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Schmidt Digital Solutions



RACE CONTROL SYSTEM 64

Scalextric Sport Digital Race Management System Manual
Version 3.0.0.9

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Introduction and Features

Race Control System 64 is a computer software Race Management System (RMS) that has been designed to enhance the functionality of the Scalextric (C7042) Digital Advanced 6 Car Powerbase (APB). The program has been developed by two serious and experienced Slot Car Racers who are also real life race fans.

Martin Schmidt, who lives in Denmark, is the programmer. Marcel Minnaard, who goes by the name of Minardi in Slotforum, is from the Netherlands, and is the driving force behind the project.

RCS64 and LabVIEW

RCS64 has been developed using LabVIEW. LabVIEW (short for Laboratory Virtual Instrumentation Engineering Workbench) is a system design platform and development environment made by National Instruments. LabVIEW is commonly used for data acquisition, instrument control, and industrial automation.

LabVIEW is a very expensive tool originally made for testing electronic parts, but it has become commonly used for testing almost everything. There are a lot of visual tools in LabVIEW to calculate and visualize results obtained.

LabVIEW is designed to communicate with all types of equipment (It actually only took a day to make the driver for the C7042). There are a lot of exciting routines that are well tested, which leads to high levels of spageility. The potential for further development using this software is vast. The RCS64 team is committed to investigating and implementing it to its full potential. The journey has only just begun!

What You Need to Use RCS64

To run RCS64 you will need a Windows PC. So far it has been tested on Windows XP and Windows 7

You will also need a cable between the powerbase and your PC - these cables are specially made for this exact purpose.

 *You can also use this cable to update the APB's firmware. To do this go to <http://ssdc.jackaments.com/firmware.shtml>.*

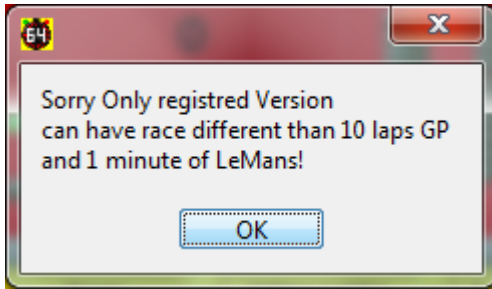
To obtain a cable contact RichG

- email - richg@girling.net or,
- PM (private message) via SlotForum - <http://www.slotforum.com/> .

Registering your Free Version

At the present time there is only one version of RCS64, which is the free version. The free version has all the basic features, plus some more advanced ones. In the future there will also be a version which will require payment for its use and will have even more features.

The 'unregistered free version', which is available for download from the RCS64 website, is limited to 10 laps for Grand Prix races and 1 minute for Endurance races.



To make full use of the 'free version' you can obtain a registration key from Marcel.

To request a registration key contact Marcel via -

- PM (private message) at SlotForum - <http://www.slotforum.com/> or,
- email at rsc64rms@gmail.com

If you have any questions about registering, or you would like to report software related issues, please do not hesitate to contact the RCS64 team using the contact methods above.

See our website: www.rcs64.com for latest news, versions and software updates

Features in current version

The following features are available in this version of RCS64:-

- 'Stop&Go' penalties
- Fuel load simulation
- Individual car settings for fuel load simulation
- APM: Advanced Pitstop Menu ©
- Qualifying events
- Grand Prix Races
- Endurance Races
- Throttle calibration

- Edipagele throttle profiles
- ID cars from PC
- Dedicated dashboards with lap difference boxes
- Automatic and Manual Track Call
- Dynamic braking
- Car damage
- Multichannel sound options

Coming Soon to RCS64

At the present time the RCS64 are working on developing a 'Tyre Wear' function and then will move on to developing 'Pace Cars'.

The RCS64 team also have a myriad of other ideas for future development, here is a list of just some of them:

- Pit lane detection (Pit-Pro)
- Driver Disqualification
- Analog mode
- Rally mode
- Start lights
- Individual driver consoles
- And a lot more cool stuff you never thought was possible.

The RCS64 team hope you enjoy using RCS64. We are having fun developing the program and we hope you have fun using it.

Happy Racing☺

Start Up – Getting Connected

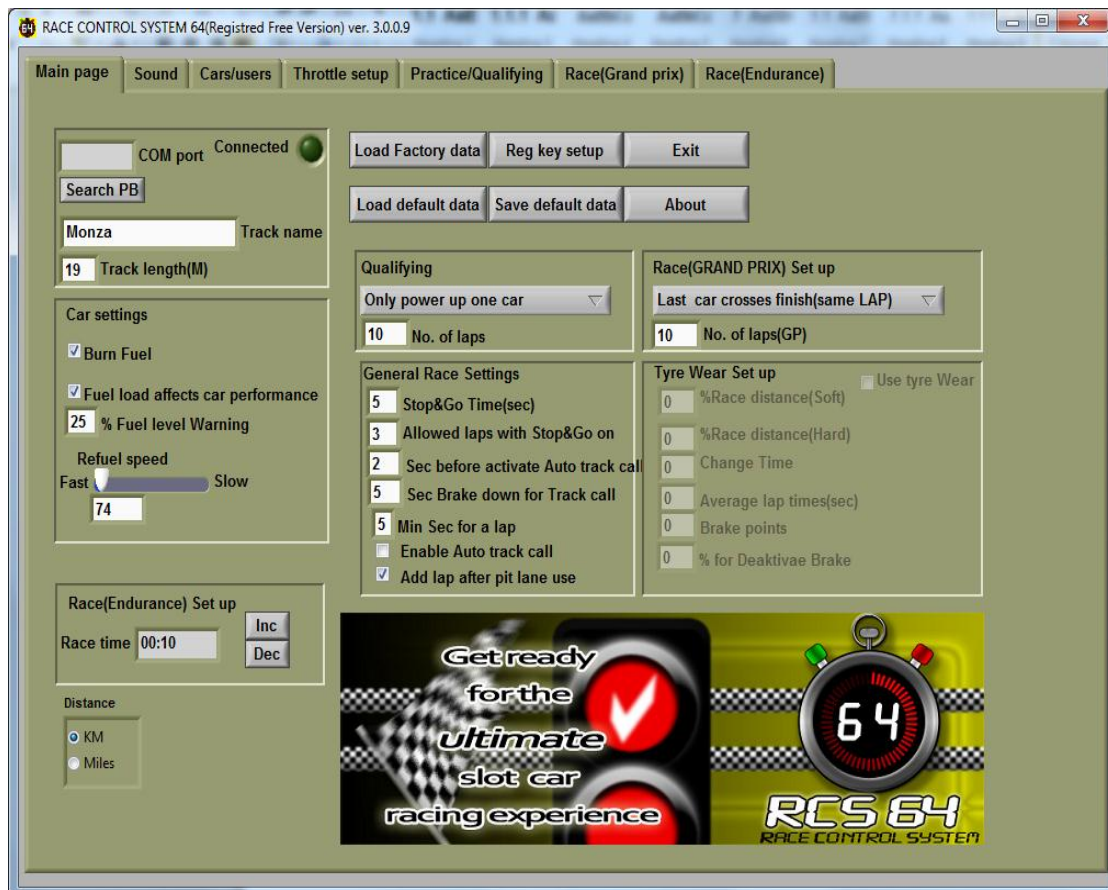
To download RCS64 go to the download page on the rcs64.com website. Or go directly to the Download page <http://schmidt-thomsen.dk/rcs64/> . Browse for the latest version and then download, following the instructions that appear on screen. The download time is longer than one would expect due to the fact that LabVIEW uses a lot of its own drivers.

The download page is also where you can download updated versions. To find out when new versions are available, either visit the website or follow developments on SlotForum.

To start using RCS64, first make sure that the cable that connects the powerbase to the PC is connected properly – and then switch on the powerbase. Then open up the RCS64 race software.

Main Page

This is the opening screen of RCS64.

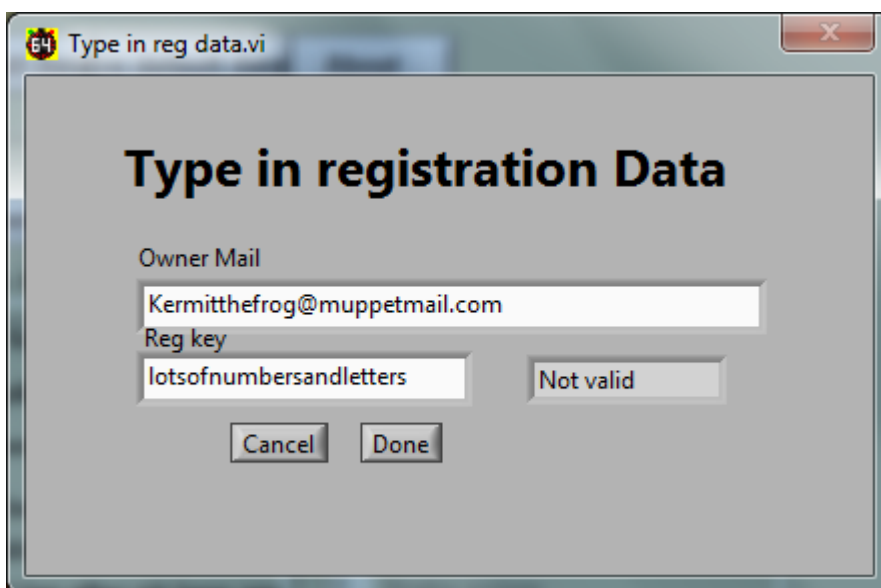


On opening RCS64 if the PC and powerbase 'see' each other the **Connected** LED will come on, a COM port will be identified and an introductory voice will be heard. If you do not become connected within a few minutes, click the **Search PB** button. If you are still not connected, see the troubleshooting section at the end of this manual.

You are now ready to start racing. At this point you can go directly to Practice/Qualifying or the Race pages and start racing using the RCS64 default settings. It is recommended that for your first races you use the default settings. However, you may wish to change some of the settings, such as drivers and cars, prior to your first race. Or, if you have registered for RCS64 and have received a registration key (available by contacting Marcel) you may wish to complete the registration process for your software first.

Registration

To complete the registration process first click on the **Reg key setup** button. Type in the email address that you used for registering and enter the registration key which you received in the **Reg key** text box and click the **Done** button. If the data is entered correctly 'Not valid' will change to 'NonFree(Paid version)' and the heading on the page will change from unregistered to registered. The software registration process is now complete.



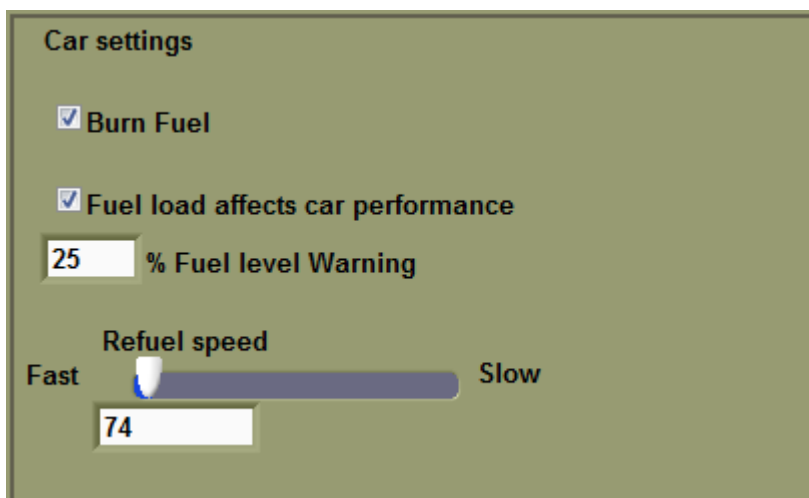
The 10 lap limit and 1 minute time limit, which applies to the free version, will no longer apply. You can now start racing using all of the features of the program.

