

FLIGHT DATA FILE

Flight Plan

STS-42

**(Rotated Flight Cycle R3
Trajectory)**

**Mission Operations Directorate
Operations Division**

**Final
November 27, 1991**

BRNH CHIEF
B. NUTE
BLDG T585
BOND

<u>EVENT</u>	<u>CST</u>		
Launch	07:54	Wed	Jan 22
EDW Landing	09:06	Wed	Jan 29



National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

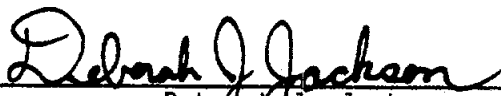


MISSION OPERATIONS DIRECTORATE

STS-42 FLIGHT PLAN

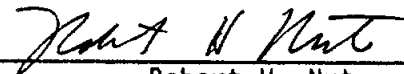
FINAL
November 27, 1991


PREPARED BY:

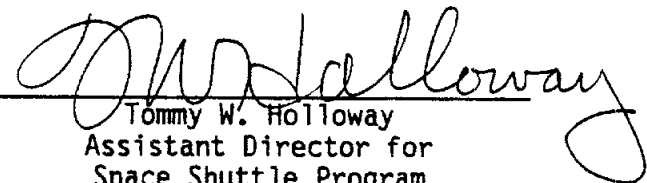

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STS-42 FLIGHT PLAN

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PCN-1 01/03/92

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(*) - Omit from flight book

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5-8.....* 42/FIN
5-9.....* 42/FIN
5-10.....* 42/FIN
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5-14.....* 42/FIN
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ALT 2.....	5-12	FLT PLN-14a/48/O/B
(Blank).....	5-12	FLT PLN-14b/48/O/A
DAP B TOC.....	5-12	FLT PLN-15a/48/O/A
DAP B1.....	5-13	FLT PLN-15b/48/O/A
B1.....	5-13	FLT PLN-16a/48/O/A
DAP B2.....	5-13	FLT PLN-16b/48/O/A
B2.....	5-13	FLT PLN-17a/48/O/A
DAP B3.....	5-14	FLT PLN-17b/48/O/A
B3.....	5-14	FLT PLN-18a/48/O/A
DAP B4.....	5-14	FLT PLN-18b/48/O/A
B4.....	5-14	FLT PLN-19a/48/O/A
DAP B5.....	5-15	FLT PLN-19b/48/O/A
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DAP B6.....	5-15	FLT PLN-20b/48/O/A
B6.....	5-15	FLT PLN-21a/48/O/A
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INTRODUCTION

The STS-42 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 entire flight is shown in the summary level timeline.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive and the requirements of the STS-42 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the Flight Cycle R3 Basic version of the STS-42 Flight Initialization Data Pack.

The flight profile used for this Flight Plan is for a launch date of January 22, 1992, at 07:54 CST. The trajectory used was rotated from the Flight Cycle R3 Trajectory (launch date January 13, 1992, at 07:57 CST). Orbiter inertial attitudes are expressed relative to a Mean of 1950 (M50) reference frame.

JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, Rev A, January 1990, has been used to build the timelines contained in this Flight Plan.

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

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STS-42 OVERVIEW

FLIGHT: STS-42		EDITION: FINAL		PUB. DATE: 11/27/91																					
MET: 000	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0
RED FD 1&2	DIRECT OR IMMEDIATE LAUNCH		POST INSERT	PRE SLEEP	SLEEP (6)						POST SLEEP	POST SLEEP	IML ACTIVITIES						IML ACTIVITIES	PRE SLEEP					
BLU FD 1&2	POST INSERT	SL ACT	IMU/ COAS	SL ACT	COAS	IML ACTIVITIES						PRE SLEEP	POST SLEEP	SLEEP						POST SLEEP	IML ACTIVITIES				
DAY/NIGHT																									
ORBIT	057/162X164		0AFT STATION		0EPC SETUP		0SO 611 AIR MON (AOS)		0SO 611 AIR MON (HAS)																
NOTES:			0FWD STATION		0CAC SETUP		0RME-III ACT & C/O																		
MET: 001	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0
RED FD 3	SLEEP						POST SLEEP	IML ACTIVITIES						IML ACTIVITIES	PRE SLEEP										
BLU FD 2&3	IML ACTIVITIES		IML ACTIVITIES				PRE SLEEP	SLEEP						POST SLEEP	IML ACTIVITIES										
DAY/NIGHT																									
ORBIT	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32									
NOTES:			0SO 611 AIR MON (AOS)																						
MET: 002	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0
RED FD 4	SLEEP						POST SLEEP	IML ACTIVITIES						IML ACTIVITIES	PRE SLEEP										
BLU FD 3&4	IML ACTIVITIES		IML ACTIVITIES				PRE SLEEP	SLEEP						POST SLEEP	IML ACTIVITIES										
DAY/NIGHT																									
ORBIT	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48									
NOTES:	0RME-III MM REPLACEMENT		0SO 611 AIR MON (AOS)										0SE-83-02 CAPILLARY												

FLIGHT: STS-42		EDITION: FINAL		PUB. DATE: 11/27/91																										
MET: 003	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0					
RED FD 5	SLEEP								POST SLEEP	IML ACTIVITIES								IML ACTIVITIES								PS R E E P				
BLU FD 485	IML ACTIVITIES				IML ACTIVITIES				PRE SLEEP	SLEEP								POST SLEEP	IML ACTIVITIES											
DAY/NIGHT																														
ORBIT	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64														
NOTES:	ØDSO 611 AIR MON (AOS)												ØDSO 611 AIR MON(MAS)						ØIPMP ACTIVATION						ØRME-III MM REPLACEMENT					
MET: 004	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0					
RED FD 6	PRE SLEEP	SLEEP								POST SLEEP	IML ACTIVITIES								IML ACTIVITIES											
BLU FD 586	IML ACTIVITIES				IML ACTIVITIES				PRE SLEEP	SLEEP								POST SLEEP	IML ACTIVITIES											
DAY/NIGHT																														
ORBIT	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80														
NOTES:	ØGOSAMR ACT				ØSE 81-09 CONVECTION				ØDSO 611 AIR MON (AOS)												Ø PRE SLEEP ACTIVITIES									
	ØIPMP DEACT				ØDTO 635 EYE WASH												■ IML													
MET: 005	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0					
RED FD 7	PRE SLEEP	SLEEP								POST SLEEP	IML ACTIVITIES								IML ACTIVITIES								FCS C/O			
BLU FD 687	IML ACTIVITIES				IML ACTIVITIES				PRE SLEEP	SLEEP								POST SLEEP	FCS C/O											
DAY/NIGHT																														
ORBIT	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96														
NOTES:	ØDSO 611 AIR MON (AOS)												ØRME-III MM REPLACEMENT																	

FLIGHT: STS-42		EDITION: FINAL		PUB. DATE: 11/27/91																							
MET: 006	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0		
RED FD 8			PRE SLEEP						SLEEP					H/O	POST SLEEP	CABIN STOW		IML	CABIN STOW	PL DEACT		SL DEACT			DEORBIT PREP		
BLU FD 7&8			IML ACTIVITIES						IML ACTIVITIES				PRE SLEEP	H/O											POST SLEEP	DEORBIT PREP	
DAY/NIGHT																											
ORBIT	96	97	98	99	100	101	102	103	104	105	106	107	108	109	110	111											
NOTES:	@TEPC STOW @CAC STOW o POST SLEEP o RCS HOT FIRE @DSO 611 AIR MON (MAS) ■ PRE SLEEP @DSO 611 AIR MON (AOS)																										
MET: 007	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0		
RED FD 8																											
BLU FD 8																											
DAY/NIGHT																											
ORBIT	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127											
NOTES:	DEORBIT EDW LANDING																										
MET: 008	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0		
RED																											
BLU																											
DAY/NIGHT																											
ORBIT	128	129	130	131	132	133	134	135	136	137	138	139	140	141	142	143											
NOTES:																											

SUMMARY TIMELINE

SUMMARY TIMELINE

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
022:13:54/ 023:01:54		000:00:00/ 000:12:00		022:07:54/ 022:19:54		/022 CST	-70.9	○	JANUARY 22, 1992	STS-42	FINAL	11/27/91
CST :022	RED FD :001											
MET :000												
BLUE	CDR		PLBDR	MNVDR								
	PLT				POST INSERTION	P/TVO2 SETUP	P/TVO2 ACT		MEAL			
	MS1					SL ACTIVATION		SL ACTIVATION		BIORACK		MEAL
	PS1	L A U N C H	I N S E R T I O N	O M S - 2		SL ACTIVATION		SL ACTIVATION		PL - A C T		
RED	MS2		PLBDR OPS									
	MS3											
	PS2											
DAY/NIGHT ORBIT												
TDRS E W												
ATTITUDE		ASC -ZLV +YVV -XLV -YVV BIASED -XLV +YVV										
NOTES:		<ul style="list-style-type: none"> ○ IMU ALIGN ● FWD STATION ● DTO 623 CAB AIR MON ● DSO 611 AIR MON (AOS) ● AFT STATION ● DSO 469 RAD DOSE DIST ■ APU HTR RECONFIG-A ■ SL ACTIVATION ■ APU HTR RECONFIG ■ APU HTR DEACT 										
											● H/O BLUE TO RED	

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE							
023:01:54/ 023:13:54		000:12:00/ 001:00:00		022:19:54/ 023:07:54		/022 CST	-72.4	☉	JANUARY 22, 1992	STS-42	PCN-1	01/03/92							
CST	:022	20	21	22	23	0	CST:023	1	2	3	4	5	6	7	8	9	0	MET:001	
RED	FD	:002	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
MET	:000																		
BLUE	CDR	SLEEP										POST SLEEP	SPE BPA	DSO 470	H/O	E SAMPLE		DTO 651 EXER	
	PLT	SLEEP										POST SLEEP	SPE BPA	DSO 470	H/O	FILTER CLEANING	EES SAM+ING	PSI/EM TTA VUX 2P 7	PACT I MAX
	MS1	SLEEP										POST SLEEP	D/P	H/O	EXERCISE	TV2 I-SAM	TV13-SPE	SLED-P A	
	PS1	SLEEP										POST SLEEP	D/P	H/O	PROTO	SPE ILL	SPORES	SLED-P A	
RED	MS2	GRP A	SDT PUE MR	SEBS DEPLOY	DSO 611	CBX AAF MTE CTR ORD	ES3 EAH SMR PLE	P/TV33 SETUP IMAX	MEAL	COOLER	ES6 EAH SMR PLE	GRP B GAS	SL TAPE	DTO 651 EXER	ORF CNFG	ES EAH SMR PLE	H/O	PRE SLEEP	
	MS3	CELLS	FRIEND	CELLS			FLY	MEAL	SLED-HR	MVIPREP	MVIPITCH	EGGS	MVISSTOW	MVISPR	MVISPR	H/O	PRE SLEEP		
	PS2	TV09-GPP	CPT-IBEM1	FOTRAN	GTHRES	SL-TAPE	CPT-IBEM1	MEAL	SLED-HR	MVIPREP	MVIPITCH	MVISSTOW	MVISPR	SPE ILL	H/O	PRE SLEEP			
DAY/NIGHT																			
ORBIT	9 10 11 12 13 14 15 16																		
TDRS	E W																		
ATTITUDE	BIASED -XLV +YVV																		
NOTES:	@DSO 611 AIR MON (MAS) ∇ IMU ALIGN @DSO 470 TRANSCRANIAL DOPPLER @DTO 651 ERGOMETER @H/O RED TO BLUE @DTO 651 ERGOMETER																		

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																										
024:01:54/ 024:13:54		001:12:00/ 002:00:00		023:19:54/ 024:07:54		/023 CST	-75.0	☉	JANUARY 23, 1992	STS-42	FINAL	11/27/91																										
CST	RED	FD	023	20	21	22	23	0	CST:024	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	MET:002				
BLUE	CDR	SLEEP															POST SLEEP	SPE BPA	H/O	SAMPLE	MWPE PWRUP /OPS																	
	PLT	SLEEP															POST SLEEP	SPE BPA	H/O	SL TAPE	P/TV27 SU/ACT IMAX	P/CT V27 IMAX																
	MS1	SLEEP															POST SLEEP	H/O	EXERCISE	VCGS- MON	TGS OPS	D/P	MWPE- GRD															
	PS1	SLEEP															POST SLEEP	SPE BPA	H/O	D/P- MWPE	TGS OPS	PROTO																
RED	MS2	MEAL		TRK MNVR	GRP E	WDI AUN SMI TPT E																ES SH H2 DE S	SPE BPA	H/O	PRE SLEEP													
	MS3	TGS OPS	SL- TAPE	GTHRES	FOURAN	VCGS- MON	MEAL	FLY	VCGS- MON	VCGS- MON	TGS OPS	VCGS- MON	CELLS	H/O	PRE SLEEP																							
	PS2	TGS OPS	MEAL	VCGS	VCGS- MON	VCGS- MON	SL- TAPE	GTHRES	VCGS- MON	TGS OPS	TGS OPS	H/O	PRE SLEEP																									
DAY/NIGHT	ORBIT																																					
TDRS	E W																																					
ATTITUDE	BIASED -XLV -YVV														BIASED -XLV +YVV																							
NOTES:	▽ IMU ALIGN														▽ WASTE DUMP TERM														H/O RED TO BLUE									

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE					
024:13:54/ 025:01:54		002:00:00/ 002:12:00		024:07:54/ 024:19:54		/024 CST	-75.8	☉	JANUARY 24, 1992	STS-42	FINAL	11/27/91					
CST :024 BLD FD :003										RED FD:004 10							
MET :002																	
BLUE	CDR	MEAL	SPE BPA OPS	GRF BPA	MEAL	PSU P/G	PCG SEEDING 2	GRF GAS	TRK MNVR	DTO 651 EXER	ESASM/H/O	PRE SLEEP	PRE SLEEP				
	PLT	MWPE OPS/PWRDN	SPE BPA OPS	P/TV27 SU/ACT IMAX	MEAL	P/TV27 ACT IMAX	ACT P/G	P/TV24 SETUP FLTK	P/TV24 ACT FLTK	DTO 653 EXER/H/O		PRE SLEEP					
	MS1	MEAL						MVIYAW		MVIYAW		PRE SLEEP					
	PS1	SHOOTS	SPE-BPA		MEAL			MVIYAW		MVIYAW	BONES		PRE SLEEP				
RED	MS2				SLEEP					POST SLEEP	H/O	GRF/E/TAPE	MWPE PWR/OPS	GRF GAS			
	MS3				SLEEP					POST SLEEP	H/O D/P	EXERCISE					
	PS2				SLEEP					POST SLEEP	H/O	SLIME					
DAY/NIGHT		ORBIT		TORS		ATTITUDE		NOTES:									
		33		34		35		36		37		38		39		40	
		BIASED -XLV +YVV		BIASED -XLV -YVV													
		MEMORY MODULE REPLACEMENT		IMU ALIGN		DSO 611 AIR MON (AOS)		DTO 651 ERGOMETER		H/O BLUE TO RED		DTO 653 ROWER					

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
025:13:54/ 026:01:54		003:00:00/ 003:12:00		025:07:54/ 025:19:54		/025 CST	-76.0	☉	JANUARY 25, 1992	STS-42	FINAL	11/27/91	
CST :025		MET :003											
BLU FD :004													
MET :003													
BLUE	CDR	E SAMPLE	MEAL					GRPP/TV27 M SETUP GAS IMAX	TRK MNVR	PACT TV27 IMAX	ESASH HOTO 653 EXER	PRE SLEEP	
	PLT	E SAMPLE	MEAL	GPPF CUBE 1 XFER		DOSO 611		PSPH VITE VU 17	PPE OPS	PPE OPS		PRE SLEEP	
	MS1	CAST OPS	MEAL	CAST OPS	VCGS-MON	CAST OPS	TGS OPS	CAST OPS	VCGS-MON	CAST OPS	CAST OPS	PRE SLEEP	
	PS1	PROTO	MEAL		SL-TAPE		CELLS			SPE-PPE	CPF-MIM CPF-TEQ	PRE SLEEP	
RED	MS2					SLEEP					POST SLEEP	H/O P/TV28 SU/ACT IMAX	DTO 653 EXER
	MS3					SLEEP					POST SLEEP	H/O D/P	EXERCISE
	PS2					SLEEP					POST SLEEP	H/O CAST OPS	
DAY/NIGHT		ORBIT		TDRS		ATTITUDE		NOTES:					
		49 50 51 52 53 54 55 56		E W		BIASED -XLV +YVV		BIASED -XLV -YVV					
						o IMU ALIGN		o DSO 653 ROWER		o MANUAL		o DTO 653 ROWER	
												o H/O BLUE TO RED	
												■ PPE PHOTO/POLARITY	

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																													
026:01:54 / 026:13:54	003:12:00 / 004:00:00	025:19:54 / 026:07:54	/025 CST	-75.5		JANUARY 25, 1992	STS-42	FINAL	11/27/91																													
CST :025	20	21	22	23	0	CST:026	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0								
RED FD :005	12	13	14	15	16	17	18	19	20	21	22	23	0	6BLU FD:005 7													MET:004											
MET :003																																						
BLUE	CDR	SLEEP										POST SLEEP	SPE	H/O	ODTO 651 EXER	MWPE OPS	ESAMPLE																					
	PLT	SLEEP										POST SLEEP	SPE	H/O	S L	PPS PHT EOO T W O /	HC UO MN F SI EG L B	MWPE OPS																				
	MS1	SLEEP										POST SLEEP	D/P	H/O	EXERCISE																							
	PS1	SLEEP										POST SLEEP	D/P	H/O	CAST OPS	VCGS - MON	FLY																					
RED	MS2	EC/LO S S	CAB TEM	GRN GAS	DSO 611	ESAMPLE	TRK MNVR	MEAL	P/TV03 SETUP MIDDK	IPMP ACT P/TV03 ACT	CNDS TK DUMP	PPE EXP	PSM/EW/TTR/VUE/2P	H/O	ES EAS M / HO 2U OES	MWPE PWRUP /OPS	PRE SLEEP																					
	MS3	GT HRES	SLIME	GT HRES	P/TV21	VCGS - MON	FLY	MEAL	S L	TAPPE	P/TV21	CAST OPS	TV17 - PIPE	CAST OPS	SPE	CAST OPS	PRE SLEEP																					
	PS2	CAST OPS	CAST OPS	VCGS - MON	CAST OPS	MEAL	CAST OPS	VCGS - MON	CAST OPS	CAST OPS	SLIME	MVIS PR	H/O	PRE SLEEP																								
DAY/NIGHT																																						
ORBIT	56	57	58	59	60	61	62	63	64																													
TDRS																																						
ATTITUDE	BIASED -XLV -YVV														BIASED -XLV +YVV																							
NOTES:	@CABIN TEMP CNTL RECONFIG ▽ HTR CONFIG @DSO 611 AIR MON (MAS)														▽ IMU ALIGN @MEMORY MODULE REPLACEMENT														@H/O RED TO BLUE @DTO 651 ERGOMETER									

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE											
026:13:54 / 027:01:54		004:00:00 / 004:12:00		026:07:54 / 026:19:54		/026 CST	-74.5		JANUARY 26, 1992	STS-42	PCN-1	01/03/92											
CST	:026	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22							
BLU FD	:005	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14							
MET	:004	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14							
BLUE	CDR	GACT SAMR	IP MPC	PSF EETS VU TOP	P/TV28 ACT IMAX			MEAL	PSM /EVP TTI VU IP 2	P/TV25 ACT S EXP		P/TV03 SETUP MIDDK	PAM /CI TTD V D K 3	ES EA SM /H ZU OE S	PRE SLEEP	PC OP NRL FIE P MED							
	PLT	MWPE OPS	P/TV28 SETUP IMAX	DTO 635	SS LA AP IL RE	ES AM P LE	MEAL	DSO 611	BIO COOLER	SE 81-09 OPS CONVECTION		DTO 653 EXER	H/O	PRE SLEEP									
	MS1	CAST OPS	MWPE -GRD	VCGS -MON	CAST OPS	CAST -MON	VCGS -MON	CAST STOW	MEAL	GTHRES	MVIP PREP	MVIP PITCH	MVIYAW	MVIH /O	VCGS -MON	MVIP PITCH	MVIYAW	MVI ROL	TGS OPS	MVIS PR	GTHRES	H/O	PRE SLEEP
	PS1	ROOTS	PROTO	MEAL	US JIM	TGS OPS	VCGS -MON	MVIP PREP	MVIP PITCH	MVIYAW	SHOOTS	BONES	MVIH /O	MVIP PITCH	MVIYAW	MVI ROL	MVIS TOW	MVIS PR	H/O	PRE SLEEP			
RED	MS2	PRE SLEEP		SLEEP				POST SLEEP		H/O	FILTER CLEANING		MP MW PRE E/ OPS										
	MS3	PRE SLEEP		SLEEP				POST SLEEP		H/O	D/P		EX ERC ISE										
	PS2	PRE SLEEP		SLEEP				POST SLEEP		H/O	D/P		VCGS -MON	TGS OPS									
DAY/NIGHT		ORBIT																					
TDRS		EW																					
ATTITUDE		BIASED -XLV +YVV																					
NOTES:		■ P/TV03 SETUP MIDDK ■ IMU ALIGN ⊙ DSO 611 AIR MON (AOS) ⊙ H/O BLUE TO RED ⊙ DTO 635 EYEWASH ⊙ DTO 653 ROWER																					

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE																						
027:01:54/ 027:13:54	004:12:00/ 005:00:00	026:19:54/ 027:07:54	/026 CST	-73.2		JANUARY 26, 1992	STS-42	FINAL	11/27/91																						
CST :026	20	21	22	23	0	CST:027	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	0	MET:005
RED FD :006	12	13	14	15	16	17	18	19	20	21	22	23	0	BLU	FD:006																
MET :004																															

BLUE	CDR	PRE SLEEP	SLEEP										POST SLEEP	P/TV24 ACT FLT DK	H/O DTD 653 EXER											
	PLT	PRE SLEEP	SLEEP										POST SLEEP	PA/O TT V 21 BM AX PSI/EN TTA VUX 2P 8	PA/O TT V 21 BM AX	P/TV28 SETUP IMAX	ACT TO 165 AX	EXER								
	MS1	PRE SLEEP	SLEEP										POST SLEEP		D/P	H/O	EXERCISE									
	PS1	PRE SLEEP	SLEEP										POST SLEEP	TV20 IMAX	D/P - MMPE	H/O	TGS OPS	VCGS - MON								
RED	MS2	M PWR OPS	P/TV27 SETUP IMAX	P/TV27 ACT IMAX	SAMPLE	MEAL					P/TV27 SETUP IMAX	ACT IMAX	P/TV27 ACT IMAX	P/TV24 & 28 SETUP FLT DK	DTO 651 EXER	ES/SM / H/O	P/TV03 SETUP MIDDK	PAMP/CTD	SLEEP							
	MS3	EXERCISE	CELLS		SLED-HR	NVBRID	TGS OPS	VCGS - MON	MEAL		P/TV99	TV12 - MVI	NVIPREP	MVIPITCH	MVIYAW	MVIOKAN	NVH/O	VCGS - MON	NVH/O	MVIPITCH	MVIYAW	MVISTOW	SHOOTS	H/O	MVILSPR	PRE SLEEP
	PS2	TGS OPS	TGS OPS	VCGS - MON	TGS OPS	TV13 - SPE	SLED-HR	GTHRES	MEAL		VCGS - MON	TGS OPS	MICG	NVIPREP	MVIPITCH	MVIYAW	MVIOKAN	NVH/O	VCGS - MON	NVH/O	MVIPITCH	MVIYAW	MVISTOW	DRILL	H/O	MVILSPR

DAY/NIGHT																
ORBIT	72	73	74	75	76	77	78	79	80							
TORS	E	[Timeline diagram showing event durations]														
ATTITUDE	BIASED -XLV +YV															

NOTES: ▽ IMU ALIGN @DTO 653 ROWER
@DTO 651 ERGOMETER @DTO 651 ERGOMETER
@H/O RED TO BLUE


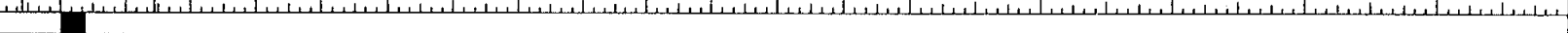
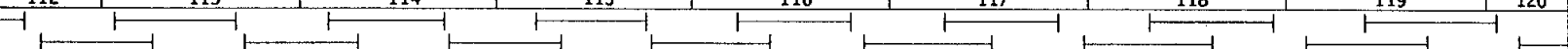
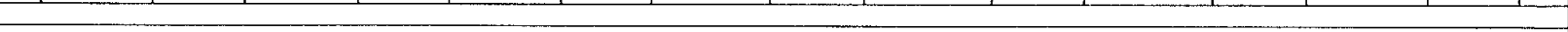
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
028:13:54/ 029:01:54	006:00:00/ 006:12:00	028:07:54/ 028:19:54	/028 CST	-67.9		JANUARY 28, 1992	STS-42	FINAL	11/27/91

CST :028
 BLU FD :007
 MET :006

BLUE	CDR	SPE BPA OPS	DTO 651 EXER	MEAL	SLED PR RELX	PCG DEACT	STING	OCAC STOW	TV27 ACT IMAX	PRE SLEEP
	PLT	SPE BPA OPS	DTO 653 EXER	MEAL	PPF CUBE 2 XFER	BIORACK UNLOAD	CRYO SYSTEM	CRYO SYSTEM	CRYO SYSTEM	PRE SLEEP
	MS1	SPE-ACU	EXERCISE	MEAL	SLED-PA	SLED-PR	BIORACK	CRYO SYSTEM	CRYO SYSTEM	PRE SLEEP
	PS1	SPE-ACU	FLY	SHOOTS	SLED-PA	SLED-PR	MEAL	TGS OPS	FES-FAC	VCGS
RED	MS2	PRE SLEEP							SLEEP	
	MS3	PRE SLEEP							SLEEP	
	PS2	PRE SLEEP							SLEEP	
DAY/NIGHT ORBIT		96	97	98	99	100	101	102	103	104
TDRS		BIASED -XLV +YVV								
ATTITUDE		STING REMOVAL ASSISTANCE								

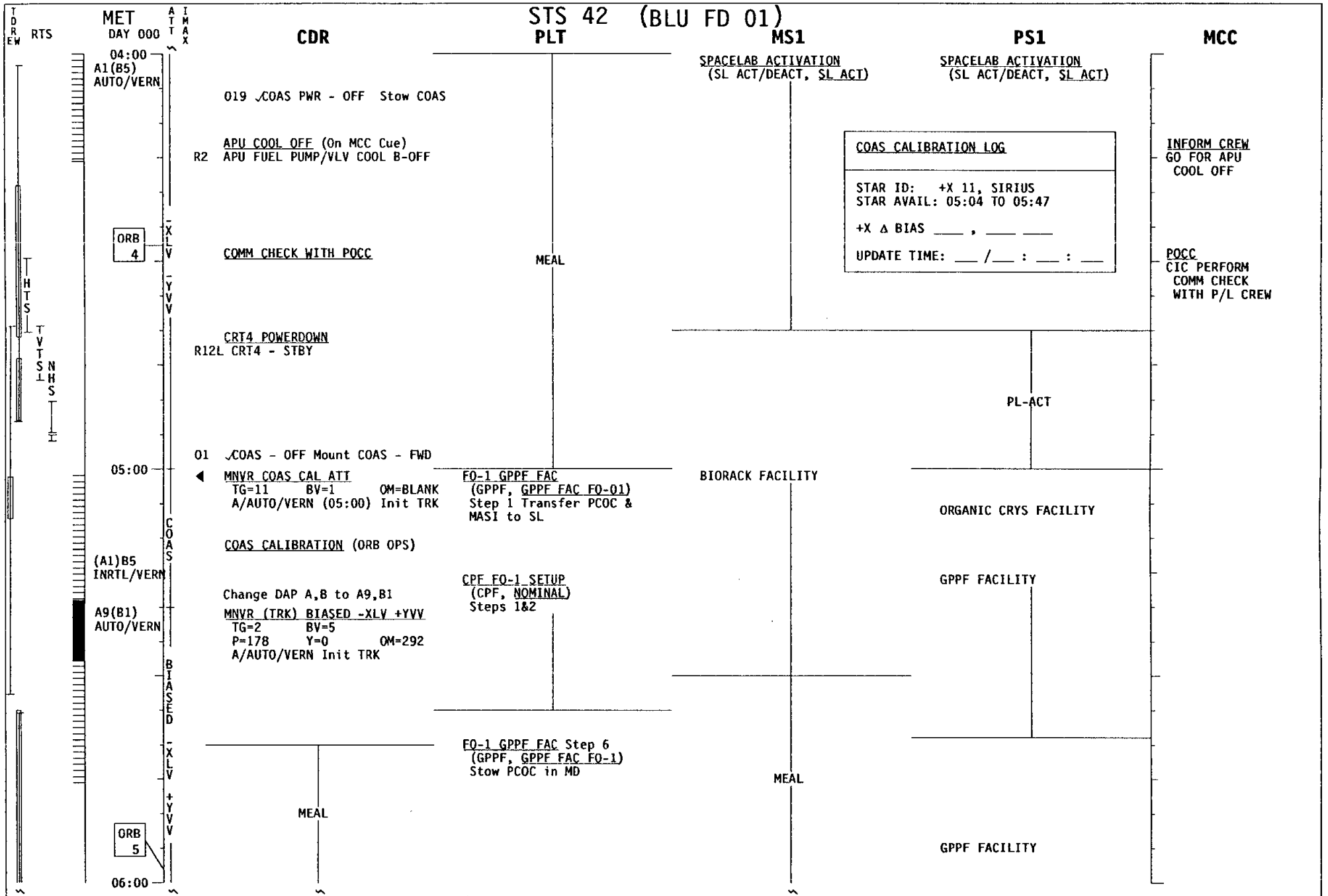
NOTES:
 P/TV32 ACT CONF
 o APU HTR RECONFIG
 o DTO 651 ERGOMETER
 o DTO 653 ROWER
 o DSO 611 AIR MON (AOS)
 o DSO 469 RAD DOSE DIST
 o IMU ALIGN
 o DSO 611 AIR MON (MAS)

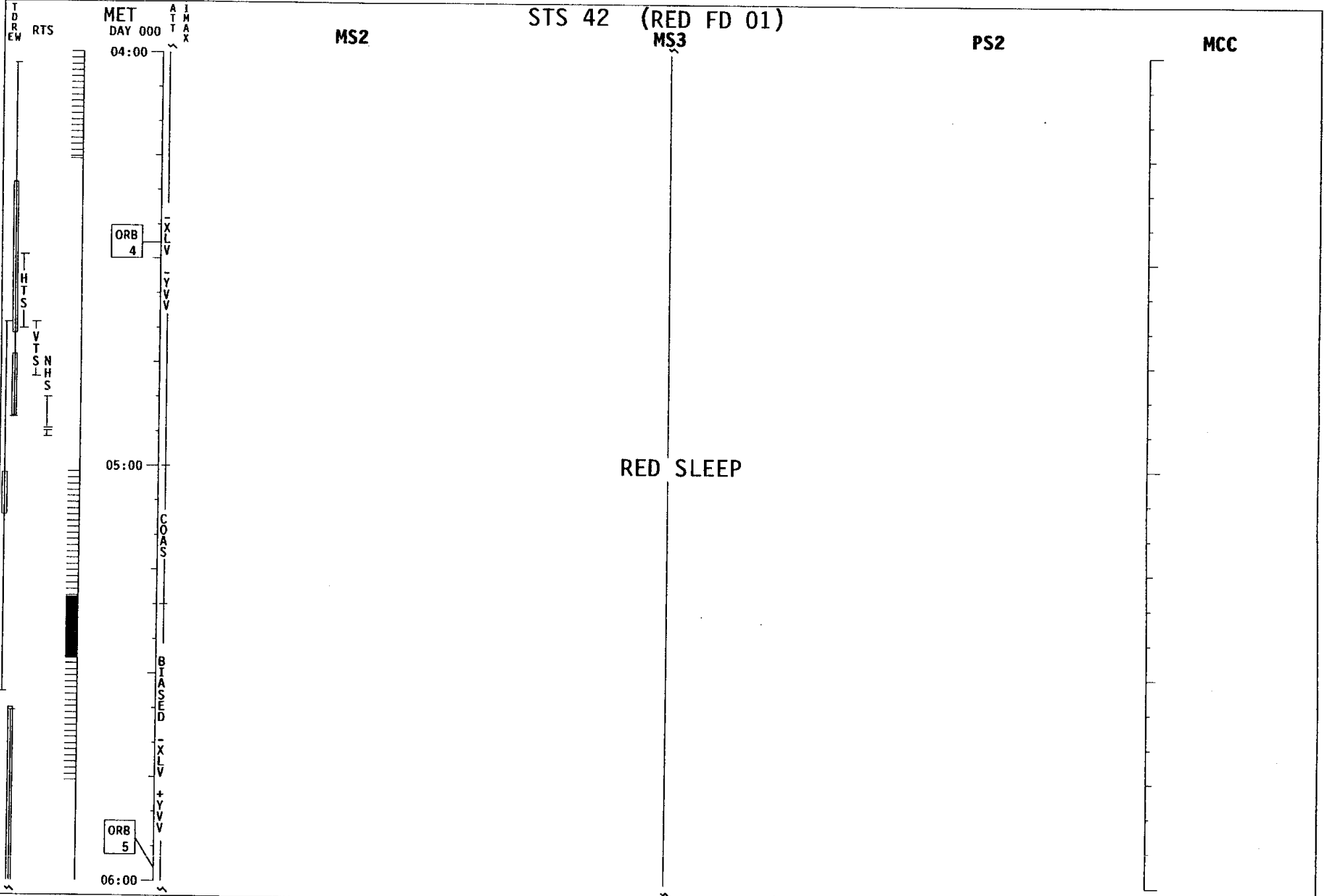
GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
029:01:54/ 029:13:54		006:12:00/ 007:00:00		028:19:54/ 029:07:54		/028 CST	-65.9		JANUARY 28, 1992	STS-42	PCN-1	01/03/92				
CST :028	20	RED	21	22	23	0	CST:029	1	2	3	4	5	6	7	0	MET:007
BLU FD :007	12	RED	13	14	15	16		17	18	19	20	21	22	23		
MET :006		FP:008														
BLUE	CDR	PS REL E P	H/O	S L E E P	SLEEP (6)				POST SLEEP	DEORBIT PREP		IMU ALIGN OPS	DEORBIT PREP			
	PLT	PS REL E P	H/O	S L E E P	SLEEP				POST SLEEP	RCS HOT	POST SLEEP	DEORBIT PREP				
	MS1	PS REL E P	H/O	S L E E P	SLEEP				POST SLEEP	DEORBIT PREP						
	PS1	PS REL E P	H/O	S L E E P	SLEEP				POST SLEEP	DP SR OE P	DEORBIT PREP					
RED	MS2	PS REL E P	H/O	POST SLEEP	IMAX STOW	GR P R G A S	A P C S T O W	MNVR & INIT PTC	CP R M P T R	P/TV06 ACT EGR	MEAL	PG WR RP	IMU ALIGN OPS	CON F	DEORBIT PREP	
	MS3	PS REL E P	H/O	POST SLEEP	CABIN STOW	P/TV06 SETUP EGR		PL DEACT	SL DEACTIVATION		MEAL	DP SR OE P	DEORBIT PREP			
	PS2	PS REL E P	H/O	POST SLEEP	CABIN STOW	ADDRESS				MEAL	DEORBIT PREP					
DAY/NIGHT																
ORBIT	104	105	106	107	108	109	110	111	112							
TDRS																
ATTITUDE	BIASED -XLV +YVV PTC BIASED -XSI															
NOTES:	@H/O BLUE TO RED @DTO 623 CAB AIR MON @DSO 603 ENTRY PREP V POST-SLEEP V IMU ALIGN @CABIN TEMP CNTL RECONFIG															

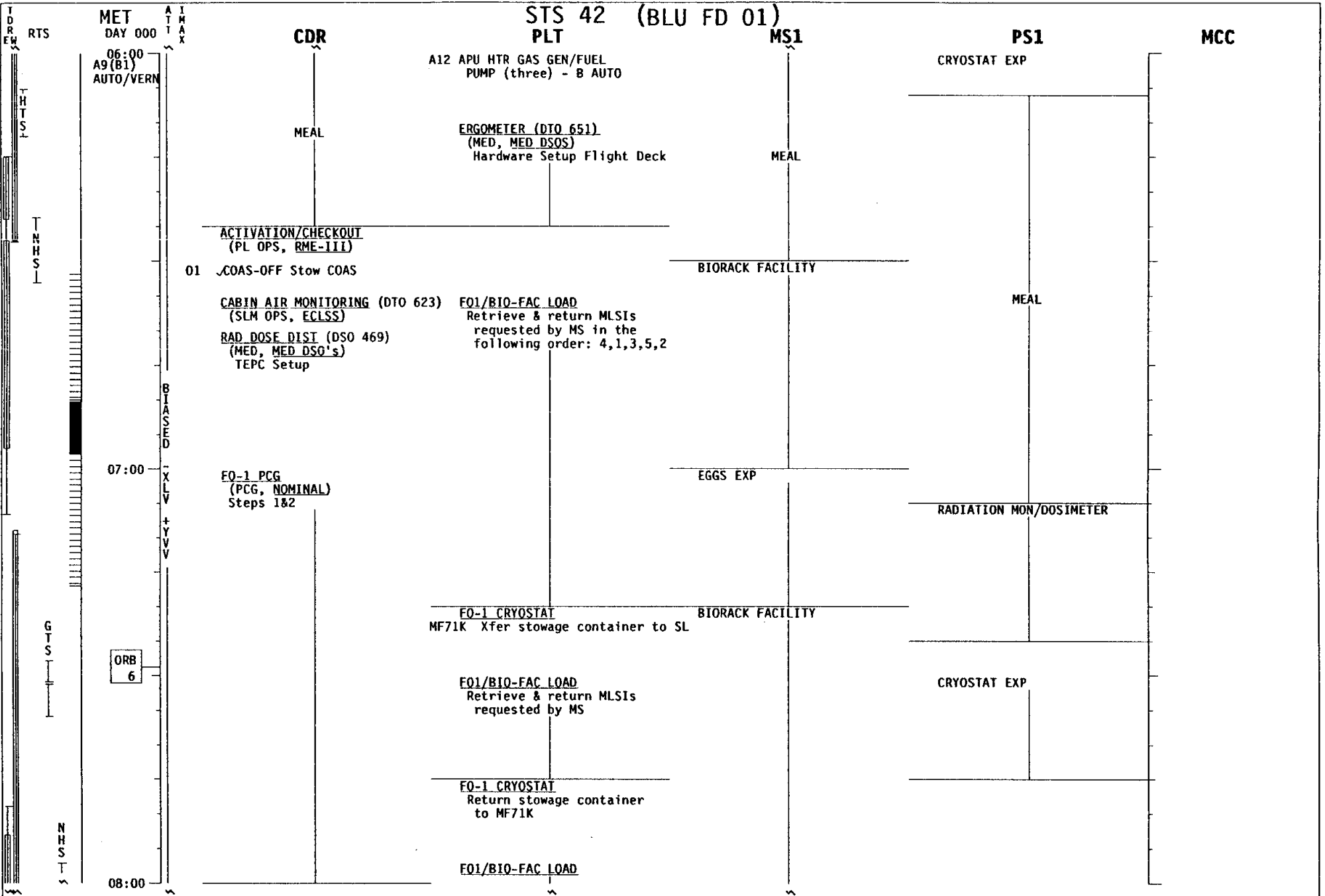
GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON 	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE			
029:13:54/ 030:01:54		007:00:00/ 007:12:00		029:07:54/ 029:19:54		/029 CST	-63.8		JANUARY 29, 1992	STS-42	FINAL	11/27/91			
CST	:029	8	9	10	11	12	13	14	15	16	17	18	19		
FD	:008														
MET	:007	0	1	2	3	4	5	6	7	8	9	10	11	12	
BLUE	CDR														
	PLT	DEORBIT	EDW												
	MS1			LANDING*											
	PS1				BURN*										
RED	MS2														
	MS3														
	PS2														
DAY/NIGHT															
ORBIT		112	113	114	115	116	117	118	119	120					
TDRS															
ATTITUDE															
NOTES:		* <table border="1" data-bbox="287 1339 393 1421"> <tr><td>DEORBIT BURN 7/00:14</td></tr> </table> * <table border="1" data-bbox="414 1339 521 1421"> <tr><td>EDW LANDING 7/01:12</td></tr> </table>												DEORBIT BURN 7/00:14	EDW LANDING 7/01:12
DEORBIT BURN 7/00:14															
EDW LANDING 7/01:12															

