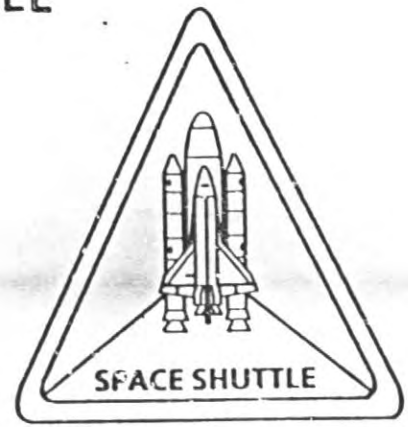
National Space Transportation System

FLIGHT DATA FILE



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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
1 - GPC

HYD THERM COND - TERM

SM 87 HYD THERMAL

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

R2	HYD CIRC PUMP 1,2,3 - OFF
	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
	3 - ON
	Wait 10 sec
R4	HYD LG HYD ISOL VLV 3 - CL
	Hold 5 sec, ✓tb - CL
R2	HYD CIRC PUMP 3 - OFF

APU HEATER RECONFIG

A12	APU HTR GAS GEN/FUEL PUMP(three) - B AUTO
	LUBE OIL LINE(three) - B AUTO
	TK/FU LINE/H2O SYS 1B,2B,3B - AUTO
	1A,2A,3A - 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, 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
R2	HYD CIRC PUMP 2 - OFF
R1	MN BUS TIE B - ON
	A - OFF

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COMM/
INST

RCD DATA ONLY

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

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

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)

KU-BD ANT DEPLOY

A1U ✓KU PWR - OFF
CNTL - PNL

R13L ✓ANT DIRECT STO - OFF
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

KU-BD ACTIVATON

R15:C
- cb MNB KU ELEC - cl
- ✓ANT HTR - cl
- ✓CABLE HTR - op
- MNC KU SIG PROC - cl

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

SM ANTENNA

CRT
- 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

When warmup complete,

CRT
- 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, ✓MCC

CRT
- SELF TEST - ITEM 7 EXEC (no *)

A1U KU MODE - COMM
KU - GPC DESIG
TAGS Perform TAGS ACTIVATION

TAGS ACTIVATION

TAGS MSTR PWR - ENA

If TAGS PWR lt - off:
A1U ✓KU CNTL - PNL
TAGS TAGS PWR - ON (mom)

A1U If KU MODE - RDR
✓CNTL - PNL
If KU MODE - COMM
CNTL - CMD

✓Mode, Paper, Overtemp Status Lamps off (within 15 sec)

If JAM/EMPTY lt - on:
ADV - ADV (mom)
Wait 30 sec (software init)
Remove paper sheet from tray
If JAM/EMPTY lt - on:
Perform MAL 2.8a, (MAL, COMM)

If initial TAGS activation:
ADV - ADV (mom)
Repeat to advance 3 pages into tray
Remove and dispose of waste paper

Notify MCC to perform remainder of config

On MCC call:
✓Top 2 sheets in tray for gray (exposed) areas
If no gray areas: Notify MCC to xmit test images

Notify MCC of test page quality

TAGS DEACTIVATION

If all expected msgs not received,
✓MCC

TAGS — If TAGS PAGE IMAGED lt - on:
TAGS ADV - ADV (wait 30 sec)
✓PAGE IMAGED lt - off
If lt remains on:
TAGS ADV - ADV (wait 30 sec)

✓DEV lt - off
If lt remains on, wait
30 additional sec

Check paper tray for msg
If no msg present, ✓MCC and proceed

TAGS MSTR PWR - OFF

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 / A2 — SLEW ELEV - as reqd:
RANGE/ELEVATION - 0(± 5°)

A1U / A2 — SLEW AZM - as reqd:
RANGE RATE/AZM - 0(± 5°)

A1U — SLEW ELEV - UP (hold for 14 sec)

If not stowing antenna:
SLEW RATE - SLOW
KU CNTL - GPC DESIG
CNTL - CMD

KU-BD ANT STOW

TAGS — Perform TAGS DEACTIVATION, then:

DAP: VERN (FREE if in PRI)

R13L — ✓PL BAY MECH PWR SYS 1,2 (two) - OFF

A1U — ✓KU PWR - ON
KU - MAN SLEW
MODE - RDR PASSIVE
CNTL - PNL

A2 — ✓DIGI-DIS SEL - EL/AZ

Perform KU-BD ANT CABLE POSITIONING, then:

A1U — SLEW RATE - as reqd

SLEW ELEV - as reqd:

A2 — RANGE/ELEVATION: -27.0(± 1°)

A1U
A2 — SLEW AZM - as reqd:
RANGE RATE/AZM: -123.0(± 1°)

R13L — KU ANT - STO
Wait 50 sec

A2 — ✓RANGE/ELEVATION: -29.0(± 1°)
✓RANGE RATE/AZM: -125.0(± 1°)

If angles incorrect,
Perform MAL, MECH, 9.5b, then:

R13L — PL BAY MECH PWR SYS 1,2 (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
MNC KU SIG PROC - op

R13L — KU ANT - GND

✓KU-BD is within STO envelope

PL BAY MECH PWR SYS 1,2 (two) - OFF

KU-BD MANUAL ACQUISITION (COMM)

1. SETUP

A2
A1U

✓DIGI-DIS SEL - EL/AZ
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

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, ✓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 :B — MCA LOGIC MNC MID 2 - OFF
MNB MID 4 - OFF

ML86B:D — cb MNA PYRO JETT SYS A KU ANT - cl
MNC PYRO JETT SYS B KU ANT - cl

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 TRANS: PULSE/PULSE/NORM

If VERN jets avail:
  DAP: A1/INRTL/VERN
If VERN jets not avail:
  DAP: B1/INRTL/PRI

Wait until rates damped, then:
  DAP: A/FREE/PRI
✓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 fps)
  (-X sense: THC dn)
  (-Z sense: THC out)
DAP: INRTL

WHEN >100' AWAY, SECOND SEP BURN

SENSE - as reqd
THC: +Z, 2 sec (1 fps)
  (-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-*)

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
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:
Go to TAGS DEACTIVATION

STD S-BD/KU-BD PNL CONFIG

If configuring for TDRS KU-BD:
Prior to configuring A1L/C3,
If KU in radar, config for KU COMM and perform KU-BD MANUAL ACQUISITION (COMM), 2-9

If KU in COMM
✓KU TRACK tb - gray
Else, perform KU-BD MANUAL ACQUISITION (COMM), 2-9

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

NOTE
If S-BD mode TDRS or STDN HI, xmit may be delayed 140 sec for PA warmup. Receive not affected

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

06 UHF MODE - as reqd

FLIGHT DECK/MIDDECK AUD CONFIG

Perform STD HANDHELD MIC/SPEAKER CONFIG, 2-16, then:

SPKR BOX CHECKOUT

M042F 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 handheld mic
MIDDECK SPKR AUD PWR - AUD/TONE

A13 OS AUD SPKR PWR - OFF
Perform comm check w/GND using middeck handheld mic
OS AUD SPKR PWR - SPKR

NOTE
If during sleep period, SM ALERT is annunciated with no fault msg, MCC has no command capability. ✓MCC. If no joy, perform COMM LOST (OPCL, COMM)

POST-SLEEP AUD CONFIG

06 /UHF MODE - as reqd

If handheld mic/speaker operation:
Perform STD HANDHELD MIC/SPEAKER CONFIG, 2-16

If VLHS/HIU operation:
Perform STD VLHS/HIU CONFIG (NO SPEAKER), 2-17

If WCCS operation:

NOTE

More than one crewmember per WCCS channel will cause intermittent loss of comm. Turn unused WCCS leg units OFF

Perform STD VLHS/HIU CONFIG (NO SPEAKER), 2-17

STD HANDHELD MIC/SPEAKER CONFIG

NOTE

For PRE-SLEEP AUD CONFIG, MS(OS*) A/G 2, and MIDDECK SPKR AUD A/G 2 switches should remain off.
* indicates OV102

FLIGHT DECK CONFIG

R10(A13*)	MS(OS*) AUD PWR	- AUD/TONE
	A/G 1	- T/R, tw-2
	A/G 2	- RCV, tw-2
	A/A	- T/R, tw-2
	ICOM A,B (two)	- RCV, tw-2
	XMIT/ICOM MODE	- PTT/PTT
A13	OS AUD SPKR PWR	- SPKR
	MSTR SPKR VOL	- 8
A11	MS(OS*) COMM CCU PWR	- ON
A2	MIC LEVEL	- fully ccw
	A11 WCCS leg units	- off

MIDDECK CONFIG

M042F	MIDDECK SPKR AUD A/G 1	- T/R, tw-2
	A/G 2	- RCV, tw-2
	A/A	- T/R, tw-2
	ICOM A,B (two)	- RCV, tw-2
	XMIT/ICOM MODE	- PTT/PTT
	SPKR PWR	- SPKR
	MSTR SPKR VOL	- 8
M039M	MIDDECK COMM CCU PWR	- ON
M029J	MIC LEVEL	- fully ccw
	A11 WCCS leg units	- off

STD VLHS/HIU CONFIG (NO SPEAKER)

XX	XX AUD PWR	
	A/G 1	- AUD/TONE
	A/G 2	- T/R, tw-2
	A/A	- RCV, tw-2
	ICOM A,B (two)	- T/R, tw-2
	XMIT/ICOM MODE	- T/R, tw-2
XX	CCU PWR	- PTT/VOX
A13	OS AUD SPKR PWR	- ON
	MSTR SPKR VOL	- OFF
A2	MIC LEVEL	- MIN
MO42F	MIDDECK SPKR AUD TONES	- FULLY CCW
	SPKR PWR	- ACCU/BYPASS
	MSTR SPKR VOL	- OFF
MO29J	MIC LEVEL	- min
		- fully ccw

NOTE

Unused audio loops either RCV or OFF.
Unused VLHS comm systems either disconnected or CCU PWR OFF and HIU VOL 0

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PRE-SLEEP ACTIVITY

FLIGHT DECK ACTIVITY LIST

- ~~IMU ALIGNMENT:~~
  Mnvr to IMU Align Att as scheduled per FLT PLN
  Perform IMU ALIGN - S TRK (GNC), 7-2, then:
  Return to FLT PLN ATT

NOTE

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

CREW SYS

2. ECLS, ~~SUPPLY WATER~~ DUMP
   CRYO HEATER/MANF VLV Config per MCC

3. DPS, SM CHECKPOINT INITIATE

CRT

4. CRT MAJ FUNC - one SM, one GNC

5. CRT TIMER FOR WAKE UP

6. ALERT TONE DURATION

L1

7. CAB TEMP - adj rotary as reqd

8. POWERDOWN:
   CRTs (one GNC-OFF, one SM-OFF)
   Perform ERR LOG reset:

   GNC 0 GPC MEMORY

   SM 0 GPC MEMORY

C3

BFC CRT DISP - ON

C2

SEL - CRT X
X - STBY

✓PWR OFF:
TV MON
CAMERAS
PWR CONTR UNIT
PWR
VTR
PLB LIGHTS
DDUs (one ON, if reqd)

9. COMM/INST, KU-BD ANT CABLE POSITIONING

10. WINDOW SHADES/FILTERS

11. LIGHTING

O14:F, O15:F, O16:F 12. Primary RJD DRIVER (eight) - OFF

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-Gallery flights)
TV PWR

7. MISSION NOTES

N/A 8. COMM/INST, PRE-SLEEP AUD CONFIG

9. LIGHTING

10. EMPTY TAGS PAPER TRAY

POST-SLEEP ACTIVITY

MIDDECK ACTIVITY LIST

1. LIGHTING (minimize if in GROUP B(C) PWRDN)
2. CO2 ABSORBER REPLACEMENT (Cue Card)
3. MESSAGE REVIEW
4. COMM/INST, POST-SLEEP AUD CONFIG

MO32M 5. If FD2:
- LEH O2 5 vlv - CL
- Insert O2 Bleed Orifice Assembly into LEH O2 5 QD
- LEH O2 5 vlv - OP

C7
- LEH O2 SPLY 1,2 vlvs - OP

MO32M If Entry day:
- LEH O2 5 vlv - CL
- Remove and stow O2 Bleed Orifice
- ~~LEH O2 5 vlv - R~~

6. FOOD PREP/POST (Cue Card)
7. HOUSEKEEPING

FLIGHT DECK ACTIVITY LIST

1. LIGHTING (minimize if in GROUP B(C) PWRDN)
2. WINDOW SHADES/FILTERS
3. COMM/INST, KU-BD ANT CABLE POSITIONING
4. CRTs (three) - ON (use only one CRT if in GROUP B(C) PWRDN)

C3
5. BFC CRT DISP - OFF
6. ALERT TONE DURATION

L1

7. CAB TEMP - adj rotary as reqd
   If Entry day:
   CAB TEMP - full COOL
   Wait 20 min
   CAB TEMP CNTLR - OFF

8. If planned: Perform I'CNCT L(R) OMS to RCS (ORB PKT, RCS), then:

014:F, 015:F, 016:F

9. Primary RJD DRIVER (eight) - ON (OFF if in GROUP B(C) PWRDN)

10. IMU ALIGNMENT:
    Mnvr to IMU Alight Att as scheduled per FLT PLN
    Perform GNC, IMU ALIGN - S TRK, then:
    Return to FLT PLN ATT

NOTE

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

R1(A1L)

11. ECLS, SUPPLY WATER DUMP
    CRYO HEATER/MANF VLV config per MCC

12. EPS, CRYO O2 TK HTR SNSR CK

CPA OPS

1. Destow CPA
2. Selector sw - SCAN (2-min warmup)
3. Log middeck readings for each sensor
4. Selector sw - OFF
5. Restow CPA

DATA LOG

MET	LOCATION	DATA READINGS, ppm	REMARKS
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	

MET	LOCATION	DATA READINGS, ppm	REMARKS
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	

MET	LOCATION	DATA READINGS, ppm	REMARKS
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	
__/__:__		1. CO ____ 2. HCN ____ 3. HF ____ 4. HC1 ____	

DPS

SINGLE G2 GPC OPS..... 4-2
DUAL G2 GPC OPS..... 4-4
G2 TO G8 TRANSITION..... 4-5
G8 TO G2 TRANSITION..... 4-6
SM OPS TRANSITION..... 4-8
CHECKPOINT INITIATE..... 4-9

SINGLE G2 GPC OPS

1. If RNDZ NAV enabled:
   Perform G2 TO G8 TRANSITION, step 3, 4-5,
   then:

2. FORM SINGLE G2 GPC SET

CRT

If MM202: GNC, OPS 201 PRO

[GNC 0 GPC MEMORY]

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

3. FREEZE DRY GPC 2 (G2 FD)

CRTX

MAJ FUNC - PL

GPC/CRT2/X EXEC

[X: PL GPC MEMORY]

CONFIG - ITEM 45 +2 EXEC

GPC - ITEM 46 +2 EXEC

STORE - ITEM 47 EXEC

Store complete when MC = 02
(~30 sec)

06

GPC MODE 2 - STBY(tb-bp), then HALT
- STBY(tb-RUN)
- HALT(tb-bp)

4. CONFIGURE STAR TRKRS

[GNC 22 S TRK/COAS CNTL]

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

[GNC 21 IMU ALIGN]

RESUME

DPS

5. CLEAR SOFTWARE FAIL VOTES

ON MCC GO
GNC 0 GPC MEMORY
ITEM 48 EXEC
SM 0 GPC MEMORY
ITEM 48 EXEC

6. If resuming RNDZ NAV TRACKING:
   Perform G8 TO G2 TRANSITION, step 3, 4-6

DUAL G2 GPC OPS

1. If RNDZ NAV enabled:
   Perform G2 TO G8 TRANSITION, step 3, 4-5, then:

2. 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

3. 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

4. CONFIGURE STAR TRKRS

   [GNC 22 S TRK/COAS CNTL]
   S TRK -Y, -Z: STAR TRK - ITEM 3,4 EXEC (*)
   [GNC 21 IMU ALIGN]
   RESUME

5. If resuming RNDZ NAV TRACKING:
   Perform G8 TO G2 TRANSITION, step 3, 4-6

G2 TO G8 TRANSITION

SM 62 PCMMU/PL COMM (161)

1. If FORMAT ID not 103/161, then:
   LOAD PCMMU FORMAT (ORB OPS FS, COMM/INST)
   FORMAT ID: 103/161

GNC 0 GPC MEMORY

2. 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
	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 GPC

MC 8 CONFIG TABLE		
CONFIG	GPC	8 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

3. If RNDZ NAV enabled and
   UNIV PTG in TRK with TGT ID = 1:

C3
CRT

   DAP: FREE

   UNIV PTG

   CNCL - ITEM 21 EXEC

014:E, 4. /cb ADTA (four) - c1
015:E,
016:E
08

   /MLS (three) - ON
   GNC, OPS 801 PRO

G8 TO G2 TRANSITION

SM 62 PCMMU/PL COMM (all)

1. If FORMAT ID 103/161 not appropriate, load desired PCMMU FORMAT (ORB OPS FS, COMM/INST)

GNC 0 GPC MEMORY

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

If 2 GNC GPCs

MC 2 CONFIG TABLE		
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

If 1 GNC GPC

MC 2 CONFIG TABLE		
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

GNC, OPS 201 PRO

3. If RESUMING RNDZ NAV TRACKING:
If RNDZ OPS, go to RNDZ NAV RECOVERY (RNDZ, CONTINGENCY OPERATIONS)
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,PRI as reqd
ROT: DISC/DISC/DISC

GNC 22 S TRK/COAS CNTL

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

GNC 21 IMU ALIGN

RESUME

If in OPS 8 for other than FCS C/O:

014:E,
015:E,
016:E
08

✓cb ADTA (four) - op

✓MLS (three) - OFF

don't do

SM OPS TRANSITION

1. If reqd,
   Perform SM CHECKPOINT INITIATE
   [GNC 1 DPS UTILITY]
   ✓CKPT RETRV ENA - ITEM 12 (*)

2. Perform PL DPS RECONFIG, Secure (PL SYS, REF DATA) or SL MDM LINK DISABLE, SSR-11 (SLP(M) MAL, CDMS), then:

3. If reqd,
   LOAD PCMMU FORMAT (ORB OPS FS, 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: SM 1 DPS UTILITY]
   UL CNTL AUTO - ITEM 35 EXEC (*)

6. If RMS onboard and MCIU pwrd, turn on MCIU I/O and cancel safing
   [SM 94 PDRS CONTROL] (MA, C/W GPC DATA lt-on)
   Item 5 EXEC (*)
   SAFING - CANCEL (tb-bp)
   ✓C/W GPC DATA lt - off

7. Perform PL DPS RECONFIG, Recovery (PL SYS, REF DATA) or REENABLE SL MDM LINKS, SSR-10 (SLP(M) MAL, CDMS)

SM CHECKPOINT INITIATE

015:F ✓MMU 2 - ON

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'

If in GROUP B(C) PWRDN, MMU 2 - OFF

Repeat procedures with MMU 1

After CHECKPT done:

X: SM 1 DPS UTILITY

✓CHECKPT RETRV ENA - ITEM 12 EXEC (*)

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ECLS

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SUPPLY WATER DUMP

1. DUMP PREP

NOTE

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

If no comm: QTY of approx 200% among TKs A,B,C,D is reqd for deorbit/entry FES usage.