Track Name and Length

You can change the track name and track length in the **Track name** and **Track length(M)** text boxes. The track length will, for now, be used for calculation of travelled distance and average speed.

Car Settings - Fuel

If you want your car to burn fuel, based on throttle input, check **Burn Fuel** box. You will then be required to refuel during a race or practice session.



Check **Fuel load affects car performance** box if you want your car to be heavier with maximum fuel load and become lighter during the race as fuel is used (fuel load simulation). Available power will be less with maximum fuel load and will increase as fuel is used. These settings can be changed in the **Power Control** section of the individual cars setting window.

Beginners and Children may find refueling difficult at first. Racing without having to refuel is probably the best choice to start off with. After they can cope with keeping the car on the track, then move on to burning fuel and then finally on to the more advanced Fuel load simulation option. Fuel load simulation has an 'ever changing power value' for controller throttle positions, which makes the controller harder to use.

You can refuel during a race, practice or qualification, by pressing the LC and Brake buttons on your controller at the same time for 2 seconds. RCS64 will then open the APM (Advanced Pitstop Menu) which will enable you to refuel along with a range of other actions. How to use the APM is covered in detail later in this manual.

 *Individual cars fuel tank size can be changed by clicking the **Cars/users page** then the **Set up cars** button.*

RMS64 will warn you when you are getting low on fuel. You can change the audible warning for low fuel level to your own desired setting by inputting a number in the **% Fuel level warning** text box - 25% would mean that you only have a quarter of a tank of fuel remaining. At your chosen fuel level you will be called to the pits – you do not have to go immediately to the pits but you do risk running out of fuel if you leave the pit stop too long.

In the current version, if you run out of fuel, laps will cease to be counted and your car will start to run at Safe Speed. Safe Speed will allow you to reach the pits to re-fuel again.

📄 *Safe Speed can be set for each individual car via the **set up cars** button in the **Cars/users** page.*

The **Refuel Speed** slider sets the speed that **all** of the cars' fuel tanks will be refueled at, during a pit stop. A combination of Refuel Speed and Fuel Tank Size determine the length of time a fuel tank will take to fill.

Example 1: A fuel tank size of 600 and a refuel Speed of 10 will fill the tank in 6secs.

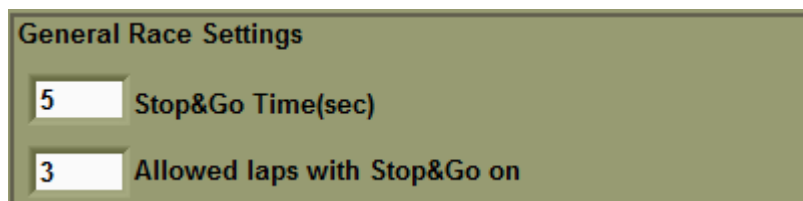
Example 2: A fuel tank size of 600 but a refuel speed of 25 will fill the tank in 15sec.

A chart (Fig.1) showing the effects of changing Tank Size and Refuel Speed is in the Race Management section of this manual.

General Race Settings

'Stop&Go'

RCS64 is proud to present '**Stop&Go**'!



'Stop&Go' is a penalty system where penalties can be given for rule infringements such as dangerous driving etc. To issue a 'Stop&Go' the race official simply enters the drivers controller/ID number into RMS64 by using the computer's keyboard. The driver must enter the pits within a set number of laps and stay stationary for a set time.

When a 'Stop&Go' is issued the green LED in the driver's dashboard will turn red. If you do not do the 'Stop&Go' within the set number of laps, all further laps will not be counted. After driving into the pits and stopping, press the LC and BRK buttons on your controller at the same time. A timer will countdown the number of seconds that have been set for the 'Stop&Go'. Power will resume to your car when the timer reaches zero. RCS64 will not allow you to refuel until the 'Stop&Go' has been completed.

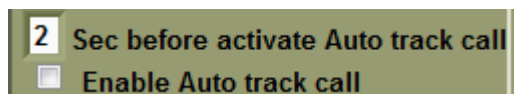
The length of time a car must remain stationary in the pits, in seconds, can be set by entering a time in the **Stop&Go Time(sec)** text box.

You also need to set an amount of laps within which the 'Stop&Go' has to be made – this can be done via the **Allowed laps with Stop&Go on** text box.

Auto Track Call

RCS64 can pause a race via its Automatic Track Call function. All power to the cars will be cut, and the race paused, if no throttle input is received from a connected controller for a set number of seconds i.e. if a car de-slots. Auto track call is only available in Grand Prix and Endurance race modes.

If you want to use this function, check **Enable Auto track call**. By entering a time in seconds in the **Sec before activate auto track call** text box, you can initiate a short delay before power is cut to all cars. You will notice that the brake is applied when an auto track call occurs. This is to prevent cars coasting too far. However, some cars just take a little more time to come to a complete stop.



To resume racing after a track call press either the space bar on the keyboard or the start button on the powerbase.

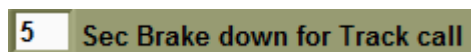
You will notice that there is a small delay after resuming the race before cars receive power again. This is to give the person who pushes the button time to focus on their car before racing recommences.

Refueling and any 'Stop&Go' in process, when the Track Call occurs, will be paused until the race is re-started.

Manual Track Call

If **'Auto Track Call'** is **not** checked, you can still pause the race by pressing the space bar or the start button on the powerbase.

You can also manually initiate a track call by holding down the brake button. The length of time (sec) you need to hold down the brake button, before a track call is started, can be changed by entering a value in the text box.



To restart the race press either the start button on the APB, or the space bar on your keyboard. Manual Track call is only available in Grand Prix and Endurance race modes.

If you do not use the brake button for braking you can set this number to as low a value as 2 sec. This will enable you to make a track call as soon as it is required. However, to stop track calls being made accidentally by drivers pressing the brake button instead of the lane change button, this value should be set higher.

Minimum Possible Lap Time


You can stop the possibility of unrealistically fast lap times being recorded by entering a time, in seconds, in the **Min Sec for a lap** text box.

5 Min Sec for a lap

This can happen when a car de-slots past the start/finish sensors but is re-slotted in front of the start/finish sensors. Choose a time that it is **not** possible for a car to do on your track. For example, if the fastest time ever recorded is 5.75 seconds, set the minimum possible lap time to 5 seconds or less.

Parallel Pit Lane

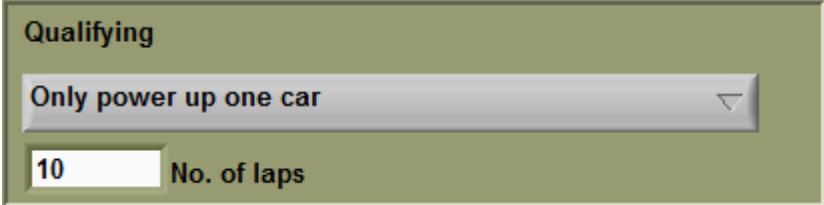
Check the **Add lap after pit lane use** box if you have a pit set up where the pit lane is parallel to the powerbase (pit entry is before the powerbase sensors and pit exit is after the powerbase sensors – lap counting is missed on pit use). If checked, a lap will be added after each pit lane use.

 *Be careful not to have this function checked if it is not needed or laps will be incorrectly recorded.*

Qualifying

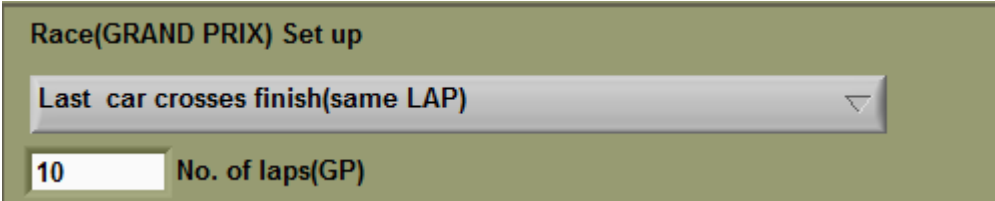
Qualifying in RCS64 can be organized in two different ways - both methods are lap limited.

Select the **All cars powered** box if you want all cars to do Qualifying at the same time. Alternatively, each car can run their qualifying laps without other cars being on the track by selecting the **Only power up one car** box.



Grand Prix Race

First enter the number of laps to be raced and then enter how the race should end.



The following race end options are available:

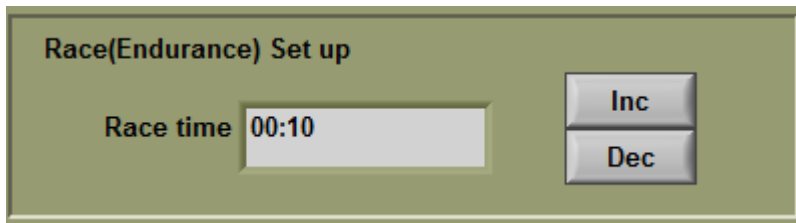
End when **First car crosses finish line**. Only the winning car completes all laps. Results for positions 2 to 6 may not be accurate. Good choice if you only want to know who won the race.

End when **last car crosses finish**. All cars finish allotted laps. When cars finish their race they will have to be removed from the track to stop causing other drivers problems. Set safe speed to enable cars to continue after the finish until they can be removed ('Safe Speed' set via Cars/users page and set up cars button).

End when **Last car crosses finish (same lap)** After winner crosses finish line, all other cars will finish when they cross the finish line next. All cars will not necessarily finish their allotted number of laps. Gives a fair and accurate result and avoids confusion at end of race. Set safe speed to enable cars to continue until they are clear of the finish area or can be removed ('Safe Speed' set via Cars/users page and Set up cars button).

Endurance

Using the increase and decrease buttons, enter the length of time that the race should last (Hrs:mins) in the **Race time** text box. Clock will countdown to zero during the race.



Race(Endurance) Set up

Race time 00:10

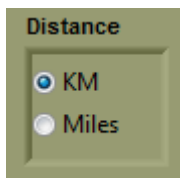
Inc

Dec

The race will end when the set time has elapsed. The winner is the car who has done the most laps. Positions for 2nd - 6th are based on the number of completed laps. If there is a tie on laps then the car who crossed the finish line first, on the last lap completed, will be placed before other tied cars.

Distance Units

Select the unit of distance that you prefer. If KM is selected data in the results HTML screen, such as average speed, will be given in metric units.



Distance

KM

Miles

Tyre Wear Set Up

Tyre wear is inoperative at the present time but will be available in the near future.

