

OB module assembly: manual vs automated

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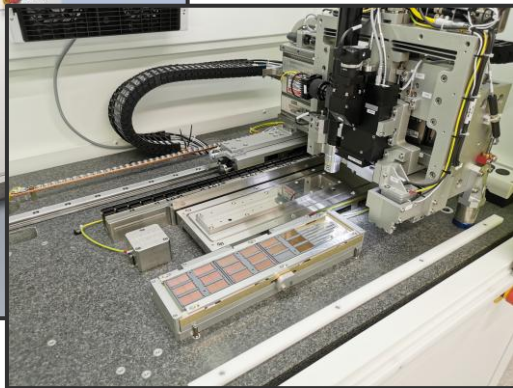


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Are we using the right approach to assemble modules?

automated

ALICE ITS2 – 10m² (ALPIDE 100um and 50um)



DL (ALICE, R3B)+ RAL (LHCb)

- Currently re-used for R3B-TRT: 0.2m² (ALPIDE 50um)
- Plan to be reused for LHCb Upgrade II tracker: ???m² (ChipName?? 50um??)
- Plan to use a similar approach for ALICE 3: 100 m² (TBC 100um or 50um)

Mu3e – 0.4 m² (MuPix 50um) Oxford



Figure 7.21: Robotic gantry (upper figure) for placement of 17 or 18 MuPIX chips on the vacuum jig (lower figure).

Are we using the right approach to assemble modules?

manual

STAR PXL detector – 0.16 m² (Ultimate2 50um)



(a)



(b)



(c)

Fig. 19. Ladder assembly. (a) Precision vacuum chuck fixture. (b) Sensors are positioned with butted edges on the fixtures. (c) The structure composed by cable and carbon fiber stiffener is aligned with the sensors through a series of pins and holes on the fixture.

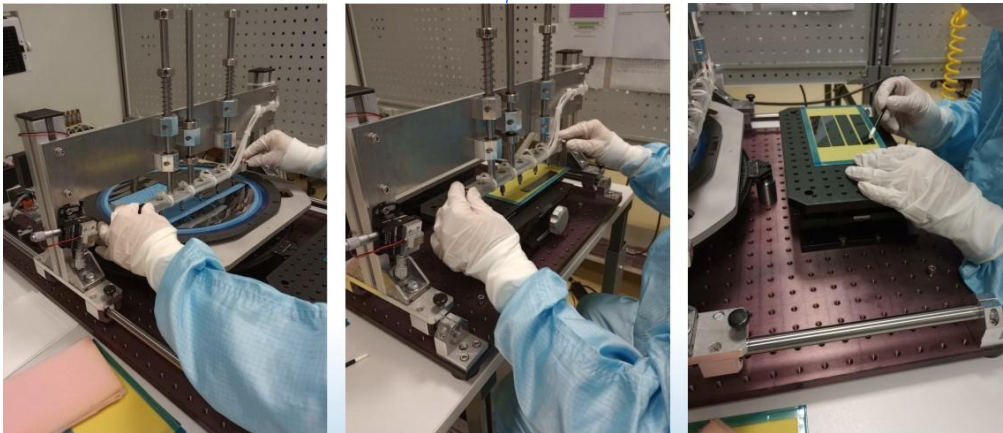
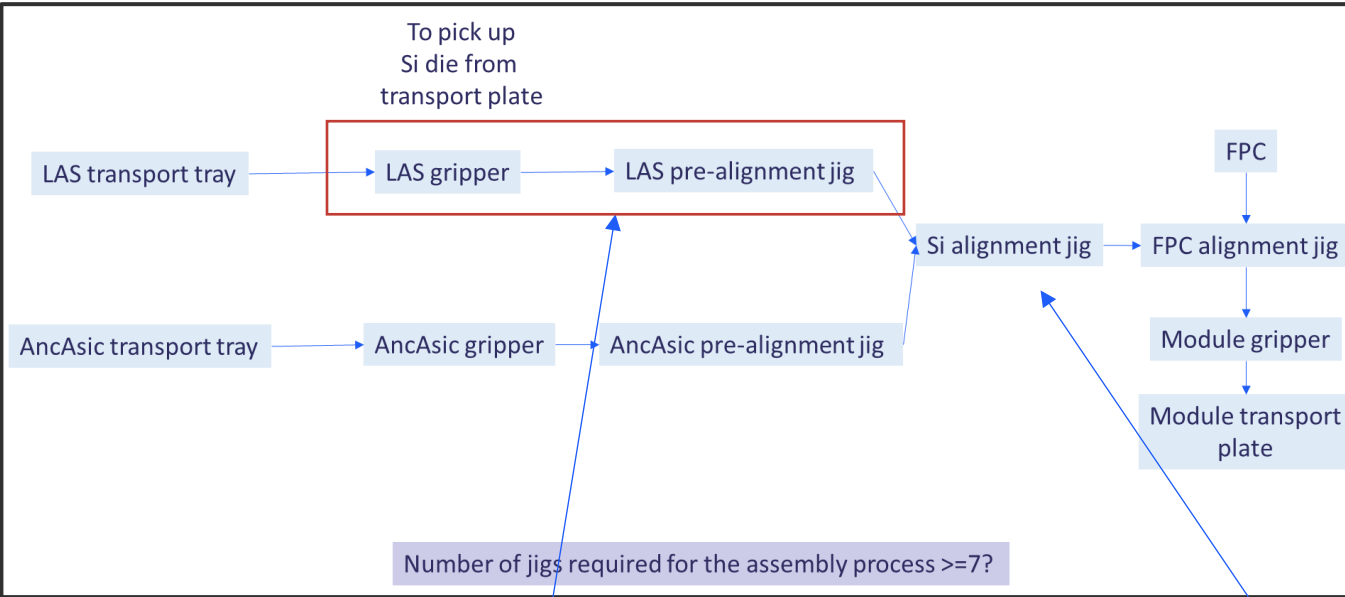
Butted edge is not suitable for LAS because of serial powering (\neq gnd)