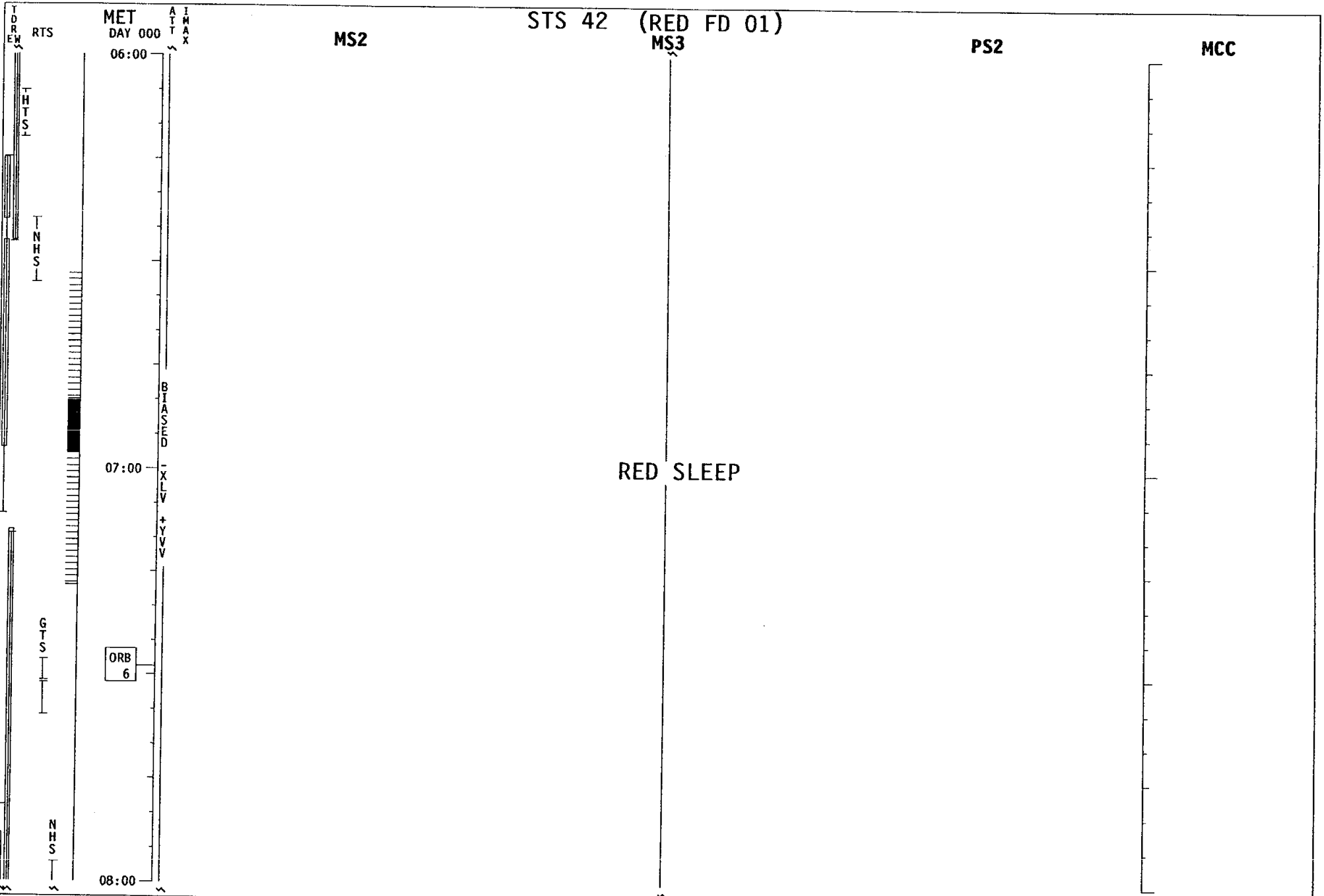
DETAILED TIMELINE

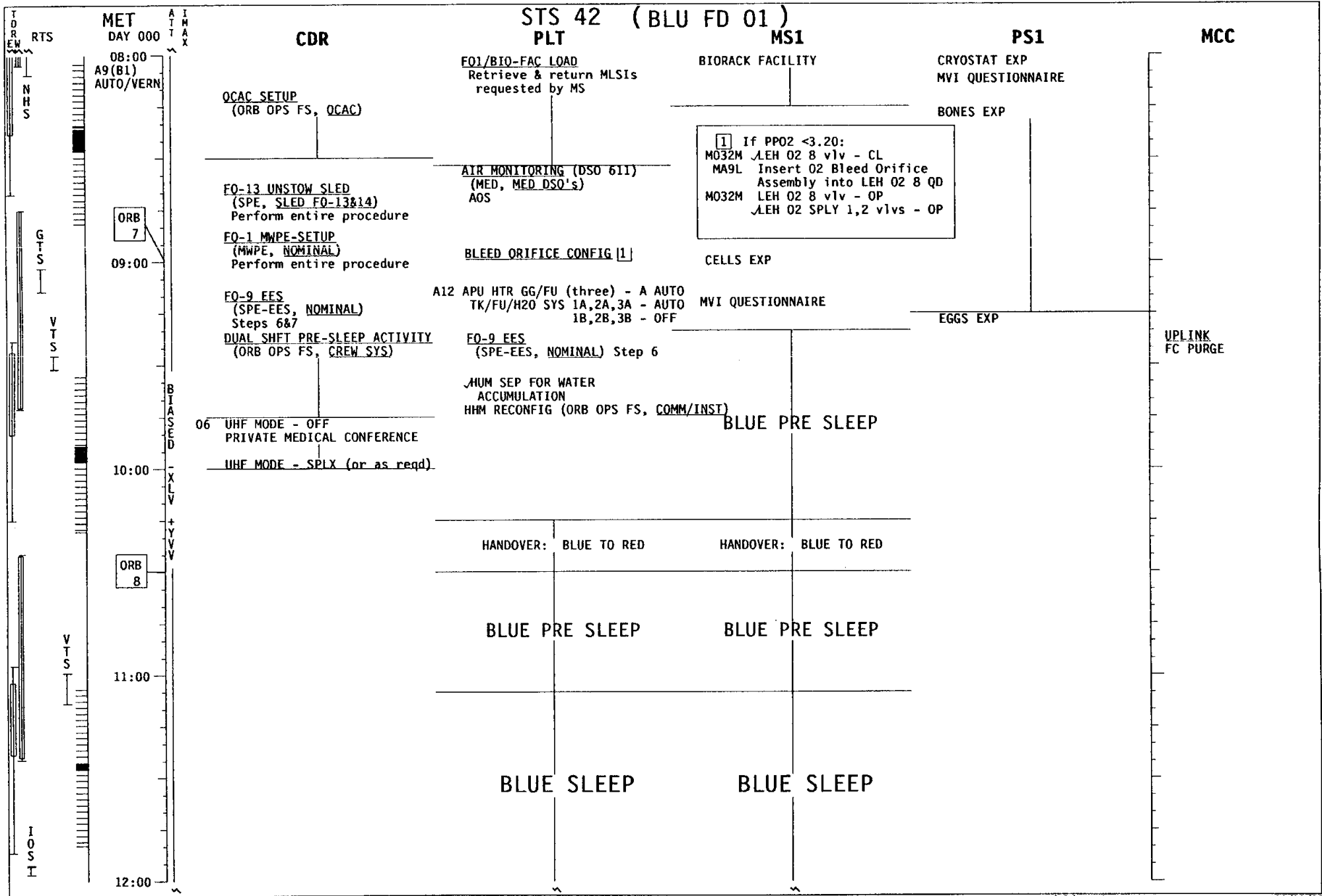
DETAILED
TIMELINE

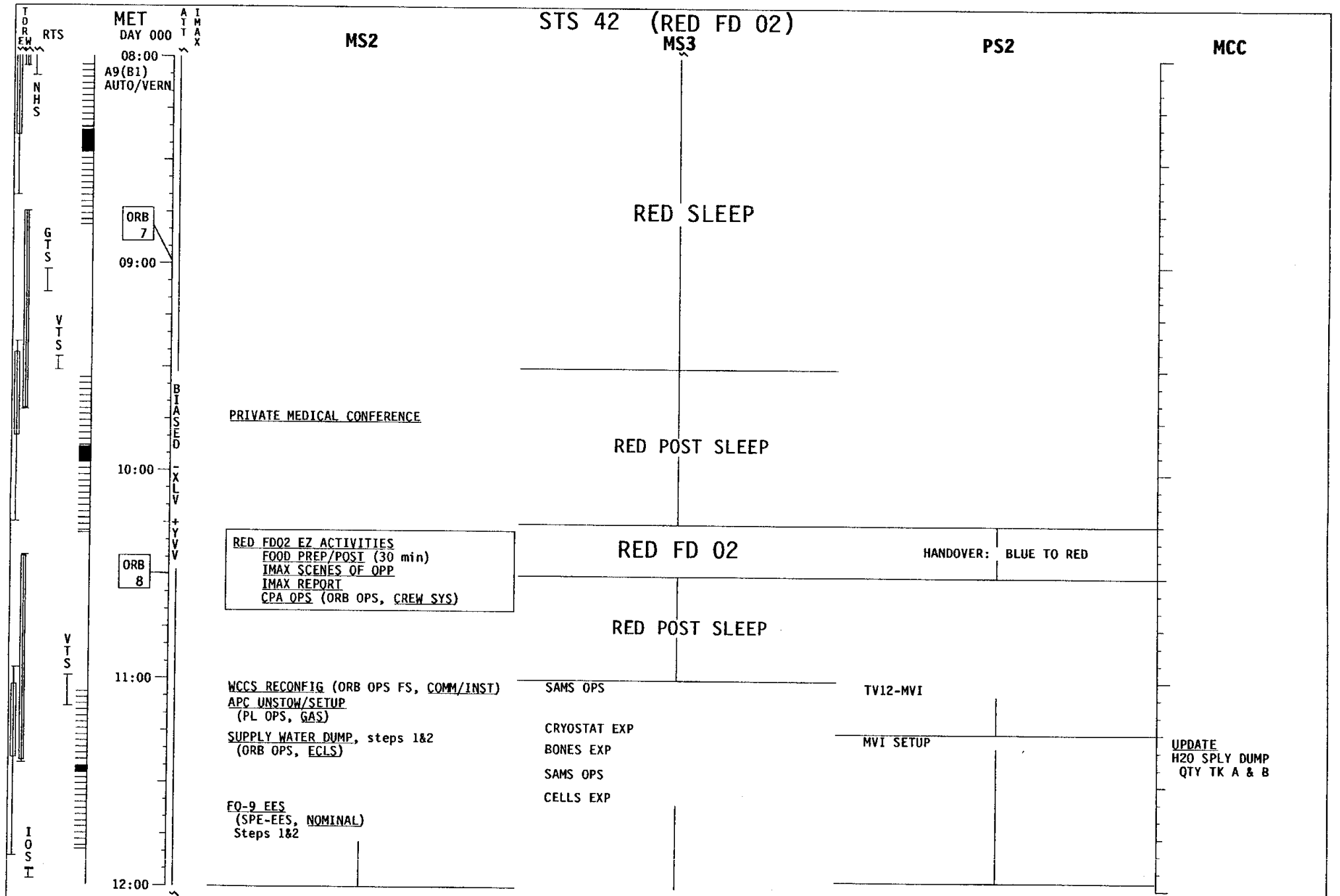


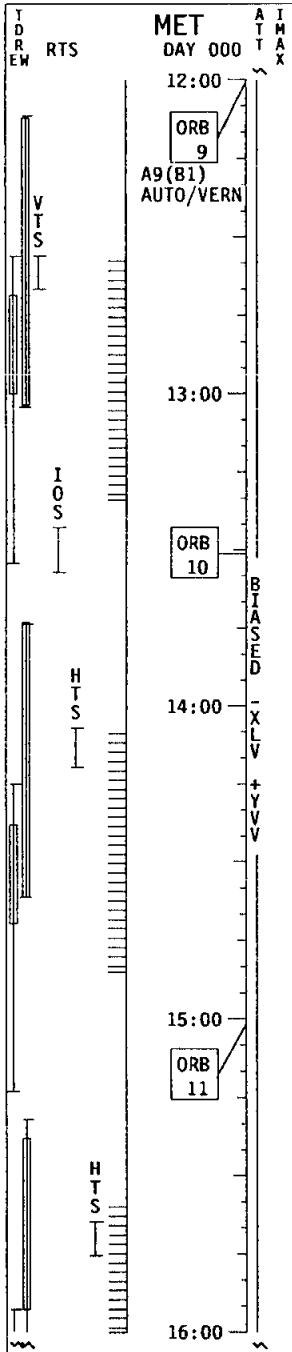












CDR

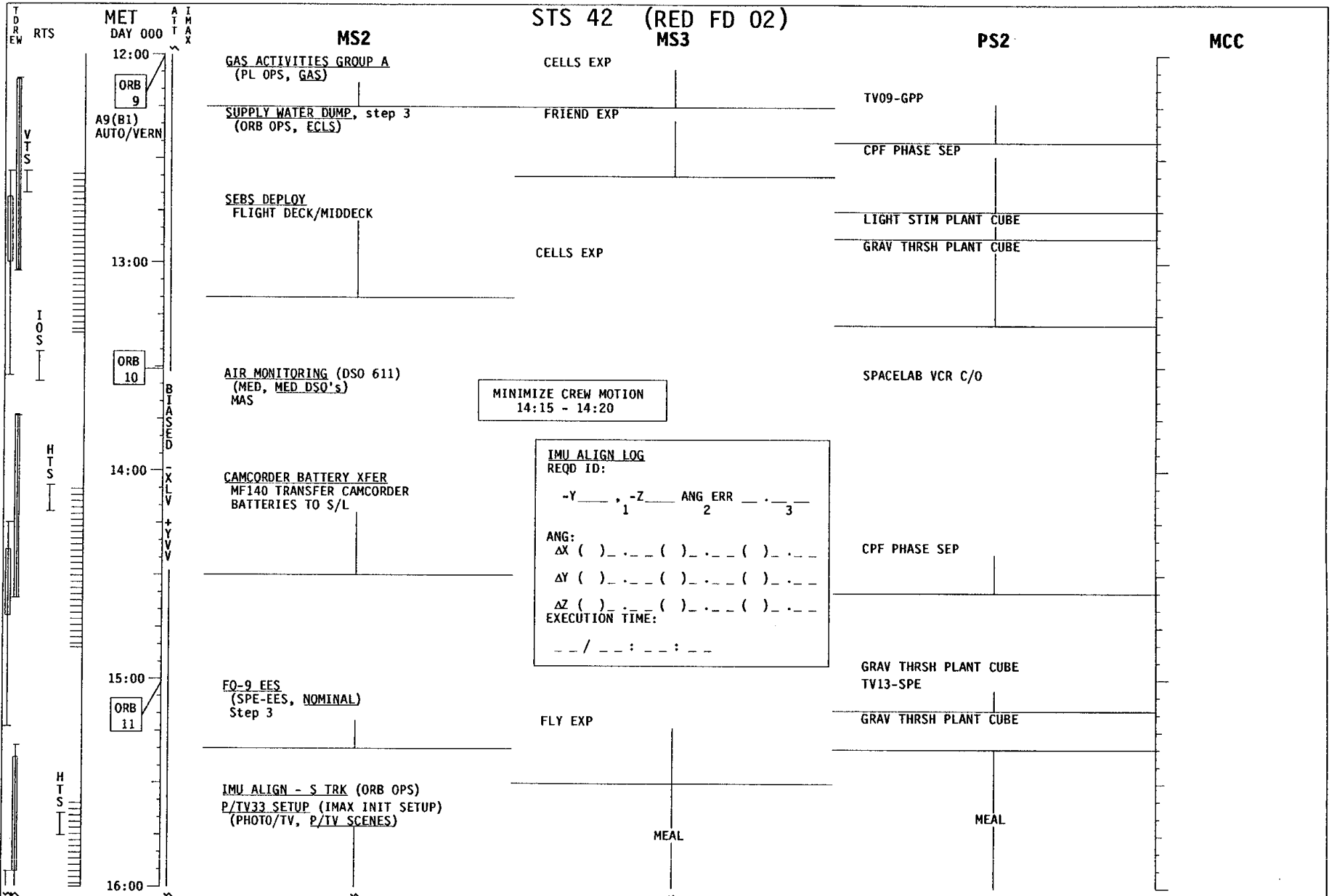
STS 42 (BLU FD 01)
 PLT MS1

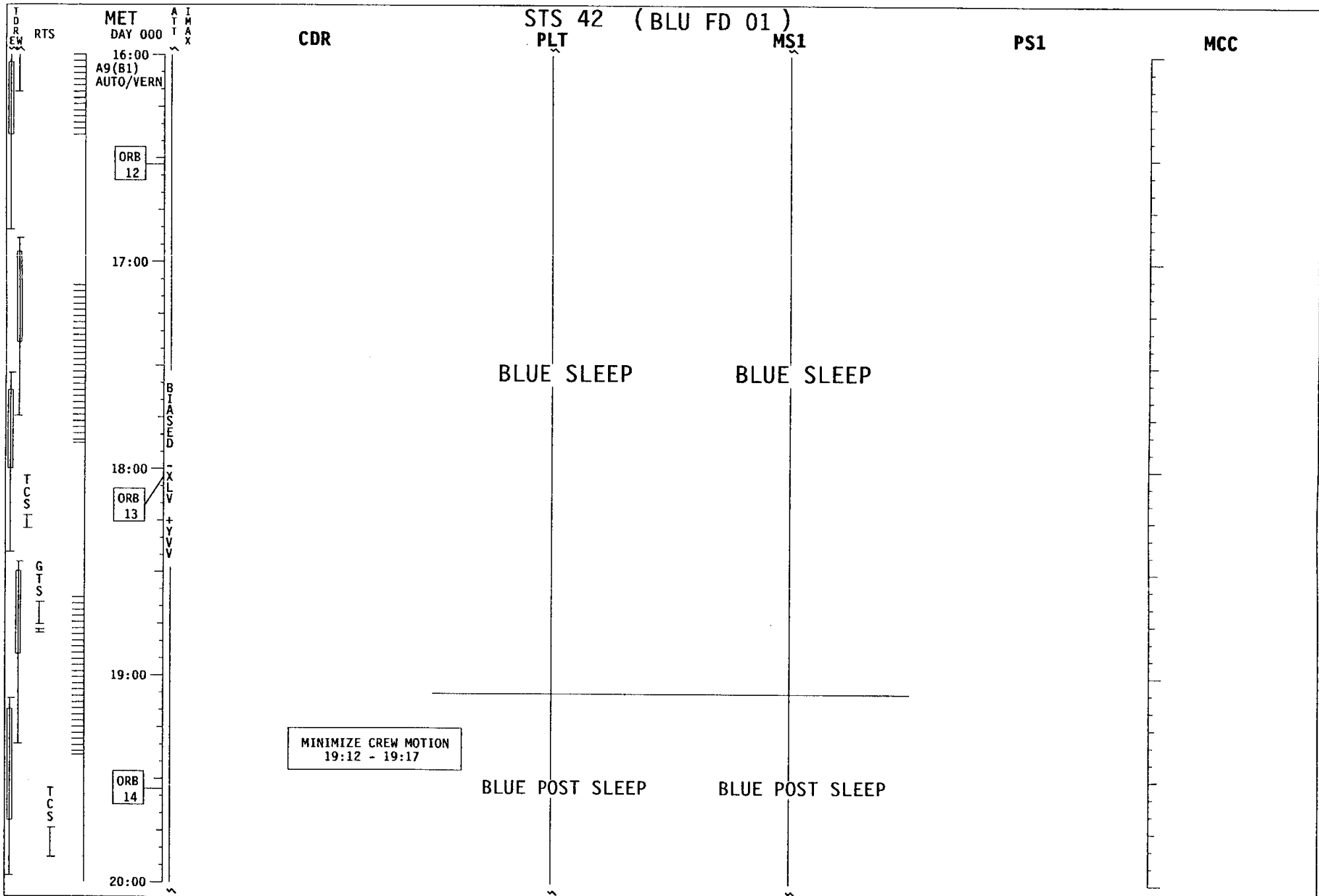
PS1

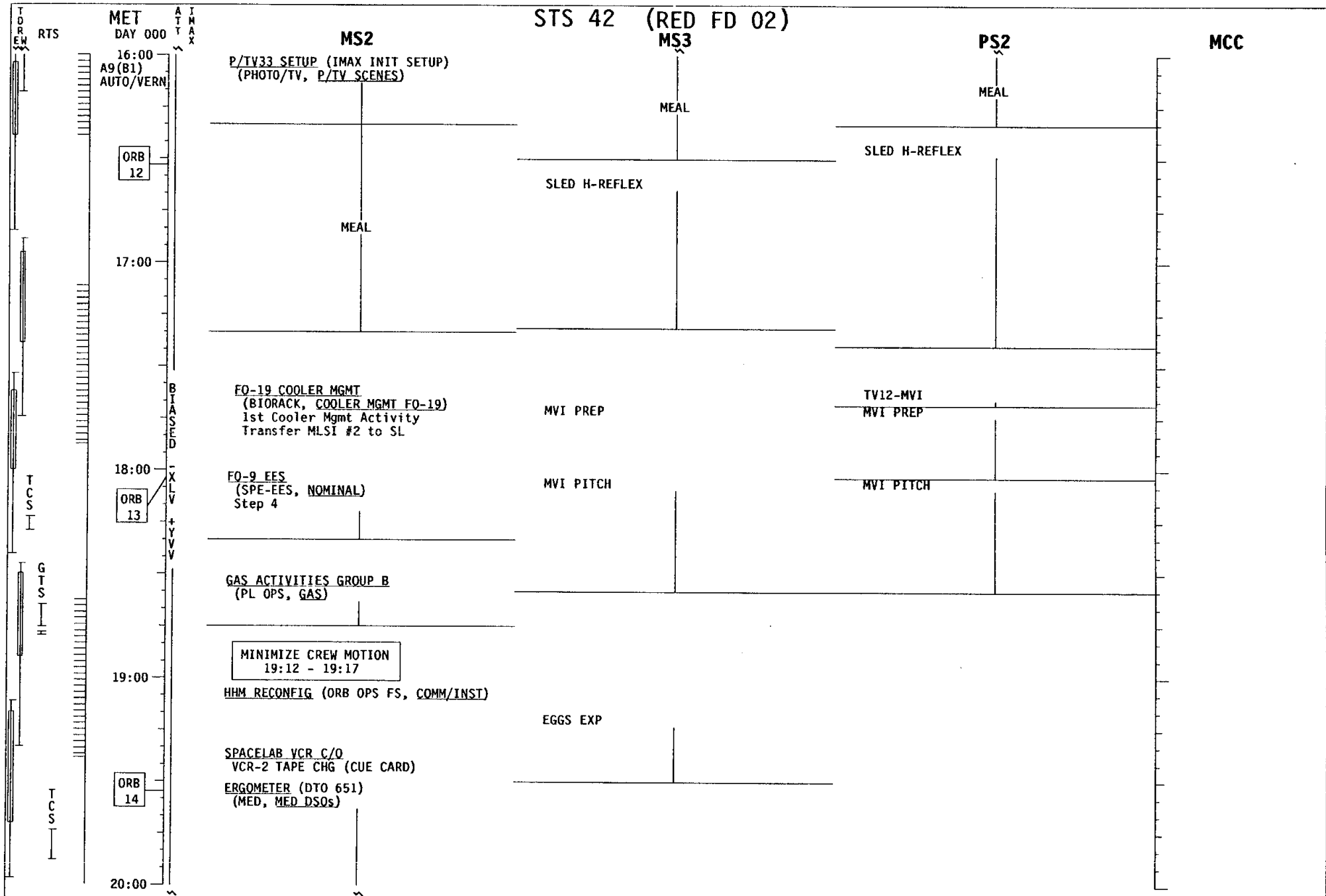
MCC

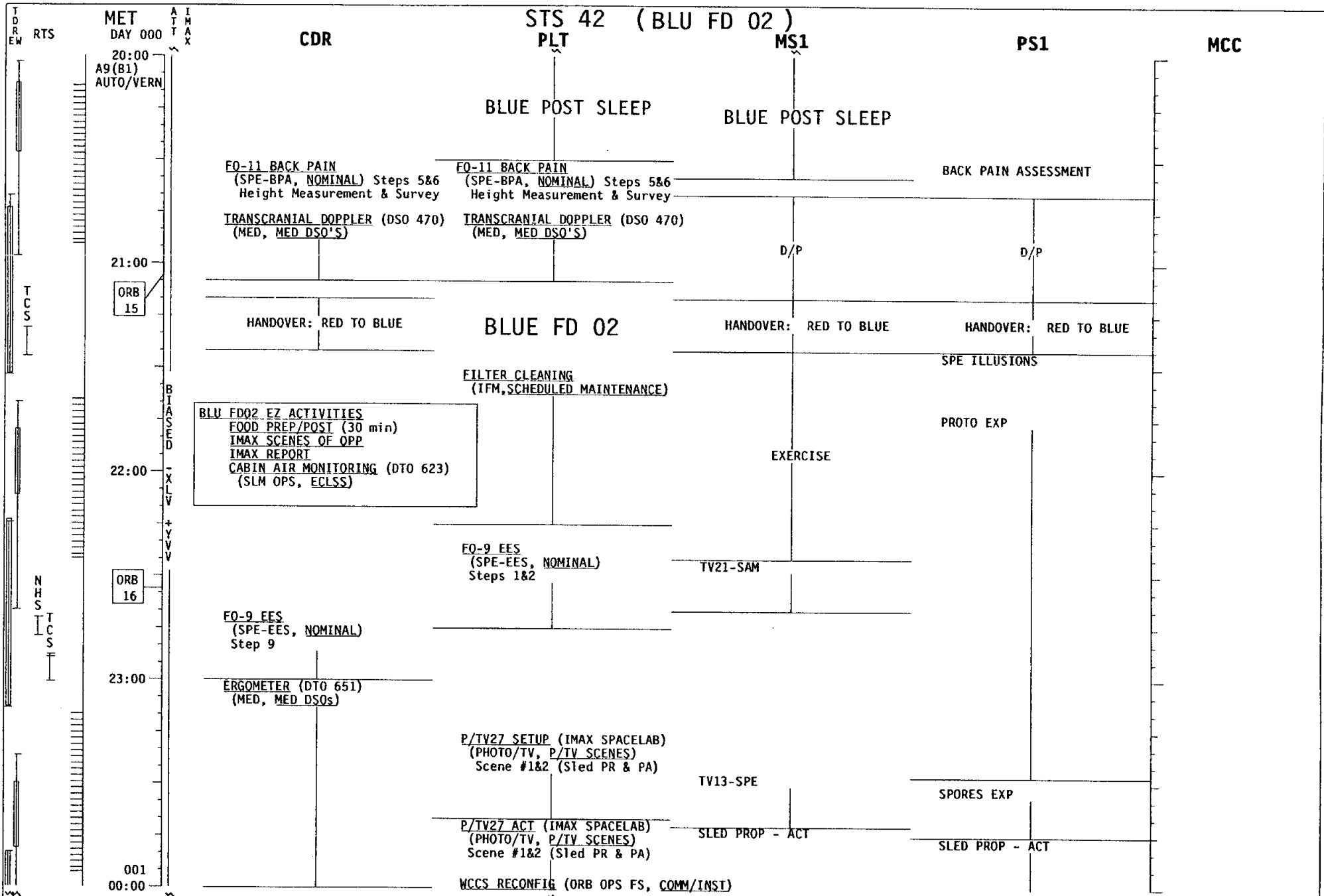
BLUE SLEEP

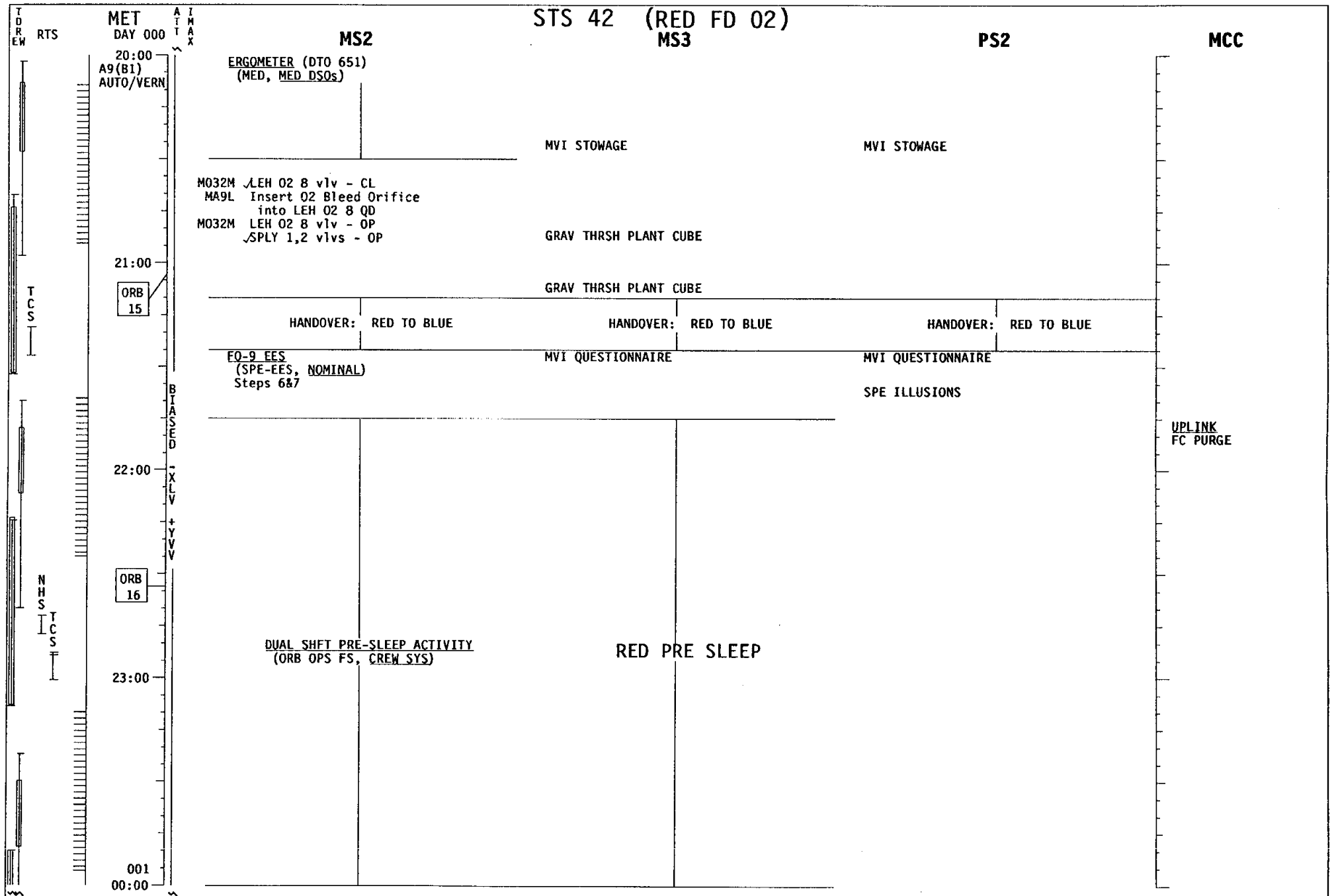
BLUE SLEEP

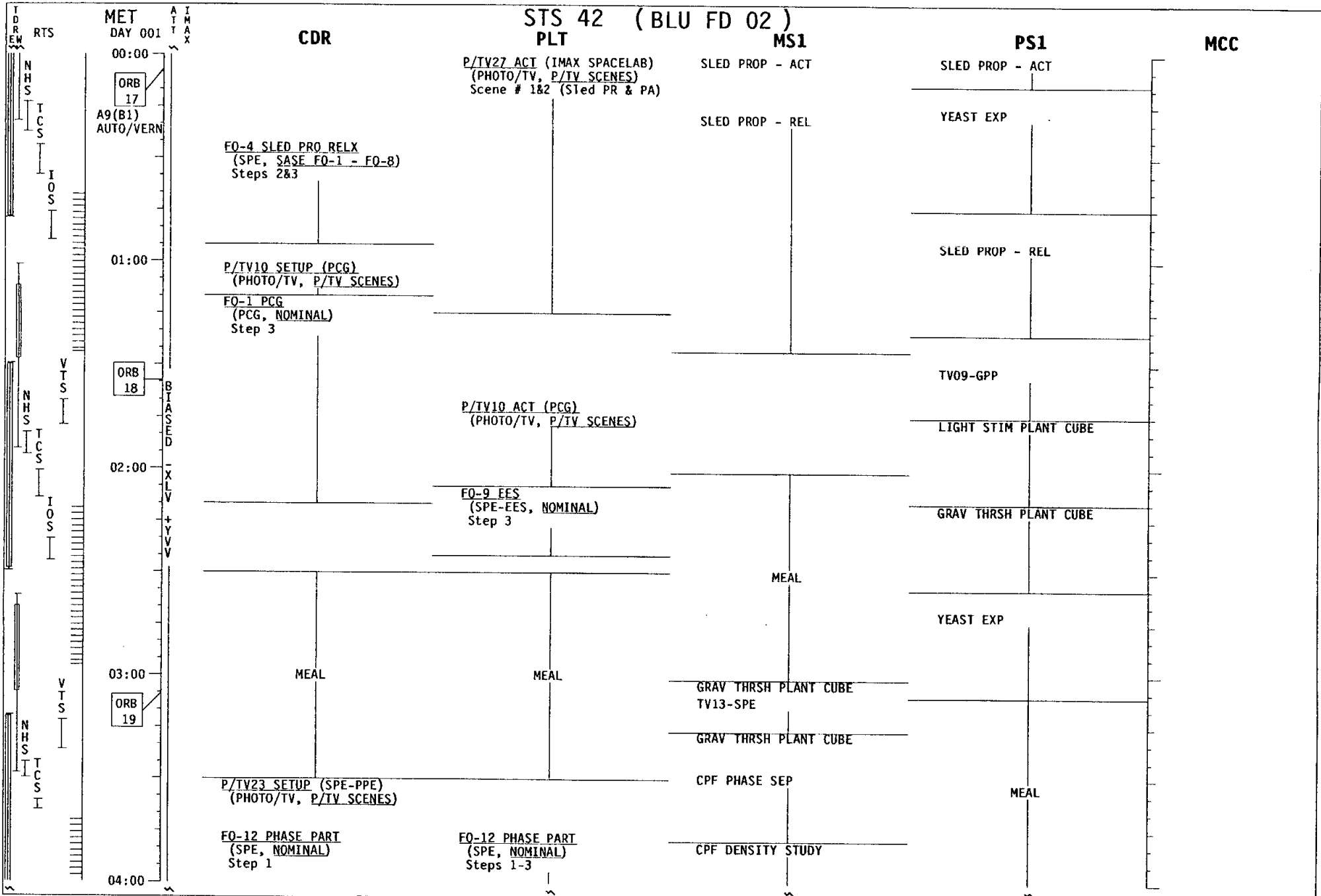


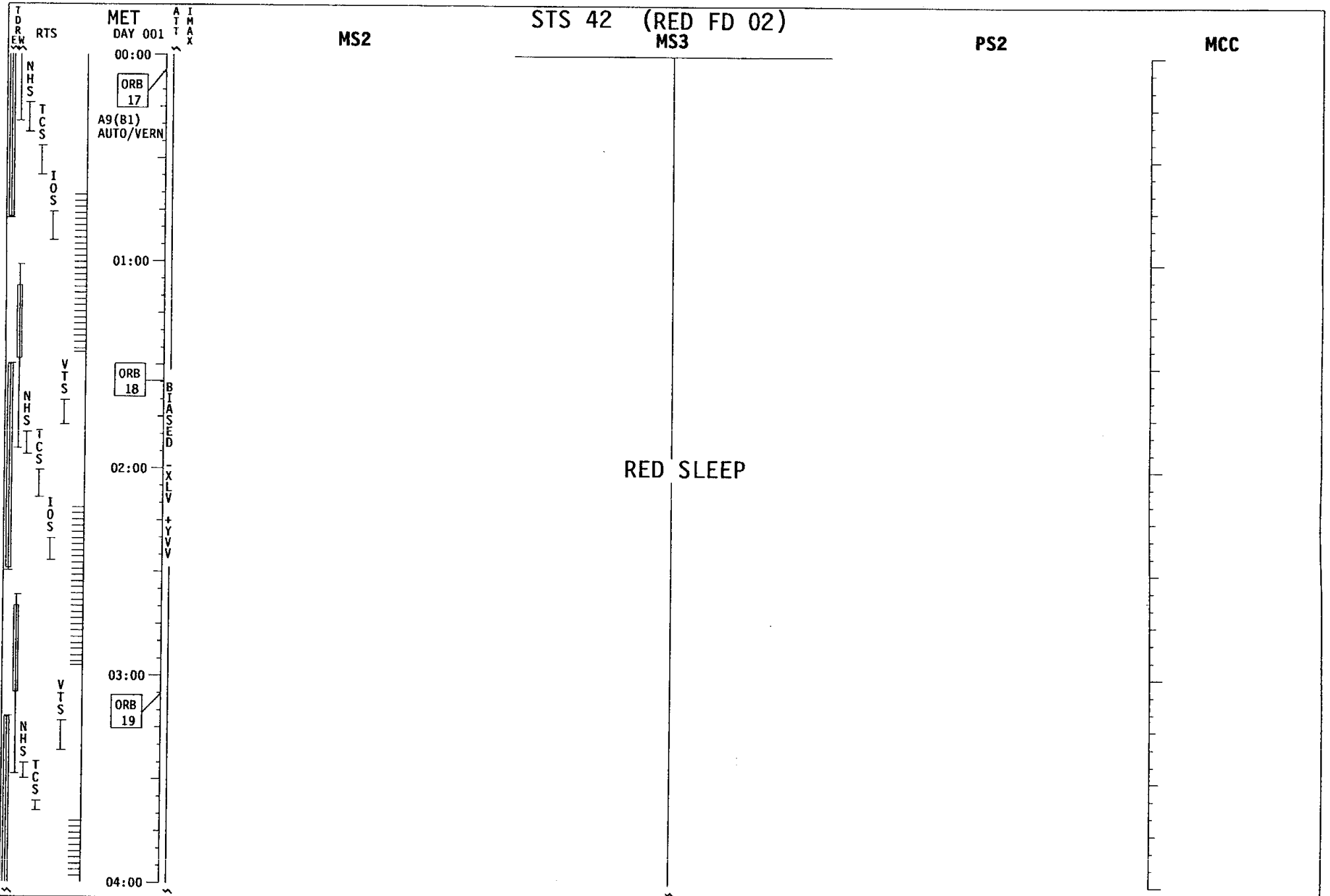


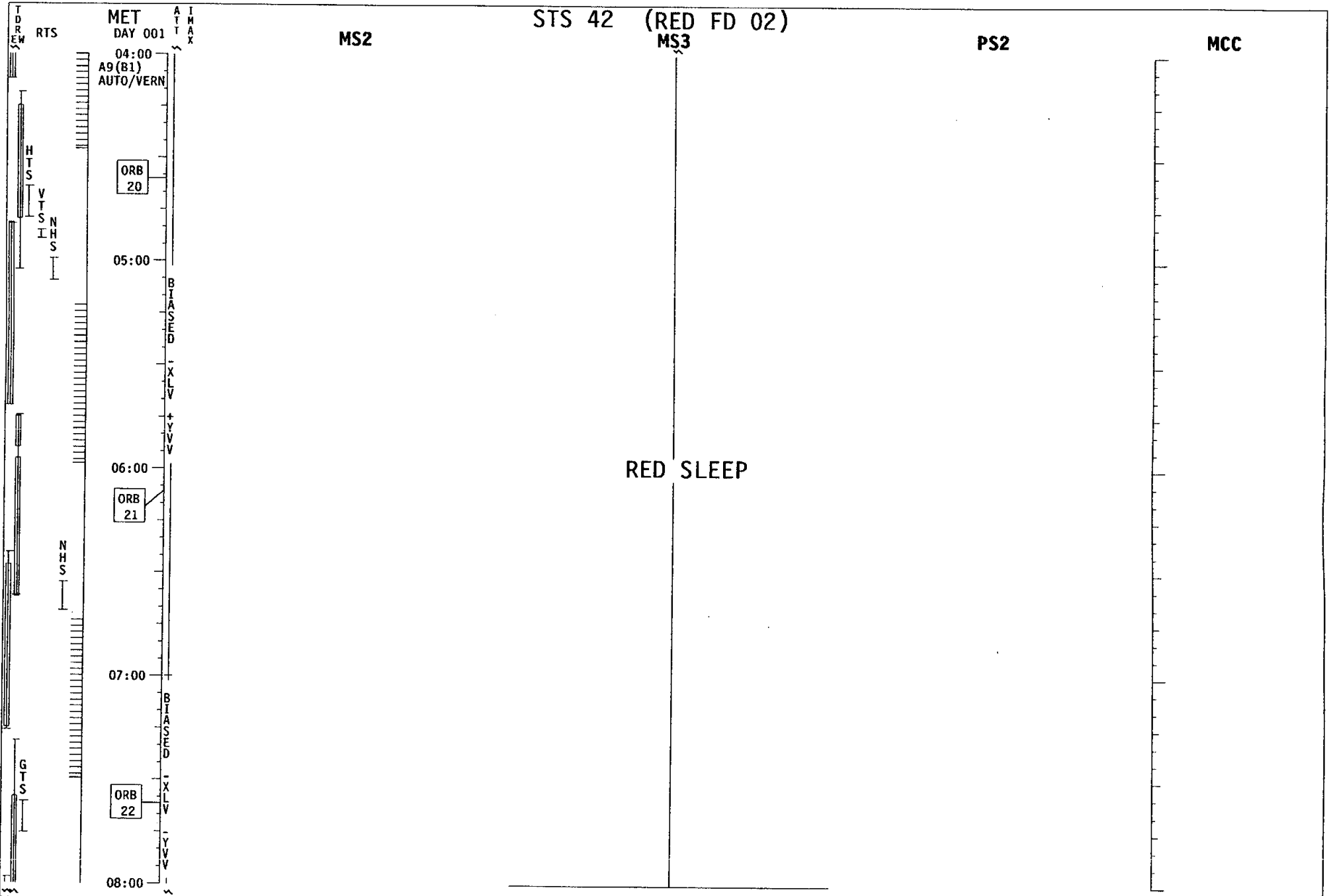


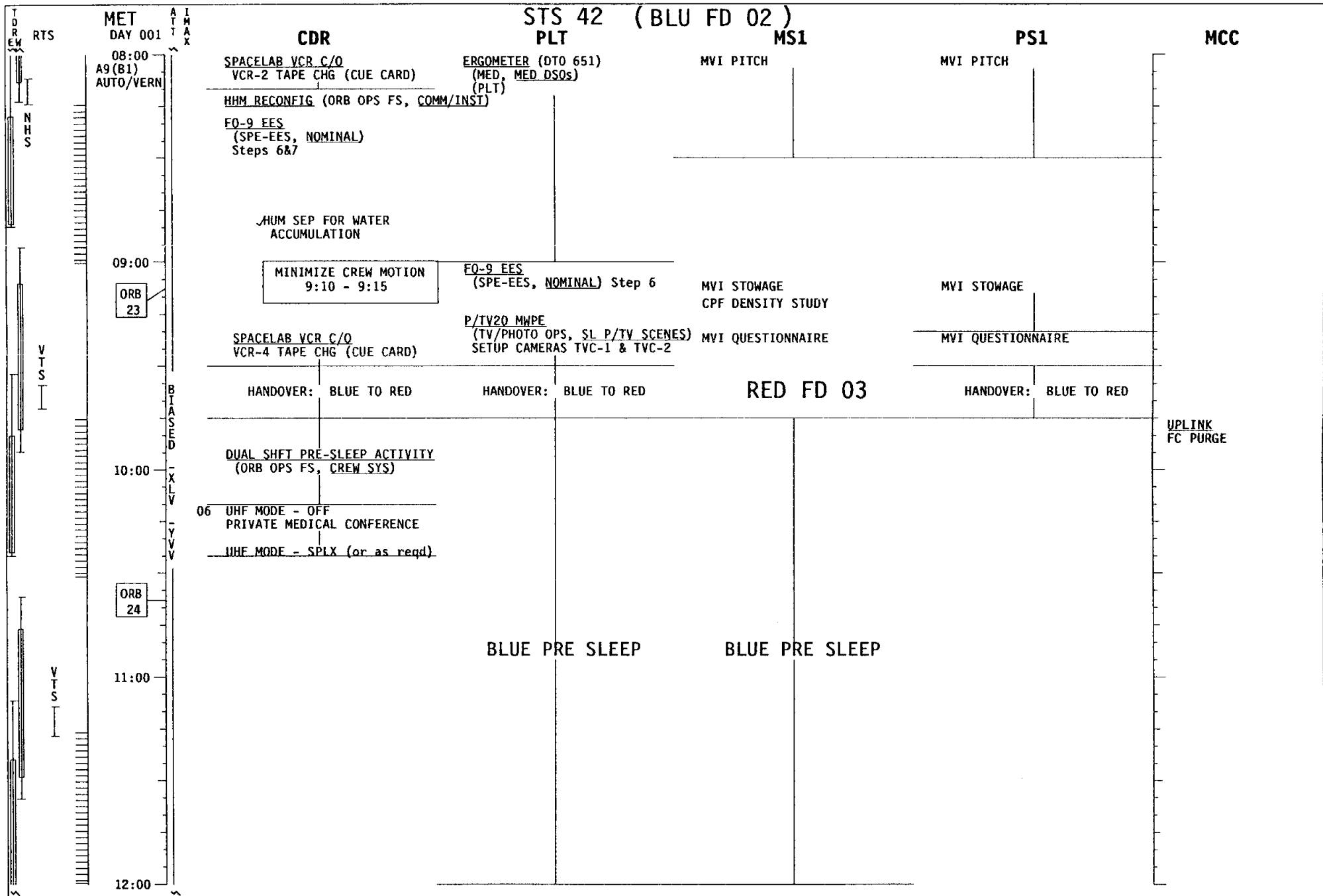


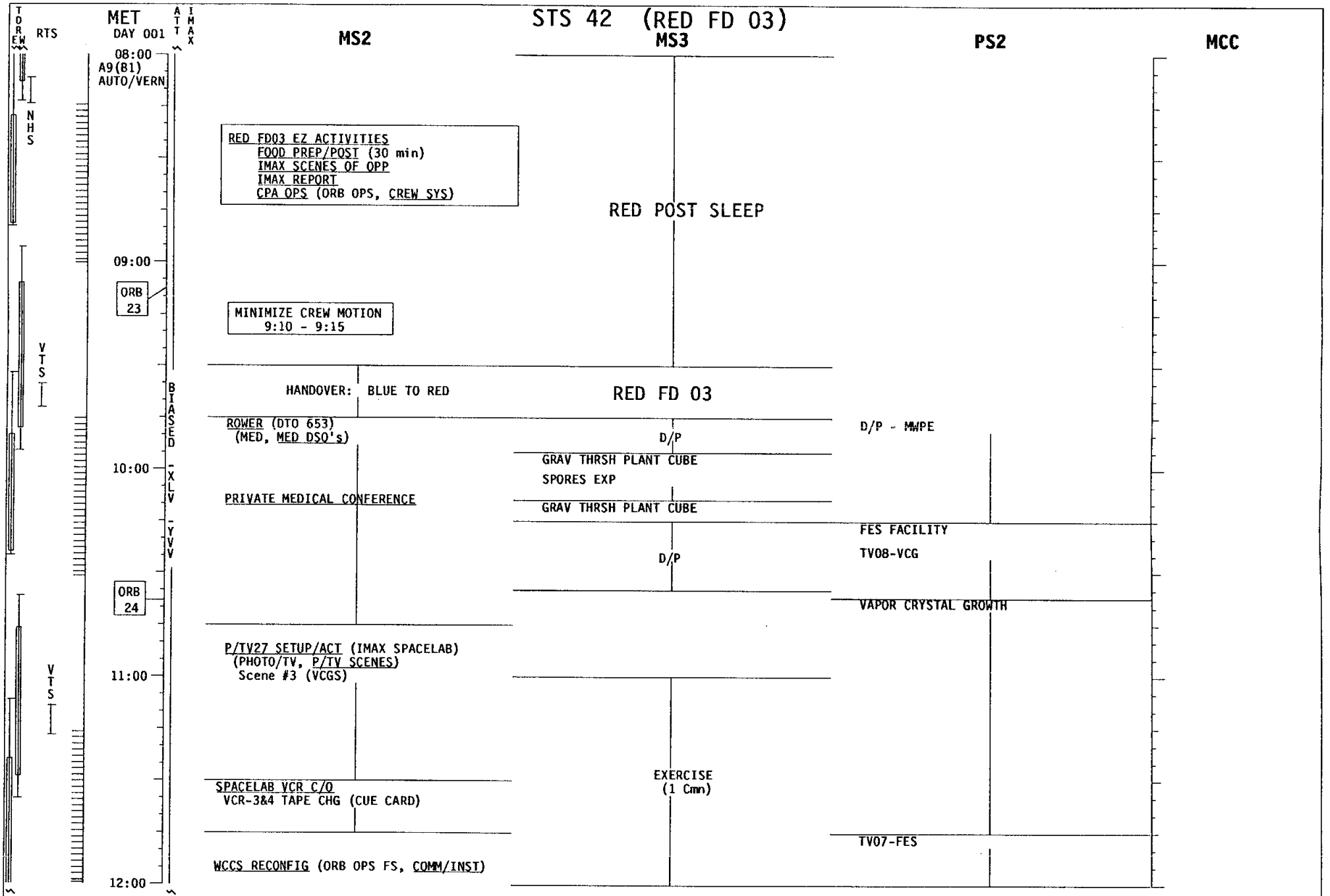


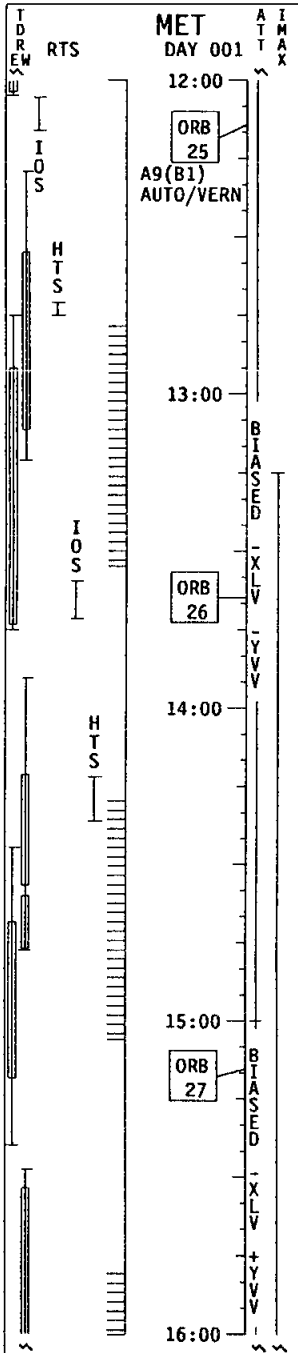












MET DAY 001

CDR

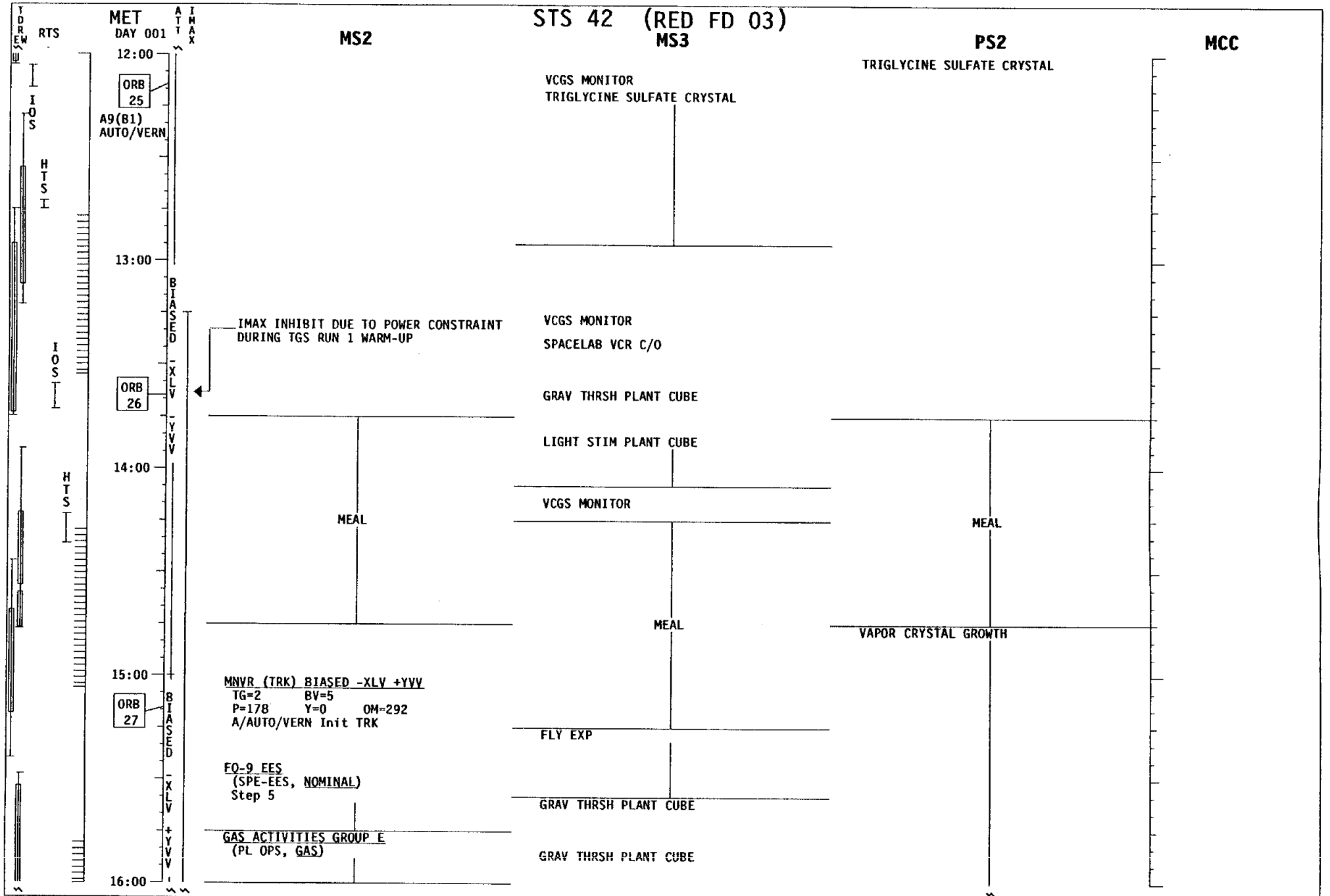
STS 42 (BLU FD 02)
PLT MS1

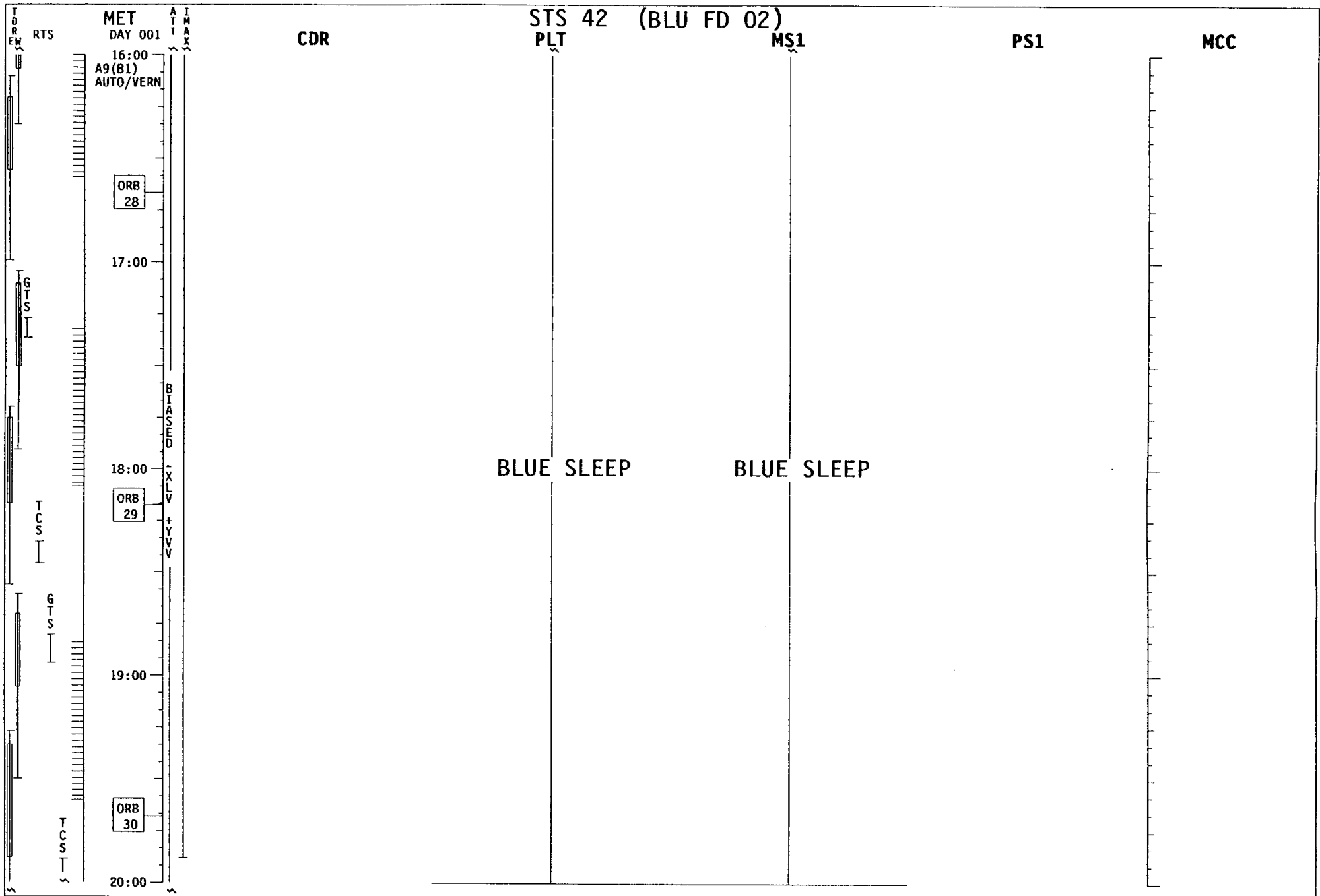
PS1

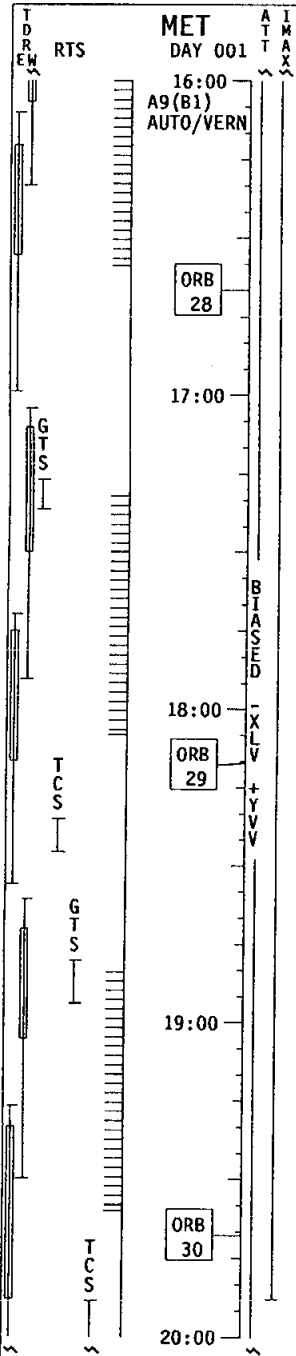
MCC

BLUE SLEEP

BLUE SLEEP







MET
DAY 001

16:00
A9(B1)
AUTO/VERN

ORB
28

17:00

18:00

ORB
29

19:00

ORB
30

20:00

MS2

WASTE WATER DUMP, steps 1,2
(ORB OPS, ECLS)
Dump Tank to 5%

IMU ALIGN - S TRK (ORB OPS)

IMU ALIGN LOG
REQD ID:
-Y___, -Z___ ANG ERR ___ . ___
 1 2 3

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

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

MINIMIZE CREW MOTION
17:44 - 17:49

WASTE WATER DUMP, step 3
(ORB OPS, ECLS)

EO-9 EES
(SPE-EES, NOMINAL)
Steps 6&7

**STS 42 (RED FD 03)
MS3**

CELLS EXP

TV09-GPP

TRIGLYCINE SULFATE CRYSTAL

VCGS MONITOR

CELLS EXP

PS2

VAPOR CRYSTAL GROWTH

VCGS MONITOR

VCGS MONITOR

SPACELAB VCR C/O

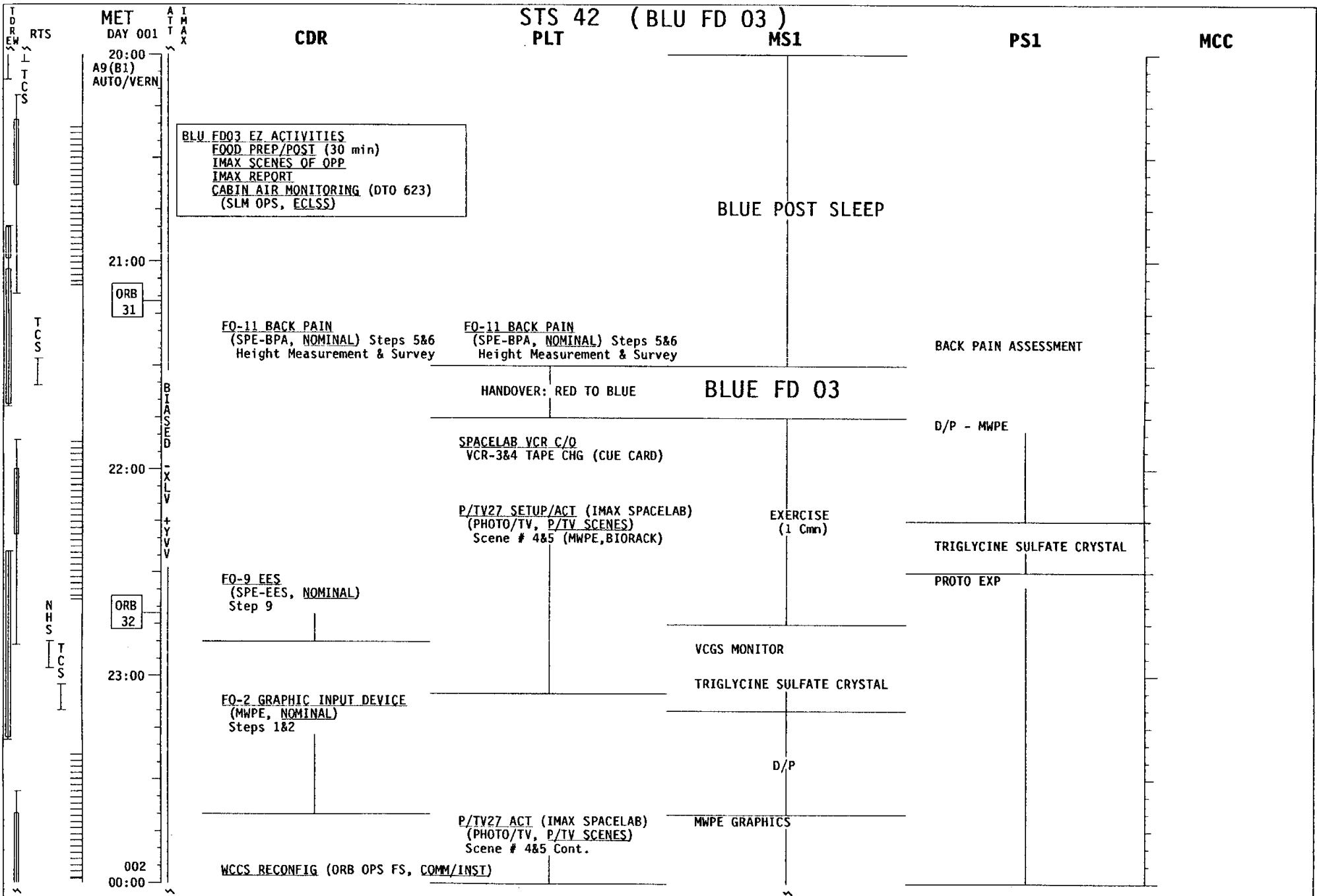
GRAV THRSH PLANT CUBE

