

STS-1 Flight Data File Crew Activity Plan

Orbital Flight Test

**Flight Operations Directorate
Crew Training and Procedures Division**

**Final
March 2, 1981**



National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
Houston, Texas

121

CHANGE CONTROL RECORD

ORBITAL FLIGHT TEST: STS-1 FDF Crew Activity Plan

CONTROL NO.	FDF EDITION INCORPORATED*		DISAPPROVED OR OTHER DISPOSITION
	TITLE	DATE	
	BASIC	12/30/80	
4-1	FINAL	03/02/81	
4-2	FINAL	03/02/81	
4-3	FINAL	03/02/81	
4-4	FINAL	03/02/81	
4-5	FINAL	03/02/81	
4-6	FINAL	03/02/81	
4-7	FINAL	03/02/81	
4-8			DISAPPROVED
4-9	FINAL	03/02/81	
4-10	FINAL	03/02/81	
4-11	FINAL	03/02/81	
4-12	FINAL	03/02/81	
4-13	FINAL	03/02/81	
4-14	FINAL	03/02/81	
4-15	FINAL	03/02/81	
4-16	FINAL	03/02/81	
4-17	FINAL	03/02/81	
4-18	FINAL	03/02/81	
4-19	FINAL	03/02/81	
4-20	FINAL	03/02/81	
4-21	FINAL	03/02/81	
4-22	FINAL	03/02/81	
4-23	FINAL	03/02/81	
4-24	FINAL	03/02/81	
4-25	FINAL	03/02/81	
4-26	FINAL	03/02/81	
4-27	FINAL	03/02/81	
4-28			DISAPPROVED
4-29			DISAPPROVED
4-30	FINAL	03/02/81	
4-31	FINAL	03/02/81	
4-32	FINAL	03/02/81	
4-33	FINAL	03/02/81	
4-34	FINAL	03/02/81	
4-35	FINAL	03/02/81	
4-36	FINAL	03/02/81	
4-37	FINAL	03/02/81	
4-38	FINAL	03/02/81	
4-39			TBD
4-40			WITHDRAWN
4-41			TBD

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

STS-1 FDF CREW ACTIVITY PLAN

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FINAL 03/02/81

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2-21.....	03/02/81	4-11.....	03/02/81
2-22.....	03/02/81	4-12.....	03/02/81
2-23.....	03/02/81	4-13.....	03/02/81
2-24.....	03/02/81	4-14.....	03/02/81
2-25.....	03/02/81	4-15.....	03/02/81
2-26.....	03/02/81	4-16.....	03/02/81
2-27.....	03/02/81	4-17.....	03/02/81
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6-5.....	03/02/81	7-5.....	03/02/81
6-6.....	03/02/81	7-6.....	03/02/81
6-7.....	03/02/81	7-7.....	03/02/81
6-8.....	03/02/81	7-8.....	03/02/81
6-9.....	03/02/81	7-9.....	03/02/81
6-10.....	03/02/81	7-10.....	03/02/81
6-11.....	03/02/81	7-11.....	03/02/81
6-12.....	03/02/81	7-12.....	03/02/81
6-13.....	03/02/81	7-13.....	03/02/81
6-14.....	03/02/81	7-14.....	03/02/81
6-15.....	03/02/81	7-15.....	03/02/81
6-16.....	03/02/81	7-16.....	03/02/81
6-17.....	03/02/81	7-17.....	03/02/81
6-18.....	03/02/81	7-18.....	03/02/81
6-19.....	03/02/81	8-1.....	03/02/81
6-20.....	03/02/81	8-2.....	03/02/81
6-21.....	03/02/81	8-3.....	03/02/81
6-22.....	03/02/81	8-4.....	03/02/81
6-23.....	03/02/81	8-5.....	03/02/81
6-24.....	03/02/81	8-6.....	03/02/81
6-25.....	03/02/81	8-7.....	03/02/81
6-26.....	03/02/81	8-8.....	03/02/81
6-27.....	03/02/81	8-9.....	03/02/81
6-28.....	03/02/81	8-10.....	03/02/81
6-29.....	03/02/81	8-11.....	03/02/81
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6-32.....	03/02/81	8-14.....	03/02/81
6-33.....	03/02/81	9-1.....	03/02/81
6-34.....	03/02/81	9-2.....	03/02/81
6-35.....	03/02/81	9-3.....	03/02/81
6-36.....	03/02/81	9-4.....	03/02/81
6-37.....	03/02/81	9-5.....	03/02/81
6-38.....	03/02/81	9-6.....	03/02/81

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9-8.....	03/02/81		
9-9.....	03/02/81		
9-10.....	03/02/81		
9-11.....	03/02/81		
9-12.....	03/02/81		
9-13.....	03/02/81		
9-14.....	03/02/81		
9-15.....	03/02/81		
9-16.....	03/02/81		
9-17.....	03/02/81		
9-18.....	03/02/81		
9-19.....	03/02/81		
9-20.....	03/02/81		
9-21.....	03/02/81		
9-22.....	03/02/81		
10-1.....	03/02/81		
10-2.....	03/02/81		
10-3.....	03/02/81		
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INTRODUCTION

The STS-1 Detailed Crew Activity Plan contains the On-Orbit Timeline, which is a flight data file article. It does not contain the detailed crew activities covered in the STS-1 Ascent Checklist, STS-1 Post Insertion Deorbit Prep or STS-1 Entry Checklist. A Summary Timeline is included which shows the major events from liftoff to landing.

The STS-1 Crew Activity Plan includes the On-Orbit Timeline that satisfies the objectives specified in the current STS-1 Flight Requirements Document (Ref. 1).

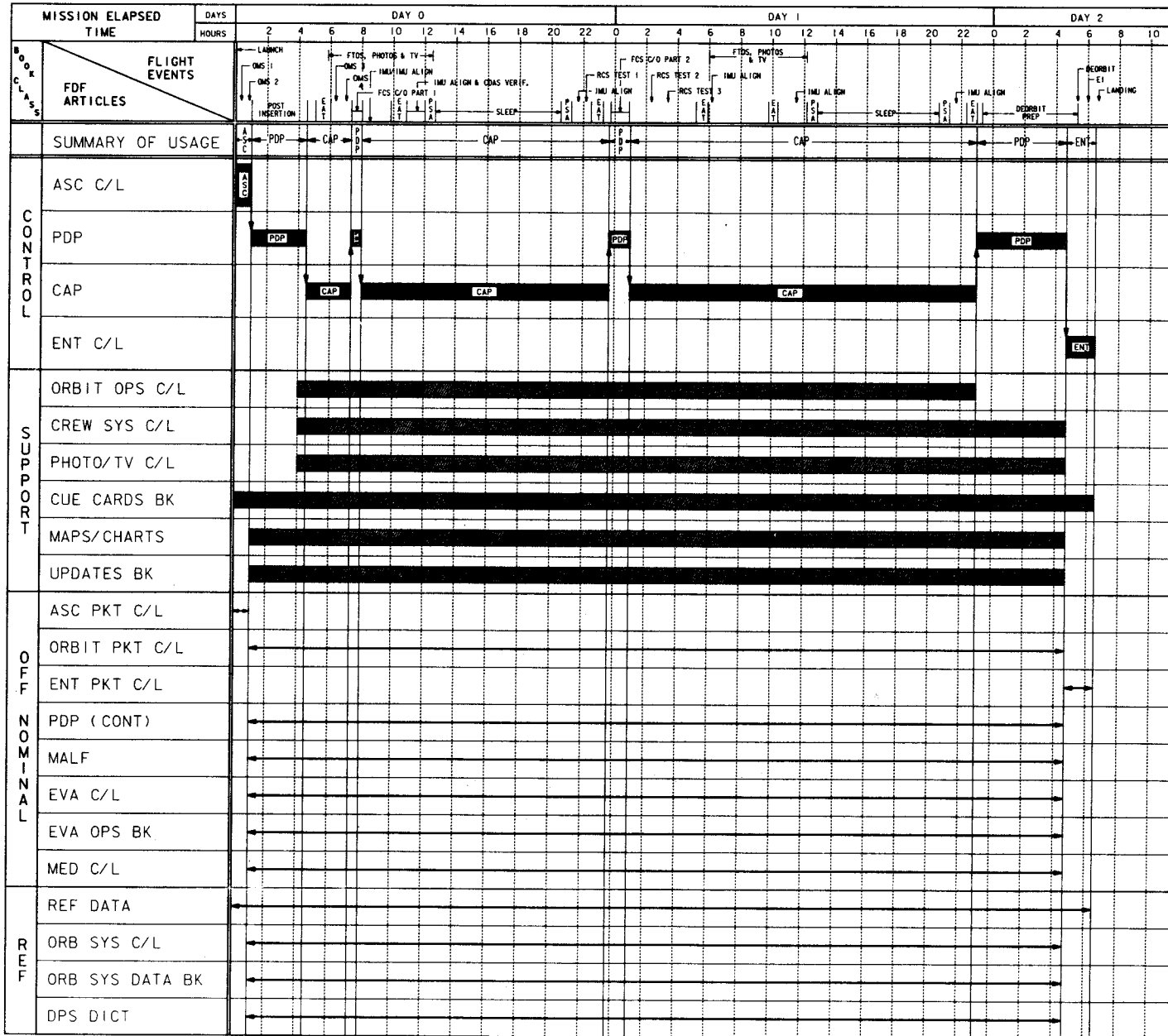
The trajectory data used for this Crew Activity Plan are from the STS-1 Operational Flight Profile - Cycle 3.3.3 as documented in Ref. 9c. |

FLIGHT DATA FILE FLOW CHART

1-1

DATE 03/02/81

STS 1 FLIGHT DATA FILE FLOW CHART

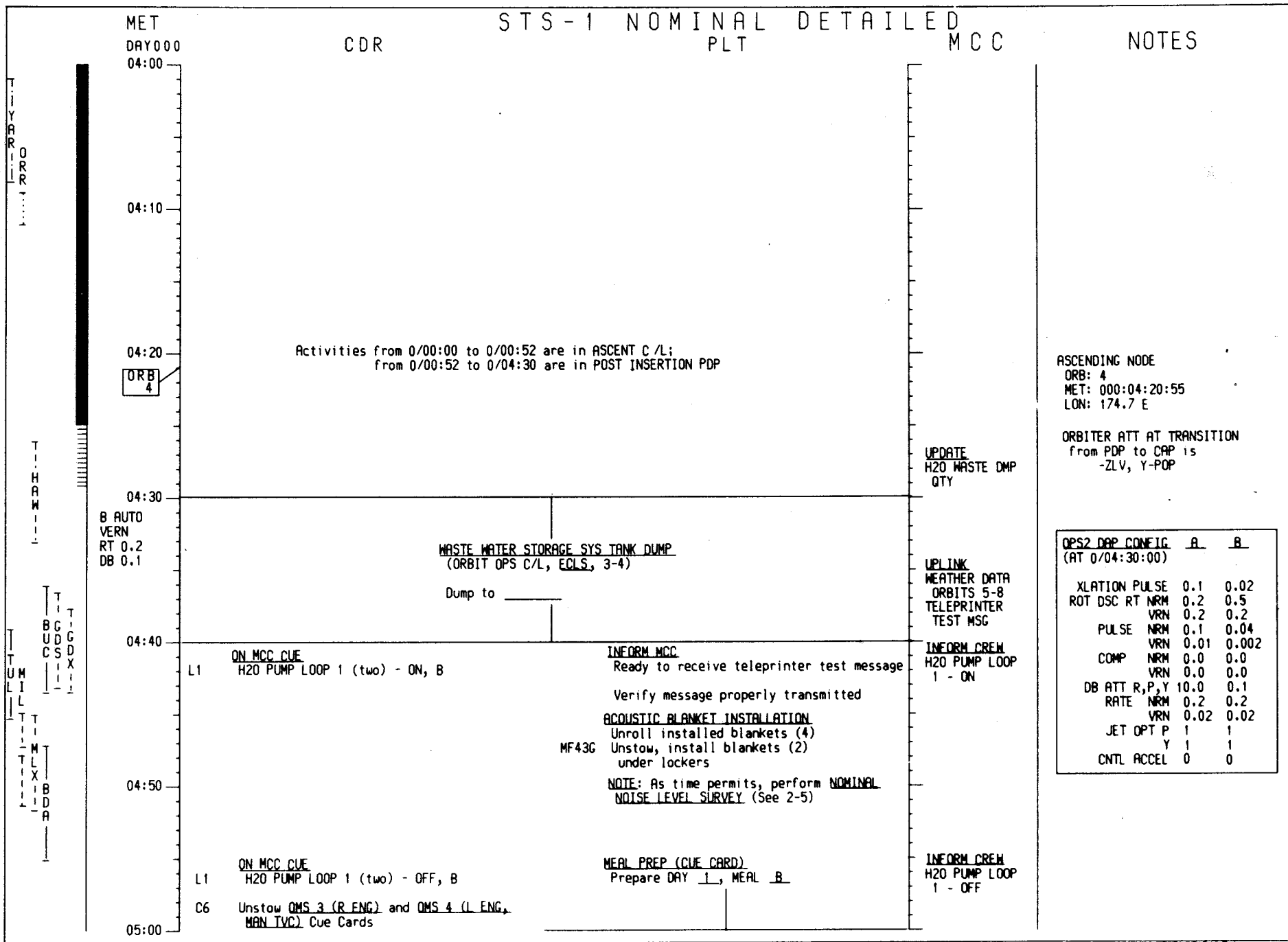


DETAILED ON-ORBIT TIMELINE

2-1

DATE 03/02/81

FLT DAY 1



MET
DAY 000

CDR

STS-1 NOMINAL DETAILED

PLT

MCC

NOTES

WORK
ACN

T
BOT

T
YAR

05:00
B AUTO
VERN
RT 0.2
DB 0.1

05:10

05:20

05:30 12:30 PM

05:40

B AUTO
NORM
RT 0.2
DB 1.0

05:50

06:00

12

CLEANUP/STORAGE, Steps 1 & 2 (Cue Card)

MA9L WIDE GAS SAMPLES (FTO 162-01)
Fill Air Bottle # 1
Record time _____

MA9L SOLID SORBENT SAMPLING (FTO 162-02)
1 Unstow, assemble Air Sampler/Vent Filter, Vent Hose
2 Sampler Position - DAY 1
MCS 3 Connect to VACUUM VENT QD
4/VAC vlv - OP
5 Record time _____

MEAL

CHANGE DAP B: DB ATT R, P, Y - 1' DB
AUTO MNVR TO OMS-3 BURN ATT
INRTL ATT: (See OMS 3 BURN (R ENG)
Cue Card)
DAP: B/AUTO/NORM
(05:43) Initiate MNVR

CO2 ABSORBER INSTALLATION
(1 into A, 2 into B)
Restow wrappers

NOTE
This is the initial installation
of CO2 ABSORBERS

R2 ✓BLR CNTLR PHR/HTR (three) - A
CNTLR (three) - ON

G2/G8 to G3 TRANS
(ORB PKT C/L, DES, 3-4)
Do not perform LOAD PCHNU FORMAT

LPLINK
ORBITER S.V.
UPDATE
OMS-3 BURN PAD
(PRELIMINARY)

UPDATE
OMS-3 BURN PAD
(FINAL)

ASCENDING NODE
ORB: 5
MET: 000:05:50:07
LON: 152.0 E

MET
DAY 000
06:00

CDR

STS-1 NOMINAL DETAILED

PLT

MCC

NOTES

DPS TRANSITION (Cont)

TRANS
DAP
RT 0.5
DB 3.5

R11L:E DFI WB MSN PWR - ON

C3 OI PCMMU FORMAT - FXD

ON-ORBIT OMS BURN (OMS 3: R OMS BURN, L TO R XFD) (FTO 142-01,-04)
(ORBIT OPS C/L, OMS, 7-2)

UPLINK
ORBITER S.V.
PASS, BFS

INFORM CREW
RELOAD TGTS

06:10

06:20

OMS-3 (0/06:21:41)

C3 /DFI RCDRS WB MSN - STBY (tb-bp)

UPDATE
OMS-4 TGTS

06:30 1:30

MAN MNVR TO OMS-4 BURN ATT
INRTL ATT: (See OMS 4 BURN (L ENG,
MAN TVC) Cue Card)

C3 /DFI RCDRS PCM - HI SAMP

UPLINK
ORBITER S.V.
ENTRY REFSMMATS
INFORM CREW
RELOAD TGTS
ENTRY REFSMMATS
ON-BOARD

06:40

06:50

ON-ORBIT OMS BURN (OMS 4: L OMS BURN, R TO L XFD) (FTO 142-02,-03)
(ORBIT OPS C/L, OMS, 7-2)

07:00 2:00 PM

T
H
A
M

T
T
B
G
C
U
D
X
S
C
T
T
U
L
M
L
X
B
D
A
M
I
L

A
C
N
=

B
O
T
T
L
E

MET
DAY 000
07:00

CDR

STS-1 NOMINAL DETAILED
PLT MCC

NOTES

TRANS
DAP
RT 0.5
DB 3.5

2 pm

BURN PREP (Cont)

DMS-4 (0/07:05:31)

G3 to G2/G8 TRANS
(ORB PKT C/L, DPS, 3-3)
Do not perform LOAD PCMMU FORMAT

07:10

C3 ✓DFI RCDRS PCM - HI SAMP
JWB MSN - STBY (tb-bp)
L1 H2O PUMP LOOP 1 (two) - GPC, B

AUTO MNVR TO FCS C/O ATT
INRTL ATT: R + 2 9 5.0
P + 3 1 2.0
Y + 3 3.0

C3 01 PCMMU FORMAT - PCM
NOMINAL NOISE LEVEL SURVEY (FTO 161-01)
SOUND LEVEL METER OPS
(CREW SYS C/L, SOUND LEVEL METER, 7-2)
LOCATION A, B, C, D

07:20

B AUTO
VERN
RT 0.2
DB 1.0

A16 Unstow DEORBIT PDP (2)

Assist PLT with SLEEP STATION
ACOUSTICAL NOISE measurements

07:30

2:30 pm

ECS C/O CONFIGURATION
014:F ASA 1 - ON
015:F ASA 2 - ON
016:F ASA 3,4 (two) - ON
C3 ✓ FCS CH (four) - AUTO

DPS CONFIG FOR ECS C/O ②
(PDP, NOM DEORBIT PREP, 3-9)

07:40

ON ORBIT FCS C/O, PART 1
(PDP, NOM DEORBIT PREP, 3-10)

07:50

DPS ON-ORBIT CONFIG ②
(PDP, NOM DEORBIT PREP, 3-21)

ASA RECONFIGURATION
014:F ASA 1 - OFF
015:F ASA 2 - OFF
016:F ASA 3,4 (two) - OFF

08:00

3:00 pm

OPS2 DAP CONFIG	A	B
(AT 0/07:15:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 6
MET: 000:07:19:19
LON: 129.2 E

UPDATE
APU # FOR
FCS C/O
UPLINK
WEATHER DATA
ORBITS 9-16
CMD
PL RCDR ON
ACIP ON

CMD
ACIP TEST

CMD
ACIP OFF
PL RCDR OFF

UPLINK
ORBITER S.V.

T
Y
A
R
I
I

G
M
M

T
T
B
G
U
D
D
C
X
S
T
U
L

T
M
I
L
L
X
U
I
T

MET
DAY 000
08:00

CDR

STS-1 NOMINAL DETAILED
PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

3PM
/DAP: B/AUTO/VERN

REPORT: NOISE LEVEL SURVEY OKAY
or IF ANY ≥ 65 dB

R5/C6 Restow DEORBIT PDP (2)

FREEZE-DRY GPC MEMORY DUMP
(ORBIT OPS C/L, DPS, 5-2)

08:10

R11L:E DFI MB MSN PWR - OFF
C3 DFI RCDRS PCM - HI SAMP

08:20

C3 DFI RCDRS PCM - CONT RCD
RCS JET TEST
(ORBIT OPS C/L, RCS, 6-6)

INERTING VERIFICATION (FTO 141-02)
MPS VACUUM INERT - INITIALIZATION
(ORBIT OPS C/L, MPS, 4-2)

CABIN TV SETUP (1005)
(PHOTO/TV C/L, TV SCENES, 1-12)

08:30

3:30 PM

/DAP: B/AUTO/VERN
NOTE: If no VAC INERTING, go to
C3 DFI RCDRS PCM - HI SAMP

INERTING VERIFICATION (FTO 141-02)
MPS VACUUM INERT - TERMINATION
(ORBIT OPS C/L, MPS, 4-2)

08:40

IMU ALIGNMENT - IMU/IMU
(ORBIT OPS C/L, IMU/ST/CDAS, 1-7)
REFSMAT UPDATE
REF IMU: IMU 3
ALIGN: IMU 1,2

08:50

ORB
7

C3 /DFI RCDRS PCM - HI SAMP
FOOD WARMER ACTIVATION (CUE CARD)

MEAL PREP (CUE CARD)
Prepare DAY 1, MEAL C

09:00

4:00 PM

OPS2 DAP CONFIG	A	B
(AT 0/08:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 7
MET: 000:08:49:36
LON: 106.2 E

STS-1 NOMINAL DETAILED

MET

DAY 000

CDR

PLT

MCC

NOTES

09:00 4:00 PM

B AUTO
VERN
RT 0.2
DB 1.0

CABIN TV ACT (TV05)
(PHOTO/TV C/L, TV SCENES, 1-13)

MEAL PREP (Cont)

UPDATE
H2O SPLY DMP
QTY A & B

09:10

DFI WB AUTO CAL
C3 DFI RCDRS WB MSN - CONT RCD
R11L:E/DFI WB MSN RCDR - FWD CNTL
PWR - ON
:F FDM CNTL - AUTO CALBR (hold 2. sec)
/CNTL - DATA (after 10 sec)
C3 DFI RCDRS WB MSN - STBY (tb-bp)

09:20 4:20 PM

TV STATUS REPORT
(TV05)

CMD
PL RCDR ON
ACIP ON

UPLINK (IF
REQD)
BLOCK DATA
B-3/9-16

TV05 (FSO S191-02,-03,-05)
SCENE: STATUS REPORT
from CDR

09:30

CABIN TV DEACT (TV05)
(PHOTO/TV C/L, TV SCENES, 1-14)

ON MCC CUE
R2 RPU FUEL PUMP/VLV COOL (two) - OFF
CNTLR PWR X - OFF

(09:30) IMU ACCELEROMETER CALIBRATION
(ORBIT OPS C/L, IMU/ST/COAS, 1-16)

ON MCC CUE:
C3 DFI RCDRS WB MSN - CONT RCD
(tb-gray)

UPLINK
ORBITER S.V.
SPC LOAD -
IOS COMM
INFORM CREW
Starting Cal
DFI WB-CONT RCD

09:40

-ZLV, Y-POP TEST, VRCS, 0.5° DB (FTO 174-08)

CHANGE DAP B: DB ATT R,P,Y - 0.5° DB
AUTO MNVR TO -ZLV, Y-POP, TAIL FWD ATT

BODY VECTOR: P + 2 Q
Y + Q
O + Q

DAP: A/AUTO/VERN; DAP: B/AUTO/VERN
(09:43) Initiate LVLH

ON MCC CUE:
C3 DFI RCDRS WB MSN - STBY (tb-bp)
R11L:E DFI WB MSN PWR - OFF

CMD
ACIP TEST
INFORM CREW
Cal Complete
DFI WB-STBY
CMD
ACIP OFF
PL RCDR OFF

SUPPLY WATER STORAGE SYS TANK DUMP, TKS A&B
(ORBIT OPS C/L, ECLS, 3-2)

Dump to QTY A = _____ QTY B = _____

09:50

MEAL

10:00 5:00 PM

Monitor QTY **SM 66 ENVIRONMENT** for H2O SUPPLY

BUCCIT

.....

SARA

STS-1 NOMINAL DETAILED
PLT MCC

NOTES

MET
DAY 000
10:00
B AUTO
VERN
RT 0.2
DB 0.5

CDR

10:10

10:20

10:30

10:40

10:50

11:00

5 PM

5:30

6 PM

ORB
8

~~XEED: R RCS to I RCS~~
(ORBIT PKT C/L, RCS, 8-5)

CHANGE DAP B: DB ATT R,P,Y - 1.0' DB ●

AUTO MNVR TO IMU ALIGN ATT ★

INRTL ATT: R + 2 5 3 .3
P + 1 6 2 .0
Y + 3 3 2 .2

DAP: A/AUTO/VERN; DAP: B/AUTO/VERN

(10:44) Initiate MNVR
STAR TRKR PWR -Z - ON
GNC, I/O RESET EXEC

06

B AUTO
VERN
RT 0.2
DB 1.0

MEAL

Monitor QTY **SM 66 ENVIRONMENT** for H2O SUPPLY

Monitor QTY **SM 66 ENVIRONMENT** for H2O SUPPLY

CLEANUP/STORAGE, Steps 1 & 2 (Cue Card)

PRIVATE MEDICAL COMMUNICATION
(IF REQUIRED)

A17 Unstow, setup 35mm Camr w/o Flash
(35MM/01)

WINDOW OBSERVATION AND REPORTING
(FIO 131-01)
35MM/01 (WINDOW OBSERVATIONS)
(PHOTO/TV C/L, 35MM SCENES, 3-3)

OPS2 DAP CONFIG	A	B
(AT 0/10:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	0.5
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 8
MET: 000:10:19:34
LON: 83.2 E

UPLINK
SPC LOAD -
IOS COMM
ACIP CMDS

STS-1 NOMINAL DETAILED

MET

DAY 000

11:00

B AUTO
VERN
RT 0.2
DB 1.0

6PM

CDR

PLT

MCC

NOTES

IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, IMU/ST/COAS, 1-2)
STAR ID: -Y: 23, BETELGEUSE
 -Z: 16, ACHERNAR

ANG DIF: 82.9
STAR TRKR PHR -Z - OFF

AUTO MNVR TO COAS/IMU ALIGN 1 ATT

INRTL ATT: R + 2 2 1 .3
 P + 1 8 6 .0
 Y + 2 2 2 .2

DAP: B/AUTO/VERN
(11:10) Initiate MNVR

COAS VERIFICATION (FTO 173-02, -06)

(ORBIT OPS C/L, IMU/ST/COAS, 1-12)
(11:17) COAS CALIBRATION (SUNSET)
STAR ID: +X: 1Z, ACURX

COAS IMU ALIGN 1ST DATA TAKE
STAR ID: +X: 1Z, ACURX

AUTO MNVR TO COAS/IMU ALIGN 2 ATT

INRTL ATT: R + 2 8 4 .9
 P + 2 1 3 .3
 Y + 1 2 4

DAP: B/AUTO/NORM; Initiate MNVR
When mnvr complete, DAP: B/AUTO/VERN
COAS IMU ALIGN 2ND DATA TAKE
STAR ID: +X: 2Q, ARCTURUS
ANG DIF: 85.0 (Stars 2Q & 1Z)

(11:35) COAS CALIBRATION (MIDNIGHT)
STAR ID: +X: 2Q, ARCTURUS

11:40

ORB
9

11:50

(11:53) COAS CALIBRATION (SUNRISE)
STAR ID: +X: 2Q, ARCTURUS

XFEED RETURN: RCS
(ORBIT PKT C/L, RCS, 8-5)

12:00

7:06 PM

WINDOW OBSERVATION (Cont)

Temp stow 35mm Camr

16MM CAMR SETUP (16MM/02)
(PHOTO/TV C/L, 16MM SCENES, 2-2)

IMU ALIGN PAD

REQD ID: -Y ____, -Z ____, ANG ERR: ____, ____, ____, 3
ANG 1 2 3

Δ X () () ()

Δ Y () () ()

Δ Z () () ()

EXECUTION TIME / : : :

UPLINK

ORBITER S.V.

Stars 16 & 23 available
from 0/10:53 to 0/11:30

Star 17 available from 0/11:08
to 0/11:54

Star 20 available from 0/11:19
to 0/12:04

COAS CALIBRATION PAD (SUNSET)

+X Δ BIAS . . .

UPDATE TIME / : : :

COAS ALIGN PAD

REQD ID: ____, ____, ____, ANG ERR: ____, ____, ____, 3

ANG 1 2 3

Δ X () () ()

Δ Y () () ()

Δ Z () () ()

COAS CALIBRATION PAD (MIDNIGHT)

+X Δ BIAS . . .

MARK TIME / : : :

UPLINK

IMU ACCEL
BIAS (IF
REQD)
SPC LOAD -
ACIP CMDS

ASCENDING NODE
ORB: 9
MET: 000:11:49:32
LON: 60.2 E

COAS CALIBRATION PAD (SUNRISE)

+X Δ BIAS . . .

MARK TIME / : : :

MET

STS-1 NOMINAL DETAILED PLT MCC

NOTES

DAY 000
12:00

7:00

CDR

B AUTO
VERN
RT 0.2
DB 1.0

AUTO MNVR TO -ZLV, Y-PDP, TAIL FWD ATT ●
BODY VECTOR: P + 2 Q
 Y + Q
 O + Q
DAP: B/AUTO/VERN; Initiate LVLH
FUEL CELL PURGE - AUTO (CUE CARD)

16MM CAMR ACT (16MM/02)/FSO S192-03,-04
(PHOTO/TV C/L, 16MM SCENES, 2-3)

MCC ONLY
COORD C&W/FDA
LIMITS CLEANUP
FOR CREW SLEEP

OPS2 DAP CONFIG	A	B
(AT 0/12:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
	VRN	0.2
PULSE NRM	0.1	0.04
	VRN	0.01
COMP NRM	0.0	0.0
	VRN	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
	VRN	0.02
JET OPT P	1	1
	Y	1
CNTL ACCEL	0	0

12:10

C3 DFI RCDRS PCM - LO SAMP
WOLF GAS SAMPLES (FTO 162-01)
MA9L Fill Air Bottle # 2

16MM CAMR DEACT (16MM/02)
(PHOTO/TV C/L, 16MM SCENES, 2-3)

Record time _____

PRE SLEEP ACTIVITY
Configure: LIGHTING

12:20

BACKUP TONES:
M042F MIDDECK SPKR AUD PWR - AUD/TONE
 /SPKR PWR - SPKR/MIC
 VOL - as reqd
 /TONES - ACCU/BYP
M058F Connect HDST to SLEEP STA TONES

INEORM CREW
STATE VECTOR
STATUS

REPORT: IMU ALIGN/COAS CAL RESULTS

ALERT TONE DURATION
CRT TIMER FOR WAKE UP
/CRT 4 MAJ FUNC - SM
CRTs (one STBY, three OFF)
WINDOW SHADES/FILTERS
C3 /DFI RCDRS PCM - LO SAMP
 /WB MSN - STBY

UPLINK
SPC LOAD -
IOS COMM
UPLINK
SPC LOAD
1ST COMM
ALERT

12:30

7:30

12:40

SM CHECKPOINT (CUE CARD)

UPLINK
IMU GYRO BIAS
(IF REQD)

12:50

MEDICAL DATA REPORT
(CREW SYS C/L, MICROCASSETTE RCDR, 4-2)

MCS CLEANING (As reqd)
MEDICAL DATA REPORT
(CREW SYS C/L, MICROCASSETTE RCDR, 4-2)

UPLINK
ORBITER S.V.

