HCAL Test Beam 2002

CERN tasks

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Schedule 1

Preliminary SPS schedule:

- **SPS regular proton run: April 18th - August 19th**
- **25 ns proton run: August 20th - September 3rd**

Deadline for submission of requests October 26th 2001.

We requested two months of beam time in July and August through CMS test beam coordinator *(CMS got very bad reputation with machine people as ECAL abandoned 60 days of beam time this summer).*

Schedule 2

Competition:

• **NA 49** (heavy ion experiment in front of H2a): They prefer to check their setup with protons before heavy ion run. Problem: they have to open their detector to let the beam pass through. Last ten days of proton run are 25 ns structured beam which gives us priority. *This year may be the last one with heavy ion beam for fixed target experiments!*

• **ECAL endcap**: they need two weeks of tests in magnetic field. Timing not clear as the request was submitted orally to Gyorgy.

• **ME1/1**: two weeks of tests in magnetic field. Preferred time August as afterwards they go to GIF.

• **Si beam telescope**: two weeks of low intensity muons, not in August. Willing to run parasitically if there is no magnetic field.

• **HF (?)**: No independent request submitted! Are we going to test production wedges? Should we do it at the same time with HB?

Hardware

Calorimeter:

- Installation of megatiles to start after Thanksgiving
- Radioactive source scans to start immediately after
- We should also calibrate PPPs

Target: HB+ wedges to be ready by March 2002.

Can we have a realistic electromagnetic calorimeter in front of HCAL?

Apparently: NO!!!

The only thing CMS ECAL has at the moment is module 0' with very noisy electronics.

Using "our" ECAL?

Which readout? Unrealistic size, beam position needed (see later)...

Table

Moving table has to be repaired: **starting this spring there was a long exchange of e-mails, test procedures and reports between G. Ginther and J. Pothier that got interrupted when H2 got the beam, Jean went for a vacation and George proposed to contact SEW Eurodrive.**

The work should be restarted a.s.a.p as Jean is retiring in few months! Not sure that there will be a replacement, certainly on theat level of competence.

I am pursuing the subject with J. Pothier, will contact G. Ginther next week.

Table control and monitoring should be computerized (PVSS):

S.S. and D.L. looking into it, but real work can start when the table is repaired (J.P. also involved).

Logging of beam parameters into run data: **relatively simple task, D.L. will try to finish it before the end of this run period (Nov. 3rd).**

