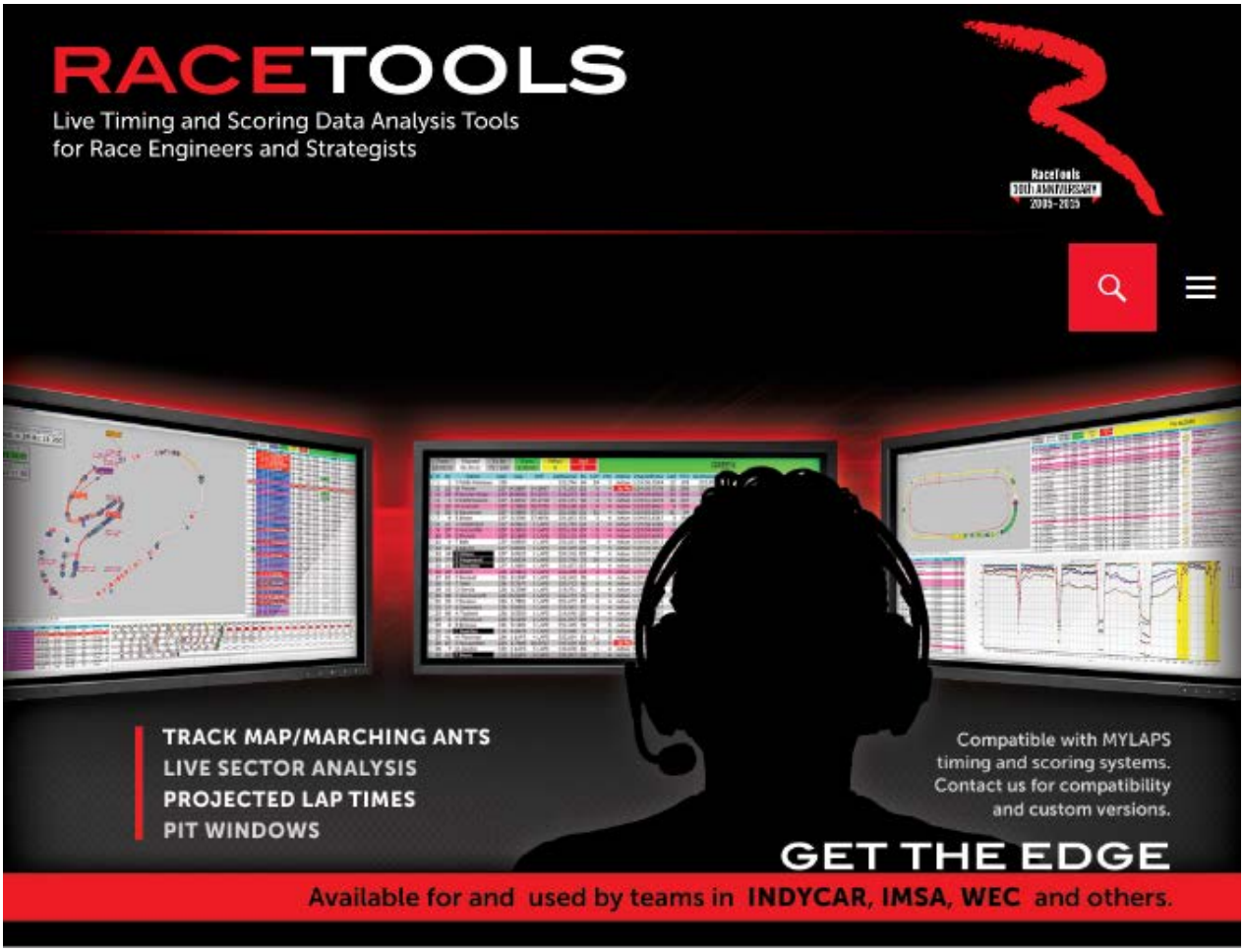
RACETOOLS USER'S MANUAL V3.17



RaceTools is a software package designed to efficiently summarize timing data provided by the sanctioning series' pit lane real time data feed. It allows for easy tracking of cars on track, summaries of performance indices, real-time lap performance and projections, and strategy management. There are also additional features designed to aid the user with summarization of session and race performance. In addition, the software is highly user configurable to allow for analysis and formatting tailored to the users specific display needs.

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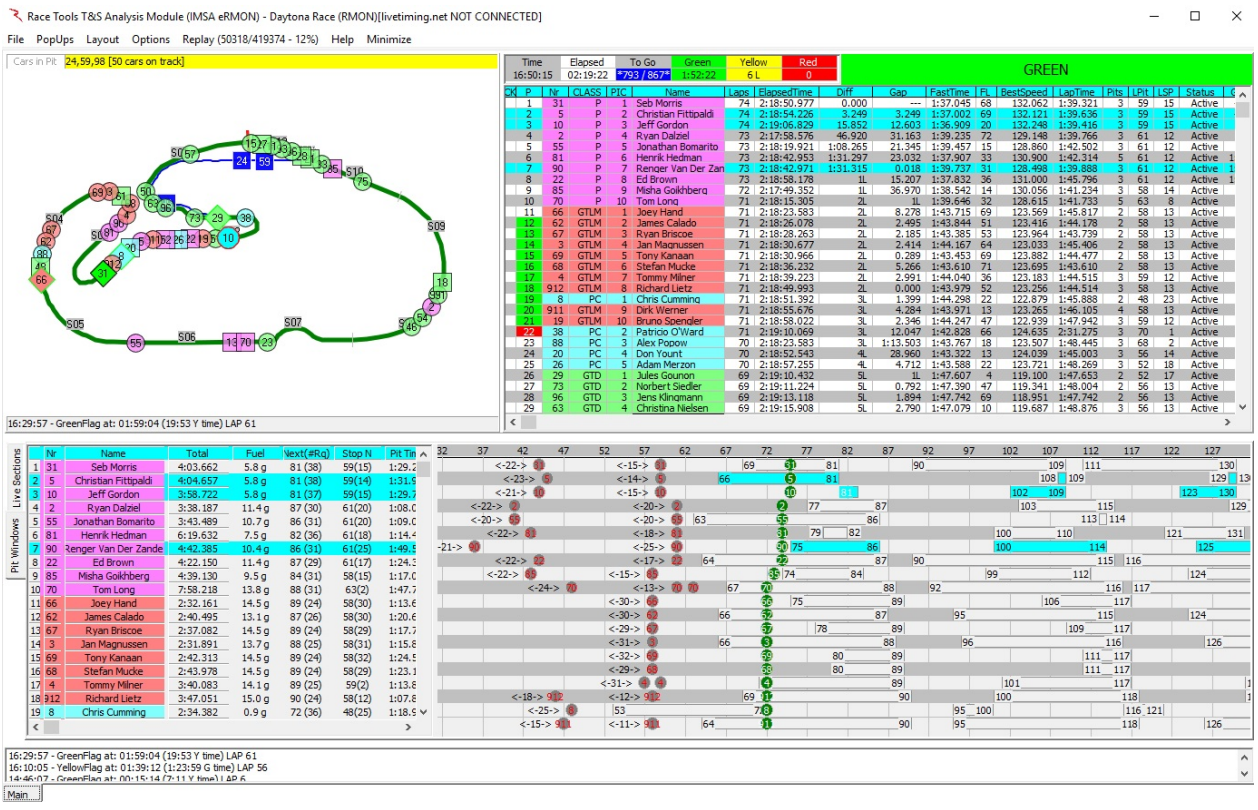
Introduction

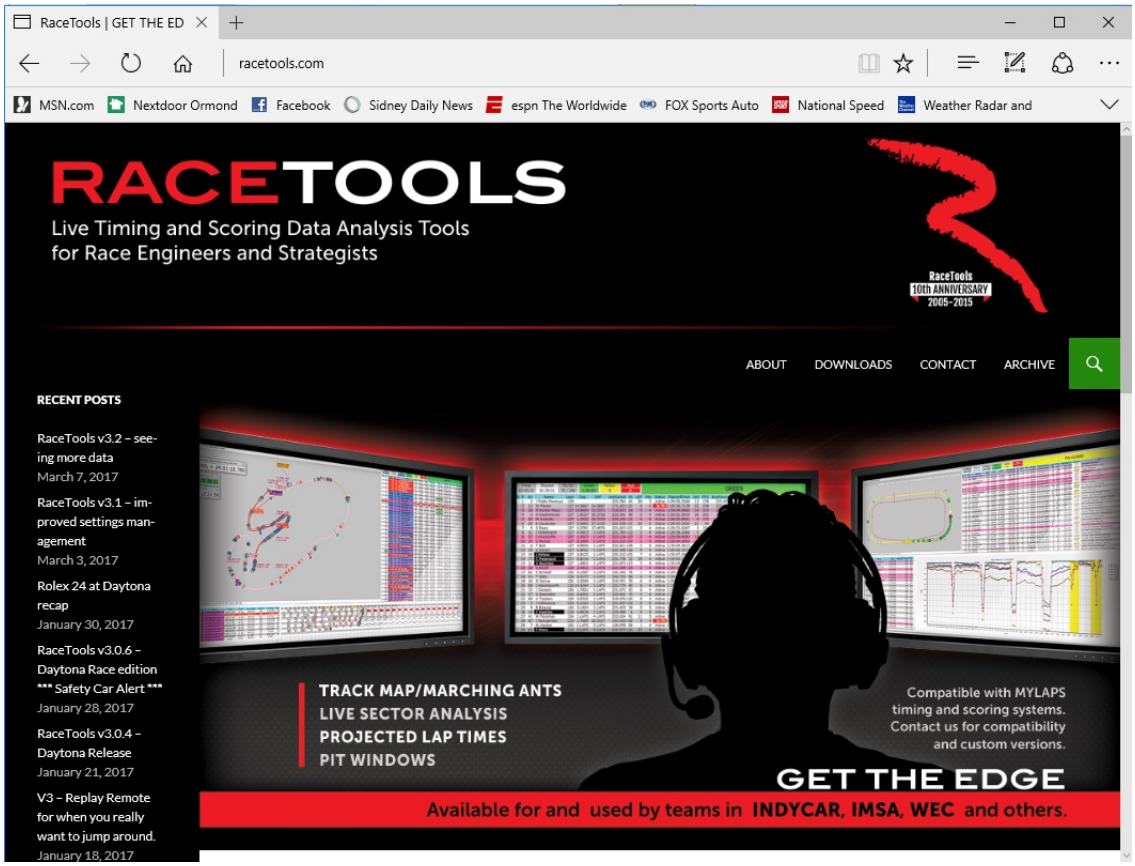
RaceTools User's Manual v3.17

RaceTools is a software package designed to efficiently summarize timing data provided by the sanctioning series' pit lane real time data feed. It allows for easy tracking of cars on track, summaries of performance indices, real-time lap performance and projections, and strategy management. There are also additional features designed to aid the user with summarization of session and race performance. In addition, the software is highly user configurable to allow for analysis and formatting tailored to the users specific display needs.



Downloading the Software

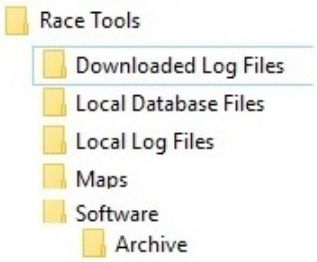
The software is available for download at http://racetools.com . Click the link for 'Downloads'. This page contains links to download the software for: IMSA, IndyCar, MRTI, and WEC.



The software can be placed wherever the user determines is best, but a structure similar to that outlined below would place the software into the RaceTools↳ Software folder. Once downloaded, the file needs to be "unzipped• in order to extract the software. The unzipped .exe file should be placed in the RaceTools↳ Software folder. Only one file will typically be generated by the unzipping process.

Suggested Initial File Structure

In order to streamline the installation of the software and downloading of associated files, an initial file structure similar to the following should be set up.



This initial structure allows for efficient management of files used for and created by the software. Below is a guide for the use for each folder.

- Downloaded Log Files – This folder is used to store files that are downloaded post session/event from http://results.imsa.com/
- Local Database Files – This folder provides a location to save the database files that are created locally by the software from the incoming data stream (setup explained later in manual)
- Local Log Files – This folder provides a location to save the log files that are created locally by the software from the incoming data stream (setup explained later in manual)
- Maps – This folder is the local archive of maps that will be used for the season. Maps are available at http://racetools.com/maps/ or provided via email when updates are required
- Software – This is the location the RaceTools software will be downloaded to and run from.
- Archive – This folder provides a place to keep previous versions of the software, leaving them available for use if needed.

NOTE: You may want to create an 'Event' folder for each event, in your 'Documents' Library, where you can store files specific to each event.

With the new season, a lot of teams are reinstalling RaceTools and upgrading to Windows 10. This has caused some users to get file access errors when running RaceTools from the 'Program Files' or 'Program Files (x86)' folder as Window's UAC restricts access to the program folder. The recommended place to store user data files is the AppData folder.

With RaceTools v3.0.3, we now support both the old style running and saving settings in the program folder or the new style separating the program and data files into the Program Files and AppData folders. If you are running RaceTools from a folder not within the Program Files or Program Files (x86) folder, then RaceTools will continue to read and save the data and configuration files in the same folder as the application. This makes it easy to run multiple versions with its own configuration or copy the configuration from one system to another. I usually run RaceTools from a folder in the Documents folder.

If you choose to run RaceTools from the Program Files or Program Files (x86) folder, then RaceTools will read and save the configuration and data files from and to the ProgramData
↳ AppData folder. This should eliminate the file access errors that Windows generates for trying to save to the Program Files folder.

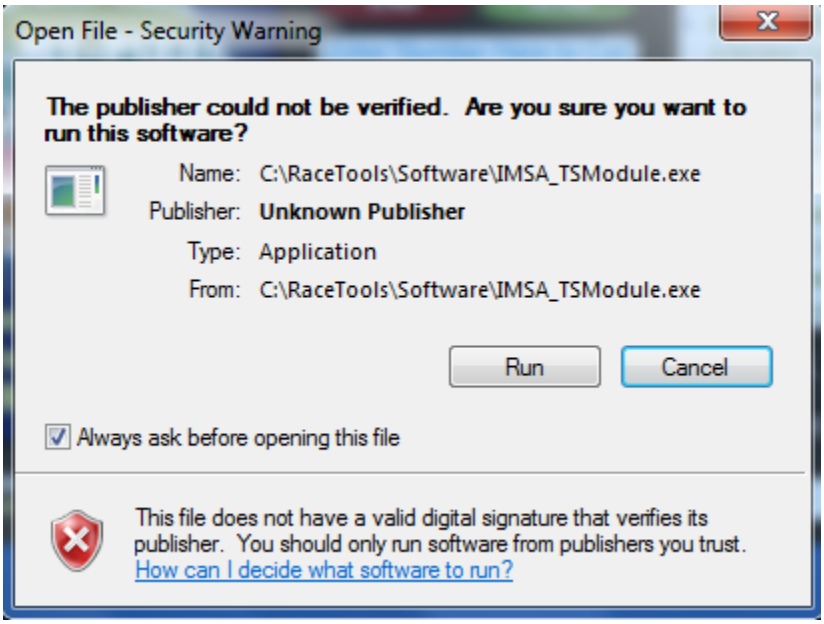
This does mean that if you are running RaceTools from the Program Files folder, you may need to reconfigure some of the settings that did not get migrated to the AppData folder. You should only have to do this once.

First Time Use

The software works like any other executable file on a computer, simply double click the icon/file (or select the file and hit the "Enter• key) and the program will load.

Note that a shortcut on the desktop is the easiest method to load the software. Simply right click the executable file and select "Create Shortcut" or ("Send to Desktop") and place this on the desktop or location of choice.

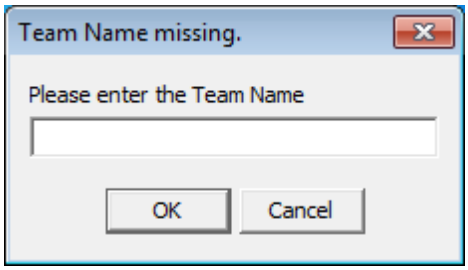
On some computers, the user may be prompted with an "Open File – Security Warning•.

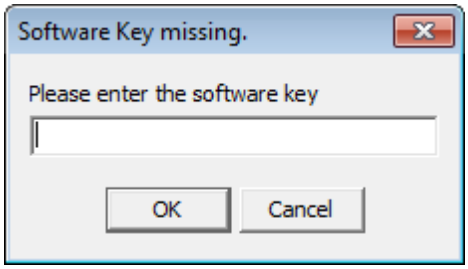


It is best to de-select the check box for "Always ask before opening this file• so that this prompt does not appear each time the software is loaded. Select "Run• in the window.

Before the software fully loads a track map needs to be selected and the user license information entered. If a track map is not available or needed, this step can be skipped.

A prompt for the Team Name and Software Key will come up automatically the first time the software is loaded. This will not be seen again until the license expires or new software is loaded from a new file location.





- The 'Team Name' and 'Software Key' will be provided by the developer when the team has obtained the license to use the software. It is suggested that a text file be created with the team name and software key. This can be stored in the Race Tools main directory for access in case of issue or for distribution to other team members.

- Before the software fully loads a track map needs to be selected and the user license information entered. If a track map is not available or needed, this step can be skipped. The track map can be loaded at any time.

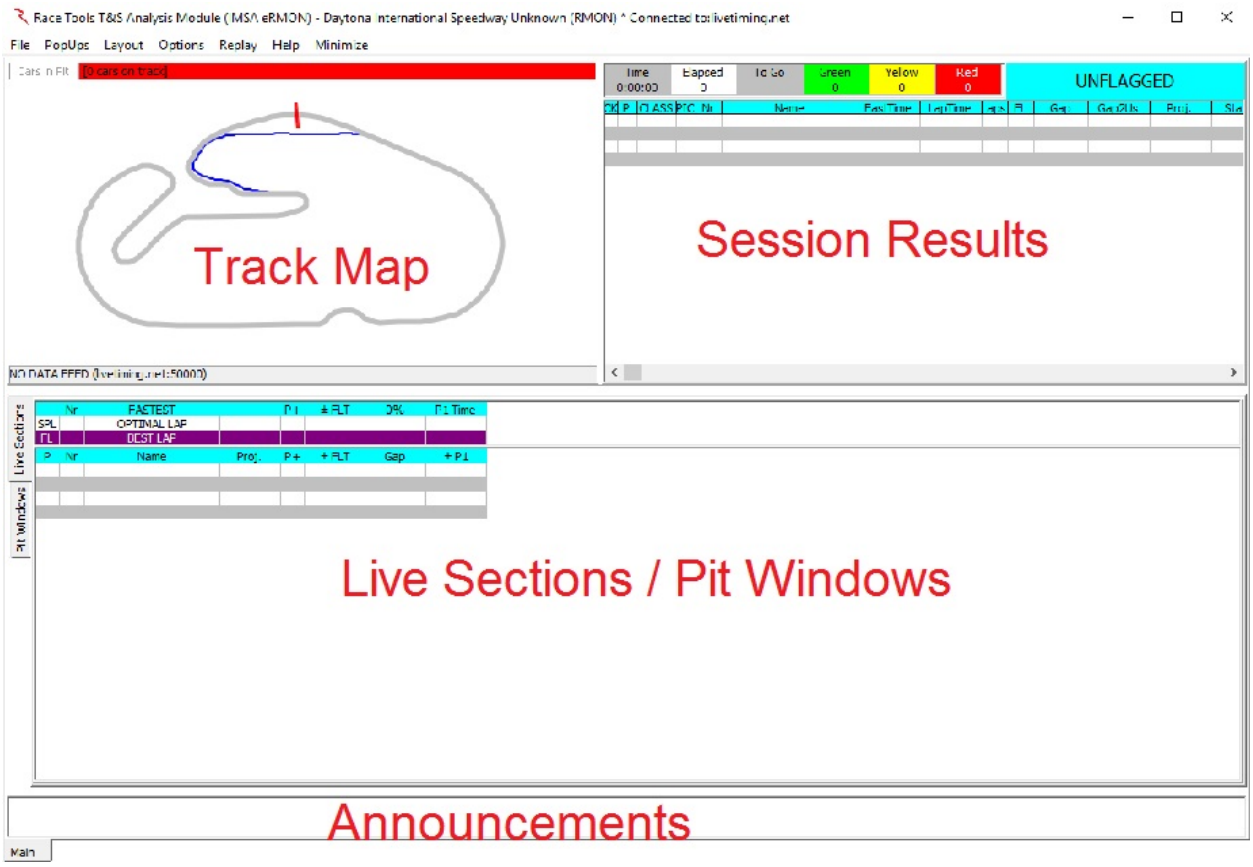
- Once these initial steps are completed, the software should load and be ready for use.

Note that a shortcut on the desktop is the easiest method to load the software. Simply right click the executable file and select "Create Shortcut" or "Send to Desktop" and place this on the desktop or location of choice.

Note: Some menu items are not applicable and will not be available in series that do not have multiple classes running together and do not have multiple drivers per car.

Software and Window Layout

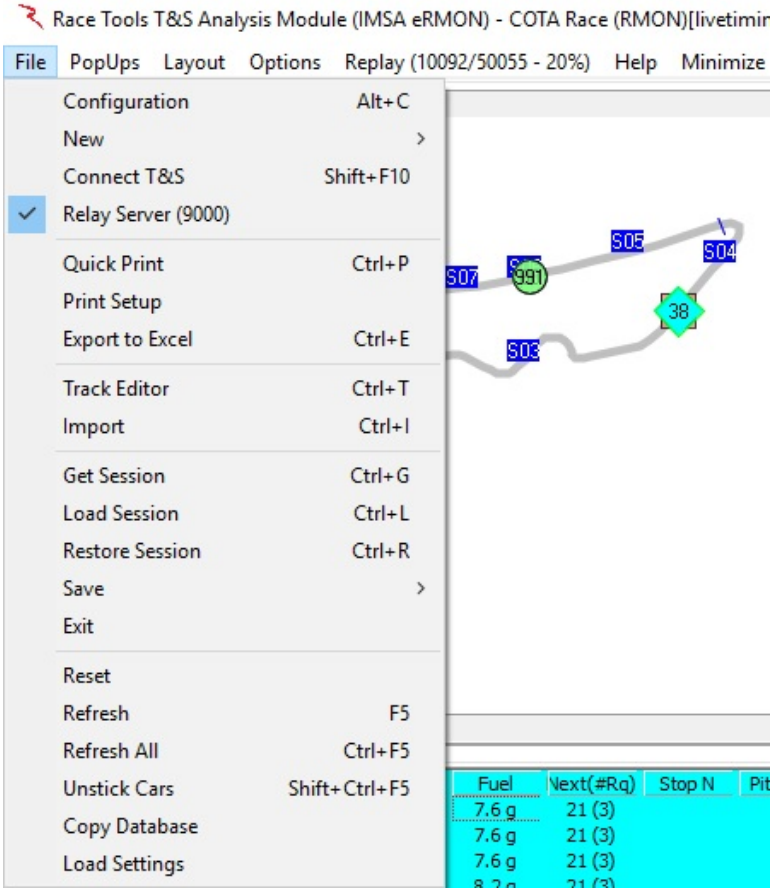
The layout consists of 4 distinct windows under the typical dropdown menus at the top left. The four windows will be referred to as the Track Map, Session Results, Live Sections/Pit Windows, and Announcements windows. Each section is labeled below.



Each section has its own distinct menus that can be accessed via right click. These will be explained later in the manual.

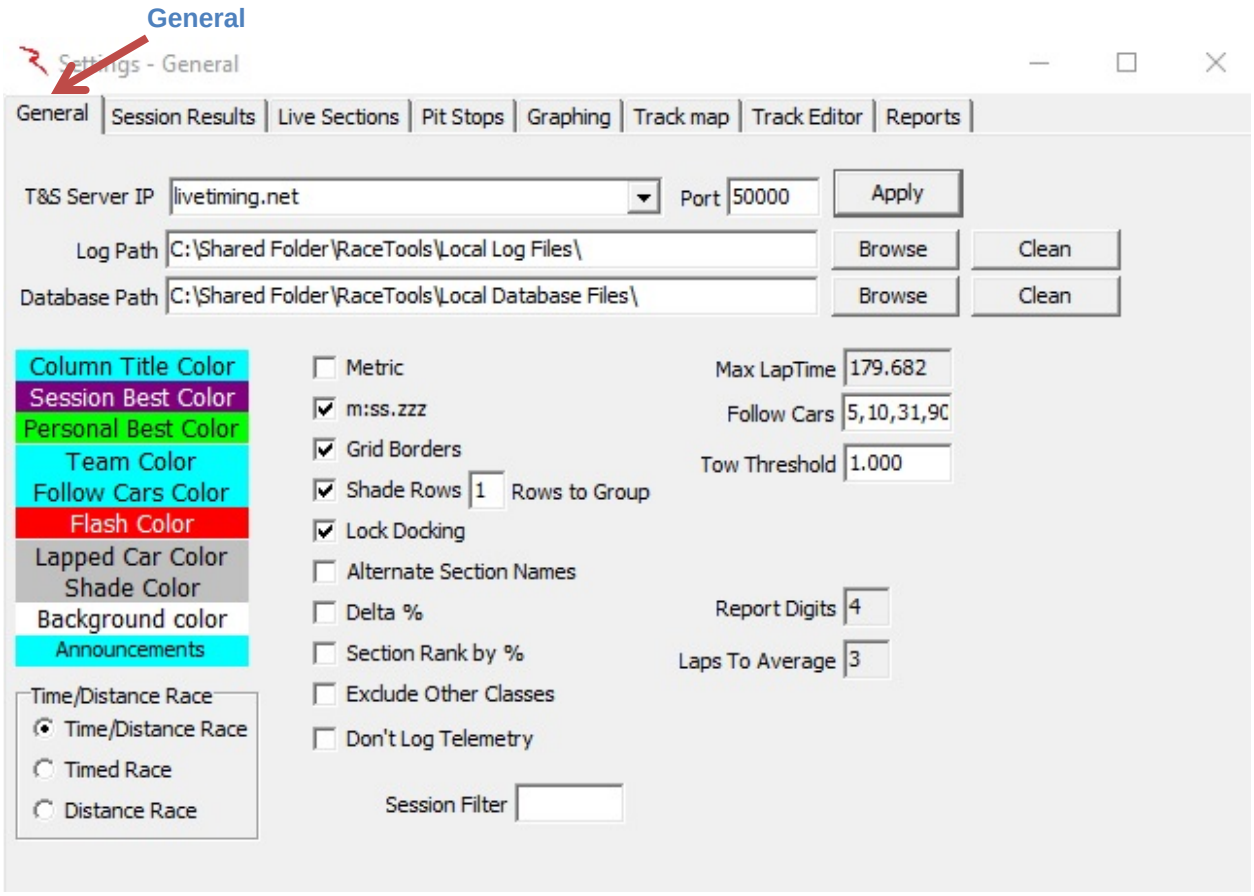
File

Clicking the "File" button opens a Menu with numerous functions.



Configuration (Alt+C)

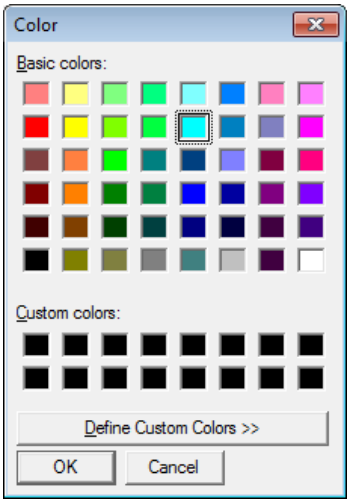
- To access the configuration settings for the software, select File↳ Configuration.
- The downloaded software should be configured to function with the current pit lane timing feed settings. NOTE: THE IP ADDRESS AND PORT NUMBER WILL BE DIFFERENT FOR EACH SERIES. Check with the 'Timing & Scoring' provider for your series to confirm the proper settings.
- NOTE: Hovering the mouse over an item will, in most cases, produce a screen tip with help on using the item.



- T&S Server IP – IP address or hostname of Timing and Scoring data feed.
- Port – Port number of Timing and Scoring data feed.
- Log Path – Where to save log or replay files. Used to replay sessions.
- Database Path – Where to store database or session files (used to reload sessions)
- Clean – Clean will delete old log files, and old session files.

In addition to setting the IP and port, the location of the software created log and database files can be set. When the software receives information from the pit lane timing feed, a log file that can be used for replay is automatically created and stored in the folder you specify. In addition, a database file is also created. This database file can also be loaded with the software, but does not allow for re-play. This will be explained in more detail later. Simply set the location by browsing to the appropriate folder(s).

The Column Title Color, Session Best Color, Personal Best Color, Team Color, Follow Cars Color, Flash Color, Lapped Car Color, Shade Color, Background Color, and Announcements color and font can be set by simply double-clicking the text of the desired parameter. Note that the parameter text in the configuration menu shows the current color configuration. Upon action, a color prompt will appear. Select the desired settings and press "OK•.



Example of color selection dialogs

- Column Title Color – the background color of the column headings for the Session Results and the Live Sections.
- Session Best Color – Used to highlight times that are P1 or Better.
- Personal Best Color – Used to highlight times that are personal best or better.
- Team Color – the color that the specified team car and corresponding rows of data will be colored for easy recognition (first car in the team cars list).
- Follow Cars Color – Used to highlight cars that are in the Follow Cars list.
- Flash Color – Used to highlight team car that needs to pit.
- Lapped Car Color – Used to highlight Lap/Gap fields of lapped cars during a race.
- Shade Color – Used to Shade even rows when Shade Rows option is enabled. Odd numbered rows use the background color.
- Background Color – Used to set the Application background color.
- Announcements – Announcements area changes to this color when new announcements are received.

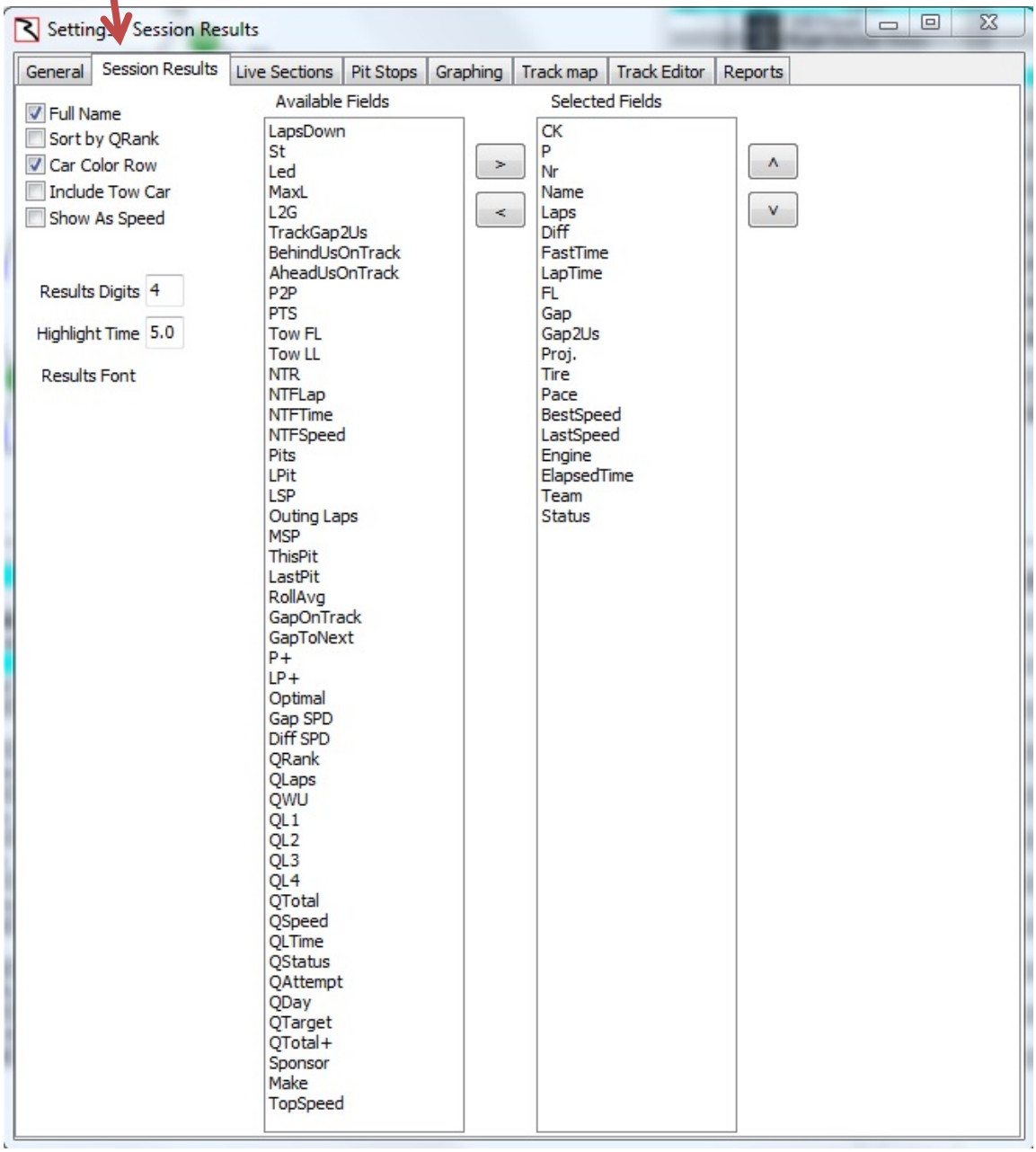
The remaining parameters allow setting formatting or calculation thresholds.

- Metric – Display distances and speeds in Metric (Km, Kph) instead of imperial units (mile, mph).
- m:ss:zzz – Display times in minutes and seconds (m:ss:zzz) instead of just seconds (s.zzz).
- Grid Borders – Draw lines to separate rows and columns in tables.
- Shade Rows – Shade even/odd rows in tables. Set Shade Color for even rows.
- Rows to Group – Number of rows to group for shading.

- Lock Docking – Disable docking and undocking.
- Alternate Section Names – Use user defined section names in place of standard section names.
- Delta % - Display Deltas as % instead of time or speed. Setting used in F1 – Best Splits and F4 – Best Lap reports.
- Section Rank by % - Rank Section Time Delta by % instead of time lost. Applies to Fastest Splits Summary and Track Map Analysis color coding. Default Rank by time shows where you are losing the most time, while Rank by % shows which sections you are most off the pace, regardless of the time lost.
- Exclude Other Classes – Exclude other classes when calculating session best times. Reports use class leader instead of overall leader for comparisons.
- Session Filter – Only process data for the specified session. Clear to disable filter.
- Max LapTime – Used to filter out slow laps from average calculations. Laptimes above Max Laptime are ignored for average laptime calculations.
- Follow Cars – Highlight comma delimited list of cars in reports. First car listed is the Team Car; others are highlighted in the reports using the Follow Cars Color.
- Tow Threshold – Seconds behind previous car to use to classify if the lap was tow assisted.
- Report Digits – Precision to display in reports.
- Laps To Average – Number of laps to use to calculate the Average Laptime used for calculating Laps To Go.

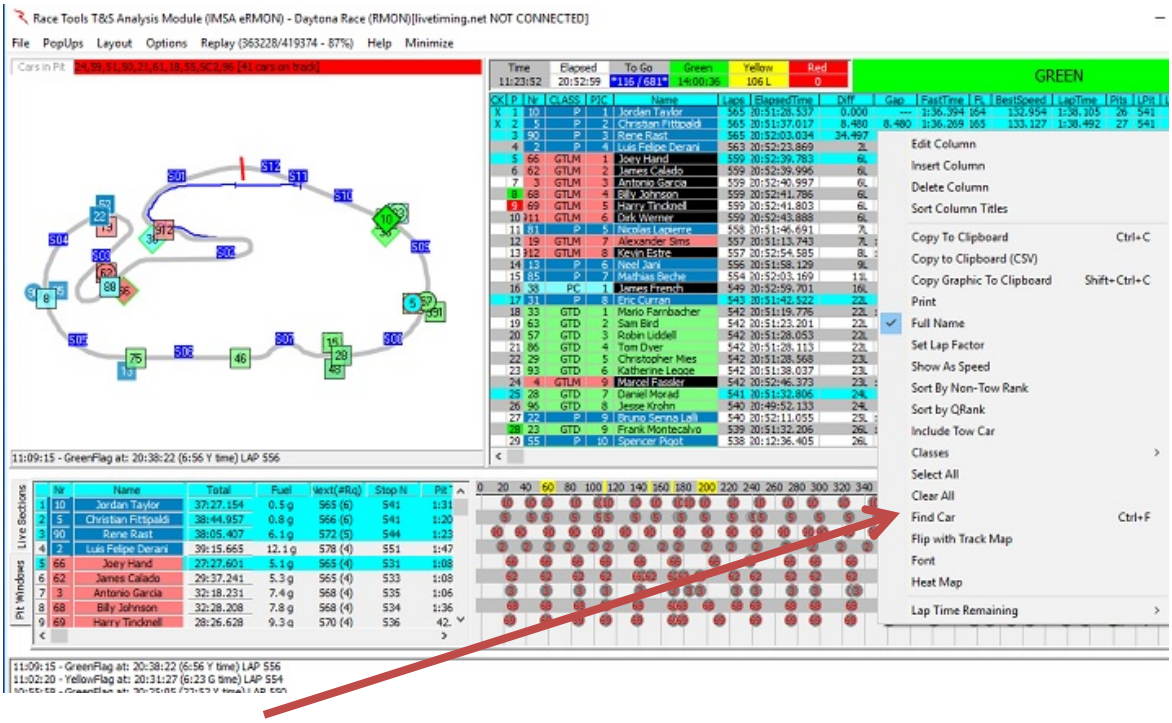
Session Results

The fields in the right side display in the "Session Results" portion of the program display. Cars are displayed in order of their standings in the session. You can add or subtract fields and arrange them in the order you prefer.

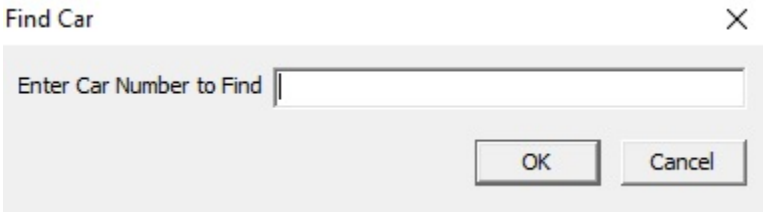


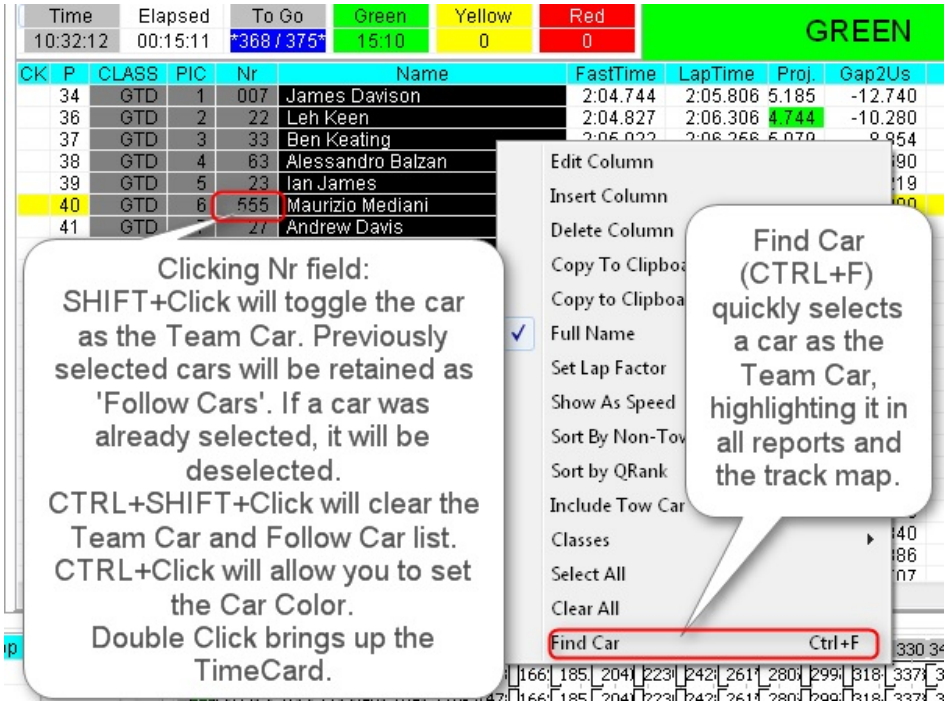
- Full Name – Display First and Last Name instead of First Initial and Last Name.
- Sort By QRank – Show competitors in Qualifying Rank order, overriding the default order.
- Car Color Row – Use Defined Car Color if available.
- Include Tow Car – Include car providing Tow in TowFL and TowLL columns.

- Show As Speed – Show times as Speed for fields that don't have corresponding Speed Columns, i.e. Pace, Proj and Q Lap time/speeds.
- Results Digits – Precision to display times in Results table.
- Highlight Time – Time in seconds to highlight a S/F crossing. Set to zero to disable.
- Results Font – Double Click to set the Results Font.
- Click here to see a list of the available fields and their descriptions, not all of which are applicable depending on the series, session type and track type.
- Click on the field in the program window to get a more detailed description of the field.



- Find Car - If you need to quickly find a car in the leaderboard or on track, you can quickly (and temporarily) set it as the 'TeamCar'. Select the 'Find Car' menu option (CTRL+F) and enter the Car Number that you want to set as the 'TeamCar'. This will highlight the car in all the reports including the track map.
- Enter Car numbers separated by a comma (11,54,65). The first car number will be the 'Team Car'.





Enhancements:

- When replaying a logfile, the Replay menu displays the progress (lines read / lines total - % complete). This helps provide feedback on whether the replay is in progress, paused or not active.

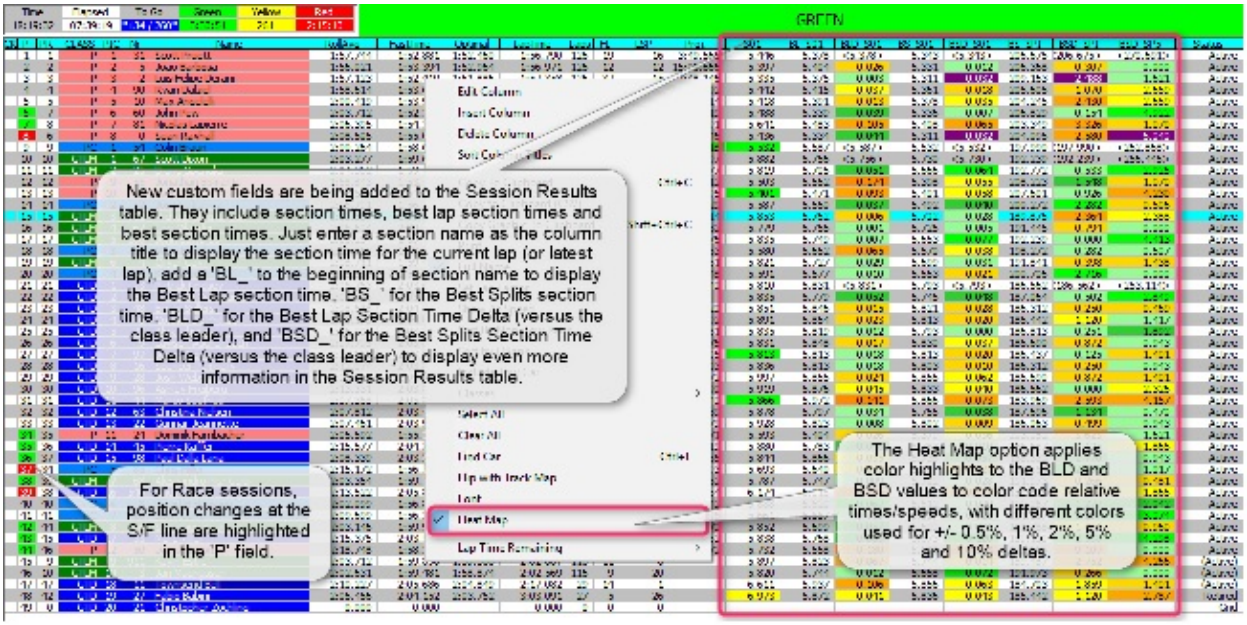
- 'Flip with Track Map' option added to Session Results popup menu to swap the positions of the track map and the Session Results.

- You can quickly select the 'Team Car' and add it to the Follow Cars list by SHIFT+Clicking the line in the Session Results table or use the 'Find Car' menu (CTRL+F, or type a numeric key with the Session Results table selected). The last car selected is added or moved to the front of the Follow Cars list (making it the primary team car to highlight on the track map and analysis). If the car was previously selected it is moved to the front of the list. To clear all of the cars from the list, enter an 'X' in the Find Car requestor. This allows you to quickly find a car in the results and/or on the track map.

- **Custom Fields in Session Results table:**
  - To bring more information to the main program window, I'm adding some custom fields that you can manually enter into the column field by using the Insert Column or Edit Column options. I consider these 'works in progress', but you will be able to add:
    - 1. Section Times/Speeds by entering the section name. If the field is defined as a speed trap, then it will be displayed as SPEED. Otherwise it will be displayed as time.
    - 2. Best Lap Section Times by entering 'BL_'+<sectionname> (i.e. '**BL_S01'**). This will display the section time for the competitor's best lap.

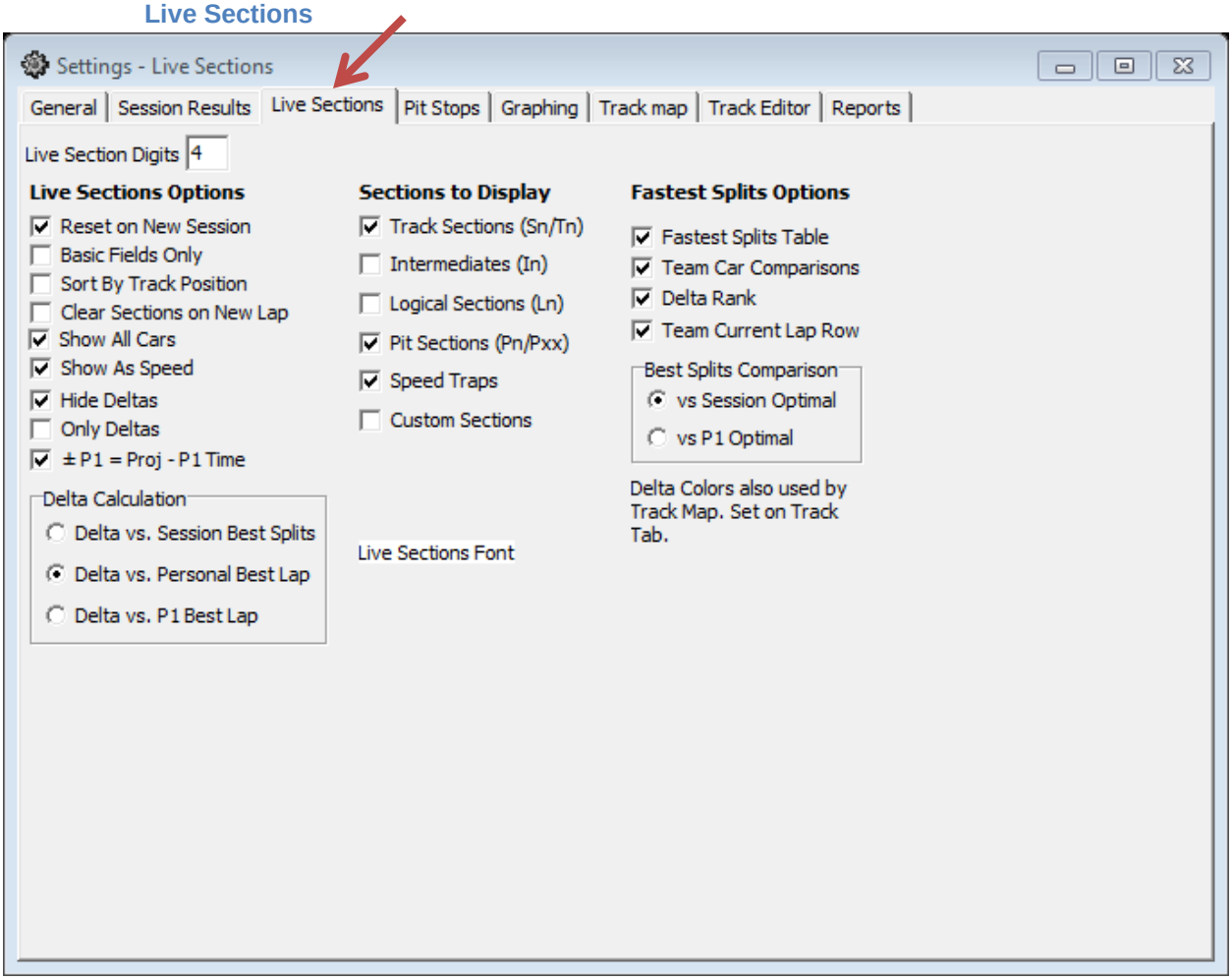
- 3. Best Splits Section Time by entering 'BS_'+<sectionname> (i.e. '**BS_S01'**). This will display the best section time for the competitor.
- 4. Best Lap Section Time Delta by entering 'BLD_'+<sectionname> (i.e. '**BLD_S01**'). For the class leader, it will display the Best Lap Section time. For all others, it will display the delta to the class leader, which may be greater than (longer time, slower) or less than zero (shorter time, faster).
- 5. Best Splits Section Time Delta by entering 'BSD_'+<sectionname> (i.e. '**BSD_S01**'). For the class leader, it will display the Best Section time. For all others, it will display the delta to the class leader, which may be greater than (longer time, slower) or less than zero (shorter time, faster).
- 6. Previous Rank by entering '**PR**'. This will display the competitor's rank at the last S/F crossing and is used to highlight improvements (P column green) or decline (P column red) in position.

- **Heat Map:**
  - To make it easier to identify faster/slower section times, the Section Time Delta fields defined above are color coded when the 'Heat Map' option is enabled. The colors below are subject to change.



There are now two 'Refresh' options. The default Refresh (F5) option refreshes the data, sorting the competitors, leaderboard, etc. but no longer resizes the Session Results columns. To auto resize the Session Results columns (and do a data refresh) you now need to use the Refresh All (CTRL+F5) option.

Live Sections



Live Sections Options

- Reset on New Session – Reset columns on new session. Automatically adjusts for any changes in track configuration between sessions.
- Basic Fields Only – Only display a subset of the Live Sections Columns.
- Sort By Track Position – List competitors based on track position instead of rank.
- Clear Sections on New Lap – Clear section times with each new lap instead of keeping old section times visible. Current section times underlined in blue if disabled.
- Show All Cars – Show all cars even if a subset is selected.
- Show As Speed – Show as speed instead of time. (Especially useful for Oval track races.)
- Hide Deltas – Hide section Delta columns.
- Only Deltas – Show only Delta times, hide section times.

- ±P1 = Proj – P1 Time – Calculate ± P1 using projected laptime instead of comparing time to line versus P1's best lap.
- Delta vs. Session Best Splits – Select type of Delta to display.
- Delta vs. Personal Best Lap – Select type of Delta to display.
- Delta vs. P1 Best Lap – Select type of Delta to display. Also applies to how Live Sections are highlighted, compared to best laps or best splits.

Sections to Display

- Track Sections (Sn/Tn) – Display physical track sections. Use Track Editor to view/edit section types.
- Intermediates (In) – Display Intermediate track sections (grouped physical sections to reduce the number of sections to analyze). Use Track Editor to view/edit section types.
- Logical Sections (Ln) – Display Logical Sections. Use Track Editor to view/edit section types.
- Pit Sections (Pn/Pxx) – Display Pit Lane sections. Use Track Editor to view/edit section types.
- Speed Traps – Display speed traps. Use Track Editor to view/edit section types.
- Custom Sections – Display user defined sections. Use Track Editor to view/edit section types.

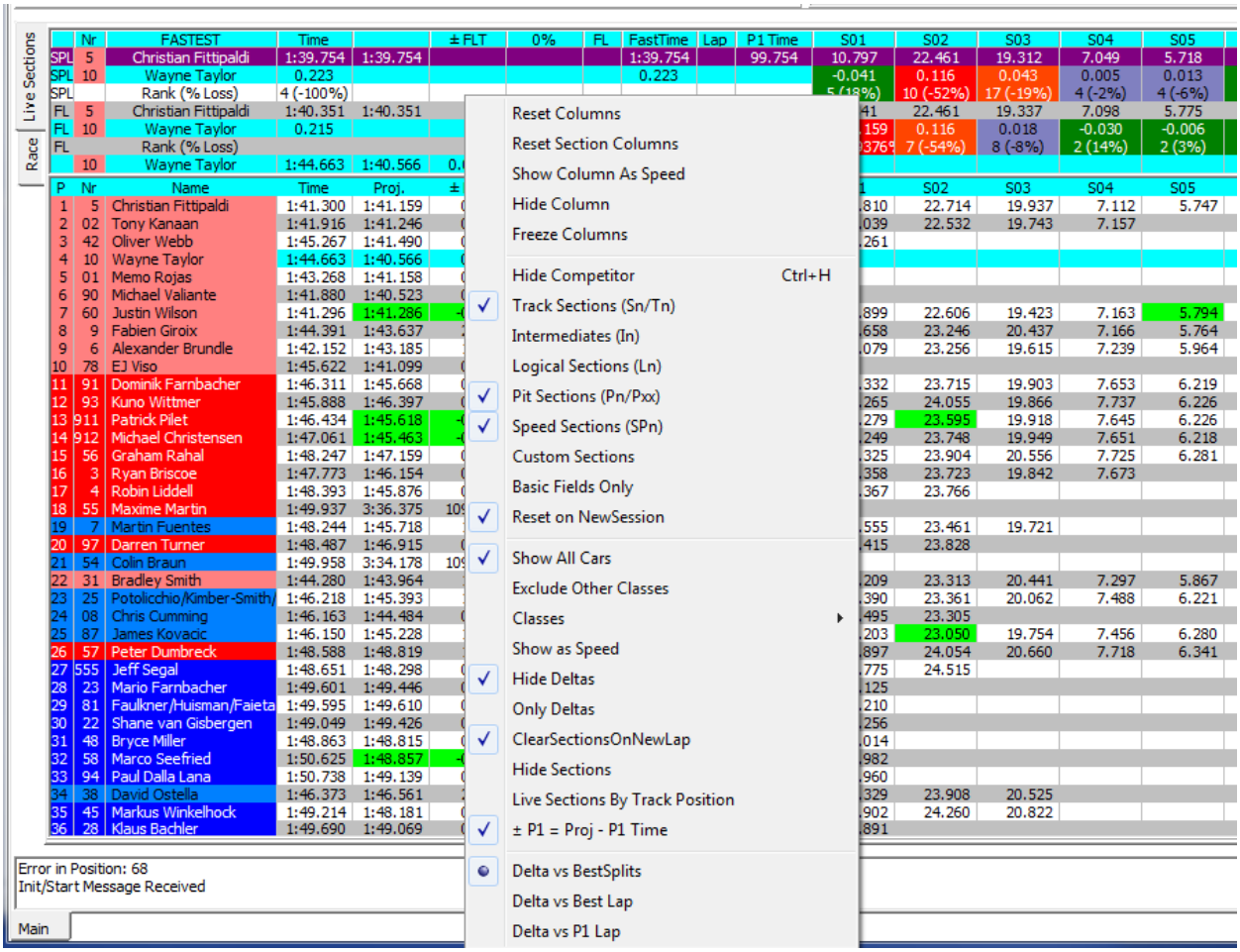
Fastest Splits Options

- Fastest Splits Table – Display Fastest Splits summary above Live Sections table.
- Team Car Comparisons – Display Team Car rows in Fastest Splits Summary Table.
- Delta Rank – Display Team Car's Optimal and Fast Lap delta and rank for each section.
- Team Current Lap Row – Display Team Car's current lap section deltas versus comparison lap.
- Best Splits Comparison – vs. Session Optimal – vs. P1 Optimal – Define Best Splits to display, either the session's optimal lap or P1's optimal lap.

