**Quick Macropulse/TMG History**

**Feb 2020 – Hall B “sticky” laser issue.**

CEBAF Hall B and UITF TMG had an issue with the ½ wave plate not retracting (or staying retracted) out of the beam path during CW.

After a phone conference with John, we decided to replace the 18V PS in the macropulse chassis with a 24V unit. This also involved removing the 6V booster chip needed for EPICS. The original R5 value on the shutter board in the TMG was 10k ohm. This fixed the PWM signal at about 70% +duty cycle. In an effort to decrease the solenoid from getting too hot, I eventually landed on R5 at 12K ohm which was about 64% +duty cycle.

This macropulse chassis mod was made to CEBAF, UITF and GTS and has eliminated the “sticky” laser problem. The updated drawing is on the wiki at https://wiki.jlab.org/ciswiki/index.php/SCAM\_macropulse\_controller\_used\_at\_CEBAF\_GTS\_and\_UITF (macropulse\_2020.pdf).

March 2021 – Trouble with Hall D shutter opening and closing without stopping. Found a cold solder joint (R8 of shutter board causing the PMW signal to be on at 94% (making the shutter very hot). After reflowing the resistor, the duty cycle was back to a normal 36%. Shutter now working as it should.

**August 2021 – Hall C tune beam disappearing.**

Initial testing could not reproduce the failure. I measured the PWM signal to the shutter as: freq. = 26.6khz, +duty = 36%. All looked good but replaced the “C” TMG and shutter with spare (8-10-21). Did not fix the intermittent issue.

On 9-28-21 the macropulse chassis was replaced with the unit from the GTS. This seemed to work for a few days but the problem soon returned (possibly more frequently).

\*From Ops observations and testing while the problem was happening, I believe it is safe to say the shutter is closing when it should be open.