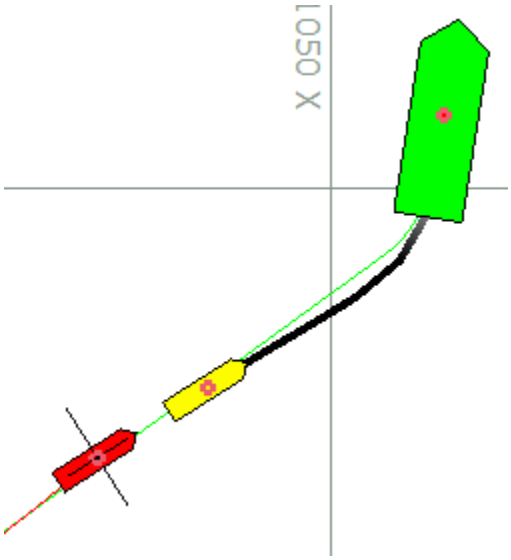
Configuring HYPACK SURVEY for a Towed Side Scan with Trailing Magnetometer

by Pat Sanders

A client recently asked how to configure HYPACK® SURVEY where they were towing a Side Scan Sonar towfish and had a magnetometer trailing 10m behind the side scan towfish. I thought I knew how. It turns out I didn't! I had to make a trip downstairs and talk to Bob Glover in our support group who taught me how to do it.



In this survey, the client wanted to see all three mobiles (Survey Boat, SSS, and Mag) in the Area Map at the same time. He also wanted to have the track lines drawn for each mobile and the position of each mobile in the Data Display window.

I'm going to use the HARDWARE program in HYPACK® 2014 to show you how to set this up.

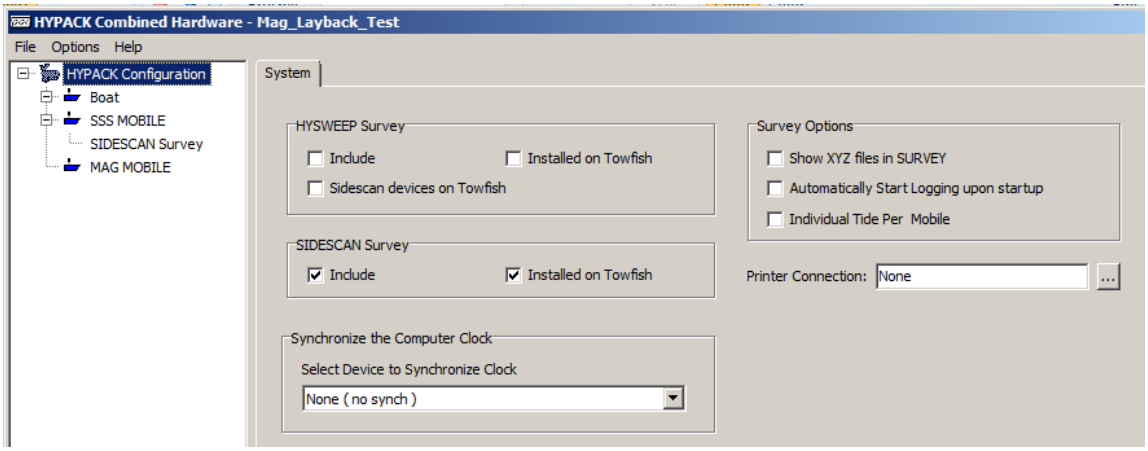
VESSELS

We're going to be tracking 3 separate items: the main survey vessel, the SSS towfish and the mag tow body).

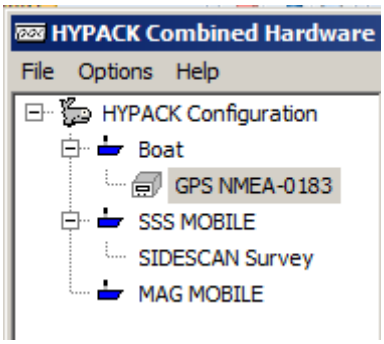
In the HARDWARE program, I can right-click on HYPACK Configuration (blue background text) and add two more vessels. I have named them SSS MOBILE and MAG MOBILE. (To rename a mobile, click on the Vessel's current name, then go to the Mobile tab.)

