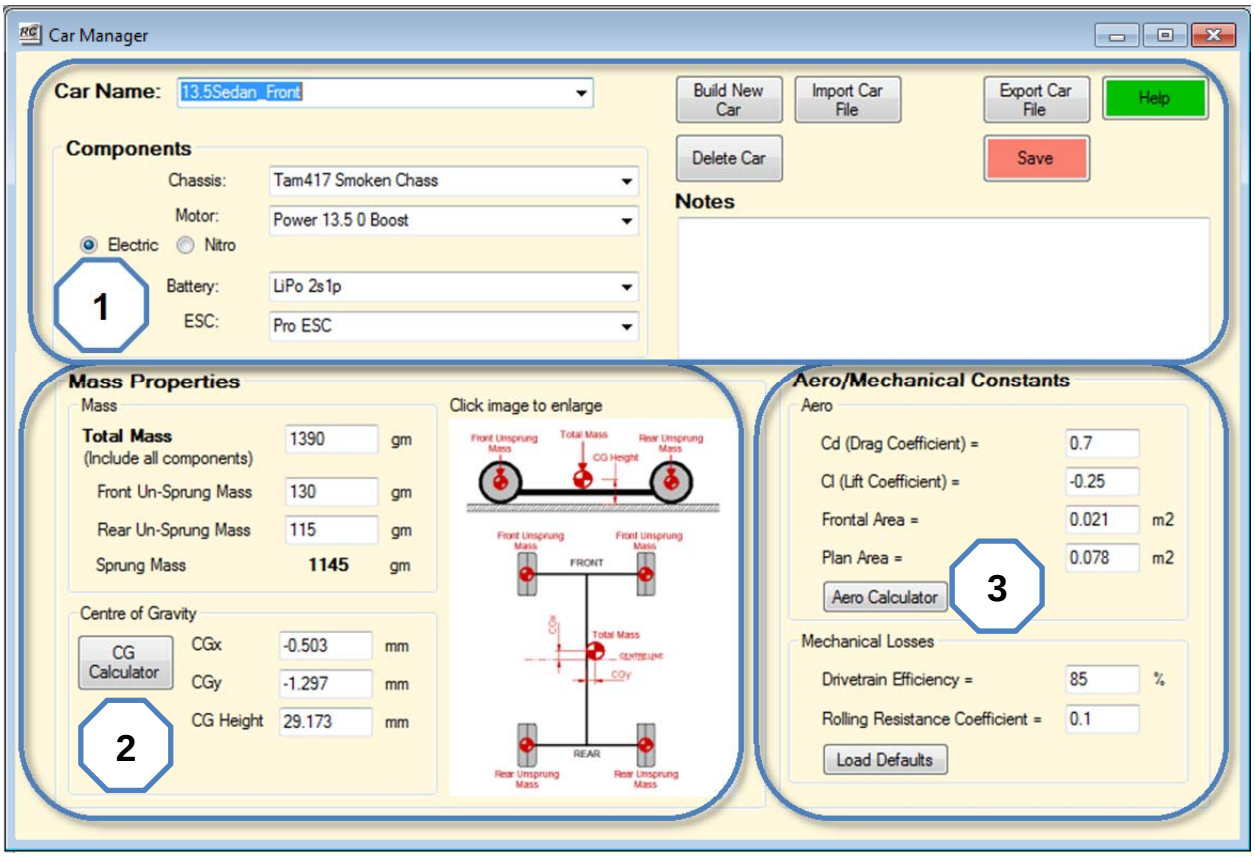
Car Manager User's Manual

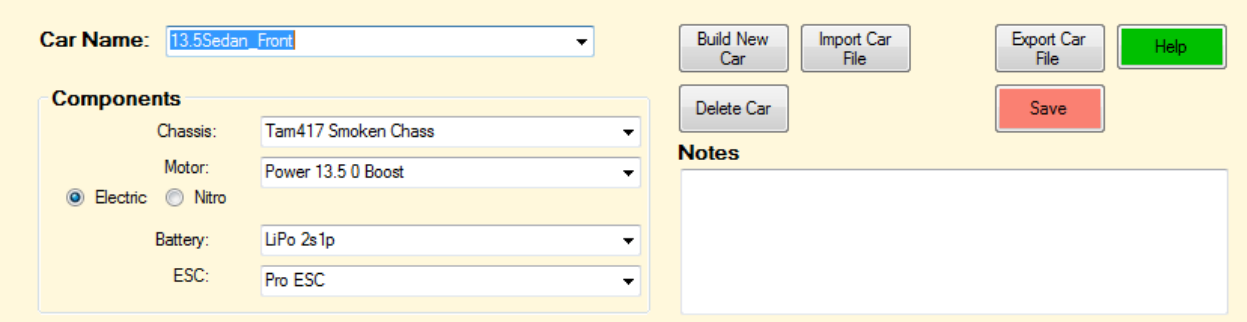
General

The Car Manager allows you to Edit, Add, Save, Delete and Import/Export Car models. The Car model displayed when you open the page corresponds to the current Car on the main page.