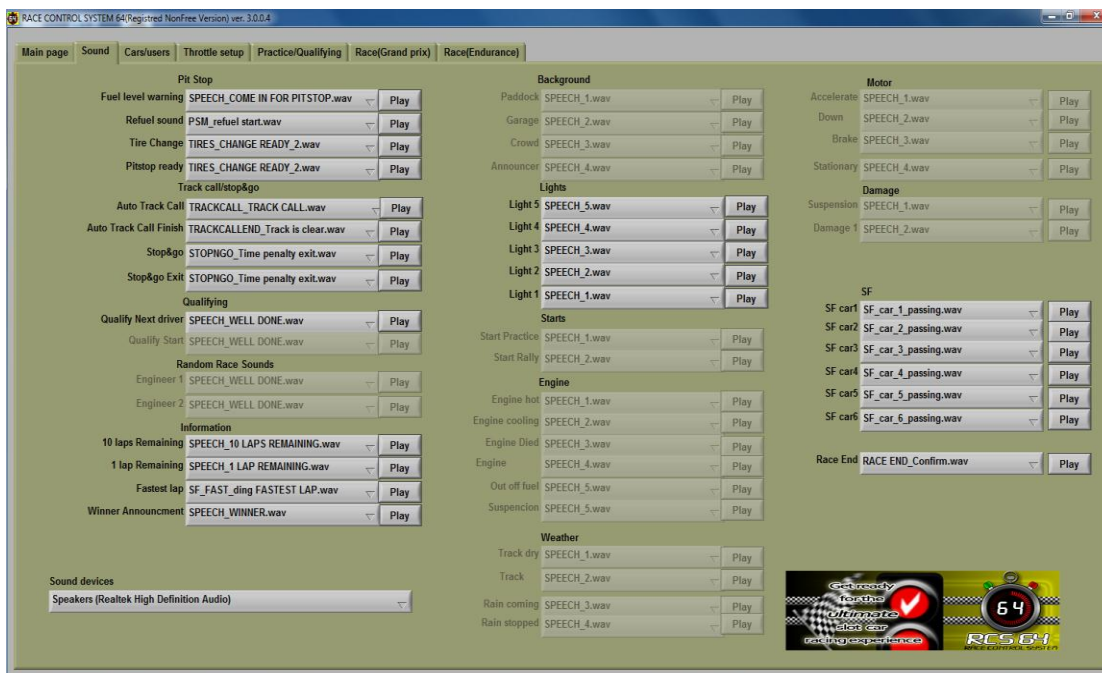
Tyre Wear Set up		<input type="checkbox"/> Use tyre Wear
<input type="text" value="0"/>	%Race distance(Soft)	
<input type="text" value="0"/>	%Race distance(Hard)	
<input type="text" value="0"/>	Change Time	
<input type="text" value="0"/>	Average lap times(sec)	
<input type="text" value="0"/>	Brake points	

Data Buttons

If for some reason you need to reload factory or default data you can do so by clicking on the **Load factory data** or the **Load default data** button. If you wish to save default data you can do so by clicking on the **Save default data** button.

Sound Page

Many more 'sound events' for RCS64 will be added in the future. The available options are highlighted in the drop down boxes - in some cases you will find a choice of samples for a particular event.

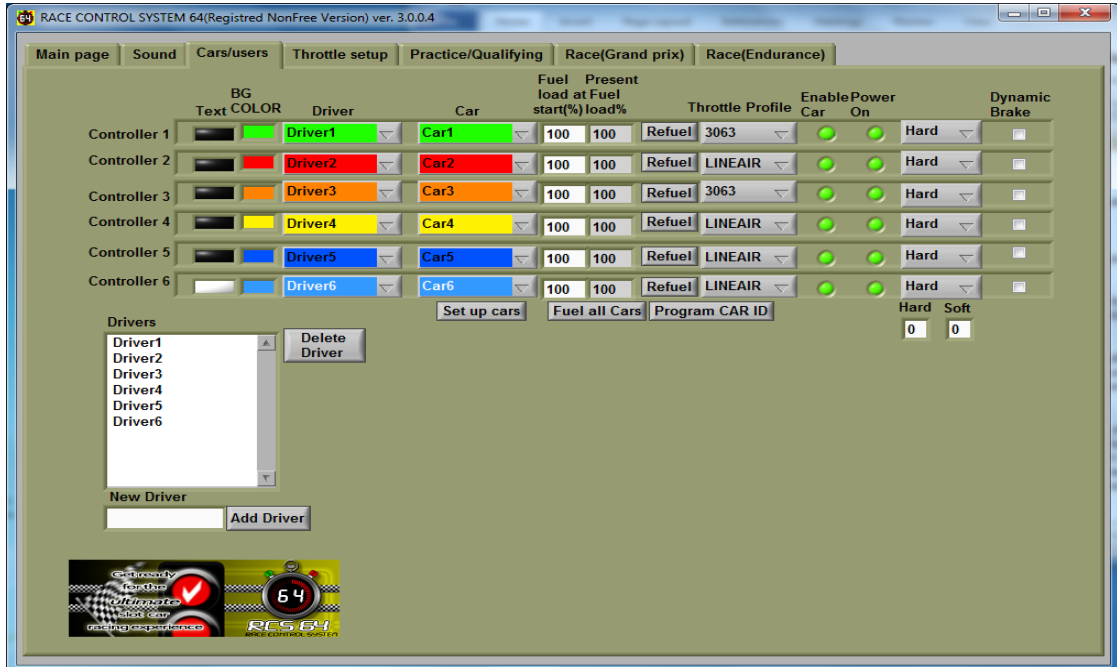


It is not necessary to explain all the options here as they are fairly self-explanatory.

However, you may like to try out some of the following fun features: Individual car sounds for passing start/finish; car passing sounds or short beeps; separate sounds for every start light that comes on; and Fastest Lap sounds!

Cars/Users Page

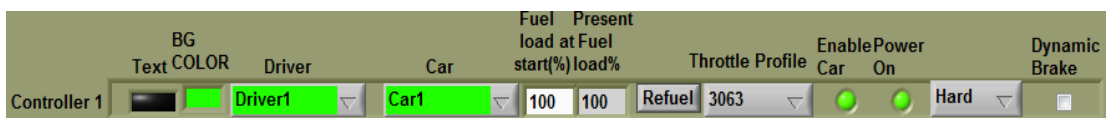
The Cars/Users Page is used to choose, drivers, cars and car set up.



Setting up Controller with Driver and Car

The top section of the page is where you can set up the driver and car settings for each controller.

The top row (see screenshot below) shows the set up for Controller 1 – the controller that is connected to port 1 on the powerbase also referred to as ID1.



RCS64 makes extensive use of colours. Clicking on the colored boxes allows you to choose your text and background color. These colors will be used to help you easily identify your race information on the screen during races.

The next columns are where you make your driver and car selection for each controller. RCS64, by default, adds Driver1 and Car1, but you can easily change them to the driver and car of your choice by using the dropdown menus. How you add drivers and cars to the dropdown menus is explained later in the manual.

The next 2 columns represent your fuel load. Choose the amount of fuel that you would like to start qualifying or a race with, by entering an amount in the **Fuel load at Start (%)** text box. Choosing less fuel will mean that you have to pit earlier but, if you are racing with Fuel Load Simulation on, then you will also be faster at the start of the race than you would be with a full tank. Also, the pits may be less crowded when you want to pit.

The next column, **Present Fuel load%**, shows a percentage value which indicates how much fuel is actually in your tank. You will see that after a race or qualifying the fuel level that is left is shown – if you are using Fuel Load Simulation and you have 30% left at the end of a race you may want to start the next race with less fuel to gain an advantage. You can, of course, choose to start a race with the amount of fuel that is left or use the **Refuel** button to refuel. By clicking the **Fuel all cars** button you can quickly and easily fill all of the fuel tanks, of all of the cars.

The **Throttle profile** column enables you to choose the throttle profile you want to start qualifying or races with. RCS64 has some interesting default profiles which are explained in the **Throttle Setup** section later in this manual. Linear is the standard profile used when the powerbase is not connected to a Race Management System.

Next to the **Throttle profile** column are 2 LED's. RCS64 automatically detects which controllers are connected and lights up the LED in the second column.

The 1st LED lights up if a controller is enabled. It is important to either ENABLE or DISABLE each car. Cars that are ENABLED but that are not used in a race can cause auto track calls to be initiated.

The next column, which is inoperative at the present time, will be used in the future for choosing a cars' tyres.

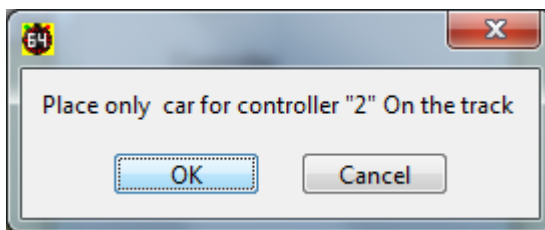
The final column **Dynamic Brake** allows you to select Dynamic Braking for each car. When the controller trigger is released, with the **Dynamic brake** box checked, brakes will automatically be applied – this is the standard setting for the APB without an RMS connected.

Programming Cars

With the **Program Cars** button you can ID cars directly from your PC. Click on the button and the following screen will appear. Choose the controller you want to program and click **Done**.



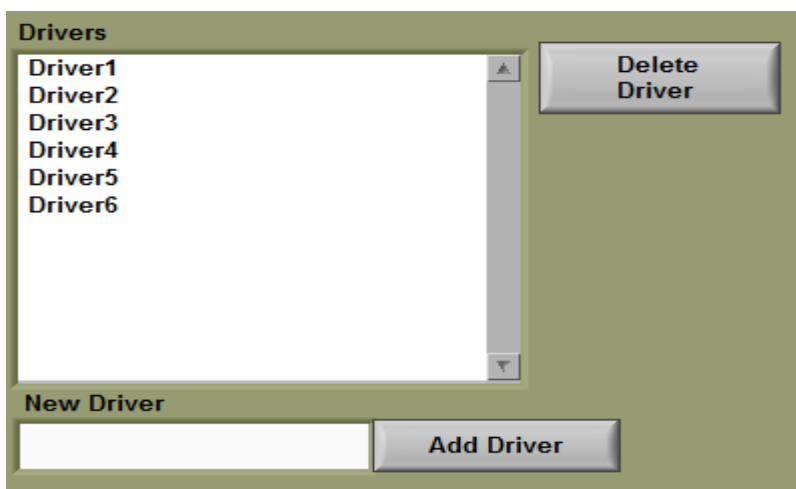
RCS64 reminds you to only have the car you want to program, to the chosen controller, on the track.



Click **OK** and the car is programmed to that controller.

Adding Drivers to List

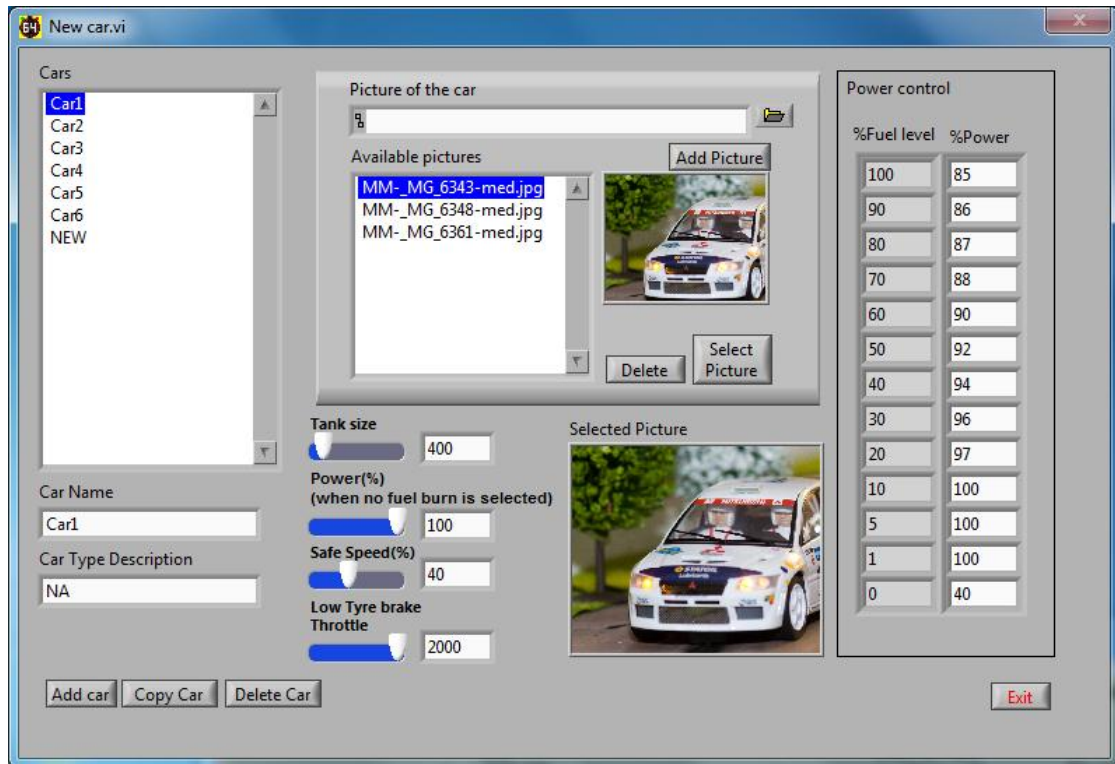
Enter a name in the **New driver** text box and then click the **Add Driver** button - the name of the new driver will be added to the drivers list above.



