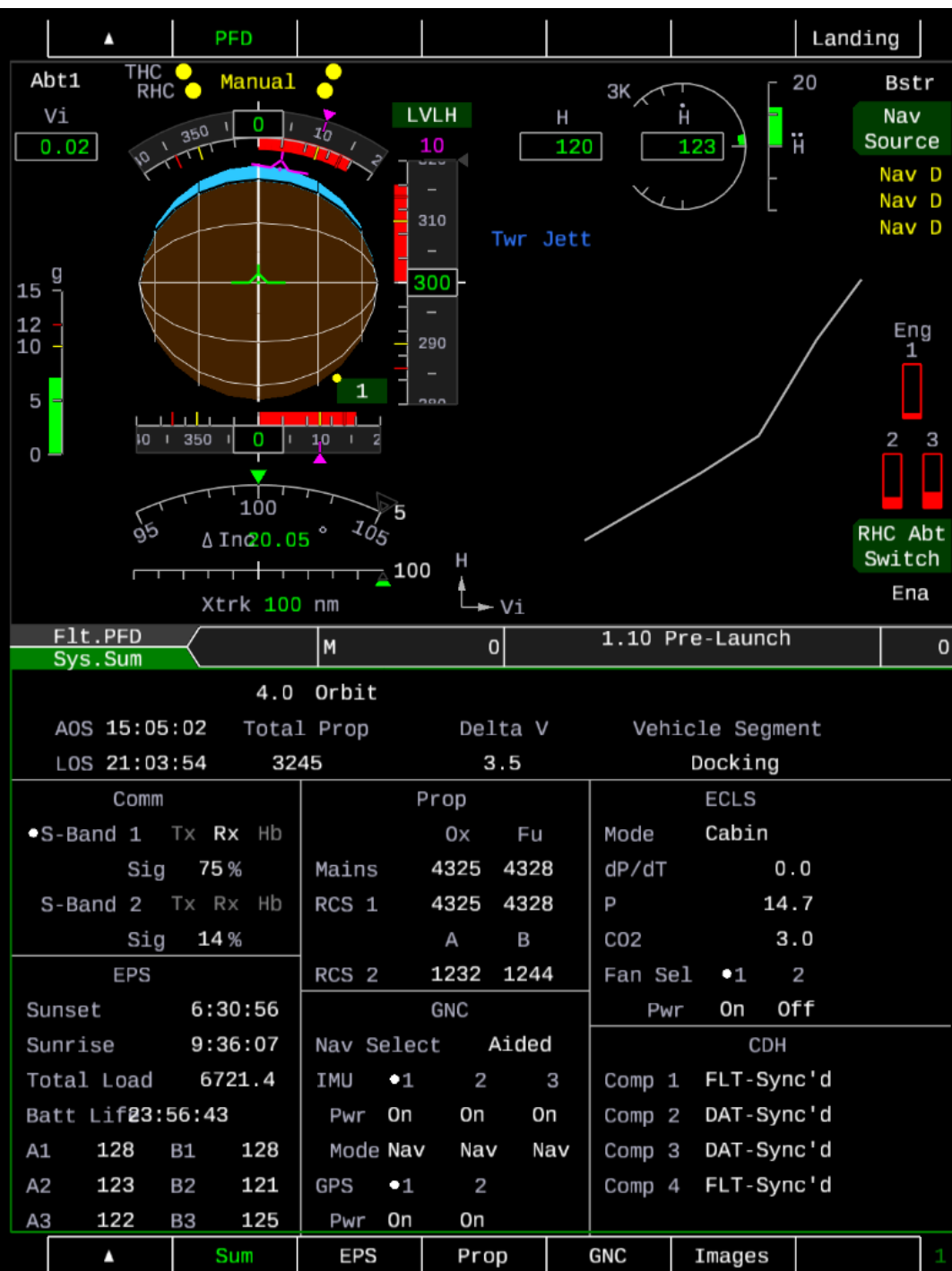




# Overview of Integrated Spacecraft Display System

Lee M. Morin  
NASA Johnson Space Center  
Houston, TX 77058