NOTE: The top of the Live Sections table has been enhanced with more analysis information. The top three rows are for the 'Best Splits' (SPL), with the top row being the Optimal Lap (best splits for all competitors in session if the vs Session Optimal option is selected) or Best Splits for P1 (if the 'vs P1 Optimal' is selected). The second row is the team car's optimal lap information. The section times are deltas Row 1. The third row is the Section Rank and % lost or gained, just like in the track maps. These also support the same color coding as the track maps to highlight the sections where the most time is lost. If you do not want these sections highlighted, set DeltaR1=DeltaR2=DeltaR3=DeltaR.

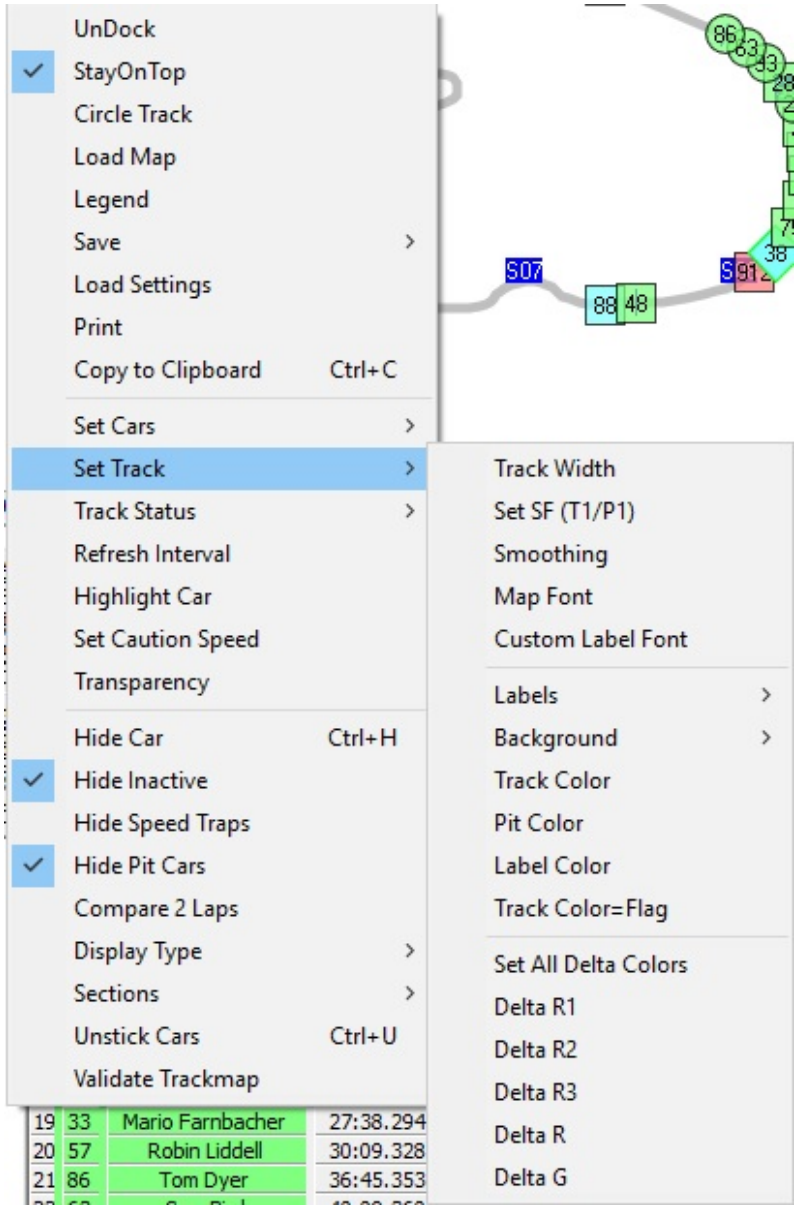
The next three rows are for the 'Fast Lap' (FL), with the first row (Row 4) being the session's fastest lap, the second row is the team car's fastest lap, and the third row is the team's section rank and % time lost or gained.

The last row is the 'Live Section' for the team car. It is almost identical to the Live Sections table below except that we display the section deltas instead of section times and section deltas are highlighted green if the section is faster than the team's best lap.
You can hide the Rank (% Loss) rows (Rows 3 and 6) with the popup menu 'Hide Delta Rank' option. If no team cars are selected, the Team and Rank rows (Rows 2, 3, 5, 6, and 7) will be hidden. You can hide the whole top table using the main menu Options/Hide Fastest Splits option.

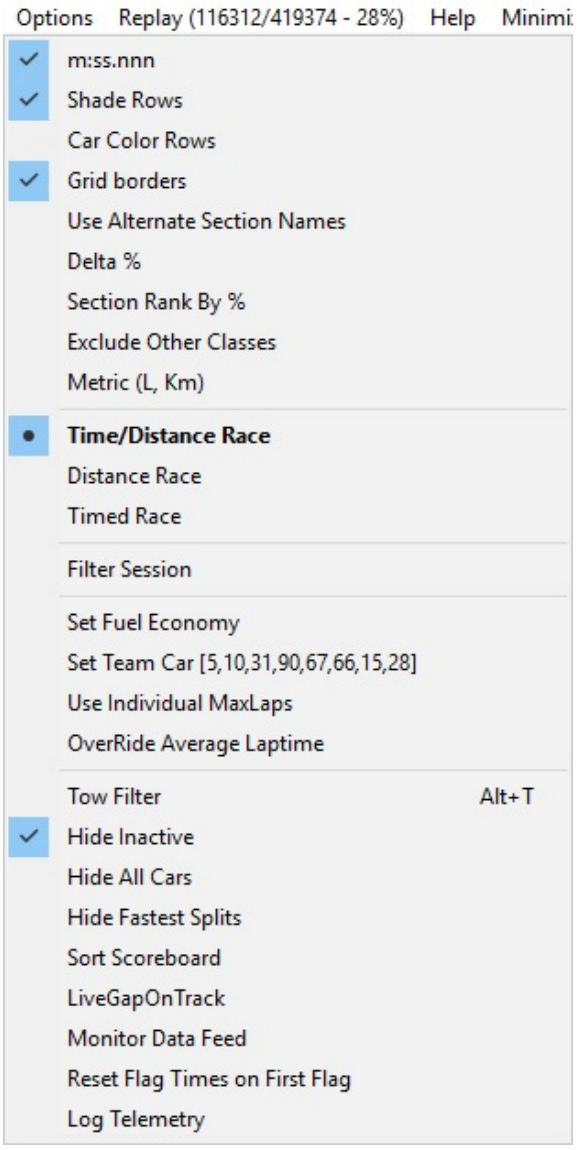


In the example, I have selected Car 10 (click the 'CK' column in the Session Results table for the car and an 'X' will mark the selected cars) and disabled the 'Show All Cars' popup menu option. Note that if no cars are selected, the 'Show All Cars' will be enabled which means at the start of each session, before cars are in the table, the 'Show All Cars' will be re-enabled since no cars can be selected. This allows you to reduce the height of the window if you only want to see section data for your own car(s).

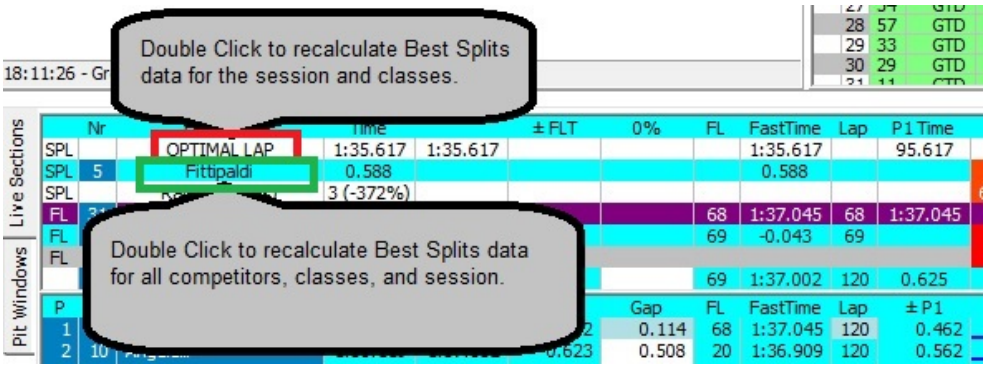
You set these colors with the new DeltaR1, DeltaR2, DeltaR3, DeltaR and DeltaG menu items found on the Track Map popup menu. The 'Set All Delta Colors' option prompts for all 5 colors consecutively if you want to review or change all of them.



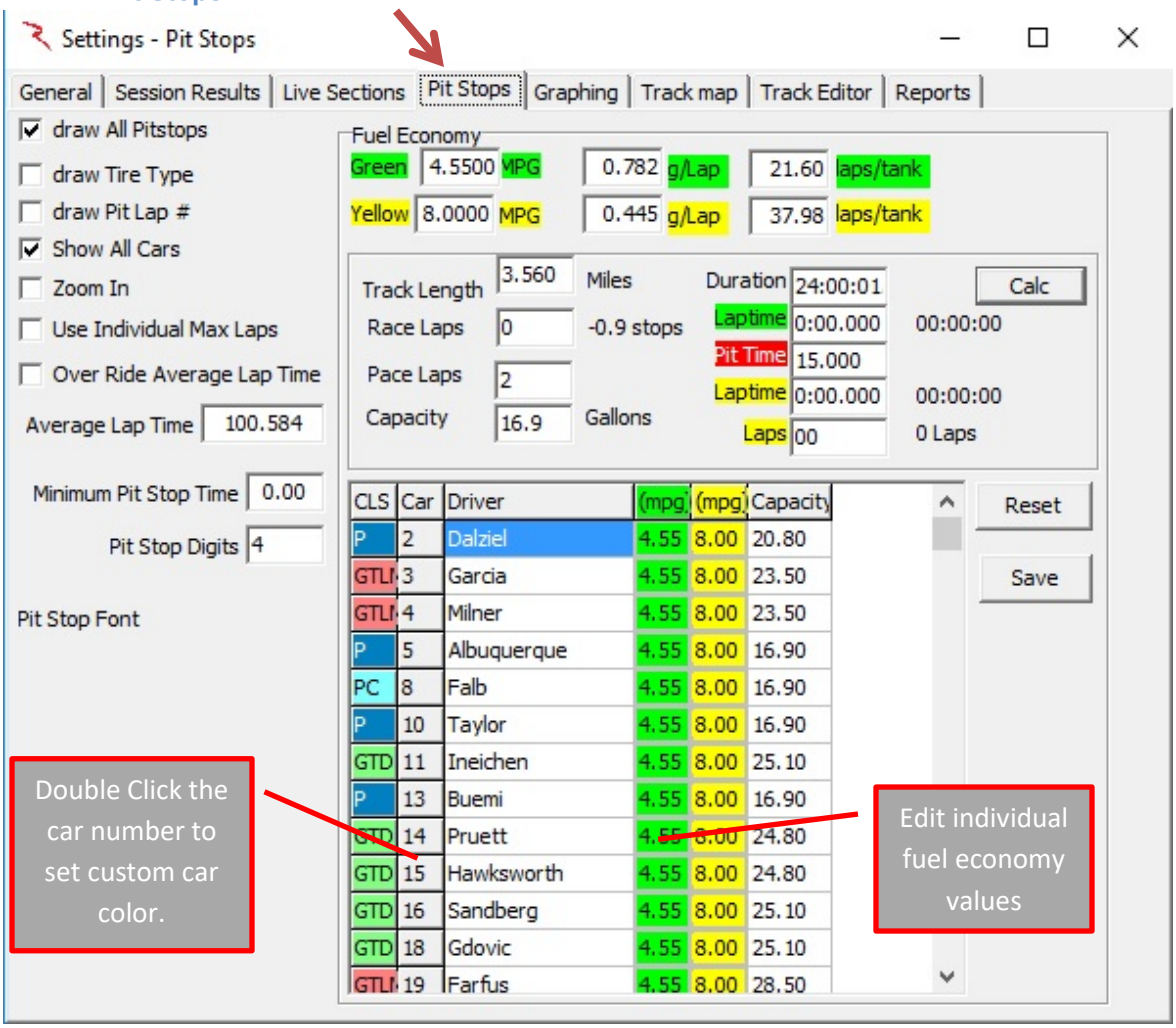
You can hide the top section completely with the 'Hide Fastest Splits' menu option in the 'Options' dropdown menu, shown below.



You can force RaceTools to recalculate the BestSplits (optimal lap) for all competitors and classes by double clicking the 'Optimal Lap' label in the Fastest Splits table. This may be required if class numbers change during a session which sometimes occurs during qualifying.



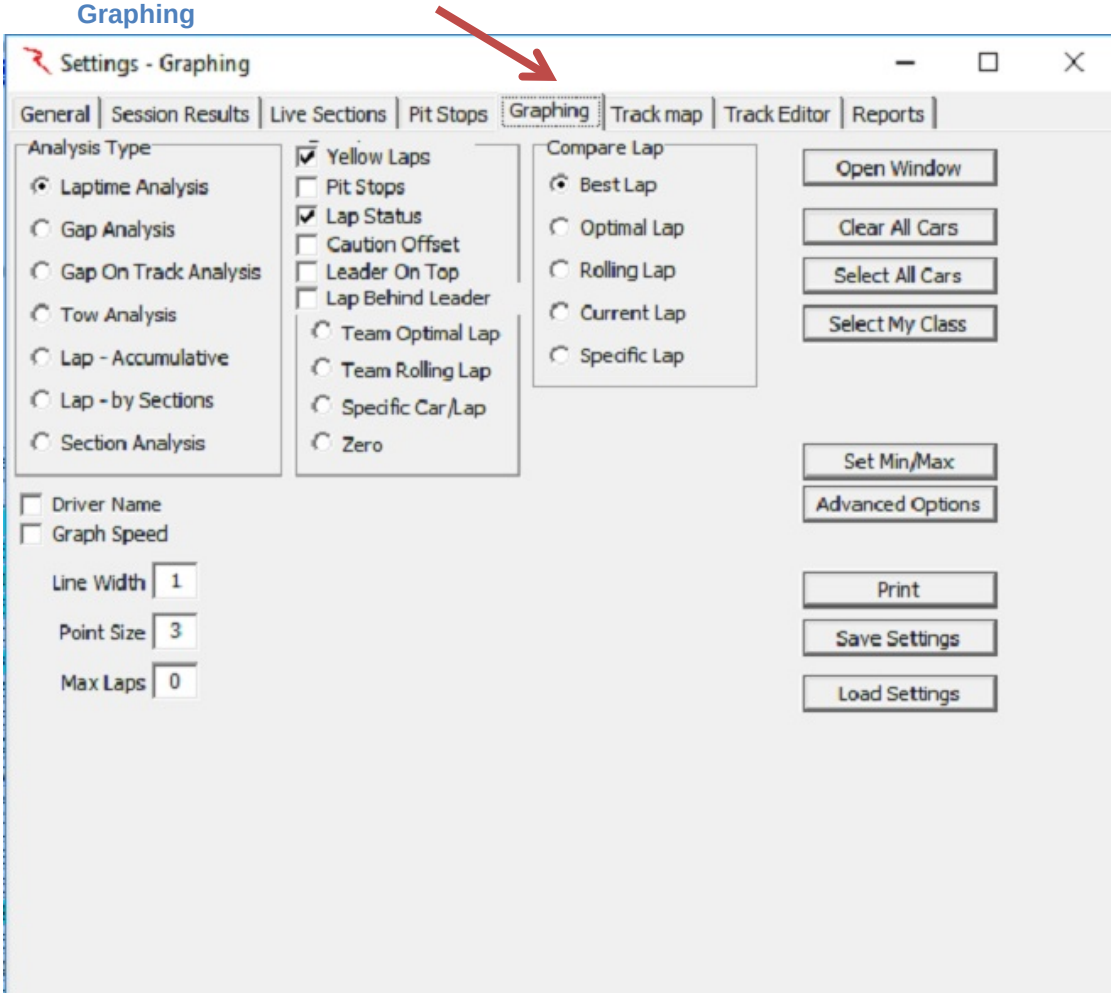
Pit Stops



- Draw All Pit Stops – Render all pit stops in Pit Stop Window graph.
- Draw Tire Type – Render Tire Type for each stint.
- Draw Pit Lap # - Render Lap Pitted instead of Car Number for each pit stop.
- Show All Cars – Show All Competitors even if a subset is selected.
- Zoom In – Only include laps 1 ½ pit windows before and 2 pit windows after the Team Car's current lap. Useful for endurance races with many pit stops.
- Use Individual Max Laps – Use individual Max Laps (laps to go) to calculate pit windows instead of the leader's Max Laps/Laps to Go.
- Over Ride Average Lap Time – Use custom average lap time to calculate TEAM Laps To Go (and pit windows) instead of rolling Green Lap average. Only applicable for times sessions.

- Average Lap Time – Average Lap Time to use instead of the Rolling Green Lap Average when 'Over Ride Average Lap Time' is enabled. Used for calculating Laps to Go and Pit Windows. Double click to reset to current Rolling Average.
- Minimum Pit Stop Time – Set minimum pit lane time for a stop. Pit times below this threshold are treated as a drive through and the fuel counter is not reset. This value is used in the Pit Lane Monitor CountDown display (for events that require a minimum pit stop time) and to exclude 'invalid' or 'non-service' pit stops from Pit Window calculations.
- Pit Stop Digits – Number of digits to display for pit stop times.
- Green MPG – Green Lap Fuel Economy.
- Yellow MPG – Yellow Lap Fuel Economy.
- g/lap – Amount of fuel used per Green Lap.
- g/lap – Amount of fuel used per Yellow Lap.
- laps/tank – Number of Green Laps possible per tank of fuel.
- laps/tank – Number of Yellow Laps possible per tank of fuel.
- Track Length Miles – Track Length. Will be updated via data feed where available.
- Race Laps – Distance of race in laps.
- Pace Laps – Number of Pace Laps. Used to calculate fuel used.
- Capacity Gallons – Car fuel tank capacity. Used to determine laps per tank and pit windows.
- Duration – Duration of race for Timed races. Used to calculate pit windows before the race.
- Laptime 00:00:000 – Average Green laptime. Used to calculate pit windows before the race.
- Pit Time – Time lost for pit stop. Used to calculate pit windows before the race.
- Laptime 00:00:000 – Average Yellow laptime. Used to calculate pit windows before the race.
- Laps – Number of Yellow laps anticipated. Used to calculate pit windows before the race.
- Calc – Calculate Pit Windows based on entered values. Used before the race to calculate pit windows.
- Reset – Apply Fuel Economy to all cars in the list, set as default.
- Save – Apply and Save Fuel Economy changes.

Graphing



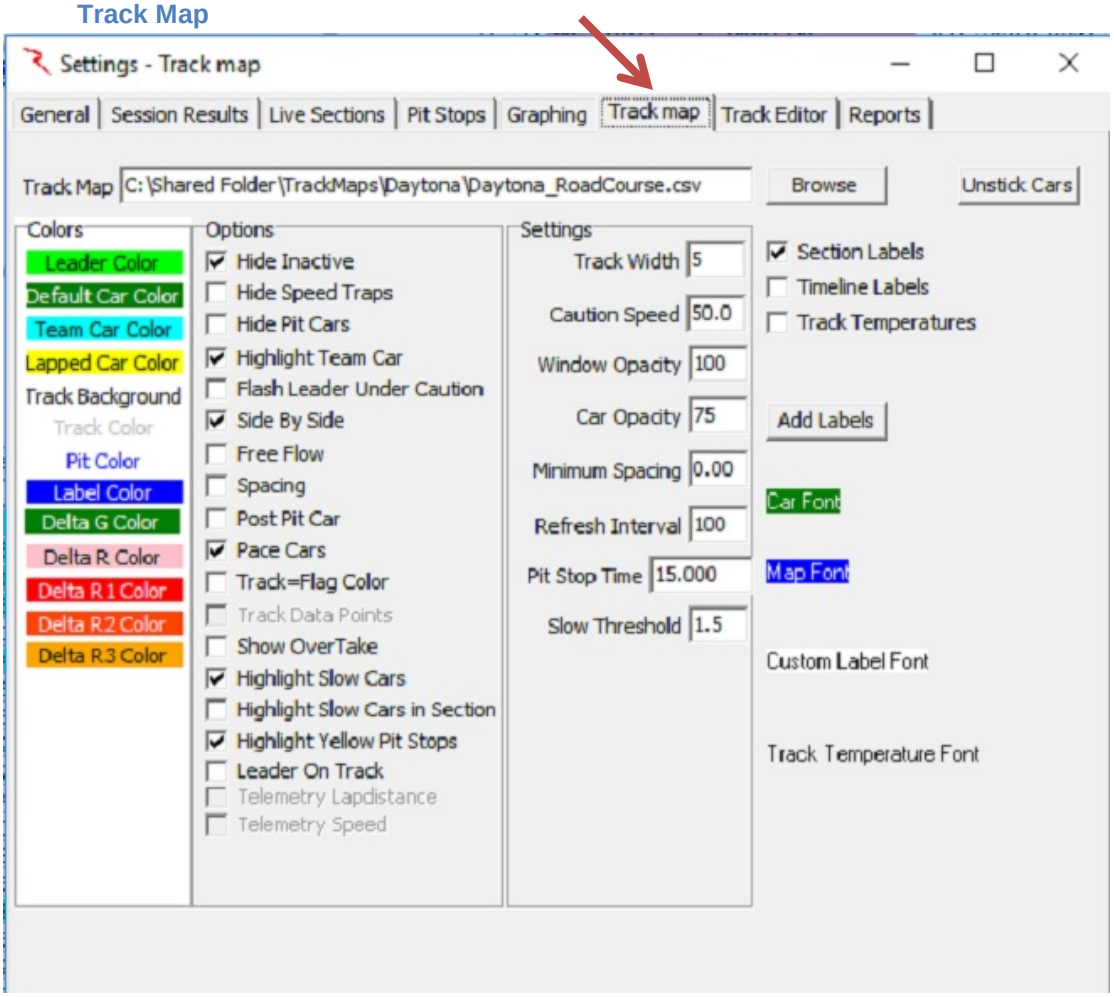
Analysis Type – Select from the list the type of graph you would like to create.

- Laptime Analysis
- Gap Analysis
- Gap On Track Analysis
- Tow Analysis
- Lap- Accumulative
- Lap – by Sections
- Section Analysis

- Driver Name – Display Driver Name in the legend.
- Graph Speed – Graph Speed instead of Time.
- Yellow Laps – Render Yellow Laps with a yellow line.
- Pit Stops – Render Pit Stops with red line/point.

- Lap Status – Render Lap Status (Yellow Laps) in background to identify caution laps.
- Vs. Time Of Day – Use TOD for x axis instead of lap number.
- Exclude Tow – Exclude Tow Laps from analysis.
- Sort By Time – Render times sorted by time instead of lap number or TOD.
- Open Window – Open Graph Popup Window.
- Clear All Cars – Clear all cars from graph. Use to reset car selection.
- Select All Cars – Select all cars to analyze.
- Select My Class – Select all cars in my class to analyze.
- Set Min/Max – Set Y axis maximum and minimum values.
- Advanced Options – Open Chart Editor to access advanced Chart properties.
- Print – Print Graph.
- Save Settings – Save Advanced Graph properties to a file.
- Load Settings – Load Advanced Options settings previously saved with Save Settings.

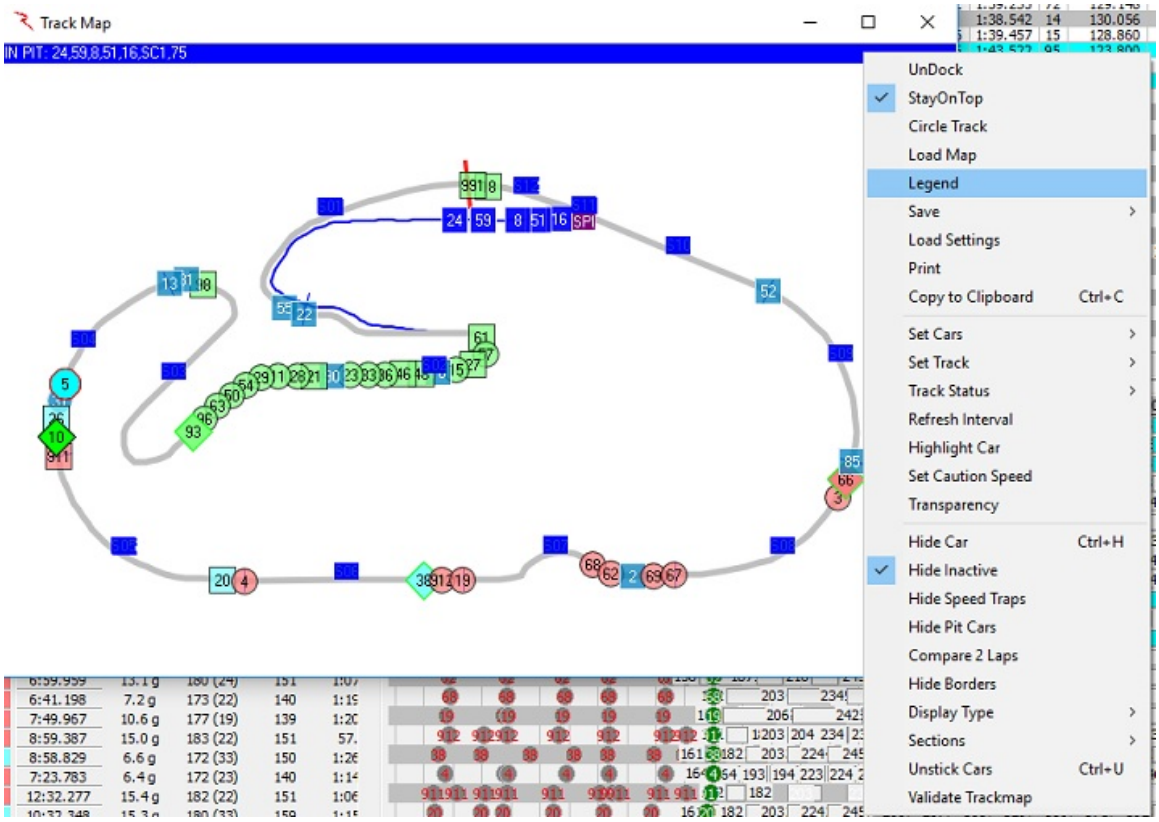
Track Map



- Track Map – Use the Browse button to find and load the Track Map.
- Colors – Double click on the items in the list to select or change the color of the selected item. Items are rendered in these colors on the Track Map.
- Hide Inactive – Hide Inactive cars (cars that have not had a line crossing for more than 3 laps. Hide Inactive option does not remove the car from the results or analysis, just from the track map and running order. The car's status will be set to '(Active)' to differentiate it from 'Active'. The will still be visible in the session results table and all of the reports.
- Hide Speed Traps – Don't render Speed Traps.
- Hide Pit Cars – Don't render cars in Pit Lane.
- Highlight Team Car – Render Team Car opaque and flash outline to help quickly identify the Team Car on the Track Map.
- Flash Leader Under Caution – Flash leader Car outline to help quickly identify the leader during a caution.

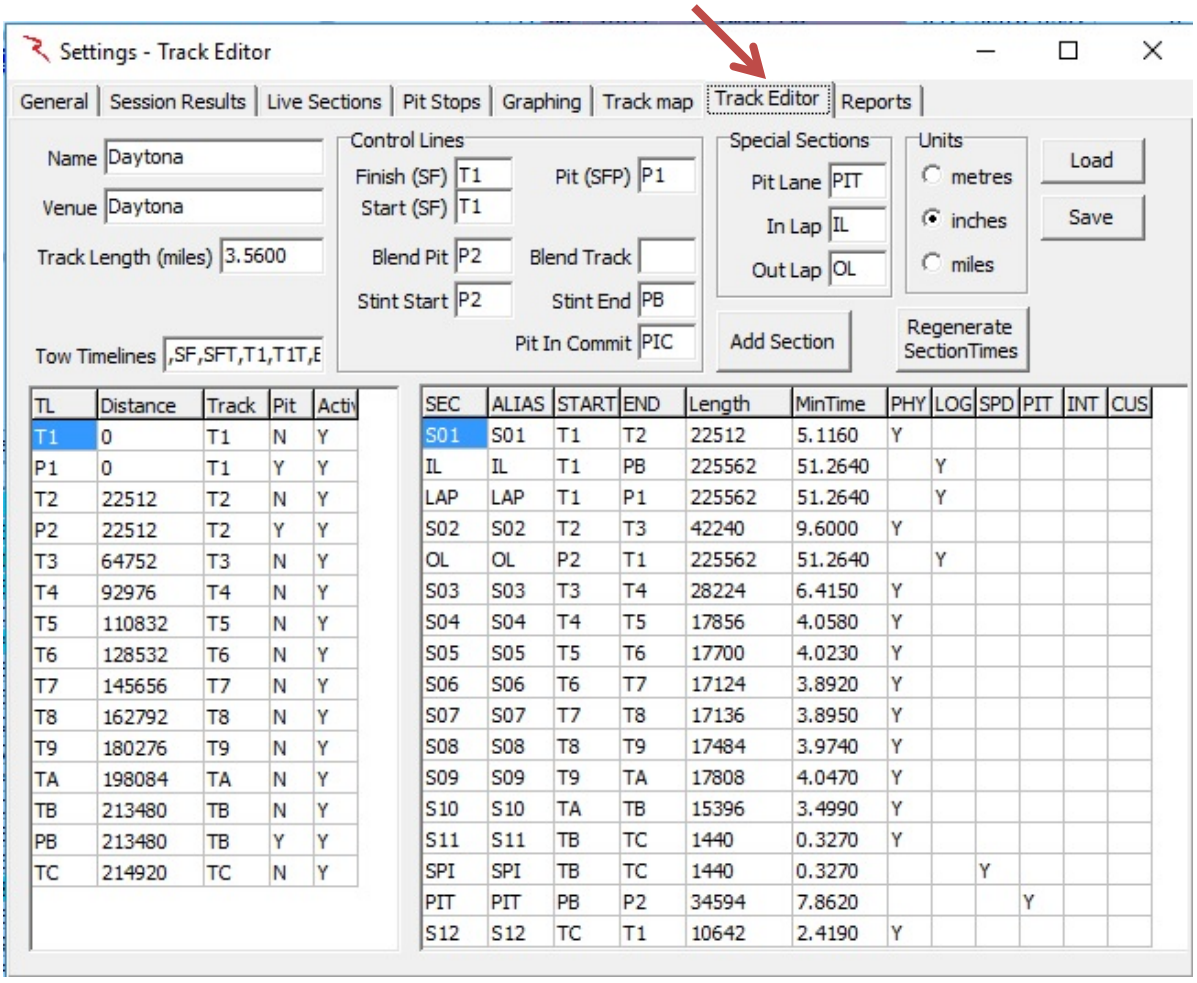
- Side By Side – Render 3 cars wide on Track Map. Useful on ovals when cars are running close together.
- Free Flow – Allow projected track positions to pass cars between timelines. Used in RIS version.
- Spacing – Render cars with a gap between cars to help identify cars close together.
- Post Pit Car – Draw where Team Car will be after a pit stop. The marker is rendered Pit Stop Time behind the Team Car.
- Pace Cars – Include Pace Car if available.
- Track =Flag Color – Render Track in the same color as the Flag.
- Track Data Points – Don't clear trackmap between updates. Leaves a trail of cars.
- Show Over Table – Highlight cars (Green with Red outline) when 'OverTake' activated.
- Track Width – Width of track outline.
- Caution Speed – Default caution speed. Calculate track position using this speed when under caution.
- Window Opacity – Window opacity when track is undocked.
- Car Opacity – Render car with transparency. Useful for being able to see below the other cars when cars are running close together. 100=opaque, 0=invisible.
- Minimum Spacing – Minimum space between cars rendered on track.
- Refresh interval – Interval in ms between trackmap updates. Default in 100ms (10Hz).
- Pit Stop Time – Time lost due to pit stop, including inlap, pit stop, and outlap compared to a regular lap. Used to draw the Post Pit Car.
- Slow Threshold – Threshold for cars slow in completing a section.
- Section Labels – Show section labels on track map.
- Timeline Labels – Show timeline labels on track map.
- Add Labels – Add Custom Labels to track map. Use to number corners or other features.
- Car Font – Double Click to set Car Number Font for track map.
- Map Font - Double Click to set Map Standard Label Font used for section and time line labels for track map.

- Custom Label Font – Double Click to set Map Custom Label font.



Track Editor

Track Editor – In the event that a supplied track .csv file needs modification, or of the user desires to apply aliases to the track sections, the track editor can be used to change editable parameters such as distances, Start/Finish Codes, min split times, split numbers, etc. See example of Daytona below. Note that at some road/street courses, the Finish, Start, and/or Pit Control lines might not be •SF•/•SFP• for some practice and qualifying sessions. Confirm Control Lines with the track map.



TL	Distance	Track	Pit	Acti
T1	0	T1	N	Y
P1	0	T1	Y	Y
T2	22512	T2	N	Y
P2	22512	T2	Y	Y
T3	64752	T3	N	Y
T4	92976	T4	N	Y
T5	110832	T5	N	Y
T6	128532	T6	N	Y
T7	145656	T7	N	Y
T8	162792	T8	N	Y
T9	180276	T9	N	Y
TA	198084	TA	N	Y
TB	213480	TB	N	Y
PB	213480	TB	Y	Y
TC	214920	TC	N	Y

SEC	ALIAS	START	END	Length	MinTime	PHY	LOG	SPD	PIT	INT	CUS
S01	S01	T1	T2	22512	5.1160	Y					
IL	IL	T1	PB	225562	51.2640		Y				
LAP	LAP	T1	P1	225562	51.2640		Y				
S02	S02	T2	T3	42240	9.6000	Y					
OL	OL	P2	T1	225562	51.2640		Y				
S03	S03	T3	T4	28224	6.4150	Y					
S04	S04	T4	T5	17856	4.0580	Y					
S05	S05	T5	T6	17700	4.0230	Y					
S06	S06	T6	T7	17124	3.8920	Y					
S07	S07	T7	T8	17136	3.8950	Y					
S08	S08	T8	T9	17484	3.9740	Y					
S09	S09	T9	TA	17808	4.0470	Y					
S10	S10	TA	TB	15396	3.4990	Y					
S11	S11	TB	TC	1440	0.3270	Y					
SPI	SPI	TB	TC	1440	0.3270			Y			
PIT	PIT	PB	P2	34594	7.8620				Y		
S12	S12	TC	T1	10642	2.4190	Y					

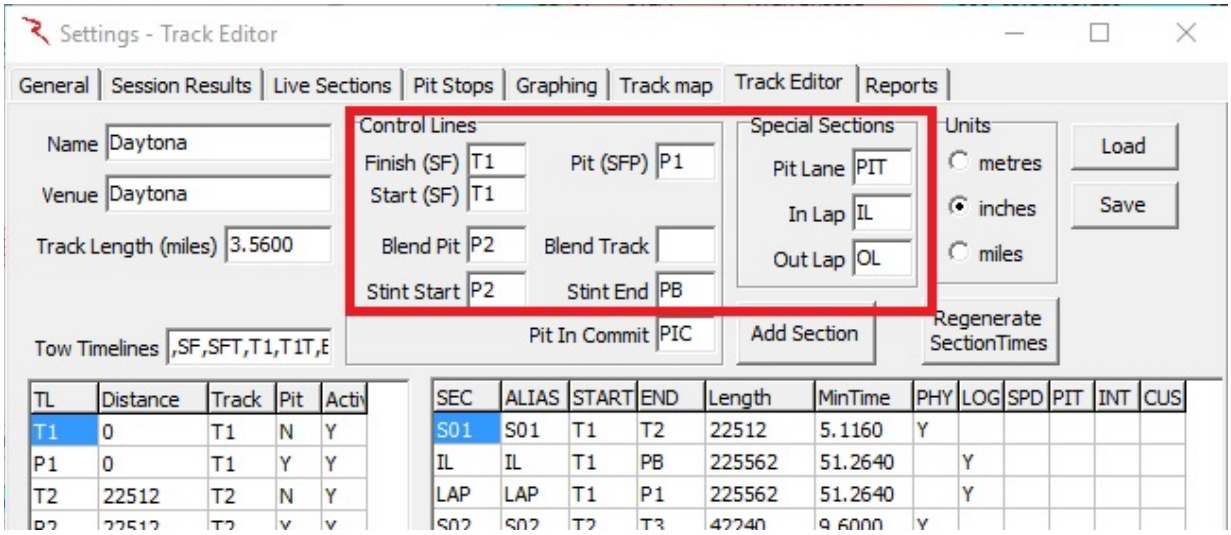
- Name – Track Name, updated with data feed when available.
- Venue -Venue Name, updated with data feed when available.
- Track Length (miles) - Track Length, updated with data feed when available.
- Tow Timelines – Tow Timelines, updated with data feed when available.
- Track TimeLine and Section tables are updated with data feed when available. You will use information from these tables to fill in the boxes under Control Lines and Special Sections. This is very Important since this data will be used in compiling various reports and graphs.
- Finish (SF) – Finish Line label. VERY IMPORTANT.

- Start (SF) – Start Line label, usually the same as Finish Line unless there is a remote start line.
- Blend Pit – Pit Lane Blend Line.
- Stint Start – Stint Start Line.
- Pit (SFP0 – Pit Lane S/F Line. If Pit Lane does not cross SF Line, use SF line.
- Blend Track – Track Blend Line.
- Pit Lane – Pit Lane Section from Pit-In to Pit-Out. See section table for details.
- In Lap – In Lap section from SF to Pit-In. See section for details.
- Out Lap – Out Lap Section from Pit-Out to SF line.
- Units – Units to use in Timeline and Section tables.
- Add Section – Add Custom Section. Group Physical Sections into other sections for analysis.
- Regenerate Section Times – Recalculate all section times using line crossing data. Automatically called when adding or deleting sections.
- Load – Load track configuration.
- Save – Save and apply track configuration.

NOTE: The Track Configuration for IMSA should always be Finish (SF) = 'T1', Pit (SFP) = 'P1', Start (SF)='T1', Pit Lane='PIT', In Lap='IL', and Out Lap='OL'.

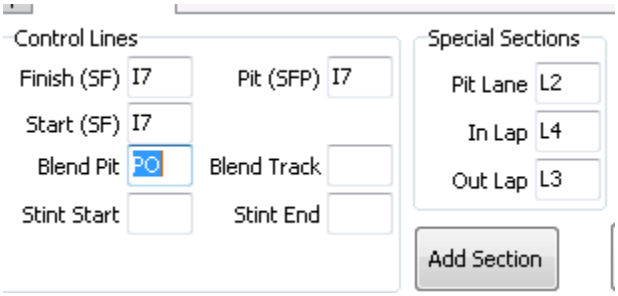
Long Beach Track Map Notes

IMSA teams should use the LongBeach_IMSA track map. Make sure the Track Definition is set up correctly. Specifically, make sure that the SF/SFP lines are set to T1 and P1 respectively and that the Pit Section is 'PIT', the In Lap is 'IL' and the Out Lap is 'OL'.

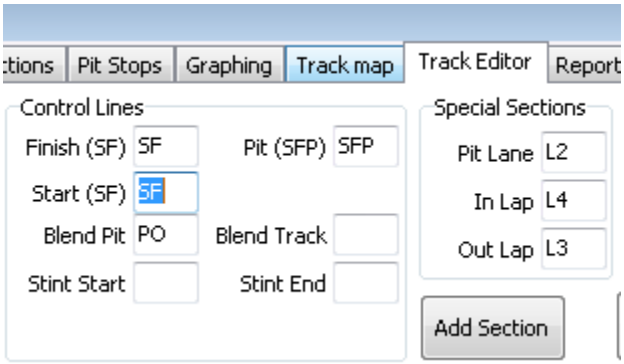


INDYCAR teams should use the LongBeach_PQ map for Practice/Qualifying sessions and the Long Beach map for the final practice and race. The SF/SFP line should be I7/I7 for the PQ map and SF/SFP for the race map. The Pit Section is 'L2', In Lap is 'L4' and Out Lap is 'L3'.

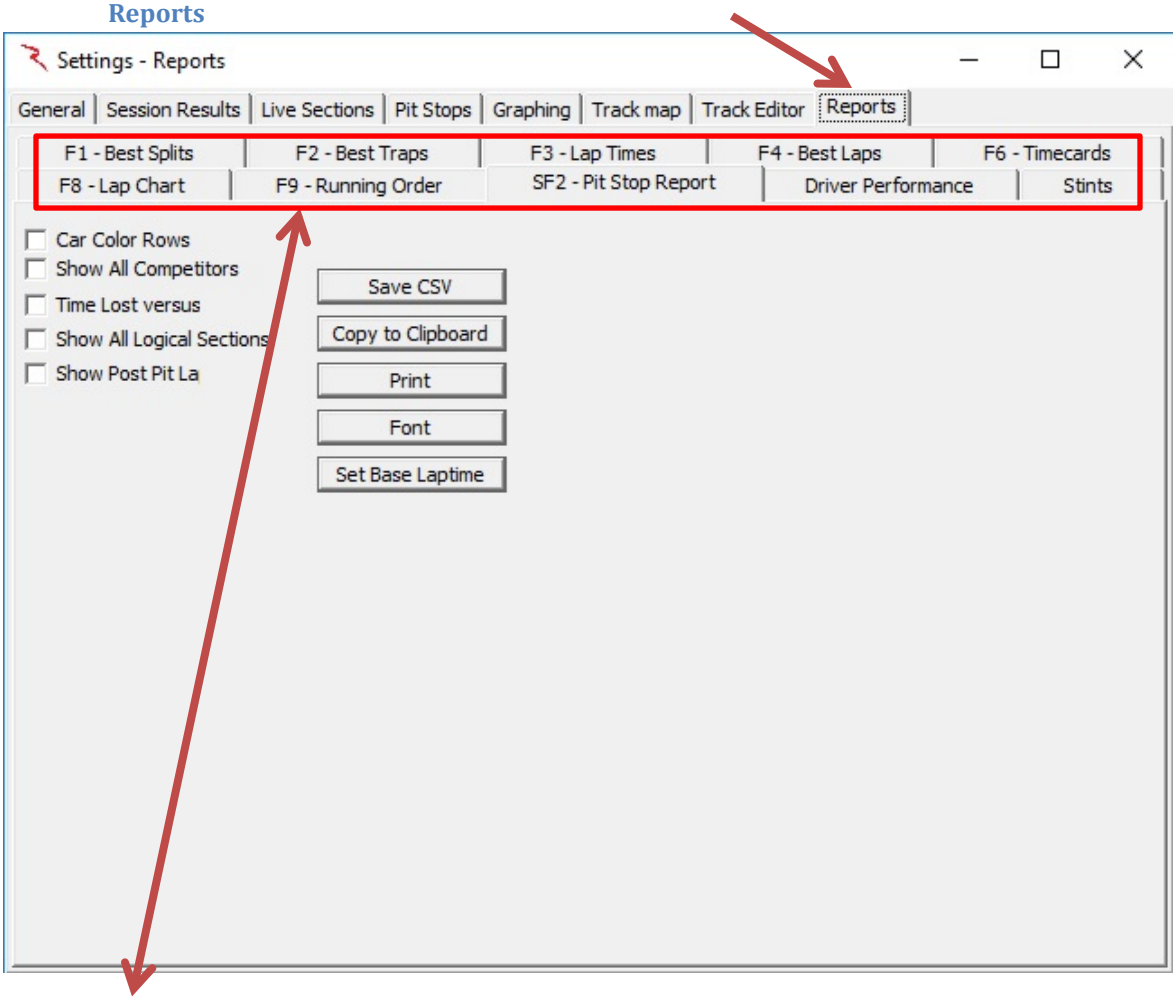
IndyCar (and Mazda Road To Indy) teams **Practice** and **Qualifying** Configuration



IndyCar (and Mazda Road To Indy) teams **Race** and **Final Practice** Configuration



Reports



The Reports Tab contains multiple options for Reports that can be printed or saved to a file.

F1 – Best Splits

F2 – Best Traps

F3 – Lap Times

F4 – Best Laps

F6 – Timecards

F8 – Lap Chart

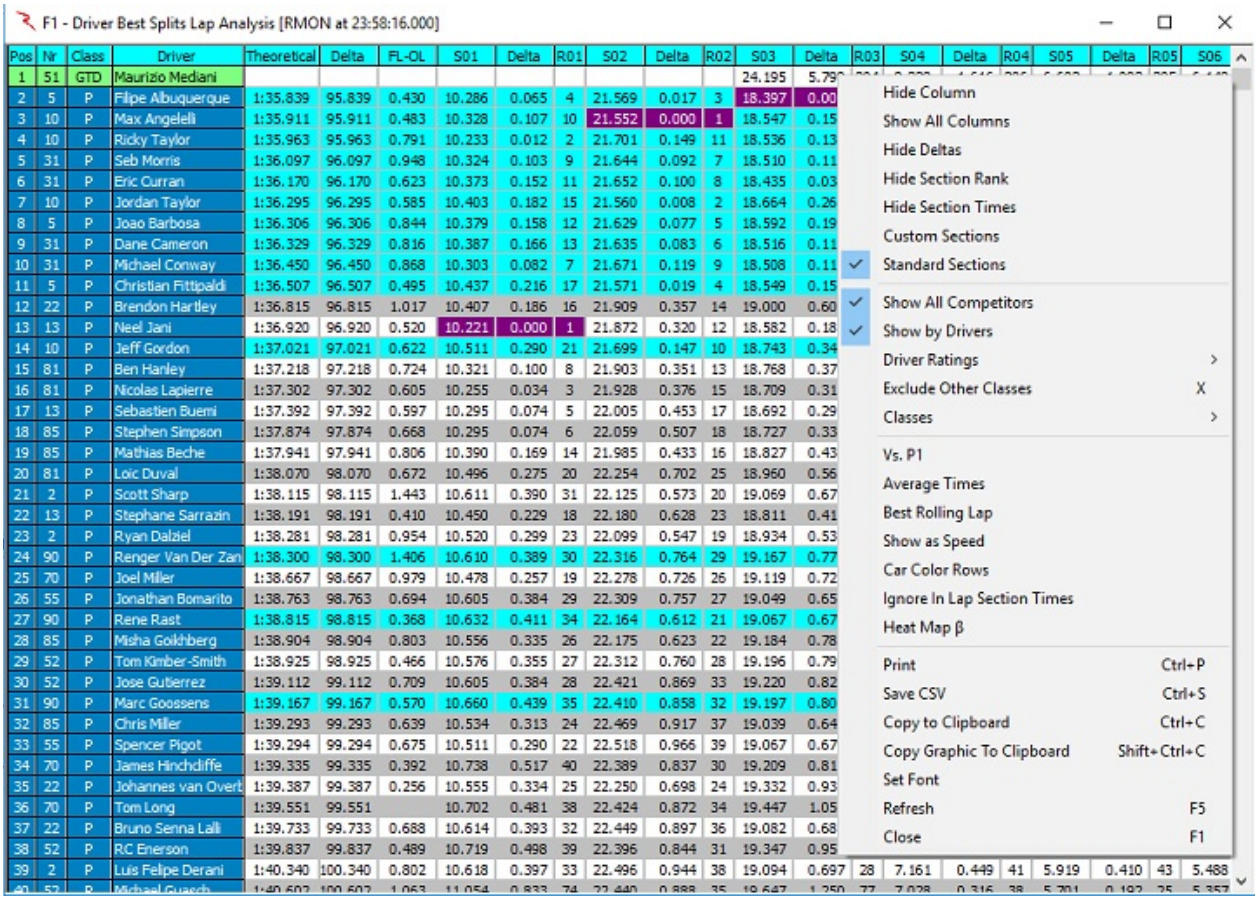
F9 – Running Order

SF2 – Pit Stop Analysis

Driver Performance

Stints

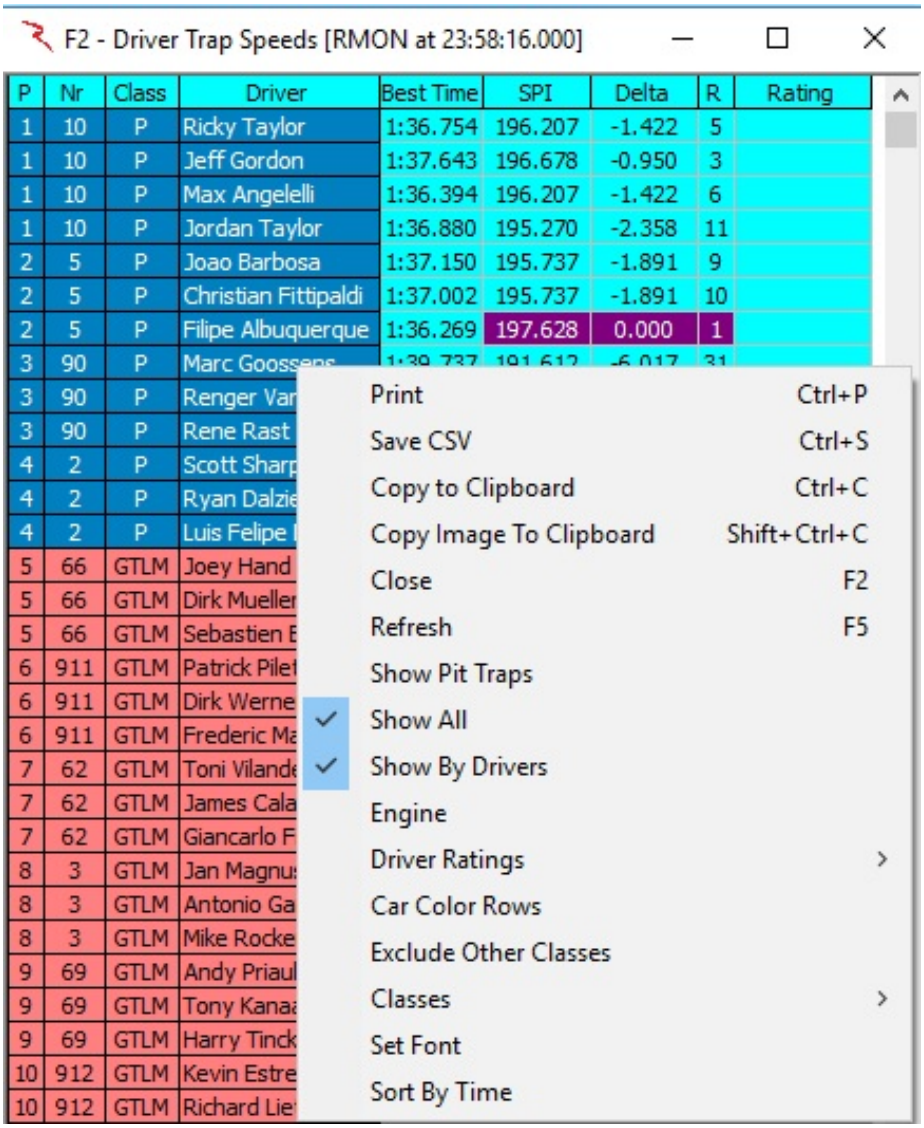
F1 – Best Splits



- Hide Column – Hide a column.
- Show All Columns – Show all the columns.
- Hide Deltas – Hide Section Delta Columns.
- Hide Section Rank – Hide Section Rank columns.
- Hide Section Times – Hide Section Time Columns.
- Custom Sections – Include Custom Sections.
- Standard Sections – Include Standard Sections.
- Show All Competitors – Show All Competitors even if a subset is selected.
- Show By Drivers – Display by drivers.
- Driver Ratings - Include All Driver Ratings in report.
- Exclude Other Classes – Exclude classes other than Team Car class.
- Classes – Show classes.

- Vs P1 – Vs Position 1 Splits.
- Average Times – Compare average best section times (top x section times) to filter out one-of section times.
- Best Rolling Lap – Compare Best Rolling Lap instead of Optimal Lap.
- Show As Speed – Show section times as speed.
- Car Color Rows – Shade Rows using specified Car colors.
- Ignore InLap Section Times – Ignore InLap section times.
- Heat Map - Section Time Delta fields are color coded.
- Print – Opens the Print dialog so you can select where to print the report.
- Save CSV – Opens a Save As dialog window so you can name the file and select where to save it.
- Copy To Clipboard – Copies the report to the Clipboard.
- Copy Image To Clipboard – Copies the report image to the Clipboard.
- Set Font – Opens a dialog window where you can select a font for the report.
- Refresh - Refresh the data.
- Close – Close the report.

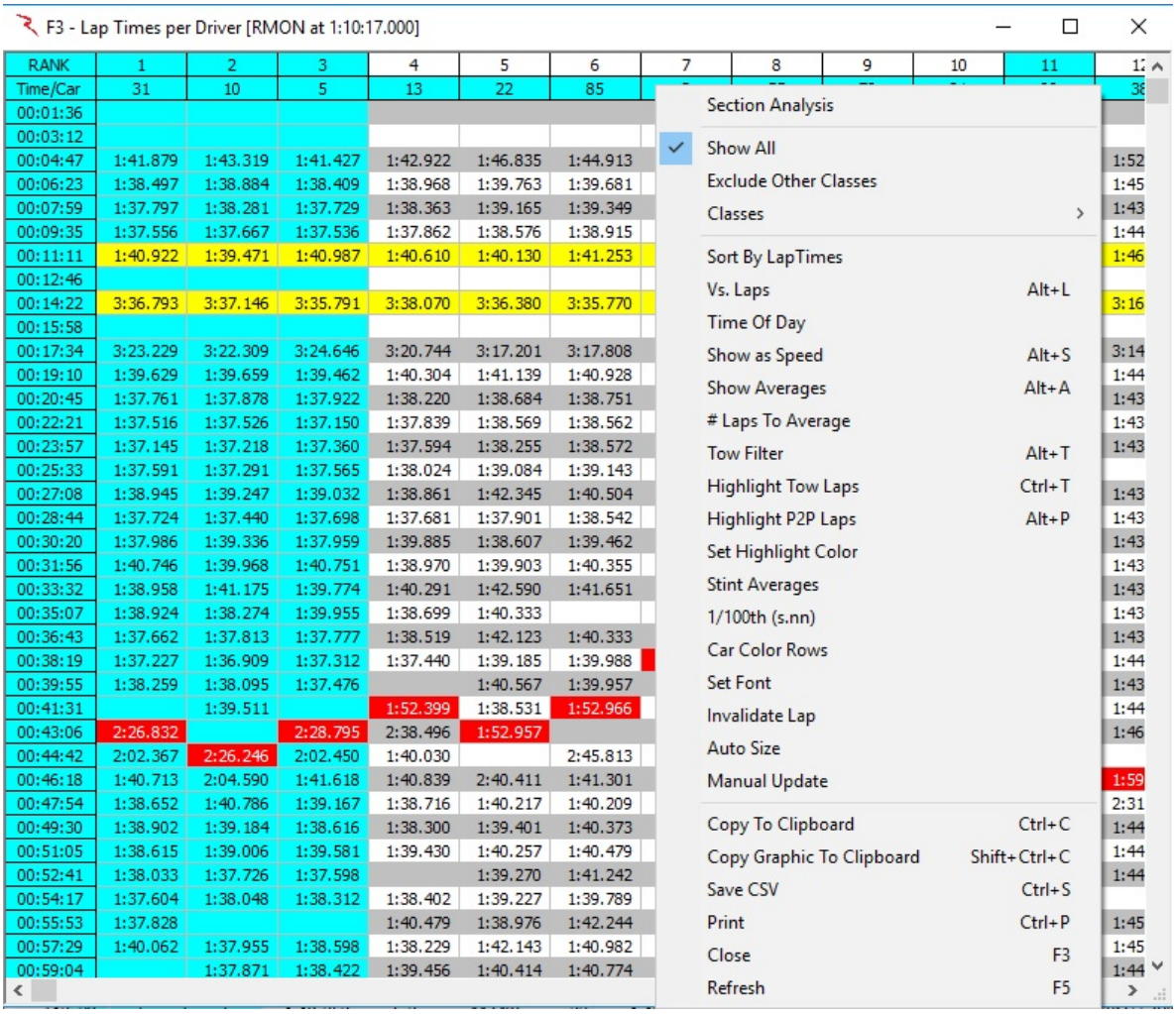
F2 – Best Traps



- Print – Opens the Print dialog so you can select where to print the report.
- Save CSV – Opens a Save As dialog window so you can name the file and select where to save it.
- Copy To Clipboard – Copies the report to the Clipboard.
- Copy Image To Clipboard – Copies the report image to the Clipboard.
- Close – Close the report.
- Refresh - Refresh the data.
- Show Pit Traps – Include Pit Lane Speed Traps.

