

4

FLIGHT PLAN

FLIGHT DATA FILE

Flight Plan

ISS ISSF
B. Schaf
Bldg 7585

2

STS-32

(Cycle 2R Trajectory)

Mission Operations Directorate
Operations Division

Final
November 22, 1989

EVENT	CST		
Launch	17:46	Mon	Dec 18
SYNCOM Deploy	18:28	Tue	Dec 19
LDEF Retrieval	19:01	Thu	Dec 21
EDW Landing	15:21	Thu	Dec 28

NASA

National Aeronautics and
Space Administration

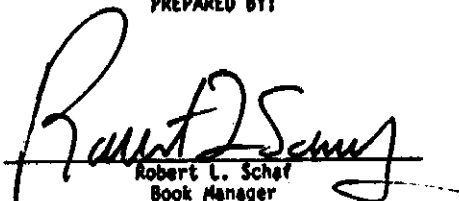
Lyndon B. Johnson Space Center
Houston, Texas

MISSION OPERATIONS DIRECTORATE

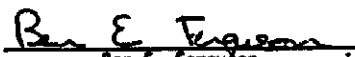
STS-32 FLIGHT PLAN

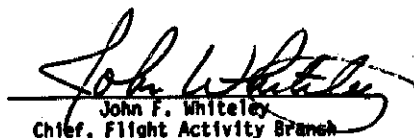
FINAL
November 22, 1989

PREPARED BY:



Robert L. Schaf
Book Manager

APPROVED BY:


Ben E. Ferguson
Head, Crew Activity Planning
Section 1


John F. Whiteley
Chief, Flight Activity Branch


Edward L. Pavelka, Jr.
Operations Division


Tommy W. Holloway
Assistant Director
for NSTS Programs,
Mission Operations

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	FLT PLN-692	FLT PLN-708	FLT PLN-721A
	FLT PLN-693	FLT PLN-710A	FLT PLN-722A
	FLT PLN-695	FLT PLN-711	FLT PLN-723
	FLT PLN-696B	FLT PLN-712A	FLT PLN-724
	FLT PLN-699	FLT PLN-713	MULTI-164
	FLT PLN-700	FLT PLN-714	MULTI-165A
	FLT PLN-701	FLT PLN-715	MULTI-176A
	FLT PLN-702	FLT PLN-716	MULTI-97A
	FLT PLN-703	FLT PLN-717	MULTI-61

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STS-32 FLIGHT PLAN

LIST OF EFFECTIVE PAGES

FINAL 11/22/89

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(*) - Omit from flight book

iii

FLT PLN/32/FIN

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STS-32 FLT PLN CUE CARDS

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DAP Book Front Cover.....	8-4	FLT PLN/32/O/BAS
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A1.....	8-5	FLT PLN/32/O/BAS
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A2.....	8-6	FLT PLN/32/O/BAS
DAP A3.....	8-6	FLT PLN/32/O/BAS
A3.....	8-6	FLT PLN/32/O/BAS
DAP A4.....	8-7	FLT PLN/32/O/BAS
A4.....	8-7	FLT PLN/32/O/BAS
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A13.....	8-10	FLT PLN/32/O/BAS
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B2.....	8-12	FLT PLN/32/O/BAS
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B4.....	8-13	FLT PLN/32/O/BAS
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INTRODUCTION

The STS-32 Flight Plan is the flight data file article that contains the on-orbit timeline. It does not contain the detailed timelines that are covered in the Ascent, Post Insertion, Rendezvous, Deorbit Prep, and Entry Checklists. The detailed deploy procedures required during the deploy timeframe are in the SYNCON Deploy Checklist. The detailed rendezvous timelines and procedures are in the Rendezvous 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-32 Flight Requirements Document. The Flight Plan, as part of the Flight Data File, meets the specifications of the Cycle 2R/Final version of the STS-32 Flight Initialization Data Pack.

The flight profile used for this Flight Plan is for a launch date of December 18, 1989, at 17:46 CST. Orbiter inertial attitudes are expressed relative to a Mean of 1950 (M50) reference frame.

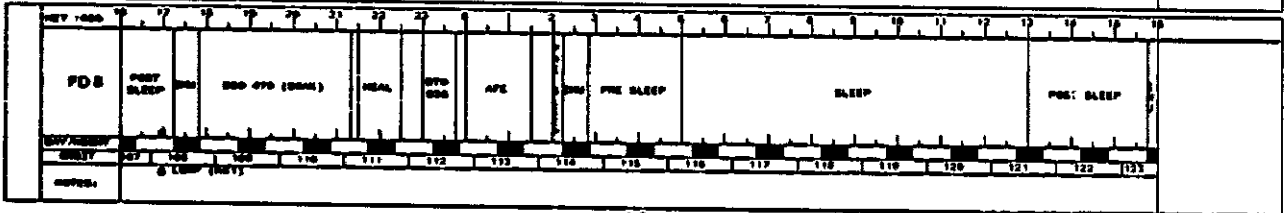
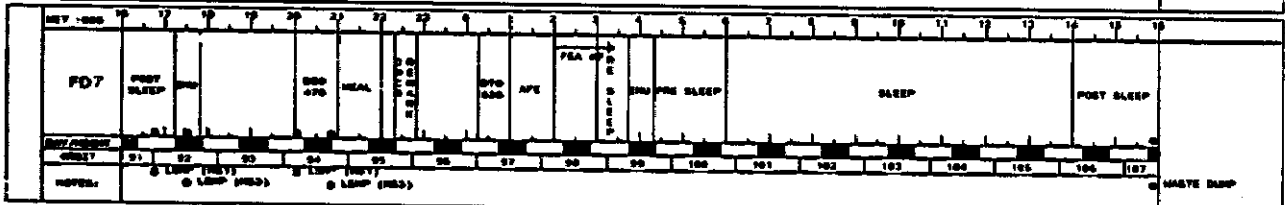
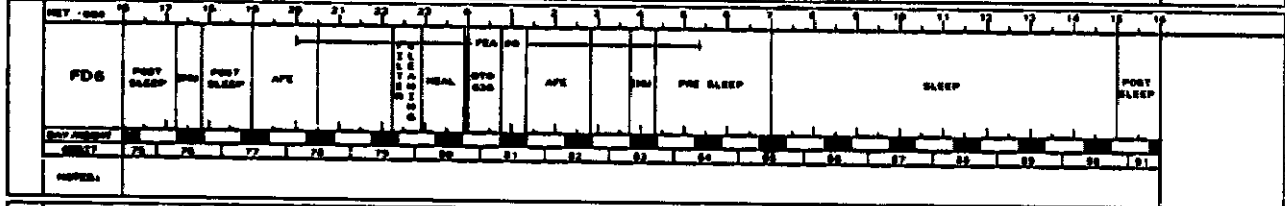
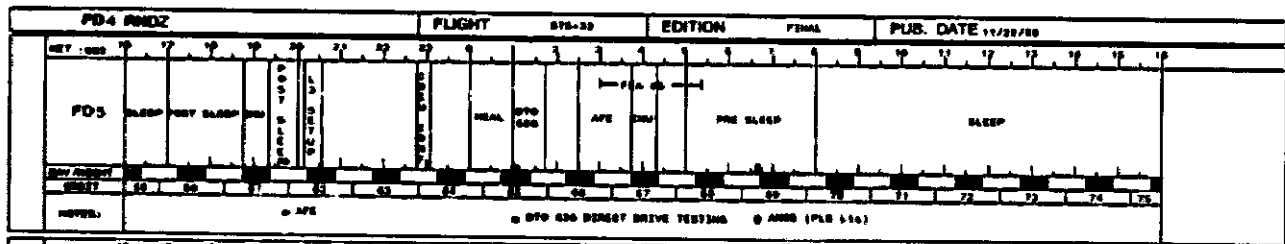
JSC-22359, Crew Scheduling Constraints (Appendix K, CPMP), Basic, March 1987, has been used to build the timelines contained in this Flight Plan.

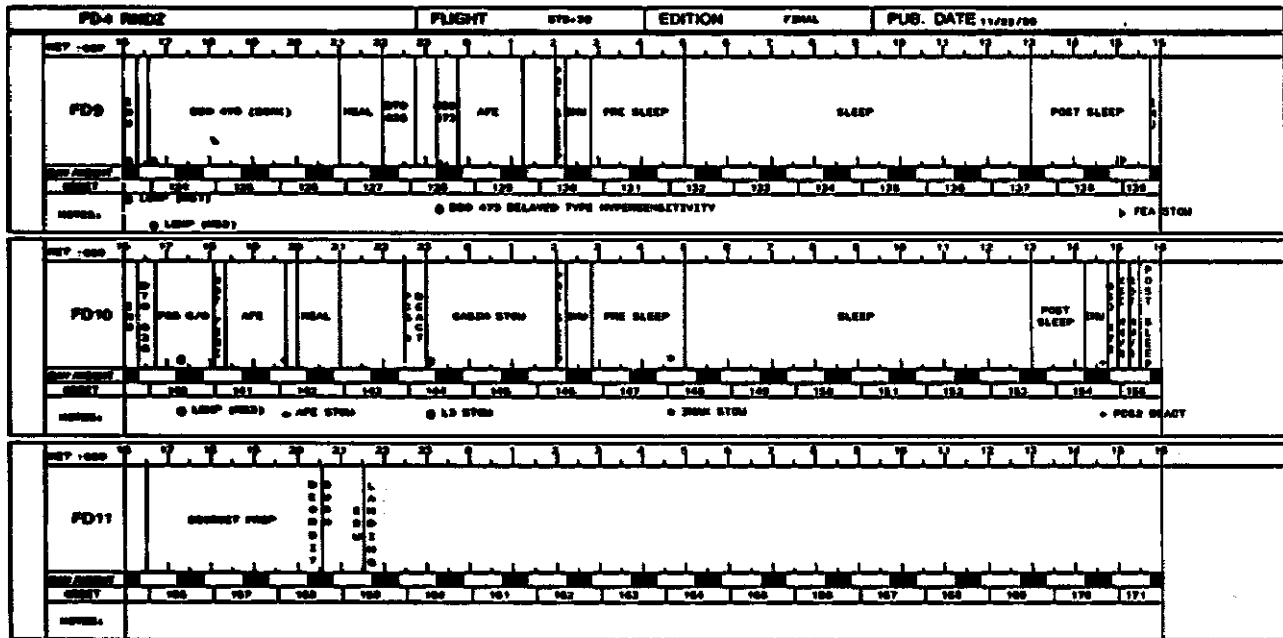
The timeline formats used in this Flight Plan are based on JSC-19933, Timeline Format Definitions and Standard Notes, Revision B, May 25, 1987.

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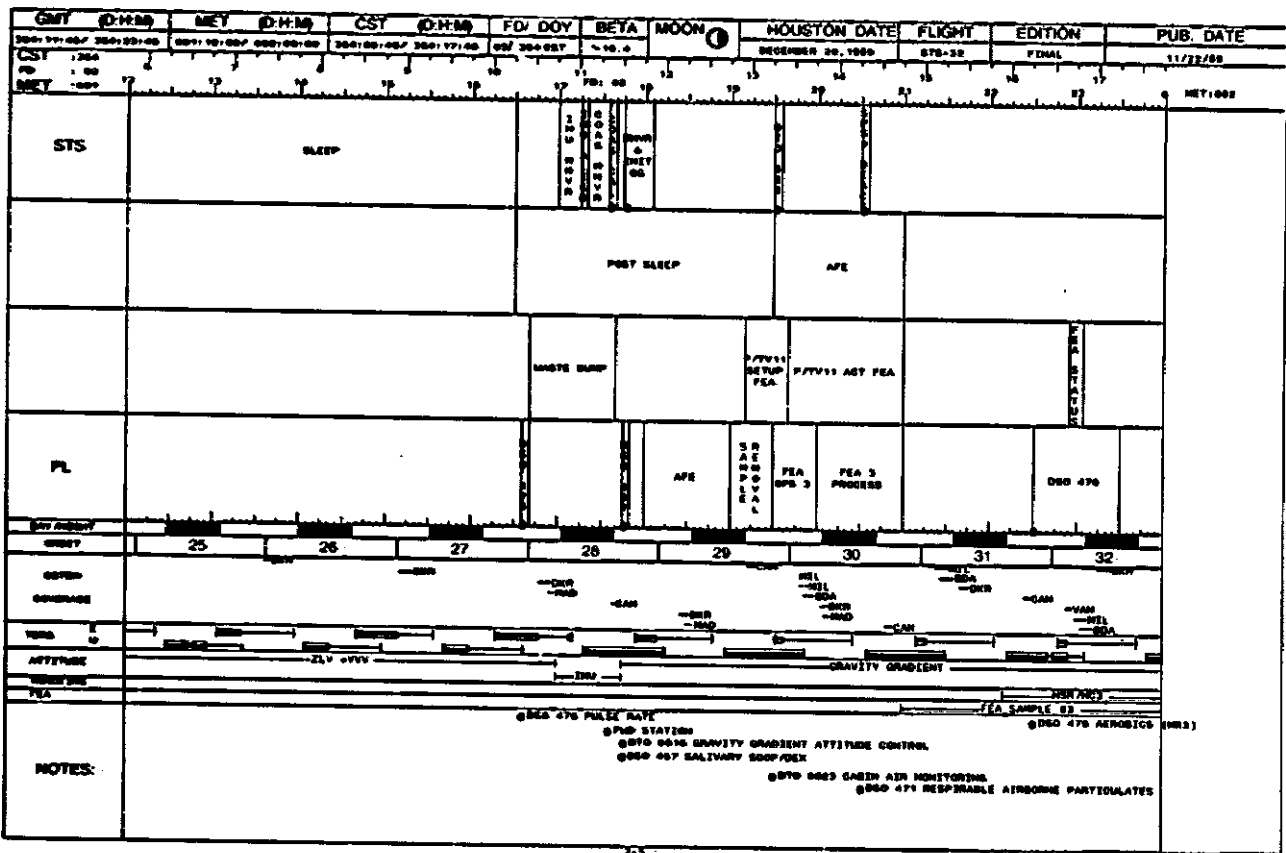
STS-32 OVERVIEW

STS-32 OVERVIEW

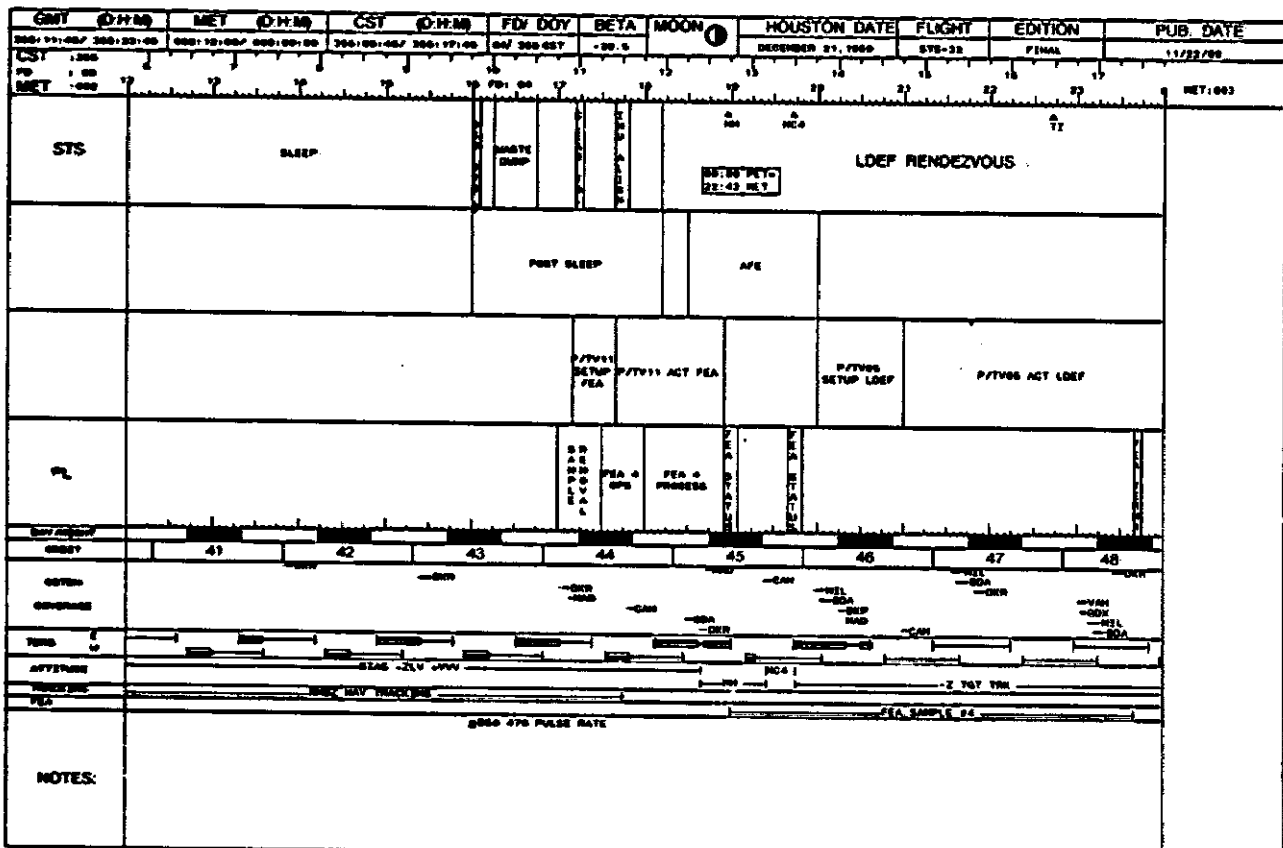




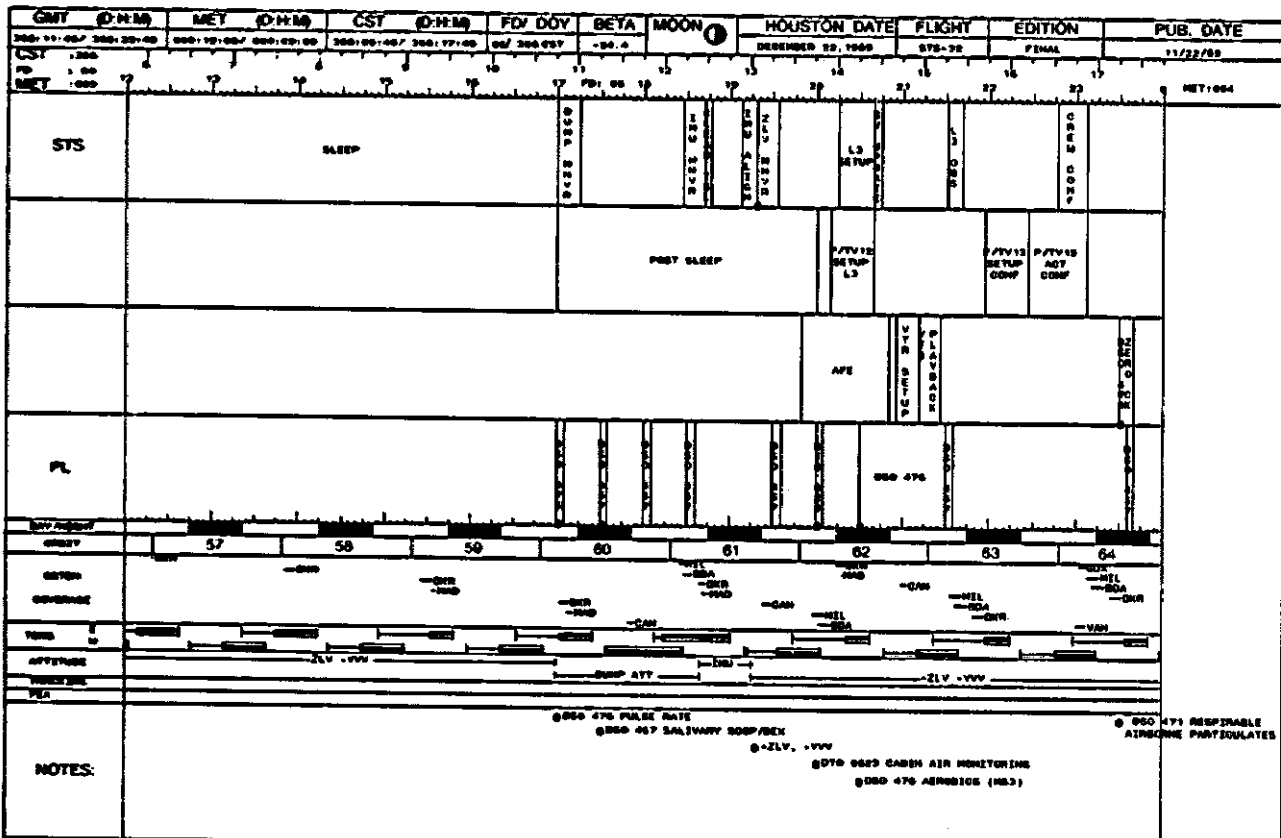
SUMMARY TIMELINE

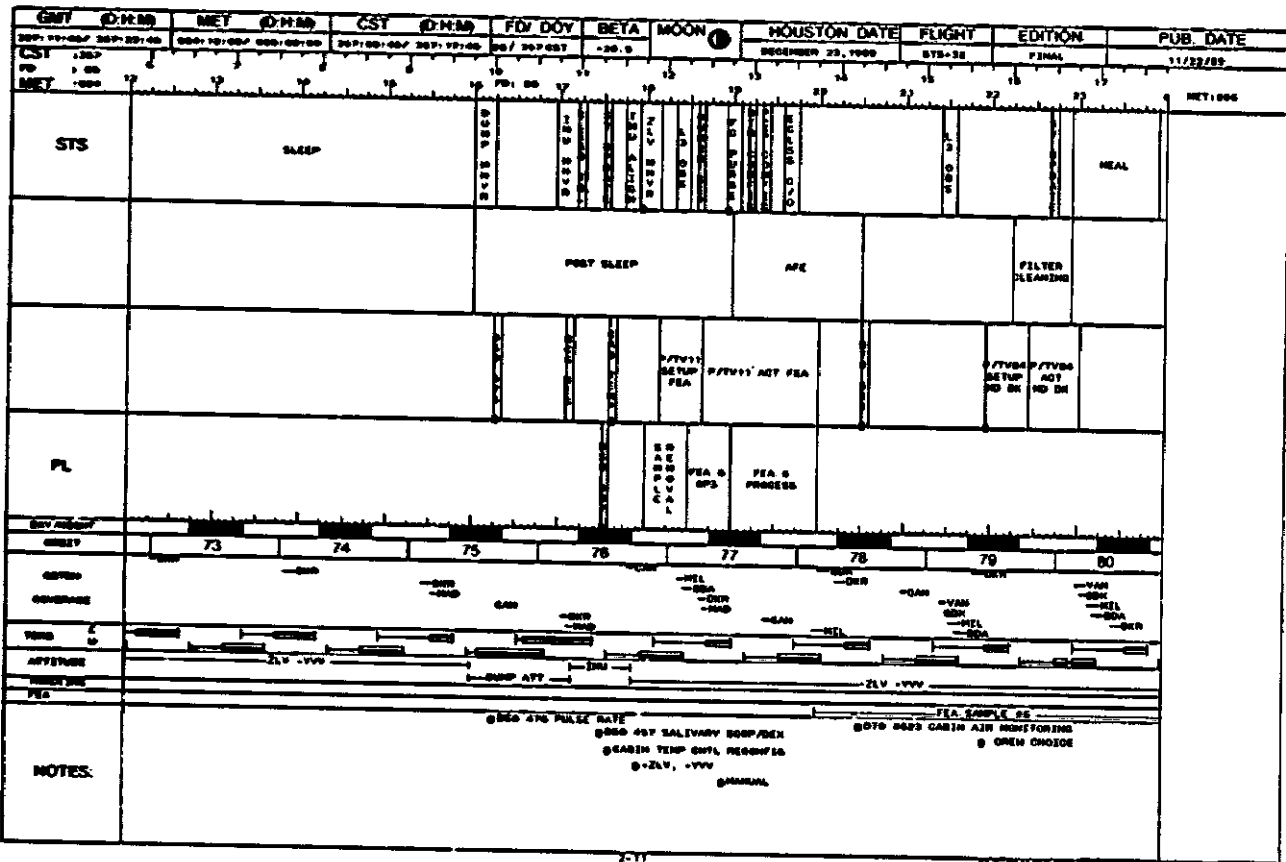


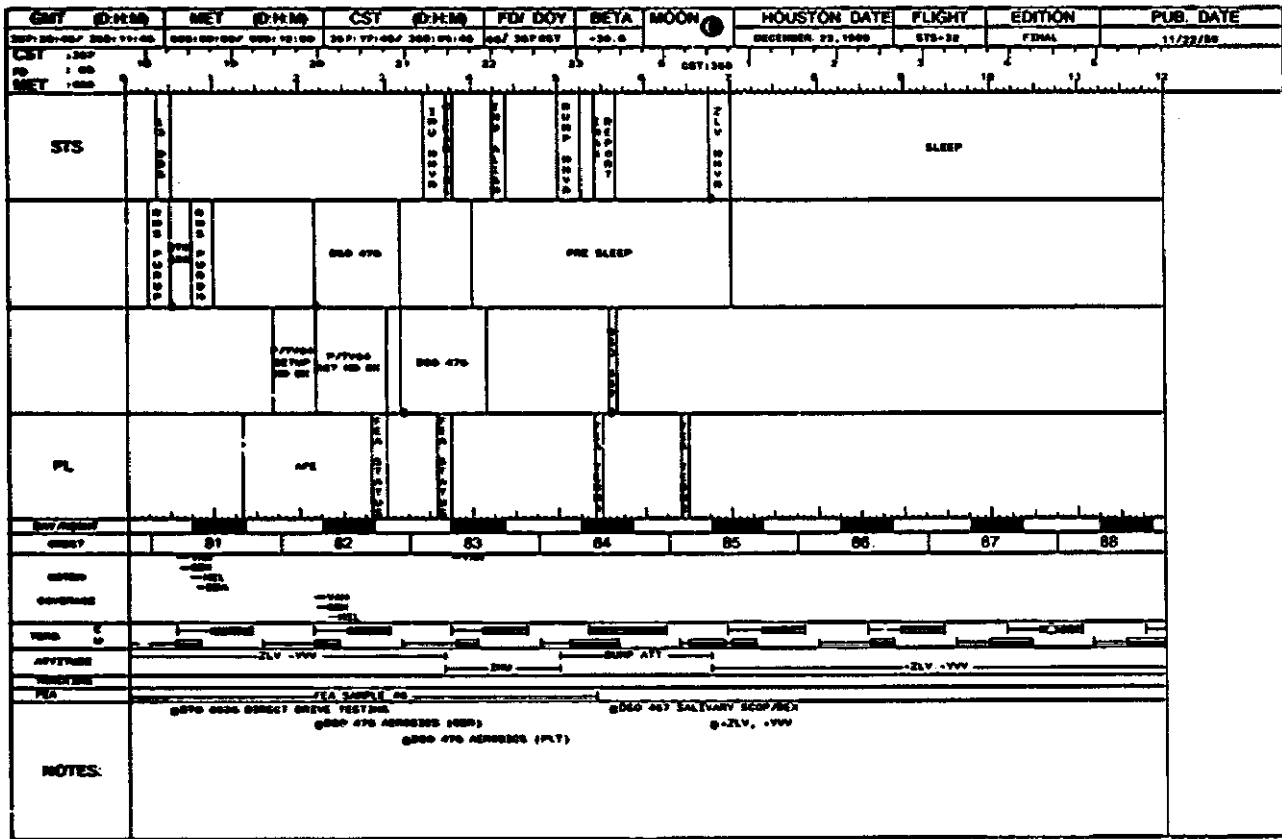
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200:22:00/ 300:17:00	000:00:00/ 000:10:00	300:17:00/ 300:10:00	007 300 037	-10.3	①	DECEMBER 20, 1960	STS-32	F2M1	11/22/60
CST 1:30 FD 1:00 MET -000									
STS	REAL	REAL	REAL	REAL	REAL	REAL	REAL	SLEEP	
			AFE	AFE	AFE	AFE	AFE	SLEEP	
						000 476	000 476		
PL									
ORBIT									
ORBIT	33	34	35	36	37	38	39	40	
COVERAGE									
TIME									
APPROX									
REMARKS									
REMARKS									
NOTES:									

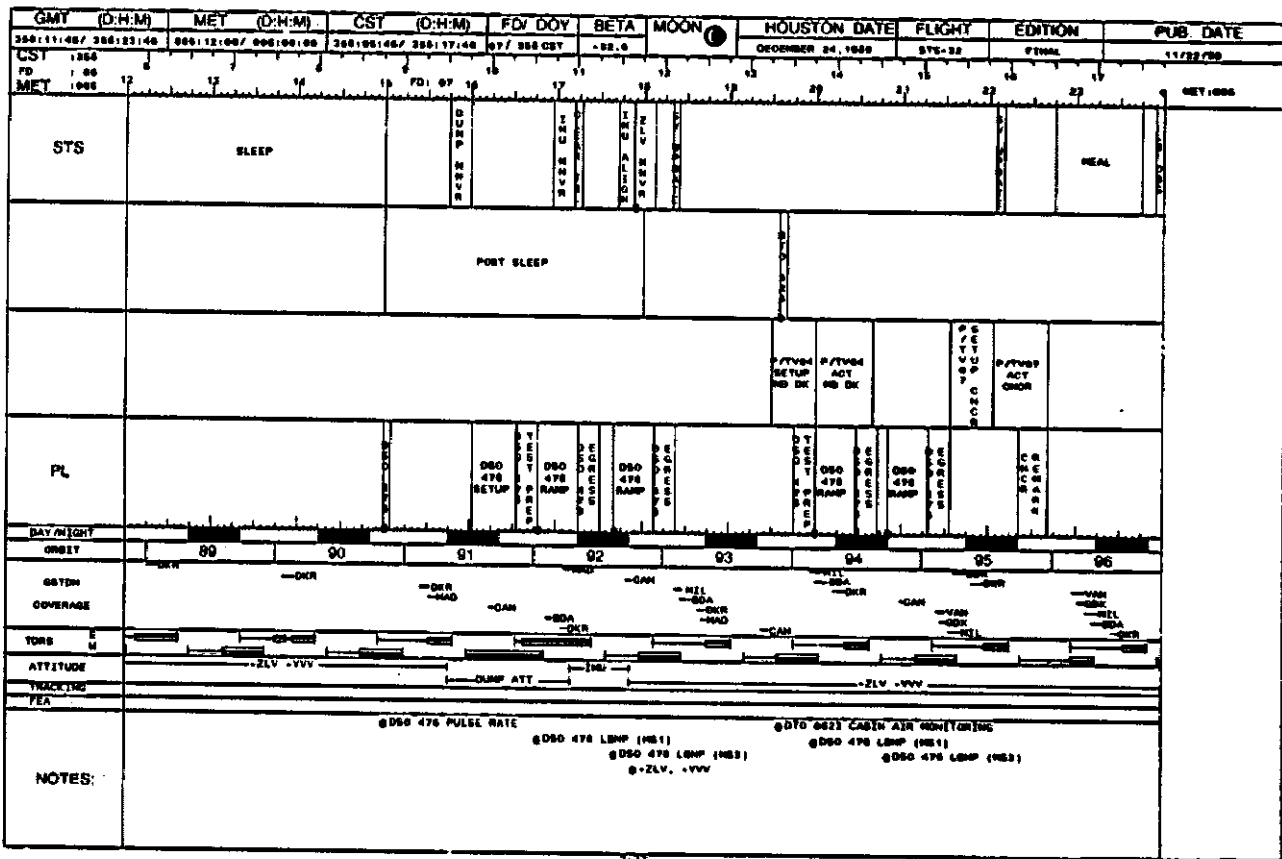


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00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00	00:00
STS	GRAPPLE PROX OPS (LSEP)								
			PHOTO SURVEY	LSEP BEFTN		PRE SLEEP			SLEEP
			P/T/MS AET LSEP.						
PL			LSEP PHOTO SURVEY						
000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00	000:00-007 200:00-00
0000	40	50	51	52	53	54	55	56	58
0000									
0000									
APPEND	PROX OPS		0246-30V 42VV			0-2LV			0-2LV -VVV
0000									
NOTES:									



