HOLD P= 99.56 Y= 71.90	Inertial Hold For Precision Flight Test
62 006/18:40:00 MET 44:32	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 90.00	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=270.00	SAFER -ZLV -ZLV Nose North
63 006/20:25:00 MET 32:30	TGT=2 BV=5 P=180.00 Y=310.00 OM= 40.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 270 P 130	LVLH R=307.45 P= 52.55 Y=324.07	Prec Flt Setup Biased -XLV Nose North/Fwd
64 006/20:35:00 MET		A1 INRT VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 47 P 110	INRTL R=126.30 HOLD P=292.41 Y=359.42	Inertial Hold For Precision Flight Test
65 006/20:55:00 MET 59:32	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 90.00	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=270.00	SAFER -ZLV -ZLV Nose North
66 007/02:00:00 MET 15:00	TGT=2 BV=5 P= 85.00 Y= 0.00 OM=270.00	B1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 0 P 85	LVLH R=270.00 P=270.00 Y= 85.00	LITE Run J Biased -ZLV Nose South
67 007/13:15:00 MET 30:00	TGT=2 BV=5 P= 95.00 Y= 0.00 OM= 90.00	B1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 360 P 95	LVLH R=270.00 P= 90.00 Y=275.00	LITE Run X Biased -ZLV Nose North
68 007/20:35:00 MET 49:35	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=275.00	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= 85.00	SOPA-H2O-ROMPS -ZLV Biased Nose Sth
69 008/14:30:00 MET 44:25	TGT=2 BV=2 P=180.00 Y= 0.00 OM= 85.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	EARTH R 124 P 180	LVLH R=275.00 P= 90.00 Y= 0.00	FCS Checkout RCS Hot Fire LITE Protected
70 008/18:05:00 MET 19:25	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=275.00	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= 85.00	H2O Dump -ZLV Nose South
71 009/00:40:00 MET 53:26	INRTL R=308.00 MNVR P= 35.00 Y=355.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 53 P 147	SPECIAL STAR PR -Y: 105 -Z: 30	IMU Align
72 009/01:00:00 MET 01:11	INRTL R=308.00 MNVR P= 33.00 Y=341.00	A1 AUTO VERN RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 30 P 146		HUD Cal STAR ID: 26

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

Attitude Timeline

MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
73 009/01:30:00 MET 38:00	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 ROMPS -ZLV Nose South
74 009/12:47:00 MET 57:29	INRTL R=308.00 MNVR P= 35.00 Y=355.00	B1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 52 P 147	SPECIAL STAR PR -Y: 105 -Z: 30	IMU Align
Init at Sunset						
75 009/13:07:00 MET 14:30	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	B1 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 Nose South
76 009/14:50:00 MET 15:01:55	TGT=4 RA= 176.026 BV=5 DEC= 1.721N P=184.00 Y= 0.00 OM= 90.00	A1 AUTO VERN	RATE 0.2000 DB AT 1.000 DB RT 0.020	SUN R 180 P 176	INRTL R=126.61 P= 4.12 Y=352.81	Rad Coldsoak -XSI -Z Space @ Noon
77 009/16:08:00 MET 22:20	INRTL R=185.00 MNVR P=205.00 Y=346.00	A1 AUTO PRI	RATE 0.2000 DB AT 5.00 DB RT 0.20	SUN R 319 P 29	STARS -Y: 21 -Z: 17	D-O IMU Align
78 009/16:24:00 MET 28:44	INRTL R= 54.00 MNVR P=134.00 Y= 14.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	SUN R 299 P 48	STARS -Y: 20 -Z: 31	D-O IMU Verif
79 009/16:30:00 MET 35:20	INRTL R= 88.00 MNVR P=332.00 Y=357.00	B1 AUTO PRI	RATE 0.5000 DB AT 3.00 DB RT 0.20	SUN R 89 P 150		D-O Thermal and Comm
80 009/18:51:00 MET 54:53	INRTL R=207.00 MNVR P=350.00 Y=324.00	TRN AUTO PRI	RATE 0.5000 DB AT 3.50 DB RT 0.50	SUN R 42 P 146		D-O Burn KSC TIG: 09:19:06

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

**Insert a copy of pages 11-5 and 11-6,
PRIORITY PWRDN GROUP B from the ORB
PKT C/L, PRIOR PWRDN after tab**

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STS-64 DAP BOOK

I-LOADED GENERIC DAP A CONFIGURATIONS

	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 VERN NT	LOSS OF VERN TAIL ONLY	RNDZ	PROX OPS