- Show All - Show All Competitors even if a subset is selected.
- Show By Drivers – Display by drivers.
- Engine –
- Driver Ratings
- Car Color Rows – Shade Rows using specified Car colors.
- Exclude Other Classes - Exclude classes other than the 'Team Car' class.
- Classes - Select the class to display.
- Set Font – Opens a dialog window where you can select a font for the report.
- Sort By Time - Sort the report by best time.

F3 – Lap Times

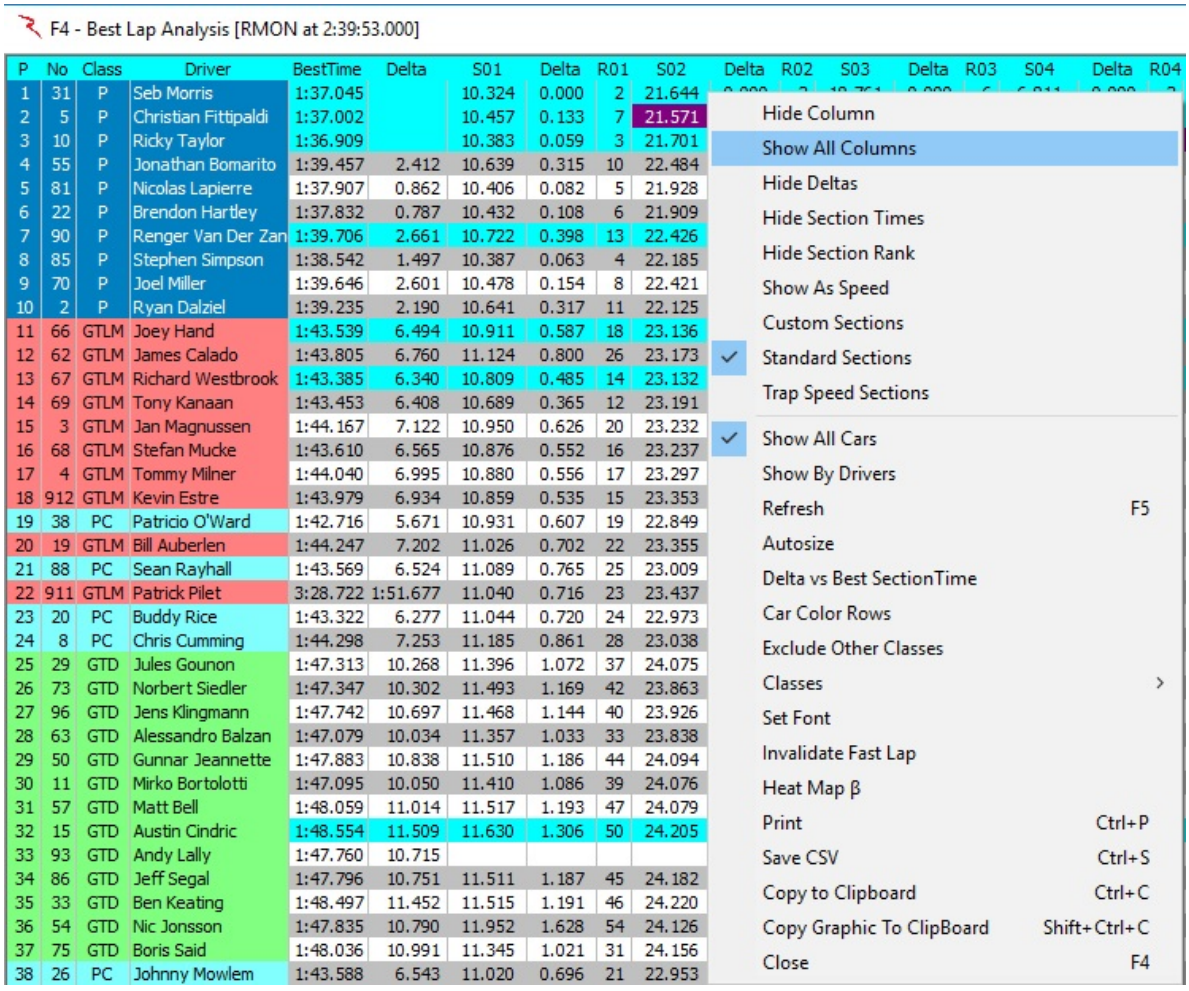


RANK	1	2	3	4	5	6	7	8	9	10	11	12
Time/Car	31	10	5	13	22	85						38
00:01:36												
00:03:12												
00:04:47	1:41.879	1:43.319	1:41.427	1:42.922	1:46.835	1:44.913						1:52
00:06:23	1:38.497	1:38.884	1:38.409	1:38.968	1:39.763	1:39.681						1:45
00:07:59	1:37.797	1:38.281	1:37.729	1:38.363	1:39.165	1:39.349						1:43
00:09:35	1:37.556	1:37.667	1:37.536	1:37.862	1:38.576	1:38.915						1:44
00:11:11	1:40.922	1:39.471	1:40.987	1:40.610	1:40.130	1:41.253						1:46
00:12:46												
00:14:22	3:36.793	3:37.146	3:35.791	3:38.070	3:36.380	3:35.770						3:16
00:15:58												
00:17:34	3:23.229	3:22.309	3:24.646	3:20.744	3:17.201	3:17.808						3:14
00:19:10	1:39.629	1:39.659	1:39.462	1:40.304	1:41.139	1:40.928						1:44
00:20:45	1:37.761	1:37.878	1:37.922	1:38.220	1:38.684	1:38.751						1:43
00:22:21	1:37.516	1:37.526	1:37.150	1:37.839	1:38.569	1:38.562						1:43
00:23:57	1:37.145	1:37.218	1:37.360	1:37.594	1:38.255	1:38.572						1:43
00:25:33	1:37.591	1:37.291	1:37.565	1:38.024	1:39.084	1:39.143						
00:27:08	1:38.945	1:39.247	1:39.032	1:38.861	1:42.345	1:40.504						1:43
00:28:44	1:37.724	1:37.440	1:37.698	1:37.681	1:37.901	1:38.542						1:43
00:30:20	1:37.986	1:39.336	1:37.959	1:39.885	1:38.607	1:39.462						1:43
00:31:56	1:40.746	1:39.968	1:40.751	1:38.970	1:39.903	1:40.355						1:43
00:33:32	1:38.958	1:41.175	1:39.774	1:40.291	1:42.590	1:41.651						1:43
00:35:07	1:38.924	1:38.274	1:39.955	1:38.699	1:40.333							1:43
00:36:43	1:37.662	1:37.813	1:37.777	1:38.519	1:42.123	1:40.333						1:43
00:38:19	1:37.227	1:36.909	1:37.312	1:37.440	1:39.185	1:39.988						1:44
00:39:55	1:38.259	1:38.095	1:37.476		1:40.567	1:39.957						1:43
00:41:31		1:39.511		1:52.399	1:38.531	1:52.966						1:44
00:43:06	2:26.832		2:28.795	2:38.496	1:52.957							1:46
00:44:42	2:02.367	2:26.246	2:02.450	1:40.030		2:45.813						
00:46:18	1:40.713	2:04.590	1:41.618	1:40.839	2:40.411	1:41.301						1:59
00:47:54	1:38.652	1:40.786	1:39.167	1:38.716	1:40.217	1:40.209						2:31
00:49:30	1:38.902	1:39.184	1:38.616	1:38.300	1:39.401	1:40.373						1:44
00:51:05	1:38.615	1:39.006	1:39.581	1:39.430	1:40.257	1:40.479						1:44
00:52:41	1:38.033	1:37.726	1:37.598		1:39.270	1:41.242						1:44
00:54:17	1:37.604	1:38.048	1:38.312	1:38.402	1:39.227	1:39.789						
00:55:53	1:37.828			1:40.479	1:38.976	1:42.244						1:45
00:57:29	1:40.062	1:37.955	1:38.598	1:38.229	1:42.143	1:40.982						1:45
00:59:04		1:37.871	1:38.422	1:39.456	1:40.414	1:40.774						1:44

- Section Analysis – Compare Section times instead of lap times. Select section to compare below.
- Show All - Show All Competitors even if a subset is selected.
- Exclude Other Classes - Exclude classes other than the 'Team Car' class.
- Classes - Select the class to display.
- Sort By Lap Times – Display results Sorted by Lap Times, overrides vs Laps and ElapsedTime order.
- vs Laps – Display Results sorted by Lap Number, overrides default ElapsedTime order.
- Time Of Day – Display results referenced by Time of Day (instead of ElapsedTime).
- Show As Speed – Show Section Times as speed.

- Show Averages – Show Averages Summary Table.
- # Laps To Average - Number of laps to use to calculate the Average Lap Time. Default is all or 100% of laps. Enter in either laps or % of laps.
- Tow Filter – Filter out Tow Laps.
- Highlight Tow Laps – Highlight Tow Laps with red text.
- Highlight P2P Laps – Highlight PushToPass Laps.(IndyCar Only)
- Set Highlight Color – Set the color for the highlights.
- Stint Averages – Display Stint Average lap times instead of Pit Lap Time.
- 1/100th (s:nn) – Display laptimes to 1/100th of a second.
- Car Color Rows – Shade Rows using specified Car colors.
- Set Font – Opens a dialog window where you can select a font for the report.
- Invalidate Lap
- Auto Size
- Manual Update
- Copy To Clipboard – Copies the report to the Clipboard.
- Copy Graphic To Clipboard – Copies the report image to the Clipboard.
- Save CSV – Opens a Save As dialog window so you can name the file and select where to save it.
- Print – Opens the Print dialog so you can select where to print the report.
- Close – Close the report.
- Refresh - Refresh the data.

F4 – Best Laps

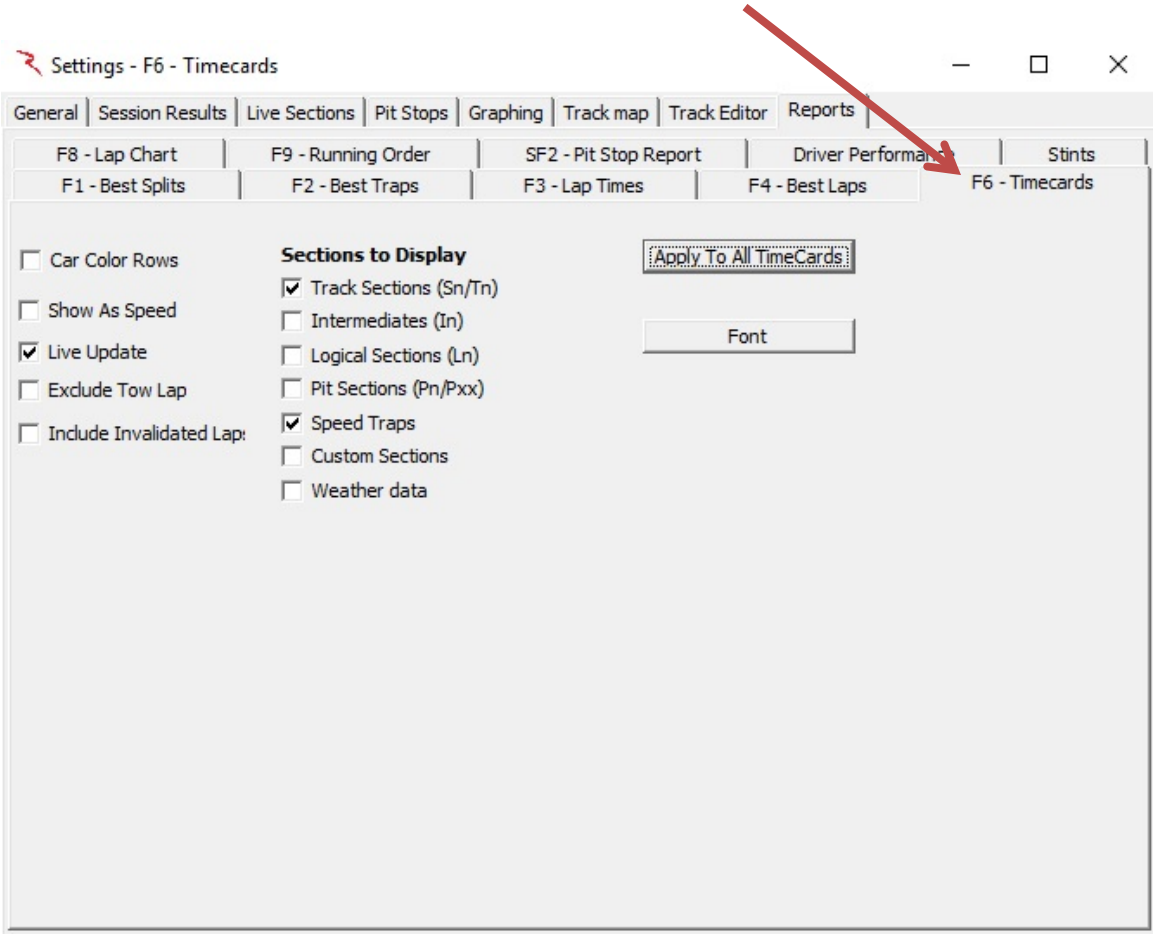


P	No	Class	Driver	BestTime	Delta	S01	Delta	R01	S02	Delta	R02	S03	Delta	R03	S04	Delta	R04
1	31	P	Seb Morris	1:37.045		10.324	0.000	2	21.644								
2	5	P	Christian Fittipaldi	1:37.002		10.457	0.133	7	21.571								
3	10	P	Ricky Taylor	1:36.909		10.383	0.059	3	21.701								
4	55	P	Jonathan Bomarito	1:39.457	2.412	10.639	0.315	10	22.484								
5	81	P	Nicolas Lapierre	1:37.907	0.862	10.406	0.082	5	21.928								
6	22	P	Brendon Hartley	1:37.832	0.787	10.432	0.108	6	21.909								
7	90	P	Renger Van Der Zan	1:39.706	2.661	10.722	0.398	13	22.426								
8	85	P	Stephen Simpson	1:38.542	1.497	10.387	0.063	4	22.185								
9	70	P	Joel Miller	1:39.646	2.601	10.478	0.154	8	22.421								
10	2	P	Ryan Dalziel	1:39.235	2.190	10.641	0.317	11	22.125								
11	66	GTLM	Joey Hand	1:43.539	6.494	10.911	0.587	18	23.136								
12	62	GTLM	James Calado	1:43.805	6.760	11.124	0.800	26	23.173								
13	67	GTLM	Richard Westbrook	1:43.385	6.340	10.809	0.485	14	23.132								
14	69	GTLM	Tony Kanaan	1:43.453	6.408	10.689	0.365	12	23.191								
15	3	GTLM	Jan Magnussen	1:44.167	7.122	10.950	0.626	20	23.232								
16	68	GTLM	Stefan Mucke	1:43.610	6.565	10.876	0.552	16	23.237								
17	4	GTLM	Tommy Milner	1:44.040	6.995	10.880	0.556	17	23.297								
18	912	GTLM	Kevin Estre	1:43.979	6.934	10.859	0.535	15	23.353								
19	38	PC	Patricio O'Ward	1:42.716	5.671	10.931	0.607	19	22.849								
20	19	GTLM	Bill Auberlen	1:44.247	7.202	11.026	0.702	22	23.355								
21	88	PC	Sean Rayhall	1:43.569	6.524	11.089	0.765	25	23.009								
22	911	GTLM	Patrick Pilet	3:28.722	1:51.677	11.040	0.716	23	23.437								
23	20	PC	Buddy Rice	1:43.322	6.277	11.044	0.720	24	22.973								
24	8	PC	Chris Cumming	1:44.298	7.253	11.185	0.861	28	23.038								
25	29	GTD	Jules Gounon	1:47.313	10.268	11.396	1.072	37	24.075								
26	73	GTD	Norbert Siedler	1:47.347	10.302	11.493	1.169	42	23.863								
27	96	GTD	Jens Klingmann	1:47.742	10.697	11.468	1.144	40	23.926								
28	63	GTD	Alessandro Balzan	1:47.079	10.034	11.357	1.033	33	23.838								
29	50	GTD	Gunnar Jeannette	1:47.883	10.838	11.510	1.186	44	24.094								
30	11	GTD	Mirko Bortolotti	1:47.095	10.050	11.410	1.086	39	24.076								
31	57	GTD	Matt Bell	1:48.059	11.014	11.517	1.193	47	24.079								
32	15	GTD	Austin Cindric	1:48.554	11.509	11.630	1.306	50	24.205								
33	93	GTD	Andy Lally	1:47.760	10.715												
34	86	GTD	Jeff Segal	1:47.796	10.751	11.511	1.187	45	24.182								
35	33	GTD	Ben Keating	1:48.497	11.452	11.515	1.191	46	24.220								
36	54	GTD	Nic Jonsson	1:47.835	10.790	11.952	1.628	54	24.126								
37	75	GTD	Boris Said	1:48.036	10.991	11.345	1.021	31	24.156								
38	26	PC	Johnny Mowlem	1:43.588	6.543	11.020	0.696	21	22.953								

- Hide Column – Hide a column.
- Show All Columns – Show all the columns.
- Hide Deltas – Hide Section Delta Columns.
- Hide Section Times – Hide Section Time Columns.
- Hide Section Rank – Hide Section Rank columns.
- Show As Speed – Show section times as speed.
- Custom Sections – Include Custom Sections.
- Standard Sections – Include Standard Sections.
- Trap Speed Sections –
- Show All Cars – Show All Competitors even if a subset is selected.

- Show By Drivers – Display by drivers.
- Driver Ratings - Include All Driver Ratings in report..
- Refresh - Refresh the data.
- Autosize
- Delta vs Best Section Time
- Car Color Rows – Shade Rows using specified Car colors.
- Exclude Other Classes – Exclude classes other than Team Car class.
- Classes – Show classes.
- Set Font – Opens a dialog window where you can select a font for the report.
- Invalidate Fast Lap
- Heat Map - Section Time Delta fields are color coded.
- Print – Opens the Print dialog so you can select where to print the report.
- Save CSV – Opens a Save As dialog window so you can name the file and select where to save it.
- Copy To Clipboard – Copies the report to the Clipboard.
- Copy Graphic To Clipboard – Copies the report image to the Clipboard.
- Close – Close the report.

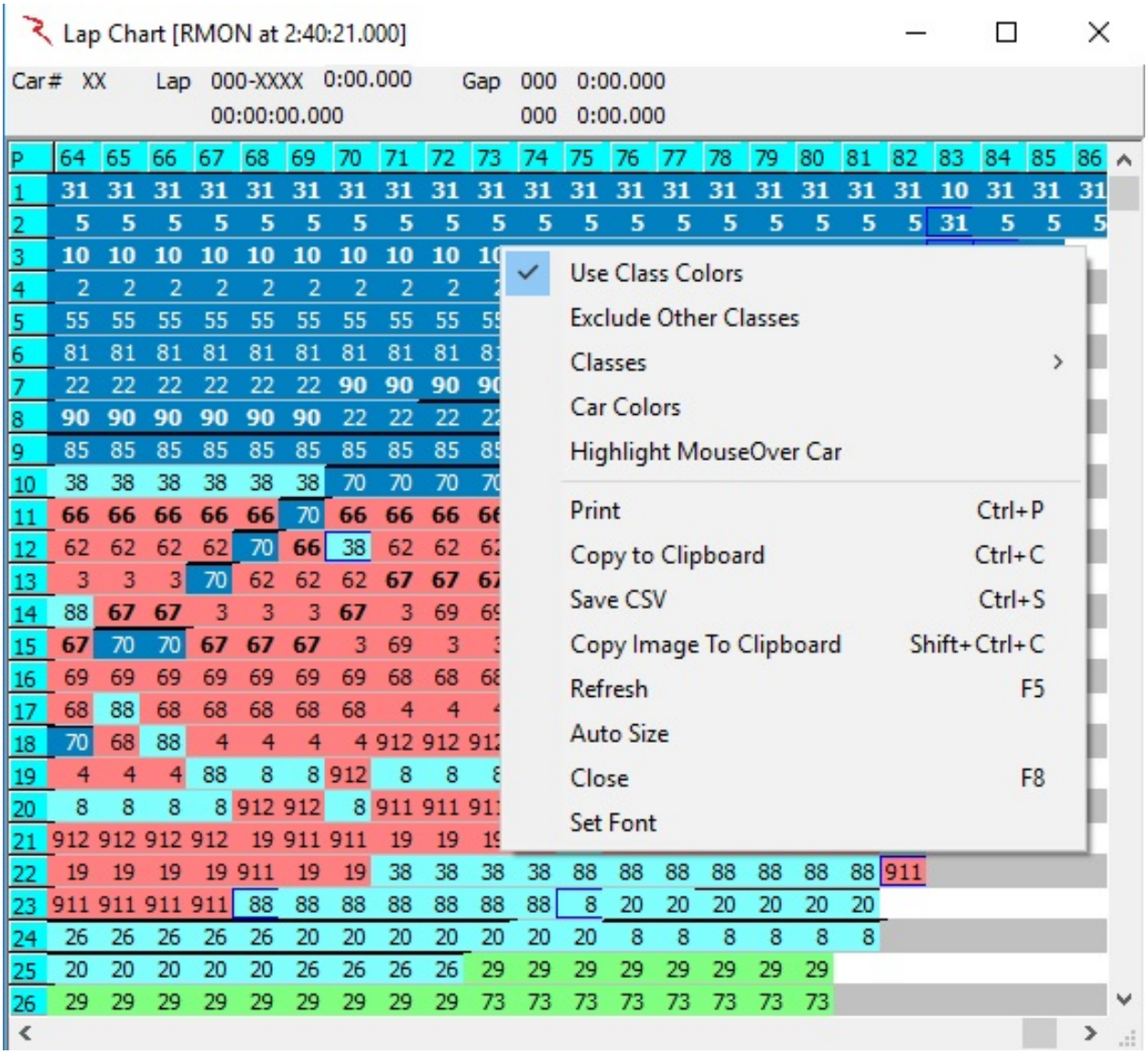
F6 – Timecards



- Car Color Rows – Shade rows using specified Car colors.
- Show As Speed – Show section times as speed.
- Live Update – Update automatically after each lap.
- Exclude Tow Lap – Exclude Tow Laps.
- Include Invalidated Laps – Include Invalidated Laps.
- Sections To Display – Click the box(es) below to select the sections to display.
- Apply To All TimeCards – Apply settings to all Time Cards.

NOTE: To view a time Card, go to the 'PopUps' menu and select 'Time Card' (F6).

F8 – Lap Chart

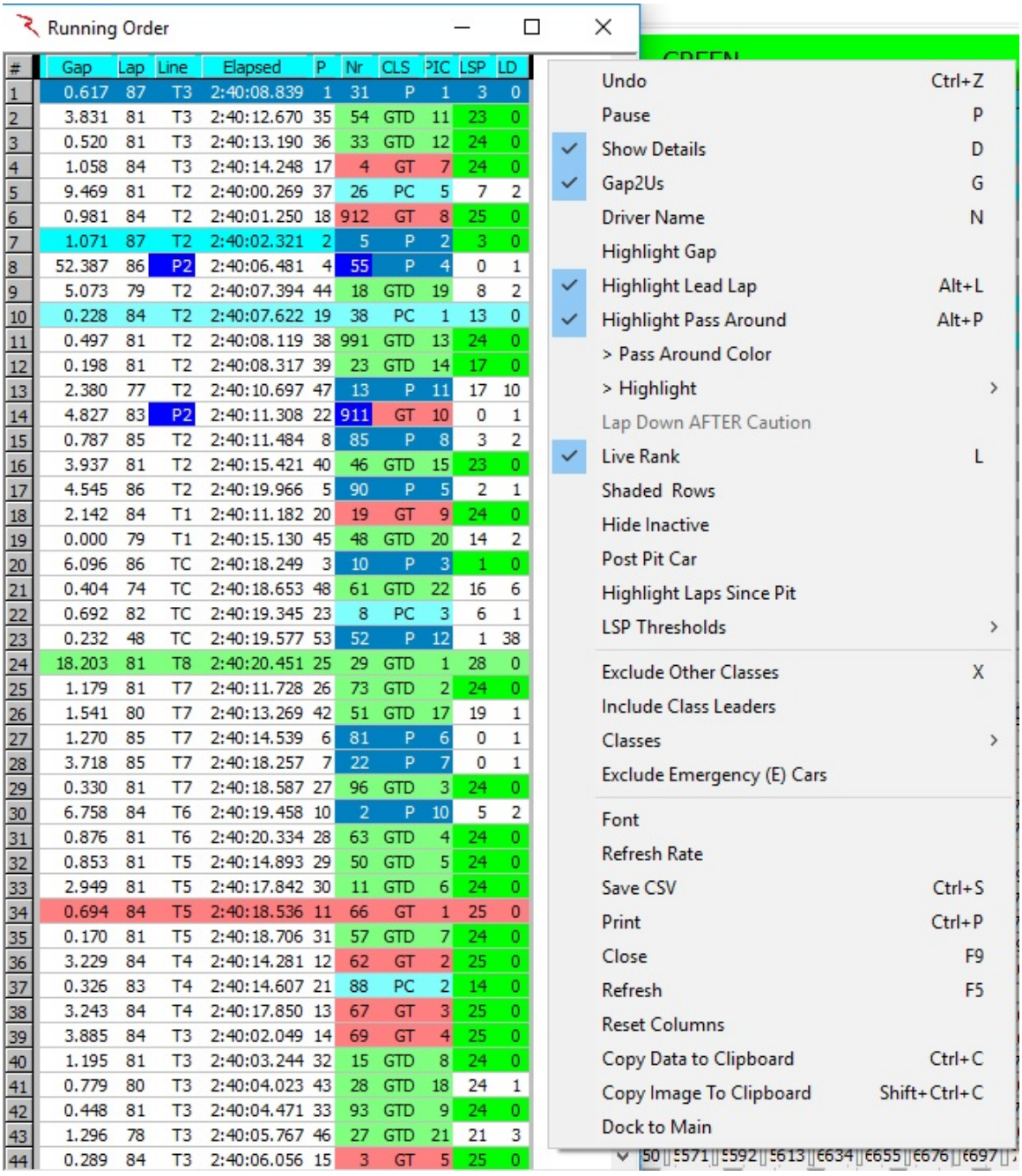


- Use Class Colors – Display Class Colors if assigned.
- Exclude Other Classes – Exclude classes other than Team Car class.
- Classes – Show classes.
- Car Colors – Display Car Colors if assigned.
- Highlight MouseOver Car – Hover the mouse over a car number to highlight that car's position on each lap.
- Print – Opens the Print dialog so you can select where to print the report.
- Copy To Clipboard – Copies the report to the Clipboard.

- Save CSV – Opens a Save As dialog window so you can name the file and select where to save it.
- Copy Image To Clipboard – Copies the report image to the Clipboard.
- Close – Close the report.
- Set Font – Opens a dialog window where you can select a font for the report.

As always, be aware that the software relies on the data and if there are interruptions in the data feed or other issues, the reports may have errors. Always double check the information and make sure you understand.

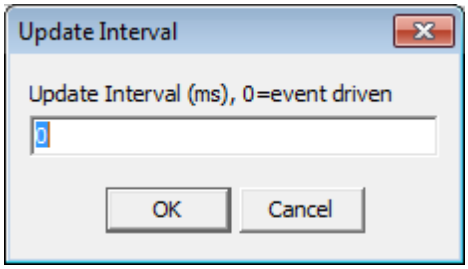
F9 – Running Order



#	Gap	Lap	Line	Elapsed	P	Nr	CLS	PIC	LSP	LD
1	0.617	87	T3	2:40:08.839	1	31	P	1	3	0
2	3.831	81	T3	2:40:12.670	35	54	GTD	11	23	0
3	0.520	81	T3	2:40:13.190	36	33	GTD	12	24	0
4	1.058	84	T3	2:40:14.248	17	4	GT	7	24	0
5	9.469	81	T2	2:40:00.269	37	26	PC	5	7	2
6	0.981	84	T2	2:40:01.250	18	912	GT	8	25	0
7	1.071	87	T2	2:40:02.321	2	5	P	2	3	0
8	52.387	86	P2	2:40:06.481	4	55	P	4	0	1
9	5.073	79	T2	2:40:07.394	44	18	GTD	19	8	2
10	0.228	84	T2	2:40:07.622	19	38	PC	1	13	0
11	0.497	81	T2	2:40:08.119	38	991	GTD	13	24	0
12	0.198	81	T2	2:40:08.317	39	23	GTD	14	17	0
13	2.380	77	T2	2:40:10.697	47	13	P	11	17	10
14	4.827	83	P2	2:40:11.308	22	911	GT	10	0	1
15	0.787	85	T2	2:40:11.484	8	85	P	8	3	2
16	3.937	81	T2	2:40:15.421	40	46	GTD	15	23	0
17	4.545	86	T2	2:40:19.966	5	90	P	5	2	1
18	2.142	84	T1	2:40:11.182	20	19	GT	9	24	0
19	0.000	79	T1	2:40:15.130	45	48	GTD	20	14	2
20	6.096	86	TC	2:40:18.249	3	10	P	3	1	0
21	0.404	74	TC	2:40:18.653	48	61	GTD	22	16	6
22	0.692	82	TC	2:40:19.345	23	8	PC	3	6	1
23	0.232	48	TC	2:40:19.577	53	52	P	12	1	38
24	18.203	81	T8	2:40:20.451	25	29	GTD	1	28	0
25	1.179	81	T7	2:40:11.728	26	73	GTD	2	24	0
26	1.541	80	T7	2:40:13.269	42	51	GTD	17	19	1
27	1.270	85	T7	2:40:14.539	6	81	P	6	0	1
28	3.718	85	T7	2:40:18.257	7	22	P	7	0	1
29	0.330	81	T7	2:40:18.587	27	96	GTD	3	24	0
30	6.758	84	T6	2:40:19.458	10	2	P	10	5	2
31	0.876	81	T6	2:40:20.334	28	63	GTD	4	24	0
32	0.853	81	T5	2:40:14.893	29	50	GTD	5	24	0
33	2.949	81	T5	2:40:17.842	30	11	GTD	6	24	0
34	0.694	84	T5	2:40:18.536	11	66	GT	1	25	0
35	0.170	81	T5	2:40:18.706	31	57	GTD	7	24	0
36	3.229	84	T4	2:40:14.281	12	62	GT	2	25	0
37	0.326	83	T4	2:40:14.607	21	88	PC	2	14	0
38	3.243	84	T4	2:40:17.850	13	67	GT	3	25	0
39	3.885	84	T3	2:40:02.049	14	69	GT	4	25	0
40	1.195	81	T3	2:40:03.244	32	15	GTD	8	24	0
41	0.779	80	T3	2:40:04.023	43	28	GTD	18	24	1
42	0.448	81	T3	2:40:04.471	33	93	GTD	9	24	0
43	1.296	78	T3	2:40:05.767	46	27	GTD	21	21	3
44	0.289	84	T3	2:40:06.056	15	3	GT	5	25	0

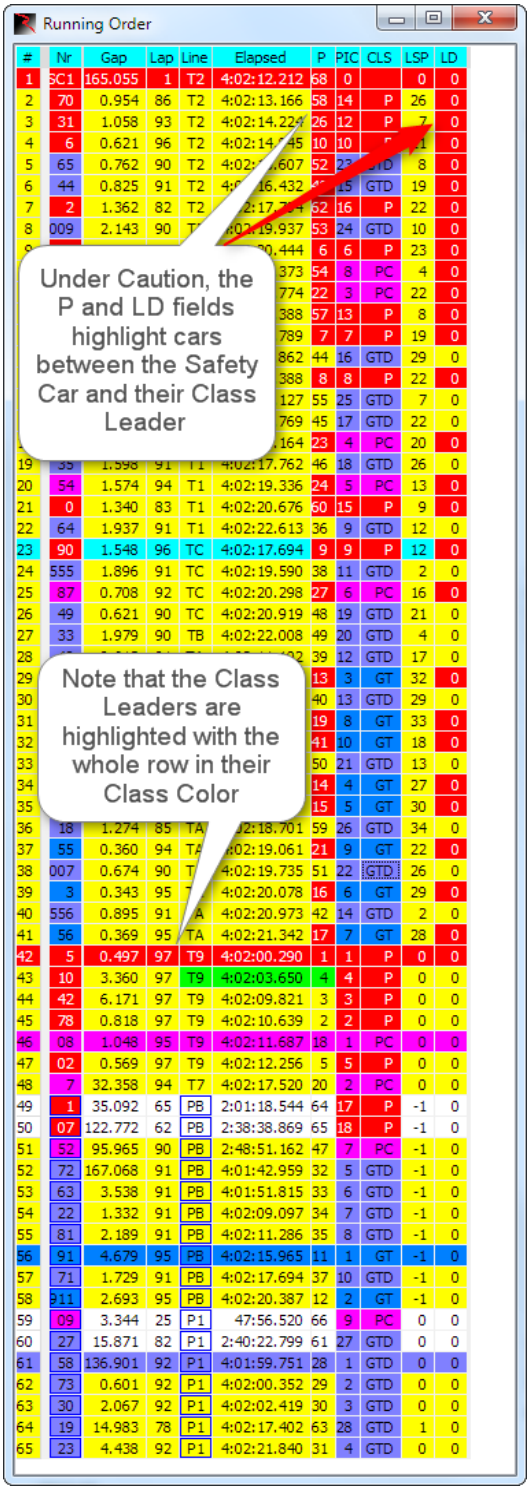
- Undo (Ctrl+Z) – Undo the previous action.
- Pause (P) - Pauses the updating of the Running Order window, Can be used to Freeze the field when a Yellow is displayed.
- Show Details (D) – this shows the timing line and time information, as shown in the right of the two figures in the popup description above.
- Gap2Us (G) – Gap from the Leader to the 'Team Car'.

- Driver Name (N) – Display the driver name'.
- Highlight Gap (X.XXXX) – highlights gaps on track relative to the input gap. Gaps less than the input will be background highlighted in red and gaps in between the input and (input + 1 second) will be background highlighted yellow. If left to 0.0000, no special formatting is applied.
- Highlight Lead Lap (Alt+L) – Highlight 'Lead Lap' cars.
- Highlight Pass Around (Alt+P) – Highlight pass around cars.
- >Pass Around Color – Set the color for Pass Around cars.
- >Highlight –
    - Cautions Only
    - Team Class Only
- Lap Down AFTER Caution - .
- Live Rank (L) – Updates rank at each timeline crossing.
- Shaded Rows – Shades even numbered rows.
- Hide Inactive – Hide inactive cars. Hide Inactive option does not remove the car from the results or analysis, just from the track map and running order. The car's status will be set to '(Active)' to differentiate it from 'Active'. The will still be visible in the session results table and all of the reports.
- Post Pit Car – Highlights the car before and after the Post Pit Car.
- Highlight Laps Since Pit – Highlights the laps since pit column.
- LSP Thresholds - Values less than threshold will be highlighted in red as likely to pit. Set the threshold for the selected class.
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes – Allows the user to select the classes to display.
- Exclude Emergency (E) Cars – Don't show Emergency cars.
- Font – changes the font of the report.
- Refresh Rate – changes the refresh rate of the popup. By default, the report is updated based on the occurrence of an event (timing line activity).



- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs
- Print – (Ctrl+P) – opens print window to print report
- Close – (F9) – closes the window. The window can also be closed via the "X• in the upper right corner.
- Refresh – (F5) – refreshes the data in the report to reflect changes in the received data.
- Reset Columns - Reset the columns.
- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image to Clipboard – (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Dock To Main - Dock to the Right of the main program window..

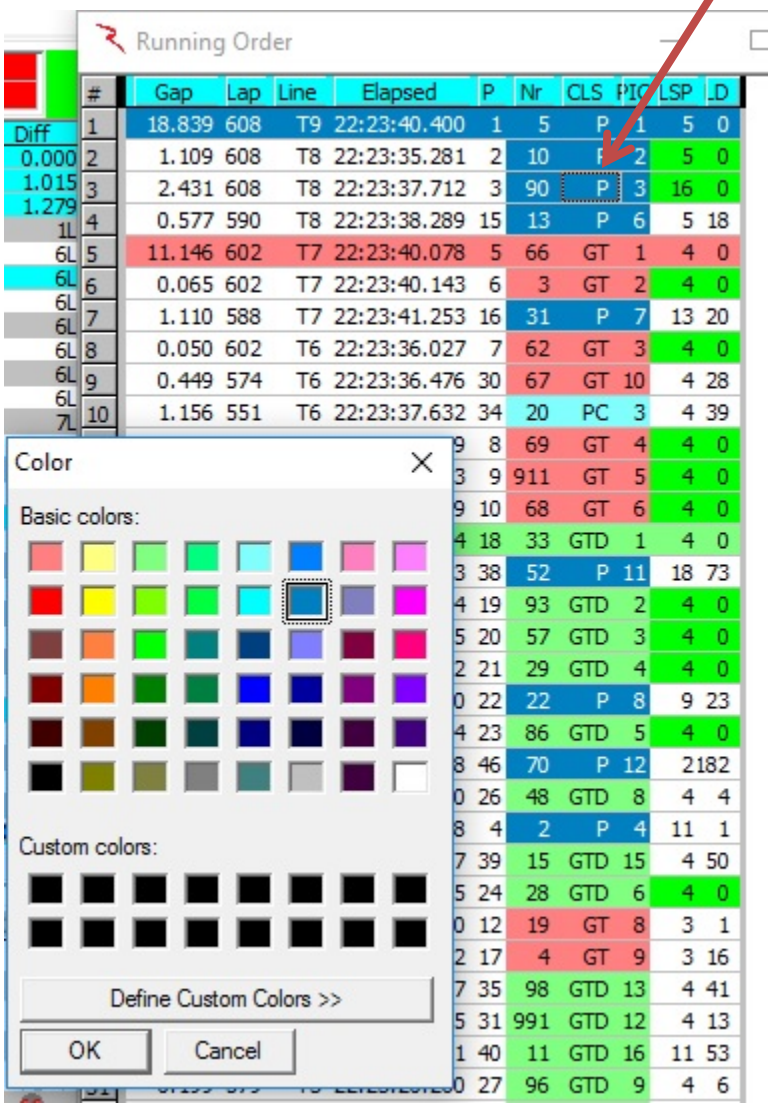
The Running Order report has been updated to reflect the elimination of the Lap Down Wave By rule. The LD@Y field is no longer available. To help identify pass-around cars, under caution, all cars between the safety car and their class leader have their 'P' and 'LD' fields highlighted in Red.



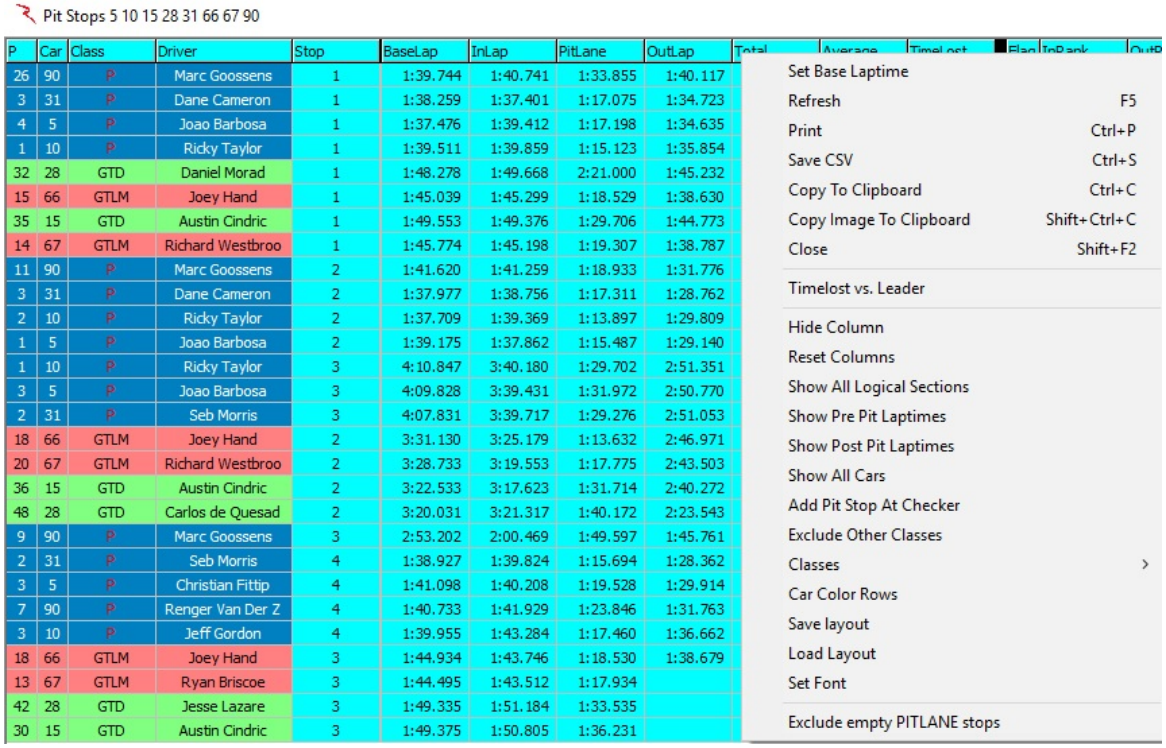
#	Nr	Gap	Lap	Line	Elapsed	P	PIC	CLS	LSP	LD
1	SC1	165.055	1	T2	4:02:12.212	68	0		0	0
2	70	0.954	86	T2	4:02:13.166	58	14	P	26	0
3	31	1.058	93	T2	4:02:14.224	26	12	P	7	0
4	6	0.621	96	T2	4:02:14.845	10	10	P	1	0
5	65	0.762	90	T2	4:02:15.607	52	23	GTD	8	0
6	44	0.825	91	T2	4:02:16.432	41	15	GTD	19	0
7	2	1.362	82	T2	4:02:17.794	52	16	P	22	0
8	009	2.143	90	T2	4:02:19.937	53	24	GTD	10	0
9					4:02:20.444	6	6	P	23	0
10					4:02:20.817	54	8	PC	4	0
11					4:02:21.591	22	3	PC	22	0
12					4:02:21.979	57	13	P	8	0
13					4:02:22.768	7	7	P	19	0
14					4:02:23.630	44	16	GTD	29	0
15					4:02:24.018	8	8	P	22	0
16					4:02:24.145	55	25	GTD	7	0
17					4:02:24.914	45	17	GTD	22	0
18					4:02:25.078	23	4	PC	20	0
19	35	1.598	91	T1	4:02:17.762	46	18	GTD	26	0
20	54	1.574	94	T1	4:02:19.336	24	5	PC	13	0
21	0	1.340	83	T1	4:02:20.676	60	15	P	9	0
22	64	1.937	91	T1	4:02:22.613	36	9	GTD	12	0
23	90	1.548	96	TC	4:02:17.694	9	9	P	12	0
24	555	1.896	91	TC	4:02:19.590	38	11	GTD	2	0
25	87	0.708	92	TC	4:02:20.298	27	6	PC	16	0
26	49	0.621	90	TC	4:02:20.919	48	19	GTD	21	0
27	33	1.979	90	TB	4:02:22.008	49	20	GTD	4	0
28						39	12	GTD	17	0
29						13	3	GT	32	0
30						40	13	GTD	29	0
31						19	8	GT	33	0
32						41	10	GT	18	0
33						50	21	GTD	13	0
34						14	4	GT	27	0
35						15	5	GT	30	0
36	18	1.274	85	TA	2:18.701	59	26	GTD	34	0
37	55	0.360	94	TA	4:02:19.061	21	9	GT	22	0
38	007	0.674	90	T	4:02:19.735	51	22	GTD	26	0
39	3	0.343	95	T	4:02:20.078	16	6	GT	29	0
40	556	0.895	91	A	4:02:20.973	42	14	GTD	2	0
41	56	0.369	95	TA	4:02:21.342	17	7	GT	28	0
42	5	0.497	97	T9	4:02:00.290	1	1	P	0	0
43	10	3.360	97	T9	4:02:03.650	4	4	P	0	0
44	42	6.171	97	T9	4:02:09.821	3	3	P	0	0
45	78	0.818	97	T9	4:02:10.639	2	2	P	0	0
46	08	1.048	95	T9	4:02:11.687	18	1	PC	0	0
47	02	0.569	97	T9	4:02:12.256	5	5	P	0	0
48	7	32.358	94	T7	4:02:17.520	20	2	PC	0	0
49	1	35.092	65	PB	2:01:18.544	64	17	P	-1	0
50	07	122.772	62	PB	2:38:38.869	65	18	P	-1	0
51	52	95.965	90	PB	2:48:51.162	47	7	PC	-1	0
52	72	167.068	91	PB	4:01:42.959	32	5	GTD	-1	0
53	63	3.538	91	PB	4:01:51.815	33	6	GTD	-1	0
54	22	1.332	91	PB	4:02:09.097	34	7	GTD	-1	0
55	81	2.189	91	PB	4:02:11.286	35	8	GTD	-1	0
56	91	4.679	95	PB	4:02:15.965	11	1	GT	-1	0
57	71	1.729	91	PB	4:02:17.694	37	10	GTD	-1	0
58	911	2.693	95	PB	4:02:20.387	12	2	GT	-1	0
59	09	3.344	25	P1	47:56.520	66	9	PC	0	0
60	27	15.871	82	P1	2:40:22.799	61	27	GTD	0	0
61	58	136.901	92	P1	4:01:59.751	28	1	GTD	0	0
62	73	0.601	92	P1	4:02:00.352	29	2	GTD	0	0
63	30	2.067	92	P1	4:02:02.419	30	3	GTD	0	0
64	19	14.983	78	P1	4:02:17.402	63	28	GTD	1	0
65	23	4.438	92	P1	4:02:21.840	31	4	GTD	0	0

There are now two 'Refresh' options. The default Refresh (F5) option refreshes the data, sorting the competitors, leaderboard, etc. but no longer resizes the Session Results columns. To auto resize the Session Results columns (and do a data refresh) you now need to use the Refresh All (CTRL+F5) option.

Class Color: To change a 'Class' color, open the 'Running Order' (F9) window. Click on a class name you want to change. A color selection window will open where you can choose the color you want for that class.



SF2 – Pit Stop Report

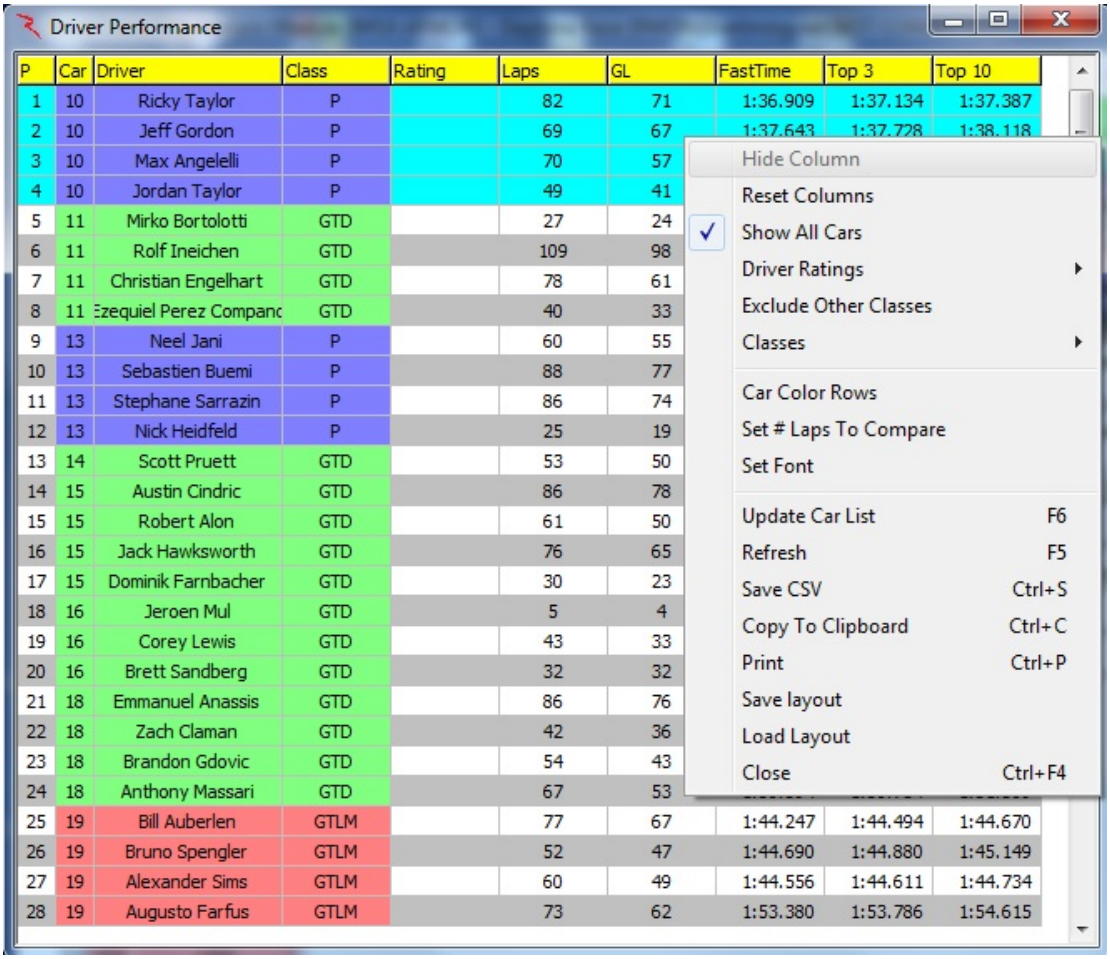


P	Car	Class	Driver	Stop	BaseLap	InLap	PitLane	OutLap
26	90	P	Marc Goossens	1	1:39.744	1:40.741	1:33.855	1:40.117
3	31	P	Dane Cameron	1	1:38.259	1:37.401	1:17.075	1:34.723
4	5	P	Joao Barbosa	1	1:37.476	1:39.412	1:17.198	1:34.635
1	10	P	Ricky Taylor	1	1:39.511	1:39.859	1:15.123	1:35.854
32	28	GTD	Daniel Morad	1	1:48.278	1:49.668	2:21.000	1:45.232
15	66	GTLM	Joey Hand	1	1:45.039	1:45.299	1:18.529	1:38.630
35	15	GTD	Austin Cindric	1	1:49.553	1:49.376	1:29.706	1:44.773
14	67	GTLM	Richard Westbroo	1	1:45.774	1:45.198	1:19.307	1:38.787
11	90	P	Marc Goossens	2	1:41.620	1:41.259	1:18.933	1:31.776
3	31	P	Dane Cameron	2	1:37.977	1:38.756	1:17.311	1:28.762
2	10	P	Ricky Taylor	2	1:37.709	1:39.369	1:13.897	1:29.809
1	5	P	Joao Barbosa	2	1:39.175	1:37.862	1:15.487	1:29.140
1	10	P	Ricky Taylor	3	4:10.847	3:40.180	1:29.702	2:51.351
3	5	P	Joao Barbosa	3	4:09.828	3:39.431	1:31.972	2:50.770
2	31	P	Seb Morris	3	4:07.831	3:39.717	1:29.276	2:51.053
18	66	GTLM	Joey Hand	2	3:31.130	3:25.179	1:13.632	2:46.971
20	67	GTLM	Richard Westbroo	2	3:28.733	3:19.553	1:17.775	2:43.503
36	15	GTD	Austin Cindric	2	3:22.533	3:17.623	1:31.714	2:40.272
48	28	GTD	Carlos de Quesad	2	3:20.031	3:21.317	1:40.172	2:23.543
9	90	P	Marc Goossens	3	2:53.202	2:00.469	1:49.597	1:45.761
2	31	P	Seb Morris	4	1:38.927	1:39.824	1:15.694	1:28.362
3	5	P	Christian Fittip	4	1:41.098	1:40.208	1:19.528	1:29.914
7	90	P	Renger Van Der Z	4	1:40.733	1:41.929	1:23.846	1:31.763
3	10	P	Jeff Gordon	4	1:39.955	1:43.284	1:17.460	1:36.662
18	66	GTLM	Joey Hand	3	1:44.934	1:43.746	1:18.530	1:38.679
13	67	GTLM	Ryan Briscoe	3	1:44.495	1:43.512	1:17.934	
42	28	GTD	Jesse Lazare	3	1:49.335	1:51.184	1:33.535	
30	15	GTD	Austin Cindric	3	1:49.375	1:50.805	1:36.231	

- Set Base Laptime – Sets the BaseLap to the leaders' previous lap laptime.
- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.
- Print (Ctrl+P) – opens print window to print the report.
- Save CSV (Ctrl+S) - creates a .csv file for the data contained in the report for use with other programs.
- Copy To Clipboard (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image To Clipboard (Shift+Ctrl+C) – Copy the image to clipboard.
- Close (F2) – closes the window. The window can also be closed via the •X• in the upper right corner.
- TimeLost vs Leader – Display time lost vs the leader.
- Hide Column – Hide a column.
- Reset Columns – Reset columns and widths.
- Show All Logical Sections –
- Show Pre-Pit Laptimes

- Show Post-Pit Laptimes
- Show All Cars
- Add Pit Stop At Checker
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes
- Car Color Rows – Display car color if defined.
- Save Layout
- Load Layout
- Set Font
- Exclude Empty PITLANE stops - Eliminates the extra false pit stops without a valid pitlane section time. This eliminates false pitlane timeline crossings. Do Not execute while cars are in Pit Lane or valid pit stops might be deleted.

Driver Performance



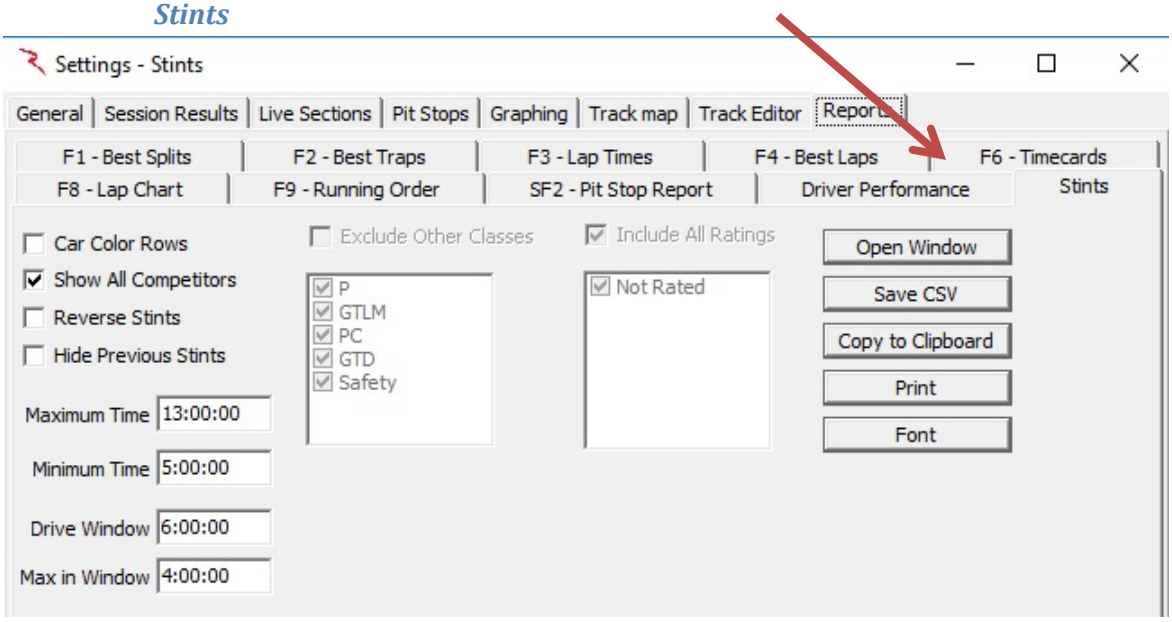
P	Car	Driver	Class	Rating	Laps	GL	FastTime	Top 3	Top 10
1	10	Ricky Taylor	P		82	71	1:36.909	1:37.134	1:37.387
2	10	Jeff Gordon	P		69	67	1:37.643	1:37.728	1:38.118
3	10	Max Angelelli	P		70	57			
4	10	Jordan Taylor	P		49	41			
5	11	Mirko Bortolotti	GTD		27	24			
6	11	Rolf Ineichen	GTD		109	98			
7	11	Christian Engelhart	GTD		78	61			
8	11	Ezequiel Perez Companc	GTD		40	33			
9	13	Neel Jani	P		60	55			
10	13	Sebastien Buemi	P		88	77			
11	13	Stephane Sarrazin	P		86	74			
12	13	Nick Heidfeld	P		25	19			
13	14	Scott Pruett	GTD		53	50			
14	15	Austin Cindric	GTD		86	78			
15	15	Robert Alon	GTD		61	50			
16	15	Jack Hawksworth	GTD		76	65			
17	15	Dominik Farnbacher	GTD		30	23			
18	16	Jeroen Mul	GTD		5	4			
19	16	Corey Lewis	GTD		43	33			
20	16	Brett Sandberg	GTD		32	32			
21	18	Emmanuel Anassis	GTD		86	76			
22	18	Zach Claman	GTD		42	36			
23	18	Brandon Gdovic	GTD		54	43			
24	18	Anthony Massari	GTD		67	53			
25	19	Bill Auberlen	GTLM		77	67	1:44.247	1:44.494	1:44.670
26	19	Bruno Spengler	GTLM		52	47	1:44.690	1:44.880	1:45.149
27	19	Alexander Sims	GTLM		60	49	1:44.556	1:44.611	1:44.734
28	19	Augusto Farfus	GTLM		73	62	1:53.380	1:53.786	1:54.615

- Hide Column – Hide the selected column.
- Reset Columns – Unhide hidden columns.
- Show All Cars - Show All Competitors even if a subset is selected.
- Driver Ratings – Show driver ratings (if available).
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes – Choose the classes to display.
- Car Color Rows – Shade rows using specified Car color.
- Set # of Laps To Compare - 1st Laps To Compare – Number of top laps to average. First set. 2nd Laps To Compare – Number of top laps to average. Second Set.
- Set Font – Set the font for the report.
- Update Car List – (F6) Update the list of cars to display in the report.

