

# **Flight Data File Crew Activity Plan 41-C (STS-13)**

**Mission Operations Directorate  
Operations Division**

**Final  
February 29, 1984**



**National Aeronautics and  
Space Administration**

**Lyndon B. Johnson Space Center  
Houston, Texas**

FLIGHT DATA FILE

CONTROL

Ascent Checklist

Post Insertion

Crew Activity Plan

Deorbit Prep

Entry Checklist

SUPPORT

Cue Cards Book

EVA Checklist

Flight Maps and Charts Book

Orbit Operations Checklist

Payload Deploy Checklist\*

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PDRS Operations Checklist\*

Photo/TV Checklist

Rendezvous/Proximity Operations\*

OFF-NOMINAL

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Orbit Pocket Checklist

Entry Pocket Checklist

Ascent/Entry Systems Procedures

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In-Flight Maintenance Checklist

Medical Checklist

Payload Systems Data and Malfunction Procedures\*

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REFERENCE

Data Processing System Dictionary

Reference Data

Systems Data

\*If required

MISSION OPERATIONS DIRECTORATE

41-C (STS-13) CREW ACTIVITY PLAN

FINAL  
February 29, 1984

PREPARED BY:

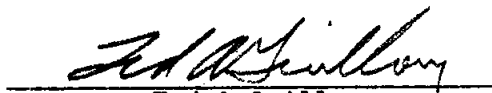


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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on standard JSC Form 482 to DH4/R. D. Snyder, Bldg 4, Rm 352, 713-483-2868.

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41-C Crew Activity Plan

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	TITLE	DATE	
	BASIC	12/05/83	
CAP(41C)-155	FINAL	02/29/84	
CAP(41C)-156	FINAL	02/29/84	
CAP(ALL)-157	DINAL	02/29/84	
CAP(T)-158	FINAL	02/29/84	
CAP(41C)-159	FINAL	02/29/84	
CAP(41C)-160	FINAL	02/29/84	
CAP(41C)-161	FINAL	02/29/84	
CAP(41C)-162	FINAL	02/29/84	
CAP(ALL)-163	FINAL	02/29/84	
CAP(41C)-164A	FINAL	02/29/84	
CAP(41C)-165A	FINAL	02/29/84	
CAP(ALL)-167	FINAL	02/29/84	
CAP(41C)-168	FINAL	02/29/84	
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FDF(ALL)-343	FINAL	02/29/84	
FDF(ALL)-321C	FINAL	02/29/84	
CAP(41B)-153	FINAL	02/29/84	

\*482 changes incorporated into current edition only are identified by change bars.

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A9.....	9-14	41-C/O/FIN
DAP A10.....	9-15	41-C/O/BAS
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DAP A11.....	9-15	41-C/O/BAS
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A12.....	9-16	41-C/O/BAS
DAP A13.....	9-16	41-C/O/BAS
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B1.....	9-17	41-C/O/BAS
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B5.....	9-19	41-C/O/BAS
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B6.....	9-20	41-C/O/FIN
DAP B7.....	9-20	41-C/O/BAS
B7.....	9-20	41-C/O/FIN
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B8.....	9-21	41-C/O/BAS
DAP B9.....	9-21	41-C/O/BAS
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## INTRODUCTION

41-C Crew Activity 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, Rendezvous, EVA, Deorbit Prep, and Entry Checklists. The PDRS OPS Checklist contains detailed procedures to activate and deploy the LDEF, and to release the SMM after it is repaired. The PDRS OPS Checklist also contains related IMAX and CINEMA 360 camera requirements. Additional IMAX and CINEMA 360 requirements reside in the Rendezvous book and EVA Checklist. The EVA Checklist contains the detailed procedures required for SMM repair including MFR, RMS, and MMU operations. The Rendezvous book contains the RMS procedures required until capture of the SMM. For continuity, the entire flight is shown in this book in the summary level timeline.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive (Ref. 1) and the requirements of the STS-13 Flight Requirements Document (Ref. 2).

The flight profile (Ref. 3) used for this Crew Activity Plan is for a launch date of April 4, 1984, 15:05 GMT.

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TIMELINE FORMAT SYMBOL NOMENCLATURE

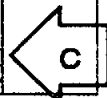
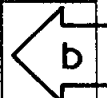
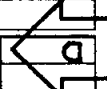
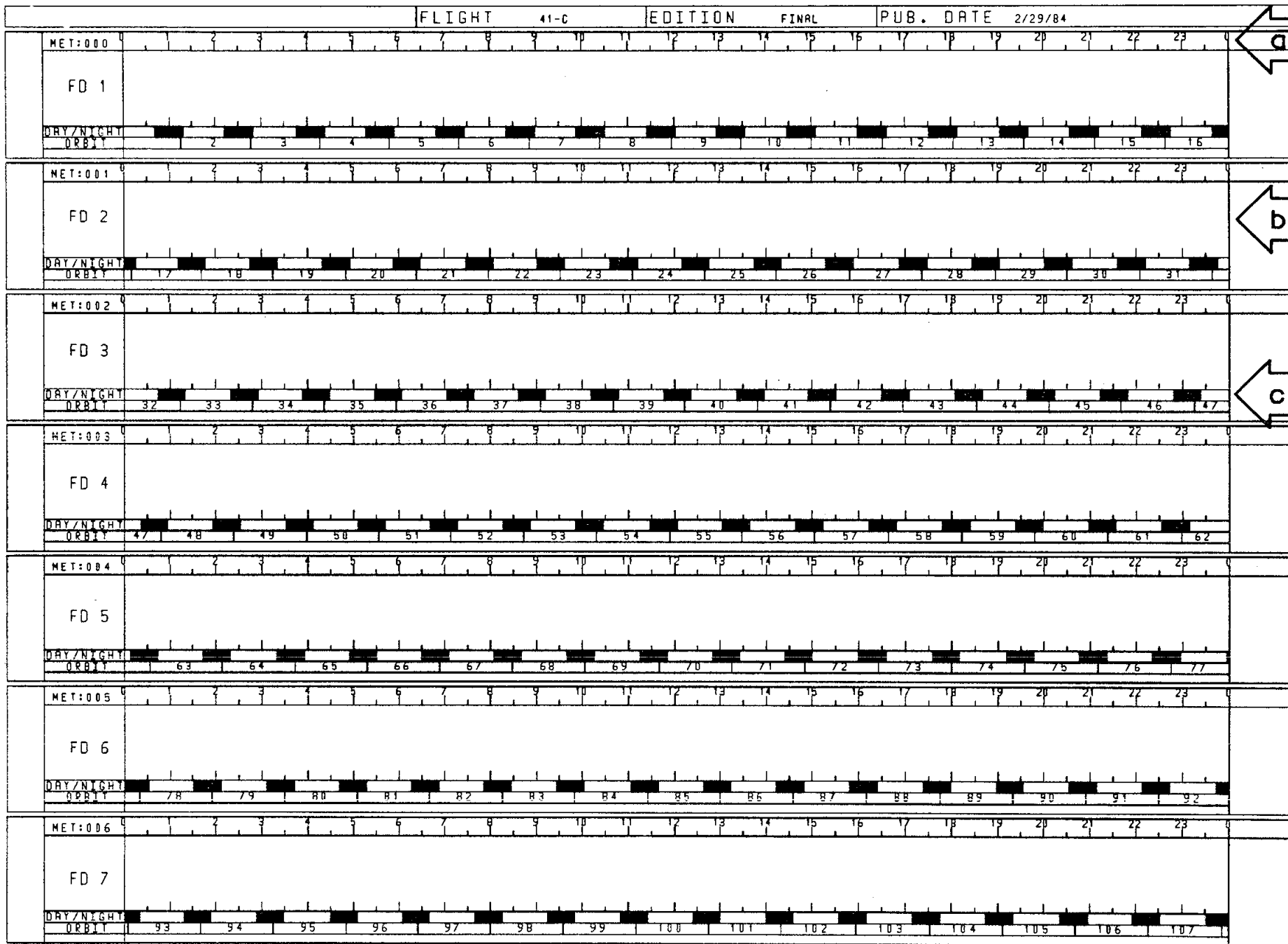


Figure 1-1 OVERVIEW  
1-2

## A. FORMAT SYMBOL NOMENCLATURE

### 1. Overview Timeline

The following letters (a-c) refer to those highlighted in Figure 1-1.

- a. **TIMESCALE** - The time reference used on this format is cumulative Mission Elapsed Time (MET) expressed in days and hours. MET is referenced to liftoff, which occurs at 0/00:00:00 (days, hours, minutes, seconds).
- b. **ACTIVITY COLUMN** - This column presents an overview of activities scheduled during the flight. For clarity of presentation, only major activities are presented, and activity durations are sometimes lengthened. Abbreviated activity titles can be found in the Abbreviations/Acronyms section of this CAP.
- c. **ORBIT and DAY/NIGHT**
  - 1) **Orbit** - Indicates which orbit the spacecraft is in by numerical sequence. The beginning of an orbit occurs when the orbiter crosses the Earth's equator going from the southern to the northern hemisphere (ascending node). The succession of orbits is numbered in this column starting with Orbit 1 for launch.
  - 2) **Day/Night** - The orbital day/night intervals are delineated with black bars indicating when the orbiter is in darkness.

### 2. Summary Level Timeline (12-Hr Timespan)

The following letters (a-f) refer to those highlighted in Figure 1-2.

- a. **TIMESCALES** - Two of three time references are presented in this section of the summary timeline format. The time references used are Time of Ignition minus (TIG), Greenwich Mean Time (GMT), and Mission Elapsed Time (MET). MET is referenced to liftoff, beginning at 0/00:00:00 (days, hours, minutes, seconds). TIG is referenced to the deorbit ignition time and counts down to 0/00:00:00 at ignition on the CRT timer. TIG is only used for the deorbit preparations on entry day.
- b. **CREWMAN (CDR, PLT, MS1, MS2, MS3)** - This is the crewman column of the format, where titles of scheduled activities are shown for the commander (CDR), pilot (PLT), and each mission specialist (MS1, MS2, MS3) at the appropriate times in the flight.



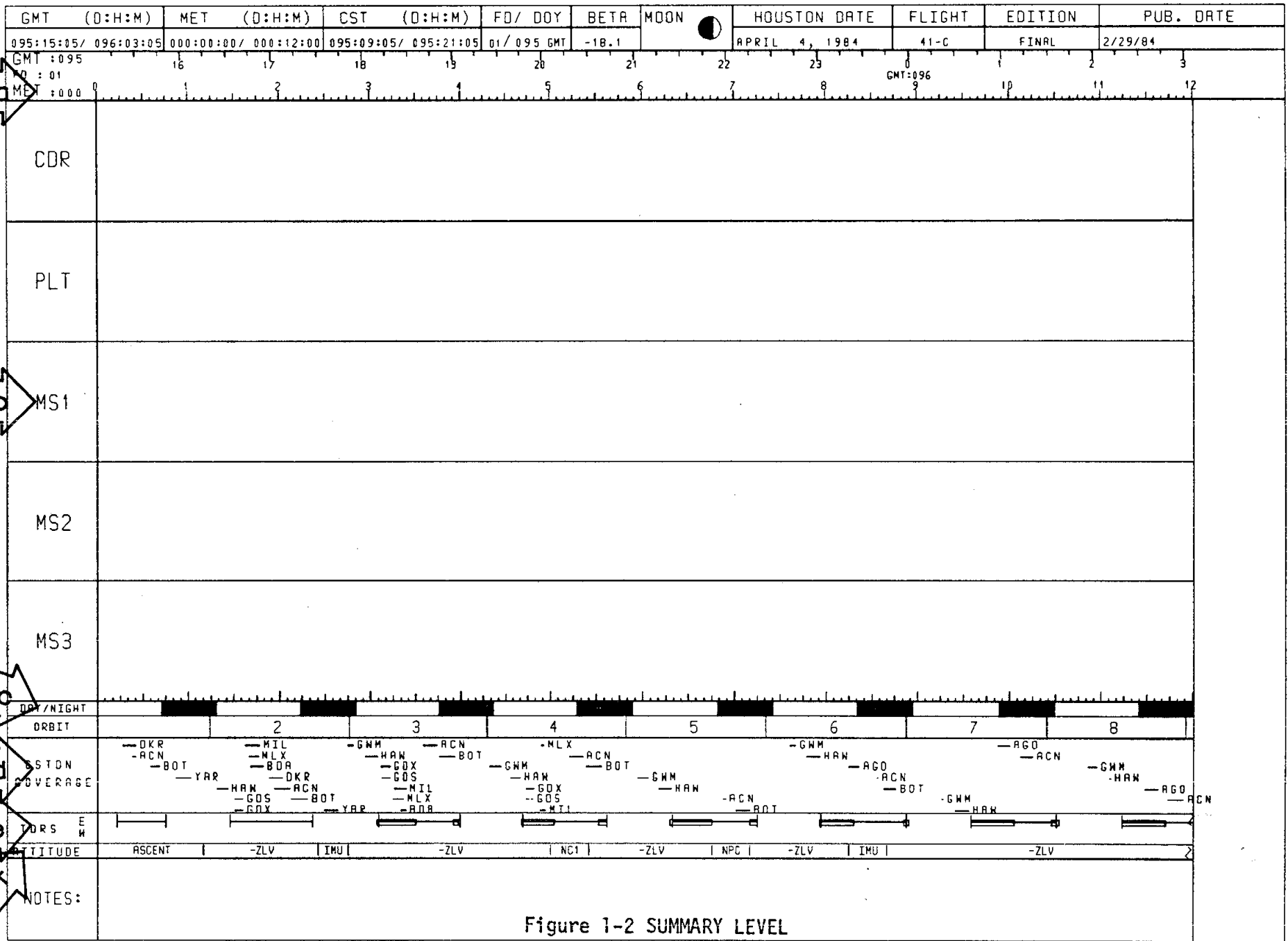


Figure 1-2 SUMMARY LEVEL

c. DAY/NIGHT and ORBIT

1) Day/Night - The orbital day/night intervals are delineated with black bars indicating when the orbiter is in darkness.

2) Orbit - Indicates which orbit the spacecraft is in by numerical sequence. The beginning of an orbit occurs when the orbiter crosses the Earth's equator going from the southern to the northern hemisphere (ascending node). The succession of orbits is numbered in this column starting with Orbit 1 for launch.

d. GSTDN COVERAGE - The GSTDN communication coverage periods are identified in this area with a horizontal line indicating when communication is available; the GSTDN site is identified to the right of the line.

e. TDRS - The TDRS communication coverage periods are identified in this area, with a horizontal line indicating when there is a line-of-sight between TDRS and the orbiter. The boxed areas indicate when there is Ku-Band communication which is based upon an unblocked line-of-sight between the Ku-Band antenna and TDRS.

f. ATTITUDE - The attitude of the vehicle (-ZLV, IMU, etc.) is shown in this column.

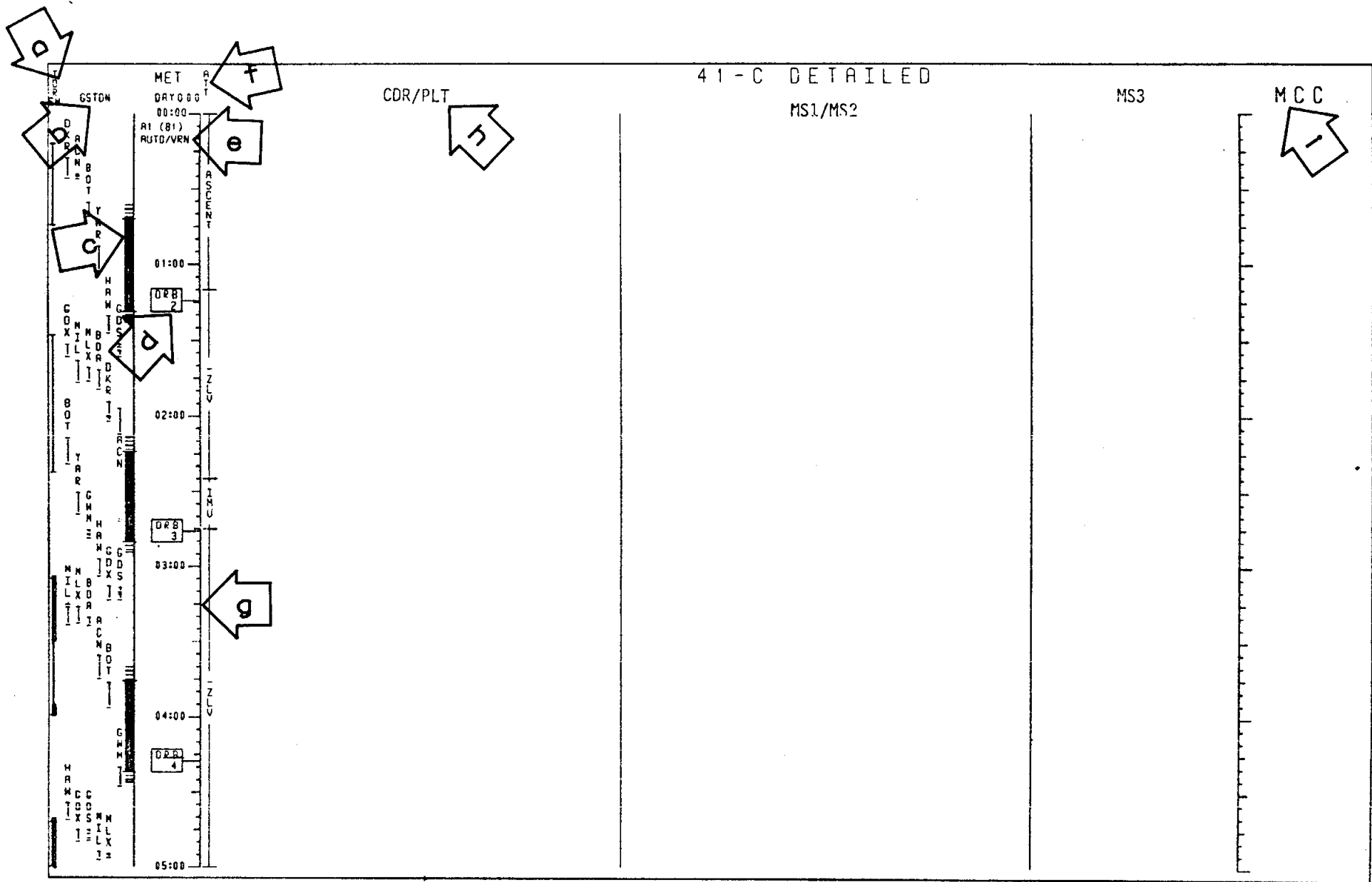


Figure 1-3 Detailed Level Timeline  
1-6

### 3. Detailed Level Timeline (5-Hr Timespan)

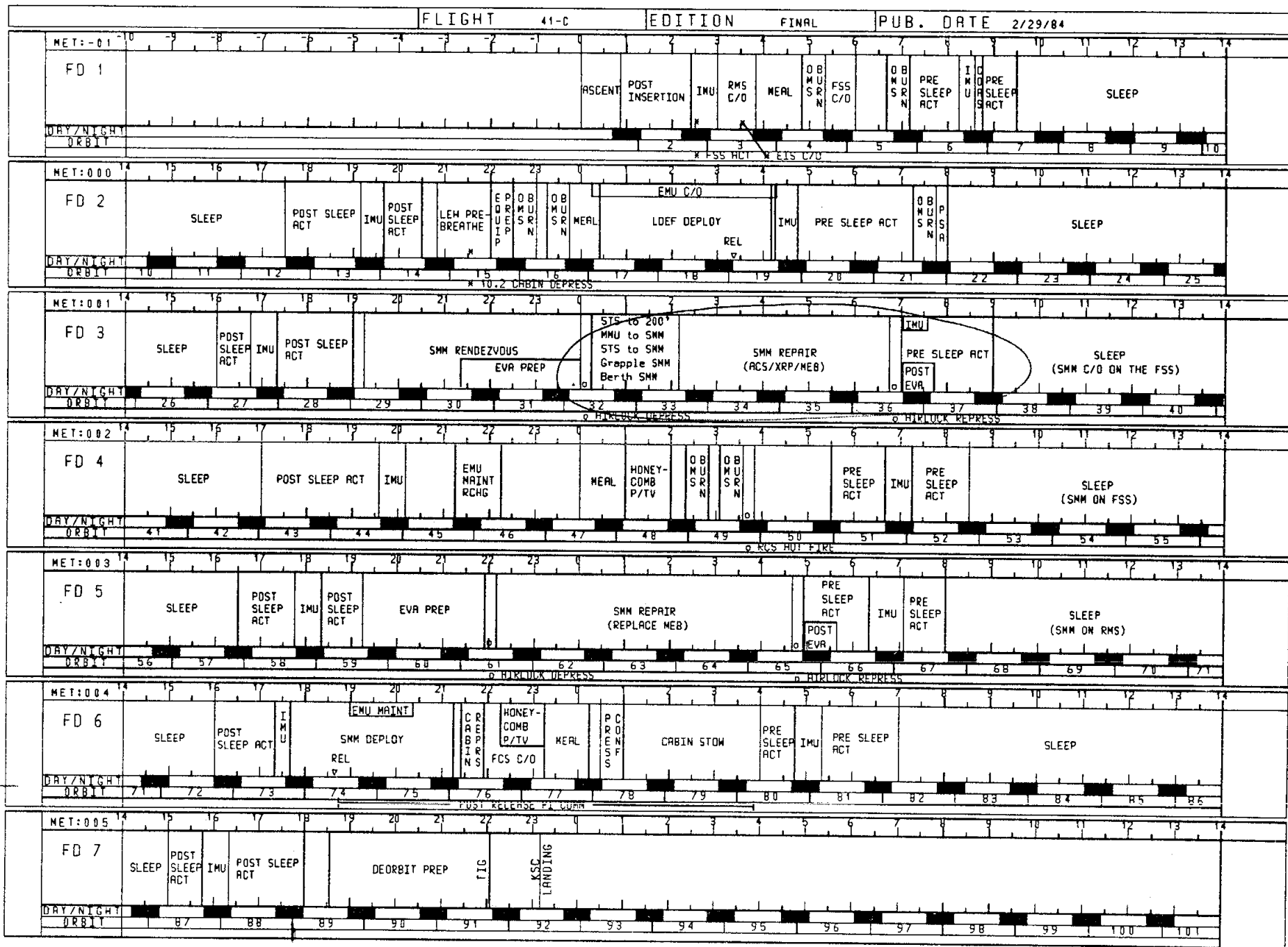
The following letters (a-i) refer to those highlighted in Figure 1-3.

- a. TDRS - The TDRS communication coverage periods are identified in this area, with a vertical line indicating when there is a line-of-sight between TDRS and the orbiter. The boxed areas indicate when there is Ku-Band communication which is based upon an unblocked line-of-sight between the Ku-Band antenna and TDRS.
- b. GSTDN COVERAGE - In this column the GSTDN sites and their acquisition periods are identified.
- c. DAY/NIGHT CYCLE - In this column a solid bar indicates the period when the orbiter and Earth are in darkness. A slashed line indicates when the orbiter is in daylight but the Earth beneath the orbiter is still in darkness (terminator).
- d. ORBIT - Indicates which orbit the spacecraft is in by numerical sequence. Orbit 1 begins at liftoff with subsequent orbits starting when the Earth's equator is crossed (ascending node).
- e. In the timescale a DAP A and DAP B CONFIG reference will be included. A number is associated with both DAPs A and B; each number indicates a particular DAP configuration; either DAP A or DAP B. The DAP reference without parentheses indicates the 'active' DAP for that time period on the page. Table 9-6 identifies the various configurations for DAP A and DAP B that are used.
- f. ATTITUDE - Indicates orbiter attitude.
- g. MET TIMESCALE - This format is a 5-hour format with 5-minute tick marks on the vertical timescale referenced to Mission Elapsed Time (MET) with liftoff occurring at 0/00:00:00.
- h. CREWMAN COLUMNS - The activities for the CDR, PLT, MS1, MS2 and MS3 are scheduled in this area.
- i. MCC COLUMN - Any uplinks, commands or updates required are scheduled at the appropriate time in this column. TV coverage is also identified in this column.

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41-C  
OVERVIEW

OVERVIEW



SUMMARY TIMELINE

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
095:15:05 / 096:03:05	000:00:00 / 000:12:00	095:09:05 / 095:21:05	01 / 095 GMT	-18.1	☾	APRIL 4, 1984	41-C	FINAL	2/29/84
GMT : 095							GMT: 096		
FD : 01									
MET : 000									
COR	POST INSERTION	UNSTOW CABIN	MEAL	DMS BURN NCI	PRE SLEEP ACT	DMS BURN NPC	PRE SLEEP ACT	PRE SLEEP ACT	SLEEP
PLT	POST INSERTION	UNSTOW CABIN	MEAL	DMS BURN	PRE SLEEP ACT	DMS BURN	PRE SLEEP ACT	PRE SLEEP ACT	SLEEP
MS1 LAUNCH (DIRECT INSERTION) OMS-2	POST INSERTION	RMS C/O	MEAL	UNSTOW CABIN			PRE SLEEP ACT		SLEEP
MS2	POST INSERTION	MEAL PREP UNSTOW CABIN	MEAL	FSS INSPECT			PRE SLEEP ACT		SLEEP
MS3	POST INSERTION	UNSTOW CABIN	MEAL	FSS C/O & POS			PRE SLEEP ACT		SLEEP
DAY/NIGHT	ORBIT	2	3	4	5	6	7	8	
BSTN COVERAGE	TDRS E	ATTITUDE	NOTES:						
-DKR -RCN	-BOT -YAR	-ZLV	-GWM -HAN -RCN -BOT	-MLX -RCN -BOT	-GWM -HAN -RCN -BOT	-GWM -HAN -RCN -BOT	-GWM -HAN -RCN -BOT	-GWM -HAN -RCN -BOT	-GWM -HAN -RCN -BOT
-MIL -MLX -BOR	-HAN -RCN -BOT	IMU	-ZLV	-ZLV	-ZLV	-ZLV	-ZLV	-ZLV	-ZLV
-GOS -GDX	-GOS -GDX	-ZLV, +XVV	-ZLV, +XVV	-ZLV, +XVV	-ZLV, +XVV	-ZLV, +XVV	-ZLV, +XVV	-ZLV, +XVV	-ZLV, +XVV
-TAR	-TAR	APU WTR DEACT	MOUNT EDAS-AFT	APU WTR RECONFIG	AFT STATION	-ZLV, +XVV			

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE								
096:03:05/ 096:15:05	000:12:00/ 001:00:00	095:21:05/ 096:09:05	02/ 096 GMT	-16.8		APRIL 4, 1984	41-C	FINAL	2/29/84								
GMT : 096																	
FD : 02																	
MET : 000																	
CDR	SLEEP					POST SLEEP ACT	IMU MNV R	ZLV MNV R	POST SLEEP ACT	HRM DEACT	10.2 CABIN DEPRESS	10.2 CABIN DEPRESS	OVS BURN NH1	OVS BURN NSR	MEAL		
PLT	SLEEP					POST SLEEP ACT			VISION ACUITY	10.2 CABIN DEPRESS	10.2 CABIN DEPRESS		OVS BURN	OVS BURN	ZLV MNV R		
MS1	SLEEP					POST SLEEP ACT			P/TV SETUP				MEAL PREP	P/TV ACT	MEAL		
MS2	SLEEP					POST SLEEP ACT			LEH PREBREATHE				EVA EQUIP PREP	VISION ACUITY	MEAL		
MS3	SLEEP					POST SLEEP ACT			LEH PREBREATHE				EVA EQUIP PREP	VISION ACUITY	MEAL		
DAY/NIGHT																	
ORBIT	9	10	11	12	13	14	15	16									
GSTON COVERAGE	-GMM	-AGO -RCH -DKR	-GMM	-DKR -MAD	-ORR	-YAR -ORR	-MAX -MIL -MLX -BDA -DKR -MAD	-YAR -ORR	-MLX -MIL -BDA -DKR	-YAR -ORR	-MIL -MLX -BDA -DKR	-YAR -ORR	-MIL -MLX -BDA -DKR	-YAR -ORR	-YAR -ORR		
TDRS E W																	
ATTITUDE	-ZLV					IMU					-ZLV					NHI	NSR
NOTES:	■ -ZLV, +XVU      ■ DSD 0408 NEAR VIS & CONTRAST      ■ -ZLV, +XVU ■ 010 602 CABIN ATMOSPHERE VERF      ■ DSD 0408 NEAR VIS & CONTRAST																

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
096:15:05/ 097:03:05	001:00:00/ 001:12:00	096:09:05/ 096:21:05	02/ 096 GMT	-15.4		APRIL 5, 1984	41-C	FINAL	2/29/84
GMT : 096	16	17	18	19	20	21	22	23	24
FD : 02									
MET : 001	0	2	3	4	5	6	7	8	12
CDR	MEAL	LDEF DEPLOY DPLY MNVR SEP	IMAX RELOAD	PRE SLEEP ACT	DMS BURN NC2	ZLV MNVR	SLEEP		
PLT	MEAL		IMU MNVR	ZLV MNVR	PRE SLEEP ACT	DMS BURN	PARCET SLEEP		
MS1	MEAL	LDEF DEPLOY REL	IMAX RELOAD	VACUITY	PRE SLEEP ACT		SLEEP		
MS2	MEAL	EMU C/O	H2O DUMP & CHRG	VACUITY	PRE SLEEP ACT		SLEEP		
MS3	MEAL	EMU C/O	H2O DUMP & CHRG	EXERCISE	PRE SLEEP ACT		SLEEP		
DAY/NIGHT	[Day/Night Cycle: Day from 0000 to 0600, Night from 0600 to 2400]								
ORBIT	17	18	19	20	21	22	23	24	
GSTDN COVERAGE	--HAN --ACN --MIL --GMM --BOT --GMM --HAN --AGO --AGD --GDS --BOT --YAR --MLX --BDA --GMM --HAN --GDS --ACN --ACN --BOT --GMM --HAN --AGD --MIL --GMM --DKR --GDS --GDX --GDX --GDS --ACN --BOT --GMM --HAN --AGD --MLX --BDA --HAN --GDS --BOT --MIL --MLX --ACN --BOT --GMM --HAN --AGD --DKR --GDX --YAR --ACN --BOT --ACN --BOT --GMM --HAN --AGD								
TDRS	[Timeline of TDRS events: -ZLV, FREE DRIFT, LDEF DPLY, LDEF TRACK, IMU, -ZLV, NC2, -ZLV]								
ATTITUDE	[Timeline of Attitude: -ZLV, FREE DRIFT, LDEF DPLY, LDEF TRACK, IMU, -ZLV, NC2, -ZLV]								
NOTES:	* DTO 501 MAX VOL/HGT P/L HANDLING DTO 762 DRB-RMS DYN INTERACTION @ -ZLV, +XVV @ DSO 0408 NEAR VIS & CONTRAST @ -ZLV, +XVV								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
097:03:05 / 097:15:05	001:12:00 / 002:00:00	096:21:05 / 097:09:05	03 / 097 GMT	-14.0		APRIL 5, 1984	41-C	FINAL	2/29/84	
GMT: 097 FD: 03 MET: 001										
CDR	SLEEP	POST SLEEP ACT	SLEEP	POST SLEEP ACT	RENDEZVOUS	NH2    NC3    NCC    TI M C M M M C C C C 1 2 3 4 TO VBAR				
PLT	SLEEP	POST SLEEP ACT	EXERCISE	EVA PREP	VTR P SETUP					
MS1	SLEEP	POST SLEEP ACT	RENDEZVOUS	*						
MS2	SLEEP	POST SLEEP ACT	P/TV SETUP & ACT	EVA PREP	P R E P A R E					
MS3	SLEEP	POST SLEEP ACT	P/TV SETUP & ACT	EVA PREP	E A T H E					
DAY/NIGHT										
ORBIT	24	25	26	27	28	29	30	31	32	
GSTDN COVERAGE	-AGC -ACN -DKR	-GWN	-AGC -DKR -ACN	-DKR -MAD -MAX	-MAX -YAR -ORR	-MAD -MAX -YAR -ORR	-DKR -MAD -MAX -YAR -ORR	-MIL -MLX -BDA -DKR -ACN -BOT	-ORR	-H -GDS -GDX
TORS E M										
ATTITUDE	-ZLV		IMU	-ZLV		SMM TRK   NH2   LVLH   NC3	SMM TRK	TI	SMM TRK	2
NOTES:	* DTD B13 SMM RENDEZVOUS SYSTEMS PERFORMANCE									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
097:15:05 / 098:03:05	002:00:00 / 002:12:00	097:09:05 / 097:21:05	03 / 097 GMT	-12.4		APRIL 6, 1984	41-C	FINAL	2/29/84
GMT : 057	16	17	18	19	20	21	22	23	24
FD : 03								GMT:098	
MET : 002	0	1	2	3	4	5	6	7	8
CDR	200 FT RENDEZVOUS PROX OPS					LOAD P T M N V R T R K			
PLT									
MS1	RENDEZVOUS								
MS2									
MS3									
DAY/NIGHT									
ORBIT	32	33	34	35	36	37	38	39	
GSTDN COVERAGE	GDS BOT GDX MIL BDA MLX DKR ACN	YAR GMM HAW GDS GDX BOT MTI	MLX BDA ACN BOT YAR GMM ACN	HAW GDS GDX MIL MLX	GMM HAW GDX GDS ACN BOT	HAW GDX GDS ACN BOT	RCN BOT GMM HAW ACN	RCN BOT GMM HAW ACN	RCN BOT GMM
TORS									
ATTITUDE	-XLV	IAH	TORS TRK	-ZLV	TORS TRK	IHU	TORS TRK		
NOTES:	* DTD 612 MMU DEMO								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
098:03:05 / 098:15:05	002:12:00 / 003:00:00	097:21:05 / 098:09:05	04 / 098 GMT	-10.9		APRIL 6, 1984	41-C	FINAL	2/29/84	
GMT : 098 FD : 04 MET : 002										
CDR	SLEEP		POST SLEEP ACT	Z S I M N V R		I M U M N V R	IMAX RELOAD	VISION ACUITY	EXERCISE	IMAX OPS
PLT	SLEEP		POST SLEEP ACT			R C S I R E E D	EXERCISE	VISION ACUITY	Z L V M N V R	LOAD P C N N U IMAX OPS
MS1	SLEEP		POST SLEEP ACT			V A C S U I O T N Y	IMAX RELOAD	A I R S A M P	V T R S E T U P	M E A L P R E P IMAX OPS
MS2	SLEEP		POST SLEEP ACT			V A C S U I O T N Y	VISION ACUITY	P/TV S E T U P & A C T	E M U M A I N T / R E C H A R G E	G A P M E A S IMAX OPS
MS3	SLEEP		POST SLEEP ACT				VISION ACUITY	P/TV S E T U P & A C T	E M U M A I N T / R E C H A R G E	G A P M E A S IMAX S E T U P IMAX OPS
DAY/NIGHT										
ORBIT	40	41	42	43	44	45	46	47		
GSTDN COVERAGE	RGD -ACN -DKR	-GMM	-DKR -MAD -MAX	-MAD -MAX	-YAR -ORR	-DKR -MAD -MAX	-BDR -DKR -MAD -MAX	-GDS -MIL -MLX -BDR	-YAR -ORR	-YAR -ORR -GDX -ACT
TDRS E										
ATTITUDE	TDRS TRK			BIASED -ZSI			IMU	TDRS TRK		-ZLV
NOTES:	* DSD 0408 NEAR VIS & CONTRAST * DTD 602 CABIN ATMOSPHERE VERF * DTD 321 CREW COMPARTMENT STRUCTURE DEFLECTION									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
098:15:05 / 099:03:05	003:00:00 / 003:12:00	098:09:05 / 098:21:05	04 / 098 GMT	-9.2		APRIL 7, 1984	41-C	FINAL	2/29/84				
GMT: 098	16	17	18	19	20	21	22	23	0	1	2	3	
FD: 04									GMT: 099				
MET: 003	0	1	2	3	4	5	6	7	8	9	10	11	12
CDR	MEAL		OMS BURN REBOOST-1	OMS BURN REBOOST-2	RCS HD 2 FIRRE	IMAX RELOAD		PRE SLEEP ACT		IMU MNV R	ZLV MNV R	PRE SLEEP ACT	SLEEP
PLT	MEAL		OMS BURN	OMS BURN	RCS HD T FIRRE	ZLV MNV R	P/TV SETUP	PRE SLEEP ACT		P/TV SLEEP	FC PURGE PRE SLEEP ACT	PRE SLEEP ACT	SLEEP
MS1	MEAL		EXERCISE			IMAX RELOAD		PRE SLEEP ACT					SLEEP
MS2	MEAL	HONEYCOMB P/TV			ALIGN MARKS	EXERCISE	TAPE MEAS	PRE SLEEP ACT					SLEEP
MS3	MEAL	HONEYCOMB P/TV			EXERCISE		TAPE MEAS	PRE SLEEP ACT					SLEEP
DAY/NIGHT													
ORBIT	47	48	49	50	51	52	53	54					
GSTDN COVERAGE	DKR RCN BOT	GDX MIL MLX BDA GMM HAW GDS	GMM HAW GDS GDX MIL MLX	RCN BOT	RCN BOT	GMM HAW GDS	GMM HAW RCN BOT	RCN BOT	GMM HAW RCN BOT	RCN BOT	GMM HAW RCN BOT	GMM HAW RCN BOT	RCN DKR
TDRS E W													
ATTITUDE	-ZLV   RBST1   RBST2   RCS   -ZLV   IMU   -ZLV												
NOTES:	<ul style="list-style-type: none"> <li>⊙ -ZLV, +XVV</li> <li>⊙ DTD 321 CREW COMPARTMENT STRUCTURE DEFLECTION</li> <li>⊙ DTD 321 CREW COMPARTMENT STRUCTURE DEFLECTION</li> <li>⊙ FC PURGE HTR ON</li> <li>⊙ MANUAL</li> <li>⊙ -ZLV, +XVV</li> <li>⊙ FC PURGE HTR OFF</li> </ul>												