7-2

FLT PLN/64/FIN

STS-64 DAP A CONFIGURATIONS

	ITEM #	A9	A10	A11	A12	A13	A14
PRI							
ROT RATE	10 (50)	0.1000	0.1000	0.0500	2.0000	0.2000	0.2000
ATT DB	11 (51)	3.00	3.00	1.00	3.00	10.00	3.00
RATE DB	12 (52)	0.20	0.20	0.20	0.20	0.20	0.20
ROT PLS	13 (53)	0.04	0.04	0.10	0.10	0.10	0.10
COMP	14 (54)	.000	.000	.000	.000	.000	.000
P OPTION	15 (55)	ALL	ALL	ALL	ALL	TAIL	ALL
Y OPTION	16 (56)	ALL	ALL	ALL	ALL	TAIL	ALL
TRAN PLS	17 (57)	0.05	0.05	0.10	0.10	0.10	0.10
ALT							
RATE DB	18 (58)	0.200	0.200	0.070	0.200	0.070	0.200
JET OPT	19 (59)	ALL	ALL	ALL	ALL	TAIL	ALL
# JETS	20 (60)	2	2	1	2	1	2
ON TIME	21 (61)	0.08	0.08	0.08	0.08	0.08	0.08
DELAY	22 (62)	4.80	5.30	0.00	0.00	0.00	0.00
VERN							
ROT RATE	23 (63)	0.2000	0.2000	0.0080	0.1000	0.2000	0.1000
ATT DB	24 (64)	3.000	3.000	0.500	0.500	10.000	0.500
RATE DB	25 (65)	.200	.200	.010	.020	.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	1	0	0	0	0
PURPOSE		SPTN LOW HOVER	SPTN RELEASE, CAPTURE, TCS# 1, 3, & 4	LITE LASING OPS	LITE CROSS- TRACK SWEEP	ROMPS	LITE LAND- MARK TRACK

NOTE: **BOLD-ITALIC** indicate a change from the I-load

I-LOADED GENERIC DAP B CONFIGURATIONS

	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 VERN TAIL ONLY	LOSS OF VERN NT	SSUS DEPLOY	COAS CAL	RNDZ	PROX OPS

NOTE: DAP B6 is not used in the generic set

STS-64 DAP B CONFIGURATIONS

	ITEM #	B9	B10
PRI			
ROT RATE	30 (50)	<i>0.0500</i>	<i>0.1000</i>
ATT DB	31 (51)	<i>1.00</i>	3.00
RATE DB	32 (52)	0.20	0.20
ROT PLS	33 (53)	0.04	0.04
COMP	34 (54)	.000	.000
P OPTION	35 (55)	ALL	ALL
Y OPTION	36 (56)	ALL	ALL
TRAN PLS	37 (57)	<i>0.01</i>	<i>0.05</i>
ALT			
RATE DB	38 (58)	<i>0.100</i>	0.200
JET OPT	39 (59)	ALL	ALL
# JETS	40 (60)	2	2
ON TIME	41 (61)	0.08	0.08
DELAY	42 (62)	<i>5.30</i>	<i>4.20</i>
VERN			
ROT RATE	43 (63)	0.2000	0.2000
ATT DB	44 (64)	1.000	<i>3.000</i>
RATE DB	45 (65)	.020	<i>.200</i>
ROT PLS	46 (66)	0.002	<i>0.010</i>
COMP	47 (67)	.000	.000
CNTL ACC	48 (68)	<i>1</i>	<i>1</i>
PURPOSE		SPTN DEAD- BAND COL LAPSE	SPTN TCS# 2, 5, & 6

NOTE: ***BOLD-ITALIC*** indicate a change from the I-load

<u>DAP</u>	<u>PURPOSE</u>	<u>DAP</u>	<u>PURPOSE</u>
A1	- NOMINAL	B1	- NOMINAL; OMS & RCS BURNS
A2	- PTC	B2	- LOSS OF VERN (TAIL ONLY)
A3	- GG	B3	- LOSS OF VERN (NOSE & TAIL)
A4	- PRE/POST DEPLOY		GG MNVR
A5	- LOSS OF VERN (NOSE AND TAIL)	B4	- SSUS DEPLOY
A6	- LOSS OF VERN (TAIL ONLY)	B5	- COAS CAL
A7	- RENDEZVOUS	B6	- (blank)
A8	- PROX OPS	B7	- RENDEZVOUS
A9	- SPARTAN LOW HOVER	B8	- PROX OPS
A10	- SPARTAN RELEASE, CAPTURE, TSC# 1, 3, 4	B9	- SPARTAN DEADBAND COLLAPSE FOR RELEASE
A11	- LITE LASING OPS	B10	- SPARTAN TCS# 2, 5, 6
A12	- LITE XTRK		
A13	- ROMPS		
A14	- LITE LMT		

