CHAPTER 15: CROSS-COUNTRY SOARING

One of the most difficult things about cross-country soaring is leaving your home airport behind for the first time. Once you overcome this hurdle, however, a world of possibilities unfurls. To many pilots, cross-country soaring provides some of the greatest challenges and rewards in aviation.

In this chapter, you will learn about the knowledge, skills, and planning required to safely and enjoyably enter the realm of cross-country soaring.

15.1 Glide Slope Management

The question that a cross-country pilot must be able to answer at all times is, "Can I glide to a safe landing zone from this altitude?" With proper glide slope management, the answer to that question should never be in doubt.

In some parts of the country, airports are considered the only safe places to land, although in others, an abundance of open fields and flat terrain make off-airport landings an acceptable alternative. This chapter assumes that the pilot only wishes to land at airports.

Modern flight computers can perform the functions necessary for glide slope management for you. However, even if you use a computer, you should know the concepts presented here, so that you understand what your computer is doing. You should be able to take over this function if the computer fails.

Safety Factor

When calculating glide distances for cross-country flying, you should reduce the expected glide ratio by a safety factor to ensure that unexpected sink or lower than expected performance of the glider (or pilot!) does not keep you from safely reaching your goal. As a beginner, you should use only 50% of the published glide ratio. As you become more comfortable and proficient, you may be able to count on up to 75% of the published glide ratio.

Safe Glide Zone

The safe glide zone is that area that is at least "one pattern altitude" above the glide slope of the glider, as shown in Figure 15.1. Here, the glide slope takes the safety factor into account.

If you remain in the safe glide zone, you should be able to make it to the airport with enough altitude for a pattern. If you are in the "danger zone", you may not have enough altitude to make it to the airport.

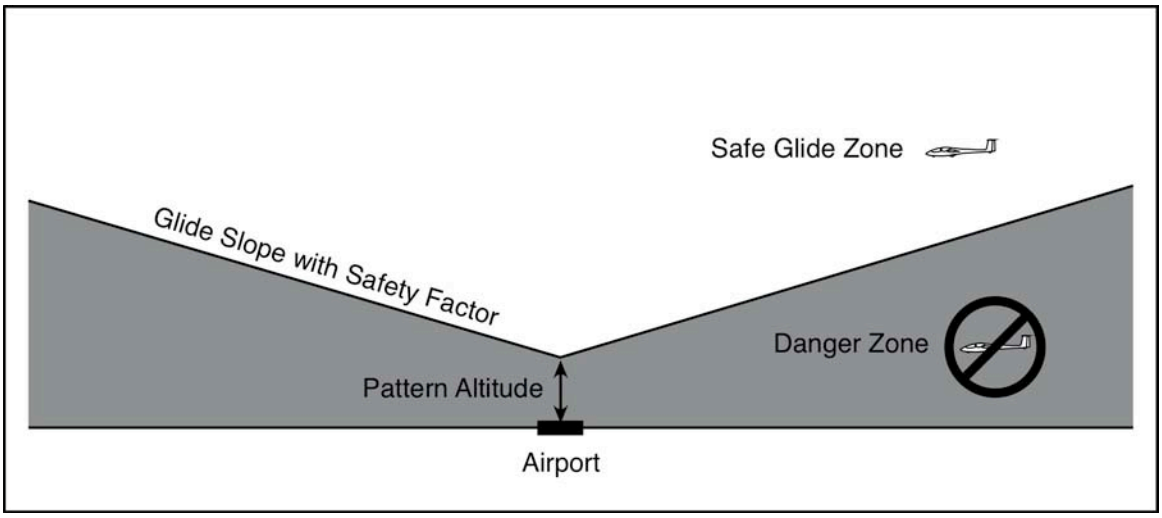

Figure 15.1 – Safe glide zone. The glide slope used to determine the safe glide zone includes a safety factor. The safe glide zone includes altitude for a normal pattern at the airport.

At your home gliderport, you probably remain in the safe glide zone without even thinking about it. However, once you leave your familiar surroundings, you need to be able to determine whether you are in the safe glide zone.

The Glide Slope Ruler

A glide slope ruler is a simple device for determining how much altitude you need to cover a given distance. It allows you to quickly determine whether you are within the safe glide zone of an airport. The ruler accounts for the safety factor and for headwinds that you may encounter. An example of a glide slope ruler is shown in Figure 15.2. Later in this section, you will learn how to make your own glide slope ruler.

