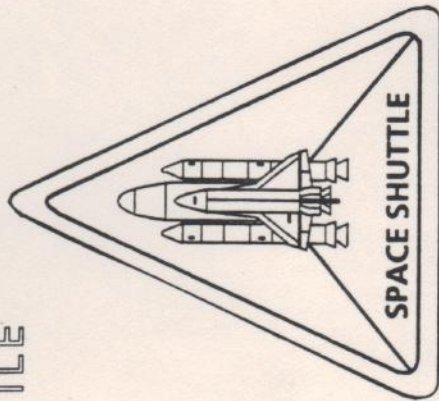


National Space Transportation System
FLIGHT DATA FILE



Red

ORBIT OPS CHECKLIST

STS

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APU/HYDRAULICS

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MANUAL CIRC PUMP 2 OPS..... 1-4

APU/HYD

HYD THERM COND - ENA

NOTE

Do not perform until after
PASS SM is active

A12 ✓HYD CIRC PUMP PWR 1 - MNA
 2 - MNB
 3 - MNC (MNA if SPACELAB)

SM SYS SUMM 2

NOTE

If HYD RSVR QTY decr > 10%,
close associated LG ISOL VLV

CAUTION

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

If buses tied for SPACELAB:

R1 MN BUS TIE A - ON
 B - OFF

R2 HYD CIRC PUMP 2 - ON
 Wait 10 sec

R4 HYD LG HYD ISOL VLV 2 - OP
 Hold 5 sec, ✓tb - OP

R2 HYD CIRC PUMP 2 - GPC (OFF if SPACELAB)

If buses tied:

R1 MN BUS TIE B - ON
 A - OFF

R2 HYD CIRC PUMP 3 - ON
 Wait 10 sec

R4 HYD LG HYD ISOL VLV 3 - OP
 Hold 5 sec, ✓tb - OP

R2 HYD CIRC PUMP 3 - GPC
 CIRC PUMP 1 - GPC

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, \sqrt{tb} - OP(CL)
- or
- HYD MPS/TVC ISOL VLV X - OP(CL)
Hold 5 sec, \sqrt{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

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COMM/
INST

RCD DATA ONLY (SLEEP)

C3 S-BD PM CNTL - CMD

SM 1 DPS UTILITY

CRT RTC (RCDR VOICE 1/2 - OFF via GCIL A(B))

ITEM 13 +7 1 0 9 0 1 F F EXEC
(710A 01FF)

CMD - ITEM 14 EXEC

ITEM 13 +7 9 0 9 0 0 5 D EXEC
(790A 005D)

CMD - ITEM 14 EXEC

RTC (OPS RCDR 1(2) RCD SERIAL 128)

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

CMD - ITEM 14 EXEC

ITEM 13 +A 8 8 9 8 6 1 0 EXEC
(A88A 8610)

CMD - ITEM 14 EXEC

SM 76 COMM/RCDR

NSP RCDR INPUT - DATA
OPS RCDRS 1(2) MODE - RCD A
TAPE - RUN

RCD DATA AND VOICE (POST-SLEEP)

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

C3 S-BD PM CNTL - CMD

SM 1 DPS UTILITY

CRT RTC (RCDR VOICE 1/2 - ON via GCIL A(B))

ITEM 13 +7 1 0 9 0 1 F F EXEC
(710A 01FF)

CMD - ITEM 14 EXEC

ITEM 13 +7 9 0 9 0 0 5 E EXEC
(790A 005E)

CMD - ITEM 14 EXEC

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

AIR ✓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)

KU-BD ACTIVATON

R15:C cb MNB KU ELEC - c1
 ✓ANT HTR - c1
 cb MNC KU SIG PROC - c1

A1U SIG STRENGTH sel - KU
 ✓SLEW RATE - SLOW
 ✓KU SCAN WARN tb - bp
 ✓TRACK tb - bp
 ✓SEARCH tb - bp
 ✓KU - MAN SLEW
 ✓RADAR OUTPUT - HI
 ✓SIG PROC HDR - TV
 ✓LDR - OPS RCDR
 MODE - RDR PASSIVE
 PWR - ON
 ✓CNTL - PNL

KYBD GNC, I/O RESET EXEC

CRT SM ANTENNA

I/O RESET KU - ITEM 8 EXEC (*)
✓SCAN WARN ENA - ITEM 5 (*)

NOTE

System warmup takes ~4 min

A2 DIGI-DIS SEL - EL/AZ
 ✓RANGE/ELEVATION - +000.0
 ✓RANGE RATE/AZM - +000.0

DIGI-DIS SEL - R/R

CRT When warmup complete,
 SELF TEST - ITEM 7 EXEC (*)

When SELF TEST complete (~3 min);

A1U ✓KU SCAN WARN tb - gray
 ✓TRACK tb - gray
 ✓SEARCH tb - gray

A2 ✓RANGE/ELEVATION - +888.8
 If RANGE/ELEVATION - +333.3, contact MCC

CRT SELF TEST - ITEM 7 EXEC (no *)

TAGS

TAGS MASTER POWER - ENABLE
TAGS POWER - ON (mom)
✓Mode, Paper, Overtemp Status Lamps off
(within 15 sec)

A1U

If operating in COMM mode:

KU MODE - COMM
KU - GPC DESIG
CNTL - CMD >>

or

If operating in RADAR mode:

CRT

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

- TAGS Deactivate TAGS per Cue Card
- 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,
Perform MAL, MECH, 9.5b, then
- R13L PL BAY MECH PWR SYS (two) - ON
- ✓KU ANT tb - STO (~23-46 sec)
If not STO, Perform MAL 9.5b, then
- A1U KU PWR - OFF
R15C cb MNB KU ELEC - OP
R13L KU ANT - GND
- ✓KU-BD is within STO envelope
(CCTV overlay)
- PL BAY MECH PWR SYS 1,2 (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, Use SLEW AZM and SLEW ELEV sw as required
A2 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 *)

DAP: A/AUTO/VERN

A6U

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

✓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 open-
ing 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

TAGS If TAGS MASTER POWER - ENABLE
Deactivate TAGS per Cue Card

KU-BD ANT DEPLOY

A1U ✓KU PWR - OFF
CNTL - PNL

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

A10 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

MO42F

MIDDECK SPKR 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
TONES	- ACCU/BYP
SPKR PWR	- SPKR/MIC

SPKR BOX CHECKOUT

MIDDECK SPKR AUD PWR - AUD
 Set off alert tone and adjust Bypass Tone volume as reqd
 CRT PWR (CRT left in STBY) - ON (then)-STBY
 MIDDECK SPKR AUD PWR - OFF
 Perform comm check w/GND using flt deck SPKR/MIC
 MIDDECK SPKR AUD PWR - AUD/TONE

A13

OS AUD SPKR PWR - OFF
 Perform comm check w/GND using middeck SPKR/MIC
 OS AUD SPKR PWR - SPKR/MIC

DUTY CREWMAN

103/104

R10 MS AUD PWR - AUD

102

A13 OS AUD PWR - AUD

ALL

MO42F MIDDECK SPKR AUD PWR - AUD
 TONES - ACCU

MO58F Conn CCU/HDST to sleep sta tones connector - set off tone

✓Receipt via HDST, Duty Crewman monitor for tones

NOTE

Duty crewman will hear tones only.
 Contact MCC if SM alert, but no message
 (Implies no command capability)

POST-SLEEP AUD CONFIG

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

A13 OS AUD SPKR PWR - OFF

 If TPNTR reqd,
 All AUD PNLs except
 TPNTR - A/G 2 - RCV, tw - R

103/104

R10 MS AUD ICOM A,B (two) - R, tw - R
 XMIT/ICOM MODE - R
 (If Duty Crewman,
 AUD PWR - AUD/TONE)

102

A13 OS AUD A/G 2 - RCV (If TPNTR reqd)
 ICOM A,B (two) - R, tw - R
 XMIT/ICOM MODE - R

ALL

06 ✓UHF MODE - as reqd

 WCCUs, LEG UNIT - ON
 AUD PNL PWR - AUD/TONE

MO42F MIDDECK SPKR AUD PWR - OFF
 A/G 2 - RCV
 ICOM A,B (two) - R
 XMIT/ICOM MODE - R
 (If Duty Crewman,
 AUD PWR - AUD/TONE)

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
- R1(A11) CYRO HEATER/MANF VLV Config per MCC |
CRT 3 ✓ CRT MAJ FUNC - one SM, one GNC
4 CRT TIMER FOR WAKE UP
5 ALERT TONE DURATION
- L1 6 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
✓ DDU's (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
- 6 ✓PWR OFF:
 FOOD WARMER (Non-Galley flights)
 TV PWR
- ✓ 7 MISSION NOTES

- ✓ 8 COMM/INST, PRE-SLEEP AUD CONFIG
- ✓ 9 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
- M032M 5 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 vlv - OP
- M032M If Entry day:
 - ✓ LEH 02 5 vlv - CL
 - Remove and stow 02 Bleed Orifice
 - ✓ LEH 02 5 vlv - R
- ✓ 6 FOOD PREP/POST (Cue Card)
- ✓ 7 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 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
- R1(A11) ~~X~~ ECLS, SUPPLY WATER DUMP
- ✓ 12 ECLS, CRYO 02 TK HTR SNSR CK
- A7L ✓ 13 MADS STRAIN GAGE - ON

3:15:41

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DPS

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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	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	

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	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	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

3/2:12:45 3/2:13:16

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	
CONFIG	2	
GPC	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	
CONFIG	2	
GPC	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/DPS RECONFIG (PL SYS/SL MAL)
- 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

1 DUMP PREP

NOTE

If PASS SM avail, monitor temps and QTY, otherwise dump only when MCC is available to monitor

Crew may reset SM alert limits to annunciate end of dump

If part of TKA and all of TKB is to be dumped:

- set TKB QTY LL to -10 to preclude nuisance alarm
- do not reset LL or dump TKA QTY less than 80

SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O SUPPLY QTY A	0620410	25.0	99.0
B	0620420	10.0	
C	0620548	45.0	
D	0620544		

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

ECLS

If only TKA is to be dumped:

R12L

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

Go to step 2

If only TKB is to be dumped or part of TKA
and all of TKB will be dumped:

NOTE

If dumping only part of TKA and all of
TKB the configuration is set up to
empty TKB and then start dumping TKA
through TKB

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

Go to step 2

If only TKC(D) is to be dumped or TKC and
TKD will be dumped:

SPLY H2O TKA,B OUTLET (two) - CL (tb-CL)

Close SPLY H2O TK C,D INLET and OUTLET
vlvs except on tank(s) to be dumped:

SPLY H2O TKC INLET - CL (tb-CL)
OUTLET - CL (tb-CL)

ML31C

TKD INLET - CL (tb-CL)

OUTLET - CL (tb-CL)