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	
B	0620420	10.0	
C	0620548	45.0	99.0
D	0620544		

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

nm -41156

ECLS

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

R12L

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

Go to step 2

If TKB and TKD will be dumped together:

NOTE

If dumping TKB and TKD together, the configuration will isolate TKC to preserve it for possible EVA usage

SPLY H2O TKC INLET - CL (tb-CL)
OUTLET - CL (tb-CL)
✓TKA OUTLET - CL (tb-CL)
✓TKB OUTLET - OP (tb-OP)

ML31C
R12L

✓TKD OUTLET - OP (tb-OP)
XOVR VLV - OP (tb-OP)

2. DUMP INITIATION

SM 66 ENVIRONMENT

CRT ✓H2O SUPPLY DMP LN T ≥ 65

ML86B:A * If DMP LN T < 65, enable 2nd heater: *
* cb MNB(MNA) H2O LINE HTR B(A) - cl *

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), cont

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

CRT ✓H2O SUPPLY QTY A(B,C,D) - decr (~1-2% per min)

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

NOTE

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

3. DUMP TERMINATION

R12L
CRT — SPLY H2O DUMP VLV - CL (tb-CL)
✓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
CRT — ✓H2O SUPPLY NOZ T A,B (two) ✓tb - bp - not incr

ML86B:A
* If H2O SUPPLY NOZ T A,B (two) incr: *
* cb MNC SUPPLY H2O DUMP VLV/NOZ *
* HTR - op *

SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT LOW	SM ALERT HIGH
H2O SUPPLY NOZ T A	0620440	-82	250
B	0620439	-82	250

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

SUPPLY WATER DUMP USING FES

NOTE

If PASS SM avail, monitor tank QTY; otherwise, monitor dump time provided by MCC

Approximately 8%/hr net Supply water used by this method

1. DUMP PREP

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

If TKA to be dumped, do not dump TKA QTY less than 80 and set TKB QTY LL to -10 to preclude nuisance alarm

SM 60 TABLE MAINT

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

R12L ✓SPLY H2O XOVR VLV tb - ~~Et~~ OP

2. DUMP INITIATION

L1 RAD CNTLR OUT TEMP - HI
If FES not activated,
O1 When EVAP OUT T -50 degF,
L1 FLASH EVAP CNTLR PRI A - ON
After one min,
✓EVAP OUT T -39 degF

3. DUMP TERMINATION

L1 RAD CNTLR OUT TEMP - NORM
FLASH EVAP CNTLR PRI A - OFF
If FES reqd: let RAD OUT T dec to ~38
01 When EVAP OUT T < 40 degF, evap OUT T inc to 50
L1 FLASH EVAP CNTLR PRI A - ON evap out T dec to < 40

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

WASTE WATER DUMP

1. DUMP PREP

NOTE

If PASS SM avail, monitor temps and QTY; otherwise, dump only when MCC avail to monitor.

Crew may reset SM alert limits to annunciate end of dump

CAUTION

Dumping waste TK1 QTY below 5% can cause bellows damage

SM 60 TABLE MAINT

PARAMETER NAME	PARA ID	SM ALERT LOW	SM ALERT HIGH
H2O WASTE QTY 1	0620540		99
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) - cl *

ML31C WASTE H2O DUMP VLV ENA/NOZ HTR - ON
✓VLV - CL (tb-CL)
CRT When H2O WASTE NOZ T A,B (two) exceed 250
(~10 min), cont
ML31C ✓WASTE H2O TK1 VLV - OP (tb-OP)
✓DUMP ISOL VLV - OP (tb-OP)
VLV - OP (tb-OP)

CRT /H2O WASTE QTY 1 - decr (~1-2% 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), cont
ML31C WASTE H2O DUMP VLV - OP (tb-OP)

3. DUMP TERMINATION ~3 min

ML31C WASTE H2O DUMP VLV - CL (tb-CL)
CRT /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), cont
ML31C WASTE H2O DUMP VLV ENA/NOZ HTR - OFF
/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	-82	250
B	0620519	-82	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 degF EXPECTED
	✓MCC	
	Implement ECLS SSR-6 CABIN EQUIP PWRDN	1 to 9 degF
	✓H2O LOOP 2(1) ICH FLOW 950	8 degF
(L1)	FLOW PROP VLV LOOP 2 - ICH (Check with MCC for payload impact)	1 degF
	FLOW PROP VLV LOOP 1 - ICH (✓MCC for payload impact)	4 degF
(MD44F)	CAB TEMP CNTLR vlv - FULL COOL	6 degF
	- 2/3 COOL	4 degF
	- 1/3 COOL	4 degF
	- FULL HEAT	4 degF
(L1)	FLOW PROP VLV LOOP 1 - PL	1 degF
	2 - PL	8 degF
	H2O LOOP 2 BYP MAN - DECR until H2O LOOP 2 ICH FLOW MAX	
(C2)	Pwrup one or two CRTs as reqd	5 degF
(L1)	H2O PUMP LOOP 1 - ON, B	
	H2O LOOP 1,2 BYP MAN - DECR until H2O LOOP 1,2 ICH FLOW MAX	
	FLASH EVAP CNTLR PRI A,B - OFF SEC - OFF	
	✓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 redundant components. The ΔP values in parentheses corresponds to a 10.2 psia cabin environment

SM 66 ENVIRONMENT

L1 IMU FAN B - OFF
A - ON

CRT ✓IMU FAN ΔP - ~~4.3 (3.2)~~ ~ 4.5

L1 IMU FAN A - OFF
C - ON

CRT ✓IMU FAN ΔP - ~~4.3 (3.2)~~ ~ 4.5

L1 IMU FAN C - OFF
B - ON
CAB FAN A - OFF
B - ON

CRT ✓CAB FAN ΔP - ~~6.0 (4.3)~~ ~ 5.8

L1 CAB FAN B - OFF
A - 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 (2.6)~~ ~ 3.8
2 - ~~3.5 (2.6)~~ ~ 3.8
3 - ~~4.3 (3.3)~~ ~ 3.9

L1 AV BAY 1 FAN A - OFF
B - ON
2 FAN B - OFF
A - ON
3 FAN A - OFF
B - ON

SM 88 APU/ENVIRON THERM

L1 FREON PUMP LOOP 1 - A

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 - A

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 - B
Wait 3 sec
FREON PUMP LOOP 2 - B

H2O PUMP LOOP 1 (two) - ON, A
CRT ✓LOOP 1 ICH FLOW > 900
L1 BYP MODE - MAN
MAN - DECR (hold 5 sec)

CRT ✓H2O LOOP 1 ICH FLOW - incr
L1 BYP MAN - INCR (until ICH FLOW ~950)
H2O PUMP LOOP 1 (two) - GPC, B
✓LOOP 2 BYP MODE - MAN
MAN - DECR (hold 5 sec)

CRT ✓H2O LOOP 2 ICH FLOW - incr
L1 BYP MAN - INCR (until ICH FLOW ~950)

RAD BYPASS/FES C/O

1. DAP: ~~B1~~ B2/AUTO/~~PRI~~ ALT

R12L 2. ✓SPLY H2O XOVR VLV - OP (tb-OP)

L1 3. FLASH EVAP CNTLR PRI A - OFF
B - OFF
SEC (two) - A SPLY,ON 29.35
✓HI LOAD DUCT HTR - B 2.30
EVAP - ENA 31.65

4. RAD BYP VLV MODE (two) - MAN 32.0
MAN SEL (two) - BYP
(tb-BYP ~3 sec)
verify RAD CNTLR LOOP (two) - OFF 29.35
After 2.5 min, 32.05 2.30
O1 HI load evap ✓FREON EVAP OUT TEMP ind - 62° ± 2 degF 27.05

L1 5. HI LOAD EVAP - OFF ✓
After 2.5 min, 34.35
O1 ✓FREON EVAP OUT TEMP ind - 62° ± 2 degF
topping OK

L1 6. HI LOAD EVAP - ENA

7. FLASH EVAP CNTLR SEC (two) - A SPLY,OFF 34.55
PRI B - ON 2:30
verify FES B After 2.5 min,
✓FREON EVAP OUT TEMP ind - 39° ± 1 degF 36.85
37.25

L11 8. ✓FLOW PROP VLV LOOP 1,2 (two) tbb - ICAH

9. RAD CNTLR OUT TEMP - NORM

on B Fes

8 20 19 15

RAD STOW/DEPLOY

1. STOW RADIATORS

If RMS uncradled:

NOTE

PORT RAD and LAT 7-12, and
STBD LAT 1-6 will operate
single motor

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)

STBD RAD cbs	PORT RAD cbs
AC1MID3	AC1MID1
AC2MID2	AC2MID4
AC3MID2	AC3MID4

2. DEPLOY RADIATORS

If RMS uncradled:
✓MCC for priority of RAD deploy/RMS ops
If MCC not avail and RADs must be deployed immediately, continue ops

NOTE
PORT RAD and LAT 7-12, and STBD LAT 1-6 will operate single motor

R13L ✓RAD LAT CNTL SYS (two) - OFF (tb-LAT)
✓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)
- OFF
CNTL SYS (two) - DPY (concurrently)
(✓tb-bp ~40 sec, DPY)
- OFF

* If either RAD deploys in > 40 sec, stop, ✓MCC *
* If either RAD tb not bp after 10 sec, stow and latch RADs *
* Redeploy only good RAD (ref table pg 5-14) *

Verify Stbd & Port RAD panels are deployed & stabilized

PL BAY MECH PWR SYS (two) - OFF

PCS 1(2) CONFIG

If FD1,

S66 ENVIRONMENT

CRT,O1 Report cabin pressure (two) to MCC

MO1OW 14.7 CAB REG INLET SYS 1(2) vlv - OP
SYS 2(1) vlv - CL

O2 REG INLET SYS 1(2) vlv - OP
SYS 2(1) vlv - CL

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 XOVER vlv - CL

L2 ✓O2 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)

✓O2/N2 CNTLR VLV SYS 1(2) - AUTO
SYS 2(1) - CL

O1 ✓O2/N2 FLOW sel - SYS 1(2) O2

✓PPO2 sel - SNSR A(B)

VENT SAFING

O14: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	SM ALERT 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

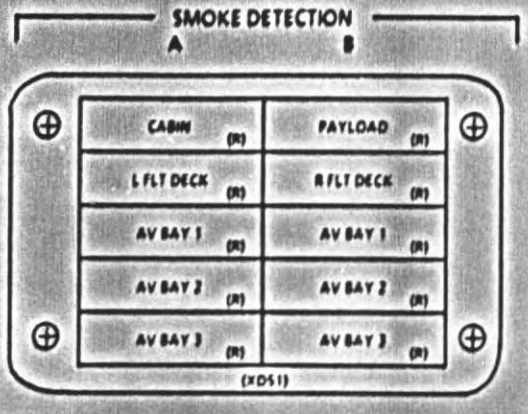
L1 ✓TOP EVAP HTR DUCT - A(B,C)
✓NOZ (L,R) - A(B) AUTO

* If htrs were off, wait 90 min, *
* then: *

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

O1 If FREON EVAP OUT TEMP > 41 and ≤ 47 degF:
L1 RAD CNTLR OUT TEMP - HI
O1 When FREON EVAP OUT TEMP = 50° ± 2 degF,
L1 RAD CNTLR OUT TEMP - NORM, then immediately:
FLASH EVAP CNTLR PRI A(B) - ON
O1 If FREON EVAP OUT TEMP ≤ 41 or > 47 degF:
L1 FLASH EVAP CNTLR PRI A(B) - ON

SMOKE DETN CKT TEST



NOTE

If any SMOKE DETN lt fails to illum (ex PAYLOAD), open and close associated cb (Pnl O14, O15, or O16) and repeat test on that CKT allowing 60 sec

CKT TEST A PART 1 (Concentration test)

L1 SMOKE DETN CKT TEST - A
✓FIRE SUPPR AV BAY pb (three) - lts on
Wait at least 5 sec (no more than 10 sec)
SMOKE DETN CKT TEST - OFF
✓FIRE SUPPR AV BAY pb (three) - lts off
✓SMOKE DETN A lts (five) - on
✓Siren - on

F2 ✓MSTR ALARM lt - on
pb - off

L1 SMOKE DETN SNSR - RESET
✓Above lights and siren - off

CKT TEST A PART 2 (rate test)

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

CKT TEST B PART 1 (concentration test)

SMOKE DETN CKT TEST - B
✓FIRE SUPPR AV BAY pb (three) - lts on
Wait at least 5 sec (no more than 10 sec)
SMOKE DETN CKT TEST - OFF
✓FIRE SUPPR AV BAY pb (three) - lts off
✓SMOKE DETN B lts (four) - on (PL lt off)
✓Siren - on
F2 ✓MSTR ALARM lt - on
pb - off
L1 SMOKE DETN SNSR - RESET
✓Above lights and siren - off

CKT TEST B PART 2 (rate test)

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

CRT

SM SYS SUMM 1

Verify:

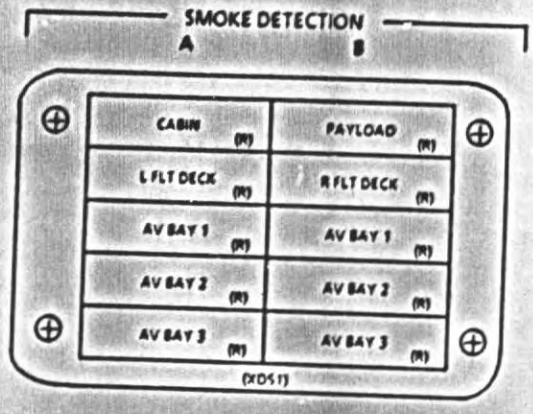
		1/A	2/B
SMOKE			
CABIN		-.1 to +.5	
L/R FD		-.1 to +.5	-.1 to +.5
AV BAY	1	-.1 to +.5	-.1 to +.5
	2	-.1 to +.5	-.1 to +.5
	3	-.1 to +.5	-.1 to +.5

