

Flight Data File Crew Activity Plan STS 51-L (Cycle 2B Trajectory)

Mission Operations Directorate
Operations Division

Final
December 23, 1985

<u>EVENT</u>	<u>CST</u>		
Launch	13:40	Wed	Jan 22
TDRS Deploy	23:41	Wed	Jan 22
SPARTAN Deploy	19:31	Fri	Jan 24
SPARTAN Retrieve	15:55	Sun	Jan 26
Teacher Lesson	10:40	Mon	Jan 27
Teacher Lesson	12:20	Mon	Jan 27
Crew Conference	15:25	Mon	Jan 27
KSC Landing	14:14	Tues	Jan 28



National Aeronautics and
Space Administration

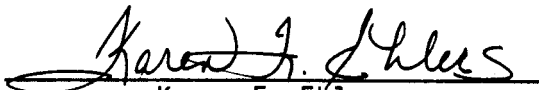
Lyndon B. Johnson Space Center
Houston, Texas

MISSION OPERATIONS DIRECTORATE

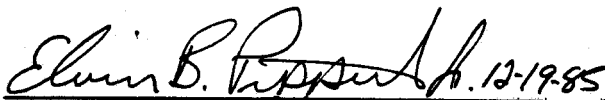
STS 51-L CREW ACTIVITY PLAN


FINAL
December 23, 1985


PREPARED BY:

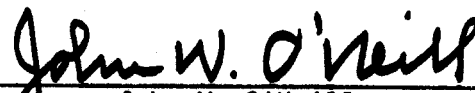

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This document is under the configuration control of the Crew Procedures Control Board (CPCB). All proposed changes must be submitted on standard JSC Form 482 to DH4/FDF Manager, Bldg 4, Rm 352, 713-483-2868.

Comments concerning this document may be addressed to DH4/Karen Ehlers or DH4/Ann Tavormina, Bldg 4, Rm 348, 713-483-3486.

Changes to the distribution list should be submitted in writing to DH4/Gwen Butler, Bldg 4, Rm 373, 713-483-5224.

Incorporates 482	
No: CAP-449	CAP-468A
CAP-450	CAP-469
CAP-451	CAP-470
CAP-452	CAP-473
CAP-455	CAP-474
CAP-456	FDF-634
CAP-458	FDF-643
CAP-467	

Incorporates DN	
No: CAP-5	
CAP-8	

ACKNOWLEDGMENTS

The following individuals contributed significantly to preparing the STS 51-L Crew Activity Plan:

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STS 51-L CREW ACTIVITY PLAN

LIST OF EFFECTIVE PAGES

FINAL 12/23/85

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INTRODUCTION

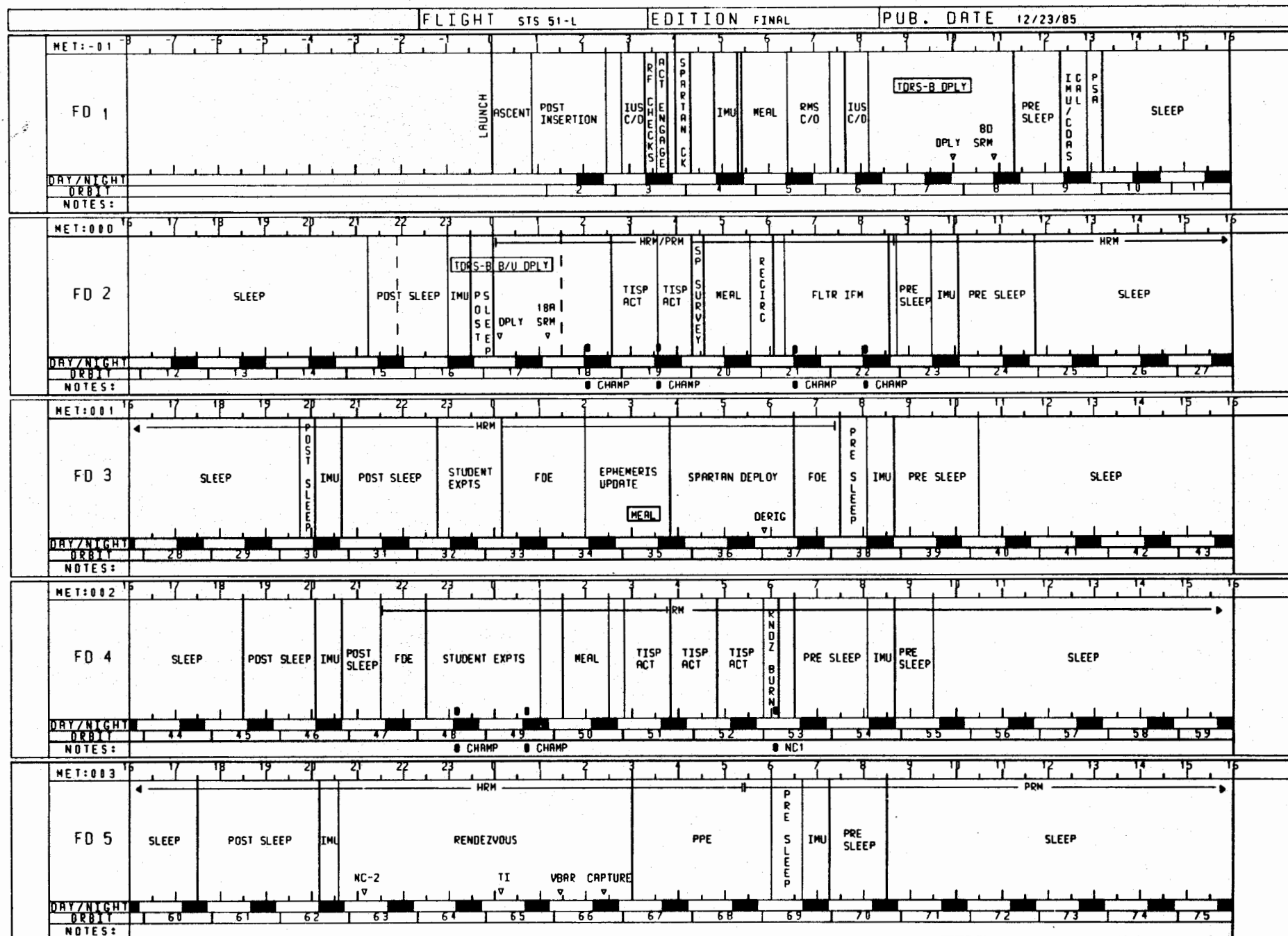
The STS 51-L Crew Activity Plan is the flight data file article that contains the on-orbit timeline. It does not contain the detailed timelines that are covered in the Ascent, Post Insertion, Rendezvous, Deorbit Prep, and Entry Checklists. The STS 51-L Rendezvous book contains all RMS procedures which are to be conducted during the rendezvous operational timelines. All other RMS procedures are in the PDRS OPS checklist. For continuity, the entire flight is shown in the summary level timeline.

This on-orbit timeline satisfies the objectives specified in the Flight Definition and Requirements Directive and the requirements of the STS 51-L Flight Requirements Document.

The flight profile (Cycle 2B trajectory data) used for this Crew Activity Plan is for a launch date of January 22, 1986, at 19:40 GMT. Orbiter inertial attitudes are expressed relative to the Mean of 1950 (M50) reference frame.

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STS 51-L OVERVIEW



MET:004	16	17	18	19	20	21	22	23	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16							
FD 6	SLEEP	POST SLEEP	IMU	PRM	POST SLEEP	FCS C/D	LESSON	LESSON # 2	LESSON #	HOI	MEAL	CREW CONF	CABIN STOW	PRE SLEEP	IMU	PRE SLEEP	SLEEP															
DAY/NIGHT																																
ORBIT		76		77		78		79		80		81		82		83		84		85		86		87		88		89		90		91
NOTES:																																

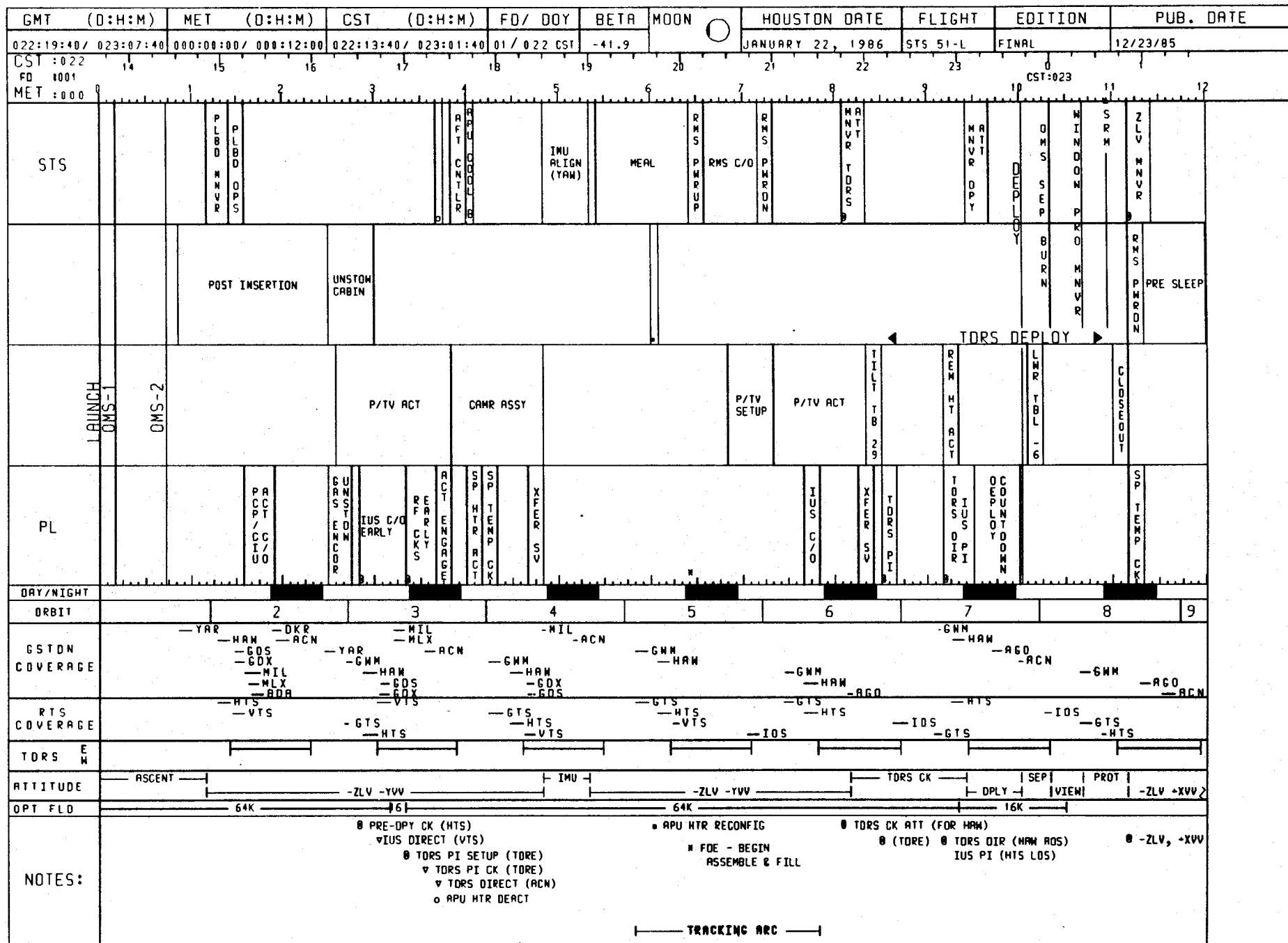
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FD 7	SLEEP	POST SLEEP	IMU	POST SLEEP	DEORBIT PREP	DEORBIT BURN	KSC LANDING																								
DAY/NIGHT																															
ORBIT		92		93		94		95		96		97		98																	
NOTES:																															

EDM OPPT

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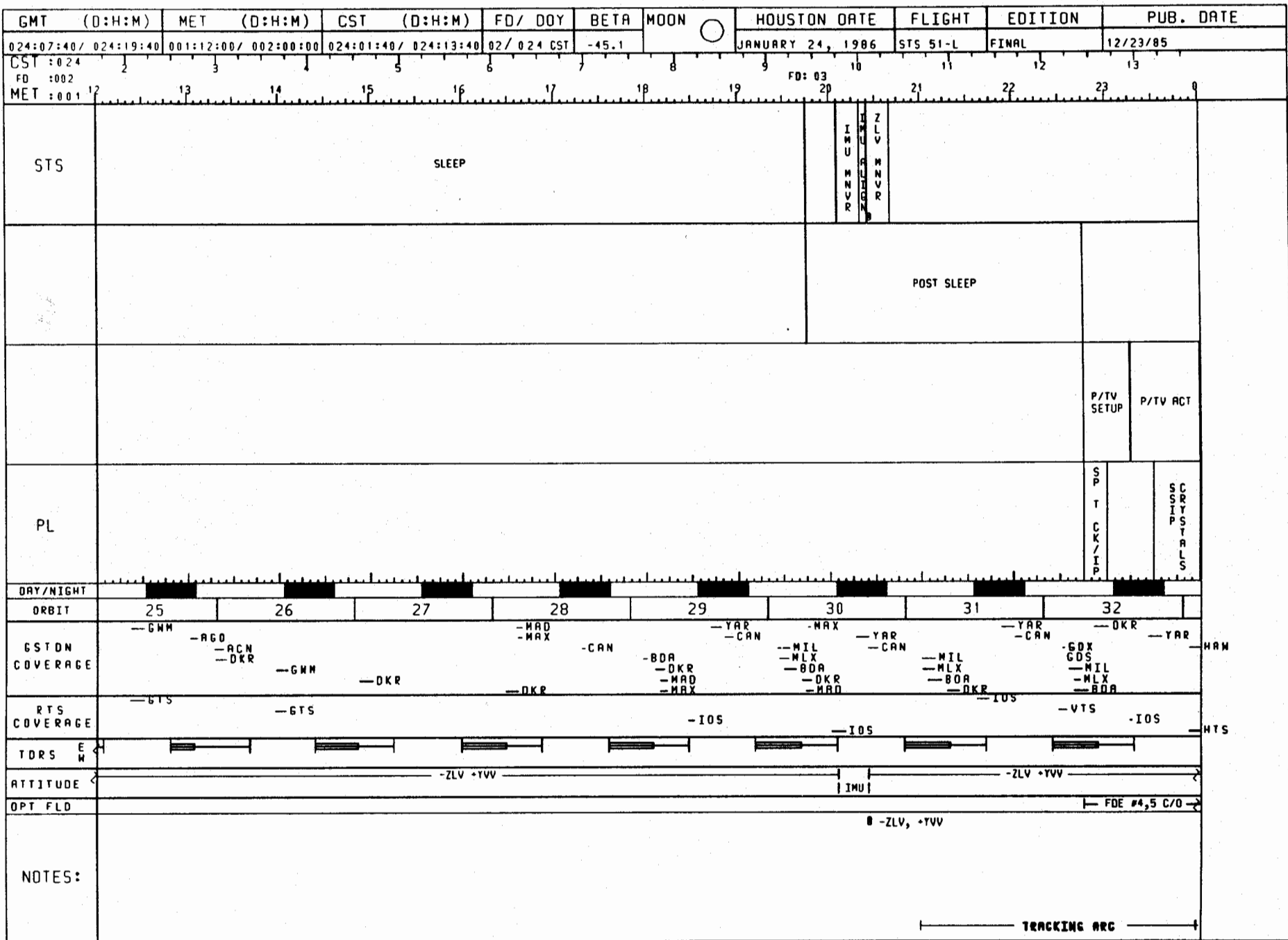
SUMMARY TIMELINE

SUMMARY TIMELINE



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
023:07:40 / 023:19:40	000:12:00 / 001:00:00	023:01:40 / 023:13:40	01 / 023 CST	-43.1	○	JANUARY 23, 1986	STS 51-L	FINAL	12/23/85	
CST : 023 FD : 001 MET : 000										
STS	SLEEP								IMU	ZLV
PRE SLEEP									IMU	ZLV
POST SLEEP									IMU	ZLV
PL									050450	
DAY/NIGHT	[Day/Night Cycle]									
ORBIT	9	10	11	12	13	14	15	16		
E5TON COVERAGE	-GMM	-AGO -ACN -DKR	-GMM	-DKR -MAD	-CAN	-MLX -MIL -BDA -DKR -MAD -MAX	-YAR -CAN	-CAN	-MLX -MIL -BDA -DKR	-YAR
RTS COVERAGE	-GTS	-GTS	-AGO -DKR	-GTS	-YAR	-DKR -MAD -MAX	-YAR	-IOS	-IOS	-YAR
TDRS	[TDRS Coverage]									
ATTITUDE	IMU	-ZLV +XVV							IMU	-ZLV -XVV
OPT FLD										
NOTES:	@ AFT STATION @ -ZLV, +XVV					@ -ZLV, -XVV @ 050 450 SALIVARY CORTISOL LEVELS				

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE										
023:19:40/ 024:07:40	001:00:00/ 001:12:00	023:13:40/ 024:01:40	02/ 023 CST	-44.2	☉	JANUARY 23, 1986	STS 51-L	FINAL	12/23/85										
CST :023	14	15	16	17	18	19	20	21	22	23	24								
FD :002										CST:024									
MET :001	0	1	2	3	4	5	6	7	8	9	10	11	12						
STS	KU-BDD DPLTY	KU-BDD DPLTY	AUTO MNVVR	ZLV MNVVR	AUTO MNVVR	ZLV MNVVR	MEAL	DMS BURM TIG	AUTO MNVVR	ZLV MNVVR	AUTO MNVVR	ZLV MNVVR	I MU MNVVR	ZLV MNVVR	SLEEP				
	POST SLEEP		P/TV SETUP		P/TV ACT					P/TV ACT				PRE SLEEP					
PL	PH RR MM RR CO TH	SP T CK /IP XK	SP P R O D U C T I O N S E T U P V T R S E T U P	VTR P L Y B C K	DSO 450	CHAMP JARDIN	TISP ACTIVITY #1	TISP ACTIVITY #2		P/TV SETUP		P/TV ACT		P/TV ACT				DSO 450	
DAY/NIGHT																			
ORBIT	17	18	19	20	21	22	23	24											
GSTDN COVERAGE	-GDS -GDX -MIL -BDA -MLX -DKR -ACN	-YAR -HAM -GDS -GDX -MIL -MLX -BDA -ACN	-ACN -HAM -GDS -GDX -MIL -BDA -ACN	-YAR -GMM -HAM -GDS -GDX -MIL	-MLX -ACN -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	-ACN -GMM -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	-ACN -GMM -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	-ACN -GMM -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	-ACN -GMM -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	-ACN -GMM -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	-ACN -GMM -HAM -GDS -GDX	-GMM -HAM -GDS -GDX	
RTS COVERAGE	-VTS	-HTS -VTS	-VTS	-HTS -VTS	-HTS -VTS	-HTS -VTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	-GTS -HTS	
TDRS E H																			
ATTITUDE	-ZLV -XVV	-ZLV -XVV	CHAMP	-ZLV -XVV	CHAMP	OMS	CHAMP	-ZLV -XVV	IMU	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	-ZLV -XVV	
OPT FLD	FDE #1,2,3 C/D			FDE #1,2,3 VTR															
NOTES:	● CHAMP ● CHAMP ● HYDROPONICS AND MAGNETISM ● CHAMP ● DSO 450 SALIVARY CORTISOL LEVELS ● -ZLV, -YVV ● DSO 450 SALIVARY CORTISOL LEVELS			● -ZLV, -XVV ● NEWTON'S LAWS ● -ZLV, -XVV ● FILTER CLEANING ● -ZLV, -XVV ● DSO 450 SALIVARY CORTISOL LEVELS			● -ZLV, -XVV ● -ZLV, -XVV ● DSO 450 SALIVARY CORTISOL LEVELS			● -ZLV, -XVV ● -ZLV, -XVV ● DSO 450 SALIVARY CORTISOL LEVELS			● -ZLV, -XVV ● -ZLV, -XVV ● DSO 450 SALIVARY CORTISOL LEVELS			● DSO 450 SALIVARY CORTISOL LEVELS			

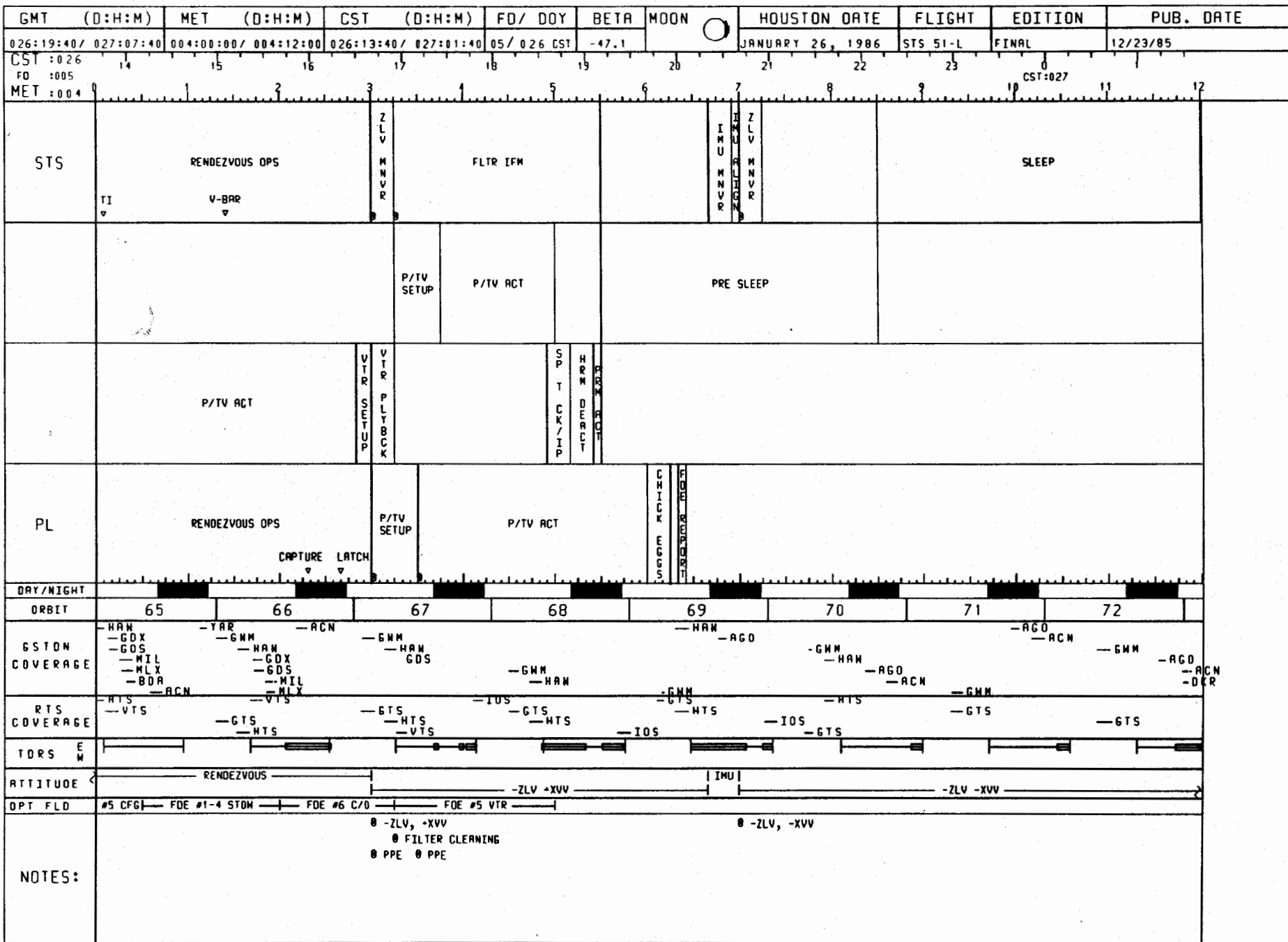


GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
024:19:40 / 025:07:40	002:00:00 / 002:12:00	024:13:40 / 025:01:40	03 / 024 CST	-45.9	○	JANUARY 24, 1986	STS 51-L	FINAL	12/23/85
CST :024	FD :003	MET :002							
STS		MEAL		SPARTAN DEPLOY					SLEEP
				MNVR ATT ▽					SEP ▽
									PRE SLEEP
PL		EPHEMERIS UPDATE		SPARTAN DEPLOY					
				GRAPPLE ▽					DERIG ▽
DAY/NIGHT									
ORBIT	33	34	35	36	37	38	39	40	
GSTDN COVERAGE	HAW -ACN -GDS -GDY -MIL -MLX -BDA -DKR	-YAR -HAW -GDS -MIL -MLX	-BDA -ACN -GMM -HAW -GDS -MIL -HTS	-MLX -ACN -GMM -HAW -GDS -MIL	-GMM -HAW -GDS -MIL -HTS	-ACN -GMM -HAW -GDS -MIL -HTS	-GMM -HAW -GDS -MIL -HTS	-ACN -GMM -HAW -GDS -MIL -HTS	-GMM -ACN -GMM -HAW -GDS -MIL -HTS
RTS COVERAGE	-VTS	-HTS -VTS	-GTS -VTS	-HTS -VTS	-IDS -GTS	-HTS -GTS	-IOS -GTS	-HTS -GTS	-GTS
TDRS E H									
ATTITUDE		-ZLV +YVV			DPY/PROX OPS	INU		-ZLV +XVV	
OPT FLD		FDE #2,3 VTR		FDE #4,5 C/O	FDE #4,5 VTR				
NOTES:	SSIP CRYSTALS			-ZLV, +XVV					

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE		
025:07:40 / 025:19:40		002:12:00 / 003:00:00		025:01:40 / 025:13:40		03 / 025 CST	-46.5	☉	JANUARY 25, 1986	STS 51-L	FINAL	12/23/85		
CST : 025		FD : 003		MET : 002		FD: 04								
STS	SLEEP						IMU MNV R		ZLV MNV R	AUTO MNV R		ZLV MNV R		
							POST SLEEP			P/TV SETUP	P/TV ACT			
											P/TV SETUP	P/TV ACT	P/TV SETUP	
PL										P/TV SETUP	P/TV ACT	CHICK EGGS		
DAY/NIGHT	[Day/Night Cycle]													
ORBIT	41	42	43	44	45	46	47	48						
ESTON COVERAGE	-GMM	-AGO -DKR -ACN	-GMM	-DKR	-MAD -MAX -YAR -CAN	-MAD -MAX -YAR -CAN	-DKR -MAD -YAR -CAN	-DKR -YAR -CAN	-MIL -BDX -MLX -BDA	-MIL -MLX -BDA	-MIL -MLX -BDA	-HAM -GDX -GDS -MIL -MLX	-HAM	
RTS COVERAGE	-GTS	-GTS			-DKR	-DKR	-IOS	-IOS				-IOS	-HTS -VTS	-HTS
TDRS	[TDRS Coverage]													
ATTITUDE	-ZLV +XVV						IMU		-ZLV +XVV		CHAMP			
OPT FLD									#4,5 CONFIG		#4,5 VTR		FDE#4,5 CONFIG	
									-ZLV, +XVV		CHAMP		CHAMP -ZLV, +XVV	
NOTES:														

