

| Line # | Spacecraft DATE/TIME | S/C Cmd #         | HEX ID# | DEC ID # | GRS Deployed Mapping Activities Run Commands | Notes                                                              | Cumulative Seconds |
|--------|----------------------|-------------------|---------|----------|----------------------------------------------|--------------------------------------------------------------------|--------------------|
| 1      | 03-322/14:31:39      | cn0832            | C47     | 3143     | c01grs_s43b_open_cool3_2.bfl                 | Executed at Orbit 143, Pixel 243                                   |                    |
| 2      |                      | (GRS cmd id 2764) | EA01    | 59905    | c01grs_is_temp_b_up_n148c.sasf               | -148°C 125°K Dn=4868 (0x1304)                                      | imm                |
| 3      |                      | (GRS cmd id 2770) | EA02    | 59906    | c01grs_is_temp_b_use_seq_44b.sasf            | Step down the temperature setpoints for the OS heater              | imm                |
| 4      |                      | (GRS cmd id 2443) | EA03    | 59907    | c01grs_os_temp_a_low_n78_2c.sasf             | -78.2°C 194.8°K Dn=2098 (0x832)                                    | imm                |
| 5      |                      | (GRS cmd id 2398) | EA04    | 59908    | c01grs_os_temp_a_up_n78_3c.sasf              | -78.3°C 194.7°K Dn=2102 (0x836)                                    | imm                |
| 6      |                      | (GRS cmd id 2776) | EA05    | 59909    | c01grs_mr_temp_a_oor_a_ct_0.sasf             | Requires zero consecutive out-of-range values                      | imm                |
| 7      |                      | (GRS cmd id 2805) | EA06    | 59910    | c01grs_mr_temp_a_low_n89_95 c.sasf           | -89.95°C 183.05°K Dn=2552 (0x9F8)                                  | imm                |
| 8      |                      | (GRS cmd id 2491) | EA07    | 59911    | c01grs_mr_temp_a_up_n90_0c.sasf              | -90°C 183°K Dn=2554 (0x9FA)                                        | imm                |
| 9      |                      | (GRS cmd id 1041) | EA08    | 59912    | c01grs_activate_sequence_41a.sasf            | Dumps fpga_a, fpga_b, analog, parameter, and data counts           | imm                |
| 10     |                      |                   |         |          |                                              |                                                                    |                    |
| 11     | 02-129/19:31:23      | cn0311            | C47     | 3143     | c01grs_s43b_open_cool3_1.bfl                 | Executed at Orbit 972, Pixel 180                                   |                    |
| 12     |                      | (GRS cmd id 2764) | EA01    | 59905    | c01grs_is_temp_b_up_n148c.sasf               | -148°C 125°K Dn=4868 (0x1304)                                      | imm                |
| 13     |                      | (GRS cmd id 2770) | EA02    | 59906    | c01grs_is_temp_b_use_seq_44b.sasf            | Step down the temperature setpoints for the OS heater              | imm                |
| 14     |                      | (GRS cmd id 2443) | EA02    | 59906    | c01grs_os_temp_a_low_n78_2c.sasf             | -78.2°C 194.8°K Dn=2098 (0x832)                                    | imm                |
| 15     |                      | (GRS cmd id 2398) | EA03    | 59907    | c01grs_os_temp_a_up_n78_3c.sasf              | -78.3°C 194.7°K Dn=2102 (0x836)                                    | imm                |
| 16     |                      | (GRS cmd id 2494) | EA04    | 59908    | c01grs_op_h_mr_a_low_n89c.sasf               | -89°C 184°K Dn=2514 (0x9D2)                                        | imm                |
| 17     |                      | (GRS cmd id 2491) | EA05    | 59909    | c01grs_op_h_mr_a_up_n90c.sasf                | -90°C 183°K Dn=2554 (0x9FA)                                        | imm                |
| 18     |                      | (GRS cmd id 1041) | EA06    | 59910    | c01grs_activate_sequence_41a.sasf            | Dumps fpga_a, fpga_b, analog, parameter, and data counts           | imm                |
| 19     |                      |                   |         |          |                                              |                                                                    |                    |
| 20     | 02-065/18:41:48      | cn0147            | C47     | 3143     | c01grs_s43b_gpa_warm_off_1.bfl               | Executed at Orbit 194, Pixel 223                                   |                    |
| 21     |                      | (GRS cmd id 2450) | EA01    | 59905    | c01grs_gpa_temp_dont_comp.sasf               | Terminate the comparison                                           | imm                |
| 22     |                      | (GRS cmd id 1323) | EA02    | 59906    | c01grs_gpa_heater_3_off.sasf                 |                                                                    | 5                  |
| 23     |                      | (GRS cmd id 2455) | EA03    | 59907    | c01grs_gpa3_temp_low_p30c.sasf               | 30°C 303°K Dn=15274 (0x3BAA)                                       | 25                 |
| 24     |                      | (GRS cmd id 2457) | EA04    | 59908    | c01grs_gpa3_temp_oor_a_ct_3.sasf             | Requires three consecutive out-of-range values                     | 25                 |
| 25     |                      | (GRS cmd id 2446) | EA05    | 59909    | c01grs_gpa3_temp_use_seq_24b.sasf            | Activates sequence to shutdown gamma subsystem.                    | 25                 |
| 26     |                      | (GRS cmd id 2447) | EA06    | 59910    | c01grs_gpa_temp_comp_less.sasf               | Counterintuitive - compares Dn value (Dn decreases as T increases) | 45                 |
| 27     |                      |                   |         |          |                                              |                                                                    |                    |
| 28     | n/a                  | n/a               |         |          | c00grs_seq_43_b_ann_is_h_on.bfl              | Pre-launch load                                                    |                    |
| 29     |                      |                   | EA01    | 59905    | c01grs_is_temp_a_use_seq_44b.sasf            | Counterintuitive - compares Dn value (Dn decreases as T increases) | imm                |
| 30     |                      |                   | EA02    | 59906    | c01grs_is_temp_b_use_seq_44b.sasf            |                                                                    | imm                |
| 31     |                      |                   | EA03    | 59907    | c01grs_is_temp_a_comp_less.sasf              |                                                                    | imm                |
| 32     |                      |                   | EA04    | 59908    | c01grs_is_temp_b_comp_less.sasf              |                                                                    | imm                |
| 33     |                      |                   | EA05    | 59909    | set anneal to start                          |                                                                    | imm                |