* If limits exceeded, /MCC *

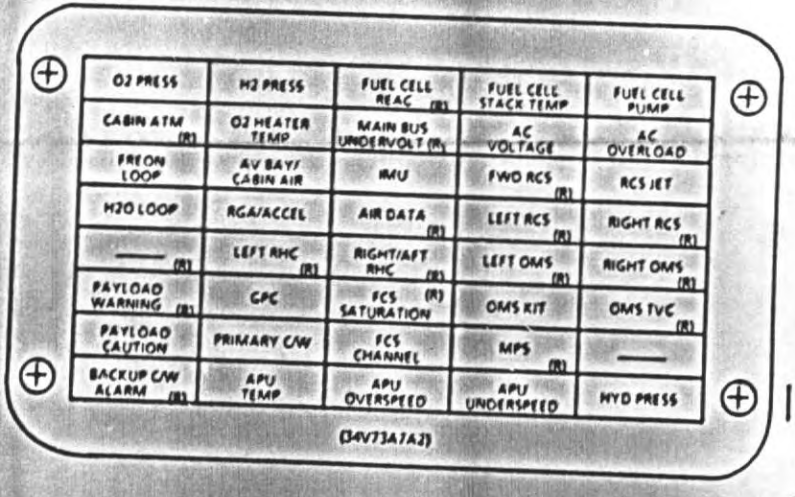
EPS

LAMP TEST..... 6-2
HEATER RECONFIG -
CONFIG B(CONFIG A) (CIL-RMS HTRS)..... 6-5
FUEL CELL PURGE - AUTO..... 6-6
- MANUAL..... 6-7
CRYO O2 TK HTR SNSR CK..... 6-8

LAMP TEST



C/W PANEL



EPS

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)	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 CREWMEMBER)

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)

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	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(cl) MNB H2O LINE HTR B - cl(op)
R2	BLR CNTLR/HTR (three) - B(A)
	If both RMS htrs active >>
A8L	PORT RMS HTR A - OFF(AUTO) B - AUTO(OFF)

FUEL CELL PURGE - AUTO, SM 2(4)

CAUTION
Do not purge FC if:
- FC AMPS > 350
- FC is shutdown

Do not init 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)

* If any flow '↓' alarm, *
* aff FC PURGE VLV - CL *

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

2. MANUAL PURGE SEQUENCE

NOTE
Fuel cells must be purged separately

CAUTION
Do not purge FC if:
- FC AMPS > 350
- FC 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 - incr ~3.3 (max)
✓H2 - incr ~0.6 (max)

* If any flow '+' alarm, *
R12U — * aff FC PURGE VLV - CL *

Wait 2 min
FC PURGE VLV 1(2,3) - 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 cont

3. TURN OFF PURGE HEATERS

R12U — FC PURGE HTR - GPC

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

CRYO O2 TK HTR SNSR CK

SM 68 CRYO SYSTEM

R1 1. O2 TK1 HTRS (one) - TEST (1 sec)

CRT 2. ✓HTR CUR SNSR 1A,1B,2A,2B (four) - '↓'
Expect 'S68 CRYO O2' msg, ignore msg

* If HTR CUR SNSR 1A and 2A (1B and 2B) not '↓': *
R1 * O2 TK1 HTRS A(B) - OFF, then: *
* If HTRS A(B) was in AUTO: *
* O2 TK1 HTRS B(A) - AUTO *

3. O2 TK1 HTRS (one) - RESET

4. Repeat steps 1-3 for the following:
O2 TK2 HTRS
TK3 HTRS (if 3 or more tks flown)

5. If not OV1O2 and 4 tks flown, repeat steps 1-3 for:
A11 CRYO TK4 HTR O2

If OV1O2 and 4 or 5 tks flown:
CRYO TK4/5 HTR O2 TK4/5 - TEST (1 sec)

CRT ✓HTR CUR SNSR TK4 1A,1B,2A,2B (four) - '↓'
Expect 'S68 CRYO O2' msg, ignore msg

* If HTR CUR SNSR 1A and 2A (1B and 2B) not '↓': *
A11 * CRYO TK4/5 HTR O2 TK4(TK5) - OFF, then: *
* If TK4(TK5) was in AUTO: *
* O2 TK5(TK4) HTR - AUTO *

CRYO TK4/5 HTR O2 TK4/5 - RESET

6. Report results to MCC

GNC

IMU ALIGN - S TRK..... 7-2
- ROTATION S TRK: ROLL(PITCH,YAW)..... 7-4
ALIGNMENT - IMU/IMU..... 7-6
S TRK SELF-TEST..... 7-7
COAS CALIBRATION..... 7-8
FCS CHECKOUT..... 7-10
AFT CONTROLLER C/O..... 7-29
OMICRON SPECIFICATION..... 7-30

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

Z Tracker FF1
Y Tracker FF3

1. COLLECT STAR DATA

✓DAP: (A1)(B1) AUTO VERB (PRI)
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) 14, 26 91.4
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 (*)
* Mnvr 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 FLT PLN
✓EXEC, ITEM 16 - (no *)

5. S TRK CONFIG VERIFICATION

GNC 22 TRK/COAS CNTL

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

6. Report IMU align results

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

1. SETUP

DAP: A5/AUTO/VERN

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

F7/F8 — FLT CNTLR PWR - ON

CRT — GNC UNIV PTG

F7/F8 — Initiate rot about desired axis of 0.3° ± .05°/sec with RHC (multiple pulses)

FLT CNTLR PWR - OFF

After rot between 180° and 270°,
DAP: A5/AUTO/VERN

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° < ANG DIF < 145° and ANG ERR ≤.08 (Rcd __.__ __) for SEL (*) star pair

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

If both STATUS - ST FAIL:
✓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 FLT PLN
✓EXEC, ITEM 16 - (no *)

6. S TRK CONFIG VERIFICATION

GNC 22 S TRK/COAS CNTL

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

Reconfig to FLT PLN 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, 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 (*)

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

Mnvr to avoid bright objects in both BOSs

GNC 22 S TRK/COAS CNTL

CRT /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 (mom)
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
- COAS - ON
- ✓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 +2 EXEC
POS +X(-Z) - ITEM 26(2$\bar{7}$) EXEC (*)
CAL MODE - ITEM 24 EXEC (*)

014:E, 015:E, 016:E
- ✓cb DDU L(AFT) (two) - c1

F7/F8 (A6U)
- FLT CNTLR PWR - ON

2. MARK ON STAR

DAP: A1/INRTL(FREE)/VERN(COARSE CNTL)
B5/INRTL(FREE)/VERN(FINE CNTL)
B5/FREE/PRI(PRCS)

Mnvr to center star in COAS:

F6 (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, /MCC *

4. CLEAN-UP

COAS: DES - ITEM 25 EXEC (*)
01(019) F7/F8 (A6U) — COAS - OFF
FLT CNTLR PWR - OFF

014:E, 015:E, 016:E — cb DDU L(AFT) (two) - as reqd

✓Data transcribed into FLT PLN

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

Reconfig to FLT PLN DAP

FCS CHECKOUT

DISPLAY/DPS CONFIG

014, 015, 016 — RGA (four) - ON
cb MNA,B,C ADTA (four) - cl
ACCEL 1,2 (two) - cl
MNA,C DDU AFT (two) - op
MNB,C DDU R (two) - cl
If APU will be used:
ASA (four) - ON
If circ pump will be used:
✓ASA (four) - OFF
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:

If using a circ pump for Part 1:
FCS CH 2,3 - OFF
ASA (four) - ON
Go to step 7b, 7-15

ON-ORBIT FCS CHECKOUT, PART 1

NOTE

Only one APU will be used for the FCS C/O. If the APU does not start or MCC advises abbreviated actuator check, a circ pump will be used. Selection of the APU or circ pump will be made real time by the MCC

NOTE

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

If WB REG PRESS '4':

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 'S86 APU TEMP' msg:
Overtemp confirmed by APU EGT:
Affected APU OPER - OFF
FUEL TK VLV - CL
✓Shutdn (hyd press)
CNTLR PWR - OFF