I also selected the "Include" option in the SIDESCAN Survey frame and told it that my SSS will be "Installed on Towfish". This will position the side scan data on the 2nd Mobile in your listing (SSS MOBILE in my example).

FIGURE 1. *Assigning the Side Scan Device to the Towfish*



DEVICES



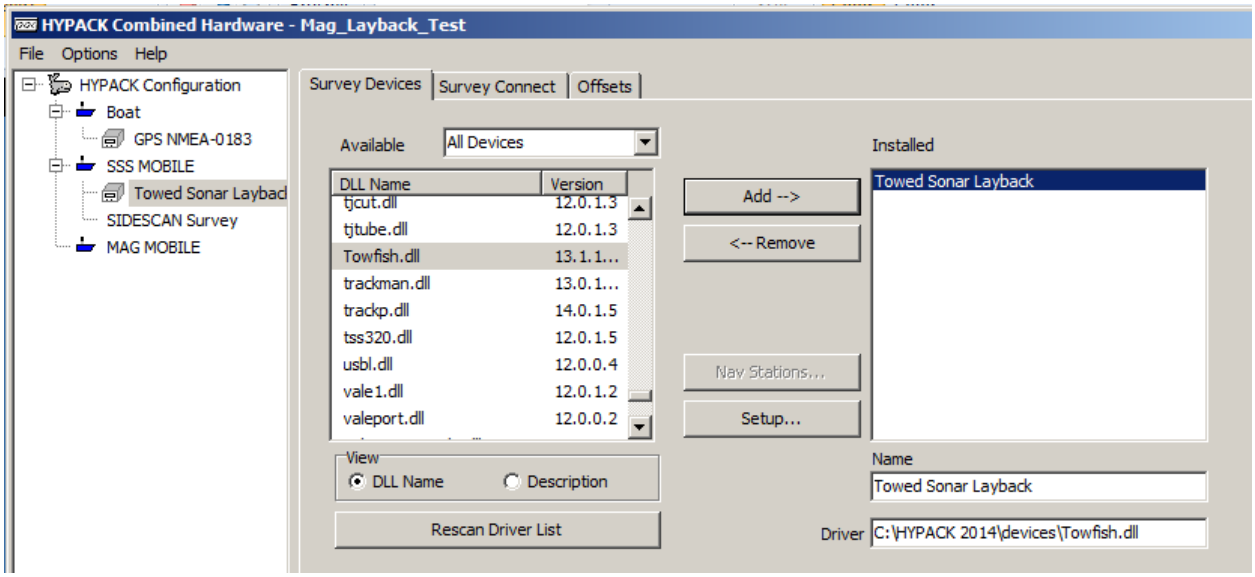
Boat: Position the survey vessel with a GPS that outputs NMEA sentences.

1. **Click on the "Boat" text.**
2. **Go to the Survey Devices Tab.**
3. **From the name of available Device Drivers, select the GPS.DLL and add it to the vessel**. (I'm not going to go into the connections, functions or set-up in this write-up as that would add about ten pages….)
4. **Enter the offsets from the boat origin (typically the center of gravity of your boat at the static waterline) as the offsets for the GPS antenna.**

SSS MOBILE: We need a way to position the SSS MOBILE. In our case, we are going to use the TOWFISH.DLL with a manual layback.

