

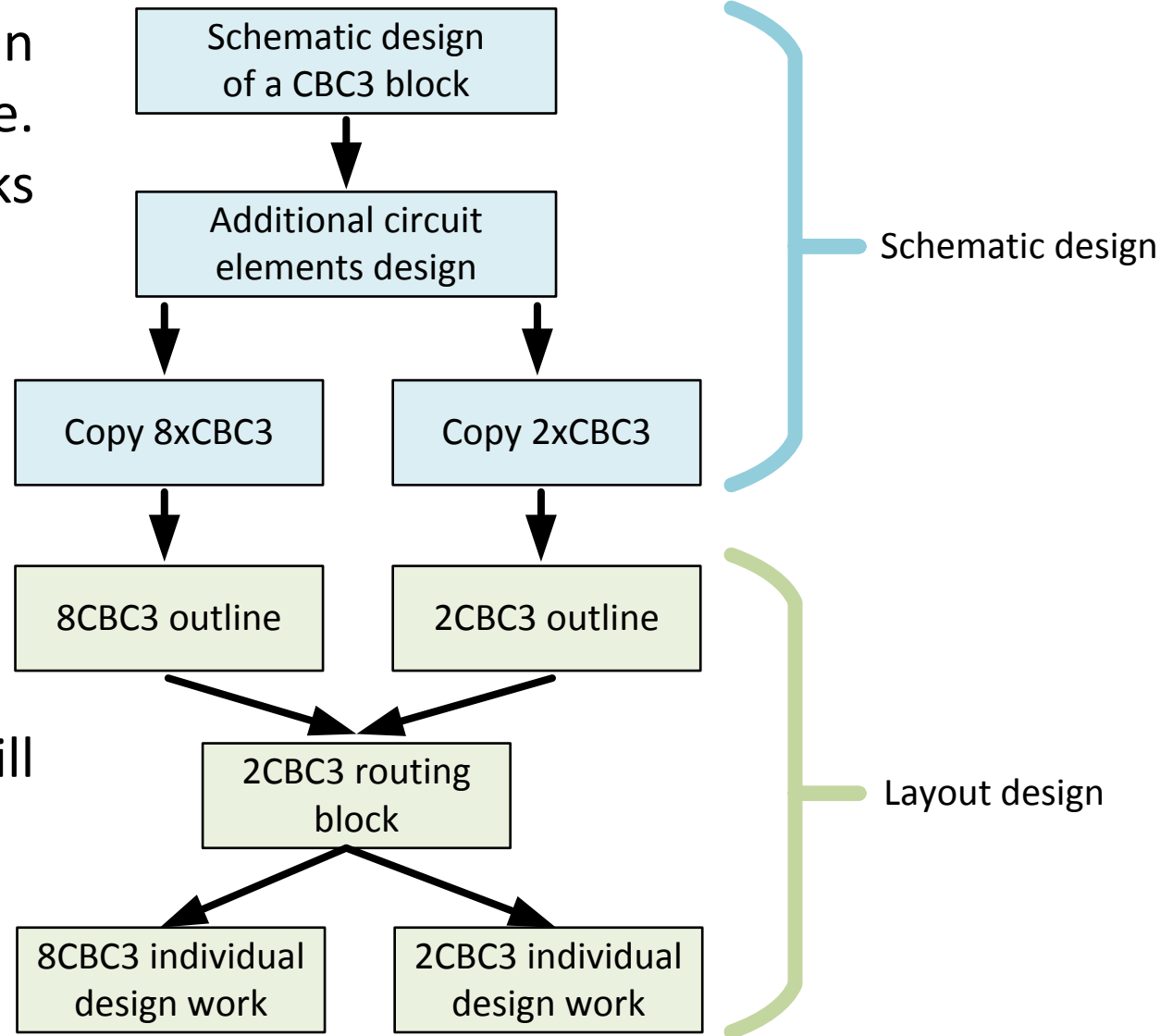
# 2CBC3 and 8CBC3 design plans

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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.

