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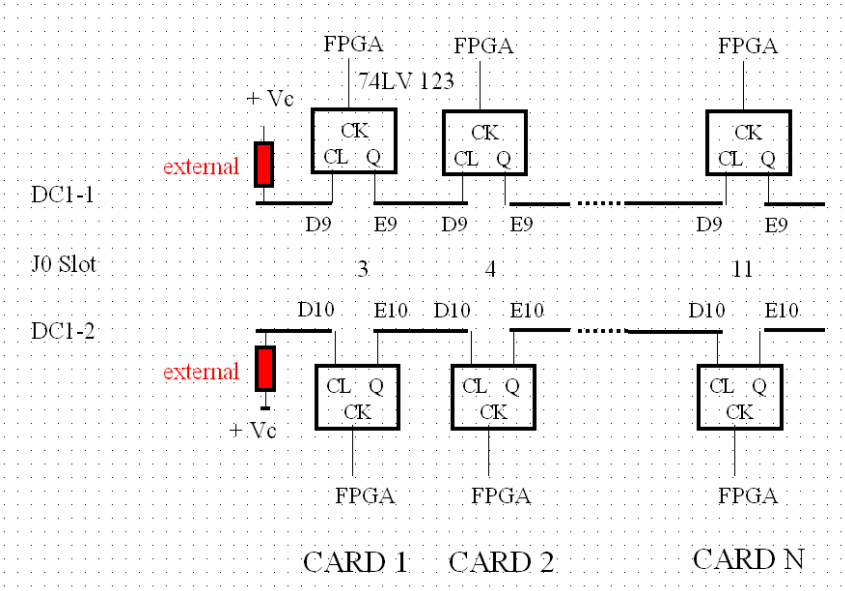
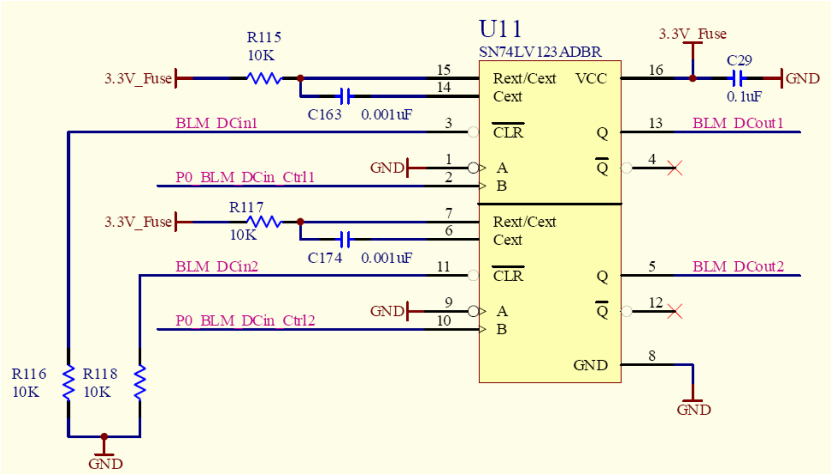
TEST OF THE DAB REV1 DAISY CHAIN

The principle of the daisy chain in the DAB is shown in the figure below.

