

STEREO MOC Status Report
Time Period: 2016:263 - 2016:269

STEREO Ahead (STA) Status:

1. The following Ground System anomalies/events occurred during this reporting period:

- On day 263, during the DSS-65 support, turbo decoder lock was lost briefly at 1723z. This anomaly resulted in the loss of one frame of SSR data.
- On day 264, during the DSS-43 support, telemetry lock was lost intermittently between 265-0051z and 0057z due to heavy rain at the Canberra complex. This anomaly resulted in the loss of 14,219 frames of SSR data. See DR #C112338 for more information.
- On day 266, during the DSS-55 support, turbo decoder lock was lost briefly at 1044z. This anomaly resulted in the loss of four frames of SSR data.
- On day 268, during the DSS-63 RTS Engineering Demo support, the command uplink was lost and telemetry performance was degraded from 1313z to 1414z due to several film height low alarms and subsequent antenna resets by the LCO. See DR# M109566 for more information.
- On day 269, during the DSS-26 support, turbo decoder lock was lost intermittently between 1732z and 2305z. This anomaly resulted in the loss of eight frames of SSR data.

2. The following spacecraft/instrument events occurred during this week. The Ahead observatory operated nominally during this week.

- The average daily science data return for Ahead was 4.0 Gbits during this week.

STEREO Behind (STB) Status:

1. The following Ground System anomalies/events occurred during this reporting period:

- None.
2. Detailed status of the recovery activities to restore operations from the Behind loss of communication anomaly, which occurred on October 1, 2014, are listed below.
- Behind Observatory Status - Low main bus voltage, 2 (#6 & 9) out of 11 battery cells are currently not functioning, attitude uncontrolled, rotating at a ~45 second period about its principal axis of inertia. Current orientation support may support some solar array input; RF communications on the +Z LGA only supports uplink of short commands to an LGA. While propellant is suspected to be frozen, from the last telemetry received on day 262, both propulsion tank latch valves are open, and pressure transducer #2 is not functioning. Power switching boards are on; nearly all switched loads off including the IEM (avionics) and PDU 1553 bus with the TWTA in standby and propulsion primary and secondary heaters on and -Y panel (R4) heaters on. EA mode is enabled. The battery charge rate is C/10. As the uncontrolled communications link is degrading, necessary macro sequences have been tested to allow the peak power tracker in C&DH standby mode to protect the battery. Detailed status of the recovery activities to restore operations from the Behind loss of communication anomaly, which occurred on October 1, 2014, are listed below. Active recovery operations began with the carrier detection on August 21, 2016.
 - On day 263, during the two hour support with DSS-14, after sending commands to protect the battery by setting the voltage controller to 2 and powering on additional loads (propulsion tank primary and secondary heaters), the carrier signal was unexpectedly lost after 5 minutes. It is suspected that the battery bus had collapsed however this cannot be confirmed without telemetry. While on the -Z LGA, the carrier signal was continuously fluctuating from -167 dBm to -174 dBm with a period of ~45 seconds. Subcarrier lock was intermittent. No telemetry frames were received.
 - On day 264, during the two hour support with DSS-43, commands were sent for increasing the battery charge rate to C/4 and closing latch valves. The carrier signal was very low, intermittent, and carrier lock could not be maintained. After switching to the +Z LGA, no downlink

signal was received. Commands were sent to the place the TWTA in standby and power on the propulsion tank primary heaters. No telemetry frames were received.

- On day 267, during the two hour support with DSS-43, a test macro containing only TWTA HV on and no-operation commands was loaded to RAM to simulate loading the larger of the two new autoexec macros, 0 (154 bytes) and 1 (190 bytes). While the actual macros 0 and 1 were loaded to the uplink buffer, they were not copied to EEPROM, since execution of the test macro failed to produce a carrier signal. The TWTA HV on command was then manually sent from the ground, but also failed to produce a carrier signal. At this point the decision was made to begin battery recovery - IEM switched power and 1553 off; TWTA to standby, primary and secondary tank and -y panel (R4) heaters on - all commands sent manually, multiple times. The battery charge rate, while temporarily set to C/4, was returned to C/10 prior to powering off the 1553. Subsequently the radio science team detected an extremely weak (~10 dB-Hz SNR) at 2200z for 15 seconds.
- On day 268, during the 3.25 hour support with DSS-26 (34 meter dish; 80 KW transmitter), multiple commands to power on the TWTA were sent shortly after BOT. Although using a 34-meter dish, carrier detection was expected, if the spacecraft was transmitting. At the expected time, no downlink carrier was detected, nor throughout the power subsystem lead's recommended maximum ~ 4 minute TWTA on/off period. Mission Ops directed DSN to begin configuring for automated battery recovery operations (i.e. repeated multiple sweeps in a 3 kHz range). At 1557z, automated battery recovery operations commenced, with Mission Ops repeatedly commanding the following configuration through EOT - IEM switched power and 1553 off; TWTA to standby, primary and secondary tank and -y panel (R4) heaters on.