CNT ACC = 0 UNLOADED
= 1 SPARTAN ON RMS
= 2-5 NOT USED

FLT PLN-1a/64/O/B

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FLT PLN-1b/64/O/A

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DAP A

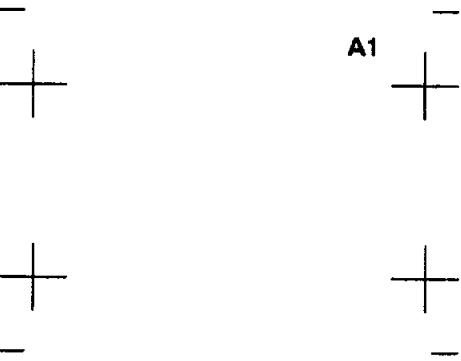
DAP A1

PURPOSE:

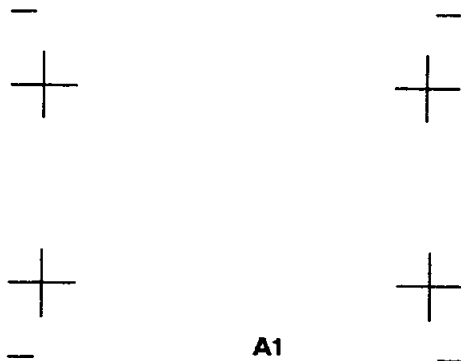
NOMINAL

FLT PLN-2a/64/O/A

FLT PLN-2b/64/O/A



A1



A1

A1
DAP A2

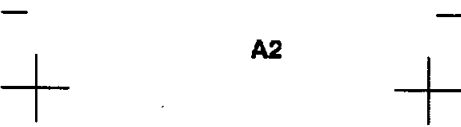
PURPOSE:

PTC

DAP A 01		PRI
0.2000	10	ROT RATE
-5.000	11	ATT DB
0.200	12	RATE DB
0.100	13	ROT PLS
.000	14	COMP
ALL	15	P OPTION
ALL	16	Y OPTION
0.100	17	TRAN PLS
		ALT
0.200	18	RATE DB
ALL	19	JET OPT
2	20	#JETS
0.08	21	ON TIME
-0.000	22	DELAY
		VERN
0.2000	23	ROT RATE
-1.000	24	ATT DB
.020	25	RATE DB
0.010	26	ROT PLS
.000	27	COMP
0	28	CNTL ACC

FLT PLN-3a/64/O/B

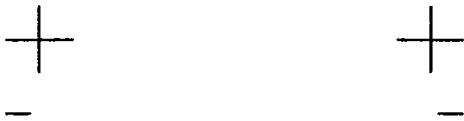
FLT PLN-3b/64/O/A



A2



(reduced copy)



A2

DAP A 0 2		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/64/O/B

A2

DAP A3

PURPOSE:
GG

FLT PLN-4b/64/O/A



A3



A3

DAP A 0 3		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	RATE DB
0.0 1 0	26	ROT PLS
.0 0 0	27	COMP
0	28	CNTL ACC

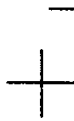
FLT PLN-5a/64/O/B

PURPOSE:
PRE/POST DEPLOY

FLT PLN-5b/64/O/A

A3

DAP A4



A4

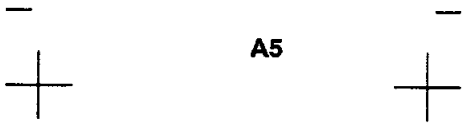
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A4

DAP A 0 4		PRI
0.5 0 0 0	10	ROT RATE
- 3.0 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

FLT PLN-6a/64/O/B



A5



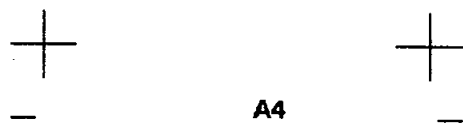
A5

DAP A 0 5		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
ALL	15	P OPTION
ALL	16	Y OPTION
0.1 0	17	TRAN PLS
		ALT
0.0 7 0	18	RATE DB
ALL	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

FLT PLN-7a/64/O/B



A6



A4
DAP A5

PURPOSE:
LOSS OF VERN
(NOSE AND TAIL)



FLT PLN-6b/64/O/A



A5

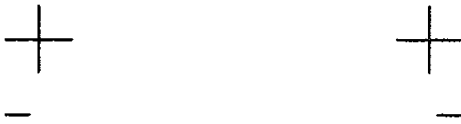
DAP A6

PURPOSE:
LOSS OF VERN
(TAIL ONLY)