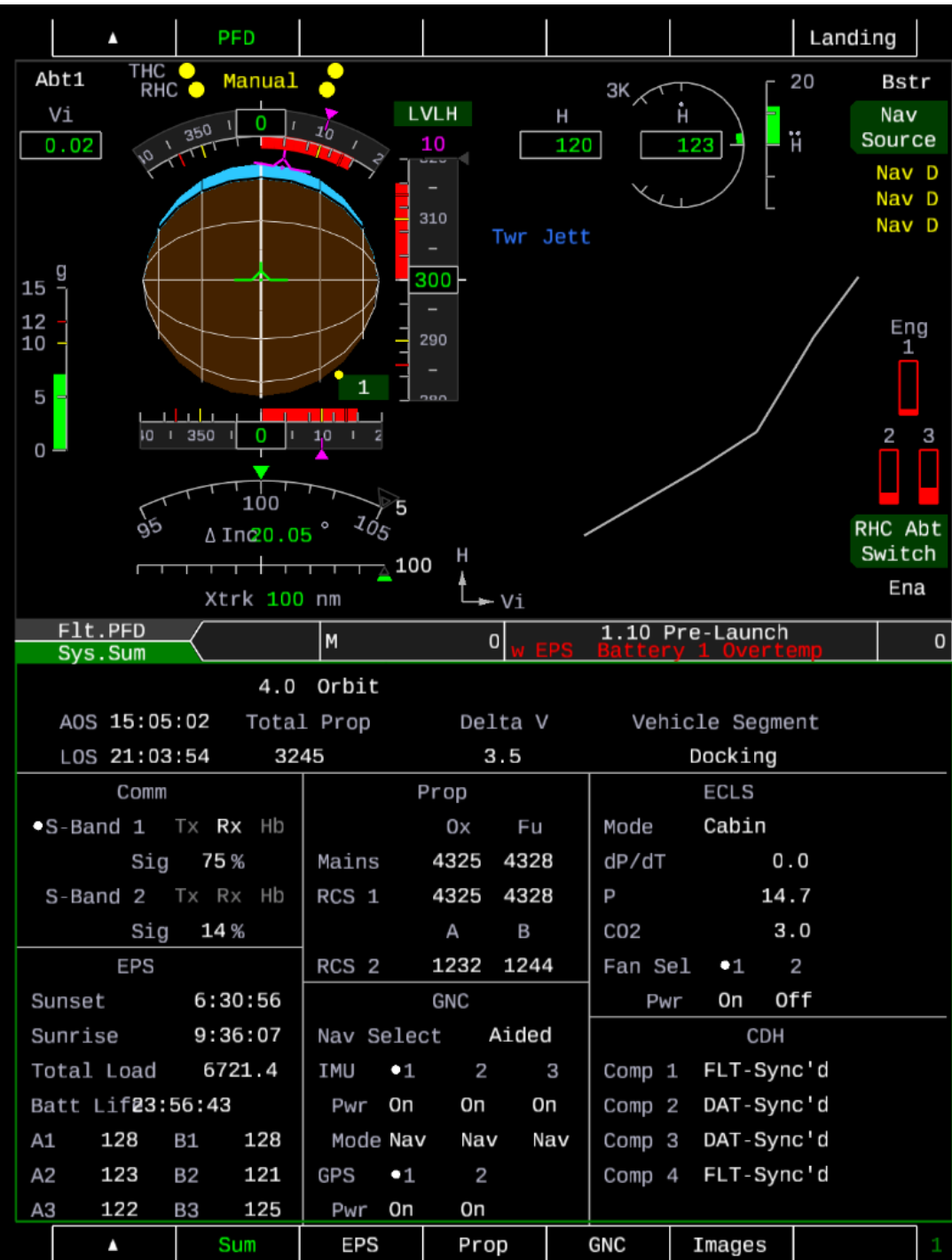


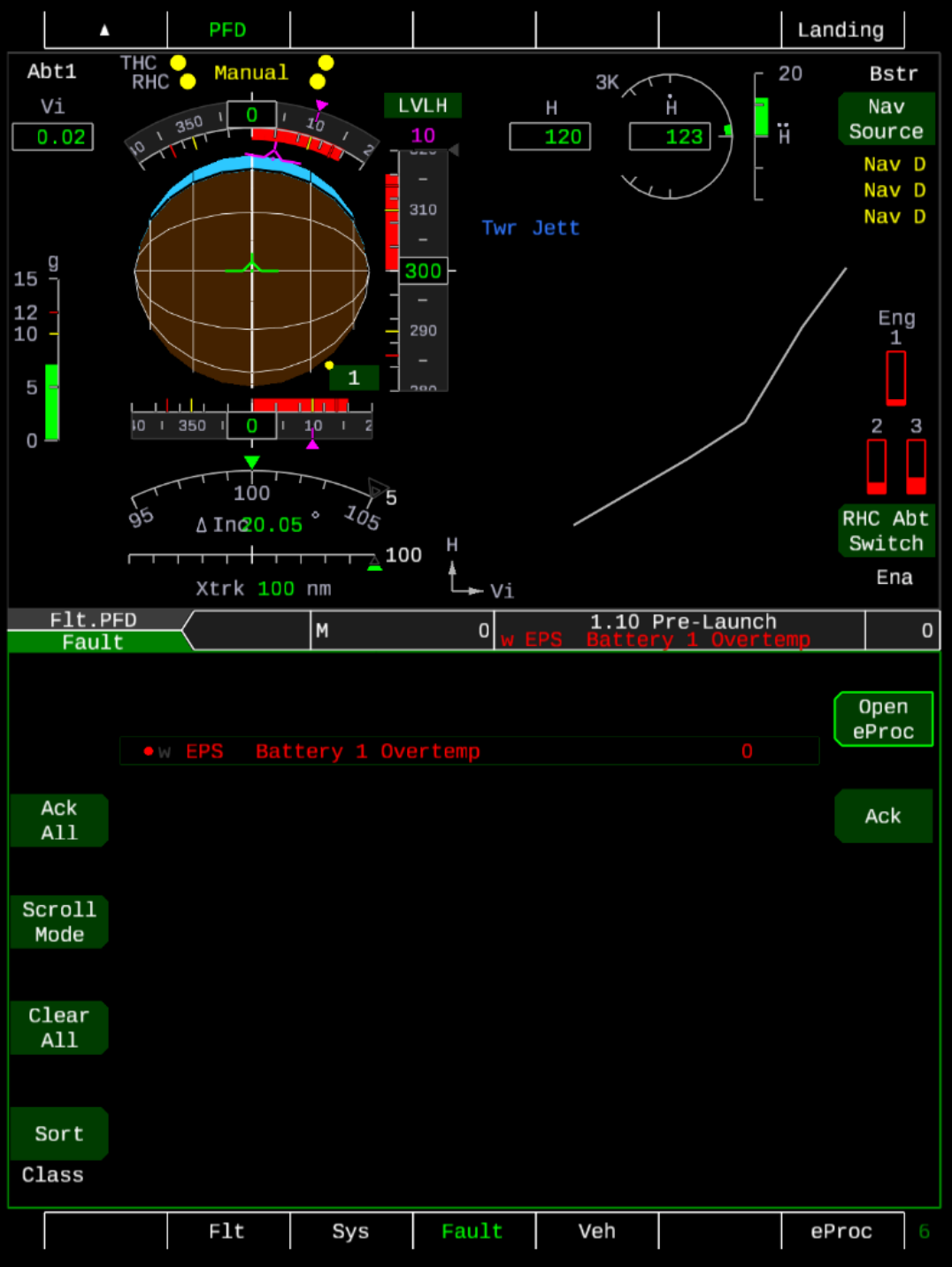
- Nominal configuration of DU 1 with Flt.PFD on the top and Sys.Sum on bottom





- A warning message (EPS Battery 1 Overtemp) appears on the center bar. A warning alarm gives the crew notice should they be away from the displays.





