



Pacific Northwest
NATIONAL LABORATORY

Prepping CENPA for 4-Cavity Experiment

November 17, 2020

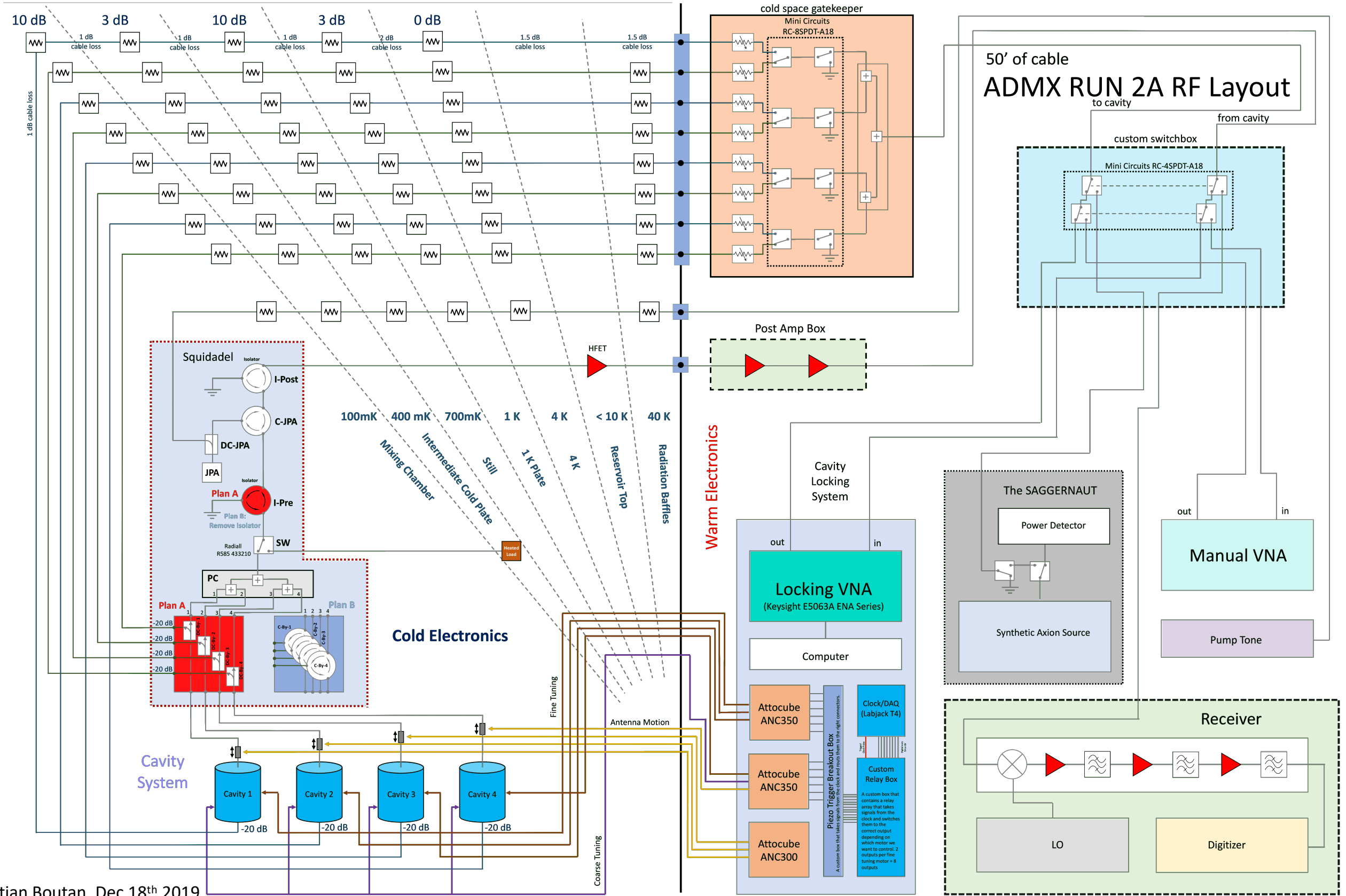
Christian Boutan

U.S. DEPARTMENT OF
ENERGY **BATTELLE**

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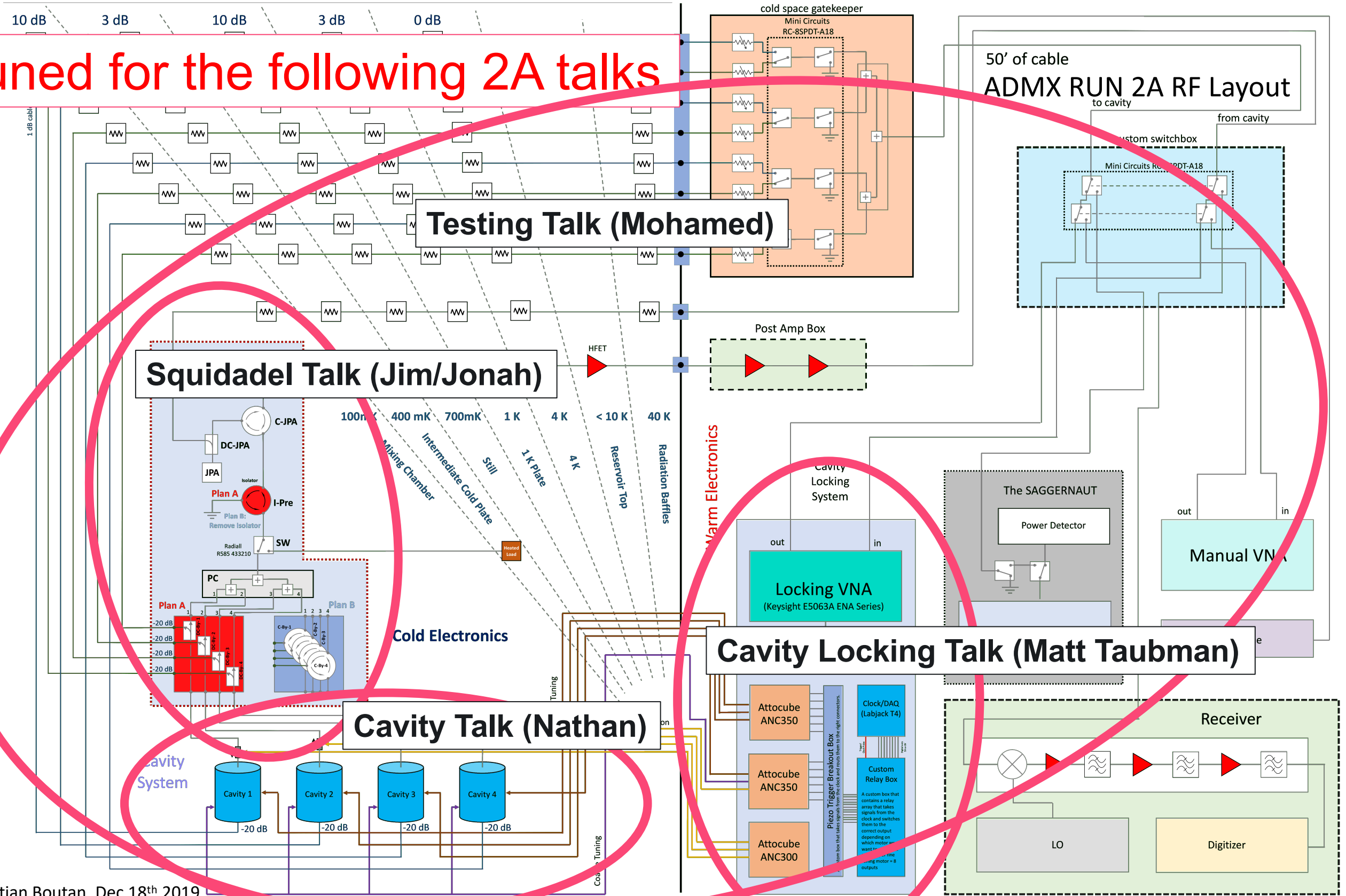
RF View of the 4-Cavity Experiment



