

Camera Synchronization Report

We were successful in our original plan of utilizing the two pins of the Ominivision OV7221 CMOS sensor, FSIN and VSYNC, to synchronize multiple PS3 cameras. According to the chip's product brief, the FSIN pin is the frame synchronization input to the CMOS sensor and the VSYNC pin is the vertical sync output. Although the layout of the PS3's chip had changed, the location of the FSIN pin is still relatively easy to find. The difficulty in the synchronization of this particular model of the PS3 camera revolves around determining where on the board the VSYNC pin is located. We began probing each pin very carefully. We were looking for an output on the oscilloscope resembling a clock: a periodic pulse. We eventually found a pin which resembled these characteristics (**Figure 1**). **Figure 2** and **Figure 3** show its position on the board.

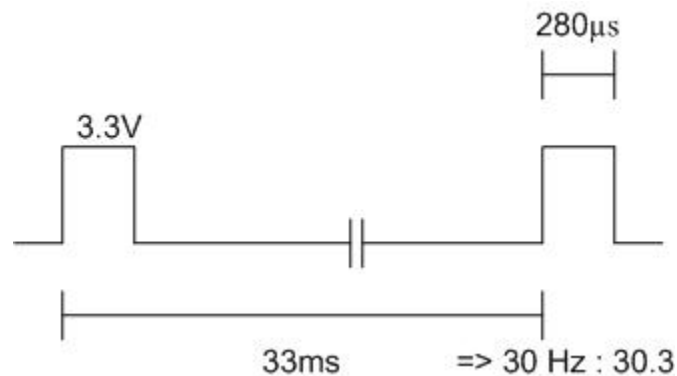


Figure 1: VSYNC Output Timing Diagram

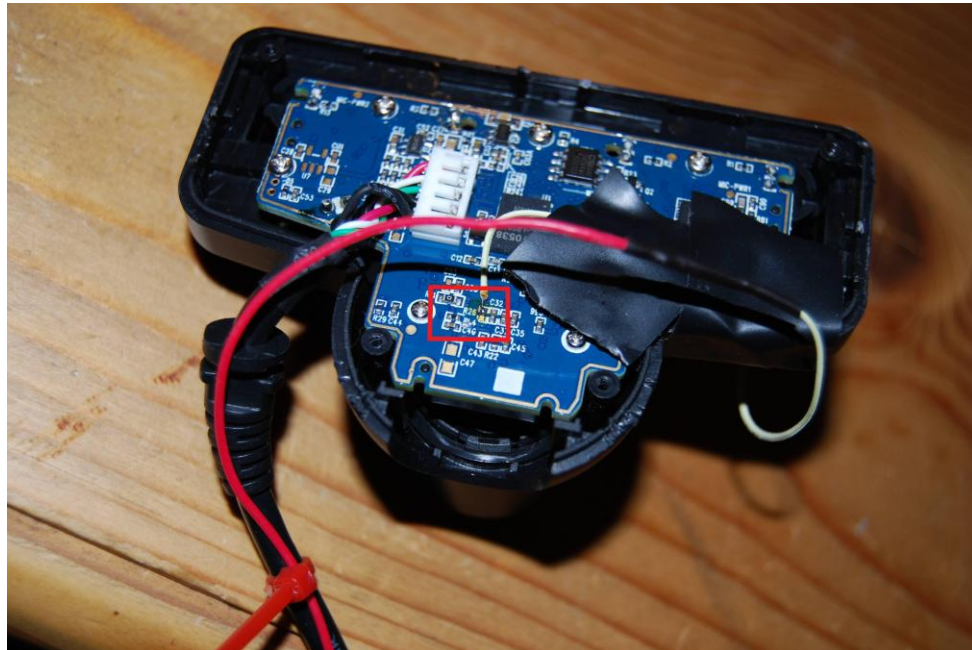


Figure 2: Relative Position of Syncing Pins on the PS3 "New EYETOY" 5702 Solution (v8.2)

