

SBS/GEN Pre Beam Checklist

Last revised 10-03-2022 **Date** _____ **time** _____

This checklist will be performed after every restricted access to Hall A that maintenance is performed

Person(s) Completing Checklist _____

Left-HRS

Spectrometers

___ Current L-HRS angle parked at 95 degrees (not to be used for calculations)

N/A Check spectrometer for obstructions to movement

___ Check Intergen bottles for correct pressure

___ Ensure that Intergen alarm switch is in the normal position and the green light on the front panel is on

N/A Ensure that 14-degree stop pin is installed (if used)

N/A Ensure that outer limit stop is installed (if used)

N/A Minimum/Maximum angles for spectrometer from _____ to _____ degrees.

___ Ensure that the Q3 insulating vacuum pump is on and has sufficient oil

___ Ensure the Q3 automatic valve is closed and open and it's the Convectron gage reads 0

___ Ensure that the Q2 insulating vacuum pump/ blower is on and has sufficient oil

___ Ensure the Q2 automatic valve is operational and open and it's the Convectron gage reads 0

___ Ensure that spectrometer turbo backing pump is on, has sufficient oil and that the automatic valve is operational

Vacuum

N/A Turbo on at turbo controller in rack # 1H71B01

N/A Pump valves open at valve controller in rack # 1H71B01 channel #2

N/A Convectron gages read "0" millitorr rack # 1H71B01

N/A Cold cathode gauge in rack # 1H71B01 < 5x10⁻⁵

N/A Actual cold cathode reading N/A

****PLEASE MAKE SURE ALL TEMP. READOUTS ARE IN FAHRENHEIT AND NOT CELSIUS****

___ Ensure that Q2 lead heaters in rack 1H71B07 are on and operating and at least 40° F
Actual lead temperatures left____ right____

___ Ensure that Q3 lead heaters in rack 1H71B08 are on and operating and at least 40° F
Actual lead temperatures left____ right____

___ Ensure that Dipole lead heaters in rack 1H71Q are on and operating and at least 40° F
Actual lead temperatures left____ right____

___ Verify bogie power disconnects are OFF and an Administrative lock is applied

Power Supplies (L-HRS)

*****MAKE SURE LCW IS ON TO ALL POWER SUPPLIES BEFORE POWERING ON*****

Q1:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Unlock power disconnect switch and turn on AC power

N/A Visually check power supply front panel for faults

N/A When all faults have been cleared, Ensure that power supply is in remote control (light ON= remote)

Q2:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Ensure that all doors and panels are closed and secured

N/A Unlock power disconnect switch and turn on AC power

N/A Turn on both sets of three pole breakers located on power supply

N/A Visually check power supply for faults

N/A When all faults have been cleared, lift lever on lower right side of supply

N/A Ensure that power supply is in remote control

Q3:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Ensure that all doors and panels are closed and secured

N/A Unlock power disconnect switch and turn on AC power

N/A Turn on both sets of three pole breakers located on power supply

N/A Visually check power supply for faults

N/A When all faults have been cleared, lift lever on lower right side of supply

N/A Ensure that power supply is in remote control

Dipole:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Unlock power disconnect switch and turn on AC power

N/A Turn on power lever on right upper side of supply

N/A Visually check power supply for faults on supply and at rack #

N/A When all faults have been cleared, Ensure that power supply is in remote control

N/A Ensure Kepco power supply is on in rack # 1H71B06

N/A Check position of polarity switch in rack # 1H71B06 positive___ negative___

N/A NMR gradient compensation for proper polarity positive___ negative___ (Dipole balcony)

Right-HRS (spectrometer is decommission)

Spectrometers

- N/A Current R-HRS angle _____ (not to be used for calculations)
- N/A Check spectrometer for obstructions to movement
- Check Intergen bottles for correct pressure
- Ensure that Intergen alarm switch is in the normal position and the green light on the front panel is on
- N/A Ensure that 14-degree stop pin is installed
- N/A Ensure that outer limit stop is installed (if used)
- N/A Minimum/maximum angles for spectrometer _____ to _____ degrees.
- N/A Ensure that the Dipole automatic valve is operational and open, that the Convectron gage reads 0 and that the backing pump is on, has sufficient oil
- N/A Ensure that the Q3 automatic valve is operational and open, that the Convectron gage reads 0 and that the backing pump is on, and has sufficient oil
- N/A Ensure that the Q2 insulating vacuum pump is on, and has sufficient oil
- N/A Ensure the Q2 automatic valve is operational and open and it's the Convectron gage reads 0
- N/A Ensure that spectrometer turbo backing pump is on, has sufficient oil and that the automatic valve is operational