Christian Boutan, Dec 18th 2019

Stay tuned for the following 2A talks

RF View of the 4-Cavity Experiment



Testing Talk (Mohamed)

Squidadel Talk (Jim/Jonah)

Cavity Locking Talk (Matt Taubman)

Cavity Talk (Nathan)

Task force to identify holes electronics wiring plan



Boutan



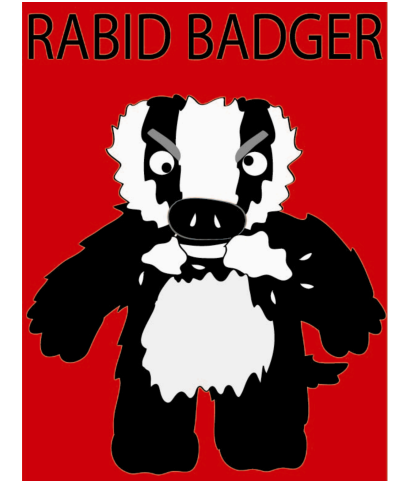
Bartram



Hollister



Nitta



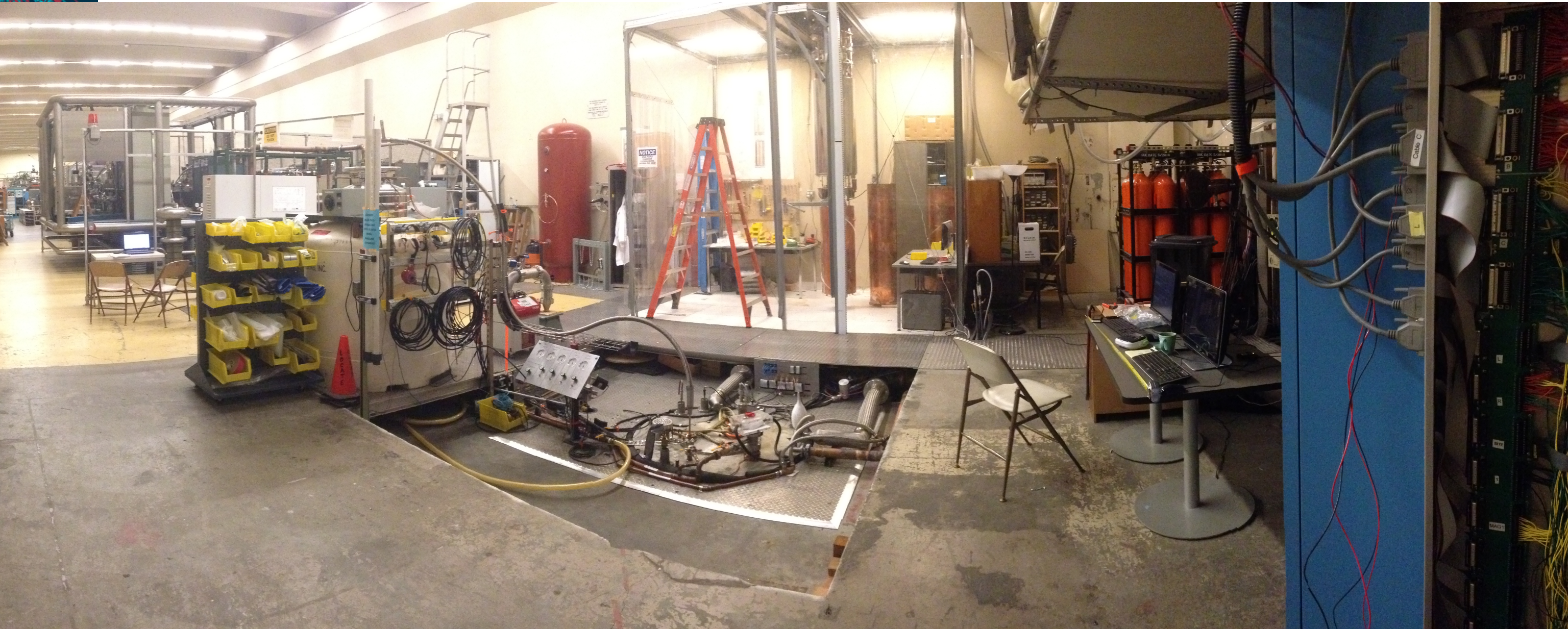
Taubman

Scope of task (abridged):