R12L

XOVR VLV - OP (tb-OP)

2 DUMP INITIATION

SM 66 ENVIRONMENT

- CRT ✓H2O SUPPLY DMP LN T \geq 65
- * If DMP LN T < 65, enable 2nd heater: *
 - * ML86B:A *
 - * cb MNB(MNA) H2O LINE HTR B(A) - c1 *
- R12L ✓SPLY H2O DUMP ISOL VLV - OP (tb-OP)
 VLV ENA/NOZ HTR - ON
 ✓VLV - CL (tb-CL)
- CRT When H2O SUPPLY NOZ T A,B (two) exceed
 100 (~5 min), continue
- R12L SPLY H2O DUMP VLV - OP (tb-OP)
- CRT ✓H2O SUPPLY QTY A(B,C,D) - decr
 (~2-3% per min)

If 'S66 H2O', H2O SUPPLY NOZ T A,B (two)
< 90, terminate dump immediately

NOTE

If the dump is terminated for H2O
SUPPLY NOZ T < 90, consult MCC about
dumping supply water through the FES
or through the waste water nozzle to
make ullage for fuel cell product
water

3 DUMP TERMINATION

- R12L SPLY H2O DUMP VLV - CL (tb-CL)
 CRT ✓H2O SUPPLY QTY A(B,C,D) - not decr
- * If H2O SUPPLY QTY A(B,C,D) decr, *
 - * Cycle H2O SUPPLY DUMP VLV *
 - * If not successful, *
 - * H2O DUMP ISOL VLV - CL (tb-CL) *
- R12L SPLY H2O DUMP VLV ENA/NOZ HTR - OFF
 ✓DUMP VLV tb - bp
 CRT ✓H2O SUPPLY NOZ T A,B (two) - not incr
- * If H2O SUPPLY NOZ T A,B (two) incr, *
 - * ML86B:A cb MNC SUPPLY H2O DUMP *
 - * VLV/NOZ HTR - OP *

SM60 TABLE MAINT

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

NOTE

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

4 TANK RECONFIGURATION

- R12L SPLY H2O XOVR VLV - CL (tb-CL)
 TKA OUTLET - CL (tb-CL)
 TKB OUTLET - OP (tb-OP)
 Open SPLY H2O TK C,D outlet and inlets
 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)

WASTE WATER DUMP

1 DUMP PREP

NOTE

If PASS SM available, monitor temps and QTY, otherwise dump only when MCC is available to monitor

Crew may reset SM alert limits to annunciate end of dump

CAUTION

Dumping waste tank 1 QTY below 5% can cause bellows damage

SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
H2O WASTE QTY 1	0620540		99
H2O WASTE NOZ T A	0620520	60	250
B	0620519	60	250

2 DUMP INITIATION

SM 66 ENVIRONMENT

CRT ✓H2O WASTE DMP LN T > 50

- * If H2O WASTE 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 - CL (tb-CL)
 CRT When H2O WASTE NOZ T A,B (two) exceed 250 |
 (~10 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% per
 min)
 ✓NOZ T A,B (two) - not incr

If 'S66 H2O', H2O WASTE NOZ T A(B) + then,
 ML31C WASTE H2O DUMP VLV - CL (tb-CL)
 CRT When H2O WASTE NOZ T A,B (two) exceeds
 250 (~8 min), continue
 ML31C WASTE H2O DUMP VLV - OP (tb-OP)

3 DUMP TERMINATION

ML31C WASTE H2O DUMP VLV - CL (tb-CL)
 CRT ✓WASTE H2O QTY 1 - not decr

- * If H2O QTY 1 decr, *
- * Cycle waste dump vlv, if not *
- * successful, *
- * ML31C WASTE H2O DUMP ISOL *
- * VLV - CL (tb-CL) *

CRT When H2O WASTE NOZ T A,B (two) exceeds 250
 (~8 min), continue

ML31C WASTE H2O DUMP VLV ENA/NOZ HTR - OFF
 ✓DUMP VLV tb - bp

- * If H2O WASTE NOZ T A,B (two) incr, *
- * ML86B:A *
- * cb MNA WASTE H2O DUMP VLV/NOZ *
- * HTR - OP *

SM 60 TABLE MAINT

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

NOTE

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		
Implement ECLS SSR-6 CABIN EQUIP PWRDN -----		
		} 1 to 9 °F
√H2O LOOP 2(1) ICH FLOW 950-----		
		} 8 °F
(L1)	FLOW PROP VLV LOOP 2 - ICH ----- (Check with MCC for payload impact)	} 1 °F
(L1)	FLOW PROP VLV LOOP 1 - ICH ----- (Check with MCC for payload impact)	} 4 °F
(MD44F)	CAB TEMP CNTLR vlv - FULL COOL-----	} 6 °F
(MD44F)	CAB TEMP CNTLR vlv - 2/3 COOL-----	} 4 °F
(MD44F)	CAB TEMP CNTLR vlv - 1/3 COOL-----	} 4 °F
(MD44F)	CAB TEMP CNTLR vlv - FULL HEAT-----	} 4 °F
(L1)	FLOW PROP VLV LOOP 1 - PL-----	} 1 °F
(L1)	FLOW PROP VLV LOOP 2 - PL-----	} 1 °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		



