

Orbit Operations Checklist

**Mission Operations Directorate
Operations Division**

**Generic
October 30, 1987**

NASA

National Aeronautics and
Space Administration

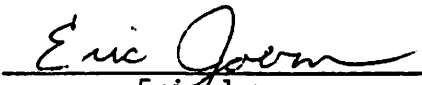
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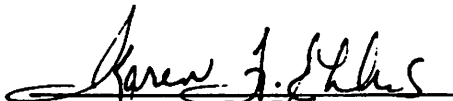
MISSION OPERATIONS DIRECTORATE
ORBIT OPERATIONS CHECKLIST

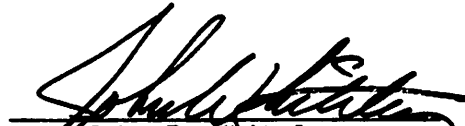
GENERIC
October 30, 1987

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ORB OPS/ALL/GEN

Incorporates the following:

482#:	ORB OPS-273	ORB OPS-300A	ORB OPS-321	FDF-750A
	ORB OPS-275	ORB OPS-301		FDF-753
	ORB OPS-277	ORB OPS-302	FDF-651A	FDF-757
	ORB OPS-279	ORB OPS-303	FDF-657A	FDF-763
	ORB OPS-281	ORB OPS-305	FDF-659C	FDF-768A
	ORB OPS-282	ORB OPS-306	FDF-661B	FDF-777A
	ORB OPS-283A	ORB OPS-307A	FDF-672	FDF-779
	ORB OPS-284A	ORB OPS-308	FDF-678	FDF-789
	ORB OPS-285	P ORB OPS-310	FDF-679	FDF-794
	ORB OPS-286	ORB OPS-311	FDF-685C	FDF-798C
	ORB OPS-287	ORB OPS-312	FDF-691B	
	ORB OPS-288	ORB OPS-313	FDF-693	
	ORB OPS-289	ORB OPS-314	FDF-706	
	ORB OPS-291A	ORB OPS-315	FDF-717A	
	ORB OPS-294A	ORB OPS-316	FDF-740	
	ORB OPS-297	ORB OPS-317	FDF-741B	
	ORB OPS-298A	ORB OPS-319	FDF-742	
	ORB OPS-299	ORB OPS-320	FDF-747	

AREAS OF TECHNICAL RESPONSIBILITY

Book Manager	DH4/E. Joern	483-4373
	DH4/M. Hurt	483-4375

ORBIT OPERATIONS CHECKLIST
ALL VEHICLE

LIST OF EFFECTIVE PAGES

GENERIC 10/30/87

Sign Off...*	ALL/GEN	3-6.....	ALL/GEN
ii.....*	ALL/GEN	4-1.....	ALL/GEN
iii.....*	ALL/GEN	4-2.....⊗	ALL/GEN
iv.....*	ALL/GEN	4-3.....	ALL/GEN
v.....*	ALL/GEN	4-4.....	ALL/GEN
vi.....*	ALL/GEN	4-5.....	ALL/GEN
vii.....	ALL/GEN	4-6.....	ALL/GEN
viii.....	ALL/GEN	4-7.....	ALL/GEN
ix.....	ALL/GEN	4-8.....	ALL/GEN
x.....	ALL/GEN	5-1.....	ALL/GEN
1-1.....	ALL/GEN	5-2.....	ALL/GEN
1-2.....	ALL/GEN	5-3.....	ALL/GEN
1-3.....	ALL/GEN	5-4.....	ALL/GEN
1-4.....	ALL/GEN	5-5.....	ALL/GEN
2-1.....	ALL/GEN	5-6.....	ALL/GEN
2-2.....	ALL/GEN	5-7.....	ALL/GEN
2-3.....	ALL/GEN	5-8.....	ALL/GEN
2-4.....	ALL/GEN	5-9.....	ALL/GEN
2-5.....	ALL/GEN	5-10.....	ALL/GEN
2-6.....	ALL/GEN	5-11.....	ALL/GEN
2-7.....	ALL/GEN	5-12.....	ALL/GEN
2-8.....	ALL/GEN	5-13.....	ALL/GEN
2-9.....	ALL/GEN	5-14.....	ALL/GEN
2-10.....	ALL/GEN	5-15.....	ALL/GEN
2-11.....	ALL/GEN	5-16.....	ALL/GEN
2-12.....	ALL/GEN	5-17.....	ALL/GEN
2-13.....	ALL/GEN	5-18.....	ALL/GEN
2-14.....	ALL/GEN	6-1.....	ALL/GEN
3-1.....	ALL/GEN	6-2.....	ALL/GEN
3-2.....	ALL/GEN	6-3.....	ALL/GEN
3-3.....	ALL/GEN	6-4.....	ALL/GEN
3-4.....	ALL/GEN	6-5.....	ALL/GEN
3-5.....	ALL/GEN	6-6.....	ALL/GEN

(*) - Omit from flight book

(⊗) - Highlights required

6-7.....	ALL/GEN	10-3.....	ALL/GEN
6-8.....	ALL/GEN	10-4.....	ALL/GEN
7-1.....	ALL/GEN	10-5.....	ALL/GEN
7-2.....	ALL/GEN	10-6.....	ALL/GEN
7-3.....	ALL/GEN	10-7.....	ALL/GEN
7-4.....	ALL/GEN	10-8.....	ALL/GEN
7-5.....	ALL/GEN	10-9.....	ALL/GEN
7-6.....	ALL/GEN	10-10.....	ALL/GEN
7-7.....	ALL/GEN	10-11.....⊗	ALL/GEN
7-8.....	ALL/GEN	10-12.....	ALL/GEN
7-9.....	ALL/GEN	10-13.....	ALL/GEN
7-10.....	ALL/GEN	10-14.....	ALL/GEN
7-11.....⊗	ALL/GEN	10-15.....	ALL/GEN
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7-13.....	ALL/GEN	10-17.....	ALL/GEN
7-14.....	ALL/GEN	10-18.....	ALL/GEN
7-15.....	ALL/GEN	10-19.....	ALL/GEN
7-16.....	ALL/GEN	10-20.....	ALL/GEN
7-17.....	ALL/GEN	10-21.....	ALL/GEN
7-18.....	ALL/GEN	10-22.....	ALL/GEN
7-19.....	ALL/GEN	11-1.....	ALL/GEN
7-20.....	ALL/GEN	11-2.....	ALL/GEN
7-21.....	ALL/GEN	11-3.....	ALL/GEN
7-22.....	ALL/GEN	11-4.....	ALL/GEN
7-23.....	ALL/GEN	CC 12-1.....*	ALL/GEN
7-24.....	ALL/GEN	CC 12-2.....*	ALL/GEN
7-25.....	ALL/GEN	CC 12-3.....*	ALL/GEN
7-26.....	ALL/GEN	CC 12-4.....*	ALL/GEN
7-27.....	ALL/GEN		
7-28.....	ALL/GEN		
8-1.....	ALL/GEN		
8-2.....	ALL/GEN		
9-1.....	ALL/GEN		
9-2.....	ALL/GEN		
9-3.....⊗	ALL/GEN		
9-4.....	ALL/GEN		
9-5.....	ALL/GEN		
9-6.....	ALL/GEN		
9-7.....	ALL/GEN		
9-8.....	ALL/GEN		
10-1.....	ALL/GEN		
10-2.....	ALL/GEN		

(*) - Omit from flight book

(⊗) - Highlights required

ORB OPS/ALL/GEN

(*) - Omit from flight book

SM CHECKPOINT INITIATE

ORB OPS-1a/O/A	CC 12-1*	(Front).....
ORB OPS-2a/O/A	CC 12-3*	FUEL CELL PURGE (Front).....
ORB OPS-2b/O/A	CC 12-4*	FUEL CELL AMPS (Back).....

ORBIT CUE CARDS

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CONTENTS

PAGE

1	<u>APU/HYDRAULICS</u>	1-1
	HYD THERM COND - ENA.....	1-2
	HYD THERM COND - TERM.....	1-3
	HYD ISOL VALVE REPOSITIONING.....	1-4
	MANUAL CIRC PUMP 2 OPS.....	1-4
2	<u>COMM/INST</u>	2-1
	RCD DATA ONLY (SLEEP).....	2-2
	RCD DATA AND VOICE (POST-SLEEP).....	2-2
	PS STATUS REPORT RECORDER CONFIG.....	2-3
	KU-BD ACTIVATION.....	2-4
	KU-BD ANT CABLE POSITIONING.....	2-5
	KU-BD ANT STOW.....	2-6
	KU-BD MANUAL ACQUISITION (COMM).....	2-7
	KU-BD ANT JETTISON.....	2-8
	KU-BD ANT DEPLOY.....	2-10
	STD S-BD/KU-BD PNL CONFIG.....	2-11
	PRE-SLEEP AUD CONFIG.....	2-12
	POST-SLEEP AUD CONFIG.....	2-14
3	<u>CREW SYSTEMS</u>	3-1
	PRE-SLEEP ACTIVITY.....	3-2
	POST-SLEEP ACTIVITY.....	3-4
4	<u>DPS</u>	4-1
	SINGLE G2 GPC OPS.....	4-2
	DUAL G2 GPC OPS.....	4-3
	G2 TO G8 TRANSITION.....	4-4
	G8 TO G2 TRANSITION.....	4-5
	SM OPS TRANSITION.....	4-6
	SM CHECKPOINT INITIATE.....	4-7

	<u>CONTENTS</u>	<u>PAGE</u>
5	<u>ECLS</u>	5-1
	SUPPLY WATER DUMP.....	5-2
	WASTE WATER DUMP.....	5-4
	CABIN TEMP CONTROL.....	5-7
	ECLSS REDUNDANT COMPONENT C/O.....	5-8
	RAD BYPASS/FES C/O.....	5-10
	RAD STOW/DEPLOY.....	5-11
	RAD DEPLOY/STOW SINGLE MOTOR OPS.....	5-13
	CRYO O2 TK HTR SNSR CK.....	5-15
	PCS 1(2) CONFIG.....	5-16
	TOPPING FES DEACTIVATION.....	5-16
	TOPPING FES STARTUP.....	5-17
6	<u>EPS</u>	6-1
	LAMP & FIRE SUPPR TEST.....	6-2
	HEATER RECONFIG.....	6-6
	FUEL CELL PURGE - AUTO.....	6-7
	FUEL CELL PURGE - MANUAL.....	6-8
7	<u>GNC</u>	7-1
	IMU ALIGN - S TRK.....	7-2
	IMU ALIGN - ROTATION S TRK:	
	ROLL(PITCH,YAW).....	7-4
	IMU ALIGNMENT - IMU/IMU.....	7-6
	S TRK SELF-TEST.....	7-7
	COAS CALIBRATION.....	7-8
	FCS CHECKOUT.....	7-10
	AFT CONTROLLER C/O.....	7-27
	OMICRON SPECIFICATION.....	7-28
8	<u>MPS</u>	8-1
	MPS INERT.....	8-2
9	<u>OMS</u>	9-1
	ON-ORBIT OMS BURN.....	9-2

CONTENTS

PAGE

10	<u>RCS</u>	10-1
	RCS HOT FIRE TEST.....	10-2
	GG FREE DRIFT.....	10-6
	0.4 DEG/SEC PTC.....	10-8
	ON-ORBIT RCS BURN.....	10-9
	LOSS OF VERNIERS.....	10-21
	RECOVERY OF VERNIERS.....	10-21
11	<u>SEP MANEUVER</u>	11-1
	SEP MANEUVER.....	11-2
12	<u>CUE CARD CONFIGURATION</u>	12-1

APU/HYDRAULICS

APU/HYD

HYD THERM COND - ENA..... 1-2
HYD THERM COND - TERM..... 1-3
HYD ISOL VALVE REPOSITIONING..... 1-4
MANUAL CIRC PUMP 2 OPS..... 1-4

HYD THERM COND - TERM

SM 87 HYD THERMAL

CAUTION

If CIRC PUMP P (HYD PRESS)
< 100 psia 30 sec after pump
on: Turn CIRC PUMP - OFF

- R2 HYD CIRC PUMP 1,2,3 - OFF
HYD CIRC PUMP 2 - ON
Wait 10 sec
- R4 HYD LG HYD ISOL VLV 2 - CL
Hold 5 sec, √tb - CL
- A12 √HYD CIRC PUMP PWR 1 - MNA
2 - MNB
3 - MNC (MNA if SPACELAB)
- R2 HYD CIRC PUMP 2 - OFF
HYD CIRC PUMP 3 - ON
Wait 10 sec
- R4 HYD LG HYD ISOL VLV 3 - CL
Hold 5 sec, √tb - CL
- R2 HYD CIRC PUMP 3 - OFF

HYD ISOL VALVE REPOSITIONING

SM 87 HYD THERMAL

NOTE

HYD LG ISOL VLV 1 should
not be opened on-orbit

CAUTION

If CIRC PUMP P (HYD PRESS)
< 100 psia 30 sec after pump
on: Turn CIRC PUMP - OFF

- R2 HYD CIRC PUMP X - ON
Wait 10 sec
- R4 HYD LG HYD ISOL VLV X - OP(CL)
Hold 5 sec, √tb - OP(CL)
or
HYD MPS/TVC ISOL VLV X - OP(CL)
Hold 5 sec, √tb - OP(CL)
- R2 HYD CIRC PUMP X - OFF

MANUAL CIRC PUMP 2 OPS

- R1 MN BUS TIE A - ON
B - OFF
- R2 HYD CIRC PUMP 2 - ON
Wait 30 min then,
- R2 HYD CIRC PUMP 2 - OFF
- R1 MN BUS TIE B - ON
A - OFF

COMM/INST

RCD DATA ONLY (SLEEP)..... 2-2
RCD DATA AND VOICE (POST-SLEEP)..... 2-2
PS STATUS REPORT RECORDER CONFIG..... 2-3
KU-BD ACTIVATION..... 2-4
KU-BD ANT CABLE POSITIONING..... 2-5
KU-BD ANT STOW..... 2-6
KU-BD MANUAL ACQUISITION (COMM)..... 2-7
KU-BD ANT JETTISON..... 2-8
KU-BD ANT DEPLOY..... 2-10
STD S-BD/KU-BD PNL CONFIG..... 2-11
PRE-SLEEP AUD CONFIG..... 2-12
POST-SLEEP AUD CONFIG..... 2-14

COMM/
INST

RTC (OPS RCDR 1(2) RCD SERIAL 192)

ITEM 13 +A 0 8 9 F F F F EXEC
(A08A FFFF)

CMD - ITEM 14 EXEC

ITEM 13 +A 8 8 9 8 0 1 0 EXEC
(A88A 8010)

CMD - ITEM 14 EXEC

SM 76 COMM/RCDR

✓NSP RCDR INPUT - D/VO
✓OPS RCDRS 1(2) MODE - RCD A
✓TAPE - RUN

PS STATUS REPORT RECORDER CONFIG

A1R ✓AUD CTR VOICE RCD SEL CH 1 - ICOM A
✓CH 2 - ICOM B

SM 76 COMM/RCDR

✓NSP RCDR INPUT - D/VO
✓OPS RCDRS 1(2) MODE - RCD A
✓TAPE - RUN
✓ATU ICOM A(B) - T/R

RECORD:

OPS RCDR ___ TRK ___ % TAPE ___ MET ___ start
___ TRK ___ % TAPE ___ MET ___ stop

Monitor % tape - do not RCD when less than
5% or greater than 95%

If no RCDR is running or if not in D/VO,
perform RCD DATA AND VOICE (POST SLEEP)

A1U If operating in COMM mode:
 | KU MODE - COMM
 | KU - GPC DESIG
 | CNTL - CMD >>
 | or
 CRT If operating in RADAR mode:
 | GNC 33 REL NAV
 | KU ANT ENA - ITEM 2 EXEC (*)

KU-BD ANT CABLE POSITIONING

NOTE

If TDRS AOS coordinate
this procedure with MCC

A1U KU CNTL - PNL
 KU - MAN SLEW
 SLEW RATE - FAST

 A2 DIGI-DIS SEL - EL/AZ

 A1U SLEW ELEV - as reqd:
 A2 RANGE/ELEVATION - 0($\pm 5^\circ$)

 A1U SLEW AZM - as reqd:
 A2 RANGE RATE/AZM - 0($\pm 5^\circ$)

 A1U SLEW ELEV - UP (hold for 14 sec)

