

# Description of Multiple Video Cameras and iPhone Accelerometers Using in Brake Testing And General Vehicle Motion Analysis

*Posting Date: 07-Feb 2013*

The most recent set of road testing conducted at Gorski Consulting involves the comparison of the iPhone 5 and iPhone 4S accelerometer outputs as retrieved by the XSensor application. Testing was conducted on February 3, 2013, primarily on snow-covered and wet asphalt road surfaces. The two iPhones were attached side-by-side to the centre console of our 2007 Buick Allure. The photo below shows the layout of the computer screen when the output of seven video cameras was assembled in our Premiere video-editing project.



At the upper left is the view of the vehicle's speedometer and tachometer. Next, in the centre-upper area, is a view looking forward through the windshield of our test vehicle.

Next, on the upper right is a view, looking from the left to the right, at the driver's foot pressing the accelerator pedal. A piece of yellow tape had been placed on the side of the brake pedal so that its position stands out more clearly when it is depressed.

In the bottom left is a view from a camera that is mounted to a horizontal bar that itself is anchored to a bike rack at the back of our vehicle. This view shows the taillights of the vehicle so that we can see when they first illuminate as well as when they extinguish. This view also allows us to see the lateral position of our test vehicle with respect to landmarks such as the roadway centre-line.

Next, in the bottom center of the screen, is a view from a camera pointing backwards toward the left front tire. This close-up view is used to explore the rotation rate of that tire during braking as well as what qualities of the surface the tire is riding on when braking takes place. We are also able to see the characteristics of the tire mark produced by this tire before the left rear tire riders over it and characteristics are destroyed.

Next, at the bottom right corner of the screen is a view of our steering wheel with a large protractor attached so that we can observe the rotation rate and magnitude of steering input during the vehicle testing.

Finally, in the centre-right is a close-up view of the screens of the two iPhones. The display to the left is from the iPhone 5 while the one to the right is from the iPhone 4S. If the two accelerometers (and XSensor app) are performing reliably then the values on both phones should be identical, minus any confounds such as anchorage issues. Overall it can be seen from this view that the displays are generally the same.

The displays from two additional camera views still need to be attached to this Premiere project before the full complement of information will be available for evaluation. We hope to provide further results from our testing in the not too distant future.

Gorski Consulting  
London, Ontario, Canada

*Copyright © Gorski Consulting,  
All rights reserved*