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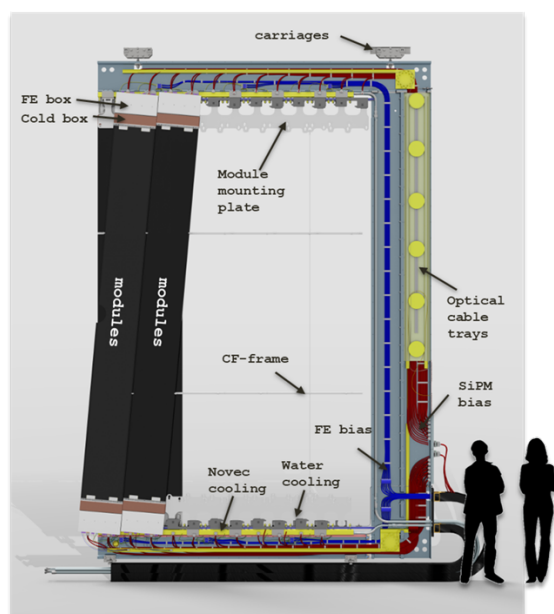
# The Prototype C-Frame

## The List of Prototype C-Frame Parts

1. Full structural mechanics (I-beams and mounting plates), Plan A (extruded) and Plan B (assembled)
2. Steel wires (maybe carbon fibre) for hanging the bottom sub-assembly
3. Novec Collars
4. Novec Manifold with connections for at least 2 cold boxes with distribution lines on the C-Frames (everything for a functional system)
5. Cabling on one side (stereo) plus cables for two X-side modules
6. Water Cooling blocks plus pipes (2 different types from multiple manufacturers) includes a set for the top X and U, and for the bottom X and U. Distribution pipes are also needed.
7. Dry gas flushing (investigate integration). A temporary solution may only be possible.
8. A minimum of 2 Stereo- and 2 X-Modules with cold boxes loaded with SiPMs; 10 modules without cold-boxes to check module deformation
9. A carbon-fibre bar to test improving the stiffness of the modules by joining the stereo and X-layer together.
10. Two functional front end Boxes

## CAD Model of the prototype

The step files can be found on EDMS: <https://edms.cern.ch/project/LHCB-0776>



## Purpose of the Prototype C-Frame

The purpose of the prototype is to answer many of the following questions to prevent critical errors and excessive delays in the serial production of the 12 C-Frames to be installed in LHCb in 2019-2020.

- –What is connected in what order?
- –Can things be done out of order?
- –What tools are needed at each step?
- –Do we have access to the connections at this step?
- –Find the logical mistakes.
- –Is alignment needed?

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- –What can be easily damaged and requires protection?
- –What can be performed in parallel in the serial production?
- What are we checking or measuring at each step? –Tolerances, deformations, etc?
- –What do we need to measure or evaluate at each step? Survey?
- What happens if a part isn't fitting/working/available? –Do we reproduce it for the prototype? Or just boot-strap it on. –Case by case basis
- assess the duration of the individual steps and define a realistic schedule for the series production
- learn the transfer of the C-frames between the various frames and cages

-- BlakeLeverington - 2018-01-29

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