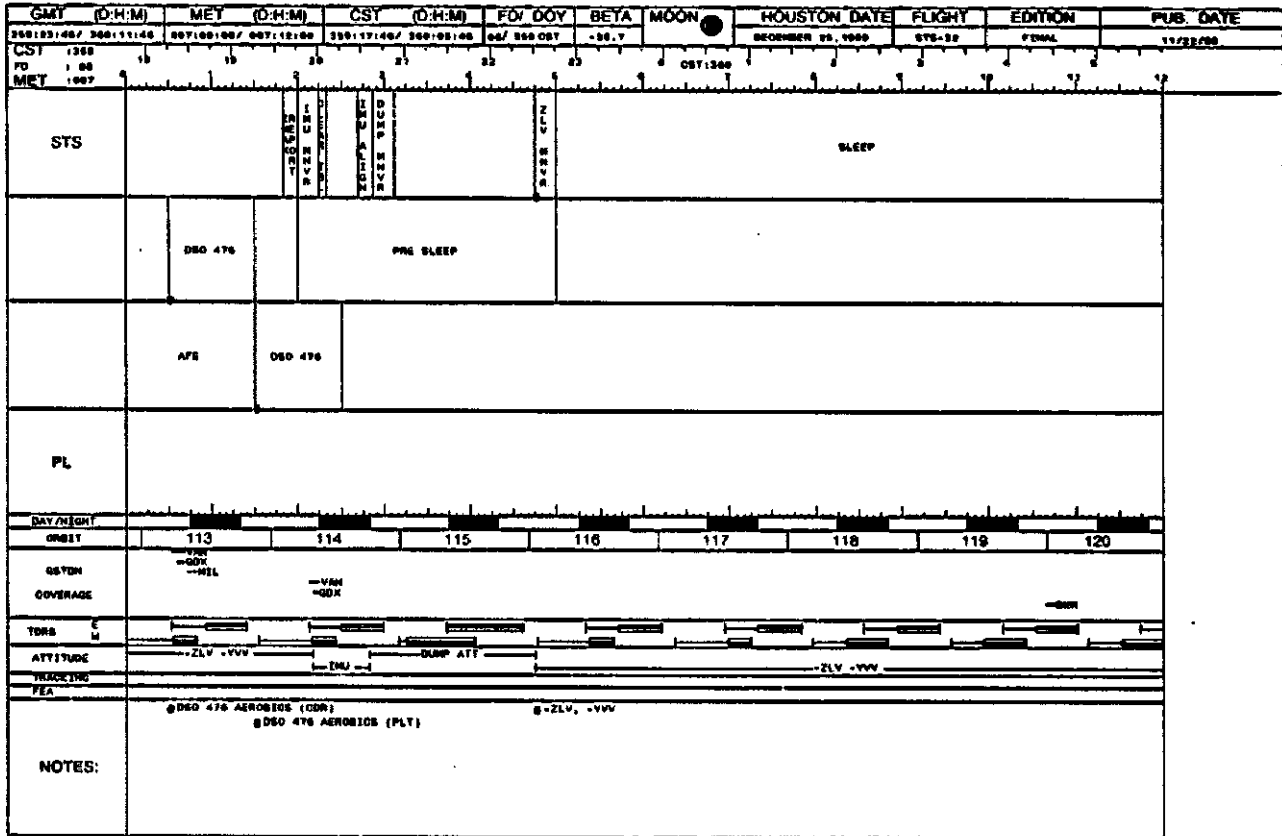


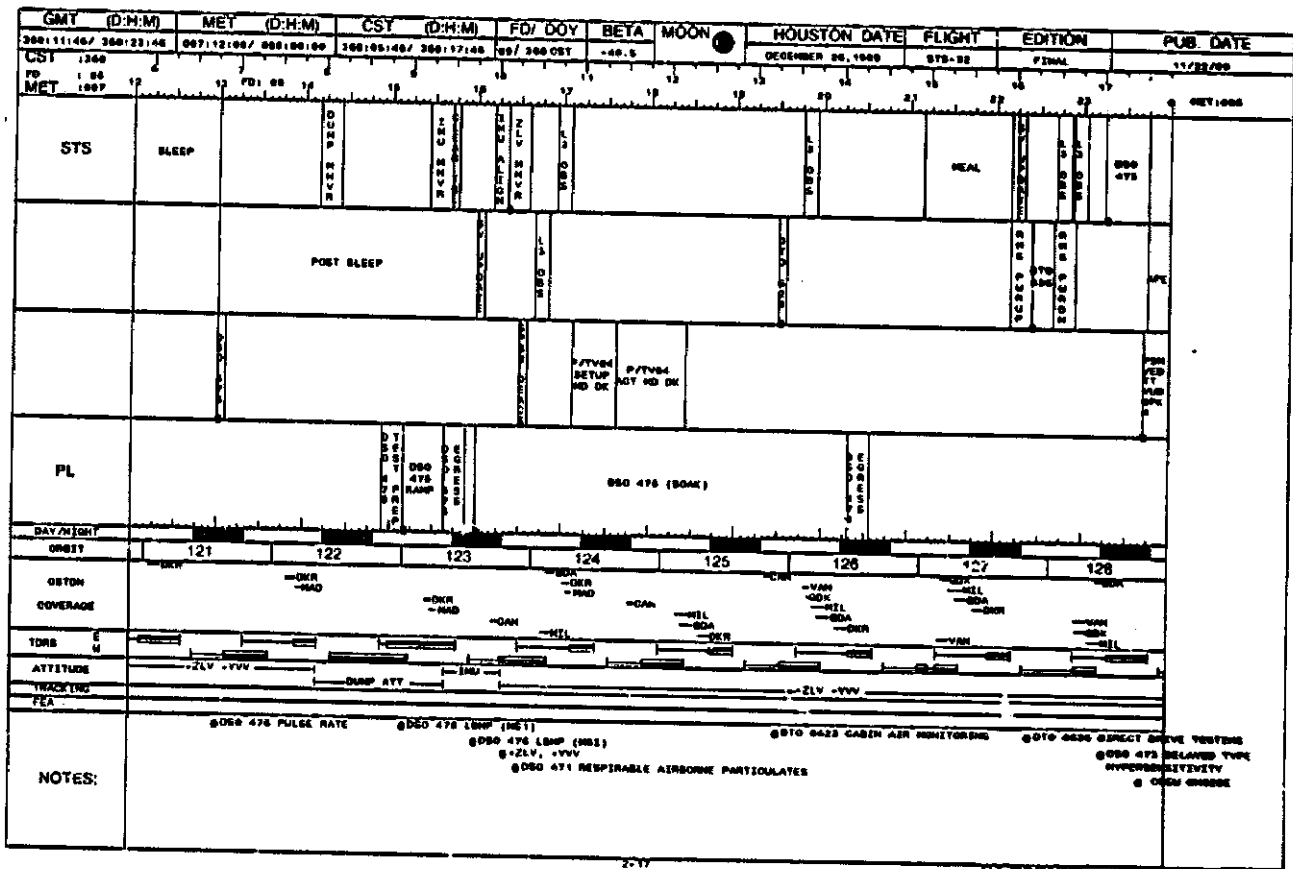


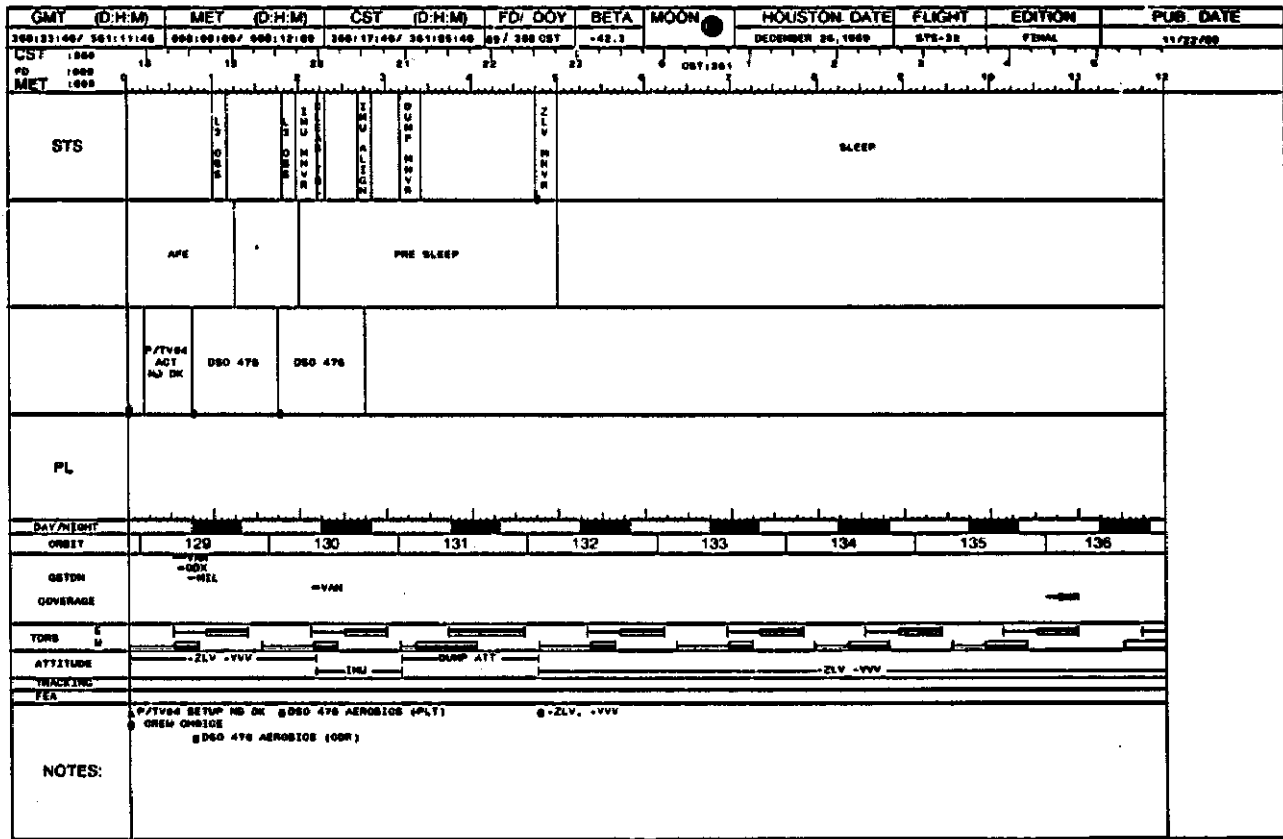


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388:23:00 / 390:11:40	088:00:00 / 088:12:00	388:17:40 / 388:05:40	07 / 350 CST	-24.0	☉	DECEMBER 24, 1968	STS-32	FINAL	11/22/68
CST 1300									
FD 1:07									
MET 1800									
STS	R R S P P S M M S N N S O O S R R S P P S M M S N N S O O S	OSO 476	U R N I S E R V I C E S E R V I C E S	L E A S E R V I C E S E R V I C E S	D U R I N G S E R V I C E S	I N T E R I O R S E R V I C E S	V I S I V I S I V I S		SLEEP
		AFE		PRE SLEEP					
	P/TV11 SETUP FEA	P/TV11 ACT FEA	P/TV64 SETUP NO DK	P/TV64 ACT NO DK	OSO 476				
PL	S R C R O P E A L	FEA 7 OPS	FEA 7 PROCES	S R C R O P E A L	S R C R O P E A L	S R C R O P E A L	S R C R O P E A L	S R C R O P E A L	S R C R O P E A L
DAY/NIGHT	ORBIT	97	98	99	100	101	102	103	104
ORBIT COVERAGE	-VAN -DCK -NIL		-VAN -DCK -NIL		-VAN				
TRNS									
ATTITUDE		-ZLV -VVV		INU	DUMP ATT			-ZLV -VVV	
FEA			FEA SAMPLE 07 1						
NOTES:		0070 0630 DIRECT DRIVE TESTING	0080 476 AEROBICS (PLT)	0080 476 AEROBICS (CON)					
			0 CREW CHOICE	0-ZLV, -VVV					

GMT (D:H:M)	MEY (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
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CST .350									
FD 1 07									
MET 1006									
12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31									
STS	SLEEP	PRAC SVM	WASTE DUMP	SLEEP C-1	POUR C-1	SLEEP C-1	POUR C-1	MEAL	
			POST SLEEP						
		P/TV84 SETUP NO DK	P/TV84 ACT NO DK			FOR FD TT MID DK 4	P/TV84 ACT NO DK		
PL					DSO 476 (SOM)				
DAY/NIGHT									
ORBIT	105	106	107	108	109	110	111	112	
STATION COVERAGE		---DKR ---MAD	---DKR ---MAD	---DKR ---MAD	---DKR ---MAD	---GAN	---MEL ---SQA ---DKR	---MEL ---SQA ---DKR	
TDRS				---MEL	---DKR		---GAN	---MEL ---SQA ---DKR	
ATTITUDE	-ZLV -VVV		DUMP ATT					-ZLV -VVV	
TRACKING									
FEA									
NOTES:	DSO 476 PULSE RATE @ ORGN ONOZC		DSO 471 RESPIRABLE AIRBORNE PARTICULATES @ DSO 476 LUMP (MS)			@TO 0425 CABIN AIR SMOKE/SMOKE		@TO 0425 @TO 0425 @TO 0425	



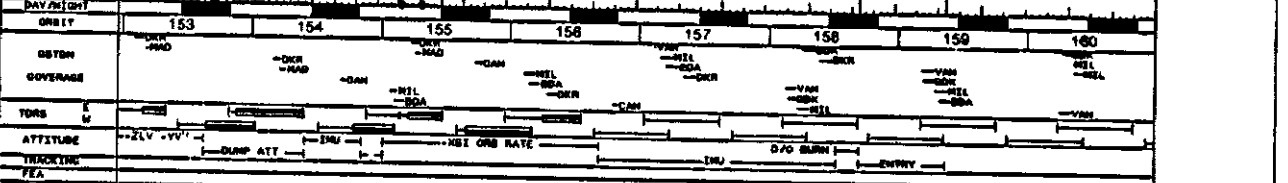
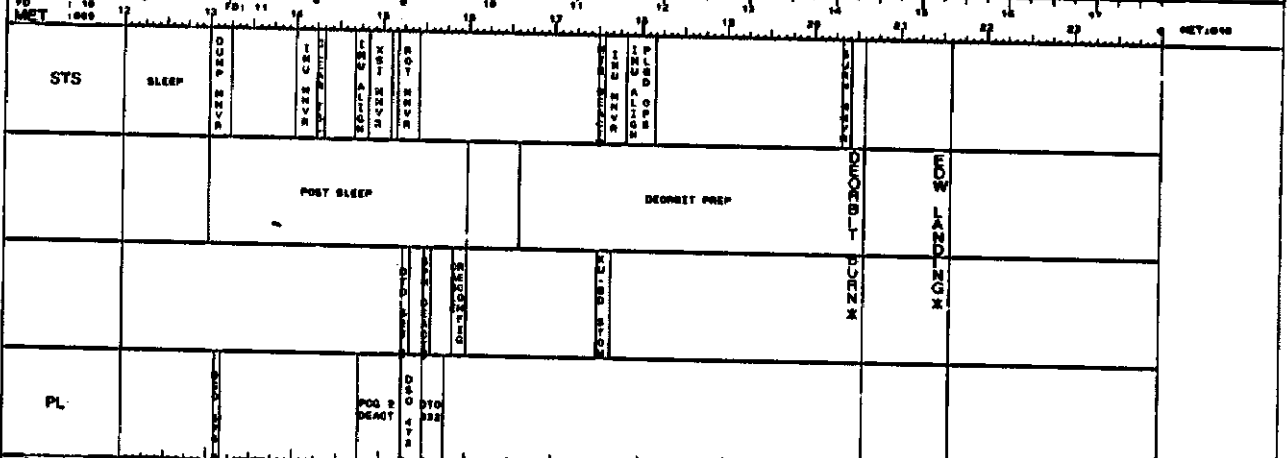




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CST 1961	FD 1000	12	13	14	15	16	17	18	19	20	21	22	23	NET:000
STS	SLEEP													
PL														
DAY/NIGHT														
DRIFT	137	138	139	140	141	142	143	144						
DSTN COVERAGE														
TRNG														
ATTITUDE														
TRACKING														
FEA														
NOTES:	@ D80 476 PULSE RATE *APU HTR ACT *APU HTR RECONFIG @ D60 476 AEROSOL (PLT) @ D70 0828 DIRECT DRIVE TESTING @ D70 476 AEROSOL (OBR) @ ZLV, .VVV @ D60 476 LBP (INS) @ D70 0828 0829 43R MONITORING													

GMT (D:H:M)		MET (D:H:M)		CST (D:H:M)		PDY DOY		BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
261:22:00 / 262:11:40		000:00:00 / 000:12:00		261:17:40 / 262:08:40		09 / 261:057		-45.0		DECEMBER 27, 1980	STD-12	FINAL	11/22/80
CST	1201												
PD	1810												
MET	1000												
STS	CABIN STOW		PRE SLEEP		SLEEP								
	2:02Z CCA	3:02Z CCA	4:02Z CCA	5:02Z CCA	6:02Z CCA	7:02Z CCA	8:02Z CCA	9:02Z CCA	10:02Z CCA	11:02Z CCA	12:02Z CCA	13:02Z CCA	14:02Z CCA
	145	146	147	148	149	150	151	152					
PL	CABIN STOW		PRE SLEEP		SLEEP								
	145	146	147	148	149	150	151	152					
NOTES:	CREW CHOICE		CREW CHOICE		CREW CHOICE								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
302:11:48 / 302:23:46	000:12:00 / 010:00:00	302:00:48 / 302:17:46	11 / 302 087	+00.0		DECEMBER 20, 1960	STS-32	FINAL	11/22/60



NOTES:

@ 060 476 PULSE RATE
 @ 070 0423 CABIN AIR MONITORING
 @ 090 472 INTRAOCULAR PRESSURE
 @ 070 0882 GASIN GROWTH
 @ 060 471 RESPIRABLE AIRBORNE PARTICULATE
 @ PNE DEORBIT ORACLE HTR DEACT

X DEORBIT BURST
 0/20-25
 X ERM LIGHTING
 0/21-26

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DETAILED TIMELINE

MET

Day 000

STS

STS-32 (FD 01)

PL

MCC

IMU_ALIGN PLANS
REQD ID:

1 - 2 - 3
4 - 5 - 6

AND:

1 - 2 - 3 - 4 - 5 - 6

EXECUTION TIME:

1 - 2 - 3 - 4 - 5 - 6

Activities prior to 0800:30 MET are in the
ASCENT & POST INSERTION checklists. Orbiter
altitude when entering the FLT PLN is
~2LV 4VVV.

P/TV downlinks

SYNCOM constraints

LDEF constraints

RV constraint

ORBITER ACTIVITIES:

- Do at earliest convenient time:
- LES CLEANING & DRYING (25 MIN)
- CCS 1/2) CONFIG (090 OPS, ECLS)
- Config Sys 1 (3 Min/2 Onn)
- LAMP & CYCLE SUPPORT TEST
(090 OPS, ECLS) (10 Min)
- COOL FAN INLET CLEANING & TEMP CK

Do not stow pole in PI

no longer constrained by 3 MET

SELECT INIT (090 OPS, ECLS)

UNDO ANT DEPLOY
(090 OPS, COMM/INSTR)
RV-80 ACTIVATION (0900 mode)
(090 OPS, COMM/INSTR)

IMU IMU ALIGN ACT
STAR PAIR (A1)

A/AUTO/VIEW Roll MVRV at 50
IMU ALIGN - 5 TH (090 OPS)

COOL COOL OFF (090 MDC Onn)
APU FUEL PUMP-PLY COOL 0 OFF
APU FUEL INLET MTR DEACT
MTR PWR (13000) - OFF

MEAL (A11)

UNSTN CABIN EQUIP (A11)

NO POWER (090 OPS, ~~090 OPS~~) FD2NO COOLING (090 OPS, ~~090 OPS~~) FD1NO FUEL/NOISE (090 OPS, ~~090 OPS~~)
Water Dehumid System Startup

Back in alt by SR

GRV 82 TR MTR SENS CK (090 OPS, ECLS)

P/TV CAMERA ASSEMBLY (PHOTO/TV, STS-32) (2 Onn) P/TV REC DATA

P/TV SETUP (P/TV) PC-A-1 (PHOTO/TV, P/TV SCENES)

P/TV SETUP (P/TV) PC-A-2 (PHOTO/TV, P/TV SCENES)

CAR AIR MONITORING (RTO 8821)
(090 OPS, CARBON AIR (RTO))
TEMP SPS (RTO 8711) (090 OPS, MED DSO/L)

Activation

P/TV SETUP & ACT (RTO 8821)
(PHOTO/TV, P/TV SCENES)

P/TV STORAGE
(090 OPS, ECLS, P/TV STOR)

COOL 2 ACTIVATION (140)
(PL OPS, ECLS)

Flight day 1 requirement

LOC (RTO 472) FD2
(MED FS, MED DSO/L)
(2 Onn)

FD1 requirement

TV (Y48)

(090 ONTLE-PLS)

FD1

uplink Early H/O

TV (Y48)

(090 ONTLE-PLS)

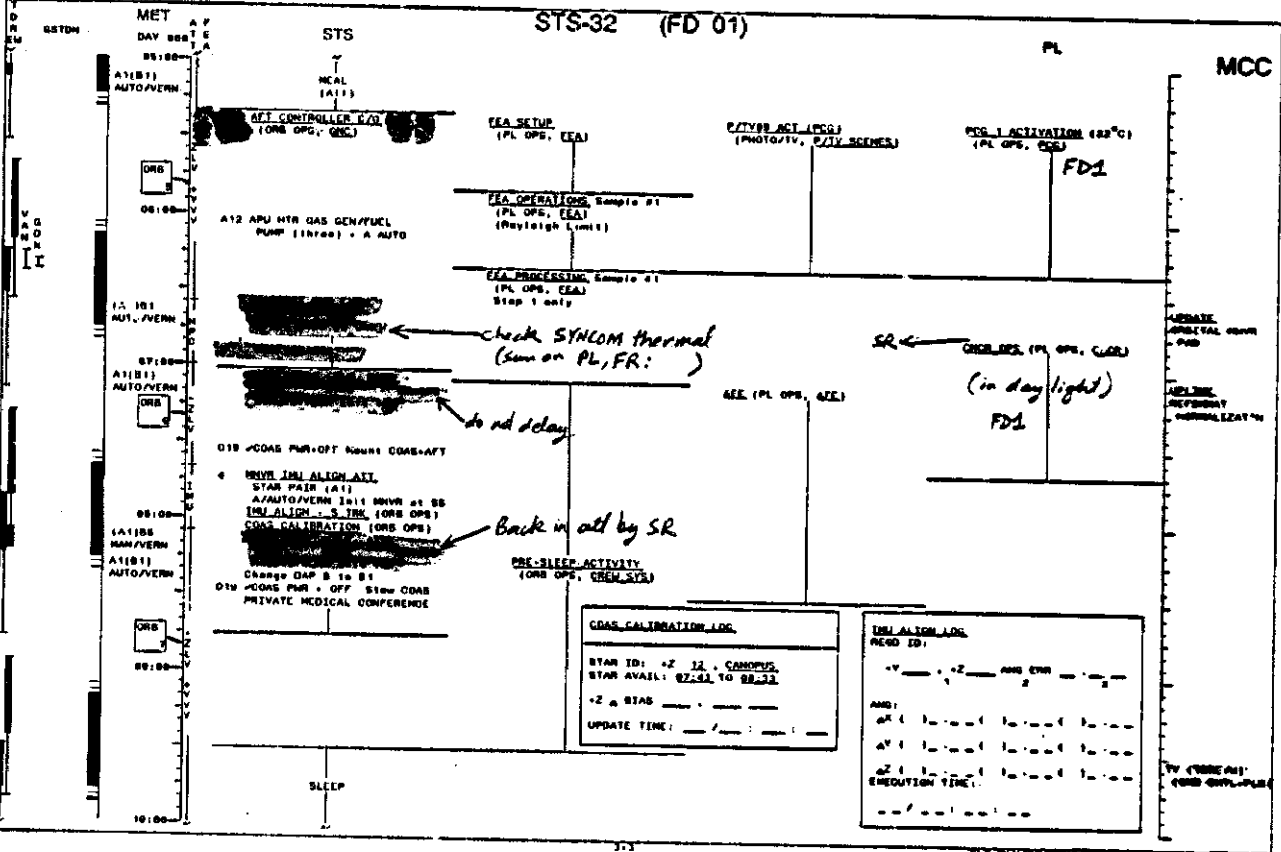
(MED OPS, ECLS)

COOL OFF

STS-32 (FD 01)

PL

MCC



GSTON

MET

DAY 506

A P P A

STS

ALL(1)
AUTO/VERN

ORB
8

11:00

ORB
9

12:00

13:00

ORB
10

14:00

ORB
11

15:00

SLEEP

15 24 6

STS-32 (FD 02)

PL

MCC

MET

STS

0600H
0700H
0800H
0900H
1000H
1100H
1200H
1300H
1400H
1500H
1600H
1700H
1800H
1900H
2000H

ANNT
APPASERS

0700
1700
2700

Syncon tracking constraints

NEW ALIGN LOG
REQD TO:

1 - 2 - 3
4 - 5 - 6 - 7 - 8 - 9 - 10 - 11 - 12 - 13 - 14 - 15 - 16 - 17 - 18 - 19 - 20 - 21 - 22 - 23 - 24 - 25 - 26 - 27 - 28 - 29 - 30 - 31 - 32 - 33 - 34 - 35 - 36 - 37 - 38 - 39 - 40 - 41 - 42 - 43 - 44 - 45 - 46 - 47 - 48 - 49 - 50 - 51 - 52 - 53 - 54 - 55 - 56 - 57 - 58 - 59 - 60 - 61 - 62 - 63 - 64 - 65 - 66 - 67 - 68 - 69 - 70 - 71 - 72 - 73 - 74 - 75 - 76 - 77 - 78 - 79 - 80 - 81 - 82 - 83 - 84 - 85 - 86 - 87 - 88 - 89 - 90 - 91 - 92 - 93 - 94 - 95 - 96 - 97 - 98 - 99 - 100 - 101 - 102 - 103 - 104 - 105 - 106 - 107 - 108 - 109 - 110 - 111 - 112 - 113 - 114 - 115 - 116 - 117 - 118 - 119 - 120 - 121 - 122 - 123 - 124 - 125 - 126 - 127 - 128 - 129 - 130 - 131 - 132 - 133 - 134 - 135 - 136 - 137 - 138 - 139 - 140 - 141 - 142 - 143 - 144 - 145 - 146 - 147 - 148 - 149 - 150 - 151 - 152 - 153 - 154 - 155 - 156 - 157 - 158 - 159 - 160 - 161 - 162 - 163 - 164 - 165 - 166 - 167 - 168 - 169 - 170 - 171 - 172 - 173 - 174 - 175 - 176 - 177 - 178 - 179 - 180 - 181 - 182 - 183 - 184 - 185 - 186 - 187 - 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689 - 690 - 691 - 692 - 693 - 694 - 695 - 696 - 697 - 698 - 699 - 700 - 701 - 702 - 703 - 704 - 705 - 706 - 707 - 708 - 709 - 710 - 711 - 712 - 713 - 714 - 715 - 716 - 717 - 718 - 719 - 720 - 721 - 722 - 723 - 724 - 725 - 726 - 727 - 728 - 729 - 730 - 731 - 732 - 733 - 734 - 735 - 736 - 737 - 738 - 739 - 740 - 741 - 742 - 743 - 744 - 745 - 746 - 747 - 748 - 749 - 750 - 751 - 752 - 753 - 754 - 755 - 756 - 757 - 758 - 759 - 760 - 761 - 762 - 763 - 764 - 765 - 766 - 767 - 768 - 769 - 770 - 771 - 772 - 773 - 774 - 775 - 776 - 777 - 778 - 779 - 780 - 781 - 782 - 783 - 784 - 785 - 786 - 787 - 788 - 789 - 790 - 791 - 792 - 793 - 794 - 795 - 796 - 797 - 798 - 799 - 800 - 801 - 802 - 803 - 804 - 805 - 806 - 807 - 808 - 809 - 810 - 811 - 812 - 813 - 814 - 815 - 816 - 817 - 818 - 819 - 820 - 821 - 822 - 823 - 824 - 825 - 826 - 827 - 828 - 829 - 830 - 831 - 832 - 833 - 834 - 835 - 836 - 837 - 838 - 839 - 840 - 841 - 842 - 843 - 844 - 845 - 846 - 847 - 848 - 849 - 850 - 851 - 852 - 853 - 854 - 855 - 856 - 857 - 858 - 859 - 860 - 861 - 862 - 863 - 864 - 865 - 866 - 867 - 868 - 869 - 870 - 871 - 872 - 873 - 874 - 875 - 876 - 877 - 878 - 879 - 880 - 881 - 882 - 883 - 884 - 885 - 886 - 887 - 888 - 889 - 890 - 891 - 892 - 893 - 894 - 895 - 896 - 897 - 898 - 899 - 900 - 901 - 902 - 903 - 904 - 905 - 906 - 907 - 908 - 909 - 910 - 911 - 912 - 913 - 914 - 915 - 916 - 917 - 918 - 919 - 920 - 921 - 922 - 923 - 924 - 925 - 926 - 927 - 928 - 929 - 930 - 931 - 932 - 933 - 934 - 935 - 936 - 937 - 938 - 939 - 940 - 941 - 942 - 943 - 944 - 945 - 946 - 947 - 948 - 949 - 950 - 951 - 952 - 953 - 954 - 955 - 956 - 957 - 958 - 959 - 960 - 961 - 962 - 963 - 964 - 965 - 966 - 967 - 968 - 969 - 970 - 971 - 972 - 973 - 974 - 975 - 976 - 977 - 978 - 979 - 980 - 981 - 982 - 983 - 984 - 985 - 986 - 987 - 988 - 989 - 990 - 991 - 992 - 993 - 994 - 995 - 996 - 997 - 998 - 999 - 1000

ISSUE 17 ACTIVITIES:
 FOOD PREP/PORT (Bar Cond)(90 Min)
 POS TAN IMBY GEARING A TRIP CH
 P/TIV SETUP & ACT (IMBL)
 (PHOTO/TV, P/TIV SCENES)
 P/TIV SETUP & ACT (IMBL)
 (PHOTO/TV, P/TIV SCENES)

AERONICS (ISSG 472) Pwrco Rv
 (MED FS, MED 050'S)
 (ALL)

NEW IMB ALIGN ATE
 STAR PAD (44)
 ANTI-ROLLING Beam Mount on SR
 IMB ALIGN - 5, 120L (400 OPS)

Try to get align in attitude

POST-SLEEP ACTIVITY
 (400 OPS, CREW SYS)

Back in all by SR

OPS OPS (ISSG 471)
 (MED FS, MED 050'S)
 of Activation

SCOP-DEX (ISSG 487) Sample
 (MED FS, MED 050'S)

TOP (ISSG 472)
 (MED FS, MED 050'S)
 (2 Ops)

SCOP-DEX (ISSG 487) Beam
 (MED FS, MED 050'S)

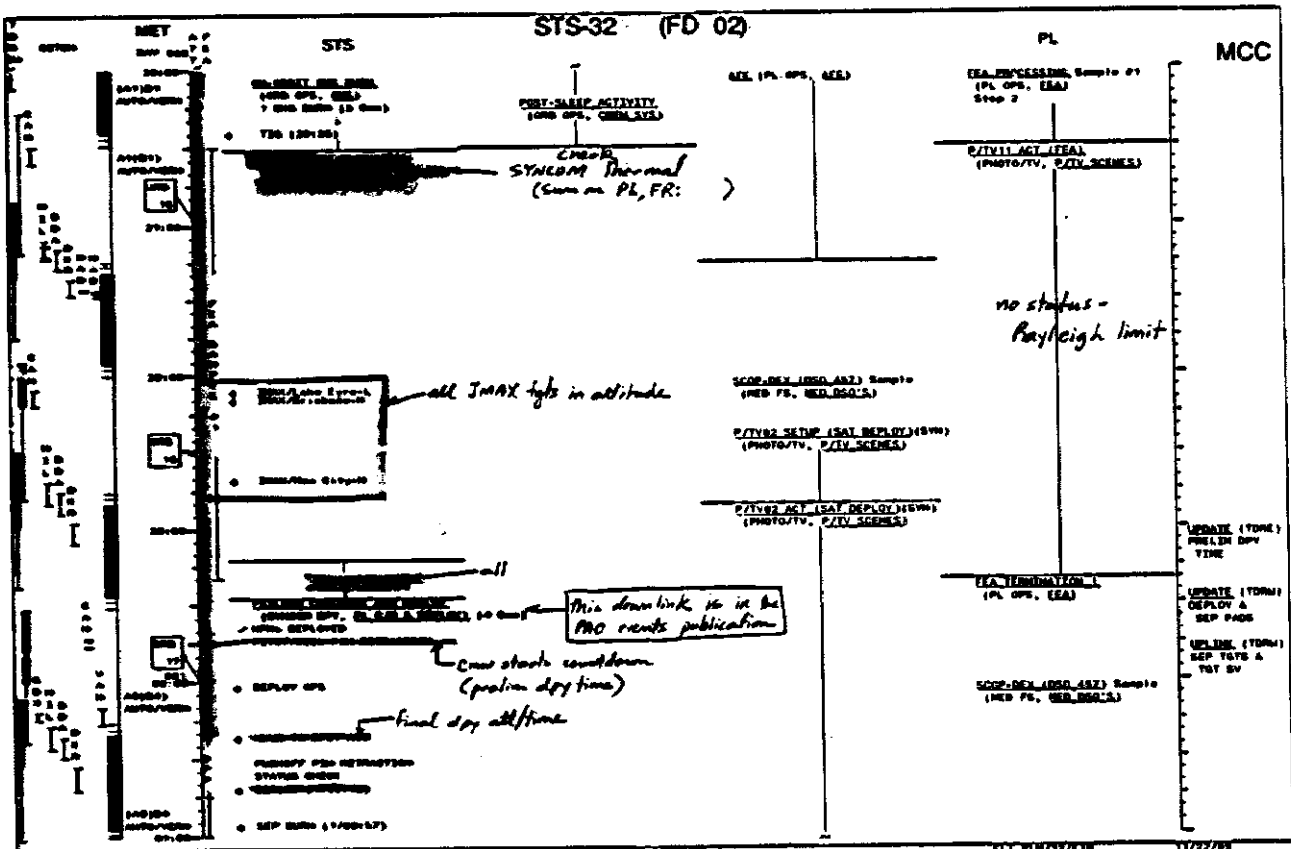
SCOP-DEX (ISSG 487) Sample
 (MED FS, MED 050'S)

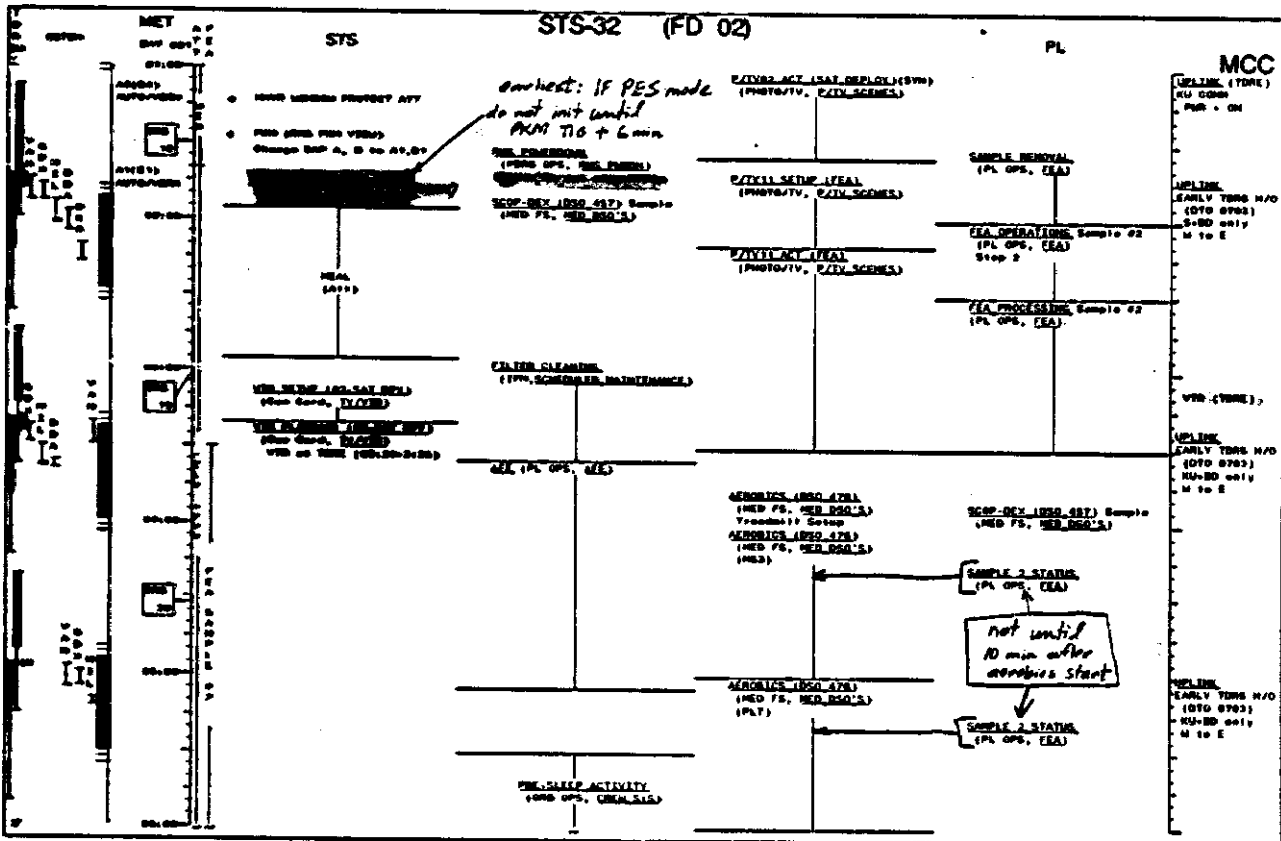
SCOP-DEX (ISSG 487) Sample
 (MED FS, MED 050'S)

P/TIV SETUP (FRM)
 (PHOTO/TV, P/TIV SCENES)

ALL (PL OPS, ALL)

ISSUE
 ORBITAL HOUR
 PAD





MET

STS

PL

MCC

AERONICS (ISSO A78)
(MED FS, MED DOG'S)
(ODD)

SCOP-DEZ (ISSO A77) Sample
(MED FS, MED DOG'S)

SAMPLE 2 STARS
(PL OPG, EEA)

THE AIRLIFT
STAR PWR (A7)
ANALYZERS 2nd UNIT at 00
THE AIRLIFT 3. THE (000 OPG)
THE AIRLIFT 2. THE
THE AIRLIFT 2. THE
THE AIRLIFT 2. THE

ONE-SLEEP ACTIVITY
(000 OPG, CHECK IYS)

PRIVATE MEDICAL CONFERENCE

SEA TERMINATION 1
(PL OPG, EEA)

Report today's sleep
scores and film usage

*after last
T.M.K.*

SEA TERMINATION 2
(PL OPG, EEA)

THE AIRLIFT
MED FS:

