

MEMORANDUM

Date: May 11, 2018
To: Distribution
From: Rolf Ent and Arne Freyberger for the Nuclear Physics Experiment
Scheduling Committee
Subject: Accelerator Schedule through December 2019

Schedule

Attached is the accelerator operations schedule through December 2019. It has also been posted at http://www.jlab.org/div_dept/physics_division/experiments/schedule.html. Access to the database format of the same schedule, as used by the beam accounting system, can be found at <https://cebaf.jlab.org/btm/schedule>.

The operations schedule is based on expected fiscal 2018 and 2019 funding, and, consequently, may be subject to further adjustments due to actual funding and the progress of repairs and maintenance tasks. As of this schedule, the FY2018 budget expected by the lab includes more weeks of operations than initially anticipated. To accommodate the increase in the number of weeks, a shorter summer down will take place and operations for physics are expected to resume late August for a total of twenty-two weeks of operations in FY2018 – i.e., until October 1, 2018. For FY2019, the schedule has seventeen weeks of physics with accelerating gradients above one GeV/pass (“high-energy”) followed by eight weeks in summer 2019 with a gradient of about one GeV/pass (“low-energy”). Repair, maintenance and upgrade tasks for CEBAF have been prioritized and staged to support the shorter summer down this year and next year low-energy summer operation.

A major milestone was achieved during the winter/spring 2018 period – simultaneous four-hall operation for physics. Hall A completed two experiments using the tritium target in this period while Hall B performed its engineering run and started the Run Group A of experiments. Hall C, after calibrating the new Super-High Momentum Spectrometer (SHMS) and re-commissioning the already existing High Momentum Spectrometer (HMS), moved on to complete a prioritized set of commissioning experiments agreed upon by the collaboration. Hall D continued taking data in GlueX-I accumulating over 120 billion events just in winter/spring 2018 with photon polarization of up to 40%.

The present schedule has Hall A completing two other experiments in Fall 2018 that make use of the tritium target: E12-11-112 and E12-17-003. E12-11-112 will use the asymmetric $A=3$ nuclei to perform a precision test of the isospin dependence of the two nucleon short range correlations, and extend such measurements into a regime where three nucleon short range correlations may be observed. E12-17-003 will determine the unknown Λn interaction which is critically important to understanding charge symmetry breaking in the strangeness nuclear physics sector. Hall A will then begin installation to run the APEX experiment in spring 2019. Installation and running of PREX-II and CREX follow in summer and Fall 2019. Hall B will continue with Run Group A in Fall 2018 followed by Run Group B in 2019. Hall B’s Run Group K may be able to take data during the month period late Fall 2018 when Hall C requires special accelerating gradients in the machine to complete the running experiments. The Hall B’s Heavy Photon Search (HPS) is scheduled to take data in summer 2019. Hall C will continue with the early running experiments above, expecting to complete them by spring 2019. The program requires a

couple of special accelerating gradients in the machine to be able to perform various longitudinal – transverse virtual photon separations. Experiment A1n in Hall C, using a polarized Helium-3 target, will be installed and ready to take data by early November 2019. Hall D is expected to complete GlueX-I in fall 2018. Hall D would then be upgraded with the addition of a Detection of Internally Reflected Cherenkov (DIRC) counter and a Forward Electromagnetic Calorimeter (FCAL) followed by a short run of the eta radiative decay width via the Primakoff effect. For Fall 2019, Hall D is schedule to start GlueX phase II with the additional DIRC counter.

On the schedule, each Physics Advisory Committee (PAC) day is mapped into two floor days. This factor of two accounts for Accelerator and hall efficiency due to system failures (not experiment overhead). It also accounts for a total of up to 16 hours a week of scheduled beam studies, maintenance, and RF recovery. An additional 8 hours a week is allocated for beam tuning to support program changes, beam tuning to address beam quality issues and to restore beam operations for physics post beam studies/maintenance periods. The remaining 144 hours a week, 86 %, is scheduled as research.