Vacuum

- N/A Turbo on at turbo controller in rack # 1H72B01
- N/A Pump valves open at valve controller in rack # 1H72B01 channel #2
- N/A Convectron gages read "0" millitorr in rack # 1H72B01
- N/A Cold cathode gauge in rack # 1H72B01 < 5x10-5
- N/A Actual cold cathode reading _____

****PLEASE MAKE SURE ALL TEMP. READOUTS ARE IN FAHRENHEIT AND NOT CELSIUS****

N/A Ensure that Q2 lead heaters in rack 1H72B08 are on and operating and at least 40° F
Actual lead temperatures left____ right____

N/A Ensure that Q3 lead heaters in rack 1H72B07 are on and operating and at least 40° F
Actual lead temperatures left____ right____

N/A Ensure that Dipole lead heaters in rack 1H72Q are on and operating and at least 40° F
Actual lead temperatures left____ right____

N/A Bogie power is ON ____ Off ____

Power Supplies (R-HRS)

MAKE SURE LCW IS ON TO ALL POWER SUPPLIES BEFORE POWERING ON

Q1:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Unlock power disconnect switch and turn on AC power

N/A Visually check power supply front panel for faults

N/A When all faults have been cleared, Ensure that power supply is in remote control (light ON= remote)

Q2:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Ensure that all doors and panels are closed and secured

N/A Unlock power disconnect switch and turn on AC power

N/A Turn on both sets of three pole breakers located on power supply

N/A Visually check power supply for faults

N/A When all faults have been cleared, lift lever on lower right side of supply.

N/A Ensure that power supply is in remote control

Q3:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Ensure that all doors and panels are closed and secured

N/A Unlock power disconnect switch and turn on AC power

N/A Turn on both sets of three pole breakers located on power supply

N/A Visually check power supply for faults.

N/A When all faults have been cleared, lift lever on lower right side of supply.

N/A Ensure that power supply is in remote control

Dipole:

___ Ensure Power supply is off and an Administration lock is applied

N/A Visual inspection of main current leads, dump resistor, and lead flags (for condition, visual shorts, etc.)

N/A Unlock power disconnect switch and turn on AC power

N/A Turn on power lever on right upper side of supply.

N/A Visually, check power supply for faults on supply and at rack #OD172Q

N/A When all faults have been cleared, Ensure that power supply is in remote control

N/A Ensure Kepco power supply is on in rack # 1H72B06

N/A Check position of polarity switch in rack # 1H72B06 positive___ negative___

N/A NMR gradient compensation for proper polarity positive___ negative___ (Dipole balcony)

SBS/Gen Equipment (at the magnets)

Magnet Shielding and Laser Box

- Ensure all platforms (upper & lower) are free of tools, equipment, debris, etc.
- Ensure inside the target enclosure is free of all tools (including lights), equipment, debris, etc.
- Ensure all panels for the Laser Box are installed and taped with aluminum tape
- Ensure pump is running that is connected to the under-side of Laser Box
- Ensure steel panels are installed over opening (leading to BB and SBS) for the current run
- Ensure alignment fiducials and posts are removed
- Ensure oven air flow is ON
- Ensure Variacs are on and at nominal values
- Ensure both sets (Be window & target cell) of cooling jets are ON
- Ensure all electronics (NMR & ERP) in small upstream bunker are turned ON
- Ensure collimator blocks that goes on G10 are installed for current run
- Ensure HCAL soft photon blocker
- Remove covers from Beryllium windows on the entrance and exit beamline
- Verify Ion chamber is mounted inside target enclosure near entrance beamline
- Ensure radiation pump is running and light on flow monitor is GREEN
- Ensure black (gaffer) tape is applied to aluminum frame around inside of door
- Ensure all doors on magnetic shielding are closed and taped with black (gaffer) tape
- Ensure all interlock lights are green on the front of Polarized 3He rack in upstream bunker