Make sure the CENPA site is ready for the 2A experiment

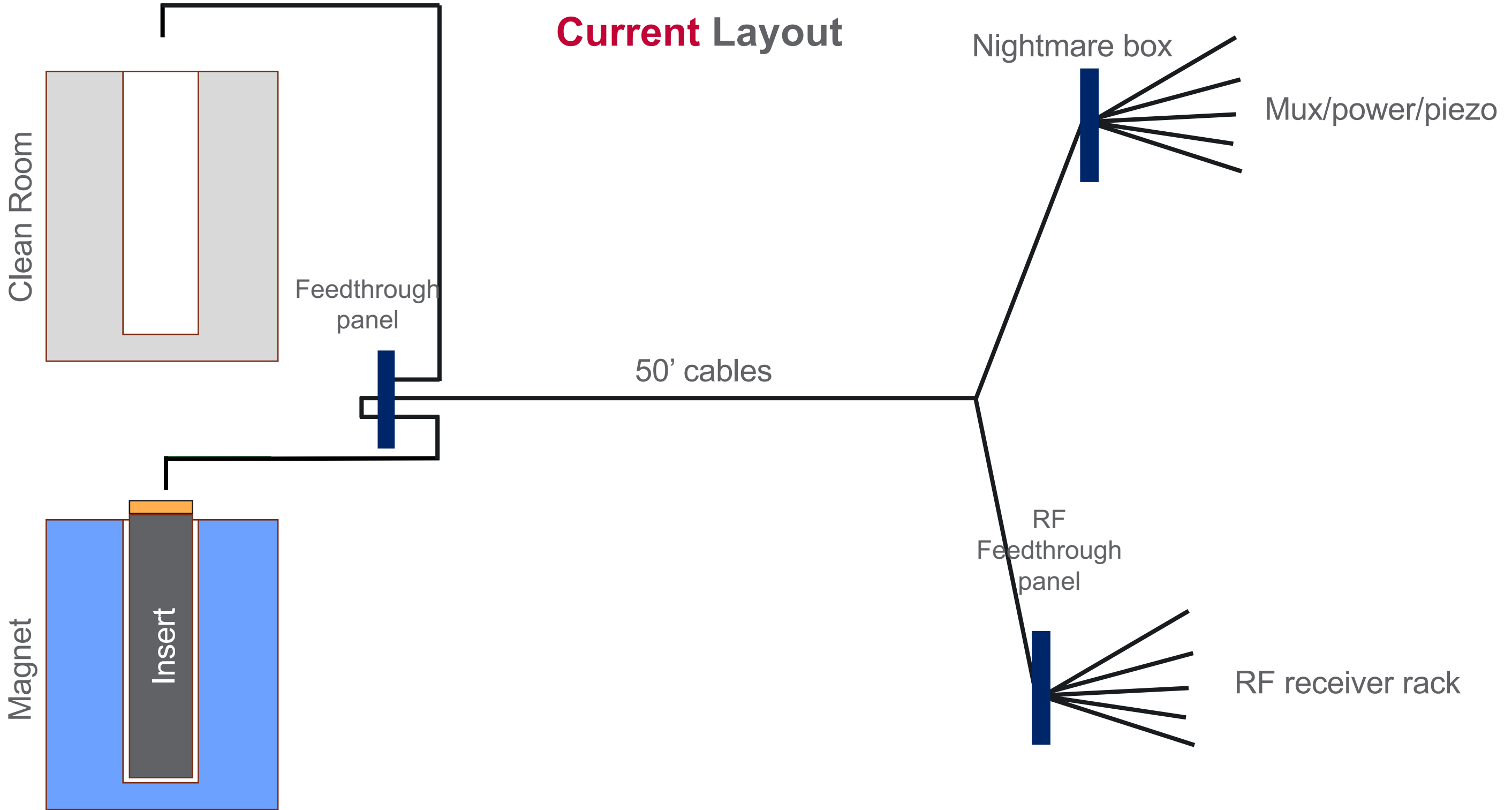


Wide view of Experimental Site (old)



