

System Test

*Partition of opto-packages, dog-legs,
harnesses & opto-plugins*

Jan Troska

CLRC

Rutherford Appleton Laboratory

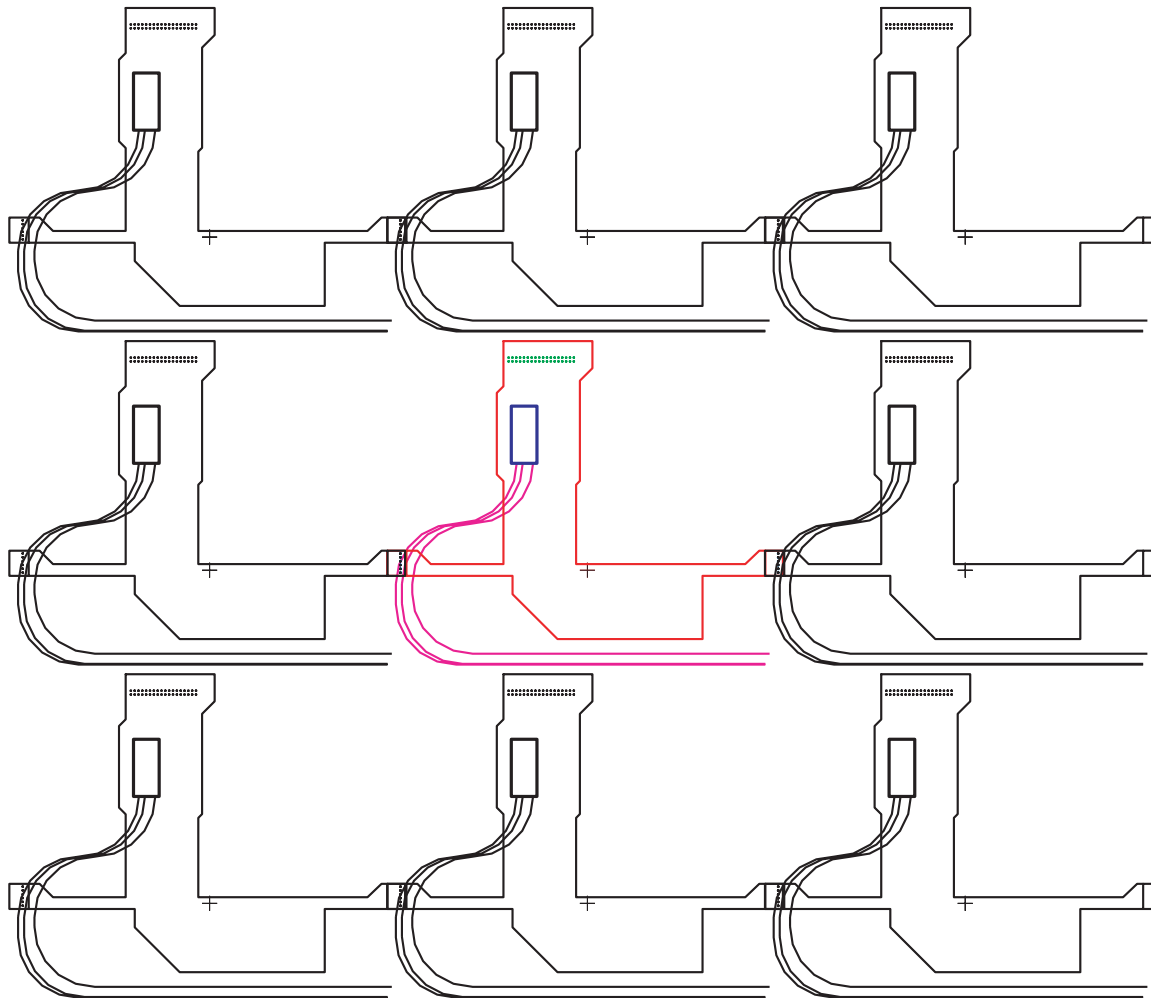




System test requirements

- **Aggressive time-scales for *both* Barrel *and* Forward System Test**
(c.f. Jo Pater's talk at systest meeting)
- **Have some (6/7) Doglegs with old-style (LED+PIN) GEC packages**
- **Have no (as yet) Forward opto-plugins**
- **MMT deliveries:**
 - 10 before end of Year (early Jan at very latest)**
 - final ~50 by Feb/March**
 - could be a staged delivery*
 - could be faster due to us adding lids*
- **How to match the requirements?**