W _____ 2 _____ AND 100 _____
2

AND:

at 1 1.1.1.1 1.1.1.1 1.1.1.1
at 1 1.1.1.1 1.1.1.1 1.1.1.1
at 1 1.1.1.1 1.1.1.1 1.1.1.1
ESTIMATED TIME:
1.1.1.1.1.1.1.1

SLEEP

TV (ISSO A7)
(000 OPG, EEA)

STS-32 (FD 02)

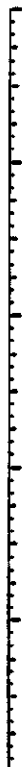
PL

MCC

MET

DAY CONT. E

STS



MET

STS

PL

MCC

0900-12 ACTIVITIES:
 0900 PREP/CHST (Sun Card)(30 Min)
 0915 (Sun) TRIPLE TELEPHONE A TEMP CHL
 0930 TV SETUP A ACT (10MIN)
 (PHOTO/TV, P/TV SCENES)
 0945 TV SETUP A ACT (10MIN)
 (PHOTO/TV, P/TV SCENES)

GEORICA (090-075) P/tee Rt
 (MED PS, MED, DSO'S)
 (ALL)

*last waste dump before
 LDEF Retrieve*

UPDATE (10NC)
 00 DTD PAD

- 0910-0915 - OFF ROOMS 0900 - PAD
- 0915-0920 - 0915-0920 - 0915-0920 - 0915-0920
- 0920-0925 - 0920-0925 - 0920-0925 - 0920-0925
- 0925-0930 - 0925-0930 - 0925-0930 - 0925-0930
- 0930-0935 - 0930-0935 - 0930-0935 - 0930-0935
- 0935-0940 - 0935-0940 - 0935-0940 - 0935-0940
- 0940-0945 - 0940-0945 - 0940-0945 - 0940-0945
- 0945-0950 - 0945-0950 - 0945-0950 - 0945-0950
- 0950-0955 - 0950-0955 - 0950-0955 - 0950-0955
- 0955-1000 - 0955-1000 - 0955-1000 - 0955-1000

CONT-SLEEP ACTIVITY
 (0900 OPS, 0900-0915)

SCOP-DEL (090-017) Sample
 (MED PS, MED, DSO'S)

SEE (14 OPS, SEE)

CRAB CALIBRATION LOG

STAR ID: 00 11. 20000
 STAR NAME: 12.02 12.02
 00 0000 00 0000
 UPDATE TIME: 00 00 00

CRAB AIR MOUNTING/STARS (0900 OPS, 0900-0915)

SEE (14 OPS, SEE)

SEE DEL (090-017)
 (MED PS, MED, DSO'S)
 0915-0920-0925

00 DTD PAD

PLANNED	ACTUAL
P 007.01	---
V 0.00	---
00 000.10	---

P/TVL SETUP (10AL)
 (PHOTO/TV, P/TV SCENES)

SAMPLE MANUAL
 (14 OPS, EAL)

P/TVL ACT (10AL)
 (PHOTO/TV, P/TV SCENES)

EAL OPERATIONS Sample 03
 (14 OPS, EAL)
 Step 2

EAL PROCESSING Sample 03
 (14 OPS, EAL)

STS-32 (FD 03)

STS

PL

MCC

RE: ALTIMETER
REQD BY:

AVI:

OPERATION TIME:

AERONICS (ISSO 478)
(REQ FS, REQ ISSO 4)
(REQ)

SAMPLE 3 STATUS
(PL OPS, EIA)

ISSO/Avionics System

ISSO/Avionics System
AS Service Request

REQ
(DATA)

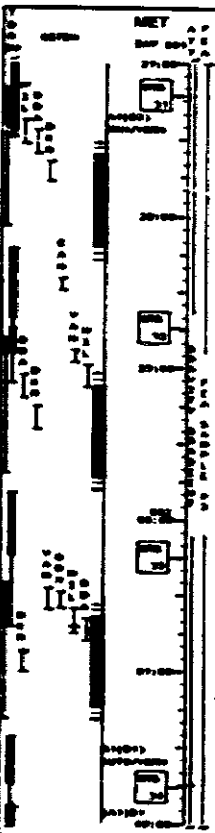
ISSO/Avionics System
(REQ OPS, ISSO)
Change ISSO 4, 5 to 07, 08
CHANGE ISSO 4, 5
(REQ OPS, ISSO)
2 ISS ISSO (2 Ops)

P/TV/ISSO SERV (INT DECK ACT)
(PHOTO/TV, P/TV SCENES)

P/TV/ISSO SERV (INT DECK ACT)
(PHOTO/TV, P/TV SCENES)
TV: YORS (07:54-08:00)

UPDATE
ORBITAL DATA
PAD

TV (YORS)
(REQ ORTL-04)



RV tracking constraint

STS-32 (FD 03)

NET
DAY

PL

MCC

720 (00:00)

ACTIVE ACT. (FLT DECK ACT.)
(PHOTO/TV, R/TV SCENES)

SAMPLE 3 STATION
(PL OPS, SEA)

DO NOT DO ST-2, ST-1, ST-3, ST-4, ST-5, ST-6, ST-7, ST-8, ST-9, ST-10, ST-11, ST-12, ST-13, ST-14, ST-15, ST-16, ST-17, ST-18, ST-19, ST-20, ST-21, ST-22, ST-23, ST-24, ST-25, ST-26, ST-27, ST-28, ST-29, ST-30, ST-31, ST-32, ST-33, ST-34, ST-35, ST-36, ST-37, ST-38, ST-39, ST-40, ST-41, ST-42, ST-43, ST-44, ST-45, ST-46, ST-47, ST-48, ST-49, ST-50, ST-51, ST-52, ST-53, ST-54, ST-55, ST-56, ST-57, ST-58, ST-59, ST-60, ST-61, ST-62, ST-63, ST-64, ST-65, ST-66, ST-67, ST-68, ST-69, ST-70, ST-71, ST-72, ST-73, ST-74, ST-75, ST-76, ST-77, ST-78, ST-79, ST-80, ST-81, ST-82, ST-83, ST-84, ST-85, ST-86, ST-87, ST-88, ST-89, ST-90, ST-91, ST-92, ST-93, ST-94, ST-95, ST-96, ST-97, ST-98, ST-99, ST-100

minimize dumps prior to Rv

OMS TIG

ALL (PL OPS, SEA)

05:00 (00:00) (00:00) (00:00)
+ 05:00 (00:00)

OMS TIG

SAMPLE 3 STATION
(PL OPS, SEA)

last man before Rv for next 2 aligns

ALL (PL OPS, SEA)

ARRIVES (ISSA, STA)
(MED FB, MED_BAG'S)
(PLT)

headmill

SAMPLE 3 STATION
(PL OPS, SEA)

- 05:10 (00:00)
- 05:15 (00:00)
- 05:20 (00:00)
- 05:25 (00:00)
- 05:30 (00:00)
- 05:35 (00:00)
- 05:40 (00:00)
- 05:45 (00:00)
- 05:50 (00:00)
- 05:55 (00:00)
- 06:00 (00:00)
- 06:05 (00:00)
- 06:10 (00:00)
- 06:15 (00:00)
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- 06:25 (00:00)
- 06:30 (00:00)
- 06:35 (00:00)
- 06:40 (00:00)
- 06:45 (00:00)
- 06:50 (00:00)
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- 07:45 (00:00)
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- 07:55 (00:00)
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- 08:10 (00:00)
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- 08:45 (00:00)
- 08:50 (00:00)
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- 09:05 (00:00)
- 09:10 (00:00)
- 09:15 (00:00)
- 09:20 (00:00)
- 09:25 (00:00)
- 09:30 (00:00)
- 09:35 (00:00)
- 09:40 (00:00)
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- 11:05 (00:00)
- 11:10 (00:00)
- 11:15 (00:00)
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- 11:35 (00:00)
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- 11:45 (00:00)
- 11:50 (00:00)
- 11:55 (00:00)
- 12:00 (00:00)
- 12:05 (00:00)
- 12:10 (00:00)
- 12:15 (00:00)
- 12:20 (00:00)
- 12:25 (00:00)
- 12:30 (00:00)
- 12:35 (00:00)
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- 12:50 (00:00)
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- 23:45 (00:00)
- 23:50 (00:00)
- 23:55 (00:00)
- 24:00 (00:00)

PRE-SLEEP ACTIVITY
(00:00 OPS, CHEM 315)

Do not perform
SUPPLY & WASTE DUMPS

ARRIVES (ISSA, STA)
(MED FB, MED_BAG'S)
(CR)

headmill

SAMPLE 3 STATION
(PL OPS, SEA)

SCOP-BEX (ISSA, STA) Sample
(MED FB, MED_BAG'S)

TEA TERMINATION 1
(PL OPS, SEA)

UPDATE
ORBITAL DATA
PAD

RV tracking constraint

STS-32 (FD 03)

STS

PL

MCC

MET
DAY 000

UN-SLEEP ACTIVITY
(1000 OPS, 0000-0100)

Do not perform
SUPPLY & WASTE DUMP

*minimize dumps
prior to RV*

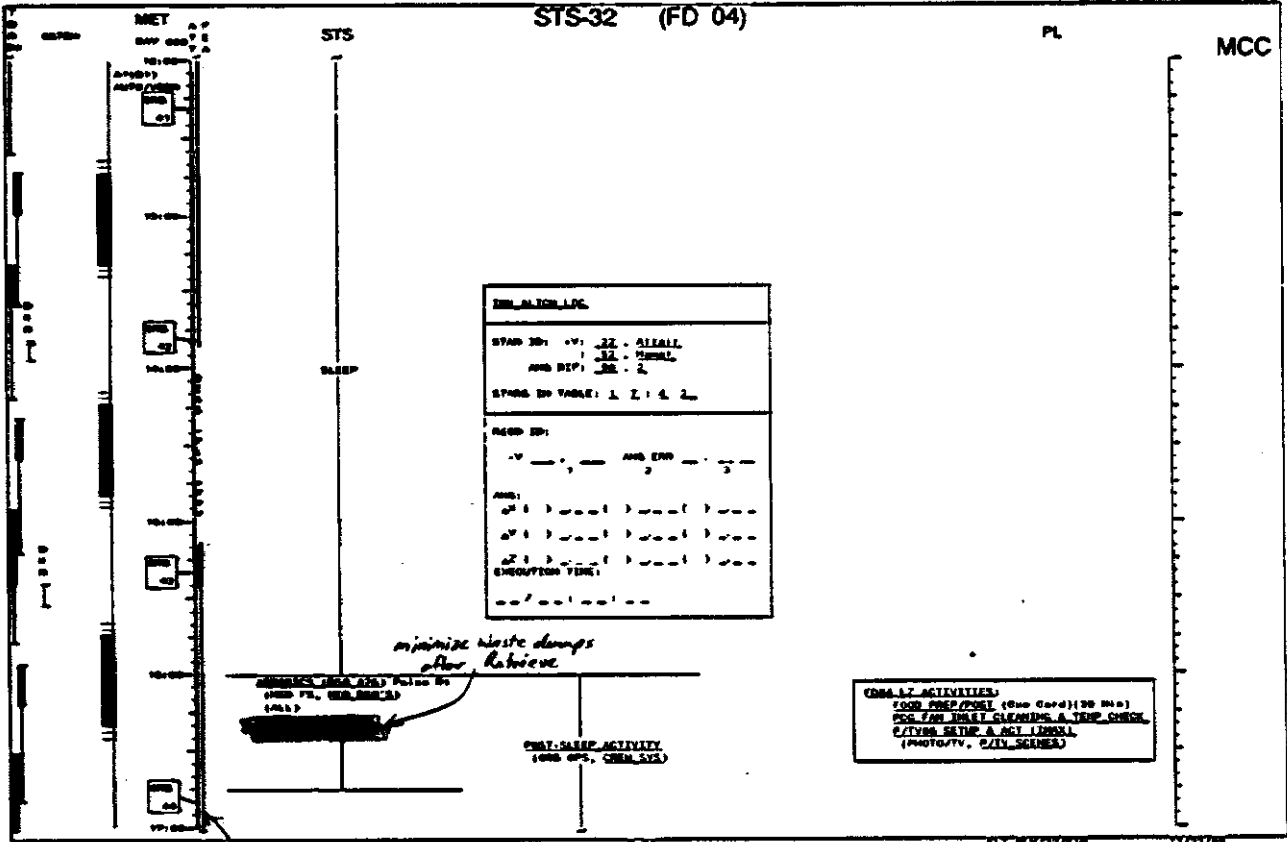
*minimize waste
dumps after Retrieve*

CEA TERMINATION 2
(PL OPS, CEA)

TV (TIME AS)
(1000 OPS, PL)

UN-SLEEP ACT.	
STND NO:	01 22 00 0000
AND STP:	00 00 00 0000
STND BY TABLE:	0 0 1 1 0
READ ID:	
01	00 00 00 0000
02	00 00 00 0000
03	00 00 00 0000
04	00 00 00 0000
05	00 00 00 0000
06	00 00 00 0000
07	00 00 00 0000
08	00 00 00 0000
09	00 00 00 0000
10	00 00 00 0000
11	00 00 00 0000
12	00 00 00 0000
13	00 00 00 0000
14	00 00 00 0000
15	00 00 00 0000
16	00 00 00 0000
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18	00 00 00 0000
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31	00 00 00 0000
32	00 00 00 0000
33	00 00 00 0000
34	00 00 00 0000
35	00 00 00 0000
36	00 00 00 0000
37	00 00 00 0000
38	00 00 00 0000
39	00 00 00 0000
40	00 00 00 0000
41	00 00 00 0000
42	00 00 00 0000
43	00 00 00 0000
44	00 00 00 0000
45	00 00 00 0000
46	00 00 00 0000
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94	00 00 00 0000
95	00 00 00 0000
96	00 00 00 0000
97	00 00 00 0000
98	00 00 00 0000
99	00 00 00 0000
100	00 00 00 0000

SLEEP



RV tracking constraint

STS-32 (FD 04)

STS

PL

MCC

70 MINUTE

• CLEAR STAR TABLE (PL OPS)

• DELTA 1000... 1. THE (1000 OPS)
 Stage 2 2000 2 (17:00)

RELEASED TIMELINE
 (1000, DELTA 1000)
 (PL OPS)

00:00 PET - 02:43 MED
 (RENDEZVOUS OPS)
 - SC 1000 - 12:15:00

TITIG

ALL (PL OPS, EEA)

POST-SLEEP ACTIVITY
 (1000 OPS, CHM 1000)

P17V11 SETUP (PEA)
 (PHOTO/TV, P/TV SCENES)

P17V11 AC (PEA)
 (PHOTO/TV, P/TV SCENES)

SAMPLE REMOVAL
 (PL OPS, EEA)

EEA OPERATIONS Sample no
 (PL OPS, EEA)
 Step 2

EEA PROCESSING Sample no
 (PL OPS, EEA)

SAMPLE & STATUS
 (PL OPS, EEA)

SAMPLE & STATUS
 (PL OPS, EEA)

P17V11 SETUP (LIBRY STBY)
 (PHOTO/TV, P/TV SCENES)

P17V11 AC (LIBRY STBY)
 (PHOTO/TV, P/TV SCENES)

MET

00:00

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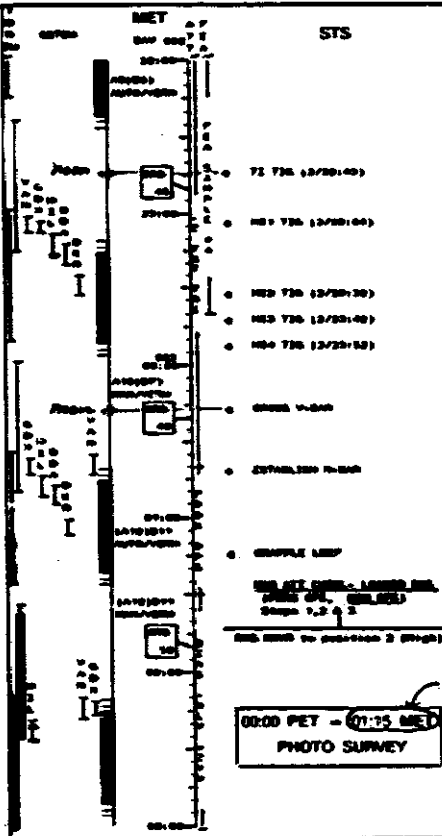
00:00

00:00

100 730 (12/10:00)

100 730 (12/10:00)

100 730 (12/10:00)



UNALIGNED

STAR ID: +V: 12 - ALPHA
 -X: 100 - ZETA-1
 ANG OFF: 11 - 1

STAR ID TABLE: 1 2 3

READ ID:
 +V -2 - ANG ERR - 3 -

ANG:
 01 - - - - -
 02 - - - - -
 03 - - - - -

EXPOSURE TIME:
 - - - - -

PL/OPS ACT ALIBET NETWORK (PHOTO/TV, LOG, MEDIA)

SEA TERMINATION 1 (PL OPS, SEA)

SEA TERMINATION 2 (PL OPS, SEA)

VIDEO SURVEY (PL OPS, LOG)

LODF PHOTO SURVEY (PL OPS)

TV (STREAM) (VIDEO OUT, PL, LOG) (VIDEO OUT, CAB)

00:00 MET - 01:25 MET
PHOTO SURVEY

LODF SAMPLE

STS-32 (FD 04)

PL

MCC

MEY

STS

NO SLEEP ACTIVITY
(NO OPS. OR LATE)

Do not perform
SUPPLY & WASTE DUMPS

NOISE (LVL) 22.1 - 20.0
10:00 09:00 08:00
ALARM/PAUSE (00:40) Into YR
Change SGP 0 to 07

SLEEP

TV (YORAN)
(NO OUTL-PLS)



11/22/78

PL/22/78

11/22/78

STS-32 (FD 05)

GSTEN

MET

DAY 005

A F P A

STS

FL

MCC



SLEEP

SCAF-REK-1886-421
10-2 2470 00-270
A/AUTO/VERN Init TRK

CRIT-SLEEP ACTIVITY
(ORB CPL, ORB SIG)

RELATION LOG

STAR ID: -V: 22 - ALMCA
L: 22 - GORRALL
ORB DEP: 02 - 2

STAR IN TABLE: L 2 : 1 1

REND ID:

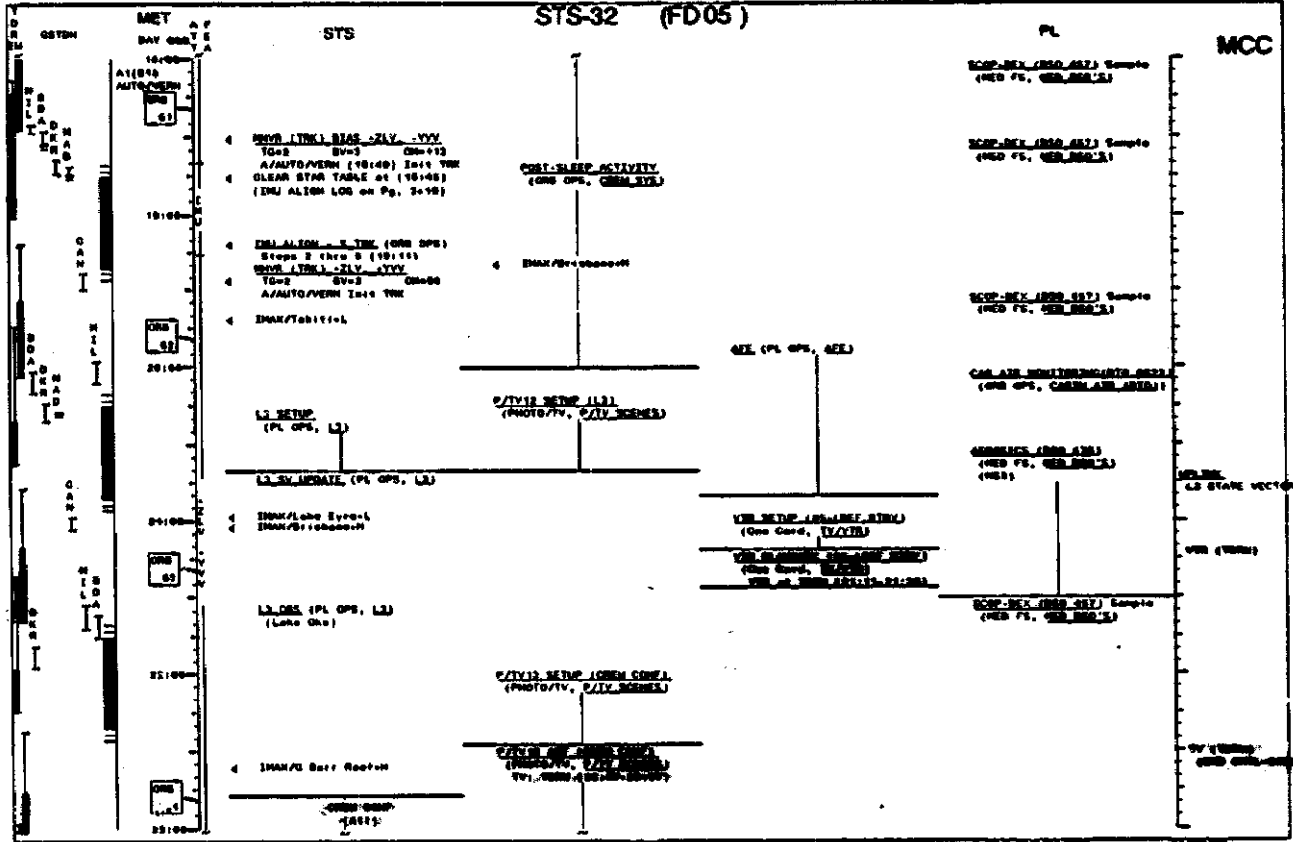
ORB:

RENDERER TIME:

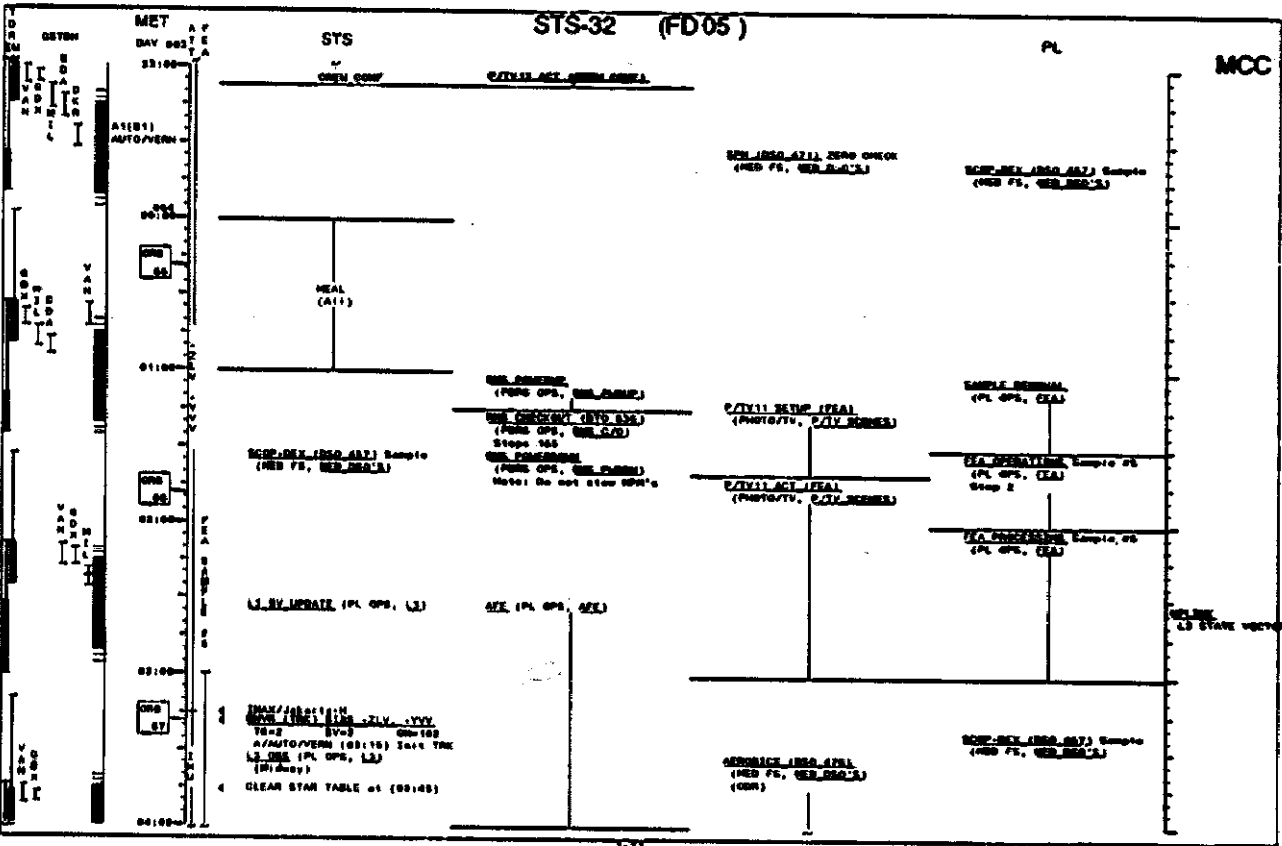
ORB ACTIVITY:
ORB DEP/POST (See Card) (20 Sec)
ORB FOR SPLIT CASING A TEST CR
C/ORB REPR A ACT (ORB)
(PHOTO/TV, CITY SCENE)
C/ORB REPR A ACT (ORB)
(PHOTO/TV, CITY SCENE)

SCAF-REK-1886-421 (1-10) 00
(REO FS, ORB, ORB, S)
(ALL)

SCAF-REK-1886-421 0000
(REO FS, ORB, ORB, S)



STS-32 (FD05)



STSTN

MET

DAY 004

STS

PL

MCC

04:00
A1(B)
AUTO/VERN

05:00
05
06

06:00
06
07

07:00
07
08

08:00
08
09

09:00

INFL ALIGN S TRK (ONS OPS)
Stops 2 thru 5 (04:15)
IMAX/Versalort Grater/H
L2 OBS (PL OPS, L2)
Revision
L2 OBS (PL OPS, L2)
L Tab

ORIG LINKS DISP ALL
TO=2 SW=5 ON=270
Pa=370 V=310 ON=270
A/AUTO/VERN Init TRK

Report today's IMAX
scenes and film usage

ORIG LINKS SLY STY
TO=2 SW=3 ON=300
A/AUTO/VERN Init TRK

SCEN FILE LIGHTING TEST
(ONS OPS, ANOS)
TO: A/06:15:00
NOTE: Do not perform
landmark track

SLEEP

L2 OBS (PL OPS, L2)
Oscrogle

ORIG SLEEP ACTIVITY
(ONS OPS, CHEM SYG)

AEROBICS (DISC 476A)
(MED FC, MED OBS'S)
(OBR)

AEROBICS (DISC 476B)
(MED FC, MED OBS'S)
(PLV)

SAMPLE 3 STAINS
(PL OPS, CIA)

SAMPLE 3 STAINS
(PL OPS, CIA)

CEA TERMINATION 1
(PL OPS, CIA)

SCOP-RUN (DISC 517) Complete
(MED FC, MED OBS'S)

CEA TERMINATION 2
(PL OPS, CIA)

INFL ALIGN LOG	
STAR ID:	4192 - SDR FERRIS
	: 22 - UNDER/ARMED
	AND DIV: 82 - 2
STARS IN TABLE: 8, 9, 1, 5	
HEAD TO:	
-V	AND ORN
1	2
AND:	
04	05
06	07
08	09
CAUTION TIME:	
04	05

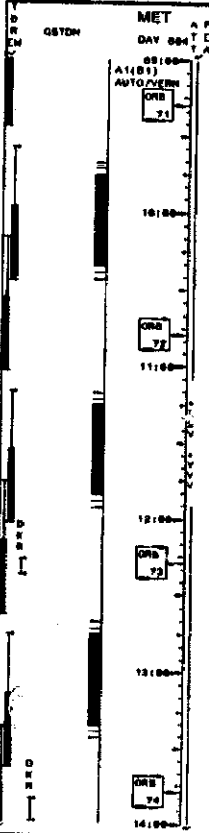
REMARK (FORM)
ADD TCA

TV (FORM)
ADD ORN, PLB

STS-32 (FD05)

PL

MCC



MET
 DAY 004
 14:00
 A(181)
 AUTO/VERN
 15:00
 16:00
 17:00
 18:00
 19:00
 MET
 DAY 004
 14:00
 A(181)
 AUTO/VERN
 15:00
 16:00
 17:00
 18:00
 19:00

STS

SLEEP

FROM EX ACTIVITIES
 (OOD PREP/POST (One Card) 100 Min)
 COC FAN INLET CLEANING & TEMP CK
 C/TVSS SETUP & ACT (MAXI)
 (PHOTO/TV, P/TV SCENER)
 P/TVSS SETUP & ACT (MAXI)
 (PHOTO/TV, P/TV SCENER)

INITIAL LOG
 STAR ID: -V: JEL, TGA, PUMBA
 : SE: Zubranshchikov, L
 AND DIR: JEL, G
 STARS IN TABLE: 1, 2, 4, 7
 NEED ID:
 -V: _____ AND DIR: _____
 AND:
 -X: _____
 -Y: _____
 -Z: _____
 EXECUTION TIME:

MOVE (1) TO BUMP ATT
 TG=2 SV=3 ON=100
 P=270 V=310 ON=270
 A/AUTO/VERN Init YNK

GEORIG (ISS 176) Pulse R1
 (MED FC, MED REQ'S)
 (ALL)

4 MOVE LINK L BEAS -ZAV -YVY
 TG=2 SV=3 ON=100
 A/AUTO/VERN (17:10) Init YNK
 4 CLEAR STAR TABLE at (17:10)

POST SLEEP ACTIVITY
 (ONS OPS, OPEN SIZ)

CCS REGMATH REGNICHIME
 07:00 No PRESS at (3:00) (CL (10:0P)
 0 (3:00) = OPC (10:0P)
 A (3:00) = OL (10:0L)

L3 SV UPRATE (PL OPS, L3)

4 INAK/Initial

CABIN TEMP CTRL REGNICHIME
 08:00 Fin CAB TEMP CTRL detector
 (change to actuator 2
 L1 CABIN TEMP CTRL - 2

VCP-REQ (ISS 187) Sample
 (MED FC, MED REQ'S)

GEORIG
 L3 STARE VCP-REQ

4 ISL ALIGN S YNK (ONS OPS)
 Steps 2 thru 5 (17:47)
 MOVE LINK L -ZAV -YVY
 TG=2 SV=3 ON=100
 4 A/AUTO/VERN Init YNK

4 INAK/Initial

P/TV11 SETUP AREA
 (PHOTO/TV, P/TV SCENER)

SAMPLE REMOVAL
 (PL OPS, SEA)

L3 ONS (PL OPS, L3)
 (Kingston)

HUMIDITY SEP REGNICHIME
 L1 HUMIDITY SEP = OFF
 A = ON

P/TV11 AC AREA
 (PHOTO/TV, P/TV SCENER)

SEA OPERATING Sample 04
 (PL OPS, SEA)
 Step 2

FC PURGE MANUAL (One Card)

STS-32 (FD 06)

MET

GSTON

DAY 004
TE
A

STS

PL

MCC

18:00

ATRS)
AUTO/VER

EC_PURGE_MAMMAL (One Card)

4EL (PL OPS, 4EL)

C/TVS1 ACT (FEAL)
(PHOTO/TV, C/TV SCENES)

CEA PROCESSING Sample 00
(PL OPS, CEA)

HEATER RECONFIG (ONS OPS)

4 PCS 1212 CONFIG (ONS OPS) (20ms)
IMAX/78/Robate-H

4 ECSS_BURNING COMPONENT C/D
(ONS OPS, ECSS)

ONS
78

20:00

4 IMAX/Max City-H

4 CAB AIR MONITORING (BITD 0622)
(ONS OPS, CABIN_AIR_BITD)

21:00

4 IMAX/Lake Eyre-L
6 IMAX/Gap Channel-L

ONS
78

4 L3_OPS (PL OPS, L3)
(Montezza)

22:00

4 C/TVS1 SETUP AIRBORNE ACT1
(PHOTO/TV, C/TV SCENES)
(ONS CHOCICE)

4 FILTER CLEANING
(17H, SCHEDULED MAINTENANCE)

ONS
80

4 IMAX/D Station
AS Barrier Reol-M

4 C/TVS1 ACT AIRBORNE ACT1
(PHOTO/TV, C/TV SCENES)
TV: 700M (22:00-22:04)

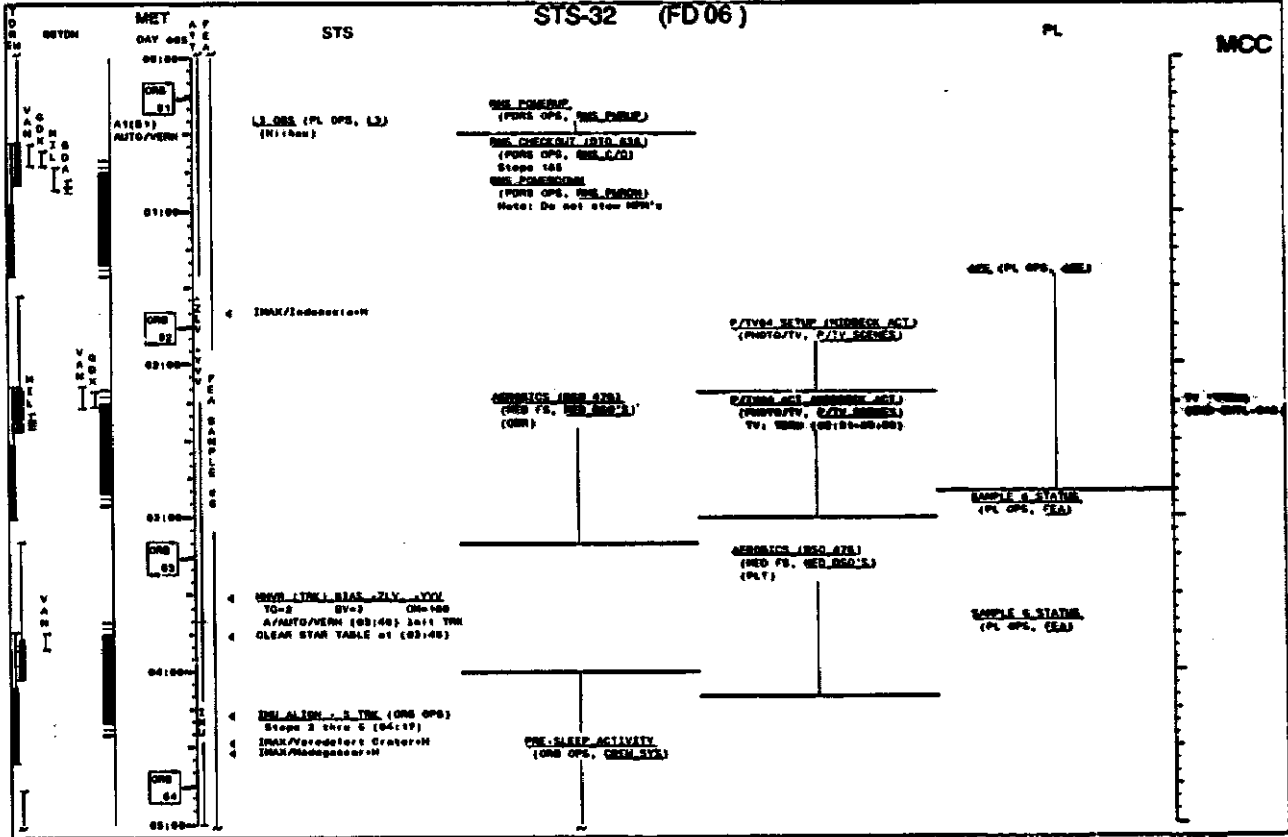
4 L3_EV_UPDATE (PL OPS, L3)

23:00

MEAL
(ALL)

00:00

STS-32 (FD 06)



STS-32 (FD06)

MCC

PL

MET

STS

QSTN

DAY 096

A F C

T C

A

05:00

A1(81)

AUTO/VERN

WOL. LBR. DMB. AIL
TG=2 SW=6 08-370
P=270 V=210
A/AUTO/VERN Init TRK

Report today's IMAX
scores and film usage

CEA_TERMINATION_1
(PL OPS, CEA)

SCOP. REV. (REQ. SET) Tempa
(REQ FR, MED. REQ'S)

CR. SLEEP ACTIVITY
(ONE OPS, CREW SYS)

06:00

ORB

85

CEA_TERMINATION_2
(PL OPS, CEA)

WOL. (TRK) . FLY . VVV
TG=2 SW=3 08-00
A/AUTO/VERN Init TRK

07:00

ORB

86

08:00

SLEEP

09:00

ORB

87

10:00

TV (TIME AS)
(ORB ORTL-PL)

DELTAION LOG

STAR ID: -VI 121 - 2nd. Curria
: SE - Cabanacchelli
AND DIR: 121 - 0

STARTS ON TABLE: S.G.: 1. Z

HEAD ID:

-V --- 1 AND ORN --- 2

AND:

2 1 | | | | |

2 1 | | | | |

2 1 | | | | |

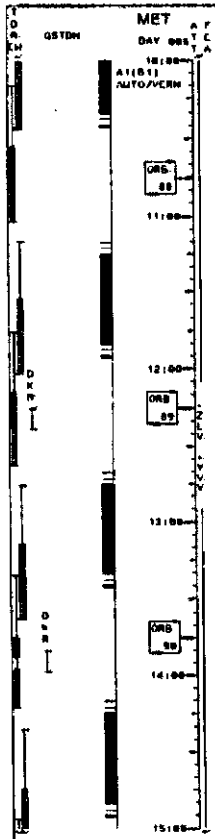
EXECUTION TIME:

2 1 | | | | |

STS-32 (FD07)

PL

MCC



STS

SLEEP

TIME ALIGN LOG

STAR ID: +V 187 - SUN PANGLOSS
 1 CR - Zehrschmitt
 ANG DEF: 181 - 6

STARS IN TABLE: 1 2 - 4 5

REQ ID:

+V _____ ANG COR _____
 1 2 2

ANG:

a1 () () () () () () () ()
 a2 () () () () () () () ()
 a3 () () () () () () () ()

EXECUTION TIME:
 - - - - -

STS-32 ACTIVITIES

COOL DRY PANEL (One One(180) One)

MCC FAN INLET CLEANING & TEMP CR.

