DSG Hall A GEM Activities Update

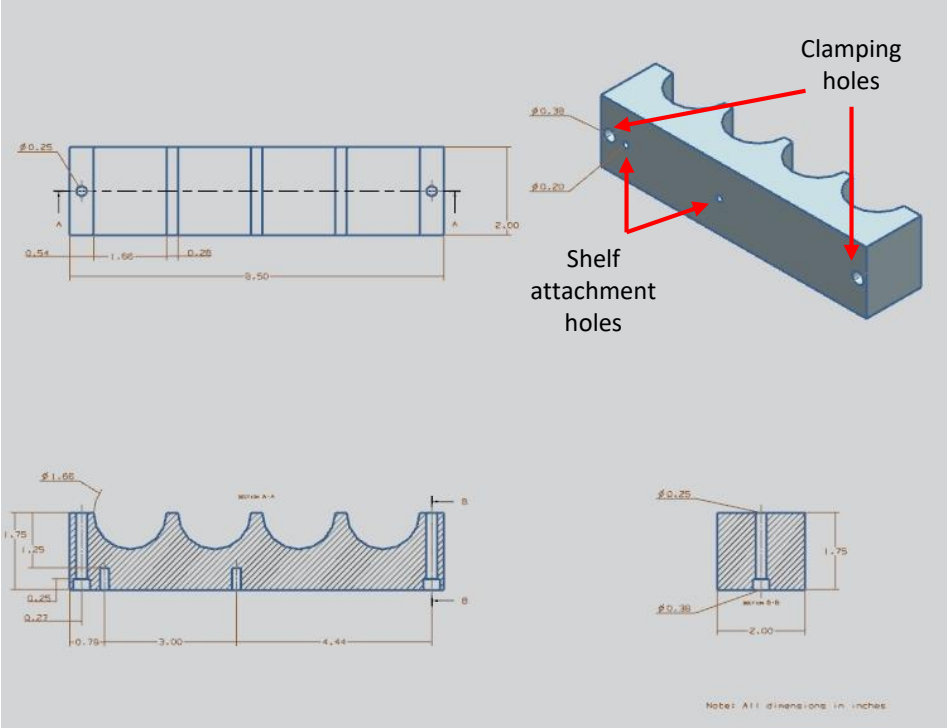
Marc McMullen
Detector Support Group
Wednesday, June 26, 2024

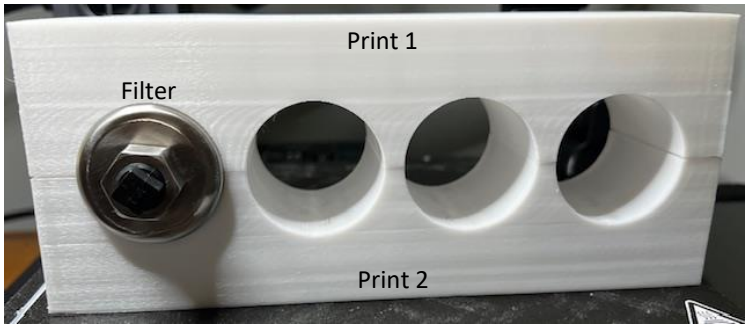
Contents

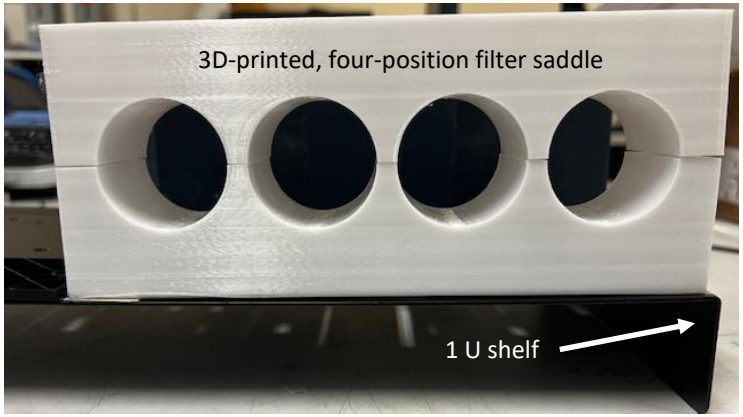
- Gas distribution system filter upgrade
- BigBite gas distribution relocation procedure
- CAEN high voltage troubleshooting
- Conclusion

Gas Distribution System Filter Upgrade

- Gas filters – George Jacobs sketched a prototype four-position filter saddle
- Marc McMullen designed the part in NX12 and made a prototype 3D print
- Improvements being made before being send out for production (18 to 20 units)
  - The part is printed twice and positioned to make the saddle
  - There are two holes that clamp the filter saddle on the filters
  - There are two holes to align the base of the saddle to the premade slots on the 1 U shelf







- Gas Filter mounting shelves - We have, in-hand, enough [illegible]

BigBite Gas Distribution Relocation Procedure

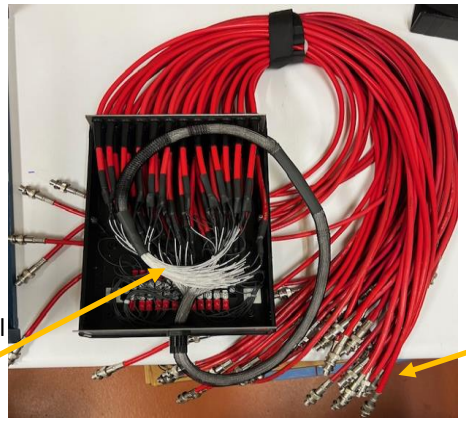
George Jacobs wrote a procedure for moving the GEM BB gas supply panels to the SBS rack.

