



International Space Station Assembly Operations

ISS-19A

Mission Operations Directorate
Operations Division

23 NOV 09

This publication replaces
all previous publications.
These procedures are available
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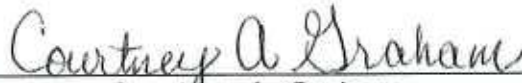


United Space Alliance

**INTERNATIONAL SPACE STATION
ASSEMBLY OPERATIONS
ISS-19A**

23 NOV 09

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This document is under the configuration control of the Systems Operations Data File Control Board (SODFCB).

Incorporates the following:
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Uplinked Messages (or Approved Flight Notes) replaced by this revision,
remove from Book:

None

**INTERNATIONAL SPACE STATION
ASSEMBLY OPERATIONS
ISS-19A**

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ACTIVATION AND CHECKOUT

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1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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OBJECTIVE:

Prepares the S1 ATA for removal.

PART 1

NOTE

The following step will manually control the PM accumulator heater so that its temperature matches the ETCS loop setpoint within 2 degrees C. This step will allow a constant temperature to be maintained at the accumulator through all Beta angles. Manual heater control should be performed until the ATA is isolated.

1. CONTROLLING PM ACCUM HEATERS TO LOOP SETPOINT

S1: TCS: PM: Loop A PM Htrs

Loop A PM Htrs

'Commands'

'Accum Htr 1'

cmd Availability Inhibit – Arm (\surd – \surd)

cmd Availability Inhibit – Inh (\surd Availability – Inh)

'Telemetry'

'Accum Htr 1'

Verify RPC Position – Op

'Accum Htr 2'

cmd Availability Inhibit – Arm (\surd – \surd)

cmd Availability Inhibit – Inh (\surd Availability – Inh)

'Telemetry'

'Accum Htr 2'

Verify RPC Position – Op

S1: TCS

S1: Loop A Overview

'PM (Pump Module)'

If N2 Temp < 1.33 deg C

S1: TCS: PM : Loop A PM Htrs: RPCM S12B A RPC 07

RPCM S12B A RPC 07

'Commands'

cmd RPC Position – Close (\surd Posn – Cl)

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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If N2 Temp > 5.33 deg C

S1: TCS: PM: Loop A PM Htrs: RPCM S12B A RPC 07

RPCM S12B A RPC 07

'Commands'

cmd RPC Position – Open (√Posn – Op)

Repeat step 1 until the PM accumulator is appropriately pre-conditioned. Manual heater operations will continue until the ATA is ready to be isolated in step 5.

NOTE

The following step should be performed when the pump module inlet pressure is at its peak in the orbit. This will preserve nitrogen.

2. PRESSURIZING ETCS LOOP A AND SUPPRESSING CWA

To suppress Event Code 4477 in the primary C&C MDM

Perform 1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS, steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL), then:

S1: TCS: PM

Loop A PM

'Telemetry'

'PM'

Verify PM Inlet Press is at its maximum value for the orbit.

Record PM Inlet Press: _____ kPa

If PM Inlet Press = 2688 kPa ± 10 kPa

Go to step 3.

If PM Inlet Press < 2583 kPa

For Loop A and a pressure of 2688 kPa

Perform 2.506 CHANGE ETCS LOOP A(B) PRESSURE - AUTO, all (SODF: TCS: NOMINAL: ETCS), then:

If PM Inlet Press > 2586 but < 2678 kPa

For Loop A and a pressure of 2688

Perform 2.508 INCREASE ETCS LOOP A(B) PRESSURE - MANUAL, all (SODF: TCS: NOMINAL: ETCS), then:

NOTE

If Suppressed Caution '**ETCS Loop A Pressure High/NH3 Transfer in Progress-S1**' is received, no action is required. FDIR will be inhibited in step 3.

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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3. INHIBITING NH3 RETURN FDIR

S1: TCS: Loop A Software: Loop A FDIR: Loop A ETCS FDIR Commands

Loop A ETCS FDIR Commands

'Commands'

'ETCS FDIR'

'NH3 Return'

cmd Inhibit – Arm (Verify – Inh Armed)

cmd Inhibit – Inhibit (Verify – Inh)

NOTE

Steps 4 and 5 should be performed at the point in the orbit when the PM Inlet pressure is the highest. This will prevent system overpressurization.

4. TERMINATING MANUAL HEATER OPS

S1: TCS: PM: Loop A PM Htrs: RPCM S12B A RPC 07

RPCM S12B A RPC 07

'Commands'

√RPC Position – Op

5. CLOSING THE PM INLET VALVE

S1: TCS

S1:Loop A Overview

'PM'

Verify PM Inlet Press is at its maximum value for the orbit.

S1: TCS: PM: Loop A PM Valves

Loop A PM Valves

'Commands'

'Inlet Isol Valve'

cmd Inlet Isol Valve Close – Arm (√ – √)

cmd Inlet Isol Valve Close – Close (√Posn – CI)

6. REENABLING LOOP A PM ACCUM HEATERS

S1: TCS: PM: Loop A PM Htrs

Loop A PM Htrs

'Commands'

'Accum Htr 1'

cmd Availability Enable – Enable (√ – Ena)

'Accum Htr 2'

cmd Availability Enable – Enable (√ – Ena)

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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CAUTION

The following step should be performed no earlier than 6 minutes after entering eclipse. Performing the isolation before this time could result in an overpressurization of the fluid line. Steps 7 and 8 should be performed in quick succession to minimize the time the fluid line is liquid locked.

7. ISOLATING ATA FROM ETCS LOOP A

Verify that the ISS has been in eclipse for at least 6 minutes.

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (\surd – Ena PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Both Isol Valves'

cmd Both Isol Valves Close – Arm (\surd – \surd)

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

cmd Set (\surd – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Both Isol Valves'

cmd Both Isol Valves Close – Close (\surd Posn – Cl)

NOTE

The vent valve will remain open until prior to EVA 1 to mitigate the hazard associated with the possibility of NH3 leakage across the PM/ATA Isolation Valves after the line is vented.

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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8. VENTING PRESSURE LOCKED ATA LINE

Loop A ATA Valves

'Commands'

'ATA Valves'

Verify Tank 1 Isol Valve – Closed

Verify Tank 2 Isol Valve – Closed

'Vent Valve'

cmd ATA Vent Valve Open – Arm (\checkmark – \checkmark)

cmd ATA Vent Valve Open – Open (\checkmark Posn – Op)

If Position \neq Open

The open arm and fire commands may be retried for up to 10 minutes.

If Position \neq Open after 10 minutes

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (\checkmark – Ena PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Both Isol Valves'

cmd Both Isol Valves Open – Arm (\checkmark – \checkmark)

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

cmd Set (\checkmark – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Both Isol Valves'

cmd Both Isol Valves Open – Open (\checkmark Position – Open)

>>

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

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NOTE

After the ATA vent valve is closed, PM pressures will be monitored to determine if there is a leak across the PM Inlet Isolation valve. In the event that a leak through the PM inlet valve is determined to exceed a total of 0.45 kg (1 lbm) over a period of 2 days (which would liquid lock the line segment), the rate cannot be determined, or the ATA cannot be replaced in 2 days, then the PM inlet isolation valve should be opened to re-fill the inlet line.

9. CLOSING ATA VENT VALVE

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Vent Valve'

cmd ATA Vent Valve Closed – Arm ($\sqrt{\text{---}}$)

cmd ATA Vent Valve Closed – Closed ($\sqrt{\text{Posn}} - \text{Cl}$)

PART 2

10. DEPRESSURIZING ETCS LOOP A ATA AND NTA

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Commands'

'NTA Valves'

Verify Both Isol Valves Position – Open

NOTE

The following step will vent approximately 30 lbs of N2 overboard.

10.1 Setting GPRV Setpoint to Desired Pressure

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Commands'

'GPRV'

'Setpoint'

sel Press Source – 3: NTA Out

input Setpoint – 6.9 kPa

cmd Set

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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NOTE

GPRV software will select a setpoint value that is one step lower than the current pressure (not the commanded setpoint). When the loop pressure reaches the setpoint value, a lower setpoint (the next step value) will be commanded by the software. This process will continue until the commanded setpoint is reached.

10.2 Monitoring Loop Pressure

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Telemetry'

Monitor NTA Outlet Press value as it approaches value entered in step 10.1.

NOTE

When the NTA outlet pressure value reaches the commanded setpoint, the ETCS Manager App Busy flag will clear. Waiting 5 minutes after the App Busy flag clears allows for pressures to stabilize.

S1: TCS: Loop A Software: Loop A ETCS Manager Details

Loop A ETCS Manager Details

'Telemetry'

'ETCS Manager'

'Data'

Verify App Busy – blank

Wait 5 minutes.

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Telemetry'

Verify NTA Out Press: 6.9 ± 96.5 kPa

PART 3

11. FLUID QD DISCONNECTION

Loop depressurization is complete.

Crew is GO to Close(Demate) M1, M2, M3, and M4 QDs.

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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PART 4

12. DISABLING ATA HEATERS

S1: TCS: ATA: Loop A ATA Heaters

Loop A ATA Heaters

'Commands'

'Group 1'

cmd Availability Inhibit – Arm (\surd – \surd)

cmd Availability Inhibit – Inh (\surd – Inh)

'Group 2'

cmd Availability Inhibit – Arm (\surd – \surd)

cmd Availability Inhibit – Inh (\surd – Inh)

13. APPLYING RPC INHIBITS TO ATA COMPONENTS

S1: TCS: ATA: Loop A ATA Htrs: RPCM S12B A RPC 12

RPCM S12B A RPC 12

cmd Close Cmd – Inhibit (Verify – Inh)

\surd RPC Position – Open

S1: TCS: ATA: Loop A ATA Htrs: RPCM S11A A RPC 14

RPCM S11A A RPC 14

cmd Close Cmd – Inhibit (Verify – Inh)

\surd RPC Position – Open

P1: EPS: RPCM S11A C: RPC 13

RPCM S11A C RPC 13

cmd Close Cmd – Inhibit (Verify – Inh)

\surd RPC Position – Open

PART 5

14. ELECTRICAL CONNECTOR DISCONNECTION

Electrical inhibits complete.

The crew is GO for electrical connector demate.

1.100 S1 ATA REMOVAL AND REPLACEMENT PREP

(ASSY OPS/19A/FIN)

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PART 6

15. INHIBITING ATA DEPENDENT ETCS FDIR AND SUPPRESSING CWA

S1: TCS: Loop A Software: Loop A FDIR: Loop A ETCS FDIR Addl

Commands

Loop A ETCS FDIR Addl Commands

'Commands'

'ETCS FDIR'

'ATA Overpress'

cmd Inhibit – Arm (Verify – Inh Armed)

cmd Inhibit – Inhibit (Verify – Inh)

'ATA Bellows Overpress'

cmd Inhibit – Arm (Verify – Inh Armed)

cmd Inhibit – Inhibit (Verify – Inh)

For Event Code 4479

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

For Event Code 4471

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

16. SUPPRESSING ATA HEATER MESSAGES

For Event Code 3700

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

For Event Code 3794

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

For Event Code 3713

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

For Event Code 3808

Go to [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 4, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL).

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1.110 S1 ATA POST-REPLACEMENT ACTIVATION

(ASSY OPS/19A/FIN)

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OBJECTIVE:

Activate and checkout the S1 ATA after installation.

PART 1

1. ELECTRICAL CONNECTIONS

Crew is GO for electrical connector mates.

PART 2

PCS

2. CLOSING THE NTA ISOLATION VALVES

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Commands'

'Both Isol Valves'

cmd Both Isol Valves Close – Arm (\surd – \surd)

cmd Both Isol Valves Close – Close (\surd – Closed)

3. VERIFYING ATA VALVE CONFIGURATION

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

Verify Tank 1 Isol Valve – Closed

Verify Tank 2 Isol Valve – Closed

Verify Vent Valve – Closed

PART 3

4. QD CONNECTION

The crew is GO to Mate(Open) the M1, M2, M3, and M4 QD.

PART 4

5. REMOVING RPC INHIBITS FROM ATA COMPONENTS

S1: TCS: ATA: Loop A ATA Htrs: RPCM S12B A RPC 12

RPCM S12B A RPC 12

cmd Close Cmd – Enable (Verify – Ena)

S1: TCS: ATA: Loop A ATA Htrs: RPCM S11A A RPC 14

RPCM S11A A RPC 14

cmd Close Cmd – Enable (Verify – Ena)

S1: EPS: RPCM S11A C: RPC 13

RPCM S11A C RPC 13

cmd Close Cmd – Enable (Verify – Ena)

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

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NOTE

Prior to pressurization, ATA dP sensors may toggle to values above Bellows Overpress FDIR limit of 69 kPa (PRACA 3333). ATA Bellows Overpress FDIR will remain inhibited until post ATA integration.

6. ENABLING ATA OVERPRESS FDIR AND CWA

S1: TCS: Loop A Software: Loop A FDIR: Loop A ETCS FDIR Addl Commands

Loop A ETCS FDIR Addl Commands

'Commands'

'ETCS FDIR'

'ATA Overpress'

cmd Enable – Enable (√ – Ena)

For Event Code 4479

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#), steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL), then:

CAUTION

Steps 7 to 13 are required to verify a successful pin connection. A bent connector pin could defeat two or more inhibits to a must-not-work function.

7. OVERRIDING ATA HEATER FOR VALVE CHECKOUT

S1: TCS: ATA: Loop A ATA Htrs

Loop A ATA Htrs

'Commands'

'Group 2'

Verify Availability – Inh

'Telemetry'

sel RPCM S11A A RPC 14

RPCM S11A A RPC 14

cmd RPC Position – Close (√Posn – Cl)

8. OPENING ATA ISOLATION VALVE 1

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (√ – Ena PTC Vlv)

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

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S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 1 Isol Valve'

cmd Tank 1 Isol Valve Open – Arm (\surd – \surd)

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

cmd Set (\surd – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 1 Isol Valve'

cmd Tank 1 Isol Valve Open – Open (\surd Posn – Op)

9. OPENING ATA ISOLATION VALVE 2

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (\surd – Ena PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 2 Isol Valve'

cmd Tank 2 Isol Valve Open – Arm (\surd – \surd)

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

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cmd Set (\surd – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 2 Isol Valve'

cmd Tank 2 Isol Valve Open – Open (\surd Position – Open)

10. CLOSING ATA ISOLATION VALVE 1

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (\surd – Ena PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 1 Isol Valve'

cmd Tank 1 Isol Valve Close – Arm (\surd – \surd)

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

cmd Set (\surd – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 1 Isol Valve'

cmd Tank 1 Isol Valve Close – Close (\surd Position – Close)

11. OPENING ATA ISOLATION VALVE 1

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

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sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (√ – Ena PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 1 Isol Valve'

cmd Tank 1 Isol Valve Open – Arm (√ – √)

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

cmd Set (√ – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 1 Isol Valve'

cmd Tank 1 Isol Valve Open – Open (√Position – Open)

12. CLOSING ATA ISOLATION VALVE 2

S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Ena PTC Vlv

cmd Set (√ – Ena PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 2 Isol Valve'

cmd Tank 2 Isol Valve Close – Arm (√ – √)

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S1: TCS: Loop A Software: Loop A Off Nominal Commands

Loop A Off Nominal Commands

'Commands'

'ETCS Cmd Override'

sel ETCS Cmd Override – Operate PTC Vlv

cmd Set (\surd – Operate PTC Vlv)

S1: TCS: ATA: Loop A ATA Valves

Loop A ATA Valves

'Commands'

'ATA Valves'

'Tank 2 Isol Valve'

cmd Tank 2 Isol Valve Close – Close (\surd Position – Close)

13. COMMANDING ATA HEATER RPC OPEN

S1: TCS: ATA: Loop A ATA Htrs: RPCM S11A A RPC 14

RPCM S11A A RPC 14

cmd RPC Position – Open (\surd Posn – Op)

14. INITIATING CLOSED LOOP CONTROL OF THE ATA HEATERS

S1: TCS: ATA: Loop A ATA Heaters

Loop A ATA Heaters

'Commands'

'Group 1'

cmd Availability Enable – Ena (Verify – Ena)

Verify Control Mode Status – Closed Loop

'Group 2'

cmd Availability Enable – Ena (Verify – Ena)

Verify Control Mode Status – Closed Loop

15. OPENING N2 SUPPLY VALVE

S1(S1): TCS: NTA: Loop A(B) NTA Valves

Loop A(B) NTA Valves

'Commands'

'NTA Valves'

cmd N2 Supply Valve Open – Arm (\surd – \surd)

cmd N2 Supply Valve Open – Open (\surd Posn – Op)

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16. SETTING NTA GPRV SETPOINT TO EQUAL ATA TANK 1 OUT PRESS READING

16.1 Recording ATA Tank Out Press Readings

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Telemetry'

Record ATA Tank 1 Out Press: _____ kPa

If ATA Tank 1 Out Press = NTA N2 Out Press \pm 96.5 kPa

Go to step 17.

16.2 Verifying Sufficient Supply Pressure

'Telemetry'

'NTA'

Verify N2 Supply Press > ATA Tank 1 Out Press in step 16.1.

16.3 Inputting Appropriate NTA GPRV Setpoint

'Commands'

'GPRV'

'Setpoint'

sel Press Source – 3: NTA Out

input Setpoint – _____ (ATA Tank 1 Out Press recorded in step 16.1)

cmd Set

16.4 Monitoring Pressure Change

'Telemetry'

'NTA'

Monitor N2 Out Press value as it approaches (value entered in step 16.3) kPa.

NOTE

When the N2 NTA Out Press value reaches the commanded setpoint, the ETCS Manager App Busy flag will clear.

16.5 Verifying Application Processing Complete

S1: TCS: Loop A Software: Loop A ETCS Manager Details

Loop A ETCS Manager Details

'Telemetry'

'ETCS Manager'

'Data'

Verify App Busy – blank

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

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NOTE

The NTA Isol Valves will not open unless the GPRV Out Pressure = highest ATA Tank in pressure \pm 96.5 kPa and the N2 Supply Valve is open.

17. OPENING NTA ISOLATION VALVES

S1: TCS: ATA

Loop A ATA

'Telemetry'

'ATA'

'Valve'

Verify Tank 1 Isol Valve – Open

Verify Tank 2 Isol Valve – Closed

S1: TCS: NTA: Loop A NTA Valves: Loop A NTA Additional Valves

Loop A NTA Additional Valves

'Commands'

'NTA Valves'

'Isol Valve 1'

cmd Isol Valve 1 Open – Arm (\surd – \surd)

cmd Isol Valve 1 Open – Open (Verify Posn – Op)

'Telemetry'

Verify ATA Tank 1 dP < 65 kPa

NOTE

The desired GPRV setpoint command in the following step should be the PM Inlet Pressure minus 69 kPa. As a result of the ATA integration occurring so quickly, the vapor created when the new ATA Tank Isolation Valves are opened will not have had enough time to cool down and collapse. The size of the vapor pocket is unknown and opening the PM Inlet Valve with equal pressure on each side of the valve could allow the vapor to reach the pump and cause cavitation. Keeping the ATA pressure 69 kPa lower than the PM Inlet pressure ensures any existing vapor bubble will stay within the ATA until it collapses.

18. SETTING GPRV SETPOINT TO DESIRED PRESSURE

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Telemetry'

'PM'

Record PM Inlet Press: _____ kPa

'Commands'

'GPRV'

'Setpoint'

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sel Press Source – 1: ATA Tnk1 Out

If PM Inlet Press < or = 2756 kPa

input Setpoint – _____ (PM Inlet Press recorded above - 69) kPa

cmd Set

If PM Inlet Press > 2757 kPa

input Setpoint – 2 6 8 8 kPa

cmd Set

NOTE

GPRV Software will select a setpoint value that is one step higher than the current pressure (not the commanded setpoint). When the loop pressure reaches the setpoint value, a higher setpoint (the next step value) will be commanded by software. This process will continue until the commanded setpoint is reached.

19. MONITORING LOOP PRESSURE

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Telemetry'

'ATA Tank 1'

Monitor Out Press value as it approaches (value entered in step 18) kPa.

NOTE

When the ATA Tank 1 Out Press value reaches the commanded setpoint, the ETCS Manager App Busy flag will clear. Waiting 5 minutes after the App Busy flag clears allows for pressures to stabilize.

S1: TCS: Loop A Software: Loop A ETCS Manager Details

Loop A ETCS Manager Details

'Telemetry'

'ETCS Manager'

'Data'

Verify App Busy – blank

Wait 5 minutes.

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Telemetry'

'ATA Tank 1'

Verify Out Press: value entered in step 18 ± 96.5 kPa

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

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20. CLOSING N2 SUPPLY VALVE

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Commands'

'NTA Valves'

'N2 Supply Valves'

cmd N2 Supply Valve Close – Arm (\surd – \surd)

cmd N2 Supply Valve Close – Close (\surd Posn – Cl)

21. OPENING THE PM INLET VALVE

S1: TCS: PM: Loop A PM Valves

Loop A PM Valves

'Commands'

'Inlet Isol Valve'

cmd Inlet Isol Valve Open – Arm (\surd – \surd)

cmd Inlet Isol Valve Open – Open (\surd Posn – Op)

NOTE

With the NTA Isolation Valves Open, the GPRV will vent nitrogen if thermal fluctuations cause the loop pressure to increase. Since nitrogen should be conserved as much as possible, this is undesirable. Step 22 will set the GPRV at a higher setpoint so that it will not vent in response to normal pressure fluctuations. Because the N2 Supply Valve is Closed, it is unlikely that the higher commanded pressure in step 22 will be attained by the GPRV. If this is the case, an abort command will be sent in step 23.

22. SETTING GPRV PRESSURE

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Telemetry'

'NTA'

Verify N2 Supply Valve = Closed

desired setpt = either N2 Out Press + 137 kPa or 2688 kPa, whichever is smaller

'Commands'

'GPRV'

'Setpoint'

input Setpoint – _____ (desired setpt) kPa

pick Press Source – 3: NTA Out

cmd Setpoint – Set

Verify GPRV CMD Setpt – desired setpt \pm 10 kPa

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

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23. TERMINATING ETCS COMMAND PROCESSING

Wait 5 minutes.

S1: TCS: Loop A Software: Loop A ETCS Manager Details

Loop A ETCS Manager Details

'Telemetry'

'ETCS Manager'

'Data'

If App Busy – X

S1: TCS: NTA: Loop A NTA Valves

Loop A NTA Valves

'Commands'

'ETCS'

cmd ETCS – Abort

S1: TCS: Loop A Software: Loop A ETCS Manager Details

Loop A ETCS Manager Details

'Data'

Verify App Busy – blank

pick Loop A ETCS PTC Details

Loop A ETCS PTC Details

'Data'

Verify App Busy – blank

24. ENABLING ATA HEATER CAUTIONS

S1: TCS

S1: Loop A Overview

'ATA'

(Ammonia Tank Assembly)

If Tank 1 Htr Temp > -38.3° C

For Event Code 3700

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

If Htr Group 2 Temp > -38.3° C

For Event Code 3794

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#),
steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL),
then:

1.110 S1 ATA POST-REPLACEMENT ACTIVATION

(ASSY OPS/19A/FIN)

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For Event Code 3713

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#), steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL), then:

For Event Code 3808

Perform [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#), steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL), then:

NOTE

Prior to pressurization, ATA dP sensors may toggle to values above Bellows Overpress FDIR limit of 69 kPa (PRACA 3333). Since ATA Tank 2 will remain isolated at low pressure, the ATA Tank 2 dP sensor will be set to fail prior to enabling the ATA Bellows Overpress FDIR.

25. [SETTING ATA TANK 2 dP SENSOR TO FAIL](#)

Perform [4.606 ETCS/TRRJ Loop A\(B\) Sensor Override](#), all for Loop A S1 ATA Tank2 dP to Fail (SODF: TCS: CORRECTIVE: ETCS), then:

26. [ENABLING ETCS FDIR AND ASSOCIATED MESSAGES](#)

S1: Loop A Overview

'PM (Pump Module)'

Verify PM Inlet Press, Byp Press, and Rad Rtn Press < 2800 kPa

S1: TCS: Loop A Software: Loop A FDIR: Loop A ETCS FDIR Commands

Loop A ETCS FDIR Commands

'Commands'

'ETCS FDIR'

'ATA Bellows Overpress'

cmd Enable – Enable (√ – Ena)

'NH3 Return'

cmd Enable – Enable (√ – Ena)

To enable Event Code 4471 in the primary C&C MDM

Go to [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#), steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL).

To enable Event Code 4477 in the primary C&C MDM

Go to [1.210 SUPPRESS, INHIBIT, AND ENABLE C&W EVENTS](#), steps 1 to 3, 6, 8 and 9 (SODF: GND AVIONICS: C&DH: NOMINAL).

1.115 ZSR RACK DEPLOY IN JPM OR JLP

(ASSY OPS/19A/FIN) Page 1 of 11 pages

OBJECTIVE:

Deploy Zero-G Soft Rack (ZSR) in JPM or JLP. This activity modifies the rear of the ZSR to mitigate interference with the JEM Shell Heaters.

LOCATION:

Installed: JPM or JLP Rack Bay

DURATION:

30 minutes per Rack

CREW:

One

MATERIALS:

Velcro Straps (two)

Zip Ties (four)

Kapton Tape

TOOLS:

Digital Camera

Leatherman Tool P/N SLZ33112269

ISS Toolbox:

Drawer 2:

Ratchet, 3/8" Drive

5/32" Hex Head, 3/8" Drive

Drawer 4:

Wire Cutters P/N 184BCP

REFERENCED PROCEDURE(S):

None

NOTE

All directional references (up, down, left, right) are with respect to front face of Rack, as you face Rack, with feet oriented towards the pivot point.



Figure 1.- PIP Pins on K-BARs.

1. ZSR ROTATION

1.1 If required, remove PIP Pins (two) from K-BARs.
Temporarily stow.
Refer to Figure 1.

1.2 K-BAR Thumb Latches (two) → down position

√Rack rotation path unobstructed

Rotate ZSR down to a controlled stop.

2. MODIFYING ZSR TO PREVENT INTERFERENCE WITH JLP AND JPM SHELL HEATERS



Figure 2.- ZSR Folded.



Figure 3.- Strap with Velcro and Zip Tie.

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(ASSY OPS/19A/FIN) Page 4 of 11 pages

- 2.1 Cut Zip Ties (six) with Wire Cutters or Leatherman Tool and release Launch Restraint Straps on back of the fabric envelope, securing strap ends to side Panel Velcro.
Refer to Figures 2 and 3.



Figure 4.- Back Panel (Open).

- 2.2 Unzip back Panels.
Refer to Figure 4.



Figure 5.- One Petal Pushed Into Position.

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- 2.3 Push petal back and to the sides until they rest against the fabric envelope.
Refer to Figure 5.

NOTE

There are three Rear Lateral Struts on a ZSR. The center strut will not be installed to avoid contact with the JEM shell heaters.



Figure 6.- Top and Bottom Strut and Socket.

- 2.4 Insert each end of the Rear Lateral Struts (two) into corresponding sockets
at rear edge of petal.
Refer to Figure 6.



Figure 7.- ZSR to Insert Tab.



Figure 8.- Tabs Between Insert.

- 2.5 Match and secure tabs (red in top and bottom of ZSR and blue in center). Refer to Figures 7 and 8.



Figure 9.- ZSR to Insert Zipper.

2.6 Connect rear zippers for both top and bottom inserts.
Refer to Figure 9.

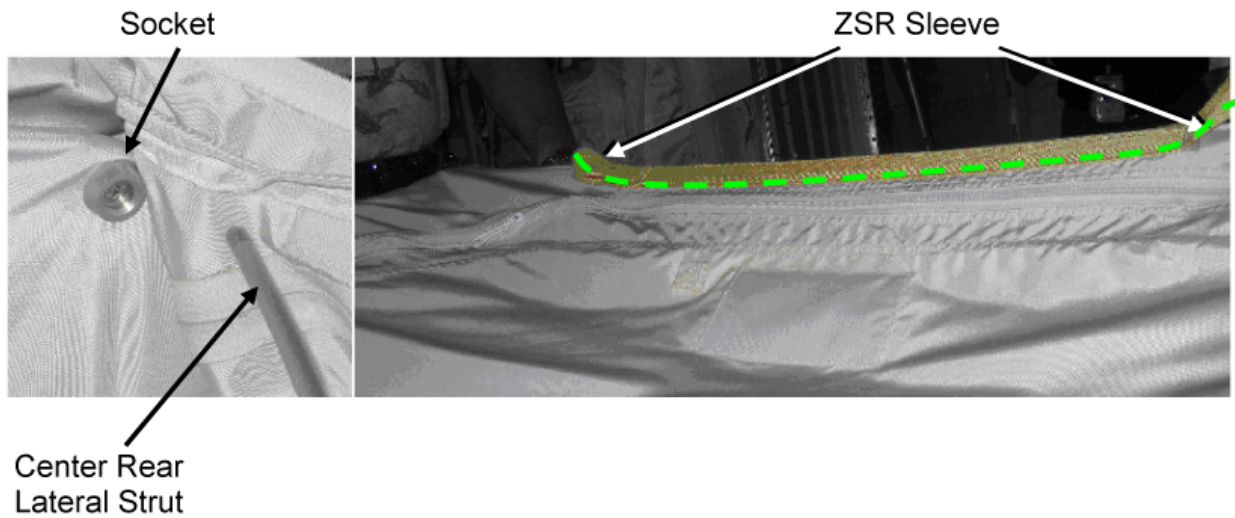


Figure 10.- ZSR Center Rear Lateral Strut, Socket, and ZSR Sleeve.

Zip Tie through zipper and Lower(Upper)
Launch Restraint Loop



Figure 11.- ZSR Rear Stowage Volumes (Empty, Unzipped, in Stowed Configuration).



Figure 12.- ZSR Rear Launch Restraint Loops Restrained with Velcro Straps.

- 2.7 Roll up inward, and secure rear ZSR stowage volumes with Zip Ties. Refer to Figure 11.
- 2.8 Restrain rear ZSR straps (Velcro Straps). Refer to Figure 12.



ISS017E019836

Figure 13.- ZSR Zipper and Cloth Tab Improperly Contacting JEM Shell Heater.

2.9 Restrain zippers and cloth zipper tabs to ZSR to prevent contact with JEM shell heaters (Kapton Tape).
Refer to Figure 13.

2.10 Photo document ZSR modifications (Digital Camera).

3. INSTALLING ZSR

3.1 \sqrt ZSR rotation path unobstructed

NOTE

When rotating ZSR up, the N-Braces in the JLP Rack Bays may interfere with the top of the ZSR. The top and side petals of the ZSR can be pressed down to clear the N-Braces and ARIS Pushrod Fitting.

3.2 ZSR K-BAR Thumb Latches (two) → up position

Tuck both upper rear corners of ZSR into ZSR volume while slowly rotating Rack up to a controlled stop to prevent impingement of ZSR onto GLA, N-Brace, or ARIS Pushrod Fitting.

Engage ZSR K-BAR Thumb Latches (two) into K-BAR Capture Mechanisms.

1.115 ZSR RACK DEPLOY IN JPM OR JLP

(ASSY OPS/19A/FIN)

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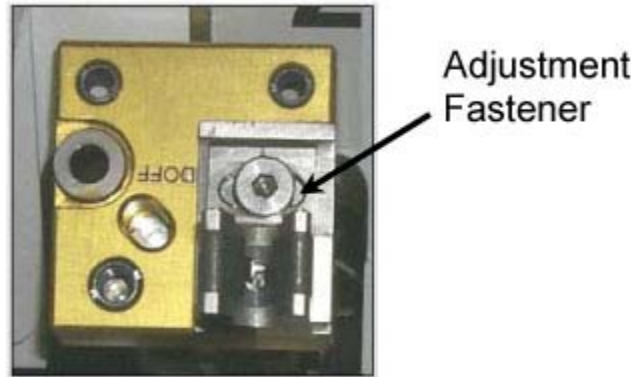


Figure 14.- K-BAR Capture Mechanism, Located on JEM Standoff.

- *****
- * If K-BAR does not align with K-BAR Capture Mechanism
- * | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex
- * | Head, 3/8" Drive).
- * | Slide capture clip left or right, as required, to engage K-BAR.
- * | Once K-BAR engaged, re-tighten Adjustment Fastener
- * | (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- * |
- * Refer to Figure 14.
- *****

CAUTION
Shell heaters and their Wire Harness are mounted on JEM Shell behind ZSRs; therefore, the clearance between ZSR Rear and JEM Shell should be controlled properly to avoid damage to Harness and heaters due to rubbing.

- 3.3 If accessible from adjacent Rack Bay
- | Verify ZSR Rear is kept away from the heaters and the Harnesses on
- | JEM Shell and over Longeron at ZSR rear bottom.

Notify **SSIPC** of result.

4. SHELF DEPLOY



Figure 15.- Open ZSR Doors.

- 4.1 Open door(s), as required, to unroll shelf from rear wall.
Align and zip from front to back.
Refer to Figure 15.
- 4.2 Separate doors, as required, stowing door connector flap by snapping to back of door.

5. CLOSEOUT

- 5.1 Photo document overview of the installed ZSRs (Digital Camera).
- 5.2 Notify **MCC-H** of task completion.
Stow tools, materials.

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TRANSFER

TRANSFER

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2.100 ZSR TRANSFER MPLM TO ISS

(ASSY OPS/19A/FIN)

Page 1 of 5 pages

OBJECTIVE:

Transfer Zero-G Soft Rack (ZSR) from MPL1S2(MPL1S4) to JLP1A1(LAB1P4). This transfer activity removes the ZSR from the MPLM and transfers the Rack to Station and structurally attaches the Rack to the Module.

LOCATION:

Stowed: MPL1S2(MPL1S4)

Installed: JLP1A1(LAB1P4)

DURATION:

25 minutes

PARTS:

None

MATERIALS:

None

TOOLS:

Digital Camera

Ratchet, 3/8" Drive (if required)

5/32" Hex Head, 3/8" Drive (if required)

REFERENCED PROCEDURE(S):

None

NOTE

All directional references (up, down, left, right) are with respect to front face of Rack, as you face Rack, with feet oriented towards the pivot point.

1. RACK SAFING

√All unnecessary equipment protruding into rack translation path has been removed, stowed (MPLM, Node 2, JPM, JLP, LAB)

2. REMOVING ZSR FROM MPLM

MPL1S2
(MPL1S4) Remove PIP Pins from ZSR brackets (four).

3. TRANSFERRING ZSR TO JLP(LAB)

3.1 Transfer ZSR to JLP1A1(LAB1P4).

2.100 ZSR TRANSFER MPLM TO ISS

(ASSY OPS/19A/FIN)

Page 2 of 5 pages



Figure 1.- ZSR on Pivot Fitting, Lower Right Side Shown.

- 3.2 Align ZSR onto Standoff until rack Pivot Latches engage Standoff Pivot Fittings.
Keep Rack rotated down.
Refer to Figure 1.

2.100 ZSR TRANSFER MPLM TO ISS

(ASSY OPS/19A/FIN)

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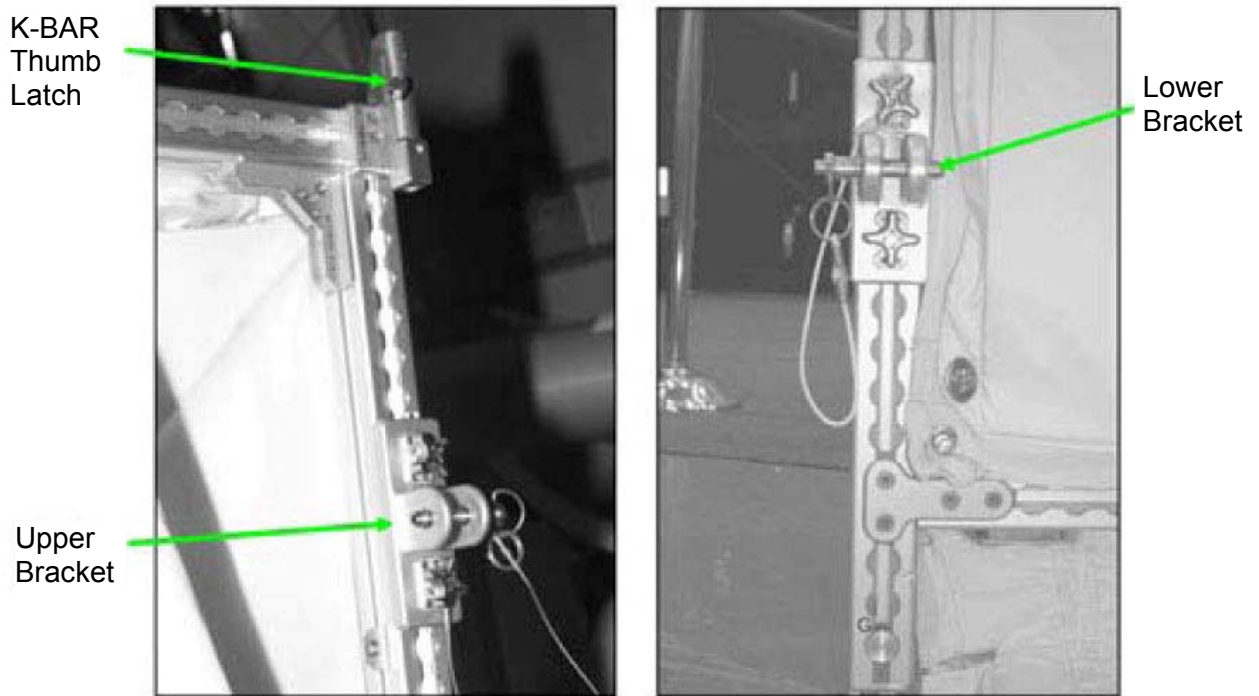


Figure 2.- ZSR with Upper Right K-BAR, Upper Bracket, and Lower Bracket.

4. FINAL INSTALLATION

4.1 ✓Rack rotation path is unobstructed

4.2 K-BAR Thumb Latches (two) → up position
Refer to Figure 2.

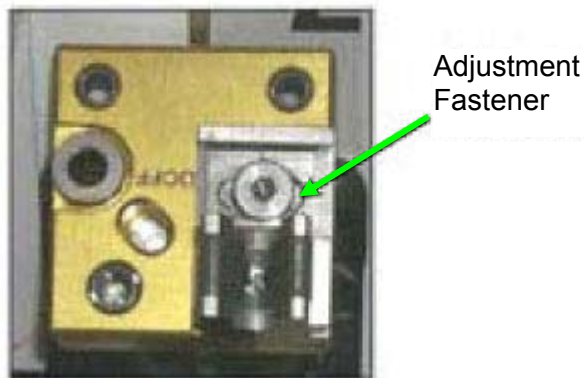


Figure 3.- K-BAR Capture Mechanism, Located on JLP(LAB) Standoff.

4.3 Slowly rotate Rack up to a controlled stop.
Engage Rack K-BAR Thumb Latches (two) in K-BAR Capture Mechanism located on JLP(LAB) Standoff.

2.100 ZSR TRANSFER MPLM TO ISS

(ASSY OPS/19A/FIN)

Page 4 of 5 pages

- *****
- * If K-BAR does not align with K-BAR Capture Mechanism
 - * | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" /Drive).
 - * | Slide capture clip left or right, as required, to engage K-BAR.
 - * | Once K-BAR is engaged, re-tighten Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
 - * | Refer to Figure 3.
- *****

5. REMOVING FSE BRACKETS FROM ZSR

NOTE

The seat track attachment plates are noncaptive and will come off the brackets if the knobs are loosened more than approximately six turns.

Remove ZSR right FSE brackets from the right side of the ZSR and ZSR left FSE brackets from the left side of the ZSR (knobs).
Temporarily stow.
Refer to Figure 2.

6. REMOVING FSE BRACKETS FROM RSR



Figure 4.- RSR Upper.



Figure 5.- RSR Lower.

- 6.1 Remove RSR right FSE brackets (two) from the right side of the RSR and RSR left FSE brackets (two) from the left side of the RSR (knobs).

2.100 ZSR TRANSFER MPLM TO ISS

(ASSY OPS/19A/FIN)

Page 5 of 5 pages

- 6.2 Connect FSE Brackets removed from ZSR in step 5 with FSE Brackets removed from RSR in step 6.1 (PIP Pins).
Stow assembled FSE Brackets per Stowage Note.

7. POST TRANSFER

- 7.1 Photo document newly installed hardware (Digital Camera).
- 7.2 Notify **MCC-H** transfer activity for ZSR is complete.
Stow tools, parts.

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2.104 RACK TRANSFER FROM MPLM TO ISS (ER7, CQ2, MARES)

(ASSY OPS/19A/FIN/HC)

Page 1 of 9 pages

OBJECTIVE:

Transfer EXPRESS-7 Rack, Crew Quarters 2, and Muscle Atrophy Resistive Exercise System (MARES) Rack from the MPLM to ISS. This transfer activity disengages all launch restraints, transfers each Rack from the MPLM, and then structurally attaches the Racks to their designated ISS Rack Bay location.

LOCATION:

EXPRESS-7 Installed: LAB1P2, Stowed: MPL1P3
Crew Quarters 2 Installed: NOD2O5, Stowed: MPL1P2
MARES Installed: COL1F3, Stowed: MPL1S3

DURATION:

1 hour per Rack

CREW:

Two

PARTS:

K-Bar Assy, Left (three) P/N 683-62201-33
K-Bar Assy, Right (three) P/N 683-62201-34
ISPR Bonding Strap P/N 3000CA001-001

MATERIALS:

Dry Wipes

TOOLS:

Digital Camera
ARIS Tool Page P/N PERS3400M
Populate ARIS Tool Page with the following tools.

ISS IVA Toolbox:

Drawer 2:

- Ratchet, 3/8" Drive
- 7/16" Socket, 3/8" Drive
- 9/16" Socket, 3/8" Drive
- 1/2" Socket, 3/8" Drive
- 5/32" Hex Head, 3/8" Drive
- (40-200 in-lbs) Trq Wrench, 3/8" Drive

Drawer 3:

- 6" Long, 3/8" Hex Head, 3/8" Drive
- 5" Long, 3/8" Ball Tip Hex Head, 3/8" Drive

Drawer 4:

- Adjustable Joint Pliers, Straight Jaw

REFERENCED PROCEDURE(S):

None

2.104 RACK TRANSFER FROM MPLM TO ISS (ER7, CQ2, MARES)

(ASSY OPS/19A/FIN/HC)

Page 2 of 9 pages

NOTE

All directional references (up, down, left, right) are with respect to front face of Rack, as you face Rack, with feet oriented towards the pivot point.

1. RACK SAFING

- 1.1 ✓ All unnecessary equipment protruding into Rack translation path has been removed, stowed (MPLM, Node 2, US LAB, COLUMBUS)

CAUTION

Disengagement sequence must be followed exactly to allow any induced loads to be released safely back into structure.

2. DISENGAGING LOWER LAUNCH RESTRAINTS

Refer to Figures 1 and 2.

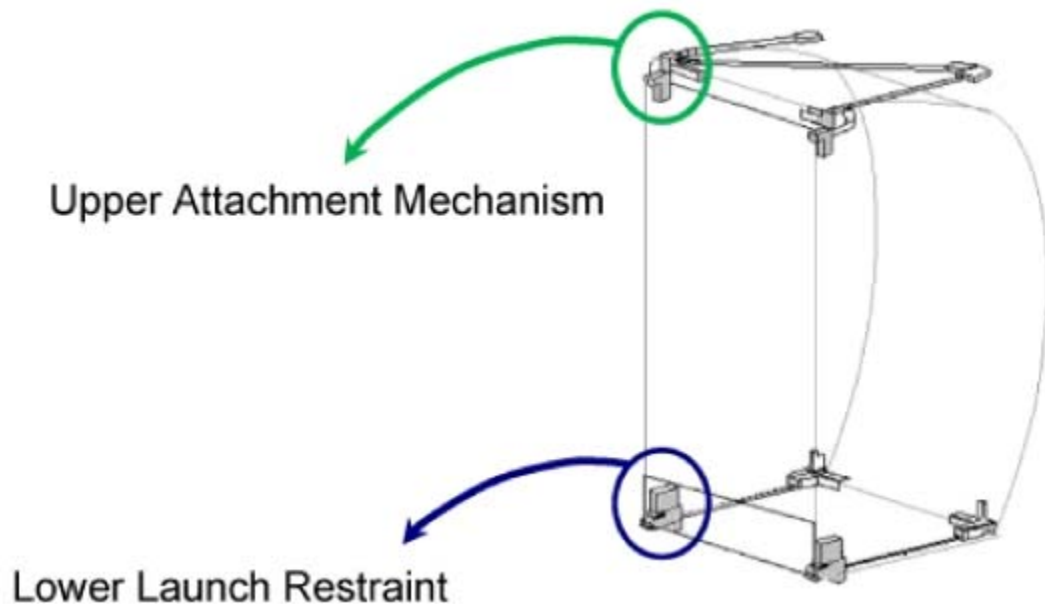


Figure 1.- Location of Rack Launch Restraint Hardware.

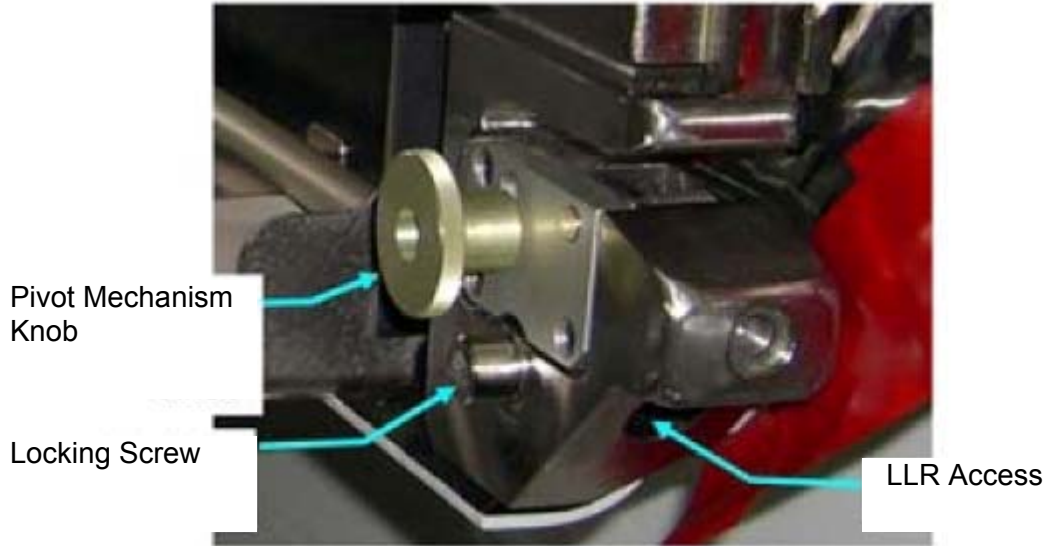


Figure 2.- USOS Rack Lower Launch Restraint, Right Side.

NOTE

Loud "pop" may occur during release of first Lower Launch Restraint.

- 2.1 Remove left Locking Screw (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
 - 2.2 Disengage left Lower Launch restraint 10 to 12 turns until hard stop (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
 - 2.3 Reinstall left Locking Screw, two to three turns.
 - 2.4 Loosen left Pivot Mechanism Knob one turn, so latch is free to move.
 - 2.5 Repeat for right side.
3. [DISENGAGING UPPER ATTACH MECHANISMS](#)
Refer to Figures 1 and 3.

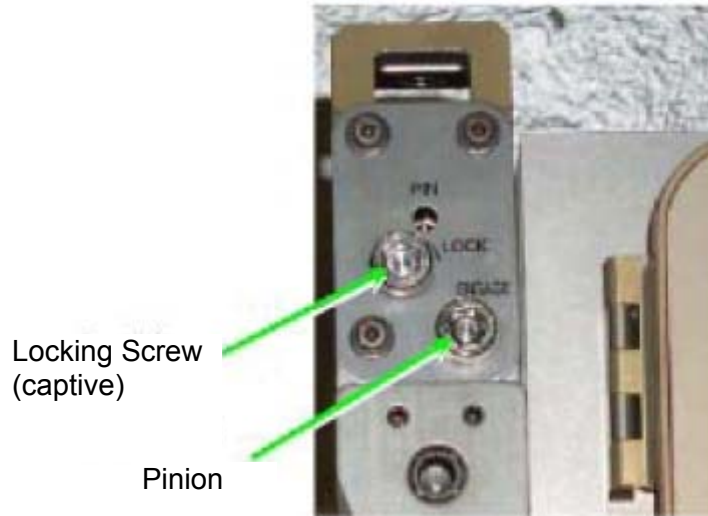


Figure 3.- USOS Rack Upper Attach Mechanism, Left Side.

- 3.1 Loosen left Locking Screw 10 to 12 turns or until threads completely disengage (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).

NOTE

1. To disengage left Pinion, turn ↺.
2. To disengage right Pinion, turn ↻.

- 3.2 Disengage left Pinion one full turn until hard stop (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
- 3.3 Repeat for right side.

4. K-BAR INSTALLATION

Refer to Figure 4.

2.104 RACK TRANSFER FROM MPLM TO ISS (ER7, CQ2, MARES)

(ASSY OPS/19A/FIN/HC)

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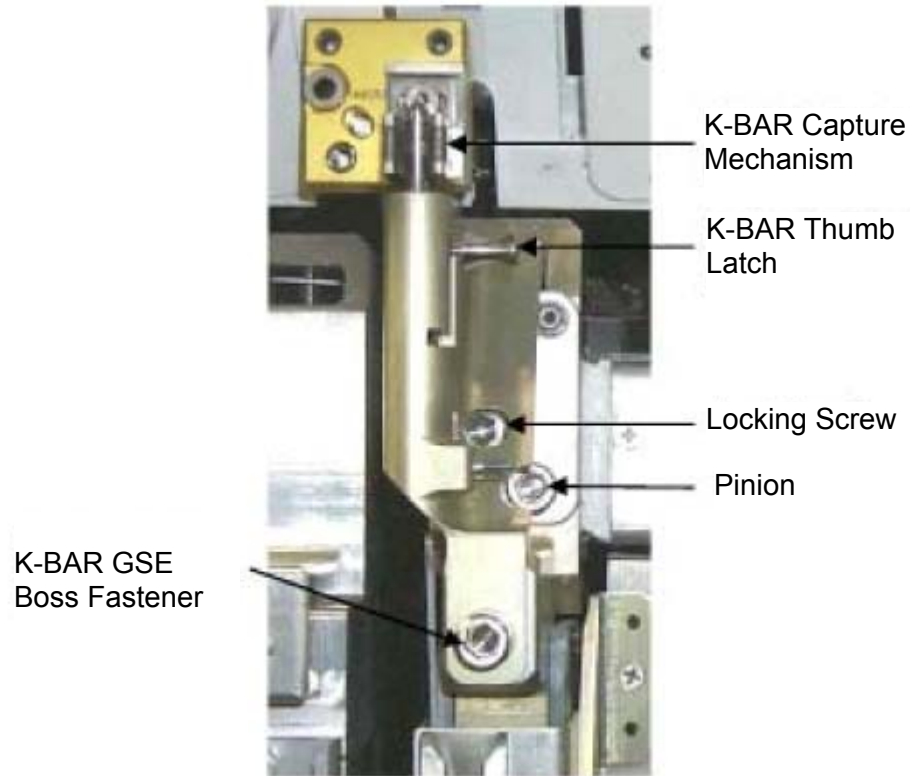


Figure 4.- USOS Rack Left K-BAR (Shown Installed).

- 4.1 Record S/N of K-BAR Assy, Left: _____
Record S/N of K-BAR Assy, Right: _____

- 4.2 Rotate Rack down only ~15 cm (~5 in).

CAUTION

Do not force Upper Attach Mechanism Pinions. Mechanism should easily engage K-BAR.

NOTE

1. To engage left Pinion, turn ↺.
2. To engage right Pinion, turn ↻.

- 4.3 Install K-BAR, Left (P/N 683-62201-33), in left Upper Attach Mechanism.
- 4.4 Check Locking Screw fully unlocked.
- 4.5 Engage Pinion, one full turn, into K-BAR (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
- 4.6 Snug Locking Screw and K-BAR GSE Boss Fastener (Ratchet, 3/8" Drive; 5" Long, 3/8" Ball Tip Hex Head, 3/8" Drive).
- 4.7 K-BAR Thumb Latch → down position

4.8 Repeat for K-BAR Assy, Right (P/N 683-62201-34)

5. RACK TRANSLATION PREPARATION

5.1 Remove any Handrails from the front of the Rack.
 Slowly rotate Rack down to a controlled stop.



Figure 5.- MPLM Knee Brace Retention Devices.

5.2 Install Knee Brace Struts (two) into MPLM “KNEE BRACES RETEN DEVICE” Locking Clips (two).
 Snug Adjustment Fasteners (two) (Ratchet, 3/8" Drive; 7/16" Socket, 3/8" Drive).
 Refer to Figure 5.

6. TRANSFERRING RACK TO ISS

Table 1. Rack Transfer Locations.

Rack	Stowed	Installed
EXPRESS-7	MPL1P3	LAB1P2
Crew Quarters 2	MPL1P2	NOD2O5
MARES	MPL1S3	COL1F3

6.1 Transfer Rack from MPLM to ISS.
 Refer to Table 1 for ISS Rack Locations.

6.2 Align Rack onto Standoff until Rack Pivot Latches engage Standoff Pivot Fittings.
 Keep Rack rotated down.

6.3 Tighten both Pivot Mechanism Knobs in latched, up position.

2.104 RACK TRANSFER FROM MPLM TO ISS (ER7, CQ2, MARES)

(ASSY OPS/19A/FIN/HC)

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7. GROUND STRAP INSTALLATION

7.1 If transferring EXPRESS-7 Rack, go to step 9.

If transferring MARES Rack, go to step 8.

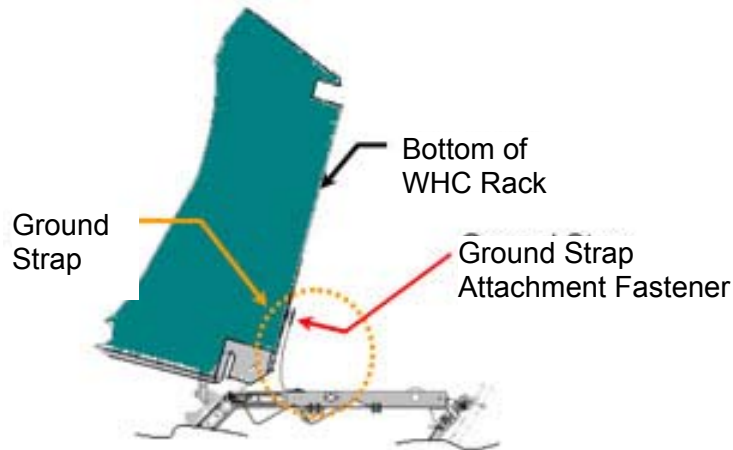


Figure 6.- Side View of Rotated Rack, Showing Rack Ground Strap Location.

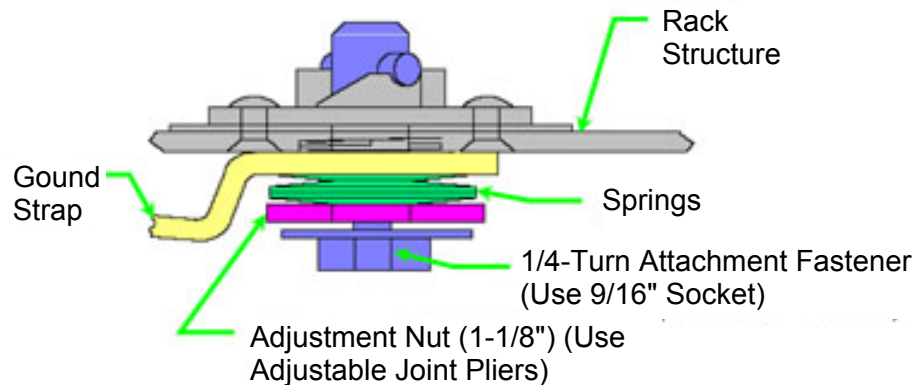


Figure 7.- Rack Ground Strap Cross-Section.

7.2 Inspect Ground Strap contact surfaces for debris and clean if required (Dry Wipes).

Refer to Figure 6.

7.3 Fully retract Adjustment Nut ↶ (towards head of Attachment Fastener) by hand.

Refer to Figure 7.

7.4 Ground Strap →|← WHC Rack, 1/4-Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket, 3/8" Drive)

2.104 RACK TRANSFER FROM MPLM TO ISS (ER7, CQ2, MARES)

(ASSY OPS/19A/FIN/HC)

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- 7.5 Snug Adjustment Nut ↻ until firm against Springs.
- 7.6 Tighten Adjustment Nut an additional 1/2 to 3/4 turn ↻ (Adjustable Joint Pliers, Straight Jaw).
- 7.7 Photo document installed Ground Strap (Digital Camera).

8. ISPR BONDING STRAP INSTALLATION

WARNING

Improper installation of Ground Strap may result in electrical shock hazard.

- 8.1 Verify ISPR Bonding Strap installed on COL Standoff.

```
*****
* If ISPR Bonding Strap not installed on COL Standoff
* | √COL-CC for stowage location of ISPR Bonding Strap and required
* | tools
* |
* | Retrieve ISPR Bonding Strap (P/N 3000CA001-001).
* | Record S/N of ISPR Bonding Strap: _____
* | Inspect ISPR Bonding Strap contact surfaces for debris and clean
* | if required (Dry Wipes).
* |
* | ISPR Bonding Strap →|← COL Standoff ISPR Bonding Strap
* | interface, 1/4-Turn Fastener (one) (9/16" Combination Wrench)
*****
```

- 8.2 Inspect ISPR Bonding Strap contact surfaces for debris and clean if required (Dry Wipes).
- 8.3 Fully retract Adjustment Nut (towards head of Attachment Fastener) by hand.
Refer to Figure 7.
- 8.4 ISPR Bonding Strap →|← HRF-2 Rack, 1/4-Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket, 3/8" Drive).
Refer to Figures 6, 7.
- 8.5 Snug Adjustment Nut , until firm against Springs.
- 8.6 Tighten Adjustment Nut an additional 1/2 to 3/4 turn (Adjustable Joint Pliers, Straight Jaw).
- 8.7 Photo document installed ISPR Bonding Strap (Digital Camera).

2.104 RACK TRANSFER FROM MPLM TO ISS (ER7, CQ2, MARES)

(ASSY OPS/19A/FIN/HC)

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9. FINAL INSTALLATION

9.1 ✓ Rack rotation path is unobstructed

9.2 K-BAR Thumb Latches (two) → up position
Refer to Figure 4.

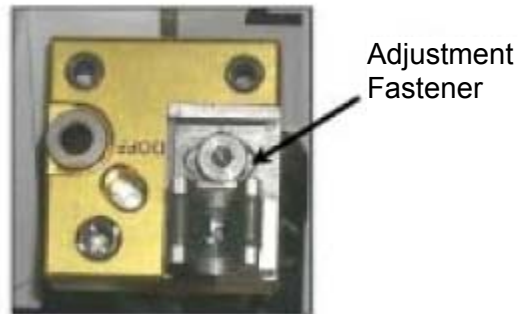


Figure 8.- K-BAR Capture Mechanism, Located on LAB Standoff.

9.3 Slowly rotate Rack up to a controlled stop.
Engage Rack K-BAR Thumb Latches (two) in Capture Mechanism located on Standoff.
Refer to Figure 8.

- * If K-BAR does not align with Capture Mechanism
- * | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- * | Slide capture clip left or right, as required, to engage K-BAR.
- * | Once K-BAR is engaged, re-tighten Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- * |
- * Refer to Figure 8.

10. CLOSEOUT, POST TRANSFER

10.1 Photo document newly installed hardware in ISS module (Digital Camera).

10.2 Notify **MCC-H** transfer activity for Rack is complete, S/Ns of K-BAR Assy(s).
Stow tools, materials, parts.

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2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

Page 1 of 10 pages

OBJECTIVE:

Transfer Minus Eighty Laboratory Freezer for ISS (MELFI-3) from the MPLM to ISS. This transfer activity disengages all launch restraints, transfers MELFI-3 Rack from the MPLM, and then structurally attaches it to the ISS Rack Bay location.

LOCATION:

MELFI-3 Installed: JPM1A1, Stowed: MPL1A1

DURATION:

1 hour

CREW:

Two

PARTS:

IHI K-Bar Assy, Left (one) P/N 683-62201-3

IHI K-Bar Assy, Right (one) P/N 683-62201-4

MATERIALS:

Dry Wipes

TOOLS:

Digital Camera

ARIS Tool Page P/N PERS3400M

Populate ARIS Tool Page with the following tools.

ISS IVA Toolbox:

Drawer 2:

Ratchet, 3/8" Drive

1/8" Hex Head, 3/8" Drive

9/16" Socket, 3/8" Drive

4" Ext, 3/8" Drive

5/32" Hex Head, 3/8" Drive

5/16" Hex Head, 3/8" Drive

9/64" Hex Head, 3/8" Drive

(40-200 in-lbs) Trq Wrench, 3/8" Drive

Drawer 3:

6" Long, 3/8" Hex Head, 3/8" Drive

Drawer 4:

Adjustable Joint Pliers, Straight Jaw

REFERENCED PROCEDURE(S):

None

NOTE

All directional references (up, down, left, right) are with respect to front face of Rack, as you face Rack, with feet oriented towards the pivot point.

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

Page 2 of 10 pages

1. INSTALLING PIVOT PIN FITTINGS

NOTE

1. MELFI Rack requires different Pivot Pin Fittings than those currently installed at JPM1A1.
2. Rack structure shown in Figure 1 is for reference only and is not currently installed at JPM1A1.

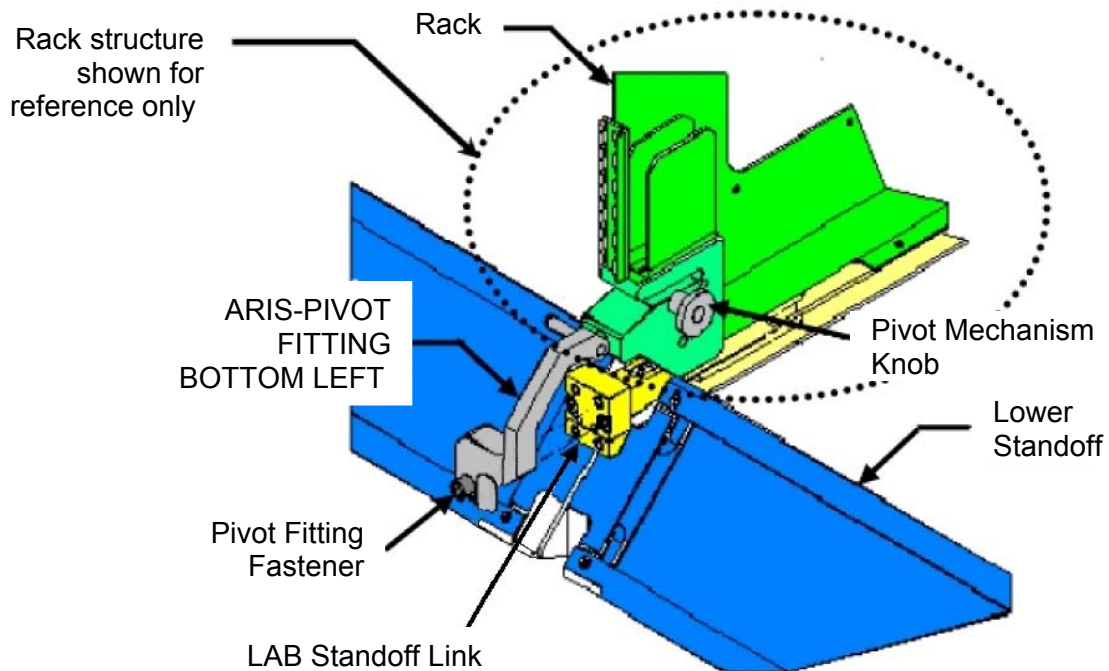


Figure 1.- ARIS - Pivot Fitting Installation Location.

JPM1A1

- 1.1 Remove ARIS - Pivot Fitting Bottom Left (P/N 683-61711-31) using Fastener from LAB Standoff Link (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
Temporarily stow.
- 1.2 Repeat removal for ARIS - Pivot Fitting Bottom Right (P/N 683-61711-32).
- 1.3 Record S/N of removed ARIS - Pivot Fitting Bottom Left:

Record S/N of removed ARIS - Pivot Fitting Bottom Right:

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

Page 3 of 10 pages

- 1.4 Install IHI/MHI Pivot Fitting Bottom Left (P/N 683-20100-1) using Fastener on LAB Standoff Link.
Tighten, torque fastener to 150 in-lbs [Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive; (40-200 in-lbs) Trq Wrench, 3/8" Drive].
- 1.5 Repeat installation for IHI/MHI Pivot Fitting Bottom Right (P/N 683-20100-2).

2. RACK SAFING

√All unnecessary equipment protruding into Rack translation path has been removed, stowed (MPLM, Node 2, JPM)

3. DISENGAGING LOWER LAUNCH RESTRAINTS

Refer to Figures 2 and 3.

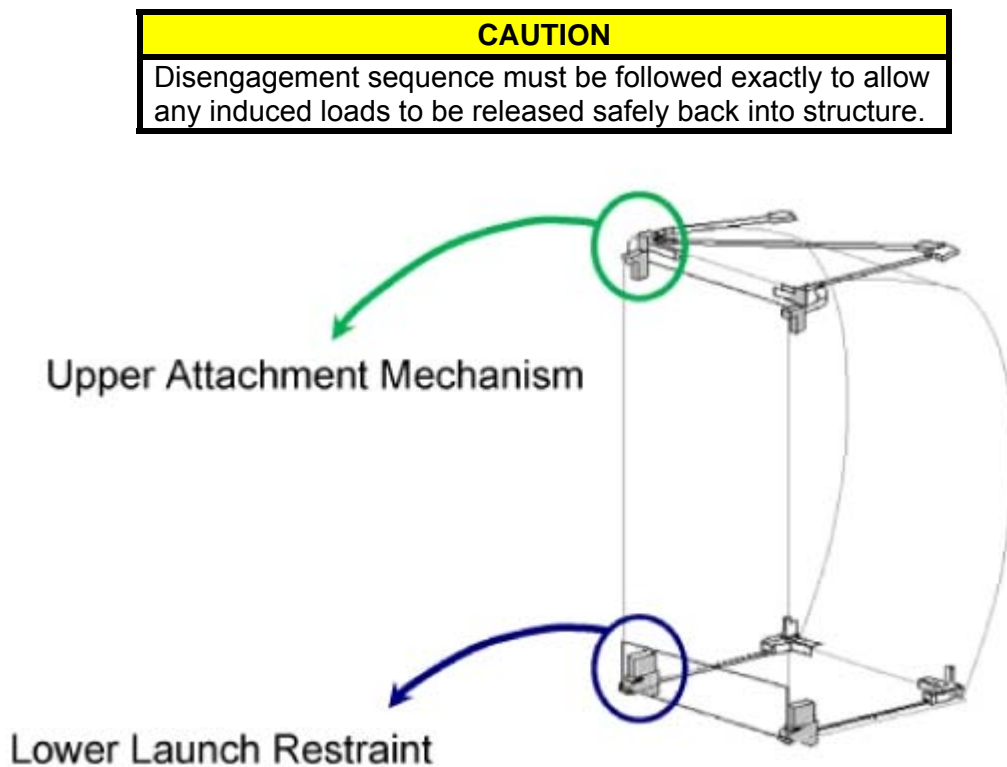


Figure 2.- Location of Rack Launch Restraint Hardware.

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

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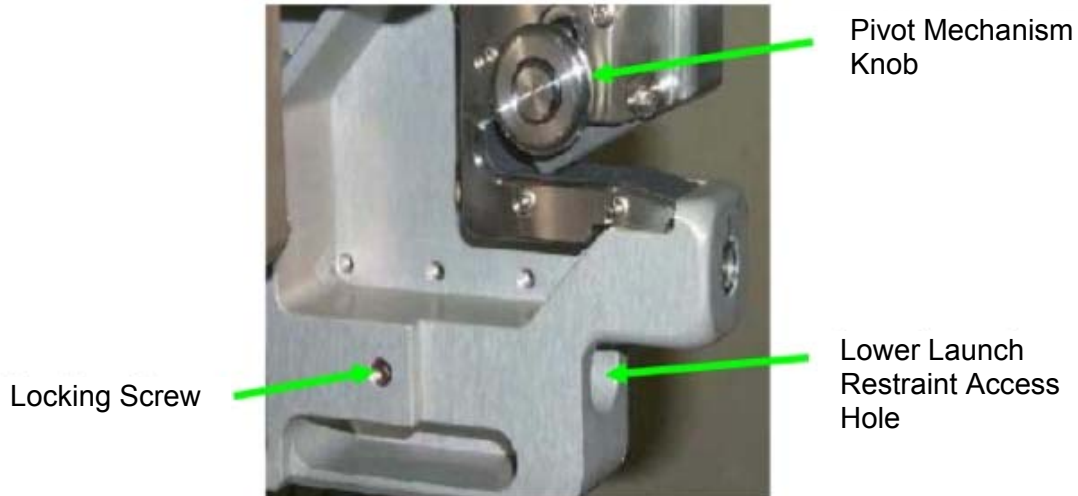


Figure 3.- MELFI-3 Lower Launch Restraint, Right Side.