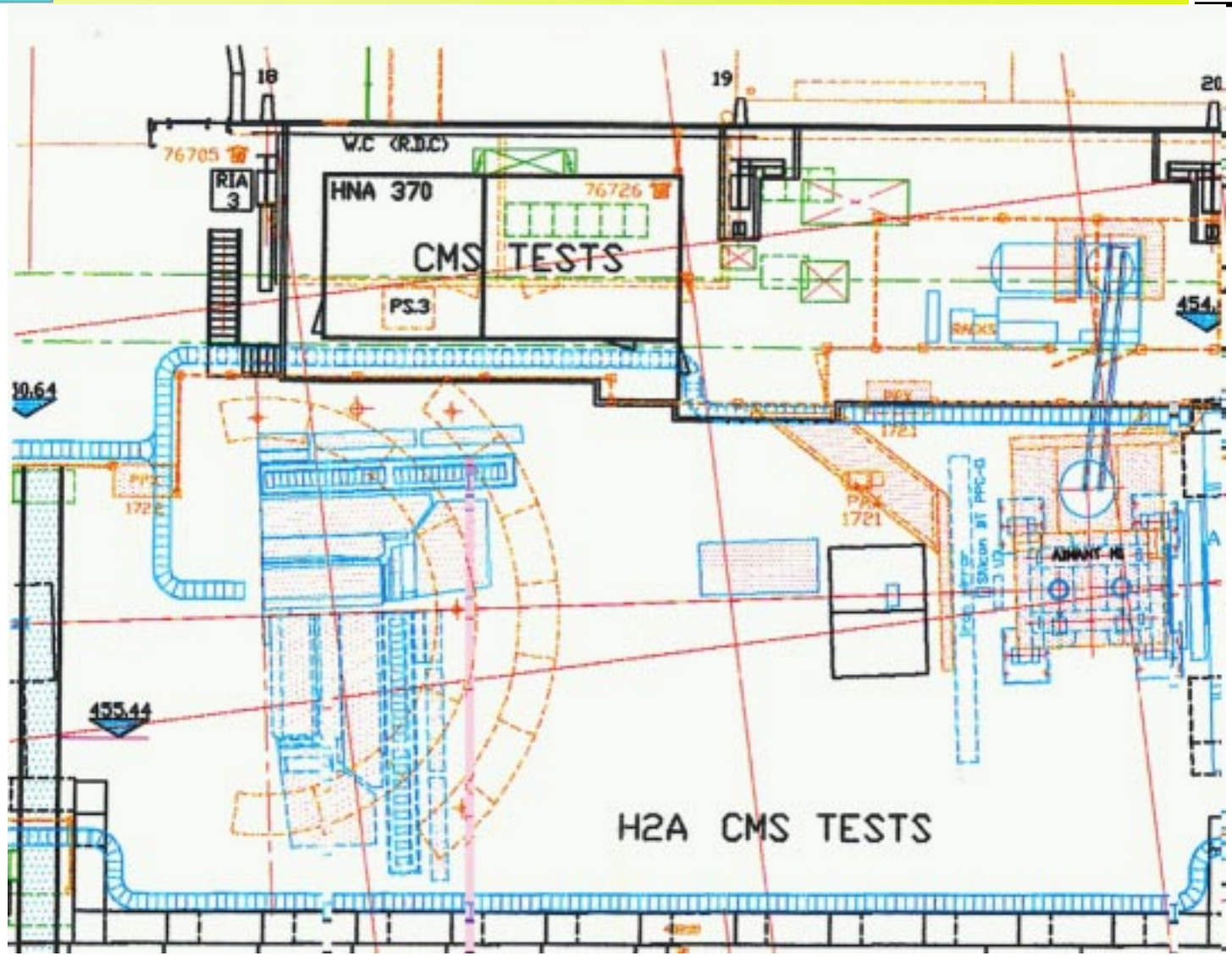
Cabling

We will need cables and fibers:

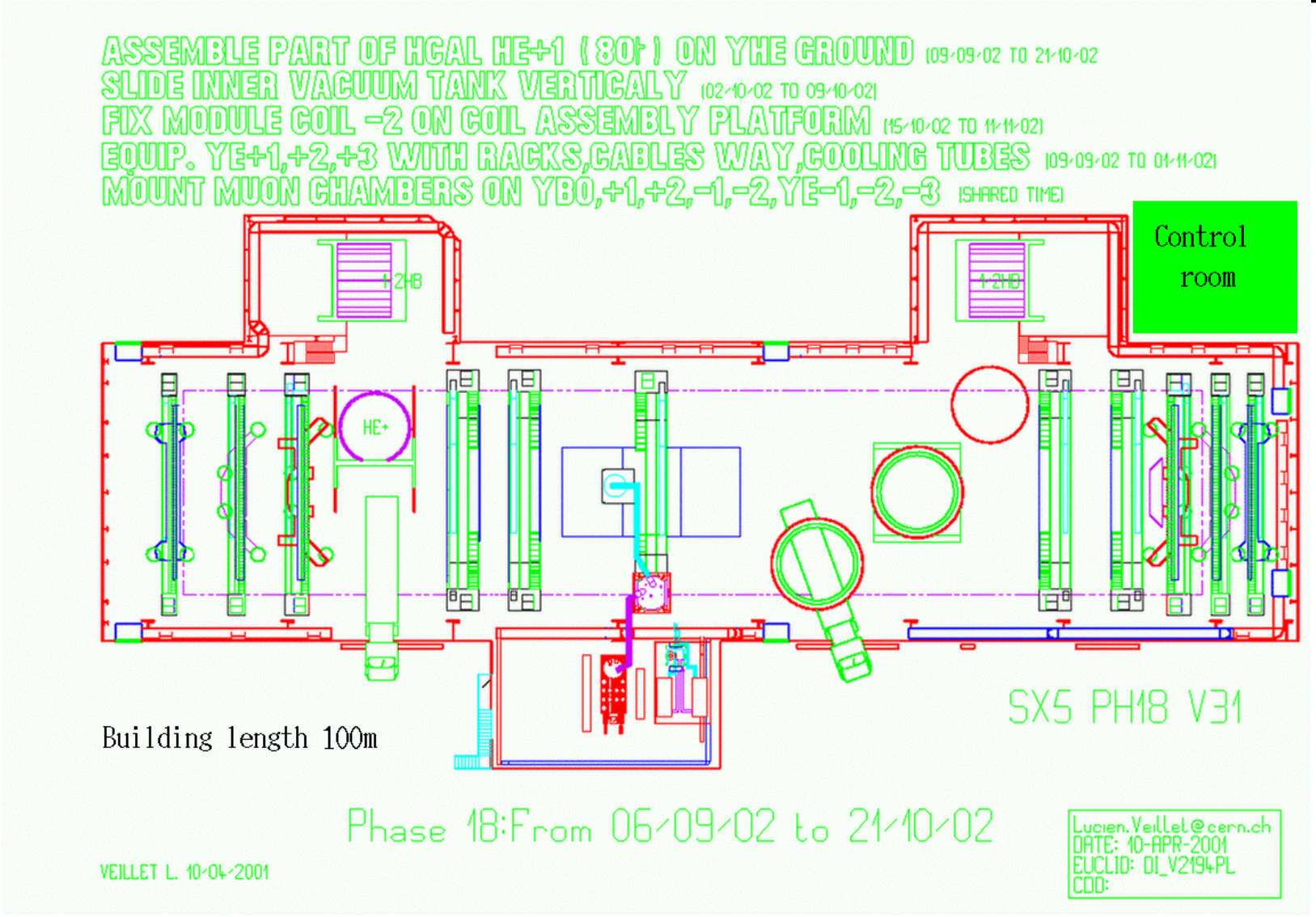
Minimal length is ~40m (see the H2a plan). It would be reasonable to re-use them in SX 5, where ~100m is needed. Number of cables and fibers to be defined as a function of number of channels.