1. **Click on the SSS MOBILE.**
2. **Go to the Survey Devices and add the TOWFISH.DLL.**

FIGURE 2. *Adding the Towfish.dll to the SSS Mobile*



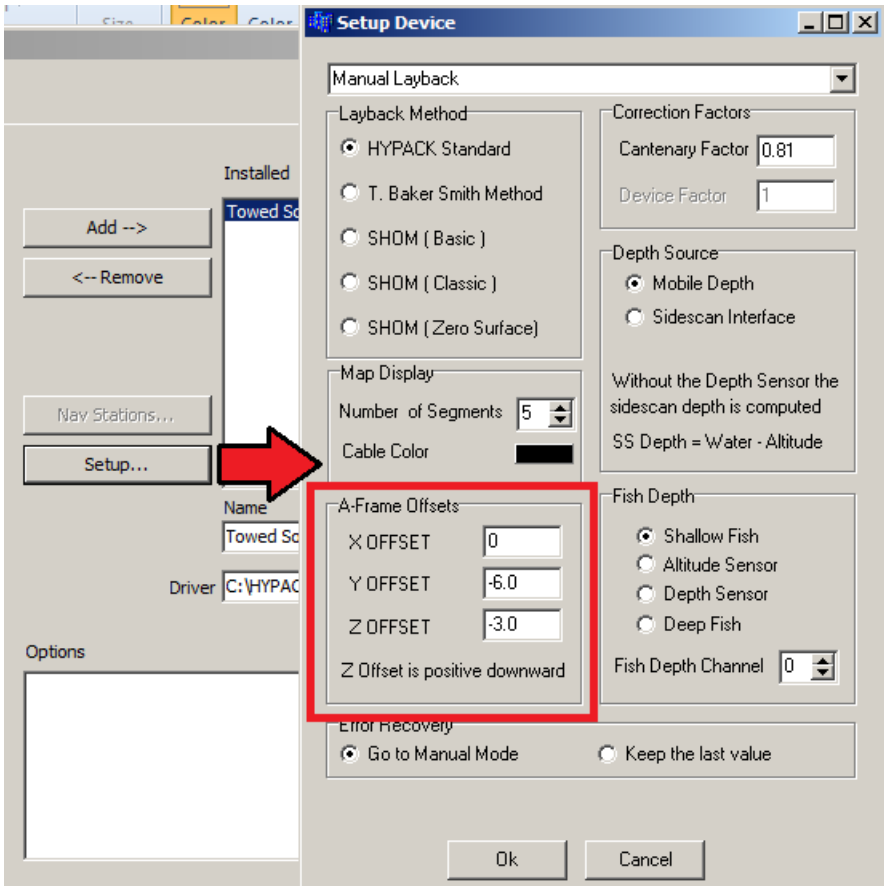
3. **Apply a manual layback for the towfish**. We can modify this in real time in SURVEY. Let's say we will determine the amount of cable from a shive (a wheel that the cable typically runs over) located 6m behind the boat origin.

Very Important: *Leave the "Offsets" for the device specified in the Offsets tab at 0.0.* (Starboard Offset = 0, Forward Offset = 0, Vertical Offset = 0).

4. **Click on the "Setup…" button and enter the offsets from the Boat Origin to the shive position as the "A Frame Offsets"**. In Figure 3, I have entered our Y OFFSET =

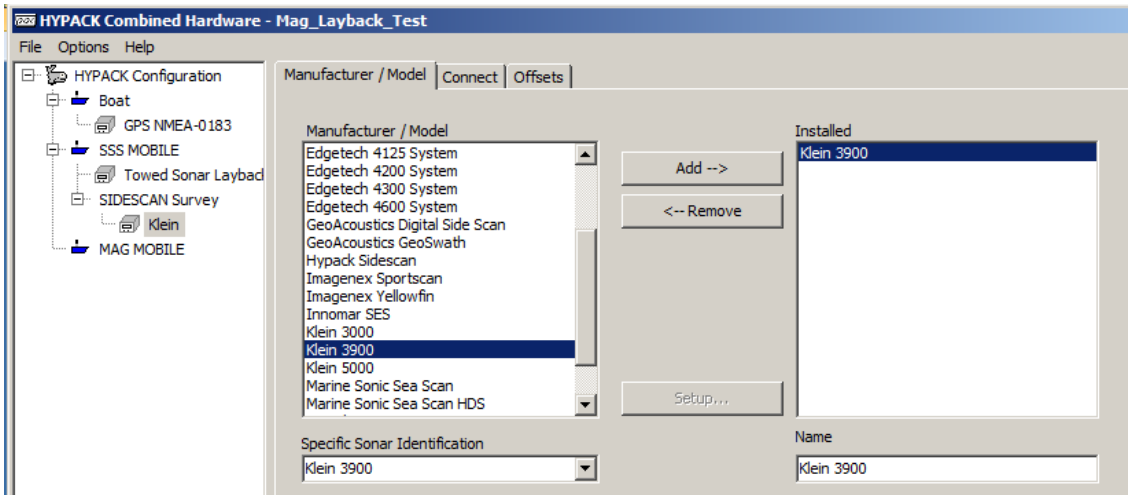
-6.0 (positive forward) and the Z OFFSET = -3.0 (negated height of shive above static water line; remember vertical offsets are positive downward).