The newly added driver's name will now also appear in the controller **Driver** drop-down lists.

Individual Car Set Up Dialog Box

To set up cars click on the **Set up cars** button. The following dialog box will appear.



Here you can copy, add, delete or edit cars, and even add a picture from your hard drive or USB.

Cars List

To add a car to the **Cars** list click on **Add car** and change the text from NEW to the name you would like to call the car.

To copy a cars set up highlight the car you want to copy in the list and click **Copy Car**.

To delete a car highlight the car from the list that you want to delete and click **Delete Car**.

Add Picture of Car

Browse your computer for the picture that you wish to add to the available pictures list. Click **Add Picture** and the picture will appear in the list of available pictures. Highlight the picture you wish to use for the car and click **Select Picture** – the picture will appear in the **Selected Picture** box.

Individual Car Fuel Tank Size

Set the volume of the tank by using the slider. Fuel Tank Size is a major factor in the length of time between refuelling stops. However, it is not the only factor – each car will burn fuel at a different rate. Cars with a higher Burn Rate will need to refuel more often. A fuller discussion on the effects of Fuel Tank Size

and Burn Rate is given in the chapter on Pit Stop Management later in this manual.

Individual Car Power%

Limits the Maximum power level available for the car (overrides throttle profile settings). Only available when you DO NOT have **Fuel load affects car performance** (fuel load simulation) on the main page checked.

This is a good way to limit the speed of cars for novices and beginners who are not ready yet to use Fuel Load Simulation.

Individual Car Safe Speed%

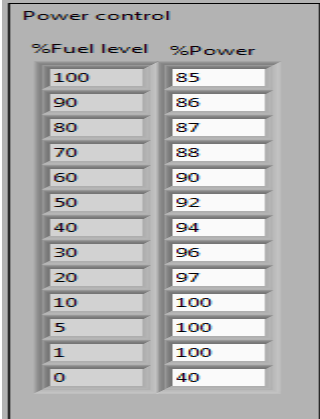
This is the speed that the car will be able to drive to the pits at the end of a race. It is also the speed that the car can drive when its fuel tank is empty. Some cars may require a higher Safe Speed to allow them to reach the pits. If you don't want cars to be able to reach the pits with an empty tank, set this value to 0.

Low Tyre Brake Throttle

Not operative in this version as of yet.

Individual Car Settings for Fuel Load Simulation

The two columns on the far right of the screen allow you to change the power available for a set fuel level.



%Fuel level	%Power
100	85
90	86
80	87
70	88
60	90
50	92
40	94
30	96
20	97
10	100
5	100
1	100
0	40

In the default settings, shown in the screen capture above,

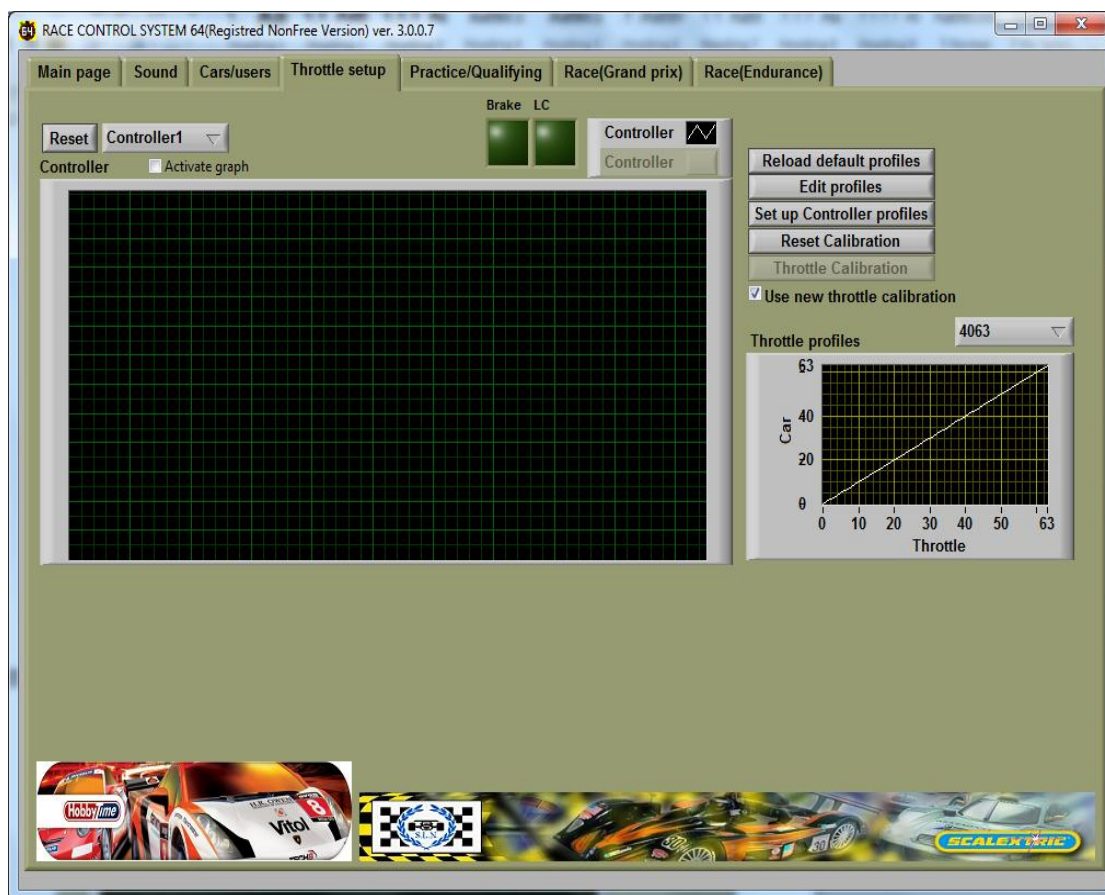
- a car with a full tank has 85% power.
- Available power increases until the fuel level reaches 10%.
- Full power is available when fuel level is between 10% and 1%.
- If the tank is empty, you have 40% available power to reach the pits.

Of course you can change all these values, including 0% for an empty tank, but please give the default settings a try as they are the results of extensive testing!

If you set the zero power value to zero cars will stop when they run out of fuel.

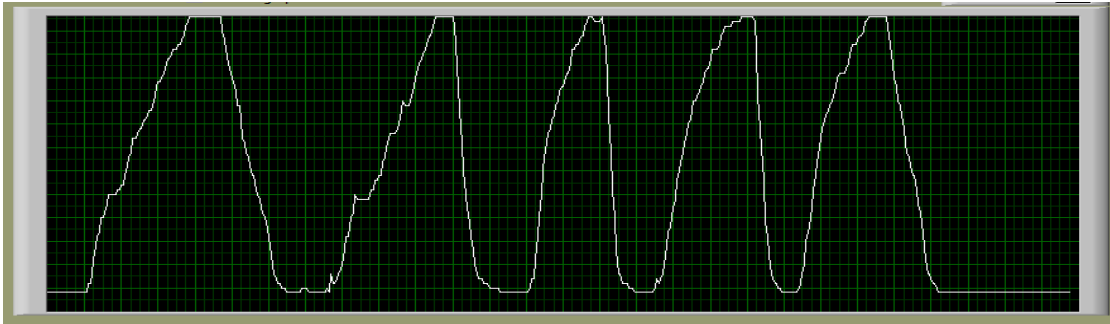
Percentage power is the maximum amount of power available to the cars. If you have a track where it is not possible to reach above the 85% power value of the default settings you will find that Fuel load simulation has no effect on car performance. In this case it will be worth lowering the values .

Throttle Setup Page



Real Time Controller Power Input Graph

With the graph at the top of the screen you can view how your controller reacts to the power input from the throttle. First click on **Activate graph** then select the controller input that you want to view. Then press the throttle on your controller slowly to see how the controller value increases with varying amounts of throttle movement. This is especially handy to see if your controller reaches top value with maximum throttle travel (63) or has a constantly low output (e.g. 3) instead of '0' with zero throttle travel.



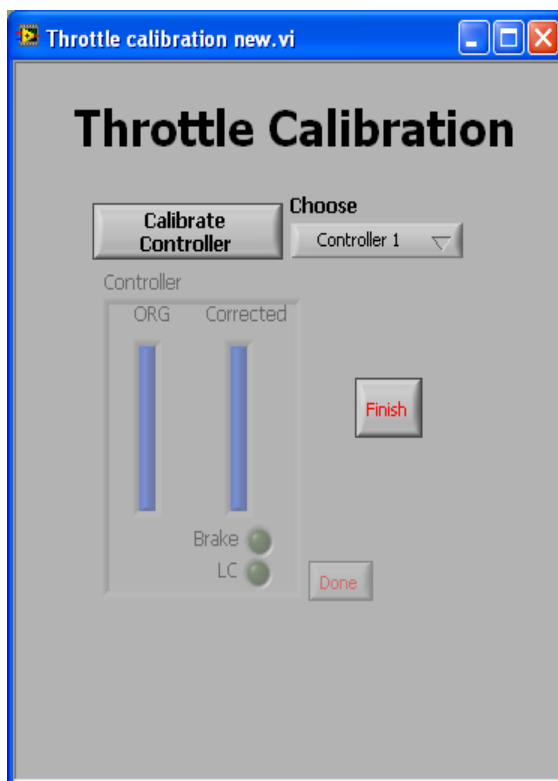
Graph 1 Power input graph showing constantly low output at zero throttle, rather than zero

Remember to uncheck the **Activate graph** box when you have finished.

The two LCDs at the top of the screen enable you to check if the brake and lane change buttons on your controller are working.

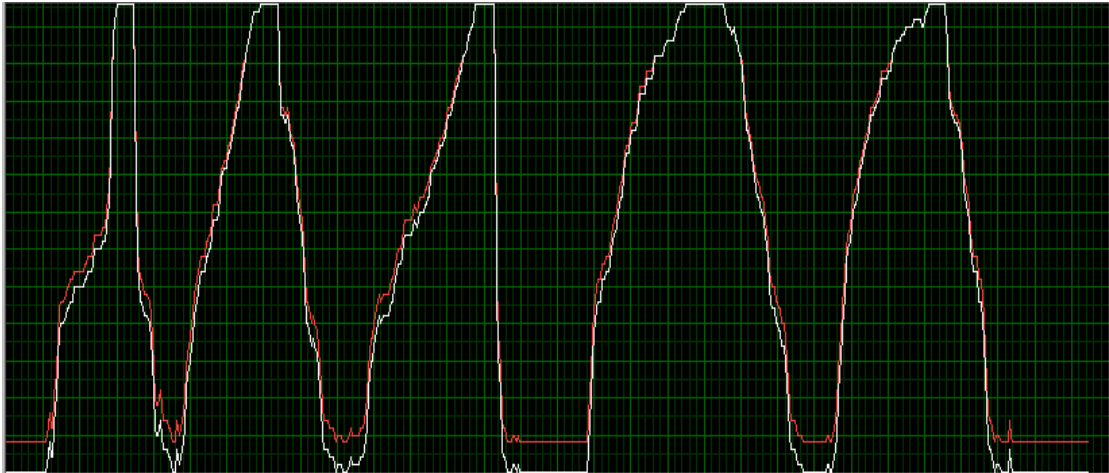
Throttle Calibration

By calibrating your controller you can improve the way your throttle functions. To calibrate your controller click on the **Throttle calibration** button. The **Throttle Calibration** window will open (shown below).



