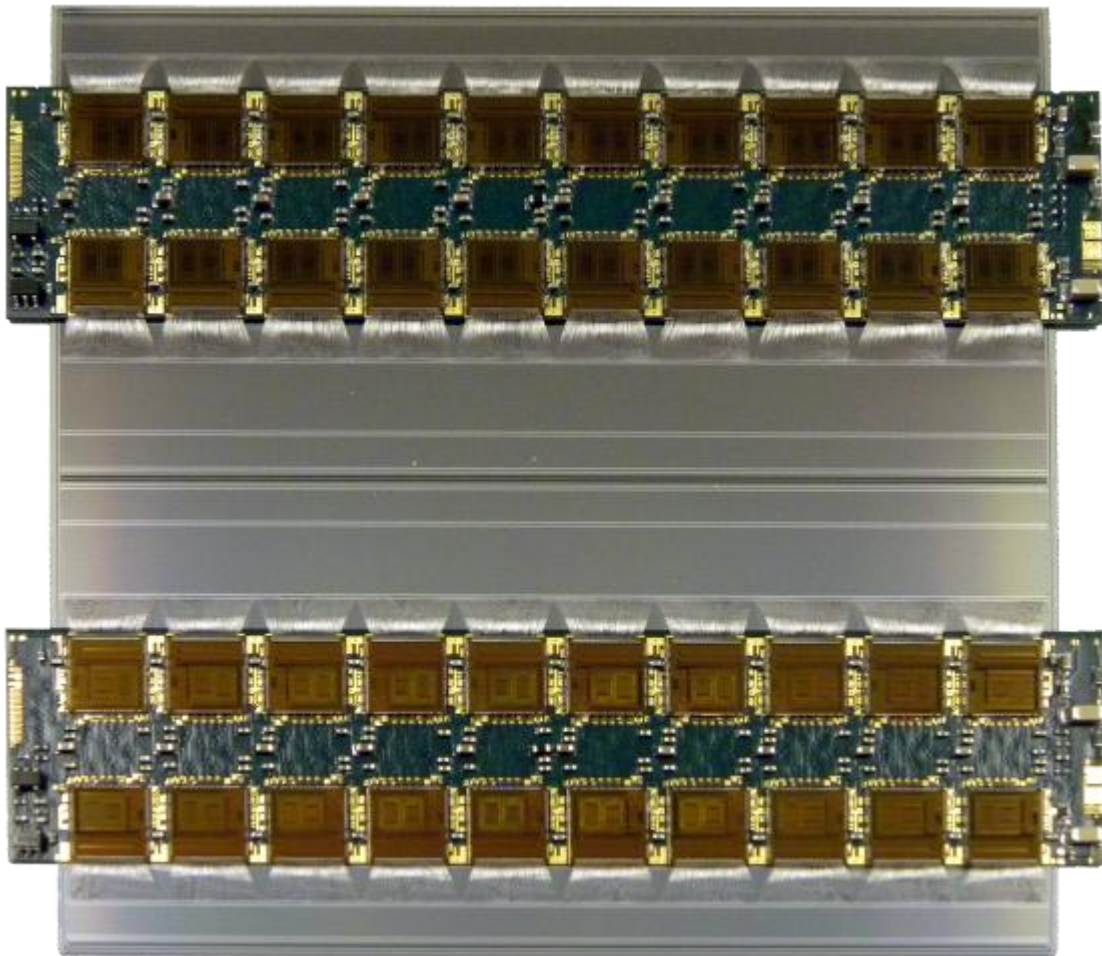




Bonding the SLHC Module

Using the H&K BJ820



Mike Wormald, 15th February 2012

Bonding a SLHC module

Definitions:

Back-End bonding:

Back-End bonding is all the bonds around the ASICs down to the hybrid circuit, and ASIC to ASIC bonds.

Front-End bonding:

Front -End bonding is all the bonds from the front end of the ASICs (channel amplifier section) to the silicon strips.

Hybrid: This is the kapton circuit board containing two rows of ASICs (see image 0.1)

Module: This is two hybrids glued to a silicon sensor (see image 0.2)

