Newsletter – *April 2016*

ASB Systems Pvt. Ltd.

Seeing things?

Would you rely on your Mobile phone's GPS to navigate your ship into Port?

Then why should you use photography and Videography to inspect critical structures underwater?? Why should you rely on some Diver's feedback? Why should you not be able to perform measurements? Why should you settle for blurry images, as an "unavoidable" result of murky waters? Why should you have to skip inspecting critical areas due to strong water currents?

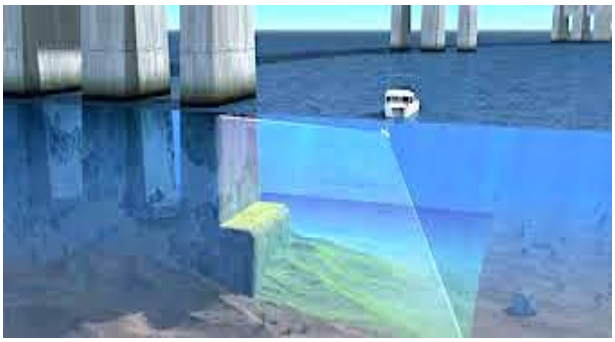
When there is Imaging Sonar technology available at hand!

Well, we are not taking it away from Multibeam Echosounders. They belong to the Bathymetric family of Survey instruments. We are also not taking on Sidescan sonars here. They are possibly the best solution for large scale surveys, such as the one carried out for the MH370.

Imaging sonars belong to a different class. Increasingly becoming popular the world over, these sonars are used for applications ranging from general purpose inspections, to generating high resolution Point clouds from 3D scans.

In this issue, we also discuss how a new technology in Motion measurement, now well-adapted for Hydrographic applications, is giving the Fiber Optic and Ring-laser Gyroscope based Motion sensors, a run for their money.

In this issue…

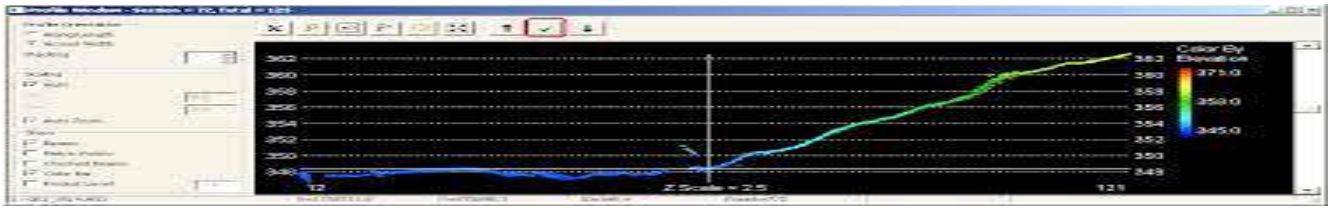


Imaging Sonars are comparatively new to the Indian market. A general perception prevails that these Sonars are only meant for special operations such as in Offshore, and are prohibitively priced. After all, these sonars are often described with a plethora of technical jargon such as 3D scanning, Point cloud imaging, Multibeam profiling, etc. One would tend to think that it takes a considerable amount of expertise and software know-how to operate these sonars.

This is not the case…As we attempt to de-mystify this amazing product, we will try and explain Imaging Sonars in a simple way.

Imaging Sonars are for Everyone!
It is as simple as that…If your business is the Marine sector, you probably need an Imaging Sonar.
Be it as simple task such as being able to inspect your Ship's hull, or being able to monitor your Diver, inspect Bridges, Locks, Dams, or a Defense based application such as Port and Harbor security, an Imaging Sonar is capable of all that and much more.

So what exactly is a Teledyne Blueview 2D Multibeam Imaging Sonar?
The 2D Sonar uses hundreds of Beams (that's why the name "Multibeam") to generate crisp, real-time Sonar imagery, and is used for General purpose inspections. Applications include Area survey, Search and Recovery, Diver monitoring, Obstacle avoidance and ROV navigation.