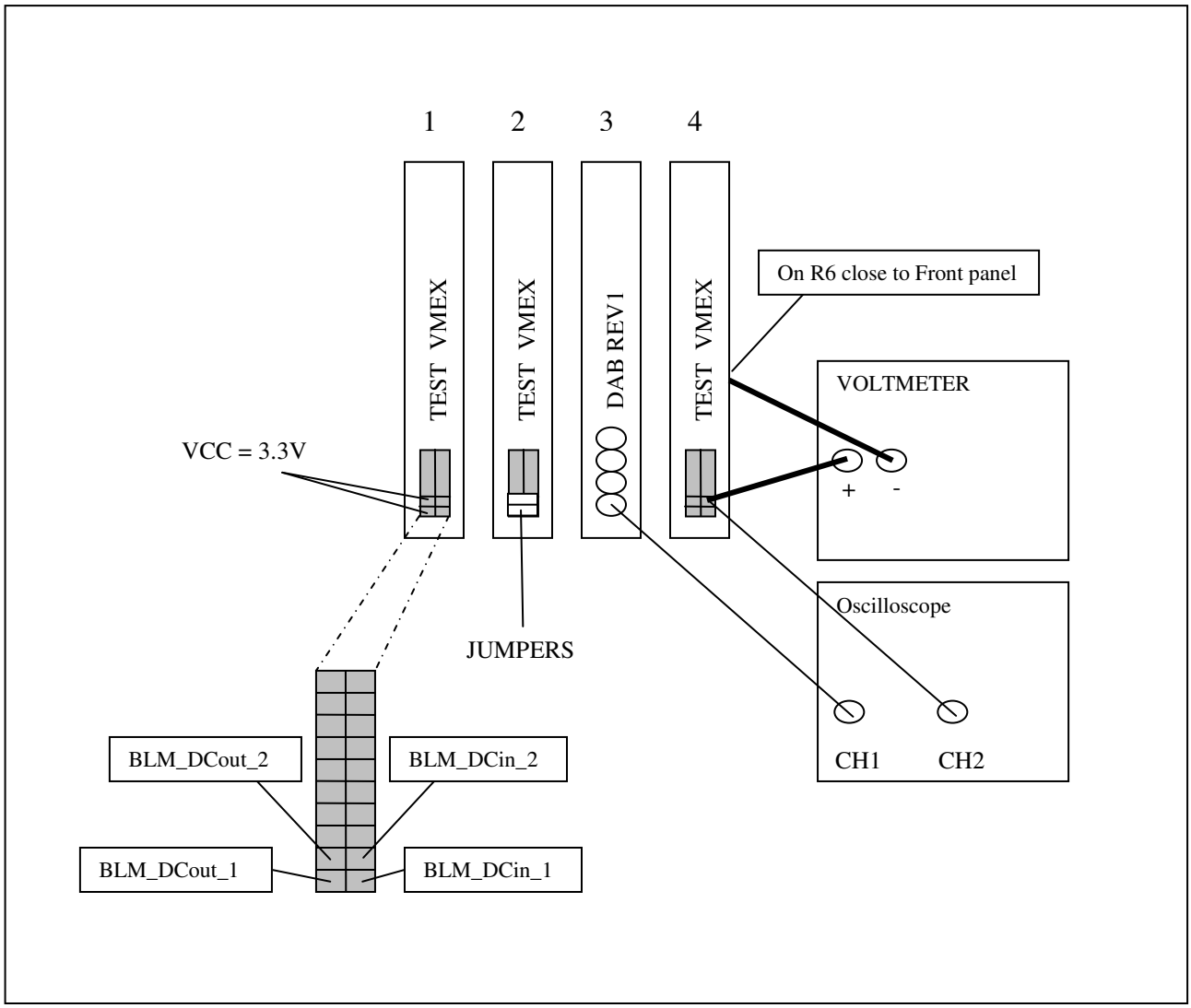


The pull-up at the beginning of the line gives a '1' to the first 'CL' (active low). Then the 'CK' input must be feed with a frequency to retrigger the internal timer and maintain the '1' to the output 'Q'. If one of the card is removed or the FPGA stop sending the frequency to the 'CK' input, the line goes to '0' and arrive to the combiner card.

Schematic of the function on the new DAB rev1:



TEST SETUP:



TEST 1:

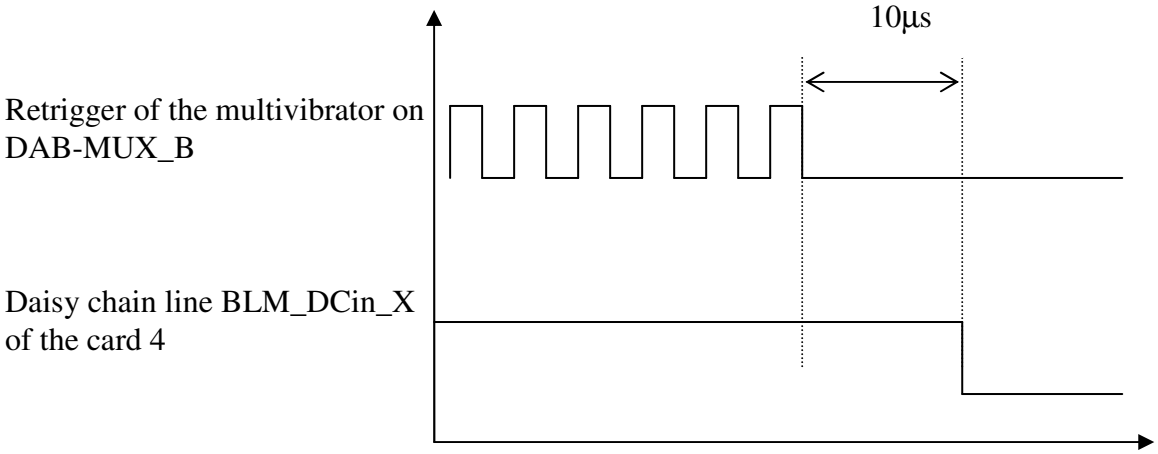
This is a basic test of removing a card which participates to the daisy chain. First apply a 3.3V on the beginning of the chain (Card '1'). Then the DAB (Card '3') should be programmed with the file DAB_TEST from the folder "Daisy_Chain_always_On".