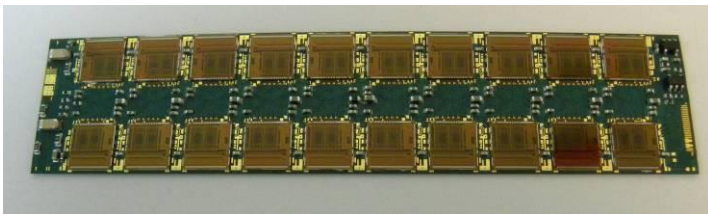


Image 0.1

HYBRID

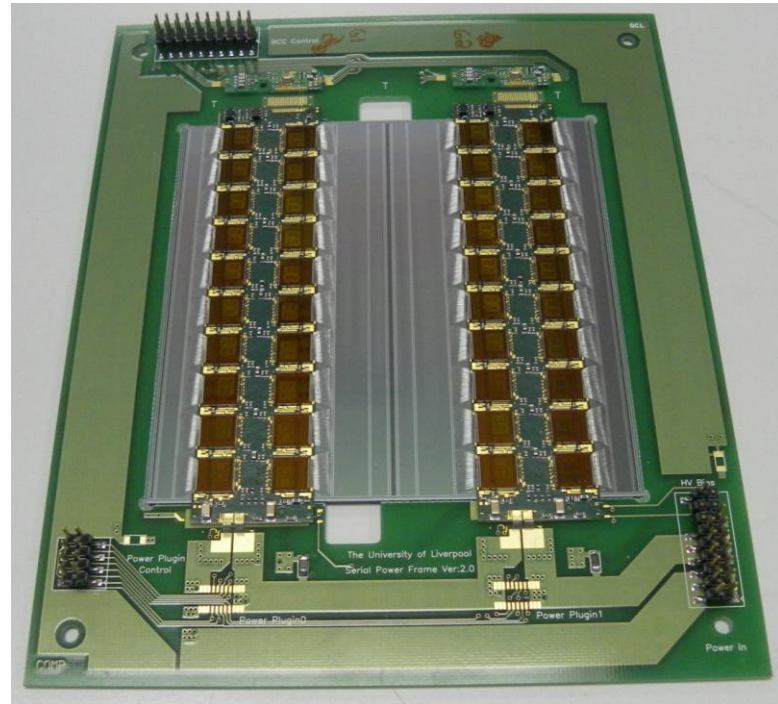
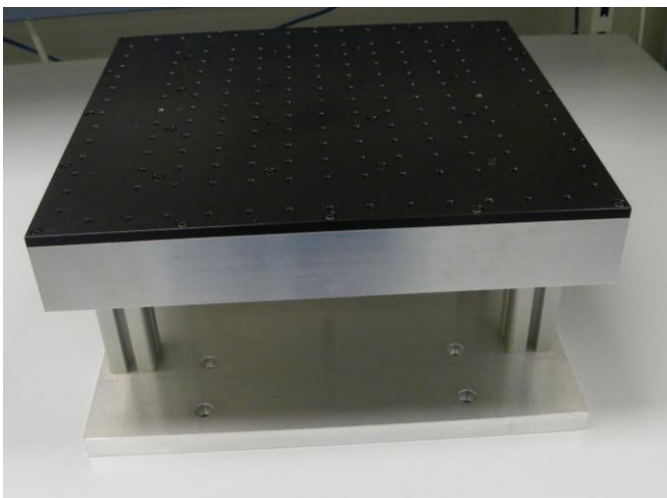


Image 0.2

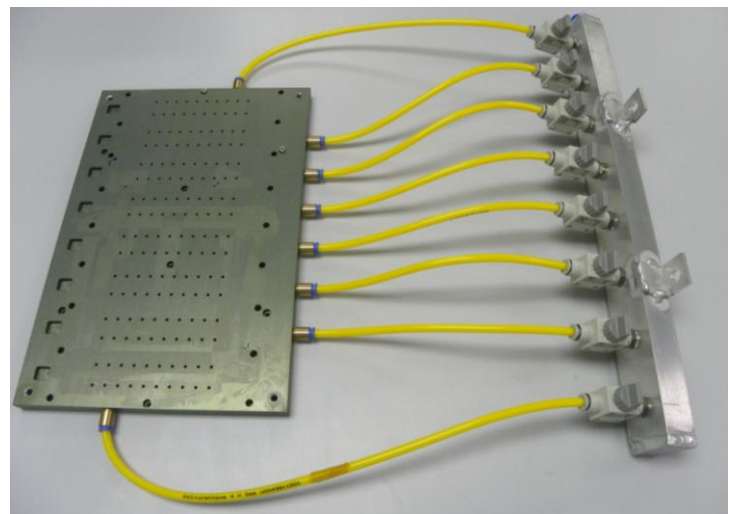
MODULE

Back-End bonding:

Mount the bonding jig to the base plate via the two locating 3mm bolts

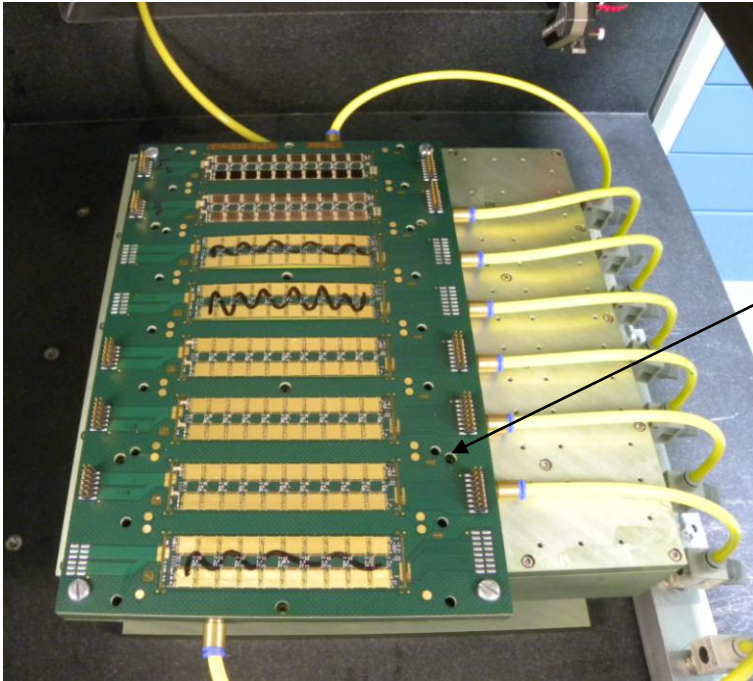


820 Base plate



Bonding Jig with Vacuum lines.

Mount the hybrid panel onto the jig and screw each corner down (4 screws). There should be an inline vacuum gauge to monitor leaks. Turn the vacuum on the hybrid to be bonded.



Hybrid mounted for bonding

Mount the hybrid with the “T” to the right hand side

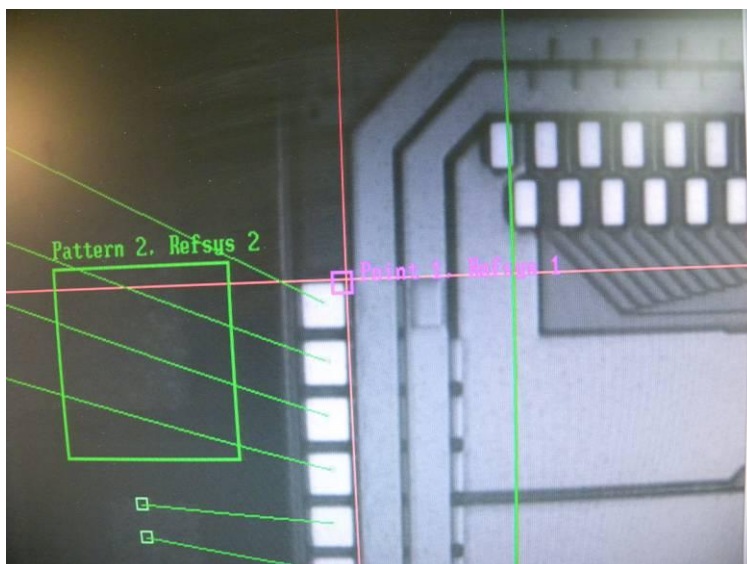
There are 44 reference systems to each hybrid. All Asics have odd numbering system from 1 to 39 inclusive and the Hybrids surrounding each Asic have even numbering systems from 2 to 40 inclusive. Reference numbers 41 to 44 are for the hybrid to support board at each end. Below are the Eye point.

Load bonding program **New_Hybrid_pluspower.bpx** (Has 44 reference systems)

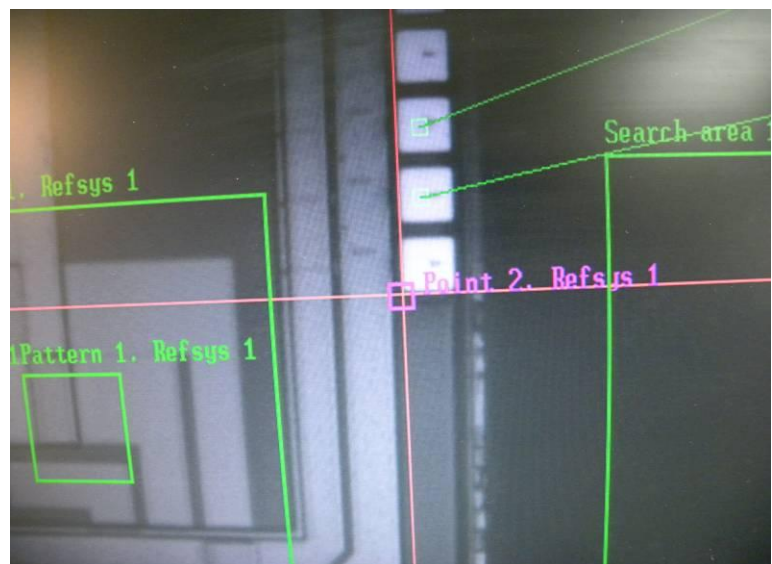
Load bonding program **New_Hybrid.bpx** (Has 40 reference systems)

This program has all the bonding parameters required for the process, to allow pull strengths around 10g. It contains 40 reference systems and 1668 wires.