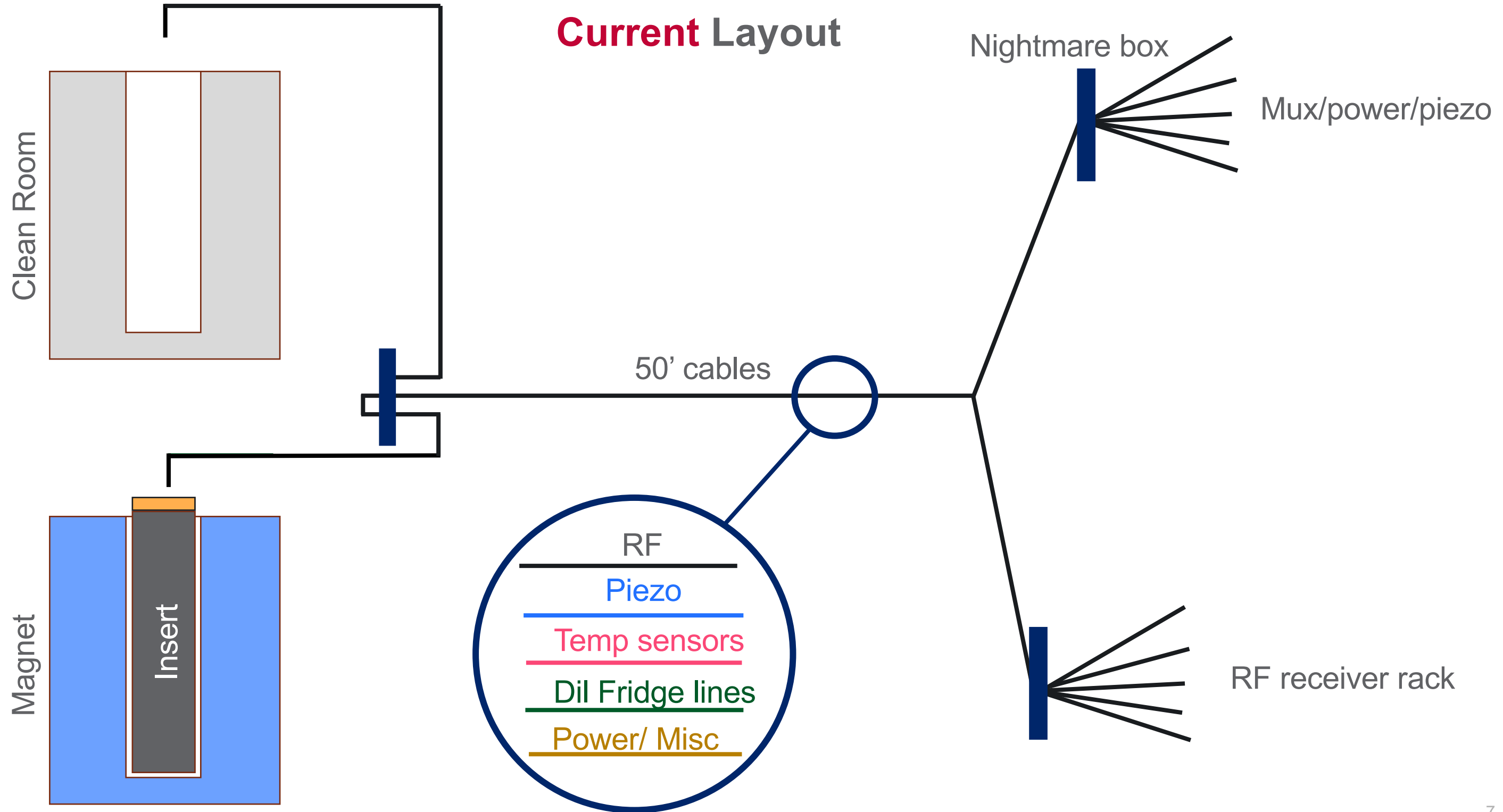


Current Layout



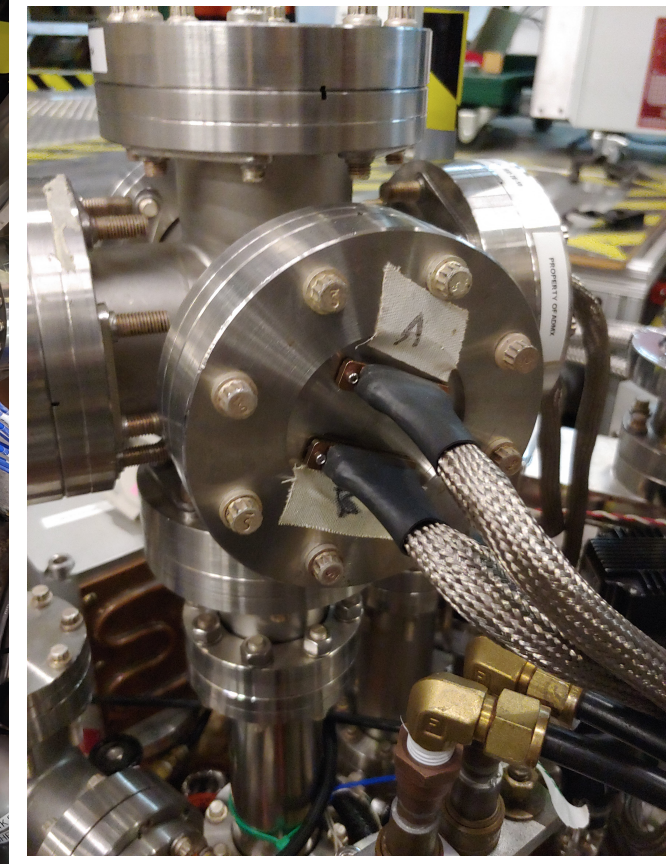
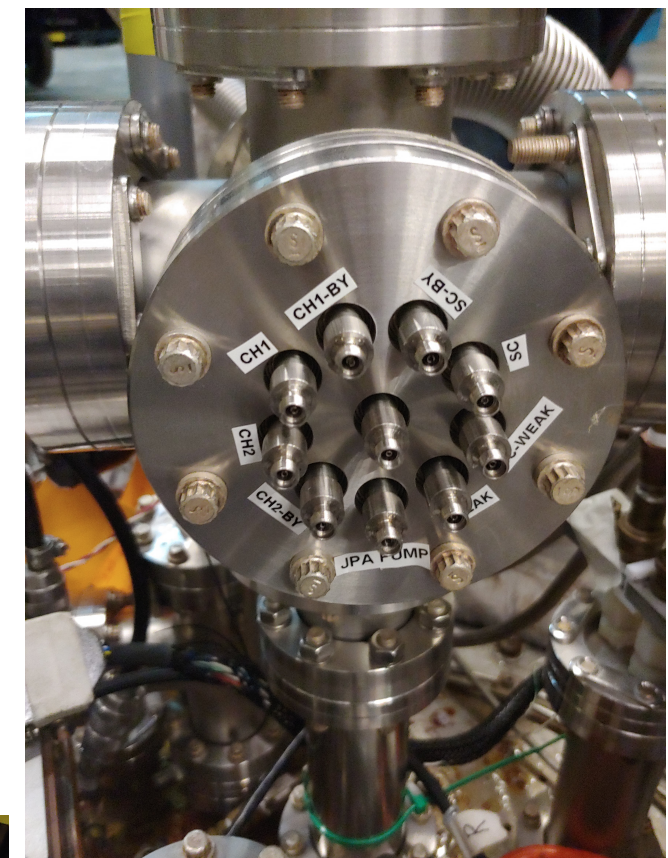
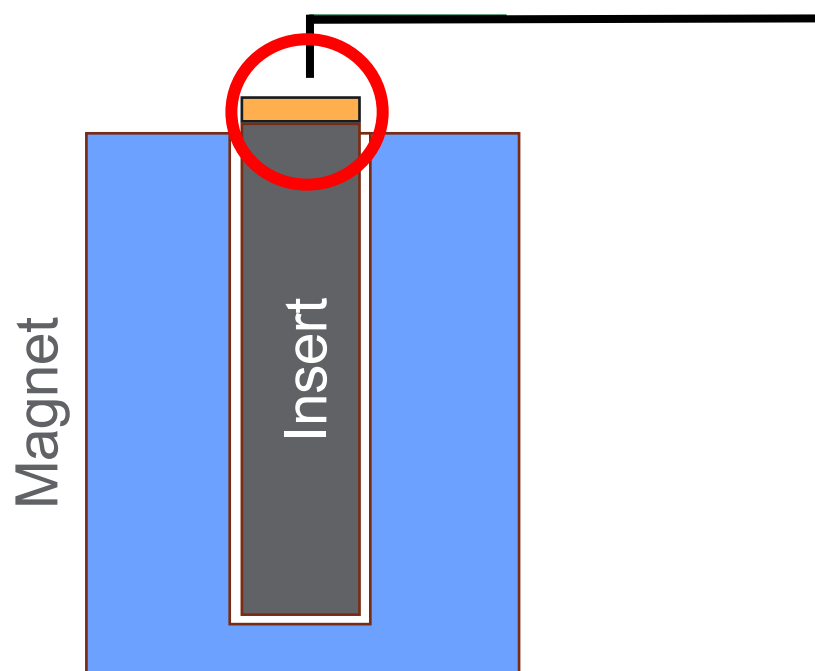


Current Layout

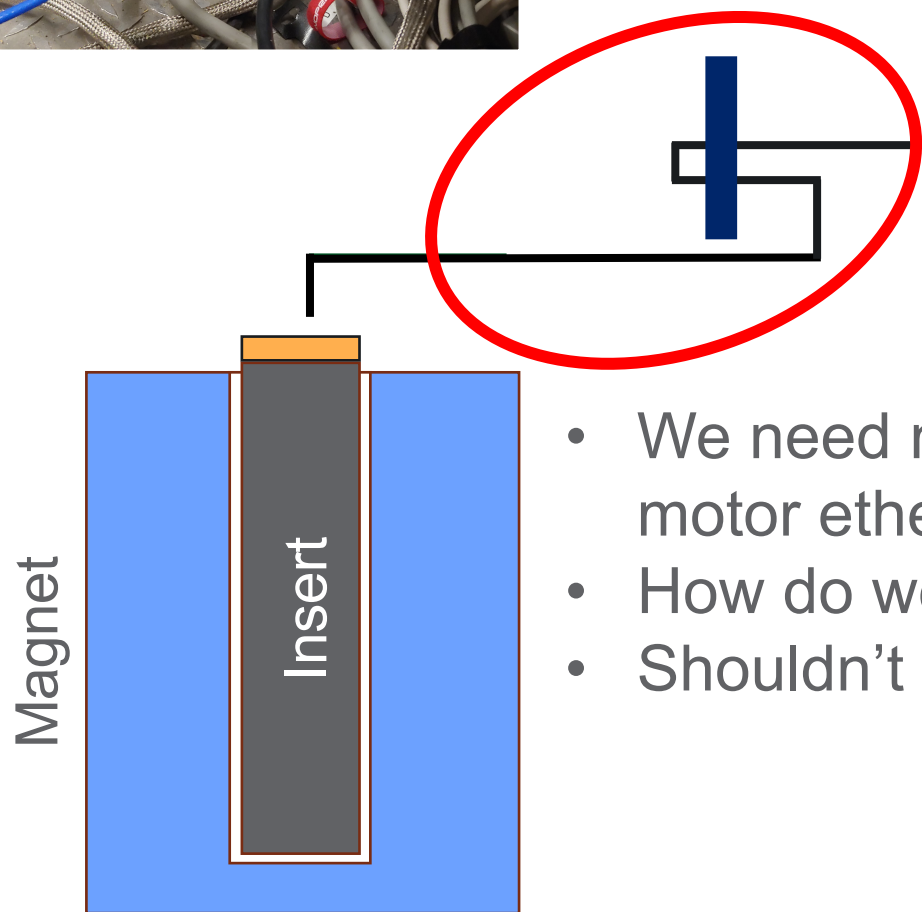
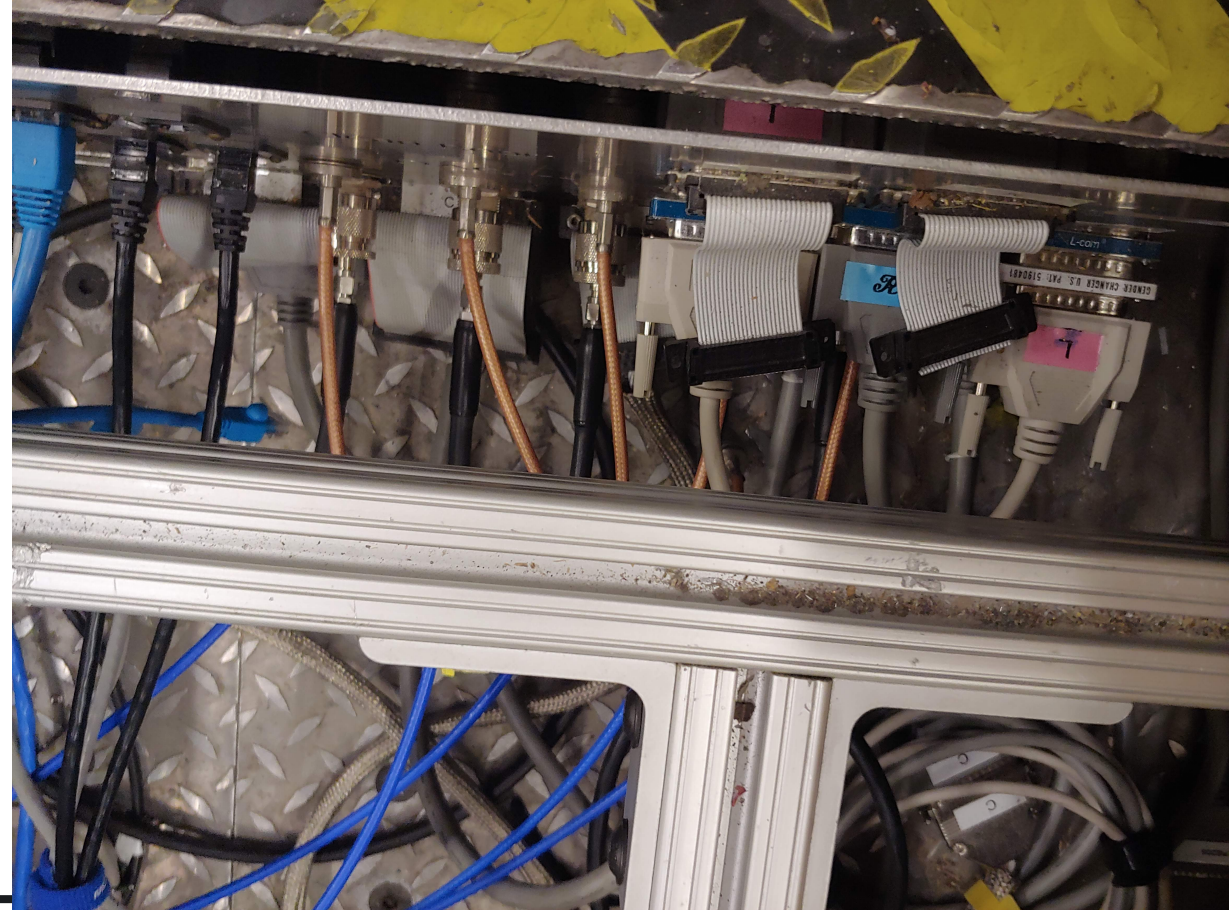
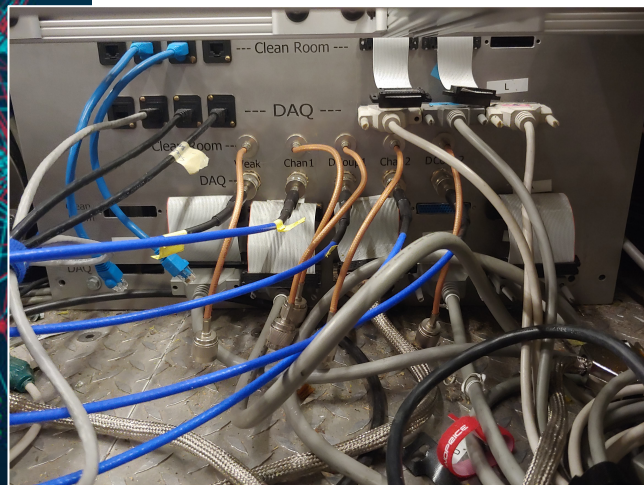