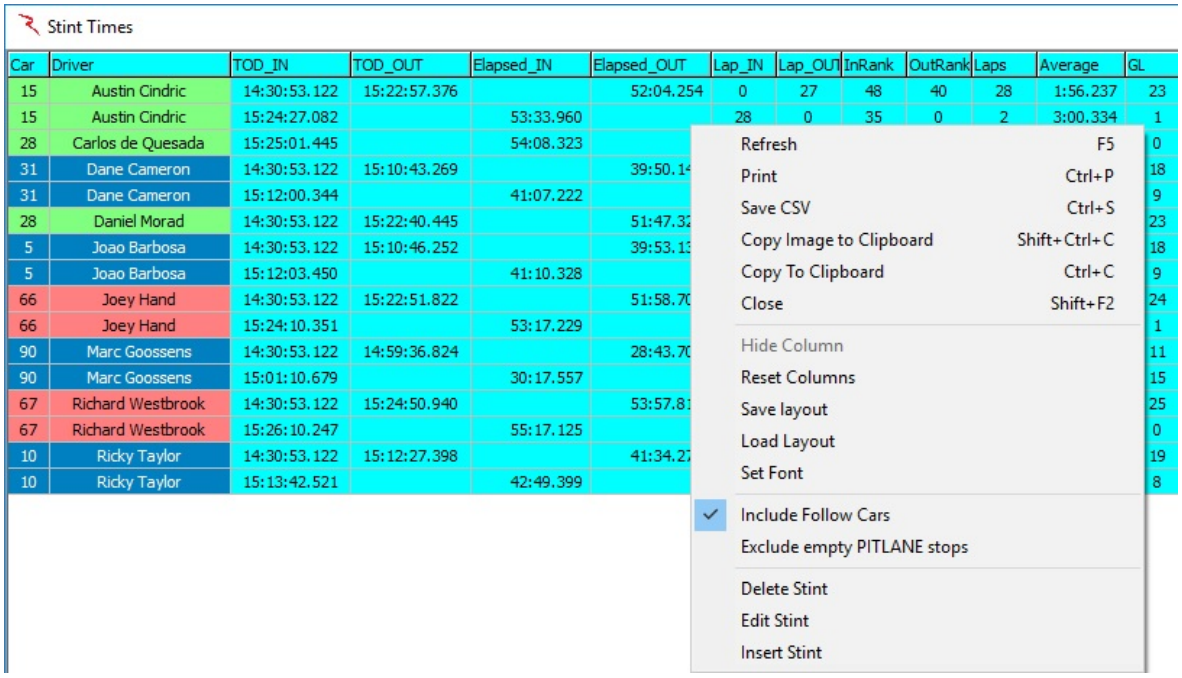
- Refresh – (F5) Refresh the data in the report.
- Save CSV – (Ctrl+S) Save the report to a csv file.
- Copy to Clipboard –(Ctrl+C) Copy the report to the clipboard for use in another program.
- Print – (Ctrl+P) Print the report.
- Save Layout – Save the current layout.
- Load Layout – Load a saved layout.
- Close – (Ctrl+F4) Close the window.

NOTE: Click on any field title to sort by that field.

Stints



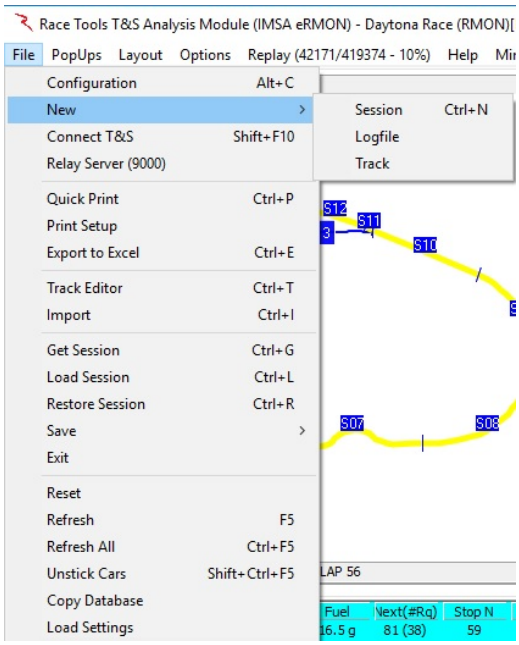
- The Stint report is also available under the PopUps menu



- Refresh – (F5) Refresh the data in the report.
- Print (Ctrl+P) – Print the report.
- Save CSV – (Ctrl+S) Save the report to a csv file.
- Copy Image to Clipboard – (Shift+Ctrl+S) Copy image to clipboard.

- Copy To Clipboard – (Ctrl+C) Copy the report to the clipboard for use in another program.
- Close – (Shift+F2) Close the report.
- Hide Column – Hide the selected column.
- Reset Columns – Unhide hidden columns.
- Save Layout – Save the current layout.
- Load Layout – Load a saved layout.
- Set Font – Set the font for the report.
- Include Follow Cars – Include the other cars you are following.
- Exclude empty PITLANE Stops – Exclude short or erroneous pit stops.
- Delete Stint – Delete a stint.
- Edit Stint – Edit a stint.
- Insert Stint – Insert a stint.

New



Session (Ctrl+N)

- Session - removes previously processed data and creates a new session in the same Log file.

Logfile

- Logfile - creates a new Log file with distinct file name.

Track

- Track - clears the track definition which will be replaced on the next $T track message.

Connect T&S (Shift+F10)

- Connect T&S (Shift+F10) – Connects software to timing feed. Indicator will show up with connection status at the top of the Track Map window.

Relay Server

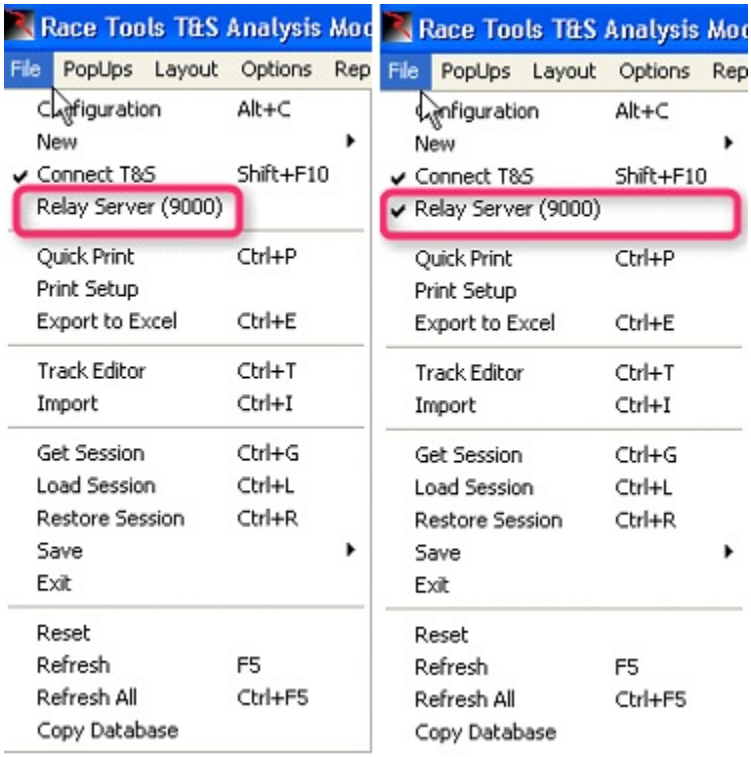
- Some new timing and scoring systems limit the number of connections each team can have to the timing and scoring feed. This means that teams must limit their use of the timing data to one system, pay for additional connections, or find a way to distribute the data stream to multiple clients.

- Fortunately RaceTools has a built in Relay Server which will allow you to distribute one data feed to as many clients as you'd like. You can mix different versions of RaceTools with the Relay Server as it only relays the data it receives, but the Get Session function to get a snapshot of a session is version dependent.

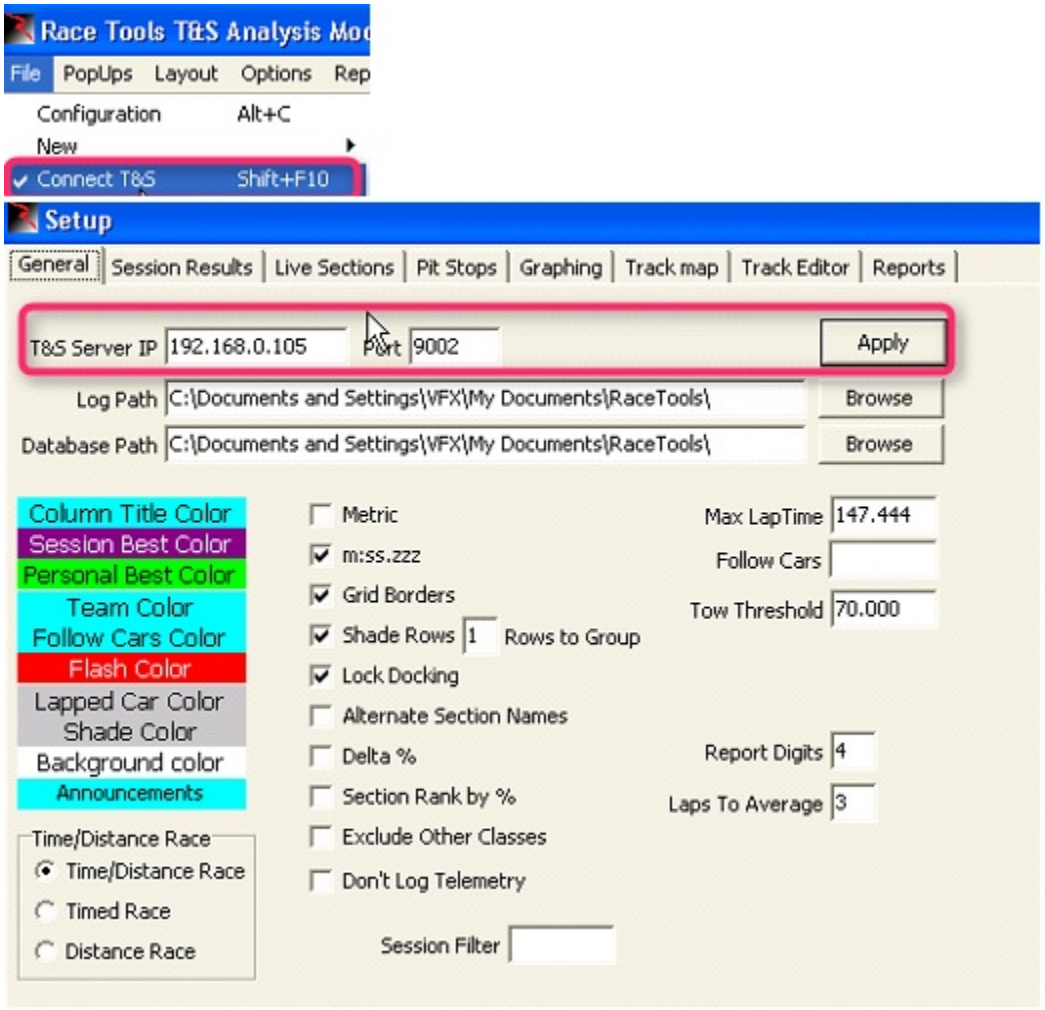
- Relay Server was included in a major update to RaceTools in version 2.56. It was added to address the connection restrictions in the WEC data feed, but this feature is also useful for non-WEC users.

- The Relay Server redistributes the data stream from one instance of RaceTools to other copies of RaceTools. This can be used to reduce network traffic to the data source, limit the number of machines connected to the pit lane network, or to synchronize clients in a replay scenario (such as for learning the software) without using another tool like IPBroadcaster.

- Enabling the Relay Server in RaceTools is very easy. Just go to the main program File menu and select Relay Server. You will be prompted to confirm or change the IP address to listen to (enter 0.0.0.0 to accept connections on any IP address, or a specific IP address if you wish to restrict access to a single IP address on that machine) and port to listen for connections on. This combination is what other clients will connect to. A checkmark beside the option means the Relay Server is active. In this case it will listen for requests on port 9000.



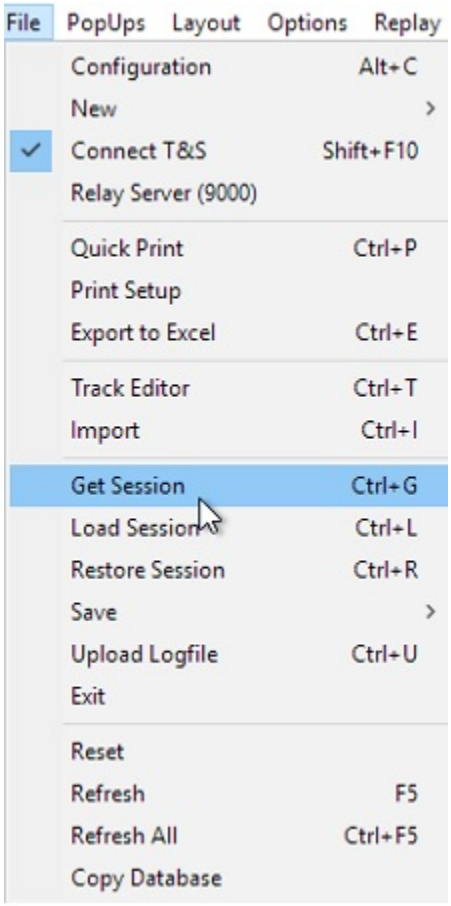
- Connecting to the Relay Server is the same as connecting to the Pit Lane server. You can either directly specify or connect to the T&S feed using the File menu Connect T&S, or use the Configuration window to specify the T&S Server IP and Port. For the IP address, enter the IP address of the Relay Server. For the Port, use the Listen port specified when you enabled or configured the Relay Server (9000 in this example). Clients connected to the Relay Server will get a copy of whatever the Relay Server receives.

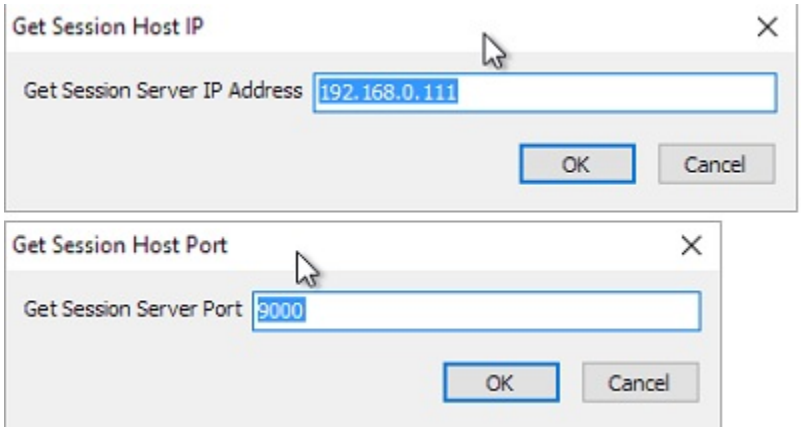


- **Get Session** One big advantage of the Relay Server is that not only can the Relay Server distribute the incoming data feed (thereby reducing network traffic between the pit stand and the T&S server) it can also share whatever data it has already captured for the session. This means that if the Relay Server has been running since the start of the session and a client connects mid-session, it can get a snapshot of everything up to that point and then continue with the live data as if it had been connected the whole time. This feature was added in version 2.75

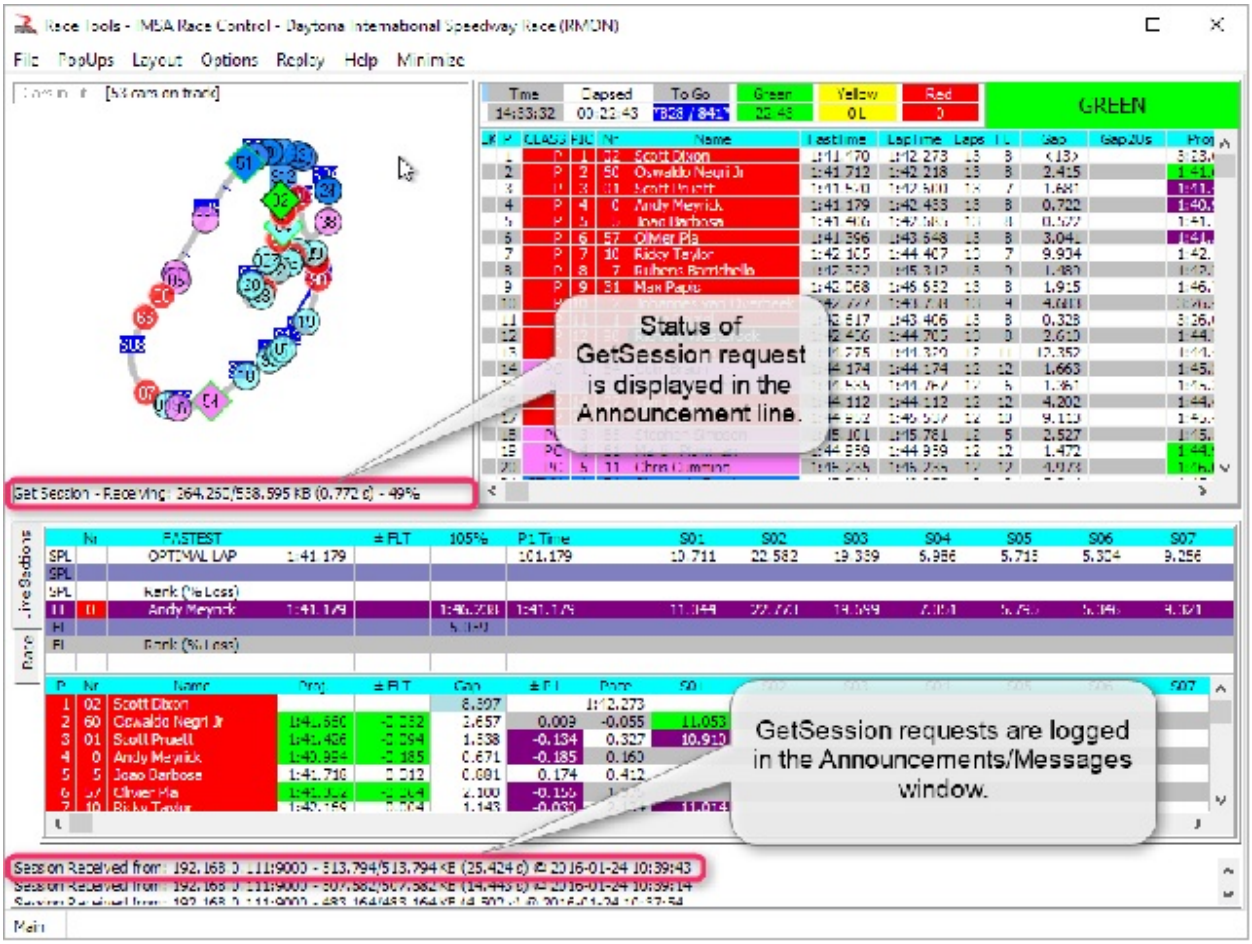
- You don't have to get the live data feed from the Relay Server for this feature to work. You can still be connected to the pit lane T&S server, but the transition from archive to live data might be a little less smooth, depending on how far you are into the race.

- To request a Session Snapshot, use the file menu 'Get Session' (CTRL+G) from the main program window. Enter the IP address and port number of the Relay Server.





- The current status and log of GetSession requests are displayed in the Announcement line and Message window, Once the Get Session request is complete, the client will have an exact copy of data that the Relay Server has and will proceed with the live data from the T&S connection.



- **Caveats**
  There is one main caveat to the Get Session function; the Relay Server and clients need to be running compatible versions of RaceTools. Because the data being sent is an exact copy of the in-memory data, any changes in how or what data is logged will make two versions incompatible. I will try to limit these changes and note them when necessary, but it means you cannot run v2.77 as the server and v2.79 as the client, or vice versa.

- **Recommendations**
  I recommend that you run a copy of RaceTools on the pit stand with the Relay Server enabled at all times (before the first session until the end of the last session) to capture the data. I would minimize the user interaction on this machine to keep it as stable as possible, perhaps using it to display the track map and basic results. This will make sure that there is a copy of the current session available to other copies of RaceTools as needed. Ideally this would be a machine that stays at the pitstand. It doesn't have to be portable or very powerful. It should have enough storage to log all of the sessions and be kept on all day.

- The client RaceTools can connect to the pit lane T&S server or the Relay Server for the live feed, but if you need to start or restart RaceTools after a session has started, you can use the Get Session command to get a snapshot of the current session.

Quick Print (Ctrl+P)

- Quick Print – Allows set up of multiple reports to print at the same time.
- Select the reports to be printed (described in "Popups• section).
- Select font size and grouping options for maps and reports, grouping makes sure certain reports/maps are grouped on a single page (typically the Best Lap and Split Maps are grouped, All Lap Times Per Driver gets its own page(s), and Best Lap Times, Best Split Times, and Best Speed Traps are grouped together).
- Setup the printer/writer (and orientation) to be used for the reports.

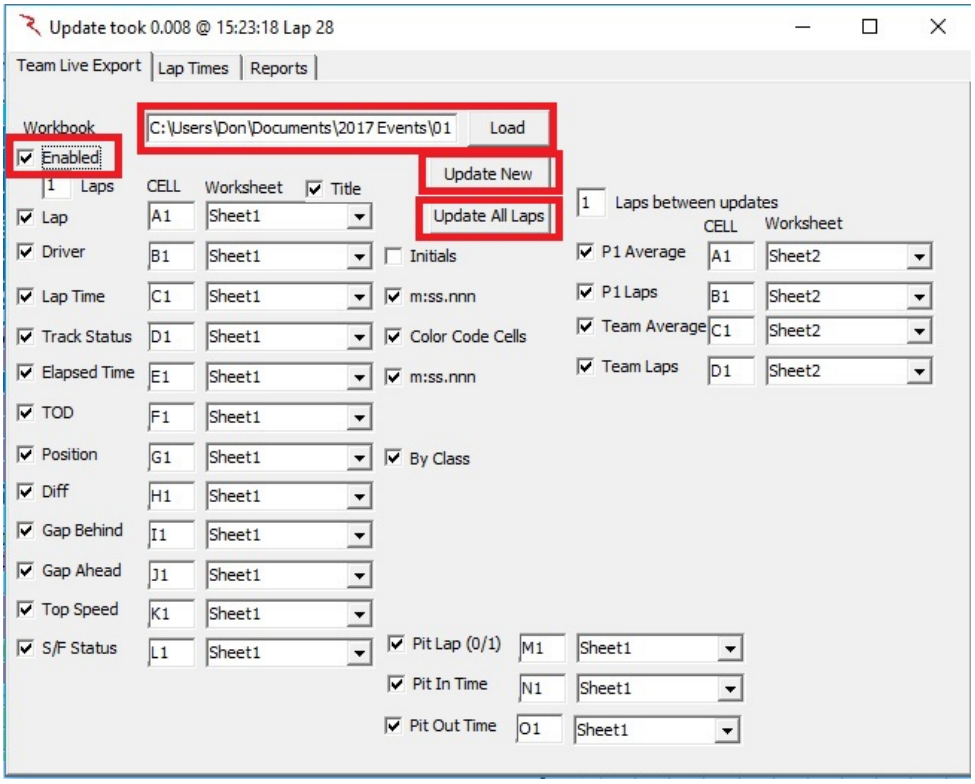
Print Setup

- Print Setup – allows for specification of top, bottom, left, and right margins. These may need to be modified to insure that grouped prints display properly

Export to Excel (Ctrl+E)

- This option allows the user to configure specific reports in Excel to be used for further analysis. This is very flexible so the user can design spreadsheets to fit his particular needs.

Live Export



- Workbook – Input the location and name of the spreadsheet where you want to store the data. (You must first create the workbook with Excel and save it in your desired location.)

- Enabled – Check this box to enable the live export of data to the spreadsheet.
- Laps – Laps between updates (1 equals update every lap).
- Lap – Check the box to export the lap number.
- Driver – Check the box to export the Driver Name.
- Lap Time – Check the box to export the Lap Time.
- Track Status – Check the box to export the track Flag Status.
- Elapsed Time – Check the box to export the session Elapsed Time.
- TOD – Check the box to export the Time of Day.
- Position – Check the box to export the Position. Check the "By Class" box to show 'Position in Class'.
- Gap Behind – Check the box to export the Gap Behind the next car.
- Gap Ahead – Check the box to export the Gap Ahead of the next car.

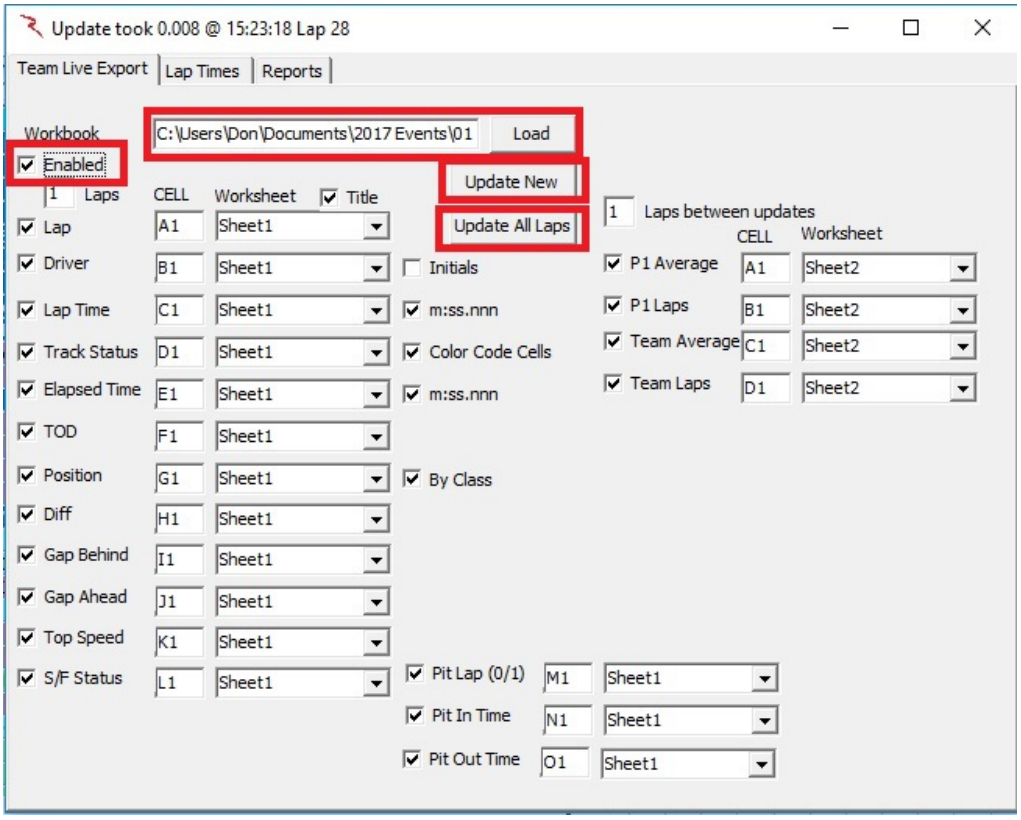
Under the column "CELL" you input the Cell in the spreadsheet where you want the data placed, and under "Worksheet" you select the name of the worksheet you want to use. Other checkboxes on this window allow you to create a spreadsheet showing average lap times for P1 and your car with projected laps based upon those average lap times.

Lap Times

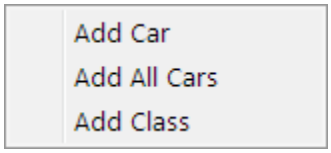
RaceTools has the ability to log laptimes for multiple competitors with the addition of the Lap Times tab in the Excel Export module. The Lap Times Export works with the Team Live Export (formerly named Live Export) tab as they share the same Workbook, Enabled checkbox and Update New and Update All Laps buttons. The Lap Times export is an extension of the Live Export function.

As before, you must first select and Load a workbook by either double clicking on the workbook text box or the Load button.

The 'Enabled' checkbox sets whether the worksheet should be updated in real time based on the team car's SF crossings. The Laps text box below it allow you to decrease the frequency of the updates in case the laptimes are short and you need time to work with the worksheet without the software trying to update the fields. The Update New button manually updates the worksheet with any new lap data. The Update All Laps button manually updates the worksheet with all lap data, which can be useful if there were holes in the spreadsheet due to the spreadsheet being busy during an update attempt.

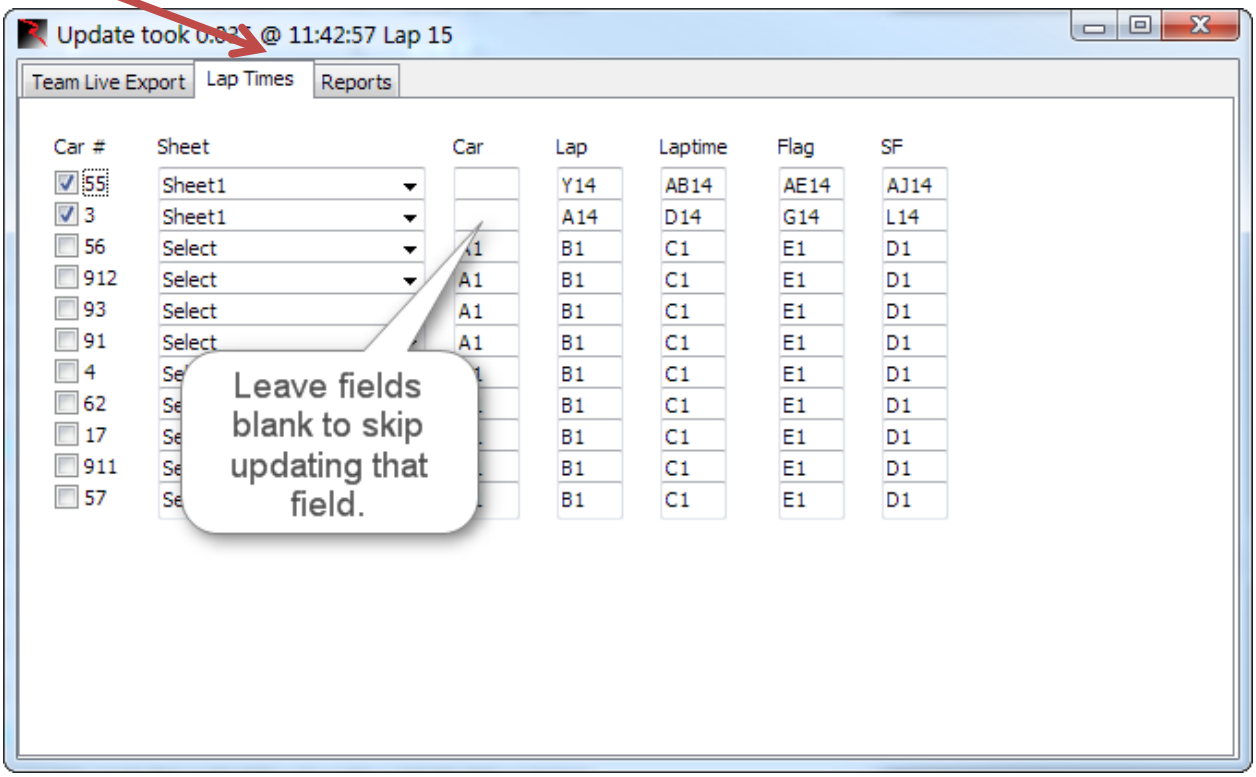


To add cars to the list, click on the "Lap Times" tab, and then right click in the open area to reveal the "Add Car" options. You can use the Add Car option (adds one car at a time), Add All Cars option (adds the current list of competitors to the list) or Add Class (adds cars with a specified Class Name to the list).

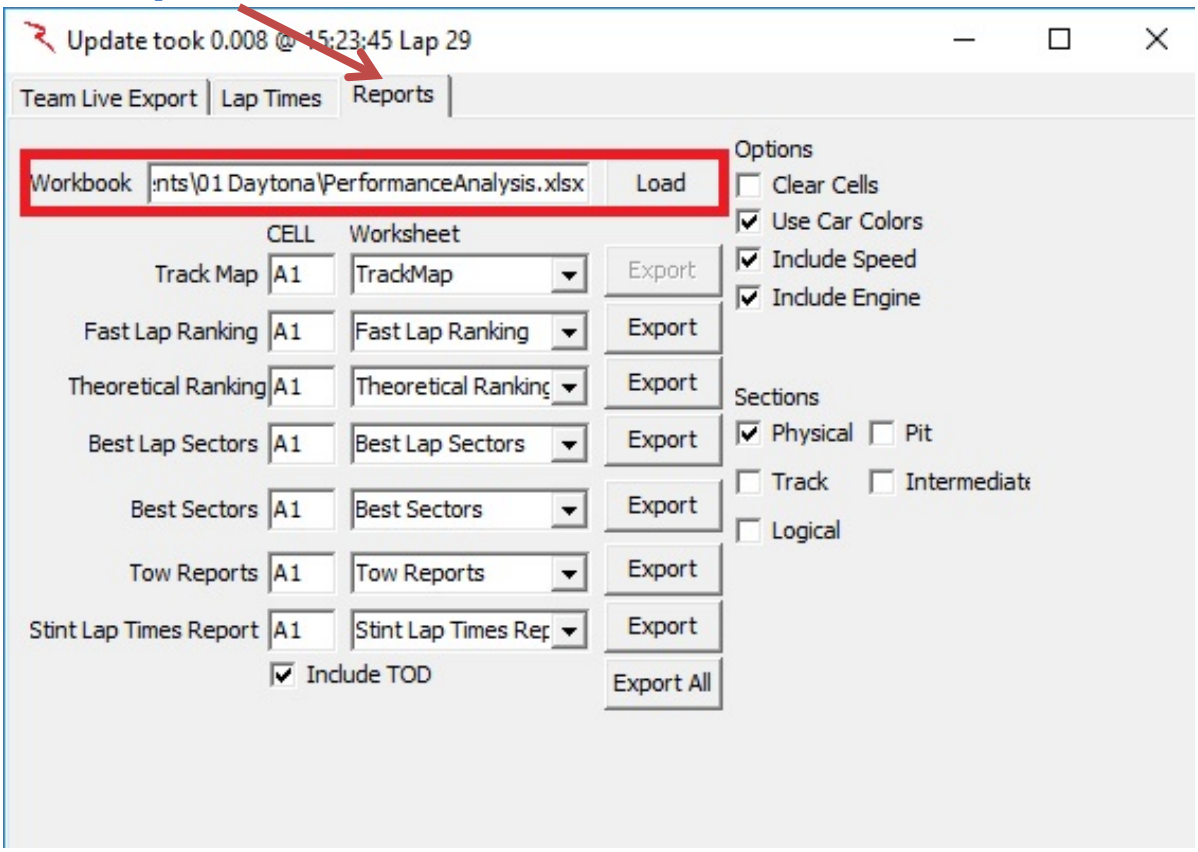


Once the car number has been added to the list, you can set the Sheet (which spreadsheet to update), and cell locations. (You might want to use a different sheet for each car.) The Cell values are for lap 0 (which is never populated) in the Column+Row format. In the example below, Car 55's Lap, Laptime, Flag and SF crossing status will be filled in on the 'Sheet1' tab of the workbook, with Lap 1 being filled in on row 15 (14+1), with the Lap value in the 'Y' column, Laptime in the 'AB' column, Flag in the 'AE' column and the crossing status (either 'T' for Track or 'P' for Pit) in the 'AJ' column. The Car Number will not be populated as it is blank.

Cars 56, 912, etc. will not be updated because they are not selected and also because their 'Sheet' field is not populated with a valid sheet name.


Update took 0.@ 11:42:57 Lap 15
Team Live Export
Lap Times
Reports
Car #
Sheet
Car
Lap
Laptime
Flag
SF
55
Sheet1
Y14
AB14
AE14
AJ14
3
Sheet1
A14
D14
G14
L14
56
Select
B1
C1
E1
D1
912
Select
A1
B1
C1
E1
D1
93
Select
A1
B1
C1
E1
D1
91
Select
A1
B1
C1
E1
D1
4
62
17
911
57
Leave fields blank to skip updating that field.

Reports


Update took 0.008 @ 15:23:45 Lap 29
Team Live Export
Lap Times
Reports
Workbook
nts\01 Daytona\PerformanceAnalysis.xlsx
Load
CELL
Worksheet
Track Map
A1
TrackMap
Export
Fast Lap Ranking
A1
Fast Lap Ranking
Export
Theoretical Ranking
A1
Theoretical Ranking
Export
Best Lap Sectors
A1
Best Lap Sectors
Export
Best Sectors
A1
Best Sectors
Export
Tow Reports
A1
Tow Reports
Export
Stint Lap Times Report
A1
Stint Lap Times Rep
Export
Include TOD
Export All
Options
Clear Cells
Use Car Colors
Include Speed
Include Engine
Sections
Physical
Pit
Track
Intermediate
Logical

- Workbook – Enter the location and name of the workbook where you want to store the report. (You must first create the workbook with Excel, name the specific worksheets, and save it in your desired location. The worksheets must be created before you can select them.)

- Track Map – Exports the Track Map. Select the beginning cell and name the worksheet.

- Fast Lap Ranking – Exports the fast lap for each car and ranks them in order of fast time.

- Theoretical Ranking – Ranks the cars by their theoretical best lap time.

- Best Lap Sectors – Shows each car with their best time in each section. Under "Sections" you can check which type sections to include in the report.

- Best Sectors – Lists each section with each car's best time in that section.

- Tow Reports – Displays the Tow Report.

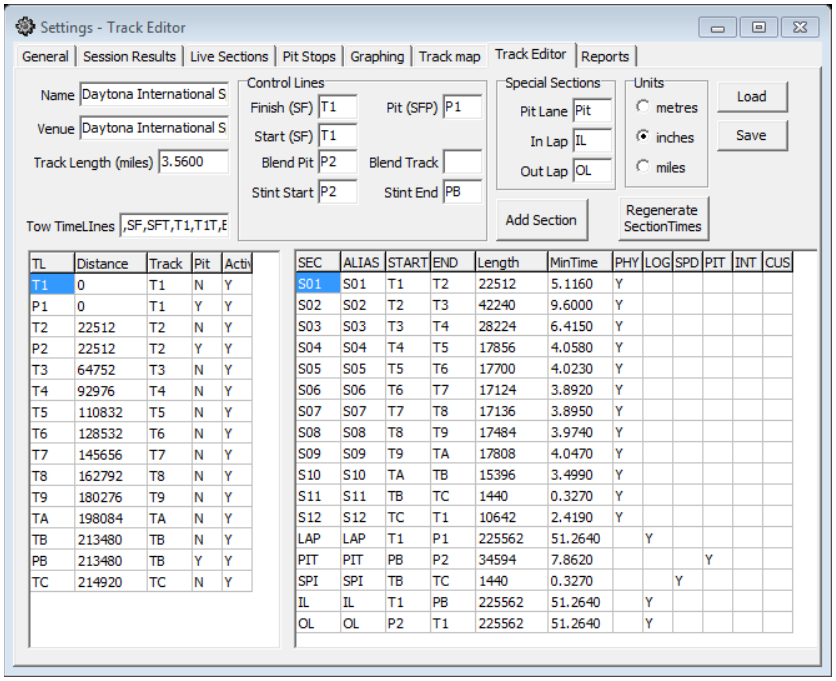
- Stint Lap Times Report –

- Export – You can export each report individually or use the Export All button to export all the reports.

Under the column "CELL" you input the Cell in the spreadsheet where you want the data placed, and under "Worksheet" you input the name of the worksheet you want to use.

Track Editor (Ctrl+T)

- Track Editor – In the event that a supplied track .csv file needs modification, or of the user desires to apply aliases to the track sections, the track editor can be used to change editable parameters such as distances, Start/Finish Codes, min split times, split numbers, etc. See example of Daytona below. Note that at some road/street courses, the Finish, Start, and/or Pit Control lines might not be "SF•/•SFP" for some practice and qualifying sessions. Confirm Control Lines with the track map.

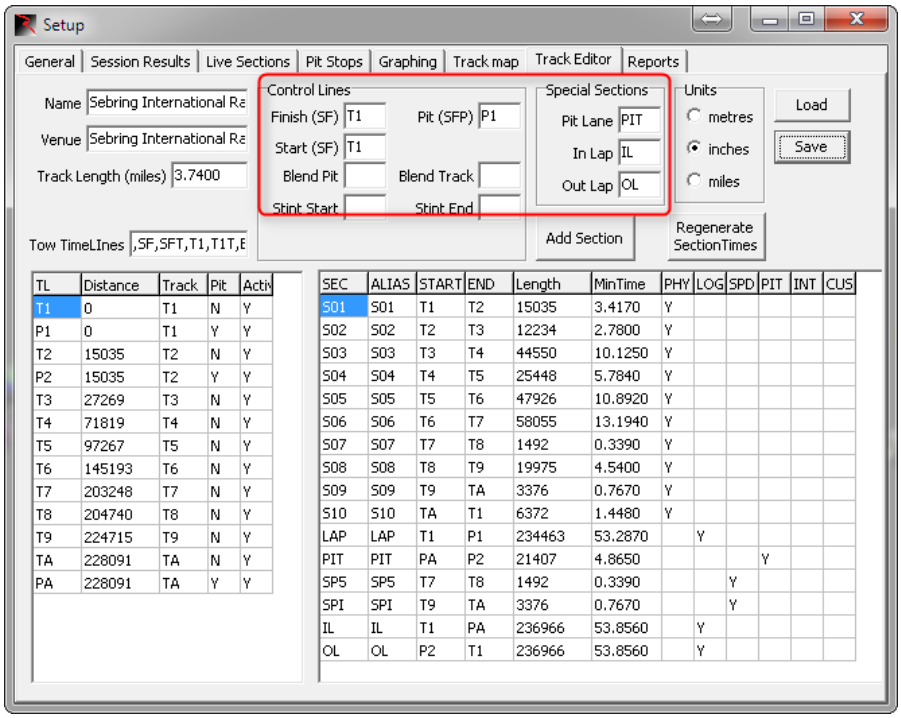


- Name – Track Name, updated with data feed when available.
- Venue -Venue Name, updated with data feed when available.
- Track Length (miles) - Track Length, updated with data feed when available.
- Tow Timelines – Tow Timelines, updated with data feed when available.
- Track TimeLine and Section tables are updated with data feed when available. You will use information from these tables to fill in the boxes under Control Lines and Special Sections. This is Very Important since this data will be used in compiling various reports and graphs.
- Finish (SF) – Finish Line label. VERY IMPORTANT.
- Start (SF) – Start Line label, usually the same as Finish Line unless there is a remote start line.
- Blend Pit – Pit Lane Blend Line.
- Stint Start – Stint Start Line.
- Pit (SFP0 – Pit Lane S/F Line. If Pit Lane does not cross SF Line, use SF line.

- Blend Track – Track Blend Line.
- Pit Lane – Pit Lane Section from Pit-In to Pit-Out. See section table for details.
- In Lap – In Lap section from SF to Pit-In. See section for details.
- Out Lap – Out Lap Section from Pit-Out to SF line.
- Units – Units to use in Timeline and Section tables.
- Add Section – Add Custom Section. Group Physical Sections into other sections for analysis.
- Regenerate Section Times – Recalculate all section times using line crossing data. Automatically called when adding or deleting sections.
- Load – Load track configuration.
- Save – Save and apply track configuration.

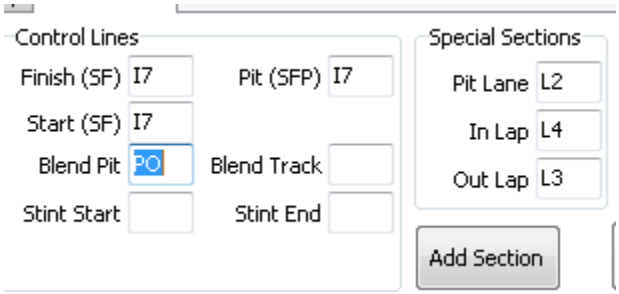
NOTE: The Track Configuration for IMSA should always be Finish (SF) = 'T1', Pit (SFP) = 'P1', Start (SF)='T1', Pit Lane='PIT', In Lap='IL', and Out Lap='OL'.

- **Long Beach Track Map Notes**
- **IMSA** teams should use the LongBeach_IMSA track map. Make sure the Track Definition is set up correctly. Specifically, make sure that the SF/SFP lines are set to T1 and P1 respectively and that the Pit Section is 'PIT', the In Lap is 'IL' and the Out Lap is 'OL'.

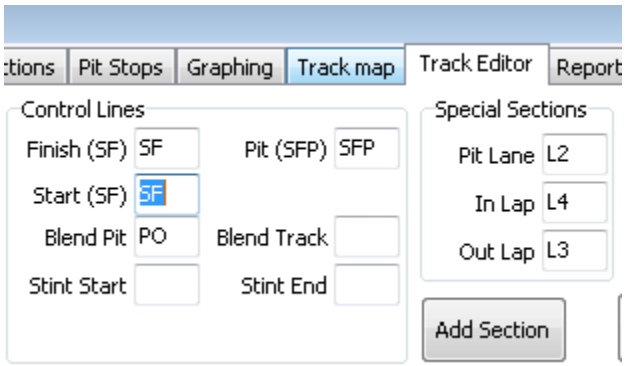


- **INDYCAR** teams should use the LongBeach_PQ map for Practice/Qualifying sessions and the Long Beach map for the final practice and race. The SF/SFP line should be I7/I7 for the PQ map and SF/SFP for the race map. The Pit Section is 'L2', In Lap is 'L4' and Out Lap is 'L3'.

- **IndyCar** (and Mazda Road To Indy) teams Practice and Qualifying Configuration

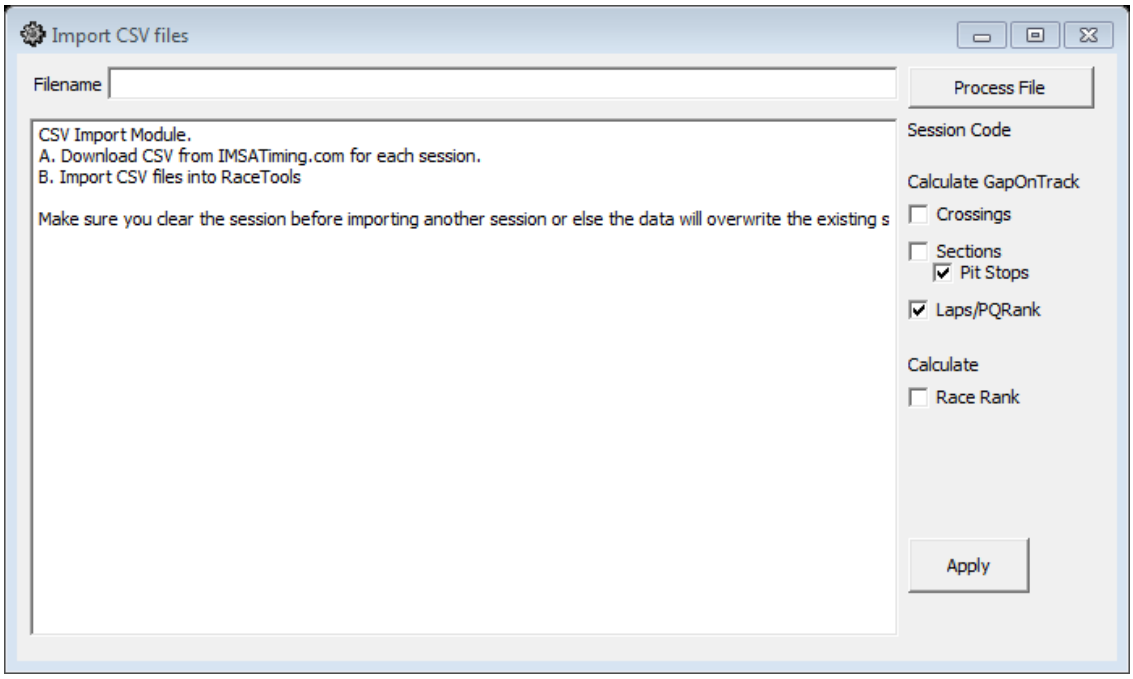


- **IndyCar** (and Mazda Road To Indy) teams Race and Final Practice Configuration



Import (Ctrl+I)

- You can import a .csv file into RaceTools.
- Download the .csv file from http://results.imsa.com/ for each session.
- Import the .csv file into RaceTools



Get Session (Ctrl+G)

- Get a Session Snapshot from the Relay Server. See Relay Server for details.

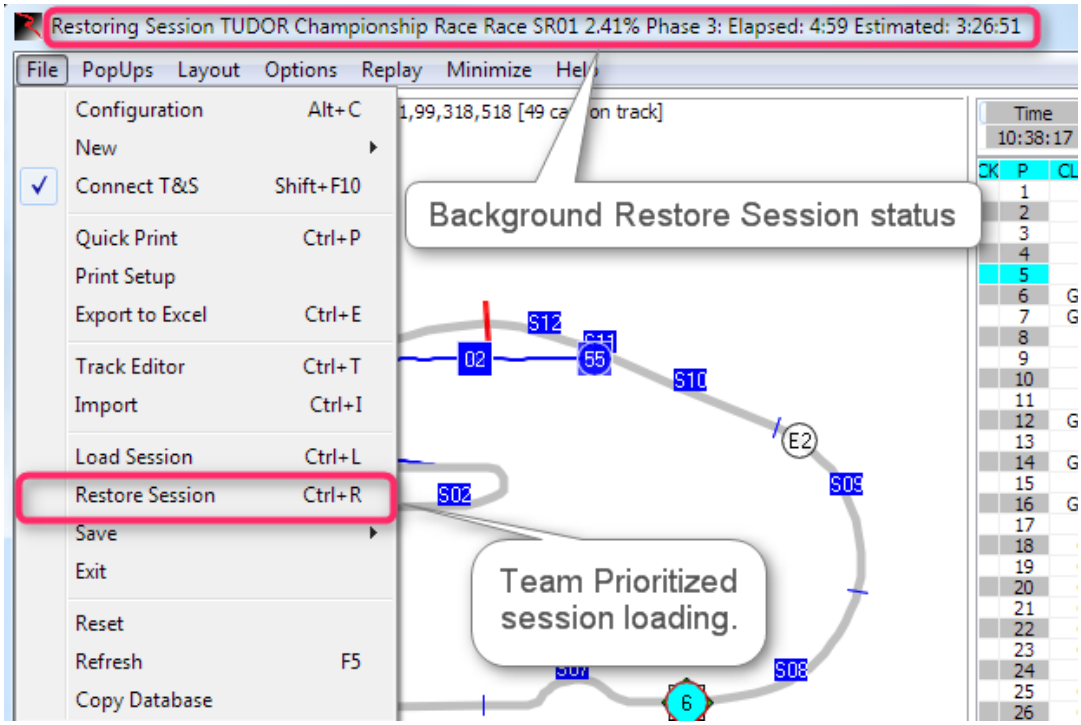
Load Session (Ctrl+L)

- Load Session – Loads a database file (.abs extension), which immediately loads an entire sessions results, not requiring replay.

Restore Session (CTRL+R)

- An optimized version of the Load Session function to recover quickly from a restart mid-session. Use this instead of Load Session if you need to restart the software mid-race. As soon as the software reloads, hit CTRL+R (or File/Restore Session from the main menu) and load the session file (*.abs) of the current session.

- Loads the stint times for all competitors (takes only a few seconds), then loads the lap times and section times for the team car, followed by all of the other cars. This means that the full details of the team car will be available within a couple of minutes including all drive times (stints), lap times, section times, pit stops, etc. The rest of the data will be restored in the background. It might take a couple of hours for a full 24 hour race, but at least you will be back up and running with as much of the team data as possible as soon as possible and the software is operational while the details are loaded in the background.



Save

Save csv

- Save CSV (deprecated) – saves all lap data for all competitors as CSV file. Use the Time Card (F6) Save CSV (CTRL+S) for a more detailed log of crossings.

Save Session (Ctrl+S)

- Save the current session.

Save Settings

- Save Settings – saves user settings selected for displays and setup.

Exit

- Exit – initiates shutdown of software, prompts user to quit Race Tools by clicking "OK•. Cancel if do not want to close Race Tools.

Reset

- Reset – resets some internal counters and flags, use when an error is thrown by the program and the tables stop updating. Reset attempts to restart the updates without having to restart the application.

Refresh (F5)

- Refresh (F5) - The default Refresh (F5) option refreshes the data, sorting the competitors, leaderboard, etc. but does not longer resize the Session Results columns.

Refresh All (Ctrl+F5)

- Refresh All – To auto resize the Session Results columns (and do a data refresh) you now need to use the Refresh All (CTRL+F5) option.

Unstick Cars (Shift+Ctrl+F5)

- Unstick Cars - Start cars moving again if they have stopped moving.

Copy Database

- Makes a copy of the Database.