The Jefferson Lab Nuclear Physics Experiment Scheduling Committee developed the schedule. Committee members are: Volker Burkert, Eugene Chudakov, Rolf Ent (Co-Chair), Arne Freyberger (Co-Chair), Javier Gomez, Cynthia Keppel, Robert McKeown, Matt Poelker, Patrizia Rossi and Mike Spata. The schedule has been reviewed and approved by the Director.

Supplementary Information

Accelerator

Accelerator operations resumed in late November 2017 with a short run prior to the Winter break, resumed in early January 2018 and continued until May 5th 2018. The run could be viewed as one long continuous run with a couple of interruptions, another view is that there were three periods with distinct accelerator performance.

Nov/Dec 2017: The initial beam operations in Nov/Dec were another shakedown of the accelerator hardware after the lengthy Summer 2017 shutdown which saw a partial unplanned warm-up of over 50% of the SRF structures. The major milestone for the accelerator in this period was the transition to operation the 4-laser/750MHz separator system to enable 4-hall operation. This transition took the better part of the pre-Winter shutdown run, but by the end of the run the system was operational waiting for 4-halls. Beam availability continued to be sub-par for this portion of the run.

Jan/Mar 2018: Beam operations resumed after the Winter break and quickly built on the gains made in the previous run. CW beam to hall four halls was established on midnight of Friday January 12th. The hall requirements were modest for the first few weeks of operation in terms of beam current and power. By February the program called for 4-hall operation at maximum allowed beam power (900 kW). The ability to deliver 900 kW of beam was hampered by beam loss monitor trips. The cause of these trips was not known and several hypothesis were pursued; beam orbit, beam optics, errant RF cavities and configuration. This effort to understand the limitation was halted when on March 5th a transformer for CHL1 failed and beam operations were interrupted for a few weeks for its repair. Prior to the transformer failure, beam availability was improved over Nov/Dec and often acceptable for this period, with the caveat that the accelerator was not capable to support the 900 kW required by the program.

Mar/May 2018: Transformer repair took a few weeks and this provided an opportunity to improve several RF systems. Beam operations resumed in the final days of March and while the RF performance was improved the 900 kW capability remained elusive. Beam studies continued to be used to investigate this limitation. In order to obtain some “dwell” time at high beam power, some of the beam loss monitors were desensitize in order to provide time with high power beam in the machine to diagnose the problem. With the machine in this configuration, the RF system was cleared as the source of the limitation. While sustaining high power delivery, a small longitudinal tail was observed on the beam. The injector setup was revisited and successfully removed the tail by scrapping it off in the chopping system. Following the change to the injector setup, 900 kW beam operations were sustainable. The source of the tail remains a high priority topic of investigation as well as improving our diagnostic/procedure for debugging these issues going forward. The beam available for this portion of the run was excellent.

Each end-station has an Accelerator Physicists Experimental Liaison (APEL) that serves to aid the Nuclear Physicists in beam related issues during all phases of an experiment, proposals, commissioning, operating and analysis. The APELs with input from the end-station scientist, injector, and diagnostics

have developed a beam parameter table for the 12 GeV era (JLAB-TN-022). Experiments requiring more stringent beam parameters should consult the APEL for the end-station in question. What is not in this document is that there are additional constraints that to be applied during the scheduling process. Most of these constraints derive from the new 4-hall system and are as follows:

- 4-hall operations requires at least one of the original halls (ABC) to receive 5th pass beam.
 - It is strongly preferred that the original halls be A or C. Coupling B-D while possible will result in additional constraints of B & D currents.
- Any of the original halls receiving 5th pass beam concurrently with Hall-D will receive beam with a 249.5 MHz repetition rate.
 - 499 MHz repetition rate is available when a hall is receiving pass 1-4 beam.
- Hall-D must be at 249.5 MHz repetition rate whenever an original hall is simultaneously receiving 5th pass beam.
- Hall-D can only receive 499 MHz beam when only two of the original halls are receiving beam on the lower passes (1-4).

