

Calorimeter Electronics for MIPP Upgrade

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MIPP Collaboration Meeting

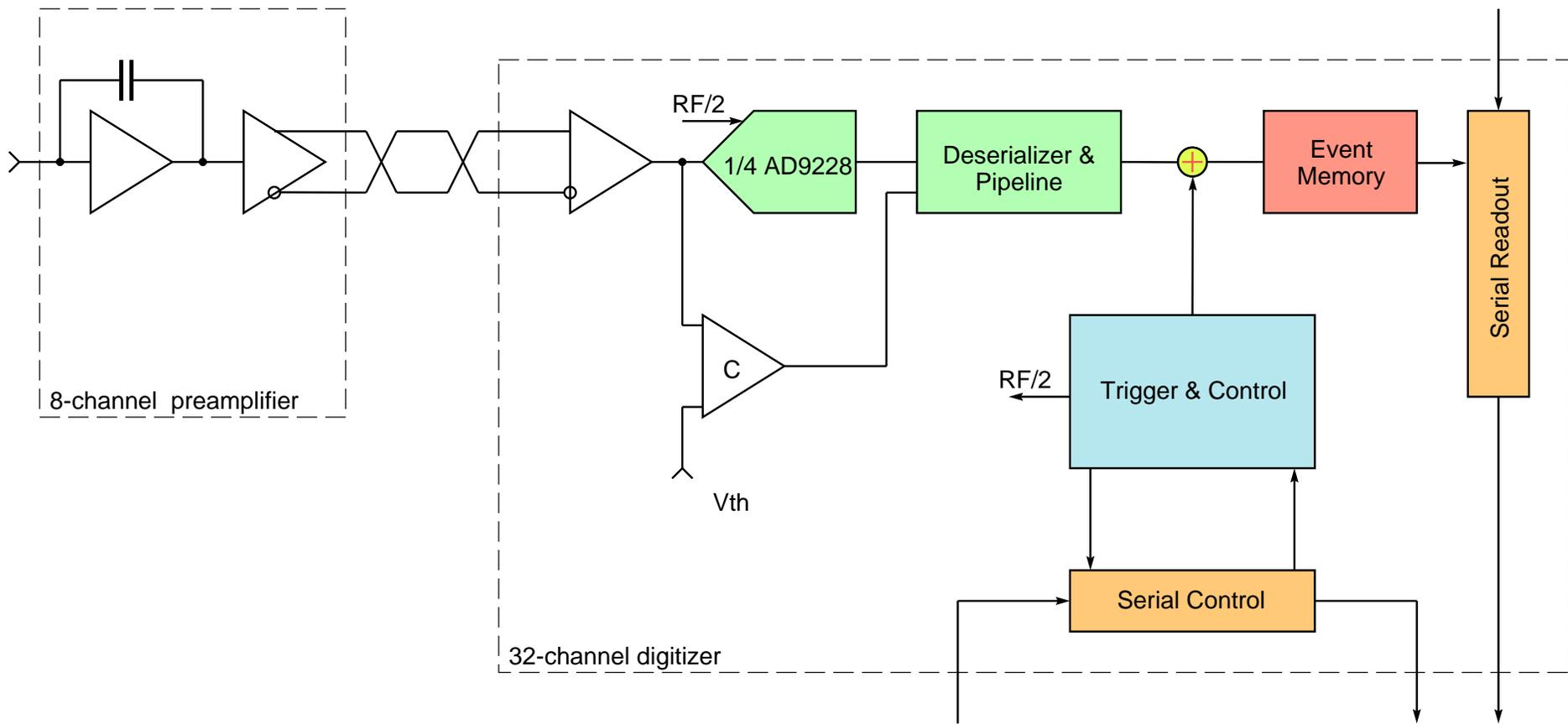
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Current System

- EMCal has 640 wires
 - *Amplification*: 20 32-channel amplifier boards ($\sim 400ns$ internal delay)
 - *Digitization*: 4 ADCs (160 channels each) – $1.5ms$ total conv. time per ADC
 - *DAQ*: 1 CAMAC interface

Upgrade

- Digitizers need to be upgraded – board being designed for the plastic ball (B. Baldin) should work (some changes)
- To conform to the new triggering/pipelining scheme, the amplifiers will have to be changed. (new 8-channel boards; 80 boards)
- Design criteria "finalized" with Boris Baldin
- HCal ADCs (8 PMTs) are fast, *but* if we are going with a pipeline/buffering scheme, we have to modify the readout. *Easiest:* Use plastic ball board.



MIPP EMCal Front-end

Design Requirements

- Dynamic range: $1\text{muon} \rightarrow \geq 100\text{muons}$
 - Minimum ionizing charge is 0.04 pC
- Capability for pedestal-subtraction
- Keep noise on amplifiers to $< 5\%$ of a MIP ($< 10^4$ electron equivalents)
- Try to eliminate some noise issues due to cabling by having amp boards mate directly to chamber ends

Summary

- EMCal electronics needs a complete upgrade to keep up with the new rate and triggering/readout scheme
- Plastic ball front-end board should work for the digitization
- Need to build new amplifier boards – 80 boards; parameters finalized
- HCal readout has to be changed to buffer the spill (plastic ball board)
- HCal may have to be inspected to fix one bad cell