Last Updated: 28 July 2006

Hall A "LEDEX" RunPlan
2nd Low-Energy Beam Period (E_o = 362 MeV): Aug. 20 – Sep. 1, 2006
E05-004

PROCEDURES FOR EACH ELASTIC SEQUENCE
For Lowest Q's (for Q < 0.200 GeV: Q=0.088 → 0.175 GeV)

1. Ensure Spectrometers/Triggers/BPM/etc. Prepared Properly

- Change electron HRS **momentum** & **angle** settings to those specified for the next desired measurement. NOTE: for all of these "lowest Q" measurements, with spectrometer angles less than 30°, there will be only **one** Momentum Setting per **angle** (follow Counting House "Whiteboard" instructions from J. Lerose for cycling quads when setting momentum).
- Make sure the other spectrometer (the Luminosity Monitor) is still set in its fixed position/setting, and ready to take data: **θ = 28.30° and p = 0.3538 GeV/c**
- Small 2 msr Collimator will be (should be!) already bolted in place on both spectrometers.
- Will use Singles Triggers (T3 for HRS-L, T1 for HRS-R) - Prescale for singles trigger on current measurement elastic-electron spectrometer should be **set as LOW as feasible**; prescale for singles trigger on Luminosity spectrometer should be set for about 1 kHz DAQ rate. T2 and T4 triggers are needed for trigger efficiency (and rate of T2, T4 should ≈ T1, T3 rates); make sure to keep sufficient amount of these triggers, too. Keep deadtimes less than 10%.
- Make sure HRS-L and HRS-R DAQ's are **SYNCH'd** Order of STARTING DAQ's for each RUN is: start HRS-R, then start HRS-L; Order of STOPPING is: stop HRS-L , then stop HRS-R.

- Check beam position on BPMs (few-tenths of mm on each); set Raster ON: ASK MCC for "6 x 4.5" (± ≈ 3 mm in X and Y)

2. Sequence of Runs for Kinematic Points from Q = 0.088 → 0.175 GeV

"non standard" procedures done periodically (not every Kin point) are in shaded boxes (see NOTES).
Estimate that we should spend a total of about 4 hours to get through each Kin point (including changes).

Target	# Counts Wanted	Kin Points (Q) to do Measurement	Purpose
Ta	~100 k	All (Q=0.088 → 0.175)	Pointing / Kin-Fit
C	3 runs × 1 M	All (Q=0.088 → 0.175)	eD prod. / Kin-Fit
C	3 × 1 M @ non-standard Currents	only once (see Notes)	Rate-Dep. / Deadtime study
C **(with sieve coll.)**	~100 cts / hole	only once: Q=0.150 (Kin 2)	Optics
Al (4 cm dummy) **(with sieve coll.)**	~200 cts / hole		
MultiFoil C	5-100 k		
Al (4 cm dummy)	100 k	All (Q=0.088 → 0.175)	eD prod. (bgnd) / Kin-Fit
LD_2	3 runs × 1 M	All (Q=0.088 → 0.175)	eD prod

LH_2	3 runs $\times$ 1 M	All (Q=0.088 $\rightarrow$ 0.175)	eD prod. / Kin-Fit
LH_2	3×1 M @ non-standard Currents	only once (see Notes)	Rate-Dep. / Deadtime study
LD_2			

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3. NOTES regarding "non standard" procedures to be done only at particular Kinematic Points:

- *Procedure for the data at "non-standard Currents"*
  - It's not clear pre-run exactly which Kinematic Setting this procedure should be carried out at, so the intent of these measurements is given briefly here to assist … will need the advice of Doug Higinbotham, or Ron Gilman, or our informed Run Coordinators to carry out this procedure (and likely one of them to be present in the Counting House!).
  - **For the ^{12}C target:**
    - Would like to understand rate effects on the extracted cross section for **total HRS trigger rates ranging from ≈ 100 Hz → ≈ 10 kHz**
    - It is likely this study with changing the current to get differing HRS trigger rates will need to be done at more than one angle to cover this entire rate range.
    - We need a "**nominal**" (nice!) Kinematic Point for which the HRS trigger rate is in the 1-2 kHz for a beam current in the 1-2 μA range.

      To be more specific: a point for which we find we can run our DAQ with a Prescale=1, and the deadtime is less than 10%.

      Ideally: this point has a current of at least **I = 2 μA** because this is where we believe the position fast-feedback to be reliably working.

    - With this "nominal" Point having taken data (with Prescale=1), do 2 more runs:
      1. **Increased Current (high rate):** increase current as high as possible (either as given by our current limit by MCC, or by maxing out safe singles rates in VDCs of HRSs) – again, ideally, this would be up to 20 times higher than nominal.
         Take data in this high current mode, using Prescale factor set to whatever value needed to give the same deadtime had at the nominal setting (less than 10%). Usual deal: **3 runs @ 1 M cts each.**
         (Ron/Doug: is it useful to also have data where Prescale factor is set so that deadtime is higher…say 30%?)

      2. **Lower Current (low rated):** decrease current down to the lowest values we take data (likely will be around 0.5 μA range). Taking data here will be an extra check on current monitoring at the extremes of our range, plus also check any DAQ/trigger rate-dependent effects. This time Prescale factor =1, and the usual: : **3 runs @ 1 M cts each.**

  - **For the LH_2 and LD_2 targets:**
    - Exact same overall goal as outlined above for Carbon target.
    - Likely, however, that finding the "nominal" (nice) kinematic point for these targets will not happen for these forward angle (Q=0.088 → 0.175 GeV) points, since the rates are higher than for Carbon at a given angle.

Because of this: the above-described current study on these targets should be done at a more backward (higher Q) point – don't worry about fitting it in for these low-Q (forward) points.