

*Shuttle*

Space Shuttle Program

JSC-48000-45

# FLIGHT DATA FILE

## Flight Plan

### STS-45

(Rotated Flight Cycle  
Trajectory)

Mission Operations Directorate  
Operations Division

Final *PCN-1*  
January 31, 1992

<u>EVENT</u>	<u>CST</u>		
Launch	07:01	Mon	March 23
KSC Landing	05:08	Tue	March 31



National Aeronautics and  
Space Administration

Lyndon B. Johnson Space Center  
Houston, Texas



STS-45 FLIGHT PLAN

FINAL (January 31, 1992)

## PCN-1 (Feb 28, 1992) Sheet 1 of 1

## List of Implemented Change Requests (482s):

FLT PLN-1242  
FLT PLN-1243  
FLT PLN-1246

## Incorporate the following:

1. Replace iii & iv
2. Replace 2-1 thru 2-10, 2-13 & 2-14, 2-17 & 2-18
3. Replace 3-3 & 3-4, 3-13 thru 3-16, 3-23 thru 3-28,  
3-37 thru 3-40, 3-49 thru 3-52, 3-71 & 3-72,  
3-75 thru 3-80, 3-93 & 3-94
4. Replace 6-9 & 6-10

Prepared by:

Fisher Reynolds  
Book Manager

Approved by:

Ben E Ferguson  
Head, Flight Planning and  
Pointing Section

John H. Kist  
Chief, Flight Activity Branch

Encl: 48 pages



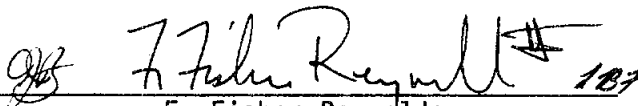
File this PCN immediately behind the front cover as a permanent record

MISSION OPERATIONS DIRECTORATE


STS-45 FLIGHT PLAN

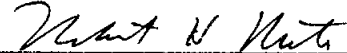
FINAL  
January 31, 1992


PREPARED BY:

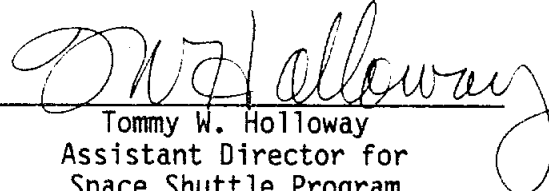
  
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	FLT PLN-1183A	FLT PLN-1214	MULTI-563A
	FLT PLN-1195	FLT PLN-1223	MULTI-574
	FLT PLN-1196	FLT PLN-1227	MULTI-576
	FLT PLN-1200	FLT PLN-1228	MULTI-584
	FLT PLN-1201A	FLT PLN-1229	<i>MULTI-551</i>
	FLT PLN-1204	FLT PLN-1230	EXEMPTION#: 33
	FLT PLN-1205	FLT PLN-1231 A	<i>FLT PLN-1233</i>
	FLT PLN-1208	FLT PLN-1232 A	<i>FLT PLN-1237</i>
			<i>FLT PLN-1238</i>

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Book Manager	DH4/F. F. Reynolds	483-4312
Nominal Timelines	DH4/A. J. Bartos	483-4424
Attitude and Pointing	DH4/L. B. Friedl	483-4454

STS-45 FLIGHT PLAN

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DAP BOOK Front Cover.....	5-5	FLT PLN-1a/45/0/A
UNIV PTG (Back of DAP BOOK Front Cover).....	5-5	FLT PLN-1b/45/0/A
DAP A TOC.....	5-6	FLT PLN-2a/45/0/B
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A6.....	5-9	FLT PLN-8a/45/0/B
DAP A7.....	5-9	FLT PLN-8b/45/0/A
A7.....	5-9	FLT PLN-9a/45/0/A
DAP A8.....	5-10	FLT PLN-9b/45/0/A
A8.....	5-10	FLT PLN-10a/45/0/A
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A9.....	5-10	FLT PLN-11a/45/0/A
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B1.....	5-12	FLT PLN-15a/45/0/A
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DAP B5.....	5-14	FLT PLN-18b/45/0/A
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DAP B6.....	5-15	FLT PLN-19b/45/0/B
B6.....	5-15	FLT PLN-20a/45/0/B
DAP B7.....	5-15	FLT PLN-20b/45/0/A
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## INTRODUCTION

The STS-45 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-45 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the Flight Cycle version of the STS-45 Flight Initialization Data Pack.

The flight profile used for this Flight Plan is for a launch date of March 23, 1992, at 7:01 CST with a landing at KSC. CLOUDS observation opportunities will be evaluated real-time for the actual flight profile and are not identified in this timeline. Orbital inertial attitudes are expressed relative to a mean of 1950 (M50) reference frame.

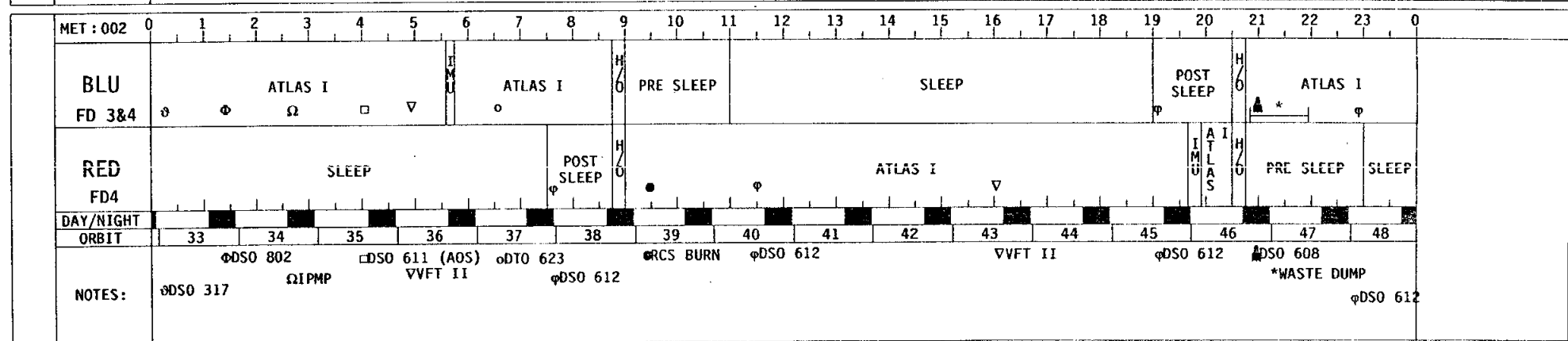
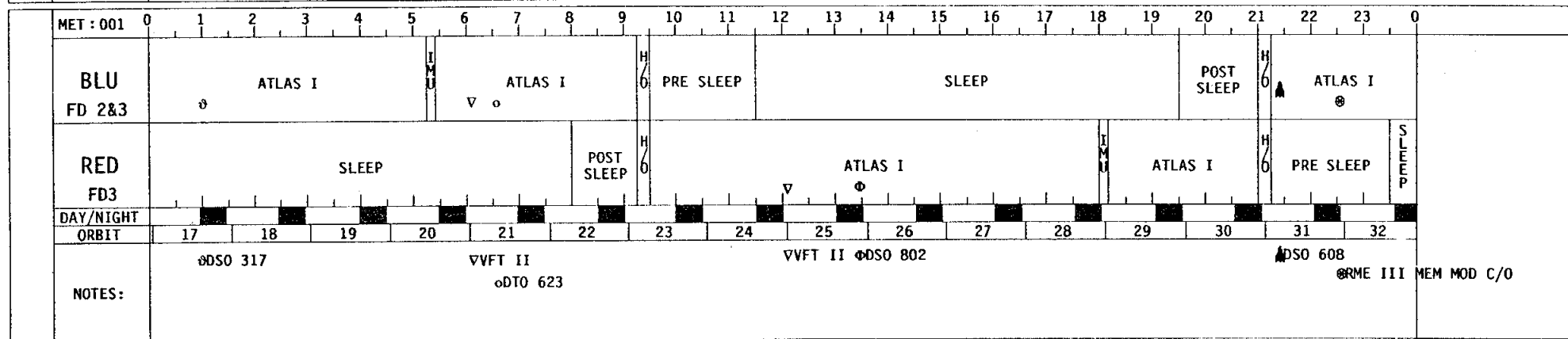
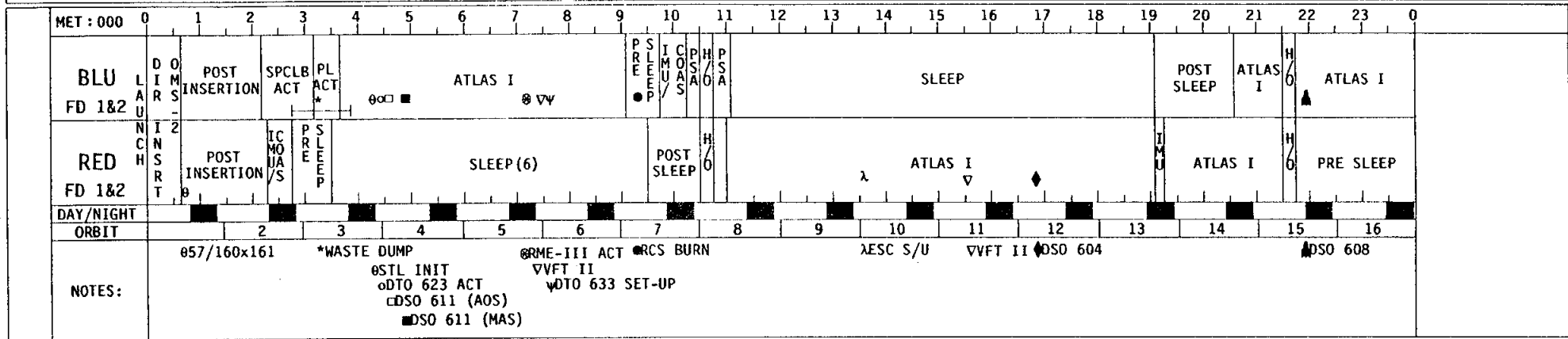
JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, Rev A, 1 April 1991, has been used to build the timelines contained in this Flight Plan. Note: The CDR is not assigned to a team and may adjust his hours real-time as necessary. Exercise for the payload specialists is scheduled once mid-flight and once near the end of flight.

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

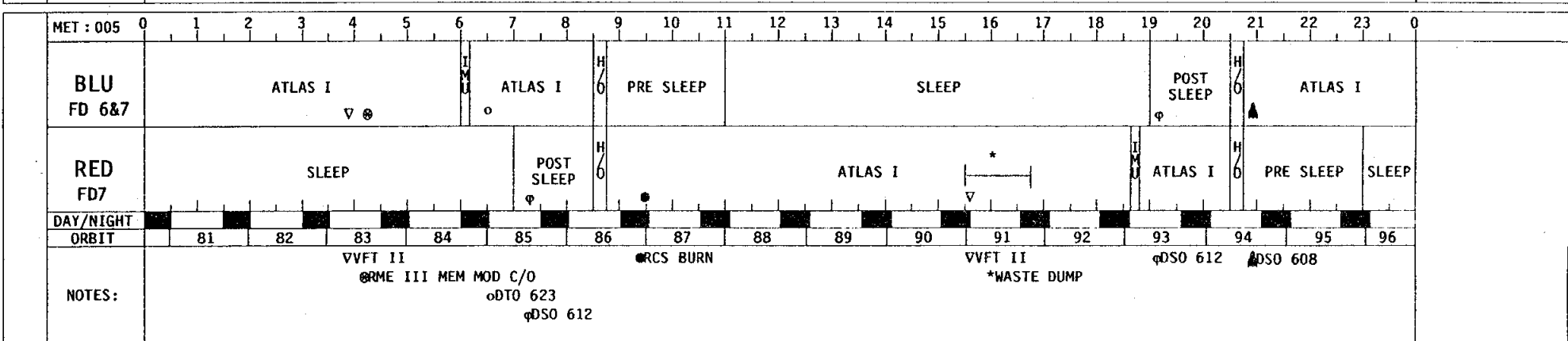
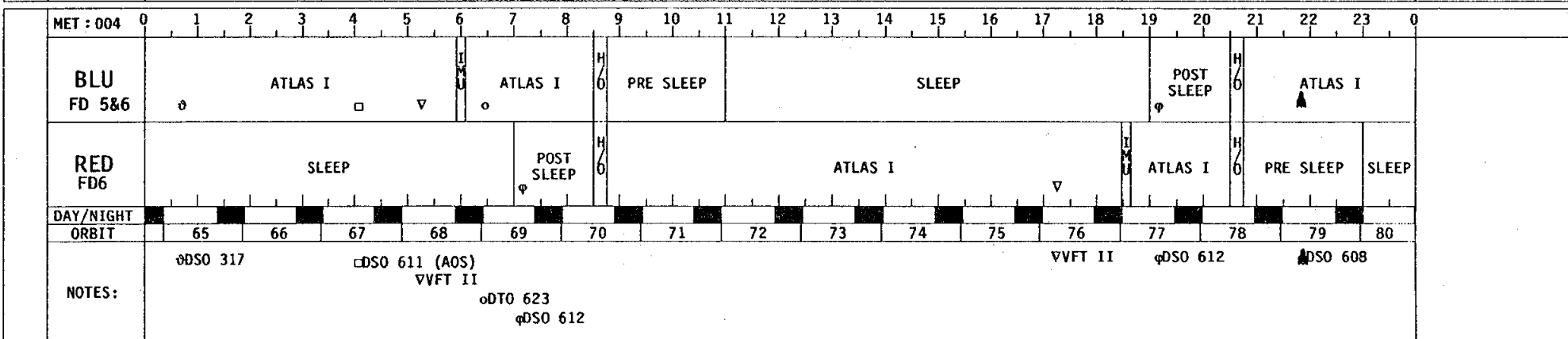
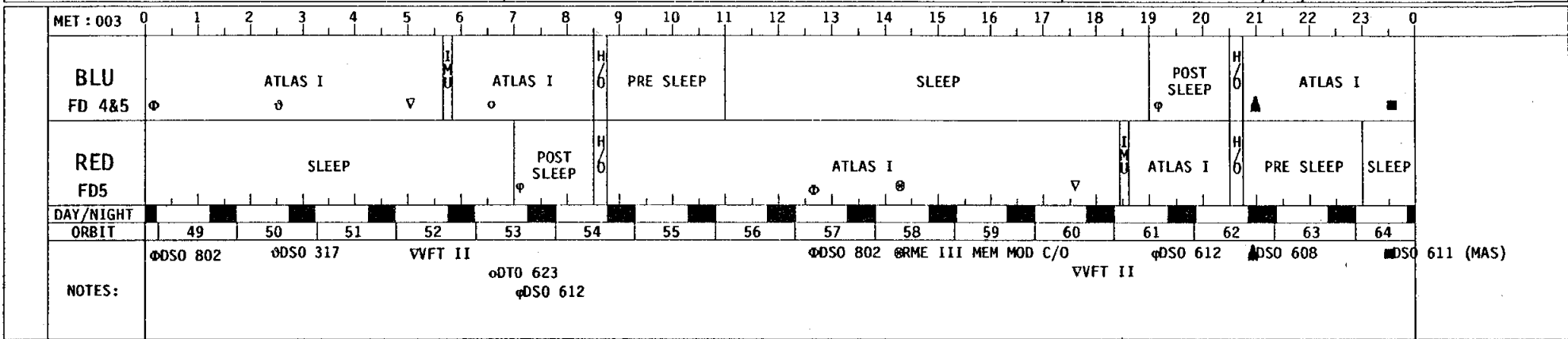
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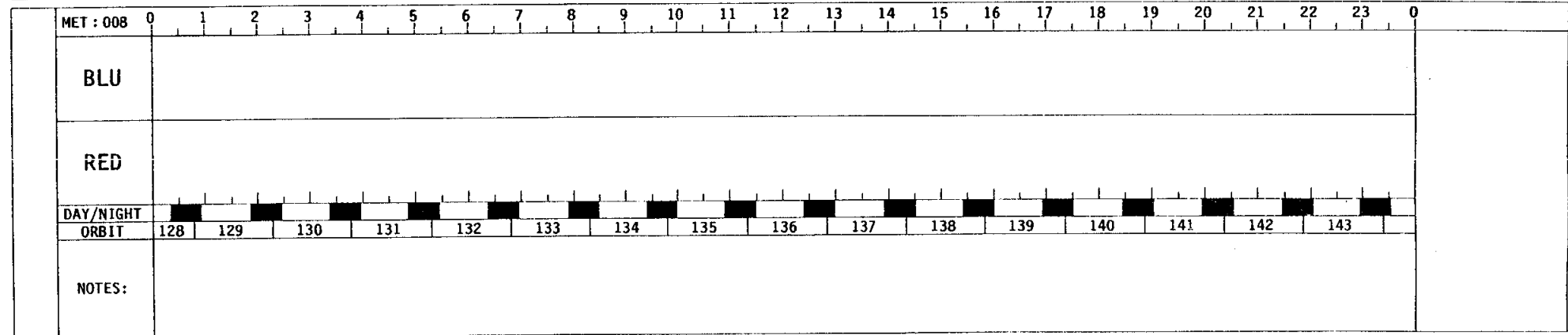
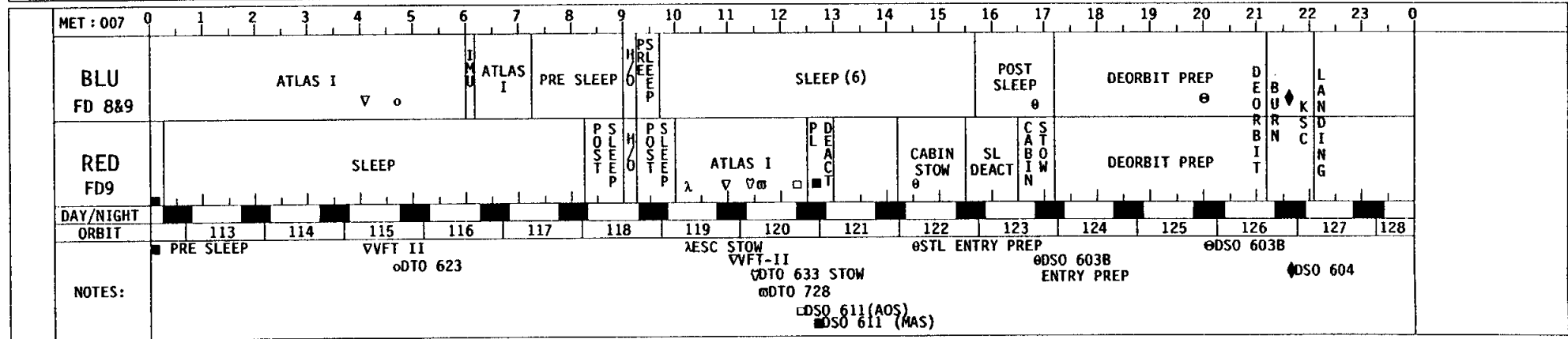
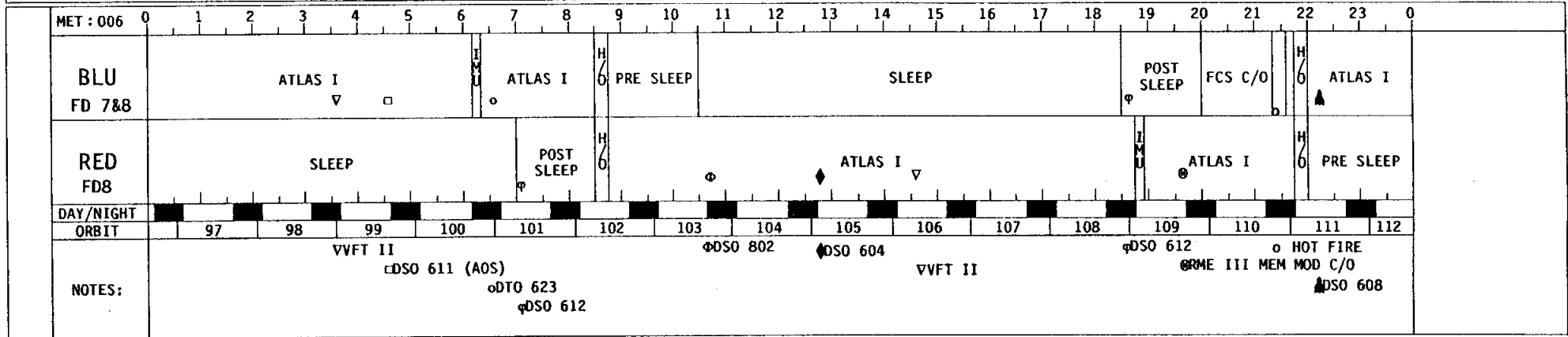
STS-45 OVERVIEW

FLIGHT: STS-45      EDITION: FINAL      PUB. DATE: 01/31/92



FLIGHT: STS-45      EDITION: FINAL      PUB. DATE: 01/31/92







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	
083:13:01/ 084:01:01		000:00:00/ 000:12:00		083:07:01/ 083:19:01		/083 CST	-55.6	☾	MARCH 23, 1992	STS-45	FINAL 1	02/28/92	
CST	:083	8	9	10	11	12	13	14	15	16	17	18	19
FD	:001	1	2	3	4	5	6	7	8	9	10	11	12
MET	:000	0	1	2	3	4	5	6	7	8	9	10	11
BLUE	CDR												
	PLT												
	MS1												
	PS1												
RED	MS2												
	MS3												
	PS2												
DAY/NIGHT													
ORBIT													
TDRS													
ATTITUDE													
NOTES:	<ul style="list-style-type: none"> <li>○ IMU ALIGN</li> <li>○ COAS MNVR</li> <li>○ FWD STATION</li> <li>○ -ZLV, +YVV</li> <li>○ BIAS -XLV +YVV</li> <li>○ APU HTR DEACT</li> <li>○ WASTE DUMP TERM</li> <li>○ APU COOL B</li> <li>○ SPACE TISSUE LOSS</li> <li>○ DTO 623 CABIN AIR MON</li> <li>○ DSO 611 BAS</li> <li>○ PCS CONFIG</li> <li>○ APU HTR RECONFIG</li> <li>○ ORME III ACTIVATION</li> <li>○ DTO 633 VTR DEMO</li> <li>○ APU HTR RECONFIG-A</li> <li>○ IMU ALIGN</li> <li>○ AFT STATION</li> <li>○ H/O BLUE TO RED</li> <li>○ HOUSTON, TX (RADIO CK)</li> <li>○ POST SLEEP</li> </ul>												

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE			
084:01:01/ 084:13:01		000:12:00/ 001:00:00		083:19:01/ 084:07:01		/083 CST	-55.5		MARCH 23, 1992	STS-45	FINAL	01/31/92			
CST	:083	20	21	22	23	0	CST:084	1	2 BLU	3	4	5	6	7	0
FD RED	:02	12	13	14	15	16	17	18	19 FD:02	20	21	22	23		MET:001
MET	:000														
BLUE	CDR	SLEEP							POST SLEEP		H/O	DSO 608		FILTER CLEANING	
	PLT	SLEEP							POST SLEEP		H/O	MANEUVER		FAUST SCAN SOUND X	
	MS1	SLEEP							POST SLEEP		H/O	AEP1HHC		D/P SAREX	
	PS1	SLEEP							POST SLEEP		H/O	AEP4AG		D/P SAREX	
RED	MS2	MEAL		MEAL		MEAL		EXERCISE		H/O	PRE SLEEP				
	MS3	MEAL		VFT-2		P/TV01		EXERCISE		SEP1CO		SAREX	H/O	PRE SLEEP	
	PS2	MEAL		MEAL		MEAL		EXERCISE		SEP1CO		H/O	PRE SLEEP		
DAY/NIGHT	ORBIT														
TDRS	E W														
ATTITUDE	TDRS														
NOTES:	◎ DTO 648 ELECTRONIC CAMERA					◎ DSO 604 VISUAL VESTIBULAR RESPONSE					◎ SAIPAN				
						◎ CARDIF, WALES					◎ HALDEN, NORWAY				
						◎ H/O RED TO BLUE					◎ DSO 608 EFFECTS OF SPACE FLIGHT				

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
084:13:01/ 085:01:01		001:00:00/ 001:12:00		084:07:01/ 084:19:01		/084 CST	-55.3		MARCH 24, 1992	STS-45	FINAL 1	02/28/92	
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MET	:001	0							RED				
									8				
									FD:03				
BLUE	CDR				MEAL			VFT-2			PRE SLEEP	PRE SLEEP	SLEEP
	PLT				MEAL			P/TV12 ACT		EXERCISE	H/O	PRE SLEEP	SLEEP
	MS1			AEP1/5A	MEAL		SAREX			EXERCISE	H/O	PRE SLEEP	SLEEP
	PS1		AEP1/5A		MEAL		AEP1/5A		AEP1/5A	AEP1/5A	H/O	PRE SLEEP	SLEEP
RED	MS2				SLEEP					POST SLEEP	H/O	SUSIM	MANEUVER
	MS3				SLEEP					POST SLEEP	H/O D/P	SUS3ALV	AUG1EGT
	PS2				SLEEP					POST SLEEP	H/O D/P	AEP1/5A D/P	SUS3ALV
DAY/NIGHT	[Day/Night Cycle Diagram]												
ORBIT	[Orbit Diagram]												
TDRS	[TDRS Diagram]												
ATTITUDE	[Attitude Diagram]												
NOTES:	@SAN DIEGO, CA      @DSO 317 OBS @DSO 317 OBS      @DEVON, ALBERTA      @INDIANOLA, IA @DSO 317 OBS      ■ IMU ALIGN												

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
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FD. RED	:03	13	14	15	16	17		18	19	20	21	22	23	0		
MET	:001	12								BLU						
										FD:03				MET:002		
BLUE	CDR	SLEEP								POST SLEEP	POST SLEEP	MANEUVER	H/O	SEP9AA	DSO 608	P/T V13
	PLT	SLEEP								POST SLEEP	H/O					MANEUVER
	MS1	SLEEP								POST SLEEP	H/O	D/P	SEP9AA			SAREX
	PS1	SLEEP								POST SLEEP	H/O	D/P		APP2A-AA		APP3DUU
RED	MS2	P/T V13	DSO 802	FAUST SCAN	MANEUVER	MEAL	FAUST SCAN	MANEUVER	FAUST SCAN	MANEUVER	EXERCISE	FAUST SCAN	H/O	PRE SLEEP	SLEEP	
	MS3	VFT-2	DSO 802	MEAL	MASPHOTO	ISOPHOTO	SSBMDASU	EXERCISE	H/O	PRE SLEEP	SLEEP					
	PS2	DSO 802	MEAL	SUBJWA	APP7WAKE	APP7WAKE	H/O	PRE SLEEP	SLEEP							
DAY/NIGHT	ORBIT															
TDRS	E W															
ATTITUDE	+ZLV -XVV -ZLV +XVV -ZLV -XVV ISO13A ISO13A -ZLV -XVV															
NOTES:	SEP2EB1	DSO 802 EDUCATIONAL PHOTOGRAPHY								V IMU ALIGN	H/O RED TO BLUE					
		DSO 608 EFFECTS OF SPACE FLIGHT														
		MEMORY MODULE REPLACEMENT														
		BRABAND, DENMARK														

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE								
085:13:01/ 086:01:01		002:00:00/ 002:12:00		085:07:01/ 085:19:01		/085 CST	-54.2		MARCH 25, 1992	STS-45	FINAL 1	02/28/92								
CST	:085	8	9	10	11	12	13	14	15	16	17	18	19							
FD BLU	:03	0	1	2	3	4	5	6	7	8	9	10	11	12						
MET	:002								RED	FP:04										
BLUE	CDR	DSO 317		DSO 802	P/TV12 ACT	MEAL	VFT-2			SAREX	SAREX	H/O	RCS BURN	PRE SLEEP	SLEEP					
	PLT		P/TV12	DSO 802	IPMP	MEAL								PRE SLEEP	SLEEP					
	MS1			DSO 802	SEP9AA	MEAL	SEP9AA							PRE SLEEP	SLEEP					
	PS1			DSO 802	APPZAA	MEAL	APPZAA							PRE SLEEP	SLEEP					
RED	MS2					SLEEP								POST SLEEP						
	MS3					SLEEP								POST SLEEP						
	PS2					SLEEP								POST SLEEP						
DAY/NIGHT	ORBIT												33	34	35	36	37	38	39	40
TORS	E M																			
ATTITUDE	-ZLV -XVV																			
NOTES:	@AUGSBURG, GERMANY @DSO 317 OBS @DSO 802 EDUCATIONAL PHOTOGRAPHY @DSO 317 OBS @IMJ ALIGN @MAYNARD, MA @DTO 623 CABIN AIR MON @DSO 612 ENERGY UTILIZATION @ORANGEBURG, SC @SAO PAULO BRAZIL @H/O PRE SLEEP @HOUSTON, TX @DSO 612 ENERGY UTILIZATION																			

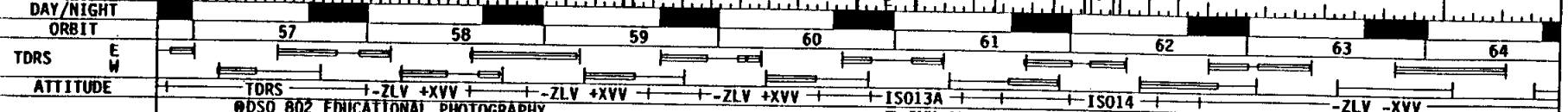
GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE			
086:01:01/ 086:13:01		002:12:00/ 003:00:00		085:19:01/ 086:07:01		/085 CST	-53.5		MARCH 25, 1992	STS-45	FINAL	01/31/92			
CST	:085	20	21	22	23	0	CST:086	1	2	3	4	5	6	7	
FD RED	:04	12	13	14	15	16		17	18	19	20	21	22	23	0
MET	:002														MET:003
BLUE	CDR	SLEEP							MANEUVER	POST SLEEP	H/O	DSO 608	MANEUVER		
	PLT	SLEEP							DCNTL 611	POST SLEEP	H/O	WDI AUN SMI E	MANEUVER	DCSN OTL 612	P/TV 15
	MS1	SLEEP								POST SLEEP	H/O	D/P	A EPT 3 DU	SSBMDASU	SEP9AA
	PS1	SLEEP							DCNTL 611	POST SLEEP	H/O	EXERCISE	D/P	DCSN OTL 612	A EPT 2 B - O L
RED	MS2	MANEUVER	MANEUVER	FAUST SCAN	MEAL	FAUST SCAN	MANEUVER	MANEUVER	MANEUVER	EXERCISE	H/O	PRE SLEEP	SLEEP		
	MS3	MANEUVER	MANEUVER	MANEUVER	MEAL	VFT-2	ISOPHOTO	ISOPHOTO	ISOPHOTO	EXERCISE	H/O	PRE SLEEP	SLEEP		
	PS2	MANEUVER	MANEUVER	MANEUVER	MEAL					A EPT 7 WAKE	H/O	PRE SLEEP	SLEEP		
DAY/NIGHT															
ORBIT															
TDRS															
ATTITUDE		TDRS + -ZLV +XVV + -ZLV +XVV + -ZLV +XVV + -ZLV +XVV + ISO13A + BIAS -XLV +YVV + ISO14													
NOTES:		o POST SLEEP o DSO 612 ENERGY UTILIZATION o POST SLEEP o IMU ALIGN o H/O RED TO BLUE o -ZLV, +YVV o DSO 608 EFFECTS OF SPACE FLIGHT o WASTE DUMP TERM o DSO 612 ENERGY UTILIZATION													

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE		
086:13:01/ 087:01:01		003:00:00/ 003:12:00		086:07:01/ 086:19:01		/086 CST	-52.5		MARCH 26, 1992	STS-45	FINAL 1	02/28/92		
CST	:086	8	9	10	11	12	13	14	15	16	17	18	19	
FD BLU	:04	1	2	3	4	5	6	7	8	9	10	11	12	
MET	:003	0	1	2	3	4	5	6	7	8	9	10	11	12
BLUE	CDR		MEAL	DSO 802		VFT-2					PRE SLEEP	SLEEP		
	PLT	DSO 802	MEAL					EXERCISE			PRE SLEEP	SLEEP		
	MS1	DSO 802	MEAL					SEP9AA	EXERCISE		PRE SLEEP	SLEEP		
	PS1		MEAL					SEP7VA			PRE SLEEP	SLEEP		
RED	MS2		SLEEP					DSO 612 TEST	POST SLEEP					
	MS3		SLEEP						POST SLEEP					
	PS2		SLEEP						POST SLEEP					
DAY/NIGHT	[Day/Night Cycle Diagram]													
ORBIT	[Orbit Cycle Diagram]													
TDRS	[TDRS Cycle Diagram]													
ATTITUDE	[Attitude Cycle Diagram]													
NOTES:	@DSO 802 EDUCATIONAL PHOTOGRAPHY @ANTWERP, BELGIUM @DSO 317 OBS @LONGWOOD, FL @SAN JOSE, CA @DSO 317 OBS ■ IMU ALIGN @H/O BLUE TO RED @DTO 623 CABIN AIR MON @DSO 612 ENERGY UTILIZATION @MANUAL													



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
087:01:01/ 087:13:01	003:12:00/ 004:00:00	086:19:01/ 087:07:01	/086 CST	-51.4		MARCH 26, 1992	STS-45	FINAL	01/31/92				
CST :086 FD RED :05 MET :003	20 13	21 14	22 15	23 16	0 17	1 18	2 19	3 20	4 21	5 22	6 23	7 0	MET:004

Crew	Position	Day/Night																			
		12	13	14	15	16	17	18	19	20	21	22	23	0							
BLUE	CDR	SLEEP																			
	PLT	SLEEP																			
	MS1	SLEEP																			
	PS1	SLEEP																			
RED	MS2	MANEUVER	DSO 802	MANEUVER	MEAL	MANEUVER	MEAL	MANEUVER	GRP B GAS	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	EXERCISE	H/O	PRE SLEEP	SLEEP			
	MS3	MANEUVER	PSET/VIP	DSO 802	MANEUVER	MEAL	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	EXERCISE	SAREX	H/O	PRE SLEEP	SLEEP	
	PS2	MANEUVER	MANEUVER	MANEUVER	MEAL	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	PRE SLEEP



NOTES:

- DSO 802 EDUCATIONAL PHOTOGRAPHY
- MEMORY MODULE REPLACEMENT
- IMU ALIGN
- DSO 612 ENERGY UTILIZATION
- HARROGATE, ENGLAND
- H/O RED TO BLUE
- DSO 608 EFFECTS OF SPACE FLIGHT
- DSO 611 MAS

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
087:13:01/ 088:01:01		004:00:00/ 004:12:00		087:07:01/ 087:19:01		/087 CST	-50.1		MARCH 27, 1992	STS-45	FINAL 1	02/28/92	
CST	:087	8	9	10	11	12	13	14	15	16	17	18	19
FD BLU	:05							RED	8				
MET	:004	0						70:06					
BLUE	CDR				MEAL		VFT-2			H/O	PRE SLEEP	SLEEP	
	PLT				MEAL			IMU	EXERCISE	H/O	PRE SLEEP	SLEEP	
	MS1				MEAL	SEP9AA			EXERCISE	H/O	PRE SLEEP	SLEEP	
	PS1				MEAL		SEP7VA	AEP8/4AG	SEP7VAH/O		PRE SLEEP	SLEEP	
RED	MS2				SLEEP			DSO 612 TEST	POST SLEEP	H/O			
	MS3				SLEEP				POST SLEEP	H/O	D/P	MASPHOTO	
	PS2				SLEEP				POST SLEEP	H/O	D/P		
DAY/NIGHT	[Day/Night Cycle Diagram]												
ORBIT	[Orbit Cycle Diagram]												
TDRS	[TDRS Cycle Diagram]												
ATTITUDE	[Attitude Cycle Diagram]												
NOTES:	@DSO 317 OBS @DSO 317 OBS @HTR CONFIG @CABIN TEMP CNTL RECONFIG @PCS CONFIG @IMU ALIGN @DTG 623 CABIN AIR MON @DSO 612 ENERGY UTILIZATION @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				
088:01:01/ 088:13:01		004:12:00/ 005:00:00		087:19:01/ 088:07:01		/087 CST	-48.7		MARCH 27, 1992	STS-45	FINAL	01/31/92				
CST :087		20	21	22	23	0	CST:088	1	2	3	4	5	6	7	MET:005	
FD RED :06	12	13	14	15	16	17		18	19	20	21	22	23	0		
MET :004																
BLUE	CDR	SLEEP								POST SLEEP	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	DSO 608
	PLT	SLEEP								DSO 612 TEST	POST SLEEP	H/O	MANEUVER	MANEUVER	MANEUVER	MANEUVER
	MS1	SLEEP								POST SLEEP	H/O	EXERCISE	SEP9AA	D/P	SEP12E	SEP12E
	PS1	SLEEP								DSO 612 TEST	POST SLEEP	H/O	EXERCISE	SEP9AA	D/P	SEP12E
RED	MS2	SSBMDASU	MANEUVER	MANEUVER	MANEUVER	MEAL	MANEUVER	MANEUVER	MANEUVER	MANEUVER	EXERCISE	H/O	PRE SLEEP	SLEEP		
	MS3	SSBMDASU	MANEUVER	MANEUVER	MANEUVER	MEAL	MANEUVER	MANEUVER	MANEUVER	VFT-2	EXERCISE	H/O	PRE SLEEP	SLEEP		
	PS2	SEP18NADG	SEP11MG+	SEP11MG+	MEAL	SEP11MG+	SEP11MG+	SEP11MG+	SEP11MG+	SEP11MG+	SEP11MG+	H/O	PRE SLEEP	SLEEP		
DAY/NIGHT ORBIT		72	73	74	75	76	77	78	79	80						
TDRS E W		[Timeline showing TDRS E and W phases]														
ATTITUDE		-ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI -ZSI														
NOTES:		▽ IMU ALIGN      ⓄH/O RED TO BLUE ⓄDSO 612 ENERGY UTILIZATION      ⓄDSO 608 EFFECTS OF SPACE FLIGHT														

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
088:13:01/ 089:01:01	005:00:00/ 005:12:00	088:07:01/ 088:19:01	/088 CST	-47.2		MARCH 28, 1992	STS-45	FINAL	01/31/92

CST	FD BLU	MET	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
:088	:06	:005															RED					
																	FD:07					

BLUE	CDR							MEAL	VFT-2													
	PLT	MANEUVER						MEAL														
	MS1	SEP12E7B	SSRCIDTV	SEP7VA				MEAL	SEP9AA													
	PS1	AEP20-EB		AEP5BNAD				MEAL	AEP2A-AA	SEP7VA												

RED	MS2							SLEEP														
	MS3							SLEEP														
	PS2							SLEEP														

DAY/NIGHT	ORBIT	80	81	82	83	84	85	86	87	88
TDRS	E									
	W									
ATTITUDE		-ZLV	-XVV		-ZLV	-XVV			-ZLV	-XVV

NOTES:

- ⊙ MEMORY MODULE REPLACEMENT
- IMU ALIGN
- ⊙ DTO 623 CABIN AIR MON
- ⊙ MSFC, AL
- ⊙ DSO 612 ENERGY UTILIZATION
- ⊙ 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
089:01:01 / 089:13:01	005:12:00 / 006:00:00	088:19:01 / 089:07:01	/088 CST	-45.6		MARCH 28, 1992	STS-45	FINAL 1	02/28/92

CST :088	20	21	22	23	0	CST:089	1	2	3	4	5	6	7	0
FD RED :07	12	13	14	15	16	17	18	19	20	21	22	23	24	
MET :005														MET:006

BLUE	CDR	SLEEP														PSOL SELETP	MAPNOSES	MALNEUVER	POST SLEEP	H/O	DSO 608	FILTER CLEANING				
	PLT	SLEEP														DSO 612 TEST	POST SLEEP/H/O					FASST	MANEUVER			
	MS1	SLEEP														POST SLEEP	H/O	D/P	REPTIHC	SUBDASU	SUBPHOTO	SUBPHOTO	SUBPHOTO	SUBPHOTO	SUBPHOTO	SEDOKA
	PS1	SLEEP														DSO 612 TEST	POST SLEEP/H/O/D/P			SUBDASU	D/P	SUBPHOTO	SUBPHOTO	SUBPHOTO	SEDOKA	

RED	MS2	MANEUVER	MANEUVER	MEAL	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	MANEUVER	EXERCISE	H/O	PRE SLEEP	SLEEP
	MS3	REPTIHC	MEAL	VFT-2	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	ISOPHOTO	SUBDASU	H/O	PRE SLEEP	SLEEP
	PS2	SUBDASU	MEAL								REPTIHC	REPTIHC	REPTIHC	REPTIHC	REPTIHC	H/O	PRE SLEEP	SLEEP

DAY/NIGHT ORBIT	88	89	90	91	92	93	94	95	96
TDRS EM									
ATTITUDE									

NOTES:  
 ◎DSO 612 ENERGY UTILIZATION  
 ◎H/O RED TO BLUE  
 ◎DSO 608 EFFECTS OF SPACE FLIGHT

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
089:13:01/ 090:01:01		006:00:00/ 006:12:00		089:07:01/ 089:19:01		/089 CST	-43.9		MARCH 29, 1992	STS-45	FINAL I	02/28/92	
CST	:089	8	9	10	11	12	13	14	15	16	17	18	19
FD BLU	:07	1	2	3	4	5	6	7	8	9	10	11	12
MET	:006	0											
BLUE	CDR			MEAL		VFT-2						PRE SLEEP	SLEEP
	PLT			MEAL					EXERCISE			PRE SLEEP	SLEEP
	MS1			MEAL				SEP9AA				PRE SLEEP	SLEEP
	PS1			MEAL				SEP7VA				PRE SLEEP	SLEEP
RED	MS2								DSO 612 TEST			POST SLEEP	DSO 802
	MS3											POST SLEEP	DSO 802
	PS2											POST SLEEP	EXERCISE
DAY/NIGHT	[Day/Night Cycle Diagram]												
ORBIT	[Orbit Cycle Diagram]												
TDRS	[TDRS Cycle Diagram]												
ATTITUDE	[Attitude Cycle Diagram]												
NOTES:	<ul style="list-style-type: none"> <li>IMU ALIGN</li> <li>OTO 623 CABIN AIR MON</li> <li>DSO 612 ENERGY UTILIZATION</li> <li>H/O BLUE TO RED</li> <li>DSO 802 EDUCATIONAL PHOTOGRAPHY</li> </ul>												

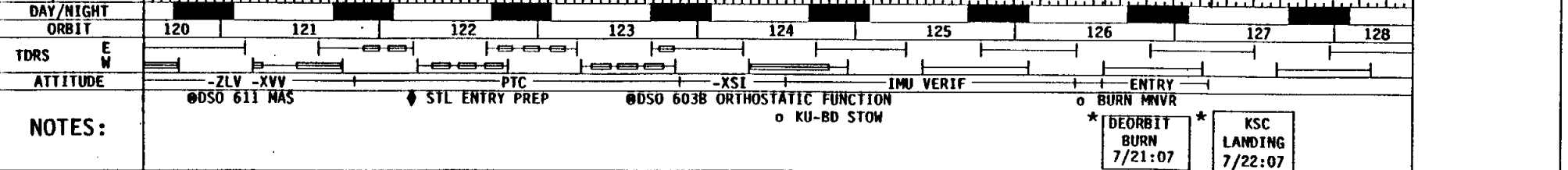
GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE								
090:01:01/ 090:13:01		006:12:00/ 007:00:00		089:19:01/ 090:07:01		/089 CST	-42.1		MARCH 29, 1992	STS-45	FINAL	01/31/92								
CST :089		20	21	22	23	0	CST:090	1	2	3	4	5	6	7	0	MET:007				
FD RED :08	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
MET :006																				
BLUE	CDR	SLEEP										POST SLEEP	FCS C/O	H/O	DSO 608					
	PLT	SLEEP										DSO 612 TEST	POST SLEEP	FCS C/O	H/O	MANEUVER				
	MS1	SLEEP										POST SLEEP		H/O D/P		A E P T 3 D U				
	PS1	SLEEP										DSO 612 TEST	POST SLEEP	H/O D/P		EXERCISE				
RED	MS2	MEAL		FAUST SCAN		MEAL		EXERCISE		FCS C/O		H/O		PRE SLEEP						
	MS3	VFT-2		MEAL		EXERCISE		EXERCISE		H/O		PRE SLEEP								
	PS2	MEAL		MEAL		EXERCISE		EXERCISE		H/O		PRE SLEEP								
DAY/NIGHT	ORBIT		TDRS		ATTITUDE		NOTES:													
	104	105	106	107	108	109	110	111	112											
	-ZLV +XVV		-ZLV +XVV		-ZLV +XVV		-ZLV +XVV		ISO13A		ISO14		-ZSI							
	DSO 604 VISUAL VESTIBULAR RESPONSE						APU HTR ACT		H/O RED TO BLUE											
							DSO 612 ENERGY UTILIZATION		APU COOL A											
							IMU ALIGN		DSO 608 EFFECTS OF SPACE FLIGHT											
							IMU ALIGN													
							MEMORY MODULE REPLACEMENT													

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
090:13:01/ 091:01:01		007:00:00/ 007:12:00		090:07:01/ 090:19:01		/090 CST	-40.2		MARCH 30, 1992	STS-45	FINAL	01/31/92	
CST	:090	8	9	10	11	12	13	14	15	16	17	18	19
FD BLU	:08	1	2	3	4	5	6	7	8	9	10	11	12
MET	:007	0								RED			
										FD:09			
BLUE	CDR				MEAL	VFT-2				PRE SLEEP			SLEEP
	PLT	MANEUVER	MANEUVER		MEAL	MEAL	MEAL	SUSIM		PRE SLEEP	H/O		SLEEP
	MS1	SSBMDASU		AEPHHC				SUS3ALV	3S&16CAM				SLEEP
	PS1	EXERCISE		AEPSSNAD									SLEEP
RED	MS2	PRE SLEEP											POST SLEEP
	MS3	PRE SLEEP											POST SLEEP
	PS2	PRE SLEEP											POST SLEEP
DAY/NIGHT													
ORBIT		112	113	114	115	116	117	118	119	120			
TDRS		E											
ATTITUDE		-ZSI	-ZSI	-ZSI	IAEP5	SUSIM	I-ZSI	-ZSI	-ZSI				
NOTES:		o HTR CONFIG		■ FAUST SCAN	@ DTO 623 CABIN AIR MON		o IMU ALIGN		@ H/O BLUE TO RED	o PRE SLEEP			@ DTO 633 VTR STOW
									v POST SLEEP				@ DTO 648 ELECTRONIC CAMERA
													@ KU-BAND ANT FRICTION



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
091:01:01/ 091:13:01	007:12:00/ 008:00:00	090:19:01/ 091:07:01	/090 CST	-38.3		MARCH 30, 1992	STS-45	FINAL 1	02/28/92
CST :090	20	21	22 BLUE	23	0	CST:091	1	2	3
FD RED :09	12	13	15 FD:09	16	17		18	19	20
MET :007		14						21	22
								23	7
									0

BLUE	CDR	SLEEP						POST SLEEP	DSO 603B ENT PREP	XSI MNVR	IMU MNVR	IAP MLL UIG D N O P S							
	PLT	SLEEP						POST SLEEP	DEORBIT PREP										
	MS1	SLEEP						POST SLEEP	DSO 603B ENT PREP	DEORBIT PREP									
	PS1	SLEEP						POST SLEEP	DEORBIT PREP										
RED	MS2	DSO 611	MEAL	MNVR & INIT PTC	PSE TTUV P12	PAC ITT P12	CABIN STOW			PG WR RP UB P	DEORBIT PREP								
	MS3	OSTOW	PL DEACT	MEAL	CABIN STOW	CABIN STOW	SL DEACT	DSO 603B ENT PREP	DEORBIT PREP										
	PS2	PL DEACT	MEAL	CABIN STOW						DEORBIT PREP									



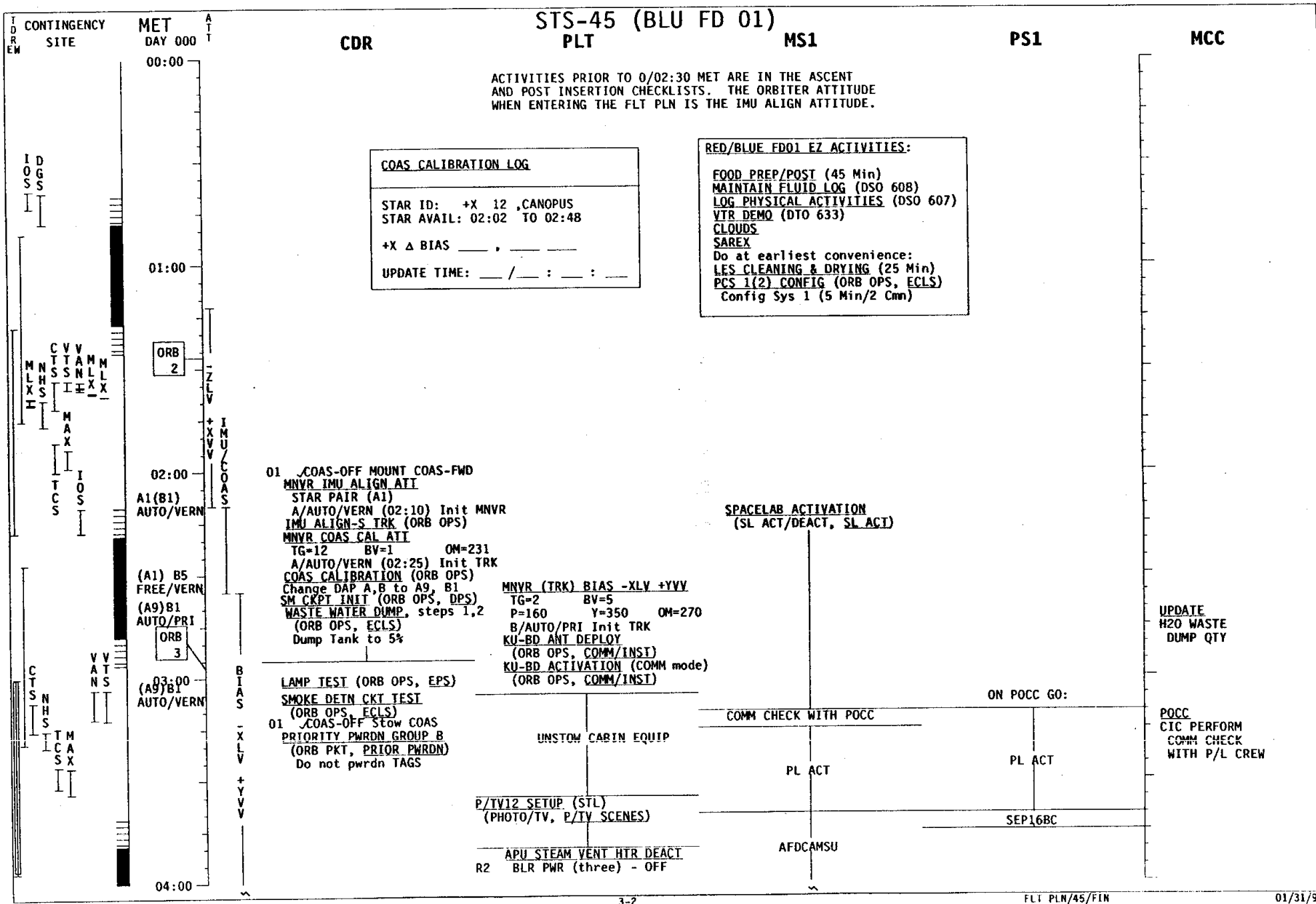
NOTES: o DSO 611 MAS o STL ENTRY PREP o DSO 603B ORTHOSTATIC FUNCTION o IMU VERIF o BURN MNVR \* DEORBIT BURN 7/21:07 \* KSC LANDING 7/22:07

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**DETAILED TIMELINE**

**DETAILED  
TIMELINE**

# DETAILED TIMELINE



T  
D  
R  
E  
W

CONTINGENCY  
SITE

MET  
DAY 000

**STS-45 (RED FD 01)**

**MS2**

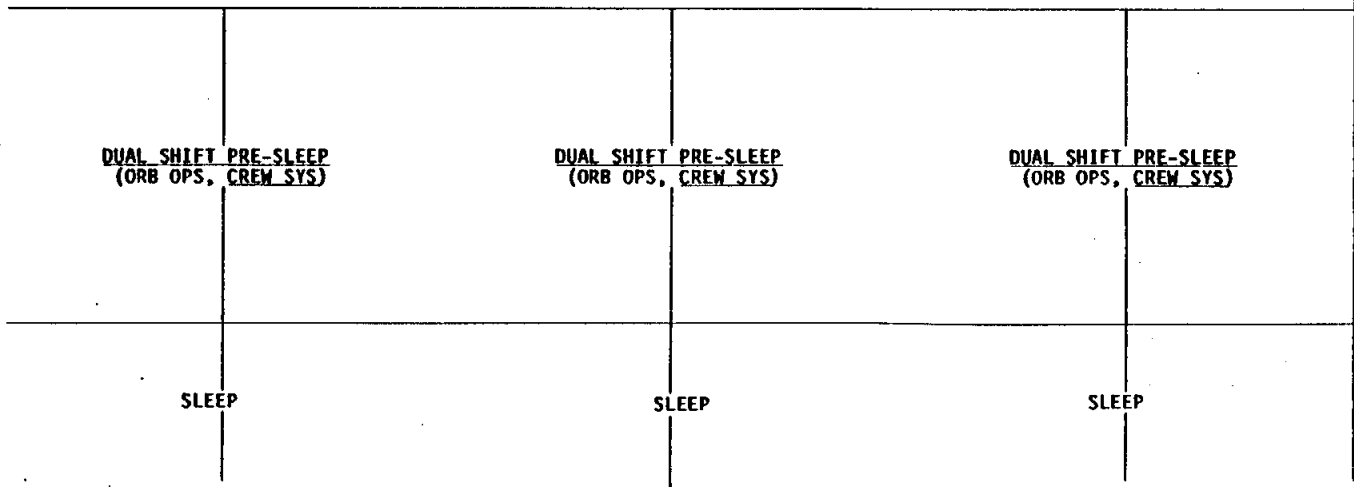
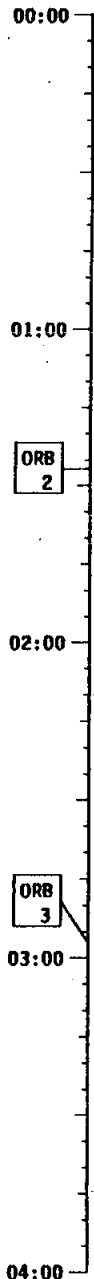
**MS3**