Reference systems 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, and 39 have the same reference points as shown below:

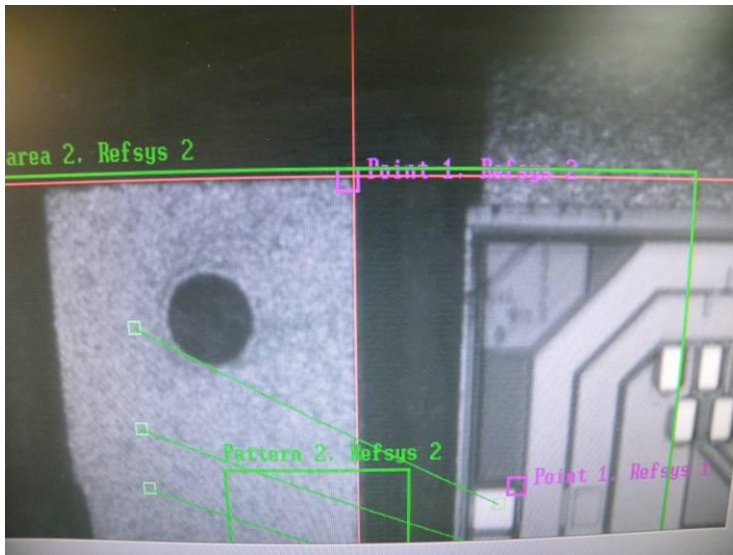


Ref system 1 point 1



Ref system 1 point 2

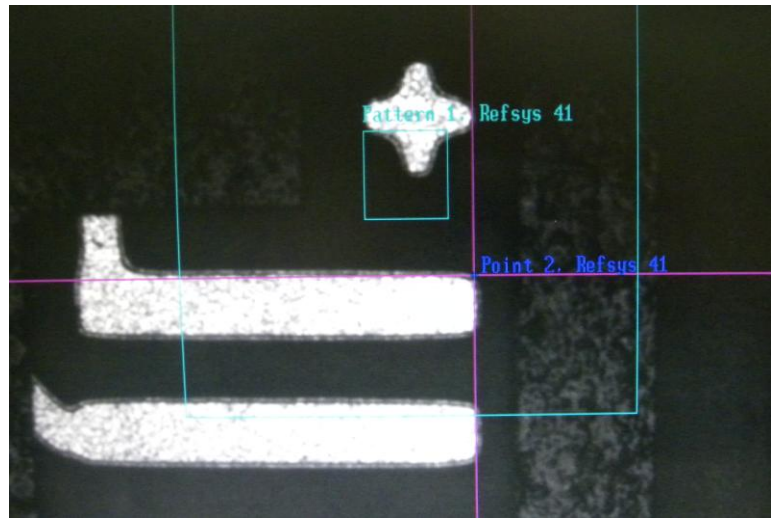
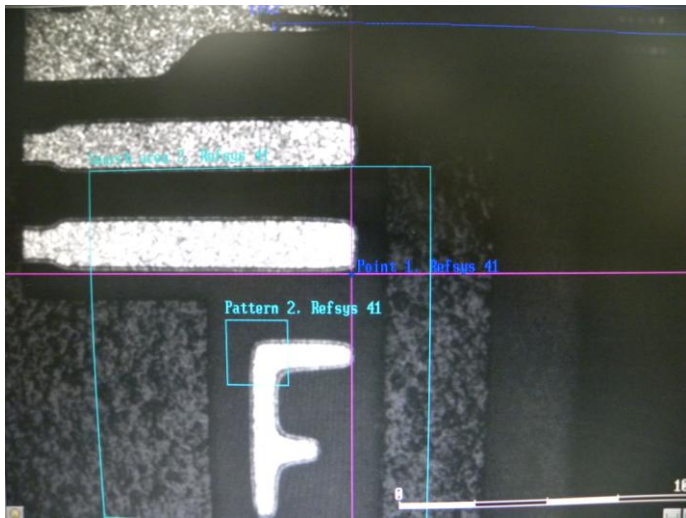
Reference systems 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, and 40 have the same reference points as shown below:



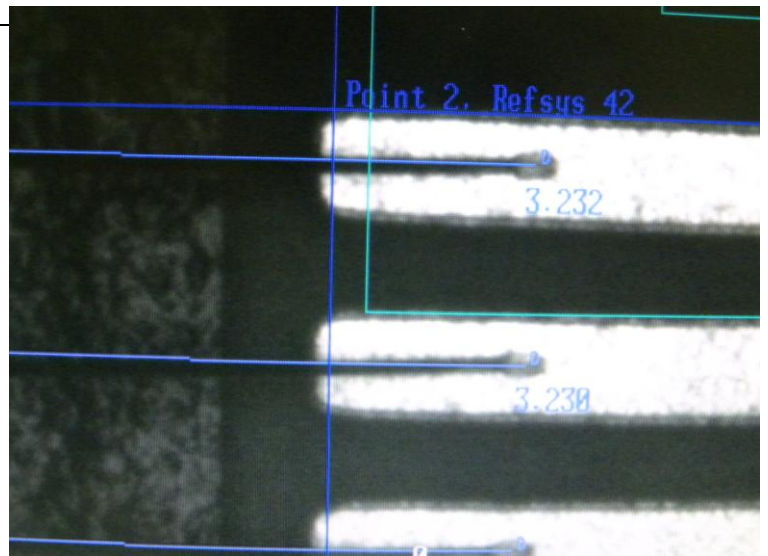
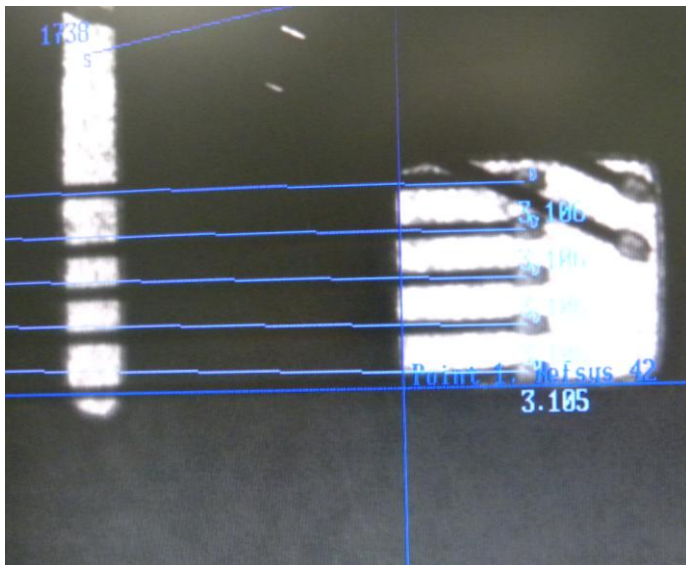
Ref system 2 point 1



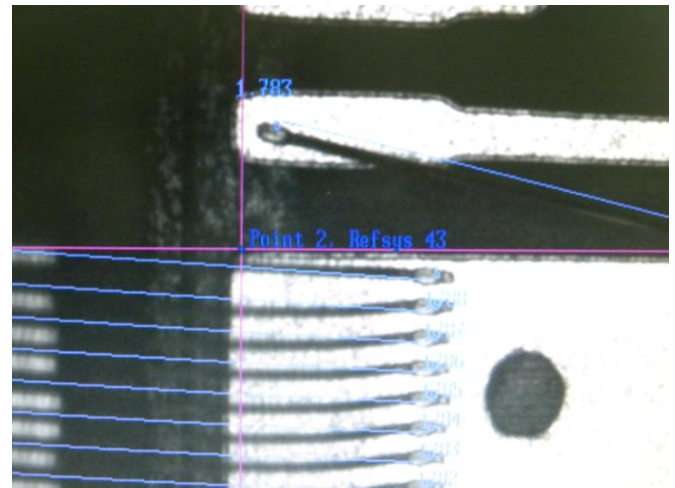
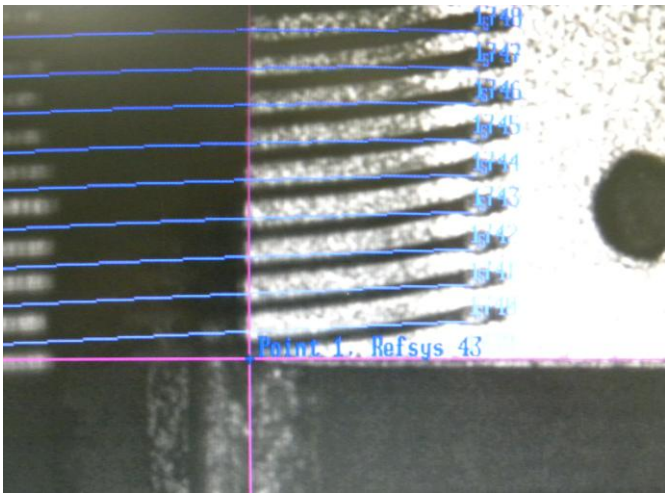
Ref system 2 point 2



