Newsletter – *December 2012*

ASB Systems Pvt. Ltd.

Fathoming the Depths

They say that the sea is tranquil…..or is it really?

Consider this: The speed of sound in air is 349 m/s, but in water it exceeds 1500 m/s!! Sea-Water is an ideal medium for sound propagation, with very little attenuation, thus allowing sound waves to travel great distances through the sea; The sea-air surface is a near perfect reflector; Almost all marine life communicates underwater using sound…so is the sea really tranquil?? Probably Not!!

Now, Echo sounding is the technique of using sound pulses to find the depth of water...ho hum, we all know that….but did you know that there are over 3000 echosounders working world-wide manufactured by Teledyne Odom alone?! Or that there is a Teledyne Odom engine at work, even inside a differently branded Echosounder?! Or that our association with Odom dates back as far as 1995?!

Odoms are popular…It is not without reason that a Teledyne Odom Echosounder features on Wikipedia's "Echo Sounding" page!

In this issue…

Customer satisfaction is our prime objective

TELEDYNE ODOM HYDROGRAPHIC
A Teledyne Technologies Company

A ready reckoner to help you select the right Sounder for your job!

ODOM	MK-III	Hydrotrac-II	Echotrac CVM	Echotrac CV	Echotrac CV100
					
Application	Shallow & deep water application, Dual frequency	Small boats, Harsh environs	Extra Rugged, Weatherproof, Portable	Modular configuration . Sub-bottoming/Sidescan capability with 3rd channel	Small Size, rugged construction, waterproof (IP-67 protection)
Frequency	Dual simultaneous. High: 100 kHz – 1 MHz Low: 3.5 kHz – 50 kHz	Single. 24, 28, 33, 40, 100, 120, 200, 210 and 340 kHz	Dual simultaneous. High: 100 kHz – 340 kHz Low: 24 kHz – 50 kHz	Dual simultaneous. High: 100 kHz – 1 MHz Low: 3.5 kHz – 50 kHz	Single. High: 100 kHz –750 KHz Low: 10 kHz – 50 kHz
Depth Range	200m@200Khz 1500m@33Khz 4000m@12KHz	600m	200m@200Khz 600m@24Khz	200m@200Khz 1500m@33Khz 4000m@12KHz	Upto 600m
Resolution	0.01m	0.01m	0.01m	0.01m	0.01m
Accuracy	0.01@200Khz 0.1@33Khz 0.18@12KHz	1cm@200KHz, 10cm@33Khz	0.01 m +/- 0.1% of depth @ 200 kHz 0.10 m +/- 0.1% of depth @ 33 kHz	0.01@200Khz 0.1@33Khz 0.18@12KHz	0.01@200Khz 0.1@33Khz
Internal DGPS	Yes	No	Yes	No	No
Sidescan	Yes	Yes	Yes	Yes. Sub-bottom array also available	No
Thermal Printing	Yes	Yes	No	Option - Thermal printer/LCD display	No - PC based data acquisition
Dimensions and Weight	450 mm H x 450 mm W x 300 mm D 16 Kgs	368 mm H x 419 mm W x 203 mm D - 10.2 Kgs	55 cm W x 41.5 cm D x 21.5 cm H , 14Kgs	89 mm H x 432 mm W x 325 mm D , 16Kgs	28 cm W x 23 cm H x 11.5 cm D , 5 Kgs

So much for Bathymetry. But what about Scientific Echosounders for applications like Bottom classification, fisheries research and aquatic habitat assessment and mapping?

Enter…..Biosonics!!

BioSonics
Offering the Widest Range of Hydroacoustic Solutions

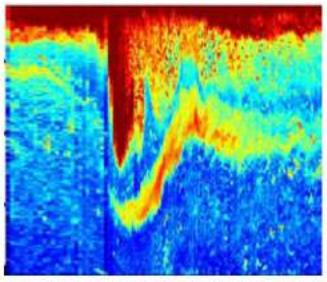
So what's so special about "Scientific Echosounders"? Simple: They are designed to do things which Bathymetric Echosounders cannot !

Like What?
Scientific Echosounders are used in Lakes, Rivers and in Marine. Typical applications are:

1. Physical Oceanography
2. Bottom classification
3. Fish & Vegetation assessment
4. Bathymetry

Lets see how….

