ORBIT OPS CHECKLIST

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APU/HYDRAULICS

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HYD ISOL VALVE REPOSITIONING..... 1-2

HYD THERM COND - ENA

```
A12        ✓HYD CIRC PUMP PWR 1 - MNA
                              2 - MNB
                              3 - MNC
```

NOTE

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

```
R2         HYD CIRC PUMP 2        - ON
R4             LG HYD ISOL VLV 2 - OP (tb-OP)
R2             CIRC PUMP 2        - GPC
           HYD CIRC PUMP 3        - ON
R4             LG HYD ISOL VLV 3 - OP (tb-OP)
R2             CIRC PUMP 3        - GPC
               CIRC PUMP 1        - GPC
```

HYD THERM COND - TERM

```
R2         HYD CIRC PUMP 1,2,3    - OFF
               CIRC PUMP 2        - ON
R4             LG HYD ISOL VLV 2 - CL (tb-CL)
R2             CIRC PUMP 2        - OFF
           HYD CIRC PUMP 3        - ON
R4             LG HYD ISOL VLV 3 - CL (tb-CL)
R2             CIRC PUMP 3        - OFF
```

HYD ISOL VALVE REPOSITIONING

NOTE

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

```
R2         HYD CIRC PUMP X        - ON
R4             LG HYD ISOL VLV X  - OP(CL) (tb-OP(CL))
               or
               MPS/TVC ISOL VLV X - OP(CL) (tb-OP(CL))
R2             CIRC PUMP X        - OFF
```

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RCD DATA ONLY (SLEEP)

C3 ✓S-BD PM CNTL - CMD

|SM 1 OPS UTILITY|

CRT RTC (RCDR VOICE 1/2 - OFF via GCIL A(B))
ITEM 13 +7 1 0 9 0 1 F F EXEC
(7I0Ā 01FF)
CMD - ITEM 14 EXEC
ITEM 13 +7 9 0 9 0 0 5 D EXEC
(790Ā 005D)
CMD - ITEM 14 EXEC

RTC (OPS RCDR 1(2) RCD SERIAL 128)
ITEM 13 +A 0 8 9 F F F F EXEC
(A08Ā FFFF)
CMD - ITEM 14 EXEC
ITEM 13 +A 8 8 9 8 6 1 0 EXEC
(A88Ā 861Ō)
CMD - ITEM 14 EXEC

|SM 76 COMM/RCDR|

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

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

When SELF TEST complete (~3 min),

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

A2 ✓RANGE/ELEVATION - +888.8

If RANGE/ELEVATION - +333.3, contact MCC

CRT SELF TEST - ITEM 7 EXEC (no *)

KU-BD ANT CABLE POSITIONING

NOTE
Perform this procedure
when not tracking

A1U KU CNTL - PNL
KU - AUTO TRACK
SLEW RATE - FAST

A2 DIGI-DIS SEL - EL/AZ

A1U SLEW ELEV - as reqd:
A2 RANGE/ELEVATION - 0(±5°)

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

A1U SLEW ELEV - UP (hold for 14 sec)

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

KU-BD ANT STOW

NOTE

Use exterior scene from PHOTO/TV C/L, TV, TV06 to monitor KU-BD ANT motion

C3	✓DAP - VERN
R13L	✓PL BAY MECH PWR SYS 1,2 (two) - OFF
A1U	✓KU PWR - ON
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	SLEW AZM - as reqd:
A2	RANGE RATE/AZM - -123.0(±1°)
A1U	KU - MAN SLEW SLEW RATE - SLOW
R13L	KU ANT - STOW Wait 50 sec
A2	✓RANGE/ELEVATION - -29.0(±1°) ✓RANGE RATE/AZM - -125.0(±1°)
R13L	PL BAY MECH PWR SYS 1,2 (two) - ON If KU ANT - tb NOT bp, Go to MALF, MECH, 9.5c
	When KU ANT tb - STO (-23-46 sec),
A1U	KU PWR - OFF
R13L	KU ANT - GND
	If no STO, Go to MALF, MECH, 9.5b
	PL BAY MECH PWR SYS 1,2 (two) - OFF

1 SETUP

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

2 ANTENNA STEERING

NOTE
ANT will not LOCK/TRACK
when slewing in FAST RATE

CRT |SM ANTENNA|

A1U,CRT Use SLEW AZM and SLEW ELEV sw as required to position LOS pointer (□) over target on CRT

CRT When ANT EL, AZ CMD angles are within 5° of ANT EL, AZ ACT angles,

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

..IF NO TRACK IN 3 MIN.....
. Repeat step 2 once .
. If still no track, contact MCC .
.....
KU CNTL - CMD

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

R15 cb MNB KU ELEC - op
ANT HTR - op
CABLE HTR - op

A1U ✓KU PWR - OFF

A14 ✓ANT ARM - SAFE
✓JETT - SAFE

ML868:D cb MNA PYRO JETT SYS A KU ANT - cl
cb MNC PYRO JETT SYS B KU ANT - cl

CONFIGURE CCTVs TO MONITOR JETTISON

CCTV MON 1 - A
2 - B
Point CCTVs as reqd
Put new tape in VTR

A6U FLT CNTLR PWR - ON

A7U ✓Lighting - as reqd

When in attitude, then

CRT |GNC 33 REL NAV|
AVG G ON - ITEM 1 EXEC (•)

SUNRISE DAMP RATES

A6U DAP ROT: DISC/DISC/DISC
TRANS: PULSE/PULSE/NORM

If VERN jets avail
| DAP: A/MAN/VERN
If VERN jets not avail
DAP: B/MAN/NORM

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

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

JETT KU ANTENNA

A14 PYRO KU ANT ARM - ARM

Wait 7 sec, then
PYRO KU ANT JETT - JETT

WHEN JETTISON COMPLETE, TRANSLATE AWAY

JETT+ 0:01 Start EVENT TIMER
THC +Z, 2 sec (1 ft/sec)
(-X sense: THC dn)
(-Z sense: THC out)
DAP ROT: DISC/DISC/DISC

2:00 SECOND SEP BURN

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

Maintain visual contact with KU ANT in
OVHD window using RHC

When KU ANT no longer visible, then

CLEANUP

R11 VTR pb - STOP

CRT |GNC 33 REL NAV|
AVG G ON - ITEM 1 EXEC (no *)

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

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

A7U ✓Lighting - as reqd

A14 PYRO KU ANT JETT - SAFE
ARM - SAFE

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

KU-BD ANT DEPLOY

R13L PL BAY MECH PWR SYS 1,2 (two) - ON
KU ANT - DPY
If KU ANT - tb NOT bp,
Go to MALF, MECH, 9.5c

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

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

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

POST-SLEEP AUD CONFIG

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

A13        OS AUD SPKR PWR - OFF

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

           If not OV102,
R10        |  MS AUD ICOM A,B (two) - R, tw - R
           |         XMIT/ICOM MODE - R
           |          (If Duty Crewman,
           |           AUD PWR - AUD/TONE)
           |
           If OV102,
A13           OS AUD A/G 2           - RCV (If TPR reqd)
                 ICOM A,B (two) - R, tw - R
                 XMIT/ICOM MODE - R

O6            UHF MODE - as reqd

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

MD42F         MIDDECK SPKR AUD PWR            - OFF
                           A/G 2             - RCV
                           ICOM A,B (two) - R
                           XMIT/ICOM MODE - R
                            (If Duty Crewman,
                             AUD PWR - AUD/TONE)
```

PRE-SLEEP AUD CONFIG

```
          TPR 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

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

A1R       AUD CTR VOICE RCD SEL CH 1,2 - OFF
          If not OV102,
R10         MS AUD PWR              - AUD/TONE
                  A/G 1             - T/R
                  A/G 2             - OFF
                  A/A               - T/R
                  ICOM A,B (two)    - OFF
                  VOL tw's          - R
                  XMIT/ICOM MODE    - PTT/PTT

          If OV102,
A13         OS AUD PWR              - AUD/TONE
                  A/G 1             - T/R
                  A/G 2             - OFF
                  A/A               - T/R
                  ICOM A,B (two)    - OFF
                  VOL tw's          - R
                  XMIT/ICOM MODE    - PTT/PTT
                  SPKR PWR          - SPKR/MIC
                  MSTR SPKR VOL     - R