13:00

8:00

06 UHF MODE - OFF (If reqd)

CMD
RCDR SLEEP
CONFIG

STS-1 NOMINAL DETAILED

MET

DAY000

13:00

4:00

CDR

PLT

MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

13:10

13:20

13:30

13:40

13:50

14:00

9:00

ORB
10

SLEEP

SLEEP

ASCENDING NODE
ORB: 10
MET: 000:13:19:31
LON: 37.3 E

B
D
T
T
L

I
S
I

H
R
N

STS-1 NOMINAL DETAILED

MET
DAY 000
14:00

CDR

PLT

MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

ORB
11

15:00 10

16:00 11 PM

ORB
12

17:00 MIDNIGHT: 13th

ORB
13

18:00 1 AM

19:00 2 AM

SLEEP

SLEEP

UPLINK
ORBITER S.V.

UPLINK
TEST DATA
PG1
(SPEC 915)

UPLINK
TEST DATA
PG2 - Part 1
(SPEC 916)

UPLINK
ORBITER S.V.

UPLINK
TEST DATA
PG2 - Part 2
(SPEC 916)

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 11
MET: 000:14:49:29
LON: 14.3 E

ASCENDING NODE
ORB: 12
MET: 000:16:19:27
LON: 8.6 W

ASCENDING NODE
ORB: 13
MET: 000:17:49:25
LON: 31.5 W

STS-1 NOMINAL DETAILED

MET

DAY 000

19:00 2 AM

B AUTO
VERN
RT 0.2
DB 1.0

19:10 2:10 AM

ORB
14

19:20

19:30

SLEEP

19:40

19:50

20:00 3 AM

PLT

SLEEP

MCC

UPLINK
ORBITER S.V.

NOTES

ASCENDING-NODE
ORB: 14
MET: 000:19:19:23
LON: 54.5 W

LOG

T
D
R
T
M
A
D
X

STS-1 NOMINAL DETAILED MCC

NOTES

MET
DAY 000
20:00

B AUTO
VERN
RT 0.2
DB 1.0

20:10

20:20

20:30

20:40

20:50

21:00

3AM

CDR

PLT

MCC

SLEEP

SLEEP

ORB
15

4:50 AM

POST SLEEP ACTIVITY

Configure: LIGHTING

COMM

06 UHF MODE - SPLX

C3 DFI RCDRS PCM - HI SAMP

ALERT TONE DURATION

CRT'S

MEAL PREP DAY 2, MEAL A (CUE CARD)

Shave electrode sites, if reqd

SM CHECKPOINT (CUE CARD) (If reqd)

UPLINK (IF
REQD)
BLOCK DATA
B-4/17-21

CMD
RCDR AWAKE
CONFIG

UPLINK
WEATHER DATA
ORBITS 17-21

UPLINK
SPC LOAD -
CLEAR COMM
ALERT

INFORM CREW
SM CKPT
REQD/NOT REQD

OPS2 DAP CONFIG (AT 0/20:00:00)	A	B
XLATION PULSE	0.1	0.02
ROT DSC RT VRN	0.2	0.5
VRN	0.2	0.2
PULSE VRN	0.1	0.04
VRN	0.01	0.002
COMP VRN	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE VRN	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE

ORB: 15

MET: 000:20:49:21

LOX: 77.5 W

MET
DAY 000
21:00

4 AM

B AUTO
VERN
RT 0.2
DB 1.0

CDR

STS-1 NOMINAL DETAILED

PLT

MCC

NOTES

21:10

Copy: CRT TIMER SETUP PAD Update,
RCS TESTS, 2-40

UPLINK
ORBITER S.V.
INFORM CREW
STATE VECTOR
STATUS
UPDATE
CRT TIMER
SETUP PAD

POST SLEEP ACTIVITY

21:20

AUTO MNVR TO IMU ALIGN ATT ★
INRTL ATT: R + 1 1 .3
 P +3 5 8 .0
 Y + 1 8 .8
DAP: B/AUTO/VERN
(21:20) Initiate MNVR
STAR TRKR PWR -Z - ON
GNC, I/O RESET EXEC

06

21:30

4:30

<u>IMU ALIGN PAD</u>		
REQD ID: -Y	-Z	ANG ERR
ANG 1	2	3
Δ X ()	()	()
Δ Y ()	()	()
Δ Z ()	()	()
EXECUTION TIME / / : : :		

IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, IMU/ST/COAS, 1-2)
STAR ID: -Y: 16, ACHERNAR
 -Z: 23, BETELGEUSE

HEATER RECONFIG
(ORBIT OPS C/L, EPS, 2-6)

21:40

06
ANG DIF: 82.9
STAR TRKR PWR -Z - OFF
REPORT: IMU ALIGN RESULTS

RJD CONFIG
DAP ROT: PULSE/PULSE/PULSE
014/015
016:E RJD DRIVER (eight) - ON
DAP ROT: DISC/DISC/DISC
CONNECT: 1 (R) OMS to RCS
(ORBIT PKT C/L, RCS, 8-3)

UPDATE
OMS/RCS
ICONNECT
CONFIG

Stars 16 & 23 available
from 0/21:23 to 0/22:01

21:50

Copy RCS 1 Burn Pad on 2-42
AUTO MNVR TO RCS 1 BURN PAD ATT
Use DAP: B/AUTO/NORM

UPDATE
RCS 1 BURN PAD

22:00

5 AM

PCS 1(2) ON-ORBIT ACTIVATION/RECONFIG
(ORBIT OPS C/L, ECLS, 3-5)
Reconfig for SYS 2

FUEL CELL PURGE - AUTO (CUE CARD)

T
M
A
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T
Y
A
R
O
R
R

MET
DAY000
22:00

CDR

STS-1 NOMINAL DETAILED PLT MCC

NOTES

OPS2 DAP CONFIG	A	B
(AT 0/22:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
 ORB: 16
 MET: 000:22:19:19
 LON: 100.4 W

TRANS
DAP
RT 0.5
DB 3.5

5 AM

OPS CONEIG to GNC 3/SM 2 ①
Go to RCS TESTS, 2-42

RCS BURN PROCEDURE ②
Go to RCS TESTS, 2-43

22:10

ORB
16

22:20

RCS 1 BURN

OPS CONEIG to GNC 2/SM 2 ①
Go to RCS TESTS, 2-44

B AUTO
VERN
RT 0.2
DB 1.0

22:30

5:30 AM

GRAVITY GRADIENT FREE DRIET, OPS 2
(ORBIT OPS C/L, RCS, 6-10)
VERN jets; ATT ID: B (Perform Steps 1 & 2)

CABIN TV SETUP (TV06)
(PHOTO/TV C/L, TV SCENES, 1-15)

UPLINK
SPC LOAD -
IOS COMM

22:40

B MAN
VERN
PULSE
RT 0.2
DB 1.0

INFORM MCC
Ready to close vent doors
ON MCC CUE
Close vent doors
Wait until MCC GO,
Open vent doors

22:50

MEAL

23:00

6 AM

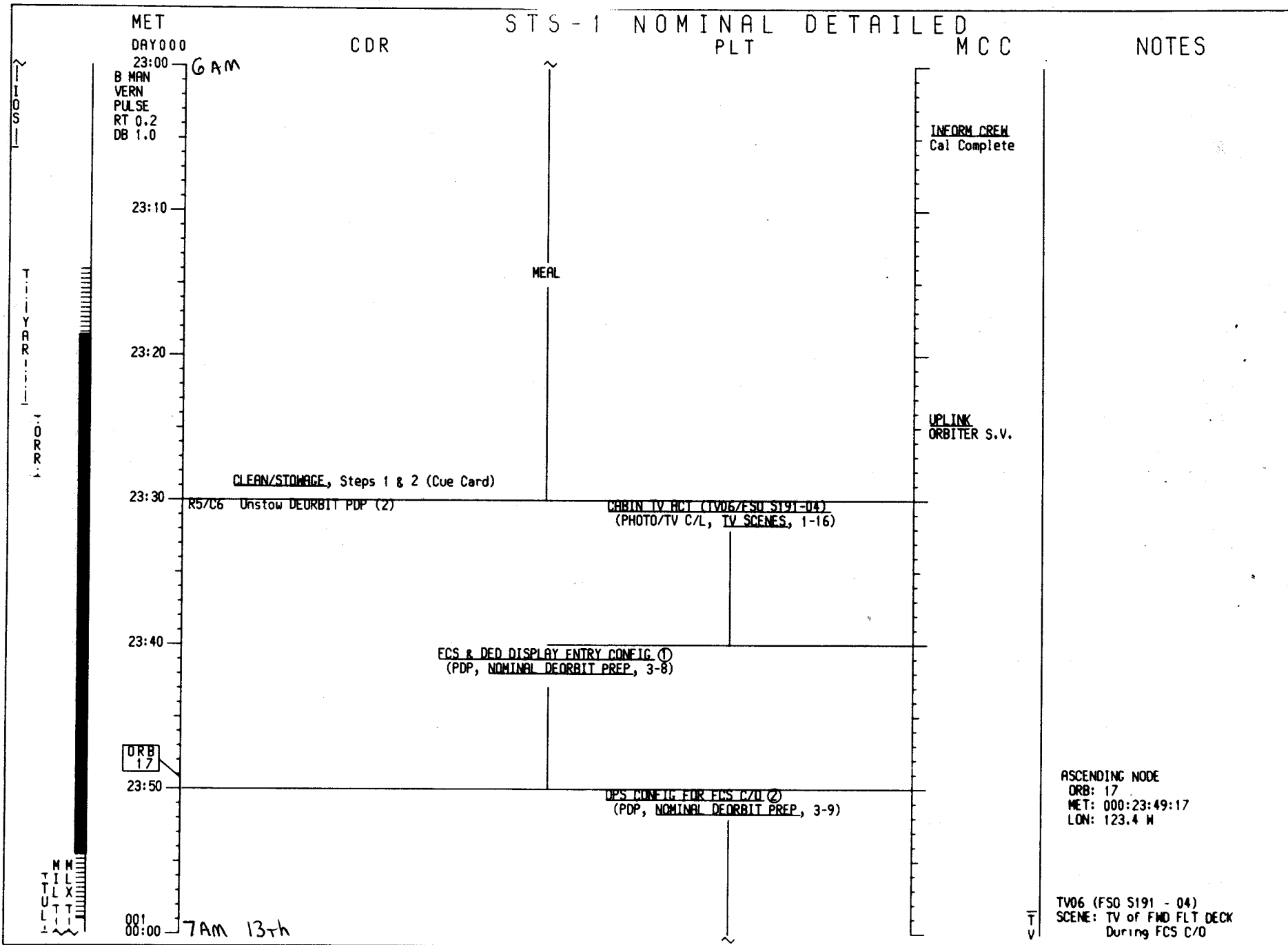
ON MCC CUE: Remain still for IMU ACCEL CAL

INFORM CREW
STARTING CAL

M
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MET

DAY 001

CDR

STS-1 NOMINAL DETAILED PLT MCC

NOTES

00:00 7 AM MON

DPS CONFIG FOR FCS C/O (Cont)

ON-ORBIT ECS CHECKOUT TEST, PART 2
(PDP, NOMINAL DEORBIT PREP, 3-12)

UPLINK
SPC LOAD -
IOS COMM

00:10

00:20

00:30

DPS IN-ORBIT CONFIG 2
(PDP, NOMINAL DEORBIT PREP, 3-21)

00:40

ECS/DED DISPLAY ORBIT CONFIG 1

00:50

R5/C6 Restow DEORBIT PDP (2)

CABIN TV DEACT (1/06)
(PHOTO/TV C/L, TV SCENES, 1 -17)

01:00 8 AM MON

DPS2 DAP CONFIG	A	B
(AT 1/00:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ECS/DED DISPLAY ORBIT CONFIG 1		
014:E	cb MNA ADTA 1	- op
	DDU AFT	- cl
:F	ASA 1	- OFF
015:E	cb MNB ADTA 2	- op
	DDU RIGHT	- op
:F	ASA 2	- OFF
016:E	cb MNC ADTA 3,4 (two)	- op
	DDU RIGHT	- op
	AFT	- cl
:F	ASA 3,4 (two)	- OFF
07	TACAN (three) MODE	- OFF
08	RADAR ALTM (two)	- OFF
	MLS (three)	- OFF
F6/F8	INST PWR (two)	- OFF
	FLT CNTL PWR	- OFF
	JTRIM RHC	- INH
	TRIM PNL	- OFF
C3	JFCS CH (four)	- AUTO

MET

STS-1 NOMINAL DETAILED

DAY 001

CDR

PLT

MCC

NOTES

01:00

8 AM

B MAN
VERN
PULSE
RT 0.2
DB 1.0

Copy: CRT TIMER SETUP PAD UPDATE,
RCS TESTS, 2-40

REMOTE CAMERA OPERATION WITH ARTIFICIAL
ILLUMINATION (ETO 175-02)

TV 04 (TV C/O)
(PHOTO/TV C/L, TV SCENES, 1-7)

Perform: TV ACT
TV C/O OPS
TV/VTR DEACT

UPLINK
ORBITER S.V.
UPDATE
CRT TIMER
SETUP PAD

01:10

01:20

01:30

8:30

Copy: RCS 2 BURN PAD, RCS TESTS, 2-42



UPDATE
RCS 2 BURN PAD

01:40

01:50

VEH RECOVERY & FES RESTART

RCS TEST 2
Go to RCS TESTS, 2-41

STOW RADIATORS

AUTO MNVR TO BURN ATT

UPLINK
WEATHER DATA
ORBITS 22-27
UPLINK (IF
REQD)
BLOCK DATA
B-5/22-27
UPLINK
IMU ACCEL
BIAS (IF
REQD)

UPLINK
ORBITER S.V.
INFORM CREW
RELOAD TCTS

02:00

9:00 AM

B AUTO
VERN
RT 0.2
DB 1.0

L. R. 2

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R

ASCENDING NODE
ORB: 18
MET: 001:01:19:15
LON: 146.4 W

MCC PLB
TV OPS

MCC PLB
TV OPS

MON

MET
DAY 001

CDR

STS-1 NOMINAL DETAILED

PLT
MCC

NOTES

02:00 9 AM
B AUTO
VERN
RT 0.2
DB 1.0

02:10
TRANS
DAP
RT 0.5
DB 3.5

02:20

02:30
B AUTO
VERN
RT 0.2
DB 1.0

02:40

ORB
19

02:50

03:00 10 AM

RCS BURN PROCEDURE

DPS CONFIG TO GNC3/SM2

RCS BURN PROCEDURE

RCS 2 BURN

DPS CONFIG TO GNC2/SM2

AUTO MNVR TO POST BURN ATT

PLBD CLOSING

RADIATOR BYPASS

RCS TEST 3
Go to RCS TESTS, 2-43

OPS2 DAP CONFIG	A	B
(AT 1/02:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

UPDATE
RCS 3 BURN PAD

ASCENDING NODE
ORB: 19
MET: 001:02:49:13
LON: 169.3 M

MET

STS-1 NOMINAL DETAILED

DAY 001

CDR

PLT

MCC

NOTES

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M
Y
A
R

03:00

B AUTO
VERN
RT 0.2
DB 1.0

10 AM

03:10

TRANS
DAP
RT 0.5
DB 3.5

RCS BURN PROCEDURE

DPS CONFIG TO GNC3/SM2

RCS BURN PROCEDURE

UPLINK
SPC LOAD -
COMM TEST 2
(FTO 172-01,
-02)

03:20

RCS 3 BURN

DPS CONFIG TO GNC2/SM2

03:30

B AUTO
VERN
RT 0.2
DB 1.0

AUTO MNVR TO POST BURN ATT

03:40

03:50

04:00

11 AM

STS-1 NOMINAL DETAILED

MET

DAY 001

11 AM

CDR

PLT

MCC

NOTES

04:00
B AUTO
VERN
RT 0.2
DB 1.0

MA9L WHOLE GAS SAMPLES (FTO 162-01)
Fill Air Bottle # 3

MEAL PREP (CUE CARD)
Prepare DAY 2, MEAL B

Record time _____

WCS SOLID SORBENT SAMPLING (FTO 162-02)
1 Disconnect Hose from VAC VENT QD
2 Rotate Air Sampler - DAY 2
3 Connect to VAC VENT QD

04:10

4 Record Time _____

ORB
20

04:20

PLBD/RAD OPENING

04:30

AUTO MNVR TO -ZLV, YPOP ATT

COMM TEST2
(FTO 172-01,
-02)
(S-HI, STG1
PA & PRA, LDR
& LO FREQ)

04:40

04:50

05:00

NOON 12PM

QPS2 DAP CONCIG	A	B
(AT 1/04:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 20
MET: 001:04:19:11
LON: 167.6 E

YERR

HMM

BCGG
 UDDX
 CSXT
 TTTU
 LLLL
 MLLX
 DDBA

MON

MET

STS-1 NOMINAL DETAILED

DAY 001

CDR

PLT

MCC

NOTES

05:00

NOON

B AUTO
VERN
RT 0.2
DB 1.0

05:10

05:20

05:30

05:40

05:50

06:00

1 PM

MEAL

16MM CAMR SETUP (16MM/08)
(PHOTO/TV C/L, 16MM SCENES, 2-14)

CLEAN/STORAGE, Steps 1 & 2 (Cue Card)

Obtain 35mm Camr w/o Flash

ASCENDING NODE
ORB: 21
MET: 001:05:49:09
LON: 144.7 E

05:00

05:10

05:20

05:30

05:40

05:50

MON

STS-1 NOMINAL DETAILED

MET

DAY 001

06:00
B AUTO
VERN
RT 0.2
DB 1.0

CDR

PLT

MCC

NOTES

AUTO MNVR TO IMU ALIGN ATT

INRTL ATT: R + 8 4 .6
P +3 5 5 .2
Y +3 3 3 .2

DAP: B/AUTO/VERN

(06:00) Initiate MNVR
STAR TRKR PHW -Z - ON
GNC, I/O RESET EXEC

WINDOW OBSERVATION & REPORTING (FTO 131-01)

35MM/01 (WINDOW OBSERVATIONS)
(PHOTO/TV C/L, 35MM SCENES, 3-3)

OPS2 DAP CONFIG	A	B
(AT 1/06:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

06:10

IMU ALIGNMENT - S TRK

(ORBIT OPS C/L, IMU/ST/COAS, 1-2)

STAR ID: -Y: 13, RIGEL
-Z: 38, NAVI
ANG DIF: 85.2

Temp stow 35mm Camr

REMOTE CAMERA OPERATION IN SUNLIT CONDITIONS (FTO 175-01)

TV04 (TV C/O)
(PHOTO/TV C/L, TV SCENES, 1-7)

Perform: TV ACT
TV C/O OPS
TV/VTR DEACT

UPLINK
SPC LOAD -
COMM TEST 4
(FTO 172-01,
-02)

06:20

06 STAR TRKR PHW -Z - OFF
REPORT: IMU ALIGN RESULTS

AUTO MNVR TO PTC ATT

INRTL ATT: R + 5 2 .8
P +3 1 5 .1
Y +2 2 2 .6

(06:22) DAP: B/AUTO/VERN; Initiate MNVR

PTC TEST, VRCS, 1 DB (FTO 174-09)

BODY VECTOR P + Q
Y + Q

IMU ALIGN PAD

REQD ID: -Y ---, -Z --- ANG ERR ---
ANG 1 2 3

Δ X () --- () --- () ---
Δ Y () --- () --- () ---
Δ Z () --- () --- () ---

EXECUTION TIME / / : : :

06:30

1:30 PM

B AUTO
VERN
RT 0.4
DB 1.0

When MNVR to PTC ATT complete,
CHANGE DAP B: ROT DISC RATE NORM - 0.4'/s
ROT DISC RATE VERN - 0.4'/s

DAP: A/AUTO/VERN; DAP: B/AUTO/VERN
Initiate ROT

FUEL CELL PURGE - AUTO (CUE CARD)

Stars 13 & 38 available
from 1/06:15 to 1/06:36

06:40

SEAT/POS CONFIG ①

UPLINK
ORBITER S.V.

SUIT DRESSING (Cue Card)

SEAT/POS CONFIG ①

- C2 Attach SUIT Cue Card to locker
Stow Helmet Bags near seat
Vent Hose connected to seat
Config seats
- ✓POS (two) stowed
- C9 SEAT 02 - OP

07:00

2 PM

SEAT INGRESS

DROGUE GUN COVER - stow
Ingress seat, connect **SEAT KIT STRAPS**
VENT HOSE*
SPURS
BIOMED CABLE*

G SUIT VLV - OFF*

HELMET, GLOVES* - remove, stow bag

Connect **COMM CABLE, Restraint Strap**
O2 HOSES, safety clips

COMM PWR - OFF

Do off, stow **COMM EQUIP**

COMM PWR - SUIT (down)

LAP BELT - connect over O2 hoses

HELMET - don, √comm

SHOULDER HARNESS - connect over O2 hoses, Comm Cable

√Head movement, adjust **Helmet Tiedown Strap**

√**PRESS CNTL - OP***

GLOVES - don*

VISOR - down & locked, √O2 flow

Suit Pressure Integrity Check*

CAUTION
Pressurizing > 1 min
can damage suit fans

Hold breath, √no face dam flow

PRESS CNTL - CL, √leaks
- OP

***Omit when neck**
ring worn

SEAT EGRESS

GLOVES - doff, stow

LAP BELT, SHOULDER HARNESS - disconnect

COMM PWR - OFF

Disconnect O2 HOSES

COMM CABLE, Restraint Strap

HELMET - stow

Disconnect BIOMED CABLE

SPURS

VENT HOSE

SEAT KIT STRAPS

DROGUE GUN COVER - install

STS-1 NOMINAL DETAILED

MET
DAY001

CDR

PLT

MCC

NOTES

07:00 2 PM

B AUTO
VERN
RT 0.4
DB 1.0

SUIT DOWNING (Cont)

PTC TEST, VRCS, 5° DB (FTO 174-09) ●
CHANGE DAP B: DB ATT R,P,Y - 5° DB
(07:09) DAP: A/AUTO/VERN; DAP: B/AUTO/VERN

07:10
B AUTO
VERN
RT 0.4
DB 5.0

SUIT FAN ACT 16MM CAMR ACT (16MM/08)/ESQ S192-02,03,04
C9 L,R Suit Fan (two) - on SEAT INGRESS, 2-25
(PHOTO/TV C/L, 16MM SCENES, 2-15)

ORB
22

07:20

ASCENDING NODE
ORB: 22
MET: 001:07:19:06
LON: 121.7 E

COMM TEST 4
(FTO 172-01,
-02)
(LO DATA RATE,
HI FREQ)

07:30

16MM CAMR DEACT (16MM/08)
SEAT EGRESS, 2-26
(PHOTO/TV C/L, 16MM SCENES, 2-16)

07:40
B AUTO
NORM
RT 0.4
DB 5.0

PTC TEST, PRCS, 5° DB (FTO 174-09) ●
(07:40) DAP: B/AUTO/NORM

SUIT FAN DEACT ②

07:50

SUIT DOWNING (Cue Card)

SUIT FAN DEACT ②
C9 SEAT 02 - CL
SUIT FAN (two) - off

UPLINK
ORBITER S.V.

08:00 3 PM

MET

DAY001

08:00

B AUTO
NORM
RT 0.4
DB 5.0

3 PM

CDR

STS-1 NOMINAL DETAILED MCC

NOTES

SUIT DOFFING (Cont)

UPLINK
SPC LOAD -
ACIP CMDS

OPS2 DAP CONFIG	A	B
(AT 1/08:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.4
VRN	0.2	0.4
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	5.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

PTC TEST, PRCS, 15° DB (FTO 174-09) ●
CHANGE DAP B: DB ATT R,P,Y - 15° DB
(08:10) DAP: B/AUTO/VERN; DAP: B/AUTO/NORM

CABIN TV SETUP (TV09)
(PHOTO/TV C/L, TV SCENES, 1-18)

16MM CAMR SETUP (16MM/04) ●
(PHOTO/TV C/L, 16MM SCENES, 2-6)

SEAT

Obtain 35mm Camr w/Flash

35MM/04 (FOOD WARMER ACT/MEAL PREP)
(PHOTO/TV C/L, 35MM SCENES, 3-4)

MEAL PREP (CUE CARD)
Prepare DAY 2, MEAL C

Temp stow 35mm Camr

08:40
RCS FTO
CONFIG

RCS FTOs - ON-ORBIT ●
(ORBIT OPS C/L, RCS, 6-3)
CONFIG FOR RCS TESTS

Obtain, restrain near seat 70mm Camr
w/80mm Lens & Mag CX21 (green) (70MM/04)
35mm Camr w/Flash (35MM/05) ●

REMOTE CAMERA SENSITIVITY TO ORBITER
MOTION (FTO 175-05)
TV 11 (THRUSTER INDUCED VIBRATION)
(PHOTO/TV C/L, TV SCENES, 1-21,22)
Perform: TV ACT
TV OPS

ORB
23

08:50

MANUAL ROTATION DISC RATE TEST, VERN
(FTO 174-03)

16MM CAMR ACT (16MM/04)/FSO S192-02,03,04 ●
(PHOTO/TV C/L, 16MM SCENES, 2-7)
Cameras on at 01:09:00

MANUAL ROTATION ACCEL TEST, VERN
(FTO 174-02)

V
T
R

09:00

4 PM

35MM/04 (FSO S193-03,-04)
SCENE: FOOD WARMER ACT &
MEAL PREP

ASCENDING NODE
ORB: 23
MET: 001:08:49:04
LON: 98.8 E

16MM/04 (FSO S192-02,-03,-04)
SCENE: OUT-THE-WINDOW
EARTH LIMB

STS-1 NOMINAL DETAILED
PLT

MET

DAY 001

CDR

MCC

NOTES

RCS FTO
CONFIG

4 PM

MANUAL ROTATION ACCEL TEST, PRCS
(FTO 174-02)

70MM/04 (OUT-THE-WINDOW EARTH LIMB)
(PHOTO/TV C/L, 70MM SCENES, 5-3)
16MM CAMR DEACT (16MM/04) ●
(PHOTO/TV C/L, 16MM SCENES, 2-7)

70MM/04
SCENE: OUT-THE-WINDOW
EARTH LIMB

MANUAL ROTATION DISC RATE TEST, PRCS
(FTO 174-03)

Temp stow 70mm Camr
35MM/05 (RCS FTOs) ●
(PHOTO/TV C/L, 35MM SCENES, 3-4)

35MM/05 (FSO S193-02, -04)
SCENE: CDR performing
RCS FTOs

09:10

POST TESTING CLEANUP

Temp stow 35mm Camr

A MAN
VERN

DISC
RT 0.2
DB 10.0

C3 ✓DFI RCDRS PCM - HI SAMP

-ZLV, Y-POP TEST, PRCS 2 DB (FTO 174-08) ●

CHANGE DAP B: ✓ROT DISC RATE VERN - 0.2 /s
DB ATT R,P,Y - 2 DB

AUTO MNVR TO -ZLV, Y-POP, TAIL FWD ATT ●

BODY VECTOR: P + 2 Q
Y + Q
O + Q

TV/VTR DEACT (TV11)
(PHOTO/TV C/L, TV SCENES, 1-21,22)

09:20

B AUTO
NORM
RT 0.5
DB 2.0

DAP: B/AUTO/VERN
(09:20) Initiate LVLH

✓When mnvr complete, DAP: B/AUTO/NORM

UPDATE
H2O WASTE DUMP
QTY
H2O SPLY DUMP
QTY TK A & B

WASTE WATER STORAGE SYS TANK DUMP
(ORBIT OPS C/L, ECLS, 3-4)

Dump to _____

SUPPLY WATER STORAGE SYS TANK DUMP, TKS A&B
(ORBIT OPS C/L, ECLS, 3-2)

Dump to QTY A = _____ QTY B = _____

UPLINK
ORBITER S.V.
UPLINK
SPC LOAD -
IOS COMM

09:30

PRIVATE MEDICAL COMMUNICATION
(IF REQUIRED)

09:40

09:50

MEAL

Monitor SM 66 ENVIRONMENT for H2O SUPPLY
QTY

10:00

5 PM

STS-1 NOMINAL DETAILED
PLT MCC

NOTES

MET
DAY 001

CDR

10:00

B AUTO
NORM
RT 0.5
DB 2.0

5 PM

-ZLV, Y-POP TEST, PRCS, 6" DB (FTO 174-08) ●
CHANGE DAP B: DB ATT R,P,Y - 6" DB
(10:05) DAP: B/AUTO/VERN; DAP: B/AUTO/NORM

B AUTO
NORM
RT 0.5
DB 6.0

10:10

MEAL

10:20

ORB
24

Monitor QTY SM 66 ENVIRONMENT for H2O SUPPLY

10:30

CLEAN/STOWAGE, Steps 1 & 2 (Cue Card)

A AUTO
NORM
RT 0.2
DB 10.0

10:40

-ZLV, Y-POP TEST, PRCS, 10" DB (FTO 174-08) ●
(10:35) DAP: A/AUTO/NORM

CABIN TV ACT (TV09)/FSO S191-03,-06
(PHOTO/TV C/L, TV SCENES, 1-19)

10:50

CO2 ABSORBER REPLACEMENT
(4 into B, stow 2)

UPLINK
SPC LOAD -
IOS COMM

TV09 (FSO S191-03,-06)
SCENE: CO2 ABSORBER
REPLACEMENT

11:00

6:00 PM

CABIN TV DEACT (TV09)
(PHOTO/TV C/L, TV SCENES, 1-20)

STS-1 NOMINAL DETAILED MCC

MET DAY001

CDR

PLT

NOTES

11:00
A AUTO
NORM
RT 0.2
DB 10.0

6:00 PM

CONNECT RETURN (OPS 2,3)
(ORBIT PKT C/L, RCS, 8-4)

11:10

Obtain 35mm Camr w/Flash
35MM/06 (AUTO MANEUVERS)
(PHOTO/TV C/L, 35MM SCENES, 3-4)
Temp stow 35mm Camr

CHANGE DAP B: DB ATT R,P,Y - 1 DB
AUTO MNVR TO IMU ALIGN ATT
INRTL ATT: R +2 4 6 .8
P +2 8 8 .6
Y +3 5 1
DAP: B/AUTO/VERN
(11:10) Initiate MNVR
STAR TRKR PHR -Z - ON
GNC, I/O RESET EXEC

UPLINK
ORBITER S.V.

