# Plans for 6-channel DAQ Feb. 09

- BPM processing:

  – Use existing LO based processors, with one on each of the 3 BPMs

- DAQ:

  – Use 3 of the FONT4 digital boards

  – Use boards 2,3 & 4 with working RS232 chips

  – Each independently logs Σ and Δ from one processor

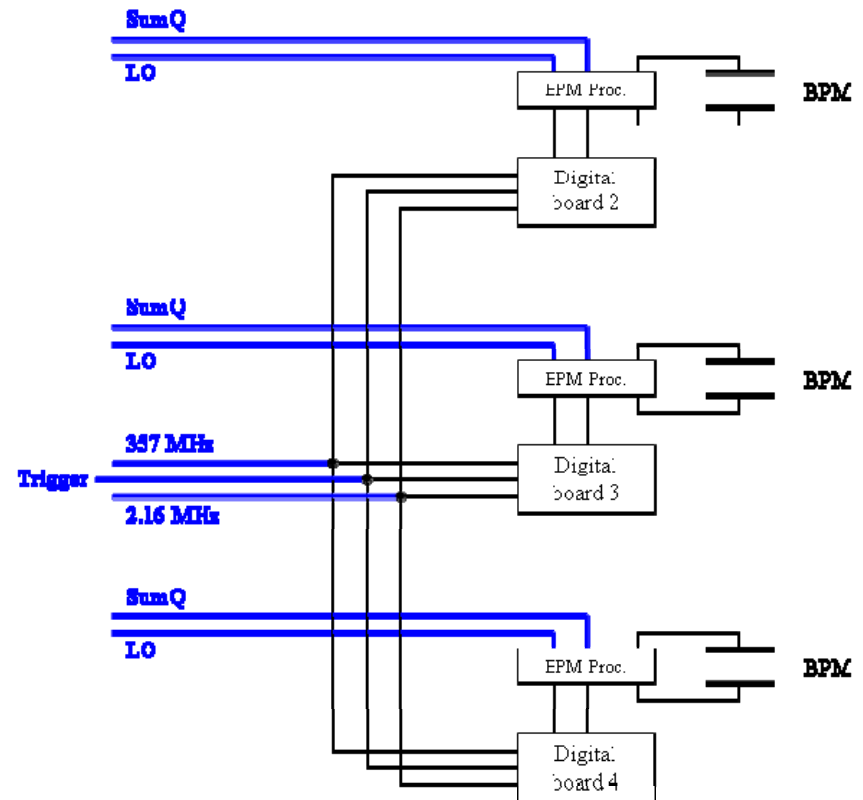 – Log data over RS232