06        UHF MODE - as reqd

          All WCCUs LEG UNIT      - OFF
                    AUD PNL PWR   - OFF
```

MD42F MIDDECK SPKR AUD PWR - AUD/TONE
A/G 1 - T/R
A/G 2 - OFF
A/A - T/R
ICOM A,B (two) - OFF
VOL tw's - R
XMIT/ICOM MODE - PTT/PTT
TONES - ACCU/BYP
SPKR PWR - SPKR/MIC

SPKR BOX CHECKOUT

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

A13 OS AUD SPKR PWR - OFF
Perform comm check using middeck SPKR/MIC
OS AUD SPKR PWR - SPKR/MIC

DUTY CREWMAN

If not OV102,
R10 MS AUD PWR - AUD

If OV102,
A13 OS AUD PWR - AUD
MD42F MIDDECK SPKR AUD PWR - AUD
TONES - ACCU

MD58F Conn CCU/HDST to sleep sta tones connector - set off tone

✓Receipt via HDST, Duty Crewman monitor for tones

NOTE
Duty crewman will hear tones only

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PRE-SLEEP ACTIVITY

FLIGHT DECK ACTIVITY LIST

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

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

CREW SYS

2 EPS, FUEL CELL PURGE - AUTO
ECLS, SUPPLY WATER DUMP PROTO H_2O Dump
3 I'CNECT RETURN (ORBIT PKT, RCS)
CRT 4 ✓CRT MAJ FUNC - one SM, one GNC
5 CRT TIMER FOR WAKE UP
6 ALERT TONE DURATION
7 POWERDOWN:
CRTs (one STBY, three OFF)
✓PWR OFF:
TV MON
TV CAMERAS
TV PWR CONTR UNIT
TV PWR
VTR
PLB LIGHTS
DDUs (one ON, if reqd)
8 COMM/INST, KU-BD ANT CABLE POSITIONING
9 WINDOW SHADES/FILTERS
10 LIGHTING
014:F, 11 Primary RJD DRIVER (eight) - OFF
015:F,
016:F

RAT LITE - ON

MIDDECK ACTIVITY LIST

1 MEAL PREP (Cue Card):
MEAL

2 HOUSEKEEPING

3 WCS cleaning and URINAL SCREEN INSPECTION/ REPLACEMENT (URINE COLLECTION Cue Card)

CDR, PLT 4 Change wireless headset battery packs
If FD1, mark with tape

NOTE

If all fresh batteries have been used, reinstall FD1 batteries

5 MISSION NOTES (MICROCASSETTE RCDR, Cue Card)

6 SET UP EQUIPMENT FOR NEXT DAY'S ACTIVITIES

MD44F 7 CAB TEMP CNTL (FULL HEAT or as reqd)

8 ✓PWR OFF:
FOOD WARMER
TV PWR

9 MED DATA REPORT (MICROCASSETTE RCDR, Cue Card)

10 COMM/INST, PRE-SLEEP AUD CONFIG

11 CO2 ABSORBER REPLACEMENT (Cue Card)
(If 5 crewmen, do last)

12 LIGHTING

POST-SLEEP ACTIVITY

MIDDECK ACTIVITY LIST

1 LIGHTING
2 CO2 ABSORBER REPLACEMENT (Cue Card)
(If 5 crewmen, do first)
3 MESSAGE REVIEW
4 COMM/INST, POST-SLEEP AUD CONFIG
MD44F 5 CAB TEMP CNTL (FULL COOL or as reqd)
6 MEAL PREP (Cue Card): MEAL
7 HOUSEKEEPING
MS1, MS2 8 Change wireless headset battery packs
If FD1, mark with tape
RAT LITE – OFF

NOTE

If all fresh batteries have been used, reinstall FD1 batteries

FLIGHT DECK ACTIVITY LIST

1 LIGHTING
2 WINDOW SHADES/FILTERS
3 COMM/INST, KU-BD ANT CABLE POSITIONING
4 CRTs (three on)
5 ALERT TONE DURATION
6 Perform I'CNECT L(R) OMS to RCS,
014:F ORBIT PKT, RCS, then:
015:F Primary RJD DRIVER (eight) - ON
016:F

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

NOTE

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

8 EPS, FUEL CELL PURGE - AUTO
ECLS, SUPPLY WATER DUMP Phase H_2O Dump

9 If FD2: ECLS, CRYO O2 TK HTR SNSR CK

CABIN CONFIG/STOW

1 AIR SAMPLE

Fill Air Sample Bottle,
Rcd Time __/__ __:__ __

2 FDF CONFIG

Unstow, install:
ENTRY & DEORBIT BURN Cue Cards
ENT C/L
ENT PKT
MS ENT and ENT PKT C/L

✓Available for Entry:
DEORB PREP
OMS/RCS SLIDE RULE (Cue Card)
LMG SITE CHARTS
Handheld Radio

3 MISC STOW

Stow Trash
Stow all Middeck/Flight Deck hardware
except:
Food Warmer/Trays
Wet Trash Bags/Manifold
Personal Hygiene Articles
35mm, 70mm Cameras
Sleeping Bags
Wireless Headsets
GAS Encoders
VTR Cassette (in VTR)
✓Modular lockers, floor compartments secure
✓Window shades/Filters stowed as reqd
✓A/L HATCH secure, locked

RADIATION INSTRUMENTATION LOG

	LOCATION MFZNG	DOS TYPE	D/HH:MM/ READING	D/HH:MM/ READING	D/HH:MM/ READING	D/HH:MM/ READING	D/HH:MM/ READING	D/HH:MM/ READING	D/HH:MM/ READING
POUCH IDENTIFICATION	1	0-200 MILLIRAD							
	2	0-200 MILLIRAD							
		0-100 RAD							
	3	0-200 MILLIRAD							
	LOOSE S/N 385	0-600 RAD							
	LOOSE S/N 438	0-600 RAD							
	4	0-200 MILLIRAD							
	5	0-200 MILLIRAD							
	6	0-200 MILLIRAD							
		0-100 RAD							

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SINGLE G2 GPC OPS

1 FORM SINGLE G2 GPC SET

If MM202: GNC, OPS 201 PRO
|GNC 0 GPC MEMORY|
CRT CONFIG - ITEM 1 +2 EXEC
Assign MC 2 per table -------->
✓DOWNLIST GPC, ITEM 44 - 1
GNC, OPS 201 PRO (✓DAP)

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

2 FREEZE DRY GPC 2 (G2 FD)

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

3 CONFIGURE DAP FOR VRCS

OPS

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

4 CONFIGURE STAR TRACKERS

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

5 CLEAR SOFTWARE FAIL VOTES

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

ECLS

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SUPPLY WATER DUMP

NOTE

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

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

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

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

1 DUMP PREP

If only TKS A&B to be dumped

R12L | ✓SPLY H2O XOVR VLV tb - CL

If TK C(D) to be dumped

SPLY H2O TK A,B OUTLET (two) - CL (tb-CL)

Close SPLY H2O TK C,D OUTLET and INLET vlvs except on tanks to be dumped:

SPLY H2O TKC OUTLET - CL (tb-CL)

INLET - CL (tb-CL)

ML31C TKD OUTLET - CL (tb-CL)

INLET - CL (tb-CL)

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

ECLS

CABIN TEMP CONTROL – SM 88 APU/ENVIRON THERM

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

Normal Control Method

← To COOL CABIN

→ To HEAT CABIN

NOTE
Throughout checkout, ignore alerts and note any discrepancies

|SM 66 ENVIRONMENT|

