



SORCE October 2001 Project

Summary

The EOS SORCE Mission experienced noteworthy progress in all areas during the month of October 2001. The SORCE Mission is still on schedule and within budget. A launch date of July 31, 2002 is anticipated. At present all LASP and Orbital SORCE schedules are success oriented. Further hindrances, (i.e. the unforeseen replacement of inferior diodes and power converters) to current schedules could impact launch date. However, if the October 2001 work pace is sustained and instrument calibration, test and integration go smoothly, the SORCE Mission schedule may be maintained. As always SORCE plans are reviewed and adjusted on a daily basis to meet program needs.

SORCE System Status

The SORCE MIWG (Mission Integration Working Group) was held at KSC (Kennedy Space Center) October 23-24, 2001. A SORCE TIM (Technical Interchange Meeting) was held October 1, 2001. During the MIWG and the SORCE TIM the SORCE Pegasus rocket was evaluated, and SORCE "gyroless" flight status finalized. The SORCE rocket fairing passed electronic inspection and is considered flight suitable. Some minor problems were discovered on the SORCE rocket, however. Tie-bases in the aft skirt had debonded. Investigation is underway to determine the cause of the debonding. Inadequate surface abrasion prior to bonding and poor bonding material may have contributed to the problem. Tie-bases will be replaced and installed with a new process and adhesive. The Pegasus fin actuator system failed during thermal cycle. The probable cause was debris on the connector pins. The fin actuator systems will be inspected, retested and recertified. Fortunately, these processes present no schedule impact to the SORCE launch vehicle.

SORCE team members may attend the HESSI launch in mid-December 2001 and the GALEX launch in May 2001 in preparation for the SORCE launch. The next SORCE MIWG is scheduled at LASP in mid January 2002 to coincide with the SORCE IM (Instrument Module) Preship Review. SORCE power, mass and memory budgets remain healthy and confidence increases as more actual measured values replace the calculated values.

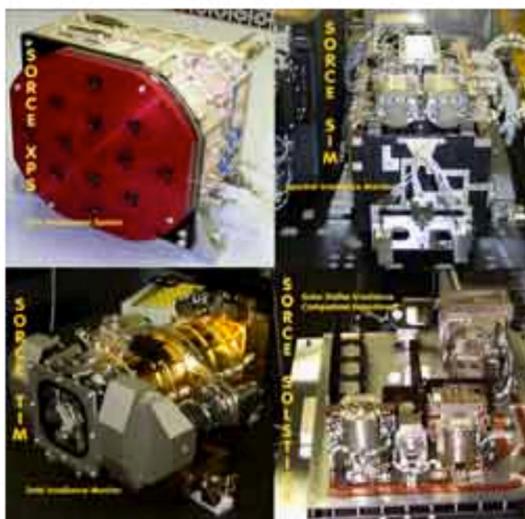
SORCE Instrument Status

XPS Instrument

The XPS instrument is complete and integrated on the SORCE IM (Instrument Module).

TIM Instrument

The TIM instrument build has been nearly complete for some time. Modifications to improve TIM performance are designed, built and incorporated on the instrument as they become evident. A case in point is the new semi-kinematic mounting base plates recently retrofit to the TIM instrument. In addition, TIM door position sensor slots have been lengthened to prevent overshoot when the door opens. The TIM door now senses its position properly. The four TIM door windows now possess superior seals, and the TIM instrument now holds a vacuum quite well. The PCB (Printed Circuit Board) thermistor has been moved to the rear wall of the TIM housing for improved performance.



TIM has logged over 500 hours of lab operation time and also has been integrated and run on the SORCE IM several times. TIM now has all flight electrical parts installed and successfully completed vibration on Nov. 6. Still remaining is the replacement of the vacuum door motor gearboxes with wet-lubed gearboxes.

TIM calibrations are well underway. Irradiance and power are being measured as well as possible. All available TIM cones are being measured for reflection. The calibrated gain as a function of temperature is also calculated. A solar simulator provides approximate solar intensity for measuring relative irradiance. "Absolute power" measurements are in progress by comparison to a trapped



diode. Noise measurement shows 4 ppm noise. Timing of pulses and bridge error signal are checked. Calibration conclusions are made through comparison measurements with NIST traceable standards. Deviations are small and refined through further measurement.