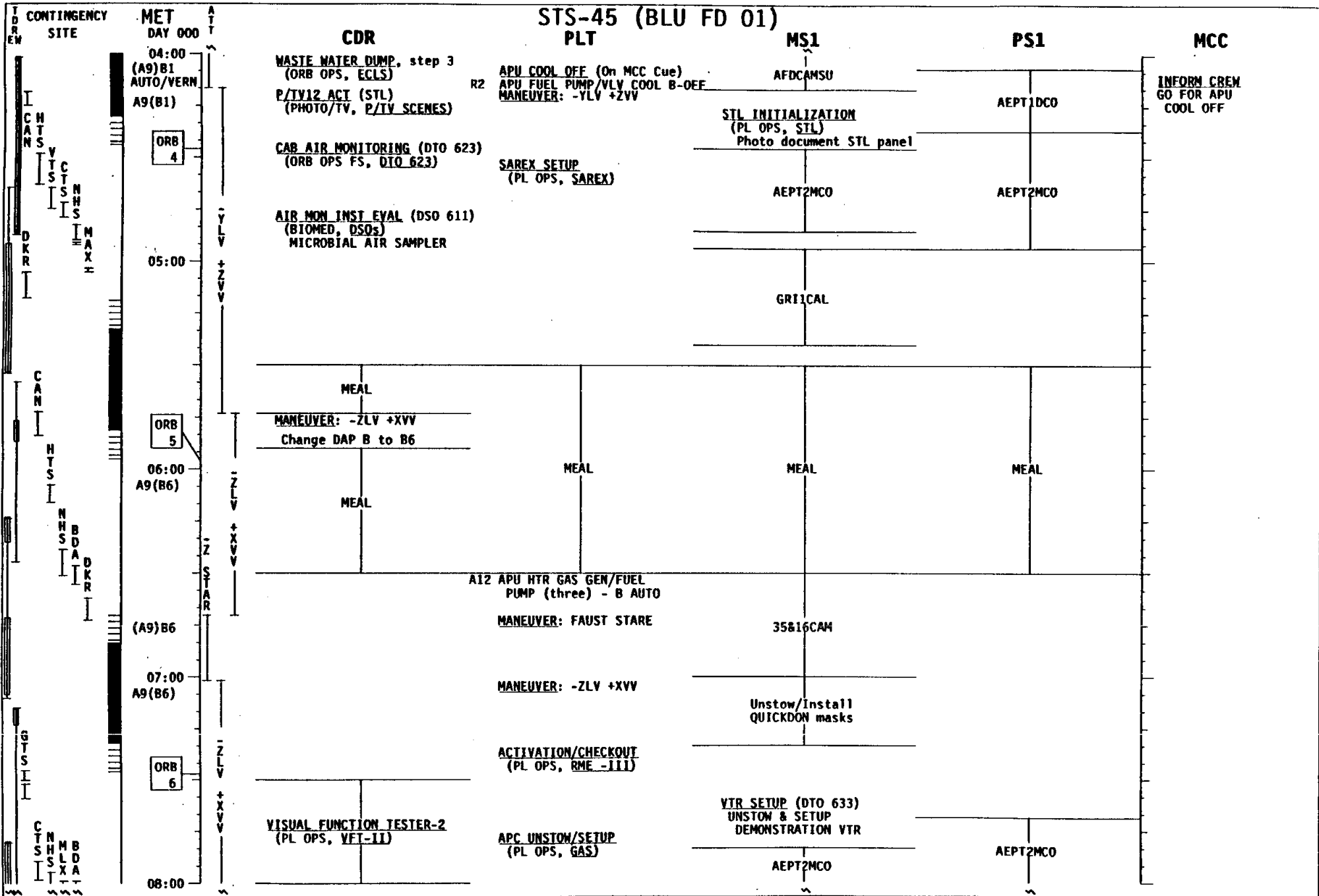
**PS2**

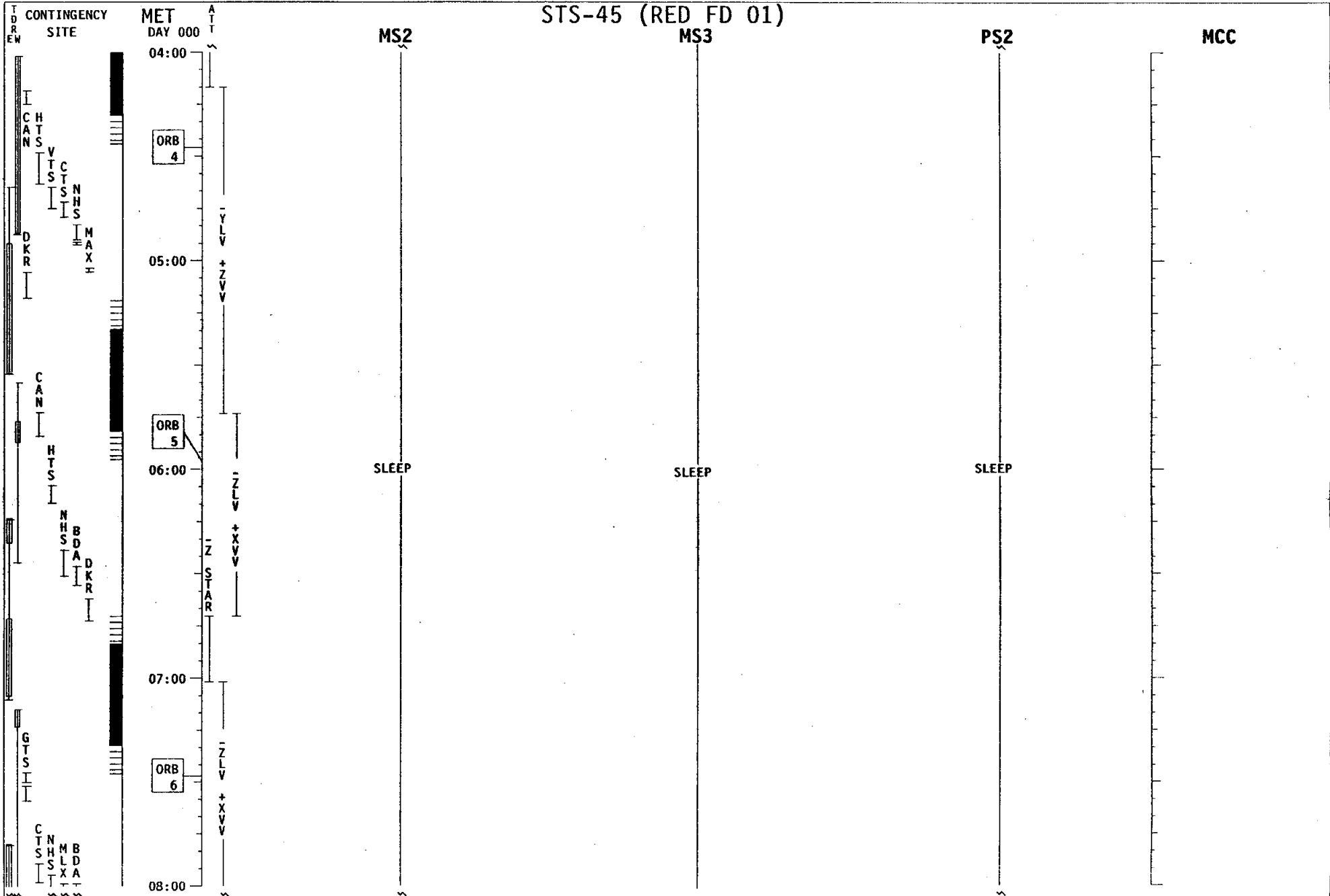
**MCC**

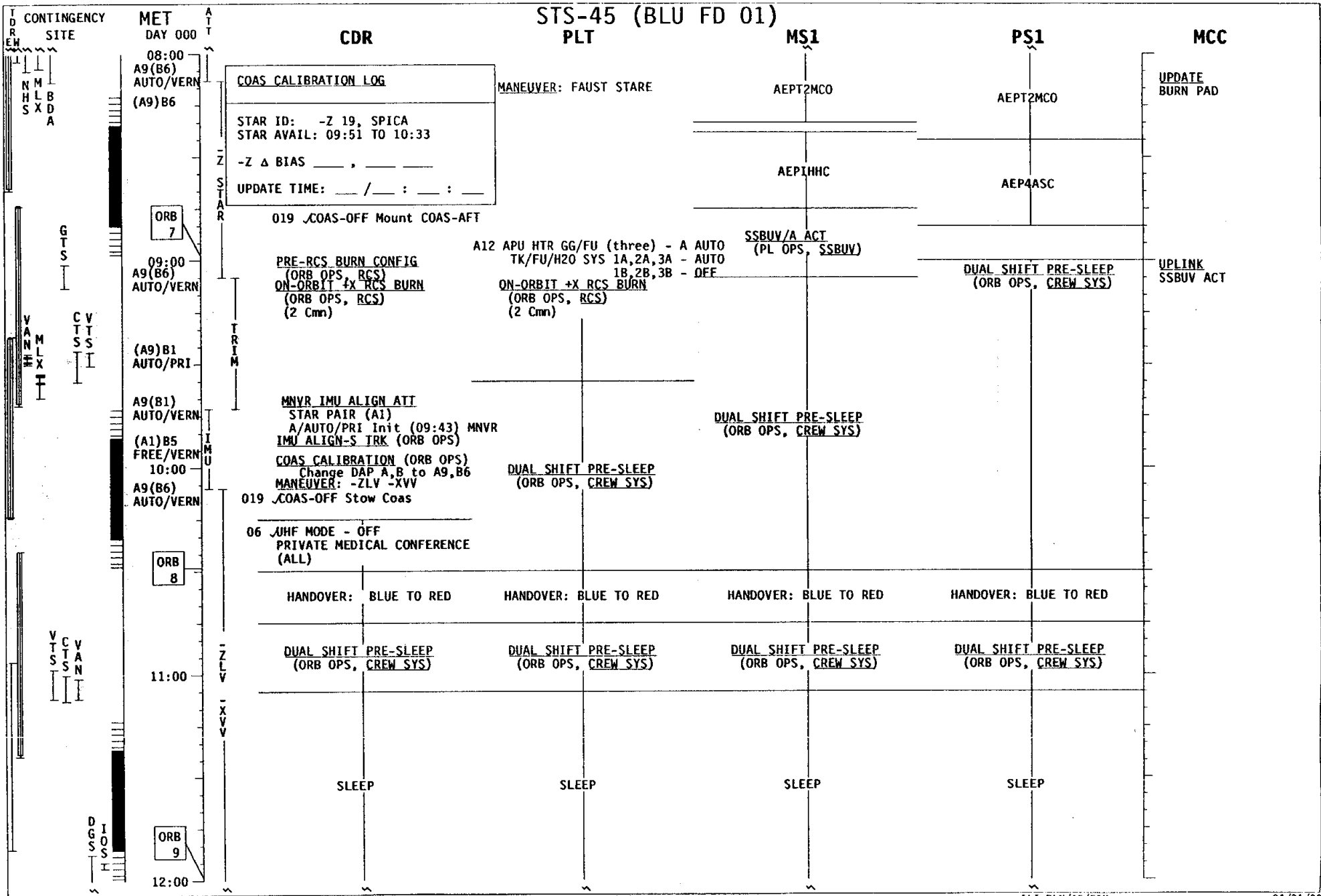
ACTIVITIES PRIOR TO 0/02:30 MET ARE IN THE ASCENT  
AND POST INSERTION CHECKLISTS. THE ORBITER ATTITUDE  
WHEN ENTERING THE FLT PLN IS THE IMU ALIGN ATTITUDE

**RED/BLU FD01 EZ ACTIVITIES:**  
FOOD PREP/POST (45 Min)  
 Do at earliest convenience:  
LES CLEANING & DRYING (25 Min)  
PCS 1(2) CONFIG (ORB OPS, ECLS)  
 Config Sys 1 (5 Min/2 Cmn)  
CPA OPS (ORB OPS, CREW SYS)

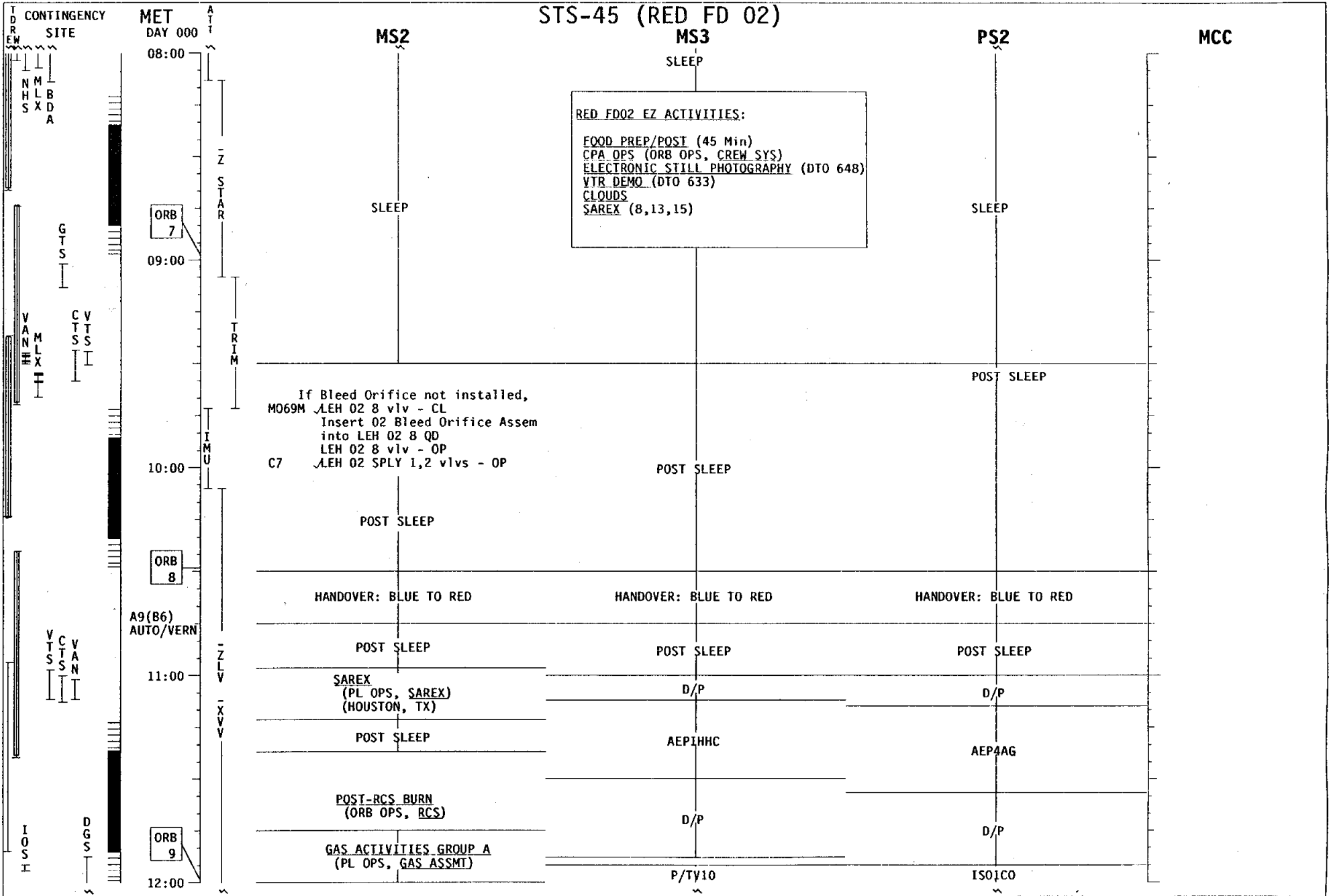


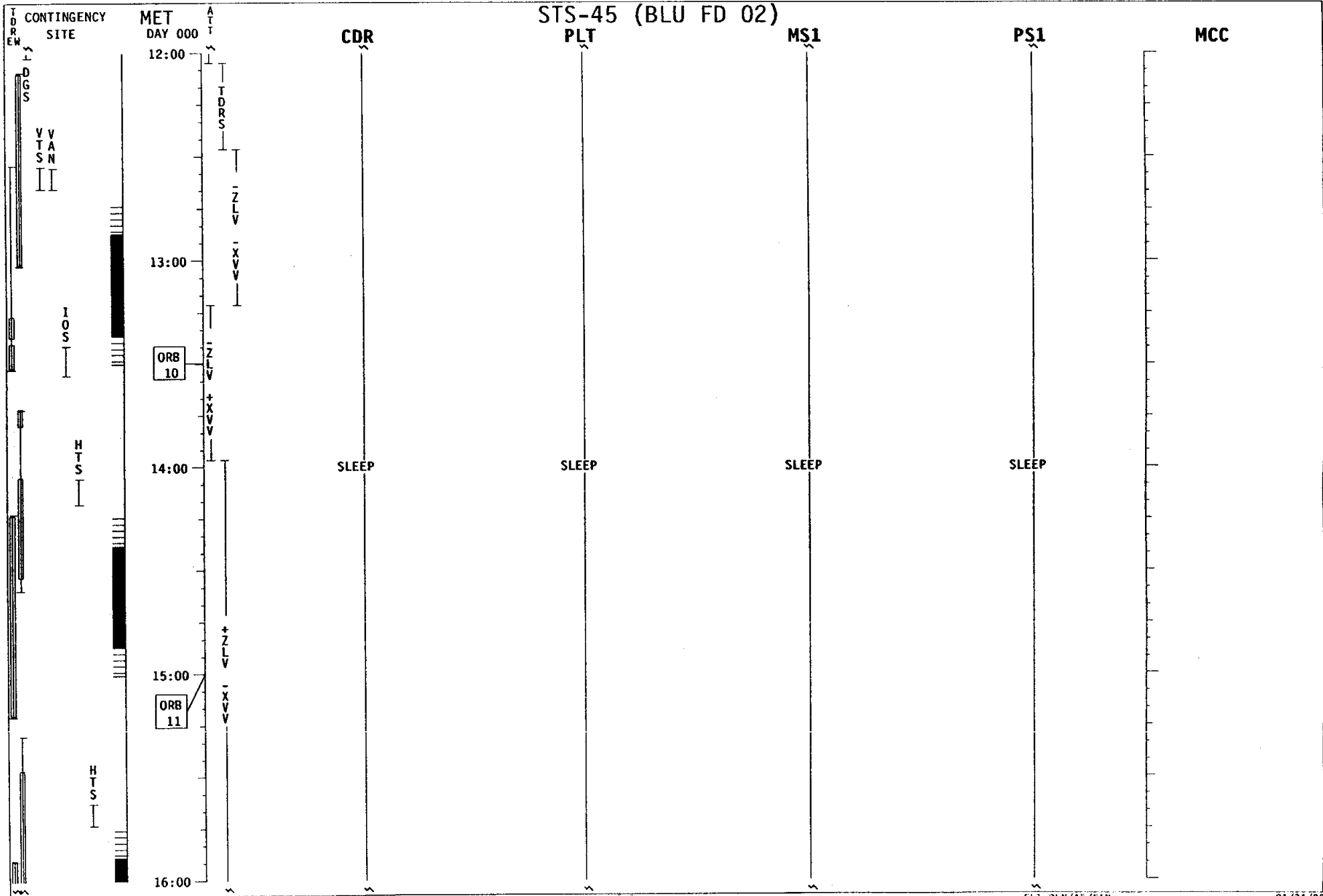


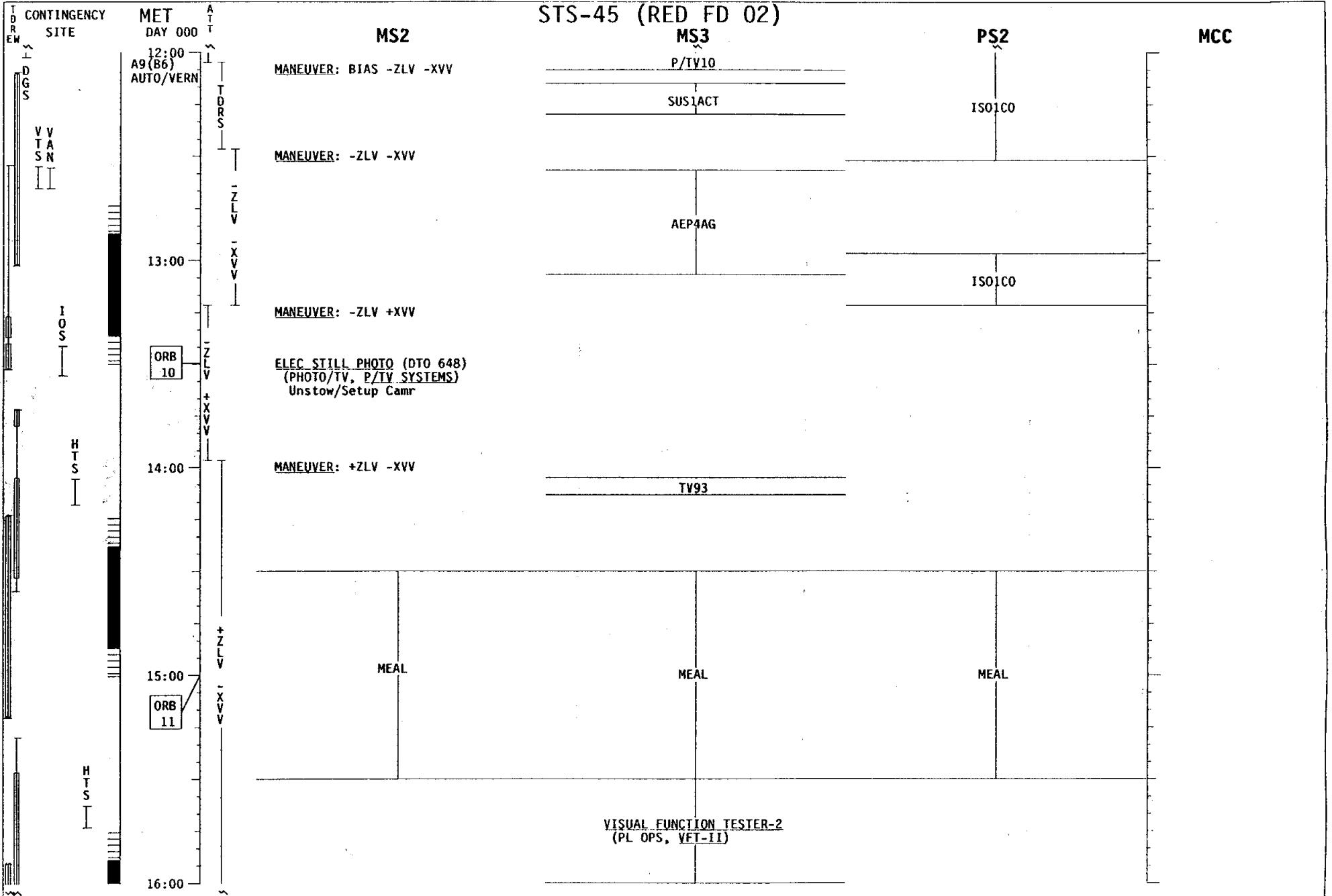




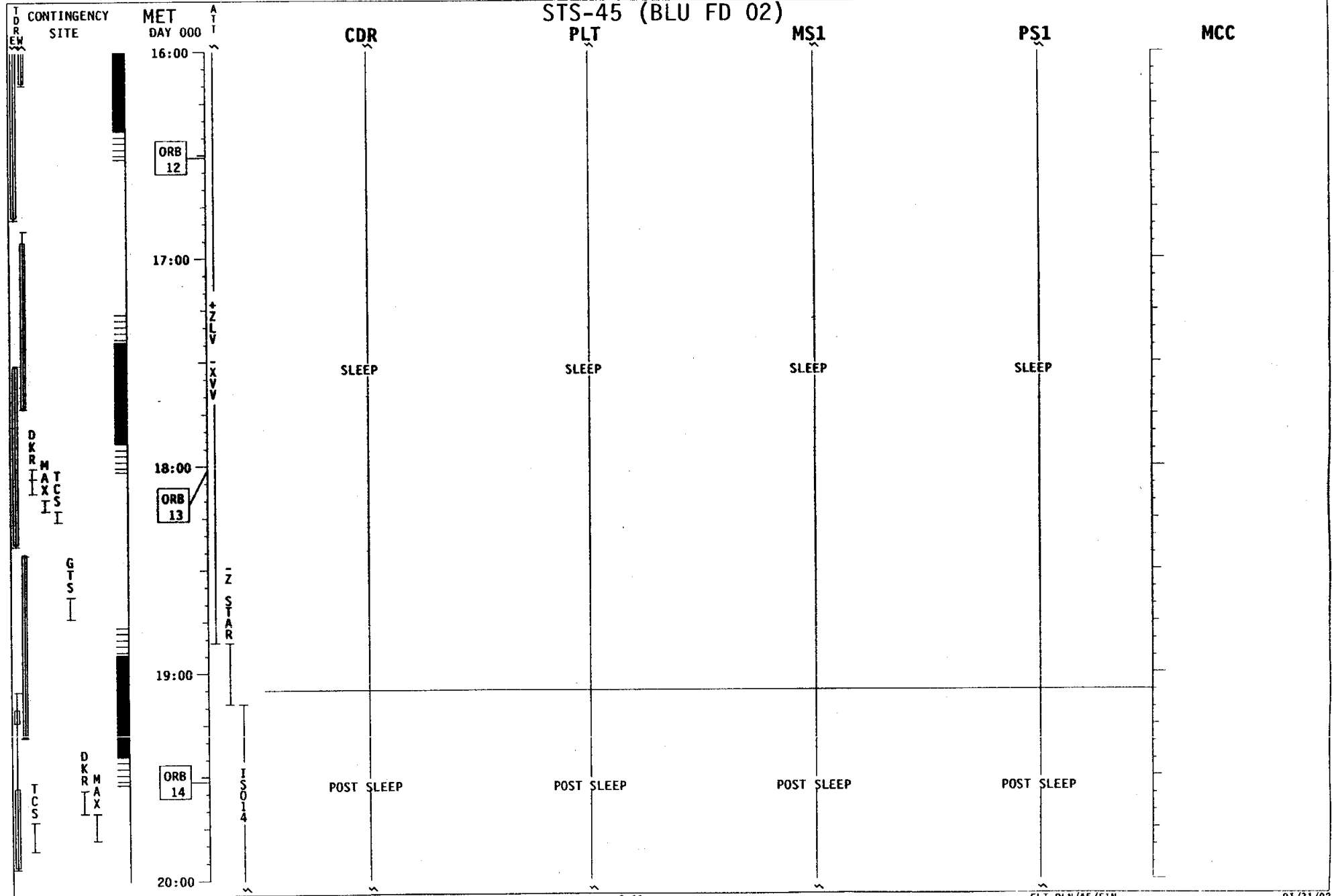


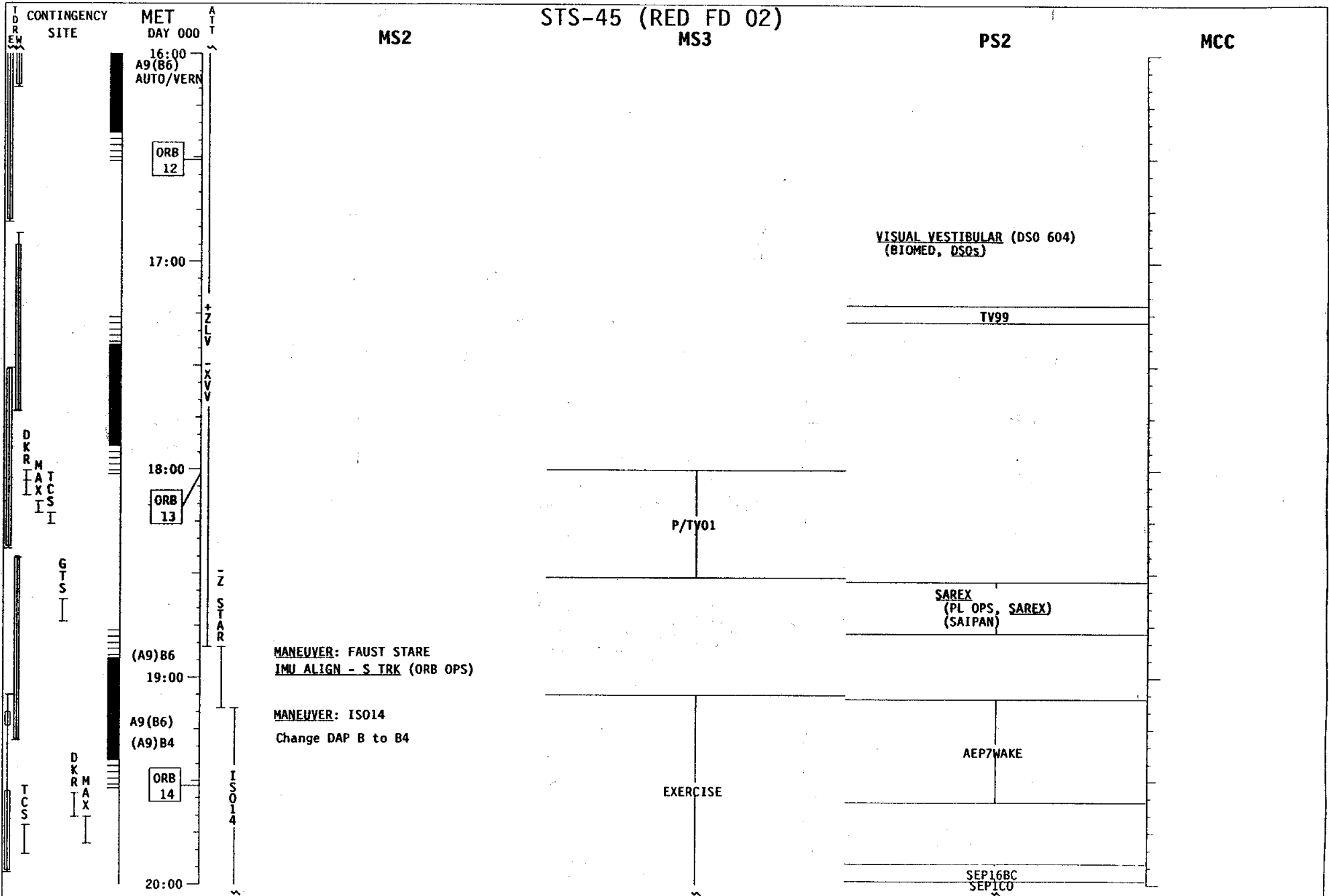


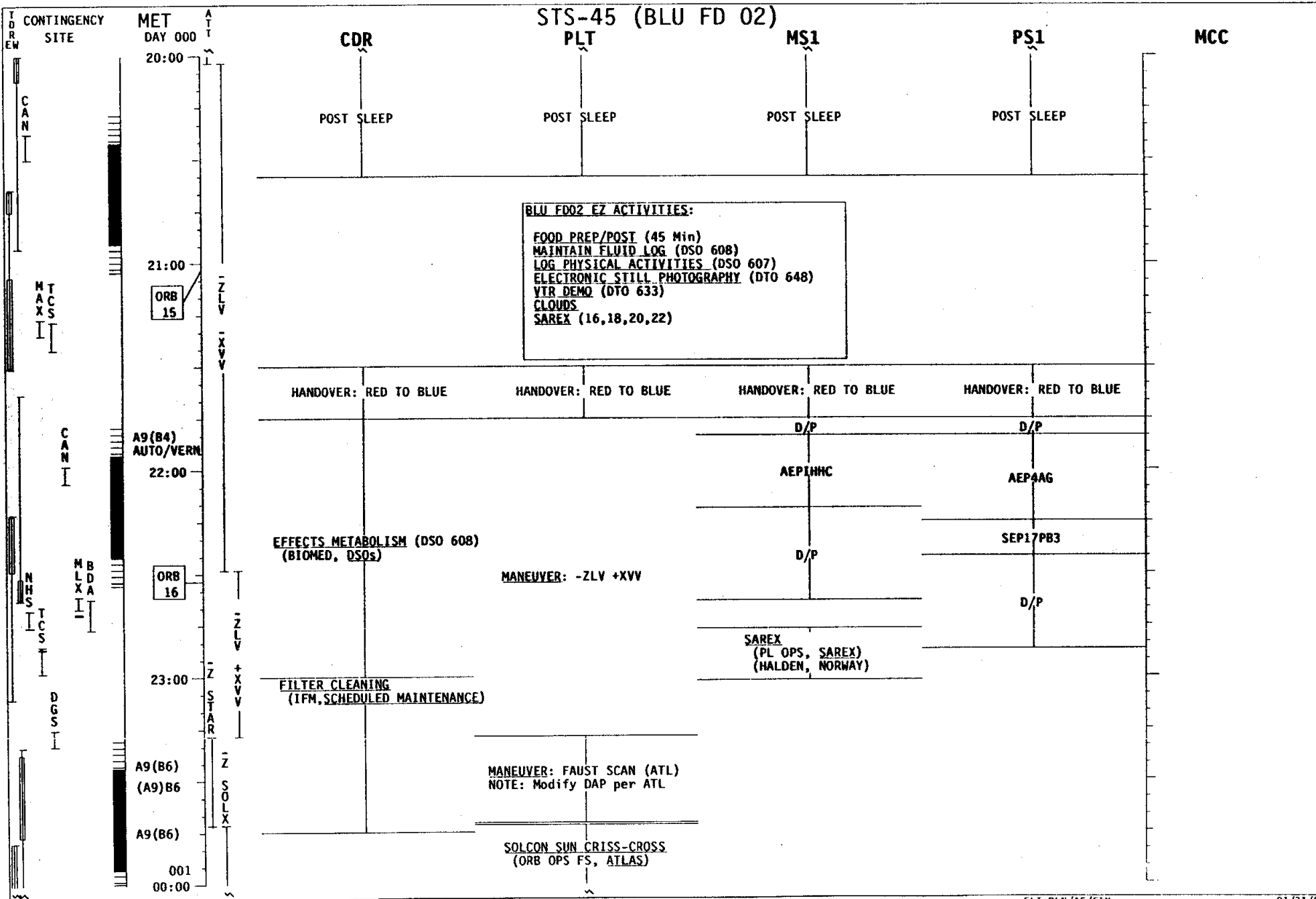


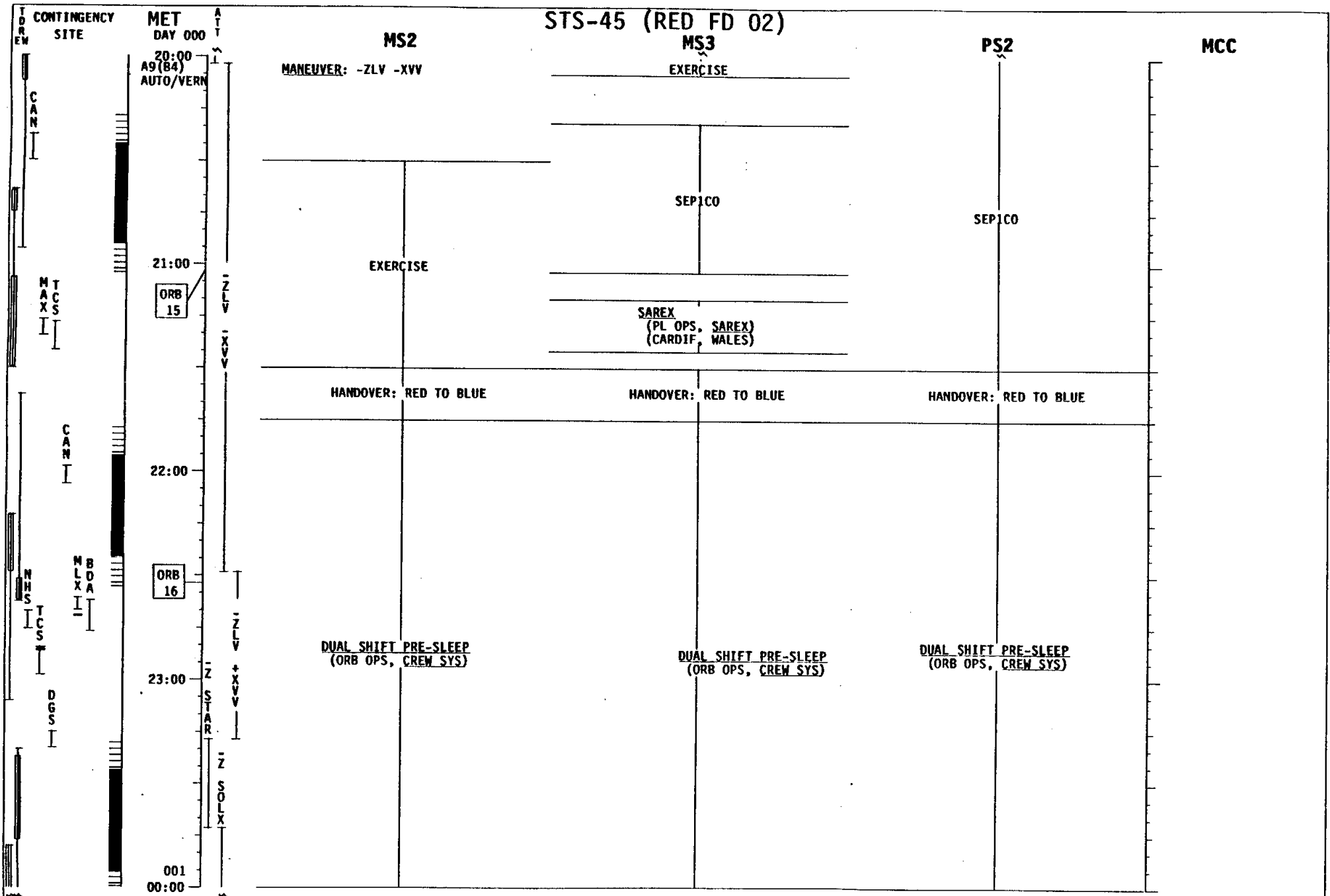


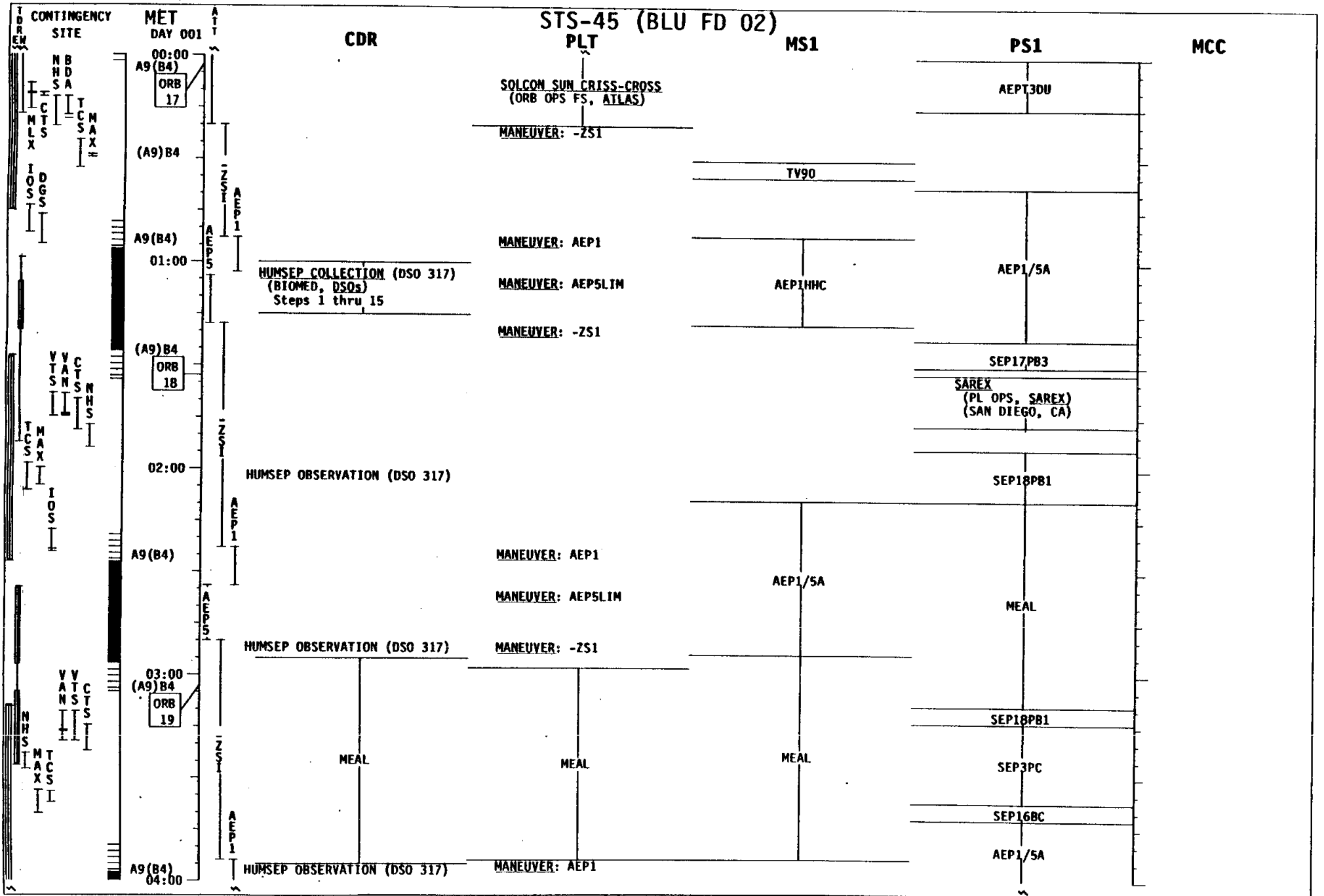
# STS-45 (BLU FD 02)



