



Newsletter – *Apr 2015*

ASB Systems Pvt. Ltd.

Motionally yours...

So when was the last time technical jargon on Motion measurements made your head spin (*no pun intended*)! In this issue, we “Pitch” in with some simplification on this, so that you can “Heave” a sigh of relief...so lets “Roll”!!

But technology is not all that bad; as they say, the basics are important. It doesn't matter if you do not know how a sphygmomanometer functions...as long as you know how to read Blood pressure with it!!

When it comes to measuring motion, there is a plethora of technology out there – Fiber Optic Gyroscopes, Ring Laser Gyroscopes, Servo accelerometers, Pendulous ones, and the latest, MEMS. So how do you choose?

Furthermore,

- What are Accelerometers and Gyroscopes?
- What is MEMS technology?
- What has Kalman filter got to do with it?

In a Nutshell, it is about measuring the Six degrees of freedom – Heaving, Swaying, Surging, Pitching, Rolling and Yawing.

A good understanding is all that is required. And in the following sections, this is exactly what we will try to put forth.

As writer Stewart Brand puts it: Once a new technology rolls over you, if you're not part of the steamroller, you're part of the road.

In this issue...



Motion jargon



SBG Systems –
New product
launch



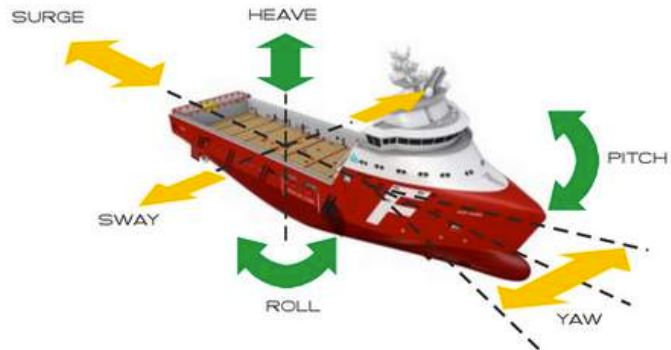
ASB Systems –
New
representation



Cheering for
Team India

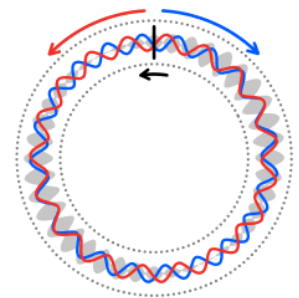
Customer satisfaction is our prime objective

An **Accelerometer** is a device that measures proper acceleration ("g-force"), which is the acceleration it experiences relative to freefall. Conceptually, an accelerometer behaves as a damped mass on a spring. When the accelerometer experiences an acceleration, the mass is displaced to the point that the spring is able to accelerate the mass at the same rate as the casing. The displacement is then measured to give the acceleration.



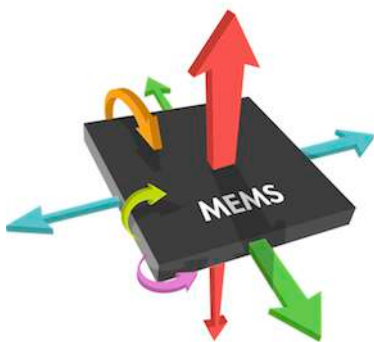
A **Gyroscope** is a physical sensor that detects and measures the angular motion of an object relative to an inertial reference frame. The unique feature of gyroscopes is the ability to measure the absolute motion of an object without any external infrastructure or reference signals.

An optical gyroscope (**Ring Laser Gyroscope and Fiber Optic Gyroscope**) determines the angular rate of the system using the "Sagnac effect". The Sagnac effect uses optical interferometry to measure rotation. Laser beams are made to travel along a path of a particular design and undergo an interaction before combining to form an interference pattern. The properties of these resulting interference fringes are measured to compute any changes in the angular rate, i.e. changes in the heading



Micro-Electro-

Mechanical Systems, or MEMS, is a technology that can be defined as miniaturized mechanical and electro-mechanical elements (i.e., devices and structures) that are made using the techniques of microfabrication. The types of MEMS devices can vary from relatively simple structures having no moving elements, to extremely complex electromechanical systems with multiple moving elements under the control of integrated microelectronics. The one main criterion of MEMS is that there are at least some elements having some sort of mechanical functionality whether or not these elements can move.



A **Kalman filter** is the numeric tool making the fusion of GPS and IMU information possible. It is a mathematical model relating the noisy and possibly incomplete IMU and GPS measurement variables in order to present estimates for the position, heading, attitude as well as their associated errors.

FOGs are commonly assumed to be more accurate than MEMS gyroscopes, but nowadays high quality MEMS sensors achieve similar or better accuracy than many FOG sensors.

SBG Systems - New Product Launch



SBG Systems releases the Apogee Series, the most accurate inertial navigation systems based on the robust and cost-effective MEMS technology. The cutting-edge Apogee Series is also the smallest and lightest inertial navigation system at this level of accuracy. High Accuracy, cost-effective, compact, the Apogee adds extreme versatility and simplicity to its many qualities.

Apogee: Highly Accurate INS/GNSS - 0.008° Real-time / 0.005° PP Roll & Pitch

SBG SYSTEMS takes another step forward with the release of the Apogee Series, the most accurate inertial navigation systems based on the robust and cost-effective MEMS technology. **This state-of-the-art INS/GNSS integrates the very last generation of MEMS sensors and Tri-frequency GNSS receiver. Apogee achieves 0.008° in roll and pitch in real-time, and 0.005° in post-processing.** With two antennas, it delivers a robust and accurate heading.

Power



Apogee-A

Motion Sensor



Apogee-N

GNSS/INS



Apogee-D

Dual GNSS/INS



Apogee-E

INS + SplitBox GNSS

In the field of hydrography, the Apogee fits every technical need with simplicity. Lightweight and small, Apogee is easy to manipulate. In option, the SplitBox, a box with standard connectors, easily connect and synchronize all the equipment onboard of the vessel. To get the required positioning accuracy, Apogee supports RTK and every Precise Point Positioning services (Marinestar, TerraStar, etc.). Already compatible with the main hydrographic software such as QINSy or Hypack, Apogee is ready to deliver its extreme precision.

ASB Systems now represents dotOcean:

dotOcean develops pioneering measurement instruments, sensor networks and data acquisition platforms for the maritime and offshore industry.



dotOcean specializes in making in-situ mud density measurement systems which are used for analyzing the underwater sediment layers. These instruments are of use in the Dredging industry, Ports & harbors, Survey, Offshore energy and construction. *Keep watching this space for more info in the coming newsletters...*

Cheering for Team India!



Team ASB cheered for Team India as it played the World Cup semi-final. Following the match ball-by-ball, team ASB enjoyed the event in the company conference room.

Drinks flowed, followed by delicious Pizzas for lunch. Although the match result was a dampener, it provided an opportunity for some memorable moments at the ASB office. Cheers!