2CBC3 and 8CBC3 design plans

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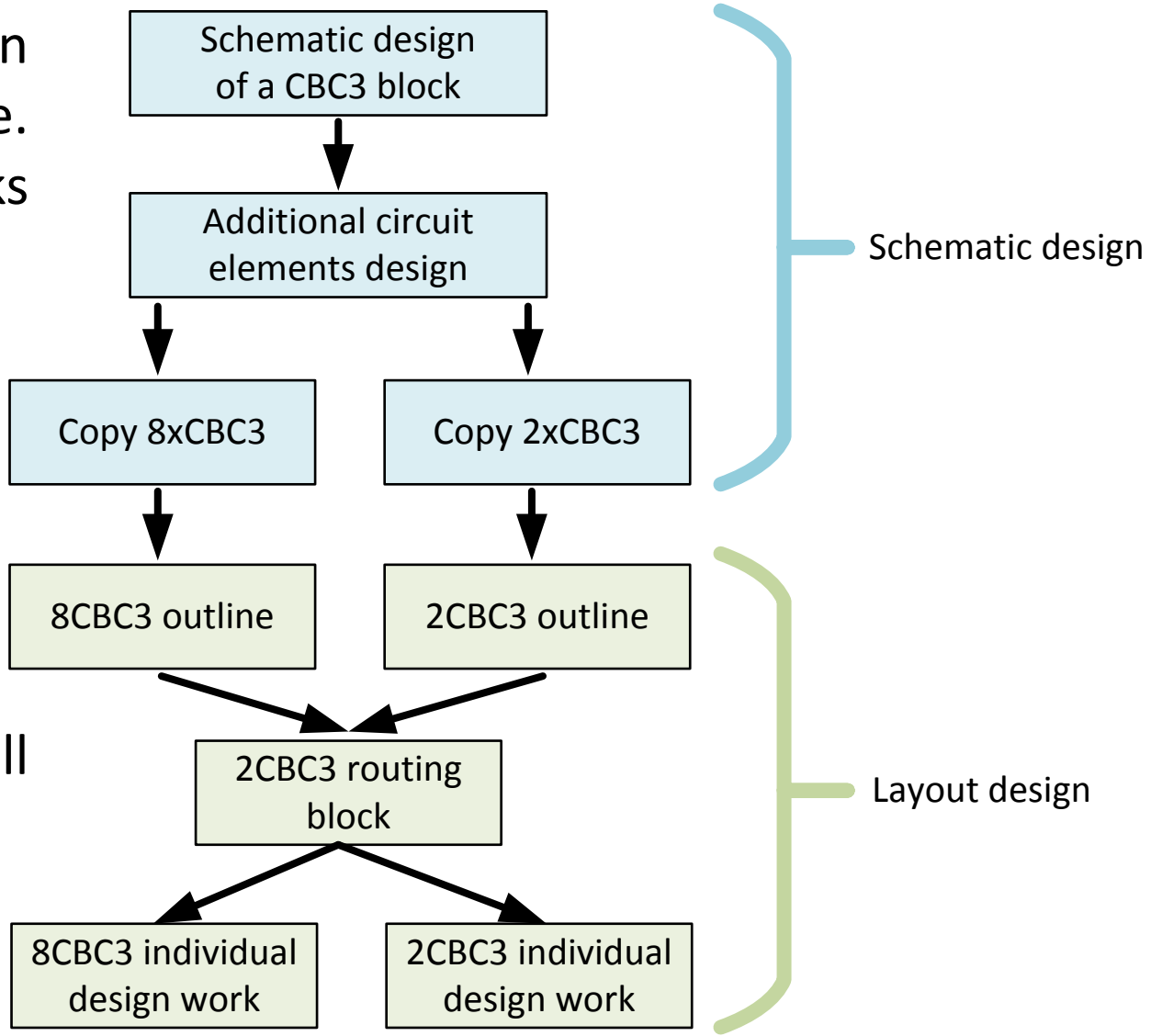
The CBC3 ASIC prototype is going to be bumped and tested early next year. A hybrid prototype is required for detailed testing of the ASIC.

In the last electronic meeting the topic was discussed. The plans are moving towards to design a 2CBC3 prototype, to gain time and decrease the chance of hybrid related failures. After the 2CBC3 hybrid, an 8CBC3 hybrid will come soon.

