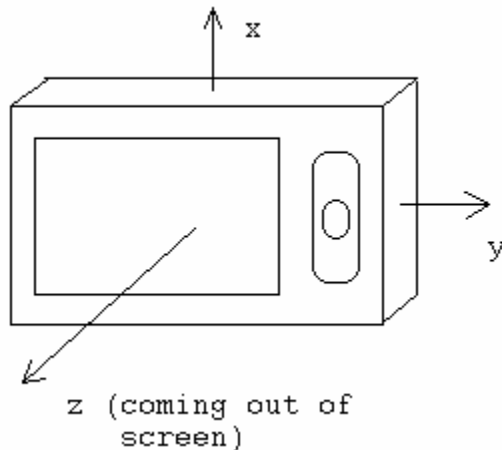


Notes on Nokia N95 Accelerometer

Accelerometer coordinate system, drawn when we are holding camera in **landscape** orientation:



If we denote the raw values from the accelerometer as vector $\mathbf{a} = (a_x, a_y, a_z)$ then the xyz coordinate system drawn above is consistent with this vector. Specifically, the x component is positive when the x-axis is pointing down (according to gravity), and similarly for the y and z directions.

Note that the coordinate system is left-handed! (I.e. it violates the usual right-hand rule.) Also note that the viewing direction (of the main camera) is in the $-z$ direction.

Acceleration units: if there is no acceleration, then the accelerometer vector points **downward** in the direction of gravity. In the no-acceleration case the vector magnitude should be close to 64, which is supposed to be equivalent to 1g (i.e. the acceleration due to gravity on the Earth's surface). In other words, this vector is perpendicular to the ground plane (assuming the ground plane is actually horizontal).

If the vector magnitude is far from 64, then this is evidence of acceleration!

Caveat: while 64 might be the official value corresponding to 1g, Vlad and Orazio both find (on different N95 phones) different values: approx. 54-56 (Vlad) and an average of 57.3820 with standard deviation of 0.4260 (Orazio, based on 214 measurements).