```
L1      HUMIDITY SEP B - OFF
                     A - ON
CRT     ✓HUMID SEP A - (no '↓')
L1      HUMIDITY SEP A - OFF
                     B - ON
        IMU FAN B - OFF
                A - ON
CRT     ✓IMU FAN ΔP - -4.43                                  |
L1      IMU FAN A - OFF
                C - ON
CRT     ✓IMU FAN ΔP - -4.43                                  |
L1      IMU FAN C - OFF
                B - ON
        CAB FAN B - OFF
                A - ON
CRT     ✓CABIN FAN ΔP - -4.5 (-0.23 OV102)
L1      CAB FAN A - OFF
                B - ON
        AV BAY 1 FAN B - OFF
                     A - ON
               2 FAN A - OFF
                     B - ON
               3 FAN B - OFF
                     A - ON
CRT     ✓AV BAY FAN ΔP 1 - -3.1 (-0.16 OV102)
                       2 - -3.4 (-0.12 OV102)
                       3 - -4.5 (-0.15 OV102)                |

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 1,2 (two) - B

        If FLOW PROP VLV LOOP 1,2 tb (two) - ICH
CRT     | ✓FREON LOOP FREON FLOW > 2000
L1      If FLOW PROP VLV LOOP 1,2 tb (two) - PL HX
CRT       ✓FREON LOOP FREON FLOW > 1350

L1      FREON PUMP LOOP 1,2 (two) - A
        H2O PUMP LOOP 1 (two) - ON, A
CRT     ✓H2O LOOP 1 ICH FLOW > 900
L1      ✓H2O LOOP 1 BYP MODE - MAN
                        MAN  - INCR (hold 10 sec)
CRT     ✓H2O LOOP 1 ICH FLOW - decreasing
L1      ✓H2O LOOP 1 BYP MAN - DECR (until ICH FLOW
                                    -950)
        H2O PUMP LOOP 1 (two) - GPC, B
        ✓H2O LOOP 2 BYP MODE - MAN
                        MAN  - INCR (hold 10 sec)
CRT     ✓H2O LOOP 2 ICH FLOW - decreasing
L1       H2O LOOP 2 BYP MAN - DECR (until ICH FLOW
                                    -950)
```

SET UP

L2 O2/N2 CNTLR VLV SYS 1 - OP
SYS 2 - CL

C7 ✓LEH O2 1 vlv - OP
2 vlv - OP
Unstow O2 Bleed Orifice Assembly

MD32M ✓LEH O2 5 vlv - CL

Insert O2 Bleed Orifice Assembly into
LEH O2 5 QD
LEH O2 5 vlv - OP

SET C&W LIMITS

C/W CH	PARAMETER NAME	SW ID	HIGH C/W VDC/EU	ENA INH
34	PPO2 A	0612511	3.40/3.40	
44	PPO2 B	0612513	3.40/3.40	
54	N2 FLOW SYS 1	0612553		INH
24	O2 FLOW SYS 2	0612205		INH

MD10W 14.7 CAB REG INLET SYS 2 vlv - OP
C&W ALARM 'CABIN ATM' and/or B/U C&W 'S66 CABIN PPO2'
MD10W 14.7 CAB REG INLET SYS 2 vlv - CL
1 vlv - OP

When N2 FLOW SYS 1 < 1.0,
14.7 CAB REG INLET SYS 1 vlv - CL

If prior to sleep,
14.7 CAB REG INLET SYS 1,2 vlv (two) - CL

RESET C&W LIMITS

C/W CH	PARAMETER NAME	SW ID	HIGH C/W VDC/EU	ENA INH
34	PPO2 A	0612511	3.60/3.60	
44	PPO2 B	0612513	3.60/3.60	
54	N2 FLOW SYS 1	0612553		ENA
24	O2 FLOW SYS 2	0612205		ENA

```
CRT     1  |GNC 20 DAP CONFIG| - Config DAP to B1
C3         DAP: B/AUTO/NORM

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

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

        4  RAD BYP VLV MODE (two) - MAN
                      MAN SEL (two) - BYP
                                   (tb-BYP ~3 sec)
           RAD CNTLR LOOP (two) - OFF
           After 2.5 min,
01          ✓FREON EVAP OUT TEMP ind - 62° ± 2° F

L1      5  HI LOAD EVAP - OFF
           After 2.5 min,
01          ✓FREON EVAP OUT TEMP ind - 62° ± 2° F

L1      6  HI LOAD EVAP - ENA

        7  FLASH EVAP CNTLR PRI B - ON
                           SEC (two) - A SPLY, OFF
01         After 2.5 min,
            ✓FREON EVAP OUT TEMP ind - 39° ± 1° F

L1      8 ✓FLOW PROP VLV LOOP 1,2 (two) tb - ICH
```

1. STOW RADIATORS

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

PL BAY MECH PWR SYS (two) - ON
RAD CNTL SYS (two) - STOW (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 MALF, 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
(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

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

Zero Timer
PL BAY MECH PWR SYS (two) - ON

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

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

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

Verify Stbd & Port RAD Panels are deployed & stabilized

PL BAY MECH PWR SYS (two) - OFF

CRYO O2 TK HTR SNSR CK

|S68 CRYO/FUEL CELLS|

R1 — O2 TK1,2,3 HTRS (three) - TEST
CRYO TK4 HTR O2(TK4/5) - TEST

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

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

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

R1 — O2 TK1,2,3 HTRS (three) - RESET
A11 — CRYO TK4 HTR O2(TK4/5) - RESET

Report results to MCC

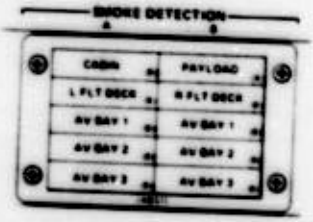
LAMP & FIRE SUPPR TEST..... 6-2

HEATER RECONFIG..... 6-6

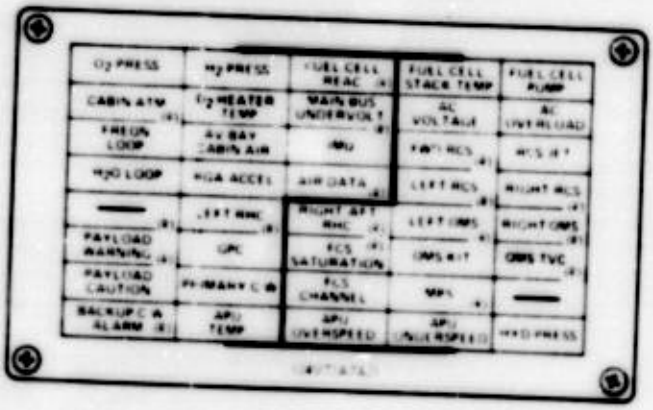
FUEL CELL PURGE - AUTO..... 6-7

FUEL CELL PURGE - MANUAL..... 6-8

LAMP & FIRE SUPPR TEST



C/W PANEL



EPS

2 FIRE/SMOKE DETECT/SUPPRESS TEST

NOTE

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

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

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

|SM SYS SUMM I|
CRT Verify:

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

* If limits exceeded, contact MCC *

HEATER RECONFIG - Config B (Config A)

```
L1          TOP EVAP HTR NOZ (two) - B AUTO(A AUTO)
                        DUCT - B(A)
L2          FLASH EVAP FDLN HTR A,B SPLY (two) - 2(1)
A12         APU HTR GAS GEN/FUEL PUMP (three) - B AUTO
                                                (A AUTO)
                  LUBE OIL LINE (three)       - B AUTO
                                                (A AUTO)
                  TK/FU LINE/H2O SYS 1B,2B,3B - AUTO
                                                (OFF)
                                     1A,2A,3A - OFF
                                                (AUTO)