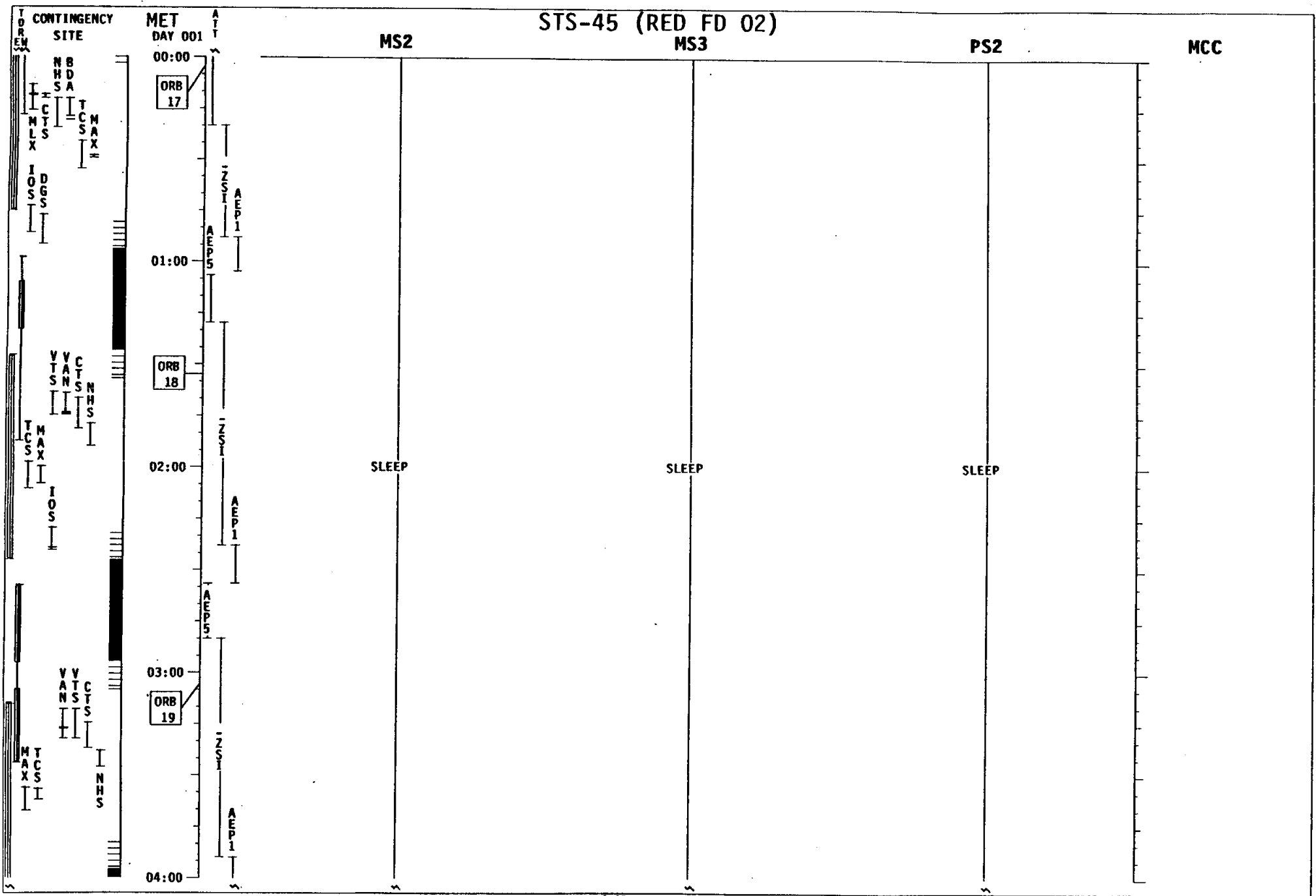


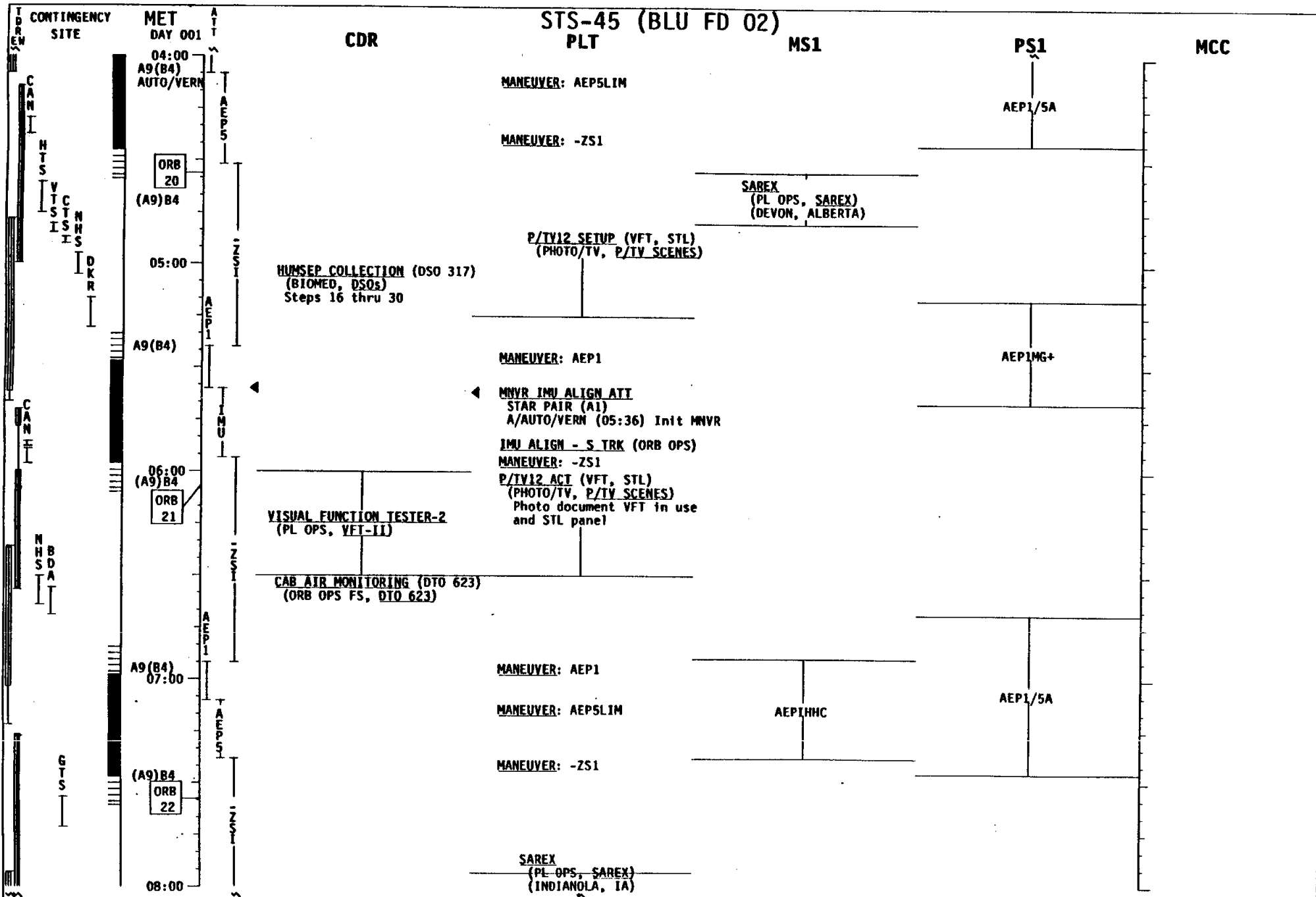


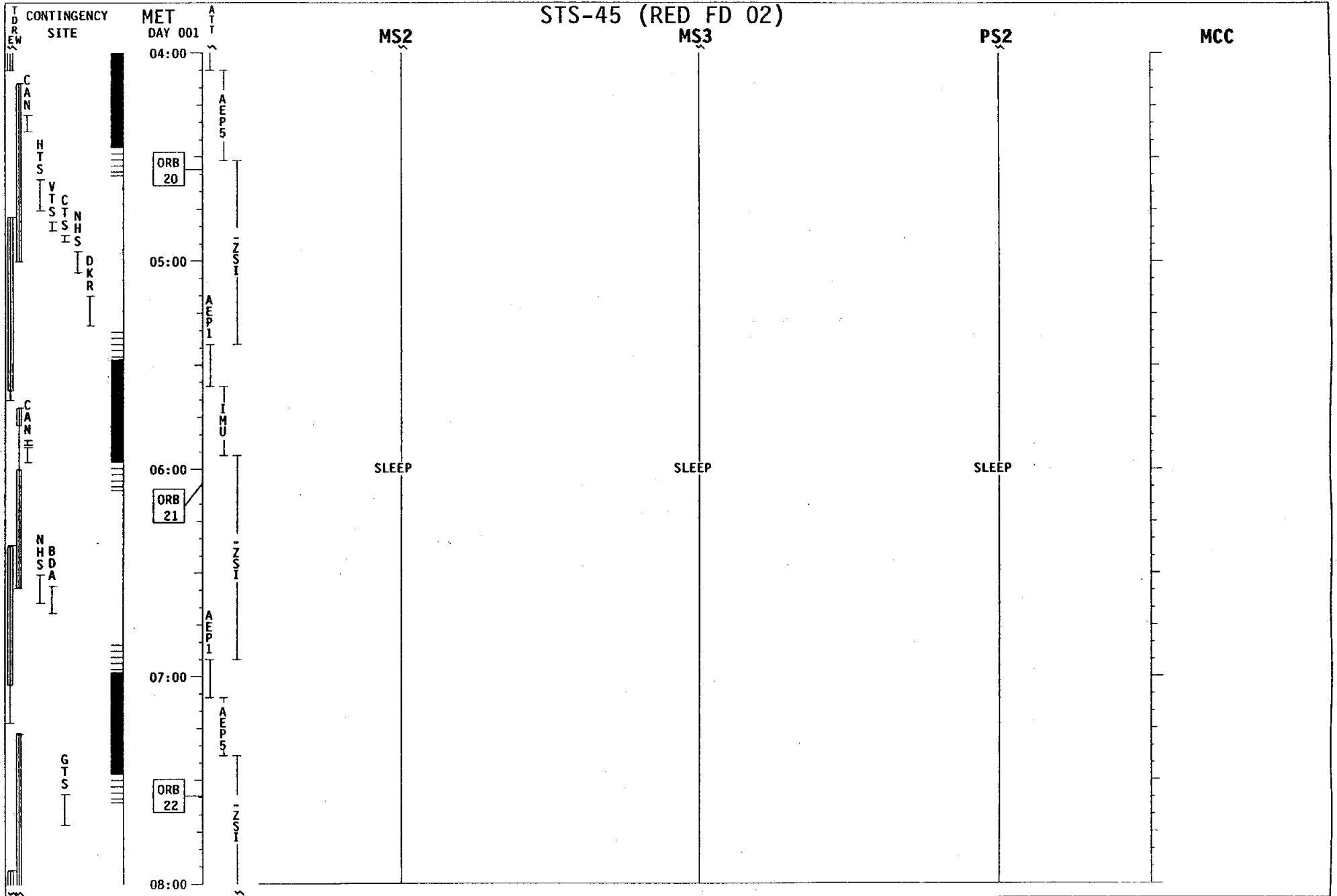


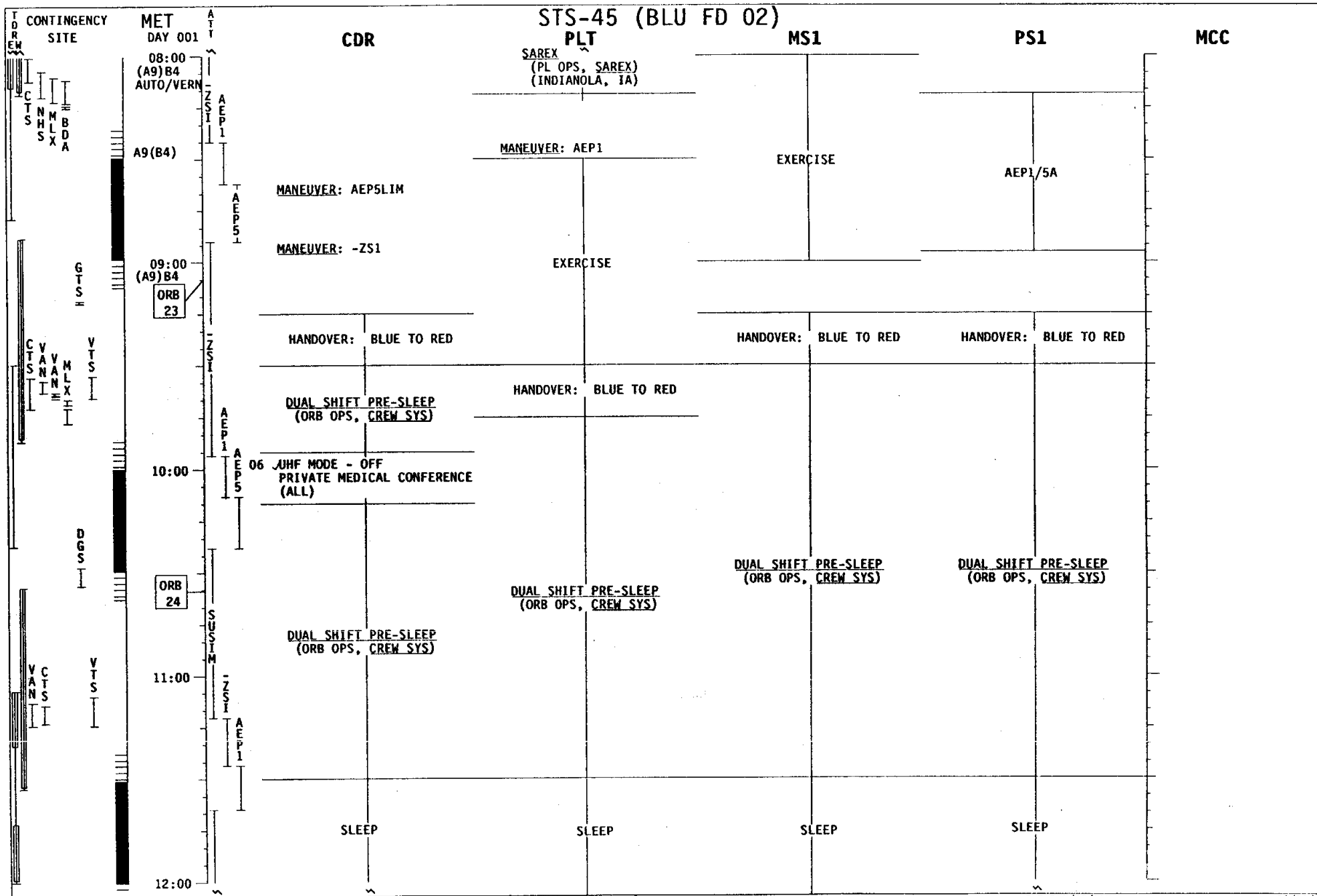


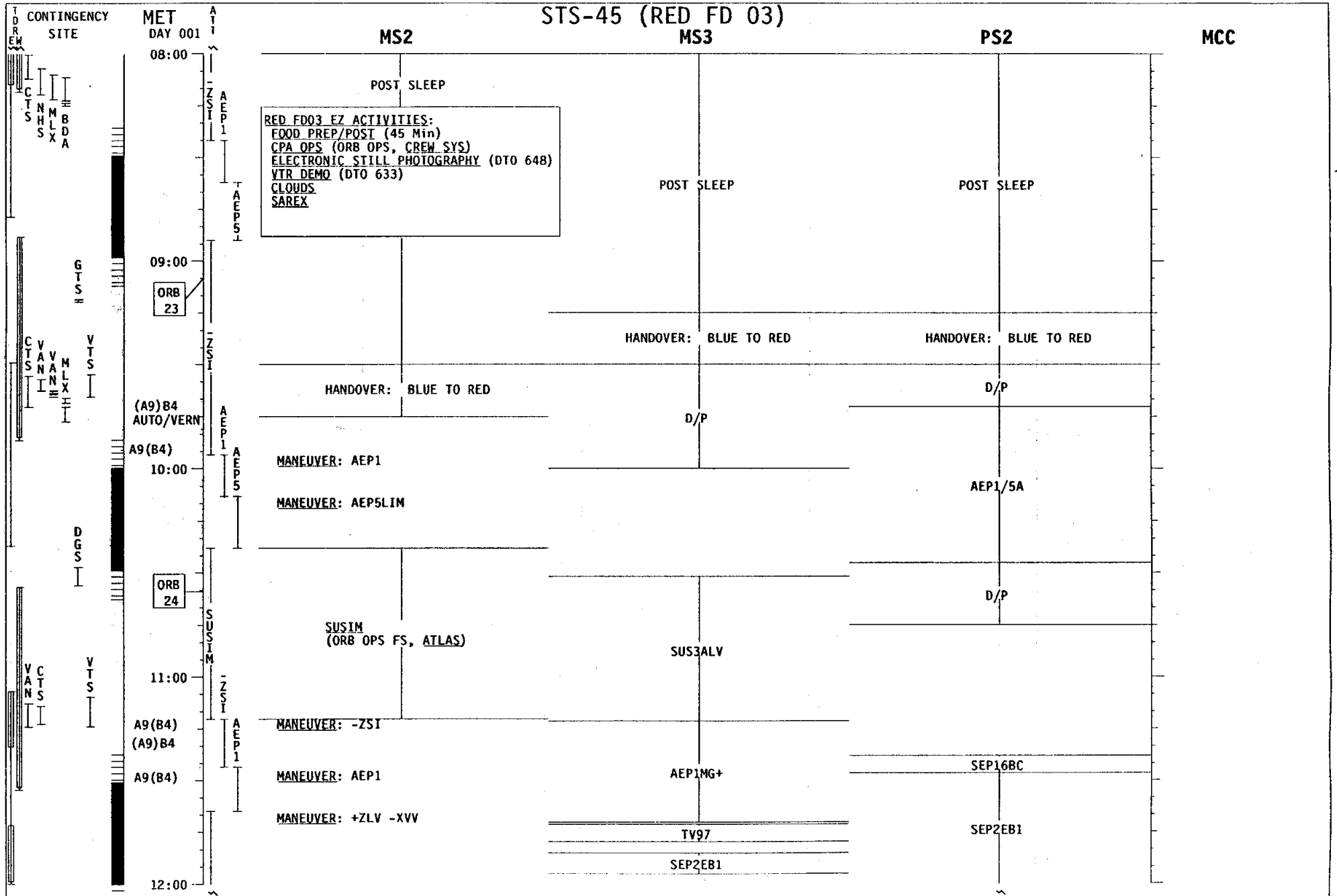


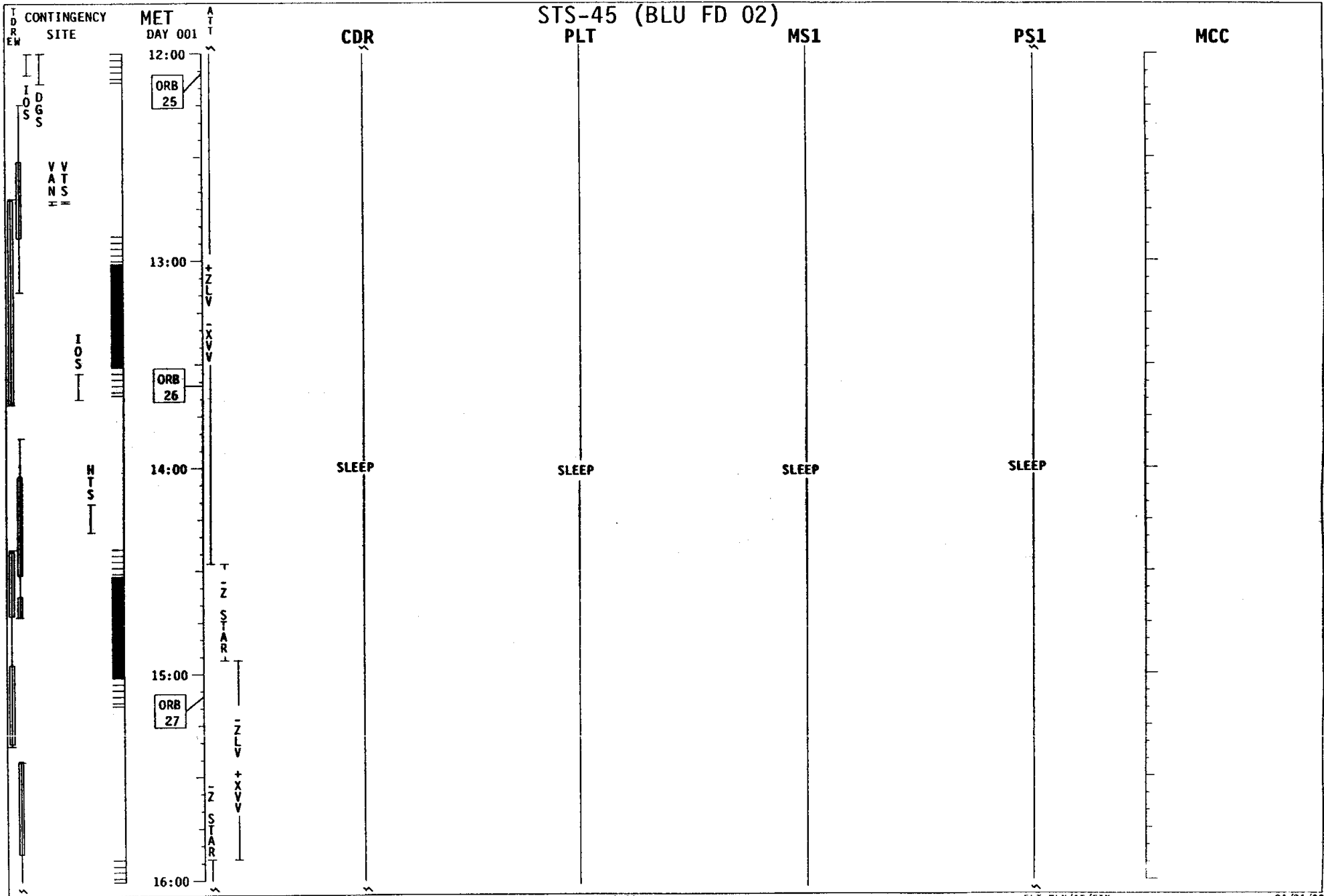


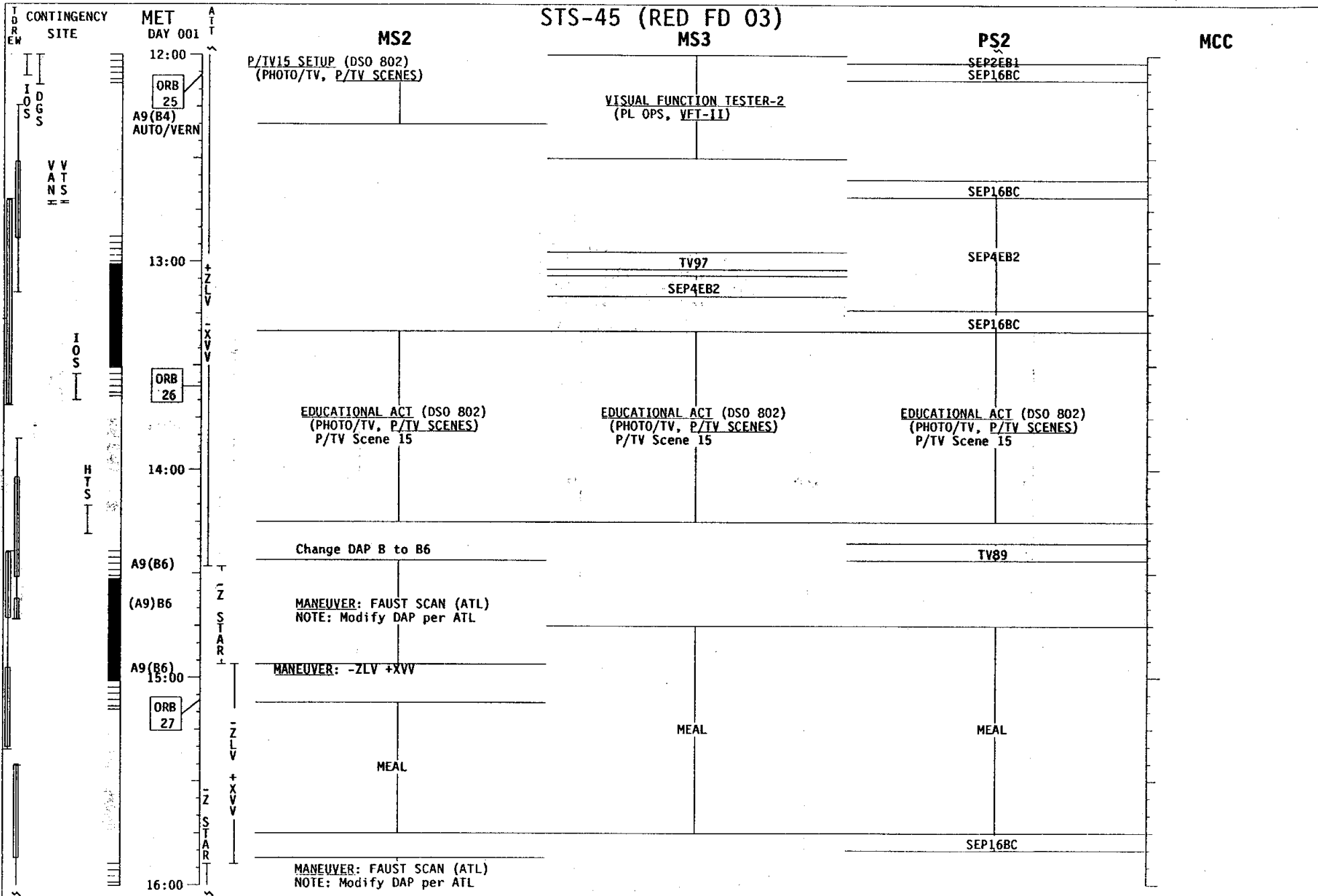


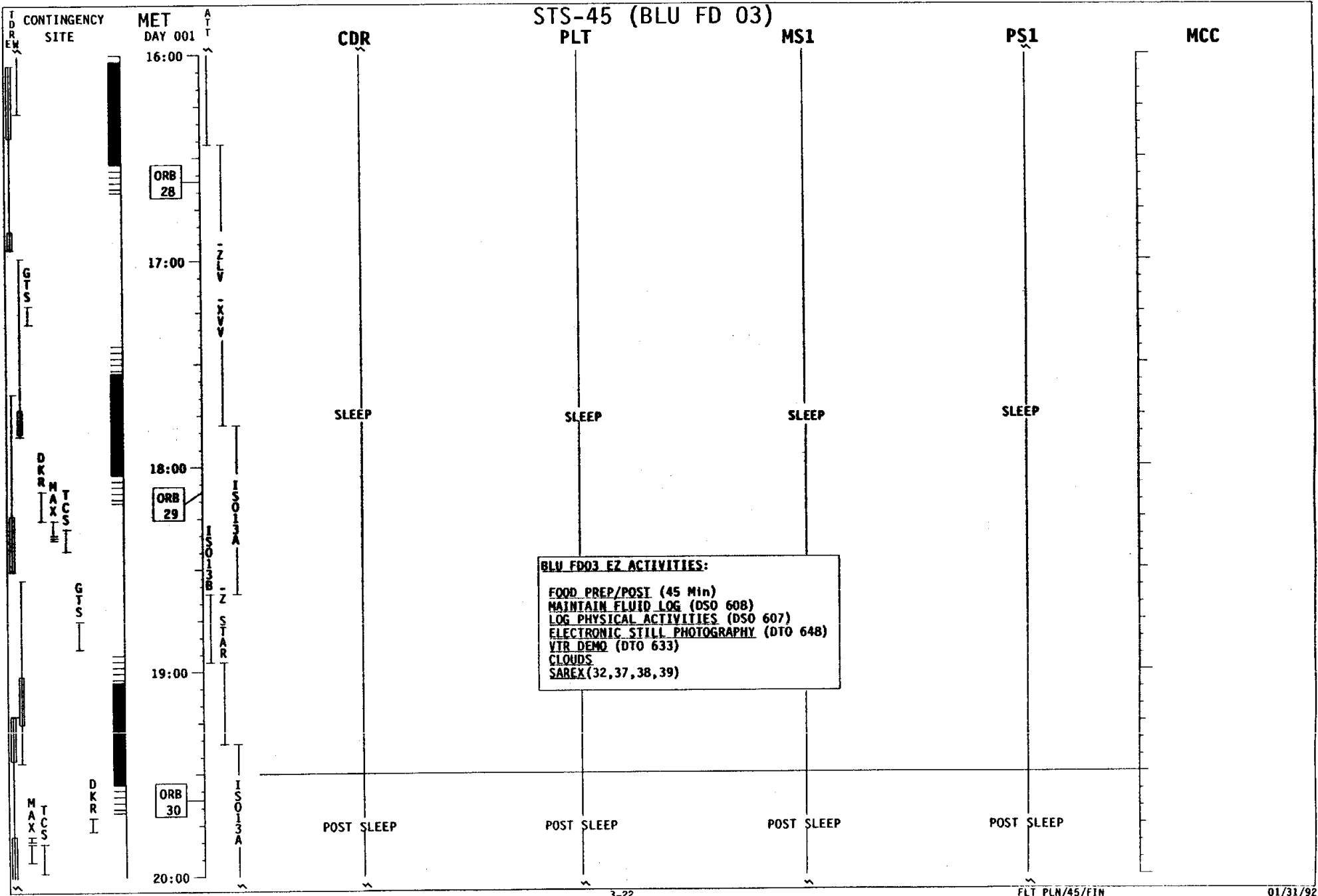




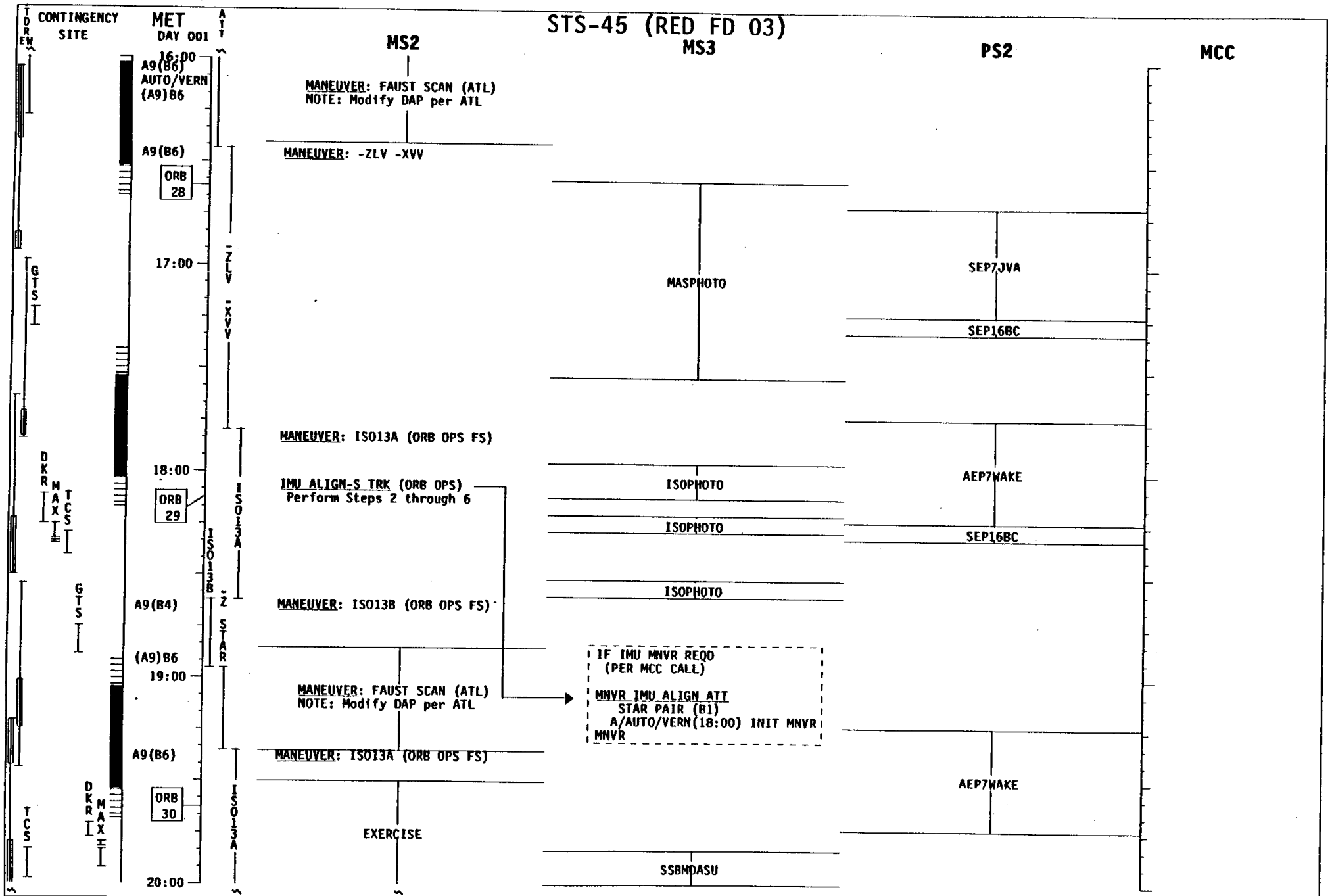


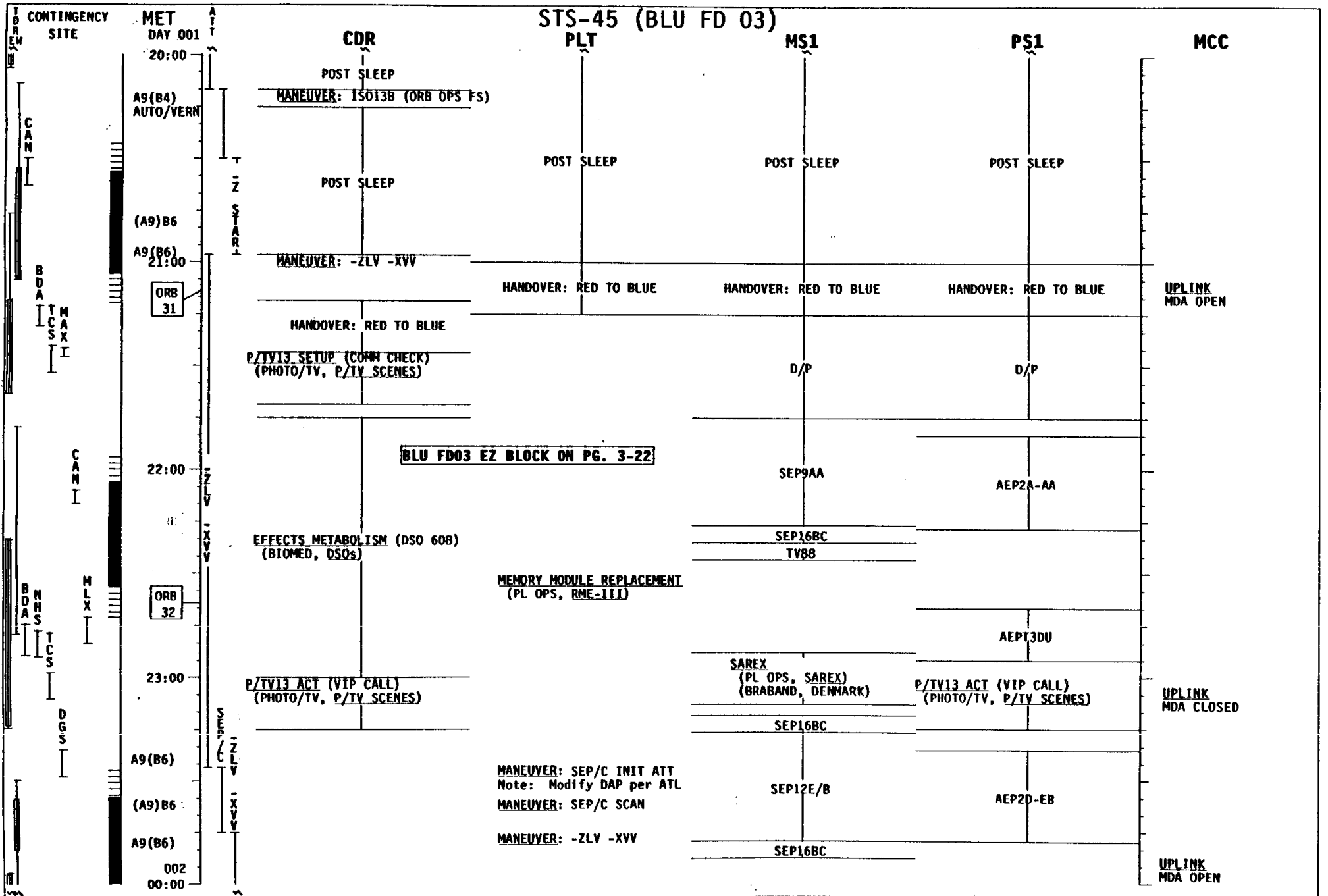


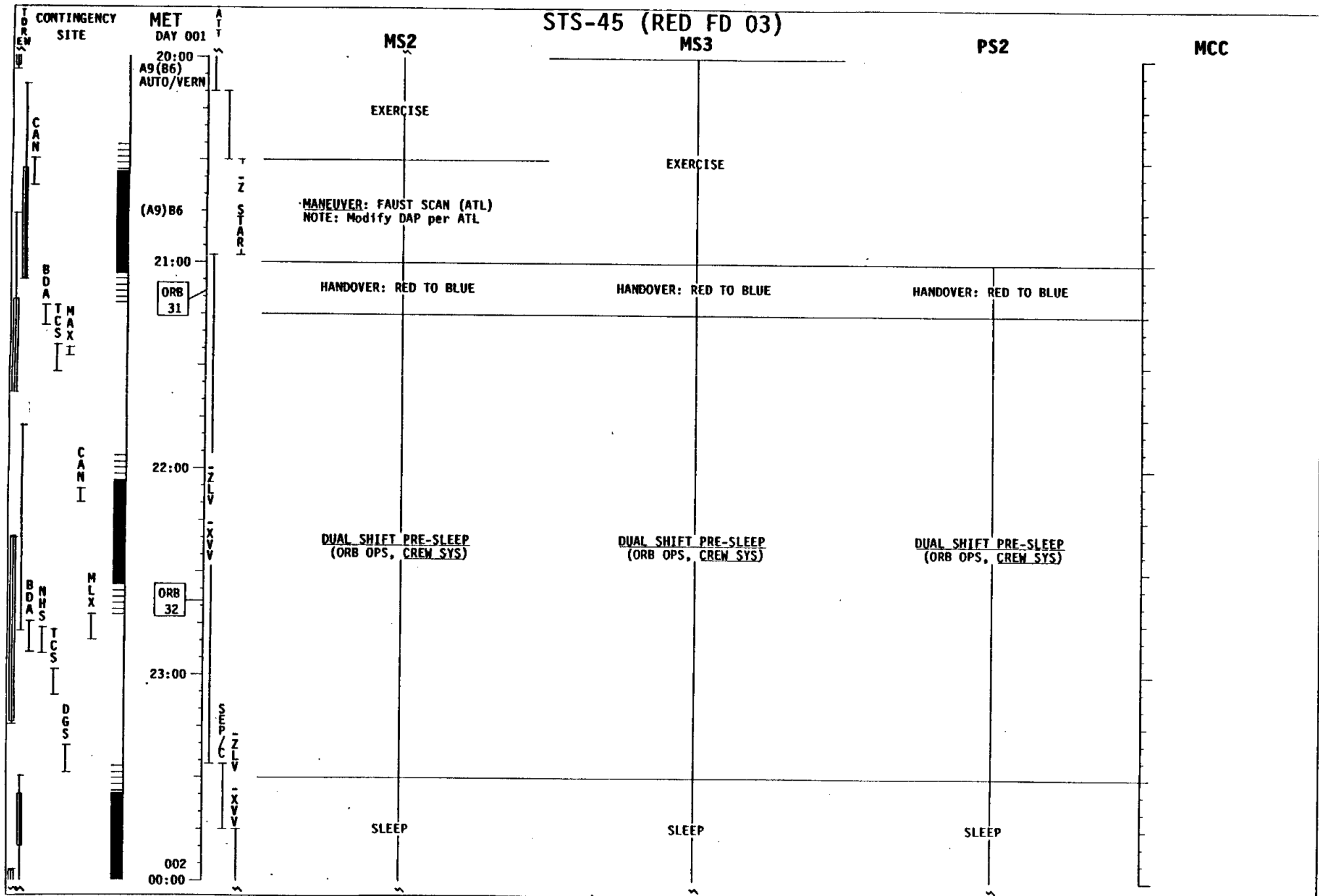


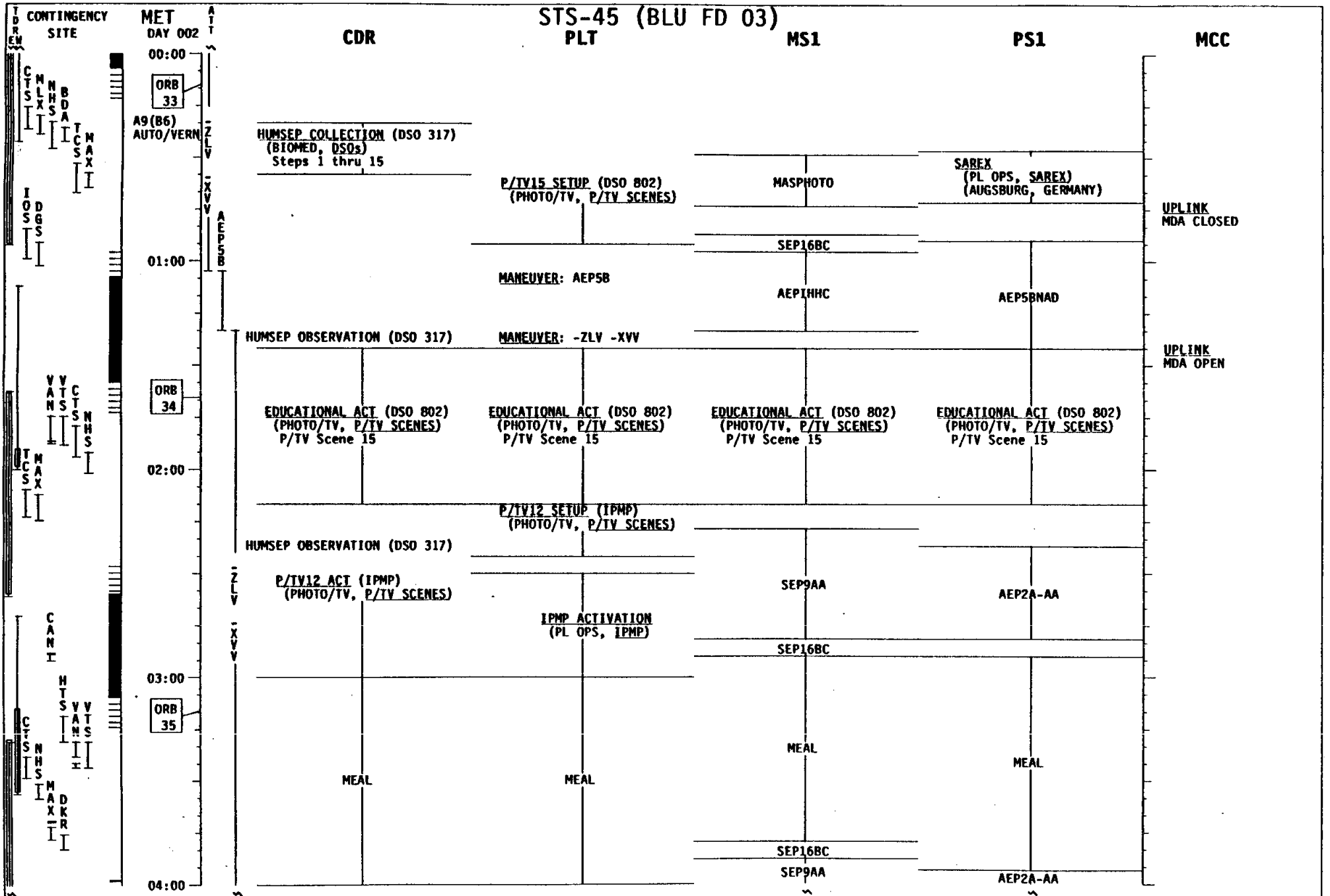




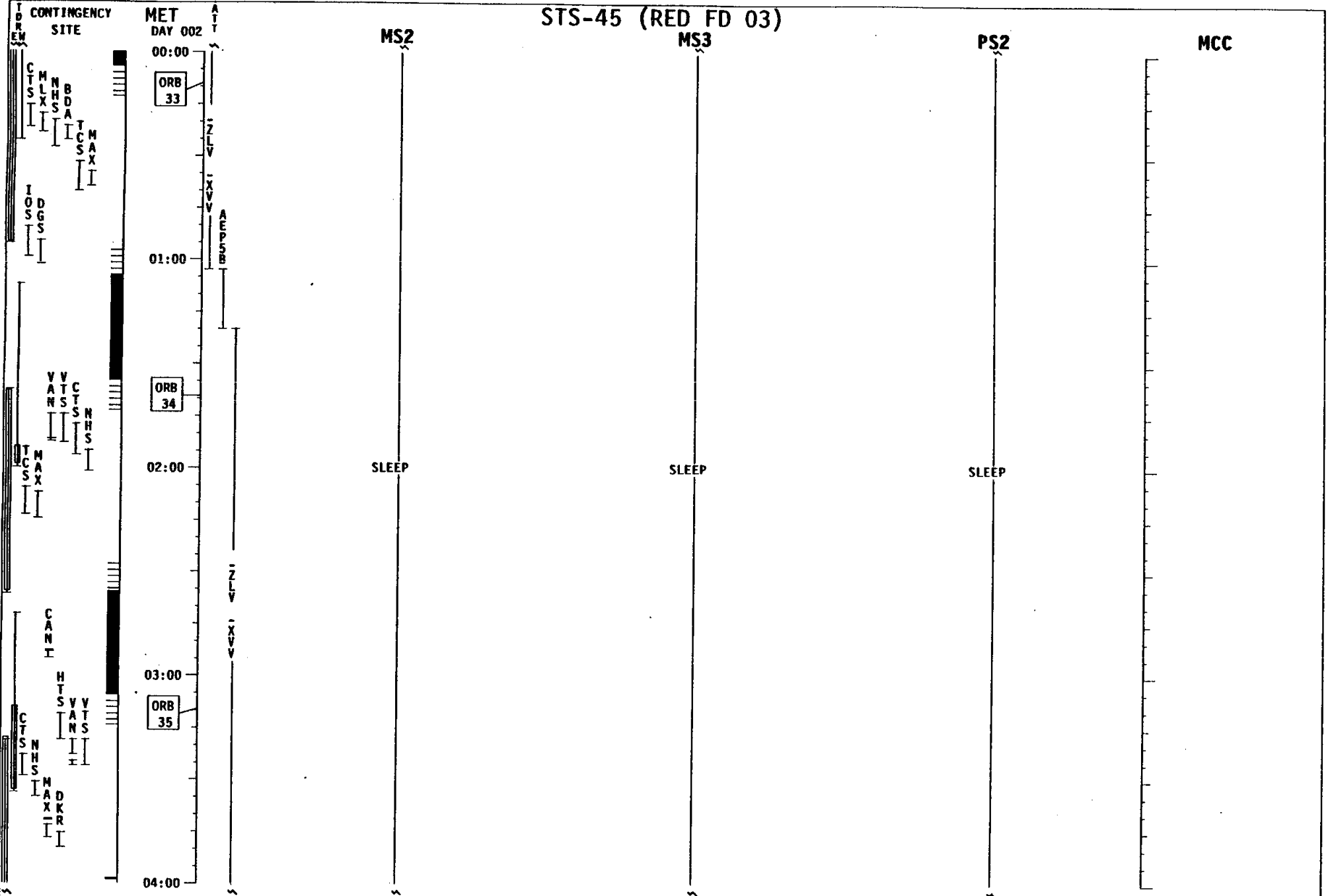


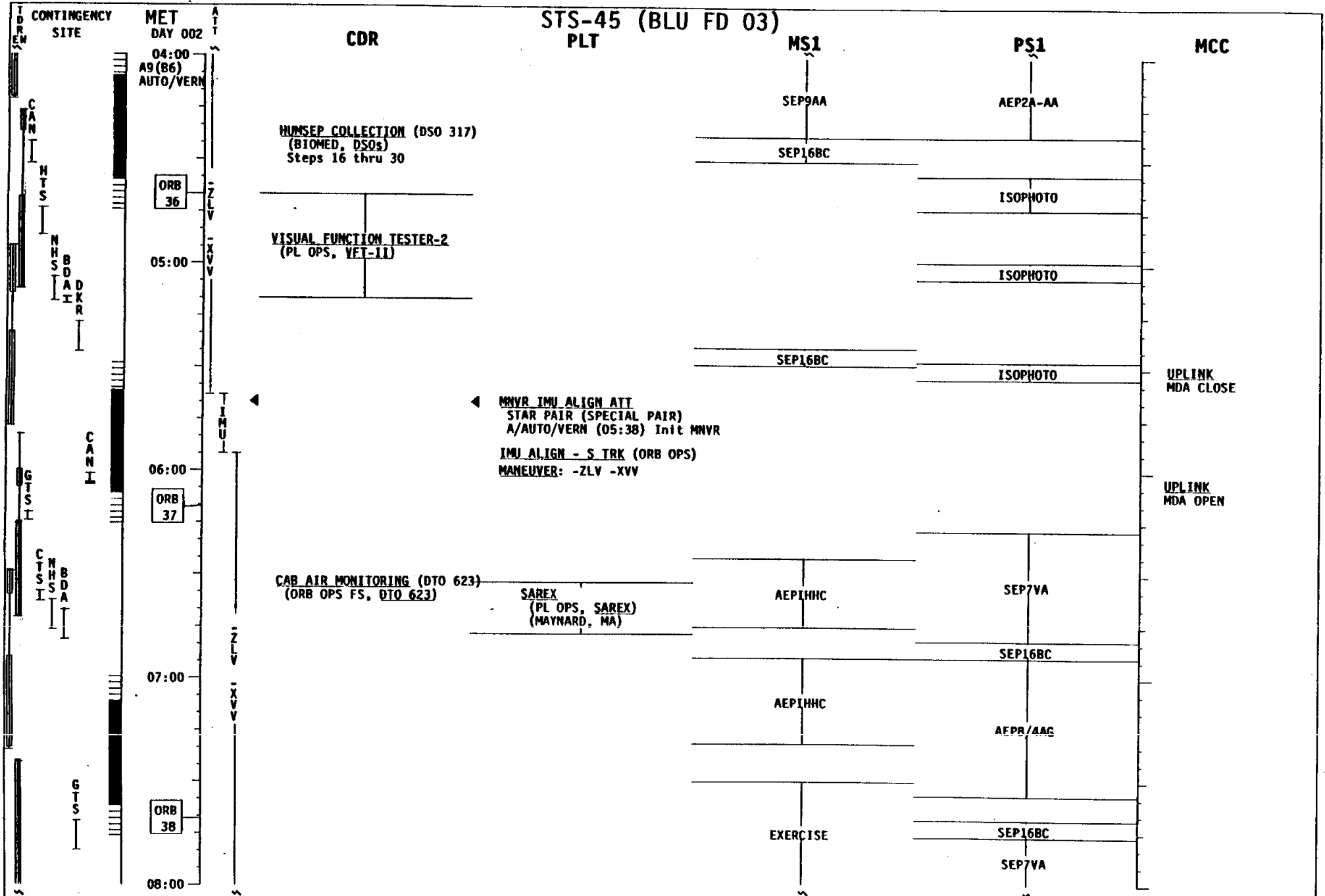




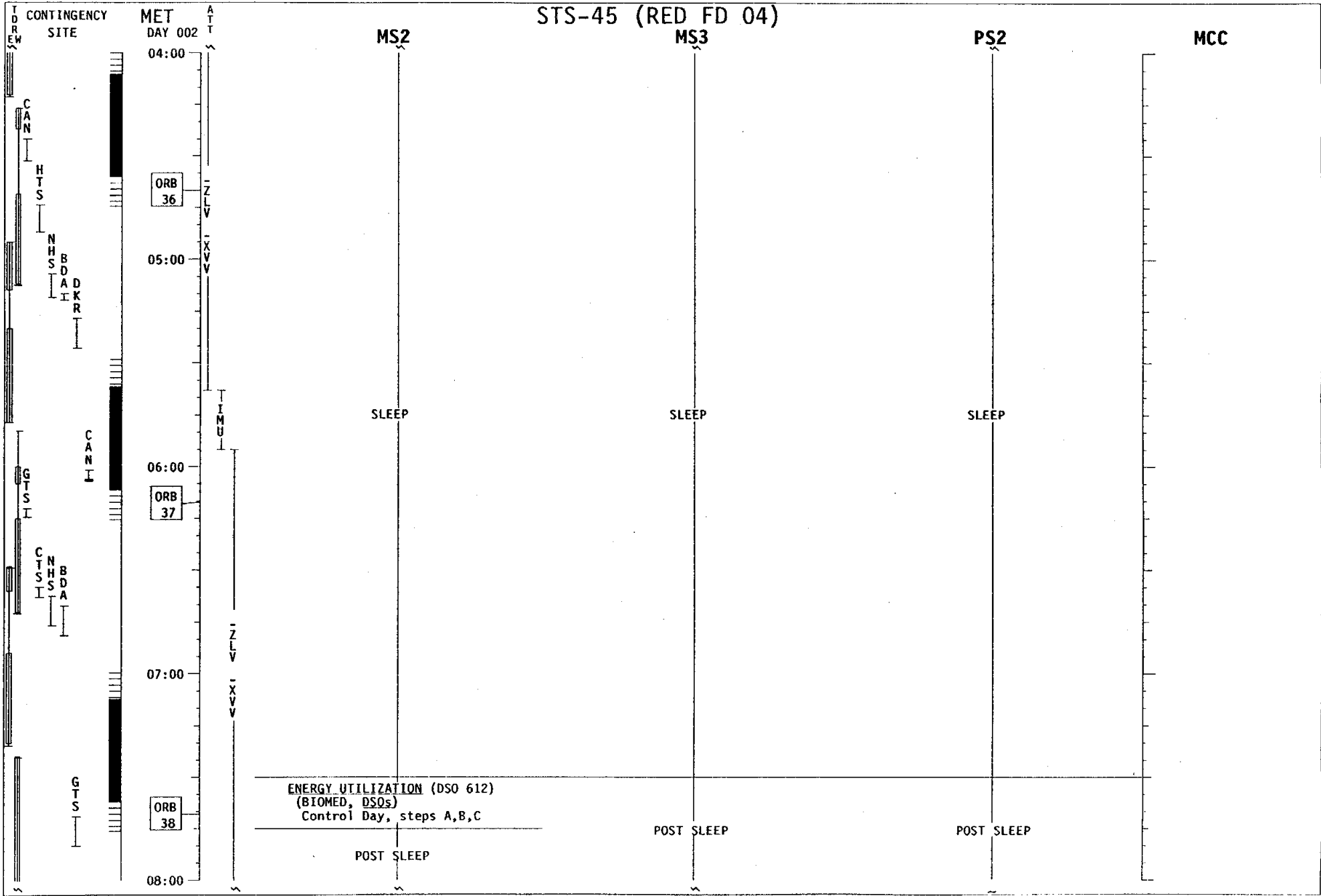


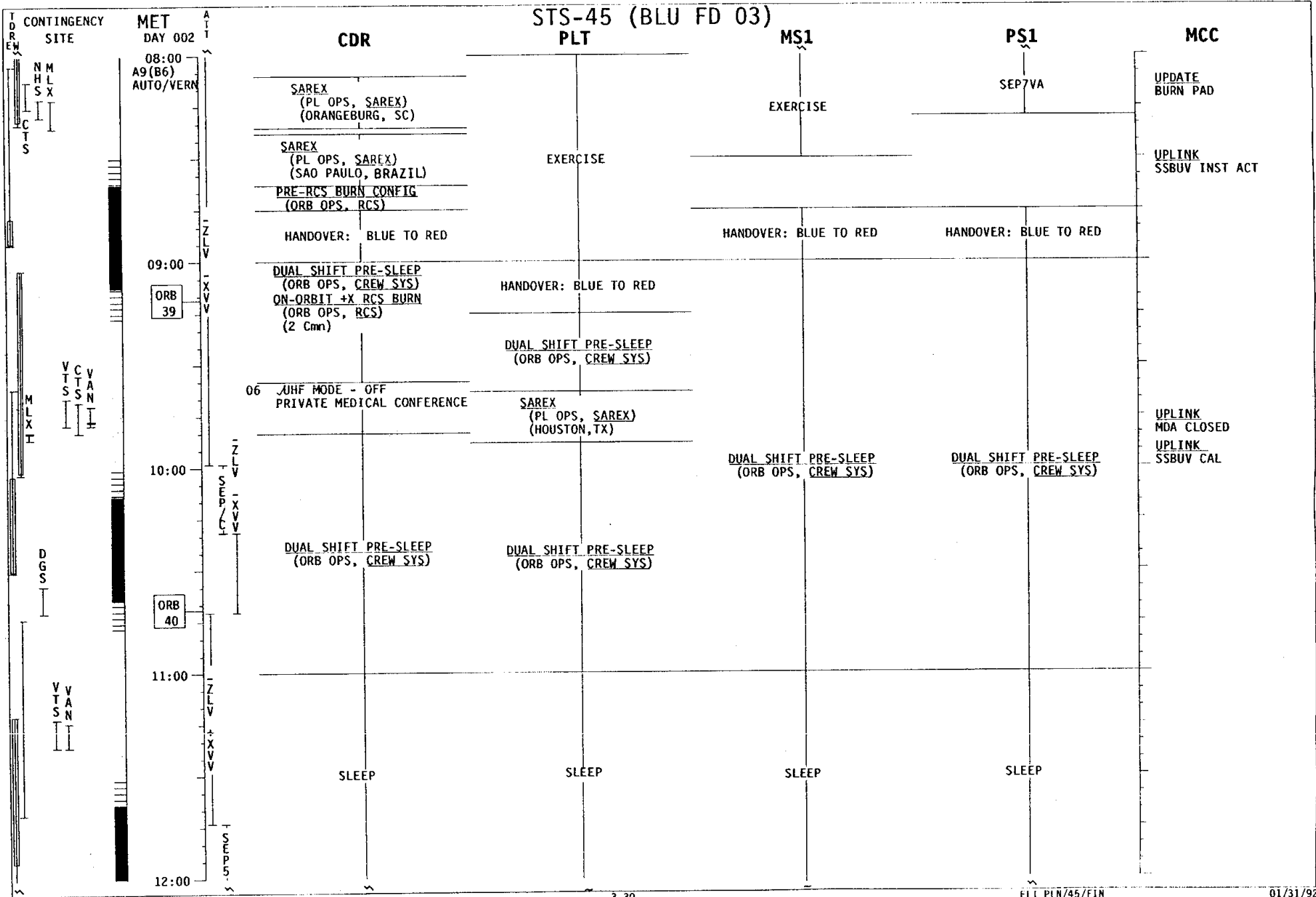
# STS-45 (RED FD 03)



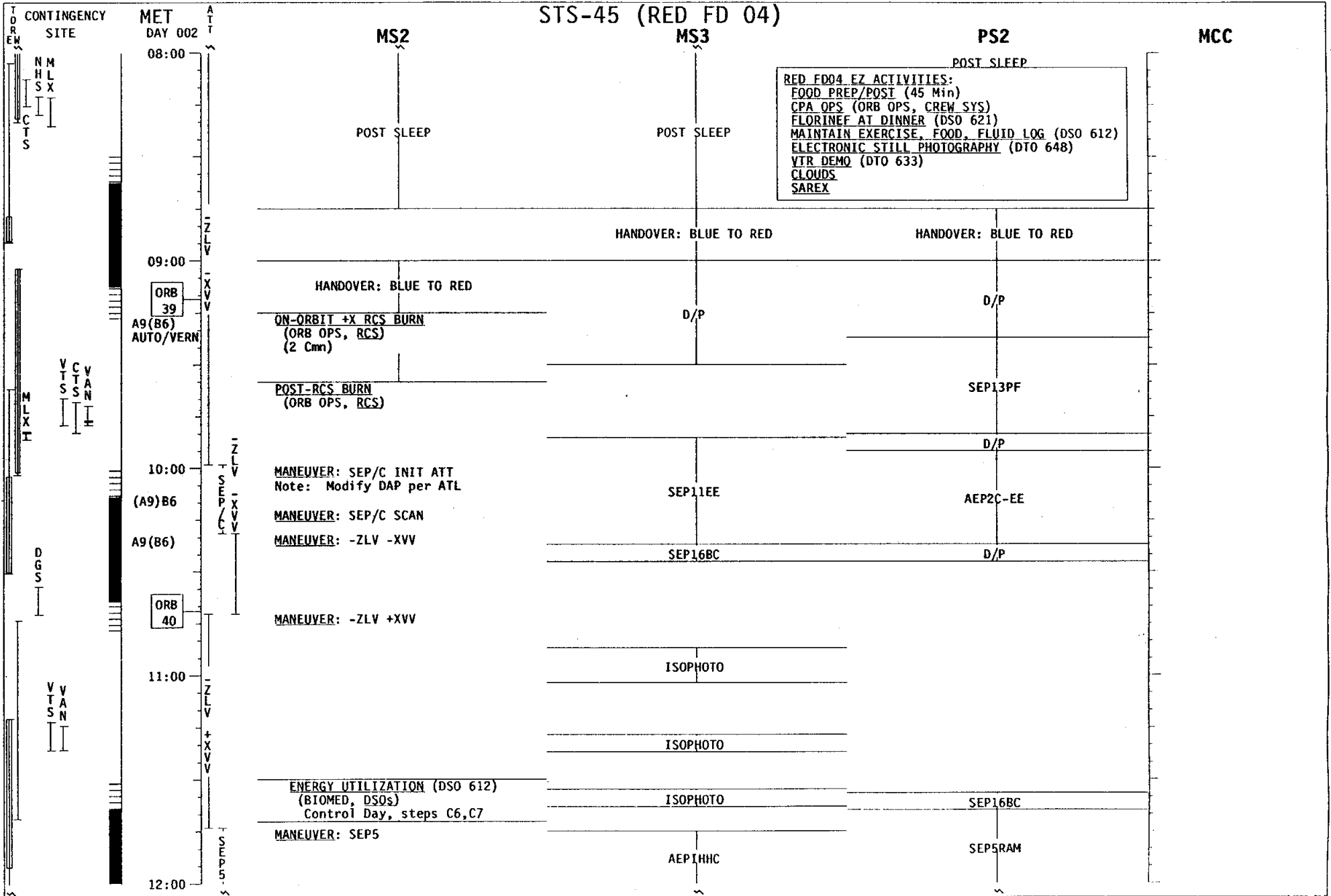


# STS-45 (RED FD 04)

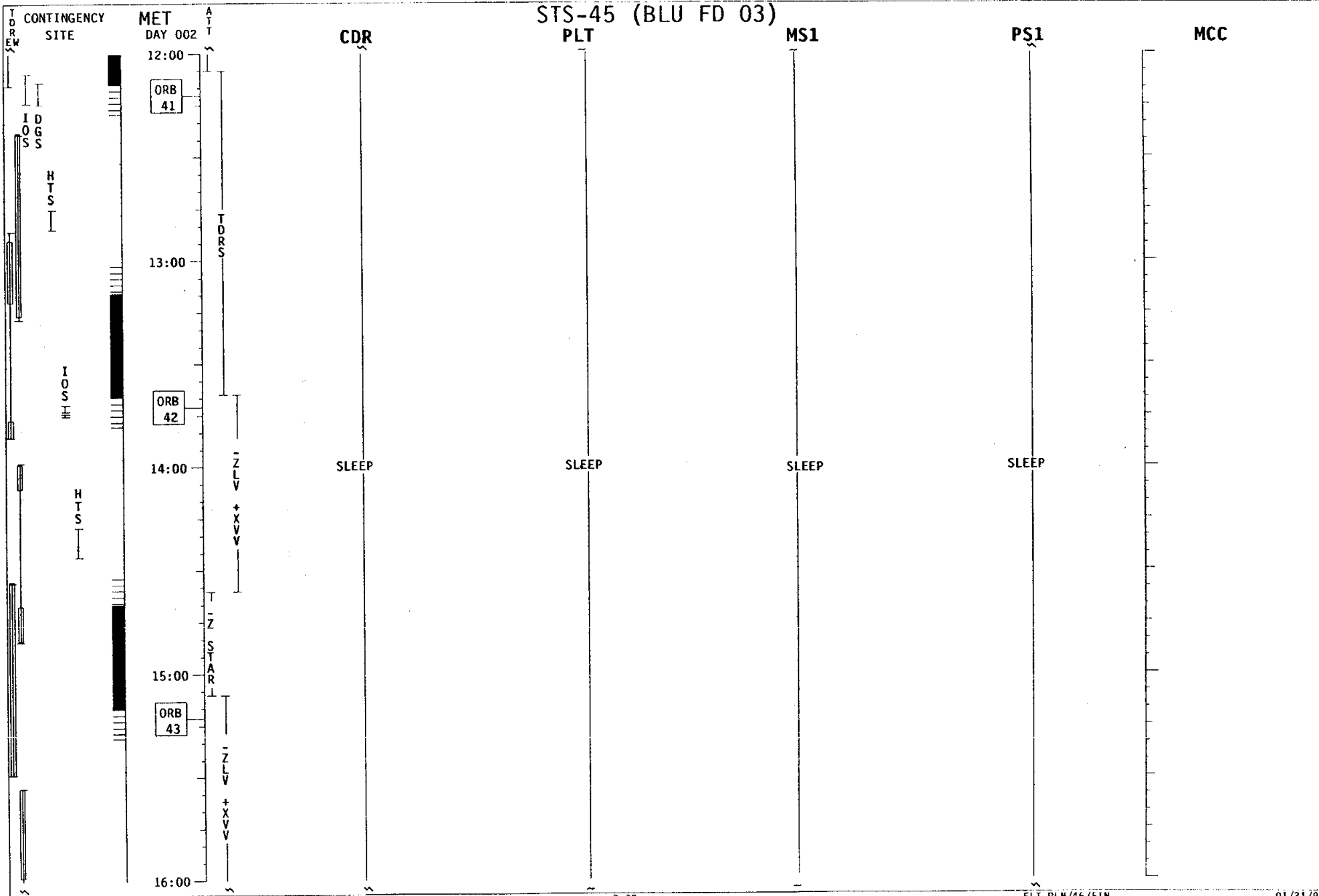


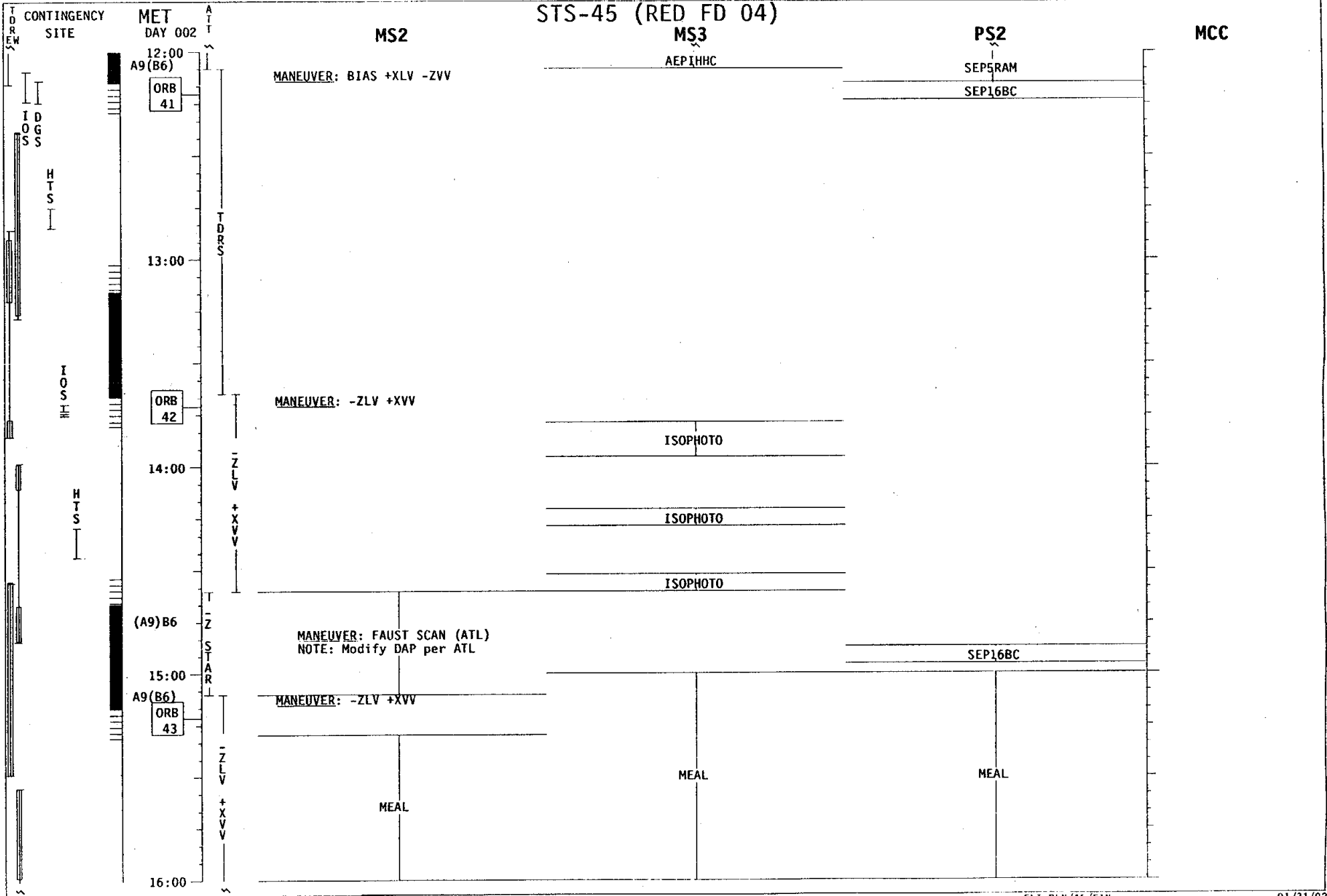


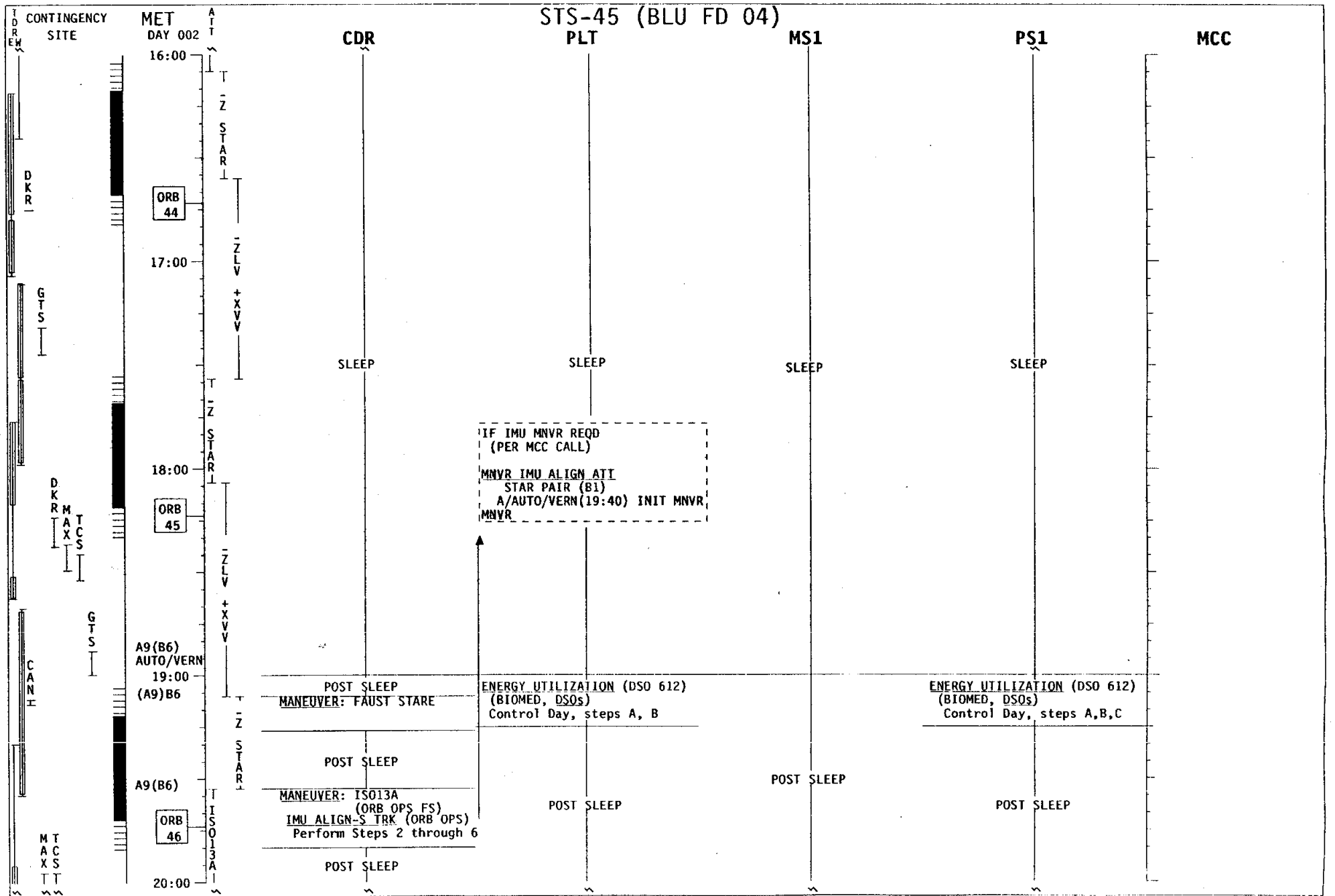


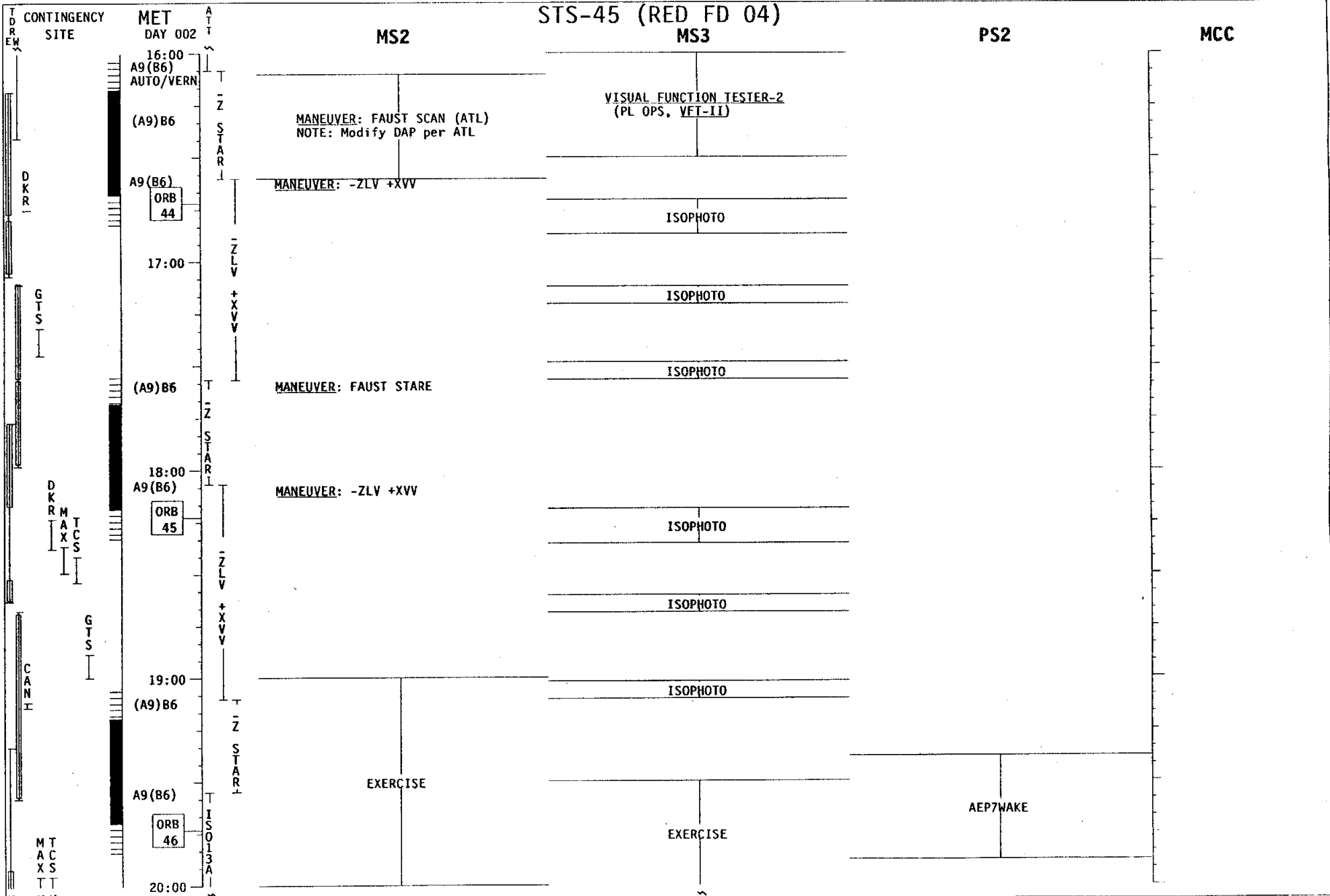


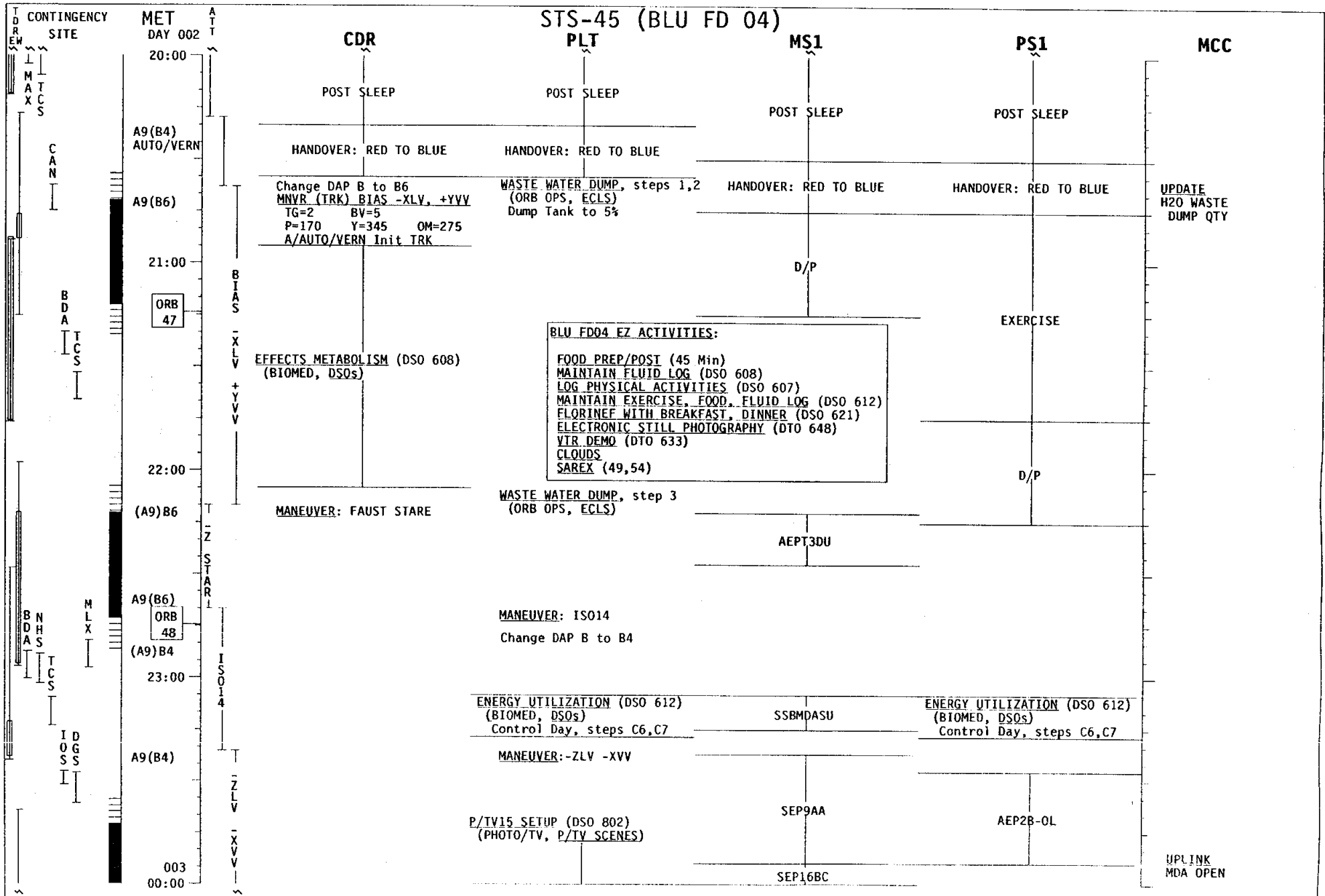
STS-45 (BLU FD 03)

