



This document describes the basic features and functionality of SeeG 1.0, a weight and balance calculator for glider pilots, published by Glideplan Inc. (www.glideplan.com) Copyright 2010. A sample glider file is available for download on the site.

Create your Glider. A "New Glider" appears when you first open the application. You can edit this one, or create an unlimited number of additional gliders and variants on existing gliders. Use the "Glider" menu or the "Add", "Delete" and "Duplicate" tools on the toolbar. Select the glider to edit from the popup menu in the upper right corner of the window (fig. 1).

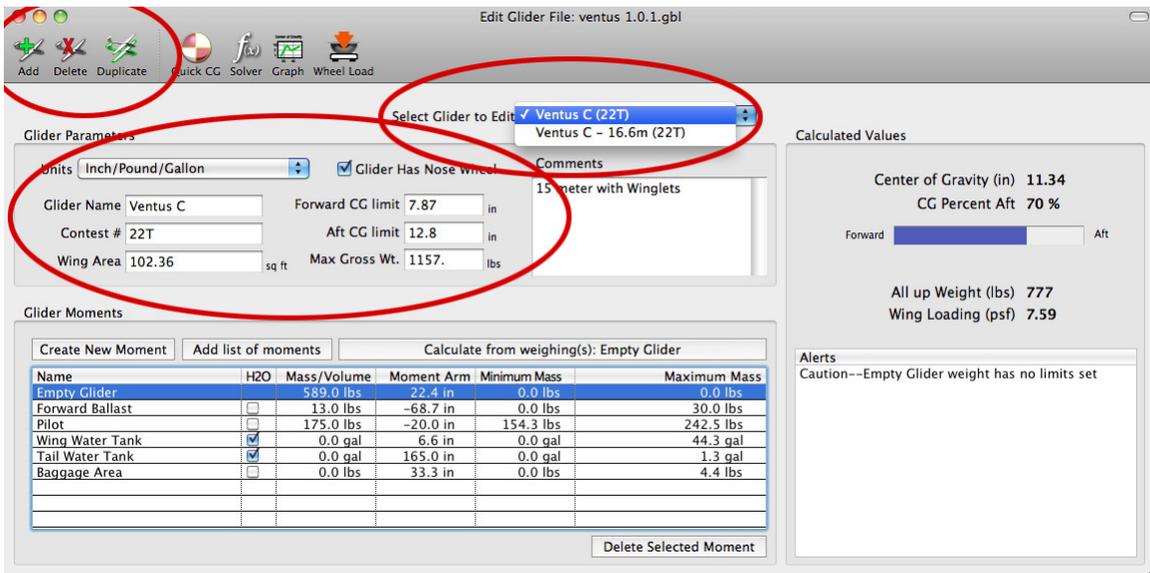


Figure 1

Set up the basic parameters. Choose the units you want to work with from the pop up menu (these can be changed any time). Checking "Glider has nose wheel" will enable dual seat glider images, and add a nose wheel and nose wheel arm to weighing calculations. Enter basic information about the glider in the "glider parameters" area of the window near the top, including Wing area, forward/rear CG limits, max gross weight, etc. (Fig. 1).

Set up the moments. Add or delete moments using the “Create New Moment” and “Delete Selected Moment” buttons above and below the list of moments in the "Glider Moments" area of the main screen (fig. 2). You can add pre-made sets of moments for your type of glider by clicking "Add list of moments" and selecting the set you want. To edit a moment value, click on the cell in the list, and click return or tab to complete the edit. Enter the Name, mass, and arm length for each moment. Note that the “Empty Glider” moment is a special case, and cannot be deleted. Remember to include the negative sign of the arm length, depending on which side of the datum the moment is on (See "Notes on Datums" below).

Checking the “H2O” box converts moment units to gallons or liters. You can change units or liquid/mass at any time, depending on what is convenient for data entry (fig. 2).