            HYD HTR RUD SPD BK A - OFF(AUTO)
                               B - AUTO(OFF)
                  BDY FLP A - OFF(OFF)
                          B - OFF(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   - OFF(A AUTO)
                                - B AUTO(OFF)
                        R POD   - OFF(A AUTO)
                                - B AUTO(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)
            cb MNB H2O LINE HTR B - cl(op)
```

NOTE

The FC auto purge capability exists only in SM OPS 2

CAUTION

Do not purge an FC if:
any FC AMPS > 350 or
FC Shutdown
Do not initiate auto purge within:
1.5 hr of OPS 3 transition
or
3 hr of deorbit

R12U FC PURGE VLV (three) - GPC
HTR - GPC
GPC PURGE SEQ - START
(After tb-gray, hold 3 sec)

FUEL CELL PURGE - MANUAL

1 TURN ON PURGE HEATERS

R12U FC PURGE HTR - ON

| SM 68 CRYO/FUEL CELLS |

CRT ✓PURGE LN O2 T > 69
✓H2 T1 > 79
✓T2 > 40

Or, wait at least 15 min

2 MANUAL PURGE SEQUENCE

NOTE

Fuel cells must be purged separately

CAUTION

Do not purge an FC if:
any FC AMPS > 350 or
FC Shutdown

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

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

CRT ✓FC 1(2,3) FLOW O2 - increase -2.2 (max)
✓H2 - increase -0.6 (max)

Wait 2 min, then

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

CRT ✓FC 1(2,3) FLOW O2 - decr -2.2 (max)
✓H2 - decr -0.6 (max)

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

3 TURN OFF PURGE HEATERS

R12U FC PURGE HTR - OFF, then GPC

GNC

IMU ALIGN - S TRK..... 7-2

IMU ALIGN - ROLL S TRK..... 7-4

S TRK SELF-TEST..... 7-6

COAS CALIBRATION..... 7-7

FCS CHECKOUT..... 7-9

AFT CONTROLLER C/O..... 7-26

UMICRON SPECIFICATION..... 7-27

IMU ALIGN - S TRK, GNC 201, 301

1 COLLECT STAR DATA

√DAP: A/AUTO/VERN

|GNC 22 S TRK/COAS CNTL|

CRT √S TRK -Y,-Z: REQD ID, ITEM 11,12 - 0
STATUS - (no BITE)
SHUTTER - OP

```
* If SHUTTER - CL:                    *
*  √Att,MET  - correct                *
*   MAN OP   - ITEM 15(16) EXEC (*)   *
```

√S TABLE CLR, ITEM 20 - (no unwanted data)
STAR TRK - ITEM 3,4 EXEC (*)

2 VERIFY STAR DATA

√S TABLE: TRK ID 1,2 - (correct #s)
ANG ERR 1 - < .08, Rcd
SEL, ITEM 17,18 - (*)

```
* If no data after 3 min or bad data:                *
*  √Att,stars,MET - correct                          *
*  √Rot Rate      - < .5°/sec                        *
*  √S TRK -Y,-Z: TRK ID - (correct #s)               *
*                ΔANG   - < 1.0                      *
* If preceding checks are good:                      *
*   Perform S TRK SELF-TEST then,                    *
*   If both STATUS - ST FAIL:                        *
*   |  Inform MCC before proceeding                  *
*   If both STATUS - ST PASS:                        *
*   |  Repeat step 1 at new att, stars               *
*   If one STATUS - ST PASS:                         *
*    √TERM/IDLE, ITEM 9(10) - (*)                    *
*     STAR TRK, GOOD S TRK - ITEM 3(4) EXEC (*)      *
*     S TABLE CLR - ITEM 20 EXEC                     *
*    √S TABLE: TRK ID 1 - (correct #)                *
*     TERM/IDLE, GOOD S TRK - ITEM 9(10) EXEC (*)    *
*     Mnvr to 2nd att, star                          *
*     STAR TRK, GOOD S TRK - ITEM 3(4) EXEC (*)      *
*     Repeat step 2 with good S TRK only             *
```

✓ TACAN DTO

DISPLAY/DPS CONFIG

014, RGA (four) - ON
015, cb MNA,B,C ADTA (four) - cl
016 cb MNA,B ACCEL 1,2 (two) - cl
cb MNA,C DDU AFT (two) - op
cb MNB,C DDU R (two) - cl
ASA (four) - ON
ACCEL 3,4 (two) - 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
HSI: ✓off flag - not visible

F8 ADI: ✓Error needles & Rate pointers - visible
C3 ✓FCS CH (four) - AUTO
✓ TACAN DTO - FS 2-4
Perform DPS, G2 TO G8 TRANSITION; then

NOTE

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

NOTE

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

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

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

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

or

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

NOTE

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

1 FCS C/O PREP

C2 Set EVENT TIMER to 00:00, count UP
DAP: A/AUTO/NORM

3 AFT RHC

Deselect A RHC:

CRT RHC A DES - ITEM 13,14,15 EXEC (*)

A RHC - deflect to hardstop in each axis

✓RHC A: R,P - > 92%

Y - > 88%

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

Reselect RHC CHs:

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

4 RECONFIG TO NOMINAL

A6U FLT CNTLR PWR - OFF

O14:E AFT DDU PWR - as reqd

O16:E

OMICRON SPECIFICATION

1 DETERMINE REFERENCE ATTITUDE

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

2 DETERMINE DESIRED ATTITUDE

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

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

NOTE

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

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MPS

MPS INERT..... 8-2

1 INITIALIZATION

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

2 TERMINATION

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

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

ON-ORBIT OMS BURN

1 OMS BURN PREP

C6 Install OMS 2/ORBIT OMS BURNS Cue Cards (two) and OMS BURN MONITOR Cue Cards (two) (F6,F8)

If OPS 2

CRT
- 1: GNC 20 DAP CONFIG - ✓DAP Config A1,B1
- 1: GNC UNIV PYG
- STOP - 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) > 750 psia
✓N2 TK L(R) > 523 psia

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

2 GIMBAL CHECK

CRT1 Perform SEC L,R then PRI L,R GMBL CK

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

3 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 (*)

4 PERFORM OMS BURN

TIG-4 If 1 ENG BURN
If Xfeed Burn
Perform OMS XFEED Cue Card, appropriate crossfeed
If No Xfeed or Mid-Burn Xfeed
08 ✓L,R OMS TK ISOL (four) - OP (tb-OP)
✓XFEED (four) - CL (tb-CL)
If 2 ENG BURN
✓L,R OMS TK ISOL (four) - OP (tb-OP)
✓XFEED (four) - CL (tb-CL)

F6/F7/F8 FLT CNTLR PWR (two) - ON

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

5 OMS POST BURN RECONFIGURATION

```
CRT1        Perform SEC L,R then PRI L,R GMBL CK
F6/F7/F8    FLT CNTLR PWR (two) - OFF
08          L,R OMS He PRESS/VAP ISOL (four) - CL
                    XFEED (four)   - CL (tb-CL)
                    TK ISOL (four) - OP (tb-OP)

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

6 CONFIGURE STAR TRACKERS

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

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

C3 DAP ROT: DISC/DISC/DISC
DAP: A/MAN/VERN
|GNC 20 DAP CONFIG| - Config DAP to A3

2 PERFORM RCS JET TEST

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

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

C3 DAP ROT: PULSE/PULSE/PULSE
TRANS: PULSE/PULSE/PULSE
DAP: A/MAN/NORM
F6 ADI RATE - LO
F6/F7 FLT CNTLR PWR - ON

THC +X, 1 PULSE (fires jets R3A,L3A)
-X, 1 PULSE (fires jets F1F,F2F)

|GNC 23 RCS|
CRT RCS FWD - ITEM 1 EXEC (*)
JET DES F1F - ITEM 15 EXEC (*)
F2F - ITEM 23 EXEC (*)

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LOAD PCMMU FORMAT..... FS 1-3
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COMM/INST

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

LOAD PCMMU FORMAT..... FS 1-3

KU-BD COMM & TRACK..... FS 1-4

LOAD PDI DECOM FORMAT

SM 52 PCMMU/PL COMM

1 PDI:

CRT ✓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 +Y 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 MALF, DPS, 5.2a >>

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

5 If LOAD - FAIL and subsequent load attempt

All PL DATA INTLVR PWR - OFF, then ON
✓ERR MSG - 'S62 BCE BYP PL'
- 'S62 BCE BYP PDI'

CRT PDI:
I/O RESET - ITEM 8 EXEC (*)
Repeat step 1 for all of config (XXX)

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

CONFIG	DECOM	INPUT	FMT
130	1	~~0~~ 1	7
(ORB PRIME)	2	0	0
	3	0	0
	4	0	0
	5		1
131	1	0	0
	2	~~0~~ 1	7
	3	0	0
	4	0	0
	5		1

LOAD PCMMU FORMAT

C3 1 OI PCMMU FORMAT - GPC

|SM 62 PCMMU/PL COMM|

CRT 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 MALF, 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'
CRT I/O RESET PCM - ITEM 5 EXEC (*)
Repeat steps 2 and 3