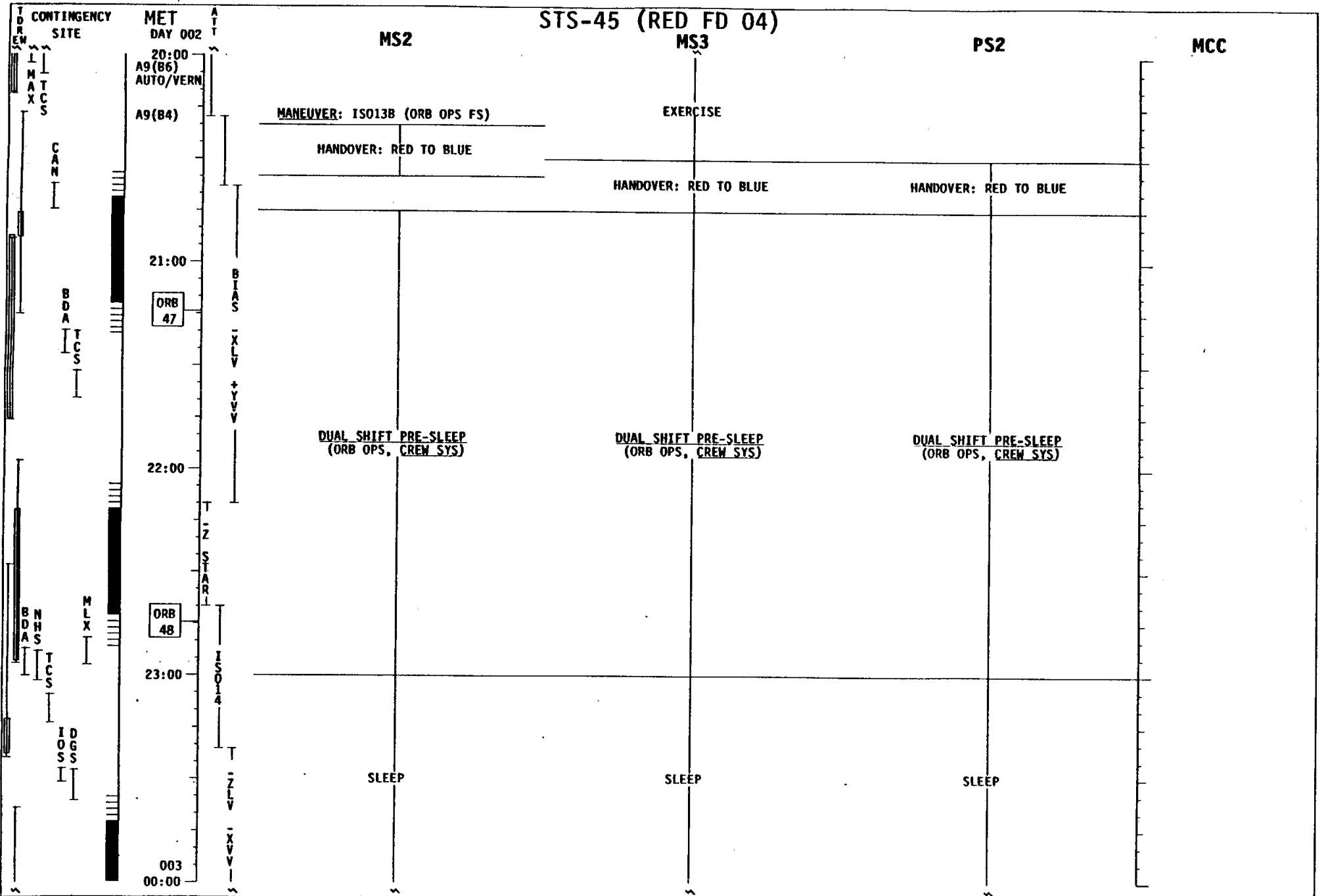


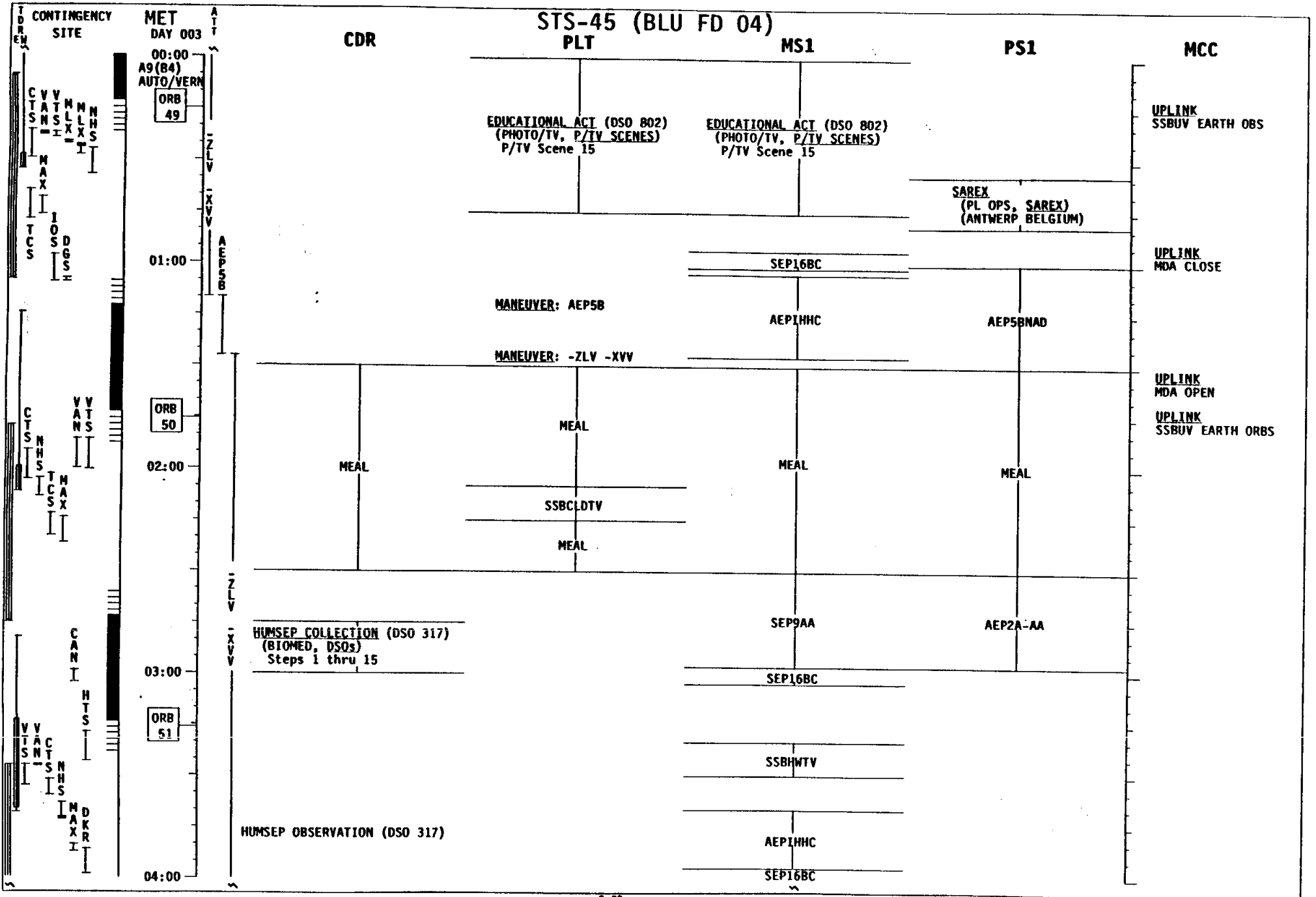






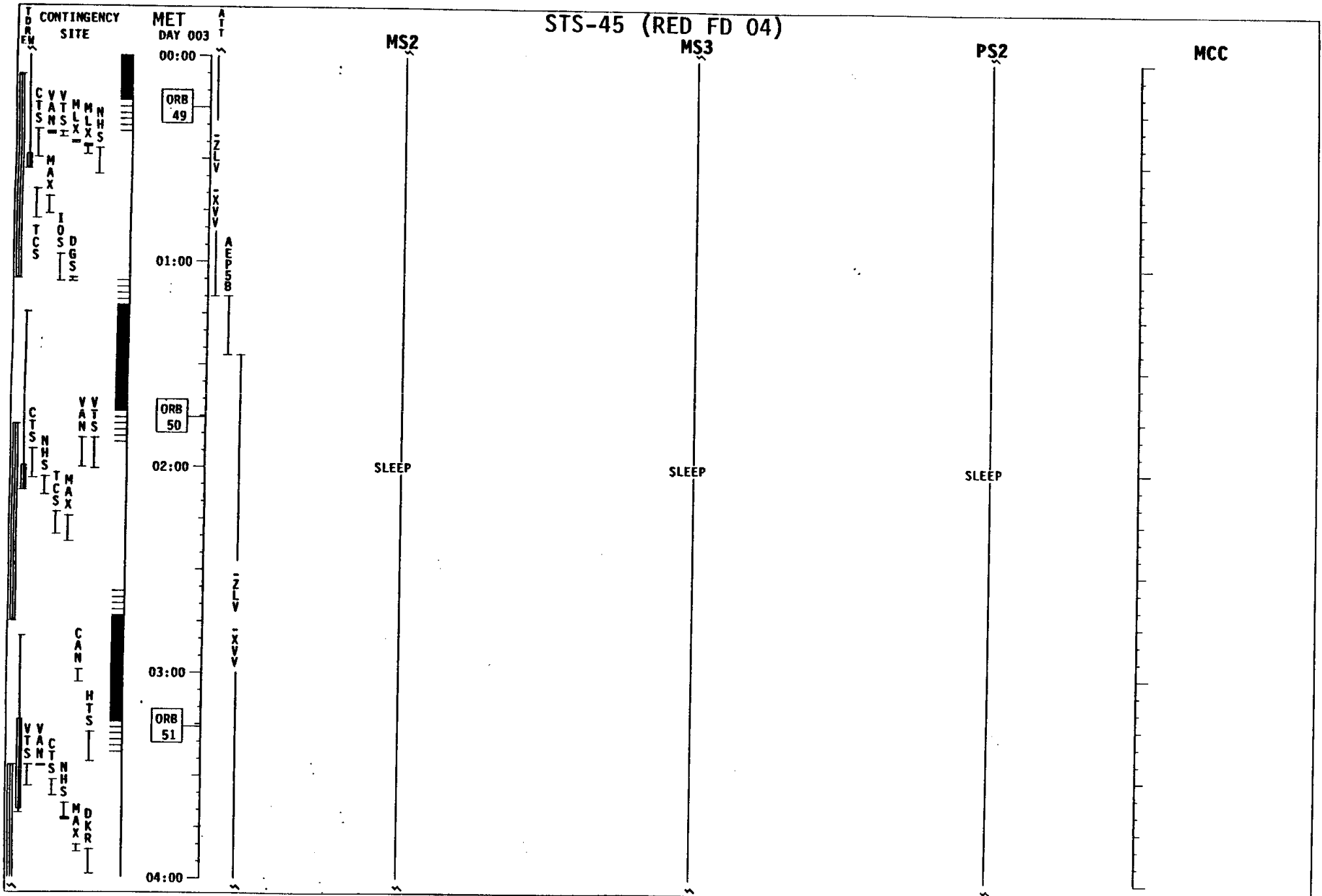


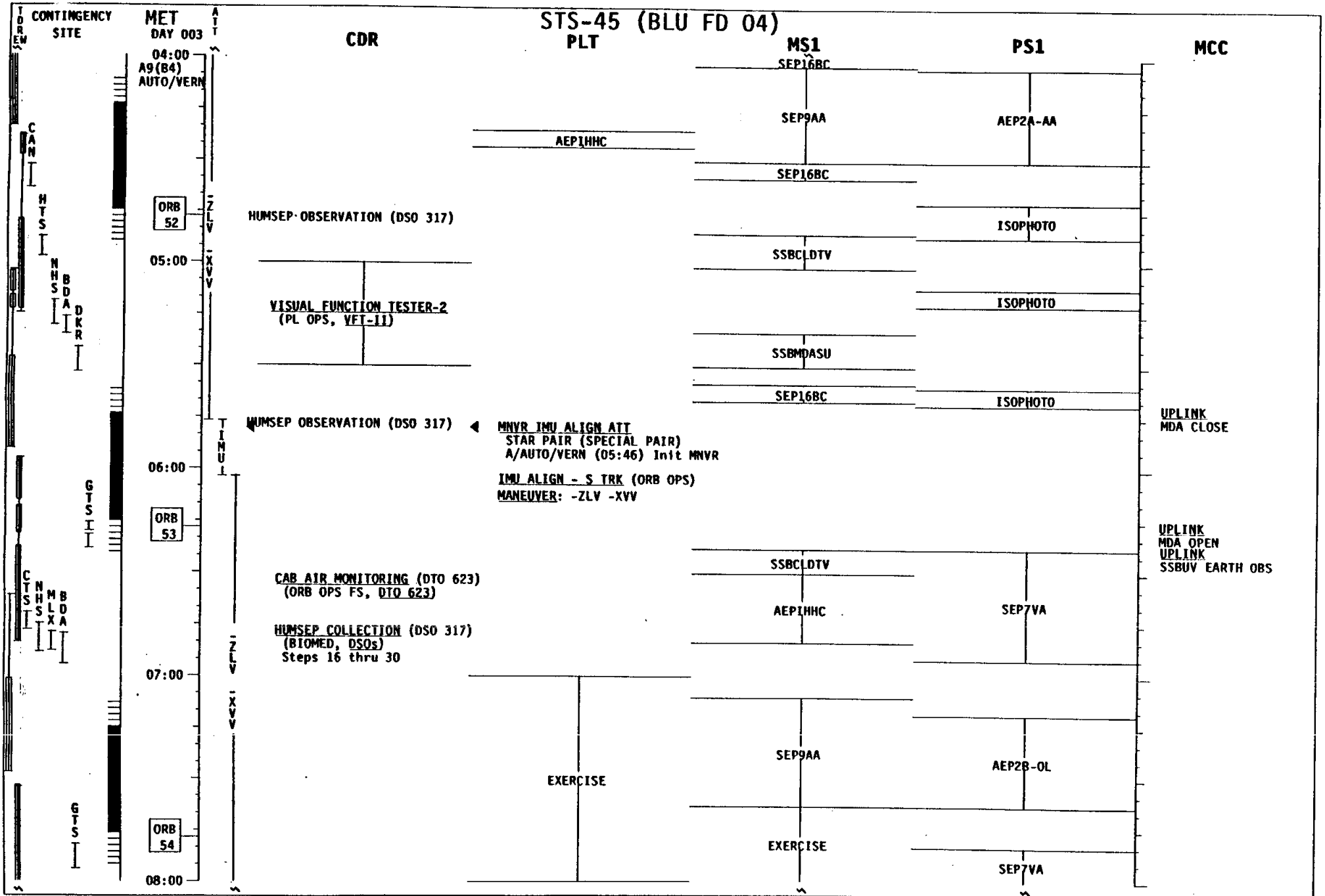




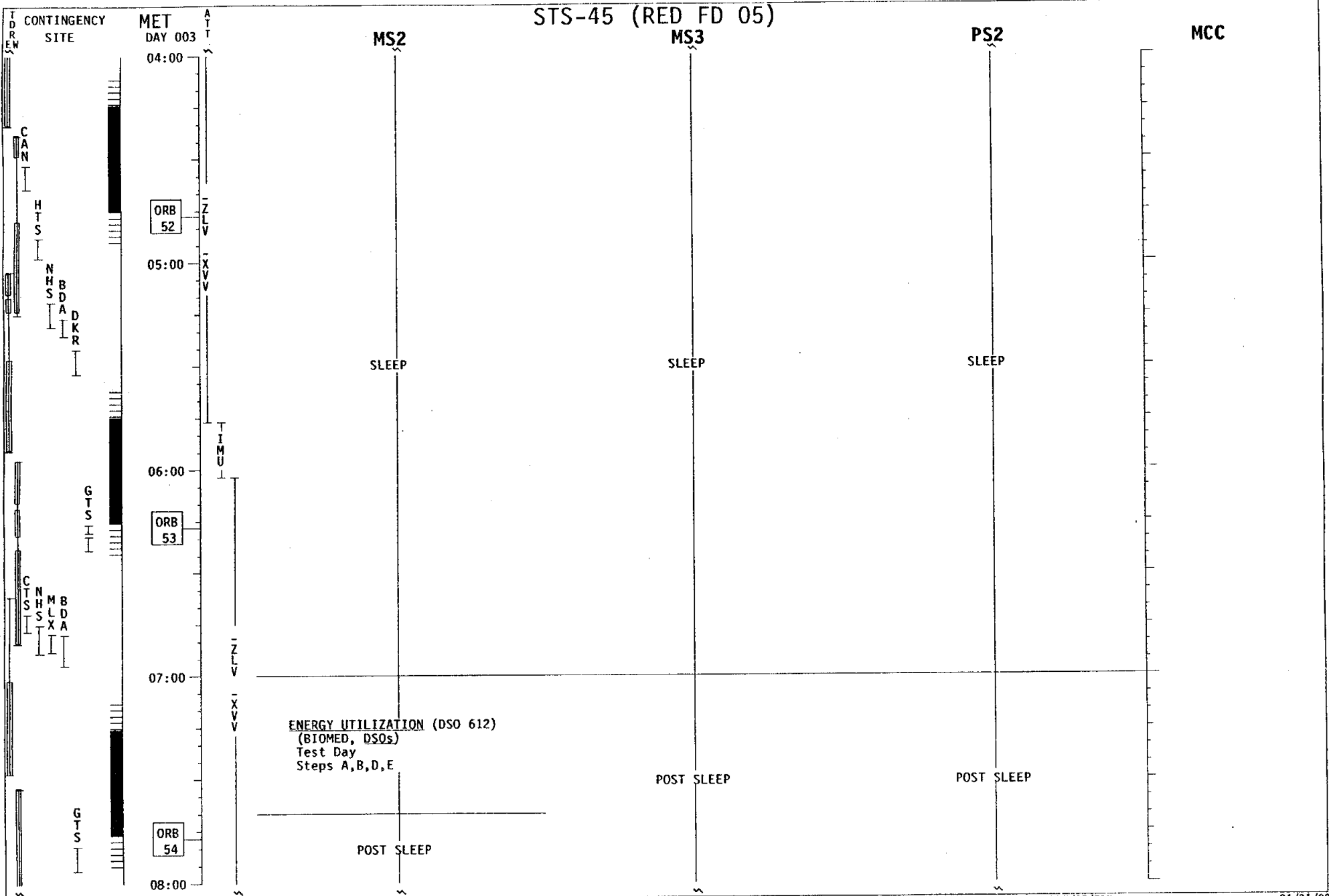


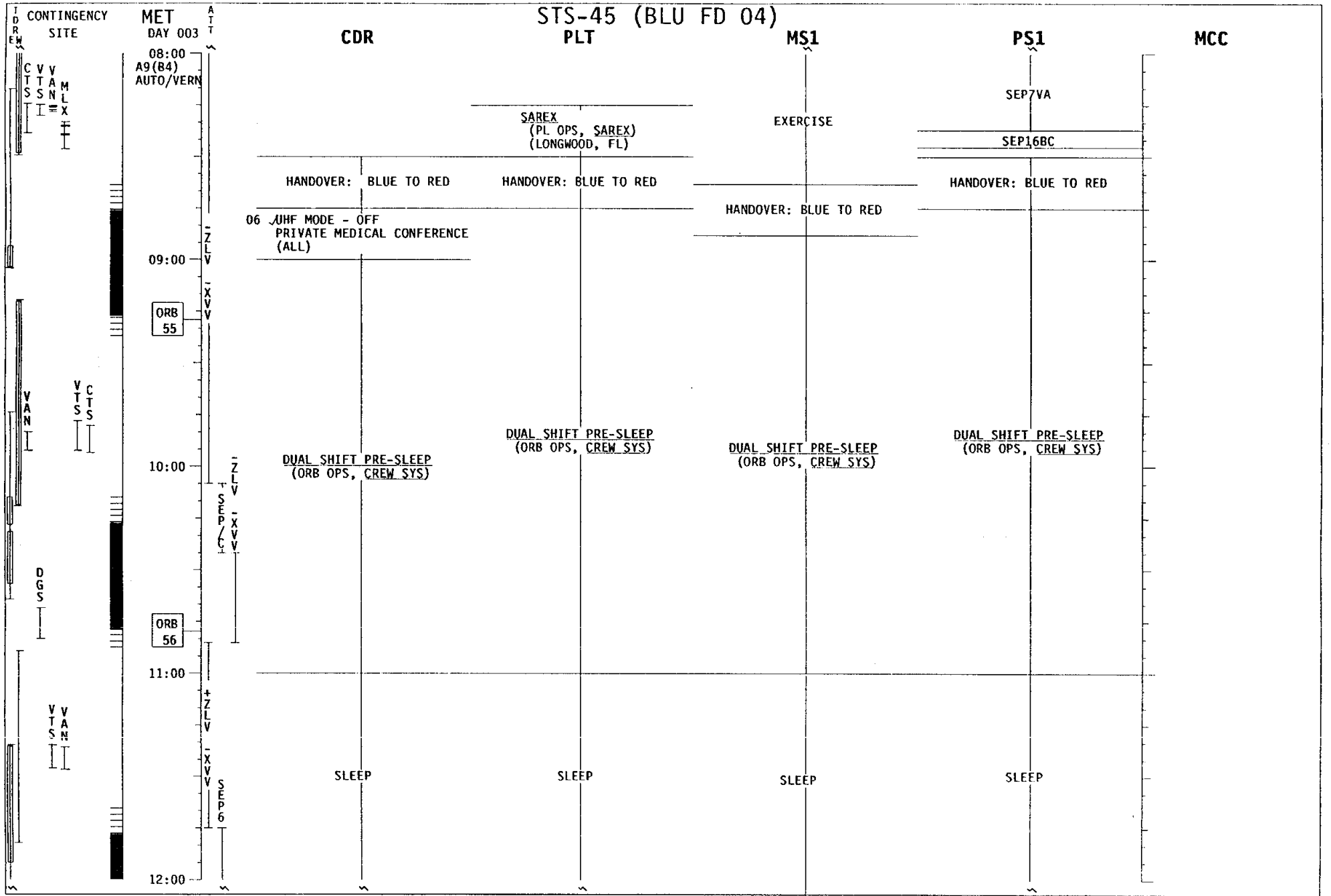
# STS-45 (RED FD 04)

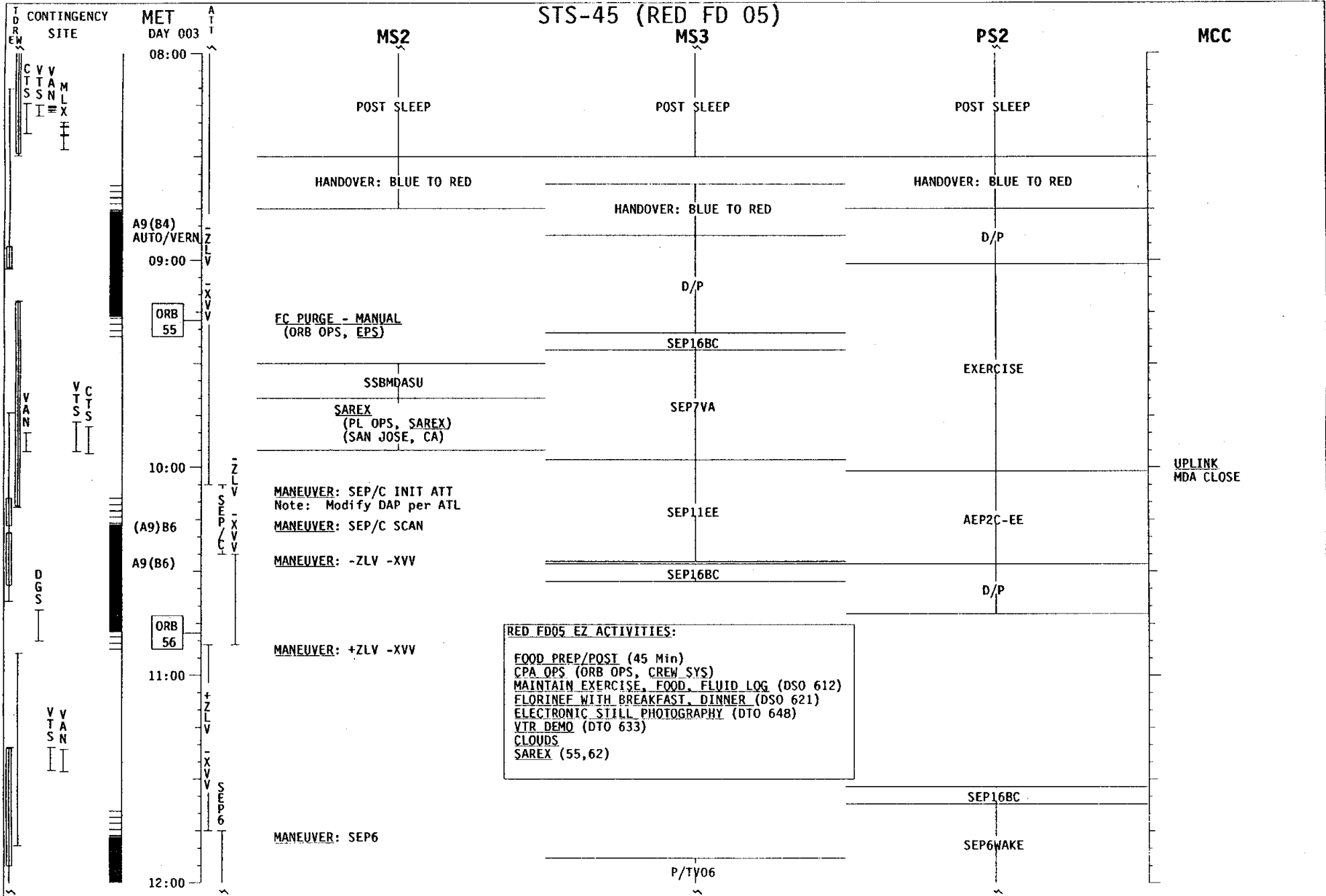


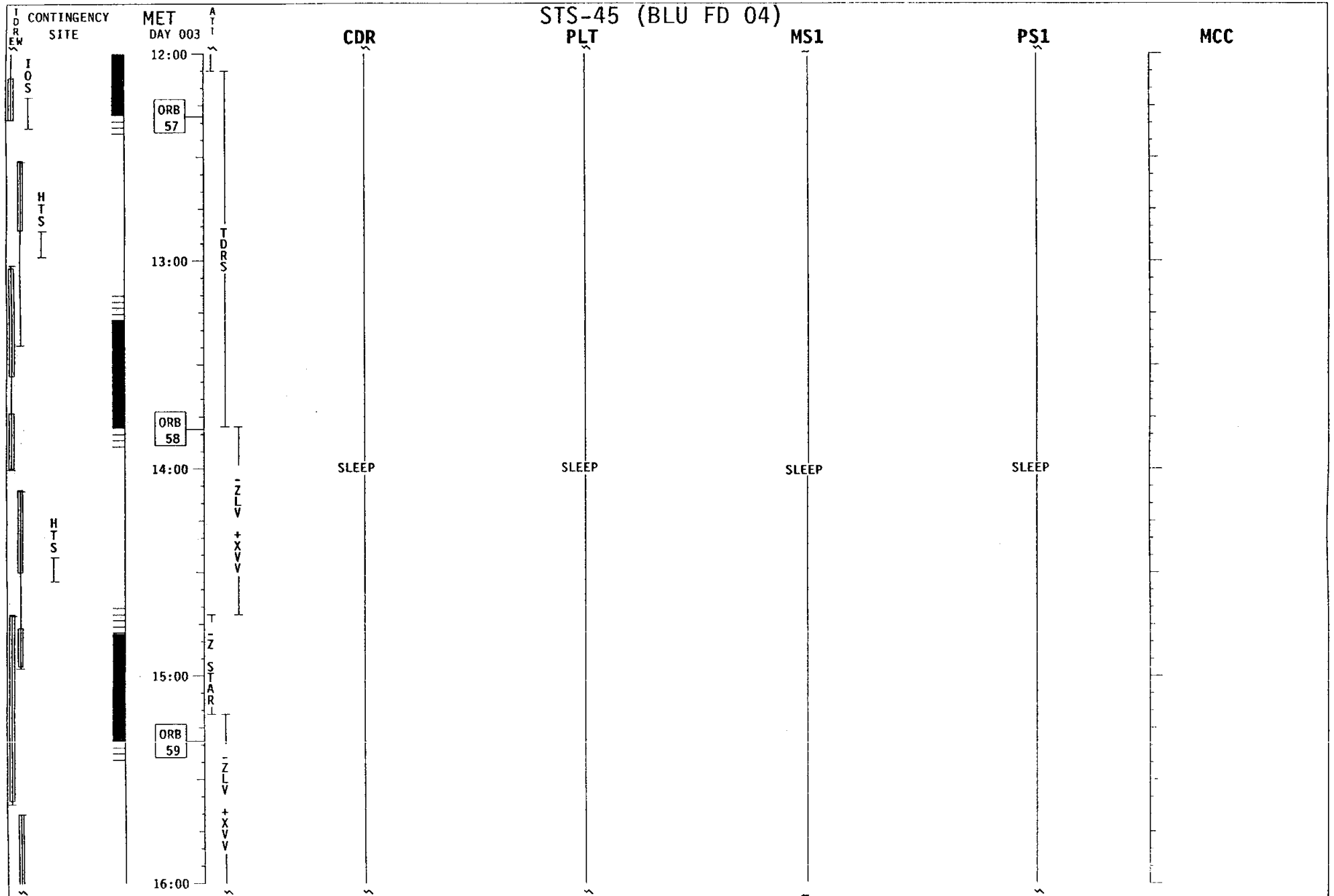


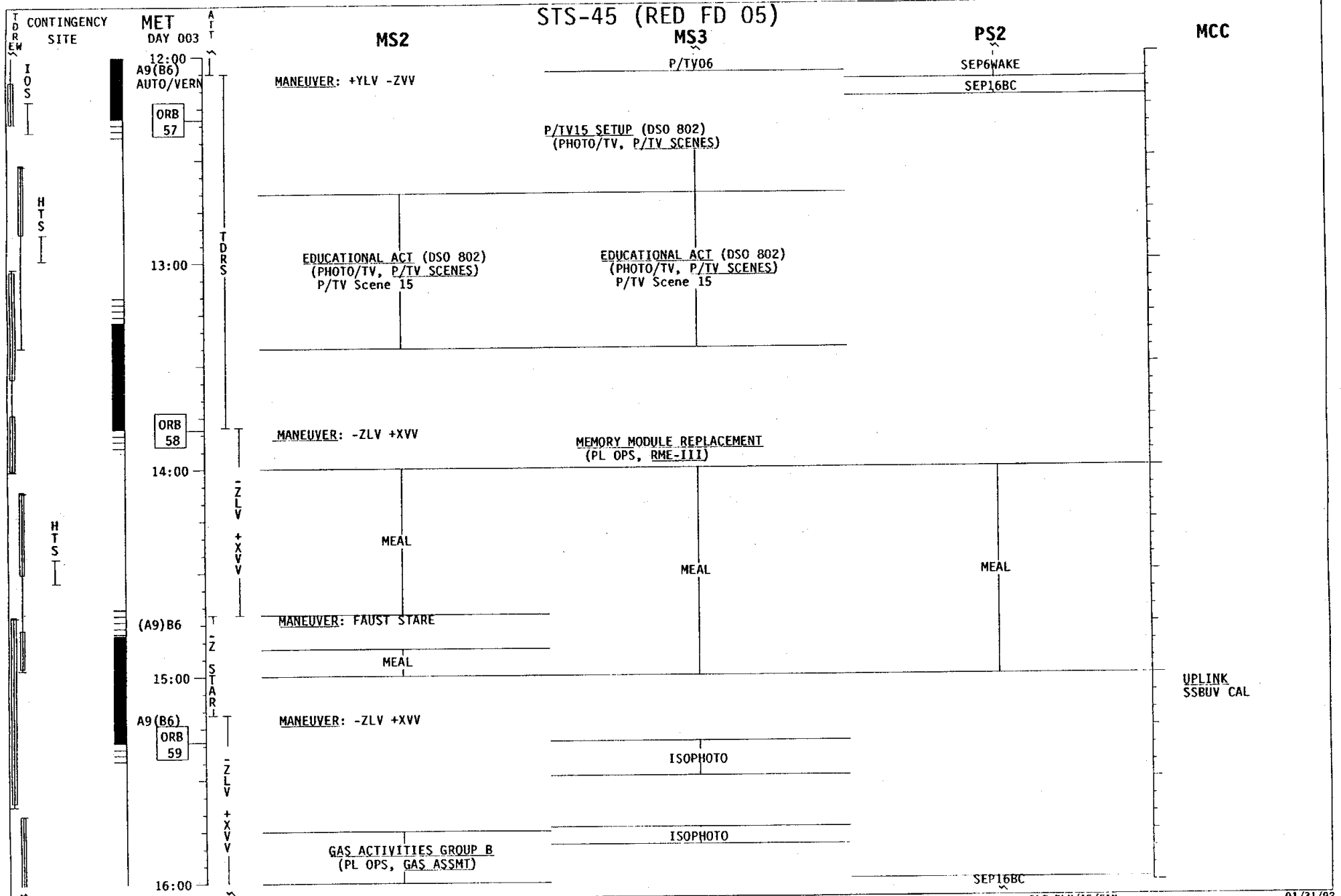
# STS-45 (RED FD 05)

