Superior Solar Conjunction Planning

May 8, 2014

Dan Ossing
STEREO Mission Operations Manager
(240) 228-8319
Agenda

- HGA Feed Temperature Constraint
- Schedule
- Key Dates
HGA Feed Temperature Constraint

- HGA feed will increase in temperature beyond acceptable limits with SPE angle below 6.5 degrees.
  - If SPE angle exceeded, damage to the feed assembly will render the HGA unusable.
  - Thermal modeling and analysis in progress
    - Results due by the end of May
    - Not done before launch as the mission was only two years.

- Off point HGA to prevent excessive heating
  - Keep feed temperature below 125 deg C
    - Temperature sensor limit = 136 deg C
    - Damage starts @ 150 deg C (adhesives)
  - AHEAD – September 2014 through December 2015
  - BEHIND – November 2014 through January 2016
  - At this time, anticipating instruments will off for these durations due to low data rates

- Investigating HGA side lobe for low data rate communications
  - Testing on May 10th (AHEAD) and May 17th (BEHIND)
HGA Feed Assembly
STEREO AHEAD Timeline Schedule - DRAFT

Reviews
- FP Readiness
- MOps Readiness
- Test on S/C
- Solar Conjunction Readiness

Date
- SPE (deg)
  - 9/2 6.6
  - 9/7 6.8

Activities
- Load C&DH FSW 3.2.4
- Load Parameters
- Load MOps Macros & FP & Set EA Bypass
- HGA Calibration
- HGA on Side Lobe
- Instrument Power Down & SSR Reconfiguration
- Rehearse w/ DSN
- Test on S/C

S/C Config
- 3 axis & Op Mode
- 3 axis & Op Mode
- HGA Low Rates
- HGA Nominal Rates
- Rotate
- Rotate @ 5 deg/min
- HCLT Reset Every 3 days
- 3 axis & Standby Mode (198 days)
- 105 days
- 155 days

RF
- HGA Nominal Rates
- HGA Auto Track Low Data Rates (198 days)
- No Communications
- HGA Auto Track Low Data Rates (155 days)

DSN
- Nominal Tracks
- 70m, 3 hrs
- 70m, Daily 3 hrs (198 days)
- No Coverage
- 70m, Daily 3 hrs (155 days)

Instruments
- Nominal Science
- Instruments Off (~469 days)
- Nominal Science

Post Solar Conjunction Assessment
- HGA on Main Lobe
- SSR Playback & Reconfiguration & S/C Checkout
- Instrument Power on & Recommissioning
## Key Dates

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<tr>
<th>Event</th>
<th>AHEAD</th>
<th>BEHIND</th>
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<td>HGA side lobe test</td>
<td>5/10/14</td>
<td>5/17/14</td>
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<td>LGA calibration test</td>
<td>6/8/14</td>
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<tr>
<td>Load C&amp;DH 3.2.4 FSW to EEPROM Copy 1</td>
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<td>Load G&amp;C and C&amp;DH parameters to EEPROM</td>
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<td>Load MOps macros &amp; FP releases to EEPROM</td>
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<td>MOps Readiness for S/C Testing Review</td>
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<td><strong>Instrument Power on &amp; Recommissioning</strong></td>
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Three Laws of STEREO Solar Conjunction

1. Take all reasonable precautions to keep the observatory safe.
   Of course, “reasonable” is subject to interpretation and judgment. We will be guided by the usual risk assessment methodology of weighing both probability and impact, which is, after all, the implicit thinking behind “engineering judgment.”

2. Return to normal science operations as soon as reasonably possible. In cases where this law conflicts with the First Law, the First Law takes precedence.
   There’s that word “reasonably” again. We do not have infinite time and manpower to prepare for conjunction. So, some management judgment is required.

3. Conduct science operations during conjunction, if reasonably feasible. In cases where this law conflicts with the first two, the first two laws take precedence.
   We do not have infinite time and manpower.