NOTE

1. Locking Screw is fully disengaged when top of screw is flush with surrounding structure.
2. A loud “pop” may occur during release of first Lower Launch Restraint.

- 3.1 Disengage left Locking Screw until hard stop, approximately 4 to 5 turns (Ratchet, 3/8" Drive; 1/8" Hex Head, 3/8" Drive).
- 3.2 Disengage left Lower Launch Restraint 10 to 12 turns until hard stop (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
- 3.3 Tighten left Locking Screw (Ratchet, 3/8" Drive; 1/8" Hex Head, 3/8" Drive).
- 3.4 Loosen Pivot Mechanism Knob so Pivot Latch is free to move.
- 3.5 Repeat for right side of MELFI-3 Rack.

4. DISENGAGING UPPER ATTACH MECHANISMS

Refer to Figures 2 and 4.

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

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Figure 4.- MELFI-3 Upper Attach Mechanism, Left Side.

- 4.1 Disengage left Stopper Knob and slide away from Lever Knob
(Ratchet, 3/8" Drive; 4" Ext, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 4.2 Move Lever Knob down until knob is positioned at end of slot.
- 4.3 Repeat for right side of MELFI-3 Rack.

5. INSTALLING K-BAR

Refer to Figure 5.

- 5.1 Record S/N of IHI K-BAR Assy, Left: _____
Record S/N of IHI K-BAR Assy, Right: _____
- 5.2 ✓ Rack rotation path is unobstructed
- 5.3 Rotate Rack down only ~15 cm (~5 in).

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

Page 6 of 10 pages

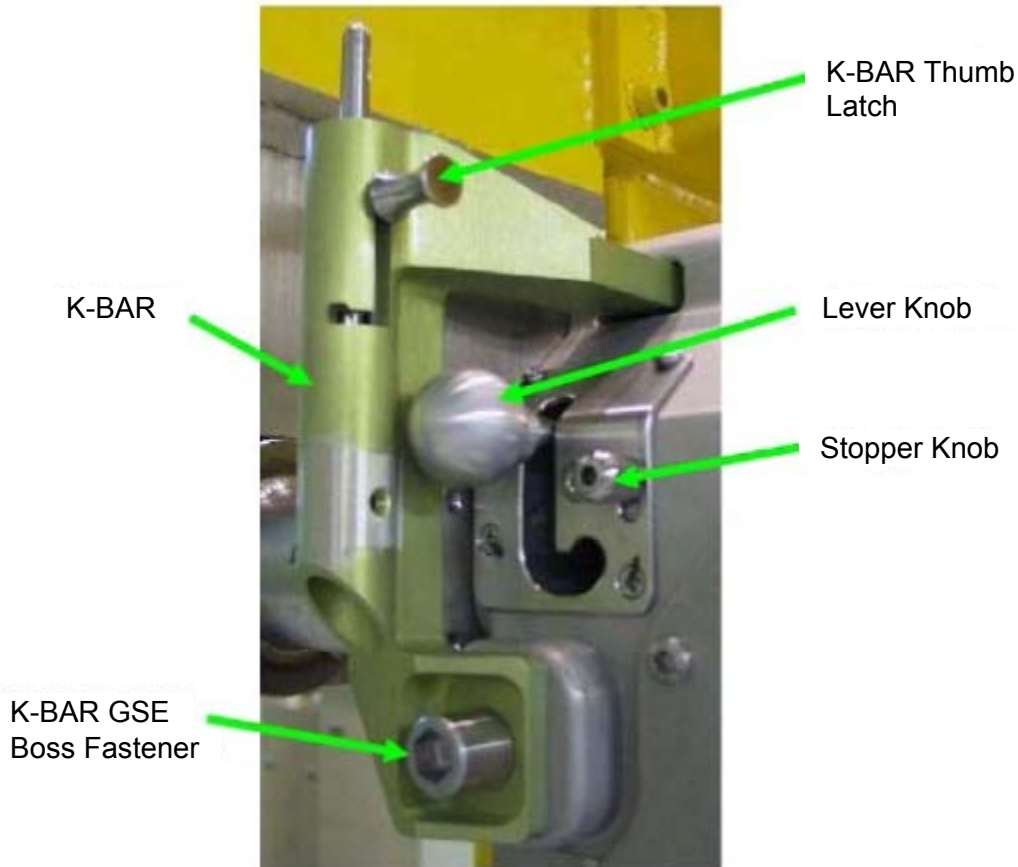


Figure 5.- MELFI-3 Rack Left K-BAR (Shown Installed).

CAUTION

Do not force Upper Attach Mechanism Pinions. Mechanism should easily engage K-BAR.

- 5.4 Install IHI K-BAR, Left (P/N 683-62201-3), in left Upper Attach Mechanism.
- 5.5 Slide Lever Knob to top position of slot to engage K-BAR.
- 5.6 Slide Stopper Knob under Lever Knob to lock Lever Knob in place. Tighten Stopper Knob (Ratchet, 3/8" Drive; 4" Ext, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
- 5.7 Tighten left K-BAR GSE Boss fastener (Ratchet, 3/8" Drive; 6" Long, 3/8" Hex Head, 3/8" Drive).
- 5.8 K-BAR Thumb Latch → down position
- 5.9 Repeat for IHI K-BAR Assy, Right (P/N 683-62201-4).

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

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6. PREPARING RACK TRANSLATION

- 6.1 Remove any Handrails from the front of the Rack.
Slowly rotate Rack down to a controlled stop.



Figure 6.- MPLM Knee Brace Retention Devices.

- 6.2 Install Knee Brace Struts (two) into MPLM "KNEE BRACES RETEN DEVICE" Locking Clips (two).
Snug Adjustment Fasteners (two) (Ratchet, 3/8" Drive; 7/16" Socket, 3/8" Drive).
Refer to Figure 6.

7. TRANSFERRING RACK TO ISS

Table 1. Rack Transfer Locations

Rack	Stowed	Installed
MELFI-3	MPL1A1	JPM1A1

- 7.1 Transfer MELFI-3 from MPLM to ISS.
Refer to Table 1 for ISS Rack Locations.
- 7.2 Align Rack onto Standoff until Rack Pivot Latches engage Standoff Pivot Fittings.
Keep Rack rotated down.
- 7.3 Tighten both Pivot Mechanism Knobs in latched, down position.

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

Page 8 of 10 pages

8. INSTALLING GROUND STRAP

Refer to Figures 7 and 8.

WARNING

Improper installation of Ground Strap may result in electrical shock hazard.

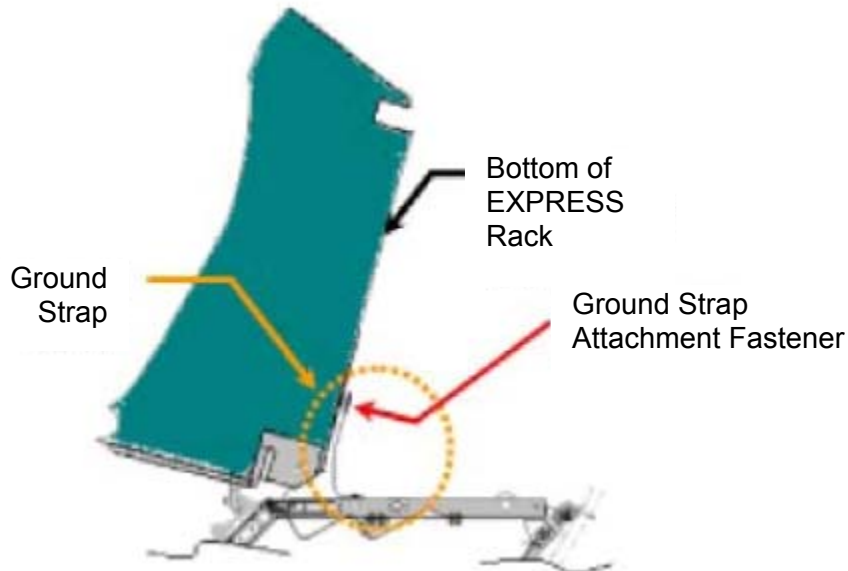


Figure 7.- Side View of Rotated Rack, Showing Rack Ground Strap Location.

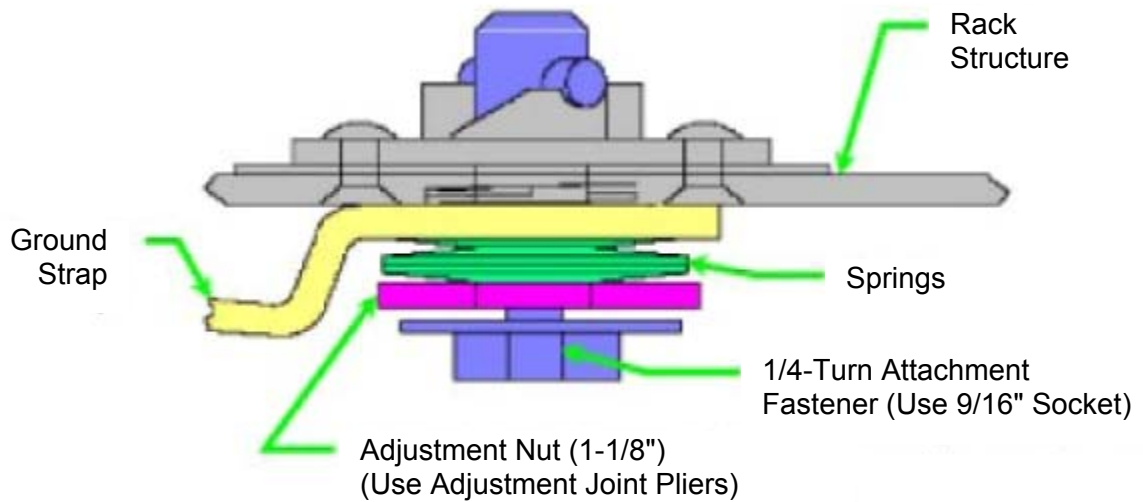


Figure 8.- Rack Ground Strap Cross-Section.

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

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- 8.1 Inspect Ground Strap contact surfaces for debris and clean if required (Dry Wipes).
- 8.2 Fully retract Adjustment Nut ↻ (towards head of Attachment Fastener) by hand.
- 8.3 Ground Strap →|← Rack, 1/4 Turn Attachment Fastener (Ratchet, 3/8" Drive; 9/16" Socket, 3/8" Drive).
- 8.4 Snug Adjustment Nut ↻ until firm against Springs.
- 8.5 Tighten Adjustment Nut an additional 1/2 to 3/4 turn ↻ (Adjustable Joint Pliers, Straight Jaw).
- 8.6 Photo document installed Ground Strap (Digital Camera).

9. FINAL INSTALLATION

- 9.1 ✓ Rack rotation path unobstructed
- 9.2 K-BAR Thumb Latches (two) → up position
Refer to Figure 5.

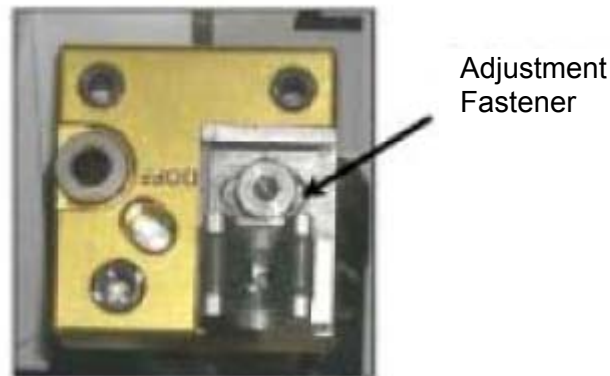


Figure 9.- K-BAR Capture Mechanism, Located on LAB Standoff.

- 9.3 Slowly rotate Rack up to a controlled stop.
Engage Rack K-BAR Thumb Latches (two) in Capture Mechanism located on Standoff.

* If K-BAR does not align with Capture Mechanism
* | Loosen Adjustment Fastener (Ratchet, 3/8" Drive; 5/32" Hex Head,
* | 3/8" Drive).
* | Slide capture clip left or right, as required, to engage K-BAR.
* | Once K-BAR is engaged, re-tighten Adjustment Fastener
* | (Ratchet, 3/8" Drive; 5/32" Hex Head, 3/8" Drive).
* | Refer to Figure 9.

2.106 RACK TRANSFER FROM MPLM TO ISS (MELFI-3)

(ASSY OPS/19A/FIN)

Page 10 of 10 pages

10. CLOSEOUT OR POST TRANSFER

- 10.1 If removed, attach MELFI UIP Closeout to Rack (Velcro).
- 10.2 Photo document newly installed hardware in ISS module (Digital Camera).
- 10.3 Notify **MCC-H** transfer activity for MELFI-3 is complete, S/Ns of K-BAR Assy(s).
Stow tools, materials, parts.

PAYLOADS

PAYLOADS

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HOOK
VELCRO

HOOK
VELCRO

AEM UNIT #1 CHECK

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

Observe conditions in first column and write code in appropriate Flight Day column.

Table 1. Codes for Daily Status Check

Water Lft/Rt	1-4					
Respiration:	(N)ormal (3/sec)	(R)apid	(S)hallow	(L)abored		(U)nable to determine
Skin: (ears, toes, tail)	(N)ormal: Dark	(D)ry/Scaly	(S)crapes/Cuts	(S)wollen/Red		(U)nable to determine
Coat/Fur:	(N)ormal: Smooth/shiny	(R)ough spiky, clump	(D)iscolored	(D)ull or (W)et	(H)air Loss	(U)nable to determine
Nose:	(N)ormal: Clear	(D)ischarge: Red/Brown	(B)leeding	(O)ther		(U)nable to determine
Eyes:	(N)ormal: Shiny/clear	(D)ischarge: Red/Brown	(S)wollen	(O)ther		(U)nable to determine
Appetite:	(N)ormal Intake Food/water	(A)bnormal intake				(U)nable to determine
Activity:	(N)ormal: Bright/Alert	(L)istless (decreased)	Un(R)esponsive	(D)ead		(U)nable to determine
Extremities:	(N)ormal	(D)eformity or fracture	(A)mputated limb or digits	(B)leeding		(U)nable to determine
Comments:						

Table 2. AEM Unit #1 Check Log

	FD1	FD2	FD3	FD4	FD5	FD6	FD7	FD8
MET								
Observer								
Water Lft/Rt								
Respiration								
Skin								
Coat/Fur								
Nose								
Eyes								
Appetite								
Activity								
Extremities								
Comments								

ASSY OPS-4a/19A/A

HOOK
VELCRO

HOOK
VELCRO

AEM UNIT #1 CHECK
(ASSY OPS/19A/FIN)

Page 2 of 2 pages

Table 1. Codes for Daily Status Check

Water Lft/Rt	1-4					
Respiration:	(N)ormal (3/sec)	(R)apid	(S)hallow	(L)abored		(U)nable to determine
Skin: (ears, toes, tail)	(N)ormal: Dark	(D)ry/Scaly	(S)crapes/Cuts	(S)wollen/Red		(U)nable to determine
Coat/Fur:	(N)ormal: Smooth/shiny	(R)ough spiky, clump	(D)iscolored	(D)ull or (W)et	(H)air Loss	(U)nable to determine
Nose:	(N)ormal: Clear	(D)ischarge: Red/Brown	(B)leeding	(O)ther		(U)nable to determine
Eyes:	(N)ormal: Shiny/clear	(D)ischarge: Red/Brown	(S)wollen	(O)ther		(U)nable to determine
Appetite:	(N)ormal Intake Food/water	(A)bnormal intake				(U)nable to determine
Activity:	(N)ormal: Bright/Alert	(L)istless (decreased)	Un(R)esponsive	(D)ead		(U)nable to determine
Extremities:	(N)ormal	(D)eformity or fracture	(A)mputated limb or digits	(B)leeding		(U)nable to determine
Comments:						

Continuation of Table 2. AEM Unit #1 Check Log

	FD9	FD10	FD11	FD12	FD13	FD14	FD15	FD16
MET								
Observer								
Water Lft/Rt								
Respiration								
Skin								
Coat/Fur								
Nose								
Eyes								
Appetite								
Activity								
Extremities								
Comments								

ASSY OPS-4b/19A/A

HOOK
VELCRO

HOOK
VELCRO

AEM UNIT #2 CHECK

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

Observe conditions in first column and write code in appropriate Flight Day column.

Table 1. Codes for Daily Status Check

Water Lft/Rt	1-4					
Respiration:	(N)ormal (3/sec)	(R)apid	(S)hallow	(L)abored		(U)nable to determine
Skin: (ears, toes, tail)	(N)ormal: Dark	(D)ry/Scaly	(S)crapes/Cuts	(Sw)ollen/Red		(U)nable to determine
Coat/Fur:	(N)ormal: Smooth/shiny	(R)ough spiky, clump	(D)iscolored	(Du)ll or (W)et	(H)air Loss	(U)nable to determine
Nose:	(N)ormal: Clear	(D)ischarge: Red/Brown	(B)leeding	(O)ther		(U)nable to determine
Eyes:	(N)ormal: Shiny/clear	(D)ischarge: Red/Brown	(S)wollen	(O)ther		(U)nable to determine
Appetite:	(N)ormal Intake Food/water	(A)bnormal intake				(U)nable to determine
Activity:	(N)ormal: Bright/Alert	(L)istless (decreased)	Un(R)esponsive	(D)ead		(U)nable to determine
Extremities:	(N)ormal	(D)eformity or fracture	(A)mputated limb or digits	(B)leeding		(U)nable to determine
Comments:						

Table 3. AEM Unit #2 Check Log

	FD1	FD2	FD3	FD4	FD5	FD6	FD7	FD8
MET								
Observer								
Water Lft/Rt								
Respiration								
Skin								
Coat/Fur								
Nose								
Eyes								
Appetite								
Activity								
Extremities								
Comments								

ASSY OPS-5a/19A/A

HOOK
VELCRO

HOOK
VELCRO

AEM UNIT#2 CHECK
(ASSY OPS/19A/FIN)

Page 2 of 2 pages

Table 1. Codes for Daily Status Check

Water Lft/Rt	1-4					
Respiration:	(N)ormal (3/sec)	(R)apid	(S)hallow	(L)abored		(U)nable to determine
Skin: (ears, toes, tail)	(N)ormal: Dark	(D)ry/Scaly	(S)crapes/Cuts	(S)wollen/Red		(U)nable to determine
Coat/Fur:	(N)ormal: Smooth/shiny	(R)ough spiky, clump	(D)iscolored	(D)ull or (W)et	(H)air Loss	(U)nable to determine
Nose:	(N)ormal: Clear	(D)ischarge: Red/Brown	(B)leeding	(O)ther		(U)nable to determine
Eyes:	(N)ormal: Shiny/clear	(D)ischarge: Red/Brown	(S)wollen	(O)ther		(U)nable to determine
Appetite:	(N)ormal Intake Food/water	(A)bnormal intake				(U)nable to determine
Activity:	(N)ormal: Bright/Alert	(L)istless (decreased)	Un(R)esponsive	(D)ead		(U)nable to determine
Extremities:	(N)ormal	(D)eformity or fracture	(A)mputated limb or digits	(B)leeding		(U)nable to determine
Comments:						

Continuation of Table 3. AEM Unit #2 Check Log

	FD9	FD10	FD11	FD12	FD13	FD14	FD15	FD16
MET								
Observer								
Water Lft/Rt								
Respiration								
Skin								
Coat/Fur								
Nose								
Eyes								
Appetite								
Activity								
Extremities								
Comments								

ASSY OPS-5b/19A/A

OBJECTIVE:

Check the status of the Animal Enclosure Module Unit #1 and Unit #2 and visually monitor mice well-being

TOOLS

Tissues

Gray Tape

- MF57H
1. Log Begin MET and Observer for appropriate Flight Day in Table 2. AEM Unit #1 Check Log.
 2. Remove muffler from locker door, temporarily stow. Unlatch, open locker door.
 3. ✓FANS A&D, FANS B&C lts (two) – on (green)
✓AEM fans operating (audible)
✓Fan airflow with Tissue, temporarily stow Tissue

*
*
* If lts off or fans not operating,
* | Perform [AEM FAN\(S\) FAILURE](#), all (SODF: ASSY OPS:
* | PAYLOADS), then:
*

 4. ✓AEM air inlet screens (two) free of debris, clean if required (gray tape).
 5. Using straps, pull AEM ~3/4 out of locker
 6. ✓cb LIGHTS B&C – close (lt on)
✓AEM interior lts (two) – illuminated

*
* If lts off
* | Perform [AEM LIGHT CYCLE INCORRECT \(OFF\) DURING](#)
* | [OPERATIONS](#), all (SODF: ASSY OPS: PAYLOADS), then:
*

 7. Log water level in Table 2. AEM Unit #1 Check Log.

*
* If water leaking in AEM
* | Perform [WATER LEAKING IN AEM](#), all (SODF: ASSY OPS:
* | PAYLOADS), then
*

 8. Log Rodent Observation in Table 2. AEM Check Log.

*
* If rodents appear distressed,
* |
* | ✓MCC-H, talk to NASA Chief Vet
*

9. Push AEM into locker
 - ✓LIGHTS sw – AUTO
 - ✓cb LIGHTS A&D – open (It off)
 - ✓FANS sw – ON
10. Close, latch locker door
Reattach Muffler to locker door.
- MF43K 11. Repeat steps 1-10, for AEM Unit #2, logging data in Table 3. AEM Unit #2
Check Log.
12. Discard used Tissue in Trash
Temporarily stow Tissues.
13. Notify **MCC-H** (AEM CHECK complete, any off-nominal rodent conditions).

AEM LIGHT TIMER CYCLE RESET

(ASSY OPS/19A/FIN)

Page 1 of 1 page

OBJECTIVE:

To correct light timer cycle in the event lights are on/off at the incorrect time.

MF57H,
MF43K

1. ✓**MCC-H** for correct Day/Night It cycle

	HH	:MM
ON/D	_____	_____
OF/N	_____	_____

NOTE

1. Pen can be used for Timer pushbuttons. If more than 2 min. pass after the most recent pb press, display reverts to current settings without saving changes.
2. On GMT display, first two characters reflect current timer It status and do not change when MENU pb pressed.

2. MENU pb – push until correct Day/Night indicator ('D' or 'N') appears on GMT display
3. HOURS pb – push to set correct hours

NOTE

Minutes can only be set in 15 min. increments.

4. MIN pb – push to set correct minutes
5. MENU pb – push
6. Repeat steps 3-5 to reset other It cycle.

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AEM

AEM ANY PWR INDICATOR OFF

(ASSY OPS/19A/FIN)

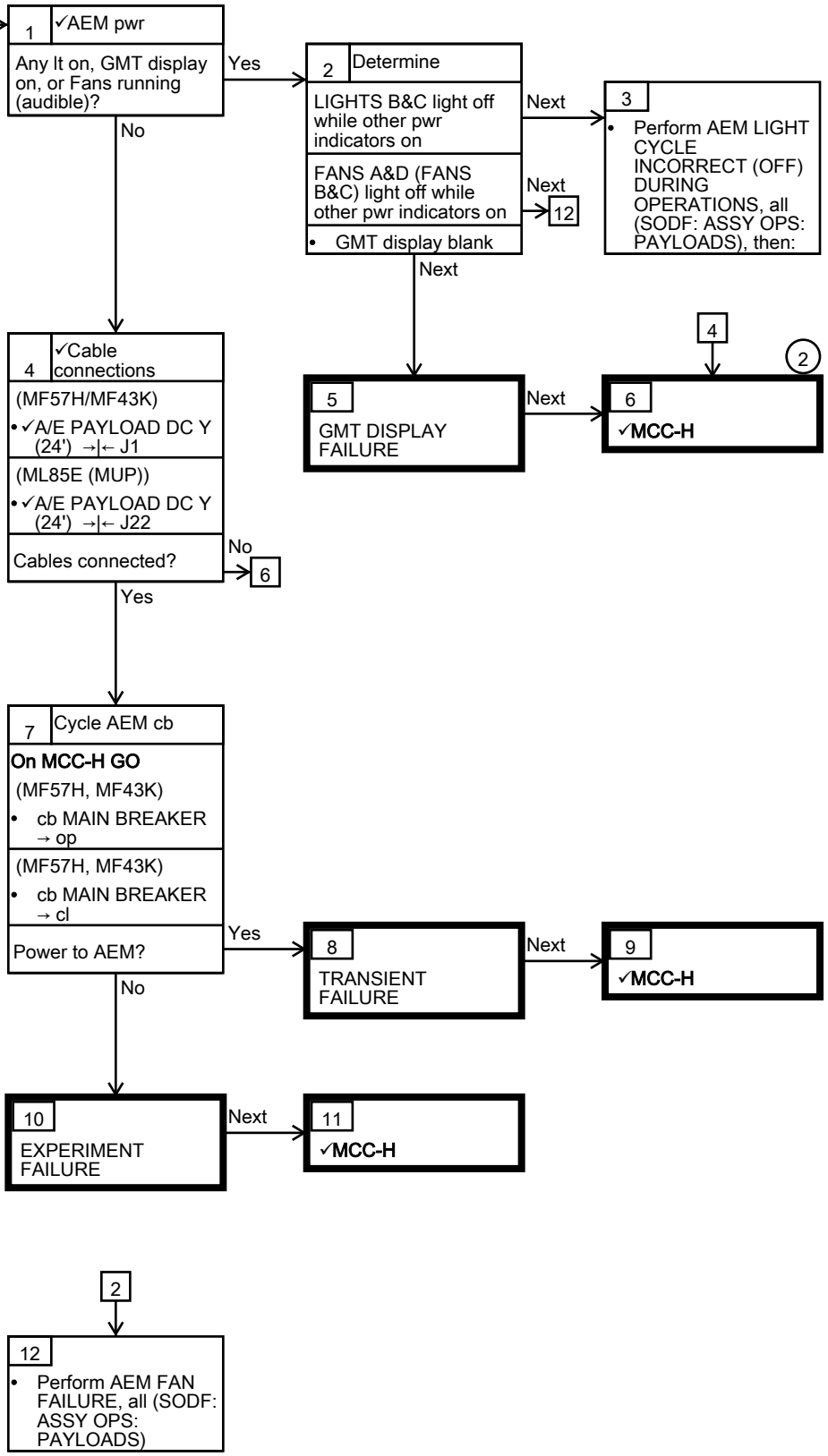
Page 1 of 1 page

① This malfunction procedure only supports troubleshooting one Animal Enclosure.

② Both AEMs are powered off the same MUP power port (J22) via the Y-cable. In order to reconfigure the Y-cable, power will need to be removed from both AEMs. **MCC-H** will direct crew if further action is required.

① Any pwr indicator - Off

- Nominal Config:**
 (MF57H, MF43K)
 cb PUMP BKR - op
 cb MAIN BREAKER - cl
 cb FANS A&D - cl (It on)
 cb FANS B&C - cl (It on)
 FANS - ON
 cb LIGHTS A&D - op (It off)
 cb LIGHTS B&C - cl (It on)
 LIGHTS - AUTO
 (ML86B)
 cb MNB MAR 2 - cl
 (ML85E(MUP))
 cb DC 10 AMP MNB CB4 - cl
 DC 10 AMP MNB S4 - ON



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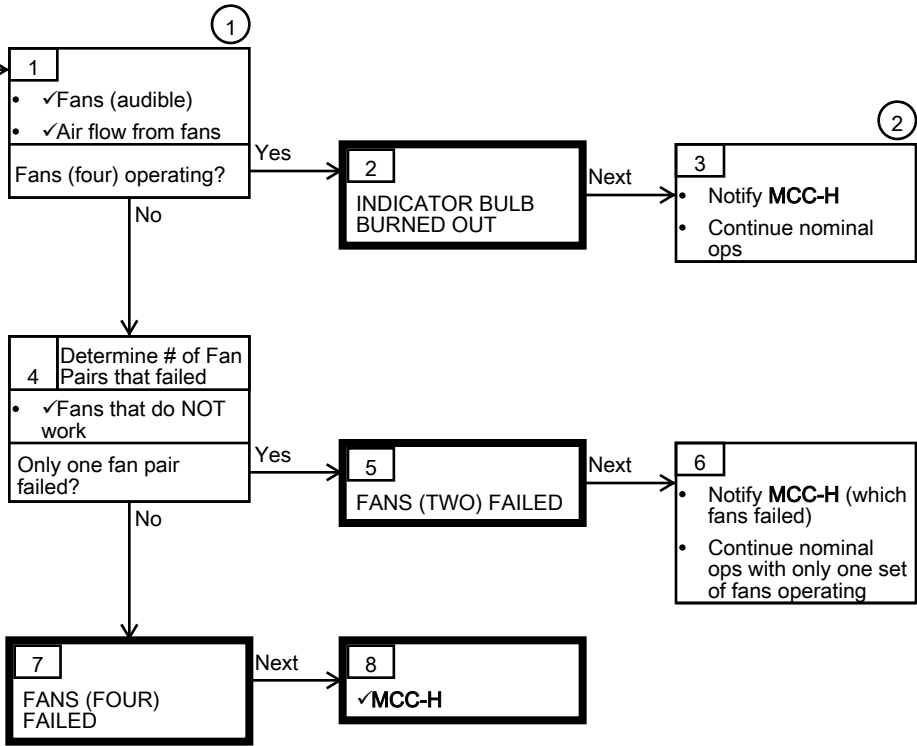
AEM

AEM FAN(S) FAILURE
(ASSY OPS/19A/FIN)

Page 1 of 1 page

Inaudible Fan(s)/Indicator Bulb(s) Off

Nominal Config:
(MF57H, MF43K)
cb PUMP BKR - op
cb MAIN BREAKER - cl
cb FANS A&D - cl (It on)
cb FANS B&C - cl (It on)
FANS - ON
cb LIGHTS A&D - op (It off)
cb LIGHTS B&C - cl (It on)
LIGHTS - AUTO
(ML86B)
cb MNB MAR 2 - cl
(ML85E (MUP))
cb DC 10 AMP MNB CB4 - cl
DC 10 AMP MNB S4 - ON



① Hold Tissue in front of fan outlet to determine existence of air flow.

② AEM can function with one set of fans operating.

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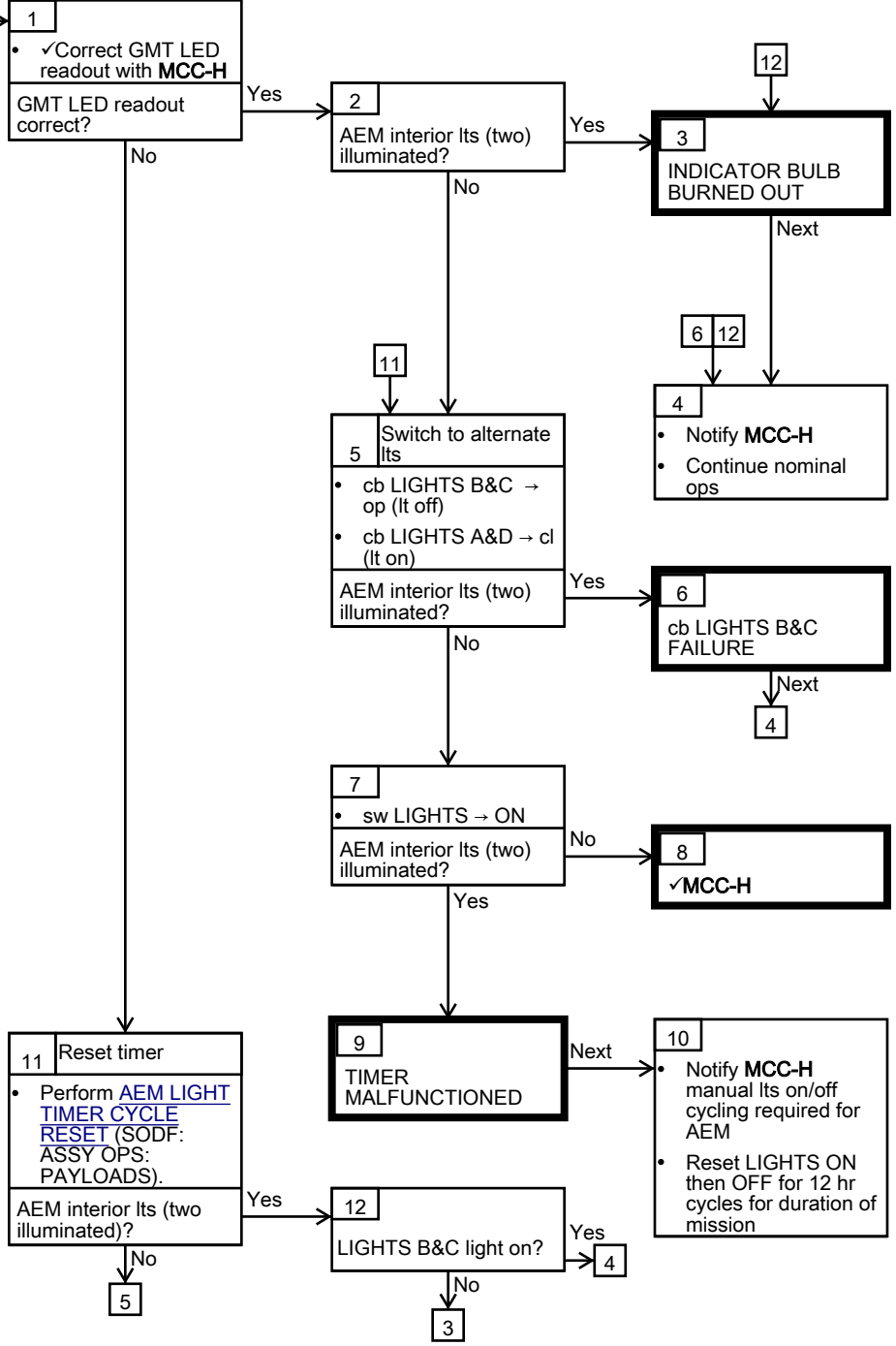
AEM

AEM LIGHT CYCLE INCORRECT (OFF) DURING OPERATIONS

(ASSY OPS/19A/FIN) Page 1 of 1 page

AEM light cycle incorrect (off) during operations

Nominal Config:
 (MF57H, MF43K)
 cb PUMP BKR – op
 cb MAIN BREAKER – cl
 cb FANS A&D – cl (lt on)
 cb FANS B&C – cl (lt on)
 FANS – ON
 cb LIGHTS A&D – op (lt off)
 cb LIGHTS B&C – cl (lt on)
 LIGHTS – AUTO
 (ML86B)
 cb MNB MAR 2 – cl
 (ML85E(MUP))
 cb DC 10 AMP MNB CB4 – cl
 DC 10 AMP MNB S4 – ON



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AEM

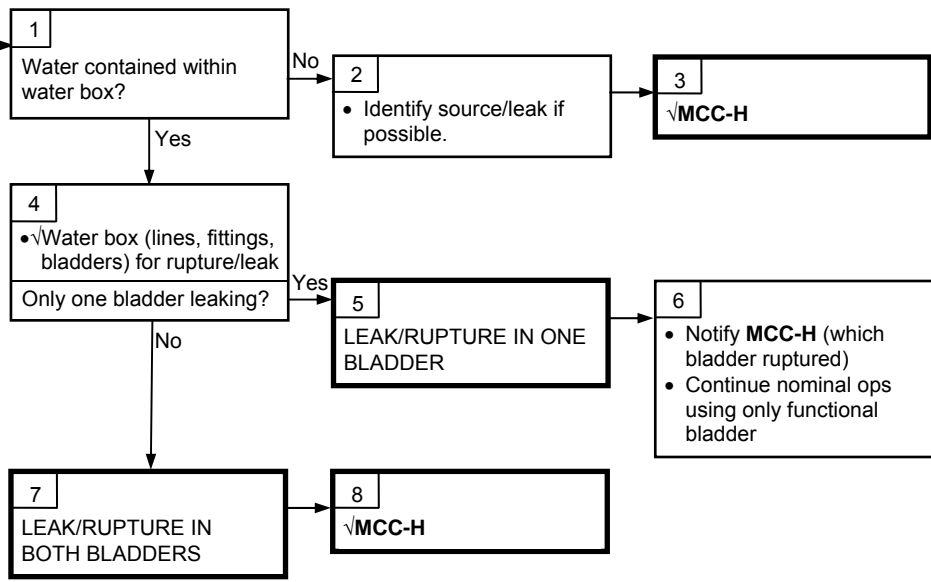
WATER LEAKING IN AEM

(ASSY OPS/19A/FIN)

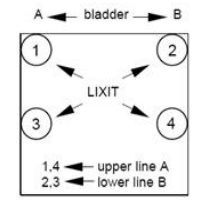
Page 1 of 1 page

①
Water Leaking in AEM

Nominal Config:
(MF57H, MF43K)
Bladder A,B – spring plates 1-4
cb PUMP BKR – op
cb MAIN BREAKER – cl
cb FANS A&D – cl (lt on)
cb FANS B&C – cl (lt on)
FANS sw – ON
cb LIGHTS A&D – op (lt off)
cb LIGHTS B&C – cl (lt on)
LIGHTS sw – AUTO



①
Water box is crossed plumbed. Lixits 1, 4 are fed from bladder A. Lixits 2, 3 are fed from bladder B. Both sides of cage have water as long as one bladder remains.



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OBJECTIVE:

To introduce additives to the BRIC-16 experiment Canisters.

TOOLS:

BRIC Actuator Tool

BRIC Actuator Rod Kit

1. BRIC HARDWARE SET UP

- 1.1 Log Start MET: ____/____:____
- MTBD 1.2 Open locker door.
- 1.3 Using pull-strap on BRIC Tray front panel, pull Tray partially out of locker.
- 1.4 Unstow BRIC Actuator Tool (shown in Figure 1) and BRIC Actuator Rod kit.

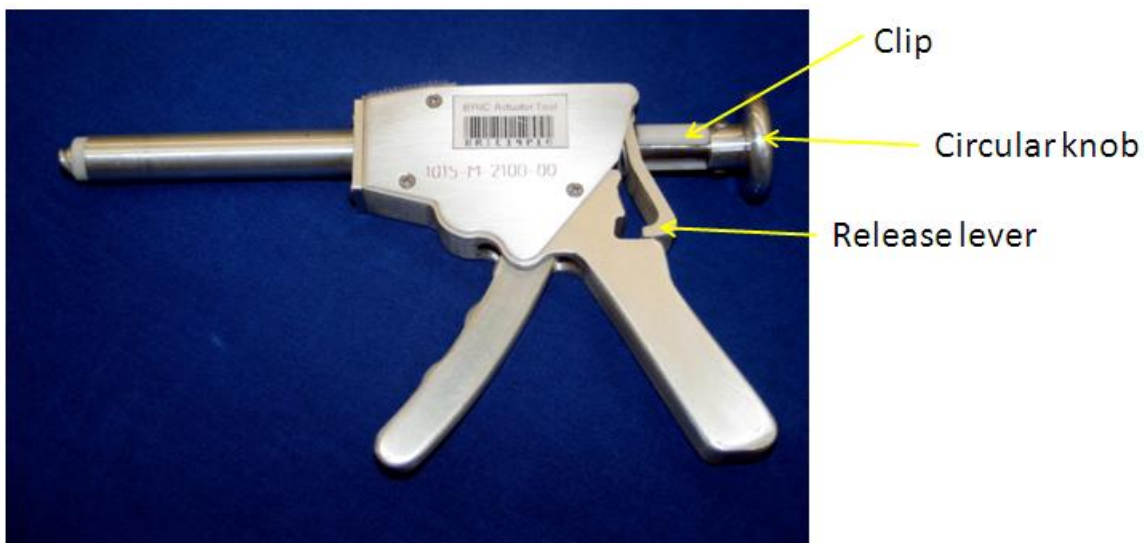


Figure 1. Actuator Tool.

2. BRIC Actuation With Clip

- 2.1 Remove BRIC Canister A(B-H) from foam per Table 1.
- 2.2 Press release lever of BRIC Actuator Tool.
- 2.3 Pull circular knob away from body of BRIC Actuator Tool.
- 2.4 ✓Tethered clip is secured below circular knob.
- 2.5 Retrieve Rod (one) from BRIC Actuator Rod Kit.
- 2.6 Insert flat end of Rod into hole at barrel end of BRIC Actuator Tool.
- 2.7 ✓Pointed end (not flat end) of Rod is facing outward.

- 2.8 Push Rod completely into BRIC Actuator Tool.
- 2.9 Gently insert BRIC Actuator Tool through guard on Canister/dish A(B-H) location per Table 1.
- 2.10 Attach BRIC Actuator Tool by threading tip cw into dish location.



Figure 2. Actuation

Table 1. Actuation with Clip

FD	Canister	Dish location	Verify (✓ as performed)
11	A	1 2 3 4 5 6	With Clip_____
11	B	1 2 3 4 5 6	With Clip_____
11	C	1 2 3 4 5 6	With Clip_____
11	D	1 2 3 4 5 6	With Clip_____
13	E	1 2 3 4 5 6	With Clip_____
13	F	1 2 3 4 5 6	With Clip_____
13	G	1 2 3 4 5 6	With Clip_____
13	H	1 2 3 4 5 6	With Clip_____

- 2.11 Squeeze trigger of BRIC Actuator Tool until tethered clip meets BRIC Actuator Tool body. Resistance may be felt.

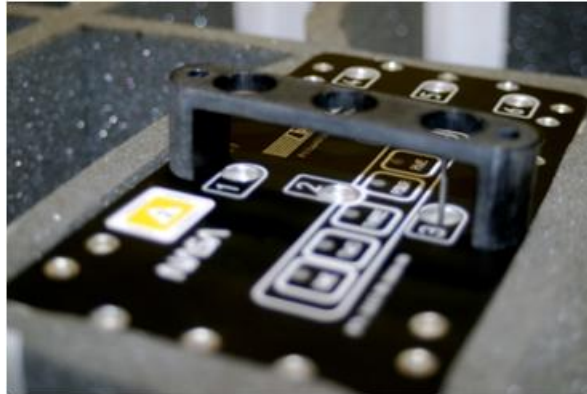


Figure 3. BRIC Top Cover

- 2.12 Remove BRIC Actuator Tool (ccw) from Rod. Rod will remain in canister.

Gently slide BRIC Actuator Tool off of Rod and out of guard.

- 2.13 Repeat steps 2.2 -2.11 for remaining Canister dish locations per Table 1 and restow each Canister in foam when complete. Retrieve next Canister per Table 1.

3. BRIC ACTUATION WITHOUT CLIP

- 3.1 Remove BRIC canister A(B-H) from foam per Table 2.

- 3.2 Remove tethered clip on BRIC Actuator Tool.

- 3.3 Attach clip to Velcro on BRIC Actuator Tool.

- 3.4 ✓clip remains tethered to BRIC Actuator Tool.

- 3.5 ✓Rod is located under the guard in dish location.

If no Rod is present,

Retrieve Rod (one) from BRIC Actuator Kit.

Insert flat end of Rod into hole at barrel end of BRIC Actuator Tool.

✓Pointed end (not flat end) of Rod is facing outward.

Push Rod completely into BRIC Actuator Tool.

- 3.6 Press release lever of BRIC Actuator Tool.

- 3.7 Pull circular knob away from body of BRIC Actuator Tool.

- 3.8 Gently guide BRIC Actuator Tool through guard and onto Rod of specified dish location and Canister per Table 2.

- 3.9 Attach BRIC Actuator Tool by threading tip cw into dish location.
- 3.10 Squeeze trigger of BRIC Actuator Tool until circular knob meets BRIC Actuator Tool Body. Resistance may be felt.
- 3.11 Remove BRIC Actuator Tool (ccw) from Rod.
- 3.12 Repeat steps 3.5-3.11 for remaining Canister dish locations per Table 2 and restow each Canister in foam when complete. Retrieve next Canister per Table 2.

Table 2. Actuation without Clip

FD	Canister	Dish Location	Verify (✓ as performed)
11	A	1 2 3 4 5 6	Without Clip_____
11	B	1 2 3 4 5 6	Without Clip_____
11	C	1 2 3 4 5 6	Without Clip_____
11	D	1 2 3 4 5 6	Without Clip_____
13	E	1 2 3 4 5 6	Without Clip_____
13	F	1 2 3 4 5 6	Without Clip_____
13	G	1 2 3 4 5 6	Without Clip_____
13	H	1 2 3 4 5 6	Without Clip_____

4. RESTOW BRIC HARDWARE

- 4.1 Stow BRIC Actuator Kit and BRIC Actuator Tool in Tray.
- 4.2 Push BRIC Tray back into locker.
- 4.3 Close, latch locker door.
- 4.4 Log Stop MET: ____/____:____
- 4.5 Notify **MCC-H** BRIC ACTUATION complete, MET from step 1.1 and 4.4, and any off-nominal conditions.

GLACIER PREPARATION FOR SAMPLE TRANSFER

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

OBJECTIVE:

The following steps will perform a status check on the Glacier System and prepare the hardware for sample transfer.

TOOLS

3/16" Hex Head, 3/8" Drive

4" Ext, 3/8" Drive

Ratchet, 3/8" Drive

MF28E/G (Glacier) 1. ✓cb POWER – Close (It on)

2. ✓sw BATTERY – ON (It on)

3. ✓Display – 'HOME'

```
*****
*
* If Display - '**Error Pending**'
*
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
*
* If 'HOME' not shown:
*
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
```

4. ✓Display – 'CURR TEMP:' is +4.0°C ± 2.0°C.

5. Log from Glacier front panel 'GPS', 'CURR TEMP' in Table 1 Glacier Log.

Table 1. Glacier Log

GPS	CURR TEMP	GPS	CURR TEMP
____:____:____	____.____°C	____:____:____	____.____°C
____:____:____	____.____°C	____:____:____	____.____°C
____:____:____	____.____°C	____:____:____	____.____°C
____:____:____	____.____°C	____:____:____	____.____°C
____:____:____	____.____°C	____:____:____	____.____°C

6. If first time opening Glacier door since launch,

Unlock Glacier Door Captive Locks (two) using 3/16" Hex Head, 3/8" Drive; 4" Ext, 3/8" Drive; Ratchet, 3/8" Drive. See Figure 1 Glacier Configuration.

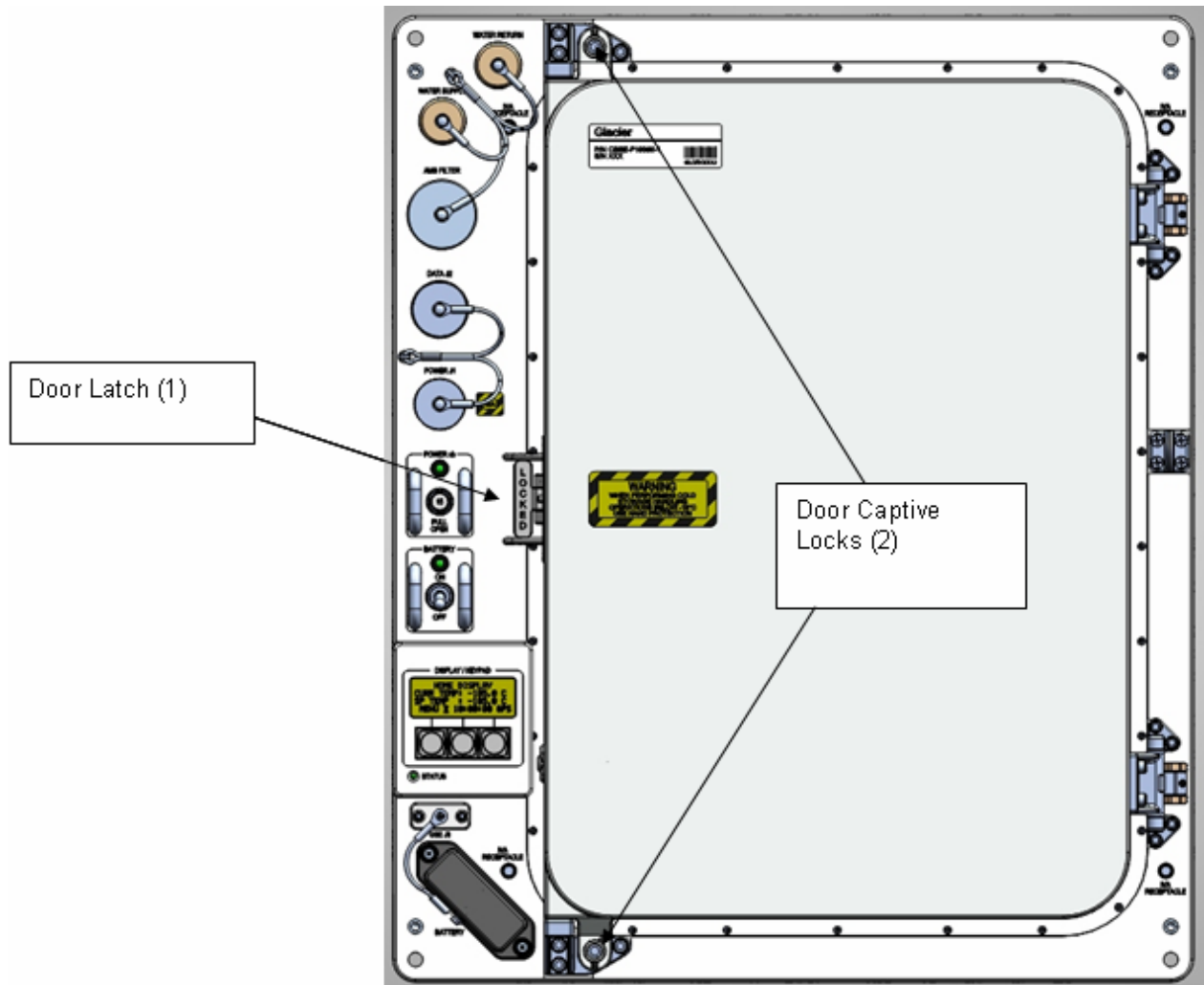


Figure 1. Glacier Configuration

7. Notify MCC-H of data recorded in Table 1 Glacier Log and any off-nominal conditions.

19A GLACIER TRANSFER AND INSTALLATION

(ASSY OPS/19A/FIN)

Page 1 of 3 pages

OBJECTIVE:

This procedure transfers the unpowered Glacier unit from the MPLM to ISS. The Cryocooler Launch Locks are unlocked and Glacier is installed in EXPRESS-2 Rack and left unpowered.

PARTS:

Glacier IVA Handle

TOOLS:

High Torque Locker Tool

ISS IVA Toolbox:

3/16" Hex Head, 1/4" Drive

Driver Handle, 1/4" Drive

1/4" Socket, 3/8" Drive

Ratchet, 3/8" Drive

(40-200 in-lbs) Trq Wrench, 3/8" Drive

- MPLM (Glacier)
1. Verify front door locking flap is positioned between finger latches.
 2. Connect Glacier IVA Handle diagonally to front face of Glacier at locations marked IVA Receptacle (two or four). Refer to Figures 1 and 2.

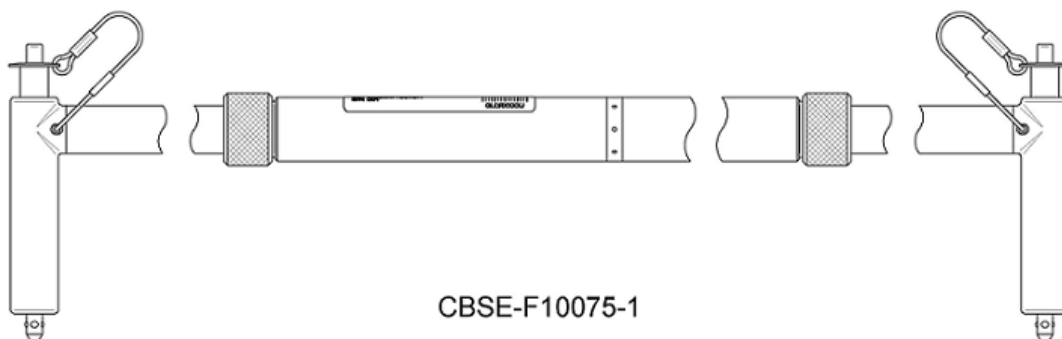


Figure 1. Glacier IVA Handle.

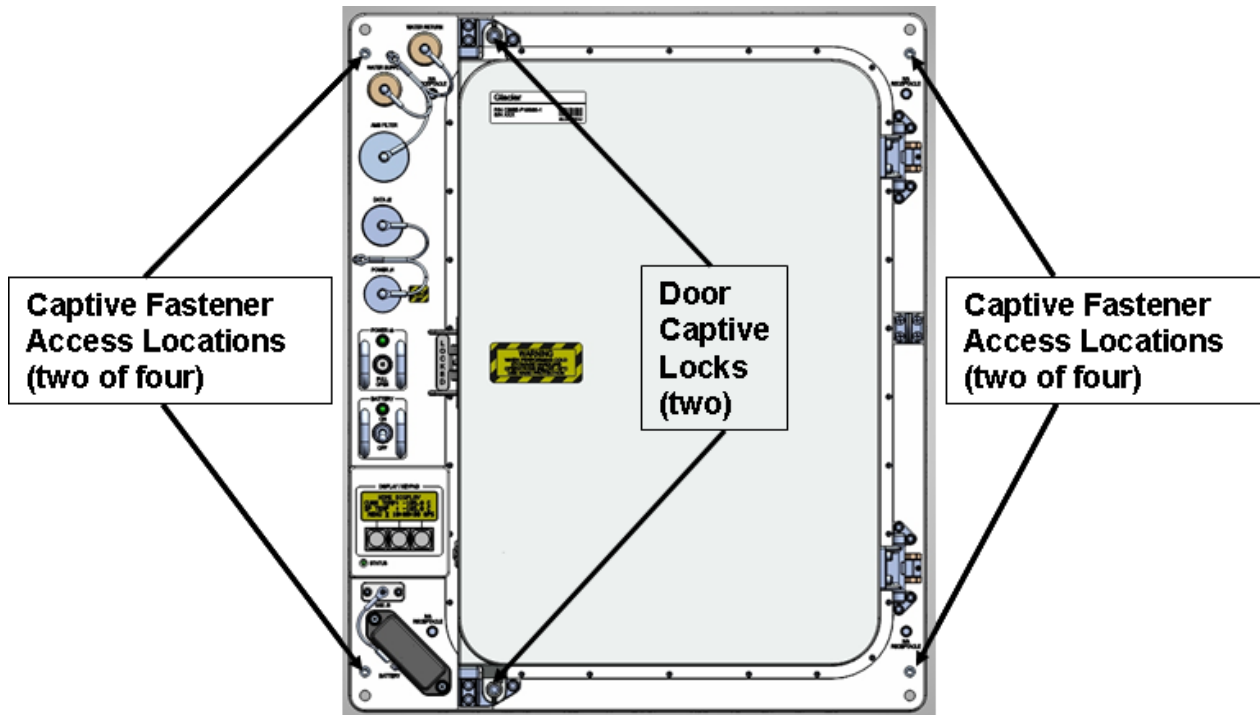


Figure 2. Glacier Configuration.

- LAB101_G 3. Transfer Glacier from MPLM to EXPRESS Rack 2.
1
4. Push in and rotate counterclockwise cryocooler launch locks (four) at rear of Ascent Glacier until locking pin is disengaged (OPEN) (3/16" Hex Head, 1/4" Drive; Driver Handle, 1/4" Drive). Refer to Figure 3.

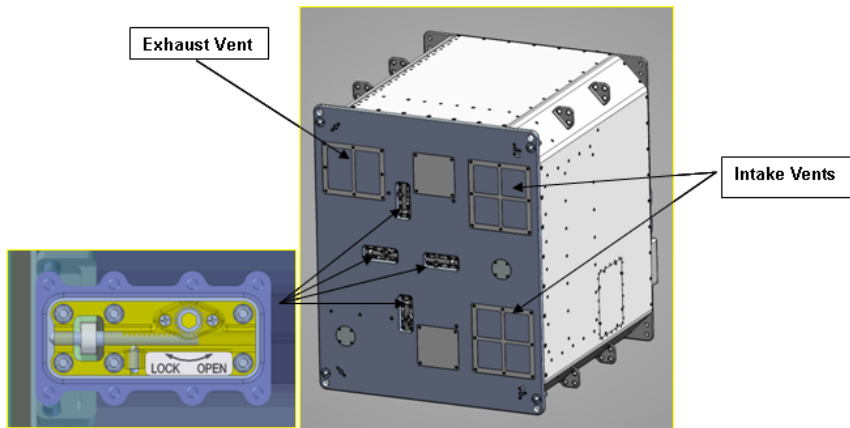


Figure 3. Cryocooler Launch Locks and Vents on Rear of Glacier.

5. Carefully slide the Glacier unit into the locker position.

19A GLACIER TRANSFER AND INSTALLATION

(ASSY OPS/19A/FIN)

Page 3 of 3 pages

LAB1O1_G 6. Fasten Glacier fasteners (four) in a diagonal pattern into EXPRESS-2 Rack,
1 torque to 75 in-lbs [High Torque Locker Tool; 1/4" Socket, 3/8" Drive; (40-
200 in-lbs) Trq Wrench, 3/8" Drive].

7. Disconnect Glacier IVA Handle from Glacier front face and stow per
Stowage note.

8. Stow:
All IVA Tools

9. GROUND UPDATES FOR IMS

Ground updates IMS for the following parts:
Glacier TO: LAB1O1_G1 (step 3)

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19A ASCENT SAMPLE TRANSFER FROM GLACIER TO MELFI

(ASSY OPS/19A/FIN)

Page 1 of 6 pages

OBJECTIVE:

This procedure will be used to unlock the Glacier door and transfer +4°C science samples from the STS Glacier to ISS MELFI, using a Double Coldbag. The crew will change the Glacier temperature setpoint from +4°C to -95°C. This activity is performed by ISS and shuttle crewmembers.

IFM TOOL LOCKER:

3/16" Hex Head, 3/8" Drive

1/4" - 3/8" Adapter

4" Ext, 3/8" Drive

Trq wrench, 1/4" Drive (40-200 in-lbs)

PARTS:

Double Coldbag S/N TBD

White Gloves

Small Coldplate/Wireway Cover P/N SEG33111361-301

ITEMS TO UNSTOW WITHIN PROCEDURE:

Ice Brick +4° C (two) (unstow step 2)

JAXA Myolab (four cassettes) (unstow step 4)

3x5 Mesh Bags (qty) (unstow step 4)

MF28E/G
(Glacier)

1. UNLOCK GLACIER DOOR

- 1.1 Unlock Glacier Door Captive Locks (two) using 3/16" Hex Head, 3/8" Drive; 1/4"-3/8" Adapter; 4" Ext, 3/8" Drive; (40 to 200 in-lbs) Trq wrench, 1/4" Drive. See Figure 1 Glacier Configuration.

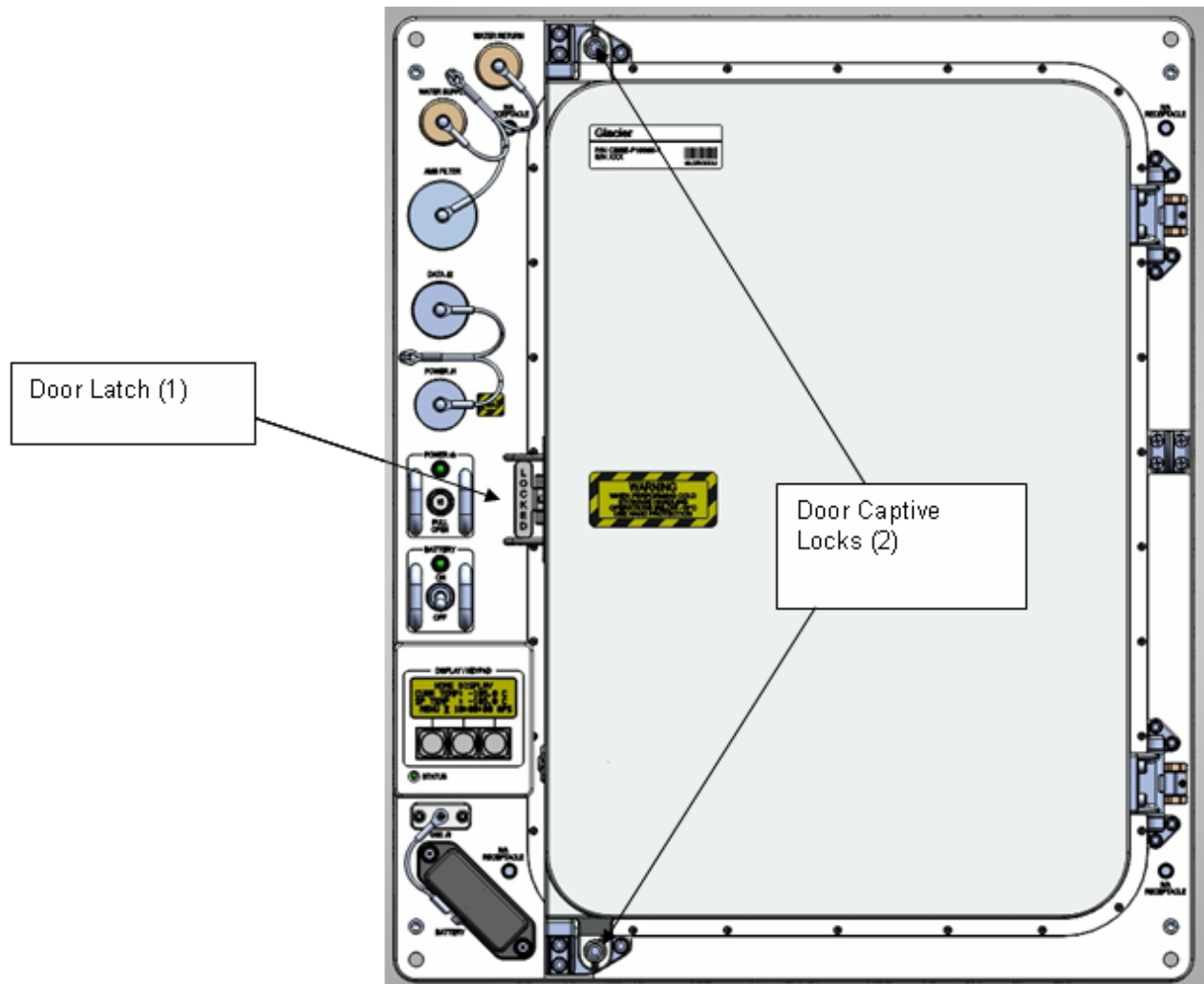


Figure 1. Glacier Configuration

1.2 Stow Tools.

MELFI 2. REMOVE ICE BRICK FROM MELFI

2.1 Retrieve Double Coldbag (S/N TBD) and temp stow near MELFI.

WARNING

Protective Gloves must be worn when manipulating MELFI trays or samples to prevent injury to exposed skin.

2.2 Don Gloves.

CAUTION

Minimize exposure of MELFI trays, frozen Icepacs, and samples to ambient air to prevent increased sample temperatures.

```

*****
*
* If MELFI Tray is stuck
*
* |
* | Insert Small Coldplate/Wireway Cover completely between
* | Tray and Dewar wall.
* |
* |
* | Firmly holding both Coldplate/Wireway Cover and Tray
* | Handle, remove Tray from Dewar.
*
*****

```

2.3 Remove Ice Bricks (two) +4 °C from Dewar TBD, Tray TBD, Section TBD.

2.4 Lay Ice Bricks (two) in the bottom of the Double Coldbag.

3. TRANSFERRING DOUBLE COLDBAG FROM ISS TO SHUTTLE

ISS to Shuttle

3.1 Transfer Double Coldbag to shuttle middeck.

Middeck

4. PACKING GLACIER SAMPLES INTO DOUBLE COLDBAG

WARNING
Protective gloves must be worn when handling frozen samples or manipulating inner doors, cold trays or samples in Glacier to prevent injury to exposed skin.

CAUTION
1. Minimize exposure of Glacier trays and samples to ambient air to prevent increased sample temperatures.
2. Glacier inner doors should remain closed when the internal volume is not being accessed.
3. Double Coldbag lid should remain closed when the internal volume is not being accessed.

MF28E/G (Glacier)

4.1 Open Glacier door.

4.2 Quickly remove JAXA Myolab cassettes (two) from Glacier Tray C and JAXA Myolab cassettes (two) from Glacier Tray D. Place JAXA Myolab cassettes (four) in the Double Coldbag.

4.3 Remove Ziplock bags (two) containing Mesh Bags from Tray D and temporarily stow.

5. TRANSFERRING DOUBLE COLDBAG FROM SHUTTLE TO ISS

LAB1S2 MELFI FU-2

5.1 Transfer Double Coldbag to MELFI FU-2.

6. UNPACK DOUBLE COLDBAG AND INSERTING SAMPLES INTO MELFI FU-2

<u>NOTE</u>
The 60 seconds and 45 minute MELFI Dewar opening rules do not apply during unpacking of the Coldbag.

WARNING
Protective gloves must be worn when handling frozen samples or manipulating inner doors, cold trays or samples in Glacier to prevent injury to exposed skin.

6.1 Don Gloves.

```

*****
*
* If MELFI Tray is stuck
*
* |
* | Insert Small Coldplate/Wireway Cover completely between
* | Tray and Dewar wall.
* |
* | Firmly holding both Coldplate/Wireway Cover and Tray
* | Handle, remove Tray from Dewar.
*
*****

```

6.2 Insert JAXA Myolab cassettes (two) in Dewar 4, Tray C, Section 3,4.

6.3 Insert JAXA Myolab cassettes (two) in Dewar 4, Tray D, Section 3,4.

7. DRYING OUT DOUBLE COLDBAG AND ICE BRICK

7.1 Remove Ice Brick +4° C (two) from Double Coldbag and place in temporary stowage location to air dry. Temporarily stow Double Coldbag in a location protected from kick loads.

MF28E/G
(Glacier)

8. CHANGING GLACIER SETPOINT TEMPERATURE

8.1 ✓Display – 'HOME'

```

*****
*
* If display - ***Error Pending***
*
* |
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS), then:
* |
* | If 'HOME' not shown:
* | |
* | | pb Right (EXIT) → Press until 'HOME' appears
* |
*
*****
  
```

8.2 Record front panel display:

'CURR TEMP': _____
 'SET POINT': _____
 'GPS': ____:____:____

8.3 pb Left (MENU) → Press (one time), following appears:
 'MAIN MENU'
 'QUICK STATUS 1/5'

8.4 pb Left (NEXT) → Press (three times), following appears:
 'MAIN MENU'
 'SETUP 4/5'

8.5 pb Center (SELECT) → Press (one time), following appears:
 'Setup'
 'Temp Control 1/3'

8.6 pb Center (SELECT) → Press (one time), following appears:
 'Temp Control'
 'Set Point Temp 1/18'

8.7 pb Center (SELECT) → Press (one time), following appears:
 'Set Point Temp'
 'XXXX °C'
 '-160.0 to +004.0'

NOTE

1. The left pushbutton (CURSOR) moves cursor between New Set Point Temp fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases New Set Point Temp selected digit field value by 1.

8.8 Enter new Set Point Temperature -095.0

8.9 pb Right (DONE) → Press (one time)

8.10 ✓Confirm New Set Point = -95.0

8.11 pb Left (APPLY) → Press (one time), following appears:
 'Temp Control'

'Set Point Temp 1/18'

- 8.12 ✓Set Point Temp = -95.0°C
- 8.13 pb Left (NEXT) → Press (two times), following appears:
'Temp Control'
'Control Sensors 3/18'
- 8.14 pb Center (SELECT) → Press (one time), following appears:
'Control Sensors'
'INNER OUTLET INLET'

NOTE

1. '0' indicates the Control Sensor is not selected and '1' indicates the Control sensor is selected.
2. The left pushbutton (CURSOR) moves cursor between Control Sensor fields. The default cursor position will be blinking.
3. The center pushbutton (PLUS) changes the value of the Control Sensor field from 0 to 1 and vice versa

- 8.15 Select the OUTLET and INLET sensors.
- 8.16 pb Right (DONE) → Press (one time)
- 8.17 ✓New Control Sensors = OUTLET and INLET
- 8.18 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Control Sensors 3/18'
- 8.19 ✓Control Sensors = OUTLET and INLET
- 8.20 pb Right (EXIT) → Press until **'HOME'** appears
- 8.21 Notify **MCC-H** that transfer activity completed, dry out location for Ice Brick and location of Double Coldbag.

9. GROUND UPDATES FOR IMS

Ground updates IMS for the following parts:
Double Cold Bag S/N TBD TO: per crew call down (step 8.21)
Ice Brick +4° C (two) TO: per crew call down (step 8.21)
Myolab (four cassettes) TO: MELFI (steps 6.2, 6.3)
3x5 Mesh Bags (TBD) TO: ISS (steps 4.3)

19A DESCENT SAMPLE TRANSFER FROM MELFI TO GLACIER

(ASSY OPS/19A/FIN)

Page 1 of 4 pages

OBJECTIVE:

This procedure will be used to swap frozen science samples between ISS MELFI and Shuttle Glacier. One Double Coldbag will be used to transfer samples from MELFI to Glacier. This activity is performed by ISS and shuttle crewmembers. The Glacier door will be locked after sample transfer is complete.