C/TVS BEING & ACT. (180)

(PHOTO/TV, C/TV SCENES)

C/TVS BEING & ACT. (180)

(PHOTO/TV, C/TV SCENES)

STS-32 (FD07)

PL

MCC

MET

STS

ADMINISTRATIVE (REQ. AIR) Portals Of
(REQ FS, CDR, SMO, S, I)
(ALL)

LEW (REQ. AIR) Group
(REQ FS, CDR, SMO, S, I)
(2 Ops)

LEW (REQ. AIR)
(REQ FS, CDR, SMO, S, I)
Test Prep
(REQ (REQ. AIR) Group
(REQ FS, CDR, SMO, S, I)
(NS)

LEW (REQ. AIR)
(REQ FS, CDR, SMO, S, I)
Crew/Reconfig

LEW (REQ. AIR) Group
(REQ FS, CDR, SMO, S, I)
(NS)

LEW (REQ. AIR)
(REQ FS, CDR, SMO, S, I)
Crew/Reconfig

LEW (REQ. AIR)
(REQ FS, CDR, SMO, S, I)
Test Prep

CONT. SLEEP ACIVITY
(ONE OPS, CDR, SMO)

4 INK/Tail-1-L

CAR AIR MONITORING (REQ. AIR)
(ONE OPS, CDR, SMO, S, I)

C/TVM SETUP (HUBBARD AC)
(PHOTO/TV, C/TV, SMO, S, I)

MON. LINK. SMO. AIR
T0-2 S0-2 00-101
P0-270 Y0-210 00-270
A/AUTO/VERN Init TRK

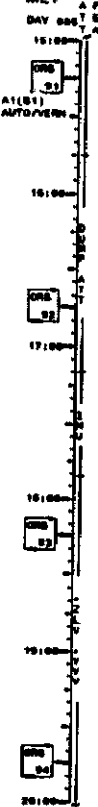
4 MON. LINK. SMO. AIR - YYY
T0-2 S0-2 00-101
A/AUTO/VERN (17:10) Init TRK
4 CLEAR STAR TABLE at (17:10)

4 INK ALIGN. S TRK (ONE OPS)
Stage 2 (Inv 5 (17:00))
MON. LINK. SMO. AIR
T0-2 S0-2 00-00
4 A/AUTO/VERN Init TRK

L3, SMO, SMO, (PL OPS, L3)

4 INK/Tail-base-H

4 INK/Tail City-H



Vertical text on the left side of the page, including 'LINK', 'AUTO/VERN', and 'MET'.

LEW (REQ. AIR)
L3 STAGE SECTION

STS-32 (FD07)



20:00
21:00
22:00
23:00
00:00
01:00

INAK/S Barr Roof+H / Cap Operational

INAK/S Barr Roof+H
INAK/How Outlook+H
AS Barr Roof+H

NEAL (A11)

L3_OES (PL OPS, L3)
(Maintenance)
INAK/How Galileo-L

OPS POWERUP
(POWS OPS, OPS_POWER)

OPS CHECKOUT (D10-41A)
(POWS OPS, OPS_C/R)
Steps 1&2

INJ_ALIGN.LOG

STAR ID: *V: J8Z, Sba, Panna
J8A, Zuharsalalball
ANG DIR: 181, S

STARS IN TABLE: 2, 4, 1, 5

REQ ID:
*Y --, --, --, --, --, --
ANG:
Δ1 () () () () ()
ΔY () () () () ()
ΔZ () () () () ()
EXECUTION TIME:
-- -- -- -- --

C/TVM ACT. (GENERAL)
(PHOTO-TV, C/TV SCENES)
TV: TIME (20:24-20:26)

C/TVM SETUP (GENERAL)
(PHOTO-TV, C/TV SCENES)

C/TVM ACT. (GENERAL)
(PHOTO-TV, C/TV SCENES)

C/TVM SETUP (GENERAL)
(PHOTO-TV, C/TV SCENES)

C/TVM ACT. (GENERAL)
(PHOTO-TV, C/TV SCENES)

C/TVM SETUP (GENERAL)
(PHOTO-TV, C/TV SCENES)

PL

LONG (ARR-ARR) Group
(MED FS, OBS, RECAL)
(M3)

LONG (ARR-ARR) Group
(MED FS, OBS, RECAL)
Green/Recording

LONG (ARR-ARR) Group
(MED FS, OBS, RECAL)
(M3)

LONG (ARR-ARR) Group
(MED FS, OBS, RECAL)
Green/Recording

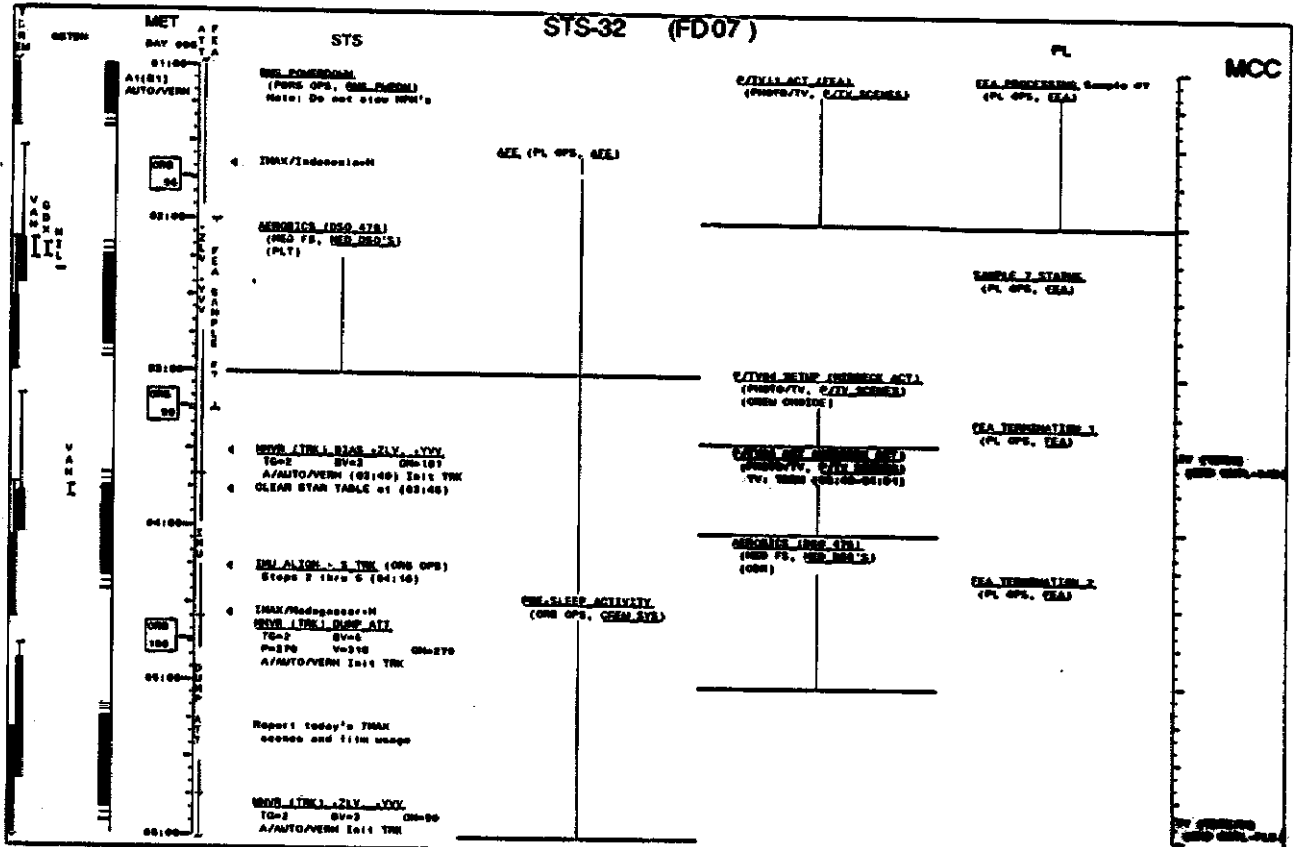
LONG (ARR-ARR) Group
(MED FS, OBS, RECAL)
(M3)

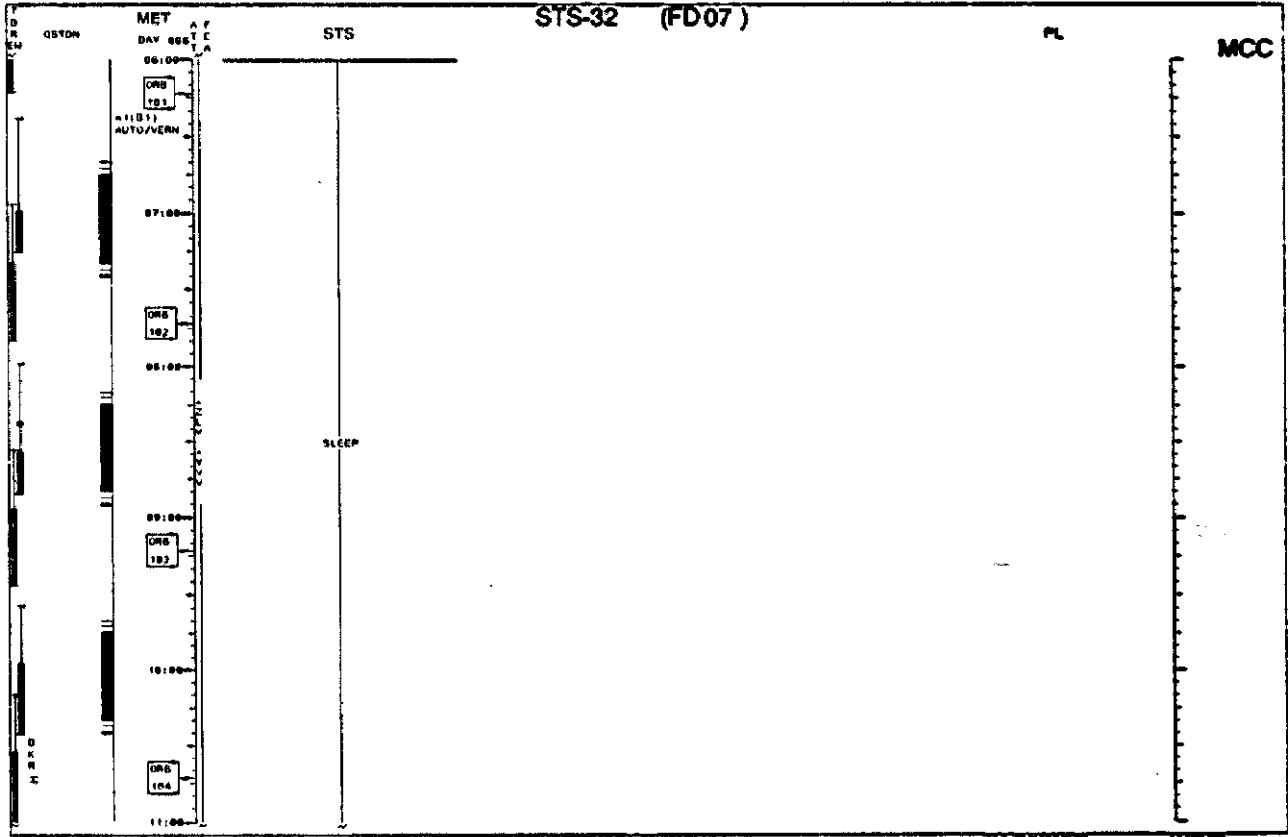
SAMPLE MANUAL
(PL OPS, CAL)

PL OPERATING Sample of
(PL OPS, CAL)
Step 2



STS-32 (FD07)





STS-32 (FD08)

PL

MCC

STS

MET

DAY

TIME

11:00

11:15

11:30

11:45

12:00

12:15

12:30

12:45

13:00

13:15

13:30

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20:30

20:45

21:00

21:15

21:30

21:45

22:00

22:15

22:30

22:45

23:00

SLEEP

NOISE LEVELS OVER ALL
15-20 dB
14-20 dB
14-20 dB
14-20 dB

OTHER EX ACTIVITIES:
FOOD PREP/POST (Crew Cab) (30 Min)
PDC FAN INLET CLEANING & TEMP CK
P/TYRS SETUP & ACT (IMAX)
(PHOTO/TV, P/TV SCENES)
P/TYRS SETUP & ACT (IMAX)
(PHOTO/TV, P/TV SCENES)

ACROBICS (MED. INT.) P/tee R1
(MED FG, MED. DMR'S)
(ALL)

P/TYRS SETUP (MIDWICK ACT)
(PHOTO/TV, P/TV SCENES)
(CREW CHOICE)

CRUI. SLEEP ACTIVITY
(ONS OPS, CREW SYS)

P/TYRS ACT. (MIDWICK ACT)
(PHOTO/TV, P/TV SCENES)
TV: TIME (17:30-18:45)

TV (TIME)
(ONS CRTL-CAB)

11

STS-32 (FD08)

MET

STS

PL

MCC

MEET/ARRIVE TIME
(MED OPS, GCS)

ORBIT/SLIP ACTIVITY
(MED OPS, GCS/SIS)

OPS OPS 1250 4711
(MED FS, MED OPS'S)
PS Activation

LINE 1250 4711
(MED FS, MED OPS'S)
Test Prep
LINE 1250 4711 Book
(MED FS, MED OPS'S)
(MS)

- MEET TIME 1250 4711
TIME 0945 0950
ARRIVE/DEPART (17:00) 2000 THE
- CLEAN STND TABLE at (17:00)

LEAVE/ARRIVE (PL OPS, L3)

- MEET/ARRIVE TIME (MED OPS)
Book 2 2000 5 (17:00)
MEET/ARRIVE TIME
TIME 2000 0900
ARRIVE/DEPART 2000 THE

• 2000/2000:00

LEAVE (PL OPS, L3)
(Logone)

CIVIL SERVICE INTERVIEW ACT.
(PHOTO/TV, P/TV SCENES)

CIVIL SERVICE INTERVIEW ACT.
(PHOTO/TV, P/TV SCENES)
TV: 2000 (10:30-20:00)

CAR AIR MOUNTING/REPAIRS 2022
(MED OPS, CAR/AN/REPAIR)

LEAVE (PL OPS, L3)
(MS)

UPLINK
L3 STATE VECTOR

TV (2000)
(MED OPS/048)

- 2000/2000:00

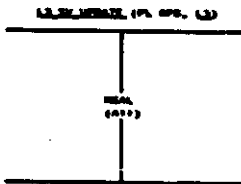
STS-32 (FD08)

STS

PL

MCC

MEY



L3 OPS (PL OPS, L3)
(Phase 1a)
L3 OPS (PL OPS, L3)
(Auto Stop)

REL. ENGINE
(PL OPS, REL. ENGINE)
REL. ENGINE (PL OPS)
(PL OPS, REL. C/U)
Stop 100
REL. ENGINE
(PL OPS, REL. ENGINE)
Note: Do not start REL's

ALPHONICS (ISSO 478)
(MED FS, MED DSO'S)
(PLT)

REL (PL OPS, REL)

ALPHONICS (ISSO 478)
(MED FS, MED DSO'S)
(PLT)

ALPHONICS (ISSO 478)
(MED FS, MED DSO'S)
Egress/Manoeuv'g

UPLINK
L3 STATE VECTOR

REL. ALPHONICS			
STAR ID:	V:	Z:	ALPHONICS
		RA:	ZUBRALLANAKH
ANG DIST:	182		1
STAR IN TABLE: L Z: 4.2			
REQD ID:			
V	ANG	ERR	
1	2	3	
ANG:			
A1			
A2			
EXECUTION TIME:			

Report Vector's Error
Source and Value usage

MET

STS

AERONICS (REQ. STA.)
(REQ. FS, SER. DESIG.)
(PLT)

- WIND ATLAS READ - ZIV - ADD
FD-2 Ser-3 (00:00)
- ALARM/VERB (00:10) Test TIM
CLEAR STAR TABLE at (00:15)

- INEL_ALIGN - S TIM (000 OPS)
Seque 2 thru 6 (00:40)
- WIND ATLAS COMP - ALL
FD-2 Ser-5
FD-270 Ver-370 (00:270)

INEL_ALIGN_ACTIVITY
(000 OPS, CHEM SUS)

WIND ATLAS - ZIV - ADD
FD-2 Ser-3 (00:00)

SLEEP

INEL_ALIGN_LOG	
STAR ID:	SV: 22, ALPHA
ANG DIR:	41, CARRIAGEBALL
	188, 1
STARS IN TABLE: 2, 2, 4, 6	
REQ ID:	
SV	ANG ERR
1	2
ANG:	
01	() () () ()
02	() () () ()
03	() () () ()
EXECUTION TIME:	
- - - - -	

TV (TIME) (000 OPS, PL)

STS-32 (FD08)

PL

MCC

MET

DAY OFF

ASSTS
AUTOVERM

179

08:00

179

09:00

179

10:00

11:00

12:00

STS

SLEEP

MET
ON STS

STS

OTHER ACTIVITIES:
 (CON FIM) (POST) (Good Good) (30 min)
 (CON FIM) (MET) (CLERK) (30 min)
 (CON FIM) (MET) (ACT) (30 min)
 (CON FIM) (MET) (ACT) (30 min)
 (CON FIM) (MET) (ACT) (30 min)

SLEEP

GROSSICS (ISSG 478) Pulver Rt
 (MED FS, MED_DSO'S)
 (ALL)

ISSALINE LOG

STAR ID: -V: 72. ALINCA
 : 48. Zehenschmall
 ANG DIP: 188. 1

STARS IN TABLE: 1 2 1 3

REG ID:

*V --- , --- ANG ERR --- 3 ---

ANG:

a1 () --- () --- () --- () ---

a2 () --- () --- () --- () ---

EXECUTION TIME:

--- () --- () ---

ISSG (ISSG 478)
 (MED FS, MED_DSO'S)
 Test Prep
 ISSG (ISSG 478) Ramp
 (MED FS, MED_DSO'S)
 (RBS)

ISSG (ISSG 478)
 (MED FS, MED_DSO'S)
 Express/Receipting

ISSG (ISSG 478) Book
 (MED FS, MED_DSO'S)
 (RBS)

PORT SLEEP ACTIVITY
 (ISSG OPS, CHG 515)

ISSG (ISSG 478)
 ISSG (ISSG 478) ALL
 Test Prep
 ISSG (ISSG 478) ISSG OPS
 ISSG (ISSG 478) ISSG OPS

ISSG (ISSG 478) ISSG OPS
 ISSG (ISSG 478) ISSG OPS
 ISSG (ISSG 478) ISSG OPS

ISSG (ISSG 478) ISSG OPS (ISSG OPS)

ISSG (ISSG 478) ISSG OPS (ISSG OPS)

ISSG OPS (ISSG 478)
 (MED FS, MED_DSO'S)
 of Deactivation

ISSG (ISSG 478) ISSG OPS (ISSG OPS)
 ISSG (ISSG 478) ISSG OPS (ISSG OPS)
 ISSG (ISSG 478) ISSG OPS (ISSG OPS)

ISSG (ISSG 478) ISSG OPS (ISSG OPS)

ISSG (ISSG 478) ISSG OPS (ISSG OPS)

STS-32 (FD09)

MET

STS

PL

MCC

LINE 1 (P. OPS. L3)
(Thru) (b)

CAMERA RETINE (MIRRORED ACT)
(PHOTO/TV, P.O.D. SCENES)

LINE 1 (RSD. 475) Book
(MED. FD, MED. DRUGS)
(MS)

CAMERA ACT (MIRRORED ACT)
(PHOTO/TV, P.O.D. SCENES)
TV: YARD (77:57-10:00)

TV (TDAU)
(DUAL CONTL-
"CAS")

CAR AIR MONITOR (MIRRORED ACT)
(MED. OPS., CARBON AIR, IRIS)

LINE 1 (P. OPS. L3)
(Thru) (b)

LINE 1 (RSD. 475)
(MED. FD, MED. DRUGS)
Egress/Monitoring

LINE 1 (RSD. 475)
As Service Monitor

LINE 1 (RSD. 475)

STS-32 (FD 09)

PL

MCC

MET
 DAY OFF: **1**
 ADDITIONAL
 COMMENTS:

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 0100
 0200
 0300
 0400
 0500
 0600
 0700
 0800
 0900
 1000
 1100
 1200
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 1400
 1500
 1600
 1700
 1800
 1900
 2000
 2100
 2200
 2300
 2400

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 1200
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 1900
 2000
 2100
 2200
 2300
 2400

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 0100
 0200
 0300
 0400
 0500
 0600
 0700
 0800
 0900
 1000
 1100
 1200
 1300
 1400
 1500
 1600
 1700
 1800
 1900
 2000
 2100
 2200
 2300
 2400

STS

or
TEAM
(ALL)

L1, W, SERVICE (PL OPS, L3)

● **ISSUE/Ingress-out**

L1, W (PL OPS, L3)
 (St+hand)

L1, W (PL OPS, L3)
 (600sec 1)

ISSU/INSTR (PL)
(ISSU FC, ISSU, ISSU)
(ALL)

● **ISSU/Ingress-out**

L1, W (PL OPS, L3)
 (Timover)

L1, W (PL OPS, L3)
 (St+hand)

● **ISSU/INSTR, ISSU, ISSU, ISSU**
 (ISSU FC) 0000 0000
 ● **ISSU/INSTR (ISSU) 1000 1000**
 ● **ISSU/INSTR (ISSU) 1000 1000**

● **ISSU/INSTR, ISSU (ISSU OPS)**
 Steps 3 thru 5 (00:00)
 ● **ISSU/Ingress-out**

ISSU/INSTR
(ISSU OPS, ISSU, ISSU)

ISSU/INSTR (ISSU, ISSU)
(ISSU OPS, ISSU, ISSU)

ISSU/INSTR
(ISSU OPS, ISSU, ISSU)
 Note: Do not allow ISSU's

ISSU (PL OPS, ISSU)

ISSU/INSTR (ISSU, ISSU)
(ISSU OPS, ISSU, ISSU)
(ISSU, ISSU)

ISSU/INSTR (ISSU, ISSU)
(ISSU OPS, ISSU, ISSU)
 TV: 1000 (00:22-00:47)

ISSU/INSTR (ISSU, ISSU)
(ISSU FC, ISSU, ISSU)
(ISSU)

ISSU/INSTR (ISSU, ISSU)
(ISSU FC, ISSU, ISSU)
(PL 1)

ISSU/INSTR (ISSU, ISSU)
(ISSU OPS, ISSU, ISSU)

ISSU/INSTR
(ISSU STATE VECTOR)

ISSU (ISSU)
(ISSU, ISSU, ISSU)

STS-32 (FD09)

MEY

STS

PL

MCC

06700

00:00

00:05

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05:00

00:00:00:000
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PRE-SLEEP ACTIVITY
 (END OPS. CHIM SYS)

00:00:00:000
 00:00:00:000
 00:00:00:000

SLEEP

INITIALS, LOC.	
STAR ID: +V	ES: SIGNALS
	IS: SLEIGH
AND DEP: IS: 2	
STAR IN TABLE: 8, 2, 4, 6	
REQ ID:	
+V	AND ERR
1	2
AND:	
AZ	() () () () () ()
AZ	() () () () () ()
AZ	() () () () () ()
EXECUTION TIME:	
.	

TV (TUNE) +
 (END ONT-PLS)

STS-32 (FD'99)

PL

MCC

MET

00:00

01:00

02:00

03:00

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05:00

06:00

07:00

08:00

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22:00

23:00

STS

SLEEP

STS-32 (FD10)

STS

PL

MCC

GENERAL (ISS, STS) Polys No
 (ISS FS, ISS, ISS, ISS)
 (ISS)

CRIB EX ACTIVITIES:
 ISS PREP/POST (See Schedule Item)
 ISS ISS TRIP/ISSISS A TIME ISS
 CRIBING SCENE A ACT (ISS)
 (PHOTO/TV, C/TV SCENE)
 CRIBING SCENE A ACT (ISS)
 (PHOTO/TV, C/TV SCENE)

ISSUATION LOG

STAR ID: 1: 11 : ALABAMA
 : 22 : ALABAMA
 AND DIP: 15 : 2

STARS IN TABLE: 1.6 : 1.2

REGD ID:

1 2 3
 1 2 3

AND:

1 2 3 4 5 6 7 8 9 10
 1 2 3 4 5 6 7 8 9 10
 1 2 3 4 5 6 7 8 9 10
 EXECUTION TIME:

1 ISSUATION

ISSUATION ISSUATION
 ISSUATION ISSUATION
 ISSUATION ISSUATION

ISSUATION ISSUATION
 (ISSUATION ISSUATION)

2 ISSUATION
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3 ISSUATION
 ISSUATION ISSUATION
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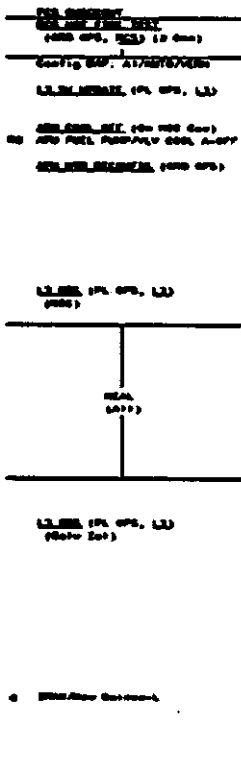
ISSUATION
 (ISSUATION ISSUATION)

ISSUATION ISSUATION
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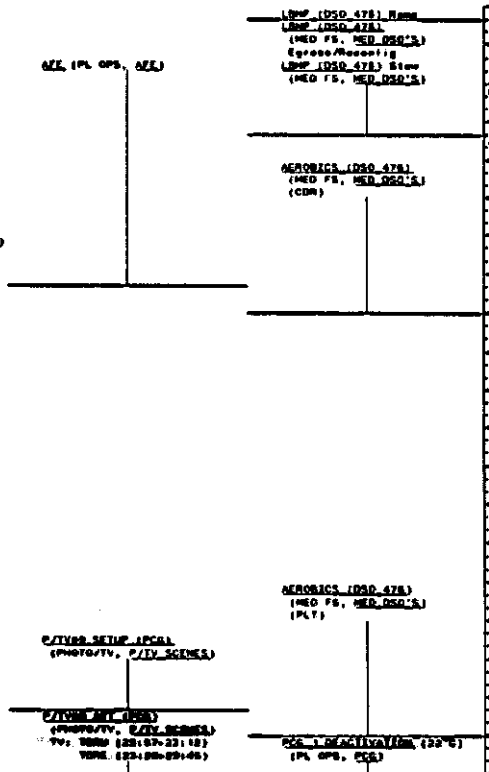
ISSUATION ISSUATION
 (ISSUATION ISSUATION)
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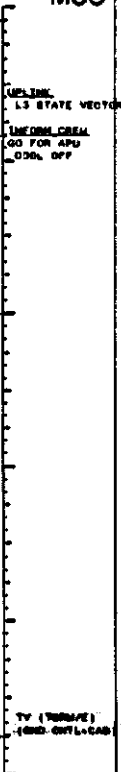
STS



PL



MCC



CAR AIR DISTRIBUTION (2800)
(ONE OPS, CARBON AIR, (RIG))

L3.000 (PL OPS, L3)
(Photo/TV)

CAMERA SETUP (PL OPS)
(PHOTO/TV, P/TV SCREENS)

CAMERA (PL OPS)
(PHOTO/TV, P/TV SCREENS)
TV: 2800 (28:07-22:12)
VME: 2800 (28:07-22:12)

LAMP (DSD 478), HALL
LAMP (DSD 478)
(MED FS, MED DSD'S)
Egress/Passage
LAMP (DSD 478) Stow
(MED FS, MED DSD'S)

AERONICS (DSD 478)
(MED FS, MED DSD'S)
(CDR)

AERONICS (DSD 478)
(MED FS, MED DSD'S)
(PLT)

PLC - 1 (PL OPS, L3)
(PL OPS, CCL)

WEL-INK
L3 STATE VECTOR
INFORM CREAM
GO FOR APU
DSD OFF

TV (VOR/VE)
(DSD ONTL-CAB)

STS-32 (FD 10)

NET
00:00
00:30

STS

PL

MCC

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CARD 00P16/270
(A11)

E/TYPE-REV. (LSD)
(PHOTO-TV, E/TM SCENES)

ECCL 2 DEACTIVATION (22'0)
(% OPS, ECL)

E/TM SETUP (MINIMUM ACT)
(PHOTO-TV, E/TM SCENES)
(GREEN CHOICE)

E/TYPE-REV. (LSD)
(PHOTO-TV, E/TM SCENES)
TV: YNN (00:55-01:00)

TV (TYPE)
(OND ONTL-CAR)

- WDS (TIME) READ... (00:00)
- CLEAR SCEN TABLE... (00:10)
- INSTALL... (00:00)
- WDS... (00:00)

CHK-SAMP ACTIVITY
(000 OPS, CHEN SYX)

INSTALLATION LOG		
STAR ID:	• V: SA	ALBACK
	:	25 AC/SCENES
	AND DIF:	24 - 2
STARS IN TABLE: 0, 2, 1, 5, 2.		
REQ ID:		
• V	---	AND ERR ---
01	---	---
02	---	---
03	---	---
04	---	---
05	---	---
EXECUTION TIME:		
---	---	---

MET

STS-32 (FD 10)

PL

MCC

STS

ORBITAL DATA LOG
 TIME OF DAY GROUP
 APPROXIMATE TIME

PRE-SLEEP ACTIVITY
 (END OPS, ORBITAL)

• SLEEP ACTIVITY

Report today's SLEEP
 TIMES and TIME RANGE

STOP TIME GROUP

TV (BREAK)
 (END ORBITAL)

SLEEP

STS-32 (FD 11)

PL

MCC

NET
DAY
NIGHT

STS

SLEEP

NON-SLEEP ACTIVITY
T000 0000 0000
T000 0000 0000
AUTO-REM 0000 0000

POST-SLEEP ACTIVITY
(END OF CHN 500)

SERVICE (END OF) Pulse Rt
(END FS, END 0000)
(ALL)

NET

STS

PL

MCC

• REPLACEMENT OF THE 1000 GPC
 1000 GPC (1000 GPC)
 ASSIGNED (1000 GPC) See THE
 BOARD SETUP PAD at (1000 GPC)
 Change SET 2 to 10

• REPLACEMENT OF THE 1000 GPC
 Steps 2 (1000 GPC) (1000 GPC)
REPLACEMENT OF THE 1000 GPC
 1000 GPC (1000 GPC)
 ASSIGNED (1000 GPC) See THE
 BOARD SETUP PAD at (1000 GPC)
 Change SET 2 to 10

PRE-FLIGHT ACTIVITY
 (1000 GPC, 1000 GPC)

CAR AIR MONITORING (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (PL OPS, 1000 GPC)

SPN OPS (1000 GPC)
 (1000 GPC, 1000 GPC)
 Description

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)
 (1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)
 (1000 GPC, 1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

Go to DEORBIT PREP at 9/16:35 MET

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)
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FOR 2 DEACTIVATION (1000 GPC)
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FOR 2 DEACTIVATION (1000 GPC)
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FOR 2 DEACTIVATION (1000 GPC)
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FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
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FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

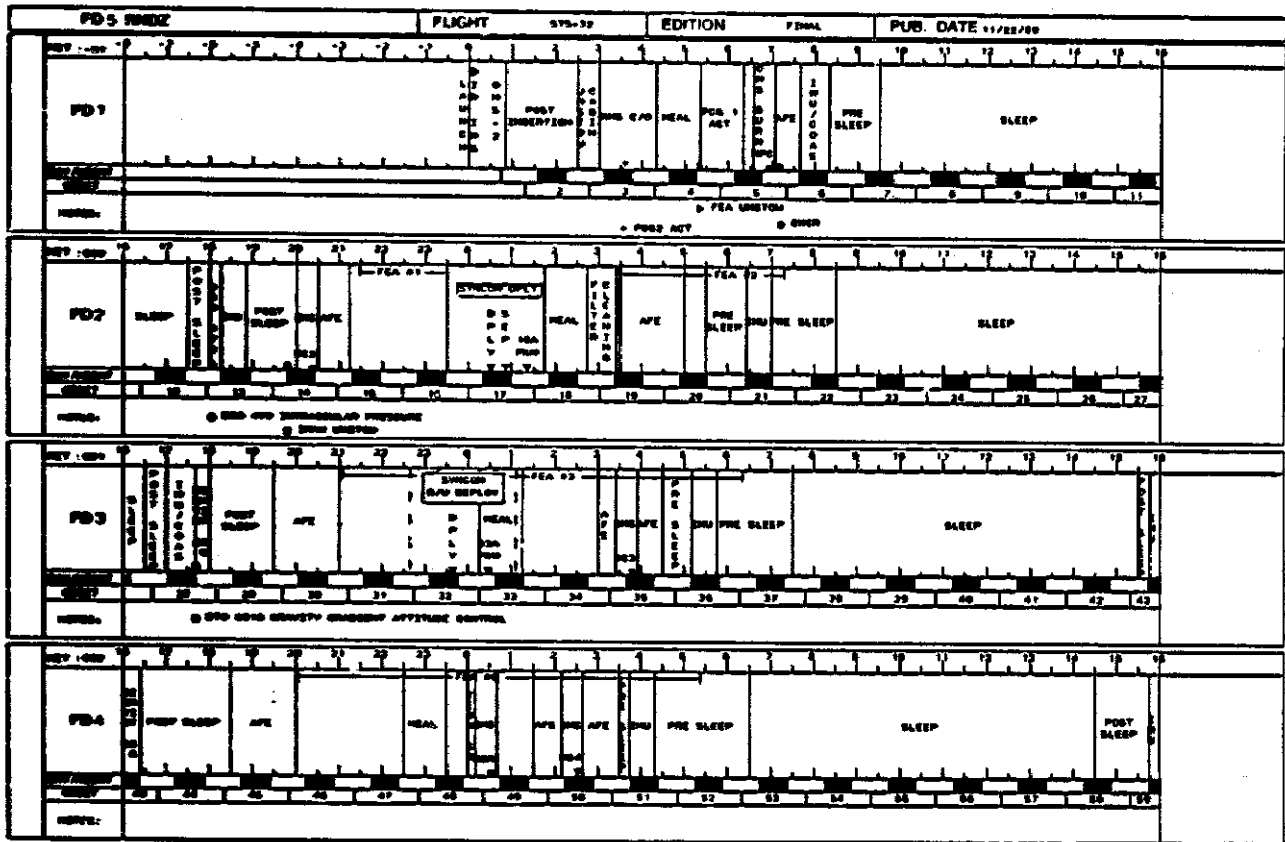
FOR 2 DEACTIVATION (1000 GPC)
 (1000 GPC, 1000 GPC)