  – A few possible control configurations

Heliax requirements

- Need a minimum of 9 heliax cables inc. individual LO phasing
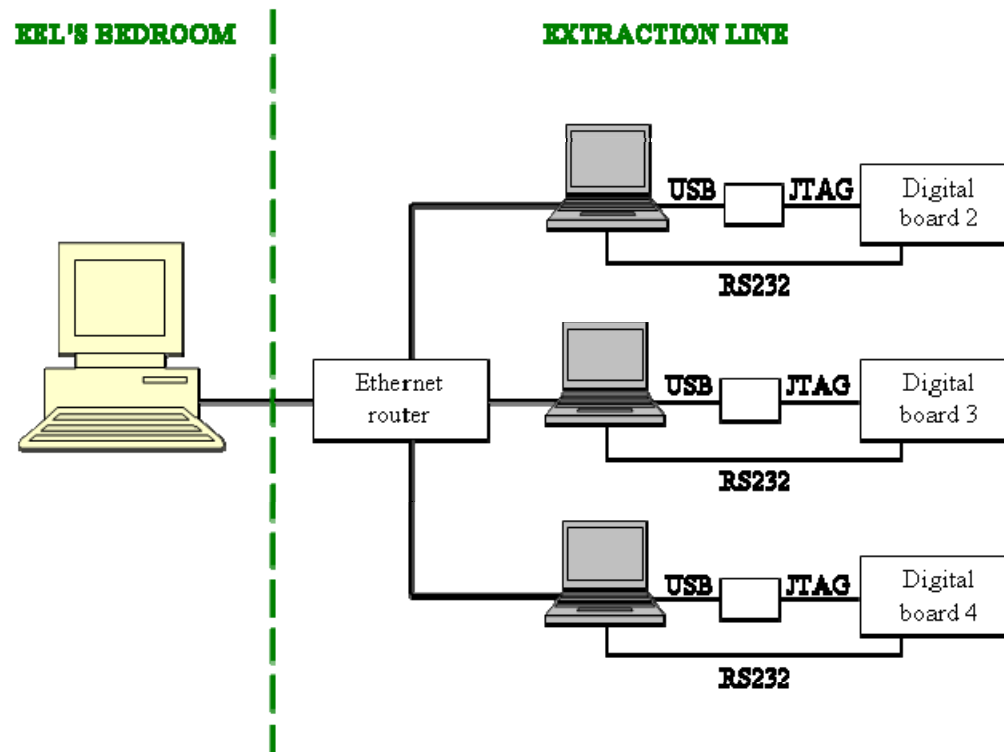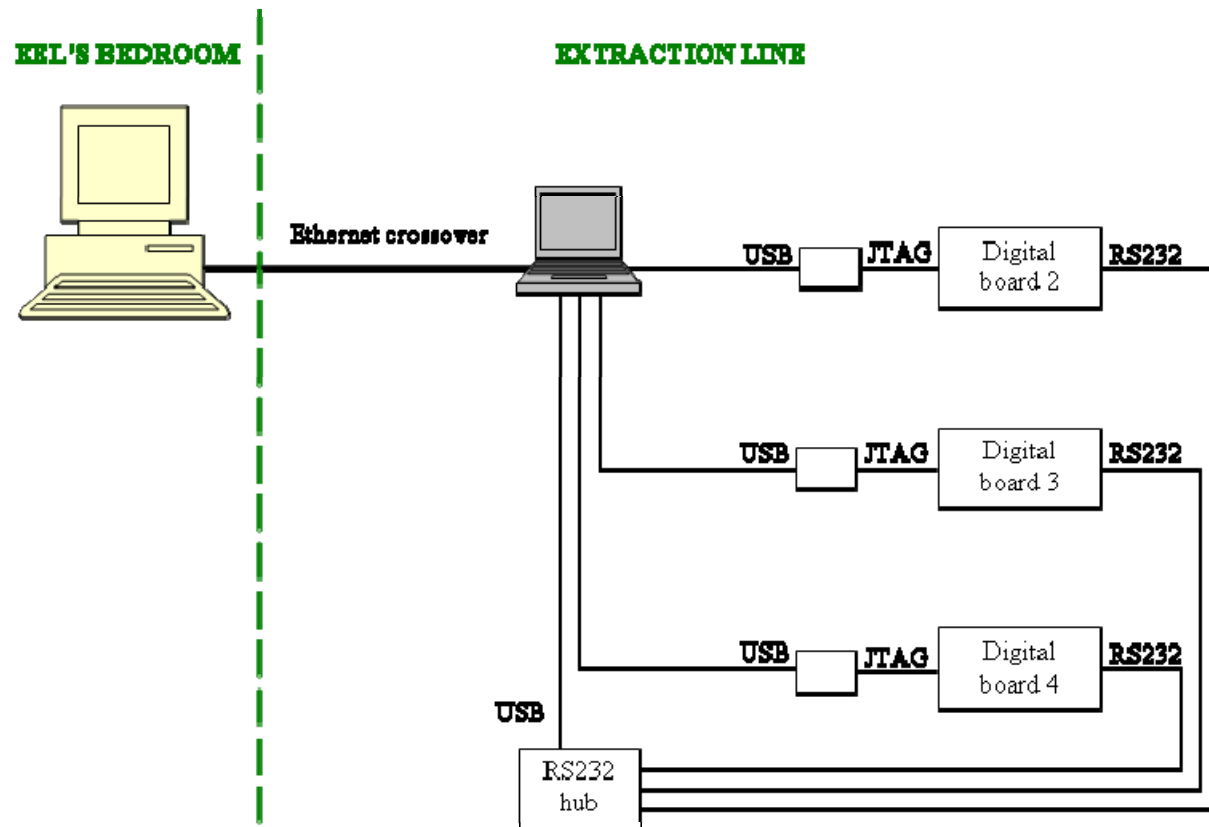
- Matched cables unnecessary
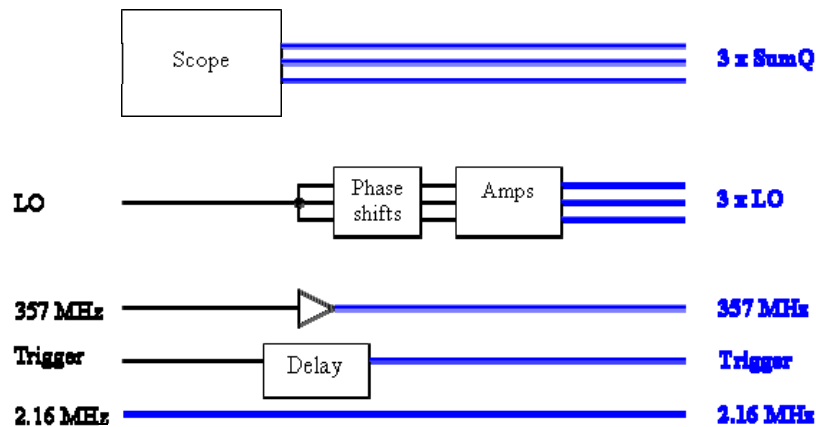
Digital board control configuration 1

