Proposed run conditions…

1. **Degauss dump dipole** - the dump dipole was implemented to suppress background when we had no TOF capability, but we now have TOF, a Be dump and know we can increase threshold to get same good affect
2. **Use a hardware timing veto** –we have TOF, but better to avoid dump events altogether – this increases dead time and is particularly bad for the thin foil elastic fraction (most are dump events). We learned we can increase discriminator threshold and get the same result, but too high threshold hand-cuffs ability to later choose asymmetry sensitivity to energy cuts,.
3. **Use a moderate discriminator threshold** – I suggest setting the threshold somewhere between the "low" and "high" from Run I. We want the threshold low enough to allow good sensitivity for changing the beam energy and if we agree on the timing veto then essentially forego the "high" threshold for thin foils.
4. **Match PMT voltages** - to match elastic peak at KE=5.0 and imaging adjusting energy as far as 4.5-5.5 MeV
5. **Match delay line** – adjust delay lines so elastic peaks occur nominally at same time
6. **BCM calibration** – do a BCM calibration so that we can make an absolute normalization of rate i.e. Hz/uA/um for comparison with calculation and modeling
7. **PITA calibration** – do a PITA calibration to minimize the charge asymmetry for IHWP=in or out; alternatively we can adjust the RWP plate so that IHWP=in or out rotates the net linear polarization at 45 deg to the photocathode analyzing power; either way is OK
8. **KE=5.0 MeV and minimize energy spread** – we will use a procedure to precisely measure the beam momentum and will then iterate with the gradients setpoint until we meet target; we will vary unit phases to achieve maximum energy gain for pair of cavity gradients
9. **31MHz rep rate up to ~5 uA CW** – we will have the Hall B laser pulsing at 31 MHz; we need to keep the laser amplifier below X Watts to ensure we don't exceed the damage threshold of the amplifier and break it. We can operate up to ~5uA without too much difficulty, but 499MHz bunch charge equivalent is ~90 uA, so we'll benefit from focusing on Mott and not setting up the beam at different beam currents.
10. **499 MHz rep rate up to 50-100 uA CW** – although a different laser we can spend time to generate high current, but we lose the TOF capability – however, we would likely want to run with thin foil to make elastic rate reasonable, but operate with a very high threshold to eliminate the dump events – at some point could be untenable due to pile-up.
11. **Null instrumental asymmetry** – for Run I we spent some time to verify we had instrumental asymmetry that was consistent with zero and stable
12. **Spin orientation** – Setup polarization with VWien, insensitive to small horizontal bend angle and allows use of prebuncher without worry about downstream prebuncher; we can use solenoids for flip-left or –right if w choose to have an UP/DOWN asymmetry

Proposed measurements…

1. **Beam energy measurement** – important for Mott analyzing power, emittance and energy spread measurements
    a. Quad center beam in 0L02, 0L03, 5D00, 5D01 so that we can transfer the adjacent quadrupole survey information to the BPM for absolute position measurement
    b. Calculate absolute bend angle for quad centered BPM
    c. Survey the magnetic field and shielding spanning BPM segments, construct a model for correction
    d. Setting beam on center 0L02-0L03 make sure 5D correctors off and MDL=0 G-cm (is MDL field map Earth field subtracted?)
    e. Setting beam on center 5D00-5D01 make sure nearby 0L correctors off
    f. Adjust gradients and phases for crest to achieve p=5.487 MeV/c within X%
2. **Beam energy spread** – important model and convolution in spectra
    a. Measure beam profile on IHA2D00
    b. Requires beam emittance measurement because intrinsic beam size (beta*epsilon) must be subtracted in quadrature from measured beam size
3. **Beam emittance** – important for energy spread measurement and to calculate beam spot size at target foil
    a. Quad center MQJ0L02
    b. Make sure IHA0L03 functions
    c. Deermine MQJ0L02 limits to span minimum in both X and Y
    d. Use qsUtility, choose zig-zag approach, make sure config file reflects X and Y limits, perform scan, fit for emittance on-line
4. **Singles Rates** – important for target thickness extrapolation
    a. Test all foils with 25mm mount
    b. Requires BCM calibration completed
    c. Operate with conditions minimizing deadtime correct
5. **Energy systematic –** only systematic we didn't measure yet
    a. Energy spread at Mott is probably 100-150 keV
    b. A 2% uncertainty in momentum is about 110 keV
    c. Suggest changing energy +/- 200, 400 keV
    d. Practically straight-forward to make relative changes in momentum
    e. Keep on crest to retain energy spread ~constant throughout
6. **Target thickness extrapolation –**measure a(t) and corresponding beam conditions, satisfying for paper and for model
    a. Test all foils with 25 mount
    b. Collect <0.5% statistics (typ ~0.25% seems feasible)
    c. Use equal IN/OUT IHWP
    d. Interleave with stability measurement (1um foil again?)
    e. Beam current systematic
    f. Perform with 31MHz from 0-max
    g. Perform with 499MHz to >50 uA and high threshold