SBS:

- Conduct thorough walk-around of the SBS magnet picking up all loose items laying within 20ft of magnet and counterweight assembly.
- Remove all items from SBS counterweight steel.
- Check the center and front cutout of the magnet for loose/foreign objects (tools, jacks, metal, etc.)
- Check top of magnet for loose/foreign objects.
- Verify guards are install and secure
- Conduct visual inspection of main current leads and lead flags at the magnet. (look for foreign objects, loose connections, visual shorts, etc.)
- Verify hydraulic jacks are down on the floor and locked into place. You should see a slight gap at the center rotating point of Hillman Rollers
- Remove all ladders, step stools, and roll away stairs at least 20ft away from the magnet.
- Verify LCW is on and is at least 110 psi
- Verify no water leaks
- N/A SBS sieve status (check one) In Out

BigBite:

- Conduct thorough walk-around of the BigBite magnet picking up all loose items laying within 20ft of magnet and detector assembly.
- Remove all items from BigBite detector platform.
- Check the center and base of the magnet for loose/foreign objects (tools, jacks, metal, etc.)
- Check top of magnet for loose/foreign objects.
- Verify guards are install and secure
- Conduct visual inspection of main current leads and lead flags at the magnet. (look for foreign objects, loose connections, visual shorts, etc.)
- Verify that hard stops are installed on floor (curved) Hillman roller track.
- Verify that hard stops are installed on BigBite (I-beam) track and magnet
- Remove all ladders, step stools, and roll away stairs at least 20ft away from the magnet.
- Verify LCW is on and is at least 110 psi.

- ___ Verify no water leaks
- ___ BB sieve status (check one) ___In ___Out

Exit Beamline Correctors:

- ___ Conduct thorough walk-around of the exit beamline corrector magnets picking up all loose items laying within 20ft of magnets.
- ___ Verify exit beamline magnetic shielding is installed.
- ___ Check top of magnet for loose/foreign objects (tools, jacks, metal, etc.)
- ___ Verify guards are install and secure
- ___ Conduct visual inspection of main current leads and lead flags at the magnet. (look for foreign objects, loose connections, visual shorts, etc.)
- ___ Verify upstream and downstream corrector braces are installed between SBS and the correctors
- ___ Remove all ladders, step stools, and roll away stairs at least 20ft away from the magnet.
- ___ Verify LCW is on and is at least 100 psi
- ___ Verify no water leaks

SBS/GEN Equipment (at the power supplies)

SBS:

- ___ Conduct visual inspection of main current leads and penetration at the power supply. (look for foreign objects, frayed cables, visual shorts, etc.)
- ___ Verify LCW is on to the power supply and is at least 110 psi.
- ___ Verify no water leaks
- ___ Ensure that all doors and panels are closed and secured
- ___ Unlock power disconnect switch and turn on AC power
- ___ Turn on main power to power supply (push ON button)
- ___ Visually check power supply front panel for faults
- ___ When all faults have been cleared, Ensure that power supply is in remote control (REM & RDY lights should be lit)

BigBite:

- ___ Conduct visual inspection of main current leads and penetration at the power supply. (look for foreign objects, frayed cables, visual shorts, etc.)
- ___ Verify LCW is on to the power supply and is at least 110 psi.
- ___ Verify no water leaks
- ___ Ensure that all doors and panels are closed and secured
- ___ Unlock power disconnect switch and turn on AC power
- ___ Visually check power supply front panel for faults
- ___ When all faults have been cleared, Ensure that power supply is in remote control (light ON= remote)

Exit Beamline Correctors:

- ___ Conduct visual inspection of main current leads and penetration at the power supply. (look for foreign objects, frayed cables, visual shorts, etc.)
- ___ Verify that all four power supplies are plugged in
- ___ Ensure that all doors and panels are closed and secured
- ___ Turn on power switch on front of the four (4) power supplies
- ___ Visually check power supply front panel for faults
- ___ When all faults have been cleared, Ensure that power supply is in remote control

Left-HRS (from the computer)

