Minimal shift plan – double shift week 1

As per Glenn's suggestions:

0. Hardware setup
1. Sampling setup
2. Kicker strip positioning & gain optimisation
3. (Latency measurement)
4. Calibration & short feedback runs
5. Long jitter/feedback runs

0. Hardware setup

- FB BPM 11, witness BPMs 10 & 12
- Attenuate strips to keep processors linear
- Split BPM 11
- Atten(11) = Atten(10 & 12) – 6dB
- Split DAC output
- Use charge normalisation firmware
- Rest of setup as usual:
  - Chipscope/RS232 DAQ on local ext. line laptop
  - Connect to Eel's Bedroom via crossover
  - MATLAB DAQ on laptop in Eel's bedroom

0. Hardware setup cont.

Suggested scope channels:

- Scope 1
  1. BPM11 sum
  2. BPM11 difference
  3. DAC output
  4. A kicker strip current monitor
- Scope 2
  1. BPM 10 sum
  2. BPM 10 difference
  3. BPM 12 sum
  4. BPM 12 difference

1. Sampling setup

- Locate bunches in ILA
- Confirm sampling is operating correctly
  - MATLAB scripts ready that will enable near real-time checking of earlier sampling problems and bit errors
- Ensure DAC output is sensible

2. Kicker strip positioning & gain optimisation

- Define extreme +ve calibration position
- Bring in strips as far as possible
- Define extreme –ve calibration position
- Determine optimal gain
  - Use ILA for data taking (11 pulses)
  - Ensure bunch 2 can be centred from extreme position
  - If necessary, redefine extreme position and iterate

3. (Latency measurement)

- Latency must be measured
- Given that latency is (as expected) low enough for FB, should this be a priority for week 1?

- For latency measurement, either:
  - Use non-CN latency test firmware and add 3 cycles of 357MHz
  - Produce new latency test firmware (preferred)
  - Glenn has sent some suggestions and I'm currently investigating

4. Calibration & short feedback runs

- Scan between calibration extremes
- Obtain calibration and ‘feedback off’ data simultaneously
- At each position record data with FB on, delay loop off/on
- ~100 runs per position

- For week 1, do we either:
  - Use constant gain over entire range?
  - Re-optimise gain at each position c.f. adaptive gain algorithm?

5. Long jitter/feedback runs

- For the remainder of the shift, take long jitter runs
  - Beam position ~centre
  - A position or two either side
  - Long runs with feedback on/off (delay loop always on to save time)
  - Record both digital and analogue data
  - Overlap data sets
  - N thousand pulses per set as time permits