IFM TOOL LOCKER:

3/16" Hex Head, 1/4" Drive

1/4" - 3/8" Adapter

4" Ext, 3/8" Drive

Trq wrench, 1/4" Drive (40-200 in-lbs)

PARTS:

Double Coldbag S/N XXXX

Light Duty Cryo Gloves (Mechanix Wear)

Small Coldplate/Wiretray Cover P/N SEG33111361-301

ITEMS TO UNSTOW WITHIN PROCEDURE:

Ice Brick -32° C (two) (unstow step 1)

TROPI (eight EMCS Bags with eighty seed cassettes) (unstow step 1)

HRP blood (one mesh bag) (unstow step 1)

HRP blood (four vial bags) (unstow step 1)

JAXA Space Seed Six KFTs with four plant chambers(unstow step 1)

MELFI 1. PACKING MELFI SAMPLES INTO DOUBLE COLDBAG

WARNING

Protective Gloves must be worn when manipulating MELFI trays or samples to prevent injury to exposed skin.

CAUTION

1. Minimize exposure of MELFI trays, frozen Ice Bricks, and samples to ambient air to prevent increased sample temperatures.
2. Double Coldbag lid should remain closed when the internal volume is not being accessed.

NOTE

The 60 seconds and 45 minutes MELFI Dewar opening rules do not apply during packing of the Coldbag.

- 1.1 Don Light Duty Cryo Gloves (Mechanix Wear).
- 1.2 Pack Double Coldbag per Table 1.

19A DESCENT SAMPLE TRANSFER FROM MELFI TO GLACIER

(ASSY OPS/19A/FIN)

Page 2 of 4 pages

```
*****
*
* If MELFI Tray is stuck
*
* |
* | Insert Small Coldplate/Wireway Cover completely between
* | Tray and Dewar wall.
* |
* |
* | Firmly holding both Coldplate/Wireway Cover and Tray
* | Handle, remove Tray from Dewar.
*
*****
```

{TBD Table 1 provided by Cold Stowage team, gives MELFI dewar locations of samples to retrieve}.

2. TRANSFERRING DOUBLE COLDBAGS FROM ISS TO SHUTTLE

ISS to Shuttle

2.1 Transfer Double Coldbag to shuttle middeck.

MF28E/G (Glacier)

3. UNPACKING DOUBLE COLDBAG AND INSERTING SAMPLES INTO GLACIER

WARNING

Protective gloves must be worn when handling frozen samples or manipulating inner doors, cold trays or samples in Glacier to prevent injury to exposed skin.

CAUTION

1. Minimize exposure of Glacier trays and samples to ambient air to prevent increased sample temperatures.
2. Glacier inner doors should remain closed when the internal volume is not being accessed.

3.1 Don Light Duty Cryo Gloves (Mechanix Wear from ISS).

3.2 Open Glacier.

3.3 Insert into Tray A: TROPI (eight EMCS Bags with eighty seed cassettes). Secure samples using Velcro straps

3.4 Insert into Tray B: Mesh Bag containing HRP blood. Secure samples using Velcro straps.

3.5 Insert into Tray C: Vial Bags containing HRP blood.

3.6 Insert into Tray D: JAXA Space Seed (six KFTs with Plant Chambers). Secure samples using Velcro straps.

4. LOCK GLACIER DOOR

4.1 ✓Glacier door – Closed

19A DESCENT SAMPLE TRANSFER FROM MELFI TO GLACIER

(ASSY OPS/19A/FIN)

*
* If Glacier outer door does not close,
* |
* | Press on top left corner and bottom left corner of door to
* | assist with closure.
* |
*

- 4.2 ✓ Glacier door latch – Locked (finger latches fully spread apart and locking flap positioned between finger latches)

WARNING

Glacier Door Captive Locks (two) must be torqued to 75 in-lbs to prevent door from opening during return.

- 4.3 Fasten Glacier Door Captive Locks (two), torque to 75 in-lbs using (3/16" Hex Head, 1/4" Drive, 1/4" - 3/8" Adapter; 4" Ext, 3/8" Drive; (40 to 200 in-lbs) Trq Wrench 1/4" Drive) (reference Figure 1).

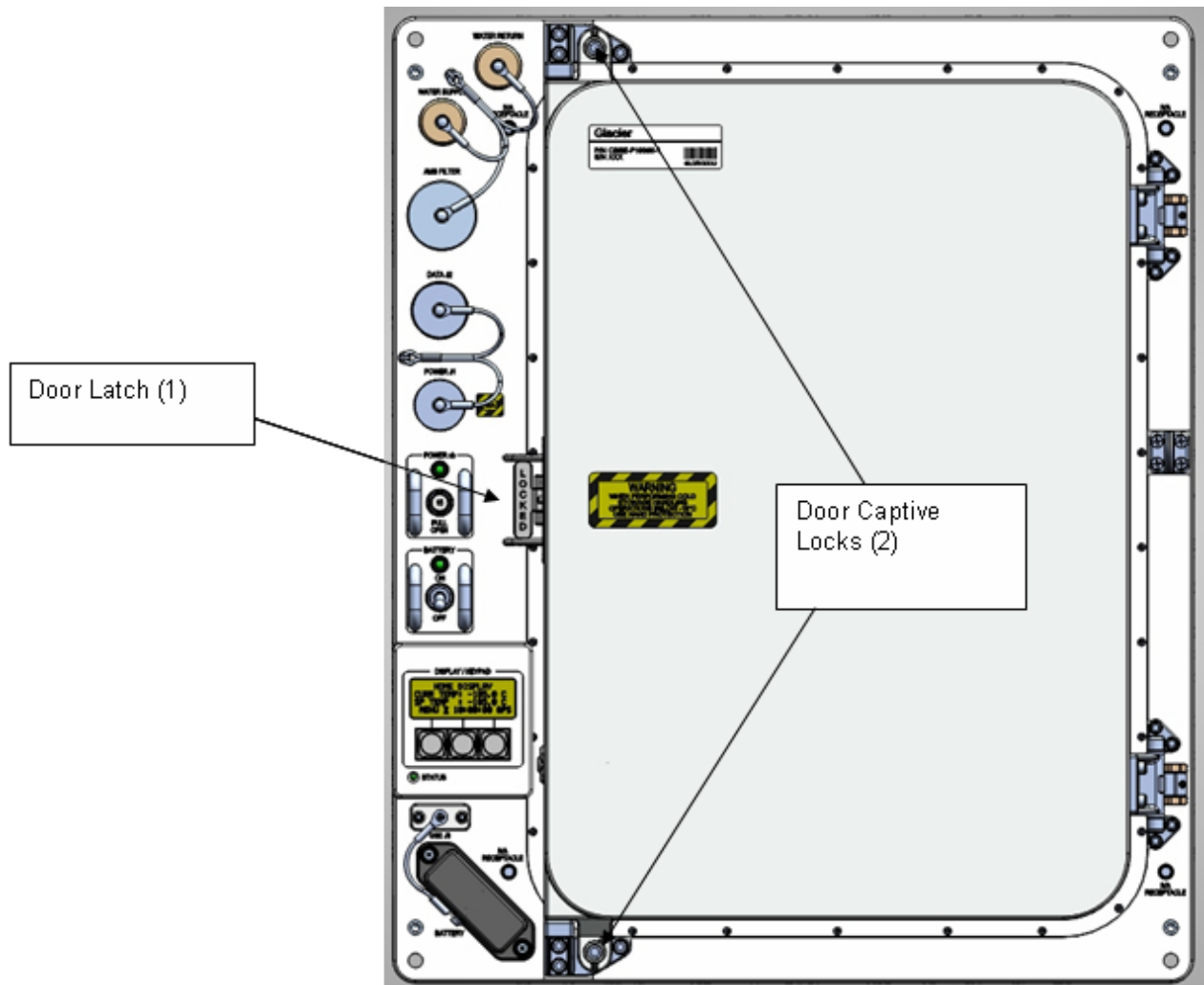


Figure 1. Glacier Door Captive Locks

19A DESCENT SAMPLE TRANSFER FROM MELFI TO GLACIER

(ASSY OPS/19A/FIN)

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4.4 Stow tools.

5. DRYING OUT ICE BRICKS

5.1 Remove Ice Brick -32° C (two) from Double Coldbag and place in temporary stowage location to air dry.
Temporarily stow Double Coldbag in a location protected from kick loads

5.2 Return Light Duty Cryo Gloves to original location on ISS.

5.3 Notify **MCC-H** that transfer activity completed, dry out location for Ice Bricks and Double Coldbag location.

6. GROUND UPDATES FOR IMS

Ground updates IMS for the following parts:

Double Cold Bag S/N XXX TO: per crew call down (step 5.3)

Ice Brick -32° C (two) TO: per crew call down (step 5.3)

TROPI (eight EMCS Bags with eighty seed cassettes) TO: Middeck Glacier

HRP blood (one mesh bag) TO: Middeck Glacier

HRP blood (four vial bags) TO: Middeck Glacier

JAXA Space Seed Six KFTs with four plant chambers TO: Middeck Glacier

OBJECTIVE:

The following steps will activate Glacier Systems.

On MCC-H GO

- ML86B 1. cb MNB MAR 1 → Open
- Glacier 2. ✓cb POWER – Open (It off)
- 3. ✓sw BATTERY – OFF (It off)
- 4. ✓SHUTTLE PAYLOAD DC PWR CABLE →|← POWER J1
- ML85E 5. ✓SHUTTLE PAYLOAD DC PWR CABLE →|← DC 20 AMP J11
- ML86B 6. cb MNB MAR 1 → Close

NOTE

System initialization may take up to 3 minutes. Initialization complete once Line 1 of front panel display reads 'HOME'.

- Glacier 7. cb POWER → Close (It on)
- 8. sw BATTERY → ON (It on)

NOTE

The **HOME** menu will be slightly different based upon the current Temperature Control Mode (**SET POINT**, **IDLE**, or **MANUAL**) of the Glacier.

- 9. ✓Display 'HOME'
- *****
- *
- * If 'HOME' not shown,
- * | Perform [GLACIER FAIL TO REPOWER](#) (SODF: ASSY OPS:
- * | PAYLOADS), then:
- * |
- * *****

*

* If Display - *****Error Pending*****

* | Perform [GLACIER ERROR MESSAGE](#) (SODF: ASSY OPS:

* | PAYLOADS), then:

* |

- 10. Log from Glacier front panel:
- GPS: _____:_____:

CURR TEMP:_____._____ °C

11. Notify **MCC-H** of Power Up complete and data recorded in step 10.

OBJECTIVE:

The following steps will perform a reboot of Glacier Systems.

- Glacier
1. ✓Display 'HOME'

*
* If 'HOME' not shown:
* |
* | pb Right (EXIT) → Press until 'HOME' appears
* |

 2. Log from Glacier front panel:
GPS: _____:_____:_____
CURR TEMP: _____.____ °C
 3. pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 4. pb Left (NEXT) → Press (four times), following appears:
'MAIN MENU'
'SHUTDOWN 5/5'
 5. pb Center (SELECT) → Press (one time), following appears:
'SHUTDOWN'
'SHUTDOWN 1/2'
 6. pb Left (NEXT) → Press (one time), following appears:
'SHUTDOWN'
'REBOOT 2/2'
 7. pb Center (SELECT) → Press (one time), following appears:
'Confirm Shutdown'
'REBOOT'
 8. pb Left (APPLY) → Press (one time), following appears:
'Glacier'
'System'
'Shutting Down'
'Please wait...'
 9. Verify Display—
'Glacier'
'System'
'Rebooting'
'Please wait...'

NOTE

System initialization may take up to 3 minutes. Initialization is complete once Line 1 of front panel display reads 'HOME'.

10. ✓Display 'HOME'

*
* If 'HOME' not shown:
* |
* | ✓MCC-H
* |

*
* If Display - *****Error Pending*****
* | Perform [GLACIER ERROR MESSAGE](#) (SODF: ASSY OPS:
* | PAYLOADS), then:
* |

11. Notify **MCC-H** of recorded data in step 2.

OBJECTIVE:

The following steps will perform a shutdown of Glacier Systems. Commanded shutdowns prevent loss of data and system errors and are the desired nominal method of shutdown.

CAUTION
Due to possible loss of experiment payload(s), Glacier should not be shutdown for more than 30 minutes at +4 ° C (or 120 minutes at -95° C), unless necessary for Orbiter contingency operations.

Glacier

1. ✓Display 'HOME'

*
* If Display - '**Error Pending**'
* | Perform [GLACIER ERROR MESSAGE](#) (SODF: ASSY OPS:
* | PAYLOADS), then:
*

*
* If 'HOME' not shown:
* | pb Right (EXIT) → push until 'HOME' appears
*

2. Log Glacier front panel:
GPS: _____:_____ : _____
CURR TEMP: _____. ____ °C
3. pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
4. pb Left (NEXT) → Press (four times), following appears:
'MAIN MENU'
'SHUTDOWN 5/5'
5. pb Center (SELECT) → Press (one time), following appears:
'SHUTDOWN'
'SHUTDOWN 1/2'
6. pb Center (SELECT) → Press (one time), following appears:
'Confirm Shutdown'
'SHUTDOWN'
7. pb Left (APPLY) → Press (one time), following appears:
'Glacier'
'System'
'Shutting Down'
'Please wait...'
8. Verify—
'Glacier'

'Shutdown Complete'
'TURN POWER OFF'

9. Wait 5 seconds before proceeding.
10. sw BATTERY → OFF (It off)

NOTE

Power light can take up to 2 minutes to fully extinguish. OK to proceed without waiting.

11. cb POWER → Open (It off)
- ML86B 12. cb MNB MAR 1 → Open
13. Notify **MCC-H** of recorded data and time in step 2.

OBJECTIVE:

The following steps will perform a power cycle of the Glacier System.

On MCC-H GO

```
*****  
*  
* If Display - '**Error Pending**'  
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:  
* | PAYLOADS), then:  
*  
*****
```

- Glacier
1. ✓Display 'HOME'
*
*
* If 'HOME' not shown:
* | pb Right (EXIT) → Press until 'HOME' appears
*

 2. pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 3. pb Left (NEXT) → Press (four times), following appears:
'MAIN MENU'
'SHUTDOWN 5/5'
 4. pb Center (SELECT) → Press (one time), following appears
'SHUTDOWN'
'SHUTDOWN 1/2'
 5. pb Center (SELECT) → Press (one time), following appears:
'Confirm Shutdown'
'SHUTDOWN'
 6. pb Left (APPLY) → Press (one time), following appears:
'Glacier'
'System'
'Shutting Down'
'Please wait...'
 7. Verify –
'Glacier'
'Shutdown Complete'
'TURN POWER OFF'
 8. Wait 5 seconds.
 9. ✓BATTERY – ON (It on)

NOTE

Power light can take up to 2 minutes to fully extinguish. Once main power has been removed, the battery light will start to flash.

- 10. cb POWER → Open (It off)
- 11. Wait 1 minute. (No need to wait for POWER light to extinguish)
- 12. cb POWER → Close (It on)

NOTE

System Initialization may take up to 3 minutes. Initialization complete once Line 1 of front panel display reads 'HOME'.

- 13. ✓Display 'HOME'

*
* If 'HOME' not shown,
* | Perform [GLACIER FAIL TO REPOWER](#) (SODF: ASSY OPS:
* | PAYLOADS), then:
*

*
* If Display —'***Error Pending***'
* | Perform [GLACIER ERROR MESSAGE](#) (SODF: ASSY OPS:
* | PAYLOADS), then:
*

- 14. Log from Glacier front panel:
CURR TEMP: _____ °C
GPS: _____/_____:_____

- 15. Notify MCC-H of Power Cycle completion and data recorded in step 14.

OBJECTIVE:

This procedure will perform a manual reconfigure of the Glacier System using the front panel and display buttons.

Glacier

1. ✓Display – 'HOME'
 - *****
 - * If display —'***Error Pending**'
 - * | Perform [GLACIER ERROR MESSAGE](#) (SODF: ASSY OPS:
 - * | PAYLOADS), then:
 - *
 - * If 'HOME'not shown:
 - * | pb Right (EXIT) → Press until 'HOME' appears
 - *
 - *****
2. Record front panel display 'CURR TEMP', 'SET POINT', and 'GPS' and any ground supplied data in [TABLE 2 GLACIER RESET LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).
3. SET CONTROL MODE TO IDLE
 - 3.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 - 3.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
 - 3.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
 - 3.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
 - 3.5 pb Left (NEXT) → Press (one time), following appears:
'Temp Control'
'Control Mode 2/18'
 - 3.6 pb Center (SELECT) → Press (one time), following appears:
'Control Mode'
'XXXX'

NOTE

1. There are 3 options for setting the Control Mode (IDLE, SET POINT, and MANUAL).
2. The left pushbutton (NEXT) changes the Mode, the center pushbutton (APPLY) selects the Mode, and the right pushbutton (CANCEL) returns to the previous Mode.

- 3.7 pb Left (NEXT) → Press as required to select desired Temperature Control Mode to Idle
- 3.8 pb Center (APPLY) → Press (one time)
- 3.9 ✓Confirm New Control Mode = Idle
- 3.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Control Mode 2/18'
- 3.11 ✓Control Mode = Idle
- 3.12 pb Right (EXIT) → Press until 'HOME' appears
4. SETPOINT TEMPERATURE
- 4.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 4.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 4.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 4.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 4.5 pb Center (SELECT) → Press (one time), following appears:
'Set Point Temp'
'XXXXX °C'
'-160.0 to +004.0'
- NOTE

 1. The left pushbutton (CURSOR) moves cursor between New Set Point Temp fields. The default cursor position will be blinking.
 2. The center pushbutton (PLUS) increases New Set Point Temp selected digit field value by 1.
- 4.6 Enter desired Set Point Temperature per **MCC-H**
- 4.7 pb Right (DONE) → Press (one time)
- 4.8 ✓Confirm New Set Point = desired Set Point
- 4.9 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'

4.10 ✓Set Point Temp = desired Set Point

4.11 pb Right (EXIT) → Press until '**HOME**' appears

5. TEMPERATURE CONTROL SENSORS

5.1 pb Left (MENU) → Press (one time), following appears:
'**MAIN MENU**'
'**QUICK STATUS 1/5**'

5.2 pb Left (NEXT) → Press (three times), following appears:
'**MAIN MENU**'
'**SETUP 4/5**'

5.3 pb Center (SELECT) → Press (one time), following appears:
'**SETUP**'
'**Temp Control 1/3**'

5.4 pb Center (SELECT) → Press (one time), following appears:
'**Temp Control**'
'**Set Point Temp 1/18**'

5.5 pb Left (NEXT) → Press (two times), following appears:
'**Temp Control**'
'**Control Sensors 3/18**'

5.6 pb Center (SELECT) → Press (one time), following appears:
'**Control Sensors**'
'**INNER OUTLET INLET**'

NOTE

1. The left pushbutton (CURSOR) moves cursor between Control Sensor fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) changes the values of the Control Sensor fields from 0 to 1 or vice versa.

5.7 Enter desired combination of Control Sensors per **MCC-H**

5.8 pb Right (DONE) → Press (one time)

5.9 ✓Confirm New Control Sensors = desired Control Sensors

5.10 pb Left (APPLY) → Press (one time), following appears:
'**Temp Control**'
'**Control Sensors 3/18**'

5.11 ✓Control Sensors = desired Control Sensors

5.12 pb Right (EXIT) → Press until '**HOME**' appears

6. AIR MANAGEMENT PROCEED MESSAGE

6.1 pb Left (MENU) → Press (one time), following appears:
'**MAIN MENU**'

'QUICK STATUS 1/5'

- 6.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 6.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 6.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 6.5 pb Left (NEXT) → Press (three times), following appears:
'Temp Control'
'AirMgmt Proceed 4/18'
- 6.6 pb Center (SELECT) → Press (one time), following appears:
'AirMgmt Proceed'
'PROCEED'
- 6.7 pb Center (APPLY) → Press (one time)
- 6.8 ✓Display line 3 – PROCEED
- 6.9 pb Right (EXIT) → Press until **'HOME'** appears

7. TEMPERATURE CONTROL BANDWIDTH

- 7.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 7.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 7.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 7.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 7.5 pb Left (NEXT) → Press (four times), following appears:
'Temp Control'
'Bandwidth 5/18'
'XX.X °C'
- 7.6 pb Center (SELECT) → Press (one time), following appears:
'Bandwidth'
'XX.X °C'
'00.1 to 25.5'

NOTE

1. The left pushbutton (CURSOR) moves cursor between Bandwidth fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases Bandwidth selected digit field value by 1.

7.7 Enter desired Bandwidth per **MCC-H**

7.8 pb Right (DONE) → Press (one time)

7.9 ✓Confirm New Bandwidth = desired Bandwidth

7.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Bandwidth 5/18'

7.11 ✓Bandwidth = desired Bandwidth

7.12 pb Right (EXIT) → Press until **'HOME'** appears

8. PRIMARY COOLER

8.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

8.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'

8.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'

8.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'

8.5 pb Left (NEXT) → Press (five times), following appears:
'Temp Control'
'Primary Cooler 6/18'

8.6 pb Center (SELECT) → Press (one time), following appears:
'Primary Cooler'
'COOLER X'

NOTE

1. There are 2 options for Primary Cooler (COOLER 1 and COOLER 2).
2. The left pushbutton (NEXT) changes the Primary Cooler, the center pushbutton (APPLY) selects the Primary Cooler, and the right pushbutton (CANCEL) returns to the previous display.

- 8.7 pb Left (NEXT) → Press as required to select desired Primary Cooler per **MCC-H**
 - 8.8 pb Center (APPLY) → Press (one time)
 - 8.9 ✓Confirm New Primary Cooler = desired Cooler
 - 8.10 pb Left (APPLY) → Press (one time), following appears:
 'Temp Control'
 'Primary Cooler 6/18'
 - 8.11 ✓Primary Cooler = desired Cooler
 - 8.12 pb Right (EXIT) → Press until '**HOME**' appears
9. COOLER 1 STROKE
- 9.1 pb Left (MENU) → Press (one time), following appears:
 'MAIN MENU'
 'QUICK STATUS 1/5'
 - 9.2 pb Left (NEXT) → Press (three times), following appears:
 'MAIN MENU'
 'SETUP 4/5'
 - 9.3 pb Center (SELECT) → Press (one time), following appears:
 'SETUP'
 'Temp Control 1/3'
 - 9.4 pb Center (SELECT) → Press (one time), following appears:
 'Temp Control'
 'Set Point Temp 1/18'
 - 9.5 pb Left (NEXT) → Press (six times), following appears:
 'Temp Control'
 'Cooler 1 Stroke 7/18'
 - 9.6 pb Center (SELECT) → Press (one time), following appears:
 'Cooler 1 Stroke'
 'XX'
 '03 to 63'

NOTE

1. The left pushbutton (CURSOR) moves cursor between Stroke fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases Cooler Stroke selected digit field by 1.

- 9.7 Enter desired Cooler 1 Stroke value per **MCC-H**
- 9.8 pb Right (DONE) → Press (one time)
- 9.9 ✓Confirm New Cooler 1 Stroke = desired Cooler 1 Stroke

- 9.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Cooler 1 Stroke 7/18'
- 9.11 ✓Cooler 1 Stroke = desired Cooler 1 Stroke
- 9.12 pb Right (EXIT) → Press until '**HOME**' appears
10. COOLER 1 STATE
- 10.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 10.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 10.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 10.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 10.5 pb Left (NEXT) → Press (seven times), following appears:
'Temp Control'
'Cooler 1 State 8/18'
- 10.6 pb Center (SELECT) → Press (one time), following appears:
'Cooler 1 State'
'XX'

NOTE

1. There are 2 options for Cooler 1 State (ON and OFF).
2. The left pushbutton (NEXT) changes the Cooler 1 State, the center pushbutton (APPLY) selects the State, and the right pushbutton (CANCEL) returns to the previous display.

- 10.7 pb Left (NEXT) → Press as required to select desired Cooler 1 State per **MCC-H**
- 10.8 pb Center (APPLY) → Press (one time)
- 10.9 ✓Confirm New Cooler 1 State = desired State
- 10.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Cooler 1 State 8/18'
- 10.11 ✓Cooler 1 State = desired Cooler 1 State
- 10.12 pb Right (EXIT) → Press until '**HOME**' appears

11. COOLER 2 STROKE

- 11.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 11.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 11.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 11.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 11.5 pb Left (NEXT) → Press (eight times), following appears:
'Temp Control'
'Cooler 2 Stroke 9/18'
- 11.6 pb Center (SELECT) → Press (one time), following appears:
'Cooler 2 Stroke'
'XX'
'03 to 63'

NOTE

1. The left pushbutton (CURSOR) moves cursor between Stroke fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases Cooler Stroke selected digit field by 1.

- 11.7 Enter desired Cooler 2 Stroke value per **MCC-H**
- 11.8 pb Right (DONE) → Press (one time)
- 11.9 ✓Confirm New Cooler 2 Stroke = desired Cooler 2 Stroke
- 11.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Cooler 2 Stroke 9/18'
- 11.11 ✓Cooler 2 Stroke = desired Cooler 2 Stroke
- 11.12 pb Right (EXIT) → Press until '**HOME**' appears

12. COOLER 2 STATE

- 12.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 12.2 pb Left (NEXT) → Press (three times), following appears:

'MAIN MENU'

'SETUP 4/5'

- 12.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 12.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 12.5 pb Left (NEXT) → Press (nine times), following appears:
'Temp Control'
'Cooler 2 State 10/18'
- 12.6 pb Center (SELECT) → Press (one time), following appears:
'Cooler 2 State'
'XX'

NOTE

1. There are 2 options for Cooler 2 State (ON and OFF).
2. The left pushbutton (NEXT) changes the Cooler 2 State, the center pushbutton (APPLY) selects the State, and the right pushbutton (CANCEL) returns to the previous display.

- 12.7 pb Left (NEXT) → Press as required to select desired Cooler 2 State per **MCC-H**
- 12.8 pb Center (APPLY) → Press (one time)
- 12.9 ✓Confirm New Cooler 2 State = desired State
- 12.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Cooler 2 State 10/18'
- 12.11 ✓Cooler 2 State = desired Cooler 2 State
- 12.12 pb Right (EXIT) → Press until '**HOME**' appears
13. MAXIMUM POWER DRAW
- 13.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 13.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 13.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'

- 13.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 13.5 pb Left (NEXT) → Press (twelve times), following appears:
'Temp Control'
'Max Power Draw 13/18'
- 13.6 pb Center (SELECT) → Press (one time), following appears:
'Max Power Draw'
'XXX W'
'000 to 420'

NOTE

- 1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
- 2. The center pushbutton (PLUS) increases selected digit field by 1.

- 13.7 Enter desired Max Power Draw value per **MCC-H**
- 13.8 pb Right (DONE) → Press (one time)
- 13.9 ✓Confirm New Max Power = desired Max Power Draw
- 13.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Max Power Draw 13/18'
- 13.11 ✓Max Power Draw = desired Max Power Draw
- 13.12 pb Right (EXIT) → Press until '**HOME**' appears
- 14. OVER CURRENT
 - 14.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 - 14.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
 - 14.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
 - 14.4 pb Center (SELECT) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
 - 14.5 pb Left (NEXT) → Press (thirteen times), following appears:
'Temp Control'
'Over Current 14/18'

- 14.6 pb Center (SELECT) → Press (one time), following appears:
'Over Current'
'XX.X A'
'00.0 to 30.0'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases selected digit field by 1.

- 14.7 Enter desired Over Current value per **MCC-H**
- 14.8 pb Right (DONE) → Press (one time)
- 14.9 ✓Confirm New Over Current = desired Over Current
- 14.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Over Current 14/18'
- 14.11 ✓Over Current = desired Over Current
- 14.12 pb Right (EXIT) → Press until **'HOME'** appears

15. AIR MANAGEMENT MODE

- 15.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 15.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 15.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 15.4 pb Left (NEXT) → Press (one time), following appears:
'SETUP'
'Air Management 2/3'
- 15.5 pb Center (SELECT) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'
- 15.6 pb Center (SELECT) → Press (one time), following appears:
'Air Mgmt Mode'
'XXXXX'

NOTE

1. There are 2 options for Air Mgmt Mode (MANUAL and AUTOMATIC).
2. The left pushbutton (NEXT) changes the Mode, the center pushbutton (APPLY) selects the Mode, and the right pushbutton (CANCEL) returns to the previous display.

- 15.7 pb Left (NEXT) → Press as required to select desired Air Mgmt Mode per **MCC-H**
- 15.8 pb Center (APPLY) → Press (one time)
- 15.9 ✓Confirm New Air Mgmt Mode = desired Air Mgmt Mode
- 15.10 pb Left (APPLY) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'
- 15.11 ✓Air Mgmt Mode = desired Air Mgmt Mode
- 15.12 pb Right (EXIT) → Press until **'HOME'** appears
16. AIR MANAGEMENT HUMIDITY
- 16.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 16.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 16.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 16.4 pb Left (NEXT) → Press (one time), following appears:
'SETUP'
'Air Management 2/3'
- 16.5 pb Center (SELECT) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'
- 16.6 pb Left (NEXT) → Press (one time), following appears:
'Air Management'
'Humidity Config 2/6'
- 16.7 pb Center (SELECT) → Press (one time), following appears:
'Humidity Config'
'Pump: 12 Valve: 1234'
'XX XXXX'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) toggles the selected Pump (1 or 2) or Valve (1-4) between 0 and 1 (OFF/ON).

- 16.8 Enter desired Humidity Config per **MCC-H**
- 16.9 pb Right (DONE) → Press (one time)
- 16.10 ✓ Confirm New Humidity Config = desired Humidity Config
- 16.11 pb Left (APPLY) → Press (one time), following appears:
'Air Management'
'Humidity Config 2/6'
- 16.12 ✓ Humidity Config = desired Humidity Config
- 16.13 pb Right (EXIT) → Press until **'HOME'** appears
17. AIR MANAGEMENT PRESSURE CONFIGURATION
- 17.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 17.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 17.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 17.4 pb Left (NEXT) → Press (one time), following appears:
'SETUP'
'Air Management 2/3'
- 17.5 pb Center (SELECT) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'
- 17.6 pb Left (NEXT) → Press (two times), following appears:
'Air Management'
'Pressure Config 3/6'
- 17.7 pb Center (SELECT) → Press (one time), following appears:
'Pressure Config'
'Pump: 12 Valve: 1234'
'XX XXXX'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) toggles the selected Pump (1 or 2) or Valve (1-4) between 0 and 1 (OFF/ON).

- 17.8 Enter desired Pressure Config per **MCC-H**
- 17.9 pb Right (DONE) → Press (one time)
- 17.10 ✓ Confirm New Pressure Config = desired Pressure Config
- 17.11 pb Left (APPLY) → Press (one time), following appears:
'Air Management'
'Pressure Config 3/6'
- 17.12 ✓ Pressure Config = desired Pressure Config
- 17.13 pb Right (EXIT) → Press until **'HOME'** appears
18. AIR MANAGEMENT MANUAL CONFIGURATION
- 18.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 18.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 18.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 18.4 pb Left (NEXT) → Press (one time), following appears:
'SETUP'
'Air Management 2/3'
- 18.5 pb Center (SELECT) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'
- 18.6 pb Left (NEXT) → Press (three times), following appears:
'Air Management'
'Manual Config 4/6'
- 18.7 pb Center (SELECT) → Press (one time), following appears:
'Manual Config'
'Pump: 12 Valve: 1234'
'XX XXXX'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) toggles the selected Pump (1 or 2) or Valve (1-4) between 0 and 1 (OFF/ON).

18.8 Enter desired Manual Config per **MCC-H**

18.9 pb Right (DONE) → Press (one time)

18.10 ✓ Confirm New Manual Config = desired Manual Config

18.11 pb Left (APPLY) → Press (one time), following appears:
'Air Management'
'Manual Config 4/6'

18.12 ✓ Manual Config = desired Manual Config

18.13 pb Right (EXIT) → Press until **'HOME'** appears

19. START HUMIDITY MONITORING TIME

19.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

19.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'

19.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'

19.4 pb Left (NEXT) → Press (one time), following appears:
'SETUP'
'Air Management 2/3'

19.5 pb Center (SELECT) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'

19.6 pb Left (NEXT) → Press (four times), following appears:
'Air Management'
'Start Humidity 5/6'

19.7 pb Center (SELECT) → Press (one time), following appears:
'Start Humidity'
'XXXXX seconds'
'00000 to 65535'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases the selected digit field value by 1.

19.8 Enter desired Start Humidity per **MCC-H**

19.9 pb Right (DONE) → Press (one time)

19.10 ✓ Confirm New Start Humidity = desired Start Humidity

19.11 pb Left (APPLY) → Press (one time), following appears:
'Air Management'
'Start Humidity 5/6'

19.12 ✓ Start Humidity = desired Start Humidity

19.13 pb Right (EXIT) → Press until **'HOME'** appears

20. START PRESSURE MONITORING TIME

20.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

20.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'

20.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'

20.4 pb Left (NEXT) → Press (one time), following appears:
'SETUP'
'Air Management 2/3'

20.5 pb Center (SELECT) → Press (one time), following appears:
'Air Management'
'Air Mgmt Mode 1/6'

20.6 pb Left (NEXT) → Press (five times), following appears:
'Air Management'
'Start Pressure 6/6'

20.7 pb Center (SELECT) → Press (one time), following appears:
'Start Pressure'
'XXXXX seconds'
'00000 to 65535'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases the selected digit field value by 1.

20.8 Enter desired Start Pressure per **MCC-H**

20.9 pb Right (DONE) → Press (one time)

20.10 ✓ Confirm New Start Pressure = desired Start Pressure

20.11 pb Left (APPLY) → Press (one time), following appears:
'Air Management'
'Start Pressure 6/6'

20.12 ✓ Start Pressure = desired Start Pressure

20.13 pb Right (EXIT) → Press until **'HOME'** appears

21. CIRCULATION FAN MODE

21.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

21.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'

21.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'

21.4 pb Left (NEXT) → Press (two times), following appears:
'SETUP'
'Auxiliary 3/3'

21.5 pb Center (SELECT) → Press (one time), following appears:
'Auxiliary'
'Circ Fan Mode 1/7'

21.6 pb Center (SELECT) → Press (one time), following appears:
'Circ Fan Mode'
'XXXXX'

NOTE

1. There are 2 options for Circ Fan Mode (MANUAL and AUTOMATIC).
2. The left pushbutton (NEXT) changes the Mode, the center pushbutton (APPLY) selects the Mode, and the right pushbutton (CANCEL) returns to the previous display.

- 21.7 pb Left (NEXT) → Press as required to select desired Circ Fan Mode per **MCC-H**
- 21.8 pb Center (APPLY) → Press (one time)
- 21.9 ✓Confirm New Circ Fan Mode = desired Circ Fan Mode
- 21.10 pb Left (APPLY) → Press (one time), following appears:
'Auxiliary'
'Circ Fan Mode 1/7'
- 21.11 ✓Circ Fan Mode = desired Circ Fan Mode
- 21.12 pb Right (EXIT) → Press until '**HOME**' appears

22. CIRCULATION FAN POWER

- 22.1 pb Left (MENU) → Press (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 22.2 pb Left (NEXT) → Press (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 22.3 pb Center (SELECT) → Press (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 22.4 pb Left (NEXT) → Press (two times), following appears:
'SETUP'
'Auxiliary 3/3'
- 22.5 pb Center (SELECT) → Press (one time), following appears:
'Auxiliary'
'Circ Fan Mode 1/7'
- 22.6 pb Left (NEXT) → Press (one time), following appears:
'Auxiliary'
'Circ Fan Power 2/7'
- 22.7 pb Center (SELECT) → Press (one time), following appears:
'Circ Fan Power'
'XXX %'
'000 to 090'

NOTE

- 1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
- 2. The center pushbutton (PLUS) increases the selected digit field value by 1.

- 22.8 Enter desired Circ Fan Power per **MCC-H**

22.9 pb Right (DONE) → Press (one time)

22.10 ✓ Confirm New Circ Fan Power = desired Circ Fan Power

22.11 pb Left (APPLY) → Press (one time), following appears:
 'Auxiliary'
 'Circ Fan Power 2/7'

22.12 ✓ Circ Fan Power = desired Circ Fan Power

22.13 pb Right (EXIT) → Press until 'HOME' appears

23. DATA STORAGE INTERVAL

23.1 pb Left (MENU) → Press (one time), following appears:
 'MAIN MENU'
 'QUICK STATUS 1/5'

23.2 pb Left (NEXT) → Press (three times), following appears:
 'MAIN MENU'
 'SETUP 4/5'

23.3 pb Center (SELECT) → Press (one time), following appears:
 'SETUP'
 'Temp Control 1/3'

23.4 pb Left (NEXT) → Press (two times), following appears:
 'SETUP'
 'Auxiliary 3/3'

23.5 pb Center (SELECT) → Press (one time), following appears:
 'Auxiliary'
 'Circ Fan Mode 1/7'

23.6 pb Left (NEXT) → Press (two times), following appears:
 'Auxiliary'
 'Data Storage 3/7'

23.7 pb Center (SELECT) → Press (one time), following appears:
 'Data Storage'
 'XXXX seconds'
 '0000 to 3600'

NOTE

1. The left pushbutton (CURSOR) moves cursor between fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases the selected digit field value by 1.

23.8 Enter desired Data Storage per **MCC-H**

23.9 pb Right (DONE) → Press (one time)

23.10 ✓ Confirm New Store Period = desired Store Period

23.11 pb Left (APPLY) → Press (one time), following appears:
 'Auxiliary'
 'Data Storage 3/7'

23.12 ✓Data Storage = desired Data Storage

23.13 pb Right (EXIT) → Press until 'HOME' appears

24. TEMPERATURE CONTROL MODE

24.1 pb Left (MENU) → Press (one time), following appears:
 'MAIN MENU'
 'QUICK STATUS 1/5'

24.2 pb Left (NEXT) → Press (three times), following appears:
 'MAIN MENU'
 'SETUP 4/5'

24.3 pb Center (SELECT) → Press (one time), following appears:
 'SETUP'
 'Temp Control 1/3'

24.4 pb Center (SELECT) → Press (one time), following appears:
 'Temp Control'
 'Set Point Temp 1/18'

24.5 pb Left (NEXT) → Press (one time), following appears:
 'Temp Control'
 'Control Mode 2/18'

24.6 pb Center (SELECT) → Press (one time), following appears:
 'Control Mode'
 'XXXX'

NOTE

1. There are 3 options for setting the Control Mode (IDLE, SET POINT, and MANUAL).
2. The left pushbutton (NEXT) changes the Mode, the center pushbutton (APPLY) selects the Mode, and the right pushbutton (CANCEL) returns to the previous Mode.

24.7 pb Left (NEXT) → Press as required to select desired Temperature Control Mode per **MCC-H**

24.8 pb Center (APPLY) → Press (one time)

24.9 ✓Confirm New Control Mode = desired Control Mode

24.10 pb Left (APPLY) → Press (one time), following appears:
 'Temp Control'
 'Control Mode 2/18'

24.11 ✓Control Mode = desired Control Mode

GLACIER MANUAL RECONFIGURE

(ASSY OPS/19A/FIN)

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- 24.12 pb Right (EXIT) → Press until '**HOME**' appears
25. Notify **MCC-H** GLACIER MANUAL RECONFIGURATION is complete.

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GLACIER

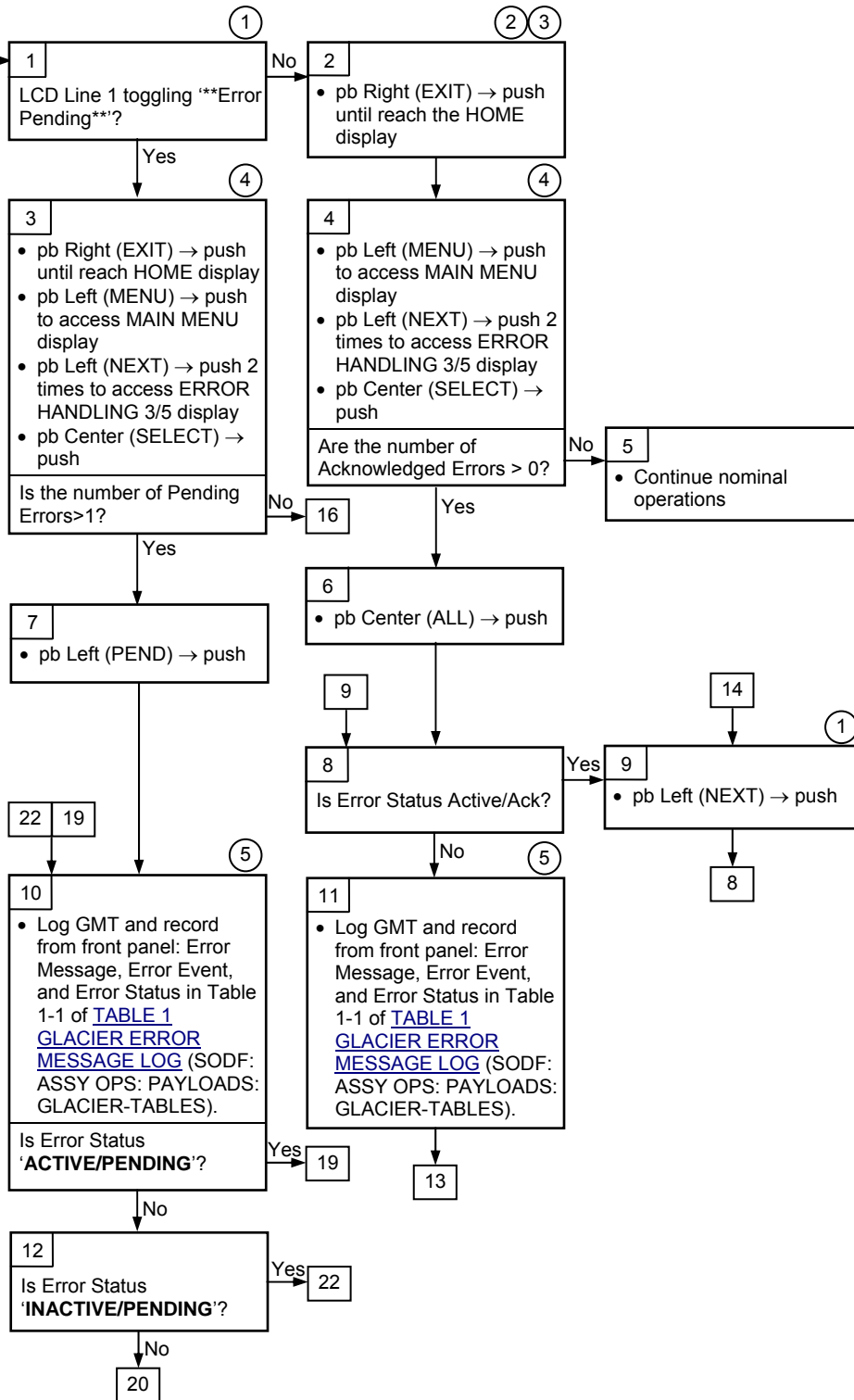
GLACIER ERROR MESSAGE

(ASSY OPS/19A/FIN)

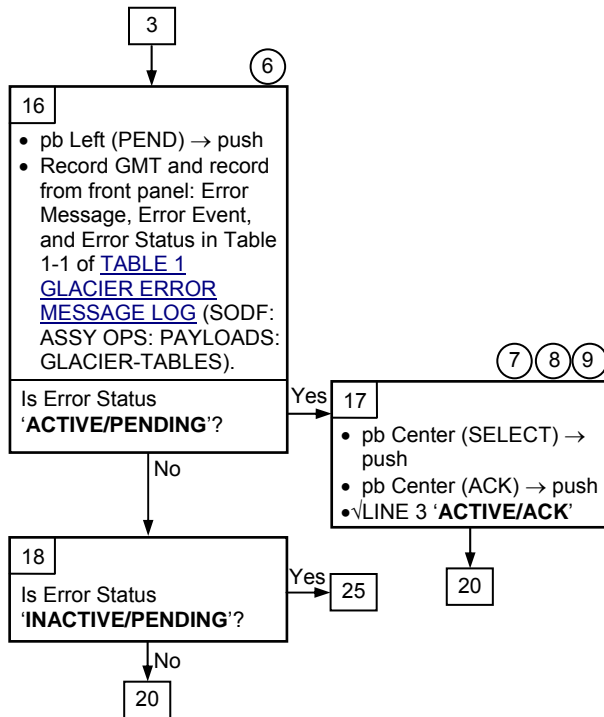
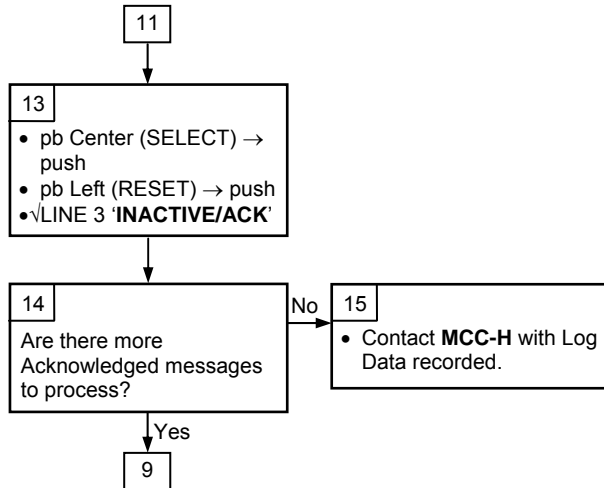
Page 1 of 17 pages

Glacier System Error

Nominal Config:
 cb POWER – Close (It on)
 sw BATTERY – ON (It on)
 (ML86B)
 cb MNB MAR 1 – Close



- ① Contact **MCC-H** before proceeding.
- ② Operator can always exit sub menus by pressing Right (EXIT) pb until 'HOME' display is reached.
- ③ ERROR HANDLING: display will identify Event on Line 2 and Status on Line 3. 'ACTIVE/PENDING' indicates that error is still occurring and should be acknowledged. 'INACTIVE/PENDING' indicates the Error is no longer occurring and can be Reset.
- ④ Menus are circular. If a display is passed, operator can keep pressing the button until desired display is reached.
- ⑤ GPS is only visible in HOME display. Record GMT from wristwatch.

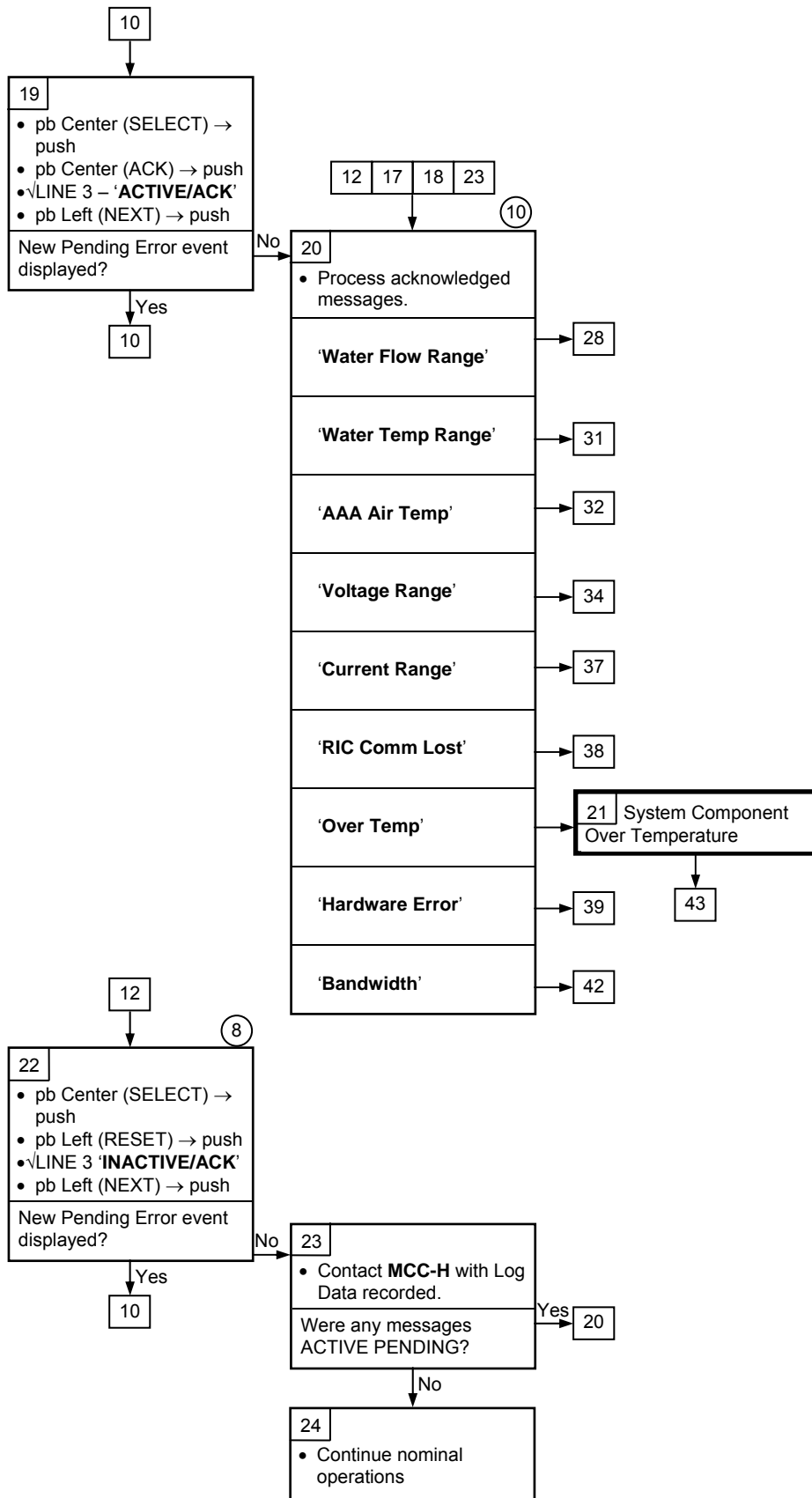


⑥
GLACIER RECORD DIAGNOSTIC DATA procedure may be performed to capture states of key data elements per **MCC-H** direction.

⑦
Power cycle requires **MCC-H** approval. Note: Set Point temperature control mode will require initialization upon restart

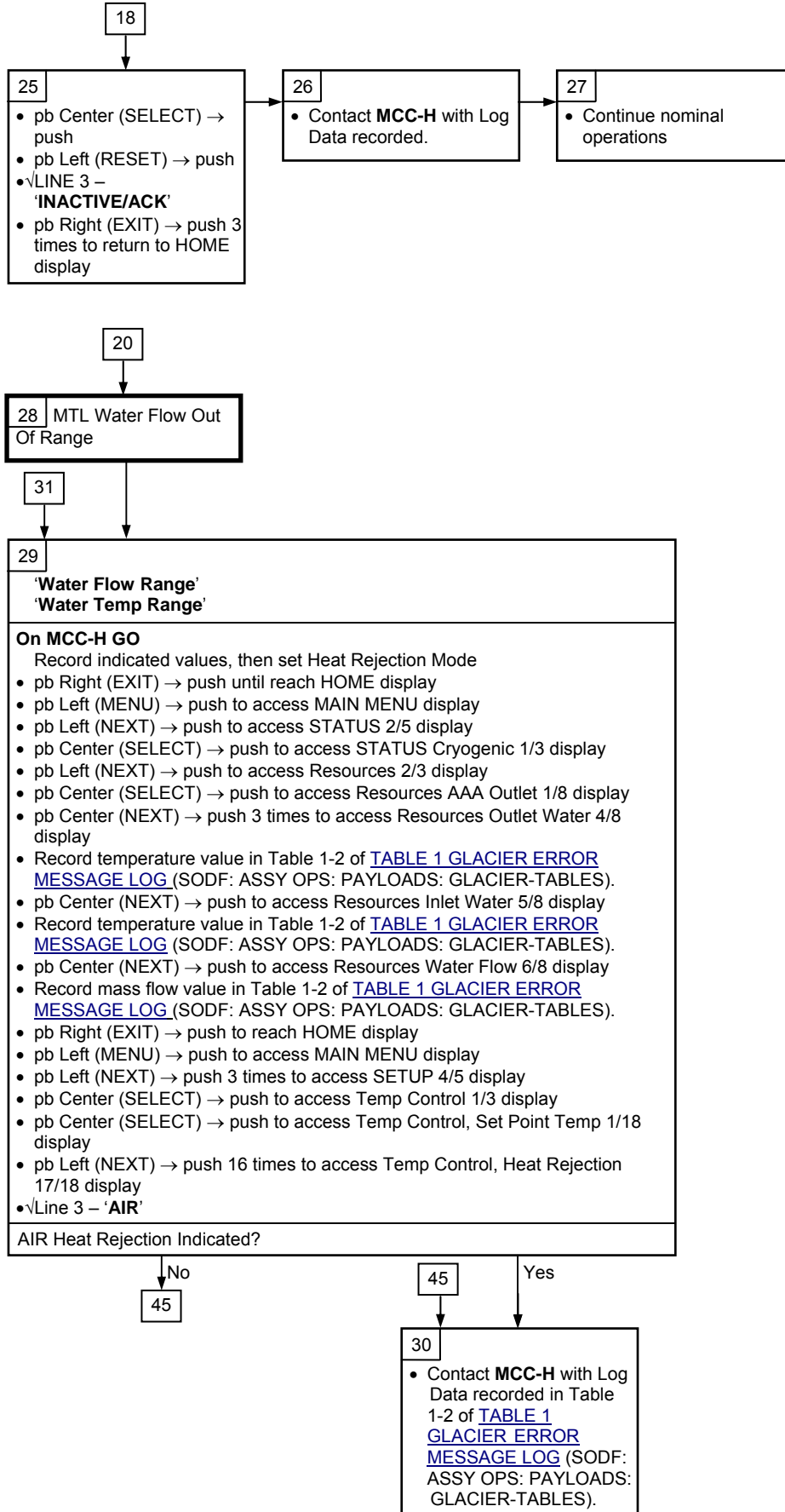
⑧
Software Errors may not reset or may be persistent due to: Frequent intermittent power failure. Single Event Upset. Electromagnetic interference

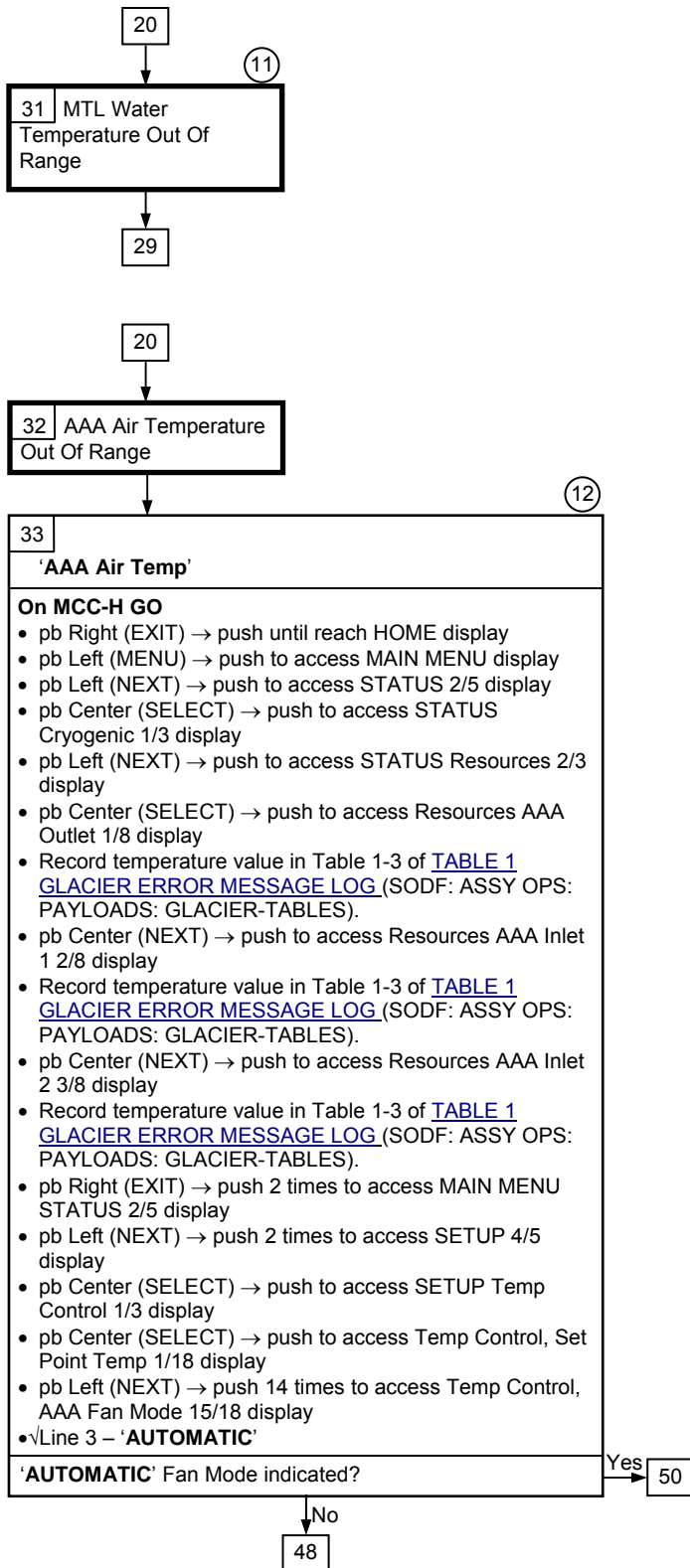
⑨
Internal voltage takes approximately 2 min to dissipate. Power LED will remain dimly illuminated



⑧ Software Errors may not reset or may be persistent due to: Frequent intermittent power failure. Single Event Upset. Electromagnetic interference

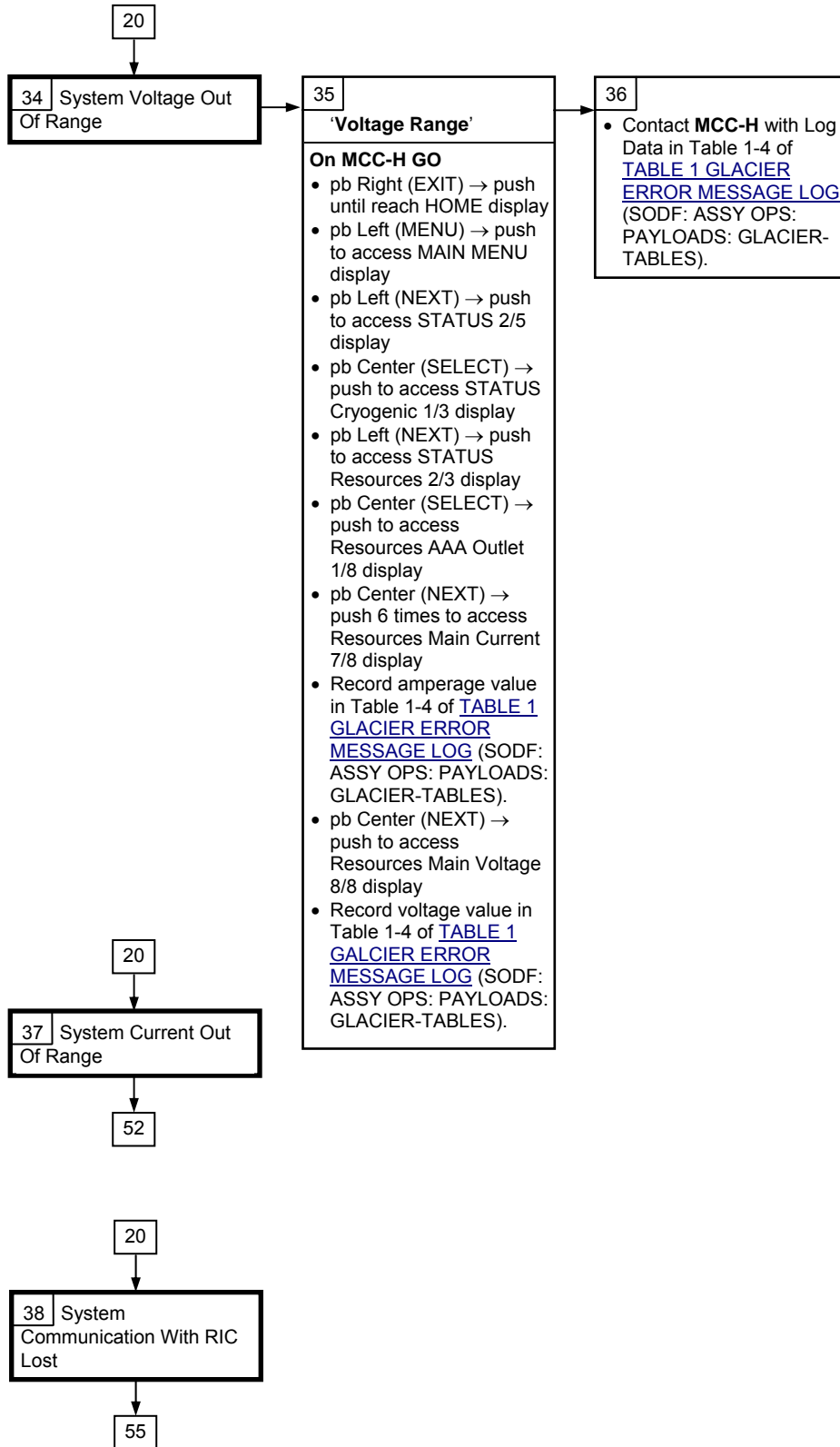
⑩ Initialization takes approximately 3 minutes and is complete when LCD Line 1 reads 'HOME'

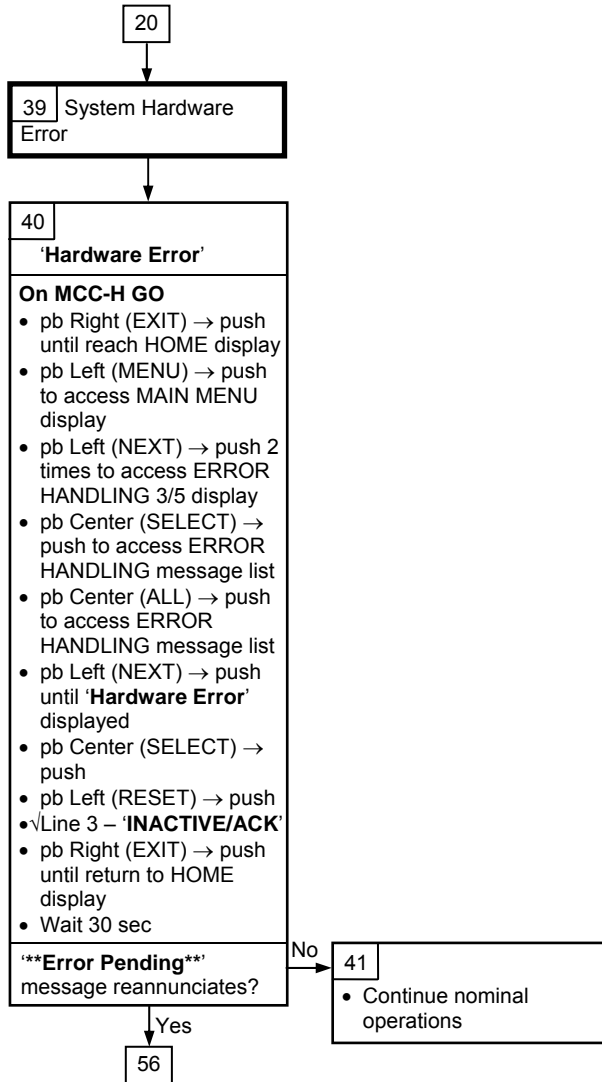




(11) AAA Air Temp value may take a long time to reflect change in fan mode.

(12) MCC-H will evaluate Av Bay temps





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'Bandwidth'

Record indicated values

- pb Right (EXIT) → push until reach HOME display
- Record from Front Panel CURR TEMP, SET POINT, GPS values in Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Left (MENU) → push once until QUICK STATUS 1/5
- pb Center (CENTER) → push once until QUICK STATUS Cold Head 1A 1/16
- Record value in Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push once until QUICK STATUS Cold Head 1B 2/16
- Record value in Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push once until QUICK STATUS Cold Head 2A 3/16
- Record value in Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push once until QUICK STATUS Cold Head 2B 4/16
- Record value in Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push nine times until QUICK STATUS CircFan Speed 13/16
- Record value in Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Right (EXIT) → push until HOME display
- Notify **MCC-H** to report log values from Table 1-6 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES) and receive further direction.

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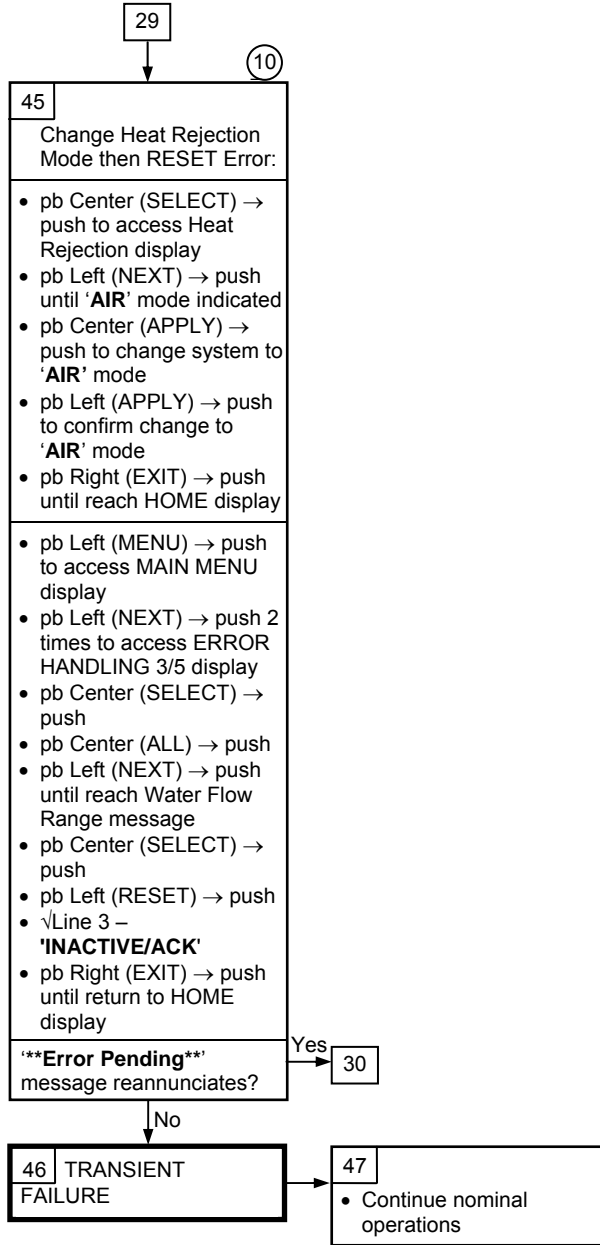
'Over Temp'

On MCC-H GO

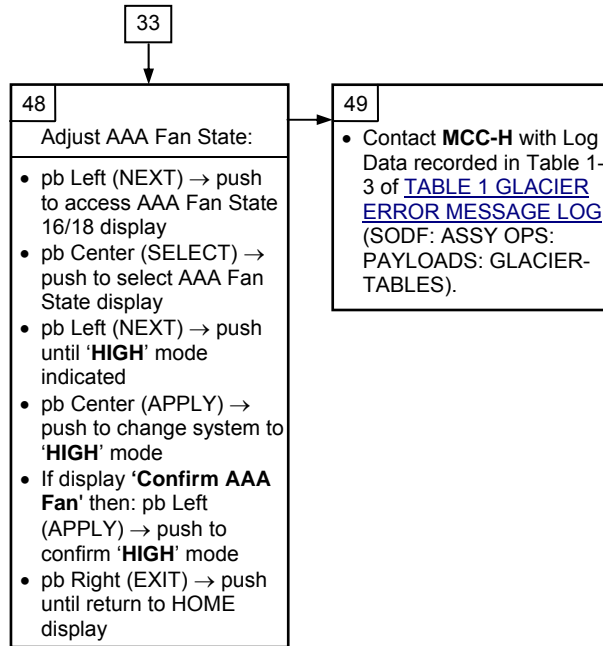
- pb Right (EXIT) → push until reach HOME display
- pb Left (MENU) → push to access MAIN MENU display
- pb Left (NEXT) → push to access STATUS 2/5 display
- pb Center (SELECT) → push to access STATUS Cryogenic 1/3 display
- pb Left (NEXT) → push 2 times to access STATUS System 3/3 display
- pb Center (SELECT) → push to access System CPU 1/9 display
- Record temperature value in Table 1-5 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push to access System Capacitors A 2/9 display
- Record temperature value in Table 1-5 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push to access System Capacitors B 3/9 display
- Record temperature value in Table 1-5 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push to access System Data Logger 4/9 display
- Record temperature value in Table 1-5 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).

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- Contact **MCC-H** with Log Data Recorded in Table 1-5 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).



