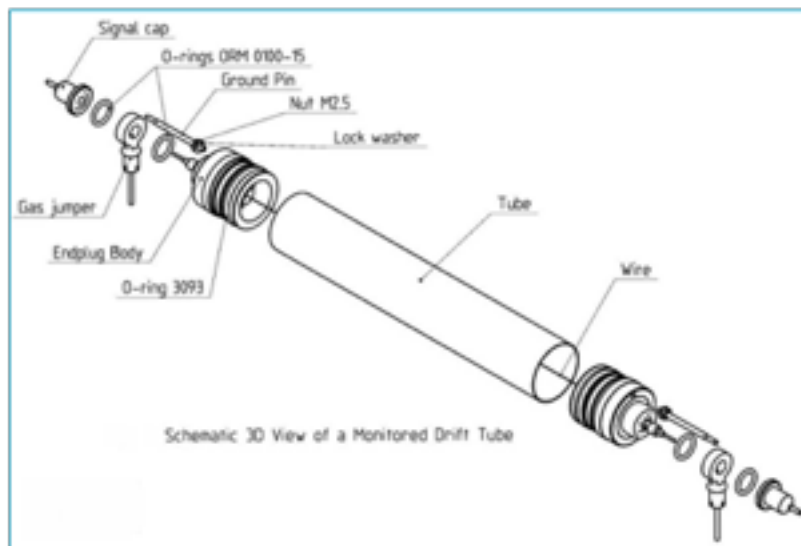
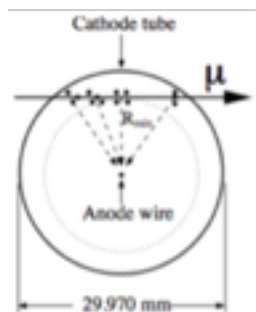


6.6.1 sMDT

- The sMDTs are “small tube” drift chambers
 - I.e. “arrays” of cylindrical tubes, each with a wire centered on the cylinder axis
 - Assembly is done in-house at MSU and U of Michigan
 - Full list of materials provided, incl. vendors we plan to use
 - Materials cannot be changed (drift chambers are complex)
 - Alternate vendors would need to be qualified