If APU shift to HI speed (✓CRT), shutdown APU

NOTE

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

1. FCS C/O PREP

C2 Set EVENT TIMER to 00:00, count UP

2. APU PRESTART APU 2

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 APU 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, ✓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:                    *
*    APU OPER X - INJECTOR COOL            *
*                 (start watch)            *
*    APU AUTO SHUTDN X - INH               *
*    At 3.5 min,                           *
*     APU OPER X - START/RUN               *
* If still no start:                       *
*    BLR PWR (three)          - OFF        *
*    APU OPER X               - OFF        *
*        FUEL TK VLV X        - CL         *
*        CNTLR PWR X          - OFF        *
*    HYD MN PUMP PRESS X      - NORM       *
*    BLR N2 SPLY X            - OFF        *
*    APU FUEL PUMP/VLV COOL A - AUTO       *
* Go to step 7                             *
```

R2

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

SM 87 HYD THERMAL

✓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 sec

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

5. SECONDARY ACTUATOR CHECK (APU)

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

MSF 61C

6. APU SHUTDOWN

On MCC GO for APU SHUTDN:

R2
BLR PWR (three) - OFF
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

BLA CNTLR/HTR 2 — B

Perform APU/HYD, HYD THERM COND - ENA, then:
Proceed to part 2

7. CIRC PUMP ACTIVATION

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

NOTE

OPS 2/8 trans must be performed with ASAs off to avoid AERO DRIVE fault msgs during actuator checks

a. Perform DPS, G8 to G2 TRANSITION, then:
014,015, 016:E ASA (four) - OFF

Perform DPS, G2 to G8 TRANSITION, then:
C3 ✓FCS CH 1,4 - AUTO
2,3 - OFF
ASA (four) - ON

b. If not already performed, APU/HYD, HYD THERM COND - TERM

R2 c. HYD CIRC PUMP X - ON

8. ABBREVIATED SECONDARY ACTUATOR CHECK (circ pump)

NOTE

If an elevon does not move to the commanded posn, bypass the affected port after the check of all channels. SEC ACT BYPASS - ITEM 21 +X X EXEC (See DPS DICT, GNC, OPS G8 for ITEM ENTRY values)

CRT1 a. ✓POS STIM ENA, ITEM 20 - (*)

C3 b. ✓FCS CH 1,4 - AUTO
✓2,3 - OFF

CRT2 c. GNC 42 SWITCH/SURF
✓All elevons move to U7.5° ± 0.8°

CRT1 d. SEC ACT CK, CH1 - ITEM 15 EXEC (*)
Wait 5 sec

e. Turn off FCS CH not being checked:

C3 FCS CH (three) - OFF

CRT2 ✓All elevons move to U1.5° ± 0.8°

* If any elevon drives past 0°, turn *
* on all FCS CHs to stop movement *
* FCS CH (four) - AUTO *
* Expect AERO DRIVE msg. Continue *
* procedure and report to MCC *

CRT1 f. STOP - ITEM 19 EXEC (*)
✓All elevons move to U7.5° ± 0.8°

C3 g. Config FCS CHs for check of next CH:
(Config switches in sequence shown)

Next CH	FCS CH switches			
	4	1	2	3
2	AUTO	OFF	AUTO	OFF
3	AUTO	OFF	OFF	AUTO
4	AUTO	OFF	OFF	AUTO

h. Repeat steps d thru g for CHs 2,3,4

9. HYDRAULIC SYSTEM RECONFIGURATION

R2 HYD CIRC PUMP X - OFF
PERFORM APU/HYD, HYD THERM COND - ENA

10. FCS CH RECONFIGURATION

a. Perform G8 to G2 TRANSITION (DPS), then:

C3 FCS CH 1,2,3 - AUTO
✓4 - AUTO

b. Perform G2 to G8 TRANSITION (DPS), then:
Continue with Part 2

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/INRTL/VERN
✓R,P,Y rates 0 ± .1°/sec, then:
DAP: FREE

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 '+'

STOP - ITEM 14 EXEC (*)
07 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		
		Y	Z
AA		+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/INRTL/VERN
✓R,P,Y rates 0 ± .1°/sec, then:
  DAP: FREE

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

RGA R	RGA P	RGA Y
+18.8 to +21.2	+9.4 to +10.6	+9.4 to +10.6

ADTA PS	ADTA PaC	ADTA PaU	ADTA PaL	ADTA 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

RGA R	RGA P	RGA Y
-18.8 to -21.2	-9.4 to -10.6	-9.4 to -10.6

ADTA PS	ADTA PaC	ADTA PaU	ADTA PaL	ADTA 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 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: /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 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

SURF TEST

Notify MCC if any single surf feedback exceeds average of other three feedbacks by greater than:

Elevons (Δ1.3 deg)
Rudder (Δ1.2 deg)
SPD BK (Δ2.2%)
BDY FLP (Δ3%)

2: GNC 44 SWITCHES

During following switch test, verify '*' appears

L2 ENTRY MODE - LO GAIN
- NO Y JET
- AUTO (no *)

4. CONTROLLER & SWITCH TEST

GO TO 7-24 IF HAVE A PROBLEM LOOK AT THIS P.

NOTE

During controller/switch test,

THC: One TX(TY,TZ) failed CLOSED - reselect all contacts (failed contact last)
One TX(TY,TZ) failed OPEN - reselect good contacts only
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

Deselect L THC:
CRT2 THC L DES - ITEMS 1,2,3 EXEC (*)

F5 L THC - deflect in each axis
CRT2 ✓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 (John Then Baker)

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 BDY FLP - UP, DN
CRT2 ✓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

L RHC Trim - deflect switch in each axis

CRT2 ✓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 (Resume 4 801)

✓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 *

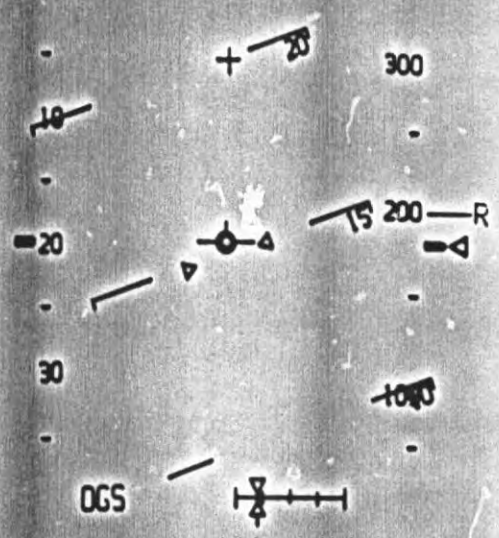
DEDICATED DISPLAY INPUT CHECKOUT VALUES TABLE

	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 20,040	20,000 fps	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%

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 lt (two) - on
- ✓ROLL/YAW AUTO,CSS lt (two) - on
- ✓SPDBK/THROT AUTO,MAN lt (two) - on
- ✓BDY FLP AUTO,MAN lt (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

C3
- FCS CH (four) - AUTO

O8
- MLS (three) - OFF
- RADAR ALTM (two) - OFF

O14, O15, O16
- RGA (four) - OFF
- cb MNA,B,C ADTA (four) - op
- ACCEL 1,2 (two) - op
- MNA,C DDU AFT (two) - cl
- MNB,C DDU R (two) - op
- ASA (four) - OFF
- ACCEL 3,4 (two) - OFF

O17 ATVC (four) - OFF

AFT CONTROLLER C/O

1. POWER UP

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

2. AFT THC

GNC 25 RM ORBIT

Deselect A THC:
THC A DES - ITEM 4,5,6 EXEC (*)

A THC - deflect in each axis
✓THC - '+' & '-'

AFT CONTROLLER C/O						
THC	PUSH	PULL	LEFT	RIGHT	UP	DOWN
DISP	+X	-X	+Z	-Z	-Y	+Y

* During THC test, *
* One TX(TY,TZ) failed CLOSED - *
* reselect all contacts (failed *
* contact last) *
* One TX(TY,TZ) failed OPEN - *
* reselect good contacts only *
* Multi +TX,-TX,+TY,-TY,+TZ,-TZ *
* failures - 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
014:E,
016:E

FLT CNTLR PWR - OFF
AFT DDU PWR - as reqd

OMICRON SPECIFICATION

1. DETERMINE REFERENCE ATTITUDE

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

2. DETERMINE DESIRED ATTITUDE

Rotate clockwise around P (right-hand rule) to desired attitude

OMICRON = angle of rotation around P from reference attitude to desired attitude

NOTE
If P = ±Y body axis, use -Z body axis for reference attitude

MPS

MPS INERT..... 8-2

MPS

MPS

MPS INERT

1. INITIALIZATION

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

2. TERMINATION

R4 MPS FILL/DRAIN LO2,LH2 OUTBD (two) - CL
Wait 10 sec
MPS FILL/DRAIN LO2,LH2 OUTBD (two) - GND
R2 PNEU He ISOL - GPC

OMS

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

ON-ORBIT OMS BURN

OMS

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 - ✓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 (*)

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 B (two) - 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) - cl

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

