HYPACK
a xylem brand

Sounding Better!

Understanding Offsets

By John Lindberg

Recently a HYPACK® user had a question regarding applying offsets after the fact. In the customer's case, he collected magnetometer data but forgot to enter a 100' layback for the mag. The immediate thought was to offset the position 100 meters back to "push" the mag back 100m. But this was not the case.

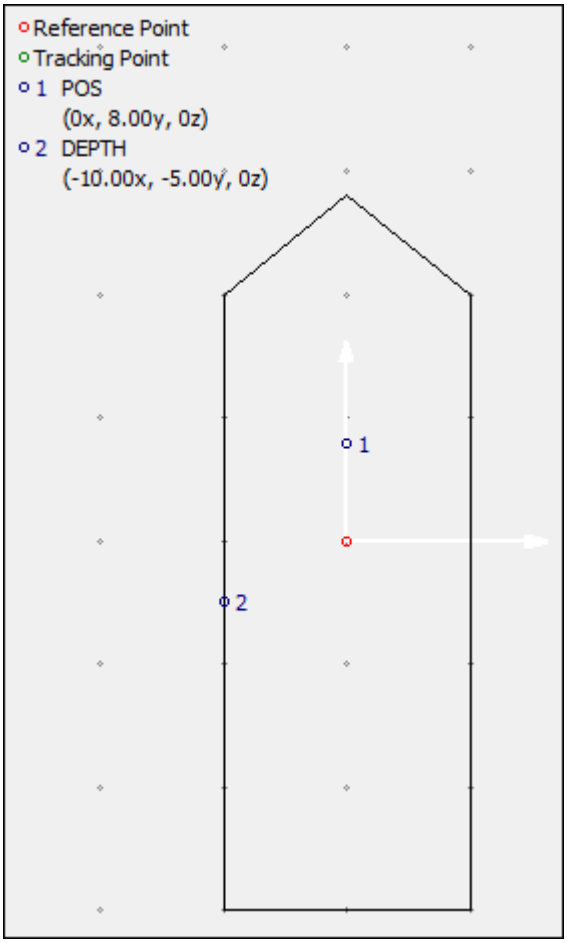
In HYPACK®, all offsets are entered based on the survey vessel origin. This origin can be anywhere on the vessel. Typically, the origin is the center of mass of the vessel, or the location of the transducer. Of course, we have users that bend the rules and try to accommodate every scenario. The following are the most common examples. To keep things simple, I am leaving out the vertical references.

Vessel Center as Origin Point

This is most common on multibeam vessels or single beam vessels that are using an MRU. In Figure 1, the red dot designates the boat origin at 0X,0Y. The GPS is located 8' forward of the origin. The echosounder is located 5'aft and 10' to the port side of the origin. So simply enter an 8' forward offset for the GPS and a -5' forward, -10' starboard offset as shown.

Note: When creating a boat shape the reference location of the vessel has to be specified.