 If not stowing antenna,
 SLEW RATE - SLOW
 KU CNTL - CMD

KU-BD ANT STOW

C3 DAP - VERN (FREE DRIFT if in NORM)
R13L ✓PL BAY MECH PWR SYS 1,2 (two) - OFF
A1U ✓KU PWR - ON
- MAN SLEW
MODE - RDR PASSIVE
CNTL - PNL

A2 ✓DIGI-DIS SEL - EL/AZ

A1U Perform KU-BD ANT CABLE POSITIONING then:
SLEW RATE - as reqd

A2 SLEW ELEV - as reqd:
RANGE/ELEVATION - $-27.0(\pm 1^\circ)$

A1U SLEW AZM - as reqd:
A2 RANGE RATE/AZM - $-123.0(\pm 1^\circ)$

R13L KU ANT - STO
Wait 50 sec

A2 ✓RANGE/ELEVATION - $-29.0(\pm 1^\circ)$
✓RANGE RATE/AZM - $-125.0(\pm 1^\circ)$

If angles incorrect,
Go to MAL, MECH, 9.5b

R13L PL BAY MECH PWR SYS (two) - ON

A1U When KU ANT tb - STO (~23-46 sec),
R13L KU PWR - OFF
KU ANT - GND

If no STO, Go to MAL, MECH, 9.5b >>

PL BAY MECH PWR SYS (two) - OFF

KU-BD MANUAL ACQUISITION (COMM)

1 SETUP

A2 ✓DIGI-DIS SEL - EL/AZ
A1U KU - AUTO TRACK
 ✓PWR - ON
 MODE - COMM
 ✓SIG PROC HDR - TV
 ✓LDR - OPS RCDR
 CNTL - PNL
 ✓SIG STRENGTH sel - KU
 SLEW RATE - as reqd
 ✓KU SCAN WARN tb - bp
 ✓TRACK tb - bp
 ✓SEARCH tb - bp

2 ANTENNA STEERING

NOTE

ANT will not LOCK/TRACK
when slewing in FAST RATE

CRT

SM ANTENNA

A1U,CRT,
A2 Use SLEW AZM and SLEW ELEV sw as required
 to position LOS pointer (□) over target
 | on CRT
 | or
 | until ANT EL, AZ angles on pnl A2 are
 | within 5° of ANT EL, AZ CMD angles on CRT

A1U KU SEARCH - SEARCH
 ✓tb - gray
 When SIG STRENGTH > 1.0 and
 KU TRACK tb - gray (< 3 min),
 ✓KU SCAN WARN tb - bp
 ✓SEARCH tb - bp

* If no track in 3 min, *
* Repeat step 2 once *
* If still no track, contact MCC *

KU CNTL - CMD

KU-BD ANT JETTISON

NOTE

Jettison between sunrise
and noon if possible

AUTO MNVR TO -XLV

CRT

GNC UNIV PTG

✓START TIME at least 15 min prior to
sunrise

✓TGT ID +2

BODY VECT +2

OM +0

START TRK - ITEM 19 EXEC (CUR *)

A6U

DAP: A/AUTO/VERN

CONFIGURE KU FOR JETTISON

A1U

✓KU PWR - OFF

CNTL - PNL

R15

cb MNB KU ELEC - op

ANT HTR - op

CABLE HTR - op

MNC KU SIG PROC - op

A14

✓ANT ARM - SAFE

✓JETT - SAFE

MA73C:A

MCA LOGIC MNC MID 2 - OFF

:B

MNB MID 4 - OFF

ML86B:D

cb MNA PYRO JETT SYS A KU ANT - c1

cb MNC PYRO JETT SYS B KU ANT - c1

CONFIGURE CCTVs TO MONITOR JETTISON

Perform TV ACT, VTR ACT, TV/VTR Cue Card

CCTV MON 1 - A

2 - B

Point CCTVs as reqd

Put new tape in VTR

A7U

✓Lighting - as reqd

A6U

FLT CNTLR PWR - ON

✓In jettison att
DAP ROT: DISC/DISC/DISC
TRANS: PULSE/PULSE/NORM

If VERN jets avail
| DAP: A1/MAN/VERN
If VERN jets not avail
DAP: B1/MAN/NORM

Wait until rates damped, then
DAP: A/MAN/NORM
DAP ROT: PULSE/PULSE/PULSE
✓SENSE - as reqd
VTR - PLAY/RCD/RUN

NOTE

After JETT, initiate opening rate ASAP. Minimize other THC/RHC inputs

A14

PYRO KU ANT ARM - ARM

Wait 1 sec, then
PYRO KU ANT JETT - JETT

WHEN JETTISON COMPLETE, TRANSLATE AWAY

THC +Z, 2 sec (1 ft/sec)
(-X sense: THC dn)
(-Z sense: THC out)
DAP ROT: DISC/DISC/DISC

WHEN >100' AWAY, SECOND SEP BURN

SENSE - as reqd
THC +Z, 2 sec (1 ft/sec)
(-X sense: THC dn)
(-Z sense: THC out)

Maintain visual contact with KU ANT in
OVHD window using RHC

When KU ANT no longer visible, then

CLEANUP

R11 VTR pb - STOP

GNC UNIV PTG

✓TGT ID +2
BODY VECT +3
✓OM +0
START TRK - ITEM 19 EXEC (CUR *)

A6U DAP: A1/AUTO/VERN
FLT CNTLR PWR - OFF

A7U ✓Lighting - as reqd

A14 PYRO KU ANT JETT - SAFE
ARM - SAFE

ML86B:D cb MNA PYRO JETT SYS A KU ANT - op
cb MNC PYRO JETT SYS B KU ANT - op
MA73C:A MCA LOGIC MNC MID 2 - ON
:B MNB MID 4 - ON

KU-BD ANT DEPLOY

R13L PL BAY MECH PWR SYS (two) - ON
KU ANT - DPY

When KU ANT tb - DPY (~23-46 sec),
KU ANT - GND

If no DPY, Go to MAL, MECH, 9.5a

PL BAY MECH PWR SYS (two) - OFF

STD S-BD/KU-BD PNL CONFIG

		IF STDN(SGLS) <u>S-BD</u>	IF TDRS <u>S-BD</u>	IF TDRS <u>KU-BD*</u>	
A1L	NSP DATA RATE XMIT	- HI	HI	HI	
	RCV	- LO(HI)	LO	HI	
	UPLK DATA	- S-BD	S-BD	KU	
	CODING XMIT	- OFF	ON	OFF	
	RCV	- OFF	ON	OFF	
	S-BD PM MODE	- STDN HI (SGLS)	TDRS DATA	--	
C3	S-BD PM CNTL	- PNL, CMD	PNL, CMD	PNL, CMD	

*NOTE: Perform KU-BD MANUAL ACQUISITION
if reqd

PRE-SLEEP AUD CONFIG

TPNTR config (if reqd):

✓XX AUD PWR - AUD
A/G 2 - T/R, tw - 9
All other LOOPS - OFF
XX AUD XMIT/ICOM MODE - PTT/PTT

✓TPNTR AUD Cable conn to XX CCU outlet
✓TPNTR PWR Cable conn to XX DC UTIL PWR &
PWR - ON
All other AUD PNLs config for A/G 2 - OFF

A1R

AUD CTR VOICE RCD SEL CH 1,2 - OFF

103/104

R10

MS AUD PWR - AUD/TONE
A/G 1 - T/R
A/G 2 - OFF
A/A - T/R
ICOM A,B (two) - OFF
VOL tw's - R
XMIT/ICOM MODE - PTT/PTT

102

A13

OS AUD PWR - AUD/TONE
A/G 1 - T/R
A/G 2 - OFF
A/A - T/R
ICOM A,B (two) - OFF
VOL tw's - R
XMIT/ICOM MODE - PTT/PTT

ALL

SPKR PWR - SPKR/MIC
MSTR SPKR VOL - R

06

UHF MODE - as reqd

All WCCUs LEG UNIT - OFF
AUD PNL PWR - OFF

CREW SYSTEMS

PRE-SLEEP ACTIVITY..... 3-2

POST-SLEEP ACTIVITY..... 3-4

CREW
SYS

PRE-SLEEP ACTIVITY

FLIGHT DECK ACTIVITY LIST

- 1 IMU ALIGNMENT:
Mnvr to IMU Align Att as scheduled per CAP
Perform GNC, IMU ALIGN - S TRK, then:
Return to CAP ATT

NOTE

Do not perform fuel cell purge or
water dumps during IMU alignment

CREW
SYS

- 2 EPS, FUEL CELL PURGE - AUTO
ECLS, SUPPLY WATER DUMP
- CRT 3 ✓CRT MAJ FUNC - one SM, one GNC
- 4 CRT TIMER FOR WAKE UP
- 5 ALERT TONE DURATION
- L1 6 If OV104, CAB TEMP - adj rotary
as reqd
- 7 POWERDOWN:
 - C2 CRTs (one GNC - OFF, one SM - OFF)
 - C3 BFC CRT DIS - ON
SEL - CRT X
 - C2 CRT X - STBY
- ✓PWR OFF:
 - TV MON
 - TV CAMERAS
 - TV PWR CONTR UNIT
 - TV PWR
 - VTR
 - PLB LIGHTS
 - DDUs (one ON, if reqd)
- 8 COMM/INST, KU-BD ANT CABLE POSITIONING
- 9 WINDOW SHADES/FILTERS
- 10 LIGHTING
- 014:F, 11 Primary RJD DRIVER (eight) - OFF
015:F,
016:F
- A7L 12 MADS STRAIN GAGE - PCM ENA

MIDDECK ACTIVITY LIST

- 1 FOOD PREP/POST (Cue Card)
- 2 CO2 ABSORBER REPLACEMENT (Cue Card)
- 3 HOUSEKEEPING
- 4 WCS CLEANING (Cue Card, URINE COLLECTION)
- 5 SET UP EQUIPMENT FOR NEXT DAY'S ACTIVITIES
- MD44F 6 If OV102 or OV103, CAB TEMP CNTL (FULL HEAT
or as reqd)
- 7 ✓PWR OFF:
 FOOD WARMER (Non-Galley flights)
 TV PWR
- 8 MISSION NOTES
- 9 COMM/INST, PRE-SLEEP AUD CONFIG
- 10 LIGHTING

POST-SLEEP ACTIVITY

MIDDECK ACTIVITY LIST

- 1 LIGHTING
- 2 CO2 ABSORBER REPLACEMENT (Cue Card)
- 3 MESSAGE REVIEW
- 4 COMM/INST, POST-SLEEP AUD CONFIG
- MD44F 5 If OV102 or OV103, CAB TEMP CNTL
(FULL COOL or as reqd)
- M032M 6 If FD2:
✓LEH 02 5 vlv - CL
Insert 02 Bleed Orifice Assembly into
LEH 02 5 QD
LEH 02 5 vlv - OP
- C7 ✓LEH 02 SPLY 1,2 vlvs - OP
- M032M If Entry day:
LEH 02 5 vlv - CL
Remove and stow 02 Bleed Orifice
LEH 02 5 vlv - R
- 7 FOOD PREP/POST (Cue Card)
- 8 HOUSEKEEPING

FLIGHT DECK ACTIVITY LIST

- 1 LIGHTING
- 2 WINDOW SHADES/FILTERS
- 3 COMM/INST, KU-BD ANT CABLE POSITIONING
- 4 CRTs (three) - ON
- C3 5 BFC CRT DIS - OFF
- 6 ALERT TONE DURATION
- L1 7 If OV104, CAB TEMP - adj rotary as reqd
- 8 If planned: Perform I'CONNECT L(R) OMS to
RCS, (ORB PKT, RCS)
- 014:F, 9 Primary RJD DRIVER (eight) - ON
015:F,
016:F
- 10 IMU ALIGNMENT:
Mnvr to IMU Align Att as scheduled per CAP
Perform GNC, IMU ALIGN - S TRK, then:
Return to CAP ATT

NOTE

Do not perform fuel cell purge or
water dumps during IMU Alignment

- 11 EPS, FUEL CELL PURGE - AUTO
ECLS, SUPPLY WATER DUMP
- 12 ECLS, CRYO O2 TK HTR SNSR CK
- A7L 13 MADS STRAIN GAGE - ON

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DPS

SINGLE G2 GPC OPS..... 4-2
DUAL G2 GPC OPS..... 4-3
G2 TO G8 TRANSITION..... 4-4
G8 TO G2 TRANSITION..... 4-5
SM OPS TRANSITION..... 4-6
SM CHECKPOINT INITIATE..... 4-7 |

DPS

SINGLE G2 GPC OPS

CRT 1 FORM SINGLE G2 GPC SET
If MM202: GNC, OPS 201 PRO

GNC 0 GPC MEMORY

CRT CONFIG - ITEM 1 +2 EXEC
Assign MC 2 per table →
√DOWNLIST GPC, ITEM 44 - 1
GNC, OPS 201 PRO

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

2 FREEZE DRY GPC 2 (G2 FD)

06 GPC MODE 2 - STBY (tb-bp),
then HALT
PWR 2 - OFF

3 CONFIGURE DAP FOR VRCS

016:F √RJD L5/F5/R5 DRIVER - ON
C3 DAP: A/AUTO/VERN

4 CONFIGURE STAR TRACKERS

GNC 22 S TRK/COAS CNTL

S TRK -Y, -Z: STAR TRK - ITEM 3,4 EXEC (*)

GNC 21 IMU ALIGN

RESUME

5 CLEAR SOFTWARE FAIL VOTES

ON MCC GO ..

GNC 0 GPC MEMORY

ITEM 48 EXEC

SM 0 GPC MEMORY

ITEM 48 EXEC

DPS

DUAL G2 GPC OPS

1 CONFIGURE G2 FD GPC FOR SET EXPANSION

✓AV BAY 2 FAN A(B) - ON

06

✓GPC MODE 2 - HALT
 ✓OUTPUT 2 - NORM
 PWR 2 - ON
 MODE 2 - STBY (tb-RUN), then RUN

2 FORM DUAL G2 GPC SET

If MM202: GNC, OPS 201 PRO

GNC 0 GPC MEMORY

CRT

CONFIG - ITEM 1 +2 EXEC

Assign MC 2 per table →

GNC, OPS 201 PRO

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

3 CONFIGURE STAR TRACKERS

GNC 22 S TRK/COAS CNTL

S TRK -Y, -Z: STAR TRK - ITEM 3,4 EXEC (*)

GNC 21 IMU ALIGN

RESUME

G2 TO G8 TRANSITION

SM 62 PCMMU/PL COMM

If FORMAT ID not 103/161, then
 LOAD PCMMU FORMAT (FLT SUPPL, COMM/INST)
 FORMAT ID: 103/161

GNC 0 GPC MEMORY

CONFIG - ITEM 1 +8 EXEC
 Modify MC 8 per MC 8 CONFIG TABLE

If 2 GNC GPCs

MC 8 CONFIG TABLE		
CONFIG GPC	8 12000	
STR 1	1	1
2	2	2
3	1	1
4	2	2
PL 1/2	0	
CRT 1	1	1
2	2	2
3	0	0
4	2	2
L 1	0	0
2	0	0
MM 1	1	1
2	2	2

If 1 GNC GPC

MC 8 CONFIG TABLE		
CONFIG GPC	8 10000	
STR 1	1	1
2	1	1
3	1	1
4	1	1
PL 1/2	0	
CRT 1	1	1
2	1	1
3	0	0
4	1	1
L 1	0	0
2	0	0
MM 1	1	1
2	1	1

..... IF RNDZ NAV ENABLED AND
TRACKING A TARGET
 C3 DAP ROT: PULSE/PULSE/PULSE
 DAP: A/MAN/VERN
 CRT **UNIV PTG**
 CNCL - ITEM 21 EEC

GNC, OPS 801 PRO

G8 TO G2 TRANSITION

SM 62 PCMMU/PL COMM

If FORMAT ID 103/161 not appropriate,
load desired PCMMU FORMAT (FLT SUPPL,
COMM/INST)

GNC 0 GPC MEMORY

CRT

CONFIG - ITEM 1 +2 EXEC
Modify MC 2 per MC 2 CONFIG TABLE

If 2 GNC GPCs

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

If 1 GNC GPCs

MC 2		
CONFIG	TABLE	
GPC	2	
	10000	
STR	1	1
	2	1
	3	1
	4	1
PL	1/2	0
CRT	1	1
	2	1
	3	0
	4	1
L	1	0
	2	0
MM	1	1
	2	1

GNC, OPS 201 PRO

..... IF RESUMING RNDZ NAV TRACKING ...
Following MCC Uplink of TGT SV,
GNC 33 REL NAV
RNDZ NAV ENA - ITEM 1 EXEC (*)
GNC UNIV PTG
TRK - ITEM 19 EXEC (cur - *)
DAP: B/AUTO/VERN, NORM as reqd
ROT: DISC/DISC/DISC