The accelerator energy for the operations to date has been 1050 MeV/linac, 40 MeV/linac below design. The energy margin during the Spring2018 campaign was at times challenged, periodically approaching zero margin in the North Linac. The Summer shutdown activities include moving two good modules from the Low Energy Recirculator Facility (LERF) to replace underperforming modules in the North Linac. This includes removing a C100 module for the start of a C100 refurbishment process. These module replacements along with other planned work are all prioritized to maintain the energy 1050 MeV/linac for the near term.

A plan for returning CEBAF back to the design energy, 1090 MeV/linac, has been developed and the first C75 module will be ready for installation in Summer2019. Beam delivery at 1090 MeV/linac is projected for Fall2021, after 4 C75 modules have been installed. The plan calls for an additional 4 C75s to increase the margin so that CEBAF can support robust beam delivery at these energies.

Hall A

Hall A completed two experiments using the tritium target during the fall 2017 and winter/spring 2018 period: E12-010-103 (“MARATHON”), a measurement of the neutron to proton structure function ratio which will enable knowledge of the elusive down to up quark ratio; and E12-14-011 which leverages the asymmetric A=3 nuclei ³H and ³He to verify predictions suggesting that high momentum distributions in nuclei are dominated by short distance correlated pairs of different type nucleons. A third experiment using the tritium target was started, and will continue into the Fall 2018 run. This experiment, E12-11-112, will also use the asymmetric A=3 nuclei, in this case to perform a precision test of the isospin dependence of the two nucleon short range correlations, and extend such measurements into a regime where three nucleon short range correlations may be observed. On a best effort basis, Hall A will then begin installation to run the APEX experiment in spring 2019. Installation and running of PREX-II and CREX follow in summer and Fall 2019.

Hall B

After the Solenoid magnet commissioning in September 2017 and the completion of CD4B, the CLAS12 spectrometer received first electron beam at 10.6 GeV during December 2017 as part of the engineering run. Following the first part of engineering run the RICH detector was installed in early January 2018. This was followed by the second part of the engineering run which ended February 4. The commissioning of Run Group A (RG-A), which covers a total of 13 individual experiments, began February 5 and ended February 14 employing 3 and 5 pass beams, and with different settings of the Solenoid and Torus magnetic fields. Production data taking for the first part of RG-A commenced February 15 and ended May 6, 2018 after an extension of the accelerator operation to make up for lost beam time due to hardware failures that prevented the operation of the accelerator.

During the spring run, RG-A accumulated a total of 125mCb charge. RG-A will continue data taking during the fall until November 15, 2018. This will be followed by a short run of RG-K at energies of 7.5 and 6.5 GeV until the holiday break. The 2019 spring run will have RG-B taking data on liquid deuterium target. This run group covers seven individual experiments, and will continue data taking in the fall of 2019. During the summer 2019 the HPS experiment will take data at 4.5 GeV beam energy employing the improved silicon tracker to reach smaller scattering angles.

Hall C

After calibrating the new SHMS and re-commissioning the existing HMS spectrometers, Hall C went on to complete E12-10-002, a measurement of hydrogen and deuterium structure functions at large parton momentum and a portion of E12-06-107, a search for the phenomenon of color transparency in protons traversing nuclei. Additionally, E12-10-008 took data on the nuclear dependence of electron scattering on new light nuclei and E12-10-003 took data investigating deuteron electro-disintegration. Hall C continued then with successful initial running of the first post-commissioning 12 GeV era experiments E12-09-017, aimed at confirming the potential for Jefferson Lab to study the proton's 3D momentum tomography. Hall C will continue the series of post-commissioning 12-GeV era experiments: E12-09-011, probing the possibility that kaons can be utilized to enable the tomography of strange quarks within the nucleon, E12-09-017, measuring the transverse momentum dependence of semi-inclusive pion production and, E12-09-002, a search for charge symmetry violating quark distributions via measurement of the π^+/π^- ratio in semi-inclusive deep-inelastic scattering. E12-16-007, a search for the LHCB charmed "pentaquark" using photoproduction of J/Ψ at threshold, follows. After a long installation period, Hall C expects to begin E12-06-110, measurement of the neutron spin asymmetry A_{1n} in the valence quark region, mid-fall 2019.