FIGURE 1. Configuring the Origin is at Vessel Center



POS

Starboard	0.000
Forward	8.000
Vertical	0.000

DEPTH

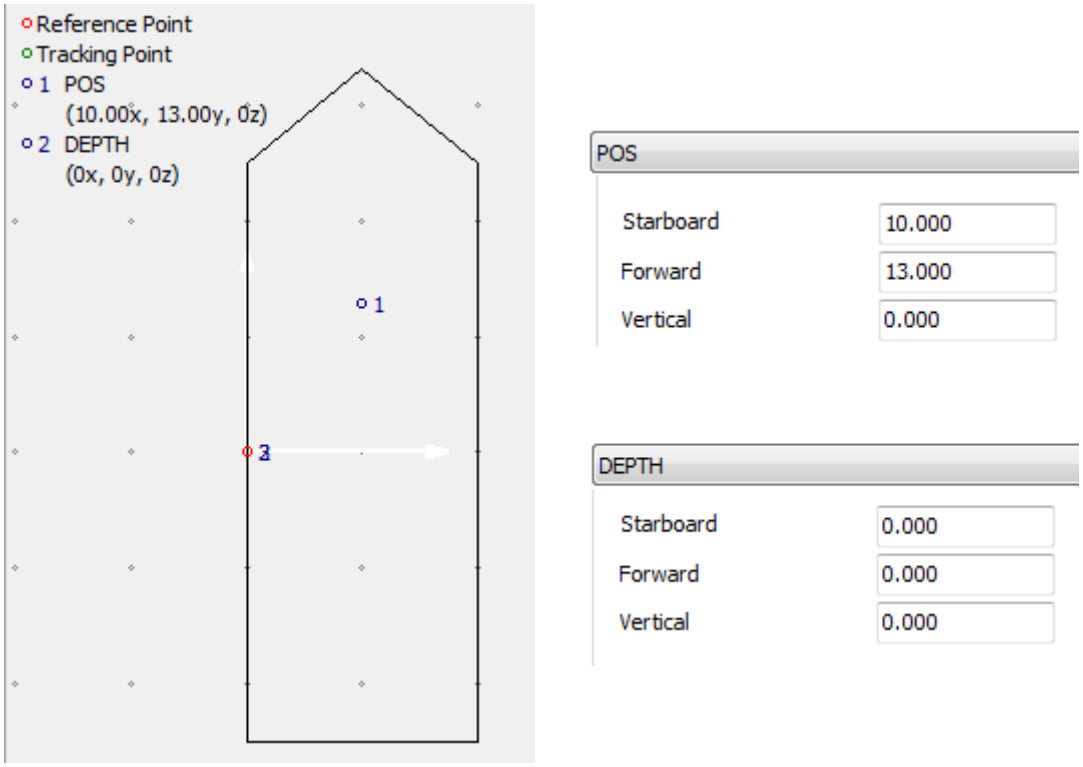
Starboard	-10.000
Forward	-5.000
Vertical	0.000

In this scenario you can use a random point on the vessel as the boat origin. Just enter the offsets of each device relative to that origin point.

ECHOSOUNDER AS ORIGIN POINT

This is very common on single beam vessels. If the vessel and devices are like the previous scenario, simply reference everything from the transducer location (0X, 0Y) as shown in Figure 2.

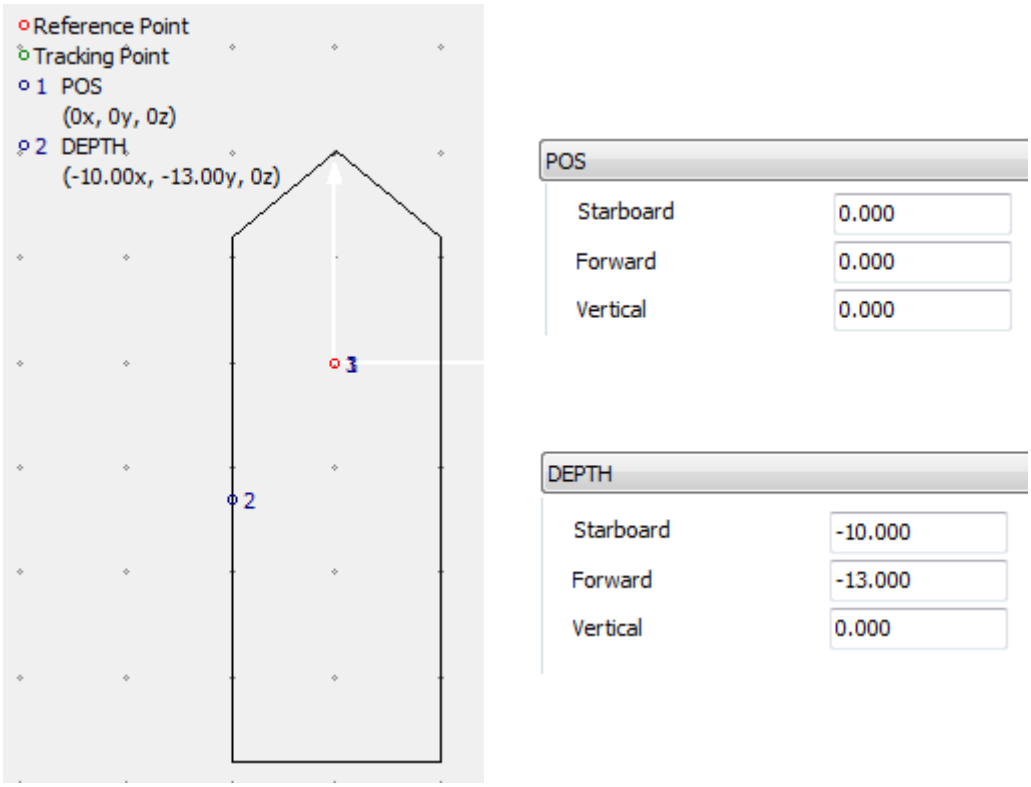
FIGURE 2. Configuring the Transducer as the Origin