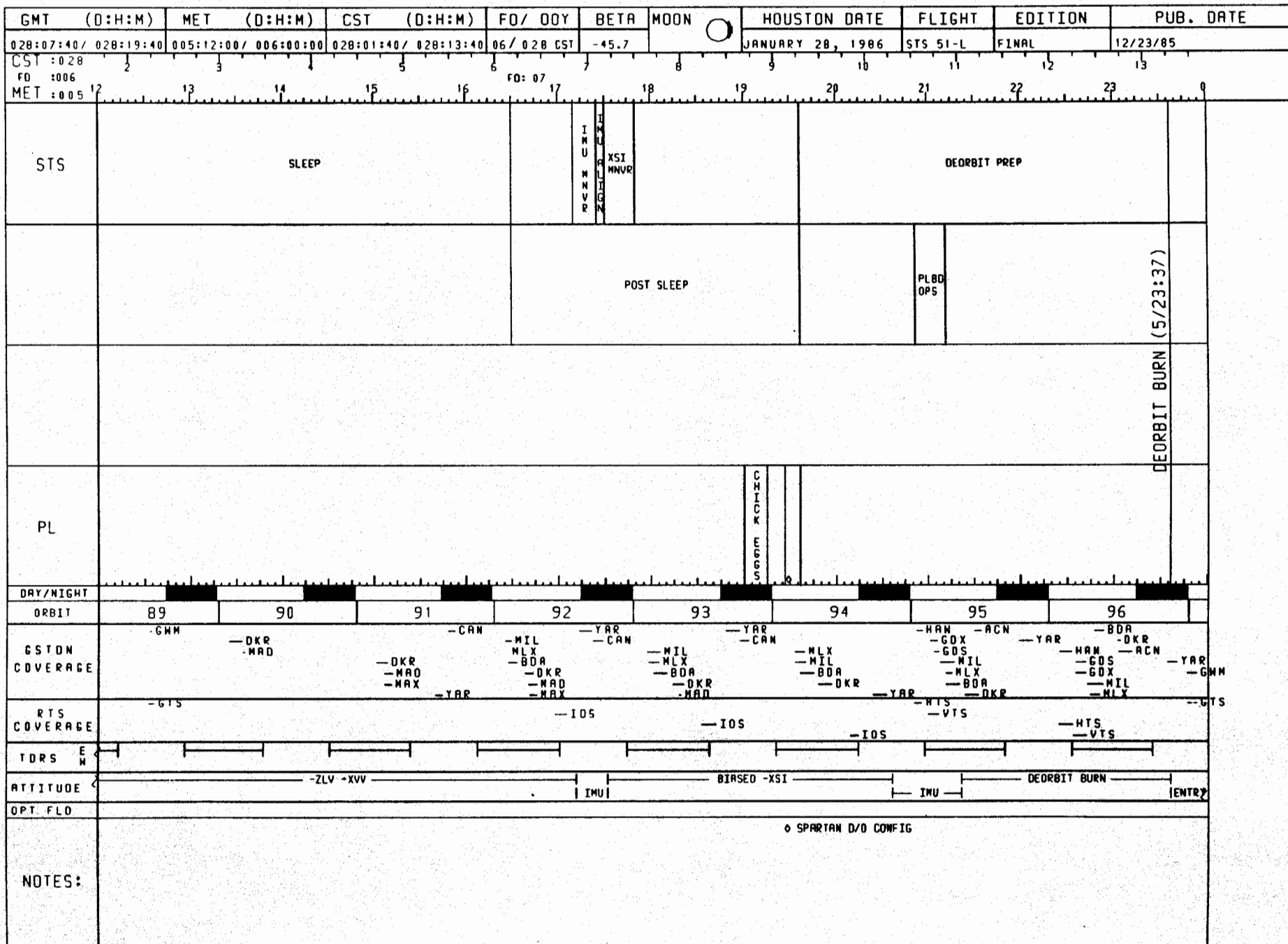
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ OQY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
025:19:40 / 026:07:40	003:00:00 / 003:12:00	025:13:40 / 026:01:40	04 / 025 CST	-46.9	☉	JANUARY 25, 1986	STS 51-L	FINAL	12/23/85
CST :025 FD :004 MET :003									
STS	AUTO MNVVR	ZLV MNVVR	MEAL		RCS BURN NC1	ZLV MNVVR	IMU MNVVR	ZLV MNVVR	SLEEP
	P/TV ACT						PRE SLEEP		
	P/TV ACT	P/TV SETUP		P/TV ACT					
PL	SSIP METALS	P/TV SETUP		TISP ACTIVITY #3	TISP ACTIVITY #4	TISP ACTIVITY #5	P/TV ACT	CHECK MOUNT	CHECK MOUNT
DAY/NIGHT									
ORBIT	49	50	51	52	53	54	55	56	
GSTDN COVERAGE	HAM -ACN -GDX -GDS -MIL -MLX -BDA -DKR	-YAR -GWM -HAM -GDS -GDX -VTS	-MIL -ACN -GWM -HAM -GDS -GDX	-GWM -HAM -GDS -GDX	-GWM -HAM -GDS -GDX	-GWM -HAM -GDS -GDX	-GWM -HAM -GDS -GDX	-GWM -HAM -GDS -GDX	-GWM -HAM -GDS -GDX
RTS COVERAGE	HTS -VTS	--GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS
TDRS E M									
ATTITUDE	CHAMP				RCS		IMU		
OPT FLD	4,5 VTR		FDE #5 CONFIG		#1,5 VTR				
NOTES:	CHAMP	■ ZLV, +XVV	■ EFFERVESCENCE AND CHROMATOGRAPHY	■ SIMPLE MACHINES	■ OPEN SESSION	● ZLV, +YVV	■ ZLV, -YVV		

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
026:07:40 / 026:19:40	003:12:00 / 004:00:00	026:01:40 / 026:13:40	04 / 026 CST	-47.1	○	JANUARY 26, 1986	STS 51-L	FINAL	12/23/85	
CST : 026	FD : 004	MET : 003			FD: 05					
STS	SLEEP					IMU HIGH	RENDEZVOUS OPS	NC2 ▼	NCC ▼	
	POST SLEEP								MEAL	
							P/TV SETUP	P/TV SETUP	P/TV ACT	
PL						CHICK EGGS	RENDEZVOUS OPS			
DAY/NIGHT										
ORBLI	57	58	59	60	61	62	63	64		
GSTDW COVERAGE	-GMM -AGD -DKR		-DKR -MAD	-MAX -YAR -CAN	-MAD -MAX -YAR -CAN	-DKR -YAR -CAN	-YAR -CAN	-YAR -HAM -DKR -ACN	-YAR -HAM -GDS -MIL -MLX -BDR	-YAR -HAM
RTS COVERAGE	-GTS			-DKR -MAD		-IOS	-IOS	-IOS	-HTS -VTS	-HTS
TDRS E M										
ATTITUDE	-ZLV -YVV						IMU	RENDEZVOUS		
OPT FLD							[FDE #5 CONFIG]	FDE #5 VTR		
NOTES:										



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
027:07:40 / 027:19:40	004:12:00 / 005:00:00	027:01:40 / 027:13:40	05 / 027 CST	-46.8	☉	JANUARY 27, 1986	STS 51-L	FINAL	12/23/85
CST : 027	FD : 005	MET : 004	FD: 06						
STS	SLEEP					FCS C/O			
PL									
DAY/NIGHT									
ORBIT	73	74	75	76	77	78	79	80	
GSTON COVERAGE	-GWM	-DKR	-DKR -MAD -MAX	-DKR -MAD -MAX	-BDA -DKR -MAD	-BDA -DKR	-BDA -MLX	-MIL -MLX -BDA	
RTS COVERAGE	-GTS		-CAN	-BDA	-MIL -MLX	-MIL -MLX	-VTS	-HAW -DKR -ACH	
TDRS									
ATTITUDE		-ZLV -XVV				-ZLV +XVV		-ZLV +XVV	
OPT FLD									
NOTES:									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	DETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
027:19:40 / 028:07:40	005:00:00 / 005:12:00	027:13:40 / 028:01:40	06 / 027 CST	-46.4		JANUARY 27, 1986	STS 51-L	FINAL	12/23/85	
CST :027	FD :006	MET :005						CST:028		
STS	MEAL	AUTO M N V R	CREW CONF	ZLV M N V R	CABIN STOW	IMU M N V R	ZLV M N V R	SLEEP		
		P/TV SETUP	P/TV ACT		KU-BD STOW		PRE SLEEP			
PL				DSO 450	SPT CK/TP	GASOW ENCDR	CHICK EGGS	DSO 450		
DAY/NIGHT										
ORBIT	81	82	83	84	85	86	87	88		
GSTDN COVERAGE	-HAM -GDS -GOX -MIL -MLX -BDA	-GMM -HAM -GOX -GDS -MIL -ACN	-HAM	-GMM -HAM -AGO		-ACN -GMM -HAM -AGO	-GMM -AGO -ACN	-GMM -AGO -ACN	-GMM -AGO -ACN	-AGO -DKR
RTS COVERAGE	-HTS -VTS	-VTS -GTS -HTS	-GMM -GTS -HTS -VTS	-IOS -GTS -HTS		-GTS -HAM -AGO -HTS -IOS -GTS	-HTS -GTS	-GTS	-GTS	
TORS E M										
ATTITUDE	-ZLV +XVV CREW CONF -ZLV +XVV IMU -ZLV +XVV									
OPT FLD	STOW #61									
NOTES:	<p>● DSO 450 SALIVARY CORTISOL LEVELS</p> <p>● -ZLV, +XVV</p> <p>● -ZLV, -XVV</p> <p>● DSO 450 SALIVARY CORTISOL LEVELS</p>									

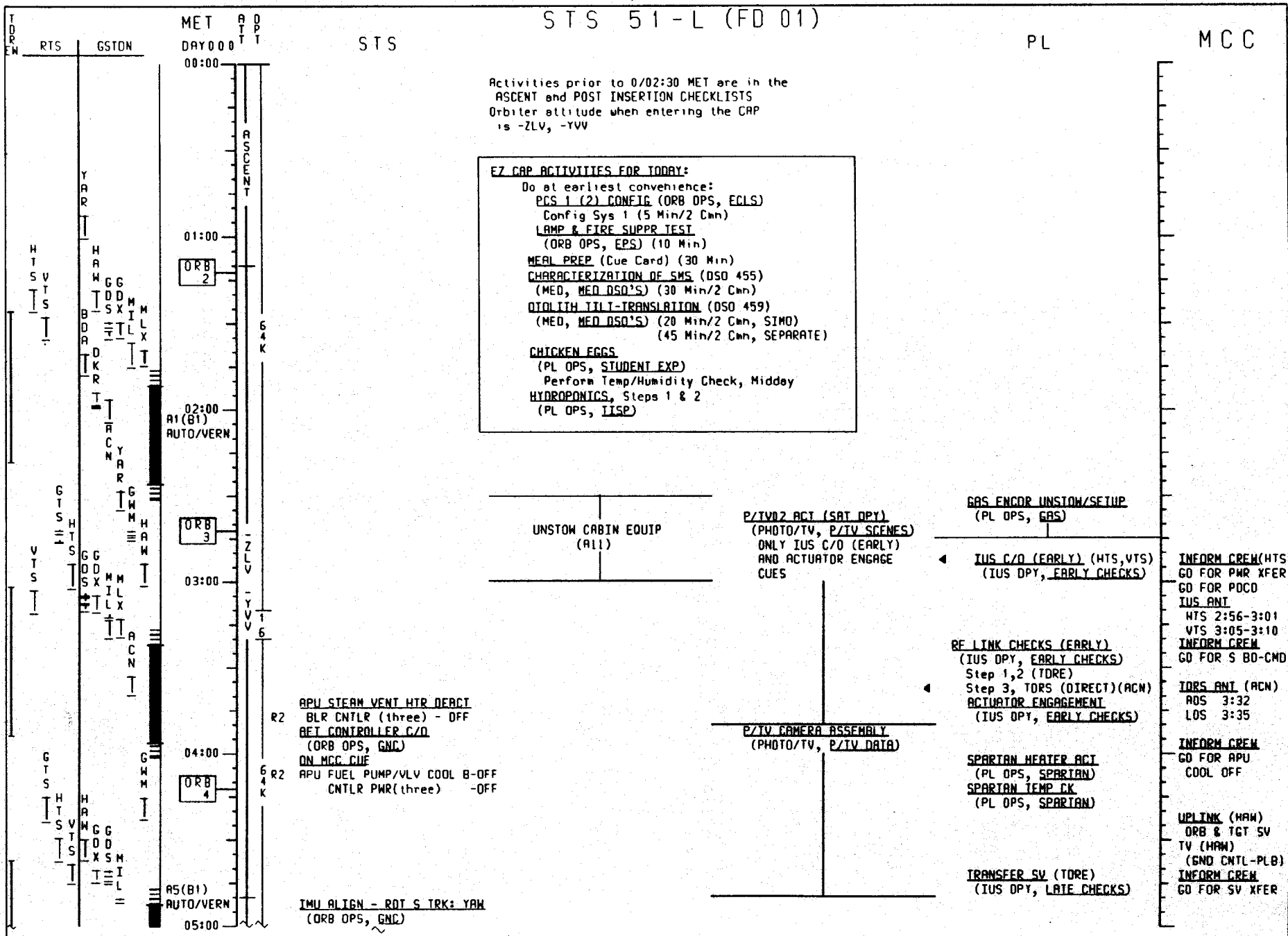


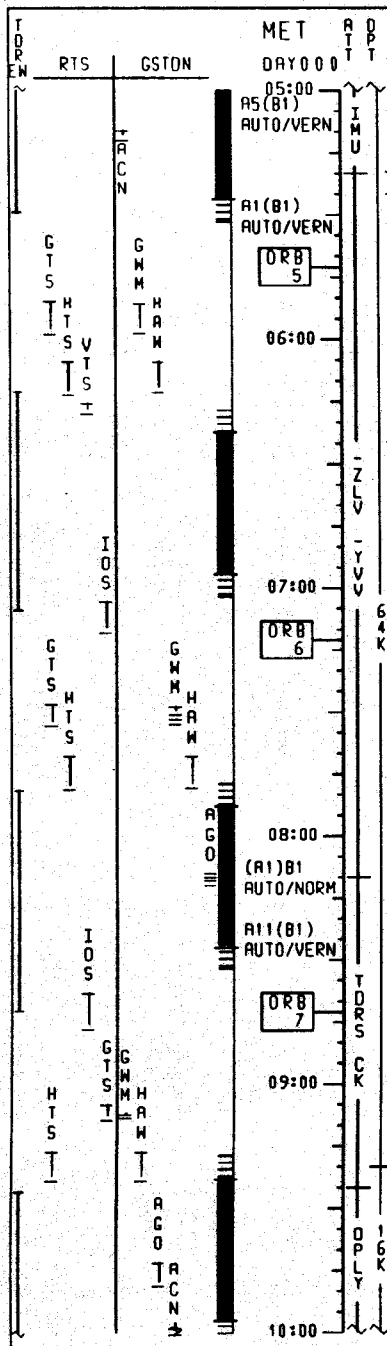
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
028:19:40 / 029:07:40	006:00:00 / 006:12:00	028:13:40 / 029:01:40	07 / 028 CST	-44.8		JANUARY 28, 1986	STS 51-L	FINAL	12/23/85
CST :028	FD :007	MET :006							
STS									
	KSC LANDING (6/00:34)								
PL									
DAY/NIGHT									
ORBIT	97	98	99	100	101	102	103	104	
GSTON COVERAGE	-HAM -GDS -GDY -MIL -MLX -ACN	-HAM -GDS -GDY	-GMM -HAM	-AGO	-GMM -HAM -AGO -ACN	-ACN	-GMM -AGO -ACN -DKR	-GMM -AGO -ACN -DKR	
RTS COVERAGE	-HTS -VTS	-GMM -VTS -HTS	-IOS -GTS -HTS	-IOS -GTS -HTS	-GTS -HTS	-GTS	-GMM -AGO -GTS	-GMM -AGO -GTS	
TORS E M									
ATTITUDE	ENTRY I								
OPT FLD									
NOTES:									

DETAILED TIMELINE

**DETAILED
TIMELINE**

DETAILED TIMELINE





STS
IMU ALIGN - RDT 5 TRK: YAW
 (ORB OPS, GNC)

 When IMU ALIGN complete,
 CONFIG DAP to A1/AUTO/VERN

IMU ALIGN LOG
 RECD ID:
 -Y __, -Z __ ANG ERR __. __
 1 2 3
ANG:
 ΔX () . . . () . . . () . . .
 ΔY () . . . () . . . () . . .
 ΔZ () . . . () . . . () . . .
 EXECUTION TIME:
 _ / _ : _ : _

A12 APU HTR GAS GEN/FUEL PUMP (three) - A AUTO

RMS POWERUP
 (PDRS DPS, RMS PWRUP)
RMS CHECKOUT
 (PDRS DPS, RMS C/D)
 (2 Cnn)

P/TVO2 SETUP (SAT OPY)
 (PHOTO/TV, P/TV SCENES)

RMS POWERDOWN
 (PDRS DPS, RMS PWRDN)
 Note: Do not stow MPMs

P/TVO2 ACT (SAT OPY)
 (PHOTO/TV, P/TV SCENES)

IUS C/D (LATE) (HTS)
 (IUS OPY, LATE CHECKS)

MNVR TO TORS CK ATT
 (IUS OPY, LATE CHECKS)

TILT TABLE ELEV TO 29
 (IUS OPY, LATE CHECKS)

TRANSFER SV (TORE)
 (IUS OPY, LATE CHECKS)

RF CKS (LATE) PART I (TORE)
 (IUS OPY, LATE CHECKS)

REM HTR ACTIVATION
 (IUS OPY, LATE CHECKS)

RF CKS (LATE) PART II
 (IUS OPY, LATE CHECKS)
 STEP 1, TORS DIRECT (HAM)
 STEP 2, IUS (PI) LOCK
DEPLOY COUNTDOWN
 (IUS OPY, DEPLOY OPS)
 XFER TO INT PWR
 REL UMBILICALS
 TILT TABLE TO 59

MNVR TO DEPLOY ATTITUDE
 (IUS OPY, DEPLOY OPS)

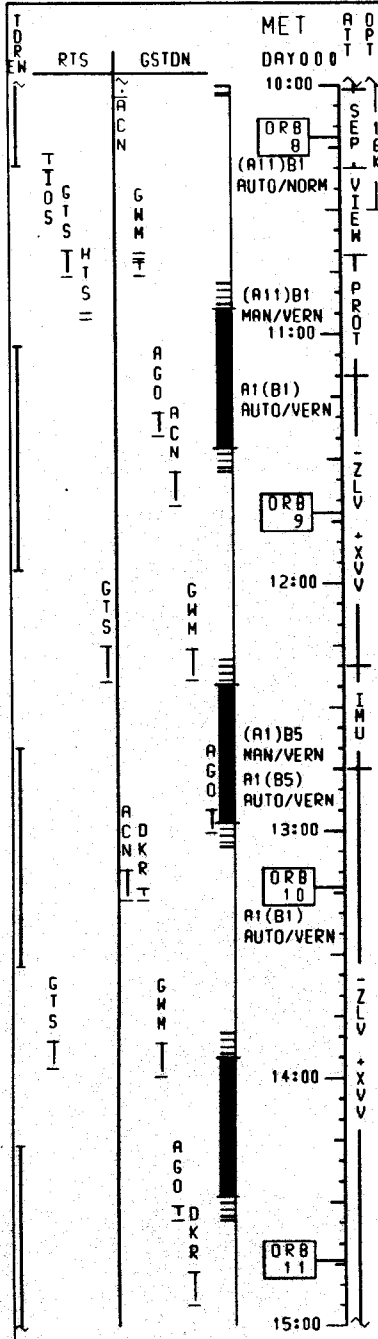
UPDATE (GMM)
DEPLOY PAD
BURN PAD
ONBOARD GO/
NO GO CHART
INFORM CREW (HAM)
GO FOR PWR XFER
GO FOR POCO
INFORM CREW
GO FOR TILT
TABLE TO 29 DEG
UPLINK (TORE)
ORB & TGT SV
INFORM CREW
GO FOR SV XFER
INFORM CREW
GO FOR S 80-CMD

TORS ANT (HAM)
AOS 9:18
LOS 9:23
UPDATE (HAM)
OPY/BURN PADS

INFORM CREW
GO FOR DEPLOY

IUS DEPLOY
(10:01)

TRACKING ARC



POSTDEPLOY SEPARATION MNVR
(IUS DPY, POSTDEPLOY OPS)
OMS BURN
PDRS PKM MONITOR
MNVR TO IUS VIEWING ATT
PI OFF
MNVR TO PROTECT ATT

P/TV02 ACT (SAT DPY)
(PHOTO/TV, P/TV SCENES)

LOWER TILT TABLE TO -6
(IUS DPY, POSTDEPLOY OPS)

DEPLOY IUS/TDRS
(IUS DPY, DEPLOY OPS)

IUS DEPLOY
(10:01)
OMS SEP BURN
(10:20)

Config DAP: A1/AUTO/VERN
MNVR (TRK) -ZLV, +XVV
TG=2 BV=3 OM=180
A/AUTO/VERN Init TRK

RMS POWERDOWN
(PDRS OPS, RMS PWRDN)

CLOSEOUT
(IUS DPY, POSTDEPLOY OPS)

SPARTAN TEMP CK
(PL OPS, SPARTAN)

SRM 1 IGNITION
(10:56)

019 ✓ COAS PWR-OFF Mount COAS-AFT

L1 FLASH EVAP CNTLR PRI A(B) - OFF

PRE SLEEP ACTIVITY
(ORB OPS, CREW SYS)

◀ MNVR IMU ALIGN ATT
STAR PAIR (A1)
A/AUTO/VERN Init MNVR at SS
IMU ALIGN - 5 TRK (ORB OPS)
COAS CALIBRATION (ORB OPS)
MNVR (TRK) -ZLV, +XVV
TG=2 BV=3 OM=180
A/AUTO/VERN Init TRK
Change DAP B to B1
✓PWR - OFF Stow COAS

IMU ALIGN LOG
REOD ID:
-Y __, -Z __ ANG ERR __
1 2 3
ANG:
ΔX () () ()
ΔY () () ()
ΔZ () () ()
EXECUTION TIME:
_ / _ : _ : _

COAS CALIBRATION LOG
STAR ID: -Z 23, BETELGEUSE
STAR AVAIL UNTIL: 1 2 : 5 8
-Z Δ BIAS __, __
UPDATE TIME: _ / _ : _ : _

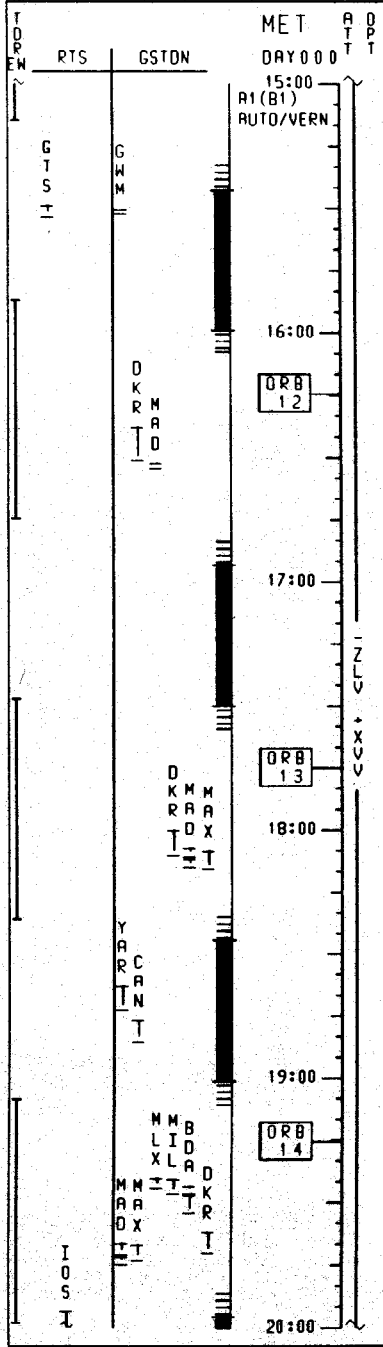
SLEEP

UPLINK
REFSMAT
NORMALIZATION

STS 51-L (FD 01)

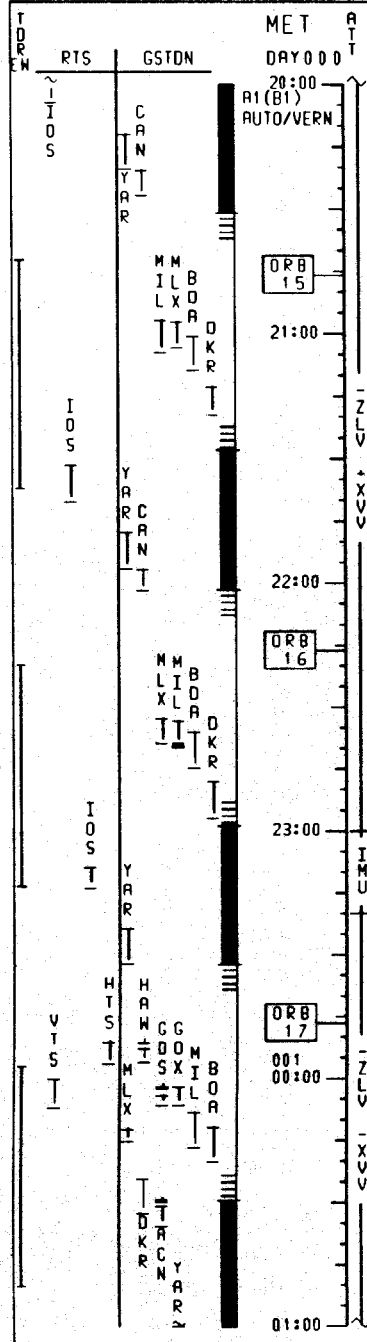
PL

MCC



STS

SLEEP



STS

SLEEP

EZ CAP ACTIVITIES FOR TODAY:
 EXERCISE (1 Hr/ALL)
 MEAL PREP (Cue Card) (30 Min)
 CHARACTERIZATION OF SMS (DSO 455)
 (MED, MED DSO'S) (30 Min/2 Cmh)

SALIVARY SAMPLE (DSO 450)
 (MED C/L, MED DSO'S)
 2 Cmh, 1 SAMPLE EACH

POST SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

◀ **MNVR IMU ALIGN ATT**
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at SS
 IMU ALIGN - S TRK (ORB OPS)
 MNVR (TRK) -ZLV, -XVV
 TG=2 BV=3 OM=0
 A/AUTO/VERN Init TRK

