

CHAPTER 1: ORIENTATION, PRE-FLIGHT, POST-FLIGHT

You must learn some basic information before you can take to the air. In this chapter, you will learn about the glider's controls and instruments, how to inspect the glider and towrope, how to move the glider around on the ground, and how to secure the glider when you are finished with it.



1.1 Primary Flight Controls

Purpose

In this lesson, you will learn the names, locations, and effects of the glider's primary flight controls.

Procedure

The primary flight controls consist of the stick and rudder pedals. They control the movement of the glider about its three axes: pitch, roll, and yaw.

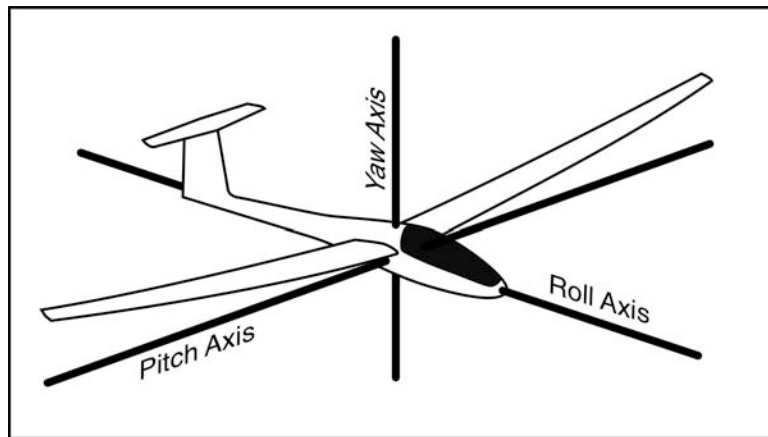


Figure 1.1 – The pitch, roll, and yaw axes intersect at the center of gravity of the glider.

Pitch is rotation of the glider about the horizontal axis that is parallel to the wings. Pitching the glider moves the nose up and down.

Roll is rotation of the glider about the horizontal axis that is parallel to the fuselage (often referred to as the longitudinal axis). Rolling the glider causes one wing to move up and the other down.

Yaw is rotation about the vertical axis. Yawing the glider causes the nose to move from side to side.

Pitch Control

Moving the stick fore and aft causes the elevator (or stabilator) to deflect, changing the pitch of the glider and the angle of attack of the wing. In normal, level flight, moving the stick forward causes the nose of the glider to pitch down, decreasing the angle of attack and increasing the airspeed of the glider. Moving the stick back pitches the nose up, increasing the angle of attack and decreasing the airspeed of the glider.

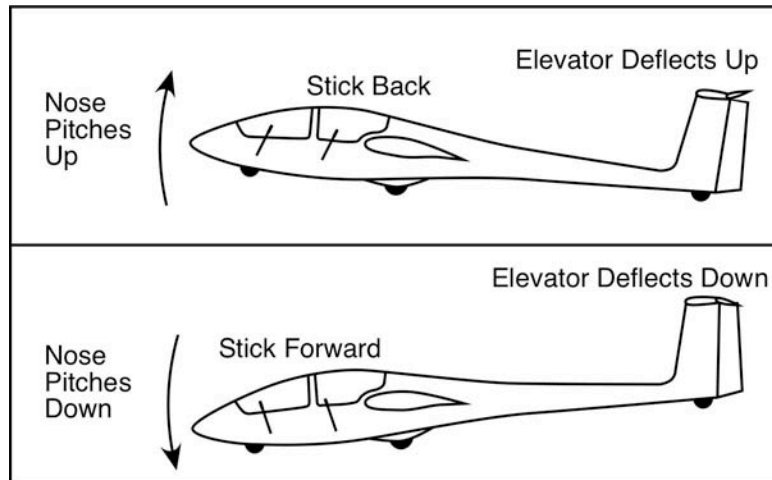


Figure 1.2 – The elevator controls pitch.

In later lessons, you will learn that when the glider is stalled, it will not necessarily react to control inputs the same way it does when in normal flight.

Roll Control

Moving the stick from side to side deflects the ailerons, causing the glider to roll. When the stick is moved to the right, the right aileron moves up and the left aileron moves down, causing the glider to roll to the right.

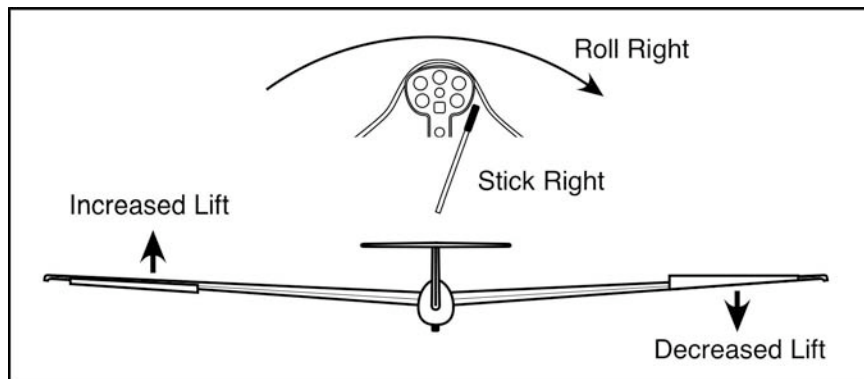


Figure 1.3 – The ailerons control roll.