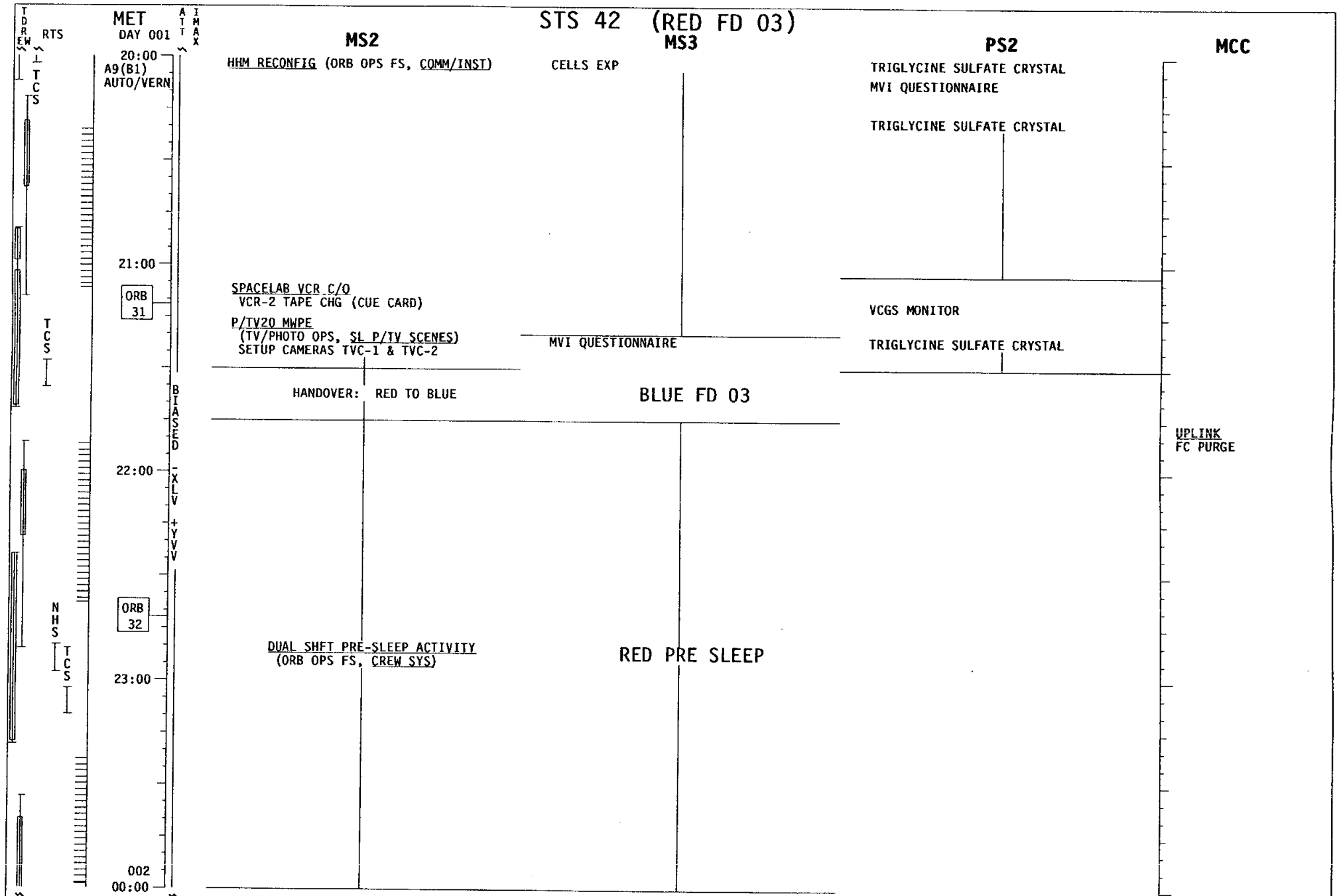
VCGS MONITOR

TRIGLYCINE SULFATE CRYSTAL

MCC

UPDATE
H2O WASTE
DUMP QTY





STS 42 (BLU FD 03)

CDR

PLT

MS1

PS1

MCC

MET DAY 002
00:00
ORB 33
A9(B1) AUTO/VERN
01:00
ORB 34
02:00
ORB 35
03:00
04:00

TDR EH
 N H S
 T C S
 I O S
 N H S
 T C S
 N H S
 T C S
 H T S
 N H S

I M A X
 B A S E D
 X L V
 + Y V V

MEM MODULE REPLACEMENT
(PL OPS, RME-III)

FO-2 GRAPHIC INPUT DEVICE
(MWPE, NOMINAL)
Steps 2&3

FO-9 EES
(SPE-EES, NOMINAL)
Step 5

FO-11 BACK PAIN
(SPE, BPA FO-11)
Steps 1-4

FO-11 BACK PAIN
(SPE, BPA FO-11)
Steps 2-4

FO-11 BACK PAIN
(SPE-BPA, NOMINAL) Steps 5&6
Height Measurement & Survey
GAS ACTIVITIES GROUP F
(PL OPS, GAS)

FO-11 BACK PAIN
(SPE-BPA, NOMINAL) Steps 5&6
Height Measurement & Survey TV99-MCG
P/TV27 SETUP/ACT (IMAX SPACELAB)
(PHOTO/TV, P/TV SCENES)
Scene #6 (GPPF)

MEAL

MEAL

P/TV27 ACT (IMAX SPACELAB)
(PHOTO/TV, P/TV SCENES)
Scene #7&8 (GPPF)

MWPE GRAPHICS
VCGS MONITOR

TRIGLYCINE SULFATE CRYSTAL

BACK PAIN ASSESSMENT

MEAL

TRIGLYCINE SULFATE CRYSTAL

VCGS MONITOR

TV09-GPP

GRAV THRSH PLANT CUBE
SHOOTS EXP

BACK PAIN ASSESSMENT

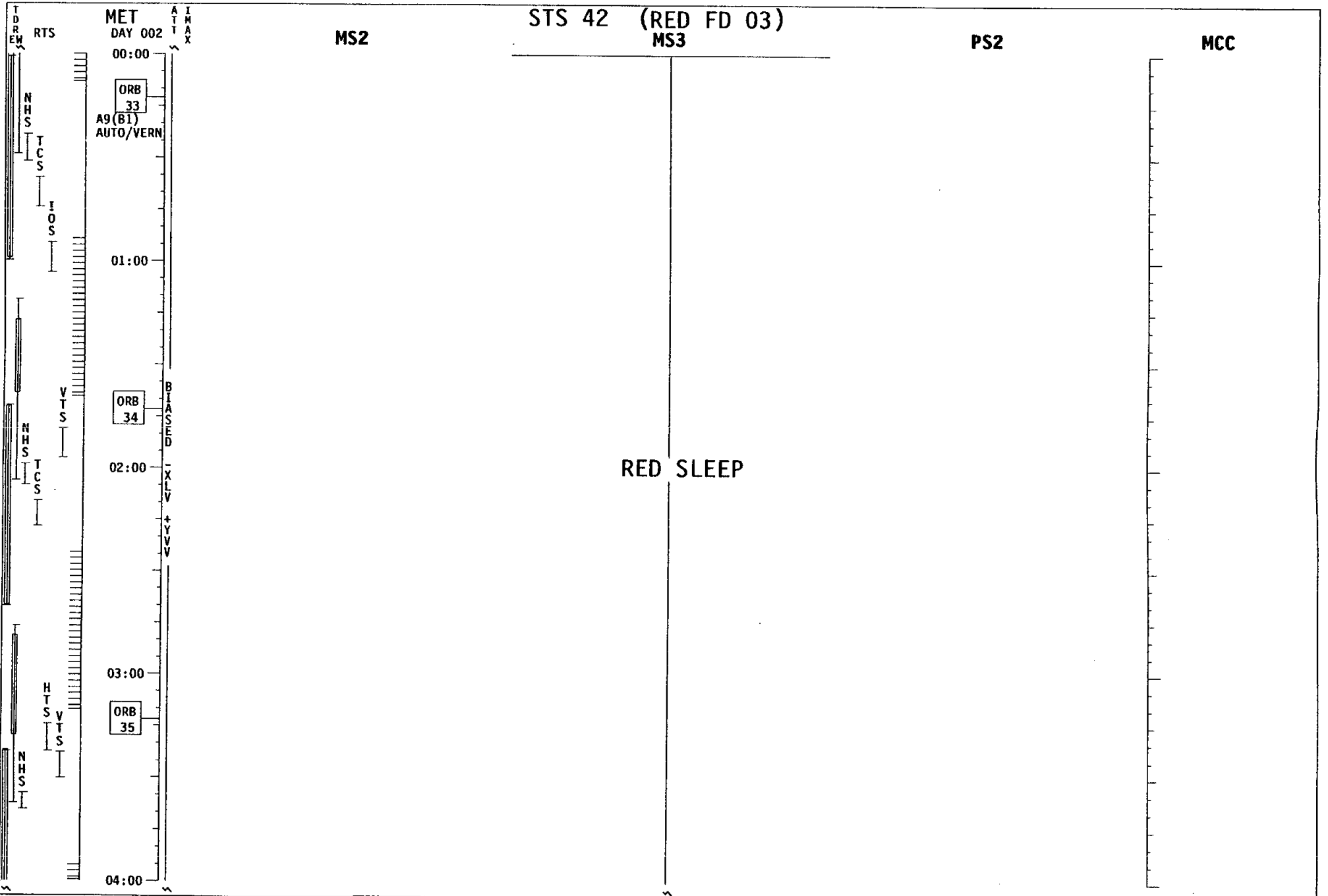
TRIGLYCINE SULFATE CRYSTAL

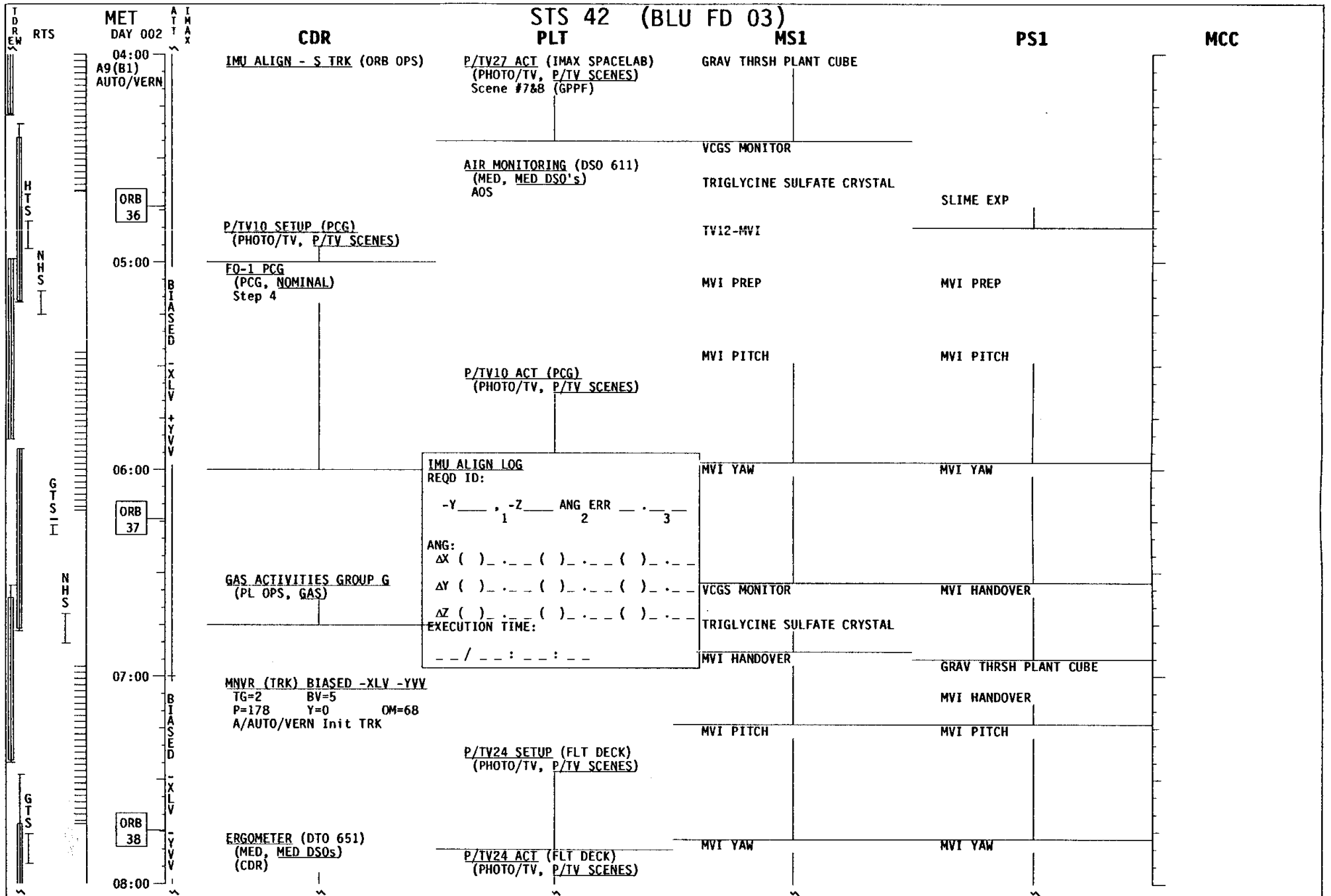
VCGS MONITOR

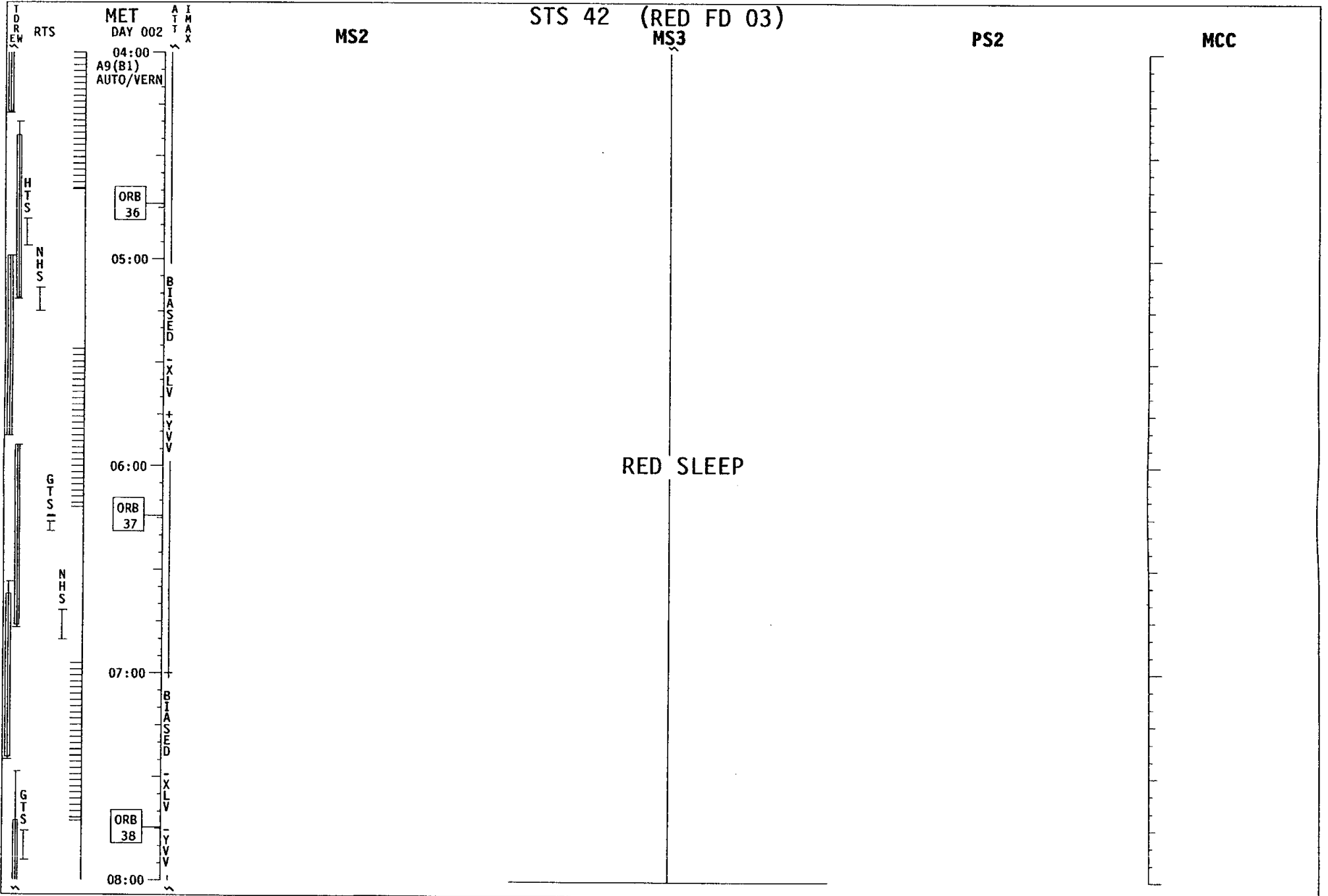
GRAV THRSH PLANT CUBE

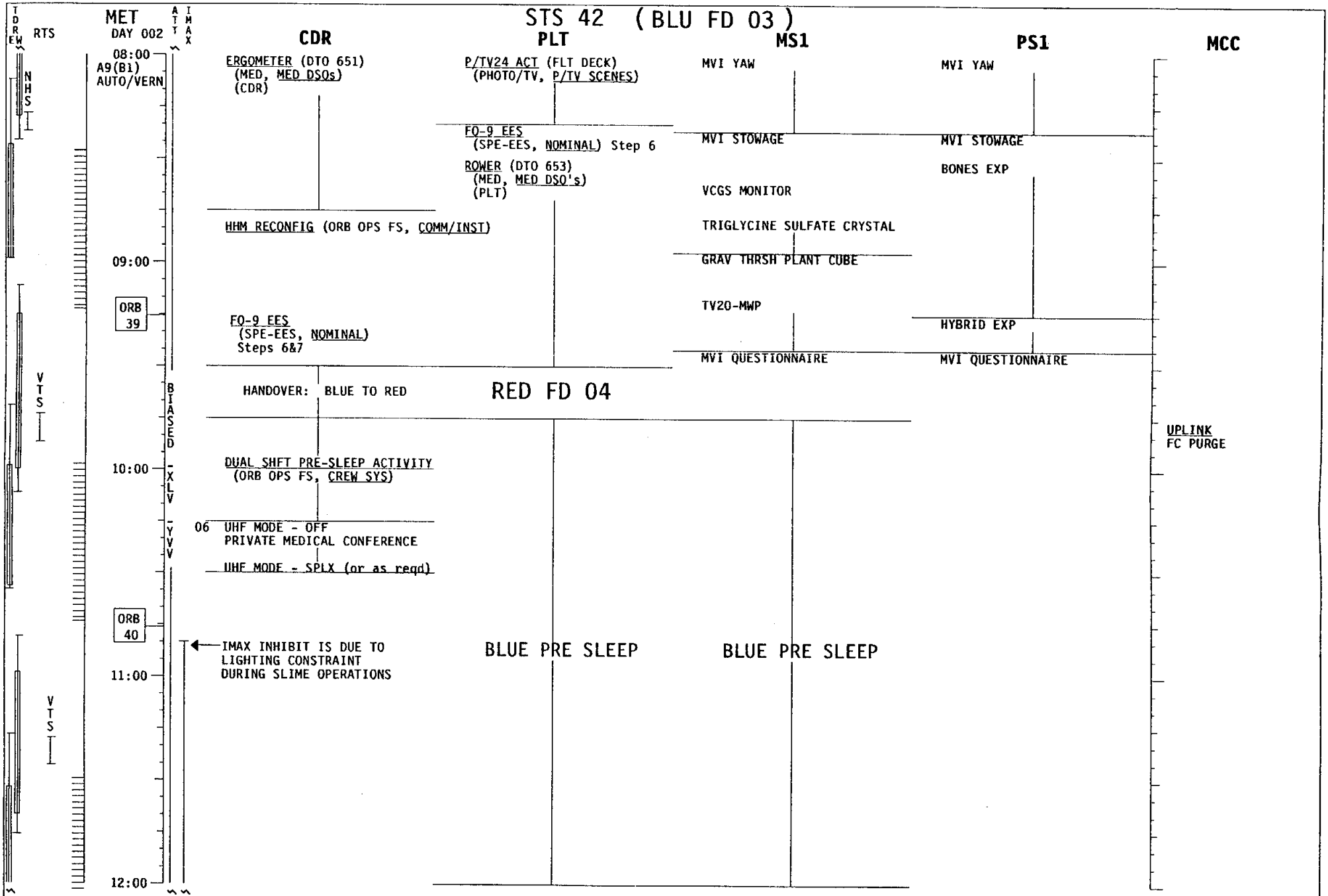
LIGHT STIM PLANT CUBE

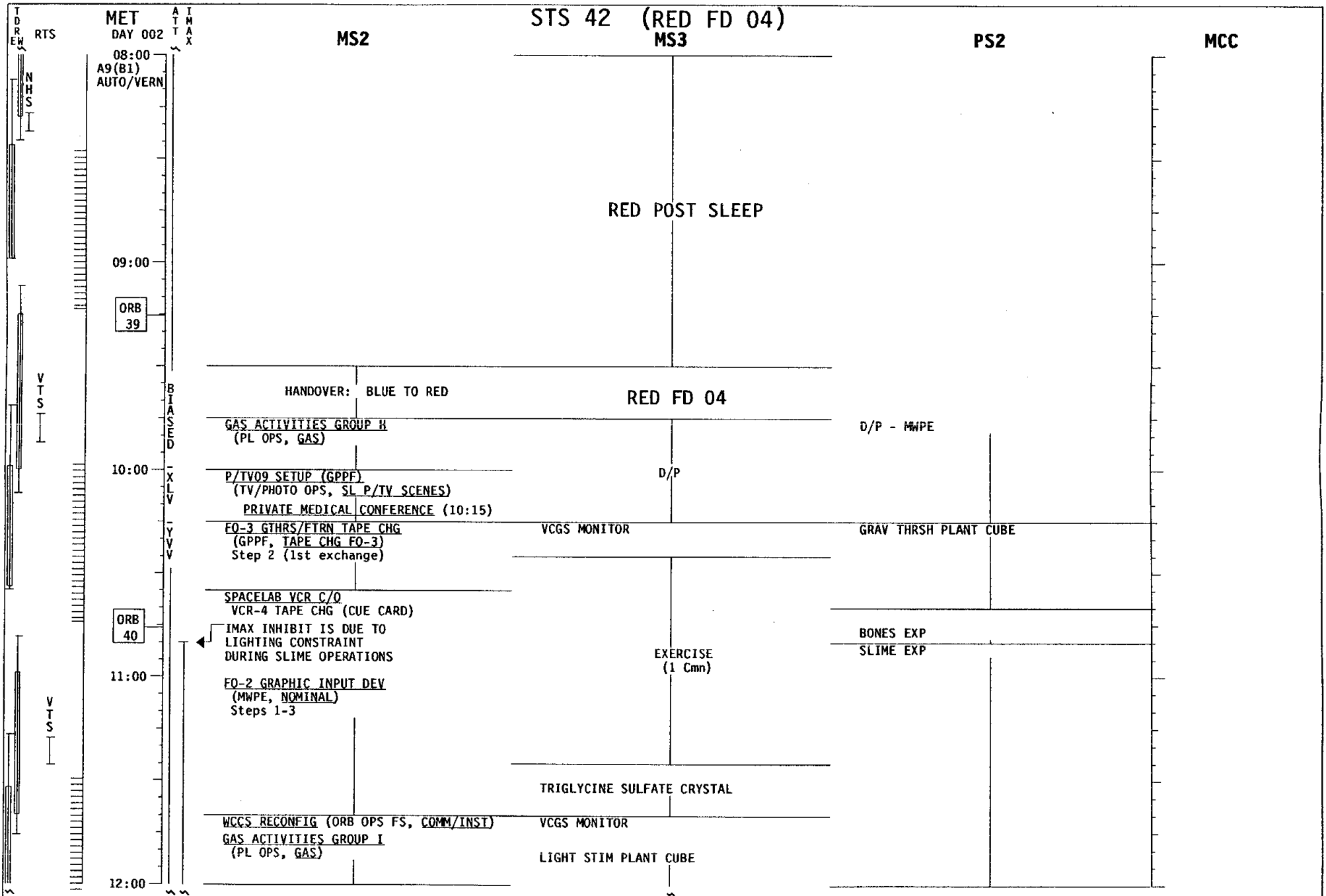
MEAL

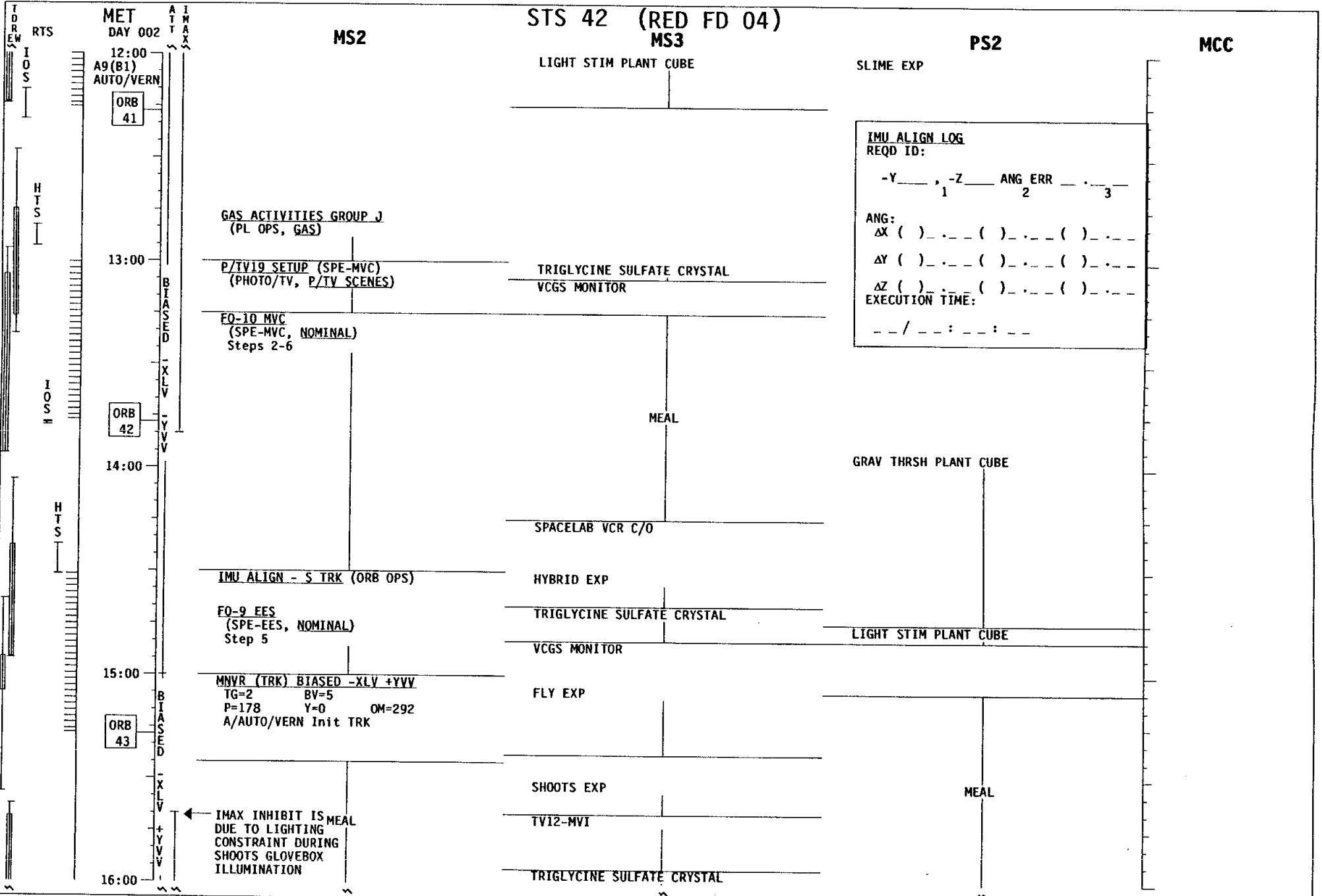












MET DAY 002

STS 42 (RED FD 04)
MS3

MS2

PS2

MCC

12:00
A9(B1)
AUTO/VERN

ORB 41

GAS ACTIVITIES GROUP J
(PL OPS, GAS)

LIGHT STIM PLANT CUBE

SLIME EXP

IMU ALIGN LOG
REQD ID:

-Y , -Z ANG ERR
 1 2 3

ANG:
ΔX () . . . () . . . () . . .