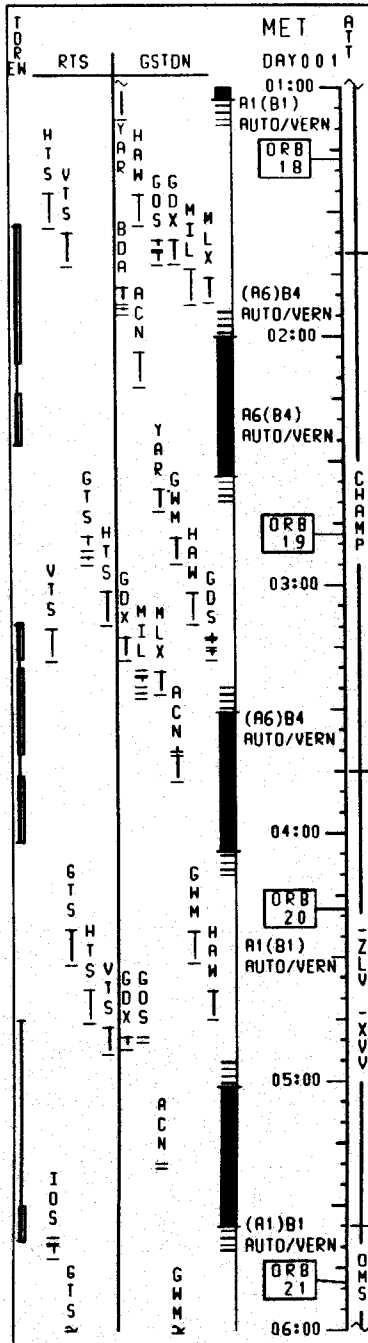
IMU ALIGN LOG
 RECD ID:
 -Y __, -Z __ ANG ERR __. __
 1 2 3
 ANG:
 ΔX () . () . () .
 ΔY () . () . () .
 ΔZ () . () . () .
 EXECUTION TIME:
 __ / __ : __ : __

KU-BD ANT DEPLOY
 (ORB OPS, COMM/INST)
KU-BD ACTIVATION (COMM mode)
 (ORB OPS, COMM/INST)

P/TV16 SETUP (CHAMP)
 (PHOTO/TV, P/IV SCENES)

PRM, Step 1 (PL OPS, RME)
HRM III, Step 1 (PL OPS)
SPARTAN TEMP CK/TGN PUMP
 (PL OPS, SPARTAN)

SPARTAN PROCESSOR CK
 (PL OPS, SPARTAN)



Change DAP A, B to A6, B4
MNVR CHAMP ATI
 R=307 P=91 Y=357
 A6/AUTO/VERN
 Init MNVR at SS-20 min
 When in ATT, B4/AUTO/VERN

When CHAMP data complete,
MNVR (TRK) -7LV, -XVV
 TG=2 BV=3 OM=0
 A6/AUTO/VERN Init TRK

MNVR CHAMP ATI
 R=307 P=91 Y=357
 A6/AUTO/VERN
 Init MNVR at SS-20 Min
 When in ATT, B4/AUTO/VERN

When CHAMP data complete,
MNVR (TRK) -7LV, -XVV
 TG=2 BV=3 OM=0
 A6/AUTO/VERN Init TRK
 Change DAP A, B to A1, B1
 Config DAP: A1/AUTO/VERN

MEAL (A11)

ON-ORBIT OMS BURN
 (ORB OPS, OMS)
 1 ENG BURN (2 Cmn)

TIG (1/06:00)

P/TV16 ACT (CHAMP)
 (PHOTO/TV, P/TV SCENES)

Perform
 UV 1 IMAGING

Perform
 UV 2 (Carbon) IMAGING

Do not Deactivate
P/TV16 SETUP (CHAMP)

RMS POWERUP
 (PORS OPS, RMS PWRUP)

SPARTAN SURVEY
 (PORS OPS, SPARTAN SURVEY)

RMS POWERDOWN
 (PORS OPS, RMS PWRDN)
VTR PLAYBACK (SPARTAN SURVEY)
 (Cue Card, TV/VTR)
 VTR at HAW (4:37 - 4:44)

P/TV11 SETUP (TEACHER DEMO)
 (PHOTO/TV, P/TV SCENES)

P/TV11 ACT (TEACHER DEMO)
 (PHOTO/TV, P/TV SCENES)

VTR SETUP (02-SAT OPY)
 (Cue Card, TV/VTR)

VTR PLAYBACK (02-SAT OPY)
 (Cue Card, TV/VTR)
 VTR at HAW-MIL (1:24-1:51)

SALIVARY SAMPLE (DSQ 450)
 (MED C/L, MED DSQ's)
 2 Cmn, 1 SAMPLE EACH
CHICKEN EGGS
 (PL OPS, STUDENT EXP)

HYDROPONICS, Step 2 & MAGNETISM
 (PL OPS, IISP)

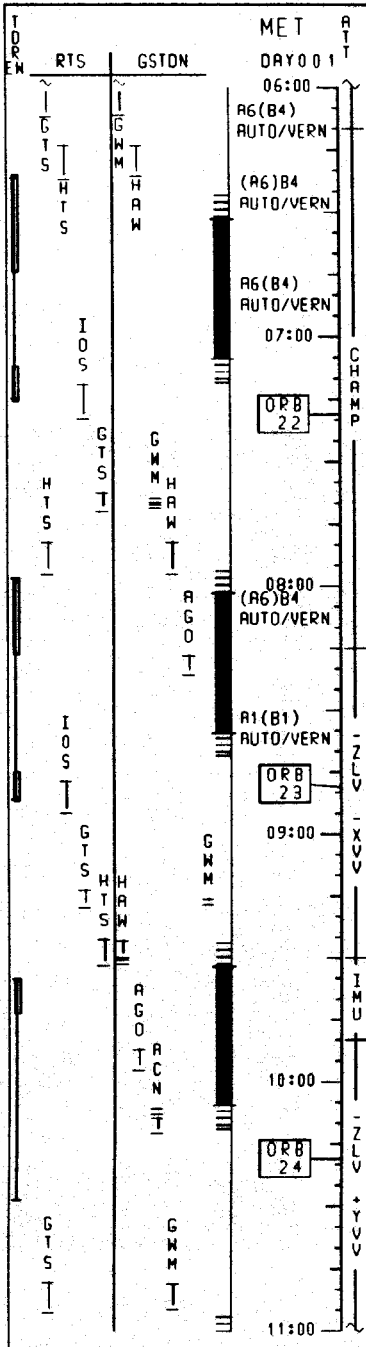
NEWTON'S LAWS
 (PL OPS, IISP)

P/TV15 SETUP (FDE)
 (PHOTO/TV, P/TV SCENES)

VTR (HAW, GDS, MIL)
 UPDATE (HAW)
 SS TIME-CHAMP
 DATA TAKES -
 ORB 18,19

VTR (HAW)

UPDATE
 OMS BURN PAD



STS
ON-ORBIT OMS BURN
 Change DAP A,B to A6,B4
MNVR CHAMP ATT
 R=306 P=96 Y=350
 A6/AUTO/VERN
 Init MNVR at SS-20 Min
 When in ATT, B4/AUTO/VERN

When CHAMP data complete,
MNVR (TRK) -ZLV, -XVV
 TG=2 BV=3 DM=0
 A6/AUTO/VERN Init TRK

MNVR CHAMP ATT
 R=306 P=96 Y=350
 A6/AUTO/VERN
 Init MNVR at SS-20 Min
 When in ATT, B4/AUTO/VERN

When CHAMP data complete,
MNVR (TRK) -ZLV, -XVV
 TG=2 BV=3 DM=0
 A6/AUTO/VERN Init TRK
 Change DAP A,B to A1,B1
 Config DAP: A1/AUTO/VERN

MNVR IMU ALIGN ATT
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, +YVV
 TG=2 BV=3 DM=270
 A/AUTO/VERN Init TRK

P/TV16 ACT (CHAMP)
 (PHOTO/TV, P/TV SCENES)

Perform
UV SPECTRA

Perform
VISIBLE SPECTRA

PRE SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

P/TV15 SETUP (FDE)
P/TV15 ACT (FDE)
 (PHOTO/TV, P/TV SCENES)
 FDE #1,2,3

FILTER CLEANING
 (IFM, SCHEDULED MAINTENANCE)

SALIVARY SAMPLE (DSO 450)
 (MED C/L, MED DSO's)
 2 Cans, 1 SAMPLE EACH
P/TV15 ACT (FDE)
 (PHOTO/TV, P/TV SCENES)
 FDE #2,3

SPARTAN TEMP CK/ION PUMP
 (PL OPS, SPARTAN)

PRM, Step 2 (PL OPS, RNE)

FDE STATUS REPORT (HAW)

IMU ALIGN LOG
 RECD ID: _____

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

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

EXECUTION TIME:
 ___ / ___ : ___

UPDATE (HAW)
 SS TIME - CHAMP
 DATA TAKES -
 ORB 21,22

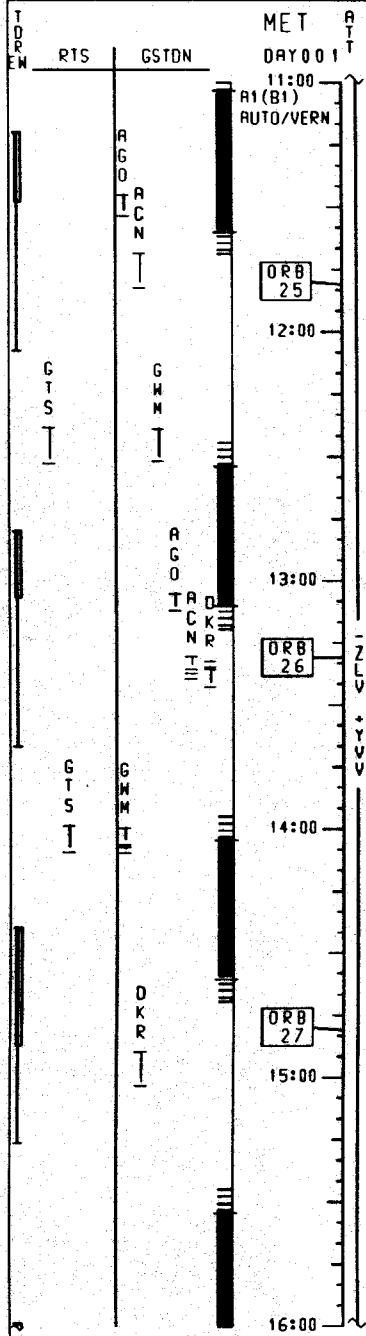
UPDATE
 OPS RCOR SETUP
 FOR FDE RPT

STS 51-L (FD 02)

STS

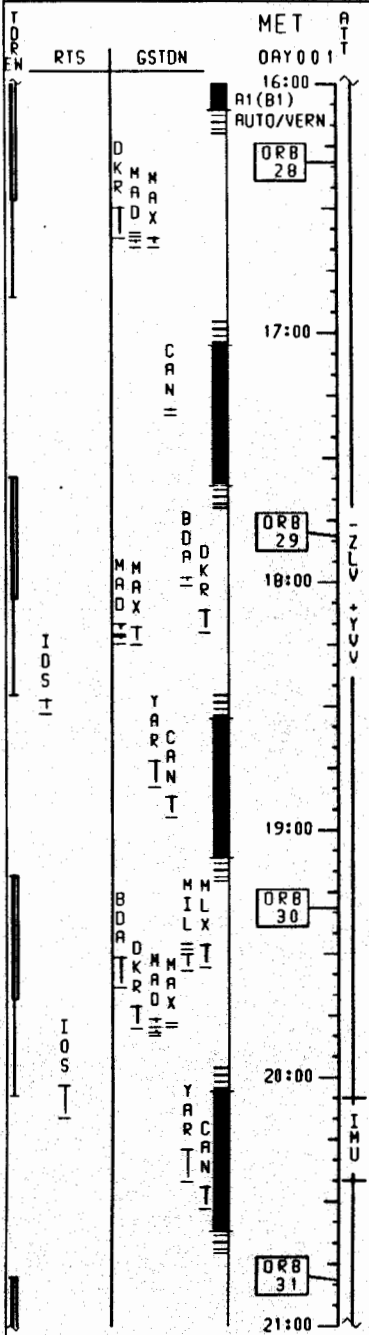
PL

MCC



PRE SLEEP ACTIVITY
(ORB OPS, CREW SYS)

SALIVARY SAMPLE (DSO 450)
(MED C/L, MED DSO's)
2 Cmn, 1 SAMPLE EACH



4 MNVR IMU ALIGN ATT
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, +YVV
 TG=2 BV=3 OM=270
 A/AUTO/VERN Init TRK

POST SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

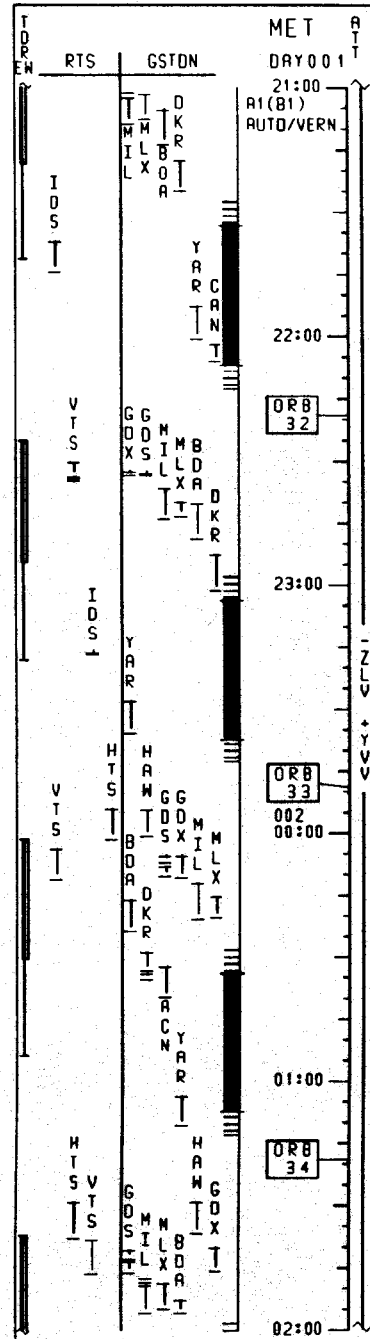
IMU ALIGN LOG		
READ ID:		
-Y	-Z	ANG ERR
1	2	3
ANG:		
ΔX	()	()
ΔT	()	()
ΔZ	()	()
EXECUTION TIME:		
_ / _ : _ : _		

STS 51-L (FD 03)

STS

PL

MCC



EZ CAP ACTIVITIES FOR TODAY:
 EXERCISE (1 Hr/ALL)
 MEAL PREP (Cue Card) (30 Min)
 CHARACTERIZATION OF SMS (OSO 455)
 (MED, MED OSO'S) (30 Min/2 Cmn)

POST SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

P/TV13 SETUP (SSTP-CRYSTALS)
 (PHOTO/TV, P/TV SCENES)

SPARTAN TEMP CK/TON PUMP
 (PL OPS, SPARTAN)

P/TV13 ACT (SSTP-CRYSTALS)
 (PHOTO/TV, P/TV SCENES)

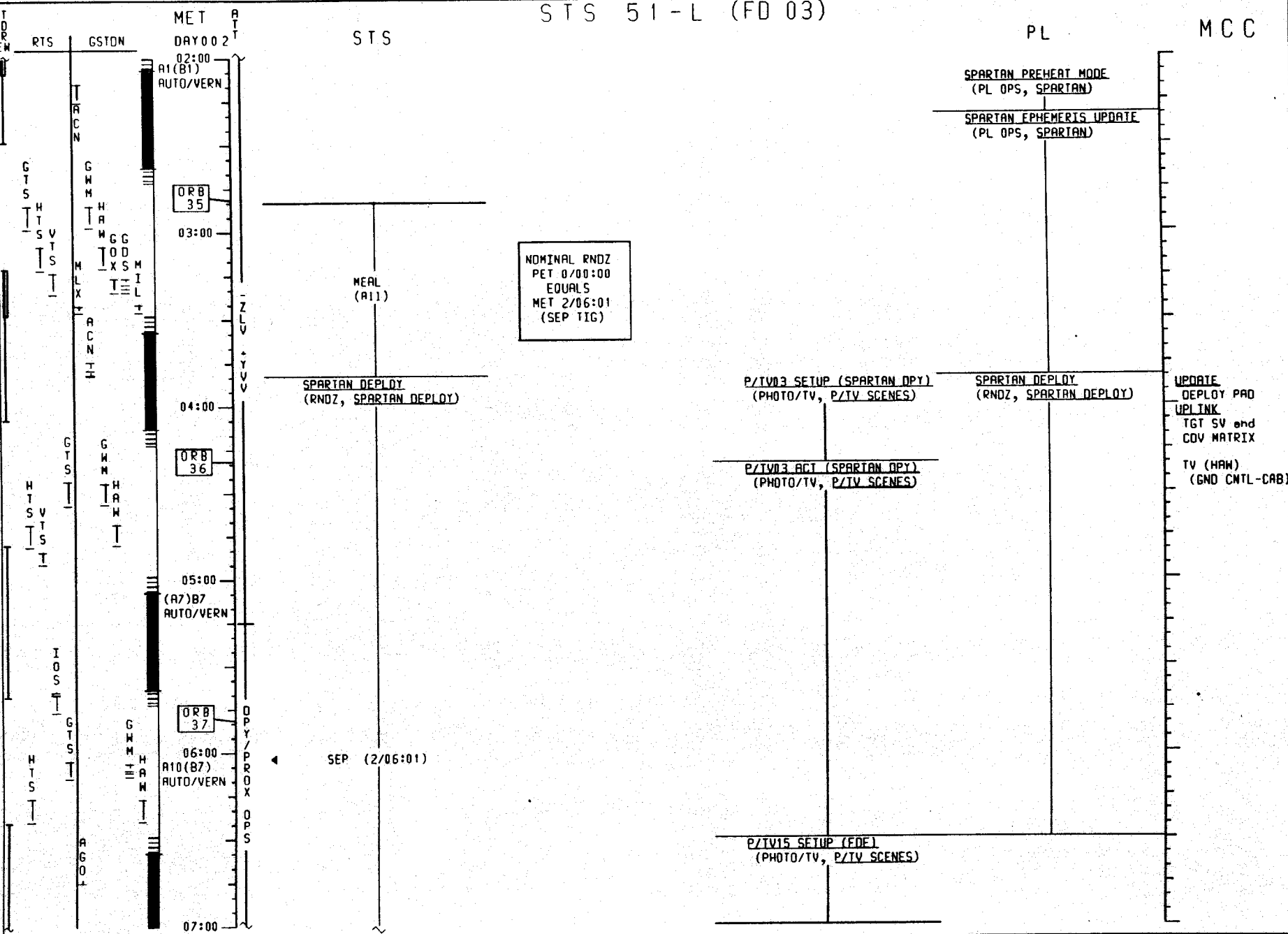
CRYSTAL MEMBRANE
 (PL OPS, STUDENT EXP)

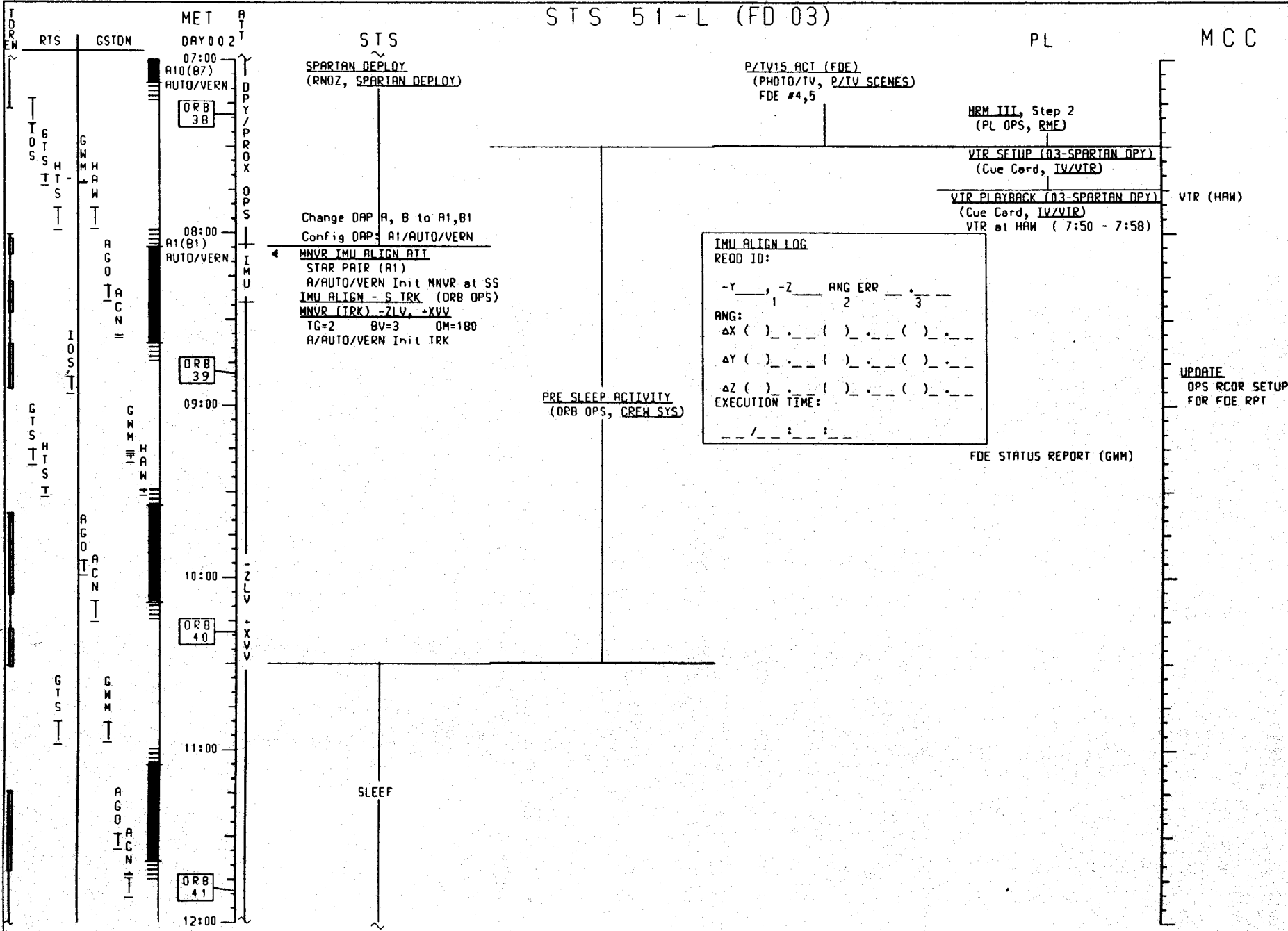
P/TV15 SETUP (FDE)
 (PHOTO/TV, P/TV SCENES)

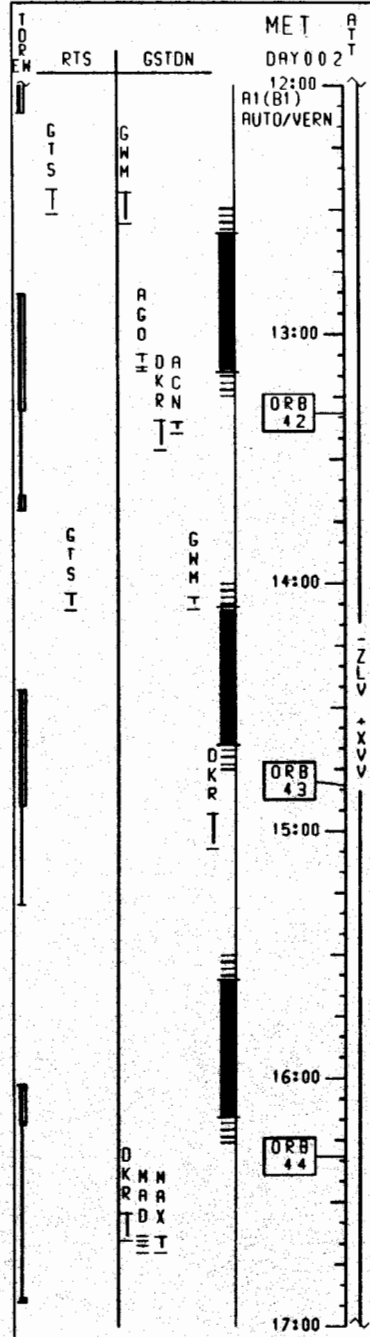
P/TV15 ACT (FDE)
 (PHOTO/TV, P/TV SCENES)
 FDE #2,3

CHICKEN EGGS
 (PL OPS, STUDENT EXP)

UPDATE (TORE)
 SPARTAN
 EPHEMERIS

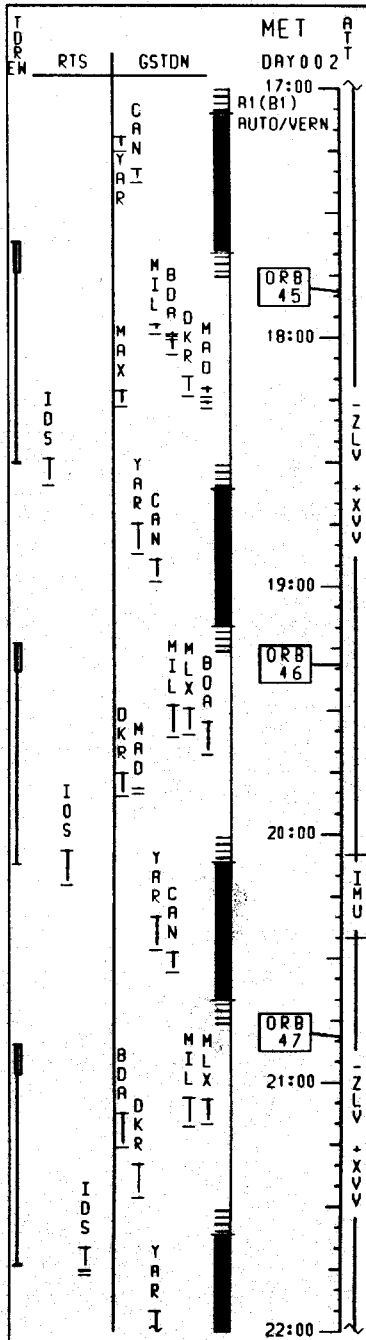






STS

SLEEP



STS
SLEEP

EZ CAP ACTIVITIES FOR TODAY:

RCS REGULATOR RECONFIGURE
07/08 He PRESS A(three)-CL(1b-CL)
B(three)-GPC(1b-OP)
Perform midflt/A.M.(10 Min)

HEATER RECONFG - B (ORB OPS, EPS)
Perform midflt/A.M.(5 Min)

EXERCISE (1 Hr/ALL)

MEAL PREP (Cue Card) (30 Min)

ECLSS REDUNDANT COMPONENT C/O
(ORB OPS, ECLS) (10 Min)
Inform MCC when complete

PCS 1 (2) CONFIG (ORB OPS, ECLS)
Config Sys 2 (5 Min/2 Cnn)
Perform midflight

CAB TEMP CNTL RECONFIG
M044F Pin CAB TEMP CNTL actuator
linkage to actuator 2
L1 CAB TEMP CNTLR - 2
Perform midflight (5 Min)

DTDLITH TILI-TRANSLATION (DSO 459)
(MED, MED DSO'S) (20 Min/2 Cnn, SIMO)
(45 Min/2 Cnn, SEPARATE)