We should also *remove old flat cables* used for C 205 readout. I removed only the last set of cables going through the control room. If we keep them in, there might be no space for fibers...

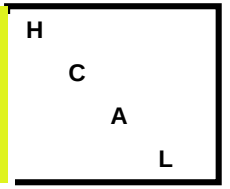
Geography of H2a



Geography of SX5



Trigger



Simplify the trigger system:

The system has been made as complex as it is as a part of preparations for multi-user tests that are still in (far?) future. The current trigger system has a number of "hidden" features that should be removed (it became painfully obvious after Gyorgy's health problems).

Speed up the trigger decision:

Only two trigger counters in coincidence, no delays, no trigger blocking…

Use TTCvi to deliver the trigger signal to the DAQ.

DAQ

J. Rohlf already talked about it, but...

We will learn a lot during tests of the "vertical slice"!

Possible problems: beam profile (TDC), trigger signals (spill on/off, muon bit, veto etc). All this is taken care of by the existing H2a DAQ, but: it is an old-fashioned system with trigger blocking, residing in 6U VME (CERN V430 standard) crate. Neither TDC (CAEN v767), nor I/O registers (CAEN v513) can work in a regular 6U crate.

Running with two branches?

Synchronization becomes the dominant issue. There is some hope to solve it, but it depends on already late delivery...

Synchronization

Major task for CMS startup! Most probably major task for running a single branch of DAQ!

Possible solution: use of custom made synchronization modules (scaler and switch unit, see specifications in *http://sulyan.home.cern.ch/sulyan*) **ordered by CMS test-beam group two years ago: the prototype modules are more than six months late.**

Switch unit could act as an I/O register, but we still need beam profile! Another TDC? V767 is made to run at 40MHz!

Calibration

Can we use source calibration with QIE?

If the answer is “YES”, then PVSS based control of the source becomes priority. Archana left CMS...

Laser/LED control and monitoring:

J.R., S.S. and D.L. worked out a simplified laser control scheme independent of PVSS during last CMS week. We will need a VME ADC for monitoring PIN diode. Something similar might be used for LED, but - source is much more important.

Summary

My major concern is DAQ and possibility that we will need two independent branches. I prefer to keep discussions off-line for the time being, at least until the end of source tests in Fermilab.

Proposal:

•iron out conceptual design during December CMS week;

•make "go - no go" decision during March CMS week.

In any case:

Installation and testing has to start early!