HAM4 Installation Plan DCC:E070289-00-0

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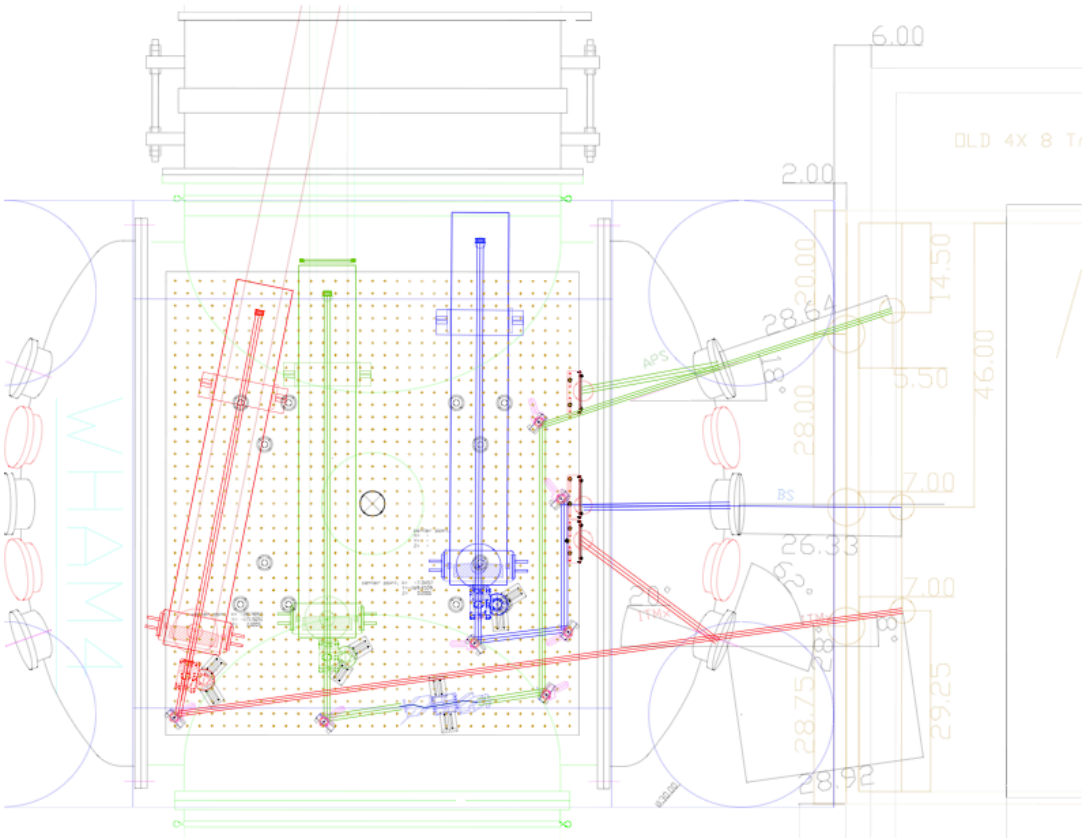
HAM4 installation goals. There are 4 goals of the HAM4 work. 1) Insert 50/50 beam splitter to direct 50% of the beam through HAM6 septum window while maintaining 50% of the beam on the current path to ISCT4. 2) Add two viewport beam dumps to the edge of the table to catch the two ghost beams from the septum window. 3) Catch the beam splitter ghost beam incident on the septum plate. 4) If possible (and deemed necessary), catch the beam splitter ghost beam along the ISCT4 beam path.

Existing HAM4 installation. As shown in the figure below of the As Built LHO HAM4, the green AS telescope is followed by a steering mirror, here designated SM1, the output faraday isolator, OFI, a second steering mirror, SM2, a third steering mirror, SM3, and the viewport, ASVP. Following the viewport, the beam is caught on a periscope on ISCT4. An output beam splitter, OBS, and two septum window beam dumps, SBD1 and SBD2, will be added to the HAM4 table. Access to the HAM4 table will be primarily through HAM5, which is from the bottom side of this image. At LHO, this table is counterweighted with a few large masses towards the table center. Holes will be counted and numbered from the lower left corner of this image; there are 33 holes left to right, 37 holes top to bottom, on two inch centers. The BS will be placed 13 inches, or ~6.5 holes to the +x side of the centerline.



1) ***Existing beam Irises.*** Irises will be placed to recover the existing beam after the shift of the OFI and the insertion of the OBS. The first iris should be placed immediately after SM2 at ~(31,4). If possible, a second iris should be placed at ~(31, 24) immediately before SM3. An iris or a target should be placed outside the ASVP to catch the beam transiting the window.
2) ***Shift OFI.*** The faraday should be translated along the beam by ~10" towards SM1 as far as possible. This may be accomplished using rails if deemed appropriate, otherwise the Faraday can be re-aligned to the existing beam.
3) ***Mount SBDs.*** The septum beam dumps are mounted to the edge of the HAM4 table. In order to confirm their mounting location, a green 532 nm laser pointer mounted in a DLC mount will be placed at the location of the OBS. The laser will be directed to the septum window center and the ghost beams should then be seen on the edge of the HAM4 table. If necessary, the septum window will be adjusted until the ghost beams can be caught with the two SBDs. SBD1 should be mounted roughly at x = 13 inches, while SBD2 should be mounted at x = -xxxx inches.
4) ***Mount OBS.*** The 2" 50/50 output beamsplitter will then be mounted in its DLC mount on a 2 inch post immediately after the OFI at x=13", maximizing the clearance of the transmitted and reflected beams. The 1064nm AS beam light will be directed to a target at the center of the septum window. If the HAM6 table is installed, the target could be an iris on the HAM6 table. The OBS transmitted beam will be shifted by 0.150" as it continues to ISCT4.
5) ***Recover ISCT4 alignment.*** Using the irises, SM1 and SM2, recover the existing ISCT4 alignment. In the worst case scenario, the OFI will have to be shifted and the angle between SM1 and SM2 adjusted to account for the OBS beam shift. Best case scenario, 0.150" is small compared to the clear aperture and the transmitted beam is OK.
6) ***Mount OBS reflected ghost beam dump.*** This beam dump is mounted in the blank flange at x = -7.5" in the septum plate. As there will be no visible beam on this dump, it will be dead reckoned and can, in fact, be installed at any time both sides of the septum are vented.
7) ***Mount OBS transmitted ghost beam dump.*** As of this writing, its not clear if there is clearance for the OBS transmitted ghost beam dump on the HAM4 table or if the ghost beam will clear the ASVP so that it may be dumped on ISCT4. If we can dump the beam on HAM4, we will install a beam dump between SM2 and SM3 using our dead-reckoning powers.