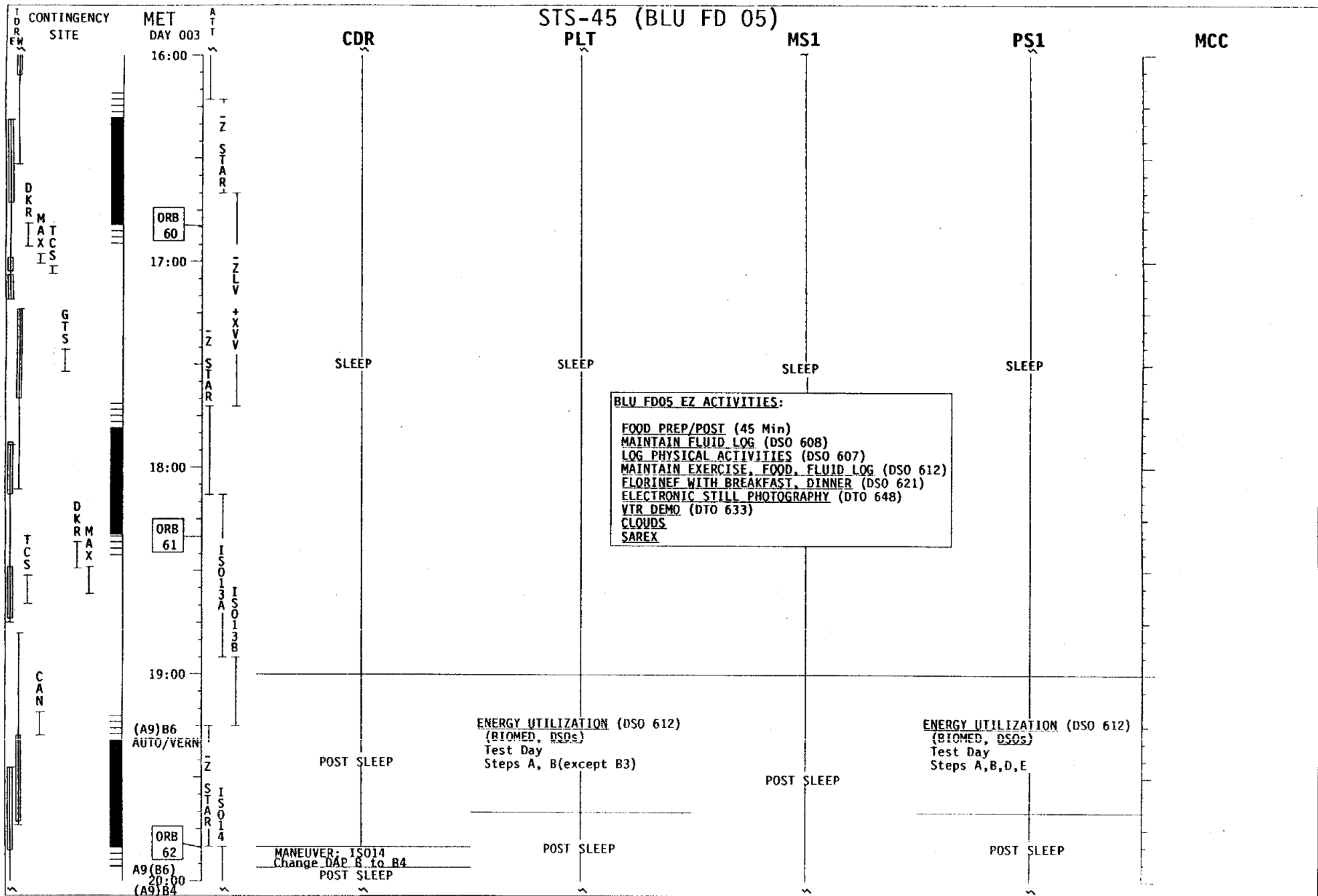




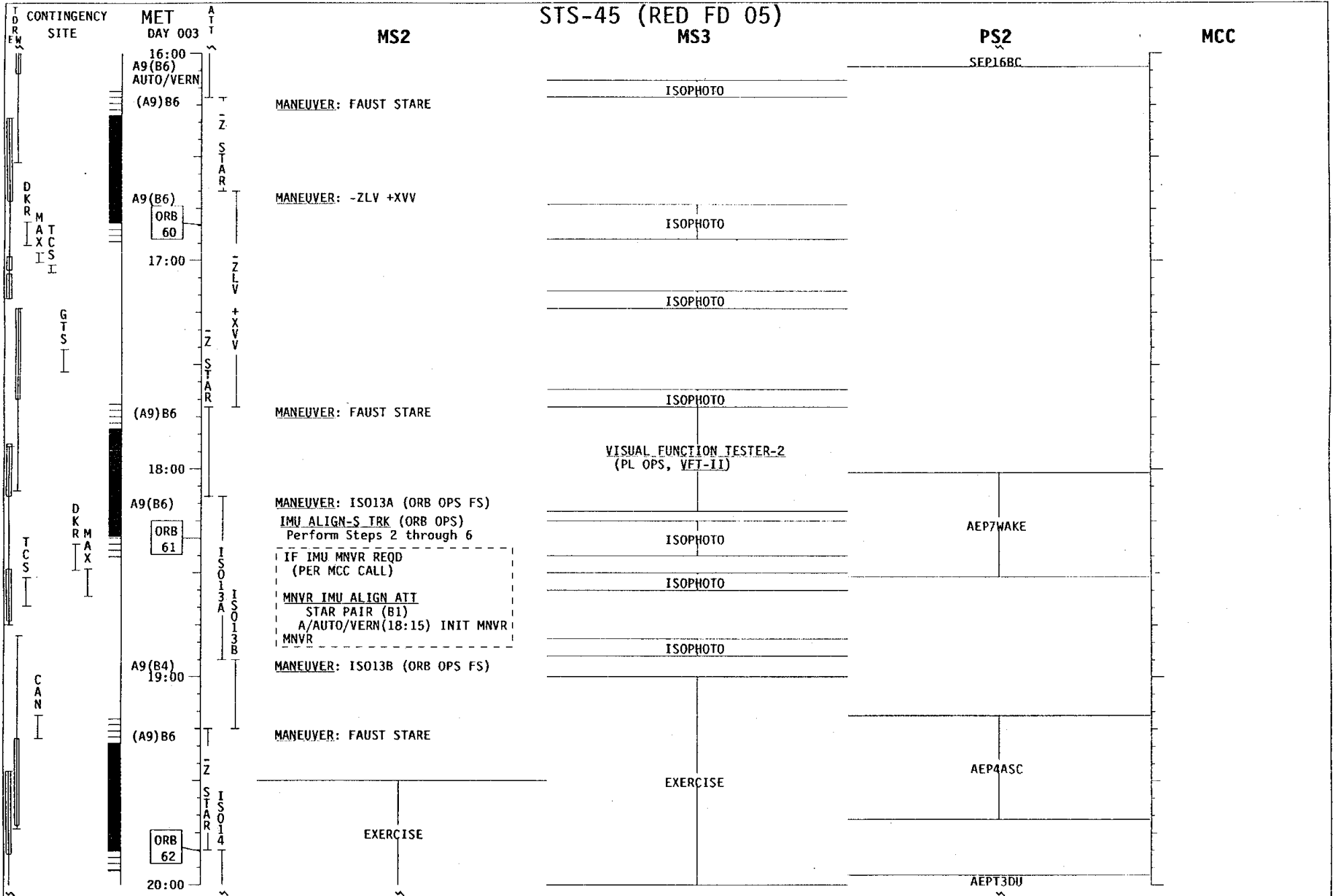


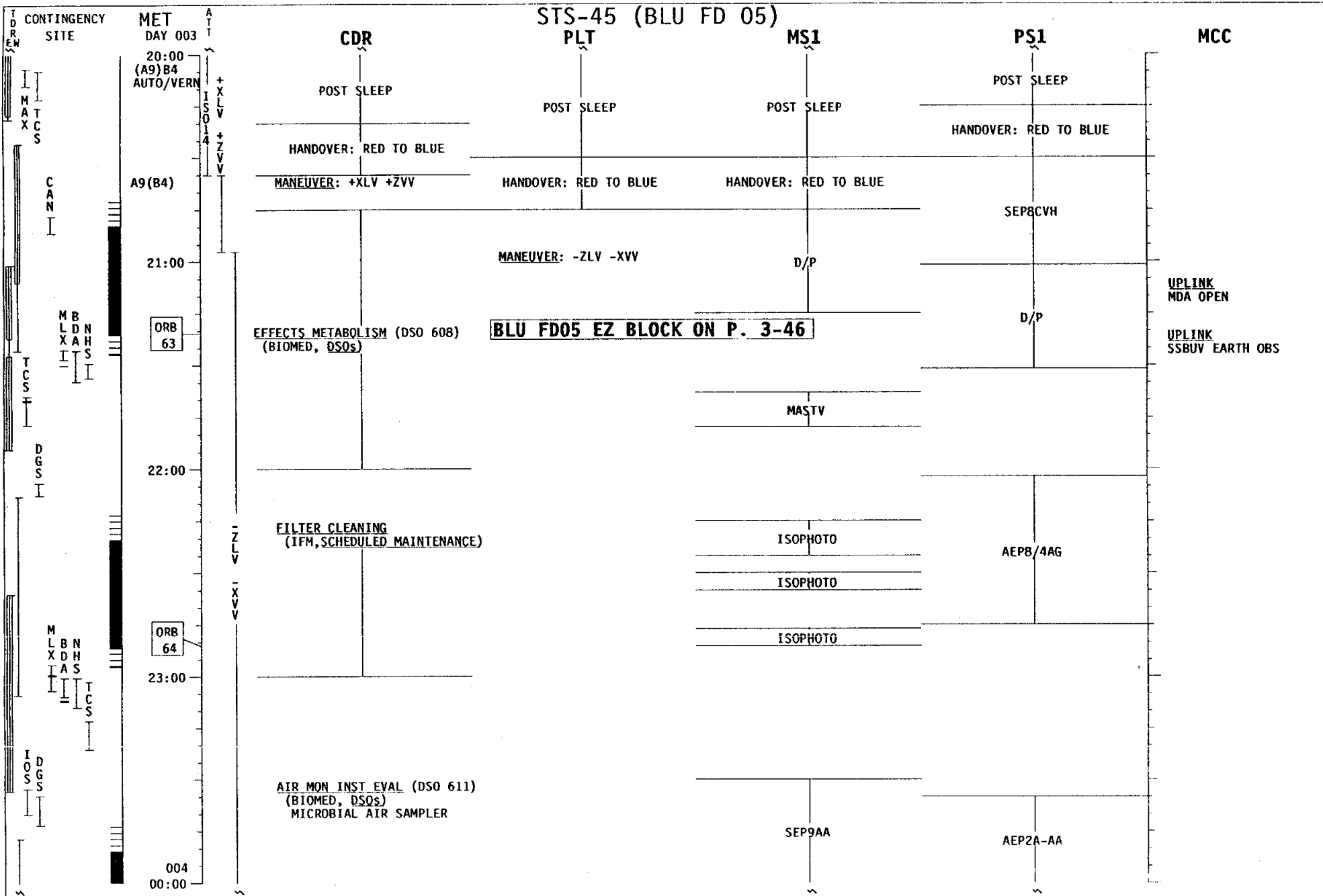


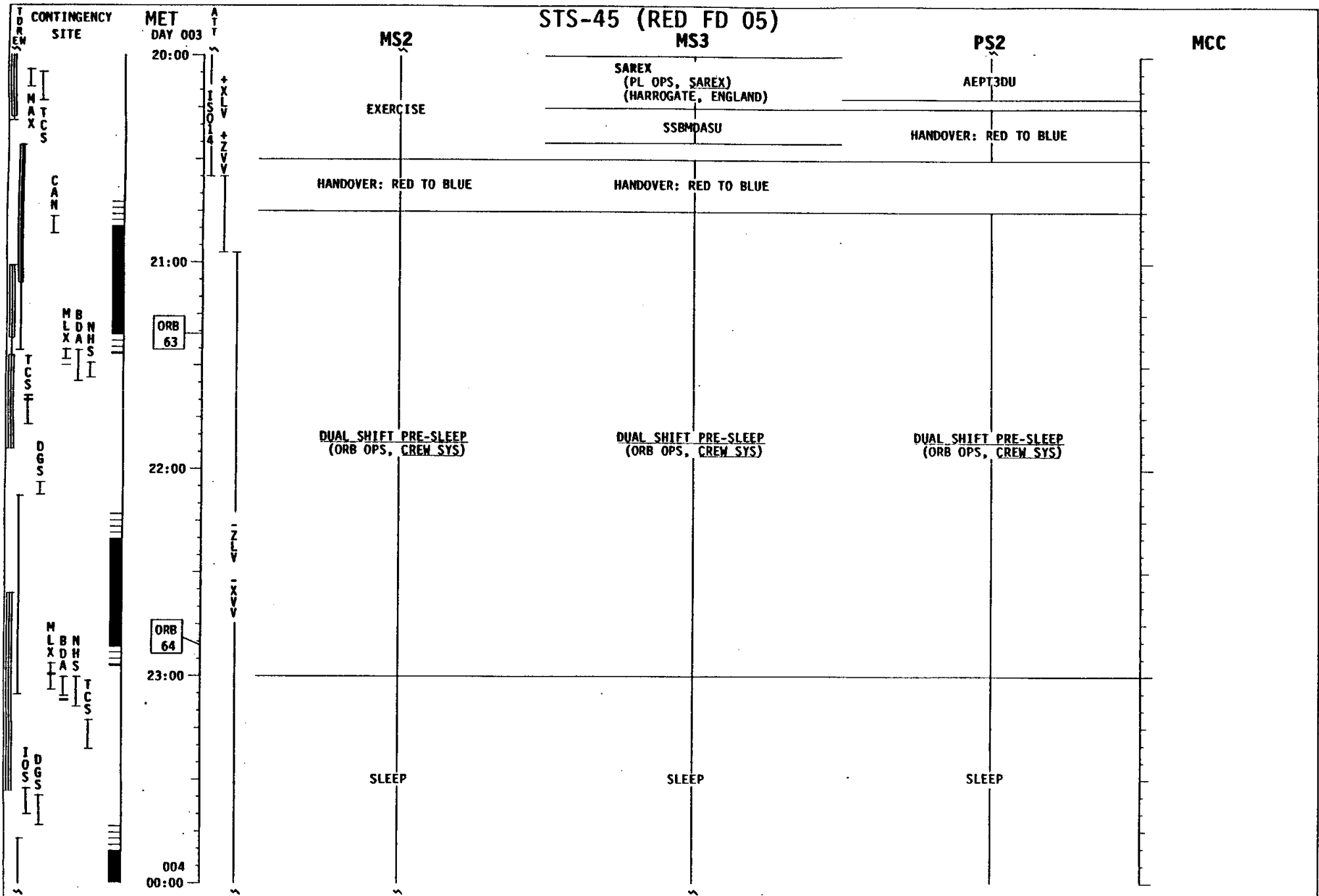


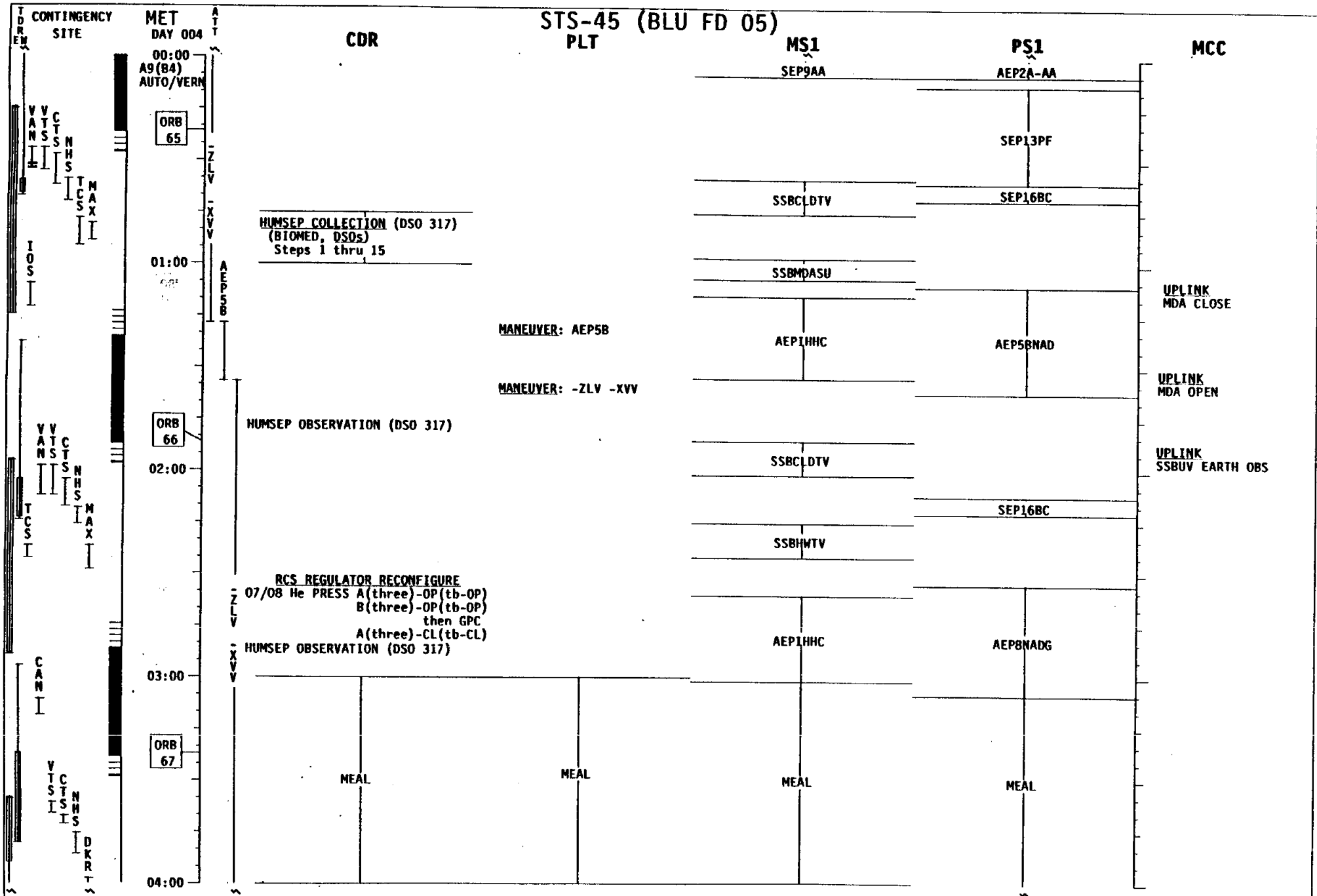




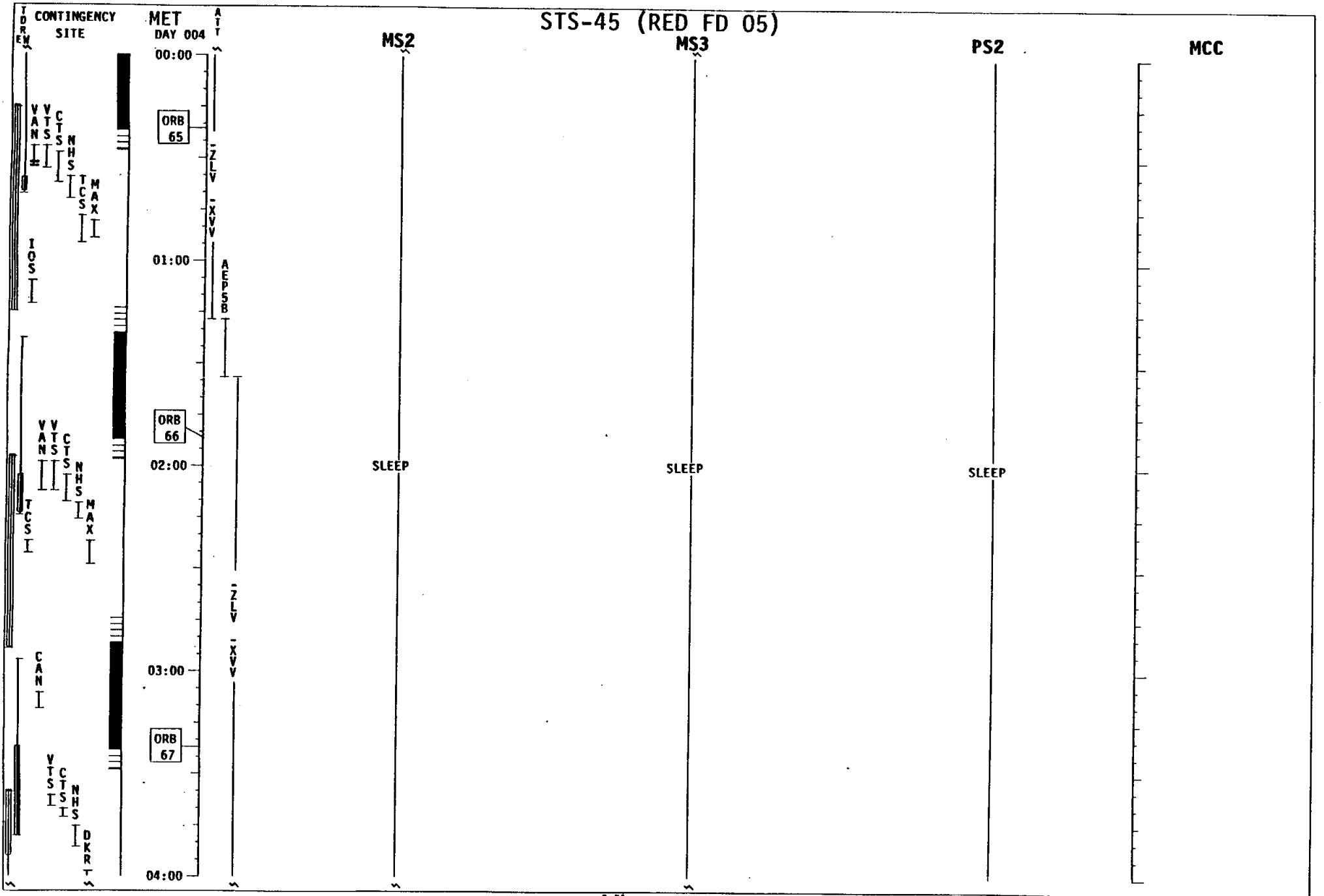


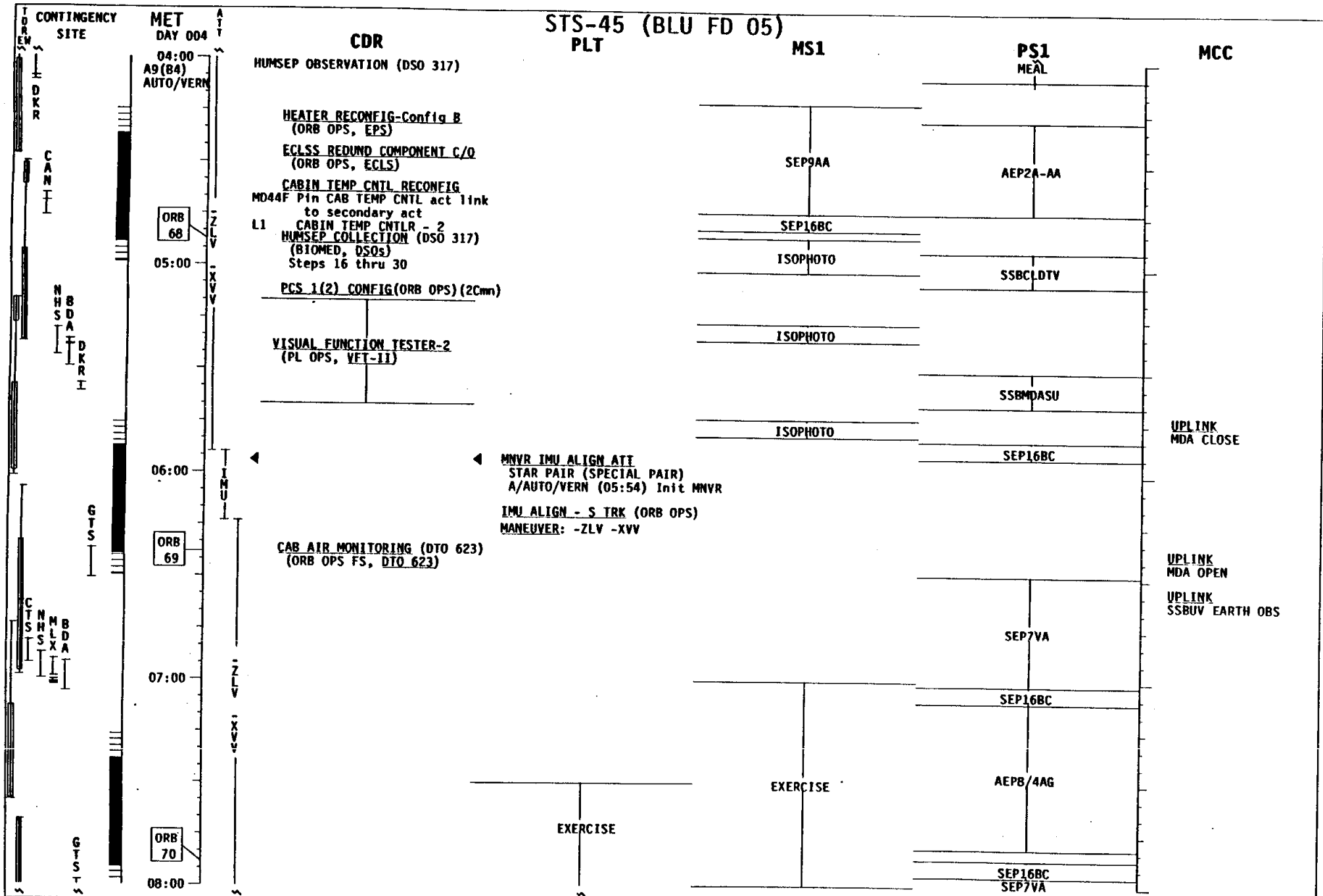




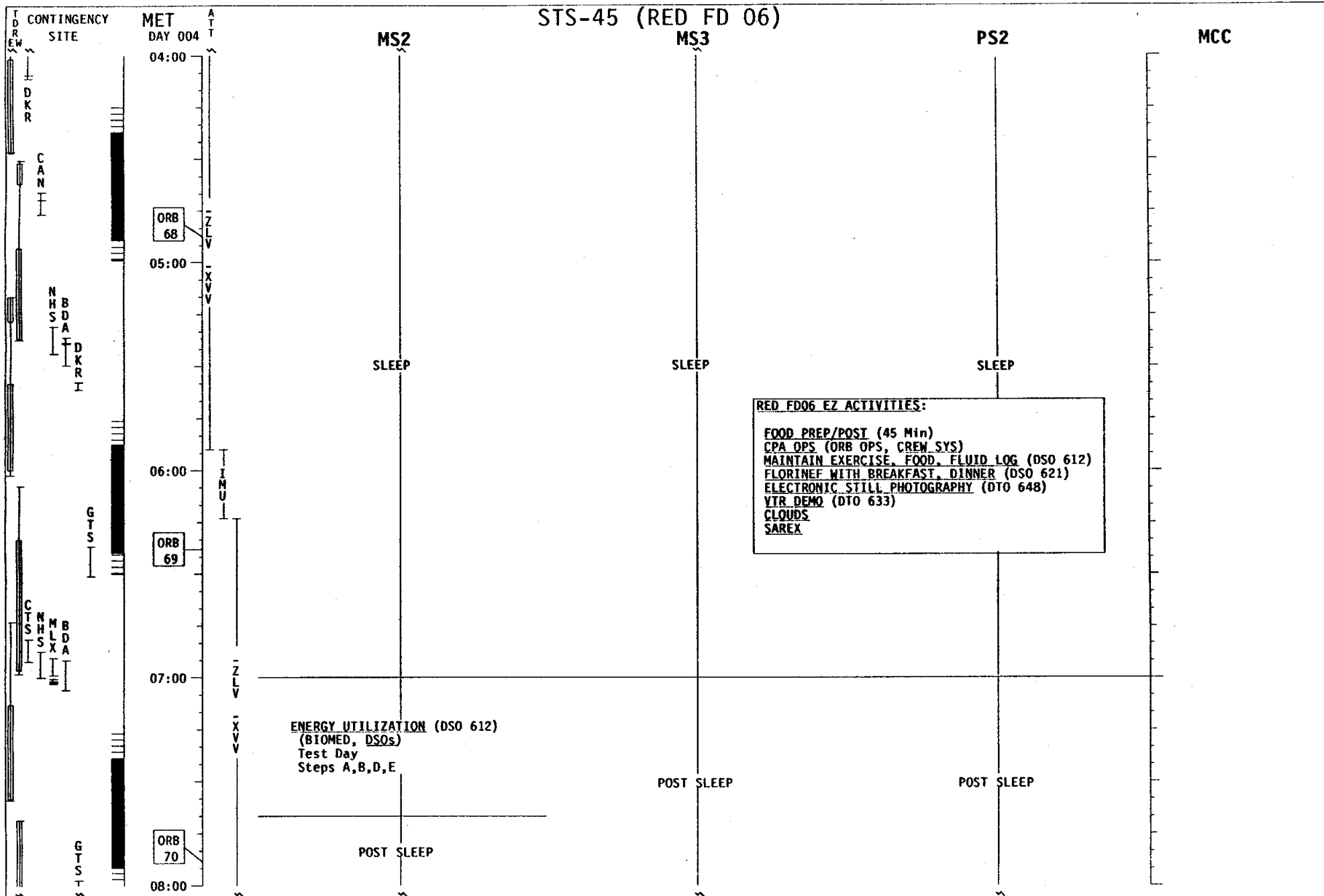


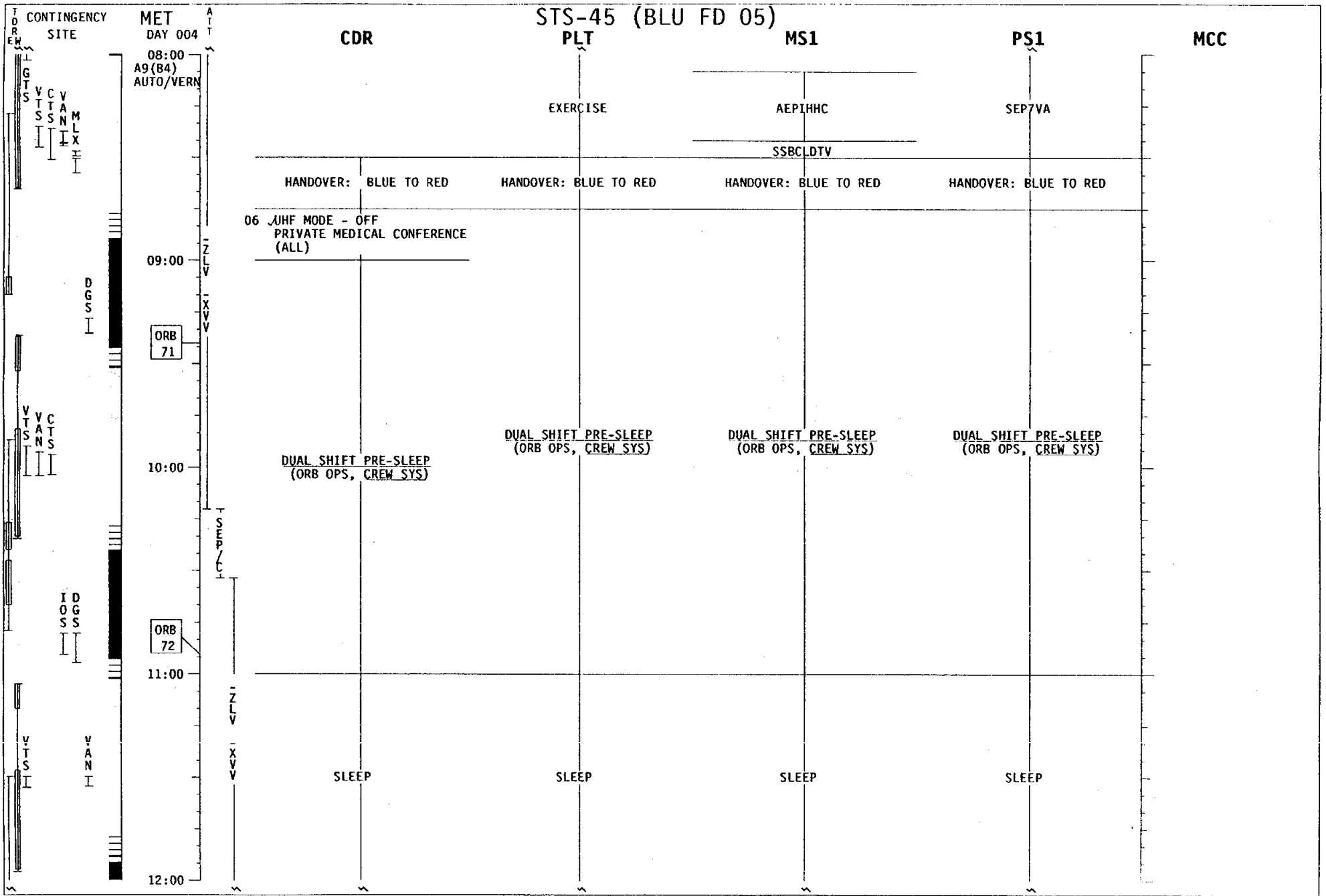
# STS-45 (RED FD 05)



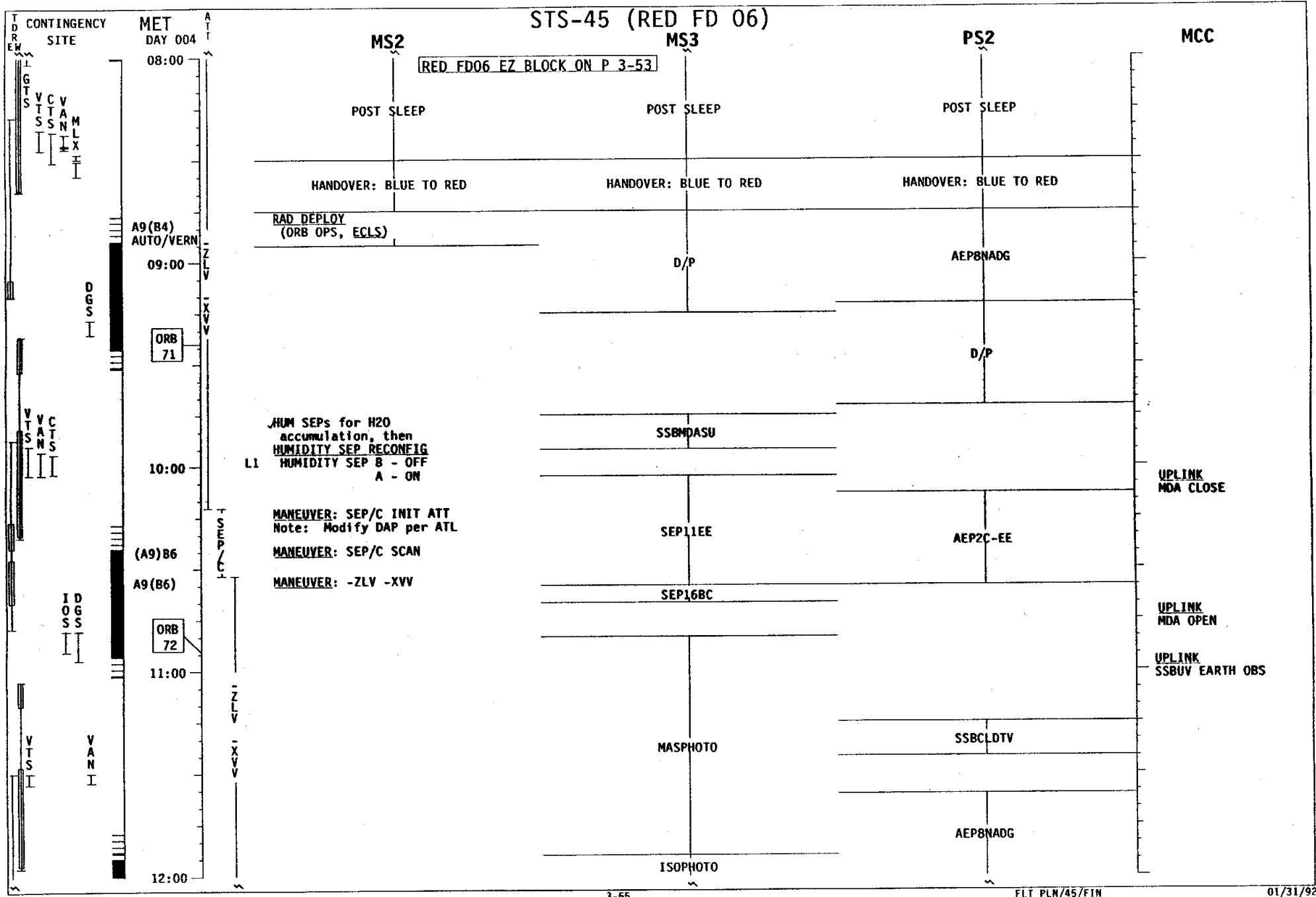


# STS-45 (RED FD 06)

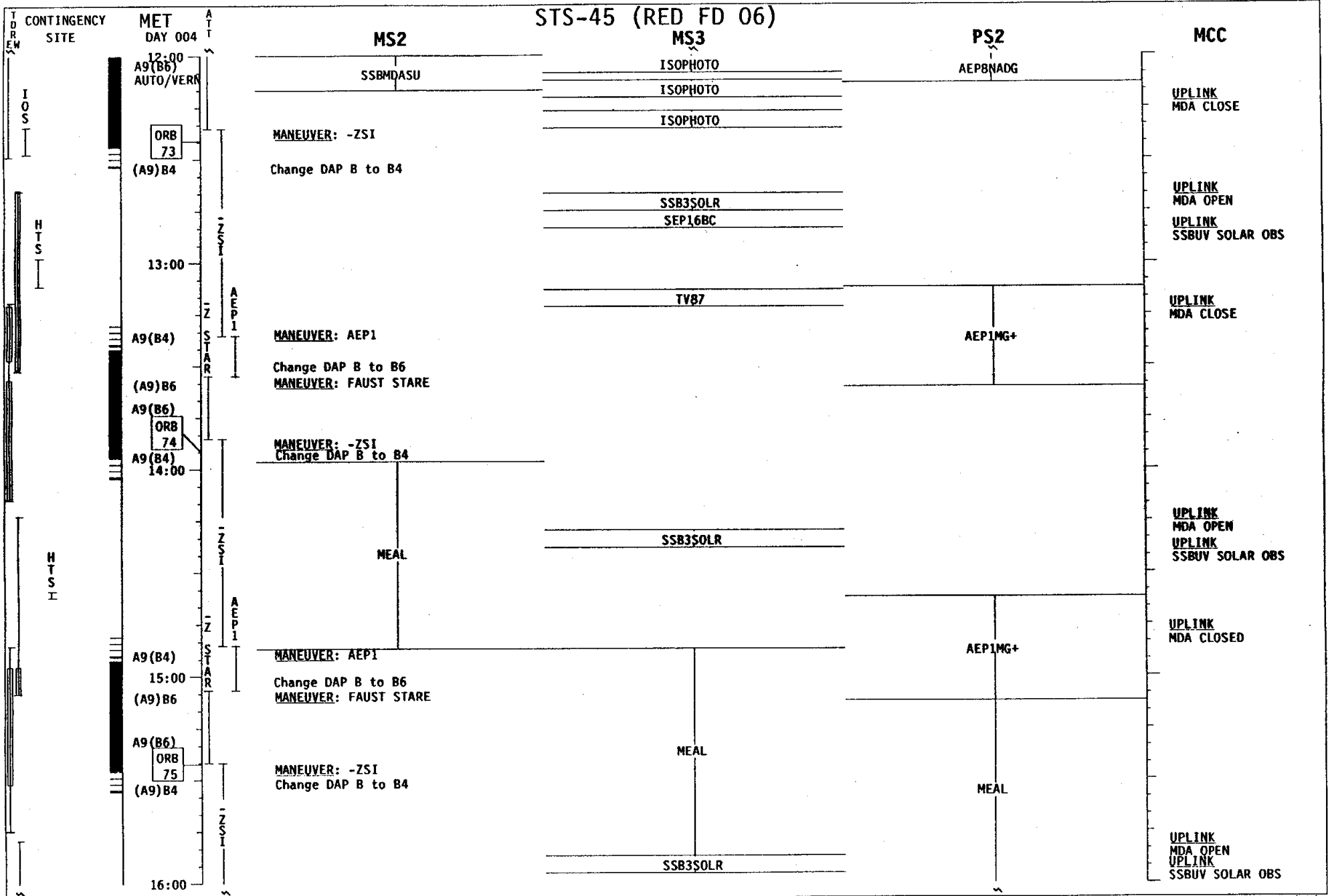




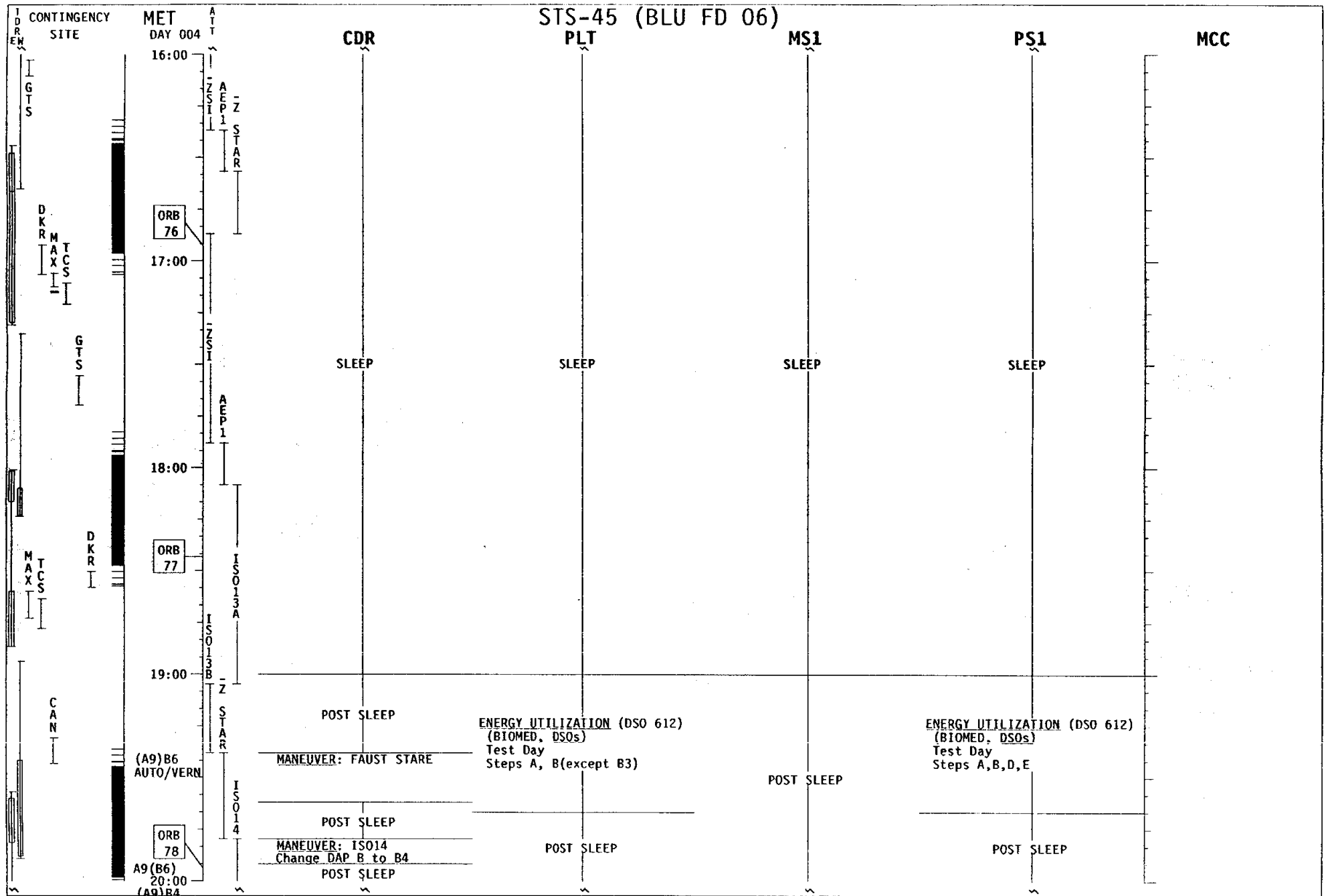


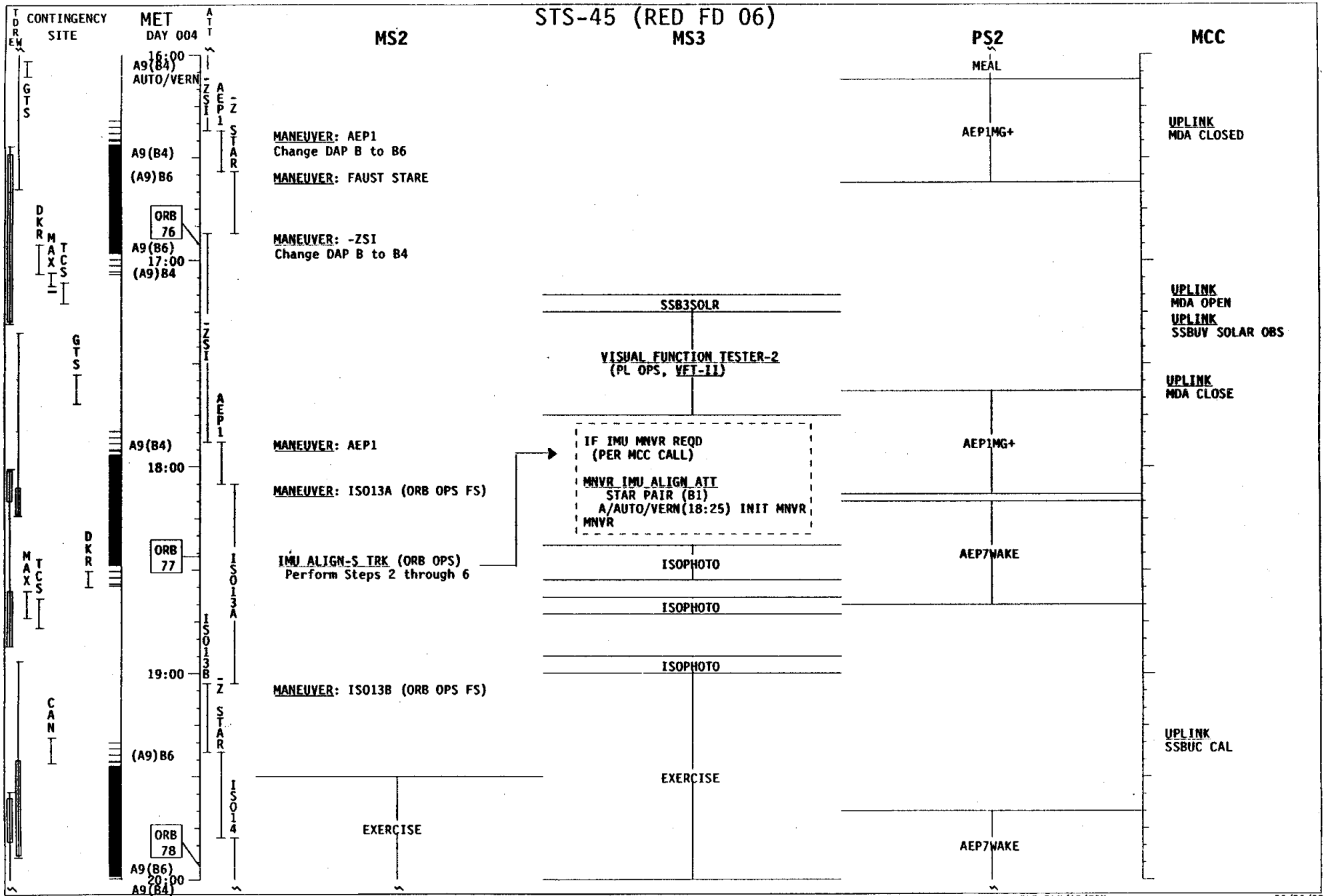


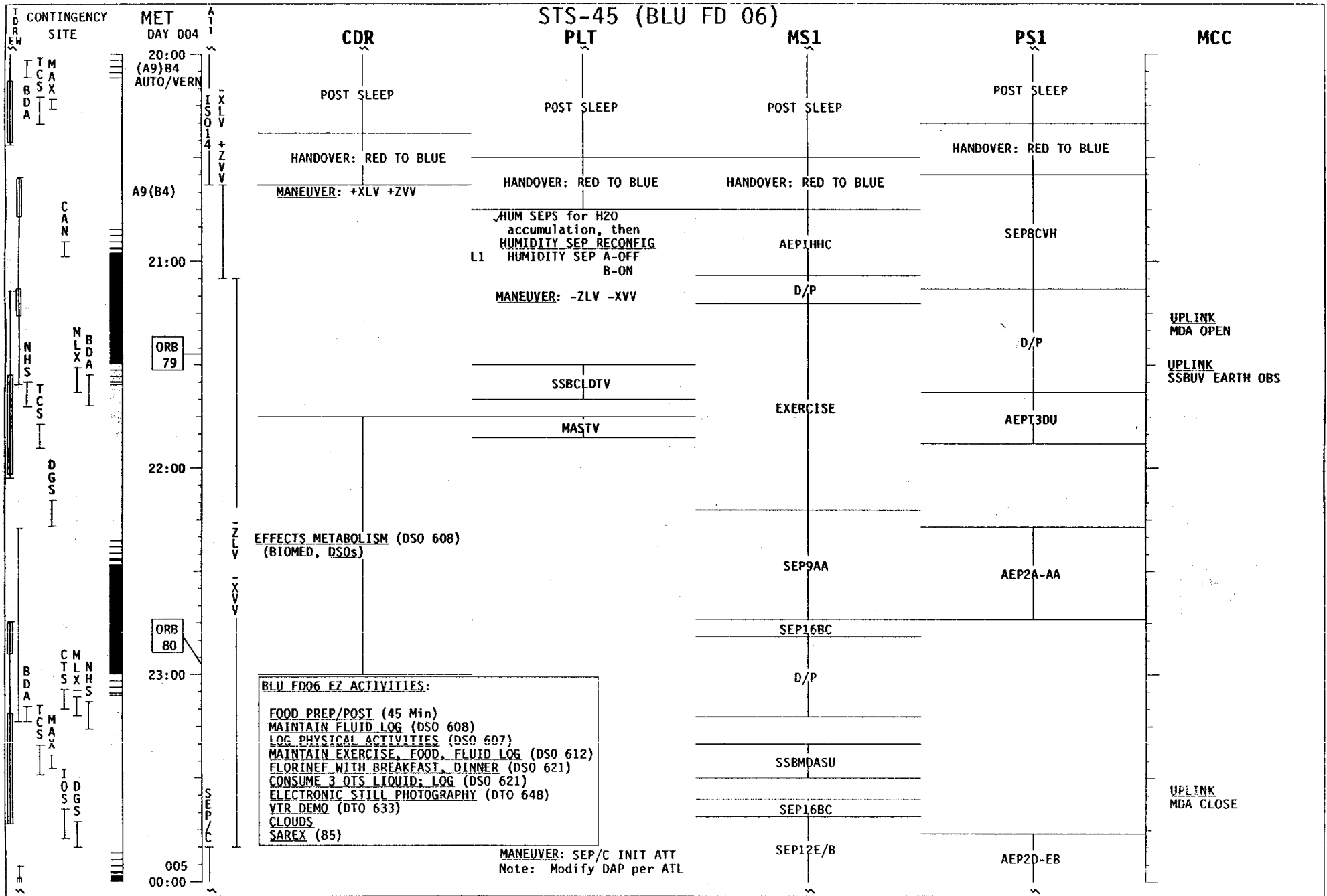


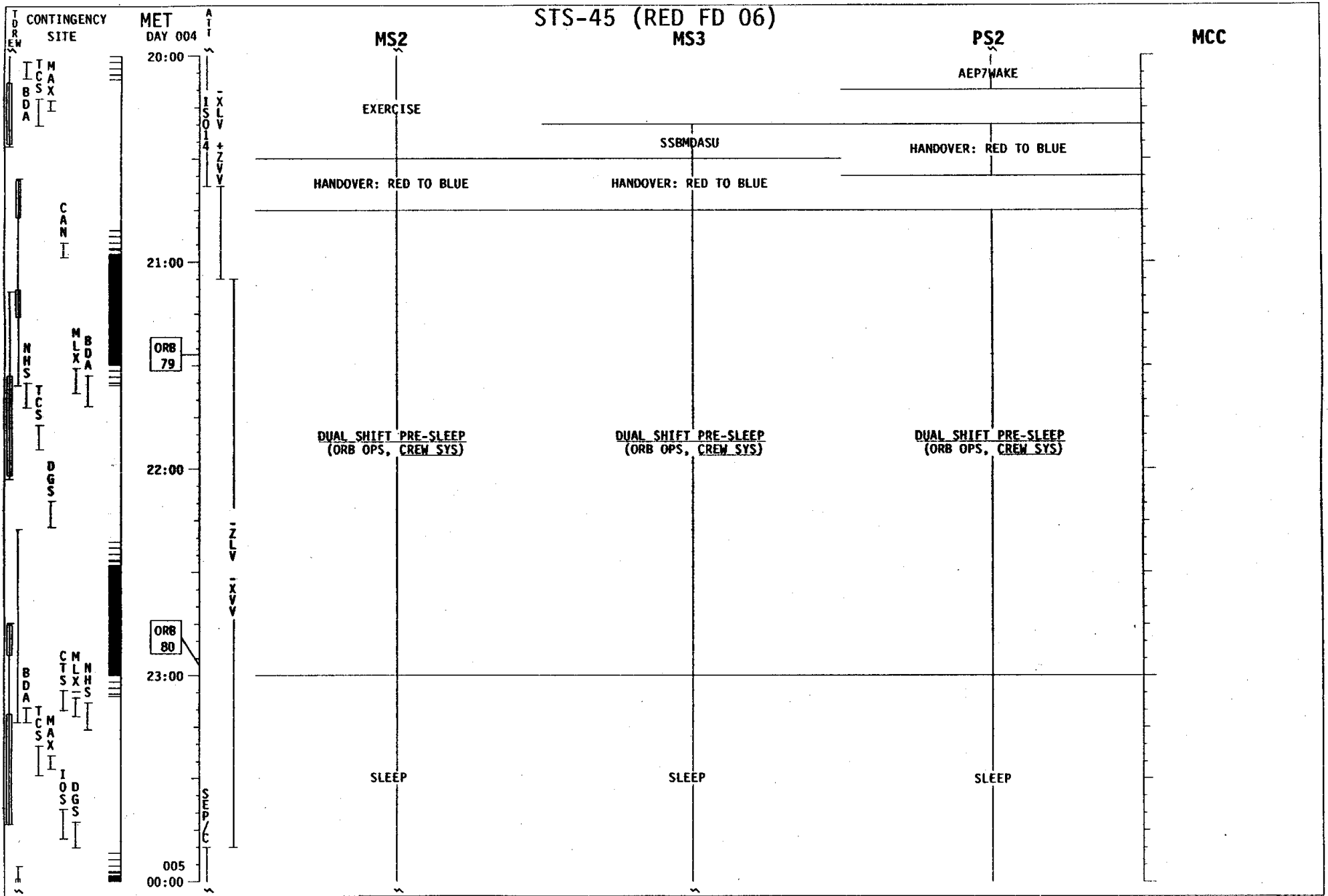


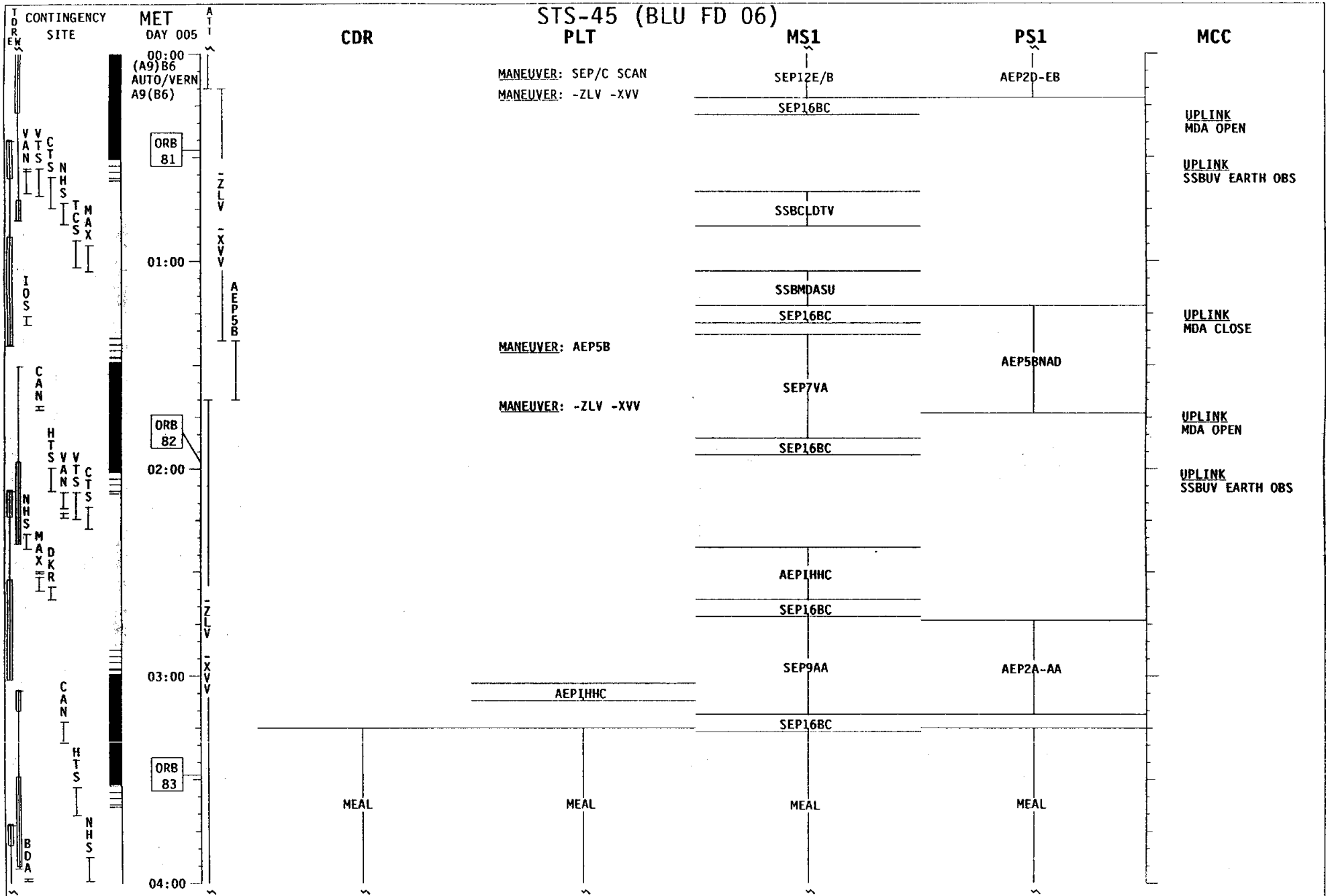
# STS-45 (BLU FD 06)