Hall D

In the spring of 2018, the 2-nd physics run of the GlueX-I (E12-06-102) experiment took place for 90 calendar days. The electron beam energy was 11.7 GeV. The conditions were similar to those of the 2017 spring run. The same 0.058mm thick radiator and the 5 mm collimator were used. Various systematic

studies have been done. GlueX-I data taking has become 80% complete and is expected to be finished in the fall run of 2018. Two new detectors - CompCal and DIRC are under construction, in order to be tested in the fall run.

Additional Schedule Information

- On the schedule, daily status changes take place at the end of the owl shift (~ 7 AM) unless otherwise indicated.
- Operating one or more of Halls A, B and C at five passes together with Hall D at 5.5 passes requires a polarized gun laser frequency of 249.5 MHz for those halls. A laser frequency of 499 MHz can be used otherwise. For the same average beam current, the charge per micro-bunch when operating the laser at 249.5 MHz will be twice that of 499 MHz. For each hall, the energy, current, polarization column now also includes the laser frequency.

The Meaning of Priority on the Accelerator Schedule

Generally, the assignment of priority to a hall means that the identified hall will have the primary voice in decisions on beam quality and/or changes in operating conditions. We will do our best to deliver the beam conditions identified in the schedule for the priority hall. It will not, however, mean that the priority hall can demand changes in beam energy that would affect planned running in the other halls without the consent of the other halls. Of course, final authority for decisions about unplanned changes in machine operation will rest with the laboratory management.

The operation of more than one hall at Jefferson Lab substantively complicates the interaction between the experimenters and the accelerator operations group. It is in the interests of the entire physics community that the laboratory be as productive as possible. Therefore, we require that the run coordinators for all operating halls do their best to respond flexibly to the needs of experiments running in other halls. The run coordinators for all experiments either receiving beam or scheduled to receive beam that day should meet with the Program Deputy at 7:45 AM in the MCC on weekdays and at the Program Deputy's discretion on weekends.

To provide some guidance and order to the process of resolving the differing requirements of the running halls, we have assigned a "priority hall" for each day beam delivery has been scheduled. We outline here the meaning of priority and its effect on accelerator operations.

The priority hall has the right to:

- require a re-tune of the accelerator to take place immediately when beam quality is not acceptable
- insist that energy changes occur as scheduled
- obtain hall access as desired
- request that beam delivery interruptions for experiment-related operations which temporarily block normal beam delivery to all other halls take place as requested. Mott measurements of the beam polarization or pulsed operation for current monitor calibrations represent examples of such interruptions. Interruptions of this type require, at a minimum, 24 hours advance notification and coordination with the Program Deputy and the other halls.

These interruptions shall be limited by a sum rule - the total time lost to the non-priority hall(s) due to such requests shall not exceed 2.5 hours in any 24-hour period. It is, of course, highly preferred that these measurements be scheduled at the morning meeting of the run coordinators whenever possible, and coordinated between halls whenever possible.

When the priority hall has requested a re-tune, if the re-tune degrades a previously acceptable beam for one of the other, lower priority running halls, then the re-tune shall continue until the beam is acceptable to both the priority hall and the other running halls that had acceptable beam at the time the re-tune began.

Non-priority halls can:

- require that a retune of the accelerator take place within 2.5 hours of the desired time (it will nominally occur at the earliest convenient break in the priority hall's schedule)
- require access to the hall within 1 hour of the desired time (again, it will nominally occur at the earliest convenient break in the priority hall's schedule)
- request that beam delivery interruptions for experiment-related operations which temporarily block normal beam delivery to all other halls occur within 2.5 hours of the desired time. Interruptions of this type require, at a minimum, 24 hours advance notification and coordination with the Program Deputy and the other halls.