FIGURE 3. *Setting Towfish Offsets ONLY in the Setup Dialog*



5. **Click on "SIDESCAN Survey" in the Mobile listing and select the Side Scan Sonar driver.** In Figure 4, I have selected a Klein 3900.

FIGURE 4. *Loading the Klein 3900 Driver*

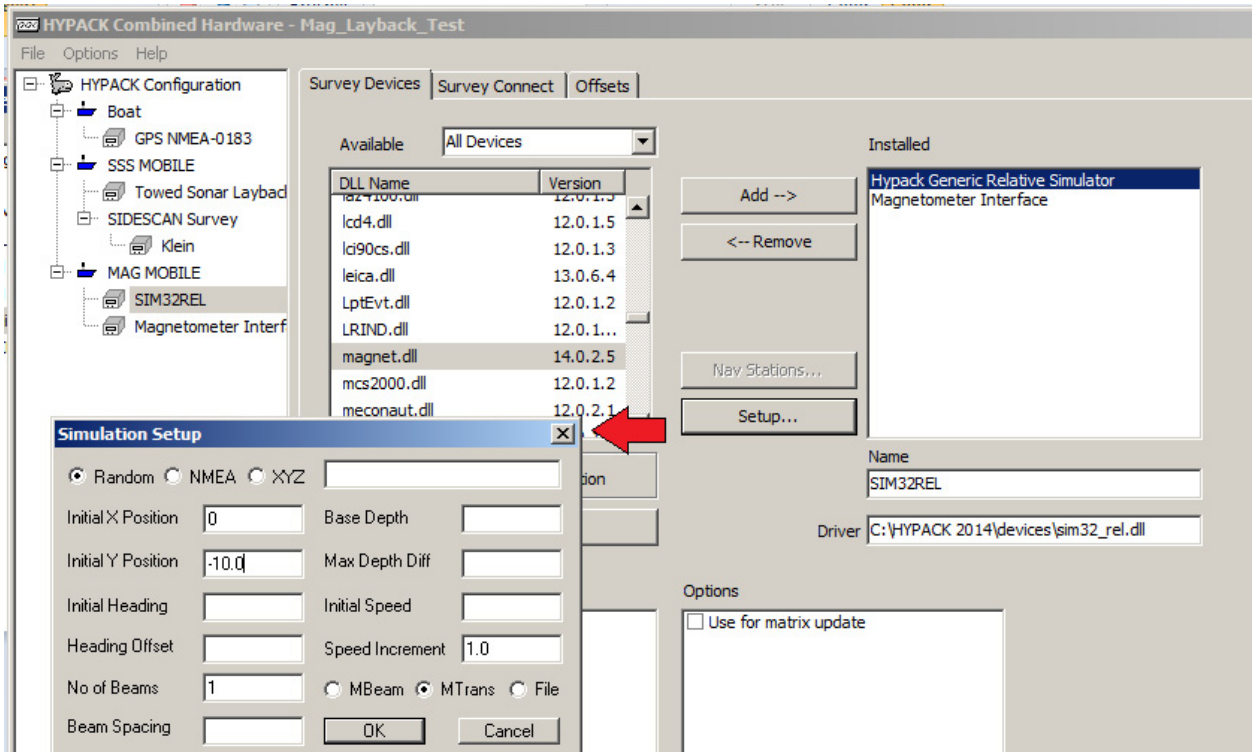


For those of you familiar with the SIDE SCAN HARDWARE program of earlier HYPACK® versions, you no longer have to specify navigation systems in the Side Scan listing. The boat origin and towfish position are now automatically read into SIDE SCAN SURVEY.