- Navigating to the Fault Log display, it can be seen that Battery 1 Overtemp in the EPS system has been added to the Fault Log



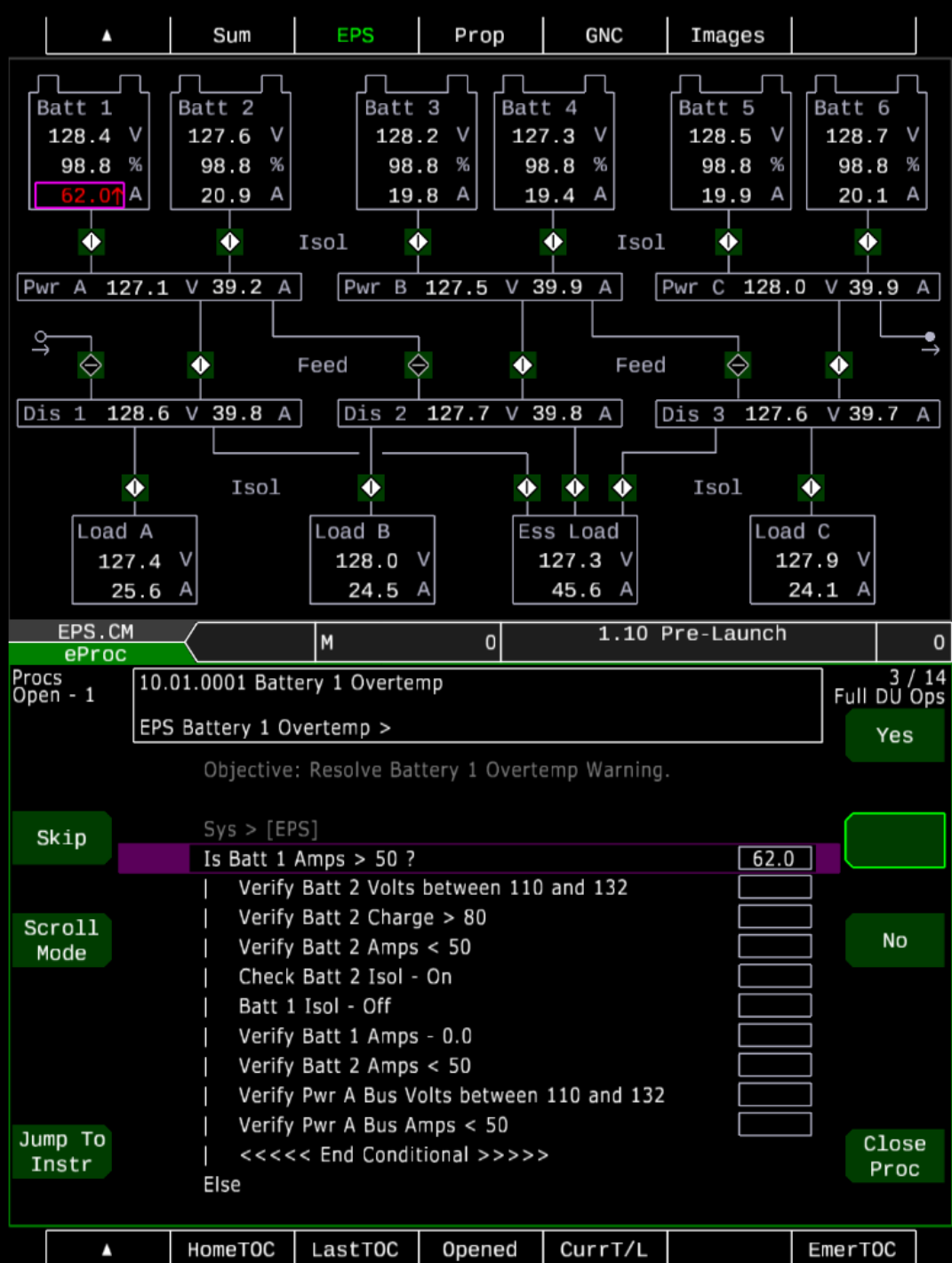


- After the crew presses the edge key for Open Proc, the appropriate eProc will be automatically opened.

