

FLIGHTBYTE COMPUTING

User manual for Weight and Balance calculator v2

Welcome to the Weight and Balance manual. Here we will discuss:

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1. Disclaimers

Put the wrong data in and you'll get the wrong data out. We've aimed to make the calculator as flexible as possible.

So you will have to make sure you use the same units for all arms and for all weights. If you don't, then it could be like that satellite that crashed through people mixing imperial and metric units. Still, they did get on television.

You're flying it, you get it right!

2. Installation

2.1 Using PC connections

If downloaded, run the file to extract the contents.

If received on CD, insert the CD in a PC's CD drive,

Connect the Pocket PC to the PC.

Copy the file 'W+B CAB' to your PC using windows explorer.

In your mobile device, double-click the file 'W+B CAB' to install it.

Should your Pocket PC object to the program, that is because it is running Pocket PC 2002 or earlier. The program requires .net compact framework 2.0. It needs .net compact framework. Run .NETCFSETUP.exe.

2.2 Via memorycard

If downloaded, run the file to extract the contents.

If received on CD, insert the CD in a PC's CD drive,

Copy the file 'W+B CAB' to your memory card using windows explorer.

In your mobile device, double-click the file 'W+B CAB' to install it.

Should your Pocket PC object to the program, that is because it is running Pocket PC 2002 or earlier. The program requires .net compact framework 2.0. It needs .net compact framework. Run .NETCFSETUP.exe

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3. Overview

The package allows you to calculate weight and balance and store data for up to four aircraft. You can set up each aircraft with a mixture of seats, baggage and fuel positions. This data is automatically stored and brought back each time the program is run.

On calculating weight and balance, a graph is shown to visually give you a guide to weight and balance

4. Using the program

When you first start the program, you will need to enter base data for the first aircraft. You will automatically be taken to the setup screen. See 'entering setup data' below.

In future uses, you will go straight to the weight and balance screen.

5. The Weight and Balance screen

The program lets you retain calculations for up to four aircraft. The main W+B screen lets you move between the aircraft, calculate weight and balance or setup the base data. If there is no data for that particular aircraft, then you will see the setup screen.

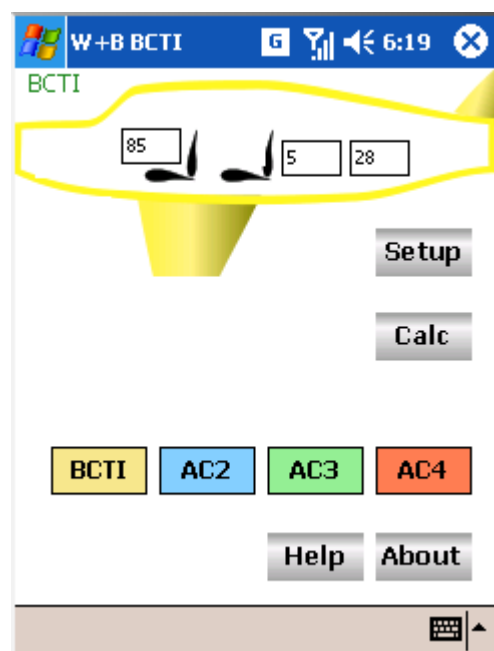
Calculating Weight and Balance

Once you have set up the aircraft, then you are ready to do your weight and balance calculation. Press the correct tab for the aircraft that you wish to check.

This will bring up a generic aircraft picture with only the load areas that you selected during setup.

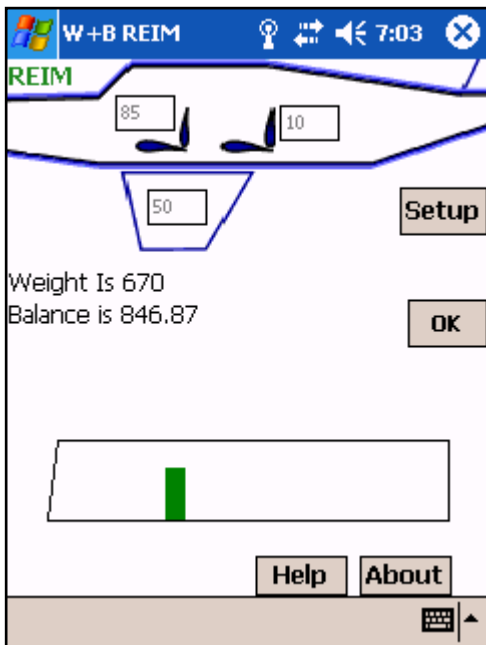
Using the weight system (kg, lbs, etc) that you used in the set up, then put in the weights of each area, or '0' if empty. If you have two pilots for example, then enter '150' or whatever, not '2'.

Now press 'Calc'



Example from K16

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This will give you a numeric and graphical representation of the weight and balance of your aircraft as currently loaded.