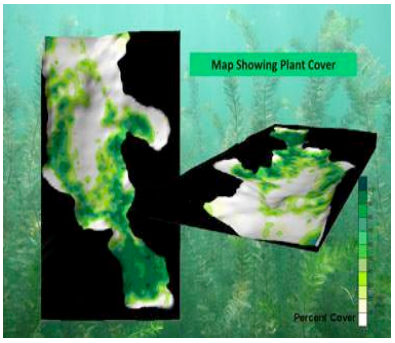
1. Physical Oceanography –
   Mixing layers and internal waves are of great interest to oceanographers and climatologists. Mixing layers play an important role in the transfer of energy and its effects on the physical climate. BioSonics DT-X echosounder is a highly sensitive scientific instrument capable of detecting very small, even particulate sized, objects in the water column. Boundaries between layers of water of different density are detectable and visible on the echogram during data collection.

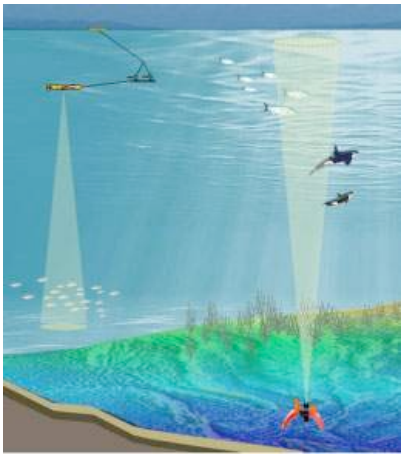

Echogram of plume front prior to release of internal waves

2. Bottom classification –
   BioSonics Scientific Echosounders used in combination with BioSonics Visual Habitat or VBT (Visual Bottom Typer) data processing software provide the ability to classify and map different substrate types such as sand, mud, cobble, rock. Bottom classification is accomplished through analysis of the bottom echo signal using specialized algorithms contained in BioSonics proprietary software programs; VBT and Visual Habitat. The software determines the relative smoothness and hardness of the bottom based on the properties of each echo signal.

3. Fisheries Stock Assessment -
   BioSonics DT-X™ mobile echosounders are widely used to determine fish population and sizing distribution in lakes, reservoirs, rivers, and coastal waters. Other applications include zooplankton biomass estimation, school size estimation, and behavioral studies.
   Scientific "split beam" echosounders are now the standard instrument of fisheries hydroacoustics.
   By comparing the phase difference of the same echo, split-beam echosounders can accurately determine the location of each target in the acoustic beam in three dimensions. This allows for highly accurate measurement of each targets reflective strength. Target strength (TS) is a measurement of how well a fish, zooplankter, or other target scatters sound back towards the transducer.

4. Submersed Aquatic vegetation –
   A high frequency transducer of the Biosonics-MX is used to collect fine resolution hydroacoustic data and detect the tips of submersed vegetation growing on the seabed. The narrow ,focused acoustic beam of sound energy can penetrate the vegetative canopy and detect the actual bottom below. Specialized software using multiple algorithms effectively determines the bottom and plant canopy levels and calculates the percent coverage in each sample report. The processed data are exported as geo-referenced CSV files which can readily mapped using GIS software tools.





DT-X$_{sub}$

Tech Tips

The Power budget

It is essential to have a good idea on how long the batteries in your survey boat will last. But this is not easy to calculate, as there are instruments which operate on 12VDC, 24VDC, 230VAC and then there are….Inverters, all operating on the same batteries.

Well, we have worked out the hard part for you!

Item	Voltage	DC Current	AC Current	AC Watts	DC Watts (Power = V x I)	
Hemisphere 131	12VDC	0.4A			5 (max)	
Odom Hydrotrac	12VDC	6.6A			80W approx	
Odom MKIII	24VDC or 220VAC				120W startup, 50W running	
Coda DA2000	230VAC	27.5A		300		AC Watts to DC Amps: (AC watts/12) x 1.1
19" LCD Monitor for Surveyor	230VAC	3.6A	1.5A		40	AC Watts to DC Amps: (AC watts/12) x 1.1
Mini CPU	12VDC	1.2A			15	

Take a look at the example above. The trick is to calculate the total "DC Amps" (column 3), adding up each of the DC Amps consumed by your instruments. These values will be provided on a label pasted on your instrument. For devices working on 230VAC, formula to convert AC watts to DC Amps is given above.

Now simply put the total DC Amps you got into the formula below, to know the total Runtime available for your survey!

$$\text{Available runtime in minutes} = \left\{\frac{(\text{Number of 12V batteries} \times \text{AH of each battery})}{\text{Total DC Amps}}\right\} \times 60$$

*** For a 12-Volt inverter system, each 100 Watts of the inverter load requires approximately 10 DC Amps from the battery.**

*** For a 24-Volt inverter system, each 200 Watts of the inverter load requires approximately 10 DC Amps from the battery**

*** The above calculations are only an example. Actual values may vary.**

Happy Surveying!!