Adam's APD Motherboard setup procedures

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1. Do not put the APDs onto the motherboard.

2. Make sure power supplies (±18 V, ±8 V, -27 V) are giving prover voltage before plugging them into the motherboard.

3. Plug power supplies into motherboard, with power supplies off.

4. Make sure JP1 jumper set to 'normal'. ('Booster' inverts the gate signal before sending to daughterboards)

5. Jumpers J4 and J5 are a way to add delay to the comparator latch signal. The comparators on the baughterboards have to be enabled before the gate signal reaches their inputs. Since the gate signal takes much longer to get to the comparator than the latch enable signal, we delay the enable signal. We currently have J4 set to the lowest delay, and J5 set to the highest delay. The delay chips have changed so the labels on the motherboard are outdated.

6. Power the motherboard power supplies.

7. Set "-30 V", to -24 V. This is the highest voltage the APDs can ever see on the copper block terminal if something goes wrong. The "-30 V" can be probed at pin 3 of U14, or R49 or C32. Set this voltage by turning R50.

8. Set APD_Bias to about -23.5 V. This is the voltage applied to the common terminals of the APDs, and can be probed at pin 6 of U17, or the big pad that the copper block screws on to. The APDs breakdown at about -24.2 V, so make sure APD_Bias is below -24.2 V.

9. Set V0_APD to about 4 V for all daughterboards by adjusting the pots in the little pot forest. You can probe VO_APD on the pots themselves, or on the slot that the daughterboard plugs into. The APDs will be biased by about (but not exactly) APD_Bias - V0_APD.

10. Verify that V0_APD, ±15 V, ±5 V are as they should be on all the slots for the daughterboards.

11. Send gate signals into the motherboard's "ACM" socket, and make sure that the gate signal is getting to all the daughterboard sockets.

12. Send gate signals instead into the motherboards "9327" socket and set "GATE_EN" high (5V). Make sure gates are getting to all the daughterboard sockets. This is how the APDs are gated on for fiducials when the 9327 detects a laser fire.

13. Send gate signals instead into the motherboards "9327" socket and set "GATE_EN" low (0V). Make sure NO gates are getting to all the daughterboard sockets.

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Daughterboard sockets
                   VO_APD [ [ All GND
                     0 V [ [
                    GATE [ [
COMPARATOR ENABLE (LATCH) [ [
                     0 V [ [
                   +15 V [ [
                   -15 V [ [
                    +8 V [ [
                    -8 V [ [
                     0 V [ [
                 /SIG OUT [ [
                  SIG OUT [ [ All GND


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                    | APDS |
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