COS
Monthly Status Review

Agenda

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Financial Splinter  GSFC/Ball/CU

Cosmic Origins Spectrograph
Hubble Space Telescope

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February 26, 2003
Progress Summary Since Last MSR

- Completed FUV-02 TV test.
- Completed Cal/FF sub-system testing.
- Continued working COS TV test procedure.
- Continued supporting I&T at Ball.
FUV Detector Overview

• FUV-01 was delivered to Ball on Wednesday, July 31st.

• FUV-01 has operated flawlessly since its integration into the instrument and has accumulated > 72 hours of instrument level run-time (>50% of that time was with HV on).

• FUV-02 has completed its qualification program:
  – Unit is available for delivery to Ball at their request.

• FUV-02 swap planned before start of COS environmentals.
# FUV Detector Verification Testing Summary

<table>
<thead>
<tr>
<th>Unit</th>
<th>Functional Testing</th>
<th>Performance Testing</th>
<th>EMI/EMC</th>
<th>Sine Burst</th>
<th>Random Vibe</th>
<th>Thermal-Vac</th>
<th>Contamination Certification</th>
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</thead>
<tbody>
<tr>
<td>FUV-01 DVA</td>
<td>C</td>
<td>C</td>
<td>@SS</td>
<td>A - C</td>
<td>A - C</td>
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<td>FUV-01 DEB</td>
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<td>@SS</td>
<td>Q - C</td>
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<td>@SS</td>
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<tr>
<td>FUV-01 SS</td>
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<td>@Comp</td>
<td>A - C</td>
<td>@Comp</td>
<td>8-cycles</td>
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<tr>
<td>FUV-02 DVA</td>
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<td>C</td>
<td>N/R</td>
<td>Q - C</td>
<td>Q - C</td>
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<td>@SS</td>
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<tr>
<td>FUV-02 DEB</td>
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<td>C</td>
<td>N/R</td>
<td>A - C</td>
<td>A - C</td>
<td>@SS</td>
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<tr>
<td>FUV-02 SS</td>
<td>C</td>
<td>C</td>
<td>N/R</td>
<td>@Comp</td>
<td>@Comp</td>
<td>8-cycles</td>
<td>P</td>
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<tr>
<td>DVA Surrogate (1)</td>
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<td>N/R</td>
<td>N/R</td>
<td>C</td>
<td>C</td>
<td>N/R</td>
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<tr>
<td>DVA Surrogate (2)</td>
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<td>C</td>
<td>C</td>
<td>C</td>
<td>N/R</td>
</tr>
</tbody>
</table>

- **C** Complete
- **@Comp** At Component
- **@SS** At Subsystem
- **A** Acceptance Levels
- **Q** Qualification Levels
- **N/R** Not Required
- **P** Planned
- **(1)** Old Door Mechanism
- **(2)** New Door Mechanism

- ETU DVA w/shaped o-ring qual vibed at NASA Ames
- DVA-02 saw qual-level vibe at Ball
- FUV-02 completing 6 cycle T/V at CU
- DEB-01 saw 1-axis workmanship vibe at Ball
- FUV-02 DEB & harness contamination certification planned at Ball
COS FUV Detector Systems

- Detector DEB
- Detector Head
Flight FUV01 Detector System

Completed thermal vacuum at CU, delivered to Ball 7/31.

Post delivery functional tests nominal.

Cleanliness certification at Ball completed successfully.

Harnesses were routed and connected in flight configuration.

Alignment tests done.

Will be swapped for FUV02 at earliest opportunity.
FUV02, Flight Backup Detector
FUV02, Flight Backup Detector Status/Actions

- QDE calibration and full functional test done
- Deep flat field test done
- Packed and shipped to CU 1/3/03
- Vibration test and post vibration functional done
- Thermal vacuum test at CU successfully completed
- Under purge in cal tank awaiting delivery to Ball
- Next - delivery to Ball and cleanliness certification
- Installation preparations & changeout with FUV01
- Alignment verification
FUV02, Flight Backup Detector, thermal vac

Thermal vac test completed successfully. Hot & cold soaks (+50 °C to -25 °C) done, 8 cycles +40 °C to 0 °C done. Door openings / closings with motor and actuator firings all done successfully, at ambient, hot and cold. Detector operation at ambient, hot and cold with data collection allowed nominal commandable settings of electronics stretch and shift to be established and tested. TQCM readings at 40°C were low (6.3 Hz/hr).
Detector Ongoing Actions

- Reviewing all test data from FUV01 and FUV02
- Reviewing and closing out all documentation items
- Looking at small power draw differences between FUV02 and FUV01, will test - but seems to be an EGSE artifact.
- Scrutinizing thermal vacuum data for temperature dependencies and trendings. (eg stimulation pin data, background rates, flat field images, etc).
- Updated Ball thermal model with measured component power consumption data (minor changes).
- Support of detector changeout and I&T flow.
Software/Ops Update

- Brownsberger and Béland continue their presence at Ball supporting the SW/OPS efforts – both are qualified COS instrument operators.

- CEDAR has been stable for some months, is supporting instrument I&T, and is ready to support upcoming I&T activities.
## COS Schedule Milestones for CU/UCB

<table>
<thead>
<tr>
<th>Task</th>
<th>Status</th>
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</thead>
<tbody>
<tr>
<td>Cal/FF SS Retest</td>
<td>Complete</td>
</tr>
<tr>
<td>Deliver FUV-02 to Ball</td>
<td>Ready</td>
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<tr>
<td>Complete COS TV Procedure</td>
<td>3/03</td>
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<tr>
<td>Support Sys. Functional at Ball</td>
<td>On-going</td>
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<tr>
<td>Support GSFC Activities</td>
<td>4/03 – 5/03</td>
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<tr>
<td>Science Cal Prep</td>
<td>2 – 5/03</td>
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</table>
Upcoming Events/Activities

- Continue support of system functional test.
- Support FUV detector swap.
- Support GSFC I&T activities.
- Prepare for and support COS PER.
- Calibrate RASCAL PMTs at CU.
Issues

• None