The screenshot displays a Primary Flight Display (PFD) with the following elements:

- Top Bar:** PFD, Landing
- Left Side:** Abt1 Vi 0.02, LVLH 10, 300, 290, 280, 15, 12, 10, 5, 0, 10, 350, 0, 10, 1, 2, 95, 100, 105, Xtrk 100 nm, Vi
- Center:** TWR Jett, 3K, H 120, H 123, 20, H
- Right Side:** Bstr, Nav Source, Nav D, Nav D, Nav D, Eng 1, 2, 3, RHC Abt Switch, Ena
- Bottom Bar:** Flt.PFD, eProc, M, 0, 1.10 Pre-Launch, 0
- Warning Panel:** Procs Open - 1, 10.01.0001 Battery 1 Overtemp, EPS Battery 1 Overtemp >, 1 / 14 Full DU Ops
- Message Box:** Skip, Bas, 12Apr17, Objective: Resolve Battery 1 Overtemp Warning., OK
- System List:** Scroll Mode, Sys > [EPS], Is Batt 1 Amps > 50 ?, Verify Batt 2 Volts between 110 and 132, Verify Batt 2 Charge > 80, Verify Batt 2 Amps < 50, Check Batt 2 Isol - On, Batt 1 Isol - Off, Verify Batt 1 Amps - 0.0, Verify Batt 2 Amps < 50, Close Proc
- Bottom Bar:** HomeTOC, LastTOC, Opened, CurrT/L, EmerTOC





- In this particular case, as the crew works through the eProc they must verify that certain telemetry values are within the parameters of the eProc. The eProc automatically opens the necessary display in order to monitor the telemetry value
- In this case, the crew must answer when prompted “Is Batt 1 Amps > 50?” The necessary value is highlighted in magenta in the upper half of the DU





- As the crew works through the eProc, steps in gray signify that that particular step has been completed.
- This is an example of when the eProc guides the crew to issue a command. The appropriate state in which the command must be in is queued up by the eProc. In this case, the Batt 1 Isol must be commanded to the Off state.



The screenshot displays a spacecraft power system interface. At the top, there are six battery units (Batt 1 to Batt 6) with their respective voltage, percentage, and current. Below them are power distribution units (Pwr A, B, C) and three distribution units (Dis 1, 2, 3). The interface also shows various loads (Load A, B, C, Ess Load) and their status. A central panel shows the 'Batt 1 Isol' status, with options for 'On', 'Off', and 'Reset'. The bottom section displays an eProc procedure for '10.01.0001 Battery 1 Overtemp', with steps for verifying other battery parameters and issuing commands. The interface includes navigation buttons like 'Skip', 'Scroll Mode', 'Jump To Instr', and 'Close Proc'. The top navigation bar shows 'Sum', 'EPS', 'Prop', 'GNC', and 'Images'. The bottom navigation bar shows 'HomeTOC', 'LastTOC', 'Opened', 'CurrT/L', and 'EmerTOC'.

Batt	V	%	A
Batt 1	128.7	98.8	61.4↑
Batt 2	128.0	98.8	20.0
Batt 3	128.3	98.8	20.1
Batt 4	127.6	98.8	20.5
Batt 5	127.0	98.8	20.0
Batt 6	128.7	98.8	20.0

Pwr	V	A
Pwr A	127.7	39.9
Pwr B	128.1	39.9
Pwr C	127.5	40.7

Dis	V	A
Dis 1	128.8	25.8
Dis 2	127.4	40.8
Dis 3	128.8	39.3

Load	V	A
Load A	128.8	25.8
Load B	127.6	26.0
Ess Load	128.1	45.2
Load C	128.4	25.0