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	X
CRT	✓HUMID SEP A - (no '↓')	
L1	HUMIDITY SEP A - OFF	X
	B - ON	X
	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	5.99
L1	CAB FAN A - OFF	
	B - ON	5.86
	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	3.23
	2 - ~3.5	3.60
	3 - ~4.3	4.51 ↑
L1	AV BAY 1 FAN A - OFF	
	B - ON	3.78
	2 FAN B - OFF	
	A - ON	3.35
	3 FAN A - OFF	
	B - ON	4.35

SM 88 APU/ENVIRON THERM

L1 FREON PUMP LOOP 1 - B

CRT | If FLOW PROP VLV LOOP 1 tb - ICH
 | ✓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

CRT | If FLOW PROP VLV LOOP 2 tb - ICH
 | ✓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 ✓

CRT H2O PUMP LOOP 1 (two) - ON, A
 L1 ✓H2O LOOP 1 ICH FLOW > 900
 ✓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,
✓FREON EVAP OUT TEMP ind - $62^{\circ} \pm 2^{\circ} F$ ✓
- 01 L1 5 HI LOAD EVAP - OFF ✓
After 2.5 min,
✓FREON EVAP OUT TEMP ind - $62^{\circ} \pm 2^{\circ} F$ ✓
- 01 L1 6 HI LOAD EVAP - ENA ✓
- 7 FLASH EVAP CNTLR PRI B - ON ✓
SEC (two) - A SPLY, OFF ✓
After 2.5 min,
✓FREON EVAP OUT TEMP ind - $39^{\circ} \pm 1^{\circ} F$ ✓
- 01 L1 8 ✓FLOW PROP VLV LOOP 1,2 (two) tb - ICH ✓
- L1 9 RAD CNTLR OUT TEMP - NORM ✓

RAD STOW/DEPLOY

1 STOW RADIATORS

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 (two) - STO (concurrently)
 ✓(tb-bp ~40 sec, STO)
 - OFF

- * 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 MAL, MECH, 9.2b or 9.2d (Stbd) or *
- * MECH, 9.2f or 9.2h (Port) *

RAD LAT CNTL SYS (two) - LAT (concurrently)
 (tb-bp ~25 sec, LAT)
 - OFF
PL BAY MECH PWR SYS (two) - OFF

SINGLE RAD OPS

NOTE

Freon Loop 1 goes through PORT RAD and
Freon Loop 2 goes through STBD RAD

(Open MA73C:C&D MCA LOGIC PWR AC cbs for failed RAD)

<u>STBD RAD cbs</u>	<u>PORT RAD cbs</u>
AC1MID3	AC1MID1
AC2MID2	AC2MID4
AC3MID2	AC3MID4

2 DEPLOY RADIATORS

R13L

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

Zero Timer

PL BAY MECH PWR SYS (two) - ON

RAD LAT CNTL SYS (two) - REL (concurrently),
start Timer
✓(tb-bp ~25 sec, REL)

RAD LAT CNTL SYS (two) - OFF

RAD CNTL SYS (two) - DPY (concurrently)
✓(tb-bp ~40 sec, DPY)
- OFF

- * If either RAD deploys in > 40 sec, *
- * stop and consult MCC *
- * If either RAD tb not bp after 10 *
- * sec, stow and latch RADs *
- * Redeploy only good RAD (ref table *
- * pg 5-12) *

Verify Stbd & Port RAD Panels are deployed &
stabilized

PL BAY MECH PWR SYS (two) - OFF

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 9.2d (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

SM 68 CRYO SYSTEM

- R1 1 02 TK1 HTRS (one) - TEST (1 sec)
- CRT 2 ✓HTR CUR SNSR 1A,1B,2A,2B (four) - '↓'
 expect 'S68 CRYO 02' msg - ignore msg
- * If HTR CUR SNSR 1A and 2A (1B and 2B) *
 * not '↓', *
 * 02 TK 1 HTRS A(B) - OFF, then *
 * If HTRS A(B) was in AUTO, *
 * 02 TK 1 HTRS B(A) - AUTO *
- R1 3 02 TK1 HTRS (one) - RESET
- 4 Repeat steps 1-3 for the following:
- 02 TK 2 HTRS
 02 TK 3 HTRS (if 3 or more tanks flown)
- 5 If not 0V102 and 4 tanks flown, repeat
 steps 1-3 for:
- A11 CRYO TK4 HTR 02
- If 0V102 and 4 or 5 tanks flown,
- A11 CRYO TK4/5 HTR 02 TK4/5 - TEST
 (1 sec)
- CRT ✓HTR CUR SNSR TK4 1A,1B,2A,2B
 (four) - '↓'
 expect 'S68 CRYO 02' msg -
 ignore msg
- * If HTR CUR SNSR 1A and 2A (1B and 2B) *
 * not '↓', *
 * CRYO TK4/5 HTR 02 TK4(TK5) - OFF, then *
 * If TK4(TK5) was in AUTO, *
 * 02 TK5(TK4) HTR - AUTO *
- A11 CRYO TK4/5 HTR 02 TK4/5 - RESET
- 6 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

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
EVAP TEMP TOPPING AFT	0631802	-10	
FWD	0631801	-10	
L DUCT	0631800	-10	
NOZ	0631878	-10	
R DUCT	0631810	-10	
NOZ	0631879	-10	

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 *

PARAMETER NAME	PARA ID	SM ALERT	
		LOW	HIGH
EVAP TEMP TOPPING AFT	0631802	100	
FWD	0631801	100	
L DUCT	0631800	50	
NOZ	0631878	40	
R DUCT	0631810	50	
NOZ	0631879	40	