Questions/Proposed Changes: Top Plate

- What do we want actually going into insert?
- Will we have a Sidecar experiment?
- Should we break the densely packed hermetic feedthrough into two bulkheads?
- If we need to add an extra feedthrough (or cross) how do we do that without interfering with crane operations (expert: Doug Will)
- Should make plan for protecting hermetic feedthroughs
- Won't need stepper feedthroughs... should we use those ports?



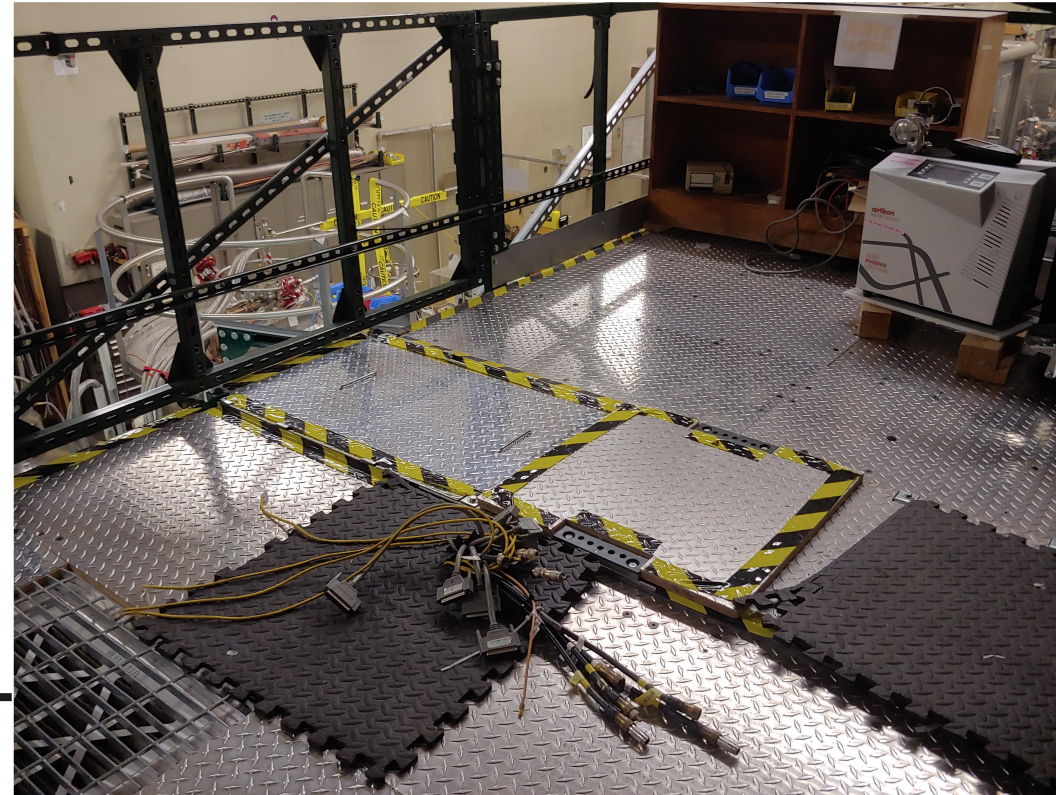
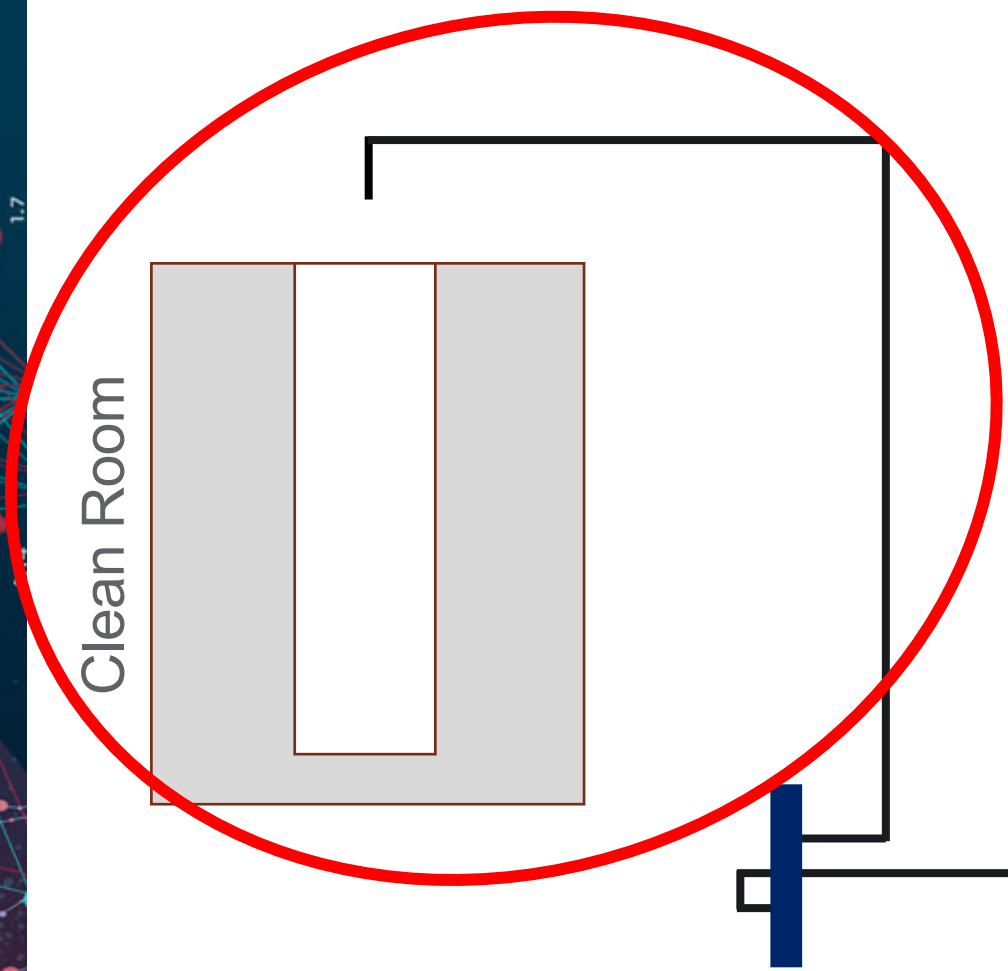
Questions/Proposed Changes: Under diamond plate panels