Two similar designs has to be prepared in the close future. Some design blocks can be reused.



The 2CBC3 design will be the priority work.

The 2CBC3 board will require a complex back-end system for testing. It is possible to save development time and manpower with a universal readout system.

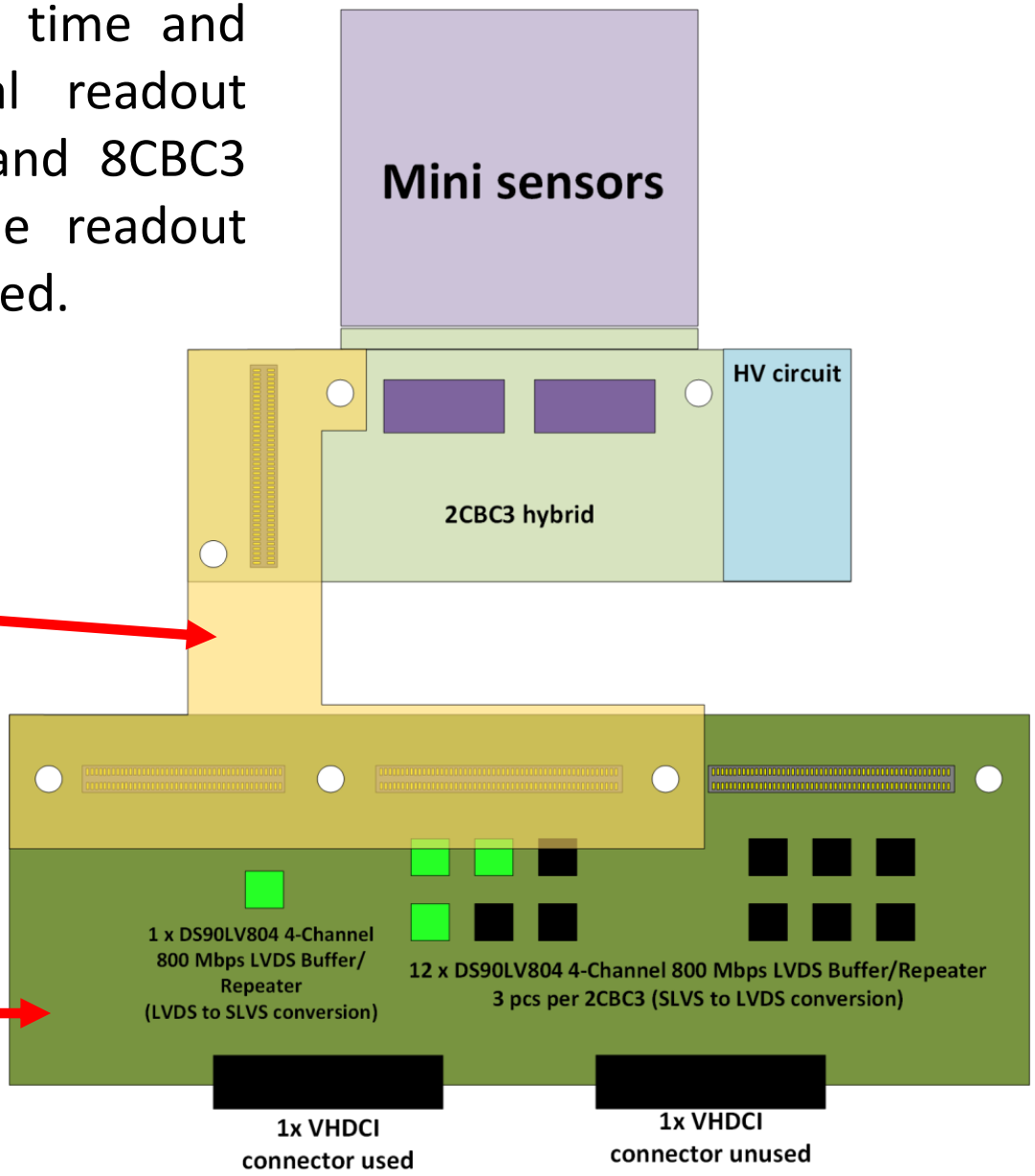
Details:

- The FC7 FPGA board will probably replace the obsolete GLIB system.
- Two LPC FMC cards must be used to read all the 8CBC3 signals without CIC.
- FMC cards will need one or more DIO5 channels and may need other features (RJ45 connector? and SFP+?).
- Only one 8CBC3 hybrid can be read by one FC7 without the CIC.
- A universal interface board can be designed for both CBC3 hybrids.
- A scalable firmware could be designed to be compatible with both hybrids.