10 Initialization takes approximately 3 minutes and is complete when LCD Line 1 reads 'HOME'



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Adjust AAA Fan Mode & State:

- pb Center (SELECT) → push to access AAA Fan Mode display
- pb Left (NEXT) → push until **'MANUAL'** mode indicated
- pb Center (APPLY) → push to select **'MANUAL'** mode
- pb Left (APPLY) → push to confirm **'MANUAL'** mode
- pb Left (NEXT) → push to access AAA Fan State 16/18 display
- pb Center (SELECT) → push to select AAA Fan State display
- pb Left (NEXT) → push until **'HIGH'** mode indicated
- pb Center (APPLY) → push to change system to **'HIGH'** mode
- If display 'Confirm AAA Fan' then pb Left (APPLY) → push to confirm **'HIGH'** mode
- pb Right (EXIT) → push until return to HOME display

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- Contact **MCC-H** with Log Data recorded in Table 1-3 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).

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'Current Range'

On MCC-H GO

- pb Right (EXIT) → push until reach HOME display
- pb Left (MENU) → push to access MAIN MENU display
- pb Left (NEXT) → push to access STATUS 2/5 display
- pb Center (SELECT) → push to access STATUS Cryogenic 1/3 display
- pb Left (NEXT) → push to access STATUS Resources 2/3 display
- pb Center (SELECT) → push to access Resources AAA Outlet 1/8 display
- pb Center (NEXT) → push 6 times to access Resources Main Current 7/8 display
- Record amperage value in Table 1-4 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Center (NEXT) → push to access Resources Main Voltage 8/8 display
- Record voltage value in Table 1-4 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- pb Right (EXIT) → push 2 times to reach MAIN MENU STATUS 2/5 display
- pb Left (NEXT) → push 2 times to access SETUP 4/5 display
- pb Center (SELECT) → push to access Temp Control 1/3 display
- pb Center (SELECT) → push to access Temp Control, Set Point Temp 1/18 display
- pb Left (NEXT) → push 13 times to access Temp Control, Over Current 14/18 display
- Record amperage value in Table 1-4 of [TABLE 1 GLACIER ERROR MESSAGE LOG](#) (SODF: ASSY OPS: PAYLOADS: GLACIER-TABLES).
- √Line 3 – '30.0 A'

'30.0 A' Over Current Limit indicated?

Yes

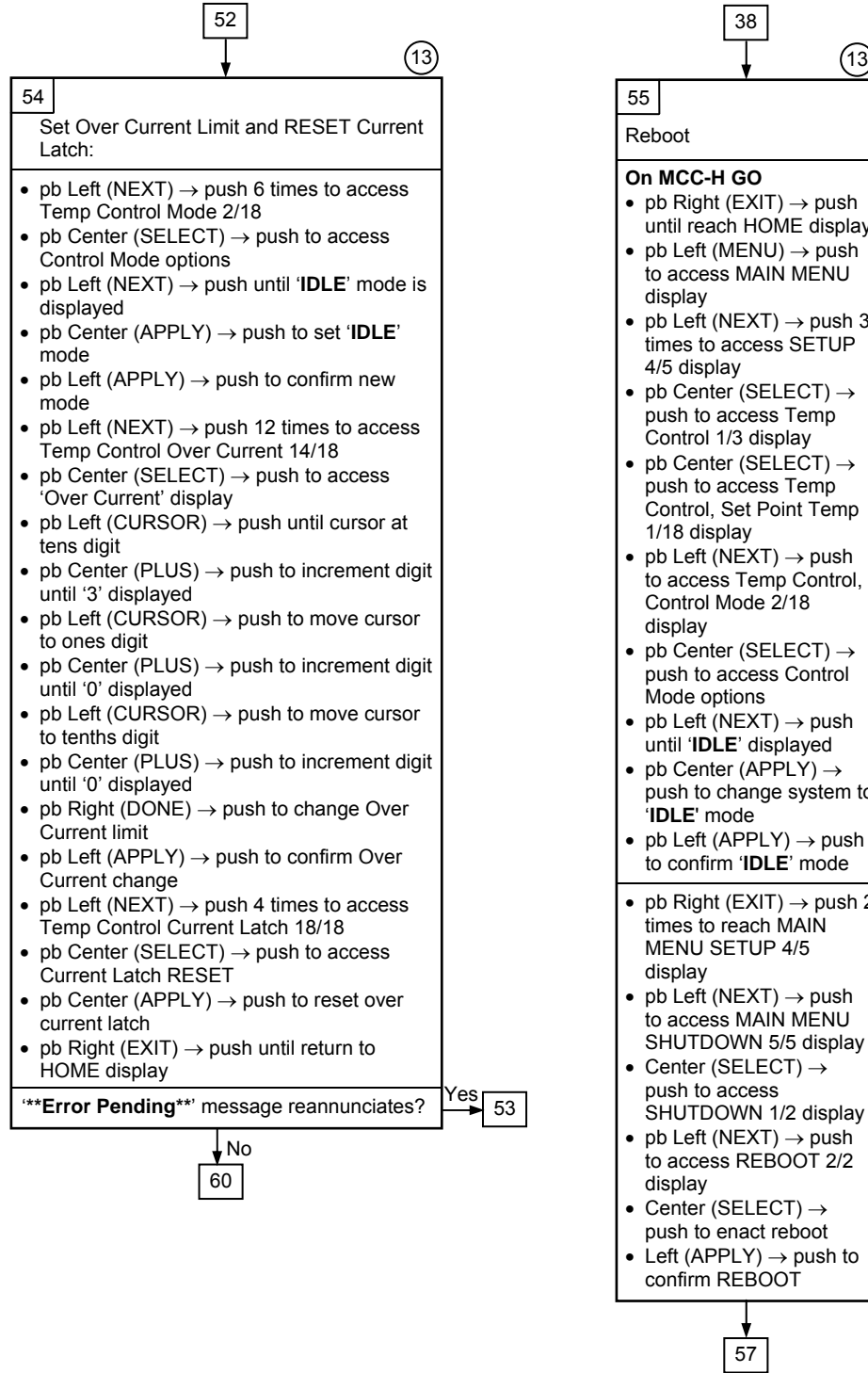
53

- Contact **MCC-H** with Log Data recorded.

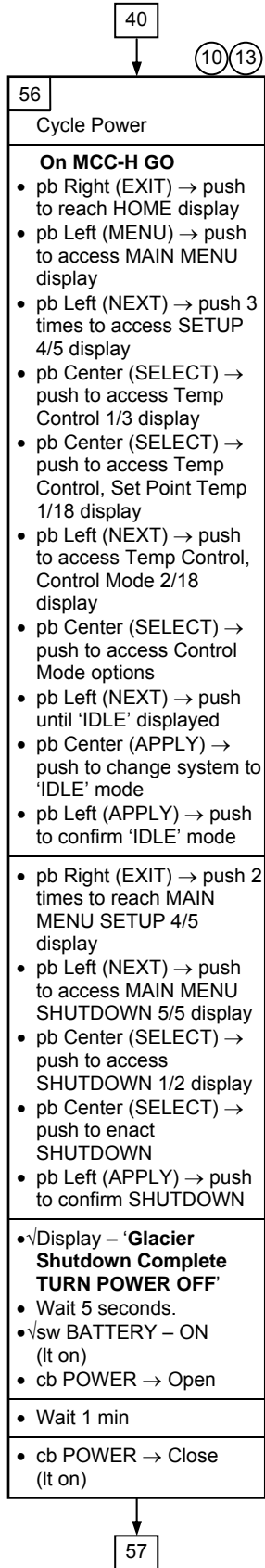
No

54

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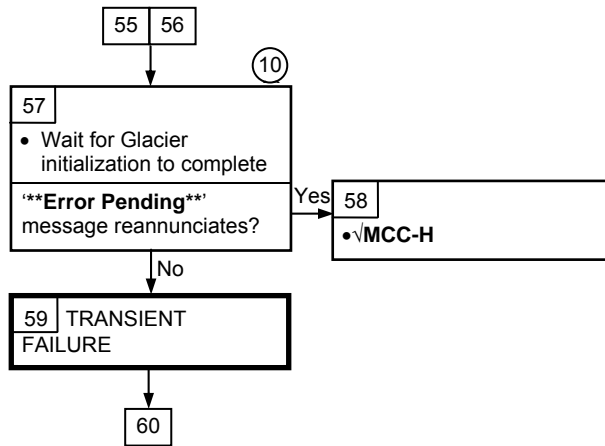


13 If parameters already set, the confirmation screen will not be displayed.



⑩ Initialization takes approximately 3 minutes and is complete when LCD Line 1 reads 'HOME'

⑬ If parameters already set, the confirmation screen will not be displayed.



⑩ Initialization takes approximately 3 minutes and is complete when LCD Line 1 reads 'HOME'

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Enable Set Point Mode

- √ MCC-H with Log Data recorded.
- On MCC-H GO**
- pb Right (EXIT) → push until reach HOME display
- pb Left (MENU) → push to access MAIN MENU display
- pb Left (NEXT) → push 3 times to access SETUP 4/5 display
- pb Center (SELECT) → push to access Temp Control 1/3 display
- pb Center (SELECT) → push to access Temp Control, Set Point Temp 1/18 display
- pb Left (NEXT) → push to access Temp Control, Control Mode 2/18 display
- pb Center (SELECT) → push to access Control Mode display
- pb Left (NEXT) → push until 'SET POINT' displayed
- pb Center (APPLY) → push to change system to 'SET POINT' mode
- pb Left (APPLY) → push to confirm 'SET POINT' mode
- Wait 1 minute
- pb Left (NEXT) → push 2 times to access 'Temp Control', 'AirMgmt Proceed 4/18' display
- pb Center (SELECT) → push to access 'AirMgmt Proceed', 'PROCEED' display
- pb Center (APPLY) → push 1 time
- √ Display Line 3 – 'PROCEED'
- pb Right (EXIT) → push until reach HOME display
- Record from front panel 'CURR TEMP':
- Contact MCC-H with recorded 'CURR TEMP'
- Monitor 'CURR TEMP' for 5 minutes to verify cooling proceeds toward 'SET POINT'.

If CURR TEMP does not proceed toward 'SET POINT'

- √ MCC-H
- Perform [GLACIER SHUTDOWN](#).
- (SODF: ASSY OPS: PAYLOADS).

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- Continue nominal operations

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If parameters already set, the confirmation screen will not be displayed.

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GLACIER FAIL TO HOLD SET POINT

(ASSY OPS/19A/FIN)

Page 1 of 9 pages

OBJECTIVE:

This procedure is required when the Glacier fails to hold set point. It performs a check of some critical parameters then directs the manual reconfiguration of some key controls as required.

Glacier 1. RECORD DATA

```
*****
*
* If Display- ***Error Pending**
*
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS: GLACIER), then:
*
*****
```

1.1 ✓Display – 'HOME'

```
*****
*
* If 'HOME' not shown:
*
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
```

1.2 Record from front panel start 'CURR TEMP', 'SET POINT', 'GPS' in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS: GLACIER)

2. CHECK STATUS OF KEY PARAMETERS

2.1 pb Left (MENU) → push (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

2.2 pb Center (SELECT) → push (one time), following appears:
'QUICK STATUS'
'Cold Head 1A 1/16'

NOTE

1. The center pushbutton (NEXT) moves to next status display.
2. The left pushbutton (PREV) moves to previous status display.

2.3 Record Cold Head 1A, Cold Head 1B, Cold Head 2A, Cold Head 2B, and CircFan Speed in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS: GLACIER)

2.4 pb Center (NEXT) → push until all data has been recorded.

2.5 pb Right (EXIT) → push until 'HOME'

2.6 ✓MCC-H to report log values from Table 3 and get direction.

2.7 Record any ground supplied data in [TABLE 2 GLACIER RESET LOG FILE](#) (SODF: ASSY OPS: PAYLOADS: GLACIER)

3. SET TEMPERATURE CONTROL MODE TO IDLE

- 3.1 pb Left (MENU) → push (one time), following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 3.2 pb Left (NEXT) → push (three times), following appears:
'MAIN MENU'
'SETUP 4/5'
- 3.3 pb Center (SELECT) → push (one time), following appears:
'SETUP'
'Temp Control 1/3'
- 3.4 pb Center (SELECT) → push (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 3.5 pb Left (NEXT) → push (one time), following appears:
'Temp Control'
'Control Mode 2/18'

NOTE

1. There are 3 options for setting the Control Mode (IDLE, SET POINT and MANUAL).
2. The left pushbutton (NEXT) changes the Mode, the center pushbutton (APPLY) selects the mode and the right pushbutton (CANCEL) returns to the previous mode.

- 3.6 pb Center (SELECT) → Press (one time), following appears:
'Control Mode'
'XXXX'
- 3.7 pb Left (NEXT) → press as required to select desired Temperature Control Mode to **IDLE**
- 3.8 pb Center (APPLY) → push (one time)
- 3.9 ✓Confirm New Control Mode = **IDLE**
- 3.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Control Mode 2/18'
- 3.11 ✓Control Mode = **IDLE**
- 3.12 pb Right (EXIT) → Press until '**HOME**' appears
4. SET SETPOINT TEMP
- 4.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

GLACIER FAIL TO HOLD SET POINT

(ASSY OPS/19A/FIN)

Page 3 of 9 pages

- 4.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'
- 4.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'
- 4.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'
'Set Point Temp 1/18'
- 4.5 pb Center (SELECT) → push (one time) following appears:
'Set Point Temp'

'XXXX.X °C'
'-160.0 to +004.0'

NOTE

1. The left pushbutton (CURSOR) moves cursor between New Set Point Temp fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases New Set Point Temp selected digit field value by 1.

- 4.6 Enter desired Set Point temperature per **MCC-H**.
- 4.7 pb Right (DONE) → push (one time)
- 4.8 ✓Confirm New Set Point = desired Set Point
- 4.9 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Set Point Temp 1/18'
- 4.10 ✓Set Point Temp = desired Set Point
- 4.11 pb Right (EXIT) → push until '**HOME**' appears

5. SET TEMP CONTROL SENSORS

- 5.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 5.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'
- 5.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'
- 5.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'

GLACIER FAIL TO HOLD SET POINT

(ASSY OPS/19A/FIN)

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'Set Point Temp 1/18'

- 5.5 pb Left (NEXT) → push (two times) following appears:
'Temp Control'
'Control Sensors 3/18'
- 5.6 pb Center (SELECT) → push (one time) following appears
'Control Sensors'
'INNER OUTLET INLET'

NOTE

1. The left pushbutton (CURSOR) moves cursor between Control Sensor fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) changes the values of the Control Sensor fields from 0 to 1 or vice versa.

- 5.7 Enter desired combination of Temp Control Sensors per **MCC-H**.
 - 5.8 pb Right (DONE) → push (one time)
 - 5.9 ✓Confirm New Control Sensors = desired Control Sensors
 - 5.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Control Sensors 3/18'
 - 5.11 ✓Control Sensors = desired Control Sensors
 - 5.12 pb Right (EXIT) → Press until '**HOME**' appears
6. SET TEMPERATURE CONTROL BANDWIDTH

- 6.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
- 6.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'
- 6.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'
- 6.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'
'Set Point Temp 1/18'
- 6.5 pb Left (NEXT) → push (four times) following appears:
'Temp Control'
'Bandwidth 5/18'
'XX.X°C'
- 6.6 pb Center (SELECT) → push (one time) following appears:

'Bandwidth'
'XX.X°C'
'00.1 TO 25.5'

NOTE

1. The left pushbutton (CURSOR) moves cursor between Bandwidth fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases Temperature Control Bandwidth selected digit field value by 1.

6.7 Enter desired Temperature Control Bandwidth per **MCC-H**

6.8 pb Right (DONE) → push (one time)

6.9 ✓Confirm New Bandwidth = desired Bandwidth

6.10 pb Left (APPLY) → Press (one time), following appears:

'Temp Control'
'Bandwidth 5/18'

6.11 ✓Bandwidth = desired Bandwidth

6.12 pb Right (EXIT) → Press until '**HOME**' appears

7. SET PRIMARY COOLER

7.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'

7.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'

7.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'

7.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'
'Set Point Temp 1/18'

7.5 pb Left (NEXT) → push (five times) following appears:
'Temp Control'
'Primary Cooler 6/18'
'COOLER X'

7.6 pb Center (SELECT) → push (one time) following appears:
'Primary Cooler'
'COOLER X'

NOTE

1. There are 2 options for Primary Cooler (COOLER 1 and COOLER 2).
2. The left pushbutton (NEXT) changes the Primary Cooler to either COOLER 1 or COOLER 2, the center pushbutton (APPLY) selects the presently displayed Primary Cooler and the right pushbutton (CANCEL) returns to the previous display.

- 7.7 pb Left (NEXT) → push as required to select desired Primary Cooler per **MCC-H**
- 7.8 pb Center (APPLY) → push (one time)
- 7.9 ✓Confirm New Primary Cooler = desired Cooler
- 7.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Primary Cooler 6/18'
- 7.11 ✓Primary Cooler = desired Cooler
- 7.12 pb Right (EXIT) → Press until '**HOME**' appears
8. SET MAXIMUM POWER DRAW SETTING
 - 8.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 - 8.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'
 - 8.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'
 - 8.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'
'Set Point Temp 1/18'
 - 8.5 pb Left (NEXT) → push (twelve times) following appears:
'Temp Control'
'Max Power Draw 13/18'
'XXX W'
 - 8.6 pb Center (SELECT) → push (one time) following appears:
'Max Power Draw'
'XXX W'
'000 to 420'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between Maximum Power Draw fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases the Maximum Power Draw selected digit field value by 1.

- 8.7 Enter desired Maximum Power Draw per **MCC-H**.
- 8.8 pb Right (DONE) → push (one time)
- 8.9 ✓Confirm New Max Power = desired Max Power Draw
- 8.10 pb Left (APPLY) → Press (one time), following appears:
'Temp Control'
'Max Power Draw 13/18'
- 8.11 ✓Max Power Draw = desired Max Power Draw
- 8.12 pb Right (EXIT) → push until **'HOME'** appears
9. SET OVER CURRENT
 - 9.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 - 9.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'
 - 9.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'
 - 9.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'
'Set Point Temp 1/18'
 - 9.5 pb Left (NEXT) → push (thirteen times) following appears:
'Temp Control'
'Over Current 14/18'
'XX.X A'
 - 9.6 pb Center (SELECT) → push (one time) following appears:
'Over Current'
'XX.X W'
'00.0 to 30.0'

GLACIER FAIL TO HOLD SET POINT

(ASSY OPS/19A/FIN)

Page 8 of 9 pages

NOTE

1. The left pushbutton (CURSOR) moves the cursor between Over Current fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases the Maximum Power Draw selected digit field value by 1.

- 9.7 Enter desired Over Current Limit per **MCC-H**.
 - 9.8 pb Right (DONE) → push (one time)
 - 9.9 ✓Confirm New Over Current = desired Over Current
 - 9.10 pb Left (APPLY) → push (one time), following appears:
'Temp Control'
'Over Current 14/18'
 - 9.11 ✓Over Current = desired Over Current
 - 9.12 pb Right (EXIT) → Press until '**HOME**' appears
10. SET TEMPERATURE CONTROL MODE
- 10.1 pb Left (MENU) → push (one time) following appears:
'MAIN MENU'
'QUICK STATUS 1/5'
 - 10.2 pb Left (NEXT) → push (three times) following appears:
'MAIN MENU'
'SETUP 4/5'
 - 10.3 pb Center (SELECT) → push (one time) following appears:
'SETUP'
'Temp Control 1/3'
 - 10.4 pb Center (SELECT) → push (one time) following appears:
'Temp Control'
'Set Point Temp 1/18'
 - 10.5 pb Left (NEXT) → push (one time) following appears:
'Temp Control'
'Control Mode 2/18'
 - 10.6 pb Center (SELECT) → push (one time), following appears:
'Control Mode'
'XXXX'

NOTE

1. There are 3 options for setting the Control Mode (IDLE, SET POINT and MANUAL).
2. The left pushbutton (NEXT) changes the Mode, the center pushbutton (APPLY) selects the mode and the right pushbutton (CANCEL) returns to the previous mode.

GLACIER FAIL TO HOLD SET POINT

(ASSY OPS/19A/FIN)

Page 9 of 9 pages

- 10.7 pb Left (NEXT) → push as required to selected desired Temperature Control Mode per **MCC-H**.
- 10.8 pb Center (APPLY) → push one time
- 10.9 ✓Confirm New Control Mode = desired Control Mode
- 10.10 pb Left (APPLY) → push (one time), following appears:
'Temp Control'
'Control Mode 2/18'
- 10.11 ✓Control Mode = desired Control Mode
- 10.12 pb Right (EXIT) → push until **'HOME'** appears.

11. CHECK GLACIER STATUS

- 11.1 ✓cb POWER – Close (It on)
- 11.2 ✓sw BATTERY – ON (It on)

11.3 ✓Display – **'HOME'**

```
*****
*
* If Display-***Error Pending**
*
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS: GLACIER), then:
*
*****
*
* If 'HOME' not shown:
*
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
```

- 11.4 ✓Display – **'CURR TEMP: XXXX.X °C' ±5.0°C** or ramping toward expected temperature.

12. RECORD END DATA

- 12.1 Record from front panel end **'CURR TEMP'**, **'SETPOINT'**, **'GPS'** in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS: GLACIER)
- 12.2 Notify **MCC-H** of logged values in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS: GLACIER)

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Glacier initialization not successfully completed when power applied during Glacier POWER UP procedure

Nominal Config:
 cb POWER- Close (It on)
 sw BATTERY-ON (It on)
 (ML86B)
 cb MNB MAR 1- Close

1 2

1 Switch to Alternate Power Source

- Contact **MCC-H** for alternate power source (fill in data below).
- _____

(Glacier)

- cb POWER → Open (It off)

(ML86B)

- cb MNB MAR 1 → Open

(ML85E)

- A/E PAYLOAD DC PWR (20') → J11

(Alternate Power Source J_)

- ✓cb _____ - Open
- ✓sw _____ - OFF
- A/E PAYLOAD DC PWR (20') → Alternate Power Source J

Next

3

2 Repower from Alternate Power Source

- (_____)
- cb _____ - Close
- sw _____ -ON

(Glacier)

- cb POWER → Close (It on)

After Initialization does display read 'HOME'?

Yes

3 PRIMARY OUTLET FAILURE

Next

4

- Record power-on time (GPS): _____
- Record power-on CURR TEMP: _____
- Record power-on SET POINT: _____
- Notify **MCC-H** of resolution and data

No

5 POSSIBLE DOWNSTREAM FAILURE

Next

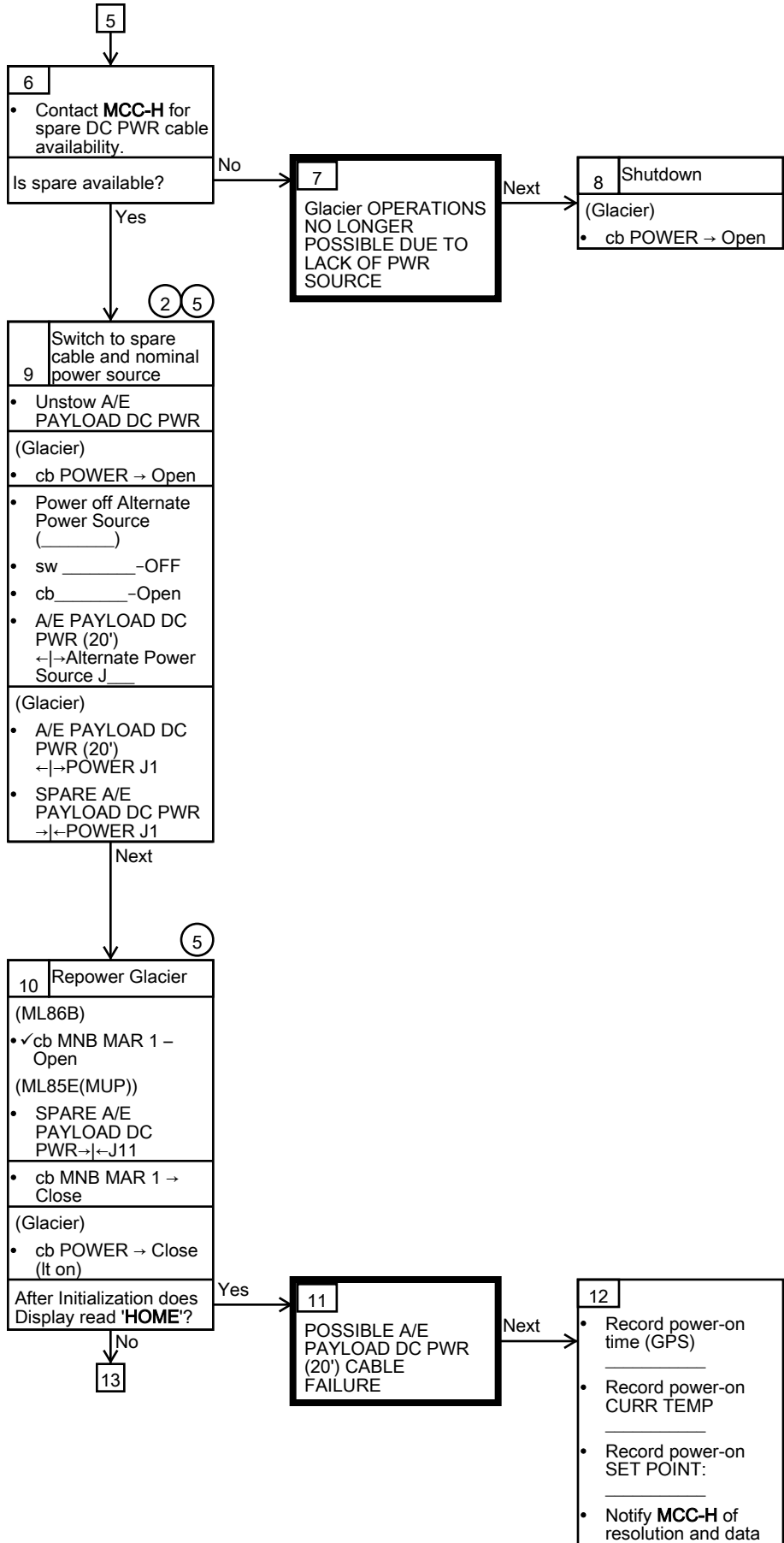
6

- 1 Always deadface DC power source when disconnecting/connecting power cable
- 2 Verify connectors are properly mated and seated securely when switching to alternate power source
- 3 Glacier will take approximately 2 min to initialize after power on; after initialization is successfully completed, LCD Line 1 will read 'HOME'

GLACIER FAIL TO REPOWER

(ASSY OPS/19A/FIN)

Page 2 of 3 pages



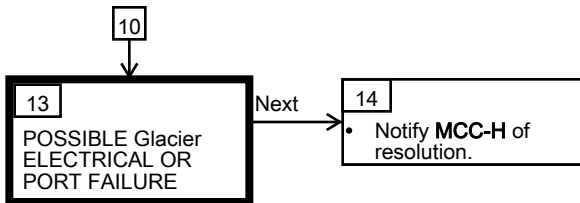
2 Verify connectors are properly mated and seated securely when switching to alternate power source

5 Alternate power source is detailed in block 1.

GLACIER FAIL TO REPOWER

(ASSY OPS/19A/FIN)

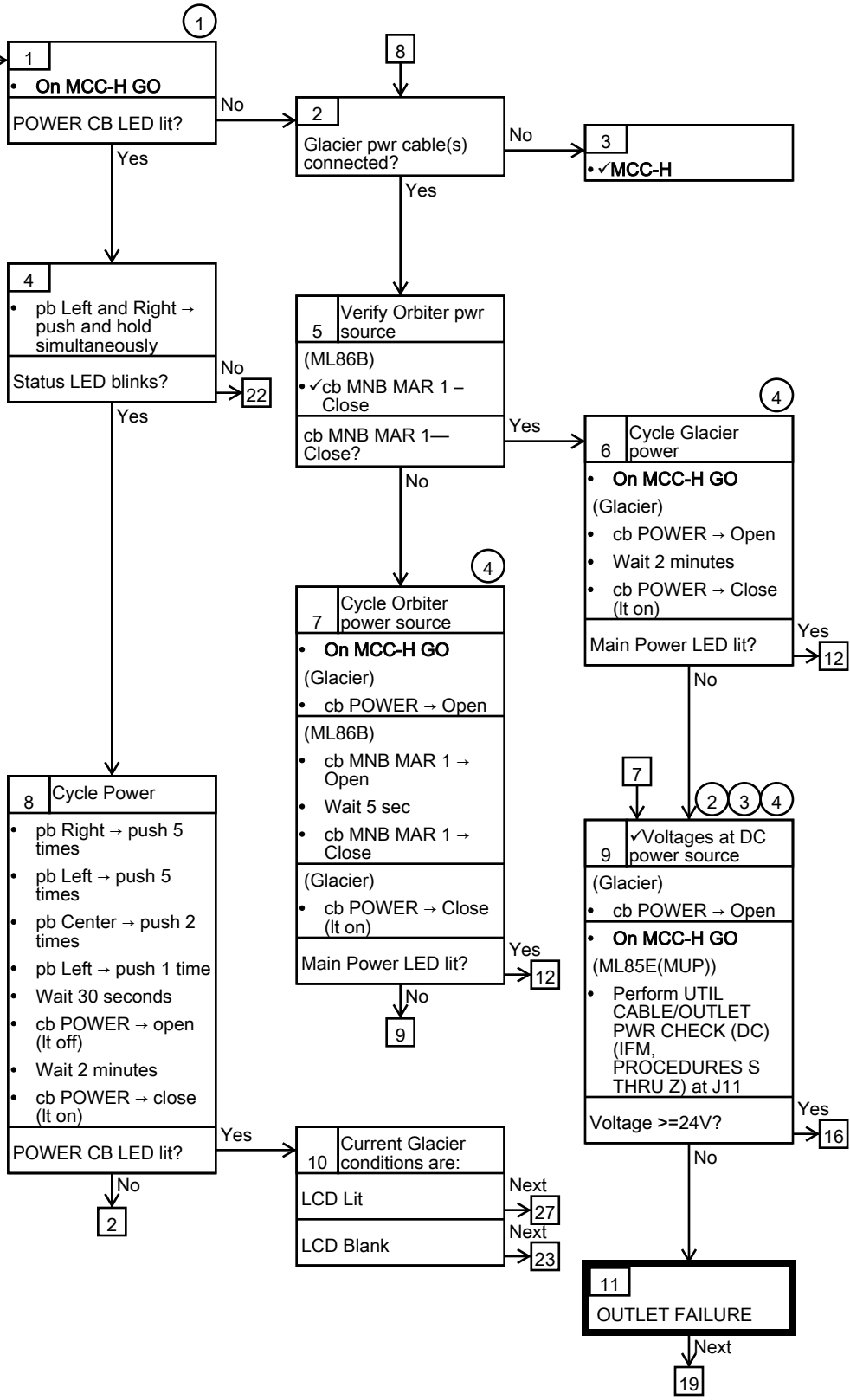
Page 3 of 3 pages



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LCD Blank

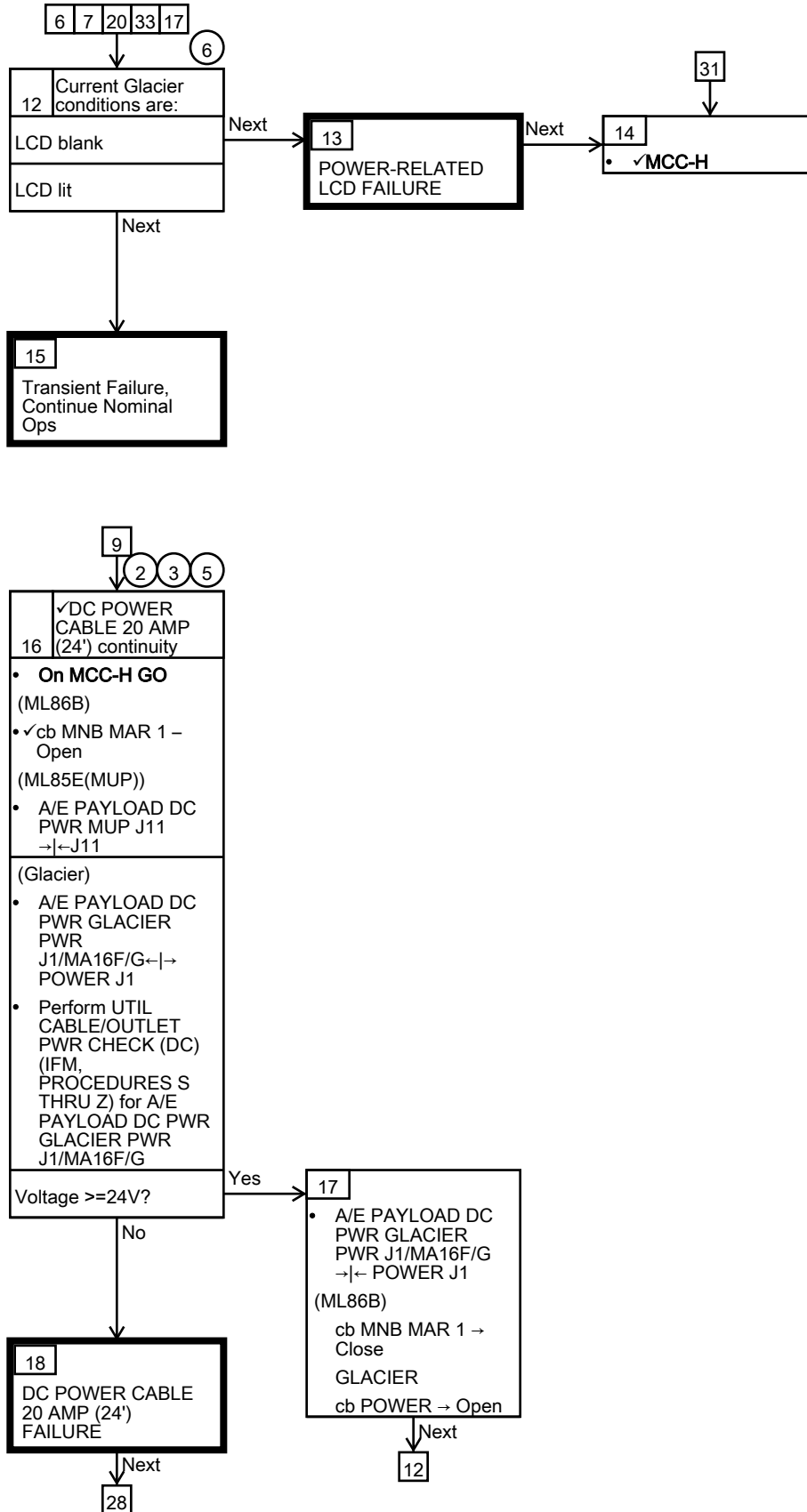
Nominal Config:
(MF28E/G)
cb POWER – Close (It on)
sw BATTERY – ON (It on)
(ML86B)
cb MNB MAR 1 – Close



- ① Fan running indicates Glacier on STS power.
- ② Always deadface DC Power source when disconnecting/connecting power cable.
- ③ Verify connectors are properly mated and seated securely.
- ④ Internal voltages require approximately 2 min to dissipate upon cb open. Dissipation complete when Power LED extinguishes.

GLACIER LCD BLANK

(ASSY OPS/19A/FIN)



- ② Always deadface DC Power source when disconnecting/connecting power cable.
- ③ Verify connectors are properly mated and seated securely.
- ⑤ Verify connectors are properly mated and seated securely when reconnecting.
- ⑥ Initialization takes approximately 2 min. Initialization is complete when LCD Line 1 reads 'HOME'.

11
2 3 4 5

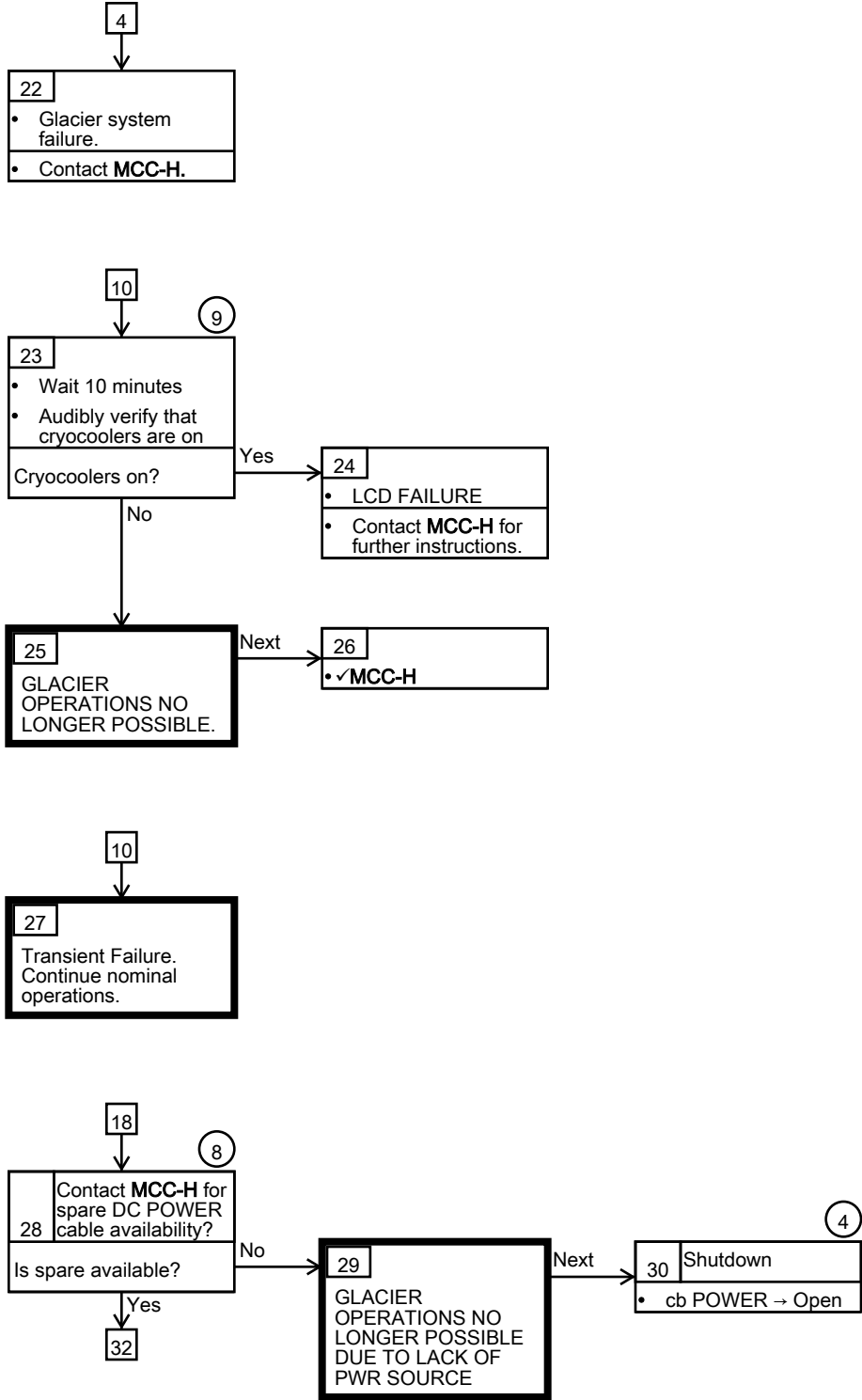
19	Switch to Alternate Power Source
<ul style="list-style-type: none"> Contact MCC-H for alternate power source (Fill in data below) 	
(Glacier)	
<ul style="list-style-type: none"> cb POWER → Open 	
(ML86B)	
<ul style="list-style-type: none"> ✓cb MNB MAR 1 – Open 	
(ML85E(MUP))	
<ul style="list-style-type: none"> ✓A/E PAYLOAD DC PWR MUP J11 ← →J11 	
<ul style="list-style-type: none"> Alternate Power source (_____) J_ ✓cb _____ Open _____ ✓sw _____ —OFF _____ 	
<ul style="list-style-type: none"> ✓A/E PAYLOAD DC PWR GLACIER PWR J1/MA16F/G→ ← POWER J1 A/E PAYLOAD DC PWR GLACIER PWR J1/MA16F/G → ←Alternate Power Source J_ 	

Next

2 5

20	Repower from Alternate Power Source
<ul style="list-style-type: none"> (_____) cb _____ Close sw _____ ON 	
(Glacier)	
<ul style="list-style-type: none"> cb POWER → Close (It on) 	
Main Power LED lit?	
No	Yes → 12
<div style="border: 2px solid black; padding: 5px; display: inline-block;"> 21 SYSTEM FAILURE </div>	
Next	
31	

- 2 Always deadface DC Power source when disconnecting/ connecting power cable.
- 3 Verify connectors are properly mated and seated securely.
- 4 Internal voltages require approximately 2 min to dissipate upon cb open. Dissipation complete when Power LED extinguishes.
- 5 Verify connectors are properly mated and seated securely when reconnecting.



4 Internal voltages require approximately 2 min to dissipate upon cb open. Dissipation complete when Power LED extinguishes.

8 Spare Cable stowed in IFM Contingency Hose and Cable Kit (CHCK).

9 Glacier will return to previous state approximately 3 minutes after initialization.

21

31	Turn off system
<ul style="list-style-type: none"> • On MCC-H GO • cb POWER → Open (It off) 	
<ul style="list-style-type: none"> • Alternate Power source () J_ • ✓cb Open • ✓sw —OFF 	

Next

14

28

2 3 4

32	Switch to spare cable
<ul style="list-style-type: none"> • Unstow spare DC POWER cable 	
(Glacier)	
<ul style="list-style-type: none"> • cb POWER → Open 	
(ML86B)	
<ul style="list-style-type: none"> • ✓cb MNB MAR 1 – Open 	
(ML85E(MUP))	
<ul style="list-style-type: none"> • A/E PAYLOAD DC PWR MUP J11 → ←J11 • SPARE DC POWER CABLE → ←J11 	
(Glacier)	
<ul style="list-style-type: none"> • ✓A/E PAYLOAD DC PWR GLACIER PWR J1/MA16F/G → ←POWER J1 • SPARE DC PWR CABLE → ←POWER J1 	

Next

33	Repower Glacier
(ML86B)	
<ul style="list-style-type: none"> • cb MNB MAR 1 → Close 	
(Glacier)	
<ul style="list-style-type: none"> • cb POWER → Close (It on) 	
Main Power LED lit?	

Yes

12

No

34

2

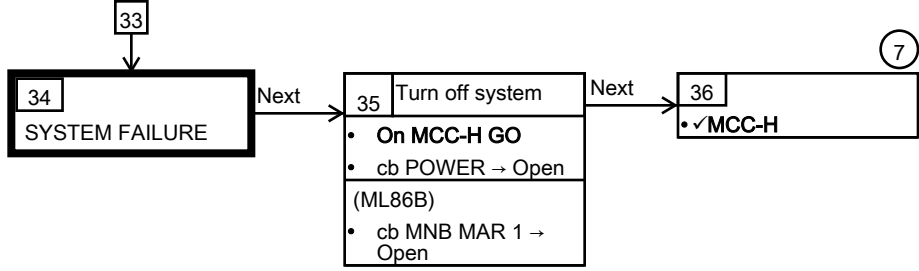
Always deadface DC Power source when disconnecting/connecting power cable.

3

Verify connectors are properly mated and seated securely.

4

Internal voltages require approximately 2 min to dissipate upon cb open. Dissipation complete when Power LED extinguishes.



7
The Glacier payload may continue to function if LCD fails.

GLACIER RECORD CRYOGENIC DIAGNOSTIC DATA

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

OBJECTIVE:

The following steps allow the recording of some Glacier data for diagnostic purposes.

```
*****
*
* If Display – ***Error Pending**:
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
```

1. RECORDING DATA

- 1.1 ✓MCC-H for parameters to record in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

Glacier

- 1.2 ✓DISPLAY – 'HOME'

```
*****
*
* If 'HOME' not shown:
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
```

2. RECORDING CRYOGENIC STATUS

- 2.1 Record from front panel 'CURR TEMP', 'SET POINT', and 'GPS' in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

- 2.2 pb Left (MENU) → push (one time), following appears:

'MAIN MENU'
'QUICK STATUS 1/5'

- 2.3 pb Left (NEXT) → push (one time), following appears:

'MAIN MENU'
'STATUS 2/5'

- 2.4 pb Center (SELECT) → push (one time), following appears:

'STATUS'
'Cryogenic 1/3'

- 2.5 pb Center (SELECT) → push (one time), following appears:

'Cryogenic'
'Cooler 1 Stroke 1/21'
'XX'

NOTE

1. The center pushbutton (NEXT) moves to next status display.
2. The left pushbutton (PREV) moves to previous status display.

- 2.6 Record Cryogenic data per **MCC-H** direction in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).
- 2.7 pb Center (NEXT) → press until all Cryogenic Status data has been recorded per **MCC-H** direction
- 2.8 pb Right (EXIT) → push until '**HOME**'
- 2.9 Notify **MCC-H** to report log values from [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

GLACIER RECORD QUICK DIAGNOSTIC DATA

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

OBJECTIVE:

The following steps allow the recording of some Glacier data for diagnostic purposes.

```
*****
*
* If Display – ***Error Pending**:
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
```

1. RECORDING DATA

- 1.1 ✓MCC-H for parameters to record in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

Glacier

- 1.2 ✓Display – 'HOME'

```
*****
*
* If 'HOME' not shown:
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
```

2. RECORDING QUICK STATUS

- 2.1 Record from front panel 'CURR TEMP', 'SET POINT', and 'GPS' in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

- 2.2 pb Left (MENU) → push (one time), following appears:

'MAIN MENU'
'QUICK STATUS 1/5'

- 2.3 pb Center (SELECT) → push (one time), following appears:

'QUICK STATUS'
'Cold Head 1A 1/16'

NOTE

1. The center pushbutton (NEXT) moves to next status display.
2. The left pushbutton (PREV) moves to previous status display.

- 2.4 Record Quick Status data per MCC-H direction in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

GLACIER RECORD QUICK DIAGNOSTIC DATA

(ASSY OPS/19A/FIN)

Page 2 of 2 pages

- 2.5 pb Center (NEXT) → push until all Quick Status data has been recorded per **MCC-H** direction.
- 2.6 pb Right (EXIT) → push until '**HOME**'
- 2.7 Notify **MCC-H** to report log values from [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

OBJECTIVE:

The following steps allow the recording of some Glacier data for diagnostic purposes.

```
*****
*
* If Display – ***Error Pending***:
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
```

1. RECORDING DATA

1.1 ✓MCC-H for parameters to record in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

Glacier

1.2 ✓DISPLAY – 'HOME'

```
*****
*
* If 'HOME' not shown:
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
```

2. RECORDING RESOURCES STATUS

2.1 Record from front panel 'CURR TEMP', 'SET POINT', and 'GPS' in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

2.2 pb Left (MENU) → push (one time), following appears:
 'MAIN MENU'
 'QUICK STATUS 1/5'

2.3 pb Left (NEXT) → push (one time), following appears:
 'MAIN MENU'
 'STATUS 2/5'

2.4 pb Center (SELECT) → push (one time), following appears:
 'STATUS'
 'Cryogenic 1/3'

2.5 pb Left (NEXT) → push (one time), following appears:
 'STATUS'
 'Resources 2/3'

2.6 pb Center (SELECT) → push (one time), following appears:
 'Resources'

'AAA Outlet 1/8'
'XX.X° C'

NOTE

1. The center pushbutton (NEXT) moves to next status display.
2. The left pushbutton (PREV) moves to previous status display.

- 2.7 Record Resource data per **MCC-H** direction in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).
- 2.8 pb Center (NEXT) → push until all Resource data has been recorded per **MCC-H** direction.
- 2.9 pb Right (EXIT) → push until '**HOME**'
- 2.10 Notify **MCC-H** to report log values from [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

OBJECTIVE:

The following steps allow the recording of some Glacier data for diagnostic purposes.

```

*****
*
* If Display – ***Error Pending***:
*
* | Perform GLACIER ERROR MESSAGE (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
  
```

1. RECORDING DATA

- 1.1 ✓MCC-H for parameters to record in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

Glacier

- 1.2 ✓DISPLAY – 'HOME'


```

*****
*
* If 'HOME' not shown:
*
* | pb Right (EXIT) → push until 'HOME' appears
*
*****
      
```

2. RECORDING SYSTEM STATUS

- 2.1 Record from front panel 'CURR TEMP', 'SET POINT', and 'GPS' in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).
- 2.2 pb Left (MENU) → push (one time), following appears:
 'MAIN MENU'
 'QUICK STATUS 1/5'
- 2.3 pb Left (NEXT) → push (one time), following appears:
 'MAIN MENU'
 'STATUS 2/5'
- 2.4 pb Center (SELECT) → push (one time), following appears:
 'STATUS'
 'Cryogenic 1/3'
- 2.5 pb Left (NEXT) → push (two times), following appears:
 'STATUS'

'System 3/3'

2.6 pb Center (SELECT) → push (one time), following appears:

'System'

'CPU 1/9'

'XX.X° C'

NOTE

1. The center pushbutton (NEXT) moves to next status display.
2. The left pushbutton (PREV) moves to previous status display.

- 2.7 Record System Status data per **MCC-H** direction in [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).
- 2.8 pb Center (NEXT) → push until all System Status data has been recorded per **MCC-H** direction.
- 2.9 pb Right (EXIT) → push until '**HOME**'
- 2.10 Notify **MCC-H** to report log values from [TABLE 3 GLACIER DIAGNOSTIC LOG FILE](#) (SODF: ASSY OPS: PAYLOADS).

TABLE 1 GLACIER ERROR MESSAGE LOG

(ASSY OPS/19A/FIN) Page 1 of 3 pages

Table 1-1 Glacier Error Log File

GMT	Error Message	Error Event	Error Status
Hours: Minutes: Seconds	Text	X of Total Number	(IP) INACTIVE / PENDING (AP) ACTIVE / PENDING (IA) INACTIVE / ACK (AA) ACTIVE / ACK (R) RESET
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____
__ : __ : __	_____	__ / __	_____

TABLE 1 GLACIER ERROR MESSAGE LOG

(ASSY OPS/19A/FIN) Page 2 of 3 pages

Possible Glacier Error Messages:

- (1) 'N/A' (Ground Message Only)
- (2) 'Water Flow Range'
- (3) 'Water Temp Range'
- (4) 'AAA Air Temp'
- (5) 'Voltage Range'
- (6) 'Current Range'
- (7) 'RIC Comm Loss'
- (8) 'Over Temp'
- (9) 'Hardware Error'
- (10) 'Bandwidth'

Table 1-2 (002) Water Flow Range/(003) Water Temp Range Error Data

Sensor	Value	Units
Outlet Water		°C
Inlet Water		°C
Flow Rate		kg/h

Table 1-3 (004) AAA Air Temp Error Data

Sensor	Value	Units
AAA Outlet		°C
AAA Inlet 1		°C
AAA Inlet 2		°C

Table 1-4 (005) Voltage Range/(006) Current Range Error Data

Sensor	Value	Units
Main Current		Amperes
Main Voltage		Volts
Over Current		Amperes

TABLE 1 GLACIER ERROR MESSAGE LOG

(ASSY OPS/19A/FIN) Page 3 of 3 pages

Table 1-5 (008) Over Temp Error Data

Sensor	Value	Units
CPU		°C
Capacitors A		°C
Capacitors B		°C
Data Logger		°C

Table 1-6 Bandwidth Error Data

Parameter	Value	Units
CURR TEMP		°C
SET POINT		°C
GPS		HH:MM:SS
Cold Head 1A		°C
Cold Head 1B		°C
Cold Head 2A		°C
Cold Head 2B		°C
Circ Fan Speed		RPM

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TABLE 2 GLACIER RESET LOG FILE

(ASSY OPS/19A/FIN)

Page 1 of 5 pages

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Parameter		Event 1	Event 2	Definition or Options
1	CURR TEMP	Start ____ °C End ____ °C	Start ____ °C End ____ °C	GLACIER Current Temperature XXXX.XX °C
2	SET POINT	Start ____ °C End ____ °C	Start ____ °C End ____ °C	-160.0 to +4.0° C
3	GPS	Start ____:____:____ GPS End ____:____:____ GPS	Start ____:____:____ GPS End ____:____:____ GPS	Hours: Min: Sec
4	Expected CURR TEMP	____ °C	____ °C	Expected Glacier Current Temperature per MCC-H (-160.0 to +4.0° C)
5	Expected SET POINT	____ °C	____ °C	Expected Set Point Temperature per MCC-H (-160.0 to +4.0° C)
Values for Reconfiguration of Setup: Temperature Control:				
6	Set Point Temp	____ °C	____ °C	-160.0 to +4.0° C

TABLE 2 GLACIER RESET LOG FILE
 (ASSY OPS/19A/FIN) Page 2 of 5 pages

184

Parameter		Event 1	Event 2	Definition or Options
7	Control Mode	IDLE <input type="checkbox"/> SET POINT <input type="checkbox"/> MANUAL <input type="checkbox"/>	IDLE <input type="checkbox"/> SET POINT <input type="checkbox"/> MANUAL <input type="checkbox"/>	
8	Control Sensors	INNER <input type="checkbox"/> OUTLET <input type="checkbox"/> INLET <input type="checkbox"/>	INNER <input type="checkbox"/> OUTLET <input type="checkbox"/> INLET <input type="checkbox"/>	
9	AirMgmt Proceed	PROCEED <input type="checkbox"/>	PROCEED <input type="checkbox"/>	
10	Bandwidth	____. ____ °C	____. ____ °C	00.1 to 25.5° C
11	Primary Cooler	COOLER 1 <input type="checkbox"/> COOLER 2 <input type="checkbox"/>	COOLER 1 <input type="checkbox"/> COOLER 2 <input type="checkbox"/>	
12	Cooler 1 Stroke	____	____	03 to 63

TABLE 2 GLACIER RESET LOG FILE
 (ASSY OPS/19A/FIN) Page 3 of 5 pages

185

Parameter	Event 1	Event 2	Definition or Options
13 Cooler 1 State	ON <input type="checkbox"/> OFF <input type="checkbox"/>	ON <input type="checkbox"/> OFF <input type="checkbox"/>	
14 Cooler 2 Stroke	_____	_____	03 to 63
15 Cooler 2 State	ON <input type="checkbox"/> OFF <input type="checkbox"/>	ON <input type="checkbox"/> OFF <input type="checkbox"/>	
16 Heater 1 Duty	_____ %	_____ %	Percent Duty Cycle
17 Heater 2 Duty	_____ %	_____ %	Percent Duty Cycle
18 Max Power Draw	_____ W	_____ W	Max Watts
19 Over Current	_____ A	_____ A	Over Current Ampere
20 AAA Fan Mode	AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/>	AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/>	

TABLE 2 GLACIER RESET LOG FILE
 (ASSY OPS/19A/FIN) Page 4 of 5 pages

186

Parameter		Event 1	Event 2	Definition or Options
21	AAA Fan State	LOW <input type="checkbox"/>	LOW <input type="checkbox"/>	
		HIGH <input type="checkbox"/>	HIGH <input type="checkbox"/>	
22	Heat Rejection	AIR <input type="checkbox"/>	AIR <input type="checkbox"/>	
		WATER <input type="checkbox"/>	WATER <input type="checkbox"/>	
Values for Reconfiguration of Setup: Air Management				
23	Air Mgmt Mode	AUTOMATIC <input type="checkbox"/>	AUTOMATIC <input type="checkbox"/>	
		MANUAL <input type="checkbox"/>	MANUAL <input type="checkbox"/>	
24	Humidity Config	Pump: 1 2 <input type="checkbox"/> <input type="checkbox"/> Valve: 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pump: 1 2 <input type="checkbox"/> <input type="checkbox"/> Valve: 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
25	Pressure Config	Pump: 1 2 <input type="checkbox"/> <input type="checkbox"/> Valve: 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pump: 1 2 <input type="checkbox"/> <input type="checkbox"/> Valve: 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
26	Manual Config	Pump: 1 2 <input type="checkbox"/> <input type="checkbox"/> Valve: 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pump: 1 2 <input type="checkbox"/> <input type="checkbox"/> Valve: 1 2 3 4 <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	

TABLE 2 GLACIER RESET LOG FILE
 (ASSY OPS/19A/FIN) Page 5 of 5 pages

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Parameter		Event 1	Event 2	Definition or Options
27	Start Humidity	_____ Seconds	_____ Seconds	00000 to 65535 Seconds
28	Start Pressure	_____ Seconds	_____ Seconds	00000 to 65535 Seconds
29	Circ Fan Mode	AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/>	AUTOMATIC <input type="checkbox"/> MANUAL <input type="checkbox"/>	
30	Circ Fan Power	_____ %	_____ %	000 to 100 %
31	Data Storage	_____ Seconds	_____ Seconds	0 to 3600 seconds
32	Ethernet Addr	____ . ____ . ____ . ____	____ . ____ . ____ . ____	TCP IP Address
33	Function Code	_____ Hex Value	_____ Hex Value	0x000A to 0xFFFE Hex Value
34	RIC Port	_____	_____	6212 to 6999
35	Remote Command	ENABLE <input type="checkbox"/> INHIBIT <input type="checkbox"/>	ENABLE <input type="checkbox"/> INHIBIT <input type="checkbox"/>	

Note: These items may need to be entered for multiple events.

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TABLE 3 GLACIER DIAGNOSTIC LOG FILE

(ASSY OPS/19A/FIN)

Page 1 of 3 pages

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Parameter		Definition	Event 1	Event 2	Event 3	Event 4
HOME MENU (Front panel)						
1	CURR TEMP	Current Temperature °C		Start: End:	Start: End:	Start: End:
2	SET POINT	Set Point °C		Start: End:	Start: End:	Start: End:
3	GPS	Hours: Minutes: Seconds		Start: ____:____:____ End: ____:____:____	Start: ____:____:____ End: ____:____:____	Start: ____:____:____ End: ____:____:____
QUICK STATUS						
1	Cold Head 1A	Temperature °C				
2	Cold Head 1B	Temperature °C				
3	Cold Head 2A	Temperature °C				
4	Cold Head 2B	Temperature °C				
5	Cold Vol Outlet	Temperature °C				
6	Cold Vol Inlet	Temperature °C				
7	Cold Vol Inner	Temperature °C				
8	Cold Vol DeltaP	psi				
9	Outlet Water	Temperature °C				
10	Inlet Water	Temperature °C				
11	Humidity 1	% Humidity				
12	Humidity 2	% Humidity				
13	Circ Fan Speed	RPM				
14	Battery	0 to greater than 9 Volts				
15	Main Current	0 to 20 Amps				
16	Total Run Time	Hours: Minutes: Seconds				

TABLE 3 GLACIER DIAGNOSTIC LOG FILE

(ASSY OPS/19A/FIN)

Page 2 of 3 pages

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Parameter		Definition	Event 1	Event 2	Event 3	Event 4
STATUS: Cryogenic						
1	Cooler 1 Stroke					
2	Cooler 2 Stroke					
3	HX 1	Heat Exchanger Temperature °C				
4	HX 2	Heat Exchanger Temperature °C				
5	Cold Head 1A	Temperature °C				
6	Cold Head 1B	Temperature °C				
7	Cold Head 2A	Temperature °C				
8	Cold Head 2B	Temperature °C				
9	Cold Vol Outlet	Temperature °C				
10	Cold Vol Inlet	Temperature °C				
11	Cold Vol Outer	Temperature °C				
12	Cold Vol Inner	Temperature °C				
13	Vac Jacket 1	Torr				
14	Vac Jacket 2	Torr				
15	Heat Sink	Temperature °C				
16	Col Vol Vac 1	Torr				
17	Col Vol Vac 2	Torr				
18	Circ Fan Speed	RPM				
19	Heater 1 Power	%				
20	Heater 2 Power	%				
21	Circ Fan Power	%				

TABLE 3 GLACIER DIAGNOSTIC LOG FILE

(ASSY OPS/19A/FIN)

Page 3 of 3 pages

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Parameter	Definition	Event 1	Event 2	Event 3	Event 4
STATUS: Resources					
1	AAA Outlet	Temperature °C			
2	AAA Inlet 1	Temperature °C			
3	AAA Inlet 2	Temperature °C			
4	Outlet Water	Temperature °C			
5	Inlet Water	Temperature °C			
6	Water Flow	kg/h			
7	Main Current	Amps			
8	Main Voltage	Volts			
STATUS: System					
1	CPU	Temperature °C			
2	Capacitors A	Temperature °C			
3	Capacitors B	Temperature °C			
4	Data Logger	Temperature °C			
5	Battery	Volts			
6	Total Run Time	Hours: Minutes: Seconds			
7	Glacier Version	##.## Day/Month/Year Hour: Minutes			
8	Logger Version	##.## Day/Month/Year Hour: Minutes			
9	Circ Fan Version	##.## Day/Month/Year Hour: Minutes			

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MERLIN 19A PACK FOR RETURN

OBJECTIVE:

One Double Coldbag will be used to transfer JAXA samples from MELFI and MELFI-2 to Shuttle middeck MERLIN. The samples will be packed in the MERLIN Pouch Assembly, which will be installed in MERLIN. This activity is performed by ISS and shuttle crewmembers.

PARTS:

Double Coldbag S/N #####

White Gloves

ITEMS TO UNSTOW WITHIN PROCEDURE:

Ice Brick +4° C (unstow steps 1)

Space Seed (six KFTs) with plant chambers (four) (unstow step 2)

Myco Collection Kits (two) (unstow step 3)

NOTE

During or following this procedure, an *****Error Pending***** message may be annunciated on the MERLIN Display due to a **'PIDT Bandwidth'** error which is an internal temperature drift from opening the MERLIN door and/or inserting the samples.

MF71E
(MERLIN)

1. REMOVING MERLIN POUCH ASSEMBLY

```
*****
*
* If Display - ***Error Pending*** prior to step 1.3
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY
* | OPS: PAYLOADS), then:
*
*
* If Display ***Error Pending*** after step 1.3
* | Complete procedure, then
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY
* | OPS: PAYLOADS), then:
*
*****
```

1.1 Verify **'CURR TEMP'** +4.0 ±2° C.

MERLIN 19A PACK FOR RETURN

(ASSY OPS/19A/FIN/MULTI E)

Page 2 of 6 pages

*
* If 'HOME DISPLAY' not shown
* | pb Right (EXIT) → Press until appears
*

- 1.2 Record MET for MERLIN door open:
(MET): _____
- 1.3 Open MERLIN locker door.
- 1.4 Remove MERLIN Pouch/Tray Assembly.
- 1.5 Close MERLIN locker door.
- 1.6 Temporarily stow MERLIN Pouch/Tray Assembly near MERLIN.

CAUTION
Minimize exposure of MELFI trays, frozen Icepacs, and samples to ambient air to prevent increased sample temperatures.

JPM1D4
(MELFI)

2. REMOVE ICE BRICK FROM MELFI
 - 2.1 Retrieve Double Coldbag (S/N #####) and temp stow near MELFI.
 - 2.2 Don White Gloves.

WARNING
White Gloves must be worn when manipulating cold trays or samples.

- 2.3 Remove Ice Bricks (two) +4°C from Dewar TBD, Tray TBD, Section TBD.
Lay Ice Bricks in Double Coldbag.

NOTE
Sample exposure to ambient environment, in steps 3 and 4, should be no greater than TBD minutes. This time interval begins when the first sample is exposed to ambient temperature and ends with the last sample being placed inside the Double Coldbag.

3. MELFI SAMPLE REMOVAL
 - 3.1 Quickly remove Space Seed KFT (six) with plant chambers (four) from Dewar 4, Tray D, Section 3, 4, placing them in the Double Coldbag.
 - 3.2 Transfer Double Coldbag to MELFI-2.

LAB1S2
(MELFI 2)

4. MELFI-2 SAMPLE REMOVAL

11 NOV 09

MERLIN 19A PACK FOR RETURN

(ASSY OPS/19A/FIN/MULTI E)

Page 3 of 6 pages

4.1 Quickly remove Myco Collection Kits (two) from Dewar 4, Tray B, Section 3, 4, placing them in the Double Coldbag.

4.2 Transfer Double Coldbag to Shuttle middeck MERLIN.

MF71E
(MERLIN)

5. POUCH/TRAY INSTALLATION AND CONFIGURE FOR DESCENT

5.1 Open MERLIN Pouch Assembly, leaving the Pouch and D-ring assemblies attached to the Tray with Velcro.

5.2 Remove samples from Double Coldbag and pack in MERLIN Pouch Assembly. Refer to Figure 1.

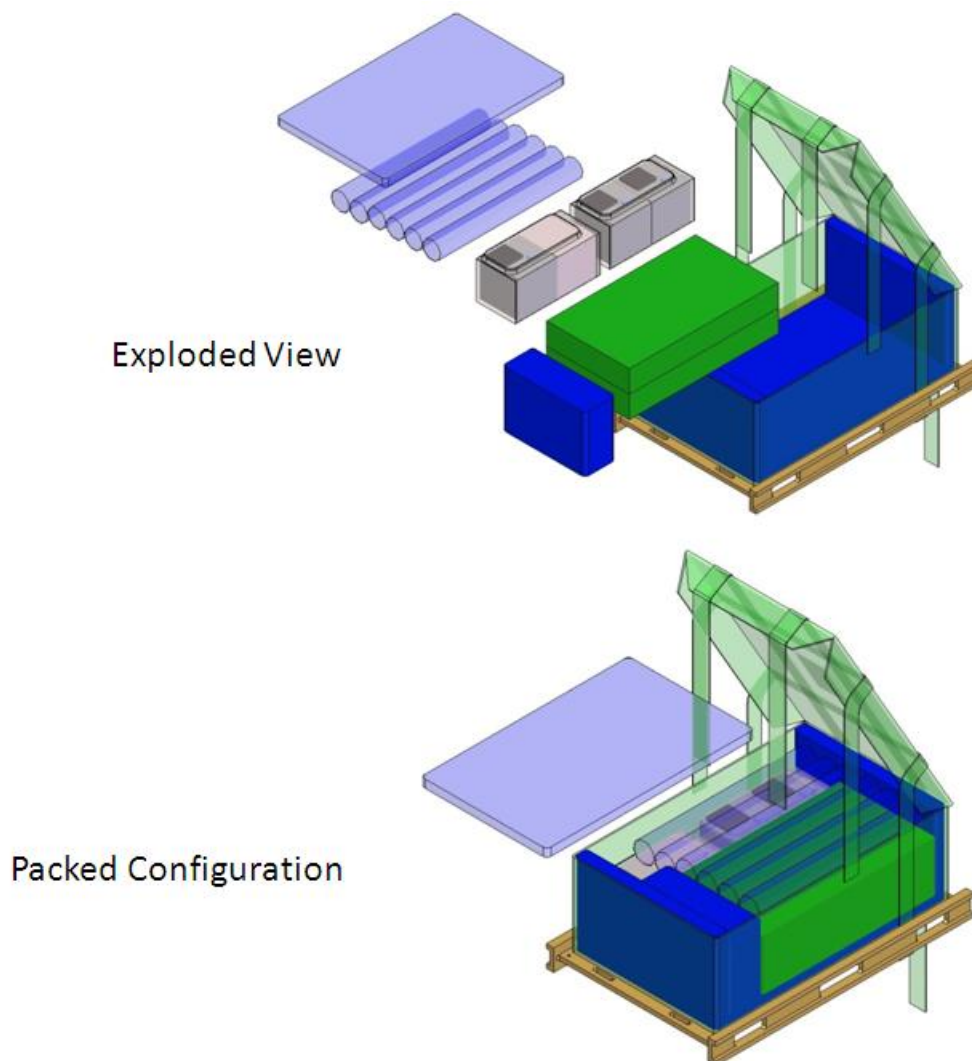


Figure 1. MERLIN Descent Packing Configuration

5.3 The foam closeout shown in Figure 1 may be used at crew discretion. Discard on-orbit if not used.

5.4 Doff White Gloves.

MERLIN 19A PACK FOR RETURN

(ASSY OPS/19A/FIN/MULTI E)

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- 5.5 Temporarily stow Double Coldbag.
- 5.6 Secure pouch to the tray using the straps and D-ring assembly. Refer to Figure 2.



Figure 2. MERLIN Pouch Assembly Strapped

MF71E
(MERLIN)

- 5.7 Open MERLIN locker door.
- 5.8 Slide Pouch/Tray Assembly into MERLIN using bottom slider rails of internal volume, with label facing outward. Refer to Figure 3.