FLT PLN-7b/64/O/A

(reduced copy)



A6

DAP A 0 6		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

FLT PLN-8a/64/O/B



A7



A6

DAP A7

PURPOSE:
RENDEZVOUS

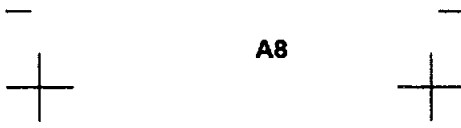
FLT PLN-8b/64/O/A



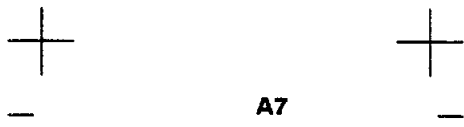
A7

DAP A 0 7		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

FLT PLN-9a/64/O/B



A8



A7

DAP A8

PURPOSE:
PROX OPS

FLT PLN-9b/64/O/A



(reduced copy)



A8

A8

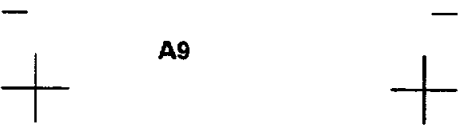
DAP A9

DAP A 0 8		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

PURPOSE:
SPARTAN
LOW HOVER

FLT PLN-10a/64/O/B

FLT PLN-10b/64/O/B



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	
- 4.8 0	22/62	DELAY	
		VERN	
0.2 0 0 0	23/63	ROT RATE	
- 3.0 0 0	24/64	ATT DB	
0.2 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	

PURPOSE:
SPARTAN
RELEASE, CAPTURE,
TCS# 1, 3, 4

FLT PLN-11a/64/O/B

FLT PLN-11b/64/O/B



A10



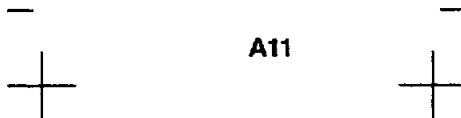
(reduced copy)



A10

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
- 5.3 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-12a/64/O/B



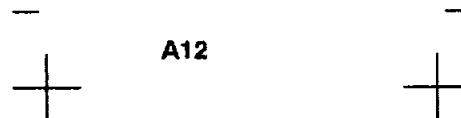
A11



A11

DAP A 1 1	1/3	PRI
0.0 5 0 0	10/50	ROT RATE
- 1.0 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
0.0 7 0	18/58	RATE DB
ALL	19/59	JET OPT
1	20/60	#JETS
0.0 8	21/61	ON TIME
- 0.0 0	22/62	DELAY
		VERN
0.0 0 8 0	23/63	ROT RATE
- 0.5 0 0	24/64	ATT DB
.0 1 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-13a/64/O/B



A12



**A10
DAP A11**

PURPOSE:
LITE LASING OPS



FLT PLN-12b/64/O/B



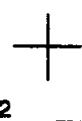
**A11
DAP A12**

PURPOSE:
LITE XTRK



FLT PLN-13b/64/O/B

(reduced copy)



A12

DAP A13

A12

DAP A 1 2	1/3	PRI
2.0 0 0 0	10/50	ROT RATE
- 3.0 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
0.1 0 0 0	23/63	ROT RATE
- 0.5 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

PURPOSE:
ROMPS

FLT PLN-14a/64/O/B

FLT PLN-14b/64/O/A



A13



A13

DAP A14

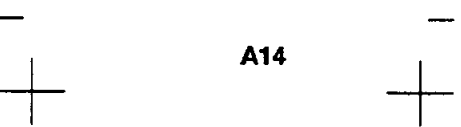
A13

DAP A 1 3	1/3	PRI
0.2 0 0 0	10/50	ROT RATE
1 0 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
TAIL	15/55	P OPTION
TAIL	16/56	Y OPTION
0.1 0	17/57	TRAN PLS
		ALT
0.0 7 0	18/58	RATE DB
TAIL	19/59	JET OPT
1	20/60	#JETS
0.0 8	21/61	ON TIME
- 0.0 0	22/62	DELAY
		VERN
0.2 0 0 0	23/63	ROT RATE
1 0 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
0	28/68	CNTL ACC

PURPOSE:
LITE LMT

FLT PLN-15a/64/O/B

FLT PLN-15b/64/O/B



A14



(reduced copy)



A14

A14

DAP A 1 4	1/3	PRI
0.2 0 0 0	10/50	ROT RATE
- 3.0 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 0	21/61	ON TIME
- 0.0 0	22/62	DELAY
		VERN
0.1 0 0 0	23/63	ROT RATE
- 0.5 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-16a/64/O/A

FLT PLN-16b/64/O/A



DAP B

DAP B1

PURPOSE:

NOMINAL; OMS &
RCS BURNS

FLT PLN-17a/64/O/B

FLT PLN-17b/64/O/B



B1

(reduced copy)

FLT PLN/64/FIN



B1

DAP B2

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	<u>0</u>

PURPOSE:

LOSS OF VERN
(TAIL ONLY)

FLT PLN-18a/64/O/B

FLT PLN-18b/64/O/B

B2



B2

DAP B3

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	<u>0</u>

PURPOSE:

LOSS OF VERN
(NOSE & TAIL)
GG MNVR

FLT PLN-19a/64/O/B

FLT PLN-19b/64/O/B

B3



(reduced copy)



B3

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

FLT PLN-20a/64/O/B



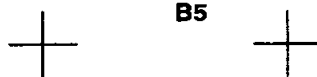
B4



B4

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

FLT PLN-21a/64/O/B



B5



B3

DAP B4

PURPOSE:
SSUS DEPLOY

FLT PLN-20b/64/O/B



B4

DAP B5

PURPOSE:
COAS CAL

FLT PLN-21b/64/O/B



(reduced copy)



B5

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

FLT PLN-22a/64/O/B



B6



B6

2	DAP B 0 6
30	- - - -
31	- - -
32	- -
33	-
34	- -
35	- - -
36	- -
37	- -
38	- - -
39	- -
40	-
41	- -
42	- - -
43	- - - -
44	- - -
45	-
46	- - -
47	- -
48	-

FLT PLN-23a/64/O/B



B7



B5

DAP B6

PURPOSE:

(blank)

FLT PLN-22b/64/O/B



B6

DAP B7

PURPOSE:

RENDEZVOUS

FLT PLN-23b/64/O/B



(reduced copy)

FLT PLN/64/FIN



B7

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

FLT PLN-24a/64/O/B



B8



B8

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

FLT PLN-25a/64/O/B



B9

DAP B8

PURPOSE:
PROX OPS

FLT PLN-24b/64/O/B

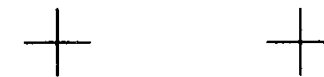


B8

DAP B9

PURPOSE:
SPARTAN
DEADBAND
COLLAPSE FOR
RELEASE

FLT PLN-25b/64/O/B



(reduced copy)



B9

2	DAP B 0 9
30	0.0 5 0 0
31	- 1.0 0
32	0.2 0
33	0.0 4
34	.0 0 0
35	ALL
36	ALL
37	0.0 1
38	0.1 0 0
39	ALL
40	2
41	0.0 8
42	- 5.3 0
43	0.2 0 0 0
44	- 1.0 0 0
45	.0 2 0
46	0.0 0 2
47	.0 0 0
48	1

FLT PLN-26a/64/O/B



B10



B10

2	DAP B 0 1 0
30	0.1 0 0 0
31	- 3.0 0
32	0.2 0
33	0.0 4
34	.0 0 0
35	ALL
36	ALL
37	0.0 5
38	0.2 0 0
39	ALL
40	2
41	0.0 8
42	- 4.2 0
43	0.2 0 0 0
44	- 3.0 0 0
45	.2 0 0
46	0.0 1 0
47	.0 0 0
48	1

FLT PLN-27a/64/O/B



B9

DAP B10

PURPOSE:

SPARTAN
TCS# 2, 5, 6

FLT PLN-26b/64/O/B



B10

FLT PLN-27b/64/O/B



(reduced copy)

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-28/64/O/B

FLT PLN-28/64/O/B is mounted on the back of the DAP Book

**STS-64
FLIGHT PLAN NOTES**

FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

Orbiter: OV103/Discovery
Inclination: 57 deg
Altitude: 140 nmi
Duration: 9 + 1 + 2

B. MAJOR EVENTS

<u>EVENT</u>	<u>MET</u>	<u>DATE</u>	<u>CDT</u>	<u>GMT</u>	<u>ΔV</u>	<u>ORBIT</u>
Launch	0/00:00	9/09/94	15:30	20:30	--	--
OMS-2	0/00:38	9/09/94	16:08	21:08	208.0	139/141
D/O Burn	09:19:06	9/19/94	10:36	15:36	TBD	--
Landing (9 + 1 day mission)	09:20:01	9/19/94	11:31	16:31	--	--

C. LANDING OPPORTUNITIES:

		<u>Landing Orbit</u>	<u>Site</u>	<u>Local Time</u>
		<u>No.</u>		
Nominal (9 days)	Primary	143	KSC	12:42 EDT
	1 Rev late	144	KSC	14:14 EDT
1 Day Late (9 +1 days)	Primary	159	KSC	12:31 EDT
	1 Rev late	160	KSC	14:04 EDT
2 Days Late	Primary	175	KSC	12:20 EDT
	1 Rev late	176	KSC	13:53 EDT