GNC 22 S TRK/COAS CNTL

S TRK -Y,-Z: STAR TRK - ITEM 3,4 EXEC (*)

GNC 21 IMU ALIGN

RESUME

SM OPS TRANSITION

- 1 If required,
Perform SM Checkpoint Initiate

GNC 1 DPS UTILITY

√CKPT RETRV ENA - ITEM 12 (*)

- 2 Perform PL SAFING (PL SYS, PL MALFUNCTIONS)
(SL MAL, CDMS SSR-11)

- 3 If required,
LOAD PCMMU FORMAT (FLT SUPPL, COMM/INST)

- 4 If S2 to S4

CONFIG	5	
GPC	00040	
STR	1	0
	2	0
	3	0
	4	0
PL 1/2	4	
CRT	1	4
	2	4
	3	0
	4	4
L	1	4
	2	0
MM	1	4
	2	4

SM, OPS 401 PRO

- If S4 to S2

CONFIG	4	
GPC	00040	
STR	1	0
	2	0
	3	0
	4	0
PL 1/2	4	
CRT	1	4
	2	4
	3	0
	4	4
L	1	4
	2	0
MM	1	4
	2	4

SM, OPS 201 PRO

- 5 √ **X: SM ANTENNA**

XX: 1 DPS UTILITY

UL CNTL AUTO - ITEM 35 EXEC (*)

- 6 If RMS onboard and MCIU pwr'd, turn on
MCIU I/O and cancel safing

SM 94 PDRS CONTROL (MA, C/W GPC DATA 1t-on)

Item 5 EXEC (*)

SAFING - CANCEL (tb-bp)

√C/W GPC DATA 1t - off

- 7 Reconfig Payload Systems

SM CHECKPOINT INITIATE

X: SM 1 DPS UTILITY

MMU 2 ASSIGN:
SM - ITEM 4 EXEC (*)

X: SM 60 TABLE MAINT

✓SM COMM BUFF - 'RDY'
INITIATE - ITEM 18 EXEC
✓Update of CHECKPT TIME
✓STATUS - "GOOD"

Repeat procedures with MMU 1

After CHECKPT done:

X: SM 1 DPS UTILITY

✓CHECKPT RETRV ENA - ITEM 12 EXEC (*)

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ECLS

SUPPLY WATER DUMP..... 5-2
WASTE WATER DUMP..... 5-4
CABIN TEMP CONTROL..... 5-7
ECLSS REDUNDANT COMPONENT C/O..... 5-8
RAD BYPASS/FES C/O..... 5-10
RAD STOW/DEPLOY..... 5-11
RAD DEPLOY/STOW SINGLE MOTOR OPS..... 5-13
CRYO O2 TK HTR SNSR CK..... 5-15
PCS 1(2) CONFIG..... 5-16
TOPPING FES DEACTIVATION..... 5-16
TOPPING FES STARTUP..... 5-17

ECLS

SUPPLY WATER DUMP

NOTE

If PASS SM avail, monitor temps and QTY, otherwise monitor dump time

Crew may reset SM alert limits to annunciate end of dump if desired

If TK A to be dumped, set TK B QTY LL to -10 to preclude nuisance alarm

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY QTY A	0620410	25.0	99.0
B	0620420	10.0	
C	0620548	75.0	

1 DUMP PREP

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY NOZ T A	0620440	90	250
B	0620439	90	250
H2O WASTE NOZ T A	0620520		250
B	0620519		250

ECLS

- R12L If only TKS A&B to be dumped
 ✓SPLY H2O XOVR VLV tb - CL
- If TK C(D) to be dumped
 SPLY H2O TK A,B OUTLET (two) - CL (tb-CL)
 Close SPLY H2O TK C,D OUTLET and INLET
 vlvs except on tanks to be dumped:
 SPLY H2O TKC OUTLET - CL (tb-CL)
 INLET - CL (tb-CL)
- ML31C TKD OUTLET - CL (tb-CL)
 INLET - CL (tb-CL)
- R12L SPLY H2O XOVR VLV - OP (tb-OP)

2 DUMP INITIATION

SM 66 ENVIRONMENT

CRT ✓H2O SUPPLY DMP LN T > 65

 * If DMP LN T < 65, enable 2nd heater: *

 * ML86B:A *

 * cb MNB(MNA) H2O LINE HTR B(A) - c1 *

R12L SPLY H2O DUMP VLV ENA/NOZ HTR - ON

 ✓DUMP VLV tb - CL

CRT When H2O SUPPLY NOZ T A(B) exceeds

 100 (~5 min), continue

R12L SPLY H2O DUMP ISOL VLV - OP (tb-OP)

 DUMP VLV - OP (tb-OP)

CRT ✓H2O SUPPLY QTY B(C,D) - decr (~2-3%/min)

NOTE

TK A will start dumping through
TK B after TK B empties

If 'S66 H2O', H2O SUPPLY NOZ T A(B)
terminate dump immediately

3 DUMP TERMINATION

CRT SPLY H2O DUMP VLV - CL (tb-CL)

 When H2O SUPPLY NOZ T A(B) exceeds 100,

 continue

 ✓H2O SUPPLY QTY - not decr

R12L SPLY H2O DUMP VLV ENA/NOZ HTR - OFF

 ✓DUMP VLV tb - bp

CRT ✓H2O SUPPLY NOZ T A(B) - not incr

 * If H2O SUPPLY NOZ T A(B) incr: *

 * ML86B:A *

 * cb MNC SUPPLY H2O DUMP VLV/NOZ *

 * HTR - op *

4 TANK RECONFIGURATION

R12L SPLY H2O XOVR VLV - CL (tb-CL)
TKB OUTLET - OP (tb-OP)

Open SPLY H2O TK C,D outlet and inlet valves except of any failed tank (external leak):

ML31C SPLY H2O TKC OUTLET - OP (tb-OP)
INLET - OP (tb-OP)
TKD OUTLET - OP (tb-OP)
INLET - OP (tb-OP)

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY NOZ T A	0620440	-10	250
B	0620439	-10	250
H2O WASTE NOZ T A	0620520		250
B	0620519		250

If H2O SUPPLY QTY limits were reset to annunciate end of dump, leave limits at annunciation value

WASTE WATER DUMP

NOTE

If PASS SM avail, monitor temps and QTY, otherwise monitor dump time.

Crew may reset SM alert limits to annunciate end of dump if desired

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O WASTE QTY 1	0620540		99.0

1 DUMP INITIATION

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY NOZ T A	0620440		250
B	0620439		250
H2O WASTE NOZ T A	0620520	60	250
B	0620519	60	250

SM 66 ENVIRONMENT

```

CRT      ✓H2O WASTE DMP LN T > 50
          * If DMP LN T < 50, enable 2nd heater: *
          *   ML86B:A                               *
          *   cb MNB(MNA) H2O LINE HTR B(A) - c1 *

ML31C    WASTE H2O DUMP VLV ENA/NOZ HTR - ON
          ✓DUMP VLV tb          - CL
CRT      When H2O WASTE NOZ T A(B) exceeds 250
          (~7 min), continue
ML31C    ✓WASTE H2O TK1 VLV      - OP (tb-OP)
          DUMP ISOL VLV - OP (tb-OP)
          DUMP VLV      - OP (tb-OP)
CRT      ✓H2O WASTE QTY 1      - decr (~2-3%/min)
          ✓NOZ T A(B) - not incr

          If 'S66 H2O', H2O WASTE NOZ T A(B)
ML31C    WASTE H2O DUMP VLV - CL (tb-CL)
CRT      When H2O WASTE NOZ T A(B) exceeds 250,
          continue
ML31C    WASTE H2O DUMP VLV - OP (tb-OP)
  
```


2 DUMP TERMINATION

ML31C WASTE H2O DUMP VLV - CL (tb-CL)
 CRT When H2O WASTE NOZ T A(B) exceeds 250
 continue
 ✓H2O WASTE QTY 1 - not decr

ML31C WASTE H2O DUMP VLV ENA/NOZ HTR - OFF
 ✓DUMP VLV tb - bp
 CRT ✓H2O WASTE NOZ T A(B) - not incr

* If H2O WASTE NOZ T A(B) incr: *
 * If not OV-103, *
 * ML86B:A *
 * cb MNA WASTE H2O DUMP VLV/NOZ *
 * HTR - op *
 * *
 * If OV-103 *
 * ML86B:B *
 * cb MNC WASTE H2O DUMP VLV/NOZ *
 * HTR - op *

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY NOZ T A	0620440		250
B	0620439		250
H2O WASTE NOZ T A	0620520	-10	250
B	0620519	-10	250

If H2O WASTE QTY limits were reset to
 annunciate end of dump, leave limits
 at annunciation value

CABIN TEMP CONTROL

SM 88 APU/ENVIRON THERM

CREW ACTION		Δ TEMP °F EXPECTED
Contact MCC		
Pwrn air cooled equip/install window shades -----		
(L1)	FLOW PROP VLV LOOP 2 - ICH -----	} 1 to 9 °F
(L1)	FLOW PROP VLV LOOP 1 - ICH -----	} 1 °F
(MD44F)	CAB TEMP CNTLR vlv - FULL COOL-----	} 4 °F
(MD44F)	CAB TEMP CNTLR vlv - 2/3 COOL-----	} 6 °F
(MD44F)	CAB TEMP CNTLR vlv - 1/3 COOL-----	} 4 °F
(MD44F)	CAB TEMP CNTLR vlv - FULL HEAT-----	} 4 °F
(L1)	H2O LOOP 2 BYP MAN - DECR until H2O LOOP 2 ICH FLOW MAX -----	} 8 °F
(C2)	Pwrup one or two CRTs as required-----	} 5 °F
(L1)	H2O PUMP LOOP 1 - ON, B----- H2O LOOP 1,2 BYP MAN - DECR until H2O LOOP 1,2 ICH FLOW MAX -----	
(L1)	FLASH EVAP CNTLR PRI A,B - OFF SEC - OFF	
Contact MCC		

↑ To COOL CABIN
 ↓ To HEAT CABIN
 Normal Control Method

ECLSS REDUNDANT COMPONENT C/O

NOTE

Throughout checkout, ignore alerts associated with switching to redundant components and note any discrepancies in the operation of the redundant components

SM 66 ENVIRONMENT

L1 HUMIDITY SEP B - OFF
A - ON
CRT ✓HUMID SEP A - (no '↓')
L1 HUMIDITY SEP A - OFF
B - ON
IMU FAN B - OFF
A - ON
CRT ✓IMU FAN ΔP - ~4.3
L1 IMU FAN A - OFF
C - ON
CRT ✓IMU FAN ΔP - ~4.3
L1 IMU FAN C - OFF
B - ON
CAB FAN B - OFF
A - ON
CRT ✓CABIN FAN ΔP - ~6.0
L1 CAB FAN A - OFF
B - ON
AV BAY 1 FAN B - OFF
A - ON
2 FAN A - OFF
B - ON
3 FAN B - OFF
A - ON
CRT ✓AV BAY FAN ΔP 1 - ~3.5
2 - ~3.5
3 - ~4.3
L1 AV BAY 1 FAN A - OFF
B - ON
2 FAN B - OFF
A - ON
3 FAN A - OFF
B - ON
5-8

ORB OPS/ALL/GEN

SM 88 APU/ENVIRON THERM

L1 FREON PUMP LOOP 1 - B
If FLOW PROP VLV LOOP 1 tb - ICH
CRT ✓FREON LOOP FREON FLOW > 2000
L1 If FLOW PROP VLV LOOP 1 tb - PL HX
CRT ✓FREON LOOP FREON FLOW > 1350
L1 FREON PUMP LOOP 2 - B
If FLOW PROP VLV LOOP 2 tb - ICH
CRT ✓FREON LOOP FREON FLOW > 2000
L1 If FLOW PROP VLV LOOP 2 tb - PL HX
CRT ✓FREON LOOP FREON FLOW > 1350
L1 FREON PUMP LOOP 1 - A
Wait 3 seconds,
FREON PUMP LOOP 2 - A
H2O PUMP LOOP 1 (two) - ON, A
CRT ✓H2O LOOP 1 ICH FLOW > 900
L1 ✓H2O LOOP 1 BYP MODE - MAN
MAN - DECR (hold 5 sec)
CRT ✓H2O LOOP 1 ICH FLOW - increasing
L1 ✓H2O LOOP 1 BYP MAN - INCR (until ICH FLOW
~950)
H2O PUMP LOOP 1 (two) - GPC, B
✓H2O LOOP 2 BYP MODE - MAN
MAN - DECR (hold 5 sec)
CRT ✓H2O LOOP 2 ICH FLOW - increasing
L1 ✓H2O LOOP 2 BYP MAN - INCR (until ICH FLOW
~950)

RAD BYPASS/FES C/O

- CRT 1 Config DAP: B1/AUTO/NORM
- R12L 2 SPLY H2O XOVR VLV - OP (tb-OP)
- L1 3 FLASH EVAP CNTLR PRI A - OFF
PRI B - OFF
SEC (two) - A SPLY, ON
✓HI LOAD DUCT HTR - B
EVAP - ENA
- 4 RAD BYP VLV MODE (two) - MAN
MAN SEL (two) - BYP
(tb-BYP ~3 sec)
RAD CNTLR LOOP (two) - OFF
After 2.5 min,
01 ✓FREON EVAP OUT TEMP ind - $62^{\circ} \pm 2^{\circ}$ F
- L1 5 HI LOAD EVAP - OFF
After 2.5 min,
01 ✓FREON EVAP OUT TEMP ind - $62^{\circ} \pm 2^{\circ}$ F
- L1 6 HI LOAD EVAP - ENA
- 7 FLASH EVAP CNTLR PRI B - ON
SEC (two) - A SPLY, OFF
01 After 2.5 min,
✓FREON EVAP OUT TEMP ind - $39^{\circ} \pm 1^{\circ}$ F
- L1 8 ✓FLOW PROP VLV LOOP 1,2 (two) tb - ICH
- 9 RAD CNTLR OUT TEMP - NORM

RAD DEPLOY/STOW SINGLE MOTOR OPS

DEPLOY RADIATORS ON MOTOR 1

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

PL BAY MECH PWR SYS (two) - ON

RAD LAT CNTL SYS A - REL
 ✓(tb-bp, ~50 sec, REL)
 - OFF

* If either tb not bp after 20 sec or if *
* either tb not REL in ~50 sec, STOP, *
* CONSULT MCC *
* R13L RAD LAT CNTL SYS A - OFF *
* PL BAY MECH PWR SYS (two) - OFF *

RAD CNTL SYS A - DPY
 ✓(tb-bp, ~80 sec, DPY)
 - OFF

* If either tb not bp after 20 sec or if *
* either tb not DPY in ~80 sec, STOW *
* and LAT RADs *

Verify STBD & PORT RAD panels are deployed
and stabilized

PL BAY MECH PWR SYS (two) - OFF

STOW RADIATORS ON MOTOR 2

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

PL BAY MECH PWR SYS (two) - ON

RAD CNTL SYS B - STO
✓(tb-bp, ~80 sec, STO)
- OFF

* If either tb not bp after 20 sec or if *
* either tb not STO in ~80 sec and no *
* motion determined visually: *

* R13L RAD CNTL SYS B - OFF *
* A - STO *

* If either tb not bp after 20 sec or if *
* either tb not STO in ~80 sec and no *
* motion determined visually: *

* R13L RAD CNTL SYS A - OFF *
* Go to MAL, MECH, 9.2b or 9.2h (STBD) *
* or MECH, 9.2f or 9.2h (PORT) *

RAD LAT CNTL SYS B - LAT
✓(tb-bp, ~50 sec, LAT)
- OFF

* If tb not bp after 20 sec or if tb not *
* LAT in ~50 sec: *

* R13L RAD LAT CNTL SYS B - OFF *
* A - LAT *

* If either tb not bp after 20 sec or if *
* tb not LAT in ~50 sec: *

* R13L RAD LAT CNTL SYS A - OFF *
* Go to MAL, MECH, 9.2a or 9.2c (STBD) *
* or MECH, 9.2e or 9.2g (PORT) *

PL BAY MECH PWR SYS (two) - OFF

CRYO O2 TK HTR SNSR CK

SM 68 CRYO SYSTEM

R1 02 TK1,2,3 HTRS (three) - TEST
 CRYO TK4 HTR 02(TK4/5) - TEST

CRT ✓HTR CUR SNSR 1A,B,2A,B (four) - '↓'
 for each tk

If any '↓' is not present, Rcd applicable
cb status (op/cl) as follows:

014:C	cb MNA CRYO O2 HTR TK1 SNSR 1	-	_____
015:C	cb MNB CRYO O2 HTR TK2 SNSR 2	-	_____
016:C	cb MNC CRYO O2 HTR TK1 SNSR 2	-	_____
			TK2 SNSR 1 - _____
ML86B:F	cb MNA CRYO O2 HTR TK3 SNSR 1	-	_____
	MNB CRYO O2 HTR TK3 SNSR 2	-	_____
			TK4 SNSR 1 - _____
	MNC CRYO O2 HTR TK4 SNSR 2	-	_____

R1 02 TK1,2,3 HTRS (three) - RESET
A11 CRYO TK4 HTR 02(TK4/5) - RESET

Report results to MCC

PCS 1(2) CONFIG

M010W 14.7 CAB REG INLET SYS 1(2) vlv - OP
SYS 2(1) vlv - CL

02 REG INLET SYS 1,2 vlv (two) - OP
H2O TK N2 REG INLET SYS 1(2) vlv - OP
SYS 2(1) vlv - CL
✓ISOL SYS 1,2 vlv (two) - OP
✓PPO2 CNTLR SYS 1,2 (two) - NORM
✓N2 XOVR vlv - CL

L2 ✓02 SYS 1,2 SPLY (two) - ctr (tb-OP)
✓XOVR SYS 1,2 (two) - OP
✓N2 SYS 1,2 SPLY (two) - ctr (tb-OP)
✓REG INLET (two) - ctr (tb-OP)
✓02/N2 CNTLR VLV SYS 1(2) - AUTO
2(1) - CL
01 ✓02/N2 FLOW sel - SYS 1(2) 02
✓PPO2 sel - SNSR A(B)

VENT SAFING

014:D ✓cb MNA CAB VENT - op
✓VENT ISOL - op

TOPPING FES DEACTIVATION

L1 FLASH EVAP CNTLR PRI A,B - OFF
SEC - OFF
Wait 30 min
TOP EVAP HTR DUCT - OFF
NOZ (L,R) - OFF

TOPPING FES STARTUP

L1 ✓TOP EVAP HTR DUCT - A(B,C)
 ✓NOZ (L,R) - A(B) AUTO

* If heaters were off, wait 90 min, then *

01 If EVAP OUT TEMP > 41 and ≤ 47
L1 | RAD CNTLR OUT TEMP - HI
01 | When EVAP OUT TEMP = 50 ± 2
L1 | RAD CNTLR OUT TEMP - NORM, then
 | immediately:
 | FLASH EVAP CNTLR PRI A(B) - ON
01 If EVAP OUT TEMP ≤ 41 or > 47
L1 FLASH EVAP CNTLR PRI A(B) - ON

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EPS

LAMP & FIRE SUPPR TEST..... 6-2
HEATER RECONFIG..... 6-6
FUEL CELL PURGE - AUTO..... 6-7
FUEL CELL PURGE - MANUAL..... 6-8

EPS

1 LAMP TEST

Forward Station

06/08 ANNUN LAMP TEST - L, hold
✓75 lights - illuminated:
(82 lights on OV102)

01	CAM lts	(25)	
F2	MSTR ALARM	(1)	
	Aerodynamic controls	(7)	(9 on OV102)
	EVENT SEQ (OV102)	(5)	
F3 (F2 OV102)	NWS FAIL	(1)	
L1	FIRE SUPPR AV BAY	(3)	
	SMOKE DETN	(10)	
F6	LDG GEAR	(2)	
	ABORT	(1)	
	RCS CMD	(3)	
	RANGE SAFE ARM	(1)	
F7	SM ALERT	(1)	
	C/W panel - partial	(20)	

06/08 ANNUN LAMP TEST - R, hold
✓58 lights - illuminated:
(65 lights on OV102)

F4	MSTR ALARM	(1)	
	Aerodynamic controls	(7)	(9 on OV102)
	EVENT SEQ (OV102)	(5)	
F3 (F4 OV102)	ANTI-SKID FAIL	(1)	
F8	LDG GEAR	(2)	
F7	MN ENG STAT	(3)	
	C/W panel - partial	(20)	
C3	DAP PANEL	(24)	

Middeck (verified by second crewman)

06(08) ANNUN LAMP TEST - L, hold
M029J ✓MIC KEY light - illuminated
06(08) ANNUN LAMP TEST - R
M052J ✓MSTR ALARM light - illuminated

Aft Station

A6U ANNUN LAMP TEST - L, hold
✓25 lights - illuminated:
DAP PANEL (24)
A2 MIC KEY (1)

A6U ANNUN LAMP TEST - R, hold
✓28 lights - illuminated:
A7U MSTR ALARM (1)
VID IN (13)
OUT (8)
CAMR CMD ALC (3)
GAMMA (3)

C/W Status

R13U C/W LAMP TEST - L, hold
✓STATUS lights - illuminated (60)
C/W LAMP TEST - R, hold
✓STATUS lights - illuminated (60)

(CONTINUED NEXT PAGE)

2 FIRE/SMOKE DETECT/SUPPRESS TEST

NOTE

If any SMOKE DETN lt fails to illum (ex PAYLOAD), open and close associated cb (Pnl 014,015 or 016) and repeat test on that CKT allowing 60 sec

L1 SMOKE DETN CKT TEST - A
✓FIRE SUPPR AV BAY (three) pb - lts on
✓(in 15-25 sec):
SMOKE DETN A lts (five) - on
Siren - on
MSTR ALARM lt - on
F2 MSTR ALARM pb - off
L1 SMOKE DETN CKT TEST - OFF
SNSR - RESET
✓Above lights and siren - off

SMOKE DETN CKT TEST - B
✓FIRE SUPPR AV BAY (three) pb - lts on
✓(in 15-25 sec):
SMOKE DETN B lts (four) - on
(PL lt off)
Siren - on
MSTR ALARM lt - on
F2 MSTR ALARM pb - off
L1 SMOKE DETN CKT TEST - OFF
SNSR - RESET
✓Above lights and siren - off

SM SYS SUMM 1

CRT Verify:
SMOKE 1/A 2/B
AV BAY 1 -.1 to +.5 -.1 to +.5
2 -.1 to +.5 -.1 to +.5
3 -.1 to +.5 -.1 to +.5

* If limits exceeded, contact MCC *

HEATER RECONFIG - Config B (Config A)

L1 TOP EVAP HTR NOZ (two) - B AUTO(A AUTO)
DUCT - B(A)

L2 FLASH EVAP FDLN HTR A,B SPLY(two) - 2(1)
A12 APU HTR GAS GEN/FUEL PUMP(three) - B AUTO
(A AUTO)
LUBE OIL LINE(three) - B AUTO
(A AUTO)
TK/FU LINE/H2O SYS 1B,2B,3B - AUTO
(OFF)
1A,2A,3A - OFF
(AUTO)

HYD HTR RUD SPD BK A - OFF(AUTO)
B - AUTO(OFF)
BDY FLP A - OFF(AUTO)
B - AUTO(OFF)
ELEV A - OFF(AUTO)
B - AUTO(OFF)
AFT FUS A - OFF(AUTO)
B - AUTO(OFF)

A14 RCS/OMS HTR FWD RCS - B AUTO(A AUTO)
L POD - A OFF(A AUTO)
- B AUTO(B OFF)
R POD - A OFF(A AUTO)
- B AUTO(B OFF)
OMS CRSFD LINES - OFF(A AUTO)
- B AUTO(OFF)

R12U FC H2O LINE HTR - B AUTO(A AUTO)
RELIEF HTR - B AUTO(A AUTO)

ML86B:A cb MNA H2O LINE HTR A - op(c1)
cb MNB H2O LINE HTR B - c1(op)

A8L PORT RMS HTR A - OFF (AUTO)
B - AUTO (OFF)

FUEL CELL PURGE - AUTO, SM 2(4)

CAUTION

Do not purge FC if:

- Its AMPS > 350
- It is shutdown

Do not initiate auto purge within:
1 hr of any SM OPS transition or
3 hr of deorbit burn

R12U

FC PURGE VLV (three) - GPC
HTR - GPC
GPC PURGE SEQ - START
(After tb-gray, hold 3 sec)

If first on orbit purge, wait 45 min,
then plot FC performance data points
(Cue Card)

FUEL CELL PURGE - MANUAL

1 TURN ON PURGE HEATERS

R12U FC PURGE HTR - ON

SM 69 FUEL CELLS

CRT ✓PURGE LN O2 T > 69
 ✓H2 T1 > 79
 ✓T2 > 40
Or, wait at least 15 min

2 MANUAL PURGE SEQUENCE

NOTE

Fuel cells must be purged separately

CAUTION

Do not purge FC if:

- Its AMPS > 350
- It is shutdown
- Within 3 hr of deorbit burn

CRT FC 1(2,3) FLOW O2 - note
 H2 - note

R12U FC PURGE VLV 1(2,3) - OP

CRT ✓FC 1(2,3) FLOW O2 - increase ~3.3 (max)
 ✓H2 - increase ~0.6 (max)

R12U Wait 2 min, then
FC PURGE VLV 1(2,3) - CL, then GPC

CRT ✓FC 1(2,3) FLOW O2 - decr ~3.3 (max)
 ✓H2 - decr ~0.6 (max)

Repeat step 2 for FCs 2 and 3
Wait at least 30 min, then continue

3 TURN OFF PURGE HEATERS

R12U FC PURGE HTR - OFF, then GPC

4 If first on orbit purge, plot
FC performance data points (Cue Card)

GNC

IMU ALIGN - S TRK..... 7-2
IMU ALIGN - ROTATION S TRK: ROLL(PITCH,YAW)..... 7-4
IMU ALIGNMENT - IMU/IMU..... 7-6
S TRK SELF-TEST..... 7-7
COAS CALIBRATION..... 7-8
FCS CHECKOUT..... 7-10
AFT CONTROLLER C/O..... 7-27
OMICRON SPECIFICATION..... 7-28

GNC

IMU ALIGN - S TRK, GNC 201, 202, 301

1 COLLECT STAR DATA

C3(A6U) ✓DAP: A1(B1)/AUTO/VERN (NORM)

GNC 22 S TRK/COAS CNTL

CRT ✓S TRK -Y,-Z: STATUS - (no BITE)
SHUTTER - OP

- * If SHUTTER - CL: *
- * ✓Att,MET - correct *
- * Visually verify no bright object *
- * in FOV *
- * After data collected and before *
- * changing attitude return shutter *
- * to AUTO *
- * To open shutter: *
- * MAN OP - ITEM 15(16) EXEC (*) *
- * To return shutter to AUTO: *
- * MAN OP - ITEM 15(16) EXEC (no *) *

If reqd ID - other than 0
STAR TRK - ITEM 3,4 EXEC (*)
Wait for TERM/IDLE (*) then,
S TABLE CLR - ITEM 20 EXEC
✓STAR TRK, ITEM 3,4 (*)

2 VERIFY STAR DATA

✓S TABLE: TRK ID 1,2 - (correct #s)
ANG ERR 1 - ≤ .08, Rcd ___
SEL, ITEM 17,18 - (*)
Wait approx 1 min for new IMU ΔANGs

- * If no data after 3 min or bad data: *
- * ✓Att,stars,MET - correct *
- * ✓Rot Rate - ≤ .5°/sec *
- * ✓S TRK -Y,-Z: TRK ID - (correct #s) *
- * ΔANG - < 1.0 *
- * If preceding checks are good: *
- * Perform S TRK SELF-TEST then, *
- * If both STATUS - ST FAIL: *
- * | Inform MCC before proceeding *
- * If both STATUS - ST PASS: *
- * | Repeat step 1 at new att, stars *
- * If one STATUS - ST PASS: *

GNC

```

* ✓TERM/IDLE, ITEM 9(10) - (*) *
* STAR TRK, GOOD S TRK - ITEM 3(4) EXEC (*) *
* S TABLE CLR - ITEM 20 EXEC *
* ✓S TABLE: TRK ID 1 - (correct #) *
* TERM/IDLE, GOOD S TRK - ITEM 9(10) EXEC (*) *
* Mnv to 2nd att, star *
* STAR TRK, GOOD S TRK - ITEM 3(4) EXEC (*) *
* Repeat step 2 with good S TRK only *

```

3 CHECK IMU ΔANGs

GNC 21 IMU ALIGN

CRT

```

✓IMU 1,2,3: STAT - blank
✓STAR ALIGN, ITEM 13 - (*)
✓ANG 1,2,3: ΔX,ΔY,ΔZ - ≤ .80
Rcd ANG 1 2 3
ΔX( )_. _ ( )_. _ ( )_. _
ΔY( )_. _ ( )_. _ ( )_. _
ΔZ( )_. _ ( )_. _ ( )_. _

```

```

* If ANG ΔX,ΔY or ΔZ > .80 for two or *
* more IMUs, repeat steps 1,2 and 3 *

```

CAUTION

If ANG ΔX,ΔY or ΔZ still > .80
for 2 or more IMUs:
DO NOT TORQUE PLATFORMS EXCEPT
UNDER MCC INSTRUCTIONS

4 ALIGN IMUs

```

ALIGN IMU 1(2,3) - ITEM 10(11,12) EXEC (*)
EXEC - ITEM 16 EXEC (*), Rcd MET _/_ _:_ _
✓Data transcribed into CAP
✓EXEC, ITEM 16 - (no *)

```

5 S TRK AUTO STAR-SELECT

GNC 22 S TRK/COAS CNTL

CRT

```

✓S TRK -Y(-Z): REQD ID, ITEM 11(12) - 0
STAR TRK - ITEM 3(4) EXEC (*)
✓Shutter not MAN OP, ITEM 15,16 - (no *)

```


IMU ALIGN - ROTATION S TRK: ROLL (PITCH, YAW)

1 SETUP

Config DAP: A5/AUTO/VERN
DAP ROT: DISC/DISC/DISC

CRT

GNC 22 S TRK/COAS CNTL

√S TRK -Y,-Z: STATUS - (no BITE)

If reqd ID - other than 0
STAR TRK - ITEM 3(4) EXEC (*)
Wait for TERM/IDLE (*) then,
√S TABLE CLR, ITEM 20 - (no unwanted data)
STAR TRK - ITEM 3,4 EXEC (*)

2 INITIATE ROTATION AT SUNSET

CRT

If in LVLH AUTO TRK attitude:

ADI ATT - LVLH
DAP: A5/LVLH/VERN
DAP ROT: Sel PULSE in desired rot axis
FLT CNTLR PWR - ON

F7/F8

CRT

GNC UNIV PTG

F7/F8

Initiate rotation about desired axis of
0.3° ± .05°/sec with RHC (multiple
pulses)

or

FLT CNTLR PWR - OFF
After rotating between 180 and 270°,
DAP: A5/AUTO/VERN

C3

If in AUTO inertial attitude:

CRT

GNC UNIV PTG

Load appropriate BODY VECT-ITEM 14(15,16)

ITEM	14	15	16
ROLL	1	0	0
PITCH	5	0	90
YAW	5	270	0

ROT - ITEM 20 EXEC (CUR - *) -

Note time ____/____:____
Add 25 min to start time and load as
future start - ITEMS 1,2,3,4
START MNVR - ITEM 18 EXEC (FUT - *)

3 VERIFY STAR DATA

CRT

GNC 22 S TRK/COAS CNTL

Verify $35^\circ < \text{ANG DIF} < 145^\circ$ and $\text{ANG ERR} \leq .08$ (Rcd ___ .__ __) for SEL (*) star pair

If no data after rotation:
Perform S TRK SELF-TEST then,

If both STATUS - ST FAIL:
Inform MCC before proceeding

If one or both STATUS - ST PASS,
repeat procedure at next sunset

4 CHECK IMU ΔANGs

CRT

GNC 21 IMU ALIGN

✓IMU 1,2,3: STAT - blank
✓STAR ALIGN, ITEM 13 - (*)
✓ANG 1,2,3: ΔX,ΔY,ΔZ - $\leq .80$

Rcd ANG 1 2 3
ΔX()__ .__ __ ()__ .__ __ ()__ .__ __
ΔY()__ .__ __ ()__ .__ __ ()__ .__ __
ΔZ()__ .__ __ ()__ .__ __ ()__ .__ __

* If ANG ΔX,ΔY or ΔZ > .80 for two or *
* more IMUs, repeat steps 1 thru 4 *

CAUTION

If ANG ΔX,ΔY or ΔZ still > .80
for 2 or more IMUs:
DO NOT TORQUE PLATFORMS EXCEPT
UNDER MCC INSTRUCTIONS

