



VDATUM Integration in HYPACK® 2011

By Pat Sanders

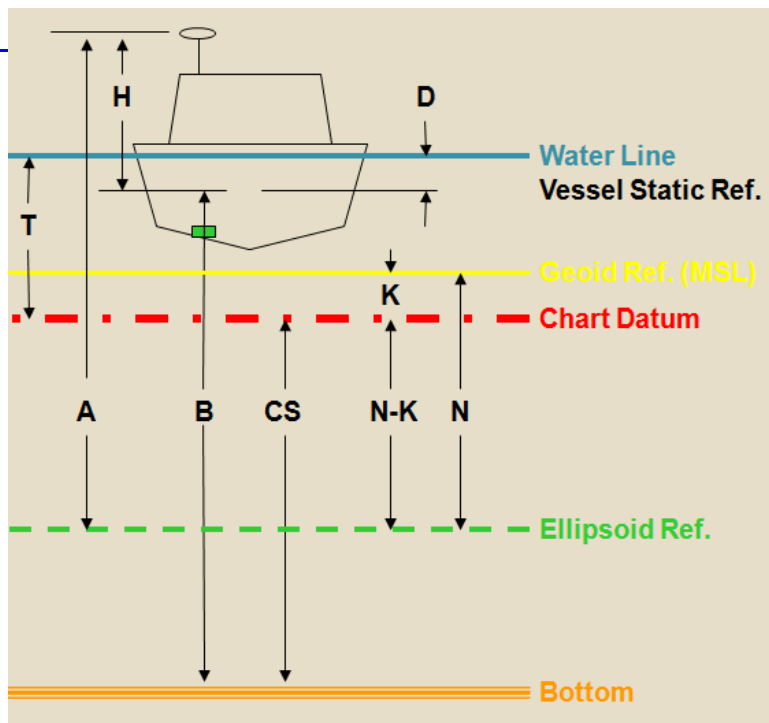
One of the new features of the upcoming HYPACK 2011 release is the ability to access NOAA's VDATUM data base to assist in the generation of RTK TIDE Correction values.

FIGURE 1.

In order to generate an RTK TIDE Correction, the user has to determine the separation between the Ellipsoid Reference and the Chart Datum. This would usually require local tests to determine the separation values (N-K).

In some cases, it was advantageous to use a Geoid file to obtain the N value and then the user would have to determine just the K value.

By incorporating NOAA's VDATUM data base into HYPACK 2011, we can now search that data base to obtain the K value.



There are 3-steps to set up what we will call the RTK VDATUM Tide generation. This routine should work where NOAA has VDATUM coverage, including most of the coastal, continental USA and the Great Lakes.

FIGURE 2. Setting Your Geodetic Parameters to use the VDatum

In GEODETTIC PARAMETERS:

1. **Select the appropriate 2009 Geoid file.** We're going to access this in HYPACK SURVEY to get the 'N' value (Height of Reference Ellipsoid relative to the Geoid).
2. **Select the VDATUM zone and Chart Datum.** If you are familiar with the GEODETTIC PARAMETERS program, you'll find these two new settings at the bottom of the window. In the screen capture (right), we have selected the NJ/ NY/CT zone with a chart datum of Mean Lower Low Water (MLLW). HYPACK SURVEY will use this information to extract the 'K' value (Height of Geoid above Chart Datum).

In HYPACK® HARDWARE:

3. **Using either the GPS.DLL, the POSMV.DLL or the F180.DLL, check the 'Tide' type** to activate RTK Tides and then enter the Vertical Offset for your GPS antenna. That is all the setup required to generate the RTK VDatum Tide Corrections!

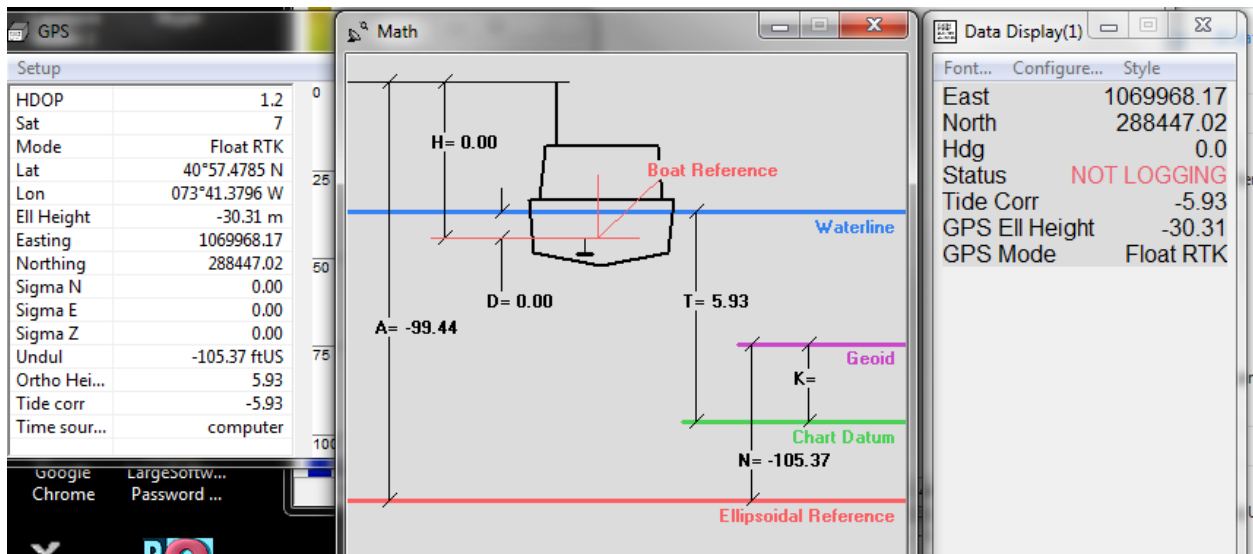
RTK VDATUM TIDE TESTING

In order to test the routine, we took screen captures from different survey boats that were in RTK Fixed mode and then pumped those numbers into the HYPACK® 2011 SURVEY program. This allowed us to compare the tide corrections generated with the older 'RTK TIDES with KTD File' against the newer 'RTK VDATUM Tides'.

TABLE 1. Sample KTD vs VDatum Comparisons:

South Carolina:		Long Island, NY	
RTK TIDE with KTD File:	5.38'	RTK TIDE with KTD File:	-5.90'
RTK VDATUM TIDE:	-5.32'	RTK VDATUM TIDE:	-5.93'
Diff	0.06'	Diff	0.03'

FIGURE 3. GPS, RTK MATH and Data Display windows for the Long Island test.



This is just the first step in our integration and testing. In the next few weeks, we should have the following ready for field testing:

- **Modification of SBMAX and MBMAX to re-compute RTK TIDES using either the KTD or VDATUM methods.** This means you can collect a data set with either method, then load it into SBMAX or MBMAX and recomputed the Tide Corrections with either method. We can then generate statistics to show you the differences between the different TIDE files.
- **Development of a new program to be able to export an XYZ file where Z is the difference between the Geoid Reference and the Chart Datum (MSL, MLLW, etc.)**
- **Modify the GPS and Math window to include more of the raw parameters and an indication of where they came from.**

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