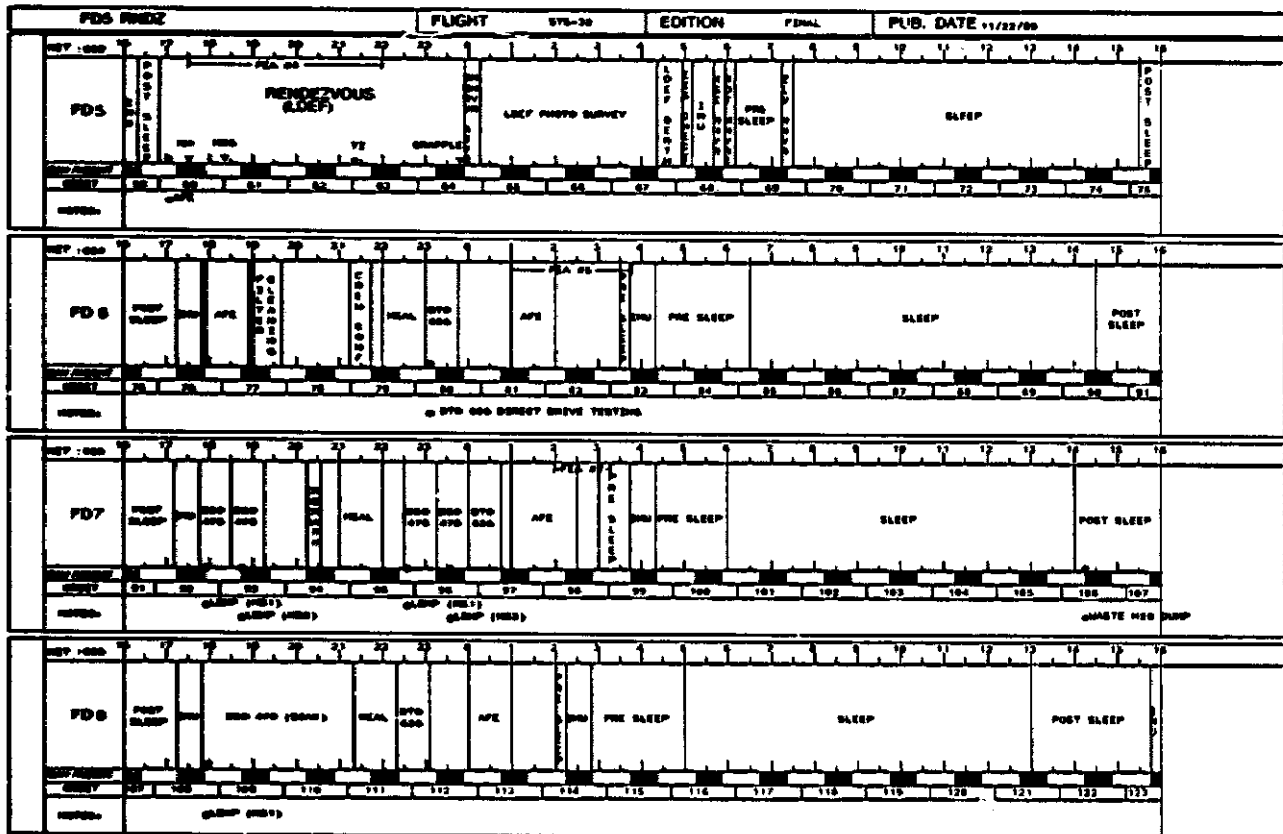
CONTINGENCY TIMELINES

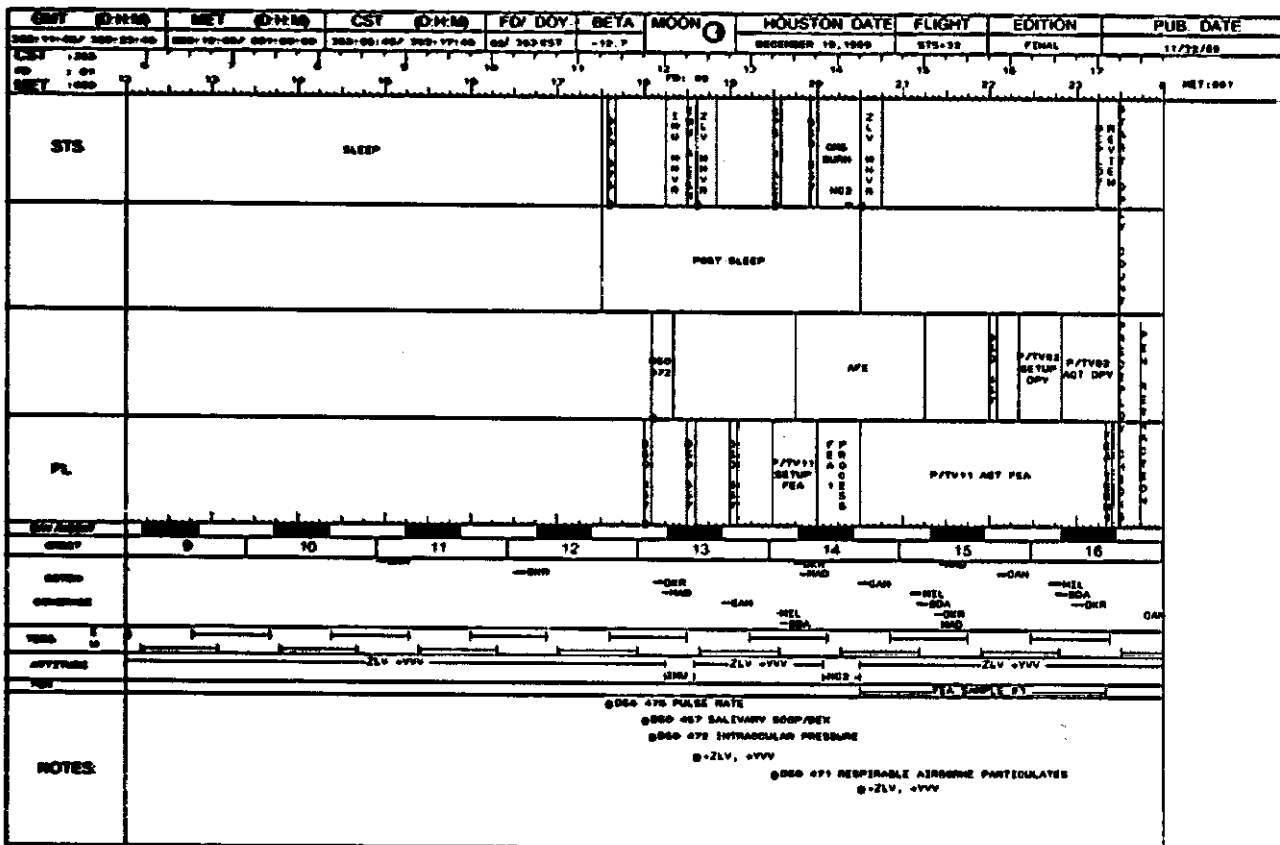
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FLIGHT DAY 5 RENDEZVOUS

The Flight Day 5 Rendezvous Timeline is designed to accommodate delaying LOEF Retrieval to the fifth flight day. In order to maximize the accomplishment of mission objectives, the flight plan will, in general, undergo changes. This timeline assumes the decision to delay to flight day 5 was made at launch. The timeline is based on the nominal Cycle 2R trajectory.







DAY	TIME	SET	TIME	CSV	TIME	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
CSY	1:00	001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
CSY	1:00	001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
STG		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
FL		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
NOTES		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69

DAY	TIME	SET	TIME	CSV	TIME	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
CSY	1:00	001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
STG		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
FL		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
NOTES		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69

DAY	TIME	SET	TIME	CSV	TIME	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
CSY	1:00	001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
STG		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
FL		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
NOTES		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69

DAY	TIME	SET	TIME	CSV	TIME	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
CSY	1:00	001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
STG		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
FL		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69
NOTES		001:00-00/	001:10:00	200:17:00/	200:00:00	007 260 007	-10.5	☉	DECEMBER 10, 1969	STG-32	FINAL	11/22/69

TIME	(D:MM)	NET	(D:MM)	CST	(D:MM)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
20:00-02:00	02:00-04:00	02:00-04:00	02:00-04:00	20:00-02:00	20:00-02:00	02/ 20-037	-10.7	☾	DECEMBER 20, 1959	078-32	FINAL	11/22/59
CST	1:00											
NET	1:00											
578	REAL											
PL												
33	34	35	36	37	38	39	40					
MOVIE												

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
355:23:46 / 355:11:45	003:00:00 / 002:12:00	355:17:46 / 355:05:40	04 / 355 OCT	-22.3	①	DECEMBER 21, 1969	STS-32	FINAL	11/22/70
CST 1355									
FD 1 04									
MET 1003									
STS	ONE BURN NSR	ONE BURN NO4	ONE BURN NSR	ONE BURN NSR	ONE BURN NSR	ONE BURN NSR	SLEEP		
		AFE	AFE	ONE SLEEP					
			050 476	050 476					
PL	PEAK ALTITUDE	PEAK ALTITUDE	PEAK ALTITUDE	PEAK ALTITUDE	PEAK ALTITUDE	PEAK ALTITUDE			
DAY/NIGHT									
ORBIT	49	50	51	52	53	54	55	56	
ORBIT COVERAGE	-VAN -HIL -SDX	-HIL	-VAN -SDX	-VAN -HIL	-VAN				
TERMS		-VAN -SDX							
ATTITUDE		NSR	NSR	ZLV +VVV	ZLV +VVV	ZLV +VVV	ZLV +VVV	ZLV +VVV	
FEA		FEA SAMPLE 08							
NOTES:	@050 476 AEROBIC (PLT, @ZLV, +VVV @050 476 AEROBIC (OGR) @050 477 RESPIRABLE AIRBORNE PARTICULATES @ZLV, +VVV								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FDY DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
355:17:45 / 355:23:45	003:12:00 / 004:00:00	255:08:45 / 355:17:45	84 / 355 057	-34.4		DECEMBER 22, 1969	STS-92	FINAL	11/22/69
CST 1396									
FD 1 04									
MET 1003									
STS	SLEEP								
PL									
DAY/NIGHT									
ORBIT	57	58	59	60	61	62	63	64	
OSTN									
COVERAGE									
TIME									
ATTITUDE									
FEA									
NOTES:									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FOY DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
356:22:58/ 357:13:08	084:00:00/ 084:12:08	356:17:48/ 357:08:48	95/ 366 OST	+56.4	☾	DECEMBER 22, 1968	STS-32	FINAL	11/22/68
CST 1300									
FD 1 00									
MET 1000									
STS								SLEEP	
	PHOTO SURVEY		LDEF BERTH					PNE SLEEP	
	P/TVSS AGY LDEF								
PL									
	LDEF PHOTO SURVEY								
DAY/NIGHT									
ORBIT	65	66	67	68	69	70	71	72	
BSTDM	--VAN --00X --MIL --80A		--VAN --00X						
COVERAGE		--VAN --00X --MIL							
TDRS									
ATTITUDE		-XLV +ZVV		IMJ	XST			-ZLV -VVV	
PCA									
		-XLV, +ZVV, STAGED						-ZLV, -VVV	
NOTES:									

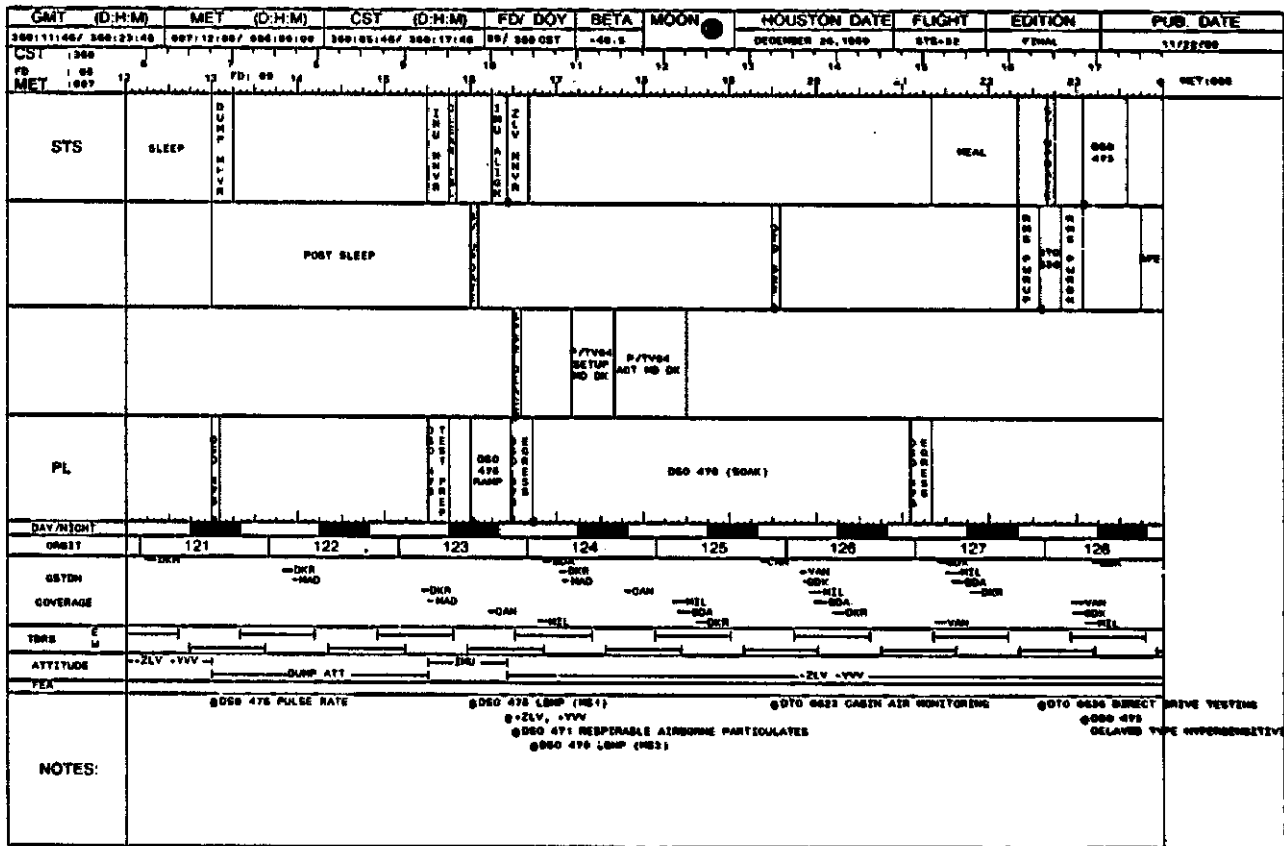
GMT (D:H:M)	MEY (D:H:M)	CST (D:H:M)	F/D/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
257:11:46 / 257:23:46	004:12:00 / 005:00:00	257:00:46 / 257:17:46	06 / 267 OBT	-00.8	☉	DECEMBER 23, 1960	STS-32	FINAL	11/22/60
CST 1007									
FD 1 00									
MET 1004									MET 006
STS	SLEEP								
PL									
DAY/NIGHT									
ORBIT	73	74	75	76	77	78	79	80	
CSTDR									
COVERAGE									
TEMP									
ATTITUDE									
FEA									
NOTES:									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
207:22:00/ 302:13:46	000:00:00/ 000:12:00	257:17:00/ 300:00:00	06/ 30705*	-20.0	①	DECEMBER 27, 1966	STW-22	72001	11/29/66
CST 1307									
FD 1 00									
MET 1000									
STS			ACN CH	EDFP EFP	ACN VEC	EEER	ACN		SLEEP
	AFE								PRE SLEEP
	P/TV11 ADT FEA	D80 476	D80 476						
PL	FEA 5 PROCESS								
DAY/NIGHT									
ORBIT	81	82	83	84	85	86	87	88	
COVAGE	-DDX -MIL -SDA		-VAN -DDX -MIL						
TIME									
ATTITUDE		ZLV -VVV		IMJ	DUMP ATT			ZLV -VVV	
FEA									
NOTES:		@D80 476 AEROBICS (COR) @D80 457 SALIVARY GPOF/DEN @D80 476 AEROBICS (PLT)				@ZLV, -VVV			

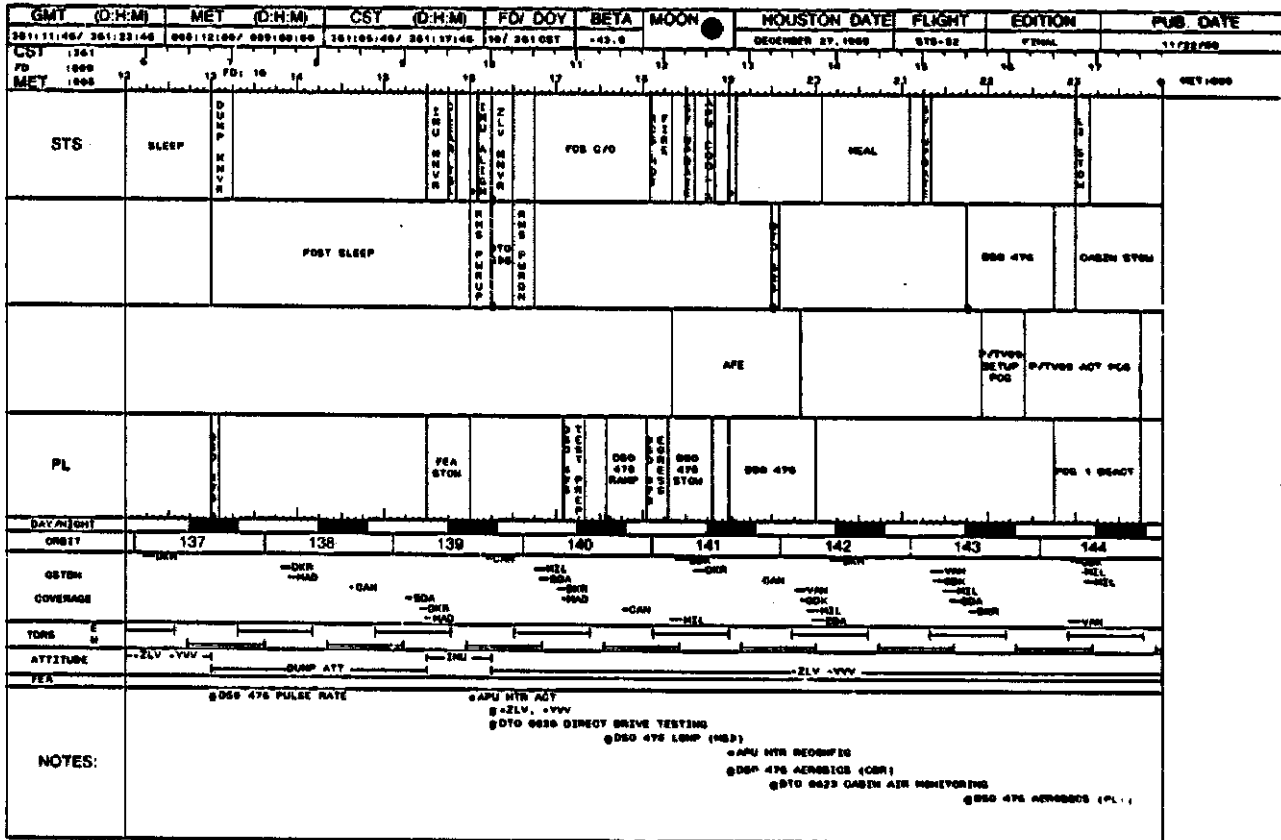
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FDY DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
350:23:46 / 350:11:46	006:00:00 / 006:12:00	350:17:46 / 350:05:48	07 / 300 057	-24.5		DECEMBER 24, 1967	070-12	FINAL	11/22/68
CST 1350									
FD 1 07									
MET 1000									
STS		D90 476							SLEEP
		APE							PRE SLEEP
		P/T/V11 SETUP FEA							D90 476
		P/T/V11 AGY FEA							
PL									
DAY/NIGHT									
ORBIT	97	98	99	100	101	102	103	104	
QSTN									
COVERAGE									
TORS									
ATTITUDE									
FEA									
NOTES:									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD* BOY	BEYA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
359:11:40 / 359:23:40	056:12:00 / 057:00:00	359:05:40 / 359:17:40	087 359-087	- 50.6		DECEMBER 25, 1969	075-02	FINAL	11/22/69
CST 359									
FD 1 07									
MET 056									MET-007
STS	SLEEP	WAKE UP	WAKE UP	WAKE UP	WAKE UP	WAKE UP	WAKE UP	WAKE UP	WAKE UP
		POST SLEEP							
						P/TV04 SETUP NO DK	P/TV04 ACT NO DK		
PL						DSD 476 (BANK)			
DAY/NIGHT									
ORBIT	105	106	107	108	109	110	111	112	
ORBIT COVERAGE									
TDRS									
AFFITUDE									
YES									
NOTES:		@DSD 476 PULSE RATE	@DSD 477 RESPONSIBLE AIRBORNE PARTICULATES	@DSD 476 LIMP (WB1)	@DSD 476 LIMP (WB1)	@DSD 476 LIMP (WB1)	@DSD 476 LIMP (WB1)	@DSD 476 LIMP (WB1)	@DSD 476 LIMP (WB1)

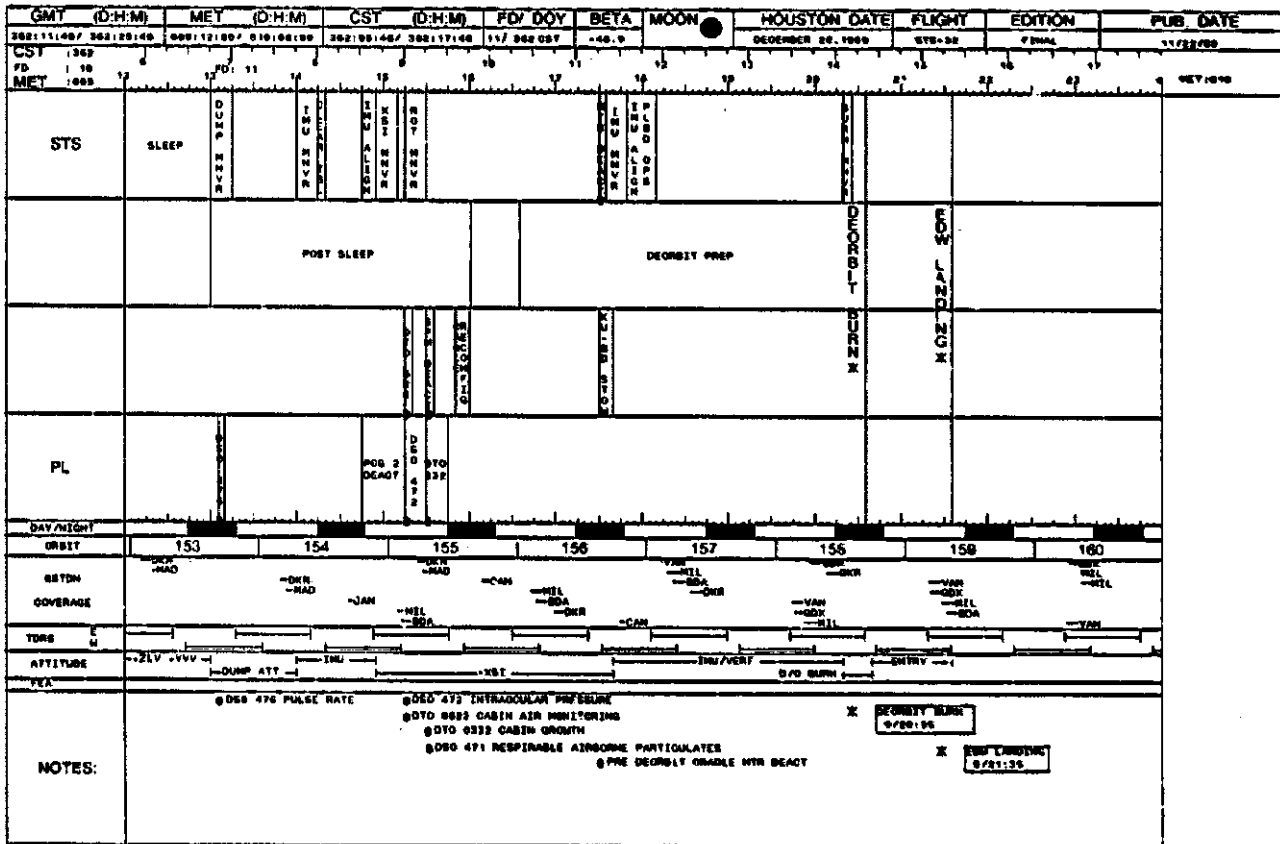
GMT (D:H:M)	MET (D:H:M)	CSY (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
358:23:48 / 358:11:48	007:00:00 / 007:12:00	258:17:46 / 258:05:48	00 / 000 007	-00.7		DECEMBER 28, 1969	STS-07 -	FORMA	11/22/69
CSY 1 00 FD 1 00 MET 1 00									
STS									
PL									
DAY/NIGHT									
ORBIT	113	114	115	116	117	118	119	120	
GSTON COVERAGE	+YVW -GOK -NIL			+VAN +GOK					
TDW									
ATTITUDE	+ZLV -YVW			DUMP ATT					
FEA									
NOTES:	@DSO 476 AEROBICS (CDR)		@DSO 476 AEROBICS (PLT)		@ZLV, -YVW				



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FDI DOY	BEYA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
200:22:48/ 201:11:48	000:00:00/ 000:12:00	200:17:48/ 201:05:48	00/ 200 05T	+42.0		DECEMBER 26, 1960	STS-32	FINAL	11/22/92
CST 1300									
FD 1000					05T:041				
MET 1000									
STS		T C U R V E R	D U M M Y	H U M A N I T I O N	Z L V H E V E R			SLEEP	
	AFE			PRE SLEEP					
		D80 476	D80 476						
PL									
DAY/NIGHT									
GRAVITY	120	130	131	132	133	134	135	136	
GSTOR COVERAGE	-001 -MIL		-VAN					-001	
TORS									
ATTITUDE	-ZLV -VVV		TWU		SLEEP ATT			-ZLV -VVV	
FLX									
NOTES:		@D80 476 AEROBICS (CDR)		@D80 476 AEROBICS (PLT)		@-ZLV, -VVV			

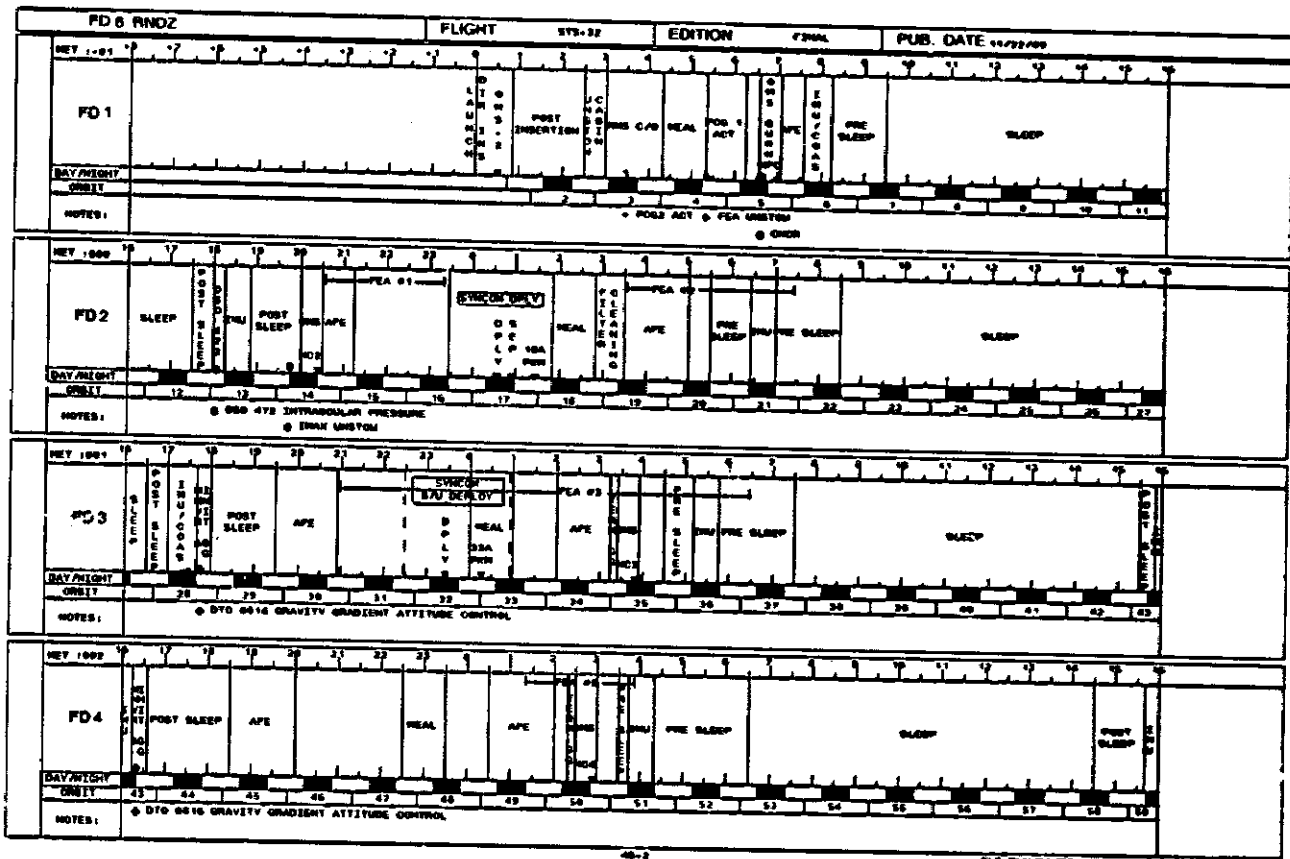


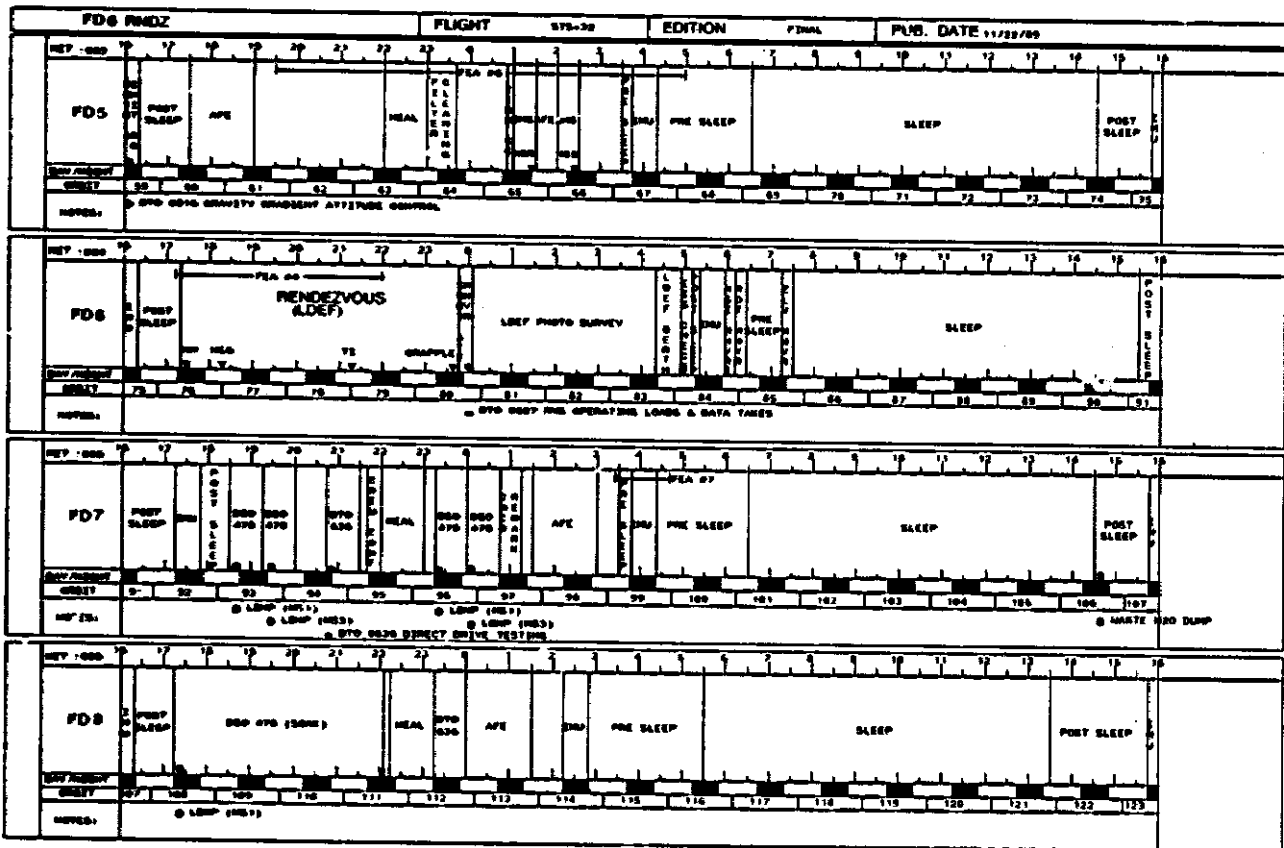
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
201123:40/ 202111:40	000:00:00/ 000:12:00	201117:40/ 202100:40	10 / 201 CST	-05.5		NOVEMBER 27, 1969	STS-32	FINAL	11/22/69
CST 1361									
FD 1010									
MET 0000									
15	15	20	21	22	23	0	1	2	3
STS		I W M N V R	I D U M P		Z L C R Y R				BLEEP
	CABIN STOW								PRE SLEEP
PL									
DAY/NIGHT									
ORBIT	145	146	147	148	149	150	151	152	
STATION COVERAGE	-VAN -QDX -MIL								
		-VAN					-QDX		
TIME									
ATTITUDE	-ZLV -VVV			DUMP ATT					
FEA									
NOTES:									

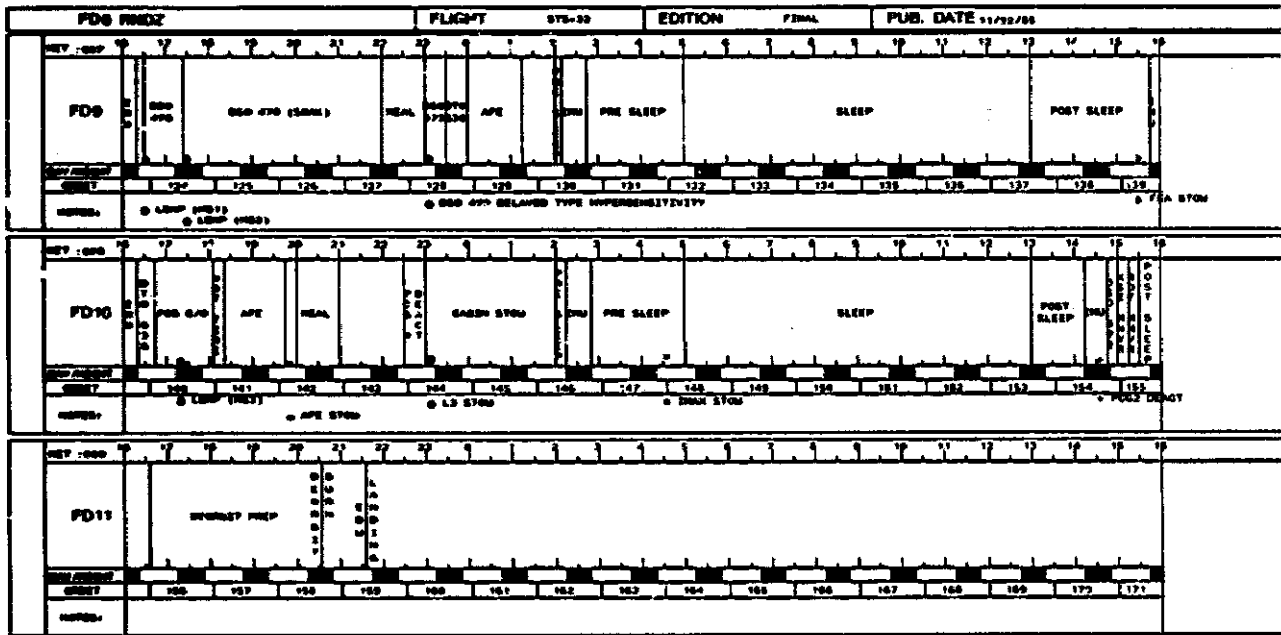


FLIGHT DAY 6 RENDEZVOUS

The Flight Day 6 Rendezvous Timeline is designed to accommodate LDEF retrieval to the sixth flight day. In order to maximize the accomplishment of mission objectives, the flight plan will, in general, undergo changes. The timeline assumes the decision to delay to flight day 6 was made at launch. The timeline is based on the nominal Cycle 2R trajectory.





