SB5W4

1. All resistance measurements are OK. Do not ask me the numbers because they are NOT relevant.
2. Measured the Signals out of the FTM on the FIB timing cable with the break-out board. We found that the behavior is very anomalous and consistent from Line to Line.
    a. When the Wedge is NOT powered (status OFF) the signals (all of them look normal)
    b. When the Wedge is powered (CPC and every ladder is in STDBY status) there is a reflection of every signal 240 nsec after the signal is issued (obviously in the opposite direction) and this reflection bounce back one more time 240 nsec further down. This behavior is present on every signal (the example of C_CLK is visible in Figure 1) but FECLK and BECLK where nothing anomalous is visible (the example of FECLK is visible in Figure 2).
3. **The challenge now is to reproduce this problem on the bench** and then try to figure out a way to deal with it. The problem could be introduced by the fact that there is ***extra power consumption*** on the 5VDOIM line. The approach on the bench will be:
    a. Add (solder) a potentiometer (0-100 Ω) between 5VDOIM and GND on the CPC.
    b. Set the resistance to the maximum available (100 Ω)
    c. Connect the breakout board at the FTM and monitor with an Oscilloscope the C_CLK Signal (or any other you want but not one of the 2 CLKs).
    d. Make sure that everything is working fine.
    e. Lower the resistance of the potentiometer up to when you reach the same power consumption in the 5VDOIM line of 2.5 A.
    f. Monitor the signal chosen in point .c versus the current measured by the power supply on the 5VDOIM channels.
4. If we do not reproduce the problem with the procedure in point 3 than we have to go back to thinking.
5. If the problem is reproduced
    a. You crank UP the %VDOIM voltage at the power supply up to a level where the problem is not present anymore.
    b. This voltage (plus a small safety margin) should be set on a Power supply that we will install in the real Wedge (SB5W4)

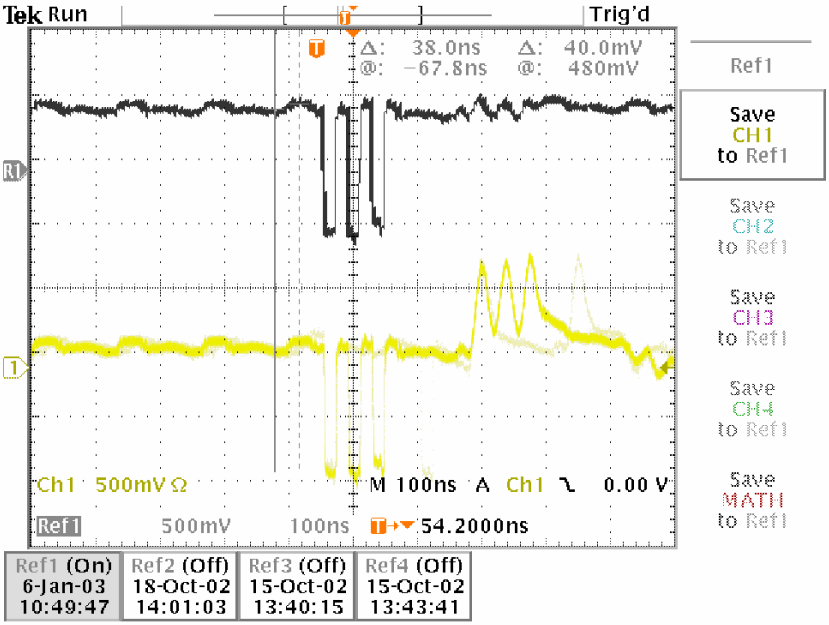

Figure 1. C-CLK signal as measured with the differential probe. BLACK is with POWER OFF and YELLOW is with POWER ON. Any other signal except for FECLK and BECLK (Figure 1) has exactly the same behavior.

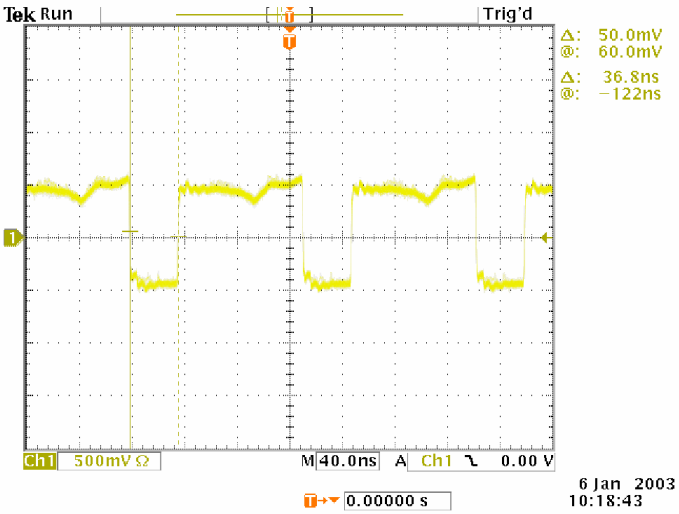

Figure 2. FECLK as measured with differential probe. BECLK is similar. Nothing anomalous is visible on these 2 lines independently from the status of the power to the CPC.