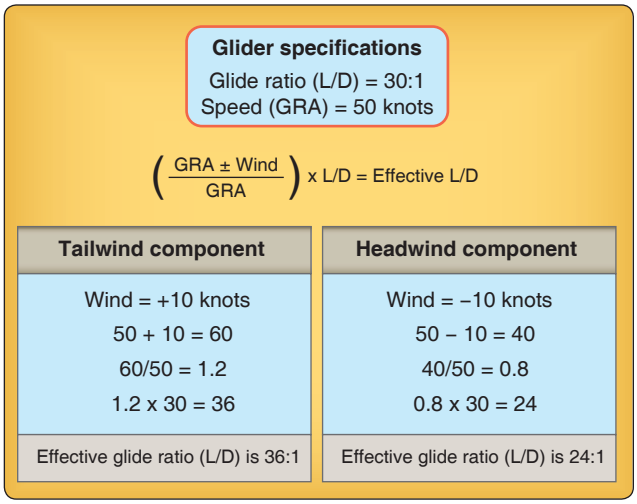

Figure 11-4. *Glide calculation example.*

Many models of electronic glide calculators now exist. Often coupled with an electronic variometer, they display the altitude necessary for distance and wind as input by the pilot. In addition, many electronic glide calculators feature speed-to-fly functions that indicate whether the pilot should fly faster or slower. Most electronic speed-to-fly directors include audio indications, so the pilot can remain visually focused outside the cockpit. The pilot should have manual backups for electronic glide calculators and speed-to-fly directors in case of a low battery or other electronic system failure.

Other equipment may be needed to verify soaring performance to receive a Federation Aeronautique Internationale (FAI) badge or record flights. These include turn-point cameras, barographs, and GPS flight recorders. For complete descriptions of these items, as well as badge or record rules, check the Soaring Society of America website (www.ssa.org) for details.

Finally, a notepad or small leg-attached clipboard on which to make notes before and during the flight is often handy. Notes prior to flight could include weather information such as winds aloft forecasts or distance between turn points. In flight, noting takeoff and start time, as well as time around any turn points, is useful to gauge average speed around the course.

Navigation

Airplane pilots navigate by pilotage (flying by reference to ground landmarks) or dead reckoning (computing a heading from true airspeed and wind, and then estimating time needed to fly to a destination). Glider pilots use pilotage since they generally cannot remain on a course line over a long distance and do not fly one speed for any length of time. Nonetheless, it is important to be familiar with the concepts of dead reckoning since a combination of the two methods is sometimes needed.

Using the Plotter

Measuring distance with the plotter is accomplished by using the straight edge. Use the Albuquerque sectional chart and measure the distance between Portales Airport (Q34) and Benger Airport (Q54), by setting the plotter with the zero mark on Portales. Read the distance of 47 nautical miles (NM) to Benger. Make sure to set the plotter with the sectional scale if using a sectional chart (as opposed to the WAC scale), otherwise the measurement will be off by a factor of two. *[Figure 11-5]*

The true heading between Portales and Benger can be determined by setting the top of the straightedge along the course line, then slide it along until the index hole is on a line of longitude intersecting the course line. Read the true heading on the outer scale, in this case, 48°. The outer scale should be used for headings with an easterly component. If the course were reversed, flying from Benger to Portales, use the inner scale, for a westerly component, to find 228°. *[Figure 11-6]*

A common error when first using the plotter is to read the course heading 180° in error. This error is easy to make by reading the scale marked W 270° instead of the scale marked E 09°. For example, the course from Portales to Benger is towards the northeast, so the heading should be somewhere between 30° and 60°, therefore the true heading of 48° is reasonable.

A Sample Cross-Country Flight

For training purposes, plan a triangle course starting at Portales Airport (PRZ), with turn points at Benger Airport (X54), and the town of Circle Back. As part of the preflight preparation, draw the course lines for the three legs. Using the plotter, determine the true heading for each leg, then correct for variation and make a written note of the magnetic heading on each leg. Use 9° east (E) variation as indicated on the sectional chart (subtract easterly variations, and add westerly variations). The first leg distance is 47 NM with a heading of 48° (48° – 9° E = 39° magnetic); the second leg is 38 NM at 178° true (178° – 9° E = 169° magnetic); the third leg is 38 NM at 282° true (282° – 9° E = 273° magnetic). *[Figure 11-7]*

Assume the base of the cumulus is forecast to be 11,000 MSL, and the winds aloft indicate 320° at 10 knots at 9,000 MSL and 330° at 20 knots at 12,000 MSL. Make a written note of the winds aloft for reference during the flight. For instance, the first leg has almost a direct crosswind from the left; on the second leg, a weaker crosswind component from the right; while the final leg is almost directly into the wind. Knowing courses and approximate headings aids the navigation and helps avoid getting lost, even though deviations to stay with the best lift are needed. During the flight, if the sky ahead