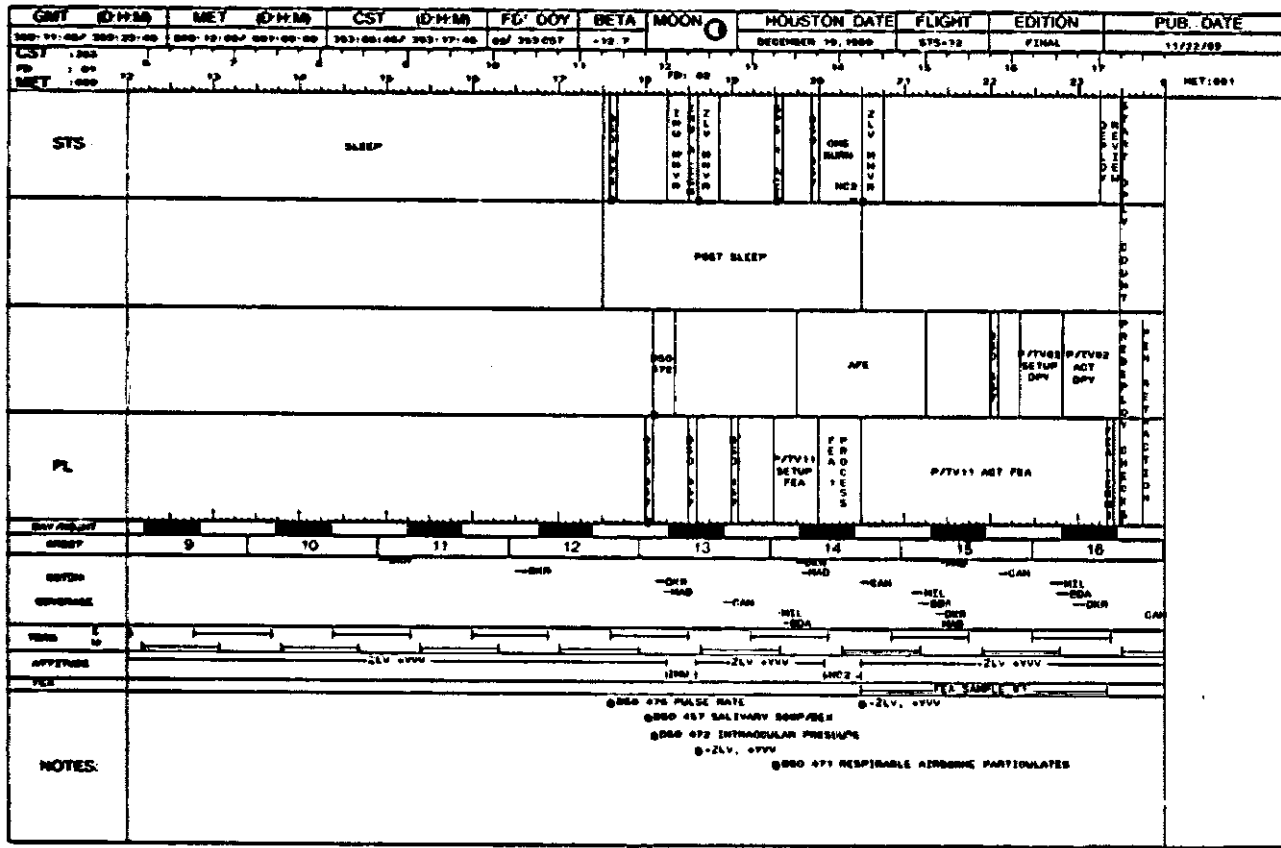


GMT (D.H.M)	MET (D.H.M)	CST (D.H.M)	FDT DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
252:22:00/ 353:17:00	000:00:00/ 000:10:00	352:17:00/ 353:05:00	01/ 352:057	+01.0	3	DECEMBER 10, 1955	STS-32	FINAL	11/22/55

STS			HEAL					SLEEP
PL								

CREW	2	3	4	5	6	7	8
STATUS							
TIME							
AFFAIRS							
PER							

NOTES:	<ul style="list-style-type: none"> SLC NR ACT 020 003 CABIN AIR MONITORING 000 073 RESPONSIBLE AIRBORNE PARTICULATES 020 003 CABIN GROUND 0-ZLV, 0VVV 0APU NR DEACT 000 079 INTRACABIN PRESSURE APU NR RECONFIG 0-ZLV, 0VVV GATT STATION 0-ZLV, 0VVV
--------	---

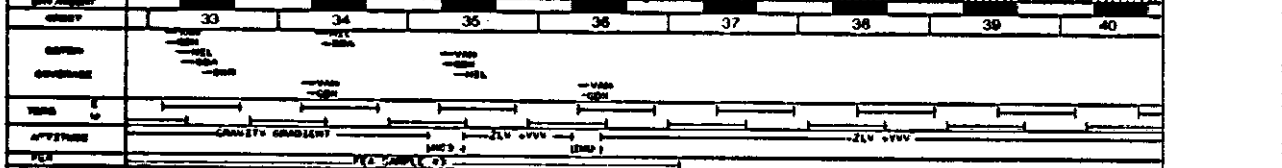


GMT	CHM	MEY	CHM	CST	CHM	FDI	DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
200-20-00P	200-19-40	000-00-00P	000-19-00	200-19-00P	200-00-00	00/ 200 00P	- 00. 0		☾	DECEMBER 19, 1969	STS-30	FINAL	11/22/69
CST	1:20												
00	1 00												
SET	00P									007:300			
STS	17	18	19	20	21	22	23	24					
REAL													
PRE SLEEP													
PL													
COVER													
ATTITUDE													
FEA													
NOTES:													

GST	DHM	MET	DHM	CST	DHM	FD	COY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
250:17:00	300:23:00	000:12:00	000:00:00	300:00:00	300:17:00	00	300	10	3	OCTOBER 20, 1968	STS-33	FINAL	11/22/68
CST	1:30	FD	1:00	MET	1:00	FD: 00							
STS	SLEEP											MET: 002	
	POST SLEEP												
	APE												
	P/TV11 SETUP FEA												
	P/TV11 ACT FEA												
PL	APE												
	S D A E M P O L V E A L												
	FEA 3 OPS												
	FEA 3 PROCESS												
	D60 476												
DAY	25 26 27 28 29 30 31 32												
CENT	25 26 27 28 29 30 31 32												
CENT	25 26 27 28 29 30 31 32												
COVERAGE	25 26 27 28 29 30 31 32												
TIME	25 26 27 28 29 30 31 32												
ATTITUDE	25 26 27 28 29 30 31 32												
FEA	25 26 27 28 29 30 31 32												
NOTES:	@D60 476 PLAS RATE @D60 476 STATION @D70 00% GRAVITY GRADIENT ATTITUDE CONTROL @D60 457 SALIVARY SCOP/DEI @D70 0023 CABIN AIR MONITORING @D60 471 RESPIRABLE AIRBORNE PARTICULATES @D60 476 AEROBICS (M63)												

GMT	(D/M)	MEY	(D/M)	CSY	(D/M)	FD DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
300+00+00	300+11+40	000+00+00	000+12+00	300+17+00	300+05+00	007 304 057	-10.3	1	DECEMBER 20, 1969	STS-33	FINAL	11/22/69
U.S.T.	1:00											
NET	1:00											

STS	REAL											SLEEP
			AFE				PRE SLEEP					
		P/TV04 SETUP SD BI	P/TV04 ACT SD BI			000 476	000 476					
PL												



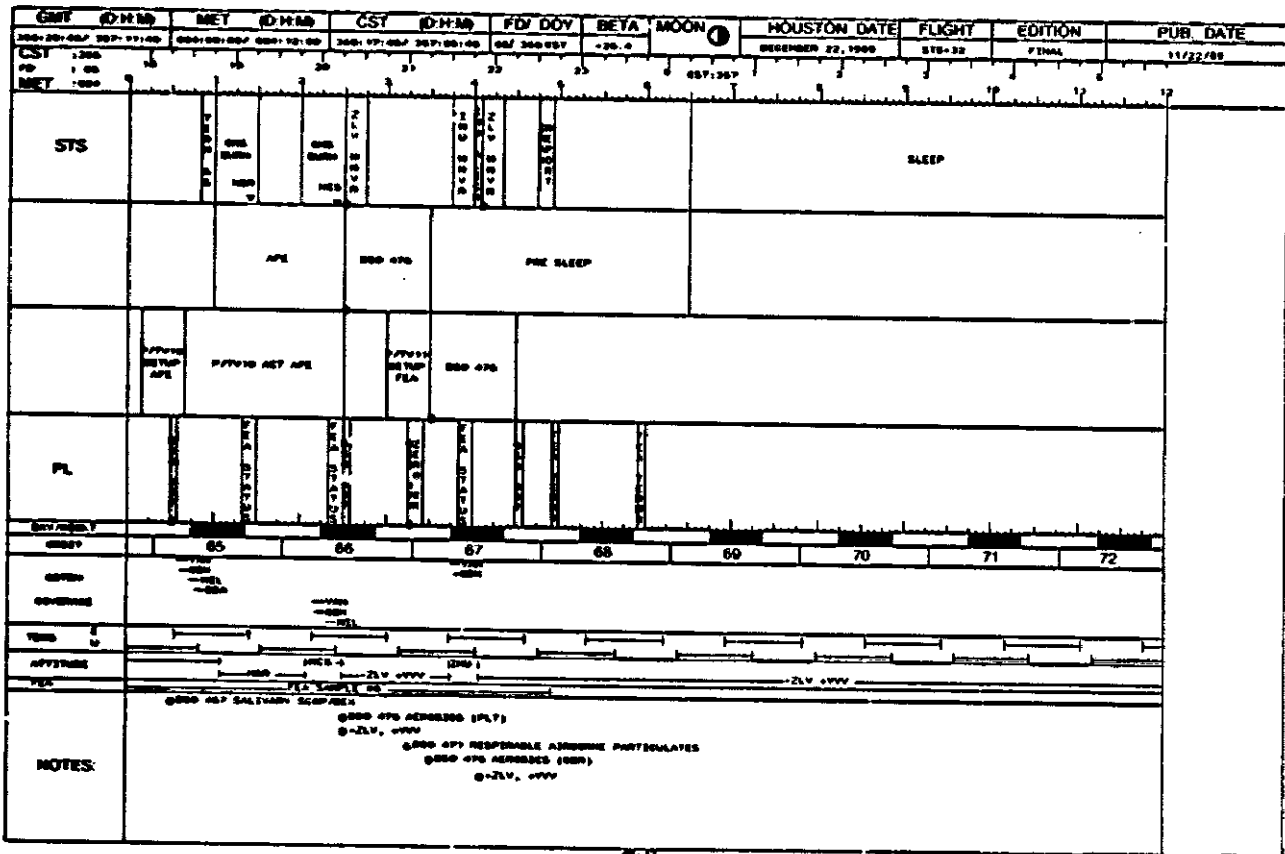
NOTES:

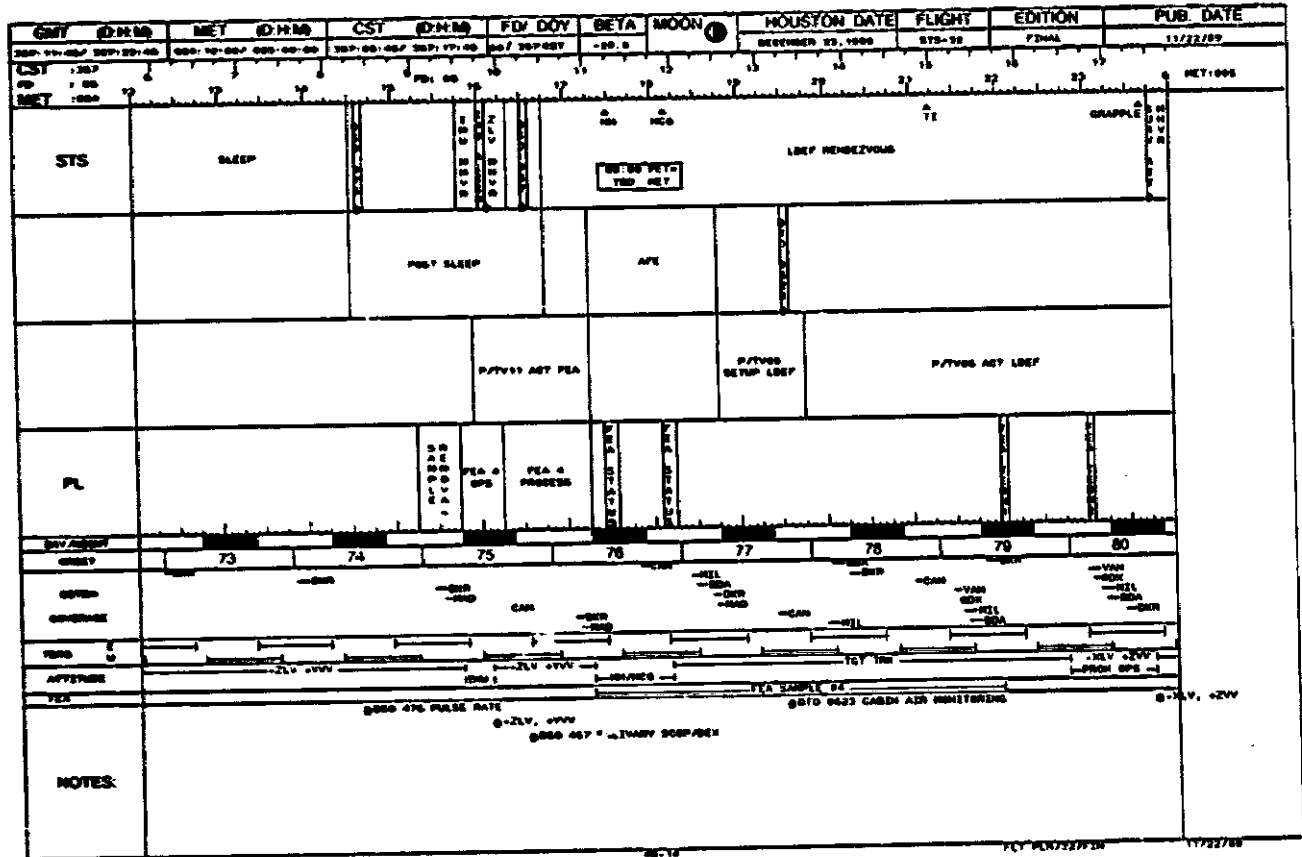
0-ZLV, +VVV
 000 476 AEROBICS (PLT)
 000 476 AEROBICS (CR)
 0-ZLV, +VVV
 000 467 SALIVARY SCOP/DEX

GMT	(Z.H.M)	MET	(Z.H.M)	CST	(Z.H.M)	FDY DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
000- 00-00P	000- 00-00	000- 10-00P	000- 00-00	000- 00-00P	000- 17-00	047	000 00P	-20.0	DECEMBER 27, 1969	STS-33	FINAL	11/22/89
CST	1:00											
FDY	1:00											
MET	1:00											MET:003
STS	SLEEP			3:00-3:30 3:30-4:00 4:00-4:30 4:30-5:00					060 476	MEAL		
				POST SLEEP		APE						
												STV11 SETUP FEA
PL												SR AE SM PO L EA L
0000	[Timeline with shaded segments]											
0001	41	42	43	44	45	46	47	48				
0002	[Activity labels: -DR, -RAB, -CAN, -MIL, -RAB, -VAN, -GOK, -MIL, -SEA]											
0003	[Timeline with shaded segments]											
0004	[Timeline with shaded segments]											
0005	[Timeline with shaded segments]											
0006	[Timeline with shaded segments]											
0007	[Timeline with shaded segments]											
0008	[Timeline with shaded segments]											
0009	[Timeline with shaded segments]											
0010	[Timeline with shaded segments]											
0011	[Timeline with shaded segments]											
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NOTES:	@060 476 PULSE RATE @070 0076 GRAVITY GRADIENT ATTITUDE CONTROL @060 476 AEROBICS (M33)											

GMT	GMT	MET	GMT	CST	GMT	FDY DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
000-20-00Z	2000-07-00	000-00-00Z	000-10-00	200-07-00Z	200-00-00	047 200 057	-22.3		DECEMBER 27, 1960	57B-32	FINAL	11/22/60
					CST 1:30P							
STS			23 1300Z	000	000	000	000	000	000	SLEEP		
	APC									FINE SLEEP		
	047/200 MET PEA	000 476			000 476							
PL	PEA 0 476	PEA 0 476	23 1300Z	23 1300Z	23 1300Z	23 1300Z	23 1300Z	23 1300Z	23 1300Z	SLEEP		
000 476	000 476											
000 476	49	50	51	52	53	54	55	56				
000 476	000 476											
000 476	000 476											
000 476	000 476											
000 476	000 476											
NOTES:	0-2LV, 000 000 476 MEMORIES (CON) 0-2LV, 000											

GMT (D:M:S)	MEY (D:M:S)	CSY (D:M:S)	FLY DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB. DATE
300-11:00/ 300-20:40	000-12:00/ 000-00:00	300-00:00/ 300-17:00	01/ 300 CSY	-20.0	①	DECEMBER 22, 1960	STS-32	FINAL	11/22/60
CSY :300									
FD :00									
NET :000	12	12	10	8	6	4	2	0	NET:004
STS	SLEEP							MEAL	
			POST SLEEP		AFE		DEG 476		FILTER CLEANING
					P/TV11 SETUP FEA		P/TV11 ACT FEA		
PL					FEA 0 OPS		FEA 0 PROCEED		
DAY/RENT									
ORBIT	57	58	59	60	61	62	63	64	
ENTER		-DNR							
COVERAGE		-DNR	-DNR		-DNR	-DNR	-DNR	-DNR	-DNR
TEMP									
ATTITUDE									
FEA									
NOTES:									

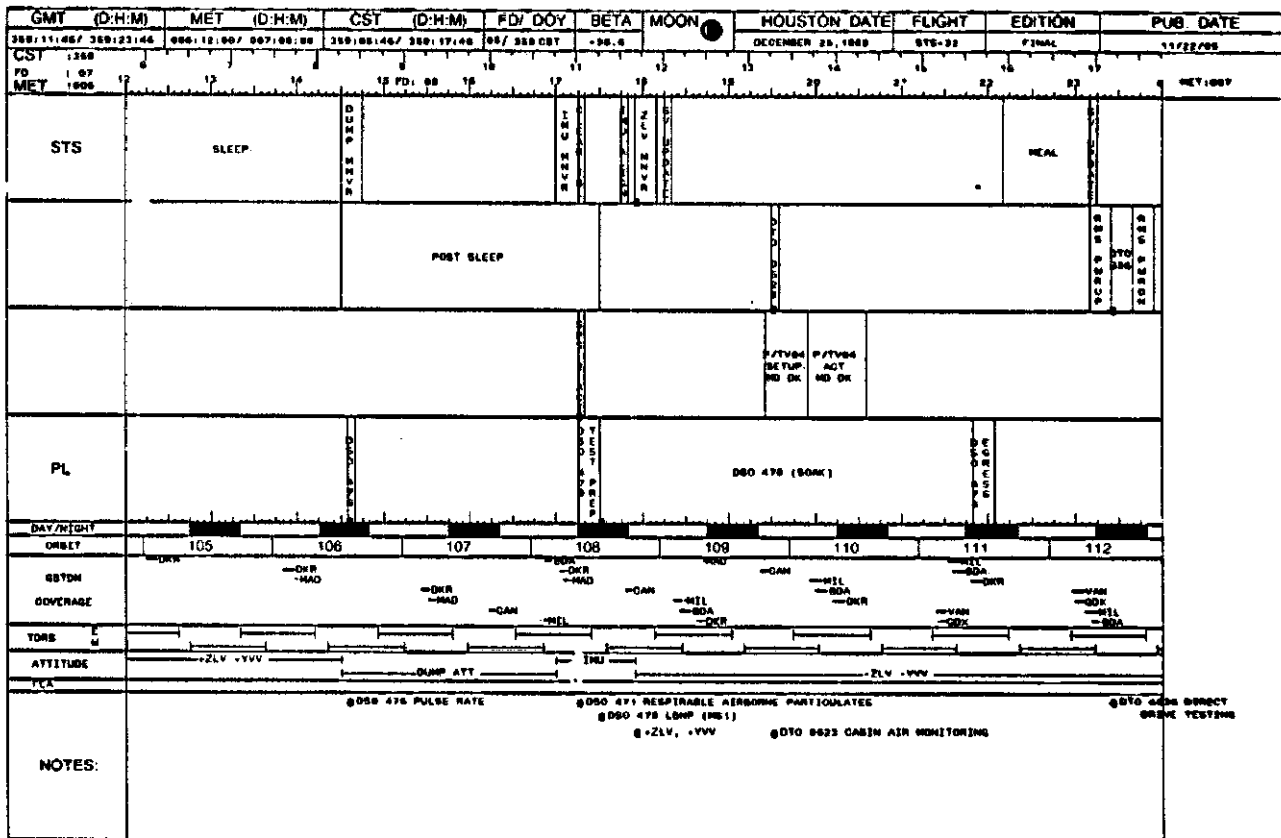




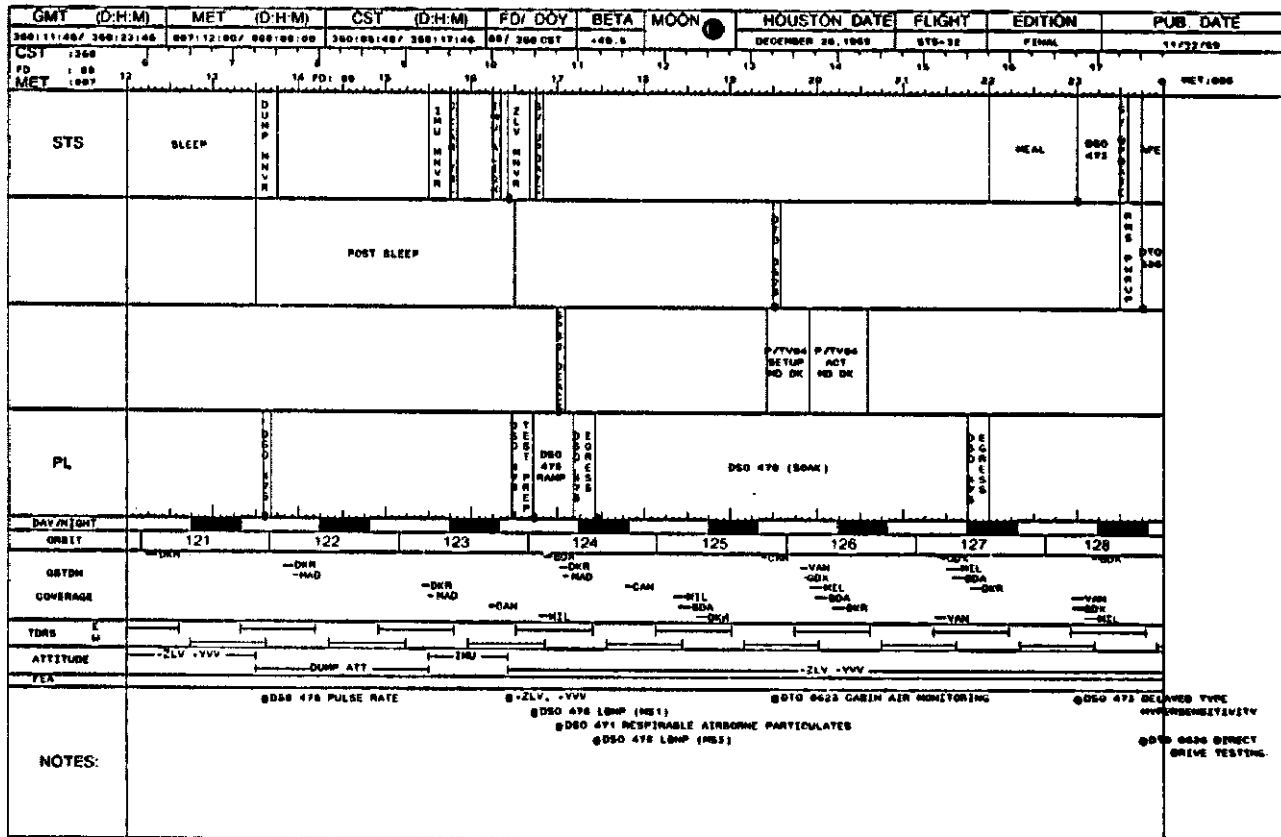
GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
357:23:46 / 358:11:48	008:00:00 / 008:12:00	357:17:46 / 358:00:48	06 / 357051	-30.6	1	DECEMBER 22, 1968	STS-22	FINAL	11/22/70
CST 1367	1008								
MET 1008									
STS									SLEEP
	PHOTO SURVEY	LDEF BERTH							PRE SLEEP
	P/TV86 AGT LDEF								
PL	LDEF PHOTO SURVEY								
DAY/NIGHT									
ORBIT	81	82	83	84	85	86	87	88	
ORBIT COVERAGE	YAN ODN MIL BDA		YAN						
YAN ODN MIL		YAN ODN MIL							
TIME									
ALTITUDE		KLV +ZVV		IMJ	XBI				ZLV -VVV
FEA									
NOTES:	SSURV ATT 88VR +KLV, +ZVV			@D60 457 SALIVARY SCOP/DEA				@-ZLV, -VVV	

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
355:11:45 / 355:23:45	005:12:00 / 005:00:00	255:05:45 / 255:17:45	07 355 057	+22.6		DECEMBER 24, 1968	STS-52	FINAL	11/22/99
CST 1:55	FD 1:00	MET 1:00							
STS	SLEEP								
PL									
DAY/NIGHT									
ORSET	89	90	91	92	93	94	95	96	
GSTDH COVERAGE									
TDRS									
ATTITUDE									
FEA									
NOTES:									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
355:23:46 / 355:11:45	005:05:00 / 005:12:00	355:17:46 / 355:05:45	07 / 355 CST	-34.5		DECEMBER 24, 1969	STS-12	FINAL	11/22/69
CST 1:55									
FD MET 1:07									
STS									SLEEP
		APE				PRE SLEEP			
	P/TV07 SETUP CHOR	P/TV07 AGT CHDR	P/TV11 SETUP FEA	P/TV11 AGT FEA	D&D 476	D&D 476			
PL	D&D 476 RAMP	ENGINEERS	CHOR SENARY	SR AC NN P V L	FEA 7 OPS	FEA 7 PROCESS	FEA 7	SR AC NN P V L	
DAY/NIGHT									
ORBIT	97	98	99	100	101	102	103	104	
GETDN COVERAGE	-VAN -GOK -MIL		-VAN -GOK -MIL						
TBR									
ATTITUDE		ZLV - YVV		IMU		QUAD ATT			ZLV - YVV
FEA				FEA SAMPLE 27					
NOTES:	D&D 476 RAMP (MG)			D&D 476 AEROSICS (CDR)		D&D 476 AEROSICS (PLT)			D&D 476 AEROSICS (PLT) @-ZLV, -YVV



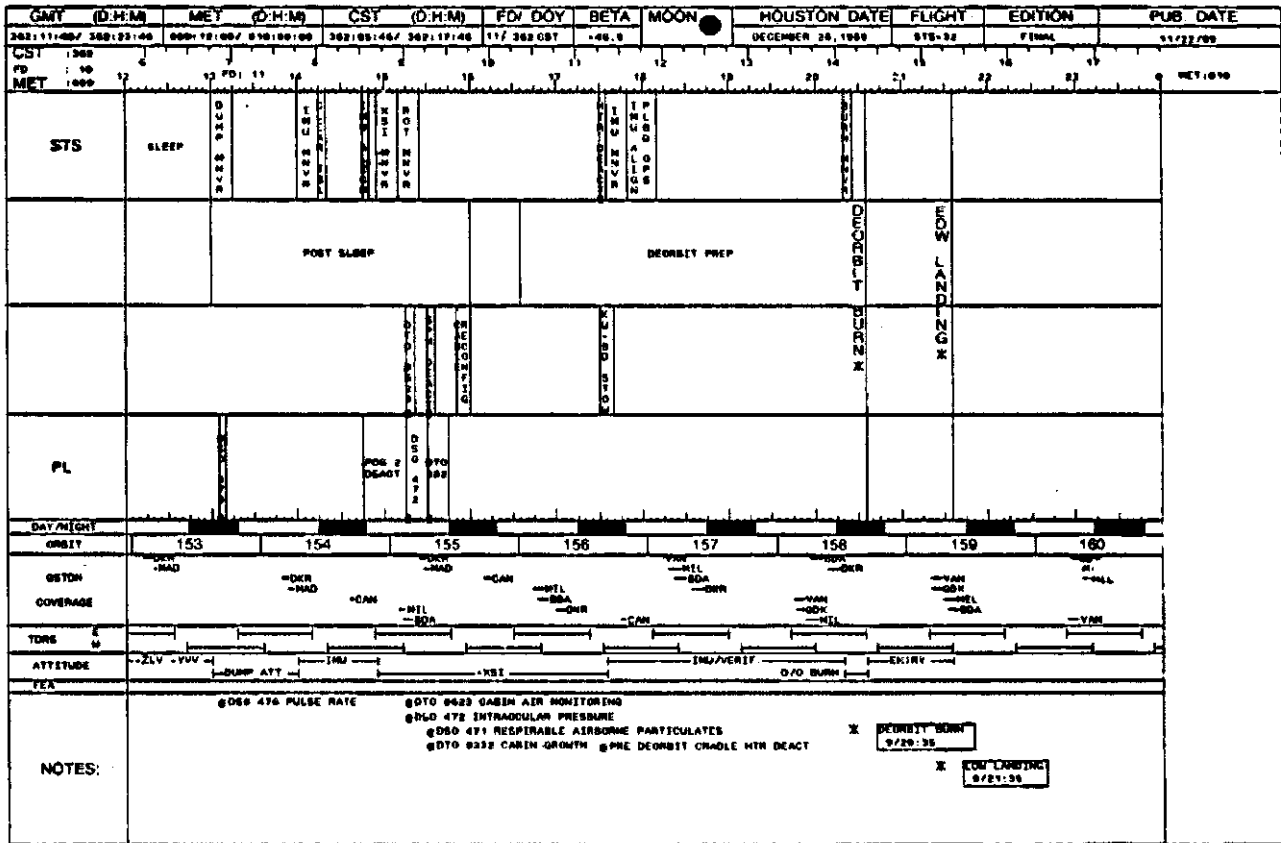
GMT	(D:H:M)	MET	(D:H:M)	CSY	(D:H:M)	FD/ DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
360/23:46/	360/11:46	007/00:00/	007/12:00	360/17:46/	360/09:46	00/ 360 OCT	-30.7		DECEMBER 28, 1960	STS-33	FINAL	11/22/60
CSY	:360							OCT 1960				
FD	:00											
MET	:007											
STS				SEE NOTE	SEE NOTE	SEE NOTE	SEE NOTE		SLEEP			
		DSO 476							PRE SLEEP			
		AFE		DSO 476								
PL												
DAY/NIGHT		[Sunrise]										
ORBIT		113		114		115		116		117		118
GSFN		-VAN										
COVERAGE		-GDX -MIL										
TDRS	E M											
ATTITUDE		-ZLV -VVV		IMU								
FEA									-ZLV -VVV			
NOTES:		① DSO 476 AERONICS (CDR)		② DSO 476 AERONICS (PLT)					③ ZLV, -VVV			



GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE	
300:23:48 / 301:11:48	000:00:00 / 000:12:00	300:17:48 / 301:00:48	09 / 300 087	+48.3	☉	DECEMBER 26, 1969	STS-32	FINAL	11/22/69	
CST 1200										
FD 1000										
MET 1000										
STS	AFE	Z I N H A R K E R	D U P P R E S S E R S	R E C O R D E R	Z L V M A Y R	BLEEP				
R M S P A R D M		PRE SLEEP								
	050 476	050 476								
PL										
DAY/NIGHT	[Day/Night indicator]									
ORBIT	129	130	131	132	133	134	135	136		
ORBIT COVERAGE	-VAN -GOX -REL	-VAN							-GOX	
TORS	[Torsion indicator]									
ATTITUDE	-ZLV -VVV	[IMU]	DUMP ATT							-ZLV -VVV
FEA	[Feature indicator]									
NOTES:	@D50 476 AEROBICS (CON) @D50 476 AEROBICS (PLY) @-ZLV, -VVV									

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
361:11:46/ 361:23:48	080:12:00/ 080:00:00	361:00:46/ 361:17:48	18/ 36:087	-43.9	●	DECEMBER 27, 1966	STS-3F	FINAL	11/22/66
CST 1307									
FD 1969									
MET 1969									
STS	SLEEP					FCB C/O		MEAL	
		POST SLEEP						DSO 476	CABIN STOW
						AFE		F/VV66 SETUP POS	F/VV66 ACT POS
PL									POB 1 DEACT
DAY/NIGHT									
ORBIT	137	138	139	140	141	142	143	144	
GSTDN									
COVERAGE									
YDRS									
ALTITUDE									
TEA									
NOTES:	<p>@DSO 476 PULSE RATE *APU HTR ACT @DTC 9656 DIRECT DRIVE TESTING *ZLV, VVV @DSO 478 LUMP (MS) @DSO 476 ACROBICS (CDR) *APU HTR RECONFIG @DTC 9653 CABIN AIR MONITORING</p>								

