

During flight, the downtubes are similar in compression to the crossbar and must be stiff and straight to maintain structural integrity. The base tube/control bar is under tension during flight.

Front and rear flying wires hold the control frame in place fore and aft. Side flying wires hold the control frame in place side to side and provide structure to hold the wings in place while flying. [Figures 3-2, 3-5, and 3-6] Strutted wings use struts in place of the side flying wires, which is discussed later in this chapter.

Training bars are added for dual controls so the person in back can fly the aircraft. These are typically used by an instructor for training but can be used by a passenger in the back also. [Figure 3-7]

King Post With Wires-on-Top Wing Design

Similar to the lower control frame holding the wing in position during flight, the king post is attached to the keel and supports the upper ground wires which hold the wing in position on the ground and negative loads during flight. [Figure 3-2] It also provides a structure for reflex lines which is discussed later in wing systems.

Topless Wings With Struts

Similar to airplanes with struts to support the wings, some WSC aircraft replace side flying wires with struts, eliminating the king post and ground wires on top of the wing. This provides a number of benefits, but primarily, no king post is needed because the struts can take a compression load and hold the wings up on the ground and also take the negative loads during flight. With struts, a WSC aircraft is much shorter in height allowing it to fit into hangars with lower doors and ceilings. This can make a big difference in finding a suitable storage for the aircraft if leaving it set up. [Figure 3-8]



Figure 3-8. Strutted wing on WSC aircraft carriage.



Figure 3-7. Passenger using training bars which are also used by the instructor during training.