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
099:03:05 / 099:15:05	003:12:00 / 004:00:00	098:21:05 / 099:09:05	05 / 099 GMT	-7.5		APRIL 7, 1984	41-C	FINAL	2/29/84
GMT : 099									
FD : 05			FD : 05						
MET : 003									
CDR	SLEEP		POST SLEEP ACT						
PLT	SLEEP		POST SLEEP ACT						
MS1	SLEEP		POST SLEEP ACT						
MS2	SLEEP		POST SLEEP ACT						
MS3	SLEEP		POST SLEEP ACT						
DAY/NIGHT									
ORBIT	55	56	57	58	59	60	61	62	
GSTDN COVERAGE	-GMM	-AGO -DKR -ACN -MAD	-MAD -MAX -YAR -ORR	-MAD -MAX -YAR -ORR	-DKR -MAD -MAX -YAR -ORR	-BDR -DKR -MAD -MAX -YAR -ORR	-GOS -CDX -MIL -BDR -MLX -YAR -ORR	-BOT -YAR -ORR -HAW -DKR -ACN	-BDA -MLX -DKR -ACN -BOT
TORS E M									
ATTITUDE		-ZLV		IMU			-ZLV		
NOTES:					3 -ZLV, +XV				



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE		
099:15:05 / 100:03:05	004:00:00 / 004:12:00	099:09:05 / 099:21:05	05 / 099 GMT	-5.7		APRIL 8, 1984	41-C	FINAL	2/29/84		
GMT : 099	16	17	18	19	20	21	22	23	24		
FD : 05											
MET : 004	0	1	2	3	4	5	6	7	8		
CDR						INAX RELOAD	PRE SLEEP ACT	IMU MNVR	SMM XSI MNVR	PRE SLEEP ACT	SLEEP
PLT		EVA SUPPORT				ARRIVAL	POST EVA			PRE SLEEP ACT	SLEEP
MS1		EVA SUPPORT (RMS/MFR OPS)				ARRIVAL	INAX RELOAD			PRE SLEEP ACT	SLEEP
MS2		EVA				ARRIVAL	POST EVA			PRE SLEEP ACT	SLEEP
MS3		EVA				ARRIVAL	POST EVA			PRE SLEEP ACT	SLEEP
DAY/NIGHT											
ORBIT	62	63	64	65	66	67	68	69	70		
HOUSTON COVERAGE	BOT YAR GMM MLX BDA ACN GDS GOX NTI	YAR GMM ACN BOT	YAR GMM ACN BOT	YAR GMM ACN BOT	YAR GMM ACN BOT	YAR GMM ACN BOT	YAR GMM ACN BOT	YAR GMM ACN BOT	YAR GMM ACN BOT		
TORS											
ATTITUDE	-ZLV	TORS TRK		SMM +XSI		IMU		SMM +XSI			
NOTES:	* RMS PWR & BRAKES STAY ON UNTIL RELEASE										

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE		
100:03:05/ 100:15:05	004:12:00/ 005:00:00	099:21:05/ 100:09:05	06/ 100 GMT	-3.9		APRIL 8, 1984	41-C	FINAL	2/29/84		
GMT :100											
FD :06											
MET :004											
CDR	SLEEP	POST SLEEP ACT			SMM DEPLOY			14.7 CABIN REPRESS	FCS C/O	MEAL	
					DPLY MNVR		SEP SEP				
PLT	SLEEP	POST SLEEP ACT			P/TV SETUP & ACT	POST SLEEP ACT		14.7 CABIN REPRESS	FCS C/O	MEAL	
					IMU						
MS1	SLEEP	POST SLEEP ACT			SMM DEPLOY				IMAX STON	MEAL PREP	MEAL
					REL						
MS2	SLEEP	POST SLEEP ACT			P/TV SETUP & ACT	POST SLEEP ACT	EMU MAINT/RECHARGE	POST EVA ENT PREP	EXERCISE	HONEYCOMB P/TV	MEAL
MS3	SLEEP	POST SLEEP ACT			P/TV SETUP & ACT	POST SLEEP ACT	EMU MAINT/RECHARGE	POST EVA ENT PREP	EXERCISE	HONEYCOMB P/TV	MEAL
DAY/NIGHT											
ORBIT	70	71	72	73	74	75	76	77			
GSTDN COVERAGE	-GMM	-ACO -DKR -ACN -MAD -MAX	-DKR -MAD -MAX	-BDA -DKR -MAD -MAX	-MLX -BDA -DKR -MAX -MAD	-MIL -MLX -BDA -DKR -MAD	-HAW -ACN -BOT -YAR	-BDA -MLX -DKR -ACN -BOT			
TORS E M											
ATTITUDE	SMM +XSI			IMU	SMM RLSE	+XLV	SEP	-XLV			
NOTES:	• DTD 602 CABIN ATMOSPHERE VERF • APU HTR ACT										

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
100:15:05/ 101:03:05		005:00:00/ 005:12:00		100:09:05/ 100:21:05		06 / 100 GMT	-2.1		APRIL 9, 1984	41-C	FINAL	2/29/84

GMT: 100  
 FD: 06  
 MET: 005

	0	1	2	3	4	5	6	7	8	9	10	11	12	
CDR	M E A L C O R T	C A B I N S T O W	P R E S S C O N F	L A N P P / S S K K K E	H R M D E A C T	C A B I N S T O W	E X E R C I S E	C A B I N S T O W	P R E S L E E P A C T	I M U M N V R	I M U A L I G N	Z L V M N V R	P R E S L E E P A C T	S L E E P
PLT	M E A L C O R T	C A B I N S T O W	P R E S S C O N F	L A N P P / S S K K K E	C A B I N S T O W	E X E R C I S E	C A B I N S T O W	L O A D P C M M U	P R E S L E E P A C T				P R E S L E E P A C T	S L E E P
MS1	M E A L	P R E S S C O N F		E X E R C I S E		C A B I N S T O W			P R E S L E E P A C T				P R E S L E E P A C T	S L E E P
MS2	M E A L	V A C U I T I O N	P R E S S C O N F	V A C U I T I O N		C A B I N S T O W			P R E S L E E P A C T				P R E S L E E P A C T	S L E E P
MS3	M E A L	V A C U I T I O N	P R E S S C O N F	V A C U I T I O N		C A B I N S T O W	E X E R C I S E		P R E S L E E P A C T				P R E S L E E P A C T	S L E E P

DAY/NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT	DAY	NIGHT
ORBIT														
GSTON COVERAGE	YAR GMM	BOR ACN	YAR GMM	GOS GMM	MIL GMM	MLX GMM	YAR GMM	ACN GMM	BOT GMM	YAR GMM	ACN GMM	BOT GMM	YAR GMM	ACN GMM
TDRS														
ATTITUDE														

NOTES:  
 ■ DSO 0408 NEAR VIS & CONTRAST  
 ■ -ZLV, +XUV

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
101:03:05/ 101:15:05	005:12:00/ 006:00:00	100:21:05/ 101:09:05	07/ 101 GMT	0.3	☉	APRIL 9, 1984	41-C	FINAL	2/29/84
TIG FO : 07 MET : 005 12 13 14 15 16 17 18 19 20 21 22 23 0									
CDR	SLEEP	POST SLEEP ACT	IMU XSI POST SLEEP ACT	POST SLEEP ACT	POST SLEEP ACT	PLBD OPS	DEORBIT PREP		
PLT	SLEEP	POST SLEEP ACT			PLBD OPS	DEORBIT PREP			KSC LANDING (5/23:12:00)
MS1	SLEEP	POST SLEEP ACT			DEORBIT BURN	ENTRY INTERFACE			
MS2	SLEEP	POST SLEEP ACT			DEORBIT PREP				
MS3	SLEEP	POST SLEEP ACT			DEORBIT PREP				
DAY/NIGHT	[Day/Night Cycle]								
ORBIT	85	86	87	88	89	90	91	92	
GSTON COVERAGE	GWH -AGG -DKR -MAD -MAX		MAX YAR -ORR	MAD MAX YAR -ORR	DKR MAD MAX	MLX BDA DKR	YAR -ORR	GDX MIL BDA MLX DKR HAW ACN GDS BOT	YAR
TDRS	E M		DKR MAD	MLX MIL BDA DKR	MIL MLX BDA	GDX MIL	YAR -ORR HAW ACN GDS BOT	MIL MLX BDA	
ATTITUDE	-ZLV		[IMU]	-XSI		[IMU]	DEORBIT	ENTRY	
NOTES:	◻ HI LOAD HTR ON    ◻ FES CNTLR CHECK								

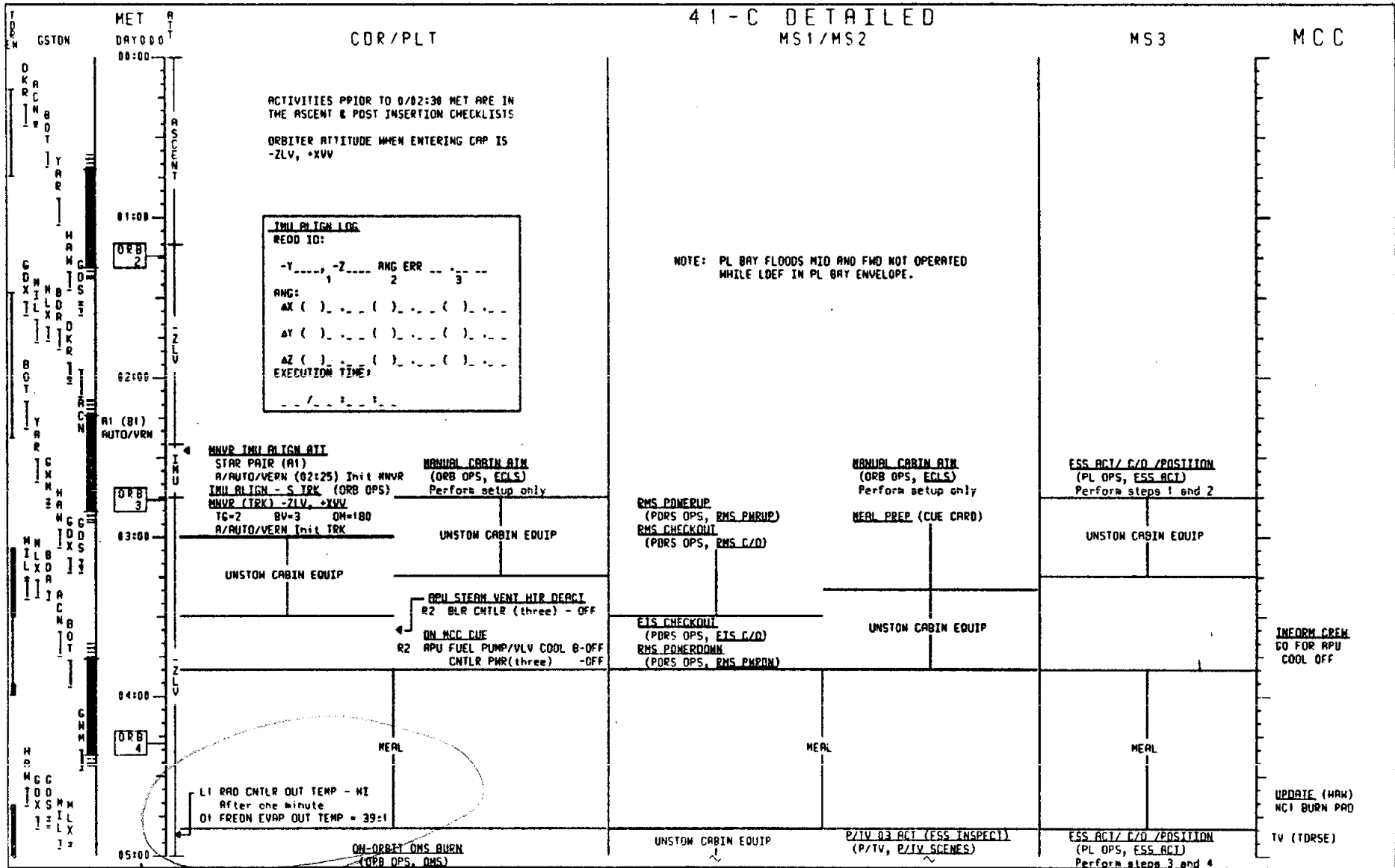
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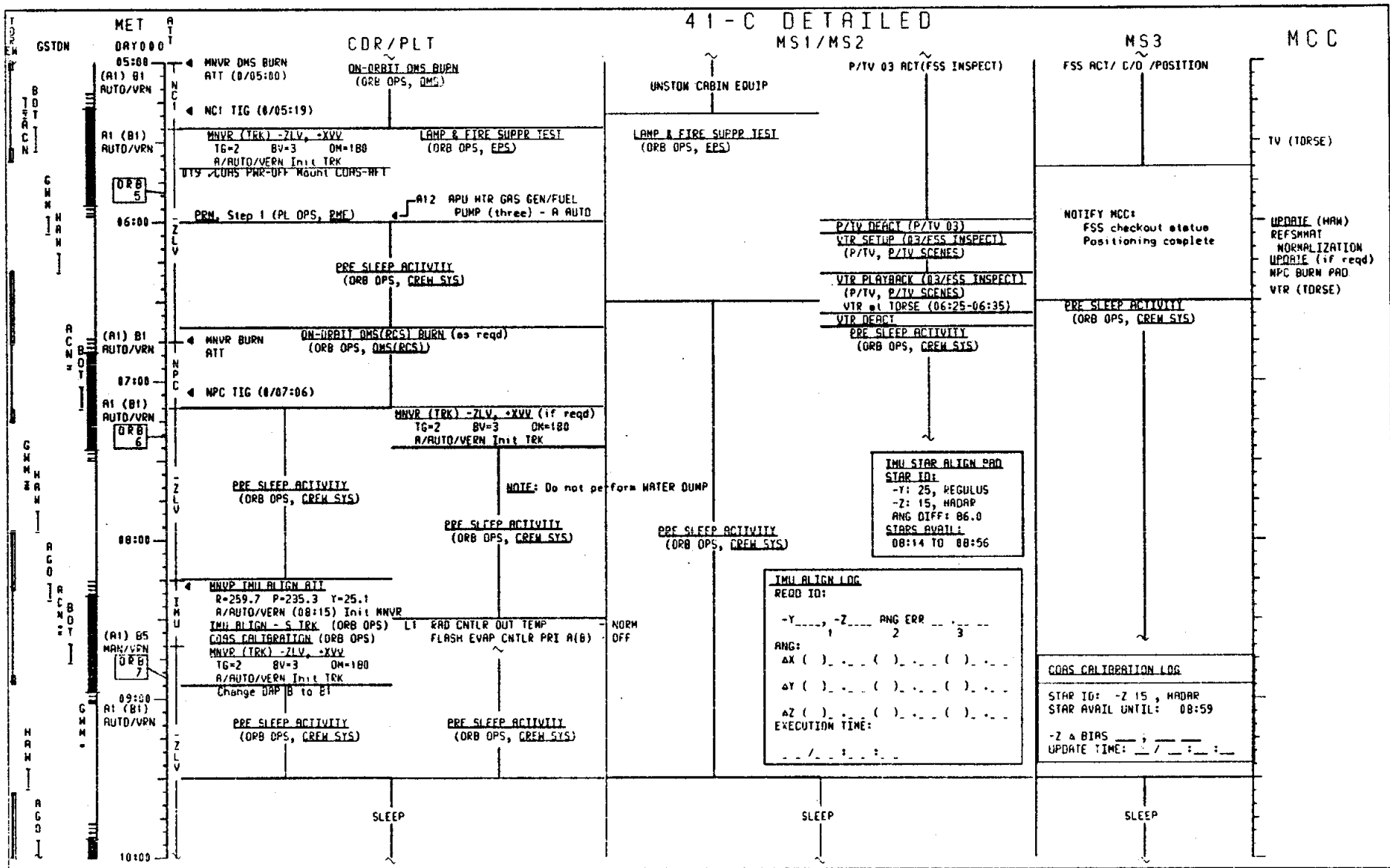
DETAILED  
TIMELINE

DETAILED TIMELINE

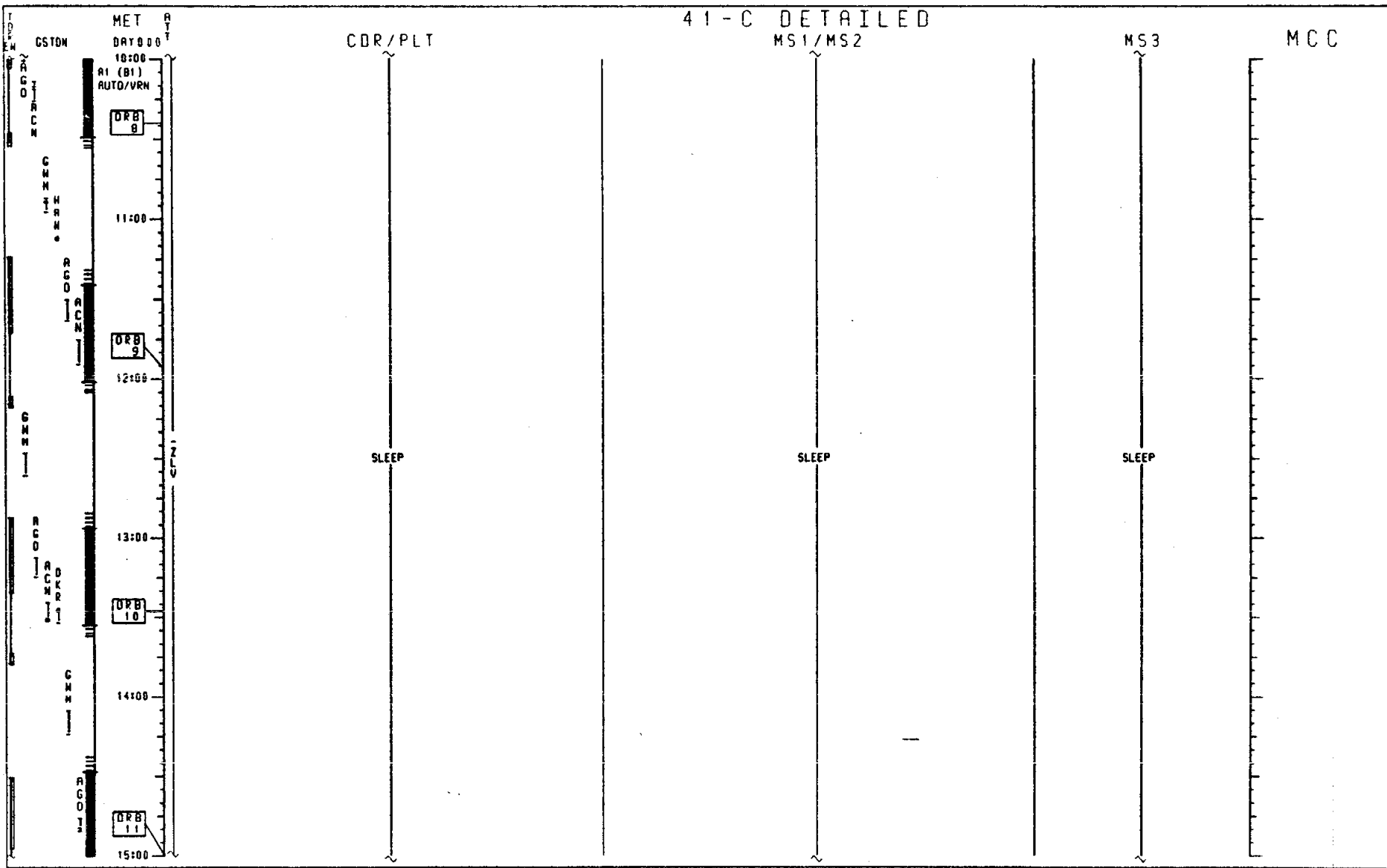
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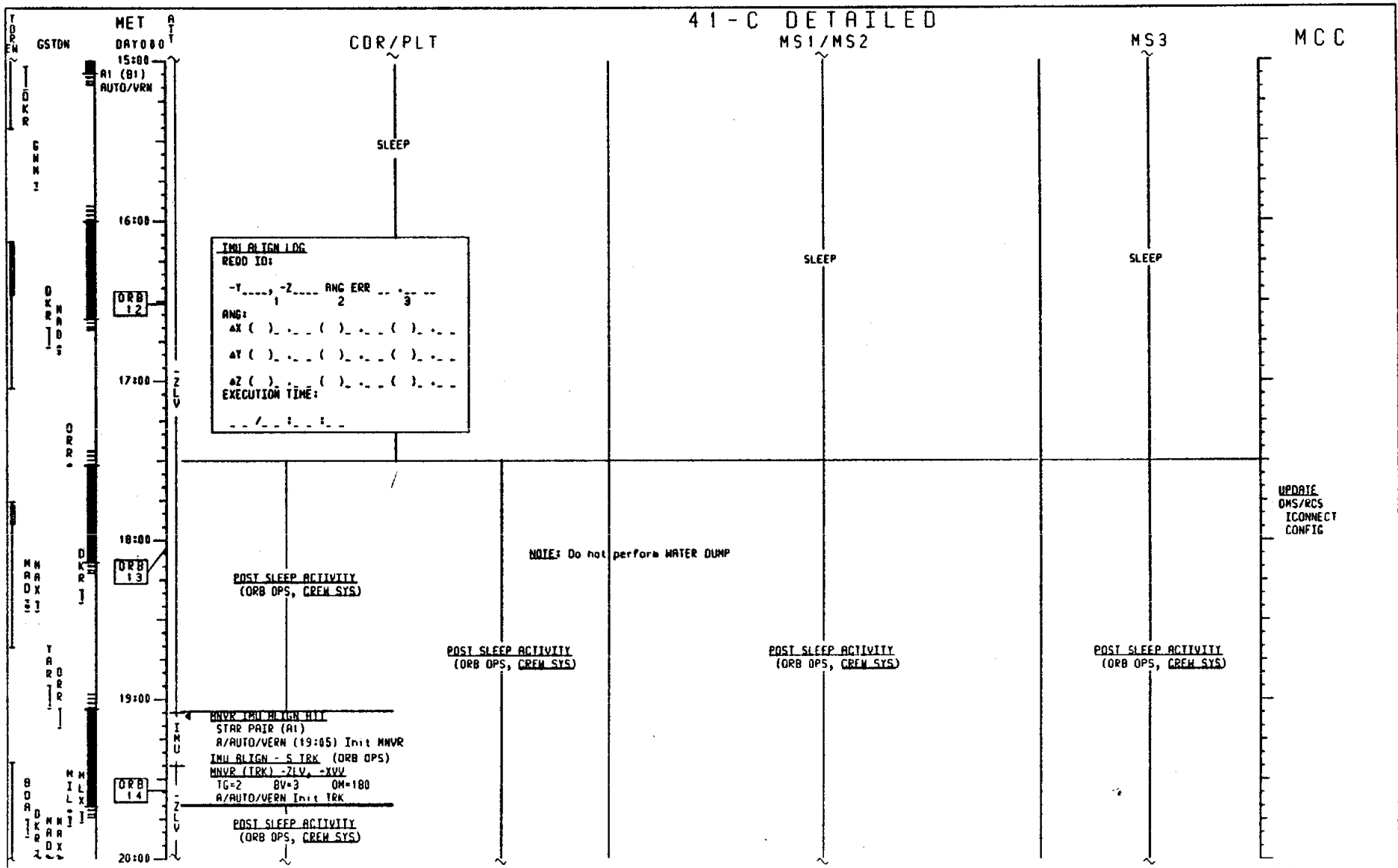
41-C DETAILED  
MS1/MS2