POST SLEEP ACTIVITY
(ORB OPS, CREW SYS)

◀ **MNVR IMU ALIGN ATT**
STAR PAIR (A1)
A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, -XVV
TG=2 BV=3 OM=180
A/AUTO/VERN Init TRK

Do **EC PURGE MANUAL (CUE CARD)**

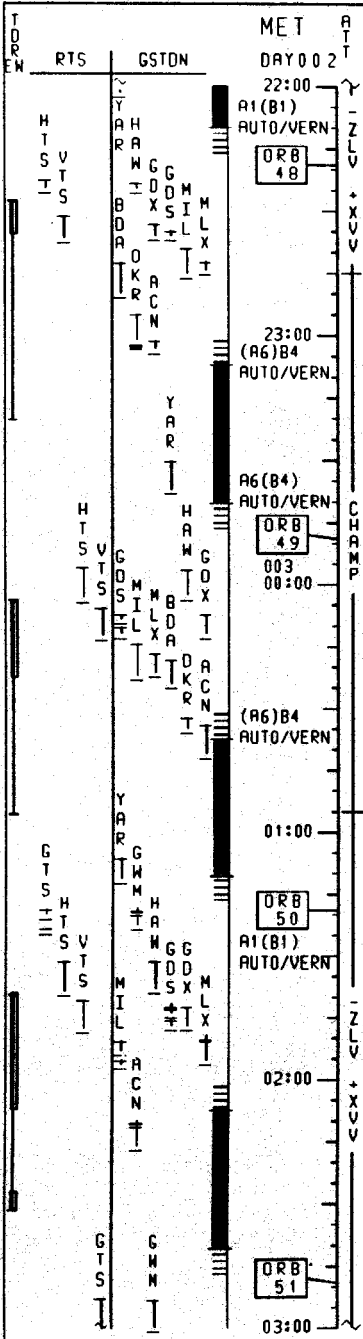
IMU ALIGN LOG
REQD IO:
-Y __, -Z __ ANG ERR __ __
1 2 3
ANG:
ΔX () . () . () .
ΔY () . () . () .
ΔZ () . () . () .
EXECUTION TIME:
_ / _ : _ : _

P/TV16 SETUP (CHAMP)
(PHOTO/TV, P/TV SCENES)

HRM III, Step 1 (PL OPS)

P/TV15 SETUP (FDF)
(PHOTO/TV, P/TV SCENES)

STS 51-L (FD 04)



STS

PL

MCC

P/TV16 SETUP (CHAMP)
(PHOTO/TV, P/TV SCENES)

P/TV15 ACT (FDE)
(PHOTO/TV, P/TV SCENES)
FDE #4,5

P/TV14 SETUP (SSIP-EGGS)
(PHOTO/TV, P/TV SCENES)

UPDATE (TORE)
SS TIME - CHAMP
DATA TAKES -
ORB 48,49

◀ Change OAP A, B to A6, B4
MNVR CHAMP ATT
R=307 P=96 Y=351
A6/AUTO/VERN
Init MNVR at SS-20 min
When in ATT, B4/AUTO/VERN

P/TV16 ACT (CHAMP)
(PHOTO/TV, P/TV SCENES)

Perform
UV 1 IMAGING

P/TV14 ACT (SSIP-EGGS)
(PHOTO/TV, P/TV SCENES)

CHICKEN EGGS
(PL OPS, STUDENT EXP)

When CHAMP data complete,
MNVR (TRK) -ZLV, +XVV
TG=2 BV=3 OM=180
A6/AUTO/VERN Init TRK

P/TV12 SETUP (SSIP-METALS)
(PHOTO/TV, P/TV SCENES)

P/TV12 ACT (SSIP-METALS)
(PHOTO/TV, P/TV SCENES)

TI GRAIN
(PL OPS, STUDENT EXP)

◀ **MNVR CHAMP ATT**
R=307 P=96 Y=351
A6/AUTO/VERN
Init MNVR at SS-20 min
When in ATT, B4/AUTO/VERN

Perform
UV 3 (Color) IMAGING

P/TV11 SETUP (TEACHER DEMO)
(PHOTO/TV, P/TV SCENES)

P/TV15 SETUP (FDE)
(PHOTO/TV, P/TV SCENES)

When CHAMP data complete,
MNVR (TRK) -ZLV, +XVV
TG=2 BV=3 OM=180
A6/AUTO/VERN Init TRK
Change OAP A, B to A1, B1
Config OAP: A1/AUTO/VERN

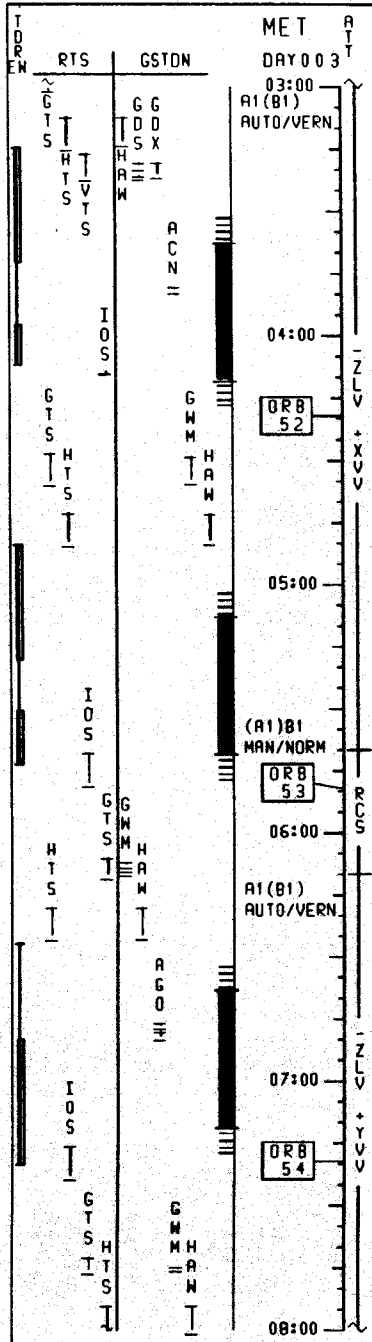
P/TV11 ACT (TEACHER DEMO)
(PHOTO/TV, P/TV SCENES)

EFFERVESCENCE & CHROMATOGRAPHY
(PL OPS, IISP)

STS

PL

MCC



ON-ORBIT RCS BURN
 (ORB OPS, RCS)
 (2 Cmn)

◀ **NC1 (3/06:06)**

MNVR (TRK) -ZLV, +YVV
 TG=2 BV=3 OM=270
 A/AUTO/VERN Init TRK

PRE SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

Do Not Perform WATER DUMP
 Between NC1 and NC2

EFFERVESCENCE & CHROMATOGRAPHY
 (PL OPS, IISP)

SIMPLE MACHINES
 (PL OPS, IISP)

OPEN SESSION
 (PL OPS, IISP)

Repeat activities as
 required for mission
 success.

P/TV15 ACT (FDE)
 (PHOTO/TV, P/TV SCENES)
 FDE #1,5

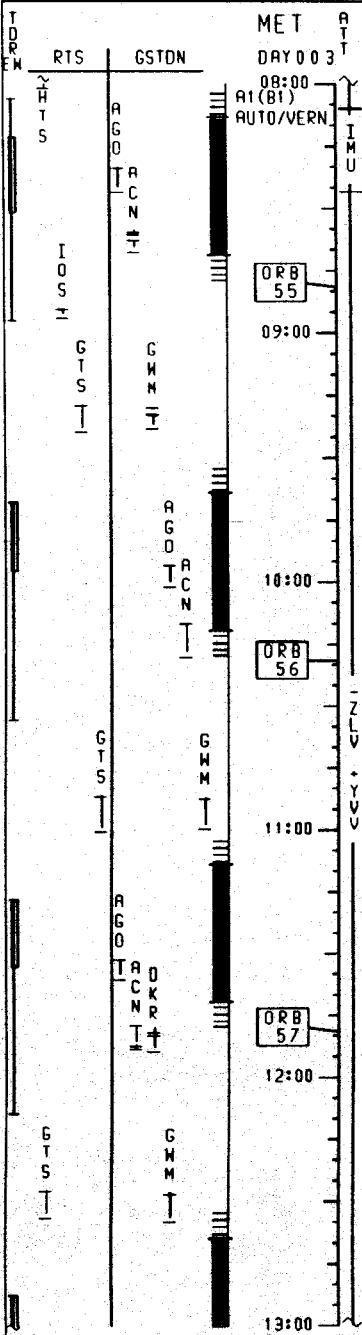
CHICKEN EGGS
 (PL OPS, STUDENT EXP)

UPDATE
 OPS RCOR SETUP
 FOR FDE RPT

FDE STATUS REPORT (HAW)

STS

MET DAY 003

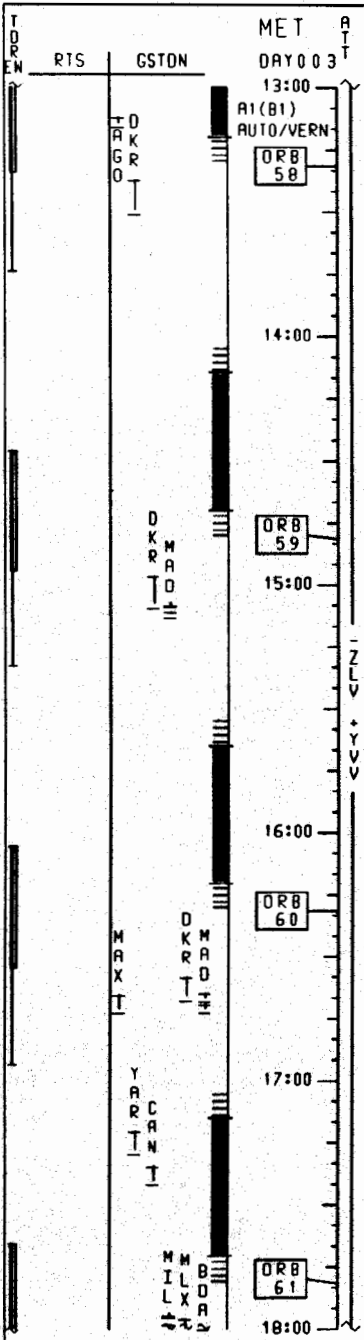


◀ MNVR IMU ALIGN ATT
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at 55
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, +YVV
 TG=2 BV=3 OM=270
 A/AUTO/VERN Init TRK

PRE SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

SLEEP

IMU ALIGN LOG
 RECD ID:
 -Y____, -Z____ ANG ERR ____
 1 2 3
 ANG:
 ΔX () . () . () .
 ΔY () . () . () .
 ΔZ () . () . () .
 EXECUTION TIME:
 _ / _ : _ : _



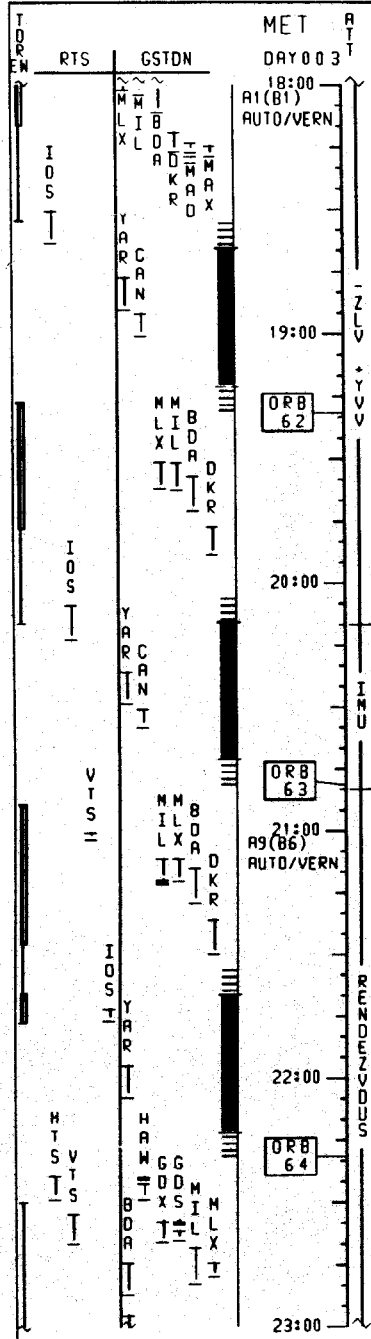
STS

SLEEP

POST SLEEP ACTIVITY
(ORB OPS, CREW SYS)

MET DAY 003

STS



NOMINAL RNDZ
 PET 0/00:00
 EQUALS
 MET 3/21:00
 (NC2 TIG)

E7 CAP ACTIVITIES FOR TODAY:
 EXERCISE (1 Hr/ALL)
 MEAL PREP (Cue Card) (30 Min)

IMU ALIGN LOG
 RECD ID:
 -Y __, -Z __ ANG ERR __. __
 1 2 3
 ANG:
 ΔX () . () . () .
 ΔY () . () . () .
 ΔZ () . () . () .
 EXECUTION TIME:
 __ / __ : __ : __

POST SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

Do Not Perform WATER DUMP
 Between NC1 and NC2

◀ MNVR IMU ALIGN ATT
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at 55
 IMU ALIGN - S TRK (ORB OPS)

RENDEZVOUS
 (RNDZ, SPARTAN RNDZ)
 (3 Cmn)

◀ NC2 (3/21:00)

CHICKEN EGGS
 (PL OPS, STUDENT EXP)

P/TV06 SETUP (RNDZ)
 (PHOTO/TV, P/TV SCENES)

RENDEZVOUS
 (RNDZ, SPARTAN RNDZ)
 (3 Cmn)

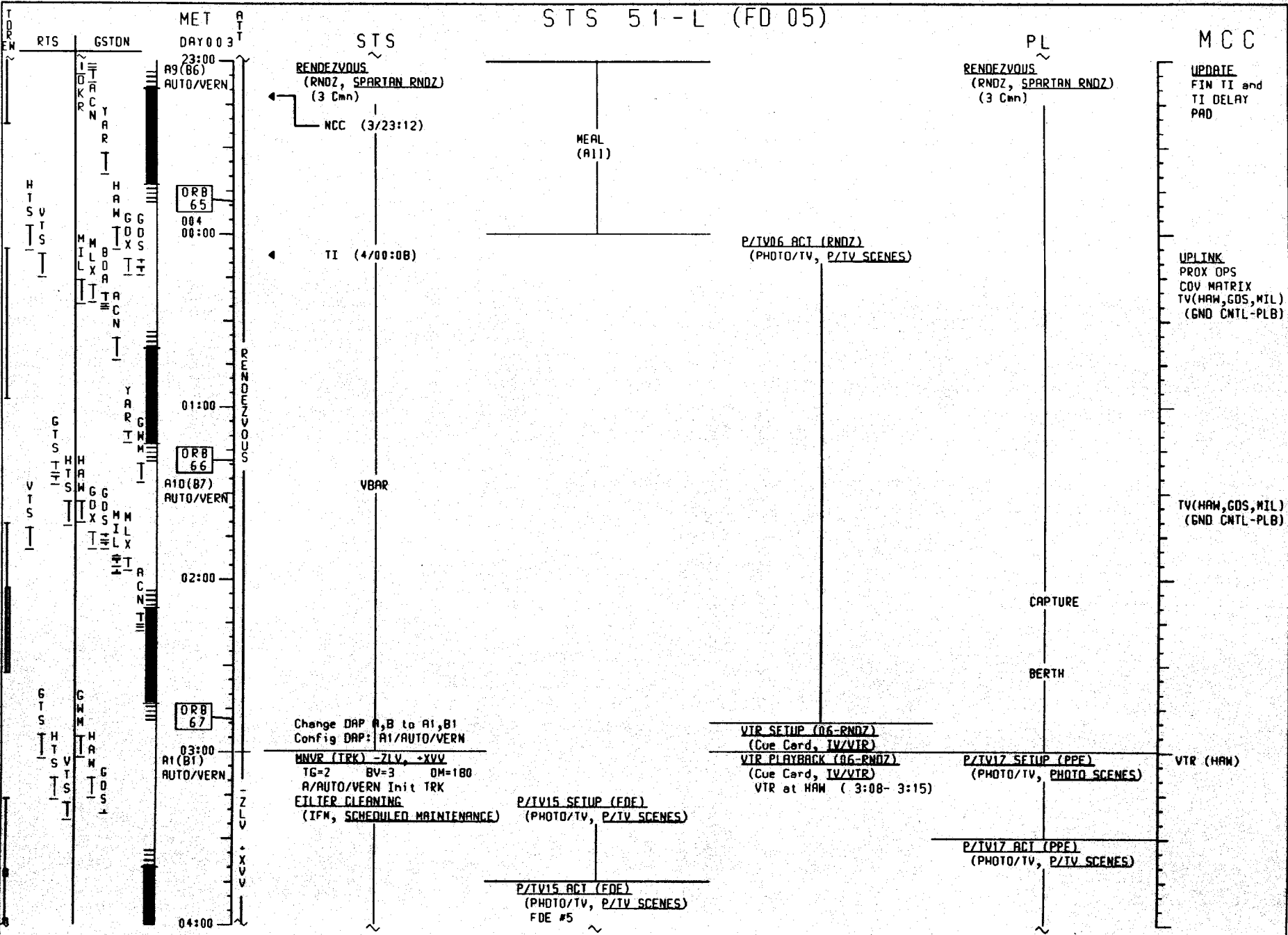
P/TV15 SETUP (FDE)
 (PHOTO/TV, P/TV SCENES)

P/TV15 ACT (FDE)
 (PHOTO/TV, P/TV SCENES)
 FDE #5

UPDATE
 FIN NC2 and
 PRELIM TI
 BURN PAD
 UPLINK
 TGT SV and
 COV MATRIX

UPDATE
 MCC Δ V
 UPDATE
 PROP GO/NO GO
 PAD

STS 51-L (FD 05)



RTS GSTDN MET DAY 004
 04:00
 A1(B1)
 AUTO/VERN
 ORB 68
 05:00
 I OS
 ORB 69
 06:00
 A G G O T
 I M U
 07:00
 ORB 70
 08:00
 A G G O T
 A C M T
 ORB 71
 09:00

STS
 FILTER CLEANING
 (IFM, SCHEDULED MAINTENANCE)

P/IV15 ACT (EDE)
 (PHOTO/TV, P/IV SCENES)
 FDE #5

PL
 P/IV17 ACT (PPE)
 (PHOTO/TV, P/IV SCENES)

MCC

SPARTAN TEMP CK/TON PUMP
 (PL OPS, SPARTAN)

HRM III, Step 2
 (PL OPS, RME)

PRM, Step 1 (PL OPS, RME)

UPDATE
 OPS RCDR SETUP
 FOR FDE RPT

CHICKEN EGGS
 (PL OPS, STUDENT EXP)

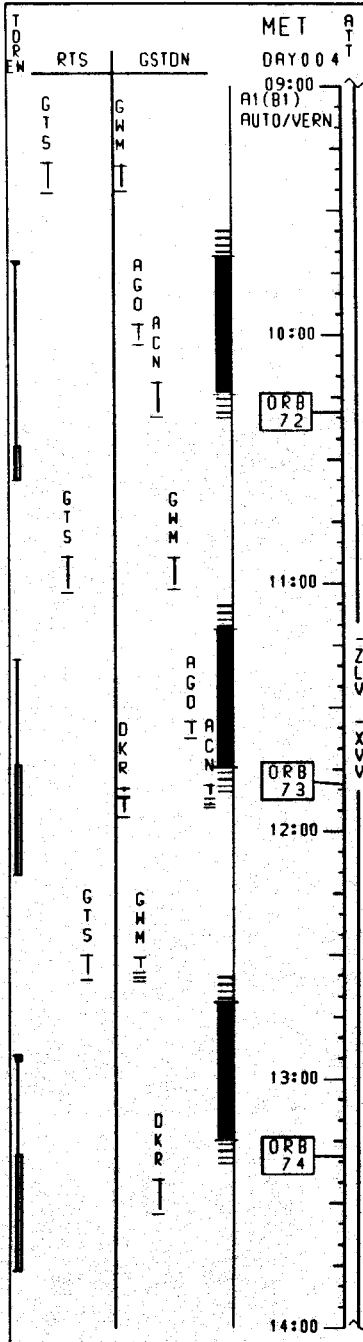
FDE STATUS REPORT (HAW)

◀ MNVR IMU ALIGN ATT
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at SS
 IMU ALIGN - S TRK (ORB OPS)
 MNVR (TRK) -ZLV, -XVV
 TG=2 BV=3 OM=0
 A/AUTO/VERN Init TRK

PRE SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

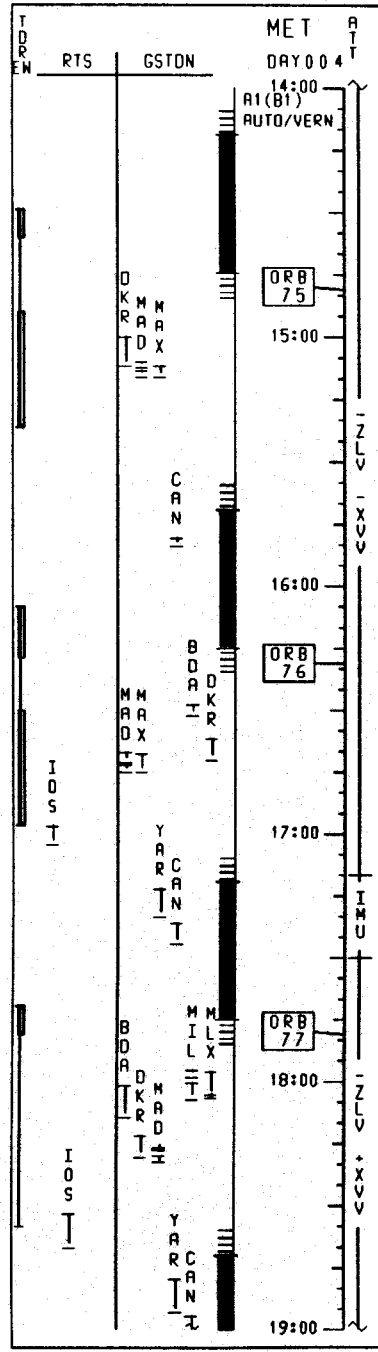
IMU ALIGN LOG
 RECD ID:
 -Y __, -Z __ ANG ERR __.
 1 2 3
 ANG:
 ΔX () () ()
 ΔY () () ()
 ΔZ () () ()
 EXECUTION TIME:
 __ / __ : __ : __

SLEEP



STS

SLEEP



STS

SLEEP

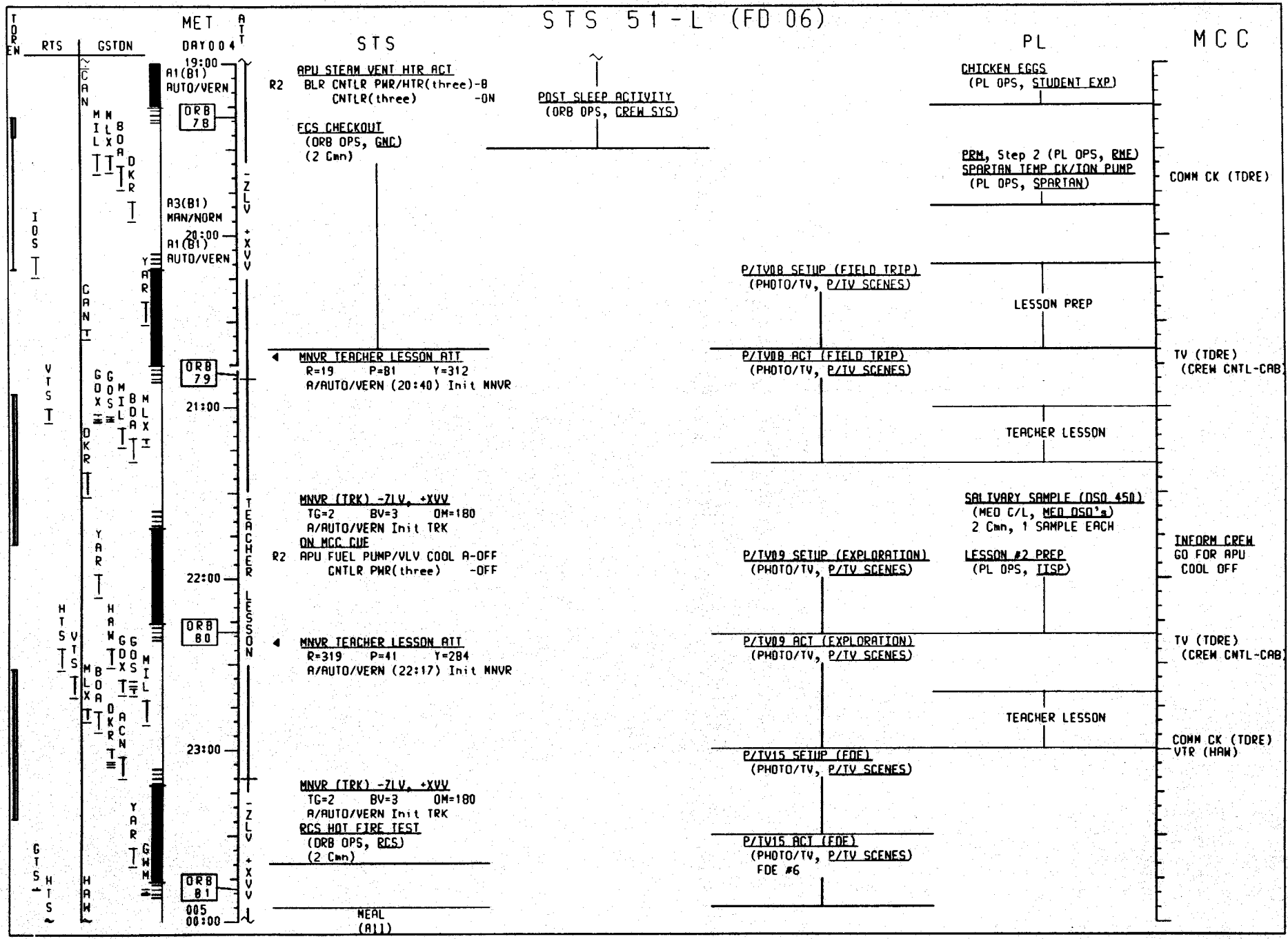
◀ MNVR IMU ALIGN ATT
STAR PAIR (A1)
A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, -XVV
TG=2 BV=3 OM=180
A/AUTO/VERN Init TRK

POST SLEEP ACTIVITY
(ORB OPS, CREW SYS)

EZ CAP ACTIVITIES FOR TODAY:
EXERCISE (1 Hr/ALL)
MEAL PREP (Cue Card) (30 Min)
OTOLITH TILT-TRANSLATION (DSD 459)
(MED, MED DSD'S) (20 Min/2 Cmn, SIMD)
(45 Min/2 Cmn, SEPARATE)

SALIVARY SAMPLE (DSD 450)
(MED C/L, MED DSD's)
2 Cmn, 1 SAMPLE EACH

IMU ALIGN LOG
REQD ID:
-Y ____, -Z ____, ANG ERR ____,
1 2 3
ANG:
ΔX () . () . () .
ΔY () . () . () .
ΔZ () . () . () .
EXECUTION TIME:
_ / _ : _ : _



