Figure 2: Our base example
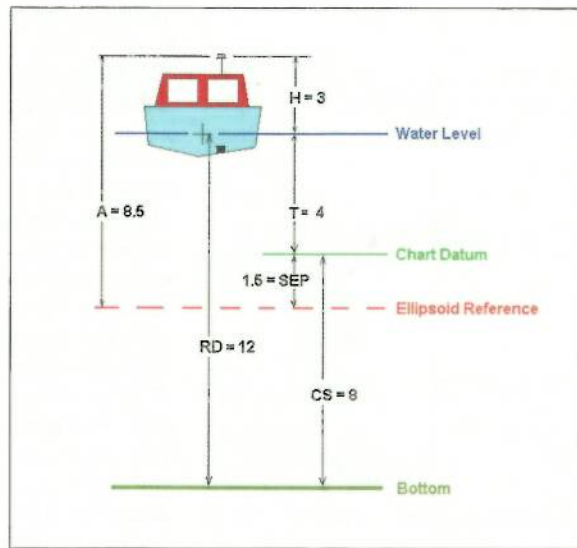

Figure 3: The tide comes in

of the Chart Datum above the Ellipsoid Reference, we can just transpose our observed values into formula (2), using the conventional tide value as our RTK tide value.

$T_k = A + D - H - SEP$
$SEP = A + D - H - T_k$
$SEP = 6.5 + 0 - 3 - 2 = 1.5$

So at this location, the Chart Datum is located 1.5 above the Ellipsoid Reference. It is important to note that this value may change over a large survey area. The height of the Chart Datum above the Ellipsoid Reference can change over a short distance, especially in areas of complex tides. We may be safe using it as a constant for a local survey about a pier, but we wouldn't want to rely on a single separation value used over a large area.

The Tide Comes In

In the next example (Figure 3), our vessel is still sitting statically at the dock but the tide has risen another 2.0. We would also expect that A (Height of RTK Antenna above the Ellipsoid Reference) and RD (raw depth from the echosounder) would also rise by the same amount. Using the formula to determine our RTK Tide correction gives the following:

$T_k = A + D - H - SEP$
$T_k = 8.5 + 0 - 3 - 1.5 = 4$

It follows that our Chart Sounding is:

$CS = RD - A + H + SEP$
$CS = 12 - 8.5 + 3.0 + 1.5 = 8$

In this case, the computed RTK Tide

(T_k) equals the conventional tide correction (T_c) and we can obtain the chart sounding in real time without any delay. It would be possible to carry out a statistical comparison between the T_k and T_c values for each sounding to see exactly how the two values compare.

The Vessel Squats

In this example (Figure 4) the vessel is underway. Due to 'squat and settlement', the vessel is sitting 0.2 lower than its normal static position. We will assume we have a method to determine this change in the vessel's dynamic draft. The tide remains the same as in the previous example. Since the vessel has 'dropped' 0.2, the values for A and RD will also drop by the same amounts. Using the formula to deter-
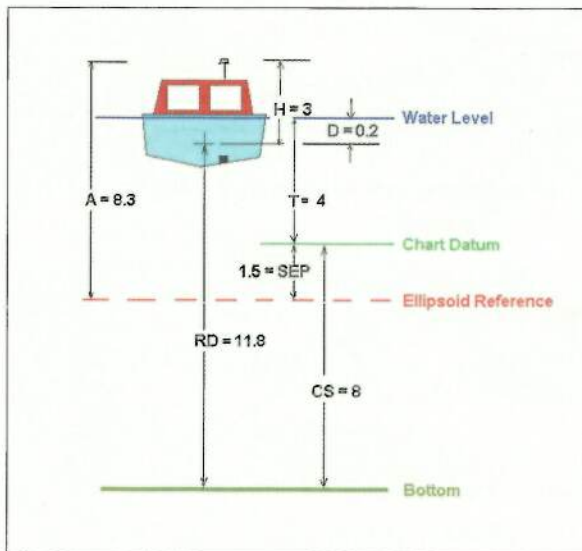

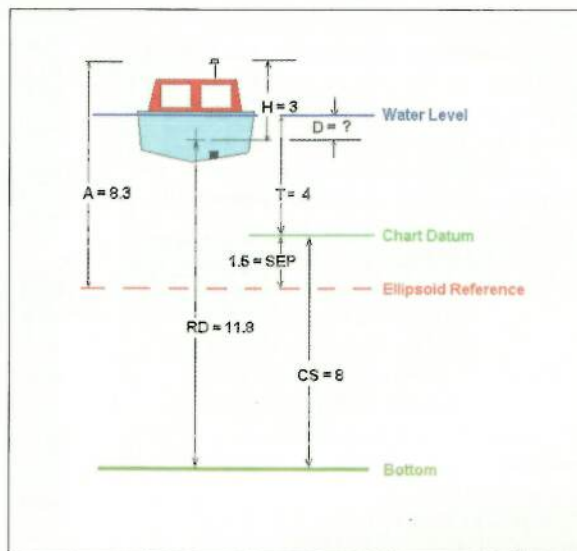
Figure 4: The vessel sinks in the water column

Figure 5: What happens when we cannot measure the draft?