
US Barrel Module Status Report

October 9, 2001

Overview

- US groups to deliver 670 modules.
- Work is split between LBL and UC Santa Cruz
- LBL
 - Hybrid assembly, test and burn-in
 - Module assembly, test and burn-in
- UCSC
 - Hybrid rework, test and burn-in
 - Module rework, test and burn-in
- Current schedule
 - February 2002 -June 2002(10%)(about 3 /week)
 - July 2002 -> October 2003(remainder)(2-3 per week)

Status(1)

- **Detector IV Measurements**
 - Probe station in place and functioning
 - Interfaced to LabView control and preliminary interface to database established.
- **Wafer Placement/Alignment System**
 - System up and running
 - Manchester/RAL code is operational
 - Placement has been verified
- **Fixtures/Jigs**
 - Year 2002 series fixtures same as at RAL in use for wafer pickup and gluing. Await new versions once baseboard/washer issues resolved. Close communication(weekly) with RAL.
 - 5 additional sets of these fixtures will be ordered to enable 3 module/day fabrication

Status(2)

- Fixtures continued
 - Remaining production fixtures/jigs are under design and fabrication(or already made in a few cases) at LBL.
 - See <http://www-atlas.lbl.gov/~goozen/sctfixt.html>
 - Models, detailed fabrication drawings, etc will be at this site
 - New hybrid folding fixture.
 - A multi-purpose plate for hybrid assembly/test
 - Glue application using masks
 - ASIC placement using custom pickup tool
 - Wire bonding interface
 - Hybrid test
 - Interface to hybrid burn-in plate, equipment
 - Rework(ASIC removal) custom tool
 - Module pickup tool that interfaces with other fixtures and jigs.

Status(3)

- Glue dispensing
 - Finisar dispensing robot in use
 - New uniform glue pattern programmed and tested
- Metrology
 - SmartScope from Optical Gauging Products(similar to RAL)
 - Metrology plate as at RAL
 - Measurements done on dummy modules
 - Imaging of old style washers is difficult
 - Shifts observed in long(X) direction, which are probably due to inconsistency in hole/cone concentricity of old-style washer
 - Design completed for measurement pin to fit in new washer or baseboard hole, assuming nominal 1.8mm diameter. Precision glass targets(custom lithography) glued to ground pins to provide easy to use targets.
 - Automation of process for production starting.

Status(4)

- Wire bonding
 - K&S 1470 bonder in regular use. Second bonder(shared with other projects) will arrive soon.
 - Pull-strength studies on K4 hybrids and other samples done. Acceptable bonding parameters have been found.
 - Auto-bonding on full hybrid appears acceptable
 - Some rework done.
- Components
 - Four K4 received. Two assembled and used(see talk by A. Ciocio)
 - One K4 mechanical sample received. Used for bonding studies.
 - Reject K3 and K4 without bridges received. Some attached to aluminum bridges for tests of fixturing and glue application.
 - 40 Atlas98 dummy detectors made(by firm) and ready for dummy module construction.
 - Dummy baseboards in use with old style washers
 - 2 TPG baseboards with old washers in hand
 - 8 detectors in hand

Status(5)

- Storage
 - Inert storage(cabinets) for detectors, later modules in construction
 - Will try UK hybrid storage boxes
 - Module boxes, would like to make joint order with others. When is design settled? This will shortly be problem.
- Electrical Testing
 - Operational. Need to exercise database. Standard reports?
 - Burn-in procedures absent.
- Personnel
 - Initial personnel in place and additions needed in full production are available at LBL, will be available at UCSC.

Status(6)

- Additional component needs to complete five qualification modules according to current plan ie. using some old baseboards, hybrids, detectors, etc
 - Detectors 10
 - Hybrids 3
 - ASICs about 40
 - TPG 3
 - Could also use a few more dummy hybrids with real C-C bridges
- We would like to build all 5 with final baseboards and tooling..
- Planning, PRR process
 - Have list of procedures both internal(special to US site) and global(eg. electrical test spec) to be documented before PRR process and started.
 - Qualification modules to be built and tested
 - Goal remains completion of this process by February 2002.

Issues

- Many new fixtures to “debug”, likely to limit qualification with final production tooling and our startup schedule.
- Hope for finalization/decision on washer etc design this week. This affects also completion of much of our internal tooling.
- If washer mounting required at LBL, will add delay(more fixtures) and some cost(more people).
- Etching problems with fanouts seen and reported.
- Reliability of chips on hybrid, non-conformity with wafer probe data seen but statistics very limited.
- In our experience, improving glue pattern(no fillet) on ASIC desirable to make chip removal easier.