Geographic Coordinate Formats

Geographic coordinates may be expressed in decimal degrees, or in degrees, minutes, and seconds. Sometimes, you need to convert from one form to another. Steve Kiouttis (personal communication, Spring 2002), manager of the Pennsylvania Urban Search and Rescue Program, described one such situation on the course Bulletin Board: "I happened to be in the state Emergency Operations Center in Harrisburg on Wednesday evening when a call came in from the Air Force Rescue Coordination Center in Dover, DE. They had an emergency locator transmitter

(ELT) activation and requested the PA Civil Air Patrol to investigate. The coordinates given to the watch o□cer were 39 52.5 n and -75 15.5 w. This was plotted incorrectly (treated as if the coordinates were in decimal degrees 39.525n and -75.155 w) and the location appeared to be near Vineland, New Jersey. I realized that it should have been interpreted as 39 degrees 52 minutes and 5 seconds n and -75 degrees and 15 minutes and 5 seconds w) and made the conversion (as we were taught in Chapter 2) and came up with a location on the grounds of Philadelphia International Airport, which is where the locator was found, in a parked airliner."

Here's how it works:

To convert -89.40062 from decimal degrees to degrees, minutes, seconds:

1. Subtract the number of whole degrees (89°) from the total (89.40062°). (The minus sign is used in the decimal degree format only to indicate that the value is a west longitude or a south latitude.)
2. Multiply the remainder by 60 minutes (.40062 x 60 = 24.0372).
3. Subtract the number of whole minutes (24') from the product.
4. Multiply the remainder by 60 seconds (.0372 x 60 = 2.232).

5. The result, expressed in the correct number of signi□cant □gures, is 89° 24' 2.2" W or S.

To convert 43° 4' 31" from degrees, minutes, seconds to decimal degrees:

DD = Degrees + (Minutes/60) + (Seconds/3600)

1. Divide the number of seconds by 60 (31 ÷ 60 = 0.5166).

2. Add the quotient of step (1) to the whole number of minutes (4 + 0.5166).

3. Divide the result of step (2) by 60 (4.5166 ÷ 60 = 0.0753).

4. Add the quotient of step (3) to the number of whole number degrees (43 + 0.0753).

5. The result, expressed in the correct number of signi□cant □gures, is 43.075°