5 ALIGN IMUs

ALIGN IMU 1(2,3) - ITEM 10(11,12) EXEC (*)
EXEC - ITEM 16 EXEC (*), Rcd MET __/__:__
✓Data transcribed into CAP
✓EXEC, ITEM 16 - (no *)

6 S TRK AUTO STAR-SELECT

GNC 22 S TRK/COAS CNTL

CRT ✓S TRK -Y(-Z): REQD ID, ITEM 11(12) - 0
STAR TRK - ITEM 3(4) EXEC (*)
✓Shutter not MAN OP, ITEM 15,16 - (no *)

Reconfig to CAP DAP

IMU ALIGNMENT - IMU/IMU

NOTE

Procedure must be accomplished
in GNC OPS 2 or 3

GNC 21 IMU ALIGN

IMU/IMU - ITEM 14 + ____ EXEC

$\Delta X()_{\text{1}} \text{---} ()_{\text{2}} \text{---} ()_{\text{3}} \text{---}$

$\Delta Y()_{\text{1}} \text{---} ()_{\text{2}} \text{---} ()_{\text{3}} \text{---}$

$\Delta Z()_{\text{1}} \text{---} ()_{\text{2}} \text{---} ()_{\text{3}} \text{---}$

ALIGN IMU 1(2,3) - ITEM 10(11,12) EXEC (*)
EXEC - ITEM 16 EXEC (*),
Rcd MET __ __/__ __:__ __

NOTE

Align will require 3-6 min

VERIFY GOOD IMU/IMU ALIGNMENT

✓EXEC, ITEM 16 - (no *)
IMU/IMU - ITEM 14 + (SAME REF IMU) EXEC
✓IMU 1,2,3 ANG ΔX, ΔY, ΔZ < 0.13

* IF ANG ΔX, ΔY, ΔZ ≥ 0.13 *
* Report to MCC *

If in GNC OPS 2 or MM 301,
STAR ALIGN - ITEM 13 EXEC (*)

Initiate track mode for both Star Trackers

CRT

GNC 22 S TRK/COAS CNTL
STAR TRK - ITEM 3,4 EXEC (*)

S TRK SELF-TEST, GNC 201, 202, 301

Mnvr to avoid bright objects in both BOSS

CRT

GNC 22 S TRK/COAS CNTL
✓S TRK -Y,-Z: STATUS - (no BITE)
SHUTTER - OP

* If SHUTTER - CL *
* ITEM 15(16) - EXEC (*) *
* ITEM 15(16) - EXEC (no *) *

SELF-TEST - ITEM 1,2 EXEC (*)
✓S TRK -Y,-Z: SHUTTER - CL
S PRES - (*)
STATUS - BITE (momentarily)
SHUTTER - OP
STATUS - ST PASS

* If STATUS - ST FAIL, repeat *
* SELF-TEST *
* If still FAIL, use only if directed *
* by MCC *

STAR TRK - ITEM 3,4 EXEC (*)

COAS CALIBRATION, GNC 201

1 COAS CALIBRATION PREP

01(019) COAS - ON
COAS ✓Barrel Index - FW(OW)
✓DAP: A/AUTO/VERN

If -Z COAS CAL, SENSE - -Z
Change DAP A,B to A1,B5

GNC 22 S TRK/COAS CNTL

COAS: REQD ID - ITEM 21 + EXEC
POS +X(-Z) - ITEM 26(27) EXEC (*)
CAL MODE - ITEM 24 EXEC (*)

F7/F8 FLT CNTLR PWR - ON
(A6U)

2 MARK ON STAR

DAP ROT: DISC/DISC/DISC(VERN)
or
DAP ROT: PULSE/PULSE/PULSE(PRCs or VERN)

DAP: A1/MAN/VERN (COARSE CNTL)
B5/MAN/VERN (FINE CNTL)
B5/MAN/NORM (PRCS)

F6 Mvnr to center star in COAS:
(A6U) ATT REF pb - push

NOTE

Repeat mark to ensure
ΔBIAS consistency (3 or more marks)

DAP: A1/AUTO/VERN

3 CALIBRATE COAS AND VERIFY

CRT

Rcd CAL +X(-Z) ΔBIAS: .
UPDATE - ITEM 28(29) EXEC, Rcd MET _/_ :_ _
√ΔBIAS goes to zero
Repeat 'MARK ON STAR'
√ΔBIAS < .12

* If ΔBIAS > .12, repeat step 3 *
* If still > .12, notify MCC *

4 CLEAN-UP

01(019)
F7/F8
(A6U)

COAS: DES - ITEM 25 EXEC (*)
COAS - OFF
FLT CNTLR PWR - OFF

√Data transcribed into CAP

NOTE

If S TRK(s) to be left in
auto star-select mode, go
to IMU ALIGN - S TRK, step 5

Reconfig to CAP DAP

FCS CHECKOUT

DISPLAY/DPS CONFIG

014, RGA (four) - ON
015, cb MNA,B,C ADTA (four) - c1
016 cb MNA,B ACCEL 1,2 (two) - c1
cb MNA,C DDU AFT (two) - op
cb MNB,C DDU R (two) - c1
ASA (four) - ON
ACCEL 3,4 (two) - ON
017 ATVC (four) - ON

08 RADAR ALTM (two) - ON
MLS (three) - ON

F6 INST PWR - FLT
F8 INST PWR - ON
F3 TRIM PNL (two) - ON
HUD PWR (two) - ON
F6/F8 HSIs: ✓off flag - not visible

F8 ADI: ✓Error needles & Rate pointers -
visible
C3 ✓FCS CH (four) - AUTO

✓DAP: A1/AUTO/VERN

Perform DPS, G2 TO G8 TRANSITION; then

ON-ORBIT FCS CHECKOUT, PART 1

NOTE

Only one APU will be used for the FCS C/O. Selection of APU will be made real time and MCC will provide APU number

NOTE

Continue FCS C/O for APU alarms except as follows:

If WB REG PRESS '↑':
R2 BLR N2 SPLY - OFF

If OIL OUT P < 25 & GBX P < 5, shut down APU

If APU OVERSPEED or APU UNDERSPEED
Confirmed overspeed or if APU has shutdown

or

If APU TEMP
Overtemp confirmed by SM APU B/U EGT:
Affected APU CNTL - OFF
FUEL TK VLV - CL

NOTE

Any previously failed actuator channel should be bypassed via ITEM 21 on FCS/DED DIS C/O display prior to APU start (See DPS DICT, GNC, OPS G8 for ITEM ENTRY values)

1 FCS C/O PREP

C2 Set EVENT TIMER to 00:00, count UP
C3 ✓DAP: A1/AUTO/VERN

2 APU PRESTART

1: GNC, FCS/DED DIS C/O | 2: SM 86 APU/HYD

CRT2 ✓APU,HYD,WB status no '↑' or '↓'
(except HYD B/U)

R4 ✓HYD LG RET/CIRC VLV - CL

Perform APU/HYD, HYD THERM COND - TERM,
then:

R2 BLR N2 SPLY X - ON
✓PWR (three) - ON
✓CNTLR/HTR (three) - B
✓APU AUTO SHUTDN (three) - ENA
CNTLR PWR X - ON
HYD MN PUMP PRESS X - LO
✓APU SPEED SEL (three) - NORM
✓OPER (three) - OFF
✓FUEL TK VLV (three) - CL
✓cb FU TK VLV ENA (six) - CL

Inform MCC: READY FOR APU START

Wait for MCC GO ..

3 APU START

R2 APU FUEL TK VLV X - OP
✓APU/HYD RDY X tb - gray

* If tb - bp, consult MCC *

00:00 Start EVENT TIMER
R2 APU OPER X - START/RUN
F8 ✓HYD PRESS ind X - LOW green
R2 ✓APU/HYD RDY X tb - bp

* If APU did not start normally: APU OPER - *
* START ORIDE/RUN (wait 3.5 min for APU *
* start) *
* If still no start: APU AUTO SHUTDN - INH *
* If still no start: APU OPER - OFF *
* FUEL TK VLV - CL *

7-12

ORB OPS/ALL/GEN

R2 HYD MN PUMP PRESS X - NORM
F8 ✓HYD PRESS ind X - HI green

CRT2 ✓SW VLV ELVN (four) - per table
✓RUD/SPDBK - per table

If HYD SYS 1	If HYD SYS 2	If HYD SYS 3
1(*)	2(*)	3(*)
1(*)	2(*)	3(*)

4 AEROSURFACE DRIVE

CRT1 SURF DR START - ITEM 10 EXEC (*)
Verify all surfaces cycling for 30 seconds

NOTE

POS '↓' may be indicated
until HYD SYS is warm

* If FCS CH failure ('↓' port status), *
* reset affected FCS CH: *
* FCS CH - ORIDE, then *
* - AUTO *

After 30 seconds of aerosurface drive,
SURF DR STOP - ITEM 11 EXEC (*)
✓Surfaces not moving

5 SECONDARY ACTUATOR CHECK

NOTE

If a port does not bypass during check, |
bypass affected port after APU shutdn: |

SEC ACT BYPASS - ITEM 21 +X X EXEC

If affected port still does not bypass: |

SEC ACT RESET - ITEM 22 +X X EXEC

(See DPS DICT, GNC, OPS G8 for ITEM
ENTRY values)

- CRT1 a. ✓POS STIM ENA, ITEM 20 - (*)
- C3 b. ✓FCS CH 1,2,3,4 - AUTO
- CRT1 c. SEC ACT CK, CH 1 - ITEM 15 EXEC (*)
- d. ✓all CH 1 ports bypass ('+')
STOP - ITEM 19 EXEC (*)
- C3 e. FCS CH 1 - ORIDE
CRT1 ✓all CH 1 ports reset (no '+')
C3 FCS CH 1 - AUTO
- f. Repeat steps c thru e for CH 2,3 & 4
- CRT1 g. NEG STIM - ITEM 20 EXEC (no *)
- h. Repeat steps b thru f

6 APU SHUTDOWN

On MCC GO for APU SHUTDN:

- R2 BLR PWR (three) - OFF
CNTLR/HTR (three) - A
APU OPER X - OFF
FUEL TK VLV X - CL
BLR N2 SPLY X - OFF
APU FUEL PUMP/VLV COOL A - AUTO

- C3 Perform APU/HYD, HYD THERM COND - ENA, then:
DAP: A1/AUTO/VERN

ON-ORBIT FCS CHECKOUT, PART 2

1 SENSOR TEST - MLS, TAC, RA, AA

NOTE

During MLS/TAC/RA/AA test, deselect
LRU for failure indicated:

MLS, TAC, RA, AA - '↑' or '↓'

or AA - BIAS/NULL limits exceeded.

Record values of failures defined

07 TACAN (three) MODE - GPC

2: GNC 40 SENSOR TEST

CRT2 ✓DES: (no *)
✓STAT: blank
✓RNG,AZ,EL: no M
✓Y,Z: dynamic data

CONFIG FOR FREE DRIFT

F6 ADI RATE - LO
DAP: A1/MAN/VERN
DAP ROT: DISC/DISC/DISC
✓R,P,Y rates 0 ±.1 deg/sec then:
DAP ROT: PULSE/PULSE/PULSE

AA BIAS/NULL SHIFT TEST

CRT2 ✓Y,Z within limits: Y -0.5 to +0.5
Z -1.3 to +1.3

MLS,TAC,RA,AA TEST

CRT2 START - ITEM 13 EXEC (*)

NOTE

'*' blanks when test is
complete; ✓no '↑' or '↓'

07 STOP - ITEM 14 EXEC (*)
TACAN (three) MODE - OFF

LIMIT VALUES TABLE			
	RNG	AZ	EL
MLS	15.0 to 15.4	+,-2.9 to +,-3.1 (+ for 3 sec, then -)	5.9 to 6.1
TAC	0 TO .5	177.5 to 182.5 NOTE: Values from 182.1 to 182.5 will be displayed as 2.1 to 2.5	
RA	ALT 900 to 1100		
AA		Y	Z
		+14.40 to 17.80	+57.70 to 71.10

2 SENSOR TEST - RGA, ADTA

NOTE

During RGA, ADTA test, deselect LRU for failure indicated:

RGA - bias null limits exceeded,
'↑' or '↓', or SMRD

ADTA - any '↑' or '↓' except temp ('T')

ADTA BITE - Perform memory read
Record values of failures defined

NOTE

If RGA does not respond to HIGH or LOW TEST or displays a 'SMRD' indication in STAT column:

Null vehicle rates

Maneuver at 0.5°/sec about appropriate axis; monitor RGA data

If RGA responds, self-test circuitry or SMRD circuitry is failed.

If no RGA response, deselect sensor

2: GNC 41 RGA/ADTA/RCS

CRT2

✓DES: (no *)

✓STAT: blank

✓R,P,Y: dynamic data

✓PS,PaC,PaU,PaL,T - no M

CONFIG FOR FREE DRIFT

✓DAP: A1/MAN/VERN

DAP ROT: DISC/DISC/DISC

✓R,P,Y rates 0 ±.1 deg/sec then:

DAP ROT: PULSE/PULSE/PULSE

RGA BIAS/NULL SHIFT TEST

CRT2

✓R,P,Y within limits: R -.4 to +.4

P/Y -.2 to +.2

HIGH TEST

CRT2

TEST HI - ITEM 9 EXEC (*)

(after 10 sec, no *)

✓no '↑' or '↓'

If ADTA BITE, read Bite status from GPC Memory (see REF DATA, MAL ADDRESSES, GNC, for addresses), ref ADTA MEMORY READ PROCEDURE

TEST STOP - ITEM 11 EXEC (*)

LOW TEST

TEST LOW - ITEM 10 EXEC (*)
(after 10 sec, no *)

√no '↑' or '↓'

If ADTA BITE, read Bite status from GPC Memory (see REF DATA, MAL ADDRESSES, GNC, for addresses), ref ADTA MEMORY READ PROCEDURE

TEST STOP - ITEM 11 EXEC (*)

DAP: A1/AUTO/VERN

If ADTA BITE:

- * ADTA MEMORY READ PROCEDURE *
- * *
- * GNC 0 GPC MEMORY *
- * *
- * DATA - ITEM 20 EXEC (*) *
- * HEX - ITEM 27 EXEC (*) *
- * ADD ID - ITEM 28 +X X X X X EXEC *
- * ADTA 1 ADTA 2 ADTA 3 ADTA 4 *
- * XXXXX = (1) (2) (3) (4) *
- * If data in actual column (last 3 char) *
- * is not equal to -FDC, -FF8, -FD8 or *
- * -FFC, deselect failed ADTA *

LIMIT VALUES TABLE				
HIGH TEST LIMITS				
<u>RGA</u>				
R	P	Y		
+18.8 to +21.2	+9.4 to +10.6	+9.4 to +10.6		
<u>ADTA</u>				
PS	PaC	PaU	PaL	T
.813 to .815	5.473 to 5.477	2.740 to 2.744	1.708 to 1.712	173.56 to 173.70
LOW TEST LIMITS				
<u>RGA</u>				
R	P	Y		
-18.8 to -21.2	-9.4 to -10.6	9.4 to -10.6		
<u>ADTA</u>				
PS	PaC	PaU	PaL	T
24.887 to 24.889	29.527 to 29.531	21.708 to 21.712	14.713 to 14.717	18.50 to 18.54

3 FCS MODE/CH SWITCH TEST

NOTE

During tests,

FCS CH:

Fail op or fail c1 - deselect failed contacts

FCS CH OVERRIDE function of a CH with failed contacts may be made operable if at least one good contact is available. Proceed: Notify MCC when possible

FCS MODE:

Fail op - 2 op or 1 op/1 c1 contacts preclude use of sw

Fail c1 - 1st failure, deselect failed contact

2nd failure L(R), deselect all L(R) contacts

SURF TEST: deselect feedback if limit exceeded

ENTRY MODE:

Fail op or c1 - 1st, 2nd failure, deselect contact
3rd failure, deselect all contacts

2: GNC 42 SWITCH/SURF

NOTE

CRT2

During following tests verify '*' appears except as noted. If '*' remains after releasing pb, contact is failed closed

F7/F8

FLT CNTLR PWR (two) - ON

C3

FCS CH (four) - ORIDE (wait 5 sec)
- AUTO (no *)

F2/F4

PITCH pb - AUTO
- CSS

ROLL/YAW pb - AUTO
- CSS

SPDBK/THROT pb - AUTO

BODY FLAP pb - AUTO

L2/C3

SBTC TAKEOVER pb - push
7-19

ORB OPS/ALL/GEN

SURF TEST

Verify no single surf feedback exceeds
average of other three feedbacks
greater than:

Elevons ($\Delta 1.3$ deg)
Rudder ($\Delta 1.2$ deg)
SPD BK ($\Delta 2.2$ %)
BDY FLP ($\Delta 3$ %)

2: GNC 44 SWITCHES

During following switch test verify '*'
appears

L2

ENTRY MODE - LO GAIN
- NO Y JET
- AUTO (no *)

4 CONTROLLER & SWITCH TEST

NOTE

During controller/switch test,

THC: One TX(TY,TZ) failure - reselect all contacts (failed contact last)

Multi +TX,-TX,+TY,-TY,+TZ,-TZ failures - reselect good contacts only

SPDBK L(R): Deselect failed xdcrs
After 2nd L(R) failures, use other side

RUD PED L(R): One failure - deselect failed xdcr
Multi L(R) failures - deselect all L(R) xdcrs

RHC L(R): One xdcr failure - reselect good xdcrs only
Multi L(R) failures - reselect good xdcrs L(R) & F7(F8) FLT
CNTLR PWR - OFF

BDY FLP L(R): Fail close, deselect all L(R) contacts

RHC TRIM L(R): If contact failed open, deselect failed contact row, then TRIM RHC L(R) - INH, use other side

PNL TRIM L(R): If contact failed open, deselect failed contact row, then TRIM PNL L(R) - OFF, use other side

2: GNC 43 CONTROLLERS

a. THC

CRT2
F5
CRT2

Deselect L THC:
THC L DES - ITEMS 1,2,3 EXEC (*)
L THC - push in each axis
✓THC - '+' & '-'
Reselect THC contacts:
THC L - ITEM 1,2,3 EXEC (no *)

b. L SBTC

L SBTC - full aft; ✓ > 95%
- full fwd; ✓ < 5%

c. RUDDER/BRAKE

RUD PED - full L; ✓ > 87% and ch Δ < 9%
- full R; ✓ > 80% and ch Δ < 9%
- null; between L 14% and R 4%
BK PED - Depress to verify unrestricted
movement (~20 to 25°)

d. L BODY FLAP SWITCH

L2
CRT2

BDY FLP - UP
- DN
✓BDY FLP UP, DN - '*'

e. L RHC

Deselect L RHC:
RHC L DES - ITEM 23,24,25 EXEC (*)
L RHC - deflect to hardstop in each axis
✓RHC L: R,P - > 92%
Y - > 88%

Reselect RHC CHs:
RHC L DES - ITEM 23,24,25 EXEC (no *)

f. L RHC TRIM SWITCH

CRT2 L RHC Trim - deflect switch in each axis
✓RHC TRIM L: R - R/L
P - U/D

g. L PANEL TRIM SWITCHES

L2 ROLL TRIM - R, then L
PITCH TRIM - UP, then DN
YAW TRIM - R, then L
CRT2 ✓PNL TRIM L: R,Y - R/L
P - U/D

h. Repeat steps b & d thru g for R
controllers/switches:
RHC R DES - ITEM 26,27,28

5 DEDICATED DISPLAY/HUD CHECK

✓HUD BRT (two) - as reqd
MODE (two) - TEST
✓Brightness
✓Format 'COMPLETE' msg
HUD MODE (two) - NORM

CRT1 DED DIS FWD - ITEM 1 EXEC (*)
LOW - ITEM 4 EXEC (*)

✓HUD using HUD low value test diagram

F6/F8 ✓Readouts for DATA BUS 1,2,3,4

CRT1 DED DIS HIGH - ITEM 3 EXEC (*)

F6/F8 ✓Readouts for DATA BUS 1,2,3,4 and record
deltas

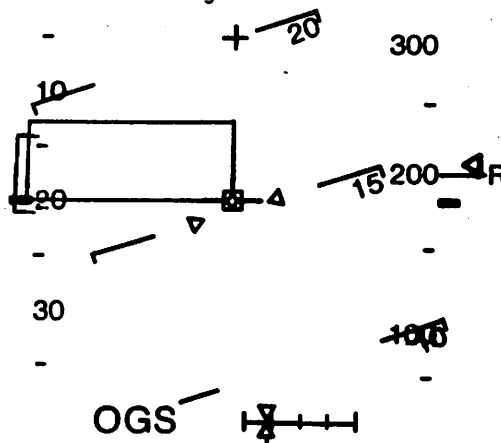
* For ADI failure, consult MCC for *
* possible replacement *

DEDICATED DISPLAY INPUT CHECKOUT VALUES TABLE			
	PARAMETER	LOW VALUE	HIGH VALUE
F6/F8 ADI:	R,P,Y ATT	20 deg	300 deg
	R,Y RATE	2 ticks L	3 ticks R
	P RATE	2 ticks D	3 ticks U
	R,Y ATT ERR	2 ticks L	3 ticks R
	P ATT ERR	2 ticks D	3 ticks U
AMI:	ALPHA	+2 deg	+30 deg
	ACCEL	+20 fps ²	+30 fps ²
	M/VEL	20,000 fps	MACH 3
	EAS	20 kts	300 kts
	AVVI:	ALT ACCEL	-2 fps ²
ALT RATE		-200 fps	+300 fps
ALT		200 ft	+300K ft
RDR ALT		200 ft	+3000 ft
HSI:		SEL COURSE	200 deg
	HEADING	20 deg	300 deg
	PRI BEAR	20 deg	30 deg
	SEC BEAR	200 deg	300 deg
	PRI,SEC MILES	200 nm	3000 nm
	CDI	1 tick L	1 tick R
	GSI	1 tick D	1 tick U
F7	SPI: ELEV	U20 deg	U30 deg
	BDY FLP	20%	30%
	RUD	20 deg L	3 deg R
	AILERON	2 deg L	3 deg R
	SPD BK	20%	30%
	SPD BK CMD	20%	30%

HUD LOW VALUE TEST

NOTE

No HUD high value test exists



6 FLAG TEST

CRT1 DED DIS FLAG - ITEM 5 EXEC (*)

FLAG TEST	
Verify flags visible:	
AMI	4
AVVI	4
HSI MILES	2
CDI	1
BRG	1
GSI	1 (pointer stowed)
ADI	1 (rate/err needle stowed)
SPI	1

TEST TERMINATE

CRT1 DED DIS OFF - ITEM 6 EXEC (*)

7 MODE LAMP TEST

TEST START

CRT1 MODE LT ON - ITEM 7 EXEC (*)

F2/F4 ✓PITCH AUTO, CSS 1t (two) - on
✓ROLL/YAW AUTO, CSS 1t (two) - on
✓SPDBK/THROT AUTO & MAN 1t (two) - on
✓BDY FLP AUTO & MAN 1t (two) - on

TEST TERMINATE

CRT1 MODE LT OFF - ITEM 8 EXEC (*)

F7/F8 FLT CNTLR PWR (two) - OFF

DISPLAY/DPS RECONFIG

Perform DPS, G8 TO G2 TRANSITION; then

F3 TRIM PNL (two) - OFF
HUD PWR (two) - OFF
F6,F8 INST PWR (two) - OFF

08 MLS (three) - OFF
RADAR ALTM (two) - OFF

014, RGA (four) - OFF
015, cb MNA,B,C ADTA (four) - op
016 cb MNA,B ACCEL 1,2 (two) - op
cb MNA,C DDU AFT (two) - cl
cb MNB,C DDU R (two) - op
ASA (four) - OFF
ACCEL 3,4 (two) - OFF

017 ATVC (four) - OFF

AFT CONTROLLER C/O

1 POWER UP

014:E ✓cb MNA DDU AFT - c1
016:E ✓cb MNC DDU AFT - c1
A6U FLT CNTLR PWR - ON

2 AFT THC

GNC 25 RM ORBIT

Deselect A THC:

CRT THC A DES - ITEM 4,5,6 EXEC (*)
 A THC - push in each axis
 ✓THC - '+' & '-'

AFT THC CHECKOUT	
THC	DISPLAY
PUSH	+X
PULL	-X
LEFT	+Z
RIGHT	-Z
UP	-Y
DOWN	+Y

- * During THC test, *
- * One TX(TY,TZ) failure - reselect *
- * all contacts (failed contact last) *
- * Multi +TX,-TX,+TY,-TY,+TZ,-TZ fail- *
- * ures - reselect good contacts only *

Reselect A THC contacts:
THC A DES - ITEM 4,5,6 EXEC (no *)

3 AFT RHC

CRT Deselect A RHC:
 RHC A DES - ITEM 13,14,15 EXEC (*)
 A RHC - deflect to hardstop in each axis
 ✓RHC A: R,P - > 92%
 Y - > 88%

- * During RHC test, *
- * One xdcr failure - reselect good *
- * xdcrs only *
- * Multi RHC failures - reselect good *
- * xdcr & A6U FLT CNTLR PWR - OFF *

 Reselect RHC CHs:
 RHC A DES - ITEM 13,14,15 EXEC (no *)

4 RECONFIG TO NOMINAL

A6U FLT CNTLR PWR - OFF
014:E, AFT DDU PWR - as reqd
016:E

OMICRON SPECIFICATION

1 DETERMINE REFERENCE ATTITUDE

Designated body axis pointed toward target (\hat{P}).
Y body axis in same plane as negative angular
momentum vector ($-\hat{h}$) and \hat{P} .

2 DETERMINE DESIRED ATTITUDE

Rotate clockwise around \hat{P} (right hand rule) to
desired attitude.

OMICRON = angle of rotation around \hat{P} from reference
attitude to desired attitude.

NOTE

If $\hat{P} = \pm Y$ body axis, use -Z body
axis for reference attitude

MPS

MPS INERT..... 8-2

MPS

8-1

ORB OPS/ALL/GEN

MPS INERT

1 INITIALIZATION

R2 MPS PNEU He ISOL - OP
R4 MPS FILL/DRAIN LO2,LH2 OUTBD (two) - OP
After 30 min, continue

2 TERMINATION

R4 MPS FILL/DRAIN LO2,LH2 OUTBD (two) - CL
Wait ten sec:
LO2,LH2 OUTBD (two) - GND
R2 MPS PNEU He ISOL - GPC

MPS

OM

ON-ORBIT OMS BURN..... 9-2

O

OMS

ON-ORBIT OMS BURN

1 OMS BURN PREP

C2
Wedge

Install OMS 2/ORBIT OMS BURNS Cue Cards
(two) and OMS BURN MONITOR Cue Cards
(two) (F6,F8)

CRT

If OPS 2

1: GNC 20 DAP CONFIG - ✓DAP Config A1,B1

1: GNC UNIV PTG

CNCL - ITEM 21 EXEC
GNC, OPS 202 PRO

1: GNC ORBIT MNVR EXEC

2: GNC SYS SUMM 2

If OPS 3

GNC, OPS 302 PRO

1: GNC DEORB MNVR EXEC

3: BFS, GNC SYS SUMM 2

F7

✓OMS PRESS He TK L(R) > 640 psia
✓N2 TK L(R) > 523 psia

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

2 LOAD TGT DATA

Load TGT DATA per Burn Pad
LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

C3

✓BURN DATA per Burn Pad
DAP: If OPS 2, B/AUTO/VERN
If OPS 3, AUTO

CRT1

MNVR - ITEM 27 EXEC (*)

3 PERFORM OMS BURN

TIG-4
08
If Xfeed Burn
L(R) OMS TK ISOL (two) - OP (tb-OP)
R(L) OMS TK ISOL (two) - CL (tb-CL)
L,R OMS XFEED (four) - OP (tb-OP)
If Straight feed
✓L,R OMS TK ISOL (four) - OP (tb-OP)

F7/F8
014:E,
015:E,
016:E
FLT CNTLR PWR (two) - ON
✓cb DDU (six) - c1

Perform OMS 2/ORBIT OMS BURNS
Cue Card, then ..

4 OMS POST BURN RECONFIGURATION

CRT1 Perform OMS TVC GMBL CK as reqd

* If down arrow(s) or Ms: *
* select good GMBL *

F7/F8
014:E,
015:E,
016:E
08
FLT CNTLR PWR (two) - OFF
cb DDU (six) - as reqd
L,R OMS He PRESS/VAP ISOL (four) - CL

If feeding ICNCT:
✓L(R) OMS XFEED A - CL (tb-CL)
B - OP (tb-OP)
R(L) OMS XFEED (two) - CL (tb-CL)

Otherwise:
L,R OMS XFEED (four) - CL (tb-CL)
TK ISOL (four) - OP (tb-OP)

.....IF OPS 2.....
.C3 DAP: B/MAN/VERN .
. DAP ROT: DISC/DISC/DISC .
.CRT GNC, OPS 201 PRO (✓DAP) .
.....

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9-5

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10

PEG 7 TGTS

ΔVX 19

ΔVY 20

ΔVZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBLCK:

	PRE	POST - BURN
L PRI	<input type="text"/>	<input type="text"/>
L SEC	<input type="text"/>	<input type="text"/>
R PRI	<input type="text"/>	<input type="text"/>
R SEC	<input type="text"/>	<input type="text"/>

RCS I'CNCT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/V AP ISOL

	GPC	OP	CL
A	<input type="text"/>	<input type="text"/>	<input type="text"/>
B	<input type="text"/>	<input type="text"/>	<input type="text"/>

IMU DES

9-6

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10 / : :

PEG 7 TGTS

ΔVX 19

ΔVY 20

ΔVZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="checkbox"/>	<input type="checkbox"/>
L SEC	<input type="checkbox"/>	<input type="checkbox"/>
R PRI	<input type="checkbox"/>	<input type="checkbox"/>
R SEC	<input type="checkbox"/>	<input type="checkbox"/>

RCS I'CNTECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/VAP ISOL

	GPC	OP	CL
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IMU DES

9-7

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

}

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6 ()

LY 7 ()

RY 8 ()

WT 9

TIG 10 / : :

PEG 7 TGTS

ΔVX 19 ()

ΔVY 20 ()

ΔVZ 21 ()

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO :

VGO X ()

VGO Y ()

VGO Z ()

HA

HP ()

TGT

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="checkbox"/>	<input type="checkbox"/>
L SEC	<input type="checkbox"/>	<input type="checkbox"/>
R PRI	<input type="checkbox"/>	<input type="checkbox"/>
R SEC	<input type="checkbox"/>	<input type="checkbox"/>

RCS I'CONNECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/VAP ISOL

	GPC	OP	CL
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IMU DES

9-8

ORB OPS/ALL/GEN

OMS BOTH 1.