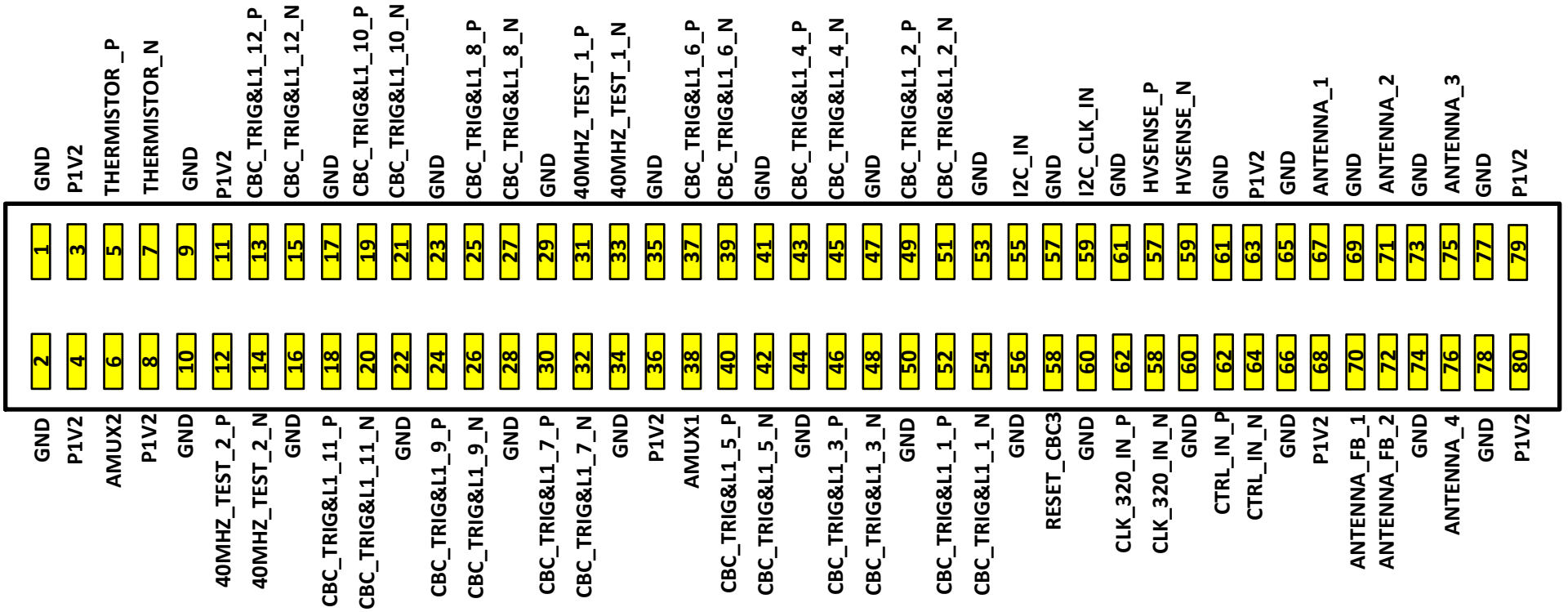
In order to save development time and effort, I propose a universal readout scheme for both the 2CBC3 and 8CBC3 hybrids. In this case only one readout firmware and hardware is required.

Hybrid adapter circuit made on flex substrate.

8CBC2flex and 2CBC2flex compatible interface board.