ΔY () . . . () . . . () . . .

ΔZ () . . . () . . . () . . .

EXECUTION TIME:
-- / -- : -- : --

13:00

P/TV19 SETUP (SPE-MVC)
(PHOTO/TV, P/TV SCENES)

TRIGLYCINE SULFATE CRYSTAL
VCGS MONITOR

FO-10 MVC
(SPE-MVC, NOMINAL)
Steps 2-6

MEAL

ORB 42

14:00

SPACELAB VCR C/O

GRAV THRSH PLANT CUBE

IMU ALIGN - S TRK (ORB OPS)

HYBRID EXP

FO-9 EES
(SPE-EES, NOMINAL)
Step 5

TRIGLYCINE SULFATE CRYSTAL

LIGHT STIM PLANT CUBE

15:00

MNVF (TRK) BIASED -XLV +YVV
TG=2 BV=5
P=178 Y=0 OM=292
A/AUTO/VERN Init TRK

FLY EXP

ORB 43

16:00

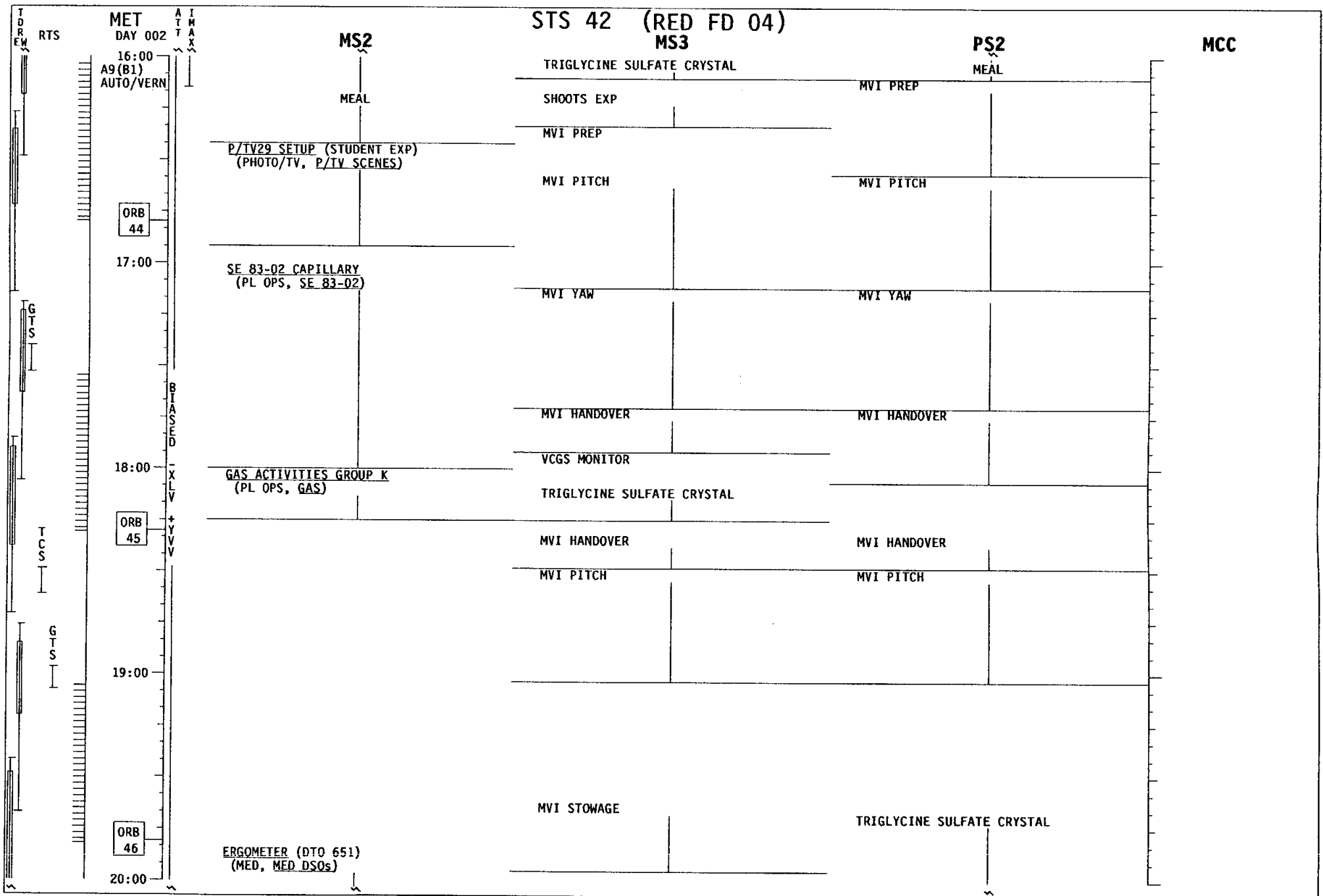
SHOOTS EXP

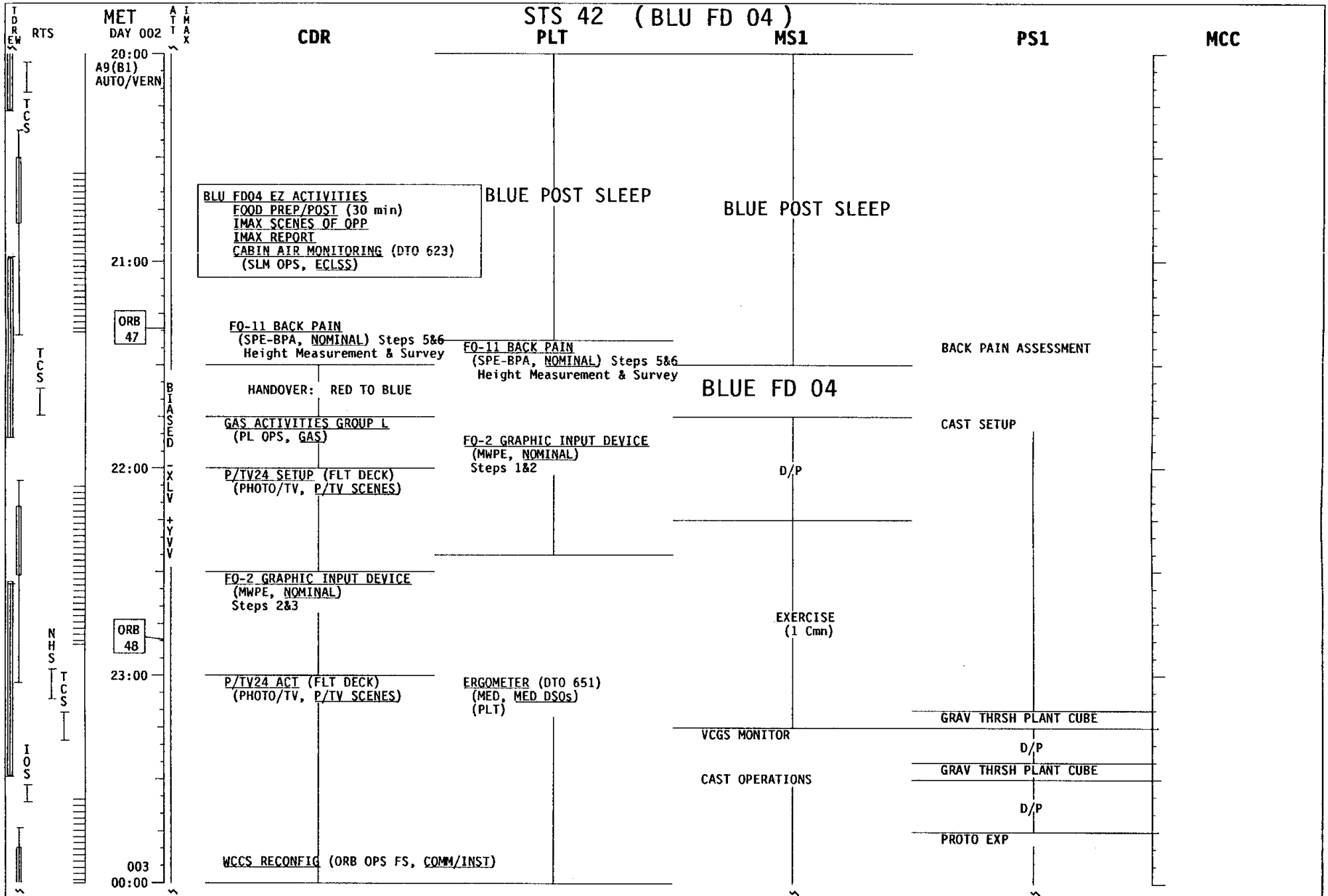
MEAL

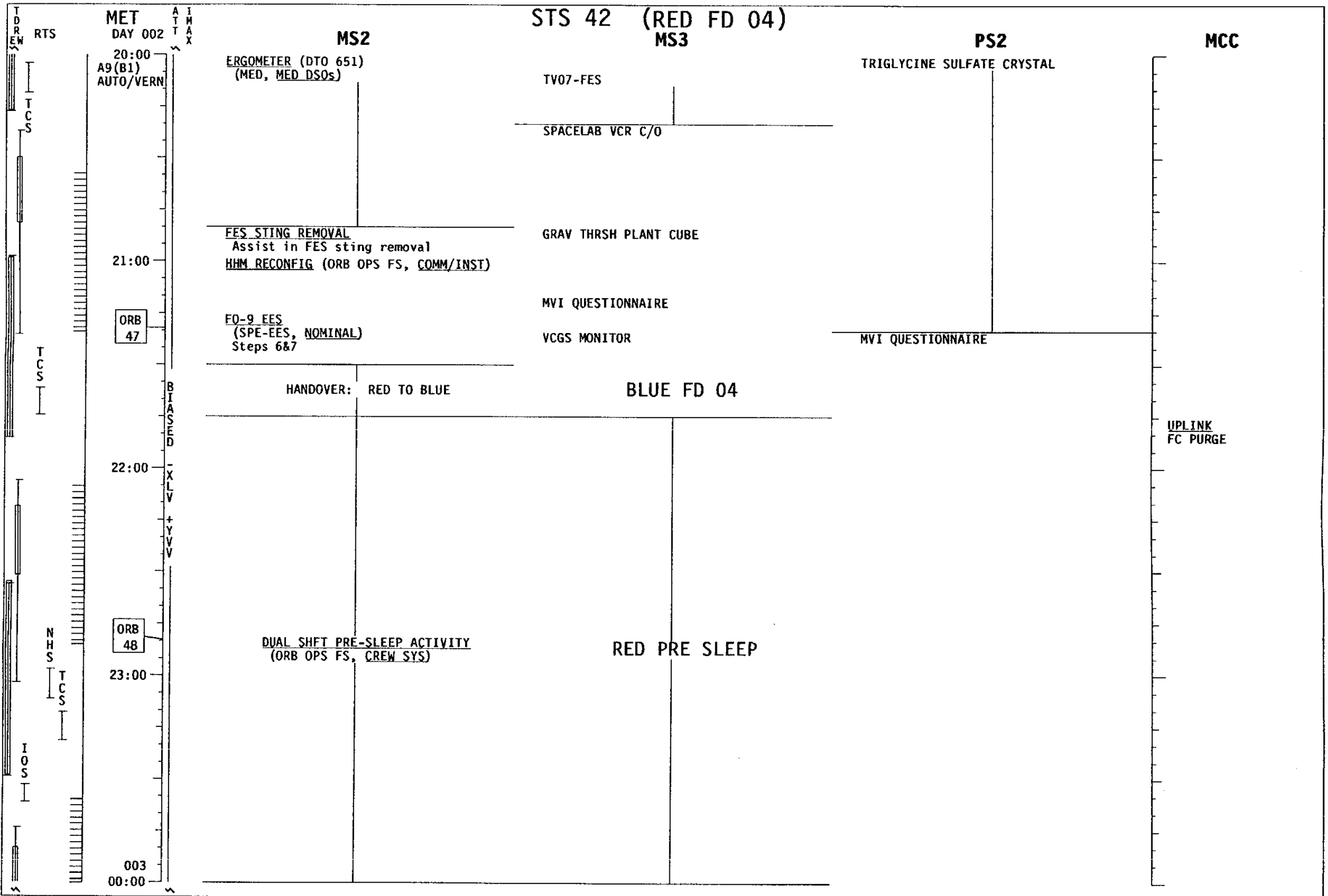
← IMAX INHIBIT IS MEAL
DUE TO LIGHTING
CONSTRAINT DURING
SHOOTS GLOVEBOX
ILLUMINATION

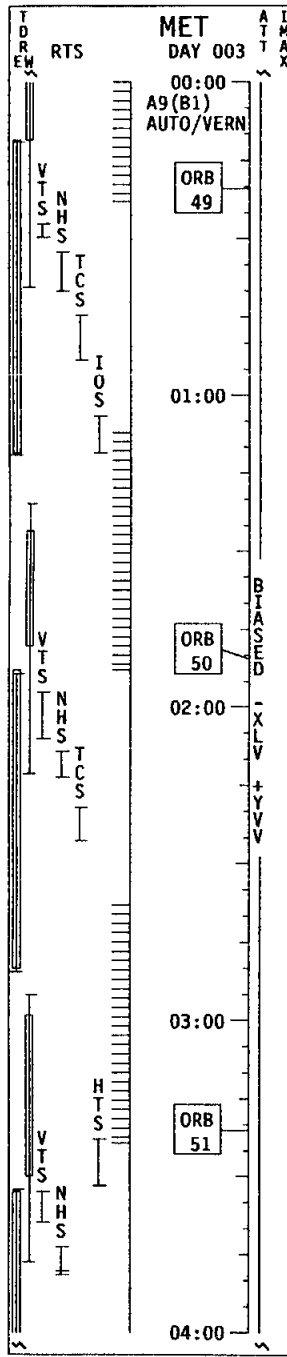
TV12-MVI

TRIGLYCINE SULFATE CRYSTAL









MET
DAY 003
00:00
A9(B1)
AUTO/VERN

ORB
49

01:00

ORB
50

02:00

03:00

ORB
51

04:00

STS 42 (BLU FD 04)
PLT

CDR

MS1

PS1

MCC

FO-9 EES
(SPE-EES, NOMINAL)
Step 9

IMU ALIGN LOG
REQD ID:
-Y ___ , -Z ___ ANG ERR ___ . ___
 1 2 3

ANG:
ΔX () . . . () . . . () . . .
ΔY () . . . () . . . () . . .
ΔZ () . . . () . . . () . . .

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

FO-9 EES
(SPE-EES, NOMINAL)
Step 5

MEAL

MEAL

MEAL

MEAL

FO-5 TRANSFER CUBES
(GPPF, TRANSFER FO-5)
Steps 1&2

IMU ALIGN - S TRK (ORB OPS)

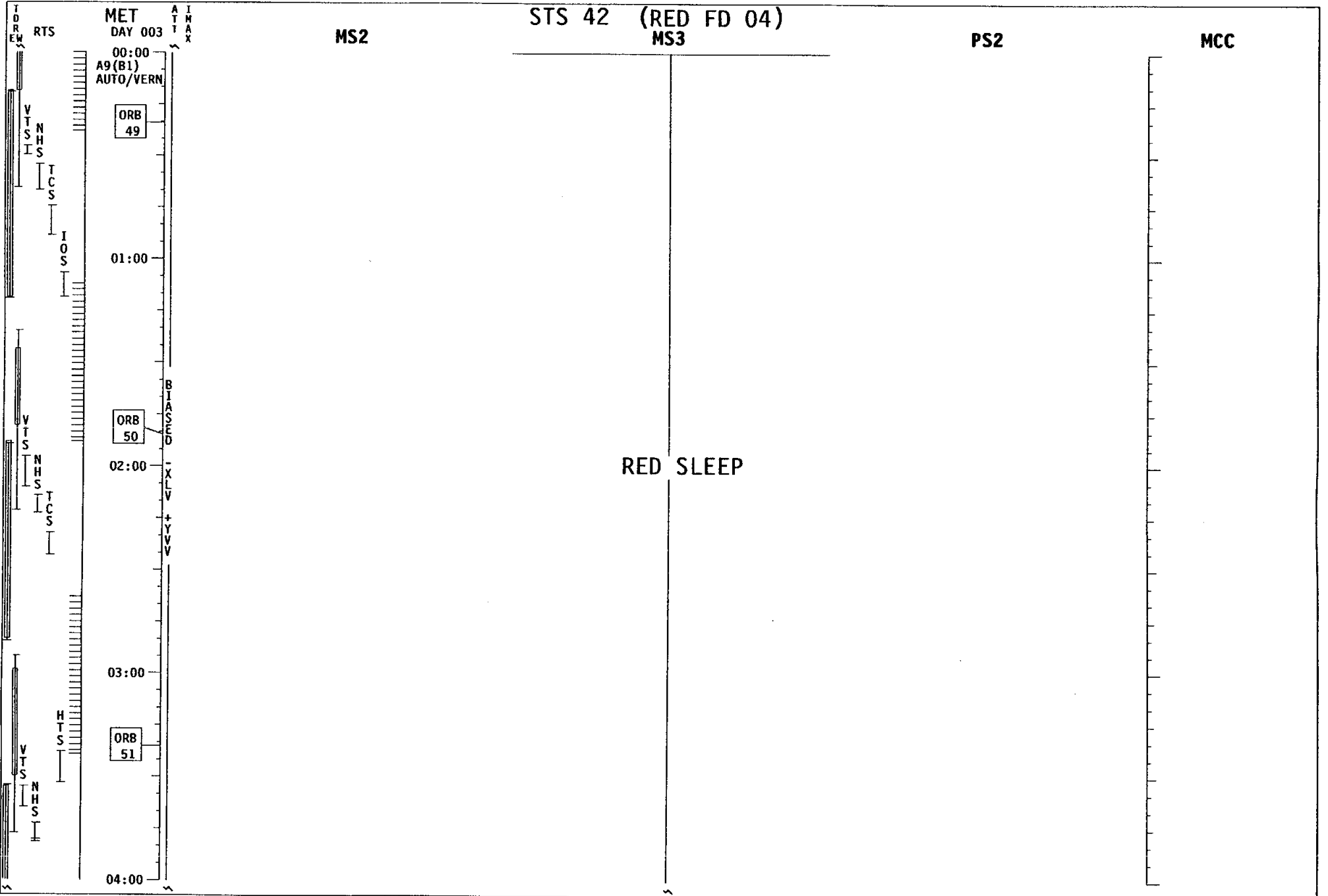
VCGS MONITOR

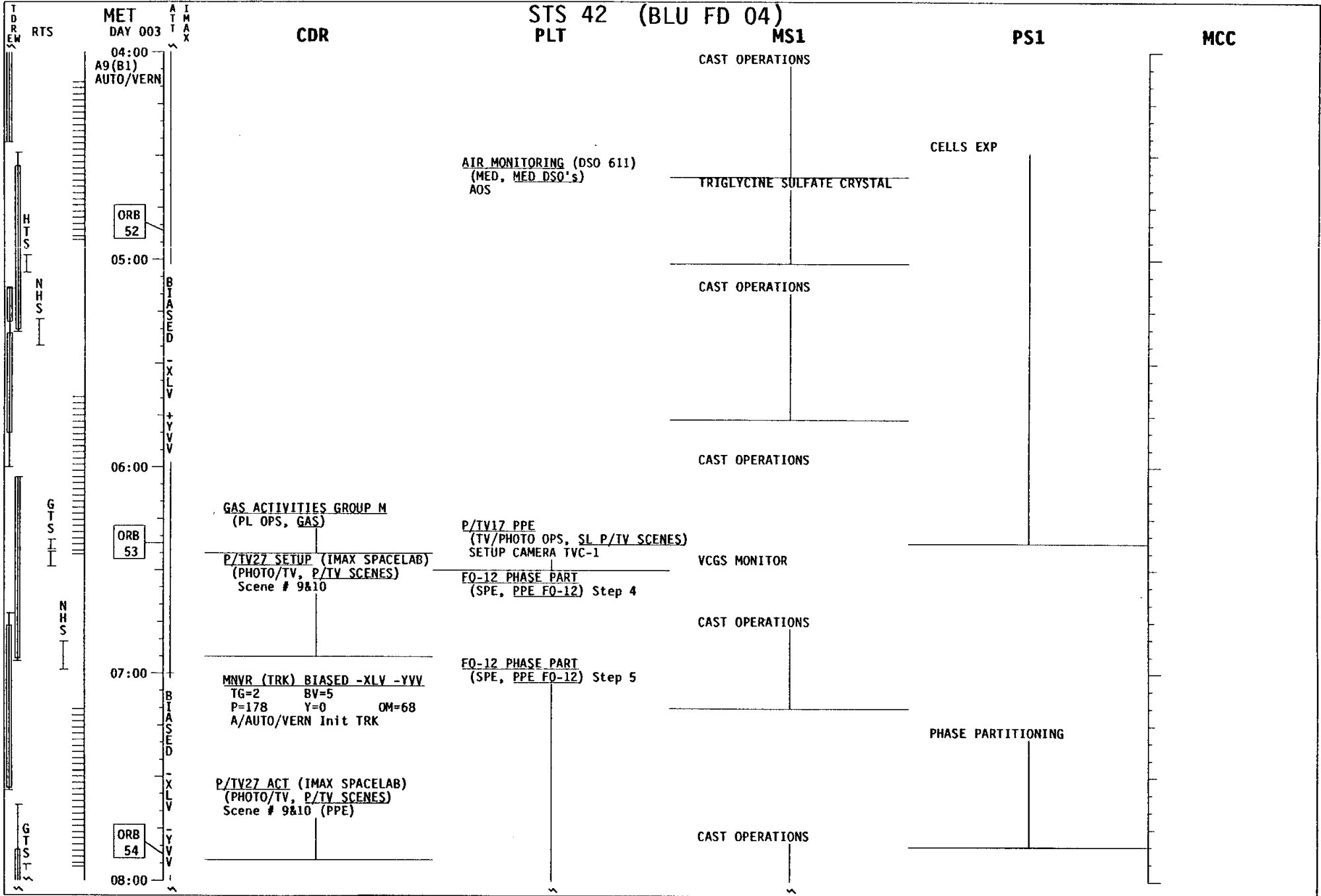
PROTO EXP

CELLS EXP

SPACELAB VCR C/O

CAST OPERATIONS





TDR EW
 RTS
 MET DAY 003
 04:00
 A9 (B1)
 AUTO/VERN
 HTS
 NHTS
 BIASED
 -XLV
 +YV
 05:00
 GTS
 NHTS
 06:00
 GTS
 NHTS
 07:00
 BIASED
 -XLV
 +YV
 08:00
 GTS
 NHTS

CDR

STS 42 (BLU FD 04)
 PLT

MS1

PS1

MCC

CAST OPERATIONS

CELLS EXP

AIR MONITORING (DSO 611)
 (MED, MED_DSO's)
 AOS

TRIGLYCINE SULFATE CRYSTAL

ORB 52

CAST OPERATIONS

CAST OPERATIONS

GAS ACTIVITIES GROUP M
 (PL OPS, GAS)

P/TV17 PPE
 (TV/PHOTO OPS, SL P/TV SCENES)
 SETUP CAMERA TVC-1

ORB 53

P/TV27 SETUP (IMAX SPACELAB)
 (PHOTO/TV, P/TV SCENES)
 Scene # 9&10

FO-12 PHASE PART
 (SPE, PPE FO-12) Step 4

VCGS MONITOR

CAST OPERATIONS

07:00

MNVN (TRK) BIASED -XLV -YV
 TG=2 BV=5
 P=178 Y=0 OM=68
 A/AUTO/VERN Init TRK

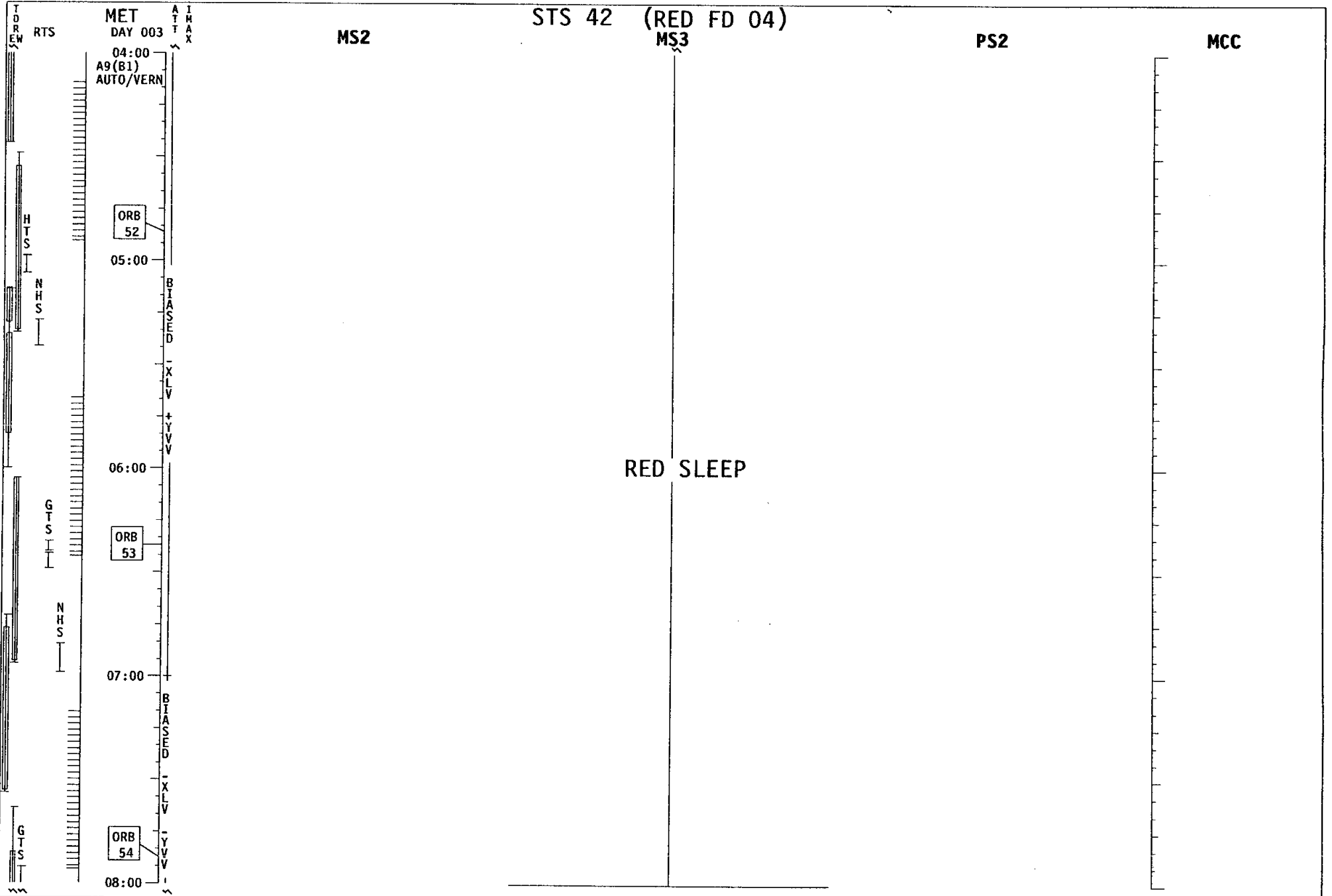
FO-12 PHASE PART
 (SPE, PPE FO-12) Step 5

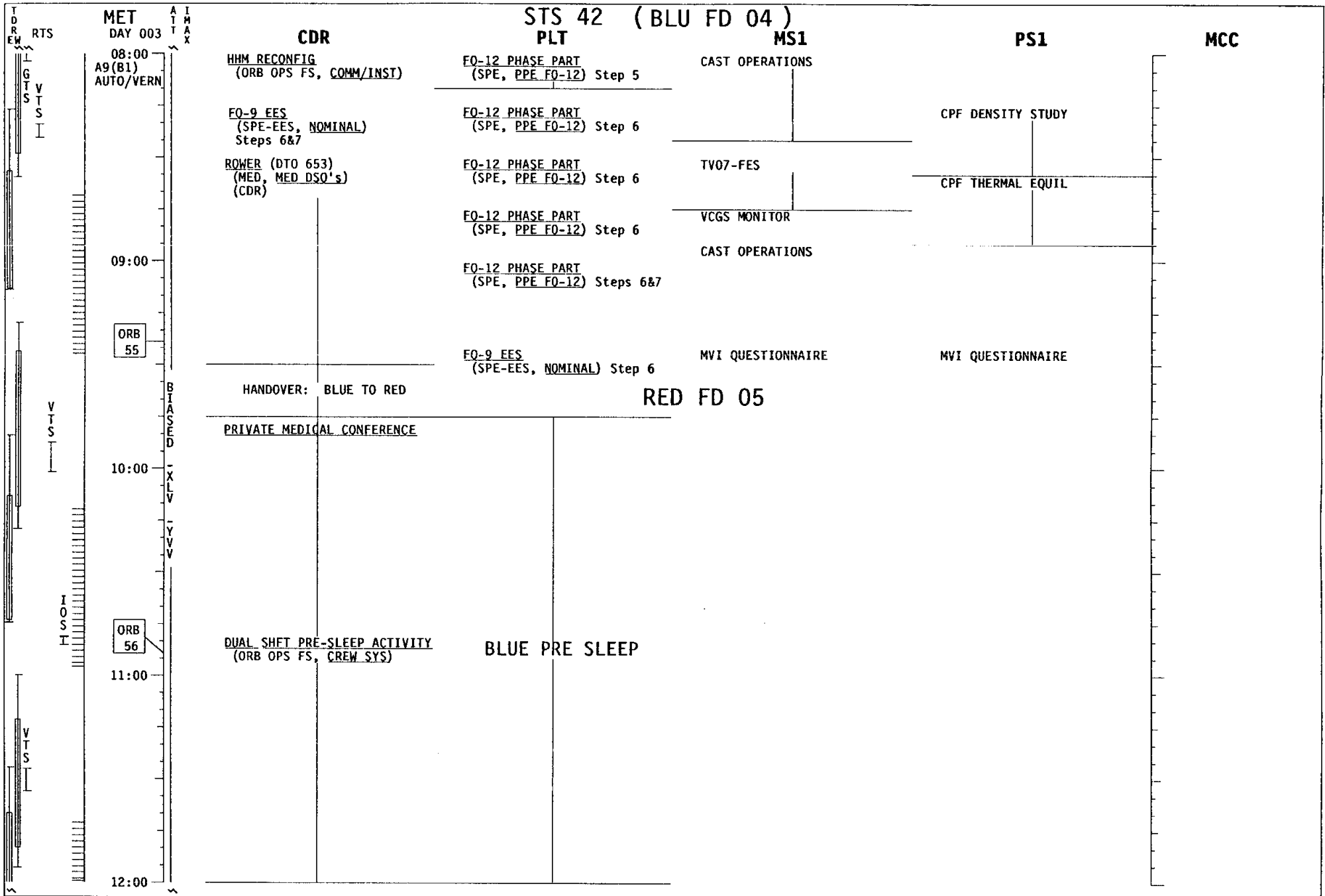
PHASE PARTITIONING

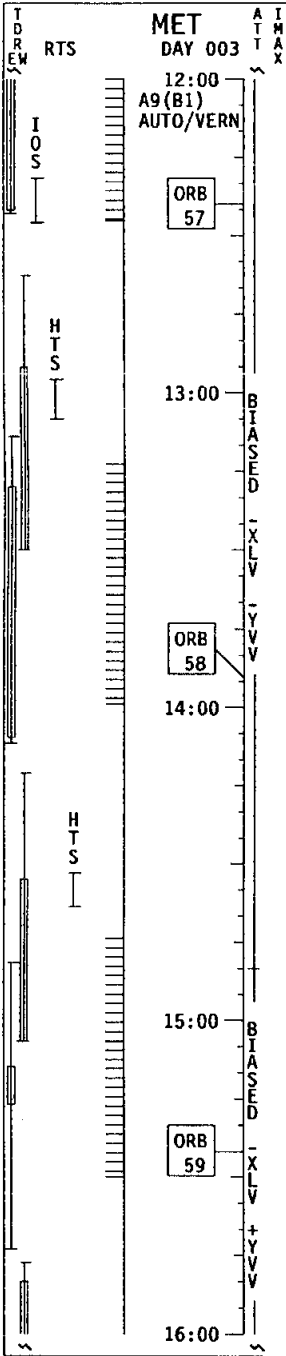
ORB 54

P/TV27 ACT (IMAX SPACELAB)
 (PHOTO/TV, P/TV SCENES)
 Scene # 9&10 (PPE)