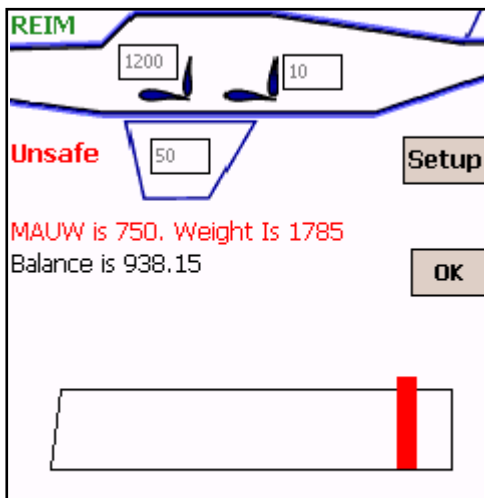
If the loading is unsafe, then the colours change to red and a reason displayed.

Note that the examples have a forward CofG that varies with weight. The left hand end of the box slopes to represent this.

It will also store all the set-up and weight data for that aircraft. When you open the program again, you won't have to type it all in again.

Press OK to return to the data entry screen

Example from Reims Cessna



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6. Entering Setup data

Use the setup button to enter or change the base data for your aircraft.

Press the correct button for the aircraft that you wish to set up.

Now enter the arms in the appropriate boxes on the aircraft picture that match your aircraft.

If you don't have a rear seat, for example, then leave it blank. Areas that are selected will be bordered in grey.

Aircraft have fuel in many positions. A PA-25 Pawnee has it in front of the pilot, while a PA-28 has it in the wings. So we've left fuel as a load, so use any box to represent your fuel tanks. You'll have to convert fuel to weight, and our FlightByte Flight Computer product does these conversions.

Now complete all the other boxes outside the aircraft picture.

The forward CofG limit often varies with weight. This release allows for this and you should enter the forward position limit at the lowest and highest weights, the repeat with the aft

Press 'save' to leave the setup screen

You can get all the arm and weight data from the CofA data or the Pilot Operating Handbook if not specified by the CofA.

Examples

The basic rule is if you can't put any load in a location represented by a box on the screen, leave the box blank.

A G-BCTI is a K16 motorglider. To remind us of which aircraft we are working on we put 'BCTI' into the 'registration' box.

- 1 There isn't anywhere to put nose baggage so we leave the first box blank.
- 2 TI has just a front row of seats, so we put the arm for the pilots of 140 into the box on the first row of seats. We leave the box for the other row of seats empty.
- 3 We've got a luggage area behind the seats, so the arm of 800 goes into that box.
- 4 Our fuel is behind the cockpit, so we enter 1050 into the last box. Our wings are empty so no entry in the wing box.
- 5 Final stages are entering data from the POH and weighing sheet:

The screenshot shows the 'Set up BCTI' screen with a top status bar displaying the Windows logo, signal strength, a speaker icon, and the time 5:28. Below the status bar is a diagram of a K16 motorglider with several input boxes for arm and weight data. The diagram shows a cockpit with two seats, a luggage area behind them, and fuel tanks in the wings. The input boxes are: a blank box for the first seat, a box containing '140' for the second seat, a box containing '800' for the luggage area, and a box containing '1050' for the fuel tanks. Below the diagram is a table for entering CofG data:

Ident	Empty Wt	Empty CG
BCTI	509	374
280 H CG	750 MAUW	380 H CG
280 @ L	509	750 380 L

Below the table is a 'Save' button and a keyboard layout with various function keys like Tab, CAP, Shift, and Ctl.

Example from K16

The CofG positions are the same for all weights, 280 forward, 380 rear so we enter the same positions for the highest weights(750) and empty weights (509)

6. Now we press 'save' and are ready to work out our loadings

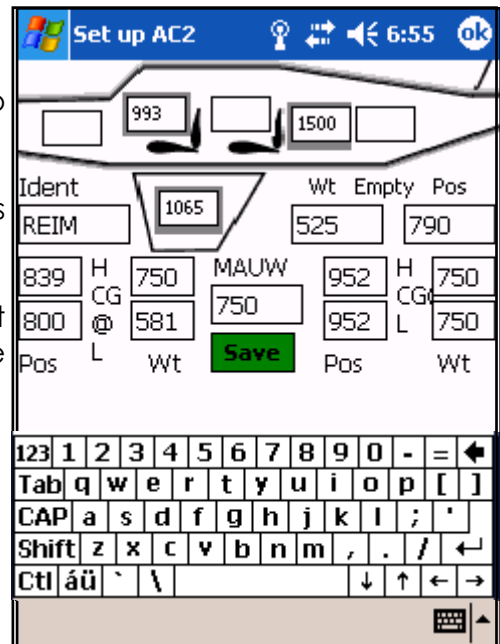
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B Reims Cessna

The Reims Cessna varies from the motorglider in two significant ways.

There is fuel in the wings, so the moment for the fuel is entered into the box on the wings.

The forward CofG limit varies with weight from 800mm at 581kg or less to 839mm at 750kg. Note how we have entered the figures into the boxes at the lower left.



Example from Reims Cessna

7. Troubleshooting

If the answers look mad, then some data as probably been entered incorrectly. The numbers might be too long for the boxes or the data has been retrieved incorrectly. Either work through the data or delete the data file to start again. Use file explorer to get to program files\flightbyte and delete "WBxxxx" and "WBxxxw" where xxx is AC1, AC2, AC3 or AC4, depending on which you are having a problem with.

8. Glossary

Arm The distance of the weight from the datum. The longer the arm, the more effect that the weight has

Datum A single reference point that all arms are measured from. It will be specified in the manufacturer's aircraft handbooks