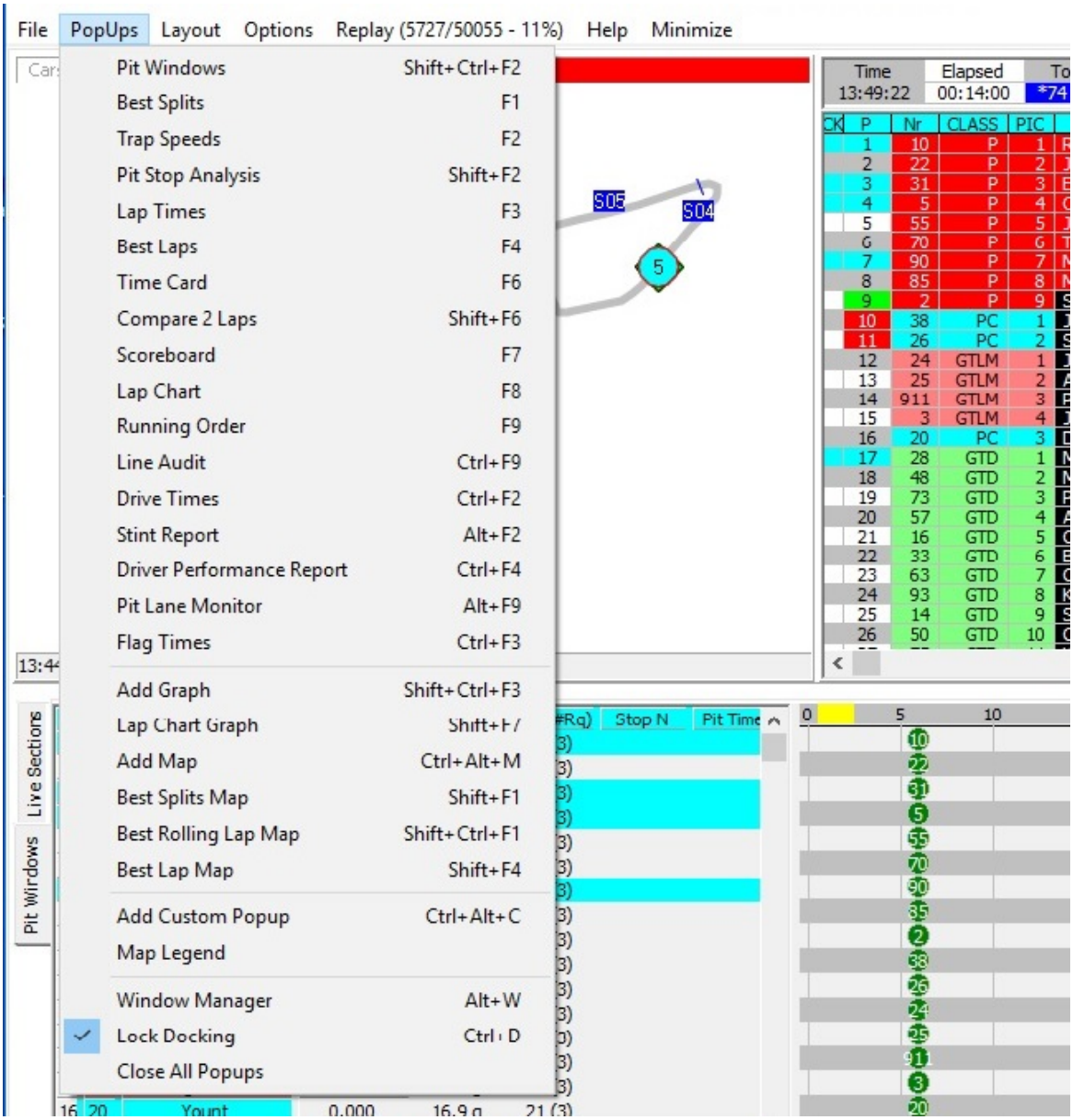
Load Settings

- Load Settings - With increased use of the docking features of the software, especially with the ability to have multiple track maps and graphs, the need for better management of configuration settings became obvious. With the change in v3 of saving configuration files to the %appdata% folder when running the executable out of the %program files% folder, There needed to be a way for you to restore the settings from v2.

- V3.0.10 adds a 'Load Settings' menu to the main program menu to load the program settings from any configuration file. This is most useful when migrating from version 2 to version 3 as the location of the configuration files may have changed, depending on where you run the software from. If you run RaceTools from the Program Files or Program Files (x86) folder, version 3 of RaceTools stores and loads the configuration from the AppData folder as recommended by Microsoft. It no longer saves to the Program Files folder as this folder is protected by the operating system and users were having problems closing the software and/or restoring their previous configuration when starting the software. If you run RaceTools from another folder, RaceTools will continue to save/restore the configuration from the same folder. With the 'Load Settings' menu, you can now load the configuration from a different folder. If you save or close the software, RaceTools will save the settings to the default folder which is the RaceTools program folder if not the windows program folder, or the AppData folder if the RaceTools program folder is in the Windows Program Folder (i.e. c:\Program Files or c:\Program Files (x86)).

- V3.1.0 now saves and restores any extra maps and/or graphs that you may have added. Previously you would have to re-add the maps and/or graphs each time you launched the software, but now RaceTools will remember how many maps/graphs you added and restore them when you start the software.

PopUps



Note: Some menu items are not applicable and will not be available in series that do not have multiple classes running together and do not have multiple drivers per car.

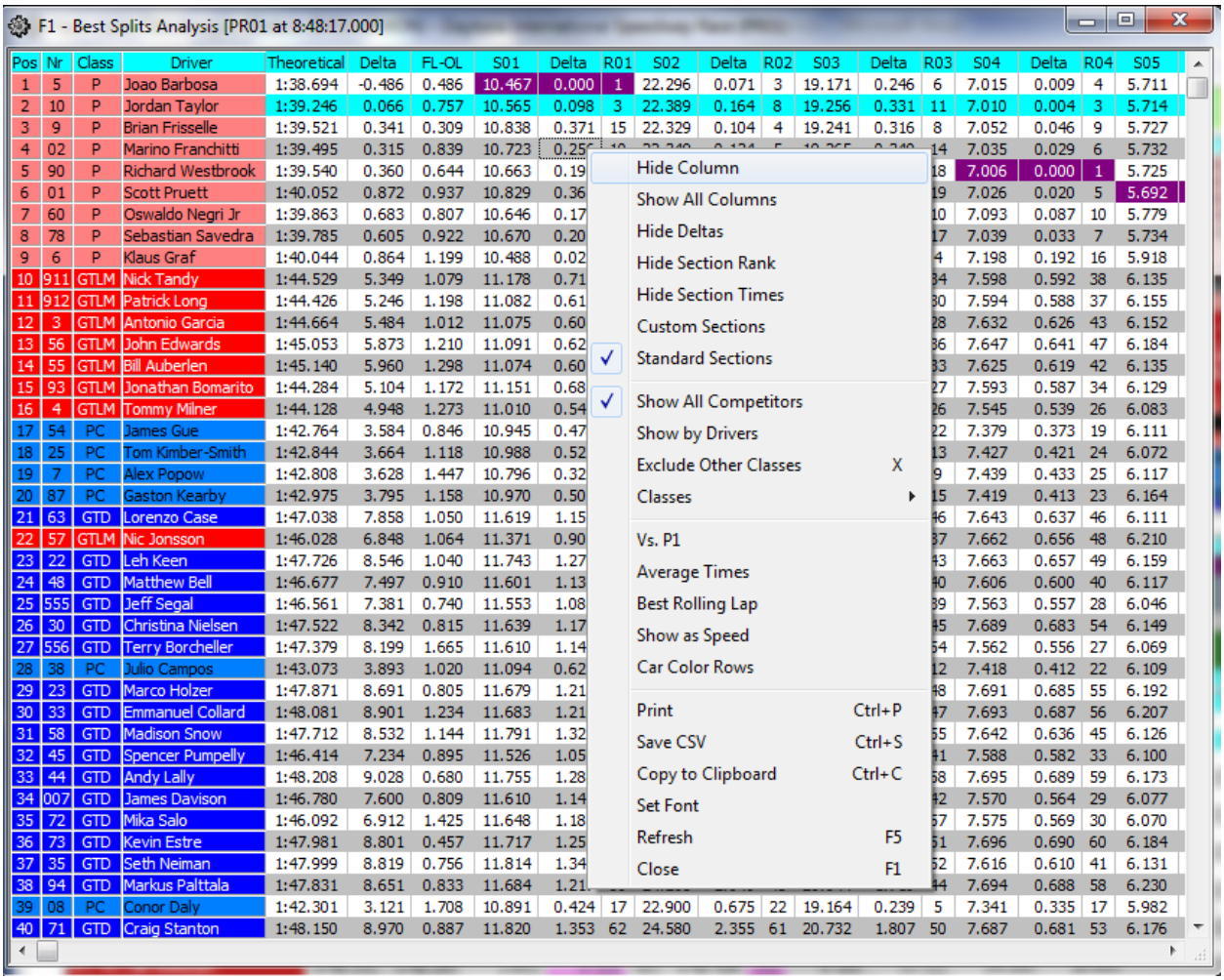
Pit Windows (Shift+Ctrl+F2)

- Pit Window – Opens the 'Pit Window' display in the lower part of the screen.

NOTES ON DOCKING GRAPHS AND REPORTS:

- Notes on Docking graphs and reports are found in the Appendix.

Best Splits (F1)



Right Click Menu – Shows different options you can select for this report.

- Hide Column – allows the user to hide any selected column. The column must be underneath the right click. This can be done by right-clicking anywhere in the column
- Show All Columns – makes all columns visible and formats column widths to be identical. This typically makes all data in the popup visible without scrolling laterally.
- Hide Deltas – hides comparative deltas for each section listed.
- Hide Section Rank – hides comparative rank for each section listed.
- Hide Section Times – hides section times.
- Custom Sections – Display Custom sections (if defined).
- Standard Sections – Display Standard sections.

- Show All Competitors – enabled by default, or if no competitors are selected (checked) in the Session Results table. Displays all of the competitors in the session. If it's disabled, the report only displays the competitors selected in the Session Results table.

- Show By Drivers – Sort by Driver Name.

- Exclude Other Classes – Exclude classes other than 'Team Car' class.

- Classes – Select classes to display.

- Vs P1 – Compare to P1.

- Average Times – Displays Average times instead of Best Times.

- Best Rolling Lap – The best complete lap, using any time line as the start/finish line of the lap. This is useful to find the best lap completed, regardless of the location of the S/F line.

- Show As Speed – Display speed instead of Time.

- Car Color Rows – formats the rows to the color applied to each individual car in the car color dialog (accessible by Ctrl+Left Click on the car number in the Session Results window).

- Print (Ctrl+P) – opens print window to print report.

- Save CSV (Ctrl+S) - creates a .csv file for the data contained in the report for use with other programs.

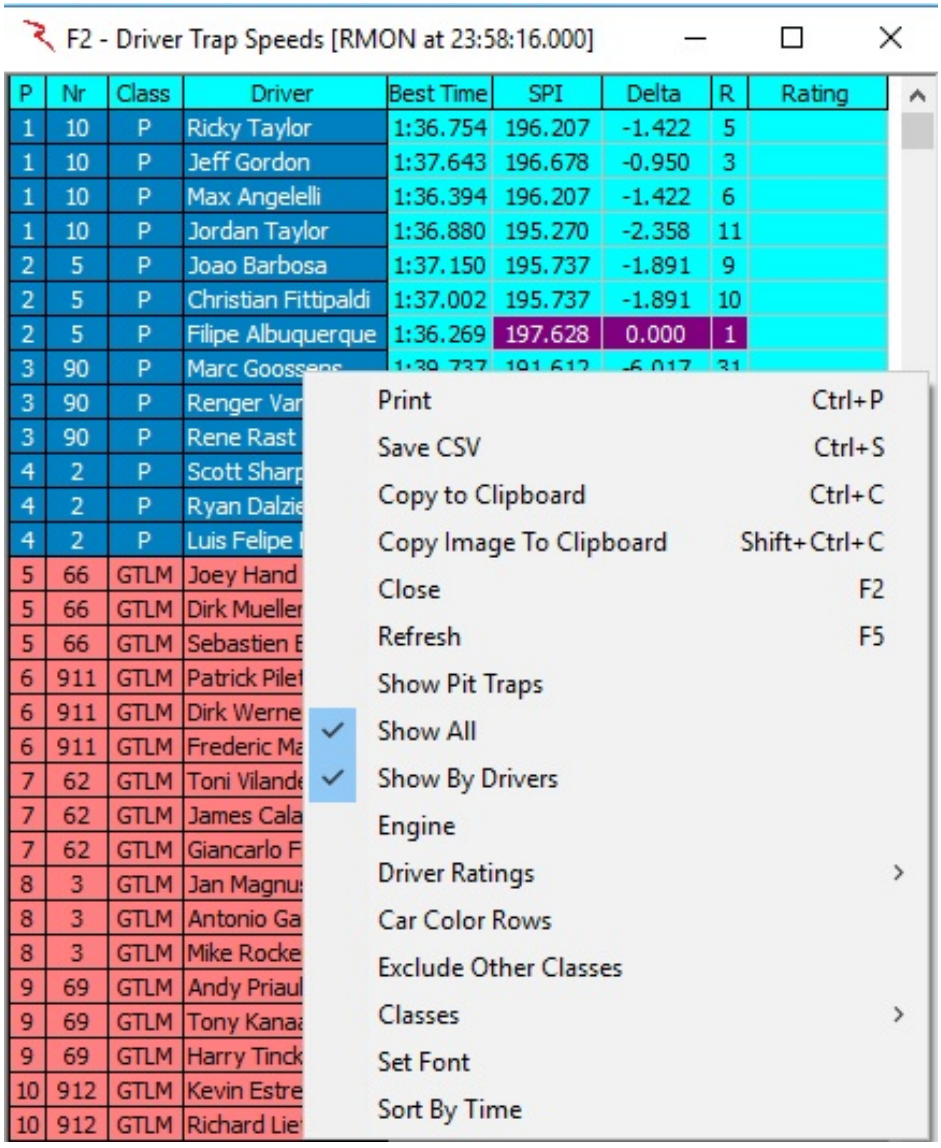
- Copy To Clipboard (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.

- Set Font – sets the font and font size for the table.

- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.

- Close (F1) – closes the window. The window can also be closed via the •X• in the upper right corner.

Trap Speeds (F2)



Right Click Menu reveals options available for this display.

- Print (Ctrl+P) – opens print window to print the report.
- Save CSV (Ctrl+S) - creates a .csv file for the data contained in the report for use with other programs.
- Copy To Clipboard (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image To Clipboard (Shift+Ctrl+C) – Copy the image to clipboard.
- Close (F2) – closes the window. The window can also be closed via the •X• in the upper right corner.

- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.
- Show Pit Traps – Display Pit traps if available.
- Show All – Displays all of the competitors in the session.
- Show by Drivers – Sort by Driver Name.
- Engine – Display Engine if available.
- Driver Ratings – Display driver rankings if available.
- Car Color Rows – formats the rows to the color applied to each individual car in the car color dialog (accessible by Ctrl+Left Click on the car number in the Session Results window).
- Exclude Other Classes – Exclude classes other than 'Team Car' class.
- Classes – Select classes to display.
- Set Font – sets the font and font size for the table.
- Sort By Time – Sort by Best Time.

Pit Stop Analysis (Shift+F2)

- The Pit Stop Analysis (Shift+F2) report provides the InLap, PitLane, and OutLap times for each pit stop. The total is the sum of the three, which is normally equal to two laps, but if the pit lane does not intersect the S/F line, the total is actually equal to one lap. The BaseLap can be set to the leaders' previous lap laptime (as indicated in the popup menu), the competitors' previous laptime (default), or a user configured laptime (Set Base Laptime). The Base Lap is used to determine the TimeLost. The TimeLost is the difference between the equivalent number of base lap laptimes and the sum of the InLap, PitLane, and OutLap times (total). The report shows the track status when the car entered the pits, the rank at the start of the InLap, the rank at the end of the OutLap, the ElapsedTime at PitIn, the GapOnTrack is actually the Gap at the PitIn Line. The LSP is the Laps Since Pit or number of laps in the stint. The GL and YL are the number of Green Laps and Yellow Laps in the stint. A lap must start and end under Green to qualify as a Green Lap. The FuelUsed is calculated using the number of GreenLaps x Green Lap Fuel Economy + Yellow Laps x Yellow Lap Fuel Economy. If the calculated Fuel Used is more than the capacity of the Fuel Tank, then the Fuel Economy numbers being used are wrong and should be adjusted. Note that you will need to refresh (F5) the report to get the most current information. The report is not automatically updated.

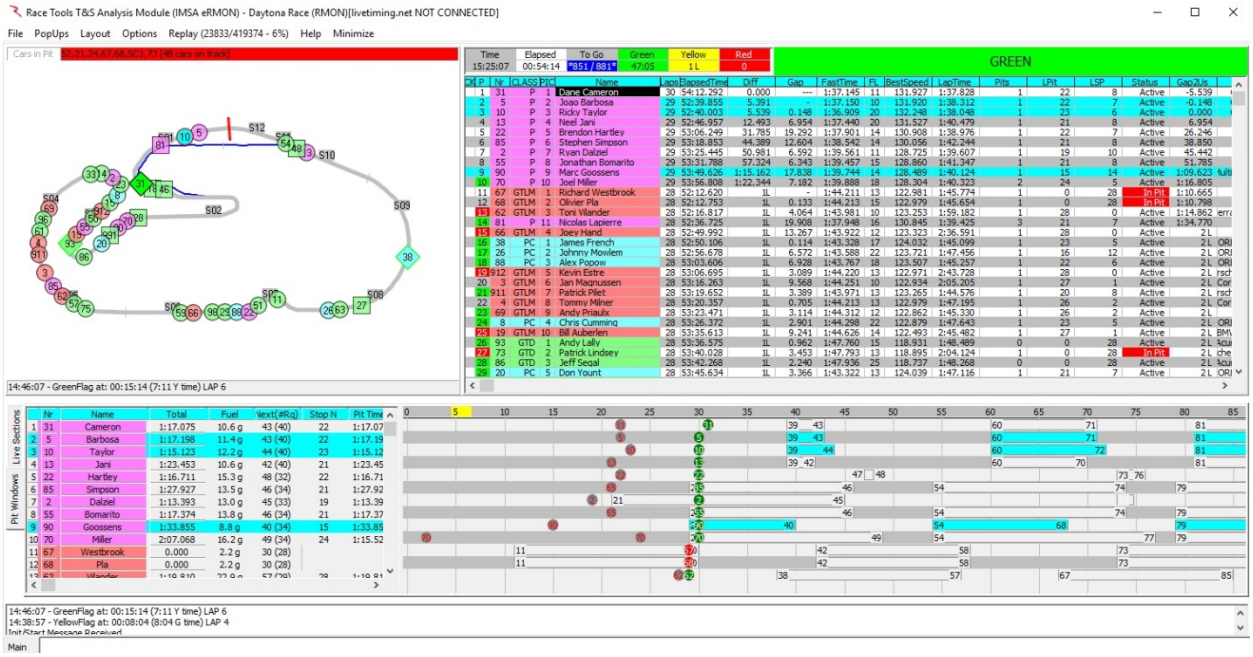
- InDriver field has been added to Pit Stop Report to display the driver that exited pit lane after the pit stop. If you don't see the InDriver column, right click the report and select the 'Reset Columns' menu to reset the report columns to display all of the selected fields. To preserve this layout, select the Save layout menu item. If you don't want this or any other column to be displayed, right click the column title and select 'Hide Column'. Remember to 'Save layout' after making any changes.

- Set Base Laptime – Sets the BaseLap to the leaders' previous lap laptime.

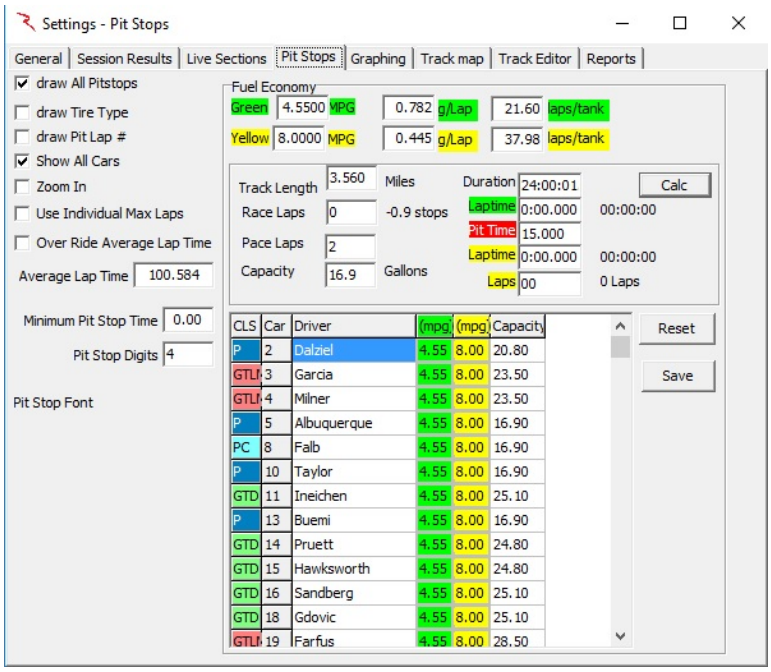
- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.

- Print (Ctrl+P) – opens print window to print the report.
- Save CSV (Ctrl+S) - creates a .csv file for the data contained in the report for use with other programs.
- Copy To Clipboard (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image To Clipboard (Shift+Ctrl+C) – Copy the image to clipboard.
- Close (F2) – closes the window. The window can also be closed via the •X• in the upper right corner.
- TimeLost vs Leader – Display time lost vs the leader.
- Hide Column – Hide a column.
- Reset Columns – Reset columns and widths.
- Show All Logical Sections –
- Show Pre-Pit Laptimes
- Show Post-Pit Laptimes
- Show All Cars
- Add Pit Stop At Checker
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes
- Car Color Rows – Display car color if defined.
- Save Layout
- Load Layout
- Set Font
- Exclude Empty PITLANE stops - Eliminates the extra false pit stops without a valid pitlane section time. This eliminates false pitlane timeline crossings. Do Not execute while cars are in Pit Lane or valid pit stops might be deleted.

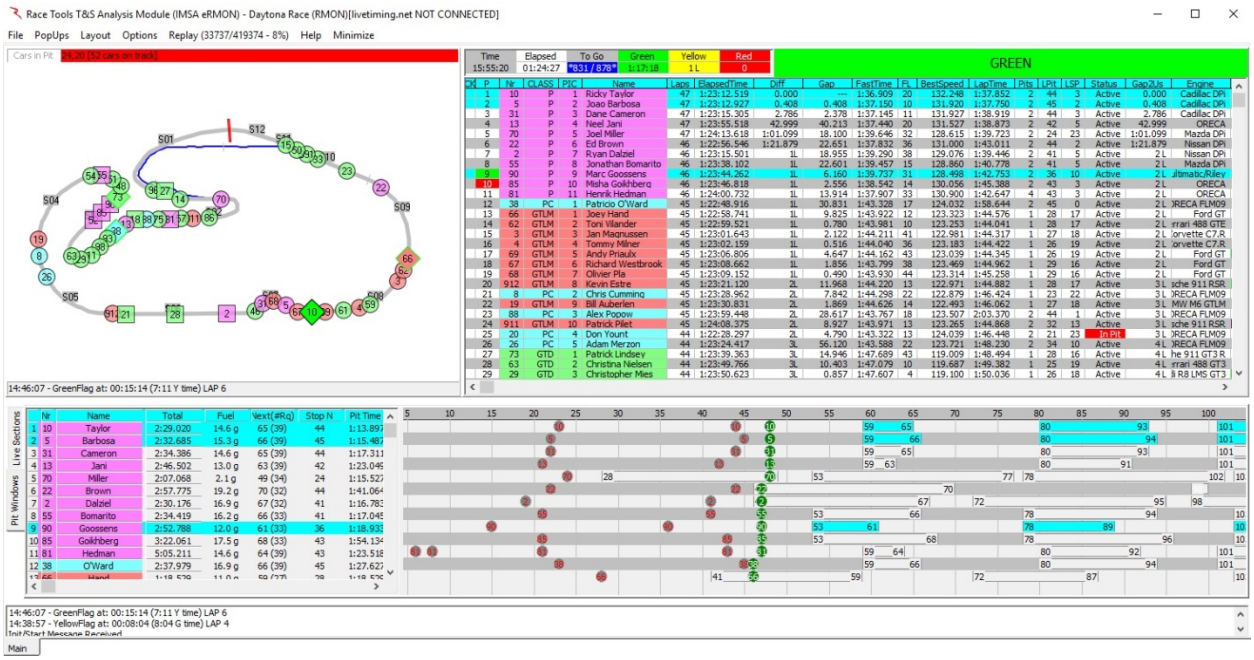
Another useful tool is the Pit Windows display. The Pit Windows tab displays projected and completed pit stop information. The left hand side shows the amount of fuel in the car (this is a calculated value, not from the team's telemetry) and the lap they need to pit by in blue. The right side of the tab displays the pit windows. The projections rely on setting the appropriate Fuel Economy for each car. At the start of the race, the projected pit windows are displayed. The cars are colored RED if they are in the pits, which is the default at the start of the race.



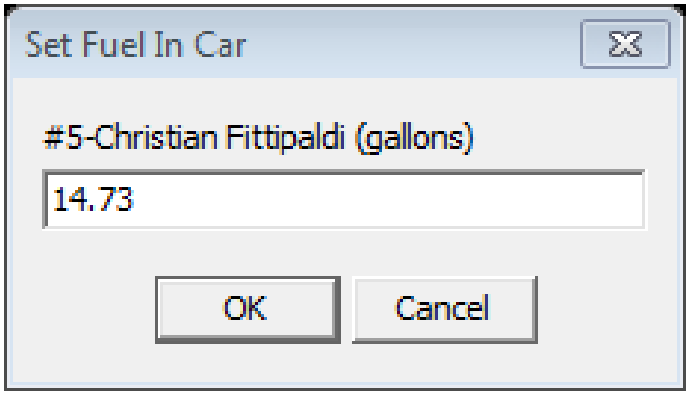
You can access the Fuel Economy table by double clicking on the Pit Stop table. You can set global Green and Yellow Fuel Economy numbers and apply them with the Reset button. You can edit the mpg figures for each competitor individually in the table. You should Save these so they will be used the next time the program is launched.



After pit stops are taken, the pit windows are updated.

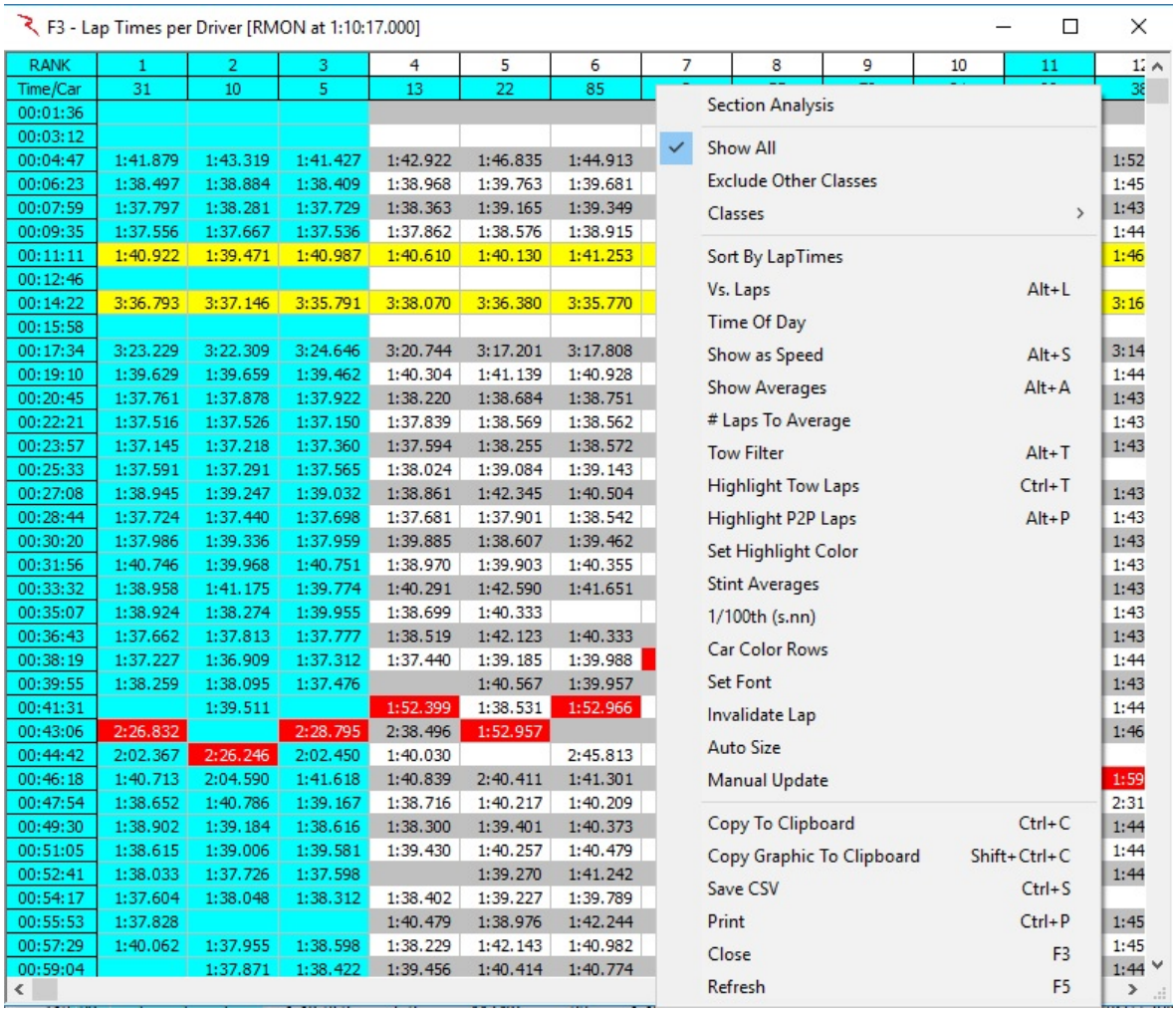


Note that the software assumes a full fill any time a car goes through pit lane. If this is not the case, you can adjust the amount of fuel in the car by clicking on the car number in the Pit Stop table. This brings up the Set Fuel In Car dialog box which allows you to set how much fuel you think is in the car at this time. If they short fueled or did not refuel at all, you would decrease this number accordingly.



Lap Times (F3)

- Lap Times (F3) – Lists the lap times for each competitor in the session. By default, lap times are listed by session time. Lap times can also be listed by competitor completed laps, lap times, or Time Of Day. Results are listed left to right by session rank. Out Laps are highlighted in red while fastest laps for each competitor are highlighted in green. This report is applicable to all session types.



RANK	1	2	3	4	5	6	7	8	9	10	11	12
Time/Car	31	10	5	13	22	85						38
00:01:36												
00:03:12												
00:04:47	1:41.879	1:43.319	1:41.427	1:42.922	1:46.835	1:44.913						1:52
00:06:23	1:38.497	1:38.884	1:38.409	1:38.968	1:39.763	1:39.681						1:45
00:07:59	1:37.797	1:38.281	1:37.729	1:38.363	1:39.165	1:39.349						1:43
00:09:35	1:37.556	1:37.667	1:37.536	1:37.862	1:38.576	1:38.915						1:44
00:11:11	1:40.922	1:39.471	1:40.987	1:40.610	1:40.130	1:41.253						1:46
00:12:46												
00:14:22	3:36.793	3:37.146	3:35.791	3:38.070	3:36.380	3:35.770						3:16
00:15:58												
00:17:34	3:23.229	3:22.309	3:24.646	3:20.744	3:17.201	3:17.808						3:14
00:19:10	1:39.629	1:39.659	1:39.462	1:40.304	1:41.139	1:40.928						1:44
00:20:45	1:37.761	1:37.878	1:37.922	1:38.220	1:38.684	1:38.751						1:43
00:22:21	1:37.516	1:37.526	1:37.150	1:37.839	1:38.569	1:38.562						1:43
00:23:57	1:37.145	1:37.218	1:37.360	1:37.594	1:38.255	1:38.572						1:43
00:25:33	1:37.591	1:37.291	1:37.565	1:38.024	1:39.084	1:39.143						
00:27:08	1:38.945	1:39.247	1:39.032	1:38.861	1:42.345	1:40.504						1:43
00:28:44	1:37.724	1:37.440	1:37.698	1:37.681	1:37.901	1:38.542						1:43
00:30:20	1:37.986	1:39.336	1:37.959	1:39.885	1:38.607	1:39.462						1:43
00:31:56	1:40.746	1:39.968	1:40.751	1:38.970	1:39.903	1:40.355						1:43
00:33:32	1:38.958	1:41.175	1:39.774	1:40.291	1:42.590	1:41.651						1:43
00:35:07	1:38.924	1:38.274	1:39.955	1:38.699	1:40.333							1:43
00:36:43	1:37.662	1:37.813	1:37.777	1:38.519	1:42.123	1:40.333						1:43
00:38:19	1:37.227	1:36.909	1:37.312	1:37.440	1:39.185	1:39.988						1:44
00:39:55	1:38.259	1:38.095	1:37.476		1:40.567	1:39.957						1:43
00:41:31		1:39.511		1:52.399	1:38.531	1:52.966						1:44
00:43:06	2:26.832		2:28.795	2:38.496	1:52.957							1:46
00:44:42	2:02.367	2:26.246	2:02.450	1:40.030		2:45.813						
00:46:18	1:40.713	2:04.590	1:41.618	1:40.839	2:40.411	1:41.301						1:59
00:47:54	1:38.652	1:40.786	1:39.167	1:38.716	1:40.217	1:40.209						2:31
00:49:30	1:38.902	1:39.184	1:38.616	1:38.300	1:39.401	1:40.373						1:44
00:51:05	1:38.615	1:39.006	1:39.581	1:39.430	1:40.257	1:40.479						1:44
00:52:41	1:38.033	1:37.726	1:37.598		1:39.270	1:41.242						1:44
00:54:17	1:37.604	1:38.048	1:38.312	1:38.402	1:39.227	1:39.789						
00:55:53	1:37.828			1:40.479	1:38.976	1:42.244						1:45
00:57:29	1:40.062	1:37.955	1:38.598	1:38.229	1:42.143	1:40.982						1:45
00:59:04		1:37.871	1:38.422	1:39.456	1:40.414	1:40.774						1:44

Additional options accessed by right click are listed below.

- Section Analysis –Display times for a particular section. Check this item, and then right click again to select a section.
    - Select Section.

- Show All - selects all competitors. The report can be run for only selected competitors if this feature is not selected. Drivers can be selected by clicking in the •CK• check box in the Session Results window (an •x• will appear). When selected drivers are changed, the report might need to be refreshed.

- Exclude Other Classes - Exclude classes other than the 'Team Car'.

- Classes – Displays Classes in session.

- Sort By LapTimes – sorts the competitor data by lap time, ascending order.
- Vs. Laps (Alt+L) – sorts the data by the lap number.
- Time of Day – sorts the data by time of day.
- Show as Speed (Alt+S) – shows lap performance as speed, most useful for oval events.
- Show Averages (Alt+A) – adds analysis of average lap time and summarizes the best laps at the top of the report. This is quite useful for sessions that contain many laps by each competitor or span a long period of time (like open test sessions).
- # Laps To Average

F3 - Lap Times per Driver [RMON at 24:29:46.000]

RANK	1	2	3	4	5
Car #	14	73 (3.37)	59 (7.48)	54 (12.12)	22 (12.63)
AVERAGE	1:53.961	1:57.931	2:03.170	2:09.678	2:10.431
CAR #	5	10	31	13	22
FASTTIME	1:36.269	1:36.394	1:36.793	1:37.440	1:37.832
Time/Car	10	5	90	2	66
G Avg	1:47.704	1:48.325	1:50.028	1:51.434	1:53.050
Y Avg	2:43.244	2:50.161	2:28.890	2:28.165	2:29.346
02:17:24	1:38.769	1:39.743	1:40.484	1:40.384	1:43.715
02:18:59	1:38.688	1:37.529	1:41.520	1:39.235	1:43.998
02:20:33	1:40.638	1:39.636	1:39.888	1:39.766	1:45.817
02:22:08	1:39.416	1:39.079	1:39.886	1:41.007	1:44.250

- Tow Filter (Alt+T) – eliminates laps from the report that are classified as 'tow' laps. If a car is within the Tow Threshold of another competitor at any timing line, the lap is considered a tow lap. This feature is most useful for oval events. Remember that the Tow Threshold is set in the File -> Configuration menu.
- Highlight Tow Laps (Ctrl+T) – this feature changes the font color of laps that are considered 'tow' laps. The color of the font changes to the user selected color to indicate a lap that was completed under a tow.
- Highlight P2P Laps (Alt+P) – Highlights PushToPass Laps.
- Set Highlight Color – sets the font color for the tow lap highlight.
- Stint Averages – when this option is selected, the out laps that are background highlighted in red change from lap time to the average lap time of the previous stint.
- 1/100 (s.nn) – reduces the resolution of the lap time/speed to 2 decimal places instead of the Report Digits.
- Car Color Rows – formats the rows to the color applied to each individual car in the cars color dialog.

- Set Font – sets the font and font size for the table.
- Invalidate Lap
- Auto Size - auto sizes the column width to the data contained within it and the window to the data of the report
- Manual Update -
- Copy to Clipboard (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Graphic to Clipboard (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Save as CSV (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs.
- Print (Ctrl+P) – opens print window to print report.
- Close (F3) – closes the window. The window can also be closed via the •X• in the upper right corner.
- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.
- Note that double clicking on a car number in the Lap Time report opens the time card for that competitor. An example time card is below. The time card shows lap time, lap speed, segment, trap, and track condition data for the selected driver.

Time Card 5

P	Car	Class	PIC	Driver	Lap	LapTime	Statu	Speed	Flag	S01	S02	S03	S04	S05	S06	S07	S08
1	5	P	1	Filipe Albuquerq	220	1:47.460	T	119.263	G	11.848	24.718	22.129	7.285	5.767	5.459	10.232	6.361
1	5	P	1	Filipe Albuquerq	221	1:47.639	T	119.065	G	11.806	25.163	22.160	7.055	5.704	5.433	10.312	6.354
1	5	P	1	Filipe Albuquerq	222	1:47.352	T	119.383	G	12.163	24.712	21.607	7.056	5.715	5.411	10.710	6.351
2	5	P	2	Filipe Albuquerq	223	2:49.332	P	75.686	G	12.265	24.824	22.019	7.427	6.209	7.341	12.874	9.305
2	5	P	2	Filipe Albuquerq	224	2:14.451	T	95.321	G			23.600	7.302	5.828	5.643	11.087	6.473
1	5	P	1	Filipe Albuquerq	225	1:51.571	T	114.869	G	12.929	25.355	21.945	7.126	5.816	5.775	12.260	6.530
1	5	P	1	Filipe Albuquerq	226	1:47.459	T	119.264	G	11.874	24.673	21.721	7.097	5.756	5.536	10.558	6.446
1	5	P	1	Filipe Albuquerq	227	1:50.005	T	116.504	G	12.203	24.707	22.289	7.260	5.769	5.681	11.769	6.559
1	5	P	1	Filipe Albuquerq	228	1:57.280	T	109.277	G	12.582	26.461	24.095	7.429	5.856	5.503	14.493	6.958
1	5	P	1	Filipe Albuquerq	229	1:49.715	T	116.812	G	12.284	25.590	22.301	7.124	5.764	5.532	10.863	6.453
1	5	P	1	Filipe Albuquerq	230	1:49.515	T	117.025	G	12.458	25.003	22.309	7.131	5.737	5.450	11.174	6.533
1	5	P	1	Filipe Albuquerq	231	1:50.664	T	115.810	G	12.357	25.278	22.058	7.135	5.748	5.514	12.205	6.565
1	5	P	1	Filipe Albuquerq	232	1:48.314	T	118.323	G	11.999	25.197	21.947	7.142	5.762	5.469	10.725	6.407
1	5	P	1	Filipe Albuquerq	233	1:51.594	T	114.845	G	12.521	27.567	21.989	7.119	5.751	5.514	10.910	6.527
1	5	P	1	Filipe Albuquerq	234	1:48.644	T	117.963	G	12.142	25.516	21.984	7.204	5.744	5.497	10.473	6.375
1	5	P	1	Filipe Albuquerq	235	1:49.803	T	116.718	G	12.081	24.891	21.841	7.217	5.757	5.924	11.739	6.599
1	5	P	1	Filipe Albuquerq	236	1:48.420	T	118.207	G	12.293	24.987	21.760	7.264	5.742	5.475	10.723	6.398
1	5	P	1	Filipe Albuquerq	237	1:47.994	T	118.673	G	11.985	24.750	22.134	7.273	5.796	5.504	10.374	6.411
1	5	P	1	Filipe Albuquerq	238	1:49.094	T	117.477	G	12.228	24.820	21.379	7.117	5.731	5.641	11.901	6.527
1	5	P	1	Filipe Albuquerq	239	1:49.923	T	116.591	G	12.141	25.815	22.417	7.209	5.754	5.612	10.690	6.466
2	5	P	2	Filipe Albuquerq	240	3:27.244	P	61.840	G	12.015	24.918	21.832	7.141	5.748	5.507	11.477	9.667
2	5	P	2	Joao Barbosa	241	2:24.918	T	88.436	G			25.419	7.438	5.816	6.102	12.451	6.721

Best Laps (F4)

- Best Laps (F4) – displays the timed best lap driven by each competitor. Also displays the segment times, ranks, and deltas for each competitor.

Right-Click menu shows available options for this report.

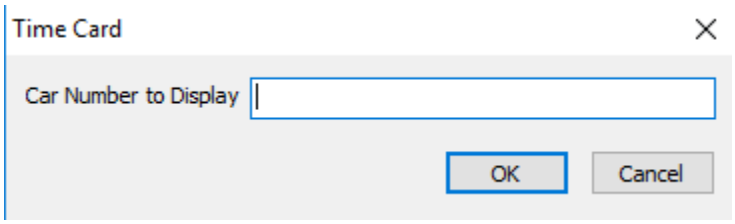
- Hide Column – allows the user to hide any selected column. The column must be selected before right clicking. This can be done by clicking anywhere in the column.
- Show All Columns – makes all columns visible and formats column widths to be identical. This typically makes all data in the popup visible without scrolling laterally.
- Hide Deltas – hides comparative deltas for each parameter listed.
- Hide Section Times – hides section times.
- Hide Section Rank – hides comparative rank for each section listed.
- Show As Speed – for this report, only the lap time and deltas show as speed, segments are still displayed as time. This is most useful for oval events where the performance index is speed.
- Custom Sections – Display Custom Sections.
- Standard Sections – Display standard sections.
- Trap Speed Sections – Display trap speed sections.

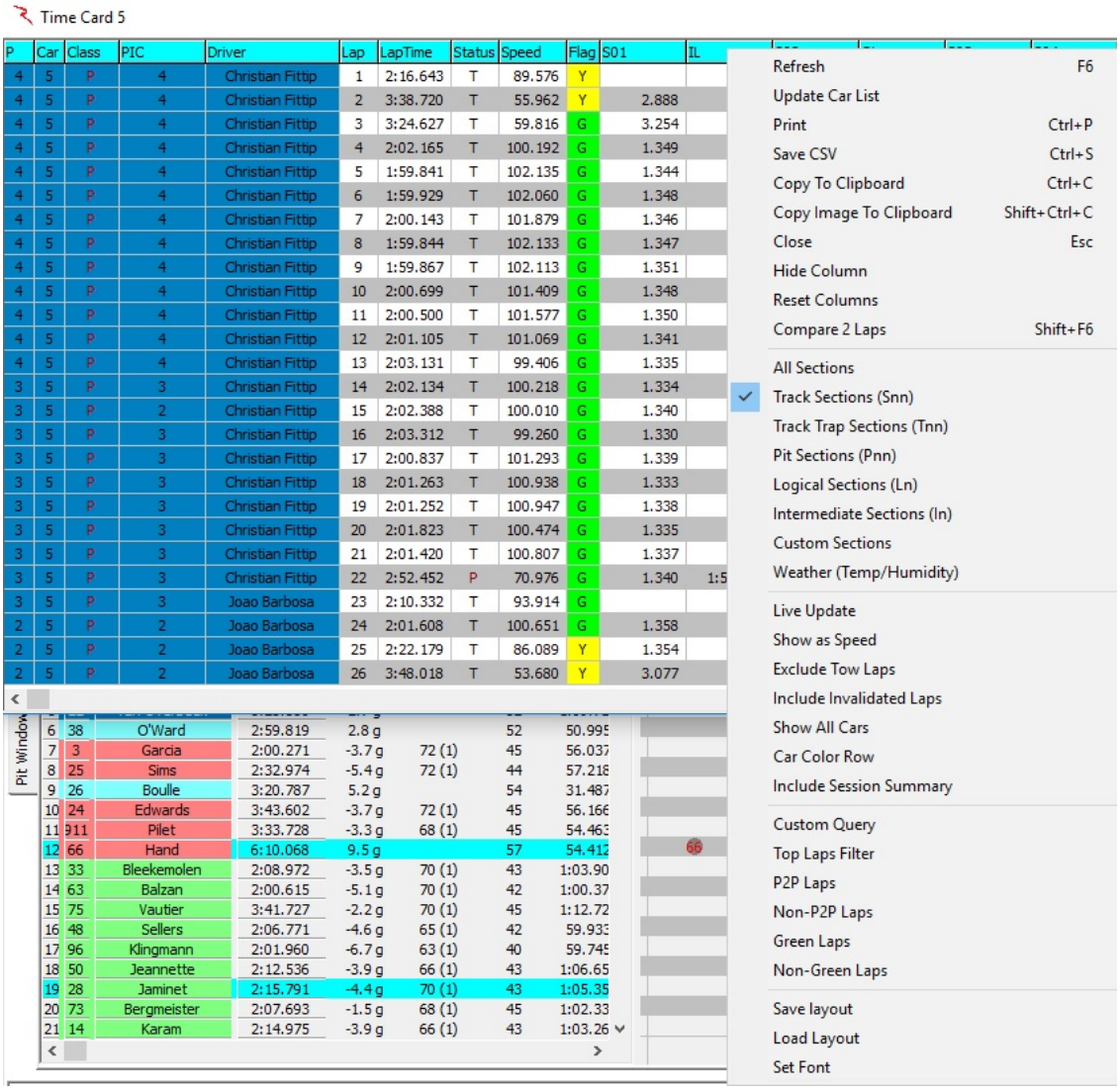
- Show All Cars – selects all competitors. The report can be run for only selected competitors if this feature is not selected. When selected drivers are changed, the report might need to be refreshed.
- Show By Drivers – Sort by Driver.
- Driver Ratings.
- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.
- Autosize – auto sizes the column width to the data contained within it and the window to the data of the report.
- Delta vs. Best Section Time – this compares the section times to the best of the session rather than that of the fastest lap.
- Car Color Rows – formats the rows to the color applied to each individual car in the cars color dialog.
- Exclude Other Classes – Excludes classes other than the 'Team Car' class.
- Classes – Displays the classes in the current session.
- Set Font – sets the font and font size for the table.
- Invalidate Fast Lap – Allows the user to invalidate the fastest lap for a competitor.
- Heat Map - To make it easier to identify faster/slower section times, the Section Time Delta fields are color coded when the 'Heat Map' option is enabled.
- Print (Ctrl+P) – opens print window to print report.
- Save as CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs.
- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Graphic to Clipboard – (Shift+Ctrl+C) – copy the graphic to the clipboard for direct pasting into other programs.
- Close (F4) – closes the window. The window can also be closed via the •X• in the upper right corner.

Time Card (F6)

- Time Card (F6) – RaceTools' TimeCard report can display the lap and section times for one or more cars within a session. You can call up a time card in many different ways. You can double click on a competitor in the Session Results, Best Splits, Best Trap, Best Lap, or Lap Times tables to bring up the Time Card for that competitor. That's a quick and easy way to see more detailed information for a specific competitor. You can also use the Popups menu (F6) to open a time card report and if you leave the list of cars empty, the time card will include all cars.

- Leave the list of car numbers to display empty to include all cars.





- Refresh – (F6) – refreshes the data in the report if the car list has changed or to reflect changes in the received data

- Update Car List – allows the user to change the competitor data in the report. More than one competitor's information can be displayed in the report. Leaving the selection window blank shows all users, otherwise, enter as ##,##,##,# to select individual entries. You can also enter list of car numbers as ## ## ##, separated by spaces.

- Print – (Ctrl+P) – opens print window to print report.

- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs.

- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.

- Copy Image to Clipboard – (Shift+Ctrl+C) - copy the image to the clipboard.

- Close – (Esc) – closes the window. The window can also be closed via the •X• in the upper right corner.

- Hide Column – allows user to hide a selected column. Note that the column title that the mouse is on when the right click is done is the column that will be hidden.

- Reset Columns – resets the report to show all columns and all information contained within the column, even if previously hidden.

- Compare 2 Laps – (Shift+F6) – Compare Laps of 2 cars at a given elapsed time into the race. (hh:mm:sss)

- All Sections – Display all sections.

- Track Sections (Tnn) – Display Track Sections.

- Track Trap Sections (Tnn) – Display Track Speed Trap sections.

- Pit Sections (Pnn) – Display Pit Sections (if available).

- Logical Sections (Ln) – Display Logical sections (if defined).

- Intermediate Sections (In) – Display Intermediate sections (if defined)

- Custom Sections – Display Custom sections (if defined).

- Weather (Temp/Humidity) – Display Weather (if available).

- Live Update – links the report to the incoming timing data to be automatically updated. If this option is not selected, only the data received prior to opening the report will be displayed (refresh updates the data).

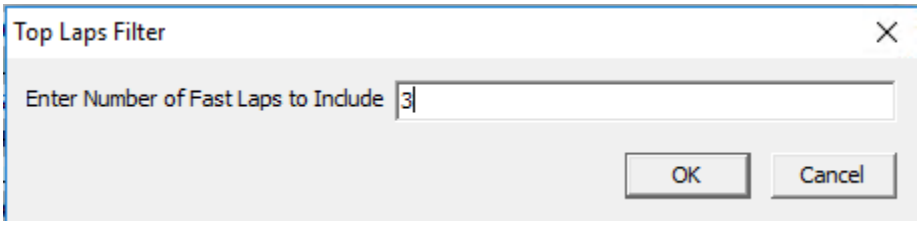
- Show as Speed – shows the timing information as speed for lap and segment information.

- Exclude Tow Laps – excludes laps categorized as 'tow' laps by thresholds set in the Configuration menu.
- Include Invalidated Laps – includes laps in the report which have been invalidated for any reason (shortcut the course, yellow flag, and rules infraction, etc.).
- Show All Cars – displays information for all cars in the session. Update Car List to select individual competitors again.
- Car Color Row – formats the rows to the color applied to each individual car in the cars color dialog.
- Include Session Summary
- Custom Query – *Description follows below*
- Top Laps Filter – Set number of top laps to filter.
- P2P Laps – Push-to-Pass Laps (IndyCar only)
- Non P2P Laps – Non Push-to-Pass Laps (IndyCar only)
- Green Laps – Display laps run under Green Flag conditions.
- Non-Green Laps – Display laps run under Non-Green Flag conditions.
- Save Layout – allows user to save a customized report, including column formatting and removal of columns.
- Load Layout – loads the saved report layout when selected. Use Reset Columns to return the report to default layout.
- Set Font – Set the font for the report.

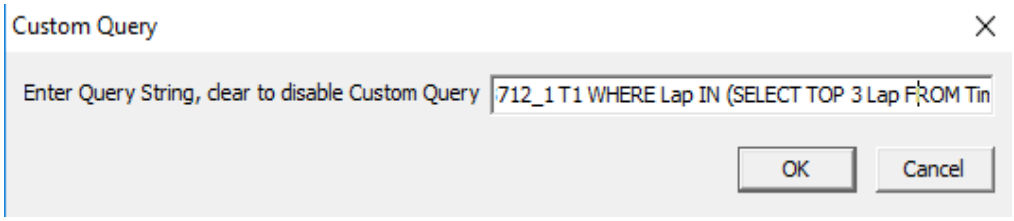
Custom Query

- Once you have a time card report, you can customize the laps to include in the report using the Custom Query feature. This feature is under development and considered in beta. I will work in making it work better, but it offers some extra control over what can be a larger amount of information.
- You can filter the report to include only the Top, P2P (IndyCar only), non-P2P (IndyCar only), Green or non-Green Laps. Selecting one of these options will build a custom Query string that will be executed against the records in the time card report.

For instance, if you only want to include the Top 3 Laps for each competitor, you can select the Top Laps Filter and you will be prompted for the number of laps to include. Enter '3' and hit OK.



RaceTools will build a Query String that only includes the top 3 laps for each car. If you don't need to change the query, just hit OK when prompted.



RaceTools will apply the following query to the time card table (TimeCard_3712_1 table name will be replaced based on the underlying TimeCard table used for the report).

SELECT * FROM TimeCard_3712_1 T1 WHERE Lap IN (SELECT TOP 3 Lap FROM TimeCard_3712_1 T2 WHERE T1.Car=T2.Car ORDER BY LapTime)

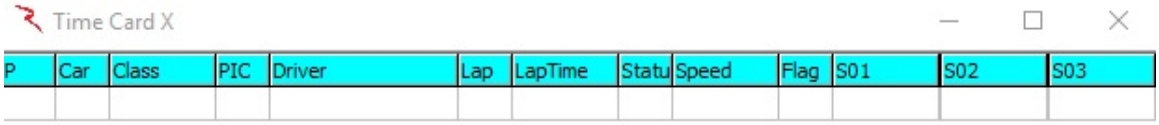
If you want to include the Top 3 Laps for each driver (rather than car), you can change the Query to:

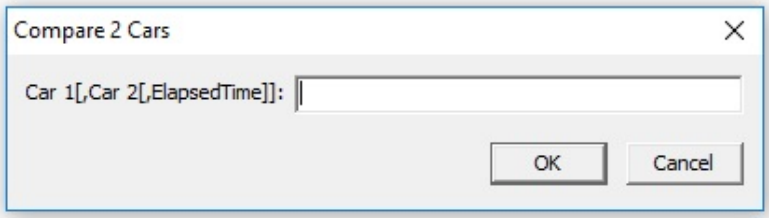
SELECT * FROM TimeCard_3712_1 T1 WHERE Lap IN (SELECT TOP 3 Lap FROM TimeCard_3712_1 T2 WHERE T1.Driver=T2.Driver ORDER BY LapTime)

Note that this process is designed to be used as a post-session tool as the Custom Query will not be retained when the results are updated and filtering using the query is very time consuming. You can refine the Query by selecting the Custom Query menu to edit the current Query String.

Compare 2 Cars (Shift+F6)

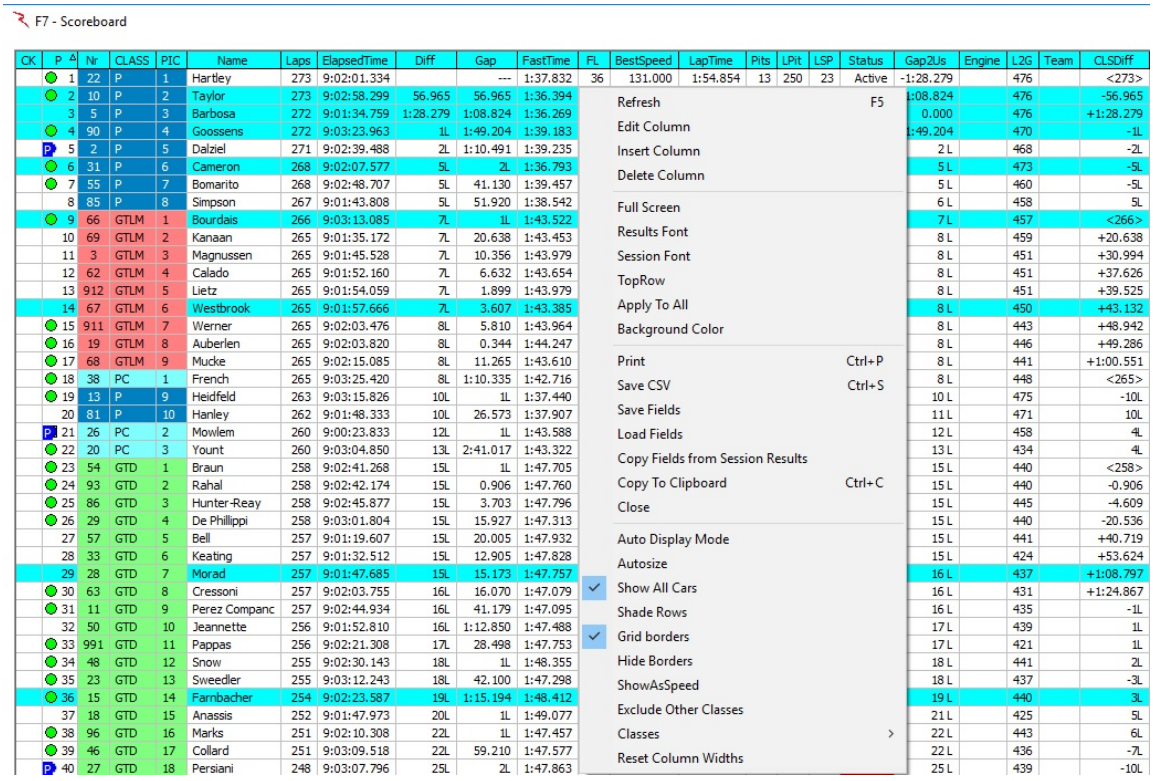
- Compare 2 Cars – (Shift+F6) – This Pop-Up allows you to compare the laptimes of two cars at a given elapsed time in the race.