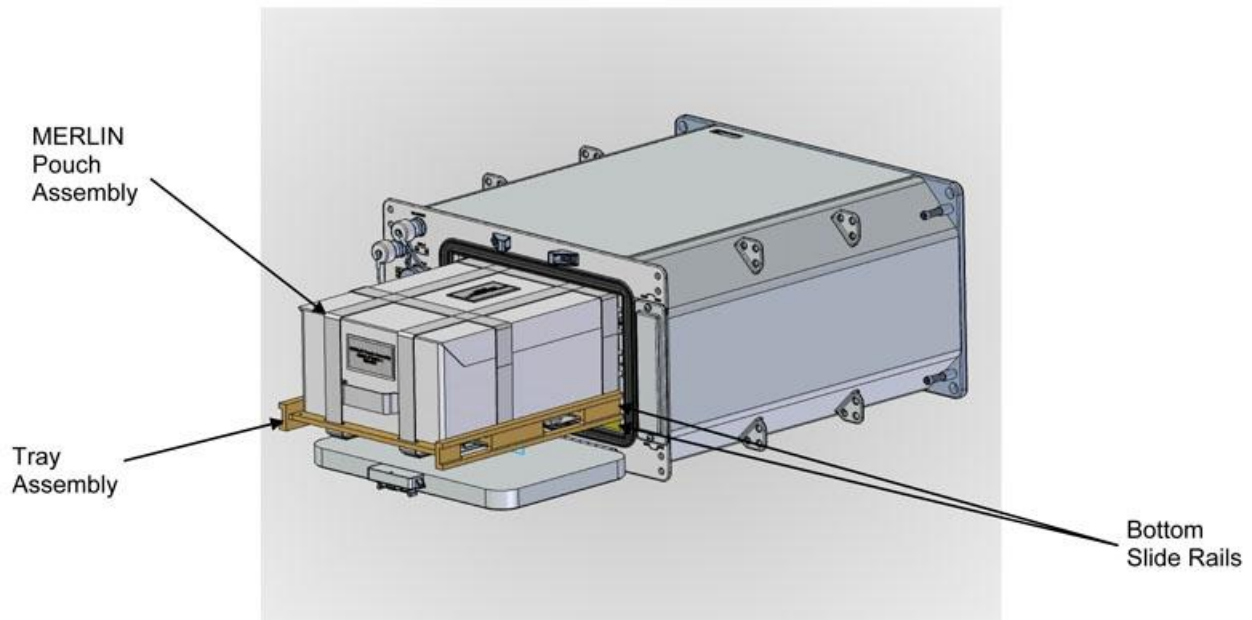


Figure 3. MERLIN Pouch Assembly Installed into MERLIN

- 5.9 Lock tray in place by using MERLIN restraint mechanisms on both sides of internal volume. Refer to Figures 4 and 5. Press restraint button flush on each side of internal volume.

Verify each slide lever went to up locked position.
Press down on each slide lever.
Verify restraint button out position.

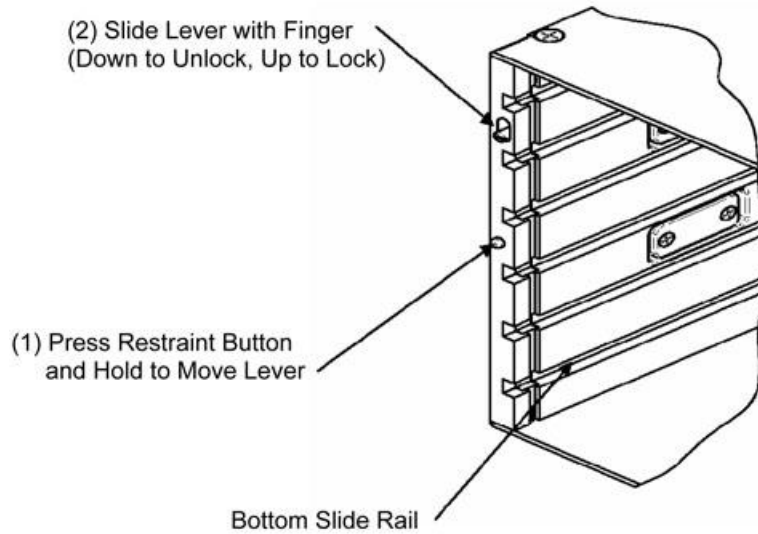


Figure 4. Payload Retainer



Unlocked

Interim Locked
Restraint Button Flush

Locked
Restraint Button Out

Figure 5. MERLIN Payload Retainer Latch

- 5.10 Close MERLIN locker door.
- 5.11 Verify locker door finger latches are fully spread apart and locking flap is positioned between finger latches. Refer to Figure 6.

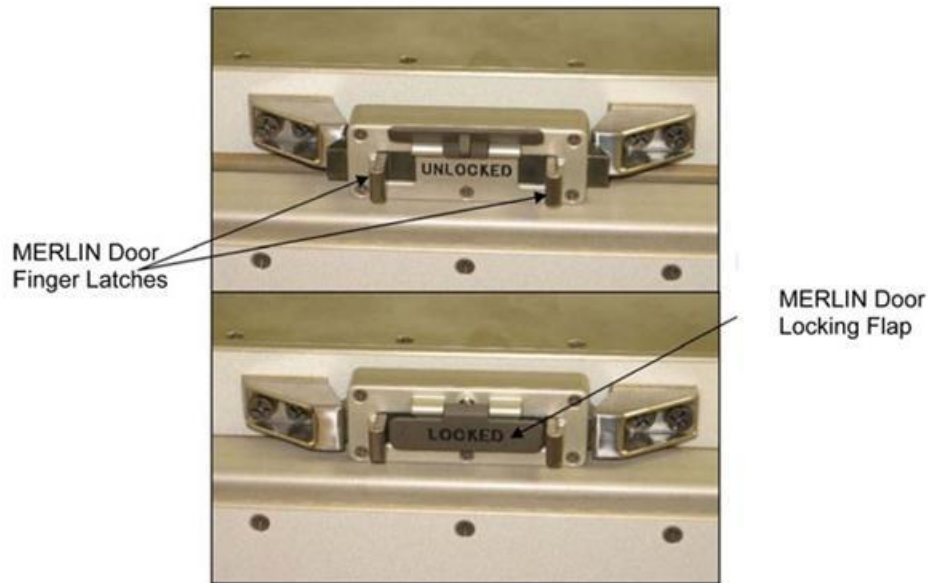


Figure 6. MERLIN Door Lock Mechanism

5.12 Record insertion of Pouch Assembly into MERLIN:

(MET): _____

5.13 ✓Display – 'HOME DISPLAY'

```

*****
*
* If 'HOME DISPLAY' not shown
* | pb Right (EXIT) → Press until appears
*
*****
    
```

5.14 Verify 'SP TEMP:' = '+04.0 C'

5.15 Record 'CURR TEMP': _____

5.17 Remove Ice Bricks (two) from Double Coldbag and place in temp stowage location to dry. Temporarily stow Double Coldbag in a location protected from kick loads.

5.18 Notify **MCC-H** of recorded MET in step 1.2 and step 5.12, CURR TEMP from step 5.15, dry out location for Ice Bricks, location of Double Coldbag, and any off-nominal conditions.

5.19 Stow materials and discard excess foam in trash.

OBJECTIVE:

Remove MERLIN POUCH ASSEMBLY from MERLIN and transport to CBEF. Remove Neuro Rad samples and provide to ISS crew for installation into the CBEF. Transfer and install MERLIN POUCH ASSEMBLY back into MERLIN and reprogram the MERLIN to +4 °C.

PARTS:

White Gloves

NOTE

During or following this procedure, an *****Error Pending***** message may be annunciated on the MERLIN Display due to a **'PIDT Bandwidth'** error which is an internal temperature drift from opening the MERLIN door.

```
*****
*
* If Display - ***Error Pending*** prior to step 1.3
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:
* | PAYLOADS), then:
*
* If Display ***Error Pending*** after step 1.3
* | Complete procedure, then
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
```

MF71E
(MERLIN)

1. REMOVING MERLIN POUCH ASSEMBLY

- 1.1 Verify **'CURR TEMP'** between $+37.0 \pm 1^\circ \text{C}$.


```
*****
*
* If 'HOME DISPLAY' not shown
* | pb Right (EXIT) → Press until appears
*
*****
```
- 1.2 Record MET for MERLIN door open:
(MET): _____
- 1.3 Open MERLIN locker door.
- 1.4 Unlock MERLIN payload retainer on each side.
Refer to figures 1 and 2.

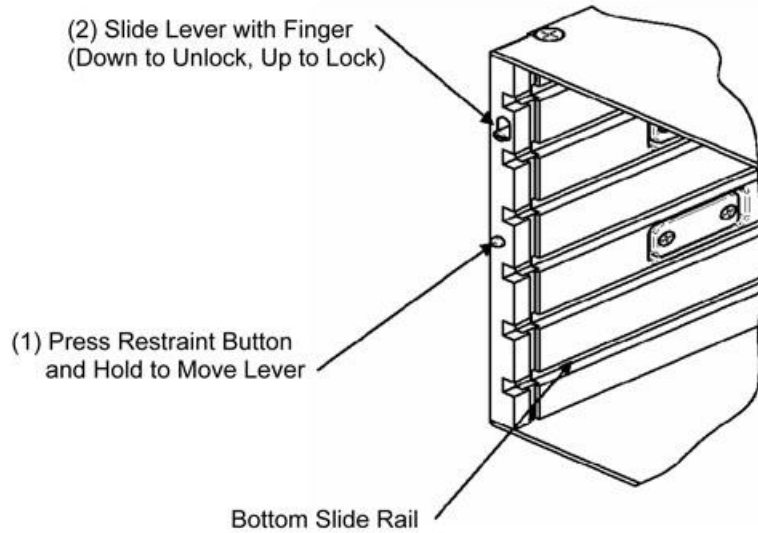
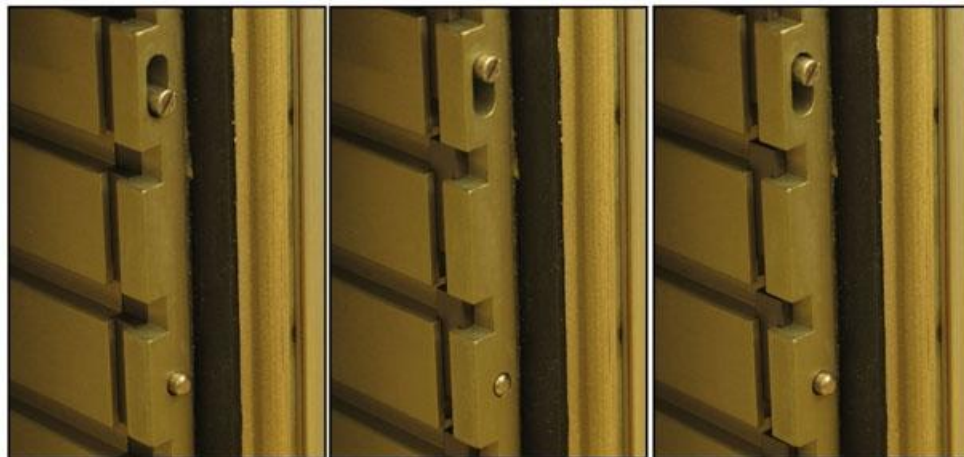


Figure 1. Payload Retainer.



Unlocked

Interim Locked
Restraint Button Flush

Locked
Restraint Button Out

Figure 2. MERLIN Payload Retainer Latch.

- 1.5 Remove MERLIN Pouch/Tray Assembly.
- 1.6 Close MERLIN locker door.
- 1.7 Transfer MERLIN Pouch/Tray Assembly to CBEF.
- 1.8 Open MERLIN Pouch Assembly by removing straps secured to D-ring.
Leave Pouch and D-Ring secured to Tray.
Refer to Figure 3.

JPM1A2
(CBEF)

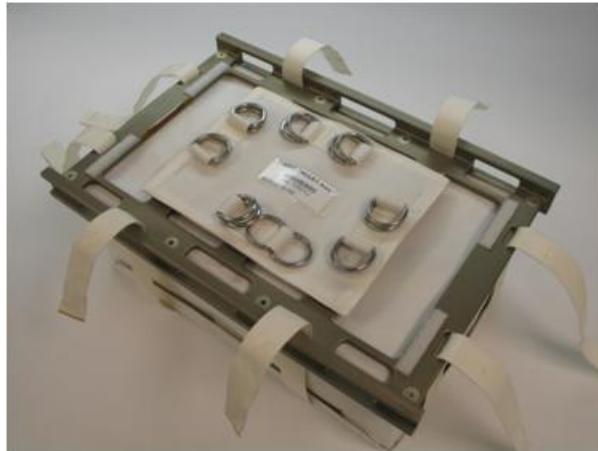


Figure 3. MERLIN Pouch Assembly With Straps Removed from D-Ring

NOTE

1. Sample exposure to ambient environment, in step 2, should be no greater than 5 minutes. This time interval begins when the first sample is removed from the Pouch and ends with the last sample being inserted into the CBEF.
2. Packing material should remain in Pouch Assembly for descent packing.

1.9 Don gloves.

2. CBEF SAMPLE INSERTION

2.1 Quickly remove Neuro Rad (4) from MERLIN Pouch Assembly (Figure 4), leaving packing material in Pouch.

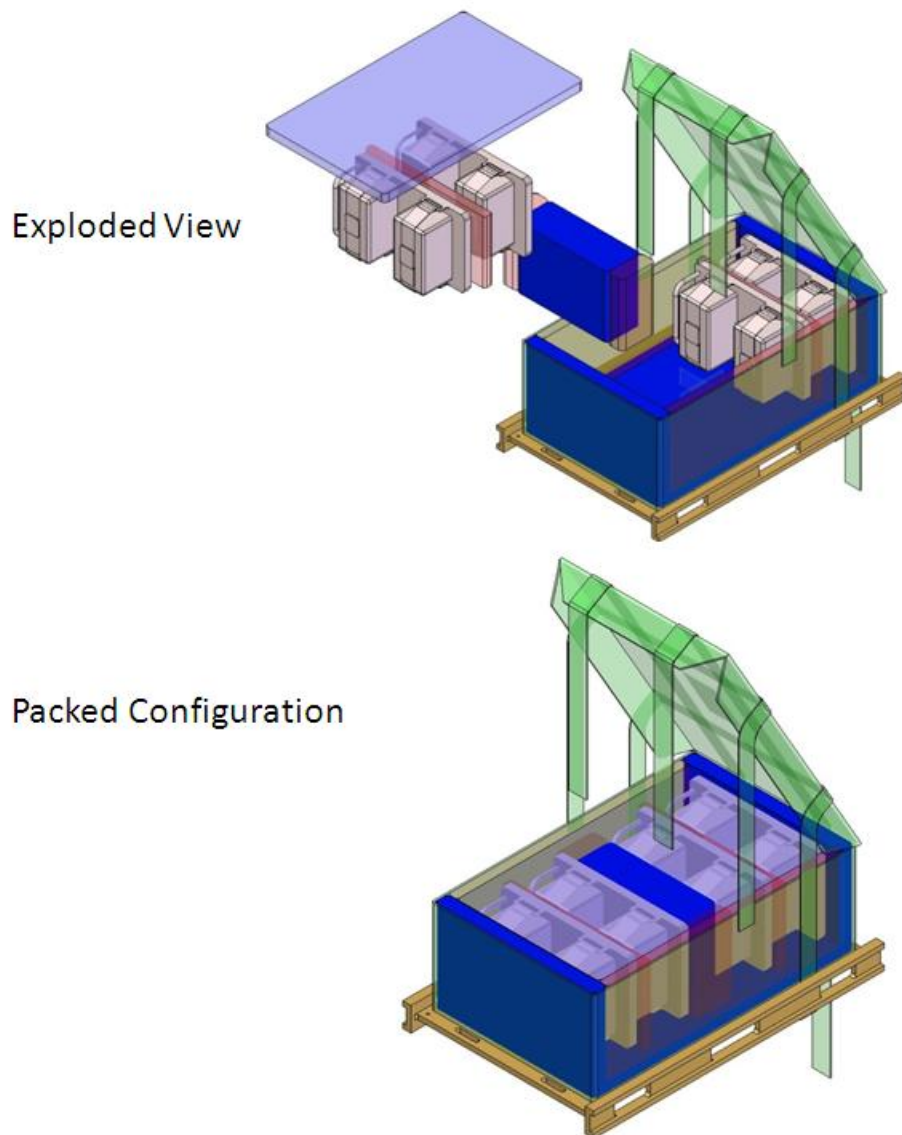


Figure 4. MERLIN Pouch Assembly Containing Neuro Rad.

- 2.2 Hand samples to ISS crewmember for installation in CBEF.
- 2.3 Doff gloves.
- 2.4 Close MERLIN Pouch Assembly while tucking straps inside Pouch Assembly to save time during 4° C packing scheduled later in the flight (refer to Figure 5).



Figure 5. MERLIN Pouch Assembly With Straps Tucked In.

3. POUCH/TRAY INSTALLATION

MF71E
(MERLIN)

- 3.1 Transfer MERLIN Pouch/Tray Assembly back to MERLIN.
- 3.2 Open MERLIN locker door.
- 3.3 Slide Pouch/Tray Assembly into MERLIN using bottom slider rails of internal volume. Refer to Figure 6.

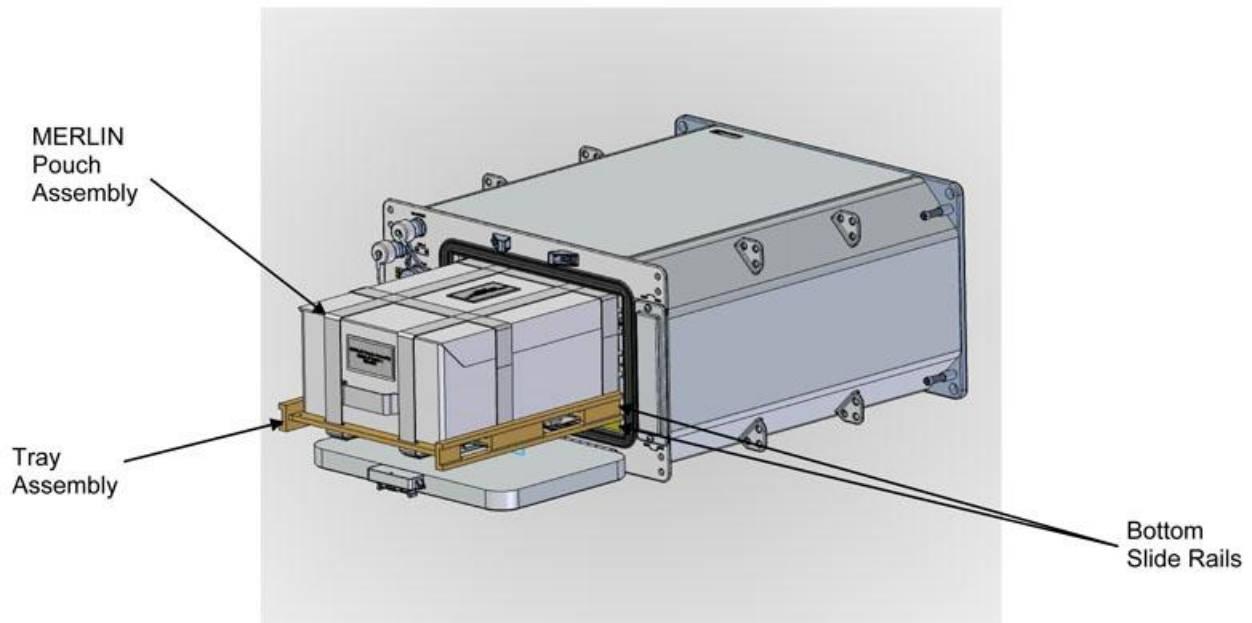


Figure 6. MERLIN Pouch Assembly Pulled Partially out of MERLIN

- 3.4 Close MERLIN locker door.
- 3.5 Verify locker door finger latches are fully spread apart and locking flap is positioned between finger latches.
- 3.6 Record insertion of Pouch Assembly into MERLIN:
(MET): _____

3.7 ✓Display – 'HOME DISPLAY'

*
* If 'HOME DISPLAY' not shown
* | pb Right (EXIT) → Press until appears
*

4. CHANGING TEMPERATURE SET POINT

4.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

4.2 pb Left (NEXT) → Press (three times), the following appears:
'MAIN MENU'
'Temp Control 4/8'

4.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'Mode 1/3'

4.4 pb Left (NEXT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'SP Mode Options 2/3'

4.5 pb Center (SELECT) → Press (two times), the following appears:
'SET PT TEMPERATURE'
'Old SP Temp: ±xx.xC'
'New SP Temp: ±xx.xC'

NOTE

1. The left pushbutton (CURSOR) moves cursor between NEW SP TEMP fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases NEW SP TEMP selected digit field value by 1.
3. NEW SP TEMP Range (-20.0 to +48.5° C).

4.6 Enter new Set Point temperature of +4.0°C.

4.7 pb Right (DONE) → Press
If Display – 'ARE YOU SURE?'
| pb Left (APPLY) → Press (one time)

4.8 Verify line 3 reads = '+04.0 C'

4.9 pb Right (EXIT) → press until 'HOME DISPLAY' appears

4.10 Record 'CURR TEMP': _____

- 4.11 Notify **MCC-H** of recorded MET in step 1.2 and step 3.6, CURR TEMP from step 4.10, and any off-nominal conditions.
- 4.12 Stow materials.

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OBJECTIVE:

The following steps will activate MERLIN Systems.

- MO63P 1. ✓10A J4 – OFF
✓cb CB4/J4 – op
- MF71E (MERLIN) 2. ✓cb MAIN – op (It off)
- 3. ✓cb PAYLOAD – op (It off)
- 4. ✓DC Jumper →|← POWER J1
- 5. ✓DC Jumper →|← A/E PAYLOAD DC PWR CABLE
- MO63P 6. ✓A/E PAYLOAD DC PWR CABLE →|← J4
- 7. cb CB4/J4 → cl
10A J4 → ON

<p><u>NOTE</u> System initialization may take up to 2 minutes.</p>
--

- MF71E (MERLIN) 8. cb MAIN – cl (It on)

*
* If MERLIN does not successfully complete initialization
* | Perform [MERLIN FAIL TO REPOWER](#), all (SODF: ASSY OPS:
* | PAYLOADS), then:
*

- 9. ✓Display Line 1 – 'HOME DISPLAY'

<p><u>NOTE</u> 1. While in the launch configuration, SP TEMP expected to be +37.0°C 2. While in the landing configuration, SP TEMP expected to be +04.0°C</p>

- 10. ✓Display Line 3 - 'SP TEMP : xx.xC'
- 11. Record from front panel:

'GPS': _____

'CURR TEMP': _____
- 12. Notify **MCC-H** MERLIN Powerup complete and report values recorded in step 11.

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OBJECTIVE:

The following steps will perform a reboot of MERLIN Systems.

```
*****  
*  
* If Display – ***Error Pending***:  
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:  
* | PAYLOADS), then:  
*  
*****
```

On MCC-H GO

1. ✓Display – 'HOME DISPLAY'

*
* If 'HOME DISPLAY' not shown
* | pb Right (EXIT) → Press until appears
*

2. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
3. pb Left (NEXT) → Press (seven times), the following appears:
'MAIN MENU'
'Shutdown 8/8'
4. pb Center (SELECT) → Press, (one time), the following appears:
'MAIN: SHUTDOWN'
'Shutdown 1/2'
5. pb Left (NEXT) → Press (one time), the following appears:
'MAIN: SHUTDOWN'
'Reboot 2/2'
6. pb Center (SELECT) → Press (one time), the following appears:
'ARE YOU SURE?'
'Reboot System'

<p><u>NOTE</u></p> <p>After Reboot begins, the display will read 'System Rebooting...' for approximately 10 seconds and then will scroll through initialization screens before getting to 'HOME DISPLAY'. Initialization may take up to 2 minutes.</p>
--

7. pb Left (APPLY) → Press (one time), the following appears:
'System Rebooting...'
8. ✓Display – 'HOME DISPLAY'
9. Record from front panel:
'GPS': ____:____

'CURR TEMP':____.____ °C

10. Notify **MCC-H** MERLIN Reboot complete and report values recorded in step 9.

MERLIN WARM SHUTDOWN

(ASSY OPS/19A/FIN)

Page 1 of 1 page

OBJECTIVE:

The following steps will perform a warm shutdown of MERLIN Systems.

Warm shutdowns prevent loss of data and system errors and are the desired nominal method of shutdown.

MF71E
(MERLIN)

1. ✓Display – '**HOME DISPLAY**'

```
*****  
*  
* If 'HOME DISPLAY' not shown:  
* | pb Right (EXIT) → Press until appears  
*  
*****
```

2. Record from front panel MERLIN '**GPS**': _____
3. pb Left (MENU) → Press (one time), the following appears:

'MAIN MENU'
'Quick Status 1/8'

4. pb Left (NEXT) → Press (seven times) until the following appears:

'MAIN MENU'
'Shutdown 8/8'

5. pb Center (SELECT) → Press (one time), the following appears:

'MAIN: SHUTDOWN'
'Shutdown 1/2'

6. pb Center (SELECT) → Press (one time), the following appears:

'SHUTDOWN'
'Select Mode 1 of 2:'
'WARM SHUTDOWN'

7. pb Center (APPLY) → Press (one time), the following appears:

'ARE YOU SURE?'

8. pb Left (APPLY) → Press (one time) the following appears:

'Shutdown Done'
'TURN POWER OFF'

9. cb MAIN – op (It off)

10. ✓cb PAYLOAD – op (It off)

MO63P

11. 10A J4 – OFF
cb CB4/J4 – op
12. Notify **MCC-H** of recorded '**GPS**' time in step 2.

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OBJECTIVE:

The following steps will perform a power cycle to the MERLIN System.

Warm shutdowns prevent loss of data and system errors.

```
*****  
*  
* If Display – ***Error Pending***:  
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:  
* | PAYLOADS), then:  
*  
*****
```

On MCC-H GO

1. ✓Display – **'HOME DISPLAY'**

*
* If **'HOME DISPLAY'** not shown
* | pb Right (EXIT) → Press until appears
*

2. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
3. pb Left (NEXT) → Press (seven times), the following appears:
'MAIN MENU'
'Shutdown 8/8'
4. pb Center (SELECT) → Press (one time), the following appears:
'MAIN: SHUTDOWN'
'Shutdown 1/2'
5. pb Center (SELECT) → Press (one time), the following appears:
'SHUTDOWN'
'Select Mode 1 of 2:'
'WARM SHUTDOWN'
6. pb Center (APPLY) → Press (one time), the following appears:
'ARE YOU SURE?'
7. pb Left (APPLY) → Press (one time), the following appears:
'Shutdown Done'
'TURN POWER OFF'
8. cb MAIN – op (lt off)
9. ✓cb PAYLOAD – op (lt off)

NOTE

System Initialization may take up to 2 minutes.

10. cb MAIN - cl (lt on)
11. ✓Display - 'HOME DISPLAY'
12. Record from front panel:
'CURR TEMP': _____
'GPS': _____
13. Notify **MCC-H** MERLIN Power Cycle complete and report values recorded in step 12.

OBJECTIVE:

The following steps will reconfigure various control modes within MERLIN System.

```
*****  
*  
* If Display - ***Error Pending***:  
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:  
* | PAYLOADS), then:  
*  
*****
```

RECORDING DATA

1. ✓Display – 'HOME DISPLAY'

*
* If 'HOME DISPLAY' not shown:
* | pb Right (EXIT) → Press until 'HOME DISPLAY' appears
*

2. Record start 'CURR TEMP', start 'GPS', and any callup data in Table 5-I, MERLIN Reset Log File.
3. SETTING TEMPERATURE CONTROL MODE
 - 3.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
 - 3.2 pb Left (NEXT) → Press (three times), the following appears:
'MAIN MENU'
'Temp Control 4/8'
 - 3.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'Mode 1/3'
 - 3.4 pb Left (NEXT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'SP Mode Options 2/3'
 - 3.5 pb Center (SELECT) → Press (two times), the following appears:
'SET PT TEMPERATURE'
'Old SP Temp: ±xx.xC'
'New SP Temp: ±xx.xC'

NOTE

1. The left pushbutton (CURSOR) moves cursor between NEW SP TEMP fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases NEW SP TEMP selected digit field value by 1.
3. NEW SP TEMP Range (-20.0 to +48.5° C).

3.6 Enter desired Set Point temperature per **MCC-H**.

3.7 pb Right (DONE) → Press

If Display - '**ARE YOU SURE?**'

| pb Left (APPLY) → Press (one time)

3.8 ✓Display – desired Set Point temperature per **MCC-H**

3.9 pb Right (EXIT) → press until '**HOME DISPLAY**' appears

4. CHANGING RAMP RATE

4.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

4.2 pb Left (NEXT) → Press (three times), the following appears:
'MAIN MENU'
'Temp Control 4/8'

4.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'Mode 1/3'

4.4 pb Left (NEXT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'SP Mode Options 2/3'

4.5 pb Center (SELECT) → Press (one time), the following appears:
'TEMP CONTROL: SP'
'Set Point Temp 1/4'

4.6 pb Left (+PARAM) → Press (one time), the following appears:
'TEMP CONTROL: SP'
'Ramp Rate 2/4'

4.7 pb Center (SELECT) → Press (one time), the following appears:
'SET PT RAMP RATE'
'Old Ramp: xx.xC/hr'
'New Ramp: xx.xC/hr'

NOTE

1. The left pushbutton (CURSOR) moves cursor between New Ramp Rate digit fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases New selected digit field value by 1.
3. New Ramp Rate must be greater than zero.

4.8 Enter desired Ramp Rate per **MCC-H**.

4.9 pb Right (DONE) → Press (one time)

If Display - '**ARE YOU SURE?**'

| pb Left (APPLY) → Press (one time)

4.10 ✓Display – desired Ramp Rate per **MCC-H**

4.11 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears

5. CHANGING SYSTEM STORAGE INTERVAL

5.1 pb Left (MENU) → Press (one time), the following appears:
'**MAIN MENU**'
'**Quick Status 1/8**'

5.2 pb Left (NEXT) → Press (three times), the following appears:
'**MAIN MENU**'
'**Temp Control 4/8**'

5.3 pb Center (SELECT) → Press (one time), the following appears:
'**MAIN: TEMP CONTROL**'
'**Mode 1/3**'

5.4 pb Left (NEXT) → Press (one time), the following appears:
'**MAIN: TEMP CONTROL**'
'**SP Mode Options 2/3**'

5.5 pb Center (SELECT) → Press (one time), the following appears:
'**TEMP CONTROL: SP**'
'**Set Point Temp 1/4**'

5.6 pb Left (+PARAM) → Press (two times), the following appears:
'**TEMP CONTROL: SP**'
'**Sys Sto Interval 3/4**'

5.7 pb Center (SELECT) → Press (one time), the following appears:
'**SP SYS STO INTERVAL**'
'**Old: xx:xx:xx**'
'**New: xx:xx:xx**'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between New digit fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases New selected digit field value by 1.
3. New System Storage Interval must be greater than zero.

5.8 Enter desired System Storage Interval per **MCC-H**

5.9 pb Right (DONE) → Press (one time)

If Display - '**ARE YOU SURE?**'

| pb Left (APPLY) → Press (one time)

5.10 ✓Display – desired System Storage Interval per **MCC-H**

5.11 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears

6. CHANGING EXPERIMENT STORAGE INTERVAL

6.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

6.2 pb Left (NEXT) → Press (three times), the following appears:
'MAIN MENU'
'Temp Control 4/8'

6.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'Mode 1/3'

6.4 pb Left (NEXT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'SP Mode Options 2/3'

6.5 pb Center (SELECT) → Press (one time), the following appears:
'TEMP CONTROL: SP'
'Set Point Temp 1/4'

6.6 pb Left (+PARAM) → Press (three times), the following appears:
'TEMP CONTROL: SP'
'Exp Sto Interval 4/4'

6.7 pb Center (SELECT) → Press (one time), the following appears:
'SP EXP STO INTERVAL'
'Old: xx:xx:xx'
'New: xx:xx:xx'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between New digit fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases New selected digit field value by 1.
3. New Experiment Storage Interval must be greater than zero.

6.8 Enter desired Experiment Storage Interval per **MCC-H**

6.9 pb Right (DONE) → Press (one time)

If Display - '**ARE YOU SURE?**'

| pb Left (APPLY) → Press (one time)

6.10 ✓Display – desired Experiment Storage Interval per **MCC-H**

6.11 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

7. SELECTING HEAT REMOVAL MODE

7.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

7.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'

7.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'

7.4 pb Center (SELECT) → Press (one time), the following appears:
'HEAT REMOVAL MODE'
'Select Mode x of 2'

NOTE

The left pushbutton (NEXT) toggles between AIR and WATER.

7.5 Select desired Heat Removal Mode per **MCC-H**.

7.6 pb Center (APPLY) → Press (one time)

7.7 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

8. SELECTING MEMORY FULL MODE

8.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

8.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'

'Setup 7/8'

- 8.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'
- 8.4 pb Left (NEXT) → Press (one time), the following appears:
'SETUP: GENERAL'
'Memory Full Mode 2/8'
- 8.5 pb Center (SELECT) → Press (one time), the following appears:
'MEMORY FULL MODE'
'Select Mode x of 2'

NOTE

The left pushbutton (NEXT) toggles between OVERWRITE OLD DATA and STOP DATA RECORDING.

- 8.6 Select desired Memory Full Mode per **MCC-H**
- 8.7 pb Center (APPLY) → Press (one time)
- 8.8 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

9. SELECTING EXTERNAL FAN MODE

- 9.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
- 9.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
- 9.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'
- 9.4 pb Left (NEXT) → Press (two times), the following appears:
'SETUP: GENERAL'
'ExternalFan Mode 3/8'
- 9.5 pb Center (SELECT) → Press (one time), the following appears:
'EXTERNAL FAN MODE'
'Select Mode x of 3'

NOTE

The left pushbutton (NEXT) toggles between OFF, ON and AUTOMATIC

- 9.6 Select desired External Fan Mode per **MCC-H**
- 9.7 pb Center (APPLY) → Press (one time)
- 9.8 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

10. SELECTING POWER RECOVERY MODE

- 10.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
- 10.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
- 10.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'
- 10.4 pb Left (NEXT) → Press (three times), the following appears:
'SETUP: GENERAL'
'PwrRecovery Mode 4/8'
- 10.5 pb Center (SELECT) → Press (one time), the following appears:
'POWER RECOVERY MODE'
'Select Mode x of 4'

NOTE

The left pushbutton (NEXT) toggles between RETURN TO SP TEMP, HOLD PRESENT TEMP, CONT RAMP LAST SP, or CONT RAMP PRES TEMP

- 10.6 Select desired Power Recovery Mode per **MCC-H**
- 10.7 pb Center (APPLY) → Press (one time)
- 10.8 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

11. SELECTING DOOR DETECTION MODE

- 11.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
- 11.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
- 11.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'
- 11.4 pb Left (NEXT) → Press (four times), the following appears:
'SETUP: GENERAL'
'Door Detection 5/8'
- 11.5 pb Center (SELECT) → Press (one time), the following appears:
'DOOR DETECTION MODE'
'Select Mode x of 2'

NOTE

The left pushbutton (NEXT) toggles between DISABLE and ENABLE.

- 11.6 Select desired Door Detection Mode per **MCC-H**.
- 11.7 pb Center (APPLY) → Press (one time)
- 11.8 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

12. SELECTING EXPERIMENT VOLUME FAN MODE

- 12.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
- 12.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
- 12.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'
- 12.4 pb Left (NEXT) → Press (five times), the following appears:
'SETUP: GENERAL'
'Expt Vol Fan Mode 6/8'
- 12.5 pb Center (SELECT) → Press (one time), the following appears:
'EXP VOLUME FAN MODE'
'Select Mode x of 2'

NOTE

The left pushbutton (NEXT) toggles between DISABLE and ENABLE.

- 12.6 Select desired Experiment Volume Fan Mode per **MCC-H**.
- 12.7 pb Center (APPLY) → Press (one time)
- 12.8 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

13. CHANGING TEMPERATURE BANDWIDTH

- 13.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
- 13.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
- 13.3 pb Center (SELECT) → Press (two times), the following appears:
'SETUP: GENERAL'
'HeatRemoval Mode 1/8'

13.4 pb Left (NEXT) → Press (six times), the following appears:
'SETUP: GENERAL'
'Temp Bandwidth 7/8'

13.5 pb Center (SELECT) → Press (one time), the following appears:
'TEMP BANDWIDTH'
'Bandwidth xx.xC'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between Bandwidth digit fields. The default cursor position will be blinking.
2. The center pushbutton (PLUS) increases Bandwidth selected digit field value by 1.

13.6 Enter desired Temp Bandwidth per **MCC-H**.

13.7 pb Right (DONE) → Press (one time)
If Display - 'ARE YOU SURE?'
| pb Left (APPLY) → Press

13.8 ✓Display – desired Temperature Bandwidth per **MCC-H**.

13.9 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

14. SELECTING PID SENSORS FOR THERMAL CARRIER CONTROL

14.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

14.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'

14.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: SETUP'
'General 1/4'

14.4 pb Left (NEXT) → Press (one time), the following appears:
'MAIN: SETUP'
'PID 2/4'

14.5 pb Center (SELECT) → Press (one time), the following appears:
'SETUP: PID'
'PID Sensors 1/2'

14.6 pb Center (SELECT) → Press (one time), the following appears:
'PID SENSORS'
'S: LRE: E: 123456789AB'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between PID SENSORS fields.
2. The center pushbutton (TOGGLE) toggles the '*' on/off indicator on row 3.
3. If a '*' character is under any of the PID SENSORS fields then this sensor is selected for use in the control of the thermal carrier.

14.7 Select desired active PID Sensors per **MCC-H**.

14.8 pb Right (DONE) → Press (one time)

If Display 'SET LRE123456789AB', 'Old:', and 'New':

| pb Left (APPLY) → Press (one time)

14.9 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

15. RESETTING POWER LOSS FLAG

15.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

15.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'

15.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: SETUP'
'General 1/4'

15.4 pb Left (NEXT) → Press (three times), the following appears:
'MAIN: SETUP'
'Alternate 4/4'

15.5 pb Center (SELECT) → Press (one time), the following appears:
'SETUP: ALTERNATE'
'TE Power 1/8'

15.6 pb Left (NEXT) → Press (four times), the following appears:
'SETUP: ALTERNATE'
'Power Loss Reset 5/8'

15.7 pb Center (SELECT) → Press (one time), the following appears:
'POWER LOSS RESET'
'RESET PWR LOSS FLAG'

15.8 pb Left (RESET) → Press one time

15.9 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.

16. CHANGING PAYLOAD FUNCTION CODE

- 16.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
- 16.2 pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
- 16.3 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: SETUP'
'General 1/4'
- 16.4 pb Left (NEXT) → Press (three times), the following appears:
'MAIN: SETUP'
'Alternate 4/4'
- 16.5 pb Center (SELECT) → Press (one time), the following appears:
'SETUP: ALTERNATE'
'TE Power 1/8'
- 16.6 pb Left (NEXT) → Press (six times), the following appears:
'SETUP: ALTERNATE'
'Function Code 7/8'
- 16.7 pb Center (SELECT) → Press (one time), the following appears:
'FUNCTION CODE'
'Old: XxXXXX'
'New: XxXXXX'

NOTE

- 1. The left pushbutton (CURSOR) moves the cursor between FUNCTION CODE digits.
- 2. The center pushbutton (PLUS) increases FUNCTION CODE selected digit field value by 1.
- 3. The values are in hexadecimal.

- 16.8 Enter desired Function Code per **MCC-H**
- 16.9 pb Right (DONE) → Press (one time)
If Display - '**ARE YOU SURE?**'
| pb Left (APPLY) → Press (one time)
- 16.10 ✓Display – desired Function Code per **MCC-H**
- 16.11 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears
- 17. SELECTING TEMPERATURE CONTROL MODE FOR THERMAL CARRIER
 - 17.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

17.2 pb Left (NEXT) → Press (three times), the following appears:
'MAIN MENU'
'Temp Control 4/8'

17.3 pb Center (SELECT) → Press (two times), the following appears:
'TEMP CONTROL: MODE'
'Select Mode x of 5:'

NOTE

The left pushbutton (NEXT) toggles between SET POINT, PROG TEMP PROFILE, SET POINT TO PROFILE, OFF, and OVERRIDE.

17.4 pb Left (NEXT) → Press until reaching desired Temp Control Mode per **MCC-H**

17.5 pb Center (APPLY) → Press (one time)

17.6 pb Right (EXIT) → Press until '**HOME DISPLAY**' appears

18. CHECKING STATUS OF THERMAL CARRIER FROM HOME DISPLAY

18.1 pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

18.2 pb Center (SELECT) → Press (one time), the following appears:
'MAIN: QUICK STATUS'
'ECW 01/19'

18.3 ✓Display (Line 3) – '**NOMINAL**'

NOTE

The MERLIN may take several minutes to achieve its command temperature once parameters have been reconfigured.

18.4 pb Right (EXIT) → press until '**HOME DISPLAY**' appears

19. CHECKING CONTROL TEMPERATURE AT HOME DISPLAY

19.1 ✓Display – '**CURR TEMP:**' expected current temperature ± bandwidth in °C per **MCC-H**

19.2 ✓Display – '**SP TEMP:**' expected Set Point temperature in °C per **MCC-H**

19.3 ✓Display – '**GPS**' incrementing

NOTE

The STATUS LED is on for approximately 2/3 of a sec and then is turned off for approximately 1/3 of a sec when an off-nominal situation is present, and continues until off-nominal situation is acknowledged.

19.4 ✓STATUS LED – Nominal (It off)

19.5 ✓Display – continuously reads '**HOME DISPLAY**'

*
* If Display, STATUS LED, ECW, CURR TEMP or SP TEMP are not in
* nominal state
* | ✓MCC-H
*

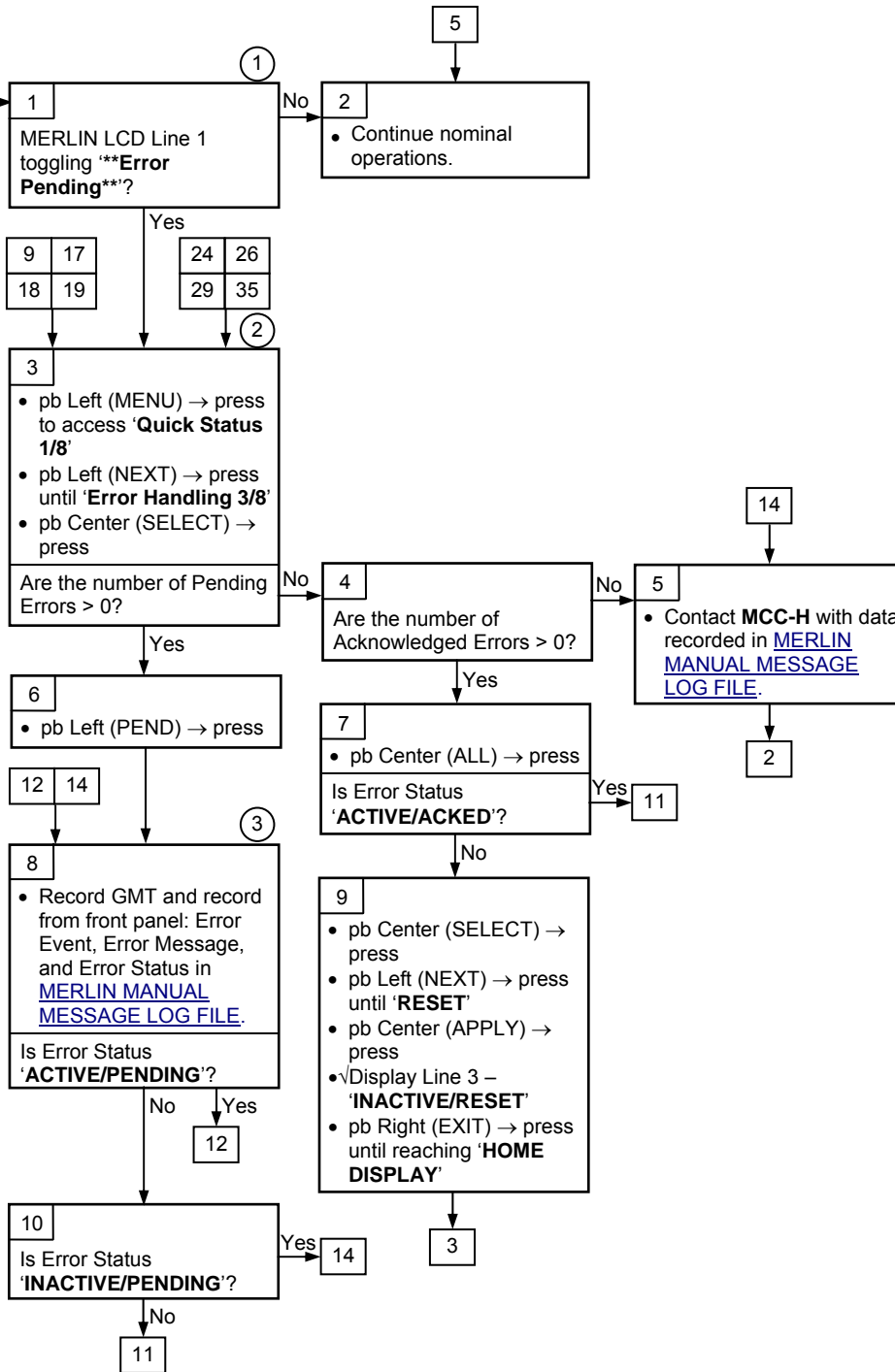
20. RECORDING END DATA

- 20.1 Record End '**CURR TEMP**' and End '**GPS**' in Table 5-I, MERLIN Reset Log File.
- 20.2 Notify **MCC-H** and report log values for log file Table 5-I, MERLIN Reset Log File.

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MERLIN System Error

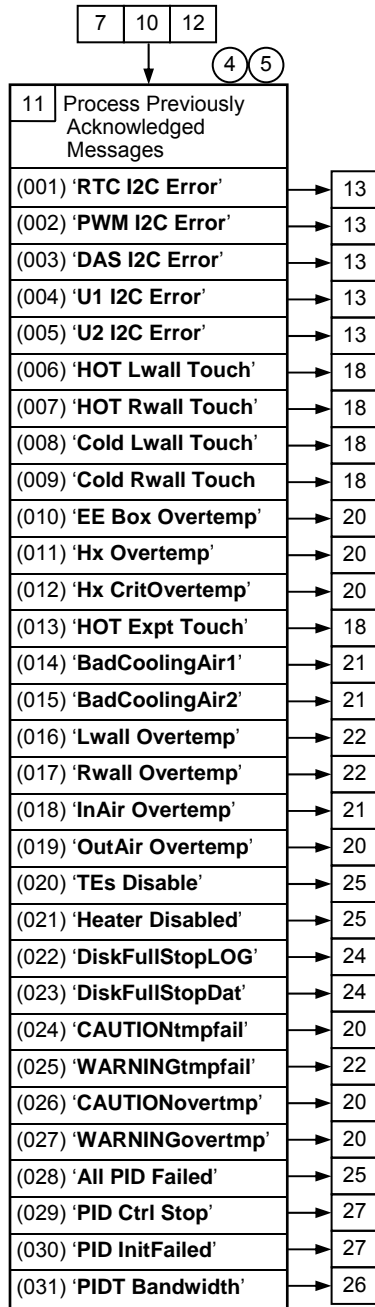
Nominal Config:
 (MF71E)
 cb MAIN - cl (lt on)
 cb PAYLOAD - op
 (lt off)
 (MO63P)
 cb CB4/J4 - cl
 10A J4 - ON



- ① Contact **MCC-H** before proceeding.
- ② Operator can always exit sub menus by pressing pb Right until **HOME DISPLAY** is reached.
- ③ **'ERR HANDLING PEND'** display will identify the Event on Display (Line 2) and the Status on Display (Line 3). **'ACTIVE/PENDING'** indicates that error is still occurring and should be acknowledged. **'INACTIVE/PENDING'** indicates the Error is no longer occurring and can be Reset.

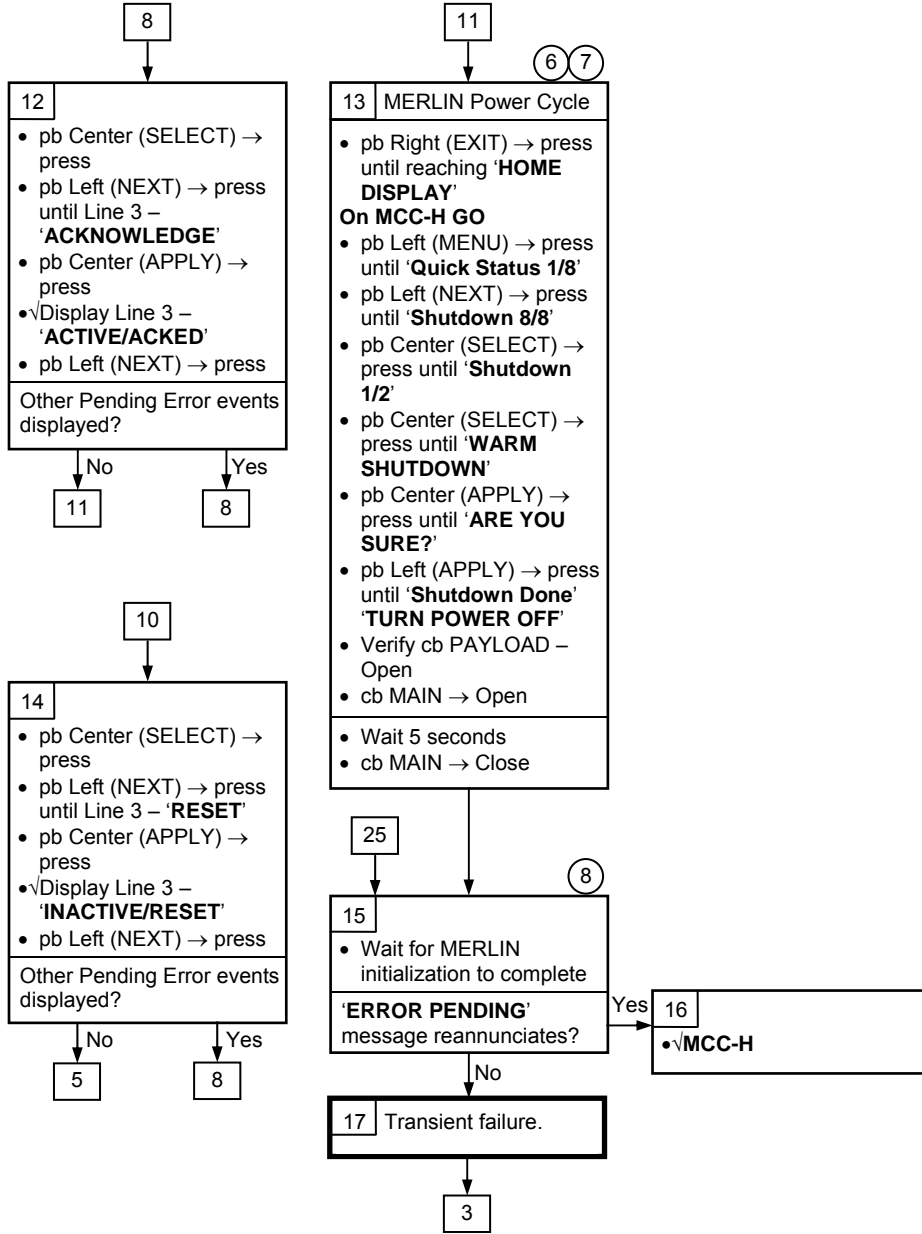
MERLIN ERROR MESSAGE

(ASSY OPS/19A/FIN)



④ The following sequence of steps list all possible MERLIN error messages.

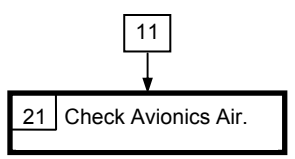
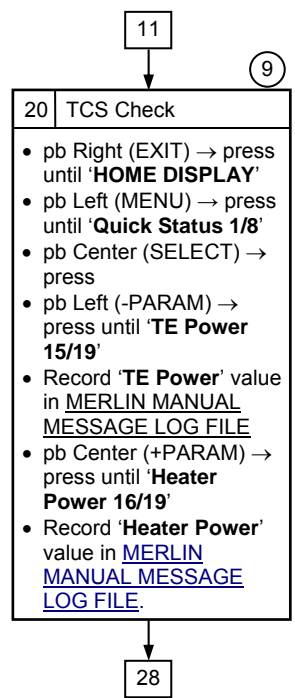
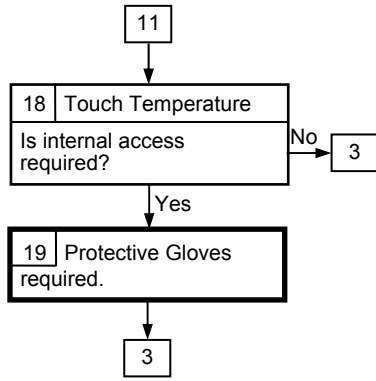
⑤ The MERLIN Manual Record Diagnostic Data procedure may be performed to capture the state of key data elements per **MCC-H** direction.



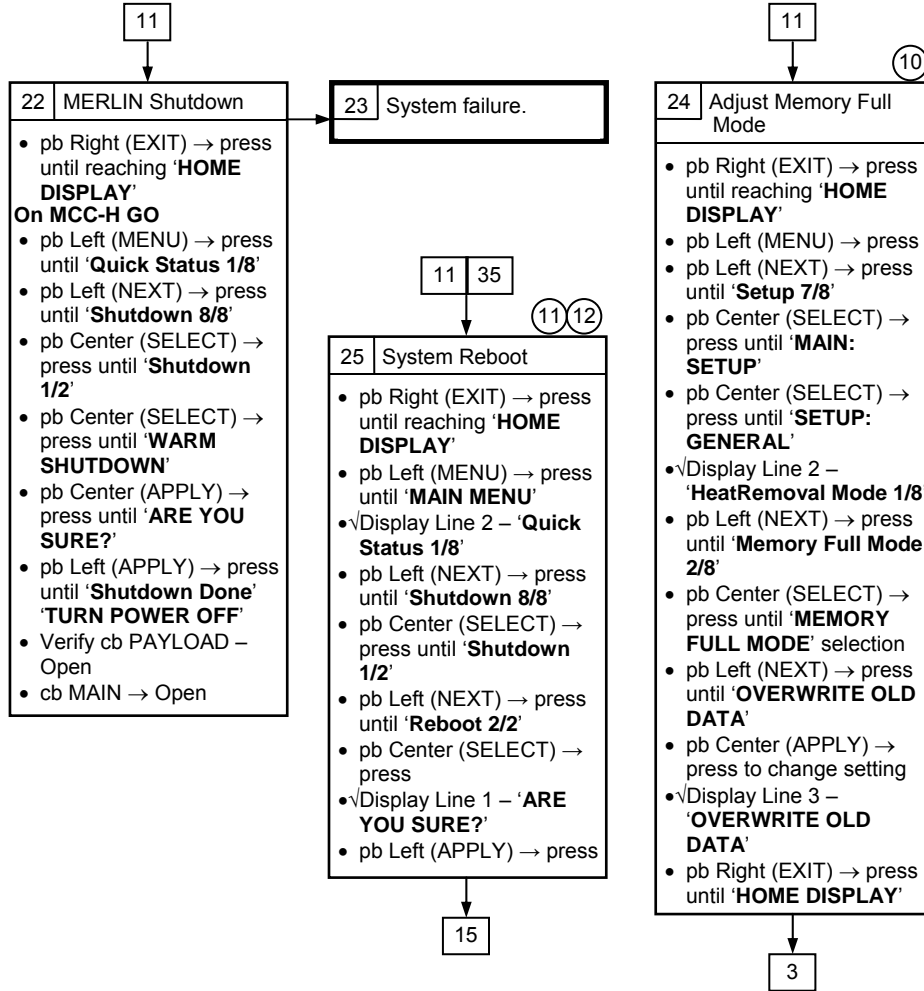
6 Power cycle requires **MCC-H** approval.

7 Some Possible causes of Software Errors not resetting: Frequent intermittent power failure, Single Event Upset, Watchdog Timer failure.

8 Initialization takes approximately 1 minute. Initialization is complete when Display (Line 1) reads **HOME DISPLAY**.



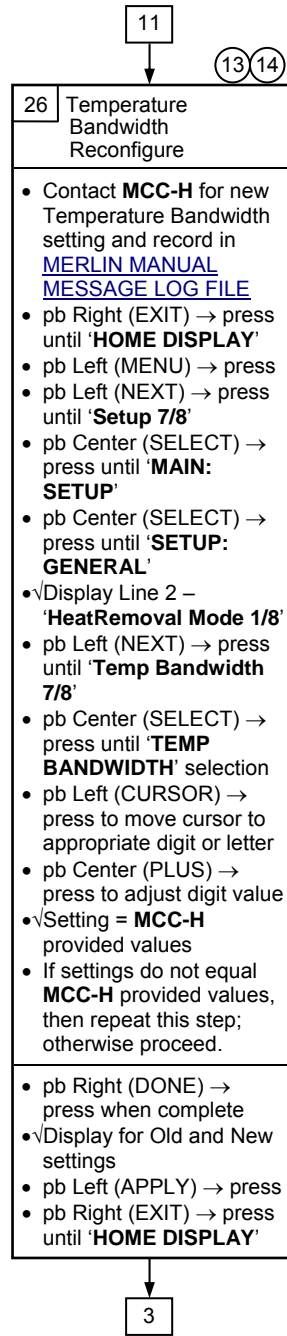
⑨ Thermal Control System (TCS) consists of Thermal Electric Devices and Heater strips.



⑩ Memory Full Mode Errors occur when the system is programmed to stop recording certain data files when memory is 95% full. Changing the system to over-write the oldest data will eliminate this error.

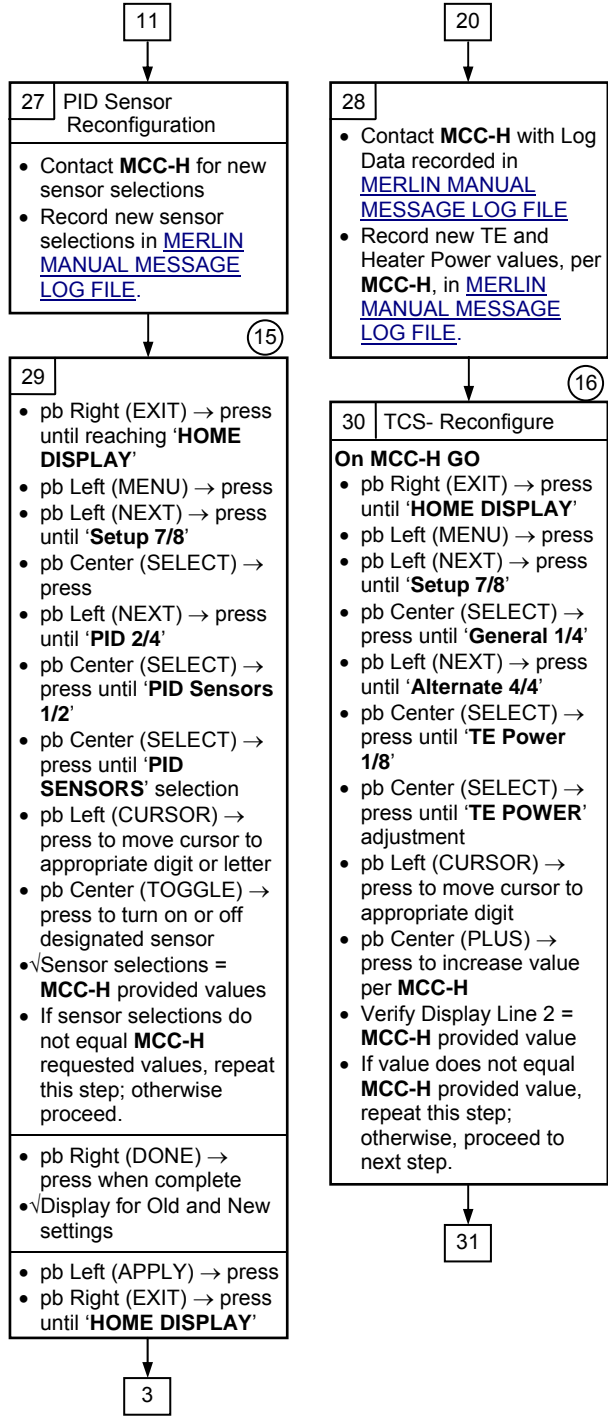
⑪ Errors 012,016, 017, 019, 020, 021 will automatically disable the TED devices; the system must be rebooted in order to re-enable them.

⑫ System reboot takes approximately 1 minute. System will initiate to 'HOME DISPLAY'



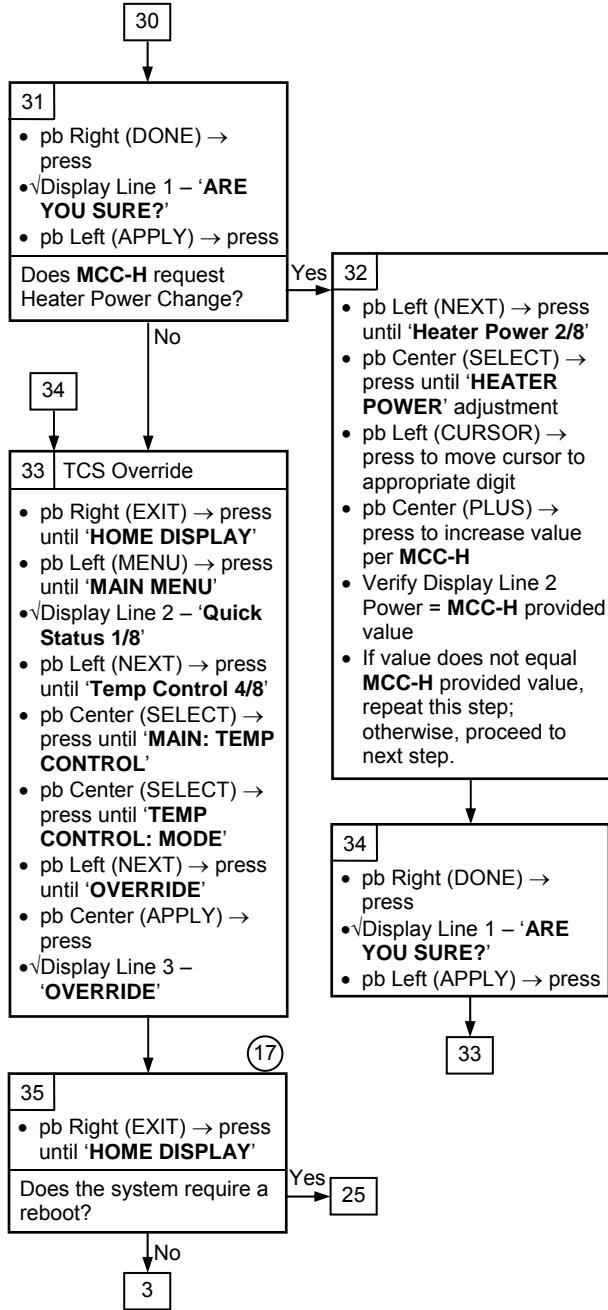
13 The thermal control bandwidth setting is used to annunciate an error when feedback experiment temperature reading exceeds desired values. Changing this setting should only be performed with PI concurrence.

14 Bandwidth setting can be adjusted from 00.1 C to 25.0 C.



15 Sensor selection is displayed in the following order. An * symbol under the designated letter or numeral indicates selected sensor. (Example) M:LRE E:123456789AB.

16 TCS and Heater Reconfigurations will set fixed power values to these devices. Setting system to Override will inhibit responsive thermal control.



①7 Errors 012,016, 017, 019, 020, 021 will automatically disable the TED devices; the system must be rebooted in order to re-enable them.

MERLIN FAIL TO HOLD SETPOINT

(ASSY OPS/19A/FIN)

Page 1 of 7 pages

OBJECTIVE:

The following steps allow reconfiguration of Temperature Control Mode, Ramp Rate, Heat Removal Mode and Fan Modes.

```
*****
*
*
* If Display - ***Error Pending***
* | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:
* | PAYLOADS), then:
*
*****
```

RECORDING DATA

1. ✓Display – 'HOME DISPLAY'

*
* If 'HOME DISPLAY' not shown
* | pb Right (EXIT) → Press until 'HOME DISPLAY' appears
*

2. Record start 'CURR TEMP', start 'GPS', and any callup data in Table 5-I. MERLIN Reset Log File.

SETTING TEMPERATURE CONTROL MODE

3. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
4. pb Left (NEXT) → Press (three times), the following appears:
'MAIN MENU'
'Temp Control 4/8'
5. pb Center (SELECT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'Mode 1/3'
6. pb Left (NEXT) → Press (one time), the following appears:
'MAIN: TEMP CONTROL'
'SP Mode Options 2/3'
7. pb Center (SELECT) → Press (two times), the following appears:
'SET PT TEMPERATURE'
'Old SP Temp: ±xx.xC'

'New SP Temp: ±xx.xC'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between NEW SP Temp fields (default cursor position will be blinking).
2. The center pushbutton (PLUS) increases New SP Temp selected digit field value by 1.
3. SP Temp Range (-20.0 to +48.5° C).

8. Input desired Set Point temperature per **MCC-H**
9. pb Right (DONE) → Press (one time)
If Display - **'ARE YOU SURE?'**
| pb Left (APPLY) → Press (one time)
10. ✓Display – desired Set Point temperature per **MCC-H**

SETTING RAMP RATE

11. pb Left (+PARAM) → Press (one time), the following appears:
'TEMP CONTROL: SP'
'Ramp Rate 2/4'
12. pb Center (SELECT) → Press (one time), the following appears:
'SET PT RAMP RATE'
'Old Ramp: xx.xC/hr'
'New Ramp: xx.xC/hr'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between New Ramp fields (default cursor position will be blinking).
2. The center pushbutton (PLUS) increases New Ramp selected digit field value by 1.
3. Ramp Range (+0.1 to +20.0° C/hr)
New value must be greater than zero.

13. Input desired Set Point Ramp Rate per **MCC-H**
14. pb Right (DONE) → Press (one time)
If Display - **'ARE YOU SURE?'**
| pb Left (APPLY) → Press (one time)
15. ✓Display – desired Ramp Rate per **MCC-H**
16. pb Right (EXIT) → Press (two times), the following appears:
'MAIN MENU'

'Temp Control 4/8'

SELECTING HEAT REMOVAL MODE

17. pb Left (NEXT) → Press (three times), the following appears:

'MAIN MENU'

'Setup 7/8'

18. pb Center (SELECT) → Press (three times)

'HEAT REMOVAL MODE'

'Select Mode x of 2:'

NOTE

The left pushbutton (NEXT) toggles between AIR and WATER.

19. pb Left (NEXT) → Press until desired Heat Removal Mode per **MCC-H**

20. pb Center (APPLY) → Press (one time), the following appears:

'SETUP: GENERAL'

'HeatRemoval Mode 1/8'

SELECTING EXTERNAL FAN MODE

21. pb Left (NEXT) → Press (two times), the following appears:

'SETUP: GENERAL'

'ExternalFan Mode 3/8'

22. pb Center (SELECT) → Press (one time), the following appears:

'EXTERNAL FAN MODE'

'Select Mode x of 3:'

NOTE

The left pushbutton (NEXT) toggles between OFF, ON and AUTOMATIC.

23. pb Left (NEXT) → Press until desired External Fan Mode per **MCC-H**

24. pb Center (APPLY) → Press (one time), the following appears:

'SETUP: GENERAL'

'ExternalFan Mode 3/8'

SELECTING EXPERIMENT VOLUME FAN MODE

25. pb Left (NEXT) → Press (three times), the following appears:

'SETUP: GENERAL'

'Exp Vol Fan Mode 6/8'

- 26. pb Center (SELECT) → Press (one time), the following appears:
'EXP VOLUME FAN MODE'
'Select Mode x of 2:'

<p><u>NOTE</u></p> <p>The left pushbutton (NEXT) toggles between DISABLE and ENABLE.</p>
--

- 27. pb Left (NEXT) → Press until desired Exp Vol Fan Mode per **MCC-H**
- 28. pb Center (APPLY) → Press (one time), the following appears:
'SETUP: GENERAL'
'Exp Vol Fan Mode 6/8'

SETTING TEMPERATURE BANDWIDTH

- 29. pb Left (NEXT) → Press (one time), the following appears:
'SETUP: GENERAL'
'Temp Bandwidth 7/8'
- 30. pb Center (SELECT) → Press (one time), the following appears:
'TEMP BANDWIDTH'
'Bandwidth: xx.xC'
'(00.1C-25.0C)'

<p><u>NOTE</u></p> <p>1. The left pushbutton (CURSOR) moves cursor between Bandwidth digit fields.</p> <p>2. The center pushbutton (PLUS) increases Bandwidth selected digit field value by 1.</p>
--

- 31. Input desired Temp Bandwidth per **MCC-H**
- 32. pb Right (DONE) → Press (one time)
If Display - **'ARE YOU SURE?'**, then:
| pb Left (APPLY) → Press (one time)
- 33. ✓Display – desired Temp Bandwidth per **MCC-H**
- 34. pb Right (EXIT) → Press until reaching **'HOME DISPLAY'**
SELECTING PID SENSORS FOR THERMAL CARRIER CONTROL
- 35. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

MERLIN FAIL TO HOLD SETPOINT

(ASSY OPS/19A/FIN)

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36. pb Left (NEXT) → Press (six times), the following appears:
'MAIN MENU'
'Setup 7/8'
37. pb Center (SELECT) → Press (one time), the following appears:
'MAIN: SETUP'
'General 1/4'
38. pb Left (NEXT) → Press (one time), the following appears:
'MAIN: SETUP'
'PID 2/4'
39. pb Center (SELECT) → Press (two times), the following appears:
'PID SENSORS'
'S:LRE E:123456789AB'

NOTE

1. The left pushbutton (CURSOR) moves the cursor between PID SENSORS fields.
2. The center pushbutton (TOGGLE) toggles the '*' on/off indicator on row 3.
3. If a '*' character is under any of the PID SENSORS fields then this sensor is selected for use in the control of the thermal carrier.