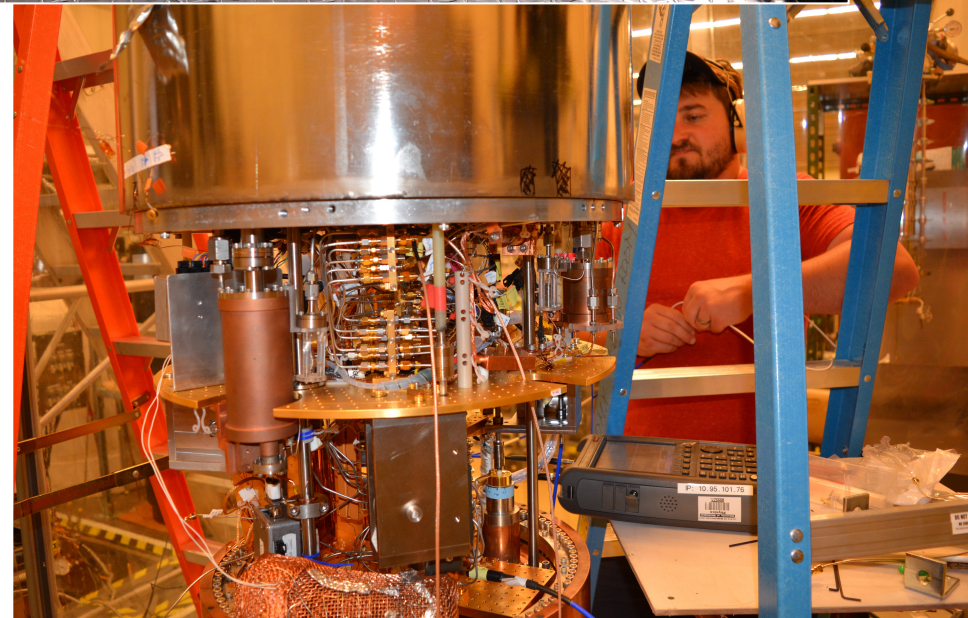
- We need many more RF lines – we don't need stepper motor ethernet cables. This should be remade!
- How do we avoid a tripping hazard?
- Shouldn't sensors be twisted pair? (expert: Hollister)



Questions/Proposed Changes: Clean Room

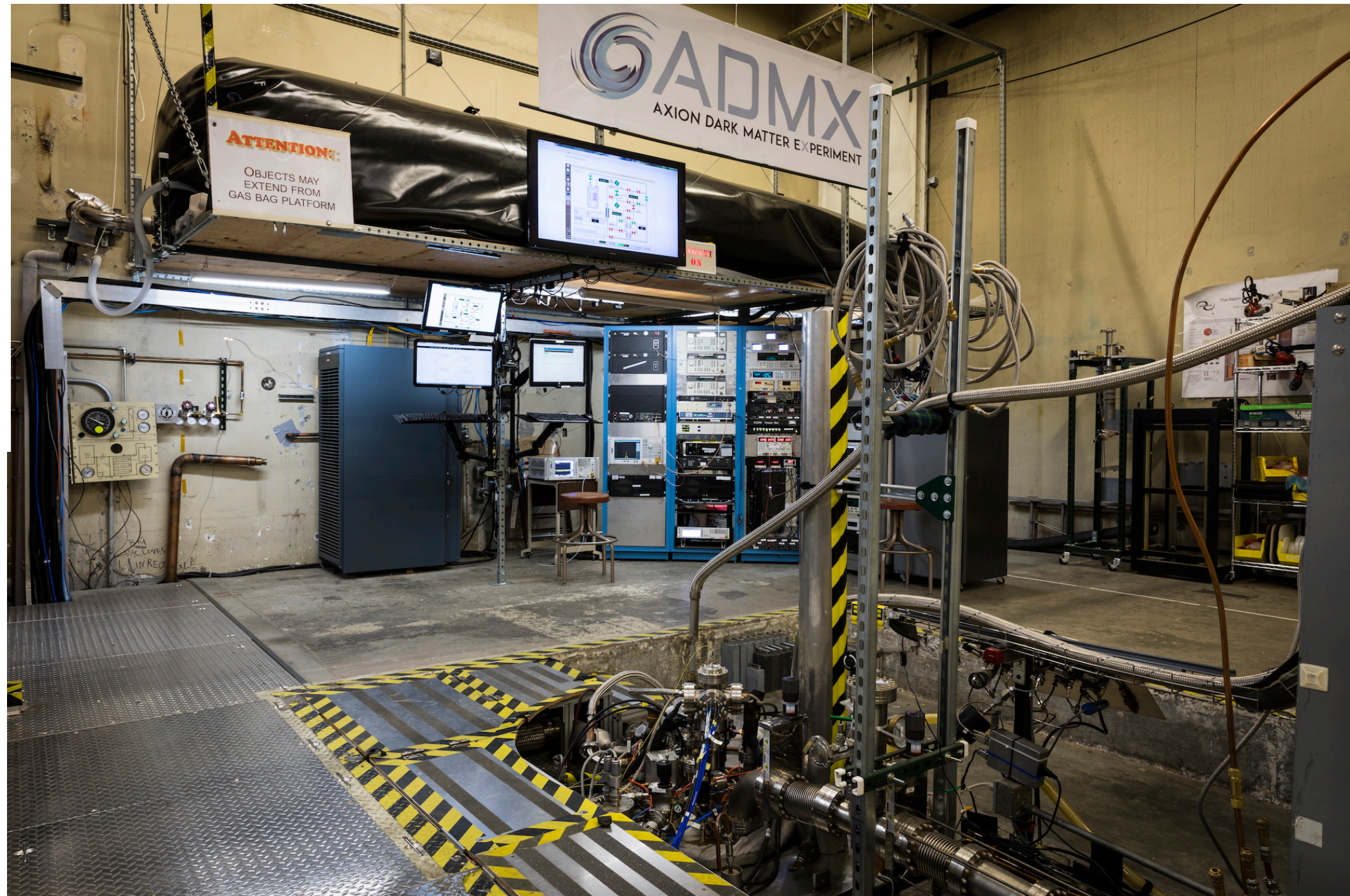


- Do we need more cables?
- Can we have a feedthrough panel at the top, that connects to a panel at the bottom for debugging purposes?