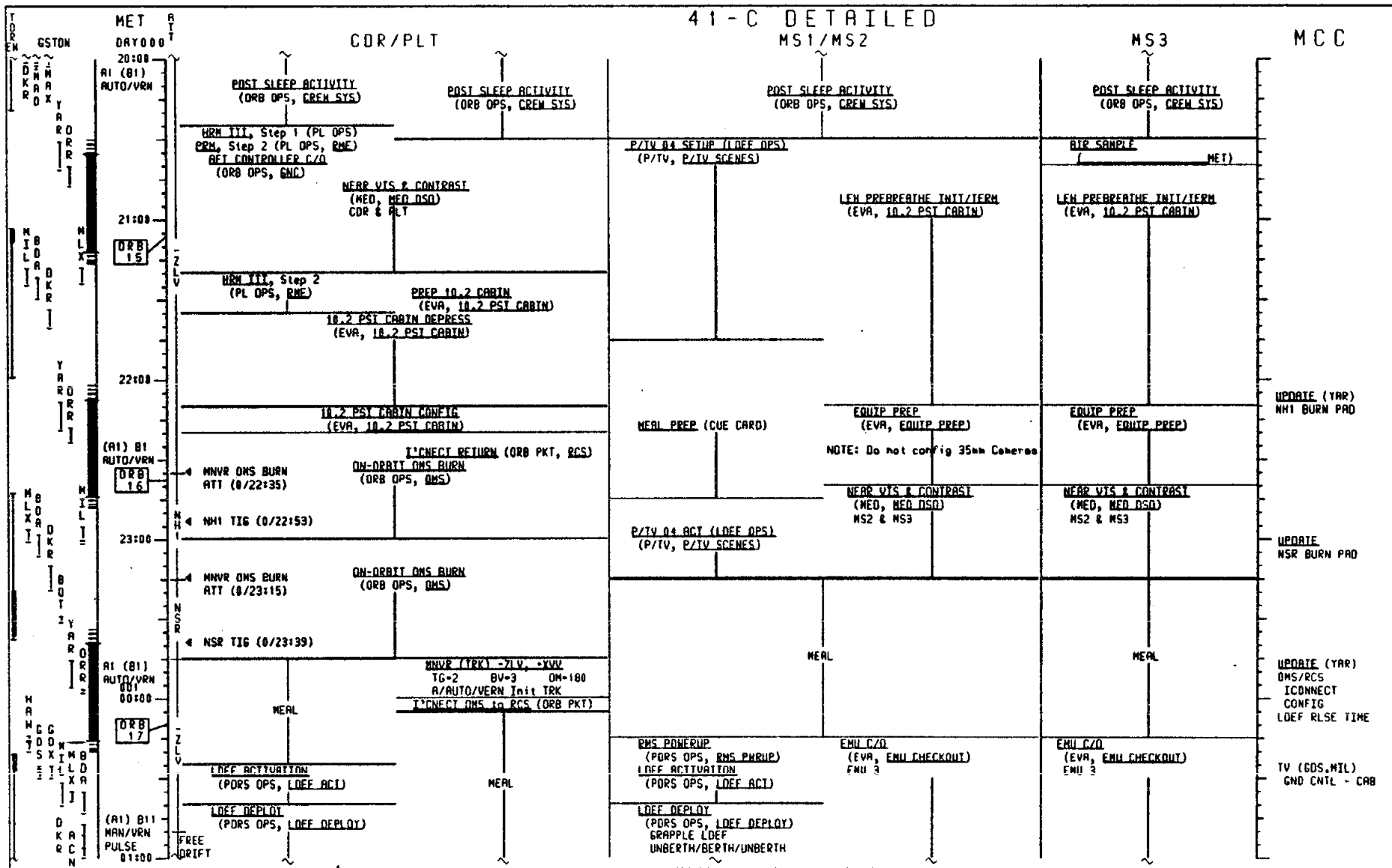


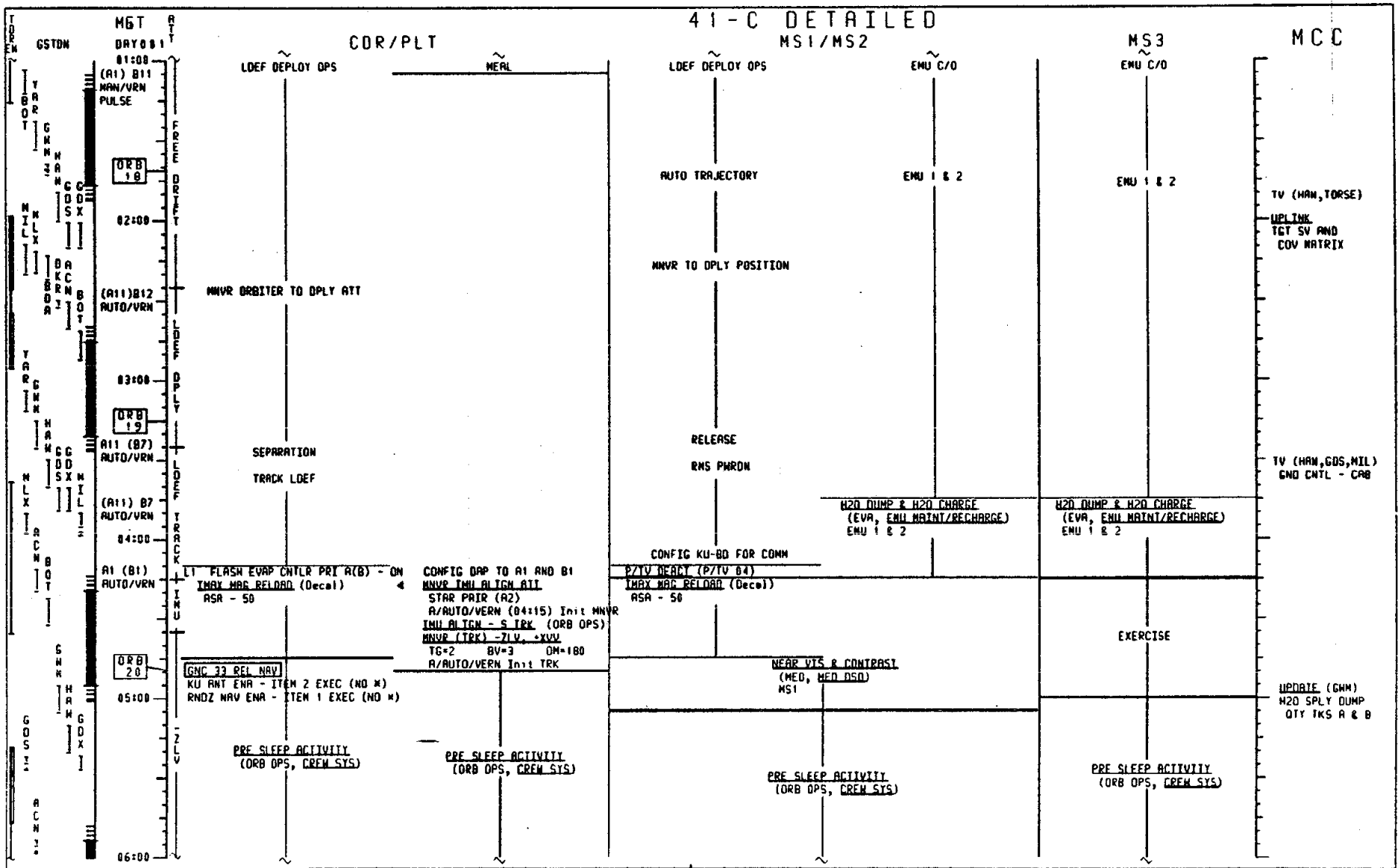


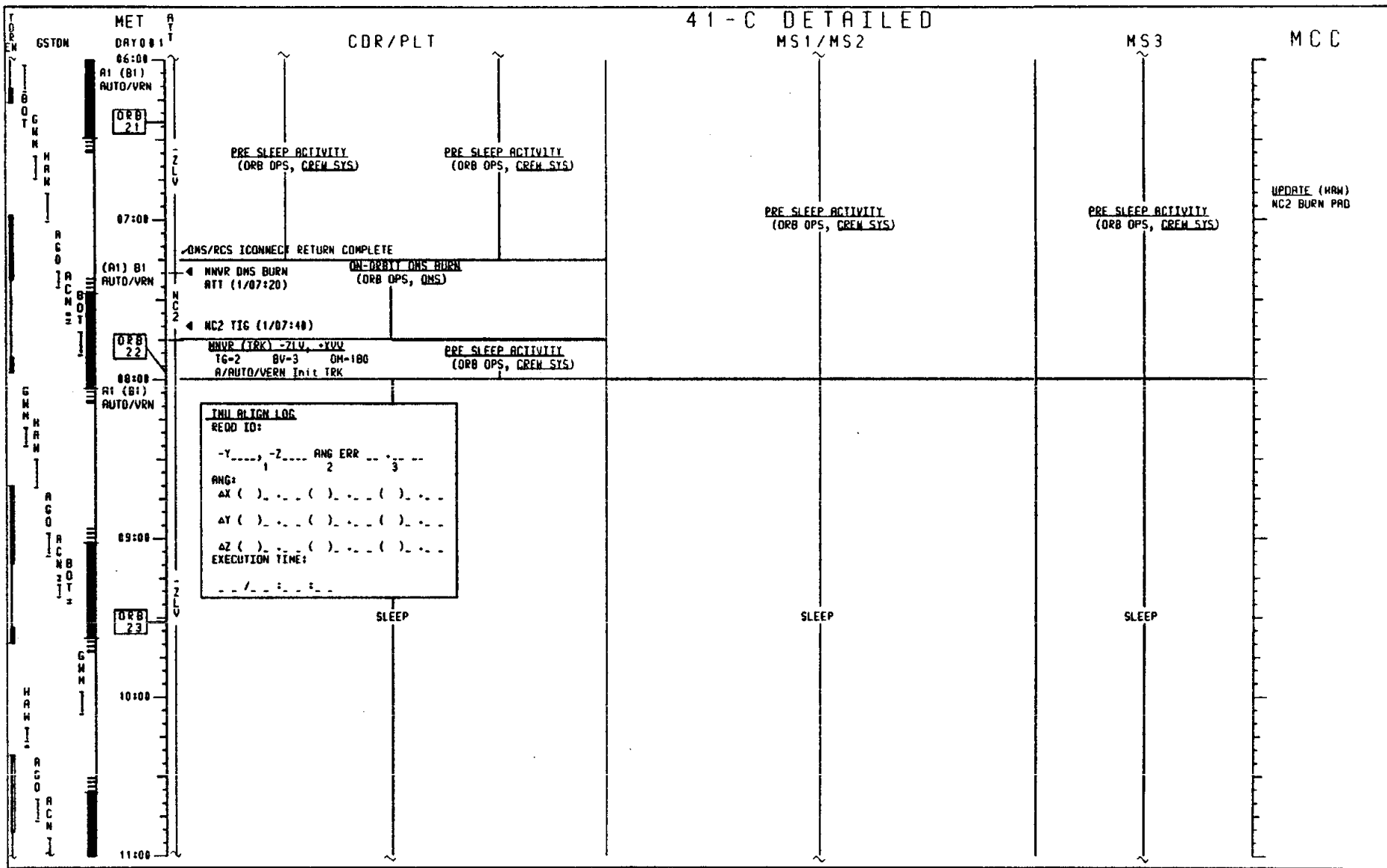




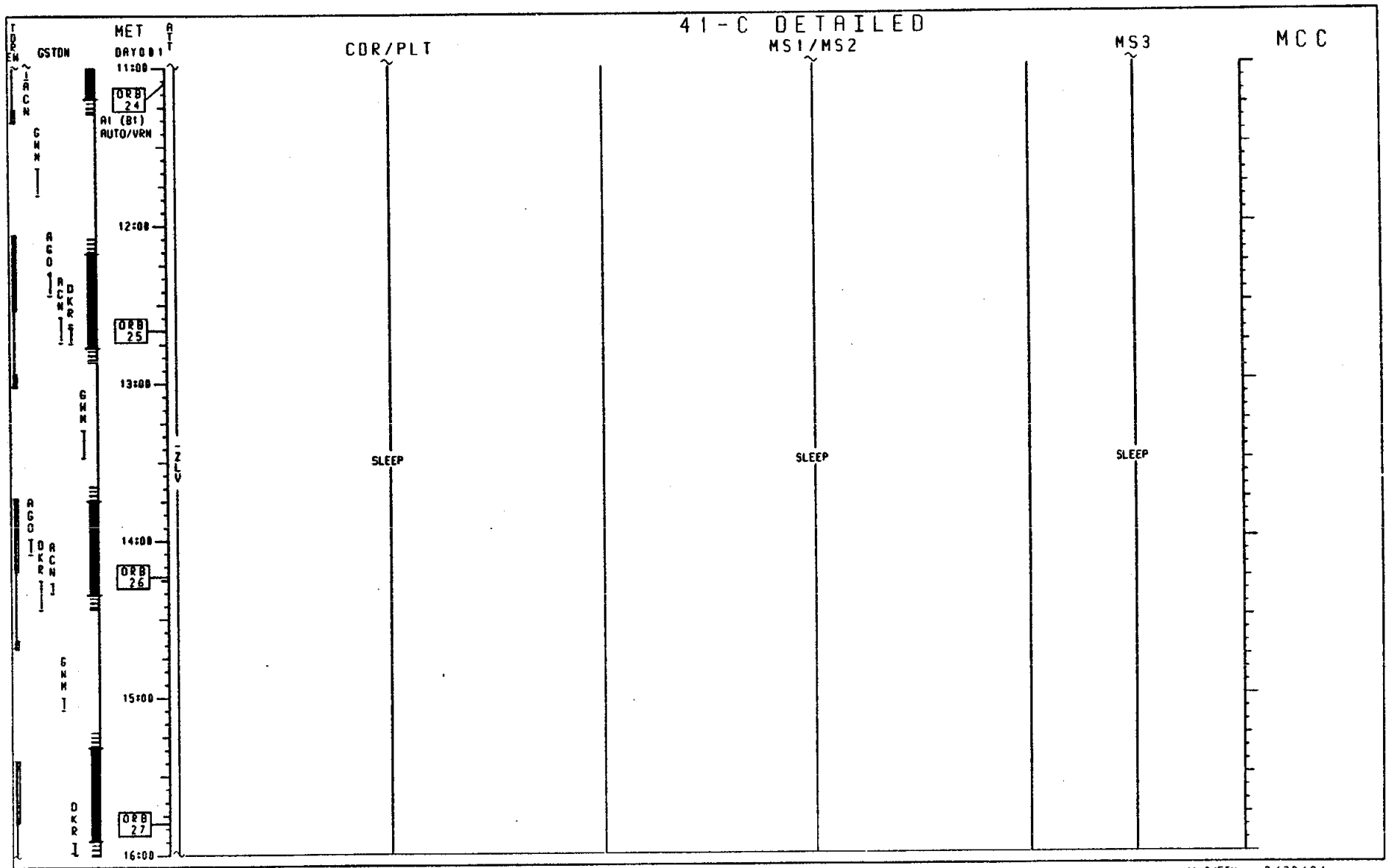




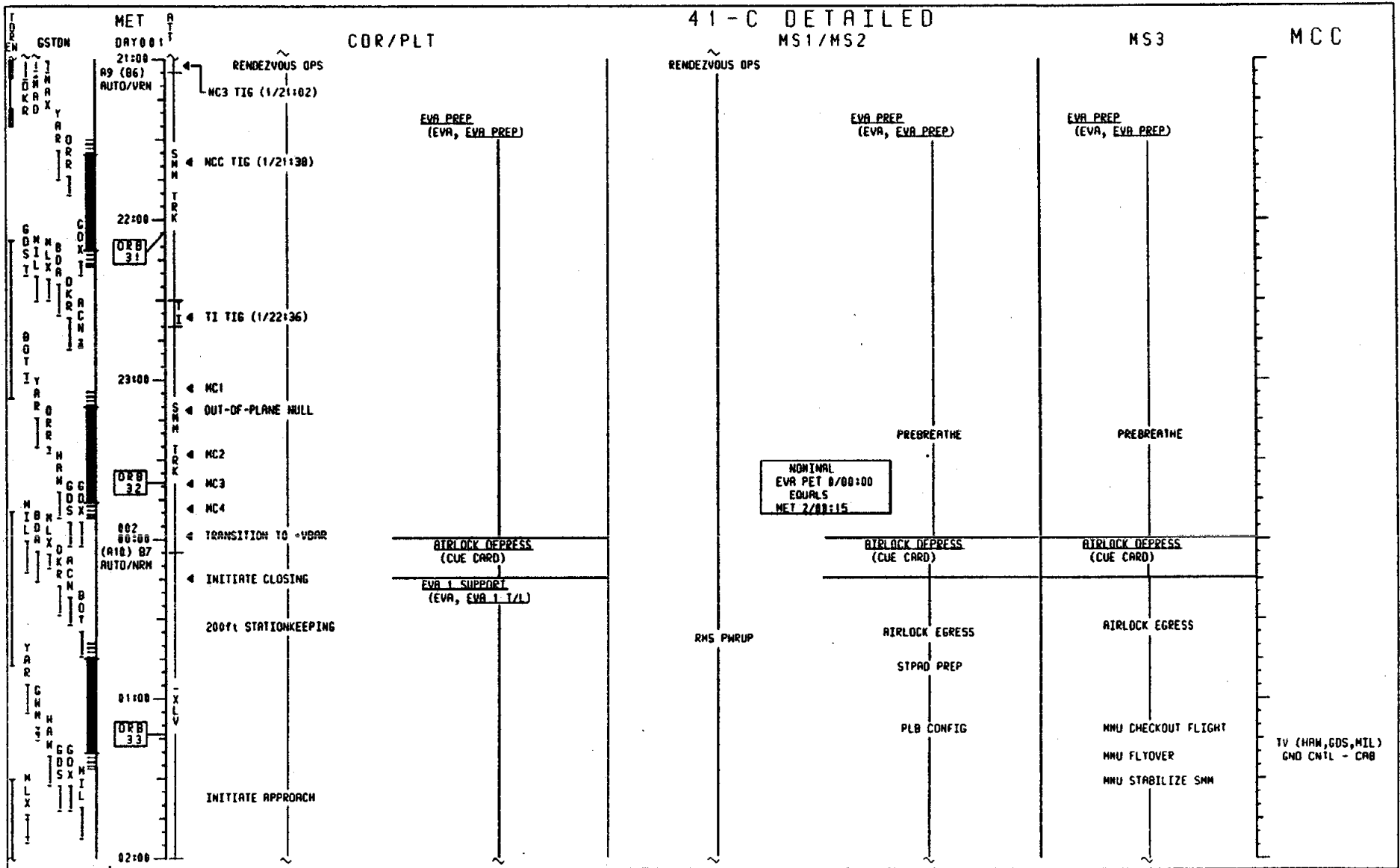




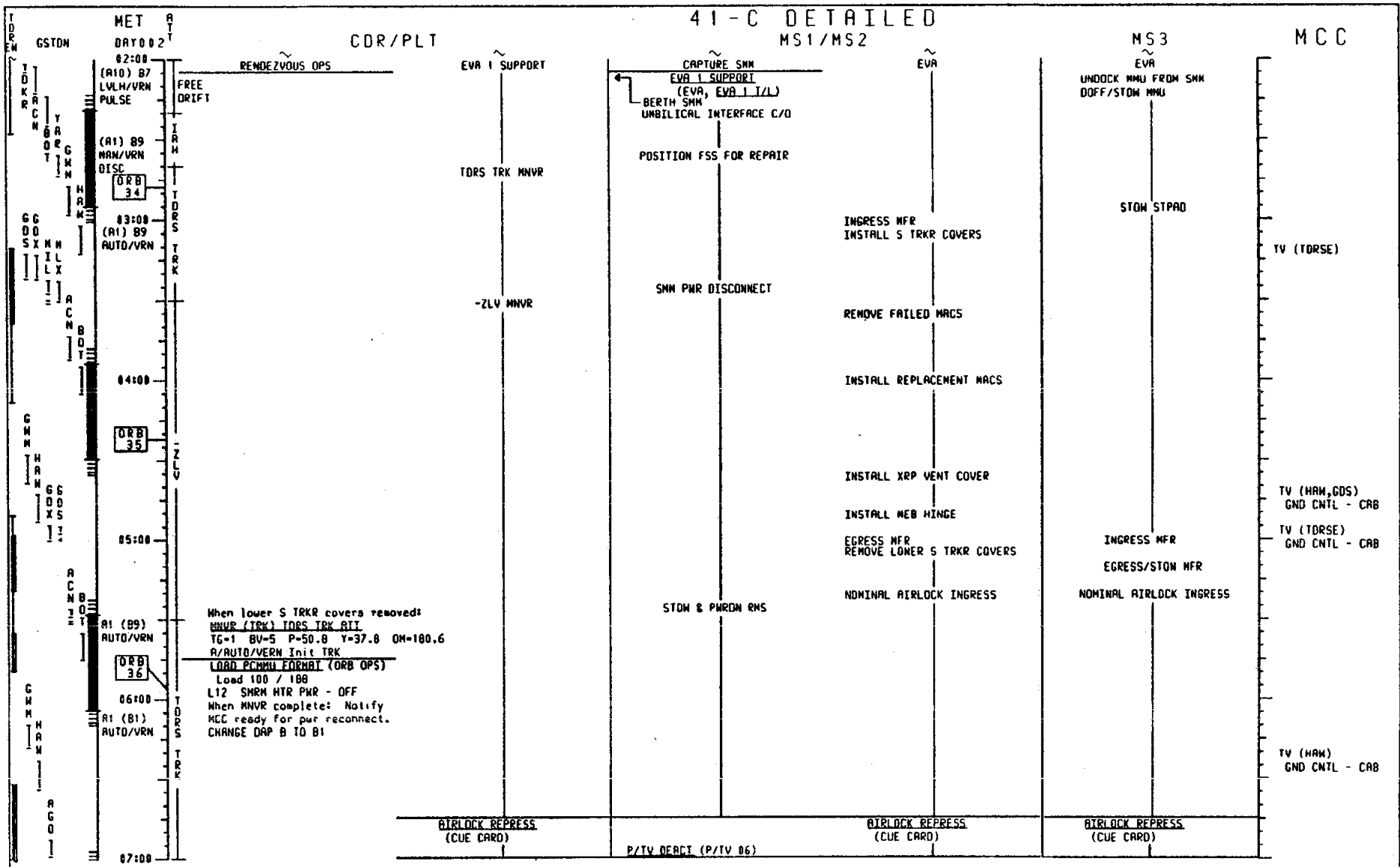
41-C DETAILED

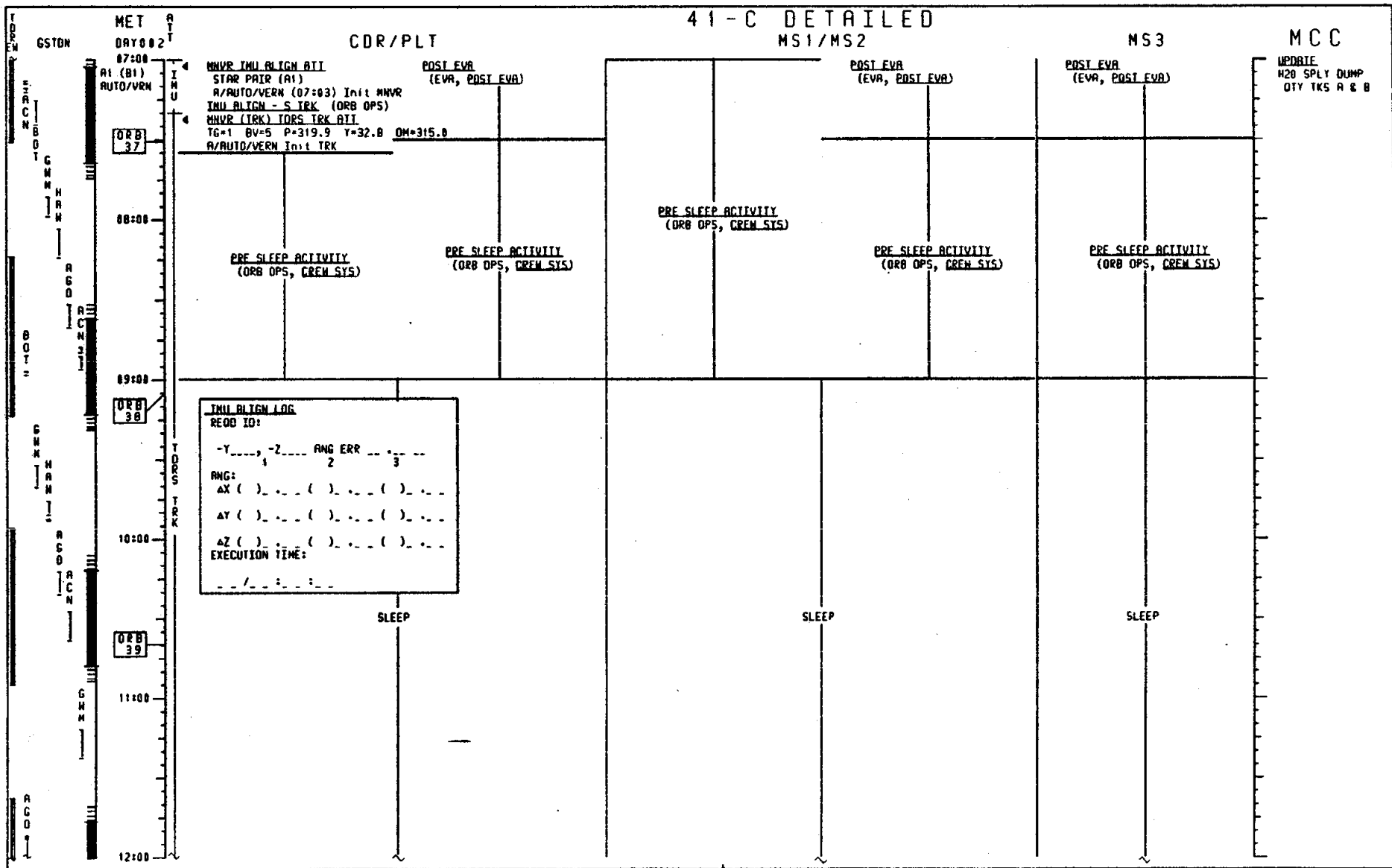


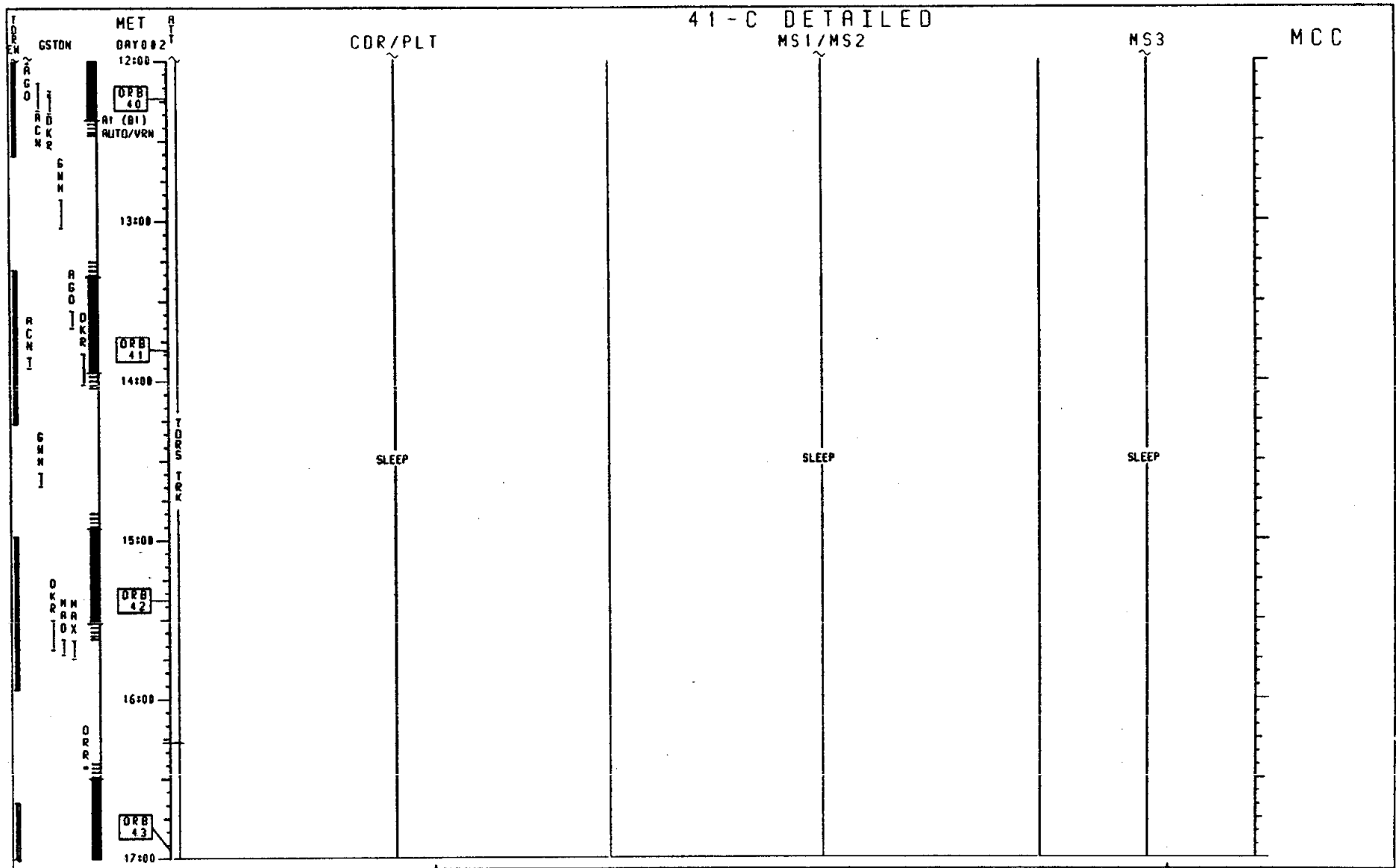
MET DAY 001		COR/PLT			41-C DETAILED MS1/MS2		MS3	MCC	
MET DAY 001 16:00 A1 (01) AUTO/VRN  17:00 ORB 28  18:00 ORB 29  19:00 A9 (06) AUTO/VRN  20:00 ORB 30  21:00	16:00 17:00 18:00 19:00 20:00 21:00	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	UPDATE NH2 SPLY DUMP QTY TKS A & B DMS/RCS ICONNECT CONFIG	UPLINK TGT SV AND COV MATRIX	
		4 NHVR IMU ALIGN AT STAR PAIR (A1) A/AUTO/VRN (16:50) Init NHVR IMU ALIGN - S TRK (ORB OPS) NHVR (TRK) -ZLV, +XVV TC=2 BV=3 QM=100 A/AUTO/VRN Init TRK POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	POST SLEEP ACTIVITY (ORB OPS, CREW SYS)	UPDATE PREL NH2, NC3, AND TI BURN PADS	INFORM CREW SNM READY FOR RNDZ
		IMU ALIGN LOG RECD ID: -Y...-2... ANG ERR ... 1 2 3 ANG: ΔX ( ) ( ) ( ) ΔY ( ) ( ) ( ) ΔZ ( ) ( ) ( ) EXECUTION TIME: - / : : :	RENDEZVOUS OPS (RNDZ, OPS T/L)	EXERCISE	RENDEZVOUS OPS (RNDZ, OPS T/L)	A7U -PL BAY FLOOD FND BHD - OFF P/TV 06 SETUP & ACT (EVR 1) (P/TV, P/TV SCENES)	P/TV 06 SETUP & ACT (EVR 1) (P/TV, P/TV SCENES)	INFORM CREW SNM READY FOR RNDZ	VTR (MIL)
		VTR SETUP (04-LOFF OPS) (P/TV, P/TV SCENES)	VTR PLAYBACK (04-LOFF OPS) (P/TV, P/TV SCENES) VTR at MIL (20:41-20:49)	VTR SETUP (04-LOFF OPS) (P/TV, P/TV SCENES)	VTR PLAYBACK (04-LOFF OPS) (P/TV, P/TV SCENES) VTR at MIL (20:41-20:49)	VTR SETUP (04-LOFF OPS) (P/TV, P/TV SCENES)	VTR PLAYBACK (04-LOFF OPS) (P/TV, P/TV SCENES) VTR at MIL (20:41-20:49)	VTR (MIL)	VTR (MIL)
		4 NH2 TIC (1/20:15)	VTR SETUP (04-LOFF OPS) (P/TV, P/TV SCENES)	VTR PLAYBACK (04-LOFF OPS) (P/TV, P/TV SCENES) VTR at MIL (20:41-20:49)	VTR SETUP (04-LOFF OPS) (P/TV, P/TV SCENES)	VTR PLAYBACK (04-LOFF OPS) (P/TV, P/TV SCENES) VTR at MIL (20:41-20:49)	VTR SETUP (04-LOFF OPS) (P/TV, P/TV SCENES)	VTR PLAYBACK (04-LOFF OPS) (P/TV, P/TV SCENES) VTR at MIL (20:41-20:49)	VTR (MIL)