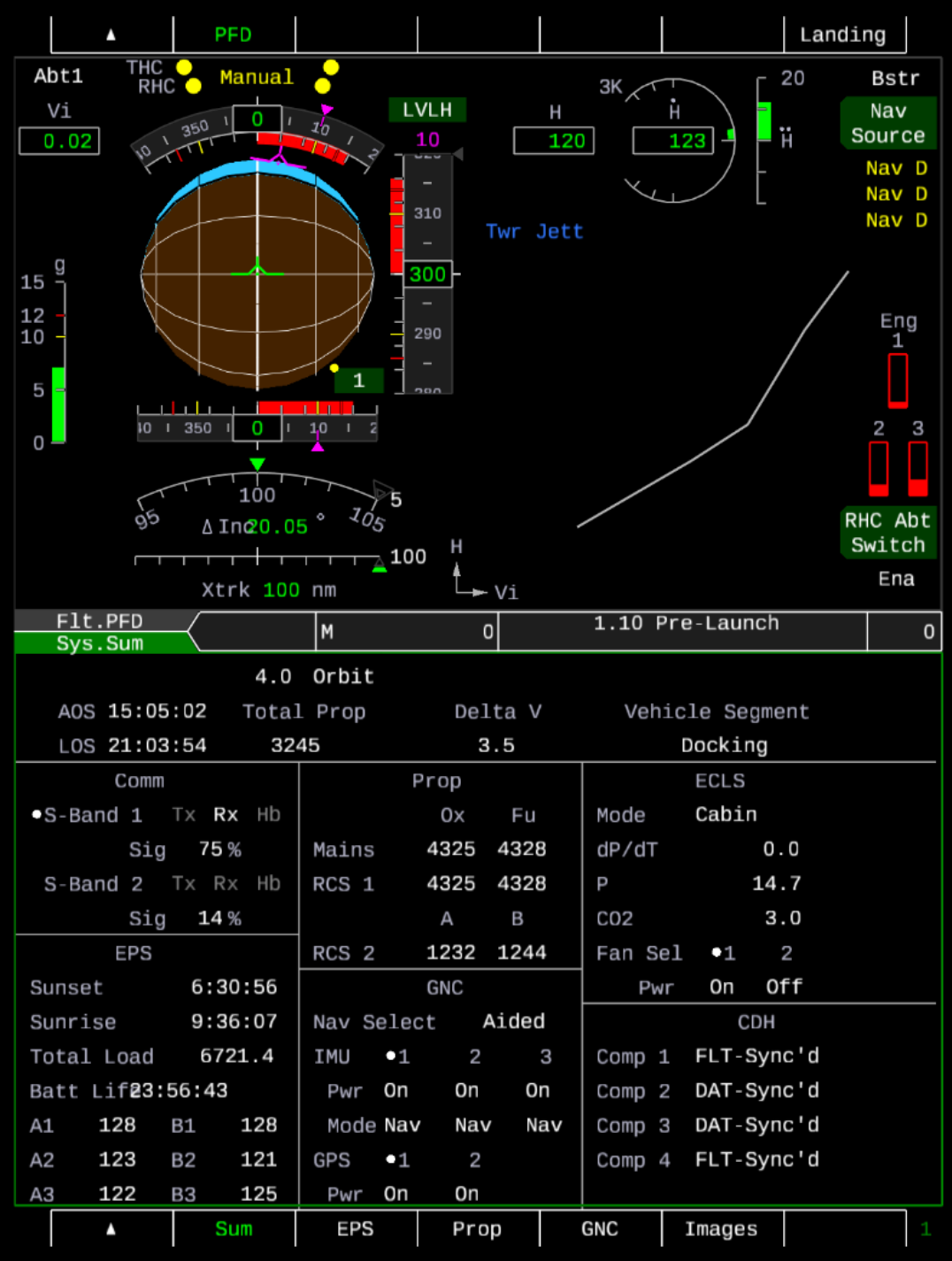
EPS.CM eProc M 0 1.10 Pre-Launch 0

Procs Open - 1 10.01.0001 Battery 1 Overtemp 8 / 14 Full DU Ops

EPS Battery 1 Overtemp >

- Verify Batt 2 Charge > 80 [98.8]
- Verify Batt 2 Amps < 50 [20.4]
- Check Batt 2 Isol - On [On]
- Batt 1 Isol - Off [On]
- Verify Batt 1 Amps - 0.0 [ ]
- Verify Batt 2 Amps < 50 [ ]
- Verify Pwr A Bus Volts between 110 and 132 [ ]
- Verify Pwr A Bus Amps < 50 [ ]
- <<<<< End Conditional >>>>>
- Else
- Call MCC.
- <<<<< End Conditional >>>>>
- <<<<< End Procedure >>>>>

Buttons: Skip, Scroll Mode, Jump To Instr, Close Proc



- After the eProc has been completed, the Warning title will be grayed out within the Fault Log and the crew will be automatically navigated back to the displays that they were monitoring prior to the warning.