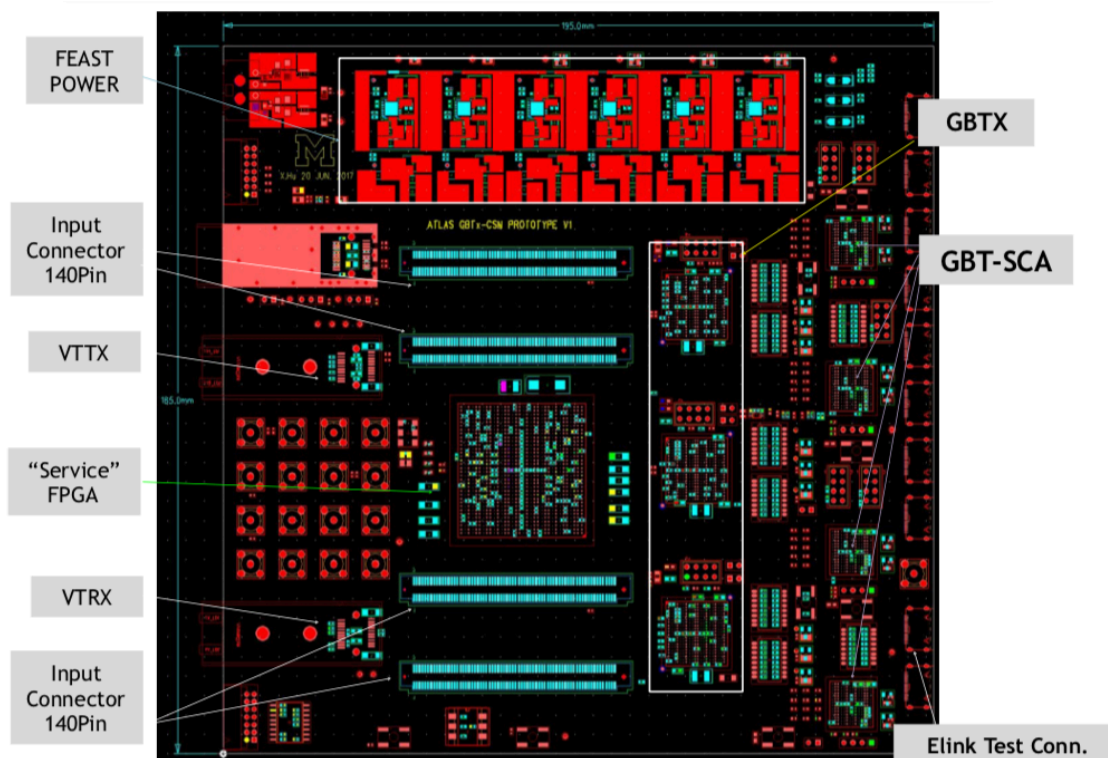
6.6.3 TDC



- A Time-to-Digital converter
 - As for the ADC, non-radiation-tolerant devices with similar performance are readily available on the market
 - But we need radiation tolerance, so we make our own
 - Expect vendors will propose (costly) military-grade devices
 - Most likely result of your investigations will be similar to results obtained for the LAr ADC
 - Radiation tolerance requirement is somewhat lower than for LAr ADC:
 - TID: 20 kRad
 - 1-MeV neutron equivalent flux: 2×10^{12} n/cm²
 - Flux of hadrons with a kinetic energy above 20 MeV: 3.4×10^{11} cm⁻²

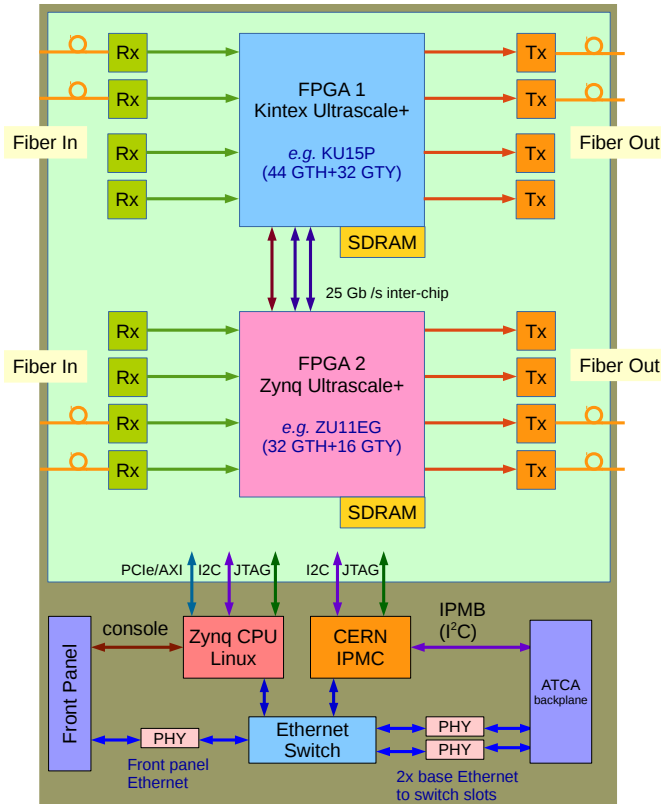
6.6.4 CSM

- An on-detector electronics board
 - BOM and gerber for prototype provided in package
 - Some (radiation tolerant) parts not commercially available (GBT, GBT-SCA, VTRX, VTTX, FEAST)
 - Suggest to proceed without the cost of those parts, then add those in at reconciliation



6.6.5 LOMDT

- Off-detector ATCA-standard blades used for data processing
 - “Service module” with logistics
 - “Command module” handling the data reception, processing and transmission
 - Package includes BOMs and gerbers for prototypes for both, should be straightforward



Command Module

Service Module

6.8.2 Hardware Track Trigger

- Off-detector ATCA-standard blades used for data processing
 - Different architecture than LOMDT
 - TP: ATCA “main” blade
 - TFM: ATCA mezzanine (on TP)
 - RTM: “passive” board (transceivers)
 - No gerbers yet (layout underway)
 - BOMs and PCB descriptions
 - Enough to get quotes
 - Impact should be small