GMT (D:H:M)	MET (D:H:M)	CST (D:H:M)	FD/DOY	BETA	MOON	HOUSTON DATE	FLIGHT	EDITION	PUB DATE
361:22:48 / 362:11:46	000:00:00 / 000:12:00	361:17:46 / 362:06:46	18 / 381 CST	+48.5		DECEMBER 27, 1966	STS-32	FINAL	11/22/66
CST 1301									
FD 1818									
MET 1000									
STS		I L U R E S S U R E S E N S I T I V E		Z L V M E N T	R E P O R T I N G	SLEEP			
	CABIN STOW					PRE SLEEP			
PL				I M A K S T O M					
DAY (M) (GHT)									
ORBIT	145	146	147	148	149	150	151	152	
OSTDM COVERAGE	-GDN -WIL		-YAN				-GDR	-GDR	
TDRS C M									
ATTITUDE	-ZLV -VVV		(M)	DUMP ATT				-ZLV -VVV	
FEA									
NOTES:									



IMAX OPPORTUNITIES

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
14	0/20:48:04	TAHITI/SOCIETY ISLANDS	L	60	-ZLV	45,61,76,92, 108,123,139	OMS BURN CONFLICT
*15	0/22:06:17	LAKE EYRE, AUSTRALIA	L	40	-ZLV	31,46,62,78	
*15	0/22:09:59	BRISBANE, AUSTRALIA	H	100	TRACK	46,61,62,77, 93	PRIME ORBITS: 15,46,93 ALTERNATE: -ZLV
*16	0/22:40:23	MEXICO CITY (LOOK SOUTH)	H	100	OBL	47,78,94,125	
16	0/23:46:28	PLANKTON BLOOM, CAPRICORN CHANNEL (AUSTRALIA) (LOOK SOUTH)	L	60	LOW OBL	47,78,94	
17	1/01:19:32	NEW GUINEA (LOOK NORTH)	H	40	OBL	48,64,95,111, 142	PRIME OPP
17	1/01:21:37	GREAT BARRIER REEF (CENTER)	H	40	-ZLV	32,48,63,64, 79,94,95,110, 111,126,142	NORTHERN REEF USUALLY HAS CLOUD COVER
19	1/02:56:02	NEW GUINEA (LOOK SOUTH)	L	40	OBL	49,96,143	MEAL CONFLICT
*21	1/07:24:07	MADAGASCAR FIRES	H	100	-ZLV OBL	36,52,83,99, 130	
27	1/16:32:45	ANDES MOUNTAINS (LOOK SOUTH)	L	40	OBL	68,74,105,121	POST SLEEP
27	1/16:35:46	BRAZIL DEFORESTATION: FIRES OR GRID PATTERNS	H	100	-ZLV OBL	43,74,90,105, 121,137	POST SLEEP
28	1/16:56:16	WESTERN SAHARA (ERG CHECK)	H	40	OBL	44,75,91,106, 122,138	LOW SUN ANGLE

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* Scheduled in Flt P1n

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
*29	1/18:15:41	CARIBBEAN (LOOK NORTH)	L	40	OBL	44,60,76,91, 107,138	POST SLEEP
*30	1/19:52:03	HAITI DEFORESTATION	L	60	-2LV LOW OBL	61,77,108,124	PRIME OPP
*31	1/22:24:29	LAKE EYRE	L	40	LOW OBL	46,62,78	
32	2/00:00:00	GOSSES BLUFF CRATER	H	100	OBL	79,126	
*32	2/00:03:44	GREAT BARRIER REEF (LOOK NORTH)	H	40	OBL	48,63,64,79, 94,95,110, 111,126,142	PRIME OPP MEAL CONFLICT
33	2/1:33:38	GREAT SANDY DESERT (LOOK SOUTH)	L	40	OBL	64,80,111,127	OMS ATTITUDE MVR
34	2/03:09:14	INDONESIAN VOLCANOES (LOOK WEST)	H	60	OBL	50,81,97,128, 144	OMS ATTITUDE
*35	2/04:44:19	JAKARTA	H	100	OBL	66,113	
*36	2/05:59:31	VREDEFORT CRATER	H	40	-2LV	67,83	
*36	2/06:04:14	MADAGASCAR FIRES (LOOK NORTH)	H	100	-2LV OBL	52,83,99,130	

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* Scheduled in Flt P1n

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FAT PLN/32/FIN

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
43	2/16:48:31	BRAZIL DEFORESTATION	H	100	-ZLV OBL	74,90,105, 121,137	POST SLEEP
44	2/16:52:14	CARIBBEAN (LOOK NORTH)	L	40	OBL	60,76,91,107, 138	
44	2/17:09:13	WESTERN SAHARA (ERG CHECK) (LOOK SOUTH)	H	40	OBL	75,91,106, 122,138	LOW SUN ANGLE
45	2/19:41:25	TAHITI/SOCIETY ISLANDS	L	60	-ZLV LOW OBL	61,76,92,108, 123,139	PRIME OPP
46	2/20:58:47	LAKE EYRE	L	40	-ZLV	62,78	
46	2/21:02:25	BRISBANE	H	100	TRACK	61,77,93	PRIME OPP ALTERNATE: -ZLV
47	2/21:32:36	MEXICO CITY	H	100	OBL	78,94,125	
47	2/22:37:48	PLANKTON BLOOM, CAPRICORN CHANNEL (LOOK SOUTH)	L	60	LOW OBL	78,94	
48	3/00:09:48	NEW GUINEA (LOOK NORTH)	H	40	OBL	64,95,111,142	PRIME OPP
48	3/00:11:53	GREAT BARRIER REEF (CENTER)	H	40	-ZLV	63,64,79,94, 95,110,111, 126,146	
49	3/01:45:06	NEW GUINEA (LOOK SOUTH)	L	40	OBL	96,143	
50	3/03:15:28	INDONESIAN VOLCANOES (LOOK EAST)	H	60	OBL	81,97,128,144	
52	3/06:09:44	MADAGASCAR FIRES	H	100	-ZLV OBL	83,99,130	

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FIT PLN/32/FIN

* Scheduled in Fit Pln

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
60	3/16:52:57	CARIBBEAN (LOOK NORTH FROM TRINIDAD)	L	40	OBL	76,91,107,138	PRIME OPP SLEEP
61	3/18:28:07	HAITI DEFORESTATION	L	100	-ZLV LOW OBL	77,106,124	DUMP ATT
*61	3/19:26:58	BRISBANE	H	100	TRACK	77,93	
*61	3/19:41:08	TAMITI/SOCIETY ISLANDS	L	60	-ZLV LOW OBL	76,92,108, 123,139	
*62	3/20:58:35	LAKE EYRE	L	40	-ZLV	78	
*62	3/21:02:12	BRISBANE	H	100	TRACK	77,93	
*63	3/22:36:29	GREAT BARRIER REEF (LOOK NORTH)	H	40	OBL	64,79,94,95, 110,111,126, 142	PRIME OPP
64	4/00:05:16	GREAT SANDY DESERT, AUSTRALIA (LOOK SOUTH)	L	40	OBL	80,111,127	MEAL CONFLICT
64	4/00:09:43	NEW GUINEA (LOOK NORTH)	H	40	OBL	95,111,142	MEAL CONFLICT
64	4/00:11:42	GREAT BARRIER REEF (LOOK SOUTH)	H	40	OBL	79,94,95,110, 111,126,142	MEAL CONFLICT USUALLY CLOUD COVERED
*66	4/03:14:27	JAKARTA	H	100	OBL	113	
*67	4/04:29:07	VREDEFORT CRATER	H	40	OBL	83	
74	15:11:00	ANDES MOUNTAINS (CENTER)	L	40	OBL	105,121	SLEEP

* Scheduled in Flt Pin

5-5

FLT PIN/32/11N

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
74	4/15:13:50	BRAZIL DEFORESTATION	H	100	-ZLV OBL	90,105,121, 137	SLEEP
75	4/15:34:20	WESTERN SAHARA (ERG CHECH) (LOOK SOUTH)	H	40	OBL	91,106,122, 138	SLEEP
76	4/16:52:39	CARIBBEAN (LOOK NORTH)	L	40	OBL	91,107,136	POST SLEEP
*76	4/18:05:37	TAHITI/SOCIETY ISLANDS	L	60	OBL	92,108,123, 139	
*77	4/18:27:48	HAITI DEFORESTATION	L	100	-ZLV LOW OBL	108,124	PRIME OPP
*77	4/19:26:41	BRISBANE	H	100	TRACK	93	ALTERNATE: -ZLV
*78	4/19:56:50	MEXICO CITY (LOOK NORTH)	H	100	OBL	94,125	
*78	4/20:58:14	LAKE EYRE (LOOK SOUTH)	L	40	OBL		LAST OPP
*78	4/21:02:05	PLANKTON BLOOM IN CAPRICORN CHANNEL (LOOK NORTH)	L	60	OBL	94	
*79	4/22:32:30	GOSSES BLUFF CRATER	H	100	LOW OBL	126	
*79	4/22:36:11	GREAT BARRIER REEF (CENTER)	H	40	-ZLV	94,95,110, 111,126,142	
80	5/00:04:53	GREAT SANDY DESERT (LOOK SOUTH)	L	40	OBL	111,127	MEAL CONFLICT
*81	5/01:39:42	INDONESIAN VOLCANOES (LOOK WEST)	H	60	OBL	97,128,144	
*83	5/04:28:44	VREDEFORT CRATER	H	40	LOW OBL		LAST OPP PRE SLEEP

* Scheduled in FIT P1n

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET);	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
*83	5/04:33:27	MADAGASCAR FIRES (LOOK NORTH)	H	100	-ZLV OBL	99,130	PRE SLEEP
90	5/15:13:19	BRAZIL DEFORESTATION	H	100	-ZLV OBL	104,121,137	POST SLEEP
91	5/15:17:00	CARIBBEAN (LOOK NORTH)	L	40	OBL	107,138	POST SLEEP
91	5/15:33:52	WESTERN SAHARA (ERG CHECH) (LOOK SOUTH)	H	40	OBL	106,122,138	POST SLEEP
*92	5/18:05:08	TAHITI, SOCIETY ISLANDS	L	60	-ZLV	108,123,139	PRIME OPP
*93	5/19:26:10	BRISBANE	H	100	TRACK		PRIME OPP / LAST OPP
*94	5/19:56:18	MEXICO CITY (LOOK SOUTH)	H	100	OBL	125	
*94	5/21:00:21	GREAT BARRIER REEF (LOOK NORTH)	H	40	OBL	95,110,111, 126,142	PRIME OPP
*94	5/21:01:34	PLANKTON BLOOM/CAPRICORN CHANNEL (LOOK SOUTH)	L	60	OBL		LAST OPP
*95	5/22:33:34	NEW GUINEA (LOOK NORTH)	H	40	OBL	111,142	PRIME OPP
*95	5/22:35:38	GREAT BARRIER REEF (CENTER)	H	40	-ZLV	110,111,126, 142	
*96	6/00:08:48	NEW GUINEA (LOOK SOUTH)	L	40	OBL	143	
*97	6/01:39:09	INDONESIAN VOLCANOES (LOOK WEST)	H	60	OBL	128,144	
*99	6/04:33:20	MADAGASCAR FIRES	H	100	-ZLV OBL	130	
105	6/13:34:43	ANDES MOUNTAINS (CENTER)	L	40	OBL	121	SLEEP, PRIME OPP

* Scheduled in F1: P1n

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
105	6/13:37:36	BRAZIL DEFORESTATION	H	100	-ZLV OBL	121,137	SLEEP
106	6/13:57:58	WESTERN SAHARA (ERG CHECH) (CENTER)	H	40	OBL	122,138	SLEEP
107	6/15:16:17	CARIBBEAN (LOOK NORTH FROM TRINIDAD)	L	40	OBL	138	DUMP ATTITUDE
108	6/16:51:24	HAITI DEFORESTATION	L	100	-ZLV OBL	124	DUMP ATTITUDE
*108	6/18:04:24	TAHITI/SOCIETY ISLANDS	L	60	OBL	123,139	
*110	6/20:59:41	GREAT BARRIER REEF (LOOK NORTH)	H	40	OBL	111,126,142	PRIME OPP
111	6/22:28:25	GREAT SANDY DESERT	L	40	OBL	127	MEAL CONFLICT
111	6/22:32:52	NEW GUINEA (LOOK NORTH)	H	40	OBL	142	MEAL CONFLICT
111	6/22:34:51	GREAT BARRIER REEF (LOOK SOUTH)	H	40	OBL	126,142	MEAL CONFLICT
*113	7/01:37:32	JAKARTA	H	100	OBL		LAST OPP
121	7/13:33:46	ANDES MOUNTAINS (LOOK SOUTH)	L	40	OBL		LAST OPP POST SLEEP
121	7/13:36:39	BRAZIL DEFORESTATION	H	100	-ZLV OBL	137	POST SLEEP
122	7/13:57:05	WESTERN SAHARA (ERG CHECH) (LOOK SOUTH)	H	40	OBL	138	POST SLEEP
*122	7/14:08:19	SAUDI ARABIA: EMPTY QUARTER (LOOK SW)	L	40	OBL	138	LOW SUN ANGLE

* Scheduled in Flt Ptn

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
*123	7/16:28:19	TAHITI/SOCIETY ISLANDS	L	60	OBL	139	
*124	7/16:50:29	HAITI DEFORESTATION (LOOK SOUTH)	L	100	-ZLV OBL		
*125	7/18:19:29	MEXICO CITY	H	100	OBL		
126	7/20:55:05	GOSSES BLUFF CRATER	H	100	OBL		
*126	7/20:58:26	GREAT BARRIER REEF (CENTER)	H	40	-ZLV		
*127	7/22:27:26	GREAT SANDY DESERT (LOOK NORTH)	L	40	OBL		
*128	8/00:02:13	INDONESIAN VOLCANOES (LOOK WEST)	H	60	OBL	144	
*130	8/02:55:53	MADAGASCAR FIRES (LOOK NORTH)	H	60	-ZLV OBL		
137	8/13:35:29	BRAZIL DEFORESTATION	H	100	-ZLV OBL		POST SLEEP
138	8/13:39:09	CARIBBEAN (LOOK NORTH)	L	40	OBL		POST SLEEP
138	8/13:56:01	WESTERN SAMARA (ERG CHECH)	H	40	OBL		LOW SUN ANGLE POST SLEEP
*138	8/14:07:14	SAUDI ARABIA EMPTY QUARTER	H	40	OBL		POST SLEEP
139	8/16:27:13	TAHITI/SOCIETY ISLANDS	L	60	OBL		RMS TEST CONFLICT
142	8/20:55:34	NEW GUINEA (LOOK NORTH)	H	40	OBL	143	MEAL CONFLICT PRIME OPP

* Scheduled in Fil Pin

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS
142	8/20:57:37	GREAT BARRIER REEF (CENTER)	H	40	-ZLV		MEAL CONFLICT
*143	8/22:30:44	NEW GUINEA (LOOK SOUTH)	L	40	OBL		
*144	9/00:01:03	INDONESIAN VOLCANOES (LOOK EAST)	H	60	OBL		
*148	9/04:42:54	GREAT HIMALAYAN RANGE	HH	60	OBL		

* Scheduled in FIT Pin

EARTH TARGETS OF OPPORTUNITY - SCHEDULE REAL TIME

	PRIORITY
HIGHLY VISIBLE MAN MADE POLLUTION OF OCEAN, LANDSCAPE OR ATMOSPHERE	H
DUST OR SANDSTORM	H
OCEAN PHENOMENA: INTERNAL WAVES, EDDIES, CURRENTS (2 SHGTS)	H
ANY PLANET OR STAR VISIBLE ON HORIZON	L
MOONRISE OR SET	L
FOREST FIRE	H
SMOKE FROM SLASH & BURN FARMING	H

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS

* Scheduled in FIT Pin

9-11

FIT PIN/32/FIN

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (NET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS

* Scheduled in FIT Pin

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (MET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS

* Scheduled in FTe P1n

6-13
PLC PLAN/22/IN

IMAX EARTH SCENE OPPORTUNITIES

ORBIT	TCA (NET)	SITE	PRIORITY	LENS	METHOD	ORBIT OF NEXT OPPORTUNITY	COMMENTS

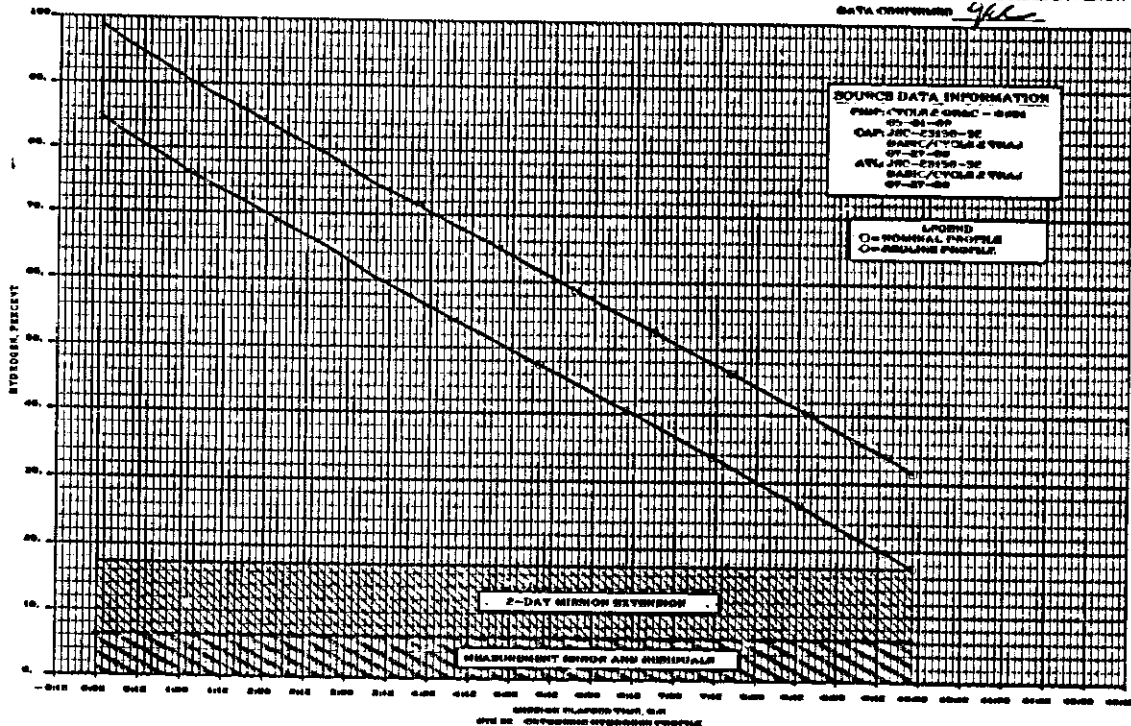
* Scheduled in FIT Plan

CONSUMABLES CURVES

DAVID PEDDICORR
ANALYSIS DATE: 10-30-88
TRAJ DTG: 0818

MISSION OPERATIONS INSTRUCTOR
SYSTEMS DIVISION

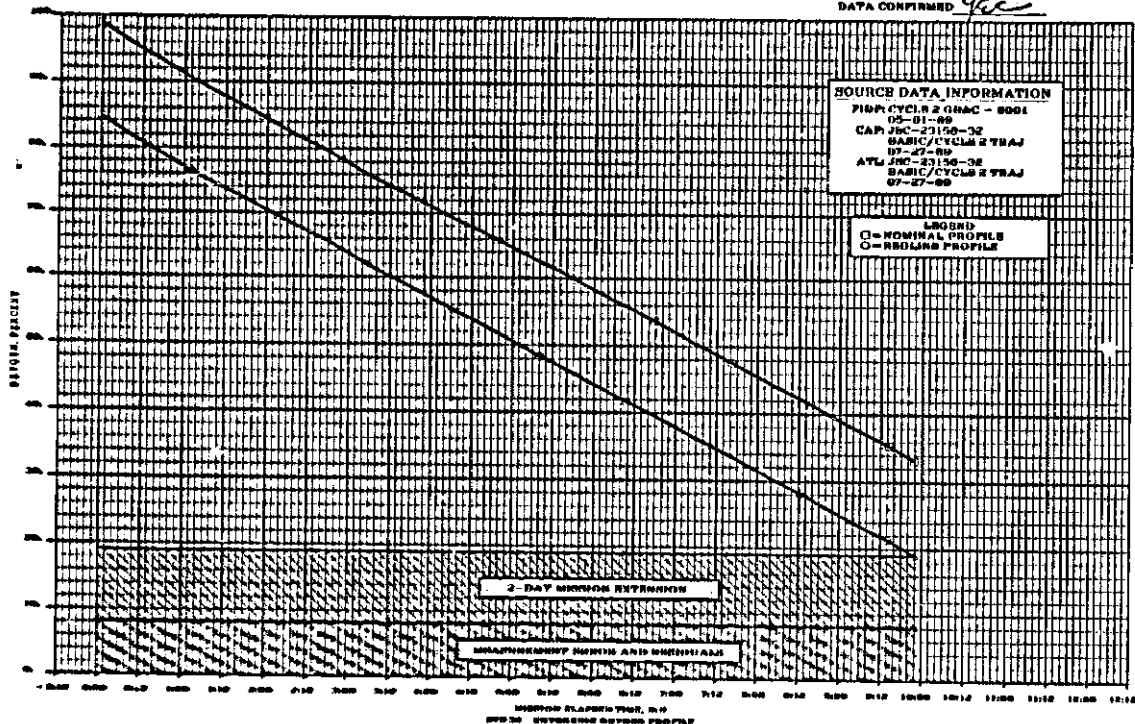
DATA CONTINUED *4/6*



DAVID FREIGHTER
ANALYSIS DATE: 10-28-88
TRAC # 960000

MISSION OPERATIONS DIRECTORATE
SYSTEMS DIVISION

DATA CONFIRMED *9600*



6-3

FLT PLAN/32/FLN

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will not be included in flight copies.

**STS-32
FLIGHT PLAN NOTES**

FLIGHT PLAN NOTES
(CONSTRAINTS AND GUIDELINES)

A. FLIGHT DESCRIPTION

The STS-32 (OV-102) launch from KSC on December 18, 1989 (Cycle 2R) will be into a 190 x 161 nm orbit at an inclination of 28.5 degrees. The mission duration will be 9 days, 21 hours. Nominal landing occurs at EDW on December 28, 1989.

Landing opportunities are:

		<u>Landing Orbit No.</u>	<u>Site</u>	<u>Landing Site Time</u>
Nominal	Primary	159	EDW	13:21 PST
	Backup	160	EDW	14:56 PST
	Weather Alt.	159	NOR	14:24 MST
1 Day Late	Primary	175	EDW	13:19 PST
	Backup	176	EDW	14:54 PST
	Weather Alt.	175	NOR	14:22 MST
2 Days Late	Primary	190	EDW	11:43 PST
	Backup	191	EDW	13:17 PST
	Weather Alt.	190	NOR	12:45 MST

MAJOR EVENTS

LAUNCH (KSC)
 MET (DD/HH:MM:SS) December 18, 1989
 0/00:00:00
 Day of year 352
 CST/GMT 17:46/23:46

OMS-2
 MET (DD/HH:MM:SS) 0/00:41:00
 DV (fps) 227.2
 DT (MM:SS) 02:34
 ORBIT ha/hp (nm) 190 X 161

NPC
 MET (DD/HH:MM:SS) 0/06:56:00
 DV (fps) 4.9
 DT (MM:SS) 00:06
 ORBIT ha/hp (nm) 191 X 161

NC2
 MET (DD/HH:MM:SS) 0/20:26:00
 DV (fps) 8.0
 DT (MM:SS) 00:08
 ORBIT ha/hp (nm) 190 X 156

SYNCOM DEPLOY
 MET (DD/HH:MM) 01/00:42:00

OMS SEPARATION BURN
 MET (DD/HH:MM:SS) 01/00:57:00
 DV (fps) 18.0
 DT (MM:SS) 00:14
 ORBIT ha/hp (nm) 190 x 166

MAJOR EVENTS (Continued)

<u>NSB</u>	
MET (DD/MH:MM:SS)	02/02:03:00
OV (fps)	41.8
DT (MM:SS)	00:28
ORBIT ha/hp (rm)	167 X 166
<u>NC3</u>	
MET (DD/MH:MM:SS)	02/03:52:00
OV (fps)	8.0
DT (MM:SS)	00:08
ORBIT ha/hp (rm)	166 x 161
<u>NH</u>	
MET (DD/MH:MM:SS)	02/18:58:00
OV (fps)	21.2
DT (MM:SS)	00:16
ORBIT ha/hp (rm)	166 x 149
<u>NC4</u>	
MET (DD/MH:MM:SS)	02/19:43:00
OV (fps)	35.8
DT (MM:SS)	00:24
ORBIT ha/hp (rm)	149 x 146
<u>TI</u>	
MET (DD/MH:MM:SS)	02/22:43:00
OV (fps)	3.2
DT (MM:SS)	00:05
ORBIT ha/hp (rm)	149 x 147
<u>LOEF RETRIEVE</u>	
MET (DD/MH:MM:SS)	03/01:15:00
<u>DEORBIT BURN</u>	
MET (DD/MH:MM:SS)	09/20:35:00
OV (fps)	259.0
<u>LANDING (EDW)</u>	
MET (DD/MH:MM:SS)	09/21:35:00
Day of year	362
CST/GMT	15:21/21:21

B. CREW

1. The 5 crewmembers flying this mission are:

CDR - Daniel C. Brandenstein
PLT - James D. Wetherbee
MS1 - Bernie J. Dunbar
MS2 - Marsha S. Ivins
MS3 - G. David Low

2. The crewmembers responsible for performing an EVA, should one become necessary, are: MS1 will be EV1, MS3 will be EV2, and PLT will be EV1.

C. ORBITER SYSTEMS

1. Communications and Instrumentation

- a. The Operational Instrumentation (OI) system will nominally be managed from the ground through uplink real-time commands (RTCs) coordinated with the crew.
- b. TDRS coverage is supported by TDRS-E (41 degrees W) and TDRS-W (171 degrees W) and is the prime mode of communication coverage.
- c. TDRS Ku-band is the prime mode for real-time TV. There are also 3 GSTDN sites available as backup for TV (90-minute lead time required): GDY(GDS), MIL(MLX), and VAN.
- d. TDRS-E and TDRS-W are available to support Ku-band text uplink (e.g., TAGS).
- e. HDR text uplink (e.g., Teleprinter) is available through S-band TDRS-E and TDRS-W.
- f. GSTDN sites available during the first 25 minutes of the mission are MIL(MLX), BOA, and IOS. IOS can be used for UHF voice during ascent.
- g. There are eight GSTDN sites available on a 90 minute call-up on-orbit and also for deorbit: VAN, GDY(GDS), MIL(MLX), BOA(BDX), CAN, MAD, OKR, and DFR. (Note: DFR is not shown in the FLT PLN).
- h. The following GSTDN sites will be available during the Rendezvous timeline: VAN

2. Guidance and Navigation

- a. The orbiter state vector must be uplinked whenever downtrack error in the on-board vector becomes greater than 20 nm, but is usually uplinked when errors are greater than 5 nm. These are real-time calls. In addition, state vectors must be uplinked for specified targets when utilizing an orbiting vehicle as a TGT ID with Universal Pointing. State vector updates are required every 4 hours when using the L3 payload.
- b. IMU alignments occur approximately every 12 hours (in the pre-sleep and post-sleep activities) and prior to major events requiring low navigation uncertainty.

3. Environmental Control and Life Support Subsystem (ECLSS)

- a. Two CO2 absorbers are installed prior to launch. On-orbit, the canisters are alternately replaced as required per the cue card.
- b. There are four supply water tanks and one waste water tank which are loaded for launch with volumes sufficient to meet a launch day deorbit opportunity with payload bay doors (PLBDs) failed closed. Tanks A and B will be managed to a level that will allow the tanks to be full prior to the next daily group of deorbit opportunities. After LOEF is retrieved, a special water dump attitude will be used during supply and waste water dumps.

4. Utility Power Usage

The following tables are the DC and AC Utility Power Outlet Schedules. These tables show the times of outlet reconfiguration during the mission.

STS-32 DC UTILITY POWER OUTLET SCHEDULE

OUTLET \ MET		PRELAUNCH	POST INSERTION	ON-ORBIT	DEORBIT PREP
			O/I:46		
MNA	O19 MO52J	PLT* MS3*	-- PCG1,PCG2	-- PCG1,PCG2	PLT* MS3*
MNB	F1 MO13Q	-- PCG1,PCG2	-- --	-- --	-- PCG1,PCG2
MNC	A11 A15 MO30F	MS1*,MS2* COR* --	-- TPR --	-- TPR FEA ACCEL	MS1*,MS2* COR* --
MNA or MNB	L15	--	--	IMAX	--

NOTES: * Crewmember suit fan

STS-32 AC UTILITY POWER OUTLET SCHEDULE

OUTLET \ MET		PRELAUNCH	POST INSERTION	ON-ORBIT	DEORBIT PREP
			O/I:12		
AC1	MO52J F1	-- --	-- SPOC	FEA SPOC	-- --
AC3	MO13Q A15	-- --	-- --	AFE L3	-- --

NOTE: Intermittent AC outlets needed for vacuum cleaner and photo floodlight

D. TEXT UPLINK SYSTEM

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

E. TELEVISION/PHOTOGRAPHY

1. The CCTV system provides one color, wide-angle camera for in-cabin coverage. There will also be five PLB TV cameras and 2 RMS cameras. There are three different lens assemblies available for the PLB cameras (color lens assembly, monochrome lens assembly, and wide-angle lens assembly). The type of lens assembly for each PLB camera is documented in the Flight Requirements Document.
2. There is a video tape recorder available with 30-minute cassettes.
3. Three camera systems are available: 35mm, 16mm, and 70mm.
4. The camcorder has been included in the manifest for test purposes. See DTO 630, Camcorder Demonstration.
5. The AFE and FEA payload will fly their own dedicated camcorders.

F. PAYLOADS

1. Long Duration Exposure Facility (LDEF)

LDEF is a free-flying passive spacecraft that provides accommodations for experiments which require long-term exposure to the space environment. Deployment was performed during mission STS 41-C (April, 1984) and LDEF is approaching the end of its orbital lifetime. Retrieval is scheduled using a ground up rendezvous on flight days 4, 5, or 6 and proximity operations to approach the LDEF so that capture with the RMS can be performed. The LDEF spacecraft has been in orbit in a gravity gradient stabilized attitude for 5 years and many of the requirements for handling of the spacecraft during retrieval have maintenance of LDEF's condition as the primary objective.

2. SYNCOM IV-5

The last SYNCOM spacecraft of the series of 5 communications satellites is the SYNCOM IV-5. As in past flights, the SYNCOM will be deployed from the orbiter payload bay so that its own third stage PKM and multi-use LAM motors can be used to elevate the satellite to geosynchronous orbit. This SYNCOM has been modified to allow PKM firing via ground command so that the mission may be accomplished even when launch occurs outside its RAAM limits. In these cases PKM firing is delayed until nodal regression allows continuation of the mission. Deployment is scheduled on orbit 17 with a backup on orbit 32.

3. American Flight Echocardiograph (AFE)

The subject's heart will be scanned using a hand-held ultrasonic transducer. The scan is displayed as a video image by the apparatus which is fitted into a middeck locker. Data is output in standard video format and is recorded on the CCTV Video Tape Recorder (VTR) or Camcorder. AFE recordings are taken daily for crewmembers involved in the data taking which investigates effects on the heart in zero-g. The AFE will also be used to support OSO 478, Lower Body Negative Pressure.

4. Characterization of Neurospora Circadian Rhythms (CNCR)

The CNCR payload consists of several specimen race tubes, six gas sampling syringes and a temperature recorder stowed in three foam packages in a middeck locker. The specimen consists of Neurospora Crassa (bread molds) which are exposed to various timed light levels and microgravity to examine the effect on circadian rhythms and metabolic rates.

5. Latitude/Longitude Locator (L3)

A 70mm Hasselblad Camera is modified with a fixed and moving reticle for sighting on targets and taking angle marks (as well as photographs). A Camera-Computer Interface Unit (CCIU) connects the camera to a GRID compass computer. The collection of marks are reduced to longitude/latitude for each of the targets on which the marks are taken. The objective of the L3 mission is to evaluate the accuracy and usability of the instrument by viewing and marking on known earth ground sites during the flight.

6. FEA (Fluids Experiment Apparatus)

The FEA payload is a middeck experiment examining the application of floating zone processes and their effects on crystal quality. The apparatus is the size of one middeck locker. Ancillary FEA hardware includes a computer, camcorder, test samples, spare parts, and 8mm and 35mm film. The apparatus consists of a heating element that moves along a track to melt and recrystallize the sample which is sealed in a pyrex tube. The camcorder and computer provide in-flight monitoring and postflight analysis of each test.

7. MLE (Mesoscale Lightning Experiment)

The MLE payload consists of the standard orbiter cargo bay Television (TV) camera system (with no restrictions on the Closed Circuit Television (CCTV) camera lens configuration) and a dedicated STS standard orbiter 35mm camera body with hr-min-sec data back and 85mm lens. The MLE camera will share lenses from the standard onboard orbiter complement. The TV system is shared on a noninterference basis with primary mission objectives. The MLE objectives are to observe and record the visual characteristics of large scale lightning as seen from space using the onboard cargo bay TV and 35mm cameras and to develop a better understanding of this type of lightning.

8. AMOS (Air Force Maui Optical Site)

The primary objective of the AMOS activity is to use the orbiter during cooperative overflights of Maui to obtain imagery and/or signature data to support the calibration of the AMOS ground-based sensors and to observe plume phenomenology. No unique onboard hardware is associated with the AMOS tests; crew and orbiter participation are required to establish the controlled conditions for the Maui cooperative overflight.

9. PCG (Protein Crystal Growth)

The PCG payload is designed to conduct experiments which will supply information on the scientific methods and commercial potential for growing large, high-quality protein crystals in microgravity. The PCG will be installed and operated on the orbiter middeck. Two PCG experiments will be flown on STS-32.

10. IMAX

The IMAX payload is a 70mm motion picture camera system. The camera and supporting equipment are stowed in the middeck and are for in-cabin use. On this flight, a large percentage of the scenes for the IMAX camera will be Earth-viewing. Scene opportunities will be provided to the crew pre-flight and in real-time. In addition, a few opportunities utilizing special orbiter attitudes/maneuvers may be scheduled in this Flight Plan.

G. ON-ORBIT OTOs

1. Cold Soak of Observation Windows (OTO 118)

The orbiter may adopt a cold (-Z space) attitude to support cold case investigation (via downlink data) of the upper window viton seals.

2. Cabin Growth (OTO 332)

Estimated cabin deflections due to release of atmospheric pressure will be interpreted by measurements and pictures taken of the mounted escape pole while on orbit.

3. Cabin Air Monitoring (OTO 623)

This OTO will use the solid sorbent sampler to continuously sample the orbiter atmosphere throughout the flight. The solid sorbent sampler is to be flown on first flights of a new vehicle or after extensive non-metallic materials refurbishment in the orbiter cabin.

4. RMS Operating Loads and Data During LDEF Retrieve (OTO 627)

Advantage of the weight and size of LDEF is taken to collect unique and extreme combinations of forces on the RMS subsystem. Data will be collected during the loaded RMS operations with the LDEF payload. A special format (26) will be required for the strain gauge data.

5. 8mm Camcorder Demonstration (OTO 0630)

The OTO will perform documentary cabin and exterior television. The equipment will be evaluated as possible future enhancement to orbiter cabin television equipment.

6. RMS Direct Drive Testing (OTO 636)

An RMS Direct Drive test will be scheduled during each flight day following LDEF berthing. The data will be used to monitor joint braking performance degradation during extended stays on orbit.