 - Number for mounting on Barrel doglegs?**
 - Number for mounting on Forward opto-plugins?**
 - Number for Pixel groups?**
 - Number for general links development?**
- **Possibility of Taiwanese opto-packages becoming available**
 - First attempts promising (c.f. other talks)**
 - Time-scales, Quantity?**

Barrel Testing Idea 1



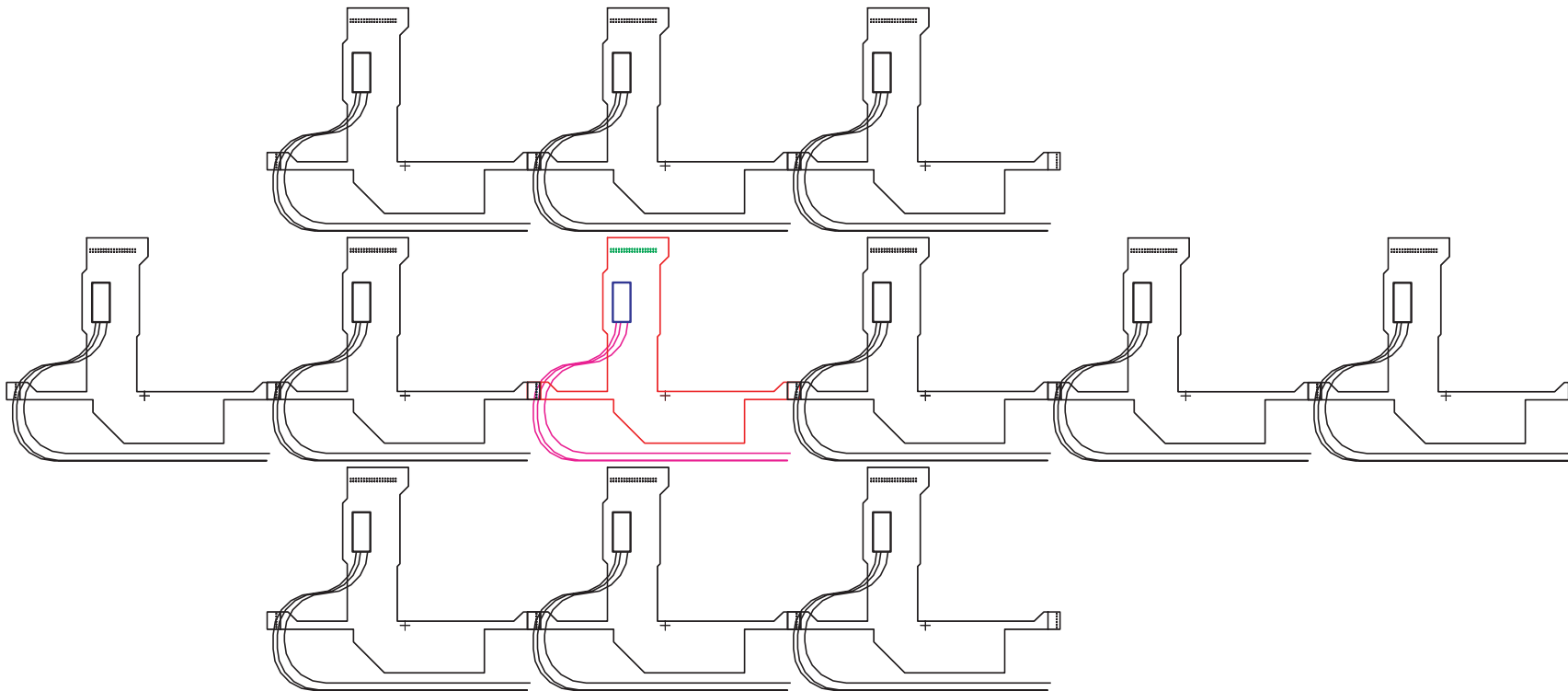
- **Requires 9 dog-legs**
Individual
No redundancy connection (?)
2xVCSEL & 1xPIN packages
- **Improvements**
Over-sleaving of fibres to opto-package
or
4way ribbon to MT4 connector - (1 unused fibre & fan-out needed)
Cover for ASICs and Opto-package
New flex-rigid dog-leg design
Change in Module connector?