40. Select desired active PID Sensors per **MCC-H**.
41. pb Right (DONE) → Press (one time)
42. ✓New PID Sensors = desired active PID sensors
43. pb Left (APPLY) → Press (one time), the following appears
'SETUP: PID'
'PID Sensors 1/2'
44. pb Right (EXIT) → Press (two times), the following appears:
'MAIN MENU'
'Setup 7/8'

SELECTING TEMPERATURE CONTROL MODE FOR THERMAL CARRIER

45. pb Left (NEXT) → Press (five times), the following appears:
'MAIN MENU'
'Temp Control 4/8'
46. pb Center (SELECT) → Press (two times), the following appears:
'TEMP CONTROL: MODE'
'Select Mode x of 5:'

NOTE

The left pushbutton (NEXT) toggles between SET POINT, PROG TEMP PROFILE, SET POINT TO PROFILE, OFF, and OVERRIDE.

- 47. pb Left (NEXT) → Press until desired TEMP CONTROL:MODE per **MCC-H**
- 48. pb Center (APPLY) → Press (one time)
- 49. pb Right (EXIT) → Press until reaching '**HOME DISPLAY**'

CHECKING STATUS OF THERMAL CARRIER

- 50. pb Left (MENU) → Press (one time), the following appears:

'MAIN MENU'
'Quick Status 1/8'

- 51. pb Center (SELECT) → Press (one time), the following appears:

'MAIN: QUICK STATUS'
'ECW 01/19'

- 52. ✓Display line 3 – '**NOMINAL**'

- 53. pb Right (EXIT) → Press until reaching '**HOME DISPLAY**'

CHECKING CONTROL TEMPERATURE

- 54. ✓Display – '**CURR TEMP:**' expected Set Point temperature ± bandwidth in degrees C per **MCC-H**

- 55. ✓Display – '**SP TEMP:**' expected Set Point temperature in degrees C per **MCC-H**

- 56. ✓Display – '**GPS**' incrementing

NOTE

The STATUS LED is on for approximately 2/3 of a second then is turned off for approximately 1/3 of a second when an off-nominal situation is present, and will toggle until off-nominal situation is acknowledged.

- 57. ✓STATUS LED – Nominal (It off)

- 58. ✓Display – continuously reads '**HOME DISPLAY**'

```

*****
*
* If Display, STATUS LED, ECW, CURR TEMP or SP TEMP are not in the
* nominal configuration,
* | ✓MCC-H
*
*****

```


RECORDING END DATA

59. Record End '**CURR TEMP**' and End '**GPS**' in Table 5-I, MERLIN Reset Log File.
60. Notify **MCC-H** Fail to Hold Setpoint complete and report log values for log file Table 5-I, MERLIN Reset Log File.

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MERLIN

MERLIN FAIL TO REPOWER

(ASSY OPS/19A/FIN) Page 1 of 4 pages

MERLIN initialization not successfully completed when power applied during MERLIN POWER UP procedure

Nominal Config:
 (MF71E)
 cb MAIN-cl (It on)
 cb PAYLOAD-op (It off)
 (MO63P)
 cb CB4/J4-cl
 10A J4-ON

① ② ③

1	Switch to Alternate Power Source
<ul style="list-style-type: none"> Contact MCC-H for alternate power source (fill in data below). _____ 	
(MERLIN)	
<ul style="list-style-type: none"> ✓cb PAYLOAD op (It off) cb MAIN → op (It off) 	
(MO63P)	
<ul style="list-style-type: none"> 10A J4-OFF cb CB4/J4 → op A/E PAYLOAD DC PWR (20') ← J4 	
(Alternate Power Source J_)	
<ul style="list-style-type: none"> ✓cb _____ - op ✓sw _____ - OFF 	
<ul style="list-style-type: none"> A/E PAYLOAD DC PWR (20') → Alternate Power Source J_ 	

Next

① ④ ⑥

2	Repower from Alternate Power Source
<ul style="list-style-type: none"> (_____) cb _____ -cl sw _____ -ON 	
(MERLIN)	
<ul style="list-style-type: none"> cb MAIN → cl (It on) 	
After Initialization does display read 'HOME DISPLAY'?	

Yes

3	PRIMARY OUTLET FAILURE
---	------------------------

Next

4	<ul style="list-style-type: none"> Record power-on time (GPS): _____ Record power-on CURR TEMP: _____ Notify MCC-H of resolution and data
---	---

No

5	POSSIBLE DOWNSTREAM FAILURE
---	-----------------------------

Next

⑥

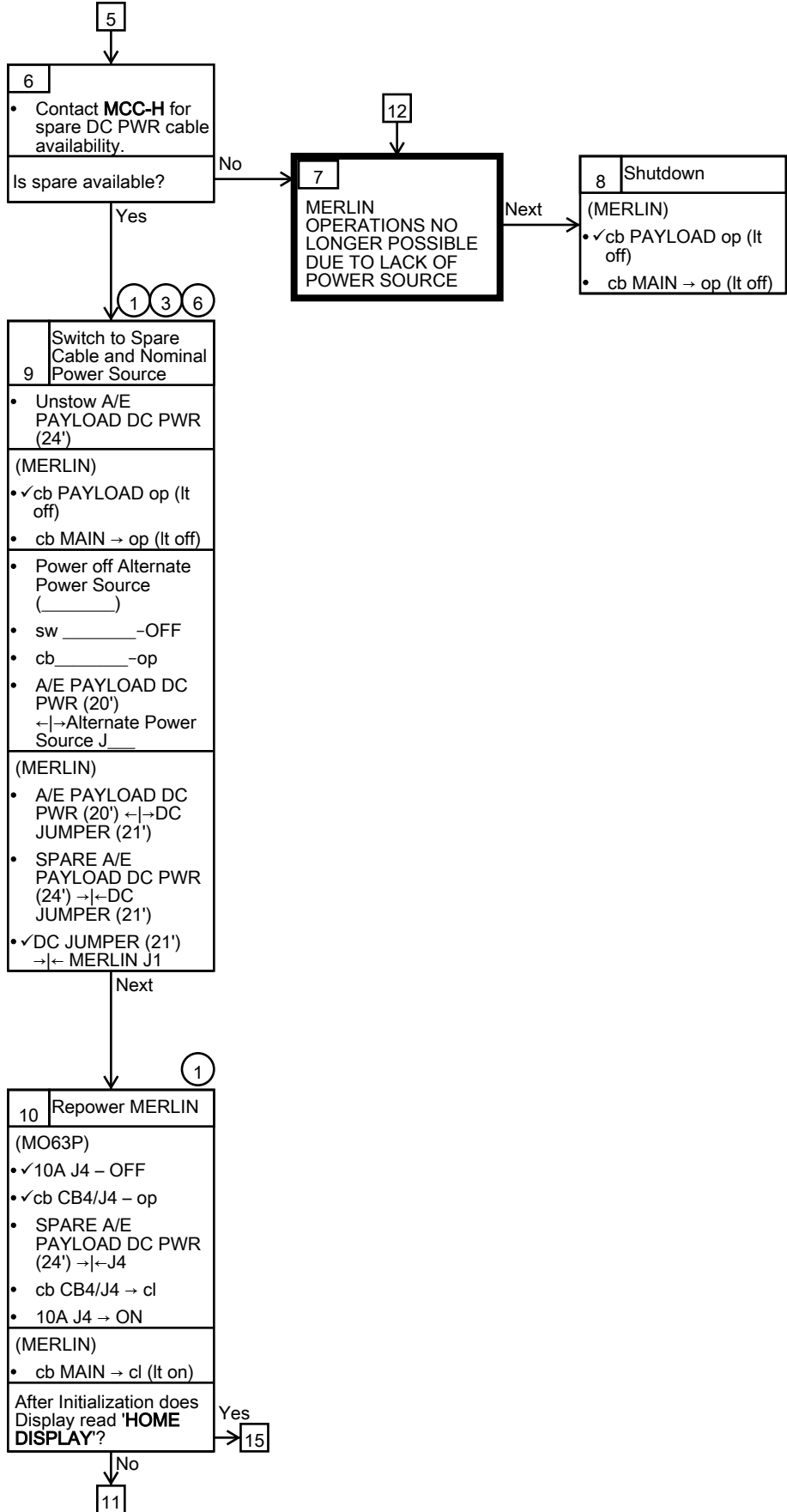
① **MCC-H** may instruct crew to an alternate power source that is not 10 AMP service. The ISS DC JUMPER cable is only reqd if the Orbiter power source is 10 amps. MO63P is 10 amp service.

② Always deadface DC power source when disconnecting/connecting power cable

③ Verify connectors are properly mated and seated securely when switching to alternate power source

④ MERLIN will take approximately 2 min to initialize after power on; after initialization is successfully completed, LCD Line 1 will read 'HOME DISPLAY'

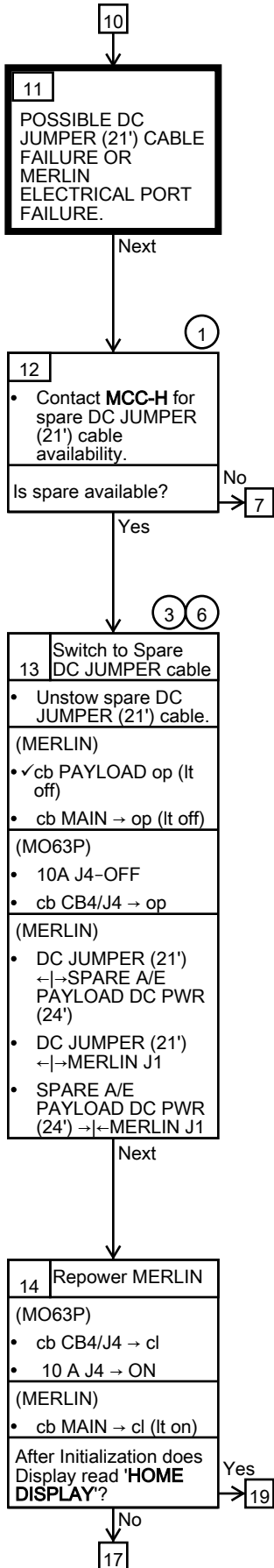
⑥ Alternate power source is detailed in block 1.



1 MCC-H may instruct crew to an alternate power source that is not 10 AMP service. The ISS DC JUMPER cable is only reqd if the Orbiter power source is 10 amps. MO63P is 10 amp service.

3 Verify connectors are properly mated and seated securely when switching to alternate power source

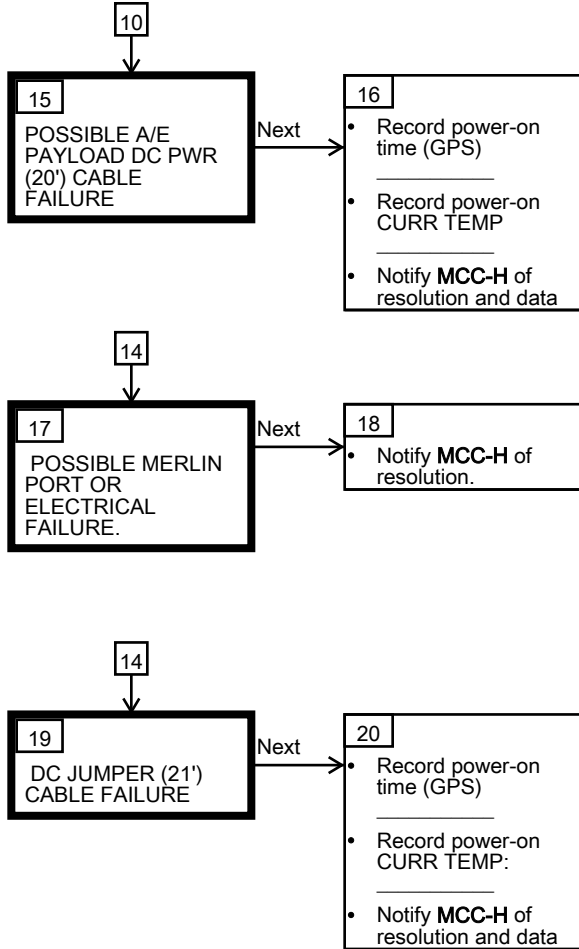
6 Alternate power source is detailed in block 1.



1
MCC-H may instruct crew to an alternate power source that is not 10 AMP service. The ISS DC JUMPER cable is only reqd if the Orbiter power source is 10 amps. MO63P is 10 amp service.

3
Verify connectors are properly mated and seated securely when switching to alternate power source

6
Alternate power source is detailed in block 1.



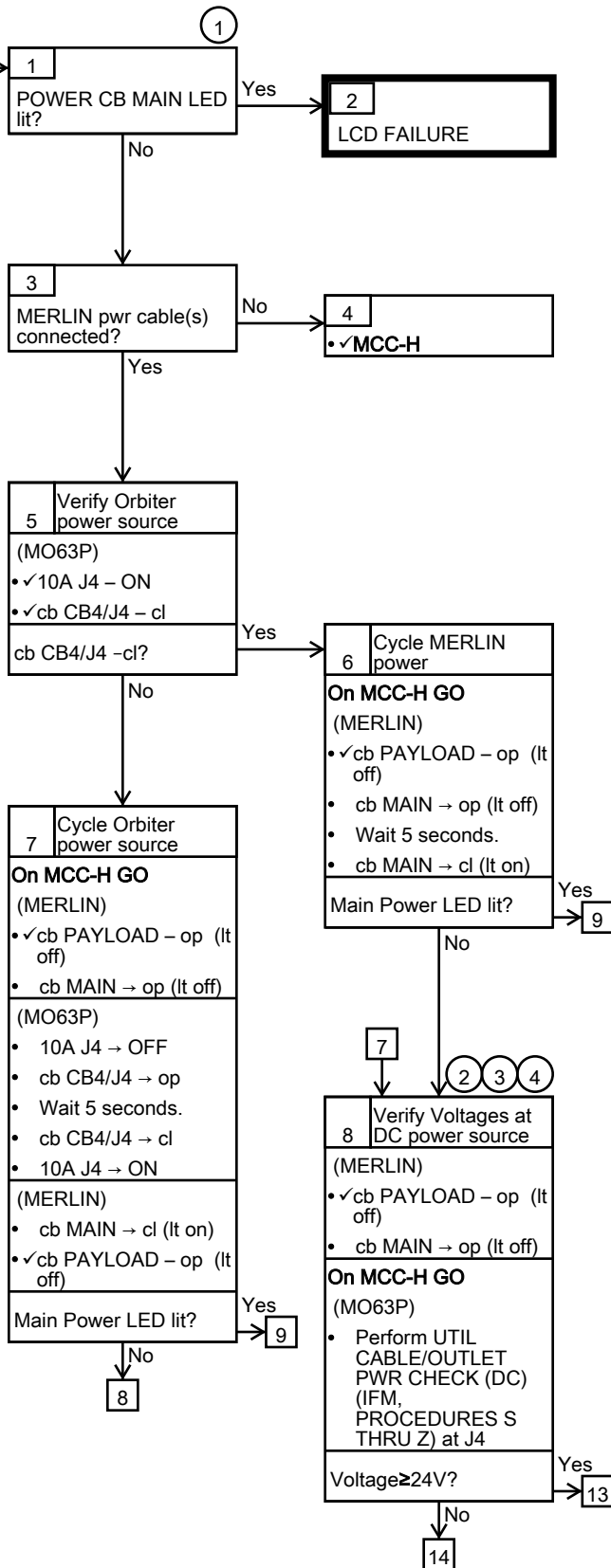
MERLIN

MERLIN LCD BLANK
(ASSY OPS/19A/FIN)

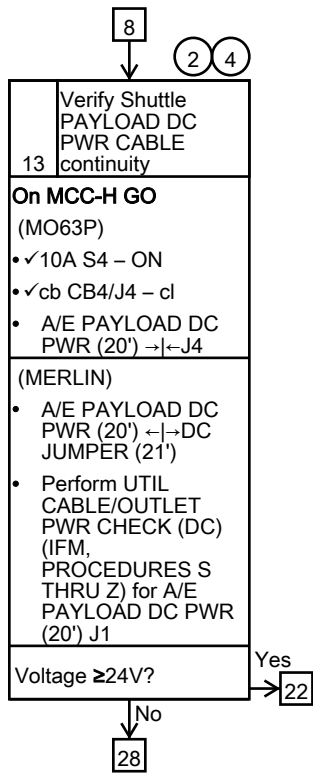
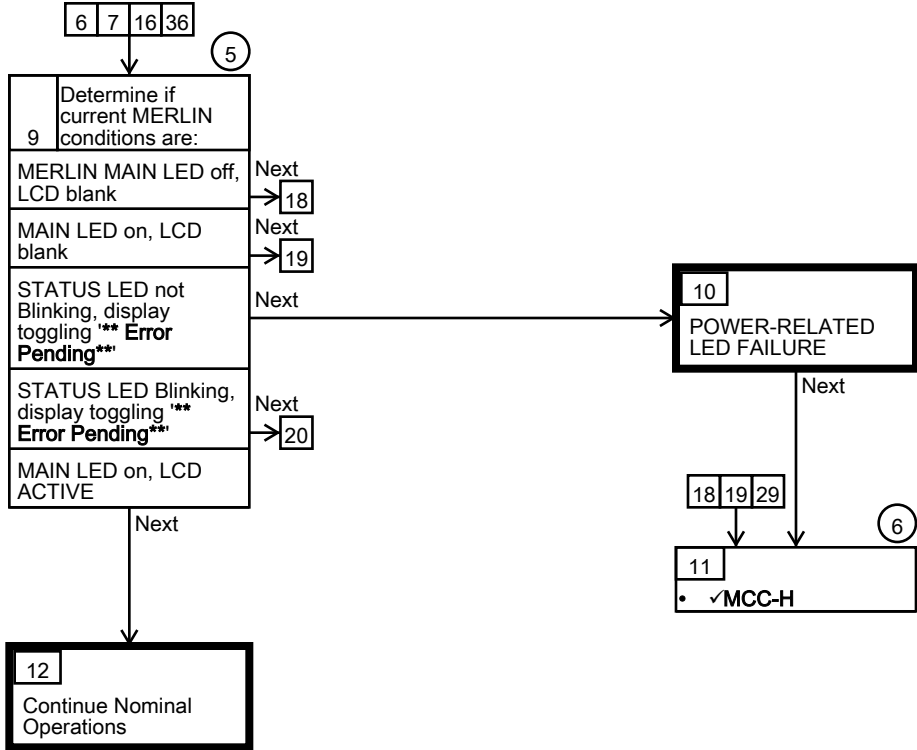
Page 1 of 8 pages

LCD Blank

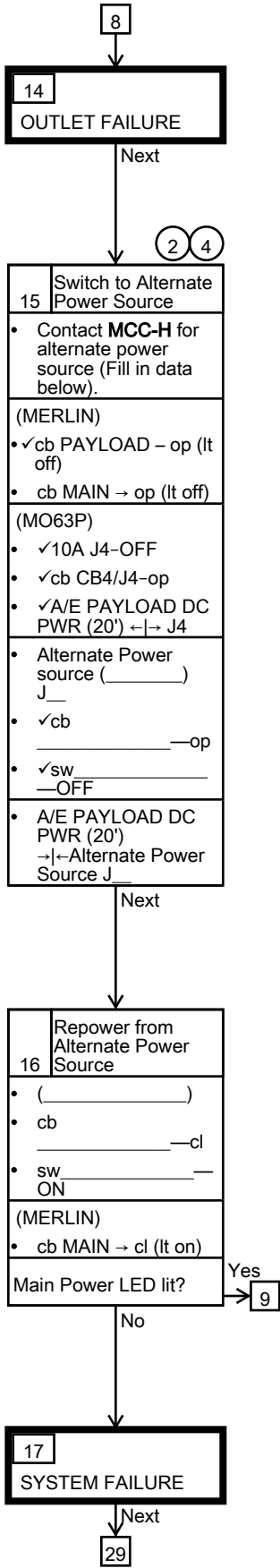
Nominal Config:
(MF71E)
cb MAIN – cl (It on)
cb PAYLOAD – op (It off)
(MO63P)
cb CB4/J4 – cl
10A J4 – ON



- ① Fan running indicates MERLIN on STS or EXPRESS power.
- ② Always deadface DC Power source when disconnecting or connecting power cable.
- ③ Path from block 6 checks MO63P outlet, from block 7 checks MERLIN cb. Internal voltages require approximately 2 min to dissipate upon cb open. Dissipation complete when Power LED extinguishes.
- ④ Verify connectors are properly mated and seated securely when reconnecting.

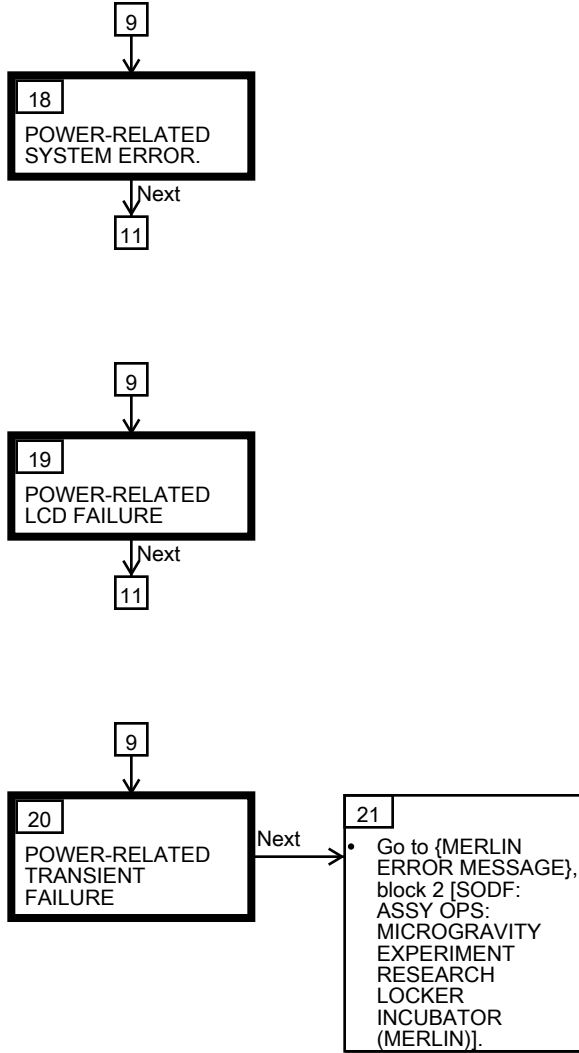


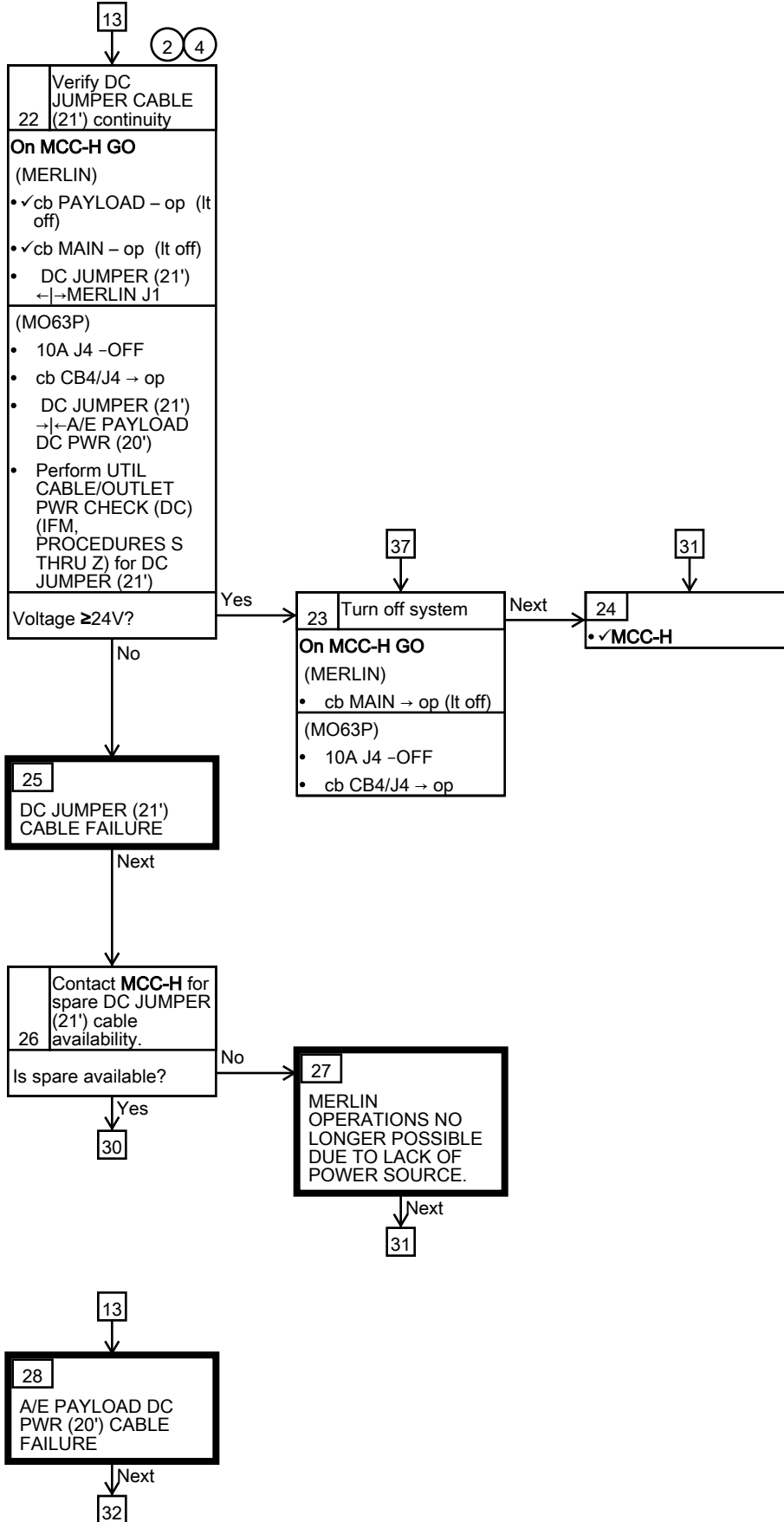
- 2 Always deadface DC Power source when disconnecting or connecting power cable.
- 4 Verify connectors are properly mated and seated securely when reconnecting.
- 5 Initialization takes approximately 2 minutes. Initialization is complete when LCD Line 1 reads 'HOME DISPLAY'.
- 6 The MERLIN payload may continue to function if LCD fails.



2
Always deadface DC Power source when disconnecting or connecting power cable.

4
Verify connectors are properly mated and seated securely when reconnecting.





② Always deadface DC Power source when disconnecting or connecting power cable.

④ Verify connectors are properly mated and seated securely when reconnecting.

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29	Turn off system
On MCC-H GO	
(MERLIN)	
<ul style="list-style-type: none"> • cb POWER → op (lt off) 	
<ul style="list-style-type: none"> • Alternate Power source (_____) J _____ 	
<ul style="list-style-type: none"> • ✓cb _____ —op 	
<ul style="list-style-type: none"> • ✓sw _____ —OFF 	

Next

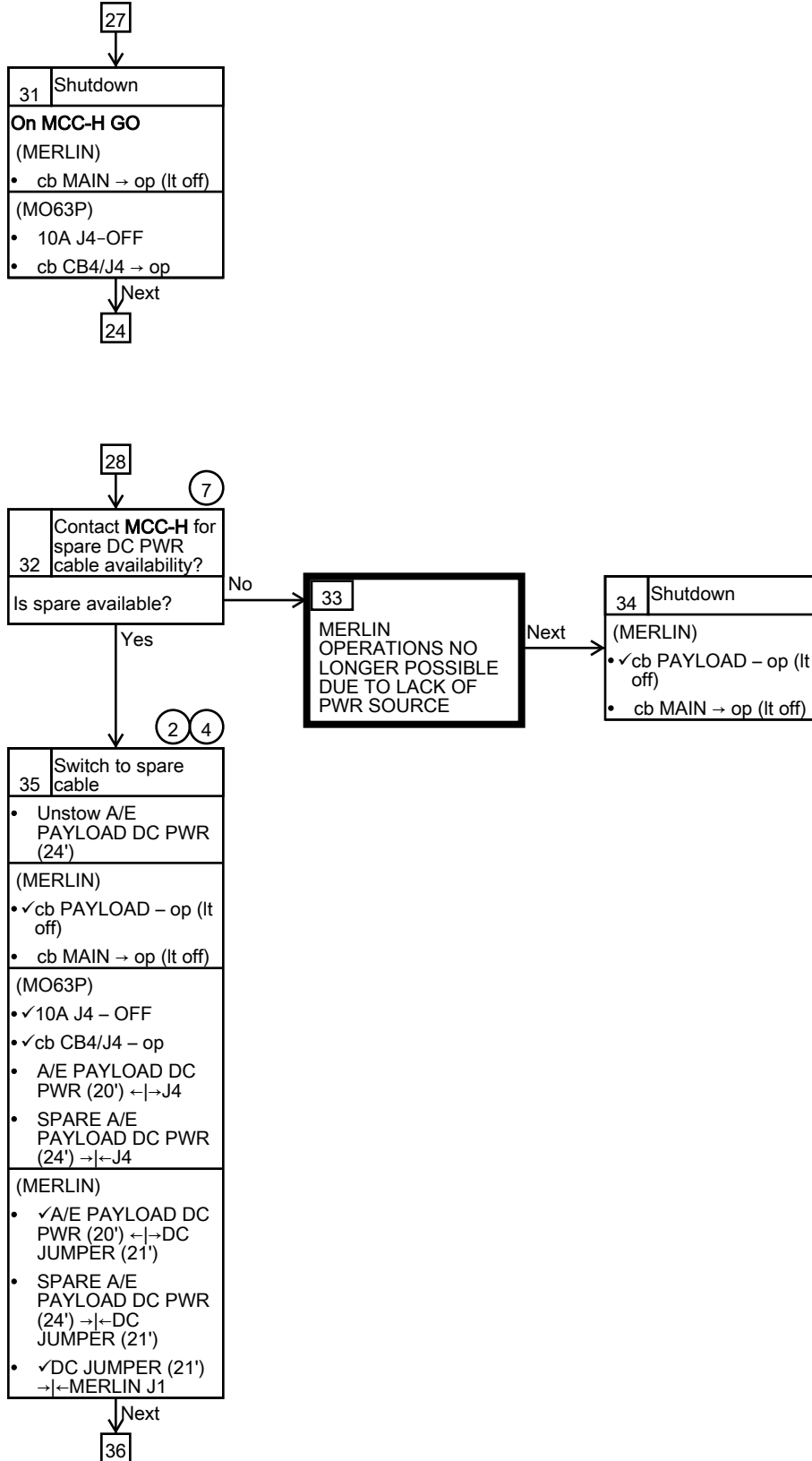
11

26

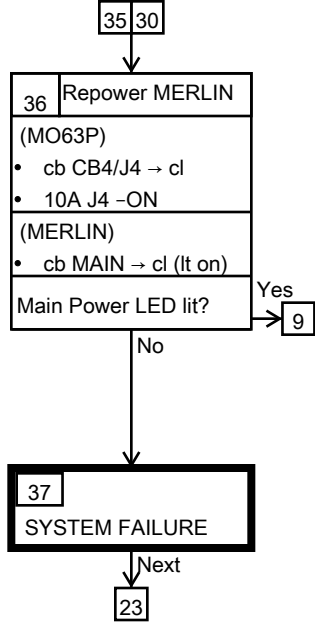
30	Switch to spare DC JUMPER (21') cable
<ul style="list-style-type: none"> • Unstow Spare DC JUMPER (21') Cable 	
(MERLIN)	
<ul style="list-style-type: none"> • ✓cb PAYLOAD – op (lt off) • cb MAIN → op (lt off) 	
(MO63P)	
<ul style="list-style-type: none"> • ✓10A J4 – OFF • ✓cb CB4/J4 – op 	
(MERLIN)	
<ul style="list-style-type: none"> • DC JUMPER (21') ← →A/E PAYLOAD DC POWER (20') • ✓DC JUMPER (21') ← →MERLIN J1 • A/E PAYLOAD DC PWR (20') → ←Spare DC JUMPER (21') • Spare DC JUMPER (21') → ←MERLIN J1 	

Next

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- ② Always deadface DC Power source when disconnecting or connecting power cable.
- ④ Verify connectors are properly mated and seated securely when reconnecting.
- ⑦ Spare Cable stowed in IFM Contingency Hose and Cable Kit (CHCK).



MERLIN RECORD DIAGNOSTIC DATA

(ASSY OPS/19A/FIN)

Page 1 of 3 pages

OBJECTIVE:

The following steps allow the recording of some MERLIN data for diagnostic purposes.

```
*****
*
* If Display - ***Error Pending***:
* |   Perform MERLIN ERROR MESSAGE, all (SODF: ASSY OPS:
* |   PAYLOADS), then:
*
*****
```

RECORDING HOME DISPLAY DATA

1. ✓ **MCC-H** for parameters to record in Table 5-II, MERLIN Diagnostic Log File

2. ✓ Display – **'HOME DISPLAY'**

```
*****
*
* If 'HOME DISPLAY' not shown
* |   pb Right (EXIT) → Press until 'HOME DISPLAY' appears
*
*****
```

3. Record **'CURR TEMP'**, **'GPS'** in Table 5-II, MERLIN Diagnostic Log File.

RECORDING QUICK STATUS

4. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'

5. pb Center (SELECT) → Press (one time), the following appears:
'MAIN: QUICK STATUS'
'ECW 01/19'

NOTE

1. The left pushbutton (-PARAM) moves to previous parameter display.
2. The center pushbutton (+PARAM) moves to next parameter display.

6. Record Quick Status data per **MCC-H** in Table 5-II, MERLIN Diagnostic Log File.

7. pb Center (+PARAM) → Press until all Quick Status data has been recorded per **MCC-H**

8. pb Right (EXIT) → Press until **'HOME DISPLAY'** appears

9. Contact **MCC-H** to report log values from log file

RECORDING THERMAL GENERAL

10. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
11. pb Left (NEXT) → Press (one time), the following appears:
'MAIN MENU'
'Status 2/8'
12. pb Center (SELECT) → Press (one time), the following appears:
'MAIN: STATUS'
'Thermal 1/6'
13. pb Center (SELECT) → Press (one time), the following appears:
'STATUS:THERMAL'
'General 1/4'
14. pb Center (SELECT) → Press (one time), the following appears:
'THERMAL: GENERAL'
'Temp Control 01/12'

NOTE

1. The left pushbutton (-PARAM) moves to previous parameter display.
2. The center pushbutton (+PARAM) moves to the next parameter display.

15. Record Thermal General data per **MCC-H** in Table 5-II, MERLIN Diagnostic Log File.
16. pb Center (+PARAM) → Press until all Thermal General data has been recorded per **MCC-H**
17. pb Right (EXIT) → Press until '**HOME DISPLAY**' appears
18. Contact **MCC-H** to report log values from log file

RECORDING ANCILLARY GENERAL

19. pb Left (MENU) → Press (one time), the following appears:
'MAIN MENU'
'Quick Status 1/8'
20. pb Left (NEXT) → Press (one time), the following appears:
'MAIN MENU'
'Status 2/8'
21. pb Center (SELECT) → Press (one time), the following appears:
'MAIN: STATUS'
'Thermal 1/6'
22. pb Left (NEXT) → Press (two times), the following appears:

MERLIN RECORD DIAGNOSTIC DATA

(ASSY OPS/19A/FIN)

Page 3 of 3 pages

'MAIN: STATUS'

'Ancillary 3/6'

23. pb Center (SELECT) → Press (one time), the following appears:

'STATUS: ANCILLARY'

'General 1/4'

24. pb Center (SELECT) → Press (one time), the following appears:

'ANCILLARY: GENERAL'

'Boot Count 01/06'

NOTE

1. The left pushbutton (-PARAM) moves to previous parameter display.

2. The center pushbutton (+PARAM) moves to next parameter display.

25. Record Ancillary General data per **MCC-H** in Table 5-II, MERLIN Diagnostic Data Log File.
26. pb Center (+PARAM) → Press until all Ancillary General data has been recorded per **MCC-H**
27. pb Right (EXIT) → Press until '**HOME DISPLAY**' appears.
28. Contact **MCC-H** to report log values from log file

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Table 5-I. MERLIN Reset Log File

Parameter	Event 1	Event 2	Definition or Options
CURR TEMP	Start ____ . ____ °C End ____ . ____ °C	Start ____ . ____ °C End ____ . ____ °C	MERLIN Current Temperature XX.XX °C
GPS	Start ____ : ____ : ____ (Day) ____ : ____ : ____ GPS End ____ : ____ : ____ (Day) ____ : ____ : ____ GPS	Start ____ : ____ : ____ (Day) ____ : ____ : ____ GPS End ____ : ____ : ____ (Day) ____ : ____ : ____ GPS	Day Month-Abbreviation Year Hours: Min: S
Expected CURR TEMP	____ . ____ °C	____ . ____ °C	Expected MERLIN Current Temperature per MCC-H (-20.0 to +48.5° C)
Expected SP TEMP	____ . ____ °C	____ . ____ °C	Expected Set Point Temperature per MCC-H (-20.0 to +48.5° C)
Set Point Temperature	____ . ____ °C	____ . ____ °C	-20.0 to +48.5° C
Ramp Rate	____ . ____ °C / Hour	____ . ____ °C / Hour	0.1 to 20.0° C / Hour

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Continuation of Table 5-I. MERLIN Reset Log File

Parameter	Event 1	Event 2	Definition or Options
System Data Storage Interval	: : : : : : : :	: : : : : : : :	Hours: Min: S (Interval must be greater than 0)
Experiment Data Storage Interval	: : : : : : : :	: : : : : : : :	Hours: Min: S (Interval must be greater than 0)
Heat Removal Mode	Air <input type="checkbox"/> Water <input type="checkbox"/>	Air <input type="checkbox"/> Water <input type="checkbox"/>	Air or Water
Memory Full Mode	Overwrite Oldest Data <input type="checkbox"/> Terminate Data Recording <input type="checkbox"/>	Overwrite Oldest Data <input type="checkbox"/> Terminate Data Recording <input type="checkbox"/>	Overwrite Oldest Data or Terminate Data Recording
External Fan Mode	Off <input type="checkbox"/> On <input type="checkbox"/> Automatic <input type="checkbox"/>	Off <input type="checkbox"/> On <input type="checkbox"/> Automatic <input type="checkbox"/>	Off or On or Automatic

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Continuation of Table 5-I. MERLIN Reset Log File

Parameter	Event 1	Event 2	Definition or Options
Power Recovery Mode	Return to Set Point Temperature <input type="checkbox"/>	Return to Set Point Temperature <input type="checkbox"/>	Return to Set Point Temperature
	Hold Present Temperature <input type="checkbox"/>	Hold Present Temperature <input type="checkbox"/>	Hold Present Temperature
	Continue Ramp from Last Set Point <input type="checkbox"/>	Continue Ramp from Last Set Point <input type="checkbox"/>	Continue Ramp from Last Set Point
	Continue Ramp from Present Set Point <input type="checkbox"/>	Continue Ramp from Present Set Point <input type="checkbox"/>	Continue Ramp from Present Set Point
Door Detection Mode	Enabled <input type="checkbox"/>	Enabled <input type="checkbox"/>	Enabled or Disabled
	Disabled <input type="checkbox"/>	Disabled <input type="checkbox"/>	
Experiment Volume Fan Mode	Enabled <input type="checkbox"/>	Enabled <input type="checkbox"/>	Enabled or Disabled
	Disabled <input type="checkbox"/>	Disabled <input type="checkbox"/>	
Temperature Bandwidth	____. ____ °C	____. ____ °C	00.1 to 25.0° C
Downlink Mode	Enabled <input type="checkbox"/>	Enabled <input type="checkbox"/>	Enabled or Disabled
	Disabled <input type="checkbox"/>	Disabled <input type="checkbox"/>	

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Continuation of Table 5-I. MERLIN Reset Log File

Parameter	Event 1	Event 2	Definition or Options
PID Temperature Sensors	Left Wall <input type="checkbox"/>	Left Wall <input type="checkbox"/>	System Left Wall
	Right Wall <input type="checkbox"/>	Right Wall <input type="checkbox"/>	Right Wall
	Experiment volume air <input type="checkbox"/>	Experiment volume air <input type="checkbox"/>	Experiment volume air
	Experiment 1-11	Experiment 1-11	
	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/>	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/>	Experiment 1-11
	7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/>	7 <input type="checkbox"/> 8 <input type="checkbox"/> 9 <input type="checkbox"/> 10 <input type="checkbox"/> 11 <input type="checkbox"/>	
Temperature Control Mode	Set Point <input type="checkbox"/>	Set Point <input type="checkbox"/>	Set Point
	Programmable Temperature Profile (PTP) <input type="checkbox"/>	Programmable Temperature Profile (PTP) <input type="checkbox"/>	Programmable Temperature Profile (PTP)
	Set Point to PTP <input type="checkbox"/>	Set Point to PTP <input type="checkbox"/>	Set Point to PTP
	Override <input type="checkbox"/>	Override <input type="checkbox"/>	Override
	Off <input type="checkbox"/>	Off <input type="checkbox"/>	Off

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Continuation of Table 5-I. MERLIN Reset Log File

Parameter	Event 1	Event 2	Definition or Options
FILE Cleanup Directories	DIRECTORIES	DIRECTORIES	DIRECTORIES
	L (Log Directory) <input type="checkbox"/>	L (Log Directory) <input type="checkbox"/>	L (Log Directory)
	M (System Data Directory) <input type="checkbox"/>	M (System Data Directory) <input type="checkbox"/>	M (MERLIN System Data Directory)
	E (Experiment Data Directory) <input type="checkbox"/>	E (Experiment Data Directory) <input type="checkbox"/>	E (Experiment Data Directory)
	U (Uplink Directory) <input type="checkbox"/>	U (Uplink Directory) <input type="checkbox"/>	U (Uplink Directory)

Note: These items may need to be entered for multiple events.

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Table 5-II. MERLIN Diagnostic Log File

Parameter	Definition	Event 1	Event 2	Event 3	Event 4
MAIN MENU					
1	CURR TEMP	Current Temperature °C			
2	GPS	Day Month-Abbreviation Year Hours: Min: S (> 0) (12Apr06 20:24:34)	____ _ __ : __ : __	____ _ __ : __ : __	____ _ __ : __ : __
QUICK STATUS					
1	ECW	Nominal Status Indicator			
2	Left Wall	Sensor Temperature °C			
3	Exp Volume Air	Sensor Temperature °C			
4	Right Wall	Sensor Temperature °C			
5	Duct Inlet	Sensor Temperature °C			
6	Hot HX Surface	Sensor Temperature °C			
7	Duct Outlet	Sensor Temperature °C			
8	Electronics Bay	Sensor Temperature °C			
9	Ambient	Sensor Temperature °C			
10	HX Humidity	% Humidity			
11	Temp Bandwidth	Bandwidth °C			
12	Exp Volume Fan	Enabled/Disabled			
13	External Fan	On/Off			
14	Memory Used	% Memory			
15	TE Power	0 to 127			
16	Heater Power	0 to 100			
17	Function Code	Hex Value			
18	IP Address	Ethernet Address			
19	Usage Meter	Days:Hours:Minutes			

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Continuation of Table 5-II. MERLIN Diagnostic Log File

Parameter		Definition	Event 1	Event 2	Event 3	Event 4
THERMAL: GENERAL						
1	Temp Control	SET POINT OFF OVERRIDE PROG TEMP PROFILE SET POINT TO PROFILE				
2	Current Temp	Sensor Temperature °C				
3	Interim Set Pt	Sensor Temperature °C				
4	End Set Point	Sensor Temperature °C				
5	Ramp Rate	Rate °C/Hour				
6	Heater Power	0 to 127				
7	TE Power	0 to 100				
8	Temp Bandwidth	Bandwidth °C				
9	B/W Status	Inside/Outside				
10	Curr Prof Line	Current profile line				
11	Prof Start GPS	Profile start time				
12	Line Time Left	Profile time left				
ANCILLARY: GENERAL						
1	Boot Count	Number of times the system had rebooted				

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Table 5-III. MERLIN Error Message Log File

GMT	MERLIN Error Message	MERLIN Error Event	MERLIN Error Status
Day Month - Abbreviation Year Hours: Min: S (12 Apr 06 20:24:34)	Text	X of Total Number (1 / 5)	(IP) INACTIVE / PENDING (AP) ACTIVE / PENDING (IA) INACTIVE / ACKED (AA) ACTIVE / ACKED (R) RESET
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____
__:__:__ : : __:__:__	_____	__/___	_____

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Continuation of Table 5-III. MERLIN Error Message Log File

GPS	MERLIN Error Message	MERLIN Error Event	MERLIN Error Status
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____
____ : ____ : ____ ____ : ____ : ____	_____	____ / ____	_____

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Continuation of Table 5-III. MERLIN Error Message Log File

Possible MERLIN Error Messages:

- | | | |
|----------------------|-------------------------|-------------------------|
| (1) RTC I2 ERROR | (12) HX CRIT OVERTEM | (23) DISK FULL STOP DAT |
| (2) PWM I2 ERROR | (13) HOT EXPT TOUCH | (24) CAUTION TMPFAIL |
| (3) DAS I2C ERROR | (14) BAD COOLING AIR1 | (25) WARNING TMPFAIL |
| (4) U1 I2C ERROR | (15) BAD COOLING AIR2 | (26) CAUTION OVERTEMP |
| (5) U2 IC2 ERROR | (16) LWALL OVERTEMP | (27) WARNING OVERTEMP |
| (6) HOT LWALL TOUCH | (17) RWALL OVERTEMP | (28) ALL PID FAILD |
| (7) HOT RWALL TOUCH | (18) IN AIR OVERTEMP | (29) PID CTRL STOP |
| (8) COLD LWALL TOUCH | (19) OUT AIR OVERTEMP | (30) PID INIT FAILED |
| (9) COLD RWALL TOUCH | (20) TEs DISABLED | (31) PIDT BANDWIDTH |
| (10) EE BOX OVERTEMP | (21) HEATER DISABLED | |
| (11) HX OVERTEMP | (22) DISK FULL STOP LOG | |

Note: Errors 12, 16, 17, 19, 20, 21 and 28 can not be reset from front panel.
The system must be rebooted to clear error.

Continuation of Table 5-III. MERLIN Error Message Log File

Current TE Power (0 to 127)	New TE Power (0 to 127)	Current Heater Power (0 to 100)	New Heater Power (0 to 100)

271

Continuation of Table 5-III. MERLIN Error Message Log File

PID Temperature Control Sensors	Left Wall	<input type="checkbox"/>	System Left Wall	
	Right Wall	<input type="checkbox"/>	Right Wall	
	Experiment volume air	<input type="checkbox"/>	Experiment Volume Air	
	Experiment 1 to 11		Experiment 1 to 11	
	1	<input type="checkbox"/>	2	<input type="checkbox"/>
	3	<input type="checkbox"/>	4	<input type="checkbox"/>
	5	<input type="checkbox"/>	6	<input type="checkbox"/>
7	<input type="checkbox"/>	8	<input type="checkbox"/>	
	9	<input type="checkbox"/>	10	<input type="checkbox"/>
	11	<input type="checkbox"/>		

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Continuation of Table 5-III. MERLIN Error Message Log File

Temperature Bandwidth	____. ____ °C	00.1 to 25.0 °C
-----------------------	---------------	-----------------

MYCO BODY SAMPLE COLLECTION

(ASSY OPS/19A/FIN)

Page 1 of 8 pages

OBJECTIVE:

This procedure is used to collect body samples for mycological evaluation. The activity must be performed first thing in the morning. In-flight sample collection will be performed during the joint operation period, and within 60 hours before closing the vehicle hatch.

PARTS:

Myco Kit P/N MK-1

Myco Sampling Sheet (5) P/N MK-3 (including 1 spare)

Myco Sampling Sheet Storage Bag P/N MK-6

Myco Swab (3) P/N MK-2

Sputum Tube P/N MK-4

BZK Wipe P/N MK-5

MATERIALS:

Drinking Water Container (filled with water (about 100cc))

Towel (Crew Preference)

Mirror (Crew Preference)

TOOLS:

Sharpie Flight Pen

1. CLEANING HANDS

NOTE

Body sample collection should be performed first thing in the morning.

Before this activity after waking up, do NOT

- eat anything
- wash the face
- brush teeth
- gargle (until step 4.1)

If needed, refer to pictures of Myco Kit in [MYCO KIT](#) (SODF: ASSY OPS: REFERENCE).

1.1 Clean hands (especially finger tips) with BZK Wipe.

2. BODY SAMPLE COLLECTIONS 1 (SAMPLING SHEET)



Figure 1. Opening the package of Myco Sampling Sheet

NOTE

Use specified Myco Sampling Sheet for each sampling location (see the label).

- 2.1 Remove Myco Sampling Sheet package for left cheek from Myco Kit. Refer to Figure 1.
- 2.2 Peel and open the package halfway. (Do NOT open the package past the kapton tape since it will be used to stow used Myco Sampling Sheet.)

Remove Myco Sampling Sheet from the package.
 Temporarily stow the package.
 Refer to Figure 1.

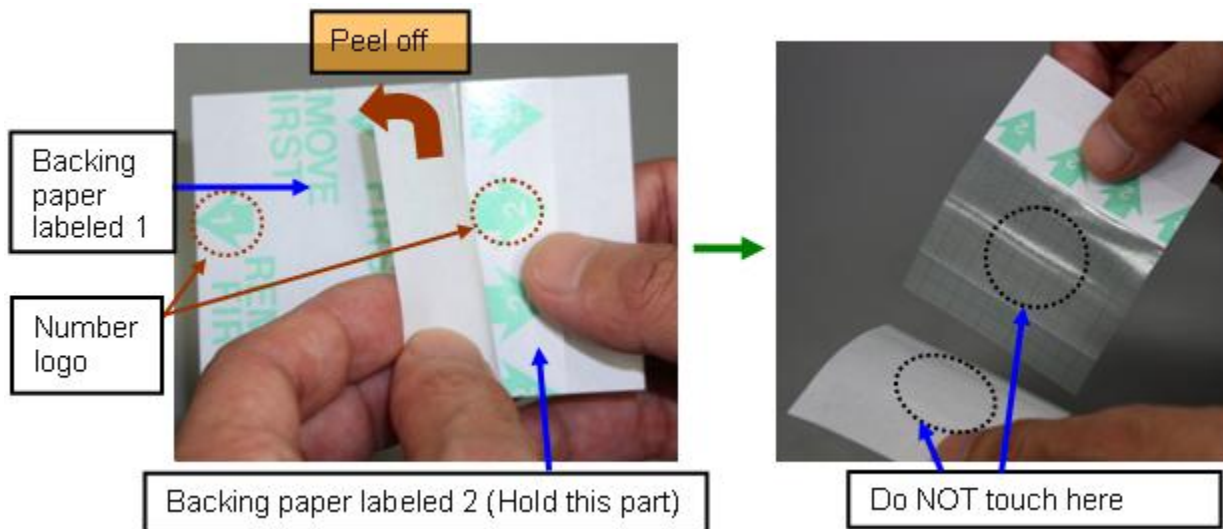


Figure 2. Peeling off backing paper labeled 1

CAUTION

Do NOT touch the center of adhesive face of Myco Sampling Sheet or the white glossy side of the backing paper labeled 1 to avoid contamination. Refer to Figure 2.

2.3 Hold the part of Myco Sampling Sheet labeled 2 with the number logo facing up.

Peel off the backing paper labeled 1. (Keep the white glossy side clean to avoid contamination)

Temporarily stow the backing paper labeled 1 in the package. (for use in step 2.7)

Refer to Figure 2.

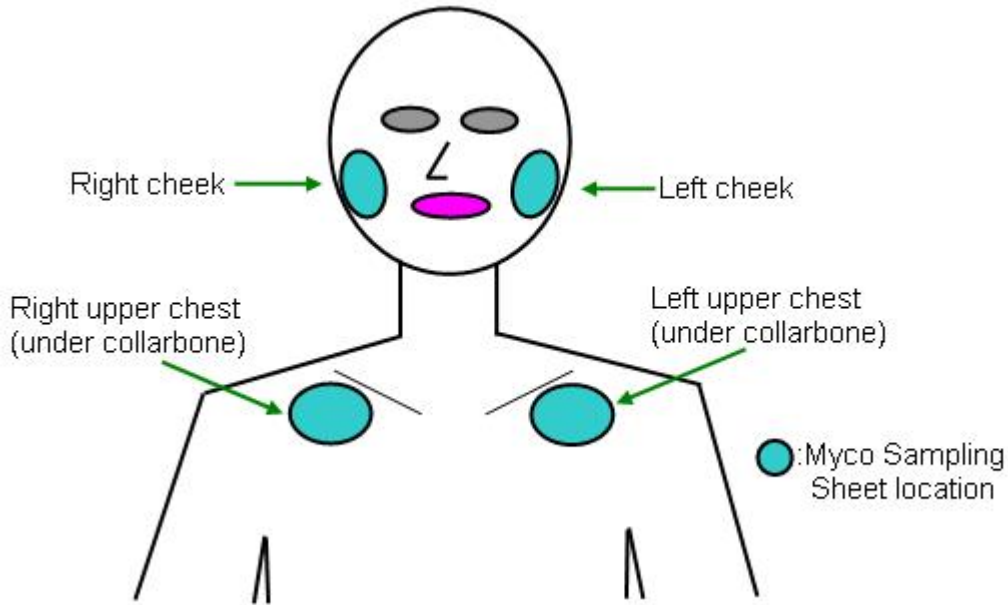


Figure 3. Myco Sampling Sheet location

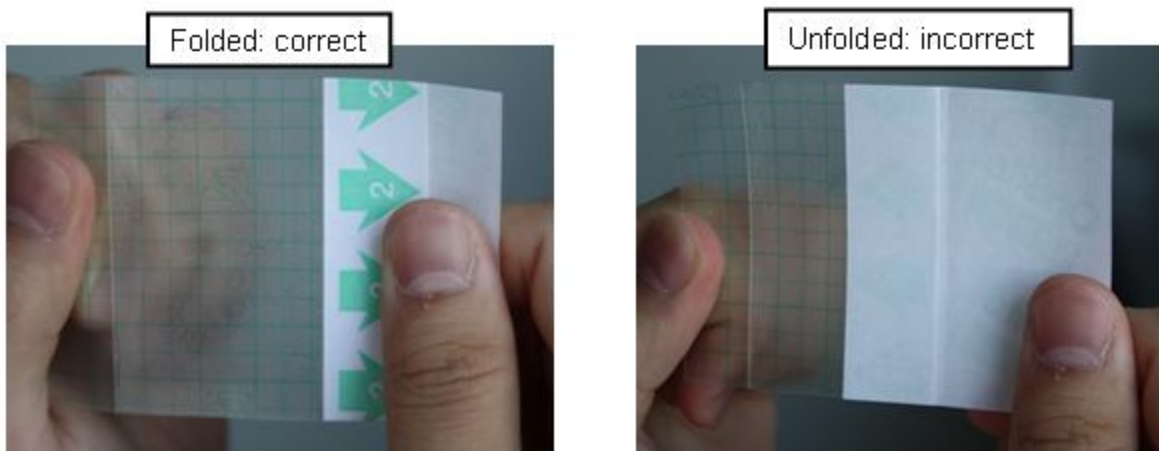
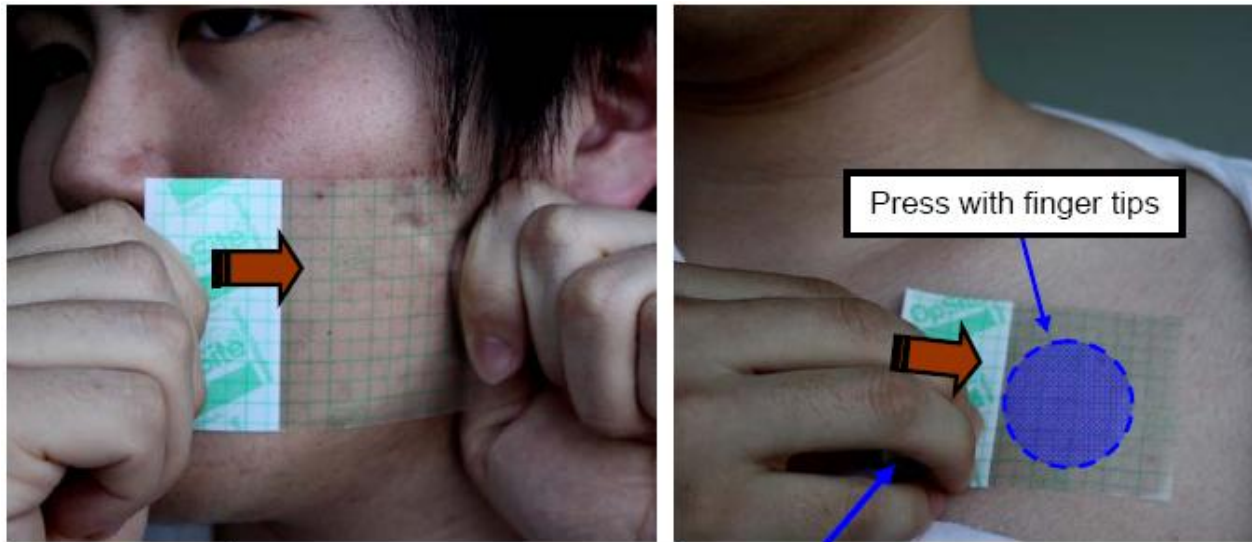


Figure 4. Unfolded and folded backing paper labeled 2



Remove Myco Sampling Sheet from the side that is attached to backing paper labeled 2.

Figure 5. Applying and removing Myco Sampling Sheet

NOTE

Unfolding the backing paper labeled 2 will significantly reduce the adhesive sampling area of Myco Sampling Sheet. Refer to Figure 4.

- 2.4 Apply the transparent part of Myco Sampling Sheet on the left cheek firmly with the adhesive side touching the skin. (Do not remove or unfold the backing paper labeled 2)

Refer to Figures 3 and 5.

If sampling location is cheek,

- Pull both ends of Myco Sampling Sheet and apply it firmly with both hands.
 - Refer to Figure 5.

If sampling location is upper chest,

- Apply Myco Sampling Sheet with one hand and press on it thoroughly with finger tips. (apply it right below the collarbone)
 - Refer to Figure 5.

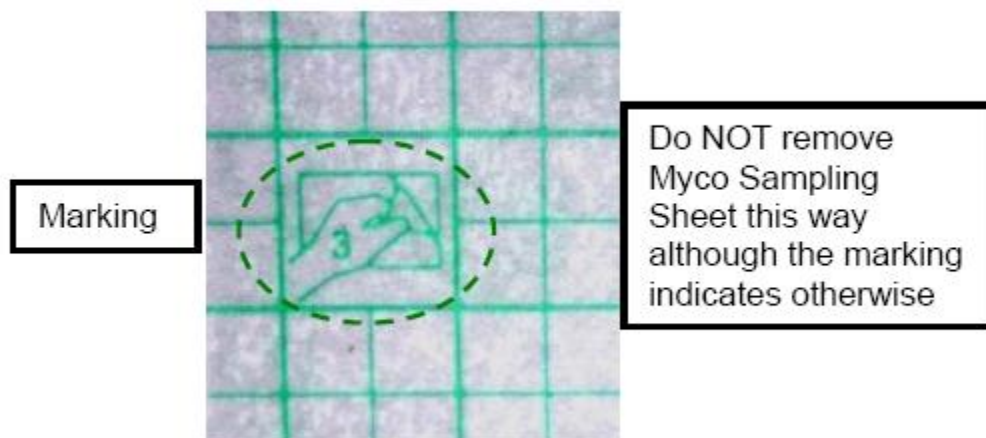


Figure 6. The marking on Myco Sampling Sheet

CAUTION
<p>Removing Myco Sampling Sheet in the direction the marking indicates will separate the upper layer with the grid from the adhesive layer. Refer to Figures 6.</p>

- 2.5 Hold Myco Sampling Sheet's edge that is attached to the backing paper labeled 2 and remove Myco Sampling Sheet from the skin as shown in Figure 5. (Do not remove it in the direction depicted on the backing, shown in Figure 6)
- 2.6 Apply and remove Myco Sampling Sheet two more times on the same place. Refer to Figure 5.

If no touch sample area inadvertently touched with something other than the Myco Sampling Sheet location,
 - Use spare Myco Sampling Sheet.
 - Label the white side of the package with the sampling location. (Sharpie Flight Pen)
- 2.7 Put Myco Sampling Sheet back on the white glossy side (no labeling) of the backing paper labeled 1 with the non-adhesive side facing up. Refer to Figure 2.
- 2.8 Put Myco Sampling Sheet back in the package. Fold the opening of the package.
- 2.9 Stow the package in Myco Sampling Sheet Storage Bag.
- 2.10 Repeat steps 2.1 to 2.9 for [x] where [x] = right cheek left upper-chest
right upper-chest
 Refer to Figure 3.

2.11 Stow Myco Sampling Sheet Storage Bag in Myco Kit.

3. BODY SAMPLE COLLECTIONS 2 (NASAL CAVITY SWAB)



Figure 7. Myco Swab

NOTE

Use specified Myco Swab for each sampling location (see the label).

3.1 Remove Myco Swab for right nasal cavity from Myco Kit.
Refer to Figure 7.

CAUTION

Keep Swab stick in the package until step 3.4 to avoid contamination of the tip.

3.2 Tear and open package of Myco Swab. (Trash the tab. Do not remove Myco Swab from package until Step 3.4.)

Refer to Figure 7.

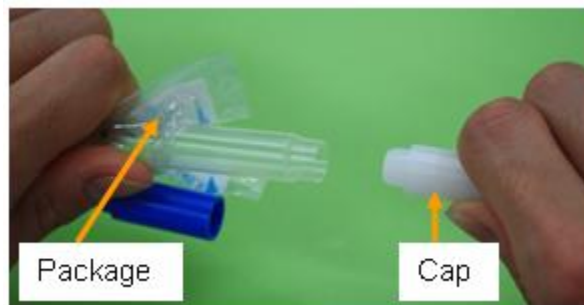


Figure 8. Removing the tube cap

3.3 Remove and trash cap from tube.

Refer to Figure 8.



Figure 9. Swab stick

CAUTION

Do NOT touch tip or stick to avoid contamination.
Refer to Figure 9.

- 3.4 Remove Swab stick from the package. (Hold blue finger grip)
Tmpry stow package. (for use in step 3.6)
Refer to Figure 9.

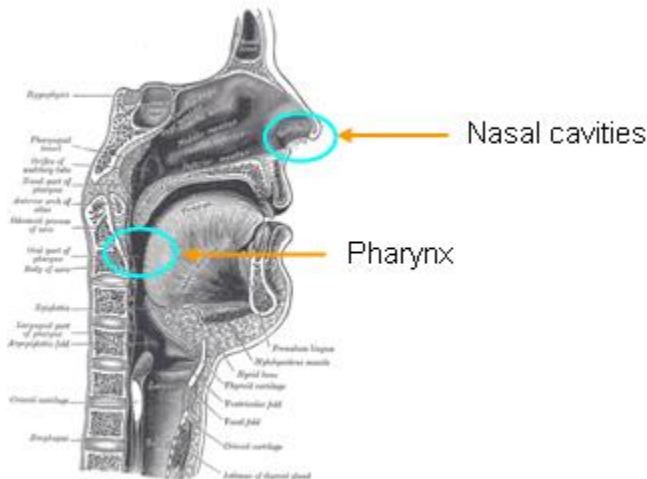


Figure 10. Myco Swab location

- 3.5 Swab the vestibule of the right nasal cavity slowly in circles 5 times with Swab Stick. (Do NOT insert Swab stick deeply into the vestibule.)

Refer to Figure 10.

- 3.6 Fully stow Swab stick into tube (Push the blue finger grip down).

- 3.7 Stow Myco Swab contained in the package in Myco Kit.

- 3.8 If posterior pharynx swab has been completed

Go to step 5

- 3.9 Repeat steps 3.1 to 3.7 for the left nasal cavity.

4. BODY SAMPLE COLLECTIONS 3 (POSTERIOR PHARYNX SWAB)

- 4.1 Rinse your mouth thoroughly with water, and swallow or spit on towel.

- 4.2 Repeat steps 3.1 to 3.7 for the posterior pharynx. (Use mirror if necessary)

Refer to Figure 10.

5. BODY SAMPLE COLLECTIONS 4 (SPUTUM TUBE)

- 5.1 Remove Sputum Tube from Myco Kit.

- 5.2 Remove cap from Sputum Tube. (rotate ccw).

5.3 Expectorate sputum into Sputum Tube.
If crew could not expectorate sputum,
| Expectorate saliva into Sputum Tube.

5.4 Close Sputum Tube cap.

5.5 Stow Sputum Tube in Myco Kit.

6. CLOSE OUT

6.1 Hand Myco Kit to ISS crew member for MELFI insertion.

6.2 Trash the following items:

Trash:

BZK Wipe

Myco Sampling Sheet (1)

Myco Swab package tab (3)

Myco Swab cap (3)

NLP-VACCINE-8 ACTIVATION

(ASSY OPS/19A/FIN)

OBJECTIVE:

Up to sixteen Group Activation Packs (GAPs) containing microbial experiments will be activated, one at a time, for the National Lab Pathfinder (NLP) - Vaccine-8 payload. Prior to activating, the Glass Barrels will be inspected for any signs of leakage. During activation, microbes will be injected into the growth media chamber so that growth may occur.

PARTS:

NLP-Vaccine-8

Group Activation Packs (GAPs) (sixteen)

Hand Crank

Ziplock Bag (if required)

1. Check Flight Plan Detail Page for which GAPs to activate. Record information in Table 1 in step 2.1

MA16D

2. ACTIVATING NLP-VACCINE-8 EXPERIMENT

- 2.1 Record Activation Start MET in Table 1.

Table 1. Activation Times

GAPs	Activation Start MET	Activation Stop MET
_____	_____	_____
_____	_____	_____
_____	_____	_____

WARNING

GAP cannot be processed if external leakage is evident. GAP will remain in Ziplock Bag.

- 2.2 Remove one GAP listed in Table 1 from Foam.

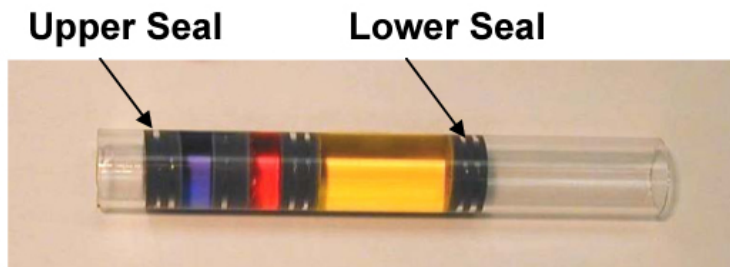


Figure 1. Loaded Glass Barrel.

- 2.3 Verify visually:

No leakage from GAP.

No fluid outside of the upper or lower seals within the Glass Barrels (Figure 1).

*
* If any external leakage is evident
* | Immediately seal GAP in Ziplock Bag, stow.
* | ✓ **MCC-H** with GAP number.
*

* If any leakage is evident in more than two Glass Barrels
* | Immediately seal GAP in Ziplock Bag, stow.
* | ✓ **MCC-H** with Glass Barrel and GAP number(s).
*

* If any leakage is evident in two or fewer Glass Barrel(s)
* | Complete step 2, then seal GAP in Ziplock Bag, stow.
* | ✓ **MCC-H** with Glass Barrel and GAP number(s).
*

2.4 Unstow Hand Crank and attach to GAP.
Slowly rotate the Hand Crank ↻ until lower edge of pressure plate aligns with lower edge of the first mark labeled "ACTIVATION" on the side of GAP housing.

2.5 Detach Hand Crank.

2.6 Shake GAP firmly by accelerating in a back and forth motion along the lengthwise axis of the GAP four times.

2.7 Verify visually:
No leakage from GAP.
No fluid outside of the upper or lower seals within the Glass Barrels (Figure 1).

*
* If any leakage from GAP or leakage within the Glass Barrel(s) is evident,
* | Immediately seal GAP in Ziplock Bag, stow.
* | ✓ **MCC-H** with GAP number.
*

2.8 Restow GAP in original location.

2.9 Repeat steps 2.2 to step 2.8 until all GAPS identified in Table 1 are activated.

2.10 Record Activation Stop MET in Table 1.

2.11 Restow Hand Crank in original location.

3. ✓ **MCC-H** with METs recorded in Table 1 (step 2.1).

NLP-VACCINE-8 TERMINATION

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

OBJECTIVE:

Up to sixteen Group Activation Packs (GAPs) containing microbial experiments will be terminated, one at a time, for the National Lab Pathfinder (NLP) - Vaccine payload. Prior to terminating, the Glass Barrels will be inspected for any signs of leakage. During termination, reagent will be injected into the growth chamber to stop the growth.