1. Visualise with a voltmeter the voltage on the card '4' the BLM_DCin 1 and 2, the voltage should be around 3.3V.
2. Without turn off the vme, remouve the card '2', this will cut the 2 lines. The voltage should be 0V
3. Connect again the card '2', the voltage should be again 3.3V.

TEST 2:

This test control the time constant of the multivibrator retriggerable on the DAB card (U11). For that, the FPGA on the DAB with generate the right frequency for 0.5s and then stop for 0.5s, the cycle will continue indefinitely. The moment that the FPGA stops retrigger the multivibrator with a frequency to the falling of the signal BLM_DCout_x is the interesting timing to measure.

1. Load the FPGA with the file from the folder called "Daisy_Chain_with_automatic_on_off".
2. Connect the oscilloscope as shown on the figure (TEST SETUP page). Channel 1 to the MUX_B out of the DAB card and the channel 2 on the card '4' signal "BLM_DCin_2".
3. Trig to the falling edge of the channel 2, 5us par division.



The result must be below 10µs. On the next revision of the card, this timing will be around 1µs to speed up the reaction of the system.

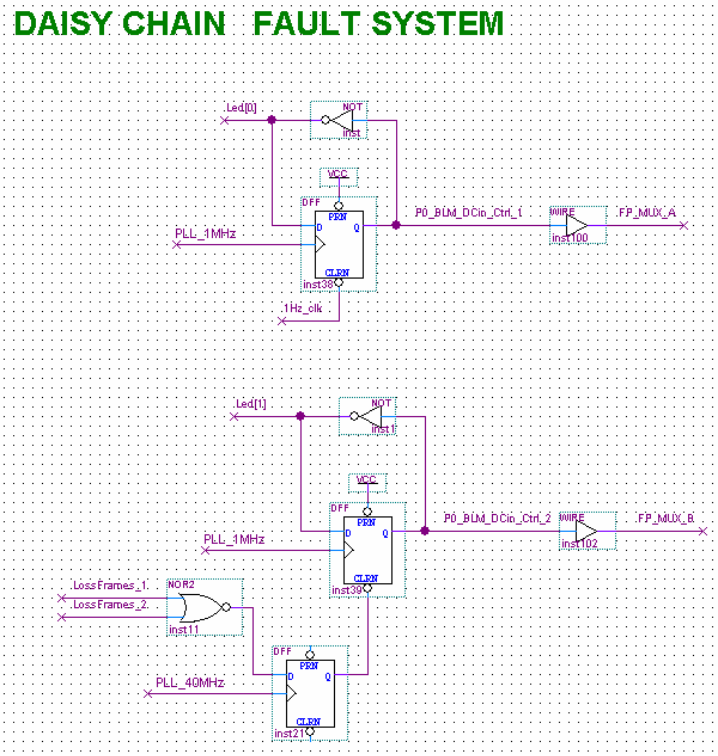
TEST 3:

On this test, the generation of the frequency for the retrigger is controlled by the presence of the optical fibres. If on is not connected, the BLM_DCout_2 of the DAB goes to the low state as long as the fibre is disconnected.

1. Load the FPGA with the file from the folder called "Daisy_Chain_with_fibres_on_dump_line_2".
2. Connect the oscilloscope (same as TEST 2) as shown on the figure (TEST SETUP page). Channel 1 to the MUX_B out of the DAB card and the channel 2 on the card '4' signal "BLM_DCin_2". Put the trigger of the oscilloscope on "Auto" mode.
3. Connect the 2 fibres input (for the first CFC) of the DAB to the 2 fibres of a working CFC.

4. The signal on the oscilloscope BLM_DCin_2 should be high. If you disconnect the fibre, this signal should goes down (same as test 2)

See below the logic for the control of the retrigger of the multivibrator and the one in case of a disconnection of a fibre. (Lines “LossFrame”)



FPGA internal signal analyzer “SignalTap” showing the loss of frame (disconnection of the fibre). The signal LossFrame_1 seems to rise before the disconnection, but the packets before the rising are already corrupted.