In a similar way attach the rudder to the vertical stabilizer. Again use the longer rivets in areas of internal reinforcing tubes as discussed in the previous paragraph.

WEIGHT AND BALANCE

Refer to the three weight and balance pages at the end of this manual, these show how to do the computations. The average wing chord is 64" and the airplane will be safe to fly at the center of gravity of the airplane is between 25% and 35% of the wing chord as measured from the leading edge. Thus 25" = 16 inches aft of the leading edge of the wing; 35% = 22 inches. Thus the airplane is in balance if the C.G. Is between 16" & 22" from the leading edge of the wing. For reference the mounting tab for the main spar is 18" aft of the leading edge. The most critical loading condition is a very light pilot flying with full fuel, in which case the C.G. Will shift aft. An airplane with a C.G. That is too far aft is a dangerous airplane – it should not be flown until the balance problem is corrected.

A very heavy pilot might result in a forward C.G. An airplane with an excessive forward C.G. Would need a faster than normal speed to take-off and would run out of elevator control before the wings would stall. Thus, with an excessive forward C.G., the pilot would need to fly faster than normal to be able to have sufficient elevator control.

Pilots weighting 150 lb. or more should not have any problem with a normally equipped 447 FireFly. Lighter pilots may want to consider putting some weight in the nose. (Some restore balance by placing a thick cushion behind their back – this moves their body weight several inches forward; many times this is all that is needed.)

Balance Basics

The basic balance equation is:

WEIGHT X DISTANCE = MOMENT

The weight is measured in pounds, and the distance should be measured in inches – all units must be consistent. The resultant moment is then in inch-pounds.

Basic Procedures

If you have high capacity scales or have 5 scales at your disposal (2 for each main wheel), you can do the weight and balance as shown by the first calculation sheet – weighing airplane, pilot and gas – everything in one weighing. This is the easiest and you are less likely to make a mistake this way. If you use 2 scales for each main wheel (bridge the 2 scales with a piece of lumber and place the whell in the center of the two scales; then simply add the 2 scale readings together).

If you are limited to 3 scales or less – your procedure will be to follow the calculations on the second calculation sheet:

1) Weigh each wheel with a separate bathroom type scale (3 scales needed).

2) Multiply each wheel weight by its distance from the datum point.

3) Add the 3 resulting moments together.

4) Divide the resultant moment by the total weight (the sum of the readings of all 3 scales) this will give the resultant distance from the C.G (of what you weighed) to the datum.