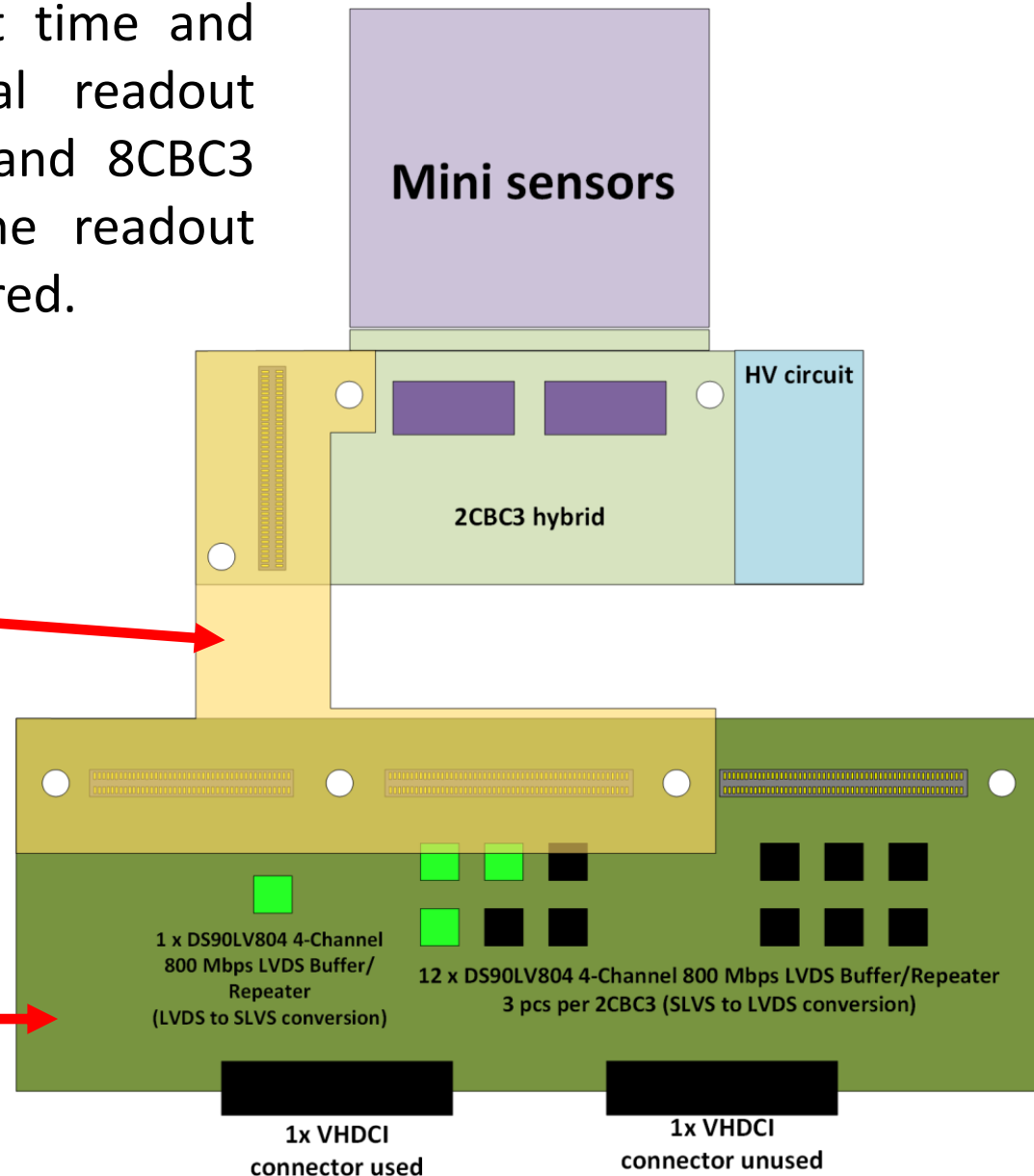
### **Details:**

- 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.