MET DAY 004

19:00
A1(B1)
AUTO/VERN
ORB 78

20:00
A1(B1)
AUTO/VERN
ORB 79

21:00
ORB 79

22:00
ORB 80

23:00
ORB 81

00:00
ORB 81

STS

APU STEAM VENT HTR ACT
R2 BLR CNTLR PWR/HTR(three)-8
CNTLR(three) -ON

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

POST SLEEP ACTIVITY
(ORB OPS, CREW SYS)

◀ MNVR TEACHER LESSON ATT
R=19 P=81 Y=312
A/AUTO/VERN (20:40) Init MNVR

MNVR (TRK) -7LV, +XVV
TG=2 BV=3 OM=180
A/AUTO/VERN Init TRK
ON MCC CUE
R2 APU FUEL PUMP/VLV COOL A-OFF
CNTLR PWR(three) -OFF

◀ MNVR TEACHER LESSON ATT
R=319 P=41 Y=284
A/AUTO/VERN (22:17) Init MNVR

MNVR (TRK) -7LV, +XVV
TG=2 BV=3 OM=180
A/AUTO/VERN Init TRK
BCS HOT FIRE TEST
(ORB OPS, RCS)
(2 Cmn)

MEAL
(ALL)

PL

CHICKEN EGGS
(PL OPS, STUDENT EXP)

PRM, Step 2 (PL OPS, RNE)
SPARTAN TEMP CK/TON PUMP
(PL OPS, SPARTAN)

P/TV08 SETUP (FIELD TRIP)
(PHOTO/TV, P/TV SCENES)

LESSON PREP

P/TV08 ACT (FIELD TRIP)
(PHOTO/TV, P/TV SCENES)

TEACHER LESSON

SALIVARY SAMPLE (DSO 450)
(MED C/L, MED DSO's)
2 Cmn, 1 SAMPLE EACH

P/TV09 SETUP (EXPLORATION)
(PHOTO/TV, P/TV SCENES)

LESSON #2 PREP
(PL OPS, ITSP)

P/TV09 ACT (EXPLORATION)
(PHOTO/TV, P/TV SCENES)

TEACHER LESSON

P/TV15 SETUP (FDE)
(PHOTO/TV, P/TV SCENES)

P/TV15 ACT (FDE)
(PHOTO/TV, P/TV SCENES)
FDE #6

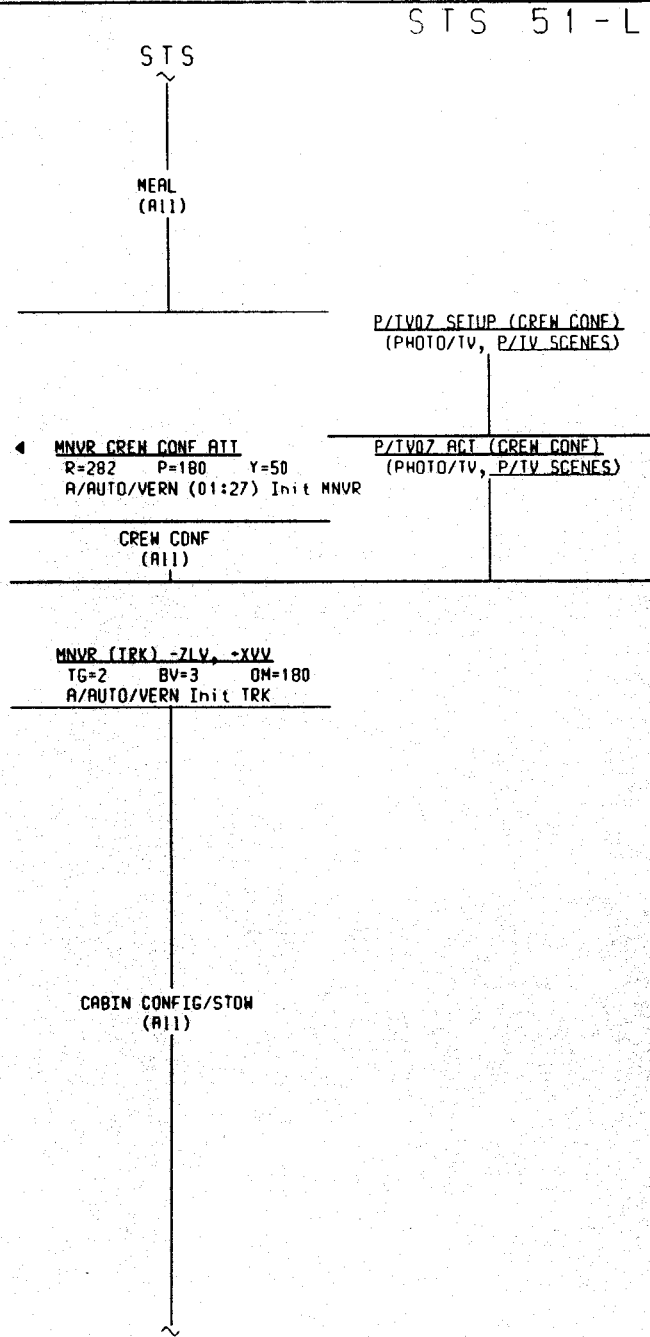
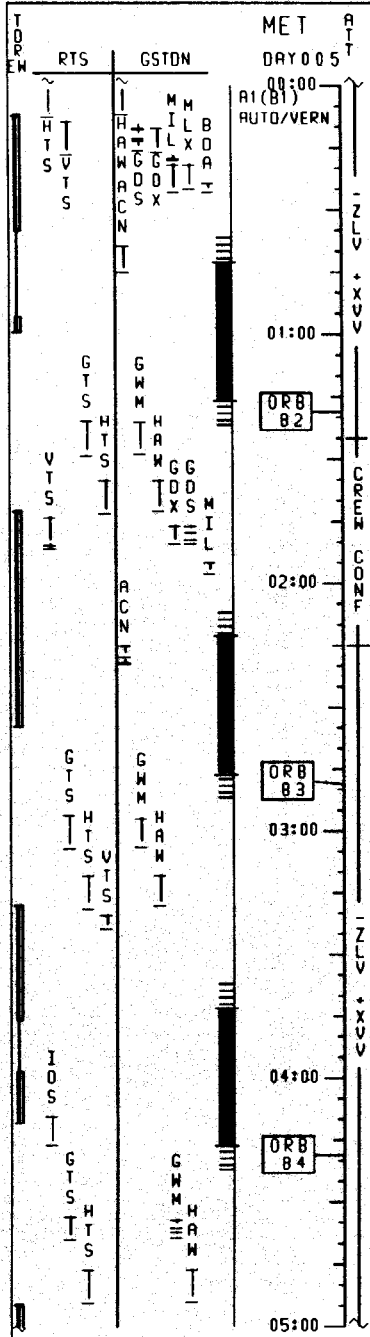
COMM CK (TDRE)

TV (TDRE)
(CREW CNTL-CAB)

INFORM CREW
GO FOR APU
COOL OFF

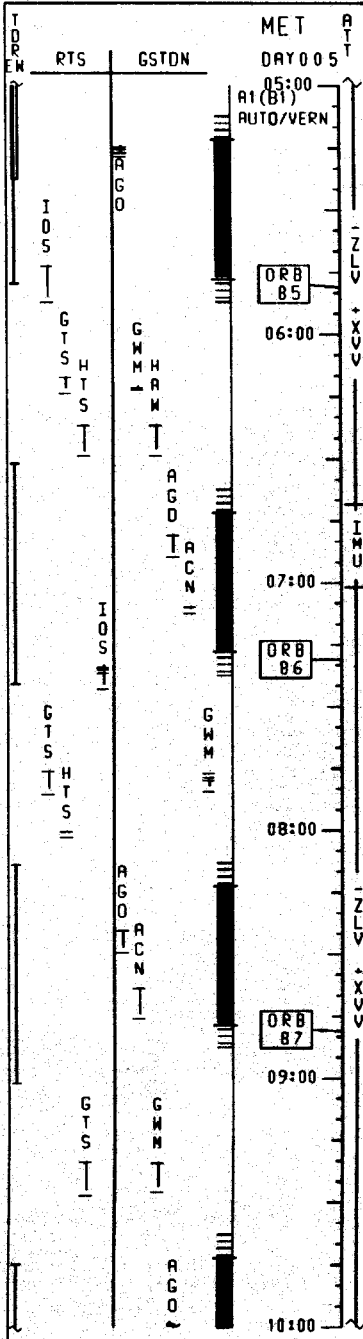
TV (TDRE)
(CREW CNTL-CAB)

COMM CK (TDRE)
VTR (HAW)



TV (TORE)
(GND CNTL-CAB)

SALIVARY SAMPLE (DSO 450)
(MED C/L, MED DSO's)
2 Cmn, 1 SAMPLE EACH



STS
CABIN CONFIG/STDN
(A11)

KU-80 ANT STOW
(ORB OPS, COMM/INST)

SPARTAN TEMP CK/TON PUMP
(PL OPS, SPARTAN)

GAS ENCDR STOW
(PL OPS, GAS)

CHICKEN EGGS
(PL OPS, STUDENT EXP)

◀ MNVR IMU ALIGN ATI
STAR PAIR (A1)
A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
MNVR (TRK) -ZLV, +XVV
TG-2 BV-3 OM-180
A/AUTO/VERN Init TRK

PRE SLEEP ACTIVITY
(ORB OPS, CREW SYS)

IMU ALIGN LOG
RECD ID:
-Y __, -Z __ ANG ERR __.
 1 2 3
ANG:
ΔX () . () . () .
ΔY () . () . () .
ΔZ () . () . () .
EXECUTION TIME:
_ / _ : _ : _

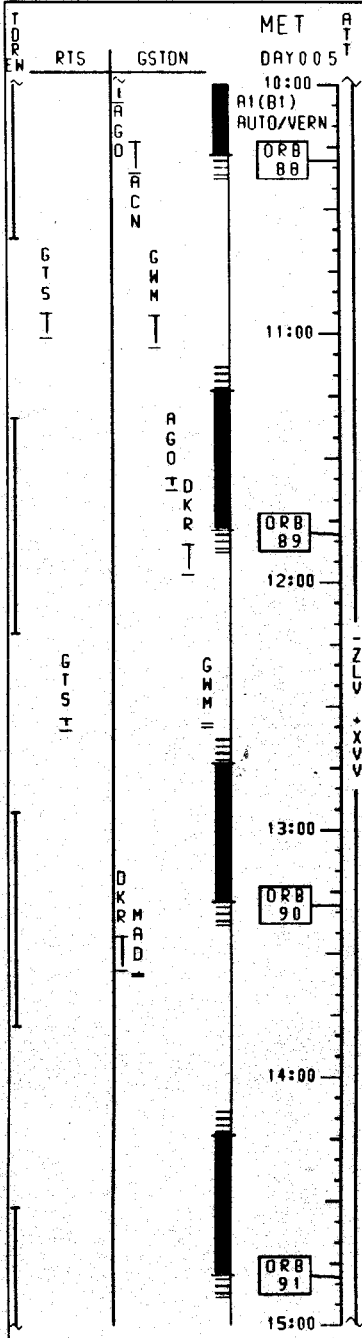
SALIVARY SAMPLE (DSQ 450)
(MED C/L, MED DSQ's)
2 Cmn, 1 SAMPLE EACH

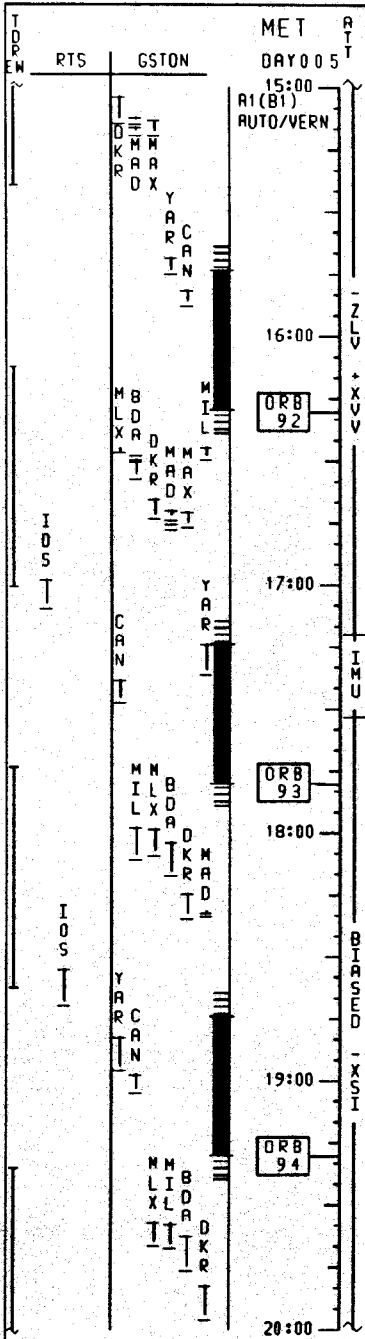
SLEEP

STS 51-L (FD 06)

PL

MCC





STS

SLEEP

EZ CAP ACTIVITIES BEFORE LEAVING CAP:
AIR SAMPLE
 Rcd MET on bottle
FLUID LOADING PREP
 Fill 4 drink containers with
 8 oz H2O each (per person)

- ◀ **MNVR IMU ALIGN ATT**
 STAR PAIR (A1)
 A/AUTO/VERN Init MNVR at SS
IMU ALIGN - S TRK (ORB OPS)
- ◀ **MNVR (TRK) BIASED -XST**
 TG=4 BV=5
 P=184 Y=0 OM =270
 A/AUTO/VERN Init TRK

POST SLEEP ACTIVITY
 (ORB OPS, CREW SYS)

Update: CRT TIMER SETUP PAD
 in NOMINAL DEORBIT PREP

IMU ALIGN LOG
 READ ID:
 -Y __, -Z __ ANG ERR __. __
 1 2 3
 ANG:
 ΔX () . __ () . __ () . __
 ΔY () . __ () . __ () . __
 ΔZ () . __ () . __ () . __
 EXECUTION TIME:
 __ / __ : __ : __

UPDATE
 CRT TIMER
 SETUP PAD

CHICKEN EGGS
 (PL OPS, STUDENT EXP)

SPARTAN HTR DEACT
 R1 PL AFT MN B - OFF

GO TO DEORBIT PREP AT 5/19:37 MET

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CONTINGENCY TIMELINES

9D TDRS DEPLOYMENT..... 4A-1
10D TDRS DEPLOYMENT..... 4B-1
18A TDRS DEPLOYMENT..... 4C-1
20A TDRS (EVA) DEPLOYMENT..... 4D-1

CONTINGENCY
TIMELINES

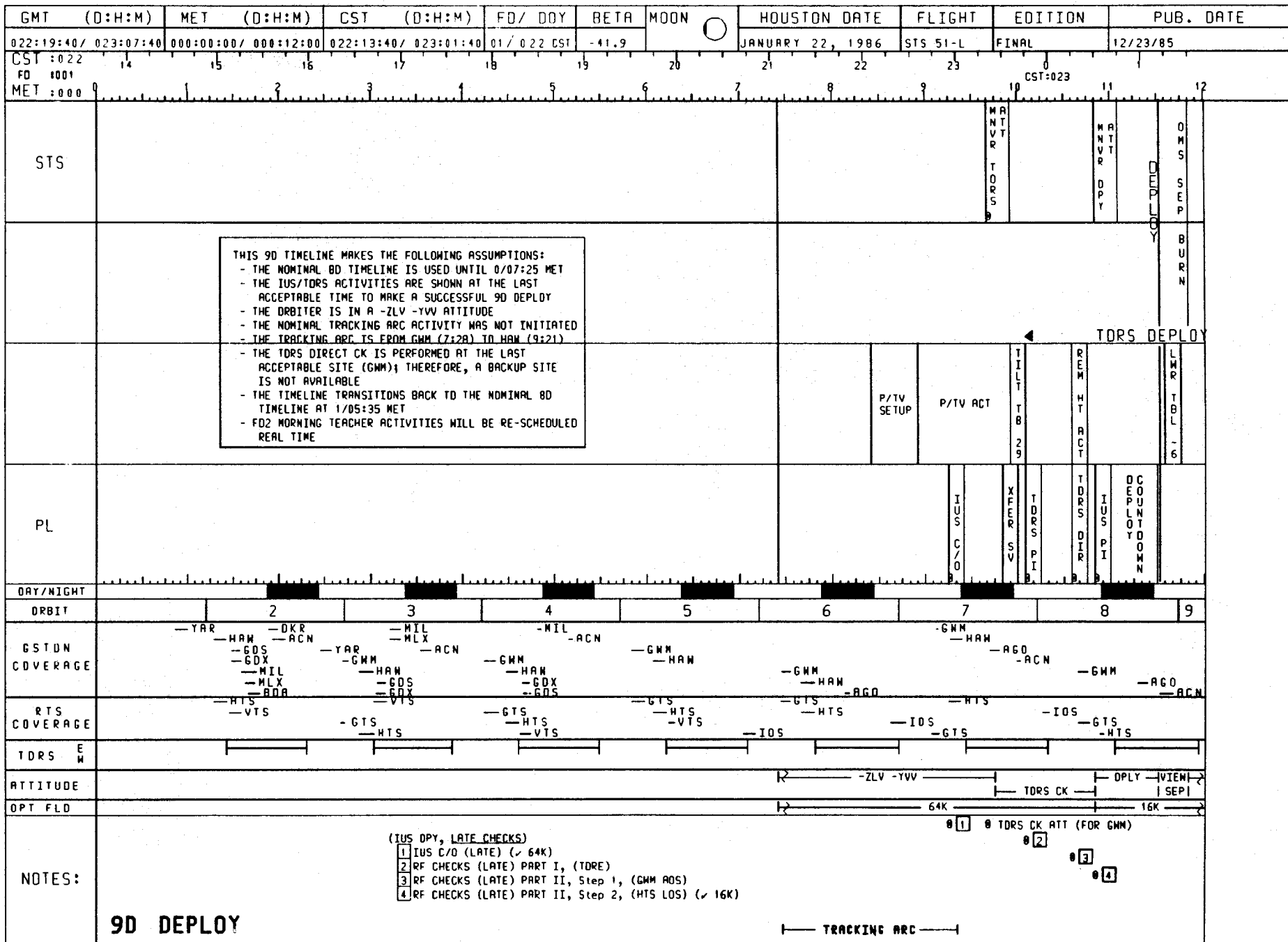
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9D TDRS DEPLOYMENT

The 9D Deployment Timeline is designed to accommodate delaying deployment of TDRS to the 9D opportunity. The nominal timeline is used until 0/07:25 MET.

All nominal deployment activities are included in this timeline. The tracking arc and the IUS C/O and TDRS late checks are performed at the last acceptable opportunities. Additional assumptions are shown on page 4A-2. The timeline is based on the nominal Cycle 2B trajectory.

9D TDRS



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
023:07:40 / 023:19:40	000:12:00 / 001:00:00	023:01:40 / 023:13:40	01 / 023 CST	-43.1	○	JANUARY 23, 1986	STS 51-L	FINAL	12/23/85	
CST :023 FD :001 MET :000										
STS	W I N D O W	S R M	I M U	Z L V	SLEEP					
	P R O		B M S		PRE SLEEP					POST SLEEP
			C L O S E D O U T							
PL			S P T E M P C K						D S O 4 5 0	
DAY/NIGHT										
ORBIT	9	10	11	12	13	14	15	16		
GSTDN COVERAGE	-GWM	-AGO -ACN -DKR	-GWM	-DKR -MAD	-CAN	-MLX -MIL -BDA -DKR -MAD -MAX	-YAR -CAN	-MIL -MLX -BDA -DKR	-CAN -MLX -MIL -BDA -DKR	-YAR
RTS COVERAGE	-GTS	-GTS	-AGO -DKR	-GTS			-YAR	-IOS	-YAR	-IOS
TDRS E M										
ATTITUDE	IMU	PRDT	-ZLV -XVV							
OPT FLD	16K	-ZLV, -XVV							DSO 450 SALIVARY CORTISOL LEVELS	
NOTES:	9D DEPLOY									

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE															
023:19:40 / 024:07:40		001:00:00 / 001:12:00		023:13:40 / 024:01:40		02 / 023	CST -44.2	○	JANUARY 23, 1986	STS 51-L	FINAL	12/23/85															
CST :023		14		15		16		17		18		19		20		21		22		23		0		1		12	
FD :002																						CST:024					
MET :001																											
STS		IMU MNVVR		ZLV MNVVR		AUTO MNVVR		ZLV MNVVR		AUTO MNVVR		ZLV MNVVR		MEAL													
		POST SLEEP		P/TV ACT		RMS SURVEY		RMS PMRDDM						RETURN TO THE NOMINAL (80) TIMELINE AT 1/05:35 MET													
		P/TV SETUP																									
PL		PH RR MM AA OO TT		S P T C K / I P		S P P R O C K		C H I C K E G G S		V T R S E T U P		V T R P L Y B C K		D S O 4 S I													
DAY/NIGHT																											
DRBIT		17		18		19		20		21		22		23		24											
GSTDN COVERAGE		-GDS -MIL -BDA -MLX -DKR -ACN		-YAR -HAW -GDS -GDX -MIL -MLX -BDA -ACN		-ACN -YAR -GMM -HAW -GDS -GDX -MIL -HTS		-MLX -ACN -GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS		-GMM -HAW -GDS -GDX -MIL -HTS	
RTS COVERAGE		-VTS -ACN		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS		-HTS -VTS	
TDRS E H		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----	
ATTITUDE		IMU		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----	
OPT FLO				-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----		-----	
NOTES:		○ MOUNT CDAS-AFT		● -ZLV, -XVW		● DSO 450 SALIVARY CORTISOL LEVELS		● -ZLV, -XVW																			
		● AFT STATION																									
		● -ZLV, -XVW																									
		● CHAMP		● CHAMP																							
9D DEPLOY																											

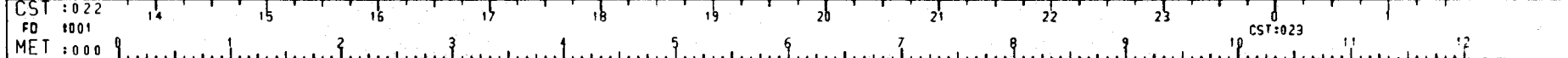
10D DEPLOYMENT

The 10D Deployment Timeline is designed to accommodate delaying deployment of TDRS to the 10D opportunity. The nominal timeline is used up to 0/07:25 MET. A 10D deployment will be considered only if a high probability of deploying exists or if an 18A cannot be accommodated due to orbiter or IUS/TDRS problems.

All nominal deployment activities are included in this timeline. The tracking arc and the IUS C/O and TDRS late checks are performed at the last acceptable opportunities. Additional assumptions are shown on page 4B-2. The timeline is based on the nominal Cycle 2B trajectory.

10D TDRS

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
022:19:40 / 023:07:40	000:00:00 / 000:12:00	022:13:40 / 023:01:40	01 / 022 CST	-41.9		JANUARY 22, 1986	STS 51-L	FINAL	12/23/85



STS									MANT VT R TDRS P
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THE 10D TIMELINE MAKES THE FOLLOWING ASSUMPTIONS:

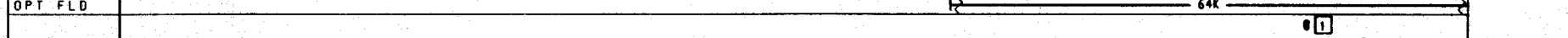
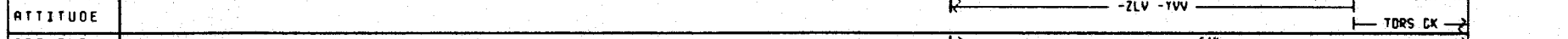
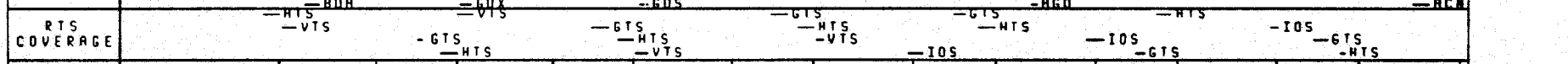
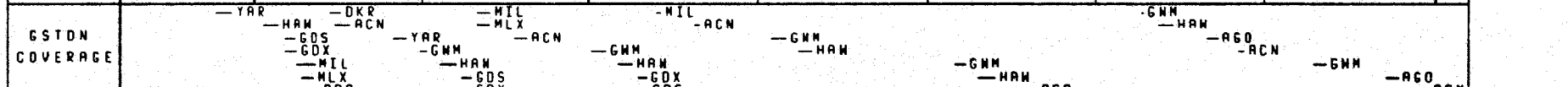
- THE NOMINAL 8D TIMELINE IS USED UNTIL 0/07:25 MET
- THE IUS/TDRS ACTIVITIES ARE SHOWN AT THE LAST ACCEPTABLE TIME TO MAKE A SUCCESSFUL 10D DEPLOY
- THE ORBITER IS IN A -ZLV -YVV ATTITUDE
- THE NOMINAL TRACKING ARC ACTIVITY WAS NOT INITIATED
- THE TRACKING ARC IS FROM GMM (7:28) TO HAW (9:21)
- THE TIMELINE TRANSITIONS BACK TO THE NOMINAL 8D TIMELINE AT 1/12:00 MET
- FD2 TEACHER ACTIVITIES WILL BE RE-SCHEDULED REAL TIME
- FD2 MORNING CHAMP OPPORTUNITIES ARE DELETED

								P/TV SETUP	P/TV ACT	TILT 1 8 2 9
--	--	--	--	--	--	--	--	---------------	-------------	--------------------------

PL										IUS C/D	TEACHER SVC	TDRS PI
----	--	--	--	--	--	--	--	--	--	------------	----------------	------------



DAY/NIGHT									
ORBIT	2	3	4	5	6	7	8	9	



NOTES:

(IUS DPLY, LATE CHECKS)

