

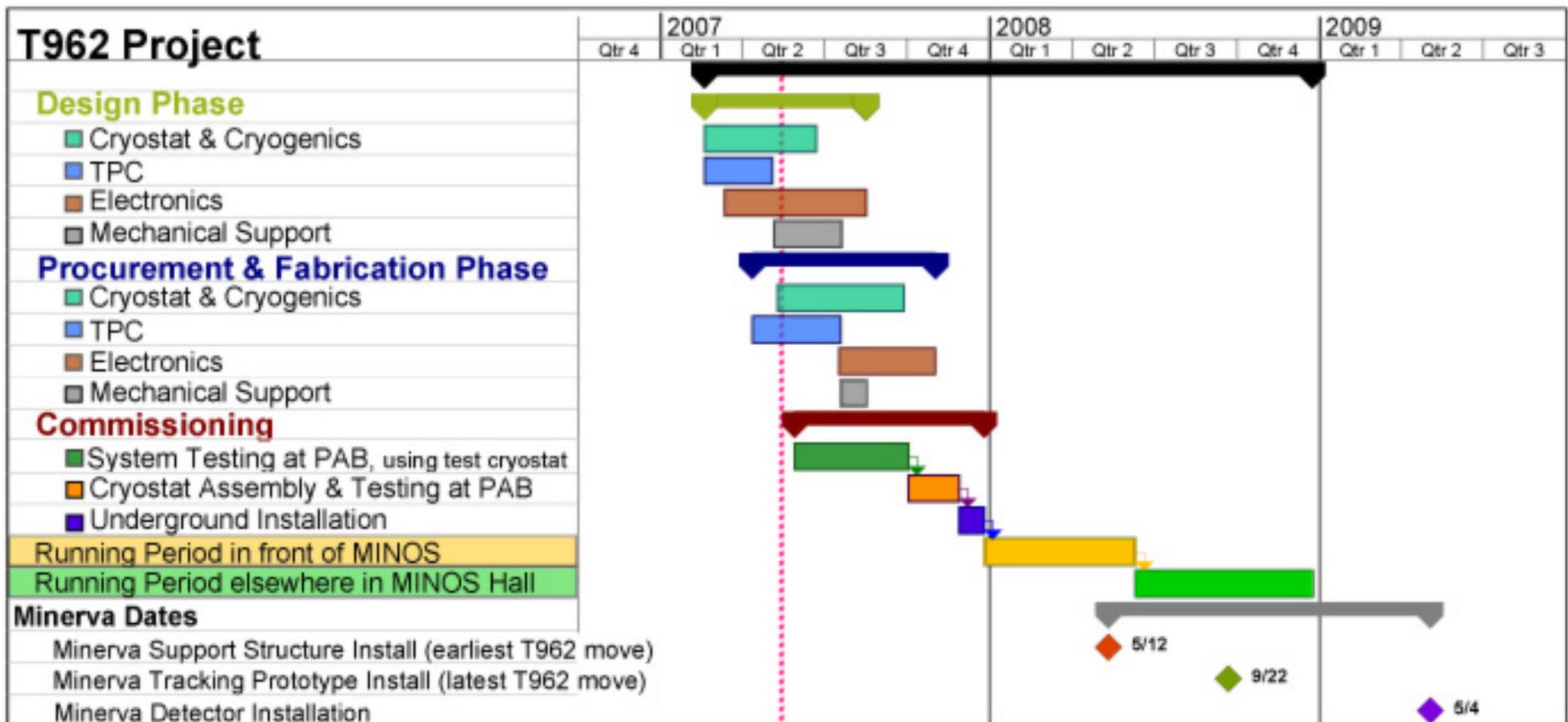
# T962 Schedule

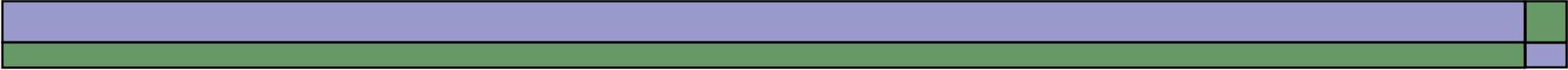
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And some Costs, some Installation issues, some Safety items.....