FLT CNTLR PWR (two) - OFF
cb DDU (six) - as reqd

08

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)

CRT

IF OPS 2
- DAP: B/INRTL/VERN
- GNC, OPS 201 PRO (✓DAP)

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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'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
FOR S TRK PASS:
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
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 CONFIG:
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
FOR S TRK PASS:
IMU DES
OMS BOTH 1
L 2
R 3
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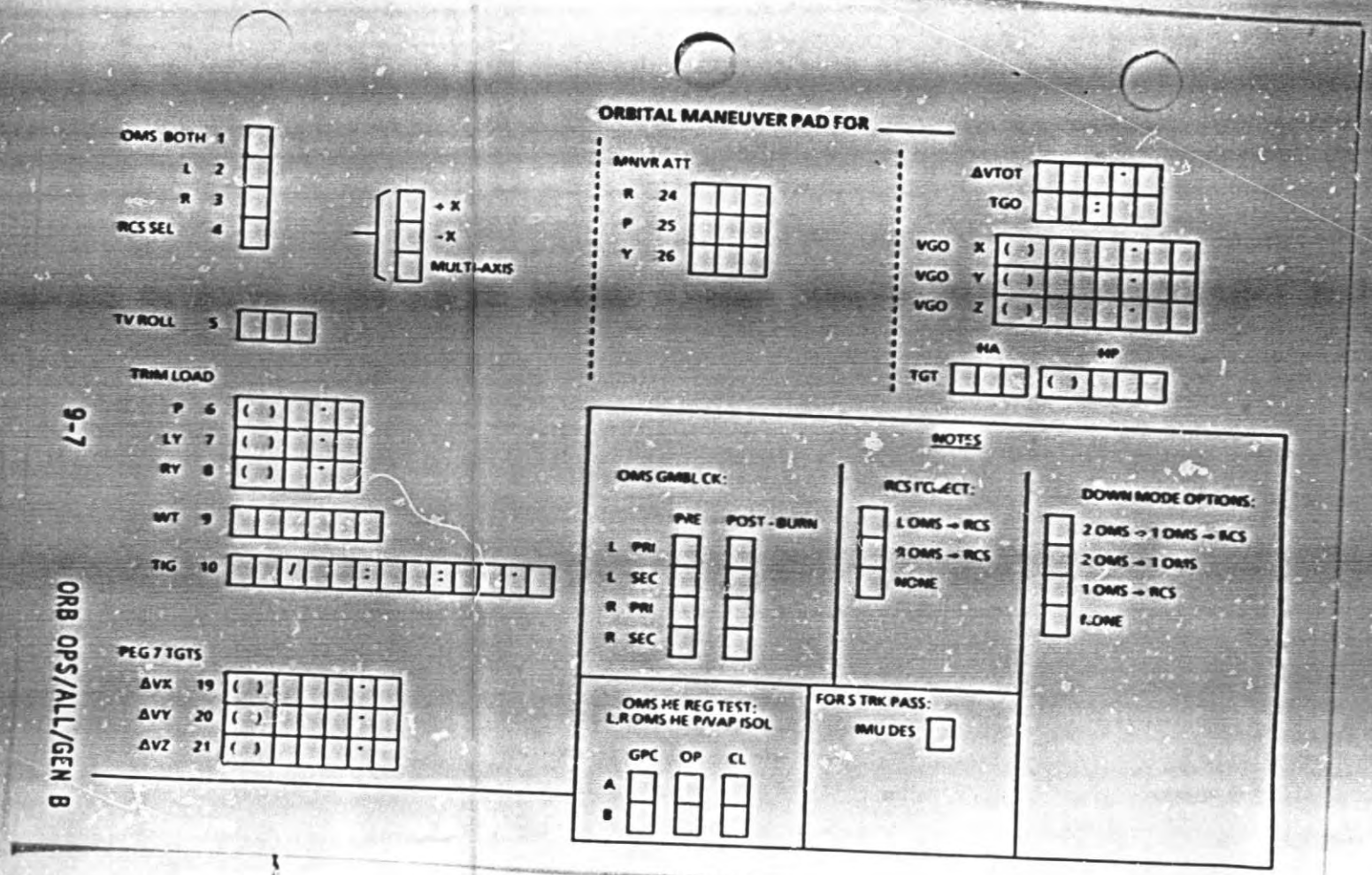
-X
MULTI-AXIS
TV ROLL 5
TRIM LOAD
P 6
LY 7
RY 8
WT 9
TG 10
PEG 7 TGTS
ΔVX 19
ΔVY 20
ΔVZ 21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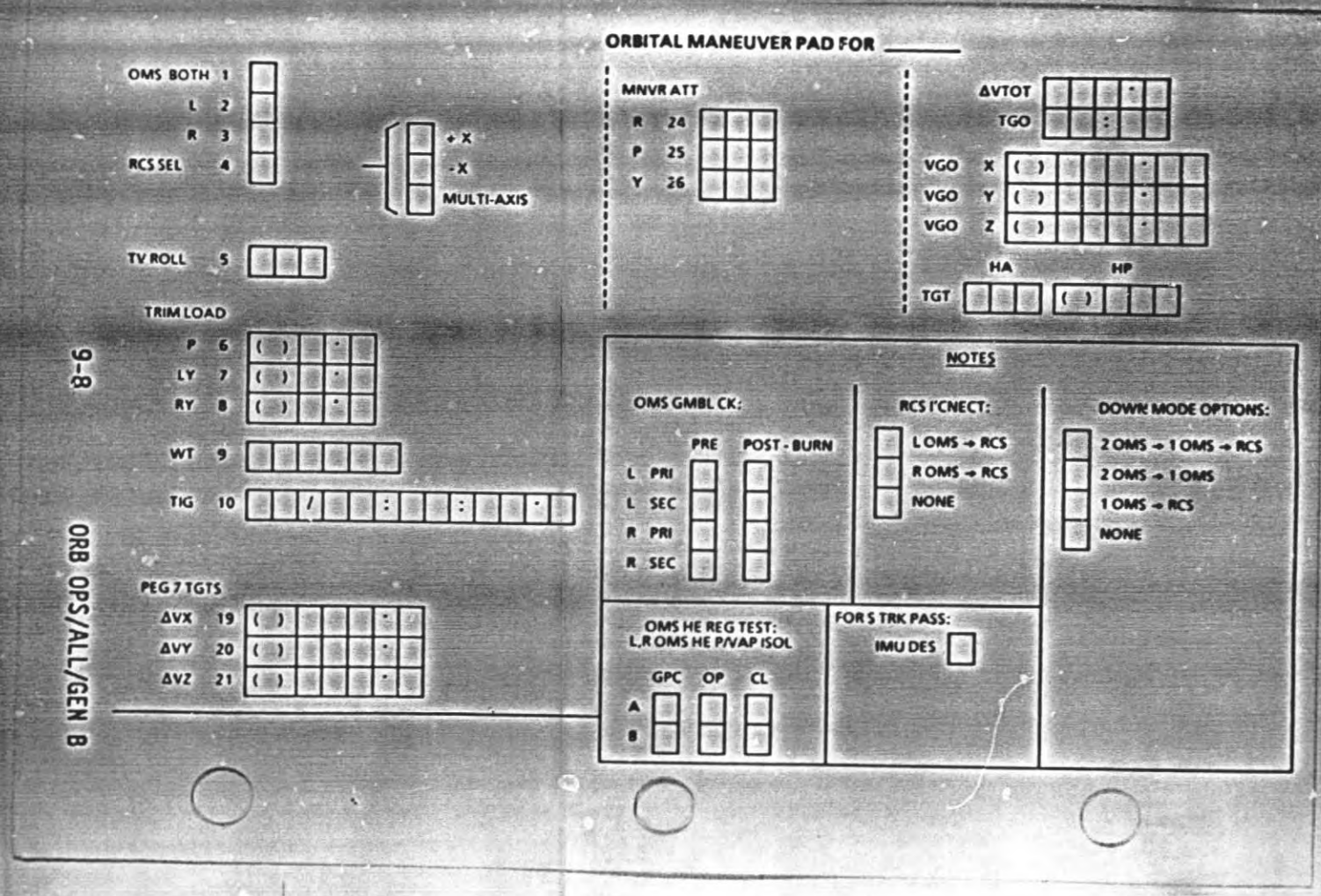
OMS BOTH 1
L 2
R 3
RCS SEL 4
+X
-X
MULTI-AXIS
TV ROLL 5
TRIM LOAD
P 6
LY 7
RY 8
WT 9
TIG 10
PEG 7 TGTS
ΔVX 19
ΔVY 20
ΔVZ 21
MNVR ATT
R 24
P 25
Y 26
ΔVTOT
TGO
VGO X
VGO Y
VGO Z
HA
HP
TGT
NOTES
OMS GIMBL CK:
PRE
POST - BURN
L PRI
L SEC
R PRI
R SEC
RCS TO ABORT:
L OMS → RCS
R OMS → RCS
NONE
DOWN MODE OPTIONS:
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
FOR S TRK PASS:
IMU DES
9-7
ORB OPS/ALL/GEN B


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
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ΔVZ 21
MNVR ATT
R 24
P 25
Y 26
ΔVTOT
TGO
VGO X
VGO Y
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TGT
NOTES
OMS GMBL CK:
PRE
POST - BURN
L PRI
L SEC
R PRI
R SEC
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
FOR S TRK PASS:
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 HOT FIRE TEST

RCS

1. CONFIGURE FOR JET TEST

   DAP: A1/INRTL/VERN

2. PERFORM RCS JET TEST

   Wait 3 sec between pulses
   Monitor CRT for JET FAIL msgs
   Monitor ADI rates to verify jet on
   or jet fail

   NOTE

   If failed RCS JET detected, wait 30 sec before next pulse, deselect any failed RCS JET not auto deselected, complete TEST, then go to MAL, RCS, 10.1a

O14:F,
O15:F,
O16:F PRIMARY RJD DRIVER (eight) - ON

DAP TRANS: PULSE/PULSE/PULSE
DAP: A/FREE/PRI
F6 ADI RATE - LO
F7 FLT CNTLR PWR - ON

GNC 23 RC

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

Perform the following pulse sequence twice,
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 *)

Perform the following pulse sequence twice,
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

Perform the following pulse sequence twice,
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

Perform the following pulse sequence twice,
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)

F7/F8 DAP: A/INRTL/VERN
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 EXEC (*)
MANF VLVS STAT OVRD
1 OP - ITEM 40 EXEC
2 OP - ITEM 41 EXEC
✓3 OP - ITEM 42
✓4 OP - ITEM 43

4. CONFIGURE FOR VERNIER MANIFOLD VALVE TEST

R15 cb MANF ISOL L5,R5,F5 (three) - op

5. PERFORM TEST

NOTE
If any vernier manifold closes, ignore DAP RECONFIG message, re-open affected manifold, complete TEST and notify MCC

07,08 L,R,F RCS MANF ISOL 5 (three) - CL (tb-OP)

6. CLEANUP

R15 cb MANF ISOL L5,R5,F5 (three) - cl

Reconfigure to FLT PLN DAP

GG FREE DRIFT

1. AUTO MNVR TO ATTITUDE

Change DAP A,B to A3,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/PRI

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

If VERN jets avail:
- DAP: A3/AUTO/VERN
- Wait 3 min
- DAP: FREE

If VERN jets not avail:
- DAP: A3/AUTO/PRI
- Wait 30 sec
- Wait until -0.01 < Roll Rate < 0.01, then:
- DAP: FREE
- Rcd MET __/__ __:__ __:__ __

NOTE

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

3. VEHICLE RECOVERY AND FES RESTART

If VERN jets avail:
- O14:F, O15:F, O16:F — ✓RJD DRIVER (nine) - ON
- ✓DAP: A3/FREE/VERN

If VERN jets not avail:
- ✓DAP: A3/FREE/PRI
- O14:F, O15:F, O16:F — ✓Primary RJD DRIVER (eight) - ON

F6,F8 — ADI ATT - as reqd

Reconfig to FLT PLN DAP

DAP: INRTL

SM 88 APU/ENVIRON THERM

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

If EVAP OUT TEMP ≤ 41 or > 47 degF:
- CRT(01) 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
+ X L V	PLBD NORTH	A	357.51	0.97	249.18	0.002	0.024	-0.062
	SOUTH	B	357.51	359.23	110.91	-0.002	0.024	0.062
	IN-PLANE	C	359.06	0.11	4.44	0.000	-0.066	0.005
- X L V	PLBD NORTH	D	177.51	0.77	69.09	0.002	-0.024	-0.062
	SOUTH	E	177.51	359.03	290.82	-0.002	-0.024	0.062
	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

DAP: A1/AUTO/VERN
GNC UNIV PTG

CRT
TGT ID - ITEM 8 +4 EXEC
BODY VECT - ITEM 14 +5 EXEC
P - ITEM 15 +270 EXEC
Y - ITEM 16 +0 EXEC
OM - ITEM 17 +270 EXEC
TRK - ITEM 19 EXEC (CUR-*)

2. INITIATE PTC ROTATION

DAP: A2/AUTO/PRI
GNC UNIV PTG

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

3. TERMINATE PTC ROTATION

O14:F, O15:F, O16:F
✓Primary RJD DRIVER (eight) - ON

DAP: A2/AUTO/PRI
GNC UNIV PTG

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

ON-ORBIT RCS BURN, MM 202

NOTE

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

1. AFT RCS/OMS SYSTEM CHECK

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

F7
03 ✓OMS PRESS He TK P L,R > 1500 psia
✓L,R OMS OX,FU PRESS > 234 psia
07 DAP: FREE
AFT L,R RCS TK ISOL (six) - CL (tb-CL)
08 XFEED (four) - OP (tb-OP)
✓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)
DAP: as reqd

CRT GNC 23 RCS
OMS PRESS ENA, L(R) OMS - ITEM 5(6) EXEC

If No I'CNCT:

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)
✓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

O14:F, ✓Primary RJD DRIVER (eight) - ON
O15:F,
O16:F

✓DAP B set to B1

GNC UNIV PTG
DAP: B/AUTO/VERN(PRI)

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) - cl
015:E,
016:E

TIG-3:00 ADI ERROR/RATE - MED
ATT - INRTL
DAP: B1/INRTL/PRI
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

At TIG, deflect THC, null VGOs
✓ATT ERR ± 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

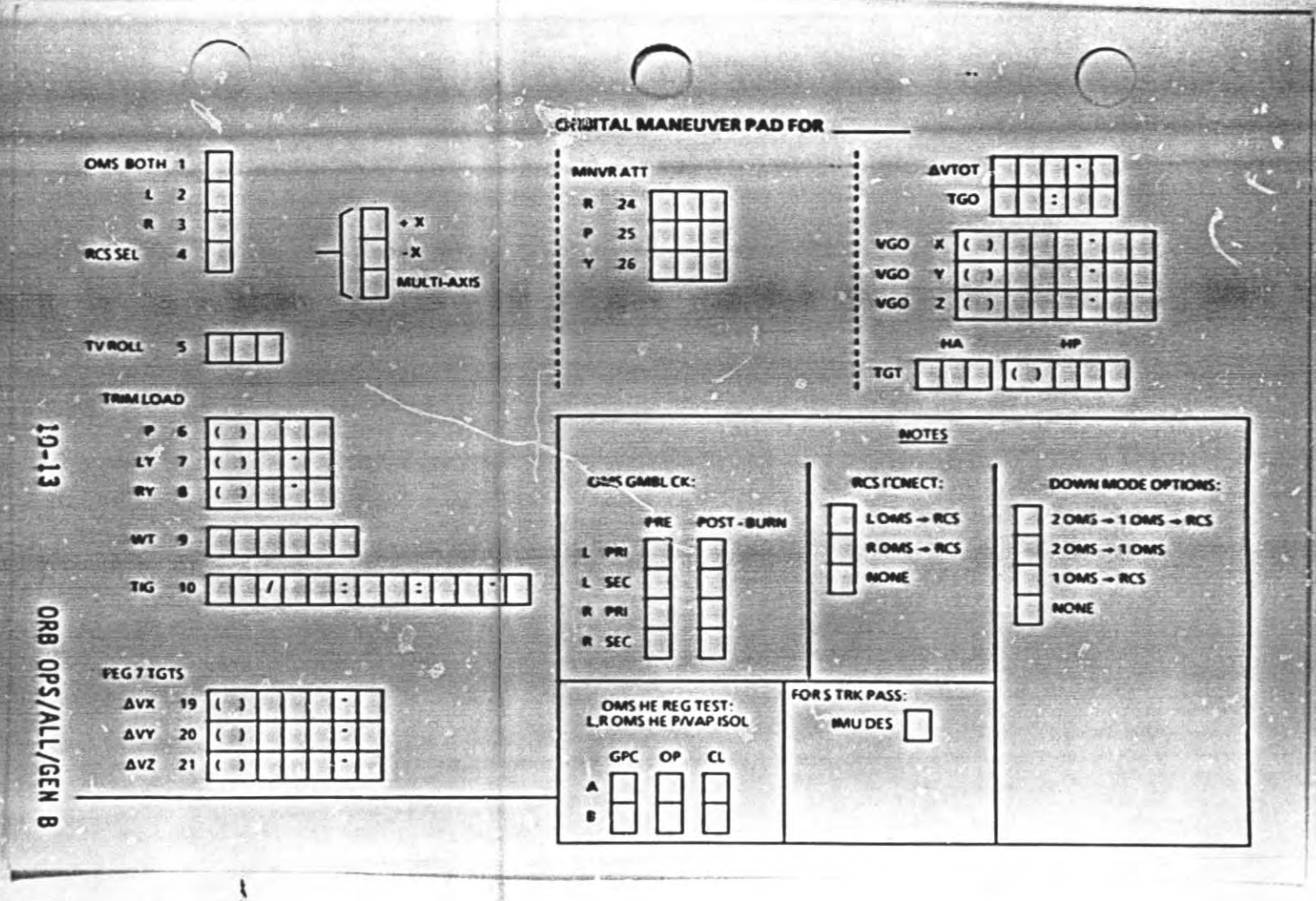
DAP: as reqd

IF I'CNECT RETURN

DAP: FREE
GNC 23 RCSI

CRT
08
07

OMS PRESS ENA, OFF - ITEM 7 EXEC
L,R OMS XFEED (four) - CL (tb-CL)
He PRESS/VAP ISOL A - CL
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)
DAP: as reqd


DIGITAL MANEUVER PAD FOR _____
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RCS SEL 4
+X
-X
MULTI-AXIS
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TRIM LOAD
P 6
LY 7
RY 8
WT 9
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MNVR ATT
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ΔVTOT
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VGO Y
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HA
HP
TGT
NOTES
GMBL CK:
PRE
POST - BURN
L PRI
L SEC
R PRI
R SEC
RCS CONNECT:
L OMS → RCS
R OMS → RCS
NONE
DOWN MODE OPTIONS:
2 OMS → 1 OMS → RCS
2 OMS → 1 OMS
1 OMS → RCS
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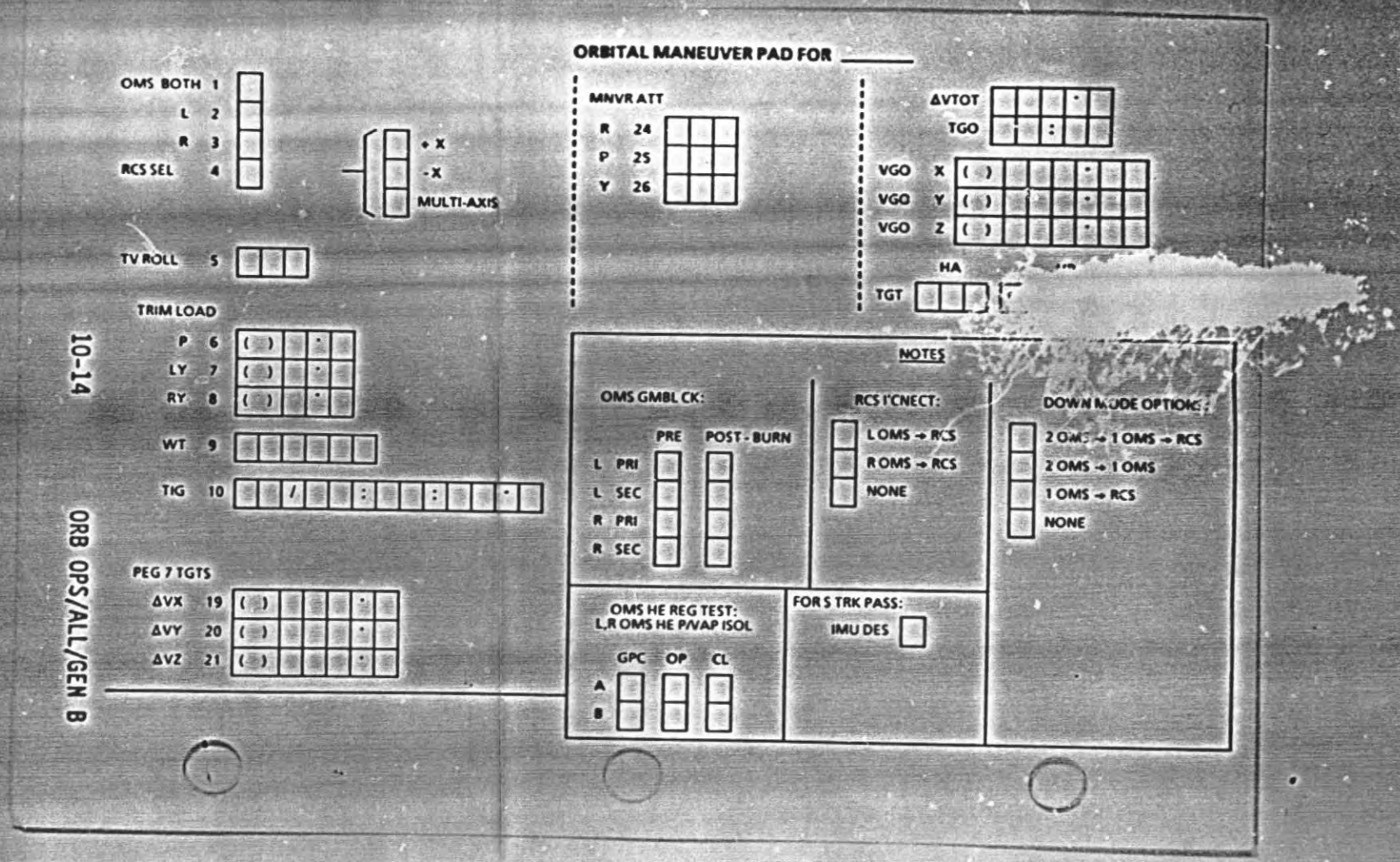
GPC
OP
CL
A
B
FOR S TRK PASS:
IMU DES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R SEC
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GPC
OP
CL
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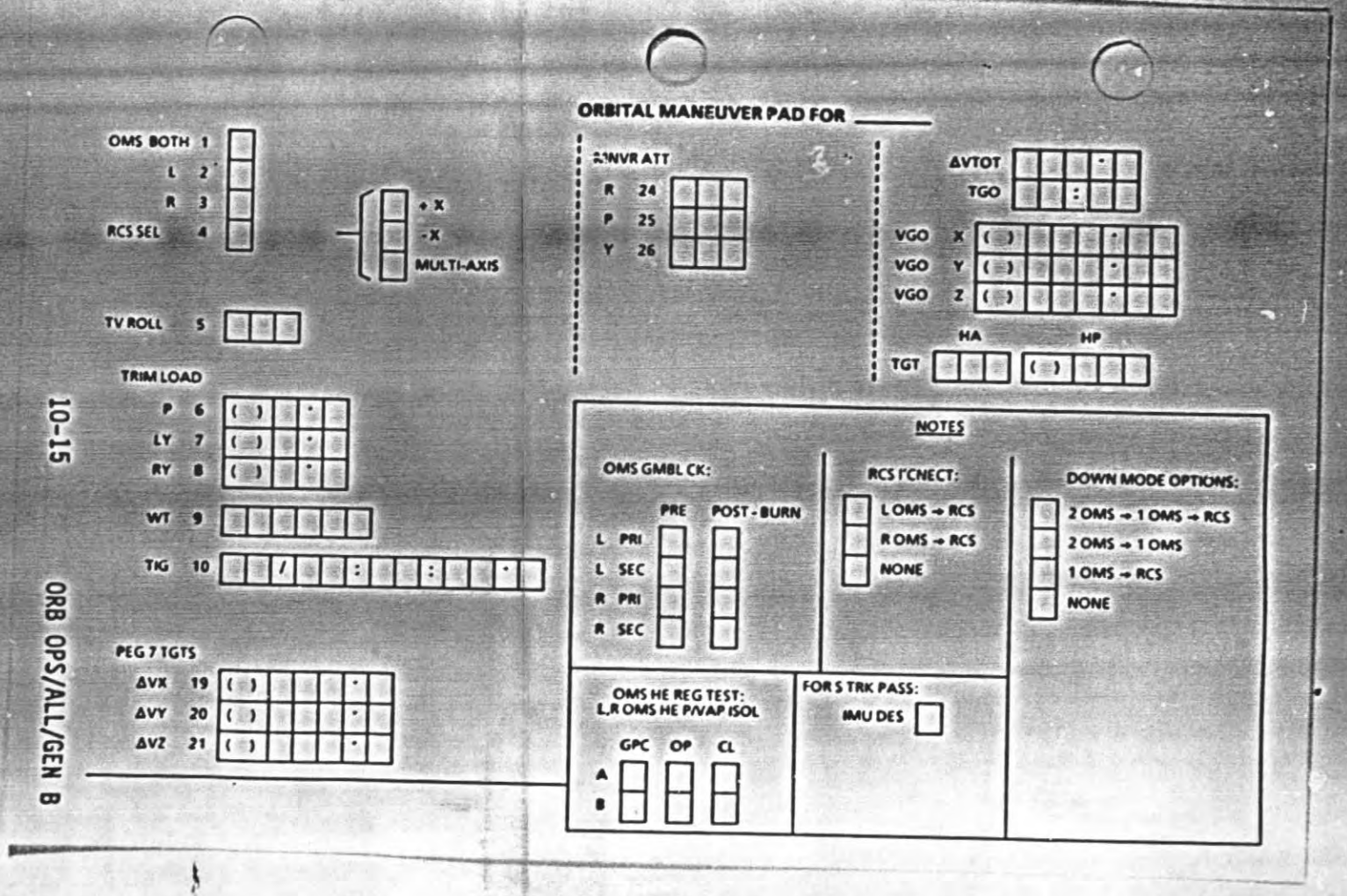
FOR S TRK PASS:
IMU DES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OMS GMBL CK:
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R PRI
R SEC
RCS DISCNECT:
L OMS → RCS
R OMS → RCS
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DOWN MODE OPTIONS:
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CL
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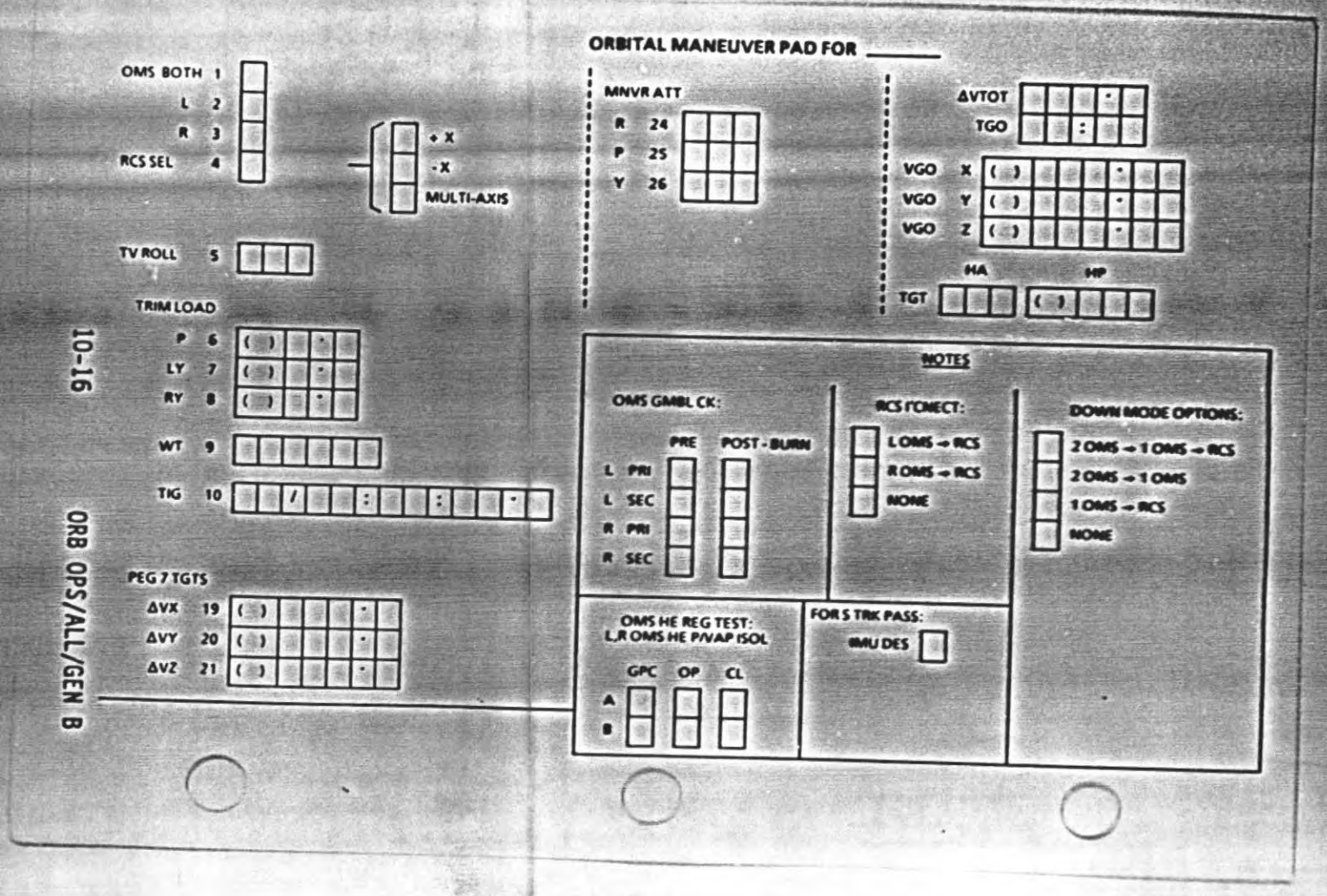
FOR S TRK PASS:
IMU DES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R 3