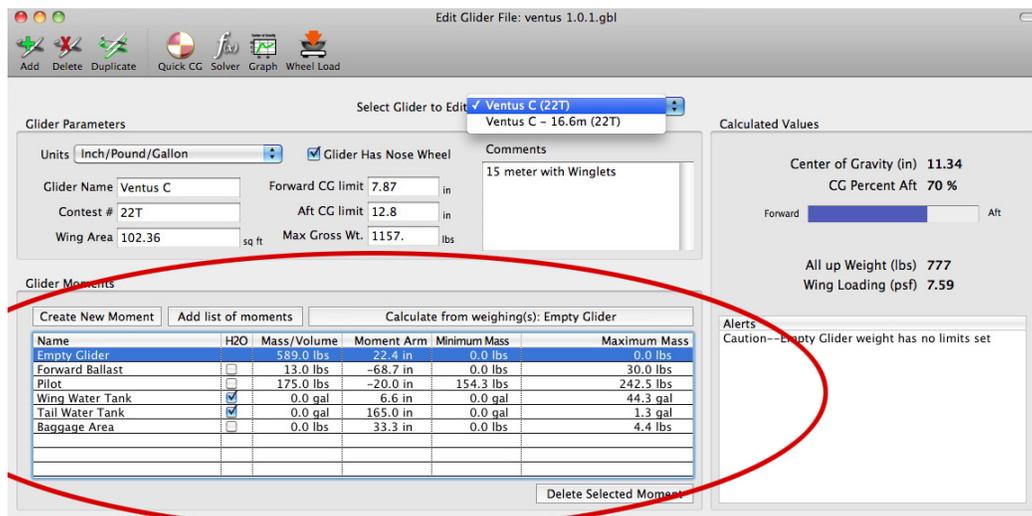


Figure 2

Use the Moment Calculator. To find the CG of the empty glider, click on any cell in the “Empty Glider” row to highlight it. Then click the blue (grey on the Mac) “Calculate from weighing(s): Empty Glider” button above the list. In the Next Screen (Figure 3), enter the moment arms for each wheel, and the weight measured on each wheel (These values are stored for use in other moment calculations and for use in the wheel load calculator, described later). Click “Calculate” and the resulting CG is displayed. Click “Save” to record these values and return to the moment list.