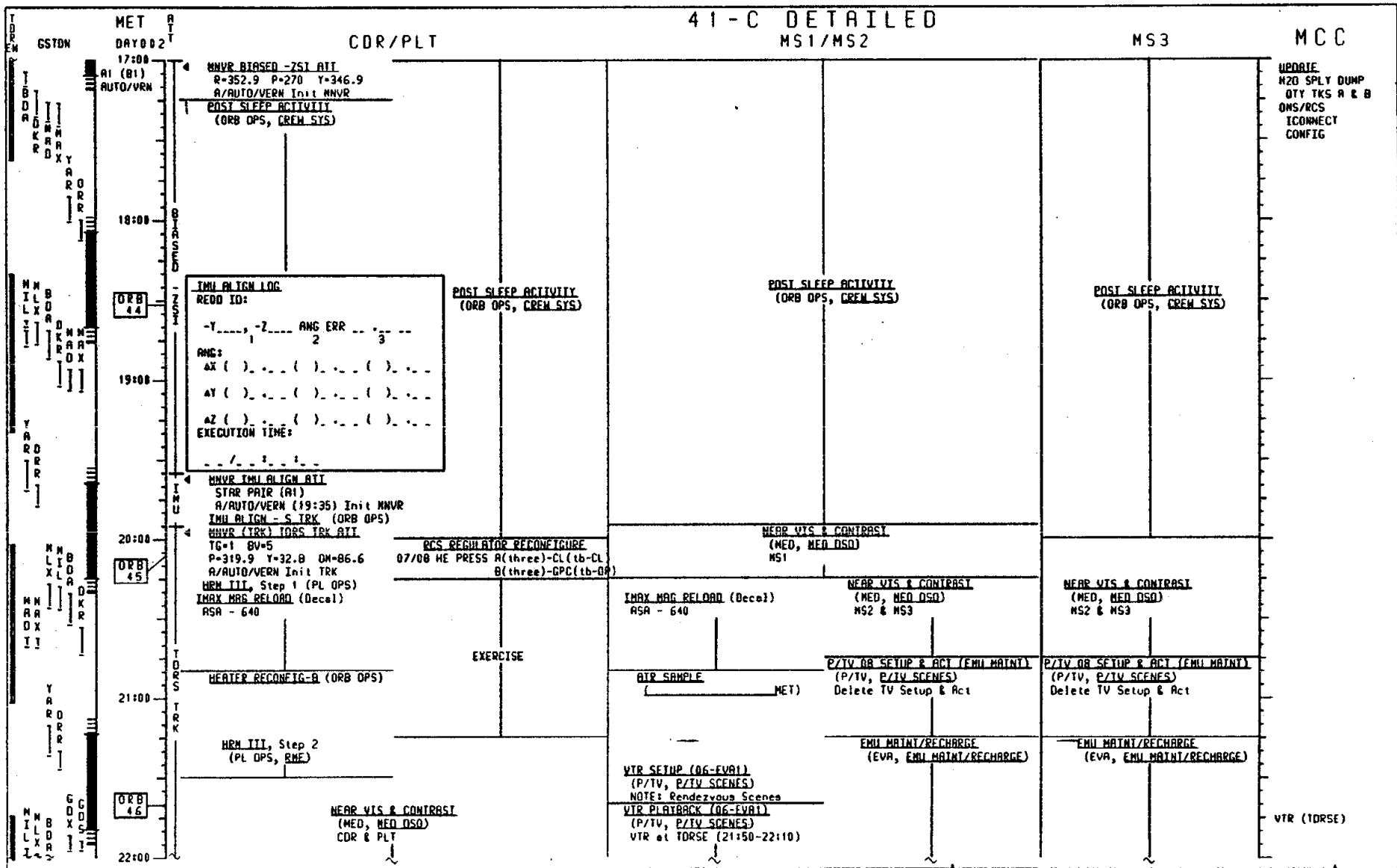


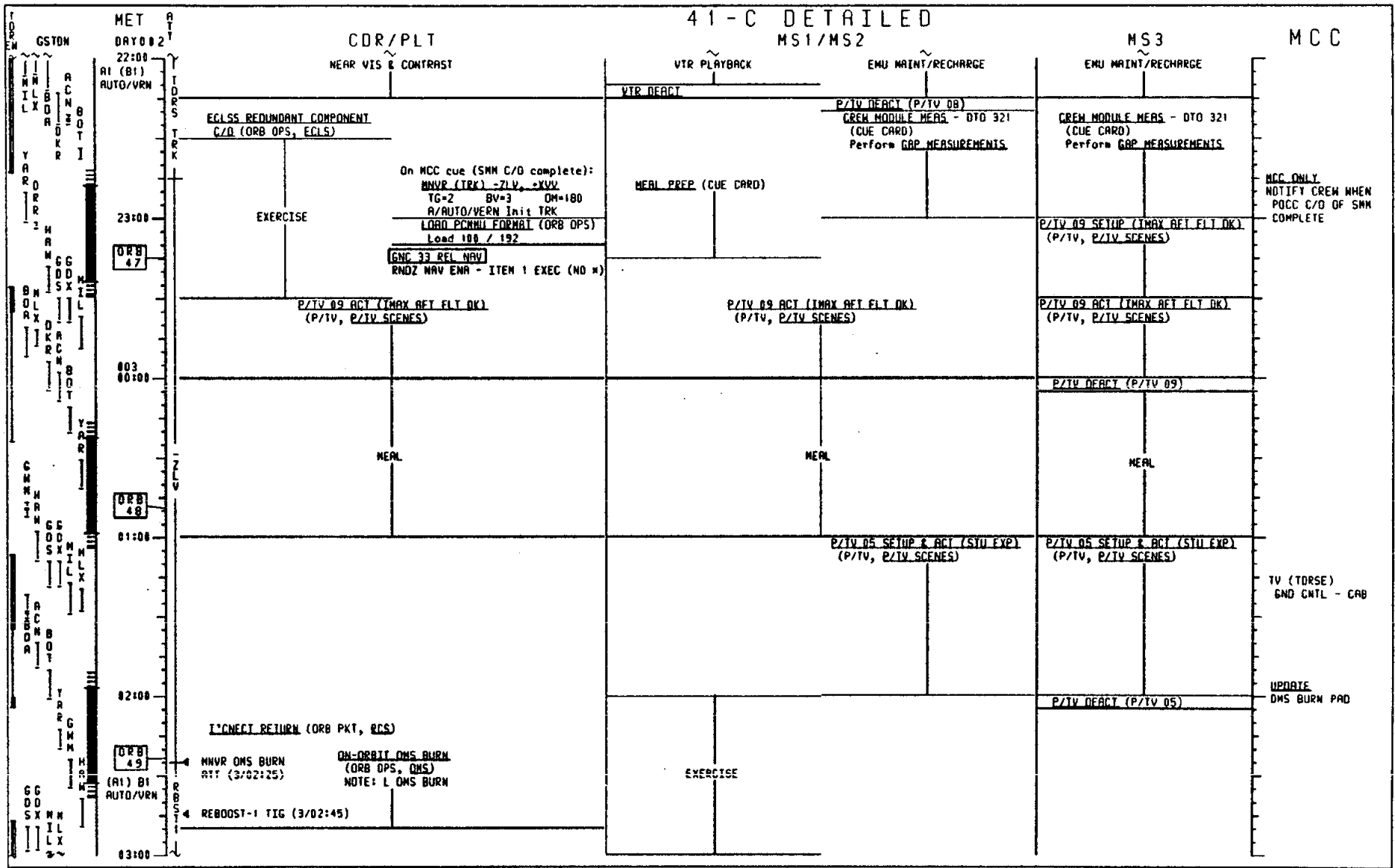


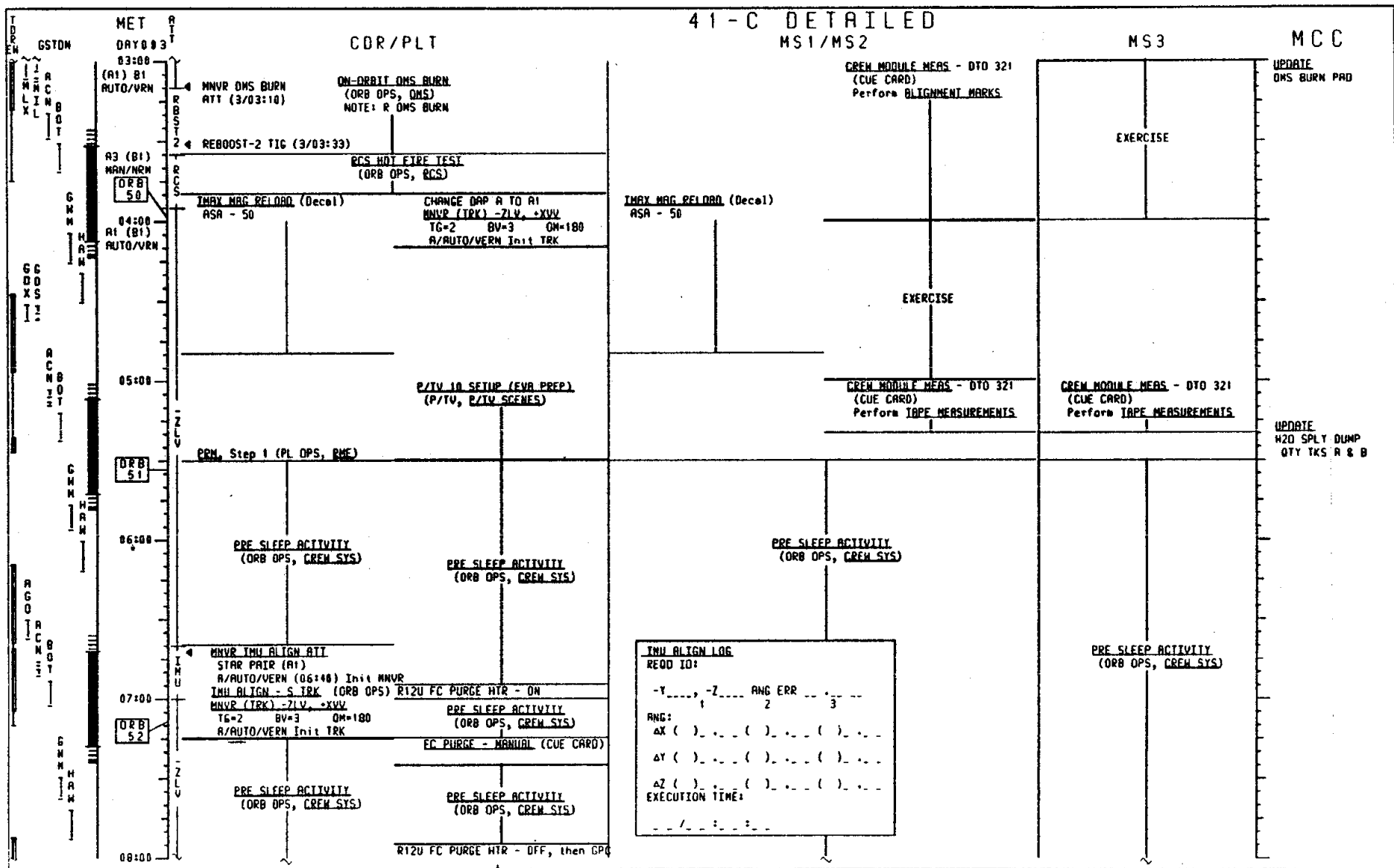


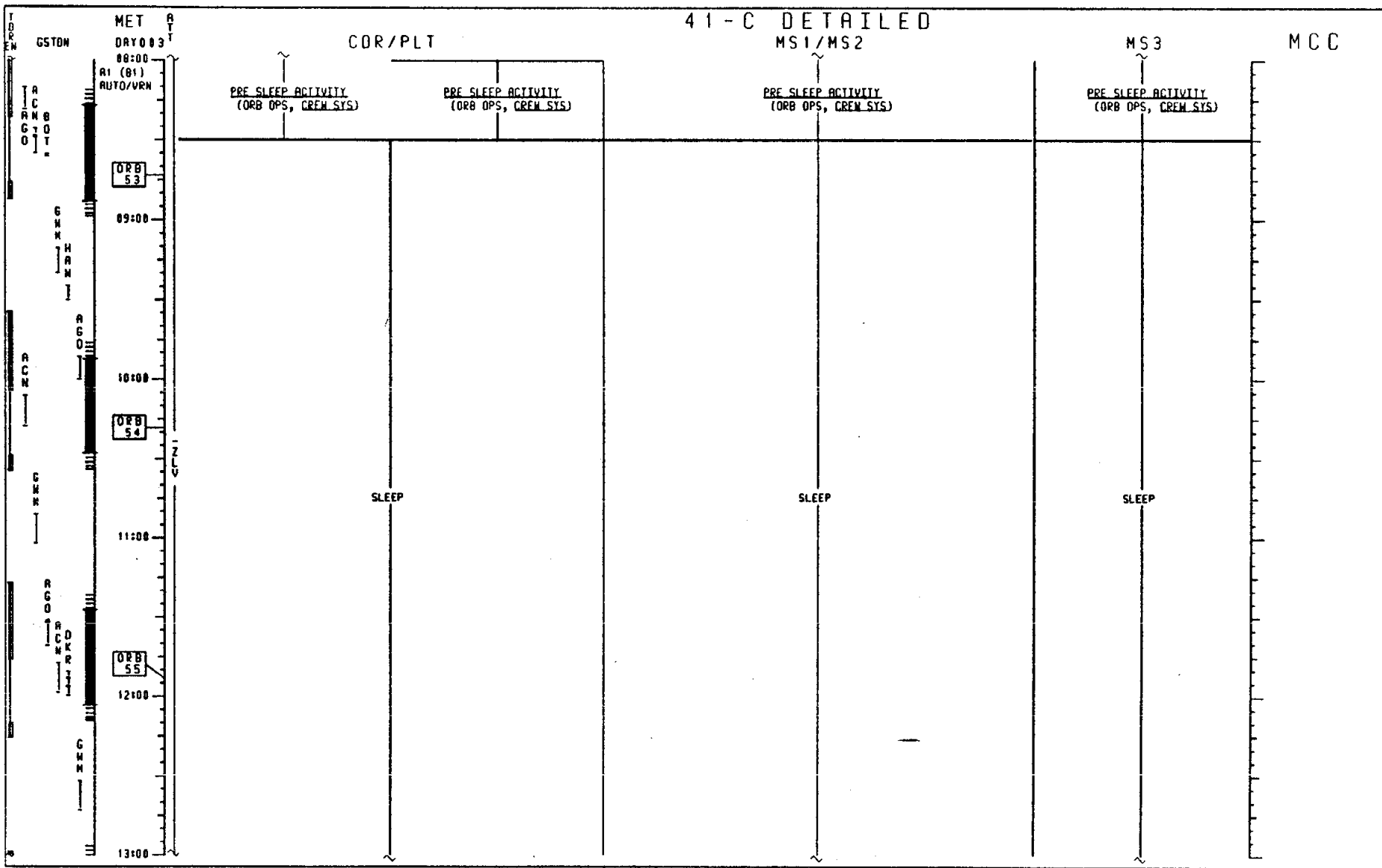


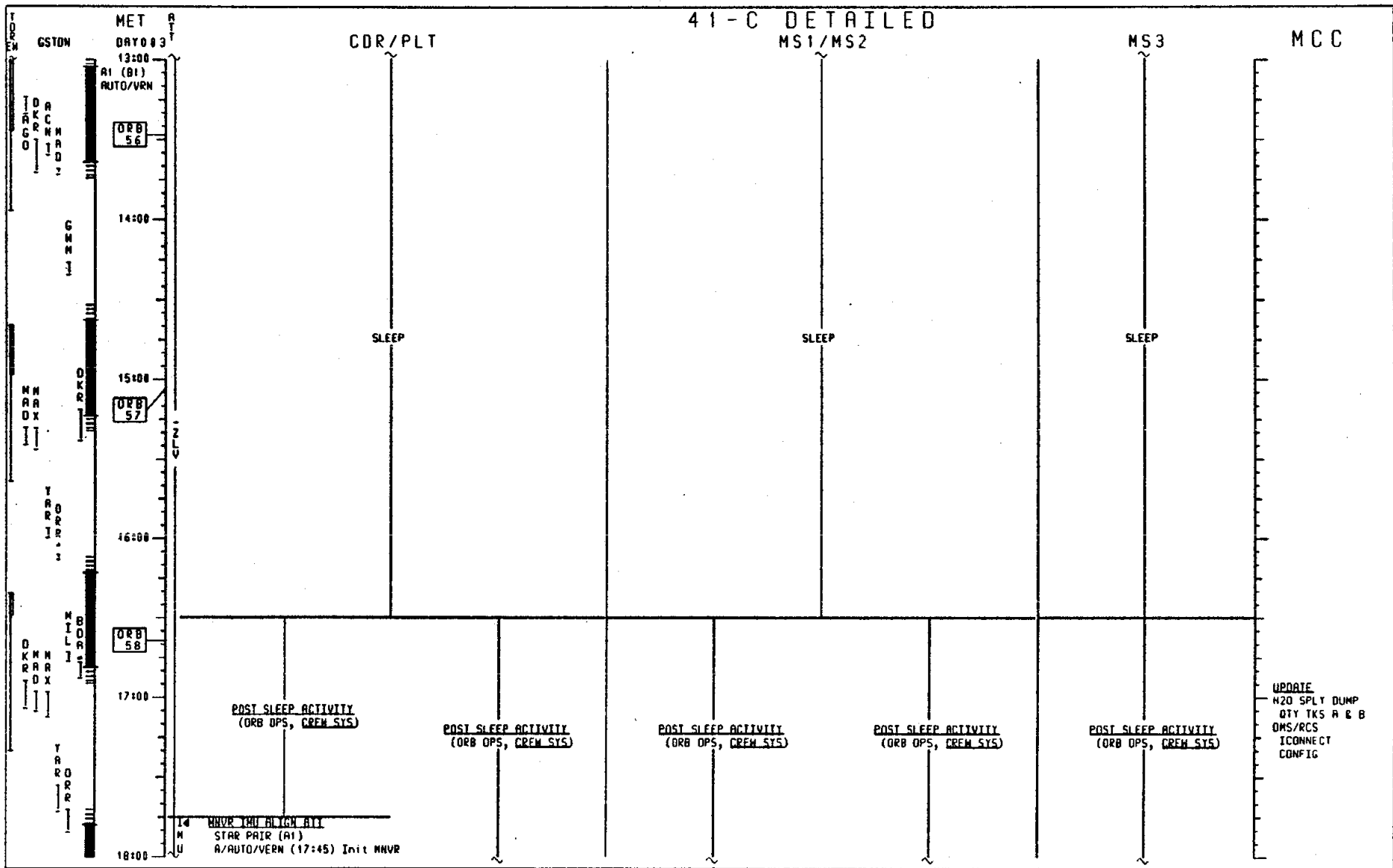




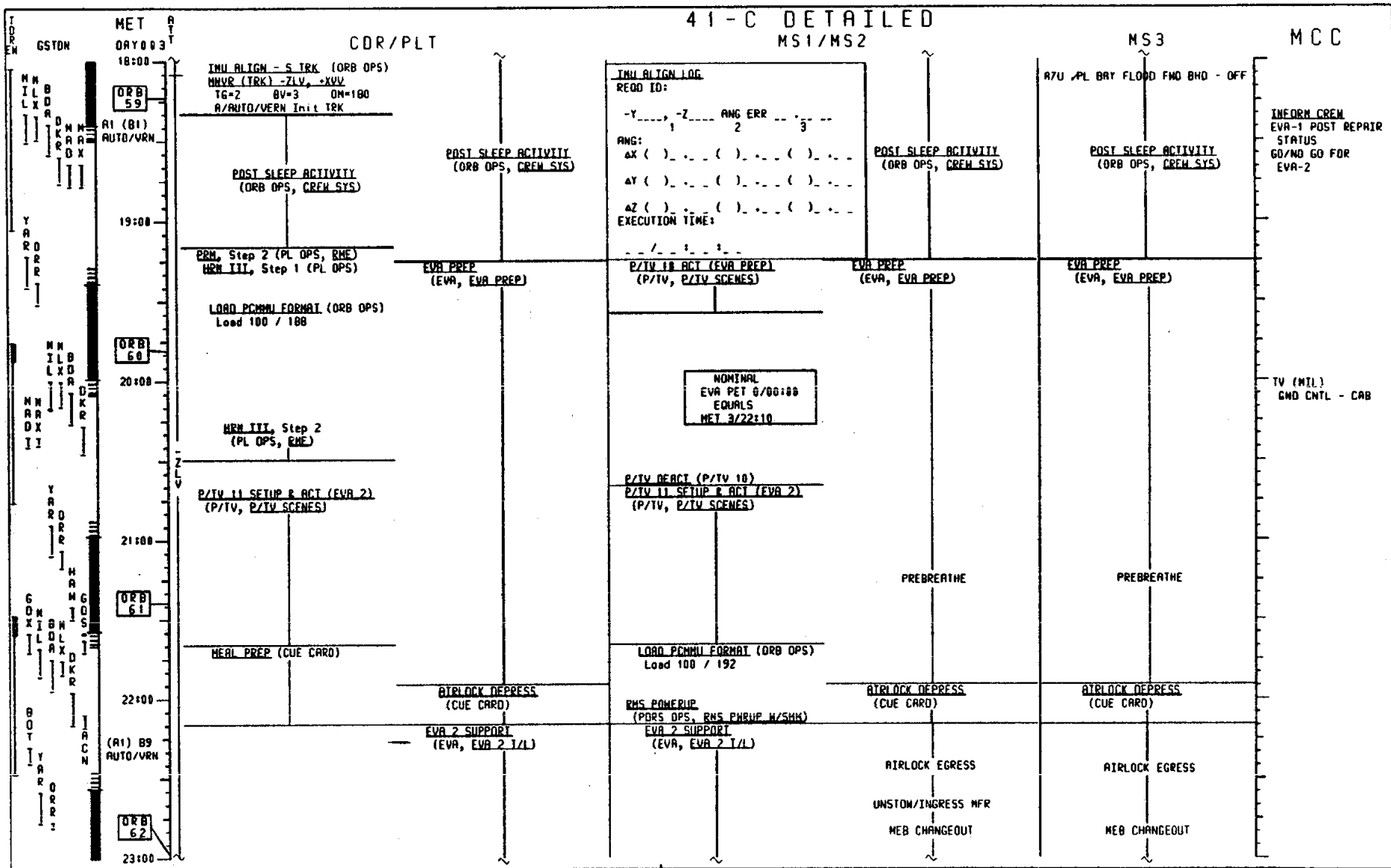


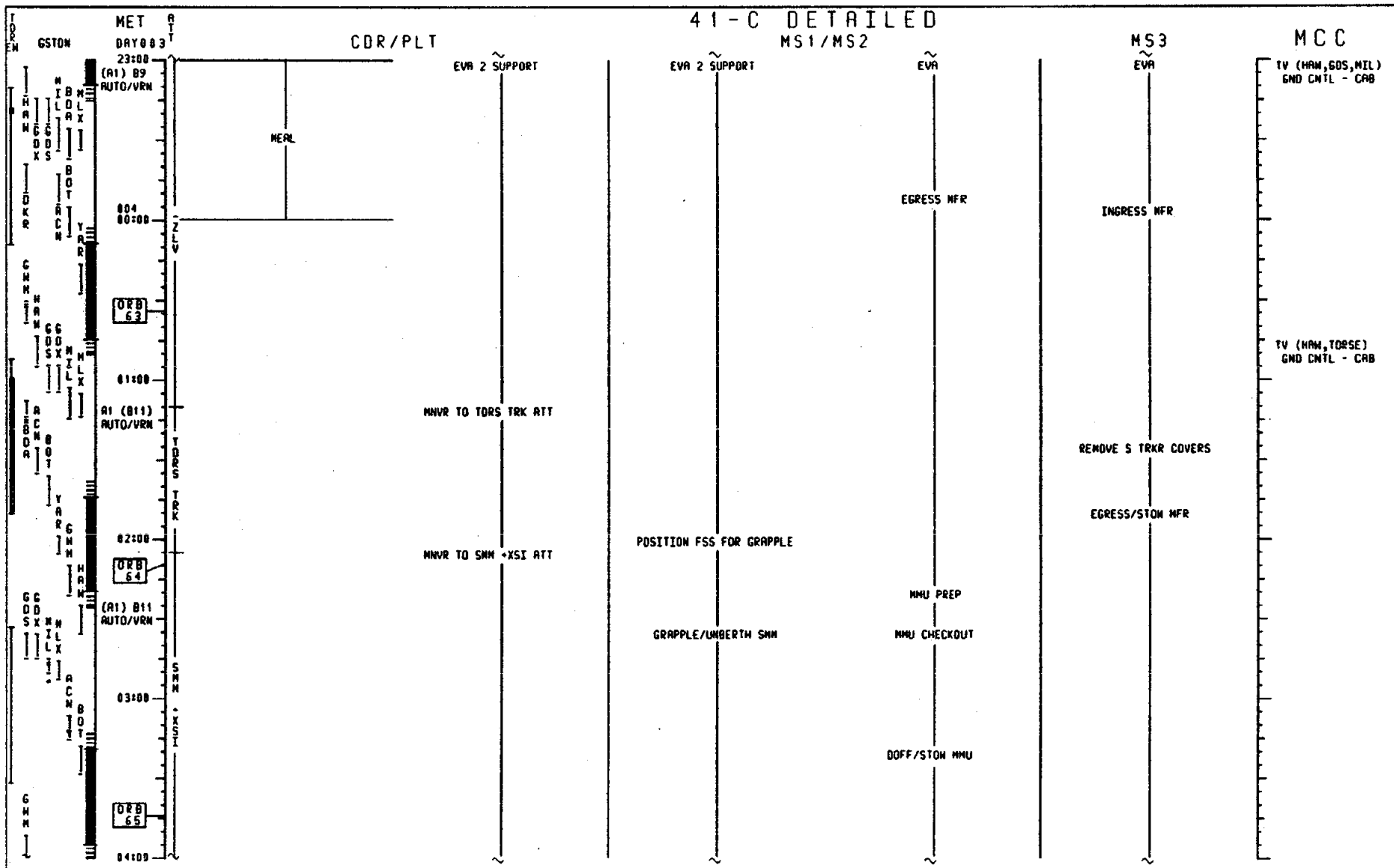


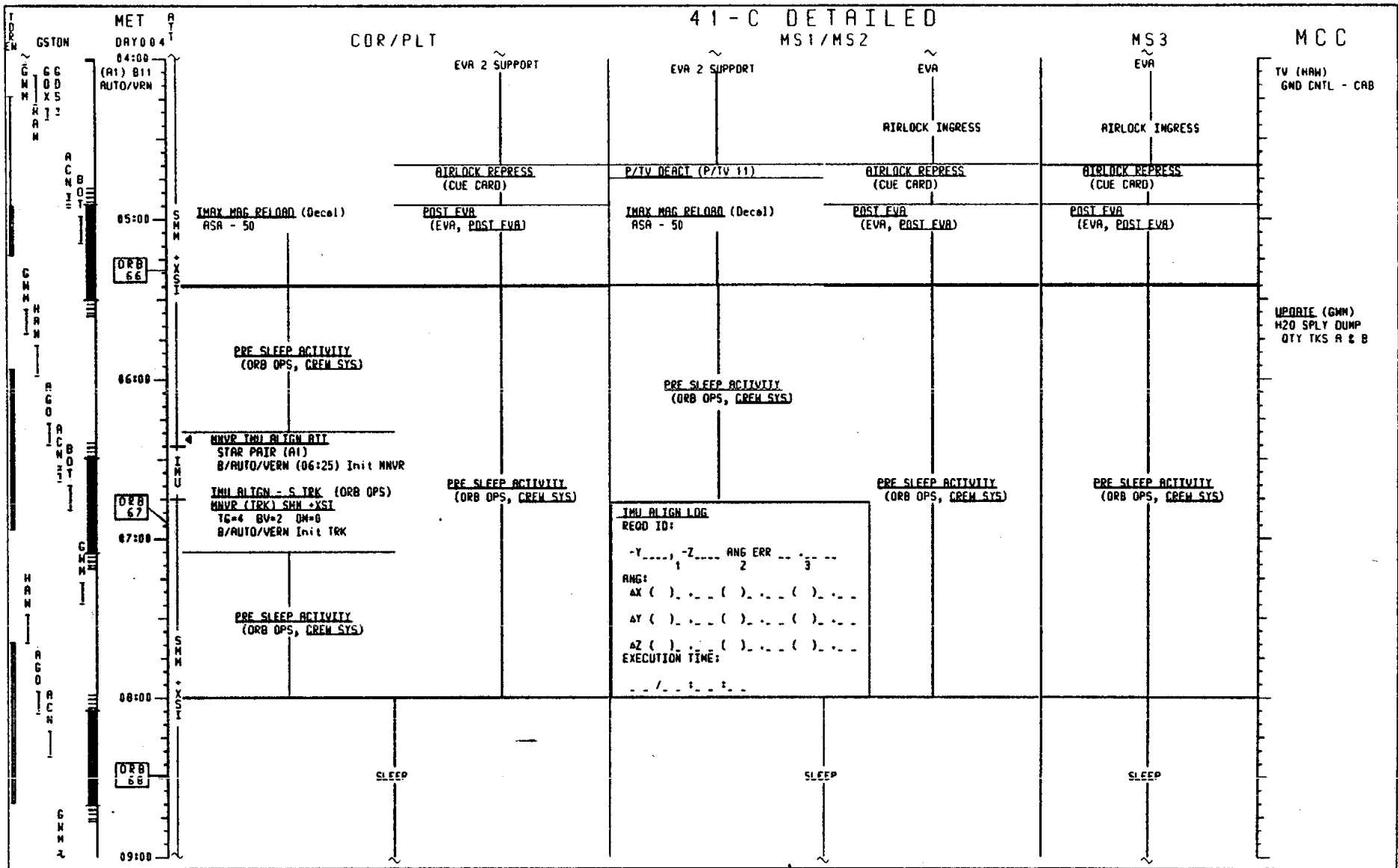


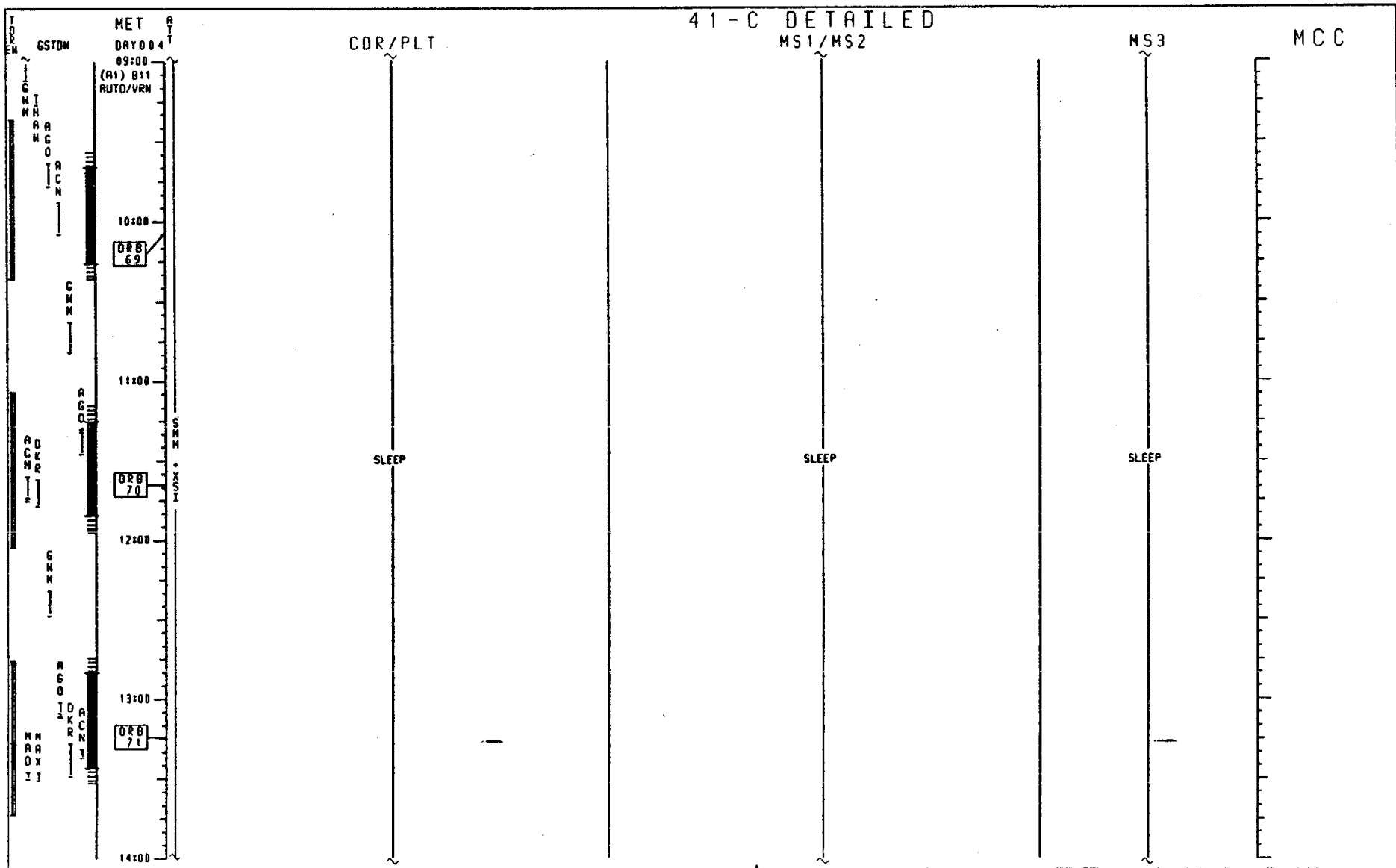


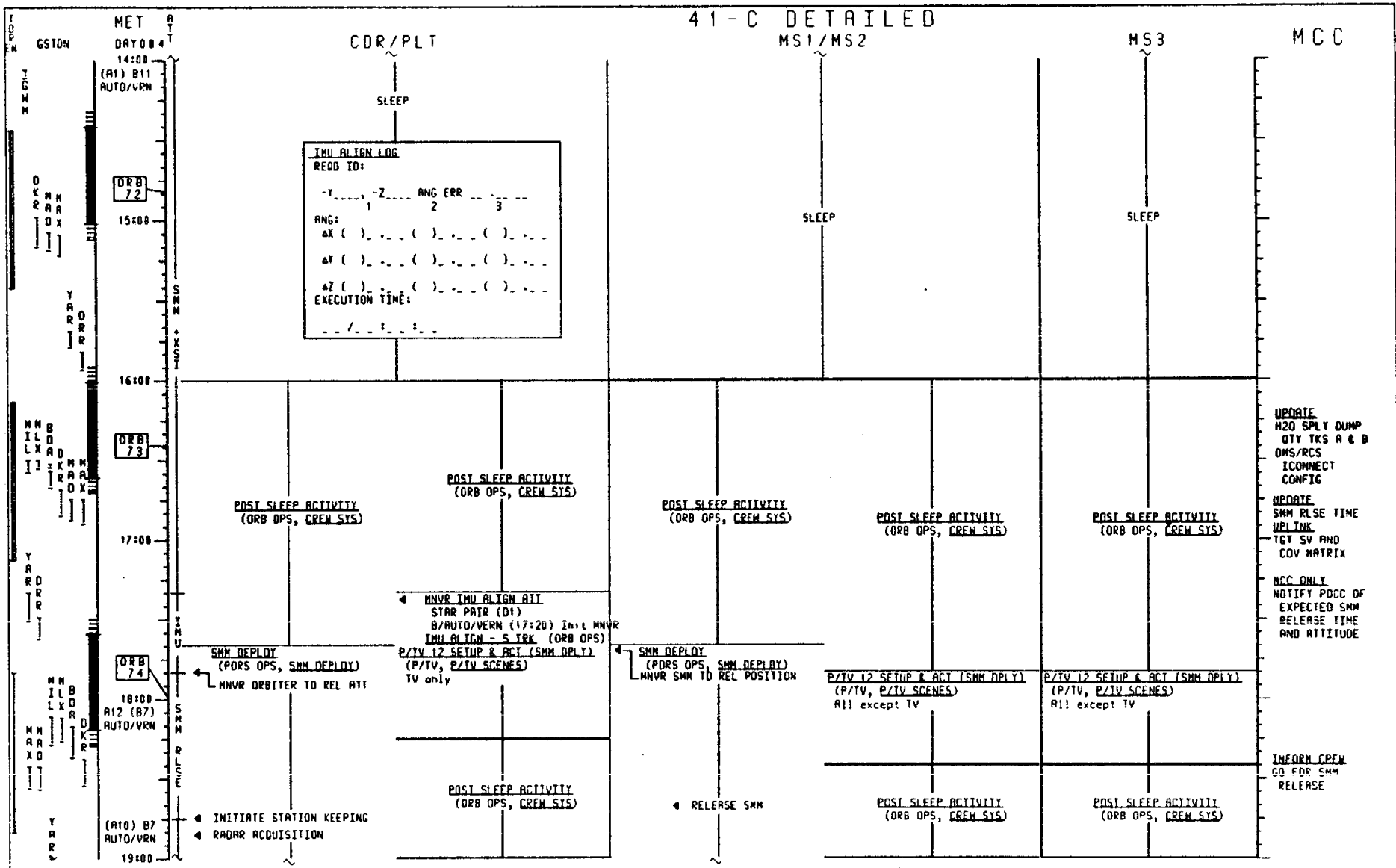


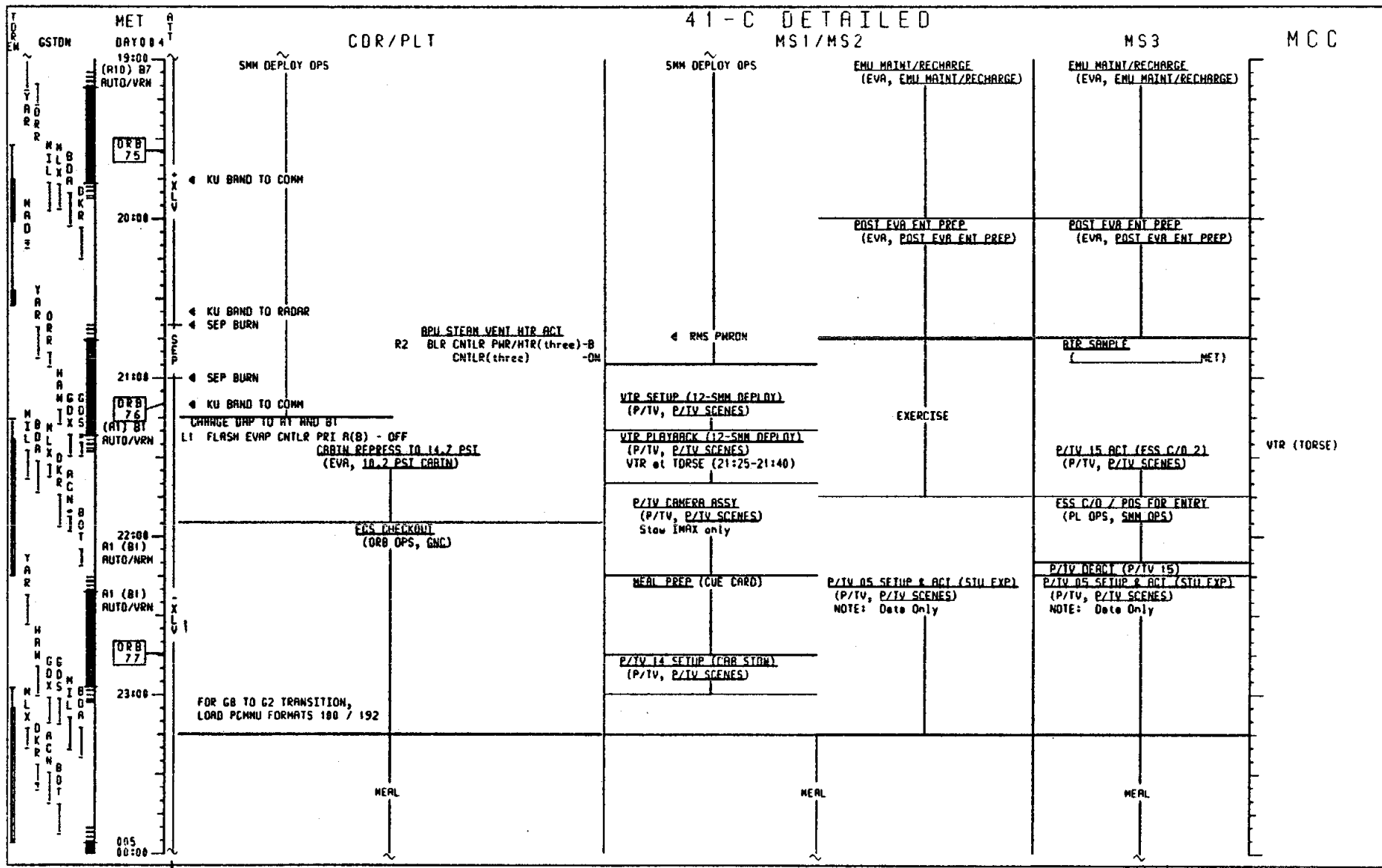


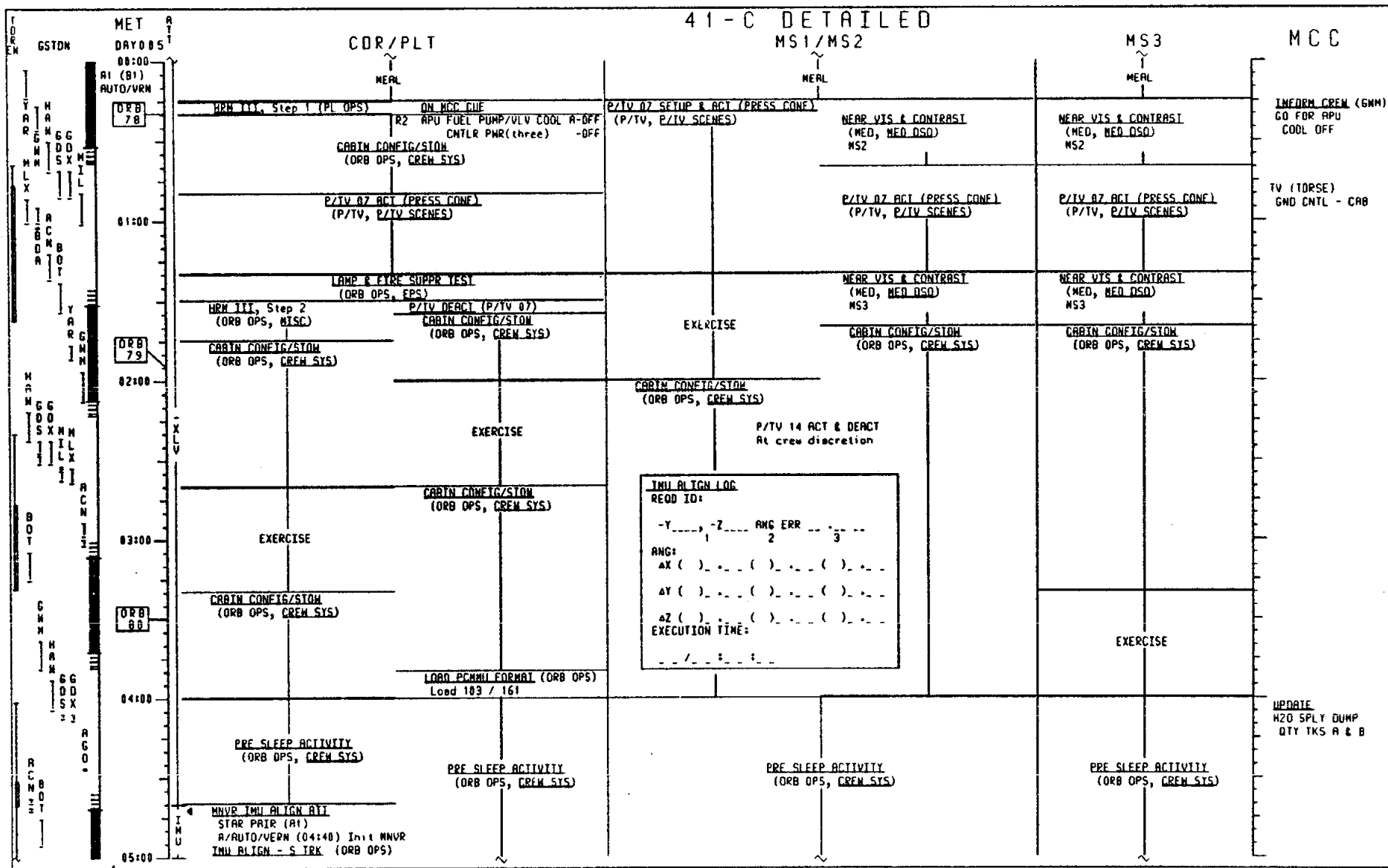


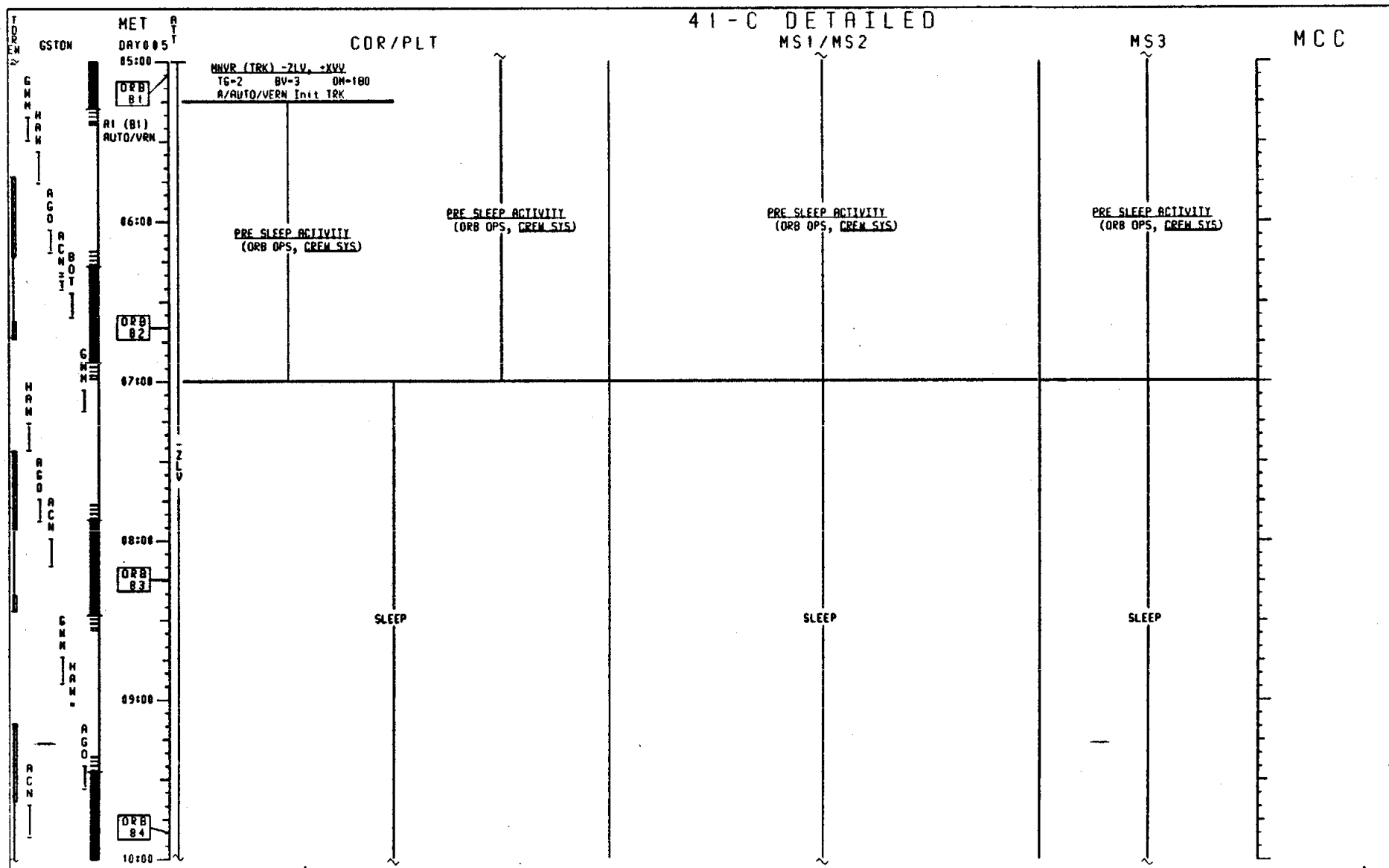




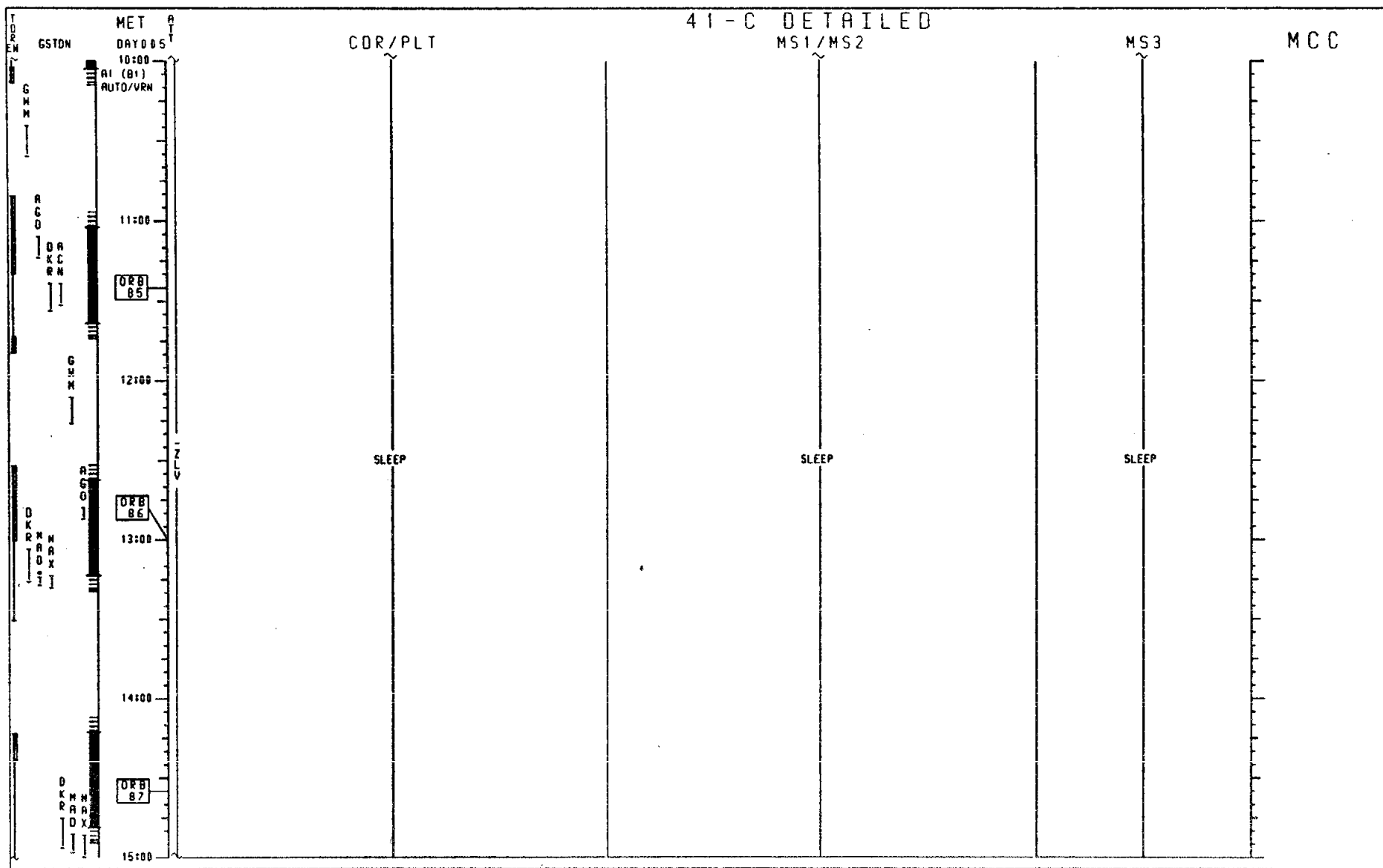


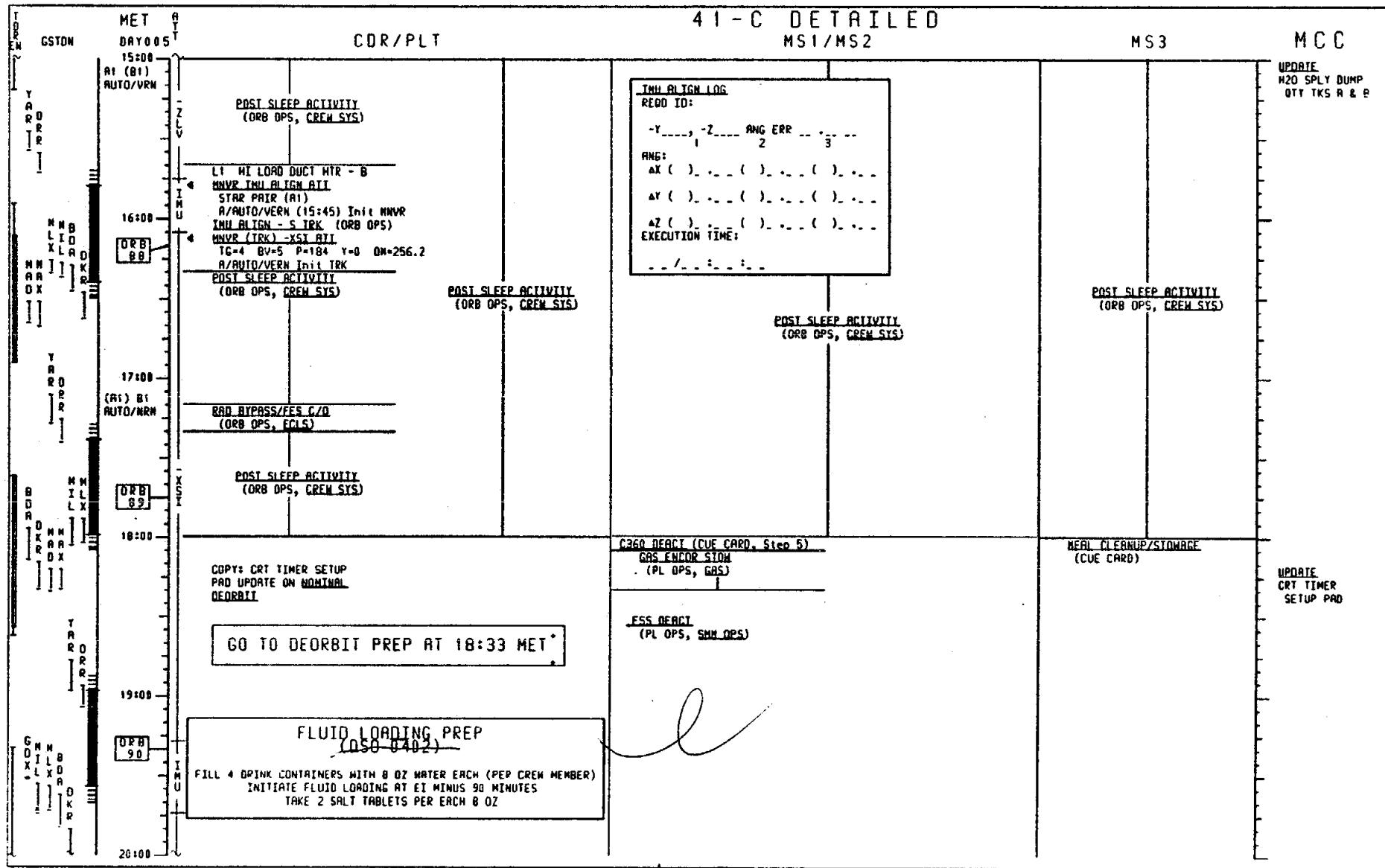












CONTINGENCY TIMELINES

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## HIGH PRIORITY MISSION

The high priority mission timeline is designed to provide a nominal deployment of LDEF on Flight Day 2, to provide one EVA for SMM repair on Flight Day 3, to release SMM on Flight Day 4, and to end the mission on Flight Day 5 with a KSC landing. All activities prior to the first EVA are unchanged from the nominal timeline including the LDEF deploy and rendezvous sequence. The first difference occurs in the EVA timeline which the crew will execute from the EVA checklist. This high priority EVA timeline will replace the SMM ACS module and unberth the SMM, leaving it attached to the RMS. The CAP reflects this configuration which is maintained overnight while the SMM is checked out prior to release the afternoon of Flight Day 4.

The high priority mission timeline is entered by the crew when they return to the CAP from the Rendezvous book or the EVA checklist, as applicable. They remain in this timeline until landing.

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
097:15:05 / 098:03:05	002:00:00 / 002:12:00	097:09:05 / 097:21:05	03 / 097 GMT	-12.4		APRIL 6, 1984	41-C	FINAL	2/29/84
GMT : 097	16	17	18	19	20	21	22	23	24
FD : 03									
MET : 002									
CDR	200 FT RENDEZVOUS OPS						IMU MNVR SMM XSI MNVR	PRE SLEEP ACT	SLEEP
PLT	ADIRP LR OC CS KS	ACTIVITIES PRIOR TO 2700:15 ARE IN THE NOMINAL CAP					POST EVA SMM XSI MNVR	PRE SLEEP ACT	SLEEP
MS1	RENDEZVOUS OPS						POST EVA	PRE SLEEP ACT	SLEEP
MS2	ADIRP LR OC CS KS						POST EVA	PRE SLEEP ACT	SLEEP
MS3	ADIRP LR OC CS KS						POST EVA	PRE SLEEP ACT	SLEEP
DAY/NIGHT	[Day/Night Cycle Bar]								
ORBIT	32	33	34	35	36	37	38	39	
GSTDN COVERAGE	GDS BOT GDX MIL MLX BDA DKR ACN	YAR GMM HAW BDA GDS ACN GDX BOT MLX YAR	MLX BDA DKR ACN GDS BOT GDX YAR	HAW GDS GDX MIL MLX ACN	GMM HAW GDX GDS RCN BOT	HAW AGO RCN BOT	RCN BOT GMM HAW AGO	GMM HAW AGO	RCN GMM
TORS	E								
ATTITUDE	-XLV	FREE IAH	TORS TRK	-2LV	TORS TRK	SMM +XSI	IMU	SMM +XSI	
NOTES:	* DTO 612 MNU DEMO      * TFL 100 / 188      * DTO 602 CABIN ATMOSPHERE VERF <b>HIGH PRIORITY MISSION</b>								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
098:03:05/ 098:15:05	002:12:00/ 003:00:00	097:21:05/ 098:09:05	04/ 098 GMT	-10.9		APRIL 6, 1984	41-C	FINAL	2/29/84				
GMT : 098													
FD : 04													
MET : 002													
CDR	SLEEP			POST SLEEP ACT	IMU MNVR SMM XSI MNVR	POST SLEEP ACT		IMAX RELOAD	HRM DEACT	CABIN STOW	EXERCISE	MEAL	
PLT	SLEEP			POST SLEEP ACT	POST SLEEP ACT	POST SLEEP ACT		VISION ACUITY	EXERCISE	CABIN STOW	P/TV SETUP & ACT		
MS1	SLEEP			POST SLEEP ACT				IMAX RELOAD	VISION ACUITY	VACUITY	TAPE MERS	MEAL	
MS2	SLEEP			POST SLEEP ACT				EMU MAINT/RECHARGE	POST EVA ENT PREP	HONEYCOMB P/TV	MEAL PREP	P/TV SETUP & ACT	
MS3	SLEEP			POST SLEEP ACT				EMU MAINT/RECHARGE	POST EVA ENT PREP	HONEYCOMB P/TV	VACUITY	TAPE MERS	
DAY/NIGHT	[Day/Night Cycle]												
ORBIT	40	41	42	43	44	45	46	47					
GSTON COVERAGE	AGD -ACN -DKR	-GWN	-DKR -MAD -MAX	-MAD -MAX	-YAR -ORR	-DKR -MAD -MAX	-BDR -DKR -MAD -MAX	-GOS -MIL -MLX -BDR	-YAR -ORR	-GOS -MIL -MLX -BDR	-YAR -ORR	-MLX -DKR -ACN	-MLX -DKR -ACN
TORS	[TORS Data]												
ATTITUDE	SMM *XSI												
NOTES:	HIGH PRIORITY MISSION												

GMT (O:H:M)	MET (O:H:M)	CST (O:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
098:15:05 / 099:03:05	003:00:00 / 003:12:00	098:09:05 / 098:21:05	04 / 098 GMT	-9.2		APRIL 7, 1984	41-C	FINAL	2/29/84	
GMT : 098	16	17	18	19	20	21	22	23	24	
FD : 04										
MET : 003										
CDR	MEAL DPLY MNVR	SMM RELEASE SEP SEP	14.7 CABIN REPRESS	FCS C/O	RFI SRE HOT	PRE SLEEP ACT	I MU M NVR	X LV M NVR	PRE SLEEP ACT	SLEEP
PLT	MEAL	CABIN STOW	14.7 CABIN REPRESS	FCS C/O	RFI SRE HOT				PRE SLEEP ACT	SLEEP
MS1	MEAL	SMM RELEASE REL	IMAX STOW	CABIN STOW					PRE SLEEP ACT	SLEEP
MS2	MEAL	CABIN STOW	R I R S M P	CABIN STOW					PRE SLEEP ACT	SLEEP
MS3	MEAL	CABIN STOW	P/TV ACT	FSS C/O & POS					PRE SLEEP ACT	SLEEP
DAY/NIGHT	[Day/Night Cycle]									
ORBIT	47	48	49	50	51	52	53	54		
GSTON COVERAGE	-DKR -RCN -BOT	-GDX -MLX -BDA -GMM -HAW -GOS	-GMM -HAW -GDS -GDX -MLX -RCN	-BOT -GMM -HAW -GDS -GDX -MLX -RCN	-GMM -HAW -GDS -GDX -MLX -RCN	-GMM -HAW -AGO -RCN -BOT	-AGO -RCN -BOT	-GMM -HAW -AGO -RCN	-GMM -HAW -AGO -RCN	-AGO -RCN -DKR
TORS	[TORS Coverage]									
ATTITUDE	SMM +XSI   SMM DPLY   -XLV   [RES] -XLV   IMU   -XLV									
NOTES:	* APU HTR ACT * P/TV 15 * DTG 602 CABIN ATMOSPHERE VERF * FOR G8 TO G2 TRANSITION LOAD TFL 100 / 192 <b>HIGH PRIORITY MISSION</b>									