# Schedule in a Nutshell

- ❑ **Set up a testing cryostat at PAB this summer, to assemble and test parts as they arrive.**
- ❑ **Wait for the long lead-time items : cryostat vessel and electronics.**
- ❑ **When these arrive, put everything together and test at PAB.**
- ❑ **Then move it all underground.**
- ❑ **About a year of running; first located in front of the MINOS detector, then to the side in the Hall**

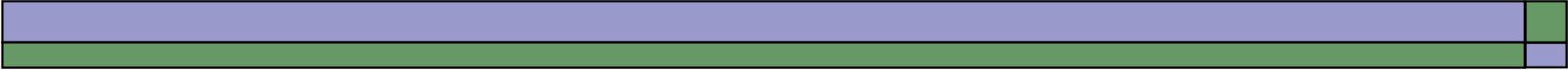




# Critical Path

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- **Is the long lead-time items      no surprise there**
  - Big print-out of the Schedule shows the Critical Path in red
  - Both the cryostat and the front-end electronics PMB boards fall onto it
  
- **This Review's purpose, in part, is to verify that the cryostat is ready to be ordered**
  - That we understand what volume of LAr to use and what systems to install to keep the underground a class-zero ODH area even if leaks occur
  - If we initiate the cryostat procurement process by the end of May then we will be able to stick with a schedule that puts the detector in the neutrino beam, underground, by January 2008



# Non-critical path procurement

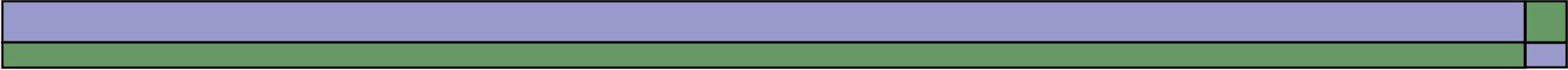
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- **Still some design details to work out for some items**
  - You choose to work on the long lead-time items first
  - Makes for some “holes” in a cost assessment
    - Most of these holes are little, but.....
  - **Some might be big holes.... T&M work underground**
    - Electrical installation, up to 2 weeks (~\$8K) of T&M electrical to run power from the closest panels to the rack locations. If T962 racks are located very close to where future MINERvA racks will go, then perhaps the costs can be shared
    - Vent to the surface for argon. There is an existing pipe in the shaft; it was used to pump out water during the excavation phase. Bottom of the pipe is clear and can be seen. Top of the pipe is under the concrete floor of the MINOS Surface Building. Dig it out? Just install a new pipe in the shaft? Pick the cheaper option. But either one will be a T&M type contract of \$10-\$20K

# Known Costs

	Mar '07	Apr '07	May '07	Jun '07	Jul '07	Aug '07	Sep '07 thru Jan '08	Total	
L. Bartoszek	\$2,850.00	\$3,990.00	\$3,610.00			\$190.00		\$10,640.00	
BE drafting		\$1,440.00	\$10,320.00	\$960.00	\$3,600.00	\$240.00	All Resources in this time period are Physicist Effort	\$16,560.00	
B. Sanders									
R. Schmitt									
T962 Group									
Yale Group									
MSU EE									
FNAL Tech Crew									
FNAL Lab 6 Tech									
FNAL Lab 8 Tech									
Electrician						\$10,000.00			\$10,000.00
Pipefitters					\$10,000.00				\$10,000.00
Cryostat					\$50,000.00				\$50,000.00
Cryo Cooler			\$30,000.00						\$30,000.00
Signal Feedthrough			\$4,000.00						\$4,000.00
HV Feedthrough			\$1,200.00						\$1,200.00
Other Feedthrough			\$5,000.00						\$5,000.00
Cryo Plumbing					\$15,000.00				\$15,000.00
Vacuum Pump & Gauges			\$10,000.00						\$10,000.00
Purity Monitor			\$6,000.00						\$6,000.00
Cryo Filter			\$10,500.00						\$10,500.00
DAQ parts									
TPC Parts			\$3,000.00					\$3,000.00	
TPC HV Supply		\$4,000.00						\$4,000.00	
PMB Boards					\$40,000.00			\$40,000.00	
Electronics Cables					\$5,000.00			\$5,000.00	
Electronics Crates & PS					\$5,000.00	\$5,000.00		\$10,000.00	
<b>Total</b>	<b>\$2,850.00</b>	<b>\$9,430.00</b>	<b>\$83,630.00</b>	<b>\$960.00</b>	<b>\$128,600.00</b>	<b>\$15,430.00</b>		<b>\$240,900.00</b>	