D. CREW

CDR - Richard Richards
PLT - Blaine Hammond
MS1 - Jerry Linenger
MS2 - Susan Helms
MS3 - Carl Meade
MS4 - Mark Lee

E. COMMUNICATIONS

TDRS Support: East (41 deg W), West (174 deg W)
Backup Real-Time TV: GDS(GDX), MIL(MLX)
Contingency GSTDN: MIL(MLX), BDA(BDX), DFR (UHF only), and GDS(GDX)
Contingency RTS: HTS, GTS, VTS, IOS, CTS, DGS, OTS, NHS; OTS and IOS
also have VHF capability

Lead time for site callup: GSTDN - 2 hour, RTS - 4 hour

FLT PLN
NOTES

F. PAYLOADS

1. LIDAR In Space Technology Experiment (LITE)

The LITE payload will demonstrate the technology of a spaceborne LIDAR system and will acquire science data on the vertical profile of certain atmospheric parameters such as cloud top heights, aerosols, temperature, and density. The measurements are obtained by emitting laser energy into the atmosphere and evaluating the returned signal. Both daytime and nighttime data takes will be performed. In addition, simultaneous ground and aircraft LIDAR system operations will be used to correlate results with the spaceborne LITE instrument. The LITE experiment requires ten 4.5-hour data taking periods in a biased -ZLV attitude. In some of these data takes the crew will perform high-rate orbiter cross-track and landmark track maneuvers in support of a special experiment. In addition, two ground site overpasses, targeted for an elevation angle of 85 degrees (75 deg minimum) are planned. Snapshot data takes 15 to 30 minutes long, are still part of the total 45-hour allocation, and will be scheduled as the timeline allows.

2. SPARTAN 201

SPARTAN will be deployed and retrieved via the remote manipulator system (RMS). The two instruments which comprise SPARTAN, the Ultraviolet Coronal Spectrometer (UVCS) and the White Light Coronagraph (WLC), will investigate the physical conditions of the solar corona. All housekeeping and science data will be recorded onboard the deployed hardware.

3. Robotically Operated Materials Processing System (ROMPS)

The ROMPS is a payload bay experiment in two GAS cans mounted on a hitchhiker carrier. The experiment hardware consists of a robot, furnace, samples, and control electronics. The robot is used to transfer samples between the storage racks and the processing furnace. The ROMPS will investigate in-space processing of semiconductor materials.

4. Shuttle Amateur Radio Experiment (SAREX II-B)

SAREX II-B is a suite of amateur radio equipment consisting of a handheld transceiver, window antenna, headset assembly, interface module, spare battery set, and a personal tape recorder. The crew will use SAREX to communicate with various ground radio operators and schools. Configuration B will allow only attended operations and does not require orbiter power. If power becomes available, SAREX C operations requiring a PGSC may be performed

5. Gas Bridge Assembly (GBA)

Ten GAS cans are currently slated for the GBA:

G178 – An experiment from Sierra College, Rocklin CA that measures upper atmosphere ozone with a CCD spectrometer and cameras. Two contiguous orbits of -ZLV and a clear ± 6 deg conical FOV from the GAS can are required.

G254 – A Kinkaid High School and Utah State University set of experiments involving distillation, photosynthesis, polarization of water, etc. The experiments are divided into three activity groups. Group one is performed early in the mission, group two requires a 6-hour low G period, and group three requires a 45-minute low G period.

G325 – A Norfolk Public School experiment investigating both the shapes of acoustic standing wave modal patterns and passive experiments with material samples. A 2.5-hour, low G period is required.

G417 – Three experiments by the American Association for the Promotion of Science in China. The experiments include paramecium reproduction, contact of two liquids, and solid/liquid interfaces. The experiment is activated early in the mission and deactivated late.

G453 – The Society of Japanese Aerospace Companies experiment involving materials processing with semiconductors and super conductors, and a boiling experiment. A 5-hour low gravity period is required.

G454 – The Society of Japanese Aerospace Companies experiment on crystal growth. A 24-hour period of low gravity is required.

G456 – The Society of Japanese Aerospace Companies experiment where colored enzymes are separated by electrophoresis under microgravity. The experiment is commanded off no earlier than 10 hours after launch.

G485 – A European Space Agency experiment on the deposition of materials onto substrates in microgravity and vacuum environment. The experiment is activated no earlier than 24 hours after launch and runs for a 24-hour period.