Because gliders have such long wings, the response to the ailerons tends to be a bit sluggish, especially at low airspeeds.

When the ailerons are deflected, the wing that creates more lift also creates more induced drag. This causes the glider to yaw opposite the direction that the stick is moved. This tendency is called adverse yaw. (See Chapter 3: Glider Aerodynamics in the *Glider Pilot's Manual of Aeronautical Knowledge*.) The rudder must be used to counteract adverse yaw.

Yaw Control

The rudder pedals control the glider about the yaw axis. Pushing on the right rudder deflects the rudder to the right, forcing the nose to the right, and vice versa.

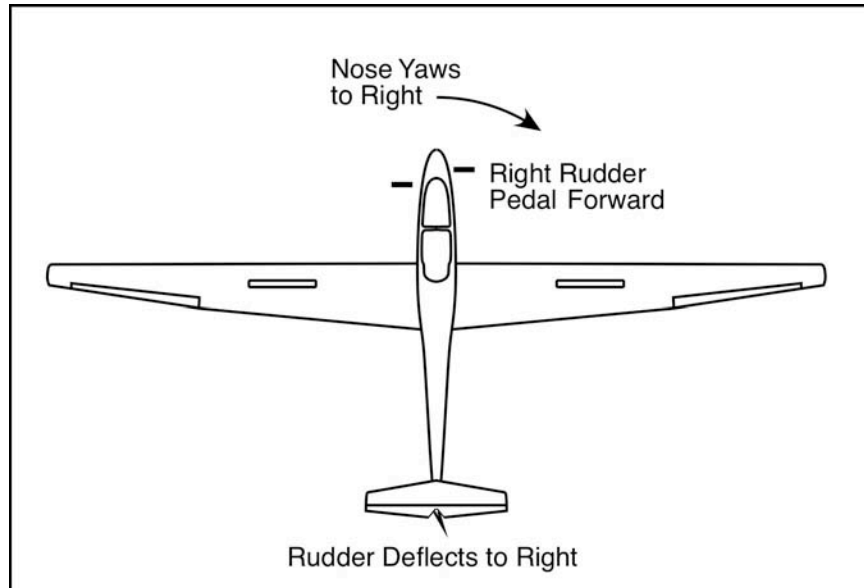


Figure 1.4 – The rudder controls yaw.

Again, the long wings of a glider tend to make it respond to the rudder rather slowly. The glider will tend to oscillate in yaw because of the momentum of the wings and the relatively small amount of damping provided by the vertical stabilizer.

Completion Standard

This lesson is complete when you can locate and describe the effects of the stick and rudder pedals.

1.2 Secondary Flight Controls

Purpose

In this lesson, you will learn about the remaining flight controls, including the towrope release, the airbrakes, the wheel brake, and the elevator trim. If the glider you are using for flight training is equipped with a retractable undercarriage or flaps, the location and use of their controls will also be covered in this lesson.

Procedure

Towrope Release

The tow hook is opened by the towrope release knob. This knob is usually located on the instrument panel or on the left side of the glider. Your instructor will show you the location of the towrope release knob in the glider that you will use for training.

Airbrakes

The airbrakes are used for glide slope control. In this manual, the term “airbrakes” will be used to refer to both dive brakes and spoilers. The airbrakes are used to control the glide path of the glider. For a steeper path, you use more airbrakes.

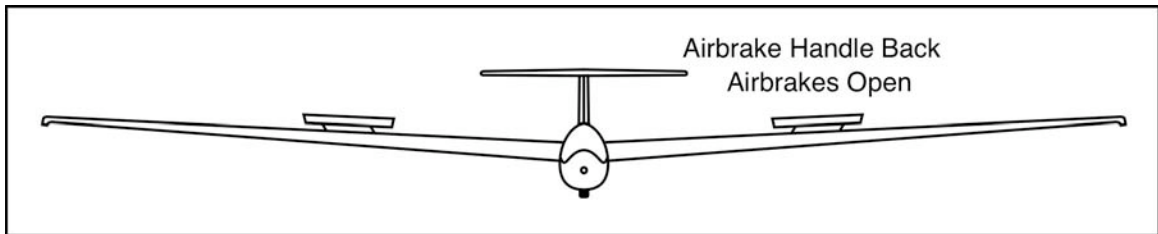


Figure 1.5 – As the airbrake handle is pulled back, the airbrakes open. The airbrakes control the glide path. On most gliders, pulling the airbrakes all the way open engages the wheel brake.

The airbrakes are deployed by moving the airbrake handle. The airbrake handle is usually located on the left side of the glider. Your instructor will demonstrate how to unlock and deploy the airbrakes. On many gliders, pulling the airbrake handle all the way back engages the wheel brake. On others, the wheel brake is activated by a lever mounted on the control stick, or elsewhere in the cockpit.

Elevator Trim

The elevator trim is used to set the airspeed at which the glider will fly when no fore or aft force is applied to the control stick. Your instructor will show you the location and function of the trim control on the glider you are using for your training.