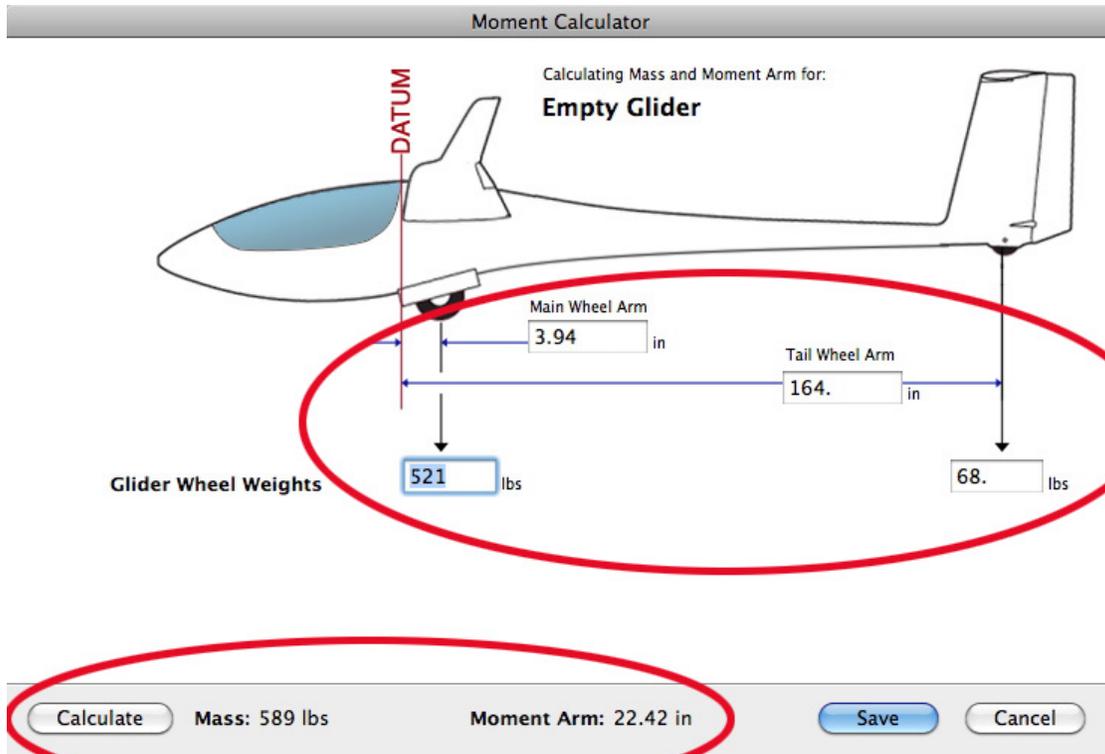


Figure 3

Find the Pilot Moment. If you know the weight on the wheels of the glider with and without the pilot, you can let the program calculate the moment for you. Select the "Pilot" moment from the list. You may first need to create one by clicking on the "Create New Moment" button. Click the blue (grey on Mac) button at the upper right corner of the moment list labeled "Calculate from weighing(s): *name of moment*".

On the Moment Calculator screen, the wheel arms will already be filled in for you from your empty glider calculation. Enter the wheel weights measured with and without the pilot seated in the glider as shown in the picture (fig. 4). If the "Without" weighing is the same as the empty glider weighing, you can click the "Use empty Glider Weights" button to load in those values. Then click "Calculate". The program computes the mass and moment arm of the Pilot, and displays them along the bottom of the window. Click "Save" to record the values to the Moment list and exit the moment calculator. Of course this method works for finding the moment of *any* mass, if you have a pair of weighings with and without that mass.

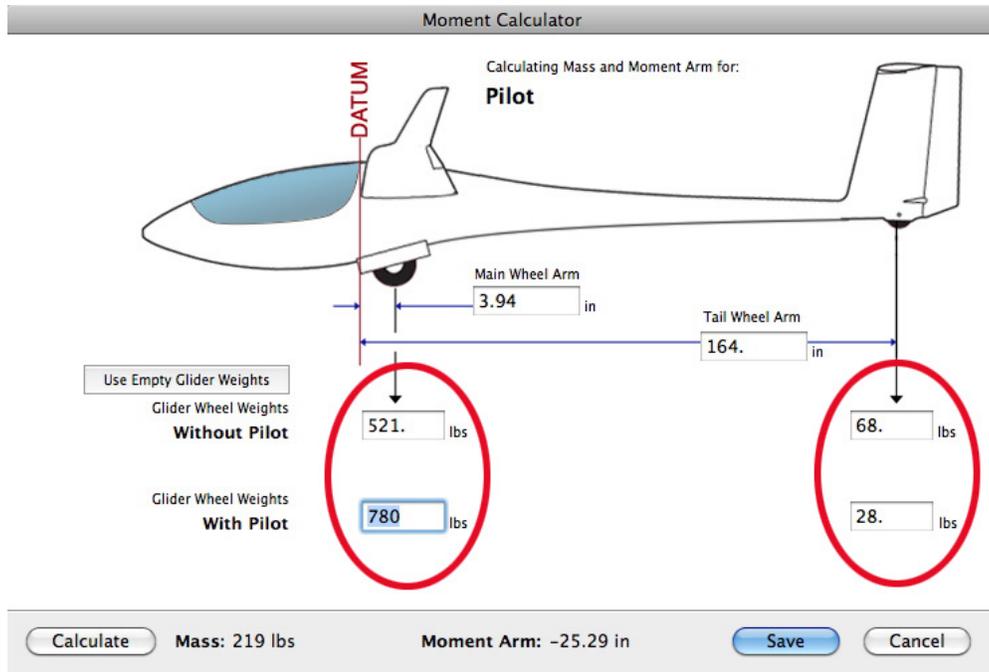


Figure 4

Alerts The alerts window tells you when values go out of range, or have no limits set (fig. 5). Set limits for moments in the moment list by filling in the “Minimum Mass” and “Maximum Mass” values. These limits are used for scaling graphs as well.