Below you will see the Car Form that is displayed when you open the Car Manager. Three main areas are boxed below and will be discussed in more detail in the following sections:



Area 1 – Selection Tabs and File Management



Car Name: On entry the current car model on the Main Page is selected. To edit a different car select one from the drop down box to edit. To change the current car name enter it in the box and click Save.

Components: Select the components from the drop down lists that make up the Car.

For electric vehicles select a Chassis, Motor, Battery and ESC.

For nitro vehicles only a Chassis and Motor are needed.

If the selected chassis for an existing Car is changed, the **Setups** associated with this car will be affected and require updating. It is better to use Build New Car to implement a change in selected Chassis.

Notes: Just like it says enter notes appropriate to the current Car.

Buttons:

Build New Car – Enter a New Car Name in the selection. The Car Name must be unique otherwise you receive an error.

The Car Components, Car Mass, CG values, and Aero/Mechanical Constants displayed will be unchanged from the model that was previously shown. Enter/select new values if required to suit the new car. Click Save when finished editing.

Import Car File – Allows a text file containing all the values for a car, Chassis and associated Setup models to be imported from a single file into the program. Car models can be shared or imported from the files distributed on the website “Model Download” page. Clicking the button will open a file dialog. Navigate to the folder, select the file and click open to import the file. RC Crew Chief Car files will have the extension .rca.

Once the file is imported the imported chassis file will be automatically assigned to the car model. Default models will be assigned for the Motor, Battery and ESC components. These values can be changed as needed. Click the save button if changes are made.

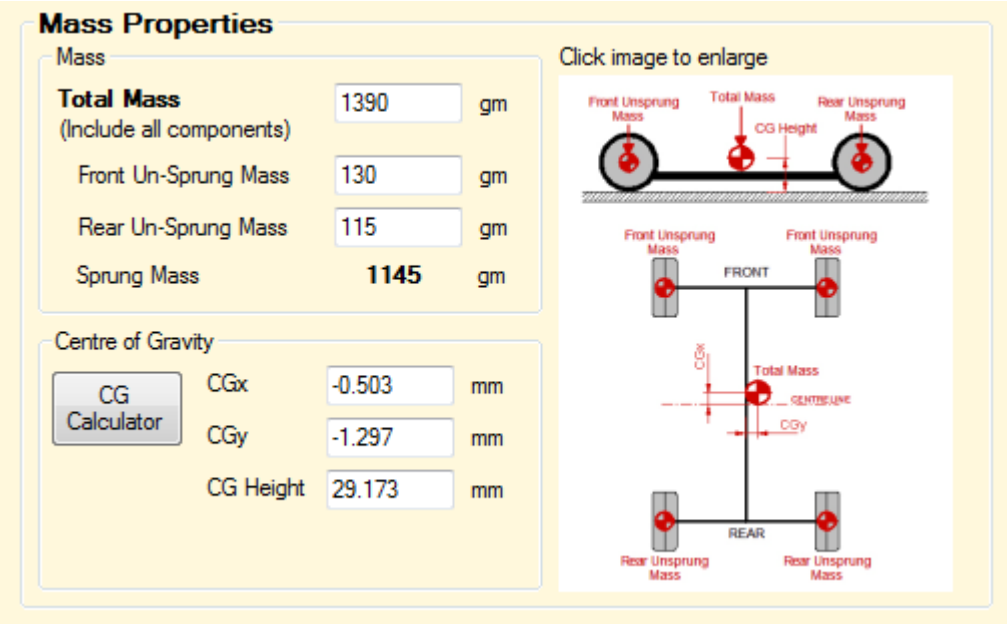
Delete Car – This will delete the currently displayed Model and any associated setup files from the database. A message box will be displayed requiring confirmation to be certain this is the action you intended.

Save – Click to add/update the model to the database. Note it is strongly recommended that you also use the **Export Car File** button to save a text file to a folder outside the program. That way you have a backup of your work. You can also share this file with your friends.

Export Car File – Exports the currently selected Car to a text file. The exported file will contain all the Car values plus the complete Chassis model and all Setups associated with this car.

Help – Guess you found that button.

Area 2 – Mass Properties



The convention used to define the location of the Centre of Gravity (CG) and mass properties is illustrated in the graphic. Click to display to enlarge graphic.