35MM/06 (FSO S193-03,-04)
SCENE: PLT performing
ATT MNVR

Stars 17 & 20 available
from 1/11:19 to 1/11:55

Star 22 available from 1/11:33
to 1/12:20

11:20
B AUTO
VERN
RT 0.2
DB 1.0

IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, IMU/ST/COAS, 1-2)
STAR ID: -Y: 20, ARCTURUS
-Z: 17, ACRUX
ANG DIF: 85.0

CABIN TV STOW
MF57E/ Stow both cameras
MF57G

IMU ALIGN PAD

REQD ID: -Y __, -Z __ ANG ERR 3
ANG 1 2 3
Δ X () () ()
Δ Y () () ()
Δ Z () () ()
EXECUTION TIME __ / __ : __ : __

11:30

AUTO MNVR TO COAS CAL ATT
INRTL ATT: R +2 4 6 .8
P +2 9 7 .1
Y + 8 .Z
DAP: B/AUTO/VERN
Initiate MNVR

11:40

COAS CALIBRATION
(ORBIT OPS C/L, IMU/ST/COAS, 1-4)
STAR ID: +X 22, ALTAIR

COAS CALIBRATION PAD

+X Δ BIAS
UPDATE TIME __ / __ : __ : __

ORB 25

06 STAR TRKR -Z - OFF
REPORT: IMU ALIGN/COAS CAL RESULTS

11:50

ANNUNCIATOR, C/W LAMP TEST
(ORBIT OPS C/L, EPS, 2-2)

16MM CAMR SETUP (16MM/07)
(PHOTO/TV C/L, 16MM SCENES, 2-12)

INFORM CREW
STATE VECTOR
STATUS

ASCENDING NODE
ORB: 25
MET: 001:11:49:00
LON: 52.8 E

12:00

7:00 PM

AUTO MNVR TO -ZLV, Y-POP, TAIL FWD ATT
BODY VECTOR: P + 9 Q
Y + Q
O + Q
DAP: B/AUTO/VERN; Initiate LVLH

MON

MET

STS-1 NOMINAL DETAILED

MCC

NOTES

DAY 001

CDR

PLT

13:00

8 PM

B AUTO
VERN
RT 0.2
DB 1.0

S
A
A
I

13:10

ORB
26

13:20

13:30

SLEEP

SLEEP

13:40

13:50

14:00

9 PM

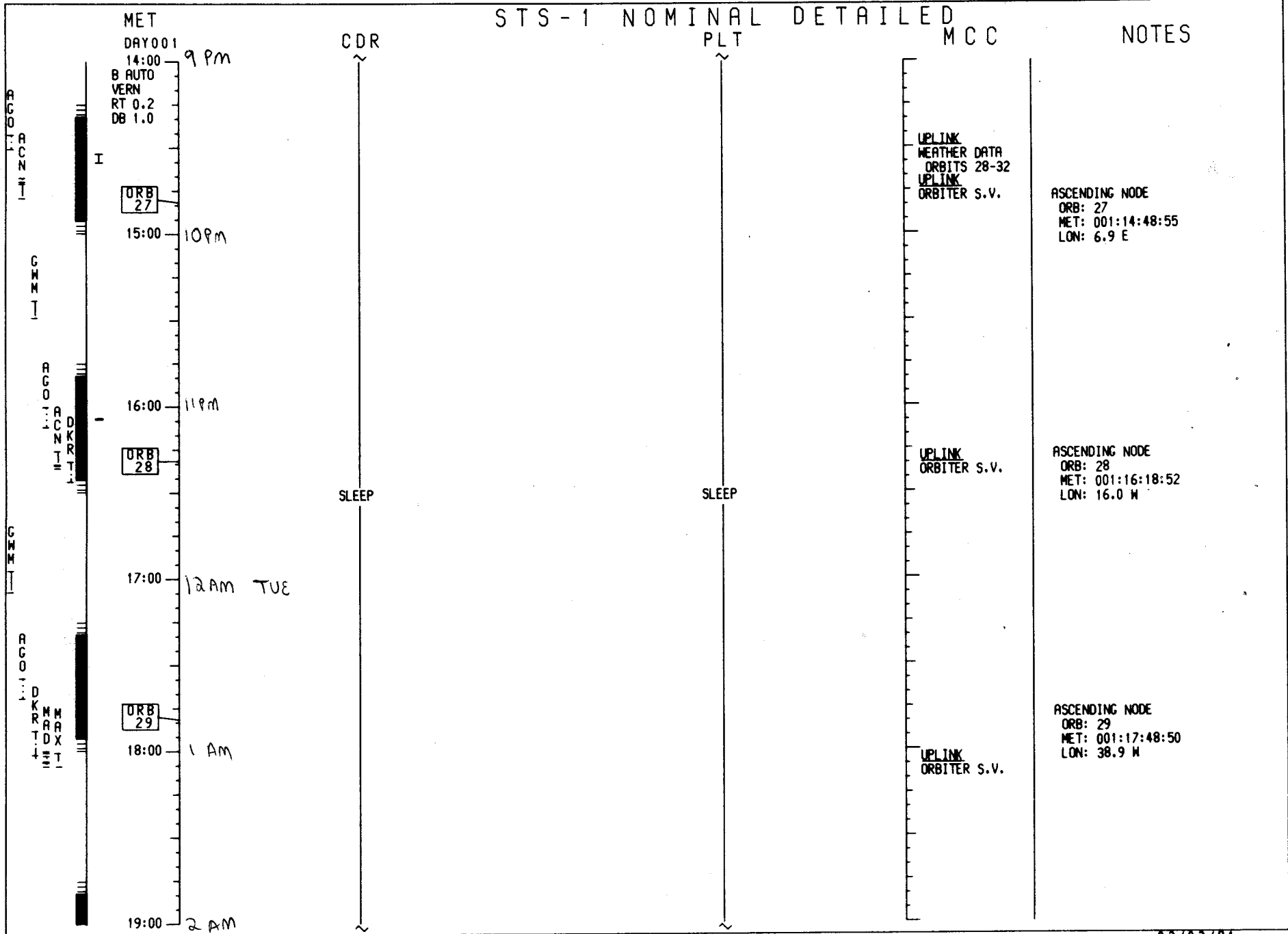
ASCENDING NODE
ORB: 26
MET: 001:13:18:57
LON: 29.9 E

MON 13th

STS-1 NOMINAL DETAILED

MCC

NOTES



TUES 14th

STS-1 NOMINAL DETAILED

MET

DAY001

19:00

B AUTO
VERN
RT 0.2
DB 1.0

2 AM

CDR

PLT

MCC

NOTES

19:10

ORB
30

19:20

19:30

2:30 AM

SLEEP

SLEEP

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 30
MET: 001:19:18:47
LON: 61.9 W

19:40

19:50

20:00

3 AM

UPLINK (IF
REQD)
BLOCK DATA
8-7/33-28

TIME

TT
MAX
D

STS-1 NOMINAL DETAILED MCC

NOTES

MET
DAY 001
20:00
B AUTO
VERN
RT 0.2
DB 1.0

3 AM

CDR

PLT

MCC

OPS2 DAP CONFIG	A	B
(AT 1/20:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

CMD
RCDR AWAKE
CONFIG

SLEEP

SLEEP

20:10

20:20

20:30

20:40

ORB
31

20:50

21:00

4 AM

POST SLEEP ACTIVITY

Configure: LIGHTING
COMM
06 UHF MODE - SPLX
C3 OFI RCDRS PCM - HI SANP
ALERT TONE DURATION
CRT'S
MEAL PREP DAY 3, MEAL A (CUE CARD)
Shave electrode sites, if reqd

UPLINK
WEATHER DATA
ORBITS 33-38
UPLINK
SPC LOAD -
CLEAR COMM
ALERT

INFORM CREW
SW CKPT -
REQD/NOT REQD

ASCENDING NODE
ORB: 31
MET: 001:20:48:44
LON: 84.8 W

STS-1 NOMINAL DETAILED

MET

DAY 001

CDR

PLT

MCC

NOTES

21:00
B AUTO
VERN
RT 0.2
DB 1.0

4AM

SM CHECKPOINT (CUE CARD) (IF REQD)

UPLINK
ORBITER S.V.
INFORM CREW
STATE VECTOR
STATUS

21:10

POST SLEEP ACTIVITY

21:20

21:30

AUTO MNVR TO IMU ALIGN ATT ★
INRTL ATT: R +2 4 6 .8
P +2 8 8 .6
Y +3 5 1

ML316 VAC VENT NOZ HTR - OFF

R2 IF APU's REQD FOR FCS C/O
✓BLR CNTLR PWR/HTR (three) - A
CNTLR (three) - ON

ACOUSTIC BLANKET STORAGE
Roll installed blankets (4)

MF43G Stow loose blankets (2)

DAP: B/AUTO/VERN
(21:36) Initiate MNVR
STAR TRKR PWR -Z - ON
GNC, I/O RESET EXEC

06

IMU ALIGN PAD

REQD ID: -Y _____, -Z _____ ANG ERR _____
ANG 1 2 3

Δ X () _____ () _____ () _____

Δ Y () _____ () _____ () _____

Δ Z () _____ () _____ () _____

EXECUTION TIME ____ / ____ : ____ : ____

21:50

STAR TRACKER SELF-TEST
(ORBIT OPS C/L, IMU/ST/COAS, 1-6)
IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, IMU/ST/COAS, 1-2)
STAR ID: -Y: 20, ARCTURUS
-Z: 1Z, ACRUX
ANG DIF: 85.0

UPDATE
H2O SPLY DMP
QTY A & B

Stars 17 & 20 available
from 1/21:50 to 1/22:25

22:00

5 AM

B D A

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R

STS-1 NOMINAL DETAILED
PLT MCC

NOTES

MET

DAY 001

22:00
B AUTO
VERN
RT 0.2
DB 1.0

5 AM

CDR

STAR TRKR PWR -7 - OFF
RCS JET TEST
(ORBIT OPS C/L, RCS, 6-6)

O2 TK HEATER RECONFIGURATION

R1 O2 TK1, TK2 HTRS B (two) - OFF
VA (two) - AUTO

22:10

R5/C6 Unstow DEORBIT PDP (2)

FUEL CELL PURGE - AUTO (CUE CARD)

ORB
32

AUTO MNR TO -ZLV, Y-POP, TAIL FWD ATT

BODY VECTOR: P + 2 Q
Y + Q
O + Q

DAP: B/AUTO/VERN
Initiate LVLH

SUPPLY WATER STORAGE SYS TANK DUMP, TKS A&B
(ORBIT OPS C/L, ECLS, 3-2)

Dump to QTY A = _____ QTY B = _____

REPORT: IMU ALIGN RESULTS

Copy: CRT TIMER SETUP PAD UPDATE
in NOMINAL DEORBIT PDP, 3-7

22:30

UPDATE
CRT TIMER
SETUP PAD
UPLINK
SPC LOAD -
IOS COMM

22:40

MEAL

UPLINK
ORBITER S.V.

22:50

Monitor SN 66 ENVIRONMENT for H2O SUPPLY
QTY

23:00

6 AM

OPS2 DAP CONFIG (AT 1/22:00:00)	A	B
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 32
MET: 001:22:18:42
LON: 107.8 W

T
T
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I
O
S

STS-1 NOMINAL DETAILED

MET

DAY 001

CDR

PLT

MCC

NOTES

23:00
B AUTO
VERN
RT 0.2
DB 1.0

6 AM

MEAL

Monitor QTY **SM 66 ENVIRONMENT** for H2O SUPPLY

CLEANUP/STOWAGE, Steps 1-4 (Cue Card)

Go to DEORBIT PDP, NOMINAL DEORBIT PREP, 3-7

23:20

23:30

23:40

23:50

002
00:00

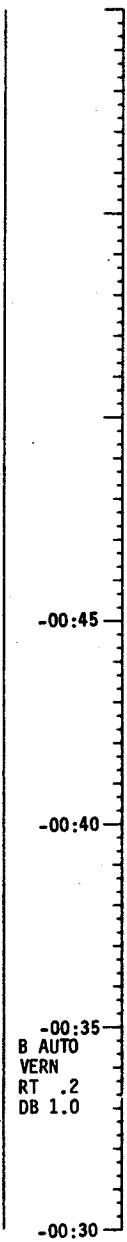
7:00 AM

ORB
33

ASCENDING NODE
ORB: 33
MET: 001:23:48:39
LON: 130.8 W

<u>CRT TIMER SETUP</u> ①									
I: GNC 2 TIME									
SET CRT TIMER TO COUNT DOWN TO RCS TEST (repeat for GNC & SM)									
<u>RCS TEST 1</u>					(HR:MIN:SEC - MET)				
ITEM 17 +			+				+		
<u>RCS TEST 2</u>									
ITEM 17 +			+				+		
<u>RCS TEST 3</u>									
ITEM 17 +			+				+		
I:GNC ORBIT									

TIG



B AUTO
VERN
RT .2
DB 1.0

Ref CAP, FLT DAY 2, 2-19 for activities prior to
RCS TEST 2 & 3

- P CRT TIMER SETUP ①
- C FES RESTART ② (TEST 2 ONLY)
- C RJD CONFIG
DAP ROT: PULSE/PULSE/PULSE
014/015
016:E RJD DRIVER (eight) - ON
DAP ROT: DISC/DISC/DISC
- P STOW RADIATORS ③ (TEST 2 ONLY)

FES RESTART ② (TEST 2 ONLY)

01 If EVAP OUT T < 47:
L1 RAD CNTLR OUT TEMP - HI
When EVAP OUT TEMP = 50 + 2:
L1 FLASH EVAP CNTLR PRI A - ON
RAD CNTLR OUT TEMP - NORM

If EVAP OUT TEMP > 47:
L1 FLASH EVAP CNTLR PRI A - ON

STOW RADIATORS ③ (TEST 2 ONLY)

A7U PL BAY FLOOD FWD,AFT (four) - ON (~3 min to full bright)
FWD BHD - ON (~3 min to full bright)

P R13L ✓RAD LAT CNTL SYS (two) - OFF (tb-REL)
✓CNTL SYS (two) - OFF (tb-DPY)

* If tb not bp after 10 sec or if tb not STO *
* in 40 sec & no motion determined visually: *
* R13L RAD CNTL SYS (two) - OFF *
* Go to MALF, MECH, 9.2c or 9.2d (Stbd) or *
* MECH, 9.2f or 9.2h (Port) *

PL BAY MECH PWR SYS (two) - ON
RAD CNTL SYS (two) - STOW (concurrently)
- /tb-bp ~40 sec, STO
- OFF

RAD LAT CNTL SYS (two) - LAT (concurrently)
- /tb-bp ~25 sec, LAT
- OFF

PL BAY MECH PWR SYS (two) - OFF

SINGLE RAD OPS
(Requires opening MA73C:C&D MCA LOGIC PWR AC cbs)

STOW: STBD RAD cbs	PORT RAD cbs
AC1MID3	AC1MID1
AC3MID2	AC3MID4
LATCH: AC1MID3	AC1MID1
AC2MID2	AC2MID4
AC3MID2	AC3MID4

DPS CONFIG TO GNC3/SM2 ①

CONFIG RGAs

014:A RGA 1 - ON
 015:A RGA 2,4 (two) - ON
 016:A RGA 3 - ON

TRANSITION GPC 1 & 2 TO GNC OPS 3

GPC/CRT 04 EXEC
 GNC 0 GPC MEMORY
 CONFIG - ITEM 1 +3 EXEC
 Modify MC 3 per Table

GNC, OPS 301 PRO
 DEORB MNVR COAST

CONFIG CRTs

GPC/CRT 03 EXEC
 GPC/CRT 24 EXEC
 GPC/CRT 44 EXEC

CONFIG	3
GPC	12000
STR 1	1
2	2
3	2
4	1
PL 1/2	0
CRT 1	1
2	2
3	2
4	0
MM 1	1
2	2

BURN ATT	8	R				
	9	P				
	10	Y				
TGT	HA		()	HP		
AVTOT						*
TGO			:			

RCS TEST SEQ 2

ENG SEL

RCS +X ACC 18 *

21 WT

27 TIG / :

36 AVX () *

37 AVY () *

38 AVZ () *

NOTES:

+X TRANS (BURN ATT - REF ITEM 8,9,10)

MULT AXIS TRANS (PERFORM BURN IN POST BURN ATT)

POST BURN ATT

R			*
P			*
Y			*

TEST/ATT H.L.D END (HH:MM)

NET

BURN ATT	8	R				
	9	P				
	10	Y				
TGT	HA		()	HP		
AVTOT						*
TGO			:			

RCS TEST SEQ 1

ENG SEL

RCS +X ACC 18 *

21 WT

27 TIG / :

36 AVX () *

37 AVY () *

38 AVZ () *

NOTES:

+X TRANS (BURN ATT - REF ITEM 8,9,10)

MULT AXIS TRANS (PERFORM BURN IN POST BURN ATT)

POST BURN ATT

R			*
P			*
Y			*

TEST/ATT H.L.D END (HH:MM)

NET

BURN ATT	8	R				
	9	P				
	10	Y				
TGT	HA		()	HP		
AVTOT						*
TGO			:			

RCS TEST SEQ 3

ENG SEL

RCS +X ACC 18 *

21 WT

27 TIG / :

36 AVX () *

37 AVY () *

38 AVZ () *

NOTES:

+X TRANS (BURN ATT - REF ITEM 8,9,10)

MULT AXIS TRANS (PERFORM BURN IN POST BURN ATT)

POST BURN ATT

R			*
P			*
Y			*

TEST/ATT H.L.D END (HH:MM)

NET

TIG

-00:30 C L1 HI LOAD DUCT HTR - A/B (may get SM ALERT)
(TEST 2 ONLY)

B AUTO
VERN
RT .2
DB 1.0

C AUTO MNVR TO BURN ATT (Ref Pad)
DAP B: ROT DISC RATE VERN 0.20/s
✓DB ATT R,P,Y - 1° DB
DAP: B/AUTO/VERN
(00:28) Initiate MNVR

-00:25

-00:20

-00:15 P DPS CONFIG TO GNC3/SM2 ①

TRANS
AUTO
RT .5
DB 3.5

-00:10 B RCS BURN PROCEDURE ②

00:00 RCS BURN IGN

RCS BURN PROCEDURE ②

OMS/RCS SYS DATA CK

03 RCS/OMS PRESS - OMS PRPLT
✓L(R) OMS OX,FU PRESS > 234 psia

WARNING

If OMS pressures not within
limits, do not execute on-orbit
burn

RCS BURN PREP

GNC, OPS 302 PRO

I: GNC DEORB MNVR EXEC

015:E cb MNB DDU R - c1
016:E cb MNB DDU R - c1

F6/F8 FLT CNTLR PWR (two) - ON
ADI ATT (two) - INRTL
ERR (two) - as reqd
RATE (two) - as reqd

CRT1 Load TGT DATA per BURN PAD
LOAD - ITEM 39 EXEC
ST CRT TIMER - ITEM 40 EXEC
Confirm BURN DATA per Burn Pad

RHC TRIM TO BURN ATTITUDE
(See Pad Attitude)

F6 ATT REF pb - push

✓MM302 ✓CNTLR PWR (two) - ON ✓ATT - CORRECT
✓ITEM 18 * ✓ADI - REF/MED ✓DAP - AUTO

:00 TIG Deflect THC (null V60s)

CUTOFF +:02
Trim RESIDUAL > .2 fps

POST BURN CONFIG

F6/F8 FLT CNTLR PWR (two) - OFF

DPS CONFIG TO GNC2/SM2 ①

TRANSITION FROM GNC OPS 302 TO 301

GNC OPS 301
|DEORB MNVR COAST|

NOTE
Use SM CRT TIMER for TIG + time reference

TRANSITION TO GNC OPS 201

GPC/CRT 04 EXEC
|GNC 0 GPC MEMORY|
CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per Table →

CONFIG	2
GPC	12000
STR 1	1
2	2
3	2
4	1
PL 1/2	0
CRT 1	1
2	2
3	2
4	0
MM 1	1
2	2

GNC OPS 201 PRO
|GNC ORBIT|

CONFIG DAP: B/AUTO/VERN

NOTE
Initiate MNVR to POST BURN ATT
as soon as Transition complete

RECONFIG CRTs

GPC/CRT 03 EXEC
GPC/CRT 44 EXEC
GPC/CRT 24 EXEC

REINITIALIZE OMS GAUGING

|2: GNC 23 RCS|
OMS PRESS ENA:
L(R) OMS - ITEM 5(6) EXEC

FLASH EVAP CONFIG ② (TEST 2 ONLY)

FLASH EVAP CONFIG

C L1 ✓FLASH EVAP CNTLR PRI A - ON
 ✓PRI B - OFF
 ✓SEC - OFF

HI LOAD DUCT HTR - B
 EVAP - ENA

R12L SPLY H2O XOVR VLV - OP (tb-OP)

PLBD CLOSING ③ (TEST 2 ONLY)
(Complete by TIG +20)

CAUTION

If SM GPC fails during any PLBD test:
06 MDM PL1,2 (two) - OFF
GPC MODE 4 - STBY,HALT
MDM PL1,2 (two) - ON
Reload SM into GPC 2
Perform MALF, DPS, SSR-5 and DPS, SSR-7

When closing/opening any PLBD latch set:
If no CL after 60 sec (bhd) and latch visually
closed with at least one microswitch closed indication
occurring at dual mtr close time, continue PLBD
procedures; otherwise wait for MCC

If latches close on single mtr (60 sec bhd), wait for MCC

Always note any single mtr latch operations

If no latch or door motion within ~10 sec after cmd,
(no motion determined visually)
PL BAY DR - STOP, wait for MCC

When closing PLBD:
If door motion stops & no RDY status,
PL BAY DR - STOP, wait for MCC
If door closes on single mtr (~120 sec), do not reopen
PLBD, wait for MCC

SM OPS 202 PRO
|4: SM PL BAY DOORS|

R13L ✓PL BAY DR - STOP
CRT4 AC POWER ON - ITEM 1 EXEC

B CLOSE LEFT DOOR TO 'RDY' Time & Record _____:

CLOSE LEFT FWD/AFT LATCH GROUPS & DOOR

CLOSE RIGHT DOOR TO PROXIMITY OF CLOSED POSITION,
VERIFY 2 MOTORS

Alternately start & stop PLBD until near closed
Determine c/l latch # that will make contact first
Record this latch # & its expected contact point
on NO GO DIAGRAM, 2-48

OPEN RIGHT DOOR ~1 FT

OPEN LEFT FWD/AFT LATCH GROUPS

OPEN LEFT DOOR ~1 FT

POST CLOSING CONFIG

CRT4 AC POWER OFF - ITEM 2 EXEC
A7U PL BAY FLOOD (all) - OFF
SM OPS 201 PRO
|4: SM ANTENNA|

TIG

00:00
 TRANS
 AUTO
 RT .5
 DB 3.5
 +00:05
 B AUTO
 VERN
 RT .2
 DB 1.0
 +00:10
 +00:15
 +00:20
 +00:25
 +00:30

Perform following activities as soon as burn completed:

- P DPS CONFIG TO GNC2/SM2 ①
- C FLASH EVAP CONFIG ② (TEST 2 ONLY)
- P PLBD CLOSING ③ (TEST 2 ONLY)
- C MNVR TO POST BURN ATT (Ref Pad)
 AUTO MNVR, DAP: B/AUTO/VERN

CONFIG RJDs & RGAs ④ (TEST 3 ONLY)

CONFIG RJDs & RGAs ④ (TEST 3 ONLY)

- B 014:A RGA 1 - OFF
- :F RJDA 1A L2/R2 DRIVER - OFF
- 2A L4/R4 DRIVER - OFF
- RJDF 1B F1 DRIVER - OFF
- 015:A RGA 2,4 (two) - OFF
- :F RJDF 1A F2 DRIVER - OFF
- 016:A RGA 3 - OFF

C RAD BYP ⑤ (TEST 2 ONLY)

RAD BYP ⑤ (TEST 2 ONLY)

- L1 RAD BYP VLV MODE (two) - MAN
 MAN SEL (two) - BYP (after ~3 sec, tb-BYP)
- Wait ~90 sec,
 RAD CNTLR LOOP (two) - OFF
- 01 ✓FREON EVAP OUT TEMP ind ~39 ± 1° (after ~2.5 min)

PLBD/RAD OPENING ① (TEST 3 ONLY)

RAD ACT

C L1 ✓RAD CNTLR OUT TEMP - NORM
BYP VLV MODE (two) - AUTO
CNTLR LOOP (two) - AUTO A
After ~90 sec, then
✓RAD BYP VLV tb (two) - RAD

PLBD OPENING

CAUTION

If SM GPC fails during any PLBD test:
06 MDM PL1,2 (two) - OFF
GPC MODE 4 - STBY,HALT
MDM PL1,2 (two) - ON
Reload SM into GPC 2
Perform MALF, DPS, SSR-5 and DPS, SSR-7

If any functions occur on single mtrs not previously discovered, command function closed (120 sec PLBD)

- * If closing on single mtr, close and latch PLBD, plan *
* deorbit
- * If close on dual mtrs, reopen & continue normal ops *

If any functions do not completely open (visual open cues acceptable), close PLBDs and command functions closed, plan deorbit

SM, OPS 202 PRO

4: SM PL BAY DOOR

A7U PL BAY FLOOD FWD,AFT (four) - ON (~3 min to full bright)
FWD BHD - ON (~3 min to full bright)

R13L ✓PL BAY DR - STOP
CRT4 AC POWER ON - ITEM 1 EXEC

✓RIGHT FWD/AFT LATCH GROUPS - OPEN

B OPEN RIGHT DOOR, Time & Record _____:

✓LEFT FWD/AFT LATCH GROUPS - OPEN

OPEN LEFT DOOR, Time & Record _____:

CRT4 AC POWER OFF - ITEM 2 EXEC
SM, OPS 201 PRO
4: SM ANTENNA

P RAD LATCH RELEASE

R13L ✓RAD LAT CNTL SYS (two) - OFF (tb-LAT)
✓RAD CNTL SYS (two) - OFF (tb-STO)

Zero timer

R13L PL BAY MECH PWR SYS (two) - ON
RAD LAT CNTL SYS (two) - REL (concurrently), start timer
- /tb-bp ~25 sec, REL
- OFF

Record elapsed time: STBD _____, PORT _____

RAD DEPLOY

- * If either rad deploys in > 40 sec, or tb not bp after *
- * 10 sec, stow and latch rads *
- * Redeploy only good rad (stbd or port) *
- * (Requires opening MA73C:C&D MCA LOGIC POWER AC cbs) *

DPY: STBD RAD cbs	PORT RAD cbs
AC1MID3	AC1MID1
AC3MID2	AC3MID4
LATCH: AC1MID3	AC1MID1
AC2MID2	AC2MID4
AC3MID2	AC3MID4

Zero timer

R13L RAD CNTL SYS (two) - DPY (concurrently), start timer
- /tb-bp ~40 sec, REL, stop timer
- OFF

Record elapsed time: STBD _____, PORT _____

Verify STBD & PORT Rad Panels are deployed & stabilized

R13L PL BAY MECH PWR SYS (two) - OFF

A7U PL BAY FLOOD (a11) - OFF

RAD VERIF & FLASH EVAP CONFIG

3: SM 88 APU/ENVIRON THERM

NOTE

CNTLR OUT TEMPS will not drop to their normal operating range (< 60 degF) until ~15 min after rads deployed

C L1 ✓RAD BYP VLV tb (two) - RAD

2: SM 88 APU/ENVIRON THERM

CRT2 After CNTLR OUT T < 60 degF,

L1 HI LOAD EVAP - OFF

R12L SPLY H2O XOVR VLV - CL (tb-CL)

Wait 30 min, then:

L1 HI LOAD DUCT HTR - OFF

TIG

+00:30
 B AUTO
 VERN
 RT .2
 DB 1.0
 +00:35
 +00:40
 +01:00
 +01:05
 +01:10
 +01:15

TEST 2 Sequence Completed per Pad Time
Reset CRT TIMER
Go to TIG-28 (RCS BURN PROCEDURE ②, 2-43)
and begin TEST 3 Sequence

Perform the following activities as convenient
(Post TEST 3 ONLY)

P MEAL PREP (CUE CARD) (TEST 3 ONLY)
 Prepare DAY 2, MEAL B

C WHOLE GAS SAMPLES (FTO 162-01) (TEST 3 ONLY)
 MAGL FILL Air Bottle #3

Record time _____

C SOLID SORBENT SAMPLING (FTO 162-02) (TEST 3 ONLY)
 WCS 1 Disconnect Hose from VAC VENT QD
 2 Rotate Air Sampler - DAY 2
 3 Connect to VAC VENT QD

4 Record Time _____

TEST 3 Sequence Completed per Pad Time

P PLBD/RAD OPENING ① (TEST 3 ONLY)

C AUTO MNVR TO -ZLV, Y-POP ATT ● (TEST 3 ONLY)

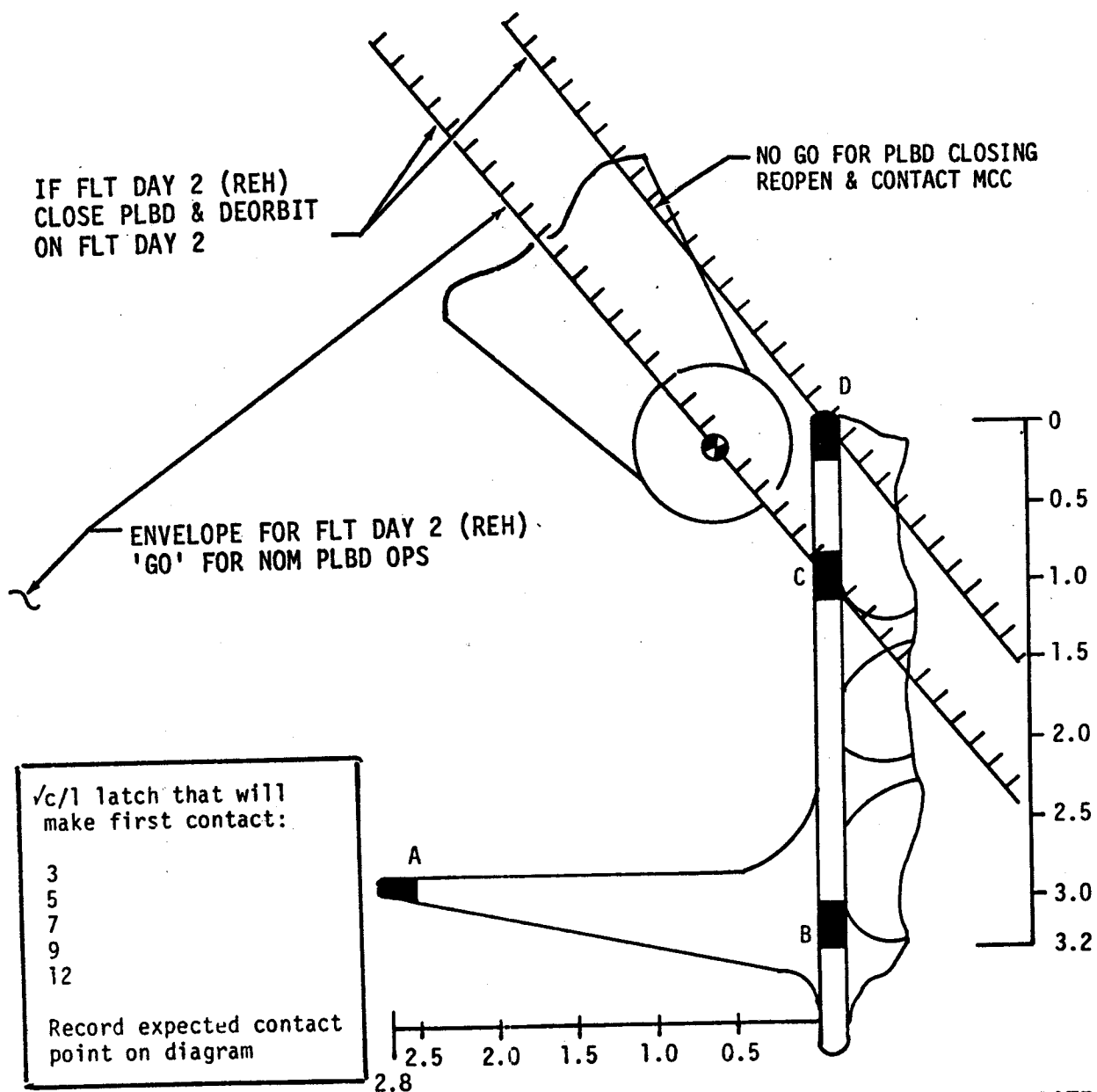
BODY VECTOR: P + 9 0
 Y + 0
 0 + 0

DAP: B/AUTO/VERN
 Initiate LVLH

Go to FLT DAY 2, 2-22 (TEST 3 ONLY)