Set the offsets for the Klein 3900 to zero, as the side scan array is located at the mobile position (generated by the TOWFISH.DLL).

MAG MOBILE: I need to assign the MAGNET.DLL to the MAG MOBILE, and I also need a way to position the mobile at a fixed layback from the SSS MOBILE. I can use the SIM32_REL.DLL (SIM = Simulation; REL = Relative; 32 = Jim Brown's number when he played for the Cleveland Browns).

1. **Click on the "MAG MOBILE" text in the vessel listing.**
2. **Go to the Survey Devices tab and add the SIM32_REL.DLL and the MAGNET.DLL.** I'm going to leave the "Offsets" for each device at zero (Offsets tab).
3. **Set the MAG MOBILE 10m behind the SSS MOBILE**. This requires two things:



- **In the Survey Devices tab, click [Setup] and enter the relative offsets for the position of the MAG MOBILE relative to the SSS MOBILE.** I have entered 0.0 for the starboard offset and -10.0 for the forward offset.
- **In the Offsets tab, down in the bottom left, tell it to position the mobile relative to the SSS MOBILE**.

Important! *This is key!* If you forget to do it, it will position the MAG MOBILE 10m behind the survey boat, instead of 10m behind the SSS MOBILE.

FIGURE 5. *Offsetting the Mag Relative to the Side Scan Mobile*

Now you are ready to go! Save your configuration on exit, and start HYPACK SURVEY AND SIDE SCAN SURVEY.

HYPACK® SURVEY

FIGURE 6. *Survey Boat Tows the Towfish Followed by the Magnetometer in HYPACK® SURVEY*