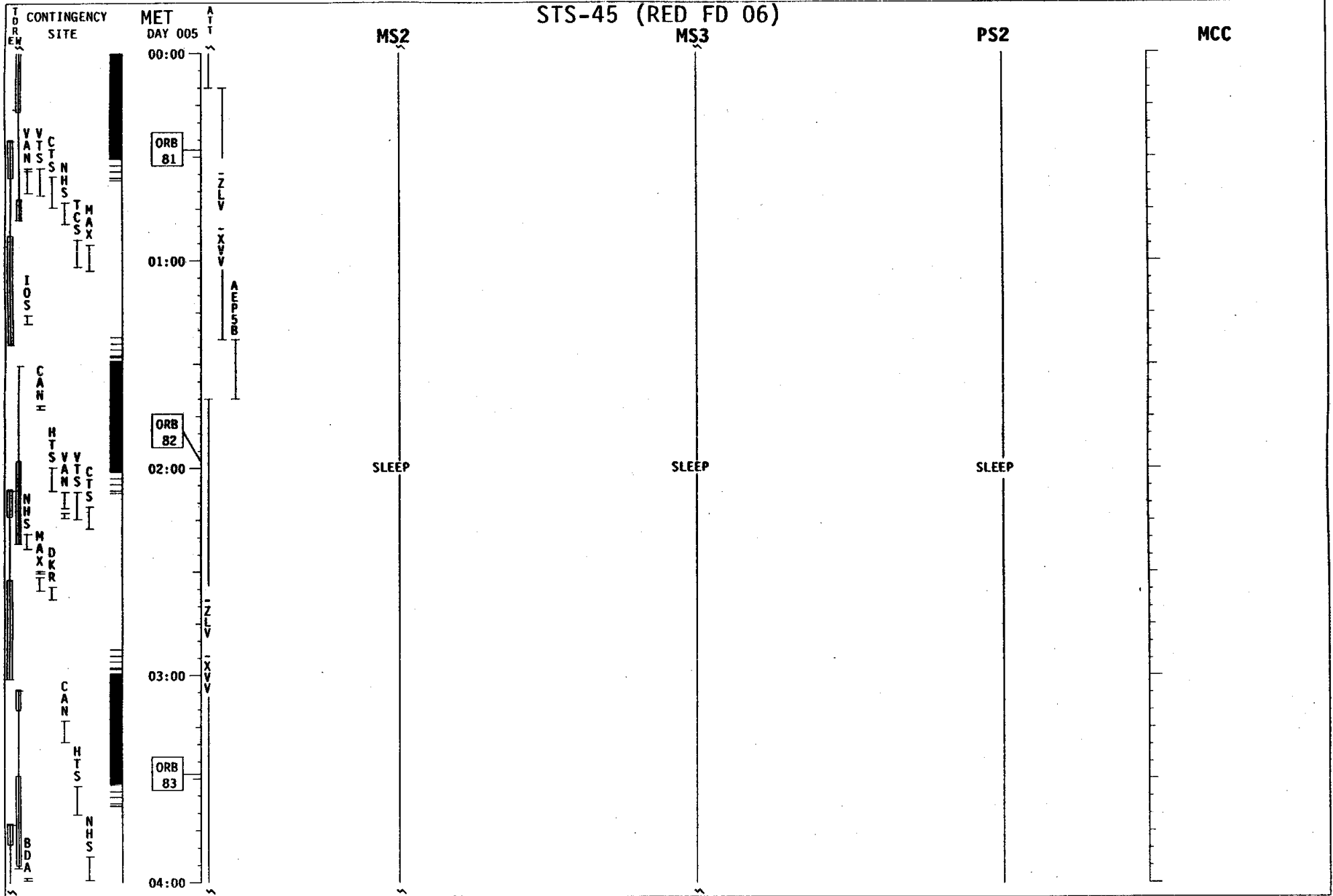


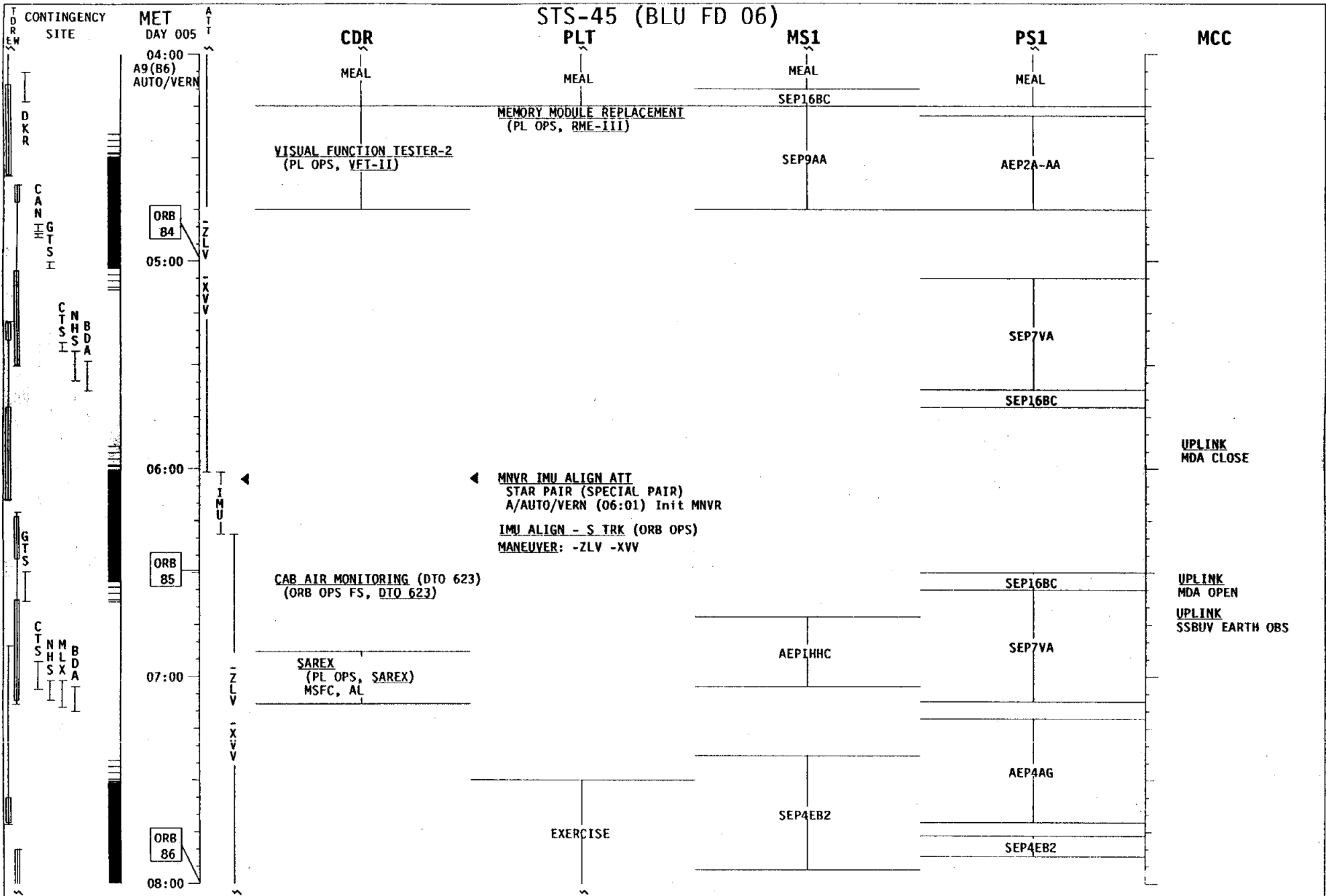


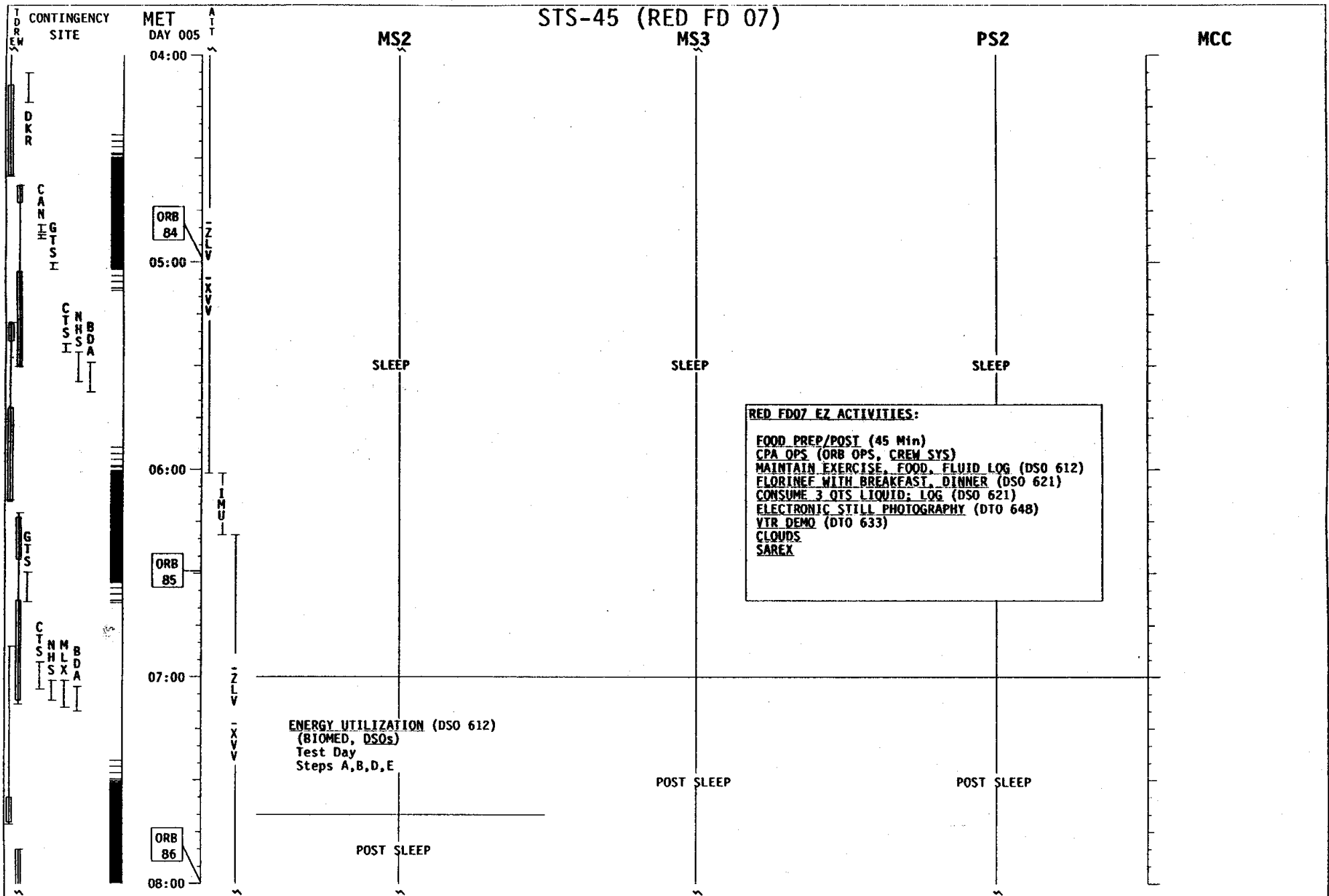


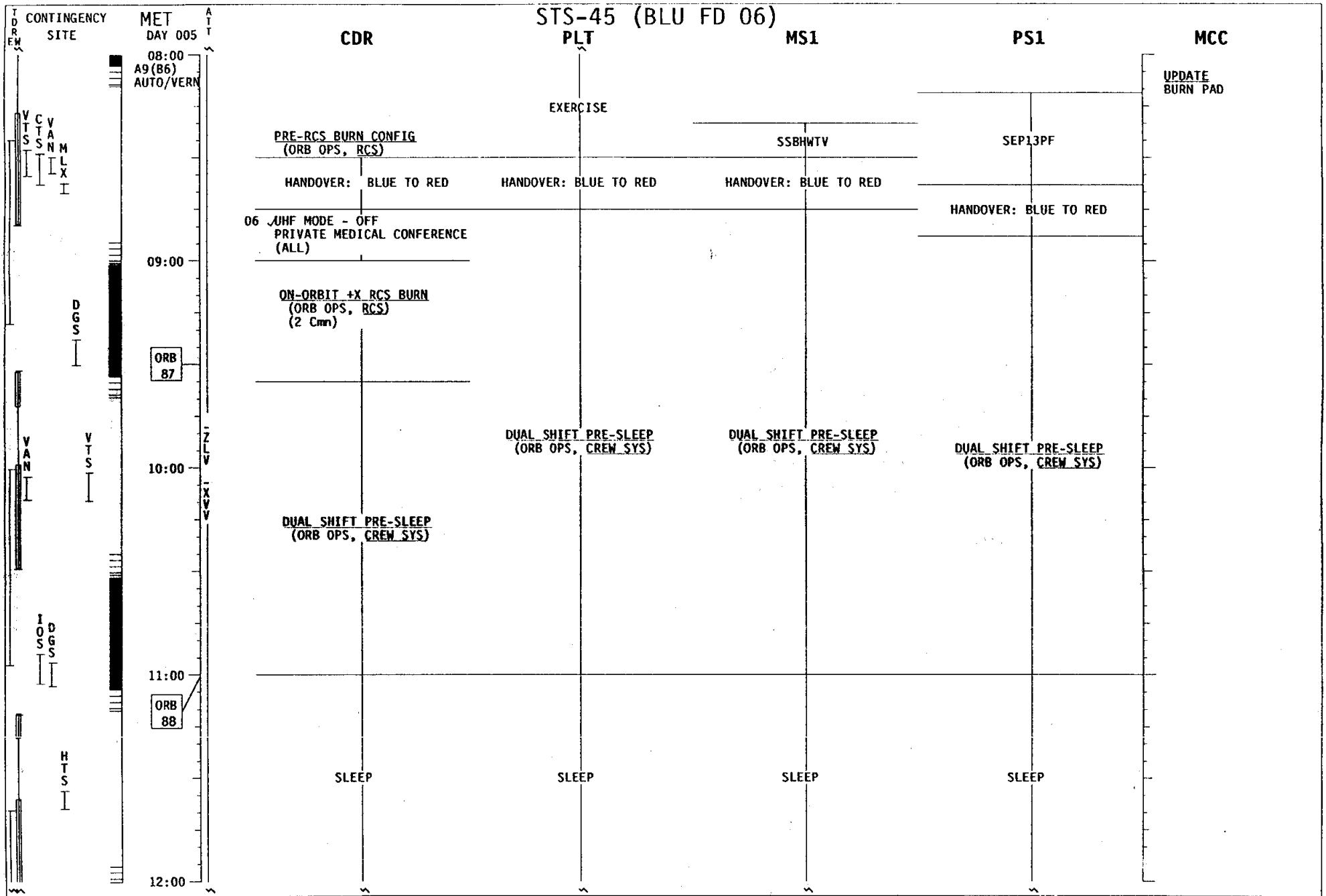


# STS-45 (RED FD 06)

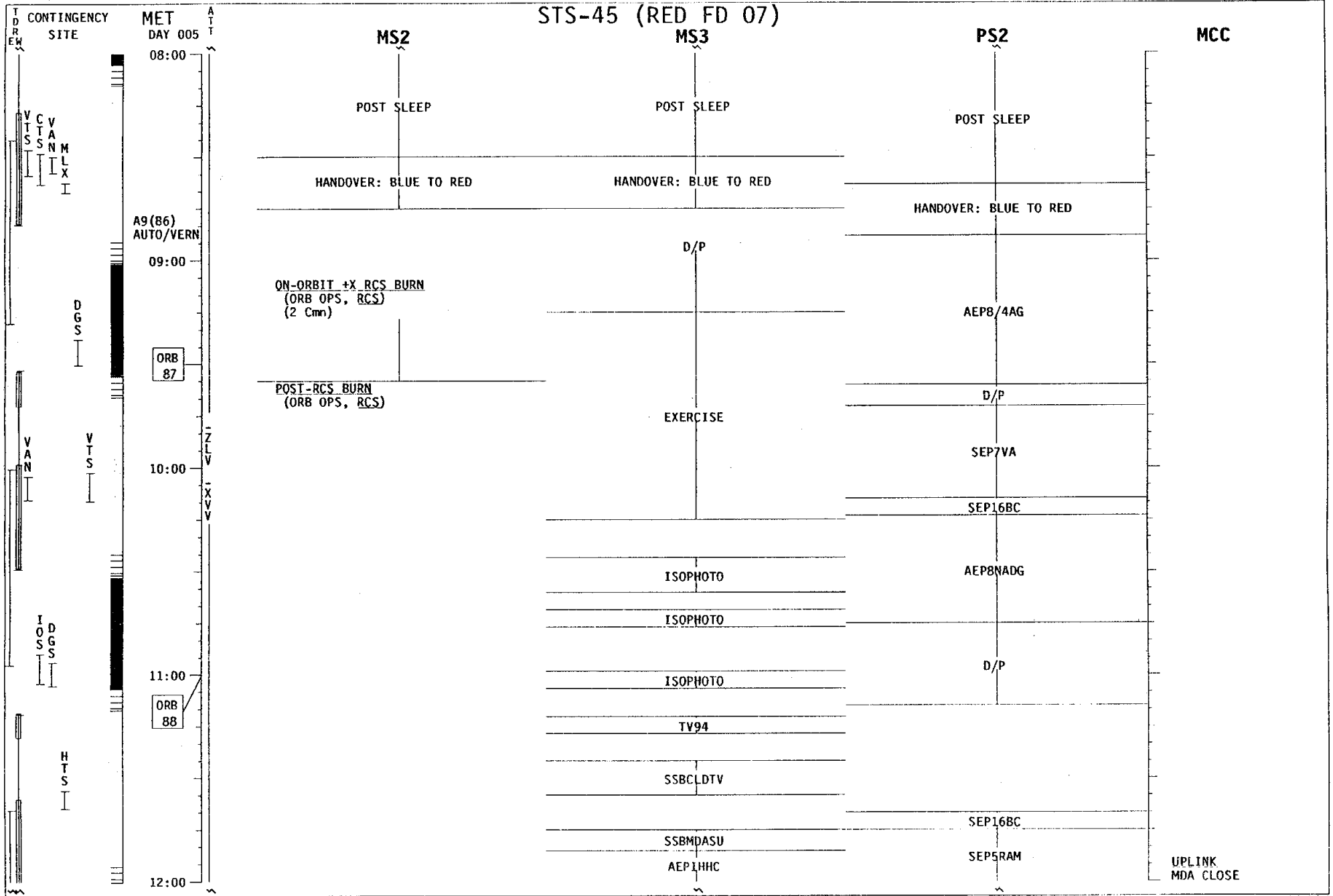


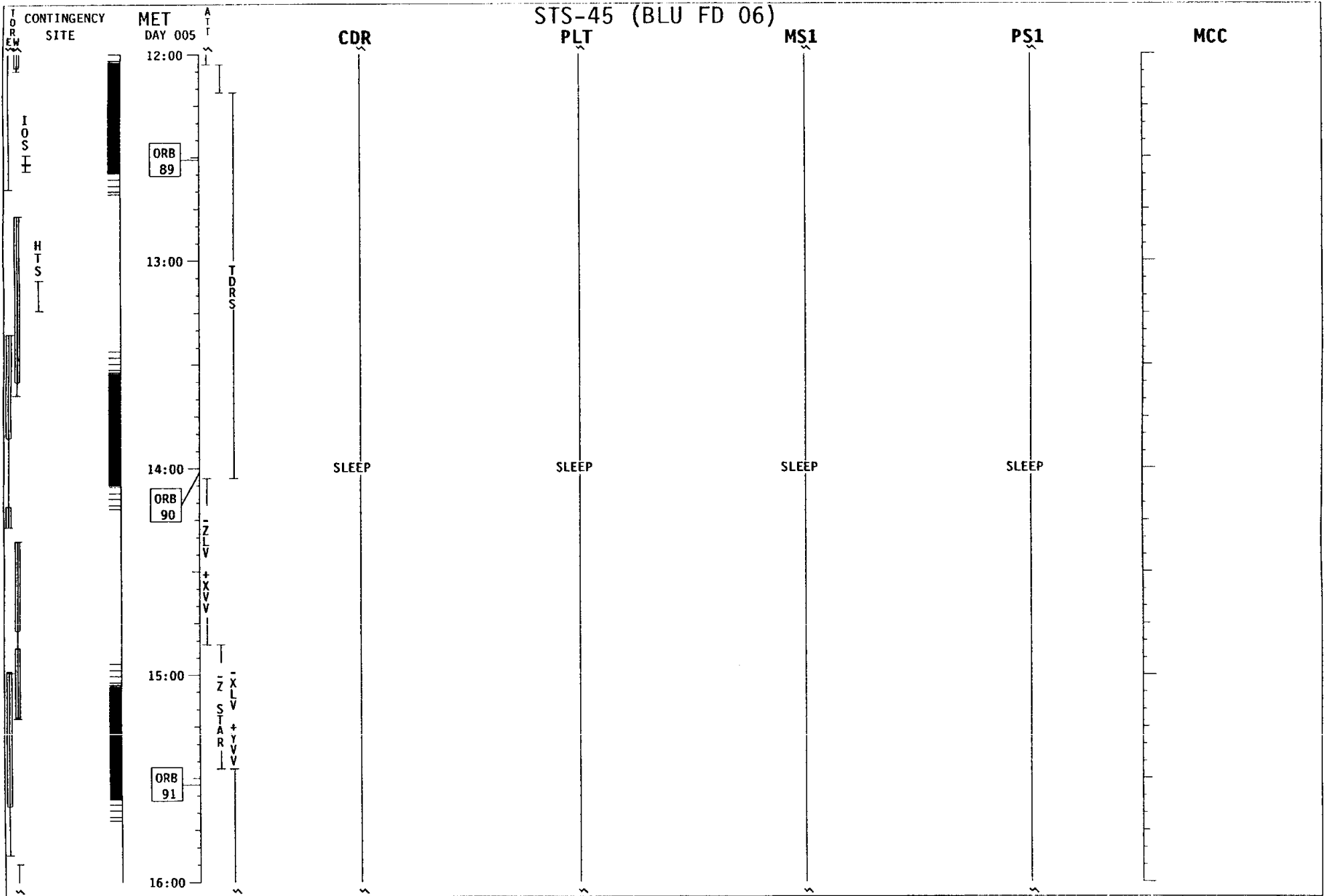


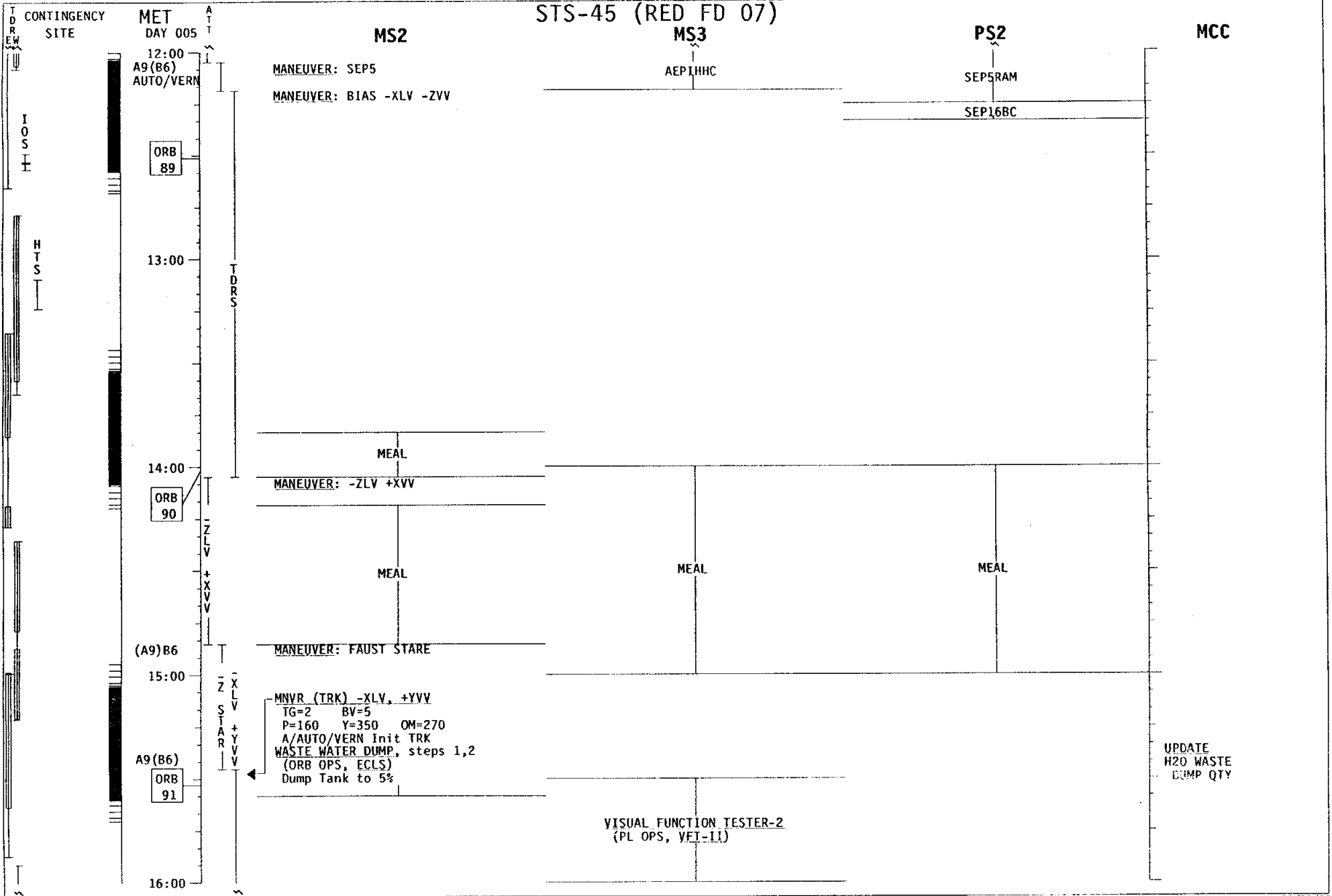


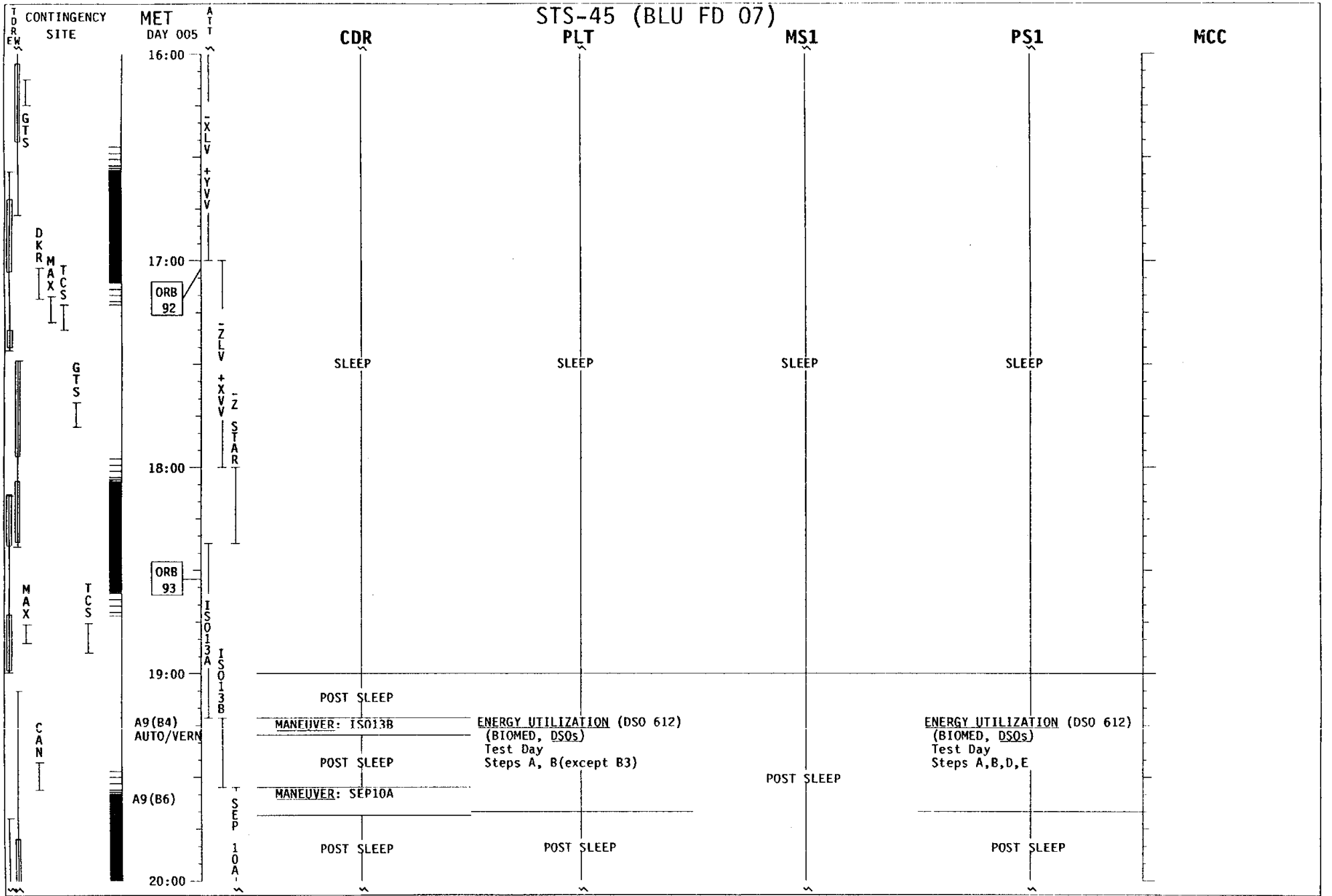


# STS-45 (RED FD 07)

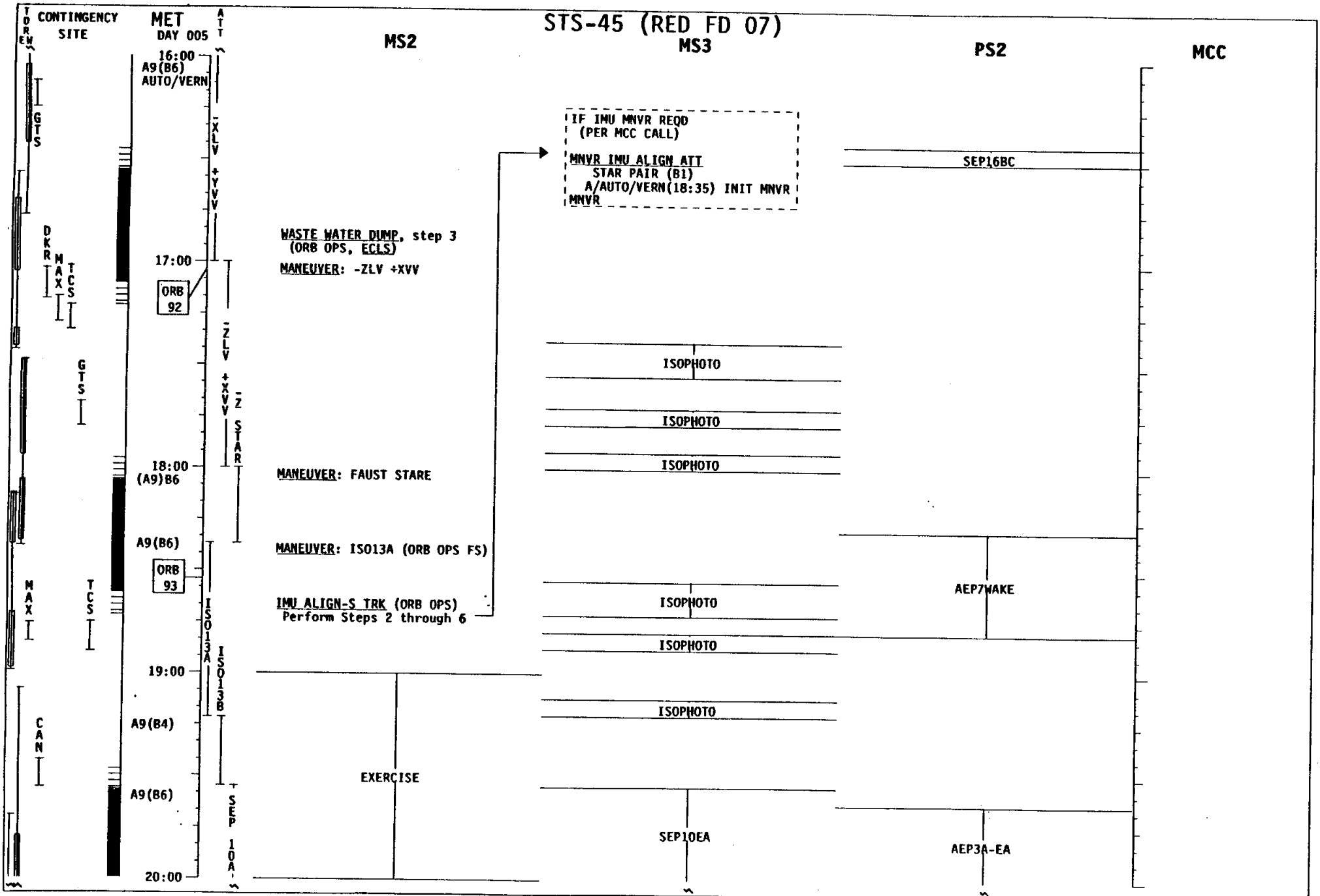


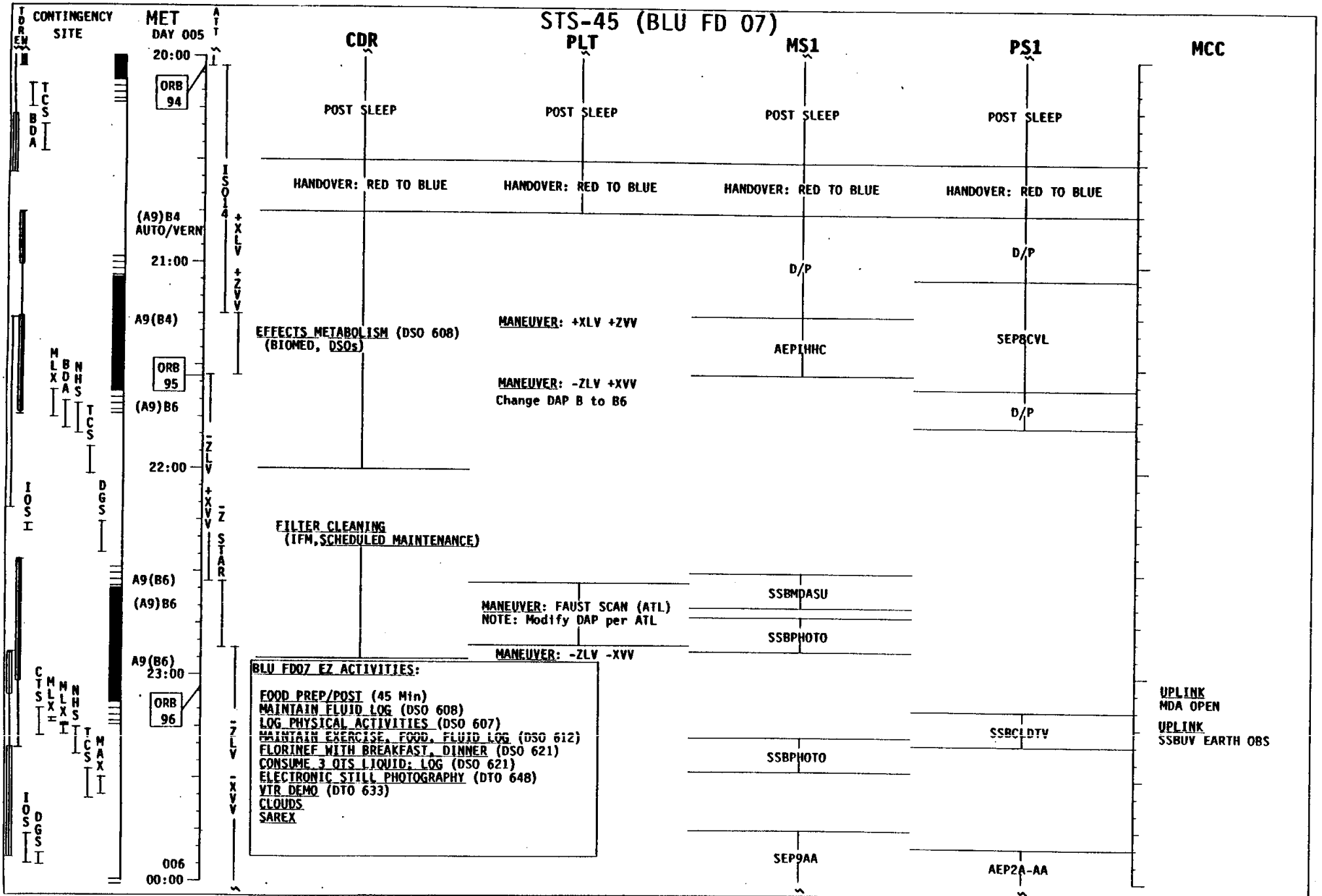




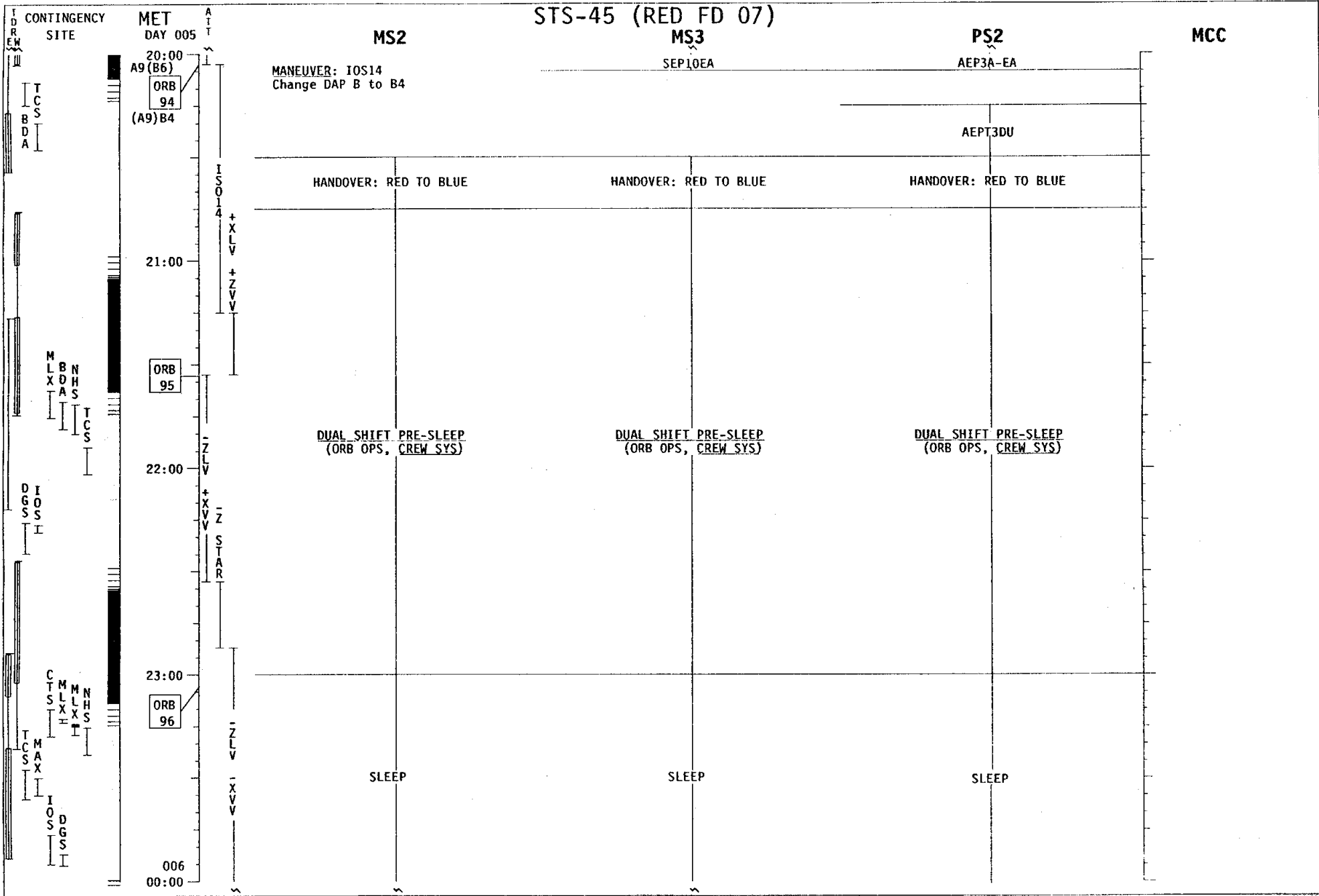


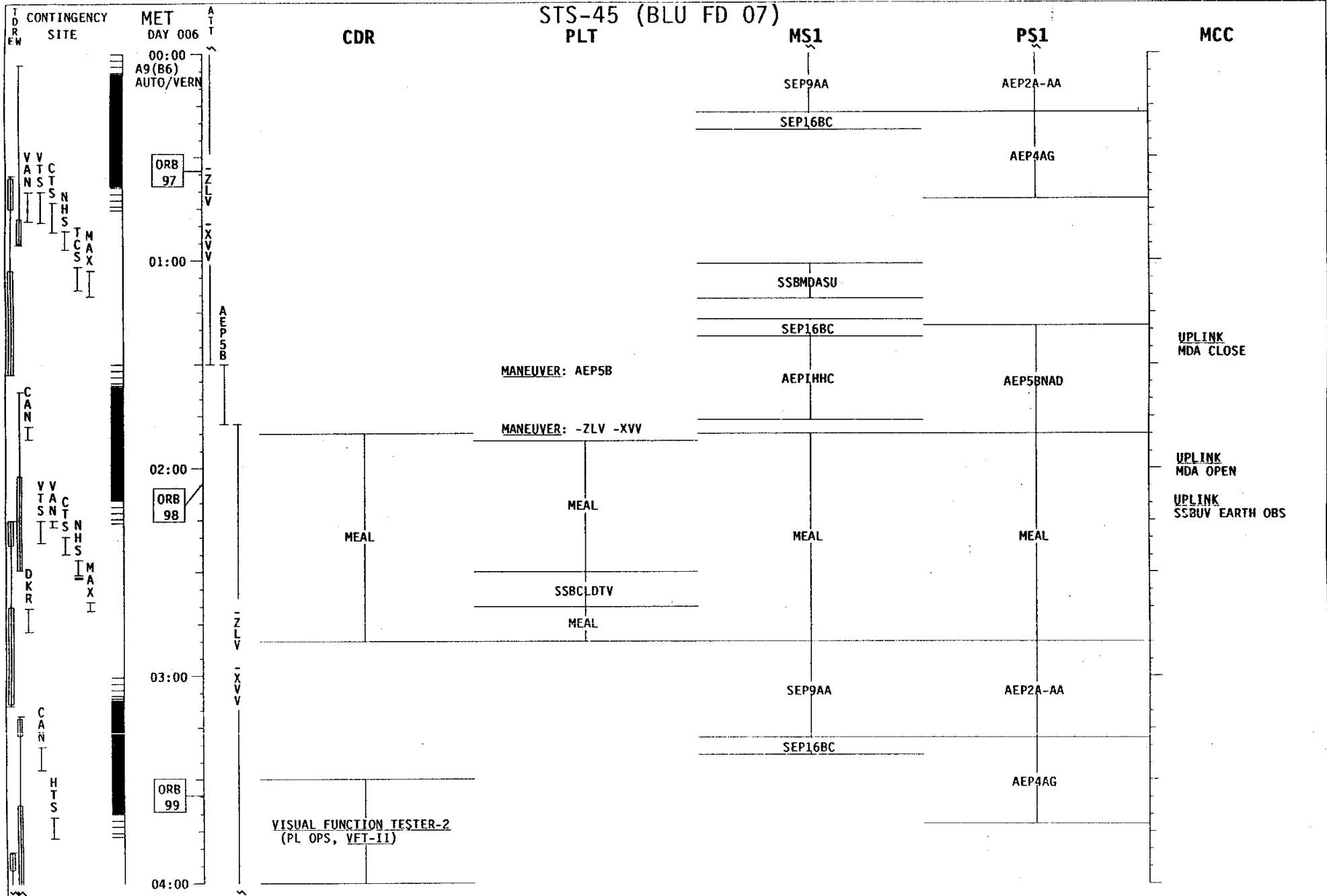


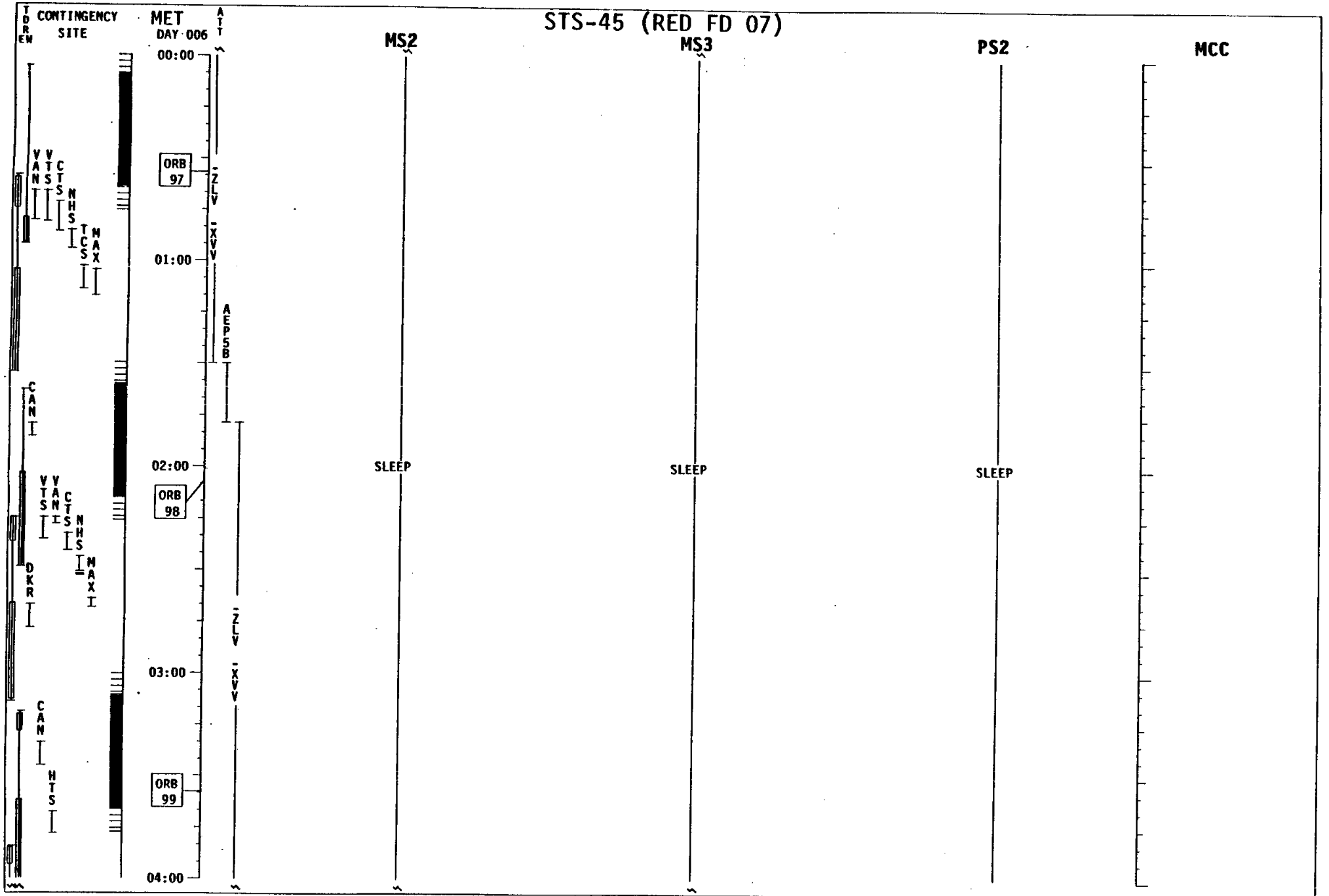


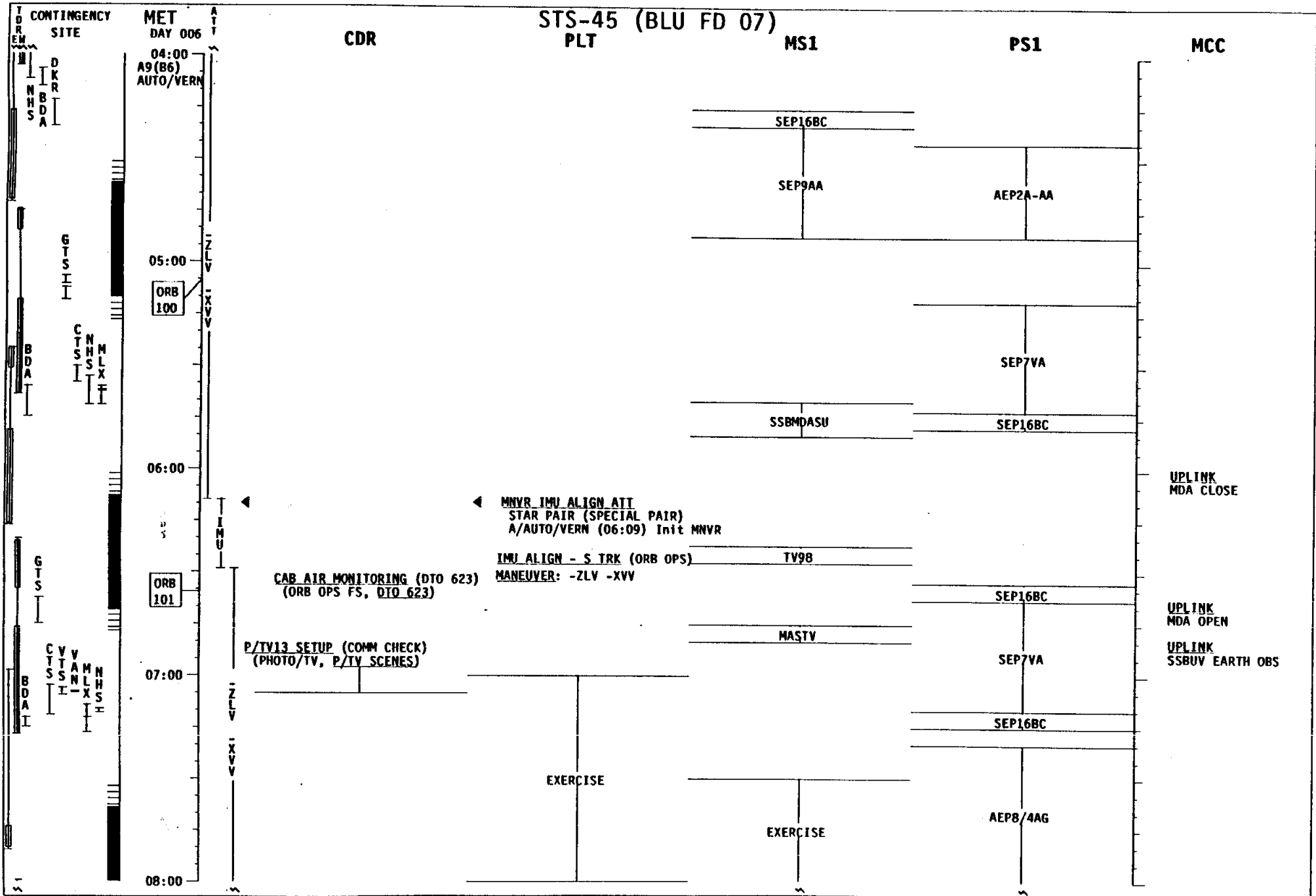


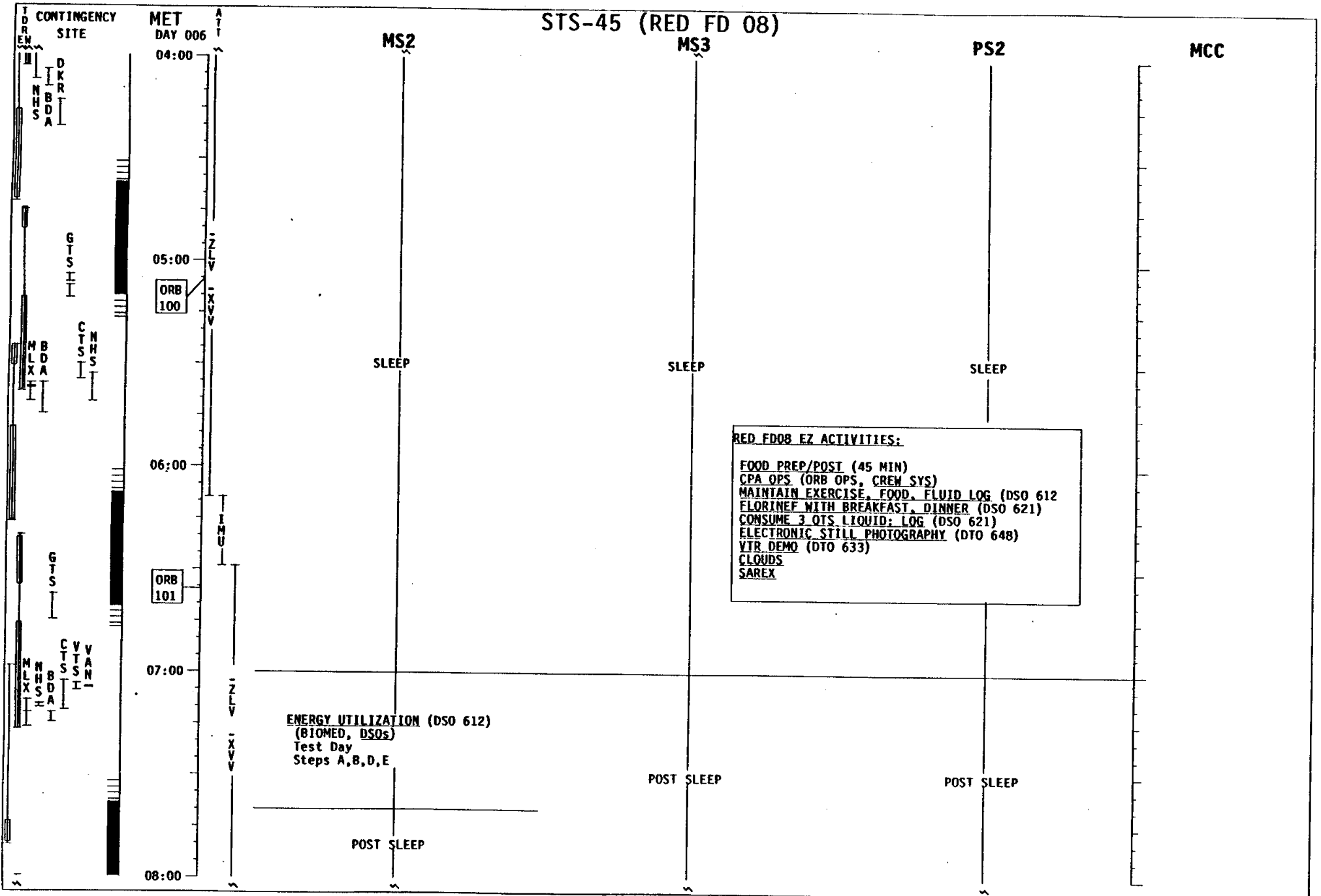
STS-45 (RED FD 07)

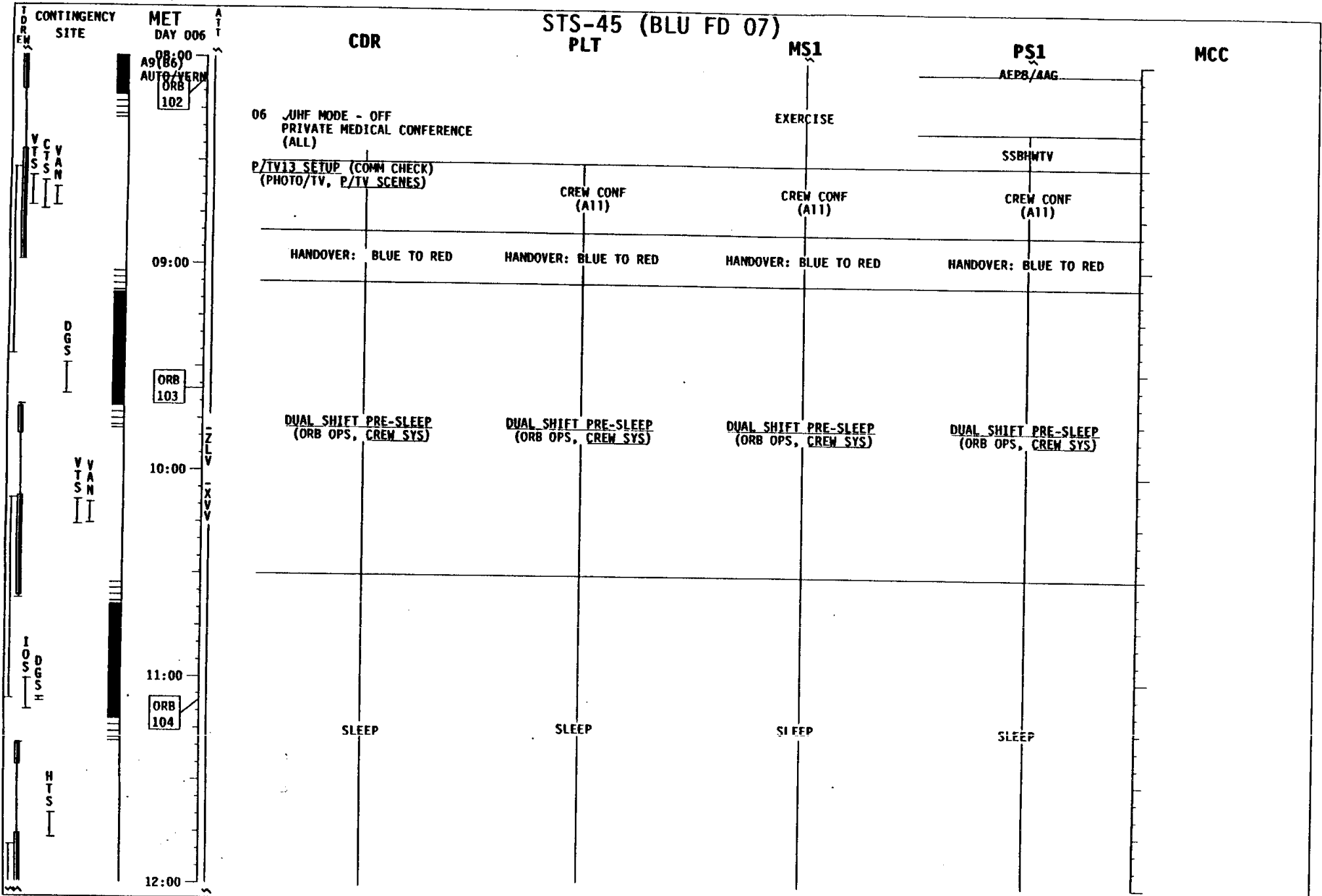














CONTINGENCY SITE

MET DAY 006

08:00

ORB 102

A9 (B6) AUTO/VERN

09:00

ORB 103

10:00

ORB 104

11:00

ORB 104

12:00

VTSS VCAN

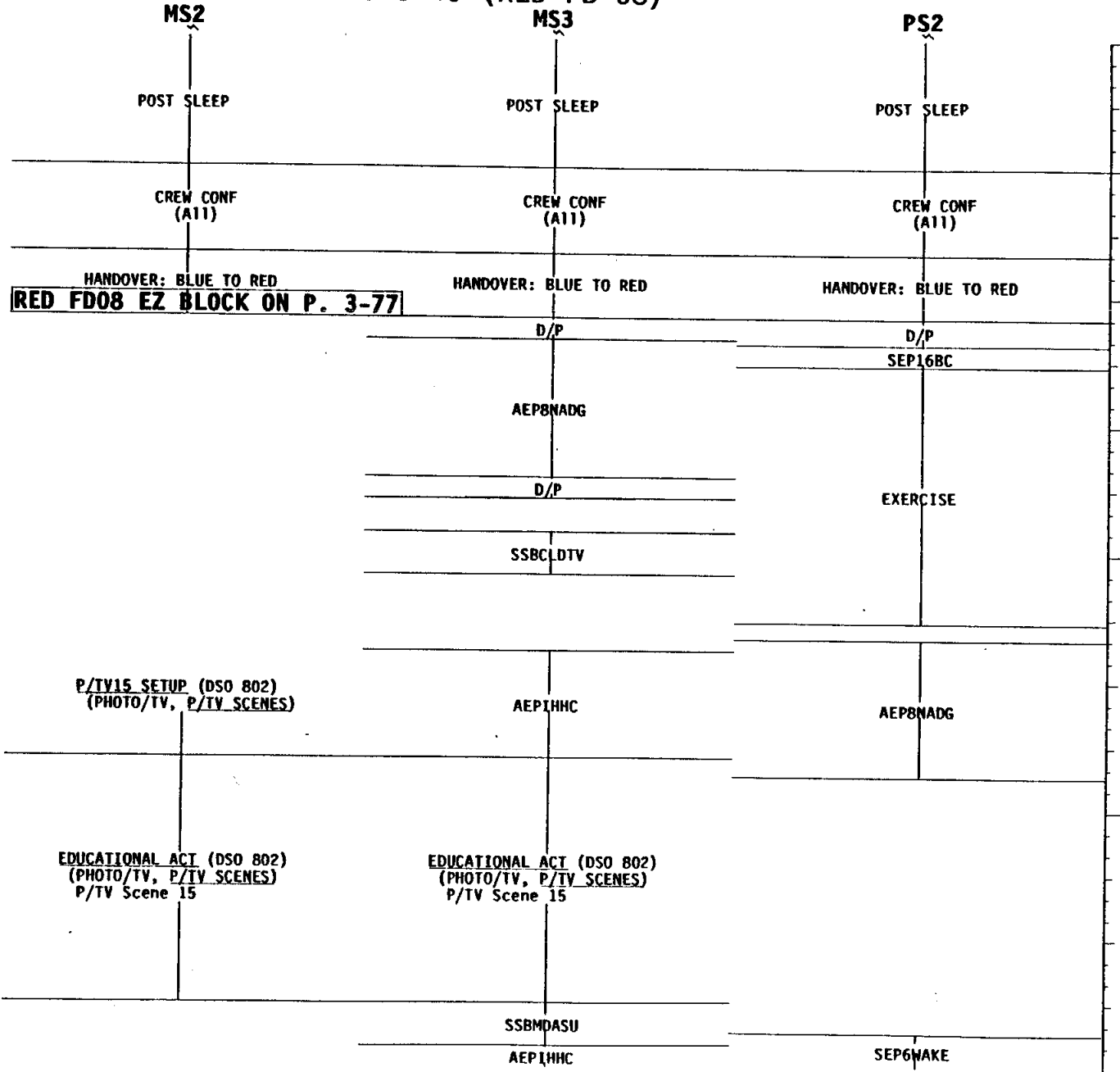
D G S S

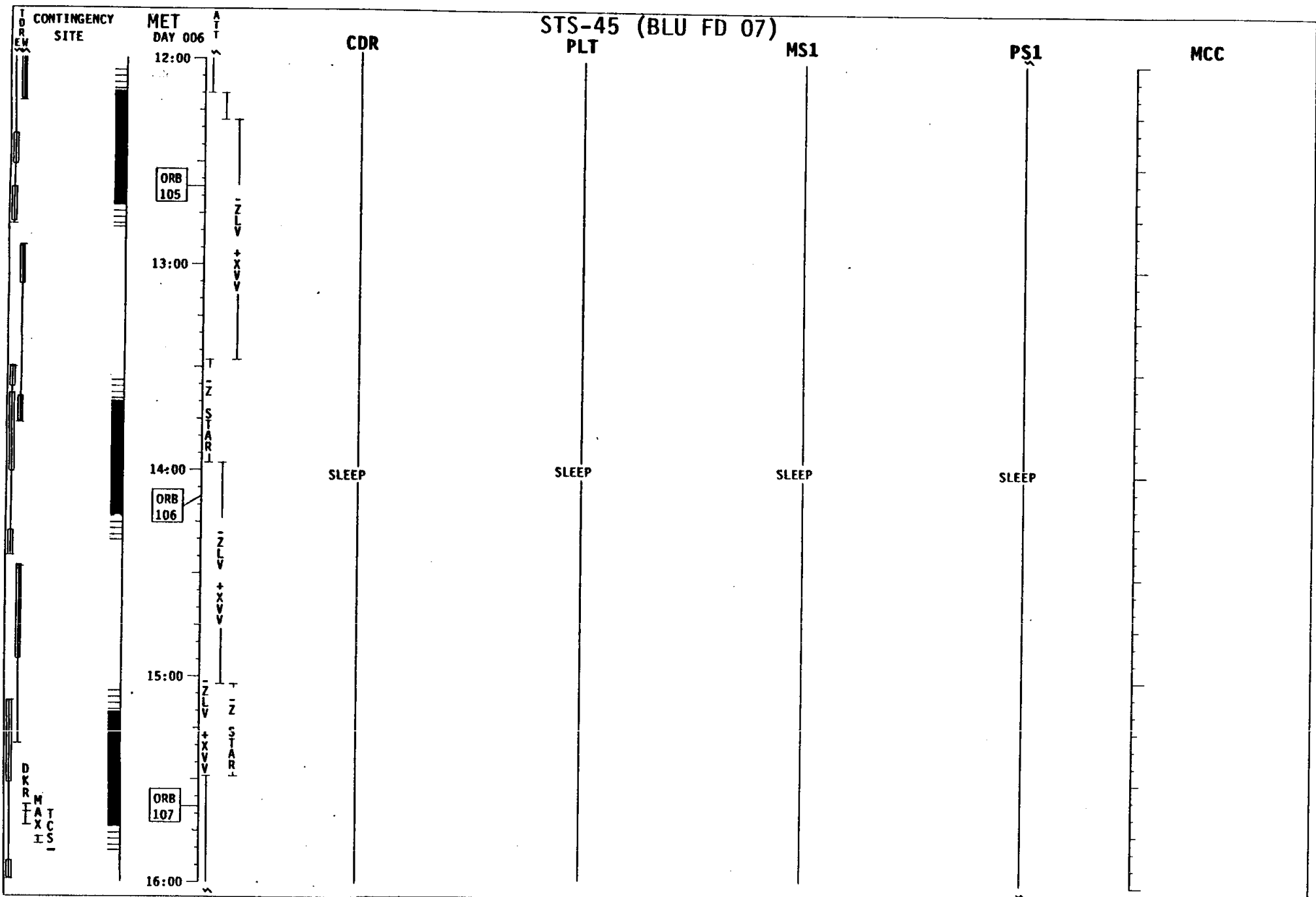
VTSS VCAN

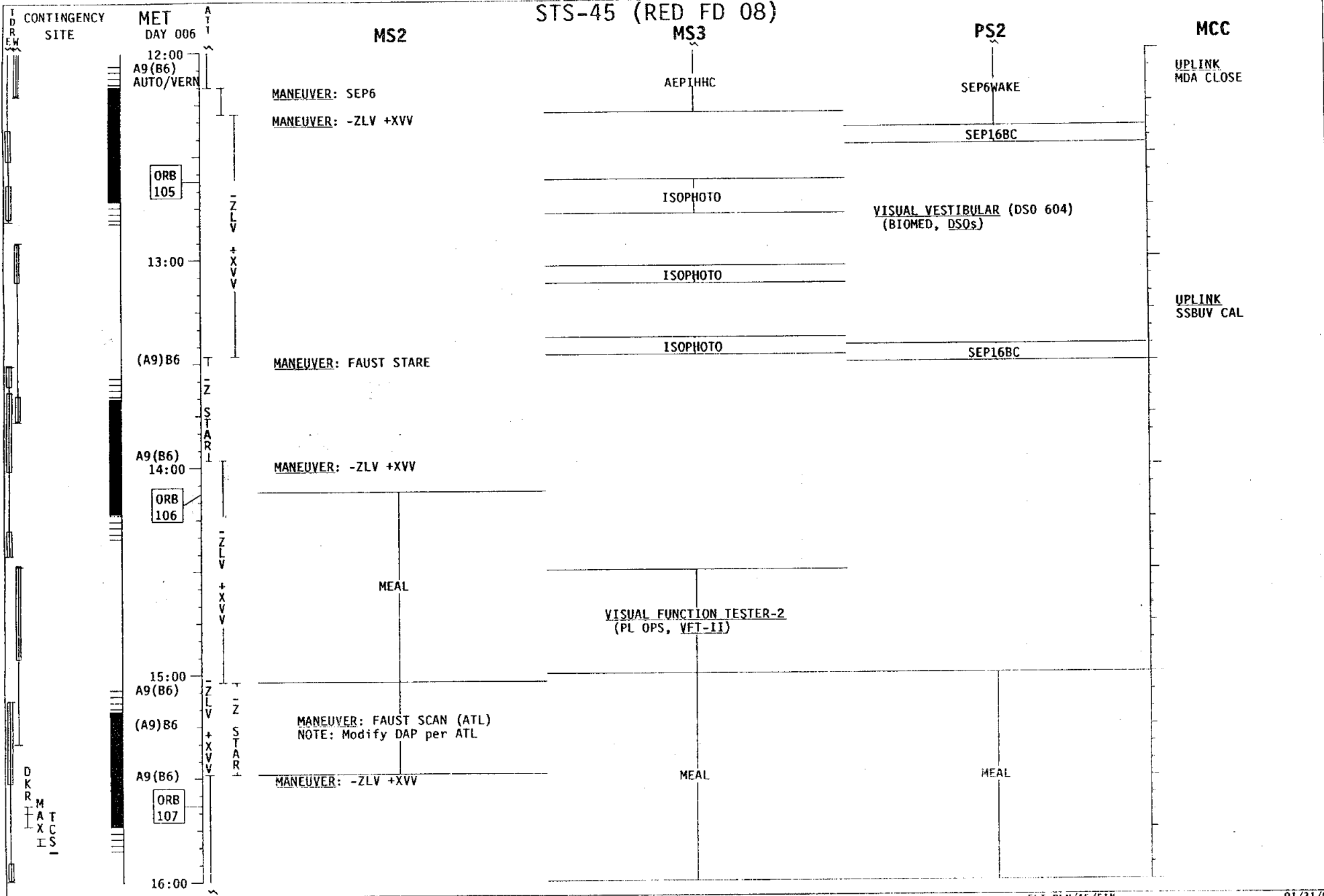
I S O D H S G S H

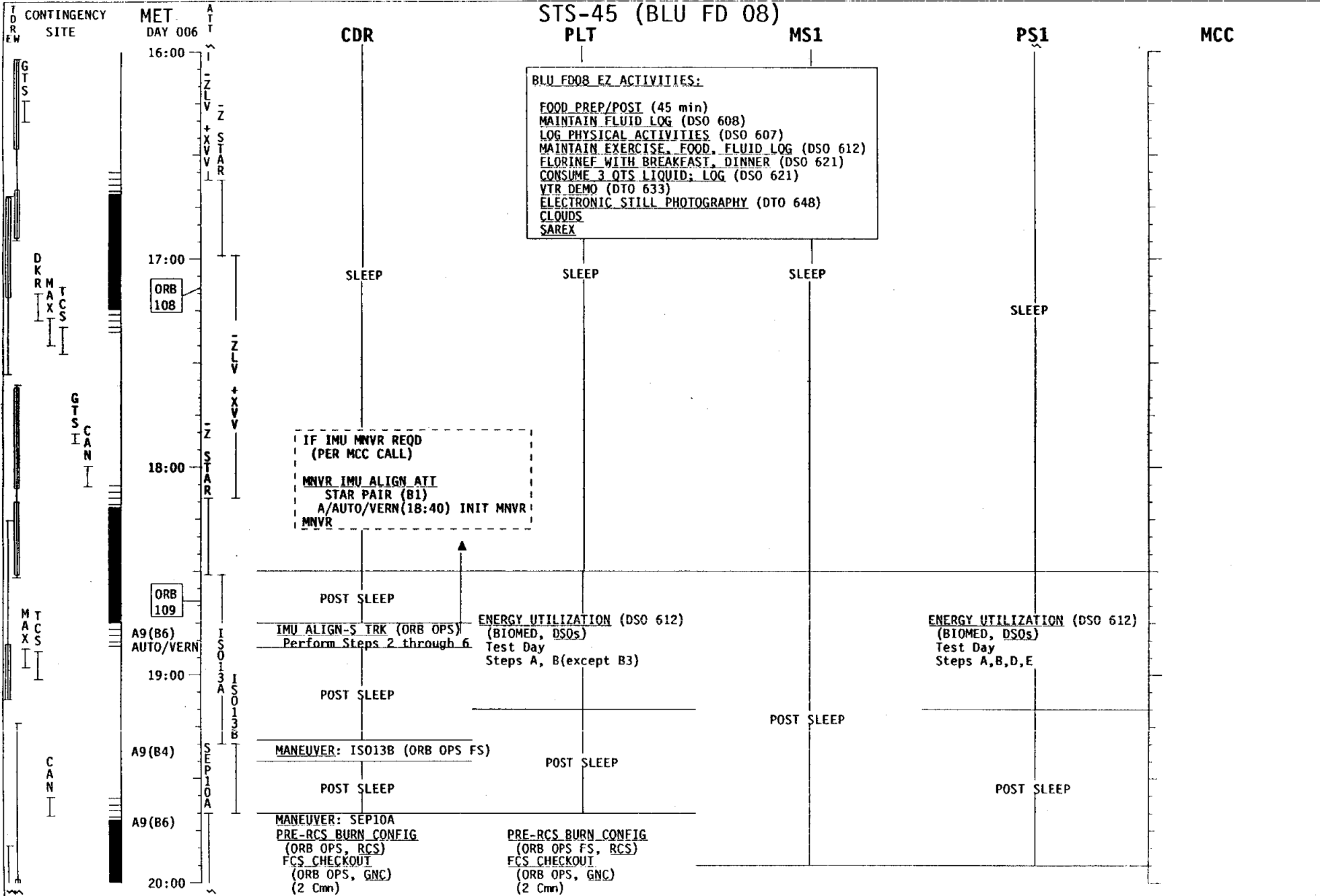
H T S

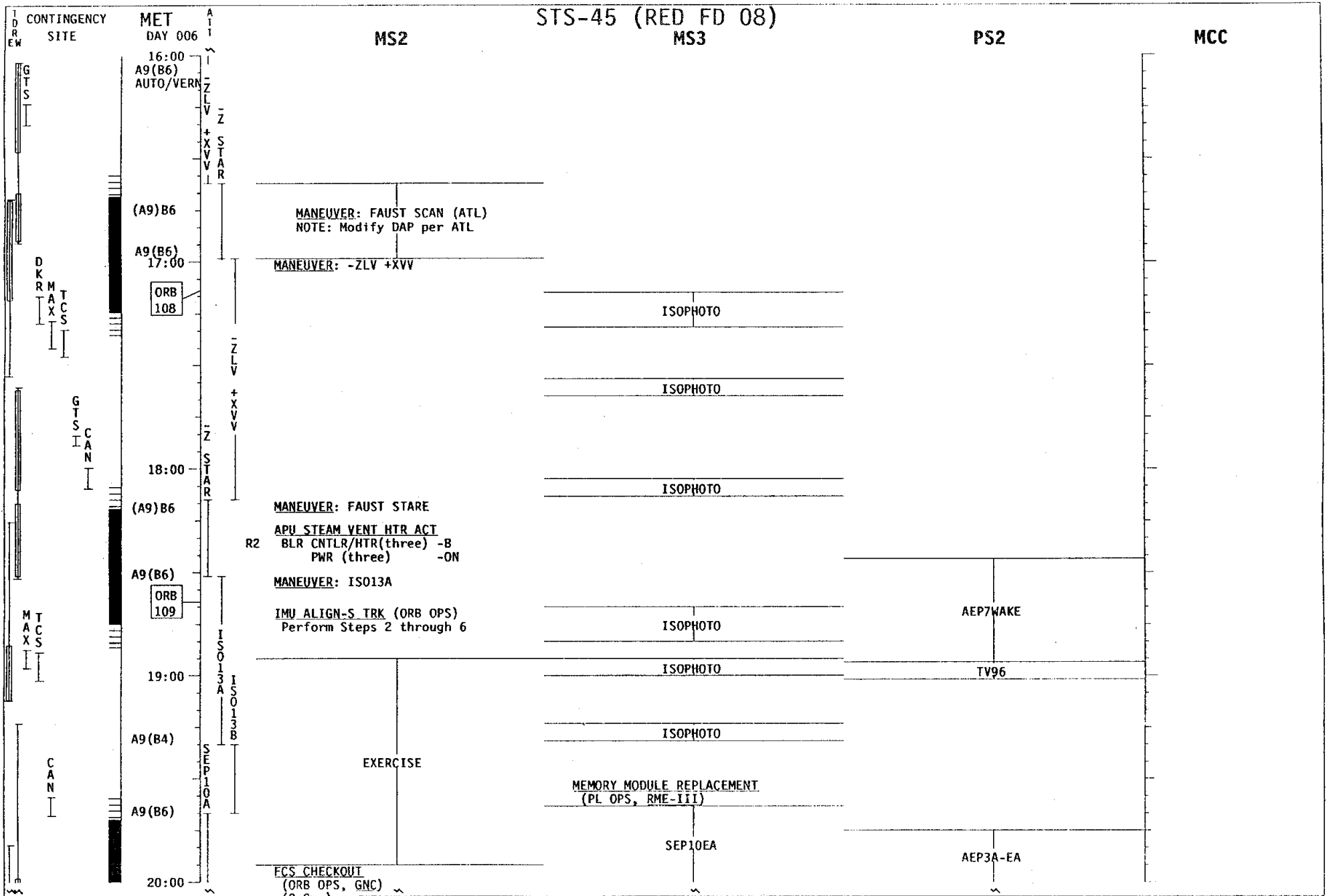
# STS-45 (RED FD 08)