Spectrometer controls

N/A Bogie controls checked for operation (do not move)

N/A Check movement of left collimator for operation at 3 positions (if used)

N/A Check left angle camera for movement in both directions

Magnet controls

Q1 (check at magnet and LCW lines)

N/A Ensure LCW is on to magnet

N/A Supply pressure _____ psi (must be >100psi)

N/A Return pressure _____ psi (must be <50psi)

Q2

N/A Q2 full of liquid (80%) actual reading from computer _____

N/A Open lead flows on Q2 to 80 slm as read from the Hall A Tools page

N/A Actual lead flows A _____ B _____

D1

N/A Dipole full of liquid (60%) actual reading from computer _____

N/A Open lead flows on Dipole to 80 slm as read from the Hall A Tools page

N/A Actual lead flows A _____ B _____

Q3

N/A Q3 full of liquid (80%) actual reading from computer _____

N/A Open lead flows on Q3 to 100 slm as read from the Hall A Tools page

N/A Actual lead flows A _____ B _____

Right-HRS (from the computer) (spectrometer is decommissioned)

Spectrometer controls

N/A Bogie controls checked for operation (do not move)

N/A Check movement of right collimator for operation at 3 positions (if used)

N/A check right angle camera for movement in both directions

Magnet controls

Q1 (check at magnet and LCW lines)

N/A Ensure LCW is on to magnet

N/A Supply pressure _____ psi (must be >100psi)

N/A Return pressure _____ psi (must be <50psi)

Q2

N/A Q2 full of liquid (80%) actual reading from computer _____

N/A Open lead flows on Q2 to 80 slm as read from the Hall A Tools page

N/A Actual lead flows A_____ B_____

D1

N/A Dipole full of liquid (60%) actual reading from computer _____

N/A Open lead flows on Dipole to 80 slm as read from the Hall A Tools page

N/A Actual lead flows A_____ B_____

Q3

N/A Q3 full of liquid (80%) actual reading from computer _____

N/A Open lead flows on Q3 to 80 slm as read from the Hall A Tools page

N/A Actual lead flows A_____ B_____

Controls check from the computer console

___ Pull up the Hall A tools page

___ Ensure that all of the lead flows for LHRS are in the green

___ Ensure that all liquid levels for LHRS are in the green

N/A Ensure all magnets on L-HRS are the same ___ negative or ___ positive

N/A Ensure all magnets on R-HRS are the same ___ negative or ___ positive

N/A Using the current button open the control page to left Q1

N/A Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A Using the current button open the control page to left Q2

N/A Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A Using the current button open the control page to left Q3

N/A Clear all faults and turn on magnet with correct polarity

___ Ramp magnet to 50 amps

N/A Using the current button open the control page to left Dipole

N/A Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A Using the current button open the control page to right Q1

___ Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A Using the current button open the control page to right Q2

N/A Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A Using the current button open the control page to right Q3

___ Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A Using the current button open the control page to right Dipole

N/A Clear all faults and turn on magnet with correct polarity

N/A Ramp magnet to 50 amps

N/A input .5 GeV for both spectrometers

N/A Ensure that all magnets lock in for the input momentum

N/A List magnets that do not _____

Target Chamber

- ___ Windows on & functional
- ___ Backing pump “on” at pump
- ___ Ensure roughing is closed
- ___ Turbo “on” at rack # 1H75B09 (at least one turbo should be on depending on target)
- ___ Turbo valve “open” at rack # 1H75B09 channel # 1 upper and/or #2 lower
- ___ Ensure target convectron gage is operational in rack # 1H75B09
- ___ Ensure target convectron set point is 5 torr
- ___ Convectron “0” millitorr at rack # 1H75B09
- ___ Cold cathode $< 5 \times 10^{-4}$ at rack # 1H75B08
- ___ Actual cold cathode reading _____

Exit beam tube

- ___ Diffuser cooler on
- ___ Diffuser water level ok
- ___ Backing pump is “on” and operational
- ___ Valve “open” at pump
- ___ Turbo “on” at rack # 1H75B09
- ___ Convectron gage operational
- ___ Convectron “<5” millitorr at rack # 1H75B09
- ___ Actual convectron gage reading _____
- N/A Verify downstream DP region turbo backing pump is on
- N/A Verify downstream DP region turbo is on
- N/A Verify shielding is in place surrounding DP turbo