FUNCTION	PLBD cb FUNCTIONS		CNTL BUS FUNCTIONS	
	MA73C: C&D		MTR 1	MTR 2
	MCA LOGIC POWER AC cbs			
	AC MTR 1/MDM	AC MTR 2/MDM		
LATCH 5-8	AC1MID3/1	AC3MID2/2	AB 3	CA 3
9-12	AC1MID1/1	AC3MID4/2	AB 3	CA 3
1-4	AC1MID3/1	AC3MID2/2	AB 3	CA 3
13-16	AC3MID4/2	AC2MID2/1	CA 3	BC 3
R FWD	AC1MID1/1	AC2MID4/2	AB 3	BC 3
R AFT	AC3MID4/2	AC2MID2/1	CA 3	BC 3
R DOOR	AC1MID1/1	AC2MID4/2	AB 3	BC 3
L FWD	AC1MID1/1	AC2MID4/2	AB 3	BC 3
L AFT	AC1MID3/1	AC3MID2/2	AB 3	CA 3
L DOOR	AC3MID4/2	AC2MID2/1	CA 3	BC 3

FLT DAY 2 (REH)/FLT DAY 3 (ENTRY) NO GO CRITERIA DIAGRAM
C/L LATCH EXTENDED GUIDE ROLLER TRAJECTORY



SUMMARY TIMELINE

3-1

DATE 03/02/81

SUMMARY
TIMELINE

SUMMARY
TIMELINE

STS 1 NOMINAL SUMMARY

		11	12	13	14	15	16	17	18	19	20	21	22	11
GMT : 105														
MET : 000		-1	0	1	2	3	4	5	6	7	8	9	10	11
CREWMEN	CDR				PLBD MON		ORBITER SYS ACT	MEAL			FCS C/O PART 1		MEAL	
	PLT				PLBD LAT/DR TEST		ORBITER SYS ACT	MEAL			FCS C/O PART 1		MEAL	
DAY/NIGHT														
ORBIT					2	3	4	5	6	7	8			
GSTDN COVERAGE														
OPS		GNC1/BFS												
TRACKING														
DEORB EDW														
OPT NOR														
KSC														
DEORB ROT														
OPT HIC														
KAD														
ATTITUDE														
MANEUVERS														
TV														
VTR														
NOTES:														

STS 1 NOMINAL SUMMARY

GMT : 105 23
 MET : 000 11

GMT: 106 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

CREWMEN	CDR	ZGT A CORS ALN/CAL VERIF	PRE-SLEEP	SLEEP	POST SLEEP	ZGT A CORS ALN/CAL VERIF BURN PREP RCS BURN PREP G3/S2 G2/S2 MUEL
	PLT	ZGT A CORS ALN/CAL VERIF	PRE-SLEEP	SLEEP	POST SLEEP	ZGT A CORS ALN/CAL VERIF BURN PREP RCS BURN PREP G3/S2 G2/S2 MUEL

DAY/NIGHT

ORBIT 8 9 10 11 12 13 14 15 16

GSTDN COVERAGE

-AGC -BOT -10S -HAW -AGO -ACN -GWM -AGO -DKR -MAD -ORR -QUT -BDA -MAD -YAR -DKR

OPS

GNC2/SM2 G3/S2 G2/S2

TRACKING

DEORB EDW OPT NOR KSC

DEORB ROT OPT HIC KAD

↑ 11:37 ↑ 13:12 ↑ 14:31 ↑ 16:05 ↑ 17:12 ↑ 18:46 ↑ 20:21 ↑ 21:55

ATTITUDE

IMU ALGN/CORS -ZLV, YPOP VRN 1'DB IMU ALGN RCS 1 BURN G.G. TOP SUN

MANEUVERS

TV

VTR

NOTES:

- CHANGEOUT
- GAS SAMPLE
- OMS/RCS ICONNECT
- VENT DOOR TEST

STS 1 NOMINAL SUMMARY

GMT : 106 11
MET : 000 23

MET: 001

		11	12	13	14	15	16	17	18	19	20	21	22	23	24	
		0	1	2	3	4	5	6	7	8	9	10	11			
CREWMEN	CDR	MEAL		FCS C/O PART 2					MEAL		SUIT DONNING		RCS MAN ROT TESTS		MEAL	
	PLT	MEAL		FCS C/O PART 2					MEAL		SUIT DONNING				MEAL	
DAY/NIGHT																
ORBIT		16	17	18	19	20	21	22	23	24						
GSTDN COVERAGE		-105 -YAR -ORR	-105 -YAR -ORR	-BDA -DKR -MAD	-BUC -TUL -MIL	-BOT -YAR -ORR	-BUC -TUL -MIL	-BOT -YAR -ORR	-BDA -DKR -MAD	-BUC -TUL -MIL	-BOT -YAR -ORR	-BUC -TUL -MIL	-BOT -YAR -ORR	-BUC -TUL -MIL	-BOT -YAR -ORR	
OPS		GNC2/SM2	GNC8/SM2	GNC2/SM2	G3/S2	GNC2/SM2	G3/S2	GNC2/SM2	G3/S2	GNC2/SM2	G3/S2	GNC2/SM2	G3/S2	GNC2/SM2	G3/S2	
TRACKING																
DEORB EDW			↑ 00:42		↑ 02:17		↑ 03:52		↑ 05:27		↑ 07:02		↑ 08:36			
OPT NOR			↑ 00:44		↑ 02:19		↑ 03:54		↑ 05:29		↑ 07:03					
KSC		↑ 23:14	↑ 00:49	↑ 01:05	↑ 02:25	↑ 04:00	↑ 05:35	↑ 07:03	↑ 08:36	↑ 10:04	↑ 09:46					
DEORB ROT		↑ 23:30	↑ 01:05													
OPT HIC																
KAD																
ATTITUDE		G.C. TOP SUN		RCS 2 BURN	RCS 2 POST BURN	RCS 3 POST BURN	-ZLV, YPOP VRN 1'DB	IMU ALGN	PTC VRN 1'DB	PTC VRN 5'DB	PTC VRN 5'DB	PTC VRN 15'DB	RCS ROT TEST	-ZLV, YPOP VRN 2'DB	-ZLV, YPOP VRN 6'DB	-ZLV, YPOP VRN 10'DB
MANEUVERS																
TV																
VTR																
NOTES:		<ul style="list-style-type: none"> ● PLBD/RAD OP ○ SOLID SORB SAMPLER INDEX SAMPLER ○ SEAT/POS CONF ■ SEAT/POS CONF ○ 35MM/04 PHOTO ● 16MM ACT/04 ● CHANGEOUT 														

STS 1 NOMINAL SUMMARY

GMT : 106 23
 MET : 001 11
 GMT: 107 0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23

CREWMEN	CDR	IMU ALGN RCS JET TST -ZLV, YPOP VRN 1'DB	PRE-SLEEP	SLEEP	POST SLEEP	IMU ALGN RCS JET TST -ZLV, YPOP VRN 1'DB	MEAL
	PLT	CAB TV STOW -ZLV, YPOP VRN 1'DB	PRE-SLEEP	SLEEP	POST SLEEP	CAB TV STOW -ZLV, YPOP VRN 1'DB	MEAL

DAY/NIGHT ORBIT 24 25 26 27 28 29 30 31 32

GSTDN COVERAGE
 -AGO -BOT -IOS -HAW -AGO -GMM -AGO -ACN -DKR -GMM -AGO -DKR -GMM -AGO -DKR -YAR -ORR -QUI -MAD -YAR -ORR -MAD -YAR -ORR -MIL -BDA -MAD

OPS GNC2/SM2

TRACKING

DEORB EDW OPT NOR KSC

DEORB ROT OPT HIC KAD
 † 11:38 † 12:56 † 14:32 † 16:06 † 17:13 † 18:47 † 20:21 † 21:56

ATTITUDE IMU ALGN/ CORS AH TL TD -ZLV, YPOP VRN 1'DB IMU ALGN RCS JET TST -ZLV, YPOP VRN 1'DB

MANEUVERS

TV VTR

NOTES:
 • TV DEACT o ANNUN, C/W LAMP T
 o OMS/RCS ICONN RET
 o FIRE/SMOKE TEST
 • ACOUSTIC BLKT STOW

STS 1 NOMINAL SUMMARY

TTC
 GMT : 107 11
 MET : 001 23
 MET : 002 0

CREWMEN		CDR	PLT	DRY/NIGHT	ORBIT	GSTDN COVERAGE	OPS	TRACKING	ATTITUDE	MANEUVERS	TV	VTR
		FCS C/O	FCS C/O		32	-IUS -YAR -ORR	GNC2/SM2		-ZLV, YPOP VRN 1'DB			
		FCS C/O	FCS C/O		33	-IUS -YAR -ORR	GNC8/SM2		ATT HLD			
		SNACK	SNACK		34	-BDK -DOR -YAR -ORR	GNC2/SM2		ATT HLD	TAIL TO SUN		
		SNACK	SNACK		35	-GDS -TUL -BDR -BOT	GNC3/BFS		IMU ALGN/ VERTIF	TOP TO SUN		
		BURN PREP	BURN PREP		36	-YAR -HAW -ACN -BOT			TOP TO SUN			
		DEORBIT IGNITION	DEORBIT IGNITION		37	-YAR -GWM -BUC -CDS -TUL -QUI -BOT			DORB IGN			
		ENTRY INTERFACE	ENTRY INTERFACE		38	-BUC -CDS -TUL			EI -5			
		LANDING	LANDING		39	-HAW -BUC -QUI -ACD -BOT -IOS						
					40	-HAW						
DEORB EDW † 00:44 † 02:18 † 03:53 † 05:28 † 07:02 OPT NOR † 00:45 † 02:19 † 03:54 † 05:29 † 07:04 KSC † 23:15 † 00:50 † 02:25 † 04:00 † 05:35 DEORB ROT † 23:31 OPT HIC † 03:42 † 08:11 † 10:04 KAD † 09:46												
NOTES:												

CONTINGENCY TIMELINES

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DETAILED TIMELINE.....	4-6
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24 HOUR
EXTENSION

24 HOUR EXTENSION NOTES

1. The 24 Hour Extension Timeline can be used for any situation that occurs while executing the deorbit prep or deorbit burn procedures, and warrants extending the flight an additional 24 hours.
2. Once the decision has been made to extend the flight an additional 24 hours, Section 4 (D/O PREP BACKOUT/POST REHEARSAL PROCEDURES), PDP, is used to 'back out' of the deorbit prep procedures. Any steps in the backout procedures may be deleted if an on-orbit configuration was never changed to the entry configuration, i.e., payload bay doors still open, suits still off, GNC in OPS 2, etc. During the backout procedures, the Orbiter will be powered down through Priority Powerdown Group 3 and adjusted per MCC instructions.
3. The following 24 Hour Extension Timeline assumes the deorbit burn procedures were executed up to go/no go for deorbit burn, at which point the decision was made to extend the flight another day.

24 HOUR
EXTENSION

STS-1 24 HR EXTENSION SUMMARY

GMT : 107 23
 MET : 002 11

CREWMEN	CDR	PRE-SLEEP	SLEEP	POST SLEEP	MEAL
	PLT	PRE-SLEEP	SLEEP	POST SLEEP	MEAL

DAY/NIGHT ORBIT

GSTDN COVERAGE

-AGO -BOT -IOS -HAW -AGO -GWM -ACN -DKR -GMM -AGO -DKR -MAD -QUI -MAD -YARR -ORR -MIL -BOA
 -MAD -YARR -ORR -QUI -MIL -BOA

OPS

GNC 2 SM 2

TRACKING

DEORB EDW OPT NOR KSC

DEORB ROT OPT HIC KAD

† 11:38 † 12:57 † 14:32 † 16:06 † 17:12 † 18:47 † 20:21 † 21:56

ATTITUDE

-ZLV VRN 1° DB IMU ALN/COAS -ZLV VRN 1° DB IMU ALN -ZLV VRN 1° DB

MANEUVERS

TV

VTR

NOTES:

- REMOUNT COAS FWD
- FC PURGE BKOUT
- CHANGEOUT
- FC PURGE
- ACOUSTIC BLKT STOW
- FC PURGE

STS-1 24 HR EXTENSION SUMMARY

TIC
 GMT : 108 11
 MET : 002 23
 MET : 003 0

CREWMEN	CDR	PLT
	FCS C/O	FCS C/O
	PLBD CLOSING	PLBD CLOSING
	SNACK	SNACK
	DEORBIT (003/05:28:00)	DEORBIT (003/05:28:00)
	BURN PREP	BURN PREP
	ENTRY INTERFACE	ENTRY INTERFACE
	LANDING	LANDING

DAY/NIGHT

ORBIT 48 49 50 51 52 53 54 55 56

GSTDN COVERAGE
 LOS -YARR -ORR
 MAD -DKR
 IOS -YARR -ORR
 BUC -TUL
 BDA
 HAW -DKR
 BUC -BOT
 YARR
 GNC 2 SM 2
 GNC 8 SM 2
 GNC 2 SM 2
 GNC 3 BFS
 GOS -TUL
 MTL
 BDA
 ACN
 BOT
 YARR
 GWM
 BUC
 CAS
 TUL
 MTL
 QUI
 BOT
 IOS
 HAW
 HGO

OPS
 GNC 2 SM 2
 GNC 8 SM 2
 GNC 2 SM 2
 GNC 3 BFS

TRACKING

DEORB EDM
 OPT NOR
 KSC
 † 23:15 † 00:44 † 02:19 † 03:54 † 05:28 † 07:03
 † 00:44 † 02:19 † 03:54 † 05:29 † 07:03

DEORB ROT
 OPT HIC
 KAD
 † 23:31 † 00:50 † 02:25 † 04:00 † 05:35 † 08:11 † 10:04

ATTITUDE
 -ZLV, YPOP VRN, I DB
 ATT HLD
 FAH
 BET
 ET D
 FAH
 TLD
 TLD
 TAIL TO SUN ATTITUDE
 TOP TO SUN ATTITUDE
 IMU ALGN
 IV ME
 UR
 TOP TO SUN ATTITUDE
 DEORB IGN
 EI-5
 † 03:42 † 08:11 † 09:46

MANEUVERS
 TV
 VTR

NOTES:
 ■ FC PURGE
 ○ CLOSE VENT DOORS

MET
DAY002
07:00

STS-1 24 HR EXTENSION DETAILED CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

Activities from 01/23:15:00 to 02/07:00:00 are in DEORBIT PDP.

R5/C6 Stow DEORBIT PDP (2)

07:10

SOLID SOLVENT SAMPLING
MA9L 1 Unstow, assemble Air Sampler/Vent Filter,
Vent Hose
2 Sampler Position - DAY 3
MCS 3 Connect to VACUUM VENT QD
4/VAC vlv - OP
5 Record time _____

CO2 ABSORBER INSTALLATION
(3 into A, 4 into B)

07:20

ACOUSTIC BLANKET INSTALLATION
MF43G Unroll installed blankets (4)
Unstow, install blankets (2)
under lockers

07:30

07:40

07:50

08:00

OPS2 DAP CONFIG	A	B
(AT 2/07:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 38
MET: 002:07:18:25
LON: 114.4 E

UPLINK
WEATHER DATA
ORBITS 39-41

ORBITER ATT AT TRANSITION
to CAP from PDP is -ZLV,
Y-POP

UPLINK
ORBITER S.V.
DEORB PEG 4
TARGETS

MET
DAY 002
08:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

08:10

08:20

08:30

08:40

08:50

09:00

S
A
R

FOOD WARMER ACTIVATION (CUE CARD)

MEAL PREP (CUE CARD)
Prepare DAY 3, MEAL C

ORB
39

ASCENDING NODE
ORB: 39
MET: 002:08:48:22
LON: 91.4 E

MET
DAY 002
09:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

09:10

09:20

09:30

09:40

09:50

10:00

OPS2 DAP CONFIG (AT 2/09:00:00)	A	B
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

UPDATE
H2O WASTE DUMP
QTY
H2O SPLY DUMP
QTY TKS A&B

WASTE WATER STORAGE SYS TANK DUMP
(ORBIT OPS C/L, ECLS, 3-4)

Dump to _____

SUPPLY WATER STORAGE SYS TANK DUMP, TKS A&B
(ORBIT OPS C/L, ECLS, 3-2)

Dump to QTY A = _____ QTY B = _____

UPLINK
SPC LOAD -
IOS COMM
ORBITER S.V.

MEAL

MONITOR SM 66 ENVIRONMENT FOR H2O
SUPPLY QTY

MET
DAY 002
10:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

10:10

MONITOR SM 66 ENVIRONMENT FOR H2O
SUPPLY QTY

10:20

ORB
40

ASCENDING NODE
ORB: 40
MET: 002:10:18:19
LON: 68.4 E

10:30

MEAL

10:40

MONITOR SM 66 ENVIRONMENT FOR H2O
SUPPLY QTY

10:50

CLEANUP/STORAGE, Steps 1 & 2 (Cue Card)

UPLINK
WEATHER DATA
ORBITS 42-47

PRIVATE MEDICAL COMMUNICATION
(IF REQUIRED)

11:00

MET
DAY002

STS-1 24 HR EXTENSION DETAILED
PLT MCC

NOTES

11:00 01 /COAS - OFF
A17 Unstow COAS, FWD Adapter Brkt
Mount FWD, plug in (01)

EC PURGE DUCT BAKEOUT
R12U (11:05) FC PURGE HTR - ON

11:10 AUTO MNVR TO IMU ALIGN ATT
INRTL ATT: R + 2 4 6.8
P + 2 8 8.6
Y + 3 5 1.0
DAP: B/AUTO/VERN
(11:10) Initiate MNVR
STAR TRKR (two) -ON
GNC, I/O RESET EXEC

11:20 IMU ALIGNMENT - S TRK
(ORBIT OPS C/L, IMU/ST/COAS, 1-2)
STAR ID: -Y: 20, ARCTURUS
-Z: 17, ACRUX
ANG DIF: 85.0

06 STAR TRKR PWR (two) - OFF

AUTO MNVR TO COAS CAL ATT
INRTL ATT: R + 2 4 6.8
P + 2 9 2.1
Y + 8.2

DAP: B/AUTO/VERN
Initiate MNVR

11:40 COAS CALIBRATION
(ORBIT OPS C/L, IMU/ST/COAS, 1-4)
STAR ID: +X: 22, ALTAIR

REPORT: IMU ALIGN/COAS CAL RESULTS

ORB
41

11:50 ANNUNCIATOR, C/W LAMP TEST
(ORBIT OPS C/L, EPS, 2-2)

AUTO MNVR TO -ZLV, Y-POP ATT

BODY VECTOR: P + 2 Q
Y + Q
O + Q

DAP: B/AUTO/VERN
Initiate LVLH

QPS2 DAP CONEIG	A	B
(AT 2/11:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

UPLINK
ORBITER S.V.

IMU ALIGN PAD

REQD ID: -Y __, -Z __ ANG ERR __
ANG 1 2 3

Δ X () () ()
Δ Y () () ()
Δ Z () () ()

EXECUTION TIME __ / __ : __ : __

COAS CALIBRATION PAD

+X Δ BIAS __
UPDATE TIME __ / __ : __ : __

Stars 17 & 20 available
from 2/11:19 until
2/11:54

INFORM CREW
STATE VECTOR
STATUS

ASCENDING NODE
ORB: 41
MET: 002:11:48:16
LON: 45.5 E

Star 22 available from
2/11:33 until 2/12:20

MET
DAY002

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

12:00

FIRE/SMOKE DETECT/SUPPRESS TEST
(ORBIT OPS C/L, EPS, 2-5)

MCC ONLY
COORD C&M/FDA
LIMITS CLEANUP
FOR CREW SLEEP

CO2 ABSORBER REPLACEMENT
(5 into A)

12:10

FUEL CELL PURGE - AUTO (CUE CARD)

PRE SLEEP ACTIVITY

Configure: LIGHTING

BACKUP TONES:

M042F MIDDECK SPKR AUD PWR - AUD/TONE
✓SPKR PWR - SPKR/MIC
VOL - as reqd
✓TONES - ACCU/BYP

M058F Connect HDST to SLEEP STA TONES

ALERT TONE DURATION

CRT TIMER FOR WAKE UP

✓CRT 4 MAJ FUNC - SM

CRTs (one STBY, three OFF)

UPLINK
SPC LOAD -
1ST COMM
ALERT
BLOCK DATA
(IF REQD)

12:20

12:30

12:40

12:50

MEDICAL DATA REPORT
(CREW SYS C/L, MICROCASSETTE RCDR. 4-2)

MEDICAL DATA REPORT
(CREW SYS C/L, MICROCASSETTE RCDR. 4-2)

WCS CLEANING (As reqd)

UPLINK
IMU GYRO BIAS
(IF REQD)
ORBITER S.V.
CMD
RCDR SLEEP
CONFIG

06 UHF MODE - OFF (If Reqd)

13:00

MET
DAY 002

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

S
A
A
I

13:00
B AUTO
VERN
RT 0.2
DB 1.0

13:10

ORB
42

13:20

13:30

SLEEP

SLEEP

13:40

13:50

14:00

OPS2 DAP CONFIG	A	B
(AT 2/13:00:00)		
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 42
MET: 002:13:18:13
LON: 22.5 E

MET
DAY 002
14:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

ORB
43

15:00

16:00

17:00

18:00

19:00

SLEEP

SLEEP

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 43
MET: 002:14:48:10
LON: 0.4 W

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 44
MET: 002:16:18:07
LON: 23.3 W

UPLINK
ORBITER S.V.

ASCENDING NODE
ORB: 45
MET: 002:17:48:04
LON: 46.3 W

LOGR
CNR

CMC

LOGR
RKO

CMC

LOGR

RKD
RRA
TDX
TTT

MET
DAY 002

STS-1 24 HP EXTENSION DETAILED
CDR PLT MCC

NOTES

19:00

B AUTO
VERN
RT 0.2
DB 1.0

19:10

ORB
46

19:20

19:30

SLEEP

SLEEP

PLN
ORBITER S.V.

19:40

19:50

20:00

ASCENDING NODE
ORB: 46
MET: 002:19:18:00
LON: 69.2 W

0011

T
M
A
D
I
I

MET
DAY 002
20:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

20:10

20:20

20:30

20:40

20:50

21:00

SLEEP

SLEEP

CMD
RCDR AWAKE
CONFIG

ORB
47

POST SLEEP ACTIVITY

Configure: LIGHTING
COMM
06 UHF MODE - SPLX
ALERT TONE DURATION
CRT'S
MEAL PREP DAY 4, MEAL A (CUE CARD)
Shave electrode sites, if reqd

UPLINK
WEATHER DATA
ORBITS 48-54
SPC LOAD -
CLEAR COMM
ALERT

ASCENDING NODE
ORB: 47
MET: 002:20:47:57
LON: 92.2 W

MET
DAY002
21:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

SM CHECKPOINT (CUE CARD) (IF REQD)

INFORM CREW
SM CKPT -
REQD/NOT REQD

QPS2 DAP CONFIG A B
(AT 2/21:00:00)

XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

UPLINK
ORBITER S.V.

INFORM CREW
STATE VECTOR
STATUS

21:10

POST SLEEP ACTIVITY

21:20

21:30

AUTO MNVR TO IMU ALIGN ATT

INRTL ATT: R +2 4 6.8
P +2 8 8.6
Y +3 5 1.0

DAP: B/AUTO/VERN

(21:37) Initiate MNVR
STAR TRKR (two) - ON
GNC, I/O RESET EXEC

ML31C VAC VENT NOZ HTR - OFF

R2 IF APU's REQD FOR FCS C/O
JBLR CNTLR PWR/HTR (three) - A
CNTLR (three) - ON

21:40

ACOUSTIC BLANKET STORAGE

MF43C Roll installed blankets (4)
Stow loose blankets (2)

21:50

STAR TRACKER SELF-TEST

(ORBIT OPS C/L, IMU/ST/COAS, 1-6)

IMU ALIGNMENT - S TRK

(ORBIT OPS C/L, IMU/ST/COAS, 1-2)

STAR ID: -Y: 20, ARCTURUS
-Z: 1Z, ACRUX

ANG DIF: 85.0

22:00

IMU ALIGN PAD

REQD ID: -Y __, -Z __ ANG ERR
ANG 1 2 3

Δ X () () ()

Δ Y () () ()

Δ Z () () ()

EXECUTION TIME ____ / ____ : ____ : ____

UPDATE
H2O SPLY DUMP
QTY A&B

Stars 17 & 20 available
from 2/21:50 to 2/22:25

MET
DAY 002
22:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

06 STAR TRKR PHR (two) - OFF

R5/C6 Unstow DEORBIT PDP (2)

AUTO MNVR TO -ZLV, Y-POP ATT

BODY VECTOR: P + 9 Q
Y + Q
O + Q

FUEL CELL PURGE - AUTO (CUE CARD)

DAP: B/AUTO/VERN
Initiate LVLH

22:10

SUPPLY WATER STORAGE SYS TANK DUMP, TKS A&B
(ORBIT OPS C/L, ECLS, 3-2)

Dump to QTY A = _____ QTY B = _____

ORB
48

22:20

ASCENDING NODE
ORB: 48
MET: 002:22:17:54
LON: 115.1 W

REPORT: IMU ALIGNMENT RESULTS

UPDATE
CRT TIMER
SETUP PAD

22:30

Copy: CRT TIMER SETUP UPDATE
in DEORBIT PDP, 3-7

UPLINK
SPC LOAD -
IOS COMM

MEAL

22:40

UPLINK
ORBITER S.V.

22:50

Monitor QTY **SM 66 ENVIRONMENT** for H2O SUPPLY

23:00

T
M
L
X
B
D
A

T
M
D
A
X
I
I

I
O
S

MET
DAY 002
23:00

STS-1 24 HR EXTENSION DETAILED
CDR PLT MCC

NOTES

B AUTO
VERN
RT 0.2
DB 1.0

MEAL

23:10

CLEANUP/STORAGE, Steps 1-4 (Cue Card)

Monitor SM 66 ENVIRONMENT for H2O
SUPPLY QTY

Go to DEORBIT PDP: NOMINAL DEORBIT PREP, 3-7

NOTE: POWER UP PER MCC INSTRUCTIONS

23:20

23:30

23:40

23:50

003
00:00

OPS2 DAP CONFIG (AT 2/23:00:00)	A	B
XLATION PULSE	0.1	0.02
ROT DSC RT NRM	0.2	0.5
VRN	0.2	0.2
PULSE NRM	0.1	0.04
VRN	0.01	0.002
COMP NRM	0.0	0.0
VRN	0.0	0.0
DB ATT R,P,Y	10.0	1.0
RATE NRM	0.2	0.2
VRN	0.02	0.02
JET OPT P	1	1
Y	1	1
CNTL ACCEL	0	0

ASCENDING NODE
ORB: 49
MET: 002:23:47:50
LON: 138.1 W

MINIMUM RCS USAGE

I. General Instructions

1. The following changes update the nominal crew activities to minimize RCS usage. These changes constitute the worst case minimum VRCS or PRCS plan and are presented on the RCS consumables curves in section 5 as the 'MIN RCS - VRCS' and 'MIN RCS - PRCS' usage lines. If the situation requires additional savings the decision on where to obtain additional savings will be made realtime by the Flight Director.
 2. Minimum RCS USAGE SUMMARY (VRCS and PRCS case)
 - a) Gravity Gradient will be used for remainder of flight except when necessary to maneuver to an IMU alignment attitude.
 - b) Non-critical IMU alignments will be done with stars of opportunity obtained while in gravity gradient attitude. If not possible to obtain stars in gravity gradient attitude, only the minimum required alignments will be done.
 - c) If a COAS Cal is obtained during the Post Insertion activities, no more will be done.
 - d) RCS FTOs and FTOs requiring special attitudes and associated activities are deleted.
 3. Minimum RCS USAGE SUMMARY (VRCS only)
 - a) Post Insertion Activities are performed as planned until 0/03:22:00.
 - b) Entry day deorbit preps are performed as planned.
 - c) All attitude maneuvers will be performed automatically using:

DISC	0.2 deg/sec
ATT DB	1.0 deg
RATE DB	0.02 deg/sec
 4. Minimum RCS USAGE SUMMARY (PRCS only)
 - a) Post Insertion Activities are performed as planned using the PRIMARY jets until 0/03:22:00.
 - b) Entry day deorbit preps are performed as planned using PRIMARY jets.
 - c) All attitude maneuvers will be performed automatically using:

DISC	0.2 deg/sec
ATT DB	10.0 deg
RATE DB	0.02 deg/sec
- For IMU alignments use 3.0 deg ATT DB to ensure the stars are within the S TRKR field-of-view. (Use 1.0 deg for PDP Post Insertion IMU alignments.)