Scoreboard (F7)

- Scoreboard – (F7) – this report is essentially a duplicate of the Session Results window that can be opened and placed outside of the software window (extended to another monitor for example). The Scoreboard can display any of the parameters available in the Session results window (see Session Results window section to see available categories). Note that this report sits on top of any other window that might be open on the desktop, even after Race Tools is minimized.



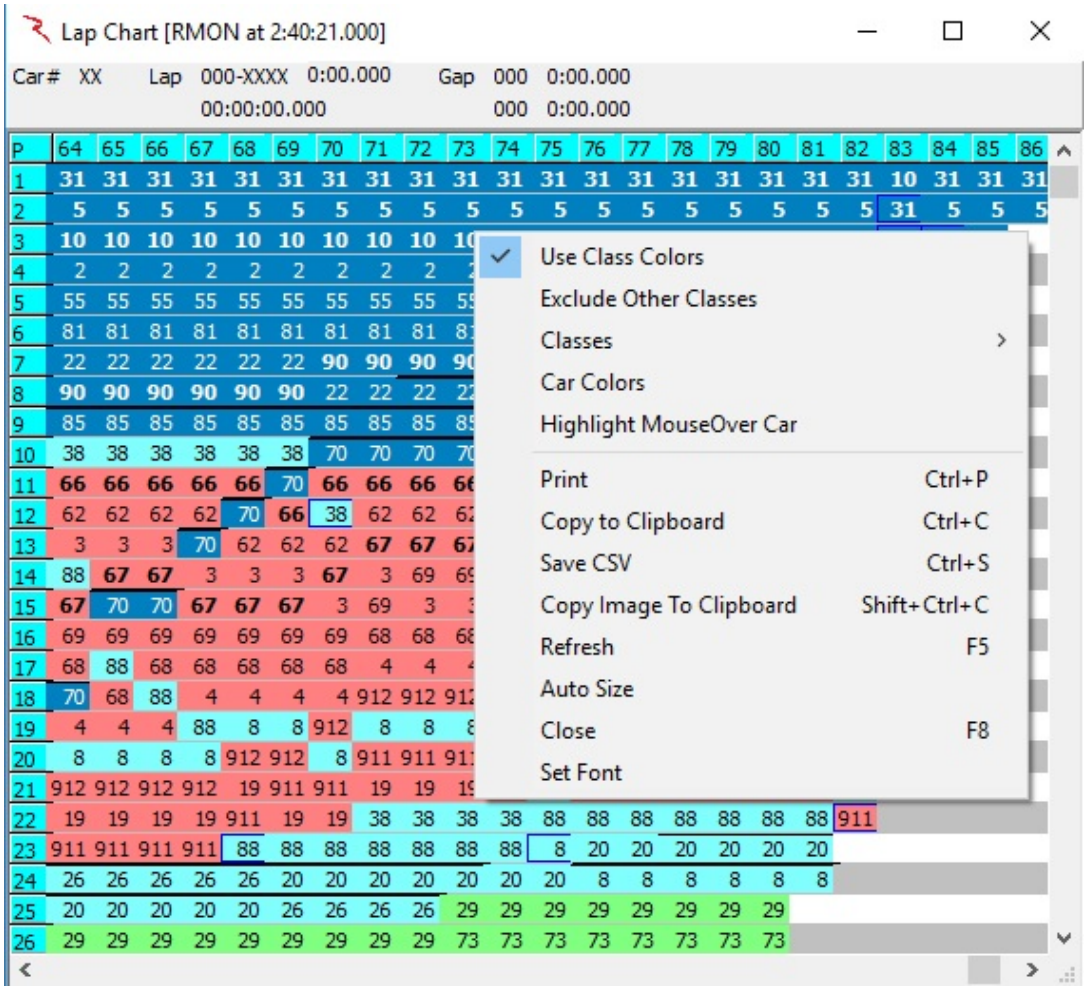
- Refresh – (F5) – refreshes the data in the report to reflect changes in the received data.
- Edit Column – allows user to change the timing parameter of a selected column. Right click on the column to change, and select parameter from the drop down menu.
- Insert Column – inserts a column at the point of the right click, then select the desired quantity from the drop down list.
- Delete Column – removes the selected column from the report. Note that the column title that the mouse is on when the right click is done is the column that will be deleted.
- Full Screen – Expand the display to fill the screen.
- Results Font – sets the font of the text in the report.
- Session Font – sets the font of the text in the report.
- Top Row (X) – This feature lists the position that is the top row in the report, for example Top Row (0) shows all competitors, while Top Row (5) shows only positions 5+. User will be prompted to input highest position to be displayed when feature is selected. Note that this is useful when there are many competitors and the window needs to be a specific size.
- Apply To All –
- Background Color – changes the background color of the report to the selected color.
- Print – (Ctrl+P) – opens print window to print report.
- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs.
- Save Fields – Save the selected fields to a file.
- Load Fields – Load fields from a saved file.
- Copy Fields From Session Results – Copy the fields from the 'Session Results' window. You modify the 'Scoreboard' window using the 'Insert Column' and 'Delete Column' functions.
- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Close – closes the window. The window can also be closed via the •X• in the upper right corner.
- Auto Display Mode – Displays a Pre-formatted scoreboard.
- Autosize – Auto sizes the window to the data that is contained in it.
- Show All Cars – by default the report is set to show all cars. If this option is not selected, then only the cars that have been selected in the "CK• column of the Session Results table will be displayed in the report. If you change this setting, you may have

to refresh the report. Note that if no individual competitors are selected and Show All Cars is not selected, all cars will still be displayed.

- Shade Rows – this shades every other row grey in order to help distinguish between the rows.
- Grid Borders – this puts borders on every "cell• to distinguish the data.
- Hide Borders – hides the borders of the window to decrease the footprint.
- ShowAsSpeed – This changes the QTotal, QWU, QL1, QL2, QL3, and QL4 oval qualifying fields to display speed instead of time.
- Exclude Other Classes – Excludes classes other than the 'Team Car' class.
- Classes – Allows selection of specific classes.
- Reset Column Widths – Reset the column widths.

Lap Chart (F8)

Lap Chart – (F8) – most useful for race sessions, this report is similar to the "Race Lap Chart• report. It displays the position of each competitor for each lap of the race, track condition (background yellow for yellow flag), and pit stops laps (framed with a blue box). In addition, clicking on a specific cell, for instance lap 170 car 02 as shown below, gives lap time, gap to car in front, gap to leader, and time of race the lap was completed.



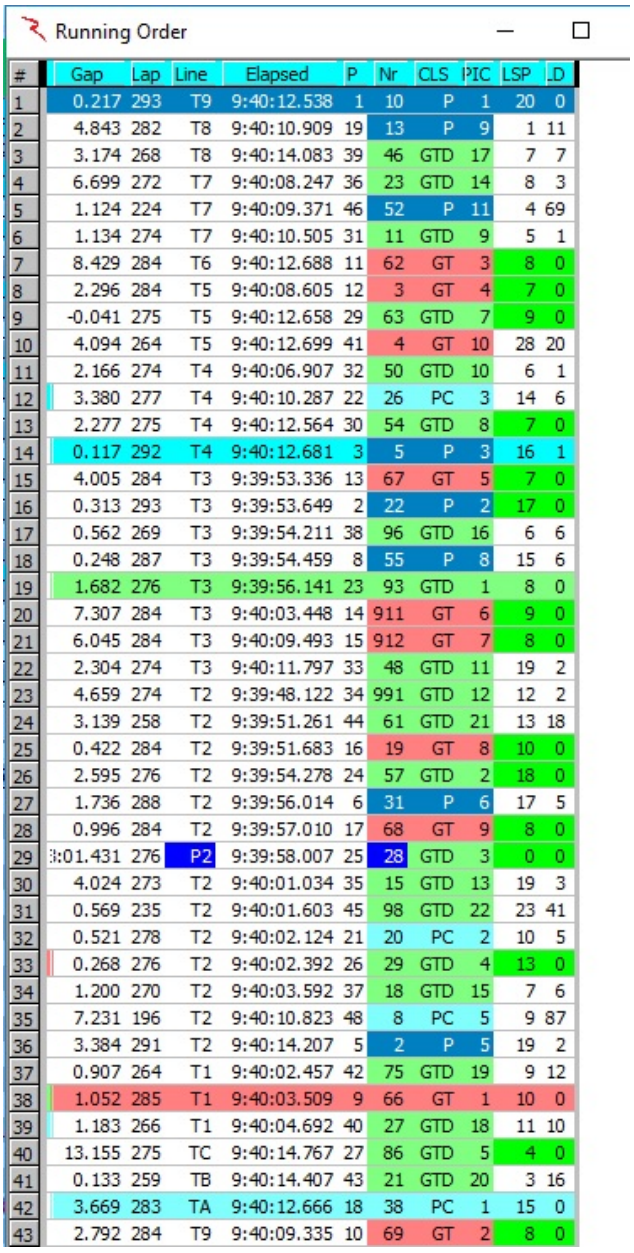
Additional options available by right click are listed.

- Use Class Colors – Display classes in colors.
- Exclude Other Classes – Exclude classes other than 'Team Car' class.
- Classes – Select Classes to display.
- Car Colors – Display car colors (if defined).
- Highlight MouseOver Car – The car will be highlighted on all laps when the mouse is over it. You can quickly see a car's position throughout the race.
- Print – (Ctrl+P) – opens print window to print report.

- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs.
- Copy Image to Clipboard – (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Refresh – (F5) – refreshes the data in the report to reflect changes in the received data.
- Autosize – Auto sizes the window to the data that is contained in it.
- Close – (F8) - Closes the window. The window can also be closed via the "X• in the upper right corner.
- Set Font – Set the font for this display.

Running Order (F9)

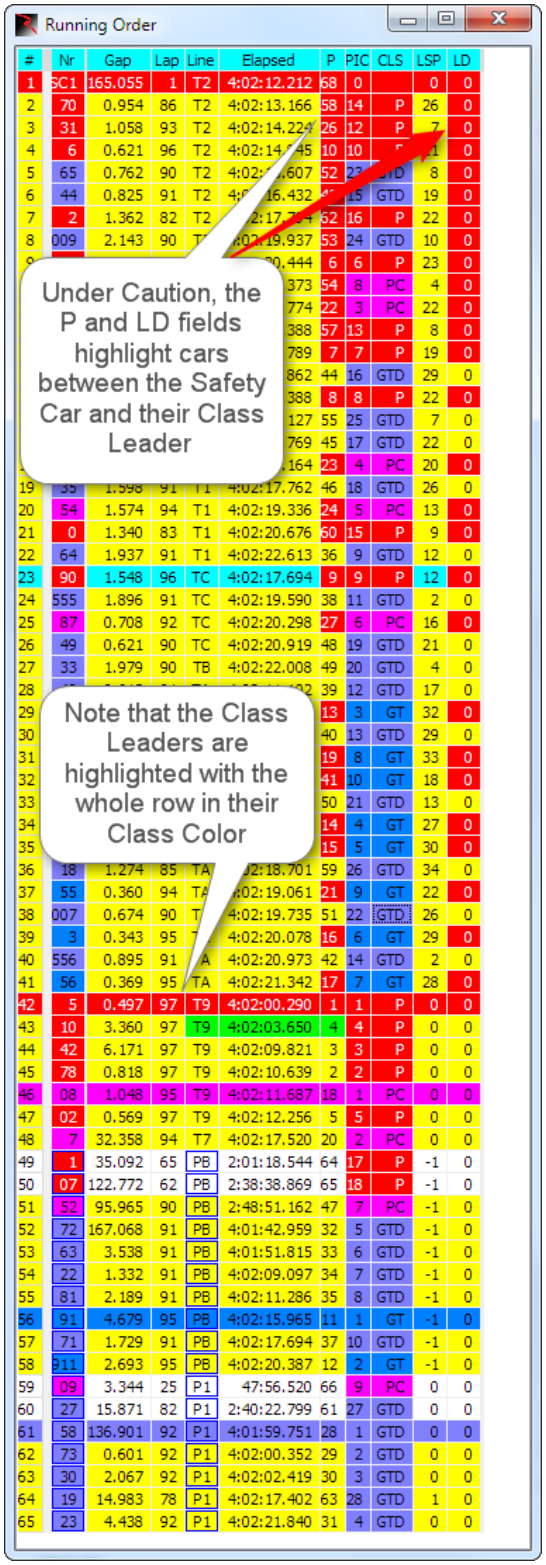
- Running Order – (F9) – most useful for race sessions, this report shows the actual running order and gaps on track for the lap. While the Session Results window and Scoreboard show position at SF, this report shows position relative to the most recent timing line. The report shows car number, gap to car directly in front, lap currently working, and scored position (SF). If the option to Show Details is selected, timing line and time information is included as well (shown below). Additionally, the report shows track condition by background highlight color and pit stops with car number cells (and pit timing line) framed in a blue box.



#	Gap	Lap	Line	Elapsed	P	Nr	CLS	PIC	LSP	LD
1	0.217	293	T9	9:40:12.538	1	10	P	1	20	0
2	4.843	282	T8	9:40:10.909	19	13	P	9	1	11
3	3.174	268	T8	9:40:14.083	39	46	GTD	17	7	7
4	6.699	272	T7	9:40:08.247	36	23	GTD	14	8	3
5	1.124	224	T7	9:40:09.371	46	52	P	11	4	69
6	1.134	274	T7	9:40:10.505	31	11	GTD	9	5	1
7	8.429	284	T6	9:40:12.688	11	62	GT	3	8	0
8	2.296	284	T5	9:40:08.605	12	3	GT	4	7	0
9	-0.041	275	T5	9:40:12.658	29	63	GTD	7	9	0
10	4.094	264	T5	9:40:12.699	41	4	GT	10	28	20
11	2.166	274	T4	9:40:06.907	32	50	GTD	10	6	1
12	3.380	277	T4	9:40:10.287	22	26	PC	3	14	6
13	2.277	275	T4	9:40:12.564	30	54	GTD	8	7	0
14	0.117	292	T4	9:40:12.681	3	5	P	3	16	1
15	4.005	284	T3	9:39:53.336	13	67	GT	5	7	0
16	0.313	293	T3	9:39:53.649	2	22	P	2	17	0
17	0.562	269	T3	9:39:54.211	38	96	GTD	16	6	6
18	0.248	287	T3	9:39:54.459	8	55	P	8	15	6
19	1.682	276	T3	9:39:56.141	23	93	GTD	1	8	0
20	7.307	284	T3	9:40:03.448	14	911	GT	6	9	0
21	6.045	284	T3	9:40:09.493	15	912	GT	7	8	0
22	2.304	274	T3	9:40:11.797	33	48	GTD	11	19	2
23	4.659	274	T2	9:39:48.122	34	991	GTD	12	12	2
24	3.139	258	T2	9:39:51.261	44	61	GTD	21	13	18
25	0.422	284	T2	9:39:51.683	16	19	GT	8	10	0
26	2.595	276	T2	9:39:54.278	24	57	GTD	2	18	0
27	1.736	288	T2	9:39:56.014	6	31	P	6	17	5
28	0.996	284	T2	9:39:57.010	17	68	GT	9	8	0
29	3:01.431	276	P2	9:39:58.007	25	28	GTD	3	0	0
30	4.024	273	T2	9:40:01.034	35	15	GTD	13	19	3
31	0.569	235	T2	9:40:01.603	45	98	GTD	22	23	41
32	0.521	278	T2	9:40:02.124	21	20	PC	2	10	5
33	0.268	276	T2	9:40:02.392	26	29	GTD	4	13	0
34	1.200	270	T2	9:40:03.592	37	18	GTD	15	7	6
35	7.231	196	T2	9:40:10.823	48	8	PC	5	9	87
36	3.384	291	T2	9:40:14.207	5	2	P	5	19	2
37	0.907	264	T1	9:40:02.457	42	75	GTD	19	9	12
38	1.052	285	T1	9:40:03.509	9	66	GT	1	10	0
39	1.183	266	T1	9:40:04.692	40	27	GTD	18	11	10
40	13.155	275	TC	9:40:14.767	27	86	GTD	5	4	0
41	0.133	259	TB	9:40:14.407	43	21	GTD	20	3	16
42	3.669	283	TA	9:40:12.666	18	38	PC	1	15	0
43	2.792	284	T9	9:40:09.335	10	69	GT	2	8	0

- The Running Order report has been updated to reflect the elimination of the Lap Down Wave By rule. The LD@Y field is no longer available. To help identify pass-

around cars, under caution, all cars between the safety car and their class leader have their 'P' and 'LD' fields highlighted in Red.



#	Nr	Gap	Lap	Line	Elapsed	P	PIC	CLS	LSP	LD
1	SC1	165.055	1	T2	4:02:12.212	68	0		0	0
2	70	0.954	86	T2	4:02:13.166	58	14	P	26	0
3	31	1.058	93	T2	4:02:14.224	26	12	P	7	0
4	6	0.621	96	T2	4:02:14.845	10	10		11	0
5	65	0.762	90	T2	4:02:[illegible].607	52	23	GTD	8	0
6	44	0.825	91	T2	4:0[illegible]16.432	41	15	GTD	19	0
7	2	1.362	82	T2	[illegible]	52	16	P	22	0
8	009	2.143	90	T[illegible]	4:02:19.937	53	24	GTD	10	0
[illegible]					[illegible].444	6	6	P	23	0
[illegible]					[illegible]373	54	8	PC	4	0
[illegible]					[illegible]774	22	3	PC	22	0
[illegible]					[illegible]388	57	13	P	8	0
[illegible]					[illegible]789	7	7	P	19	0
[illegible]					[illegible]862	44	16	GTD	29	0
[illegible]					[illegible]388	8	8	P	22	0
[illegible]					[illegible]127	55	25	GTD	7	0
[illegible]					[illegible]769	45	17	GTD	22	0
[illegible]					[illegible].164	23	4	PC	20	0
19	33	1.598	91	T1	4:02:17.762	46	18	GTD	26	0
20	54	1.574	94	T1	4:02:19.336	24	5	PC	13	0
21	0	1.340	83	T1	4:02:20.676	60	15	P	9	0
22	64	1.937	91	T1	4:02:22.613	36	9	GTD	12	0
23	90	1.548	96	TC	4:02:17.694	9	9	P	12	0
24	555	1.896	91	TC	4:02:19.590	38	11	GTD	2	0
25	87	0.708	92	TC	4:02:20.298	27	6	PC	16	0
26	49	0.621	90	TC	4:02:20.919	48	19	GTD	21	0
27	33	1.979	90	TB	4:02:22.008	49	20	GTD	4	0
28	[illegible]				[illegible]102	39	12	GTD	17	0
29	[illegible]				[illegible]	13	3	GT	32	0
30	[illegible]				[illegible]	40	13	GTD	29	0
31	[illegible]				[illegible]	19	8	GT	33	0
32	[illegible]				[illegible]	41	10	GT	18	0
33	[illegible]				[illegible]	50	21	GTD	13	0
34	[illegible]				[illegible]	14	4	GT	27	0
35	[illegible]				[illegible]	15	5	GT	30	0
36	18	1.274	85	TA	[illegible]2:18.701	59	26	GTD	34	0
37	55	0.360	94	TA	[illegible]02:19.061	21	9	GT	22	0
38	007	0.674	90	T[illegible]	4:02:19.735	51	22	GTD	26	0
39	3	0.343	95	T[illegible]	4:02:20.078	16	6	GT	29	0
40	556	0.895	91	[illegible]A	4:02:20.973	42	14	GTD	2	0
41	56	0.369	95	TA	4:02:21.342	17	7	GT	28	0
42	5	0.497	97	T9	4:02:00.290	1	1	P	0	0
43	10	3.360	97	T9	4:02:03.650	4	4	P	0	0
44	42	6.171	97	T9	4:02:09.821	3	3	P	0	0
45	78	0.818	97	T9	4:02:10.639	2	2	P	0	0
46	08	1.048	95	T9	4:02:11.687	18	1	PC	0	0
47	02	0.569	97	T9	4:02:12.256	5	5	P	0	0
48	7	32.358	94	T7	4:02:17.520	20	2	PC	0	0
49	1	35.092	65	PB	2:01:18.544	64	17	P	-1	0
50	07	122.772	62	PB	2:38:38.869	65	18	P	-1	0
51	52	95.965	90	PB	2:48:51.162	47	7	PC	-1	0
52	72	167.068	91	PB	4:01:42.959	32	5	GTD	-1	0
53	63	3.538	91	PB	4:01:51.815	33	6	GTD	-1	0
54	22	1.332	91	PB	4:02:09.097	34	7	GTD	-1	0
55	81	2.189	91	PB	4:02:11.286	35	8	GTD	-1	0
56	91	4.679	95	PB	4:02:15.965	11	1	GT	-1	0
57	71	1.729	91	PB	4:02:17.694	37	10	GTD	-1	0
58	911	2.693	95	PB	4:02:20.387	12	2	GT	-1	0
59	09	3.344	25	P1	47:56.520	66	9	PC	0	0
60	27	15.871	82	P1	2:40:22.799	61	27	GTD	0	0
61	58	136.901	92	P1	4:01:59.751	28	1	GTD	0	0
62	73	0.601	92	P1	4:02:00.352	29	2	GTD	0	0
63	30	2.067	92	P1	4:02:02.419	30	3	GTD	0	0
64	19	14.983	78	P1	4:02:17.402	63	28	GTD	1	0
65	23	4.438	92	P1	4:02:21.840	31	4	GTD	0	0

- The calculations for the LD/Laps Down field have been updated so the LD/Laps Down field is more consistently updated at each time line.

- This is a calculated field and it's not as simple as one would think if we want it to be accurate at each timeline instead of the more traditional calculation at the S/F line. It is not simply Class Leader Laps – Competitor Laps. That's true at the S/F line, and many scoring systems will put cars a lap down as soon as the leader crosses the S/F line, even though they might not be a lapped car. They just haven't finished their lap yet. RaceTools calculates and displays the Diff and Laps Down fields respecting not just the Laps Completed field, but also when they crossed the S/F line relative to the leader.

- To make the Laps Down field reflect changes at each timeline adds another layer of complexity. It now needs to track how far each car is into the lap and when they crossed each timeline, relative to the class leader.

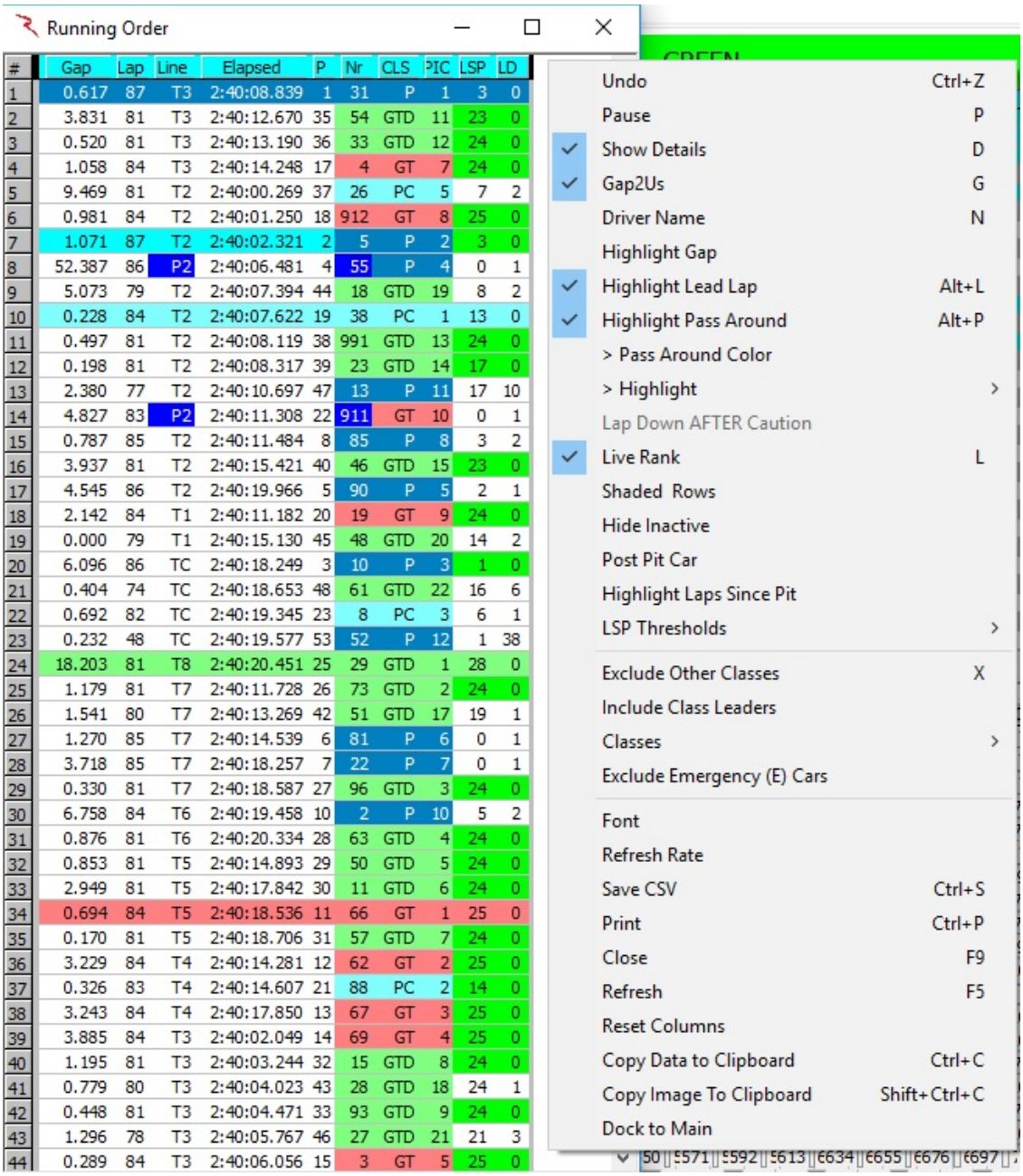
- Sometimes the data looks 'funny' but it is actually accurate. For instance, if you look at the example below, the cars above the class leader (Car 33) have the Laps Down being equal to Leader Laps – Laps -1 because they are actually ahead of the leader in the lap (and between the overall leader and their leader). What is less obvious is the Laps Down value for the cars below the class leader that have not completed their lap. These also have their Laps Down field being the Leader Laps – Laps -1 and not Leader Laps – Laps.

#	Nr	Gap	Lap	Line	Elapsed	P	PIC	CLS	LSP	LD
1	73	10.945	61	T5	2:15:15.162	36	15	GTD	2	0
2	93	10.846	61	T4	2:15:11.046	35	14	GTD	0	0
3	27	11.119	60	T4	2:15:22.165	41	20	GTD	9	1
4	23	4.428	61	T3	2:15:01.368	37	16	GTD	3	0
5	57	26.907	61	T2	2:15:22.551	38	17	GTD	1	0
6	33	5.445	62	T1	2:15:22.104	22	1	GTD	1	0
7	46	0.889	61	T1	2:15:22.993	39	18	GTD	3	1
8	28	1.744	61	TA	2:15:21.973	23	2	GTD	28	0
9	18	1.368	60	T9	2:15:21.813	40	19	GTD	24	1
10	29	1.251	61	T8	2:15:12.434	24	3	GTD	6	0
11	16	7.361	61	T8	2:15:19.795	25	4	GTD	10	0
12	50	5.090	61	T6	2:14:56.047	26	5	GTD	1	0
13	11	1.977	61	T6	2:14:58.024	27	6	GTD	10	0
14	15	1.417	61	T6	2:14:59.441	28	7	GTD	8	0
15	54	5.575	59	T6	2:15:05.016	42	21	GTD	4	2
16	14	1.543	61	T6	2:15:06.559	29	8	GTD	9	0
17	86	7.265	61	T6	2:15:13.824	30	9	GTD	15	0
18	96	1.447	61	T6	2:15:15.271	31	10	GTD	6	0
19	75	1.346	61	T6	2:15:16.617	32	11	GTD	3	0
20	63	9.513	61	T5	2:15:00.806	33	12	GTD	1	0
21	48	0.465	61	T5	2:15:01.271	34	13	GTD	2	0

- There are now two 'Refresh' options. The default Refresh (F5) option refreshes the data, sorting the competitors, leaderboard, etc. but no longer resizes the Session Results columns. To auto resize the Session Results columns (and do a data refresh) you now need to use the Refresh All (CTRL+F5) option.

As always, be aware that the software relies on the data and if there are interruptions in the data feed or other issues, the reports may have errors. Always double check the information and make sure you understand.

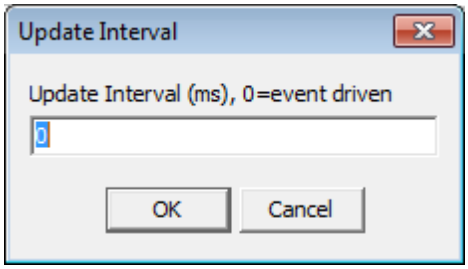
Right clicking reveals the following options for the Running Order popup:



#	Gap	Lap	Line	Elapsed	P	Nr	CLS	PIC	LSP	LD
1	0.617	87	T3	2:40:08.839	1	31	P	1	3	0
2	3.831	81	T3	2:40:12.670	35	54	GTD	11	23	0
3	0.520	81	T3	2:40:13.190	36	33	GTD	12	24	0
4	1.058	84	T3	2:40:14.248	17	4	GT	7	24	0
5	9.469	81	T2	2:40:00.269	37	26	PC	5	7	2
6	0.981	84	T2	2:40:01.250	18	912	GT	8	25	0
7	1.071	87	T2	2:40:02.321	2	5	P	2	3	0
8	52.387	86	P2	2:40:06.481	4	55	P	4	0	1
9	5.073	79	T2	2:40:07.394	44	18	GTD	19	8	2
10	0.228	84	T2	2:40:07.622	19	38	PC	1	13	0
11	0.497	81	T2	2:40:08.119	38	991	GTD	13	24	0
12	0.198	81	T2	2:40:08.317	39	23	GTD	14	17	0
13	2.380	77	T2	2:40:10.697	47	13	P	11	17	10
14	4.827	83	P2	2:40:11.308	22	911	GT	10	0	1
15	0.787	85	T2	2:40:11.484	8	85	P	8	3	2
16	3.937	81	T2	2:40:15.421	40	46	GTD	15	23	0
17	4.545	86	T2	2:40:19.966	5	90	P	5	2	1
18	2.142	84	T1	2:40:11.182	20	19	GT	9	24	0
19	0.000	79	T1	2:40:15.130	45	48	GTD	20	14	2
20	6.096	86	TC	2:40:18.249	3	10	P	3	1	0
21	0.404	74	TC	2:40:18.653	48	61	GTD	22	16	6
22	0.692	82	TC	2:40:19.345	23	8	PC	3	6	1
23	0.232	48	TC	2:40:19.577	53	52	P	12	1	38
24	18.203	81	T8	2:40:20.451	25	29	GTD	1	28	0
25	1.179	81	T7	2:40:11.728	26	73	GTD	2	24	0
26	1.541	80	T7	2:40:13.269	42	51	GTD	17	19	1
27	1.270	85	T7	2:40:14.539	6	81	P	6	0	1
28	3.718	85	T7	2:40:18.257	7	22	P	7	0	1
29	0.330	81	T7	2:40:18.587	27	96	GTD	3	24	0
30	6.758	84	T6	2:40:19.458	10	2	P	10	5	2
31	0.876	81	T6	2:40:20.334	28	63	GTD	4	24	0
32	0.853	81	T5	2:40:14.893	29	50	GTD	5	24	0
33	2.949	81	T5	2:40:17.842	30	11	GTD	6	24	0
34	0.694	84	T5	2:40:18.536	11	66	GT	1	25	0
35	0.170	81	T5	2:40:18.706	31	57	GTD	7	24	0
36	3.229	84	T4	2:40:14.281	12	62	GT	2	25	0
37	0.326	83	T4	2:40:14.607	21	88	PC	2	14	0
38	3.243	84	T4	2:40:17.850	13	67	GT	3	25	0
39	3.885	84	T3	2:40:02.049	14	69	GT	4	25	0
40	1.195	81	T3	2:40:03.244	32	15	GTD	8	24	0
41	0.779	80	T3	2:40:04.023	43	28	GTD	18	24	1
42	0.448	81	T3	2:40:04.471	33	93	GTD	9	24	0
43	1.296	78	T3	2:40:05.767	46	27	GTD	21	21	3
44	0.289	84	T3	2:40:06.056	15	3	GT	5	25	0

- Undo (Ctrl+Z) – Undo the previous action.
- Pause – (P) - Pauses the updating of the Running Order window, Can be used to Freeze the field when a Yellow is displayed.

- Show Details – (D) – this shows the timing line and time information, as shown in the right of the two figures in in the popup description above.
- Gap2Us (G) – Gap from the Leader to the 'Team Car'.
- Driver Name (N) – Display the driver name'.
- Highlight Gap (X.XXXX) – highlights gaps on track relative to the input gap. Gaps less than the input will be background highlighted in red and gaps in between the input and (input + 1 second) will be background highlighted yellow. If left to 0.0000, no special formatting is applied.
- Highlight Lead Lap (Alt+L) – Highlight 'Lead Lap' cars.
- Highlight Pass Around (Alt+P) – Highlight pass around cars.
- >Pass Around Color – Set the color for Pass Around cars.
- >Highlight –
    - Cautions Only
    - Team Class Only
- Lap Down AFTER Caution - .
- Live Rank (L) – Updates rank at each timeline crossing.
- Shaded Rows – Shades even numbered rows.
- Hide Inactive – Hide inactive cars. Hide Inactive option does not remove the car from the results or analysis, just from the track map and running order. The car's status will be set to '(Active)' to differentiate it from 'Active'. The will still be visible in the session results table and all of the reports.
- Post Pit Car – Highlights the car before and after the Post Pit Car.
- Highlight Laps Since Pit – Highlights the laps since pit column.
- LSP Thresholds - Values less than threshold will be highlighted in red as likely to pit.
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes – Allows the user to select the classes to display.
- Font – changes the font of the report.
- Refresh Rate – changes the refresh rate of the popup. By default, the report is updated based on the occurrence of an event (timing line activity).



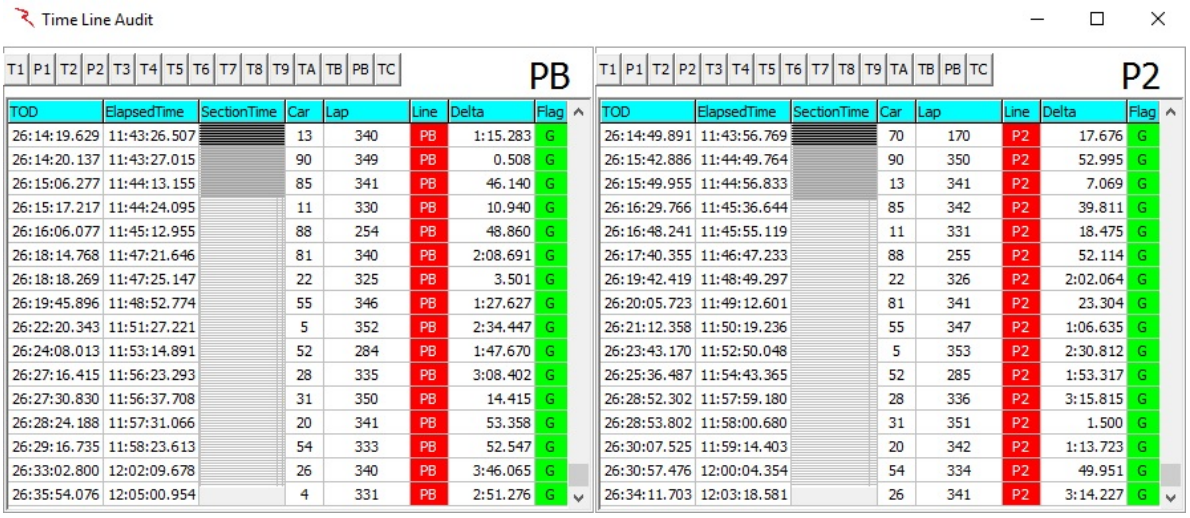
- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs
- Print – (Ctrl+P) – opens print window to print report
- Close – (F9) – closes the window. The window can also be closed via the "X• in the upper right corner.
- Refresh – (F5) – refreshes the data in the report to reflect changes in the received data.
- Reset Columns - Reset the columns.
- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image to Clipboard – (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Dock To Main - Dock to the Right of the main program window.

Line Audit (Ctrl+F9)

RaceTools offers many different ways to view the available data. It sometimes gets complicated, but that's the price of being flexible and customizable to the many users of the software. It seems everyone wants something slightly different.

If all you want is the Pit In and Pit Out times for either your team car or all cars, you can use the **Time Line Audit** popup.

Click on the timeline button to select that timeline to monitor. If you want to see two or more timelines at once, select the Add Monitor from the popup menu (right click). If you only want to see your team car, enable the 'Team Car Only' filter.

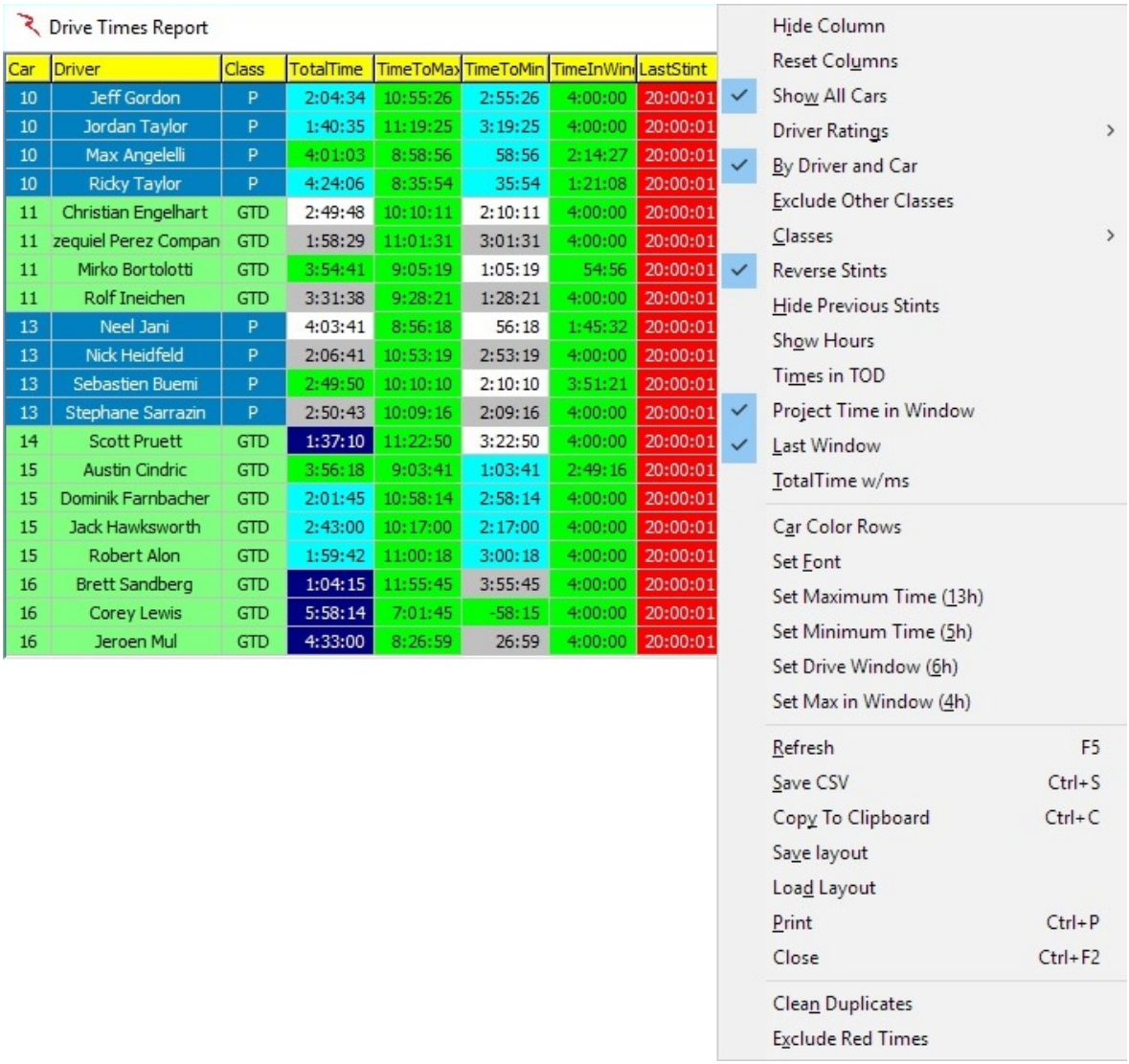


- Add Monitor – Add a monitor window to monitor another timeline.
- Delete Monitor – Delete an added monitor window.
- Save Layout – Save the layout to a file.
- Load Layout – Load a saved layout from a file.
- Team Car Only – Display data for the Team Car only. ('Set Team Car' in the Options menu.)
- Copy Data to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image to Clipboard – (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Clear Data - Clear the data in the window.
- Stay On Top - Keep this window on top of other windows.

Drive Times Report (Ctrl+F2)

- Complements the Stint Report
- Displays the information required by IMSA for logging Drive Times for each driver.
- As with the other reports, you can change the sort order by clicking on the column title. The default is by Driver Name so that they are grouped by Driver, but you can change it to sort by Lap or any other column.

- The Drive Times report now properly uses the race start time as the start of the race rather than the first team car crossing.



Menu settings:

These are my recommended settings for the Drive Times report.

Some are based on personal preference.

- **Show All Cars** is optional. If you only want to see your team drivers, uncheck this option.

Some are recommended.

- **Reverse Stints** displays the stints in reverse chronological order so that the current or latest stint is on the left, closer to the rest of the current information and more likely to be visible instead of on the right hand side of the table where it might be off-screen if there are a number of stints for the driver.

- You can select the '**Hide Previous Stints**' option if you only want to see the current or latest stint for each driver.

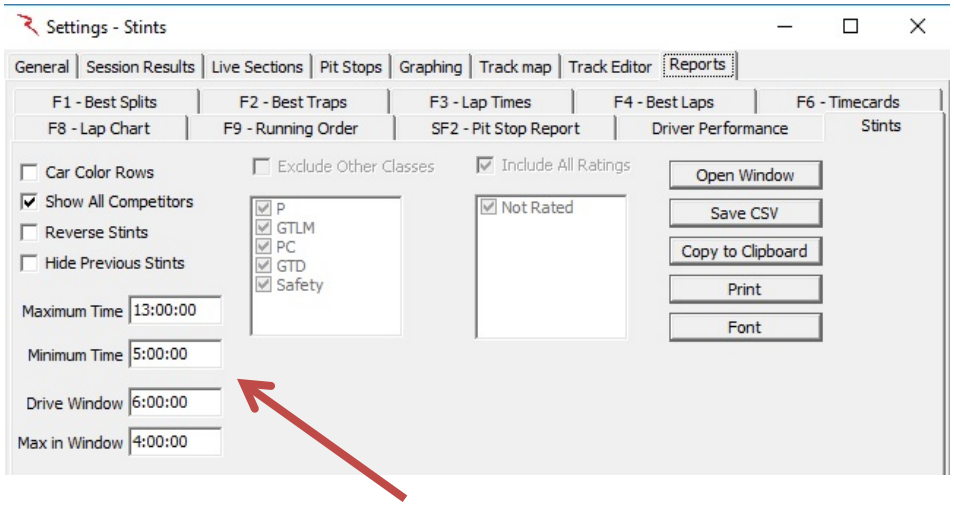
- **Project Time in Window** takes into account drive time that may roll out of the 6 hour window while the driver is in the car. Without this option, the report only looks at the last 6 hours to calculate how much drive time is available to the driver if he is currently in the car or if he were to get into the car. If the driver was in the car 4-6 hours ago, some of that drive time may expire while the driver is in the car therefore increasing the amount of drive time available. I recommend keeping this option selected.

- **Last Window** should be enabled near the end of the race (last 5-6 hours) to determine when a driver can get into the car and be able to drive to the end of the race.

Some are required.

- **By Driver and Car** is only relevant for drivers who drive multiple cars. Selecting this treats the driver/car combination as a unique, independent set rather than including drive times for a particular driver regardless of the car he was driving in.

- Make sure you set the Maximum Time, Minimum Time, Drive Window (6 hours) and Max in Window (4 hours) as appropriate for the race.



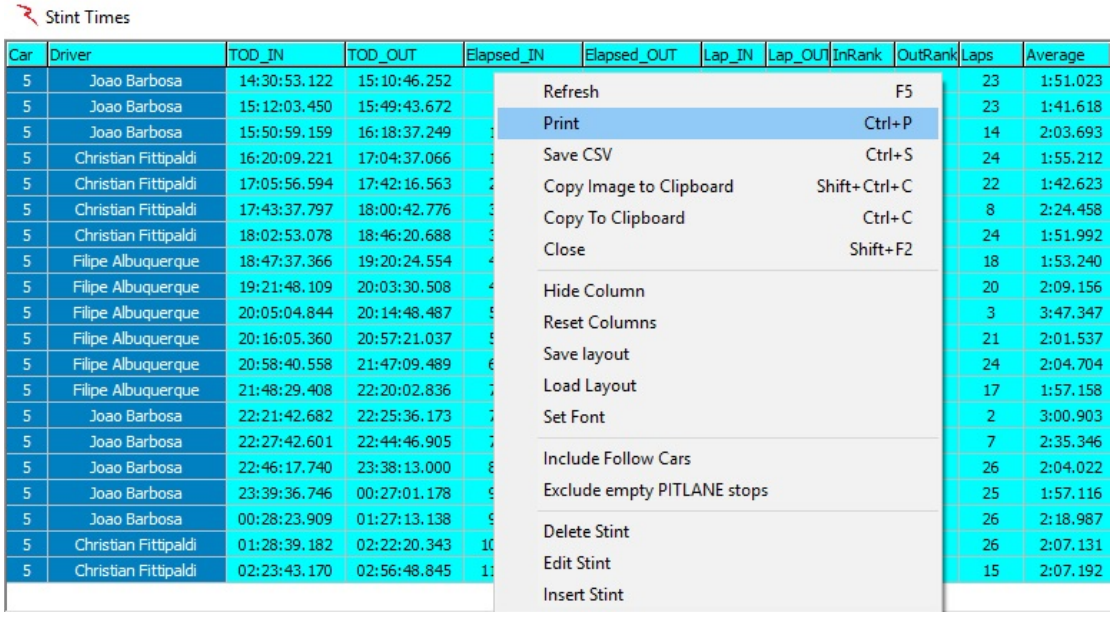
NOTE: Drive time limits may also be set in the File↳ Configuration↳ Reports ↳ Stints window

Car	Driver	Class	TotalTime	TimeToMax	TimeToMin	TimeInWin	LastStint	Stint_1_In	Stint_1_Out	Status
11	Mirko Bortolotti	GTD	4:39:18	8:20:41	20:41	4:00:00	20:00:01	11:45:55.119	13:20:54.555	COMPLETED
85	Misha Goikhberg	P	3:50:50	9:09:10	1:09:10	3:01:38	20:00:01	16:13:14.381		RUNNING
13	Neel Jani	P	4:03:41	8:56:18	56:18	4:00:00	20:00:01	11:44:56.833	12:25:58.810	COMPLETED
54	Nic Jonsson	GTD	3:53:56	9:06:04	1:06:04	4:00:00	20:00:01	12:00:04.354	12:14:50.389	COMPLETED
38	Nicholas Boulle	PC	3:47:26	9:12:34	1:12:34	4:00:00	20:00:01	12:27:25.929	14:10:31.136	COMPLETED
13	Nick Heidfeld	P	2:06:41	10:53:19	2:53:19	4:00:00	20:00:01	9:36:56.576	10:06:52.525	COMPLETED
81	Nicolas Lapierre	P	6:06:41	6:53:18	-1:06:42	4:00:00	20:00:01	8:19:17.431	14:33:34.305	COMPLETED
73	Norbert Siedler	GTD	56:58	12:03:01	4:03:01	4:00:00				COMPLETED
4	Oliver Gavin	GTLM	5:52:38	7:07:22	-52:38	1:24:02				RUNNING
68	Olivier Pla	GTLM	6:32:12	6:27:48	-1:32:12	1:16:35				COMPLETED
86	Oswaldo Negri Jr.	GTD	6:03:20	6:56:40	-1:03:20	18:00				COMPLETED
27	Paolo Ruberti	GTD	2:28:26	10:31:33	2:31:33	4:00:00				COMPLETED
38	Patricio O'Ward	PC	4:29:11	8:30:48	30:48	4:00:00				COMPLETED
73	Patrick Lindsey	GTD	1:49:54	11:10:05	3:10:05			54:53.860	1:51:22.118	COMPLETED
54	Patrick Long	GTD	1:54:12	11:05:47	3:0			45:16.477	6:30:46.822	COMPLETED
911	Patrick Pilet	GTLM	5:36:33	7:23:26	-3			59:29.439	13:20:30.207	RUNNING
98	Paul Dalla Lana	GTD	3:12:47	9:47:12	1:4			09:11.698	17:11:22.973	COMPLETED
98	Pedro Lamy	GTD	3:51:20	9:08:39	1:08			35:29.426	16:07:40.283	COMPLETED
51	Peter Mann	GTD	1:05:22	11:54:37	3:54:37	4:00:00	20:00:01	51:08.605	1:56:31.398	COMPLETED
23	Pierre Kaffer	GTD	6:06:09	6:53:50	-1:06:10	1:18:53	20:00:01	14:25:50.982	15:15:16.112	COMPLETED
27	Raffaele Giammaria	GTD	3:24:20	9:35:39	1:35:39	2:10:03	20:00:01	15:19:44.953	16:18:11.151	COMPLETED
52	RC Enerson	P	5:13:04	7:46:55	-13:05	1:17:27	20:00:01	15:19:57.267	16:57:15.167	COMPLETED
8	Remo Ruscitti	PC	5:24:27	7:35:33	-24:27	1:21:32	20:00:01	14:23:52.058	15:59:13.878	COMPLETED
90	Rene Rast	P	5:44:36	7:15:23	-44:37	4:00:00	20:00:01	13:59:27.387	14:20:57.916	COMPLETED
90	Renger Van Der Zande	P	4:08:08	8:51:52	51:52	3:52:39	20:00:01	17:04:14.693	10:56:04.929	RUNNING
912	Richard Lietz	GTLM	6:10:53	7:49:06	-1:10:54	1:15:27	20:00:01	15:16:17.340		RUNNING
67	Richard Westbrook	GTLM	3:57:37	9:	1:02:22	4:00:00	20:00:01	8:20:28.858	9:24:00.373	COMPLETED
10	Ricky Taylor	P	5:22:43	7:37:17	-22:43	3:01:23	20:00:01	16:12:59.176		RUNNING
51	Rino Mastronardi	GTD	1:27:44	11:32:15	3:32:15					COMPLETED
15	Robert Alon	GTD	4:59:47	8:00:13	13					RUNNING
8	Robert Wickens	PC	2:49:52	10:10:07	2:10:07					COMPLETED
61	Roberto Pampanini	GTD	2:02:44	10:57:15	2:57:15					COMPLETED
57	Robin Liddell	GTD	3:35:10	9:24:49	1:24:49					COMPLETED
11	Rolf Ineichen	GTD	3:31:38	9:28:21	1:28:21					COMPLETED
61	Rolf Ineichen	GTD	2:06:29	10:53:30	2:53:30	3:19:23	20:00:01	16:38:09.079	16:32:45.553	RUNNING
67	Ryan Briscoe	GTLM	6:02:31	6:57:28	-1:02:32	4:00:00	20:00:01	12:13:53.469	13:54:22.916	COMPLETED
2	Ryan Dalziel	P	6:49:57	6:10:02	-1:49:58	2:09:33	20:00:01	16:58:28.502	16:57:11.387	RUNNING

- Hide Column – allows the user to hide any selected column. The column must be underneath the right click. This can be done by right-clicking anywhere in the column
- Reset Columns – makes all columns visible and formats column widths to be identical. This typically makes all data in the popup visible without scrolling laterally.
- Show All Cars – Display drive times for all cars.
- Driver Ratings
- By Driver and Car – Useful if a driver drives more than one car.
- Exclude Other Classes – Exclude classes other than 'Team Car' class.
- Classes – Select classes to display.

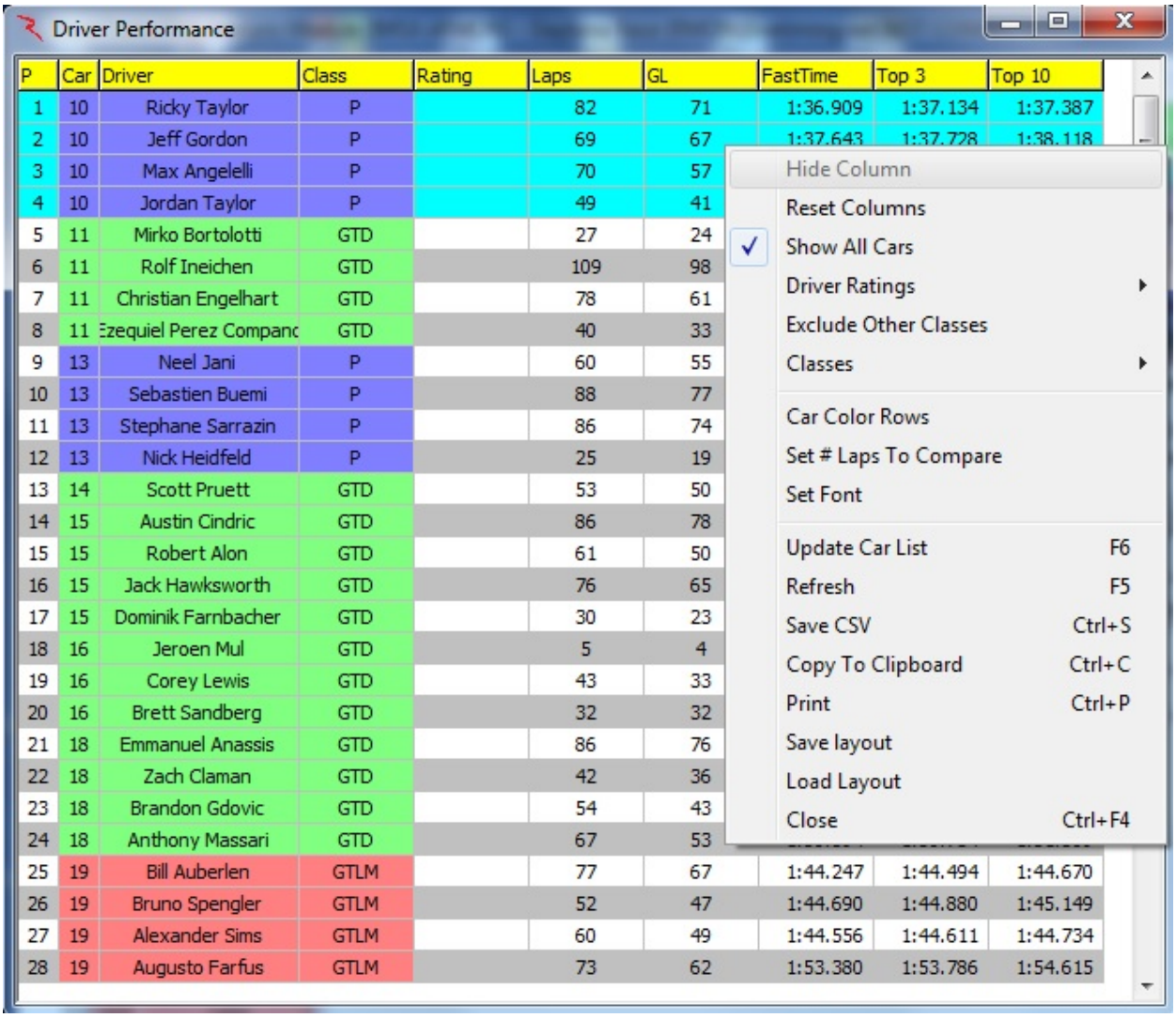
- Custom Sections – Display Custom sections (if defined).
- Reverse Stints – Display latest stints first.
- Hide Previous Stints - .
- Show Hours
- Times In TOD – Display times in Time Of Day.
- Project Time in Window – Display projected time in Drive Time window.
- Last Window – Display time driver can enter the car and drive to the end of the race.
- Total Time w/ms - .
- Car Color Rows – formats the rows to the color applied to each individual car in the car color dialog (accessible by Ctrl+Left Click on the car number in the Session Results window).
- Set Font – sets the font and font size for the table.
- Set Maximum Time () – Set maximum drive time in the race.
- Set Minimum Time () – Set minimum drive time for the race.
- Set Drive Window () – Set the drive window.
- Set Max in Window () – Set maximum drive time within the drive window.
- Refresh (F5) – while the popup will typically automatically update while the session is in progress, it may occasionally be required to •Refresh• the window to reflect the most current data.
- Save CSV (Ctrl+S) - creates a .csv file for the data contained in the report for use with other programs.
- Copy To Clipboard (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Save Layout – Save a layout.
- Load Layout – Load a saved layout.
- Print (Ctrl+P) – opens print window to print report.
- Close (F1) – closes the window. The window can also be closed via the •X• in the upper right corner.
- Clean Duplicates
- Exclude Red Times

Stint Report (Alt+F2)



- Refresh – (F5) Refresh the data in the report.
- Print (Ctrl+P) – Print the report.
- Save CSV – (Ctrl+S) Save the report to a csv file.
- Copy Image to Clipboard – (Shift+Ctrl+S) Copy image to clipboard.
- Copy To Clipboard – (Ctrl+C) Copy the report to the clipboard for use in another program.
- Close – (Shift+F2) Close the report.
- Hide Column – Hide the selected column.
- Reset Columns – Unhide hidden columns.
- Save Layout – Save the current layout.
- Load Layout – Load a saved layout.
- Set Font – Set the font for the report.
- Include Follow Cars – Include the other cars you are following.
- Exclude empty PITLANE Stops – Exclude short or erroneous pit stops.
- Delete Stint – Delete a stint.
- Edit Stint – Edit a stint.
- Insert Stint – Insert a stint.