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

PHASE/DOWNLIST/OPS	FORMAT ID 64 / 128	CONFIG NO
ORB/G2 ORB BURN/G2,S2	103 / 161	13
ORB/PL PRIME/G2,S2	114 / 173	130
ORB/PL BU/G2,S2	114 / 173	131
FCS CKOUT/G8,S2	104 / 162	19
ENTRY/G3,BFS	105 / 164	28
GPC/G2,S2,DUMP or OPS 0	-- / 163	30
GPC/MMU C/O/G2,S2,P9	-- / 163	32

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

1 ROLL MANEUVERS

Config DAP: B1/AUTO/NORM

CRT |GNC UNIV PTG|
BODY VECT - ITEM 14 +1 EXEC
At TDRS AOS,
ROT - ITEM 20 EXEC (CUR - *)
Note MET (Start of roll) ____/____:____:____

Add 24 min to MET and enter as,
START TIME - ITEM 1+_ _ _+_ _+_ _+_ _ EXEC

BODY VECT - ITEM 14 +2 EXEC
ROT - ITEM 20 EXEC (FUT - *)

After 48 min from Start of roll,
STOP - ITEM 21 EXEC
Reconfig to CAP DAP

2 PITCH MANEUVERS

Config DAP: B1/AUTO/NORM

CRT |GNC UNIV PTG|
BODY VECT - ITEM 14 +5 EXEC
P - ITEM 15 +0 0 0 EXEC
Y - ITEM 16 +0 9 0 EXEC
Com flashing & no entry req
At TDRS AOS,
ROT - ITEM 20 EXEC (CUR - *)
Note MET (Start of pitch) ____/____:____:____

Add 24 min to MET and enter as,
START TIME - ITEM 1+_ _ _+_ _+_ _+_ _ EXEC

Y - ITEM 16 +2 7 0 EXEC
ROT - ITEM 20 EXEC (FUT - *)

After 48 min from Start of pitch,
STOP - ITEM 21 EXEC
Reconfig to CAP DAP

BACKUP STAR PAIRS PAD..... FS 2-2

BACKUP STAR PAIRS..... FS 2-3

ADTA MEMORY READ TABLE..... FS 2-4

TACAN NAV..... FS 2-4

BACKUP STAR PAIRS PAD

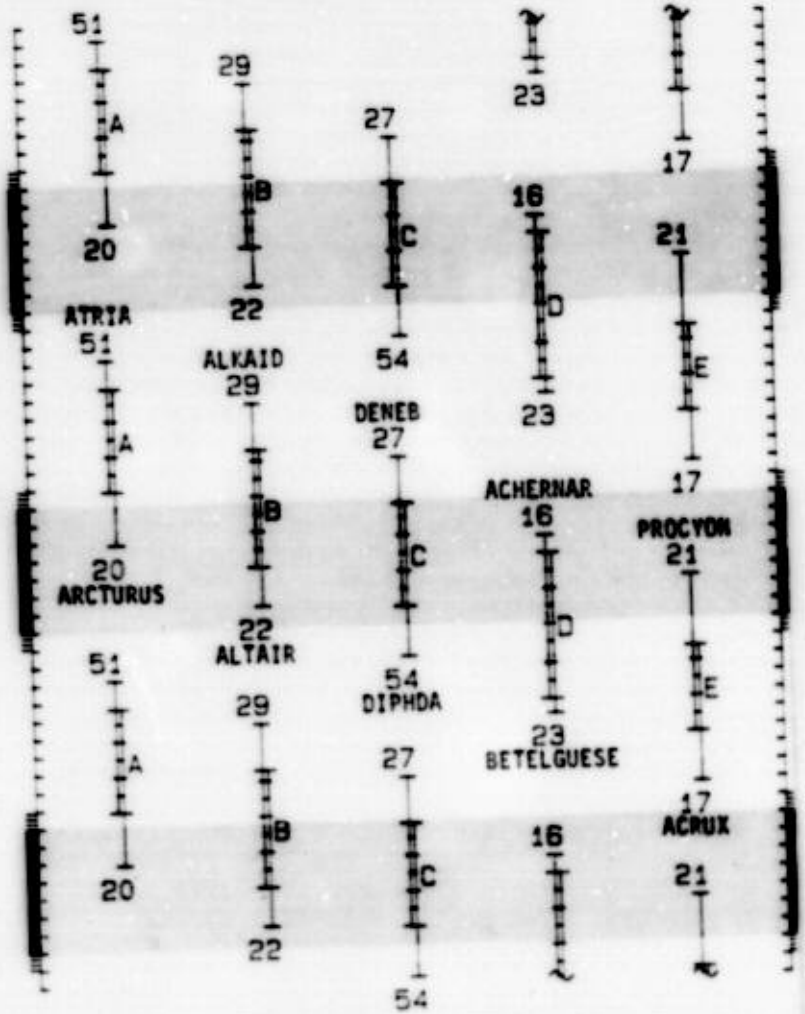
PAIR	ANG SEP	ATT SET 1			ATT SET 2		
		DUAL S TRK	SINGLE S TRK -Z	SINGLE S TRK -Y	DUAL S TRK	SINGLE S TRK -Z	SINGLE S TRK -Y
A	92.4	-Y 51 -Z 20 R + 21.3 P +133.3 Y +338.8	-Z 51 R +287.2 P +117.9 Y +343.	-Y 20 R +111.2 P +137. Y +353.6	-Y 20 -Z 51 R +254.7 P +296.7 Y + 13.1	-Z 20 R +161.9 P +309.1 Y + 22.6	-Y 51 R +342.5 P +306.2 Y + 1.3
B	83.8	-Y 29 -Z 22 R +173.2 P + 33.7 Y + 50.9	-Z 29 R + 77.8 P + 48.6 Y + 40.6	-Y 22 R +267.4 P + 20.6 Y + 39.6	-Y 22 -Z 29 R +107.1 P +227.1 Y +324.1	-Z 22 R + 16. P +218.4 Y +317.4	-Y 29 R +177.5 P +202.6 Y +330.2
C	83.7	-Y 54 -Z 27 R + 73. P +279.7 Y +322.1	-Z 54 R +337.6 P +263.6 Y +313.6	-Y 27 R +152.8 P +270.3 Y +334.3	-Y 27 -Z 54 R +212.7 P + 77.5 Y + 44.1	-Z 27 R +114.3 P + 97.4 Y + 42.5	-Y 54 R +298.2 P + 76.1 Y + 15.3
D	82.9	-Y 23 -Z 16 R +253.1 P +161.8 Y +331.8	-Z 23 R +173.4 P +173.3 Y +341.8	-Y 16 R +343.5 P +172.6 Y +320.4	-Y 16 -Z 23 R + 11.2 P +358.4 Y + 19.	-Z 16 R +292.3 P +343.7 Y + 23.5	-Y 23 R + 97.2 P + 6. Y + 31.8
E	86.6	-Y 21 -Z 17 R +268.4 P +195. Y + 24.5	-Z 21 R +177. P +205.3 Y + 36.3	-Y 17 R +350.5 P +206.8 Y + 14.9	-Y 17 -Z 21 R + 10.8 P + 31. Y +324.3	-Z 17 R +276.2 P + 15.3 Y +330.9	-Y 21 R +100.3 P + 37.9 Y +337.7

Data Applicable 08/29/83 - 09/05/83

SINGLE S TRK MIN MNVR OPT
TGT ID = 11-60 NAV STAR 0
BODY VECTOR = 5

	-Z S TRK	-Y S TRK
P	87.7	0
Y	358.0	280.6

BACKUP STAR PAIRS



Data Applicable 08/29/83 - 09/05/83

ADTA MEMORY READ TABLE

GNC 0 GPC MEMORY

DATA - ITEM 20 EXEC (*)
HEX - ITEM 27 EXEC (*)
ADD ID - ITEM 28 +_ _ _ _ _ (see below)