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

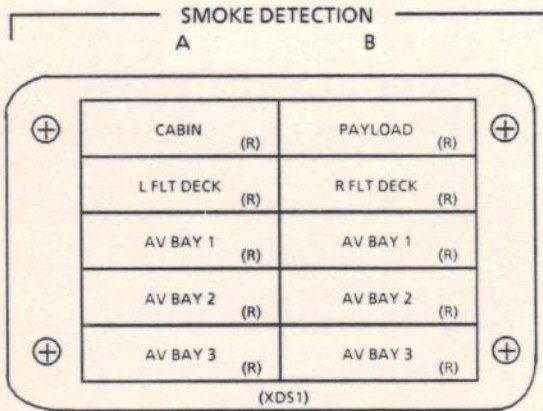
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EPS

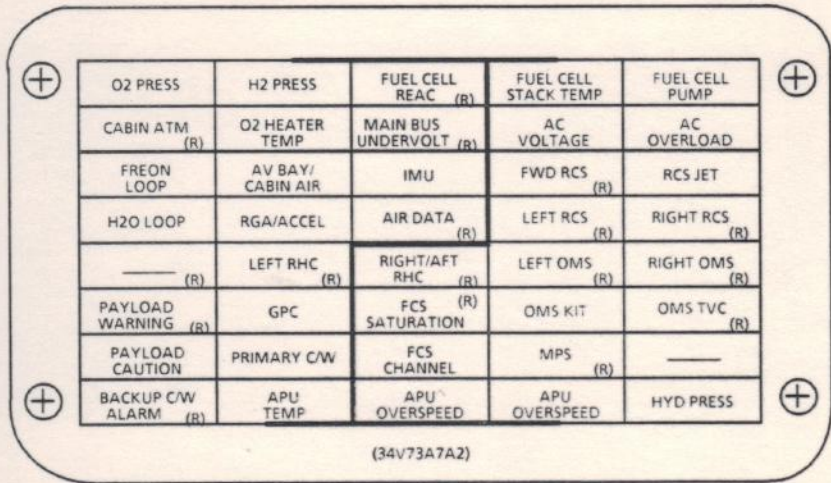
LAMP & FIRE SUPPR TEST..... 6-2
HEATER RECONFIG..... 6-6
FUEL CELL PURGE - AUTO..... 6-7
FUEL CELL PURGE - MANUAL..... 6-8

EPS

LAMP & FIRE SUPPR TEST



C/W PANEL



EPS

1 LAMP TESTForward 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)	ANTISKID 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)

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

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: *

* ✓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'r 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 *)

6 Report IMU align results

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
 $0.3^\circ \pm .05^\circ/\text{sec}$ 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 - ≤ .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

✓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

7 Report IMU align results

IMU ALIGNMENT - IMU/IMU

NOTE

Procedure must be accomplished
in GNC OPS 2 or 3

GNC 21 IMU ALIGN

IMU/IMU - ITEM 14 + ____ EXEC

 1 2 3
ΔX()_._ _ ()_._ _ ()_._ _

ΔY()_._ _ ()_._ _ ()_._ _

ΔZ()_._ _ ()_._ _ ()_._ _

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

NOTE

Align will require 3-6 min

Report IMU align results

VERIFY GOOD IMU/IMU ALIGNMENT

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

* IF ANG ΔX , ΔY , $\Delta Z \geq 0.13$ *
* 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)

Mnvr to center star in COAS:
ATT REF pb - push

F6
(A6U)

NOTE

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

DAP: A1/AUTO/VERN

1,3
1,28
1,28

3 CALIBRATE COAS AND VERIFY

CRT

Rcd CAL +X(-Z) Δ BIAS: 1.28
UPDATE - ITEM 28(29) EXEC, Rcd MET /_ _ :_ _
✓ Δ BIAS goes to zero
Repeat 'MARK ON STAR'
✓ Δ BIAS < .12

* If Δ BIAS > .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

Δ B 1.3

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 ✓
 017 ACCEL 3,4 (two) - ON ✓
 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 OPER - OFF

FUEL TK VLV - CL

✓Shutdn (hyd press)

CNTRLR PWR - OFF

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
C3

Set EVENT TIMER to 00:00, count UP ✓
✓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 ✓
 ✓APUSEL (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 *

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 ✓
✓shutdn (hyd press)
CNTLR PWR X - OFF ✓
BLR N2 SPLY X - OFF ✓
APU FUEL PUMP/VLV COOL A - AUTO ✓

Perform APU/HYD, HYD THERM COND - ENA, then: ✓

DAP: AI/AUTO/VERN ✓

C3

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, ADTANOTE

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>RGAR</u>	P	Y		
+18.8 to +21.2	+9.4 to +10.6	+9.4 to +10.6		
<u>ADTA</u>	PaC	PaU	PaL	T
PS .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>RGAR</u>	P	Y		
-18.8 to -21.2	-9.4 to -10.6	-9.4 to -10.6		
<u>ADTA</u>	PaC	PaU	PaL	T
PS 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 cl - 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 cl contacts preclude use of sw

Fail cl - 1st failure, deselect failed contact

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

ENTRY MODE:

Fail op or cl - 1st, 2nd failure, deselect contact
3rd failure, when in OPS 3,

GNC 51 OVERRIDE

AUTO SEL - ITEM 42
EXEC (*)