The ability of non-priority halls to request retunes and accesses shall be limited by a sum rule - the total time lost to the priority hall due to such requests shall not exceed 2.5 hours in any 24-hour period. (To facilitate more extended tuning associated with complex beam delivery, with the agreement of the run coordinators for all operating halls, the sum rule may be applied over a period as long as three days, so long as the average impact is less than 2.5 hours/day.) In the event that two non-priority halls are running, the 2.5 hours shall be split evenly between them in the absence of mutual agreement on a different split.

All Halls:

Can negotiate with other halls, and with the Accelerator and Physics Division for changes in scheduled energy changes (either direction).

Initial Tune-up of New Beams:

Normally one and one half shifts (12 hours) is set aside for tune-up whenever a new beam setup is being tuned (for unusual beam setups more time may be scheduled explicitly for tuning at the discretion of the scheduling committee). It is understood that beam tune-ups shall *always* be done in the order that the accelerator operations group believes will minimize the *total* time needed to tune *all* scheduled beams (i.e., the "priority hall" beam is not necessarily tuned first). In the event that obtaining the new beam setup requires more than the scheduled time, the Accelerator Program Deputy is authorized to spend up to one additional shift of tuning in an effort to deliver all scheduled beams instead of just the "priority hall" beam.

Maintenance/Beam Studies. Accelerator Division may request up to sixteen hours per week. Users will be consulted in deciding how these sixteen hours per week are placed on the calendar, i.e. five shorter or three long blocks of time.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
91	05/28/18	Monday												
92	05/29/18	Tuesday												
93	05/30/18	wednesday												
94	05/31/18	Thursday												
95	06/01/18	Friday												
96	06/02/18	Saturday												
97	06/03/18	Sunday												
98	06/04/18	Monday												
99	06/05/18	Tuesday												
100	06/06/18	wednesday												
101	06/07/18	Thursday												
102	06/08/18	Friday												
103	06/09/18	Saturday												
104	06/10/18	Sunday												
105	06/11/18	Monday												
106	06/12/18	Tuesday												
107	06/13/18	wednesday												
108	06/14/18	Thursday												
109	06/15/18	Friday												
110	06/16/18	Saturday												
111	06/17/18	Sunday												
112	06/18/18	Monday												
113	06/19/18	Tuesday												
114	06/20/18	wednesday												
115	06/21/18	Thursday												
116	06/22/18	Friday												
117	06/23/18	Saturday												
118	06/24/18	Sunday												
119	06/25/18	Monday												
120	06/26/18	Tuesday												
121	06/27/18	wednesday												
122	06/28/18	Thursday												
123	06/29/18	Friday												
124	06/30/18	Saturday												
125	07/01/18	Sunday												
126	07/02/18	Monday												
127	07/03/18	Tuesday												
128	07/04/18	wednesday												
129	07/05/18	Thursday												
130	07/06/18	Friday												
131	07/07/18	Saturday												
132	07/08/18	Sunday												
133	07/09/18	Monday												
134	07/10/18	Tuesday												
135	07/11/18	wednesday												
136	07/12/18	Thursday												
137	07/13/18	Friday												
138	07/14/18	Saturday												
139	07/15/18	Sunday												
140	07/16/18	Monday												
141	07/17/18	Tuesday												
142	07/18/18	wednesday												
143	07/19/18	Thursday												
144	07/20/18	Friday												
145	07/21/18	Saturday												
146	07/22/18	Sunday												
147	07/23/18	Monday												
148	07/24/18	Tuesday												
149	07/25/18	wednesday												
150	07/26/18	Thursday												
151	07/27/18	Friday												
152	07/28/18	Saturday												
153	07/29/18	Sunday												
154	07/30/18	Monday												