G506 – Two experiments by the GSFC, including the Orbiter Stability Experiment and the fogging of photographic film by energetic particles. With no solar pointing permitted on STS-64, the experiment is desired to be activated for 90 minutes (minimum 1 hour). There are no attitude or deadband constraints.

G562 – A National Research Council of Canada investigation into directional solidification and diffusion. Two experiment series are performed, lasting 6 hours and 6.5 hours, preferably scheduled during the first two crew sleep periods.

6. Solid Surface Combustion Experiment (SSCE)

SSCE is a middeck payload that will study flame propagation and physics in a microgravity environment. The experiment consists of a chamber assembly with 2 internally mounted Polymethyl Methacrylate fuel samples. The samples are ignited by a hot filament wire; 16mm Cameras capture side edge and top views of the combustion process.

7. Biological Research In Canisters (BRIC)

This middeck payload consists of investigations into the effects of spaceflight on small arthropod animal and plant specimens. The Block 3 configuration will be flown on STS-64. No crew activities are required.

8. Radiation Monitoring Experiment (RME-III)

The RME-III configuration consists of a handheld instrument with replaceable memory modules which takes measurements of the radiation environment at a specified sample rate.

9. Military Applications of Ship Tracks (MAST)

The crew will use the Hasselblad Camera to correlate ship activity to the ship tracks formed in stratus, stratocumulus, and fog when ship-induced disturbances and emissions alter the existing cloud structure.

10. Air Force Maui Optical Site Calibration Test (AMOS)

The primary objective of the AMOS activity is to use the orbiter during a cooperative overflight of Maui to obtain imagery and/or signature data to support the calibration of the AMOS ground based sensors and to observe plume phenomenology. No unique hardware is associated with the AMOS tests; crew and orbiter participation are required to perform the burn sequence.

G. ON-ORBIT DTOs

1. EDO Treadmill Evaluation (DTO 659)

This DTO will evaluate the extended duration orbiter (EDO) treadmill for ease of setup and use, physical comfort, noise, ease of stowage, and subject restraint system. The newly designed treadmill includes improvement in the size of the running surface of the restraint system which will allow for greater comfort during exercise. The speed of the treadmill and the subject load device/restraint system will be adjustable. Each crewmember will don a heart watch during exercise to provide comparative data on heart rate responses in 0-g versus 1-g.

2. Simplified Aid For EVA Rescue (DTO 661)

This DTO will flight test the developmental version of a mini-MMU called SAFER. The SAFER is intended to support an EVA emergency such as a tumbling crewmember by allowing the crewmember to stabilize his attitude and fly back to the orbiter payload bay. Both EVA crewmembers will perform a series of tasks including a translation familiarization, a systems engineering evaluation, and a set of precision flight tests.

3. Cabin Temperature Survey (DTO 664)

The purpose of this DTO is to compile a temperature profile of the crew cabin and to correlate the data with the cabin temperature sensor readings during on-orbit operations. The results will be used to support proposed cabin temperature control changes to improve crew comfort and maintain avionics cooling.

4. EVA hardware for future scheduled EVA missions (DTO 671)

The primary objective of this DTO is to test, in the space environment, candidate EVA hardware and techniques prior to their scheduled EVA. For STS-64 numerous tests will be conducted in conjunction with completing the SAFER DTO 661 objectives. In addition some independent DTO 671 activities will be scheduled in the EVA timeline.

5. EMU Electronic Cuff Checklist (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. Post EVA, new data will be uplinked and transferred to the unit to test the update capability.

6. EDO Rower Ergometer Evaluation (DTO 673)

The aerobic and resistive exercise capability of the EDO rower ergometer will be evaluated for use in future in-flight exercised prescriptions. The EDO rower ergometer was developed using the recommendations from the crew who used the MK 1 rower in-flight and has the additional capability to measure the workload using a memory card internal to the rower. The memory card is capable of providing a unique exercise protocol for each subject as well as data storage medium for postflight analysis.

7. Thermo-electric liquid cooling system evaluation (DTO 674)

The purpose of this DTO is to evaluate a system designed to provide better cooling to the crew during ascent and entry. For STS-64 the CDR and PLT will be the subject crewmembers. Since the mission is power critical, they will use the new system to "cold soak" prelaunch prior to switching to orbiter power. Orbiter power for the new cooling system is highly desired during entry since the CDR and PLT will not have the old Personal Suit Ventilation System.

8. Payload Bay Mounted Rendezvous Laser (DTO 700-5)

The purpose of the Trajectory Control Sensor (TCS) will be to demonstrate the capability to provide the orbiter crew with reliable rendezvous data for precise on-orbit rendezvous, proximity operations, and payload berthing or deploy operations. Crew involvement in collecting the data is to be minimized. The TCS will be used during SPARTAN 201 deploy and rendezvous operations. The SP201 spacecraft on the RMS and TCS sensor will also be used, post grapple, to simulate shuttle approaches to the Mir space station. This test will evaluate the readiness of the TCS for use with that application on future shuttle missions.