Select the controller you want to calibrate and then click on the **Calibrate Controller** button. Do not touch your controller's throttle or buttons during the calibration of the zero value of your throttle - this should take approximately 5 seconds. To obtain the maximum value of your controller you will be asked to apply maximum throttle 5 times. When calibration is complete, click the **Finish** button.

After calibration, you can see the difference in the real time throttle input view. You can view the power output values before and after calibration. The white curve on the graph is the present curve for the controller and the red curve is the old curve prior to calibration.



Graph 2 Power Input graph showing pre and post calibration curves.

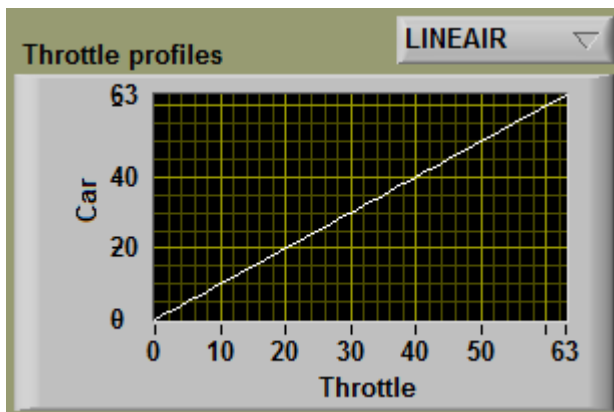
If you wish to zero set the values of all controllers, click on the **Reset calibration** button. This may be useful if you switch controllers around.

The idea of calibration is to get a 0-value with controllers that actually don't reach 0, and a maximum value (63) for controllers that can't reach maximum values. RSC64 stores the minimum and maximum values and then interpolates the data. If the controller works in area 3..59, then RCS64 calculates $59 = 63$ and $3 = \text{zero}$ and interpolates the other values.

If you don't want to use the corrected values, uncheck the **Use Throttle calibration** box next to the throttle calibration button in the **Throttle setup** page.

Viewing Throttle Profiles

To view a throttle profile, click the button to open up a drop down list of available profiles. There are 19 default throttle profiles.



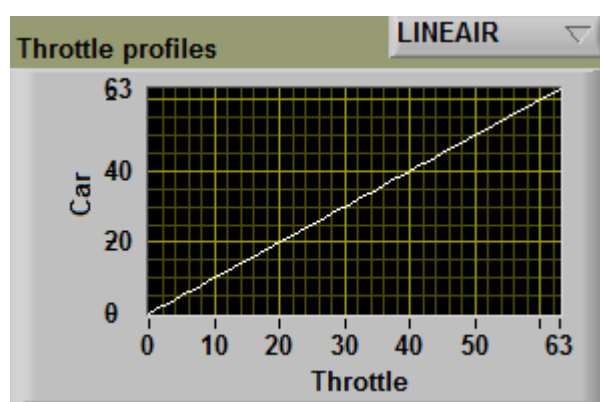
The horizontal axis displays the amount of travel of the throttle and the vertical axis shows the resulting power that the car will receive. The values used correspond to the 63 steps that the Scalextric controller has.

With the Linear profile when the throttle is half way through its range of travel (31.5) the car will receive 50% (31.5) of the maximum power available.

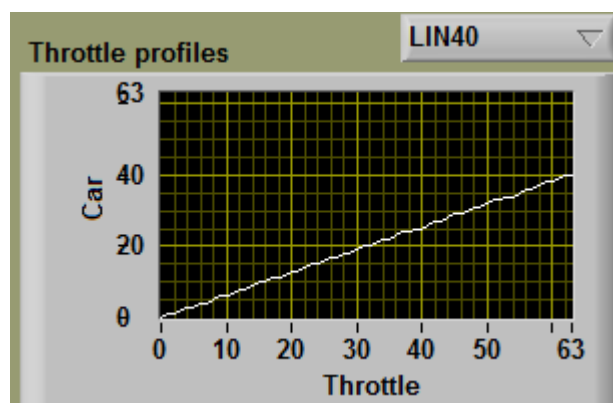
Some Profiles Explained

Linear

Standard linear response. Power will increase proportionally with amount of throttle movement. The screenshot below shows a linear throttle profile that reaches maximum power (63).

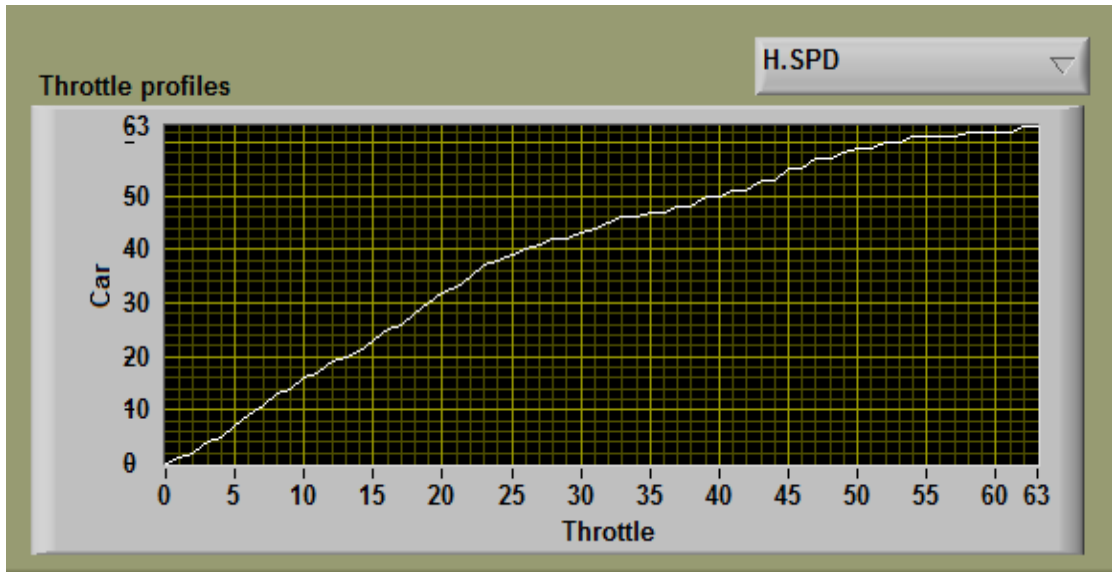


The screenshot below shows a linear throttle profile with power limited to 40 (63%).



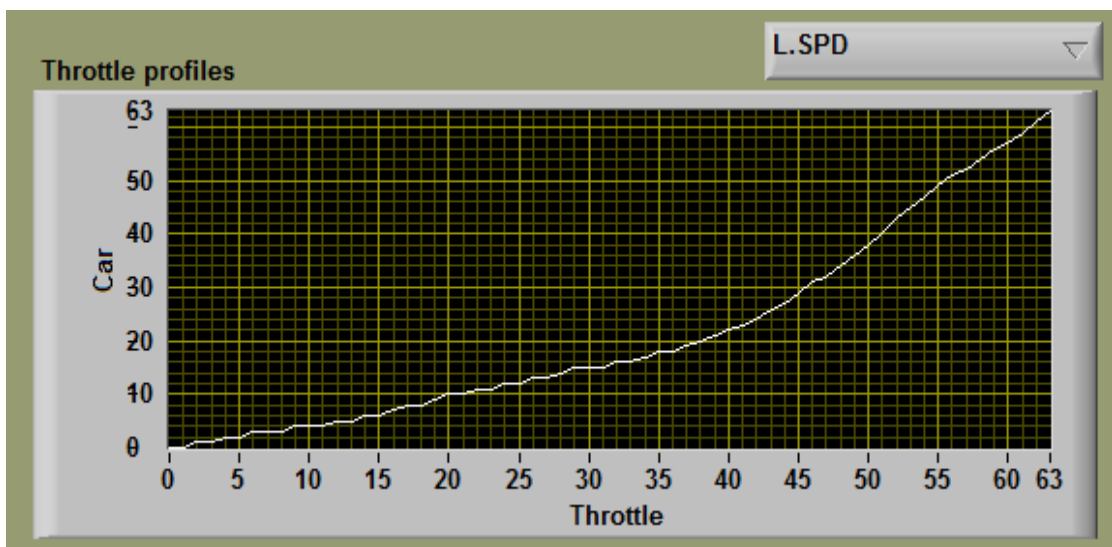
Appendix 1 has a chart with values for other linear throttle profiles that do not reach maximum power.

High Speed (H.SP.D)



Power will increase quickly within the first 50% of throttle movement and slowly for the remaining 50% of throttle movement. Suipagele for heavy cars with lots of magnet – fast acceleration with little throttle movement. H.SP.D also has variations + and - which have slightly different power increase and decrease values but is a similar curve to H.SP.D.

Low Speed (L.SP.D):



Initial throttle trigger movements give only small increases in power. The final 50% of throttle movement gives large increase in power. This profile gives more control in the first 50% of throttle movement. Suipagele for higher RPM motors (scalextric F1 for example) tight technical circuits, children and beginners.

L.SP.D also has variations + and - which have slightly different power increase and decrease values but is a similar curve to L.SP.D.

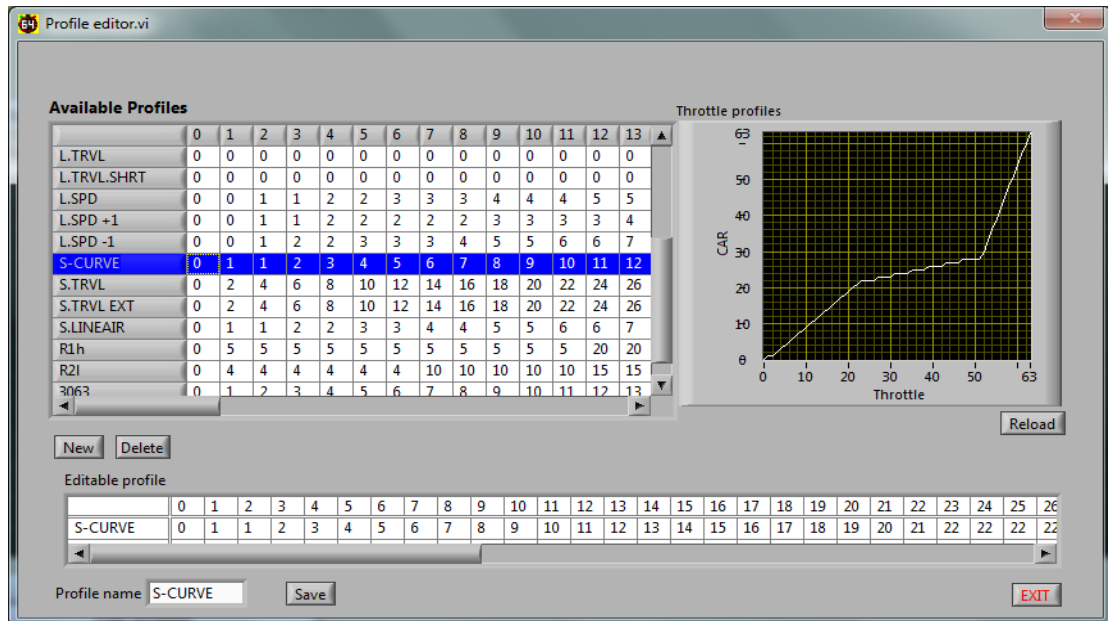
- 📖 *Default throttle profiles R1h and R21 are for testing weather influences. You can ignore them for now.*

Reloading Default Profiles

Use the **Load default profiles** button to reload default profiles in the event that the defaults are lost or edited in error. This can happen when editing profiles in the **Edit Profiles** screen which is discussed next.

Editing Profiles

To enter the Profile Editor dialog box click on the **Edit Profiles** button.



