AMS-02 Weekly Activity Report, July 29, 2005

Upcoming Events:

- Uninterruptible Power Supply (UPS) Critical Design Review (CDR) – August 8, 2005 – Taiwan
- USS-02 Extruded Beams Delivery – August 13, 2005
- AMS-02 Technical Electronics Meeting (TEM) @ CSIST – September 26-30. 2005 – Taiwan
- STA Vacuum Case Delivery (on dock at STADCO) – September 29, 2005 (subject to weld inspection and review)
- AMS-02 General Technical Interchange Meeting (TIM) @ CERN – October 24-28, 2005 – Geneva
- AMS-02 Phase II Safety Review – Date TBD (Schedule under review) – JSC

Upcoming Tests:

- Interface Plate Static Test – Date TBD – Location TBD
- Lower Joint Static Test – Date TBD – Location TBD
- STA Sine Sweep Test – January 2006 – INFN, Terni, Italy
- STA Acoustic Test – April 2006 – ESTEC, Noordwijk, Netherlands
- Full Assembly Modal & Static Tests – May 2006 – IABG, Munich, Germany

General

- ESCG AMS personnel traveled to Geneva, Switzerland to participate in the AMS-02 General Technical Interchange Meeting (TIM) at the European Center for Nuclear Research (CERN), July 25-29. Splinter meetings were conducted with the representatives of each detector and subsystem group to discuss delinquent information needed to complete the Safety Data Package for the Phase II Flight Safety Review.

USS-02 and GSE Manufacturing:

- A sketch of the test article for the Rivet Test was completed and provided to shop personnel for fabrication and assembly. When complete, the test article will be turned over to the Materials and Processes Branch (ES4) for the performance of an engineering evaluation to determine if the rivets procured for the assembly of the Unique Support Structure – 02 (USS-02) are acceptable for use on the flight hardware. After a period of storage the rivets appeared to be covered with a thin layer of surface corrosion. The rivets are being cleaned prior to installation on the test article. The test will verify that the corrosion and cleaning has not degraded the structural integrity of the rivets.

- A new riveting and assembly technician with 20+ years experience in aircraft assembly has been hired and assigned to work on the AMS Project. His first assignment was to prepare the test article for the Rivet Test that was scheduled to begin on July 28. In preparing the test article, a problem with the riveting tool was discovered. The tool would

stop before the rivet was fully seated. The Rivet Test is on hold until the tool can be repaired or replaced.

- Dispositions were prepared for three Discrepancy Reports (DRs) written against the tubes for the Keel and the Lower USS-02 for scratches on the surfaces of the parts. The dispositions called for the scratches to be smoothed out before being sent for metal finishing. Shop personnel completed the repairs and sent the parts to metal finish.

- The USS-02 Build-up Assembly and Fixturing drawing was updated and is in checking. The Procedure for USS-02 Build-up is also being updated and is approximately 90 percent complete.

- Work is continuing on the design modifications to the Primary Support Stand. The modifications will provide the capability to transport the AMS-02 Payload in the mid-level configuration.

- The PSS Sliding Frames are in final machining in the JSC Bldg 10 Shop.

- Programming for the USS-02 Alignment Template was completed. Fabrication is pending machine availability in the Bldg 10 Shop.

Vacuum Case:

- The welding of the Second Article (Conical Flange and Inner Cylinder) was completed at STACDO. Prior to welding, temperature sensors were applied to the backside of the weld area to record temperatures of the inside surface of the Vacuum Case during the welding process. The inside surface was then covered by a layer of super-insulation*, identical to the material that will be used in the flight article. The temperatures recorded during the welding process were higher than expected and damage to the super-insulation was revealed in a post-weld inspection. A potential fix has been identified that will be verified on the Structural Test Article (STA) Vacuum Case (VC) closeout weld that will take place the week of August 8. The fix utilizes ceramic tape to cover the backside of the weld area, providing a thermal barrier between the aluminum surface of the VC and the super-insulation. Space Cryomagnetics Ltd. (SCL) has provided six additional sheets of the super-insulation to support this test.
  * NOTE: The super-insulation is wrapped around the flight magnet. Any damage to the insulation reduces the endurance of the magnet by allowing more heat to enter the cryogenic system.

- Five DRs written against the Flight VC were closed and six more are in various stages of disposition and Material Review Board (MRB) activity. Dispositions for DRs written against the STA VC are also in work.

Testing:

- A meeting was conducted with representatives of IABG in Munich, Germany to further discuss the static and modal testing of the AMS-02 Payload. IABG is a European

aerospace testing company that will perform the full assembly testing of the payload. ESCG AMS personnel made presentations on the layouts and test set-ups for the static and modal tests. A main point of concern raised by IABG was the lack of defined loads for the Static Test. The Modal Test did not present a problem with the exception that the model needs to be updated to reflect missing parts and target modes of interest need to be identified.

Avionics:

- A preliminary test report for the ISS Systems Integration Laboratory (ISIL) AMS-02 Front-end Data Interface Electronics Testing was prepared and submitted for review.

- Work was initiated on the preparation of questions and delivery items required by CSIST for the Uninterruptible Power Supply (UPS) Critical Design Review (CDR), to be conducted in Taiwan on Tuesday, Aug. 9.

Thermal:

- The AMS-02 Attitude Data Base was used to provide candidate worst case ISS attitudes for the Tracker Thermal Control System (TTCS). Twenty extreme attitudes were provided to Carlo Gavazzi Space (CGS), who will run detailed cases and provide interface data to NLR (National Aerospace Laboratory – The Netherlands). Additional evaluations are underway to determine extreme cases for TTCS startup, potential TTCS box radiator surfaces, and potential mounting locations for the TTCS manifolds.