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
099:03:05 / 099:15:05	003:12:00 / 004:00:00	098:21:05 / 099:09:05	05 / 099 GMT	-7.5		APRIL 7, 1984	41-C	FINAL	2/29/84
CDR	SLEEP	POST SLEEP ACT	POST SLEEP ACT	IMU	XSI	POST SLEEP	PLBD OPS	DEORBIT PREP	
PLT	SLEEP	POST SLEEP ACT	POST SLEEP ACT	IMU	XSI	POST SLEEP	PLBD OPS	DEORBIT PREP	
MS1	SLEEP	POST SLEEP ACT	POST SLEEP ACT	IMU	XSI	POST SLEEP	PLBD OPS	DEORBIT PREP	
MS2	SLEEP	POST SLEEP ACT	POST SLEEP ACT	IMU	XSI	POST SLEEP	PLBD OPS	DEORBIT PREP	
MS3	SLEEP	POST SLEEP ACT	POST SLEEP ACT	IMU	XSI	POST SLEEP	PLBD OPS	DEORBIT PREP	
DAY/NIGHT									
ORBIT	55	56	57	58	59	60	61	62	
GSTON COVERAGE	-GWM	-AGD -DKR -ACN -HAD	-HAD -MAX -YAR -ORR	-HAD -MAX -YAR -ORR	-DKR -HAD -MAX -YAR -ORR	-BDR -DKR -HAD -MAX -YAR -ORR	-GOS -CDX -MIL -BDR -MLX -DKR -ACN	-BOT -YAR -ORR -HAW -GOS -MTI	-BDR -MLX -DKR -ACN -BOT
TDRS									
ATTITUDE	-XLV			IMU	-XSI		IMU	DEORBIT	ENTRY
NOTES:	<p>o HI LOAD HTR ON</p> <p>* FES CNTLR CHECK</p> <p>* FNT 103 / 161</p> <p>HIGH PRIORITY MISSION</p>								

## WAVE-OFF (1 DAY LATE ENTRY)

The timeline provided in this section is designed to follow a Deorbit Prep Backout on Flight Day 7. It, therefore, assumes that the nominal timeline has already been accomplished.

The primary landing site on Flight Day 8 is KSC at MET 6/22:57 which is 3 hours after sunrise. The crossrange is 223 nm. There is an additional KSC landing opportunity one orbit later should it be required.

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
101:03:05/ 101:15:05	005:12:00/ 006:00:00	100:21:05/ 101:09:05	07/ 101 GMT	0.3		APRIL 9, 1984	41-C	FINAL	2/29/84
GMT : 101									
FD : 07									
MET : 005									
CDR						DEORBIT PREP		BACKOUT	
PLT	USE NOMINAL CAP UNTIL 5/22:03					DEORBIT PREP		BACKOUT	
MS1						DEORBIT PREP	NO DEORBIT BURN	BACKOUT	BACKOUT
MS2						DEORBIT PREP		BACKOUT	
MS3						DEORBIT PREP		BACKOUT	
DAY/NIGHT	[Day/Night Cycle Bar]								
ORBIT	85	86	87	88	89	90	91	92	
GSTDN COVERAGE	[Coverage Legend: GWN, ACO, DKR, MAD, MAX, YAR, DRR, MLX, MIL, BDA, ORR, YAR, ORR, MIL, MLX, BDA, GDX, BDA, DKR, MLX, HAW, ACN, GDS, BOT, YAR]								
TDRS E W	[TDRS Legend: DKR, MAD, MLX, BDA, GDX, BDA, HAW, ACN, GDS, BOT]								
ATTITUDE	DEORBIT   -ZLV								
NOTES:	WAVEOFF								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
101:15:05/ 102:03:05	006:00:00/ 006:12:00	101:09:05/ 101:21:05	07/ 101 GMT	1.5	☾	APRIL 10, 1984	41-C	FINAL	2/29/84
GMT : 101	16	17	18	19	20	21	22	23	24
FD : 07									
MET : 006	0	1	2	3	4	5	6	7	8
CDR	SNACK UNSTON CABIN	EXERCISE		CABIN STOW	PRE SLEEP ACT	I M U M N V R Z L V M N V R	PRE SLEEP ACT		SLEEP
PLT	SNACK UNSTON CABIN		EXERCISE	CABIN STOW			PRE SLEEP ACT		SLEEP
MS1	SNACK UNSTON CABIN			CABIN STOW			PRE SLEEP ACT		SLEEP
MS2	SNACK UNSTON CABIN			CABIN STOW			PRE SLEEP ACT		SLEEP
MS3	SNACK UNSTON CABIN			CABIN STOW			PRE SLEEP ACT		SLEEP
DAY/NIGHT	[Day/Night Cycle Diagram]								
ORBIT	93	94	95	96	97	98	99	100	
GSTON COVERAGE	[Coverage Diagram]								
TORS E H	[TORS Diagram]								
ATTITUDE	-ZLV [IMU] -ZLV								
NOTES:	A BACKOUT -ZLV, +XVV WAVEOFF								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
102:03:05 / 102:15:05	006:12:00 / 007:00:00	101:21:05 / 102:09:05	08 / 102 GMT	3.4		APRIL 10, 1984	41-C	FINAL	2/29/84	
11G FD: 08 MET: 006 12 13 14 15 16 17 18 19 20 21 22 23 0										
CDR	SLEEP	POST SLEEP ACT	POST SLEEP ACT	IMU MNR	XSI MNR	POST SLEEPS	KUI BOR STOM	DEORBIT PREP	PLBD OPS	DEORBIT PREP
PLT	SLEEP	POST SLEEP ACT	POST SLEEP ACT	RAD BY P	POST SLEEP ACT		KUI BOR STOM	DEORBIT PREP	PLBD OPS	DEORBIT PREP
MS1	SLEEP	POST SLEEP ACT	POST SLEEP ACT			POST SLEEPS				DEORBIT BURN
MS2	SLEEP	POST SLEEP ACT	POST SLEEP ACT							ENTRY INTERFACE
MS3	SLEEP	POST SLEEP ACT	POST SLEEP ACT							KSC LANDING (6/22:57:28)
DAY/NIGHT										
ORBIT	100	101	102	103	104	105	106	107		
GSTON COVERAGE	GMM -AGO -DKR -MAD -MAX		-MAX -YAR -DRR	-MAD -MAX -YAR -DRR	-DKR -MAD -MAX -YAR -DRR	-MLX -MIL -BOR -DKR -BOT -YAR -DRR	-HAW -ACN -GDS -BOT -YAR -DRR -GMM	-MIL -MLX -BDA -DKR -GMM	GMM -MIL -MLX -BDA -DKR -GMM	GMM
TDRS	E H		-DKR -MAD	-MLX -BDA -DKR	-MIL -MLX -BDA	-YAR -DRR -GDS -BOT	-YAR -DRR -DKR	-YAR -DRR -DKR	-YAR -DRR -DKR	
ATTITUDE	-ZLV		IMU		-XSI		IMU		DEORBIT	
NOTES:	WAVEOFF									

CONSUMABLES CURVES

D. HEATH, E. E. FISHER

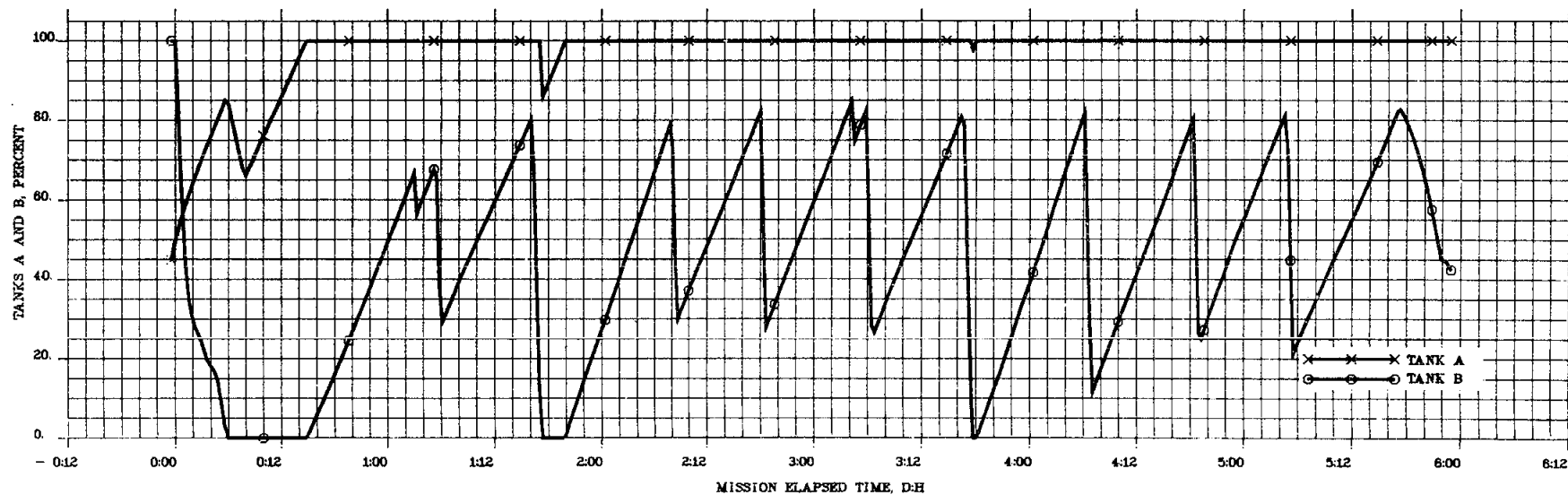
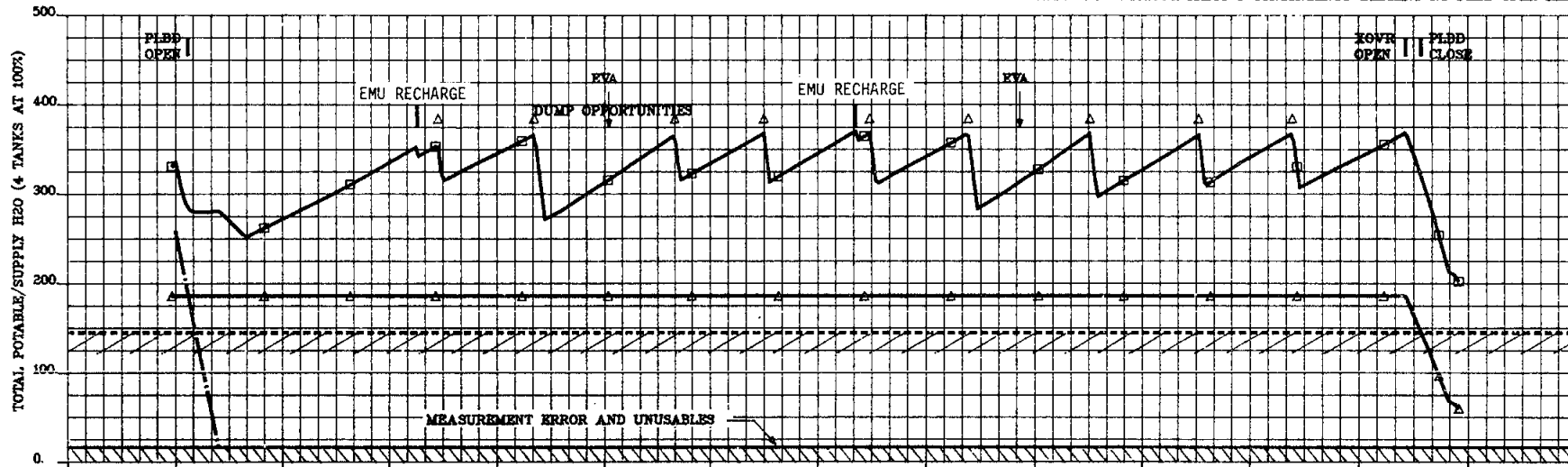
DATA SOURCE JSC-19090 (CAP) 12/05/83

DATA CONFIRMED *DW Heath 1/23/84*

TRAJECTORY: OFF CYCLE 1  
CAP: BASIC 12/05/83  
ANALYSIS DATE 01/19/84

□ □ □ TANKS A-D  
△ △ △ TANKS C-D

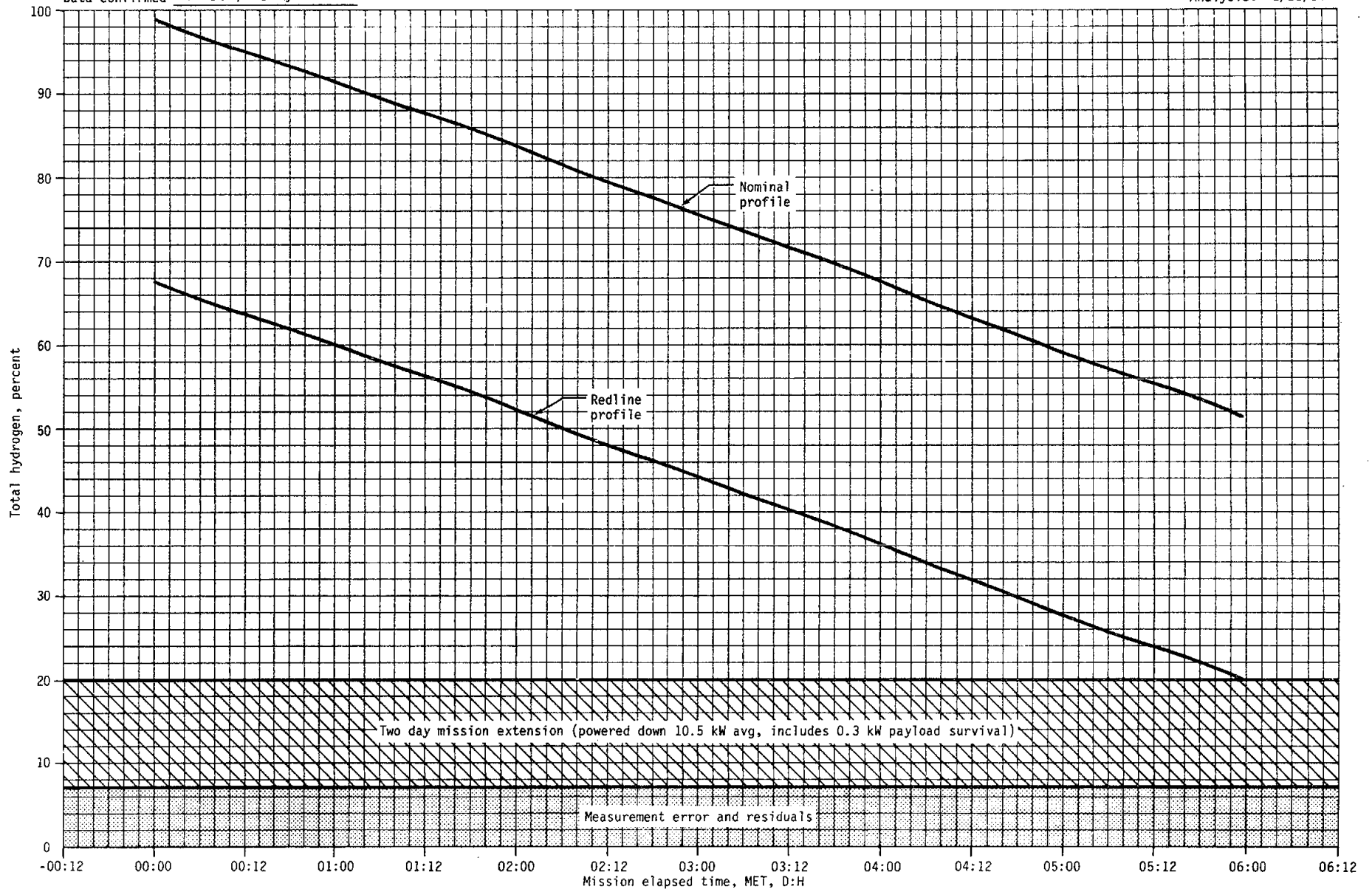
----- ANYTIME CONTINGENCY DEORBIT (165 MIN) REDLINE  
- - - - - ORBIT 4 CONTINGENCY DESCENT NO PLBD OPEN REDLINE



41-C SUPPLY WATER

S. Price, G. Clark/FPB/MPAD  
Data source JSC 19090 (CAP) 12/5/83  
Data confirmed *Walt Sear*

Trajectory: Cycle 1  
CAP: Basic 12/5/83  
Analysis: 1/13/84

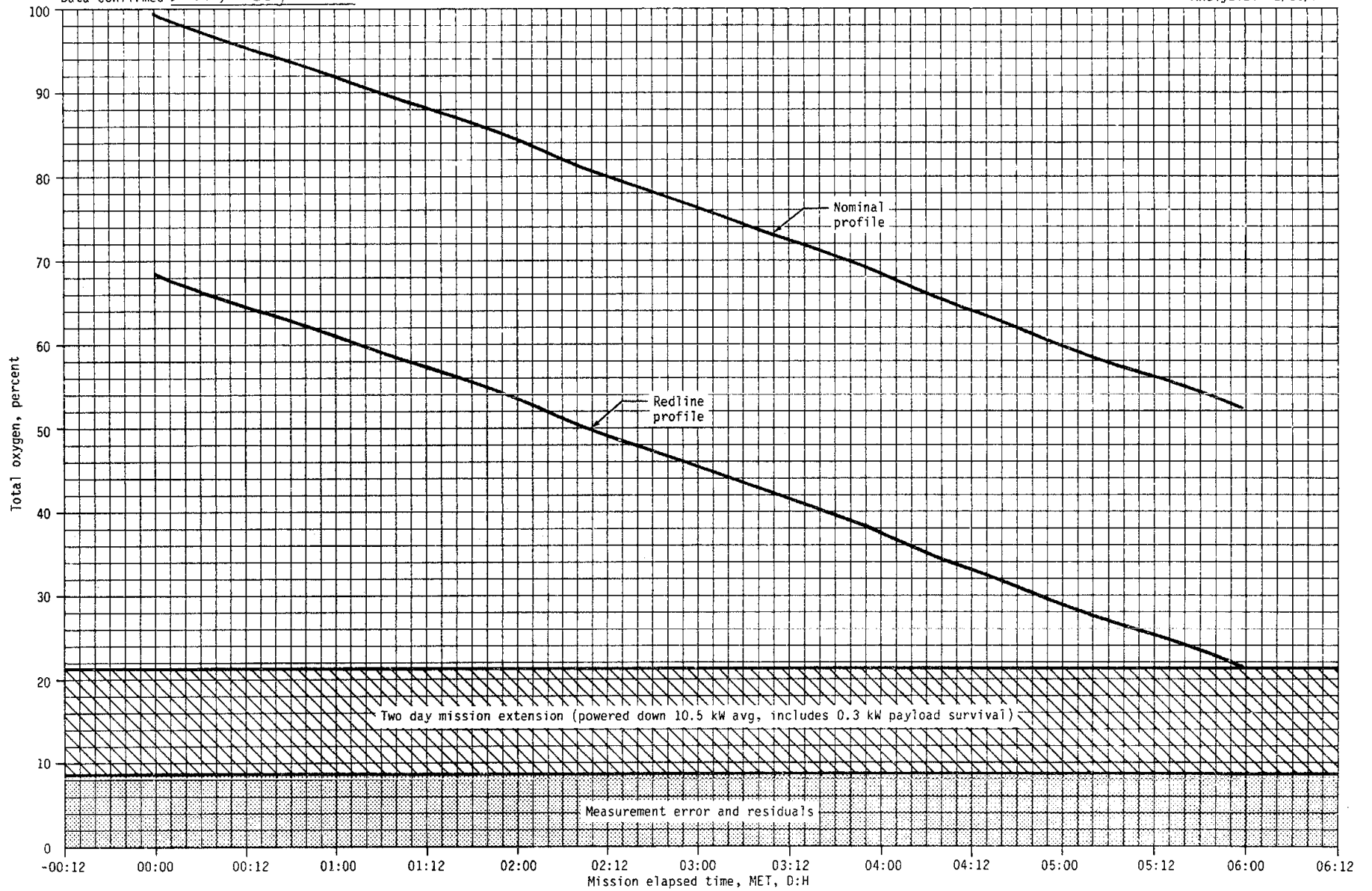


Flight 41-C cryogenic hydrogen profile.



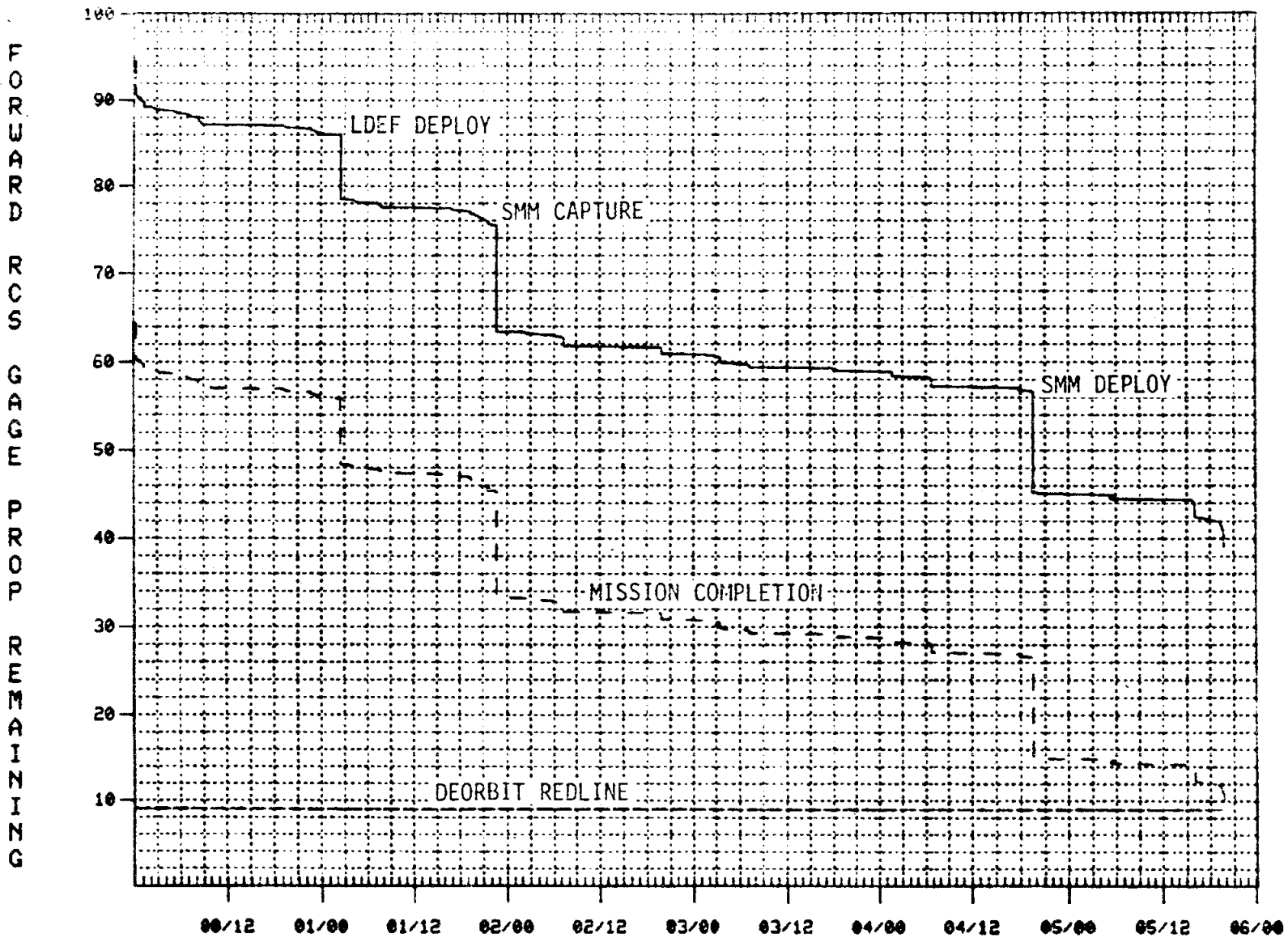
S. Price, G. Clark/FPB/MPAD  
Data source JSC 19090 (CAP) 12/5/83  
Data confirmed *Walt Sneyd*

Trajectory: Cycle 1  
CAP: Basic 12/5/83  
Analysis: 1/13/84



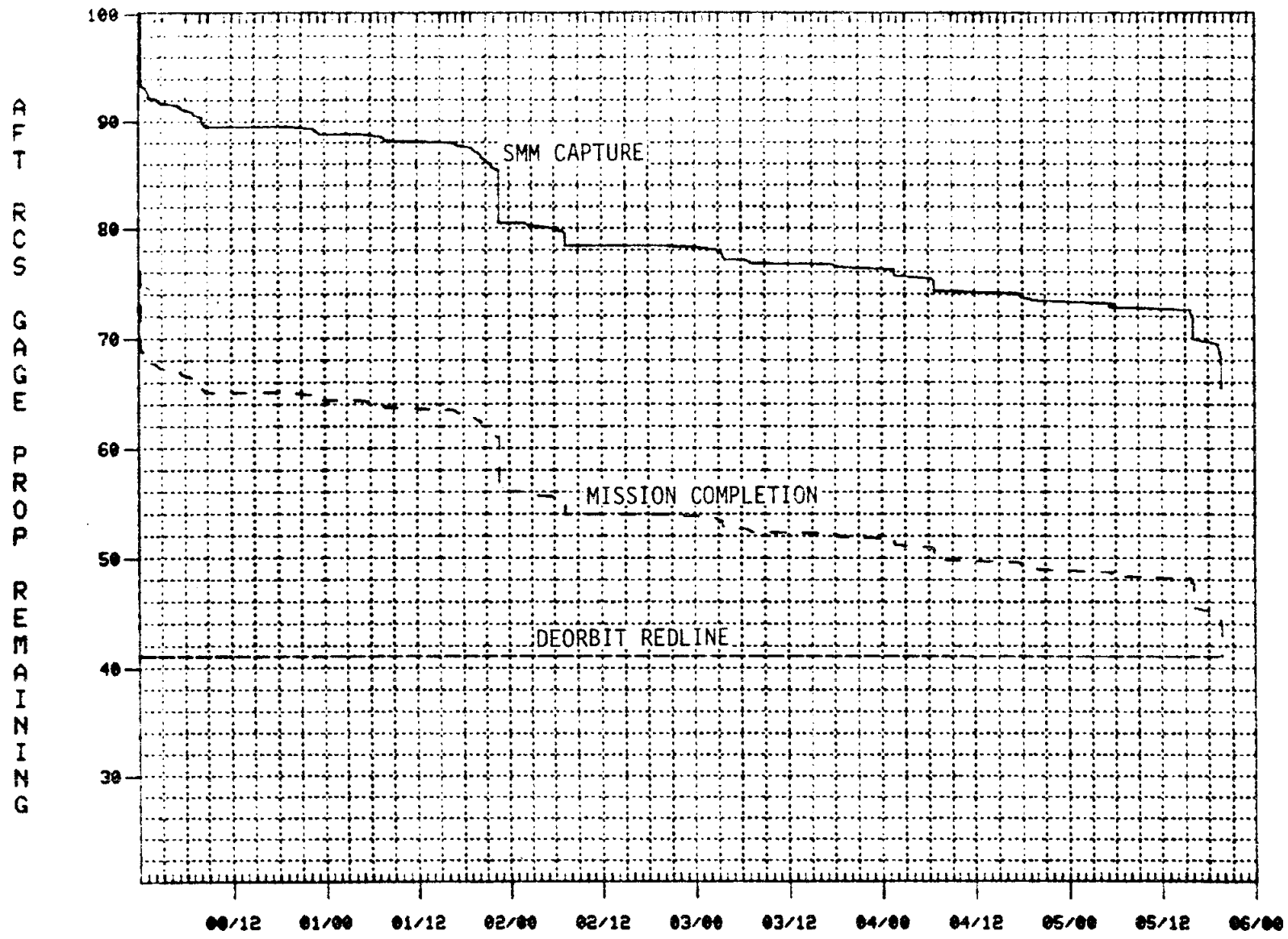
Flight 41-C cryogenic oxygen profile.