7. TDRS to TDRS Handover Demonstration (OTO 703)

The OTO will perform demonstrations of S-Band and Ku-Band TDRS to TDRS handover capability. Ku-Band handovers will involve the return link only.

8. Gravity Gradient Attitude Control (OTO 816)

Data collected during this OTO will help refine the computer models used to predict stable gravity gradient attitudes. On STS-32, only long duration tests (8-12 hours) will be done. The long duration tests will help determine the amplitude of steady state attitude oscillations and the sensitivity of these oscillations to attitude and rate errors at attitude initiation.

9. Additional Stowage Evaluation for Extended Duration Orbiter (OTO 823)

Several provisions for additional stowage are being tested in this OTO for ultimate use on extended duration orbiter (EDO) missions.

H. ON-ORBIT OSOs

1. Inflight Salivary Pharmacokinetics of Scopolamine and Dextroamphetamine (OSO 457)

The purpose of this OSO is to investigate the pharmacokinetics of anti-motion sickness agents during space flight and predict the resultant therapeutic consequences. The crewmember will take the drug after an 8-hour fast, and take salivary samples at required intervals during the flight day.

2. Characterization of Airborne Particulate Matter in Shuttle Atmospheres (OSO 471)

Airborne particles and floating debris have been reported as the cause of eye and respiratory tract irritation by crewmembers. Some instrument failure has also been attributed to airborne particulates. The Airborne Particulate Sampler will be used to characterize the type and amount of debris in the cabin atmosphere. Samples will be analyzed to determine the health and safety consequences of airborne matter and to identify sources of contamination.

3. Intraocular Pressure (OSO 472)

Pressure measurements 20-25% above normal/preflight levels were observed in bedrest studies, during 0-G on the KC-135, and on the O-1 shuttle mission. The possible deleterious effects of sustained deviations in intraocular pressure are difficult to predict since no statistically valid in-flight data exists. Even though a few days or weeks of elevated intraocular pressure would be harmless, months or years of sustained high pressure, due to microgravity, could cause ocular disturbances. Significant baseline data is needed to define normal intraocular pressure ranges in microgravity and to determine the magnitude of pressure rises to be expected in crewmembers. A tono-pen is used to measure IOP among the STS-32 crewmembers.

4. Delayed-type Hypersensitivity (OSO 473)

The purpose of this OSO is to detect immunological alterations in the human system resulting from spaceflight. Delayed-Type Hypersensitivity will also assess the impairment of in-vivo cell mediated immunity and the medical significance of immune dysfunction events.

5. Inflight Aerobic Exercise (OSO 476)

Daily inflight aerobic exercise will 1) inhibit the decrease in cardiac dimensions observed during space flight and thus improve postflight orthostatic tolerance, and 2) minimize the loss of aerobic capacity after flight. The STS-32 crew is divided into two groups (exercisers and non-exercisers) which participate in daily measurements of resting heart rate. The exercisers will conduct detailed test protocols of aerobic exercise while measurement of ECG and heart rate are recorded. This research hopes to develop counter measures that will provide complete prevention of post-space flight orthostatic intolerance.

6. Inflight Lower Body Negative Pressure (LBNP) (OSO 478)

Fluid loading via ingestion of salt tablets and water in association with lower body negative pressure (LBNP) treatment will protect tolerance to orthostasis (simulated inflight by LBNP). The objective of this study is to evaluate the effectiveness of fluid loading during LBNP in improving tolerance of a LBNP stress protocol.

7. Documentary Television (OSO 901)

This OSO requires live television transmission or VTR dumps of crew activities and spacecraft functions which include: Payload Bay Views, SYNCOM Predeploy, Deploy and Separation Activities, views of SYNCOM PKM firing, views of LDEF during capture through berthing, In-Flight Crew Conference, views of AFE Sessions, and unscheduled TV Activities.

8. Documentary Motion Picture Photography (OSO 902)

This OSO requires documentary and public affair motion picture photography of significant activities which best depicts the basic capabilities of the Space Shuttle and key objectives. This OSO includes motion picture photography of SYNCOM Predeploy and Deploy Activities, Flight Deck Activities, Middeck Activities, and any unscheduled Motion Picture Photography.

9. Documentary Still Photography (OSO 903)

This OSO requires still photography of crew activities in the orbiter, spacecraft accommodations, and mission related scenes of general public and historical interest. Still photography with 70mm format for exterior photography and 35mm format for interior photography is required.

I. TIMELINE FORMATS

The timeline formats used in this Flight Plan are based on JSC document 19933: Timeline Format Definitions and Standard Notes, Revision B, May 25, 1987.

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STS-32 OAP BOOK

DAP A CONFIGURATIONS

	A1*	A2	A3	A4	A5	A6	A8	A9	A10	A12	A13
<u>TRANSLATION</u>											
PULSE ft/sec	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.05	0.10	
<u>ROTATION</u>											
DSC RT NORM */sec	0.200	0.400	0.200	0.200	0.200	0.200	0.500	0.200	0.200	0.200	
VERN */sec	0.200	0.400	0.200	0.008	0.200	0.200	0.200	0.200	0.200	0.200	
PULSE NORM */sec	0.10	0.10	0.30	0.10	0.10	0.10	0.10	0.10	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	
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)	5.00	1.00	5.00	1.00	5.00	5.00	3.00	2.00	2.00	2.00	
VERN (deg)	1.000	1.000	1.000	0.070	1.000	1.000	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	
VERN */sec	.020	.020	.020	.010	.020	.020	.020	.020	.020	.020	
<u>JET OPT</u>											
P	1	1	3	1	1	3	1	1	1	1 or 3	
Y	1	1	3	3	1	3	1	1	1	1 or 3	
CNTL ACCEL	0	0	0	0	0	0	0	0	0	3 thru 5	

*I-LOADED OPS-2 DAP Configuration

DAP B CONFIGURATIONS

	B1*	B2	B3	B4	B5	B6	B7	B9	B10	B11	B12
<u>TRANSLATION</u>											
PULSE ft/sec	0.02	0.02	0.02	0.02	0.02	0.05	0.01	0.02	0.02	0.10	
<u>ROTATION</u>											
BSC RT NORM ^o /sec	0.500	0.200	0.200	0.200	0.200	0.500	0.200	0.066	0.500	0.200	
VERN ^o /sec	0.200	0.200	0.200	0.008	0.016	0.200	0.200	0.066	0.200	0.200	
PULSE NORM ^o /sec	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.77	0.04	
VERN ^o /sec	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.002	0.005	
COMP NORM ^o /sec	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	
VERN ^o /sec	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
<u>BEARINGS</u>											
ATT NORM (deg)	3.00	3.00	3.00	0.30	3.00	2.00	2.00	5.000	2.00	2.00	
VERN (deg)	1.000	1.000	1.000	0.100	0.033	1.000	1.000	1.000	1.000	2.000	
RATE NORM ^o /sec	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
VERN ^o /sec	.020	.020	.020	.010	.020	.020	.020	0.020	0.020	0.100	
<u>JET OPT</u>											
P	1	3	1	3	3	1	1	3	1	1 or 3	
V	1	3	1	3	3	1	1	3	1	1 or 3	
CTRL ACCEL	0	0	0	0	0	0	0	0	0	3 thru 5	

*1-LOADED OPS-2 DAP Configuration

DAP BOOK

HOOK
VELCRO

FLT PLN/32/0/BAS

UNIV DTG		FLT PLN/32/0/BAS
TGT ID = 1	Orbiting vehicle	
2	Earth ctr	
3	Earth tgt	
	Input LAT (± 90)	
	LOH (± 180 , + = East)	
	ALT (-3444.0 to 20000.0 nm)	
4	Sun ctr	
5	Celestial tgt	
	Input RA (0-360.00)	
	DEC (± 90)	
	11-110 Max Stars	
BODY VECT = 0	+2°	
1	-2°	
2	+2°	
3	-2°	
4	PTC (-2° below $+2^\circ$)°	
5	Options	
	Input P (0-360.00)	
	T (270-360.00, 0-90)	
0 Input OM =	OM (0-360.00)	
FOR AXIS = 0	+1	
1	-1	
DAP DAP COMP IS		
CHL ACCEL = 0	Orbiter alone	JET OPT = 1 Normal
1	thru 8 orbiter/LDEF	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 ROTATION
- A6 - LOSS OF VERN
(TAIL ONLY)
- A8 - PRE/POST DEPLOY
- A9 - RENDEZVOUS
- A10 - PRON OPS
- A12 - LOAEO MMVR
(LOAEO RMS)
- A13 - Blank

FLT PLN/32/O/FER

A1

TOP

DAP A1

A1

PURPOSE:

NOMINAL
IMU ALIGN
LOSS OF VERN
(NOSE & TAIL)

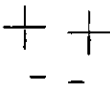
0-1	Q	1	TRANSLATION PULSE
0-2	Q	2	ROTATION BSC RT
0-3	Q	3	NORM VERN
0-4	Q	4	PULSE VERN
0-5	Q	5	COMP VERN
0-6	Q	6	DEADBAND ATT
0-7	Q	7	NORM VERN
0-8	Q	8	RATE VERN
0-9	Q	9	
0-10	Q	10	RATE VERN
0-11	Q	11	
0-12	Q	12	JET OPT
0-13	Q	13	P T
0-14	Q	14	CHTL ACCEL

FLT PLN/32/O/BAS

FLT PLN/32/O/BAS

A2

TOP



TOP



A1

DAP A2

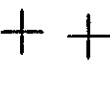
PURPOSE:
PTC

A2

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

FLT PLR/32/0/BAS

FLT PLR/32/0/BAS

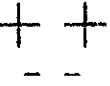


A3



TOP

TOP



A2

DAP A3

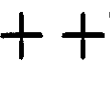
PURPOSE:
RCS HOT FIRE

A3

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

FLT PLR/32/0/BAS

FLT PLR/32/0/BAS



A4



TOP



A3

DAP A4

PURPOSE:

GG

FLT PLN/32/0/BAS



TOP



DAP A5

PURPOSE:

IMJ ROTATION

FLT PLN/32/0/BAS



TOP

(reduced copy)



TOP

A4

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

FLT PLN/32/0/BAS



A5

TOP

A4



A5

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

FLT PLN/32/0/BAS



A6

FLT PLN/32/FIN

TOP

AS

DAP A6

PURPOSE:

LOSS OF VERN
(TAIL ONLY)

A6

0-1 0	1	TRANSLATION	
		PULSE	
0-2 0 0	2	ROTATION	
0-2 0 0	3	DSC RT	NORM
0-2 0 0	4	PULSE	NORM
0-2 0 0	5	VERN	NORM
0-2 0 0	6	COMP	NORM
0-2 0 0	7	VERN	VERN
0-3 0 0	8	DEADBAND	
0-3 0 0	9	ATT	NORM
0-3 0 0	10	RATE	NORM
0-3 0 0	11	VERN	VERN

1	12	JET OPT	P
1	13		Y

0 14 CNTL ACCEL

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

A6

TOP

TOP

A6

DAP A6

PURPOSE:

PRE/POST DEPLOY

A6

0-1 0	1	TRANSLATION	
		PULSE	
0-2 0 0	2	ROTATION	
0-2 0 0	3	DSC RT	NORM
0-2 0 0	4	PULSE	NORM
0-2 0 0	5	VERN	NORM
0-2 0 0	6	COMP	NORM
0-2 0 0	7	VERN	VERN
0-3 0 0	8	DEADBAND	
0-3 0 0	9	ATT	NORM
0-3 0 0	10	RATE	NORM
0-3 0 0	11	VERN	VERN

1	12	JET OPT	P
1	13		Y

0	14	CNTL ACCEL	
---	----	------------	--

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

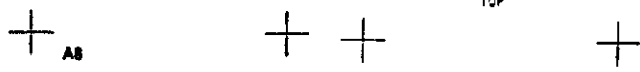
A6

TOP

(reduced copy)

8-8

FLT PLN/32/FIN



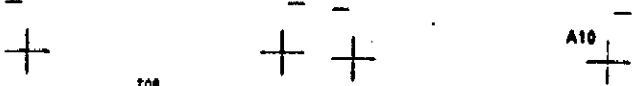
DAP A9
 PURPOSE:
 RENDEZVOUS

A9

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

FLT PLN/32/O/BAS

FLT PLN/32/O/BAS



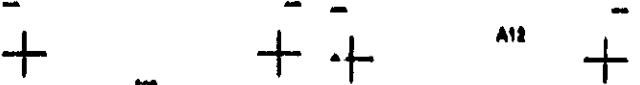
DAP A10
 PURPOSE:
 PROX OPS

A10

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

FLT PLN/32/O/BAS

FLT PLN/32/O/BAS



TOP

A10

DAPA12

PURPOSE: LDEF MNVR
(LOADED RMS)

A12

0-1 0	1	TRANSLATION	
		PULSE	
		ROTATION	
0-2 0	2	DSC RT	NORM
0-3 0	3		VERN
0-4 0	4	PULSE	NORM
0-5 0	5		VERN
0-6 0	6	COMP	NORM
0-7 0	7		VERN
		DEADBAND	
0-8 0	8	ATT	NORM
0-9 0	9		VERN
0-10 0	10	RATE	NORM
0-11 0	11		VERN
1 or 2	12	JET OPT	P
1 or 3	13		V
3 thru 5	14	CNTL ACCEL	

FLT PLN/32/O/BAS

FLT PLN/32/O/F:R

A13

TOP

TOP

A12

DAPA13

PURPOSE: (Blank)

A13

...	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		V
...	14	CNTL ACCEL	

FLT PLN/32/O/BAS

FLT PLN/32/O/BAS

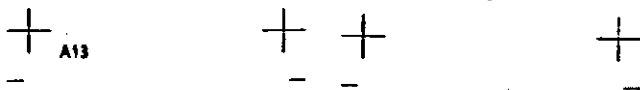
TOP

(reduced copy)

8-10

FLT PLN/32/FIN

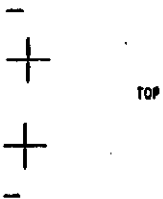
TOP



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 - SYNCOM DEPLOY
- B5 - COAS CAL
- B6 - RENDEZVOUS
- B7 - PROX OPS
- B9 - ORB RATE ROTATION
- B10 - IMAX
- B11 - LDEF MNVR
(LOADED RMS)
- B12 - Blank

FLT PLN/32/0/BAS

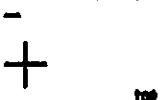


DAP B1

PURPOSE:

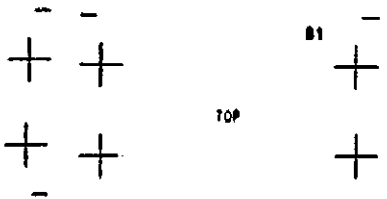
NOMINAL
PRCS IMU ALIGN
OMS & RCS BURNS

FLT PLN/32/0/BAS



TOP

FLT PLN/32/0/FIN



TOP

B1

TRANSLATION
PULSE 15 2-2 2

ROTATION
DSC RT NORM 16 0-0 0 0
VERN 17 0-0 0 0
PULSE NORM 18 0-0 0 0
VERN 19 0-0 0 0
COMP NORM 20 0-0 0 0
VERN 21 0-0 0 0

DEADBAND
ATT NORM 22 1-1 1 1
VERN 23 1-1 1 1

RATE NORM 24 0-0 0 0
VERN 25 0-0 0 0

JET OPT P 26 1
V 27 1

CNTL ACCEL 28 1
FLT PLN/32/0/BAS



B2

(reduced copy)

8-11

FLT PLN/32/FIN

TOP

B1

DAP B2

PURPOSE:

LOSS OF VERN
(TAIL ONLY)

FLT PLR/32/O/BAS

TOP

B2

DAP B3

PURPOSE:

LOSS OF VERN
(NOSE & TAIL)
ON HWYR

FLT PLR/32/O/BAS

TOP

(reduced copy)

8-12

FLT PLR/32/PIN

B2

TRANSLATION
PULSE

15 Q-Q Z

ROTATION

DSC RT	NORM	16	Q-Q	Z
VERN		17	Q-Q	Z
PULSE	NORM	18	Q-Q	Z
VERN		19	Q-Q	Z
COMP	NORM	20	Q-Q	Z
VERN		21	Q-Q	Z

DEADBAND

ATT	NORM	22	Q-Q	Z
VERN		23	Q-Q	Z

RATE	NORM	24	Q-Q	Z
VERN		25	Q-Q	Z

JET OPT	P	26	Q-Q	Z
VERN		27	Q-Q	Z

CNTL ACCEL

Q

FLT PLR/32/O/BAS

B3

TOP

B3

TRANSLATION
PULSE

15 Q-Q Z

ROTATION

DSC RT	NORM	16	Q-Q	Z
VERN		17	Q-Q	Z
PULSE	NORM	18	Q-Q	Z
VERN		19	Q-Q	Z
COMP	NORM	20	Q-Q	Z
VERN		21	Q-Q	Z

DEADBAND

ATT	NORM	22	Q-Q	Z
VERN		23	Q-Q	Z

RATE	NORM	24	Q-Q	Z
VERN		25	Q-Q	Z

JET OPT	P	26	Q-Q	Z
VERN		27	Q-Q	Z

CNTL ACCEL

Q

FLT PLR/32/O/BAS

B4

TOP

+ + +

83

DAP 84

PURPOSE:
SYNCOM DEPLOY

B4

TRANSLATION
PULSE 15 0.2 2

ROTATION
DSC RT NORM 16 0.2 0.2 0
 VERN 17 0.2 0.2 0
PULSE NORM 18 0.2 0.2 0
 VERN 19 0.2 0.2 0
COMP NORM 20 0.2 0.2 0
 VERN 21 0.2 0.2 0

DEADBAND
ATT NORM 22 0.2 0.2 0
 VERN 23 0.2 0.2 0

RATE NORM 24 0.2 0.2 0
 VERN 25 0.2 0.2 0

JET OPT P 26 1
 V 27 1

CNTL ACCEL 28 2

FLT PLN/32/0/BAS

+ + +

TOP

+ + +

B4

TOP

DAP 85

PURPOSE:
COAS CAL

B5

TRANSLATION
PULSE 15 0.2 2

ROTATION
DSC RT NORM 16 0.2 0.2 0
 VERN 17 0.2 0.2 0
PULSE NORM 18 0.2 0.2 0
 VERN 19 0.2 0.2 0
COMP NORM 20 0.2 0.2 0
 VERN 21 0.2 0.2 0

DEADBAND
ATT NORM 22 0.2 0.2 0
 VERN 23 0.2 0.2 0

RATE NORM 24 0.2 0.2 0
 VERN 25 0.2 0.2 0

JET OPT P 26 1
 V 27 1

CNTL ACCEL 28 2

FLT PLN/32/0/BAS

+ + +

TOP

B6

TOP

B5

DAP B6

PURPOSE:
RENDEZVOUS

FLT PLN/32/O/BAS

TOP

B6

DAP B7

PURPOSE:
PROX OPS

FLT PLN/32/O/BAS

TOP

(reduced copy)

B6

TRANSLATION PULSE	15	Q-Q	I
ROTATION			
DSC RT NORM	16	Q-Q	I
VERN	17	Q-Q	I
PULSE NORM	18	Q-Q	I
VERN	19	Q-Q	I
COMP NORM	20	Q-Q	I
VERN	21	Q-Q	I
DEADBAND			
ATT NORM	22	I-Q	I-Q
VERN	23	I-Q	I-Q
RATE NORM	24	Q-Q	I
VERN	25	Q-Q	I
JET OPT P	26		I
T	27		I
CNTL ACCEL	28		Q
FLT PLN/32/O/BAS			

B7

TOP

B7

TRANSLATION PULSE	15	Q-Q	I
ROTATION			
DSC RT NORM	16	Q-Q	I
VERN	17	Q-Q	I
PULSE NORM	18	Q-Q	I
VERN	19	Q-Q	I
COMP NORM	20	Q-Q	I
VERN	21	Q-Q	I
DEADBAND			
ATT NORM	22	I-Q	I-Q
VERN	23	I-Q	I-Q
RATE NORM	24	Q-Q	I
VERN	25	Q-Q	I
JET OPT P	26		I
T	27		I
CNTL ACCEL	28		Q
FLT PLN/32/O/BAS			

B8

8-14

FLT PLN/32/PII

+

87

+

+

TOP

+

OAP 89

PURPOSE: DRB RATE
ROTATION

89

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

FLT PLN/32/0/BAS

+

+

+

810

+

TOP

TOP

+

89

+

+

+

OAP 810

PURPOSE: I MAX

810

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

FLT PLN/32/0/BAS

+

+

+

811

+

TOP

TOP

B10

DAP B11

PURPOSE: LOEF HWYR
(LOADED RMS)

B11

TRANSLATION
PULSE 16 0-1 QROTATION
DSC RT NORM 16 0-2 Q
VERN 17 0-2 Q
PULSE NORM 18 0-2 Q
VERN 19 0-2 Q
COMP NORM 20 0-2 Q
VERN 21 0-2 QDEADBAND
ATT NORM 22 2-2 Q
VERN 23 2-2 QRATE NORM 24 0-2 Q
VERN 25 0-2 QJET OPT P 26 1 or 1
V 27 1 or 1

CNTL ACCEL 28 1 thru 1

FLT PLN/32/0/14

FLT PLN/32/0/BAS

B12

TOP

TOP

B11

DAP B12

PURPOSE: (Blank)

B12

TRANSLATION
PULSE 16ROTATION
DSC RT NORM 16
VERN 17
PULSE NORM 18
VERN 19
COMP NORM 20
VERN 21DEADBAND
ATT NORM 22
VERN 23RATE NORM 24
VERN 25JET OPT P 26
V 27

CNTL ACCEL 28

FLT PLN/32/0/BAS

FLT PLN/32/0/BAS

TOP

FLT PLN/32/0/BAS

(reduced copy)

0-10

+
- 812

+
-

-
+ FLT PLN/32/0/BAS

+
-

+
-

TOP

TOP
BACK COVER 'DAP BOOK'

+
-

+
-

HOOK
VELCRO

+
- FLT PLN/32/0/BAS

(reduced copy)

8-17

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FLT PLN/32/FIN

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STS-32
ATTITUDE TIMELINE

Attitude Timeline

REF	MODE OPTION	MODE	DSC	DB AT	DB RT	E/S	REMARKS	EVENT
1 0/01:12:00 33:33	TRK TGT=2 BV=3(90.00, 0.00) CM=270.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.20	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-ELV NOSE SOUTH PLED OPENING
2 0/03:05:10 18:10	MNVR R+145.00 P+176.00 Y+353.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	SUN T 79 P 101	STAR PR A1 -Y ST: 33 -S ST: 12	IMU ALIGN
3 0/03:25:00 38:07	TRK TGT=2 BV=3(90.00, 0.00) CM=270.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-ELV NOSE SOUTH
4 0/06:35:00 11:53	MNVR R+133.00 P+ 47.00 Y+ 10.00	B1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	SUN T 84 P 115	TIG: 0/06:55:54	NPC BURN
5 0/07:00:00 01:53	TRK TGT=2 BV=3(90.00, 0.00) CM=270.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-ELV NOSE SOUTH
6 0/07:40:00 53:38	MNVR R+145.00 P+176.00 Y+353.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	SUN T 79 P 101	STAR PR A1 -I COAS: 12	IMU ALIGN COAS CAL
7 0/08:05:00 17:01	TRK TGT=2 BV=3(90.00, 0.00) CM=270.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-ELV NOSE SOUTH
8 0/18:15:00 28:12	MNVR R+145.00 P+176.00 Y+353.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	SUN T 80 P 101	STAR PR A1	IMU ALIGN
9 0/18:35:00 48:13	TRK TGT=2 BV=3(90.00, 0.00) CM=270.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-ELV NOSE SOUTH
10 0/20:05:00 13:59	MNVR R+278.00 P+326.00 Y+ 48.00	B1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	SUN T 149 P 29	TIG: 0/20:25:57	NC2 BURN
11 0/20:30:00 37:51	TRK TGT=2 BV=3(90.00, 0.00) CM=270.00	A1 AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-ELV NOSE SOUTH
12 1/00:21:46 30:50 DPLY -20:00	MNVR R+275.00 P+339.00 Y+357.00	AS AUTO VERN	DSC 0.200	DB AT 1.00	DB RT 0.02	SUN T 97 P 16	DEPLOY: 1/00:41:46	SYNCOM DEPLOY ATTITUDE

Attitude Timeline

NET	MNVR OPTION	DAP	E/S	REMARKS	EVENT	
1 1/00:44:46 50:35 DPLY +03:00	MNVR R+258.00 P+141.00 Y+293.00	A8 AUTO NORM	DSC 0.500 DB AT 3.00 DB RT 0.20	SUN T 18 P 302	TIG: 1/00:56:46	SEP BURN
2 1/00:59:46 59:55 DPLY +18:00	TRK TGT-2 BV=3(90.00, 0.00) OM=180.00	A8 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 0	-2LV NOSE FWD
3 1/01:10:46 25:38 DPLY +29:00	TRK TGT-1 BV=3(310.00, 0.00) OM= 9.10	A8 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 95 P 10	INRTL R+281 P+339 Y+355	WINDOW PROTECT
4 1/01:26:46 DPLY +45:00	CANCEL	A8 MAN VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 95 P 10	INRTL R+281 P+339 Y+355	INRTL HOLD
5 1/01:40:00 51:23	TRK TGT-2 BV=3(90.00, 0.00) OM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-2LV NOSE SOUTH
6 1/06:25:00 38:26	MNVR R+145.00 P+176.00 Y+353.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 80 P 101	STAR PR A1	IMU ALIGN
7 1/06:45:00 58:03	TRK TGT-2 BV=3(90.00, 0.00) OM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+ 90	-2LV NOSE SOUTH
8 1/17:00:00 09:42	MNVR R+125.00 P+359.00 Y+ 25.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 114 P 171	STAR PR A2 -Y ST: 12 -Z ST: 31	IMU ALIGN
9 1/17:20:00 26:24	MNVR R+ 13.00 P+122.00 Y+ 70.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 138 P 240	*X COAS: 11	COAS CAL
10 1/17:45:00 54:29	TRK TGT-2 BV=3(357.51, 0.97) OM=249.18	B3 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 3 P 199	LVLH R+249 P+268 Y+358	GG INIT BIAS +X,Y PLBD NORTH
11 1/01:45:00 58:41	MNVR R+ 88.00 P+150.00 Y+300.00	B1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 26 P 131	TIG: 2/02:03:08	NSR BURN
12 2/03:20:00 35:40	MNVR R+271.00 P+333.00 Y+308.00	B1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 53 P 25	TIG: 2/03:31:57	NCJ BURN

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FLT PLN/32,FIN

ALL ATTITUDES IN MEAN OF 1950

Attitude Timeline

MET	MNVR OPTION	DAP	F/S	REMARKS	EVENT	
1 2/03:55:00 04:02:12	TRK TGT-2 BV=3(90.00, 0.00) CM=277.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 83	IMU ALIGN -Y ST: 22 52 (FD'S 3 & 4)
2 2/18:40:00 48:07	MNVR R+268.00 P+330.00 Y+311.00	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 56 P 27	TIG: 2/18:58:12	NH BURN
3 2/19:00:00	LVLH HOLD	A9 LVLH VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 67 P 360	LVLH R+ 0 P+203 Y+ 0	LVLH HOLD
4 2/19:25:00 31:43	MNVR R+ 93.00 P+150.00 Y+ 49.00	B6 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 124 P 152	TIG: 2/19:43:12	NC4 BURN
5 2/19:45:00 47:15	TRK TGT-1 BV=3(90.00, 0.00) CM= 0.00	B6 AUTO NORM	DSC 0.500 DB AT 2.00 DB RT 0.20	EARTH T 0 P 0	LVLH R+ 0 P+270 Y+ 0	-2 TARGET TRK
6 2/23:55:00	ROT BV=5(0.00, 90.00)	A9 MAN NORM	DSC 0.033 DB AT 2.00 DB RT 0.20		ROT R+268 START P+311 ATT Y+344	MANUAL CONTROL
7 3/00:43:00 40:04	TRK TGT-2 BV=3(90.00, 0.00) CM= 0.00	A10 AUTO NORM	DSC 0.200 DB AT 2.00 DB RT 0.20	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0	-RBAR APPROACH
8 3/00:43:00 45:30	TRK TGT-2 BV=3(90.60, 0.00) CM=330.00	B7 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 30	ALIGN GRAPPLE FIXTURE
9 3/01:30:00 33:30	TRK TGT-2 BV=2(180.00, 0.00) CM= 0.00	B11 MAN VERN	DSC 0.200 DB AT 2.00 DB RT 0.10	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+ 0	-30 DEGREE YAW
10 3/01:32:30 40:00	TRK TGT-2 BV=2(180.00, 0.00) CM= 0.00	B11 MAN VERN	DSC 0.200 DB AT 2.00 DB RT 0.10	EARTH T 180 P 0	LVLH R+ 0 P+ 90 Y+ 0	-90 DEGREE PITCH
11 3/01:40:00 40:50	TRK TGT-2 BV=3(180.00, 330.00) CM= 0.00	B11 MAN VERN	DSC 0.200 DB AT 2.00 DB RT 0.10	EARTH T 170 P 270	LVLH R+ 0 P+ 90 Y+350	-10 DEGREE YAW PHOTO SURVEY
12 3/06:30:00 35:55	TRK TGT-2 BV=3(180.00, 61.00) CM= 0.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 119 P 90	LVLH R+ 0 P+ 90 Y+ 61	IMU ALIGN -Y ST: 57 -8 ST: 104

Attitude Timeline

MET	MNVR OPTION	DAP	E, S	REMARKS	EVENT	
1 3/07:05:00 12:58	TRK TGT=4 BV=2(180.00, 0.00) CM=312.80	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 180 P 71	INRTL R+ 17 P+269 Y+ 67	-XSI
2 3/07:15:00	ROT BV=1(0.00, 0.00)	B9 AUTO VERN	DSC 0.066 DB AT 1.00 DB RT 0.02		ROT R+ 17 START P+269 ATT Y+ 67	-XSI ROTOR
3 3/08:45:00 53:47	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH
4 3/17:00:00 10:50	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
5 3/18:40:00 50:55	TRK TGT=2 BV=3(90.00, 0.00) CM=113.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+293	IMU ALIGN -Y ST: 72 53
6 3/19:16:00 17:55	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH
7 4/03:15:00 16:00	TRK TGT=2 BV=3(90.00, 0.00) CM=102.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+282	IMU ALIGN -Y ST: 107 98
8 4/05:00:00 10:51	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
9 4/06:30:00 40:50	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH
10 4/16:00:00 10:50	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
11 4/17:10:00 20:51	TRK TGT=2 BV=3(90.00, 0.00) CM=100.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+280	IMU ALIGN -Y ST: 107 48
12 4/17:52:00 52:50	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH

ALL ATTITUDES IN MEAN OF 1950

Attitude Timelines

MET	MNVR OPTION	DAP	E/S	REMARKS	EVENT	
1 5/03:40:00 40:50	TRK TGT-2 BV=3(90.00, 0.00) CM=100.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+280	IMU ALIGN -Y ST: 107 48
2 5/05:00:00 10:51	TRK TGT-2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
3 5/06:45:00 55:50	TRK TGT-2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH
4 5/15:45:00 55:50	TRK TGT-2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
5 5/17:10:00 20:51	TRK TGT-2 BV=3(90.00, 0.00) CM=101.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+281	IMU ALIGN -Y ST: 107 48
6 5/17:51:00 51:55	TRK TGT-2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH
7 6/03:40:00 40:55	TRK TGT-2 BV=3(90.00, 0.00) CM=101.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+281	IMU ALIGN -Y ST: 107 48
8 6/04:35:00 45:51	TRK TGT-2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
9 6/05:45:00 55:50	TRK TGT-2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH
10 6/14:00:00 10:50	TRK TGT-2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
11 6/17:10:00 20:53	TRK TGT-2 BV=3(90.00, 0.00) CM=107.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+287	IMU ALIGN -Y ST: 72 96
12 6/17:48:00 49:28	TRK TGT-2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-2LV NOSE NORTH

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FLY PLAN/33/FIN

ALL ATTITUDES IN MEAN OF 1950

Attitude Timeline

NET	MNVR OPTION		DAP	E/S	REMARKS	EVENT
1 7/02:10:00 11:20	TRK TGT=2 BV=3(90.00, 0.00) CM=106.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+286	IMU ALIGN -Y ST: 72 48
2 7/02:50:00 03:00:53	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
3 7/04:45:00 55:50	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-SLV NOSE NORTH
4 7/14:10:00 20:50	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
5 7/15:40:00 50:53	TRK TGT=2 BV=3(90.00, 0.00) CM=106.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+286	IMU ALIGN -Y ST: 72 48
6 7/16:19:00 20:20	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-SLV NOSE NORTH
7 8/02:10:00 10:55	TRK TGT=2 BV=3(90.00, 0.00) CM= 79.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+281	IMU ALIGN -Y ST: 55 20
8 8/03:10:00 20:51	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
9 8/04:45:00 55:50	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-SLV NOSE NORTH
10 8/14:19:00 25:50	TRK TGT=2 BV=5(270.00,310.00) CM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
11 8/15:40:00 50:51	TRK TGT=2 BV=3(90.00, 0.00) CM= 79.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+281	IMU ALIGN -Y ST: 55 20
12 8/16:18:00 18:55	TRK TGT=2 BV=3(90.00, 0.00) CM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-SLV NOSE NORTH

ALL ATTITUDES IN NEAR OF 1990

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PLT PLN/35/PIN

Attitude timelines

NET	MNVR OPTION	DAP	E/S	REMARKS	EVENT	
1 9/02:10:00 10:40	TRK TGT=2 BV=3(90.00, 0.00) OM= 82.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+278	IMU ALIGN -Y ST: 55 20
2 9/02:47:00 57:51	TRK TGT=2 BV=5(270.00, 310.00) OM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
3 9/04:15:00 25:50	TRK TGT=2 BV=3(90.00, 0.00) OM= 90.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+180 P+ 0 Y+270	-ZLV NOSE NORTH
4 9/13:00:00 10:50	TRK TGT=2 BV=5(270.00, 310.00) OM=270.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 230	LVLH R+310 P+ 0 Y+270	WATER DUMP ATTITUDE
5 9/14:10:00 20:51	TRK TGT=2 BV=3(90.00, 0.00) OM= 81.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	EARTH T 90 P 0	LVLH R+ 0 P+180 Y+278	IMU ALIGN -Y ST: 55 101
6 9/14:50:00 15:02:31	TRK TGT=4 BV=5(184.00, 0.00) OM=224.40	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 176 P 181	INRTL R+130 P+259 Y+ 63	TAIL SUN COLD SOAK
7 9/15:05:00	ROT BV=5(4.00, 0.00)	B9 AUTO VERN	DSC 0.066 DB AT 1.00 DB RT 0.02		ROT R+130 START P+259 ATT Y+ 63	TAIL SUN ROTOR
8 9/17:35:00 43:53	MNVR R+ 12.00 P+146.00 Y+ 29.00	A1 AUTO VERN	DSC 0.200 DB AT 1.00 DB RT 0.02	SUN T 110 P 233	-Y ST: 48 -Z ST: 44	O/O IMU ALIGN
9 9/17:49:00 51:57	MNVR R+ 1.00 P+ 74.00 Y+335.00	B1 AUTO VERN	DSC 0.500 DB AT 1.00 DB RT 0.20	SUN T 41 P 268	-Y ST: 43 -Z ST: 47	IMU VERIF
10 9/20:20:00 23:41 TIG -15:00	MNVR R+245.00 P+ 43.00 Y+352.00	* MAN *	DSC 0.500 DB AT 1.30 DB RT 0.30	SUN T 61 P 39	TIG: 9/20:34:52	DEORBIT ATT

ALL ATTITUDES IN MEAN OF 1950

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PLT PLN/32/FIN

END

DATE

FILMED

5-29-90