MINIMUM
RCS USAGE

II. IMPLEMENTATION

1. Verify that the DAP CONFIGURATION TABLE is as follows:

		A	B
XLATION PULSE		0.1	0.02
ROT DSC RT	NRM	0.2	0.2
	VRN	0.2	0.2
PULSE	NRM	0.1	0.04
	VRN	0.01	0.002
COMP	NRM	0.0	0.0
	VRN	0.0	0.0
DB ATT R,P,Y		10.0	*1.0
RATE	NRM	0.2	0.2
	VRN	0.02	0.02
JET OPT	P	1	1
	Y	1	1
CNTL ACCEL		0	0

*30 DB for PRCS Case

2. Enter the list of changes at the appropriate point (time) for when the contingency case called.

NOTE

Only the crew actions have been updated, no changes were included for the DAP configuration callouts in either the time column or notes column.

III. POST INSERTION CHANGES (POST INSERTION PDP, Section 1)

1. For PRCS Case only:

- a) Use NORM jets where VERN jets called out
- b) -ZLV Attitude Mode is done with DAP A (10° DB)

2. For Both PRCS and VRCS cases:

- a) Pg 1-15 at 0/03:22:00
 replace: 'C AUTO MNVR TO -ZLV, Y-POP ATTITUDE
 (FTO 174-08)'

 with: C GRAVITY GRADIENT FREE DRIFT, OPS 2
 (ORBIT OPS C/L, RCS, 6-10)
 ATT ID: B (Perform Steps 1&2)
- b) Pg 1-17 at 0/03:59:00
 delete: 'C -ZLV TEST, VRCS, 0.1° DB
 (FTO 174-08)'

MINIMUM
RCS USAGE

IV. CREW ACTIVITY PLAN CHANGES (Section 2)

1. Verify DAP CONFIGURATION TABLE per II 1.
2. Delete activities marked with a ●
3. Establish gravity gradient attitude if not already in it.

GRAVITY GRADIENT FREE DRIFT, OPS 2

(ORBIT OPS C/L, RCS, 6-10)

ATT ID: B (Perform Steps 1&2)

4. The attitude maneuvers for IMU Alignments marked with a ★ are performed only if stars of opportunity are not available for the IMU alignment.

If stars of opportunity not available:

a) GRAVITY GRADIENT FREE DRIFT, OPS 2

(ORBIT OPS C/L, RCS, 6-10)

Perform Step 3 (VEH RECOVERY & FES RESTART)

Do not RESTART FES if returning to G.G. Att after IMU align.

b) MNVR TO IMU ALIGN ATT

c) After completing Align, to return to G.G. Att:

GRAVITY GRADIENT FREE DRIFT, OPS 2

(ORBIT OPS C/L, RCS, 6-10)

ATT ID: B (Perform Steps 1&2)

5. If WATER DUMP REQD while in G.G. Att

Pg 2-2 at 0/04:30:00

Pg 2-7 at 0/09:45:00

Pg 2-29 at 1/09:23:00

ENABLE +XLV ATT FOR H2O DUMP

RJD DRIVERS (4) - ON

DAP: A/AUTO/VERN(NORM)

when Water Dump complete

GRAVITY GRADIENT FREE DRIFT, OPS 2

(ORBIT OPS C/L, RCS, 6-10)

Perform Step 2 (ESTABLISH FREE DRIFT)

V. DEORBIT PREP (DEORBIT PDP, Section 3)

1. For VRCS case there are no changes
2. For PRCS case
 - a) Use NORM jets where VERN jets called out
 - b) For -ZLV Attitude Mode and Inertial Attitude Hold use DAP A (10° DB) for both OPS 2 and OPS 8

VI. D/O PREP BACKOUT/POST REHEARSAL (DEORBIT PDP, Section 4)

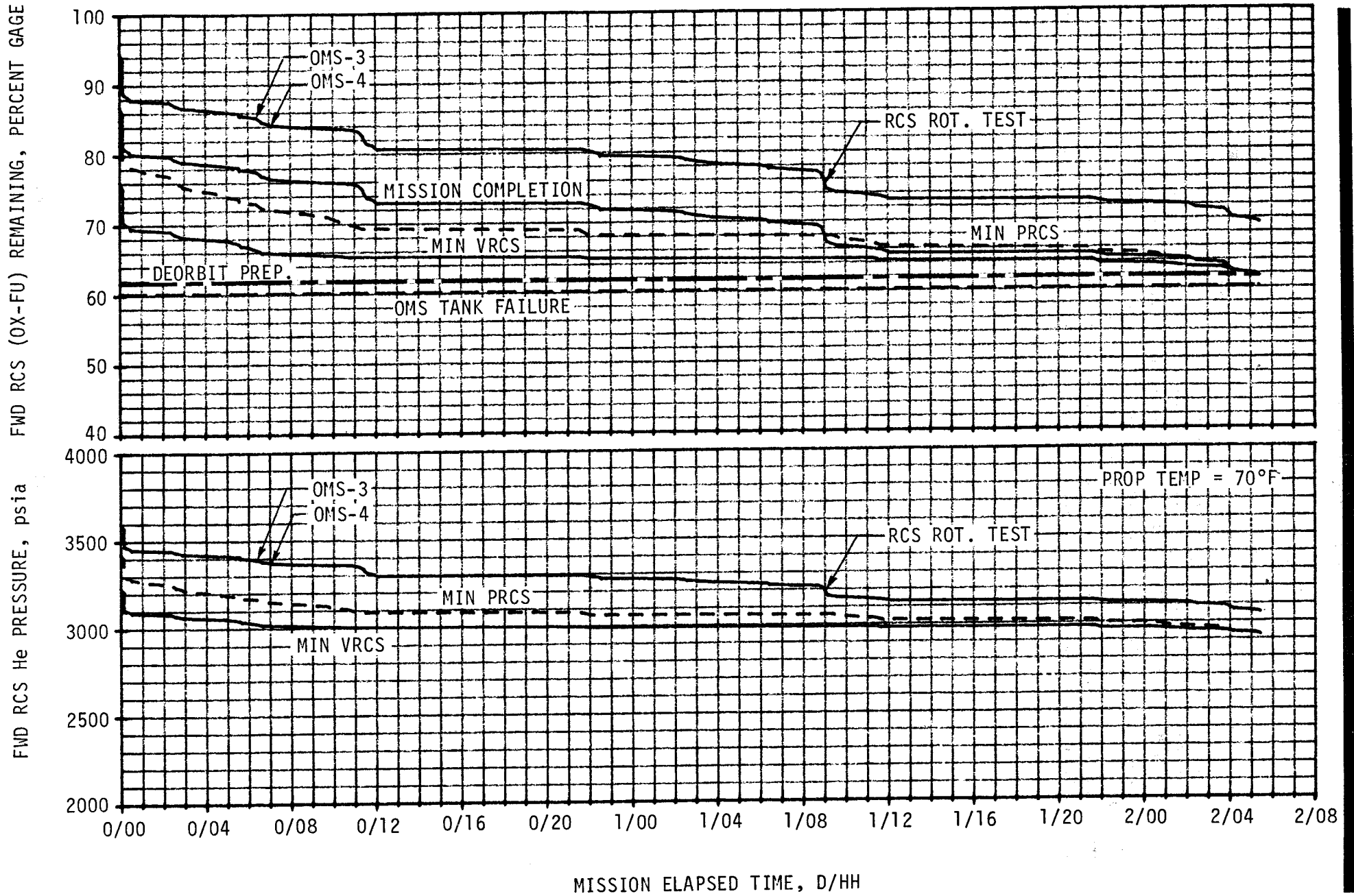
1. Pg 4-9 at 01/06:02:00, in crew column,
replace: 'AUTO MNVR TO -ZLV (Y-POP)'
with: GRAVITY GRADIENT FREE DRIFT, OPS 2
(ORBIT OPS C/L, RCS, 6-10)
ATT ID: B (Perform Steps 1&2)

CONSUMABLES CURVES

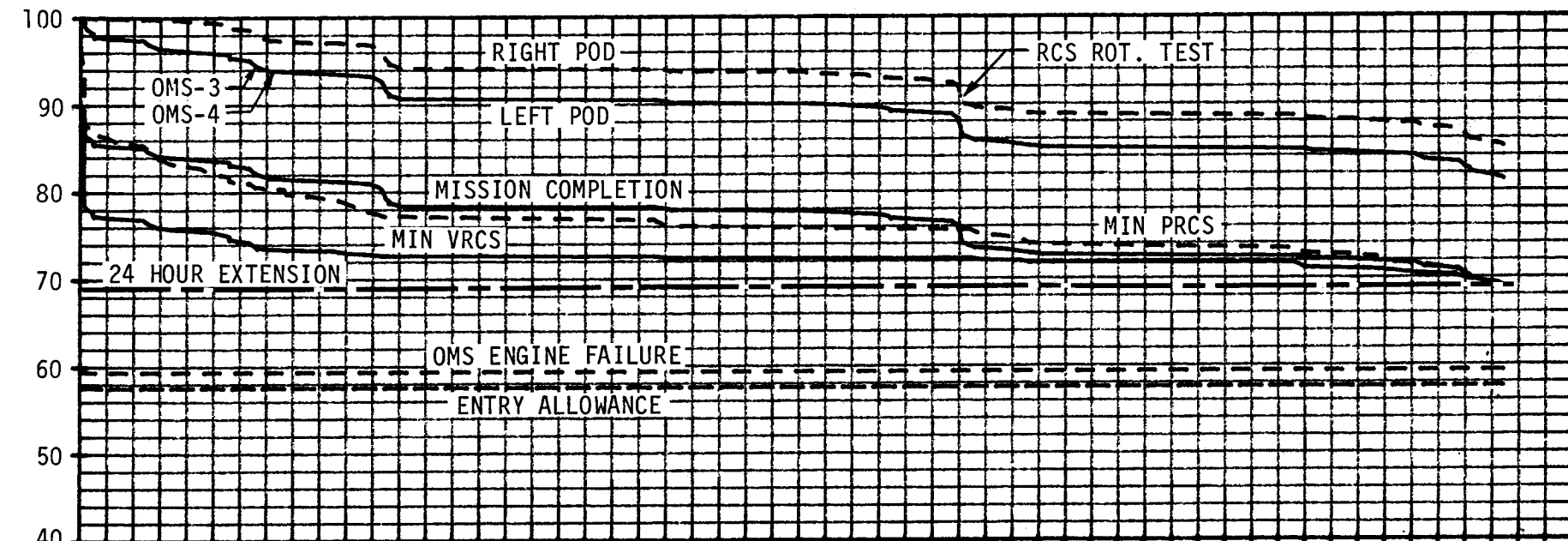
	Page
FWD RCS PROPELLANT & He PRESS.....	5-2
AFT RCS PROPELLANT & He PRESS.....	5-3
OMS PROPELLANT CURVE (R & L POD).....	5-4
OMS He PRESSURE (R & L POD).....	5-4
OMS N2 PRESSURE (R & L POD).....	5-4
SUPPLY WATER.....	5-5
CRYO H2 CURVE.....	5-6
CRYO O2 CURVE.....	5-7

CONSUMABLES
CURVES

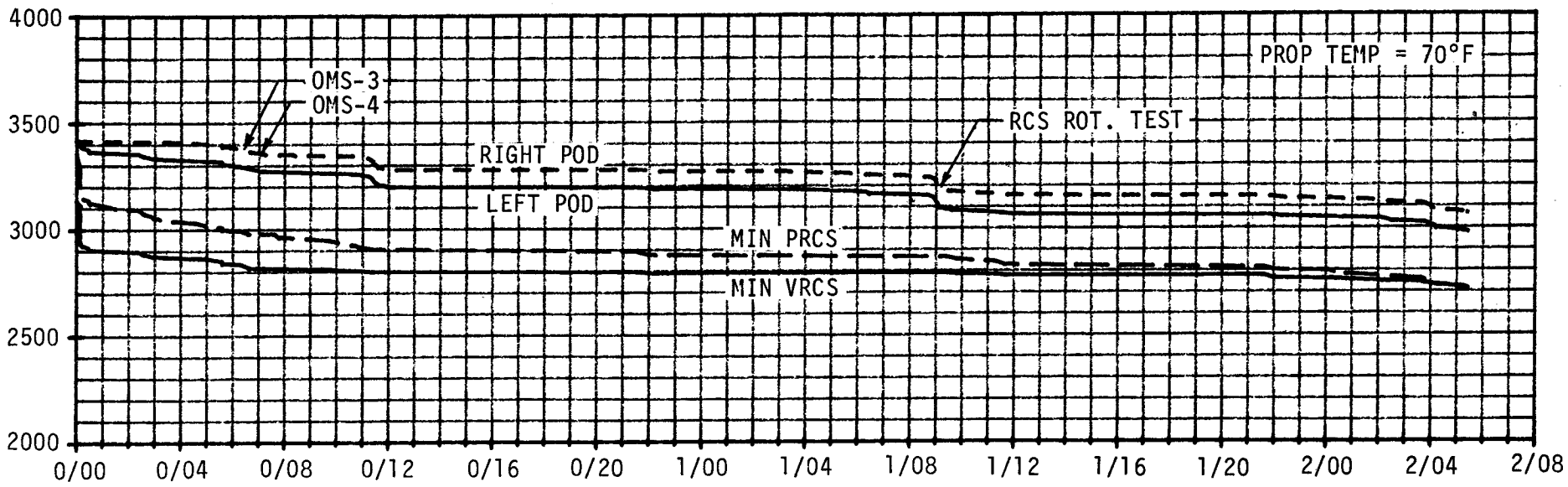
CONSUMABLES CURVES



AFT RCS (OX-FU) REMAINING, PERCENT, GAGE

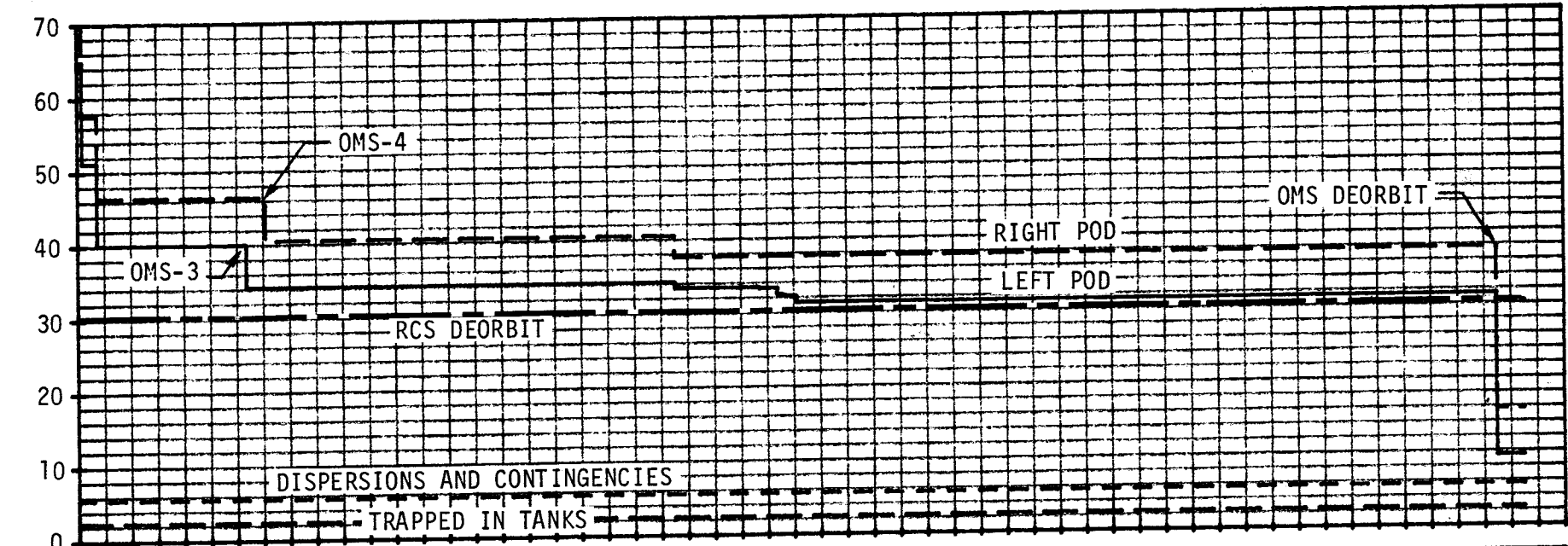


AFT RCS He PRESSURE, psia

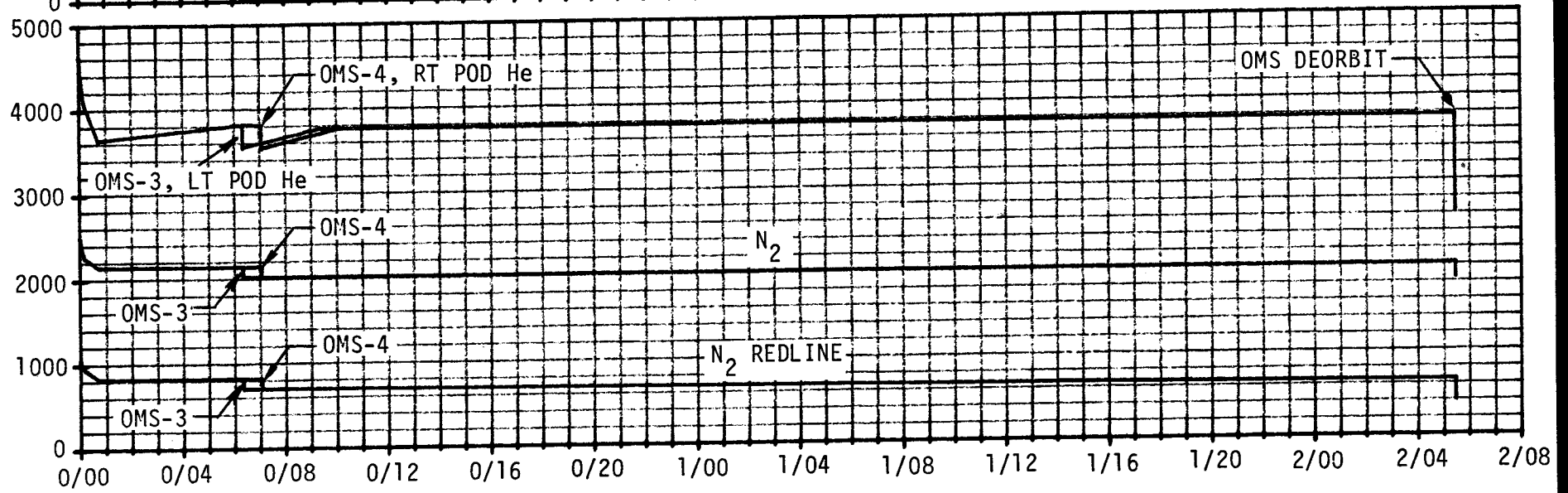


MISSION ELAPSED TIME, D/HH

OMS (FUEL-OX) REMAINING, PERCENT GAGE



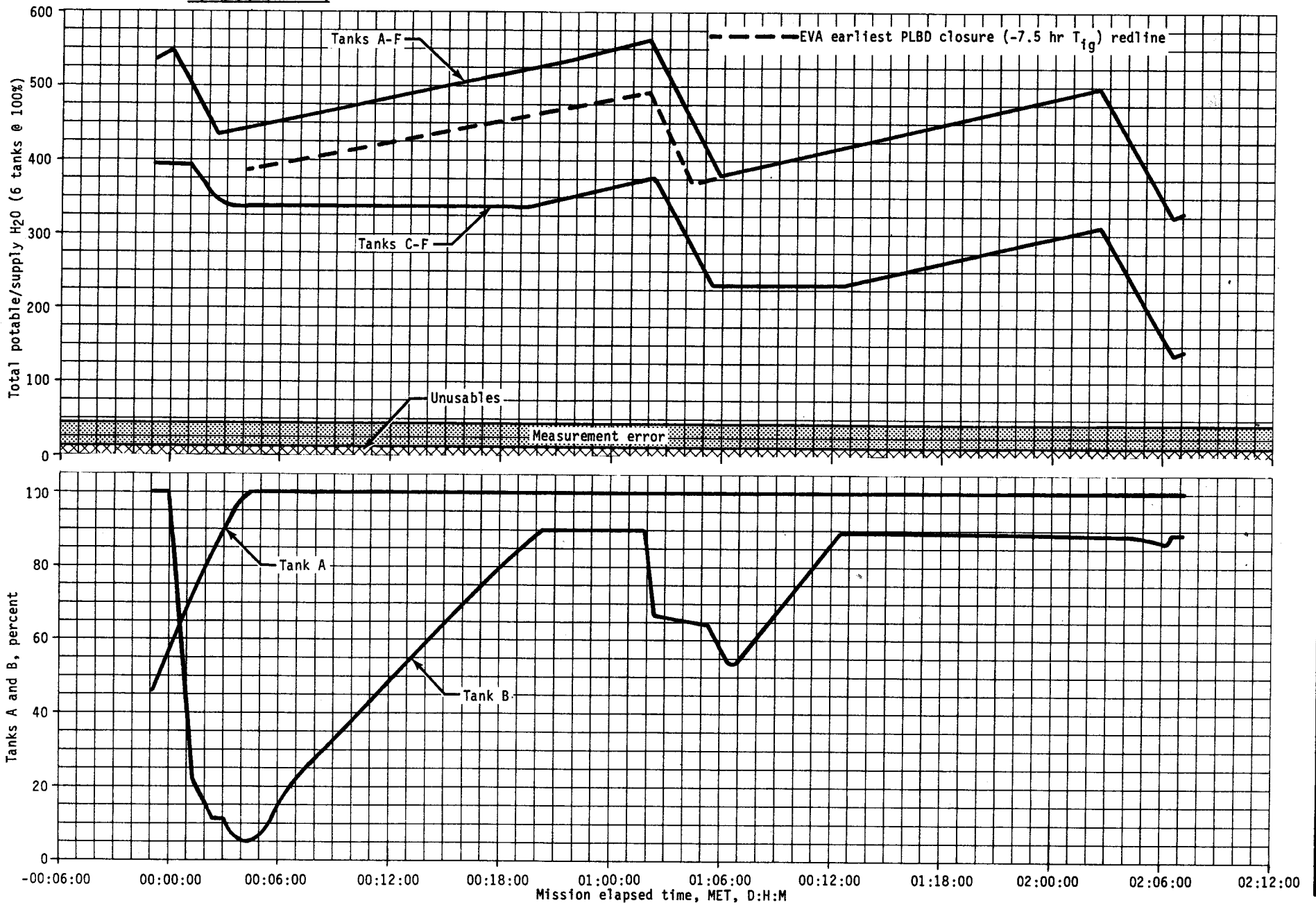
OMS TANK PRESSURES, psia



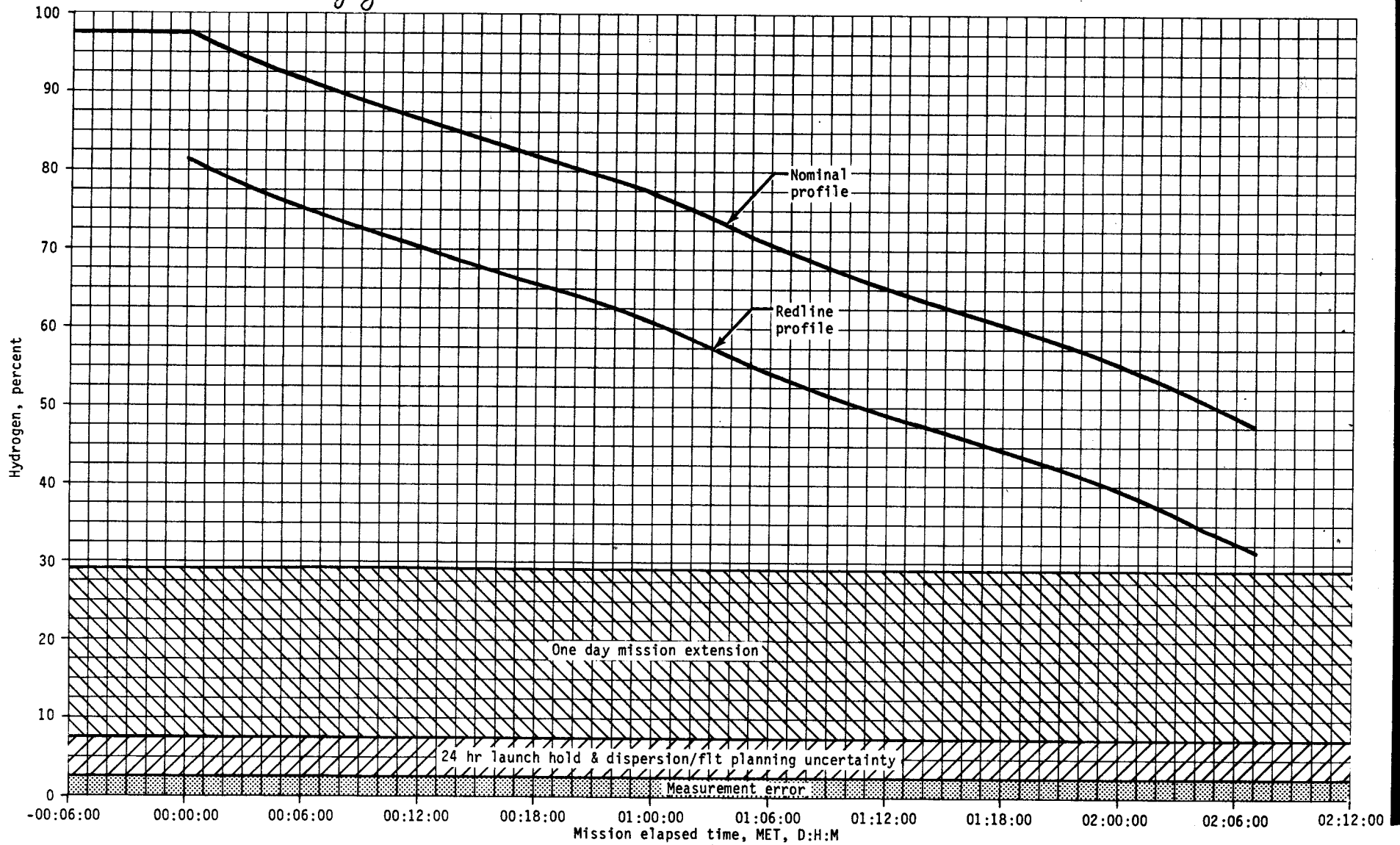
MISSION ELAPSED TIME, D/HH

DATE 03/02/81

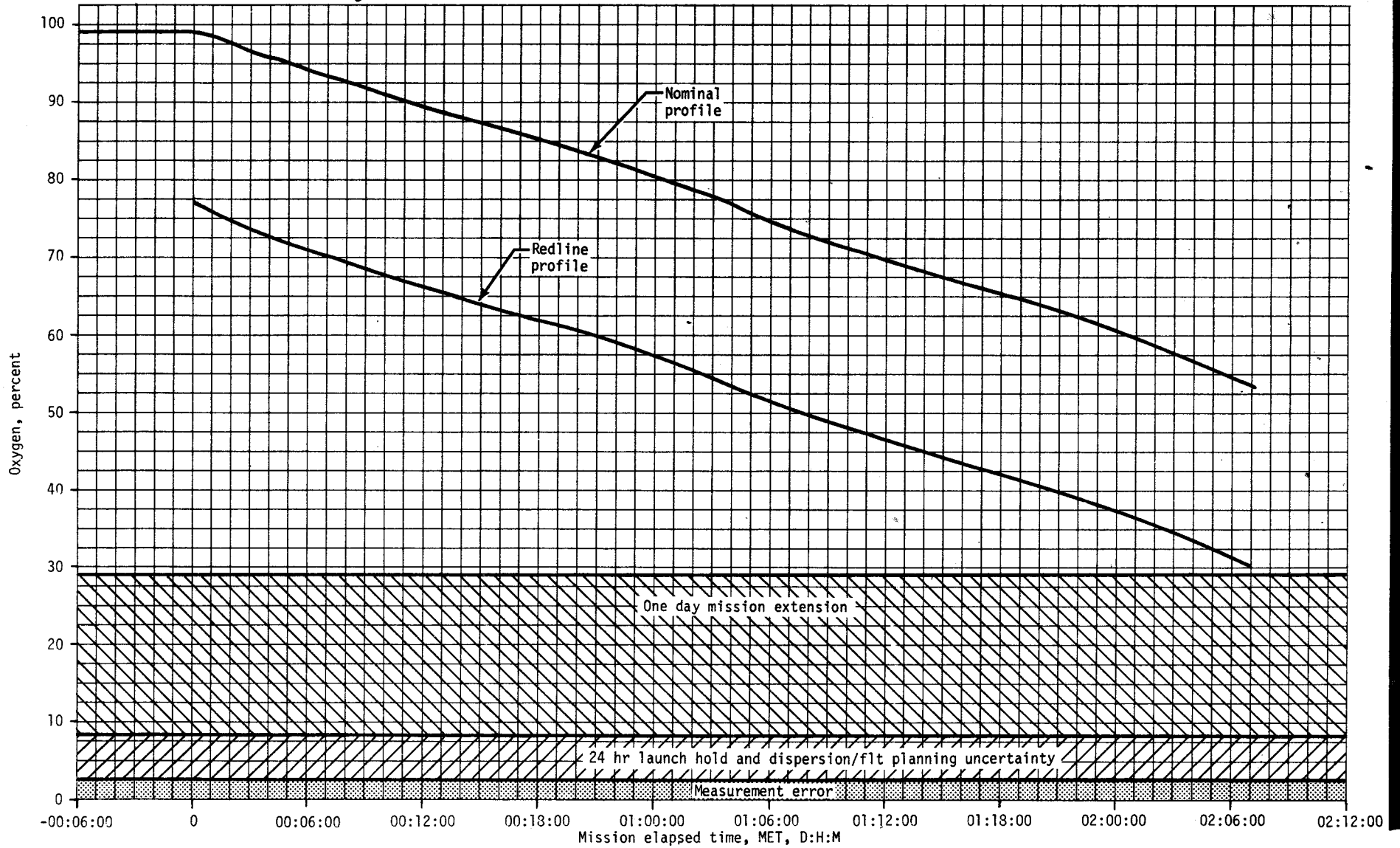
Dave Heath/FPB/MPAD
 Data source JSC-17023, Vol. II
 Data confirmed Dave Heath



Richard Gonzalez/FPB/MPAD
Data source JSC-16683, Vol. VIII
Data confirmed *Richard Gonzalez*



Richard Gonzalez/FPB/MPAD
Data source JSC-16683, Vol. VIII
Data confirmed *Richard Gonzalez*



