Recommendation	Responsible People	Page #	PAC	ERR
Proceed with more realistic detector design incorporating mechanical details such as support structures	NIlanga Kondo	2		x
Perform full simulations, including timing of signals	Rachel Eric	3	x	
Present an effective and tested tracking algorithm in a simulated high background environment (150 tracks/module/trigger).	Steve	3		x
Comment		**Page #**	**PAC**	**ERR**
Detailed simulations populating the recoil detector with ∼ 150 tracks/module/trigger have not been performed.	Rachel Eric	2	x	
Background rates of this magnitude can present challenges to track reconstruction. This is especially true for forward going tracks (∼ 45°) where two or more sub-chambers will be involved to reconstruct a single track.	n/a	2	n/a	n/a
Track reconstruction software specific to this application has not been developed. This software is required to reconstruct the momentum and vertex time and will be necessary to finalize the detector design.	Steve	2		x
Both hydrogen and helium are likely to permeate through the thin Kapton sections of the target causing thickness, density, and contamination issues. As proposed the target cell with 20μm wall thickness will not safely contain hydrogen at 4 or even 3 atm.	Dipangkar	2	x	
The presented detector performances shown in Fig. 4 do not look realistic. In the left graph of the figure the momentum resolution ($\Delta p/p$) peaks at ∼ 0%, while on the right graph high efficiency for 70 MeV/c protons is reported, when at 4.7 Tesla solenoid field 70 MeV/c protons even at 90° will not make into half of the chamber.	Rachel Eric Bogdan	2	x	

Important details of the mechanical design have not been sufficiently determined. The proposed detector as presented in Figures 1 and 2 is not sufficient to build a prototype. Supports for foils will impact detection of low energy protons.	NIlanga Kondo Thia	2		x
The proposed readout pads of dimension 5 mm by 5 mm are quite small and it may be rather difficult to reduce the pad size even more to accommodate the extremely high rates in the inner radii. Note that for a 3 layer GEM the electron shower width is already order 1 mm wide.	Nilanga Kondo	4	x	
The current GEM system is based on two layers with a total gain of 2000. It is not obvious that such a gain in electron amplification is sufficient.	Nilanga Kondo	4	x	
The resulting occupancy in the mTPC is at the level of 70% with significant multi-hit probabilities of which many can not be resolved as the hit resolution is of order 200 ns. At more forward angles, this resolution may be significantly larger. Such a high occupancy requires detailed studies and software development to identify and reconstruct these multiple tracks in a single event. In addition, random hits from other charged particle tracks like pions that pass through the detector volume within the trigger readout window are not considered.	Rachel Eric Steve	4	x	
It is not clear how the results in Figures 4 and 5 were obtained, with 4.7 T field, 70 MeV/c protons will not make through half of the radial part of TPC even at $90°$. As stated above, forward going tracks (< $60°$) have to be reconstructed in 2 or more chambers, with complicated, energy-angle dependent efficiencies.	Eric	5	x	
...it is not clear if the presented simulations are realistic. For example, electrons from the upstream end of the extended target will hit the solenoid yoke	Rachel Eric	5	x	

at 12˚.				
The suggested length of the target as shown in Figure 7 is slightly longer than the recoil detector. However the thin wall section is significantly shorter resulting in more than half of the hydrogen space length surrounded by aluminum. This may cause a significant variation of the recoil detector acceptance as a function of z-vertex position along the beam line since no low momenta protons will make it through the aluminum tubes.	Dipangkar Thia	5	x	
The combination of cell wall thickness and internal pressure must be optimized.	Dipangkar	6		x
It is not obvious how easily these electronics can be incorporated into a DAQ system at JLAB that is optimized to readout the SBS with a trigger system that runs on a sub harmonic of the accelerator frequency close to 250MHz.	Paul Alexandre Ed	6	x	
The collaboration should consider the possibility of operating at 31.1875 MHz with the same bunch charge. This is below the 40 MHz that the SAMPA system was designed for and might not significantly affect the physics if the PAC days were increased by a factor of two.	Nilanga Paul Thia	6		x