Monthly Status Review

LAT Testbed Status

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Overview

• The Testbed is a complete “flight-like” Trigger and Dataflow system with simulated front-end inputs.

• Purpose of the Testbed
  – Validate the Level 3 Filter
  – Validate Flight Software
  – Validate Trigger and Dataflow System
  – Eventually, passed to ISOC
  – Can be used to test on orbit scenarios

• The testbed is the only place where all parts of the T&DF system are assembled in a test environment
  – The last line of defense for catching system-level problems
The LAT Testbed (+z)

- 16 TKR FES
- 16 CAL FES
- 8 ACD FES
- 1 Control FES
- 16 Tower Loads

11 FES Control PCs
## Hardware Status

<table>
<thead>
<tr>
<th>Component</th>
<th>Need</th>
<th>Have</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEM</td>
<td>16 Updated</td>
<td>6 Updated</td>
<td>4 Updated, awaiting testing</td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 un-updated</td>
<td>6 Awaiting update</td>
</tr>
<tr>
<td>SIU</td>
<td>2</td>
<td>1</td>
<td>Cold Spares to remain unpopulated (due to limited BAE Boards)</td>
</tr>
<tr>
<td>EPU</td>
<td>3</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>GASU</td>
<td>1</td>
<td>1</td>
<td>To be upgraded</td>
</tr>
<tr>
<td>PDU</td>
<td>1</td>
<td>1</td>
<td>To be upgraded</td>
</tr>
<tr>
<td>FES</td>
<td>41 FES Boards</td>
<td>All</td>
<td>Functionality Verified</td>
</tr>
<tr>
<td>Tower Loads</td>
<td>16</td>
<td>All</td>
<td>Functionality Verified</td>
</tr>
<tr>
<td>T&amp;DF Harness</td>
<td>121 cables, 20 varieties</td>
<td>All</td>
<td>Complete and verified</td>
</tr>
<tr>
<td>FES Harness</td>
<td>192 FES-TEM</td>
<td>All FES-TEM</td>
<td>21 FES-TEM cables queued, pending arrival of connectors</td>
</tr>
<tr>
<td></td>
<td>24 FES-AEM</td>
<td>3 FES-TEM</td>
<td></td>
</tr>
</tbody>
</table>
Schedule

- TEM upgrade to be completed in conjunction with PDU and GASU upgrades
- A sample of ACD-FES have been checked for length and connectivity, assembly of remainder is queued
- As hardware is upgraded
  - Critical to re-verify connectivity and data-path
    - FES → TEM → GASU → EPU/SIU/LATTE
    - Example: Use FES to tickle every trigger line in all 16 TEM every time a TEM is replaced.
  - More extensive regression test suite is desirable
    - Get this for free as a product of developing FES with the goal of testing the Level 3 Filter
Front-End Simulators

• New collaborators from *The* Ohio State University
• Developing a architecture for generating and processing simulated input
  – Creating FES input
    • Diagnostic Samples (trace-back)
    • GLEAM MC Samples
  – Organizing and moving the large files
  – Controlling the timing of the FES signals to T&DF
• This will allow comprehensive testing of the trigger system, data integrity and flow, as well as regression tests to verify low level connectivity
• Weekly (nominally) meeting to coordinate effort
Summary

• The LAT Testbed is the only place to verify the T&DF system in a test environment
• Testbed hardware to be fully upgraded in next few weeks
• The system is complete and has already proved itself useful as the only multi-tower teststand.
  – Example: A bug was discovered in the FPGA code that accounted for the relative rotation of the TEMs in odd numbered bays.

• Our priorities:
  – Test a vertical slice of the data path in the next week to continue the bootstrap process of debugging the FES and T&DF system
  – Continue to develop the tools to comprehensively test T&DF