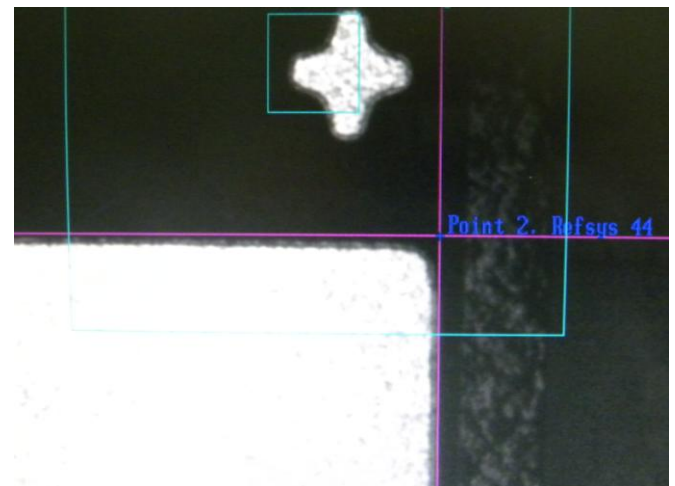
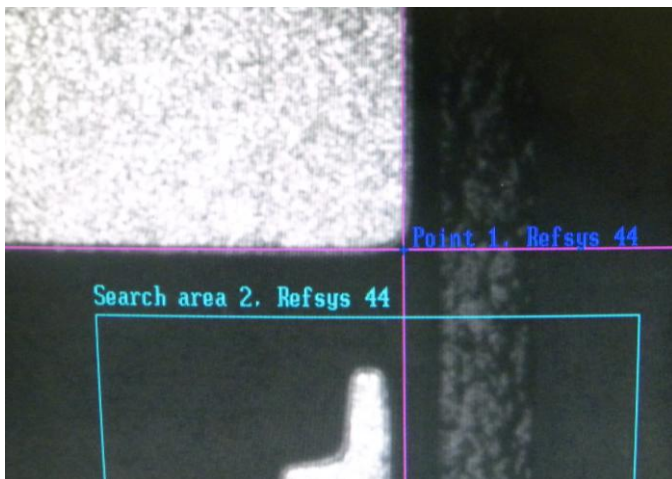
Eye Points for reference system 41 points one and two.



Eye Points for reference system 42 points one and two.



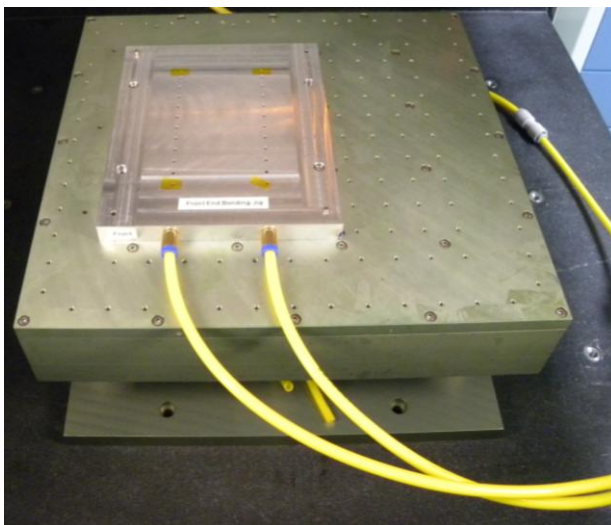
Eye Points for reference system 43 points one and two.



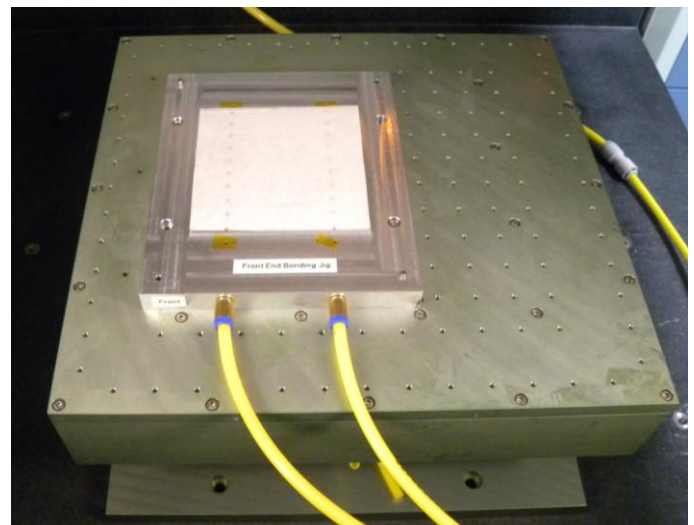
Eye Points for reference system 44 points one and two.

Front-End bonding:

Mount the bonding jig to the base plate and secure using 3mm bolts

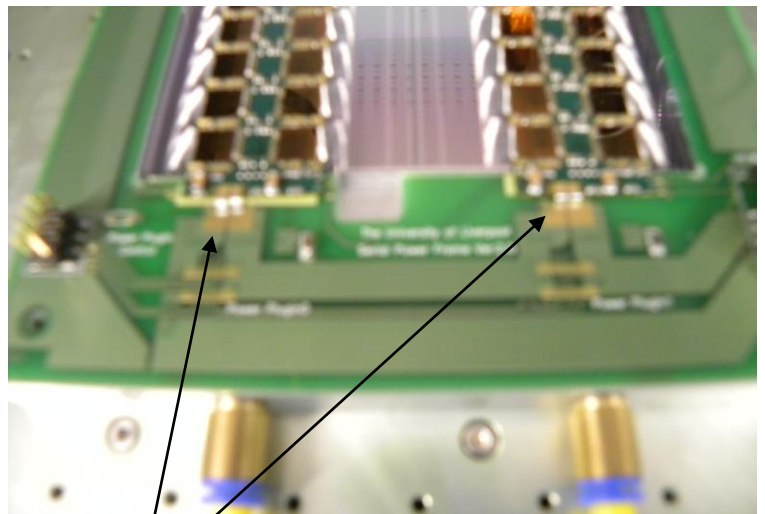
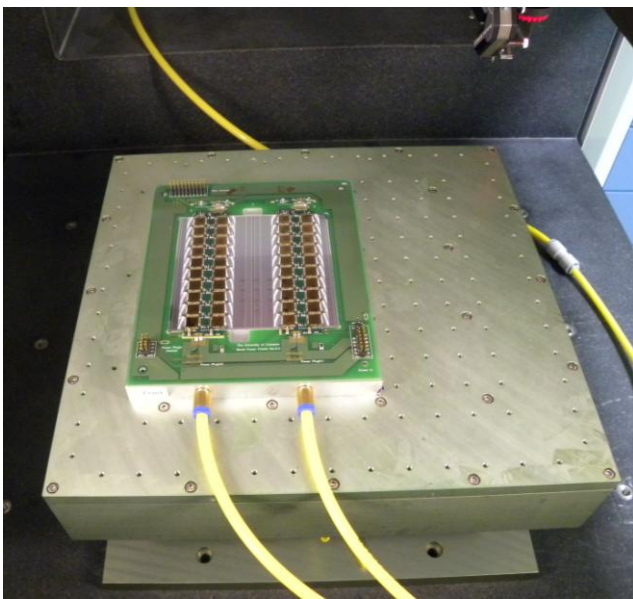


Bonding Jig mounted on base plate.



Clean room paper placed on jig (diffuse vacuum).

Mount the Module on the bonding jig with a lining of paper to allow the vacuum to be diffused across the whole Module. Switch on the vacuum.



Power rails should be facing front (towards operator)

Please Note:- It is important that the module is mounted with the BCC's at the back end of the module and the two power pads at the front. (The programs will bond either way).

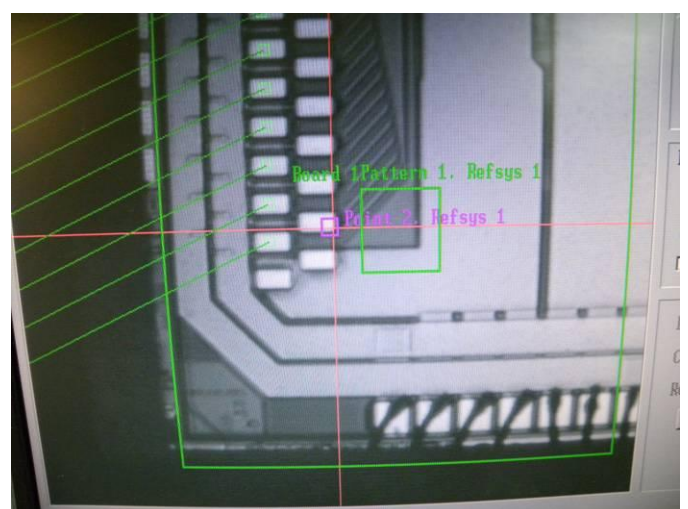
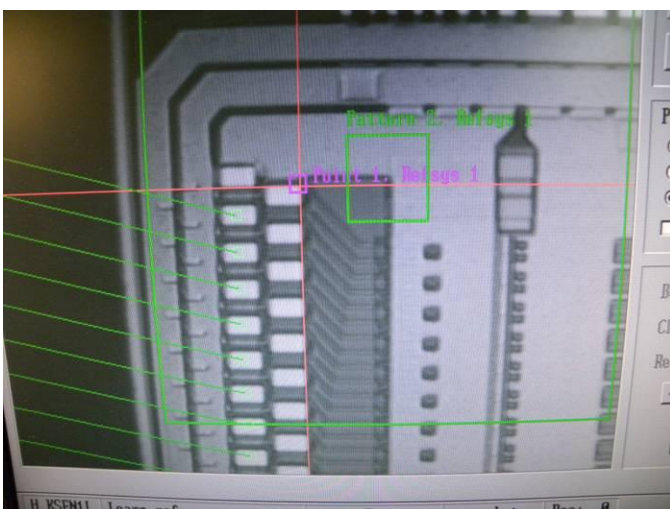
Front end bonding consists of 2 programs and should be loaded and run in the following order:-

SLHC MODULE LOW.BPX	low loops
SLHC_MODULE_HIGH.BPX	High loops

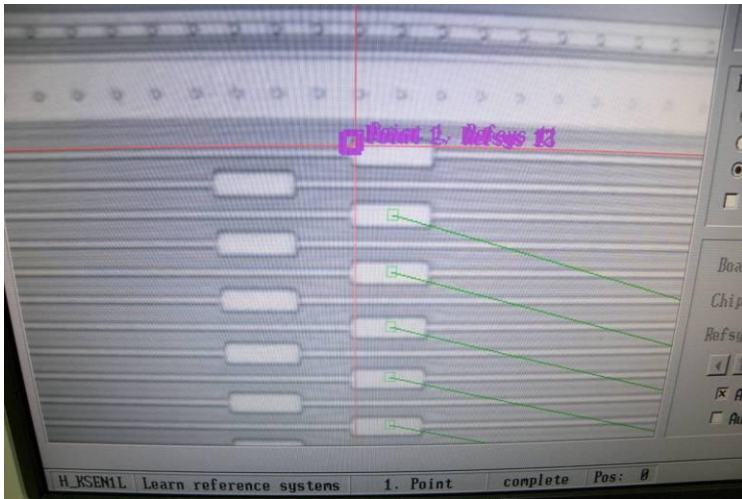
Load bonding program **SLHC MODULE LOW.BPX**

This program has all the bonding parameters required for the process to allow pull strengths around 10g. It contains 13 reference systems and 640 wires.