1 IUS C/D (LATE) (- 64K)

2 RF CHECKS (LATE) PART I, (TORE)

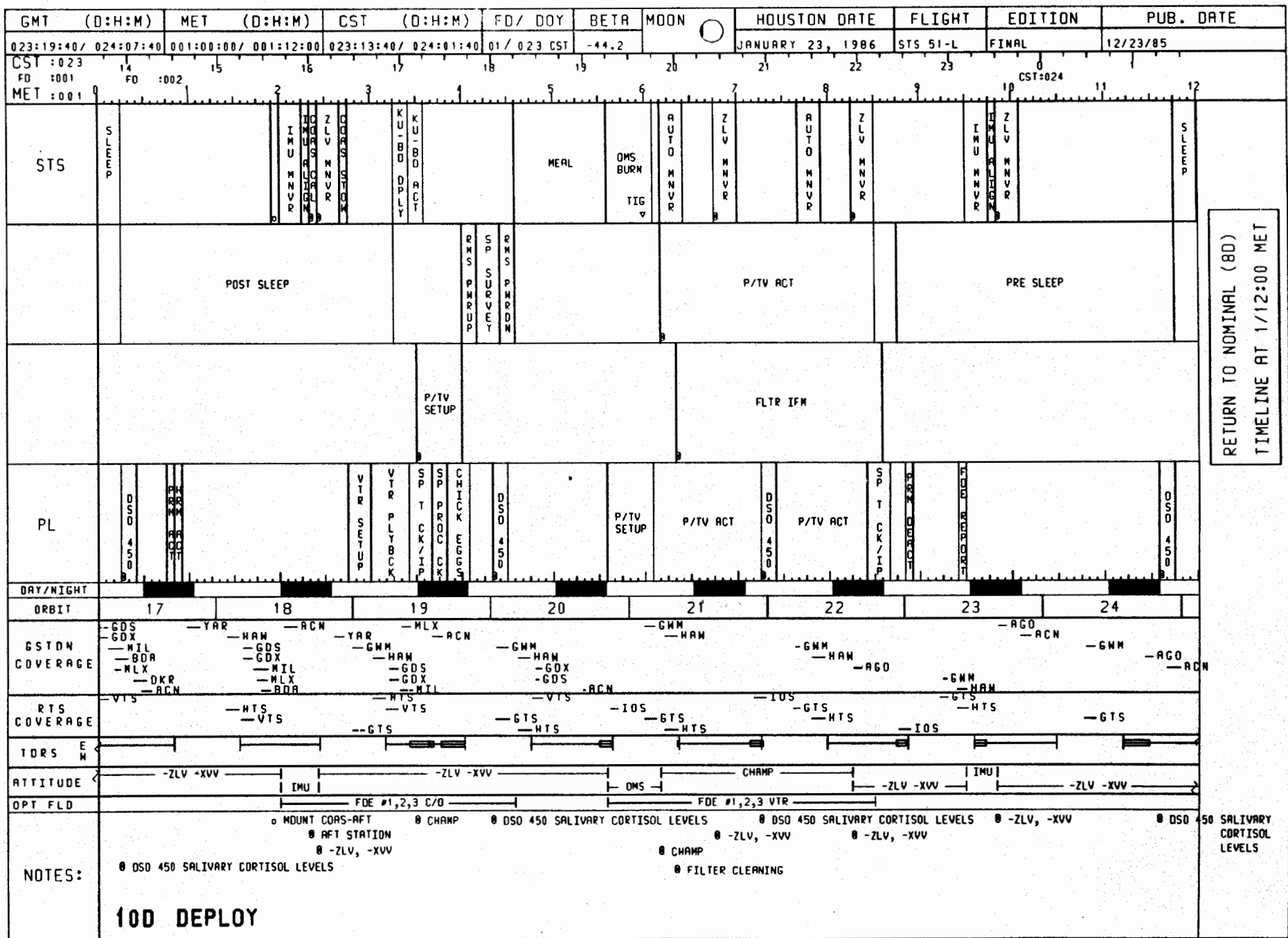
10D DEPLOY

TRACKING ARC

1 TDRS CK ATT (FOR GMM)

2

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE	
023:07:40 / 023:19:40	000:12:00 / 001:00:00	023:01:40 / 023:13:40	01 / 023 CST	-43.1	○	JANUARY 23, 1986	STS 51-L	FINAL	12/23/85	
CST :023										
FD :001										
MET :000										
STS	MD NV R TT OT	D M S S E P	W I N D O W P R O D M N V R	S R N	I M U M N V R	Z L V H N V R	SLEEP			
		B U R N	R M S P M R D N				PRE SLEEP			
		TDRS DEPLOY								
	R E M H T A C T	L M R T B L	C L O S E O U T							
PL	T D R S O I R	D E P L O Y	S P T E M P C Y							
DAY/NIGHT	[Day/Night Cycle]									
DRBT	9	10	11	12	13	14	15	16		
GSTON COVERAGE	-GMM	-AGD -ACN -DKR	-GMM	-DKR -MAD	-CAN	-MLX -MIL -BDA -DKR -MAD -MAX	-YAR -CAN	-CAN	-MLX -MIL -BDA -DKR	-YAR
RTS COVERAGE	-GTS	-GTS	-GTS	-GTS	-YAR	-YAR	-YAR	-YAR	-YAR	-YAR
TDRS E M	[TDRS E M Coverage]									
ATTITUDE	-ZLV -XVW									
OPT FLD	64K	16K								
NOTES:	<p>①</p> <p>②</p> <p>(IUS DPLY, LATE CHECKS)</p> <p>① RF CHECKS (LATE) PART II, Step 1 (GMM ADS)</p> <p>② RF CHECKS (LATE) PART II, Step 2 (GTS LDS) (✓ 16K)</p> <p>100 DEPLOY</p>									



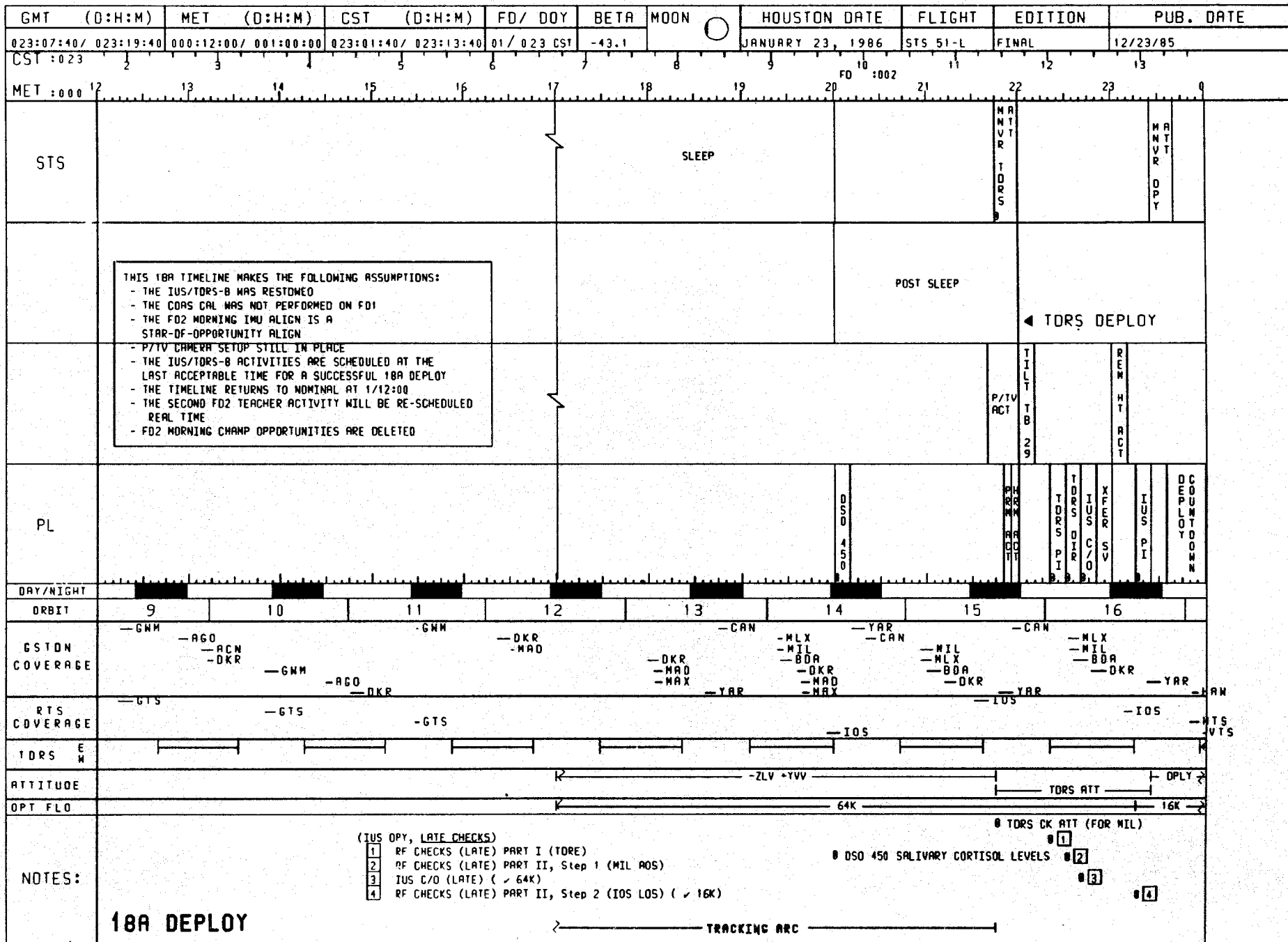
RETURN TO NOMINAL (80)
TIMELINE AT 1/12:00 MET

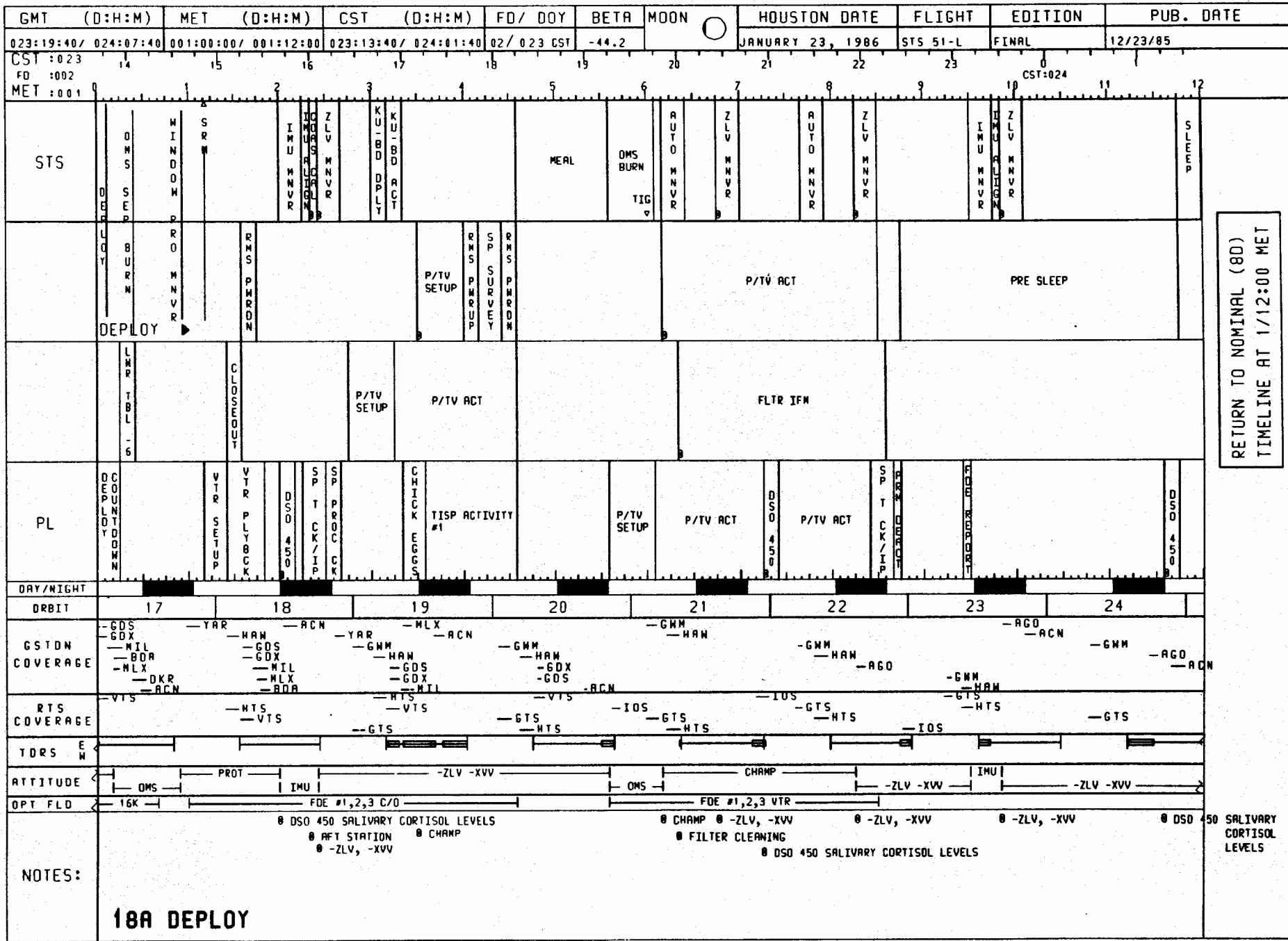
18A TDRS DEPLOYMENT

The 18A Deployment Timeline is designed to accommodate delaying deployment of TDRS to the 18A opportunity. The timeline begins during crew sleep and assumes the tilt table is stowed at 0°. All nominal deployment activities are included in this timeline. Additional assumptions are shown on page 4C-2.

The timeline is based on the nominal Cycle 2B trajectory.

18A TDRS





RETURN TO NOMINAL (80)
TIMELINE AT 1/12:00 MET

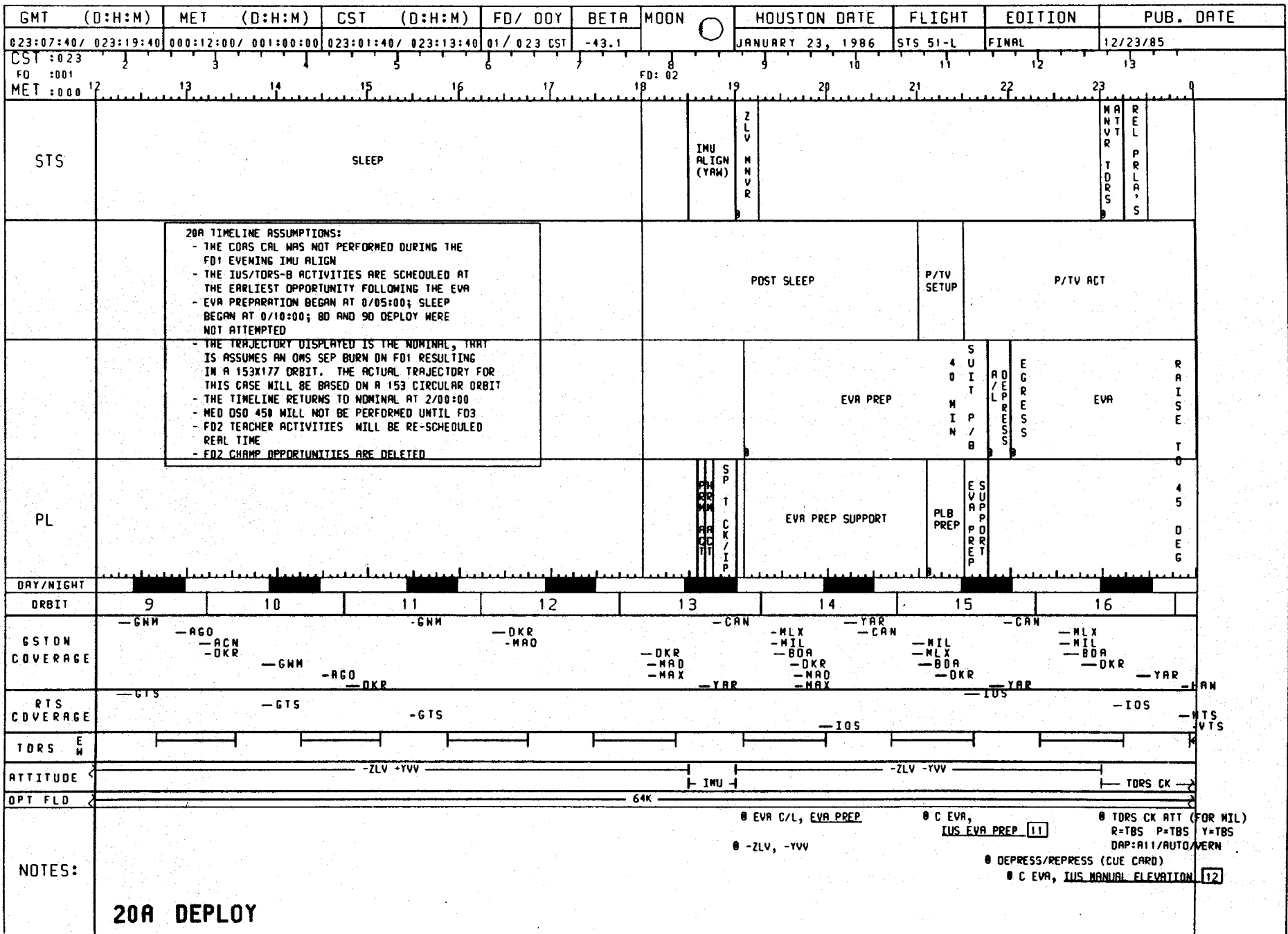
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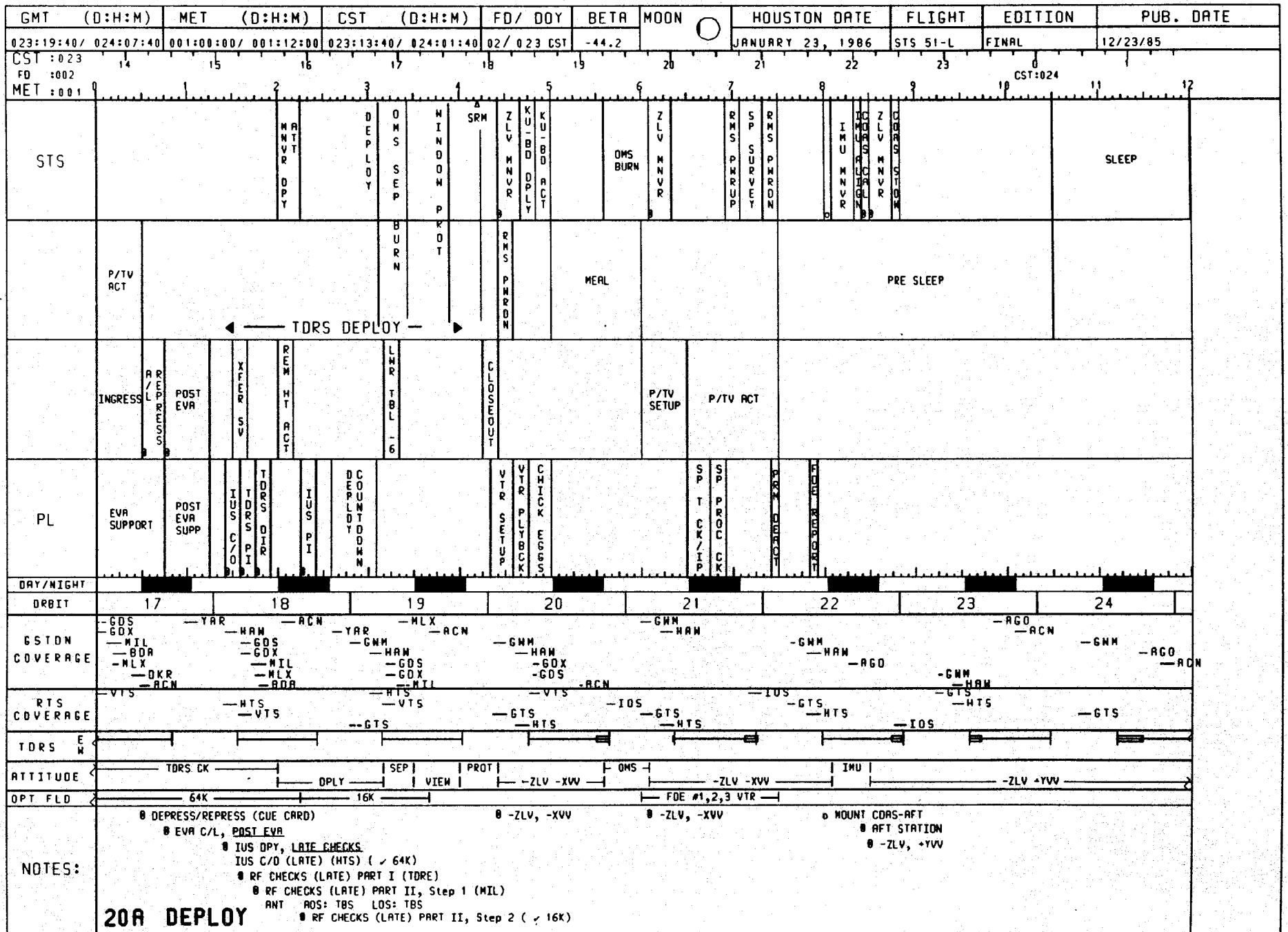
20A TDRS (EVA) DEPLOYMENT

The 20A Deployment Timeline is designed to accommodate delaying deployment of TDRS to the 20A opportunity following an EVA to manually raise the tilt table. The decision to perform an EVA must be made by 0/05:00 MET in order to meet EVA preparation and equipment checkout constraints. The 10.2 psi cabin EVA protocol is used. There will be no Flight Day 1 EVA. The Contingency EVA Operations STS 51-L Flight Supplement, Contingency EVA for Payload Failures Section, is the source document for the 20A deployment timeline. Additional assumptions are shown on page 4D-3.

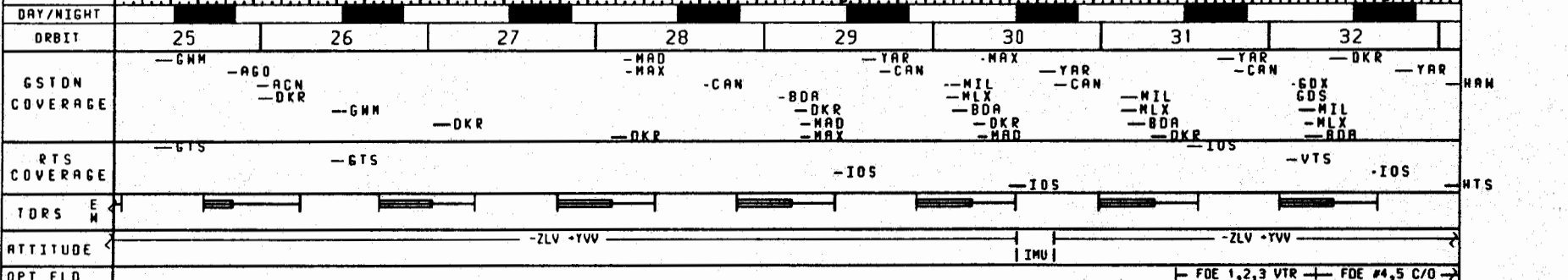
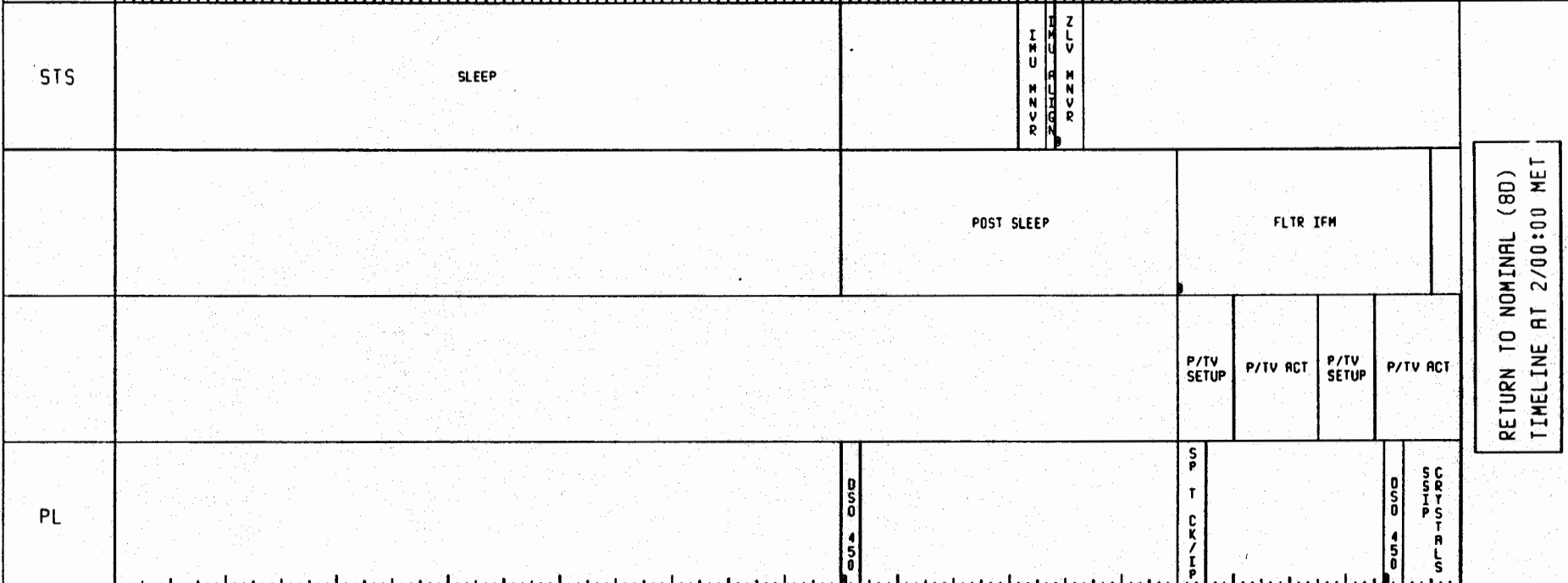
The timeline is based on the nominal Cycle 2B trajectory.