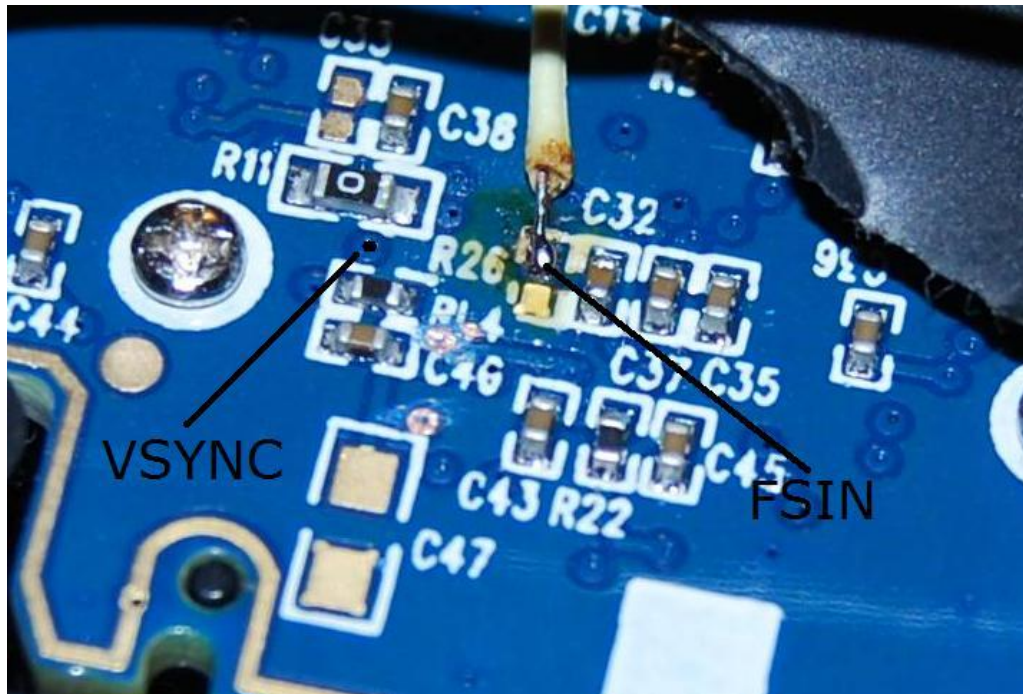


Figure 3: Position of VSYNC and FSIN on PS3 Webcam.

Once we were confident that we had found the correct pins we connected them in a master-slave configuration. In this case the camera with the wire soldered to VSYNC is the master and the FSIN soldered pin is the slave. We were able to validate our synchronization by probing the VSYNC of each camera with an oscilloscope.

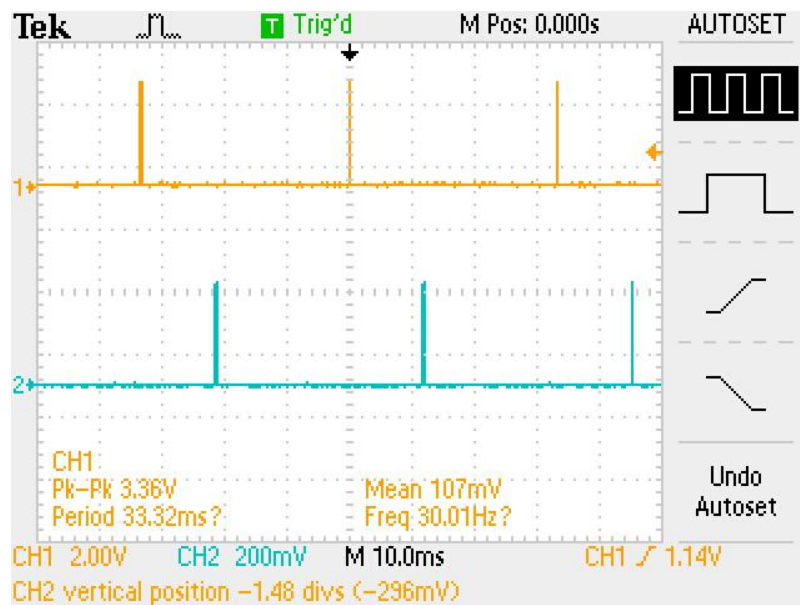


Figure 4: The VSYNC output of two unsynchronized cameras.