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
C3

FLT CNTLR PWR (two) - ON ✓
FCS CH (four) - ORIDE (wait 5 sec) ✓
- AUTO (no *) ✓

F2/F4

PITCH pb - AUTO ✓
- CSS ✓
ROLL/YAW pb - AUTO ✓
- CSS ✓

L2/C3

SPDBK/THROT pb - AUTO ✓
BODY FLAP pb - AUTO ✓
SBTC TAKEOVER pb - push ✓

SURF TEST

Notify MCC if any single surf feedback exceeds average of other three feedbacks by 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 fail-
ures - 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 xdcrc
Multi L(R) failures -
deselect all L(R) xdcrcs

RHC L(R): One xdcrc failure - reselect
good xdcrcs only
Multi L(R) failures - reselect
good xdcrcs 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

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; ✓ < 15% ✓

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

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 *) ✓

CRT2
F5
CRT2

L2
CRT2

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

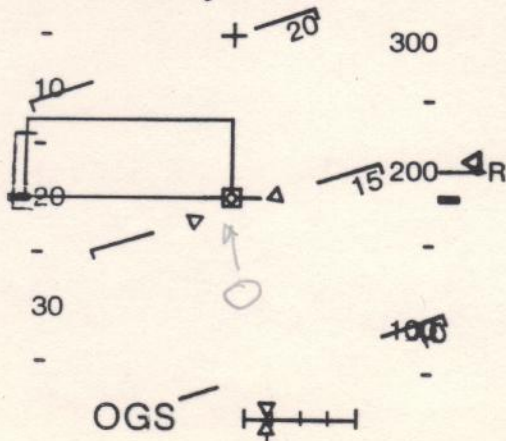
PARAMETER		LOW VALUE		HIGH VALUE	
F6/F8 ADI:	R, P, Y ATT	20 deg	✓	300 deg	✓
	R, Y RATE	2 ticks L	✓	3 ticks R	✓
	P RATE	2 ticks D	✓	3 ticks U	✓
	R, Y ATT ERR	2 ticks L	✓	3 ticks R	✓
	P ATT ERR	2 ticks D	✓	3 ticks U	✓
AMI:	ALPHA	+2 deg	✓	+30 deg	✓
	ACCEL	+20 fps ²	✓	+30 fps ²	✓
	M/VEL	20,060	✓	MACH 3	✓
	EAS	20 kts	✓	300 kts	✓
AVVI:	ALT ACCEL	-2 fps ²	✓	+3 fps ²	✓
	ALT RATE	-200 fps	✓	+300 fps	✓
	ALT	200 ft	✓	+300K ft	✓
	RDR ALT	200 ft	✓	+3000 ft	✓
HSI:	SEL COURSE	200 deg	✓	30 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%	✓

*CDI
NOISE
LOW
HIGH*

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 TESTTEST 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

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

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 INERT..... 8-2

MPS INERT

1 INITIALIZATION

R2 MPS PNEU He ISOL - OP
R4 MPS FILL/DRAIN L02,LH2 OUTBD (two) - OP
After 30 min, continue

2 TERMINATION

R4 MPS FILL/DRAIN L02,LH2 OUTBD (two) - CL
Wait ten sec:
L02,LH2 OUTBD (two) - GND
R2 MPS PNEU He ISOL - GPC

OM

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

O

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) > 564 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

✓BURN DATA per Burn Pad

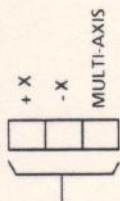
C3 DAP: If OPS 2, B/AUTO/VERN

If OPS 3, AUTO

CRT1 MNVR - ITEM 27 EXEC (*)

This Page Intentionally Blank

OMS BOTH 1
L 2
R 3
RCS SEL 4



TV ROLL 5

TRIM LOAD

P 6
LY 7
RY 8

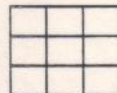
WT 9

TIG 10

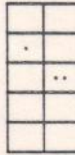
PEG 7 TGTS

ΔVX 19
ΔVY 20
ΔVZ 21

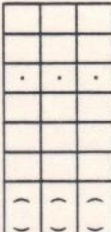
MNVRATT
R 24
P 25
Y 26



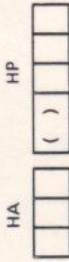
ΔVTOT
TGO



VGO X
VGO Y
VGO Z



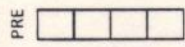
HA
TGT
HP



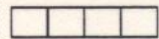
NOTES

OMS GMBL CK:

L PRI
L SEC
R PRI
R SEC

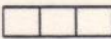


PRE POST-BURN



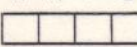
RCS I/CNECT:

L OMS → RCS
R OMS → RCS
NONE



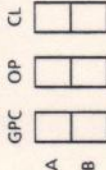
DOWN MODE OPTIONS:

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 B



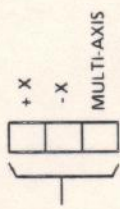
IMU DES



ORBITAL MANEUVER PAD FOR _____

OMS BOTH 1 [] [] [] []
 L 2 [] [] [] []
 R 3 [] [] [] []
 RCS SEL 4 [] [] [] []

TV ROLL 5 [] [] [] []



MNVRATT
 R 24 [] [] [] []
 P 25 [] [] [] []
 Y 26 [] [] [] []

ΔVTOT [] [] [] []
 TGO [] [] [] []

VGO X () () () ()
 VGO Y () () () ()
 VGO Z () () () ()

HA [] [] [] []
 HP [] [] [] []
 TGT [] [] [] []

TRIM LOAD

P 6 () () () ()
 LY 7 () () () ()
 RY 8 () () () ()
 WT 9 [] [] [] []
 TIG 10 [] [] [] []