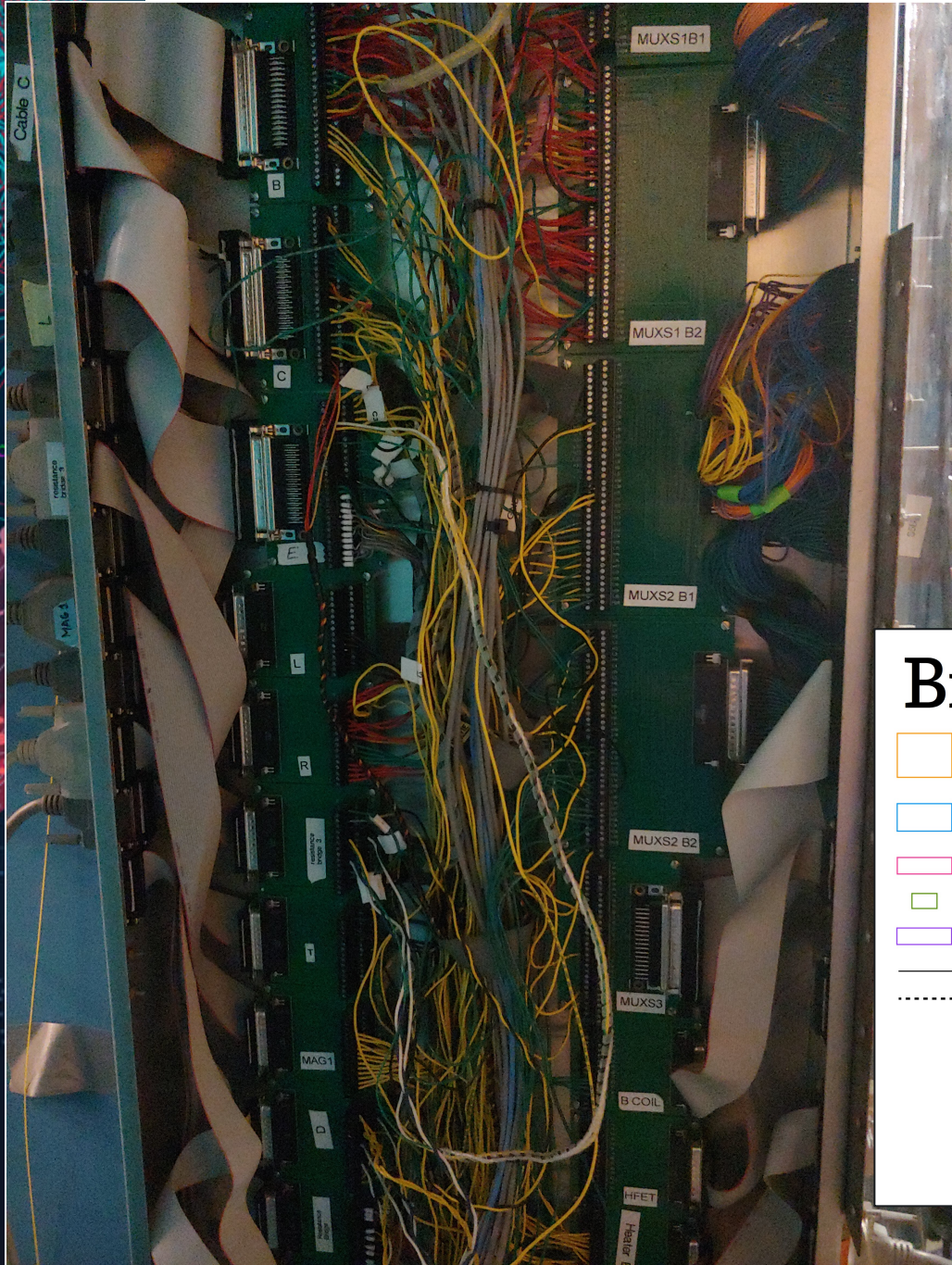


Questions/Proposed Changes: Long Cables/Racks

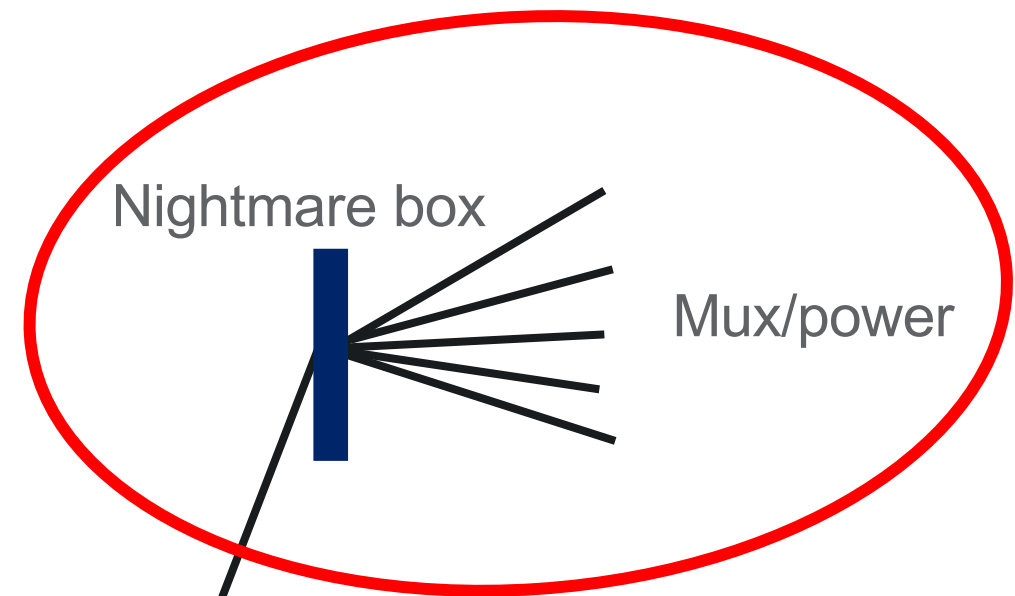
- We need to order more 50'+ Cables.
- Does the rack location still make sense?
- Does UW still have the 1-2 GHz receiver that PNNL sent to UW 4-5 years ago?
- Can we make the rack not load-bearing?