ADTA 1 BITE 0 3 6 4 2
ADTA 2 BITE 0 3 6 A 2 (RELEASE F0 8 02 00)
ADTA 3 BITE 0 3 7 0 2
ADTA 4 BITE 0 3 7 6 2

If data in actual column (last 3 char) is not equal to -FDC, -FF8, or -FFC, deselect failed ADTA

TACAN NAV (DTO 0771)

1 INITIATION

07 TACAN 1,2,3 MODE (three) - T/R
ANT SEL (three) - UPPER

NOTE
System warmup takes ~2 min

Perform DPS, G2 to G8 TRANSITION, then

Use table to select TACAN CHANNEL at the proper MET

2 TERMINATION

TACAN 1,2,3 MODE (three) - OFF
ANT SEL (three) - AUTO

Go to DPS, G8 to G2 TRANSITION

MET	TACAN 1 CH	TACAN 2 CH	TACAN 3 CH	AREA/NOTES
1/04:13:00	095X	095X	095X	INDONESIA
1/04:22:00	054	082	023	PACIFIC IS
1/04:35:00	093	093	093	
1/04:50:00	106	106	106	MEXICO
1/04:58:00	112		094	CENT. AMERICA
1/05:07:00			102	SO. AMERICA
1/05:20:00	104	092	116	AFRICA
1/05:36:00	057	057	057	CHAGOS IS
1/05:47:00	110	110	110	SINGAPORE
1/05:55:00	023	023	023	TAIWAN
1/06:00:20	035	035	035	PACIFIC IS
1/06:04:30	023	023	023	
1/06:10:00	093	093	093	
1/06:14:30	100	124	073	HAWAII
1/06:42:00	058	058	058	SO. AMERICA
1/06:48:50	093	077	077	
1/07:00:00	092	108	116	AFRICA
1/07:05:30	108			
1/07:24:00	109	105	093	THAILAND
1/07:31:20	102	057	101	TAIWAN
1/07:34:20			102	JAPAN/KADENA
1/07:37:10	035	035	035	PACIFIC IS
1/07:40:30	023	023	023	
1/07:45:00	093	093	093	
1/07:51:00	100	073	073	HAWAII
1/07:53:50		116	116	
1/08:00:00				GO TO STEP 2
3/21:49:00	078X	078X	078X	AUSTRALIA
3/21:55:00	088	108	108	
3/22:24:00	025	069	025	CONUS
3/22:29:50	020			
3/22:30:10			022	
3/22:31:00		056		
3/22:32:40			042	
3/22:35:20	018	018		GRAND TURK
3/22:48:00	096	090	085	AFRICA
3/23:00:00	112	082	058	
3/23:10:00				GO TO STEP 2

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MISC

TAIL GLOW EXPERIMENT..... FS 3-2

EOIM ACTIVATION..... FS 3-3

EOIM DEACTIVATION..... FS 3-3

MRM-III OPS..... FS 3-4

PRM OPS..... FS 3-9

HEAT PIPE..... FS 3-10

TAIL GLOW EXPERIMENT

Record experiment start time from MCC,
MET __/__ __:__ __:__ __

Change DAP B to B1

DAP ROT: PULSE/PULSE/PULSE

A6 ✓SENSE - -X

(B) 30 sec before start time,
DAP: B1/MAN/VERN

MISC

At start time begin photo sequence,

35mm
8 sec
4 sec
1 sec
1/4 sec
1/15 sec

(A) Set SHUTTER SPEED to 2 sec

NOTE
To record jet firing, fire jet
an instant after shutter opening

Make background exposure
Count down to shutter opening, AFT RHC +P
(tail up, fires one L5D, R5D VRCS pulse)
Wait 30 sec

Make background exposure
Count down to shutter opening, AFT RHC -P
(tail dn, fires one F5L, F5R VRCS pulse)

CRT GMC 23 RCS
RCS FWD - ITEM 1 EXEC (*)
JET DES F5L - ITEM 39 EXEC (*)
F5R - ITEM 41 EXEC (*)
DAP: B1/MAN/VERN

30 sec after last exposure,
Make background exposure
Count down to shutter opening,
AFT RHC +Y (fires one R5R VRCS pulse)
Wait 30 sec

Make background exposure
Count down to shutter opening,
AFT RHC -Y (fires one L5L VRCS pulse)

CRT JET DES F5L - ITEM 39 EXEC (no *)
F5R - ITEM 41 EXEC (no *)

Reconfig to CAP DAP

EOIM ACTIVATION

L12 EOIM HTR - ON
UV EXP - ON
GRID - ON

EOIM DEACTIVATION

L12 EOIM HTR - OFF
UV EXP - OFF
GRID - OFF

- Repeat A → end (no moon)
- Repeat B → A (no moon)
- Star Photos with Grating (shopping list pg 3-48)
  - Bright star
    ID _____
    Att _____
    (Intl) _____
    _____

- no orbiter
- moon rise ok

Approx Camr L
R/L _____
U/D _____

- Photo Sequence
  8 sec
  2 sec
  1/2 sec
  1/8 sec
  1/32 sec
- Reconfig DAP

Extra data takes — 1 or 2/day
— SAA if possible

HRM-III OPS

1 ACTIVATION & CHECKOUT

Unstow HRM

Remove Velcro

Set Rotary sw - CR (✓Display - 8888)

```
* If display flashes, is blank, or shows    *
*  other than 8888, turn OFF; replace, mark,*
*  and stow used battery and repeat step 1  *
```

Set BKG RST - MANUAL, then release
Press and hold HV Button for 20 sec
(✓Display > 4000)

```
* If not > 4000 after ~20 sec,  *
*  release HV Button and repeat *
```

Release HV (display now shows counts/sec)
Set DELTA SELECT sw - 90
BKG RST - MANUAL, then release

2 INITIALIZATION

Set Rotary sw - A (✓Display - 8888)
BKG RST - MANUAL, then release
Rcd MET on HRM DATA PAD and report to MCC
Set BKG RST -AUTO(✓Display counts up from 0)
Restow HRM

3 DATA RECORDING

1-3 hr after step 2,unstow HRM(✓Display-0105)
Set BKG RST - ctr
Rotary sw - B (✓Display - 8888)
DELTA SELECT sw - 06 or as reqd
BKG RST - MANUAL, then release
(✓Display 0 1)
BKG RST - AUTO
Note channel number (after ~2 sec Display shows counts/sec)
Rcd counts/sec on HRM DATA PAD (after ~2 sec Display shows next channel number)
Rcd counts/sec for remaining 104 channels
Set Rotary sw - OFF
Restow HRM

GLOW EXPERIMENT

NOTES

Setup: In [illegible] it took ~30 min

Focus: 20 ft on lens is a real focus of infinity

Aiming: zero-order tail (faint, but sharp) should be on left side of frame

This means camera will be pointed slightly to the right (in part side)

This will put first order spectrum (happy image) roughly in center of frame

[illegible] order use spotlight to [illegible] tail.

[illegible] order

EXTRA OBJECTIVES (wish list):

After Tail Glow (Day 1)

Point camera away from tail and body to get clear view of sky

Get star photos (with grating) 8 sec, 2 sec, [illegible] sec, [illegible] sec, [illegible] sec

Preferable to have bright star(s) in field of view

Note direction camera is pointing with respect to orbiter

These photos can be taken after maneuver (glow photos cannot)

although moon should not be in field of view

After RMS Glow (Day 5)

1. Point camera to EOIM pallet. Check focus if possible, otherwise use same as RMS glow (11 ft.) Take same exposure sequence as RMS glow
2. Point camera at OMS pods. Focus set to 20 ft (m). Same exposure sequence as RMS glow [illegible]
3. Photographs of starfields (clear of orbiter) without grating 8, 2, [illegible], [illegible], [illegible]
4. Attach grating; focus 20 ft; repeat as for tail glow.
   At same time: roll orbiter 45° (ok for all RMS)
   In new attitude, repeat tail glow photos

4a. If roll maneuver not possible:
   Attach grating; orient "TOP" towards either side; focus 20 ft
   repeat to get top of OMS pod in bottom of frame (zero order)
   (First order spectrum of glow from top of OMS pods)
   Follow rest of Tail Glow procedure.