155	07/31/18	Tuesday												
156	08/01/18	wednesday												
157	08/02/18	Thursday												
158	08/03/18	Friday												
159	08/04/18	Saturday												
160	08/05/18	Sunday												
161	08/06/18	Monday												
162	08/07/18	Tuesday												
163	08/08/18	wednesday												
164	08/09/18	Thursday												
165	08/10/18	Friday												
166	08/11/18	Saturday												
167	08/12/18	Sunday												
168	08/13/18	Monday												
169	08/14/18	Tuesday												
170	08/15/18	wednesday	2.1	Restore										
171	08/16/18	Thursday	2.1	Restore										
172	08/17/18	Friday	2.1	Restore										
173	08/18/18	Saturday	2.1	Restore										
174	08/19/18	Sunday	2.1	Restore										
175	08/20/18	Monday	2.1	Restore										
176	08/21/18	Tuesday	2.1	Restore										
177	08/22/18	wednesday	2.1	Physics			Run Group A	10.6/100/p/250	E12-09-011	8.5/70/-/250	E12-06-102	11.7/200/-/250	D/C/B/A	-/5/4/5.5
178	08/23/18	Thursday	2.1	Physics			Run Group A	10.6/100/p/250	E12-09-011	8.5/70/-/250	E12-06-102	11.7/200/-/250	D/C/B/A	-/5/4/5.5
179	08/24/18	Friday	2.1	Physics			Run Group A	10.6/100/p/250	E12-09-011	8.5/70/-/250	E12-06-102	11.7/200/-/250	D/C/B/A	-/5/4/5.5
180	08/25/18	Saturday	2.1	Physics			Run Group A	10.6/100/p/250	E12-09-011	8.5/70/-/250	E12-06-102	11.7/200/-/250	D/C/B/A	-/5/4/5.5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
271	11/24/18	Saturday	1.86	Physics			Run Group K	7.5/100/p/250	E12-09-011	9.4/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	B/D/C/A	-/4/5/5.5
272	11/25/18	Sunday	1.86	Physics			Run Group K	7.5/100/p/250	E12-09-011	9.4/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	D/C/B/A	-/4/5/5.5
273	11/26/18	Monday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	9.4/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	D/C/B/A	-/4/5/5.5
274	11/27/18	Tuesday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	9.4/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	D/C/B/A	-/4/5/5.5
275	11/28/18	Wednesday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	9.4/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	C/B/D/A	-/4/5/5.5
276	11/29/18	Thursday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	Pass Change	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	C/B/D/A	-/4/2/5.5
277	11/30/18	Friday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	C/B/D/A	-/4/2/5.5
278	12/01/18	Saturday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	B/D/C/A	-/4/2/5.5
279	12/02/18	Sunday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	B/D/C/A	-/4/2/5.5
280	12/03/18	Monday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	B/D/C/A	-/4/2/5.5
281	12/04/18	Tuesday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	D/C/B/A	-/4/2/5.5
282	12/05/18	Wednesday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	D/C/B/A	-/4/2/5.5
283	12/06/18	Thursday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	D/C/B/A	-/4/2/5.5
284	12/07/18	Friday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	C/B/D/A	-/4/2/5.5
285	12/08/18	Saturday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	C/B/D/A	-/4/2/5.5
286	12/09/18	Sunday	1.86	Physics	INSTALL		Run Group K	7.5/100/p/250	E12-09-011	3.8/70/-/500	GlueX-II/Primakoff tests?	10.3/200/-/250	C/B/D/A	-/4/2/5.5
287	12/10/18	Monday	1.61	Accelerator	INSTALL									
288	12/11/18	Tuesday	1.61	Accelerator	INSTALL									
289	12/12/18	Wednesday	1.61	Accelerator	INSTALL									
290	12/13/18	Thursday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	C/B/D/A	-/4/3/5.5
291	12/14/18	Friday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	C/B/D/A	-/4/3/5.5
292	12/15/18	Saturday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	B/D/C/A	-/4/3/5.5
293	12/16/18	Sunday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	B/D/C/A	-/4/3/5.5
294	12/17/18	Monday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	D/C/B/A	-/4/3/5.5
295	12/18/18	Tuesday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	D/C/B/A	-/4/3/5.5