Driver Performance Report (Ctrl+F4)



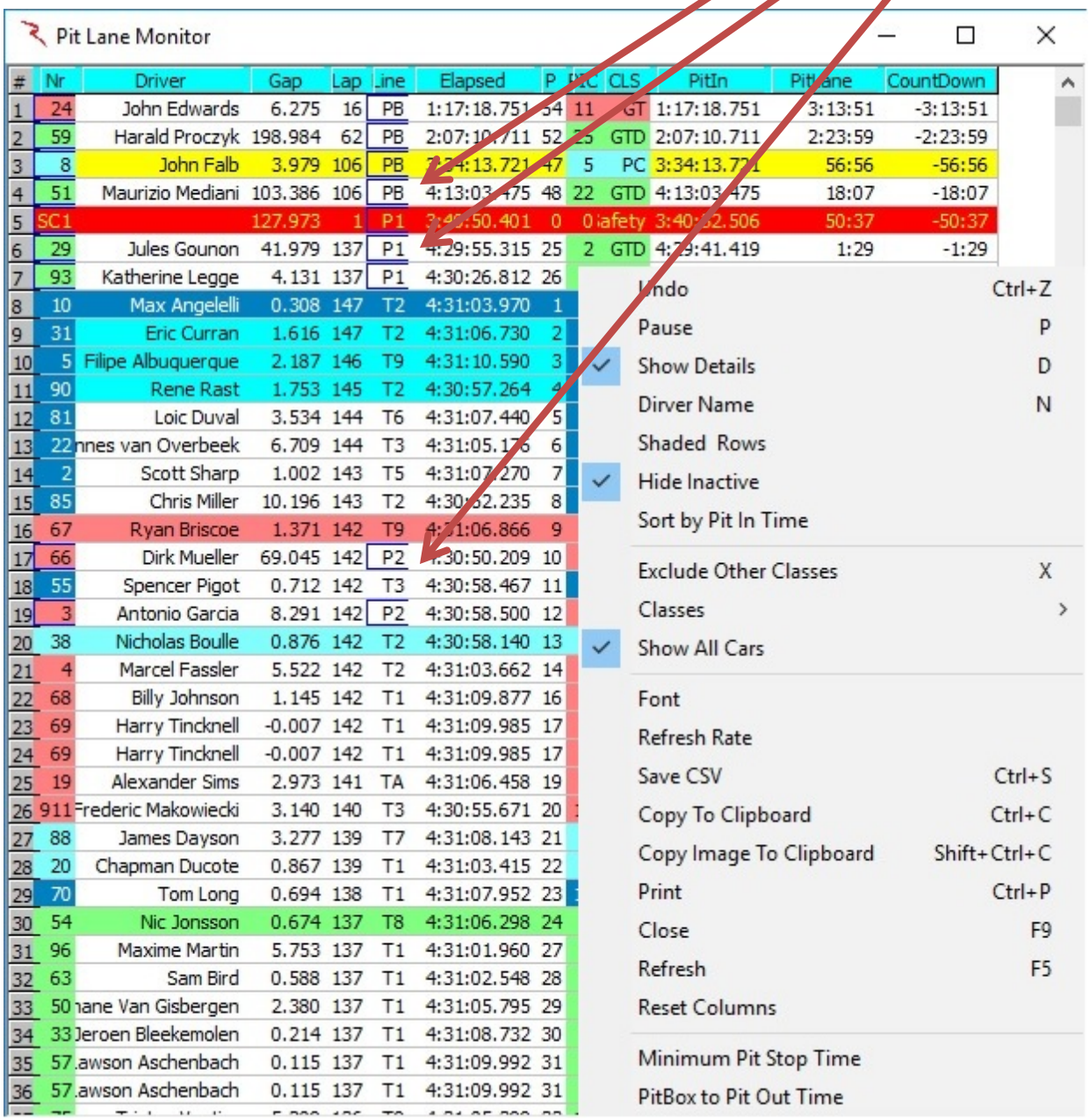
- Hide Column – Hide the selected column.
- Reset Columns – Unhide hidden columns.
- Show All Cars - Show All Competitors even if a subset is selected.
- Driver Ratings – Show driver ratings (if available).
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes – Choose the classes to display.
- Car Color Rows – Shade rows using specified Car color.
- Set # of Laps To Compare - 1st Laps To Compare – Number of top laps to average. First set. 2nd Laps To Compare – Number of top laps to average. Second Set.
- Set Font – Set the font for the report.

- Update Car List – (F6) Update the list of cars to display in the report.
- Refresh – (F5) Refresh the data in the report.
- Save CSV – (Ctrl+S) Save the report to a csv file.
- Copy to Clipboard – (Ctrl+C) Copy the report to the clipboard for use in another program.
- Print – (Ctrl+P) Print the report.
- Save Layout – Save the current layout.
- Load Layout – Load a saved layout.
- Close – (Ctrl+F4) Close the window.

NOTE: Click on any field title to sort by that field.

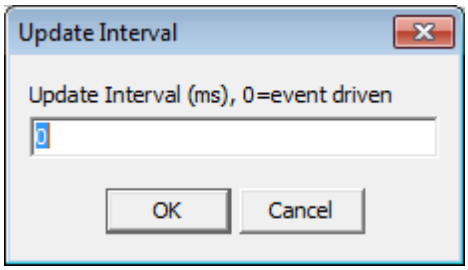
Pit lane Monitor (Alt+F9)

This report shows the time when each car crosses a scoring line (Pit-In, Pit S/F, Pit-Out) in the Pits.



- Undo (Ctrl+Z) – Undo the previous action.
- Pause – (P) - Pauses the updating of the Running Order window, Can be used to Freeze the field when a Yellow is displayed.
- Show Details – (D) – this shows the timing line and time information, as shown in the right of the two figures in in the popup description above.

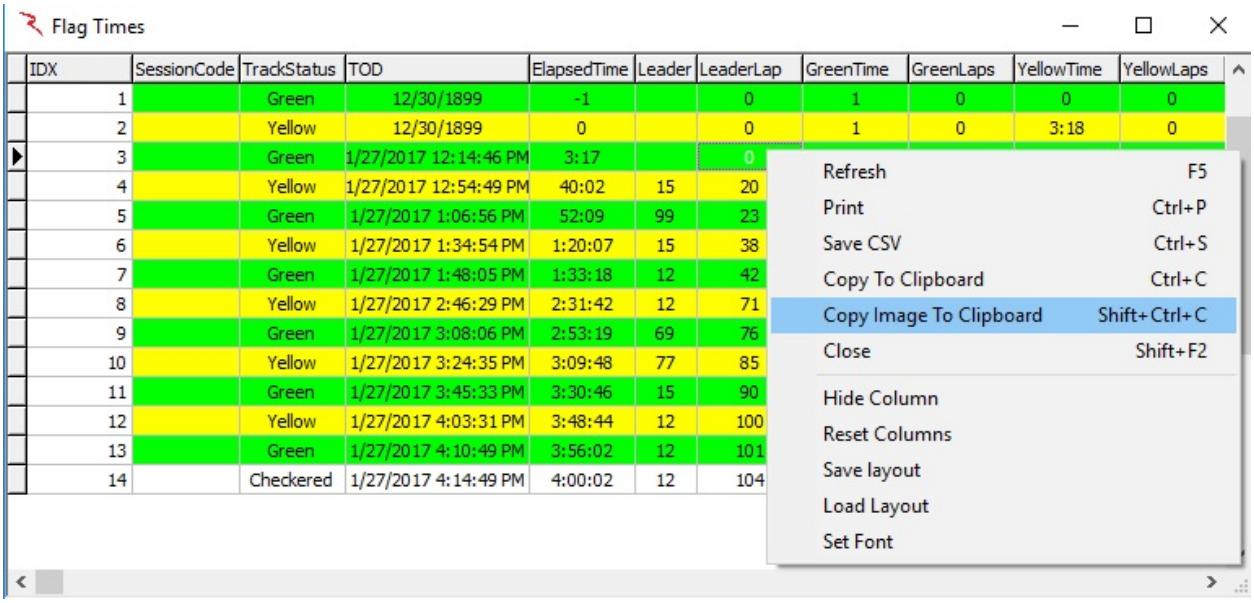
- Driver Name (N) – Display the driver name'.
- Shaded Rows – Shades even numbered rows.
- Hide Inactive – Hide inactive cars. Hide Inactive option does not remove the car from the results or analysis, just from the track map and running order. The car's status will be set to '(Active)' to differentiate it from 'Active'. The will still be visible in the session results table and all of the reports.
- Sort By Pit In Time - Sort by time at pit in.
- Exclude Other Classes –(X) Exclude classes other than the 'Team Car' class.
- Classes – Allows the user to select the classes to display.
- Show All Cars – Display pit stops for all cars.
- Font – changes the font of the report.
- Refresh Rate – changes the refresh rate of the popup. By default, the report is up-dated based on the occurrence of an event (timing line activity).



- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs
- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image to Clipboard – (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Print – (Ctrl+P) – opens print window to print report
- Close – (F9) – closes the window. The window can also be closed via the "X• in the upper right corner.
- Refresh – (F5) – refreshes the data in the report to reflect changes in the received data.
- Reset Columns - Reset the columns.
- Minimum Pit Stop Time - Set the minimum pit stop time
- PitBox To Pit Out Time -

Flag Times (Ctrl+F3)

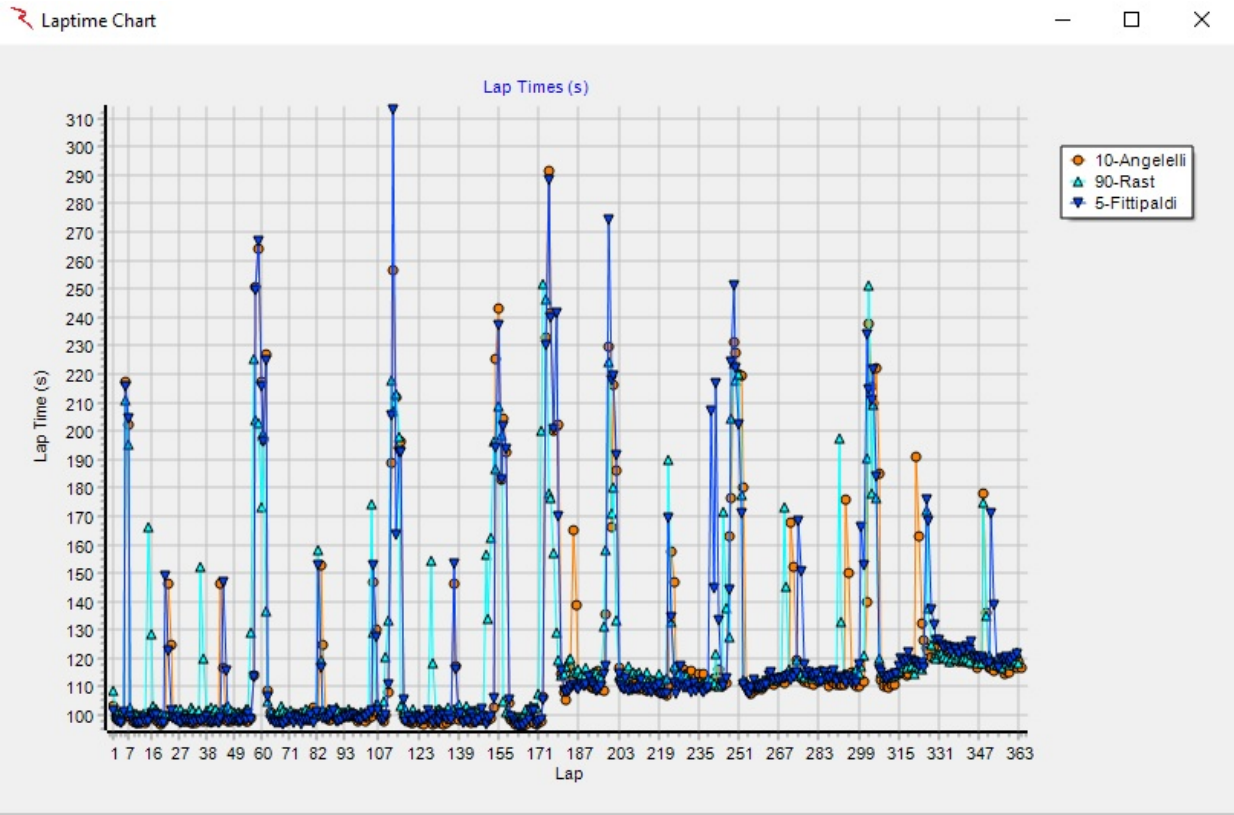
- Displays the times the various flags were displayed.



- Refresh – (F5) – refreshes the data
- Print – (Ctrl+P) – opens print window to print report
- Save CSV – (Ctrl+S) – creates a .csv file for the data contained in the report for use with other programs
- Copy to Clipboard – (Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Copy Image to Clipboard – (Shift+Ctrl+C) – copy the data contained in the report to the clipboard for direct pasting into other programs.
- Close – (Shift+F2) Close the window.
- Hide Column – Hide the selected column.
- Reset Columns – Unhide hidden columns.
- Save Layout – Save the current layout.
- Load Layout – Load a saved layout.
- Set Font – sets the font and font size for the table.

Add Graph (Shift+Ctrl+F3)

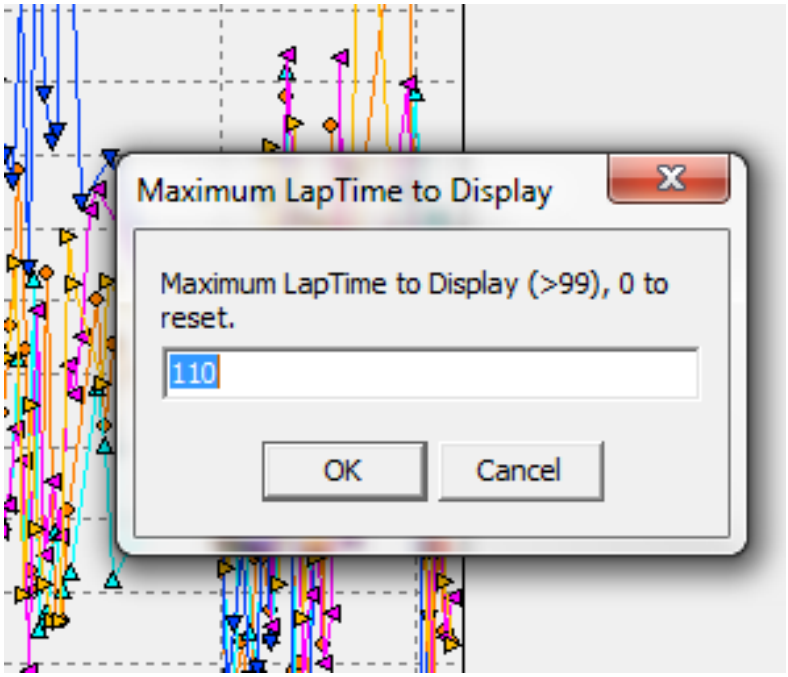
- Laptime Graph – (Shift+Ctrl+F3) – shows the lap times in graphical format for all/selected competitors against laps or time of day. Also contains the Gap analysis graph for race scenarios.



In its simplest format, this graph displays the lap times for the user to be able to gage the performance of the competitors graphically in real time. For P&Q sessions, this means versus time of day or lap, for races this means either against the time of day, lap, or a gap analysis.

When the graph is first selected, no information will typically be displayed. If by chance the user preselected cars by clicking in the "CK• column of the session results display, these cars will show up in the graph. To select all cars, either 'select' all cars in the "CK• column of the session results display or right click on the graph and enable the 'Select All Cars' option. Selected entries can only be selected in the "CK" column. Use the "Clear All Cars• right click option to clear all cars before selecting entries or simply deselect unwanted entries after selecting all cars.

The range may not be set properly because it will likely make the maximum for the y-axis equal to the longest lap, pit time included (autoscale). So for P&Q the scale will be very large. Simply click the Y- axis, to bring up the quick prompt for the maximum lap time/speed to display. Input the appropriate value, the scaling will change accordingly based on the user input and fastest lap time/speed.

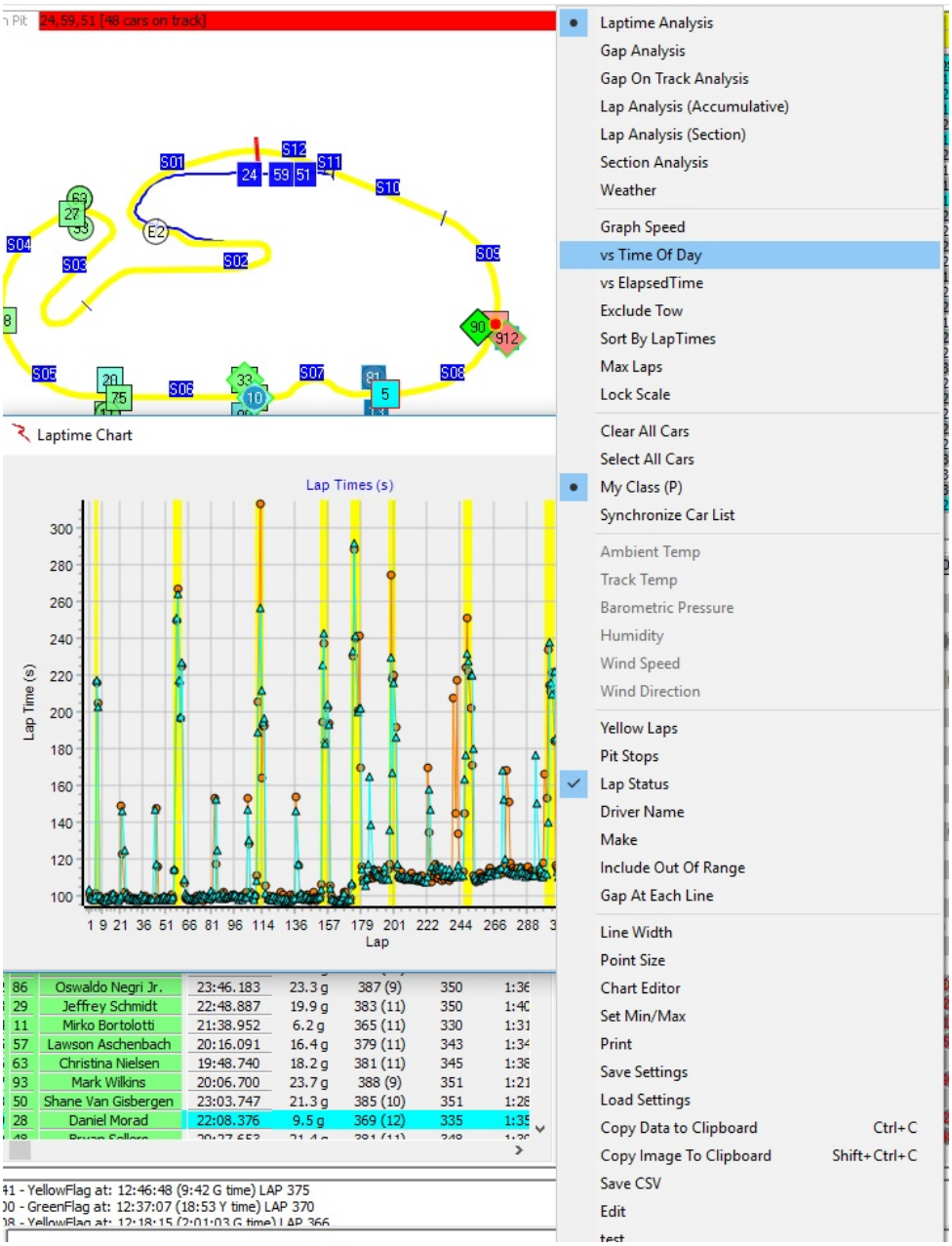


The graph can be changed from the time of day to lap or gap analysis scaling on the x-axis and is quite useful at this stage.

The colors of the competitor data series are randomly assigned by the software unless the car colors have already been set (Ctrl+left click on competitor number in the Session Results window).

In order to access the more sophisticated features of the report, an additional menu is available via right click and even greater control is available by left clicking on the legend of the plot.

Options available from right clicking on the Laptime Analysis graph are listed below.



- Laptime Analysis – this sets the graph to be the lap time analysis. With Laptime Analysis, the performance index is plotted on the graph vs time of day or lap number.

- Gap Analysis – this sets the graph to be the gap analysis. With Gap Analysis, the gap on track relative to the selected baseline is graphed vs lap number. Note that the right click menu will change from that explained here when this option is selected.

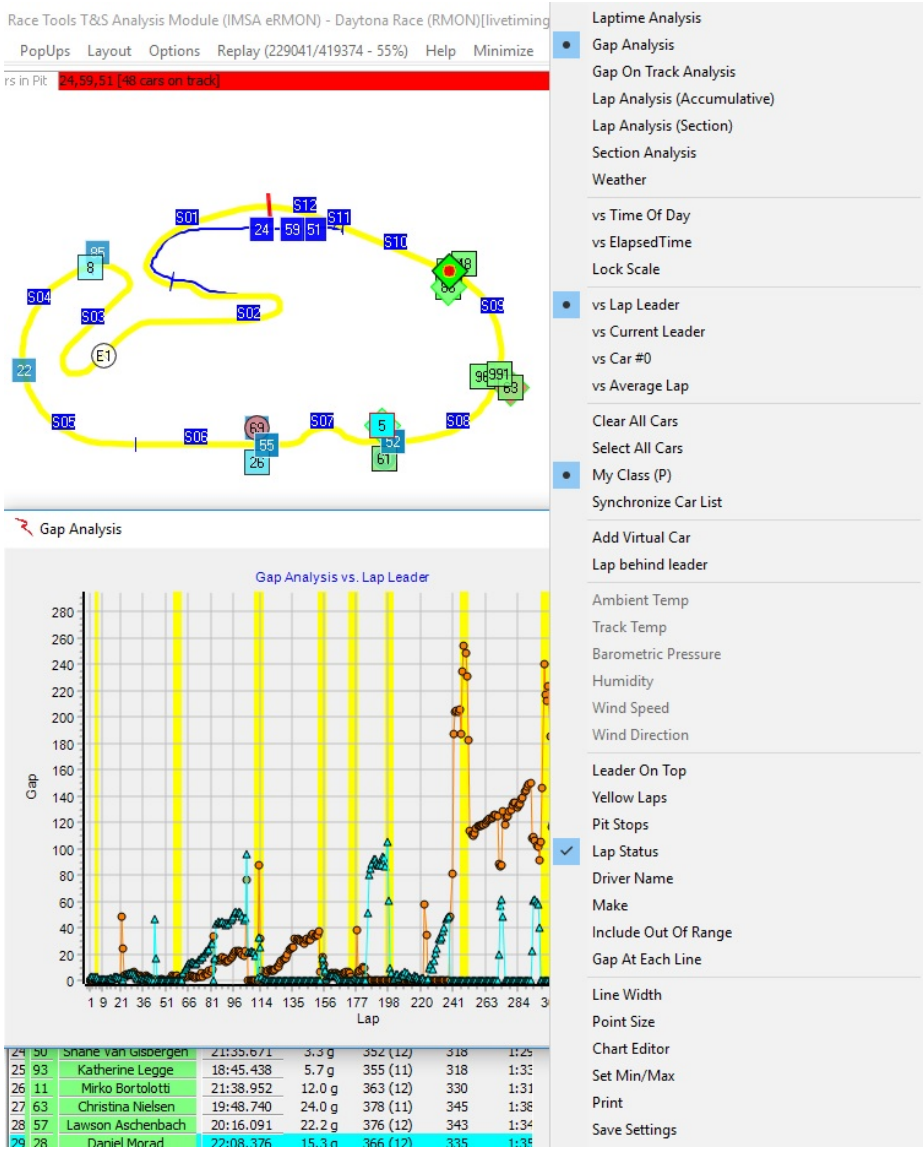
- Gap On Track Analysis –

- Lap Analysis (Accumulative) –

- Lap Analysis (Section) – Lap Analysis by section.
- Section Analysis – Display a specific section analysis.
- Weather – Display weather information if available.
- Graph Speed – this changes the performance index to lap speed for the graph.
- When this is selected, Y-axis scaling may need to be changed.
- vs Time Of Day – changes X-axis scaling from lap based to time of day.
- vs Elapsed Time – changes X-axis scaling from lap based to elapsed time.
- Exclude Tow – removes laps determined to be 'tow' laps from the plot.
- Sort By LapTimes – sorts the laps by each competitor from fastest to slowest. Y-axis scaling may need to be changed.
- Max Laps – sets the max number of laps to display for each competitor. Deselect the option to remove the filter.
- Lock Scale – Lock the scale of the chart.
- Clear All Cars – removes all selected cars from the plot.
- Select All Cars – adds all cars in the session to the plot.
- My Class () – Displays info on the cars in the 'Team Car' class.
- Synchronize Car List
- Yellow Laps – formats the graph to color the data points and connecting lines yellow for laps flagged as yellow.
- Pit Stops – formats the graph to color the data points and connecting lines red for in and out laps of pit stops.
- Lap Status – formats the graph to color the entire column yellow for a yellow lap when lap number is the x-axis parameter.
- Driver Name – Displays the Driver Name.
- Make – Displays the make.
- Include Out Of Range - Displays the Out of range times.

- Gap At Each Line - Displays the gap at each timeline.
- Line Width – sets the line width that connects the data points in the plot.
- Point Size – changes the point size for the data points on the graph.
- Chart Editor – Allows the user to format the graph, extract data, print, etc. See the appendix for an explanation of the options.
- Set Min/Max – Set the Maximum and Minimum lap times for the chart to display.
- Print – opens print window to print report.
- Save Settings – Save the Chart settings to a file.
- Load Settings – Load saved chart settings from a file.
- Copy Data To Clipboard – (Ctrl+C) Copy the data in the chart to the clipboard for use in another program.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy the data in the chart to the clipboard for use in another program.
- Save CSV – Save the data in the graph to a .csv file for further analysis with another program.
- Edit
- Test

Gap Analysis is an available option in the list above. This feature will change the analysis mode for the report to a gap on track comparison for strategic purposes. When the graph is changed to Gap Analysis mode, the options available in the right click menu change, as shown below.



- Laptime Analysis – this sets the graph to be the lap time analysis. With Laptime Analysis, the performance index is plotted on the graph vs time of day or lap number.

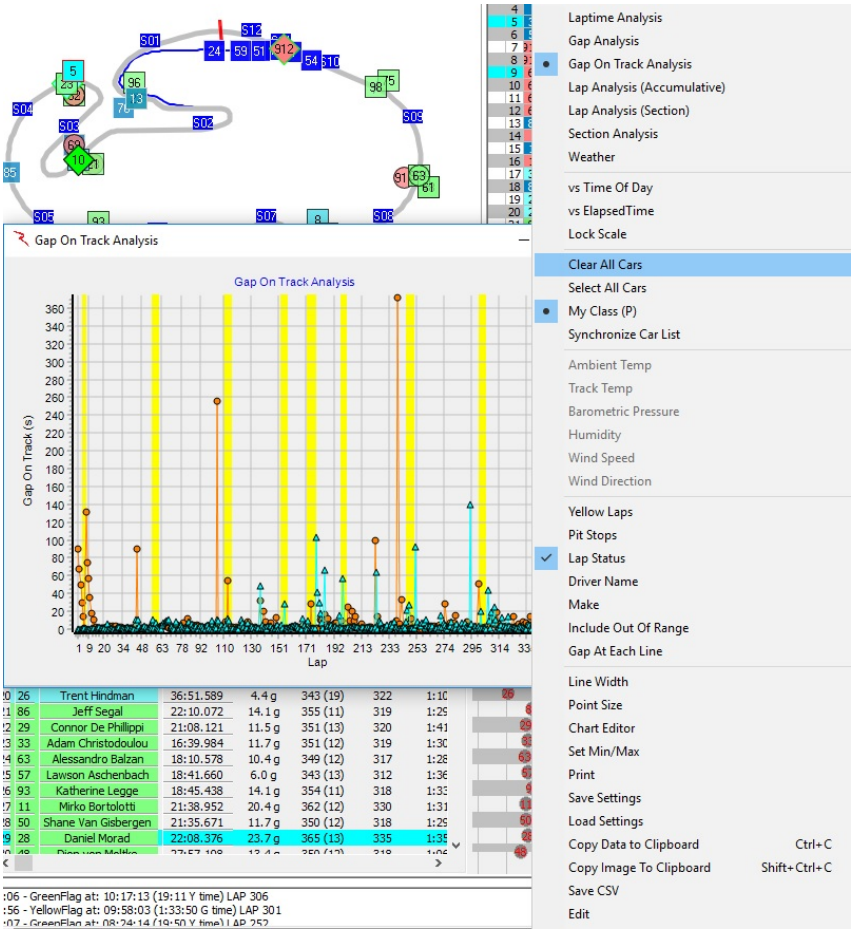
- Gap Analysis – this sets the graph to be the gap analysis. With Gap Analysis, the gap on track relative to the selected baseline is graphed vs lap number. Note that the right click menu will change from that explained here when this option is selected.

- Gap On Track Analysis –

- Lap Analysis (Accumulative) –
- Lap Analysis (Section) – Lap Analysis by section.
- Section Analysis – Display a specific section analysis.
- vs Time Of Day – Displays the gap in time of day.
- vs Elapsed Time – Displays the gap in Elapsed time.
- Max Laps
- Lock Scale – Lock the scale of the chart.
- Vs Lap Leader – Displays the gap to the lap leader.
- vs Current Leader – Displays the gap to the Current Leader.
- vs Car # – Displays the gap to a Specific Car.
- vs Average Lap – Displays the gap to and Average Lap.
- Clear All Cars – Clear all cars from the graph.
- Select All Cars – Select All cars for display on the graph.
- Select My Class – Display the cars in the 'Team Car' class.
- Synchronize Car List
- Add Virtual Car –
- Lap Behind Leader – Displays Laps down status.
- Leader On Top – Inverts the graph to show the leader on top.
- Yellow Laps – Highlight the cars 'Yellow" flag laps.
- Pit Stops – Highlight the cars 'Pit Stops' in the chart.
- Lap Status – Displays the 'Track Condition' on the chart.
- Driver Name – Display the 'Driver Name' in the legend.
- Make – Display the 'Make' in the legend.
- Include Out Of Range – Include Out Of Range cars.
- Gap At Each Line – Display gap at each timeline.
- Line Width – Adjust line width on the graph.
- Point Size – Adjust the point size for the cars in the graph.

- Chart Editor – Opens the Chart Editor window. See Appendix for description.
- Set Min/Max – Set Minimum and Maximum gaps to display in the graph.
- Print – Opens the Print dialog window for printing.
- Save Settings – Save settings to a file.
- Load Settings – Load settings from a file.
- Copy Data To Clipboard – (Ctrl+C) Copy data to the Clipboard for insertion in another program.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy image to the Clipboard for insertion in another program.
- Save CSV – Save data to a csv file for use in another program.
- Edit
- Test
- Stay On Top – Keep graph on top of other windows.
- Hide Borders – Hide borders in the graph

Another available graph is the Gap On Track Analysis. The list of right click options is shown below.



- Laptime Analysis – this sets the graph to be the lap time analysis. With Laptime Analysis, the performance index is plotted on the graph vs time of day or lap number.

- Gap Analysis – this sets the graph to be the gap analysis. With Gap Analysis, the gap on track relative to the selected baseline is graphed vs lap number. Note that the right click menu will change from that explained here when this option is selected.

- Gap On Track Analysis –

- Lap Analysis (Accumulative) –

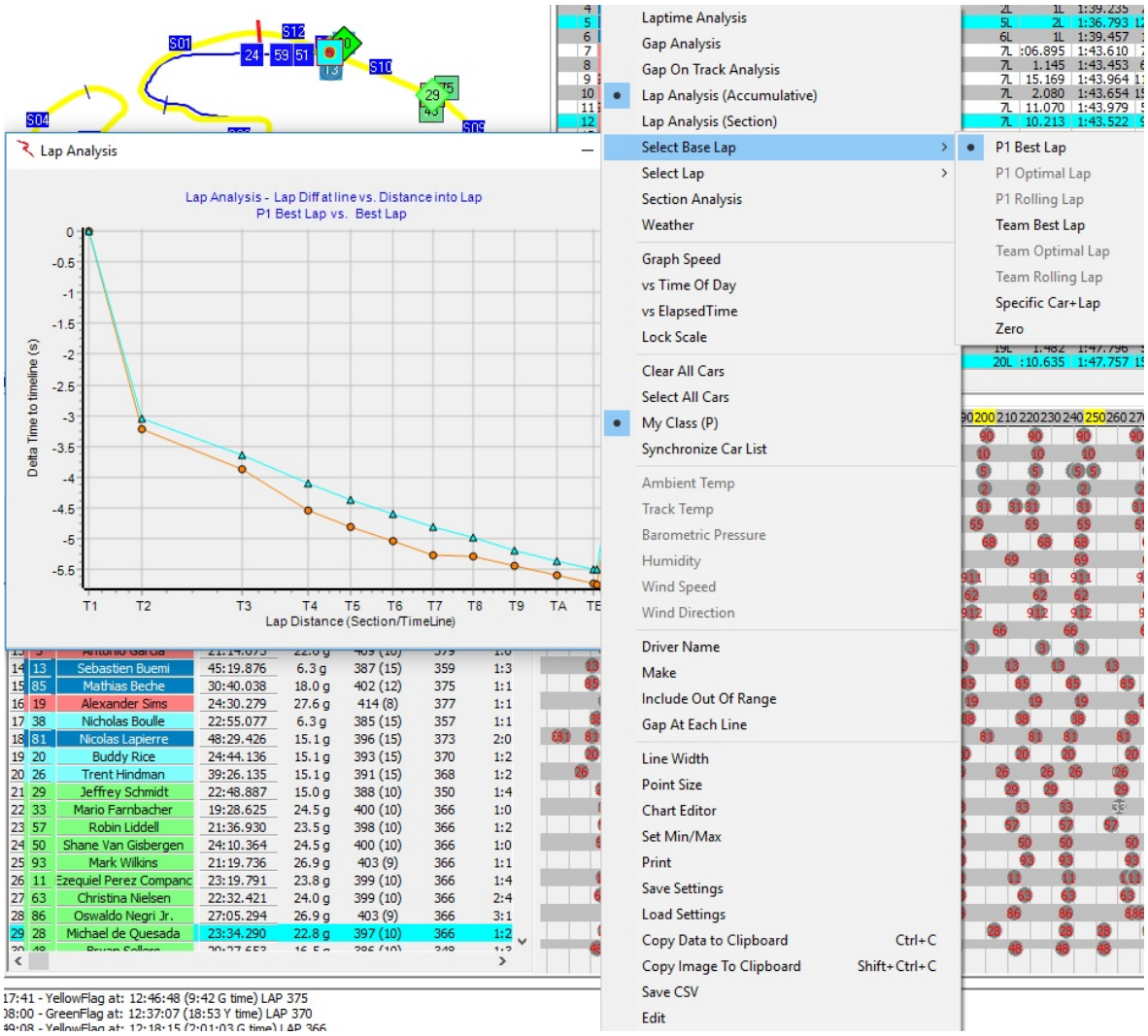
- Lap Analysis (Section) – Lap Analysis by section.

- Section Analysis – Display a specific section analysis.

- vs Time Of Day – Displays the gap in time of day.

- vs Elapsed Time – Displays the gap in Elapsed time.
- Max Laps
- Lock Scale – Lock the scale of the chart.
- Clear All Cars – Clear all cars from the graph.
- Select All Cars – Select All cars for display on the graph.
- My Class – Display the cars in the 'Team Car' class.
- Yellow Laps – Highlight the cars 'Yellow" flag laps.
- Pit Stops – Highlight the cars 'Pit Stops' in the chart.
- Lap Status – Displays the 'Track Condition' on the chart.
- Driver Name – Display the 'Driver Name' in the legend.
- Make
- Include Out Of Range – Include Out Of Range cars.
- Gap At Each Line
- Line Width – Adjust line width on the graph.
- Point Size – Adjust the point size for the cars in the graph.
- Chart Editor – Opens the Chart Editor window. See Appendix for description.
- Set Min/Max – Set Minimum and Maximum gaps to display in the graph.
- Print – Opens the Print dialog window for printing.
- Save Settings – Save settings to a file.
- Load Settings – Load settings from a file.
- Copy Data To Clipboard – (Ctrl+C) Copy data to the Clipboard for insertion in another program.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy image to the Clipboard for insertion in another program.
- Save CSV – Save data to a csv file for use in another program.
- Stay On Top – Keep chart on top of other windows.
- Hide Borders

Another available graph is the Lap Analysis (Accumulative). The list of right click options is shown below.



- Laptime Analysis – this sets the graph to be the lap time analysis. With Laptime Analysis, the performance index is plotted on the graph vs time of day or lap number.

- Gap Analysis – this sets the graph to be the gap analysis. With Gap Analysis, the gap on track relative to the selected baseline is graphed vs lap number. Note that the right click menu will change from that explained here when this option is selected.

- Gap On Track Analysis –

- Lap Analysis (Accumulative) –

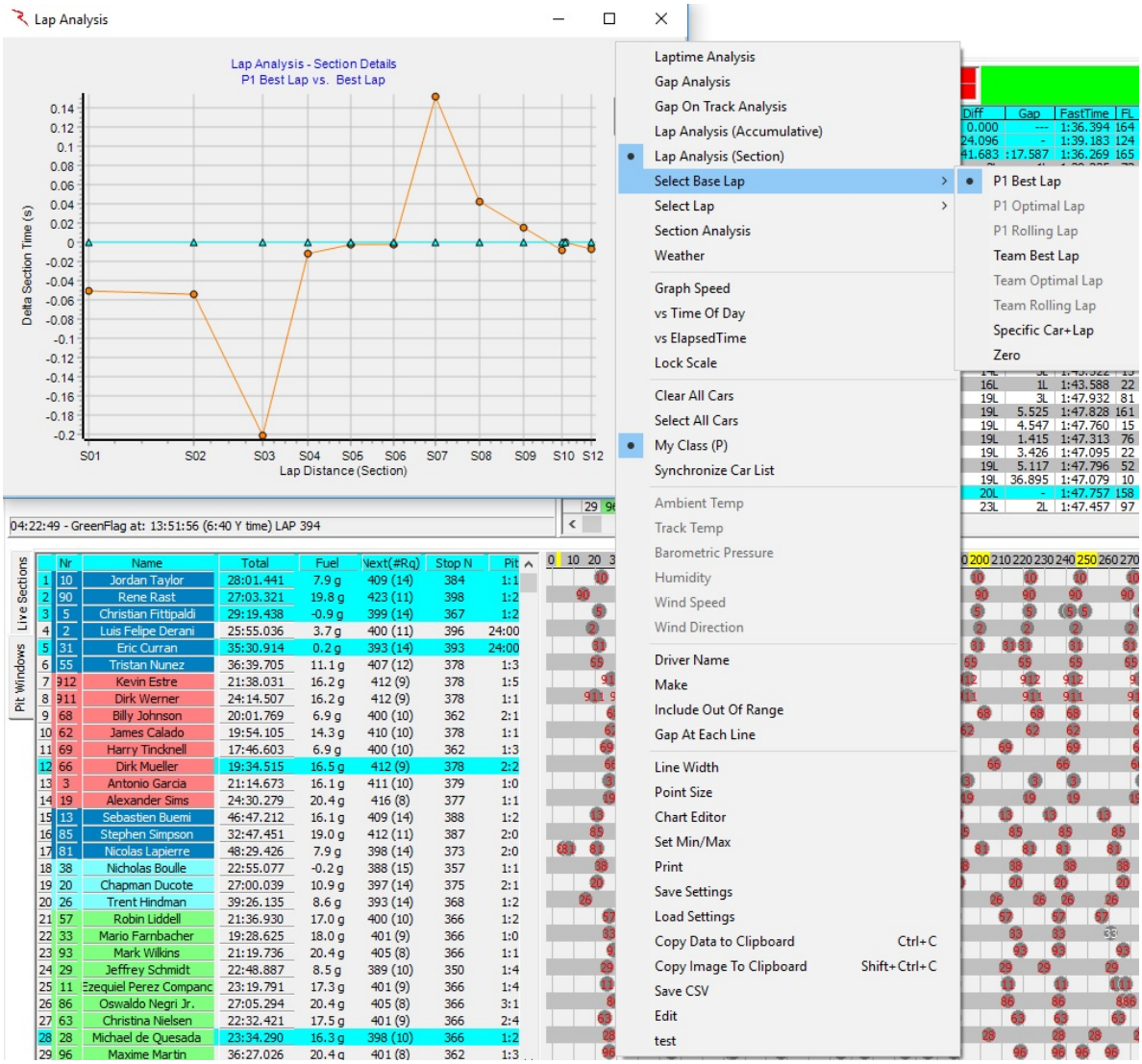
- Lap Analysis (Section) – Lap Analysis by section.

- Section Analysis – Display a specific section analysis.

- Select Base Lap
  - P1 Best Lap
  - P1 Optimal Lap
  - P1 Rolling Lap
  - Team Best Lap
  - Team Optimal Lap
  - Team Rolling Lap
  - Specific Car + Lap
  - Zero
- Select Lap
  - Best Lap
  - Optimal Lap
  - Rolling Lap
  - Current Lap
  - Select Lap
- Section Analysis - .
- Graph Speed – Displays the Speed on the chart.
- vs Time Of Day – Displays the gap in time of day.
- vs Elapsed Time – Displays the gap in Elapsed time.
- Lock Scale – Lock the scale of the chart.
- Clear All Cars – Clear all cars from the graph.
- Select All Cars – Select All cars for display on the graph.
- My Class – Display the cars in the 'Team Car' class.
- Driver Name – Display the 'Driver Name' in the legend.
- Include Out Of Range – Include Out Of Range cars.
- Line Width – Adjust line width on the graph.
- Point Size – Adjust the point size for the cars in the graph.
- Chart Editor – Opens the Chart Editor window. See Appendix for description.

- Set Min/Max – Set Minimum and Maximum gaps to display in the graph.
- Print – Opens the Print dialog window for printing.
- Save Settings – Save settings to a file.
- Load Settings – Load settings from a file.
- Copy Data To Clipboard – (Ctrl+C) Copy data to the Clipboard for insertion in another program.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy image to the Clipboard for insertion in another program.
- Save CSV – Save data to a csv file for use in another program.
- Stay On Top – Keep chart on top of other windows.
- Hide Borders

Another available graph is the Lap Analysis (Section). The list of right click options is shown below.



- Laptime Analysis – this sets the graph to be the lap time analysis. With Laptime Analysis, the performance index is plotted on the graph vs time of day or lap number.

- Gap Analysis – this sets the graph to be the gap analysis. With Gap Analysis, the gap on track relative to the selected baseline is graphed vs lap number. Note that the right click menu will change from that explained here when this option is selected.

- Gap On Track Analysis –

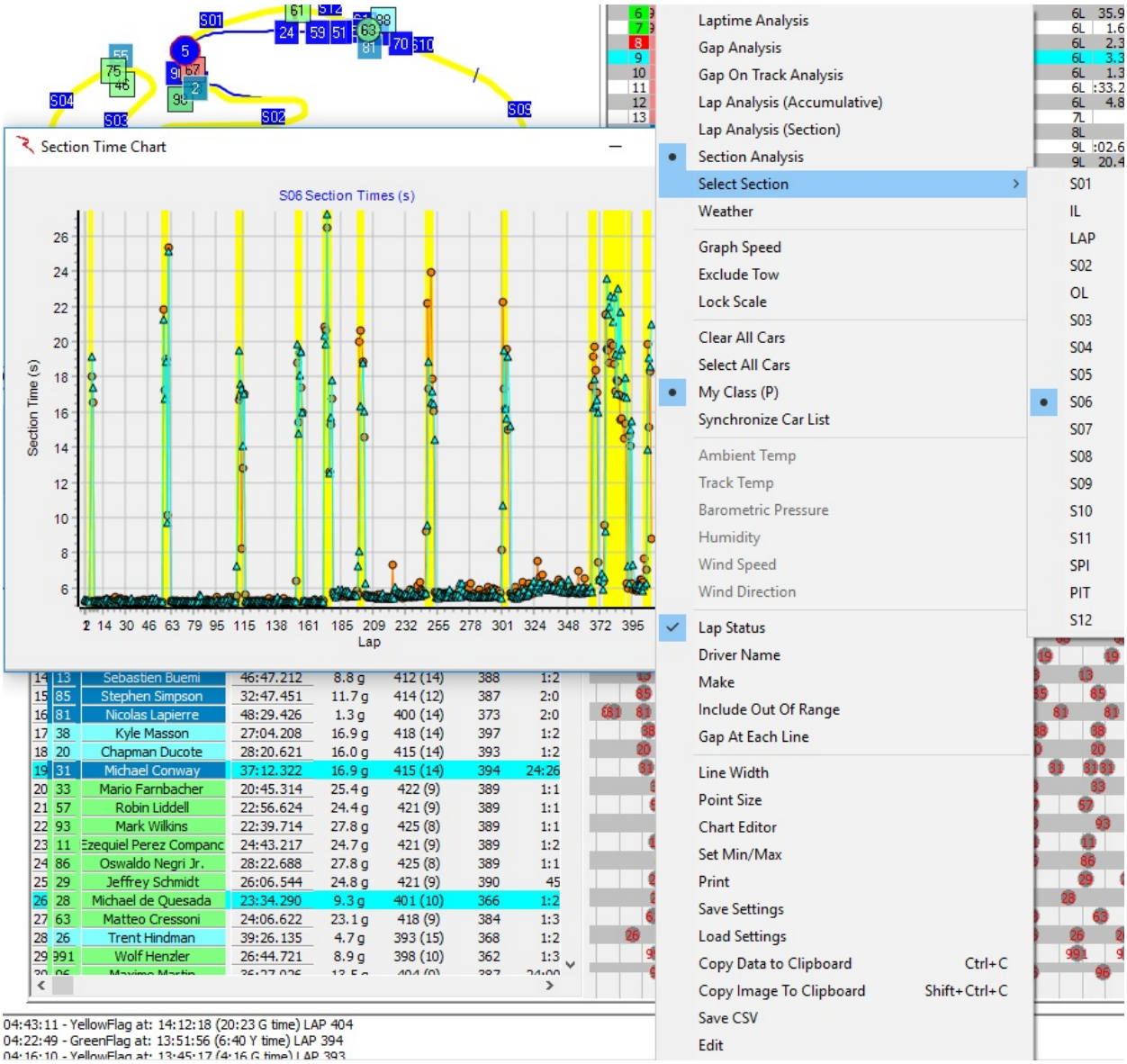
- Lap Analysis (Accumulative) –

- Lap Analysis (Section) – Lap Analysis by section.

- Section Analysis – Display a specific section analysis.
- Select Base Lap
  - P1 Best Lap
  - P1 Optimal Lap
  - P1 Rolling Lap
  - Team Best Lap
  - Team Optimal Lap
  - Team Rolling Lap
  - Specific Car + Lap
  - Zero
- Select Lap
  - Best Lap
  - Optimal Lap
  - Rolling Lap
  - Current Lap
  - Select Lap
- Section Analysis - .
- Graph Speed – Displays the Speed on the chart.
- vs Time Of Day – Displays the gap in time of day.
- vs Elapsed Time – Displays the gap in Elapsed time.
- Lock Scale – Lock the scale of the chart.
- Clear All Cars – Clear all cars from the graph.
- Select All Cars – Select All cars for display on the graph.
- My Class – Display the cars in the 'Team Car' class.
- Driver Name – Display the 'Driver Name' in the legend.
- Make
- Include Out Of Range – Include Out Of Range cars.
- Gap At Each Line

- Line Width – Adjust line width on the graph.
- Point Size – Adjust the point size for the cars in the graph.
- Chart Editor – Opens the Chart Editor window. See Appendix for description.
- Set Min/Max – Set Minimum and Maximum gaps to display in the graph.
- Print – Opens the Print dialog window for printing.
- Save Settings – Save settings to a file.
- Load Settings – Load settings from a file.
- Copy Data To Clipboard – Copy data to the Clipboard for insertion in another program.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy image to the Clipboard for insertion in another program.
- Save CSV – Save data to a csv file for use in another program.
- Stay On Top
- Hide Borders

Another available graph is the Section Analysis. The list of right click options is shown below



- Laptime Analysis – this sets the graph to be the lap time analysis. With Laptime Analysis, the performance index is plotted on the graph vs time of day or lap number.

- Gap Analysis – this sets the graph to be the gap analysis. With Gap Analysis, the gap on track relative to the selected baseline is graphed vs lap number. Note that the right click menu will change from that explained here when this option is selected.

- Gap On Track Analysis –

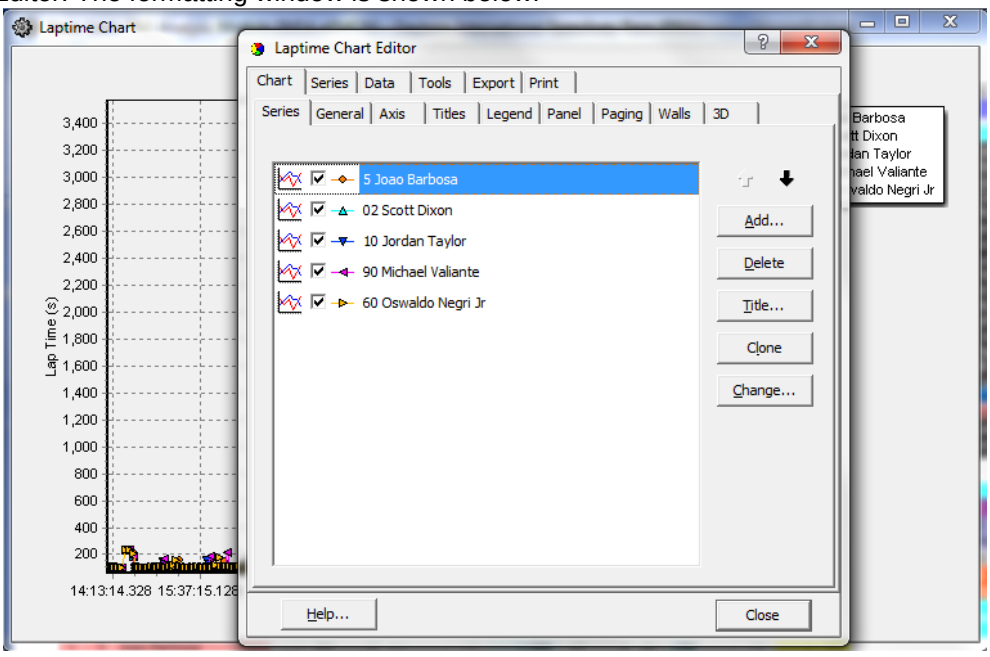
- Lap Analysis (Accumulative) –

- Lap Analysis (Section) – Lap Analysis by section.
- Section Analysis – Display a specific section analysis.
- Select Section
  - S01 – Section 1
  - S02 – Section 2
  - S03 – Section 3
  - S04 – Section 4
  - S05 – Section 5
  - S06 – Section 6
  - S07 – Section 7
  - S08 – Section 8
  - S09 – Section 9
  - S10 – Section 10
  - S11 – Section 11
  - S12 – Section 12
  - Lap – Section Complete lap
  - PIT – Section pits
  - SPI – Speed Section
  - IL – In-Lap
  - OL – Out-Lap
- Graph Speed – Display speeds on the chart instead of times.
- Exclude Tow – Exclude Tow laps.
- Lock Scale – Lock the scale of the chart.
- Clear All Cars – Clear all cars from the graph.
- Select All Cars – Select All cars for display on the graph.
- My Class – Display the cars in the 'Team Car' class.
- Lap Status – Displays the 'Track Condition' on the chart.
- Driver Name – Display the 'Driver Name' in the legend.
- Make
- Include Out Of Range – Include Out Of Range cars.
- Gap At Each Line
- Line Width – Adjust line width on the graph.
- Point Size – Adjust the point size for the cars in the graph.
- Chart Editor – Opens the Chart Editor window. See Appendix for description.
- Set Min/Max – Set Minimum and Maximum gaps to display in the graph.

- Print – Opens the Print dialog window for printing.
- Save Settings – Save settings to a file.
- Load Settings – Load settings from a file.
- Copy Data To Clipboard – Copy data to the Clipboard for insertion in another program.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy image to the Clipboard for insertion in another program.
- Save CSV – Save data to a csv file for use in another program.
- Stay On Top
- Hide Borders

Note that on all graphs a competitor can be selected by clicking on the data series. This highlights the series for easier recognition. If it is desired to highlight more than one driver, then Ctrl+left click on additional series.

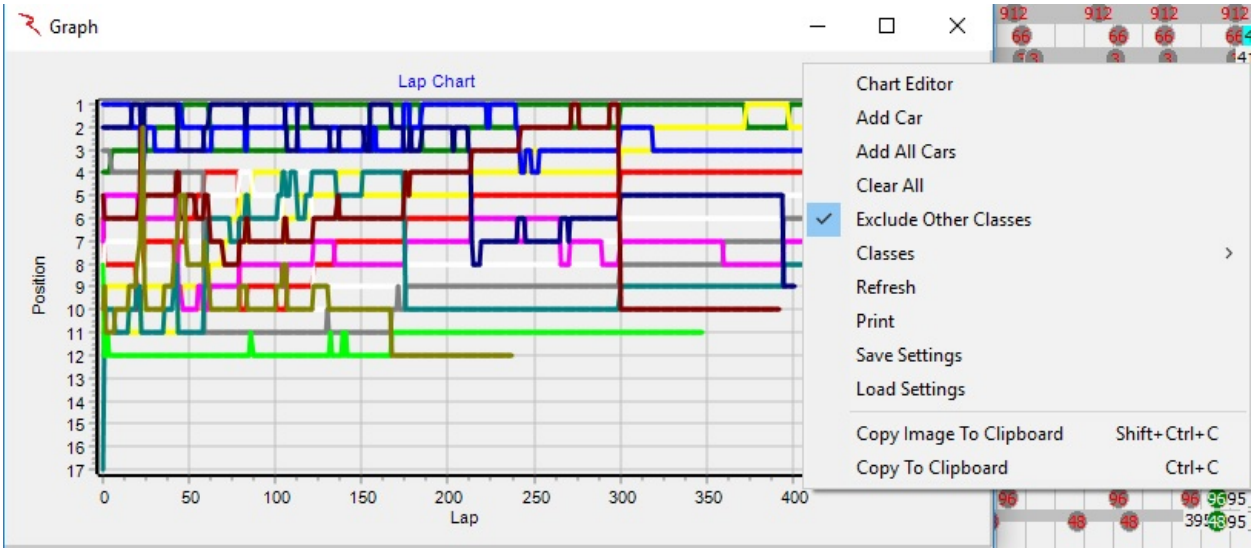
Chart Editor - There are many options available for the graphs, including formatting, printing, copying data, exporting, and other tools. These are accessed by right clicking on the graph and selecting Chart Editor. The formatting window is shown below.