To edit a profile's characteristics highlight the profile you wish to edit - the profile data will appear in the **Edipagele profile** area of the window. Then, simply change the values in the text boxes and save.

The column headings are the throttle values:- 0 = No throttle travel, 31/32 = 50% throttle travel, 63 = 100% throttle travel. The edipagele text boxes are for available car power. It is also possible to change the name of the profile by simply clicking on the profile name, editing and pressing save.

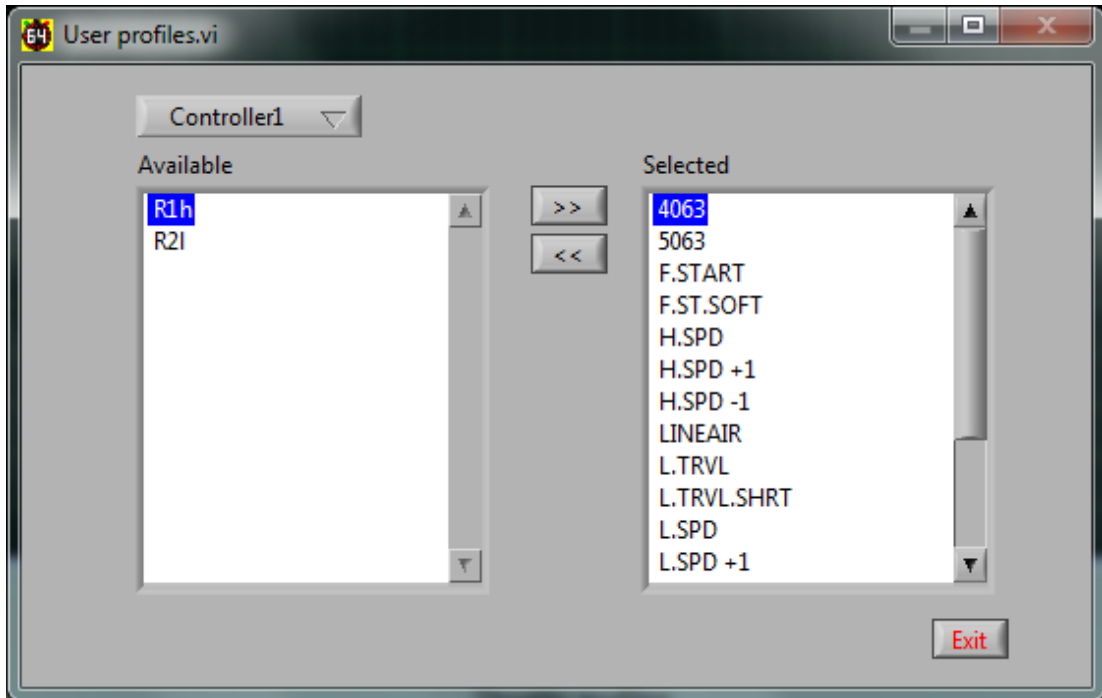
Click the **Reload** button to update the graph, which will enable you to view the edited profile.

To create a new profile click the **New** button. A profile named 'New' will be created at the bottom of the **Available Profiles** text boxes. Highlight the profile and it will appear in the Edipagele profile area of the window. Edit the name using the **Profile name** text box. Edit the profile by changing the values in the text boxes and then save your new profile. Use the **Reload** button to view your newly created profile on the **Throttle profiles** graph.

Choosing Individual Controller Throttle Profiles

RCS64 allows you to change the throttle profile that you are using during a pit stop.

The default setting for each controller is to have 17 throttle profiles available during a pitstop. You can increase or decrease the number of available controller profiles by clicking on the **Set up controller profiles** button. Select the controller that you would like to edit. Highlight the profile that you would like to move. Click on one of the central buttons to either move it to the selected list or back to the available list. The profiles you have selected, are now selectable in the Advanced Pit Stop menu and **Cars/users** page.



- 📄 *Selecting throttle profiles is only related to controller at the present time, not driver*
- 📄 *Only 'enabled' controllers show up in drop down list.*
- 😊 *Say you only like 3 profiles, select them only. Now making a selection during a pitstop will be a lot easier as you will not have to scroll through all available options.*

Advanced Pitstop Menu © (APM)

RCS64 is very proud to present the Advanced Pitstop Menu (APM). A new way of making pitstops.

The Advanced Pitstop Menu is used to:

- *start and stop refueling,*
- *change throttle profile,*
- *change tyres,*
- *repair damage.*

To enter the APM you need to stop your car and then press the Lane Change (LC) and Brake buttons on your controller simultaneously and keep them pressed until the APM is shown in your dashboard or leaderboard.

Note: RCS64 does not support the use of pit lane entry and exit sensors (Pit-Pro) at the present time - this means that the APM can be entered anywhere on the track. Ideally a dedicated pitlane would be the best place to enter the APM but if one is not available then find somewhere on the track where speeds are slow to refuel etc.

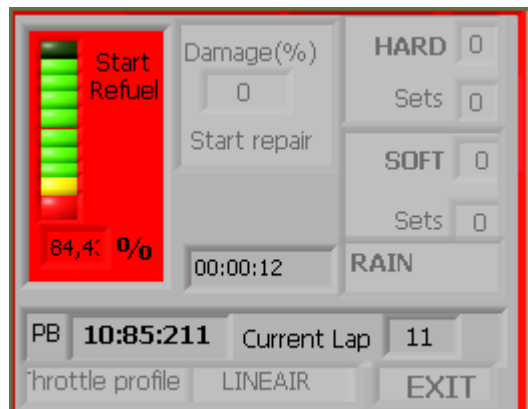
When the APM becomes visible, you can jump through the available options using the LC button on your controller. To confirm your selection press the BRAKE button on your controller.

Pitstop Menu for Practice/Qualifying



Tyre and weather options are not yet available.

Pitstop Menu in GP/Endurance Mode



As you can see the GP/Endurance APM also shows your personal best lap time, your current lap number plus has a damage repair option.

 *Tyre, weather and damage options are not yet available*

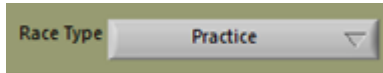
How to Refuel using APM

So, for refuelling;

1. *Drive into the pits*
2. *Stop car*
3. *Press LC/BRK until menu opens (screen greys out). Power is cut.*
4. *Tap LC button once to highlight the refueling option.*
5. *Press BRK button to start refueling. Refueling will continue until you click the **exit** button.*
6. *Scroll, using the LC button, through the available options stopping to make further selections if required.*
7. *Or scroll through directly to the **exit** button where you can wait until you have received the required fuel load and then exit via clicking on the **exit** button.*
8. *On pressing exit power will return to your car so you can drive out.*

Practice/Qualifying Page


On opening the Practice/Qualifying page you will need to select Practice or Qualifying modes by using the **Race Type** button.



Practice Mode

Practice is not time or lap limited. To use the practice mode you only have to make sure that **practice** is selected under the **Race type** heading. No further settings need to be changed. However, changing driver and car in the **Cars/users** menu would be a good idea.


The screen will change during the practice - always showing the car with the fastest lap time at the top. To reset race data to zero click the **Zero set** button.

 *If cars will not start, it may be that you are in qualifying mode not practice mode.*

The screenshot shows the RACE CONTROL SYSTEM 64 interface in Practice/Qualify mode. The window title is "RACE CONTROL SYSTEM 64(Unregistered) ver. 3.0.0.1". The interface includes a menu bar with "Main page", "Sound", "Cars/users", "Throttle setup", "Practice/Qualify", "Race(Grand prix)", and "Race(LeMans)". Below the menu bar, there is a "Race Type" dropdown set to "Practice" and a "Zero set" button. The main display area shows six cars, each with a unique color and name:

Driver	Car	POS	Last Lap	Dif	Best Lap	LINEAIR	Laps
Cookie Monster	White Lambo	1	06:97:646	00:00:000	06:97:646	54.4	7
Miss Piggy	Green Lambo	3	07:67:232	00:09:959	07:27:737	31.1	7
Kermit	Red Lambo	4	07:75:052	00:11:387	07:39:124	46.3	7
Oscar	Yellow Lambo	5	07:42:440	00:08:316	07:42:440	52.5	7
Barney	Blue Lambo	6	09:12:367	01:01:502	08:43:942	55.5	4

Additional controls include "Start Refuel" (66.319), "Throttle Profile" (LINEAIR), "HARD" (0), "SOFT" (0), "RAIN" (0), and an "EXIT" button (00:01:07). The interface also features several empty boxes under the difference boxes, which are noted as being for a non-operational tyre wear feature.

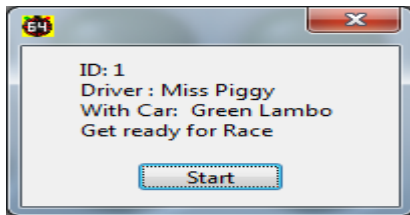
 *The two boxes that appear under the difference boxes (not shown on this screenshot) are for the tyre wear feature that is not operational in this version.*

Qualifying Mode

To use the qualifying mode click **Qualifying** under the **race type** heading. Make sure that you entered the length of race and type of qualifying event you want to run in the **main menu**. Change driver and car settings in **Cars/users** menu if required.

TO START QUALIFYING YOU MUST PRESS THE 'START RACE' BUTTON OR NO POWER WILL BE SUPPLIED TO THE TRACK.

If in the Main Page you chose only power up one car RCS64 will call each driver up in turn.



If you chose to power up all cars then a text box will appear asking if all cars are ready to race. Press start and the countdown will begin.



After both practice and qualifying you can see how much fuel you used by going to the Cars/Users page. If you wish to refuel your car, or all cars, you can do so by using either the **Refuel** buttons for each car or the **Refuel all cars** button. However, if you do not refuel, the level of fuel remaining at the end of the last session will be used for the next race/qualifying or practice session.

Screens for Practice and Qualifying

During Practice/qualifying the driver with the fastest lap time is shown at the top of the screen (leaderboard style). The color set in the **Cars/users** page for each driver is used to easily identify that drivers information.

The information shown for each driver is as follows –

Miss Piggy	Last Lap	Dif	Best Lap	L.TRVL	Laps
Green Lambo	POS 3	07:67:232	00:09:959	07:27:737	31.1
					7

- *Driver name and Car*
- *Position (based on fastest lap time)*

- *Last lap time (recorded to 100 000ths of a second! Yes it's that accurate!),*
- *Difference between drivers fastest lap time and the driver placed immediatly in front's fastest lap time,*
- *Tyre wear and Tyre chosen (inoperative at present),*
- *Throttle profile being used,*
- *LCDs showing fuel level,*
- *Numeric value for fuel level (% of fuel remaining),*
- *Number of laps completed.*

At the end of qualifying an HTML screen will appear showing a summary of the results.

Result from Race(Qualify)

Track name : Monza

Place	Driver	Car	LAPS	Best lap	Average time	Scale distance(KM)	Real distance(M)	Average Speed(km/h)	Scale Average Speed	Pitstops	Pit stop verage time	Best pit stop time	Stop&Go
1	Oscar	Yellow Lambo	10	06:84:261	16:31:551	6.08	190.00	4.19	134.15	0	00:00:000	00:00:000	0
2	Cookie Monster	White Lambo	10	06:90:721	07:03:256	6.08	190.00	9.73	311.24	0	00:00:000	00:00:000	0
3	Kermit	Red Lambo	10	07:06:771	07:38:386	6.08	190.00	9.26	296.43	0	00:00:000	00:00:000	0
4	Fozzy	Orange Lambo	10	07:35:191	10:07:608	6.08	190.00	6.79	217.23	0	00:00:000	00:00:000	0
5	Barney	Blue Lambo	10	07:38:679	13:45:640	6.08	190.00	5.08	162.66	0	00:00:000	00:00:000	0
6	Miss Piggy	Green Lambo	10	07:69:415	08:31:244	6.08	190.00	8.23	263.32	0	00:00:000	00:00:000	0

Date/Time : 06/10/2012 12:30 PM
 @ Copyright by Martin Schmidt

Race (Grand Prix) Page

Race (Grand Prix) is a lap limited race. Go to the Main Page to adjust settings such as number of laps, track calls, fuel load etc. Choose the drivers and cars in the Cars/Users page. Click on start race and a window will appear asking if all cars ready to start. Click ready and the starting lights will start the countdown. No power is available before the last light goes out, however fuel is being burnt if the throttle is applied prior to the start.