296	12/19/18	Wednesday	1.61	Physics	INSTALL		Run Group K	6.5/100/p/250	E12-09-011	4.9/70/-/500	GlueX-II/Primakoff tests?	9/200/-/250	C/B/D/A	-/4/3/5.5
297	12/20/18	Thursday			INSTALL									
298	12/21/18	Friday			INSTALL									
299	12/22/18	Saturday												
300	12/23/18	Sunday												
301	12/24/18	Monday												
302	12/25/18	Tuesday												
303	12/26/18	Wednesday												
304	12/27/18	Thursday												
305	12/28/18	Friday												
306	12/29/18	Saturday												
307	12/30/18	Sunday												
308	12/31/18	Monday												
309	01/01/19	Tuesday												
310	01/02/19	Wednesday			INSTALL									
311	01/03/19	Thursday			INSTALL									
312	01/04/19	Friday			INSTALL									
313	01/05/19	Saturday			INSTALL									
314	01/06/19	Sunday			INSTALL									
315	01/07/19	Monday			INSTALL									
316	01/08/19	Tuesday			INSTALL									
317	01/09/19	Wednesday			INSTALL									
318	01/10/19	Thursday			INSTALL									
319	01/11/19	Friday			INSTALL									
320	01/12/19	Saturday			INSTALL									
321	01/13/19	Sunday			INSTALL									
322	01/14/19	Monday			INSTALL									
323	01/15/19	Tuesday			INSTALL									
324	01/16/19	Wednesday			INSTALL									
325	01/17/19	Thursday			INSTALL									
326	01/18/19	Friday			INSTALL									
327	01/19/19	Saturday			INSTALL									
328	01/20/19	Sunday			INSTALL									
329	01/21/19	Monday			INSTALL									
330	01/22/19	Tuesday			INSTALL									
331	01/23/19	Wednesday			INSTALL									
332	01/24/19	Thursday			INSTALL									
333	01/25/19	Friday			INSTALL									
334	01/26/19	Saturday			INSTALL									
335	01/27/19	Sunday			INSTALL									
336	01/28/19	Monday			INSTALL									
337	01/29/19	Tuesday			INSTALL (~8 weeks)									
338	01/30/19	Wednesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	D/C/B/A	1/5/5/5.5
339	01/31/19	Thursday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	D/C/B/A	1/5/5/5.5
340	02/01/19	Friday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	A/D/C/B	1/5/5/5.5
341	02/02/19	Saturday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	A/D/C/B	1/5/5/5.5
342	02/03/19	Sunday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	B/A/D/C	1/5/5/5.5
343	02/04/19	Monday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	B/A/D/C	1/5/5/5.5
344	02/05/19	Tuesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	C/B/A/D	1/5/5/5.5
345	02/06/19	Wednesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	C/B/A/D	1/5/5/5.5
346	02/07/19	Thursday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	C/B/A/D	1/5/5/5.5
347	02/08/19	Friday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	C/B/A/D	1/5/5/5.5
348	02/09/19	Saturday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	D/C/B/A	1/5/5/5.5
349	02/10/19	Sunday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	D/C/B/A	1/5/5/5.5
350	02/11/19	Monday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	D/C/B/A	1/5/5/5.5
351	02/12/19	Tuesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	D/C/B/A	1/5/5/5.5
352	02/13/19	Wednesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	A/D/C/B	1/5/5/5.5
353	02/14/19	Thursday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	A/D/C/B	1/5/5/5.5
354	02/15/19	Friday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	A/D/C/B	1/5/5/5.5
355	02/16/19	Saturday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	A/D/C/B	1/5/5/5.5
356	02/17/19	Sunday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	B/A/D/C	1/5/5/5.5
357	02/18/19	Monday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	B/A/D/C	1/5/5/5.5
358	02/19/19	Tuesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	B/A/D/C	1/5/5/5.5
359	02/20/19	Wednesday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-16-007	10.6/70/-/250	E12-10-011	11.7/200/-/250	B/A/D/C	1/5/5/5.5
360	02/21/19	Thursday	2.1	Physics	E12-10-009	2.2/70/-/500	Run Group B	10.6/100/p/250	E12-09-002	10.6/70/-/250	E12-10-011	11.7/200/-/250	C/B/A/D	1/5/5/5.5