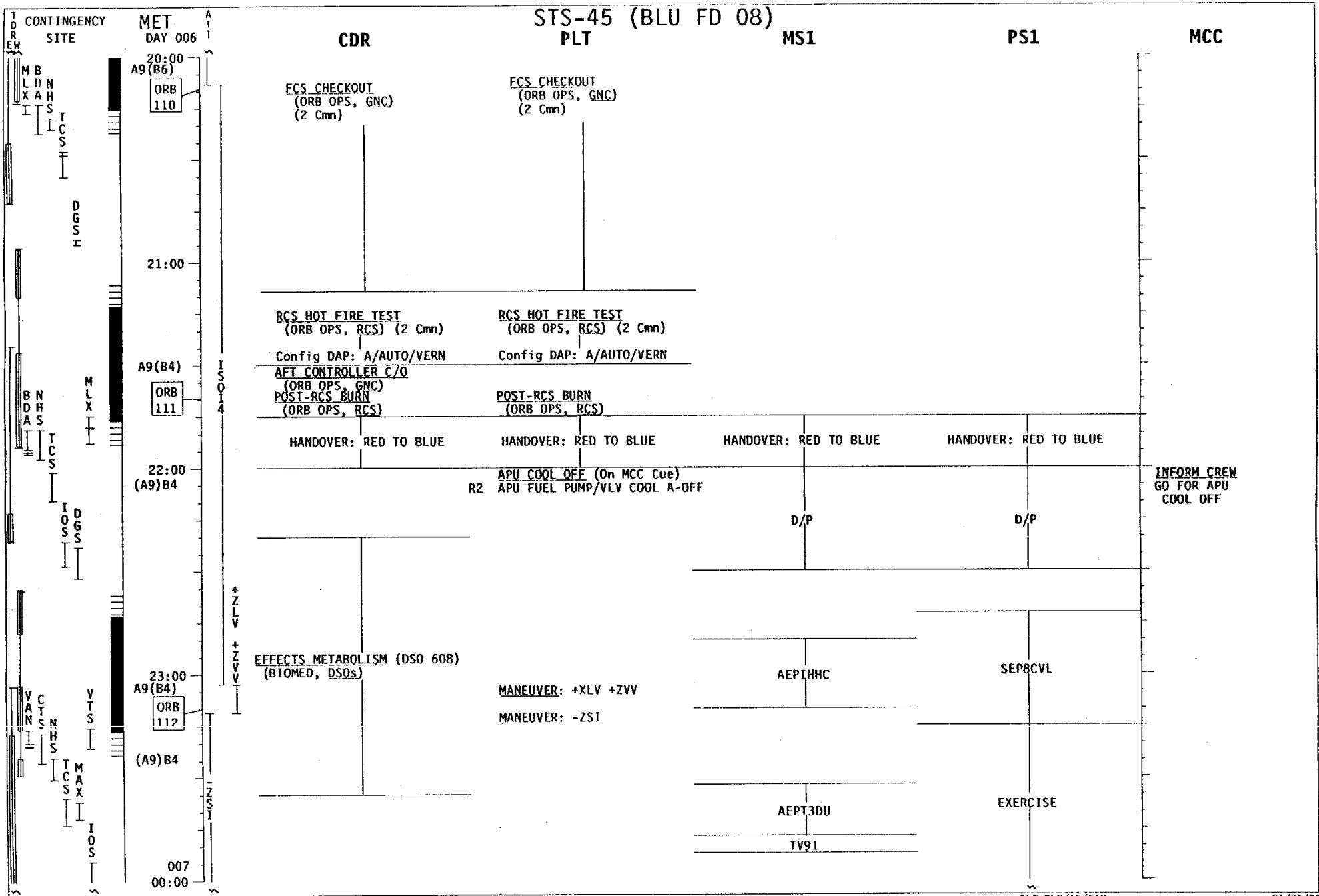


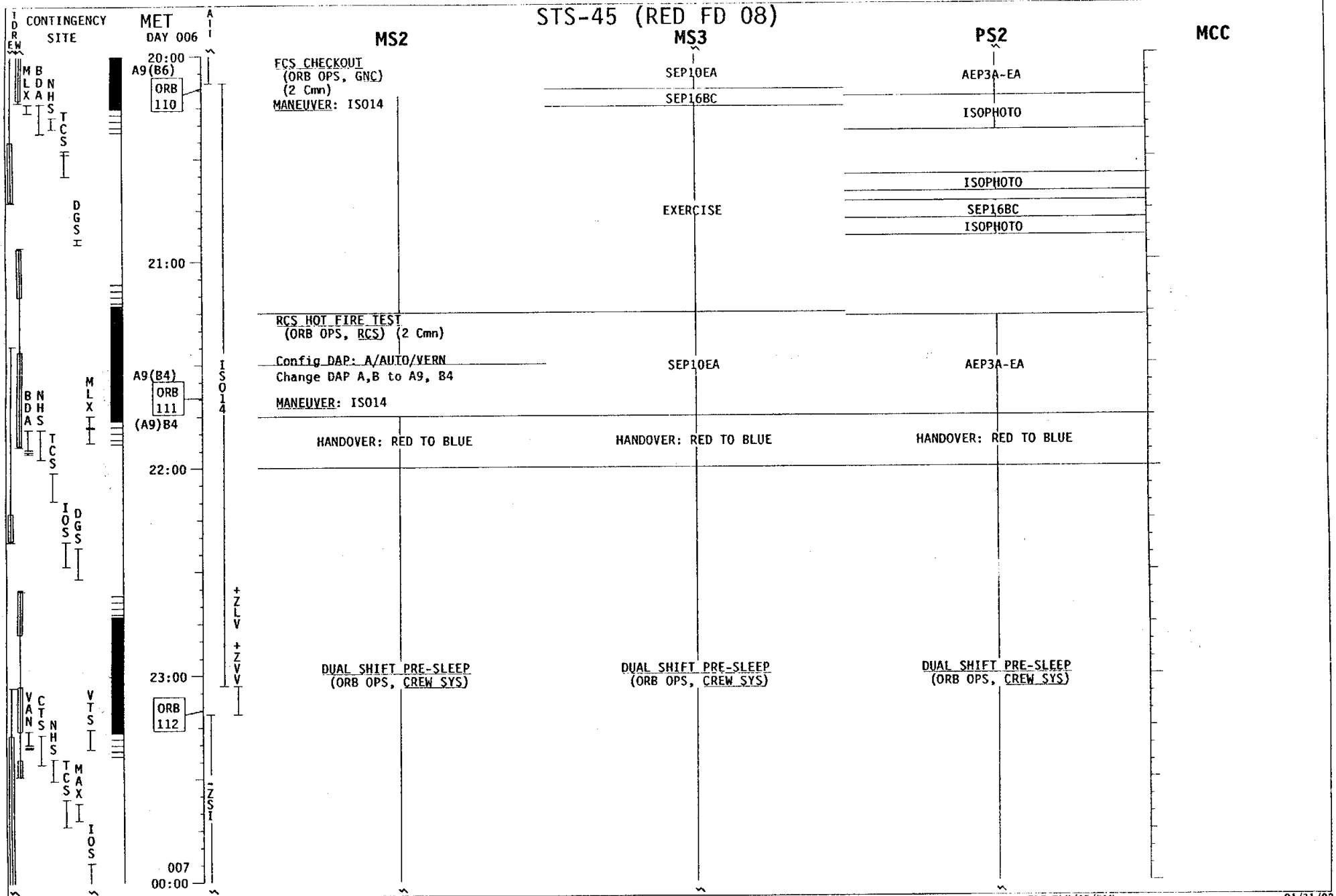


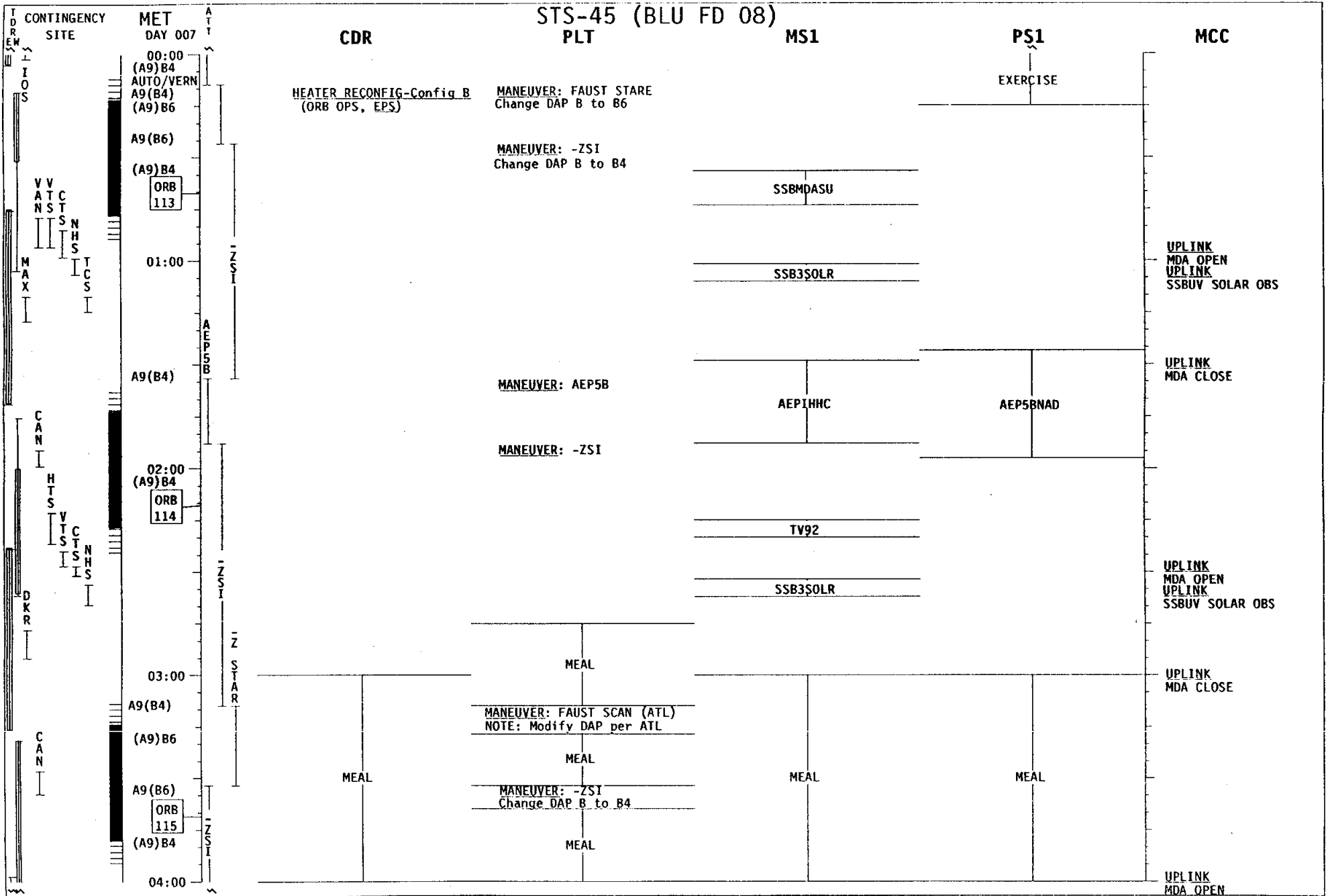






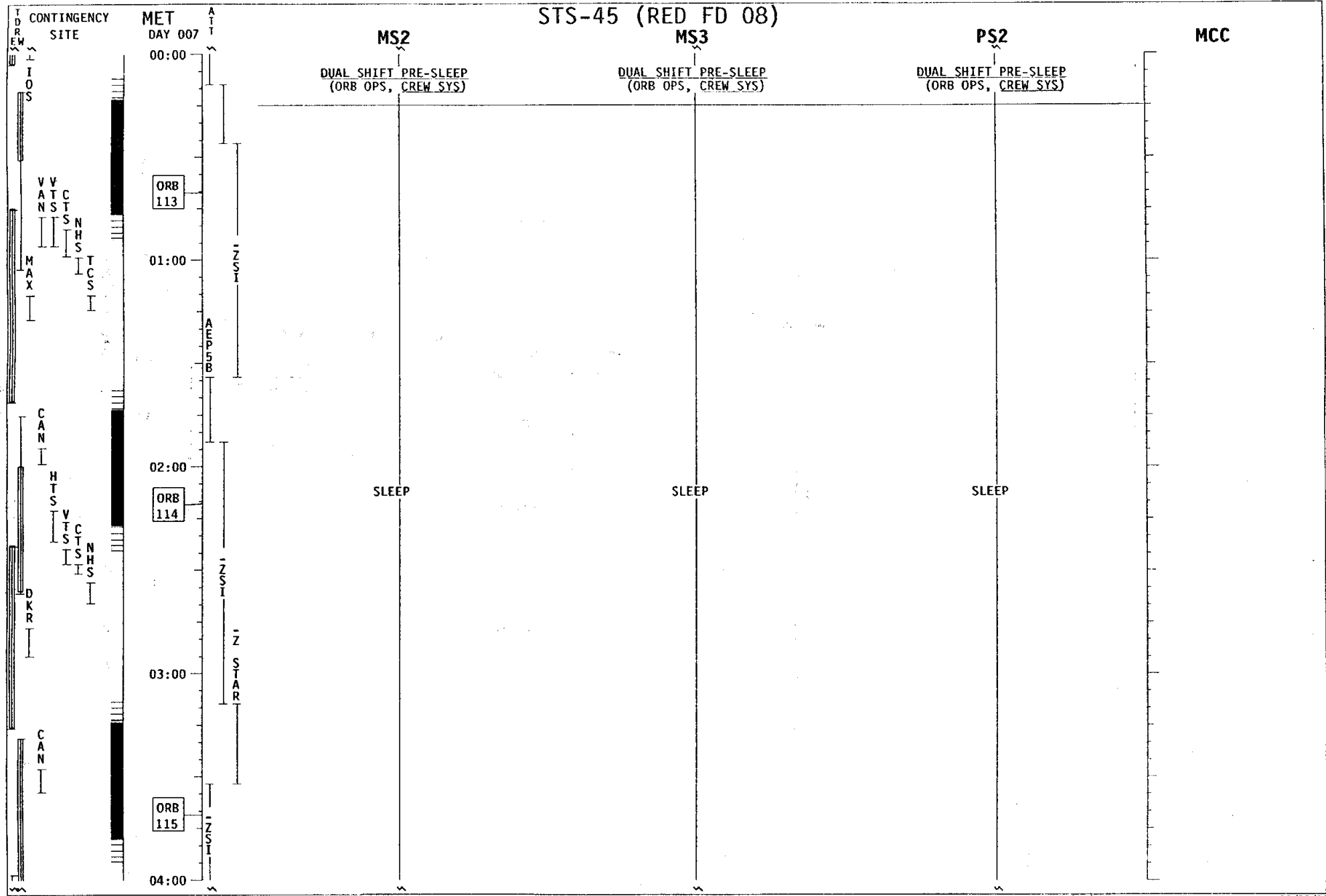








# STS-45 (RED FD 08)



MET DAY 007  
00:00  
01:00  
02:00  
03:00  
04:00

MS2  
DUAL SHIFT PRE-SLEEP  
(ORB OPS, CREW SYS)

MS3  
DUAL SHIFT PRE-SLEEP  
(ORB OPS, CREW SYS)

PS2  
DUAL SHIFT PRE-SLEEP  
(ORB OPS, CREW SYS)

MCC

SLEEP

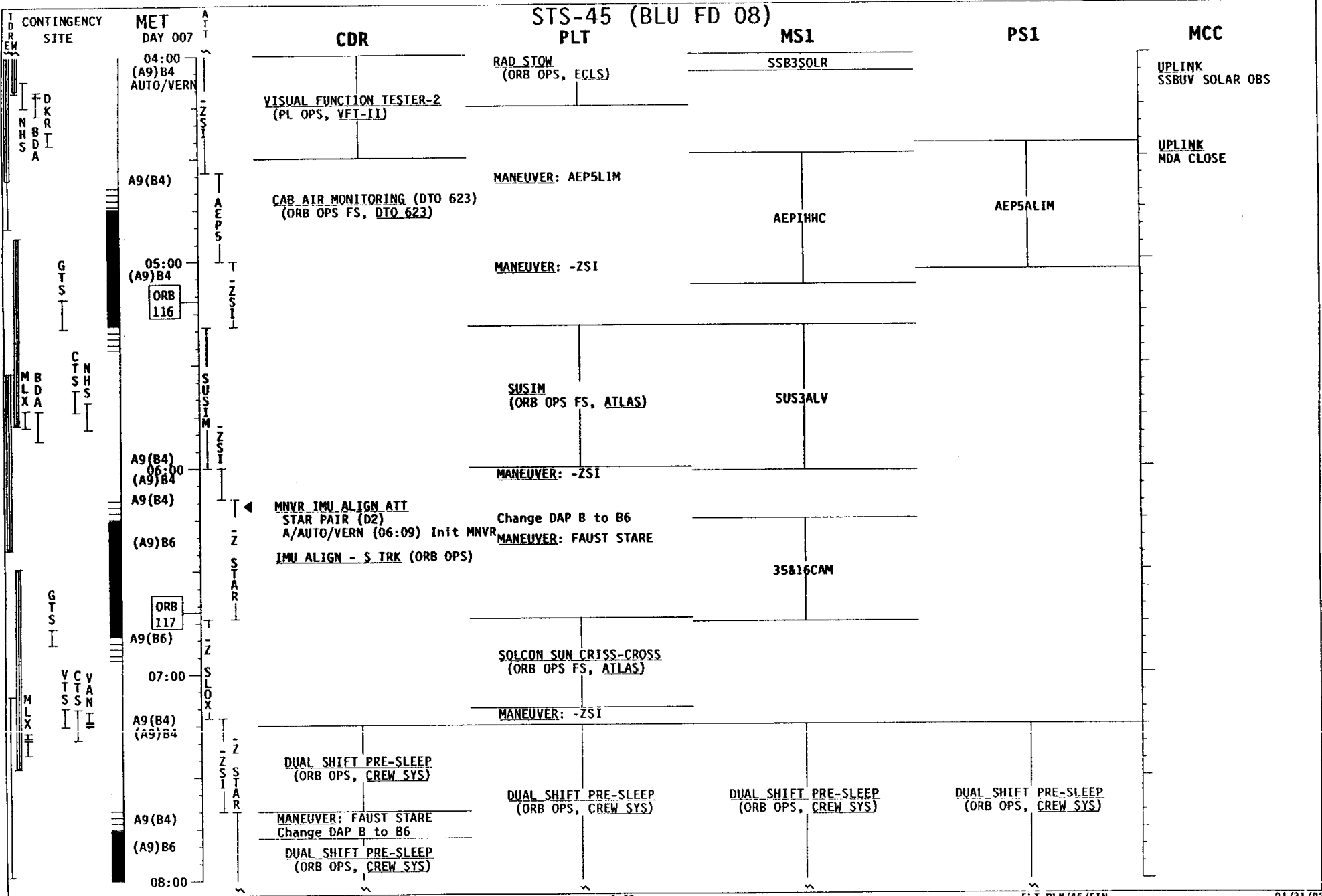
SLEEP

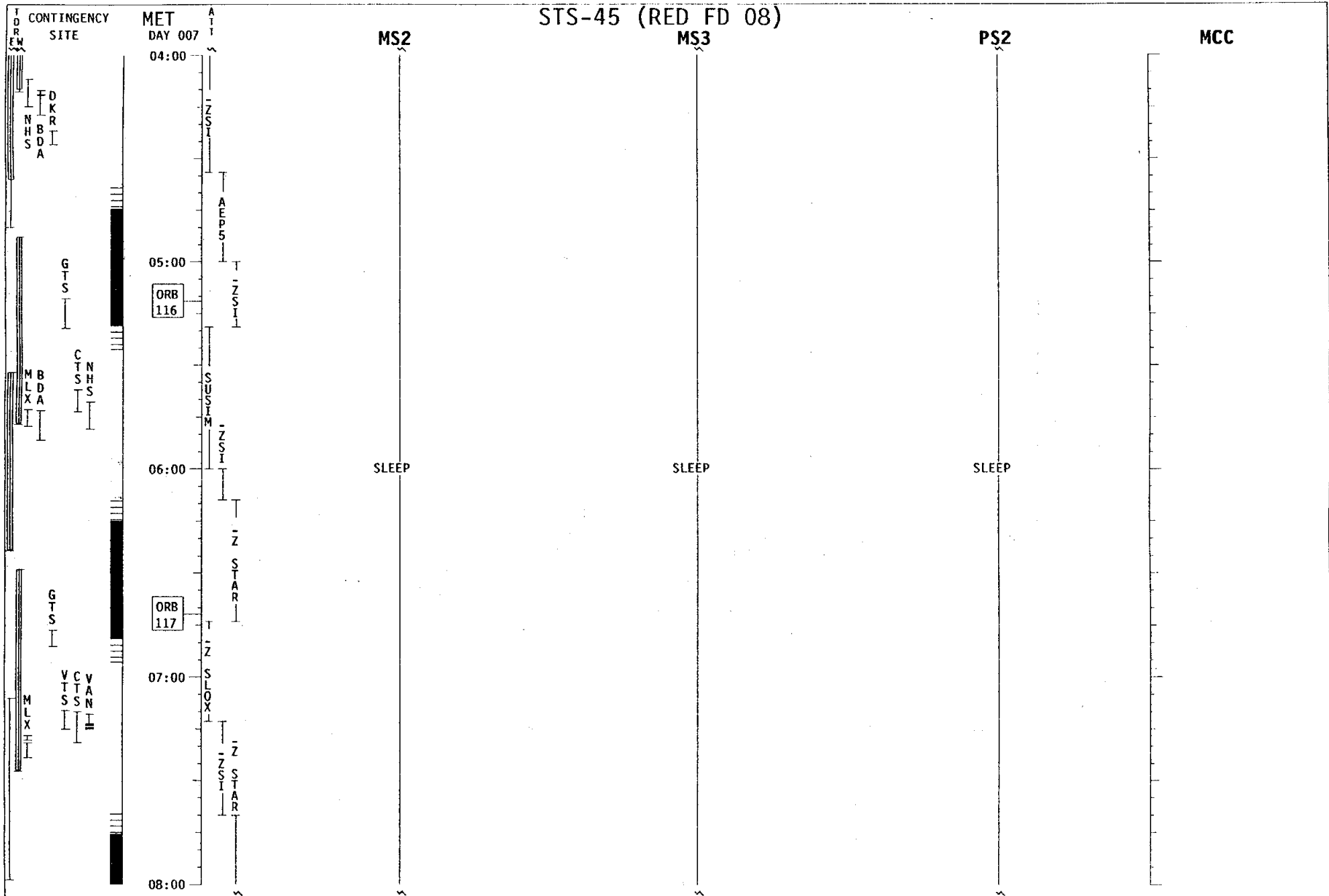
SLEEP

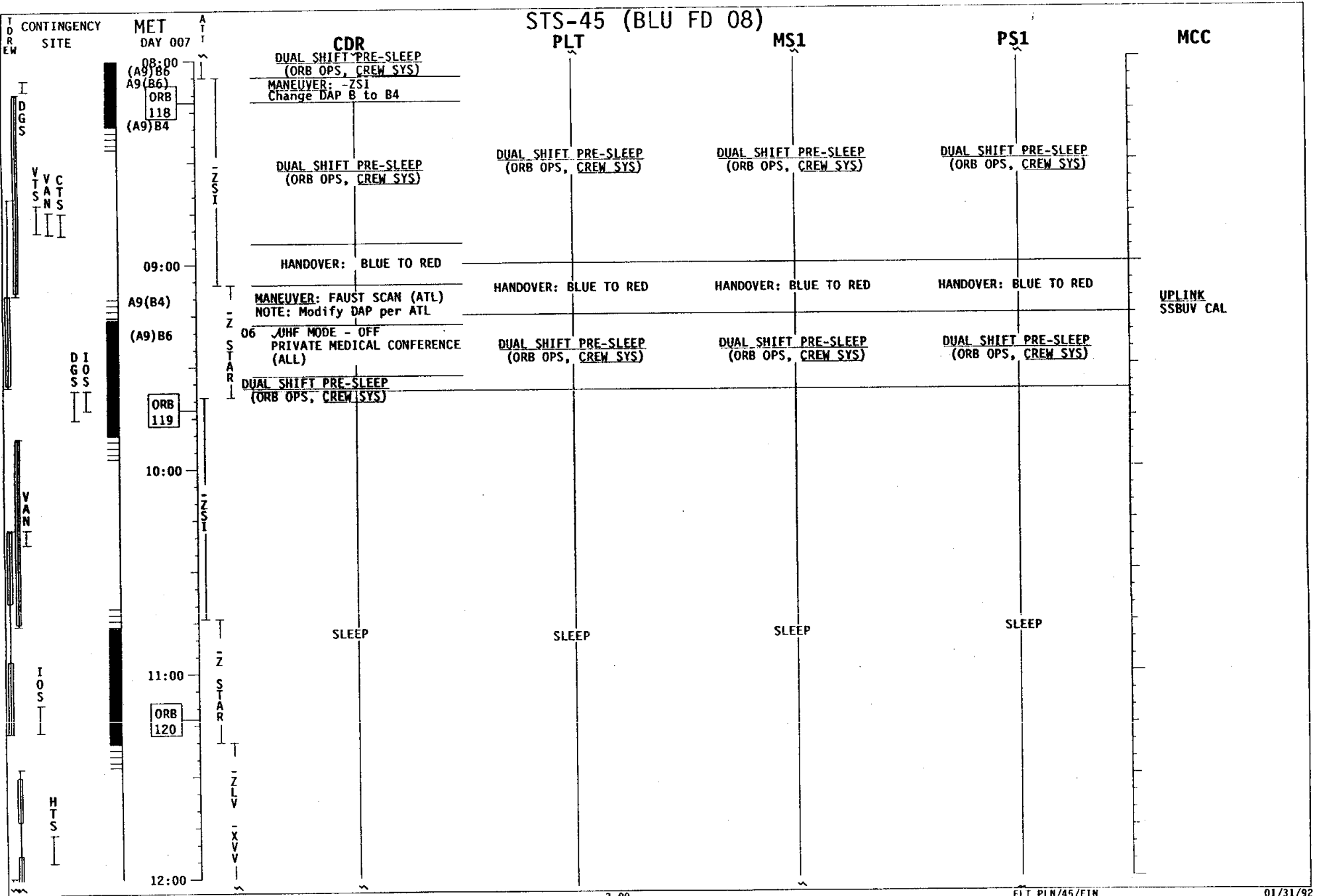
ORB 113

ORB 114

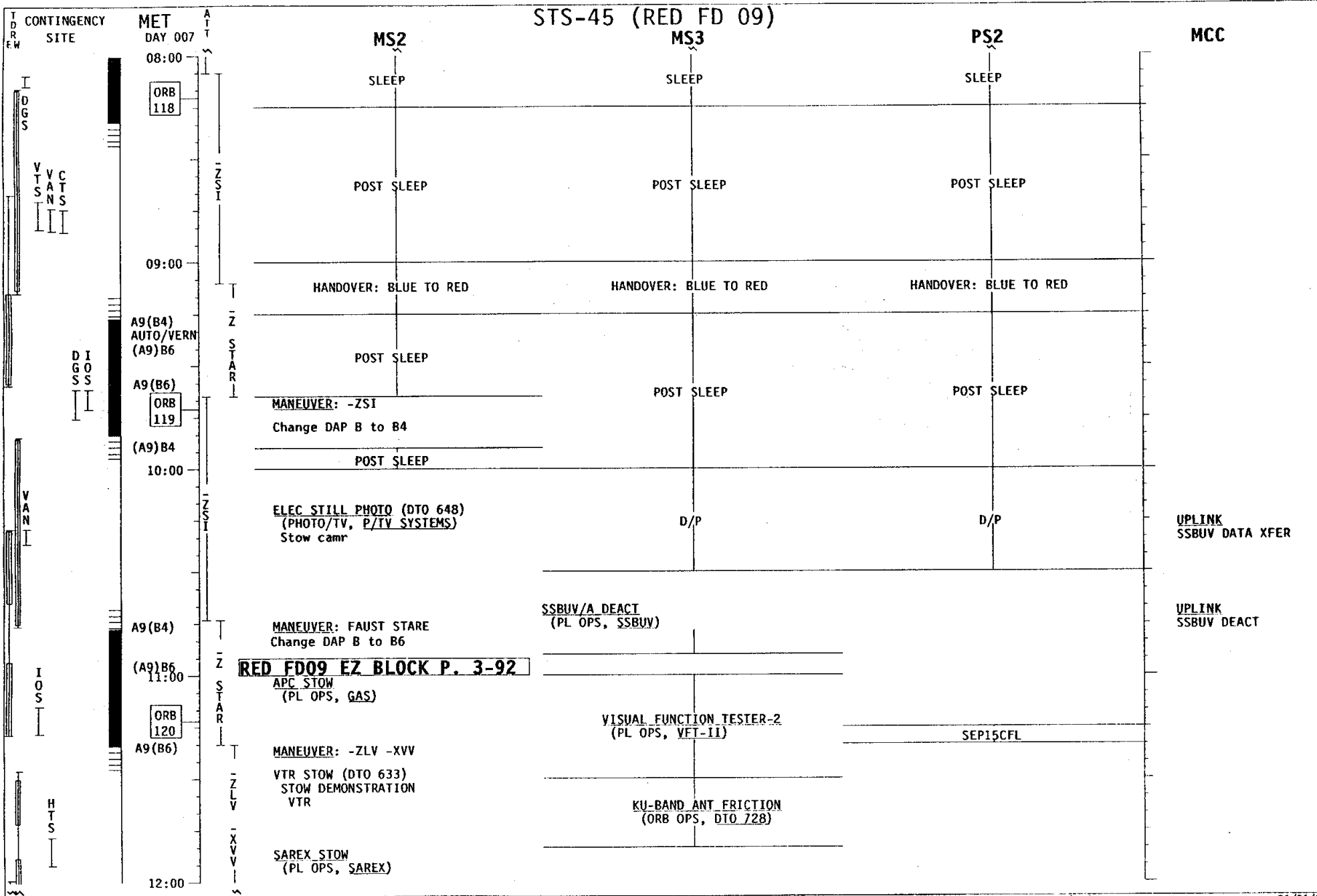
ORB 115

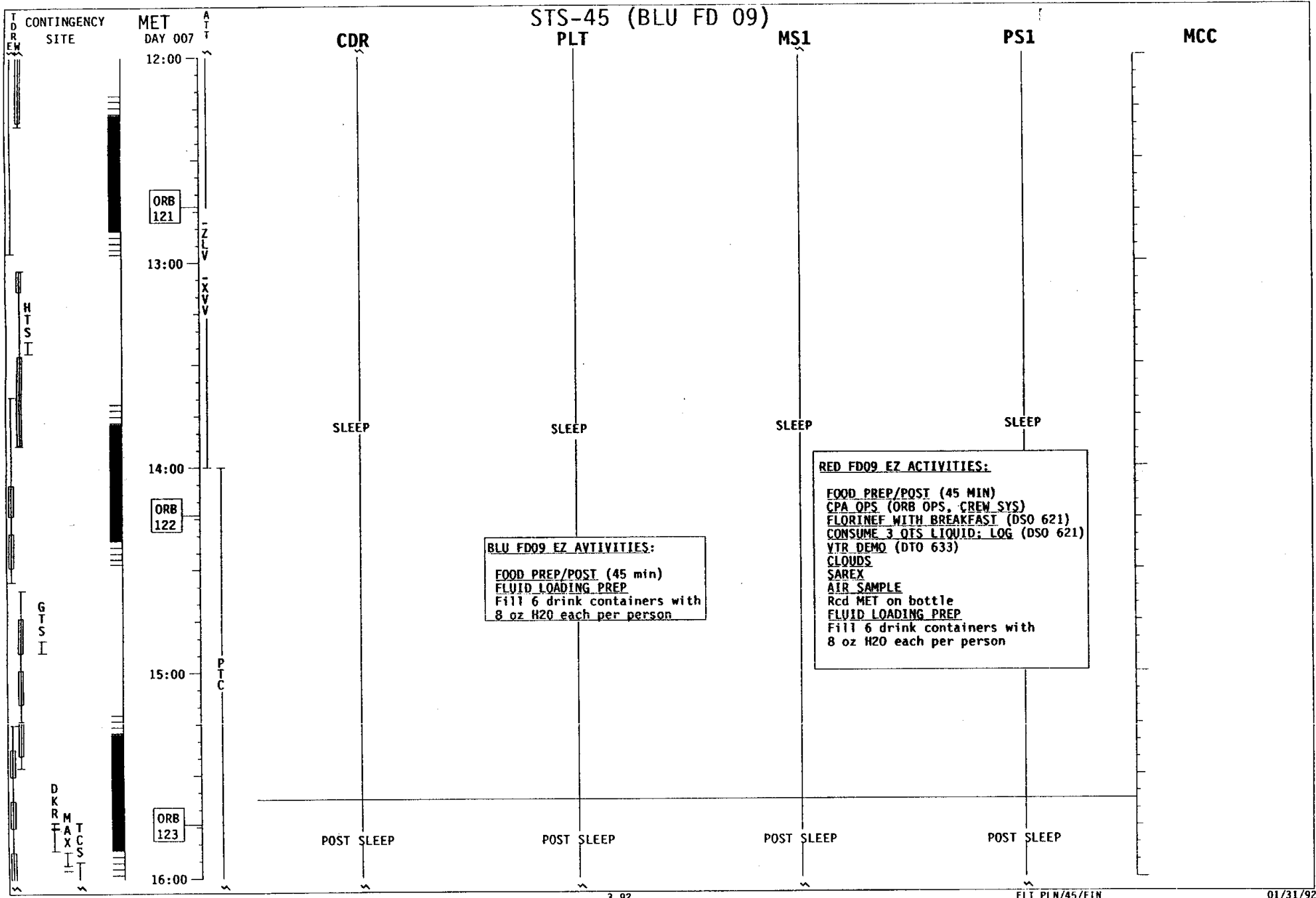


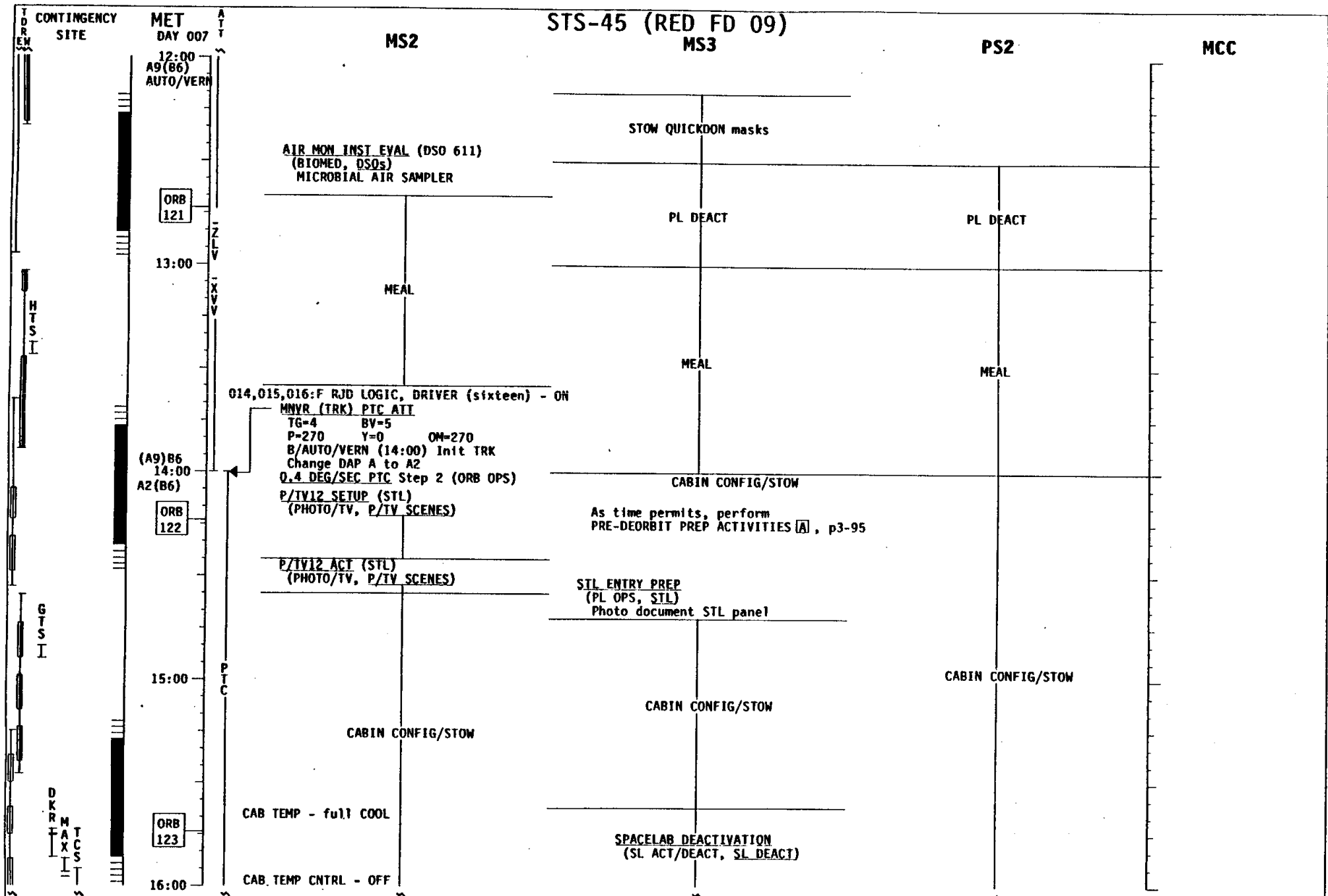


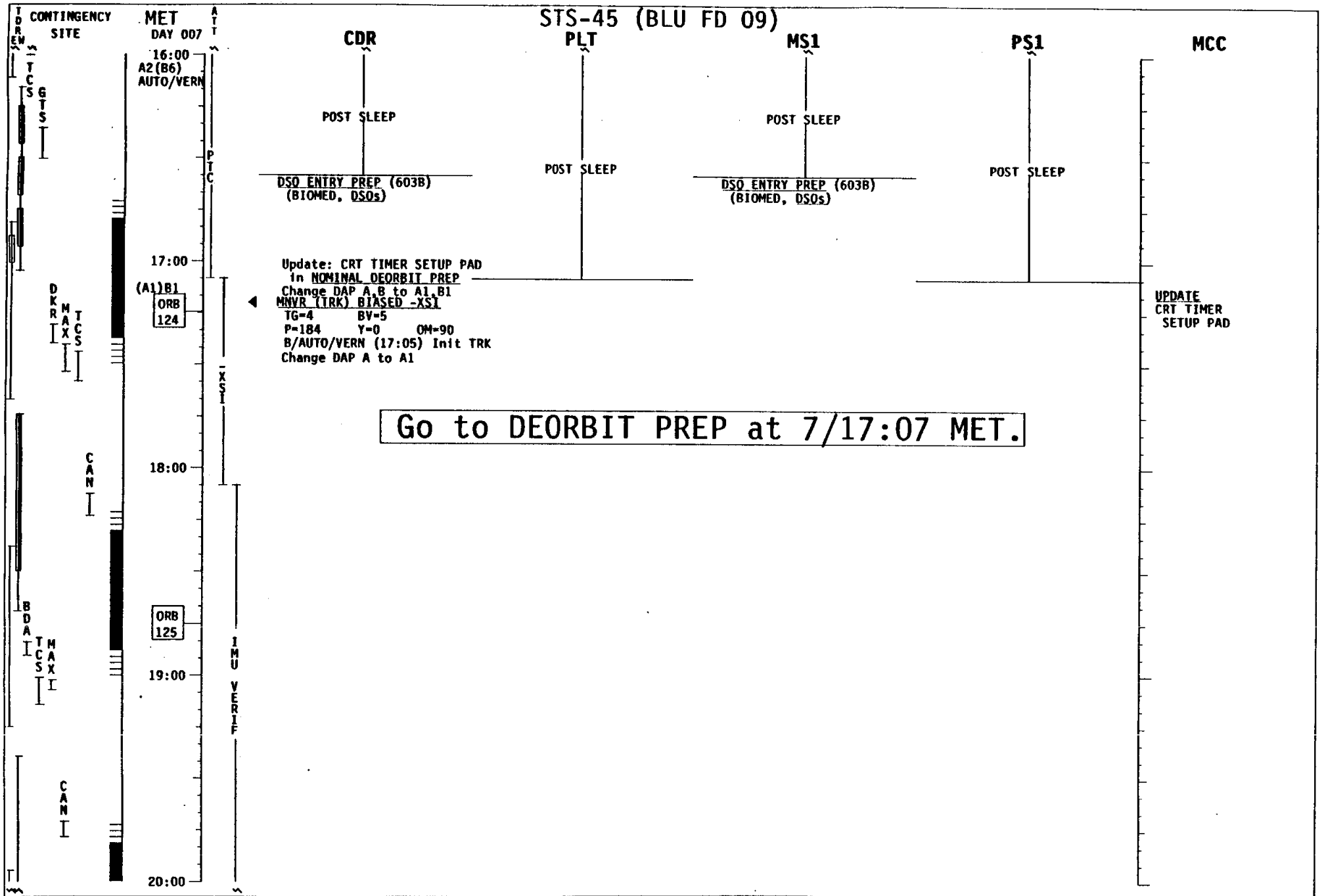


# STS-45 (RED FD 09)



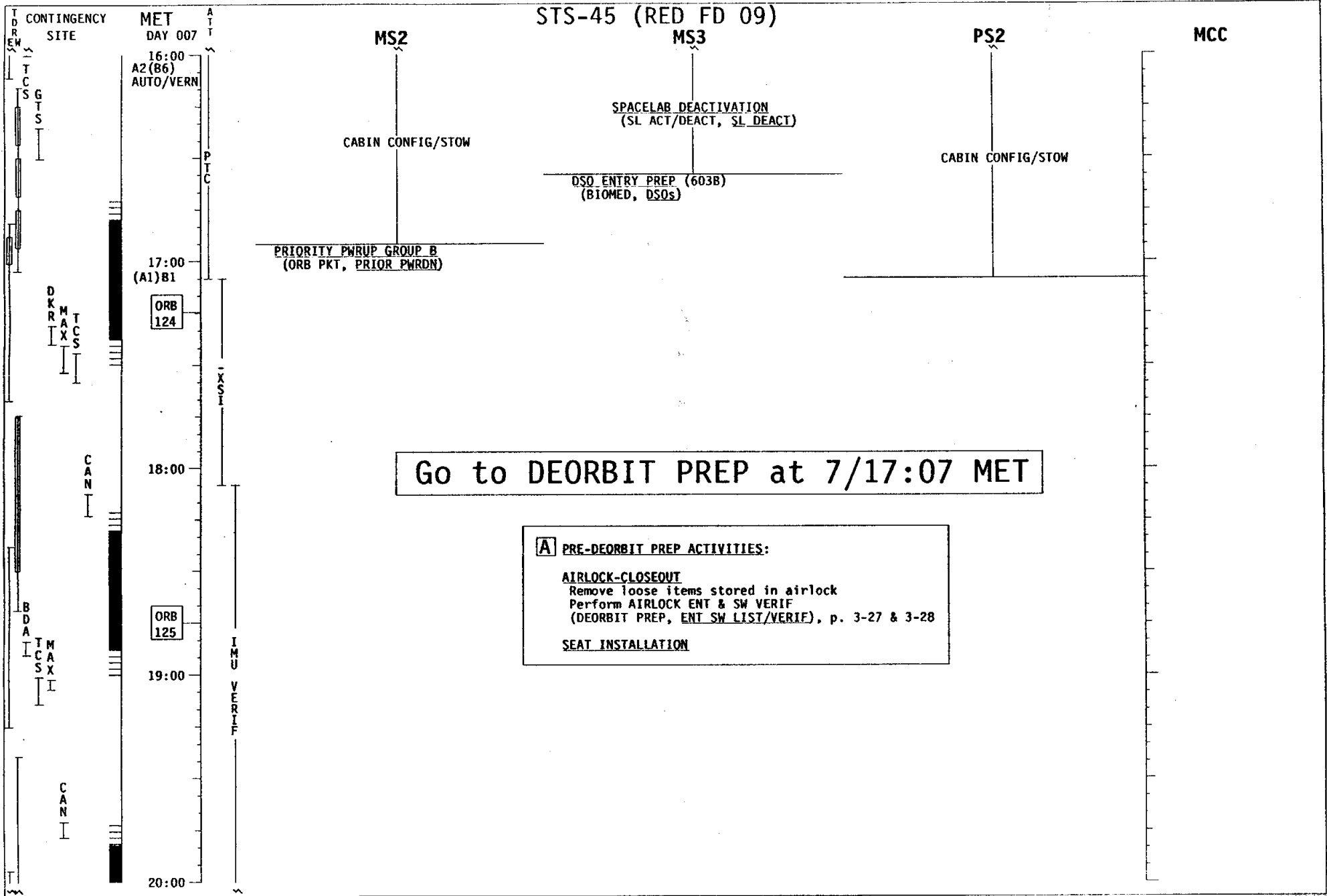








# STS-45 (RED FD 09)



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ATTITUDE TIMELINE

ATTITUDE  
TIMELINE

Attitude Timeline						
GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 083/14:13:00 GMT 21:58 000/01:12:00 MET 20:58	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	PLBD OPEN ATT -ZLV +YVV
2 083/15:11:00 GMT 20:20 000/02:10:00 MET 19:20	INRTL R=329.00 MNVR P=105.00 Y= 46.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 198 P 99	STAR PAIR A1 -Y:33 -Z:19	IMU ALIGN
3 083/15:26:00 GMT 27:00 000/02:25:00 MET 26:00	TGT=12 BV=1 RA= 95.711 DEC= -52.668S P= 0.00 Y= 0.00 OM=231.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 199 P 93	INRTL R=335.62 P= 94.34 Y= 37.12	+X COAS CAL: 12, CANOPUS
4 083/15:36:00 GMT 41:12 000/02:35:00 MET 40:12  (AFTER COAS)	TGT=2 BV=5 P=160.00 Y=350.00 OM=270.00	B1 AUTO PRI	DSC 0.500 DB AT 3.00 DB RT 0.20	EARTH R 333 P 158	LVLH R= 90.00 P=100.00 Y= 20.00	WATER DUMP
5 083/15:42:00 GMT 000/02:41:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B1/VERN  DAP A TO A9					
6 083/17:11:00 GMT 21:39 000/04:10:00 MET 20:39	TGT=2 BV=5 P= 0.00 Y=270.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 270 P 90	LVLH R= 0.00 P= 90.00 Y=270.00	-YLV +ZVV COMM ATT.
7 083/18:45:00 GMT 55:00 000/05:44:00 MET 54:00  MNVR A9/LOAD B6	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, MAS
8 083/19:43:00 GMT 50:16 000/06:42:00 MET 49:16	INRTL R=353.20 MNVR P=106.80 Y= 8.00	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 182 P 107		FAUST STARE: VIRGOP2
9 083/20:02:00 GMT 12:07 000/07:01:00 MET 11:07	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, MAS
10 083/21:09:00 GMT 21:04 000/08:08:00 MET 20:04	INRTL R=324.90 MNVR P=333.80 Y= 1.40	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 38 P 25		FAUST STARE: TELESCOPIUM
11 083/22:06:00 GMT 09:39 000/09:05:00 MET 08:39	INRTL R= 0.00 MNVR P= 0.00 Y= 0.00  *EXACT ATT TBD*	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 113 P 3		TRIM BURN ATTITUDE TO BE DETERMINED
12 083/22:44:00 GMT 52:35 000/09:43:00 MET 51:35	INRTL R=329.00 MNVR P=105.00 Y= 46.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 197 P 99	STAR PAIR A1 -Y:33 -Z:19	IMU ALIGN/ -Z COAS CAL 19, SPICA

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 083/23:07:00 GMT 18:46 000/10:06:00 MET 17:46  MNVR A9/LOAD B6	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ALAE, MAS)
2 084/01:04:00 GMT 06:30 000/12:03:00 MET 05:30	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=330.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 30.00	BIAS -ZLV -XVV TDRS COMM ISO CHECKOUT
3 084/01:29:00 GMT 31:30 000/12:28:00 MET 30:30	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV ISO CHECKOUT SR/SS: ATM, GRI (ATLAS OPS)
4 084/02:14:00 GMT 29:00 000/13:13:00 MET 28:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, GRILLE, ISO, MAS
5 084/02:59:00 GMT 03:14:00 000/13:58:00 MET 14:13:00	TGT=2 BV=5 P=270.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 180 P 90	LVLH R=180.00 P=180.00 Y= 0.00	+ZLV -XVV ALAE, ATMOS, ISO
6 084/07:52:00 GMT 54:50 000/18:51:00 MET 53:50	INRTL R= 64.20 MNVR P=302.90 Y= 0.80	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 299 P 56		FAUST STARE: L1642
7 084/08:10:00 GMT 12:32 000/19:09:00 MET 11:32  MNVR A9/LOAD B4	TGT=2 BV=5 P= 14.20 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 14	LVLH R=180.00 P=284.20 Y= 0.00	ISO14 BIAS +XLV +ZVV
8 084/08:13:00 GMT 000/19:12:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
9 084/09:03:00 GMT 18:00 000/20:02:00 MET 17:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SEPAC CHECKOUT SR/SS: ATM, GRI (ATLAS OPS)
10 084/11:30:00 GMT 45:00 000/22:29:00 MET 44:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
11 084/12:18:00 GMT 31:47 000/23:17:00 MET 30:47  MNV A9/LOAD B6*	INRTL R=101.90 MNVR P=209.30 Y= 6.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 275 P 148		FAUST SCAN: UV220A-B
12 084/12:19:00 GMT 000/23:18:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN=0.08 IN ATT, DAP B6*					FAUST SCAN RATE CHANGE

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 084/12:33:00 GMT 43:00 000/23:32:00 MET 42:00	INRTL R=104.00 MNVR P=197.20 Y= 53.60	B6 AUTO VERN	DSC 0.080 DB AT 1.00 DB RT 0.02	SUN R 324 P 121		SCAN MNVR
2 084/12:43:30 GMT 000/23:42:30 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO A9					DAP CHANGE
3 084/12:44:00 GMT 000/23:43:00 MET	SOLCON SUN CRISS-CROSS  ORB OBS F-S					-ZSI ATTITUDES
4 084/13:21:00 GMT 25:23 001/00:20:00 MET 24:23	INRTL R=170.60 MNVR P= 96.90 Y= 65.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
5 084/13:26:00 GMT 001/00:25:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
6 084/13:53:00 GMT 24 001/00:52:00 MET 24	TGT=2 BV=5 P=170.00 Y= 6.10 OM=302.30	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 32 P 168	LVLH R= 57.14 P= 90.25 Y= 11.69	AEP1
7 084/14:05:24 GMT 08:13 001/01:04:24 MET 07:13	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
8 084/14:19:00 GMT 26:53 001/01:18:00 MET 25:53	INRTL R=170.60 MNVR P= 96.90 Y= 65.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
9 084/14:27:00 GMT 001/01:26:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
10 084/15:24:00 GMT 15 001/02:23:00 MET 15	TGT=2 BV=5 P=169.90 Y= 5.60 OM=302.40	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 29 P 168	LVLH R= 57.03 P= 90.75 Y= 11.51	AEP1
11 084/15:35:56 GMT 38:45 001/02:34:56 MET 37:45	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
12 084/15:51:00 GMT 59:17 001/02:50:00 MET 58:17	INRTL R=170.70 MNVR P= 96.70 Y= 64.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 084/16:01:00 GMT 001/03:00:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB	
2 084/16:55:00 GMT 06 001/03:54:00 MET 06	TGT=2 BV=5 P=170.00 Y= 6.10 OM=302.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 32 P 168	LVLH R= 56.94 P= 90.29 Y= 11.69	AEP1
3 084/17:06:27 GMT 09:17 001/04:05:27 MET 08:17	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
4 084/17:23:00 GMT 31:46 001/04:22:00 MET 30:46	INRTL R=170.70 MNVR P= 96.70 Y= 64.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
5 084/17:32:00 GMT 001/04:31:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB	
6 084/18:25:30 GMT 37 001/05:24:30 MET 37	TGT=2 BV=5 P=170.00 Y= 5.60 OM=302.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 29 P 169	LVLH R= 56.94 P= 90.72 Y= 11.43	AEP1
7 084/18:37:00 GMT 51:31 001/05:36:00 MET 50:31	INRTL R=329.00 MNVR P=105.00 Y= 46.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 197 P 99	STAR PAIR A1 -Y:33 -Z:19	IMU ALIGN
8 084/18:57:00 GMT 19:10:47 001/05:56:00 MET 06:09:47	INRTL R=171.10 MNVR P= 96.20 Y= 62.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
9 084/19:11:00 GMT 001/06:10:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB	
10 084/19:56:00 GMT 07 001/06:55:00 MET 07	TGT=2 BV=5 P=170.00 Y= 7.20 OM=302.40	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 36 P 168	LVLH R= 57.04 P= 89.35 Y= 12.28	AEP1
11 084/20:07:30 GMT 10:20 001/07:06:30 MET 09:20	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
12 084/20:24:00 GMT 32:40 001/07:23:00 MET 31:40	INRTL R=171.10 MNVR P= 96.20 Y= 62.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 084/20:33:00 GMT 001/07:32:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB	
2 084/21:26:00 GMT 18 001/08:25:00 MET 18	TGT=2 BV=5 P=169.90 Y= 6.70 OM=302.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 34 P 168	LVLH R= 56.92 P= 89.84 Y= 12.10	AEP1
3 084/21:38:02 GMT 40:52 001/08:37:02 MET 39:52	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
4 084/21:55:00 GMT 22:03:46 001/08:54:00 MET 09:02:46	INRTL R=171.10 MNVR P= 96.00 Y= 61.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 1 P 90		-ZSI: SOLAR OBS
5 084/22:05:00 GMT 001/09:04:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB	
6 084/22:57:00 GMT 09 001/09:56:00 MET 09	TGT=2 BV=5 P=170.00 Y= 7.20 OM=302.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 36 P 168	LVLH R= 56.94 P= 89.37 Y= 12.28	AEP1
7 084/23:08:34 GMT 11:25 001/10:07:34 MET 10:25	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
8 084/23:24:00 GMT 001/10:23:00 MET	SUSIM ALIGNMENT VERIFICATION  ORB OPS F-S				-ZSI ATTITUDES	
9 085/00:13:00 GMT 19:19 001/11:12:00 MET 18:19	INRTL R=171.10 MNVR P= 96.00 Y= 61.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
10 085/00:20:00 GMT 001/11:19:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB	
11 085/00:27:00 GMT 19 001/11:26:00 MET 19	TGT=2 BV=5 P=169.90 Y= 6.70 OM=302.60	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 34 P 168	LVLH R= 56.82 P= 89.87 Y= 12.10	AEP1
12 085/00:40:00 GMT 52:24 001/11:39:00 MET 51:24	TGT=2 BV=5 P=270.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 180 P 90	LVLH R=180.00 P=180.00 Y= 0.00	+ZLV -XVV ALAE, ISO, SEPAC

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



Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 085/03:29:00 GMT 37:11 001/14:28:00 MET 36:11  MNVR A9/LOAD B6*	INRTL R=199.60 MNVR P=276.90 Y= 43.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 157 P 81		FAUST SCAN: NGP2A-B
2 085/03:30:00 GMT 001/14:29:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .144 IN ATT, DAP B6*					FAUST SCAN RATE CHANGE
3 085/03:38:00 GMT 55:58 001/14:37:00 MET 54:58	INRTL R= 0.00 MNVR P=270.00 Y= 66.60	B6 AUTO VERN	DSC 0.144 DB AT 1.00 DB RT 0.02	SUN R 360 P 86		SCAN MNVR
4 085/03:57:00 GMT 04:08:29 001/14:56:00 MET 15:07:29	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, GRILLE, ISO, MAS
5 085/04:55:00 GMT 05:07:29 001/15:54:00 MET 16:06:29  MNVR A9/CHK B6*	INRTL R=199.50 MNVR P=304.20 Y=316.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 190 P 68		FAUST SCAN: NGP2A-B W/90
6 085/04:56:00 GMT 001/15:55:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHECK DAP B6* DSC VERN= .144 IN ATT, DAP B6*					FAUST SCAN RATE CHECK
7 085/05:08:00 GMT 25:58 001/16:07:00 MET 24:58	INRTL R=180.00 MNVR P= 90.00 Y= 23.40	B6 AUTO VERN	DSC 0.144 DB AT 1.00 DB RT 0.02	SUN R 356 P 90		SCAN MNVR
8 085/05:27:00 GMT 33:21 001/16:26:00 MET 32:21	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SEPAC
9 085/06:48:00 GMT 58:00 001/17:47:00 MET 57:00	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT +YLV +ZVV
10 085/06:49:00 GMT 001/17:48:00 MET	ISO13A/B ROTATIONS ORBIT OPS F-S					
11 085/07:58:00 GMT 08:08:45 001/18:57:00 MET 19:07:45  MNVR A9/MOD B6*	INRTL R= 31.80 MNVR P= 66.00 Y= 21.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 153 P 68		FAUST SCAN: P3HYDB1A-B
12 085/07:59:00 GMT 001/18:58:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .225 IN ATT, DAP B6*					FAUST SCAN RATE CHANGE

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 085/08:10:00 GMT 21:00 001/19:09:00 MET 20:00	INRTL R=180.00 MNVR P= 90.00 Y=293.80	B6 AUTO VERN	DSC 0.225 DB AT 1.00 DB RT 0.02	SUN R 360 P 94		SCAN MNVR
2 085/08:21:30 GMT 29:49 001/19:20:30 MET 28:49	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT +YLV +ZVV
3 085/08:22:00 GMT 001/19:21:00 MET	ISO13A/B ROTATIONS ORBIT OPS F-S					
4 085/09:31:00 GMT 40:22 001/20:30:00 MET 39:22 MNVR A9/MOD B6*	INRTL R=126.00 MNVR P=306.00 Y= 52.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 205 P 65		FAUST SCAN: P3HYDB1A-B W/90
5 085/09:32:00 GMT 001/20:31:00 MET (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN=0.027 IN ATT, DAP B6*					FAUST SCAN RATE CHANGE
6 085/09:44:00 GMT 57:56 001/20:43:00 MET 56:56	INRTL R=157.80 MNVR P=270.40 Y= 67.10	B6 AUTO VERN	DSC 0.027 DB AT 1.00 DB RT 0.02	SUN R 202 P 85		SCAN MNVR
7 085/09:59:00 GMT 10:12:05 001/20:58:00 MET 21:11:05	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
8 085/12:27:00 GMT 36:57 001/23:26:00 MET 35:57 MNVR A9/MOD B6*	TGT=2 BV=5 P= 48.60 Y=280.60 OM=130.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 278 P 83	LVLH R=171.92 P=269.91 Y=276.99	SEP/C SCAN: INITIAL ATT
9 085/12:28:00 GMT 001/23:27:00 MET (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN=0.033 IN ATT, DAP B6*					SEP/C SCAN RATE CHANGE
10 085/12:40:00 GMT 44:54 001/23:39:00 MET 43:54	TGT=2 BV=5 P=346.71 Y=277.44 OM=193.40	B6 AUTO VERN	DSC 0.033 DB AT 1.00 DB RT 0.02	EARTH R 268 P 83	LVLH R=181.73 P=270.01 Y=277.24	SCAN MNVR
11 085/12:45:00 GMT 001/23:44:00 MET (IN ATTITUDE)	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9					RESET DAP B6
12 085/12:46:00 GMT 56:27 001/23:45:00 MET 55:27	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 085/14:04:00 GMT 08:10 002/01:03:00 MET 07:10	TGT=2 BV=5 P= 90.00 Y=310.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 310 P 90	LVLH R= 50.00 P=180.00 Y= 0.00	AEP5B
2 085/14:21:00 GMT 25:10 002/01:20:00 MET 24:10	TGT=2 BV=5 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
3 085/18:39:00 GMT 50:05 002/05:38:00 MET 49:05	INRTL R= 67.70 MNVR P= 92.50 Y= 7.20	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 107 P 94	SPECIAL PAIR -Y:19 -Z:21 PR LOS 2/05:54	SPECIAL IMU ALIGN AND FAUST OBS
4 085/18:56:00 GMT 19:02:07 002/05:55:00 MET 06:01:07	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
5 085/23:00:00 GMT 10:15 002/09:59:00 MET 10:09:15 MNVR A9/MOD B6*	TGT=2 BV=5 P= 36.20 Y=305.20 OM=138.20	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 293 P 62	LVLH R=157.49 P=270.09 Y=297.72	SEP/C SCAN: INITIAL ATT
6 085/23:01:00 GMT 002/10:00:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .039 IN ATT, DAP B6*				SEP/C SCAN RATE CHANGE
7 085/23:14:00 GMT 18:59 002/10:13:00 MET 17:59	TGT=2 BV=5 P= 20.70 Y=298.80 OM=156.70	B6 AUTO DB AT 1.00 VERN DB RT 0.02	DSC 0.039 EARTH R 281 P 63	LVLH R=169.06 P=270.05 Y=296.79	SCAN MNVR
8 085/23:19:30 GMT 002/10:18:30 MET  (IN ATTITUDE)	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9				RESET DAP B6
9 085/23:20:00 GMT 30:48 002/10:19:00 MET 29:48	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV ATMOS, GRILLE
10 085/23:43:00 GMT 58:00 002/10:42:00 MET 57:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
11 086/00:45:00 GMT 01:00:00 002/11:44:00 MET 59:00	TGT=2 BV=5 P= 60.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 0 P 60	LVLH R= 0.00 P=210.00 Y= 0.00	SEP5
12 086/01:06:00 GMT 11:55 002/12:05:00 MET 10:55	TGT=2 BV=5 P= 0.00 Y=320.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 270 P 40	LVLH R= 0.00 P=270.00 Y= 40.00	BIAS +XLV -ZVV ISO TDRS COMM

