



Status of TOB Module Testing and Repair Facilities at UC Riverside

Tracker Module Test meeting

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Gail Hanson, Geng-yuan Jeng, Gabriella Pásztor

University of California, Riverside



Outline



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- **Status**
 - **Personnel**
 - **Space**
 - **Equipment**
 - ARC and Long Term Testing
 - Further Investigation
 - **Current Situation**
 - **Future Plan**



Personnel



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- **Faculty**
 - Gail Hanson
- **Post Docs**
 - Gabriella Pásztor
 - Asish Satpathy (New)
- **Graduate Students**
 - Geng-yuan Jeng
 - Hongliang Liu
- **A technician to be hired**



The Clean Room



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- About 100 m²
- A/C was replaced in late January
- Passed certification with an ISO 7 Classification (class 10000)
- Temperature ~20 °C
- Humidity Control
RH% < 50%





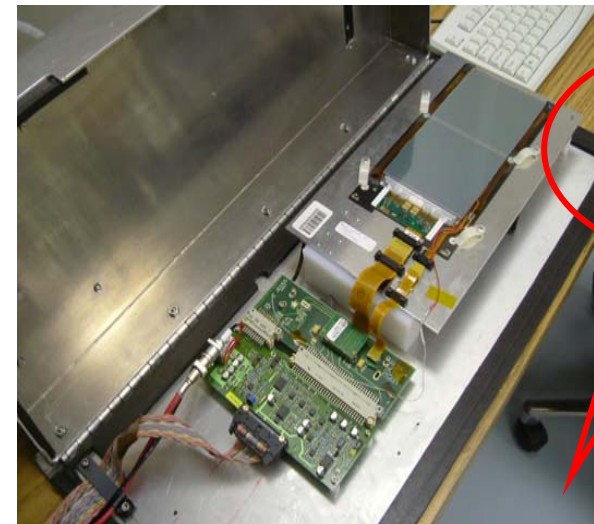
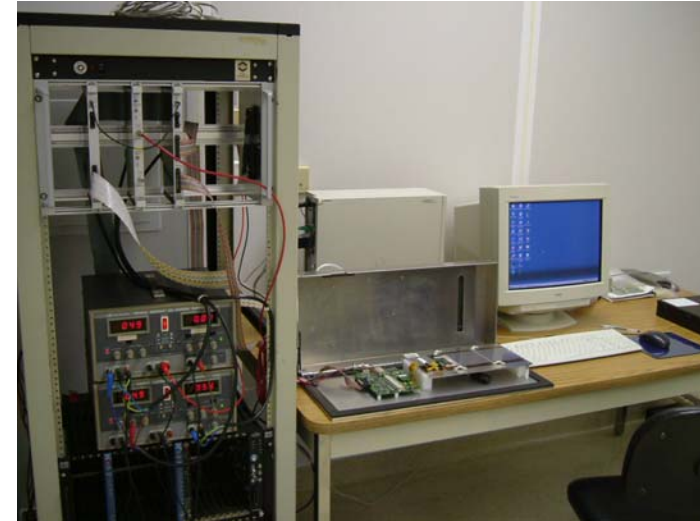
Equipment



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•Module Testing

- ARC Teststand Operational
 - Hardware setup
 - Tests on bad modules using ARCS 7.2 bugfix
 - 30200020007520 (FNAL)
→ With Bad Via
 - 30200020005063 (UCSB)
→ With all kinds of faulty channels added deliberately
 - Able to reproduce expected problems
 - Need more samples for further study



Static
Dissipation
pad



Equipment



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- **LT Teststand**
 - CAEN HV supply arrived in Dec 2004
 - New Chiller
 - Most of the components for DAQ are in hand
 - FEC $\times 1$
 - FEC to CCUM $\times 2$
 - CCU25 $\times 1$
 - VUTRI $\times 5$
 - PAACB $\times 6$
 - hybrid-to-utri (ver d) $\times 7$
 - eMUX Crate $\times 1$, Board $\times 3$
 - Why not ready?
 - Waiting for TSC, FED, TPO