FORWARD RCS PROP REMAINING(% GAGE)



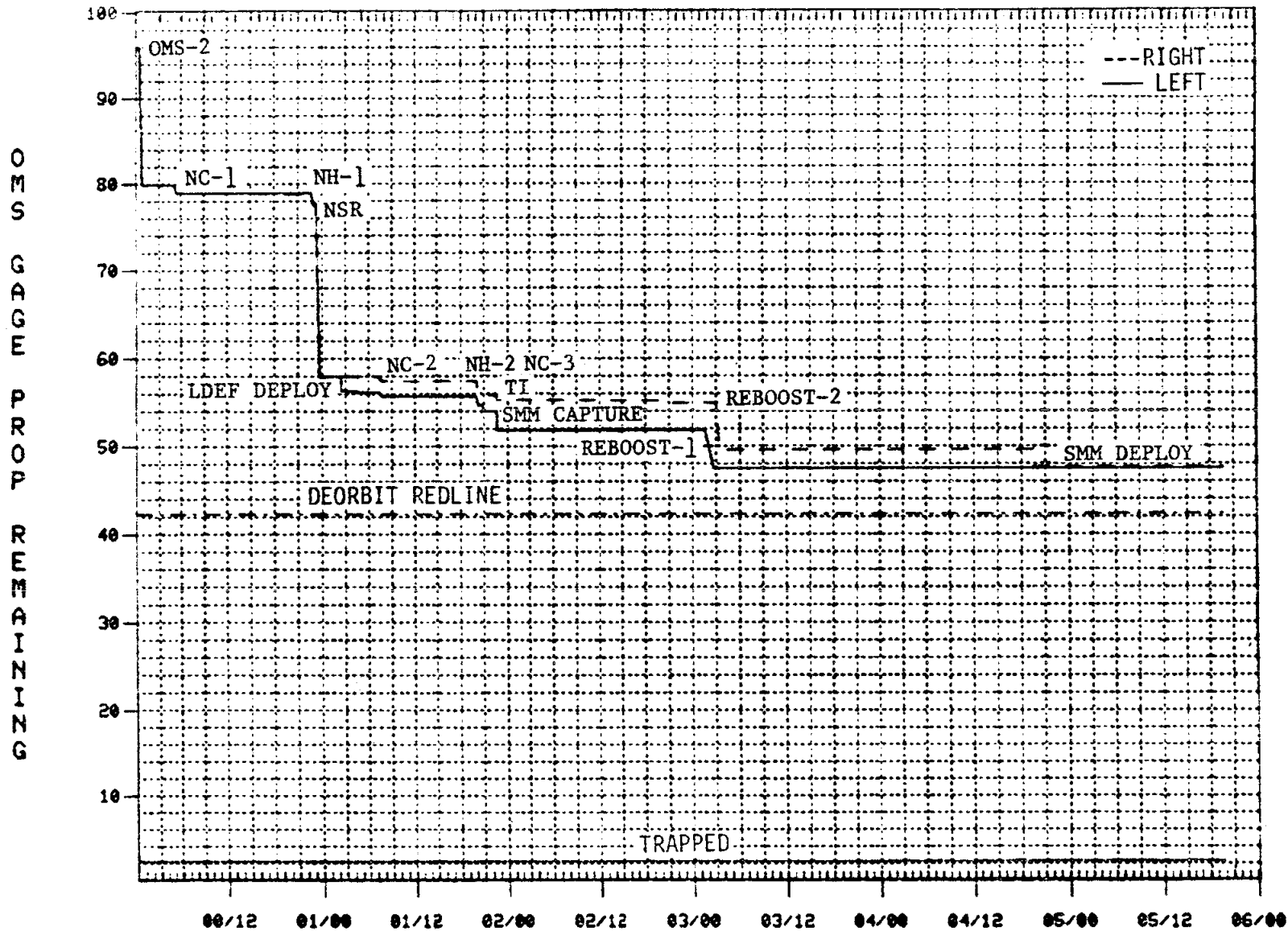
MISSION ELAPSED TIME IN DAYS/HOURS

# AFT RCS PROP REMAINING(% GAGE)



MISSION ELAPSED TIME IN DAYS/HOURS

# OMS PROP REMAINING(% GAGE)



MISSION ELAPSED TIME IN DAYS/HOURS

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

CREW ACTIVITY PLAN NOTES  
(CONSTRAINTS AND GUIDELINES)

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CAP NOTES

CREW ACTIVITY PLAN NOTES  
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

41-C will launch from KSC using OV-099 on April 4, 1984, into an orbit with a 250 nm apogee and a perigee between 250 and 120 nm depending on phasing requirements. The orbital inclination will be 28.50°. The mission duration will be 6 days (~143 hrs). Nominal landing occurs at KSC on April 10, 1984.

Landing opportunities (with reboost burns) are:

		<u>LANDING ORBIT NO.</u>	<u>SITE</u>	<u>LOCAL TIME</u>
Nominal	Primary	92	KSC	09:15 EST
	Backup	93	KSC	10:56 EST
	Weather Alternate	92	EDW	06:06 PST
1 Day Late	Primary	107	KSC	09:02 EST
	Backup	108	KSC	10:43 EST
	Weather Alternate	107	EDW	05:54 PST
2 Days Late	Primary	121	KSC	07:08 EST
	Backup	122	KSC	08:49 EST
	Weather Alternate	122	EDW	05:40 PST

MAJOR EVENTS

<u>LAUNCH (KSC)</u>	April 4, 1984
MET (DD/HH:MM:SS)	0/00:00:00
Day of year (EST)	095
EST/GMT	10:05/15:05 (approx)

<u>MECO</u>	
MET (DD/HH:MM:SS)	0/00:08:12
ALT (nm)	57

<u>OMS-1</u>	
Not Done	
(Direct Insertion)	

<u>OMS-2 (Subject to change depending on phasing requirements)</u>	
MET (DD/HH:MM:SS)	0/00:42:47
ΔV (fps)	168.9
ΔT (MM:SS)	2:04
ORBIT ha/hp (nm)	251 x 137

<u>NC-1 (Phasing Maneuver)</u>	
MET (D/HH:MM:SS)	0/05:19:03
ΔV (fps)	10.1
ΔT (MM:SS)	00:09
ORBIT ha/hp (nm)	251/142

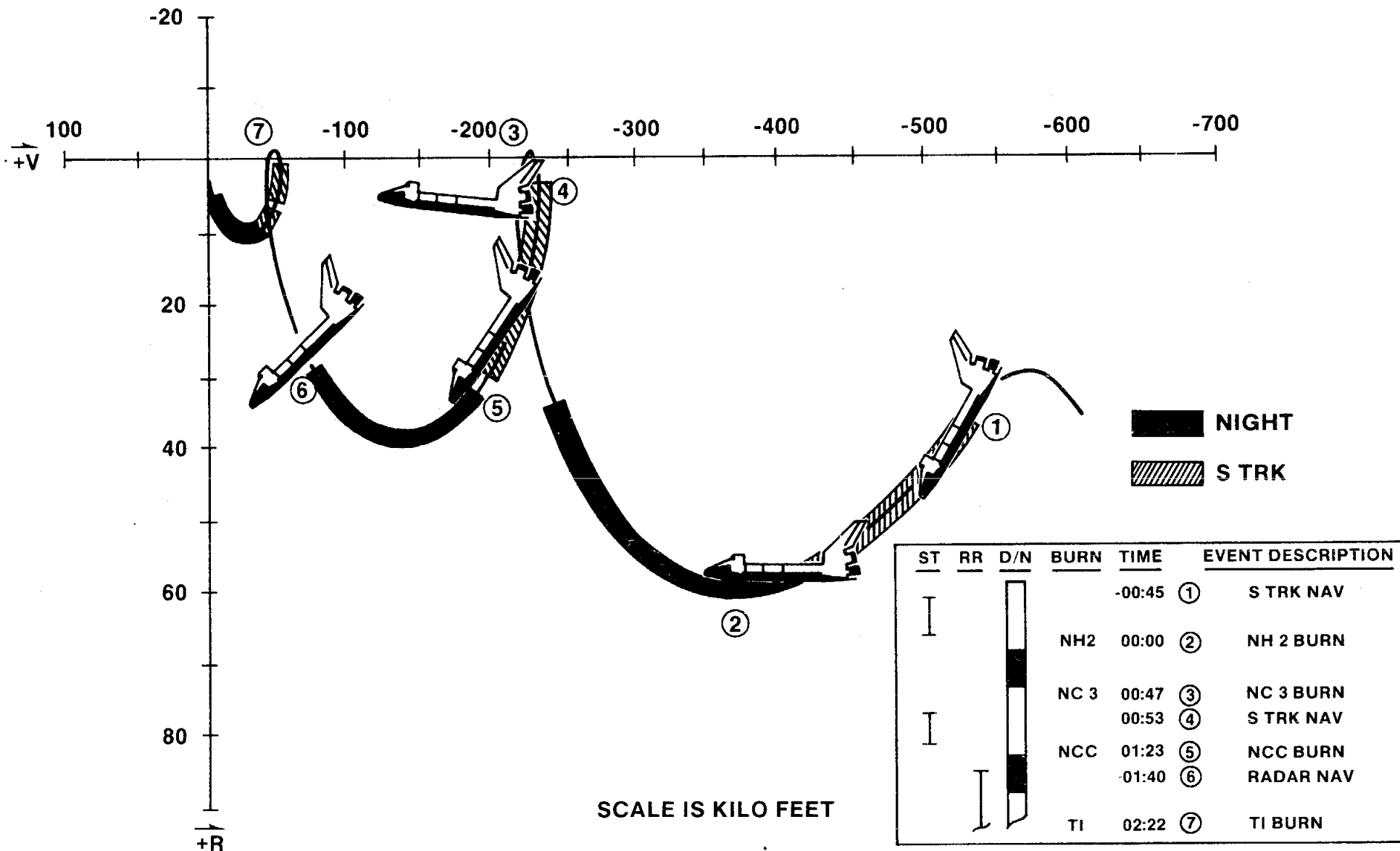
CAP NOTES



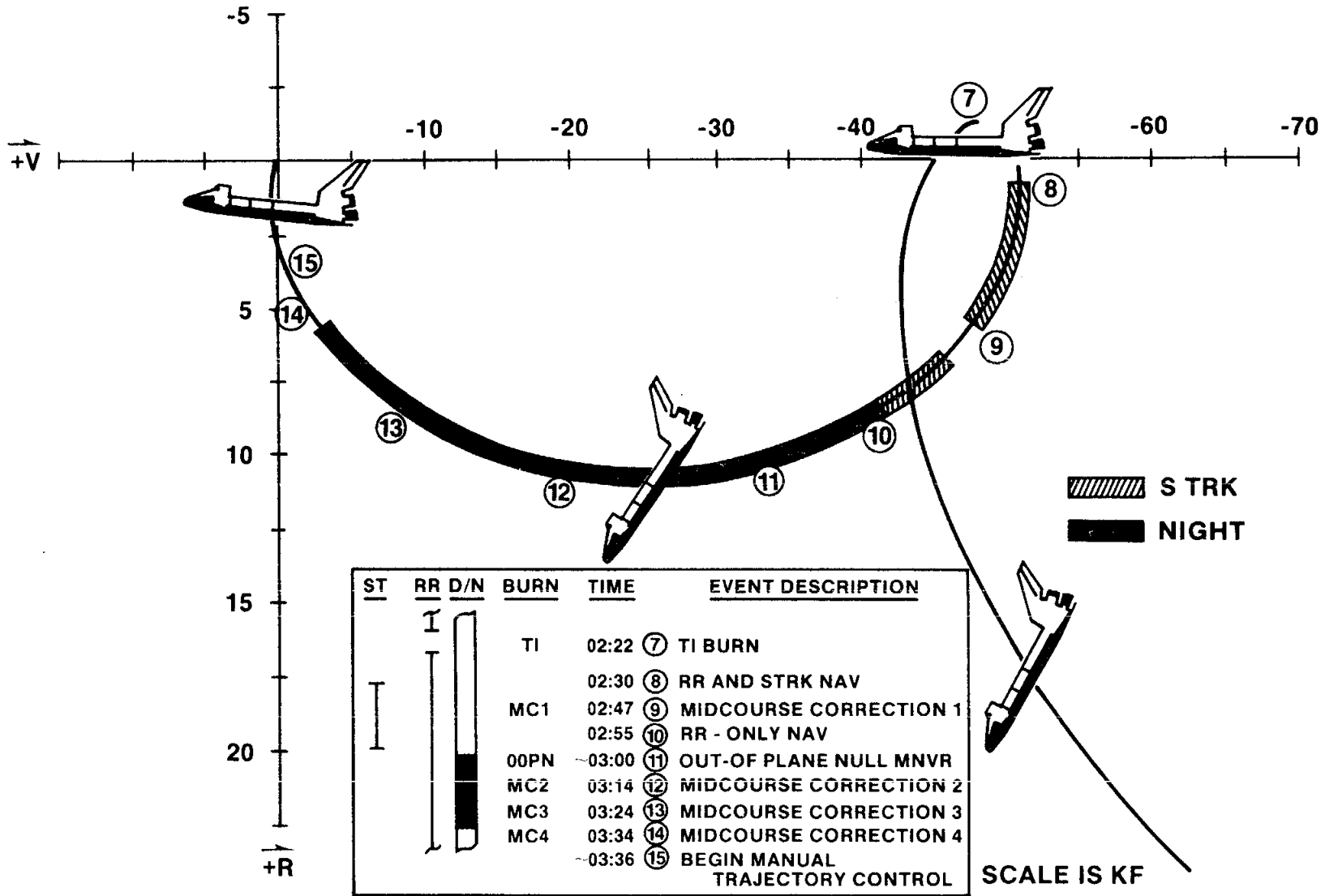
<u>NPC (Plane Change Maneuver)</u>	
MET (D/HH:MM)	0/07:05 (approx)
$\Delta V$ (fps)	0 (nominal)/10 (average)
<u>NH-1 (Height Adjust Maneuver)</u>	
MET (D/HH:MM:SS)	0/22:53:09
$\Delta V$ (fps)	13.2
$\Delta T$ (MM:SS)	00:08
ORBIT ha/hp (nm)	259/132
<u>NSR (Coelliptic Maneuver - line of apsides and ha/hp adjust)</u>	
MET (D/HH:MM:SS)	0/23:39:04
$\Delta V$ (fps)	213.5
$\Delta T$ (MM:SS)	02:13
ORBIT ha/hp (nm)	260/257
<u>LDEF SEPARATION</u>	
MET (D/HH:MM:SS)	03:21:46
$\Delta V$ (fps)	0.5
$\Delta T$ (MM:SS)	00:02
ORBIT ha/hp (nm)	260/256
<u>NC-2 (Phasing Maneuver)</u>	
MET (D/HH:MM:SS)	1/07:40:25
$\Delta V$ (fps)	6.3
$\Delta T$ (MM:SS)	00:06
ORBIT ha/hp (nm)	261/259
<u>NH-2 (Height Adjust Maneuver)</u>	
MET (D/HH:MM:SS)	1/20:14:36
$\Delta V$ (fps)	10.7
$\Delta T$ (MM:SS)	00:09
ORBIT ha/hp (nm)	267/259
<u>NC-3 (Phasing Maneuver)</u>	
MET (D/HH:MM:SS)	1/21:01:49
$\Delta V$ (fps)	7.8
$\Delta T$ (MM:SS)	00:07
ORBIT ha/hp (nm)	267/263
<u>NCC (Corrects phasing, altitude, and plane)</u>	
MET (D/HH:MM)	1/21:38 (approx)
$\Delta V$ (fps)	0 (nominal)
<u>TI (Terminal Phase Initiation)</u>	
MET (D/HH:MM:SS)	1/22:36:19
$\Delta V$ (fps)	6.2
$\Delta T$ (MM:SS)	00:06
ORBIT ha/hp (nm)	268/266
<u>MC-1 (Midcourse Correction)</u>	
MET (D/HH:MM)	1/23:03 (approx)
$\Delta V$ (fps)	0 (nominal)
<u>MANUAL OUT-OF-PLANE NULL</u>	
MET (D/HH:MM)	1/23:11 (approx)
$\Delta V$ (fps)	0 (nominal)

<u>MC-2 (Midcourse Correction)</u>	
MET (D/HH:MM)	1/23:28 (approx)
$\Delta V$ (fps)	0 (nominal)
<u>MC-3 (Midcourse Correction)</u>	
MET (D/HH:MM)	1/23:38 (approx)
$\Delta V$ (fps)	0 (nominal)
<u>MC-4 (Midcourse Correction)</u>	
MET (D/HH:MM)	1/23:48 (approx)
$\Delta V$ (fps)	0 (nominal)
<u>TRANSITION TO +V-BAR (800ft from SMM on V-Bar)</u>	
MET (D/HH:MM:SS)	2/00:00:10
$\Delta V$ (fps)	5.3
$\Delta T$ (MM:SS)	00:20
ORBIT ha/hp (nm)	269/266
<u>REBOOST-1</u>	
MET (D/HH:MM:SS)	3/02:44:41
$\Delta V$ (fps)	26
$\Delta T$ (MM:SS)	00:17
ORBIT ha/hp (nm)	285/266
<u>REBOOST-2</u>	
MET (D/HH:MM:SS)	3/03:32:51
$\Delta V$ (fps)	31.9
$\Delta T$ (MM:SS)	00:21
ORBIT ha/hp (nm)	285/285
<u>RADIAL SEPARATION</u>	
MET (D/HH:MM)	4/20:40 (approx)
$\Delta V$ (fps)	1.0
<u>FINAL SEPARATION</u>	
MET (D/HH:MM)	4/21:00 (approx)
$\Delta V$ (fps)	0.5
<u>DEORBIT BURN</u>	
MET (D/HH:MM:SS)	5/22:02:54
$\Delta V$ (fps)	465
$\Delta T$ (MM:SS)	4:06
ORBIT ha/hp (nm)	287/24
<u>ENTRY INTERFACE</u>	
MET (D/HH:MM:SS)	5/22:40:10
<u>LANDING</u>	
MET (D/HH:MM:SS)	5/23:11:00
Day of Year (EST)	099
EST/GMT	09:16/14:16

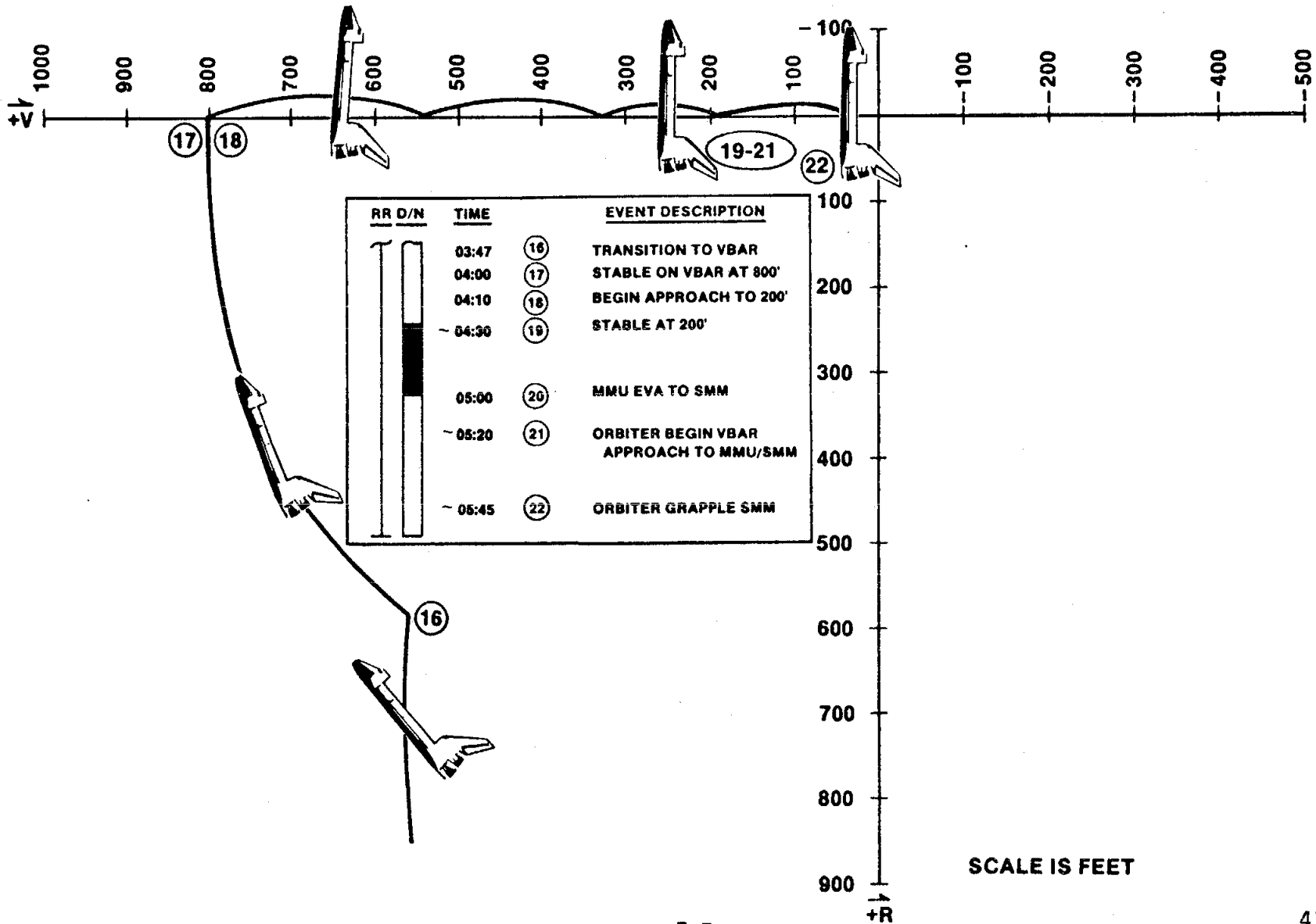
# SOLAR MAX RENDEZVOUS PROFILE (SMM AT CENTER OF ROTATING LVLH REFERENCE FRAME)



# SOLAR MAX RENDEZVOUS PROFILE (SMM AT CENTER OF ROTATING LVLH REFERENCE FRAME)



## SOLAR MAX RENDEZVOUS PROFILE (SMM AT CENTER OF ROTATING LVLH REFERENCE FRAME)



SCALE IS FEET

## B. CREW

1. The crew will launch with an integrated harness restraint over Intravehicular Activity (IVA) clothing. Anti-G suits will be worn by all crewmembers for entry.
2. All crewmembers will launch wearing the Launch/Entry Helmets (LEH). After ascent, the Wireless Communication Control Units (WCCUs) are unstowed and distributed to the crew. Prior to seat ingress on entry day, the WCCUs are stowed and the LEHs are donned for entry until landing.

## C. ORBITER SYSTEMS

### 1. Communications and Instrumentation

- a. The Operational Instrumentation (OI) system will nominally be managed from the ground through uplink RTC commands coordinated with the crew.
- b. The Modular Auxiliary Data System (MADS) will nominally be managed through uplink RTC commands and crew switch actions.
- c. There are 12 GSTDN sites available for on-orbit coverage: ORR, GDS(GDX), MIL(MLX), BDA, HAW, GWM, AGO, ACN, MAD(MAX), YAR, BOT, and DKR.
- d. There are 3 GSTDN sites available for real-time TV: GDS, MIL, and HAW.
- e. There are 2 GSTDN sites available for UHF voice only: YAR and BOT.
- f. There is one SGLS site available for contingency on-orbit coverage: IOS.

### 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 much greater than 5 nm. These are real-time calls. In addition, state vectors must be uplinked for specified targets when using an orbiting vehicle as a TGT ID with Universal Pointing.
- b. IMU alignments are scheduled approximately every 12 hours in morning and evening activities and prior to major events requiring low navigation uncertainty.

- c. The on-orbit avionics configuration is listed below. GPC 2 may be shut down during orbit to reduce electrical loads, if required.

GPC 1	- GNC OPS 2
GPC 2	- GNC OPS 2
GPC 3	- FD OPS 3 (OFF)
GPC 4	- SM OPS 2
GPC 5	- BFS (OFF)
IMUs (3)	- OPERATE
STAR TRACKERS (2)	- ON
MASS MEMORY UNITS (2)	- ON
FLIGHT-CRITICAL MDMs (8)	- ON

3. Environmental Control and Life Support Subsystem (ECLSS)

- a. The CO2 absorbers are installed for launch and entry and are alternately replaced as needed.
- b. The four supply water tanks and one waste water tank are loaded for launch with volumes sufficient to meet a rev 4 launch day deorbit opportunity with PLBDs failed closed (TK A = EMPTY, TK B = FULL, TK C = 93%, TK D = 93%, Waste TK = EMPTY). If waste water production exceeds storage capacity, a real-time call will be made to perform a dump. Ten supply dumps are estimated to occur. Potential supply water dumps are scheduled, based upon predicted fuel cell water production. A real-time call will be made prior to each to inform the crew whether a dump is required, and to what level. Tanks A and B will be dumped to a level that will allow the tanks to be full prior to the next daily group of deorbit opportunities.

D. TEXT UPLINK SYSTEM

1. The teleprinter (TPR) will provide an on-orbit capability to receive and reproduce text-only data (such as procedures, weather data, and CAP updates or changes) from MCC during routine and off-nominal situations. The TPR uses S-Band and is not dependent on TDRS Ku-Band. TPR uplink requires 1 to 2.5 minutes per message, depending upon the number of lines (up to 66). Activation includes powering up the unit during Post Insertion. The TPR will remain on continuously until deactivation prior to seat ingress on entry day.
2. The Text and Graphics System (TAGS) is basically a hard copy machine that operates via command link. TAGS will not be carried on this flight.

## 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, and two RMS TV cameras configured as follows:

<u>Camera</u>	<u>Lens</u>
A(Port Fwd)	CLA(Color Lens Assembly)
B(Port Aft)	MLA(Monochrome Lens Assembly)
C(Starboard Aft)	MLA
D(Starboard Fwd))	CLA
EE(RMS End Effector)	MLA
Elbow(RMS)	WLA (Wide Angle Lens Assembly)

2. The video tape recorder (VTR) is available with 30-min cassettes.
3. 35mm, 16mm, and 70mm camera systems are available.
4. A Cinema 360 camera will be flown in the payload bay.
5. An IMAX camera will be flown in the cabin.
6. A Linhof Aero Technika camera will be flown in the cabin, but no specific crew activities will be scheduled.

## F. REMOTE MANIPULATOR SYSTEM (RMS)

The RMS will be used and evaluated in the accomplishment of the following DTOs:

1. DTO 0501 Maximum Weight/Maximum Volume Payload Handling Performance
2. DTO 0762 Orbiter - RMS Dynamic Interaction Test

The RMS will be used to deploy the LDEF. In the process of deploying the LDEF the arm will be used to perform DTO 0501 and support DTO 0762. The RMS will also be used to retrieve, support EVA repair of, and deploy the SMM.

## G. PAYLOADS

1. CINEMA-360

The Cinema-360 is part of a joint endeavor agreement between NASA and Cinema-360, Inc., a group of 3 planetariums, to produce a color motion picture film of Shuttle Flight Operations from launch to landing. One 35mm 'Arriflex' motion picture camera will be flown in the PL bay, starboard side, mounted in a heated, pressurized 'GAS' can, viewing through an optical dome, using a 'Fisheye' lens.



## 2. IMAX

The IMAX camera is part of a joint endeavor agreement between NASA and IMAX Systems Corp. of Toronto, Canada, to produce a color motion picture film of Shuttle Flight Operations from launch to landing. One 70mm motion picture camera will be stowed in the middeck with several lenses, two loaded film magazines, and seven rolls of reload film.

## 3. LDEF (Long Duration Exposure Facility)

The LDEF is a free-flying passive spacecraft which provides accommodations for experiments which require long-term exposure to the space environment.

The LDEF is designed to accommodate a large number of experiments in standardized trays. The LDEF will be carried to an almost circular, ~260 nm orbit, deployed in a gravity-gradient stabilized mode, and then retrieved during a subsequent Shuttle flight. The experiments will then be returned to the investigators for data analysis.

The LDEF is approximately 169 in. in diameter and will occupy a cargo bay length of approximately 362 in.

The LDEF has two grapple fixtures. One is part of the LDEF Experiment Initiation System (EIS) and will be grappled and rigidized momentarily on-orbit to start various experiment initiation timers. Indicators on the LDEF will be observed by an RMS camera to confirm EIS activation. The EIS grapple fixture will then be released by the RMS, which will grapple the other, standard, grapple fixture and proceed with deployment. These grapple fixtures, along with the trunnion latches operated from the aft flight deck, constitute the only LDEF-orbiter interfaces. There are no electrical power or data interfaces with LDEF.

## 4. RME (Radiation Monitoring Equipment)

The RME experiment is designed to measure radiation levels in the orbiter middeck at various times throughout the flight. Experiment equipment includes the Handheld Radiation Monitor (HRM-III), a gamma and electron dosimeter, and the Pocket REM Meter (PRM), a neutron and proton dosimeter. The HRM-III will operate four times during the mission, while the PRM will operate twice.

## 5. SMRM (Solar Maximum Repair Mission)

The SMRM includes the SMM observatory presently in orbit and the Flight Support System (FSS) for berthing the SMM and return of the SMM to the ground if it cannot be repaired in orbit.

The STS will launch from KSC and will rendezvous with the SMM observatory. Onboard the STS, the FSS and attached unique servicing hardware will be deactivated and in a stowed position for launch and ascent. To achieve and maintain thermal control of the FSS, FSS activation will be required after PLBD opening. Configuration and checkout activities for the FSS will be performed prior to rendezvous with the SMM.

Retrieval and repair of the SMM will be made using the Remote Manipulator System (RMS) in conjunction with Extravehicular Activity (EVA) which includes Manned Maneuvering Unit (MMU) operations. The first of two scheduled EVAs starts with the orbiter stationkeeping near the SMM. The MMU crewman will fly over to the SMM, attach to one of its trunnion pins, and null the SMM rates. The orbiter will then close, and the SMM will be grappled by the RMS and berthed on the FSS. After berthing, the SMM is powered down and the Modular Attitude Control System (MACS) module is replaced. A plasma baffle will be installed over the X-ray Polychromator (XRP) instrument vent port and, time permitting, the hinge will be installed on the main electronic box (MEB) for the Chronograph/Polarimeter (C/P) instrument. (MEB changeout is completed during the second EVA.) The SMM will then be powered up so that the GSFC Payload Operations Control Center (POCC) can conduct an extensive checkout and verification of the SMM after the first EVA is complete. This checkout will be complete and the SMM orbit will be raised to 285 nm circular (propellant permitting) before the start of the second EVA. The second EVA will complete the changeout of the MEB. The MMS portion of the satellite will remain powered up during this replacement, precluding the need for a lengthy post repair checkout on the FSS. As a result, the SMM will be grappled and unberthed shortly after the MEB changeout is complete allowing the EVA crewmen to visually confirm deployment of the SMM high gain antenna system (HGAS) before ending the EVA. The SMM will then remain on the RMS until released. After release, the orbiter will establish stationkeeping with the SMM for about 2 hours and will then start a slow separation which will provide up to 8 hours of post release communications with the SMM through the orbiter's PI. This permits the GSFC POCC to assure proper SMM attitude control. Before deorbit, the FSS platform will be checked out, positioned for entry, and deactivated.

#### 6. STUDENT EXPERIMENT (Comparison of Honeycomb Structures)

The purpose of this experiment is to determine the effects of weightlessness on honeycomb construction by a colony of bees. Physical characteristics of the honeycomb constructed onboard will be compared post-flight with a honeycomb constructed on the ground by a control colony. Also, in-flight video will be used to compare bee behavior in zero gravity to that of the control colony. The onboard experiment is contained in a Bee Enclosure Module (BEM) which is a self-contained unit designed to provide an environment for honeycomb construction. The BEM occupies one half of a standard middeck stowage locker.

ON-ORBIT CREW ACTIVITY  
DETAILED TEST OBJECTIVES (DTOs),  
DETAILED SUPPLEMENTARY OBJECTIVES (DSOs)

INTRODUCTION..... 8-2  
TABLE 8-1 41-C DTOs/DSOs..... 8-3

DTOs/DSOs

## INTRODUCTION

The following Table describes the scheduling data and rationale for on-orbit crew activity related DTOs/DSOs for 41-C. The current FRD and approved changes thereto (Ref. 2) were used to compile this table.