Grand Prix Screen



At the top of the page the current leader, best lap time, and the number of laps completed/laps to be completed (e.g.12/50) are shown. An LED is in the top right corner which shows whether the automated track call setting has been enabled or not.

The second row shows at a glance which driver is in which position. This information changes as race positions change during the race. Driver name and the number of laps behind the leader are shown in each box.

Grand Prix Dashboard

The screen for Grand Prix races has an individual dashboard for each driver that stays stationary on the screen during the race.



The LED in the top left corner will change from green to red if a Stop&Go penalty is given to the driver. Driver name, car and controller ID number are also shown on the top row.

The number of 'Stop&Go' penalties and pit stops, time for last lap and the driver position in the race are shown on the second row.

Down the lefthand side is information which will be used for Tyre changes and Damage repair which will be funtional in future RCS64 versions.

The number of laps completed by the driver is shown in large text in the center of the dashboard.

Two rows of vertical LED's showing fuel level and throttle level are on the righthand side with a text box underneath showing present fuel load (%).

Throttle profile chosen is under the lap counter and under that are two small LED's which light up when the Lane Change or Brake buttons on the controller are pressed.

You can stop the race at any time with the **Stop race** button, and then reset race data by pressing the **Reset race** button.

The status of the race is shown at the bottom of the screen - Race is Running, Track Call, Waiting for all drivers to pass, Race Finished etc.

📄 Tyre change and damage repair are not available yet.

At the end of a Grand Prix race an HTML screen will appear showing a summary of the results.

Race (Endurance) Page

All the functions of the Endurance race mode are the same as for the Grand Prix race mode, except for the time remaining in the race is shown in the top lefthand corner instead of number of laps. Start the race using the **Start race** button. The race will end when the time has elapsed. The winner of the race is the car that has completed the most laps. If the laps completed are the same the winner is the car that completed the last full lap first – not necessarily the car that is in the lead when the time has elapsed.

Endurance Screen



☺ When using Endurance mode it makes sense to set the **Allowed laps with stop&go on**, which can be found on the main page, to zero.

At the end of an Endurance race an HTML screen will appear showing a summary of the results.

Pace Cars – A Workaround!

RCS64 does not, at present, support Pace Cars however, it is possible to get them working with a fairly high degree of success.

The key to getting them to work is to first set up some new throttle profiles. These profiles should look like this:

Editable profile																										
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Pace25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25

As you can see the 0 value for throttle travel is set to a corresponding power value of 25. So, when a controller is set to this Pace25 profile a car will move around the track even if the throttle isn't being pulled.

You can set up varying profiles to suit different cars. So with four cars on the track the fastest car might have their throttle profile set at Pace24 and the fastest car might have their throttle set at Pace26, with the other cars at Pace25. With this set up cars can be made to travel around the track at approximately the same pace. Be aware that the lane that a car is in will effect it's speed so you must allow for this also.

Pace cars cannot change lanes automatically however, lane change can be operated manually via the controllers. A fun game is to have one racer and one pace car operator – the pace car operator changes lanes to cause the driver problems!

To make sure the Pace Cars stop at the end of a race set the 'Safe Speed' to zero.

To stop the cars during a race click Stop Race and all cars will stop (not practice) or press space bar or the start button on the APB to initiate a track call (Endurance and GP mode only)

To stop practice sessions with pace cars you need to exit the practice session by clicking on one of the other race pages or the profile page.

Remember that this is only a workaround. Pace cars will be way better than this when they are actually added to RCS64.

Children and Beginners Using RCS64

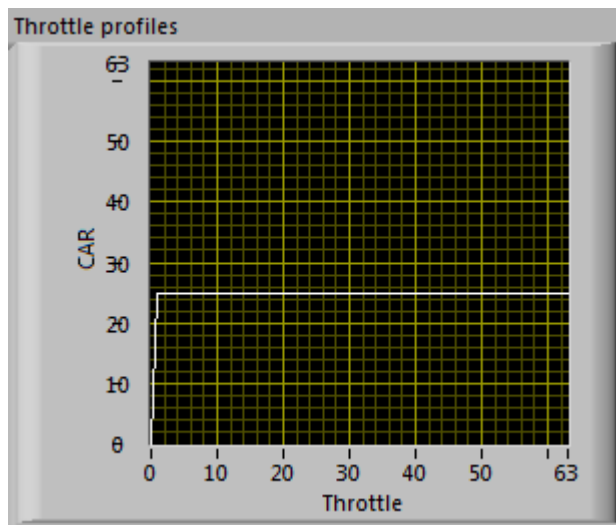
RCS64 is a perfect Race Management System for use with Children and beginners to Slot Car Racing.

Again the key to success is setting up appropriate profiles for the racers.

For racing with Children and beginners it is sensible to turn off the 'Burn Fuel' option – Children and beginners have enough to worry about let alone running out of fuel. If you want to burn fuel it may be easier to turn of fuel load simulation as this is harder again to use. Remember also that different lanes require different driving, so it would be best to limit lane changing until drivers have mastered both lanes independently of each other.

Child25

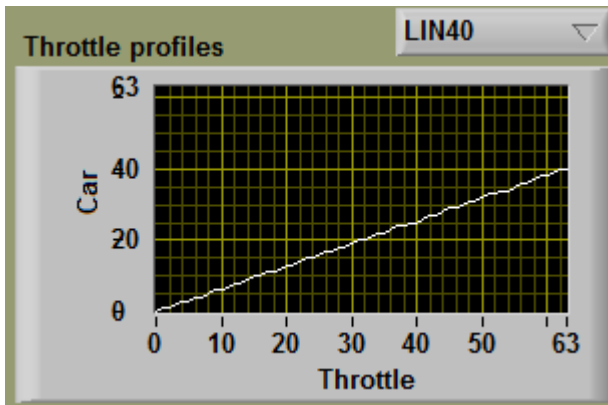
The following profile works well with very young children – as young as 2 years of age.



Editable profile																											
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Child25	0	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25	25

When the throttle is pressed the car moves. Set the profile to a speed that keeps the car on the track in both lanes. This profile enables even the youngest child to achieve success and feel that they are part of the action. You will need to avoid them because the can't slow down and they may stop at any moment.

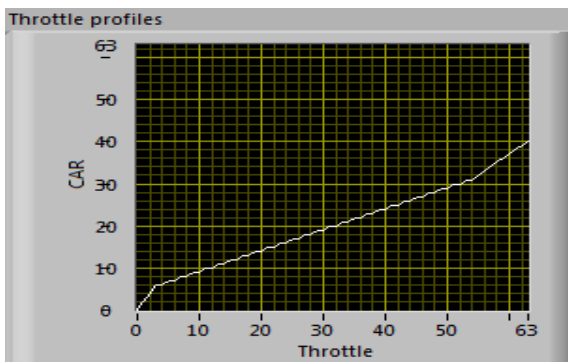
Linear (Restricted)



Set the maximum power just below deslot level on both tracks. This is perfect for young children who get frustrated by deslotting. They can race, change lanes and have lots of fun. You can also level car performance (approximately) using the same method as for the pace car workaround. A chart showing a full range of linear throttle curves is in Appendix 1.

Beginner40

The next profile works well with beginners and young children and gets them used to driving carefully around bends and accelerating down straights.



	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
Beginner40	0	2	4	6	6	7	7	8	8	9	9	10	10	11	11	12	12	13	13	14	14	15	15	16	16	17
26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50		
17	18	18	19	19	20	20	21	21	22	22	23	23	24	24	25	25	26	26	27	27	28	28	29	29		
51	52	53	54	55	56	57	58	59	60	61	62	63														
30	30	31	31	32	33	34	35	36	37	38	39	40														

This profile has a lot of throttle travel at the start, very slow gradual rise in power with throttle movement in the middle, up to 30, and a linear rise in power at the end rising to a low power value of 40. The end of the middle section, which in this example is 30, should be equal to the max value that a pace car can travel around the track without deslotting. The maximum power value is set to 40 so that the driver can accelerate down straights however, crashes will not require major car rebuilds! Setting the Dynamic Brake option on will help cars slow quickly after the release of the throttle.

Using RCS64 you can make any profile you want – experiment and pass on your findings via SlotForum.

Pit Stop Management

Making races where all drivers take a set number of pit stops during a race can be achieved through trial and error by varying cars' fuel tank size. However, the following section explains how to design race formats with set numbers of pit stops, of the same duration, using a more systematic approach. It is complicated and does have its limitations which are:

- *May not be able to be used with cars with large differences in fuel burn rates (Mini with an F1 car)*
- *The number of pit stops must be in a reasonable proportion to the race length e.g. **not** 5 pit stops in 2 minute race.*
- *Use similar throttle profiles for each driver – preferably linear with max power setting the same.*

Step 1: Determining Burn Rate and Average Lap Time (GP and Endurance)

Determine fuel burn rates and average lap times for all cars in the race.

Protocol:

- *Set **Burn Fuel** option on in main menu*
- *Set fuel tank size to 1000*
- *Use same controller for test*
- *Clean cars tyres and braids*
- *Use only one driver*
- *Do not change any settings between tests*
- *Use same lane – no lane changing*
- *No deslots*
- *Check car has full tank of fuel*
- *Start cars on starting grid near to APB sensors.*

In practice mode race around the track as fast as possible until fuel runs out.

Take note of the time from start to when the car runs out of fuel and stops. For an accurate result get someone else to time while the other races.

Also, take note of how many complete laps it does and any parts of a lap that it completes. Record the distance to the nearest quarter of a lap for a reasonable level of accuracy.

Step 2: Calculating Burn Rates (GP and Endurance)

Calculate fuel burn rate for each car using the formula.

$$1000/\text{time to empty}(\text{sec}) = \text{Burn rate units/sec}$$

You now have a burn rate for each car for the track that you are using. If you use the same cars and the same track configuration you can record the results and use them each time you come to do a race.

Setting up a Grand Prix race

Decide on the number of laps that the race will last.

Also, decide on the number of pit stops that you want the cars to have to take.

Average Lap Time Calculation

To work out the average lap time use the following formula.

$$\text{Time to Empty}/\text{Laps Completed} = \text{Average Lap Time}$$

Race Duration Calculation

Once you have found out the average lap time for each car use the formula below to obtain the length of time that each car will take to complete the set number of laps.

$$\text{Average Lap Time} \times \text{Number of Laps} = \text{Race Duration}$$

Fuel Usage Calculation

Now, using the results from the two tests (burn rate and race duration), you need to work out the fuel usage for each car using the following formula.

$$\text{Fuel Burn Rate (units/sec)} \times \text{Race Duration (sec)} = \text{Fuel Usage (units)}.$$

- ☞ *If you don't want pits stops, just make sure you set Tank Size to above the value of the car with the highest fuel usage.*

Mid. Fuel Use Value Calculation

Now you have determined the fuel usage for each car you need to determine the middle fuel usage value.

$$(\text{Highest Fuel Usage} + \text{Lowest Fuel Usage})/2 = \text{Mid. Fuel Usage value}$$

Fuel Tank Size Setting Calculation

Now, using the middle. fuel usage value, use the formula to find the fuel tank size setting for all cars.

$$\text{Middle Fuel Usage}/\text{number of pit stops} + 0.5 = \text{Fuel Tank Size (all cars)}$$

Checking Fuel Tank Size Setting

To check that the value you have obtained will work with the number of pit stops chosen use the following formula.

$$\text{Fuel Tank Size} \times \text{Number of Pit stops} = \text{Fuel used before final pit stop}$$

If the value is higher than the fuel usage value for the car with the lowest fuel usage value then you will have to reduce the number of pit stops.