Are we using the right approach to assemble modules?

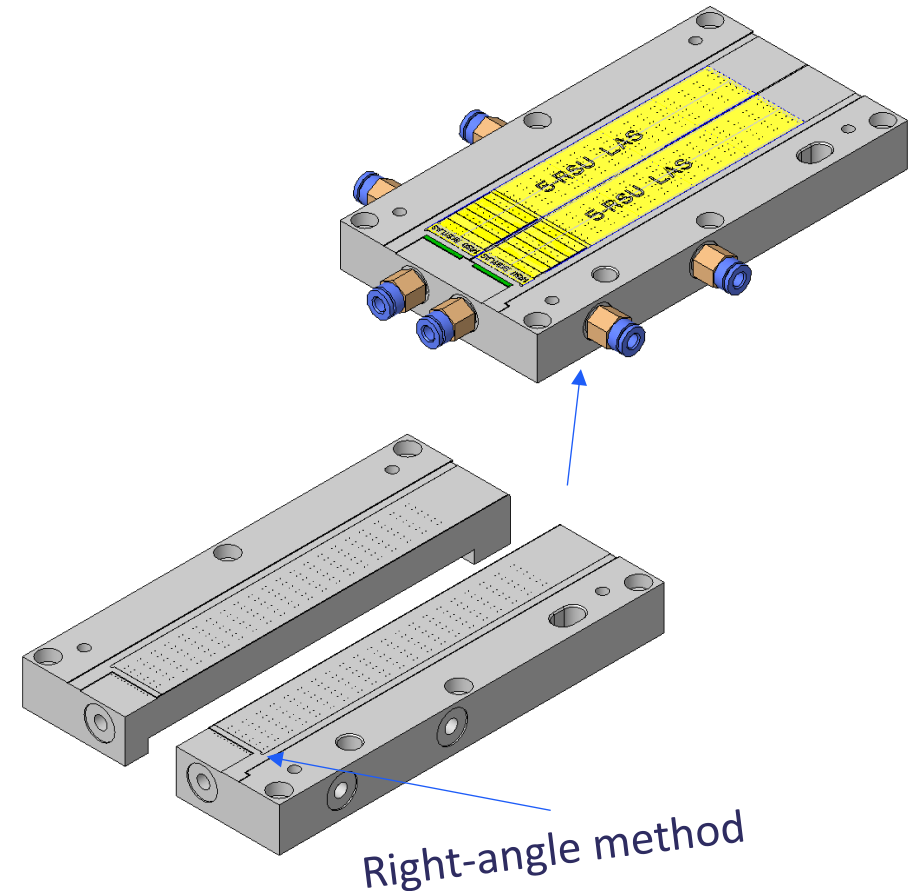
manual

EPIC-SVT 8 m² (LAS 50um)

Manual: lower cost? simpler to implement?
Automated: higher cost? Higher reliability/yield?