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+ X
- X
MULTI-AXIS
TV ROLL 5
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MNVR ATT
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VGO Z
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POST - BURN
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FOR S TRK PASS:
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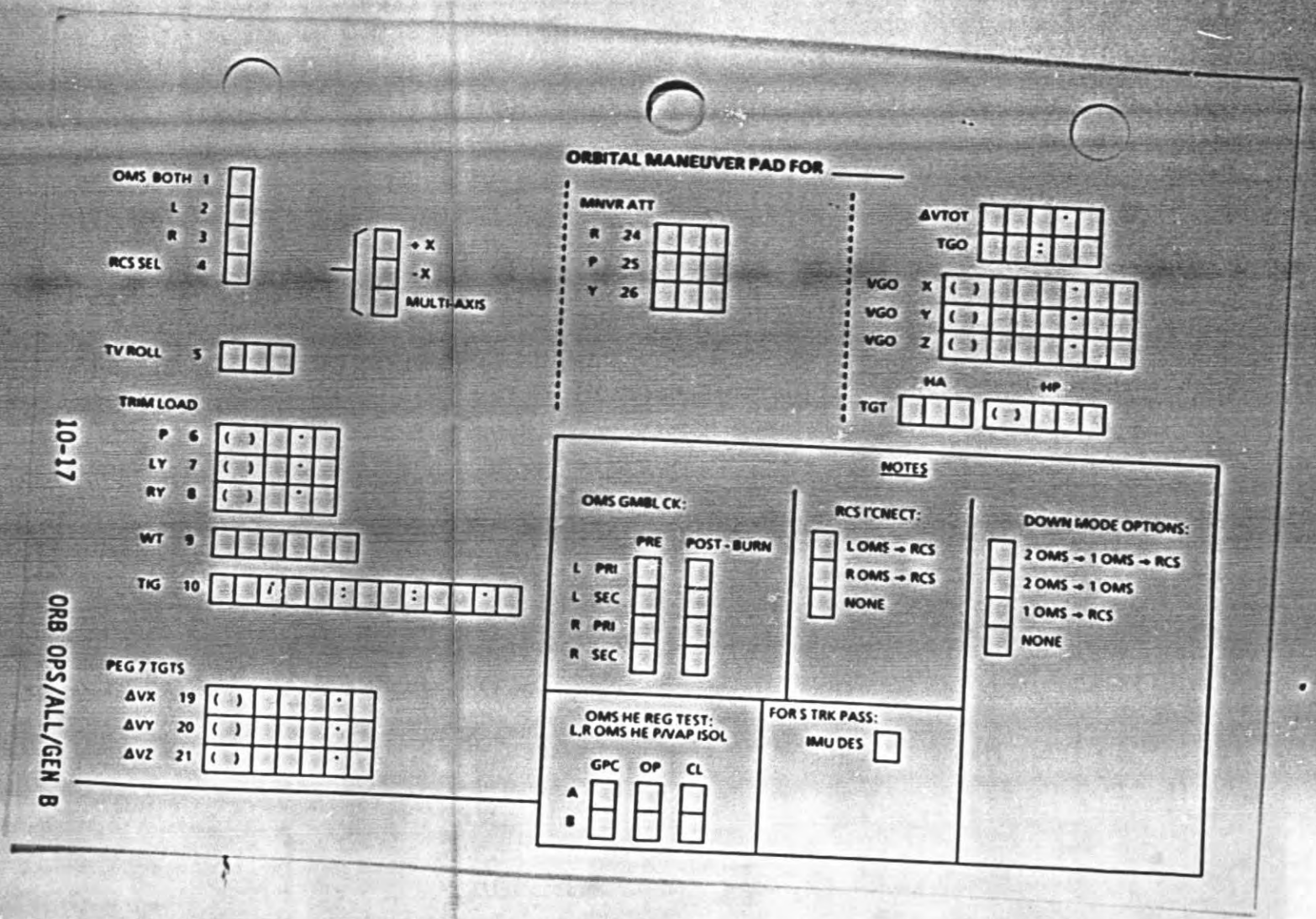
10-16
ORB OPS/ALL/GEN B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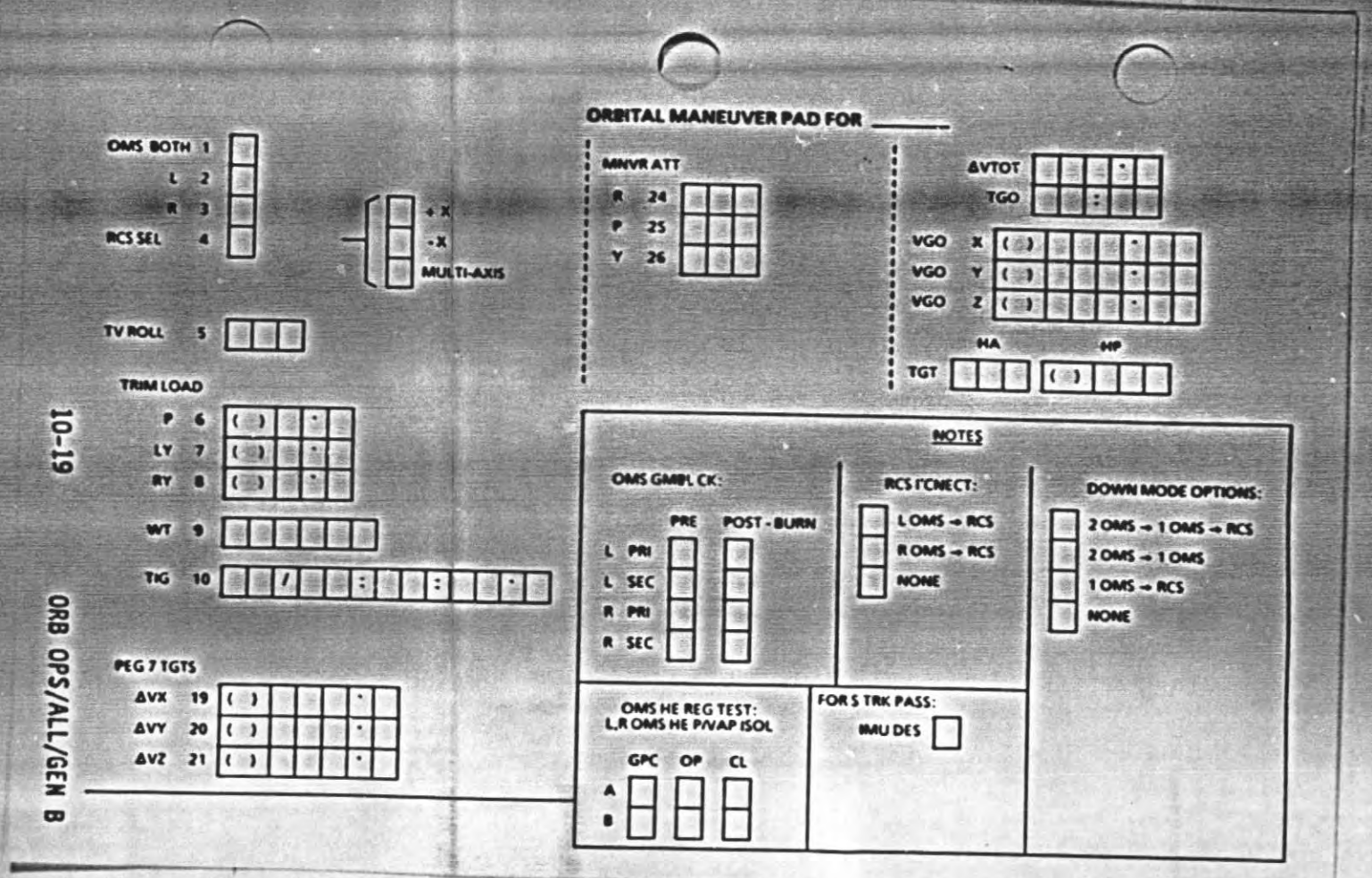
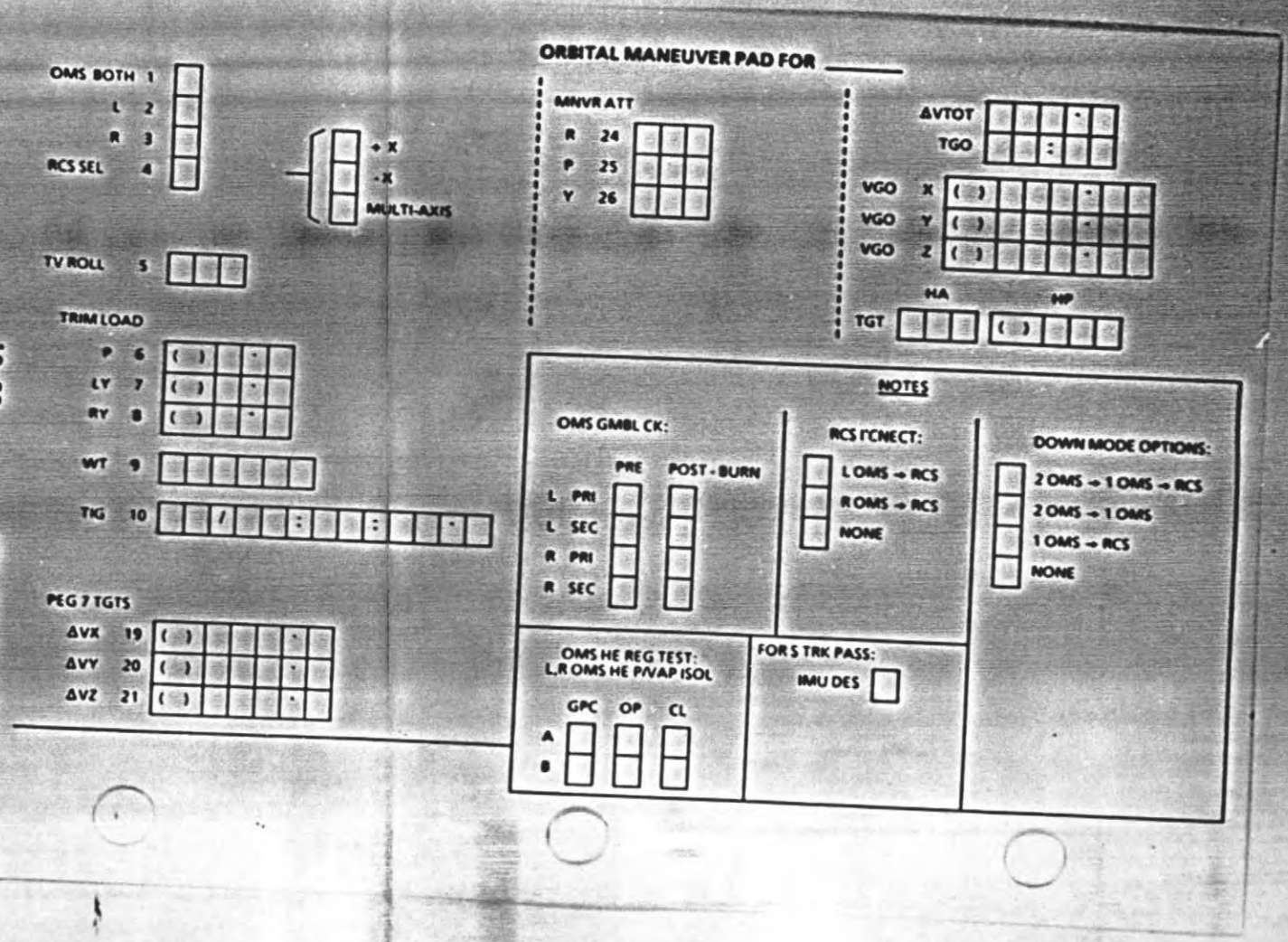
ΔVZ 21
MNVR ATT
R 24
P 25
Y 26
ΔVTOT
TGO
VGO X
VGO Y
VGO Z
HA
HP
TGT
NOTES
OMS GIMBL CK:
PRE
POST-BURN
L PRI
L SEC
R PRI
R SEC
RCS I'CNECT:
L OMS → RCS
R OMS → RCS
NONE
DOWN MODE OPTIONS:
2 OMS → 1 OMS → RCS
2 OMS → 1 OMS
1 OMS → RCS
NONE
OMS HE REG TEST:
L,R OMS HE P/VAP ISOL
GPC
OP
CL
A
B
FOR S TRK PASS:
IMU DES

ORB OPS/ALL/GEN B


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
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 DISCONNECT:
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
FOR S TRK PASS:
IMU DES
10-19
ORB OPS/ALL/GEN B


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
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 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
FOR S TRK PASS:
IMU DES

LOSS OF VERNIERS

NOTE

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

DAP: FREE

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

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

2. ESTABLISH PRIMARY CONTROL

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

016:F ✓RJD L5/F5/R5 DRIVER - OFF

DAP: A6(A1)/FREE/PRI
A6(A1)/AUTO/PRI

RECOVERY OF VERNIERS

DAP: FREE

1. CONFIG DAP

   Reconfig to FLT PLN DAP

2. CONFIG FOR VERNIER (PRIMARY) CONTROL

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

DAP: A/AUTO/VERN(PRI)

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SEP MANEUVER

SEP MANEUVER..... 11-2

SEP MNVR

SEP MANEUVER

SEP MNVR

1. SET UP AFT STATION

A6U

✓SENSE - as reqd
DAP: A1/INRTL/PRI
DAP TRANS: as reqd
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 1 min,
repeat SEARCH as convenient

5. OBTAIN ~1 FPS OPENING RATE

A6U
DAP TRANS: NORM/NORM/NORM
THC: +Z for 3 sec (DN: -X SENSE)
(OUT: -Z SENSE)
* 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

✓VGO Z ≥ 0; if VGO Z < 0, then:

* TGT PEG 7 ΔV_y - ITEM 20 -2 EXEC *
* LOAD - ITEM 22 EXEC *
* TIMER - ITEM 23 EXEC *
* ✓VGO Z ≥ 0 *

DO NOT MNVR to BURN ATT

A6U
At TIG deflect THC to null VGOs

7. PERFORM FINAL SEP

CRT
GNC ORBIT MNVR EXEC
✓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 ΔVx - ITEM 19 +3 EXEC
ΔVy - ITEM 20 +0 EXEC
ΔVz - ITEM 21 +0 EXEC

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

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-*)

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PDI DECOM FORMAT..... FS 1-4

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~~CUE CARD CONFIGURATION..... FS CC 8-1~~

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COMM/INST

LOAD PCMMU FORMAT..... FS 1-2
PDI DECOM FORMAT..... FS 1-4

COMM/INST

LOAD PCMMU FORMAT

C3 1. OI PCMMU FORMAT - GPC
SM 62 PCMMU/PL COMM

2. FORMAT:
FXD - ITEM 1 EXEC (*)
SEL ID - ITEM 3 +X X X EXEC

3. ✓SM COMM BUF - RDY
LOAD - ITEM 4 EXEC
✓LOAD, ITEM 4 - RUN, CPLT

4. If LOAD - CPLT
Repeat steps 2 and 3 for 2nd ID

5. If LOAD - FAIL & ERR MSG -'I/O ERR MMU 1(2)'
Go to MAL, DPS, 5.2a >>

6. If LOAD - FAIL and first load attempt
Repeat steps 2 and 3 for FAIL ID

7. If LOAD - FAIL and subsequent load attempt
C3 OI PCMMU PWR - 2(1)
✓ERR MSG - 'I/O ERR PCM'
- 'I/O ERR DL'
I/O RESET PCM - ITEM 5 EXEC (*)
Repeat steps 2 and 3

8. When final LOAD - CPLT
PGM - ITEM 2 EXEC (*)

DNLIST COMPATIBILITY	PHASE	FORMAT ID 64 / 128	CONFIG NO
G2,G8,S2,S4	ORB/ORB BURN/FCS C/O	103 / 161	775
G2,S2,G8,S4	IUS-16K (PRIME)	103 / 192	763
G2,S2,G8,S4	IUS-16K (B/U)	103 / 211	770
G2,S2,S4	IUS-64K (PRIME)	103 / 183	759
G2,S2,S4	IUS-64K (B/U)	103 / 204	766
G3,BFS	ENTRY	102 / 164	777
G2,S2,S4,OPS 0	OPS 0	/ 163	776
G2,S2,S4,P9	MMU C/O	/ 163	776
G3,S2,S4	LOSS OF 2 GNC GPCs	/ 172	779
GNC,BFS	-	- / FXD	-

NOTE

LDR TFL may affect PCMMU BITE. If PCMMU or SM 2 GPC has been switched since last TFL, ID 64 and 128 will not reflect current state

GPC DUMP/TFL COMPATIBILITY

DUMP TYPE			PCMMU FORMAT IDs	
			(NSP DATA XMIT = HI)	(XMIT = LO)
PASS	H/W (HISAM)**		FXD,160,161,163,164,166,192,201, 211	
	S/W HDR	GNC	FXD,160,161,163,164,166,192,201,211	
		SM	161,163,192,211	
		OPS0/PL9*	160,163	
	S/W LDR	GNC	183***,204***	102,103
		SM	183***,204***	103
		OPS0/PL9*		
BFS	H/W (HISAM)**		FXD,164,166,201	
	S/W HDR		FXD,164,166,201	
	S/W LDR			102

*Requires downlist GPC change on SPEC 0

**If NSP DATA XMIT - LO, dump will not be in the downlist but will be recorded on the OPS recorders

***For IUS TFL's 183 and 204 in DPS SSR-2, use 'DUMP LDR' values in all tables and steps even if NSP DATA XMIT - HI

LOAD PDI DECOM FORMAT

SM 62 PCMMU/PL COMM

1. PDI:
   ✓I/O RESET - ITEM 8 (*)
   SEL DECOM - ITEM 9 +X EXEC
   SEL FMT - ITEM 10 +X X X EXEC
   LOAD - ITEM 11 EXEC

2. If LOAD - CPLT
   SEL INPUT - ITEM 12 +X EXEC
   LOAD - ITEM 13 EXEC
   Continue steps 1 and 2 for additional DECOMS/FPM

3. If LOAD - FAIL & ERR MSG -'I/O ERR MMU 1(2)'
   Go to MAL, DPS, 5.2a >>

4. If LOAD - FAIL and first load attempt
   Repeat step 1

5. If LOAD - FAIL and subsequent load attempt
   ✓MCC for possible power cycle attempt

6. PCM:
I/O RESET PCM - ITEM 5 EXEC (*)

CONFIG	DECOM	FMT	INPUT	USE
763 ORB, IUS-16K PRIME TFL 192	1 2 3 4 5-FPM	18 7 16 15 506	2 3 5 5	TDRS SHARE IUS-64K IUS-16K
770 ORB, IUS-16K B/U TFL 211	1 2 3 4 5-FPM	17 8 5 6 504	3 2 5 5	SHARE TDRS IUS-16K IUS-64K
759 ORB, IUS-64K PRIME TFL 183	1 2 3 4 5-FPM	18 7 16 15 503	2 3 5 5	TDRS SHARE IUS-64K IUS-16K
766 ORB, IUS-64K B/U TFL 204	1 2 3 4 5-FPM	17 8 5 6 505	3 2 5 5	SHARE TDRS IUS-16K IUS-64K

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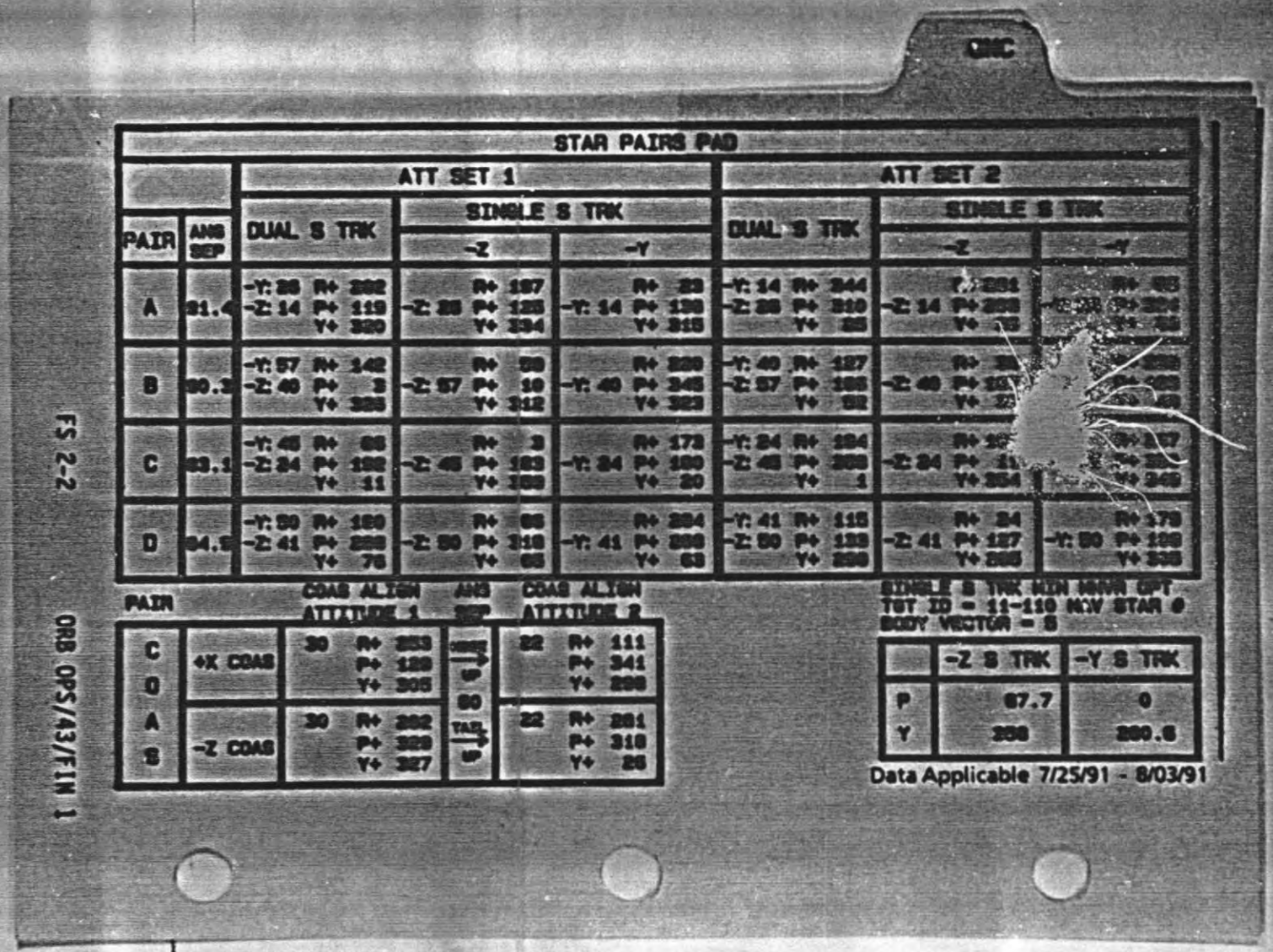
GNC

STAR PAIRS PAD..... FS 2-2
STAR PAIRS..... FS 2-3
DEORBIT IMU STAR PADS..... FS 2-4

GNC

QNC



STAR PAIRS PAD

PAIR	ANG SEP	ATT SET 1 DUAL S TRK	ATT SET 1 SINGLE S TRK -Z	ATT SET 1 SINGLE S TRK -Y	ATT SET 2 DUAL S TRK	ATT SET 2 SINGLE S TRK -Z	ATT SET 2 SINGLE S TRK -Y
A	31.4	-Y: 26 R+ 282 -Z: 14 P+ 119 Y+ 320	R+ 187 -Z: 26 P+ 125 Y+ 334	R+ 23 -Y: 14 P+ 138 Y+ 315	-Y: 14 R+ 344 -Z: 26 P+ 310 Y+ 25	R+ 281 -Z: 14 P+ 288 Y+ [illegible]	R+ [illegible] [illegible] P+ [illegible] [illegible]
B	30.3	-Y: 57 R+ 142 -Z: 40 P+ 3 Y+ 325	R+ 58 -Z: 57 P+ 10 Y+ 312	R+ 220 -Y: 40 P+ 345 Y+ 323	-Y: 40 R+ 127 -Z: 57 P+ 186 Y+ 52	R+ [illegible] -Z: 40 P+ [illegible] Y+ [illegible]	[illegible]
C	33.1	-Y: 45 R+ 66 -Z: 24 P+ 192 Y+ 11	R+ 3 -Z: 45 P+ 183 Y+ 359	R+ 173 -Y: 24 P+ 180 Y+ 20	-Y: 24 R+ 184 -Z: 45 P+ 358 Y+ 1	R+ [illegible] -Z: 24 P+ [illegible] Y+ 354	R+ [illegible] [illegible] Y+ 349
D	34.9	-Y: 50 R+ 180 -Z: 41 P+ 288 Y+ 76	R+ 66 -Z: 50 P+ 318 Y+ 65	R+ 284 -Y: 41 P+ 288 Y+ 63	-Y: 41 R+ 115 -Z: 50 P+ 133 Y+ 298	R+ 24 -Z: 41 P+ 127 Y+ 285	R+ 179 -Y: 50 P+ 108 Y+ 305

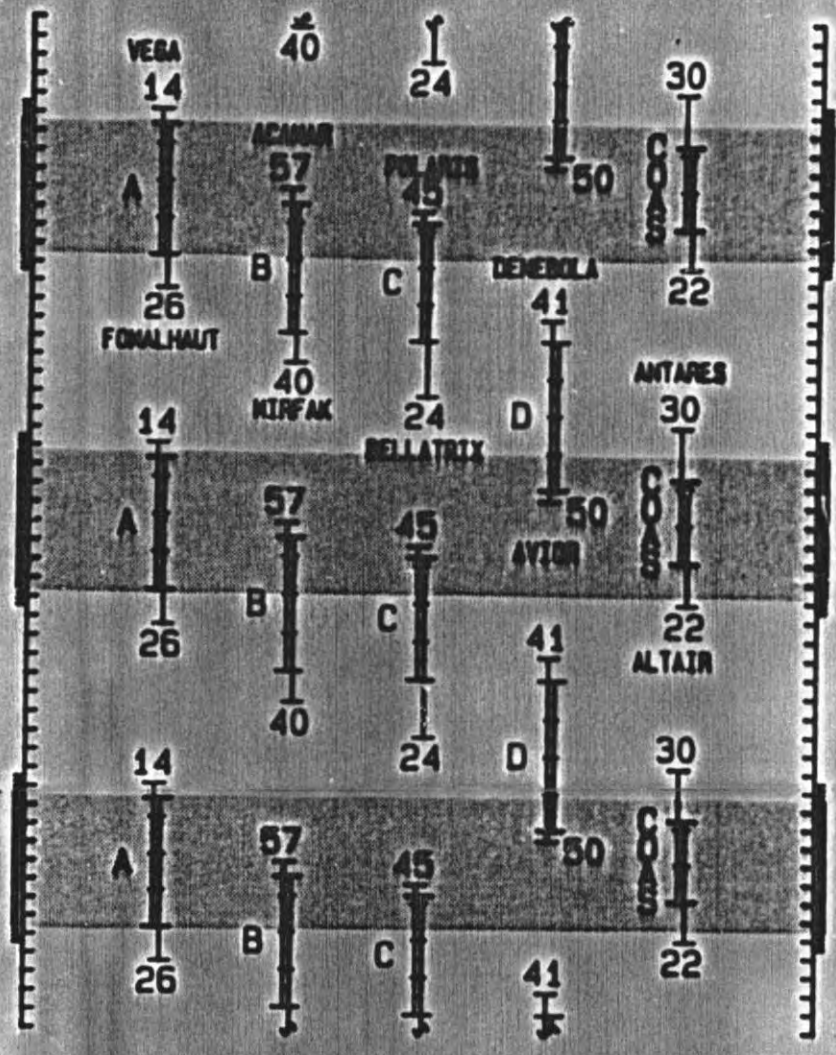
PAIR		COAS ALIGN ATTITUDE 1	ANG SEP	COAS ALIGN ATTITUDE 2
COAS	+X COAS	30 R+ 253 P+ 129 Y+ 305	60 (HORIZ → UP)	22 R+ 111 P+ 341 Y+ 298
	-Z COAS	30 R+ 282 P+ 329 Y+ 327	60 (TAIL → UP)	22 R+ 281 P+ 318 Y+ 26

SINGLE S TRK MIN NMVR OPT
TGT ID = 11-110 NAV STAR #
BODY VECTOR = 5

	-Z S TRK	-Y S TRK
P	67.7	0
Y	358	280.6

Data Applicable 7/25/91 - 8/03/91

STAR PAIRS



Data Applicable 7/25/91 - 8/03/91

FS 2-3 ORB OPS/43/FIN 1