Mass - Enter the **Total Mass** of the car. This value should be measured with the car fully assembled ready to race.

The Un-Sprung mass is defined as components that are attached outboard of the springs (weight not supported by the springs). Sprung Mass is all components that are inboard of the springs (chassis, Motor, electronics etc.).

To determine the **Front Un-Sprung Mass** weigh all components that are connected completely outboard of the springs. Wheels/tires, hubs, axles and axle bearings are all 100% un-sprung mass. Next weigh the components that connect between the wheel and chassis, suspension arms, camber links, tie rods, and the shock/spring itself. Take 50% (1/2 of the value) and add it to the un-sprung mass. Assuming you only weighed components on one side of the car multiply number by 2 and enter it as the **Front Un-Sprung Mass**. Repeat this process for the rear of the car. The program will calculate the Sprung Mass value.

Centre of Gravity - The Centre of Gravity fore/aft position, **CGx**, is relative to the midpoint between the front and rear axles. A positive value means the CG is biased to the front, negative to the rear.

The left/right position, **CGy**, is measured relative to the centreline of the car. A positive number means the CG would be biased to the right side, negative to the left.

The height, **CGheight**, is measured relative to the ground.

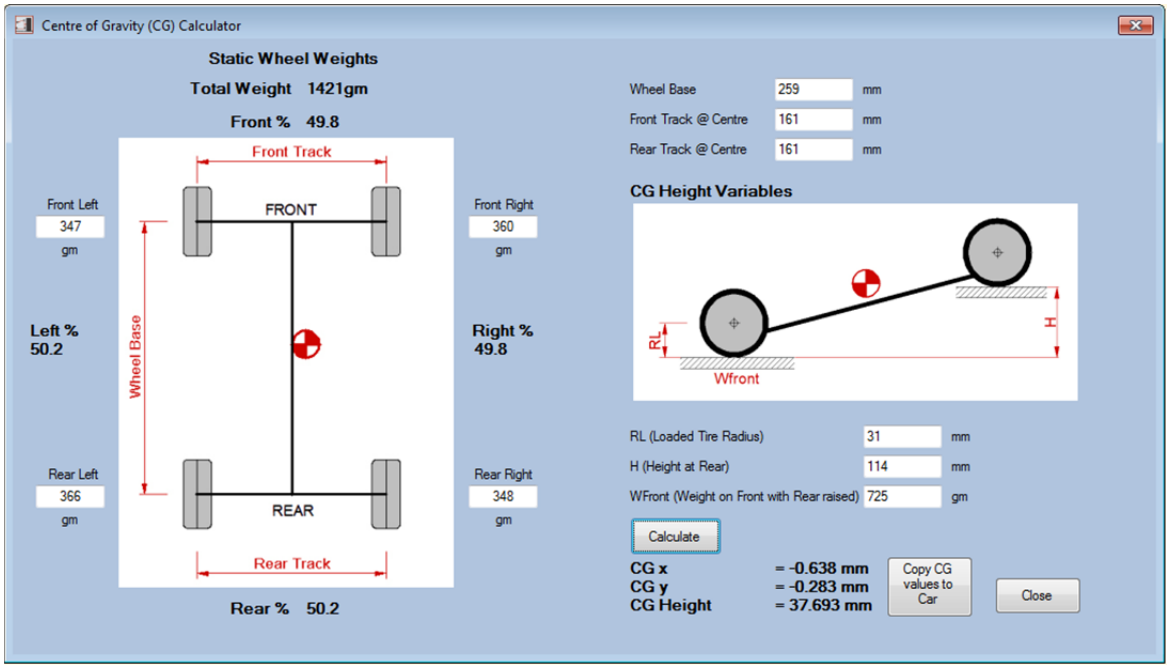
You can enter an assumed value for the CG or if you have 4 wheel scales you can use the CG calculator to measure and calculate it.

CG Calculator

In order to calculate the suspension properties and complete the Handling simulation the location of the CG is required. The weight on each wheel is required for the calculations, 4 wheel scales is the easiest way to achieve this.

Place the scales on a level surface and enter the wheel weights into the calculator. This will establish the fore/aft, left/right CG position. Note that it is important that the values entered are oriented to match the positions defined in the graphic.

To determine the CG height the rear of the car is raised a known distance. The higher the rear is raised the more accurate the result will be. A height of 4”-5” seems to work well for 1/10 scale sedans. When the rear is raised the car will want to roll off the scales so you need to lock the drivetrain. The easiest way to do this is to insert a piece of paper between the pinion and spur. Remember to remove it when you are done.



Three values are required to calculate the CG height:

RL (loaded Tire Radius) – This is the distance from the centre of the wheel axle to the ground. The default value provided is the half the tire diameter for the current car. Since the tire will distort slightly the loaded tire radius will be slightly less than this value.