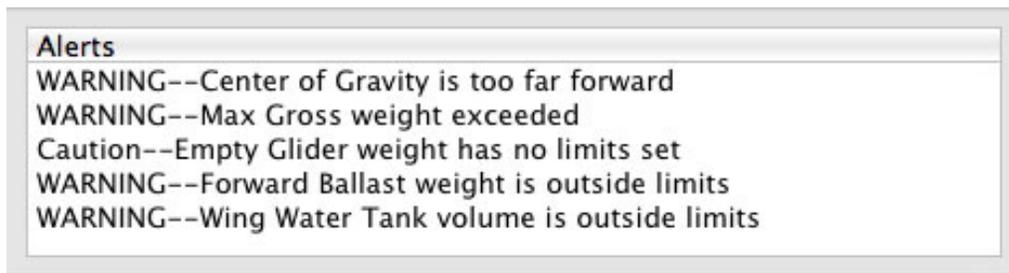


Figure 5

Use the Solver. The solver can be used to determine the value of one parameter, while varying another with a slider. Select "Solver" from the tools menu and follow the steps shown. Select a parameter from the left popup menu (#1) that you would like to vary with the slider (fig. 6). From the right pop up menu (#2), select a mass that will be adjusted to achieve the value chosen slider value. Now move the slider and observe that both values will be adjusted, along with the other parameters like “All up Weight” and “wing Loading” in the results box at the bottom of the window. When you choose a mass from the left popup, and a mass from the right popup, both masses will adjust to keep the CG constant.

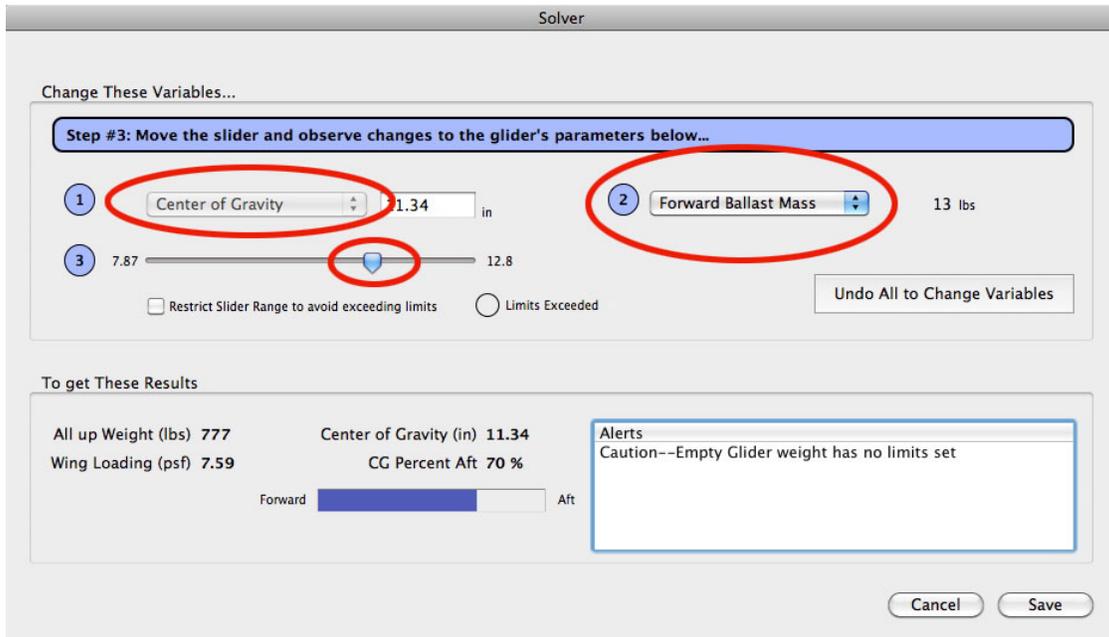


Figure 6

Use Graph. You can graph one parameter against another by clicking the "Graph" tool in the toolbar. Select the X and Y axis from the two popup menus. The relationship will be plotted in the currently selected units. For example, plot CG against Wing water tank to see how your CG will change with the addition of water. The red dot indicates the current values of the glider. You can print the graph here as well (fig. 7).