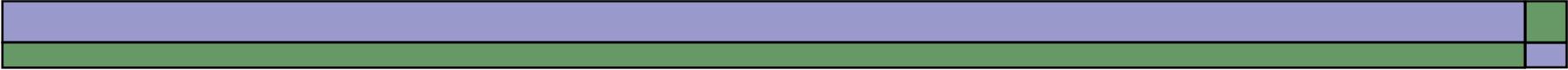




# Installation Items

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- We are not reviewing the installation process today.....  
however, some items to note
  - Once the MINERvA detector support stand is installed, T962 must move away from the front of the MINOS detector, and cannot go back
    - The gap between MINERvA and MINOS is for access to MINERvA
    - Plenty of neutrinos all over the Hall
  - The earliest support stand install date is well ahead of any MINERvA detector installation
    - The stand will be used first by a prototype tracking detector, but this won't be ready until the fall 2008
    - Full MINERvA installation begins early in 2009
  - So exactly when T962 will have to move is to-be-negotiated with the MINERvA collaboration
    - It is best to spend a little time now to design the “skids” and connecting plumbing so that moving is not such a big deal

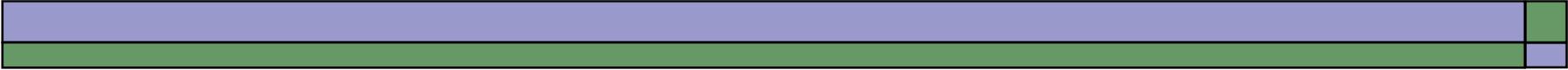


# Installation Items

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## □ other details to note

- The T962 platform and detector supporting structures are steel, and they are being positioned within a B-field of 10's of gauss
  - Not a huge field, but safety considerations always go first
  - B-field must be turned off during any installation at the front of the MINOS detector
  - MINOS is still taking data, so installation negotiations must take place with MINOS as well as with MINERvA
- House-keeping rules always apply
  - Quantities of “stuff” are not stored underground – not a lot of space anyway
  - Can allow one metal cabinet underground, but all other spare parts and tools must be kept upstairs in the MINOS Surface Building



# Some Safety Stuff

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## □ Underground Life Safety

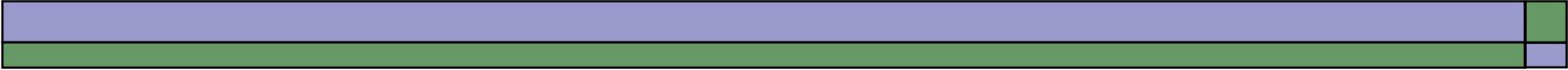
- Determining the means of escape when something bad happens
- Limiting the ability of something bad to happen
- All this was done back in 2001, with only MINOS in mind
  - Total amount of flammable material was assessed to be what is in the MINOS detector installation
  - No accounting for T962, MINERvA, NOvA, and who else??

## □ So.... It is all getting reviewed, FESS sets this up

- And frankly, there is not much we can do or say, except abide by the rules when they are handed down

## □ And then there's the SAD FNAL Safety Assessment Doc

- Makes no mention of liquid gases. Once the ODH analysis is reviewed and recommendations made, the SAD will be updated
  - Again, this is pretty much out of T962's hands



# More Safety Stuff

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## □ Operational Readiness Clearance

- A system of safety sign-offs for all experiments in PPD areas
- Involves Documentation (provided by the experiment) and Inspection/Review (performed by PPD)
  - Mechanical support designs – make sure nothing falls down
  - Electronics designs – make sure nothing burns up
  - Cryogenics – make sure ODH rules are followed
- Reviews performed as each sub-system is ready for one
  - pORC – partial Operational Readiness Clearance
  - When everything is installed and the experiment wants “unattended operation” a final inspection is done for the full ORC