DEORBIT IMU STAR PADS

IMU STAR ALIGN PAD

ID -Y: 26, FOMALHAUT
(TIG -02:53 to -02:09)
-Z: 14, VEGA
(TIG -02:57 to -02:14)
ANG DIF: 91.4

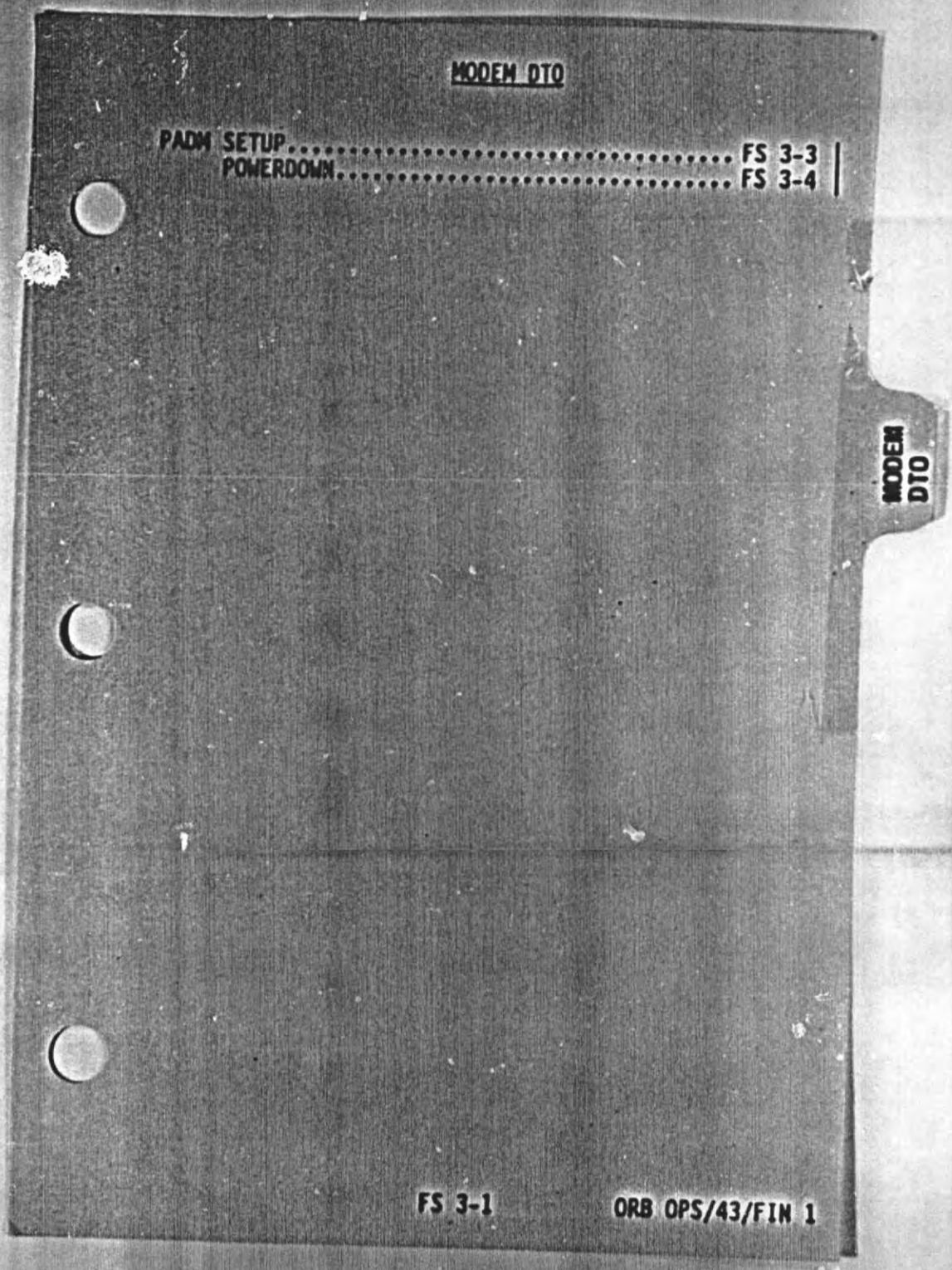
DUAL S TRKR ALIGNMENT		2nd ATTITUDE (SINGLE S TRKR) -Z:	-Y:
R	282	197	23
P	119	125	138
Y	320	334	315

IMU VERIFICATION STAR ALIGN PAD

ID -Y: 57, ACAMAR
(TIG -02:37 to -01:44)
-Z: 40, MIRFAK
(TIG -02:37 to -01:49)
ANG DIF: 90.3

DUAL S TRKR ALIGNMENT		2nd ATTITUDE (SINGLE S TRKR) -Z:	-Y:
R	142	59	220
P	3	10	345
Y	326	312	323

Launch - 07/25/91
TIG - 08/21:45:06 MET


MODEM DTO
PADM SETUP..... FS 3-3
POWERDOWN..... FS 3-4
MODEM DTO
FS 3-1
ORB OPS/43/FIN 1

MODEM
010

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PADM SETUP

Unstow:
PGSC/PADM
DC pwr cable
PADM DATA diskette

PGSC PWR - OFF

/DC UTIL PWR - OFF
Connect DC pwr cable from PGSC port 7
to DC UTIL PWR outlet

R6 R COMM PWR - OFF

Connect PADM audio cable from PADM to
R COMM OUTLET

O9 R AUD A/G 1 - OFF
A/G 2 - T/R
A/A - OFF
ICOM (two) - OFF
VOL A/G 2 tw - 0
XMIT/ICOM MODE - PTT/PTT

L9 PS AUD A/G 2 - OFF
O5 L AUD A/G 2 - OFF

R10 MS AUD A/G 2 - OFF

MO42F MIDDECK SPKR AUD A/G 2 - OFF

R6 R COMM PWR - ON

DC UTIL PWR - ON
PGSC PWR - ON

Notify MCC ready for modem ops

On MCC GO,
Select 'MODEM' from PGSC main menu
Insert PADM data diskette into PGSC
floppy drive

/PGSC in host mode

PADM POWERDOWN

If PGSC main menu not present (still in host mode)
Press <ESC> to quit host mode
Press <ALT-X> then <Y> to confirm exit of modern software

R6 R COMM PWR - OFF

Unplug PADM audio cable

Reconfigure Audio System

09 R AUD A/G 1 - T/R
A/G 2 - RCV
A/A - T/R
ICOM (two) - T/R
VOL A/G 2 tw - as reqd
XMIT/ICOM MODE - PTT/VOX

L9 PS AUD A/G 2 - RCV
O5 L AUD A/G 2 - RCV
R10 MS AUD A/G 2 - RCV
M042F MIDDECK SPKR AUD A/G 2 - RCV

NOTE

If PADM is to be removed, power off PGSC prior to removal

AMOS

AMOS RCS TEST..... FS 4-3

AMOS

AMOS

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AMOS RCS TEST

TCA	TEST 1	TEST 2	TEST 3
ACTUAL MET	__/__:__:__	__/__:__:__	__/__:__:__

A7U — ✓PL BAY FLOOD (eight) - OFF

CRT — SM 2 TIME
Set CRT timer counting down to TCA

F7 — Set event timer counting down to TCA

UNIV PTG
✓TGT ID: 2
✓BODY VECT: 3
✓OM: 180

Change DAP B to B2

DAP TRANS: NORM/NORM/NORM

TCA-00:24 — DAP: B/FREE/PRI

F7/F8 — FLT CNTLR PWR (two) - ON

TCA-00:14 — THC -X (out), hold 3 sec (0.9 ft/sec) (fires F1F,F2F)

TCA-00:06 — THC +X (in), hold 3 sec (0.8 ft/sec) (fires R3A,L3A)

TCA+00:02 — RHC +PITCH (up, past soft stop), hold 3 sec (1.5 deg/sec) (fires L1U,R1U)

TCA+00:10 — RHC -PITCH (down, past soft stop), hold 3 sec (1.0 deg/sec) (fires L3D,R3D)

F7/F8 — FLT CNTLR PWR (two) - OFF

DAP: A/AUTO/VERN

Reconfig to FLT PLN DAP

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ALT MODE DAP

ALT MODE DAP (DTO 798)..... FS 5-2
ATTITUDE HOLD TEST..... FS 5-2
MMVR PERFORMANCE TEST..... FS 5-4
ROTATION PERFORMANCE TEST..... FS 5-6
UARS SIMULATION TEST..... FS 5-8

ALT MODE DAP (DTO 798)

1. ATTITUDE HOLD TEST

a. | 1: GNC 2O DAP CONFIG | 2: GNC UNIV PTG |

CRT1

ITEM 23 +0.5 EXEC
/ITEM 35: 0.08

CRT1,2

b. Set event timer to test duration

Set DAP B/LOW Z/UNIV PTG option per TEST CONFIG TABLE - desired test #

CRT2

If MNVR:
  MNVR - ITEM 18 EXEC (*)
If TRK:
  TRK - ITEM 19 EXEC (*)

When in att and within deadband,
DAP: B/AUTO/ALT
Start timer

* If during tests, *
* continuous jet firings *
* DAP: B/FREE/PRI *
* A/INRTL/PRI * 6-20 12+1 13+1
* /MCC *

At end of test duration,
If next test 1-9:
  DAP: B/AUTO/PRI
  Repeat part b for next att hold test
If next test 10-21:
  DAP: B/AUTO/VERN

ALT MODE DAP

TEST CONFIG TABLE - ATTITUDE HOLD

		Relaxed Deadband Tests				Tight Deadband Tests				
	TEST # ->	1	2	3	4	5	6	7	8	9
	ATT HOLD DURATION (MIN)	20	20	20	20	10	10	10	10	2
GNC 20 DAP CONFIG	DISC RATE (ITEM 18)	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.2
	DEADBAND ATT (ITEM 22)	5.0	3.0	5.0	5.0	0.5	0.5	0.5	3.0	0.3
	CNTL ACCEL (ITEM 28)	0	0	0	1	0	0	0	1	0
	RATE DB (ITEM 32)	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.1	0.1
	JET OPT (ITEM 33)	1	3	1	1	1	3	1	1	1
	# JETS (ITEM 34)	2	1	3	2	2	2	1	2	2
	DELAY TIME (ITEM 36)	0	0	0	15	0	0	0	15	0
	LOW Z?	YES	NO	NO	YES	YES	NO	NO	YES	YES
UNIV PTG	R P Y			027 074 011	027 074 011					198 066 029
	TGT ID BODY VECT PITCH,YAW OM	2 3 90.0 280	2 3 90.0 280			2 3 90.0 280	2 3 90.0 280	2 3 90.0 280	2 3 90.0 280	

2. MNVR PERFORMANCE TEST

a. /DAP: B/AUTO/VERN

1: GNC 20 DAP CONFIG	2: GNC UNIV PTG

CRT1

/ITEM 23: 0.5
/ITEM 35: 0.08

CRT1,2

b. Set event timer to test duration

Set DAP B/LOW Z/UNIV PTG option per TEST CONFIG TABLE - desired test #

When within deadband,
DAP: B/AUTO/ALT

CRT2

If MNVR:
| MNVR - ITEM 18 EXEC (*)
If TRK:
TRK - ITEM 19 EXEC (*)
Start timer

* If during tests, *
* continuous jet firings *
* DAP: B/FREE/PRI *
* DAP: A/INRTL/PRI *
* /MCC *

At end of test duration,
DAP: B/AUTO/VERN
Repeat part b for next mnvr test

TEST CONFIG TABLE - MNVR PERFORMANCE

		MNVRS - Relaxed Deadbands				MNVRS - Tight Deadbands			
	TEST # ->	10	11	12	13	14	15	16	17
	TEST DURATION (MIN)	7:30	3:00	15:00	7:30	7:30	7:30	11:15	7:30
GNC 20 DAP CONFIG	DISC RATE (ITEM 16)	0.2	0.5	0.1	0.2	0.2	0.2	0.2	0.2
	DEADBAND ATT (ITEM 22)	3.0	3.0	3.0	3.0	1.0	0.5	3.0	1.0
	CNTL ACCEL (ITEM 28)	0	0	1	0	0	0	1	0
	RATE DB (ITEM 32)	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1
	JET OPT (ITEM 33)	1	1	1	1	3	1	1	1
	# JETS (ITEM 34)	3	3	3	1	2	2	2	2
	DELAY TIME (ITEM 36)	0	0	15	0	0	0	15	0
	LOW Z?	NO	NO	YES	YES	NO	NO	NO	YES
UNIV PTG	R P Y	048 111 006	027 074 011	054 071 335	027 074 011				
	TGT ID BODY VECT PITCH, YAW OM					2 5 69.30 301	2 3 90.0 280	2 5 122.18 312	2 3 90.0 280

3. ROTATION PERFORMANCE TEST

a. /DAP: B/AUTO/VERN
DAP: NO LOW Z

1: GNC 20 DAP CONFIG	2: GNC UNIV PTG

CRT1 /ITEM 35: 0.08

CRT1,2 b. Set event timer to test duration

Set DAP B/UNIV PTG per TEST CONFIG TABLE - desired test #

When within deadband,
DAP: B/AUTO/ALT
CRT2 ROT - ITEM 20 EXEC (*)
Start timer

* If during tests, *
* continuous jet firings *
* DAP: B/FREE/PRI *
* A/INRTL/PRI *
* /MCC *

At end of test duration,
CNCL - ITEM 21 EXEC
Wait 30 sec
DAP: B/AUTO/PRI
Repeat part b for next rot test

TEST CONFIG TABLE - ROTATION PERFORMANCE

	TEST # ->	18	19	20	21
	TEST DURATION (MIN)	1:30	7:30	3:00	2:08
GNC 20 DAP CONFIG	DISC RATE (ITEM 16)	1.0	0.2	0.5	0.7
	DEADBAND ATT (ITEM 22)	3.0	3.0	3.0	1.0
	CNTL ACCEL (ITEM 28)	0	1	0	0
	RATE DB (ITEM 32)	0.2	0.2	0.2	0.2
	JET OPT (ITEM 33)	1	1	1	3
	# JETS (ITEM 34)	3	3	3	2
	DELAY TIME (ITEM 36)	0	15	0	0
UNIV PTG	BODY VECT	4	1	5	5
	P Y	N/A N/A	N/A N/A	45 45	0 90

90°

4. UARS SIMULATION TEST

Set DAP B/UNIV PTG per test #22

DAP: B/AUTO/ALT
INIT TRK - ITEM 19 EXEC (*)

Return to FLT PLN

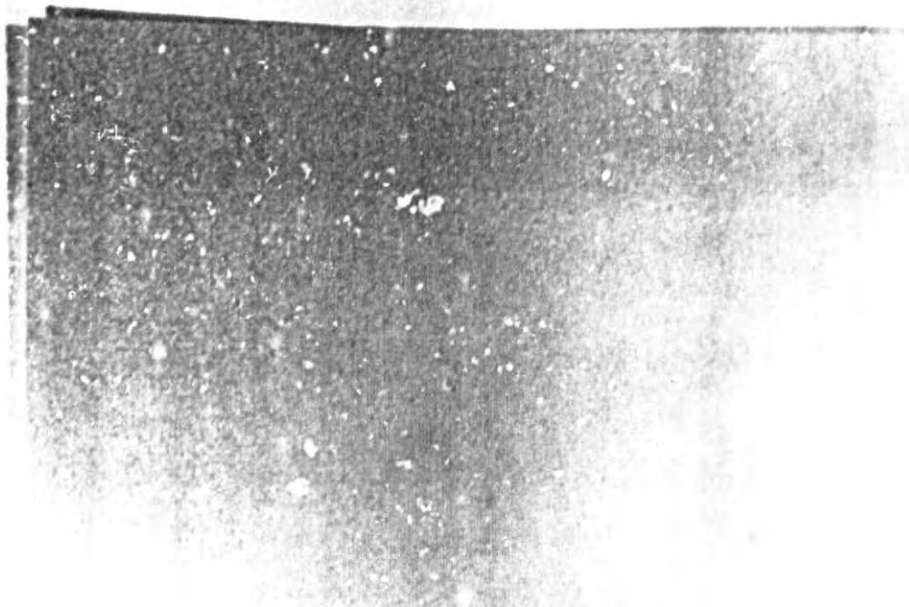
TEST CONFIG TABLE - UARS SIMULATION

	TEST # ->	22
GNC Z0 DAP CONFIG	DISC RATE (ITEM 16)	0.1
	DEADBAND ATT (ITEM 22)	3.0
	CNTL ACCEL (ITEM 28)	1
	RATE DB (ITEM 32)	0.1
	JET OPT (ITEM 33)	3
	# JETS (ITEM 34)	2
	DELAY TIME (ITEM 36)	3.75
UNIV PTG	TGT ID BODY VECT	2 3
	P Y OM	90 0 270

290

CURSOR CNTL DTO

CURSOR CNTL DEVICE (DTO 1208)..... FS 6-3



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JURSOR
CNTL DTO

CURSOR CNTL DEVICE (DTO 1208)

1. INITIAL POWERUP (Perform only if first use of Mac)

   a. ✓Display lid closed and locked
   b. Install fuse
   c. ✓Locking sw (left side of computer) - pulled forward
   d. Plug computer power cord in AC3-J3 on power panel A15
   e. Open display lid
   f. Depress any key for > 0.5 sec, wait for boot sequence completion
   g. Pull down <APPLE> menu and select <CONTROL PANEL>