- If standard Chipscope control method is used, we'd need 3 laptops in the extraction line
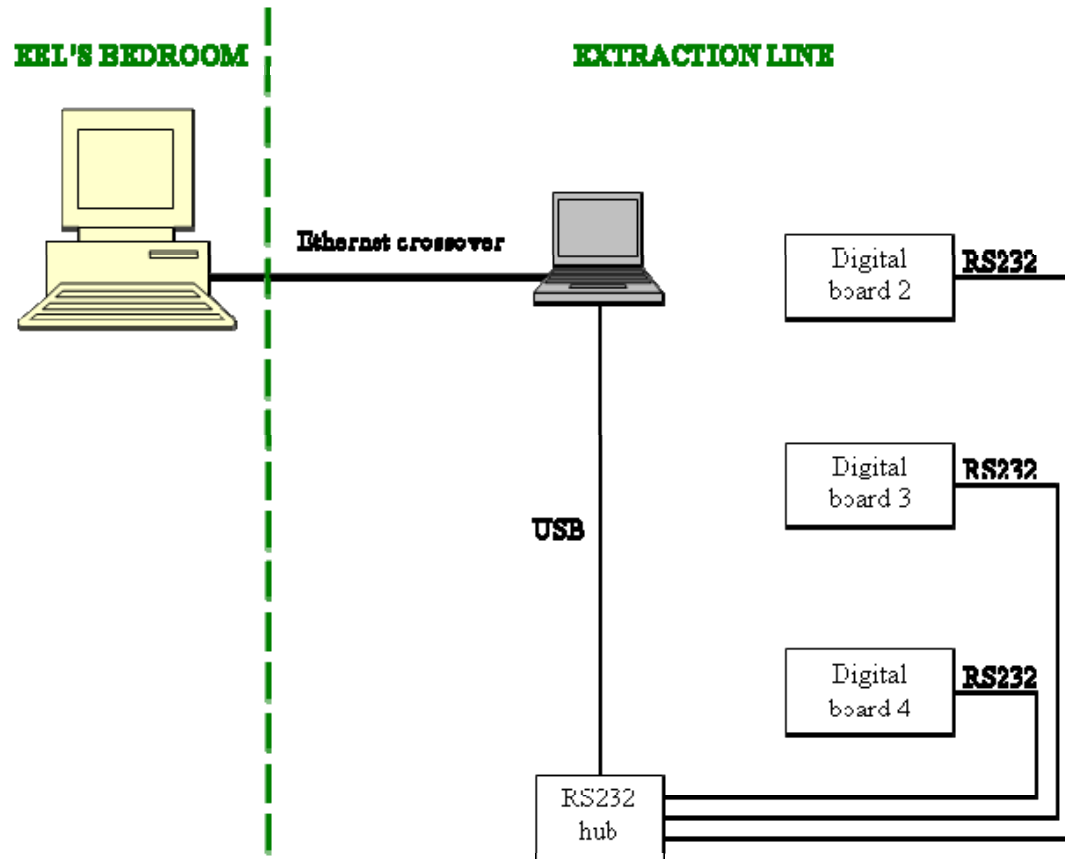
- Not particularly desirable!

Digital board control configuration 2

- One laptop MAY be possible if individual USB ports can be disabled/enabled

- Will test this in lab. Hope to use as a backup configuration

Digital board control configuration 3

- Controlling boards over RS232 simplifies configuration

- Ext. line laptop not strictly necessary but simple & useful

RS232 control of current firmware

- RS232 control can be implemented by February with some work

- Control for DAQ requires adding several modules to firmware:

  - UART   *Successfully tested*

  - UART decoder   *Successfully tested*

  - Control registers   *Successfully tested*

  - Logic to transmit RAM contents over RS232   *Successfully tested*

  - Input delay reset and increment logic   *Fairly straightforward*

- DAQ software must be modified to:

  - Provide correct control signals   *Fairly straightforward*

  - Timestamp data for multi-BPM synchronisation   *Very straightforward*

  - Display incoming data in real-time   *This is where the work is!*

RS232 control of current firmware cont.

- Very good practise for new 9-channel board

    - Creating a 2-channel version of much of the new system

    - Firmware control mechanisms essentially identical

    - In February will run one instance of the 2-channel software per board

    - 2-channel DAQ/control software easily expanded to 9-channels

Summary

- Bare minimum cables to lay for February:

  - 2x heliax to each BPM (not necessarily matched but prob. a good idea)

  - 3x heliax for clocks/trigger. Distribute within extraction line

  - 1x crossover ethernet

- Preparation in Oxford for February:

  - Test whether alternative USB/Chipscope scheme will work

  - Place and route new firmware with RS232 control to check timing etc.

  - Modify DAQ software for 2-channel control and real-time display

  - Lab tests of 2-channel system

- Also, are we using the old power supply / phase shifter combo?