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

CREW ACTIVITY PLAN NOTES

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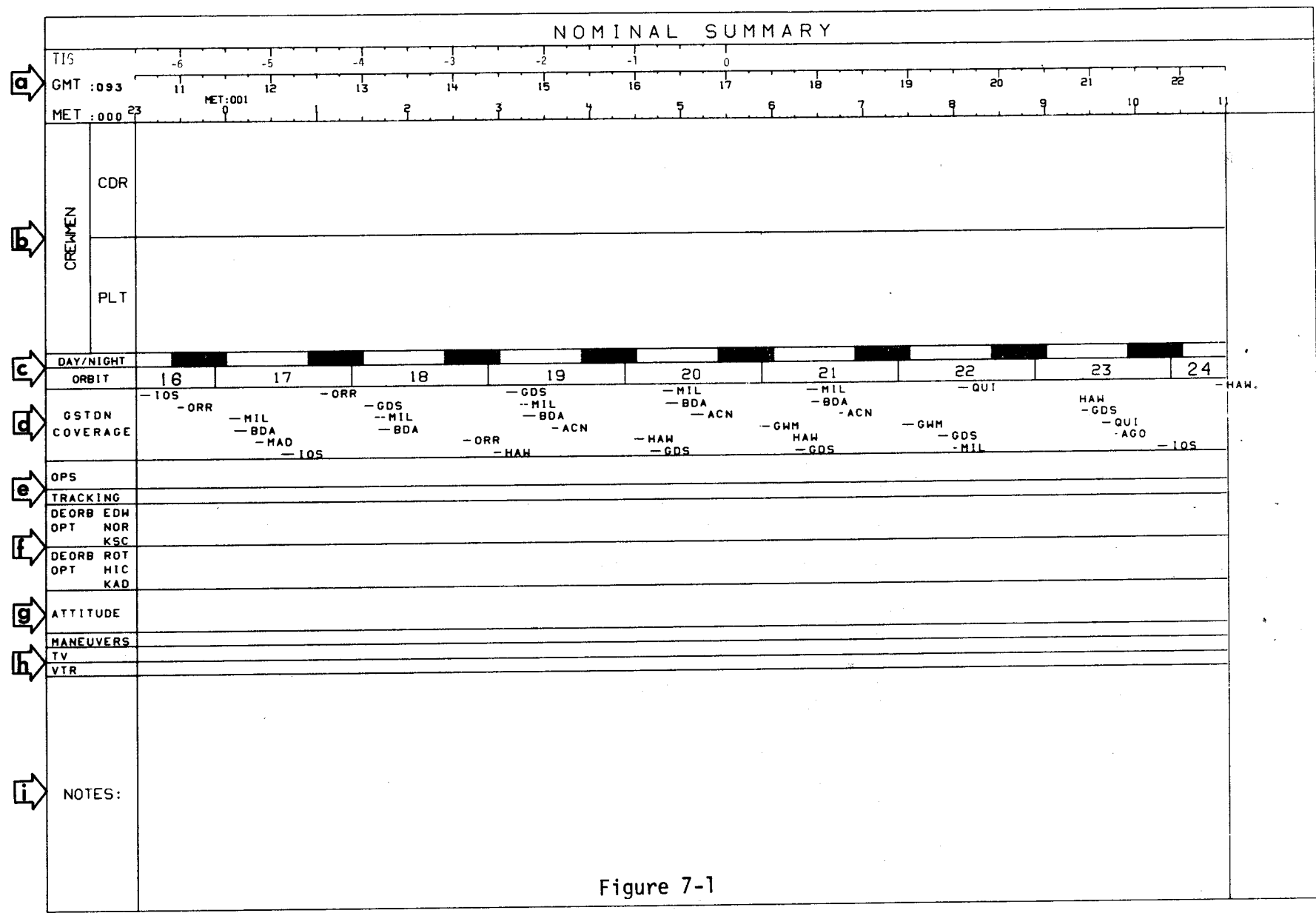


Figure 7-1

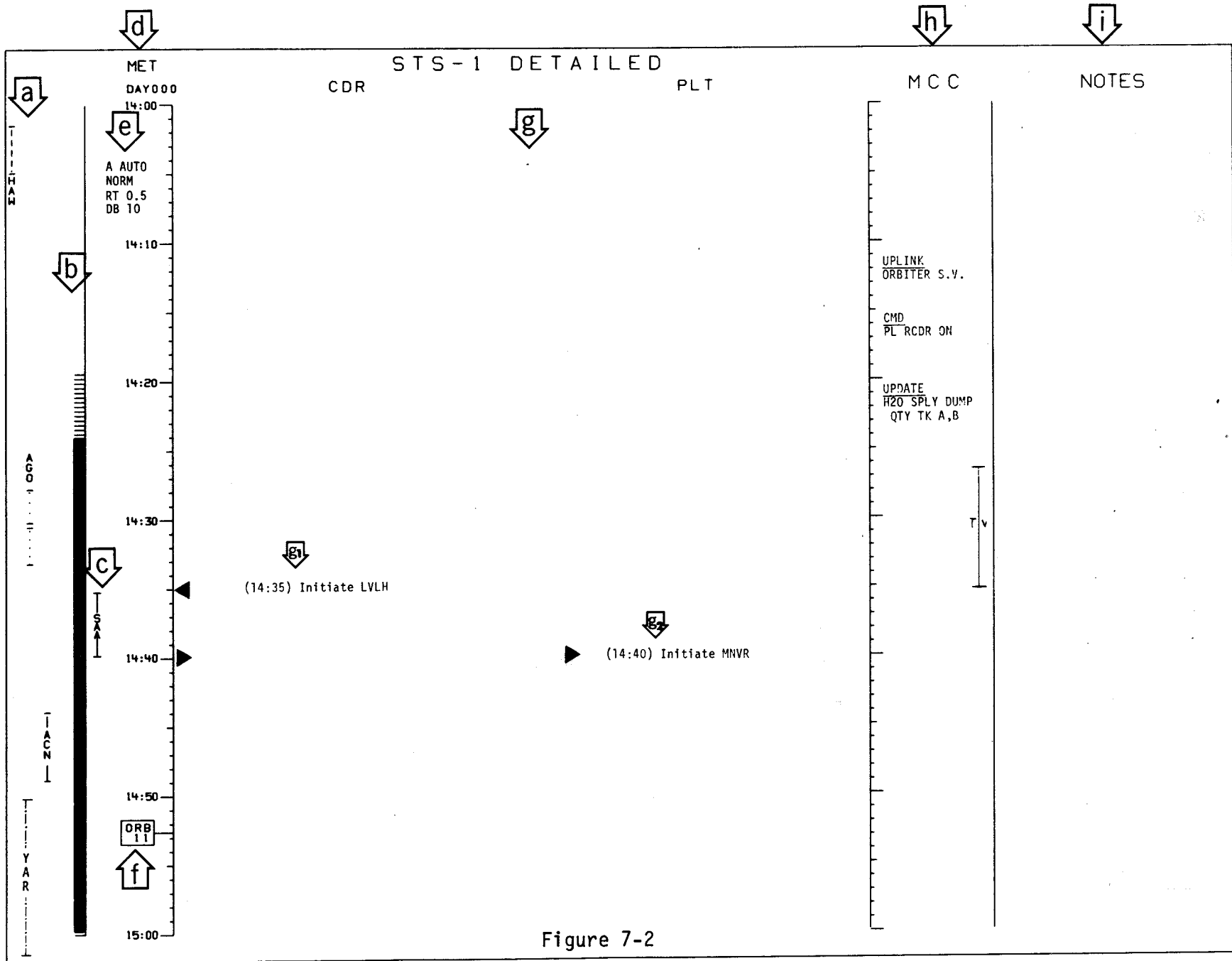
A. FORMAT SYMBOL NOMENCLATURE

1. Summary Level Timeline (12-Hr Timespan)

The following letters (a-i) reference those highlighted in Figure 7-1.

- a. Timescales: Three time references are presented in this section of the summary timeline format. The three time references used are Mission Elapsed Time (MET), Greenwich Mean Time (GMT) and TIG Minus Time (TIG). The MET and GMT time scales are shown on every page with TIG appearing on the pages when the deorbit preparations are performed on rehearsal day and entry day.
 - 1) TIG: The TIG is referenced to the deorbit ignition time and counts down to 0/00:00:00 at ignition on the CRT TIMER CLOCK. This time base is used for the deorbit preparations on entry day. When the TIG timescale is shown on the page, 15 minute interval tick marks are also provided.
 - 2) GMT: The GMT references the local mean time at the Greenwich meridian. The day of the year is identified at the left margin of the GMT timescale. As the day of year changes it is noted within the timescale, e.g., GMT:093. Fifteen (15) minute interval tick marks are also included in the timescale.
 - 3) MET: The MET is referenced to liftoff beginning at 0/00:00:00 (days, hours, minutes and seconds). The MET days are identified at the left margin of the MET timescale. At liftoff, the MET day zero remains zero until 24 hours have elapsed and then the MET day becomes 001. As the MET day of the flight changes, it is annotated within the timescale, e.g., MET:001. The MET timescale includes 5-minute interval tick marks.
- b. CREWMEN (CDR & PLT): This is the crewmen column of the format where titles of scheduled activities are shown for the commander (CDR) and pilot (PLT) at the appropriate times in the flight.
- c. DAY/NIGHT and ORBIT
 - 1) Day/Night - The orbital day/night intervals are delineated with black bars indicating when the Orbiter is in darkness.
 - 2) Orbit - Indicates which orbit the spacecraft is in by numerical sequence. The beginning of an orbit occurs when the Orbiter crosses the earth's equator going from the southern to the northern hemisphere (ascending node). The succession of orbits is numbered in this column starting with Orbit 1 for launch.

- d. GSTDN COVERAGE - The GSTDN communication coverage periods are indicated in this area with a horizontal line indicating when communication is available; the GSTDN site is identified to the right of the line.
- e. OPS and TRACKING
 - 1) Ops - The GPC software configuration in use during the flight is indicated in this area.
 - 2) Tracking - The primary ground tracking interval for deorbit targeting data is indicated in this area with a '|-----|'.
- f. DEORBIT OPT - When applicable, times are identified in this area when deorbit burn opportunities exist with a crossrange less than 710 nm for EDW (Edwards AFB), NOR (Northrup Strip), KSC (Kennedy Space Center), ROT (Rota, Spain), HIC (Hickam AFB), and KAD (Kadena AB, Ryuku Islands).
- g. ATTITUDE and MANEUVERS
 - 1) Attitude - The current attitude of the vehicle is identified in this area, i.e., PTC, IMU, -ZLV.
 - 2) Maneuvers - An '↑' is placed at the time an attitude maneuver occurs.
- h. TV and VTR - Live TV or recorded TV (VTR) is indicated in this area with a '|-----|'.
- i. NOTES - This section of the format is used for additional information needed to supplement activities scheduled in the crewman columns. Bullets are used to reference these data.



2. Detailed Level Timeline (1-Hr Timespan)

The following letters (a-i) reference those highlighted in Figure 7-2.

- a. GSTDN Coverage - In this column the GSTDN sites and their acquisition periods are identified. Each site acquisition period is annotated by a solid line, a dashed line, or a dotted line or a dot-dash-dot line. The different annotations indicate the following:
- T A site that has S-Band, UHF voice and TV capabilities (GDS, HAW, MAD, MIL, MLX, GDX, MAX)
 - I A site with S-Band and UHF voice capabilities (BDA, GWM, ACN, BUC, TUL, IOS)
 - ⋮ A site with only S-Band (no UHF or TV) capabilities (AGO, ORR, QUI)
 - ! A site with only UHF (no S-Band or TV) capabilities (BOT, YAR, DKR)
- b. DAY/NIGHT CYCLE - In this column a solid bar indicates the period when the Orbiter and earth are in darkness. A dashed line indicates when the Orbiter is in daylight but the earth beneath the Orbiter is still in darkness.
- c. South Atlantic Anomaly (SAA) - This bar defines those periods when the Orbiter passes through the SAA.
- d. MET Timescale - This format is a one hour format with 60 minute tick marks on the vertical timescale referenced to Mission Elapsed Time (MET) with liftoff occurring at 0/00:00:00. The DAY designation immediately beneath the MET label is for MET DAY accounting, e.g., MET DAY 001 is equal to 24 hours into flight.
- e. DAP Configuration - At the top of each page the active DAP configuration is identified for that MET time. (It will not be shown if the crew is within a checklist procedure). When the active DAP configuration is changed in the middle of the page the new configuration will be documented in this column adjacent to the point where the change was made. A change to the DAP configuration table, since it does not change the active DAP configuration, is not indicated. The following is identified: DAP (A or B), MODE (AUTO or MAN), Jets (NORM or VERN), Rotation Discrete Rate (RT), and Attitude Deadband (DB).
- f. ORBIT - Indicates which orbit the spacecraft is in by numerical sequence. Orbit one begins at liftoff with subsequent orbits starting when the earth's equator is crossed (ascending node).

- g. CREWMAN columns - The activities for the CDR and PLT are scheduled in this area.
 - g1) If there is a time-critical event scheduled for the CDR, the MET time is defined before the action. An arrow pointing left is positioned to the left of the CDR's column at the correct time on the timescale.
 - g2) If there is a time-critical event scheduled for the PLT, the MET time is defined before the action. For the PLT two arrows are positioned at the correct time pointing right: one at the timescale and the other in the PLT's column.
- h. MCC column - Any uplinks, commands or updates required are scheduled at the appropriate time in this column. A vertical line is also used to delineate live TV coverage.
- i. NOTES - This area will be used for location of pads, times of star availability, time and longitude of the ascending node, TV and photography scenes, and any other supplemental information required.

B. FLIGHT DESCRIPTION - MAJOR EVENTS

<u>MISSION DURATION</u> (day/hr:min:sec)	2/06:27:43
<u>LAUNCH</u> (KSC)	15 April 1981
MET(day/hr:min:sec)	0/00:00:00
Day of Year	105
CST/GMT	0558/1158
<u>MECO</u>	
MET (day/hr:min:sec)	0/00:08:32
ORBIT ha/hp (nm)	81 x 13
<u>ET SEP/-Z RCS BURN</u>	
MET (day/hr:min:sec)	0/00:08:50
ΔV (fps)	4.0
ΔT (min:sec)	00:07
ORBIT ha/hp (nm)	80 x 14
<u>+Y EVASIVE MANEUVER</u>	
MET (day/hr:min:sec)	0/00:08:59
ΔV (fps)	4.0
ΔT (min:sec)	00:24
ORBIT ha/hp (nm)	80 x 14
<u>OMS-1 1/LOX VENT/BEGIN LH2 VENT</u>	
MET (day/hr:min:sec)	0/00:10:32
ΔV (fps)	165
ΔT (min:sec)	01:23
ORBIT ha/hp (nm)	130 x 55
<u>END LH2 VENT & LOX VENT</u>	
MET (day/hr:min:sec)	13:32
ORBIT ha/hp (nm)	130 x 55
<u>OMS-2</u>	
MET (day/hr:min:sec)	0/00:44:00
ΔV (fps)	137
ΔT (min:sec)	01:09
ORBIT ha/hp (nm)	130 x 130
<u>OMS-3</u>	
MET (day/hr:min:sec)	0/06:20:40.6
ΔV (fps)	36.5
ΔT (min:sec)	00:38.8
ORBIT ha/hp (nm)	150/128.9
<u>OMS-4</u>	
MET (day/hr:min:sec)	0/07:05:31.2
ΔV (fps)	37.5
ΔT (min:sec)	00:39.7
ORBIT ha/hp (nm)	150.5/150.1
<u>DEORBIT</u>	
MET (day/hr:min:sec)	2/05:27:52
ΔV (fps)	299.1
ΔT (min:sec)	02:35
ORBIT ha/hp (nm)	151 x 2

ENTRY INTERFACE

MET (day/hr:min:sec)

2/05:56:02

LANDING (EDW)

MET (day/hr:min:sec)

17 April 1981

Day of year

2/06:27:43

CST/GMT

107

1251/1851

C. CREW

1. Crew designations and responsibilities

a. Commander (CDR): Prime crewman for launch, entry, and aborts. Responsible for overall command of the vehicle including the safety of both vehicle and crew.

b. Pilot (PLT): Prime crewman for contingency EVA. Responsible for on-orbit management of STS and attached payload systems.

2. A typical crew day will be that specified in the STS Work Day Handbook (Ref. 12). The daily on-orbit STS activities and their scheduling constraints are identified in the referenced document.

3. The crew will wear Emergency Ejection Suits (EES) from launch through post-insertion and will don them again for entry. Whenever the EES is worn, OBS sensors are also worn. Inflight garments are worn at all other times.

4. The headset configuration for the crew during the on-orbit phase of the flight is the lightweight headset.

5. The crew will sleep on the Flight Deck in the seats. The headset configuration for the crew during the sleep period will be one crewman configured for normal comm and the other crewman configured only for C&W tone alert using Sleep Sta Tone outlet (Pnl M058F) and Tones switch (Pnl M042F).

D. ORBITER SYSTEMS

1. Electrical Power System

- a. A crew-initiated automatic purge of the fuel cells will be scheduled approximately every 8 hours.
- b. In the deorbit preparations timeline the fuel cells are manually purged approximately one hour before deorbit ignition with the post purge bakeout step deleted. This is done to ensure adequate bus voltages during entry for the nominal or one orbit late deorbit. The bakeout step must be performed manually prior to the first purge for a 24-hour extension.
- c. The fuel cell purge schedule is shown in Table 9-1.

2. Communications and Instrumentation

- a. The Operational Instrumentation (OI) System will be managed from the ground through uplink commands coordinated with the crew. Exceptions to this would be the result of contingencies. Real-time OI data will be transmitted to MCC during each ground station pass via the S-Band PM downlink. In parallel with this, one of the two operations recorders will dump recorded OI data at a 5- or 8-to-1 playback-to-record ratio (depending upon whether or not voice is included in the recorded data). One OI recorder will be recording at all times, and the other will dump at every station pass via the S-Band FM downlink. Video downlink causes an exception to this recorder dump plan, but only during the station passes where TV is scheduled as a crew activity.
- b. The Development Flight Instrumentation (DFI) System will be crew-controlled. The Ascent Recorder is not used on orbit. The Ascent Recorder usage schedule is shown in Table 9-7. The PCM Recorder will be operated during the entire flight in one of three modes: CONTINUOUS RECORD, HI SAMPLE (a 10-second snapshot of data every 5 minutes) and LO SAMPLE (a 10-second snapshot of data every 10 minutes). The nominal configuration during the on-orbit day is in HI SAMPLE; during the crew sleep period, it is in LO SAMPLE. The PCM DFI usage schedule is shown in Table 9-9. The Wideband Mission Recorder will be operated in the continuous record mode with all tracks recording in parallel during OMS and RCS burns and as required for FTOs or FSOs. The recorder is powered on for Ascent through OMS-2, Deorbit Prep, and as required on-orbit. The Wideband Mission Recorder usage schedule is shown in Table 9-8. DFI data will be downlinked every ground station pass via a separate S-Band DFI FM downlink. These data will be recorded at the ground station for post-flight shipment to MCC; fourteen (14) selected parameters will be shipped to MCC realtime from launch (MIL) and landing (BUC) sites. Recorded DFI data will not be dumped to the ground stations during on-orbit operations.

- c. There are fifteen (15) GSTDN sites for on-orbit coverage: ORR, BUC, GDS, MIL, BDA, HAW, GWM, QUI, AGO, ACN, MAD, TUL, YAR, DKR, and BOT, and one (1) SGLS site: IOS. The BUC site will not support data dump via S-Band FM downlink.
- d. Four (4) GSTDN sites can be used for real-time TV: GDS, MIL, MAD, and HAW.
- e. Ten (10) GSTDN sites have UHF Voice capability in addition to S-Band: GDS, MIL, BDA, HAW, GWM, ACN, BUC, MAD, TUL, and IOS.
- f. Three (3) sites have only UHF Voice capability: YAR, BOT, and DKR.
- g. The UHF MODE switch (Pnl 06) is configured ON during the flight day and OFF during the crew sleep period.

3. Guidance and Navigation

- a. The COAS is unstowed about two and one-half hours into the flight. It is mounted in the +X window (W3) position and calibrated. The COAS will remain mounted in the +X position until it is stowed during deorbit prep on entry day.
- b. Prelaunch block update data will be documented in the Updates Book. Updates of the block data via voice or teleprinter will be performed whenever required in flight realtime. See Table 9-13 for when the updates would occur, if required.
- c. A landing site weather status report will be uplinked by text uplink, at selected times during the flight, to provide the crew with the weather conditions for the upcoming landing opportunities. See Table 9-13 for when the weather reports would be uplinked.
- d. The Orbiter state vector is routinely uplinked approximately once an orbit.
- e. IMU alignments will be routinely scheduled approximately every eight (8) hours.
- f. The -Y star tracker is left on continuously. The -Z star tracker is turned off except for IMU alignments. The -Z star tracker must be turned on and warmed up for 15 minutes before a scheduled alignment. A self-test of the star tracker will be performed once a day, normally just prior to the IMU alignment scheduled after the sleep periods.

- g. Each IMU will be aligned with different REFSMMATs to provide skewed platforms for enhancement of redundancy management at launch and entry. The launch REFSMMATs have a square root of five skewing and the preferred skew for entry is a square root of six. The REFSMMATs will be changed for entry normally at 0/08:40 MET. In order to simplify recovery procedures for some contingency cases one of the IMUs will have the same REFSMMAT for launch and entry. For the case where an IMU fails prior to the switch to the square root of six REFSMMATs, the IMU REFSMMATs, for entry, will be changed to a square root of two skewing to enhance the redundancy management during entry.
- h. The ADI RELMATs provide a means to change the reference system for presenting vehicle attitudes to the crew without having to reposition the IMU platforms. The RELMATs support specific flight phase requirements and are defined as listed below.

1) ASCENT (OPS 1 and 6)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0 deg, pitch 0 deg, and yaw 0 deg when the vehicle +X axis is pointed at 0 deg Right Ascension, 0 deg Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

This will be a pad-oriented inertial RELMAT, defined as having the vehicle's +X axis downrange along the first stage launch azimuth and the +Z down towards the center of the earth along the pad radius vector at the time of lift-off. This provides a +X sense ADI ball reading of roll 55.3 deg (launch azimuth), pitch 90 deg, and yaw 0 deg, at lift-off.

'LVLH' Position:

This RELMAT will provide for an unbiased LVLH frame in major modes 104, 105, and 106 (i.e., the bias matrix will be an identity matrix). In major modes 101, 102, 103, and 601, the LVIY reference frame will be used.

2) ON-ORBIT (OPS 2 and 8)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0 deg, pitch 0 deg, and yaw 0 deg when the vehicle +X axis is pointed at 0 deg Right Ascension, 0 deg Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0 deg, pitch 0 deg, and yaw 0 deg when the vehicle +X axis is in the direction of the velocity vector and the +Z axis is directed radially down to the center of the earth at the orbital noon time which is closest to the midway MET between TIG for nominal OMS 2 and TIG for nominal deorbit burn.

'LVLH' Position:

This RELMAT will provide for an unbiased LVLH frame (i.e., the bias matrix will be an identity matrix).

3) ENTRY (OPS 3)

'INRTL' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0 deg, pitch 0 deg, and yaw 0 deg when the vehicle is pointed at 0 deg Right Ascension, 0 deg Declination and the vehicle +Y axis is pointed at the celestial North Pole.

'REF' Position:

This RELMAT will provide a +X sense ADI ball reading of roll 0 deg, pitch 180 deg, and yaw 0 deg when the vehicle is in the heads-down deorbit ignition attitude for a no fuel wasting in-plane AOA OMS 2 burn (nominal target line) where AOA was selected Post-MECO and pre-OMS 1 for earliest AOA case (MPS fuel depletion MECO). OMS 1 is performed with ATO/AOA common targets.

'LVLH' Position:

Unbiased.

i. The OPS 2 I-loaded DAP configuration is:

	<u>DAP A</u>	<u>DAP B</u>
Translation Pulse	0.1	0.02
Rotation Discrete Rate - NORM	0.2 deg/sec	0.5 deg/sec
- VERNIERS	0.2 deg/sec	0.2 deg/sec
Rotation Pulse - NORM	0.1	0.04
- VERNIERS	0.01	0.002
Rotation Compensation - NORM	0.0	0.0
- VERN	0.0	0.0
Attitude Deadband (R,P,Y axis)	10.0 deg	1.0 deg
Rate Deadband - NORM	0.2 deg/sec	0.2 deg/sec
VERN IERS	0.02 deg/sec	0.02 deg/sec
Jet Opt Pitch	1	1
Yaw	1	1
Cntl Accel	0	0

j. The OPS 3 Transition DAP configuration is:

Rotation Discrete Rate	0.5 deg/sec
Attitude Deadband	3.5 deg
Rate Deadband	0.3 deg/sec

4. Propulsion

The major burns maneuver schedule for STS 1 is identified in Section 7.B., FLIGHT DESCRIPTION - MAJOR EVENTS.

5. Environmental Control and Life Support Subsystem (ECLS)

- a. The CO₂ absorbers are not installed for launch or entry. Both canisters are initially installed at approximately 0/05:45 MET and are then alternately replaced with new canisters within the required frequency of every 24 hours. The canisters are left installed until approximately TIG-4:23 when both are removed during the deorbit preparations on entry day. The installation/replacement schedule is shown in Table 9-3.
- b. The waste water tank is full at launch, less sufficient ullage volume to handle waste water generated during launch and post insertion. This is to provide the maximum amount of water for cooling in case problems occur in the initial opening of the payload bay doors. There is a waste water dump scheduled once after launch; this will dump the tank to a level that will allow the tank to be full prior to the group of Edwards' deorbit opportunities on entry day. The waste water dump schedule is shown in Table 9-2. A realtime call will be made prior to a dump to verify the level to be dumped to.
- c. The supply water tanks are full at launch except for tank A which has sufficient ullage volume to handle fuel cell water production during ascent. Tank A is unavailable for use by the flash evaporators at ascent water flow rates. The supply water crossover valve is opened at 0/01:19 MET to permit use of water out of Tanks C, D, E, and F by the flash evaporators. There are four potential supply water dumps scheduled in the crew activity plan which may or may not be required. A realtime call will be made prior to each scheduled dump to inform the crew if a dump is required and to what level. Tanks A & B will be dumped to a level that will allow the tanks to be full prior to the next daily group of Edwards' deorbit opportunities. The supply water dump schedule is shown in Table 9-2.

E. DEU EQUIVALENTS

There are no DEU equivalents nominally planned for STS-1.

F. INTERIM TELEPRINTER SYSTEM (ITS)

1. The Interim Teleprinter System (ITS) will be used for STS-1. The system will provide an on-orbit capability to receive and reproduce text data (such as procedures and CAP updates or changes) from the MCC during routine and off-nominal situations.
2. The teleprinter with flight locker will not exceed 60 lbs by weight. The teleprinter will utilize Orbiter direct current, 24-32 Vdc. The maximum power consumption will be approximately 1 watt when it is on but not receiving, and 50-60 watts while it is receiving and printing. The teleprinter utilizes an impact-type printing process, with a special 63(+SPACE)-character set, at an operating speed of up to 1200 Baud per minute; however, the MCC ground line limit is 600 Baud. One roll of paper approximately 8 1/2 inches in width will be sufficient for STS-1.
3. The teleprinter is located on the middeck in a standard flight locker (MA9F) adjacent to Avionics Bay 3A. Foam insulation inside the locker is used to reduce the noise from the teleprinter during operation.
4. The teleprinter will be activated on-orbit after suit doffing. Activation includes unstowing and subsequent connection of two cables, audio and power, from the teleprinter to the MS COMM connector on Pnl A11, and configuring Pnl R10 for use of the MS AUD A/G 2 circuit. The teleprinter will then remain on continuously throughout the flight until deactivation prior to seat ingress.

G. TELEVISION/PHOTOGRAPHY

1. The Closed Circuit Television (CCTV) system will be used for STS-1. This system provides two cameras for in-cabin coverage and payload bay TV cameras for coverage of payload bay activities. The system, after activation, will be managed by ground commands during live TV GSTDN passes. For TV coverage outside of STDN coverage, the crew must manage the CCTV system and the Video Tape Recorder (VTR). See Table 9-4 for real-time TV schedule.
2. There is a VTR available to record video during periods when there is no STDN coverage. The video is recorded on 30 minute cassettes and will normally not be dumped to the ground. The VTR management must be performed entirely by the crew. See Table 9-4 for VTR TV Schedule.
3. 16mm, 35mm and 70mm camera systems are available.
4. The photography schedule is provided in Table 9-5.

H. PAYLOADS

1. ACIP (Aerodynamic Coefficient Identification Package)

The data from this package are recorded on the payload recorder. The package is controlled by commands sent from the ground and the only crew operation is to turn on the ACIP heaters after completing the post insertion activities. The heaters are left on for the duration of the flight. The ACIP package is turned on several times during the flight by ground command to collect baseline data. The command timeline is in Table 9-12.

DATA ONLY DETAILED TEST OBJECTIVES (DTOs),
FUNCTIONAL TEST OBJECTIVES (FTOs),
FUNCTIONAL SUPPLEMENTARY OBJECTIVES (FSOs)

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TABLE 8-1. STS-1 DTOs/FTOs/FSOs.....	8-3

FTOs/FSOs

INTRODUCTION

The FTOs/FSOs required for STS-1, including scheduling data and remarks, are described in the following TABLE. The current FRD (Ref. 1) was used in compiling this table.