SIM Instrument

To date all SIM sub-assemblies have been thoroughly tested. SIM has some hours of operating time on the SORCE IM. SIM possesses a very clean vacuum environment. Initial FOV maps came out reasonably well, but additional refinement is desired. Prism transmission measurements have begun. SIM solar spectra have been achieved and recorded. SIM solar simulator tests have started, including the test of detectors and CCD with ~1 sun intensity and scattered light tests. Additional prism transmission measurement tests are planned for the SIM ESR (Electrical Substitution Radiometer). BG-20 filters will be incorporated with a light source to give a secondary wavelength standard. Vacuum testing in the Bemco tank will also be performed on the SIM ESR at ambient and 10 C degrees.

SOLSTICE Instrument Status

SOLSTICE A integration, calibration and test are complete with the exception of the SOLSTICE GCI Micro Electrical Interface Testing. SOLSTICE B has now completed SURF (Synchrotron Ultraviolet Radiation Facility) calibration. Still remaining are the Limited Thermal-Vacuum Test, Final Preparation and Instrument Module Installation. and SOLSTICE to GCI-Micro Electrical Interface Testing also remains.

Both SOLSTICE A and B have completed Flight Instrument Assembly and Alignment, LASP Optical Mechanical Functional Testing, LASP Pre-Environmental Test Characterization, Final Assembly and Environmental Test Preparation, Vibration Test and LASP Post Vibration Test Verification. Some additional work is required on the IM flight configuration. A quantitative assessment of the detector head noise immunity and characterization of noise on the high voltage monitor still remains. The SOLSTICE B vacuum chamber and detector heater and optical cube also need more testing

Orbital Spacecraft Bus Status

During the month of October, Orbital completed and successfully tested the FPGA (Field Programmable Gate Array) redesigns on the APE (Attitude Power Electronics) controller and micro controller and delivered flight APE#2 to I&T (Integration and Test). Preliminary cross-strapping and interface testing is underway prior to APE#2 FPGA change and subsequent ATP (Acceptance Test Procedures).

Orbital has received the Orb View-4 EDU's (Engineering Development Units) and the reconfiguration of OV-4's APE is nearly complete. This unit will be functionally identical to the SORCE ED. The CEU EDU from OV-4 was used to debug vibe failure. The battery integration has been completed, and safe to mate tests have been successfully run.

The S/A (Solar Array) simulator installation is complete. Alenia, supplier of the SORCE transceiver has reworked SN#1 and performed the Delta-TVAC (Thermal Vacuum). The EMC (Electromagnetic Compatibility) was completed on SN#2. Both units are in final functional testing and Pre-Ship review is scheduled through November 8 - 9, 2001. Orbital has received four of the twelve SORCE solar panels. The remaining eight panels are being readied for shipment.

Orbital supported the October 1, 2001 TIM (Technical Interchange Meeting) with GSFC and LASP. A signed ECP (Engineering Change Proposal) permitting SORCE "gyro less" flight resulted from the meeting.

FSW (Flight Software) build 4.0 has been completed, and its formal release will occur in early November 2001.

The 4th RWA (Reaction Wheel Assembly), RWE (Reaction Wheel Electronics), 3rd MTB (Magnetic Torquer Bar), FSSE (Fine Sun Sensor Electronics), FSS (Fine Sun Sensor) and trackers have been integrated on the SORCE spacecraft bus. The thermal subsystem integration is also complete. The ACS (Attitude Control System) hardware subsystem testing has begun, RWAs and TAMs (Three Axis Magnetometers) have been tested, and the FSS and trackers are in the test process. A new backplane for the CEU#1 has been built, due to a vibe failure resulting from enlarged connector sockets. The backplane passed 3-axis vibe, and is now in TVAC test.

The BPT (Bus Performance Test) procedure has been written and practiced in dry run sessions. Redlines and modifications have been done and the release of the BPT procedure is expected by the middle of November 2001. Current schedules show the completion of the final BPT prior to December 25, 2001. But the BPT schedule is tight and success-oriented. Further delays could impact bus availability, although bus delivery still supports the SORCE instruments delivery date. The SORCE transceiver delivery is later than anticipated due to failures and rework at Alenia. Further delays could impact the BPT scheduling.

APE cross-strapping test identified a blocking diode would be needed to maintain high impedance of the unpowered APE. Other interface issues resulting from test are still developing.

Upcoming Meetings:

SORCE Scientists and Engineers plan to present papers and attend the following meetings:

- AGU, San Francisco, CA December 2001
- MIWG, Boulder, CO Mid-January 2002
- SORCE Calibration Workshop Gaithersburg, MD January 2002
- NEWRAD at NIST, Gaithersburg, MD delayed to Spring 2002

To submit information please contact:
Kathy.Lozier@lasp.colorado.edu