PARTS:

NLP-Vaccine-8

Group Activation Packs (GAPs) (sixteen)

Hand Crank

Ziplock Bag (if required)

1. Check Flight Plan Detail Page for which GAPs to terminate. Record information in Table 1 in step 2.1

MA16D

2. TERMINATING NLP-VACCINE-8 EXPERIMENT

- 2.1 Record Termination Start MET in Table 1.

Table 1. Termination Times

GAPs	Termination Start MET	Termination Stop MET
_____	_____	_____
_____	_____	_____
_____	_____	_____

WARNING

GAP cannot be processed if external leakage is evident. GAP will remain in Ziplock Bag.

- 2.2 Remove one GAP listed in Table 1 from Foam.

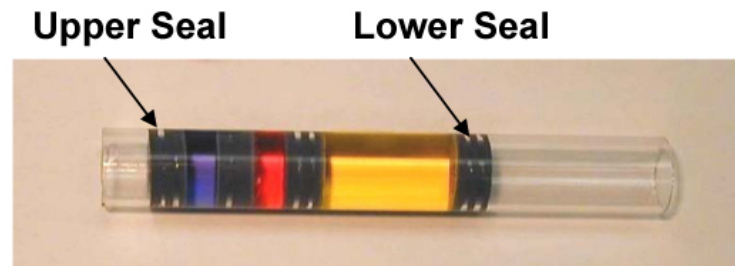


Figure 1. Loaded Glass Barrel.

- 2.3 Verify visually:
No leakage from GAP.
No fluid outside of the upper or lower seals within the Glass Barrels (Figure 1).

```

*****
*
* If any external leakage is evident
* |   Immediately seal GAP in Ziplock Bag, stow.
* |   ✓ MCC-H with GAP number.
*
*
* If any leakage is evident in more than two Glass Barrels
* |   Immediately seal GAP in Ziplock Bag, stow.
* |   ✓ MCC-H with Glass Barrel and GAP number(s).
*
*
* If any leakage is evident in two or fewer Glass Barrel(s)
* |   Complete step 2, then seal GAP in Ziplock Bag, stow.
* |   ✓ MCC-H with Glass Barrel and GAP number(s).
*
*****

```

2.4 Unstow Hand Crank and attach to GAP.
Slowly rotate the Hand Crank ↻ until lower edge of pressure plate aligns with lower edge of the first mark labeled "TERMINATION" on the side of GAP housing.

2.5 Detach Hand Crank.

2.6 Shake GAP firmly by accelerating in a back and forth motion along the lengthwise axis of the GAP four times.

2.7 Verify visually:
No leakage from GAP.
No fluid outside of the upper or lower seals within the Glass Barrels (Figure 1).

```

*****
*
* If any leakage from GAP or leakage within the Glass Barrel(s) is
* evident
* |   Immediately seal GAP in Ziplock Bag, stow.
* |   ✓ MCC-H with GAP number.
*
*****

```

2.8 Restow GAP in original location.

2.9 Repeat steps 2.2 to step 2.8 until all GAPs identified in Table 1 are terminated.

2.10 Record Termination Stop MET in Table 1.

2.11 Restow Hand Crank in original location.

3. ✓ MCC-H of METs recorded in Table 1 (step 2.1).

OBJECTIVE:

The following steps will initialize the STL System.

MA9G
(STL)

1. ✓POWER It – on

✓F1 It – off

*
* If POWER It off or F1 It on,
* | Perform [STL FAILURE](#), all (SODF: ASSY OPS: PAYLOADS).
*

2. ✓Display shows cycling status information including 'PRESS BUTTON FOR ORBIT TIME REF'

NOTE
Complete step 4 within 5 sec of step 3.
3. PULSE pb–push, hold until display reads 'PRESS BUTTON TO CONFIRM SIGNAL'

*
* If Display –'THE ACTION HAS BEEN CANCELED'
* |
* | wait at least 2 sec; then return to step 2
*

4. PULSE pb–push, hold until display reads 'THE ACTION HAS BEEN CONFIRMED' (2 sec)

✓Display shows cycling status information including 'PRESS BUTTON FOR LANDING PREP'
5. Photograph STL, including LCD display, Ops Item 4 (P/TV, SCENES, P/TV09 MIDDECK PAYLOADS)
6. Record MET ____:____ and Rail temps ____.

✓Rail temps (four) within nominal range 36-39 °C

*
* If temps out of range
* |
* | Perform [STL TEMP OUT OF RANGE ON LCD](#), all (SODF: ASSY OPS: PAYLOADS), then:
*

7. Notify **MCC-H** activity complete and report values recorded in step 6.

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OBJECTIVE:

The following steps will initialize the STL System.

TOOLS

Digital Camera

MA9G
(STL)

1. ✓POWER It – on

✓F1 It – off

*
* If POWER It off or F1 It on,
* | Perform [STL FAILURE](#), all (SODF: ASSY OPS: PAYLOADS).
*

2. ✓Display shows cycling status information including 'PRESS BUTTON FOR LANDING PREP'

NOTE

Complete step 4 within 5 sec of step 3.
3. PULSE pb–push, hold until display reads 'PRESS BUTTON TO CONFIRM SIGNAL'

*
* If Display –'THE ACTION HAS BEEN CANCELED'
* |
* wait at least 2 sec; then return to step 2
*

4. PULSE pb–push, hold until display reads 'THE ACTION HAS BEEN CONFIRMED'(2 sec)
5. Photograph STL, including LCD display, Ops Item 4 (P/TV, SCENES, P/TV09 MIDDECK PAYLOADS)
6. Record MET ____:____ and Rail temps ____.
✓Rail temps (four) within nominal range 36-39 °C

*
* If temps out of range
* |
* Perform [STL TEMP OUT OF RANGE ON LCD](#), all (SODF: ASSY OPS: PAYLOADS), then:
*

7. Notify **MCC-H** activity complete and report values recorded in step 6.

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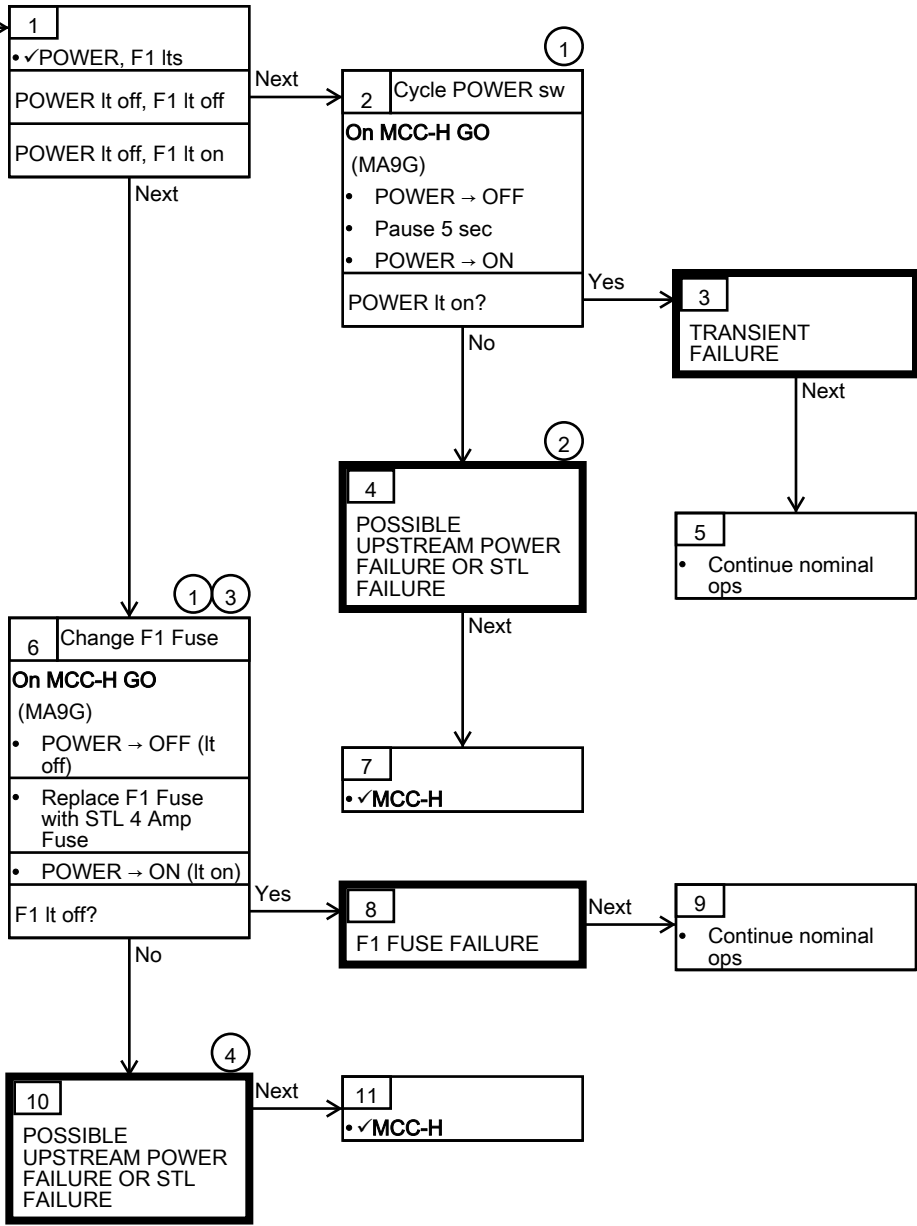
STL

STL FAILURE
(ASSY OPS/19A/FIN)

Page 1 of 1 page

POWER It or
F1 It Off -
nominal

Nominal Config:
(MA9G)
POWER It- on
F1 It-off
(MO13Q)
DC UTIL PWR
MNB-ON



1 Do not leave STL pwr off for >15 min.

2 MCC-H may direct crew to switch to alternate power source or replace A/E payload DC PWR (24') cable (P/N 10108-10082-07) with spare cable stowed in IFM Contingency Hose & Cable Kit (CHCK).

3 STL 4 Amp Fuse (two) located in MTBD.

4 MCC-H may direct crew to switch to alternate power source, or replace A/E payload DC PWR (24') cable (P/N 10108-10082-07) with spare stowed in IFM Contingency Hose & Cable Kit (CHCK), or replace F1 Fuse using STL 4 Amp Fuse in MTBD.

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STL

STL LCD FROZEN, BLANK, OR SCRAMBLED

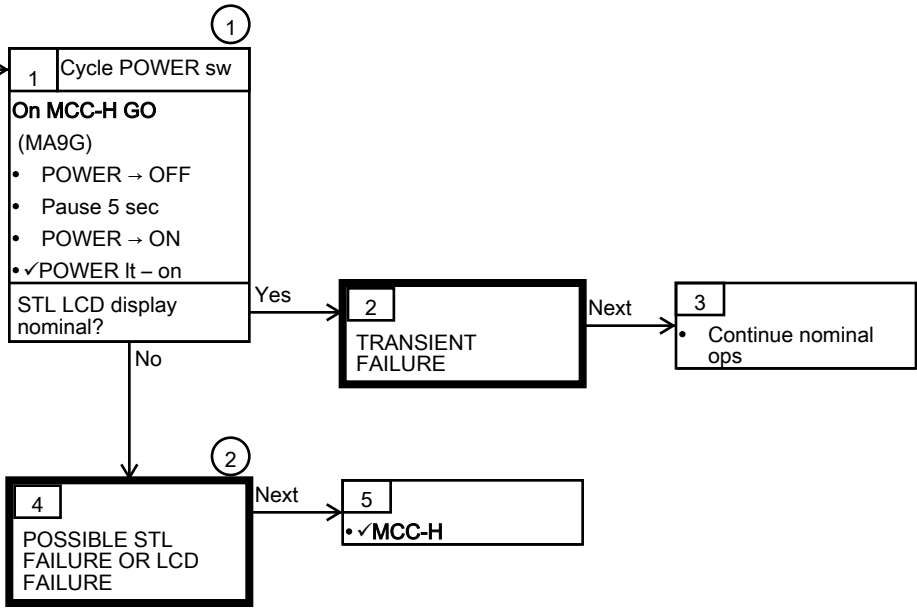
(ASSY OPS/19A/FIN) Page 1 of 1 page

①
Do not leave STL pwr off for >15 min.

②
The STL payload may continue to function if LCD fails.

LCD Display Frozen, Blank, or Scrambled

Nominal Config:
(MA9G)
POWER It- on
F1 It-on
LCD display-scrolling thru rail status 1-4 and system status msgs
(O15:C)
cb MNB UTIL PWR F1/MO13Q-cl
(MO13Q)
DC UTIL PWR MNB-ON



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STL

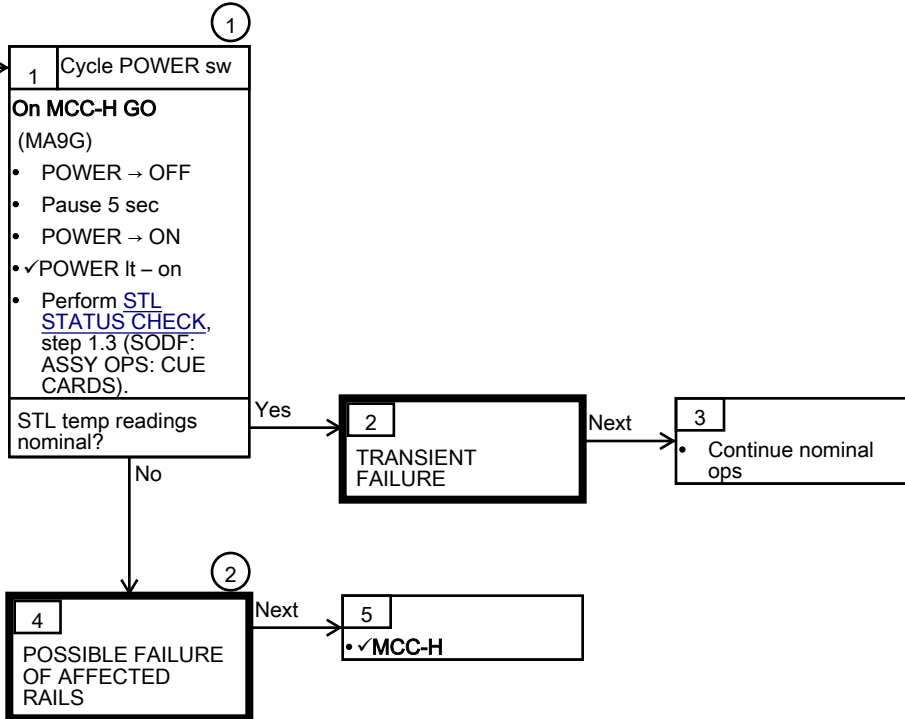
STL TEMP OUT OF RANGE ON LCD
(ASSY OPS/19A/FIN) Page 1 of 1 page

①
Do not leave
STL pwr off for
>15 min.

②
If any rails
continue to
display nominal
temp readings,
the payload may
continue to
operate for
remaining
functional rails

STL Temp
Readings
Off-Nominal

Nominal Config:
(MA9G)
POWER It- on
F1 It-on
(O15:C)
cb MNB UTIL
PWR
F1/MO13Q-cl
(MO13Q)
DC UTIL PWR
MNB-ON



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SPINAL ELONGATION OPERATOR PROCEDURE

(ASSY OPS/19A/FIN)

Page 1 of 12 pages

OBJECTIVE:

This procedure defines the steps needed for an operator to correctly set-up an Anthropometer Base and D2Xs Camera, correctly measure subject data, and then correctly take down and stow Anthropometer Base and D2Xs Camera for the Spinal Elongation investigation.

PARTS:

Spinal Elongation Kit

TOOLS:

12-24mm Lens

4GB EVA Flash Card (empty)

CF Card Adapter

D2Xs Camera

Multi-Use Arm (Shuttle)

SB-800 Flash

Shutter Release Cable (labeled Remote Cord Assembly)

1. UNSTOW HARDWARE

- 1.1 If first session for Spinal Elongation,
 - Unstow from ISS (consult stowage notes):
 - Spinal Elongation Kit
 - Retrieve from Shuttle Location:
 - Multi-Use Arm

- If subsequent session for Spinal Elongation,
 - Retrieve from tmpary stow location on Shuttle:
 - Spinal Elongation Kit
 - Multi-Use Arm

- 1.2 Retrieve from Shuttle:
 - 12-24mm Lens
 - CF Card Adapter
 - D2Xs Camera
 - SB-800 Flash

2. SETUP SPINAL ELONGATION HARDWARE ON CREW SEAT

- 2.1 CDR SEAT PWR BUS SEL - AC 2 (up)
- 2.2 Remove parachute from CDR seat (attached by velcro strap) and tmpary stow.
- 2.3 Configure CDR seat back in entry configuration and move seat all the way forward.

SPINAL ELONGATION OPERATOR PROCEDURE

(ASSY OPS/19A/FIN)

Page 2 of 12 pages

- 2.4 Wrap shoulder harness around back of CDR seat and tie. Remove seat pan cushion and place on top of tied shoulder harness to line up with Velcro on back of seat. Refer to Figure 1.

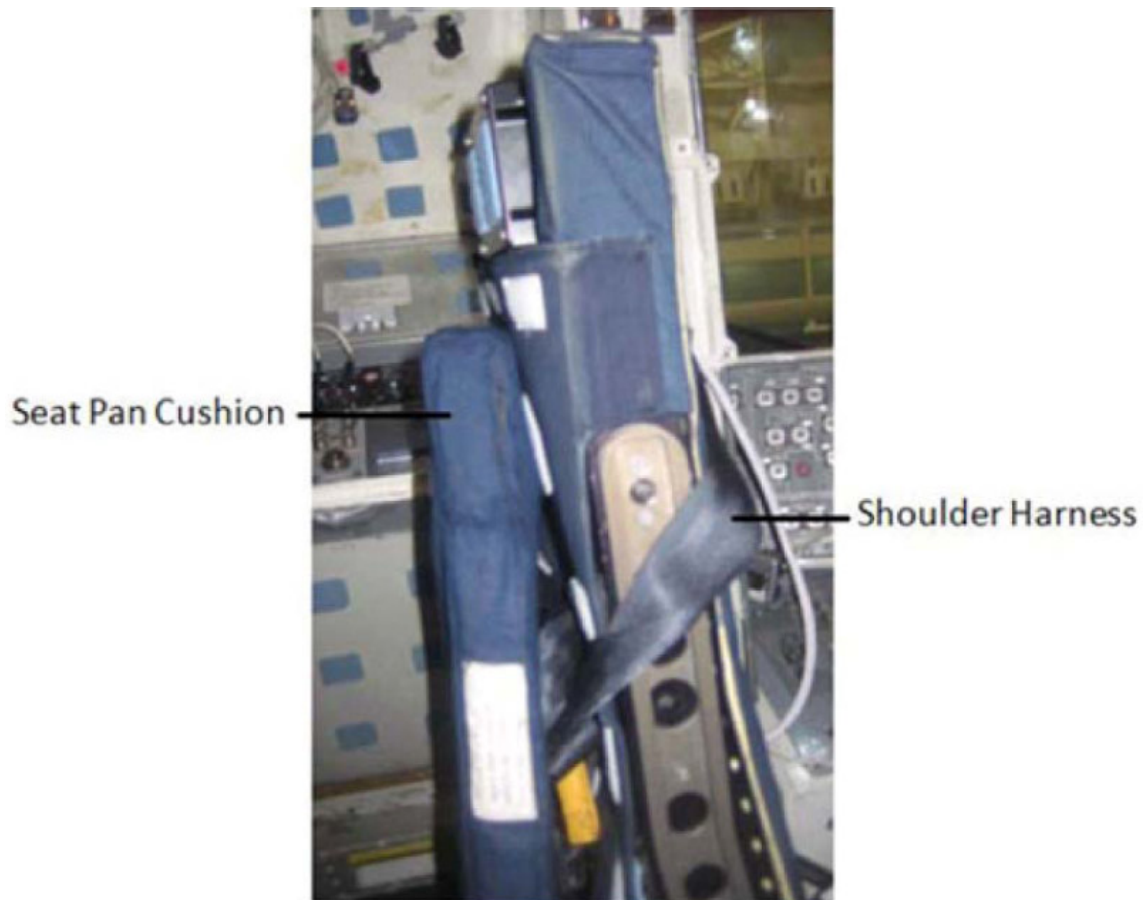


Figure 1. Shoulder Harness Wrapped Around CDR Seat Back.

- 2.5 Remove head rest from top of CDR seat and tmpy stow.
- 2.6 Unstow:

Spinal
Elongation
Kit

Anthropometer Base
Slider Post
Head Bar

Place hardware in CDR seat for setup.

- 2.6.1 Remove seat cover enough that Anthropometer Base will lay flat against the top of the seat.

CAUTION

1. The Anthropometer Base should easily slide into the seat and should not be forced. If forced, the hardware may become jammed, preventing the seat to be configured correctly for entry.
2. Spinal hardware should not be used as a hand-hold to move oneself.

- 2.6.2 To setup Anthropometer Base, hold Anthropometer Base by the anchor point, sliding the legs of the Anthropometer Base into the head rest holes on top of the seat. Refer to Figure 2.
- 2.6.3 ✓Anthropometer leg with the hole is oriented closest to the headrest release knob.
- 2.6.4 ✓Anthropometer Base label and lanyard face aft.

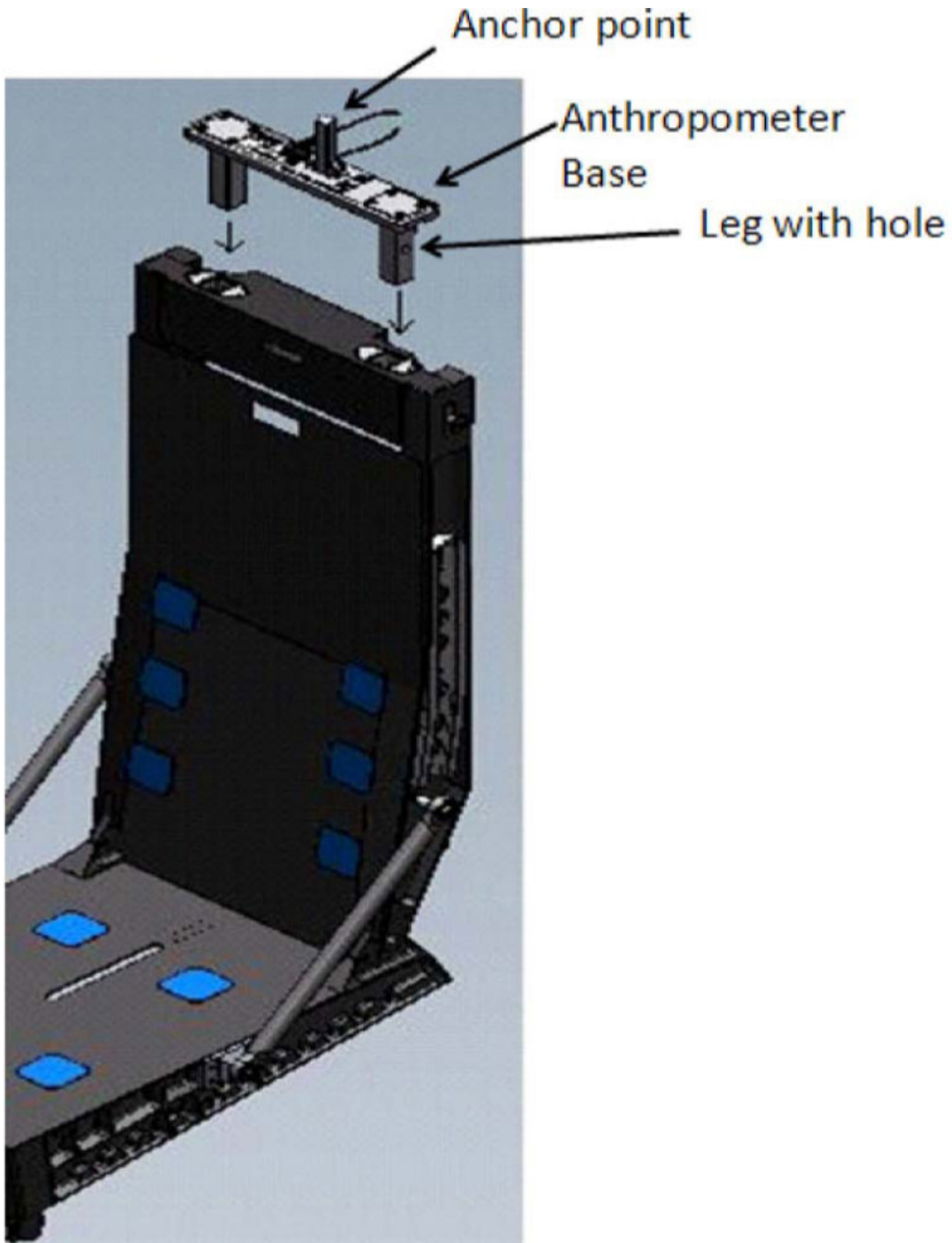


Figure 2. Anthropometer Base on CDR Seat.

- 2.6.5 Remove pin from Anthropometer Base.
- 2.6.6 Attach Slider Post onto anchor point of Anthropometer Base (ensure numbers face toward PLT seat).
- 2.6.7 Reinstall pin to secure Slider Post.
- 2.6.8 Insert Head Bar into slot on Slider Post (loosen adjustment screw if necessary to insert Head Bar).

Refer to Figure 3.

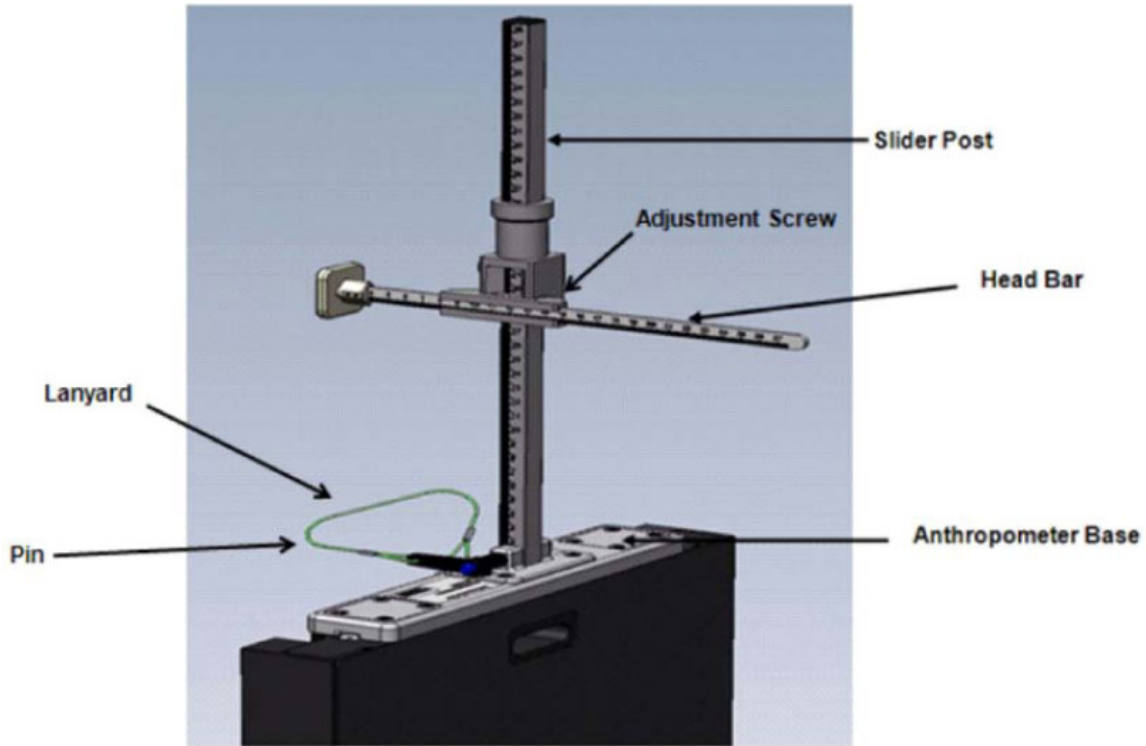


Figure 3. Final Assembly of Anthropometer Base on CDR Seat.

3. LAP BELT SETUP

3.1 Lengthen lap belt straps and wrap lap belt straps around the joint between the seat and the seat back (black metal frame) by wrapping from the inside of the frame then around the joint (point A to point B in Figure 4).

3.1.1 Ensure that lap belt adjustment is accessible and possible. Refer to Figures 4 and 5.

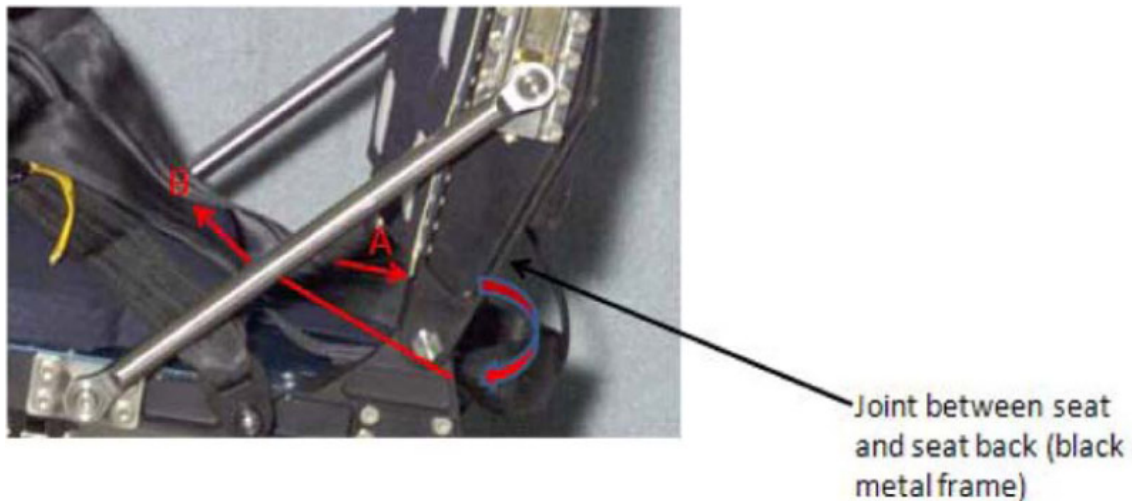


Figure 4. Lap Belt and Seat Back Joint Illustration.



Figure 5. Joint Between Seat and Seat Back (Black Metal Frame).

4. D2XS CAMERA SETUP AND CONFIGURE

- 4.1 Install SB-800 Flash onto D2Xs Camera (if not installed).
Install 12-24mm Lens onto D2Xs Camera (if not installed).
- 4.2 Install Shutter Release Cable onto D2Xs Camera (if not installed).
- 4.3 Check memory of 4GB EVA Flash Card in D2Xs Camera is empty.
If memory of 4GB EVA Flash Card in D2Xs Camera is not empty,
| Remove 4GB EVA Flash Card from D2Xs Camera and tmpy
| stow.
| Retrieve 4GB EVA Flash Card with empty memory and install in
| D2Xs Camera.
- 4.4 D2Xs Camera settings should be as follows:
Lens - 12-24mm Lens, set at 15mm
Lens Focus Mode - M/A
Body Focus Mode - S
✓Batt installed
✓Flash Card installed
Pwr - ON

Top LCD:

- ✓Batt
- ✓Frames remaining sufficient
- Exp Comp - 0.0
- Exp Mode - A
- f/stop - 11
- Meter - Matrix
- Diopter - Adjust
- Frame Rate - S
- ✓BKT disabled – 0F

Rear LCD:

- ✓ISO – 100
- ✓QUAL – RAW
- ✓WB – 0, A
- AF Area Mode - []
- ✓Focus Area – Center
- ✓Focus Selector Lock – L

SB-800 Flash Settings:

- ✓Diffuser Dome installed
- pb ON/OFF → ON
- ✓MODE – TTL BL
- ✓Exp Comp – 0 EV

Tilt - Direct

NOTE

Multi-Use Arm may have to be adjusted to achieve the correct angle.

- 4.5 Position D2Xs Camera on Multi-Use Arm in a vertical orientation (SB -800 Flash towards forward) and install Multi-Use Arm to R6 camera shoe (forward towards window as seen in Figure 6).

Mount D2Xs Camera on Multi-Use Arm such that D2Xs Camera is orthogonal to CDR seat. Refer to Figure 6.

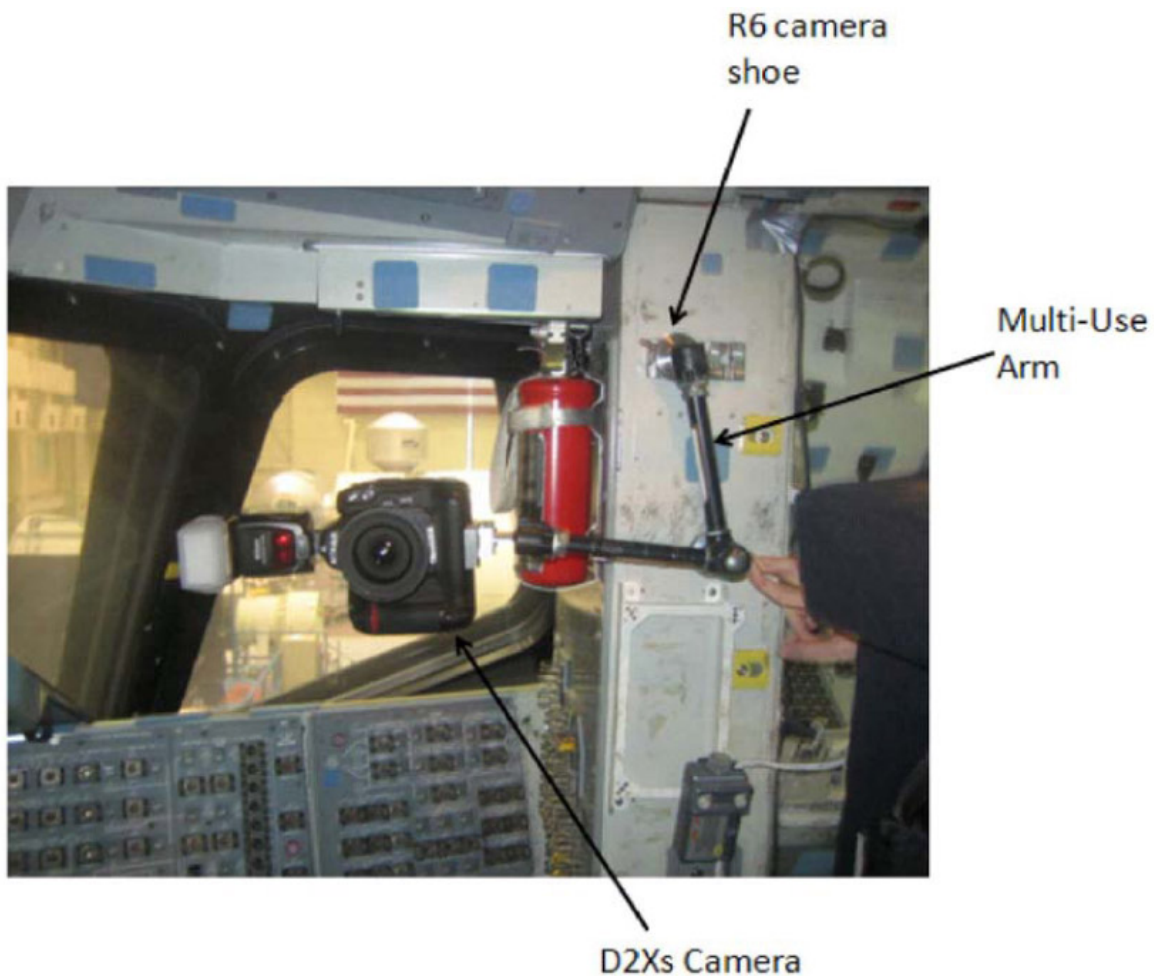


Figure 6. D2Xs Camera Positioned on R6 Camera Shoe.

- 4.6 Autofocus on CDR seat (specifically on the side of the seat with the circle as seen in Figure 7).

NOTE

Body Focus Mode - M will eliminate the possibility of the focus shifting to another subject.

- 4.7 After autofocusing on the seat, change Body Focus Mode - M.
- 4.8 Reposition camera to ensure D2Xs Camera is parallel to R6 wall and not pitched to ceiling or deck.
- 4.9 Take a test photograph. Entire profile of the CDR seat should appear in the picture. Refer to Figure 7 for an example.

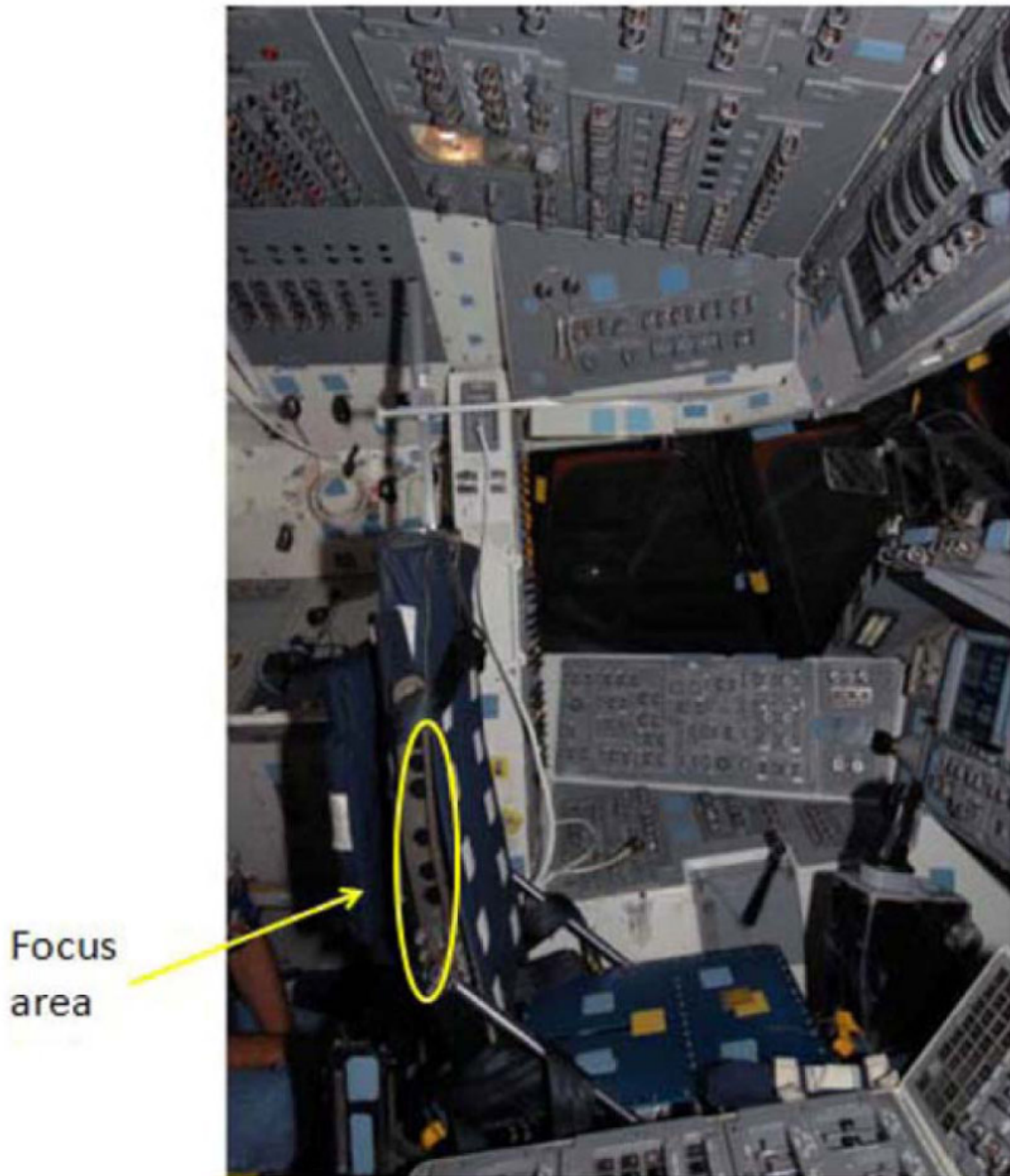


Figure 7. Correct D2Xs Camera Image Capture Area.

5. SUBJECT POSITIONING

CAUTION

Do not take nominal Spinal Elongation measurements within one hour of compression exercise or countermeasures (Penguin Suit, EVA, weight exercises, ARED, IRED, etc.) as exercise would adversely affect the measurements being taken in this activity.

5.1 Before proceeding with this step,
~

SPINAL ELONGATION OPERATOR PROCEDURE

(ASSY OPS/19A/FIN)

Page 10 of 12 pages

subject should wear light-weight clothing.

- 5.2 Remove and tmpy stow Head Bar.
- 5.3 ✓Sufficient clearance for the Slider Post from the cabin ceiling.
- 5.4 Subject should sit in CDR seat and fasten lap belt and crotch strap ensuring a tight fit (ensure positive contact between buttocks and seat pan).

Ensure seat height is high enough that subject's thighs are at a 90 degree angle (feet touching the floor).
- 5.5 Operator will ensure subject sits erect and gazes directly ahead (head lines up, not looking at an angle) at the HUD reference object. Operator should also ensure subject is centered between the left and right sides of the seat.
- 5.6 Retrieve Head Bar from tmpy stow and insert into slot on Slider Post, ensuring that numbers on the Head Bar and slot on the Slider Post are facing the D2Xs Camera. Refer to Figure 8.

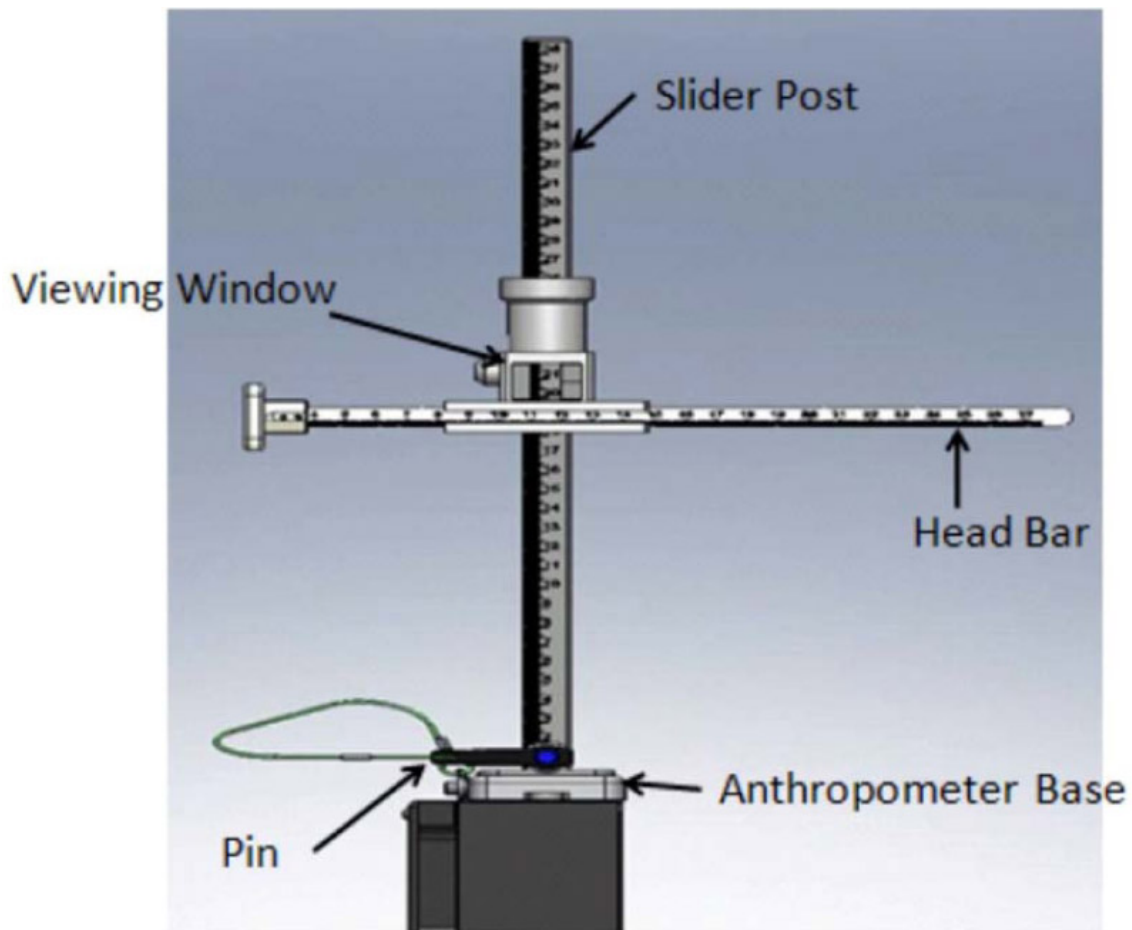


Figure 8. Head Bar Connected to Slider Post.

5.7 Ensure Head Bar is in firm contact with the top of subject's head.

6. DATA COLLECTION

6.1 Record measurement on SPINAL ELONGATION LOG.
Measurements should be taken as the number between the marks on the viewing window of the Slider Post.

6.2 Operator should take photograph of subject using D2Xs Camera.

6.3 Remove Head Bar and tmpy stow.

6.4 Subject should exit CDR seat and stretch. Subject should then return to seat.

6.5 Repeat step 5.4 through step 6.3 to complete the second measurement (for a total of two measurements per subject).

6.6 Repeat step 5.4 through step 6.5 for each additional subject (ensure new subjects wear light-weight clothing).

7. DISASSEMBLY

7.1 Remove D2Xs Camera from Multi-Use Arm.
Remove Multi-Use Arm from R6 camera shoe.
Put away Multi-Use Arm to original location.

7.2 Remove 4GB EVA Flash Card from D2Xs Camera.
Retrieve CF Card Adapter.
Insert 4GB EVA Flash Card into CF Card Adapter.
Insert CF Card Adapter into any networked PGSC.

✓**MCC-H** (specify which PGSC file resides on)

7.3 Disassemble Spinal Elongation hardware from CDR seat.

7.3.1 Remove pin from Anthropometer Base and remove Slider Post from anchor point. Install pin back into Anthropometer Base.

7.3.2 Retrieve Head Bar from tmpy stow,

7.3.3 Remove Anthropometer Base from top of the seat. Restore seat cover to original placement on the top of the seat.

7.4 Reconfigure CDR seat to nominal configuration.

7.4.1 Retrieve head rest and seat pan cushion from tmpy stow.

7.4.2 Install head rest on top of CDR seat

7.4.3 Put seat pan cushion back in place. Untie and unwrap shoulder harness from back of CDR seat. Return lap belt to nominal configuration.

SPINAL ELONGATION OPERATOR PROCEDURE

(ASSY OPS/19A/FIN)

Page 12 of 12 pages

7.4.4 Retrieve parachute from tmpy stow and install on back of CDR seat.

7.4.5 CDR SEAT PWR BUS SEL - OFF (ctr)

8. CONCLUDING OPERATIONS

8.1 Remove SPINAL ELONGATION LOG from the Assembly Operations book, place in manilla envelope, and place envelope in AOP.

Spinal
Elongation
Kit

8.2 Stow:

Anthropometer Base
Slider Post
Head Bar

If Spinal Elongation Kit is being tmpy stowed on Shuttle for subsequent sessions,

| Crew should inform ground of tmpy stow location.

8.3 When all sessions for this mission are concluded,

| Spinal Elongation Kit must be restowed on ISS prior to undocking (consult Stowage Notes).

SPINAL ELONGATION LOG

(ASSY OPS/19A/FIN)

Page 1 of 1 page

	Subject ID	Session #	GMT/MET	Measurement	Notes
1				1st Sitting:	
				2nd Sitting:	
2				1st Sitting:	
				2nd Sitting:	
3				1st Sitting:	
				2nd Sitting:	
4				1st Sitting:	
				2nd Sitting:	
5				1st Sitting:	
				2nd Sitting:	
6				1st Sitting:	
				2nd Sitting:	
7				1st Sitting:	
				2nd Sitting:	
8				1st Sitting:	
				2nd Sitting:	
9				1st Sitting:	
				2nd Sitting:	
10				1st Sitting:	
				2nd Sitting:	
11				1st Sitting:	
				2nd Sitting:	
12				1st Sitting:	
				2nd Sitting:	
13				1st Sitting:	
				2nd Sitting:	
14				1st Sitting:	
				2nd Sitting:	
15				1st Sitting:	
				2nd Sitting:	
16				1st Sitting:	
				2nd Sitting:	

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CONTINGENCY EVA PL CONFIGURATION

CONTINGENCY EVA
PL CONFIGURATION

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N/A

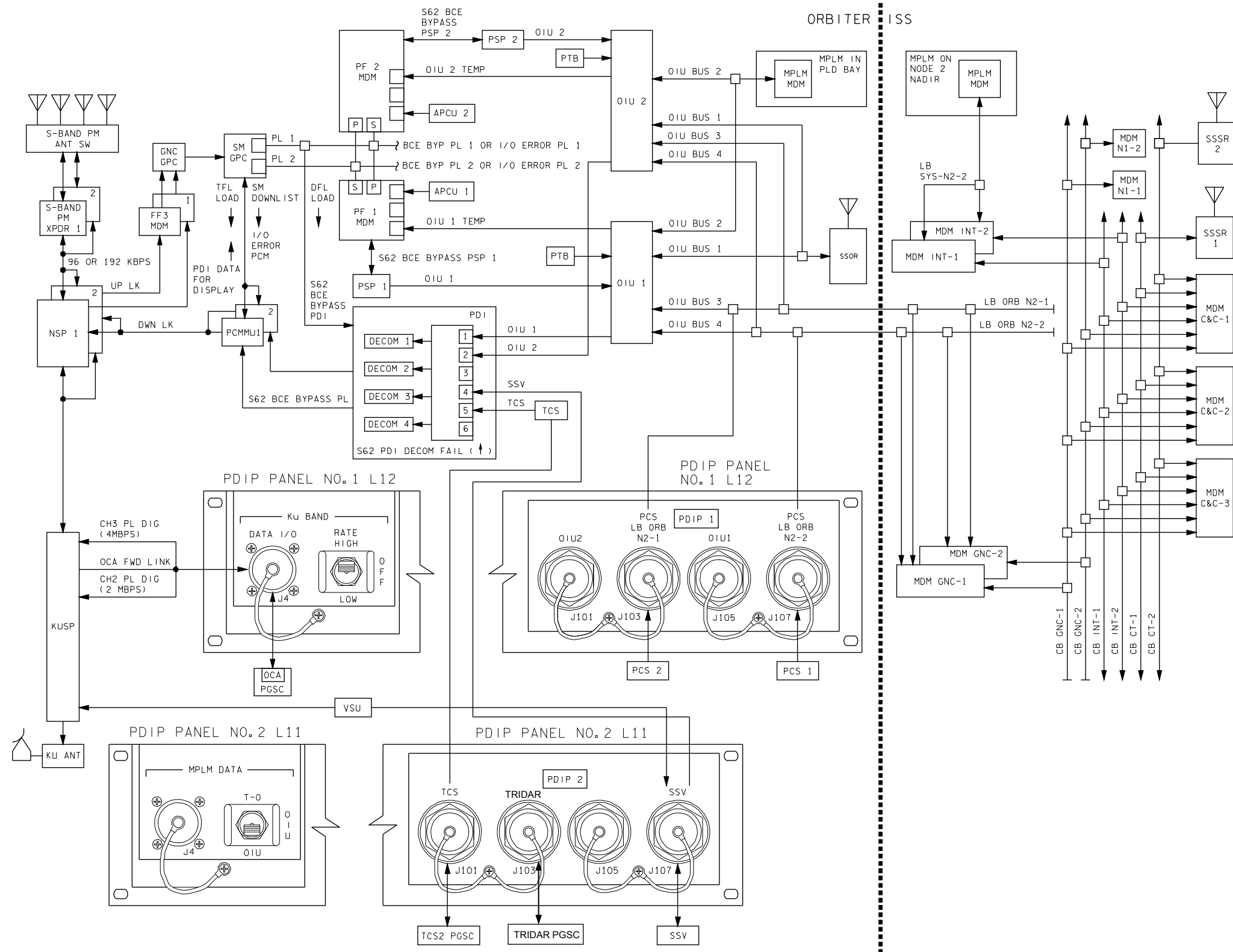
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N/A

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MALFUNCTION

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4850201_121. SCH# 5

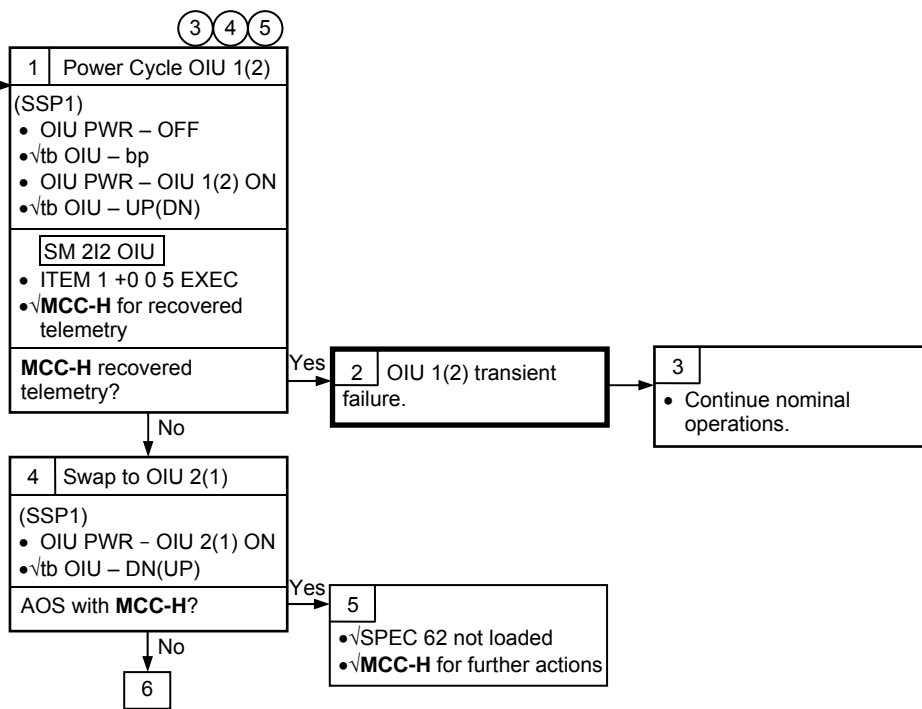
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ASSY OPS

LOSS OF MPLM TELEMETRY (ASSY OPS/19A/FIN) Page 1 of 2 pages

① ②
MCC-H Reports
 No or Loss of MPLM Telemetry While MPLM in Payload Bay

Nominal Config:
 (R1)
 PL CAB – MNA(MNB)
 PL AUX – ON (SSP1)
 OIU PWR – OIU 1(2) ON
 tb OIU – UP(DN) (A15)
 PTU/MAIN BUS A – ON (tb-ON)
 APCU 1 CONV – ON
 APCU 1 OUTPUT – CL



① This malfunction only treats OIU to MPLM interface problems and MPLM interface problems. OIU to PDI problems would announce an S62 PDI DECOM FAIL message.

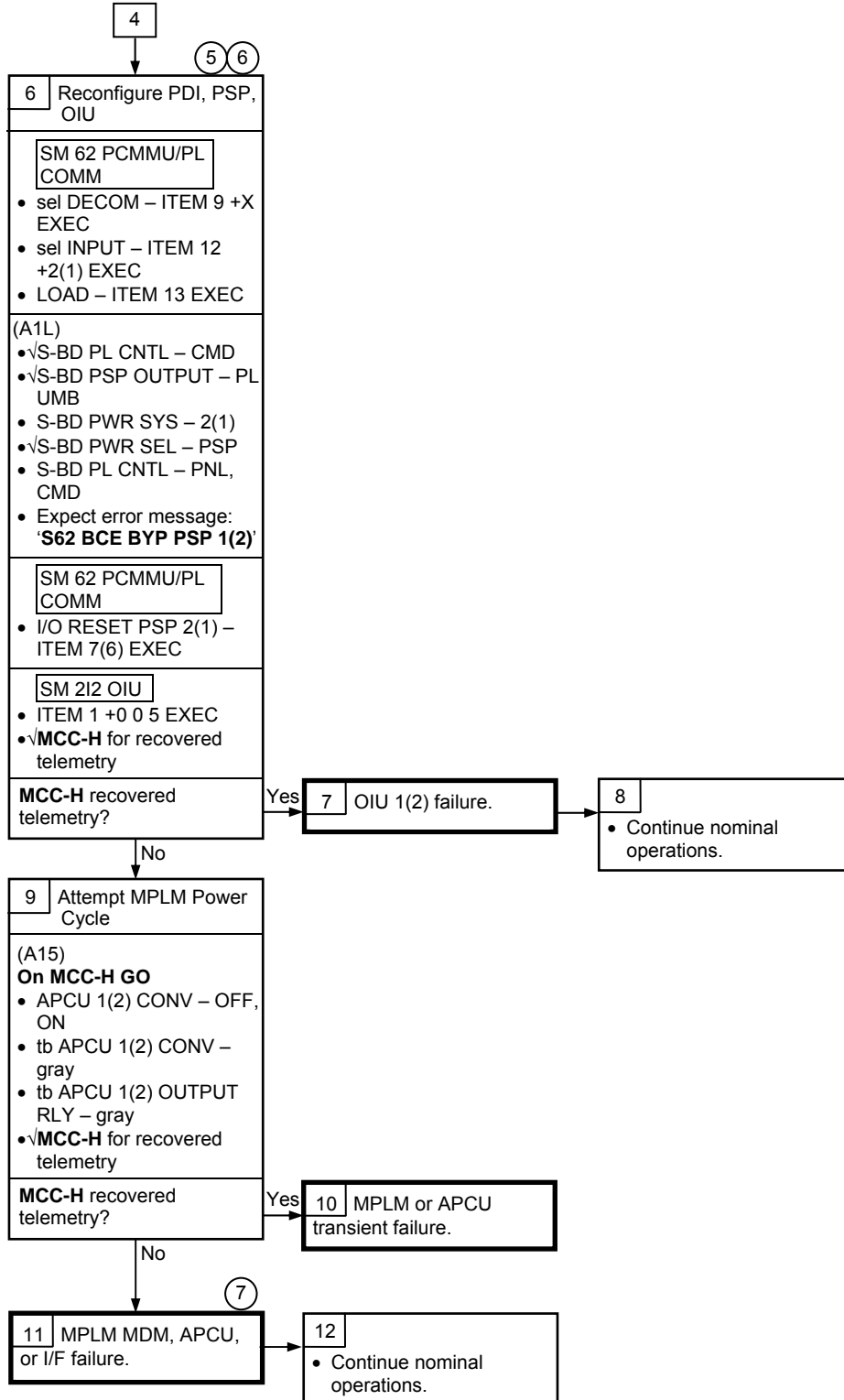
② Loss of MPLM telemetry does not announce S212 OIU AD NOLK, because OIU is BC.

③ Reloading OIU format does not force a resync when OIU is BC.

④ **MCC-H** may recommend starting in block 4 depending on the error signature.

⑤ OIU powerup config on OIU BUS 2 (MPLM via ROEU) is BC on ch A.

LOSS OF MPLM TELEMETRY
(ASSY OPS/19A/FIN) Page 2 of 2 pages



⑤
OIU powerup config on OIU BUS 2 (MPLM via ROEU) is BC on ch A.

⑥
PSP swap must be performed prior to sending format command to OIU.

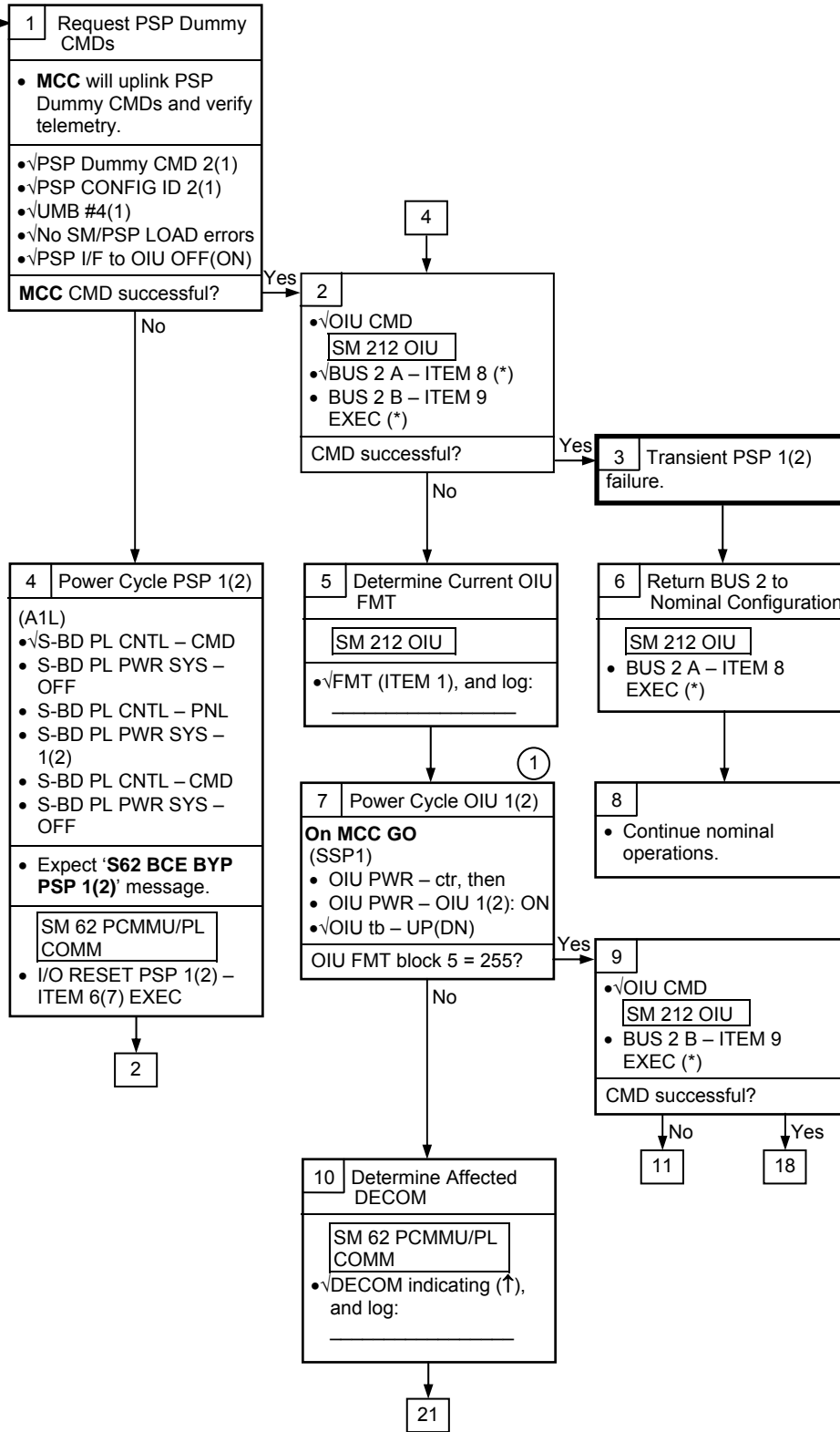
⑦
If unable to verify MPLM pressure and temperature, MPLM is still go for unberthing from payload bay.

COMM

OIU FAIL TO COMMAND
(ASSY OPS/19A/FIN) Page 1 of 3 pages

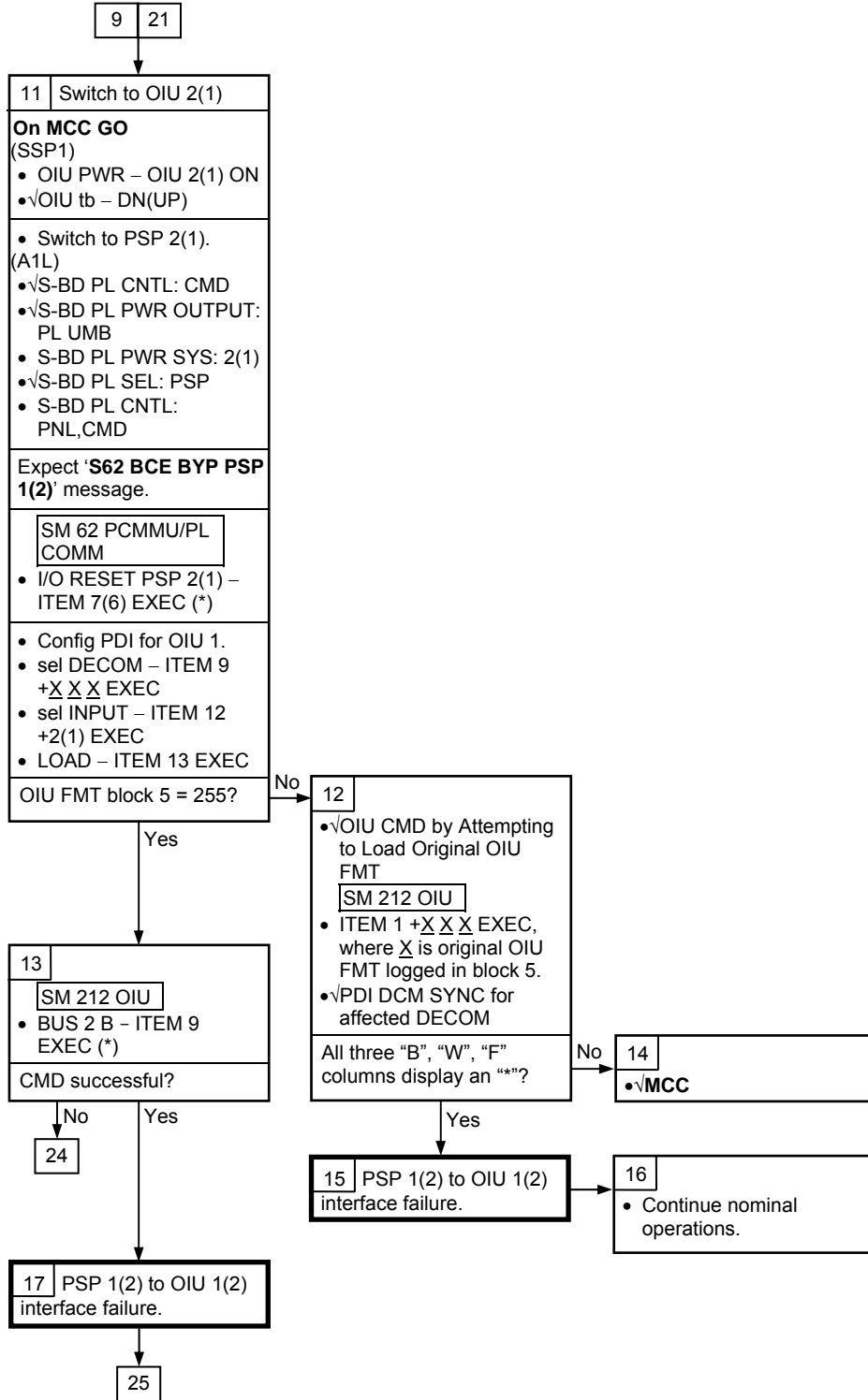
No Response to OIU Configuration or Routed Commands

Nominal Config:
(A1L)
S-BD PL CNTL – CMD
PWR SYS – 1
PWR SEL – PSP
PSP OUTPUT – PL UMB
(SSP1)
OIU PWR – OIU 1(2) ON
tb OIU – UP(DN) (R1)
PL CAB – MNA(MNB)
PL AUX – ON

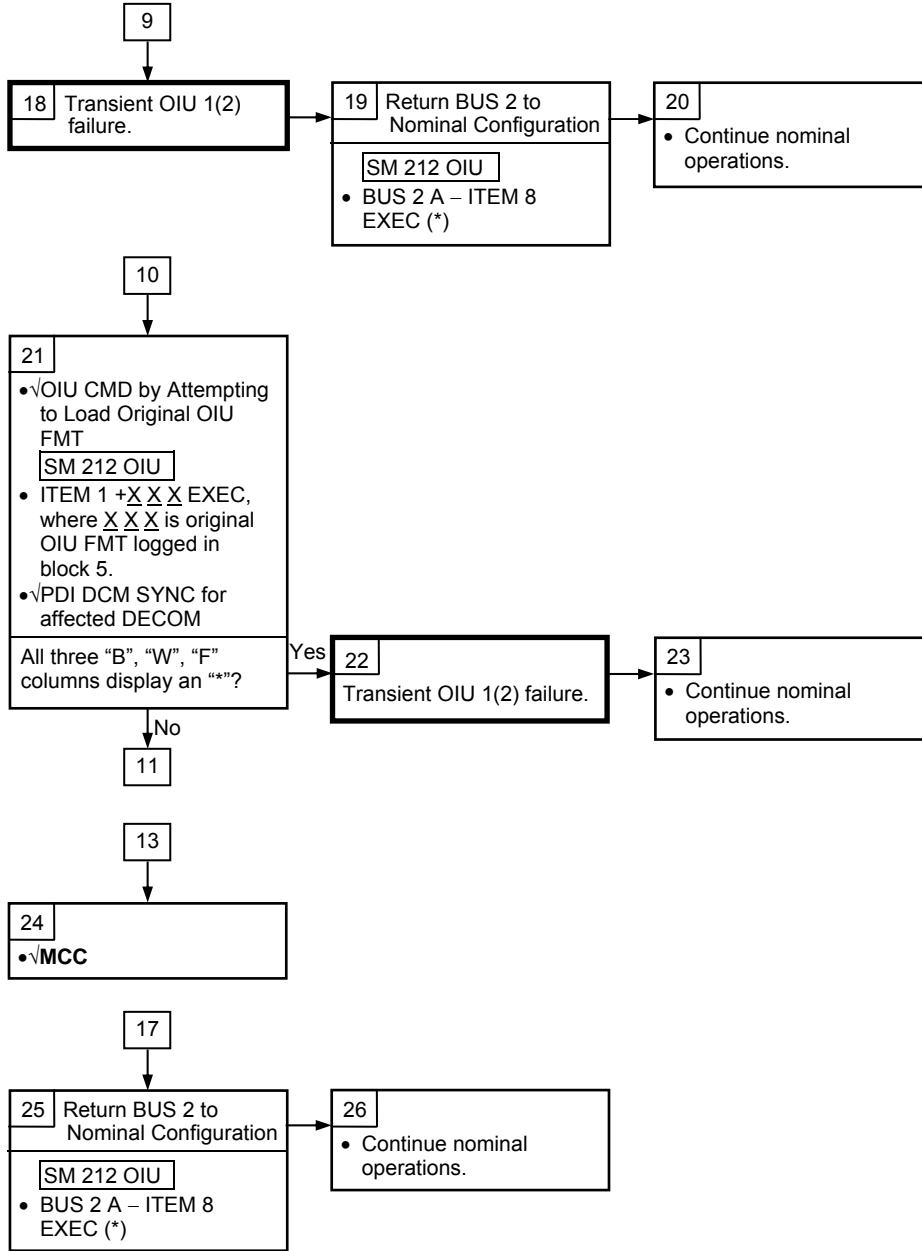


① Power cycle will place OIU in Format 255. OIU Station TLM will be lost until OIU CMD is recovered. OIU H&S TLM will also be lost if PDI is not configured for OIU FMT 255.