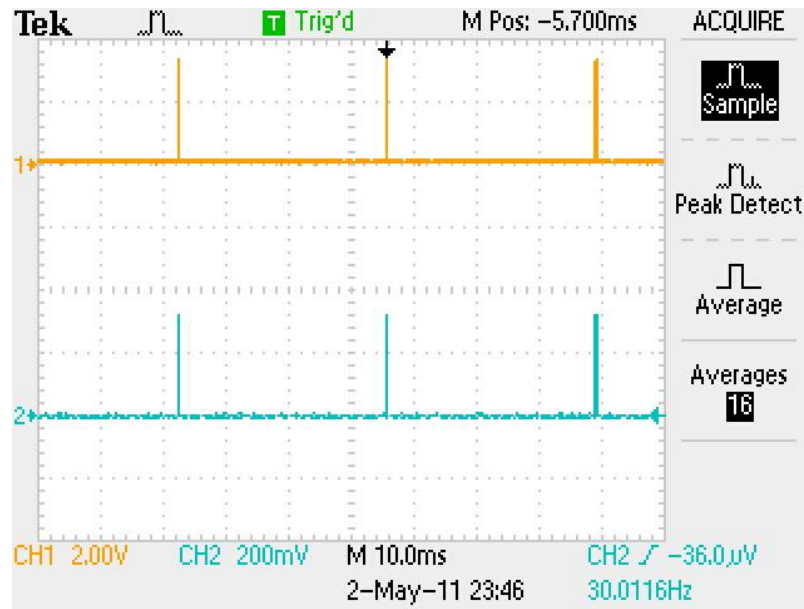


Figure 5: The VSYNC output of two synchronized cameras.

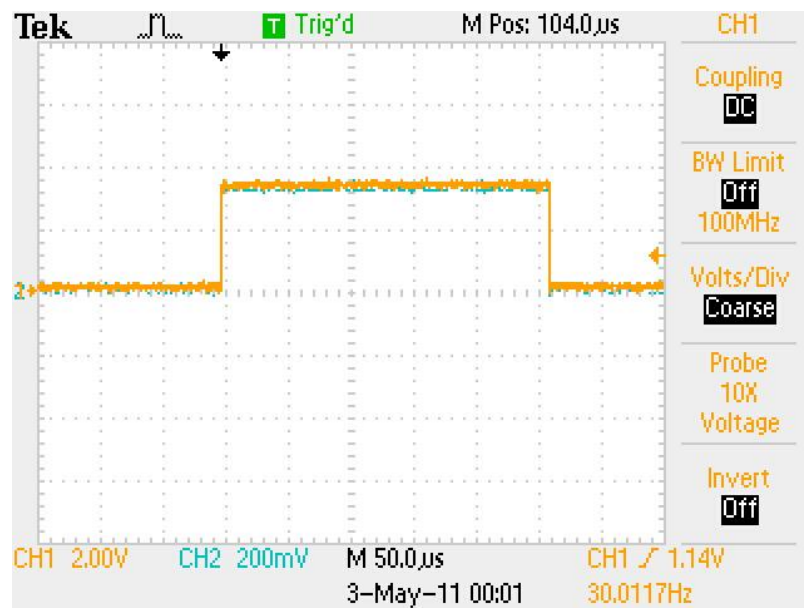


Figure 6: A square wave of the same VSYNC pin. Notice both VSYNC pins: blue and orange.

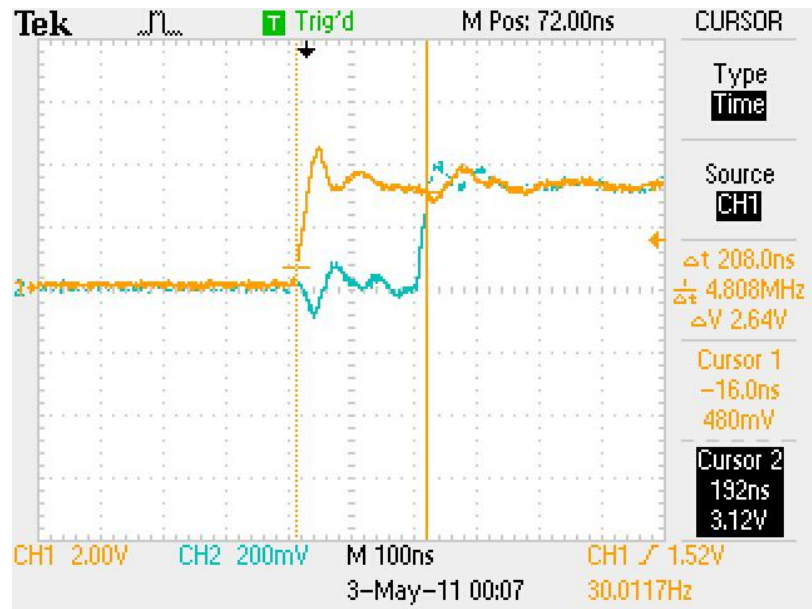


Figure 7: The VSYNC pin output of synchronized cameras with latency around 200ns