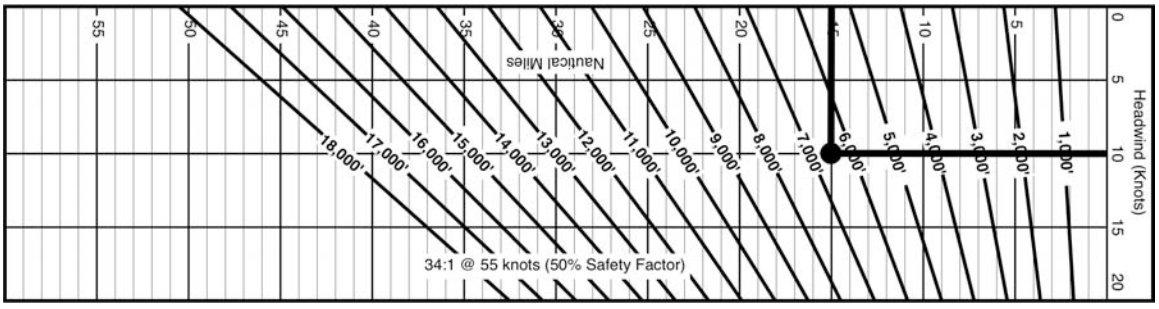

Figure 15.2 – Example of a glide slope ruler (not to scale). The ruler shows that to fly 15 miles into a 10-knot headwind, you would need 6,500 feet of altitude.

Notice that the shorter axis indicates headwind in 5-knot increments, and the longer axis indicates distance in nautical miles. The diagonal lines indicate the altitude needed to cover a distance given a particular headwind.

For example, if you need to fly a distance of 15 nautical miles into a 10-knot headwind, you would need about 6,500 feet of altitude. To get the indicated altitude, however, you must also add the pattern altitude and airport elevation.

Using a Glide Slope Ruler

You can use the ruler to determine the safe glide altitude right on a sectional, without having to do any math in your head. Place the ruler so that the altitude that you want to arrive at is adjacent to the airport symbol. Suppose you are over the dam to the northwest of Kody Field, as shown in Figure 15.3.

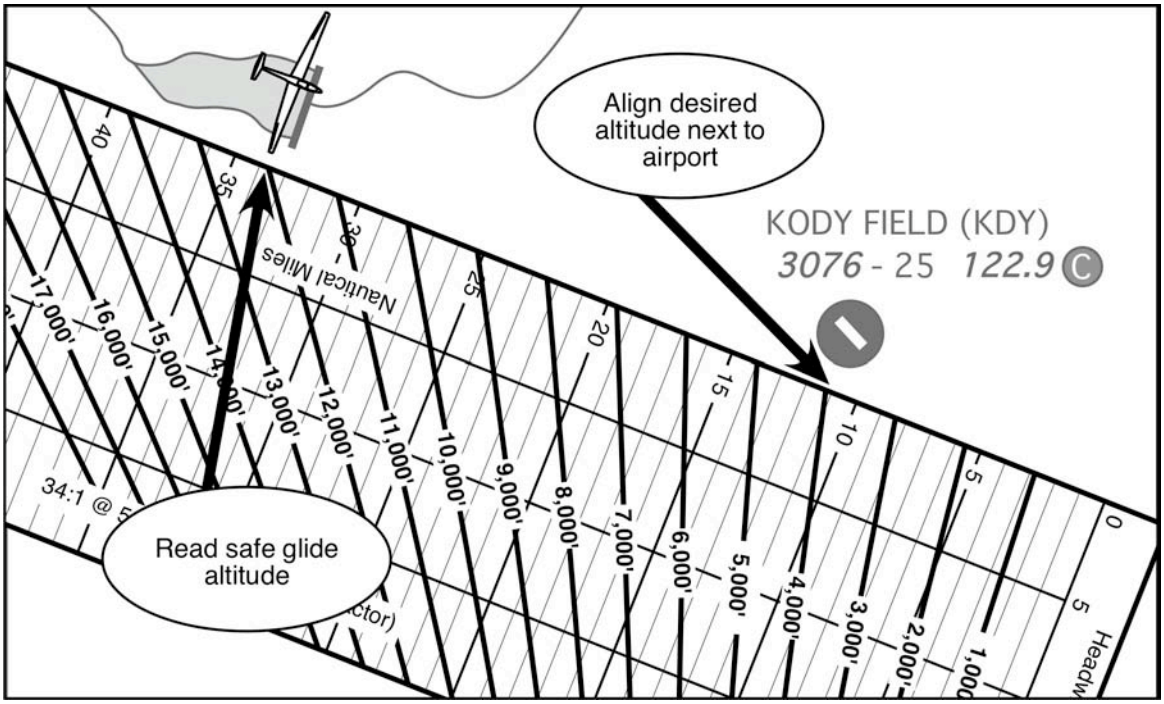

Figure 15.3 – To use the glide slope ruler, align the required arrival altitude with the airport, and read off the safe glide altitude corresponding to the glider's position.