OIU FAIL TO COMMAND
(ASSY OPS/19A/FIN) Page 2 of 3 pages



OIU FAIL TO COMMAND
(ASSY OPS/19A/FIN) Page 3 of 3 pages



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ASSY OPS

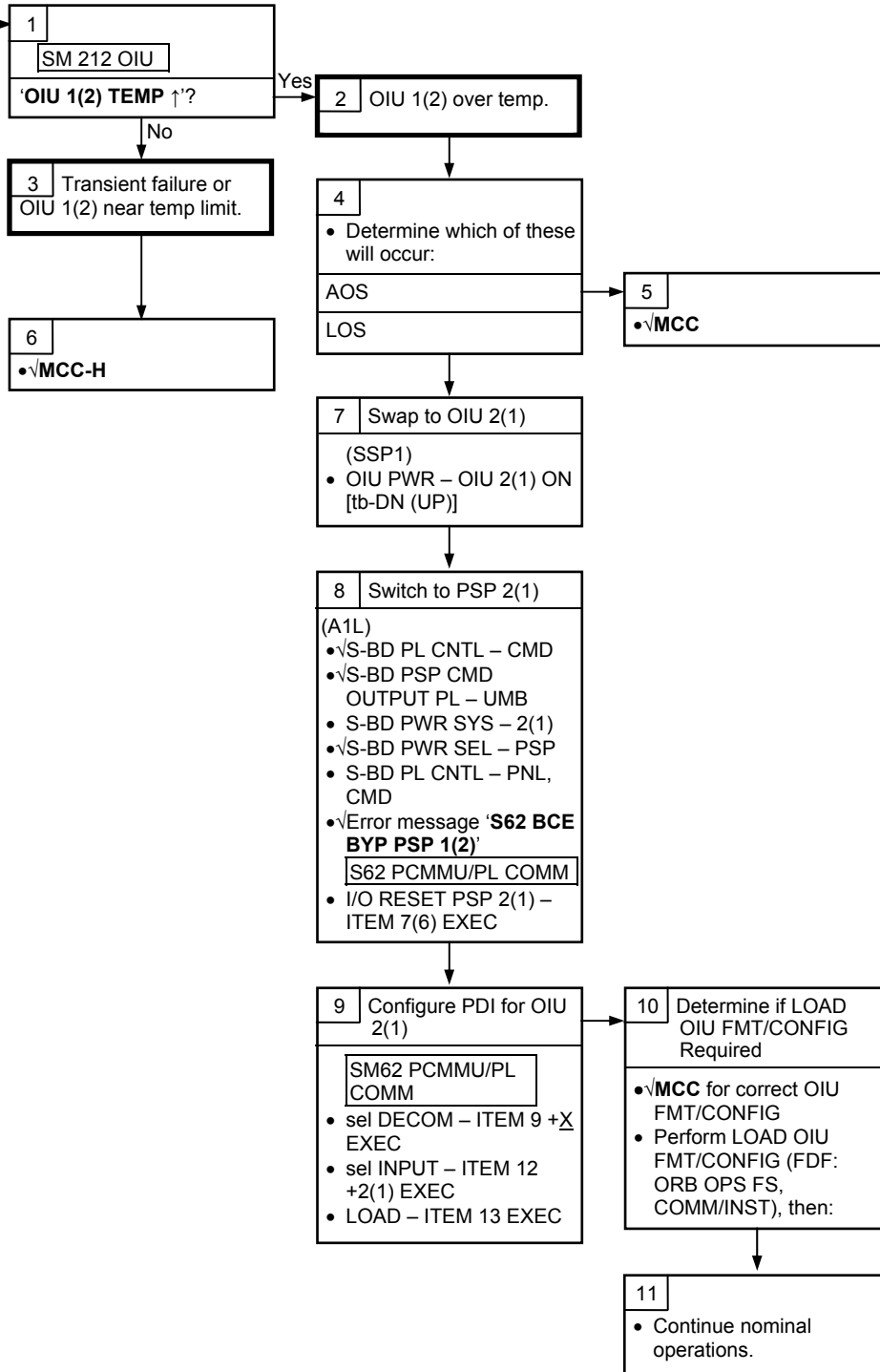
OIU TEMP (UP ARROW)
(ASSY OPS/19A/FIN)

SM 212 OIU TEMP

OIU message: OIU TEMP > 212

Nominal Config:

(R1)
PL CAB –
MNA(MNB)
PL AUX – ON
(SSP1)
OIU PWR – OIU 1(2)
ON
tb OIU – UP(DN)



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COMM

S212 OIU AD 1 NOLK/LOSS OF ISS OR SSOR TELEMETRY
(ASSY OPS/19A/FIN) Page 1 of 3 pages

SM ALERT

S212 OIU AD1 NOLK

Loss of Data On SPEC 205 During Undocking

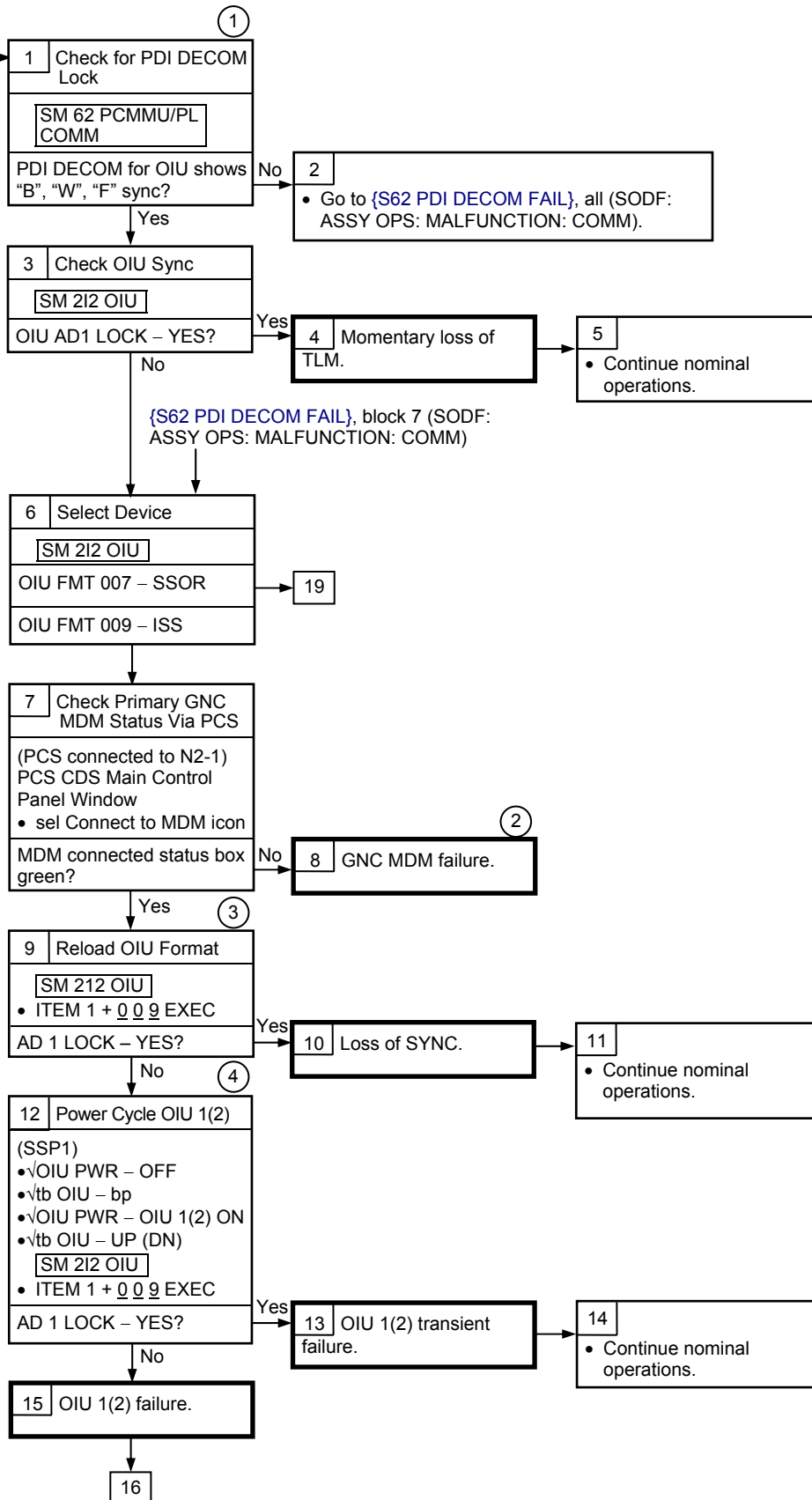
MCC-H Reports Loss of ISS Data To Ground Via OIU

Nominal Config:

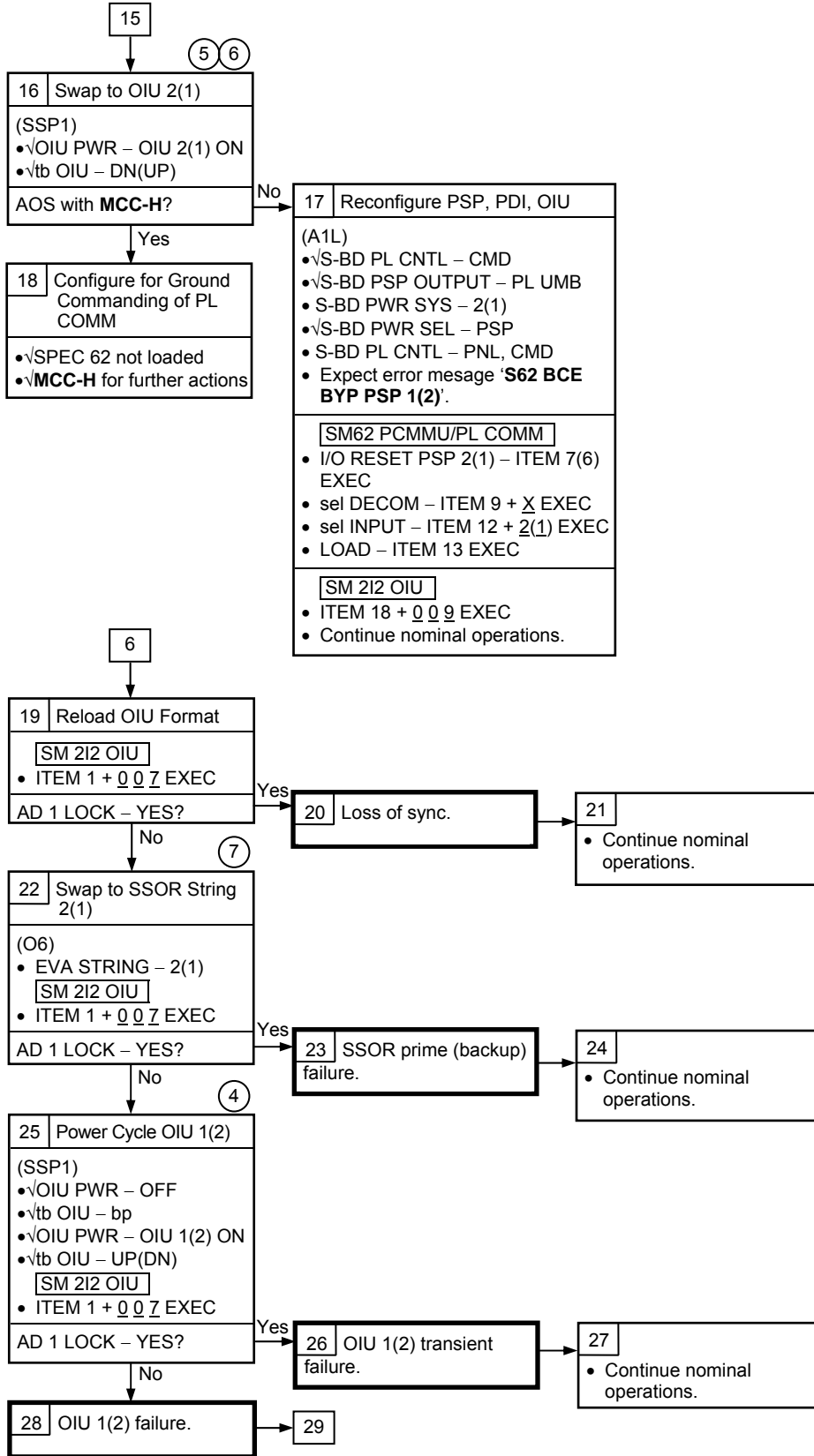
(R1)
PL CAB
- MNB(MNA)
PL AUX - ON (SSP1)
OIU PWR
- OIU 1(2) ON
tb OIU - UP(DN)

For ISS:
One PCS connected to Primary GNC MDM
SM 212 OIU
OIU FMT: 009

For SSOR:
(R14)
cb MNA UHF EVA - cl
cb MNC UHF EVA - cl
(O6)
EVA STRING: 1(2)
UHF MODE - EVA
SM 212 OIU
OIU FMT - 007



- ① OIU to PDI problems would announce a 'S62 PDI DECOM FAIL' message if FDA enabled.
- ② MCC-H will likely direct STS or ISS crew to perform {3.301 LOSS OF PCS TELEMETRY} (SODF: POC: MALFUNCTION).
- ③ Reloading the OIU format forces a resync with the GNC MDM or SSOR.
- ④ OIU active device mapping occurs with format load.

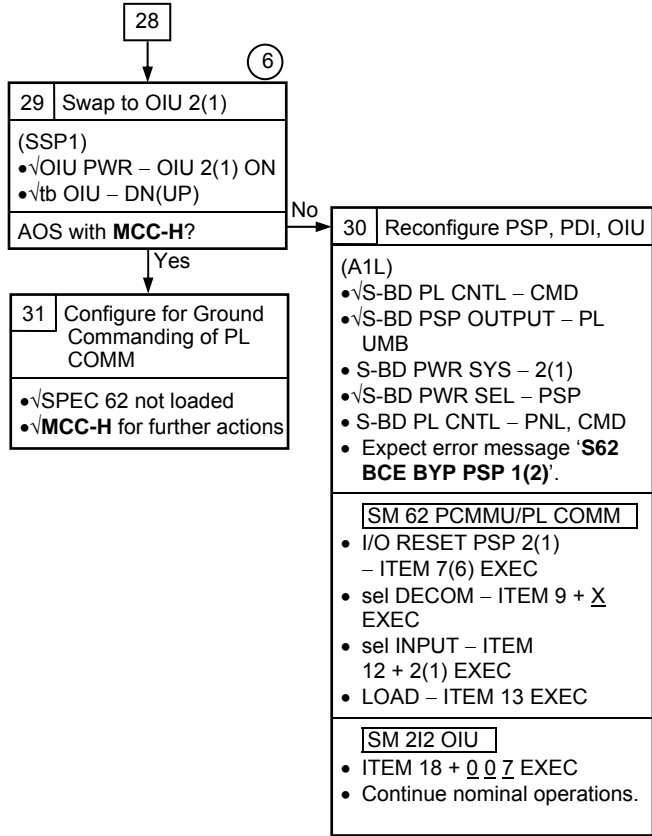


④ OIU active device mapping occurs with format load.

⑤ Malfunction restores operational capability; additional troubleshooting to determine BIA failure may be performed later.

⑥ OIU powerup config on OIU BUS 3 is RT on ch A.

⑦ Reloading the OIU format forces a resync with the SSOR.



⑥
 OIU powerup config
 on OIU BUS 3 is RT
 on ch A.

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S62 PDI DECOM FAIL

(ASSY OPS/19A/FIN)

{S212 OIU AD 1 NOLK/LOSS OF ISS OR SSOR TELEMETRY},
block 2 (SODF: ASSY OPS: MALFUNCTION: COMM)

SM
ALERT

S62 PDI
DECOM FAIL

Nominal Config:

(A1L)
PL DATA INTLVR
PWR – ON

(R1)
PL CAB MNA(MNB)
PL AUX – ON

(SSP1)
OIU PWR – OIU 1(2)
ON
tb OIU – UP(DN)

SM 62 PCMMU/
PLCOMM

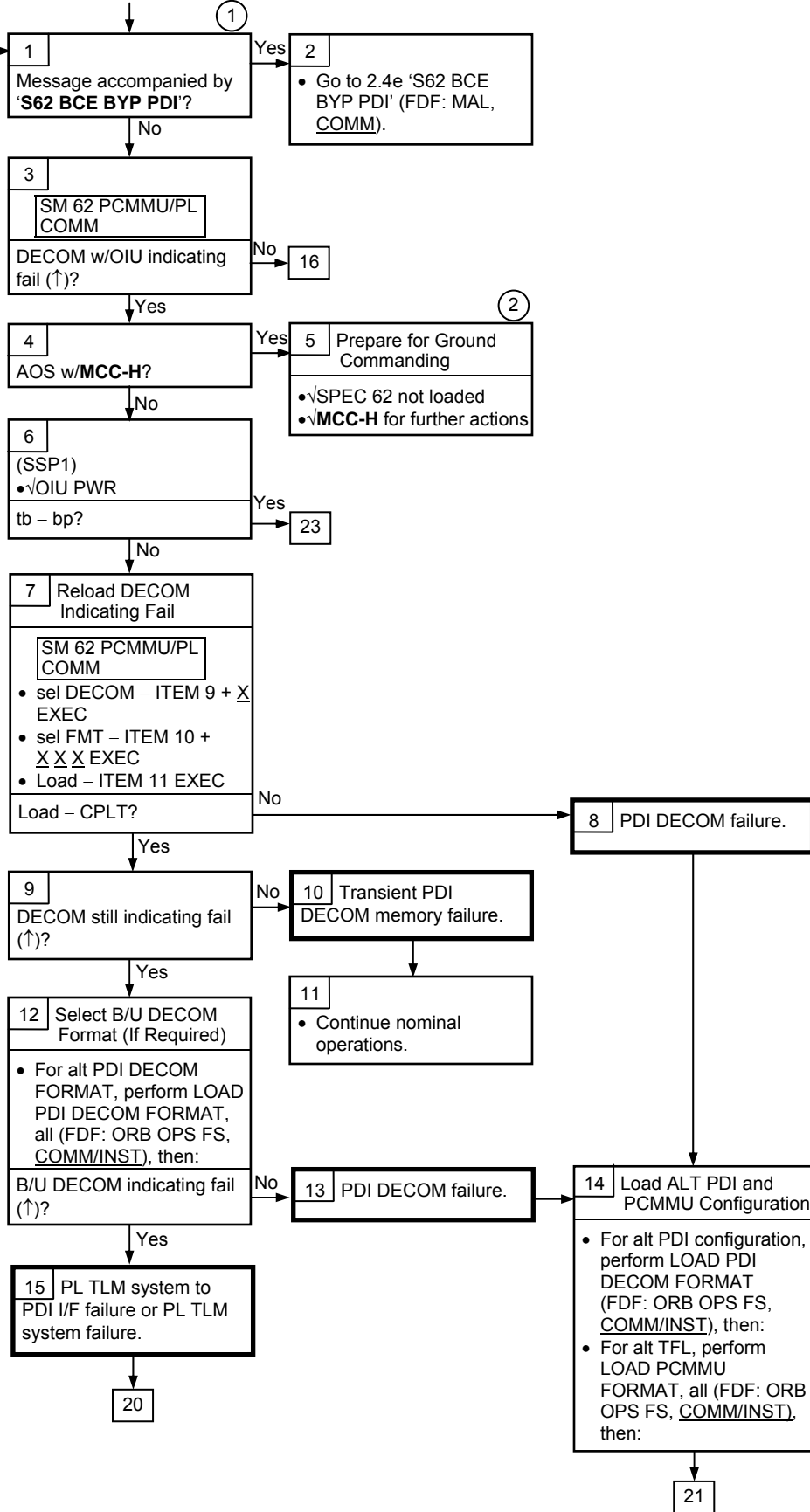
DECOM FDA ENA
ITEM 14 (15, 16,
17) = ENA (*)

SM212 OIU

OIU FMT 5 = MPLM
OIU FMT 7 = RNDZ
OIU FMT 9 = ISS

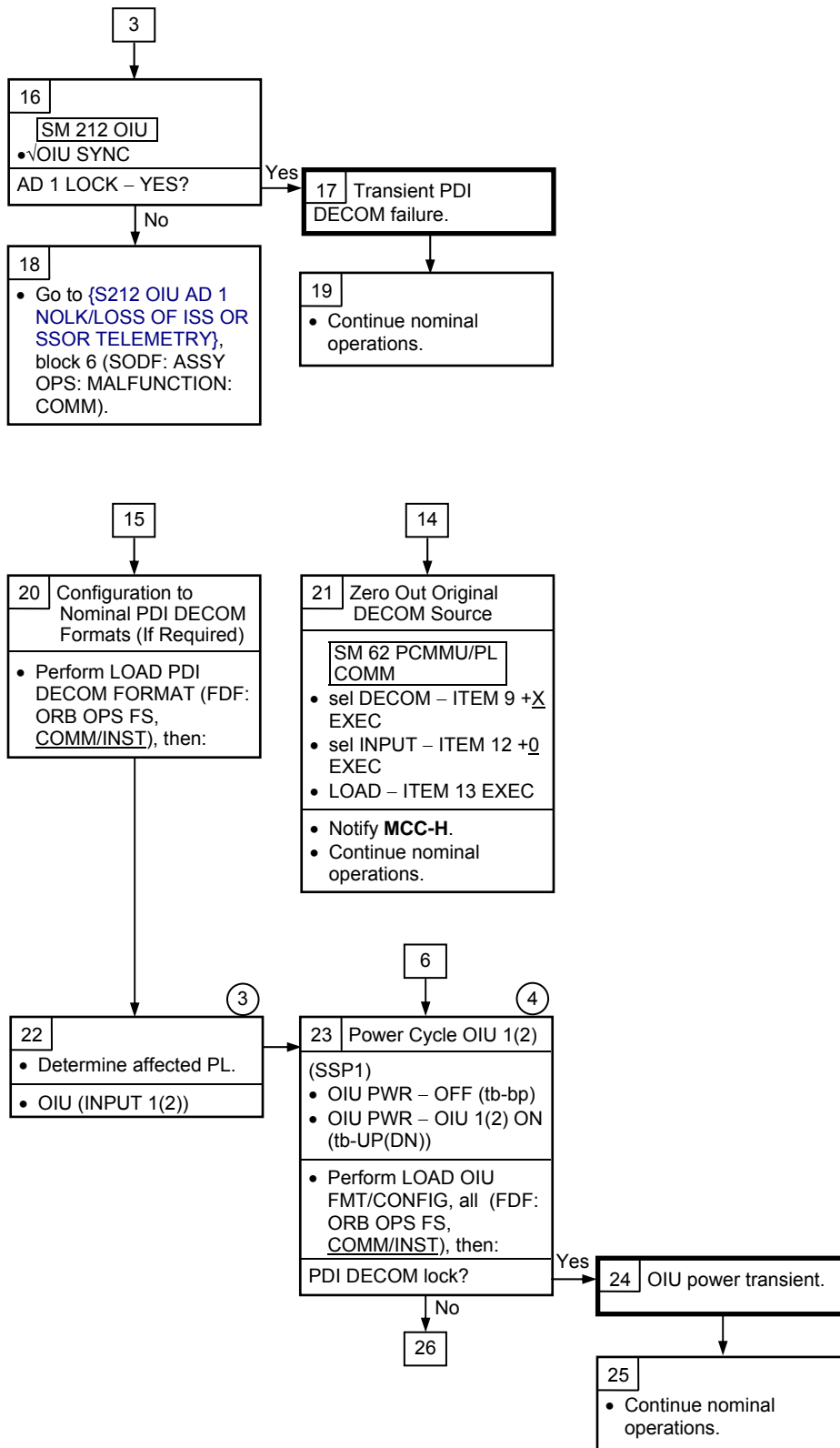
ISS Config:
GNC – 1 prime on
LB ORB N2-1.

OIU FMT 255 = H&S



①
'S212 OIU AD 1
NOLK' indicates
OIU active device
lock = NO.

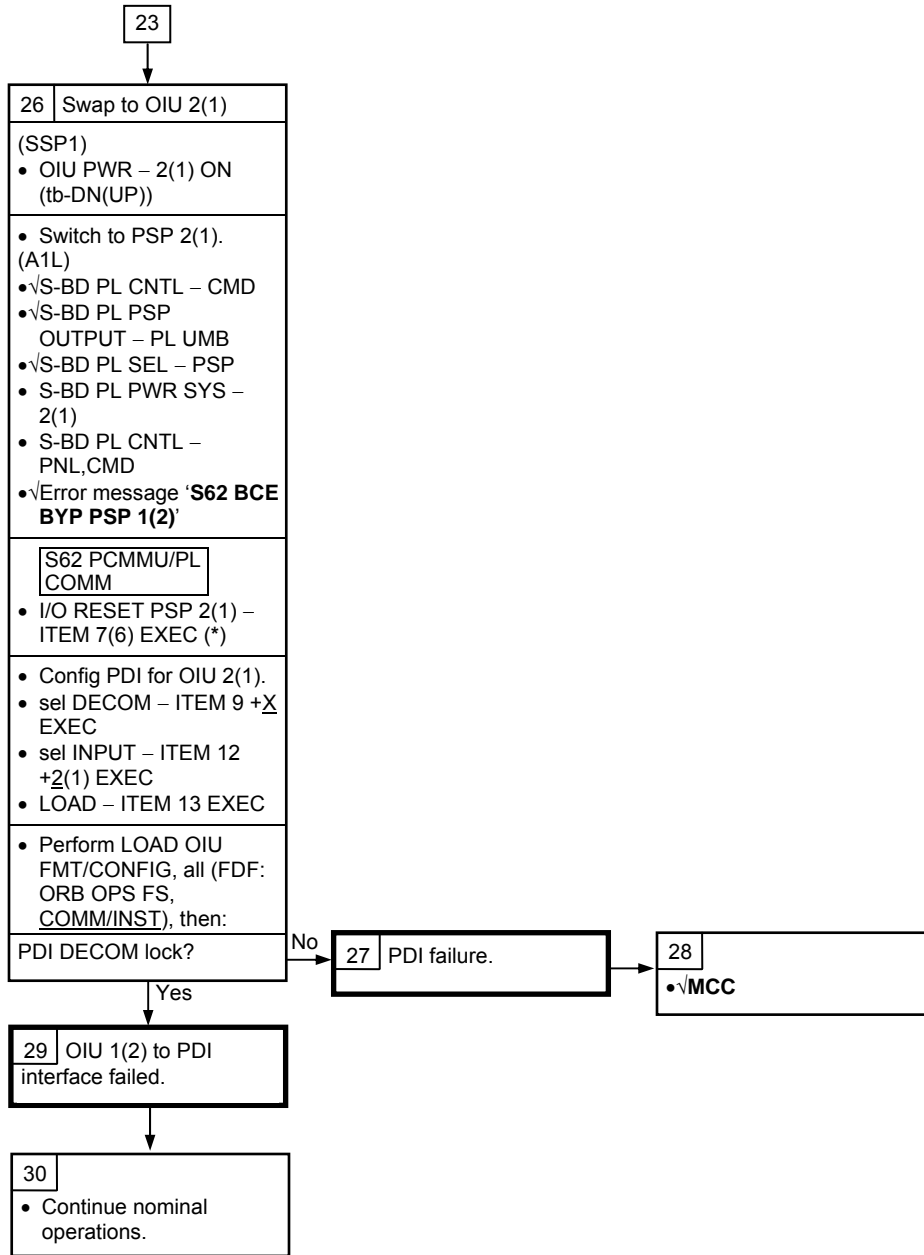
②
MCC-H can perform
all PL COMM
reconfig, except OIU
PWR cycle and
swap steps.



3
TCS/SSV is not addressed in malfunction; FDA is not enabled.

4
If a config other than GNC-1 prime on N2-1 is active, **MCC**.

S62 PDI DECOM FAIL
(ASSY OPS/19A/FIN)



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PL/DPS RECONFIG

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

Procedure	Secure Action	Recovery Action	Info
PL1(2) MDM I/O ERROR; PL1(2) MDM OUTPUT (FDF, ORB PKT, DPS)	N/A	N/A	A
5.3c I/O ERROR PL1(2); MDM OUTPUT PL1(2) (FDF, MAL, DPS)	N/A*	N/A	A
PASS SM GPC FAIL (FDF, ORB PKT, DPS)	N/A	D	B
5.1a CS SPLIT (FDF, MAL, DPS)	N/A*	C,D,E**	B
GNC RECOVERY VIA G2FD (FDF, ORB PKT, DPS)	N/A*	C,D	B
5.3e I/O ERROR FLEX (FDF, MAL, DPS)	N/A	N/A	N/A
5.3f BCE BYP FLEX (FDF, MAL, DPS)	N/A	N/A	N/A
5.3g BCE BYP PL1(2) (FDF, MAL, DPS)	N/A*	N/A	A
GPC FRP-4 PASS RECOVERY AFTER BFS ENGAGE (FDF, MAL, DPS)	N/A*	C,D	B
GPC FRP-7 DPS RECONFIG FOR LOSS OF AV BAY COOLING (FDF, MAL, DPS)	N/A*	C,D	B
DPS SSR-3 GNC REASSIGNMENT (FDF, MAL, DPS)	N/A	N/A	B
DPS SSR-4 SM REASSIGNMENT (FDF, MAL, DPS)	N/A	C,D	B
ECLSS SSR-10 H2O PUMP OPS VIA GPC (FDF, MAL, ECLS)	N/A	C,D,E**	B

* Procedure does not call out PL/DPS RECONFIG, Secure.

** Procedure does not call out PL/DPS RECONFIG, Recovery.

INFO A

If '**I/O ERROR PL1**' message

Loss of ground and orbiter MEDS command interface to ISS via PSP 1/OIU 1.

For additional impacts, refer to [ORBITER MDM LOSS IMPACTS](#) (SODF: ASSY OPS: MALFUNCTION: CRITICAL EQUIPMENT LOST).

If '**I/O ERROR PL2**' message

Loss of ground and orbiter MEDS command interface to ISS via PSP 2/OIU 2.

For additional impacts, refer to [ORBITER MDM LOSS IMPACTS](#) (SODF: ASSY OPS: MALFUNCTION: CRITICAL EQUIPMENT LOST).

INFO B

If SM GPC affected

Note PL commanding via SM GPC (ground and/or orbiter MEDS) not possible until SM machine is restored and PL 1(2) MDM I/F is restored.

If GNC GPC affected

Ground commanding not possible until GNC machine is restored.

ACTION C

If PSP I/O reset not previously performed

SM 62 PCMMU/PL COMM

I/O RESET PSP 1(2) – ITEM 6(7) EXEC

Notify **MCC-H** when completed.

Resume SPEC 62.

ACTION D

Reload PDI DECOM FORMAT (FDF: ORB OPS FS, COMM/INST).

As required, reenable PDI DECOM FDA.

Resume SPEC 62.

ACTION E

Reload PCMMU TFLs, LOAD PCMMU FORMAT (FDF: ORB OPS FS,
COMM/INST).

ORBITER ELECTRICAL BUS LOSS MATRIX

(ASSY OPS/19A/FIN) Page 1 of 2 pages

ORBITER EPS BUSES	ESS 1BC		ESS 2CA		ESS 3AB	CNT AB2	MNA DA1						MNB DA2				FC3	MNC DA3			CNT CA1				
	PNL O13, R14	ESS 1BC FD	ESS 2CA FD	PNL O13, R14	PNL O13		PNL O14	MPC1			MPC2			PNL O15	MAR2	MAR1		(R)	(R)	P		PNL O16	APC 6 APC 3		
								AUX PLA	P	(R)	AUX PLB	APC5	AFT PLB											AFT PLC	MO63P
								CAB			PRI PL														
PL1			PL2			PL3																			
ORBITER EQUIPMENT																									
PTU1	XRC																			XRC					
APCU1 (MPLM)						XC	X																		
OPCU						XC	X																		
PTU2				XRC																XRC					
APCU2 (LCS)																					XC				
OPCU																					XC				
OIU1										X															
OIU2											X														
TCS			XR								X														
Video Processing Unit (VPU)																				X					
Keel Camera/Illuminator (Bay 10)										X															
Primary C/L Camera											X														
Secondary C/L Camera										X															
PDIP 1 (Ku-Band relay, PCS-to-OIU interface)											X														
PDIP 2 (MPLM relay, TCS/SSV)											X														
Payload Timing Buffer												X													
Orbiter PCS											X														
TRIDAR (electronics)										XC															
TRIDAR (hts)																									
MIDDECK PAYLOADS																									
Glacier																									
MDS																				X	X				
MERLIN																					X				
STL																				X					

(1) Redundant MPLM MDM/PDB pwr is available from APCU2 through the interconnect cable (the power still must go through APCU1's output relay).

(2) Redundant LCS pwr is available from APCU1 through the interconnect cable (the power still must go through APCU2's output relay).

X - Total Loss of Operational Power

XR - Loss of Redundant Power

XC - Total Loss of Control Power

XRC - Loss of Redundant Control Power

XRM - Loss of Redundant to Monitor Power

P - Primary Power Source

(R) - Redundant Power Source (requires crew action to use)

ORBITER ELECTRICAL BUS LOSS MATRIX

(ASSY OPS/19A/FIN) Page 2 of 2 pages

ORBITER EPS BUSES	ESS 1BC		ESS 2CA		ESS 3AB	CNT AB2	MNA DA1						MNB DA2				FC3		MNC DA3		CNT CA1					
	PNL O13, R14	ESS 1BC FD	ESS 2CA FD	PNL O13, R14	PNL O13		PNL O14	MPC1			MPC2			PNL O15	MAR2	MAR1	(R)	(R)	P	PNL O16		APC 6 APC 3				
								AUX PLA	P	(R)	AUX PLB	APC5	APC2										AFT PLB	PRI PL	AFT PLC	MO63P
								CAB																		
PL1			PL2			PL3																				
ISS EQUIPMENT																										
LMC (EuTEF Htrs)																										
MPLM Shell Htr Pwr (+28 VDC)																										
MPLM MDM/PDB Pwr (+124 VDC via APCU 1) (1)																										
PMA 2 Hooks - Group 1, 2 - Sys A																										
PMA 2 Hooks - Group 1, 2 - Sys B																										
OBSS																										
LCS (+124 VDC via APCU 2) (2)																										
LDRI, ITVC, PTU (on SRMS)																										
LDRI, ITVC, PTU, LCS HTRS (In MPMs)																										
RSC																										
RSC Illuminator																										
DTV MUX & VTR																										
PAYLOAD BUS CONTROL POWER																										
Cabin P/L Bus - MNA Cntl Pwr (nominal source)																										
Cabin P/L Bus - MNB Cntl Pwr (backup source)																										
Aux P/L Bus B - MNB Cntl Pwr																										
Aux P/L Bus A - MNA Cntl Pwr																										
PL AFT - MNB Cntl Pwr																										
PL AFT - MNC Cntl Pwr																										
P/L PRI - MNC DA3 Cntl Pwr (nominal source)																										
P/L PRI - MNB DA2 Cntl Pwr (backup source)																										
P/L PRI - FC3 Cntl Pwr (backup source)																										

- (1) Redundant MPLM MDM/PDB pwr is available from APCU2 through the interconnect cable (the power still must go through APCU1's output relay).
- (2) Redundant LCS pwr is available from APCU1 through the interconnect cable (the power still must go through APCU2's output relay).
- X - Total Loss of Operational Power
- XR - Loss of Redundant Power
- XC - Total Loss of Control Power
- XRC - Loss of Redundant Control Power
- XRM - Loss of Redundant tb Monitor Power
- P - Primary Power Source
- (R) - Redundant Power Source (requires crew action to use)

ORBITER MDM LOSS IMPACTS

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

MDM FF1	Uplink through NSP 1
MDM FF3	Uplink through NSP 2 FRCS Vernier command path (loss of verns)
MDM FA1	LRCS Vernier command path (loss of verns)
MDM FA2	RRCS Vernier command path (loss of verns)
MDM PF1 (PL1)	ISS OIU Command Path (via PSP 1 – UMB 1 and OIU 1) OIU 1 telemetry (health and status)
MDM PF2 (PL2)	ISS OIU Command Path (via PSP 2 – UMB 1 and OIU 2) OIU 2 telemetry (health and status)
MDM OF1	PCMMU 1, 2 – ON/OFF power select, BFS auto TFL PL Bay MECH System 1, 2 power switch telemetry ROEU Latch 2, 3 (MATE/DEMATE, LAT/REL, ELEC CONT) Sys B – telemetry MID MCAs 1, 3 – operational status telemetry for ROEU PL AUX A – RPC ON discrete telemetry
MDM OF2	PL AUX B – RPC ON discrete telemetry Payload Retention System – System Redundancy Telemetry for LAT/R-F-L/REL (PL SEL 1,2,3) MID MCA 1 OP STATUS 5,6 telemetry MID MCA 3 OP STATUS 5,7,8 telemetry
DSC OF2	FRCS Vernier Inj Temps (loss of verns)
MDM OF3	Insight into orbiter S-Band command path PL PRI (MNC, MNB, FC3) – ON discrete telemetry
MDM OF4	Ku-Band – loss of insight to RADAR mode and RADAR output power telemetry only S-Band, Ku-Band – PNL/CMD switch – position telemetry only PSP, GCIL – ON/OFF telemetry S-Band P/L control telemetry PDI Power Switch position indication CAB P/L (MNA, MNB), PL AUX – ON discrete telemetry ROEU Latch 2,3 (MATE/DEMATE, LAT/REL, ELEC CONT) System A telemetry APCU-1 telemetry APCU-2 telemetry
DSC OM1	MNC bus voltage telemetry
DSC OM2	MNA, MNB bus voltage telemetry

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ORBITER MDM LOSS IMPACTS

(ASSY OPS/19A/FIN)

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MDM OA1	ODS X4/PMA2 X3 connector mate telemetry PMA2 Group 1 passive hooks (1,3,5) closed telemetry PMA2 Group 1 passive hooks (7,9,11) closed telemetry DIH ODS X1 CONN MATE (A) DIH ODS X1 CONN MATE (B)
DSC OA1	ODS X4/PMA2 X3 connector mate power telemetry PMA2 Group 1 passive hooks (1,3,5) closed power telemetry PMA2 Group 1 passive hooks (7,9,11) closed power telemetry
MDM OA2	ODS X3/PMA2 X4 connector mate telemetry PMA2 Group 2 passive hooks (2,4,6) closed telemetry PMA2 Group 2 passive hooks (8,10,12) closed telemetry PL AFT MNB Amps and PWR ON discrete telemetry DIH ODS X2 CONN MATE (A) DIH ODS X2 CONN MATE (B)
DSC OA2	ODS X3/PMA2 X4 connector mate power telemetry PMA2 Group 2 passive hooks (2,4,6) closed power telemetry PMA2 Group 2 passive hooks (8,10,12) closed power telemetry Vernier R5D Inj Temps (loss of verns)
MDM OA3	ROEU Latch 1 (RELAX) System A telemetry P/L SEL 1,2 (latch 1) Primary LAT/R-F-L/REL – latch status telemetry PL AFT MNC Amps and PWR ON telemetry
DSC OL1	LRCS Vernier Inj Temps (loss of verns)
DSC OR1	RRCS Vernier Inj Temps (loss of verns)

DEORBIT PREP

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PAYLOAD DEACTIVATION

(ASSY OPS/19A/FIN)

Page 1 of 1 pages

- | | | |
|-----------------|----|--|
| L12U
(SSP 1) | 1. | cb SW PWR 1 – op
cb PDIP 1 PWR 2/KuBAND RLY – op
MPLM CHAN 1 HTR PWR – OFF (tb-bp)
MPLM CHAN 2 HTR PWR – OFF (tb-bp)
cb PDIP1 PWR 1 – op |
| L12L
(SSP 2) | 2. | MPLM KEEL CAM PWR – OFF
MPLM KEEL CAM HTR/ILLUM PWR – OFF
cb SW PWR 3 – op
cb PDIP 2 PWR 2/MPLM RLY – op
cb PDIP 2 PWR 1 – op |
| L12 (PDIP 1) | | Ku BAND RATE – OFF |
| R1 | 3. | PL CAB – OFF
PRI MNC – OFF (tb-OFF)
AFT MN B – OFF |

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PAYLOAD REACTIVATION

(ASSY OPS/19A/FIN) Page 1 of 1 pages

- | | | |
|-----------------|----|--|
| R1 | 1. | PL CAB – MNA
PL PRI MNC – ON (tb-ON)
PL AFT MN B – ON |
| L12U
(SSP 1) | 2. | MPLM CHAN 1 HTR PWR – ON (tb-gray)
MPLM CHAN 2 HTR PWR – ON (tb-gray) |
| L12L
(SSP 2) | 3. | cb SW PWR 3 – cl
MPLM KEEL CAM HTR/ILLUM PWR – ON |

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PAYLOAD ENTRY SWITCH LIST/VERIFICATION

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

OBJECTIVE:

The purpose of this procedure is to verify the configuration of payload related switches in the shuttle prior to re-entry to earth.

- R1 1. √PL CAB – OFF
 √PRI MNC – ctr (tb-OFF)
 √MNB – ctr (tb-OFF)
 √FC3 – ctr (tb-OFF)
 √AUX – ON
 √AFT MNB – OFF
 √MNC – OFF
- L12U (SSP1) 2. √cb SW PWR 1 – op
 √cb PDIP 1 PWR 2/KuBAND RLY – op
 √MPLM CHAN 1 HTR PWR – OFF (tb-bp)
 √MPLM CHAN 2 HTR PWR – OFF (tb-bp)
 √TCS PWR – OFF (tb-bp)
 √cb PDIP 1 PWR 1 – op
 √OIU PWR – OFF (tb-bp)
- L12L (SSP2) 3. √cb SW PWR 3 – op
 √MPLM KEEL CAM PWR – OFF
 √MPLM KEEL CAM HTR/ILLUM PWR – OFF
 √cb PDIP 2 PWR 2/MPLM RLY – op
 √C/L CAM PWR – OFF
 √cb PDIP 2 PWR 1 – op
 √TRIDAR PWR – OFF (tb-bp)
- L12 (PDIP1) 4. √Ku BAND RATE – OFF
 √DC PWR 1 – OFF
 √DC PWR 2 – OFF
- L11 (PDIP2) 5. √MPLM DATA – OIU
 √DC PWR 1 – OFF
 √DC PWR 2 – OFF
- MF28E/G 6. (GLACIER)
 √cb POWER – cl (It on)
 √BATTERY – ON (It on)
- MF57H 7. (AEM-1)
 √cb PUMP BKR – op { }
 √MAIN BREAKER – cl { }
 √FANS A&D, B&C (two) – cl { }
 √FANS A&D, B&C (two) – It on
 √FANS – ON (audible fan operation)
 √LIGHTS – AUTO
 √cb LIGHTS B&C – cl { }
 √A&D – op { }
 √LIGHTS B&C – It on (off during night cycle)

PAYLOAD ENTRY SWITCH LIST/VERIFICATION

(ASSY OPS/19A/FIN)

Page 2 of 2 pages

√A&D – It off

√LED Display – showing GMT time

MF43K

8. (AEM-2)

√cb PUMP BKR – op { }

√MAIN BREAKER – cl { }

√FANS A&D, B&C (two) – cl { }

√FANS A&D, B&C (two) – It on

√FANS – ON (audible fan operation)

√LIGHTS – AUTO

√cb LIGHTS B&C – cl { }

√A&D – op { }

√LIGHTS B&C – It on (off during night cycle)

√A&D – It off

√LED Display – showing GMT time

MF71E

9. (MERLIN)

√STATUS LED – It off

√cb MAIN – cl (It on)

√PAYLOAD – op (It off)

MA9G

10. (STL)

√POWER It – on

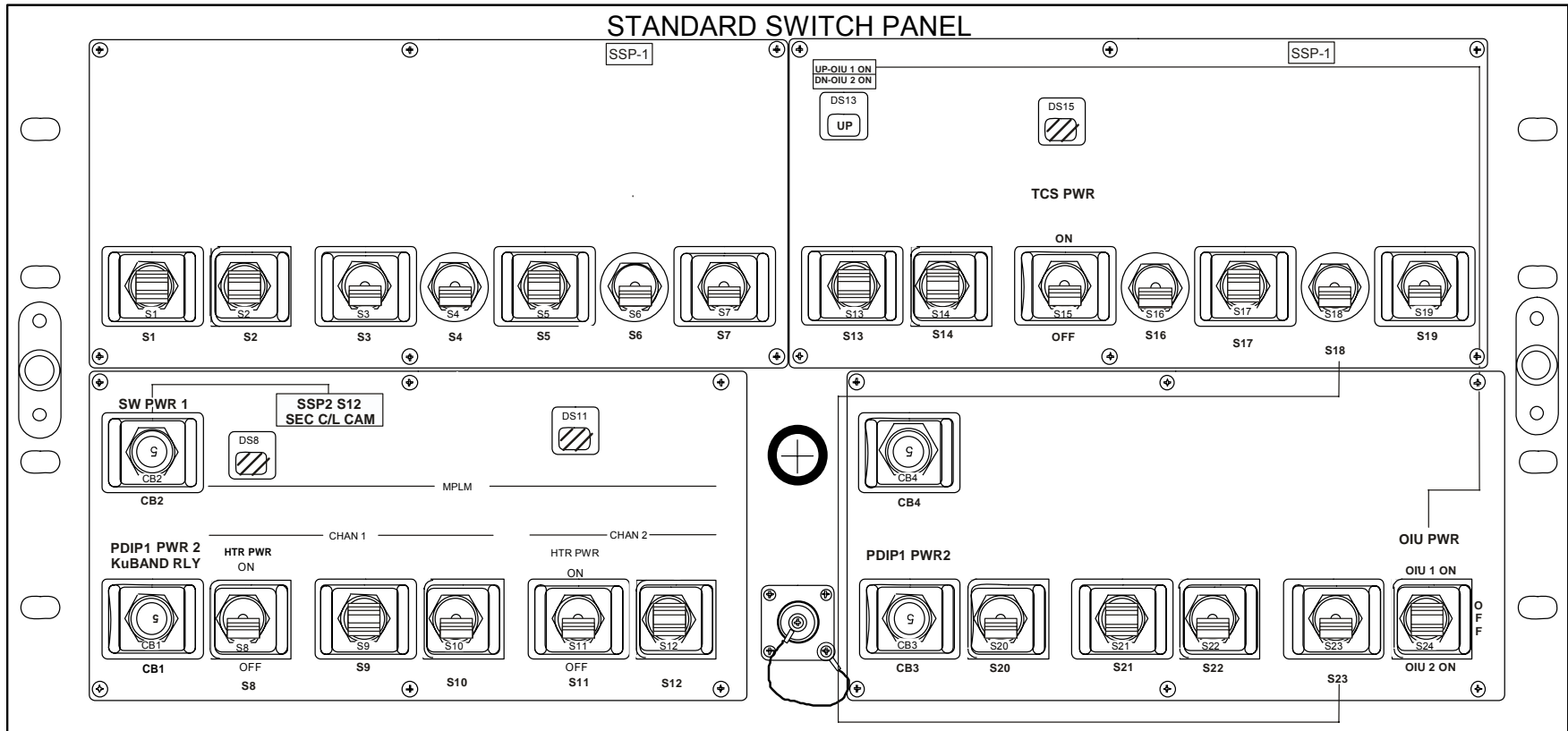
√F1 It – off

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STANDARD SWITCH PANEL 1
 (ASSY OPS/19A/FIN) Page 1 of 1 page

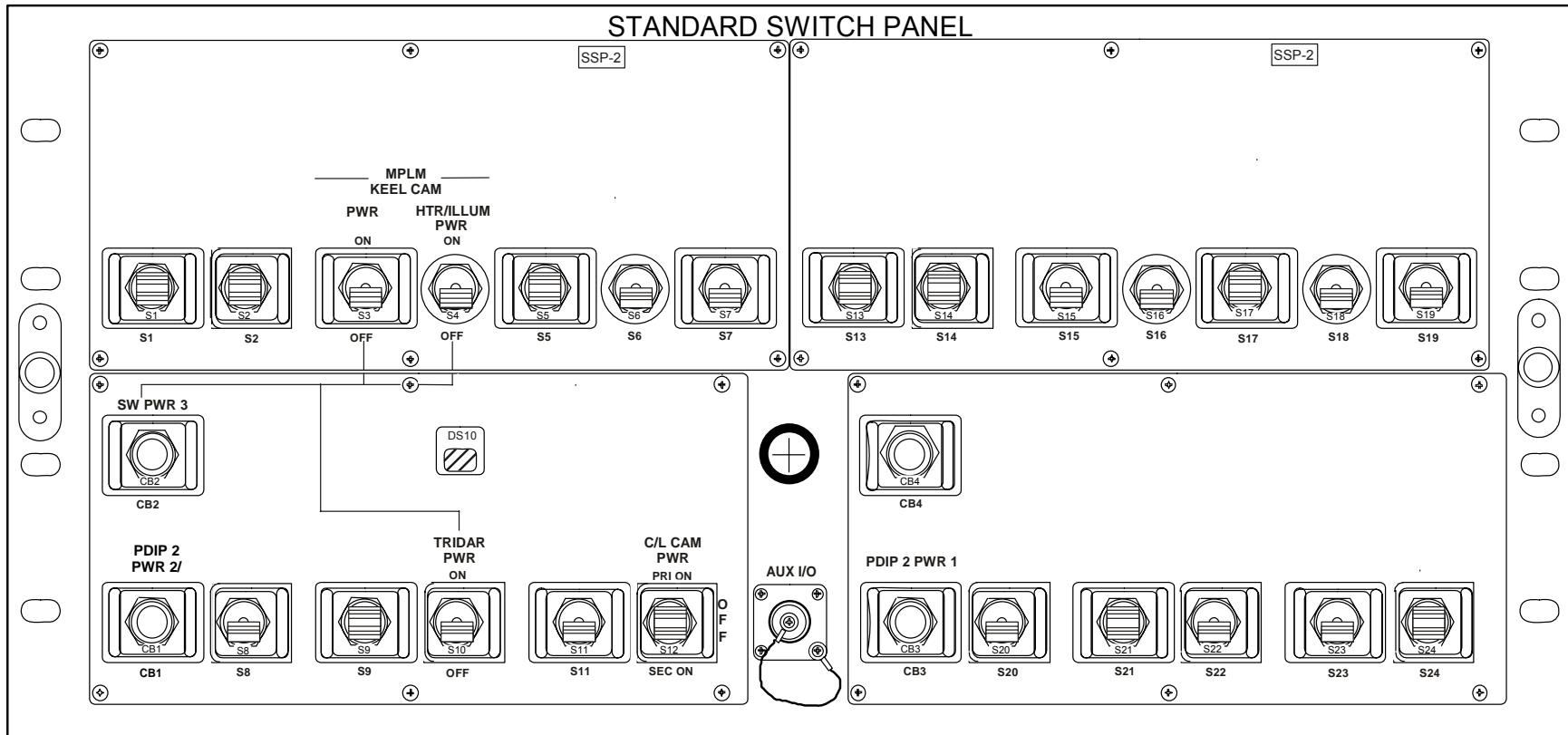
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STANDARD SWITCH PANEL 2
 (ASSY OPS/19A/FIN) Page 1 of 1 page

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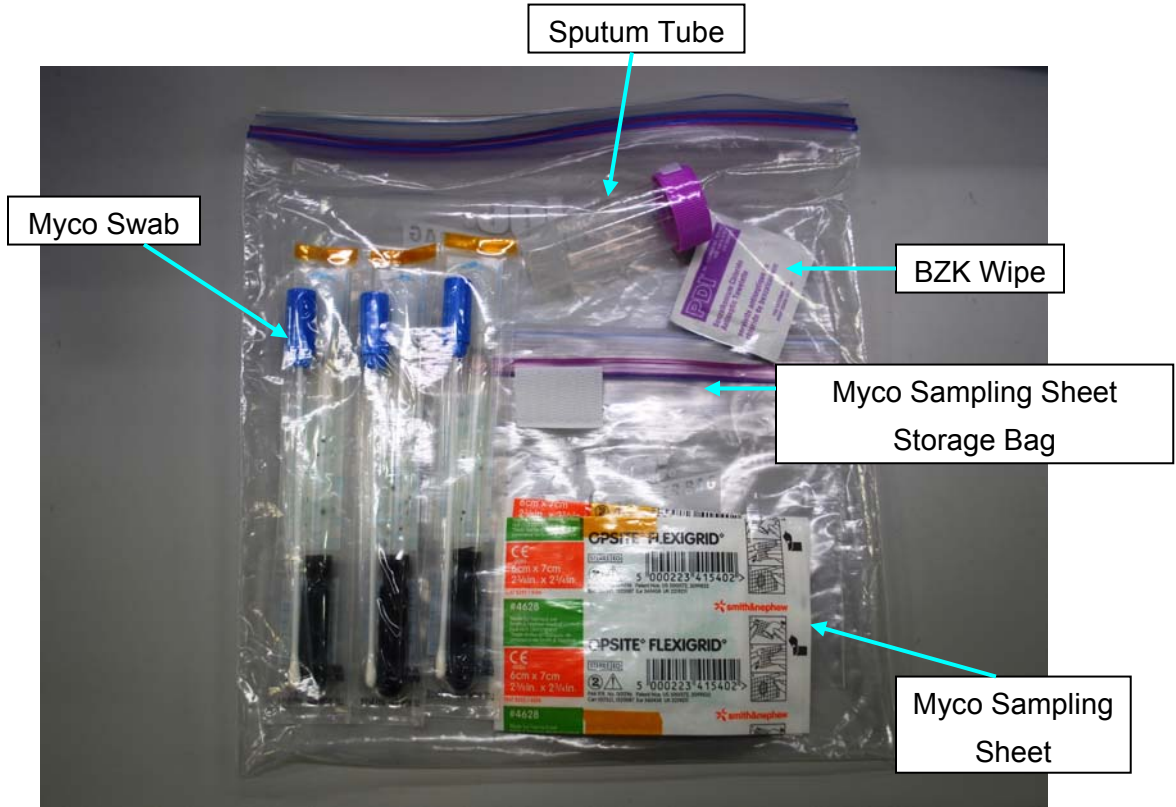


Figure 1.- Myco Kit.

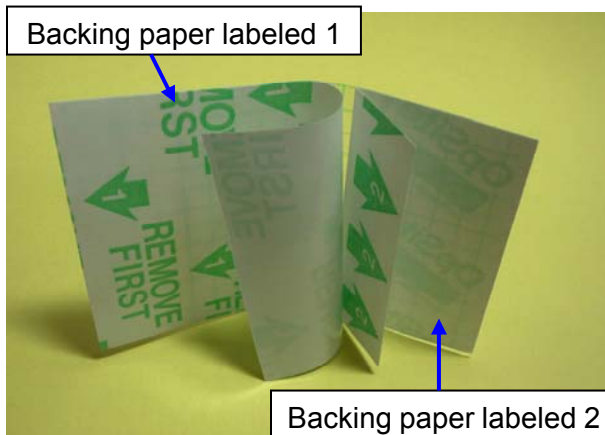


Figure 2.- Myco Sampling Sheet.



Figure 3.- Myco Sampling Sheet Storage Bag.

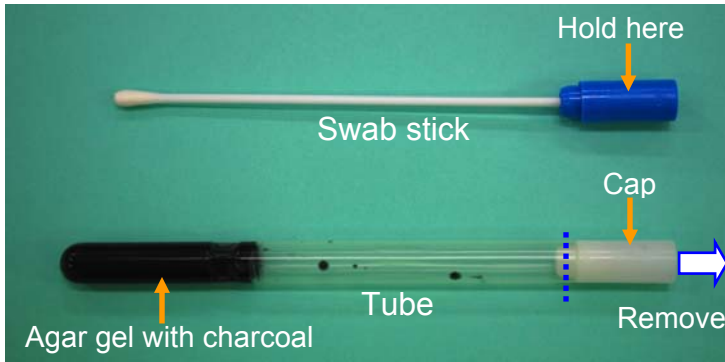


Figure 4.- Myco Swab.



Figure 5.- Sputum Tube.

CUE CARD

CUE CARD

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HOOK
VELCROHOOK
VELCRO**MERLIN STATUS CHECK**

(ASSY OPS/19A/FIN) Page 1 of 2 pages

OBJECTIVE:

The following steps will perform a status check on MERLIN.

1. MERLIN STATUS CHECK (TWICE DAILY)MF71E
(MERLIN) 1.1 √cb PAYLOAD – op (It off)

1.2 √cb MAIN – cl (It on)

- * POWER CB MAIN LED – It off and cb MAIN closed
- *
- * √Display – active
- *
- * If Display is not active,
- * | Perform MERLIN LCD BLANK, all (SODF: ASSY OPS:
- * | MICROGRAVITY EXPERIMENT RESEARCH LOCKER
- * | INCUBATOR (MERLIN)), then:

1.3 √Display – ‘HOME DISPLAY’

- * If Display – ‘*****Error Pending*****,
- * | Perform MERLIN ERROR MESSAGE, all (SODF: ASSY
- * | OPS: MICROGRAVITY EXPERIMENT RESEARCH
- * | LOCKER INCUBATOR (MERLIN)), then:
- *
- * If ‘HOME DISPLAY’ not shown,
- * pb Right (EXIT) – press until ‘HOME DISPLAY’ appears.

NOTE

1. While in the launch configuration,
CURR TEMP expected to be +37.0°C
2. During the ramp period for descent configuration prep,
CURR TEMP may be out of range, approaching +04.0°C
3. While in the landing configuration,
CURR TEMP expected to be +04.0°C

- 1.4 If prior to 19A MERLIN Unpack Activity,
√Display – ‘**CURR TEMP: +37.0C**’ ± 2.0°C
Log CURR TEMP and front panel GPS data in Table 1. MERLIN
LOG

ASSY OPS-1a/19A/A

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MERLIN STATUS CHECK

(ASSY OPS/19A/BAS) Page 2 of 2 pages

- 1.5 If after 19A MERLIN Unpack Activity,
√Display – '**CURR TEMP: +4.0C**' ± 2.0°C
Log CURR TEMP and front panel GPS data in Table 1. MERLIN LOG

- 1.6 √**MCC-H** of logged data and any off-nominal conditions.

Table 1. MERLIN LOG

CURR TEMP	GPS HH:MM:SS	CURR TEMP	GPS HH:MM:SS
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :
	: :		: :

HOOK
VELCROHOOK
VELCRO**GLACIER STATUS CHECK**

(ASSY OPS/19A/FIN) Page 1 of 2 pages

OBJECTIVE:

The following steps will perform a status check on Glacier.

1. GLACIER STATUS CHECKMF28E/G
(Glacier)

- 1.1 √cb POWER – cl (It on)
- 1.2 √sw BATTERY – ON (It on)
- 1.3 √Display – ‘HOME’

- * If Display – ‘**Error Pending**’
- * | Perform [GLACIER ERROR MESSAGE](#), all (SODF: ASSY
- * | OPS: PAYLOADS), then:
- *
- * If ‘HOME’ not shown
- * pb Right (EXIT) → Press until ‘HOME’ appears

NOTE

After door opens, CURR TEMP may be out of range ramping toward set point.

- 1.4 √Display – ‘CURR TEMP:’ is $+4.0^{\circ} \text{C} \pm 5.0^{\circ} \text{C}$
- 1.5 Record from Glacier front panel ‘GPS’, ‘CURR TEMP’ in Table 1 Glacier Log.
- 1.6 √MCC-H with data recorded in Table 1. Glacier Log and any off-nominal conditions.

TOP
BACK OF 'GLACIER STATUS CHECK'

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GLACIER STATUS CHECK

(ASSY OPS/19A/FIN)

Page 2 of 2 pages

Table 1. Glacier Log

GPS	CURR TEMP	GPS	CURR TEMP
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C
__:__:__	__.__°C	__:__:__	__.__°C

ASSY OPS-2b/19A/A

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HOOK
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STL STATUS CHECK

(ASSY OPS/19A/FIN)

Page 1 of 2 pages

OBJECTIVE:

The following steps will perform a status check on STL.

1. STL STATUS CHECK

MA9G 1.1 √POWER It – on
(STL)

√F1 It – off

```

*****
* If POWER It off or F1 It on,
* | Perform STL FAILURE, all (SODF: ASSY OPS:
* | PAYLOADS), then:
*****

```

1.2 Record MET and Rail temps

√Rail temps (four) within nominal range 36-39 °C.

```

*****
* If temps out of range,POWER It off or F1 It on,
* | Perform STL TEMP OUT OF RANGE ON LCD, all (SODF:
* | ASSY OPS: PAYLOADS), then:
*****

```

1.3 Record MET and Rail temps

√Rail temps (four) within nominal range 36-39 °C.

1.4 √**MCC-H** with data recorded in Table 1. STL Log and any off-nominal conditions.

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STL STATUS CHECK
(ASSY OPS/19A/FIN)

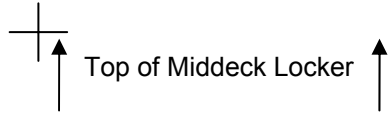
Page 2 of 2 pages

Table 1. STL Log

MET	TEMP (°C)			
	RAIL1	RAIL2	RAIL3	RAIL4
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
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_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____
_ / _ : _	_____	_____	_____	_____

SPINAL ELONGATION STANDING HEIGHT LOG

(ASSY OPS/19A/FIN)



SPINAL ELONGATION STANDING HEIGHT LOG

- 1) Velcro cue card to the farthest right column of the middeck lockers ensuring that the top of the page lines up with the top of the middeck locker.
- 2) Subject holds self with his/her back against the middeck lockers and holds self down.
- 3) Operator helps to ensure feet are flush with the ground.
- 4) Operator marks height of subject using a cue card as a flat edge on paper with a pen and labels with Subject ID and date.
- 5) Repeat steps 2-4 for each subject.
- 6) After all subjects have been completed, remove Spinal Elongation Height Log from middeck lockers and place in the Spinal Procedure manila envelope for return.

ASSY OPS-6a/17A - ALL/A



HINGE



SPINAL ELONGATION STANDING HEIGHT LOG
(ASSY OPS/19A/FIN)



HINGE

ASSY OPS-6b/17A - ALL/A



TOP
HINGED AT BOTTOM OF
'SPINAL ELONGATION STANDING HEIGHT LOG'
HINGE

SPINAL ELONGATION STANDING HEIGHT LOG
(ASSY OPS/19A/FIN)



ASSY OPS-6aa/17A - ALL/A



TOP
HINGED AT BOTTOM OF
BACK OF 'SPINAL ELONGATION STANDING HEIGHT LOG'
HINGE

SPINAL ELONGATION STANDING HEIGHT LOG
(ASSY OPS/19A/FIN)

+

ASSY OPS-6bb/17A - ALL/A



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TRIDAR ACTIVATION (ASSY OPS/19A/FIN)

1. TRIDAR Control Computer PGSC Setup

- PDIP2 √Pre-routed TRIDAR DATA cable connected to PDIP2 TRIDAR port (J103)
- A31p Connect pre-routed TRIDAR DATA cable to RJ45 Ethernet port on PGSC

2. TRIDAR Control Software Startup

- If PGSC not already powered:
- A31p PGSC Pwr – ON

NOTE

After Network setup script is executed, the PGSC onboard network adapter cannot be used for standard ops until Network Setup script is executed to reconfigure the RJ45 port in the TRIDAR DEACTIVATION procedure

Shutdown KFX Software if running

Sel 'Shuttle Apps'>'TRIDAR'> TriDAR RJ45 Network Setup 'Network'

- Enter '1' in the box
- Click 'OK'
- 'TriDAR'
- Click 'OK'

√Yellow 'RJ-45 Port Configured for TRIDAR Ops' displayed on desktop crew patch

NOTE

Wait for the network config script to complete and command text box to close.

Sel 'Shuttle Apps' > 'TRIDAR' > 'TRIDAR'

NOTE

Status items on 'TRIDAR Control' GUI will be yellow or gray until TRIDAR hardware is powered on

√'TRIDAR DTO' GUI displayed

3. TRIDAR Hardware Powerup

- SSP2 √cb SW PWR 3 – cl
TRIDAR PWR – ON (tb – gray)

- A31p After approx 3 mins
- √System Active – gray
 - √Comms – green
 - √Log Space – green
 - √Sensor Health – green

4. Select TRIDAR Operation

- A31p If Docking:
Sel Operation drop down item 'Dock <Tracking>'
- If Undocking:
Sel Operation drop down item 'Undock <Imaging>'

5. Start Active Operations

- A31p Press 'Start' (Start Button button turns gray)
√System Active – green

6. Monitor TRIDAR Operations

- A31p Check status approximately every 15 minutes:
- √System Active – Green
 - √Comms – Green
 - √Log Space – Green
 - √Sensor Health – Green

- * If check items are yellow or gray: *
- * √**MCC** *

TOP
BACK OF 'TRIDAR ACTIVATION'

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TRIDAR DEACTIVATION (ASSY OPS/19A/FIN)

1. Stop Operations

A31p 'TRIDAR DTO'
 Press 'Stop'
 √System Active – gray

2. TRIDAR Hardware Powerdown

SSP2 TRIDAR PWR – OFF (tb – bp)

A31p √Comms – yellow
 √Sensor Health – gray

3. TRIDAR Software Shutdown

A31p Sel 'Exit...' from the 'File' menu

4. Restore Network

A31p Disconnect TRIDAR DATA Cable from RJ45 Port
 Reconnect Ethernet Cable to TriDAR PGSC RJ45 Port

Sel 'Shuttle Apps' > 'TriDAR' > TriDAR RJ45 Network Setup
'Network'

Enter '2' in the box
Click 'OK'

'PGSC'
Click 'OK'

√Yellow 'RJ-45 Port Configured for TRIDAR Ops' not displayed
on desktop crew patch

If required restart KFX Software.

5. PGSC Shutdown

If PGSC not required:
PGSC Sel 'Start'
 Sel 'Shutdown'

TRIDAR TROUBLESHOOTING

NOTE

Refer to descriptions below for appropriate
troubleshooting procedure

1. 'Sensor Health' Status - Yellow

A31p Expand 'Sensor Health' category
 Report items and values backlit in yellow to **MCC**

2. 'Comm' Status - Yellow

PDIP2 Verify TRIDAR DATA cable connected to PDIP2 TRIDAR
port (J103)

A31p Verify TRIDAR DATA cable connected to PGSC ethernet
port

A31p Verify Yellow 'RJ-45 Port Configured for TRIDAR Ops'
displayed on desktop crew patch

If requested, restart TRIDAR Software:

A31p Close TriDAR Software:
 Press 'Stop'
 Sel 'Exit...' from the 'File' menu

A31p Start TriDAR Software:
 Sel 'Shuttle Apps' > 'TRIDAR' > 'TRIDAR'
 √Comms - Green
 √Sensor Health – Green
 √Log Space – Green

A31p If Docking:
 Sel Operation drop down item 'Dock <Tracking>'
If Undocking:
 Sel Operation drop down item 'Undock <Imaging>'

A31p Press 'Start' (Start Button turns gray)
 √System Active – green

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TOP
BACK OF 'TRIDAR DEACTIVATION/TROUBLESHOOTING'

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TRIDAR DEACTIVATION
(ASSY OPS/19A/FIN)

Sel 'OK'

TRIDAR TROUBLESHOOTING

If requested, reboot TRIDAR System:
Perform TRIDAR DEACTIVATION
Perform TRIDAR ACTIVATION

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