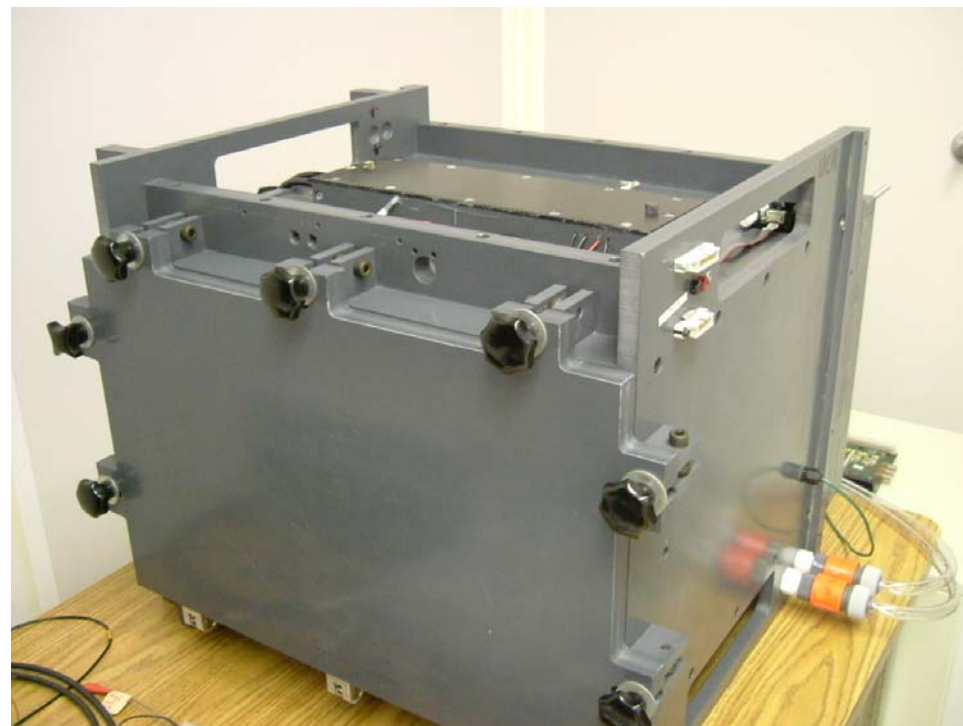
Equipment



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Neslab
Chiller



Vienna Cold Box



Equipment



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• Further Investigation

• Microscope

- Visually inspect bonding problems, scratches, surface contamination and corrosion
- Mechanical problems

• Probe Station

ALESSI REL-4500

- Check electrical connectivity
- Digital oscilloscope and logic analyzer





Equipment



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- **LFHIT**
 - Easy to check electrical connectivity of front-end hybrid
- **Manual K&S wire bonder**





Current Situation



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- **With existing equipment we can**
 - readout module/hybrid with ARCS to reproduce reported problems
 - visually inspect module/hybrid under microscope
 - use microprobes to check various clock/data lines using digital oscilloscope and logic analyzer
 - To be studied on module 30200020005063
- **We are not to repair modules, but to investigate problematic modules to provide feedback on potential failure modes**



Future Plan



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- **Set up LT Teststand as soon as missing parts become available**
- **Prepare storage space with supplied dry air**
- **Start to receive faulty TOB modules with error reports and reproduce the problems**
- **Collect statistics on failure modes and provide feedback**
- **Collaborate with TEC and TIB Repair Centers**



Which modules



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- **All faulty TOB Modules should be sent to Riverside**
 - **grade C modules (>2% bad channels)**
 - These could be recertified if they had channel flagged incorrectly
 - **Modules with CMN problem**
 - The high noise channels could be removed from readout
 - **Modules with problematic APV's**
 - Groups of 128 channels fail
 - **Modules with “weird” readout problems**
 - Compressed frames → broken hybrid tails
 - I2C errors when the module is cold