Testing Idea 2

- Requires 1 harness and 6 dog-legs
- Services 12 modules
- Harness interface as for final SCT

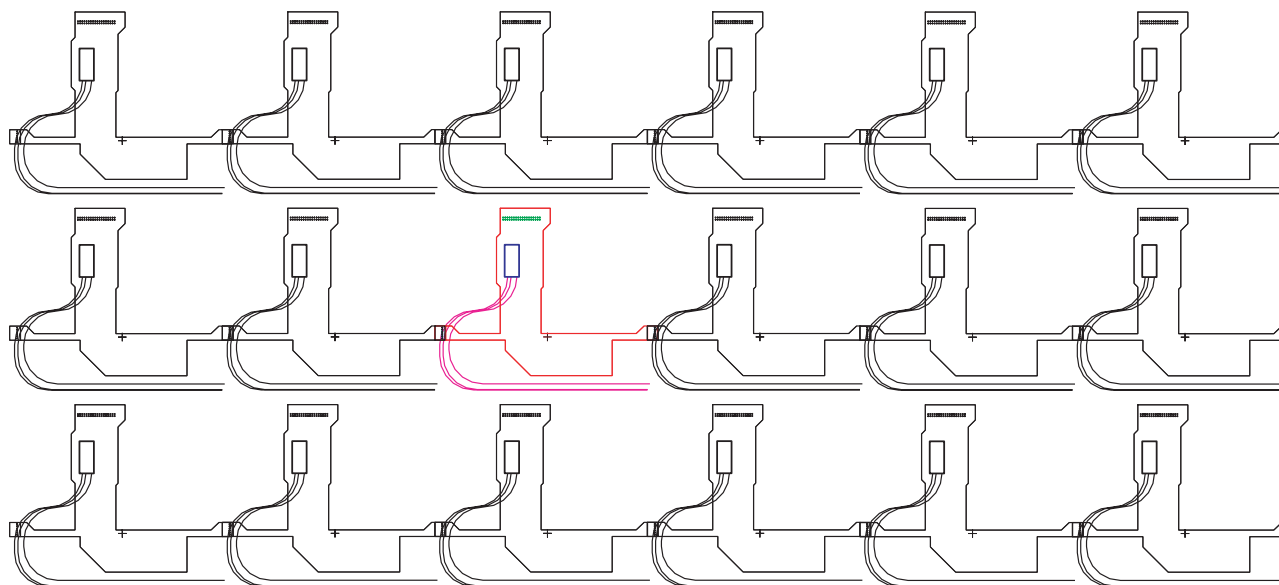
1xMT12 Data & 1xMT8 Clock (2 unused fibres)

