**Summer SAD Injector – 2018 (Updated June 1, 2018)**

* **Perform Bubble Experiment Engineering Run**
	+ Vacuum work - install harp and ceramic break on 5D beam line
	+ Bubble chamber – reinstall target chamber as before
	+ Beam Run – approximately one week of 24/7 running (up to 100uA)
* **Install 350 kV HVPS**
	+ Assemble HVPS/SF6 tank near Gun2
	+ Install HVPS controls/software
	+ Modify and integrate PSS controls
	+ Certify operation of HVPS
	+ Demonstrate capability to switch between new/old supplies
* **Install 200 kV Gun**
	+ Protect photocathode supply in Gun2
	+ Vent Gun2 to install/align the 200kV electrode from UITF
	+ Bake Gun2, leak free
	+ High voltage condition Gun2, vacuum and/or gas conditioning
	+ Make photocathode, check laser alignment
	+ Restore and run beam at 130keV (new gun and HVPS)
	+ Increase voltage to test injector settings needed w/ 200keV beam
* **Reliable Polarized Source**
	+ Demonstrate “new gun” ready for operations
	+ Gun back-out possible
	+ HVPS back-out possible



**May 6 – May 19: First two weeks of SAD are highly integrated**

* **Sun/6**
	+ Beam off at 6am, then surveys
	+ Attach turbo pump to 5D over board valve, clean-up overnight
* **Mon/7**
	+ Bubble
		- Secure 5D vacuum valve
		- Unstack lead hut (RCG)
		- Vent 5D, install harp + ceramic break, verify isolation
		- **S&A** set harp rotation
		- Pump down + leak check vacuum OK
		- **Install** move crates tunnel, work w/ Brad begin install
		- **S&A** work w/ Brad set Bubble chamber
		- Install Bubble laser shutter
* **Tue/8**
	+ Bubble
		- Final leak check Bubble line
		- **Tony** (re)allocate harp cable, make-up + HCO harp
		- Connect dump picoammeter
		- **Install** work w/ Brad to roughly set Bubble chamber
		- When ready **S&A** check 5D radiator/collimator set Bubble
	+ Gun
		- **Install** move Suitcase, mate to Load and start bake
* **Wed/9**
	+ Bubble
		- **S&A** complete alignment of Bubble chamber
		- **ACE** support for network controls
		- Brad continues Bubble assembly and training
	+ Gun/HVPS
		- **Install** move/assemble SF6 + HV stack w/ John in tunnel
		- End suitcase bake
* **Thu/10**
	+ Bubble
		- Complete Bubble assembly and training
		- Complete Bubble HCO checklists
* **Thu/10 1600 – Fri/18 0800**
	+ 24/7 Ops and INJ/NL begins…(CA/RA by exp’t as needed)
	+ Turn on Extractor Gauge
* **Sat/19**
	+ Open House

**Week of May 21st (#1)**

**Monday**

* + Check laser retro-reflection
	+ Admin Lockout gun from HV system
	+ PSS Lockout 150kV Glassman
	+ Secure gun valve
	+ Magnet racks off, remove correctors from NEG tube
	+ Move photocathodes to Suitcase
	+ Remove HV cable, oil tank, computer cart away from gun
	+ Crane OUT (optic table, clean table)
	+ Crane IN (SF6 tank)
	+ Allow S&A to setup

**Tuesday**

* + S&A have right of way measure (HV, electrode, NEG)
	+ Stage turbo to vent HV chamber

**Wednesday**

* + Vent gun, remove electrode, cover 10” flange
	+ Electrode to S&A lab to for measurement
	+ Remove NEG tube, blank until ready for install
	+ Remove RGA, replace w/ right angled valve (ready for plumbing)

**Thursday**

* + Check 200kV vs. 130kV puck cage => choose best one
	+ SF6 tank could be staged

**Friday**

* + Install fiducialized 200kV electrode to Gun2, set/align
	+ Install NEG tube w/ M20 BPM’s
	+ Check all electrical isolations
	+ Start Gun2 pumpdown, to leak check by Monday
	+ RF condition choppers for 200kV operation

**May 28 – June 1 : Bake Gun + Complete HVPS Installation**

* Gun
	+ Setup bake (HV chamber, NEG tube, right angled valve)
	+ Careful bake: up – soak – down – activate – down
* HVPS/PSS
	+ Facilities/PSS install conduit and AC contactors, cabling
	+ Install 350kV Glassman control unit
	+ Install 350kV Glassman interface chassis
	+ Install 350kV Glassman control software
	+ Install DAC iocin3, software/cabling
	+ Move Keithley readbacks to 350kV
	+ PSS/Software install VME comparator card
	+ Complete assembly/cabling, HCO w/o PSS permissive
	+ Continue HVPS assembly (add resistor + charge SF6)

**June 4 – June 8: Operation HVPS + HV Condition Gun**

* Gun
	+ Careful bake: up – soak – down – activate NEG– down
	+ Add krypton leak valve + plumbing, bake line
	+ Leak check w/ PREP RGA
	+ Lasers ON (A=pre-amp, D=atten)
	+ Test magnets/PS for 200kV limits
	+ Open gun valve, check retroreflection w/ C laser
	+ Terminate BPM’s w/ 50ohm loads
	+ Return Decarad, anode monitoring
	+ Lock-out laser shutter
* HVPS/PSS
	1. Complete HCO of PSS/HVPS (interlocks, controls, software)
	2. Operate PSS/HVPS on itself (no gun connection)
	3. PSS Cert/Review/OK for connection to gun
	4. Connect gun to HVPS
	5. HV condition w/o Kr first (assess x-ray/vacuum/anode)
	6. Kr condition, eliminate FE at 200kV
1. Remove Brock cavity 500kV line
	1. Attach turbo, prep for venting
	2. Prep to remove Brock cavity (ATLIS, notes, nipple, drawing)
	3. Vent 1D, remove Brock cavity, replace
	4. Pump down

**June 11 – June 15 : Restore Gun Operation!**

* Gun
1. Hook-up two new BPM’s, perform HCO
2. Reconnect cables, magnets
3. Move Suitcase photocathodes to Prep
4. Remove bulk GaAs to Suitcase for holding
5. Make photocathode, install gun, LV to measure QE, check retro-reflection
6. Remove SF6 w/ DILO, replace resistor for short, fill SF6
* 130 keV Beam
1. standard operation INJ SEG mode
2. Use 130kV beam and test PSS kicker in “200kV location”
3. Restore beam to FC2 w/ new gun @ 130 keV
4. Once satisfied, test transition between 350/150 HVPS ???

**June 18 – June 22: Bakout Option / Float !!!**

**June 25 – July 29: 200 keV operation**

1. Configured and scale injector for 200keV beam
2. Operate gun at 200kV, setup/test injector for beam to FC1 (chopper OFF)
3. Perform PSS kicker and PSS dipole (INJ SEG) testing/certification
	1. If desired move PSS kicker to a new “200kV location”
4. Use Wien or spectrometer to measure energy stability
5. Turn on chopper, measure deflection v. power, perform chopper setup
6. Benchmark beam v. charge (transmission, emittance)
7. Decide on possible setup to FC2 (chopper ON/OFF, capture ON/OFF)

**July 2 – July 13: Complete 130/200 keV Beam Studies**

INJ SEG

1. Magnet capabilities/optics
2. Chopping/dechopping
3. Longitudinal bunch length
4. Lifetime
5. Transverse emittance
6. Wien reach

INJ/NL

1. FC2 setup
2. Mott/transmission polarimeter