9. Orbiter Data For Real-Time Navigation Evaluation (DTO 700-7)

This DTO operates simultaneously with DTO 700-5 and provides orbiter PCMMU data to the PGSCs running RPOP (Rendezvous and Proximity Ops Program) software in support of the TCS and the handheld laser. A Grid 1535 portable computer is required to interface to the PCMMU and decommutate the data for the PGSCs.

10. Shuttle Plume Impingement Flight Experiment (DTO 830)

The SPIFEX is designed to directly measure RCS plume loads in the far field regime under actual on-orbit conditions. The experiment consists of a 32-foot boom which is grappled by the RMS and positioned over a selected orbiter jet. The experiment arm at the end of the boom contains a Load Measuring System (LMS) and a camera system for position verification. After the jet is fired, data collected by the LMS is transferred to a PGSC running SPIFEX software on the orbiter flight deck. The experiment also includes the Cold Plume Generator (CPG) located in the payload bay. This nitrogen plume generator will be used to correlate the LMS on-orbit data to ground, vacuum chamber tests. Approximately 14 hours are required to complete the SPIFEX test point matrix.

H. ON-ORBIT DSOs

1. Cardiac Rhythm Disturbances During EVA (DSO 482)

The purpose of this experiment is to record the presence of cardiac dysrhythmias during preflight EVA training, inflight EVA, and inflight normal daily activities. The subject will wear a Halter recorder for 24 hours on EVA day and for 24 hours within 2 days of landing.

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 onorbit rather than relying on post flight reporting.

3. 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 Cooled Garment 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.

4. Orthostatic Function During Entry, Landing, and Egress (DSO 603C)

DSO 603C measures changes in orthostatic function and skin temperature of crewmembers during the stress of entry, landing, and egress from the orbiter. Participating crewmembers will don and calibrate equipment prior to deorbit preparation. At LES donning, they will connect cables and power the equipment. Verbal comments will be recorded during entry, landing, and egress. Results from this DSO are used to assess the effectiveness of current and/or proposed in-flight countermeasures to orthostatic intolerance.

5. In-Flight Assessment of Renal Stone Risk (DSO 610)

DSO 610 aims to define the major metabolic factors contributing to kidney stone formation in orbit. Previous post-flight urine analysis reveals significant changes in the urinary excretion of stone-forming salts or inhibitors of stone formation. Such changes increase the risk of developing kidney stones. On this mission, two crewmembers will collect urine samples on various flight days and complete a daily food, fluid, and exercise log. Post-flight analysis will contribute to the development of countermeasures against kidney stone formation.

6. Energy Utilization (DSO 612)

The determination of the energy utilization of crewmembers in flight will provide data for developing dietary countermeasures to prevent muscle loss. The crew members will consume doubly labeled water; keep logs of food, fluid, and exercise; and collect urine and saliva samples over a 5-day period starting no earlier than flight day 3. Daily galley water samples will also be collected.

7. In-Flight Use of Florinef to Improve Orthostatic Intolerance Post Flight (DSO 621)

DSO 621 uses Florinef, a blood plasma expander, as an improved countermeasure against orthostatic intolerance. Participating crewmembers will take two Florinef tablets and one potassium supplement on the last flight day. Increased fluid consumption is also required for the last two flight days.

8. CV Responses To Submaximal Exercise (DSO 624)

For this DSO the crewmember will wear a heart watch during exercise to help evaluate the changes in aerobic capacity pre-, in-, and postflight. Crewmembers participating in this DSO will maintain an exercise log.

9. Documentary Television (DSO 901)

This DSO requires live television transmission or VTR dumps of crew activities, spacecraft functions which include: Payload Bay Views, orbiter and payload crew activities, VTR downlink of crew activities, inflight crew conference, and unscheduled TV activities.

10. Documentary Motion Picture Photography (DSO 902)

This DSO requires documentary and public affair motion picture photography of significant activities which best depict the basic capabilities of the space shuttle and key objectives. This DSO includes motion picture photography of flight deck activities, middeck activities, and any unscheduled motion picture photography.

11. Documentary Still Photography (DSO 903)

This DSO requires still photography of crew activities in the orbiter and mission-related scenes of general public and historical interest. Still photography with 70mm format for exterior photography and 34mm format for interior photography is required.

FLIGHT DATA FILE
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64 FLT PLN FSP FIN

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