H (height at Rear) – The height the rear is raised above the front.

WFront - With the rear raised enter the total weight on the front wheel (sum of left and right wheels).

Click the **Calculate** button.

To update the CG position for the current car click the **Copy CG Values to Car** button. This will also update the **Total Mass**.

Area 3 – Aero/Mechanical Constants

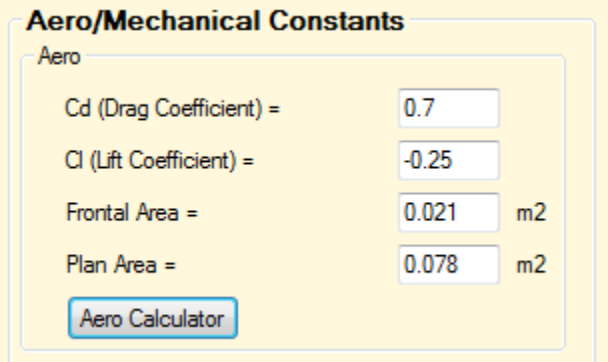
Aero – To utilize the Acceleration Simulation you need to enter values for the lift and drag forces on the car. The required values are

Cd (drag coefficient) = The aerodynamic drag coefficient for the body shape

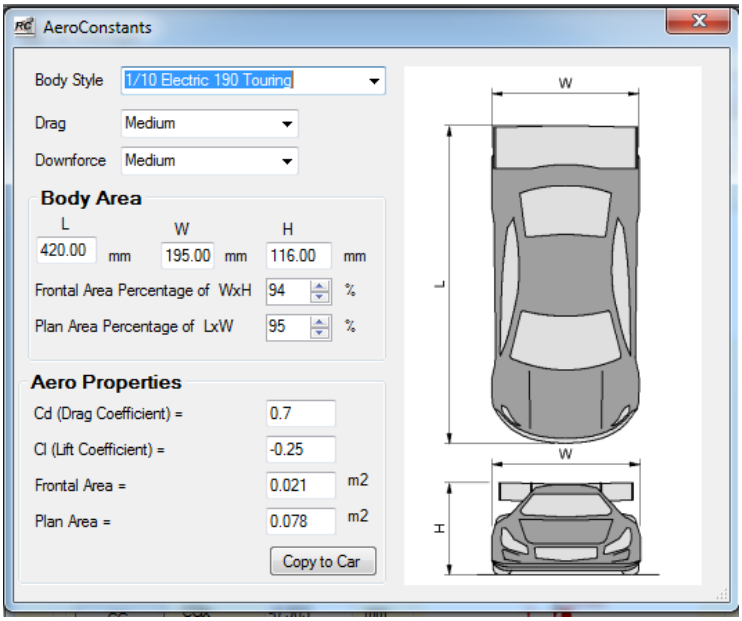
Cl (Lift/Downforce coefficient) – The aerodynamic lift coefficient for the body shape. +ve values create lift, –ve values create downforce.

Frontal Area = The profile of the front of the vehicle projected onto a vertical plane. Used in drag calculations

Plan Area = The profile of the vehicle in plan projected onto a horizontal plane. Used in lift/downforce calculations.



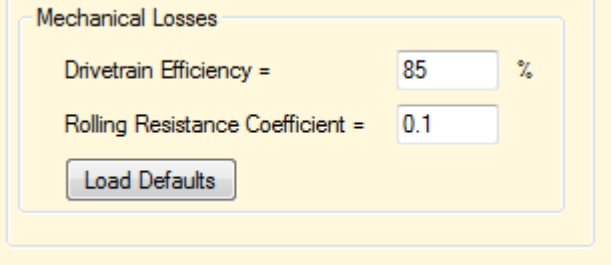
If you are unsure of the aero values to entere click the Aero Calculator button for some guidance.



Aero Calculator – A list of typical RC body styles, and suggested aero properties is provided to choose from or you can create your own. To use one of the provided aero models just select a Body Style from the list and click the **Copy to Car** button to apply it to the current car.

If you would like to create your own model you can use the **Body Area** area calculator section to estimate the plan and Frontal areas and then enter the Cd and Cl values you wish to use.

Mechanical Losses – The mechanical losses are also only used in the acceleration simulation.



Drivetrain Efficiency – Percentage of motor torque that is transmitted through the drivetrain to the rear wheels.

Rolling Resistance Coefficient – Coefficient appled to the total vertical tire load (vehicle weight plus downforce) to establish the Tire Rolling Resistance Force that resists forward motion.

Click **Load Defaults** to reset to the recommended values shown.