Entrance beam tube

- ___ Ensure that beam line girder turbo and backing pump are on and running
- ___ Ensure that beam line girder turbo fan is on
- ___ Ensure backing pump has sufficient oil, valve to turbo is open and automatic valve is operational
- ___ Verify cooling water flow to the Moeller Dipole (feel water line to determine if flow is present)
- ___ Verify LCW valves to 4 Moeller Quads are open
- ___ Ensure turbo upstream of Moeller and backing pump are on and running
- ___ Ensure Moeller turbo fan is on
- ___ Ensure backing pump has sufficient oil, valve to turbo is open and automatic valve is operational
- ___ Instrument air compressor functioning normally (this can be done by observing the compressor function [located near the flame lockers] or checking to see if the Hall have compressed air near the pivot)

- ___ Call MCC (x7048), get the name of the person you talked to _____ and say “I am doing the Hall A pre beam checklist, Please Ensure that the Hall A beam line valves are set to close” after they say that they are, say “I am turning the control key from **MAINTENANCE to OPERATIONAL** are you ready” after they say yes, turn key and tell them “you have control could you please open the valves so that we can verify operability and make an e-log entry”

- ___ Actuate the following valves; ___ VBV1C20, ___ VBV1C20A, ___ VBV1H00A, ___ VBV1H00B, ___ VBV1H04B & ___ VBV1H04X.

- ___ Ensure all beam line vacuum valves are “OPEN” (visually check VBV1H04B which is upstream of target enclosure)

Hall

- ___ All interlocks in rack # 1H75B08 indicate green
- ___ Ensure that all 4 Moeller power supplies for on and in remote
- ___ Ensure installation of Ion Chambers at Compton, Moeller, inside target enclosure, and downstream target enclosure
- ___ Correct LCW flow and pressure (≥ 110 psi supply and < 50 psi return)
- N/A CCTV monitors at X terminal off
- ___ Walk to entire beamline clear it of all unnecessary trash, tools and equipment; make sure all guards are on and in place
- ___ Clear the beam line balcony of unnecessary tools, equipment and trash.
- ___ Clear the pivot area both HRS links of unnecessary tools, equipment and trash.
- ___ Clear the left and right power supply balconies of unnecessary tools, equipment and trash.
- ___ Clear the left and right detector platforms of unnecessary tools, equipment and trash.
- ___ Clear the hall floor of unnecessary tools, equipment and trash
- ___ Scissor Lift and Forklift near truck ramp
- ___ Move JLG inside truck ramp
- ___ Ensure that all lifting slings and safety harnesses are correctly stored and that the storage cage is at least 90 deg from the beam dump and at least 60 ft from the target
- ___ Perform pre sweep of run safe boxes [15 totals]. (6-along wall, 3-L-HRS, 3-R-HRS, 1-Compton area, 1-personnel p-way, 1-top truck ramp door)
- N/A Move Left spectrometer stairs clear of lower balcony.
- ___ Ensure raster air conditioner is "ON"
- N/A Ensure polar crane is positioned over the entrance beam pipe, and that power is off at the power disconnect switch
- N/A Ensure that spectrometer entrance window guards are removed
- N/A Ensure that spectrometer exit window guards are removed
- N/A Ensure that detector VDC covers are removed
- N/A Ensure that target window guards are removed
- ___ Ensure operability of shield house doors
- ___ Check camera monitors on upper level of LHRS to verify operability
- ___ Sweep RHRS detector hut for personnel, closed the door, and apply lock.
- ___ Deliver checklist to Work Coordinator

___ Make the following entries into the HALOG

"Checklist Complete"

"Target enclosure has been taped and locked

"BigBite angle is ____ degrees and is at ____ meters"

"SBS angle is ____ degrees and is at ____ meters"

"HCAL angle is ____ degrees and is at ____ meters"

"BigBite external sieve is ____"

"The tech on call at startup is ____"

***Note any outstanding issues not completed on the checklist

***Note any special requirements or restrictions

Name of person checklist was delivered to _____ .