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE				
022:19:40 / 023:07:40	000:00:00 / 000:12:00	022:13:40 / 023:01:40	01 / 022 CST	-41.9	○	JANUARY 22, 1986	STS 51-L	FINAL	12/23/85				
CST : 022	14	15	16	17	18	19	20	21	22	23	0	1	12
FD 1001											CST:023		
MET : 000													
STS		PLBD MNR	PLBD MNR				IMU ALIGN (YAW)	SNACK			IMU ALIGN (YAW)	ZLV MNR	SLEEP
		POST INSERTION	UNSTOW CABIN								PRE SLEEP		
	LAUNCH OMS-1	OMS-2	P/TV ACT	CAMR ASSY			PREP CAB	10.2 CABIN DEPRESS			CYCLAS		
PL		PA CPT / CC I/ UO	UNSTOW CABIN	IUS C/O EARLY	ACT ENGAGE	SP HTR ACT	SP T EMP	XFER SV	LEH TERN		EMU CHECKOUT		
DAY/NIGHT													
ORBIT		2	3	4	5	6	7	8	9				
ESTDN COVERAGE		-YAR -HAM -GDS -GDX -MIL -MLX -ACN	-YAR -GMM -HAM -GDS -GDX -VTS	-MIL -MLX -ACN	-MIL -ACN	-GMM -HAM	-GMM -HAM -AGD -ACN	-GMM -HAM -AGD -ACN	-GMM -HAM -AGD -ACN				
RTS COVERAGE		-HTS -VTS	-GTS -HTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS	-GTS -HTS -VTS
TORS E													
ATTITUDE	ASCENT		ZLV -YVV		IMU		ZLV -YVV		IMU		ZLV -YVV		
OPT FLD		64K	16				64K						
NOTES:	<p>20A DEPLOY</p> <ul style="list-style-type: none"> • PRE-DPY CK (HTS) • IUS DIRECT (VTS) • TORS PI SETUP (MIL) • TORS PI CK (TORE) • TORS DIRECT (ACN) • APU HTR DEACT • APU HTR RECONFIG • C EVA, LEH PREBREATHE INITIATE • EVA C/L, EQUIP PREP • C EVA, PREP FOR 10.2 PSI CABIN • EVA C/L, EMU CHECKOUT AT 10.2 PSI • C EVA, CABIN DEPRESS TO 10.2 PSIA • C EVA, 10.2 PSI CABIN CONFIG • C EVA, LEH PREBREATHE TERMINATE • -ZLV, -YVV 												





20A DEPLOY



NOTES:

20A DEPLOY

■ -ZLV, -YVV ■ FILTER CLEANING ■ OSO 450 SALIVARY CORTISOL LEVELS
 ■ OSO 450 SALIVARY CORTISOL LEVELS

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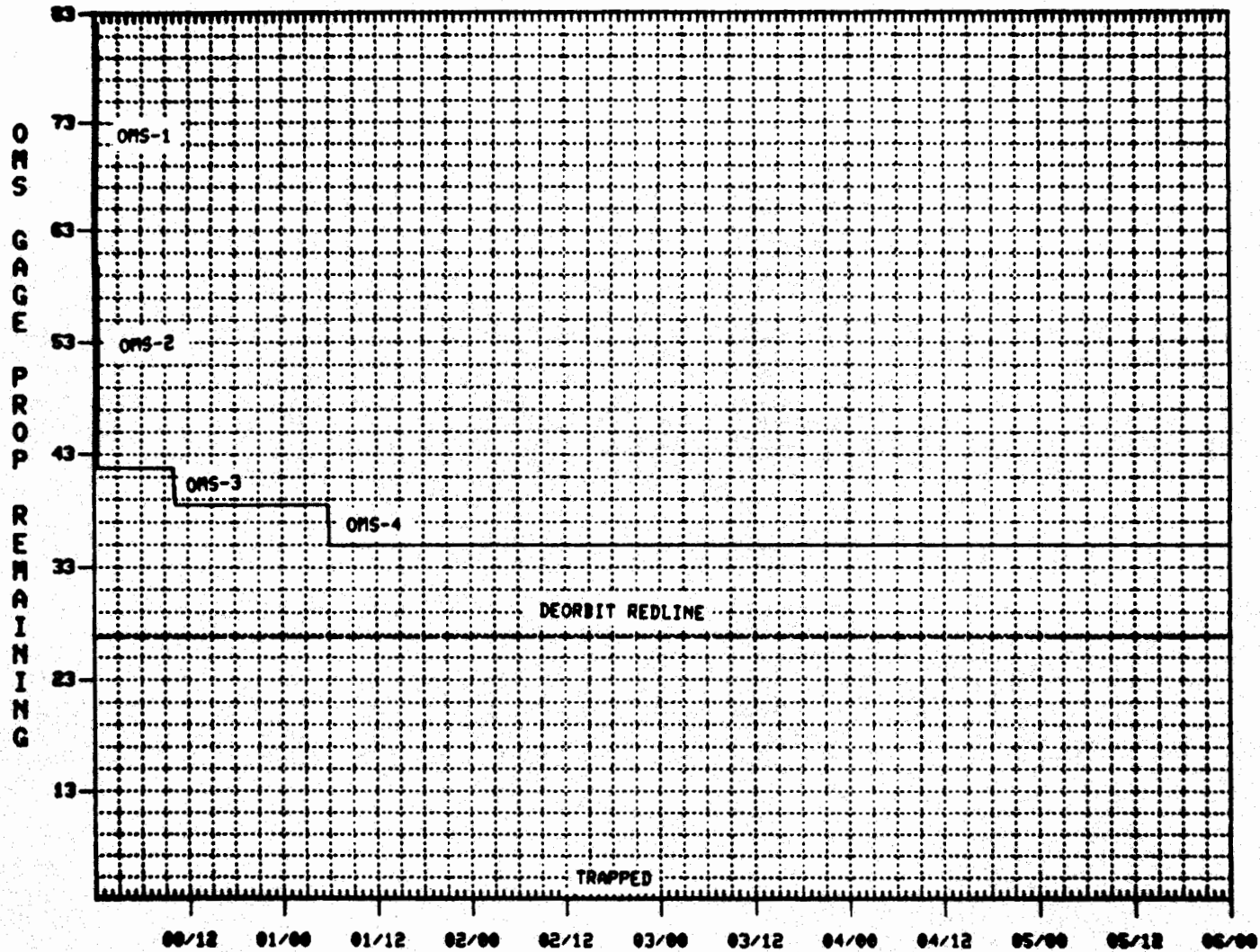
CONSUMABLES CURVES

**CONSUMABLES
CURVES**

CONSUMABLES
CURVES

22 August 1985
S.O.D.S. J-766 Add 6
Prepared by: Bill Hollister
Verified by: *Bill Hollister*

51-L OMS PROP REMAINING(% GAGE)



MISSION ELAPSED TIME IN DAYS/HOURS

22 August 1985
S.O.D.S. J-766 Add 6
Prepared by: Bill Hollister
Verified by: *P.O. [Signature]*

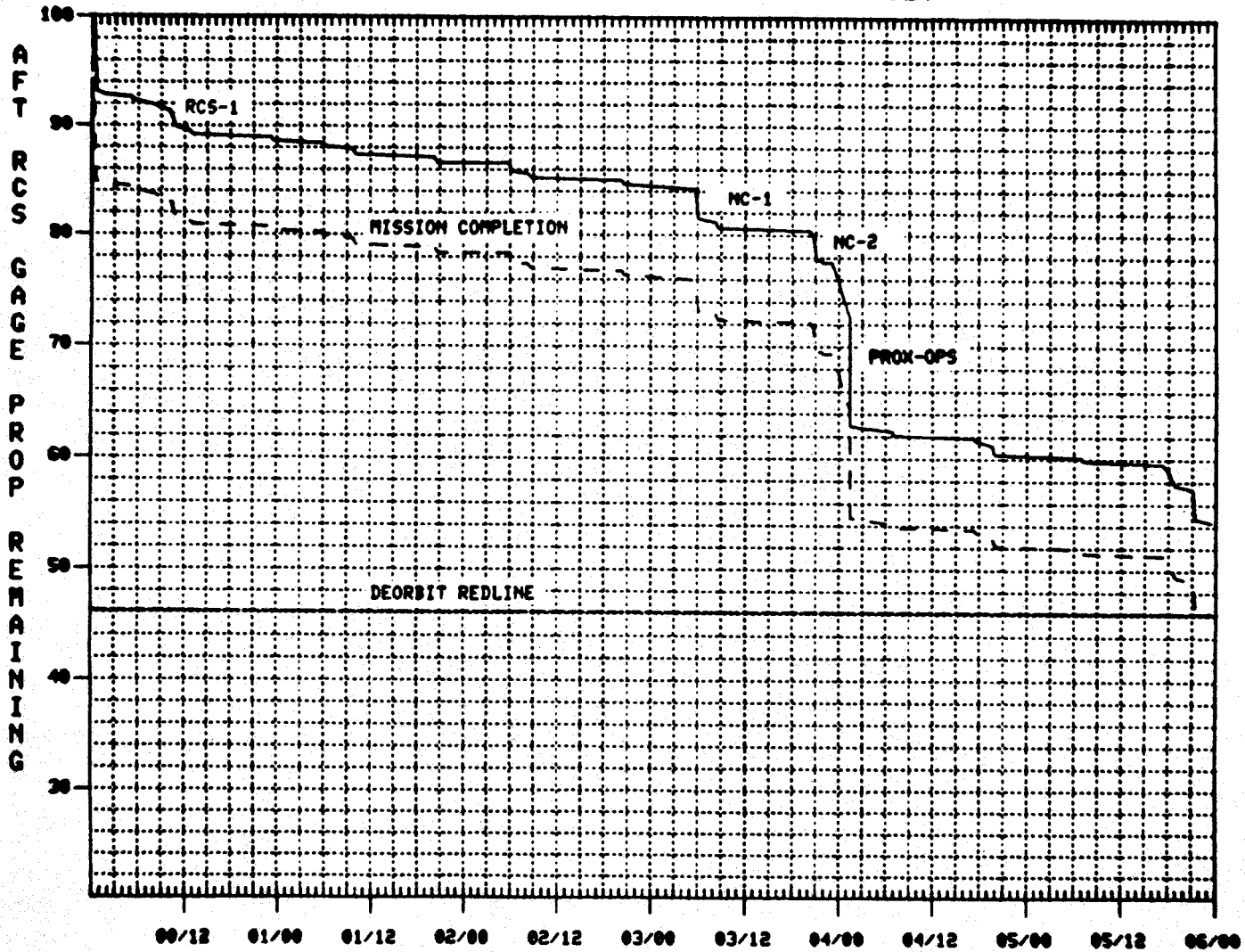
51-L FORWARD RCS PROP REMAINING(% GAGE)



MISSION ELAPSED TIME IN DAYS/HOURS

22 August 1985
S.O.D.S. J-766 Add 6
Prepared by: Bill Hollister
Verified by: *Bill Hollister*

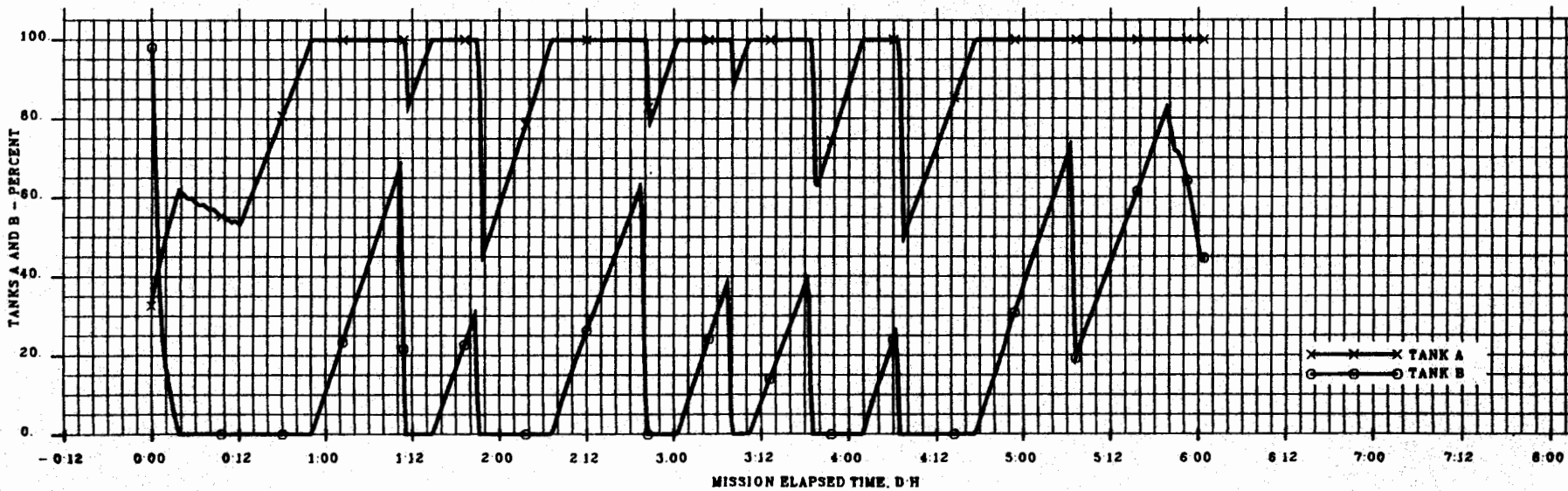
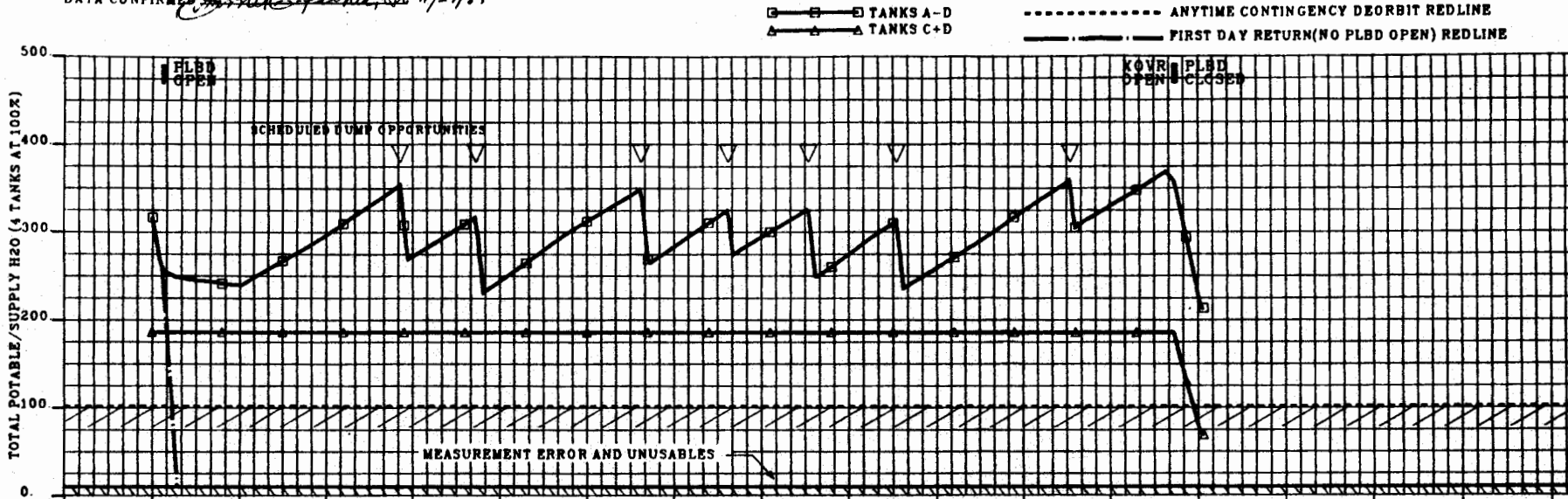
51-L AFT RCS PROP REMAINING(% GAGE)



MISSION ELAPSED TIME IN DAYS/HOURS

KHANDAKER M RAHMAN
JSC-20695 (CAP) 9/28/85
DATA CONFIRMED

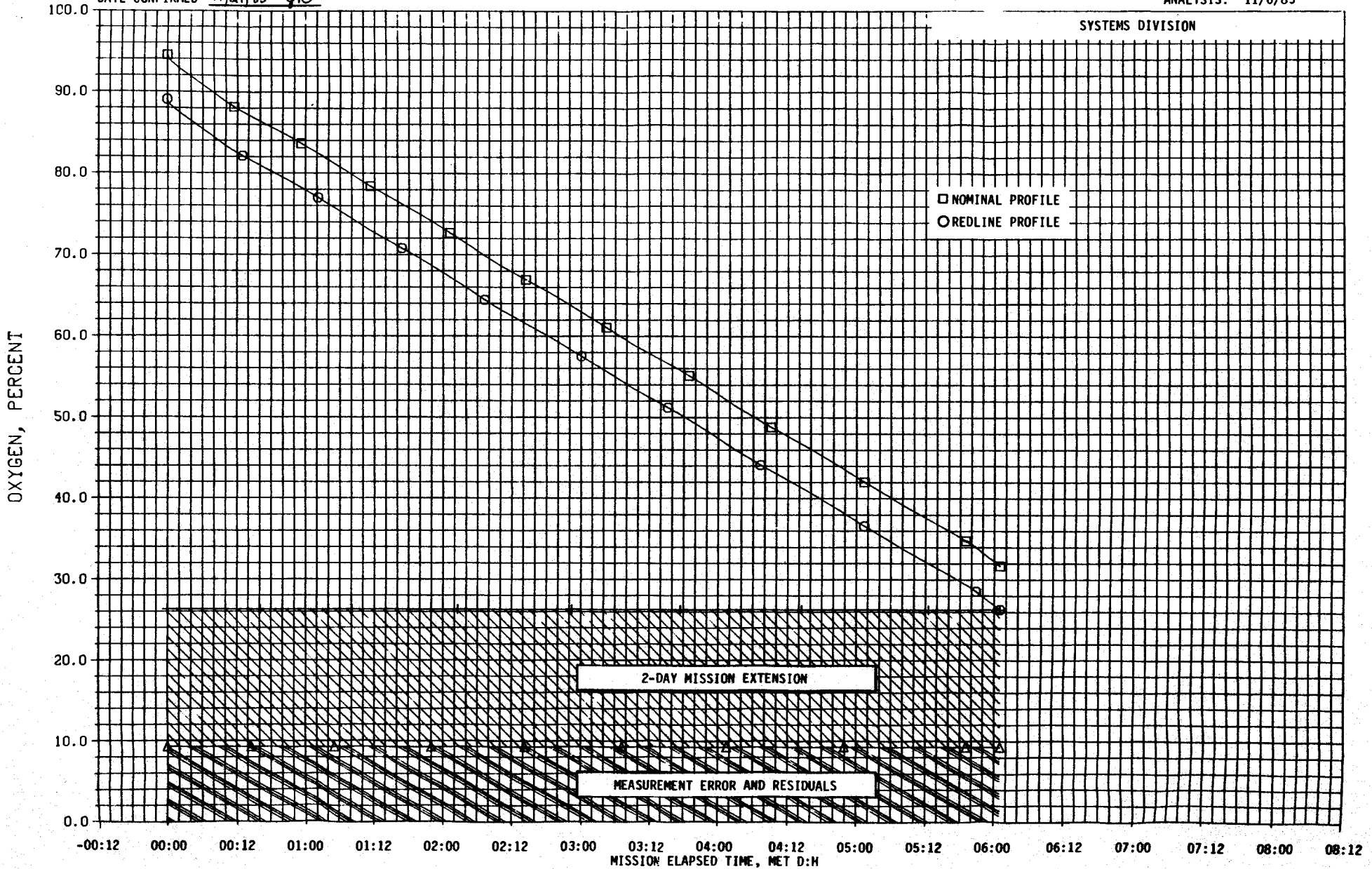
Sanjiv Kumar 11/2/85



L. PERRINE/DF6
JSC-20695
DATE CONFIRMED 11/21/85 *gm*

TRAJECTORY: OFF CYCLE 2
CAP: BASIC 9/18/85
ANALYSIS: 11/6/85

SYSTEMS DIVISION

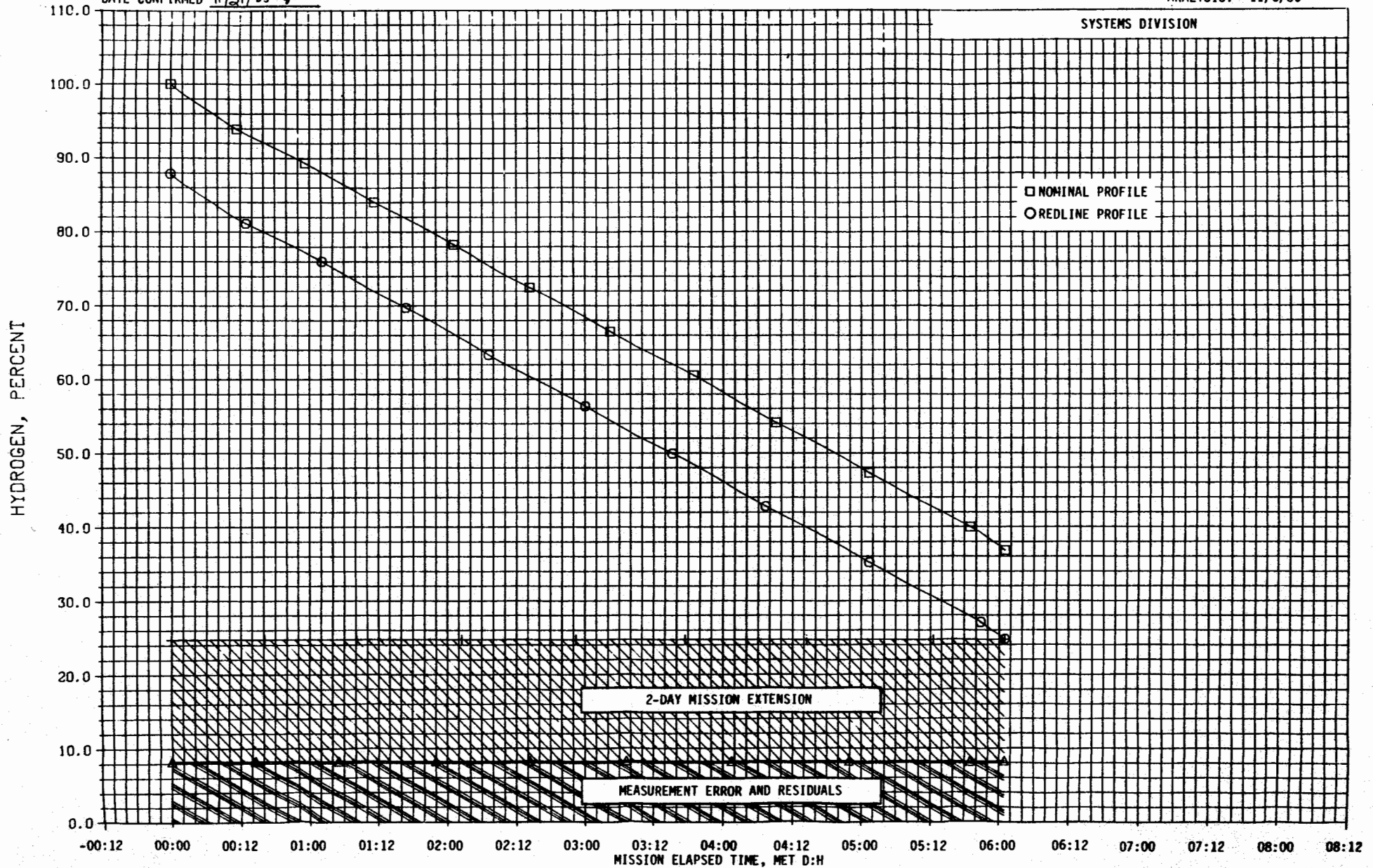


FLIGHT 51-L CRYOGENIC OXYGEN PROFILE.

L. PERRINE/DF6
JSC-20695
DATE CONFIRMED 11/21/85 gn

TRAJECTORY: OFF CYCLE 2
CAP: BASIC 9/18/85
ANALYSIS: 11/6/85

SYSTEMS DIVISION



FLIGHT 51-L CRYOGENIC HYDROGEN PROFILE.

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

STS 51-L DAP BOOK

DAP A CONFIGURATIONS

	A1*	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13
<u>TRANSLATION</u>													
PULSE ft/sec	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.10	0.10	0.05	0.25	0.05	0.10
<u>ROTATION</u>													
DSC RT NORM °/sec	0.200	0.400	0.200	0.200	0.200	0.200	0.100	0.500	0.200	0.200	0.200	0.100	0.200
VERN °/sec	0.200	0.400	0.200	0.008	0.200	0.200	0.008	0.200	0.200	0.200	0.200	0.008	0.300
PULSE NORM °/sec	0.10	0.10	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.10	0.10
VERN °/sec	0.010	0.010	0.010	0.010	0.050	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
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)	5.00	1.00	5.00	1.00	5.00	5.00	1.00	3.00	2.00	2.00	1.00	1.00	5.00
VERN (deg)	1.000	1.000	1.000	0.070	1.000	1.000	0.500	1.000	1.000	1.000	1.000	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	0.20	0.20	0.20
VERN °/sec	.020	.020	.020	.010	.020	.020	.010	.020	.020	.020	.010	.010	.010
<u>JET OPT</u>													
P	1	1	3	1	1	3	3	1	1	1	1	3	1
Y	1	1	3	3	1	3	3	1	1	1	1	3	1
<u>CNTL ACCEL</u>													
	0	0	0	0	0	0	2	0	0	0	0	3	0

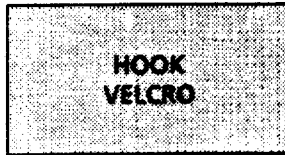
*I-LOADED OPS-2 DAP Configuration

DAP B CONFIGURATIONS

	B1*	B2	B3	B4	B5	B6	B7	B8
<u>TRANSLATION</u>								
PULSE ft/sec	0.02	0.02	0.02	0.02	0.02	0.05	0.01	
<u>ROTATION</u>								
DSC RT NORM °/sec	0.500	0.200	0.200	0.200	0.200	0.500	0.200	
VERN °/sec	0.200	0.200	0.200	0.008	0.016	0.200	0.200	
PULSE NORM °/sec	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	
COMP NORM °/sec	.00	.00	.00	.00	.00	.00	.00	
VERN °/sec	.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	
VERN (deg)	1.000	1.000	1.000	0.100	0.033	1.000	1.000	
RATE NORM °/sec	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
VERN °/sec	.020	.020	.020	.010	.020	.020	.020	
<u>JET OPT</u>								
P	1	3	1	3	3	1	1	
Y	1	3	1	3	3	1	1	
<u>CNTL ACCEL</u>								
	0	0	0	0	0	0	0	

*I-LOADED OPS-2 DAP Configuration

DAP BOOK



CAP/51-L/O/BAS

UNIV PTG		CAP/51-L/O/BAS
TGT ID = 1 Orbiting Vehicle = 2 Earth ctr = 3 Earth tgt Input LAT (± 90) LON (± 180 , + = East) ALT (-3444.0 to 20000.0 nm) = 4 Sun ctr = 5 Celestial tgt Input RA (0-359.99) DEC (± 90) = 11-110 Nav Stars		
BODY VECT = 1 +X* = 2 -X* = 3 -Z* = 4 PTC ($\sim 2^\circ$ below +X)* = 5 Optional Input P (0-359.99) Y (270-359.99, 0-90) OM (0-359.99)		
* -input OM \rightarrow OM (0-359.99)		
MON AXIS = 1 +X 2 -X		

G20 DAP CONFIG	
CNTL ACCEL = 0 Orbiter alone 2 SPARTAN Nominal Dpy 3 SPARTAN Single Joint Dpy	JET OPT = 1 Normal = 2 Nose only = 3 Tail only

TOP

DAP PURPOSE

- A1 - NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)
- A2 - PTC
- A3 - RCS HOT FIRE
- A4 - GG
- A5 - IMU ALIGN (ROTATING)
- A6 - LOSS OF VERN
(TAIL ONLY)
- A7 - SPARTAN RELEASE
(NOMINAL)
- A8 - PRE/POST DEPLOY
- A9 - RENDEZVOUS
- A10 - PROX OPS
- A11 - IUS DEPLOY
- A12 - SPARTAN RELEASE
(SINGLE JOINT DPY)
- A13 - IUS STAR SCAN

CAP/51-L/O/FIN

A1

TOP

DAP A1

PURPOSE:

NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)

A1

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

CAP/51-L/O/BAS

CAP/51-L/O/BAS

A2

TOP

TOP



A1

DAP A2

PURPOSE:

PTC

0.1 0

1. TRANSLATION PULSE

0.4 0 0

2 DSC RT NORM

0.4 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

DEADBAND

1.0 0

8 ATT NORM

1.0 0 0

9 VERN

0.2 0

10 RATE NORM

0.2 0

11 VERN

1

12 JET OPT P

1

Y

0

14 CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS



TOP

A3



TOP

A2

DAP A3

PURPOSE:

RCS HOT FIRE

0.1 0

1. TRANSLATION PULSE

0.2 0 0

2 DSC RT NORM

0.2 0 0

3 VERN

0.3 0 0

4 PULSE NORM

0.0 1 0

5 VERN

.0 0 0

6 COMP NORM

.0 0 0

7 VERN

DEADBAND

5.0 0

8 ATT NORM

1.0 0 0

9 VERN

0.2 0

10 RATE NORM

0.2 0

11 VERN

3

12 JET OPT P

3

Y

0

14 CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS



TOP

A4

TOP



A3



DAP A4

A4

PURPOSE:

GG

0.1 0

1. TRANSLATION PULSE

0.2 0 0

2. ROTATION DSC RT NORM

0.0 0 0

3. VERN

0.1 0 0

4. PULSE NORM

0.0 1 0

5. VERN

.0 0 0

6. COMP NORM

.0 0 0

7. VERN

DEADBAND

1.0 0

8. ATT NORM

0.0 7 0

9. VERN

0.2 0

10. RATE NORM

.0 1 0

11. VERN

1

12. JET OPT P

3

13. Y

0

14. CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS



TOP

A5



A4

TOP

DAP A5

A5

PURPOSE:

IMU ALIGN (ROTATING)

0.1 0

1. TRANSLATION PULSE

0.2 0 0

2. ROTATION DSC RT NORM

0.2 0 0

3. VERN

0.1 0 0

4. PULSE NORM

0.0 5 0

5. VERN

.0 0 0

6. COMP NORM

.0 0 0

7. VERN

DEADBAND

5.0 0

8. ATT NORM

1.0 0 0

9. VERN

0.2 0

10. RATE NORM

.0 2 0

11. VERN

1

12. JET OPT P

1

13. Y

0

14. CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS



TOP

A6

TOP

A5

DAP A6

PURPOSE:

LOSS OF VERN
(TAIL ONLY)

0.1 0

1. TRANSLATION
PULSE

0.2 0 0

2 ROTATION
DSC RT NORM

0.2 0 0

3 VERN

0.1 0 0

4 PULSE NORM

0.0 1 0

5 VERN

.0 0 0

6 COMP NORM

.0 0 0

7 VERN

DEADBAND

5.0 0

8 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

CAP/51-L/O/BAS

CAP/51-L/O/BAS

A7

TOP

TOP

A6

DAP A7

PURPOSE:

SPARTAN RELEASE
(NOMINAL)

0.0 5

1. TRANSLATION
PULSE

0.1 0 0

2 ROTATION
DSC RT NORM

0.0 0 0

3 VERN

0.1 0 0

4 PULSE NORM

0.0 1 0

5 VERN

.0 0 0

6 COMP NORM

.0 0 0

7 VERN

DEADBAND

1.0 0

8 ATT NORM

.5 0 0

9 VERN

0.2 0

10 RATE NORM

.0 1 0

11 VERN

3

12 JET OPT P

3

13 Y

2

14 CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS

A8

TOP

TOP

A7

DAP A8

PURPOSE:
PRE/POST DEPLOY

A8

0.1 0	1.	TRANSLATION PULSE
0.5 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
3.0 0	8	DEADBAND ATT NORM
1.0 0 0	9	VERN
0.2 0	10	RATE NORM
.0 2 0	11	VERN
1	12	JET OPT P
1	13	Y
0	14	CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS

A9

TOP

TOP

A8

DAP A9

PURPOSE:
RENDEZVOUS

A9

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

CAP/51-L/O/BAS

CAP/51-L/O/BAS

A10

TOP

TOP

A9

DAPA10

PURPOSE:
PROX OPS

0.0 5

1. TRANSLATION
PULSE

0.2 0 0
0.2 0 0
0.1 0 0
0.0 1 0
0.0 0 0
0.0 0 0

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

2.0 0
1.0 0 0

DEADBAND
8 ATT NORM
9 VERN

0.2 0
0.2 0

10 RATE NORM
11 VERN

1
1

12 JET OPT P
13 Y

0

14 CNTL ACCEL

CAP/51-L/O/BAS

CAP/51-L/O/BAS

A11

TOP

TOP

A10

DAPA11

PURPOSE:
IUS DEPLOY

0.2 5

1. TRANSLATION
PULSE

0.2 0 0
0.2 0 0
0.0 5
0.0 1 0
0.0 0 0
0.0 0 0

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

1.0 0
1.0 0 0

DEADBAND
8 ATT NORM
9 VERN

0.2 0
0.1 0

10 RATE NORM
11 VERN

1
1

12 JET OPT P
13 Y

0

14 CNTL ACCEL

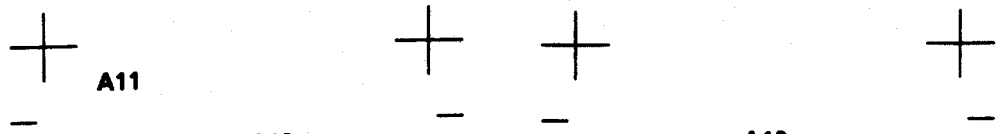
CAP/51-L/O/BAS

CAP/51-L/O/BAS

A12

TOP

TOP



A11

DAP A12

Purpose:

SPARTAN RELEASE
(SINGLE JOINT DPY)

0.0 5

1. TRANSLATION
PULSE

0.1 0 0

2 DSC RT NORM

0.0 0 8

3 VERN

0.0 1 0

4 PULSE NORM

0.0 1 0

5 VERN

.0 0 0

6 COMP NORM

.0 0 0

7 VERN

DEADBAND

1.0 0

8 ATT NORM

0.5 0 0

9 VERN

0.2 0

10 RATE NORM

0.0 1 0

11 VERN

3

12 JET OPT P

3

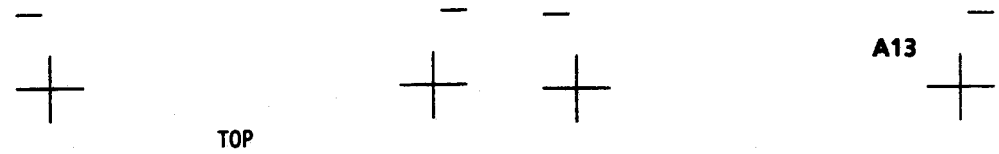
13 Y

3

14 CNTL ACCEL

CAP/51-L/O/BAS

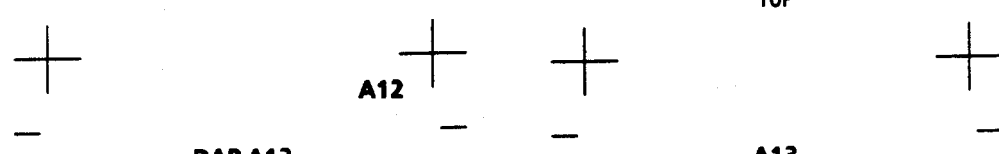
CAP/51-L/O/FIN



TOP

A13

TOP



A12

DAP A13

PURPOSE:

IUS STAR SCAN

0.1 0

1. TRANSLATION
PULSE

0.2 0 0

2 DSC RT NORM

0.3 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

DEADBAND

5.0 0

8 ATT NORM

1.0 0 0

9 VERN

0.2 0

10 RATE NORM

0.0 1 0

11 VERN

1

12 JET OPT P

1

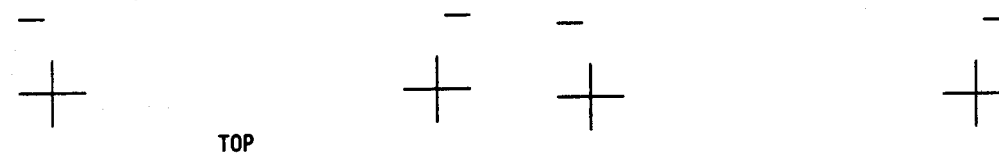
13 Y

0

14 CNTL ACCEL

CAP/51-L/O/FIN

CAP/51-L/O/FIN



TOP

TOP

A13

DAP PURPOSE

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

CAP/51-L/O/FIN

CAP/51-L/O/BAS

B1

TOP

TOP

DAP B1

B1

PURPOSE:

NOMINAL
PRCS IMU ALIGN
OMS & RCS BURNS

TRANSLATION
PULSE 15 0.0 2

ROTATION

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

DEADBAND

ATT	NORM	22	3.0 0
	VERN	23	1.0 0 0

RATE	NORM	24	0.2 0
	VERN	25	.0 2 0

JET OPT	P	26	1
	Y	27	1

CNTL ACCEL 28 0

CAP/51-L/O/BAS

CAP/51-L/O/BAS

B2

TOP



B1



TOP



DAP B2

PURPOSE:

LOSS OF VERN
(TAIL ONLY)

TRANSLATION				
PULSE	15	0.0	2	
ROTATION				
DSC RT	NORM 16	0.2	0	0
	VERN 17	0.2	0	0
PULSE	NORM 18	0.0	4	
	VERN 19	0.0	0	2
COMP	NORM 20	.0	0	0
	VERN 21	.0	0	0

B2

DEADBAND				
ATT	NORM 22	3.0	0	0
	VERN 23	1.0	0	0
RATE				
	NORM 24	0.2	0	
	VERN 25	.0	2	0
JET OPT				
	P 26		3	
	Y 27		3	
CNTL ACCEL 28 0				

CAP/51-L/O/BAS

CAP/51-L/O/BAS



TOP



B3



B2



TOP



DAP B3

PURPOSE:

LOSS OF VERN
(NOSE & TAIL)
GG MNVR

TRANSLATION				
PULSE	15	0.0	2	
ROTATION				
DSC RT	NORM 16	0.2	0	0
	VERN 17	0.2	0	0
PULSE	NORM 18	0.0	4	
	VERN 19	0.0	0	2
COMP	NORM 20	.0	0	0
	VERN 21	.0	0	0

B3

DEADBAND				
ATT	NORM 22	3.0	0	0
	VERN 23	1.0	0	0
RATE				
	NORM 24	0.2	0	
	VERN 25	.0	2	0
JET OPT				
	P 26		1	
	Y 27		1	
CNTL ACCEL 28 0				

CAP/51-L/O/BAS

CAP/51-L/O/BAS

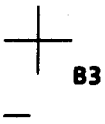


TOP



B4





B3

DAP B4

PURPOSE:

SSUS DEPLOY

CAP/51-L/O/BAS



TOP



DAP B5

PURPOSE:

COAS CAL

CAP/51-L/O/BAS



TOP



TOP

B4

TRANSLATION
PULSE

.15 0.0 2

ROTATION

DSC RT	NORM	16	0.2	0	0
	VERN	17	0.0	0	8
PULSE	NORM	18	0.0	0	4
	VERN	19	0.0	0	2
COMP	NORM	20	.0	0	0
	VERN	21	.0	0	0

DEADBAND

ATT	NORM	22	0.3	0
	VERN	23	0.1	0
RATE	NORM	24	0.2	0
	VERN	25	.0	1

JET OPT	P	26		3
	Y	27		3

CNTL ACCEL 28 0

CAP/51-L/O/BAS



B4



B5

TOP



B5

TRANSLATION
PULSE

.15 0.0 2

ROTATION

DSC RT	NORM	16	0.2	0	0
	VERN	17	0.0	1	6
PULSE	NORM	18	0.0	0	4
	VERN	19	0.0	0	2
COMP	NORM	20	.0	0	0
	VERN	21	.0	0	0

DEADBAND

ATT	NORM	22	3.0	0
	VERN	23	0.0	3
RATE	NORM	24	0.2	0
	VERN	25	.0	2

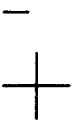
JET OPT	, P	26		3
	Y	27		3

CNTL ACCEL 28 0

CAP/51-L/O/BAS



B6



TOP

B5

DAP B6

PURPOSE:
RENDEZVOUS

B6

TRANSLATION
PULSE 15 0.0 5

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

DEADBAND
ATT NORM 22 2.0 0
VERN 23 1.0 0 0

RATE NORM 24 0.2 0
VERN 25 .0 2 0

JET OPT P 26 1
Y 27 1

CNTL ACCEL 28 0

CAP/51-L/0/BAS

CAP/51-L/0/BAS

B7

TOP

TOP

B6

DAP B7

PURPOSE:
PROX OPS

B7

TRANSLATION
PULSE 15 0.0 1

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

DEADBAND
ATT NORM 22 2.0 0
VERN 23 1.0 0 0

RATE NORM 24 0.2 0
VERN 25 .0 2 0

JET OPT P 26 1
Y 27 1

CNTL ACCEL 28 0

CAP/51-L/0/BAS

CAP/51-L/0/BAS

B8

TOP

TOP



B7



DAP 88

B8

PURPOSE: (Blank)

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

CAP/51-L/O/BAS

CAP/51-L/O/BAS



TOP



B8



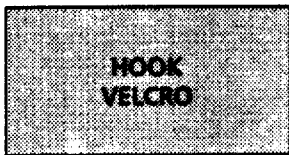
CAP/51-L/O/BAS



TOP



TOP
BACK COVER 'DAP BOOK'



CAP/51-L/O/BAS



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STS 51-L ATTITUDE TIMELINE

Attitude Timeline

MET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 0/00:08:30	MNVR R+ 25.00 P+ 38.00 Y+ 79.00	* AUTO *	DSC 0.500 DB AT 3.50 DB RT 0.30	SUN T 53 P 4		MECO
2 0/00:09:30 09:45	MNVR R+345.00 P+ 79.00 Y+ 80.00	* AUTO *	DSC 0.500 DB AT 3.50 DB RT 0.30	SUN T 133 P 245	TIG=:10:24	OMS-1 ATT
3 0/00:20:00 24:27	MNVR R+285.00 P+164.00 Y+315.00	* AUTO *	DSC 0.500 DB AT 3.50 DB RT 0.30	SUN T 76 P 316	TIG=:43:52	OMS-2 ATT
4 0/01:10:00 20:43 DAP A/A/V	TRK TGT=2 BV=3(90.00, .00) OM= 90.00	A1 AUTO NORM	DSC .200 DB AT 5.00 DB RT .20	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+270	-ZLV NOSE NTH
5 0/04:53:00	LVLH ROT FREE ROTATION ABOUT +Z AXIS RATE= .200	A5 LVLH VERN	DSC .200 DB AT 1.00 DB RT .02			YAWING IMU ALIGN START
6 0/05:13:00 23:00 DAP A1	TRK TGT=2 BV=3(90.00, .00) OM= 90.00	A5 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+270	-ZLV NOSE NTH
7 0/08:05:00 10:06	MNVR R+ 44.00 P+166.00 Y+329.00	B1 AUTO NORM	DSC .500 DB AT 3.00 DB RT .20	SUN T 89 P 199	ANT AOS 09:18-09:23	TDRS DIRECT CHECK ATT
8 0/09:23:00 30:47	TRK TGT=4 BV=5(242.00, .00) OM=270.00 DEPLOY: 0/10:01:32	A11 AUTO VERN	DSC .200 DB AT 1.00 DB RT .01	SUN T 118 P 180	INRTL R+117 P+251 Y+358	TDRS DPLY ATT
9 0/10:02:32	ROT BV=5(.00,270.00)	A11 MAN NORM	DSC .200 DB AT 1.00 DB RT .20		ROT R+117 START P+251 ATT Y+358	-2.2 FPS SEP AND BEGIN -70 DEG PITCH
10 0/10:02:40	ROT BV=5(.00,270.00)	A11 MAN NORM	DSC .200 DB AT 1.00 DB RT .20		ROT R+117 START P+252 ATT Y+357	SEP CUTOFF CONTINUE -70 DEG PITCH
11 0/10:03:51	CANCEL	A11 MAN NORM	DSC .200 DB AT 1.00 DB RT .20	SUN T 102 P 180	INRTL R+118 P+258 Y+344	END OF -70 DEG PITCH
12 0/10:09:32 12:28	MNVR R+173.00 P+321.00 Y+ 19.00	B1 AUTO NORM	DSC .500 DB AT 3.00 DB RT .20	SUN T 93 P 134	DV= 40 FPS DT= 26 SEC TIG 0/10:20:32	OMS SEP

Attitude Timeline

MET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 0/10:21:04 25:00 DAP B1/A/V	TRK TGT=1 BV=3(90.00, .00) OM= .00	B1 AUTO NORM	DSC .500 DB AT 3.00 DB RT .20			VIEWING ATT
2 0/10:42:32 47:00 DAP B1/A/V	TRK TGT=1 BV=5(310.00, .00) OM=344.40	B1 AUTO NORM	DSC .500 DB AT 3.00 DB RT .20			WINDOW PROTECT ATT
3 0/10:56:32	CANCEL	B1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 142 P 130	INRTL R+ 85 P+160 Y+ 38	INRTL ATT HOLD AT IUS SRM IGNITION
4 0/11:10:00 23:45	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
5 0/12:25:00 37:04 B5 FOR COAS	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 54 P 173	-Y ST:34 -Z ST:23 12:25-12:58	IMU ALIGN COAS CAL PAIR A1
6 0/12:45:00 57:11	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
7 0/22:59:00 23:11:00	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 54 P 173	-Y ST:34 -Z ST:23 22:59-23:32	IMU ALIGN PAIR A1
8 0/23:20:00 31:29	TRK TGT=2 BV=3(90.00, .00) OM= .00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0	-ZLV TAIL FWD
9 1/01:40:00 50:55 DAP B4/A/V	MNVR R+307.00 P+ 91.00 Y+357.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 69 P 286	-8 DEG SUN LOS=02:03 COMET LOS= 02:05	CHAMP OPPORTUNITY 1 ATT 1
10 1/02:06:00 15:56	TRK TGT=2 BV=3(90.00, .00) OM= .00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0 02:05	-ZLV TAIL FWD
11 1/03:10:00 20:59 DAP B4/A/V	MNVR R+307.00 P+ 91.00 Y+357.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 69 P 286	-8 DEG SUN LOS=03:34 COMET LOS= 03:36	CHAMP OPPORTUNITY 2 ATT 1
12 1/03:37:00 46:57 DAP A1/A/V	TRK TGT=2 BV=3(90.00, .00) OM= .00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0 03:36	-ZLV TAIL FWD

Attitude Timeline

MET	MNVR OPTION		DAF	E/S	REMARKS	EVENT
1 1/05:40:00 45:54	MNVR R+101.00 P+155.00 Y+352.00	B1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 105 P 135	DV= 43 FPS DT= 00:27 TIG 1/06:00:00	ORBIT ADJUST BURN
2 1/06:12:00 24:27 DAP B4/A/V	MNVR R+306.00 P+ 96.00 Y+350.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 66 P 284	-8 DEG SUN LOS=06:35 COMET LOS= 06:37	CHAMP OPPORTUNITY 3 ATT 2
3 1/06:42:00 52:20	TRK TGT=2 BV=3(90.00, .00) OM= .00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0 06:37	-ZLV TAIL FWD
4 1/07:42:00 52:47 DAP B4/A/V	MNVR R+306.00 P+ 96.00 Y+350.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 67 P 284	-8 DEG SUN LOS=08:05 COMET LOS= 08:07	CHAMP OPPORTUNITY 4 ATT 2
5 1/08:12:00 22:19 DAP A1/A/V	TRK TGT=2 BV=3(90.00, .00) OM= .00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0 08:07	-ZLV TAIL FWD
6 1/09:33:00 47:09	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 54 P 173	09:33-10:05	IMU ALIGN PAIR A1
7 1/09:53:00 10:03:12	TRK TGT=2 BV=3(90.00, .00) OM=270.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 90	-ZLV NOSE STH
8 1/20:04:00 17:46	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 53 P 172	-Y ST:34 -Z ST:23 20:04-20:36	IMU ALIGN PAIR A1
9 1/20:24:00 34:07	TRK TGT=2 BV=3(90.00, .00) OM=270.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 90	-ZLV NOSE STH
10 2/05:16:00 29:24	MNVR R+203.00 P+227.00 Y+ 22.00 DEPLOY: 2/05:51:16	B7 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 150 P 90		SPARTAN DPLY ATT
11 2/06:01:16	SPARTAN SEP BURN	A10 MAN VERN	DSC .200 DB AT 1.00 DB RT .02		DV= 2 FPS	SEP TIG
12 2/06:10:00 13:13	TRK TGT=1 BV=3(90.00, .00) OM=180.00	A10 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 270	LVLH R+270 P+ 0 Y+270	-Z TGT TRACK

Attitude Timeline

MET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 2/08:06:00 20:58	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 53 P 172	-Y ST:34 -Z ST:23 08:05-08:37	IMU ALIGN PAIR A1
2 2/08:26:00 37:41	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
3 2/20:08:00 20:42	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 52 P 172	-Y ST:34 -Z ST:23 20:06-20:39	IMU ALIGN PAIR A1
4 2/20:28:00 39:28	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
5 2/22:47:00 55:23 DAP B4/A/V	MNVR R+307.00 P+ 96.00 Y+351.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 68 P 282	-8 DEG SUN LOS=23:11 COMET LOS= 23:11	CHAMP OPPORTUNITY 5 ATT 3
6 2/23:16:00 21:49	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0 23:11	-ZLV NOSE FWD
7 3/00:17:00 25:25 DAP B4/A/V	MNVR R+307.00 P+ 96.00 Y+351.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 68 P 282	-8 DEG SUN LOS= 00:41 COMET LOS= 00:41	CHAMP OPPORTUNITY 6 ATT 3
8 3/00:46:00 51:48 DAP A1/A/V	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0 00:41	-ZLV NOSE FWD
9 3/05:45:00 59:59	MNVR R+111.00 P+165.00 Y+345.00	B1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 106 P 130	DV= 4.3 FPS TIG 3/06:06:09	NC1 BURN ATT
10 3/06:10:00 17:44	TRK TGT=2 BV=3(90.00, .00) OM=270.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+270	-ZLV NOSE STH
11 3/08:09:00 21:07	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 52 P 171	-Y ST:34 -Z ST:23 08:06-08:40	IMU ALIGN PAIR A1
12 3/08:29:00 38:29	TRK TGT=2 BV=3(90.00, .00) OM=270.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 90	-ZLV NOSE STH

Attitude Timeline

MET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 3/20:10:00 24:41	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 52 P 171	-Y ST:34 -Z ST:23 20:07-20:41	IMU ALIGN PAIR A1
2 3/20:48:00 59:48	MNVR R+113.00 P+168.00 Y+344.00	A9 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 107 P 130	DV= 4.2 FPS TIG 3/21:07:49	NC2 BURN ATT
3 3/21:10:00 15:51	TRK TGT=1 BV=3< 90.00, .00> OM= .00	B6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 0 P 0	LVLH R+ 0 P+270 Y+ 0	-Z TGT TRACK
4 3/21:40:00 43:41	MNVR R+222.00 P+298.00 Y+300.00	B6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 50 P 109	DV= 0 FPS TIG 3/21:52:50	NH BURN ATT IF REQUIRED
5 3/21:55:00 55:44	TRK TGT=1 BV=3< 90.00, .00> OM= .00	B6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 7 P 180	LVLH R+ 0 P+277 Y+ 0	-Z TGT TRK
6 3/23:05:00 07:10	MNVR R+134.00 P+201.00 Y+302.00	B6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 74 P 131	DV= 0.2 FPS TIG 3/23:11:38	NCC BURN ATT
7 3/23:15:38 16:56	TRK TGT=1 BV=3< 90.00, .00> OM= .00	B6 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 8 P 180	LVLH R+ 0 P+278 Y+ 0	-Z TGT TRK
8 3/23:48:00 56:21	MNVR R+245.00 P+254.00 Y+ 29.00	A9 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 140 P 74	DV= 3.2 FPS TIG 4/00:07:53	TI BURN ATT
9 4/01:18:00 29:50	TRK TGT=2 BV=2<180.00, .00> OM= .00	A9 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 180 P 0	LVLH R+ 0 P+ 90 Y+ 0	VBAR TRANSITION
10 4/01:33:00		A10 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02			VBAR ARRIVAL
11 4/03:30:00 45:00	TRK TGT=2 BV=3< 90.00, .00> OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
12 4/06:41:00 53:47	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 51 P 171	-Y ST:34 -Z ST:23 06:37-07:12	IMU ALIGN PAIR A1

Attitude Timeline

MET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 4/07:01:00 11:49	TRK TGT=2 BV=3(90.00, .00) OM=.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0	-ZLV TAIL FWD
2 4/17:13:00 25:43	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 51 P 170	-Y ST:34 -Z ST:23 17:07-17:43	IMU ALIGN PAIR A1
3 4/17:33:00 44:00	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
4 4/20:40:00 54:11	MNVR R+ 19.00 P+ 81.00 Y+312.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 36 P 180		TEACHER LESSONS ATT 1 WITH 100% KU
5 4/21:49:00 22:01:08	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
6 4/22:17:00 31:45	MNVR R+319.00 P+ 41.00 Y+284.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 30 P 150		TEACHER LESSONS ATT 2 WITH 100% KU
7 4/23:24:00 37:05	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
8 5/01:27:00 40:18	MNVR R+282.00 P+180.00 Y+ 50.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 162 P 258		CREW CONFERENCE ATT W/100% KU
9 5/02:35:00 44:35	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
10 5/06:44:00 57:05	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 50 P 170	-Y ST:34 -Z ST:23 06:37-07:14	IMU ALIGN PAIR A1
11 5/07:04:00 15:00	TRK TGT=2 BV=3(90.00, .00) OM=180.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-ZLV NOSE FWD
12 5/17:15:00 28:09	MNVR R+101.00 P+ 26.00 Y+ 4.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 50 P 170	-Y ST: 34 -Z ST: 23 17:07-17:47	IMU ALIGN ATT

Attitude Timeline

MET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 5/17:35:00 47:24	TRK TGT=4 BV=5(184.00, .00) OM=270.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 176 P 175	INRTL R+168 P+212 Y+ 45	TAIL SUN ATT
2 5/20:37:25 50:43 DAP B1/A/N	MNVR R+272.00 P+344.00 Y+315.00	A1 AUTO VERN	DSC .200 DB AT 1.00 DB RT .02	SUN T 30 P 71	-Y ST: 49 -Z ST: 48 20:36-21:14	D.O. PREP IMU ALIGN ATT
3 5/20:59:25 21:02:04	MNVR R+291.00 P+304.00 Y+ 20.00	B1 AUTO NORM	DSC .500 DB AT 3.00 DB RT .20	SUN T 99 P 23	-Y ST: 29 -Z ST: 22 20:50-21:17	IMU VERIF ATT
4 5/21:22:25 24:58 TRANS DAP	MNVR R+212.00 P+ 41.00 Y+ 59.00	B1 AUTO NORM	DSC .500 DB AT 3.00 DB RT .20	SUN T 106 P 48		DEORBIT BURN ATTITUDE
5 5/23:37:25		* AUTO *	DSC 0.500 DB AT 3.50 DB RT 0.30		DV= 275 FPS DT= 02:26	OMS IGNITION
6 5/23:42:25 46:47 MM303	MNVR R+226.47 P+310.85 Y+310.24	* AUTO *	DSC 0.500 DB AT 3.50 DB RT 0.30	SUN T 49 P 107		EI-5 ATT
7 6/00:01:42 MM304	EI-5	* AUTO *	DSC 0.500 DB AT 3.50 DB RT 0.30		LVLH R+ 1 P+ 39 Y+359	EI-5

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