

**MULLARD SPACE SCIENCE LABORATORY
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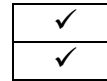
SOLAR-B EIS MODES

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EIS-Science
EIS-Tech



CHANGE RECORD

ISSUE	DATE	PAGES CHANGED	COMMENTS
01	14/06/2000	All new	
02	04/08/2004	Major overhaul	Added power switching operations Added modes power consumption

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Applicable References (appears in [] within this technical note):

- 1 – MSSSL/SLB-EIS/SP007.07: EIS Science requirements
- 2 – NAO/SLB-EIS/SP/MDP3.4: MDP-ICU Electrical Interface
- 3 – MSSSL/SLB-EIS/SP016.05: EIS Telecommanding Structure
- 4 – Private discussion with Jason Tandy

2.0 Instrument Modes table

MODE	AVERAGE POWER (WATT) [4]	PEAK POWER (WATT) [4]	NOTES
Off	0	0	All OFF
Boot	8.12	8.12	CAM makeup heater OFF MHC makeup heater OFF Bake-out heaters Disabled Bake-out heaters OFF CAM OFF MHC OFF
Standby	19.6	19.6	CAM makeup heater ON MHC makeup heater ON Bake-out heaters Disabled Bake-out heaters OFF CAM OFF MHC OFF
Bake-out	8	46	CAM makeup heater OFF MHC makeup heater OFF Bake-out heaters Enabled Bake-out heaters ON/OFF (as required by the close loop heater controller) The peak power assumes CCDs A and B heaters ON
Manual	24	47	CAM makeup heater OFF MHC makeup heater OFF Bake-out heaters Disabled CAM ON MHC ON The peak power assumes two MHC heaters ON and Slit/Slot moving
Auto	24	47	CAM makeup heater OFF MHC makeup heater OFF Bake-out heaters Disabled CAM ON MHC ON The peak power assumes two MHC heaters ON and Slit/Slot moving
Emergency	19.6	19.6	CAM makeup heater ON MHC makeup heater ON Bake-out heaters Disabled Bake-out heaters OFF CAM OFF MHC OFF

3.0 EIS mode transition rules:

1. Following operational code start-up, Enable mode transition command must be sent before mode transitions can commence. Failing to do so will result in rejecting mode transitions command
2. The ICU, in the events of flare or event trigger response, autonomously disables mode transition. This inhibits mode changes by the OP/OG command store, as this may result in accidental aborting of a response sequence. The mode transition is re-enabled when the response sequence completed. If a ground abort is required, then the mode transition command must be issued followed by Manual mode.
3. Mode transitions can only go through the arrowed lines. Any violation will result in the mode transition being rejected. For example, mode transition from Manual to bake-out is not allowed as that leaves the CAM and MHC powered ON. The transition to bake-out must be via standby mode.
4. Emergency mode can be invoked un-conditionally (red button).

4.0 EIS mode transition notes

1. Boot mode is entered either via a Reset ICU command or power ON or watchdog
2. Standby mode is the first mode that entered from Boot mode.
3. Standby mode is commanded into Manual mode (all subsystems are ON) prior to science (sequence interpreter) operations. This is the “normal” EIS operations route. Mode transition requires Enable Mode Transition Command
4. Manual to Auto (sequence run) operations can be performed as follows:
 - i. From Manual mode, select a sequence number.
 - ii. Go to Auto mode
 - iii. This operational procedure is recommended by the J-side for all Solar-B instruments
5. CCD bake-out operations are performed from bake-out mode. Heater power is applied to the CCDs via a closed loop heater controller.
6. Emergency safe is a mode unconditionally invoked by ground command or autonomously by the on-board health monitor upon detecting voltages, currents or

temperatures out of range. Emergency mode also invoked as a consequence of loss of communication with the MDP for over 10 seconds [2]. Also the ICU invokes it if communications with the MHC is lost and the ICU cannot recover it via re-cycling power, i.e. serious error condition.