Setting Refuel Speed

To set the **Refuel Speed** correctly you will have to decide how long you would like refueling (empty to full) to take.

Refuelling may effect the way drivers choose to drive a race. A long refuel time (10% of race time) may make drivers drive slower, in effect lowering their Burn Rate, so that they can avoid pitting. A short amount of refuelling time (5% of race time) will make drivers drive at full speed with no thought of avoiding pit stops. A refuelling rate of around 7% should make the driver consider both options, full speed or slowing to save fuel.

Then using your newly calculated tank size setting and the refueling time required, you can determine the **Refuel Speed** setting by using the chart (Fig 1) below.

Refuel Speed Setting Chart

Tank Size (units)	Refueling Time Required (Sec)																
	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
300	13	17	20	23	27	30	33	37	40	43	47	50					
350	11	14	17	20	23	26	29	31	34	37	40	43	46	49			
400	10	12	15	18	20	23	25	27	30	33	35	38	40	42	45	47	50
450	9	11	13	16	18	20	22	24	27	29	31	33	37	38	40	42	44
500	8	10	12	14	16	18	20	22	24	26	28	30	32	34	36	38	40
550	7	9	11	13	15	16	18	20	22	24	25	27	29	31	33	35	36
600	7	8	10	12	13	15	17	18	20	22	23	25	27	28	30	32	33
650	6	8	9	11	12	14	15	17	18	20	22	23	25	26	28	29	31
700	6	7	9	10	11	13	14	16	17	19	20	21	23	24	26	27	29
750	5	7	8	9	11	12	13	15	16	17	19	20	21	23	24	25	27
800	5	6	7	9	10	11	12	14	15	16	17	19	20	21	22	24	25
850	5	6	7	8	9	11	12	13	14	15	16	18	19	20	21	22	24
900	4	6	7	8	9	10	11	12	13	14	16	17	18	19	20	21	22
950	4	5	6	7	8	9	11	12	13	14	15	16	17	18	19	20	21
1000	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1050	4	5	6	7	8	9	10	11	11	12	13	14	15	16	17	18	19
1100	4	5	5	6	7	8	9	10	11	12	13	14	15	16	16	17	18
1150	3	4	5	6	7	8	9	10	10	11	12	13	14	15	16	17	17
1200	3	4	5	6	7	8	8	9	10	11	12	12	13	14	15	16	17
1250	3	4	5	6	6	7	8	9	10	10	11	12	13	14	14	15	16
1300	3	4	5	5	6	7	8	8	9	10	11	11	12	13	14	15	15
1350	3	4	4	5	6	7	7	8	9	10	10	10	12	13	13	14	15
1400	3	4	4	5	6	6	7	8	9	9	10	10	11	12	13	14	14
1450	3	3	4	5	6	6	7	8	8	9	10	10	11	12	12	13	14
1500	3	3	4	5	5	6	7	7	8	9	9	10	11	11	12	13	13
1550	3	3	4	4	5	6	6	7	8	8	9	10	10	11	12	12	13
1600	2	3	4	4	5	6	6	7	8	8	9	9	10	11	11	12	12
1650	2	3	4	4	5	5	6	7	7	8	8	9	10	10	11	11	12
1700	2	3	4	4	5	5	6	6	7	8	8	9	9	10	11	11	12
1750	2	3	3	4	5	5	6	6	7	7	8	9	9	10	10	11	11
1800	2	3	3	4	4	5	6	6	7	7	8	8	9	9	10	10	11
1850	2	3	3	4	4	5	5	6	6	7	8	8	9	9	10	10	11
1900	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10	11
1950	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	9	10
2000	2	2	3	3	4	4	5	6	6	6	7	8	8	9	9	9	10
2050	2	2	3	3	4	4	5	5	6	6	7	7	8	9	9	9	10
2100	2	2	3	3	4	4	5	5	6	6	7	7	8	8	9	9	10
2150	2	2	3	3	4	4	5	5	6	6	7	7	7	8	8	9	9
2200	2	2	3	3	4	4	5	5	6	6	6	7	7	8	8	8	9
2250	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	8	9
2300	2	2	3	3	3	4	4	5	5	6	6	7	7	8	8	8	9
2350	2	2	3	3	3	4	4	5	5	6	6	6	7	8	8	8	9
2400	2	2	2	3	3	4	4	5	5	5	6	6	7	7	8	8	9
2450	2	2	2	3	3	4	4	4	5	5	6	6	7	7	8	8	8
2500	2	2	2	3	3	4	4	4	5	5	6	6	6	7	8	8	8
2550	2	2	2	3	3	4	4	4	5	5	5	6	6				
2600	2	2	2	3	3	3	4	4	5	5	5	6	6				
2650	2	2	2	3	3	3	4	4	5	5	5	6	6				
2700	2	2	2	3	3	3	4	4	4	5	5	6	6				
2750	2	2	2	3	3	3	4	4	4	5	5	6	6				
2800	2	2	2	2	3	3	4	4	4	5	5	6	6				
2850	2	2	2	2	3	3	4	4	4	5	5	6	6				
2900	2	2	2	2	3	3	3	4	4	4	5	6	6				
2950	1	2	2	2	3	3	3	4	4	4	5	6	5				
3000	1	2	2	2	3	3	3	4	4	4	5	6	5				

Figure 1 Setting Refuel Speed using Fuel Tank Size Settings (units) and Required Pit Stop Duration (sec)

Race Settings

You now have all the race settings that you require. Make sure that you have done the following and then you are ready to race:

- *Set Number of Laps in Main Menu,*
- *Set Refuel Speed in the Main Menu*
- *Set Fuel Tank Size (all cars) for each car in the individual Cars/users menu*
- *Refuel all cars*
- *Check Burn Fuel is on.*

Setting up an Endurance race

Decide on the length of time that the race will take and the number of pit stops required.

Fuel Use Calculation

Now, using race duration and fuel burn rate (which you worked out earlier) you need to work out the fuel usage for each car using the following formula.

$$\text{Fuel Burn Rate (units/sec)} \times \text{Race Duration (sec)} = \text{Fuel Usage (units)}.$$

- ☞ *If you don't want pits stops, make sure you set fuel tank size to above the value of the car with the highest fuel usage.*

Mid. Fuel Use Value Calculation

Now you have determined the fuel usage for each car, you need to determine the middle fuel usage value.

$$(\text{Highest Fuel Usage} + \text{Lowest Fuel Usage})/2 = \text{Mid. Fuel Usage value}$$

Pit Stop and Unused Fuel

Due to the fact that Endurance races are timed races, you need to make an allowance for the time taken to refuel - due to the fact that you will not be burning fuel at that time.

1. *To do this, determine the length of time that you would like each pit stop to take - multiply this number by the number of pit stops, to obtain the length of time taken refuelling.*
2. *Then, use the following formula to work out the amount of fuel that was **not used** due to the time spent refuelling:*

$$\text{Total Refuel Time} \times \text{Fuel Burn Rate} = \text{Fuel not burnt due to refuelling in pits}$$

3. *Take this number away from the Mid. Fuel Usage value.*

$$\text{Mid. Fuel Usage value} - \text{Fuel Not Burnt} = \text{revised Mid. Fuel Usage value}$$

Fuel Tank Size Setting Calculation

Now use the formula below to determine the fuel tank size Setting.

$$\text{Revised Mid. Fuel Usage/Number of Pit Stops} + 0.5 = \text{Fuel Tank Size (all cars)}$$

Checking Fuel Tank Size Setting

To check that the value you have obtained will work with the number of pit stops chosen use the following formula.

$$\text{Fuel Tank Size} \times \text{Number of Pit Stops} = \text{Fuel used before final pit stop}$$

If the value is higher than the fuel usage value for the car with the lowest fuel usage value then you will have to reduce the number of pit stops.

Setting Refuel Speed

To set the **Refuel Speed** correctly you will have to decide how long you would like refueling (empty to full) to take.

Refuelling may effect the way drivers choose to drive a race. A long refuel time (10% of race time) may make drivers drive slower, in effect lowering their Burn Rate, so that they can avoid pitting. A short amount of refuelling time (5% of race time) will make drivers drive at full speed with no thought of avoiding pit stops. A refuelling rate of around 7% should make the driver consider both options, full speed or slowing to save fuel.

Then using your newly calculated tank size setting and the refueling time required, you can determine the **Refuel Speed** setting by using the chart (Fig 1) above.

Race Settings

You now have all the race settings that you require. Make sure that you have done the following and then you are ready to race:

- *Set Time of Race in Main Menu,*
- *Refuel Speed in the Main Menu*
- *Set Fuel Tank Size (all cars) for each car in the individual Cars/users menu*
- *Refuel all cars*
- *Check Burn Fuel is on.*

Wow that was easy! Now write down your results so that you can use the same information next time you race.

Looking forward to the day when RCS64 can do it all for you!

Race Computations Form

RACE DATE:-

Car	Burn Rate Test Time (A) (sec)	Burn Rate (B) (Units/sec) $1000/A$	Laps Completed (Z)	Average Lap Time (sec) (C) A/Z	Fuel Usage (Units/sec) (CxD)B	Lowest/Highest Fuel Usage (E) and (F)

GRAND PRIX

No. of Laps (D) =

No. of Mand. Pit Stops (H) =

Pit Stop Time (sec) =

Results

Lowest Fuel Usage (E) =

Highest Fuel Usage (F) =

Middle Fuel Usage (G) $(E + F)/2$ =

Settings

Fuel Tank Setting $(G/(H+0.5))$ =

Refuel Speed Setting (Fig.1) =

ENDURANCE

Race Time (sec) (J) =

No. of Mandatory Pit Stops (N) =

Pit Stop Time (sec) (M) =

Results

Lowest Fuel Usage (E) =

Highest Fuel Usage (F) =

Middle Fuel Usage (G) $(E + F)/2$ =

Length of Time in Pits (sec) (P) $(M \times N)$ =

Unburnt Fuel (units) (Q) $(P \times \text{lowest B value})$ =

Revised Fuel Usage (units) (R) $(G - Q)$ =

Settings

Fuel Tank Setting $(R/(N+0.5))$ =

Refuel Speed Setting (Fig.1) =

Troubleshooting

Software cannot 'see' powerbase

- *Do you have the correct cable? See RCS64 website or contact RichG*
- *Check cable connection between computer and powerbase*
- *Is powerbase functioning. Remove aux port cable from powerbase. Test powerbase.*
- *Is the cable functioning correctly. Incorrect use of cable can cause problems. Refer to manufactures instructions.*
- *Are you running Windows 7 or Windows XP. RCS64 has only been tested on these.*

Cars stuttering around track

- *Unlikely to be software issue*
- *Check track connections are good. See SlotForum.com for more details.*
- *Clean track using Inox. See SlotForum.com for more details.*

Powerbase shorting out

- *Unlikely to be software issue*
- *Check for metal objects touching track rails. Vacuum track to get out difficult to see objects.*
- *Do you have old style lanechangers that have not been modified? See SlotForum.com for more details.*

Car moves without touching the trigger

- *Check controller's throttle map – is throttle returning to zero (white line at very bottom of graph). If not recalibrate controller.*
- *Check profile set for controller – at throttle setting 0 is car setting at 0. If not change car setting to 0.*

Known Issues

- *Poor screen quality using Windows 7 – Change screen resolution settings to optimize image quality. This is a known issue which will be resolved in the near future.*