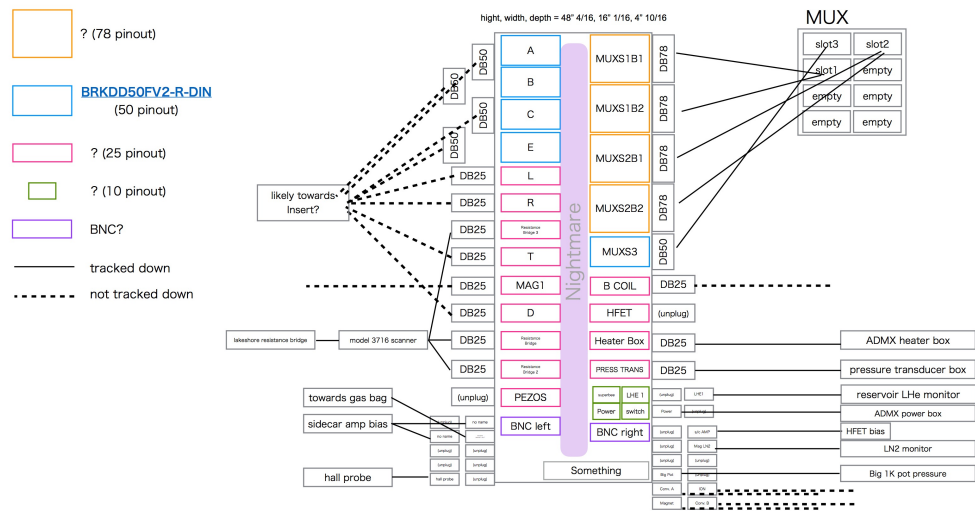
Questions/Proposed Changes: Breakout (nightmare) box



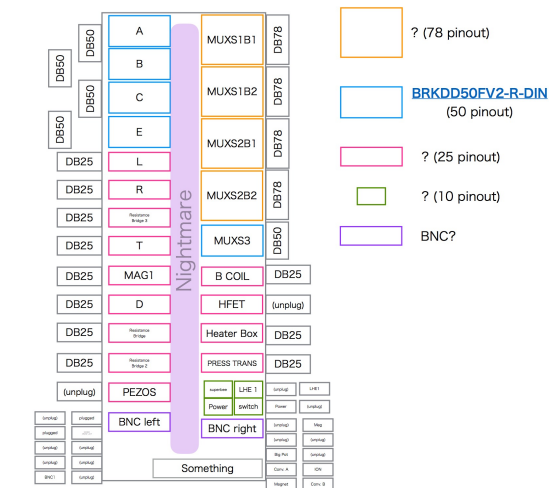
- What is going on?
- Have to match with what's going into insert
- 3 options:
 - a) keep it
 - b) toss it
 - c) phase it out slowly



Breakout Box Schematic



pinout utilization



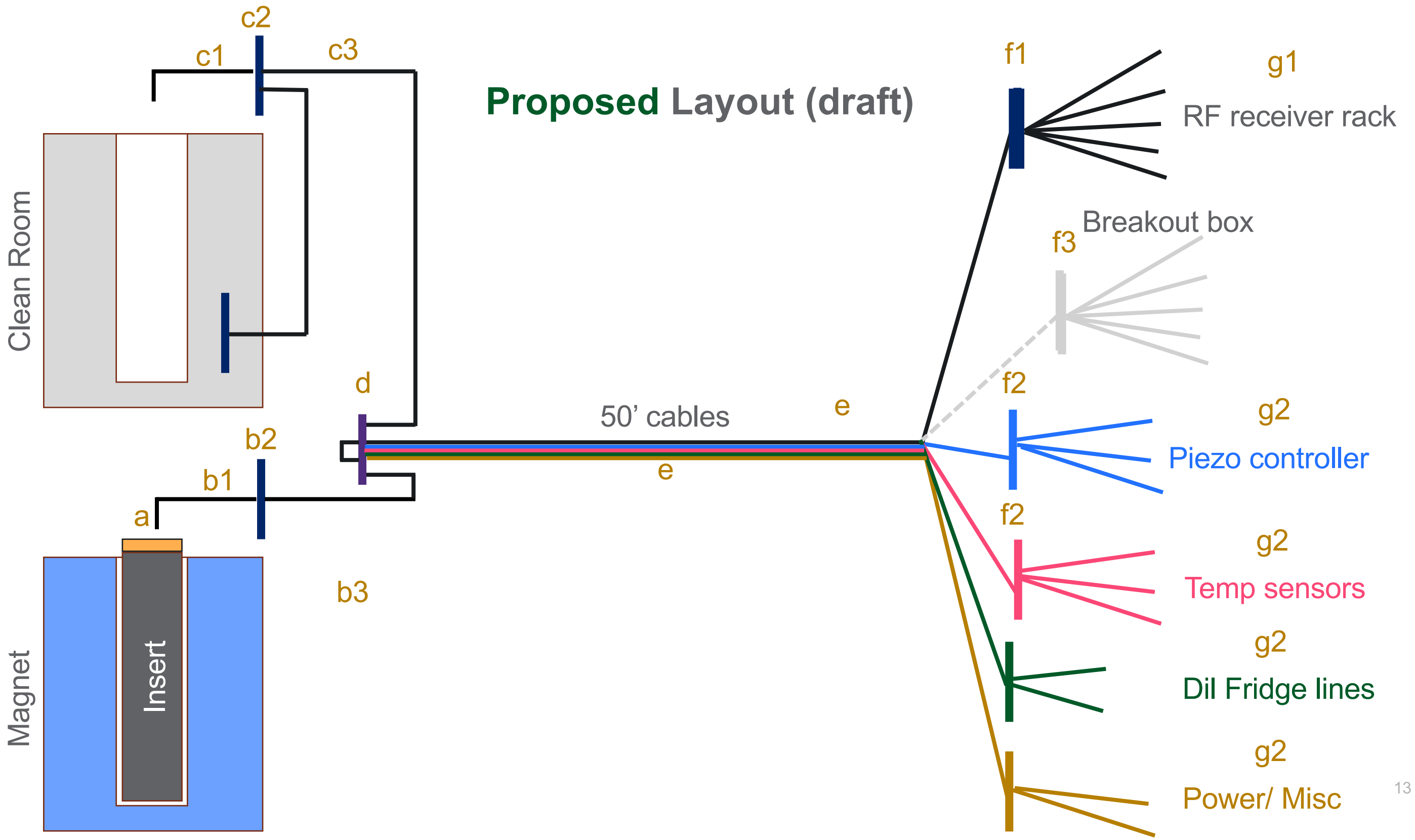
Counted by eye
not strict numbers

name	Number of Pinouts	Used (roughly)	Ratio
A	50	23	0.46
B	50	47	0.94
C	50	31	0.62
E	50	28	0.56
L	25	8	0.32
R	25	20	0.80
Resistance3	25	15	0.60
T	25	9	0.36
MAG1	25	12	0.48
D	25	16	0.64
Resistance	25	15	0.60
Resistance2	25	10	0.40
PEZOS	25	0	0.00
BNC left	25	0	0.00
total	425	234	0.55

left hand side

name	Number of Pinouts	Used (roughly)	Ratio
MUXS1 B1	78	56	0.72
MUXS1 B2	78	52	0.67
MUXS2 B1	78	24	0.31
MUXS2 B2	78	25	0.32
MUX3	50	6	0.12
B COIL	25	4	0.16
HFET	25	0	0.00
Heater Box	25	17	0.68
PRESS TRANS	25	16	0.64
SUPERBEE	10	6	0.60
LHE 1	10	4	0.40
Power Supply	10	4	0.40
Switch	10	0	0.00
BNC right	25	0	0.00
total	502	214	0.43

right hand side



Next steps

- Nail down what needs to be going to insert
 - RF: ?
 - Temp sensors: ?
 - Dil Fridge
 - Power
 - ...
- Work backwards from there
- Be decisive, write up advice, hand to Noah/Andrew
- Dissolve group