PEG 7 TGT5

ΔVX 19 () () () ()
 ΔVY 20 () () () ()
 ΔVZ 21 () () () ()

NOTES

OMS GMBL CK:

L PRI [] [] [] []
 L SEC [] [] [] []
 R PRI [] [] [] []
 R SEC [] [] [] []

POST - BURN

[] [] [] []

RCS T/CNECT:

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 PIVAP ISOL

GPC OP CL [] [] [] []
 A [] [] [] []
 B [] [] [] []

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
CRT

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

2 PERFORM RCS JET TEST

NOTE

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

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

014:F,
015:F,
016:F
C3

PRIMARY RJD DRIVER (eight) - ON ✓

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

DAP: A/MAN/NORM ✓

F6
F7

ADI RATE - LO ✓
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 ✓

JET DES F2U ITEM 21 EXEC (*) ✓

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 ✓

CRT 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 ✓

F5 THC +X, 1 PULSE (fires jets R1A,L1A) ✓
 -X, 1 PULSE (fires jets F1F,F2F) ✓
 +Z, 1 PULSE (fires jets F1U,R1U,L1U) ✓
F6 +Y, 1 PULSE (fires jets F1L,L1L) ✓
 -Y, 1 PULSE (fires jets F2R,R1R) ✓

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

 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 F - ITEM 1 EXEC (*) ✓
 JET DES F1U ITEM 17 EXEC (*) ✓
 JET DES F2U ITEM 21 EXEC (no *) ✓

 THC +Z, 1 PULSE (fires jets F2U,L2U,R2U) ✓
 -Z, 1 PULSE (fires jets F1D,F2D,L2D,R2D) ✓
 +Y, 1 PULSE (fires jets F1L,L2L) ✓
 -Y, 1 PULSE (fires jets F2R,R2R) ✓

 ✓RCS F, ITEM 1 - (*) ✓
 JET DES F1U ITEM 17 EXEC (no *) ✓
 MANF VLVS STAT OVRD
 1 CL - ITEM 40 EXEC ✓
 2 CL - ITEM 41 EXEC ✓
 3 OP - ITEM 42 EXEC ✓
 4 OP - ITEM 43 EXEC ✓

CRT

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

THC +X, 1 PULSE (fires jets L3A,R3A) ✓
-X, 1 PULSE (fires jet F3F) ✓
-Z, 1 PULSE (fires jets F3D,F4D,L3D,R3D) ✓
+Y, 1 PULSE (fires jets F3L,L3L) ✓
-Y, 1 PULSE (fires jets F4R,R3R) ✓

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

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 ✓

THC +Z, 1 PULSE (fires jets F3U,L4U,R4U) ✓
-Z, 1 PULSE (fires jets F3D,F4D,L4D,R4D) ✓
+Y, 1 PULSE (fires jets F3L,L4L) ✓
-Y, 1 PULSE (fires jets F4R,R4R) ✓

C3

DAP ROT: DISC/DISC/DISC ✓

DAP: A/MAN/VERN ✓

F7/F8

FLT CNTLR PWR - OFF ✓

3 RECONFIGURE JET SELECT

CRT

✓RCS L, ITEM 2 - (*) ✓

MANF VLVS STAT OVRD

1 OP - ITEM 40 EXEC ✓

2 OP - ITEM 41 EXEC ✓

3 OP - ITEM 42 EXEC ✓

✓4 OP - ITEM 43 ✓

RCS R - ITEM 3 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 ✓

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,
015:F,
016:F

✓RJD DRIVER (nine) - ON

✓DAP: A4/MAN/VERN

If VERN jets not avail

014:F,
015:F,
016:F
F6,F8

✓DAP: A4/MAN/NORM

✓Primary RJD DRIVER (eight) - ON

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 - *)
C3 When ROT RATE $\sim 0.4^\circ/\text{sec}$,
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'CNECT: 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'CNECT

- 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
08 ✓He PRESS > 456 psia
✓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

GNC UNIV PTG

C3 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

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

.....IF I'CNECT......
.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

C3 At TIG, deflect THC, null VGOs
 ✓ATT ERR $\pm 3^\circ$
 Cutoff release THC ..
 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 .
.....

ORBITAL MANEUVER PAD FOR _____

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

()			.
()			.
()			.

MINVRATT

R	24		
P	25		
Y	26		

ΔVTOT

TGO

			.
	:		

VGO X

VGO Y

VGO Z

()			.
()			.
()			.

HA

--	--

HP

()		
-----	--	--

TGT

NOTES

OMS GMBL CK:

L PRI

L SEC

R PRI

R SEC

PRE POST - BURN

--	--	--	--

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

B

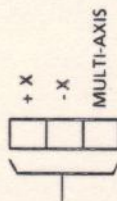
IMU DES

--

ORBITAL MANEUVER PAD FOR _____

OMS BOTH 1
L 2
R 3
RCS SEL 4

--	--	--	--



TV ROLL 5

--	--

TRIM LOAD

P 6
LY 7
RY 8

()	.		
()	.		
()	.		

WT 9

--	--	--	--	--

TIG 10

	/						:			.
--	---	--	--	--	--	--	---	--	--	---

PEG 7 TGTS

ΔVX 19
ΔVY 20
ΔVZ 21

()			.	
()			.	
()			.	

MNVR ATT

R 24				
P 25				
Y 26				

ΔVTOT

		.	
		:	

TGO

VGO X

VGO Y

VGO Z

()	.			
()	.			
()	.			

