RPC Assembly

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$2 \times 2 m^2 RPC Module$

Individual RPCs are $1 \times 2 \mod 2$ in area (and only 6 mm thick. Two such RPC in a single plane from the basic $2 \times 2 \mod 2$ module. The RPC array is to be built of 4 layers of such modules.









RPC Array Built from 4-Layer 2 x 2 m² Modules

- Baseline scenario is to construct 4-layer 2 x2 m² modules, and tile them to from the 18 x 18 m² array (Far Hall) and 12 x 18 m² arrays (Near Halls).
- To minimize loss of efficiency at module boundaries, we desire to overlap the modules.
- With square 2 \times 2 m² modules, this requires the modules to be in 4 different horizontal planes.
- But, if the 2 x 2 m² modules have "notched" corners, only 2 different horizontal planes are needed (J. Link, Doc DB 293).
- Such arrays could be assembled using a crane and no additional work platform.
- \Rightarrow RPC assembly performed directly above water pools, or along near edge of pool.
- If RPC support structure is built in modules 4 m wide, then "easy" to assembly the RPC modules onto a support module – and service the RPC modules later IF each support module remains separately movable.





Assembly of 2 x 2 m² RPCs onto 4 x 18 m² Support Modules

- Build the 18-m-long RPC arrays out of 5 modules, which are never strongly bolted together.
- Only the first support module has powered wheels. It is used as the locomotive to build up and move the train of the 4 other support modules.







RPC Array Using "Notched" 2 x 2 m² Modules



Modules are arrayed such that they only abut other modules at their corners.

Mounting hardware, gas, high voltage and signal connectors are on the open edges.

The full array is completed with a complimentary second layer which overlaps the modules of the first layer.

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RPC Array Using Square 2 x 2 m² Modules

(Y.-G. Xie, Doc DB 1144)







Long Readout Strip Option

- An alternative assembly concept tiles 4 horizontal planes with RPCs, and inserts long readout strips between these planes, permitting all services to be located at the edges of the large arrays.
- (B. Sands, 1/2007, + Doc DB 944, 1095, 1066, 1133, 1201)
- Could reduce number of readout channels by 4.
- Signal quality via long transmission line readout verified in lab to be good.

IF RPCs have high singles rate, the 3-out-of-4 trigger must be based on x strips only. Mechanical engineering

- underway for detailed assembly procedure with goal of 1 week in tunnel per each of the 4 RPC layers.
- Assembly of upper 3 planes of RPCs requires an additional work platform.
- Assembly performed with RPCs above water pools.
- Assembly should include immediate testing of newly installed RPCs.







Tiling of RPCs in 4 Staggered Layers for Long Strip Readout







Option for Assembly Using $4 \times 6 \text{ m}^2$ Supermodules

Largest footprint of RPC transport vehicle is ~ 4 x 6 m².
⇒ Consider use of 4 x 6 m² supermodules with readout strips of length 4 or 6 m (Doc DB 1136).



Figure 13. 3D explosive view of the layers. This is only for illustration purpose, the dimensions on the plot are not up to date. All 8m dimension should be replaced by 9m. Notice the slots on the foam spacer, as mentioned in the text they are used to pass the utilities from inner region to the edges.



Figure 10. Modular tiling arrangement, (A) near hall, 9 4m x 6m modules, (B) far hall, 12 4m x 6m modules and 3 2m x 6m modules.





Option for Gas Routing Using "Notched" Corners on the RPCs



Figure 11. (A) RPCs in a module. Green lines show the gas flow direction; (B) Details of the corner gas connection for a pair of RPCs.