Thanks! Good Luck - Good Flight

INIT MET _____ HUM _____ A PADS

CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0_1		0_22		0_43		0_64		0_85	
0_2		0_23		0_44		0_65		0_86	
0_3		0_24		0_45		0_66		0_87	
0_4		0_25		0_46		0_67		0_88	
0_5		0_26		0_47		0_68		0_89	
0_6		0_27		0_48		0_69		0_90	
0_7		0_28		0_49		0_70		0_91	
0_8		0_29		0_50		0_71		0_92	
0_9		0_30		0_51		0_72		0_93	
0_10		0_31		0_52		0_73		0_94	
0_11		0_32		0_53		0_74		0_95	
0_12		0_33		0_54		0_75		0_96	
0_13		0_34		0_55		0_76		0_97	
0_14		0_35		0_56		0_77		0_98	
0_15		0_36		0_57		0_78		0_99	
0_16		0_37		0_58		0_79		0100	
0_17		0_38		0_59		0_80		0101	
0_18		0_39		0_60		0_81		0102	
0_19		0_40		0_61		0_82		0103	
0_20		0_41		0_62		0_83		0104	
0_21		0_42		0_63		0_84		0105	

INIT NE. / HDM 1A PADS

CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0 1		0 22		0 43		0 64		0 85	
0 2		0 23		0 44		0 65		0 86	
0 3		0 24		0 45		0 66		0 87	
0 4		0 25		0 46		0 67		0 88	
0 5		0 26		0 47		0 68		0 89	
0 6		0 27		0 48		0 69		0 90	
0 7		0 28		0 49		0 70		0 91	
0 8		0 29		0 50		0 71		0 92	
0 9		0 30		0 51		0 72		0 93	
0 10		0 31		0 52		0 73		0 94	
0 11		0 32		0 53		0 74		0 95	
0 12		0 33		0 54		0 75		0 96	
0 13		0 34		0 55		0 76		0 97	
0 14		0 35		0 56		0 77		0 98	
0 15		0 36		0 57		0 78		0 99	
0 16		0 37		0 58		0 79		0100	
0 17		0 38		0 59		0 80		0101	
0 18		0 39		0 60		0 81		0102	
0 19		0 40		0 61		0 82		0103	
0 20		0 41		0 62		0 83		0104	
0 21		0 42		0 63		0 84		0105	

INIT MET ___ / ___ / ___ / ___ HRM DATA PADS

CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC	CHANNEL	COUNTS/SEC
0_1		0_22		0_43		0_64		0_85	
0_2		0_23		0_44		0_65		0_86	
0_3		0_24		0_45		0_66		0_87	
0_4		0_25		0_46		0_67		0_88	
0_5		0_26		0_47		0_68		0_89	
0_6		0_27		0_48		0_69		0_90	
0_7		0_28		0_49		0_70		0_91	
0_8		0_29		0_50		0_71		0_92	
0_9		0_30		0_51		0_72		0_93	
0_10		0_31		0_52		0_73		0_94	
0_11		0_32		0_53		0_74		0_95	
0_12		0_33		0_54		0_75		0_96	
0_13		0_34		0_55		0_76		0_97	
0_14		0_35		0_56		0_77		0_98	
0_15		0_36		0_57		0_78		0_99	
0_16		0_37		0_58		0_79		0100	
0_17		0_38		0_59		0_80		0101	
0_18		0_39		0_60		0_81		0102	
0_19		0_40		0_61		0_82		0103	
0_20		0_41		0_62		0_83		0104	
0_21		0_42		0_63		0_84		0105	

1 ACTIVATION & CHECKOUT

Unstow PRM
If second operation, replace, mark, and stow used battery
Set Rotary sw - HRS
ON/OFF sw - ON
✓Display counts down from 9999 and record MET on PRM DATA PAD when Display = 0.00

* If display shows a colon or is blank, set ON/OFF sw - OFF; replace, mark, and stow used battery and repeat step 1 *

Report MET to MCC
Restow PRM (leave ON)

2 DATA RECORDING

8-18 hrs after step 1, unstow PRM
Set rotary switch to appropriate positions and record display outputs on PRM DATA PAD

Set ON/OFF sw - OFF
Stow PRM

PRM DATA PAD

0.00 MET	__/__ __:__ __:__ __	__/__ __:__ __:__ __
HRS	__ __.__ __	__ __.__ __
CNTS	.__ __ __ E (__) __ __	.__ __ __ E (__) __ __
RAD	__ __.__ __ E (__) __ __	__ __.__ __ E (__) __ __
REM	__ __.__ __ E (__) __ __	__ __.__ __ E (__) __ __

HEAT PIPE

1 Verify PHOTO/TV C/L, 35mm PHOTO DATA, 35mm/04, HEAT PIPE, step 6

NOTE

F/stop - 11 (day), 2.8 (nite)
For night photos, ✓PLB ltg config:
A7U PL BAY FLOODS - all OFF except FWD BKHD

L12 2 cb HEAT PIPE SW PWR - c1
HEAT PIPE HTR 75W - ON

3 Rcd MET (___/___ ___:___ ___)
Start a timer

4 Intervalometer PWR - ON

5 Record observations on ICOM Recorder for 10 min

6 After 10 min,
Intervalometer PWR - OFF

* If after 10 min condenser tapes remain black and evaporator tapes rapidly passed through their colors, (Heat Pipe has failed)

  HEAT PIPE HTR 75W - OFF

  Confirm evaporator cooldown, visually record observations on ICOM Recorder

  HEAT PIPE HTR 25W - ON
  Repeat steps 3 thru 9

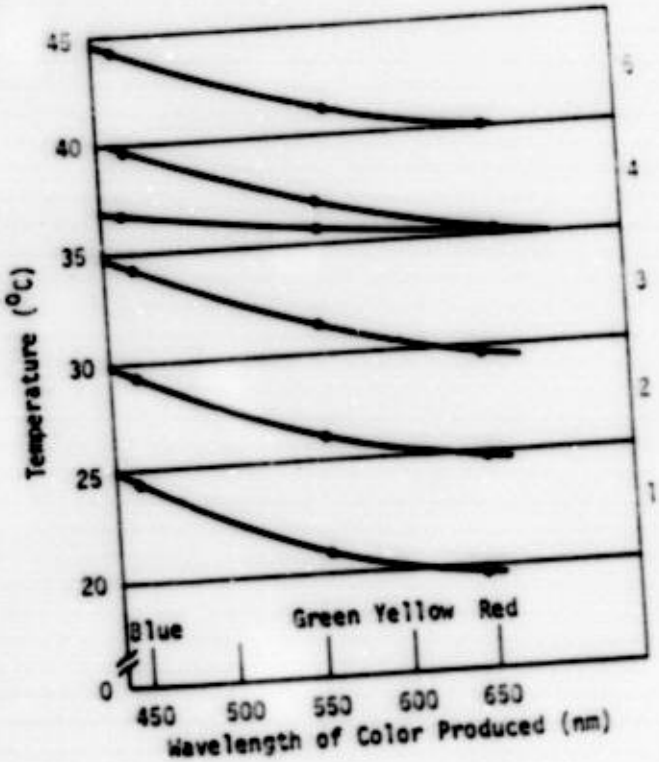
* If both evaporator and condenser tapes respond but go completely through the color bands and go black, (Heat Pipe is working but above 45° C)