FTOs/FSOs

TABLE 8-1 STS-1 DTOs/FTOs/FSOs

DTO/FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
DTO 101 DTO 102 DTO 103 DTO 104	Ascent Phase Tests SRB Recovery and ET Impact Assessment On-Orbit Phase Tests Entry/Approach and Landing Phase Tests	N/A (ALL)	No crew interaction required except for DFI Recorder configurations
FTO 111-01	Structural Conditioning	NO	Any crew interaction will be a real-time requirement only
FTO 131-01	Window Observation and Reporting	00/10:55 MET 01/06:00 MET	No special attitude maneuvers made to optimize lighting conditions through windows First observation scheduled at first opportunity after post-insertion. Due to lack of time in pre-deorbit timeline, second observation is scheduled on second day
FTO 141-01	Vacuum Inerting	00/00:17 MET	The inerting is terminated just prior to the OMS-2 Burn at 00/00:43 MET. This provides 26 minutes of inerting

FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 141-02	Inerting Verification	00/08:20 MET	
FTO 142-01	Left to Right Crossfeed	00/06:21 MET	OMS-3 Burn
FTO 142-02	Right to Left Crossfeed	00/07:06 MET	OMS-4 Burn
FTO 142-03	Manual OMS Thrust Vector Control	00/07:06 MET	OMS-4 Burn
FTO 142-04	Automatic OMS Thrust Vector Control	00/06:21 MET	OMS-3 Burn
FTO 151-01	Latch Tests	00/01:26 MET	
FTO 151-02	Door Tests	00/01:43 MET	
FTO 151-03	Radiator Unlatch/Deploy	00/02:17 MET	
FTO 151-04	PLBD Cycle Test	01/02:30 MET 01/04:24 MET	Both doors are closed and put into a configuration for gap measurement test. Afterward, both doors are opened about 1 foot for about 2 hours before full door opening. These operations do <u>not</u> follow 12 hrs of PTC or ZLV

FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 151-05	Radiator Stowing/Door Closing	02/02:31 MET	
FTO 161-01	Nominal Noise Level Survey	00/07:15 MET	Only the first four reading locations are performed, with a voice recorder dump to the ground later. The remaining six locations are required only if ground evaluation of the report indicates more readings are required
FTO 161-02	Cyclic Equipment Noise Levels	NO	These acoustic noise readings are to be accomplished at the crew's discretion
FTO 162-01	Whole Gas Samples	00/05:45 MET 00/12:11 MET 01/04:00 MET 01/23:22 MET	Bottle #1 Bottle #2 Bottle #3 Bottle #4
FTO 162-02	Solid Sorbent Sampling	00/05:50 MET 01/04:05 MET 01/23:21 MET	Opened at position 1 Indexed to position 2 Stowed

FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 171-01	Ascent UHF Test	During Ascent	
FTO 171-02	Entry UHF Test	During Entry	No special scheduling required. MCC will verify UHF as part of normal post-blackout A/G voice procedure
FTO 171-03	On-Orbit UHF Test	During Orbit	Accomplished by normal operations while on orbit
FTO 172-01	S-Band PM Performance	<u>Test</u> 1 NO 2 01/04:25 MET 3 NO 4 01/07:23 MET	<u>Test</u> 1 Satisfied during ascent. Only voice quality evaluation required 2 Only voice quality evaluation required 3 Obtained through normal on-orbit operations; voice quality evaluation required 4 Only voice quality evaluation required
FTO 172-02	S-Band FM Performance	<u>Test</u> 1 NO 2 00/01:32 MET	<u>Test</u> 1 Data obtained throughout flight every time OPS Recorder data are dumped
FTO 172-03	S-Band Ranging	NO	No crew interaction required. Data obtained throughout flight

FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 173-01	AFT Station COAS Calibration	00/02:26 MET	COAS calibration is performed at the FWD station
FTO 173-02	AFT Station COAS IMU Alignment Verification	00/11:15 MET	Procedure integrated with that for FTO 173-06. The stars are pre-picked for the test. This does not satisfy the FTO requirement for crew to pick stars at random. COAS calibrations are performed at the FWD station
FTO 173-03	IMU Nominal Alignment and Performance	00/11:00 MET 00/21:35 MET 01/06:14 MET 01/11:30 MET 01/21:52 MET	
FTO 173-04	IMU Accelerometer Calibration	00/09:30 MET	
FTO 173-05	Star Tracker Performance	Test 1 NO 2 NO	Test 1 IMU ALIGN while at 0.4 deg/sec PTC assumed accomplished by data collected by ground during PTC using Star Tracker Auto Track Mode 2 The requirement to perform an alignment as close as possible to the sun but greater than 30 deg away is accomplished by normal operations. No special alignment has been scheduled

FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 173-06	AFT Station COAS Calibration Verification	00/11:15 MET	COAS calibrations are performed at the FWD station
FTO 173-07	Star Tracker Alignment Verification	00/02:43 MET	
FTO 174-01	Manual Rotation Pulse Command Performance	NO	Accomplished by normal operations during COAS calibrations. Both NORMAL and VERNIER JETS are used to position stars for COAS marks. Initial positioning done with NORMAL JETS and final positioning done with VERNIERS
FTO 174-02	Manual Rotation Acceleration Command Performance	01/08:56 MET 01/09:00 MET	
FTO 174-03	Manual RCS Rotation Discrete Rate Command/ Attitude Hold Performance	01/08:52 MET 01/09:06 MET	
FTO 174-04	Automatic RCS Rotational Maneuver Performance	NO	Accomplished by normal automatic attitude maneuvers

FTO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 174-08	Attitude Hold Performance	01/09:20 MET 01/10:05 MET 01/10:35 MET 00/04:00 MET 00/09:43 MET 00/03:25 MET	<u>FTO Test</u> -ZLV,Y-POP: PRCS 2 deg DB 6 deg DB 10 deg DB VRCS 0.1 deg DB 0.5 deg DB 1 deg DB
FTO 174-09	PTC Performance	01/07:40 MET 01/08:10 MET 01/06:22 MET 01/07:09 MET	<u>FTO Test</u> PTC: PRCS 5 deg DB 15 deg DB VRCS 1 deg DB 5 deg DB
FTO 175-01	Remote Camera Operation in Sunlit Conditions	01/06:17 MET	
FTO 175-02	Remote Camera Operation with Artificial Illumination	01/01:00 MET	
FTO 175-03	CCTV System Operation	NO	Satisfied by normal operations
FTO 175-04	Cabin Camera Operation	NO	Partially accomplished in conjunction with performing DSO S191 requirements; VTR data not taken

FTO/FSO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FTO 175-05	Remote Camera Sensitivity to Orbiter Motion	01/08:52 MET	
FTO 176-01	Continuous Text Uplink Test	00/14:45 MET	Test data analyzed post flight
FTO 176-02	Multiple Site Transmit Capability	00/15:25 MET 00/16:00 MET	Test data analyzed post flight
FSO S131-01	IECM Operation	NO	Not scheduled because IECM not in vehicle
FSO S133-01	Prelaunch Test and Ascent ACIP Operation	NO	The ACIP operation prelaunch and during ascent is performed by ground commands
FSO S133-02	ACIP Test and Deactivation	00/00:36 MET	ACIP Test Run to assess sensors after launch environment. Performed by ground CMD, no crew interaction
FSO S133-03	ACIP On-Orbit Test	00/09:36 MET	On-Orbit calibration test run while the IMU Accelerometer Test is performed
FSO S133-04	Aerosurface Drive ACIP Test	00/07:48 MET	ACIP data collected during FSO C/O aerosurface drive operation to determine surface signatures

FSO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FSO S133-05	ACIP Pre-entry Test and Entry Operation	NO	Ground function to load stored program commands for ACIP post deorbit operation
FSO S134-01	Deploy Radiation Dosimeter Pouches	00/03:55 MET	
FSO S134-02	Stow Radiation Dosimeter Pouches	02/01:13 MET	
FSO S135-01	Infrared Imagery of Shuttle	NO	Data taken by C-141 plane during entry
FSO S141-01	Inflight Motion Sickness Data Collection	00/12:50 MET 01/12:50 MET	
FSO S191-01	Initial Payload Bay Door Operation TV	00/01:25 MET (VTR) 00/01:36 MET 00/01:52 MET	Video from the CCTV will be recorded on the VTR for the entire PLBD activities. Live TV will be transmitted to ground through MLX and MAX
FSO S191-02	TV of CDR	00/09:20 MET	

FSO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FSO S191-03	TV of PLT	00/09:20 MET 01/10:49 MET	
FSO S191-04	TV of Cockpit Activities	00/23/58 MET 01/00:16 MET	
FSO S191-05	TV of Aft Flight Deck Activities	00/09:20 MET	
FSO S191-06	TV of Crew Quarters Activities	01/10:49 MET	
FSO S191-07	TV of Activity of Interest	NO	Currently unidentified TV requirements to be identified at a later date
FSO S192-01	Launch Photography	-00/00:00 MET	
FSO S192-02	Photography of the CDR	01/07:17 MET 01/09:00 MET 01/12:25 MET	
FSO S192-03	Photography of the PLT	00/12:05 MET 01/07:17 MET 01/09:00 MET	

FSO NUMBER	TITLE	SCHEDULED (DD/HH:MM)	SCHEDULING REMARKS
FSO S192-04	On-Orbit Photography	01/12:05 MET 01/07:17 MET 01/09:00 MET 01/12:25 MET	
FSO S192-05	Landing Photography	Landing - ~6 min	Both DACs will be activated at the earliest time practical for continuous operation until 30 seconds after touchdown
FSO S193-01	Payload Bay Door Photography	00/01:45 MET	
FSO S193-02	Still Photos of CDR	01/09:08 MET	
FSO S193-03	Still Photos of PLT	01/08:18 MET 01/11:18 MET	
FSO S193-04	Crew Activity Photos	01/08:18 MET 01/09:08 MET 01/11:18 MET	
FSO S193-05	Unscheduled Photography	NO	This photography is accomplished as targets of opportunity

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TABLE 9-1 - ORBITER FUEL CELL PURGES

APPROX MET (DD/HH:MM)	FUEL CELL PURGE	
	NO.	ΔT (HH:MM)
00/03:15	1	
00/12:05	2	8:50
00/21:55	3	9:50
01/06:35	4	8:40
01/12:05	5	5:30
01/22:15	6	10:10
02/04:11	7	5:56

TABLE 9-2 - ORBITER WATER DUMPS (WASTE & SUPPLY)

APPROX MET (DD/HH:MM)	WASTE H2O		SUPPLY H2O	
	NO.	ΔT (HH:MM)	NO.	ΔT (HH:MM)
00/04:30	1			
00/09:45			1	
01/09:23	2	28:53	2	23:38
01/22:20			3	12:57

TABLE 9-3 - CO₂ ABSORBER REPLACEMENT

APPROX MET (DD/HH:MM)	ABSORBER NO.	POSITION A OR B	POSITION A ΔT (HH:MM)	POSITION B ΔT (HH:MM)
* 00/05:45	1 & 2	A & B		
** 00/12:05	3	A	6:20	
01/10:49	4	B		29:04
*** 02/01:09		A & B	37:04	14:20

- * INITIAL INSTALLATION OF BOTH CO₂ ABSORBERS
- ** CO₂ ABSORBER NO 1 IS REWRAPPED AND SAVED FOR CONTINGENCY USAGE
- *** BOTH CO₂ ABSORBERS REMOVED FOR ENTRY AND REWRAPPED FOR CONTINGENCY USAGE

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TABLE 9-4 - TV SCHEDULE

APPROX MET (DD/HH:MM)	SCENE	STDN SITE
00/01:25 - 02:25	PLBD latch tests, door tests and radiator deploy tests during the first PLBD operations	VTR
00/01:36 - 01:42 00/01:52 - 01:56	TV of PLBD opening/closing	MLX MAX
00/09:20 - 09:25	Status report from CDR	GDX
00/23:58 - 00:06 01/00:16 - 00:22	TV of forward flight deck activities during flight control system checkout	MIL MAD
01/01:00 - 01:20	CCTV C/O with Artificial Illumination	VTR
01/01:29 - 01:33 01/01:34 - 01:41	Ground Remote Payload Bay TV Operations	GDX MIL
01/06:17 - 06:35	CCTV C/O with Sunlit Conditions	VTR
01/08:52 - 09:10	CCTV Remote Camera Sensitivity to Orbiter Motion	VTR
01/10:49 - 10:54	TV of PLT replacing CO2 absorber on middeck	HAW
02/01:31 - 01:35 02/01:36 - 01:41	Ground Remote Payload Bay TV Operations	GDS MLX
02/02:32 - 03:03	PLBD closing for Deorbit	VTR

TABLE 9-5 - PHOTOGRAPHY SCHEDULE

APPROX MET (DD/HH:MM)	CAMERA	SCENE
-00/00:00:30	16mm	Launch
00/01:20	70mm	Payload Bay Photography
00/12:05	16mm	Middeck: CO2 Absorber Replacement
01/07:17	16mm	Seat Ingress Activities
01/08:18	35mm	Middeck: Food Warmer Act & Meal Prep
01/09:00	16mm	Out-the-Window Earth Limb with CDR performing RCS FTO Tests
01/09:00	70mm	Out-the-Window Earth Limb
01/09:08	35mm	Flight Deck: Cockpit Operations (RCS FTOs)
01/11:18	35mm	Forward Flight Deck: Auto Maneuver
01/12:25	16mm	Middeck: Personal Hygiene
85 K feet	16mm	Landing

TABLE 9-6 - CRYO MANAGEMENT SCHEDULE

APPROX MET (DD/HH:MM)	O2, H2 TK 1&2 HTR A&B SW POS
00/00:00	O2 TK 1&2 HTR A&B (four) - OFF H2 TK 1&2 HTR A&B (four) - OFF
00/00:05	O2 TK 1&2 HTR B (two) - AUTO H2 TK 1&2 HTR B (two) - AUTO
00/00:15	O2 TK 1&2 HTR A (two) - AUTO H2 TK 1&2 HTR A (two) - AUTO
01/22:00	O2 TK 1&2 HTR B (two) - OFF

TABLE 9-7 - DFI WIDEBAND ASCENT RECORDER USAGE

APPROX MET DD/HH:MM:SS	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (MM:SS)	TAPE REMAINING (MM:SS)	P*
-00/00:05:00	CONT	ON	--	00:00	32:00	
00/00:13:30	STBY	ON	18:30	18:30	13:30	9
00/00:43:50	CONT	ON	--	--	--	
00/00:48:21	STBY	ON	04:31	23:01	8:59	7
00/01:05:00	--	OFF	--	--	--	

* Data Priority based from 10 down to 1 (OI Data is 10)

TABLE 9-8 - DFI WIDEBAND MISSION RECORDER USAGE

APPROX MET DD/HH:MM:SS	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
-00/00:05:00	CONT	ON	--	00:00:00	02:00:00	ASCENT THRU OMS-1 BURN	9
00/00:13:30	STBY	ON	18:30	00:18:30	01:41:30	-----	
00/00:43:50	CONT	ON	--	--	--	OMS 2 BURN	7
00/00:48:21	STBY	ON	04:31	00:23:01	01:36:59	-----	
00/01:05:00	--	OFF	--	--	--	-----	
00/06:05:00	--	ON	--	--	--	-----	
00/06:19:41	CONT	ON	--	--	--	OMS 3 BURN	7
00/06:22:22	STBY	ON	02:41	00:25:42	01:34:18	-----	
00/07:03:31	CONT	ON	--	--	--	OMS 4 BURN	7
00/07:06:13	STBY	ON	02:42	00:28:24	01:31:36	-----	
00/07:25:00	CONT	ON	--	--	--	ACOUSTICAL NOISE MEASUREMENT AT SLEEP STATION	4
00/07:38:00	STBY	ON	13:00	00:41:42	01:18:36	-----	
00/07:47:00	CONT	ON	--	--	--	ACIP AEROSURFACE DRIVE TEST	3
00/07:53:00	STBY	ON	06:00	00:47:24	01:12:36	-----	
00/08:09:00	--	OFF	--	--	--	-----	
00/09:10:00	CONT	ON	--	--	--	CALIBRATION ON LAUNCH DAY	1
00/09:11:00	STBY	ON	01:00	00:48:24	01:11:36	-----	
00/09:33:00	CONT	ON	--	--	--	ACIP ON-ORBIT TEST	2
00/09:38:00	STBY	OFF	05:00	00:53:24	01:06:36	-----	
01/23:32:00	CONT	ON	--	--	--	CALIBRATION ON DEORBIT DAY	5
01/23:33:00	STBY	ON	01:00	00:54:24	01:05:36	-----	
02/05:29:00	CONT	ON	--	--	--	DEORBIT BURN	7
02/05:35:00	STBY	ON	06:00	01:00:24	00:59:36	-----	
02/05:54:14	CONT	ON	--	--	--	ENTRY	8

* Data Priority based from 10 down to 1 (OI Data is 10)

TABLE 9-8 - DFI WIDEBAND MISSION RECORDER USAGE (CONTINUED)

APPROX MET DD/HH:MM:SS	MODE	PWR	Δt USAGE (MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE REMAINING (HH:MM:SS)	REASON	P*
ROLLOUT + ~20:00 (02/06:51:00)	CONT	ON	56:46	01:35:51	00:24:09	POST FLIGHT CALIBRATION	1
ROLLOUT + ~40:00 (02/07:11:00)	**	**	**	**	**	-----	-

* Data Priority based from 10 down to 1 (OI Data is 10)

**RCDR stops when tape runs out or when ground crew stops it after crew egress of Orbiter.

TABLE 9-9 - DFI PCM RECORDER USAGE

APPROX MET DD/HH:MM:SS	MODE	Δt HH:MM:SS	ΔE TAPE * USAGE (HH:MM:SS)	ACCUM USAGE (HH:MM:SS)	TAPE RE- MAINING (HH:MM:SS)	REASON	p***
-00/00:05:00	CONT	--	--	01:04:00	06:26:00	ASCENT THRU OMS-2 BURN	8
00/01:00:00	HI SAMPLE	01:05:00	01:05:00	02:09:00	05:21:00	POST OMS-2, AWAKE MODE OF OPERATION	7
00/06:19:41	CONT	05:19:41	00:11:11	02:20:11	05:09:49	OMS-3 BURN	7
00/06:38:00	HI SAMPLE	00:18:19	00:18:19	02:38:30	04:51:30	POST OMS-3	7
00/07:03:31	CONT	00:25:31	00:00:44	02:39:14	04:50:46	OMS-4 BURN	7
00/07:08:11	HI SAMPLE	00:04:40	00:04:40	02:43:54	04:46:06	POST OMS-4	7
00/07:47:00	CONT	00:38:49	00:01:10	02:45:04	04:44:56	ACIP AEROSURFACE TEST	7
00/08:10:00	HI SAMPLE	00:23:00	00:23:00	03:08:04	04:21:56	POST ACIP TEST	7
00/08:20:00	CONT**	00:10:00	00:00:11	03:08:15	04:21:45	RCS JET/VAC INERT	7
00/08:50:00	HI SAMPLE	00:30:00	00:30:00	03:38:15	03:51:45	POST RCS/VAC INERT	7
00/12:10:00	LO SAMPLE	03:20:00	00:06:58	03:45:13	03:44:47	SLEEP MODE OF OPERATION	7
00/20:52:00	HI SAMPLE	08:42:00	00:09:21	03:54:34	03:35:26	AWAKE MODE OF OPERATION	7
01/08:52:00	CONT	12:00:00	00:25:18	04:19:52	03:10:08	RCS FTOs	7
01/09:10:00	HI SAMPLE	00:18:00	00:18:00	04:37:52	02:52:08	POST RCS FTOs	7
01/12:13:00	LO SAMPLE	03:03:00	00:06:25	04:44:17	02:45:43	SLEEP MODE OF OPERATION	7
01/20:52:00	HI SAMPLE	08:39:00	00:09:10	04:53:27	02:36:33	AWAKE MODE OF OPERATION	7
02/05:27:00	CONT	08:35:00	00:18:09	05:11:36	02:18:24	APU ACTIVATION THRU LANDING	9
02/06:31:00	HI SAMPLE	01:04:00	01:04:00	06:15:36	01:14:24	--	6

* 11 SEC OF TAPE (1 SEC FOR RECORDER RAMP DOWN AFTER DATA TAKE) USED EVERY 5 MIN 11 SEC FOR HI SAMPLE AND EVERY 10 MIN 11 SEC FOR LO SAMPLE

** IF INERTING VERIF IS NOT REQUIRED, GO TO HI SAMPLE AT 00/08:35:00

*** DATA PRIORITY BASED FROM 10 TO 1 (OI DATA IS 10)

TABLE 9-10 - ATTITUDE AND EVENT TIMELINE

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
0/00:08:38	ATT HOLD POST MECO	322.9 187.0 179.5	61.4 48.1 2.9	22.2 344.1 356.5	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	93	1	93	1	333	-28	38	230	
0/00:08:51	ET SEP (4fps, -Z)	322.7 186.6 179.5	62.2 47.1 2.9	21.8 334.0 356.5	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	93	1	93	1	332	-28	39	229	
0/00:08:58	Y SEP (4fps, +Y)	322.6 186.4 179.5	62.6 46.6 2.9	21.5 333.9 356.5	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	93	1	93	1	333	-28	39	229	
0/00:09:34	INITIATE MAN MNVR TO OMS 1 BURN ATT	---	---	---	---	---	3.5	0.3	0.5	*	MAN ACCEL	*	-	-	-	-	-	-	-	-	MNVR TIME = 1.0 MINS EIG ANG = 29.6
0/00:10:20	OMS 1 BURN ATT	319.9 174 180	83.7 14 339	0.3 337 0	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	69	0	69	0	303	-25	61	209	
0/00:10:38	OMS 1 IGNITION/ START MPS DUMP	319.9 174 180	83.7 14 350.1	0.3 337 358.1	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	80	0	80	360	303	-25	60	209	
0/00:12:12	OMS 1 CUTOFF	319.9 174 180	83.7 14 9.1	0.3 337 357.8	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	99	0	99	0	303	-25	60	209	
0/00:13:23	MPS DUMP TERMINATED	319.9 174 180	83.7 14 295.4	0.3 337 357.6	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	25	-2	26	355	303	-25	60	209	
0/00:27:00	INITIATE MAN MNVR TO OMS 2 BURN ATT	---	---	---	---	---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 4.3 MINS EIG ANG = 127.5
0/00:32:00	OMS 2 BURN ATTITUDE	26.9 165 180	218.6 251 299	329.1 181 0	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	29	0	29	0	175	-25	155	280	
0/00:44:00	OMS 2 IGNITION	26.9 165 179.9	218.6 251 347.3	329.1 181 0	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	77	0	77	0	175	-25	155	280	
0/00:45:17	OMS 2 CUTOFF	26.9 165 179.9	218.6 251 352.5	329.1 181 0	INRTL REF LVLH	PFR0 PFR1 PFRA	3.5	0.3	0.5	*	AUTO	*	83	0	83	0	175	-25	155	280	
0/00:57:00	DPS RECONFIG TO GNC 2 DAP DEFAULT VALUES	26.9 165 179.9	218.6 251 43.8	329.1 181 0.03	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	134	0	134	0	175	-24	155	280	
0/01:05:00	INITIATE -ZLV, Y-POP ATTITUDE MODE (PLBD OPENING ATT)	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 15.0 MINS EIG ANG = 179.8
0/01:20:00	-ZLV, Y-POP ATTITUDE (PLBD OPENING ATT)	171.5 336.7 0	160.4 295.8 180	320.6 1.5 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	90	0	90	0	137	25	132	34	P 90 Y 0 OMI 0

* The TRANS DAP interfaces only with the CONTROL pbi's on the DAP panels. AUTO control is coded to be MAN ATT HOLD, DISC RATE, and NORM RCS JETS. MAN control is coded to be MAN FREE DRIFT, PULSE, and NORM RCS JETS.

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P, Y, R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
0/02:22:00	INITIATE AUTO MNVR TO COAS CAL ATT	---	---	---	---	---	1	0.2	0.5	B	AUTO	NORM	-	-	-	-	-	-	-	-	MNVR TIME = 5.8 MINS EIG ANG = 174.7
0/02:28:00	COAS CALIBRATION ATTITUDE	9.6 147 153	213.3 221 24	19.4 336 314	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	112	42	106	44	164	27	149	62	
0/02:28:00	COAS CALIBRATION	9.6 147 153	213.3 221 24	19.4 336 314	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	112	42	106	44	164	27	149	62	+Xby TO STAR 20 AVAIL 0/02:20 TO 0/03:05
0/02:33:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 1.3 MIN EIG ANG = 15.2
0/02:34:00	IMU ALIGNMENT ATTITUDE	12.4 153 165	208.6 235 63	5.0 344 324	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	157	39	136	64	172	13	164	59	-YST TO STAR 51 -ZST TO STAR 33 ANG DIF = 84.0
0/02:43:00	IMU ALIGNMENT, SINGLE IMU ALIGN	12.4 153 164.9	208.6 235 99.2	5.0 344 323.8	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	201	31	143	121	172	13	164	59	STARS 51 & 22 AVAIL 0/02:35 TO 0/02:57
0/02:54:00	INITIATE AUTO MNVR TO IMU ALIGN VERIFICATION ATT	---	---	---	---	---	1	0.2	0.5	B	AUTO	NORM	-	-	-	-	-	-	-	-	MNVR TIME = 2.2 MINS EIG ANG = 66.0
0/02:57:00	IMU ALIGNMENT VERIFICATION ATTITUDE	61.2 188 202	240.6 246 155	317.8 39 19	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	246	12	114	167	185	-45	134	265	-YST TO STAR 26 -ZST TO STAR 14 ANG DIF = 91.4
0/02:57:00	IMU ALIGNMENT, DUAL IMU ALIGN/ALIGNMENT VERIFICATION	61.2 188 202	240.6 246 155	317.8 39 19	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	246	12	114	167	185	-45	134	265	STARS 26 & 14 AVAIL 0/02:37 TO 0/03:22
0/03:25:00	INITIATE -ZLV, Y-POP ATTITUDE MODE	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 12.8 MINS EIG ANG = 153.3
0/03:38:00	-ZLV, Y-POP ATTITUDE (FTO 174-08)	174.3 21.6 0	1.9 100.5 180	39.8 352.2 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	90	0	90	0	333	24	36	135	P 90 Y 0 OMI 0
0/04:00:00	-ZLV, Y-POP ATTITUDE (FTO 174-08)	140 352.1 0	87.2 8.8 180	356.4 338.5 0	INRTL REF LVLH	PFR0 PFR2 PFRA	0.1	0.02	0.2	B	AUTO	VERN	90	0	90	0	62	24	65	27	
0/05:43:00	INITIATE AUTO MNVR TO OMS 3 BURN ATT	---	---	---	---	---	1	0.2	0.5	B	AUTO	NORM	-	-	-	-	-	-	-	-	MNVR TIME = 5.9 MINS EIG ANG = 175.8
0/05:49:00	OMS 3 BURN ATT	329.1 156 177	126.7 324 219	341.9 339 349	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.2	0.5	B	AUTO	NORM	309	-9	52	192	253	-24	105	205	
0/05:57:00	DPS RECONFIG TO GNC 3 TRANS DAP & RELMATS (OMS 3 BURN ATT)	329.1 156 177	126.7 324 251.6	341.9 339 349	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	342	-11	21	213	253	-24	105	205	

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MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (0/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (0/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
0/06:21:41	OMS 3 IGNITION	329.1 156 177.1	126.7 324 351.1	341.9 339 349.0	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	81	1	81	1	253	-24	105	205	
0/06:22:20	OMS 3 CUTOFF	329.1 156 177.1	126.7 324 353.8	341.9 339 349.0	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	84	2	84	2	253	-24	105	205	
0/06:24:00	ATT HOLD	329.1 156 177.1	126.7 324 0.5	341.9 339 349.0	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	90	3	90	3	253	-24	105	205	
0/06:35:00	INITIATE MAN MNVR TO OMS 4 IGNITION ATT	--- --- ---	--- --- ---	--- --- ---	--- --- ---	--- --- ---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 5.6 MINS EIG ANG = 169.3
0/06:41:00	OMS 4 IGNITION ATTITUDE	25.2 205 183	317.0 134 238	22.7 18 11	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	328	11	34	160	63	-22	65	335	
0/07:05:31	OMS 4 IGNITION	25.2 205 183	317.0 134 337	22.7 18 11	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	67	1	67	2	63	-22	65	335	
0/07:06:11	OMS 4 CUTOFF	25.2 205 183	317.0 134 340	22.7 18 11	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	70	1	70	1	63	-22	65	335	
0/07:08:00	DPS RECONFIG TO GNC 2, DAP & RELMAT (OMS 4 ATTITUDE)	25.2 205 183	317.0 134 347	22.7 18 11	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	77	0	77	359	63	-22	65	335	
0/07:17:00	INITIATE AUTO MNVR TO FCS CKOUT ATT	--- --- ---	--- --- ---	--- --- ---	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 7.8 MINS EIG ANG = 93.1
0/07:25:00	FCS CKOUT ATT	295 112 91	312 138 54	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	180	36	144	90	50	57	69	64	
0/07:46:00	APUs ACTIVATED	295 112 91	312 138 138	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	181	-48	132	269	50	57	69	64	
0/07:53:00	APUs DEACTIVATED	295 112 91	312 138 166	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	183	-76	104	269	50	57	69	64	
0/08:00:00	ATTITUDE HOLD	295 112 91	312 138 194	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	358	-76	76	269	50	57	69	64	
0/08:20:00	RCS JET TEST	295 112 91	312 138 274	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	A	MAN PULSE	NORM	0	4	4	89	50	57	69	64	
0/08:35:01	ATTITUDE HOLD	295 112 91	312 138 334	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	1	64	64	89	50	57	69	64	

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MET (D/HH:MM:SS)	EVENT	ATTITUDE (P, Y, R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
0/08:40:00	IMU ALIGN - IMU/IMU	295 112 91	312 138 354	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	7	84	84	89	50	57	69	64	
0/09:32:00	IMU ACCELEROMETER CALIBRATION	295 112 91	312 138 202	33 7 0	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	VERN	358	-68	68	269	50	57	69	64	
0/09:43:00	INITIATE -ZLV, Y-POP ATTITUDE MOD	---	---	---	---	---	0.5	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 9.0 MINS EIG ANG = 108.0
0/09:52:00	-ZLV, Y-POP ATTITUDE	141.7 3 0	65.5 38 180	12.9 338 0	INRTL REF LVLH	PFR0 PFR2 PFRA	0.5	0.02	0.2	B	AUTO	VERN	90	0	90	0	34	24	41	38	P 90 Y 0 OMI 0
0/10:44:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 10.0 MINS EIG ANG = 118.2
0/10:54:00	IMU ALIGNMENT ATTITUDE	253.3 57 79	162 292 326	332.2 351 348	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	356	57	57	93	153	-35	137	303	-YST TO STAR 23 -ZST TO STAR 16 ANG DIF = 82.9
0/11:00:00	IMU ALIGNMENT	253.3 57 79	162 292 350	332.2 351 348	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	319	77	80	99	153	-35	137	303	STARS 16 & 23 AVAIL 0/10:53 TO 0/11:30
0/11:10:00	INITIATE AUTO MNVR TO COAS/IMU ALIGN #1 ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 3.3 MINS EIG ANG = 39.3
0/11:14:00	COAS IMU ALIGN #1 ATT	271.3 58 81	186 290 30	297.2 29 23	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	173	62	118	86	128	-19	126	337	+Xby TO STAR 17
0/11:17:00	COAS VERIFICATION #1 (FTO 173-06)	271.3 58 81	186 290 42	297.2 29 23	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	167	51	128	79	128	-19	126	337	STAR 17 AVAIL 0/11:08 TO 0/11:54
0/11:23:00	COAS IMU ALIGNMENT #1 (FTO 173-02)	271.3 58 81	186 290 66	297.2 29 23	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	161	27	147	57	128	-19	126	337	
0/11:27:00	INITIATE AUTO MNVR TO COAS IMU ALIGN #2 ATT	---	---	---	---	---	1	0.2	0.5	B	AUTO	NORM	-	-	-	-	-	-	-	-	MNVR TIME = 2.8 MINS EIG ANG = 85.0
0/11:30:00	COAS IMU ALIGNMENT #2	284.9 62 67	213.3 221 38	19.4 336 315	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	238	34	116	142	207	16	149	147	+Xby TO STAR 20 STAR 17 & 20 ANG DIF 85.0
0/11:35:00	COAS IMU ALIGNMENT #2 (FTO 173-02)	284.9 62 67	213.3 221 58	19.4 336 315	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	231	15	127	162	207	16	149	147	+Xby TO STAR 20 AVAIL 0/11:19 TO 0/12:04
0/11:36:00	COAS VERIFICATION #2	284.9 62 67	213.3 221 62	19.4 336 315	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	230	11	129	166	207	16	149	147	

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P, Y, R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
0/11:39:00	ATTITUDE HOLD	284.9 62 67	213.3 221 74	19.4 336 315	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	MAN DISC RATE	VERN	227	-1	133	181	207	16	149	147	
0/11:53:00	COAS VERIFICATION #3 (FTO 173-06)	284.9 62 67	213.3 221 130	19.4 336 315	INRTL REF LVH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	204	-54	123	253	207	16	149	147	
0/11:56:00	ATTITUDE HOLD	284.9 62 67	213.3 221 142	19.4 336 315	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	191	-64	116	264	207	16	149	147	
0/12:00:00	INITIATE -ZLV, Y-POP ATTITUDE MODE	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 8.0 MINS EIG ANG = 88.3
0/12:08:00	-ZLV, Y-POP ATTITUDE	219.0 359 0	248.3 214 180	349.7 21 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	90	0	90	0	218	23	137	145	P 90 Y 0 OMI 0
0/21:20:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 14.7 MINS EIG ANG = 176.6
0/21:35:00	IMU ALIGNMENT ATTITUDE	11.3 217 198	358 94 173	18.8 13 21	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	263	15	97	165	25	-12	27	334	-YST TO STAR 16 -ZST TO STAR 23 ANG DIF = 82.9
0/21:35:00	IMU ALIGNMENT	11.3 217 198	358 94 173	18.8 13 21	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	263	15	97	165	25	-12	27	334	STARS 23 & 16 AVAIL 0/21:23 TO 0/22:01
0/21:50:00	INITIATE AUTO MNVR TO RCS 1 BURN ATT	---	---	---	---	---	1	0.2	0.5	B	AUTO	NORM	-	-	-	-	-	-	-	-	
0/21:56:00	RCS 1 BURN ATT	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.2	0.5	B	AUTO	NORM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
0/22:00:00	DPS RECONFIG TO GNC 3 TRANS DAP & RELMAT	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
0/22:20:00	RCS 1 IGNITION	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
0/22:23:00	DPS RECONFIG TO GNC 2 DAP & RELMAT (RCS 1 BURN ATT)	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
0/22:30:00	INITIATE AUTO MNVR TO GRAVITY GRADIENT ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	
0/22:45:00	GRAVITY GRADIENT ATT	298.3 87 105	188.7 276 267	319.7 11 2	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN	VERN	357	-2	4	221	161	-28	147	302	P 357 Y 358 OMI 105

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MAN control is coded to be MAN FREE DRIFT, PULSE, and NORM RCS JETS.