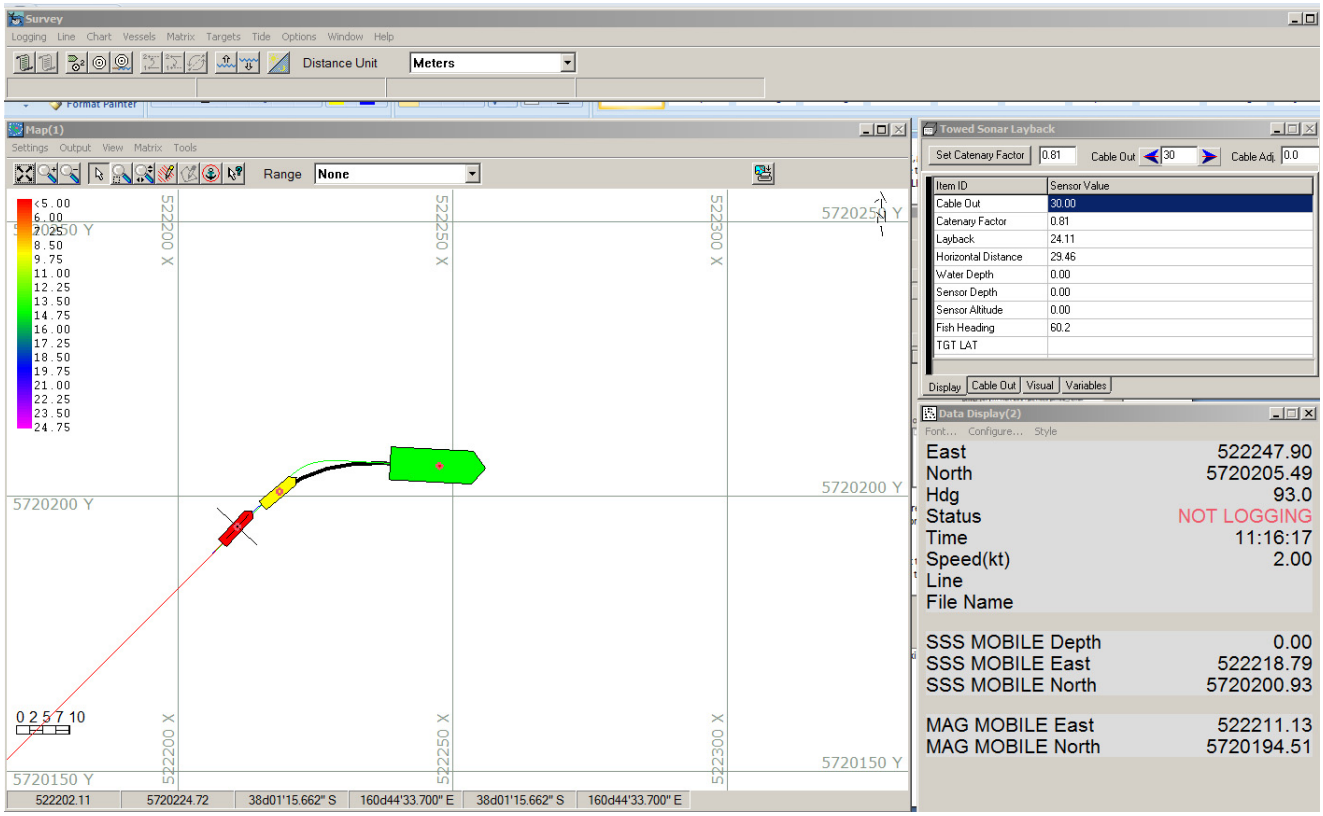


FIGURE 7. *Assigning Boat Features to Each Mobile*

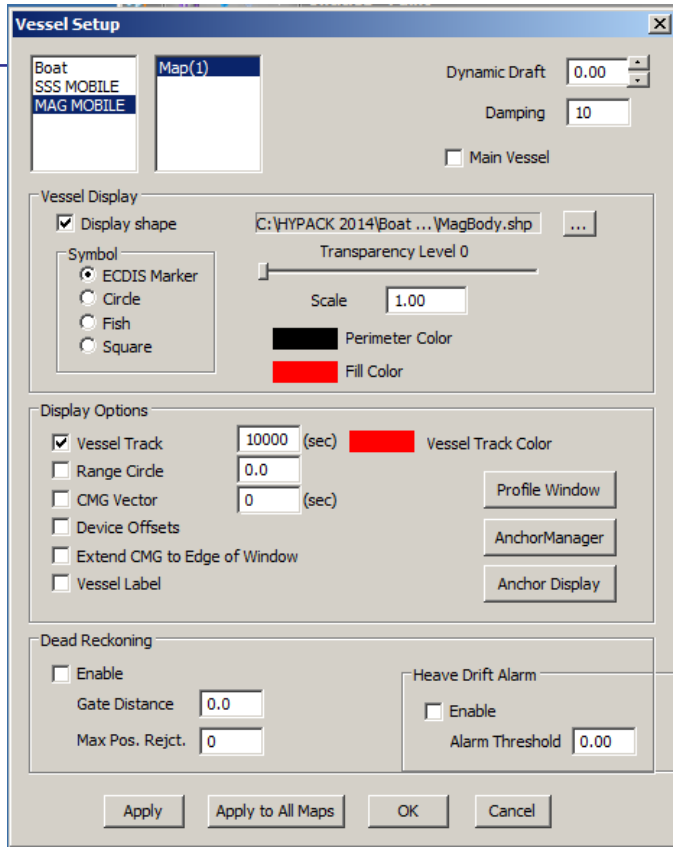


Figure 6 from HYPACK® SURVEY shows the main survey boat (green fill) with the side scan towfish (yellow fill) and the magnetometer (red fill).

1. **Use the BOAT SHAPE EDITOR to create a simple towfish shape.** For the MAG MOBILE, I added a little cross at the location of the mag.
2. **Set the display options for each mobile.** In the Vessels Setup dialog (VESSELS menu) of HYPACK® SURVEY (Figure 7), you can assign the following:
   - A Boat Shape file to each mobile,
   - Specify the color fill
   - Enable/disable the track line.

There you have it!