The elevation of the field is 3,076 feet, so you will want to arrive at the field at about 4,000 feet to give yourself about 1,000 feet for a pattern. You therefore align the 4,000-foot mark with the airport symbol. Now read off the indicated altitude that you would need to safely reach the airport. In this case, it is 12,000 feet.

If there is wind, you use the axis that corresponds to the headwind component. For example, if you also had to consider a 10-knot headwind, you would set up the glide slope ruler as shown in Figure 15.4.

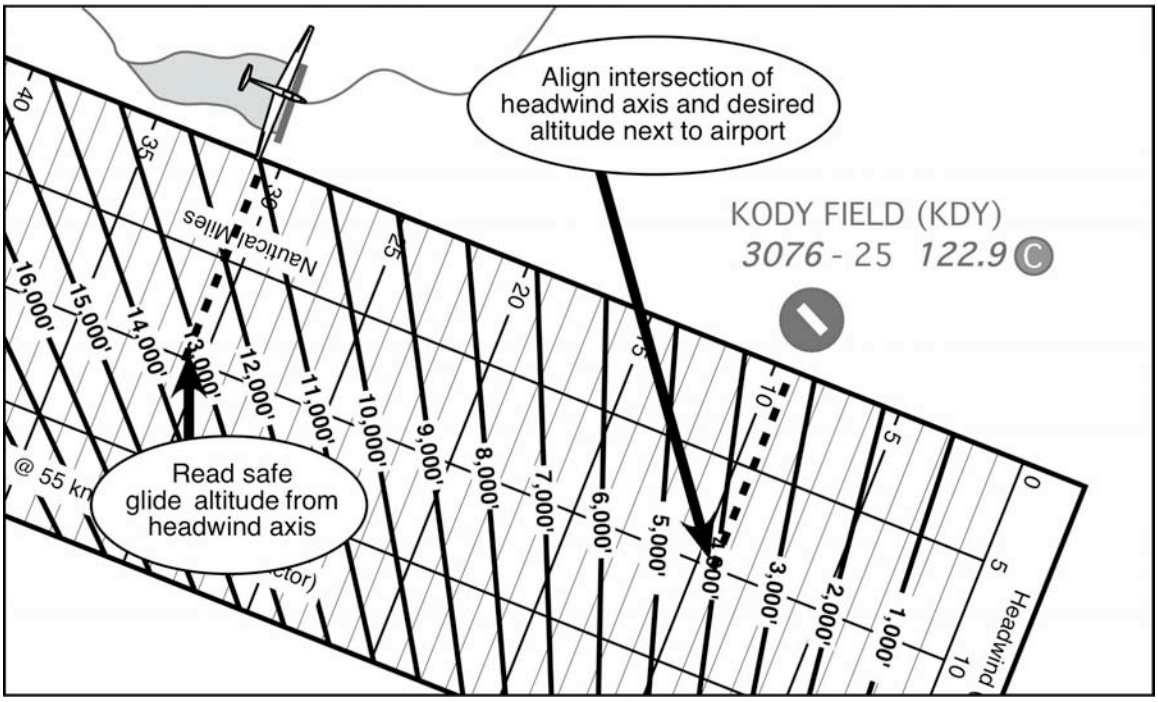

Figure 15.4 – To use the glide slope ruler when there is a 10-knot headwind, align the intersection of the required arrival altitude line and the 10-knot headwind line with the airport, and read off the safe glide altitude corresponding to the glider's position from the 10-knot axis.

In this case, you align the intersection of the 4,000-foot altitude line and the 10-knot headwind line with the airport (as shown by the heavy dotted line). You can then read off the safe glide altitude from the 10-knot axis (again, shown by a heavy dotted line), which in this case would be about 13,500 feet.

Safe Glide Circles

While the glide slope ruler makes it relatively easy to determine how much altitude you need to safely glide to an airport, if you draw safe glide circles on your sectional, it will be even easier. For example, in Figure 15.5, safe glide circles have been drawn around Kody Field at 2,000-foot intervals.