- Re-use the now 3 spare dog-legs & opto-packages for next phase



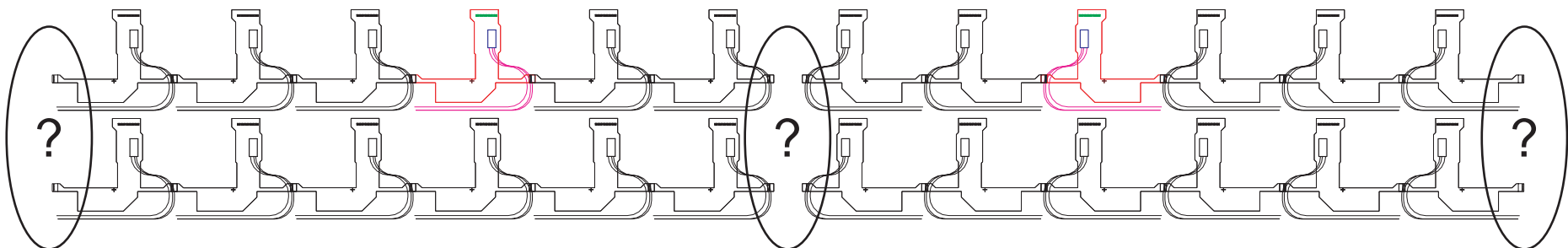
Testing Idea 3

- Requires 2 harnesses and 6 dog-legs
- 6 dog-legs used together to simulate a harness
- Services 18 modules
- Harness interface as for final SCT
 - 1xMT12 Data & 1xMT8 Clock (2 unused fibres)
- Can then add another harness if opto-packages are available i.e. service 24 modules



Testing Idea 4

- Requires 3 harnesses and 6 dog-legs
- 6 dog-legs used together to simulate a harness
- Services 24 modules
- Harness interface as for final SCT
 - 1xMT12 Data & 1xMT8 Clock (2 unused fibres)
- Which arrangement of modules is most desirable for the System Test?
 - Definition of “Worst Case”?





Proposal - 2 phase delivery for Barrel

- **Phase 1**

- Build 6 Dog-legs individually using:**

- Tooling and technique for putting fibres into lids*

- 4-way ribbon terminated with MT4 connectors and supply (3xMT4 to MT12) & (MT12 to 12xST) fan-outs for system test lab*

- Use fibre over-sleaving on exposed fibre end going into opto-package*

- Aim for a box-type lid over opto-package and ASICs*

- Flex-rigid design for dog-leg*

- **Phase 2**

- Build 2 harnesses using techniques developed for phase 1:**

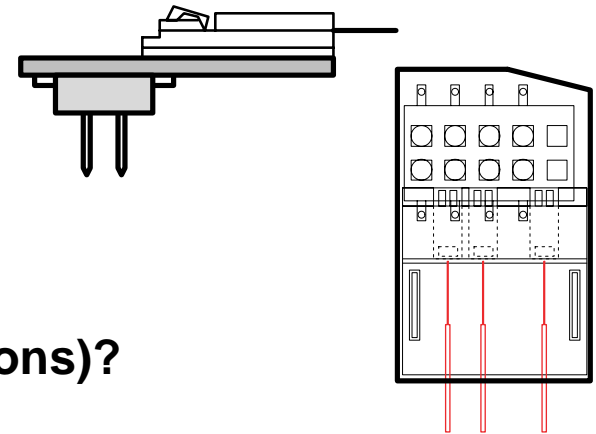
- Update module electrical connector if required*

- Improve on production and testing methods*

- Reserve the possibility of re-using some opto-packages for a third prototype harness so that 24 modules can be read-out at the system test**

Forward Opto-plugins

- What does the forward equivalent of a dog-leg look like?
 - Single opto-plugin with 3 fibres attached
 - Keep plugins separate from each other!
- How does it route on the forward disk sector?
- How does one install it?
- How robust should it be for the system test (& final versions)?
- How many are required?
 - Forward system test sector will hold 9-11 modules
 - NIKHEF have developed an interim solution



IDEAS

- Extend opto-plugin board to provide an anchor for strain relief of fibres
- Add a lid to protect opto-package & bonds
- Use oversleaving on bare fibres
- Use 4-way ribbon & MT4 for each opto-plugin



Partition of Devices

- **Next Phase of MMT Delivery (10 Devices) - Late Dec / early Jan**
 - 4 Barrel – 4 Forward
 - 6 Barrel – 2 Forward
 - Pixels?
- **Final Set of Devices - Feb/March**
 - As set-out originally**
 - 20 Barrel, 20 Forward, 10 Pixel, 10 Optolinks*