CAST OPERATIONS







CDR

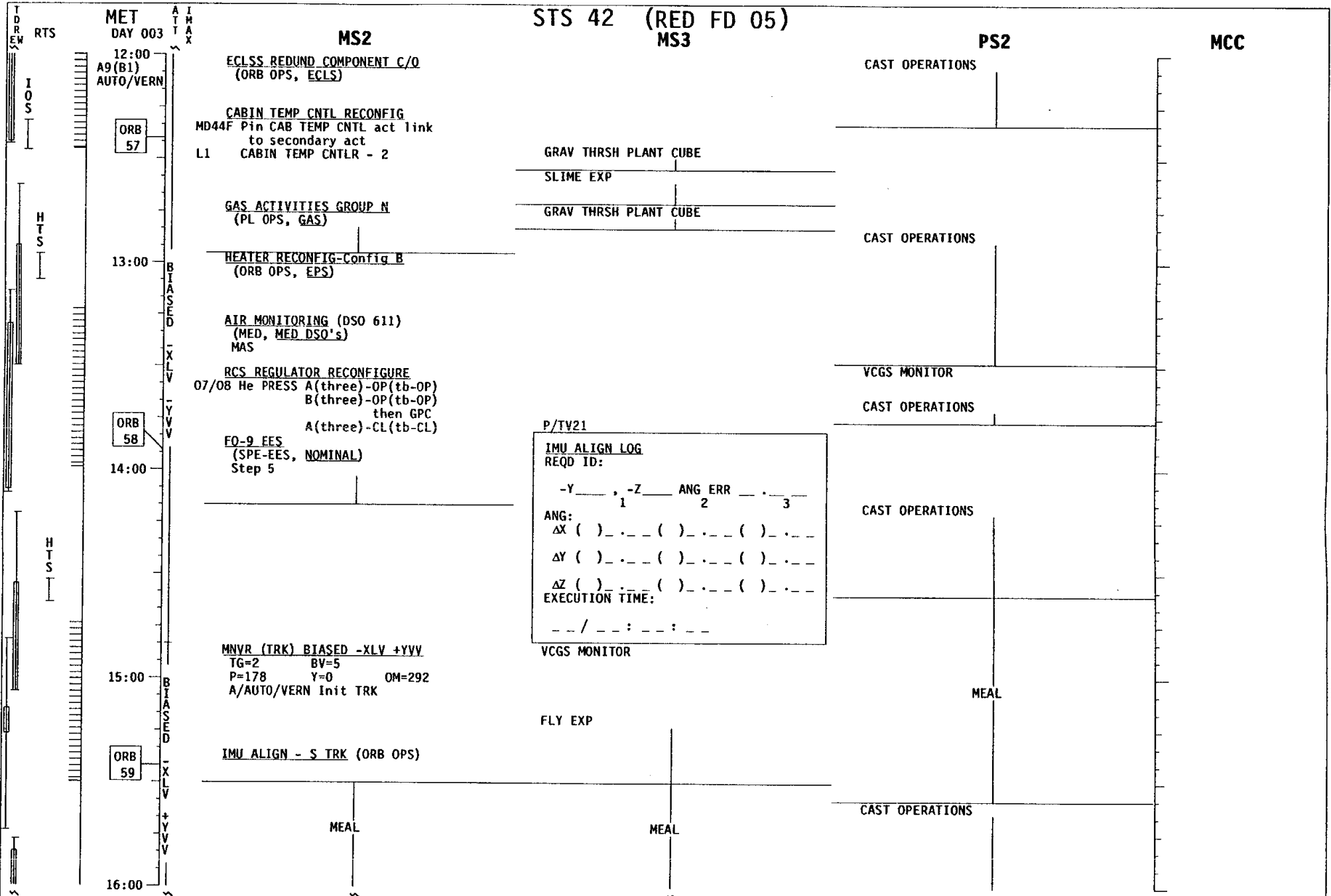
STS 42 (BLU FD 04)
PLT MS1

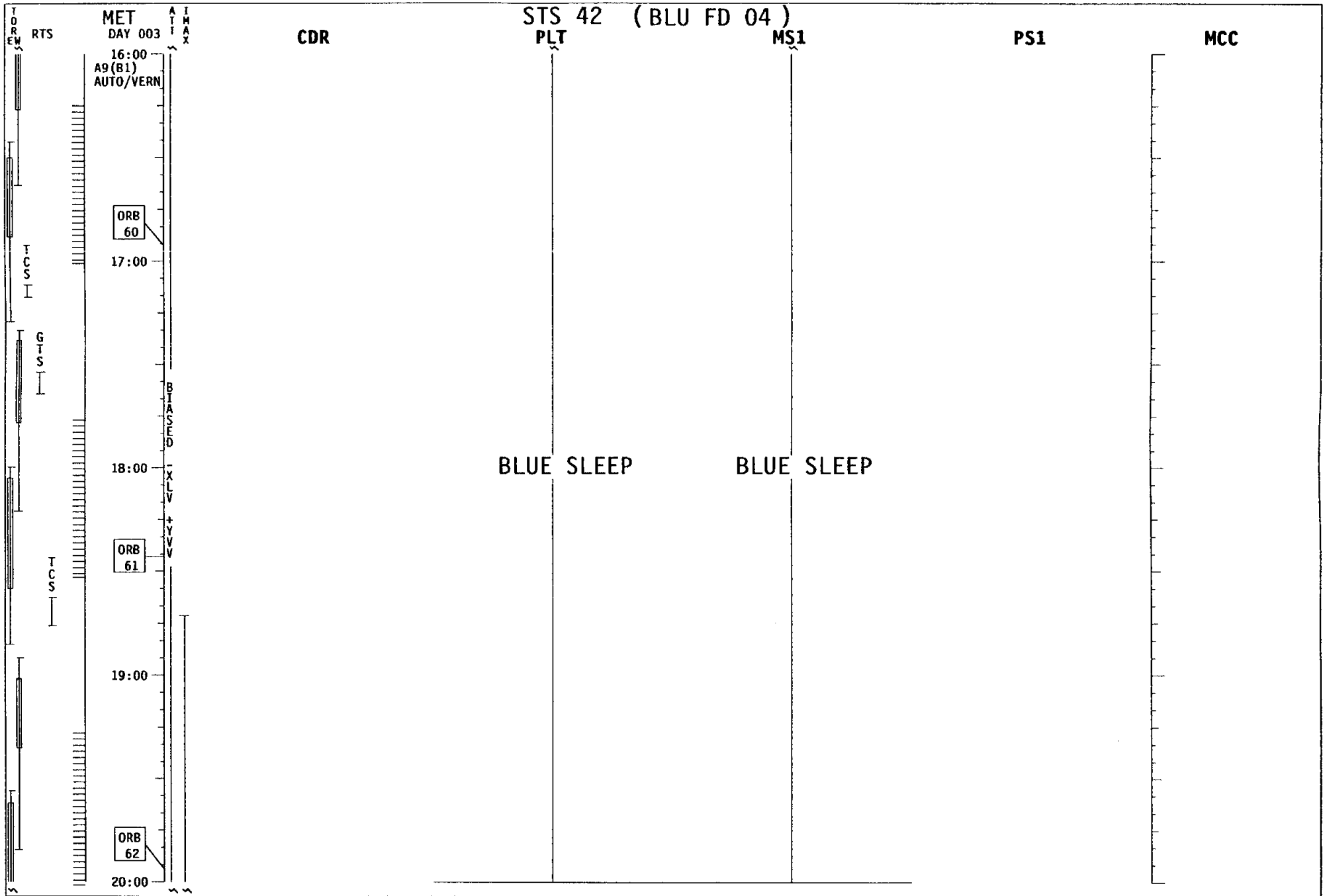
PS1

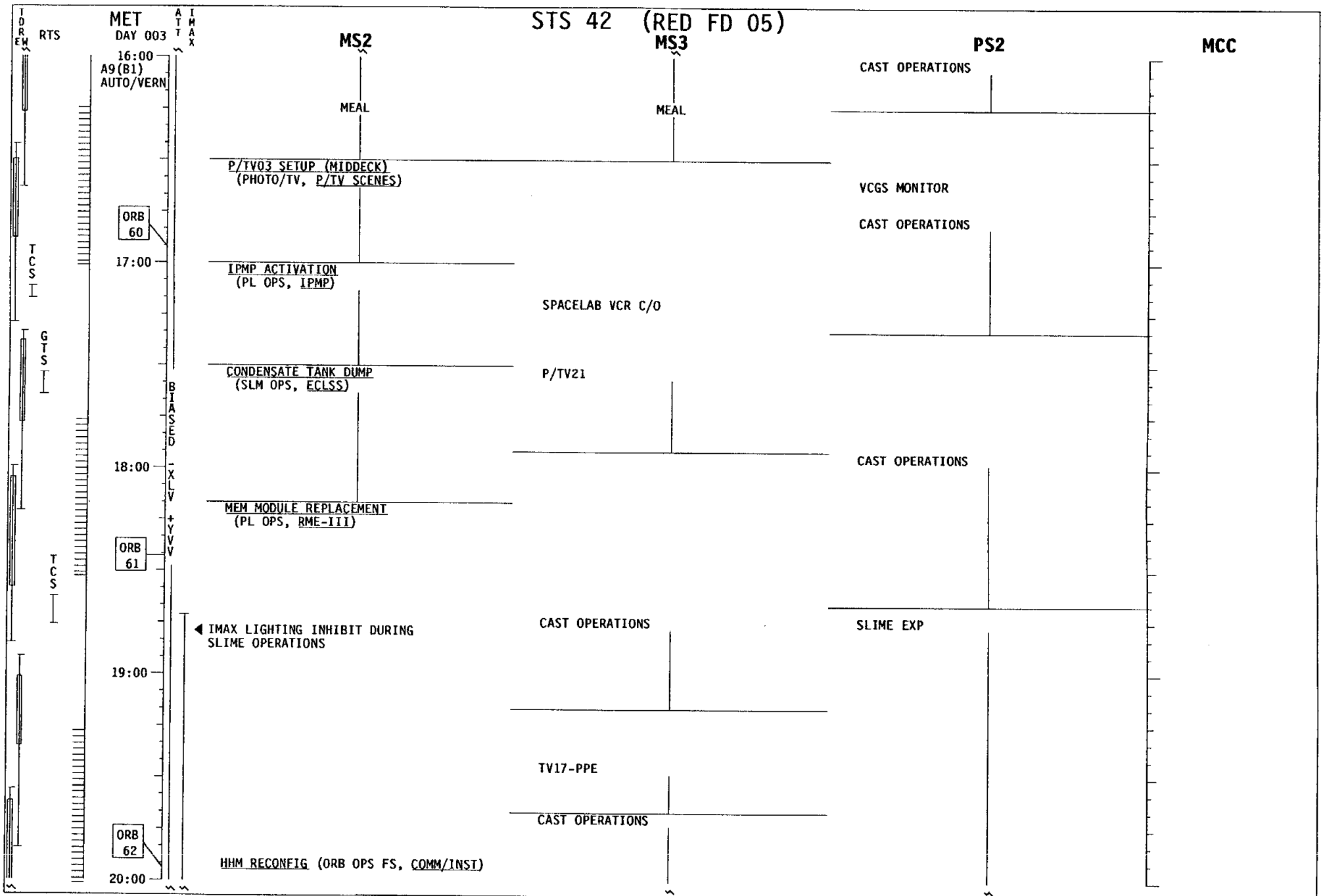
MCC

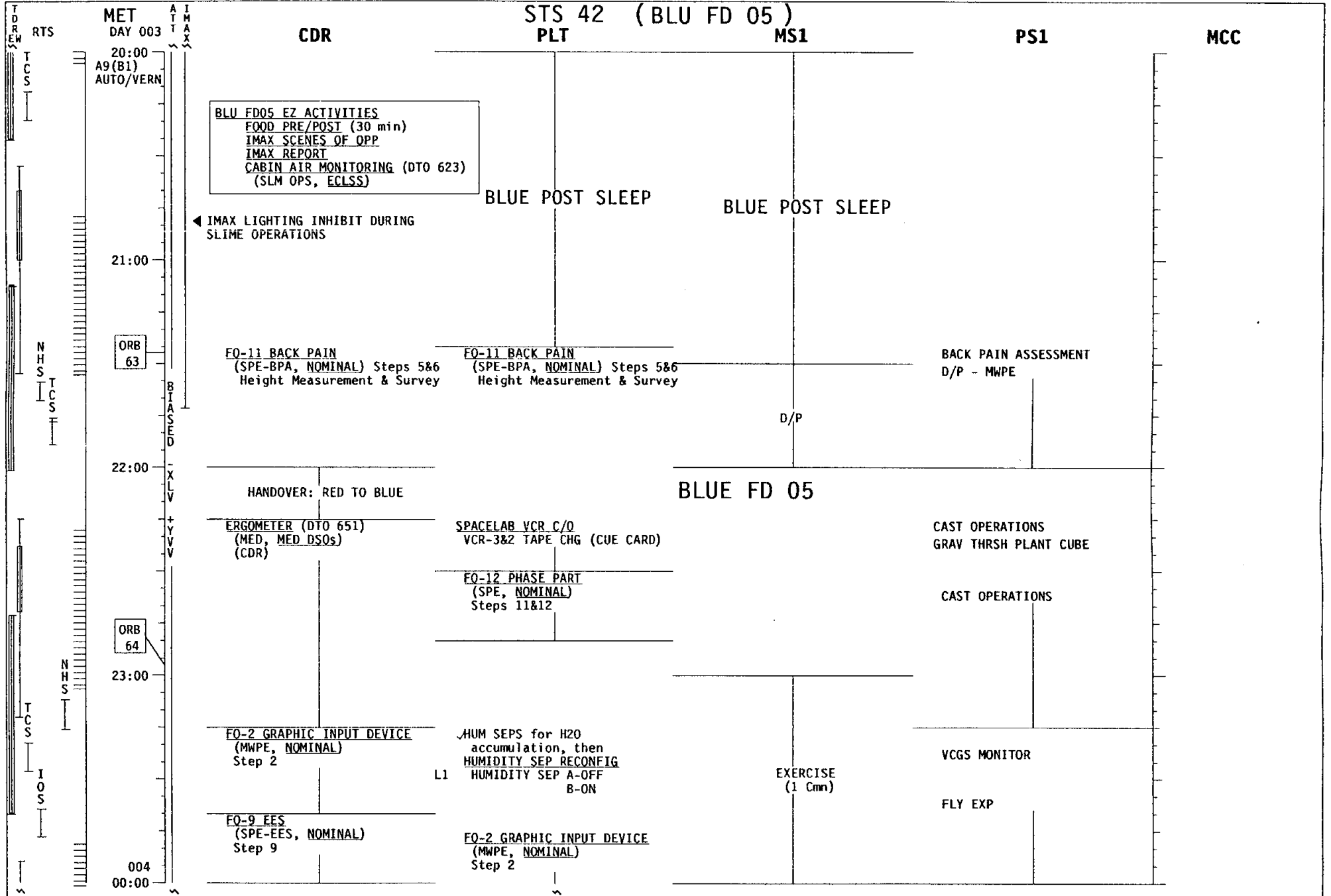
BLUE SLEEP

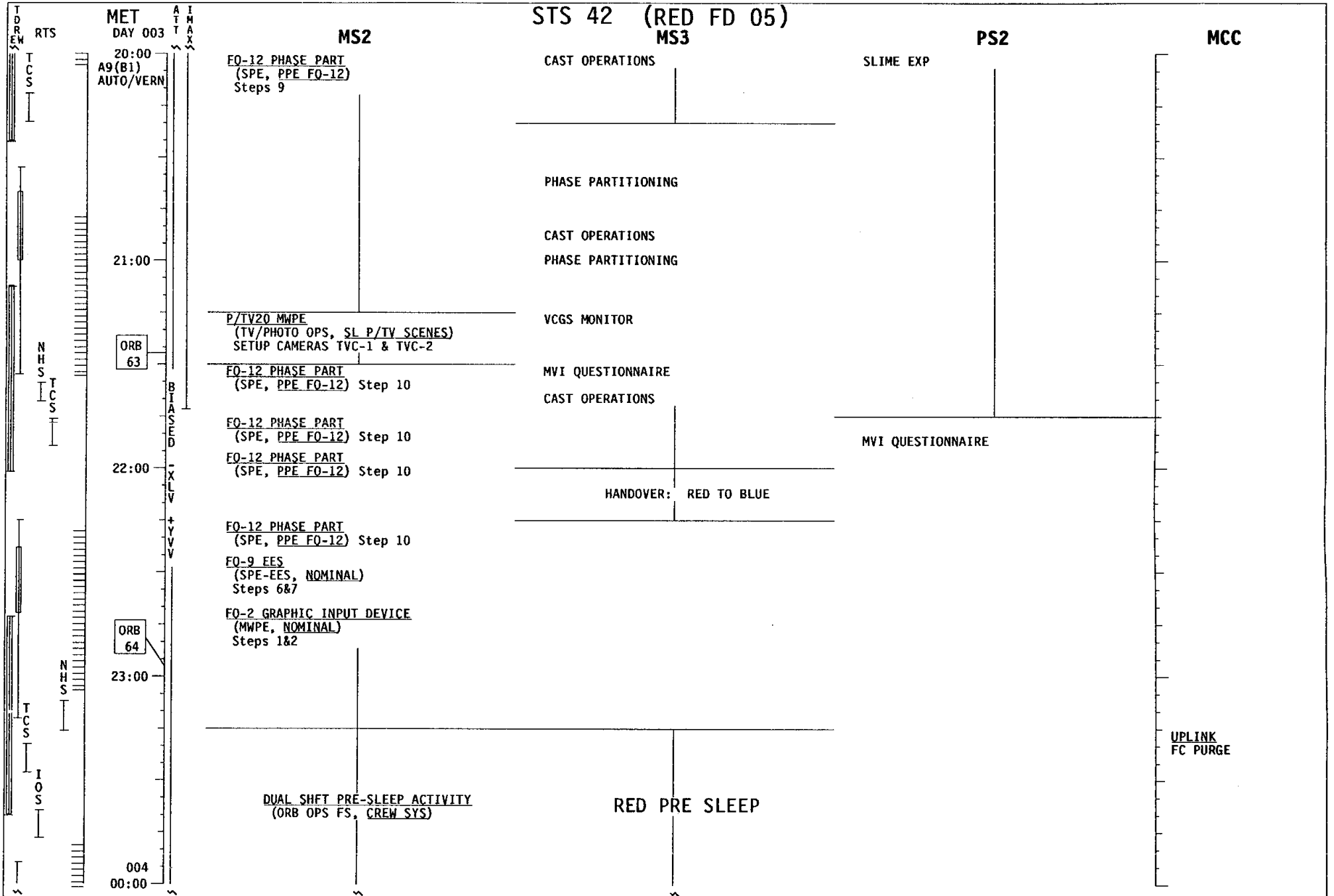
BLUE SLEEP

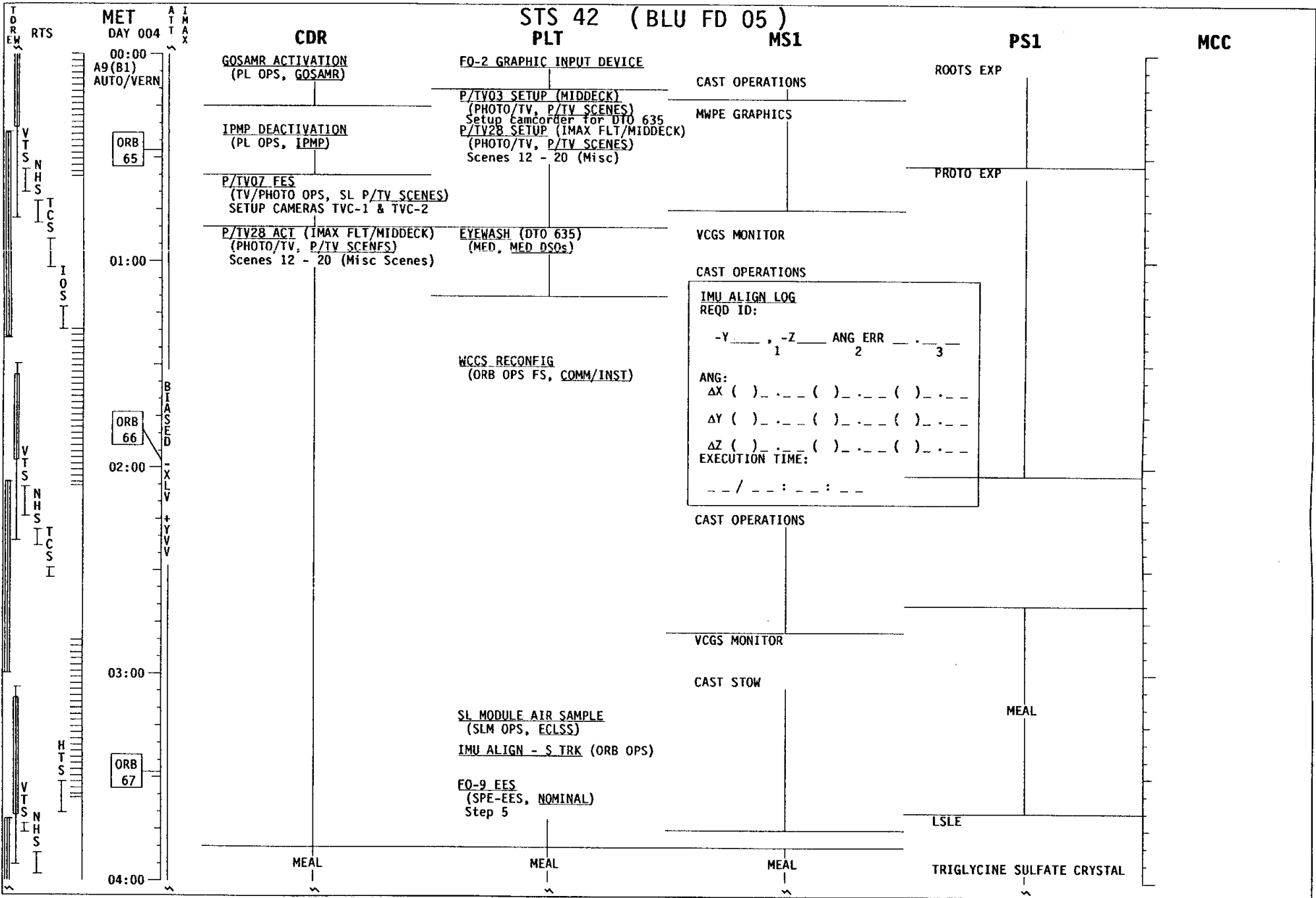


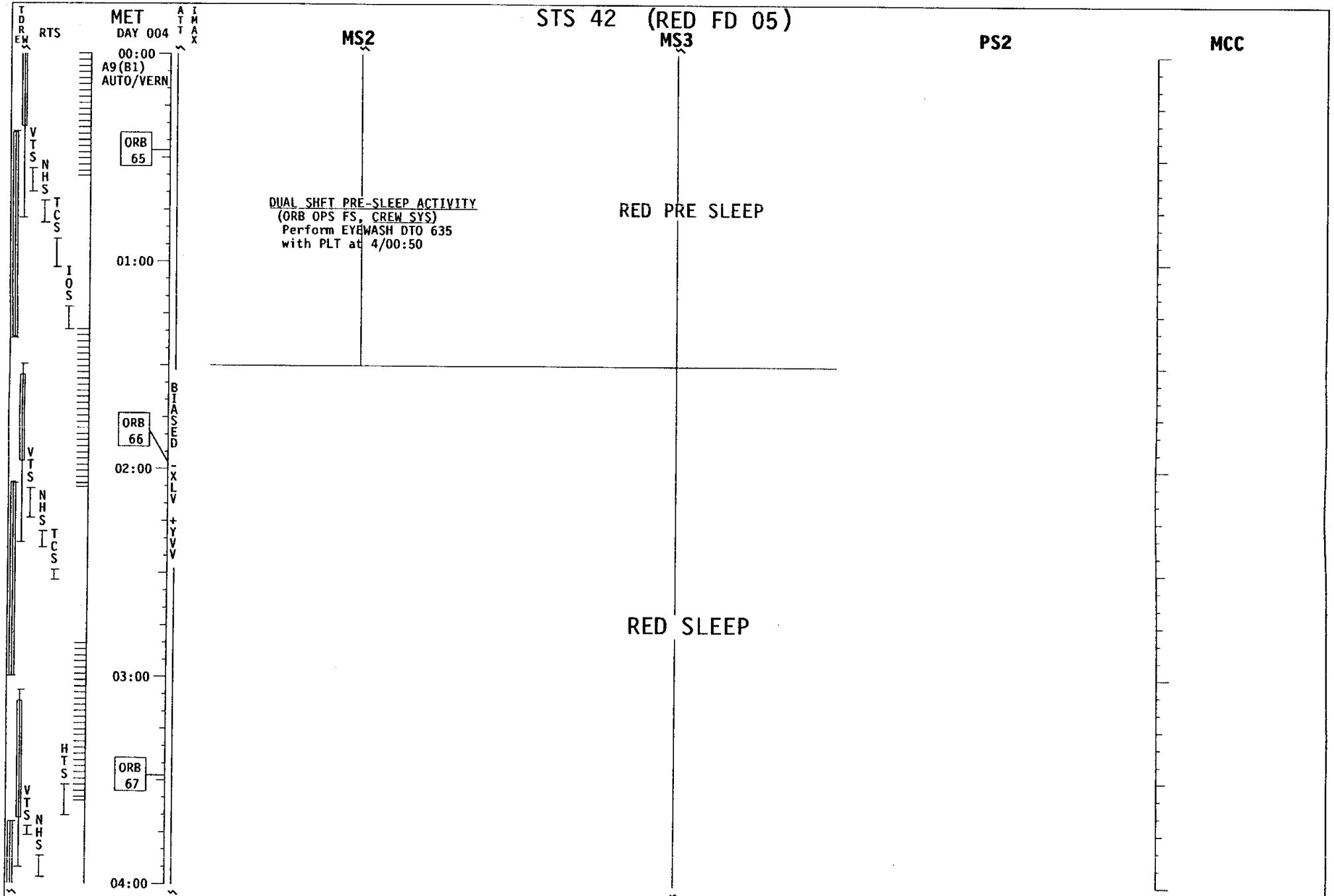


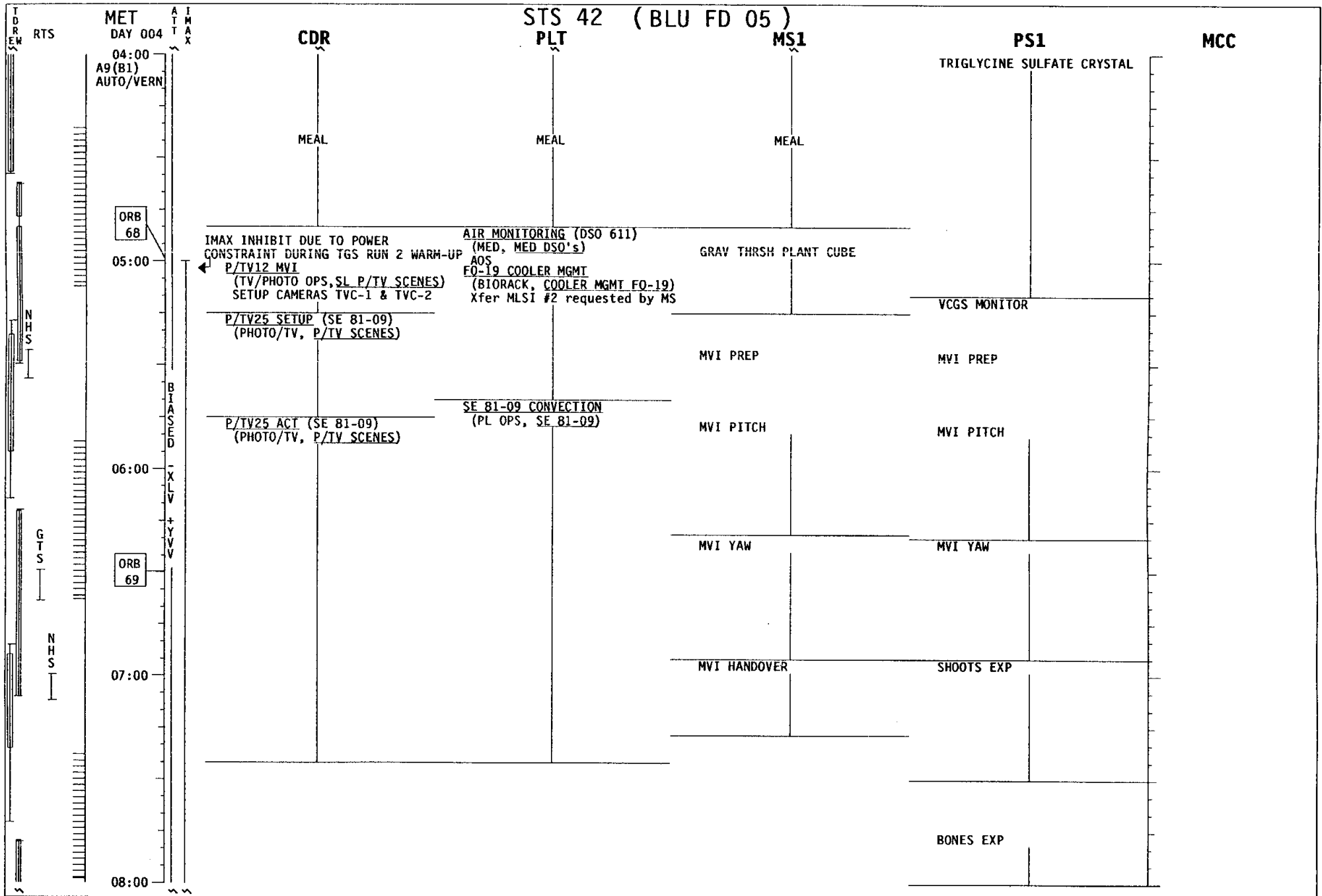


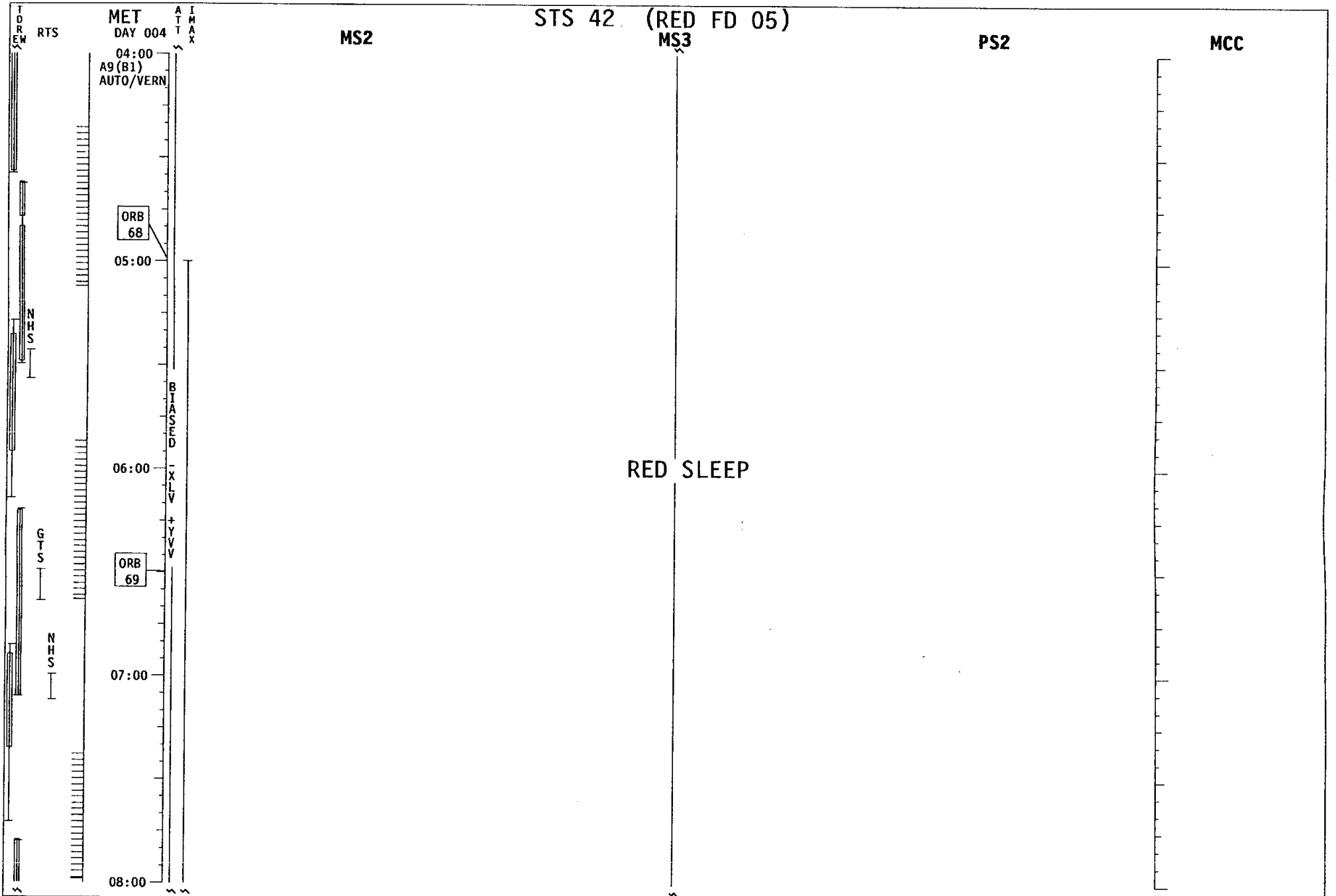


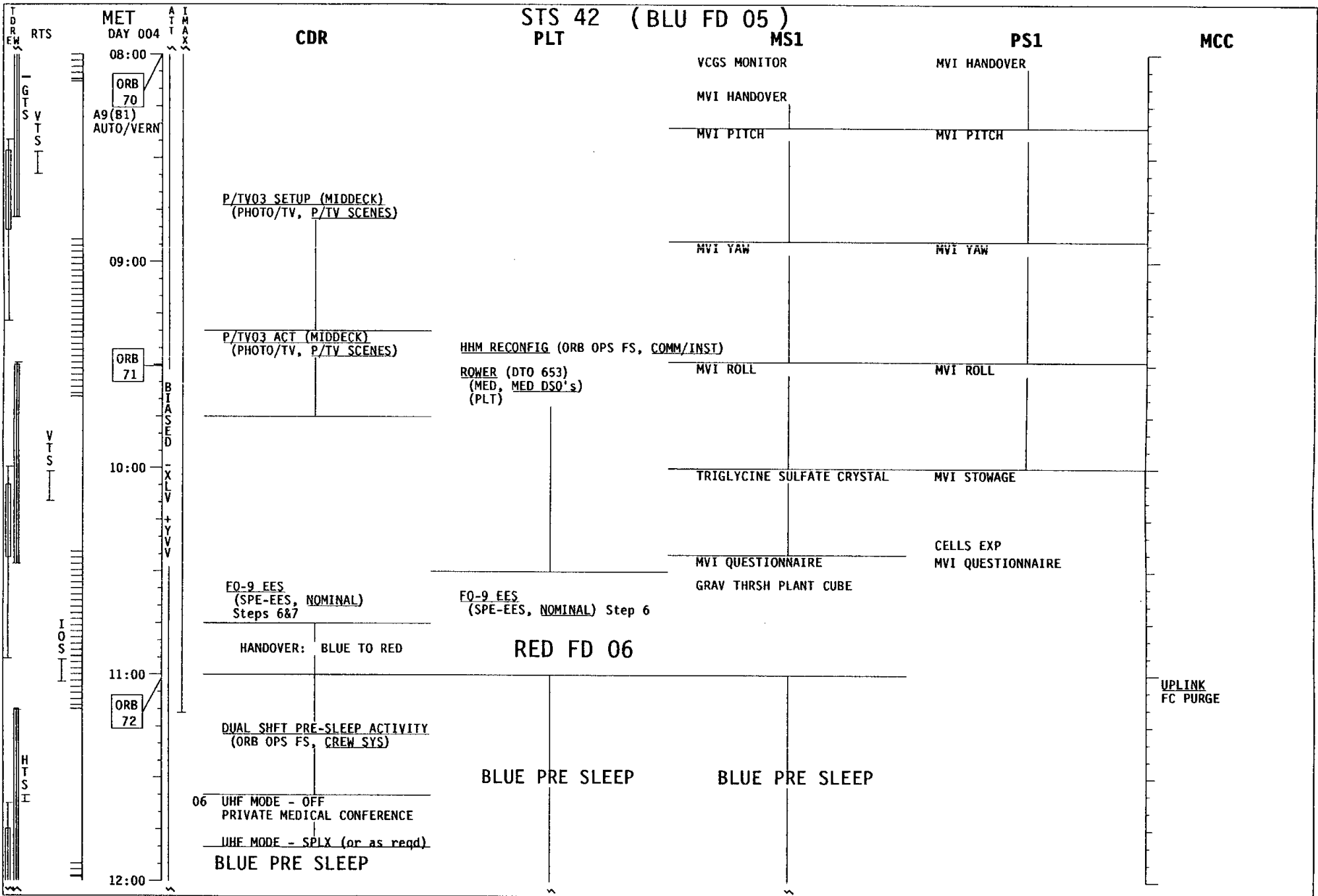


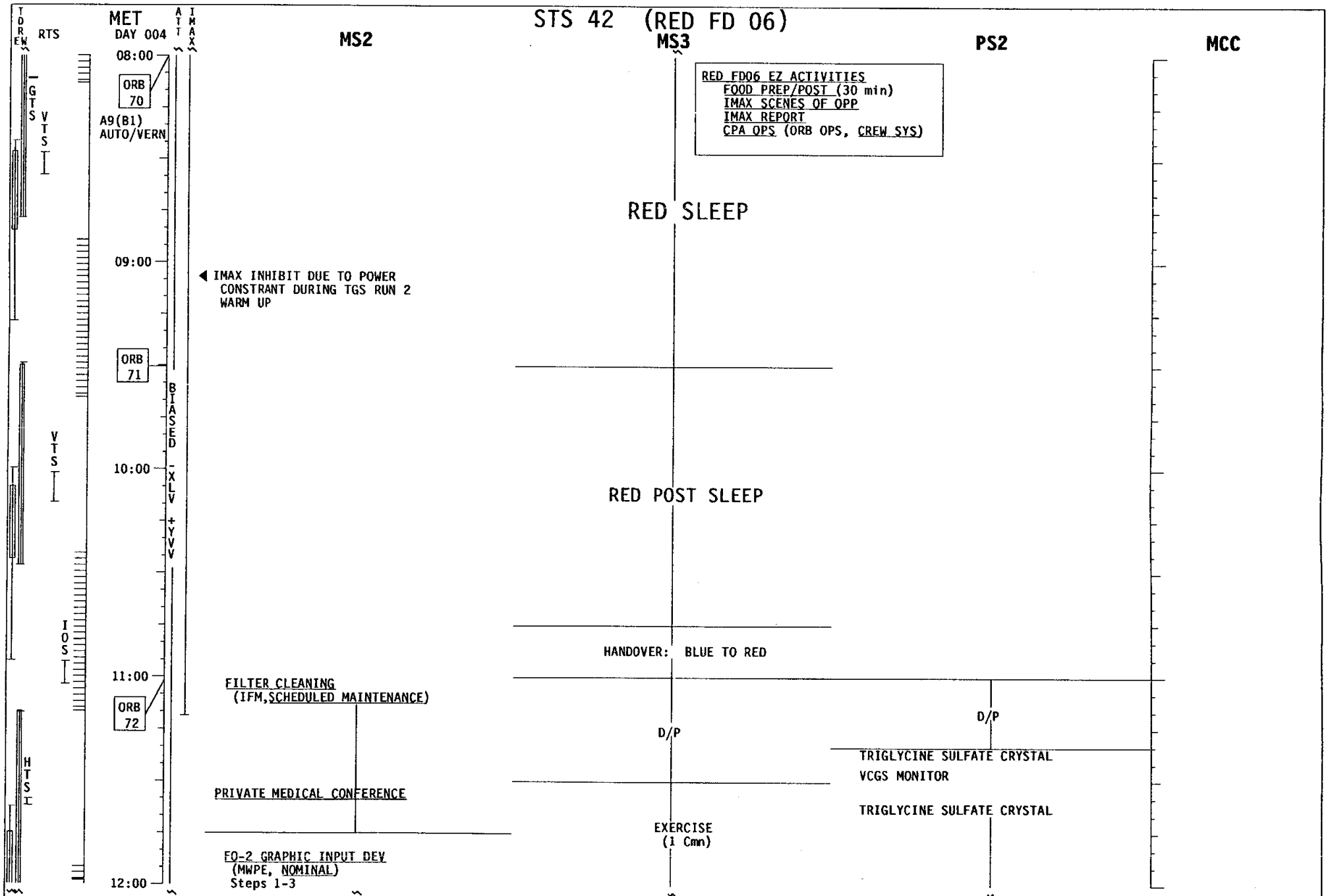


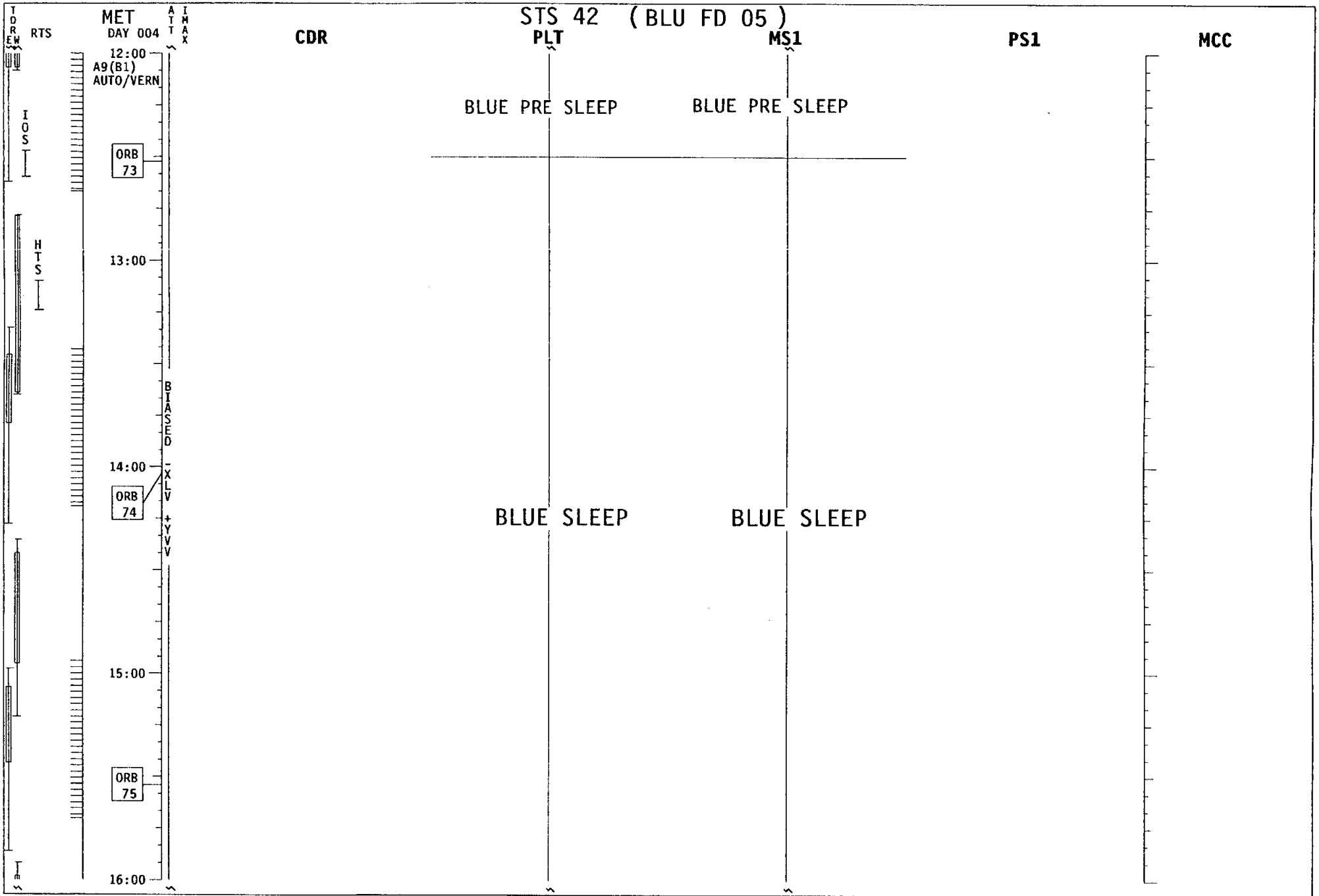


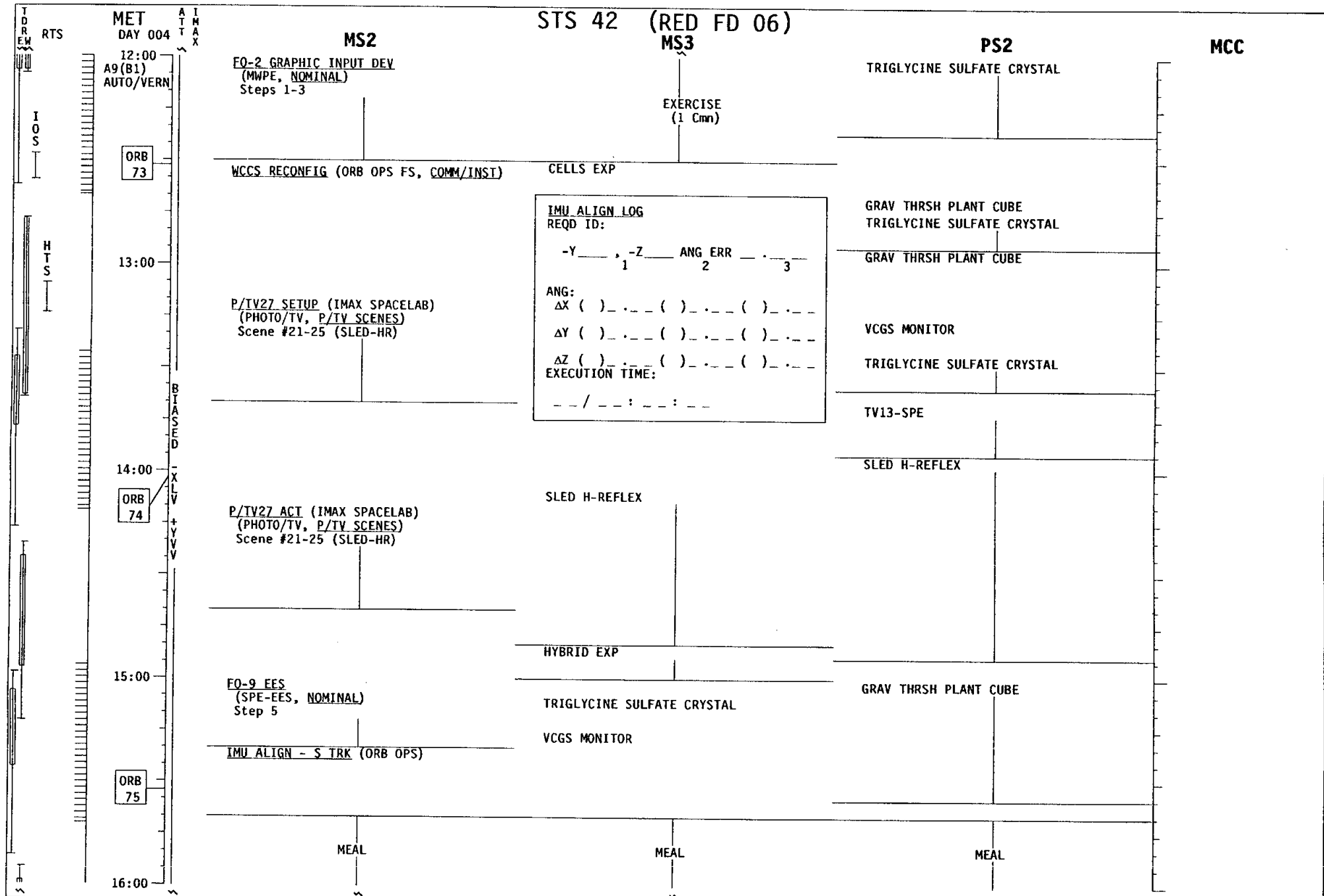


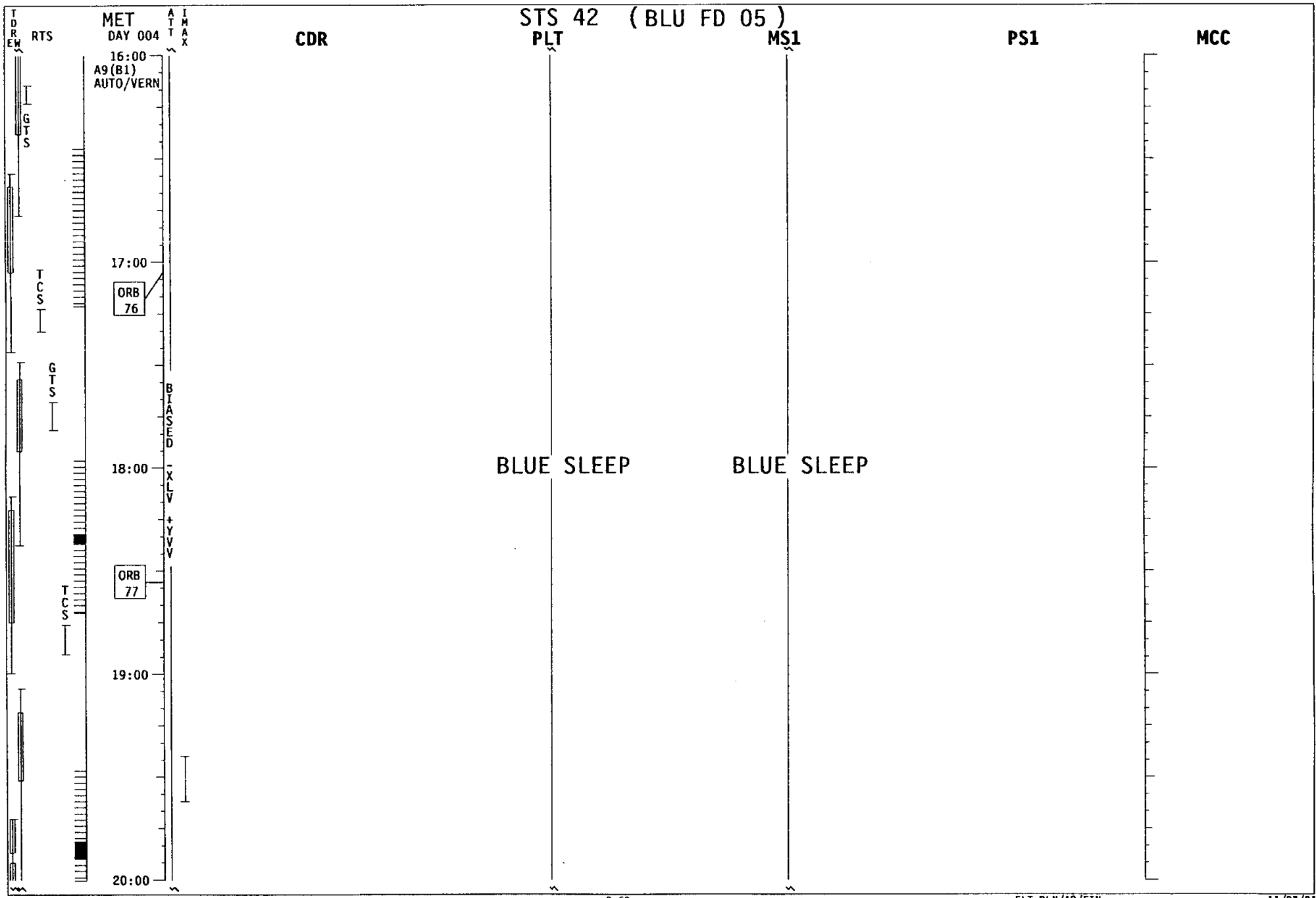


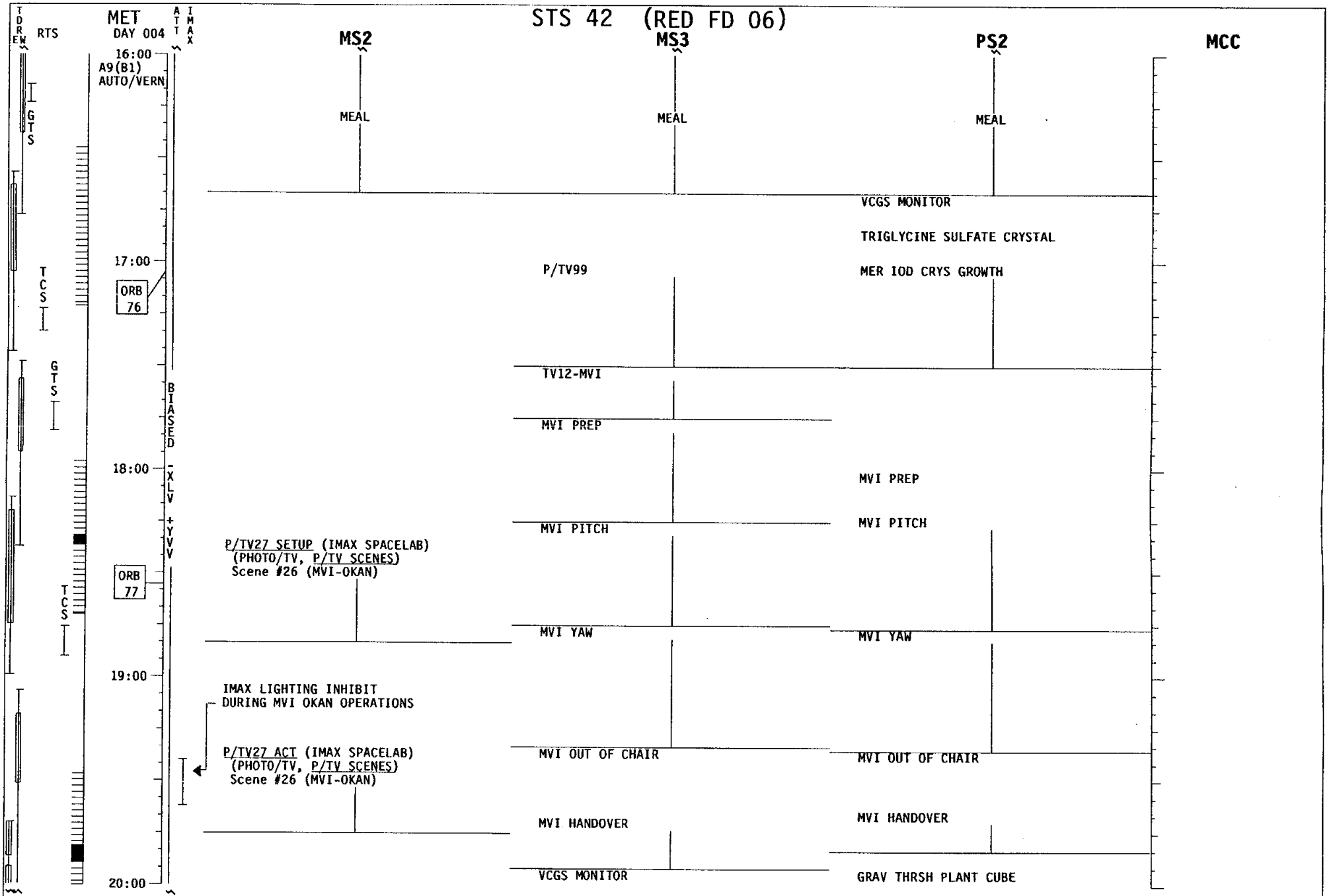


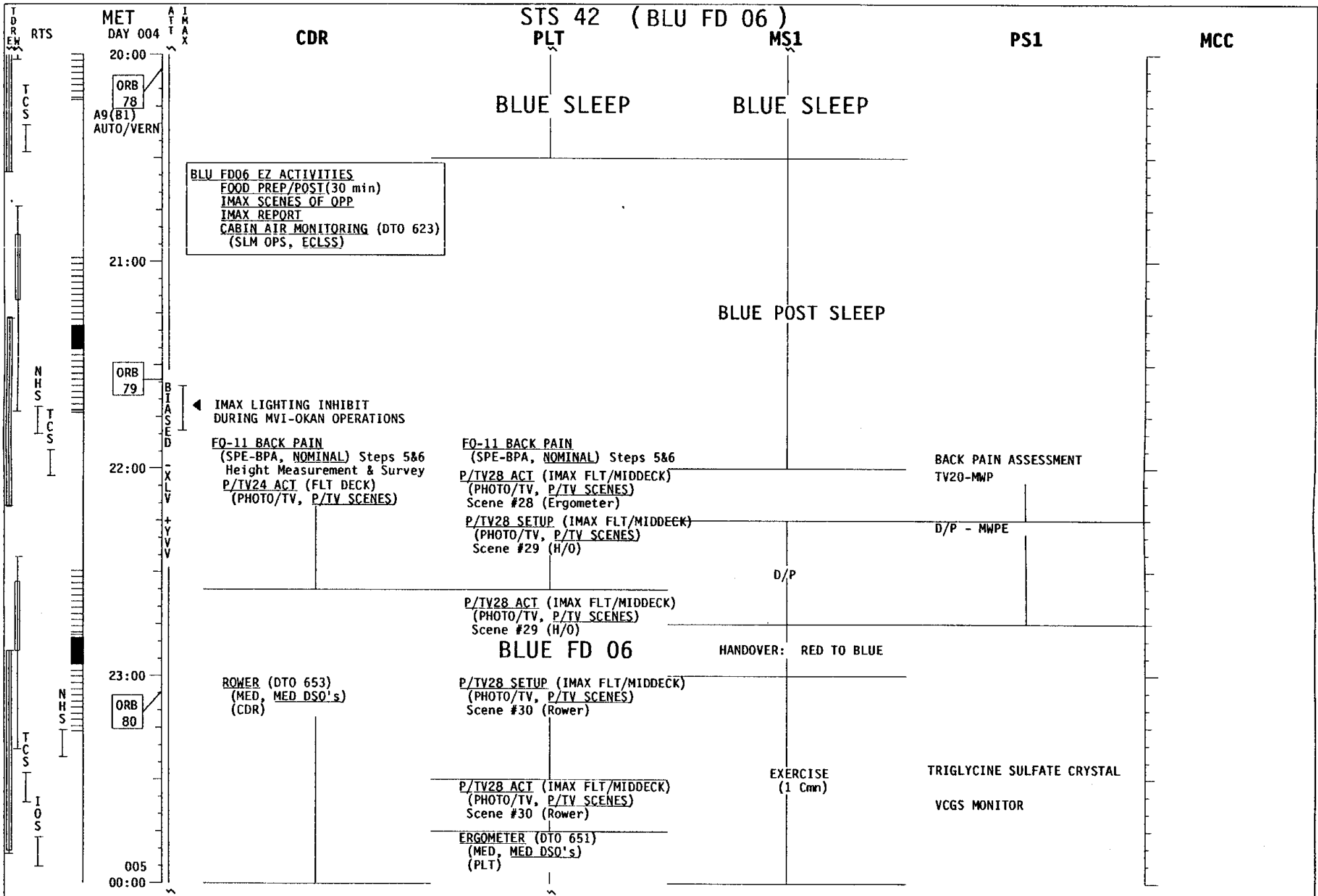


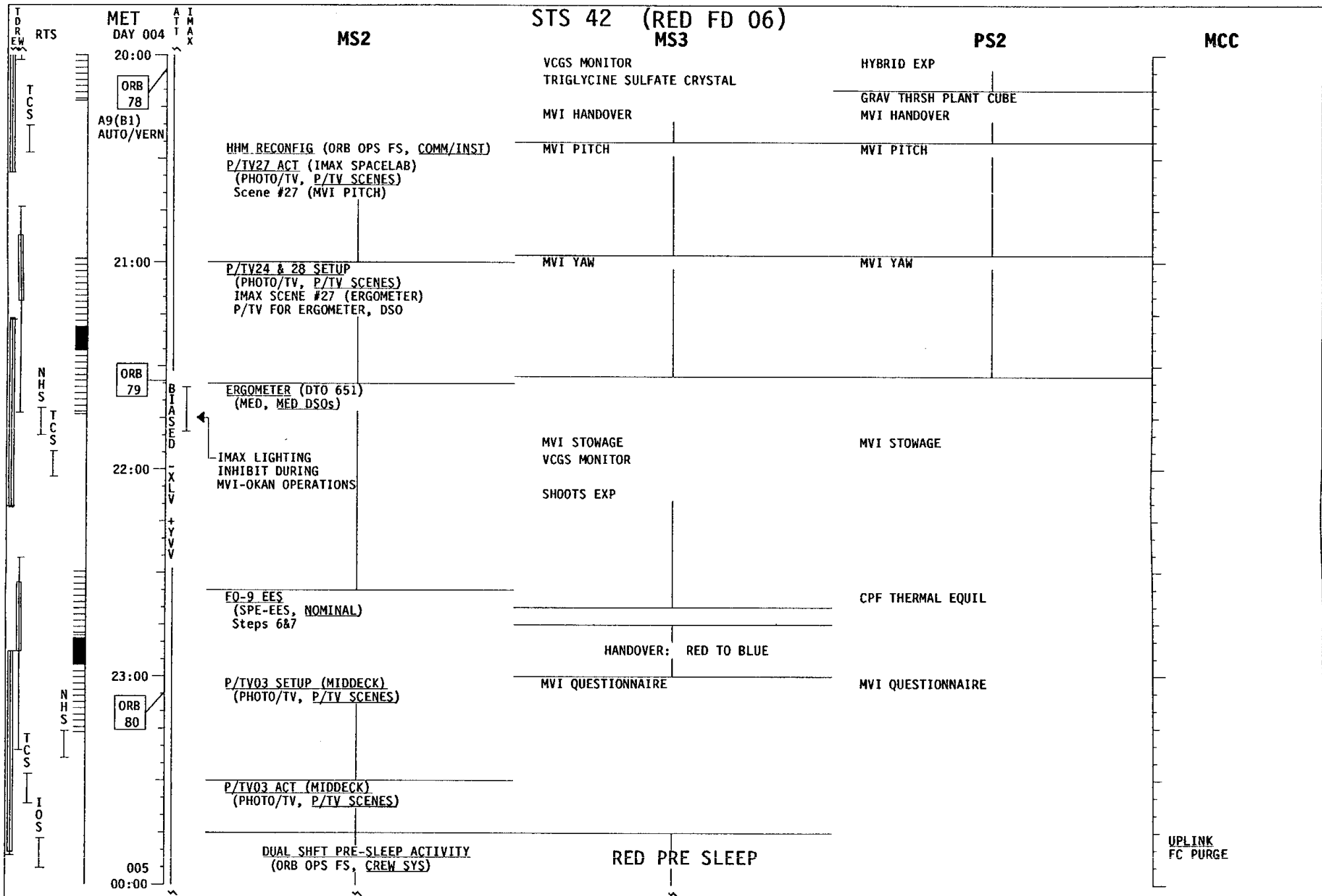


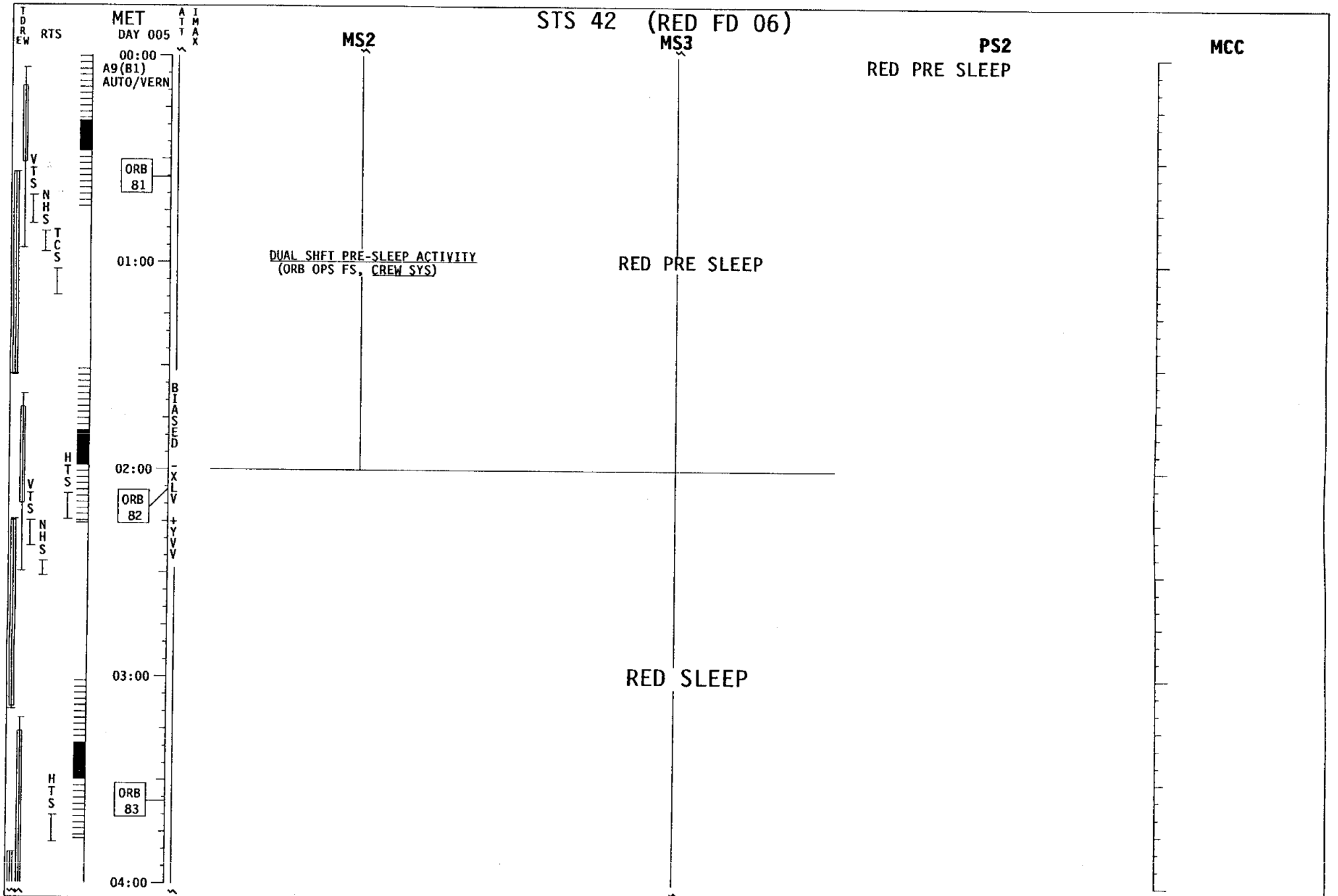