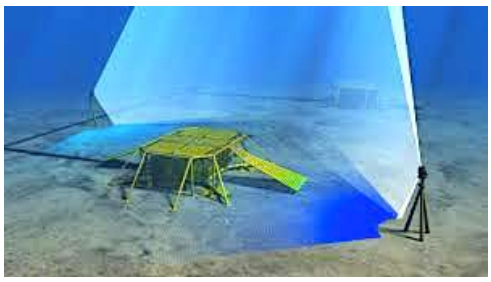


What is a Profile? - a graphical or other representation of information relating to particular characteristics of something, recorded in a quantified form. A Sonar profile is composed of data from individual beams. A series of profiles form a complete image. The Sonar capable of collecting such imagery data is known as a **3D Multibeam Profiler**.

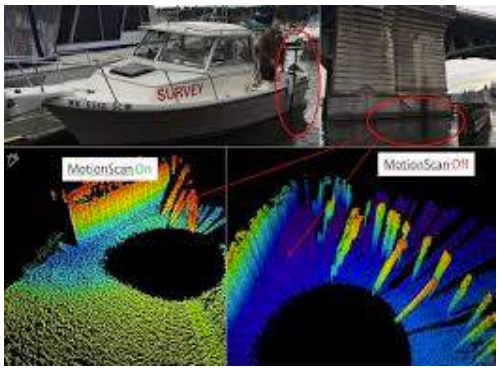
What is a Point cloud? - It is a set of data points in some coordinate system.
In a three-dimensional coordinate system, these points are usually defined by X, Y, and Z coordinates, and often are intended to represent the external surface of an object.
Point clouds may be created by 3D scanners. These devices measure a large number of points on an object's surface, and often output a point cloud as a data file. The point cloud represents the set of points that the device has measured.

What is a 3D Mechanical Scanning Sonar? – This Is simply a 3D Multibeam profiler installed in a Mechanically rotating device, known as a Pan and Tilt Positioner. This is a software controlled unit which can house the Multibeam Profiler sonar and rotate it 360 deg in both axes with an accuracy of 1.5 deg. It enables the Sonar to scan in a 360° pattern.

The Blueview BV5000 is a combination of a multibeam profiler sonar with a pan and tilt to scan areas of interest generating 3D point clouds.



Can the 3D Scanning Sonar be used from a moving boat?
Yes. Teledyne Blueview's MotionScan system allows the BV5000 3D scanning sonar user to collect motion corrected 3D point clouds from a moving platform. The MotionScan system is comprised of an RTK capable dual antenna GPS with precision heading output, a heave, pitch and roll sensor, a topside control console and a data acquisition software.



Hypack can now integrate the BlueView 5000 Sonar
It is the first supported sonar featuring dynamic pan and tilt changes during acquisition. One can collect "traditional" multibeam data with the head tilted down or hold the boat position steady and pan the head for a 360 degree scan of structures in the water column or those hard-to-reach nooks and crannies. The data is piped directly into the HYPACK Real-Time Cloud displays for immediate, fully motion-corrected 3D cloud views.

Hypack can integrate the Blueview 5000

HYPACK treats the Blueview BV5000 as a topographic laser. This is because of the nature of the system and its ability to pan and tilt. With the Blueview, you can use the Topographical Laser window and the 3D Point Cloud window. Hypack logs the traditional HSX format data that can be opened and processed using Hysweep.

Below is a comparison table between Multibeam Profiler Sonar and Multibeam Echosounder. This will enable the reader to have an understanding of how both the technologies are similar, yet with different applications. One is designed for Imaging, while the other is for Bathymetry.