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Back-up

Dummy silicon wafer quotes from Nanosystems JP



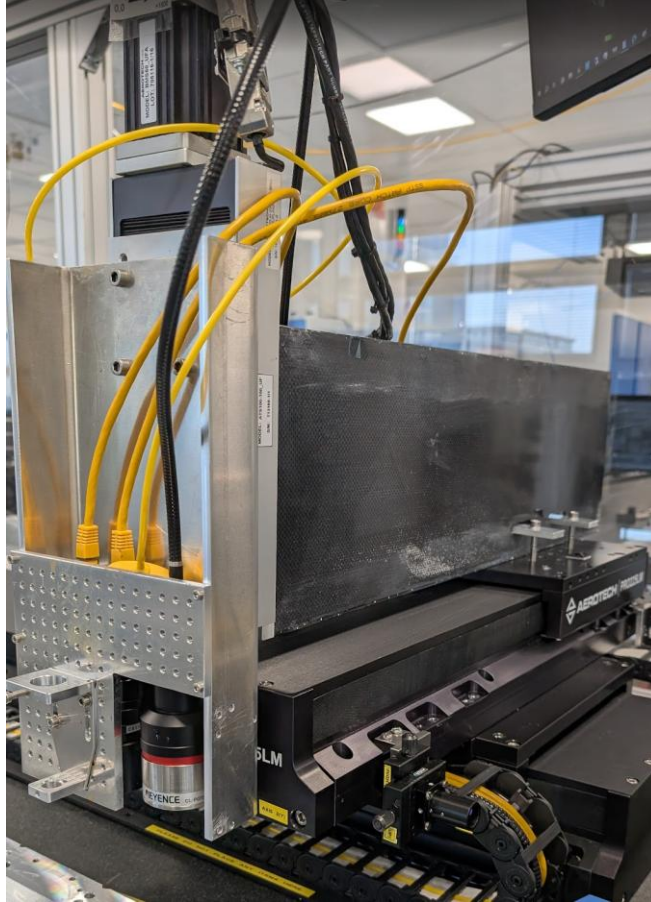
- Open questions

- Should we proceed with babyLAS production? How many chips?
- Any suggestions on the number of dummy LAS? Only 5RSU LAS?
- When the order is expected to be placed and what's the target shipment date?
 - Final bonding pads to be designed based on the examples shared with suppliers
 - Provide the Gel-Pak trays for LAS packaging and shipment?
 - Comments from the supplier
 - We may need a delivery time of 1 to 1.5 months. If you would like to place an order, please let us know at least 1 to 2 months in advance

- **Option 1:** 50 5RSU LAS + 500 AncASIC = 19900 + 11900 = 31800 USD
 - 20 5RSU LAS: 12900 USD
 - 50 5RSU LAS: 19900 USD
 - 20 5RSU LAS + 20 6RSU LAS: 19900 USD
 - 50 5RSU LAS + 50 6RSU LAS: 27900 USD
 - 500 – 800 AncASIC: 11900 USD
- **Option 2:** 41400 USD → 41400 – 31800 = 9600 USD for additional 50 babyLAS
 - ~50 5RSU LAS + ~50 1RSU babyLAS
 - 500 – 600 AncASIC
- **Option 3:** 46390 USD
 - ~50 6RSU LAS + ~50 5RSU LAS + ~30 1RSU babyLAS (possibly a few more)
 - 500 – 600 AncASIC

- RAL gantries:
 - Aerotech Ltd.
 - Cost:
 - Small gantry ~35k GBP; large gantry 50k GBP; both procured ~7 years ago.

Aerotech Pro225LM (large gantry)



Aerotech Pro165LM (small gantry)

