7.8.2 Wing Location with Respect to the Fuselage

A more appropriate title for this section might have been “Fuselage Location with Respect to the Wing”. It is better to think of the wing as being in the reference location, and then moving the fuselage to achieve the required c.g. location of the complete aircraft with respect to the MAC of the wing. If the engines are located on the wing (so that they don’t move as the fuselage is moved), then the fuselage may have to be moved a surprisingly large distance longitudinally to move the c.g. to the correct location.

Raymer suggests an initial reference location of the c.g. as 30% MAC. Slightly refined values would be to put the c.g. at 25% MAC for a transport aircraft (Ref. 7.8.2.1) and 35% MAC for a fighter (Ref. 7.8.2.2).

References

7.8.2.1 Torenbeek, E., “Synthesis of Subsonic Aircraft Design”, Delft University Press, 1982.

7.8.2.2 Nicolai, L., and Carichner, G., “Fundamental of Aircraft and Airship Design, Volume 1- Aircraft Design”, AIAA, 2010.