Items 1, 9, 10, 11, and 12 have steps which require involvement of the Hall A technical staff (pressure systems activities)

1. Depressurize the 1/2" supply line to the BB gas panel and remove it from the pressure regulator. (**Hall A techs**)
    a) The BB gas supply line will not be used and should be removed from service.
2. Remove the 1/4" lines from the 3 BB gas panels.
3. Disconnect cables from BB pressure sensors and BB flow transducer chassis.
4. Remove the 3 BB gas supply panels from BB gas supply rack.
5. Install panels on back side of SBS gas supply rack.
    a) Install the BB flow transducer chassis above the SBS panels maintaining a 1U gap.
    b) Install the BB FMV panel above the BB flow transducer panel with no gap.
    c) Install the BB PR and distribution manifold panel above the BB FMV panel with no gap.
6. Install and label new 1/4" lines from the BB supply manifolds to the BB FMV inlets.
7. Install and label new 1/4" lines from the BB FMV outlets to the flow transducer inlet panel.
8. Connect cables to BB pressure transducers and BB flow transducer chassis.
9. Depressurize the 1/2" supply line to the SBS gas panel. (**Hall A techs**)
10. Install a 1/2" tee fitting in the SBS gas supply line and run a new section of 1/2" tubing from the tee to the BB gas supply PR inlet port. (**Hall A techs**)
11. Pressurize the 1/2" GEM gas supply line and leak check system. (**Hall A techs**)
12. Connect BB GEM gas lines to BB flow transducer chassis outlets. (**Hall A techs**)

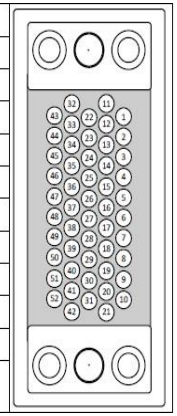
CAEN HV Troubleshooting

- Mindy Leffel started fabrication of a Radiallconnector-to-SHV adapter
- Aaron Brown provided the pinout for the Radiall, 52-pin, connector



Radiall 52-pin-to-SHV adapter

A1515TG/ CG/TGHP / BTGHP									
1	NC	11	RETURN	22	NC	32	RETURN	43	NC
2	NC	12	NC	23	NC	33	NC	44	NC
3	NC	13	NC	24	B_Anode	34	A_GEM1 Bot	45	A_Anode
4	NC	14	B_GEM1 Bot	25	B_GEM3 Bot	35	A_GEM1 Top	46	A_GEM3 Bot
5	NC	15	B_GEM1 Top	26	B_GEM3 Top	36	A_Cathode	47	A_GEM3 Top
6	NC	16	B_Cathode	27	B_GEM2 Bot	37	NC	48	A_GEM2 Bot
7	NC	17	NC	28	B_GEM2 Top	38	NC	49	A_GEM2 Top
8	NC	18	NC	29	NC	39	NC	50	NC
9	SAFETY LOOP	19	NC	30	NC	40	NC	51	NC
10	SAFETY LOOP	20	NC	31	SHIELD	41	NC	52	SHIELD
		21	RETURN			42	RETURN		



Radiall, 52-pin, connector pinout for the CAEN A1515BTG HV module

The DSG-developed Radiall 52 pin to SHV adapter will be used to connect the A1515BTG module to the DSG-developed 2-MΩ load chassis used to test HV modules

CAEN HV Troubleshooting (Cont.)

- Pablo Campero picked up a working power supply crate, a CPU, and modules from Hall A. These have the same specifications as the problematic unit, for comparison
- Pablo configured a computer and installed all required software to connect with the power supply
- Pablo contacted CAEN support regarding the support ticket submitted in May
  - Reviewed troubleshooting information suggested by CAEN technical support
- Pablo is writing a detailed procedure for testing the modules and power supplies

(Left) problematic power supply and modules. (Right) working power supply. Both located in EEL 121 room

Conclusion

- DSG is contributing to the upgrade of the GEM gas distribution system
  - Designed in-line filter saddle
  - Wrote procedure to combine the BigBite and Super BigBite gas distribution racks

- DSG is developing a test stand for the GEM HV modules and crates
  - Fabricating the Radial 52-to-SHV adapter
  - Troubleshooting power supply and developing procedure