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10

PEG 7 TGTS

ΔVX 19

ΔVY 20

ΔVZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

		.		
	:			

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="checkbox"/>	<input type="checkbox"/>
L SEC	<input type="checkbox"/>	<input type="checkbox"/>
R PRI	<input type="checkbox"/>	<input type="checkbox"/>
R SEC	<input type="checkbox"/>	<input type="checkbox"/>

RCS I'CNNECT:

LOMS → RCS

ROMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/V AP ISOL

	GPC	OP	CL
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IMU DES

RCS

RCS HOT FIRE TEST..... 10-2
GG FREE DRIFT..... 10-6
0.4 DEG/SEC PTC..... 10-8
ON-ORBIT RCS BURN..... 10-9
LOSS OF VERNIERS..... 10-21
RECOVERY OF VERNIERS..... 10-21

RCS

RCS HOT FIRE TEST

1 CONFIGURE FOR JET TEST

C3

DAP ROT: DISC/DISC/DISC
DAP: A3/MAN/VERN

GNC 20 DAP CONFIG - Config DAP to A3

RCS

2 PERFORM RCS JET TEST

NOTE

If failed RCS JET detected,
complete RCS JET TEST, then
go to MAL, RCS, 10.1a

Monitor CRT for JET FAIL messages
Monitor ADI rates to verify jet on
or jet fail

C3

DAP ROT: PULSE/PULSE/PULSE
TRANS: PULSE/PULSE/PULSE

DAP: A3/MAN/NORM

F6

ADI RATE - LO

F7

FLT CNTLR PWR - ON

GNC 23 RCS

CRT

RCS FWD - ITEM 1 EXEC (*)

MANF VLVS STAT OVRD

✓1 OP - ITEM 40

✓2 OP - ITEM 41

3 CL - ITEM 42 EXEC

4 CL - ITEM 43 EXEC

CRT

RCS L - ITEM 2 EXEC (*)
MANF VLVS STAT OVRD
 ✓1 OP - ITEM 40
 2 CL - ITEM 41 EXEC
 3 CL - ITEM 42 EXEC
 4 CL - ITEM 43 EXEC

RCS R - ITEM 3 EXEC (*)
MANF VLVS STAT OVRD
 ✓1 OP - ITEM 40
 2 CL - ITEM 41 EXEC
 3 CL - ITEM 42 EXEC
 4 CL - ITEM 43 EXEC

THC +X, 1 PULSE (fires jets R1A,L1A)
 -X, 1 PULSE (fires jets F1F,F2F)
RHC +P, 1 PULSE (fires jets L1U,R1U)
 +Y, 1 PULSE (fires jet R1R)
 -Y, 1 PULSE (fires jet L1L)

RCS L - ITEM 2 EXEC (*)
MANF VLVS STAT OVRD
 1 CL - ITEM 40 EXEC
 2 OP - ITEM 41 EXEC
 ✓3 CL - ITEM 42
 ✓4 CL - ITEM 43

RCS R - ITEM 3 EXEC (*)
MANF VLVS STAT OVRD
 1 CL - ITEM 40 EXEC
 2 OP - ITEM 41 EXEC
 ✓3 CL - ITEM 42
 ✓4 CL - ITEM 43

RHC +P, 1 PULSE (fires jets R2U,L2U)
 -P, 1 PULSE (fires jets R2D,L2D)
 +Y, 1 PULSE (fires jet R2R)
 -Y, 1 PULSE (fires jet L2L)

CRT

✓RCS R, ITEM 3 - (*)
MANF VLVS STAT OVRD
✓1 CL - ITEM 40
2 CL - ITEM 41 EXEC
3 OP - ITEM 42 EXEC
✓4 CL - ITEM 43

RCS L - ITEM 2 EXEC (*)
MANF VLVS STAT OVRD
✓1 CL - ITEM 40
2 CL - ITEM 41 EXEC
3 OP - ITEM 42 EXEC
✓4 CL - ITEM 43

RCS F, - ITEM 1 EXEC (*)
MANF VLVS STAT OVRD
1 CL - ITEM 40 EXEC
2 CL - ITEM 41 EXEC
3 OP - ITEM 42 EXEC
✓4 CL - ITEM 43

THC +X, 1 PULSE (fires jets R3A,L3A)
-X, 1 PULSE (fires jet F3F)
RHC -P, 1 PULSE (fires jets R3D,L3D)
+Y, 1 PULSE (fires jet R3R)
-Y, 1 PULSE (fires jet L3L)

RCS L - ITEM 2 EXEC (*)
MANF VLVS STAT OVRD
✓1 CL - ITEM 40
✓2 CL - ITEM 41
3 CL - ITEM 42 EXEC
4 OP - ITEM 43 EXEC

RCS R - ITEM 3 EXEC (*)
MANF VLVS STAT OVRD
✓1 CL - ITEM 40
✓2 CL - ITEM 41
3 CL - ITEM 42 EXEC
4 OP - ITEM 43 EXEC

CRT RHC +P, 1 PULSE (fires jets R4U,L4U)
-P, 1 PULSE (fires jets R4D,L4D)
+Y, 1 PULSE (fires jet R4R)
-Y, 1 PULSE (fires jet L4L)

C3 DAP ROT: DISC/DISC/DISC

DAP: A/MAN/VERN

F7 FLT CNTLR PWR - OFF

3 RECONFIGURE JET SELECT

CRT ✓RCS R, ITEM 3 - (*)
MANF VLVS STAT OVRD
1 OP - ITEM 40 EXEC
2 OP - ITEM 41 EXEC
3 OP - ITEM 42 EXEC
✓4 OP - ITEM 43

RCS L - ITEM 2 EXEC (*)
MANF VLVS STAT OVRD
1 OP - ITEM 40 EXEC
2 OP - ITEM 41 EXEC
3 OP - ITEM 42 EXEC
✓4 OP - ITEM 43

✓RCS F, ITEM 1 - (*)
MANF VLVS STAT OVRD
1 OP - ITEM 40 EXEC
2 OP - ITEM 41 EXEC
✓3 OP - ITEM 42
4 OP - ITEM 43 EXEC

Reconfigure to CAP DAP

GG FREE DRIFT

1 AUTO MNVR TO ATTITUDE

Change DAP A, B to A4, B3

GNC UNIV PTG

CRT ✓TGT ID, ITEM 8 - 2
 BODY VECT - ITEM 14 +5 EXEC
 Load Body Vector P,Y,OM (table, 10-7)
 ✓START TIME, ITEM 1 - in the past

If VERN jets avail
| DAP: B3/AUTO/VERN

If VERN jets not avail
| DAP TRANS: NORM/NORM/NORM,LOW Z
| DAP: B3/AUTO/NORM

GNC UNIV PTG

CRT TRK - ITEM 19 EXEC (CUR - *)
 ✓ERR TOT - ITEM 23 (*)

2 ESTABLISH FREE DRIFT

F6,F8 ✓Att mnvr complete
 ADI ATT - LVLH
L1 FLASH EVAP CNTLR PRI A,B (two) - OFF
 ✓SEC - OFF
 ✓HI LOAD DUCT HTR - OFF
 DAP ROT: PULSE/PULSE/PULSE

If VERN jets avail
| DAP: A4/AUTO/VERN
| Wait 3 min
| DAP: A4/MAN/VERN

If VERN jets not avail
| DAP: A4/AUTO/NORM
| Wait 30 sec
| Wait until $-0.01 < \text{Roll Rate} < 0.01$; then
| DAP: A4/MAN/NORM

Rcd MET / : :
 10-6 ORB OPS/ALL/GEN

NOTE
 If FREON EVAP OUT TEMP > 60, execute
 PRIORITY POWERDOWN PROCEDURES - GROUP A
 and subsequent (ORB PKT, PRIOR PWRDN)
 to maintain FREON EVAP OUT TEMP ≤ 55

3 VEHICLE RECOVERY AND FES RESTART

✓DAP ROT: PULSE/PULSE/PULSE

If VERN jets avail

014:F, | ✓RJD DRIVER (nine) - ON

015:F,

016:F

| ✓DAP: A4/MAN/VERN

If VERN jets not avail

| ✓DAP: A4/MAN/NORM

014:F, | ✓Primary RJD DRIVER (eight) - ON

015:F,

016:F

F6,F8

ADI ATT - as reqd

Reconfig to CAP DAP

DAP ROT: DISC/DISC/DISC

SM 88 APU/ENVIRON THERM

CRT (01) | If EVAP OUT TEMP > 41 and ≤ 47

L1 | RAD CNTLR OUT TEMP - HI

CRT (01) | When EVAP OUT TEMP = 50 + 2

L1 | or RAD CNTLR OUT TEMP - NORM,

| then immediately:

| FLASH EVAP CNTLR PRI A(B) - ON

CRT (01) | If EVAP OUT TEMP ≤ 41 or > 47

L1 | FLASH EVAP CNTLR PRI A(B) - ON

GRAVITY GRADIENT BODY VECTORS

		ATT ID	EXEC DATA			BODY RATES (±0.002)		
			P	Y	OM	R	P	Y
+	PLBD							
	X NORTH	A	357.51	0.97	249.18	0.002	0.024	-0.062
	L SOUTH	B	357.51	359.23	110.91	-0.002	0.024	0.062
V	IN-PLANE	C	359.06	0.11	4.44	0.000	-0.066	0.005
-	PLBD							
	X NORTH	D	177.51	0.77	69.09	0.002	-0.024	-0.062
	L SOUTH	E	177.51	359.03	290.82	-0.002	-0.024	0.062
V	IN-PLANE	F	179.06	359.89	175.56	0.000	0.066	-0.005

0.4 DEG/SEC PTC

1 MNVR TO PTC ATTITUDE

Config DAP: A1/AUTO/VERN

GNC UNIV PTG

CRT TGT ID - ITEM 8 +4 EXEC
BODY VECT - ITEM 14 +5 EXEC
P - ITEM 15 +2 7 0 EXEC
Y - ITEM 16 +0 EXEC
OM - ITEM 17 +2 7 0 EXEC
TRK - ITEM 19 EXEC (CUR - *)

2 INITIATE PTC ROTATION

Config DAP: A2/AUTO/NORM

GNC UNIV PTG

CRT BODY VECT - ITEM 14 +1 EXEC
ROT - ITEM 20 EXEC (CUR - *)
When ROT RATE ~0.4°/sec,
C3 DAP: A2/AUTO/VERN

3 TERMINATE PTC ROTATION

014:F, ✓Primary RJD DRIVER (eight) - ON
015:F,
016:F

DAP: A2/AUTO/NORM

GNC UNIV PTG

CRT CNCL - ITEM 21 EXEC
When RATES DAMPED,
C3 DAP: A2/AUTO/VERN
Reconfig to CAP DAP

ON-ORBIT RCS BURN, MM 202

NOTE

PRESS & VLV checks reqd only
on RCS pods to be used during
burn (steps 1 & 2)

WARNING

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

1 AFT RCS/OMS SYSTEM CHECK

If I'CONNECT: L(R) OMS to RCS

F7 ✓OMS PRESS He TK P L,R > 1500 psia
03 ✓L,R OMS OX,FU PRESS > 234 psia
C3 DAP: Configure for free drift
07 AFT L,R RCS TK ISOL (six) - CL (tb-CL)
XFEED (four) - OP (tb-OP)
08 ✓L,R OMS He PRESS VAP/ISOL (four) - CL
✓TK ISOL A,B (four) - OP (tb-OP)
✓XFEED A (two) - CL (tb-CL)
L(R) OMS XFEED B - OP (tb-OP)
C3 DAP: as reqd

GNC 23 RCS

CRT OMS PRESS ENA, L(R) OMS - ITEM 5(6) EXEC

If No I'CONNECT

03 ✓L,R RCS OX,FU PRESS > 190 psia
✓He PRESS > 456 psia
07 ✓AFT L,R RCS He PRESS A(B) (two) - GPC
(tb-OP)
✓He PRESS B(A) (two) - CL
(tb-CL)
✓TK ISOL (six) - OP (tb-OP)
✓XFEED (four) - CL (tb-CL)

2 FWD RCS SYSTEM CHECK

03 ✓FWD RCS OX,FU PRESS > 190 psia
 ✓He PRESS > 456 psia
08 ✓A(B) - GPC (tb-OP)
 ✓B(A) - CL (tb-CL)

3 LOAD TGT DATA AND MNVR

014:F, ✓Primary RJD DRIVER (eight) - ON
015:F,
016:F

CRT GNC 20 DAP CONFIG - ✓DAP Config to B1

C3 GNC UNIV PTG
 DAP: B/AUTO/VERN(NORM)

```
.....IF -X BURN.....  
. Perform Auto Mnvr to Burn Att .  
.                               .  
. Load MNVR OPTION:           .  
. R ITEM 5 + _ _ _ . _       .  
. P ITEM 6 + _ _ _ . _       .  
. Y ITEM 7 + _ _ _ . _ EXEC   .  
. START MNVR - ITEM 18 EXEC   .  
. When in Att, proceed        .  
.....
```

CNCL - ITEM 21 EXEC
GNC, OPS 202 PRO

1: GNC ORBIT MNVR EXEC
2: GNC SYS SUMM

Load TGT DATA per Burn Pad
LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC
✓BURN DATA per Burn Pad

If -X or Multi-Axis Burn:
| Perform Burn in current Att,
| ignore computed Att
If +X Burn:
MNVR - ITEM 27 EXEC (*)

4 PERFORM RCS BURN

F7/F8 FLT CNTLR PWR (two) - ON
014:E, ✓cb DDU (six) - c1
015:E,
016:E

 TIG -3:00 ADI ERROR/RATE - MED
 ATT - INRTL
C3 DAP: B1/MAN/NORM
 DAP ROT: DISC/DISC/DISC
 TRANS: NORM/NORM/NORM

.....IF I'CONNECT.....
.TIG -2:00 L(R) OMS He PRESS/VAP ISOL A - OP.
.....

NOTE

For Multi-Axis burns, if
VGO Z is neg, use Z,X,Y
sequence otherwise use X,Y,Z

F8 ✓BURN ATT then,
 ADI - REF
 ATT REF pb - push

 At TIG, deflect THC, null VGOs
 ✓ATT ERR \pm 3'
 Cutoff release THC ..
C3 DAP TRANS: PULSE/PULSE/PULSE

CRT GNC, OPS 201 PRO
F7/F8 FLT CNTLR PWR (two) - OFF
014:E, cb DDU (six) - as reqd
015:E,
016:E

C3 DAP: as reqd

.....IF I'CONNECT RETURN.....
· C3 DAP: Configure for free drift ·
· IGNC 23 RCS ·
· CRT OMS PRESS ENA, OFF - ITEM 7 EXEC ·
· 08 L,R OMS XFEED (four) - CL (tb-CL) ·
· L,R OMS He PRESS/VAP ISOL A - CL ·
· 07 AFT L,R RCS ·
· √He PRESS A(B) (two) - GPC (tb-OP) ·
· √B(A) (two) - CL (tb-CL) ·
· XFEED (four) - CL (tb-CL) ·
· TK ISOL (six) - OP (tb-OP) ·
· C3 DAP: as reqd ·
.....

10-13

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6 () .

LY 7 () .

RY 8 () .

WT 9

TIG 10 / : : .

PEG 7 TGTS

ΔVX 19 () .

ΔVY 20 () .

ΔVZ 21 () .

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

.

TGO :

VGO X
VGO Y
VGO Z

() .

() .

() .

HA HP

TGT ()

NOTES

OMS GMBLCK:

	PRE	POST - BURN
L PRI	<input type="checkbox"/>	<input type="checkbox"/>
L SEC	<input type="checkbox"/>	<input type="checkbox"/>
R PRI	<input type="checkbox"/>	<input type="checkbox"/>
R SEC	<input type="checkbox"/>	<input type="checkbox"/>

RCS I'CNNECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE PVAP ISOL

	GPC	OP	CL
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IMU DES

10-14

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10 / : : .

PEG 7 TGT5

ΔVX 19

ΔVY 20

ΔVZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="text"/>	<input type="text"/>
L SEC	<input type="text"/>	<input type="text"/>
R PRI	<input type="text"/>	<input type="text"/>
R SEC	<input type="text"/>	<input type="text"/>

RCS I'CONNECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/VAP ISOL

	GPC	OP	CL
A	<input type="text"/>	<input type="text"/>	<input type="text"/>
B	<input type="text"/>	<input type="text"/>	<input type="text"/>

IMU DES

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6 () .

LY 7 () .

RY 8 () .

WT 9

TIG 10 / : : .

PEG 7 TGTS

ΔV_X 19 () .

ΔV_Y 20 () .

ΔV_Z 21 () .

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔV_{TOT} .

TGO :

VGO X () .

VGO Y () .

VGO Z () .

HA

HP ()

TGT

10-15

ORB OPS/ALL/GEN

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="checkbox"/>	<input type="checkbox"/>
L SEC	<input type="checkbox"/>	<input type="checkbox"/>
R PRI	<input type="checkbox"/>	<input type="checkbox"/>
R SEC	<input type="checkbox"/>	<input type="checkbox"/>

RCS I'CNNECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/VAP ISOL

	GPC	OP	CL
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IMU DES

10-16

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6 () .

LY 7 () .

RY 8 () .

WT 9

TIG 10 / : : .

PEG 7 TGTS

ΔVX 19 () .

ΔVY 20 () .

ΔVZ 21 () .

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO :

VGO X () .

VGO Y () .

VGO Z () .