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
451	05/23/19	Thursday			INSTALL									
452	05/24/19	Friday			INSTALL									
453	05/25/19	Saturday			INSTALL									
454	05/26/19	Sunday			INSTALL (11 WEEKS)									
455	05/27/19	Monday												
456	05/28/19	Tuesday												
457	05/29/19	wednesday												
458	05/30/19	Thursday												
459	05/31/19	Friday												
460	06/01/19	Saturday												
461	06/02/19	Sunday												
462	06/03/19	Monday												
463	06/04/19	Tuesday												
464	06/05/19	wednesday												
465	06/06/19	Thursday												
466	06/07/19	Friday												
467	06/08/19	Saturday												
468	06/09/19	Sunday												
469	06/10/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	E12-06-101/-07-105	2.75/90/-/500			B/A/C	1/5/3/-
470	06/11/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	E12-07-105/-06-101	2.75/90/-/500			B/A/C	1/5/3/-
471	06/12/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	Pass change	3.65/90/-/500			A/C/B	1/5/4/-
472	06/13/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	E12-06-101/-07-105	3.65/90/-/500			A/C/B	1/5/4/-
473	06/14/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	E12-07-105/-06-101	3.65/90/-/500			C/B/A	1/5/4/-
474	06/15/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	Pass change	4.55/90/-/500			C/B/A	1/5/5/-
475	06/16/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	E12-06-101/-07-105	4.55/90/-/500			B/A/C	1/5/5/-
476	06/17/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	E12-07-105/-06-101	4.55/90/-/500			B/A/C	1/5/5/-
477	06/18/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				B/A/C	1/5/TBD/-
478	06/19/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				B/A/C	1/5/TBD/-
479	06/20/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				A/C/B	1/5/TBD/-
480	06/21/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				A/C/B	1/5/TBD/-
481	06/22/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				A/C/B	1/5/TBD/-
482	06/23/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				A/C/B	1/5/TBD/-
483	06/24/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				C/B/A	1/5/TBD/-
484	06/25/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				C/B/A	1/5/TBD/-
485	06/26/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				C/B/A	1/5/TBD/-
486	06/27/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				C/B/A	1/5/TBD/-
487	06/28/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				B/A/C	1/5/TBD/-
488	06/29/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				B/A/C	1/5/TBD/-
489	06/30/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	TBD				B/A/C	1/5/TBD/-
490	07/01/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
491	07/02/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
492	07/03/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
493	07/04/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
494	07/05/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
495	07/06/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
496	07/07/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
497	07/08/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
498	07/09/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
499	07/10/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
500	07/11/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
501	07/12/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
502	07/13/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
503	07/14/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
504	07/15/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
505	07/16/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
506	07/17/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
507	07/18/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
508	07/19/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
509	07/20/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
510	07/21/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
511	07/22/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
512	07/23/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
513	07/24/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
514	07/25/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
515	07/26/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
516	07/27/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
517	07/28/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
518	07/29/19	Monday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
519	07/30/19	Tuesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
520	07/31/19	wednesday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
521	08/01/19	Thursday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
522	08/02/19	Friday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				B/A	1/5/-/-
523	08/03/19	Saturday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
524	08/04/19	Sunday	0.9	Physics	E12-11-101	0.95/70/p/500	E12-11-006	4.55/100/-/500	INSTALL				A/B	1/5/-/-
525	08/05/19	Monday	OFF						INSTALL					
526	08/06/19	Tuesday							INSTALL					
527	08/07/19	wednesday							INSTALL					
528	08/08/19	Thursday							INSTALL					
529	08/09/19	Friday							INSTALL					
530	08/10/19	Saturday							INSTALL					
531	08/11/19	Sunday							INSTALL					
532	08/12/19	Monday							INSTALL					
533	08/13/19	Tuesday							INSTALL					
534	08/14/19	wednesday							INSTALL					
535	08/15/19	Thursday							INSTALL					
536	08/16/19	Friday							INSTALL					
537	08/17/19	Saturday							INSTALL					
538	08/18/19	Sunday							INSTALL					
539	08/19/19	Monday							INSTALL					
540	08/20/19	Tuesday							INSTALL					