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 086/02:40:00 GMT 52:40 002/13:39:00 MET 51:40	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, GRILLE, ISO, MAS
2 086/03:37:00 GMT 44:35 002/14:36:00 MET 43:35	INRTL R=319.30 MNVR P= 89.10 Y= 48.40	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 217 P 87		FAUST SCAN: HYDRB2B-A
MNVR A9/MOD B6*						
3 086/03:38:00 GMT 002/14:37:00 MET	BEFORE SCAN, CHANGE DAP B6* DSC VERN=0.018 IN ATT, DAP B6*					FAUST SCAN RATE CHANGE
(BEFORE SCAN)						
4 086/03:46:00 GMT 04:05:07 002/14:45:00 MET 15:04:07	INRTL R=345.00 MNVR P= 81.50 Y= 51.00	B6 AUTO VERN	DSC 0.018 DB AT 1.00 DB RT 0.02	SUN R 197 P 82		SCAN MNVR
5 086/04:07:00 GMT 19:10 002/15:06:00 MET 18:10	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
6 086/05:06:00 GMT 15:41 002/16:05:00 MET 14:41	INRTL R=210.10 MNVR P=220.10 Y= 30.20	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 183 P 127		FAUST SCAN: HYDRB2B-A W/90
MNVR A9/CHK B6*						
7 086/05:07:00 GMT 002/16:06:00 MET	BEFORE SCAN, CHECK DAP B6* DSC VERN=0.018 IN ATT, DAP B6*					FAUST SCAN RATE CHECK
(BEFORE SCAN)						
8 086/05:17:00 GMT 36:08 002/16:16:00 MET 35:08	INRTL R=191.90 MNVR P=242.50 Y= 37.40	B6 AUTO VERN	DSC 0.018 DB AT 1.00 DB RT 0.02	SUN R 188 P 107		SCAN MNVR
9 086/05:36:30 GMT 002/16:35:30 MET	WHEN IN ATT, RESET DAP B6 DSC VERN=0.2 IN ATT, DAP A9					RESET DAP B6
(IN ATTITUDE)						
10 086/05:37:00 GMT 47:39 002/16:36:00 MET 46:39	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
11 086/06:35:00 GMT 45:32 002/17:34:00 MET 44:32	INRTL R=200.70 MNVR P=263.20 Y= 70.40	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 165 P 87		FAUST STARE: VIRGOM87
12 086/07:05:00 GMT 16:42 002/18:04:00 MET 15:42	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 086/08:07:00 GMT 16:50 002/19:06:00 MET 15:50	INRTL R=351.30 MNVR P= 48.10 Y=357.60	B6 AUTO DB AT 1.00 VERN DB RT 0.02	DSC 0.200 R 180 P 51	SUN	FAUST STARE: CENTAURUS
2 086/08:33:00 GMT 38:15 002/19:32:00 MET 37:15	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 90 P 90	EARTH LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT +YLV +ZVV
3 086/08:34:00 GMT 002/19:33:00 MET	ISO13A/B ROTATIONS ORBIT OPS F-S				
4 086/09:39:00 GMT 49:11 002/20:38:00 MET 48:11	TGT=2 BV=5 P=170.00 Y=345.00 OM=275.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 303 P 162	EARTH LVLH R= 85.11 P=105.79 Y= 8.67	WATER DUMP
5 086/11:11:00 GMT 23:02 002/22:10:00 MET 22:02	INRTL R= 81.60 MNVR P=337.80 Y= 31.10	B6 AUTO DB AT 1.00 VERN DB RT 0.02	DSC 0.200 R 228 P 32	SUN	FAUST STARE: PKS0745
6 086/11:41:00 GMT 43:54 002/22:40:00 MET 42:54 MNVR A9/LOAD B4	TGT=2 BV=5 P= 13.67 Y= 0.00 OM=180.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 360 P 14	EARTH LVLH R=180.00 P=283.67 Y= 0.00	ISO14 BIAS +XLV +ZVV
7 086/11:45:00 GMT 002/22:44:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
8 086/12:22:00 GMT 37:00 002/23:21:00 MET 36:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 360 P 90	EARTH LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
9 086/14:11:00 GMT 15:10 003/01:10:00 MET 14:10	TGT=2 BV=5 P= 90.00 Y=310.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 310 P 90	EARTH LVLH R= 50.00 P=180.00 Y= 0.00	AEP5B
10 086/14:28:00 GMT 32:10 003/01:27:00 MET 31:10	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 0 P 90	EARTH LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
11 086/18:47:00 GMT 56:26 003/05:46:00 MET 55:26	INRTL R=206.60 MNVR P=246.00 Y= 60.60	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 175 P 96	SUN SPECIAL PAIR -Y:12 -Z:103 PR LOS 3/06:10	SPECIAL IMU ALIGN AND FAUST OBS
12 086/19:03:00 GMT 14:09 003/06:02:00 MET 13:09	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 R 360 P 90	EARTH LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 086/23:06:00 GMT 16:26 003/10:05:00 MET 15:26  MNVR A9/LOAD B6*	TGT=2 BV=5 P= 32.20 Y=307.80 OM=141.40	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 292 P 59	LVLH R=157.45 P=269.92 Y=301.24	SEP/C SCAN: INITIAL ATT
2 086/23:07:00 GMT 003/10:06:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .042 IN ATT, DAP B6*				SEP/C SCAN RATE CHANGE
3 086/23:20:00 GMT 24:58 003/10:19:00 MET 23:58	TGT=2 BV=5 P= 18.80 Y=299.70 OM=158.60	B6 AUTO VERN DSC 0.042 DB AT 1.00 DB RT 0.02	EARTH R 280 P 62	LVLH R=169.59 P=270.00 Y=297.97	SCAN MNVR
4 086/23:25:30 GMT 003/10:24:30 MET  (IN ATTITUDE)	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9				RESET DAP B6
5 086/23:26:00 GMT 36:53 003/10:25:00 MET 35:53	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV ATMOS, GRILLE
6 086/23:52:00 GMT 087/00:07:00 003/10:51:00 MET 11:06:00	TGT=2 BV=5 P=270.00 Y= 0.00 OM=180.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 180 P 90	LVLH R=180.00 P=180.00 Y= 0.00	+ZLV -XVV ALAE, ISO
7 087/00:46:00 GMT 01:01:00 003/11:45:00 MET 12:00:00	TGT=2 BV=5 P=120.00 Y= 0.00 OM= 0.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 120	LVLH R= 0.00 P=150.00 Y= 0.00	SEP6
8 087/01:06:00 GMT 17:33 003/12:05:00 MET 16:33	TGT=2 BV=5 P= 0.00 Y= 90.00 OM=270.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P=270.00 Y=270.00	+YLV -ZVV ISO TDRS COMM
9 087/02:49:00 GMT 59:00 003/13:48:00 MET 58:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, GRILLE, ISO, MAS
10 087/03:43:00 GMT 52:26 003/14:42:00 MET 51:26	INRTL R=358.60 MNVR P=109.20 Y= 69.80	B6 AUTO VERN DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 159 P 92		FAUST STARE: NGPKM1
11 087/04:12:00 GMT 25:00 003/15:11:00 MET 24:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
12 087/05:14:00 GMT 23:39 003/16:13:00 MET 22:39	INRTL R=214.40 MNVR P=325.60 Y=286.60	B6 AUTO VERN DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 203 P 82		FAUST STARE: NGPNB1

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 087/05:41:00 GMT 50:27 003/16:40:00 MET 49:27	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
2 087/06:43:00 GMT 54:37 003/17:42:00 MET 53:37	INRTL R=163.90 MNVR P=147.00 Y=280.90	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 75 P 105		FAUST STARE: SMC47TUC
3 087/07:08:00 GMT 15:04 003/18:07:00 MET 14:04	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT +YLV +ZVV
4 087/07:09:00 GMT 003/18:08:00 MET	ISO13A/B ROTATIONS ORBIT OPS F-S					
5 087/08:16:00 GMT 26:13 003/19:15:00 MET 25:13	INRTL R=200.60 MNVR P=260.40 Y= 70.00	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 168 P 87		FAUST STARE: VIRGOP1
6 087/08:51:00 GMT 57:23 003/19:50:00 MET 56:23 MNVR A9/LOAD B4	TGT=2 BV=5 P= 15.70 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 16	LVLH R=180.00 P=285.70 Y= 0.00	ISO14
7 087/08:58:00 GMT 003/19:57:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
8 087/09:36:00 GMT 37:19 003/20:35:00 MET 36:19	TGT=2 BV=1 P= 0.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 158 P 0	LVLH R=180.00 P=270.00 Y= 0.00	+XLV +ZVV SEPAC
9 087/09:58:00 GMT 10:13:00 003/20:57:00 MET 21:12:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
10 087/14:18:00 GMT 22:10 004/01:17:00 MET 21:10	TGT=2 BV=5 P= 90.00 Y=310.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 310 P 90	LVLH R= 50.00 P=180.00 Y= 0.00	AEP5B
11 087/14:35:00 GMT 39:10 004/01:34:00 MET 38:10	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
12 087/18:55:00 GMT 19:04:22 004/05:54:00 MET 06:03:22	INRTL R= 2.40 MNVR P=145.90 Y= 24.40	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 137 P 137	SPECIAL PAIR -Y:73 -Z:46 PR LOS 4/06:38	SPECIAL IMU ALIGN AND FAUST OBS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 087/19:15:00 GMT 22:28 004/06:14:00 MET 21:28	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
2 087/23:13:00 GMT 23:43 004/10:12:00 MET 22:43	TGT=2 BV=5 P= 26.50 Y=307.80 OM=147.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 289 P 57	LVLH R=161.00 P=270.08 Y=303.26	SEP/C SCAN: INITIAL ATT
MNVR A9/LOAD B6*						
3 087/23:14:00 GMT 004/10:13:00 MET	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .04 IN ATT, DAP B6*					SEP/C SCAN RATE CHANGE
(BEFORE SCAN)						
4 087/23:27:00 GMT 31:59 004/10:26:00 MET 30:59	TGT=2 BV=5 P= 14.00 Y=299.90 OM=164.00	B6 AUTO VERN	DSC 0.040 DB AT 1.00 DB RT 0.02	EARTH R 278 P 61	LVLH R=172.17 P=270.08 Y=298.93	SCAN MNVR
5 087/23:32:30 GMT 004/10:31:30 MET	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9					RESET DAP B6
(IN ATTITUDE)						
6 087/23:33:00 GMT 44:04 004/10:32:00 MET 43:04	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
7 088/01:22:00 GMT 27:03 004/12:21:00 MET 26:03	INRTL R=169.10 MNVR P= 95.30 Y= 49.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 1 P 90		-ZSI: SOLAR OBS
MNVR A9/LOAD B4						
8 088/01:27:30 GMT 004/12:26:30 MET	WHEN IN ATT, DAP TO B4 NEXT MNVR ON A9					COLLAPSE DB
(IN ATTITUDE)						
9 088/02:22:30 GMT 43 004/13:21:30 MET 43	TGT=2 BV=5 P=170.00 Y= 0.60 OM=310.30	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 3 P 170	LVLH R= 49.22 P= 96.05 Y= 8.00	AEP1
MNVR A9/LOAD B6						
10 088/02:34:00 GMT 41:09 004/13:33:00 MET 40:09	INRTL R=216.80 MNVR P=147.50 Y= 36.50	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 272 P 129		FAUST STARE: NGC6752
11 088/02:52:00 GMT 59:23 004/13:51:00 MET 58:23	INRTL R=172.50 MNVR P= 89.50 Y= 20.20	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 1 P 90		-ZSI: SOLAR OBS
MNVR A9/LOAD B4						
12 088/03:00:00 GMT 004/13:59:00 MET	WHEN IN ATT, DAP TO B4 NEXT MNVR ON A9					COLLAPSE DB
(IN ATTITUDE)						

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



Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 088/03:52:30 GMT 53 004/14:51:30 MET 53 MNVR A9/LOAD B6	TGT=2 BV=5 P=168.50 Y= 29.80 OM=304.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 71 P 148	LVLH R= 56.50 P= 71.40 Y= 26.21	AEP1
2 088/04:05:00 GMT 15:42 004/15:04:00 MET 14:42	INRTL R=276.90 MNVR P= 96.90 Y= 21.20	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 253 P 97		FAUST STARE: ORPHIUCUS
3 088/04:26:00 GMT 34:56 004/15:25:00 MET 33:56 MNVR A9/LOAD B4	INRTL R=172.50 MNVR P= 89.50 Y= 20.20	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 1 P 90		-ZSI: SOLAR OBS
4 088/04:35:00 GMT 004/15:34:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
5 088/05:23:00 GMT 22 004/16:22:00 MET 22 MNVR A9/LOAD B6	TGT=2 BV=5 P=168.50 Y= 29.60 OM=305.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 71 P 148	LVLH R= 56.24 P= 71.68 Y= 26.16	AEP1
6 088/05:35:00 GMT 42:07 004/16:34:00 MET 41:07	INRTL R=209.40 MNVR P=165.30 Y= 11.10	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 275 P 159		FAUST STARE: NGC6752
7 088/05:53:00 GMT 06:00:24 004/16:52:00 MET 59:24 MNVR A9/LOAD B4	INRTL R=172.90 MNVR P= 85.70 Y=350.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
8 088/06:01:00 GMT 004/17:00:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
9 088/06:53:30 GMT 52 004/17:52:30 MET 52	TGT=2 BV=5 P=160.60 Y= 58.30 OM=294.20	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 78 P 120	LVLH R= 73.86 P= 39.76 Y= 39.19	AEP1
10 088/07:05:00 GMT 09:38 004/18:04:00 MET 08:38	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT  +YLV +ZVV
11 088/07:06:00 GMT 004/18:05:00 MET	ISO13A/B ROTATIONS  ORBIT OPS F-S					
12 088/08:24:00 GMT 37:21 004/19:23:00 MET 36:21	INRTL R=240.40 MNVR P=180.00 Y= 66.50	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 207 P 107		FAUST STARE: LHEM83

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 088/08:49:00 GMT 56:07 004/19:48:00 MET 55:07 MNVR A9/LOAD B4	TGT=2 BV=5 P= 13.67 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 14	LVLH R=180.00 P=283.67 Y= 0.00	ISO14
2 088/08:57:00 GMT 004/19:56:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
3 088/09:39:00 GMT 40:08 004/20:38:00 MET 39:08 MNVR A9/LOAD B4	TGT=2 BV=1 P= 0.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 135 P 0	LVLH R=180.00 P=270.00 Y= 0.00	+XLV +ZVV SEPAC
4 088/10:06:00 GMT 21:00 004/21:05:00 MET 20:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
5 088/12:51:00 GMT 13:01:15 004/23:50:00 MET 005/00:00:15 MNVR A9/LOAD B6*	TGT=2 BV=5 P=358.90 Y=275.10 OM=181.10	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 270 P 85	LVLH R=180.05 P=269.95 Y=275.10	SEP/C SCAN: INITIAL ATT
6 088/12:52:00 GMT 004/23:51:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .038 IN ATT, DAP B6*					SEP/C SCAN RATE CHANGE
7 088/13:05:00 GMT 09:59 005/00:04:00 MET 08:59	TGT=2 BV=5 P=304.30 Y=283.60 OM=236.50	B6 AUTO VERN	DSC 0.038 DB AT 1.00 DB RT 0.02	EARTH R 259 P 82	LVLH R=191.64 P=270.34 Y=277.61	SCAN MNVR
8 088/13:10:30 GMT 005/00:09:30 MET  (IN ATTITUDE)	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9					RESET DAP B6
9 088/13:11:00 GMT 21:57 005/00:10:00 MET 20:57	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
10 088/14:24:00 GMT 28:10 005/01:23:00 MET 27:10	TGT=2 BV=5 P= 90.00 Y=310.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 310 P 90	LVLH R= 50.00 P=180.00 Y= 0.00	AEP5B
11 088/14:41:00 GMT 45:10 005/01:40:00 MET 44:10	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV
12 088/19:02:00 GMT 16:32 005/06:01:00 MET 15:32	INRTL R= 30.70 MNVR P= 34.50 Y=334.30	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 113 P 49	SPECIAL PAIR -Y:73 -Z:50 PR LOS 5/06:28	SPECIAL IMU ALIGN AND FAUST OBS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
088/19:20:00 GMT 31:01 005/06:19:00 MET 30:01	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
089/01:04:00 GMT 06:30 005/12:03:00 MET 05:30	TGT=2 BV=5 P= 60.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 60	LVLH R= 0.00 P=210.00 Y= 0.00	SEP5
089/01:12:00 GMT 23:43 005/12:11:00 MET 22:43	TGT=2 BV=5 P=180.00 Y=314.30 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 270 P 134	LVLH R=180.00 P= 90.00 Y= 45.70	BIAS -YLV -ZVV ISO TDRS COMM
089/03:04:00 GMT 12:13 005/14:03:00 MET 11:13	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, GRILLE, ISO, MAS
089/03:52:00 GMT 04:03:03 005/14:51:00 MET 15:02:03	INRTL R=101.90 MNVR P=287.40 Y= 55.40	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 245 P 72		FAUST STARE: VELASNR
089/04:28:00 GMT 42:35 005/15:27:00 MET 41:35	TGT=2 BV=5 P=160.00 Y=350.00 OM=270.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 333 P 158	LVLH R= 90.00 P=100.00 Y= 20.00	WATER DUMP
089/06:01:00 GMT 10:32 005/17:00:00 MET 09:32	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
089/07:01:00 GMT 07:38 005/18:00:00 MET 06:38	INRTL R=337.90 MNVR P=100.70 Y=305.20	B6 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 209 P 104		FAUST STARE: 1COMA
089/07:22:00 GMT 32:59 005/18:21:00 MET 31:59	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT +YLV +ZVV
089/07:23:00 GMT 005/18:22:00 MET	ISO13A/B ROTATIONS ORBIT OPS F-S					
089/08:34:00 GMT 41:53 005/19:33:00 MET 40:53	TGT=2 BV=1 P= 0.00 Y= 0.00 OM=147.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 180 P 0	LVLH R=147.00 P=270.00 Y= 0.00	SEP10A
089/09:04:00 GMT 07:02 005/20:03:00 MET 06:02	TGT=2 BV=5 P= 15.70 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 16	LVLH R=180.00 P=285.70 Y= 0.00	ISO14

MNVR A9/LOAD B4  
\*\*\* ALL ATTITUDES IN MEAN OF 1950 \*\*\*  
\*\*\* PYR EULER SEQUENCE \*\*\*

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
089/09:08:00 GMT 005/20:07:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
089/10:16:00 GMT 17:19 005/21:15:00 MET 16:19	TGT=2 BV=5 P= 0.00 Y= 0.00 OM=180.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	DSC 0.200 EARTH R 0 P 0	LVLH R=180.00 P=270.00 Y= 0.00	+XLV +ZVV SEPAC
089/10:34:00 GMT 41:30 005/21:33:00 MET 40:30  MNVR A9/LOAD B6	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
089/10:42:00 GMT 005/21:41:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B6  NEXT MNVR ON A9				COLLAPSE DB
089/11:34:00 GMT 38:22 005/22:33:00 MET 37:22  MNVR A9/MOD B6*	INRTL R=288.70 MNVR P=120.00 Y= 5.10	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 239 P 122		FAUST SCAN: NPSPURB-A
089/11:35:00 GMT 005/22:34:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC RT= .009 IN ATT, DAP B6*				FAUST SCAN RATE CHANGE
089/11:40:00 GMT 51:32 005/22:39:00 MET 50:32	INRTL R=288.00 MNVR P=121.90 Y=359.20	B6 AUTO DB AT 1.00 VERN DB RT 0.02	SUN R 243 P 125		SCAN MNVR
089/11:52:00 GMT 005/22:51:00 MET  (IN ATTITUDE)	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9				RESET DAP B6
089/11:53:00 GMT 12:07:52 005/22:52:00 MET 23:06:52	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
089/14:31:00 GMT 35:10 006/01:30:00 MET 34:10	TGT=2 BV=5 P= 90.00 Y=310.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	EARTH R 310 P 90	LVLH R= 50.00 P=180.00 Y= 0.00	AEP5B
089/14:48:00 GMT 52:10 006/01:47:00 MET 51:10	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
089/19:10:00 GMT 24:10 006/06:09:00 MET 23:10	INRTL R= 34.10 MNVR P= 49.90 Y=344.20	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 126 P 58	SPECIAL PAIR -Y:73 -Z:56 PR LOS 6/06:35	SPECIAL IMU ALIGN AND FAUST OBS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 089/19:30:00 GMT 39:37 006/06:29:00 MET 38:37	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R= 0.00 P=180.00 Y= 0.00	-ZLV -XVV SR/SS: ATM, GRI (ATLAS OPS)
2 090/01:11:00 GMT 13:30 006/12:10:00 MET 12:30	TGT=2 BV=5 P=120.00 Y= 0.00 OM= 0.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 120	LVLH R= 0.00 P=150.00 Y= 0.00	SEP6
3 090/01:19:00 GMT 34:00 006/12:18:00 MET 33:00	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
4 090/02:29:00 GMT 40:56 006/13:28:00 MET 39:56	INRTL R= 89.30 MNVR P=254.50 Y= 60.10	B6 AUTO VERN DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 285 P 89		FAUST STARE: DORADO
5 090/02:59:00 GMT 05:08:20 006/13:58:00 MET 14:07:20	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
6 090/04:03:00 GMT 13:38 006/15:02:00 MET 12:38  MNVR A9/MOD B6*	INRTL R=177.50 MNVR P=162.00 Y=332.90	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 54 P 157		FAUST SCAN: LMCSMA-B
7 090/04:04:00 GMT 006/15:03:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC RT= .03 IN ATT, DAP B6*				FAUST SCAN RATE CHANGE
8 090/04:15:00 GMT 28:50 006/15:14:00 MET 27:50	INRTL R=156.00 MNVR P=168.00 Y=331.60	B6 AUTO VERN DSC 0.030 DB AT 1.00 DB RT 0.02	SUN R 91 P 158		SCAN MNVR
9 090/04:30:00 GMT 44:46 006/15:29:00 MET 43:46	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
10 090/05:38:00 GMT 44:27 006/16:37:00 MET 43:27  MNVR A9/MOD B6*	INRTL R=259.90 MNVR P=129.40 Y= 31.10	A9 AUTO VERN DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 247 P 120		FAUST SCAN: UV335A-B
11 090/05:39:00 GMT 006/16:38:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .067 IN ATT, DAP B6*				FAUST SCAN RATE CHANGE
12 090/05:45:00 GMT 58:57 006/16:44:00 MET 57:57	INRTL R=316.60 MNVR P=128.00 Y= 34.80	B6 AUTO VERN DSC 0.067 DB AT 1.00 DB RT 0.02	SUN R 190 P 117		SCAN MNVR

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT	
1 090/05:59:00 GMT 006/16:58:00 MET  (IN ATTITUDE)	WHEN IN ATT, RESET DAP B6 DSC VERN= 0.2 IN ATT, DAP A9				RESET DAP B6	
2 090/06:00:00 GMT 13:11 006/16:59:00 MET 17:12:11	TGT=2 BV=3 P= 90.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R=180.00 P= 0.00 Y= 0.00	-ZLV +XVV ALAE, ISO, MAS
3 090/07:10:00 GMT 17:18 006/18:09:00 MET 16:18	INRTL R=355.20 MNVR P=121.50 Y= 17.30	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 164 P 120		FAUST STARE: COMAI
4 090/07:31:00 GMT 39:46 006/18:30:00 MET 38:46	TGT=2 BV=5 P= 0.00 Y= 90.00 OM= 90.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 90 P 90	LVLH R= 0.00 P= 90.00 Y= 90.00	ISO13A/B ROT: INITIAL ATT  +YLV +ZVV
5 090/07:32:00 GMT 006/18:31:00 MET	ISO13A/B ROTATIONS  ORBIT OPS F-S					
6 090/08:41:00 GMT 48:53 006/19:40:00 MET 47:53	TGT=2 BV=1 P= 0.00 Y= 0.00 OM=147.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 135 P 0	LVLH R=147.00 P=270.00 Y= 0.00	SEP10A
7 090/09:09:00 GMT 11:59 006/20:08:00 MET 10:59	TGT=2 BV=5 P= 14.20 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 14	LVLH R=180.00 P=284.20 Y= 0.00	ISO14  FCS C/O
8 090/10:40:00 GMT 01 006/21:39:00 MET 01  MNVR A9/LOAD B4	TGT=2 BV=5 P= 14.20 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 0 P 14	LVLH R=180.00 P=284.20 Y= 0.00	ISO14  RE-INITIATE AFTER FCS C/O
9 090/10:41:00 GMT 006/21:40:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB
10 090/12:04:00 GMT 05:11 006/23:03:00 MET 04:11	TGT=2 BV=5 P= 0.00 Y= 0.00 OM=180.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 171 P 0	LVLH R=180.00 P=270.00 Y= 0.00	+XLV +ZVV SEPAC
11 090/12:12:00 GMT 26:17 006/23:11:00 MET 25:17	INRTL R=166.00 MNVR P= 75.40 Y=311.50	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 89		-ZSI: SOLAR OBS
12 090/12:27:00 GMT 006/23:26:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9					COLLAPSE DB

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 090/13:10:00 GMT 16:14 007/00:09:00 MET 15:14  MNVR A9/LOAD B6	INRTL R=138.20 MNVR P=127.30 Y=331.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 55 P 130	FAUST STARE: QUASAR2
2 090/13:17:00 GMT 007/00:16:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B6  NEXT MNVR ON A9				COLLAPSE DB
3 090/13:27:00 GMT 35:45 007/00:26:00 MET 34:45  MNVR A9/LOAD B4	INRTL R=134.90 MNVR P=130.30 Y= 76.90	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90	-ZSI: SOLAR OBS
4 090/13:36:00 GMT 007/00:35:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
5 090/14:35:00 GMT 42:15 007/01:34:00 MET 41:15	TGT=2 BV=5 P= 90.00 Y=310.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 310 P 90	LVLH R= 50.00 P=180.00 Y= 0.00 AEP5B
6 090/14:54:00 GMT 15:01:03 007/01:53:00 MET 02:00:03	INRTL R=170.60 MNVR P= 84.40 Y=350.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90	-ZSI: SOLAR OBS
7 090/15:02:00 GMT 007/02:01:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
8 090/16:10:00 GMT 17:58 007/03:09:00 MET 16:58  MNV A9/LOAD B6*	INRTL R=107.80 MNVR P=131.70 Y=321.60	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 97 P 130	FAUST SCAN: UV220A-B
9 090/16:11:00 GMT 007/03:10:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .037 IN ATT, DAP B6*				FAUST SCAN RATE CHANGE
10 090/16:19:00 GMT 31:54 007/03:18:00 MET 30:54	INRTL R= 97.80 MNVR P=125.00 Y=348.70	B6 AUTO VERN	DSC 0.037 DB AT 1.00 DB RT 0.02	SUN R 80 P 130	SCAN MNVR
11 090/16:33:00 GMT 40:21 007/03:32:00 MET 39:21  MNVR A9/LOAD B4	INRTL R=170.50 MNVR P= 84.40 Y=350.80	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90	-ZSI: SOLAR OBS
12 090/16:41:00 GMT 007/03:40:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 090/17:35:00 GMT 42:28 007/04:34:00 MET 41:28	TGT=2 BV=5 P=160.00 Y= 0.00 OM=270.00	A9 AUTO DB AT 2.00 VERN DB RT 0.32	DSC 0.200 EARTH R 360 P 160	LVLH R= 90.00 P= 90.00 Y= 20.00	AEP5LIM
2 090/18:01:00 GMT 03:53 007/05:00:00 MET 02:53	INRTL R=165.70 MNVR P= 75.10 Y=311.60	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 0 P 89		-ZSI: SOLAR OBS
3 090/18:04:00 GMT 007/05:03:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
4 090/18:20:00 GMT 007/05:19:00 MET	SUSIM ALIGNMENT VERIFICATION  ORB OPS F-S				-ZSI ATTITUDES
5 090/19:01:00 GMT 01 007/06:00:00 MET 01	INRTL R=165.70 MNVR P= 75.10 Y=311.60	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
6 090/19:02:00 GMT 007/06:01:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
7 090/19:10:00 GMT 15:21 007/06:09:00 MET 14:21  MNVR A9/LOAD B6	INRTL R=143.00 MNVR P=119.00 Y=334.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 44 P 123	STAR PAIR D2 -Y: 55 -Z: 57	IMU ALIGN
8 090/19:20:00 GMT 21:26 007/06:19:00 MET 20:26  (AFTER IMU ALN)	INRTL R=127.50 MNVR P=102.80 Y=327.40	B6 AUTO DB AT 1.00 VERN DB RT 0.02	SUN R 54 P 109		FAUST STARE: FORNAX
9 090/19:45:00 GMT 007/06:44:00 MET	SOLCON SUN CRISS-CROSS  ORB OPS F-S				-ZSI ATTITUDES
10 090/20:14:00 GMT 18:39 007/07:13:00 MET 17:39	INRTL R=169.90 MNVR P= 82.50 Y=341.00	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 0 P 90		-ZSI: SOLAR OBS
11 090/20:19:00 GMT 007/07:18:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
12 090/20:41:00 GMT 48:36 007/07:40:00 MET 47:36  MNVR A9/LOAD B6	INRTL R=116.20 MNVR P=114.30 Y=293.20	A9 AUTO DB AT 2.00 VERN DB RT 0.02	SUN R 87 P 109		FAUST STARE: LMCALONE

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



Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 090/20:49:00 GMT 007/07:48:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B6  NEXT MNVR ON A9				COLLAPSE DB
2 090/21:06:00 GMT 13:15 007/08:05:00 MET 12:15  MNVR A9/LOAD B4	INRTL R=165.70 MNVR P= 75.10 Y=311.60	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90	-ZSI: SOLAR OBS
3 090/21:14:00 GMT 007/08:13:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
4 090/22:07:00 GMT 19:05 007/09:06:00 MET 18:05  MNV A9/LOAD B6*	INRTL R=104.70 MNVR P=339.70 Y= 60.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 186 P 52	FAUST SCAN: HVC1A-B
5 090/22:08:00 GMT 007/09:07:00 MET  (BEFORE SCAN)	BEFORE SCAN, CHANGE DAP B6* DSC VERN= .009 IN ATT, DAP B6*				FAUST SCAN RATE CHANGE
6 090/22:20:00 GMT 38:50 007/09:19:00 MET 37:50	INRTL R=111.00 MNVR P=332.40 Y= 69.70	B6 AUTO VERN	DSC 0.009 DB AT 1.00 DB RT 0.02	SUN R 186 P 63	SCAN MNVR
7 090/22:40:00 GMT 54:57 007/09:39:00 MET 53:57  MNVR A9/LOAD B4	INRTL R=133.60 MNVR P=131.40 Y= 76.70	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 0 P 90	-ZSI: SOLAR OBS
8 090/22:55:00 GMT 007/09:54:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B4  NEXT MNVR ON A9				COLLAPSE DB
9 090/23:45:00 GMT 57:37 007/10:44:00 MET 56:37  MNVR A9/LOAD B6	INRTL R=202.20 MNVR P=305.40 Y=342.30	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	SUN R 182 P 57	FAUST STARE: A1795
10 090/23:58:00 GMT 007/10:57:00 MET  (IN ATTITUDE)	WHEN IN ATT, DAP TO B6  NEXT MNVR ON A9				COLLAPSE DB
11 091/00:21:00 GMT 34:03 007/11:20:00 MET 33:03	TGT=2 BV=3 P= 90.00 Y= 0.00 OM= 0.00	A9 AUTO VERN	DSC 0.200 DB AT 2.00 DB RT 0.02	EARTH R 360 P 90	LVLH R= 0.00 P=180.00 Y= 0.00 -ZLV -XVV
12 091/03:01:00 GMT 12:49 007/14:00:00 MET 11:49  MNVR B6/LOAD A2	TGT=4 BV=5 RA= 9.250 DEC= 3.988N P=270.00 Y= 0.00 OM=270.00	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 180 P 90	INRTL R=192.09 P=258.11 Y= 40.05 +ZSI FOR PTC REFERENCE ORB OPS - RCS

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

Attitude Timeline

GMT/MET	MNVR OPTION	DAP	E/S	REF ATT/REMARKS	EVENT
1 091/03:13:00 GMT 007/14:12:00 MET  ( IN ATTITUDE)	INRTL BV=1 ROTR P= 0.00 Y= 0.00	A2 AUTO PRI DSC 0.400 DB AT 1.00 DB RT 0.20		INRTL R=192.11 P=258.09 Y= 40.10	INITIATE PTC ROTATION
2 091/06:05:00 GMT 007/17:04:00 MET  CNCL A2/LOAD B1	CANCEL				TERMINATE PTC ROTATION
3 091/06:06:00 GMT 13:53 007/17:05:00 MET 12:53  MNVR B1/LOAD A1	TGT=4 RA= 9.367 BV=5 DEC= 4.038N P=184.00 Y= 0.00 OM= 90.00	B1 AUTO VERN DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 180 P 176	INRTL R= 40.55 P=172.83 Y=348.04	-XSI TAIL SUN COLD SOAK ATT.
4 091/07:06:00 GMT 17:08 007/18:05:00 MET 16:08	INRTL R= 53.00 MNVR P= 42.00 Y= 41.00	A1 AUTO VERN DSC 0.200 DB AT 1.00 DB RT 0.02	SUN R 152 P 51	STAR PAIR -Y: 51 -Z: 55	D/O IMU ALIGN
5 091/07:26:00 GMT 28:38 007/18:25:00 MET 27:38	INRTL R=289.00 MNVR P=184.00 Y= 55.00	B1 AUTO PRI DSC 0.500 DB AT 3.00 DB RT 0.20	SUN R 152 P 115	STAR PAIR -Y: 17 -Z: 20	D/O VERIF ALIGN
6 091/07:36:00 GMT 38:11 007/18:35:00 MET 37:11	INRTL R=254.00 MNVR P=261.00 Y= 25.00	B1 AUTO PRI DSC 0.500 DB AT 3.00 DB RT 0.20	SUN R 117 P 90	KSC LANDING	D/O BURN ATT. D/O BURN TIG: 7/21:07

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

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

STS-45 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	0.500
VERN °/sec	3	0.200	0.400	0.008	0.200	0.200	0.200	0.200	0.200	0.200
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	3.00	2.00	2.00	3.00
VERN (deg)	9	1.000	1.000	0.070	1.000	1.000	2.000	1.000	1.000	2.000
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	.020
<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*
RATE DEADBAND	32	0.200
JET OPTION	33	1
NUMBER OF JETS	34	2
ON TIME	35	0.08
DELAY	36	0.00

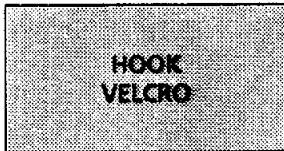
\*I-LOADED OPS-2 DAP  
Configuration

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	0.02	0.05	0.01
<u>ROTATION</u>									
DSC RT NORM °/sec	16	0.500	0.200	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	0.200
PULSE NORM °/sec	18	0.04	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	0.002
COMP NORM °/sec	20	.00	.00	.00	.00	.00	.00	.00	.00
VERN °/sec	21	.000	.000	.000	.000	.000	.000	.000	.000
<u>DEADBAND</u>									
ATT NORM (deg)	22	3.00	3.00	3.00	0.30	3.00	1.00	2.00	2.00
VERN (deg)	23	1.000	1.000	1.000	0.100	0.033	1.000	1.000	1.000
RATE NORM °/sec	24	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
VERN °/sec	25	.020	.020	.020	.010	.020	.020	.020	.020
<u>JET OPT</u>									
P	26	1	3	1	3	3	3	1 or 3	1
Y	27	1	3	1	3	3	3	1 or 3	1
<u>CNTL ACCEL</u>	28	0	0	0	0	0	0	0	0

\*I-LOADED OPS-2 DAP Configuration

# DAP BOOK



FLT PLN-1a/45/0/A

UNIV PTG	
TGT ID = 1 Orbiting Vehicle = 2 Earth ctr = 3 Earth tgt Input LAT ( $\pm 90$ ) LON ( $\pm 180$ , + = East) ALT (-3444.0 to 20000.0 nm) = 4 Sun ctr = 5 Celestial tgt Input RA (0-359.99) DEC ( $\pm 90$ ) = 11-110 Nav Stars	CNTL ACCEL = 0 Orbiting Vehicle = 1 thru 5 not used  PRI JET OPT = 1 Normal = 2 Nose only = 3 Tail only  Alt JET OPT = 1 Normal = 2 Illegal entry = 3 Tail only
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)	
* input OM $\rightarrow$	
MON AXIS = 1 +X 2 -X	

FLT PLN-1b/45/0/A





<u>DAP</u>	<u>PURPOSE</u>
A1	- LOSS OF VERN (NOSE & TAIL)
A2	- PTC
A3	- GG
A4	- PRE/POST DEPLOY
A5	- IMU ROTATION
A6	- STS-45 LOSS OF VERN (TAIL ONLY)
A7	- RENDEZVOUS
A8	- PROX OPS
A9	- STS-45 NOMINAL

FLT PLN-2a/45/0/B

A1



**DAP A1**

PURPOSE:

LOSS OF VERN  
(NOSE & TAIL)

**A1**

0.1 0	1	TRANSLATION PULSE
0.2 0 0	2	ROTATION DSC RT NORM
0.2 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
5.0 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-2b/45/0/A

FLT PLN-3a/45/0/A

A2



A1



DAP A2

PURPOSE:

PTC

A2

0.1 0	1	TRANSLATION	
		PULSE	
		ROTATION	
0.4 0 0	2	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
		DEADBAND	
1.0 0 0	8	ATT	NORM
1.0 0 0	9		VERN
0.2 0 0	10	RATE	NORM
.0 2 0	11		VERN
1	12	JET OPT	P
1	13		Y
0	14	CNTL ACCEL	

FLT PLN-3b/45/0/A

FLT PLN-4a/45/0/A



A3



A2

DAP A3

PURPOSE:

GG

A3

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

FLT PLN-4b/45/0/A

FLT PLN-5a/45/0/A



A4



A3



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	4	PULSE	NORM
0.0 1 0	5		VERN
.0 0	6	COMP	NORM
.0 0 0	7		VERN
DEADBAND			
3.0 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-5b/45/0/B

FLT PLN-6a/45/0/A



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	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
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-6b/45/0/A

FLT PLN-7a/45/0/A



A6





A5



DAP A6

PURPOSE:

STS-45 LOSS OF VERN  
(TAIL ONLY)

0.1 0

A6

TRANSLATION  
PULSE

0.2 0 0

ROTATION  
DSC RT NORM  
VERN

0.2 0 0

PULSE NORM

0.1 0 0

VERN

0.0 1 0

COMP NORM

.0 0 0

VERN

.0 0 0

DEADBAND

3.0 0 0

ATT NORM

2.0 0 0

VERN

0.2 0 0

RATE NORM

.0 2 0

VERN

3

12 JET OPT P

3

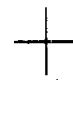
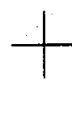
13 Y

0

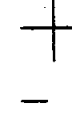
14 CNTL ACCEL

FLT PLN-7b/45/0/B

FLT PLN-8a/45/0/B



A7



A6

DAP A7

PURPOSE:

RENDEZVOUS

0.1 0

A7

TRANSLATION  
PULSE

0.2 0 0

ROTATION  
DSC RT NORM

0.2 0 0

VERN

0.1 0 0

PULSE NORM

0.0 1 0

VERN

.0 0 0

COMP NORM

.0 0 0

VERN

DEADBAND

2.0 0 0

ATT NORM

1.0 0 0

VERN

0.2 0 0

RATE NORM

.0 2 0

VERN

1 or 3

12 JET OPT P

1 or 3

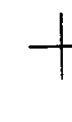
13 Y

0

14 CNTL ACCEL

FLT PLN-8b/45/0/A

FLT PLN-9a/45/0/A



A8

A7

+

+

+

DAP A8

A8

PURPOSE:  
PROX OPS

0.0 5 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 12 JET OPT P  
1 13 Y

0 14 CNTL ACCEL

FLT PLN-9b/45/0/A

FLT PLN-10a/45/0/A

+

+

+

A9

+

A8

+

+

+

DAP A9

A9

PURPOSE:  
STS-45 NOMINAL

0.1 0 1 TRANSLATION PULSE

0.5 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

3.0 0 8 DEADBAND ATT NORM  
- 2.0 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-10b/45/0/B

FLT PLN-11a/45/0/A

+

+

+

+



A9



DAP

PURPOSE

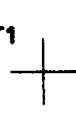
ALT1 - NOMINAL I-LOAD

FLT PLN-11b/45/0/A

FLT PLN-12a/45/0/A



ALT1



DAP ALT1

ALT1

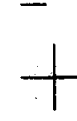
PURPOSE:

NOMINAL I-LOAD

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

FLT PLN-12b/45/0/A

FLT PLN-13a/45/0/A



(reduced copy)

FLT PLN/45/FIN



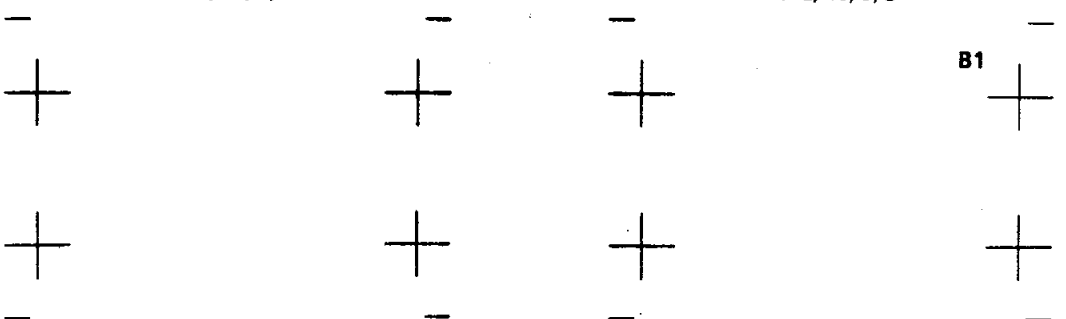
ALT1

DAP                      PURPOSE

- B1 - PRCS IMU ALIGN  
          OMS & RCS BURNS
- B2 - GENERIC LOSS OF VERN  
          (TAIL ONLY)
- B3 - LOSS OF VERN  
          (NOSE & TAIL)  
          GG MNVR
- B4 - TIGHT DEADBANDS
- B5 - COAS CAL
- B6 - NOMINAL  
          STS-45 LOSS OF VERN  
          (TAIL ONLY)
- B7 - RENDEZVOUS
- B8 - PROX OPS

FLT PLN-13b/45/0/A

FLT PLN-14a/45/0/B



B1

DAP B1

B1

PURPOSE:

PRCS IMU ALIGN  
OMS & RCS BURNS

TRANSLATION				
PULSE	15	0.0	2	
ROTATION				
DSC RT	NORM 16	0.5	0 0	
	VERN 17	0.2	0 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	
	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-14b/45/0/B

FLT PLN-15a/45/0/A



B2

(reduced copy)

FLT PLN/45/FIN



B1



DAP B2

PURPOSE:  
GENERIC LOSS OF VERN  
(TAIL ONLY)

FLT PLN-15b/45/0/B



B2



DAP B3

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

FLT PLN-16b/45/0/A



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 4
	VERN	19	0.0 2 2
COMP	NORM	20	.0 0 0
	VERN	21	.0 0 0
DEADBAND			
ATT	NORM	22	3.0 0
	VERN	23	1.0 0 0
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-16a/45/0/A

B3

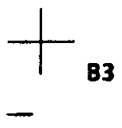
B3

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 4
	VERN	19	0.0 2 2
COMP	NORM	20	.0 0 0
	VERN	21	.0 0 0
DEADBAND			
ATT	NORM	22	3.0 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-17a/45/0/A

B4





B3

DAP B4

PURPOSE:  
TIGHT DEADBANDS

FLT PLN-17b/45/0/B



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 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  
VERN 23 0.1 0 0

RATE NORM 24 0.2 0  
VERN 25 .0 1 0

JET OPT P 26 3  
Y 27 3

CNTL ACCEL 28 0

FLT PLN-18a/45/0/A



B4



B5

DAP B5

PURPOSE:  
COAS CAL

FLT PLN-18b/45/0/A



B5

TRANSLATION  
PULSE 15 0.0 2

ROTATION  
DSC RT NORM 16 0.2 0 0  
VERN 17 0.0 1 6  
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 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-19a/45/0/A



B6

B5

DAP B6

PURPOSE:

NOMINAL  
STS-45 LOSS OF VERN  
(TAIL ONLY)

FLT PLN-19b/45/0/B

B6

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	4
	VERN 19		0.0	0 2
COMP	NORM 20		.0	0 0
	VERN 21		.0	0 0
DEADBAND				
ATT	NORM 22		1.0	0
	VERN 23		1.0	0 0
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/45/0/B

B7

B6

DAP B7

PURPOSE:

RENDEZVOUS

FLT PLN-20b/45/0/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-21a/45/0/A

B8

+

B7

-

DAP B8

PURPOSE:  
PROX OPS

FLT PLN-21b/45/0/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-22a/45/0/A

+

+

+

FLT PLN-22b/45/0/A

+

+

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FLT PLN-23a/45/0/A

## DAP BOOK

HOOK  
VELCRO

FLT PLN-23b/45/0/A

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STS-45  
FLIGHT PLAN NOTES

FLIGHT PLAN NOTES  
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

The STS-45 (OV-104) launch from KSC on March 23, 1992, (Flight Cycle) will be into a 160 nm orbit at an inclination of 57.0 degrees. The mission duration will be 8 days. Nominal landing occurs at KSC on March 31, 1992.

Landing opportunities are:

		<u>Landing Orbit No.</u>	<u>Site</u>	<u>Local Time</u>
Nominal	Primary	127	KSC	05:08 EST
	Backup	129	EDW	06:12 PST
	Weather Alt.	128	NOR	05:39 MST
1 Day Late	Primary	143	KSC	06:06 EST
	Weather Alt.	145	EDW	06:07 PST
2 Days Late	Primary	159	KSC	06:01 EST
	Weather Alt.	161	EDW	06:03 PST

Major Events

<u>LAUNCH (KSC)</u>	March 23, 1992
<u>MET (DD/HH:MM:SS)</u>	0/00:00:00
<u>Day of year</u>	83
<u>CST/GMT</u>	07:01/13:01

<u>OMS-2</u>	
<u>MET (DD/HH:MM)</u>	0/00:39
<u>DV (fps)</u>	252.3
<u>ORBIT ha/hp (nm)</u>	159/160

<u>DEORBIT BURN</u>	
<u>MET (DD/HH:MM)</u>	07/21:07

<u>LANDING (KSC)</u>	
<u>MET (DD/HH:MM)</u>	07/22:07
<u>Day of year</u>	91
<u>CST/GMT</u>	05:08/11:08

B. CREW

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

RED team - MS2, MS3, PS2  
BLUE team - PLT, MS1, PS1

The CDR is not assigned to a team and is free to adjust his hours real-time as necessary. Each team works approximately 12 hours followed by 12 hours off duty. This allows continuous 24 hour/day payload operations.

FLT PLN NOTES

2. The crewmembers will be assigned to the following tasks:

CDR - Charles Bolden  
PLT - Brian Duffy  
MS1 - Kathryn Sullivan  
MS2 - David Leestma  
MS3 - Michael Foale  
PS1 - Dirk Frimout  
PS2 - Byron Lichtenberg

3. The crewmembers responsible for performing an EVA, should one become necessary, are: MS1 will be EV1, MS3 will be EV2, MS2 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 assumed to be supported by TDRS-E (41 degrees W) and TDRS-W (171 degrees W) and is the prime mode of communication coverage.
- c. GSTDN sites are available on an on-orbit contingency support basis (2-4 hours call-up): MIL (MLX), BDA, DKR, GDS (GDX), VAN, DFR. NOTE: The DFR site is not indicated in this version of the Flight Plan. RID and CAN are available on an emergency support basis only.
- d. RTS sites are available for contingency support (2 hours lead time required): HTS, GTS, VTS, IOS, NHS, CTS, and OTS.
- e. TDRS Ku-band is the prime mode of real-time TV; however, there are also three GSTDN sites available as backup (2-4 hours lead time required): GDS (GDX), MIL (MLX), VAN.
- f. TDRS-E and TDRS-W are assumed available to support Ku-band uplink (e.g., TAGS).
- g. HDR uplink (e.g., Teleprinter) is available through TDRS-E and TDRS-W.

2. Guidance and Navigation

- a. The orbiter state vector must be uplinked whenever downtrack error in the on-board vector becomes greater than 20 nm, but is usually uplinked when errors are greater than 5 nm. These are real-time calls.
- b. IMU alignments occur approximately every 12 hours and prior to major events requiring low navigation uncertainty. IMU alignments will use stars of opportunity when possible during ATLAS-1 attitudes and maneuvers.



### 3. Environmental Control and Life Support Subsystem (ECLSS)

- a. Two CO<sub>2</sub> absorbers are installed prior to launch. On orbit, the canisters are alternately replaced as required per the cue card.
- b. There are four supply water tanks and one waste water tank which are loaded for launch with volumes sufficient to meet a launch day deorbit opportunity with payload bay doors (PLBDs) failed closed. Management of supply water will be accomplished through the use of the topping flash evaporator system (FES). Waste tank dumps will be performed as scheduled in the timeline.

### D. TEXT UPLINK SYSTEM

1. The Text and Graphics System (TAGS) is a high-resolution facsimile system that scans text or graphics material and converts the analog SCAN data into serial digital data. This data is transmitted via a telemetry link to the cathode-ray tube hardcopier. Transmission time for an 8-1/2 by 11-inch page can vary from just over 1 minute to just over 16 minutes depending on the hardcopy resolution desired. The TAGS can only uplink images using Ku-band. This Flight Plan assumes Ku-band forward link is available for both TDRS-E and TDRS-W, and TAGS is the primary mode of text uplink. Instrumentation has the capability to uplink onboard hardcopier control commands via S-band or Ku-band for power on, advance, ready, standby, and off.
2. The teleprinter (TPR) will provide a backup on-orbit capability to receive and reproduce text-only data from MCC. The TPR uses S-band and is not dependent on TDRS Ku-band. TPR requires 1 to 2.5 minutes per message, depending on the number of lines (up to 66). Activation will be scheduled during Post Insertion and the TPR will remain on continuously until deactivation prior to seat ingress on entry day.

### E. 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 are two video tape recorders available with 30-minute cassettes.
3. Three camera systems are available: 35mm, 16mm, and 70mm.

## F. PAYLOADS

### 1. Atmospheric Laboratory For Applications And Science Mission 1 (ATLAS-1)

The first ATLAS-1 is a NASA mission with an international payload, with the European Space Agency providing operational support for the European investigations. The ATLAS-1 represents the first of a series of shuttle-borne payloads which are intended to study the composition of the middle atmosphere and its possible variations due to solar changes over the course of an 11-year solar cycle. A first in this evolutionary program, the ATLAS-1 will carry a payload of instruments originally flown on the Spacelab-1 and Spacelab-3 missions. The ATLAS-1 mission therefore exploits the shuttle capability to return sophisticated instruments to the ground for refurbishment and updating, and the multi-mission reflight of the instruments at intervals required by the scientific goals. In addition to the investigations specific to the ATLAS-1 objectives, the first mission payload includes others that are intended to study or use the near Earth environment.

ATLAS-1 is a multidiscipline mission, comprising four broad areas of science: Atmospheric Physics, Solar Physics, Space Plasma Physics, and Astronomy. At present, the mission science payload comprises 12 investigations. These are located on the two pallets.

#### a. Atmospheric Physics

- (1) Atmospheric Trace Molecule Spectroscopy (ATMOS) will map trace molecules middle atmosphere by measuring the infrared radiation absorbed. During orbital sunrises and sunsets the sunlight that passes through the Earth's atmosphere will be recorded. The wavelengths of light will identify molecules and their locations.
- (2) Millimeter Wave Atmospheric Sounder (MAS) will perform simultaneous measurements of day/night concentrations of ozone, middle atmosphere temperature, and trace molecules involved in the creation/destruction of ozone.
- (3) Atmospheric Lyman Alpha Emissions (ALAE) will spectroscopically measure atomic hydrogen and deuterium in the terrestrial atmosphere in order to understand the evolution of atmospheres and their dynamics.
- (4) Grille Spectrometer (GRILLE) will study atmospheric composition between 15 km and 150 km on a global scale. High resolution infrared spectroscopy measurements are made primarily in solar occultation.
- (5) Imaging Spectrometric Observatory (ISO) will determine upper atmosphere photochemistry, composition of energetics, and stratospheric OH by emission spectroscopy. Measures airglow over a wavelength range extending from extreme ultraviolet to near infrared.
- (6) Energetic Neutral Atom Precipitation (ENAP) will measure faint emissions at nighttime arising from fluxes of energetic neutral atoms in the thermosphere. ENAP measurements will be made using the ISO hardware.

## b. Solar Physics

- (1) Active Cavity Radiometer (ACR) and Solar Constant (SOLCON) experiments will use precise instruments to measure ultraviolet light through infrared radiation. With slightly different techniques each experiment will determine a value for solar constant and the values will be compared. Instrument accuracy and solar variations will be determined.
- (2) Solar Spectrum (SOLSPEC) will measure ultraviolet through infrared solar radiation to determine how the amount of these energies change over time and where they are absorbed in the atmosphere.
- (3) Solar Ultraviolet Spectral Irradiance Monitor (SUSIM) will determine both long-term and short-term variation of the total ultraviolet flux emitted by the Sun.

## c. Space Plasma Physics

- (1) Atmospheric Emissions and Photometric Imaging (AEPI) will study selected atmospheric phenomena, together with natural and artificial auroras. It will utilize visible imaging with Z-axis gimballed photometer.
- (2) Space Experiments with Particle Accelerators (SEPAC) will carry out active experiments on Earth's ionosphere and magnetosphere including vehicle charge neutralization, beam plasma physics and beam-ionosphere interactions.

## d. Astronomy

Far Ultraviolet Space Telescope (FAUST) will observe faint astronomical sources in the far ultraviolet (extended and point sources).

## 2. Shuttle Solar Backscatter Ultraviolet (SSBUV/A)

The SSBUV program is designed to provide calibration of backscatter ultraviolet (UV) instruments being flown currently on free-flying satellites. The payload configuration consists of two canisters interconnected by cables mounted on a Get-Away Special (GAS) adapter beam. The canister containing the SSBUV spectrometer is equipped with a Motorized Door Assembly (MDA). The adjacent support canister contains data, command, and power systems. Crew interface is through a GAS Autonomous Payload Controller (GAPC) on the aft flight deck. After an outgassing period, the instrument will operate in three modes: Earth view, solar view, and calibration.

## 3. Space Tissue Loss (STL)

The objective of STL is to validate models of muscle, bone, and endothelial biochemical and functional loss induced by microgravity stress; to evaluate cytoskeleton, metabolism, membrane integrity and protease activity in target cells; and to test tissue loss pharmaceuticals for efficacy.

STL is stowed in a middeck locker with a modified locker door. A crewmember will initiate it when on orbit and prepare it for entry. The only other crew involvement would be to check occasionally for normal operating status and replace fuses if necessary.

4. Visual Function Tester-2 (VFT-2)

VFT-2 is a handheld battery-powered testing device the crew looks into to measure changes in a number of vision parameters affected by microgravity.

5. Radiation Monitoring Equipment III (RME-III)

The RME-III measures the radiation at different locations throughout the orbiter. The experiment contains a liquid crystal display (LCD) for real-time data display and a keyboard for controlling its functions.

6. CLOUDS-IA

Clouds IA consists of various photographic equipment which will be used on orbit to obtain photographic sequences of certain types of cloud fields of interest as specified preflight by the USAF/SD and to obtain photographic sequences of cloud fields over preflight specified ground target locations. The overhead or AFD windows may be used.

7. 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.

8. Investigations 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. With at least 24 hours remaining before entry the crew will activate the experiment and log the MET.

9. Get-Away Special (GAS) Canister

Attached cargo operations will be performed with the one GAS canister experiment. The lone GAS experiment, G229, is mounted on the port side of the orbiter payload bay, aft of the ATLAS payload.

G-229 is by GTE Laboratories Incorporated. The experiment will melt and regrow gallium arsenide crystals with convective effects absent.

9. Changes in the Endocrine Regulation of Orthostatic Tolerance Following Space Flight (DSO 613)

DSO 613 will characterize the extent and pattern of changes in plasma volume during space flight of up to 16 days duration. It will also determine whether resting levels of catecholamines are elevated immediately after flight, and whether catecholamine release in response to varying degrees of orthostatic and cardiovascular stresses is impaired after space flight. There are no on-orbit activities for this DSO.

10. The Effect of Prolonged Spaceflight on Head and Gaze Stability During Locomotion (DSO 614)

The purpose of DSO 614 is to characterize preflight and postflight head and body movement along with gaze stability during walking, running, and jumping, all of which are relevant to egress from the shuttle. There are no on-orbit activities for this DSO.

11. Education Activities (DSO 802)

The purpose of this DSO is to produce an educational video product with scenes recorded on orbit and on the ground. The crew will film several scenes on orbit using the camcorder.

12. Documentary Television (DSO 901)

This 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.

13. Documentary Motion Picture Photography (DSO 902)

This DSO 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.

14. Documentary Still Photography (DSO 903)

This DSO 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.

I. Timeline Formats

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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