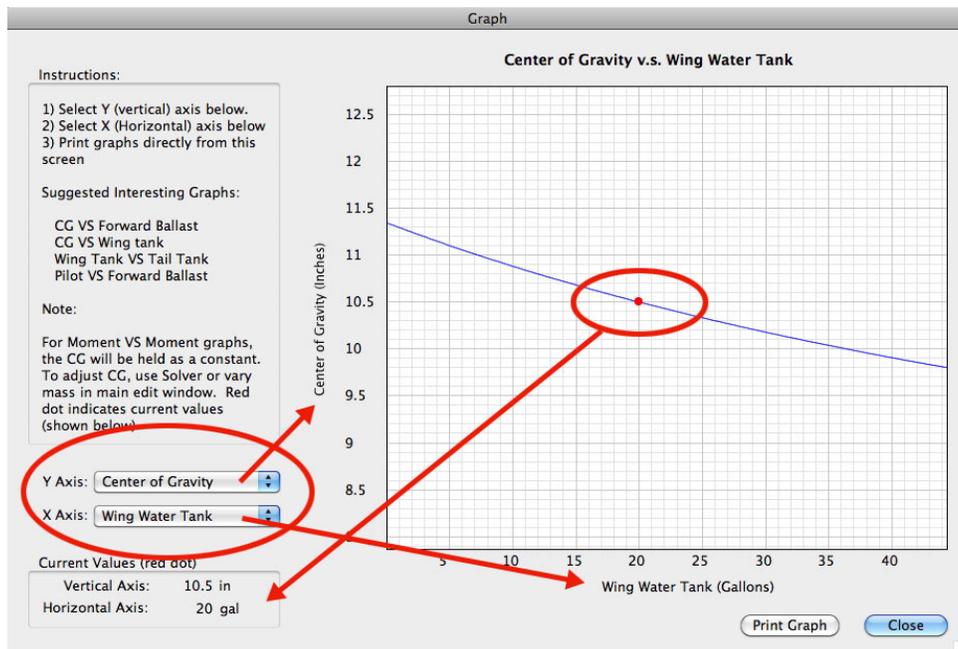


Figure 7
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Use Quick CG. If you just need to find the “as flown” CG from weighing the glider with everything in it, use the “Quick CG” tool from the “Tools” menu. Enter the moment arms of the wheels as shown (they may be pre-populated with the arms from the current glider), then the weights on the wheels. Press Calculate, and the CG, as well as Percent Aft values (if you have entered forward and aft CG limits in the main window) will be calculated.

This tool can be used on it’s own for quick ramp checks, etc, without entering or affecting any other glider information. Figure 8 shows a dual seat glider resting on it’s nose wheel in the Quick CG window. Note the negative value of the nose wheel moment arm.

