Remarks from the Module -1 cabling

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Abstract

This short note reviews the remarks we had and problems we encountered during the cabling of the module -1 in LAPP, Annecy in August 1998.

1 Glossary

SB = Summing Board
MB = Mother Board
HVB = High Voltage Board

2 Summing Boards

60 front SB and 28 back SB were inserted on the module. Inserting a front SB is delicate but possible. By removing a summing board, it has been seen that pins had been folded. So it is not obvious when a SB has been inserted that ALL the pins are correctly inserted. We think this is related to the alignement fo the kapton connectors and shouldn't be a problem for future electrodes. It is more manageable to insert BACK SB as they have each less pins in z and there is more space around to proceed. Counting how many pins have been folded will be done at the dismounting on the module.

Removing a front SB is possible if the access at small and large η is possible. Removing a front SB close to a inner ring without damaging it is very delicate.

One SB is found with a trace shorted to ground. Sent back to BNL for investigation. The short is an assembly problem with the SB and would not have occured if we had chosen have a solder mask.

Request: Is it possible to reduce the z size of the SB by 1 or 2 mm ?

Work done at BNL since:

- The width of the SB has been reduced by 2.54 mm (1.27mm on each side).
- A tolerance on the overall thickness of the SB has been specified. The front SB were thicker than the back, because they were outside tolerance causing some of the difficulty in mounting them.
- A solder mask has been specified to allow cleaner assembly and hence prevent the type of shorts that has been faound found.

3 Mother Boards

8 front and 7 back MB were assembled on the module.

On front MB #8 (BARREL END) it is proposed to move the socket with resistive network to give free space for running cables coming from other sectors.

It has been shown that the blue socket and the low profile connector fit well together as far as electrical connection is concerned. It seems however that the cables are too rigid and allows the low profile connector to be partially disconnected. We need here a firmer connection. Can this be achieve using longer pins on low profile connectors?

The blue socket in the front doesn't seem to be a problem as far as the space in R left for cabling is concerned.

Important: The pins to connect the BACK SB to the BACK MB are too short when they are far in ϕ from the median ϕ line of the MB, due to the curvature of the module. A solution could be to provide 2 different connection pin lengthes, one for the 2 inner rows in ϕ, a longer one for the 2 outer rows (Reminder: each BACK SB is connected to the MB by 4 rows of connection pins).

Important: Some holtite on the MBs went away when we removed the connection pins binding the SB and the MB.

The front MB for sector 6 has a wrong positioning of the holtite relative to the summing board (and the electrodes). The hole tights for the SB #7 are one step (2.54mm) to far in z. This MB should be rebuild for the Module 0 in May 1999.

Work done at BNL since:

- Fixed front MB #6
- Fixed Front MB #8
- Specified a tighter tolerance to prevent holtite's from coming out.

4 G10 Boards

Holes in the G10 boards are needed to attach the cables. In Front G10 boards it would be nice to have 2 holes in ϕ systematically between the SBs at a given z, with diameter 3-4mm.

The front G10 board for sector 8 is too long by 1.5 cm.

5 HV Boards

7 HV boards has been assembled on the module. No problem were found so far and they can take the high voltage.

6 Harnesses

It would be better to receive the harnesses rather straight than curl and with different low profile unwired from the μ-D connector. **Request:** Is it possible to deliver the harness straight and heat them in a straight position, otherwise they are very difficult to unwire.

Cables of the harness 14B (monitoring) shouldn't be bound by 8 but by 4.

When opening the harness carton boxes, some low profile connectors have bent pins and the white protection doesn't hold on the low profile. Generally these pins are fragile and need to be better protected.

Harness labelling: on the μ-D connector: put a label with a Orsay number and a feedthrough number (2A,2B,...,15B,15B). On the low profile, put a label with the feedthrough number and a low profile number (1 to 8) for the signal and (1 to 16) for the calibration for the barrel.

7 Work to be done on the cables

For May 1999 (module 0) we propose to modify some harnesses:
1) cut the harness 14B at length (for temperature probes).
2) reduce the harness 14A (from .65m to .40m).

A labelling of the HV harnesses is mandatory: on each half barrel we have 2 HV harnesses. Their cables are labelled from 1 to 8. Each harness has also to be labelled (1,2) to differentiate them.

8 Patch Panels

Front covers: They can cover everything, be as thick as possible.

Have thicker Patch panels (2mm Stainless Steel). This impacts the **length of the screws on the μ-D. ("colonette")**