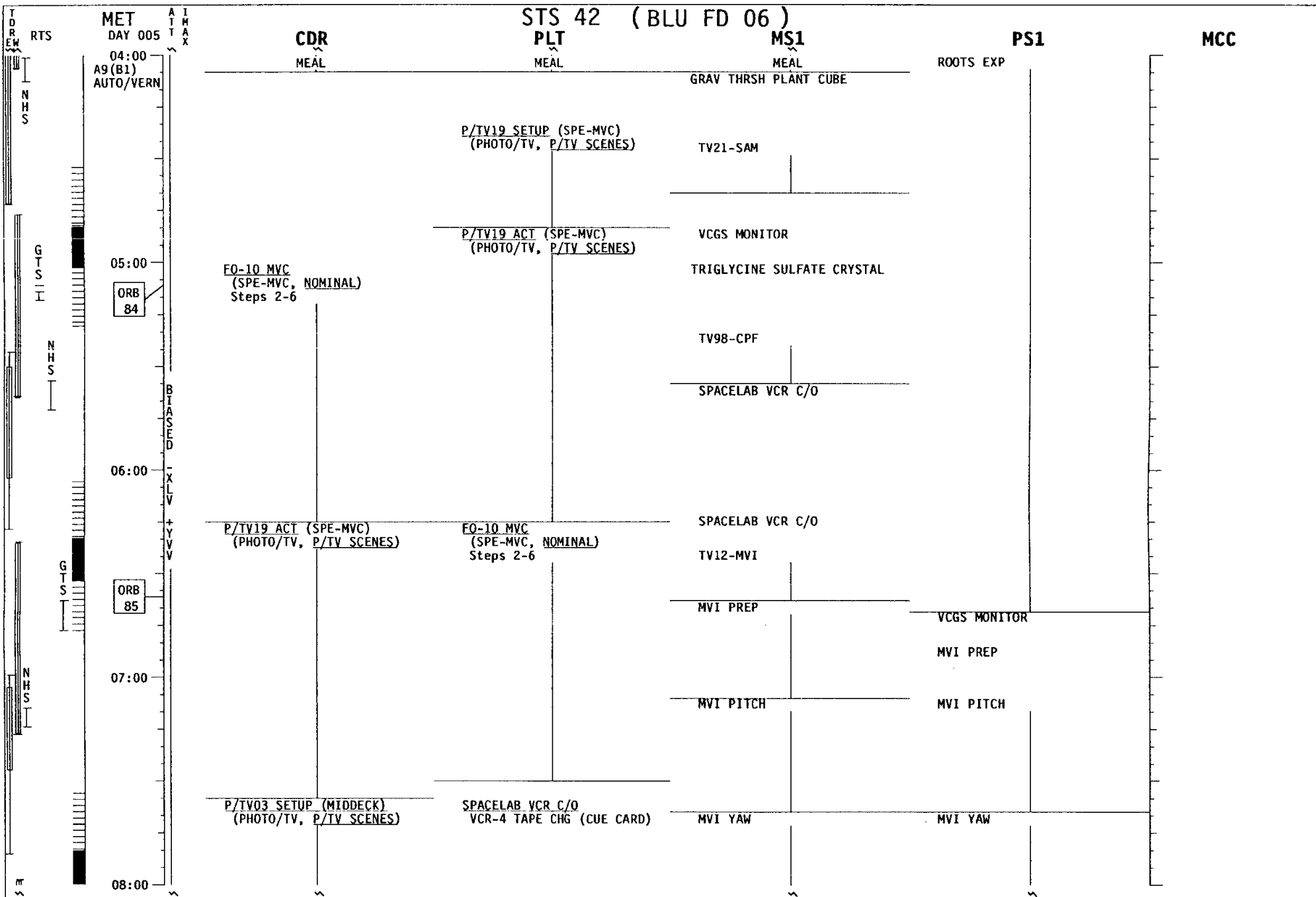


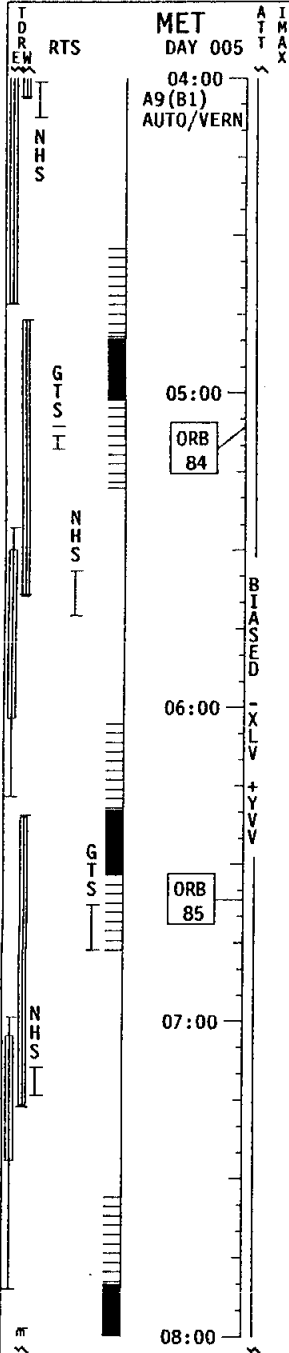






STS 42 (BLU FD 06)





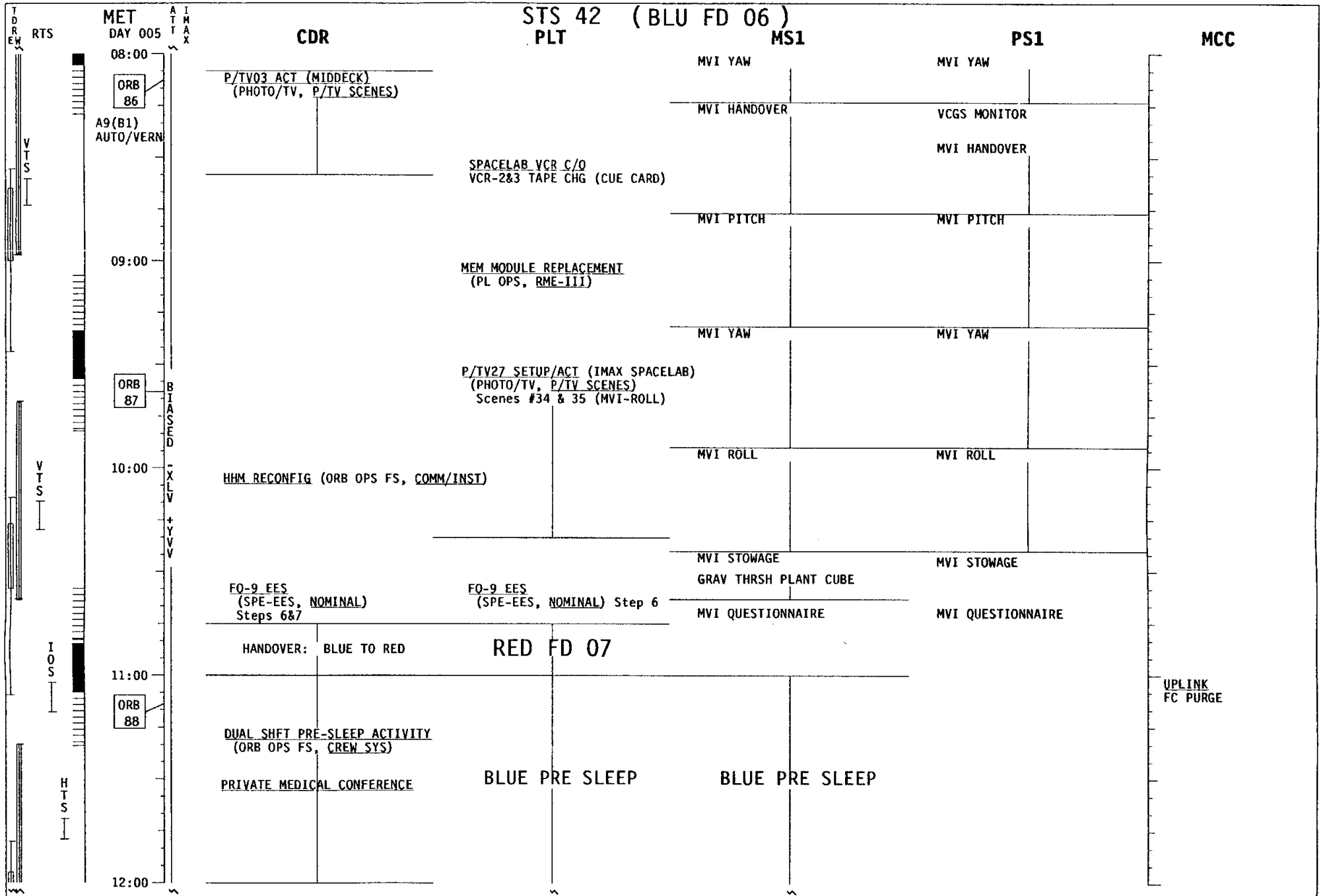
MS2

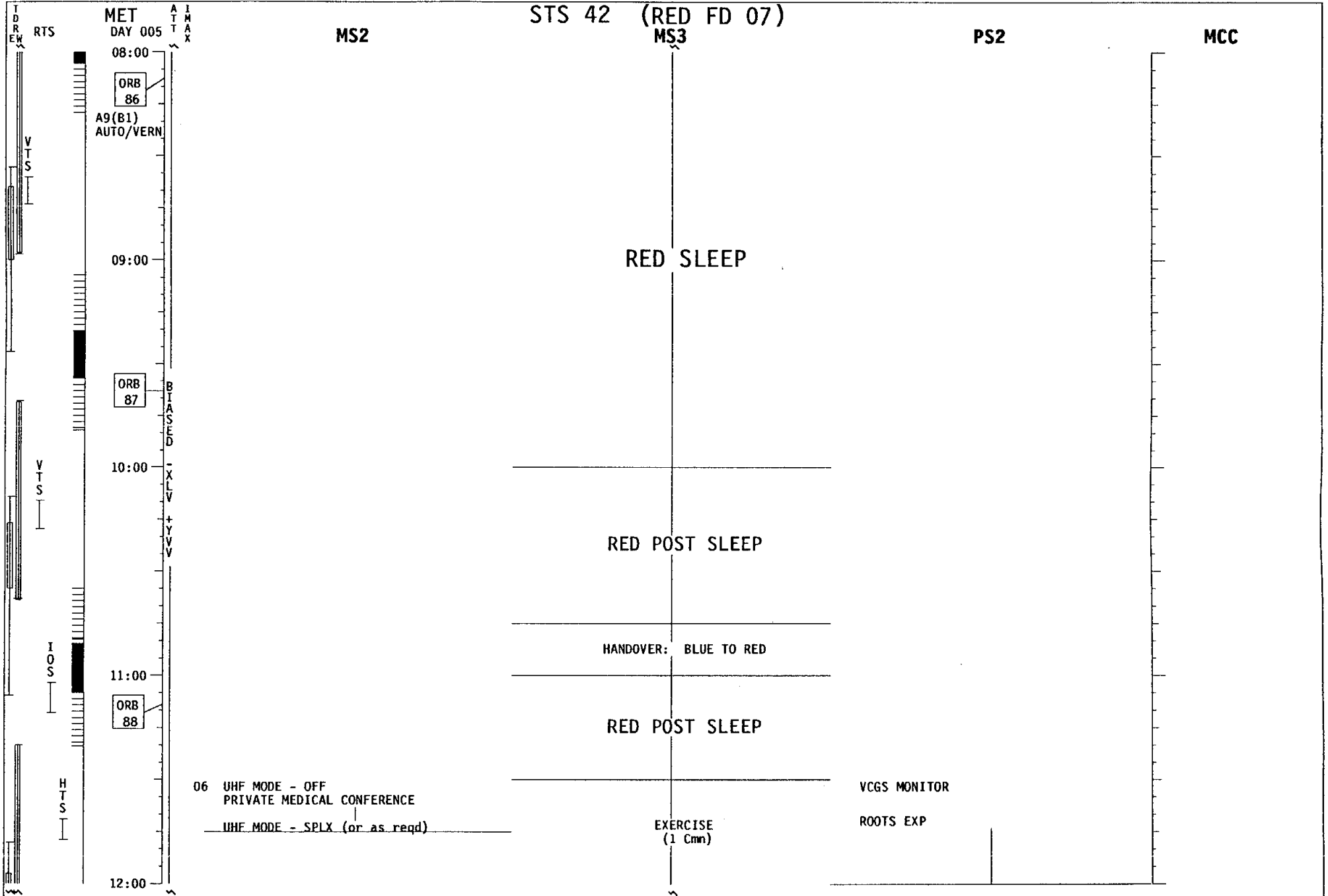
STS 42 (RED FD 06)
MS3

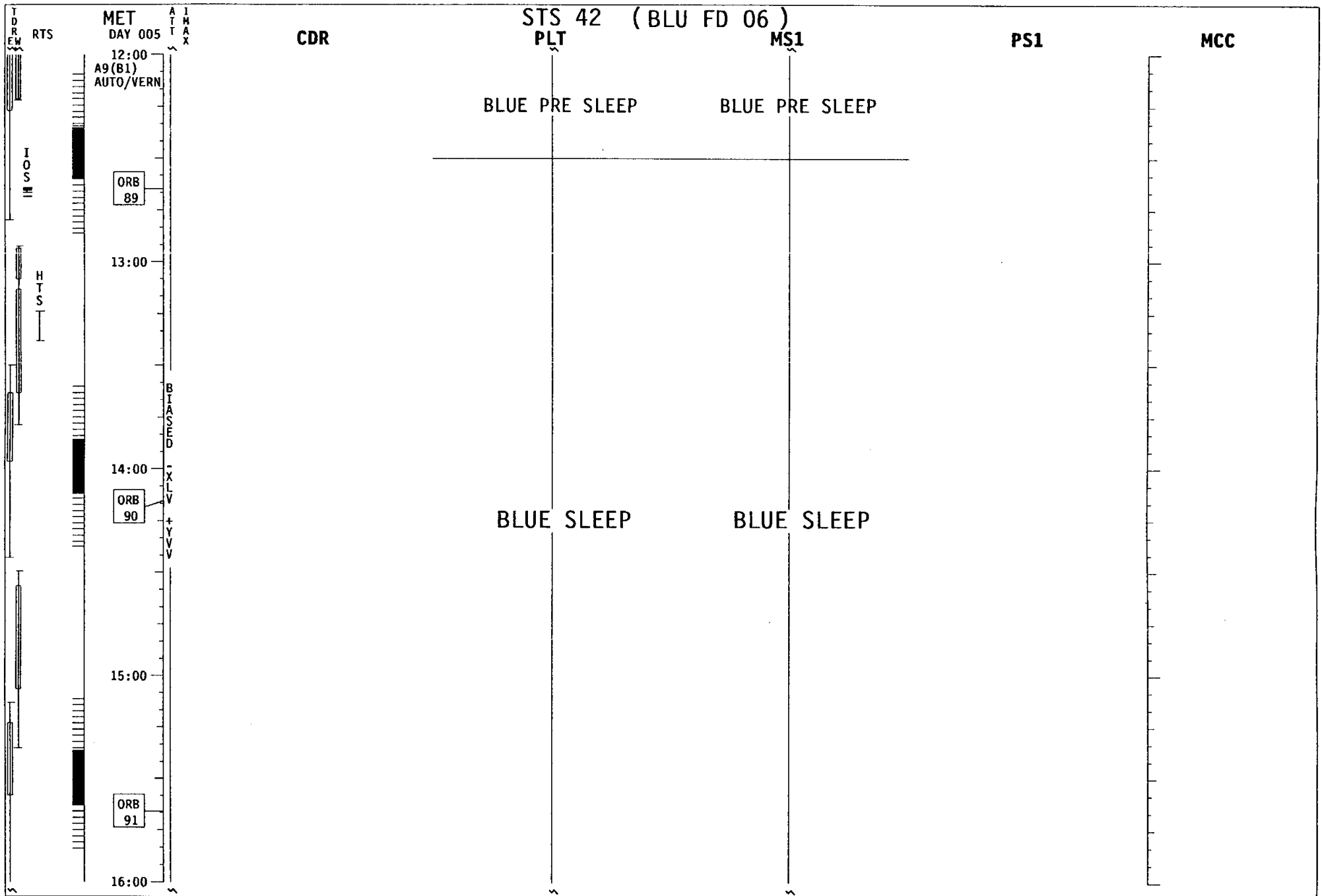
PS2

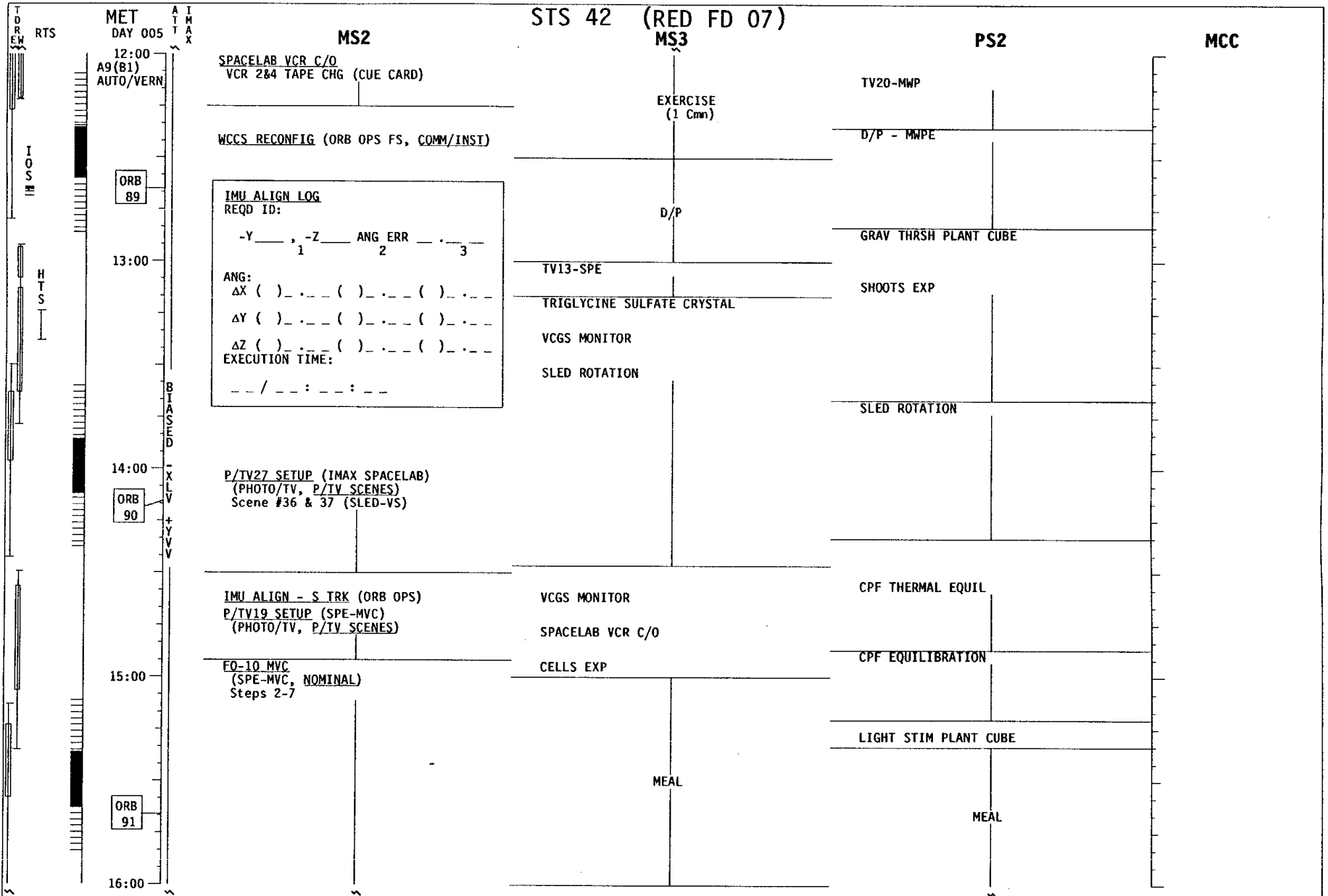
MCC

RED SLEEP









STS 42 (RED FD 07)
MS3

MS2

PS2

MCC

MET DAY 005
12:00
A9(B1)
AUTO/VERN
ORB 89
13:00
ORB 90
14:00
ORB 91
15:00
16:00

SPACELAB VCR C/O
VCR 2&4 TAPE CHG (CUE CARD)

WCCS RECONFIG (ORB OPS FS, COMM/INST)

IMU ALIGN LOG
REQD ID:
-Y , -Z ANG ERR .
 1 2 3

ANG:
ΔX () () ()
ΔY () () ()
ΔZ () () ()
EXECUTION TIME:
- - / - - : - - : - -

P/TV27 SETUP (IMAX SPACELAB)
(PHOTO/TV, P/TV SCENES)
Scene #36 & 37 (SLED-VS)

IMU ALIGN - S TRK (ORB OPS)
P/TV19 SETUP (SPE-MVC)
(PHOTO/TV, P/TV SCENES)

FO-10 MVC
(SPE-MVC, NOMINAL)
Steps 2-7

EXERCISE
(1 Cmn)