DTOs/DSOs

DTO/DSO NUMBER	TITLE	SCHEDULED (DD/HH:MM) (MET)	SCHEDULING REMARKS
DTO 0321	Crew Compartment Structure Deflection Investigation	2/22:15 3/03:00 3/05:00	Comprised of three major activities (tape measurements, locker gap measurements, and locker marking), this test is scheduled whenever compatible with other middeck activities
DTO 0501	Max Volume/Max Weight Payload Deployment	~1/00:40	RMS autosequences and reberthing using the LDEF. Test sequence requires about 2 hours. Orbiter required to be in free drift for portions of the test. Test precedes LDEF deploy
DTO 0602	Cabin Atmosphere Verification	0/20:30 2/20:50 4/20:45	First sample desired with cabin at 14.7 PSI just prior to depress to 10.2 PSI. Second sample desired midway through 10.2 PSI period. Last sample desired at the end of 10.2 PSI before cabin repress to 14.7 PSI
DTO 0612	MMU Satellite Support Capabilities Demonstration	~2/01:00	Perform during MMU ops with SMM. No DTO unique activities are scheduled
DTO 0762	Orbiter-RMS Dynamic Interaction Test	~1/00:40	Requires free drift. A data collection DTO accomplished coincident with DTO 0501 prior to LDEF deploy

TABLE 8-1 41-C ON-ORBIT CREW ACTIVITY RELATED DTOs/DSOs

DTO/DSO NUMBER	TITLE	SCHEDULED (DD/HH:MM) (MET)	SCHEDULING REMARKS
DTO 0813	SMM Rendezvous Systems Performance	~1/19:15	A data-only test accomplished as part of nominal, planned rendezvous operations
DSO 0401	Validation of Predictive Tests and Countermeasures for Space Adaptation Syndrome	At each crewman's convenience during Pre Sleep Activity when practical	Allow 5 minutes per crewman each mission day after evening meal before sleep. Uses a debriefing checklist and microcassette recorder
DSO 0402	Cardiovascular Deconditioning Countermeasure Assessment	Prior to Deorbit Preparations	Crew fills drink containers to use for fluid loading before entry

TABLE 8-1 41-C ON-ORBIT CREW ACTIVITY RELATED DTOs/DSOs

DTO/DSO NUMBER	TITLE	SCHEDULED (DD/HH:MM) (MET)	SCHEDULING REMARKS
DSO 0408	Near Vision Acuity and Contrast Sensitivity	0/20:45 0/22:40 1/04:45 2/19:55 2/20:15 2/21:40 5/00:20 5/01:20	Desired three items for each crewmember. Flight days 1, 3, and 5 desired, but any schedule is acceptable. One crewmember takes test while the second records data
DSO 0901	Documentary Television	FD1 FD2 FD3 FD4 FD5 FD6	One TV downlink per day desired. Live TV, VTR dump, or bring-home tape for each flight-unique activity EIS Check and FSS Inspection LDEF Deploy EVA 1 Student Experiment EVA Prep and EVA 2 SMM Deploy, Press Conference, FSS Checkout and Stow, Student Experiment

TABLE 8-1 41-C ON-ORBIT CREW ACTIVITY RELATED DTOs/DSOs

DTO/DSO NUMBER	TITLE	SCHEDULED (DD/HH:MM) (MET)	SCHEDULING REMARKS
DSO 0902	Documentary Motion Picture Photography	FD2 FD3 FD4 FD5 FD6	Include P/L bay before and during any deploy. Include any anomalies or other items of interest LDEF Deploy EVA 1 EMU Maintenance EVA Prep and EVA 2 SMM Deploy and Cabin Stow
DSO 0903	Documentary Still Photography	FD2 FD3 FD4 FD5 FD6	Includes crew activities, orbiter functions, accommodations, mission related scenes, and any unscheduled activities of interest. Use 70mm HRC for PLB prior to any deploy LDEF Deploy EVA 1 Student Experiment, EMU Maintenance EVA 2 SMM Deploy
DTO 0764	Orbital Aero and Gravity Gradient Torque Measurements - Hi Orbit	Shopping List	Inhibit all RCS jets, systems vents, and water dumps during each 5 minute data take. Total of 6 data takes with maneuvers in between each. Not scheduled



TABLE 8-1 41-C ON-ORBIT CREW ACTIVITY RELATED DTOs/DSOs

<p>DTO 0776</p>	<p>On-orbit TACAN navigation</p>	<p>Shopping List</p>	<p>Cannot be done when the SMM repair sequence requires TFL 188. Requires OPS 8. Includes as many TACAN data takes as can be scheduled real time. Each data take can consist of tracking a specified TACAN site or a period of -ZLV used to obtain data from multiple stations. Not scheduled</p>
<p>DTO 0777</p>	<p>CCTV Laser Ranging</p>	<p>Shopping List</p>	<p>Crew compares range/range rate data from the laser rangefinder with that from the rendezvous radar. Other than turning the equipment on and off, no crew activity is scheduled</p>

TABLES

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TABLE 9-2 - SMRM EVENTS AND TIMES..... 9-3  
TABLE 9-3 - RADIATION MONITORING EQUIPMENT..... 9-4  
TABLE 9-4 - IMAX..... 9-5  
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TABLES

TABLE 9-1  
 LDEF DEPLOYMENT EVENTS AND TIMES  
 (All times approximate)

EVENT	MET (D/HH:MM)	DEPLOY MINUS (HH:MM)
RMS POWER UP	1/00:15	02:40
GRAPPLE EIS FIXTURE	1/00:25	02:30
VERIFY EIS TALKBACKS	1/00:35	02:20
GRAPPLE DEPLOYMENT FIXTURE	1/00:40	02:15
RELEASE LATCHES	1/00:55	02:00
PERFORM DTO 0501	1/01:00	01:55
RMS MNVR LDEF TO DEPLOY POSITION	1/02:15	00:40
MNVR ORBITER TO DEPLOY ATT	1/02:25	00:30
LDEF READY FOR RELEASE	1/02:55	00:00
DEPLOY AND MEASURE TIPOFF RATES	1/03:21	00:00
SEPARATION BURN	1/03:24	+00:03

TABLES

TABLE 9-2  
SMM REPAIR EVENTS AND TIMES OVERVIEW\*  
(All times approximate)

EVENT	MET(D/HH:MM)	APPROX DURATION (HH:MM)
FSS ACTIVATION	0/02:30	00:05
FSS CHECKOUT AND POSITION FOR BERTHING	0/04:50	00:50
EVA - 1	2/00:15	6:30 maximum
● ORBITER STA KEEP AT 200'	2/00:30	
● MMU STABILIZES SMM	2/01:30	
● GRAPPLE AND BERTH SMM	2/02:00	
● POSITION SMM/FSS FOR REPAIR	2/02:35	
● SMM POWER DISCONNECT	2/03:25	
● MACS MODULE REPLACEMENT	2/03:35	
● MEB HINGE INSTALLATION	2/04:50	
SMM POWER RECONNECT AND POST REPAIR C/O (GROUND COMMANDED)	2/06:10	8:00 of comm coverage
REBOOST OMS BURNS	3/02:20	1:25
EVA - 2	3/22:10	6:30 maximum
● S/C MEB MODULE CHANGEOUT	3/22:50	
● GRAPPLE AND UNBERTH	4/02:35	
● HGAS DEPLOY (GROUND COMMANDED)	4/02:50	
POCC DEPLOYMENT OPERATIONS (GROUND COMMANDED)	4/03:00	2:15 of comm coverage
RELEASE/ INITIATE STATIONKEEPING	4/18:40	
START SLOW SEPARATION (MAINTAIN PI COMM WITH SMM)	4/20:40	8:00 maximum post release
FSS C/O AND POSITION FOR LANDING	4/21:45	00:25
FSS DEACTIVATION	5/18:30	0:05

\*NOTE: This table does not present all SMM repair activities. It is an overview only. Detailed procedures in other FDF articles will contain complete SMM repair requirements.

TABLE 9-3  
 RADIATION MONITORING EQUIPMENT (RME)  
 ACTIVATION AND OPERATION TIMES

EVENT			APPROX MET (D/HH:MM)	DURATION (HH:MM)
HRM	DATA	ACT	0/20:25	00:55
		RCD	0/21:20	
	DATA	ACT	2/20:15	01:00
		RCD	2/21:15	
DATA	ACT	3/19:15	01:00	
	RCD	3/20:15		
DATA	ACT	5/00:15	01:00	
	RCD	5/01:30		
PRM	DATA	ACT	0/05:55	14:35
		RCD	0/20:30	
DATA	ACT	3/05:25	13:45	
	RCD	3/19:10		

TABLE 9-4  
IMAX (Cabin Camera)

SCHEDULED	SCENE
FD2 - Crew Discretion	RMS OPS WITH LDEF
FD2 - Crew Discretion	LDEF POST RELEASE
FD3 - Crew Discretion	MMU RELEASE OF GRAPPLED SMM WITH MMU FLYAROUND
FD3 - Crew Discretion	FSS ROTATION WITH BERTHED SMM
FD3 - Crew Discretion	ACS MODULE REPLACEMENT
FD4 - (~2/21:15 MET)	EMU MAINTENANCE
FD4 - (~2/23:30 MET)	CDR AFT STATION (STARBOARD) MS1 AFT STATION (PORT) PLT AS IV CREWMAN CREW ON MIDDECK
FD5 - Crew Discretion	MEB CHANGEOUT
FD5 - Crew Discretion	MMU CHECKFLIGHT
FD5 - Crew Discretion	SMM HIGH GAIN ANTENNA DEPLOY/GIMBAL
FD6 - Crew Discretion	SMM POST RELEASE AT 200 ft AND 300 ft

Cues to operate this camera are frequently found in the FDF article

TABLE 9-5  
CINEMA-360 (PLB Camera)

DESIRED SCHEDULE	SCENE
FD1	PAYLOAD BAY DOOR OPFNING
FD2	LDEF DEPLOY
FD3	SMM CAPTURE AND BERTHING
FD3 and 5	SMM REPAIR
FD6	SMM DEPLOY
When convenient after LDEF deploy	RMS UNBERTHING

Cues to activate this camera can be found in the flight data file article which contains the procedure to perform the desired scene (i.e., Post Insertion, PDRS OPS, EVA, and Rendezvous book).

TABLE 9-6  
DAP A CONFIGURATIONS

	A1*	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12
<u>TRANSLATION</u>												
PULSE ft/sec	0.10	0.10	0.10	0.10	0.10	0.10			0.10	0.05	0.10	0.10
<u>ROTATION</u>												
DSC RT NORM °/sec	0.200	0.400	0.200	0.200	0.200	0.200			0.200	0.200	0.100	0.100
VERN °/sec	0.200	0.400	0.200	0.008	0.200	0.200			0.200	0.200	0.008	0.150
PULSE NORM °/sec	0.10	0.10	0.30	0.10	0.10	0.10			0.10	0.10	0.04	0.04
VERN °/sec	0.010	0.010	0.010	0.010	0.050	0.010			0.010	0.010	0.002	0.002
COMP NORM °/sec	.00	.00	.00	.00	.00	.00			.00	.00	.00	.00
VERN °/sec	.000	.000	.000	.000	.000	.000			.000	.000	.000	.000
<u>DEADBAND</u>												
ATT NORM (deg)	5.000	1.00	5.00	1.00	5.00	5.00			2.00	2.00	3.00	3.00
VERN (deg)	1.000	1.000	1.000	.070	1.000	1.000			0.500	0.500	0.500	1.000
RATE NORM °/sec	0.20	0.20	0.20	0.20	0.20	0.20			0.20	0.20	0.20	0.20
VERN °/sec	.020	.020	.020	.010	.020	.020			.020	.020	0.010	.100
<u>JET OPT</u>												
P	1	1	3	1	1	3			1	1	1	1
Y	1	1	3	3	1	3			1	1	3	3
<u>CNTL ACCEL</u>												
	0	0	0	0	0	0			0	0	2	4

\*I-loaded OPS-2 DAP Configuration

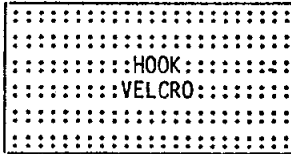


TABLE 9-6 (Cont)  
DAP B CONFIGURATIONS

	B1*	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11	B12	B13
<u>TRANSLATION</u>													
PULSE ft/sec	0.02	0.02	0.02	0.02	0.02	0.05	0.01	0.02	0.02	0.02	0.02	0.02	0.02
<u>ROTATION</u>													
DSC RT NORM °/sec	0.500	0.200	0.200	0.200	0.200	0.500	0.200	0.500	0.100	0.100	0.100	0.100	0.100
VERN °/sec	0.200	0.200	0.200	0.008	0.016	0.200	0.200	0.007	0.150	0.150	0.150	0.150	0.150
PULSE NORM °/sec	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
VERN °/sec	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002
COMP NORM °/sec	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
VERN °/sec	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
<u>DEADBAND</u>													
ATT NORM (deg)	3.00	3.00	3.00	0.30	3.00	2.00	2.00	3.00	3.00	3.00	3.00	3.00	3.00
VERN (deg)	1.000	1.000	1.000	0.100	0.033	0.500	0.500	1.000	5.00	1.000	1.000	1.000	1.000
RATE NORM °/sec	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20
VERN °/sec	.020	.020	.020	.010	.020	.020	.020	.020	.200	.100	.100	0.100	0.100
<u>JET OPT</u>													
P	1	3	1	1	3	1	1	1	1	1	1	1	1
Y	1	3	1	3	3	1	1	1	3	3	3	3	3
<u>CNTL ACCEL</u>	0	0	0	0	0	0	0	0	0	0	3	2	1

\*I-loaded OPS-2 DAP Configuration

# DAP BOOK



41-C/O/BAS

UNIV PTG	
TGT ID = 1	Orbiting Vehicle
= 2	Earth ctr
= 3	Earth tgt
	Input LAT ( $\pm 90$ )
	LON ( $\pm 180$ , + = East)
	ALT ( $\pm 99.99$ nm)
= 4	Sun ctr
= 5	Celestial tgt
	Input RA (0-359.99)
	DEC ( $\pm 90$ )
= 11-60	Nav Stars
BODY VECT = 1	+X*
= 2	-X*
= 3	-Z*
= 4	PTC ( $\sim 20$ below +X)*
= 5	Optional
	Input P (0-359.99)
	Y (270-359.99, 0-90)
* input OM +	OM (0-359.99)
MON AXIS = 1	+X
2	-X

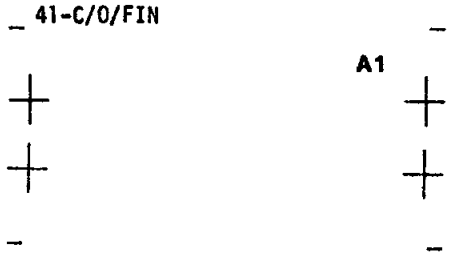
41-C/O/BAS

G20 DAP CONFIG	
CNTL ACCEL = 0	Orbiter alone
= 1	LDEF at auto seq
	points 1 and 8
= 2	LDEF high hover and
	release
= 3	LDEF 4' from berth;
	SMM parked
= 4	SMM release
JET OPT = 1	Normal
= 2	Nose only
= 3	Tail only

TOP



- DAP                      PURPOSE
- A1 - NOMINAL
    - ZLV
    - IMU ALIGN
    - TAIL ONLY CONTROL
    - BACKOUT
    - PRE/POST PAM DEPLOY
    - OMS BURN
    - TAIL-TO-SUN
    - LOSS OF VERN
  - A2 - PTC
  - A3 - RCS HOT FIRE
  - A4 - GG
  - A5 - IMU ROLL
  - A6 - LOSS OF VERN  
(TAIL ONLY)
  - A7 - (Blank)
  - A8 - (Blank)
  - A9 - RENDEZVOUS
  - A10 - PROX OPS
  - A11 - LDEF RELEASE
  - A12 - SMM RELEASE
  - A13 - (Blank)



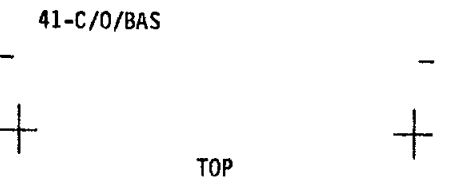
A1

TOP

DAP A1

- PURPOSE:
- ZLV
  - IMU ALIGN
  - TAIL ONLY CONTROL BACKOUT
  - PRE/POST PAM DEPLOY
  - OMS BURN
  - TAIL-TO-SUN
  - LOSS OF VERN  
(NOSE & TAIL)

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



41-C/O/BAS

A2

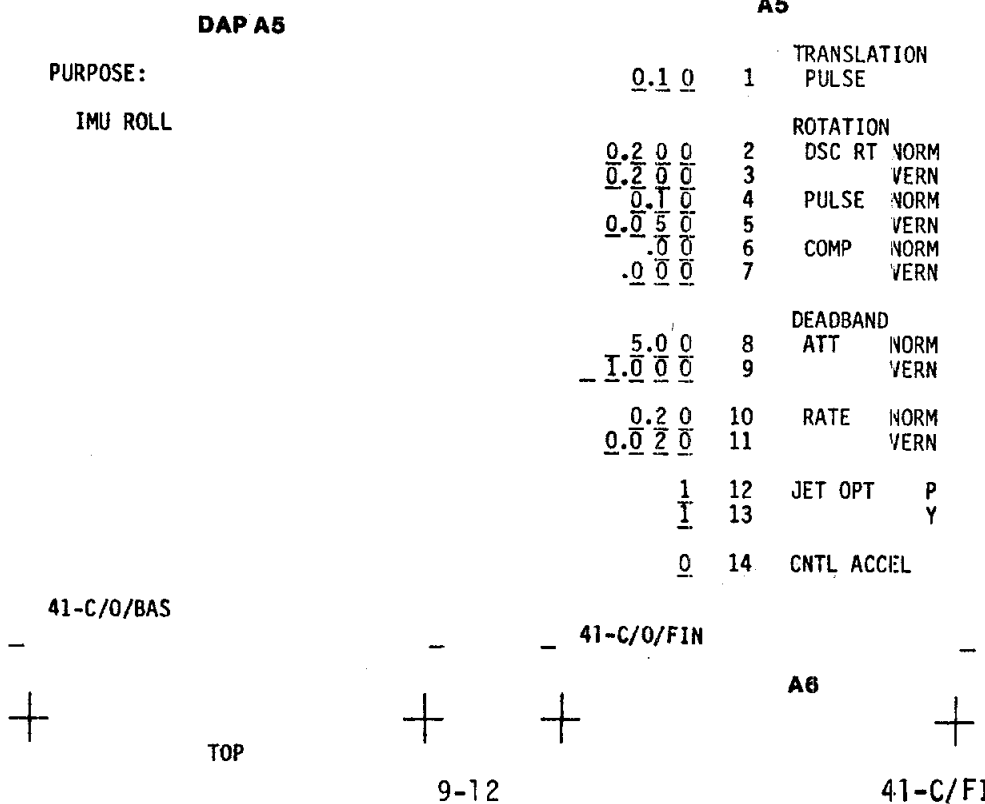
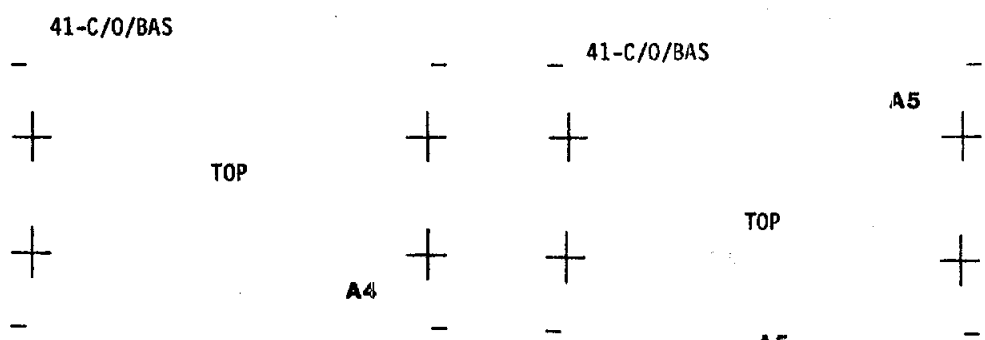
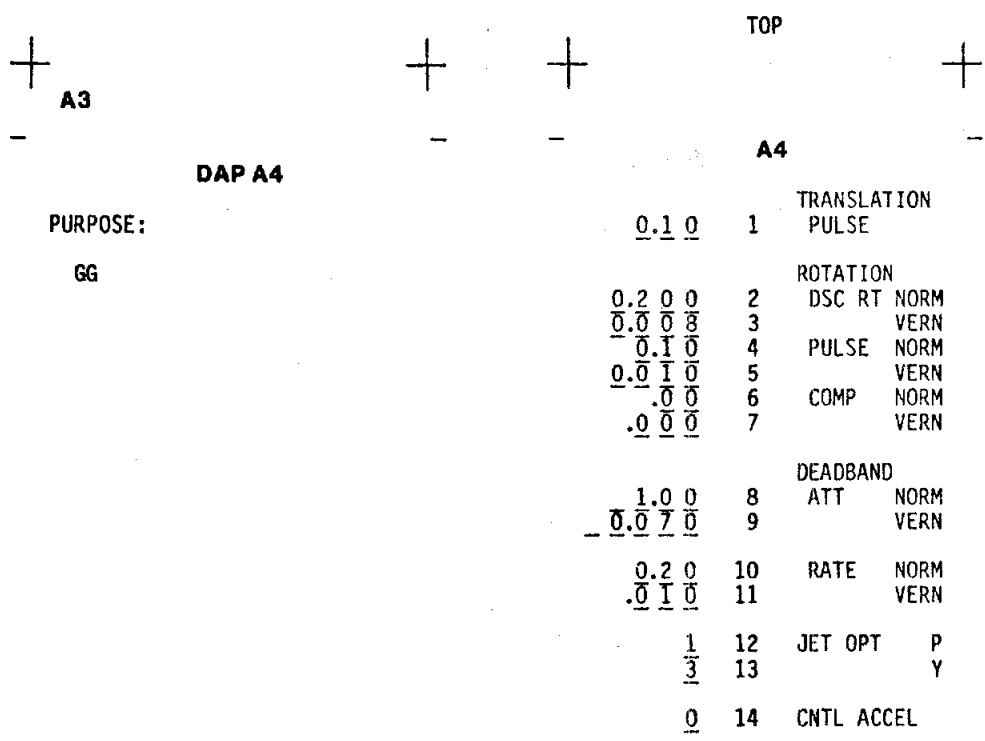
TOP

+	+	+	+	TOP
-	-	-	-	
	A1			
	DAP A2			A2
PURPOSE:		0.1 0	1	TRANSLATION PULSE
PTC		0.4 0 0	2	ROTATION DSC RT NORM
		<u>0.4 0 0</u>	3	VERN
		0.1 0	4	PULSE NORM
		0.0 1 0	5	VERN
		<u>0.0 0</u>	6	COMP NORM
		<u>0.0 0</u>	7	VERN
		1.0 0	8	DEADBAND ATT NORM
		<u>1.0 0 0</u>	9	VERN
		0.2 0	10	RATE NORM
		<u>0.2 0</u>	11	VERN
		1	12	JET OPT P
		<u>1</u>	13	Y
		0	14	CNTL ACCEL

-	-	-	-	-
	41-C/O/BAS		41-C/O/BAS	
+		+	+	+
	TOP			A3
+		+	+	TOP
-	A2	-	-	-
	DAP A3			A3

PURPOSE:		0.1 0	1	TRANSLATION PULSE
RCS HOT FIRE		0.2 0 0	2	ROTATION DSC RT NORM
		<u>0.2 0 0</u>	3	VERN
		0.3 0	4	PULSE NORM
		0.0 1 0	5	VERN
		<u>0.0 0</u>	6	COMP NORM
		<u>0.0 0</u>	7	VERN
		5.0 0	8	DEADBAND ATT NORM
		<u>1.0 0 0</u>	9	VERN
		0.2 0	10	RATE NORM
		<u>0.2 0</u>	11	VERN
		3	12	JET OPT P
		<u>3</u>	13	Y
		0	14	CNTL ACCEL

-	-	-	-	-
	41-C/O/BAS		41-C/O/BAS	
+		+	+	+
	TOP			A4



+	+	+	+
-	-	-	-
A5			A6
DAP A6			
PURPOSE:	0.1 0	1	TRANSLATION PULSE
LOSS OF VERN (TAIL ONLY)	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	6	COMP NORM
	.0 0 0	7	VERN
	5.0 0	8	DEADBAND ATT NORM
	1.0 0 0	9	VERN
	0.2 0	10	RATE NORM
	.0 2 0	11	VERN
	3	12	JET OPT P
	3	13	Y
	0	14	CNTL ACCEL

-	-	-	-
41-C/O/BAS		41-C/O/BAS	
+	+	+	+
TOP			A7
+	+	+	+
A6			TOP
-	-	-	-
DAP A7			A7

PURPOSE: (Blank)	. . . . .	1	TRANSLATION PULSE
	. . . . .	2	ROTATION DSC RT NORM
	. . . . .	3	VERN
	. . . . .	4	PULSE NORM
	. . . . .	5	VERN
	. . . . .	6	COMP NORM
	. . . . .	7	VERN
	. . . . .	8	DEADBAND ATT NORM
	. . . . .	9	VERN
	. . . . .	10	RATE NORM
	. . . . .	11	VERN
	. . . . .	12	JET OPT P
	. . . . .	13	Y
	. . . . .	14	CNTL ACCEL

-	-	-	-
41-C/O/FIN		41-C/O/FIN	
+	+	+	+
TOP		A8	
+	+	+	+
-	-	-	-
41-C/FIN			41-C/FIN

+ A7 + + TOP +  
 - - -

**DAP A8**  
 PURPOSE: (Blank)

**A8**  
 1 TRANSLATION PULSE  
 ROTATION  
 2 DSC RT NORM  
 3 VERN  
 4 PULSE NORM  
 5 VERN  
 6 COMP NORM  
 7 VERN  
 DEADBAND  
 8 ATT NORM  
 9 VERN  
 10 RATE NORM  
 11 VERN  
 12 JET OPT P  
 13 Y  
 14 CNTL ACCEL

41-C/O/FIN  
 - - -  
 + TOP + + TOP +  
 + +  
 - - -  
 A8 A9

**DAP A9**  
 PURPOSE:  
 RENDEZVOUS

**A9**  
 1 TRANSLATION PULSE  
 ROTATION  
 2 DSC RT NORM  
 3 VERN  
 4 PULSE NORM  
 5 VERN  
 6 COMP NORM  
 7 VERN  
 DEADBAND  
 8 ATT NORM  
 9 VERN  
 10 RATE NORM  
 11 VERN  
 12 JET OPT P  
 13 Y  
 14 CNTL ACCEL

41-C/O/BAS  
 - - -  
 + TOP + + TOP +  
 + +  
 - - -  
 A10

+	+	+	+	TOP
-	-	-	-	-
A9				A10
DAP A10				
PURPOSE:	0.0 5			1 TRANSLATION PULSE
PROX OPS				
	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
	2.0 0			8 DEADBAND ATT NORM
	0.5 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

-	-	-	-	-
+	+	+	+	+
-	-	-	-	-
41-C/O/BAS				41-C/O/FIN
TOP				TOP
+	+	+	+	+
-	-	-	-	-
A10				A11
DAP A11				
PURPOSE:	0.1 0			1 TRANSLATION PULSE
LDEF RELEASE				
	0.1 0 0			2 ROTATION DSC RT NORM
	0.0 0 8			3 VERN
	0.0 4			4 PULSE NORM
	0.0 0 2			5 VERN
	.0 0			6 COMP NORM
	.0 0 0			7 VERN
	3.0 0			8 DEADBAND ATT NORM
	0.5 0 0			9 VERN
	0.2 0			10 RATE NORM
	0.0 1 0			11 VERN
	1			12 JET OPT P
	3			13 Y
	2			14 CNTL ACCEL

-	-	-	-	-
+	+	+	+	+
-	-	-	-	-
41-C/O/BAS				41-C/O/FIN
TOP				TOP
+	+	+	+	+
-	-	-	-	-
A12				A12



+ A11 + + TOP +  
 - - - - -

DAP A12

PURPOSE:  
SMM RELEASE

0.1 0

A12

1 TRANSLATION PULSE

2 ROTATION DSC RT NORM  
3 VERN  
4 PULSE NORM  
5 VERN  
6 COMP NORM  
7 VERN

0.1 0 0  
0.1 5 0  
0.0 4  
0.0 0 2  
0.0 0  
0.0 0

8 DEADBAND ATT NORM  
9 VERN

3.0 0  
1.0 0 0

10 RATE NORM  
11 VERN

0.2 0  
0.1 0 0

12 JET OPT P  
13 Y

1  
3

4 14 CNTL ACCEL

41-C/O/BAS

41-C/O/BAS

+ TOP + + A13 +  
 - - - - -  
 + + TOP +  
 - - - - -  
 + A12 + +  
 - - - - -

DAP A13

PURPOSE: (Blank)

-. -

A13

1 TRANSLATION PULSE

2 ROTATION DSC RT NORM  
3 VERN  
4 PULSE NORM  
5 VERN  
6 COMP NORM  
7 VERN

-. - -  
-. - -  
-. - -  
-. - -  
-. - -  
-. - -

8 DEADBAND ATT NORM  
9 VERN

-. - -  
-. - -

10 RATE NORM  
11 VERN

-. - -  
-. - -

12 JET OPT P  
13 Y

-  
-

14 CNTL ACCEL

41-C/O/BAS

41-C/O/BAS

+ TOP + + 41-C/FIN +  
 - - - - -

TOP

A13

- DAP PURPOSE
- B1 - NOMINAL  
PRCS IMU ALIGN  
TOP-TO-SUN  
TAIL ONLY CNTRL BACKOUT  
OMS & RCS BURNS
  - B2 - LOSS OF VERN (TAIL ONLY)
  - B3 - LOSS OF VERN; GG MNVR
  - B4 - PAM DEPLOY
  - B5 - COAS CAL
  - B6 - RENDEZVOUS
  - B7 - PROX OPS  
LDEF SEP; SMM SEP
  - B8 - ZSI ROT
  - B9 - MFR OPS
  - B10 - UNLOADED RMS
  - B11 - LDEF TRIM #1 (4' ABOVE  
BERTH); SMM PARK
  - B12 - LDEF TRIM #2  
(HIGH HOVER)  
(MNVR TO RELEASE)
  - B13 - LDEF TRIM #3 (AUTO SEQ)
  - B14 - (Blank)

41-C/O/BAS

41-C/O/BAS

B1

TOP

TOP

DAP B1

B1

PURPOSE:

PRCS IMU ALIGN  
TOP-TO-SUN  
TAIL ONLY CONTROL BACKOUT  
OMS & RCS BURNS

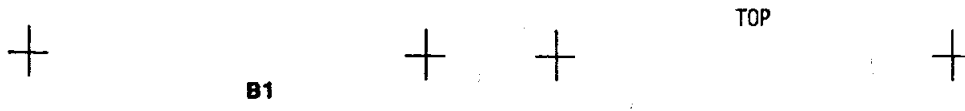
TRANSLATION			
PULSE	15		<u>0.0 2</u>
ROTATION			
DSC RT NORM	16		<u>0.5 0 0</u>
VERH	17		<u>0.2 0 0</u>
PULSE NORM	18		<u>0.0 4</u>
VERN	19		<u>0.0 2</u>
COMP NORM	20		<u>.0 0</u>
VERN	21		<u>.0 0 0</u>
DEADBAND			
ATT NORM	22		<u>3.0 0</u>
VERN	23		<u>1.0 0 0</u>
RATE NORM	24		<u>0.2 0</u>
VERN	25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

41-C/O/BAS

41-C/O/BAS

B2

TOP



B1

DAP B2

PURPOSE:  
LOSS OF VERN  
(TAIL ONLY)



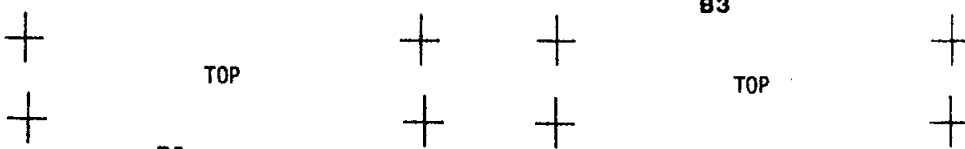
B2

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



41-C/O/BAS

41-C/O/BAS



B3

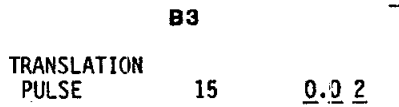
TOP

TOP

B2

DAP B3

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



B3

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



41-C/O/BAS

41-C/O/BAS



B4

TOP

+ + + TOP +

- - - B3 -

**DAP B4**

PURPOSE:  
PAM DEPLOY

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

- - - 41-C/O/BAS -

+ + + TOP +

- - - B4 -

**DAP B5**

PURPOSE:  
COAS CAL

TRANSLATION				
PULSE		15		<u>0.0 2</u>
ROTATION				
DSC RT	NORM	16		0.2 0 0
	VERN	17		<u>0.0 1 6</u>
PULSE	NORM	18		<u>0.0 4</u>
	VERN	19		<u>0.0 0 2</u>
COMP	NORM	20		<u>0.0 0</u>
	VERN	21		<u>.0 0 0</u>
DEADBAND				
ATT	NORM	22		3.0 0
	VERN	23		<u>0.0 3 3</u>
RATE				
	NORM	24		0.2 0
	VERN	25		<u>0.0 2 0</u>
JET OPT	P	26		3
	Y	27		<u>3</u>
CNTL ACCEL		28		<u>0</u>

- - - 41-C/O/BAS -

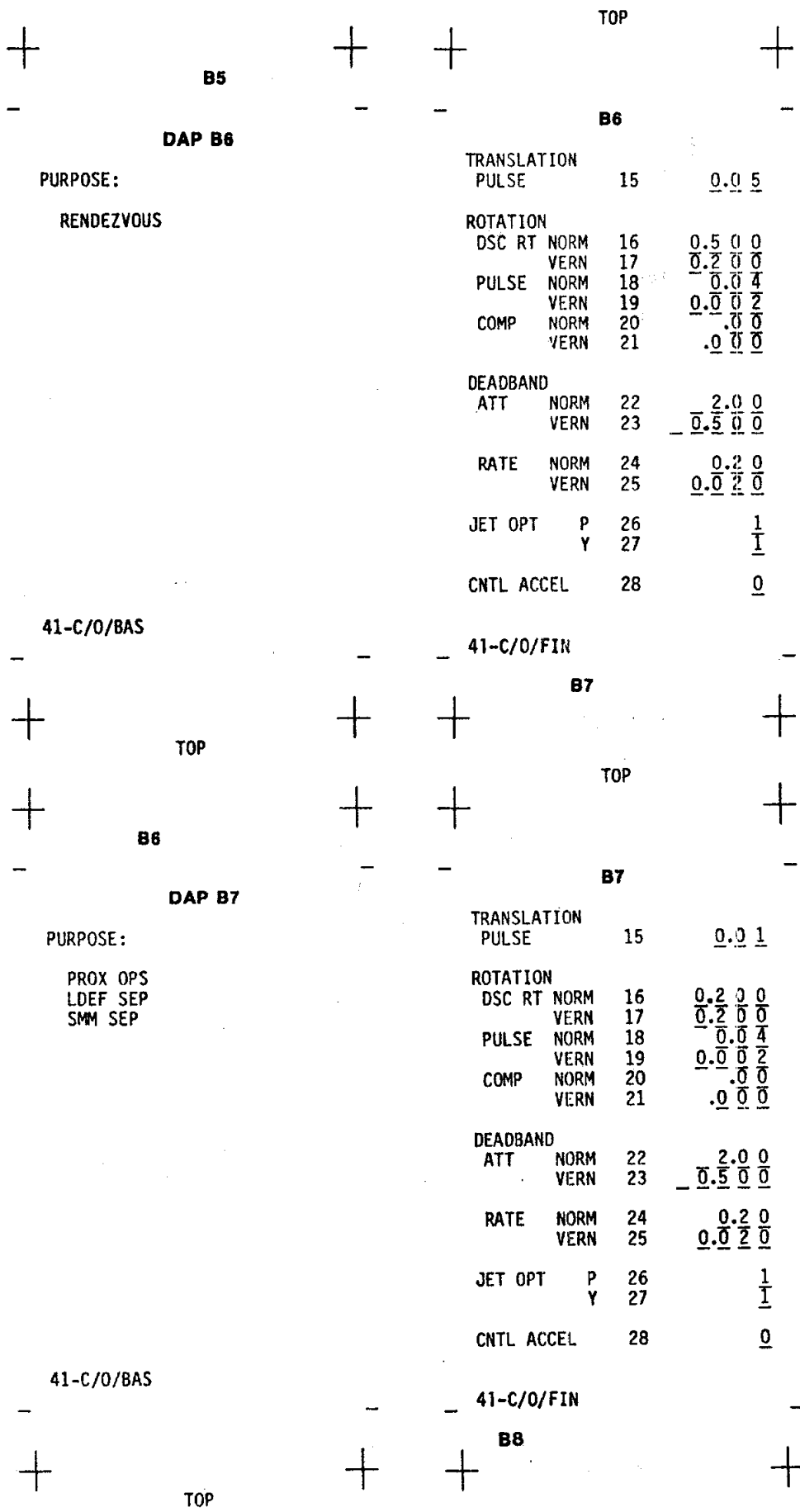
+ + + TOP +

- - - B5 -

+ + + TOP +

- - - B6 -

- - - 41-C/FIN -



**B5**

**DAP B6**

PURPOSE:  
RENDEZVOUS

41-C/O/BAS

TOP

**B6**

**DAP B7**

PURPOSE:  
PROX OPS  
LDEF SEP  
SMM SEP

41-C/O/BAS

TOP

TOP

**B6**

TRANSLATION				
PULSE		15	<u>0.0 5</u>	
ROTATION				
DSC RT	NORM	16	0.5 0 0	
	VERN	17	<u>0.2 0 0</u>	
PULSE	NORM	18	<u>0.0 4</u>	
	VERN	19	<u>0.0 2</u>	
COMP	NORM	20	<u>.0 0</u>	
	VERN	21	<u>.0 0</u>	
DEADBAND				
ATT	NORM	22	2.0 0	
	VERN	23	<u>- 0.5 0 0</u>	
RATE	NORM	24	0.2 0	
	VERN	25	<u>0.0 2 0</u>	
JET OPT	P	26	1	
	Y	27	<u>1</u>	
CNTL ACCEL		28	<u>0</u>	