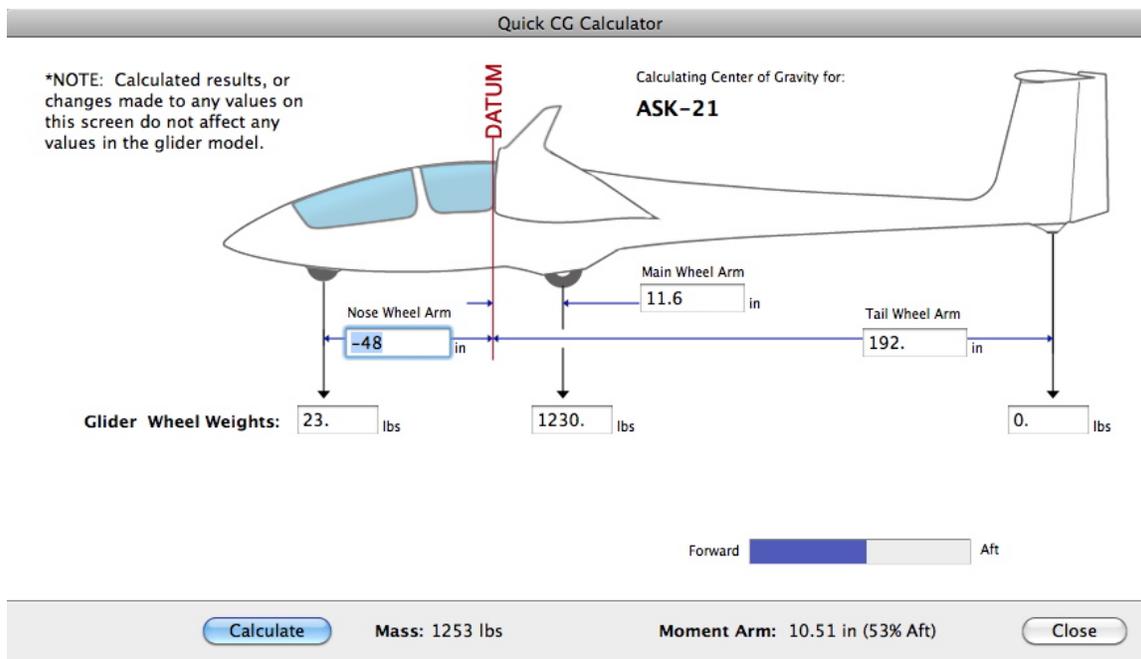


Figure 8

Use Find Wheel Loads. If you want to double check your SeeG model setup against a weighing, or calculate the wheel weights you should see when you fill your main water tank and fin tank to the right weights, open the "Find Wheel Loads" tool from the "Tools" menu. Here you can individually select all the moments you want used in the final calculation (Fig. 9). The weight on each wheel is shown below the glider.

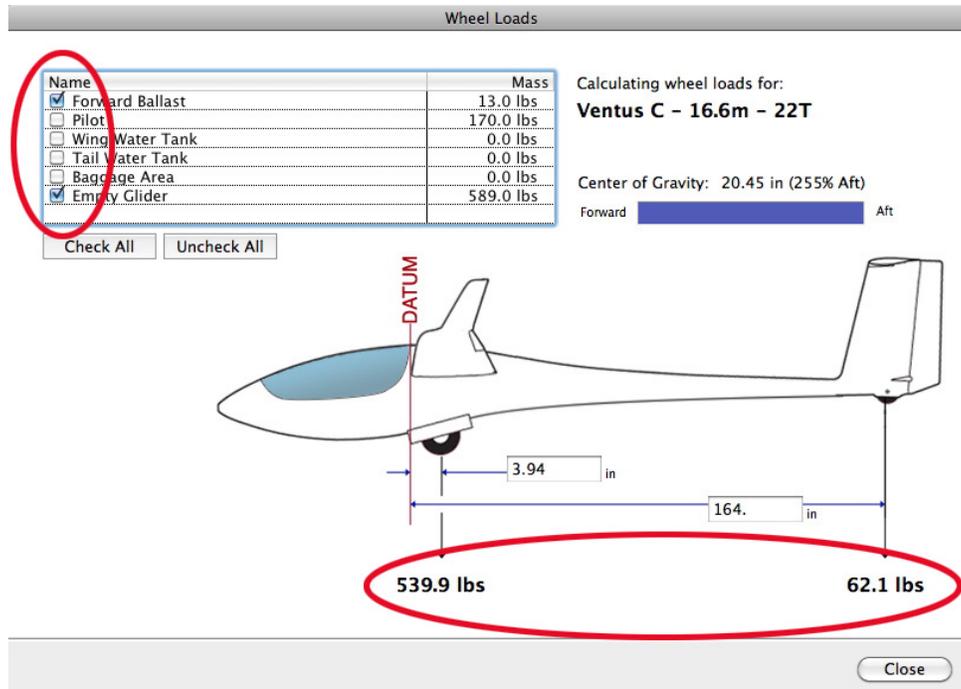


Figure 9

Save your work. Use the “Save’ or “Save As” menus to create a file with your glider(s) for later editing.

Import and Export. You can export a single glider by using the “Export” menu under “File”. This creates a valid SeeG file that can be opened directly, or imported. Only the currently selected glider will be exported. Importing a file results in adding the glider or gliders in the file to those currently in the program. The imported glider(s) are appended to the list.

Notes on Datums. A datum is just an arbitrary point along the fore/aft line of the glider. Most often, the leading edge of the wing is used, but any point will work. There is no need to enter any information about the location of the glider datum into the program. The red DATUM lines in the various screens are meant as a general reference, and not intended to depict the leading edge should be used. Just make sure all Moment arms are measured from the chosen datum to the moment in question.

Datum lengths have a sign. Forward of the datum is usually a negative number and aft of the datum is positive. This sign can be reversed, as long as you are consistent about it’s use on all arm measurements.

For more information visit www.glideplan.com or email support@glideplan.com.