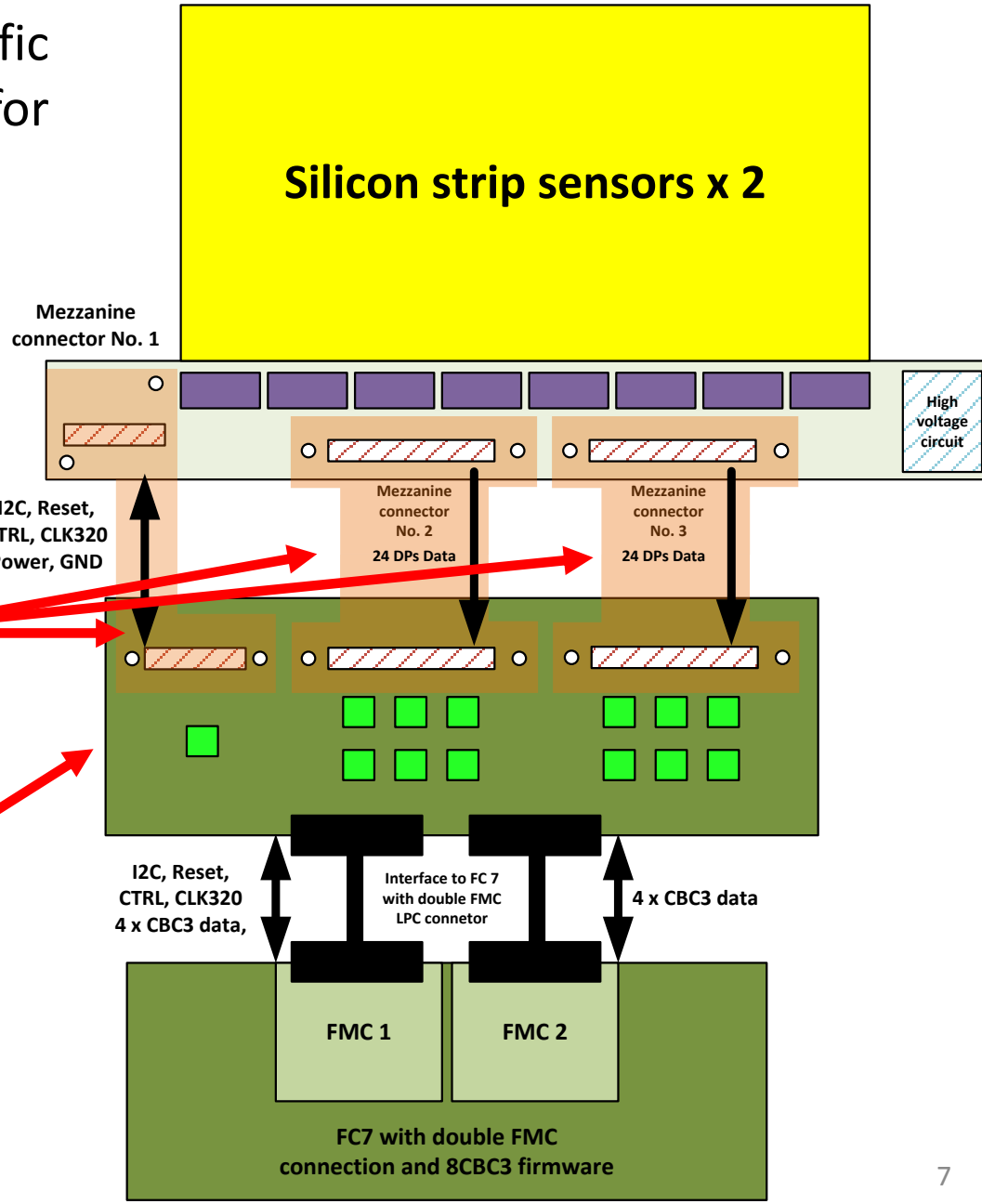
At least 80 pins are required for the 2CBC3 to pass power and signals. I propose a mezzanine connector (Panasonic A35S series) for this purpose.



The interface board can be reused in an 8CBC2 configuration. Specific adapter circuits are needed for each hybrid.

Hybrid adapter circuits made on flex substrate.

8CBC2flex and 2CBC2flex compatible interface board.



There are several board designs in the to do list:

- 8CBC2flex reproduction (planned submission in December 2016)
- PS-MCK interface board (planned submission in January 2017)
- 2CBC3flex (planned submission in March 2017)
- Universal interface board for CBC3 (planned submission in April 2017)
- FMC cards for 8CBC3 system (Who will design it?)
- 8CBC3flex (2017?)

- New hybrids to be designed for the CBC3 testing.
- New readout system is needed to test the ASICs and the hybrids.
- With good planning we can save significant amount of time and workload.
- New FMC boards are needed for the FC7 system.