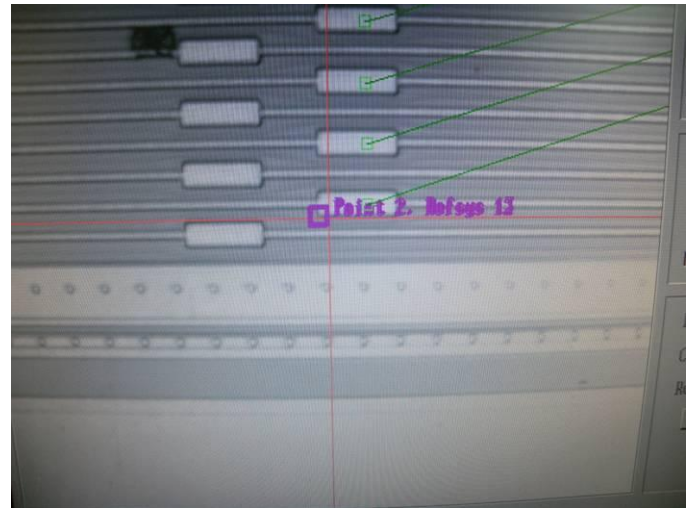
Reference systems 1, 2, 3, 4, 5, 6, 7, 8, 9, and 10 have the same reference points as shown below:



Reference systems 11, 12, and 13 have the same reference points as shown below:



Ref system 2 point 1



Ref system 2 point 2

PLEASE NOTE THAT ON THE FRONT END BONDING THE PADS HAVE A SPACING OF ONLY 30UM FROM LOW LOOPS TO HIGH LOOPS (See image 0.3)

EXPANDED VIEW

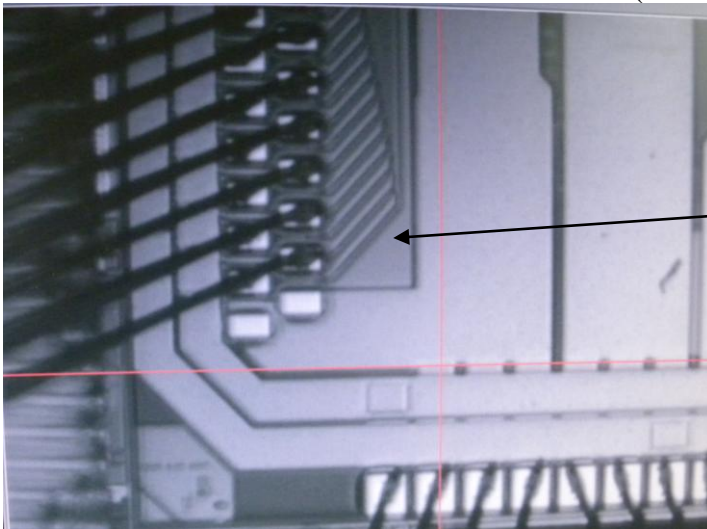
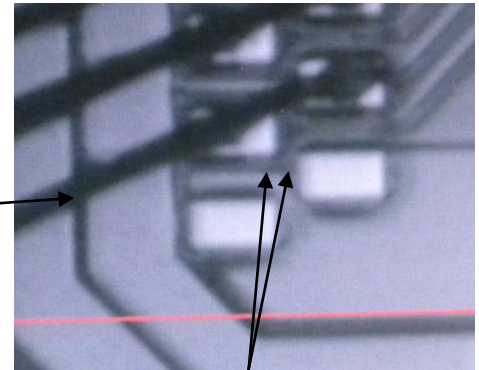


Image 0.3



30um gap

THIS MEANS THE LOW BONDS ARE BIASED TO THE FRONT OF THE PAD AND THE HIGH BONDS ARE BIASED TOWARDS THE BACK. (See image 0.3)

On completion of program **SLHC MODULE LOW.BPX** visually inspect the bonds and carry out any repair work now (should it be required). Log the wires that have been re-bonded. This will be placed in the Liverpool database and will be used to cross reference any future problems.

Load bonding program **SLHC_MODULE_HIGH.BPX**

This program has all the same eye points as the low wire program (slhc module low.bpx)

Again on completion visual inspect and carry out any repair work and record in data base