HA

HP ()

TGT

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="checkbox"/>	<input type="checkbox"/>
L SEC	<input type="checkbox"/>	<input type="checkbox"/>
R PRI	<input type="checkbox"/>	<input type="checkbox"/>
R SEC	<input type="checkbox"/>	<input type="checkbox"/>

RCS I'CNCT:

LOMS → RCS

ROMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/WAP ISOL

	GPC	OP	CL
A	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

IMU DES

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10

PEG 7 TGTS

Δ VX 19

Δ VY 20

Δ VZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

Δ VTOT

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

10-17

ORB OPS/ALL/GEN

NOTES

OMS GMBL CK:

	PRE	POST - BURN
L PRI	<input type="text"/>	<input type="text"/>
L SEC	<input type="text"/>	<input type="text"/>
R PRI	<input type="text"/>	<input type="text"/>
R SEC	<input type="text"/>	<input type="text"/>

RCS I'CNCT:

<input type="text"/>	L OMS → RCS
<input type="text"/>	R OMS → RCS
<input type="text"/>	NONE

DOWN MODE OPTIONS:

<input type="text"/>	2 OMS → 1 OMS → RCS
<input type="text"/>	2 OMS → 1 OMS
<input type="text"/>	1 OMS → RCS
<input type="text"/>	NONE

OMS HE REG TEST:
L,R OMS HE PVAP ISOL

	GPC	OP	CL
A	<input type="text"/>	<input type="text"/>	<input type="text"/>
B	<input type="text"/>	<input type="text"/>	<input type="text"/>

IMU DES

10-18

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X
 - X
 MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10

PEG 7 TGTS

ΔV_X 19

ΔV_Y 20

ΔV_Z 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔV_{TOT}

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBL CK:

PRE POST - BURN

L PRI

L SEC

R PRI

R SEC

RCS I'CONNECT:

L OMS \rightarrow RCS

R OMS \rightarrow RCS

NONE

DOWN MODE OPTIONS:

2 OMS \rightarrow 1 OMS \rightarrow RCS

2 OMS \rightarrow 1 OMS

1 OMS \rightarrow RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/VAP ISOL

GPC OP CL

A

B

IMU DES

10-19 ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10

PEG 7 TGTS

ΔVX 19

ΔVY 20

ΔVZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBLCK:

	PRE	POST - BURN
L PRI	<input type="text"/>	<input type="text"/>
L SEC	<input type="text"/>	<input type="text"/>
R PRI	<input type="text"/>	<input type="text"/>
R SEC	<input type="text"/>	<input type="text"/>

RCS I'CNNECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE PVAP ISOL

	GPC	OP	CL
A	<input type="text"/>	<input type="text"/>	<input type="text"/>
B	<input type="text"/>	<input type="text"/>	<input type="text"/>

IMU DES

10-20

ORB OPS/ALL/GEN

OMS BOTH 1

L 2

R 3

RCS SEL 4

+ X

- X

MULTI-AXIS

TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10 / : :

PEG 7 TGTS

ΔVX 19

ΔVY 20

ΔVZ 21

ORBITAL MANEUVER PAD FOR _____

MNVR ATT

R 24

P 25

Y 26

ΔVTOT

TGO

VGO X

VGO Y

VGO Z

HA

HP

TGT

NOTES

OMS GMBL CK:

PRE POST-BURN

L PRI

L SEC

R PRI

R SEC

RCS I'CONNECT:

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS

2 OMS → 1 OMS

1 OMS → RCS

NONE

OMS HE REG TEST:
L,R OMS HE P/VAP ISOL

GPC OP CL

A

B

IMU DES

LOSS OF VERNIERS

NOTE

Use TAIL ONLY CNTL for nominal & sleep config. Use NOSE & TAIL CNTL when reqd to minimize state vector perturbations; or as reqd during deploys, RNDZ, EVA or to meet payload requirements

DAP: Configure for free drift

1 CONFIG DAP FOR TAIL ONLY (NOSE & TAIL) CNTL

Change DAP A,B to A6,B2(A1,B3)

2 ESTABLISH PRIMARY CONTROL

014:F, ✓Primary RJD DRIVER (eight) - ON
015:F,
016:F
016:F ✓RJD L5/F5/R5 DRIVER - OFF

DAP: A6(A1)/MAN/NORM
A6(A1)/AUTO/NORM

RECOVERY OF VERNIERS

DAP: Configure for free drift

1 CONFIG DAP

Reconfig to CAP DAP

2 CONFIG FOR VERNIER (PRIMARY) CONTROL

016:F RJD L5/F5/R5 DRIVER - ON, wait 5 sec |

DAP: A/AUTO/VERN(NORM)

Faint, illegible text at the top of the page, possibly a header or introductory paragraph.

Several lines of faint, illegible text in the middle section of the page.

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Large block of faint, illegible text in the lower middle section of the page.

SEP MANEUVER

SEP MANEUVER..... 11-2

SEP MNVR

SEP MANEUVER

1 SET UP AFT STATION

A6U ✓SENSE - as reqd
 DAP: A/MAN/NORM
 DAP TRANS: as reqd
 DAP ROT: DISC/DISC/DISC
 FLT CNTLR PWR - ON

2 OBTAIN VISUAL CONTACT THROUGH OVHD WINDOW

DAP ROT: as reqd
RHC - as reqd

When adequate visual contact obtained,
DAP ROT: DISC/DISC/DISC

3 NULL CLOSING RATE

THC - +Z (dn - -X SENSE)
 (out - -Z SENSE)
as reqd to null closing rate

4 PERFORM RR ACQ (if desired)

A1U KU MODE - RDR PASSIVE
 RADAR OUTPUT - HI
 KU - AUTO TRACK
 KU CNTL - PNL

Slew antenna to target
✓KU TRACK tb - gray

If no TRK,
KU SEARCH - SEARCH (tb-gray)

If no lock-on within one minute,
repeat SEARCH as convenient

SEP MNVR

5 OBTAIN ~1 FPS OPENING RATE

A6U

DAP TRANS: NORM/NORM/NORM
THC - +Z for 3 sec.

* If Low Z (MCC call) *
* THC - +Z for 12 sec *

6 PERFORM OUT-OF-PLANE MANEUVER

CRT

GNC UNIV PTG
CNCL - ITEM 21 EXEC
GNC, OPS 202 PRO

GNC ORBIT MNVR EXEC
RCS SEL - ITEM 4 EXEC (*)

Set TIG to current time +2:00
TGT PEG 7 ΔV_x - ITEM 19 +0 EXEC
 ΔV_y - ITEM 20 +2 EXEC
 ΔV_z - ITEM 21 +0 EXEC
LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC

$\sqrt{VGO Z} \geq 0$; if $VGO Z < 0$, then

* TGT PEG 7 ΔV_y - ITEM 20 -2 EXEC *
* LOAD - ITEM 22 EXEC *
* TIMER - ITEM 23 EXEC *
* $\sqrt{VGO Z} \geq 0$ *

DO NOT MNVR to BURN ATT

A6U

At TIG deflect THC to null VGOs

7 PERFORM FINAL SEP

CRT

GNC ORBIT MNVR EXEC
 $\sqrt{RCS SEL - ITEM 4 (*)}$

If ΔVY (Block 6) is +2
| TV ROLL - ITEM 5 +2 7 0 EXEC
If ΔVY (Block 6) is -2
TV ROLL - ITEM 5 +0 9 0 EXEC

Set TIG to TIG from step 6 +15:00
TGT PEG 7 ΔV_x - ITEM 19 +3 EXEC
 ΔV_y - ITEM 20 +0 EXEC
 ΔV_z - ITEM 21 +0 EXEC

LOAD - ITEM 22 EXEC
TIMER - ITEM 23 EXEC
DAP: A/AUTO/NORM

At TIG -8:00; MNVR - ITEM 27 EXEC (*)

A6U At TIG deflect THC to null VGOS
FLT CNTLR PWR - OFF

8 MNVR TO MINIMUM DRAG ATTITUDE (-ZLV)

A6U DAP: A/AUTO/VERN

CRT GNC, OPS 201 PRO

GNC UNIV PTG

✓TGT ID - 2

BODY VECT - 3

OM - 180

START TRK - ITEM 19 EXEC (CUR *)

TOP
BACK OF 'ORBIT SPEC'

SM CHECKPOINT INITIATE

X: SM 1 DPS UTILITY

MMU 2 ASSIGN:
SM - ITEM 4 EXEC (*)

X: SM 60 TABLE MAINT

✓SM COMM BUFF - 'RDY'
INITIATE - ITEM 18 EXEC
✓Update of CHECKPT TIME
✓STATUS - 'GOOD'

Repeat procedures with MMU 1

After CHECKPT done:

X: SM 1 DPS UTILITY

✓CHECKPT RETRV ENA - ITEM 12 EXEC (*)

ORB OPS-1a/0/A

CUE CARD
CONFIG

HOOK
VELCRO

HOOK
VELCRO

FAB USE ONLY

CC 12-1

ORB OPS/ALL/GEN

CUE CARD
CONFIG

Orbit Spec (Back of SM Checkpoint) located
in Flight Supplement

CC 12-2

ORB OPS/ALL/GEN

TOP

FUEL CELL PURGE - MANUAL

1 TURN ON PURGE HEATERS

R12U FC PURGE HTR - ON

SM 69 FUEL CELLS

CRT ✓PURGE LN O2 T > 69
 ✓H2 T1 > 79
 ✓T2 > 40
Or, wait at least 15 min

2 MANUAL PURGE SEQUENCE

NOTE

Fuel cells must be purged separately

CAUTION

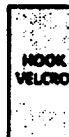
Do not purge FC if:
• Its AMPS > 350
• It is Shutdown
• Within 3 hrs of deorbit burn

CRT FC 1(2,3) FLOW O2 - note
 H2 - note

R12U FC PURGE VLV 1(2,3) - OP

CRT ✓FC 1(2,3) FLOW O2 - increase ~3.3 (max)
 ✓H2 - increase ~0.6 (max)

Wait 2 min, then,
R12U FC PURGE VLV 1(2,3) - CL, then GPC
CRT ✓FC 1(2,3) FLOW O2 - decr ~3.3 (max)
 ✓H2 - decr ~0.6 (max)
Repeat step 2 for FCs 2 and 3
Wait 30 min, then continue



3 TURN OFF PURGE HEATERS

R12U FC PURGE HTR - OFF, then GPC

4 If first on orbit purge, plot FC performance data points (Cue Card)

FUEL CELL PURGE - AUTO, SM 2(4)

CAUTION

Do not purge FC if:
• Its AMPS > 350
• It is Shutdown
Do not initiate auto purge within:
1 hr of any SM OPS transition or
3 hr of deorbit burn

R12U FC PURGE VLV (three) - GPC
 HTR - GPC
 GPC PURGE SEQ - START
 (After tb-gray, hold 3 sec)
If first on-orbit purge, wait 45 min, then plot
FC performance data points (Cue Card)

ORB OPS-2a/0/A

FAB USE ONLY

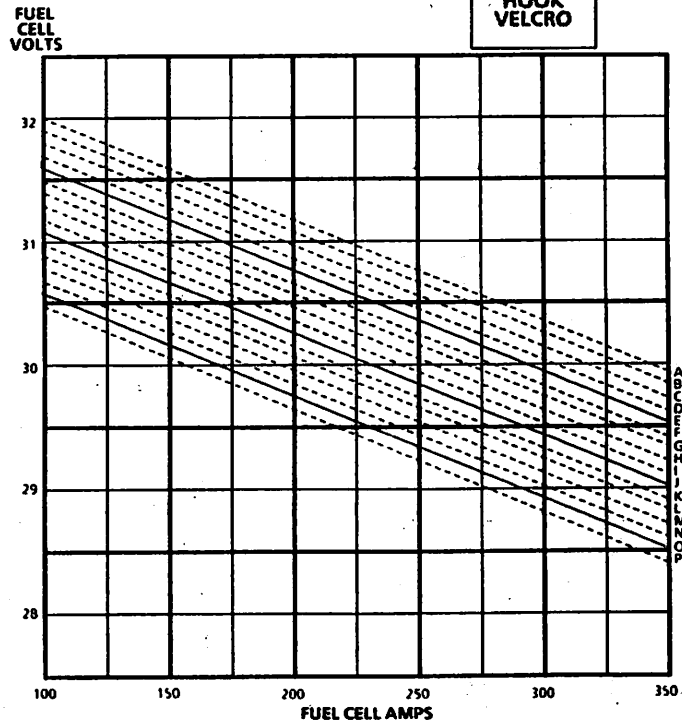
CC 12-3

ORB OPS/ALL/GEN

TOP
BACK OF 'FUEL CELL PURGE'

HOOK
VELCRO

ORB OPS-2b/0/A



NOTE
Record FC performance after first on-orbit purge. Each curve represents a difference in performance of 0.1 volts. A drop of 0.5 volts during a subsequent check indicates a degraded FC

- O = FC1
- X = FC2
- Δ = FC3

FAB USE ONLY

CC-12-4

ORB OPS/ALL/GEN
NASA-JSC

FLIGHT DATA FILE
CORE DISTRIBUTION
10/07/87

JSC
AP/Director
AP3/Support (2)
Pub. Information
CA7/Chief
DF24/INCO (4)
DF4/Crew Sys. (2)
DF75/Sys. Analysis Sect.
DG6/Rockwell
DH4/FDF MGR
FAO
T/L
Flt Act Br (11)
DH6/Branch Off
EC/Chief
EC6/Shuttle Support Branch (2)
EF2/Chief
EH3/Chief
Support
EH4/Chief
FX/FDF Rep.
JM2/Technical Library (3)
NS/Safety Div.
SD2/Surgeon Support (3)
SP4/Head
TM/Mgr
VF/Manager
VF3/Support
VF5/CPCB Rep.
VP/GFE Project Office
ZR1/MMC Library (2)
SD-DET2 (2)

Allied/Bendix Aerospace
OAG Suite 450
10210 Greenbelt Rd
Seabrook, MD 20706
Attn: J. F. Ryan (3)

Boeing
HS-04/D. Bennett

NASA Headquarters
MC/C. Lee

Kennedy Space Center
LSO-038/Tech. Data
LSO-207/J. Likon
LSO-209/Eng Learning Ctr,
VAB Rm MK3
TP-TMS-A/Astronaut Office (2)
TP-TMS-B/LCC VITT Office
TV-PEO-2/J. C. Fairey

Marshall Space Flight Center
CN22D/Tech Doc Repos
EE45/R. Marmann
MDAC-HSV MS12C/
K. A. Jackson (2)
W. S. Phillips
SA82/R. R. Pride

Goddard Space Flight Center
405/J. B. Hartmann
501/T. Janoski

Charles Stark Draper Lab
MS23/R. A. Larson

IBM - Houston
MC6272A/OBS T. O. Lib (2)

Lockheed - Houston
B16/R. D. Bassett (2)

Rockwell - Houston
RS12/W. E. Smith
RS14/Flt Mgr.

Singer-Link - Houston
SMS Data Library

Honeywell Inc. Avionic Division
13350 U.S. Highway 19
Clearwater, FL 33546
#818-5/J. R. Peterson

Martin-Marietta Corp. - Denver
- GOLDENROD -
G6245/Library
G6496/J. Barnes

Space Division
Worldway Postal Center
P.O. Box 92960
Los Angeles, CA 90009
SD-YOM/FDF
YOO/Data Mgr.
CFG5/E. Hill

AFSCF/VOS
P.O. Box 3430
Sunnyvale, CA 94088
Lt. Col. Etbauer (10)

Wyle Laboratories
ARI/E. C. Miller

Wyle Laboratories
3000 Bowers Ave.
Santa Clara, CA 95051
G. Asher

LAB For ATMOS & SPACE PHYS.
5525 Central Ave.
Boulder, CO 80301
Attn: Alan Stern

Total 100

ORBIT OPS CHECKLIST
CORE DISTRIBUTION
10/13/87

JSC
AP3/Chief
DF22/Head
DF4/Chief
DF6/GNC (4)
DF7/Environ. Sect. (2)
Sys Analysis Sect.
Pocket C/L Bk Mgr.
DG4/Comm/Inst (3)
DG47/Payload Sect.
DG66/Control/Prop Sect. (8)
DG67/DPS/NAV Sect. (4)
DH4/Book Manager (20)
DH6/Branch Office
EC3/Support (2)
EE2/RCA Support (2)
EE7/TCD FDF Mgr. (2)
EE8/Support
EH2/SAIL Testing
EH4/Support
ES6/Support
WG/Deputy Mgr

Goddard Space Flight Center
420/D. Filson (2)
742.2/J. Barrowman
S. Olden

Kennedy Space Center
LSO-038/Tech Data (4)
TV-GDS-23/B. Register
TV-MSD-13/C. W. Sperrn
TV-PEO-2/P. Puckett

Marshall Space Flight Center
CA01/L. Cywanowicz
CN22D/Repository
ES83/O. H. Vaughn
FA51/R. H. Ellis (2)

Rockwell - Houston
ZC01/(7)
R. Linow
555 Gemini
Houston, TX 77058

RSOC - Houston
RS12/B. Tubielewicz
Q. B. Hawkins
RS16E/Support (2)
T. O. Library
RS18/R. W. Hager
R. Solis

Rockwell International STS
12214 Lakewood Boulevard
Downey, CA 90241
841-BA36/M. J. Malagon (29)

Air Force Plant Representative
P.O. Box 504
Sunnyvale, CA 94086
Tech. Data, Dept. 95-20, Bldg. 104

Hamilton Standard
Bradley Field Rd.
Windsor Locks, CT 06096
1A204/T. H. Beck

Total 121