41-C/O/FIN

**B7**

TOP

**B7**

TRANSLATION				
PULSE		15	<u>0.0 1</u>	
ROTATION				
DSC RT	NORM	16	0.2 0 0	
	VERN	17	<u>0.2 0 0</u>	
PULSE	NORM	18	<u>0.0 4</u>	
	VERN	19	<u>0.0 2</u>	
COMP	NORM	20	<u>.0 0</u>	
	VERN	21	<u>.0 0</u>	
DEADBAND				
ATT	NORM	22	2.0 0	
	VERN	23	<u>- 0.5 0 0</u>	
RATE	NORM	24	0.2 0	
	VERN	25	<u>0.0 2 0</u>	
JET OPT	P	26	1	
	Y	27	<u>1</u>	
CNTL ACCEL		28	<u>0</u>	

41-C/O/FIN

**B8**

TOP  
+ + + +  
B7

DAP B8

PURPOSE:  
ZSI ROT

TRANSLATION PULSE	15	<u>0.0 2</u>
ROTATION		
DSC RT NORM	16	0.5 0 0
VERN	17	<u>0.0 0 7</u>
PULSE NORM	18	0.0 4
VERN	19	<u>0.0 0 2</u>
COMP NORM	20	.0 0
VERN	21	<u>.0 0 0</u>
DEADBAND		
ATT NORM	22	3.0 0
VERN	23	<u>1.0 0 0</u>
RATE NORM	24	0.2 0
VERN	25	<u>0.0 2 0</u>
JET OPT P	26	1
Y	27	<u>1</u>
CNTL ACCEL	28	<u>0</u>

41-C/O/BAS

41-C/O/BAS

TOP  
+ + + +  
B8

DAP B9

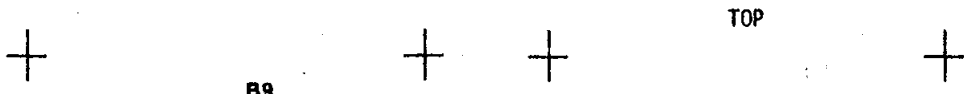
PURPOSE:  
MFR OPS

TRANSLATION PULSE	15	<u>0.0 2</u>
ROTATION		
DSC RT NORM	16	0.1 0 0
VERN	17	<u>0.1 5 0</u>
PULSE NORM	18	0.0 4
VERN	19	<u>0.0 0 2</u>
COMP NORM	20	.0 0
VERN	21	<u>.0 0 0</u>
DEADBAND		
ATT NORM	22	3.0 0
VERN	23	<u>5.0 0 0</u>
RATE NORM	24	0.2 0
VERN	25	<u>0.2 0 0</u>
JET OPT P	26	1
Y	27	<u>3</u>
CNTL ACCEL	28	<u>0</u>

41-C/O/BAS

41-C/O/FIN

TOP  
+ + + +  
B10



B9

DAP B10

PURPOSE:  
UNLOADED RMS

41-C/O/BAS



B10

DAP B11

PURPOSE:  
LDEF TRIM #1  
(4' ABOVE BERTH)  
SMM PARK

41-C/O/BAS



TOP



TOP

B10

TRANSLATION					
PULSE		15		<u>0.0</u>	<u>2</u>
ROTATION					
DSC RT	NORM	16		0.1	0 0
	VERN	17		<u>0.1</u>	<u>5 0</u>
PULSE	NORM	18		<u>0.0</u>	<u>4</u>
	VERN	19		<u>0.0</u>	<u>0 2</u>
COMP	NORM	20		<u>.0</u>	<u>0 0</u>
	VERN	21		<u>.0</u>	<u>0 0</u>
DEADBAND					
ATT	NORM	22		3.0	0
	VERN	23		<u>1.0</u>	<u>0 0</u>
RATE	NORM	24		0.2	0
	VERN	25		<u>0.1</u>	<u>0 0</u>
JET OPT	P	26			<u>1</u>
	Y	27			<u>3</u>
CNTL ACCEL		28			<u>0</u>

41-C/O/BAS



B11

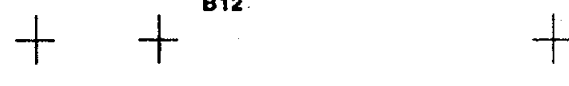
TOP



B11

TRANSLATION					
PULSE		15		<u>0.0</u>	<u>2</u>
ROTATION					
DSC RT	NORM	16		0.1	0 0
	VERN	17		<u>0.1</u>	<u>5 0</u>
PULSE	NORM	18		<u>0.0</u>	<u>4</u>
	VERN	19		<u>0.0</u>	<u>0 2</u>
COMP	NORM	20		<u>.0</u>	<u>0 0</u>
	VERN	21		<u>.0</u>	<u>0 0</u>
DEADBAND					
ATT	NORM	22		3.0	0
	VERN	23		<u>1.0</u>	<u>0 0</u>
RATE	NORM	24		0.2	0
	VERN	25		<u>0.1</u>	<u>0 0</u>
JET OPT	P	26			<u>1</u>
	Y	27			<u>3</u>
CNTL ACCEL		28			<u>3</u>

41-C/O/BAS



B12

TOP

+
+
+
+

B11

B12

**DAP B12**

PURPOSE:  
 LDEF TRIM #2  
 (HIGH HOVER)  
 (MNVR TO RELEASE)

TRANSLATION				
PULSE	15		<u>0.0</u>	<u>2</u>
ROTATION				
DSC RT	NORM	16	<u>0.1</u>	<u>0 0</u>
	VERN	17	<u>0.1</u>	<u>5 0</u>
PULSE	NORM	18	<u>0.0</u>	<u>4</u>
	VERN	19	<u>0.0</u>	<u>0 2</u>
COMP	NORM	20	<u>0.0</u>	<u>0</u>
	VERN	21	<u>0.0</u>	<u>0</u>
DEADBAND				
ATT	NORM	22	<u>3.0</u>	<u>0</u>
	VERN	23	<u>1.0</u>	<u>0 0</u>
RATE				
	NORM	24	<u>0.2</u>	<u>0</u>
	VERN	25	<u>0.1</u>	<u>0 0</u>
JET OPT				
	P	26		<u>1</u>
	Y	27		<u>3</u>
CNTL ACCEL		28		<u>2</u>

41-C/O/BAS

41-C/O/BAS

TOP

+
+
+
+

TOP

B13

B12

B13

**DAP B13**

PURPOSE:  
 LDEF TRIM #3  
 (AUTO SEQ)

TRANSLATION				
PULSE	15		<u>0.0</u>	<u>2</u>
ROTATION				
DSC RT	NORM	16	<u>0.1</u>	<u>0 0</u>
	VERN	17	<u>0.1</u>	<u>5 0</u>
PULSE	NORM	18	<u>0.0</u>	<u>4</u>
	VERN	19	<u>0.0</u>	<u>0 2</u>
COMP	NORM	20	<u>0.0</u>	<u>0</u>
	VERN	21	<u>0.0</u>	<u>0</u>
DEADBAND				
ATT	NORM	22	<u>3.0</u>	<u>0</u>
	VERN	23	<u>1.0</u>	<u>0 0</u>
RATE				
	NORM	24	<u>0.2</u>	<u>0</u>
	VERN	25	<u>0.1</u>	<u>0 0</u>
JET OPT				
	P	26		<u>1</u>
	Y	27		<u>3</u>
CNTL ACCEL		28		<u>1</u>

41-C/O/BAS

41-C/O/BAS

TOP

+
+
+
+

B14



TOP

+ + + +

B13

- - - -

DAP B14

PURPOSE: (Blank)

B14

TRANSLATION  
PULSE 15 . . . .

ROTATION  
DSC RT NORM 16 . . . .  
VERN 17 . . . .  
PULSE NORM 18 . . . .  
VERN 19 . . . .  
COMP NORM 20 . . . .  
VERN 21 . . . .

DEADBAND  
ATT NORM 22 . . . .  
VERN 23 . . . .

RATE NORM 24 . . . .  
VERN 25 . . . .

JET OPT P 26 . . . .  
Y 27 . . . .

CNTL ACCEL 28 . . . .

41-C/O/BAS

- - - -

+ + + +

TOP

+ + + +

B14

- - - -

41-C/O/BAS

41-C/O/BAS

- - - -

+ + + +

TOP

9-24

41-C/FIN

TOP  
BACK COVER 'DAP BOOK'



41-C/O/BAS



TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
0/00:08:36	MNVR R+331.60 P+ 79.20 Y+354.20	* AUTO *	ISC 0.500 IB AT 3.50 IB RT 0.30	SUN T 66 P 199	LVLH R+180 P+ 3 Y+ 1	MECO
0/00:20:00 25:16	MNVR R+ 27.80 P+240.20 Y+354.20	* AUTO *	ISC 0.500 IB AT 3.50 IB RT 0.30	SUN T 134 P 335		OMS-2 ATT
0/00:42:47	OMS IGNITION	* AUTO *	ISC 0.500 IB AT 3.50 IB RT 0.30		DV = 186.1 DT = 2:04	OMS-2
0/01:10:00 17:07	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO NORM	ISC 0.200 IB AT 5.00 IB RT 0.20	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
0/02:25:00 34:38	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 139 P 138	-Y ST: 30 -Z ST: 29 2:15-3:03	IMU ALIGN PAIR A1
0/02:45:00 59:55	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
0/05:00:00 07:26	MNVR R+ 28.00 P+240.90 Y+355.20	B1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 133 P 336		NC-1 ATT
0/05:19:07	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 10.1 DT = 0:09	NC-1
0/05:25:00 25:33	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
0/07:06:06	RCS/OMS BURN PER PAD (IF REQD)	B1 MAN NORM	ISC 0.500 IB AT 3.00 IB RT 0.20			NPC
0/08:15:00 25:30	MNVR R+259.70 P+235.30 Y+ 25.13	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 129 P 133	-Y ST: 25 -Z ST: 15 08:14-08:56	IMU ALIGN COAS STAR 15 ANG DIFF: 86.0
0/08:40:00 52:09	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD

TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
0/19:05:00 12:21	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 138 P 137	-Y ST: 30 -Z ST: 29 19:04-19:53	IMU ALIGN PAIR A1
0/19:25:00 37:16	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
0/22:35:00 42:20	MNVR R+332.20 P+ 53.50 Y+ 5.90	B1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 39 P 205		NH-1 ATT
0/22:53:00	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 13.5 DT = 0:11	NH-1
0/23:15:00 29:39	MNVR R+ 28.10 P+237.10 Y+356.20	B1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 138 P 337		NSR ATT
0/23:39:00	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 196.3 DT = 2:08	NSR
0/23:45:00 46:01	TRK TGT=2 BV=5( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
1/00:50:00	FREE DRIFT	B11 MAN VERN	ISC 0.150 IB AT 1.00 IB RT 0.10			LDEF UNBERTH DTO 501
1/02:25:00 44:13	TRK TGT=2 BV=5(164.50, 347.00) OM=359.00	B12 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	EARTH T 160 P 319	LVLH R+ 5 P+106 Y+348	LDEF DEPLOY
1/03:22:00	RCS BURN	A11 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20		DV = .5	LDEF SEP
1/03:25:00 38:42	TRK TGT=1 BV=3( 90.00, 0.00) OM= 0.00	B7 AUTO VERN	ISC 0.200 IB AT 0.50 IB RT 0.02			LDEF TRK
1/04:15:00 18:21	MNVR R+216.40 P+316.60 Y+ 29.80	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 59 P 133	-Y ST: 29 -Z ST: 30 04:20-05:10	IMU ALIGN PAIR A2

TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
1/04:35:00 47:41	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
1/07:20:00 27:42	MNVR R+ 22.70 P+277.40 Y+ 17.40	B1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 95 P 346		NC-2 ATT
1/07:40:00	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 6.3 DT = 0:06	NC-2
1/07:45:00 45:16	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
1/16:50:00 56:26	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 138 P 136	-Y ST: 30 -Z ST: 29 16:54-17:44	IMU ALIGN PAIR A1
1/17:10:00 21:11	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
1/19:20:00 26:00	TRK TGT=1 BV=3( 90.00, 0.00) OM= 0.00	B6 AUTO NORM	ISC 0.500 IB AT 2.00 IB RT 0.20			SMM TRK
1/20:00:00 01:42	MNVR R+212.00 P+246.00 Y+ 17.00	B6 AUTO NORM	ISC 0.500 IB AT 2.00 IB RT 0.20	SUN T 125 P 169		NH-2 ATT
1/20:14:36	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 10.8 DT = 0:11	NH-2
1/20:20:00	LVLH	A9 LVLH VERN	ISC 0.200 IB AT 0.50 IB RT 0.02	EARTH T 57 P 169	LVLH R+ 3 P+ 36 Y+349	LVLH ATT HOLD
1/20:45:00 52:04	MNVR R+156.00 P+ 77.00 Y+ 3.00	A9 AUTO VERN	ISC 0.200 IB AT 0.50 IB RT 0.02	SUN T 61 P 18		NC-3 ATT
1/21:01:49	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 8.3 DT = 0:08	NC-3

TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
1/21:05:00 08:56	TRK TGT=1 BV=3( 90.00, 0.00) OM= 0.00	B6 AUTO NORM	ISC 0.500 IB AT 2.00 IB RT 0.20			SMM TRK
1/21:38:00	RCS BURN PER PAD (IF REQD)	B1 MAN NORM	ISC 0.500 IB AT 3.00 IB RT 0.20			NCC
1/22:30:00 32:16	MNVR R+159.00 P+ 91.00 Y+359.00	B6 AUTO NORM	ISC 0.500 IB AT 2.00 IB RT 0.20	SUN T 76 P 14		TI ATT
1/22:36:19	OMS IGNITION	B6 AUTO NORM	ISC 0.500 IB AT 2.00 IB RT 0.20		DV = 6.3 DT = 0:06	TI
1/22:40:00 43:31	TRK TGT=1 BV=3( 90.00, 0.00) OM= 0.00	B6 AUTO NORM	ISC 0.500 IB AT 2.00 IB RT 0.20			SMM TRK
1/23:05:00	RCS BURN PER PAD (IF REQD)	A9 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20			MC 1
1/23:30:00	RCS BURN PER PAD (IF REQD)	A9 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20			MC 2
1/23:40:00	RCS BURN PER PAD (IF REQD)	A9 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20			MC 3
1/23:50:00	RCS BURN PER PAD (IF REQD)	A9 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20			MC 4
2/00:00:10	MANUAL APPROACH TO VBAR	A10 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20			TRANSITION TO +V BAR
2/00:05:00	TRK TGT=2 BV=2(180.00, 0.00) OM= 0.00	A10 AUTO NORM	ISC 0.200 IB AT 2.00 IB RT 0.20	EARTH T 180 P 0	LVLH R+ 0 P+ 90 Y+ 0	+ VBAR STATION KEEPING
2/02:00:00	FREE DRIFT	B7 MAN VERN	ISC 0.200 IB AT 0.50 IB RT 0.02			SMM BERTH

TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
2/02:20:00	STOP	B9 MAN VERN	ISC 0.150 IB AT 5.00 IB RT 0.20	SUN T 12 P 93	INRTL R+172 P+130 Y+333	POST SMM BERTHING
2/02:40:00 57:38	TRK TGT=1 BV=5(319.90, 32.80) OM=176.60	B9 AUTO VERN	ISC 0.150 IB AT 5.00 IB RT 0.20	SUN T 88 P 175	INRTL R+354 P+ 96 Y+314	TDRS TRACK NO SUN IN BAY
2/03:30:00 34:04	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	B9 AUTO VERN	ISC 0.150 IB AT 5.00 IB RT 0.20	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
2/05:30:00 44:44	TRK TGT=1 BV=5( 50.80, 37.80) OM=180.60	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 24 P 197	INRTL R+320 P+ 38 Y+357	TDRS TRACK NO SUN IN BAY PWR RECONNECT
2/07:03:00 13:17	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 138 P 135	-Y ST:30 -Z ST:29 7:03-7:53	IMU ALIGN PAIR A1
2/07:20:00 28:20	TRK TGT=1 BV=5(319.90, 32.80) OM=315.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 94 P 29	INRTL R+135 P+122 Y+ 53	TDRS TRK--SUN IN BAY UNTIL MET 2/14:21:15
2/17:00:00 11:12	MNVR R+352.90 P+270.00 Y+346.90	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 107 P 10		BIASED TOP SUN
2/19:35:00 47:17	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 137 P 135	-Y ST:30 -Z ST:29 19:39-20:29	IMU ALIGN PAIR A1
2/19:55:00 20:05:57	TRK TGT=1 BV=5(319.90, 32.80) OM= 86.60	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 89 P 109	INRTL R+261 P+293 Y+325	TDRS TRK NO SUN IN BAY
2/22:45:00 59:00	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
3/02:25:00 32:36	MNVR R+331.80 P+ 56.10 Y+356.50	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 41 P 193		REBOOST 1 ATT
3/02:44:41	OMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 26.0 DT = 0:18	REBOOST 1

TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
3/03:10:00 24:37	MNVR R+ 28.40 P+232.00 Y+ 1.40	B1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 144 P 346		REBOOST 2 ATT
3/03:32:51	DMS IGNITION	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20		DV = 31.9 DT = 0:21	REBOOST 2
3/03:35:00	FREE DRIFT	A3 MAN NORM	ISC 0.200 IB AT 5.00 IB RT 0.20			RCS HOT FIRE
3/03:55:00 04:01:16	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
3/06:40:00 46:28	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 137 P 134	-Y ST: 30 -Z ST: 29 6:43-7:33	IMU ALIGN PAIR A1
3/07:00:00 11:30	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
3/17:45:00 51:11	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 137 P 134	-Y ST: 30 -Z ST: 29 17:49-18:39	IMU ALIGN PAIR A1
3/18:05:00 16:12	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
4/01:10:00 13:19	TRK TGT=1 BV=5(319.90, 32.80) OM=162.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 68 P 161	INRTL R+333 P+ 58 Y+309	TDRS TRK NO SUN IN BAY
4/02:05:00 17:23	TRK TGT=4 BV=2(180.00, 0.00) OM= 0.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 180 P 79	INRTL R+206 P+198 Y+353	SMM +X SI (ORB TAIL SUN)
4/02:45:00	FREE DRIFT	B11 MAN VERN	ISC 0.150 IB AT 1.00 IB RT 0.10			SMM GRAPPLE/ UNBERTH
4/02:50:00 55:00	TRK TGT=4 BV=2(180.00, 0.00) OM= 0.00	B11 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	SUN T 180 P 40	INRTL R+206 P+198 Y+353	SMM +X SI (ORB TAIL SUN)



TABLE 9-7 ATTITUDE TIMELINE

MET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
4/06:25:00 39:47	MNVR R+ 63.90 P+156.10 Y+334.40	B11 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	SUN T 136 P 133	-Y ST:30 -Z ST:29 06:30-07:20	IMU ALIGN PAIR A1
4/06:45:00 59:48	TRK TGT=4 BV=2(180.00, 0.00) OM= 0.00	B11 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	SUN T 179 P 90	INRTL R+206 P+198 Y+352	SMM +X SI (ORB TAIL SUN)
4/17:20:00 27:47	MNVR R+253.10 P+161.80 Y+331.80	B11 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	SUN T 140 P 311	-Y ST:23 -Z ST:16 16:58-17:52	IMU ALIGN PAIR D1
4/17:50:00 57:45	TRK TGT=4 BV=2(180.00, 0.00) OM= 0.00	B11 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	SUN T 180 P 75	INRTL R+206 P+198 Y+352	SMM +X SI (ORB TAIL SUN)
4/18:40:00	TRK TGT=4 BV=2(180.00, 0.00) OM= 0.00	A12 AUTO VERN	ISC 0.150 IB AT 1.00 IB RT 0.10	SUN T 180 P 284	INRTL R+207 P+198 Y+352	SMM RELEASE ATT
4/20:40:00	RCS BURN	B7 MAN NORM	ISC 0.200 IB AT 2.00 IB RT 0.20		DV = 0.5	SMM SEP RADIAL BURN TOWARDS COE
4/20:41:00	TRK TGT=1 BV=3( 90.00, 0.00) OM= 0.00	B7 AUTO VERN	ISC 0.200 IB AT 0.50 IB RT 0.02		ROT R+207 START P+198 ATT Y+352	SMM TRK LVLH R+0, P+270, Y+0 TO R+0, P90, Y+0
4/20:58:00 59:52	TRK TGT=2 BV=2(180.00, 0.00) OM= 0.00	B7 AUTO VERN	ISC 0.200 IB AT 0.50 IB RT 0.02	EARTH T 180 P 0	LVLH R+ 0 P+ 90 Y+ 0	FINAL SEP ATTITUDE
4/21:00:00	RCS BURN	B7 AUTO VERN	ISC 0.200 IB AT 0.50 IB RT 0.02		DV = 1.0	FINAL SEP RETRO BURN
5/04:40:00 51:00	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 136 P 132	-Y ST:30 -Z ST:29 4:42-5:33	IMU ALIGN PAIR A1
5/05:00:00 11:39	TRK TGT=2 BV=3( 90.00, 0.00) OM=180.00	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
5/15:45:00 51:05	MNVR R+ 63.90 P+156.10 Y+334.40	A1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 136 P 132	-Y ST:30 -Z ST:29 15:48-16:39	IMU ALIGN PAIR A1

TABLE 9-7 ATTITUDE TIMELINE

NET	MNVR OPTION		IAP	E/S	REMARKS	EVENT
5/16:05:00 15:42	TRK TGT=4 BV=5(184.00, 0.00) OM=256.20	R1 AUTO VERN	ISC 0.200 IB AT 1.00 IB RT 0.02	SUN T 176 P 180	INRTL R+311 P+196 Y+355	-XSI (TAIL SUN)
5/19:16:00 20:11	MNVR R+216.40 P+316.60 Y+ 29.80	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20	SUN T 62 P 137	-Y ST:29 -Z ST:30 18:58-19:49	IMU ALIGN PAIR A2
5/19:32:00 34:16	MNVR R+217.80 P+ 10.80 Y+347.60	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20	SUN T 22 P 210	-Y ST:27 -Z ST:36 19:16-19:57	IMU VERIF
5/19:44:00 46:19	MNVR R+152.00 P+ 21.70 Y+ 5.00	B1 AUTO NORM	ISC 0.500 IB AT 3.00 IB RT 0.20	SUN T 4 P 337		DEORBIT BURN ATT
5/22:02:54	OMS IGNITION	* AUTO *	ISC 0.500 IB AT 3.50 IB RT 0.30		DV = 465 DT = 4:07	DEORBIT BURN
5/22:08:00 11:13	MNVR R+190.20 P+281.30 Y+ 28.40	* AUTO *	ISC 0.500 IB AT 3.50 IB RT 0.30	SUN T 93 P 181		EI-5 ATT
5/22:35:11	EI-5	* AUTO *	ISC 0.500 IB AT 3.50 IB RT 0.30		LVLH R+ 1 P+ 39 Y+ 359	EI-5

## ABBREVIATIONS/ACRONYMS

More complete compilations of abbreviations and acronyms are available in the STS glossary (Ref. 12).

ABBREVIATIONS/ACRONYMS

ABS	ABSORBER
ACIP	AERODYNAMIC COEFFICIENTS IDENTIFICATION PACKAGE
ACN	ASCENSION ISLAND (STDN SITE)
ACS	ATTITUDE CONTROL SYSTEM
ACT	ACTIVATE/ACTIVATION
ADI	ATTITUDE DIRECTION INDICATOR
AFD	AFT FLIGHT DECK
AGO	SANTIAGO, CHILE (STDN SITE)
ALN	ALIGNMENT
ANT	ANTENNA
AOA	ABORT ONCE AROUND
AOS	ACQUISITION OF SIGNAL
APU	AUXILIARY POWER UNIT
ASE	AIRBORNE SUPPORT EQUIPMENT
ATCS	ACTIVE THERMAL CONTROL SYSTEM
ATM	ATMOSPHERE
ATO	ABORT TO ORBIT
ATT	ATTITUDE
BDA	BERMUDA ISLAND, BWI (STDN SITE)
BHD	BULKHEAD
BK	BOOK
BLKT	BLANKET
BLR	BOILER
BOT	BOTSWANA (STDN SITE)
B/U	BACKUP
BV	BODY VECTOR
BYP	BYPASS

ABBREVIATIONS/  
ACRONYMS

C EVA OPS	CONTINGENCY EVA OPERATIONS
CAL	CALIBRATION
CAMR	CAMERA
CAP	CREW ACTIVITY PLAN
CBSA	CARGO BAY STORAGE ASSEMBLY
CCTV	CLOSED-CIRCUIT TV
CDR	COMMANDER
CHG	CHANGE
C/L	CHECKLIST
CL	CLOSE/CLOSED
CLN	CLEAN
CNTRLR	CONTROLLER
C/O	CHECKOUT
COAS	CREWMAN OPTICAL ALIGNMENT SIGHT
COMM	COMMUNICATIONS
CONFIG/CNFG	CONFIGURATION
COV	COVARIANCE
C/P	CORONOGRAPH/POLARIMETER
CRT	CATHODE RAY TUBE
CST	CENTRAL STANDARD TIME
CTLS	CONTROLS
C&W	CAUTION AND WARNING
DAP	DIGITAL AUTO PILOT
DB	DEADBAND
DEACT	DEACTIVATE
DED	DEDICATED
DEORB	DEORBIT
DEU	DISPLAY ELECTRONICS UNIT
DISP	DISPLAY

DKR	DAKAR, SENEGAL (STDN SITE)
DMP	DUMP
DPLY/DPY	DEPLOY
DSO	DETAILED SUPPLEMENTARY OBJECTIVE
DTO	DETAILED TEST OBJECTIVE
ECLS	ENVIRONMENTAL CONTROL LIFE SUPPORT SYSTEM
EDW	EDWARDS AFB, CALIFORNIA
EI	ENTRY INTERFACE
EIS	EXPERIMENT INITIATION SYSTEM
EMU	EXTRAVEHICULAR MOBILITY UNIT
ENA	ENABLE
ENT	ENTRY
EPS	ELECTRICAL POWER SYSTEM
EVA	EXTRAVEHICULAR ACTIVITY
EX/EXER	EXERCISE
EXP	EXPERIMENT
FC	FUEL CELL
FCS	FLIGHT CONTROL SYSTEM
FD	FREEZE DRIED; FLIGHT DAY; FLIGHT DECK
FDF	FLIGHT DATA FILE
FDRD	FLIGHT DEFINITION AND REQUIREMENTS DIRECTIVE
FES	FLASH EVAPORATOR SYSTEM
FM	FREQUENCY MODULATION
FMDM	FLEXIBLE MULTIPLEXER/DEMULTIPLEXER
FMT	FORMAT
FOV	FIELD OF VIEW
FSS	FLIGHT SUPPORT SYSTEM
FWD	FORWARD

GDS	GOLDSTONE, CALIFORNIA (STDN SITE, 1ST ANTENNA)
GDX	GOLDSTONE, CALIFORNIA (STDN SITE, 2ND ANTENNA)
GMT	GREENWICH MEAN TIME
GNC	GUIDANCE NAVIGATION AND CONTROL
GPC	GENERAL PURPOSE COMPUTER
GRP	GROUP
GSE	GROUND SUPPORT EQUIPMENT
GSFC	GODDARD SPACE FLIGHT CENTER
GSTDN	GROUND SPACE TRACKING & DATA NETWORK
GWM	GUAM ISLAND, U.S. (STDN SITE)
H2O	WATER
HAW	HAWAII (KAUAI, STDN SITE)
HE	HELIUM
HGAS	HI GAIN ANTENNA SYSTEM
HL	HI LOAD FLASH EVAPORATOR
HRM	HANDHELD RADIATION MONITOR
HTR	HEATER
HYD	HYDRAULIC
ICONNECT/ I' CNECT	INTERCONNECT
IMU	INERTIAL MEASUREMENT UNIT
INH	INHIBIT
INRTL	INERTIAL
KSC	KENNEDY SPACE CENTER
KU-BD	KU-BAND
LDEF	LONG DURATION EXPOSURE FACILITY
LEH	LAUNCH/ENTRY HELMET
LOS	LOSS-OF-SIGNAL; LINE OF SIGHT

LVLH	LOCAL VERTICAL LOCAL HORIZONTAL
MACS	MODULAR ATTITUDE CONTROL SYSTEM
MAD	MADRID, SPAIN (STDN SITE, 1ST ANTENNA)
MADS	MODULAR AUXILIARY DATA SYSTEM
MAX	MADRID, SPAIN (STDN SITE, 2ND ANTENNA)
MC	MIDCOURSE CORRECTION MANEUVER
MCC	MISSION CONTROL CENTER
MD	MIDDECK
MDM	MULTIPLEXER/DEMULTIPLEXER
MEB	MAIN ELECTRONICS BOX
MECH	MECHANISM; MECHANICAL
MECO	MAIN ENGINE CUTOFF
MET	MISSION ELAPSED TIME
MFR	MANIPULATOR FOOT RESTRAINT
MIL	MERRITT ISLAND, FLORIDA (STDN SITE)
MILA	MERRITT ISLAND LAUNCH AREA
MLX	MERRITT ISLAND, FLORIDA (STDN SITE, 2ND ANTENNA)
MMS	MULTIMISSION MODULAR SPACECRAFT
MMU	MANNED MANEUVERING UNIT
MNVR	MANEUVER
MPS	MAIN PROPULSION SYSTEM
MS	MISSION SPECIALIST
MSB	MECHANISM SELECTION BOX
MSG	MESSAGE
NAV	NAVIGATION
NC	NORMAL CORRECTIVE (PHASING) MANEUVER
NCC	NORMAL CORRECTIVE COMBINATION MANEUVER
NH	NORMAL HEIGHT ADJUST MANEUVER



NM	NAUTICAL MILES
NPC	NORMAL PLANE CHANGE MANEUVER
NSR	NORMAL SLOW RATE (COELLIPTIC) MANEUVER
OEX	ORBITER EXPERIMENTS
OFIU	ORBITER/FSS INTERFACE UNIT
OI	OPERATIONAL INSTRUMENTATION
OM	OMICRON
OMS	ORBITAL MANEUVERING SYSTEM
O/O	ON ORBIT
OP	OPEN
OPS	OPERATIONS; OPERATIONAL SEQUENCE
ORB	ORBITER
ORR	ORRORAL VALLEY, AUSTRALIA (STDN SITE)
PAD	PRELIMINARY ADVISORY DATA (CREW DATA UPLINK)
P&BS	PLATFORM AND BERTHING STATION
PCM	PULSE-CODE MODULATION
PCMMU	PULSE-CODE MODULATION MASTER UNIT
PCS	PRESSURE CONTROL SYSTEM
PDRS	PAYLOAD DEPLOYMENT AND RETRIEVAL SYSTEM
PERF	PERFORM; PERFORMANCE
PET	PHASE ELAPSED TIME
PI	PAYLOAD INTERROGATOR
PLBD	PAYLOAD BAY DOORS
PL/PLD	PAYLOAD
PLT	PILOT
POCC	PAYLOAD OPERATIONS CONTROL CENTER
PRCS	PRIMARY REACTION CONTROL SYSTEM
PREP	PREPARATION

PRM	POCKET REM METER
PRO	PROCEED
PSA	PRE/POST SLEEP ACTIVITY
PSI	POUNDS PER SQUARE INCH
PTC	PASSIVE THERMAL CONTROL
PWRDN	POWERDOWN
QTY	QUANTITY
RAD	RADIATOR
RBST	REBOOST OMS BURN
RCD	RECORD
RCS	REACTION CONTROL SYSTEM
REF	REFERENCE
REFSMAT	REFERENCE STABLE MEMBER MATRIX
RELMAT	RELATIVE MATRIX
RF	RADIO FREQUENCY
RME	RADIATION MONITORING EQUIPMENT
RMS	REMOTE MANIPULATOR SYSTEM
RNDZ	RENDEZVOUS
ROT	ROTATION; ROTA FIELD
RSET	RESET
RTC	REAL-TIME COMMAND
SAA	SOUTH ATLANTIC ANOMALY
S-BD	S-BAND
S/C	SPACECRAFT
SCIU	SPACECRAFT INTERFACE UNIT
SEL	SELECT
SEP	SEPARATION
SEQ	SEQUENCE

SK	STATIONKEEP
SMM	SOLAR MAXIMUM MISSION
SMRM	SOLAR MAXIMUM REPAIR MISSION
SPC	STORED PROGRAM COMMAND
SPLY	SUPPLY
SSP	STANDARD SWITCH PANEL
ST/S TRKR	STAR TRACKER
STBD	STARBOARD
STDN	SPACE TRACKING & DATA NETWORK
STS	SPACE TRANSPORTATION SYSTEM
STW	STOW
SV	STATE VECTOR
SW	SWITCH
SYS	SYSTEM
TAGS	TEXT AND GRAPHICS SYSTEM
TB	TALKBACK
TBD	TO BE DETERMINED
TDRS(E)	TRACKING AND DATA RELAY SATELLITE SYSTEM (EAST)
TERM	TERMINATE; TERMINAL
TFL	TELEMETRY FORMAT LOAD
TG	TARGET
TI	TERMINAL PHASE INITIATION MANEUVER
TIG	TIME OF IGNITION
TKS	TANKS
TL	TIMELINE
TPAD	TRUNNION PIN ATTACHMENT DEVICE
TRK	TRACK
UHF	ULTRA HIGH FREQUENCY

VAC	VACUUM
VAL	VALIDATION
VBAR	VELOCITY VECTOR
VER	VERIFICATION
VLV	VALVE
VRCS	VERNIER REACTION CONTROL SYSTEM
VTR	VIDEO TAPE RECORDER
WCS	WASTE COLLECTION SYSTEM
XFER	TRANSFER
X-POP	X BODY AXIS PERPENDICULAR TO ORBIT PLANE
XRP	X-RAY POLYCHROMATOR
XSI	X SOLAR INERTIAL (X-AXIS TOWARDS SUN)
+X VV	+X BODY AXIS COINCIDENT WITH VELOCITY VECTOR
YAR	YARRAGADEF (STDN SITE)
Y-POP	Y BODY AXIS PERPENDICULAR TO ORBIT PLANE
-ZLV	-Z LOCAL VERTICAL (-Z BODY AXIS TOWARDS EARTH)
-ZSI	-Z SOLAR INERTIAL (-Z BODY AXIS TOWARDS SUN)

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