D/P

TV13-SPE

TRIGLYCINE SULFATE CRYSTAL

VCGS MONITOR

SLED ROTATION

VCGS MONITOR

SPACELAB VCR C/O

CELLS EXP

MEAL

TV20-MWP

D/P - MWPE

GRAV THRSH PLANT CUBE

SHOOTS EXP

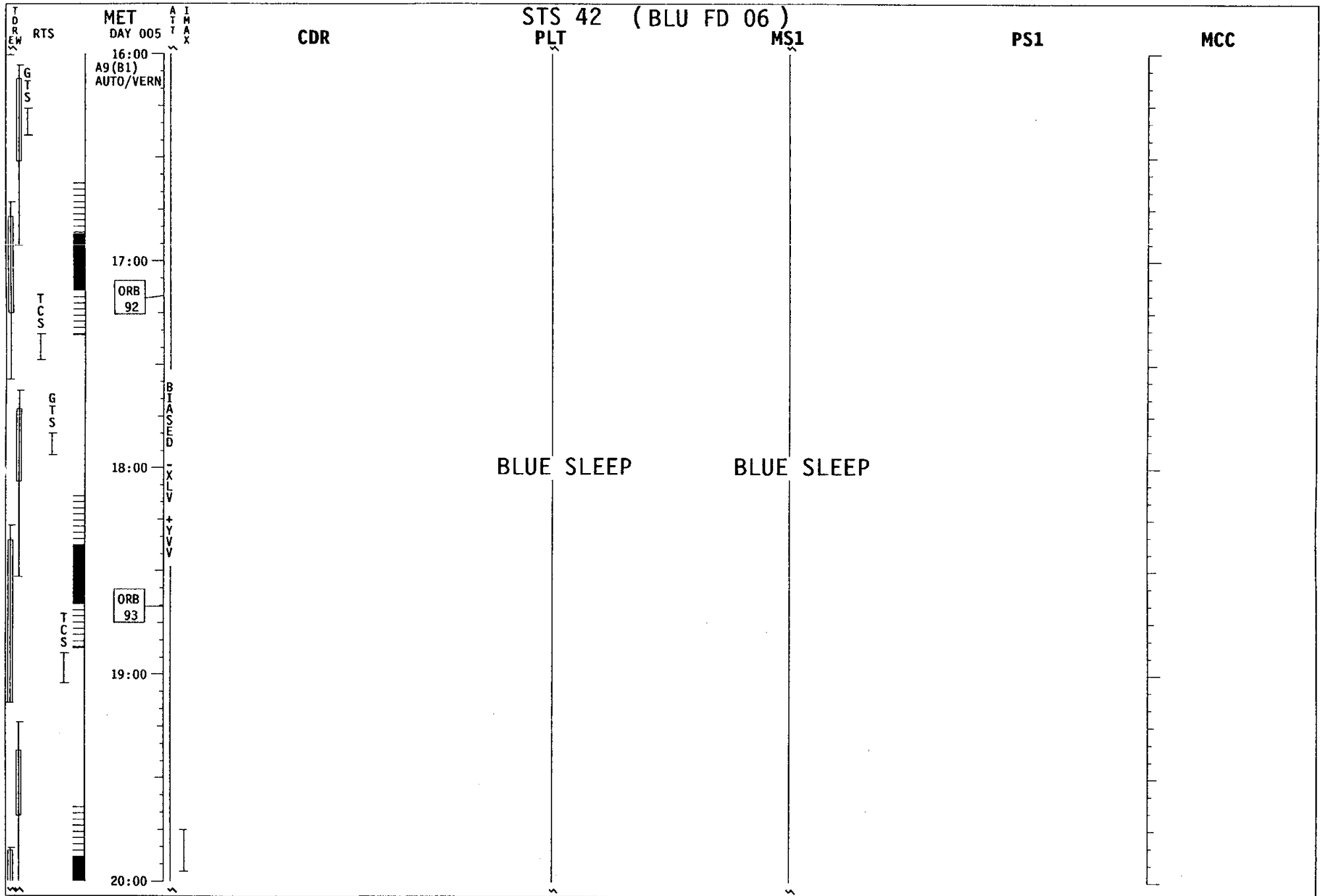
SLED ROTATION

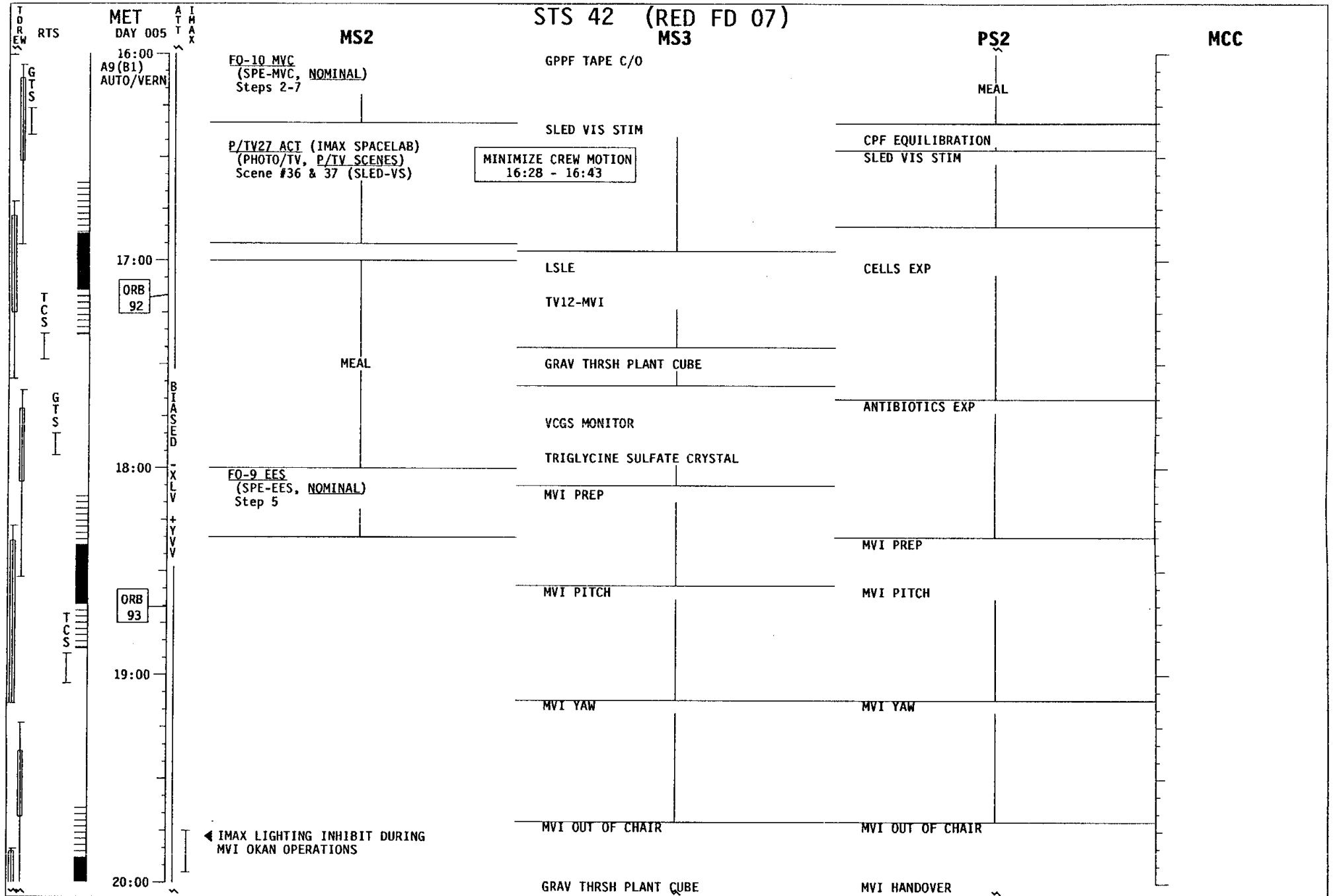
CPF THERMAL EQUIL

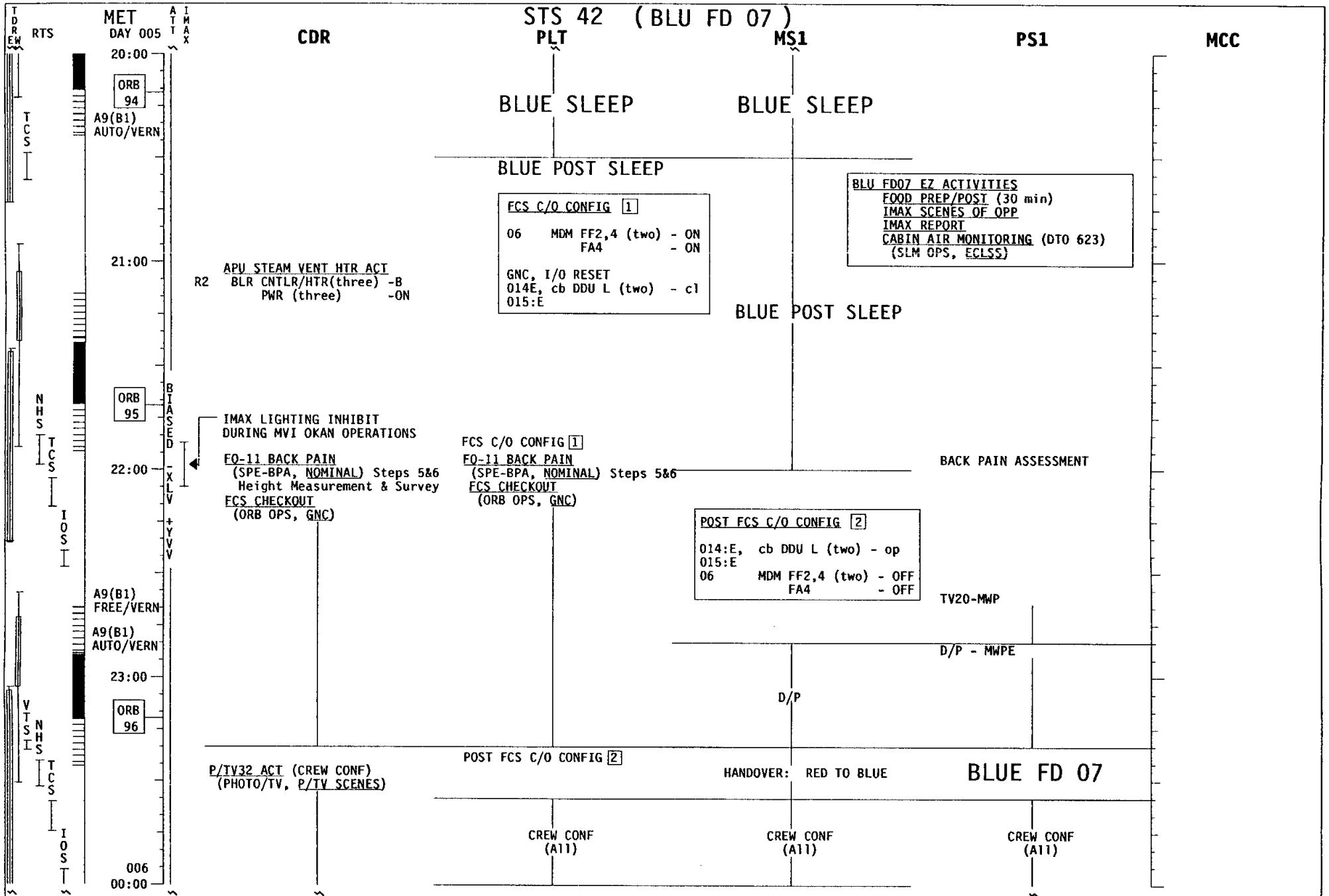
CPF EQUILIBRATION

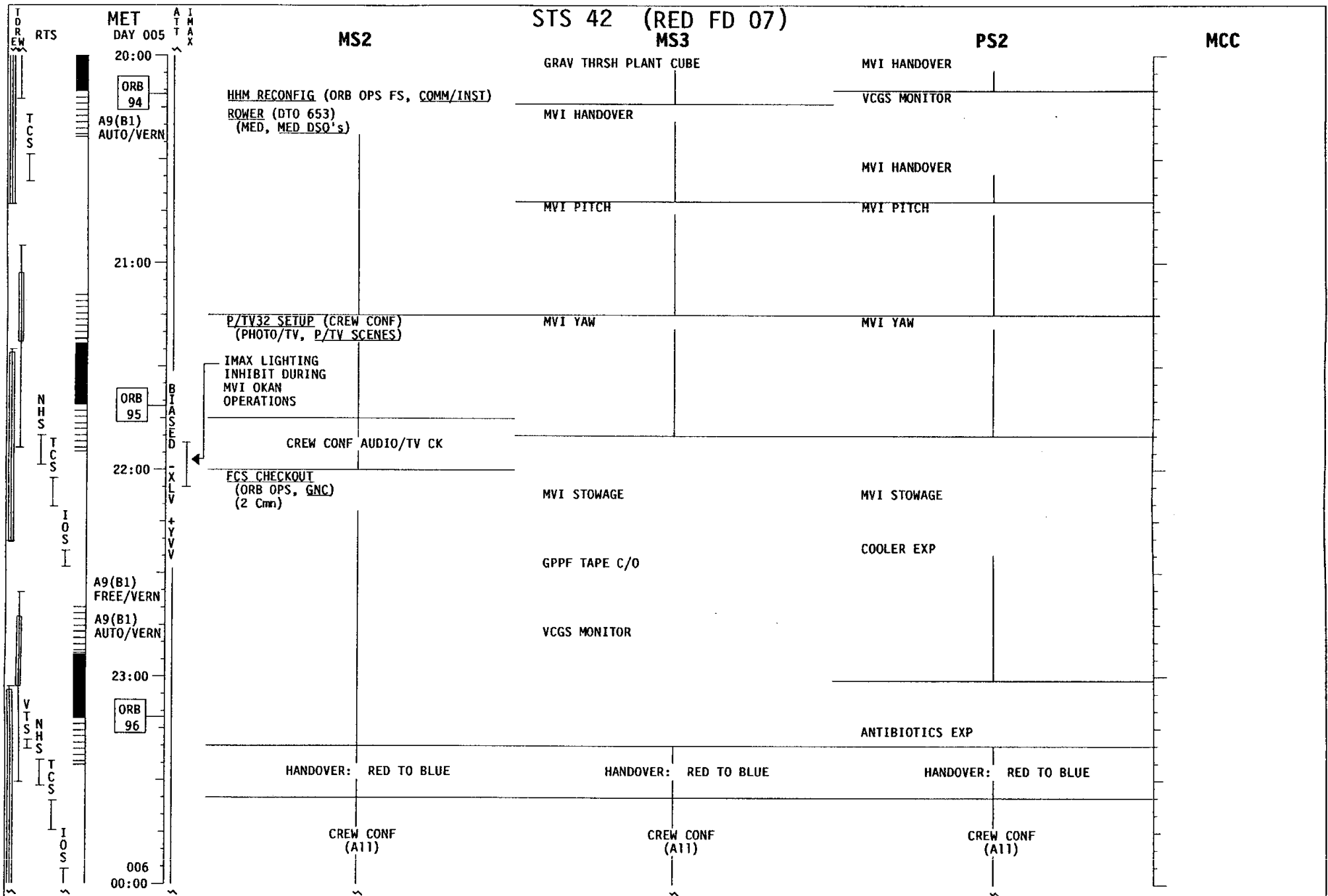
LIGHT STIM PLANT CUBE

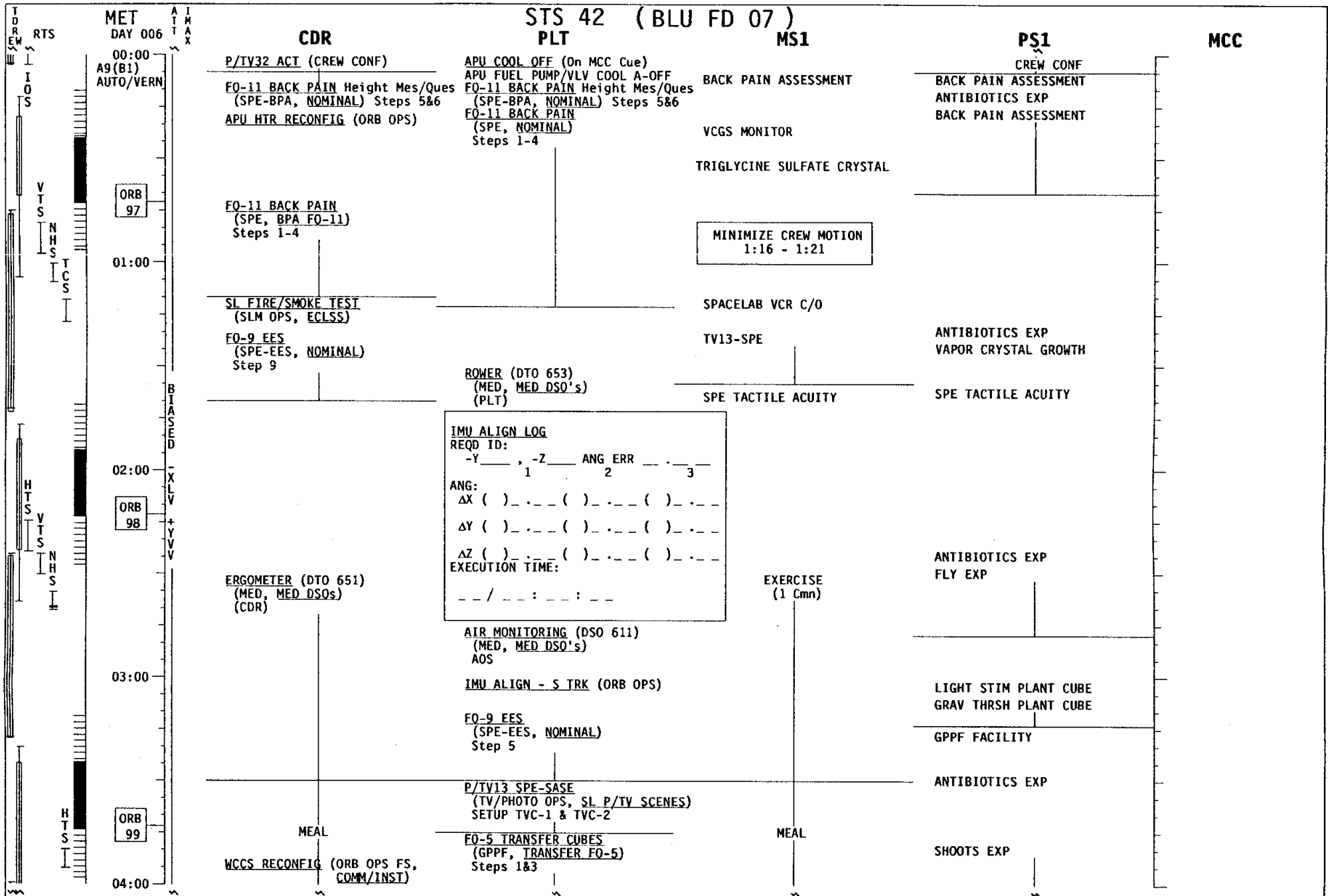
MEAL

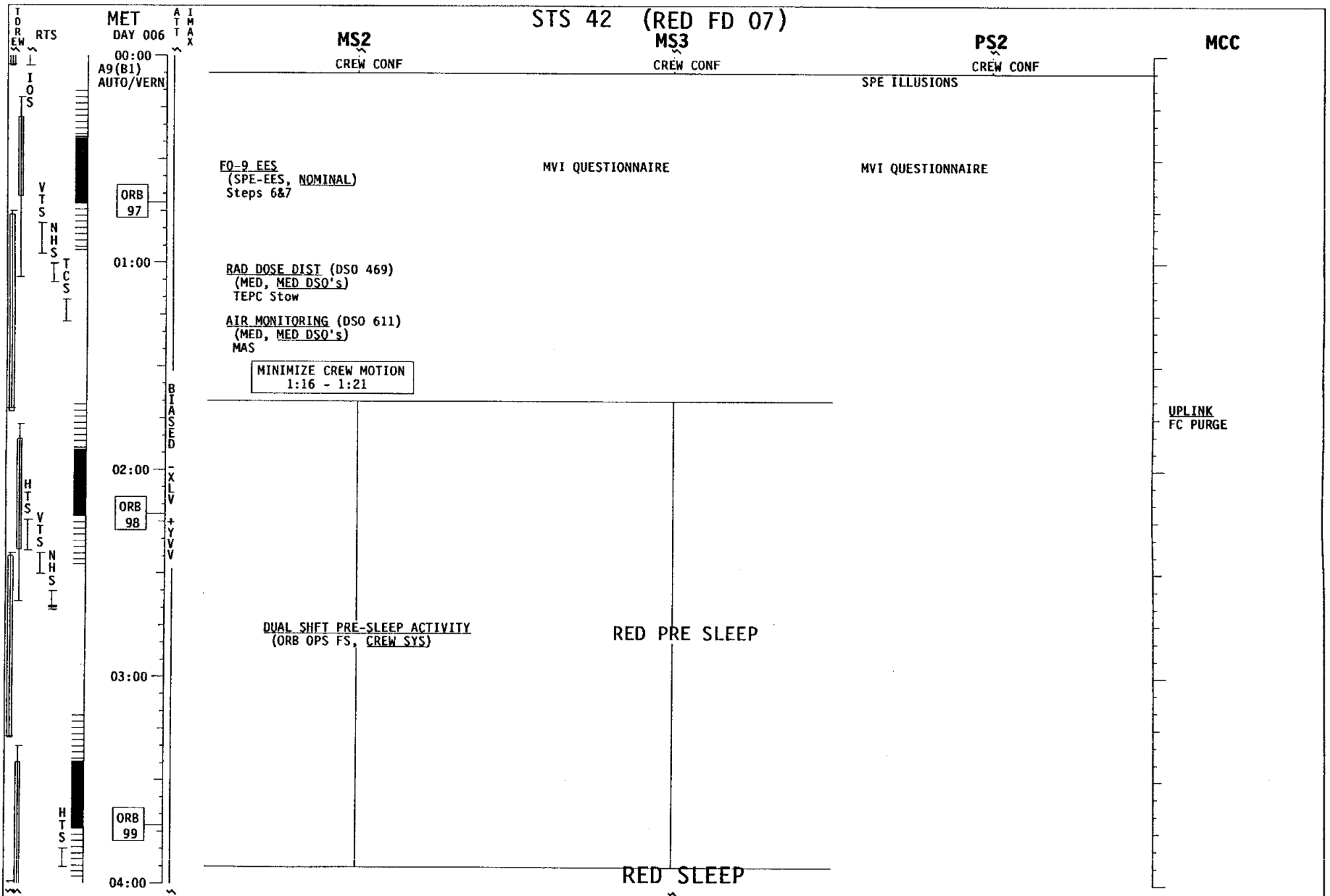


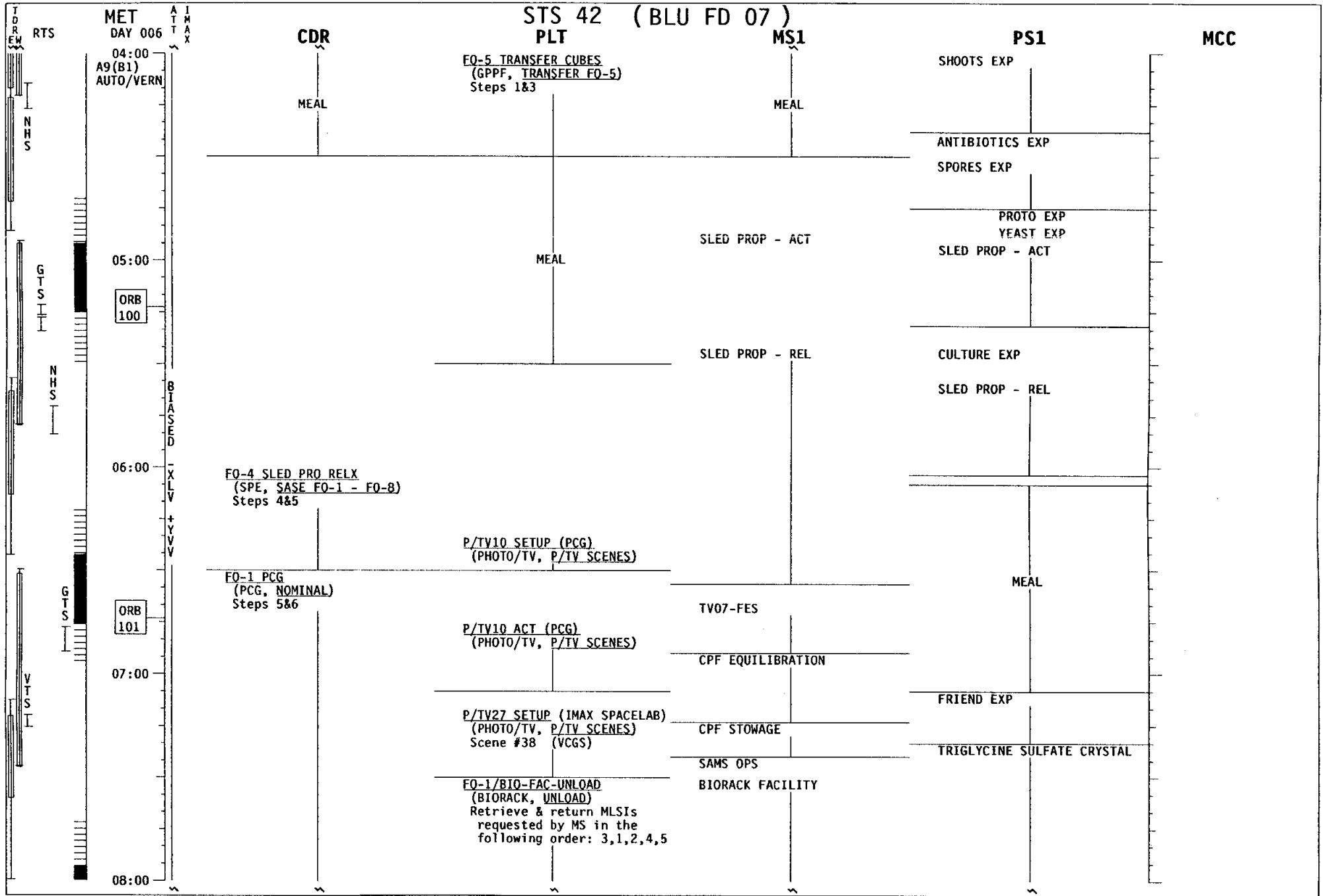


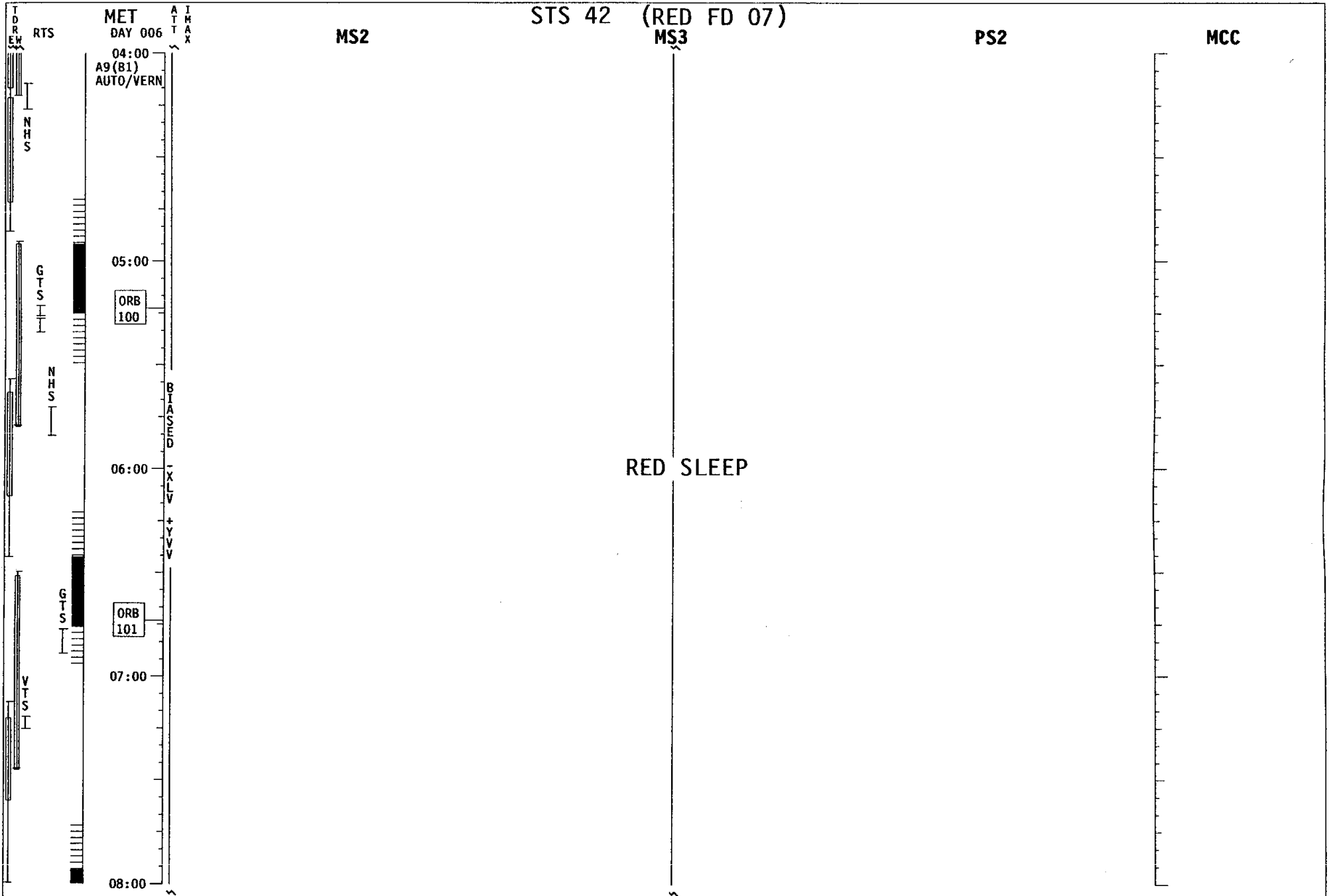


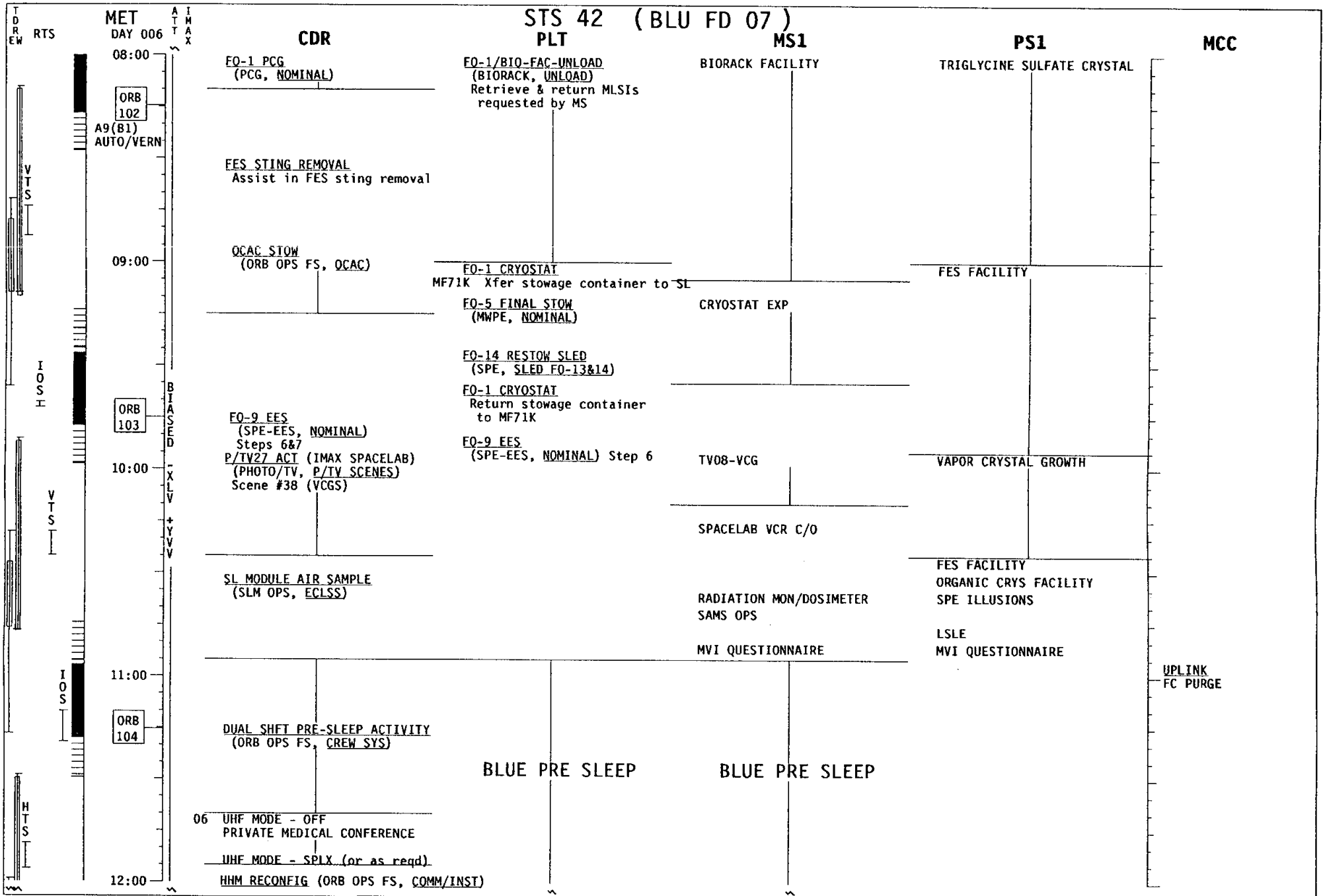


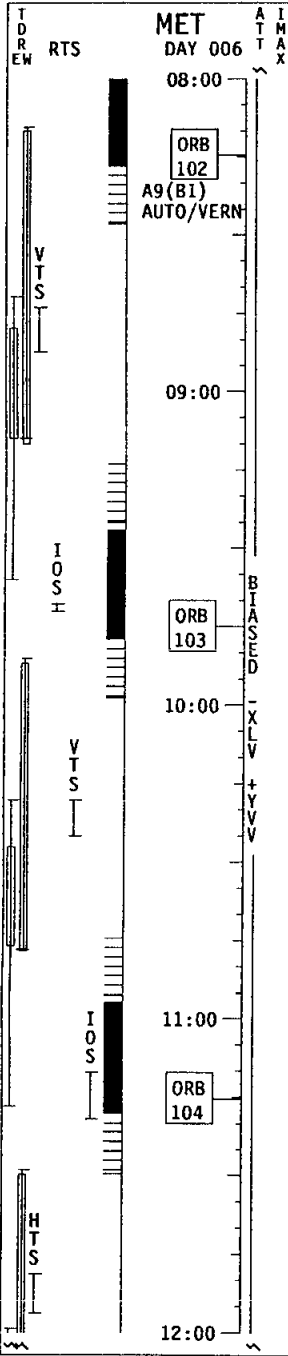












MET
DAY 006

08:00
09:00
10:00
11:00
12:00

ORB
102

A9(BI)
AUTO/VERN

ORB
103

ORB
104

STS 42 (RED FD 07)
MS3

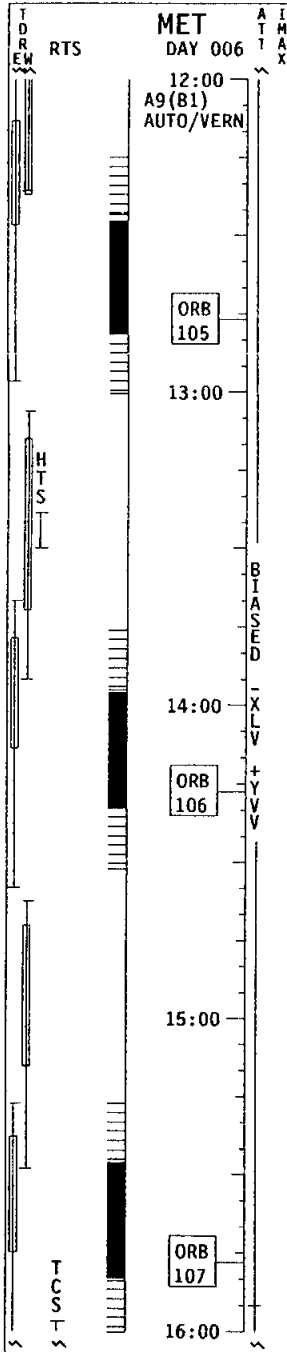
MS2

PS2

MCC

RED SLEEP

RED POST SLEEP



CDR

STS 42 (BLU FD 07)

PLT

MS1

PS1

MCC

BLUE PRE SLEEP

BLUE PRE SLEEP

HANDOVER: BLUE TO RED

RED FD 08

BLUE PRE SLEEP

BLUE PRE SLEEP

BLUE SLEEP

BLUE SLEEP

TDR EN
 RTS
 MET DAY 006
 12:00
 A9(B1)
 AUTO/VERN
 ORB 105
 13:00
 HTS
 BIASED
 14:00
 X L V
 + Y V V
 ORB 106
 15:00
 IMU ALIGN - S TRK (ORB OPS)
 GAS ACTIVITIES GROUP R (PL OPS, GAS)
 APC STOW (PL OPS, GAS)
 Change DAP A to A1
 MNRV PTC ATT
 ORB 107
 A1(B1)
 AUTO/VERN
 16:00
 TCS T

MS2

STS 42 (RED FD 08)
MS3

PS2

MCC

RED POST SLEEP

HANDOVER: BLUE TO RED

CABIN TEMP CNTL RECONFIG
 CABIN TEMP - full cool
 wait 20 min then,
 CABIN TEMP CNTLR - OFF
 WCCS RECONFIG (ORB OPS FS, COMM/INST)

IMU ALIGN LOG

REQD ID:

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

ANG:

ΔX () _ _ _ () _ _ _ () _ _ _

ΔY () _ _ _ () _ _ _ () _ _ _

ΔZ () _ _ _ () _ _ _ () _ _ _

EXECUTION TIME:

__ / __ : __ : __

RED POST SLEEP

IMAX STOW

RED FD08 EZ ACTIVITIES
 FOOD PREP/POST (30 min)
 IMAX SCENES OF OPP
 IMAX REPORT
 CPA OPS (ORB OPS, CREW SYS)

CABIN AIR MONITORING (DTO 623)
 (SLM OPS, ECLSS)

CABIN CONFIG/STOW (A11)

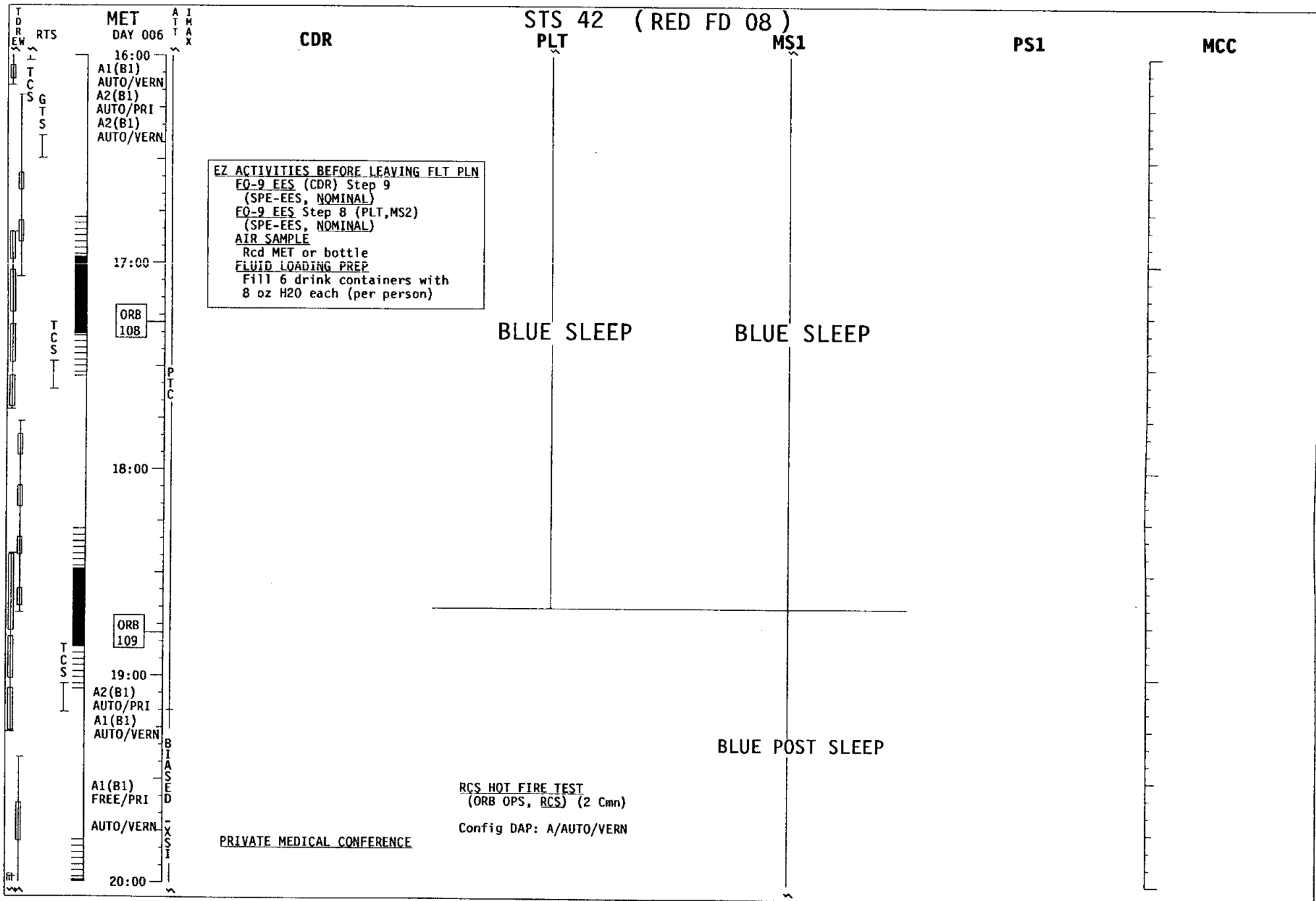
CABIN CONFIG/STOW (A11)

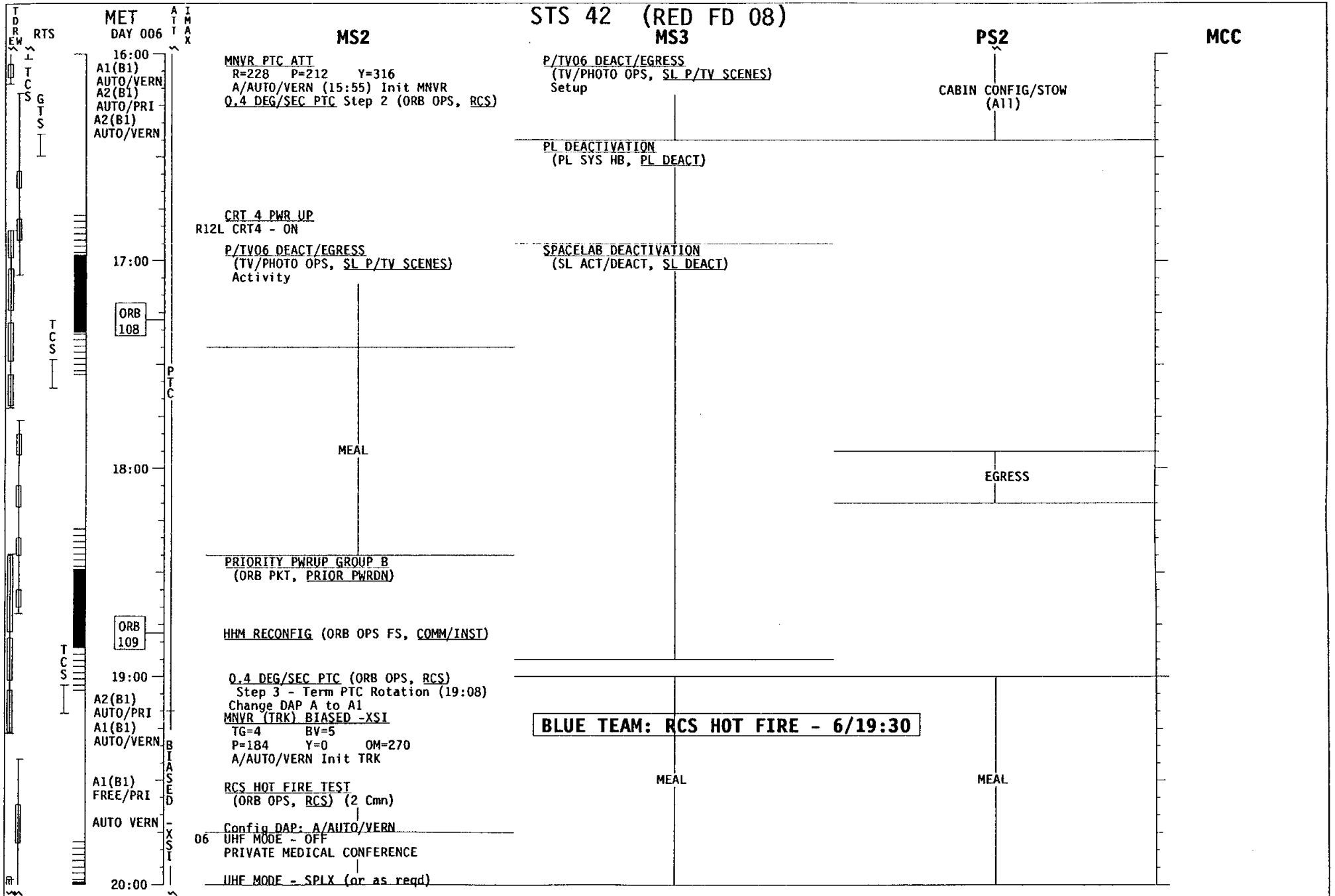
IMU ALIGN - S TRK (ORB OPS)

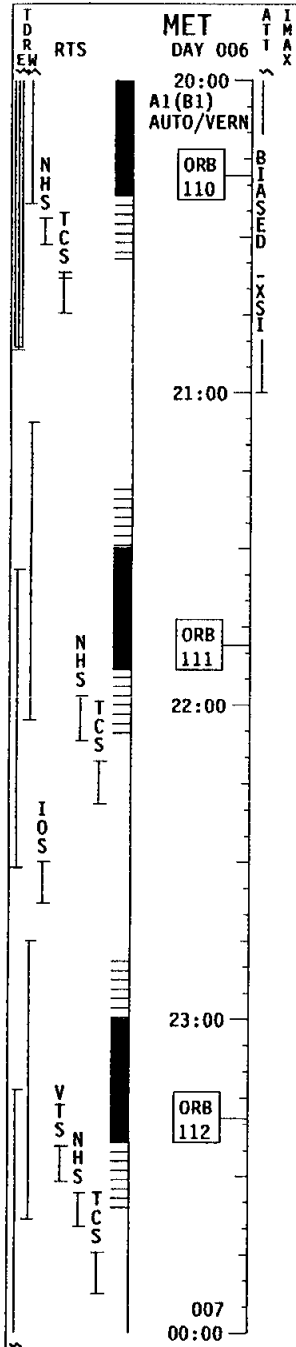
GAS ACTIVITIES GROUP R
 (PL OPS, GAS)