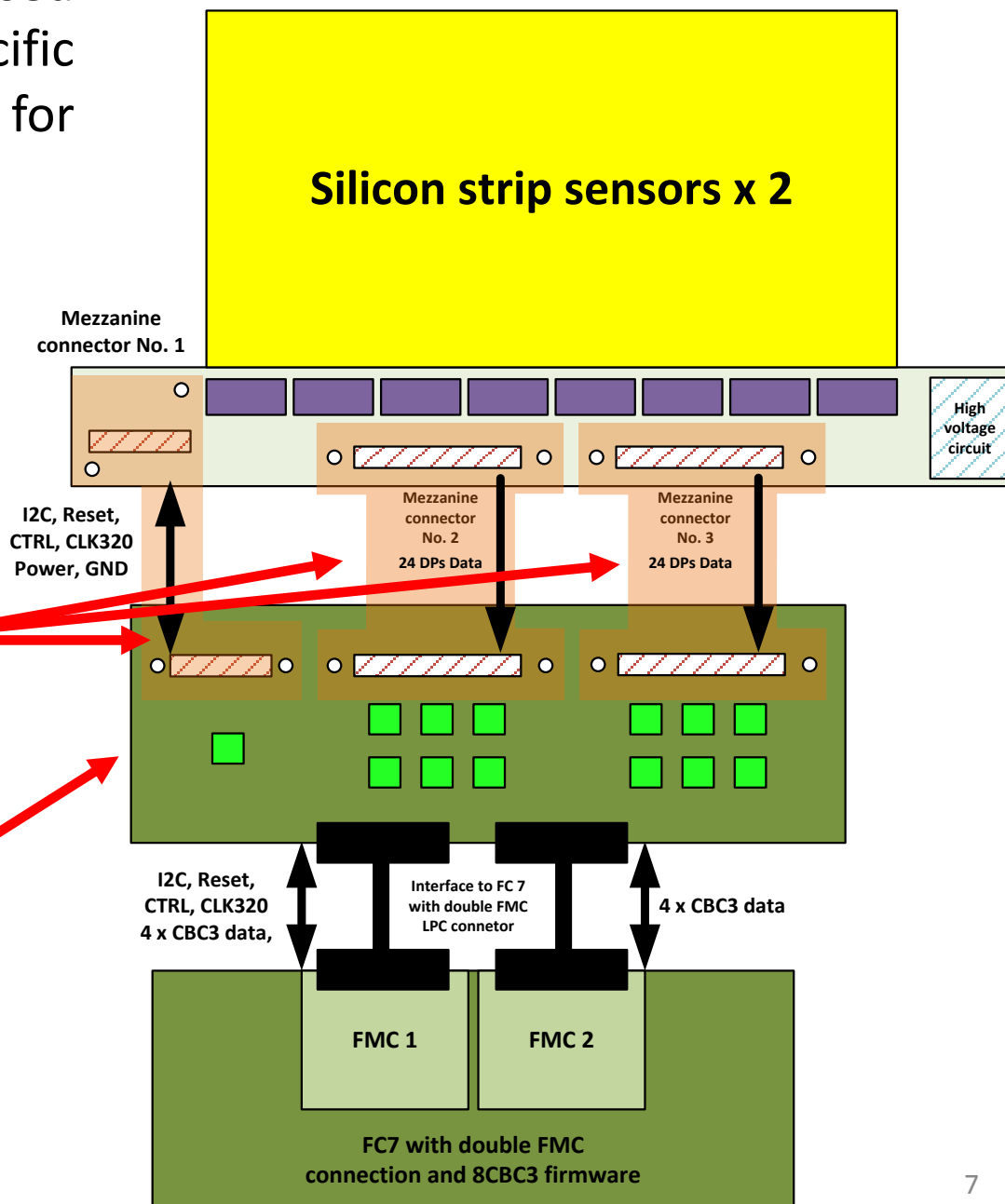
At least 80 pins are required for the 2CBC3 to pass power and signals. I propose a mezzanine connector (Panasonic A35S series) for this purpose.

GND	1	2	GND
P1V2	3	4	P1V2
THERMISTOR_P	5	6	AMUX2
THERMISTOR_N	7	8	P1V2
GND	9	10	GND
P1V2	11	12	40MHZ_TEST_2_P
CBC_TRIG&L1_12_P	13	14	40MHZ_TEST_2_N
CBC_TRIG&L1_12_N	15	16	GND
GND	17	18	CBC_TRIG&L1_11_P
CBC_TRIG&L1_10_P	19	20	CBC_TRIG&L1_11_N
CBC_TRIG&L1_10_N	21	22	GND
GND	23	24	CBC_TRIG&L1_9_P
CBC_TRIG&L1_8_P	25	26	CBC_TRIG&L1_9_N
CBC_TRIG&L1_8_N	27	28	GND
GND	29	30	CBC_TRIG&L1_7_P
40MHZ_TEST_1_P	31	32	CBC_TRIG&L1_7_N
40MHZ_TEST_1_N	33	34	GND
GND	35	36	P1V2
CBC_TRIG&L1_6_P	37	38	AMUX1
CBC_TRIG&L1_6_N	39	40	CBC_TRIG&L1_5_P
GND	41	42	CBC_TRIG&L1_5_N
CBC_TRIG&L1_4_P	43	44	GND
CBC_TRIG&L1_4_N	45	46	CBC_TRIG&L1_3_P
GND	47	48	CBC_TRIG&L1_3_N
CBC_TRIG&L1_2_P	49	50	GND
CBC_TRIG&L1_2_N	51	52	CBC_TRIG&L1_1_P
GND	53	54	CBC_TRIG&L1_1_N
I2C_IN	55	56	GND
GND	57	58	RESET_CBC3
I2C_CLK_IN	59	60	GND
GND	61	62	CLK_320_IN_P
HVSENSE_P	63	64	CLK_320_IN_N
HVSENSE_N	65	66	GND
GND	67	68	CTRL_IN_P
P1V2	69	70	CTRL_IN_N
GND	71	72	GND
ANTENNA_1	73	74	P1V2
GND	75	76	ANTENNA_FB_1
ANTENNA_2	77	78	ANTENNA_FB_2
GND	79	80	GND
ANTENNA_3			ANTENNA_4
GND			GND
P1V2			P1V2

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.