   h. Set <SPEAKER VOLUME> TO <7> by dragging indicator up
   i. Set <TIME> and <DATE> fields to SPEC 2 GMT values by clicking on hour, minute or second and click on arrows to adjust
   j. ✓<RAM CACHE> - OFF
   k. Select <PORTABLE> from <CONTROL PANEL> icon list on left side of window using arrows
   l. Set <HARD DISK> automatic sleep to 30 min by dragging indicator
   m. Adjust <SCREEN BRIGHTNESS> as needed by dragging indicator up or down
   n. Hold down <OPTION> key and click on text <MINUTES UNTIL AUTOMATIC SLEEP>
   o. Select the <DON'T REST> radio button and click <OK>
   p. If <STAY AWAKE WHEN PLUGGED IN> is not marked, click box to mark it. Click <OK> or press <RETURN>
   q. Close <CONTROL PANEL> window by clicking small box in upper left-hand corner
   r. Insert DTO 1208, spare disk into MAC
      Double-click diskette icon
      Double-click <DTO 1208 INSTALL> icon
      Click <INSTALL>
      Click <QUIT>
      Close <DTO 1208 INSTALL> window
      Eject diskette
   s. Open (double-click) <MacSPOC> folder

Rename Spare Diskette
Click once on diskette icon
Press <delete> key
Type "DTO 1208 Update"

t. Open (double-click) <MacSPOC+> application
u. Update fields for <EDIT LIFTOFF GMT> and <EDIT M50 STATE VECTOR>
v. Click <CHECK SV...>
   Click <SAVE>
   Click <GO>
w. Pull down <FILE> menu and select <QUIT>
x. /<MacSPOC.cp> document in <MacSPOC> folder
   If file not there, go to step t

2. SOFTWARE STARTUP

NOTE

All key sequences should be entered in sequence by pressing and holding each key down.

If necessary to abort task at any time, press <OPTION> - <APPLE> - <5> at the same time.

If necessary to suspend task at any time, press <CONTROL> - <ESCAPE>. To resume, press <OPTION> - <ESCAPE>

a. Notify ground that session is beginning
b. Depress any key for > 0.5 sec; wait for boot sequence completion
c. /<TIME> and <DATE> fields for SPEC 2 GMT values
   If incorrect, go to INITIAL POWERUP and perform procedures (e-q)
d. Reboot portable by pressing <APPLE>-<F>
e. Open (double click) <DTO-1208, CURSOR EVAL> folder
f. Open (double click) <CURSOR EVAL> icon
g. Pause until screen setup complete (do not touch cursor control device)
h. If prompted, press <OPTION>-<g> when ready to begin
   If prompted, reboot portable by pressing <APPLE>-<F>

3. SETUP SOFTWARE

a. Plug in appropriate device

	ADAMSON		LOW		LUCID*	
Session	1st Dev	2nd Dev	1st Dev	2nd Dev	1st Dev	2nd Dev
1	B	D	C	A	A	D
2	A	C	D	B	B	C
3	D	A	B	C	D	B
4	C	B	A	D	C	A

A - Built-in trackball
C - Thumbball

B - Optical mouse
D - Trackball (w/restraint)
* - only if time permits
Note: Dev stands for device

b. Enter last name and hit <OK> or hit <RETURN>

c. Enter device label as specified in onscreen control device assignment matrix (A,B,C,D) and hit <OK> or hit <RETURN>

d. Device plugged in

e. Enter <Y> for 'yes' or <N> for 'no' and hit <OK> or hit <RETURN>

f. If using A (Built-in Trackball), <SHIFT>-<OPTION>-<6>

If using B (Optical mouse), <SHIFT>-<OPTION>-<9>

If using C (Thumbball), <SHIFT>-<OPTION>-<6>

If using D (External Trackball), <SHIFT>-<OPTION>-<6>

Pause for computer to set speed

g. Click <NEXT> to start

4. TEXT SELECT TASK

NOTE

If error made during test, click <SELECT> to repeat trial.

If inadvertent keystrokes corrupt underlined field, click <SELECT> and reselect underlined text

a. Click <SELECT> and immediately highlight (Drag Select) underlined text, then click <NEXT>. Repeat until first 18 trials complete

b. Press <CONTROL> - <5> to continue when prompted

c. Click <NEXT> to continue

d. Click <SELECT> and immediately highlight (Drag Select) underlined text, then click <NEXT>. Repeat until second 18 trials complete

e. If first device then:
   Press <APPLE>-<CONTROL>-<5> to continue when prompted
   If desired, add notes by using <MOCKWRITE>
   Press <APPLE>-<CONTROL>-<9>
   Go back to step 3 (SETUP SOFTWARE)

   If second device and if last session then:
   Press <CONTROL>-<5>
   Answer electronic questionnaire
   Press <SHIFT>-<OPTION>-<1> to end task when prompted

   If second device and if session 1 thru 3 then:
   If desired, add notes by using <MOCKWRITE>
   Press <SHIFT>-<OPTION>-<1> to end task when prompted

5. SAVE DATA

a. Insert appropriately numbered session diskette (label side up)

b. Double click floppy diskette icon

c. Copy (Drag) <HYPERCARD (KEYS)> icon into your folder on floppy diskette

d. Copy (Drag) named files (2) icons into your folder on floppy diskette

e. Eject diskette by dragging floppy diskette icon to trash can icon

f. Move (Drag) named icons (2) into folder named <DATA>

g. Notify ground that session has been completed

h. If not desired to PWRDN laptop, press <APPLE>-<L>

i. If desired to PWRDN laptop - <SHUT DOWN> in <SPECIAL> icon on menu bar

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MAC MODEM

MAC MODEM..... FS 7-3
MODEM MALF..... FS 7-6

MAC MODEM

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MAC MODEM

1. MAC DATA XFR SETUP

Unstow:
- Macintosh
- Mac pwr cable assy
- Mac modem cable

R6 — R COMM PWR - OFF

✓Macintosh PWR - OFF

✓AC UTIL PWR - OFF

A15 — Connect Mac pwr cable assy from Macintosh to AC UTIL PWR outlet

Connect Mac modem cable to Macintosh

Connect PADM audio cable from Mac modem cable to R COMM outlet

O9 — R AUD A/G 1 - OFF
A/G 2 - T/R
A/A - OFF
ICOM (two) - OFF
VOL A/G 2 tw - 0
XMIT/ICOM MODE - PTT/PTT

L9 — PS AUD A/G 2 - OFF

O5 — L AUD A/G 2 - OFF

R10 — MS AUD A/G 2 - OFF

MO42F — MIDDECK SPKR AUD A/G 2 - OFF

R6 — R COMM PWR - ON

AC UTIL PWR - ON

Macintosh PWR - ON

Open (double click) <APPLELINK> icon

On MCC GO, continue

Note system clock time on <CONTROL PANEL>
____:____:____

Enter password: ANYSEES
(Do not press return)

Click <CONNECT LATER>
Select <GET UNREAD ITEMS AND SAVE THEM>
Click <SELECT FOLDER>

✓<NEW MAIL> folder open (in box below <SELECT THE FOLDER TO HOLD THE RECEIVED ITEMS>)

If <NEW MAIL> folder not open:
- Position cursor arrow on folder identifier box
- Hold down trackball bar
- Select <Macintosh HD> from list
- Double-click <NEW MAIL>

Click <OK>

Set <CONNECT TO THE NETWORK AT> time to approx 1 or 2 min past estimated current system clock time

Click <BEGIN CONNECTION>

NOTE

File transfers are complete when "Disconnecting from the Applelink Network" momentarily appears and Applelink services window disappears

When file transfers complete, continue

2. MAC DATA XFR POWERDOWN

If desired (at any time):
Uplinked files may be opened using Applelink
WristMac files moved to <WristMac> folder
MacSPOC files moved to <MacSPOC> folder

Enter <COMMAND-Q> to quit Applelink

If required, shut down Mac, pull down <SPECIAL> menu, select <SHUTDOWN>

R6 R COMM PWR - OFF

Unplug and recap PADM audio cable

Reconfigure Audio System

09 R AUD A/G 1 - T/R
A/G 2 - RCV
A/A - T/R
ICOM (two) - T/R
VOL A/G 2 tw - as reqd
XMIT/ICOM MODE - PTT/VOX

L9 PS AUD A/G 2 - RCV
O5 L AUD A/G 2 - RCV
R10 MS AUD A/G 2 - RCV
MO42F MIDDECK SPKR AUD A/G 2 - RCV

MAC MODEM MALF

If Mac does not start up:
- ✓Mac power cable connected securely to AC UTIL PWR outlet
- ✓AC UTIL PWR - ON
- Depress tabs on rear of Mac and remove cover
- ✓Internal battery and fuse properly installed
- Replace cover
- If operating normally:
  - Reset clock to "SPEC 2 GMT"
  - Return to normal operations
- If still does not start, ✓MCC

If no response to keystrokes or clicks:
- Push back locking sw (left side of computer)
- Press button of left side of computer nearest locking sw (the Mac will restart)
- If operating normally, return to normal operations. If not: ✓MCC