APC STOW
 (PL OPS, GAS)
 Change DAP A to A1
 MNRV PTC ATT

P/TV06 DEACT/EGRESS
 (TV/PHOTO OPS, SL P/TV SCENES)
 Setup







MS2

STS 42 (RED FD 08)
MS3

PS2

MCC

DSO ENTRY PREP
(MED, MED DSO's)
DSO 603

Go to DEORBIT Prep at 6/20:14 MET

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

STS-42
ATTITUDE TIMELINE

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 022/15:06:00 GMT 18:14 000/01:12:00 MET 24:14	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=270.00	A1 AUTO PRI	DSC 0.200 DB AT 5.00 DB RT 0.20	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 90.00	-ZLV NOSE SOUTH PLBD OPENING
2 022/17:19:00 GMT 29:35 000/03:25:00 MET 35:35	INRTL R=101.00 MNVR P=341.00 Y=359.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 201 P 67	STAR PR C2 -Y: 16 -Z: 23	IMU ALIGN -Z COAS CAL
3 022/17:49:00 GMT 57:06 000/03:55:00 MET 04:03:06	TGT=2 BV=2 P=180.00 Y= 0.00 OM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH R 292 P 180	LVLH R=270.00 P= 90.00 Y= 0.00	PLB COOL DOWN -XLV BAY NORTH
4 022/18:54:00 GMT 19:02:14 000/05:00:00 MET 08:14	TGT=11 BV=1 P= 0.00 Y= 0.00 OM=(blank)	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 217 P 137	INRTL R=347.17 P=121.90 Y= 70.27	+X COAS CAL +X: 11
5 022/19:14:00 GMT 42:55 000/05:20:00 MET 48:55	TGT=2 BV=5 P=178.00 Y= 0.00 OM=292.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 360 P 178	LVLH R= 67.99 P= 90.75 Y= 1.85	-XLV BAY SOUTH
6 023/20:54:00 GMT 21:16:40 001/07:00:00 MET 22:40	TGT=2 BV=5 P=178.00 Y= 0.00 OM= 68.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 0 P 178	LVLH R=292.01 P= 90.75 Y=358.15	-XLV BAY NORTH
7 024/04:54:00 GMT 05:16:40 001/15:00:00 MET 22:40	TGT=2 BV=5 P=178.00 Y= 0.00 OM=292.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 360 P 178	LVLH R= 67.99 P= 90.75 Y= 1.85	-XLV BAY SOUTH
8 024/20:54:00 GMT 21:16:40 002/07:00:00 MET 22:40	TGT=2 BV=5 P=178.00 Y= 0.00 OM= 68.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 0 P 178	LVLH R=292.01 P= 90.75 Y=358.15	-XLV BAY NORTH
9 025/04:54:00 GMT 05:16:40 002/15:00:00 MET 22:40	TGT=2 BV=5 P=178.00 Y= 0.00 OM=292.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 0 P 178	LVLH R= 67.99 P= 90.75 Y= 1.85	-XLV BAY SOUTH
10 025/20:54:00 GMT 21:16:40 003/07:00:00 MET 22:40	TGT=2 BV=5 P=178.00 Y= 0.00 OM= 68.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 0 P 178	LVLH R=292.01 P= 90.75 Y=358.15	-XLV BAY NORTH
11 026/04:44:00 GMT 05:06:40 003/14:50:00 MET 15:12:40	TGT=2 BV=5 P=178.00 Y= 0.00 OM=292.00	A9 AUTO VERN	DSC 0.100 DB AT 0.50 DB RT 0.01	EARTH R 360 P 178	LVLH R= 67.99 P= 90.75 Y= 1.85	-XLV BAY SOUTH
12 029/05:49:00 GMT 48 006/15:55:00 MET 48	INRTL R=228.00 MNVR P=212.00 Y=316.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 45 P 90		PTC INIT

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 029/05:54:00 GMT 006/16:00:00 MET	INRTL BV=1 ROTR P= 0.00 Y= 0.00	A2 AUTO DB AT 1.00 PRI DB RT 0.20		INRTL R=228.00 P=212.00 Y=316.00	INIT PTC ROTR
2 029/09:02:00 GMT 006/19:08:00 MET		A2 INRT DB AT 1.00 PRI DB RT 0.20	SUN R 214 P 90	INRTL R= 60.00 HOLD P=212.00 Y=316.00	TERM PTC ROTR
3 029/09:04:00 GMT 17:02 006/19:10:00 MET 23:02	TGT=4 RA= 310.540 BV=5 DEC= -18.242S P=184.00 Y= 0.00 OM=270.00	A1 AUTO DB AT 1.00 VERN DB RT 0.02	SUN R 180 P 176	INRTL R=205.80 P=212.09 Y= 48.06	TAIL SUN RAD COLDSOAK RCS HOTFIRE
4 029/11:07:00 GMT 17:03 006/21:13:00 MET 23:03 TIG - 02:58	INRTL R= 81.00 MNVR P= 40.00 Y= 25.00	A1 AUTO DB AT 1.00 VERN DB RT 0.02	SUN R 179 P 72	-Y: 17 -Z: 21	D/O IMU ALIGN
5 029/11:24:00 GMT 27:02 006/21:30:00 MET 33:02	INRTL R= 12.00 MNVR P=146.00 Y= 29.00	B1 AUTO DB AT 3.00 PRI DB RT 0.20	SUN R 206 P 130	-Y: 48 -Z: 44	D/O IMU VERIF
6 029/13:49:00 GMT 53:44 006/23:55:00 MET 59:44 TIG - 00:15	INRTL R=209.00 MNVR P=306.00 Y= 7.00	AUTO DB AT 3.00 PRI DB RT 0.20	SUN R 104 P 89		D/O BURN

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

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STS-42 DAP BOOK

DAP A CONFIGURATIONS

	ITEM #	A1*	A2	A3	A4	A5	A6	A7	A8	A9
<u>TRANSLATION</u>										
PULSE ft/sec	1	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.10
<u>ROTATION</u>										
DSC RT NORM °/sec	2	0.200	0.400	0.200	0.500	0.200	0.200	0.200	0.200	0.100
VERN °/sec	3	0.200	0.400	0.008	0.200	0.200	0.200	0.200	0.200	0.100
PULSE NORM °/sec	4	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
VERN °/sec	5	0.010	0.010	0.010	0.010	0.050	0.010	0.010	0.010	0.010
COMP NORM °/sec	6	.00	.00	.00	.00	.00	.00	.00	.00	.00
VERN °/sec	7	.000	.000	.000	.000	.000	.000	.000	.000	.000
<u>DEADBAND</u>										
ATT NORM (deg)	8	5.00	1.00	1.00	3.00	5.00	5.00	2.00	2.00	3.00
VERN (deg)	9	1.000	1.000	0.070	1.000	1.000	1.000	1.000	1.000	0.500
RATE NORM °/sec	10	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
VERN °/sec	11	.020	.020	.010	.020	.020	.020	.020	.020	0.010
<u>JET OPT</u>										
P	12	1	1	1	1	1	3	1 or 3	1	3
Y	13	1	1	3	1	1	3	1 or 3	1	3
CNTL ACCEL	14	0	0	0	0	0	0	0	0	0

*I-LOADED OPS-2 DAP Configuration

ALT DAP CONFIGURATIONS

	ITEM #	ALT1*	ALT2
RATE DEADBAND	32	0.200	0.07
JET OPTION	33	1	3
NUMBER OF JETS	34	2	1
ON TIME	35	0.08	0.08
DELAY	36	0.00	1.0

*I-LOADED OPS-2 DAP Configuration

DAP B CONFIGURATIONS

	ITEM #	B1*	B2	B3	B4	B5	B6	B7	B8
<u>TRANSLATION</u>									
PULSE ft/sec	15	0.02	0.02	0.02	0.02	0.02		0.05	0.01
<u>ROTATION</u>									
DSC RT NORM °/sec	16	0.500	0.200	0.200	0.200	0.200		0.500	0.200
VERN °/sec	17	0.200	0.200	0.200	0.008	0.016		0.200	0.200
PULSE NORM °/sec	18	0.04	0.04	0.04	0.04	0.04		0.04	0.04
VERN °/sec	19	0.002	0.002	0.002	0.002	0.002		0.002	0.002
COMP NORM °/sec	20	.00	.00	.00	.00	.00		.00	.00
VERN °/sec	21	.000	.000	.000	.000	.000		.000	.000
<u>DEADBAND</u>									
ATT NORM (deg)	22	3.00	3.00	3.00	0.30	3.00		2.00	2.00
VERN (deg)	23	1.000	1.000	1.000	0.100	0.033		1.000	1.000
RATE NORM °/sec	24	0.20	0.20	0.20	0.20	0.20		0.20	0.20
VERN °/sec	25	.020	.020	.020	.010	.020		.020	.020
<u>JET OPT</u>									
P	26	1	3	1	3	3		1 or 3	1
Y	27	1	3	1	3	3		1 or 3	1
CNTL ACCEL	28	0	0	0	0	0		0	0

*I-LOADED OPS-2 DAP Configuration

DAP BOOK

**HOOK
VELCRO**

FLT PLN-1a/42/0/A

UNIV PTG	
<p>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</p>	<p>CNTL ACCEL = 0 Orbiting Vehicle = 1 thru 5 not used</p> <p>PRI JET OPT = 1 Normal = 2 Nose only = 3 Tail only</p> <p>Alt JET OPT = 1 Normal = 2 Illegal entry = 3 Tail only</p>
<p>BODY VECT = 1 +X* = 2 -X* = 3 -Z* = 4 PTC ($\sim 2^\circ$ below +X)* = 5 Optional Input P (0-359.99) Y (270-359.99, 0-90) OM (0-359.99)</p>	
<p>* input OM \rightarrow OM (0-359.99)</p> <p>MON AXIS = 1 +X 2 -X</p>	

FLT PLN-1b/42/0/A

DAP PURPOSE

- A1 - NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)
- A2 - PTC
- A3 - GG
- A4 - PRE/POST DEPLOY
- A5 - IMU ROTATION
- A6 - LOSS OF VERN
(TAIL ONLY)
- A7 - RENDEZVOUS
- A8 - PROX OPS
- A9 - IML-01 OPS

FLT PLN-2a/42/0/A

A1

DAP A1

PURPOSE:

NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)

A1

TRANSLATION
PULSE

0.1 0 1

ROTATION

0.2 0 0 2 DSC RT NORM

0.2 0 0 3 VERN

0.1 0 0 4 PULSE NORM

0.0 1 0 5 VERN

.0 0 0 6 COMP NORM

.0 0 0 7 VERN

DEADBAND

ATT NORM

5.0 0 8

1.0 0 0 9 VERN

0.2 0 10 RATE NORM

.0 2 0 11 VERN

1 12 JET OPT P

1 13 Y

0 14 CNTL ACCEL

FLT PLN-2b/42/0/A

FLT PLN-3a/42/0/A

A2



A1

DAP A2

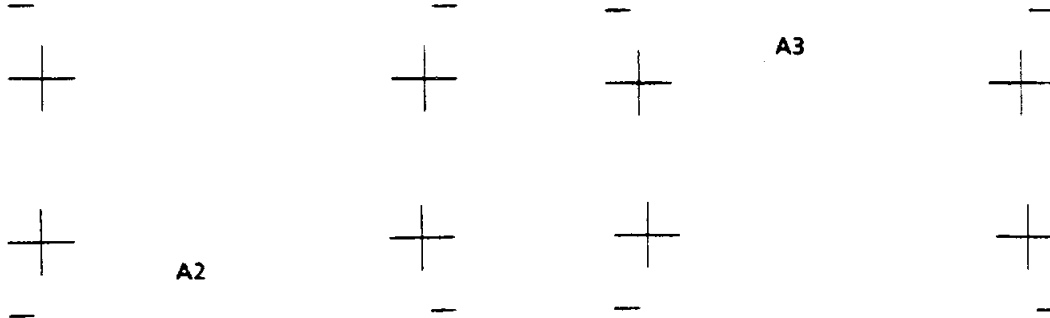
PURPOSE:
PTC

A2

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

FLT PLN-3b/42/0/A

FLT PLN-4a/42/0/A



A3

A2

DAP A3

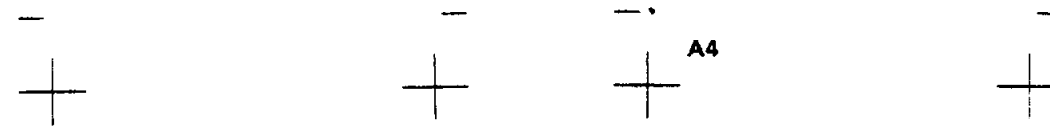
PURPOSE:
GG

A3

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

FLT PLN-4b/42/0/A

FLT PLN-5a/42/0/A



A4

A3

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DAP A4

PURPOSE:
PRE/POST DEPLOY

A4

0.1 0	1	TRANSLATION	
		PULSE	
		ROTATION	
0.5 0 0	2	DSC RT	NORM
0.2 0 0	3	VERN	
0.1 0 0	4	PULSE	NORM
0.0 1 0	5	VERN	
.0 0 0	6	COMP	NORM
.0 0 0	7	VERN	
		DEADBAND	
3.0 0	8	ATT	NORM
1.0 0 0	9		VERN
		RATE	
0.2 0	10		NORM
0.0 2 0	11		VERN
		JET OPT	P
1	12		
1	13		Y
		CNTL ACCEL	
0	14		

FLT PLN-5b/42/0/A

FLT PLN-6a/42/0/A

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A5

+

+

A4

+

+

+

DAP A5

PURPOSE:
IMU ROTATION

A5

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

FLT PLN-6b/42/0/A

FLT PLN-7a/42/0/A

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+

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A6

+



A5

DAP A6

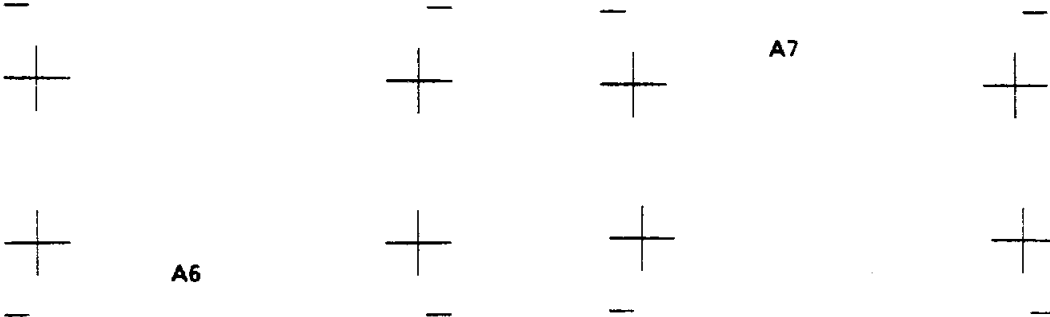
PURPOSE:
LOSS OF VERN
(TAIL ONLY)

A6

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

FLT PLN-7b/42/0/A

FLT PLN-8a/42/0/A



A7

A6

DAP A7

PURPOSE:
RENDEZVOUS

A7

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

FLT PLN-8b/42/0/A

FLT PLN-9a/42/0/A



A8

A7

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+

+

DAP A8

PURPOSE:
PROX OPS

A8

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

FLT PLN-9b/42/0/A

FLT PLN-10a/42/0/A

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A9

+

+

A8

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+

+

DAP A9

PURPOSE:
IML-01 OPERATIONS

A9

0.1 0	1	TRANSLATION	
		PULSE	
		ROTATION	
0.1 0 0	2	DSC RT	NORM
0.1 0 0 0	3		VERN
0.1 0 0	4	PULSE	NORM
0.0 1 0 0	5		VERN
.0 0 0	6	COMP	NORM
.0 0 0	7		VERN
		DEADBAND	
3.0 0	8	ATT	NORM
0.5 0 0	9		VERN
0.2 0	10	RATE	NORM
0.0 1 0	11		VERN
3	12	JET OPT	P
3	13		Y
0	14	CNTL ACCEL	

FLT PLN-10b/42/0/A

FLT PLN-11a/42/0/A

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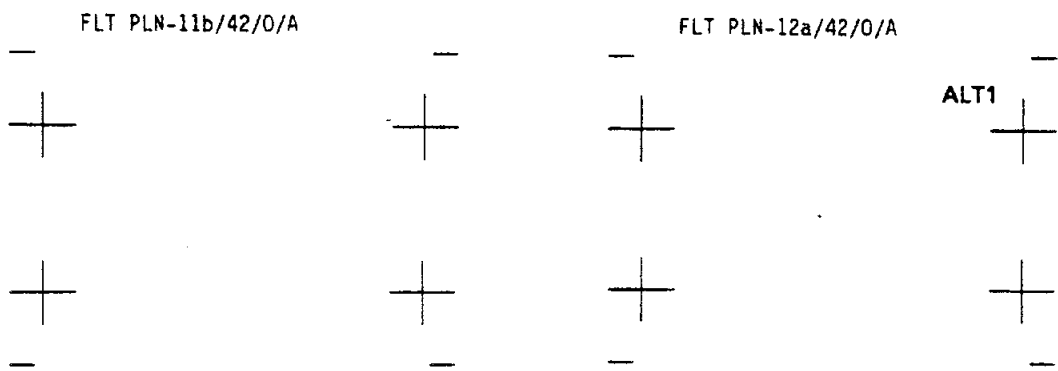
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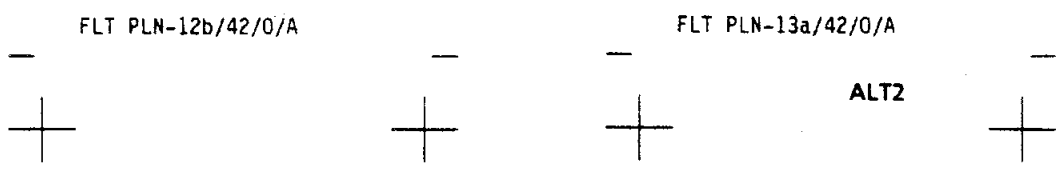
A9

DAP PURPOSE
 ALT1 - NOMINAL I-LOAD
 ALT2 - IML-01 OPERATIONS
 LOSS OF VERN



DAP ALT1
 PURPOSE:
 NOMINAL I-LOAD

ALT1
 0.2 0 0 32 RATE DB
 1 33 JET OPT
 2 34 # JETS
 - 0.0 8 35 ON TIME
 - 0.0 0 36 DELAY





ALT1



DAP ALT2

PURPOSE:

IML-1 OPERATIONS
LOSS OF VERN

ALT2

0.0	7	0	32	RATE DB
		3	33	JET OPT
		1	34	# JETS
0	0.0	8	35	ON TIME
0	1.0	0	36	DELAY

FLT PLN-13b/42/0/A



FLT PLN-14a/42/0/B



ALT2



<u>DAP</u>	<u>PURPOSE</u>
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- B1 - NOMINAL
PRCS IMU ALIGN
OMS & RCS BURNS
- B2 - LOSS OF VERN
(TAIL ONLY)
- B3 - LOSS OF VERN
(NOSE & TAIL)
GG MNVR
- B4 - SSUS DEPLOY
- B5 - COAS CAL
- B6 - (Blank)
- B7 - RENDEZVOUS
- B8 - PROX OPS

FLT PLN-14b/42/0/A

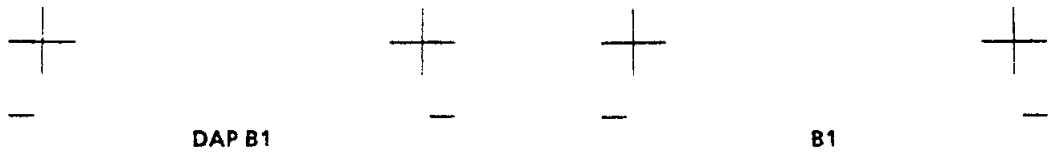


FLT PLN-15a/42/0/A



B1





DAP B1

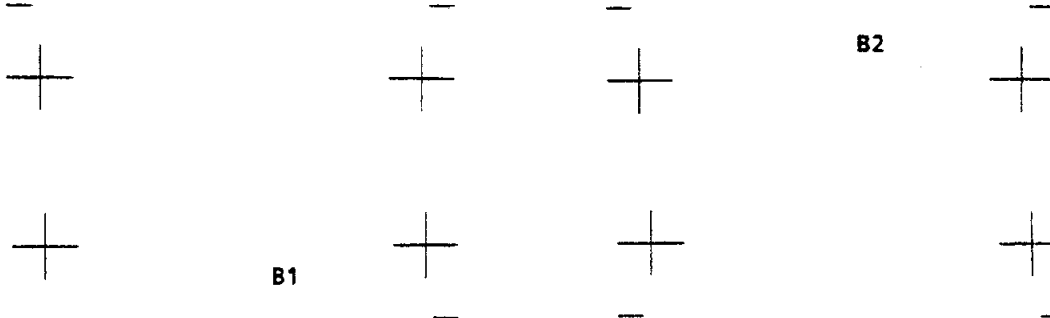
PURPOSE:
 NOMINAL
 PRCS IMU ALIGN
 OMS & RCS BURNS

FLT PLN-15b/42/0/A

B1

TRANSLATION				
PULSE	15	0.0	2	
ROTATION				
DSC RT	NORM 16	0.5	0 0	
	VERN 17	0.2	0 0	
PULSE	NORM 18	0.0	0 4	
	VERN 19	0.0	0 2	
COMP	NORM 20	0.0	0 0	
	VERN 21	0.0	0 0	
DEADBAND				
ATT	NORM 22	3.0	0 0	
	VERN 23	1.0	0 0	
RATE				
	NORM 24	0.2	0 0	
	VERN 25	0.2	0 0	
JET OPT	P 26		1	
	Y 27		1	
CNTL ACCEL	28		0	

FLT PLN-16a/42/0/A



B1

DAP B2

PURPOSE:
 LOSS OF VERN
 (TAIL ONLY)

FLT PLN-16b/42/0/A

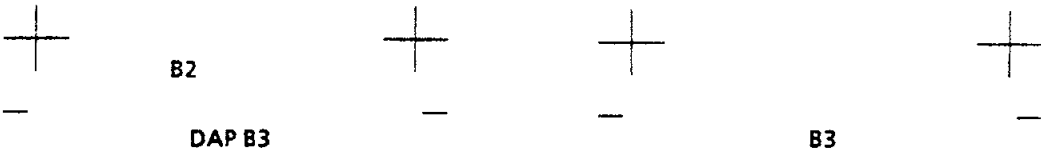
B2

B2

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

FLT PLN-17a/42/0/A

B3

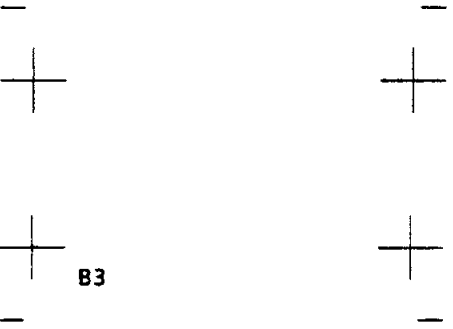


B2

DAP B3

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

FLT PLN-17b/42/0/A

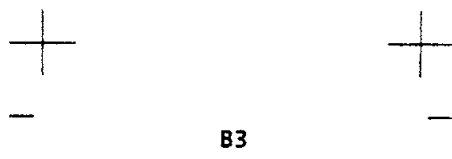


B3

DAP B4

PURPOSE:
SSUS DEPLOY

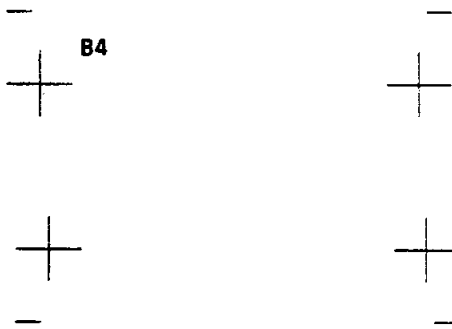
FLT PLN-18b/42/0/A



B3

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

FLT PLN-18a/42/0/A

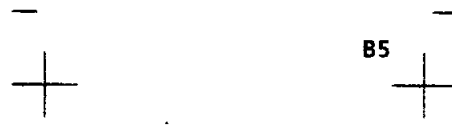


B4

B4

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

FLT PLN-19a/42/0/A



B5

B4

DAP B5

PURPOSE:
COAS CAL

FLT PLN-19b/42/0/A

B5

DAP B6

PURPOSE: (Blank)

FLT PLN-20b/42/0/A

B5

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

FLT PLN-20a/42/0/A

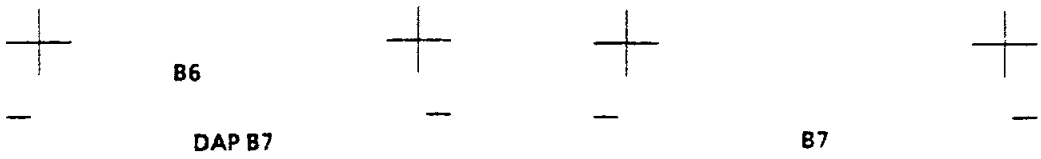
B6

B6

TRANSLATION			
PULSE	15	---	---
ROTATION			
DSC RT	NORM 16	---	---
	VERN 17	---	---
PULSE	NORM 18	---	---
	VERN 19	---	---
COMP	NORM 20	---	---
	VERN 21	---	---
DEADBAND			
ATT	NORM 22	---	---
	VERN 23	---	---
RATE			
	NORM 24	---	---
	VERN 25	---	---
JET OPT			
	P 26		---
	Y 27		---
CNTL ACCEL	28		---

FLT PLN-21a/42/0/A

B7

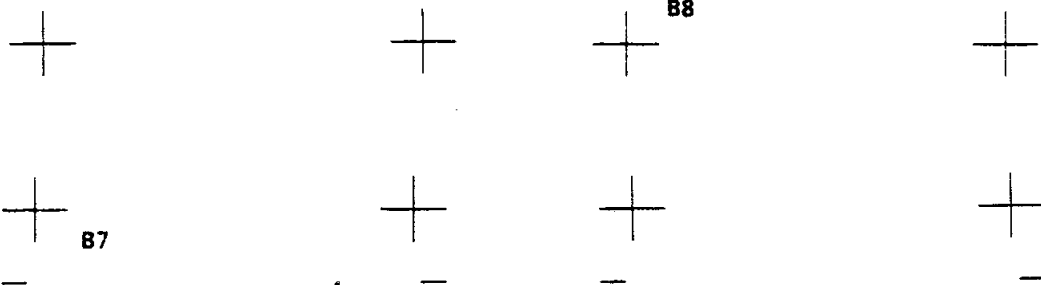


B6

DAP B7

PURPOSE:
RENDEZVOUS

FLT PLN-21b/42/0/A

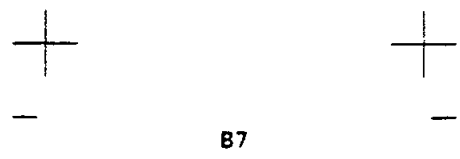


B7

DAP B8

PURPOSE:
PROX OPS

FLT PLN-22b/42/0/A



B7

TRANSLATION
PULSE 15 0.0 5

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

DEADBAND
ATT NORM 22 2.0 0
VERN 23 1.0 0 0

RATE NORM 24 0.2 0
VERN 25 .0 2 0

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

CNTL ACCEL 28 0

FLT PLN-22a/42/0/A



B8

B8

TRANSLATION
PULSE 15 0.0 1

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

DEADBAND
ATT NORM 22 2.0 0
VERN 23 1.0 0 0

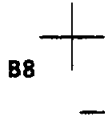
RATE NORM 24 0.2 0
VERN 25 .0 2 0

JET OPT P 26 1
Y 27 1

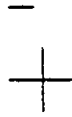
CNTL ACCEL 28 0

FLT PLN-23a/42/0/A





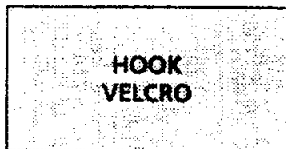
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FLT PLN-24a/42/0/A

DAP BOOK



FLT PLN-24b/42/0/A

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STS-42
FLIGHT PLAN NOTES

FLT PLN NOTES

FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

The STS-42 (OV-103) launch from KSC on January 22, 1992, will be into a 162 by 164 nm orbit at an inclination of 57 degrees. The mission duration will be 7 days. Nominal landing occurs at EDW on January 29, 1992.

Landing opportunities are:

		<u>Landing Orbit No.</u>	<u>Site</u>	<u>Local Time</u>
Nominal	Primary	113	EDW	07:06 PST
	Weather Alt.	111	KSC	07:03 EST
	Weather Alt.	113	NOR	08:08 MST
1 Day Late	Primary	129	EDW	07:14 PST
	Weather Alt.	127	KSC	07:11 EST
2 Days Late	Primary	145	EDW	07:22 PST
	Weather Alt.	143	KSC	07:19 EST

MAJOR EVENTS

<u>LAUNCH</u> (KSC)	January 22, 1992
MET (DD/HH:MM:SS)	0/00:00:00
Day of year	22
CST/GMT	7:54/13:54

<u>OMS-2</u>	
MET (DD/HH:MM)	0/00:39
DV (fps)	262.3
ORBIT ha/hp (nm)	164/162

<u>DEORBIT BURN</u>	
MET (DD/HH:MM)	07/00:14
DV (fps)	268.0

<u>LANDING</u> (EDW)	
MET (DD/HH:MM)	07/01:12
Day of year	29
CST/GMT	09:06/15:06

B. CREW

1. There will be seven crewmembers onboard divided into teams as follows:

BLUE Team - CDR, PLT, MS1, PS1
RED Team - MS2, MS3, PS2

FLT PLN NOTES

2. There crewmembers assigned to the mission

CDR - Ronald J. Grabe
PLT - Stephen S. Oswald
MS1 - Norman E. Thagard
MS2 - William F. Readdy
MS3 - David C. Hilmers
PS1 - Roberta L. Bondar
PS2 - Ulf D. Merbold

3. The crewmembers responsible for performing an EVA, should one become necessary, are: MS1 will be EV1, MS2 will be EV2, and PLT will be IV1.

C. ORBITER SYSTEMS

1. Communications and Instrumentation

- a. The Operational Instrumentation (OI) system will nominally be managed from the ground through uplink real-time commands (RTCs) coordinated with the crew.
- b. TDRS coverage is supported by TDRS-E (41 degrees W) and TDRS-W (171 degrees W) and is the prime mode of communication coverage.
- c. TDRS Ku-band is the prime mode of real-time TV. There are also three GSTDN sites available as backup for TV (90-minute lead time required): GDS(GDX), MIL(MLX), and VAN.
- d. HDR uplink (e.g., Teleprinter) is available through TDRS-E and TDRS-W.
- e. TDRS-E and TDRS-W are assumed available to support Ku-band uplink (e.g., TAGS).
- f. GSTDN sites available during the first 25 minutes of the mission are MIL(MLX), PDL, BDA, DKR, and IOS. IOS can be used for UHF voice during ascent.
- g. There are five GSTDN sites available on orbit or for deorbit: VAN, GDS(GDX), MIL(MLX), BDA(BDX), and DFR. (Note: DFR is not shown in the Flight Plan). CAN and MAD can be called up for emergencies.
- h. RTS sites are available for contingency support (4 hours lead-time required): HTS, GTS, VTS, IOS, NHS, CTS, and OTS.

D. TELEVISION/PHOTOGRAPHY

1. The CCTV systems provide two color, wide-angle cameras for in-cabin coverage. There will also be four PLB TV cameras. There are three different lens assemblies for the PLB cameras (color lens assembly, monochrome lens assembly, and wide-angle lens assembly). The type of lens assembly for each PLB camera is documented in the Flight Requirements Document.
2. There is a video tape recorder available with 30-minute cassettes.

3. Three camera systems are available: 35mm, 16mm, and 70mm.

E. PAYLOADS

1. INTERNATIONAL MICROGRAVITY LABORATORY - 1

IML-1 is a mission of multidiscipline experiments conducted in the Spacelab long module. The objective of this payload is to conduct application, science, and technology investigations that require the low-gravity environment of Earth orbit and extended duration stable vehicle attitude, with emphasis on investigating the effect of microgravity on experiments in the microgravity science and life science disciplines. The payload consists of six experiments that have previously flown on earlier Spacelab missions and nine new experiments.

1.1 MATERIALS SCIENCE EXPERIMENTS

a. Fluid Experiment System (FES)

The FES is an experiment facility designed for the investigation of crystal growth and fluid medium behavior characteristics in the near weightless conditions of Earth orbit. The study of Solution Crystal Growth in Low Gravity (TGS) was previously flown on Spacelab-3. A new experiment, which uses the FES facility, is an Optical Study of Grain Formation (CAST).

b. Vapor Crystal Growth System (VCGS)

The VCGS is a materials processing experiment designed to grow Mercuric Iodide crystals on-orbit to determine the effects of microgravity on vapor phase crystal growth. This experiment is a reflight from Spacelab-3.

c. Mercury Iodide Crystal Growth (MICG)

The purpose of MICG is to grow near-perfect crystals of Mercury Iodide in a microgravity environment which will decrease the convection effects on crystal growth. This experiment is a reflight of the Spacelab-3 experiment with minor changes in the number of samples and containers.

d. Protein Crystal Growth (PCG)

The primary objective of PCG is to produce large high-quality crystals of selected proteins under controlled conditions in microgravity. This experiment was flown in the middeck on STS-26, STS-29, STS-32 and STS-37.

e. Organic Crystal Growth Facility (OCGF)

The OCGF experiment consists of organic crystal growth in low gravity by a diffusion method.

f. Cryostat (CRY)

The CRY experiment performs protein crystal growth in low gravity. These crystals will be analyzed using x-ray diffraction analysis.

g. Space Acceleration Monitoring System (SAMS)

The SAMS experiment consists of three triaxial sensors and a data acquisition system to provide acceleration measurements in support of the Spacelab integrated FES and MVI experiments.

h. Critical Point Facility (CPF)

The CPF experiment will enable measurements of material properties at the critical point at which many physical properties assume extreme values, or at which profound step changes in material properties occur.

1.2 LIFE SCIENCE EXPERIMENTS

a. Gravitational Plant Physiology Facility (GPPF)

The GPPF is designed to enable biological investigations on plants during spaceflight. The GPPF investigations consist of two plant experiments: the Gravity Threshold Experiment (GTHRES) and the Phototropic Transients Experiment (FOTRAN).

b. Biorack (BR)

The BR is a multipurpose facility that is designed to enable biological investigations on such life forms such as plants, tissues, cells, bacteria, and insects during spaceflight. The BR facility is a reflight of the facility flown on the Spacelab D1 mission. For IML-1, a third incubator has been added, and a new set of experiments will be flown.

c. Space Physiology Experiments (SPE)

The SPE experiment consists of a series of functional objectives using a mini-sled mounted in the center aisle to investigate space adaptation and space motion sickness. The objectives are as follows: Space Adaptation Syndrome Experiments (SASE); Measurement of Venous Compliance (MVC); Phase Partitioning Experiment (PPE); assessment of Back Pain in Astronauts (BPA); Energy Expenditure in Space Flight (EES); and evaluation of Positional/Spontaneous Nystagmus (PSN).

d. Microgravity Vestibular Investigations (MVI)

The MVI experiment uses a rotating chair mounted in the module center aisle to study space motion sickness.

e. Biostack (BSK)

The BSK experiment consists of passive containers of layered biological objects as cosmic ray detectors in space. The BSK will determine the radiobiological importance of cosmic ray particles of high mass number and energy and nuclear disintegration stars.

f. Mental Workload and Performance Evaluation (MWPE)

This experiment consists of computer tasks to test operator performance in zero gravity.

g. Radiation Monitoring Container/Dosimeter (RMCD)

This experiment hardware consists of four dosimeters to measure the effect of radiation on biological materials in space.

1.3 SECONDARY/OTHER INFLIGHT PAYLOAD ELEMENTS

a. The Life Sciences Laboratory Equipment (LSLE)

Refrigerator will be flown and will be treated as Mission Peculiar Equipment. Other MPE, including the fluid pump, fluid loop, vacuum vent, and some module structural items, is reflown (or series) hardware from Spacelab-3.

b. The IMAX camera will be flown on IML-1 and will be considered orbiter-provided equipment. Stowage space will be provided for the IMAX camera within the Spacelab module.

2. GET AWAY SPECIAL (GAS) CANISTERS

Attached cargo operations will be performed with the ten GAS canisters experiments contained in the GAS Bridge Assembly. The ten GAS experiments are G086, F102, G140, G143, G329, G336, G337, G457, G609, G610, and G614.

a. The G-086 is a Booker T. Washington High School (Houston, TX) experiment. The experiment will fly brine shrimp *Artemia* to determine the behavioral and physiological effects of micro-gravity on cysts hatched in space..

b. The G-140 is by Deutsche Forschungs - und Versuchsanstalt fur Luft - und Raumfahrt (DFVLR). The experiment is Marangoni: Convection in a Floating Zone. Some of the objectives of the experiment are to detect higher modes of the oscillatory Marangoni convection in floating zones and to study the influence of the rotation on the steady and the oscillatory Marangoni convection.

c. The G-143 is by Deutsche Forschungs - und Versuchsanstalt fur Luft - und Raumfahrt (DFVLR). The experiment is Gas Bubbles in Glass Melts. The objective of the experiment is to gain further insight in the process of glass fining; i.e., the removal of all visible gaseous inhomogeneities from the glass melt.

- d. The G-329 experiment is by the Swedish Space Corporation. The scientific objective is to study solidification phenomena in metal alloys. After the experiment is performed, the resultant unidirectionally solidified sample will be studied for dendritic growth and the effect of the absence of convection on metal alloy samples.
- e. The G-336 is by the United States Air Force Geophysics Laboratory. The objective of the Visual Photometric Experiment (VIPER) is to measure the diffuse zodiacal and galactic emissions at the B, R, and V standard astronomical wavelengths.
- f. The G-337 is by the United States Air Force Space Systems Division and the Naval Postgraduate School. The objective of this experiment is to measure the performance of a thermo-acoustic refrigerator under microgravity conditions. The refrigerator is driven by acoustic resonance.
- g. The G-457 is by the Society of Japanese Aerospace Companies, Inc. The experiment is a preliminary study of a method of gas-liquid separation under conditions of microgravity. Gas bubbles are separated out of a liquid by artificial gravity generated by an impeller.
- h. The G-609/G610 experiment is by the Australian Space office in AUSPACE limited. The scientific objectives are to make ultraviolet observations of deep space. These observations will be made to study the structure of galactic supernova remnants, the distribution of hot gas in the Magellanic clouds, the hot galactic halo mission, and emission associated with galactic cooling flows and jets.
- i. The G-614 is sponsored by the Chinese Society of Astronautics and the American Association for Promotion of Science in China. This payload contains two experiments. The first experiment will study the motion of debris in the shuttle under microgravity conditions. The second experiment contains two low-melting point materials (paraffin and wood's metal). Eight small cylindrical containers will be premixed in various ratios and manners in the solid form on Earth and remelted on orbit, then left to cool and resolidify.

3. GELATION OF SOLS: APPLIED MICROGRAVITY RESEARCH (GOSMAR)

The GOSMAR payload is a middeck experiment which will investigate the influence of microgravity on the processing of jelled sols.

4. STUDENT EXPERIMENT (SE83-2)

This student experiment, "Zero-G Capillary Rise of Liquid through Granular Porous Media", is a middeck experiment that investigates the effects of gravity on the flow characteristics of a fluid.

5. STUDENT EXPERIMENT (SE81-9)

This student experiment, "Convection in Zero Gravity", is a middeck experiment that studies surface tension induced flows in microgravity.

6. INVESTIGATION INTO POLYMER MEMBRANE PROCESSING (IPMP)

The research objective of the IPMP payload is to flash evaporate mixed solvent systems in the absence of convection to control the porosity of the polymer membrane.

7. RADIATION MONITORING EQUIPMENT (RME-III)

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

F. ON-ORBIT DTOs

1. Cabin Air Monitoring (DTO 623)

This DTO will use the solid sorbent sampler to continuously sample the orbiter atmosphere throughout the flight. The solid sorbent sampler is to be flown on all Spacelab manned module flights.

2. Eyewash (DTO 635)

The purpose of this DTO is to demonstrate the utility of the Shuttle Emergency Eyewash (SEE) system, which has been proposed as an addition to the Shuttle Orbiter Medical System (SOMS). The SEE is a device designated to rinse an individual's eyes with large volumes of water in the event of exposure to toxic chemicals or irritants.

3. On-Orbit Cabin Air Cleaner Evaluation (DTO 637)

This DTO tests a proposed system to be used to filter the cabin air. The system's primary use location is mounted in the starboard interdeck passageway. Additional methods are provided to temporarily mount the system in other locations utilizing the seat mounting provisions. Objectives include evaluation of the air velocity produced by the fan, noise generation, and general air quality.

4. Spacelab CO2 Control (DTO 641)

The purpose of the DTO is to evaluate on-orbit PPCO2 levels in the orbiter and Spacelab crew compartments with only the orbiter carbon dioxide removal system operating. This information is needed to determine whether the Regenerative CO2 Removal System (RCRS), which is being developed for Extended Duration Orbiter (EDO) missions, is capable of controlling CO2 levels on mission involving Spacelab as an attached habitable volume.

5. Electronic Still Photography (DTO 648)

Electronic still photography is a new technology which provides the means for a handheld camera to electronically capture and digitize an image with resolution approaching film quality. The digital image is stored on disks and can be converted to a format suitable for downlink transmission or enhanced using image processing software. The ability to enhance and/or downlink high

resolution images in real time will greatly improve capabilities in Earth observations. The objective of this DTO is to determine camera response to the photographic conditions encountered on orbit, using a variety of lenses and camera settings.

6. Cycle Ergometer Hardware Evaluation (DTO 651)

This DTO will evaluate the cycle ergometer as an alternative to the shuttle treadmill. Treadmill use has raised several concerns including noise, vibration, subject discomfort, and inability to quantify workload. These concerns warrant evaluation of alternate in-flight exercise hardware. Vibration and physical discomfort will be documented and biomedical analysis will be performed in conjunction with various protocols/workloads. Heart rate will be recorded for evaluation of the resistive workload settings in zero-g.

7. Evaluation of the MK I Rowing Machine (DTO 653)

This DTO will evaluate the MK I rowing machine as an alternative to the shuttle treadmill. Noise and vibration associated with the MK I are anticipated to be significantly less than in the case of the treadmill. In-flight simulated rowing is anticipated to provide total body exercise including aerobic and anaerobic conditioning. Heart rate will be recorded to determine the effectiveness of changes in the resistive settings of the device.

G. ON-ORBIT DSOs

1. In-Flight Radiation Dose-Distribution (DSO 469)

The objective of this investigation is to establish, evaluate, and verify analytical and measurement methods for assessing and managing health risks from exposure to space radiation. It will measure the radiation in the Spacelab tunnel. The DSO is also a part of the Extended Duration Orbiter Medical Project (EDOMP).

2. The Relationship of Space Adaptation Syndrome to Middle Cerebral Artery Blood Velocity Measured in Flight by Doppler (DSO 470)

The purpose of this test is to explore in-flight the use of a small, lightweight portable instrument that measures blood flow velocities. Also, the test will document the changes in cerebral and regional blood flows that occur in the microgravity environment and try to correlate these changes with the onset and severity of Space Adaptation Syndrome.

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

The objective of this DSO is to measure the changes in orthostatic function of crewmembers during the actual stresses of entry, landing, and egress from the orbiter. Crewmembers will don equipment prior to donning the LES during deorbit preparation. Equipment consists of a blood pressure monitor, accelerometers, an Impedance Cardiograph, and Transcranial Doppler hardware. The crewmember wears the equipment and records verbal comments throughout entry.

4. Visual Vestibular Integration as a Function of Adaption
(DSO 605)

The objective of this DSO is to investigate visual vestibular and perceptual adaptive responses as a function of longer missions and to determine the operational impact on performance of entry, landing, and egress procedures. This data will be used to develop training and/or countermeasures to assure the safety and success of extended missions by promoting optimal neurosensory function needed for entry, landing, and possible emergency egress.

5. Air Monitoring Instrument Evaluation and Atmosphere Characterization (DSO 611)

The purpose of this DSO is to evaluate air monitoring equipment and to collect data on contaminant levels during missions of varying durations.

6. Documentary Television (DSO 901)

The DSO requires live television transmission or VTR dumps of crew activities and spacecraft functions which include: Payload Bay Views, STS and Payload Crew Activities, VTR Downlink of Crew Activities, In-Flight Crew Conference, and unscheduled TV Activities.

7. Documentary Motion Picture Photography (DSO 902)

The DSO 902 requires documentary and public affair motion picture photography of significant activities which best depicts the basic capabilities of the space shuttle and key objectives. This DSO includes motion picture photography of Spacelab Module Activities, Flight Deck Activities, Middeck Activities, and any unscheduled Motion Picture Photography.

8. Documentary Still Photography (DSO 903)

The DSO 903 requires still photography of crew activities in the orbiter, spacelab and mission related scenes of general public and historical interest. Still photography with 70mm format for exterior photography and 35mm format for interior photography is required.

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