Electronics Meeting

Padova, March 20, 2002

Attendance

Marco Bellato
Lorenzo Castellani
Roberto Cirio
Flavio Dal Corso
Marco Dallavalle
Cristina Fernández
Fabrizio Gasparini
Marco de Giorgi
Franco Gonella
Ivano Lippi
Gaetano Maron
Anna Meneguzzo
Alessandro Montanari
Fabrizio Odorici
Matteo Pegoraro
Antonio Ranieri
Marco Verlato
Carlos Willmott
Pierluigi Zotto
Gianni Zumerle

Agenda

- Burn in
- RO status and production plans
- TRACO status and plans, including radiation tests
- TRB production
- Clock issues
- CCB+SB status/production
- Grounding
- RO-MC operation with chambers + ROS + DDU
- MC integration
- MC production and installation
- Optical transmitters/receivers, fibers, connectors
- Future meeting on monitoring, calibration, noise management
- CMS Electronics Week
- 12V pressure sensors

Burn in

Carlos presents the history of burn in plans, since Martinelli's times, and, taking into account the limited temperature operating range of HPTDC, makes a proposal for ROB burn in consisting in

- 70ºC / 1 month
- 168 ROB's per batch
- powered and clocked
- basic check once every day
- full test every 2 weeks with test pulses and triggers
- dead boards repaired, re-burned in and keep as spares
- learn in the process (failure modes, rates) and adjust timing

Matteo reports that FEB were initially burned in at industry during 1 week at 125ºC. Now this time is been reduced to 4 days. Screened fraction about 1%.

RO status and production plans

Cristina presents Madrid plans for ROB production and tests, including HPTDC issues. The HPTDC operates correctly in test beams, irradiation tests and crosstalk tests. HPTDC definitive version depends on CERN/EP-MIC conclusions about 2.5V power supply problem. ROB production planning involves staged assembly and an acceptance test in industry. Test jig and software will be provided to the industry.

TRACO status and plans, including radiation tests

TRACO production has been launched after successful tests of prototypes. Full production is expected to be delivered in April. Carlos will organize irradiation tests for June-July, once TRB-ϕ will be available. The plan is to irradiate 2 TRB's, with 4 TRACO's each, with the same set-up used last year.

TRB production

The main issue is that BTIM production has not yet started as CERN paper work is still going on. Metallux announced that they are able to accelerate production by a factor 2, once they receive the order, which would allow us to recover some time. At the moment there are only enough BTIM for 3 TRB's.

In the second place it is not clear how we are going to test TRB's. The test jig would be finished for the pre-series (in 4 months), but before launching the production we must prove to ourselves and to INFN management that we have a sound design. A proper vector test set which could be used with present tools is missing. The way to proceed is under discussion.

Clock issues

Carlos reports on Marchioro's proposal to produce a new device(s), preliminarily named QPLL, to clean TTCrx clock jitter below 100 ps pk-pk.

Possible schedule:

- Submission of prototype run April 2002
- Test and evaluation by whole community, summer-fall 2002
- Production late 2002-early 2003

This plan will delay the production of final CCB's to first quarter 2003 and the final assembly of MC to mid-2003, in the assumption that there will be no additional delay in TRB or ROB production. The installation of MC on chambers could start by July-September 2003.

CCB+SB status/production

Lorenzo reports that what we thought was the final CCB design, incorporating a Synergy PLL, is finished.

We need to assemble 5-6 of such units to test MC's until a solution is found for clock jitter. This board with a "poor" clock would be sufficient for testing, although we may find occasionally jitter-related errors on TDC's and/or serializers.

SB PCB is finished and being assembled.

Grounding

After a general discussion of the present grounding schemes for RPC's and DT's, it is generally accepted that we will propose a "new" common scheme in which both chambers are connected to the iron in one single point. The point on the chambers to make this connection will be where the LV splitter is connected to DT body. This solution is acceptable for both DT's and RPC's. Matteo will present this common new scheme at next CMS Electronics Week.

Note: on April 3, during Muon Week, it was stated that this solution has still to be studied by RPC's people, in particular in view of Link Box grounding.

RO-MC operation with chambers + ROS + DDU

Roberto presents the status and plans for DDU development: the prototype is finished and tested in the lab, final design by end 2002, and production start in 2003.

Carlos shows a picture of the first RO minicrate assembled and tested in Madrid. They are waiting for ROS to test it with a real chamber. The mechanical design of MB2-MC has started and production will follow. The idea is still to provide each site with a RO-MC. There are 30 ROB's assembled and fully tested in Madrid to equip those MC's. One CCB/SB, a TTC system, LB, and one ROS (eventually a DDU) are required to complete and operate a RO-MC.

MC integration

In order to assemble a full MC we will require:

- LB, CCB/SB, ROB's, TRB's, wiring, link I/O's, cooling

And to test it:

- Jigs: pattern generators, control and data links, ROS, DDU(optional), TR unit(s).
- Software: HC-16, control, DAQ, trigger.

We should start this complex task, involving many people, as soon as possible. The target would be the MB1 unit presently in Padova. Fundamental missing bits are:

- Assembly of 3 TRB-ϕ
- ROS
- Assembly of 3 pattern generators (now only 2 in Madrid)
- DAQ
- ?

A possible starting time could be beginning of May.

MC production and installation

There are a few basic questions without clear answers:

- Who is going to produce and take care of the production of mechanical parts. This item does not appear in Cost Book.
- Where MC's are going to be assembled: each Lab, one Lab, industry? Taking into account the number of tools and jigs required for testing a MC it seems sensible to perform this task at one single place. This item is not costed.
- Do we burn in MC's? Does not seem feasible.
- Where are we going to install MC's on chambers: production Labs, CERN? and how are we going to test MC's on chambers? It looks like the preferred solution

would be to set up an assembly team at CERN: already this is required for existing chambers at CERN, reduced number of test tools, impossibility to have or develop the required MC expertise at each assembly Lab, etc.

People are invited to think about these questions for future discussion.

A possible MC schedule (starting dates):

Full integration of first MC (MB1 prototype)	May-July 2002
Mechanics production	Nov 2002
MC assembly	May 2003
Installation on chambers	Jul-Sep 2003

Optical transmitters/receivers, fibers, connectors

Due to lack of audience this point is left for future discussion.

Future meeting on monitoring, calibration, noise management

Same as previous point.

CMS Electronics Week

On May 13-17 there will be a new CMS Electronics Week. People are requested to keep those days free on their datebooks, until the agenda of the meeting will be known.

12V pressure sensors

Hans Reithler has proposed a pressure sensor requiring a 12V (50 mA) power supply. Two per chamber. Other sensors are not accurate enough.

It does not seem possible or convenient to add a DC/DC converter from existing power lines near or at the chambers. One solution would be a set (250) of additional power supplies for this job, with the consequent additional cost. The discussion is postponed until more information will be available on the sensor.