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RA-Aus Technical Manual

Section 7.1.4 Annex F

Weight and Balance

In order to conduct a proper weight and balance on an aircraft, the following information is required:

a) The level reference of the aircraft. (see Appendix)

b) The Forward and aft centre of gravity limits. (see Appendix)

c) Datum. This is the working point for all distances.

d) Distance arms. (see Appendix)

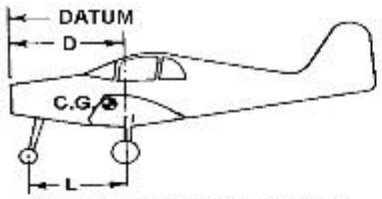
All required information should be available from the aircraft handbook.

If not, consult the manufacturer or contact the RA-Aus Technical Manager for further information.

The examples below are taken from the retired FAA AC43.13 – 1B* which is still relevant to this topic. The examples demonstrate the testing sequence necessary in order to gain a correct result. The results should be within the FWD and AFT CoG limits.

This process must be repeated using the various ACFT weight configurations as outlined on this form. Level the aircraft, using the level reference point/s of the aircraft, prior to recording weights.

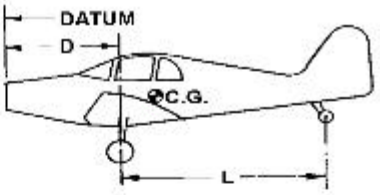
The completed form MUST be submitted to the RA-Aus office with every newly registered aircraft or at the request of the Technical Manger.



NOSE WHEEL TYPE AIRCRAFT

DATUM LOCATED FORWARD OF THE MAIN WHEELS

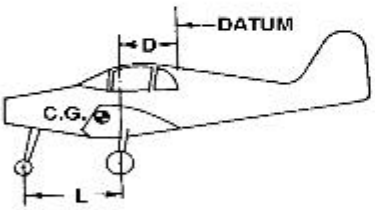
$$C.G. = D - \left(\frac{F \times L}{W}\right)$$



TAIL WHEEL TYPE AIRCRAFT

DATUM LOCATED FORWARD OF THE MAIN WHEELS

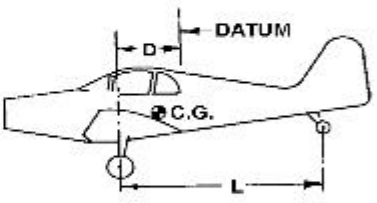
$$C.G. = D + \left(\frac{R \times L}{W}\right)$$



NOSE WHEEL TYPE AIRCRAFT

DATUM LOCATED AFT OF THE MAIN WHEELS

$$C.G. = -\left(D + \frac{F \times L}{W}\right)$$



TAIL WHEEL TYPE AIRCRAFT

DATUM LOCATED AFT OF THE MAIN WHEELS

$$C.G. = -D + \left(\frac{R \times L}{W}\right)$$

C.G. = Distance from datum to center of gravity of the aircraft.
W = The weight of the aircraft at the time of weighing.
D = The horizontal distance measured from the datum to the main wheel weighing point.
L = The horizontal distance measured from the main wheel weighing point to the nose or tail weighing point.
F = The weight at the nose weighing point.
R = The weight at the tail weighing point.

RA-Aus Weight and Balance (Section 7.1.4 - Annex F)

			Date / /
Aircraft Type		Aircraft Rego	
Engine Type		Engine Model	
Propeller Type		MTOW	
Datum			
Level Reference			
Scales used			
Designed FWD Limit	mm	Designed AFT Limit	mm

Equipment list – Number of items					
Radio		EGT		GPS	
Altimeter		RPM Gauge		Turn Coordinator	
ASI		Transponder		Oil (litres)	
VSI		ELT/ADSB			
CHT		A/H			
Hour meter		Cushions			

NO PILOT - LITRES UNUSABLE FUEL

	Weight in Kg	Arm in mm	Moment (kg/mm)
Left Main Wheel			
Right Main Wheel			
Nosewheel/Tailwheel			
Payload			
Total			
Centre of Gravity from Datum			

PILOT KG PLUS LITRES UNUSABLE FUEL

	Weight in Kg	Arm in mm	Moment (kg/mm)
Left Main Wheel			
Right Main Wheel			
Nosewheel/Tailwheel			
Payload			
Total			
Centre of Gravity from Datum			

PILOT KG PLUS LITRES FUEL

	Weight in Kg	Arm in mm	Moment (kg/mm)
Left Main Wheel			
Right Main Wheel			
Nosewheel/Tailwheel			
Payload			
Total			
Centre of Gravity from Datum			

REMARKS:

OWNERS SIGNATURE:

Witnessed by: **AUTHORITY No:**

Appendix

Information Sheet

Definition of Terms

Required Specific Information (explanation of Terms)

A. In what attitude the aircraft is to be placed when conducting the weighing.

   Note: This is important as it will affect the weighing results

B. Forward and aft centre of gravity limits. This information is vital and doing a weight and balance without it is pointless.
C. Reserved
D. This information is required to calculate the moments. Various items such as fuel, pilots, baggage, tail wheel etc, all play a part in the weight and balance and can be ascertained from the manufacturer's figures.

ACFT Aircraft

AFT the rear of the airframe

CoG centre of gravity

FWD the front of the airframe

RA-Aus recognized Reference

* Retired FAA AC43.13 – 1B. The AC is available from the office on request.