GPS AS ORIGIN POINT

GPS as the Origin is not as common as the transducer at the origin scenario, but we've seen it! Just enter offsets for the transducer relative to the GPS antenna location (Figure 3).

FIGURE 3. Configuring the GPS as the Origin



CONSIDER THE TRACKING POINT

Keep in mind that if you don't enter a tracking point location, SURVEY will track the origin as the vessel tracking location. In HYPACK® SURVEY, you can also change the XY location of the tracking point. For example, you have the vessel origin at the center of mass, and you want to track the location of the transducer, you would enter the location of the transducer relative to the origin. The Left-Right Indicator, Map and Data Display in HYPACK® SURVEY will then track that transducer location.

ENTERING OFFSETS DURING POST-PROCESSING

There is no need to worry if you forgot to enter the device offsets in HARDWARE. You can always enter them in the Editors after the fact. Again, just use the same convention (relative to the origin) as previously described. The next 2 images of the SBMAX64 Offsets dialog demonstrate the options you have, as in the case described earlier, where the customer failed to enter a mag layback.

In Figure 4, I entered a forward offset of 100' for the GPS and saved an edited file. In Figure 5, I entered a forward offset of -100' for the mag and saved another file.

FIGURE 4. *Forward Offset of 100' for the GPS*

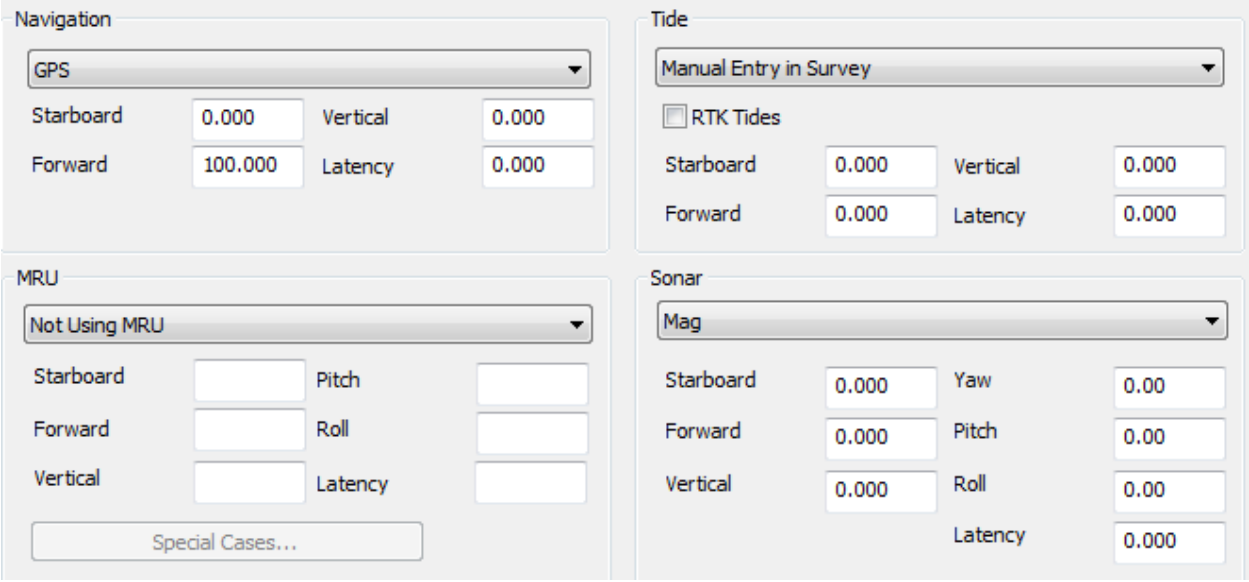
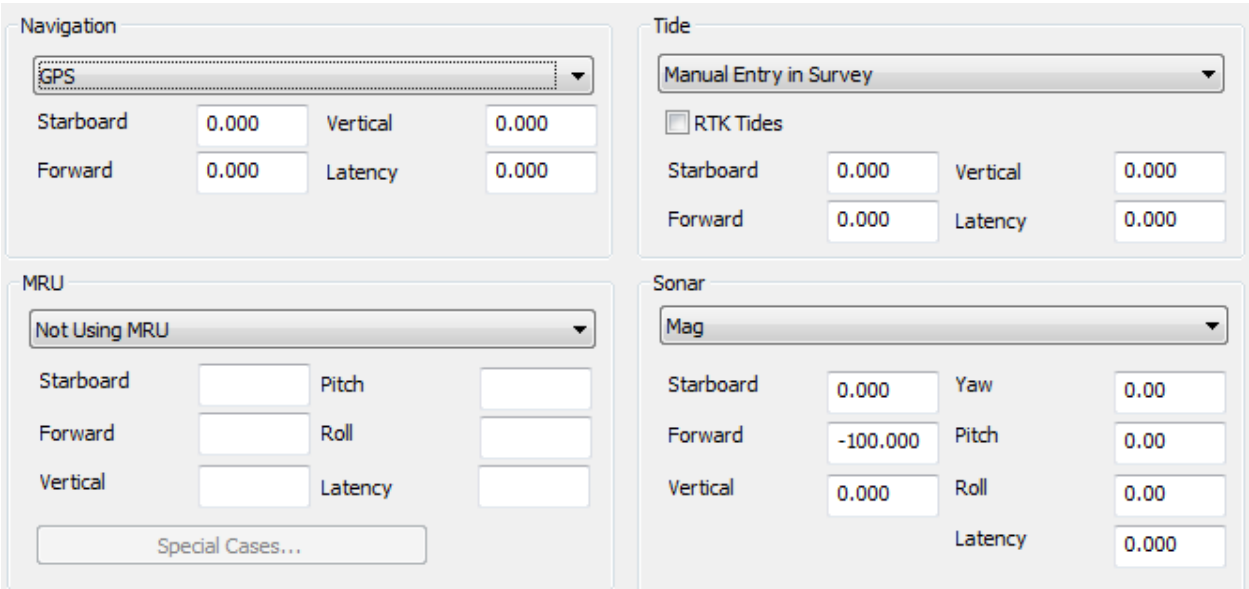


FIGURE 5. *Forward Offset of -100' for the Mag*



Now look at the 2 images showing the track overlays as compared to the original track with no offsets. Both scenarios lay over where they should be. This is because, in both cases, the offsets result in positioning the mag behind the GPS.

FIGURE 6. *Track Line Comparisons—No Offsets vs Mag 100' Aft (left), No Offsets vs GPS 100' Forward (right)*

The image below shows the customer's thinking, where he entered the -100' GPS offset, thinking that shifting the position device will shift the mag. As you can see below we get the opposite effect because it places the GPS behind the mag.

FIGURE 7. *Track Line Comparison—No Offsets vs GPS 100' Aft*

CONCLUSION

I always find myself second guessing when working with offsets, and as you can see by the examples, you can very easily get yourself in trouble if you enter the offsets incorrectly. Take your time, draw out your device locations on a piece of paper, designate the origin location and enter all offsets relative to that origin. You can't go wrong if you follow these rules!