MET (D/HH:MM:SS)	EVENT	ATTITUDE (°)			ADI ATT REF LVLH	REL ID PFR0 PFR2 PFRA	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
1/01:48:00	ATTITUDE HOLD	307.1 89.9 105	252.8 264.7 267	323.5 13.9 2	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	MAN	VERN	357	-2	4	221	160	-17	154	319	
1/01:55:00	INITIATE AUTO MNVR TO RCS 2 BURN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	
1/02:07:00	RCS 2 BURN ATT	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
	DPS RECONFIG TO GNC 3 TRANS DAP & RELMATS (RCS 2 BURN ATT)	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/02:22:00	RCS 2 IGNITION	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/02:25:00	DPS RECONFIG TO GNC 2 DAP & RELMAT (RCS 2 BURN ATT)	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/02:32:00	AUTO MNVR TO POST RCS 2 BURN ATT	---	---	---	---	---	N/A	N/A	N/A	B	AUTO	VERN	-	-	-	-	-	-	-	-	
1/02:47:00	POST RCS 2 BURN ATTITUDE HOLD	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	3.5	0.3	0.5	B	AUTO	VERN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/03:07:00	DPS RECONFIG TO GNC 3 TRANS DAP & RELMAT	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/03:22:00	RCS 3 IGNITION	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/03:25:00	DPS RECONFIG TO GNC 2 DAP ATT HOLD	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	MAN DISC RATE	NORM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/03:30:00	INITIATE AUTO MNVR TO POST RCS 3 BURN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	
1/03:45:00	POST RCS 3 BURN ATTITUDE HOLD	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/04:33:00	INITIATE -ZLV, Y-POP ATT MODE	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	
1/04:41:00	-ZLV, Y-POP ATTITUDE	220.1 2.8 0	254.1 204 180	358.3 18 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	90	0	90	0	226	21	130	152	

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MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
1/06:00:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 13.0 MINS EIG ANG = 154.8
1/06:13:00	IMU ALIGNMENT ATTITUDE	84.6 306 280	355.9 68 73	333.9 52 65	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	246	-7	115	179	40	-25	46	324	-YST TO STAR 13 -ZST TO STAR 38 ANG DIF = 85.2
1/06:15:00	IMU ALIGNMENT	84.6 306 280	355.9 68 81	333.9 52 65	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	245	1	114	184	40	-25	46	324	STARS 13 & 38 AVAIL 1/6:15 TO 1/6:36
1/06:22:00	INITIATE AUTO MNVR TO PTC ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 3.8 MINS EIG ANG = 45.2
1/06:26:00	PTC ATTITUDE	52.8 59 120	315.1 309 286	297.6 77 69	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	298	43	70	133	90	-30	90	330	SUN IN YZby PLANE +Xby TOWARD H
1/06:24:00	INITIATE PTC ROTATION	---	---	---	---	---	1	0.02	0.4	B	AUTO	VERN	-	-	-	-	-	-	-	-	
1/06:24:00	PTC ATTITUDE (FTO 174-09)	52.8 59 120	315.1 309 278	297.6 77 69	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.4	B	AUTO	VERN	296	36	69	141	90	-30	90	330	
1/07:09:00	PTC ATTITUDE (FTO 174-09)	52.8 59 120	315.1 309 98	297.6 77 69	INRTL REF LVLH	PFR0 PFR2 PFRA	5	0.02	0.4	B	AUTO	VERN	116	-36	111	322	90	-30	90	330	
1/07:40:00	PTC ATTITUDE (FTO 174-09)	76.8 83 144	315.1 309 222	297.6 77 69	INRTL REF LVLH	PFR0 PFR2 PFRA	5	0.2	0.4	B	AUTO	NORM	284	4	76	176	90	-54	90	306	
1/08:10:00	PTC ATTITUDE (FTO 174-09)	76.8 83 144	315.1 309 342	297.6 77 69	INRTL REF LVLH	PFR0 PFR2 PFRA	15	0.2	0.4	B	AUTO	NORM	80	53	84	53	90	-54	90	306	
1/08:44:00	INITIATE +XLV, Y-POP ATTITUDE MODE	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 12.0 MINS EIG ANG = 135.3
1/08:56:00	+XLV, Y-POP ATTITUDE	143.3 349 0	96.8 353 270	342.6 346 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.2	0.5	B	AUTO	NORM	0	0	0	0	75	20	76	21	P 0 Y 0 OMI 0
1/08:57:00	MAN ROT DISC RATE TEST, VRCS (FTO 174-03)	144.3 348 0	100.2 349 270	340.2 347 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.1	B	MAN DISC RATE	VERN	0	0	0	0	79	20	80	21	
1/09:01:00	MAN ROT ACCEL TEST, VRCS (FTO 174-02)	144.3 348 0	100.2 349 286	340.2 347 0	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.02	0.2	A	MAN ACCEL	VERN	344	0	16	180	79	20	80	21	
1/09:05:00	MAN ROT ACCEL TEST, PRCS (FTO 174-02)	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.5	A	MAN ACCEL	NORM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P, Y, R EULER SEQ)			ADI ATT ID	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			sw	ATT (deg)		RATE (°/sec)	SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	
1/09:11:00	MAN ROT DISC TEST, PRCS (FTO 174-03)	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.5	A	MAN DISC RATE	NORM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/09:15:00	SELECT VRCS JETS & RCS TEST DAP CLEANUP	N/A	N/A	N/A	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.02	0.2	A	MAN DISC RATE	VERN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	
1/09:20:00	INITIATE -ZLVL, Y-POP ATT MODE	---	---	---	---	---	2	0.2	0.2	B	AUTO	NORM	-	-	-	-	-	-	-	-	
1/09:35:00	-ZLV, Y-POP ATTITUDE (FTO 174-08)	176.9 17 0	349.7 109 180	40.0 356 0	INRTL REF LVLH	PFR0 PFR2 PFRA	2	0.2	0.2	B	AUTO	NORM	90	0	90	0	321	20	43	149	P 90 Y 0 OMI 0
1/10:05:00	-ZLV, Y-POP ATTITUDE (FTO 174-08)	145.0 348 0	101.7 347 180	339.0 347 0	INRTL REF LVLH	PFR0 PFR2 PFRA	6	0.02	0.2	B	AUTO	NORM	90	0	90	0	81	20	82	21	
1/10:35:00	-ZLV, Y-POP ATTITUDE (FTO 174-08)	217.1 355 0	233.9 229 180	343.5 17 0	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	AUTO	NORM	90	0	90	0	201	20	151	134	
1/11:10:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 9.0 MINS EIG ANG = 105.6
1/11:19:00	IMU ALIGNMENT ATTITUDE	246.8 42 29	288.6 174 308	351 43 29	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	314	-1	46	182	256	57	98	123	-YST TO STAR 20 -ZST TO STAR 17 ANG DIF = 85.0
1/11:15:00	IMU ALIGNMENT	246.8 42 29	288.6 174 332	351 43 29	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	295	14	66	165	256	57	98	123	STARS 20 & 17 AVAIL 1/11:19 TO 1/11:55
1/11:33:00	INITIATE AUTO MNVR TO COAS CAL ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 1.6 MINS EIG ANG = 19.6
1/11:40:00	COAS CALIBRATION	246.8 52 37	297.1 156 294	8.7 29 19	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	NORM & VERN	330	1	30	179	277	57	86	123	+Xby TO STAR 22 AVAIL 1/11:33 TO 1/12:20.
1/11:43:00	ATTITUDE HOLD	246.8 52 37	297.1 156 26	8.7 29 19	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	237	41	114	134	277	57	86	123	
1/12:00:00	INITIATE -ZLV, Y-POP	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 8.0 MINS EIG ANG = 88.3
1/12:08:00	-ZLV, Y-POP ATTITUDE	219.3 359 0	243.3 217 180	351.0 17 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	90	0	90	0	213	20	142	146	P 90 Y 0 OMI 0
1/21:36:00	INITIATE AUTO MNVR TO IMU ALIGN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 8.0 MINS EIG ANG = 91.4

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
1/21:44:00	IMU ALIGNMENT ATTITUDE	246.8 42 30	288.6 174 287	351 43 30	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	332	-16	34	209	255	56	98	123	-YST TO STAR 20 -ZST TO STAR 17 ANG DIF = 85.0
1/21:53:00	IMU ALIGNMENT	246.8 42 30	288.6 174 323	351 43 30	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	302	8	59	171	255	56	98	123	STARS 20 & 17 AVAIL 1/21:50 TO 1/22:25
1/22:02:00	RCS JET TEST	246.8 42 30	288.6 174 359	351 43 30	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	A	MAN PULSE	NORM	271	30	89	150	255	56	98	123	
1/22:18:00	INITIATE -ZLV, Y-POP ATT MODE	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 10.0 MINS EIG ANG = 114.1
1/22:28:00	-ZLV, Y-POP ATTITUDE	207.0 349 0	206.1 259 180	329.1 11 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	90	0	90	0	171	18	160	65	P 90 Y 0 OMI 0
1/23:43:00	TERMINATE -ZLV	---	---	---	---	---	1	0.02	0.2	B	MAN DISC RATE	VERN	-	-	-	-	-	-	-	-	
1/23:43:00	ATTITUDE HOLD	162 345 0	132 318 180	323 356 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	MAN DISC RATE	VERN	90	0	90	0	111	18	110	19	
1/23:46:00	ATTITUDE HOLD	162 345 0	132 317 192	323 356 0	INRTL REF LVLH	PFR0 PFR2 PFRA	10	0.2	0.2	A	AUTO	NORM	78	0	78	0	111	18	110	19	
2/00:00:00	FCS CHECKOUT ATTITUDE W/O APUS ON	162 345 0	132 318 248	323 357 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	MAN DISC RATE	VERN	22	-1	22	359	111	18	110	19	
2/00:03:00	RGA & AA SENSORS CHECKOUT	162 345 0	132 318 260	323 357 0	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	VERN	10	0	10	0	111	18	110	19	FREE DRIFT
2/00:13:00	ATTITUDE HOLD	162 345 0	132 318 300	323 357 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	MAN DISC RATE	VERN	330	0	30	181	111	18	110	19	
2/00:34:00	IMU ACCELEROMETER CALIBRATION	162 345 0	132 318 24	323 357 0	INRTL REF LVLH	PFR0 PFR2 PFRA	N/A	N/A	N/A	B	MAN PULSE	VERN	246	0	114	180	111	18	110	19	FREE DRIFT
2/00:41:00	ATTITUDE HOLD	162 345 0	132 318 52	323 357 0	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.2	0.5	B	MAN DISC RATE	NORM	218	0	142	179	111	18	110	19	
2/00:48:00	INITIATE AUTO MNVR TO TAIL TO SUN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 6.1 MINS EIG ANG = 73.3
2/01:03:00	TAIL TO SUN ATT	176 319 328	206 247 71	349 355 342	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	188	-25	154	253	180	0	180	163	

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P,Y,R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
2/02:08:00	INITIATE AUTO MNVR TO TOP TO SUN ATT	---	---	---	---	---	1	0.02	0.2	B	AUTO	VERN	-	-	-	-	-	-	-	-	MNVR TIME = 6.8 MINS EIG ANG = 81.6
2/02:15:00	TOP TO SUN ATT	169 359 15	125 330 121	2 319 326	INRTL REF LVLH	PFR0 PFR2 PFRA	1	0.02	0.2	B	AUTO	VERN	152	-37	135	302	99	0	99	0	
2/02:31:00	DPS RECONFIG TO GNC 3 TRANS DAP	169 359 15	125 330 153	2 319 326	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	115	-29	112	329	99	0	99	0	
2/03:38:00	MAN MNVR TO IMU ALIGN ATT	---	---	---	---	---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 5.0 MINS EIG ANG = 146.0
2/03:53:00	IMU ALIGN ATTITUDE	23 213 229	125 330 121	2 319 326	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	178	45	135	88	259	34	99	146	-YST TO STAR 17 -ZST TO STAR 20 ANG DIF = 85.0
2/03:53:00	IMU ALIGNMENT	23 213 229	125 330 121	2 319 326	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	ATO	*	178	45	135	88	259	34	99	146	STARS 17 & 20 AVAIL 2/03:50 TO 2/04:25
2/03:58:00	INITIATE MAN MNVR TO IMU ALIGN VERIFICATION ATT	---	---	---	---	---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 2.0 MINS EIG ANG = 54.2
2/04:00:00	IMU ALIGNMENT VERIFICATION ATT	349 190 202	104 338 145	318 6 14	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	236	11	124	167	271	5	89	175	-YST TO STAR 33 -ZST TO STAR 19 ANG DIF = 88.8
2/04:04:00	IMU ALIGNMENT VERIFICATION	349 190 202	104 338 161	318 6 14	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	251	17	108	162	271	5	89	175	STARS 33 & 19 AVAIL 2/03:50 TO 2/04:28
2/04:08:00	INITIATE MAN MNVR TO TOP TO SUN ATT	---	---	---	---	---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 5.8 MINS EIG ANG = 175.2
2/04:14:00	TO TO SUN ATT	171 23 30	94 9 237	7 326 339	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	38	-1	38	359	68	0	68	0	
2/05:12:52	INITIATE MAN MNVR TO DEORBIT IGNITION ATT	---	---	---	---	---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 1.14 MINS EIG ANG = 34.2
2/05:15:00	DEORBIT IGNITION ATTITUDE	138 350 357	94 9 121	7 326 339	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	146	-16	143	332	64	31	68	33	
2/05:24:52	ACTIVATE APUs	138 350 357	94 9 161	7 326 339	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	108	-4	108	356	64	31	68	33	
2/05:27:52	DEORBIT BURN IGNITION	138 350 357	94 9 173	7 326 339	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	97	0	97	0	63	31	67	33	

* The TRANS DAP interfaces only with the CONTROL pbi's on the DAP panels. AUTO control is coded to be MAN ATT HOLD, DISC RATE, and NORM RCS JETS. MAN control is coded to be MAN FREE DRIFT, PULSE, and NORM RCS JETS.

MET (D/HH:MM:SS)	EVENT	ATTITUDE (P, Y, R EULER SEQ)			ADI ATT sw	REL ID	DEADBANDS		DISC RATE (°/sec)	DAP			EARTH				SUN				REMARKS
		Roll	Pitch	Yaw			ATT (deg)	RATE (°/sec)		SEL	CONT	RCS	P	Y	θ	φ	P	Y	θ	φ	
		138 350 357	94 9 183	7 326 339			INRTL REF LVLH	PFR0 PFR3 PFRA		3.5	0.3	0.5	*	AUTO	*	87	4	87	4	64	
2/05:30:27	DEORBIT BURN CUTOFF																				
2/05:31:30	INITIATE MAN MNVR TO EI-5 ATTITUDE	---	---	---	---	---	N/A	N/A	N/A	*	MAN	*	-	-	-	-	-	-	-	-	MNVR TIME = 4.5 MINS EIG ANG = 135.2
2/05:36:30	EI-5 ATTITUDE	203 13 0	302 146 342	34 5 0	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	288	0	72	180	282	17	79	162	
2/05:51:02	EI-5	203 13 0	302 146 40	34 5 0	INRTL REF LVLH	PFR0 PFR3 PFRA	3.5	0.3	0.5	*	AUTO	*	230	0	130	180	282	17	79	162	

* The TRANS DAP interfaces only with the CONTROL pbi's on the DAP panels. AUTO control is coded to be MAN ATT HOLD, DISC RATE, and NORM RCS JETS. MAN control is coded to be MAN FREE DRIFT, PULSE, and NORM RCS JETS.

TABLE 9-11 - RELMATS

PFRA

(UNBIASED LVLH)

Xx 1.0	Xy 0.0	Xz 0.0
Yx 0.0	Yy 1.0	Yz 0.0
Zx 0.0	Zy 0.0	Zz 1.0

PFRO

ALL OPS (INRTL)

M50 to ADI MATRIX

Xx 1.0	Xy 0.0	Xz 0.0
Yx 0.0	Yy 0.0	Yz 1.0
Zx 0.0	Zy -1.0	Zz 0.0

PFRI

ASCENT (REF)

M50 to ADI MATRIX

Xx 0.83089421	Xy 0.29880153	Xz 0.46939591
Yx 0.55440529	Yy -0.37265624	Yz -0.74415195
Zx -0.04743042	Zy 0.87854709	Zz -0.47529504

PFRI2

ON-ORBIT (REF)

M50 to ADI MATRIX

Xx 0.10622223	Xy 0.88935917	Xz -0.44469888
Yx 0.47348487	Yy -0.43851067	Yz -0.76388511
Zx -0.87437343	Zy -0.12941661	Zz -0.46767771

PFRI3

ENTRY/AOA (REF)

M50 to ADI MATRIX

Xx -0.84150702	Xy -0.36347091	Xz -0.39969342
Yx 0.52485251	Yy -0.37467199	Yz -0.76429755
Zx 0.12804600	Zy -0.85294184	Zz 0.50605772

TABLE 9-12 - ACIP SCHEDULE

APPROX MET (DD/HH:MM:SS)	EVENT	COMMENTS	P*
-00/00:45:00 -00/00:45:00 -00/00:42:00 -00/00:39:00 -00/00:39:00 -00/00:05:00 +00/00:36:00 +00/00:39:00 +00/00:39:00	P/L RCD SERIAL A ACIP PWR ON ACIP TEST ACIP PWR ON P/L STOP P/L RCD SERIAL A ACIP TEST ACIP OFF P/L STOP	PRELAUNCH AND ASCENT DATA	7
+00/03:30:00	ACIP HTR - ON	CREW ACTION	--
+00/07:27:00 +00/07:27:00 +00/07:54:00 +00/07:57:00 +00/07:57:00	P/L RCD SERIAL A ACIP PWR ON ACIP TEST ACIP OFF P/L STOP	FCS CHECKOUT	8
+00/09:20:00 +00/09:20:00 +00/09:36:00 +00/09:39:00 +00/09:39:00	P/L RCD SERIAL A ACIP PWR ON ACIP TEST ACIP OFF P/L STOP	IMU ACCEL CAL	9
+00/11:05:00 +00/11:05:00 +00/11:57:00 +00/12:00:00 +00/12:00:00	P/L RCD SERIAL A ACIP PWR ON ACIP TEST ACIP OFF P/L STOP	COAS VERIFICATION	5
+01/08:35:00 +01/08:35:00 +01/09:24:00 +01/09:27:00 +01/09:27:00	P/L RCD SERIAL A ACIP PWR ON ACIP TEST ACIP OFF P/L STOP	MANUAL ROTATION DISC RATE/ ACCEL DATA	6
+02/05:41:00 +02/05:41:00 +02/05:44:00 +02/05:47:00 +02/06:33:00 +02/06:36:00 +02/06:36:00	P/L RCD SERIAL A ACIP PWR ON ACIP TEST ACIP PWR ON ACIP TEST ACIP OFF P/L STOP	ENTRY AND POST LANDING DATA	10

*Data Priority based on 10 down to 1 (OI Data is 10)

TABLE 9-13 - BLOCK DATA AND WEATHER DATA GENERATION/UPLINK SCHEDULE

BLOCK DATA						WEATHER DATA					
BLOCK NO./ ORBITS	TOT ORBS	TIME (GET-H:M)			UPLINK SITE	WX DATA TO FDO			TIME (GET-H:M)		UPLINK SITE
		DATA COMPUTED	LOAD GENERATED	LOAD UPLINKED		ORBITS	TOT ORBS	GET DELIVERED	LOAD GENERATED	LOAD UPLINKED	
B-2/5-8	4	0/01:30:00	0/03:15:00	0/04:30:00	HAW	5-8	4	0/01:00:00	0/03:45:00	0/04:40:00	GDS
B-3/9-16	8	0/05:30:00	0/08:45:00	0/09:22:00	GDS	9-16	8	0/05:00:00	0/06:55:00	0/07:25:00	GWM
B-4/17-21	5	0/16:00:00	0/19:00:00	0/20:15:00	ORR	17-21	5	0/15:00:00	0/20:00:00	0/20:45:00	QUI
B-5/22-27	6	0/23:00:00	1/01:00:00	1/01:35:00	MIL	22-27	6	0/22:00:00	1/00:15:00	1/01:30:00	GDS
B-6/28-32	5	1/08:00:00	1/11:30:00	1/12:25:00	HAW	28-32	5	1/07:30:00	1/13:30:00	1/14:28:00	AGO
B-7/33-38	6	1/16:00:00	1/18:45:00	1/19:35:00	MAD	33-38	6	1/15:30:00	1/19:45:00	1/20:50:00	QUI
B-8/39-41	3	1/23:00:00	2/01:00:00	2/01:40:00	MIL	39-41	3	1/22:00:00	2/00:30:00	2/01:30:00	GDS

ABBREVIATIONS/ACRONYMS

(More complete compilations of abbreviations and
acronyms available in documents under Ref. 10 and 11)

ABBREVIATIONS/
ACRONYMS

ABBREVIATIONS/ACRONYMS

AA	ACCELEROMETER ASSEMBLY, ANGULAR ACCELEROMETER
A/A	AIR-TO-AIR
ACCEL	ACCELEROMETER
ACCU	AUDIO CENTER CONTROL UNIT
ACIP	AERODYNAMIC COEFFICIENTS IDENTIFICATION PACKAGE
ACN	ASCENSION ISLAND (STDN SITE)
ADI	ATTITUDE DIRECTIONAL INDICATOR
AGO	SANTIAGO, CHILE (STDN SITE)
ANG	ANGLE
ANT	ANTENNA
AOA	ABORT ONCE AROUND
AOS	ACQUISITION OF SIGNAL
APU	AUXILIARY POWER UNIT
ATO	ABORT TO ORBIT
AUD	AUDIO
AUTO	AUTOMATIC
BDA	BERMUDA ISLAND, BWI (STDN SITE)
BOT	BOTSWANA (STDN SITE)
BRT	BRIGHT
BUC	BUCKHORN, CALIFORNIA (STDN SITE)
CAL	CALIBRATION
CAMR	CAMERA
CCTV	CLOSED CIRCUIT TELEVISION
CCU	CREWMAN COMMUNICATIONS UMBILICAL
CDR	COMMANDER
CNSL	CONSOLE
CNTRLR	CONTROLLER

ABBREVIATIONS/
ACRONYMS

C/O	CHECKOUT
COAS	CREWMAN OPTICAL ALIGNMENT SIGHT
CONT	CONTINUOUS
CRT	CATHODE RAY TUBE
CTR	CENTER
C/W	CAUTION AND WARNING
DAP	DIGITAL AUTO PILOT
DB	DEADBAND
DEU	DISPLAY ELECTRONICS UNIT
DFI	DEVELOPMENT FLIGHT INSTRUMENTATION
DISC	DISCRETE
DKR	DAKAR, SENEGAL (STDN SITE)
DTO	DETAILED TEST OBJECTIVE
ECLS	ENVIRONMENTAL CONTROL LIFE SUPPORT
EDW	EDWARDS AFB, CALIFORNIA (DEORB OPT SITE)
EES	EMERGENCY EJECTION SUITS
EET	ENTRY ELAPSED TIME
EI	ENTRY/INTERFACE
ET	EXTERNAL TANK
FCS	FLIGHT CONTROL SYSTEM
FDF	FLIGHT DATA FILE
FM	FREQUENCY MODULATION
FRD	FLIGHT REQUIREMENTS DOCUMENT
FSO	FUNCTIONAL SUPPLEMENTARY OBJECTIVE
FTO	FUNCTIONAL TEST OBJECTIVE
FXD	FIXED

GDS	GOLDSTONE, CALIFORNIA (STDN SITE, 1ST ANTENNA)
GDX	GOLDSTONE, CALIFORNIA (STDN SITE, 2ND ANTENNA)
GLRSHLD	GLARESHIELD
GMT	GREENWICH MEAN TIME
GNC	GUIDANCE NAVIGATION AND CONTROL
GPC	GENERAL PURPOSE COMPUTER
GWM	GUAM ISLAND, U.S. (STDN SITE)
H2	HYDROGEN
HAW	HAWAII (KAUAI, STDN SITE)
HIC	HICKAM AFB, HAWAII (DEORB OPT SITE)
HTR	HEATER
IECM	INDUCED ENVIRONMENTAL CONTAMINATION MONITOR
IMU	INERTIAL MEASUREMENT UNIT
INRTL	INERTIAL
IOS	INDIAN OCEAN (STDN SITE)
ITS	INTERIM TELEPRINTER SYSTEM
KAD	KADENA AB, RYUKU ISLANDS (DEORB OPT SITE)
KSC	KENNEDY SPACE CENTER, FLORIDA (DEORB OPT SITE)
L	LEFT
LH2	LIQUID HYDROGEN
LON	LONGITUDE
LOS	LOSS-OF-SIGNAL
LOX	LIQUID OXYGEN
LTG	LIGHTING
LVLH	LOCAL VERTICAL LOCAL HORIZONTAL

MAD	MADRID, SPAIN (STDN SITE, 1ST ANTENNA)
MAN	MANUAL
MAX	MADRID, SPAIN (STDN SITE, 2ND ANTENNA)
MECO	MAIN ENGINE CUTOFF
MET	MISSION ELAPSED TIME
MIL	MERRITT ISLAND, FLORIDA (STDN SITE, 1ST ANTENNA)
MLX	MERRITT ISLAND, FLORIDA (STDN SITE, 2ND ANTENNA)
MNVR	MANEUVER
MSN	MISSION
NOR	NORTHROP FLT STRIP, NEW MEXICO (DEORB OPT SITE)
NOZ	NOZZLE
O2	OXYGEN
OBS	OPERATIONAL BIOMED SENSORS
OFI	OPERATIONAL FLIGHT INSTRUMENTATION
OI	OPERATIONAL INSTRUMENTATION
OMS	ORBITAL MANEUVERING SYSTEM
OPR	OPERATOR
OPS	OPERATIONS, OPERATIONAL SEQUENCE
ORB	ORBITER
ORR	ORRORAL VALLEY, AUSTRALIA (STDN SITE)
OVHD	OVERHEAD
PA	POWER AMPLIFIER
PCM	PULSE-CODE MODULATION
PCMMU	PULSE-CODE MODULATION MASTER UNIT
PGM	PROGRAM
PL	PAYLOAD
PLBD	PAYLOAD BAY DOORS
PLT	PILOT

PM	PHASE MODULATION
PMC	PRIVATE MEDICAL COMMUNICATION
PNL	PANEL
POS	POSITION
PRO	PROCEED
PTC	PASSIVE THERMAL CONTROL
PWR	POWER
QTY	QUANTITY
QUI	QUITO, ECUADOR (STDN SITE)
R	RIGHT
RCDR	RECORDER
RCS	REACTION CONTROL SYSTEM
REF	REFERENCE
REFSMAT	REFERENCE STABLE MEMBER MATRIX
RELMAT	RELATIVE MATRIX
RGA	RATE GYRO ASSEMBLY
RJD	REACTION JET DRIVER
ROS	REGULATED OXYGEN SYSTEM
ROT	ROTA, SPAIN (DEORB OPT SITE); ROTATION
RT	ROTATION DISCRETE RATE
SAA	SOUTH ATLANTIC ANOMALY
SAMP	SAMPLE
SEL	SELECT
SEP	SEPARATION
SGLS	SPACE GROUND LINK SYSTEM
SPC	STORED PROGRAM COMMAND
SPKR	SPEAKER

SPLY	SUPPLY
STBY	STANDBY
SV	STATE VECTOR
SYS	SYSTEMS
TB	TALKBACK
TDRS	TRACKING AND DATA RELAY SATELLITE
TGTS	TARGETS
TK	TANK
T/L	TIMELINE
TRKR	TRACKER
TUL	TULA PEAK, NEW MEXICO (STDN SITE)
TV	TELEVISION
UHF	ULTRA HIGH FREQUENCY
VAC	VACUUM
VLV	VALVE
VTR	VIDEO TAPE RECORDER
WCS	WASTE COLLECTION SYSTEM
WMC	WASTE MANAGEMENT COMPARTMENT
XFER	TRANSFER
X-POP	X BODY AXIS PERPENDICULAR TO ORBIT PLANE
YAR	YARAGADEE, AUSTRALIA (STDN SITE)
Y-POP	Y BODY AXIS PERPENDICULAR TO ORBIT PLANE
-ZLV	-Z LOCAL VERTICAL (-Z BODY AXIS TOWARDS EARTH)

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