Feature	Multibeam Profiler Sonar	Multibeam Echosounder
Main Purpose	Imaging	Bathymetry
Secondary	Bathymetry	Imaging
Platform	Tripod, Boat, AUV, ROV	Boat, AUV, ROV
Can be used from Stationary platform?	YES	NO
Can be used from a moving boat?	YES	YES
Final Product	Point Cloud (XYZ data)	Point Cloud (XYZ data)
Enhancement	Can perform a 360° scan from stationary platform. Multiple scans can be co-registered	Not available
Compatibility	Hypack and other survey s/w	Hypack and other survey s/w
Frequency	1.35 MHz, 2.25 MHz	180 kHz till 455 kHz

SBG MEMS Based Motion Sensors for the Hydrography market

Mostly used in hydrography, Fiber Optic Gyroscopes (FOG) and compass offer different levels of performance. FOG inertial systems, known to be expensive, offer full functionality including attitude, yaw, position, and connections with aiding equipment. On the other hand, compass is an affordable solution, but only provides heading. The gap between these two technologies is wide, and choice was very limited. Consequently, engineers had to compromise between cost, functions, and performance. Thanks to important recent developments, Micro-Electro-Mechanical Systems (MEMS) fulfill the gap between FOG and magnetic compass performance. They appear as a serious alternative for the survey vessel's orientation, navigation, and SONAR data georeferencing.

Well known for its small size, low price, and robustness, MEMS was also perceived as a limited performance solution. In the past 5 years, attitude accuracy jumped from the industrial grade (<0.35°) to achieve the tactical (<0.05°) allowing MEMS to also enter the underwater navigation market.

In various cases, the miniature, low-power consumption, affordable, and high performance MEMS technology offers a clever alternative compared to compass and FOG technologies. While the FOG inertial unit price starts around $60K, tactical grade MEMS costs between $16K and $40K. Being ten times smaller, less-power consumption, and much cheaper, the accuracy of MEMS sensor was the only area missing to make this technology a serious candidate at FOG replacement. Now delivering from 0.05° attitude and offering the same functions, tactical grade MEMS inertial navigation systems now compete with FOG sensors. These high-end inertial measurement units fuse inertial data with information from DVL, USBL, GPS, depth, and sound velocity sensors to deliver precise information for AUV control and SONAR data georeferencing.

OEM News

Teledyne Odom Hydrographic delivers biggest ever order – eleven MB2 multibeam echosounders to Indonesian Ministry of Marine Transportation

Teledyne Odom Hydrographic received an order of eleven MB2 Multibeam sonars with integrated Applanix POSMV, from the Indonesian Ministry of Marine Transportation. The Ministry of Marine Transportation covers all commercial ports in Indonesia including Java, Sumatra, Kalimantan, Sulawesi, Nusa Tenggara and Maluku & Papua.

"This is our biggest MB2 order ever, which we received on Thanksgiving day (November 26th) and which included delivery and training of all eleven systems in Indonesia by December 23rd. It has been a great experience working together with Hydronav Services, PT Hidronav Tehnikatama and The Ministry of Marine Transportation to make it all happen in such a short time", says Grant Jennings, Sales Director at Odom Hydrographic.

Positioning – DGPS

Subsea Positioning – DVL, USBL

Heading – Dual Antenna GPS

Inertial Measurement Sensors

Bathymetry – Singlebeam & Multibeam Echosounders

Survey Software

Currents and Discharge measurements

Scientific Echosounders

Motion Sensors

Dredging – Real-time monitoring, Graviprobe

Sub-Bottom Profiling

Underwater communication – Modems, Acoustic Release

Underwater Imaging – Offshore, Structural inspection, Underwater Vision solutions

Geophysical Survey systems

Water Quality sensors and probes

Surface Current measurement

Buoys, Floats, Instrument housings, Bottom mounts, Mooring systems

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Hemisphere

SBG SYSTEMS

TELEDYNE ODOM HYDROGRAPHIC
A Teledyne Technologies Company

HYPACK, Inc.
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Everywhereyoulook

Coda Octopus
Sound Underwater Intelligence

nke
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