HA

HP

		()	
		()	

TGT

NOTES

OMS GMBL CK:

L PRI
L SEC
R PRI
R SEC

--	--	--	--

PRE POST - BURN

--	--	--	--

RCS I/CNECT:

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

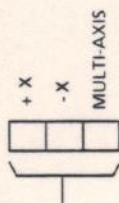
GPC OP CL

A			
B			

IMU DES

--

OMS BOTH 1
L 2
R 3
RCS SEL 4



TV ROLL 5

TRIM LOAD

P 6
LY 7
RY 8

WT 9

TIG 10

PEG 7 TGTS

AVX 19
AVY 20
AVZ 21

MINVRATT

R 24
P 25
Y 26

AVTOT
TGO

VGO X
VGO Y
VGO Z

HA
TGT

HP

NOTES

OMS GMBL CK:

L PRI
L SEC
R PRI
R SEC

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

A
B

GPC OP CL

IMU DES

ORBITAL MANEUVER PAD FOR _____

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 () () () () . [] [] [] []

MNVRATT

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'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 [] [] [] []
 B [] [] [] []

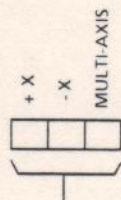
IMU DES

OMS BOTH 1

L 2

R 3

RCS SEL 4



TV ROLL 5

TRIM LOAD

P 6

LY 7

RY 8

WT 9

TIG 10

PEG 7 TGTS

ΔVX 19

ΔVY 20

ΔVZ 21

MNVR ATT

R	24	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
P	25	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Y	26	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

ΔVTOT

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
TGO	:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

VGO X

()	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
VGO Y	()	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
VGO Z	()	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>

HA

<input type="text"/>	<input type="text"/>
----------------------	----------------------

HP

()	<input type="text"/>	<input type="text"/>	<input type="text"/>
-----	----------------------	----------------------	----------------------

NOTES

OMS GMBL CK:

PRE

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

L SEC

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

R PRI

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

R SEC

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

POST - BURN

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

RCS F'CNNECT:

<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------

L OMS → RCS

R OMS → RCS

NONE

DOWN MODE OPTIONS:

<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
----------------------	----------------------	----------------------	----------------------

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

<input type="text"/>	<input type="text"/>
----------------------	----------------------

<input type="text"/>	<input type="text"/>
----------------------	----------------------

A

B

IMU DES

ORBITAL MANEUVER PAD FOR _____

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

()	.
()	.
()	.

MMVRATT

R 24

P 25

Y 26

--	--	--	--

ΔVTOT

TGO

				.	
	:				

VGO X ()

VGO Y ()

VGO Z ()

()	.
()	.
()	.

HA

HP

TGT ()

()				

NOTES

OMS GMBL CK:

L PRI

L SEC

R PRI

R SEC

PRE

POST - BURN

--	--	--	--

RCS I/CNECT:

--	--	--

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

CL

A

B

--	--

--	--

--	--

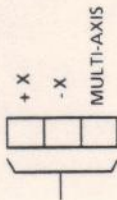
IMU DES

--

ORBITAL MANEUVER PAD FOR _____

OMIS BOTH 1 [] [] [] []

L 2 [] [] [] []
R 3 [] [] [] []
RCS SEL 4 [] [] [] []



TV ROLL 5 [] [] [] []

TRIM LOAD

P 6 () () () () () ()
LY 7 () () () () () ()
RY 8 () () () () () ()

WT 9 [] [] [] [] [] []

TIG 10 [] [] / [] [] : [] [] [] [] . [] [] [] []

PEG 7 TGT'S

ΔVX 19 () () () () () ()
ΔVY 20 () () () () () ()
ΔVZ 21 () () () () () ()

MNVRATT

R	24	[]	[]	[]	[]
P	25	[]	[]	[]	[]
Y	26	[]	[]	[]	[]

ΔVTOT [] [] [] []
TGO [] [] [] []

VGO X	()	[]	[]	[]	[]
VGO Y	()	[]	[]	[]	[]
VGO Z	()	[]	[]	[]	[]

HA [] [] [] []
TGT [] [] [] []
HP [] [] [] []
() [] [] [] []

NOTES

OMIS GMBL CK:

L PRI	[] [] [] [] [] []
L SEC	[] [] [] [] [] []
R PRI	[] [] [] [] [] []
R SEC	[] [] [] [] [] []

PRE POST - BURN

[]	[]	[]	[]	[]	[]
-----	-----	-----	-----	-----	-----

RCS T/CNECT:

L OMS → RCS	[] [] [] [] [] []
R OMS → RCS	[] [] [] [] [] []
NONE	[] [] [] [] [] []

DOWN MODE OPTIONS:

2 OMS → 1 OMS → RCS	[] [] [] [] [] []
2 OMS → 1 OMS	[] [] [] [] [] []
1 OMS → RCS	[] [] [] [] [] []
NONE	[] [] [] [] [] []

OMIS HE REG TEST:
L,R OMS HE PVAPISOL

GPC A	[] [] [] [] [] []
OP B	[] [] [] [] [] []
CL	[] [] [] [] [] []

IMU DES [] [] [] [] [] []

LOSS OF VERNIERS

NOTE

Unless otherwise specified in Deploy, RNDZ, PDRS, or EVA FS C/L's (to satisfy payload requirements), use TAIL ONLY CNTL for nominal and sleep configurations or NOSE & TAIL CNTL when required to minimize state vector perturbations

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)

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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

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 VG0s
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 *)