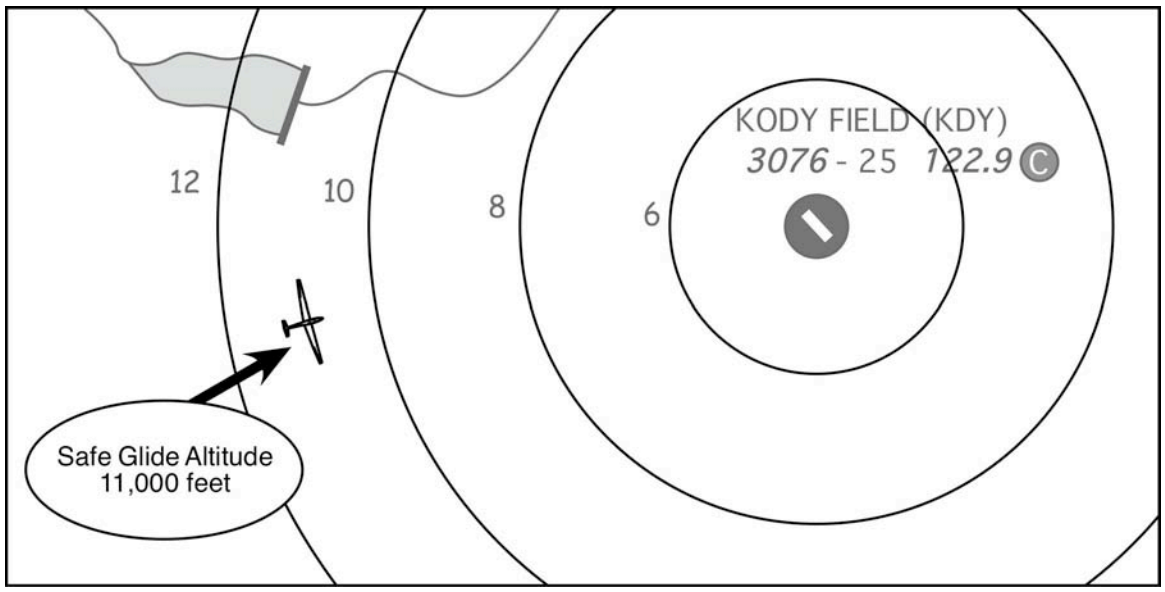

Figure 15.5 – Safe glide circles greatly simplify glide slope management.

If you were located where the glider is shown, you would need 11,000 feet indicated to make it to the field with an altitude of 4,000 feet, which would allow you 1,000 feet for a pattern.

When laying out safe glide circles around multiple airports, what you want to know is whether you have enough altitude to make it to any airport. Therefore, you can leave out any arcs that are "redundant". For example, in Figure 15.6, the 12,000-foot arc for Kody Field is not shown where the glider is located, because the glider could make it to Dakota Airport with only 9,000 feet of altitude.

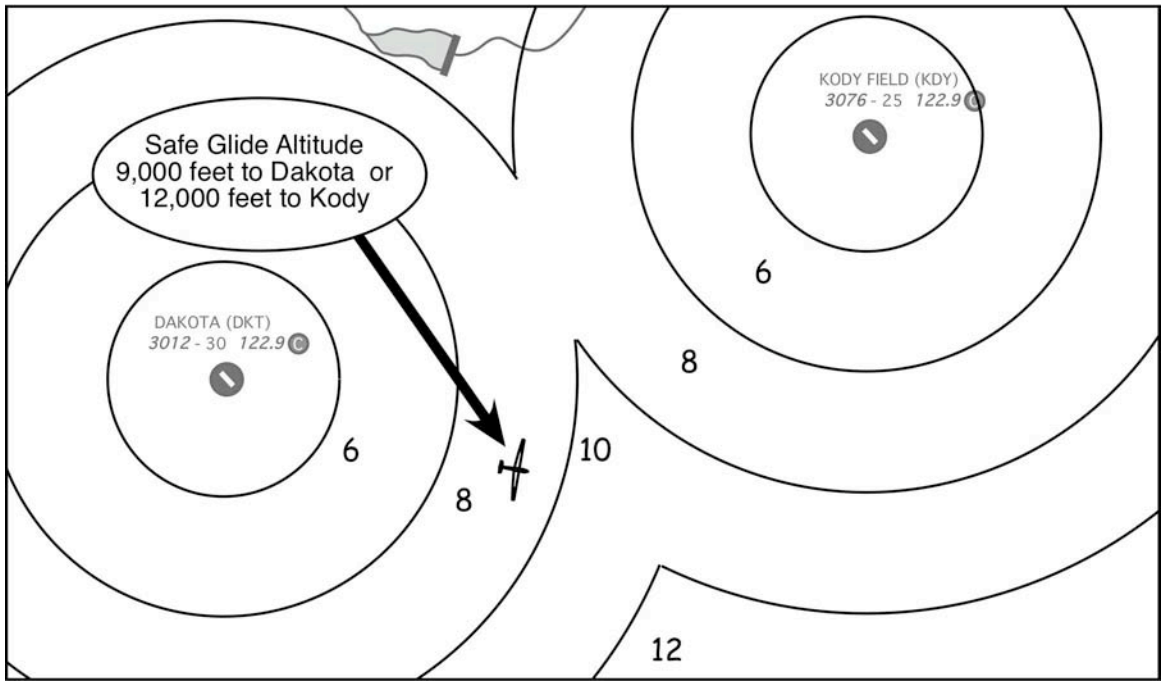

Figure 15.6 – Safe glide circles for multiple airports