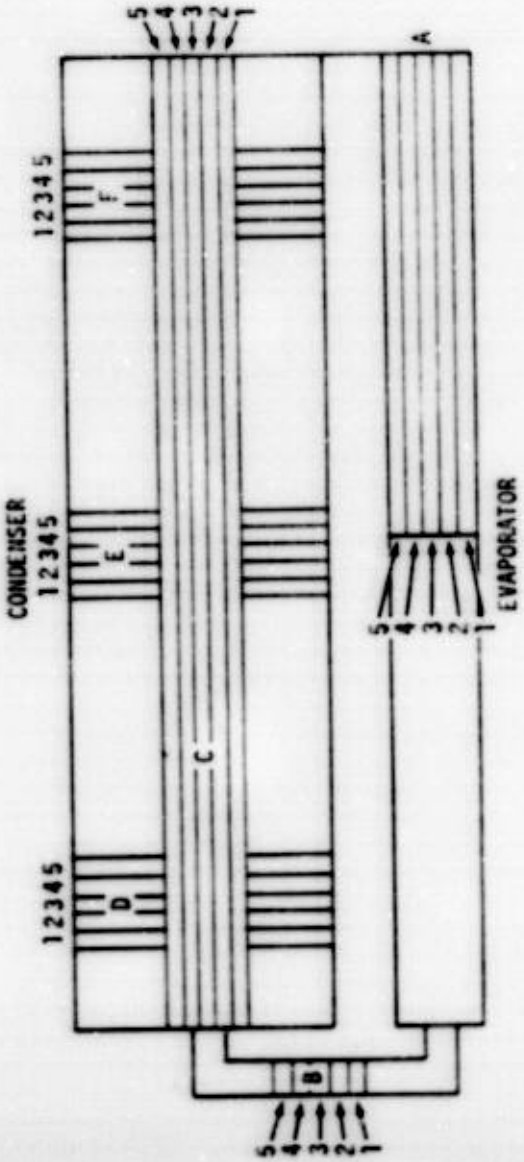
```
*   HEAT PIPE HTR 75W - OFF                    *
*                 25W - ON                     *
*   Repeat steps 3 thru 9                      *
*                                              *
* If all the tape remains black,               *
*   HEAT PIPE HTR 25W - ON                     *
*   Repeat steps 3 thru 9                      *
*                                              *
* If all the tape remains black and both       *
*   heaters are on,                            *
*   HEAT PIPE HTR 75W - OFF                    *
*                 25W - OFF                    *
*   Change out film if reqd                    *
*                                              *
*   Wait 30 minutes,                           *
*   Repeat steps 2 thru 9                      *
```

7 Intervalometer
  INTERVAL TIMING - 6 min
  PWR - ON

8 After 1 hr 50 min,
  Intervalometer PWR - OFF

9 HEAT PIPE HTR 75 WATT - OFF
                25 WATT - OFF
  cb HEAT PIPE SW PWR - OFF


45
40
35
30
25
20
0
Temperature (°C)
5
4
3
2
1
Blue
Green
Yellow
Red
450
500
550
600
650
Wavelength of Color Produced (nm)



FS 3-13

STS-8/FIN A.1

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GAS (GET AWAY SPECIAL)

GROUP A..... FS 4-2

GROUP B..... FS 4-2

GROUP C..... FS 4-2

NORMAL OPERATION..... FS 4-3

ANOMALIES..... FS 4-4

EMERGENCY SHUTDOWN OPERATION..... FS 4-4

PAYLOAD	RELAYS
GAS #1 - G346	00
GAS #2 - G348	03
GAS #3 - G475	06 07
GAS #4 - G347	NONE

ACTIVITY	MET
GROUP A	
GAS #1 Relay 00 - LATENT to HOT	__/__ __:__ __
GAS #2 Relay 03 - LATENT to HOT	__/__ __:__ __
GAS #3 Relay 06 - LATENT to HOT	__/__ __:__ __
07 - LATENT to HOT	__/__ __:__ __
NOTE Wait at least 30 seconds then,	
Relay 07 - HOT to LATENT	__/__ __:__ __
GROUP B	
GAS #3 Relay 06 - HOT to LATENT	__/__ __:__ __
GROUP C	
GAS #1 Relay 00 - HOT to LATENT	__/__ __:__ __
GAS #2 Relay 03 - HOT to LATENT	__/__ __:__ __

GAS

NORMAL OPERATION

GAS UNSTOW/SETUP - Unstow GAS encoder from locker, connect cable to SSP (L12U)

RELAY nm, X to Y

Enter <CLR> or <CLR> <CLR>
(<CLR> <CLR> back lights the display)
✓Display: A -- A or A.-.-.A

* If blank, change encoder *
* or replace battery *

Enter <nm>
✓Display: A nm A, then A nm X
(X is the current relay state L or H)

* If dislay A nm - : *
* ✓encoder plugged into SSP *
* ✓nm a valid relay *

Enter <O/S>
✓Display: P nm Y
(Y is proposed opposite state H or L)

Enter <E>
✓Display: Y nm Y

* If not, repeat procedure *
* If still no go, repeat with *
* other encoder *

GAS STOW - Unplug encoder from SSP, stow in locker

ANOMALIES

Colon appears between n and m (battery low)

Use other encoder or change battery:
Insert pen into hole on back of controller, slide off enclosure back
Replace battery (stored with spare encoder)

EMERGENCY SHUTDOWN OPERATION

(If no time to change individual relays to LATENT)

Enter <CLR>
✓Display: A -- A

Enter <99>
✓Display: A 99 A (blinking), then P 99 L

Enter <E>
✓Display: L 99 L (this should set all relays to L)

Enter <E>
✓Display: incrementing 00, 01, etc., until - nm - (relay nm not resident)

Enter <E> until all relays for this flight checked

```
* If H nm H displayed, relay nm did   *
*  not reset to L. Note number of     *
*  relay and attempt to reset indivi- *
*  dually at end of shutdown          *
* Enter <E> to check remainder of     *
*  relays                             *
```

SECTION 2
GAS EXPERIMENTS, STS-8

The STS-8 GAS experiments consist of four canisters, as follows:

Canister #1: GAS payload No. G346

USER: Goddard Space Flight Center

PAYLOAD BAY LOCATION: Bay 2, forward location, starboard side

EXPERIMENT: Determine effects of cosmic rays on integrated circuits.

Canister #2: GAS Payload No. G348

USER: Goddard Space Flight Center

PAYLOAD BAY LOCATION: Bay 2, forward location, port side

EXPERIMENT: Contamination monitor package

Canister 3: GAS Payload No. G475

USER: Asahi Shimun Company (Morning Sun Newspaper Company)

PAYLOAD BAY LOCATION: Bay 2, aft location, port side

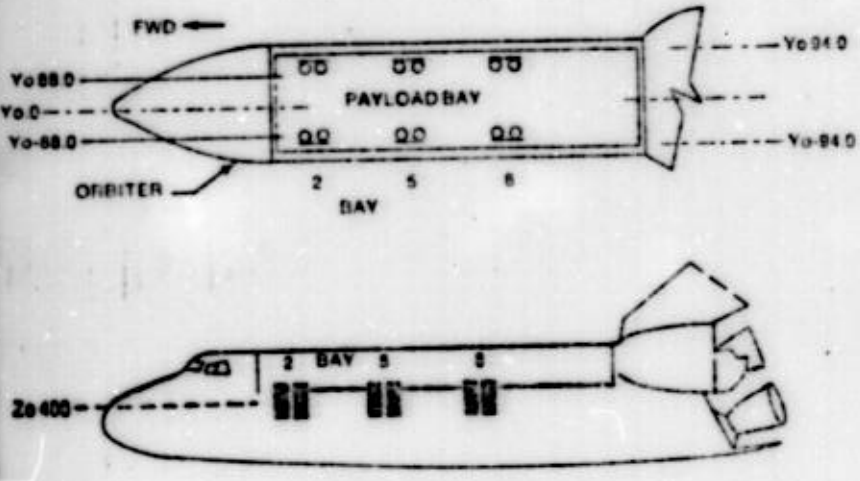
EXPERIMENTS: Crystal growth of artificial snow in weightlessness

Canister #4: GAS Payload No. G347

USER: Goddard Space Flight Center/Naval Research Laboratory

PAYLOAD BAY LOCATION: Bay 2, aft location, starboard side

EXPERIMENTS: Measure the effect of Shuttle bay environment on ultraviolet sensitive film.



GAS NO	EXP NO	BAY
1	G346	2 FWD STBD
2	G346	2 FWD PORT
3	G475	2 AFT PORT
4	G347	2 AFT STBD
POSTAL COVERS		5 FWD STBD
		5 AFT STBD
		5 FWD PORT
		5 AFT PORT
		8 FWD STBD
		8 AFT STBD
		8 FWD PORT
		8 AFT PORT

FIGURE 1-1 - GAS CANISTER LOCATION PLAN, STS-8