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Design of complex services routing of the CMS Upgrade Tracker TBPS

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The Tracker Barrel with PS-modules (TBPS) is one of the subdetectors of the new CMS Phase-2 Tracker. It will have 2872 Pixel-Strip (PS) modules on three concentric layers. Each layer has three sections, one Flat section in the middle surrounded by two Tilted sections. In the Flat section the modules are on straight Planks while in the Tilted section they are on conical Rings. A particular difficulty is the routing of the cooling, electrical and optical services of the TBPS. The services need to fit in small spaces, be compatible with the detector assembly sequence and be constrained reliably. Services routing and supporting have been designed to fulfil these requirements, still keeping the mass as low as possible.

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