There are six different categories of options; Chart, Series, Data, Tools, Export, and Print. A quick overview of the categories and submenus is necessary to outline all of the possibilities available. Because of the multitude of options available, this feature tree will be located in the Appendix of the manual.

Lap Chart Graph (Shift+F7)

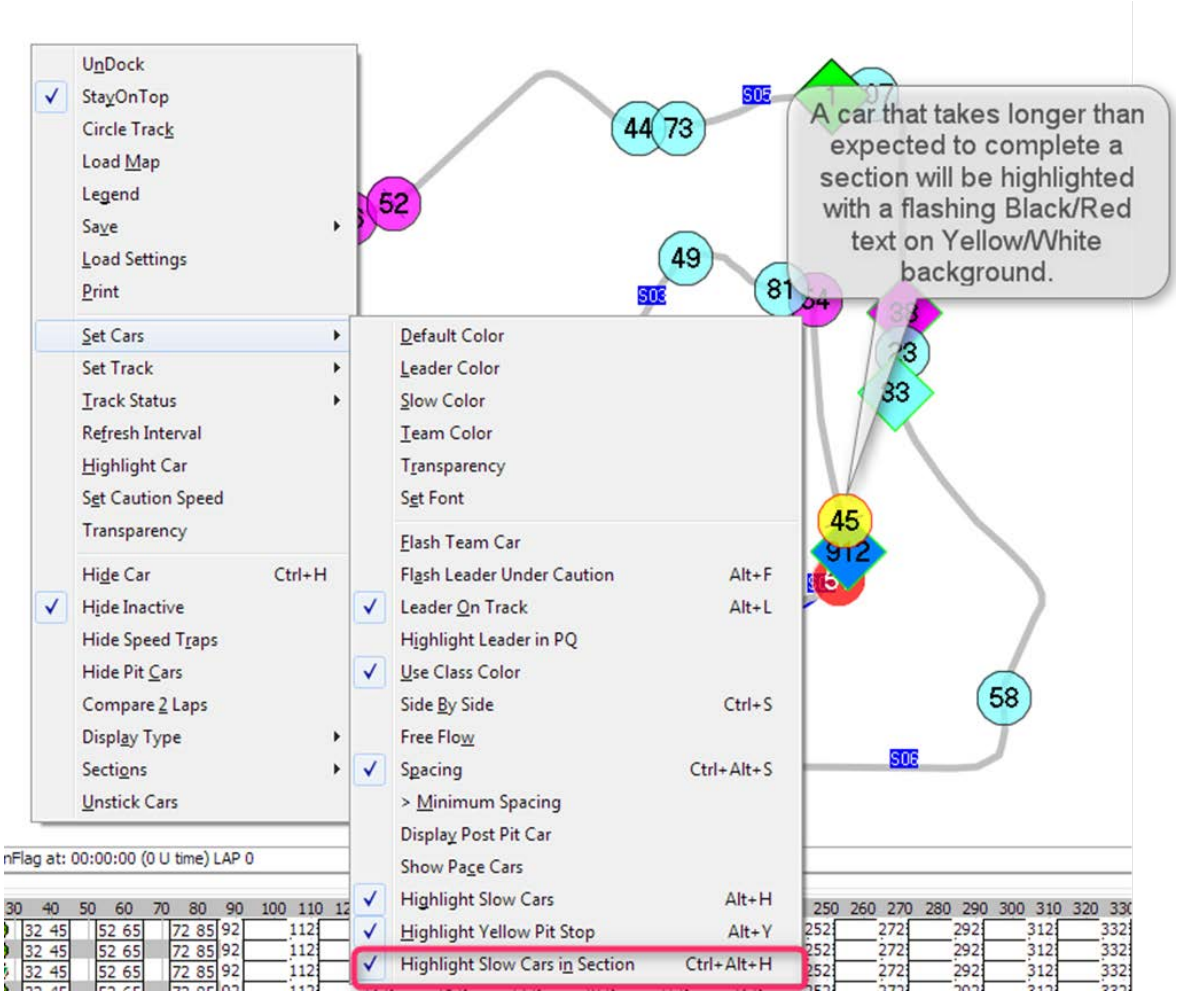
- Lap Chart Graph – (Shift+F7) – This chart allows you to create a graph tracking the position of the cars you choose. Right clicking the chart reveals various options for configuring your graph.



- Chart Editor – opens the same chart editor available in the Laptime Graph. Allows the user to format the graph, extract data, print, etc. See the appendix for an explanation of the options.
- Add Car – allows user to add selected cars to the chart. Input the desired competitors in the form of •9,12,11,6• (comma delimited) or •9 12 11 6• (space delimited).
- Add All Cars – adds all cars completing a lap in the session to the chart.
- Clear All – removes all cars from the chart.
- Exclude Other Classes – Exclude classes other than the 'Team Car' class.
- Classes - Allows the user to select the classes to display.
- Refresh – refreshes the data in the chart to show most recently received results.
- Print – opens the print menu for printing the graph.
- Save Settings – Save settings to a file.
- Load Settings – Load saved settings from a file.
- Copy Image To Clipboard – (Shift+Ctrl+C) Copy image to the Clipboard for insertion in another program.
- Copy To Clipboard – (Ctrl+C) Copy to the Clipboard for insertion in another program.

Add Map (Ctrl+Alt+M)

- Add Map – Add another track map to the window.
- The example below shows the 'Highlight slow cars in section' feature.



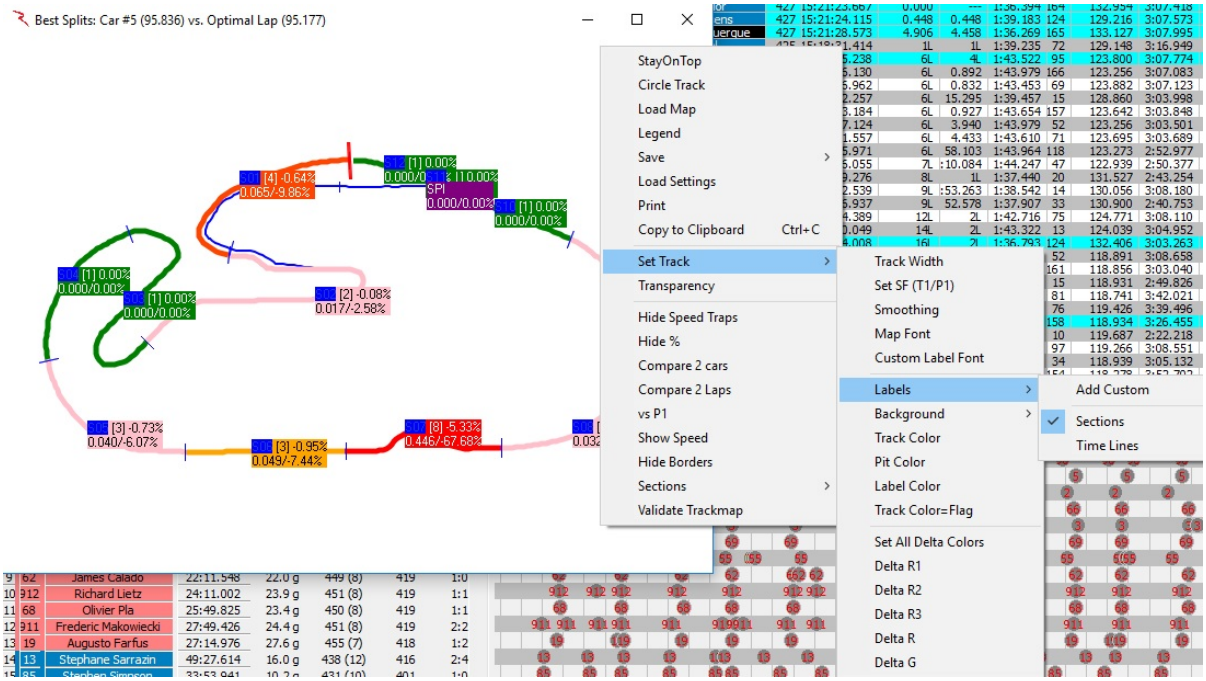
- Use the File↳ Configuration↳ Track Map tab Setting (Slow Threshold) to fine tune when a car should be highlighted as being slow in section.

Best Splits Map (Shift+F1)

- Best Splits Map – (Shift+F1) – this map shows the best splits and traps of the team car (set at Options -> Set Team Car [X]) versus the best splits of the rest of the entrants (optimal lap). Splits in green reflect the team car being best in that section.

- The Analysis Maps have extra information in the session labels. The first line contains the Section Name, the Section Rank and the Section Delta %. The second line contains the Section Delta and % loss or gain.

- The Section Rank is the rank of each section time compared to the other competitors. The % Loss or Gain is the Section Delta / Lap Delta, which highlights the relative amount of time lost or gained for each section. Note that the Lap Delta is the sum of time lost and gained and that the sum of the deltas equals 100%. This means that if there is a mixture of both time lost and gained in a lap, the percentages are of the lap delta, not the 'time lost' / 'total time lost' or 'time gained' / 'total time gained', but the key is the relative percentages which can highlight which sections your car is losing the most time. To help highlight this further, there are now color codes for the top 3 time lost sections referred to as DeltaR1 (Red), DeltaR2 (Blue), and DeltaR3 (Purple). The other time lost sections are highlighted with the DeltaR (Orange) color. The time gained sections are highlighted with the DeltaG (Green) color.



Each splits/traps information label can be moved by left clicking and on the split/trap label and dragging. The track map can also be rotated in 45 degree steps by double clicking in the window.

See the 'Enhanced Analysis Maps' section of the Appendix for more information.

Many options are available via right click in the popup window.

- StayOnTop – forces the map to stay on top of all other applications running on the computer, even when Race Tools is minimized.

- Circle Track – loads a circular track to display the data on. Useful if a track map is not available for some reason.
- Load Map – allows user to load the applicable map for the data.
- Save – extends to reveal additional options.
- Image – opens menu to save popup as a bitmap file.
- Settings – allows user to save user defined settings such as fonts, track width, etc.
- Print – opens print window to print report.
- Set Track – extends to reveal additional options.
    - Track Width – opens dialog box to change track width which will be used when the track map is next updated.
    - Set S/F – sets the timing line used as the SF during the session. Typically set within track map, but some circumstances require the timing line to be set differently if timing lines fail or change and an updated track map is not available.
    - Smoothing – allows user to manipulate "smoothness" of track map rendering. Lower number increases the number of points to use.
    - Map Font – sets the font for the section deltas and labels.
    - Custom Label Font – sets the font for custom labels (custom labels are created in the next menu).
    - Labels – extends to reveal additional options.
        - Add Custom – creates custom map labels. Move the custom labels in the undocked map.
        - Sections – shows section labels.
        - Time Lines – shows time line labels.
    - Background – extends to reveal additional options.
        - Color – changes the background color of the map.
        - Image – allows an image to be used as the background for the map.

        - Clear Image – removes loaded image from background of map.

    - Track Color – sets the color of the track rendering (only refreshes if map size is changed or rotated).

    - Pit Color – sets the color of the pit lane.

    - Label Color – sets the background color of the segment labels on the map.

    - Track Color = Flag – changes the track color to reflect the track condition – yellow, green, red.

    - Set All Delta Colors – Set all the Delta colors.

    - Delta R1 – Set Color for Delta R1 (default Red). (Most Time Lost Section)

    - Delta R2 – Set Color for Delta R2 (default Blue). (2nd Most Time Lost Section)

    - Delta R3 – Set Color for Delta R3 (default Purple). (3rd Most Time Lost Section)

    - Delta R – Set Color for Delta R (default Orange). (Other Time Lost Sections)

    - Delta G - Set Color for Delta G (default Green). (Time Gained Sections)

- Transparency – this sets the transparency of the window. Remember that the report can be set to "Stay On Top", and the transparency will allow the report to be seen as well as the program running behind it. 100% is the default transparency, completely opaque.

- Hide Speed Traps – Hide the Speed Trap Section.

- Hide % – this hides the % performance index for the section deltas (the % is simply the percentage of the selected drivers delta to the fastest split time for that section, can be"+" or "-").

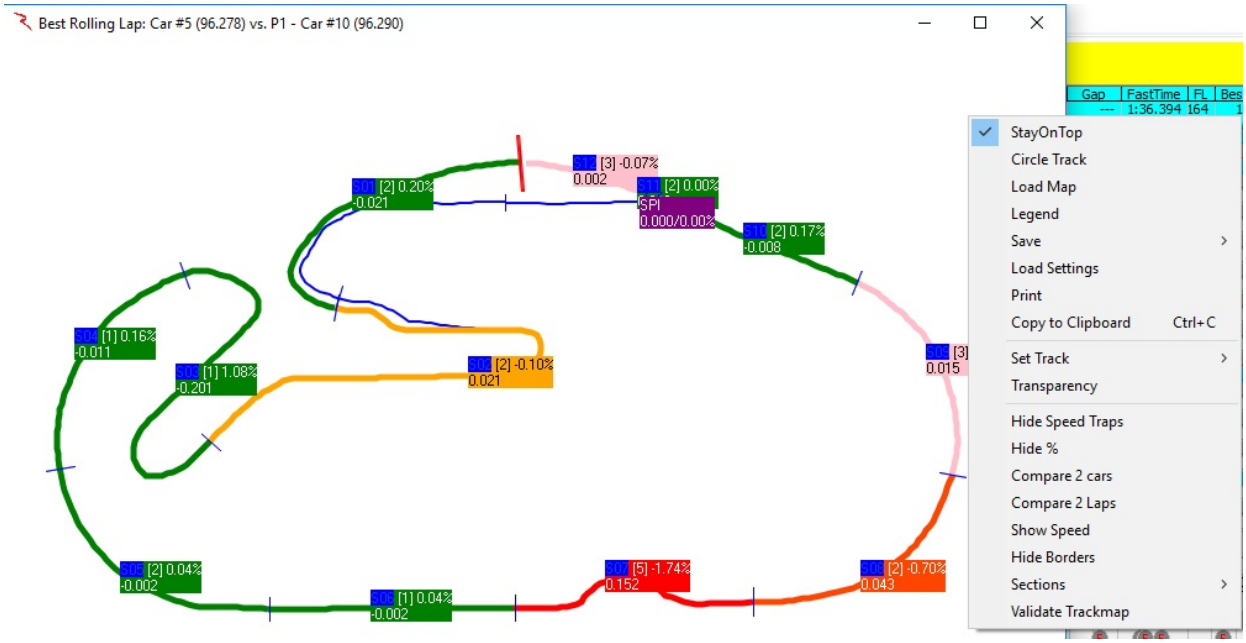
- Compare 2 Cars – allows the user to compare 2 Cars rather than the "team car" to the optimal lap. The user will be prompted to input the two car numbers to compare. To reset the compare to the default optimal lap comparison, simply select the option again to uncheck it.

- Compare 2 Laps – allows the user to compare 2 laps of selected cars rather than the "team car" to the Best Lap, Rolling Lap, or Optimal Lap. The user will be prompted to input the two car numbers and select Best Lap, Rolling Lap, or Optimal Lap to compare. To reset the compare to the default optimal lap comparison, simply select the option again to uncheck it.

- vs P1 – Compare to P1.
- Show Speed – changes the performance index to speed. This is most useful for ovals.
- Hide Borders – hides the borders of the window to decrease the footprint.
- Sections – Standard or Custom.
    - Standard – Display Standard sections.
    - Custom – Display Custom sections (if defined).
- Validate Track Map - As a special note if the track map is messed up, you can force a redraw by CTRL+Left Clicking the map to force a refresh.

Best Rolling Lap Map (Shift+Ctrl+F1)

- Best Rolling Lap Map – (Shift+Ctrl+F1) – this track map compares the team's best rolling lap (the best complete lap, using any time line as the start/finish line of the lap. This is useful to find the best lap completed, regardless of the location of the S/F line, with P1's best rolling lap, if the best rolling lap data is available.



See the '<u>Enhanced Analysis Maps</u>' section of the Appendix for more information.

- StayOnTop – forces the map to stay on top of all other applications running on the computer, even when Race Tools is minimized.
- Circle Track – loads a circular track to display the data on. Useful if a track map is not available for some reason.
- Load Map – allows user to load the applicable map for the data.
- Legend
- Save – extends to reveal additional options.
    - Image – opens menu to save popup as a bitmap file.
    - Settings – allows user to save user defined settings such as fonts, track width, etc.
- Print – opens print window to print report.
- Set Track – extends to reveal additional options.

- Track Width – opens dialog box to change track width which will be used when the track map is next updated.
- Set S/F – sets the timing line used as the SF during the session. Typically set within track map, but some circumstances require the timing line to be set differently if timing lines fail or change and an updated track map is not available.
- Smoothing – allows user to manipulate "smoothness" of track map rendering. Lower number increases the number of points to use.
- Map Font – sets the font for the section deltas and labels.
- Custom Label Font – sets the font for custom labels (custom labels are created in the next menu).
- Labels – extends to reveal additional options.
    - Add Custom – creates custom map labels. Move the custom labels in the undocked map.
    - Sections – shows section labels.
    - Time Lines – shows time line labels.
- Background – extends to reveal additional options.
    - Color – changes the background color of the map.
    - Image – allows an image to be used as the background for the map.
    - Clear Image – removes loaded image from background of map.
- Track Color – sets the color of the track rendering (only refreshes if map size is changed or rotated).
- Pit Color – sets the color of the pit lane.
- Label Color – sets the background color of the segment labels on the map.
- Track Color = Flag – changes the track color to reflect the track condition – yellow, green, red.
- Set All Delta Colors – Set all the Delta colors.
- Delta R1 – Set Color for Delta R1 (default Red). (Most Time Lost Section)

  - Delta R2 – Set Color for Delta R2 (default Blue). (2nd Most Time Lost Section)
  - Delta R3 – Set Color for Delta R3 (default Purple). (3rd Most Time Lost Section)
  - Delta R – Set Color for Delta R (default Orange). (Other Time Lost Sections)
  - Delta G - Set Color for Delta G (default Green). (Time Gained Sections)

- Transparency – this sets the transparency of the window. Remember that the report can be set to "Stay On Top", and the transparency will allow the report to be seen as well as the program running behind it. 100% is the default transparency, completely opaque.

- Hide Speed Traps – Hide the Speed Trap Section.

- Hide % – this hides the % performance index for the section deltas (the % is simply the percentage of the selected drivers delta to the fastest split time for that section, can be"+" or "-").

- Compare 2 Cars – allows the user to compare 2 Cars rather than the "team car" to the optimal lap. The user will be prompted to input the two car numbers to compare. To reset the compare to the default optimal lap comparison, simply select the option again to uncheck it.

- Compare 2 Laps – allows the user to compare 2 laps of selected cars rather than the "team car" to the Best Lap, Rolling Lap, or Optimal Lap. The user will be prompted to input the two car numbers and select Best Lap, Rolling Lap, or Optimal Lap to compare. To reset the compare to the default optimal lap comparison, simply select the option again to uncheck it.

- Show Speed – changes the performance index to speed. This is most useful for ovals.

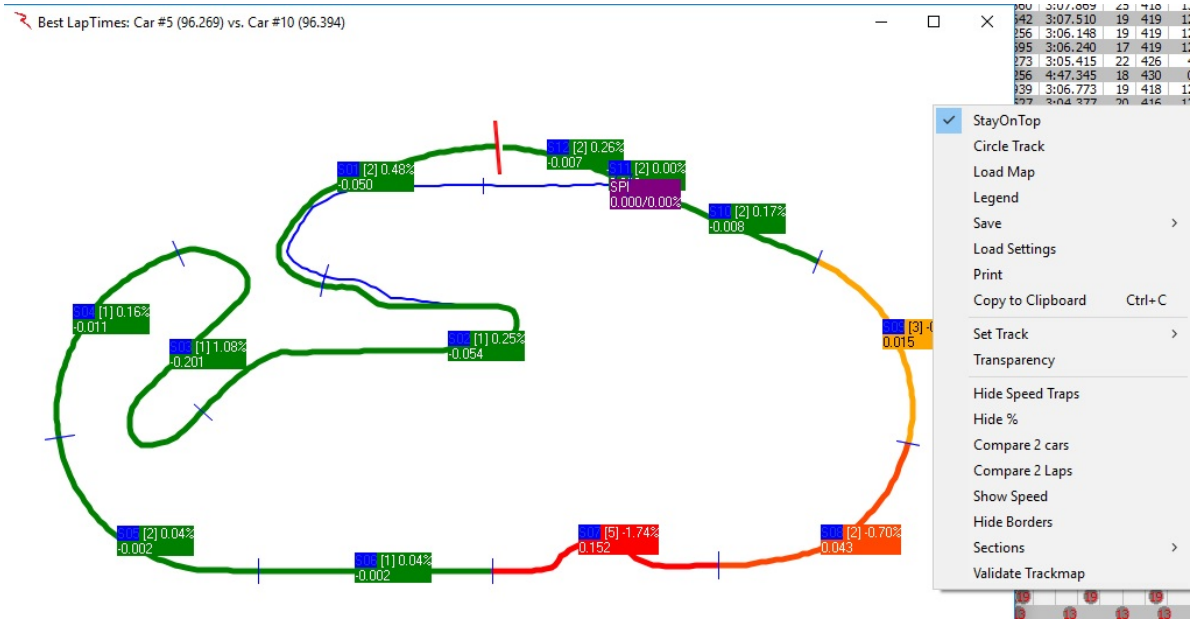
- Hide Borders – hides the borders of the window to decrease the footprint.

- Sections – Standard or Custom.
  - Standard – Display Standard sections.
  - Custom – Display Custom sections (if defined).

- Validate Track Map - As a special note if the track map is messed up, you can force a redraw by CTRL+Left Clicking the map to force a refresh.

Best Lap Map (Shift+F4)

- Best Lap Map – (Shift+F4) – this track map displays the team's best lap.



See the '<u>Enhanced Analysis Maps</u>' section of the Appendix for more information.

- StayOnTop – forces the map to stay on top of all other applications running on the computer, even when Race Tools is minimized.
- Circle Track – loads a circular track to display the data on. Useful if a track map is not available for some reason.
- Load Map – allows user to load the applicable map for the data.
- Legend
- Save – extends to reveal additional options.
    - Image – opens menu to save popup as a bitmap file.
    - Settings – allows user to save user defined settings such as fonts, track width, etc.
- Print – opens print window to print report.
- Set Track – extends to reveal additional options.
    - Track Width – opens dialog box to change track width which will be used when the track map is next updated.

- Set S/F – sets the timing line used as the SF during the session. Typically set within track map, but some circumstances require the timing line to be set differently if timing lines fail or change and an updated track map is not available.

- Smoothing – allows user to manipulate "smoothness" of track map rendering. Lower number increases the number of points to use.

- Map Font – sets the font for the section deltas and labels.

- Custom Label Font – sets the font for custom labels (custom labels are created in the next menu).

- Labels – extends to reveal additional options.

    - Add Custom – creates custom map labels. Move the custom labels in the undocked map.

    - Sections – shows section labels.

    - Time Lines – shows time line labels.

- Background – extends to reveal additional options.

    - Color – changes the background color of the map.

    - Image – allows an image to be used as the background for the map.

    - Clear Image – removes loaded image from background of map.

- Track Color – sets the color of the track rendering (only refreshes if map size is changed or rotated).

- Pit Color – sets the color of the pit lane.

- Label Color – sets the background color of the segment labels on the map.

- Track Color = Flag – changes the track color to reflect the track condition – yellow, green, red.

- Set All Delta Colors – Set all the Delta colors.

- Delta R1 – Set Color for Delta R1 (default Red). (Most Time Lost Section)

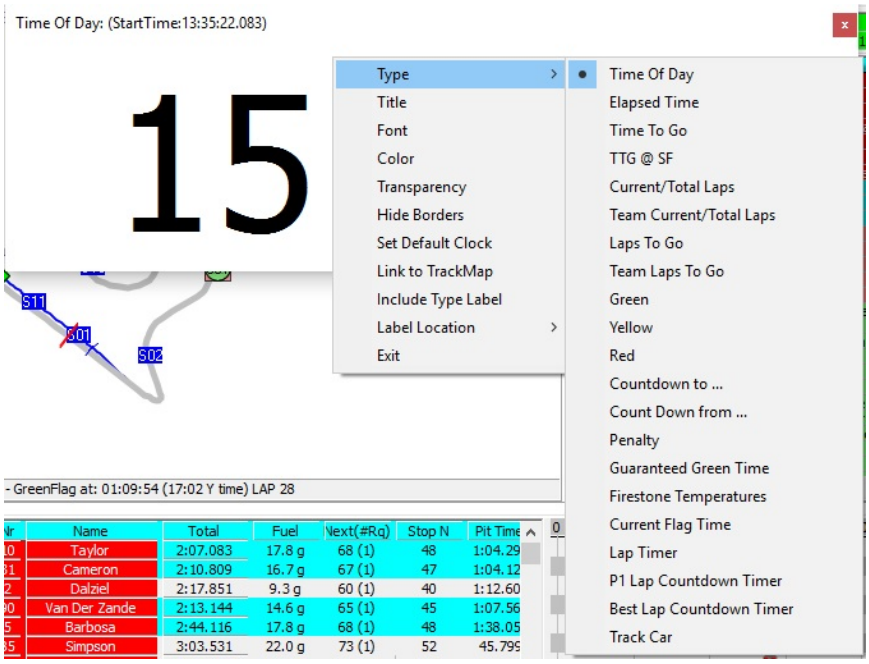
- Delta R2 – Set Color for Delta R2 (default Blue). (2nd Most Time Lost Section)

  - Delta R3 – Set Color for Delta R3 (default Purple). (3rd Most Time Lost Section)
  - Delta R – Set Color for Delta R (default Orange). (Other Time Lost Sections)
  - Delta G - Set Color for Delta G (default Green). (Time Gained Sections)

- Transparency – this sets the transparency of the window. Remember that the report can be set to "Stay On Top", and the transparency will allow the report to be seen as well as the program running behind it. 100% is the default transparency, completely opaque.
- Hide Speed Traps – Hide the Speed Trap Section.
- Hide % – this hides the % performance index for the section deltas (the % is simply the percentage of the selected drivers delta to the fastest split time for that section, can be"+" or "-").
- Compare 2 Cars – allows the user to compare 2 Cars rather than the "team car" to the optimal lap. The user will be prompted to input the two car numbers to compare. To reset the compare to the default optimal lap comparison, simply select the option again to uncheck it.
- Compare 2 Laps – allows the user to compare 2 laps of selected cars rather than the "team car" to the Best Lap, Rolling Lap, or Optimal Lap. The user will be prompted to input the two car numbers and select Best Lap, Rolling Lap, or Optimal Lap to compare. To reset the compare to the default optimal lap comparison, simply select the option again to uncheck it.
- Show Speed – changes the performance index to speed. This is most useful for ovals.
- Hide Borders – hides the borders of the window to decrease the footprint.
- Sections – Standard or Custom.
  - Standard – Display Standard sections.
  - Custom – Display Custom sections (if defined).
- Validate Track Map - As a special note if the track map is messed up, you can force a redraw by CTRL+Left Clicking the map to force a refresh.

Add Custom Pop-Up (Ctrl+Alt+C)

- Add Clock – (Ctrl+Alt+C) – adds a clock to the interface. Clocks are used to display session information in a larger format, and in a user determined location. When the feature is selected, a large clock displaying the current time of day will appear in the Race Tools window. This clock can be moved to any location on the screen and be sized to any size. The text will automatically resize as the window size is changed.



Once the clock is added, the type of clock can be selected. It is best practice to choose the type of clock before determining location and formatting size. To choose the clock type, right click in the background of the clock window. Note that certain clocks will also have a background color representative of the current track status.

The options for clock type are explained below.

- Time of Day – displays timing and scoring broadcasted time of day.
- Elapsed Time – displays the broadcasted elapsed time from the start of the current session/race.
- Time To Go – displays the time to go in the current session/race (note time to go will display for a race session even if not timed race, this is done based on inputs of Pit/Lap calculator or broadcast value from timing and scoring, use with caution).
- TTG @ SF – displays the time to go (TTG) when the session leader crosses the start finish line. This is typically most useful for timed races, allowing the user to calculate remaining laps based on the leaders timing data.

- Current/Total Laps – for races, displays the current lap the leaders are working and the total laps for the race (will reflect the calculated number of laps if the race becomes a timed race, must select timed race in Options menu).

- Laps To Go – displays the laps to go in the race. This will show the calculated laps remaining if "Timed Race• is selected in the Options.

- Green – total time of session that has been flagged as "green•.

- Yellow – total time of session that has been flagged as "yellow•.

- Red – total time of session that has been flagged as "red•.

- Countdown to … – allows the user to specify a time to countdown to. Enter the time in the format "11:12:53 AM•. The user will be prompted to change the title of the clock after the time has been entered.

- Count Down from … – starts a countdown timer for the user. Input the time to countdown from in the format 'hh:mm:ss.xxx'. The user will be prompted to change the title of the clock after the time has been set.

- Penalty – creates a user set up penalty clock. The clock is defined in the same manner as the "Count Down from• clock. The clock title automatically changes to display the time the penalty clock was started.

- Firestone Temperatures – displays the logged Firestone air and track temperatures (in Fahrenheit) as well as the time the temperature were logged. (IndyCar version)

Other right-click options available for the clock feature are:

- Title – change the title of the clock.

- Font – change the font of the clock. Note that changing the font will change the size of the clock and that the font will increase in size if the clock size is increased (doesn't lock the font size).

- Color – change the background color of the clock (not applicable to clocks that display track condition color, like the elapsed time clock).

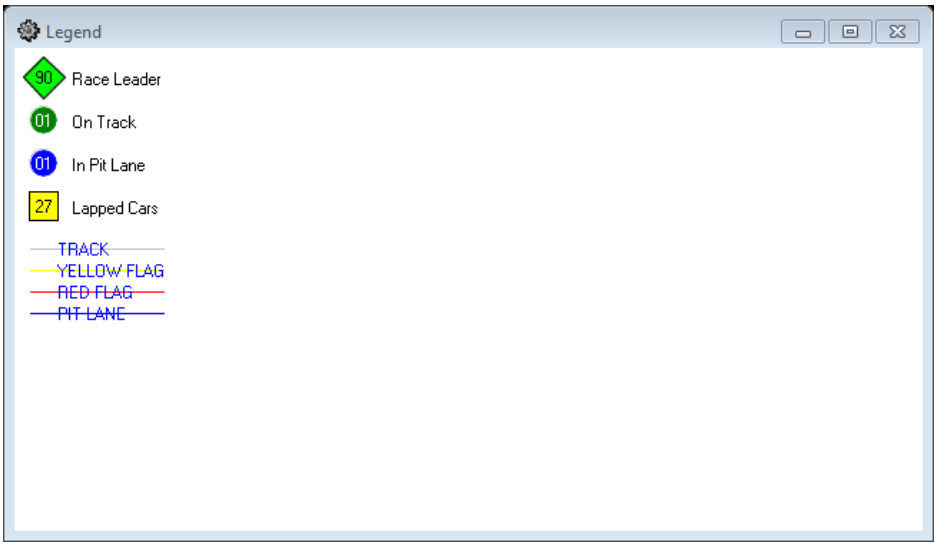
- Transparency – sets the transparency of the clock (100% is opaque).

- Hide Borders – allows user to hide the borders of the clock. Note that the clock cannot be moved with borders hidden.

- Set Default Clock – sets the currently selected clock type as the default clock. All subsequently added clocks will be of this type.

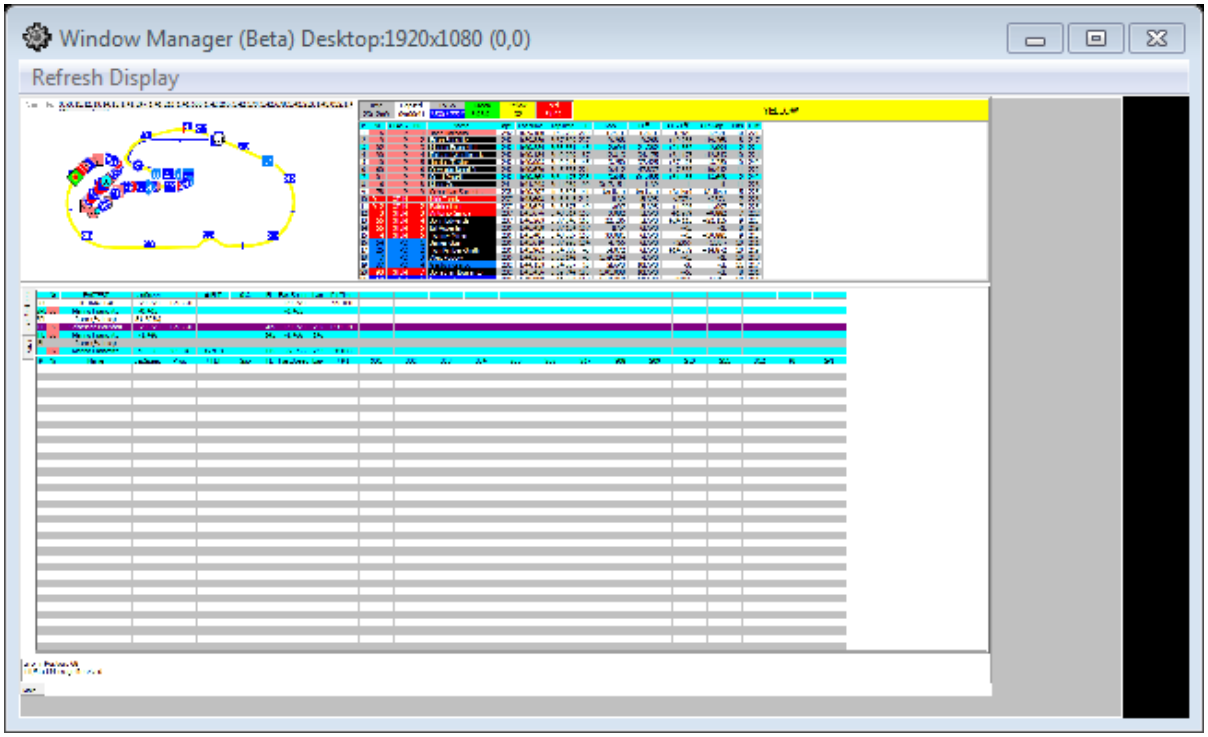
- Exit – closes the clock window. Can also be closed with the "X" in the upper right corner (if not hidden).

Map Legend



Display the legend of items shown on the track map.

Window Manager (Alt+W)



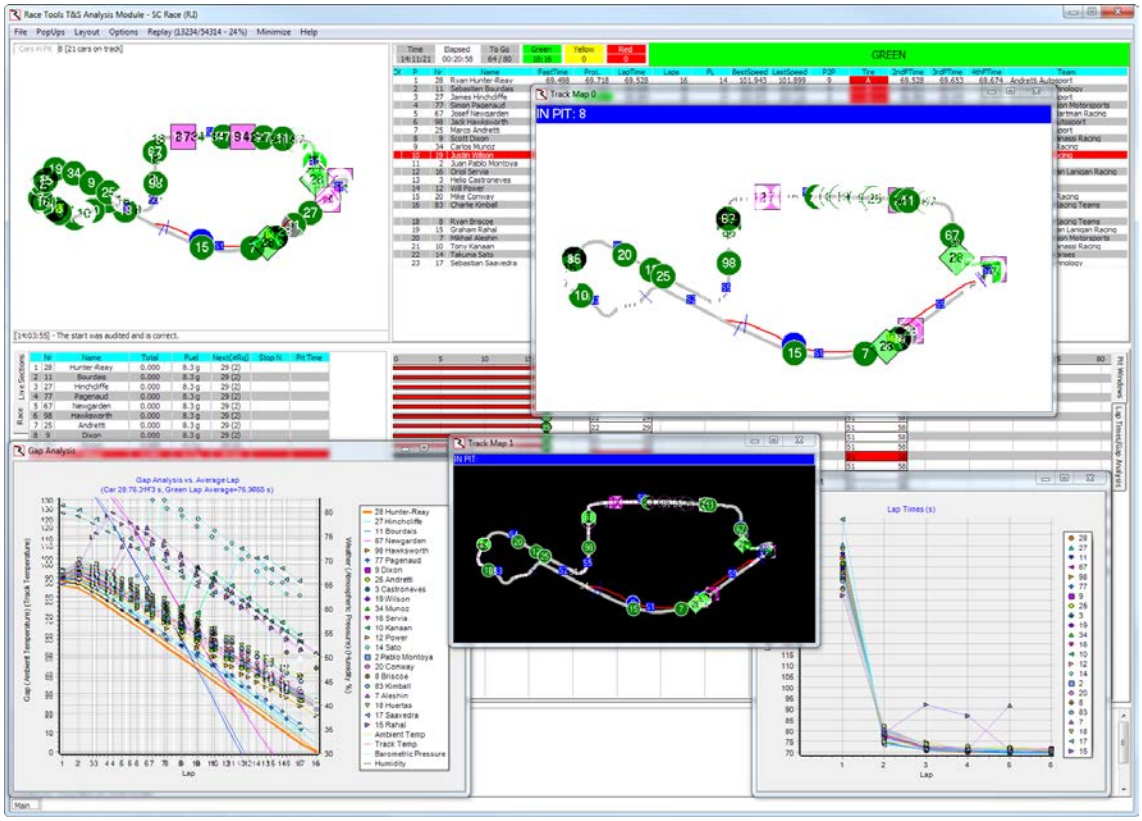
Manages the placement of various windows displayed.

Lock Docking (Ctrl+D)

- Lock Docking (see details on docking in the Appendix)– allows the user to dock or undock the map from the Race Tools software. The docked location is always the upper left corner of the software, while the undocked Track Map can be placed anywhere, including extended displays, as well as be resized.

- RaceTools has the ability to have multiple graphs and maps open.

- You can add Graphs and Maps using the Add Graphs and Add Maps menus.



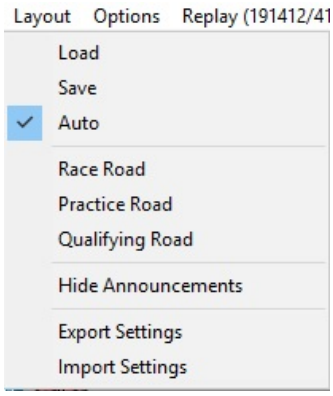
Close All Popups

- Close All Popups – Closes all popup windows.

Layout

RaceTools allows you to save and restore custom layouts with quick links to predefined, commonly used layouts. Specifically, there are quick links to Race, Qualifying and Practice layouts. IndyCar versions get to choose Road versus Oval layouts. These custom layouts use a special file naming template: **<application name>_<SessionType>_<TrackType>.ini.**
<application name> is the name of the program, usually INDYCAR_TSModule, IMSA_TSModule, MRTI_TSModule or WEC_TSModule.
<SessionType> is either 'Race', 'Qualifying' or 'Practice'
<TrackType> is either 'Road' or 'Oval' (for INDYCAR and MRTI versions).
i.e. '*IMSA_TSModule_PracticeRoad.ini*' is the filename for the Practice Layout for the IMSA version of RaceTools. '*INDYCAR_TSModule_QualifyingOval.ini*' is the filename for the Oval Qualifying Layout for the INDYCAR version of RaceTools. '*WEC_TSModule_RaceRoad.ini*' is the Race Layout for the WEC version of RaceTools.

Once you have organized the layout of the software to your satisfaction, select the **Layout/Save** option to save the layout to a file. You can name it anything you'd like or use the above file naming convention to make it the default layout for the different session types. To transfer the layout to other computers on your team, just copy the .ini file(s) to each machine where they can be loaded and modified.



Load

- Load – Load a saved layout.

Save

- Save – Save a layout.

Auto

- Auto – If you select this option, RaceTools will automatically load the correct layout when the session changes.

Race Oval

- Race Oval – Oval track Race layout.

Race Road

- Race Road – Road Course Race layout.

Practice Oval

- Practice Oval – Oval track Practice layout.

Practice Road

- Practice Road – Road Course Practice layout.

Qualifying Oval

- Qualifying Oval – Oval track Qualifying layout.

Qualifying Road

- Qualifying Road – Road course Qualifying layout.

Hide Announcements

- Hide Announcements – Hide the announcements window.

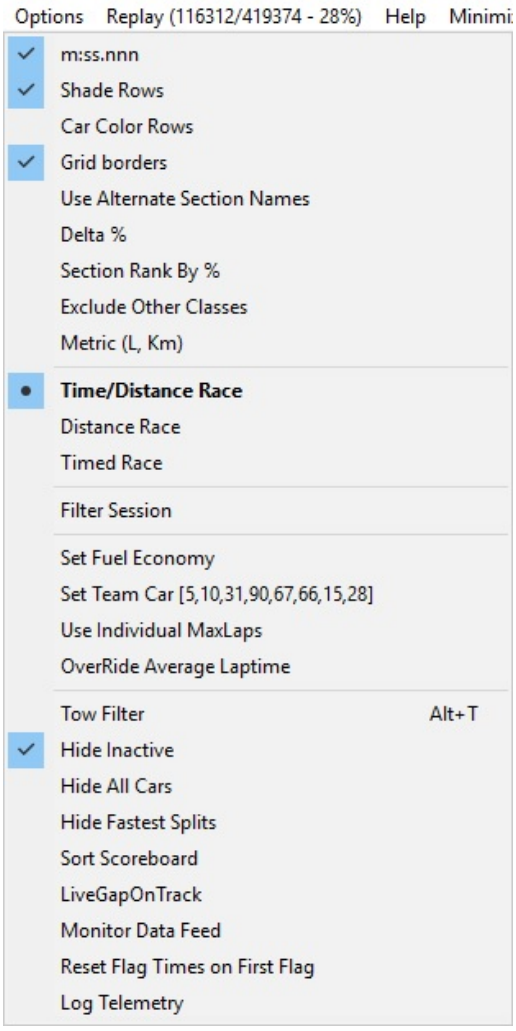
Export Settings

- Export Settings – Package application settings files into a zip file to easily export them to another instance or machine

Import Settings

- Import Settings – Import application settings from a zip file

Options



Mm:ss:nnn

- mm:ss.nnn - changes the lap time performance index from 'ss.nnn' to 'mm:ss.nnn' when this feature is selected (example 64.1255 vs 1:04.1255)

Shade Rows

- Shade Rows - formats the Session Results and Live Sections window to alternate shading between rows of data, by default the shading is white and grey

Car Color Rows

- Car Color Rows - if colors have been assigned to cars (Ctrl+left click on the car number in the Session Results window, the numbers and marching ants will be the assigned color) already, then the rows of the cars with assigned colors will be formatted to that background color. If car colors need changed, either select the entrant again and change colors or manipulate the file "CarColors‟ in the root menu. If color

codes are known, it may prove easier to set colors for all entrants in this file rather than setting in the software.

Grid Borders

- Grid Borders - adds or removes borders from the tables in the Session Results and Live Sections windows.

Use Alternate Section Names

- Use Alternate Section Names - Use alternate section names (if defined).

Delta %

- Delta % - Displays the Delta as percentage.

Section Rank by %

- Section Rank by % - Displays the Section Rank as percentage.

Exclude Other Classes

- Exclude Other Classes - Exclude classes other than 'Team Car' class.

Metric (L, Km)

- Metric (L, Km) - Change distances to Metric values.

Time/Distance Race

- Time/Distance Race - for race sessions, this sets the race type to the hybrid of Time/Distance. In this mode, the race distance will be determined by the maximum time duration or total laps for the race whichever is reached first. The information is available in the data stream and will be calculated automatically. The software uses the leaders' last three green laps to project the maximum number of laps possible with the time remaining and compares it with the number of laps to go for a distance race and displays the lower of the two in the To Go field.

Distance Race

- Distance Race - sets the race type to Distance, resulting is a set number of laps needing to be completed, as set by the Pit/Lap Calculator or the data feed.

Timed Race

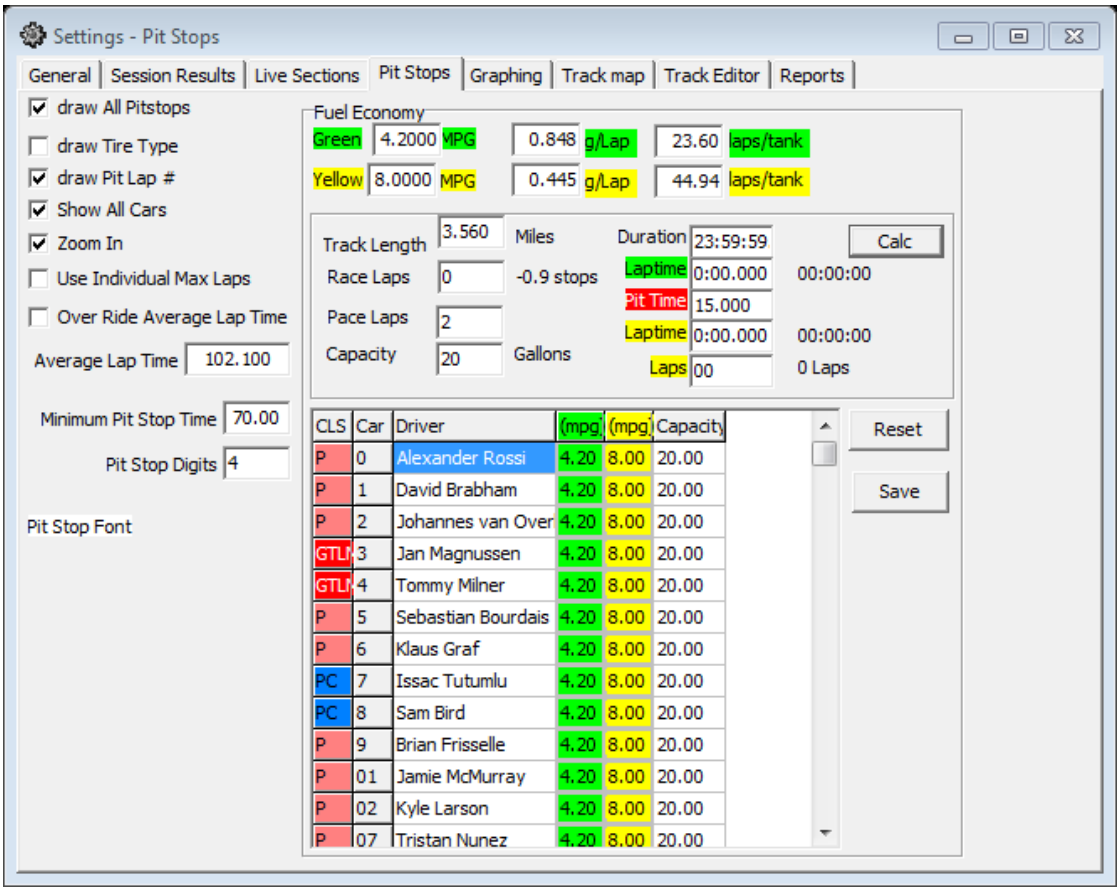
- Timed Race - sets the race type to timed, resulting in a variable number of race laps based on race time remaining and average lap time calculations.

Filter Session

- Filter Session - places a filter on data stream parser to only process the data from the desired session. This feature is most useful for situations where one session is interrupted for another session (like practice with qualifying during Indy 500 qualifying days, can filter out the qualifying session).

Set Fuel Economy – Pit/Lap Calculator

- Set Fuel Economy - Pit/Lap Calculator – not a report, rather a setup menu for the real time pit window analysis contained in the Live Sections/Pit Windows window (accessible by selecting the "Pit Windows• tab on the left of the window). Parameters required are shown below in the popup window. Note that this is identical to the menu available under Options -> Set Fuel Economy.



Pressing the Calc button applies the input information to the calculations in the analysis. The Reset button resets all entrants' economies to those input at the top of the window. Note that individual economies can be set to reflect the abilities of drivers/teams to be able achieve better/worse economies.

- *Some of the information required for this menu comes across the timing stream, such as laps, track length, etc. It is always good policy to check the information and apply numbers as seen fit by the user.*

Set Team Car [X]

- Set Team Car [X] - sets the competitor that will be considered the team car and have any applicable analysis and formatting applied to it. Enter the competitor car number in the pop up menu. Examples of reports and formatting affected by this setup parameter are the Best Splits/Lap Maps, row formatting, and team color among other things. You can enter more than one car number by entering them as a comma delimited string (i.e. "2,3,4•). The first car number will be treated as the team car for

comparative analysis and be highlighted with the team color, the other car numbers will be highlighted with the highlight color.

Use Individual MaxLaps

Override Average Laptime

Tow Filter (Alt+T)

- Tow Filter – Filters out tow assisted laps based upon the Tow Threshold setting.

Hide Inactive

- Hide Inactive - sets cars that have not crossed a timeline within one lap time as (inactive) and hides it from the track map. Hide Inactive option does not remove the car from the results or analysis, just from the track map and running order. The car's status will be set to '(Active)' to differentiate it from 'Active'. The will still be visible in the session results table and all of the reports.

Hide All Cars

- Hide All Cars - Hide all cars on the track map.

Hide Fastest Splits

- Hide Fastest Splits – Hide the fastest splits from the 'Live Sections' window.

Check Control Line

- Adjust Control Line (S/F) for Practice/Qualifying or Race. (IndyCar)

Sort Scoreboard

- Sort The Scoreboard.

LiveGapOnTrack

- Show Live Gap on Track.

Monitor Data Feed

- Monitor Data Feed

Reset Flag Times on First Flag

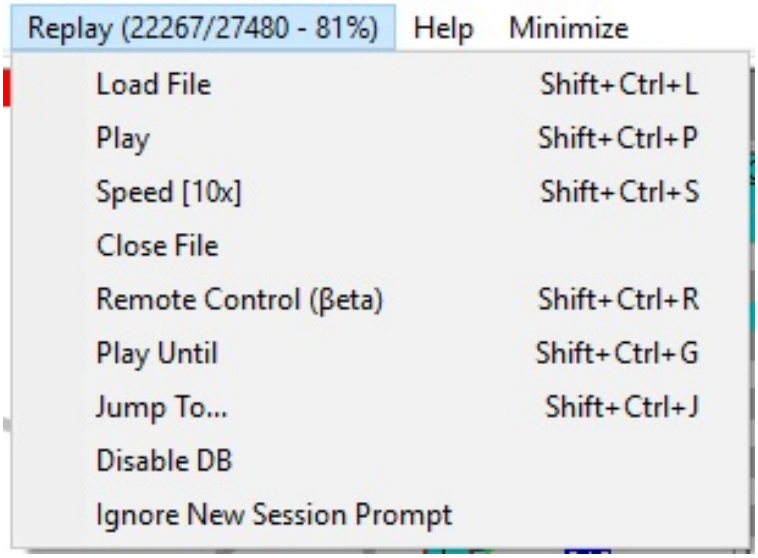
- Reset Flag Times on First Flag is to help track the Guaranteed Minimum Green Flag time for qualifying. Because the Qualifying session is one long session with multiple groups, and the Minimum Green Time is for each group, we need to reset the Flag Times at the start of each group. The Reset Flag Times on First Flag option clears the flag times when a session goes from Checkered, Unflagged (Warm), or Cold to Green, Yellow or Red. You can manually reset the Flag Times by double clicking on the 'Green' flag time in the Session Results table.

Log Telemetry

- Log Telemetry if available.

Replay

- The Race Tools software can utilize downloaded (http://results.imsa.com/) or local log files for replay. This feature acts as an emulator and the software behaves exactly as if it was receiving a real time telemetry feed. The Replay menu contains the following options:



Load File (Shift+Ctrl+L)

- Load File –accesses the "Open Replay Menu" and allows the user to open a desired replay file. Simply navigate to the location of either the downloaded log file or to the local log file directory as set up in the configuration menu.

Play/Pause (Shift+Ctrl+P)

- Play/Pause –starts and controls the progress of the replay.

Speed [1x] (Shift+Ctrl+S)

- Speed [1x] – sets the replay speed of the file. This can be set from 1-50 times the actual speed.

Close File

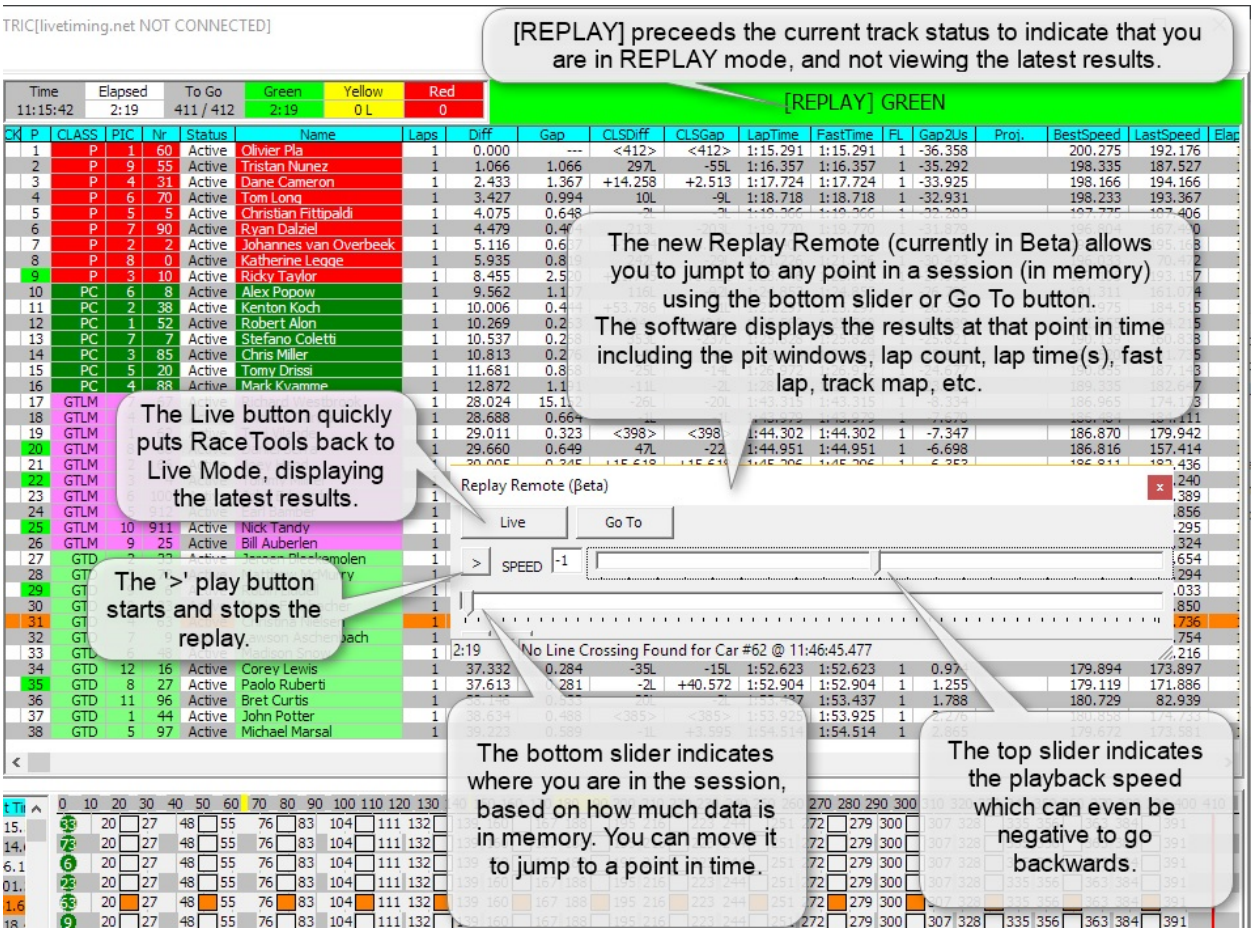
- Close File – Close the replay file.

Remote Control (βeta) (Shift+Ctrl+R)

- Remote Control - Currently in beta, this interface will allow you to pause, rewind or jump ahead to any point in time that the software has in memory. You can load the session into memory using the traditional replay feature, or load a previously saved session using the Load Session feature. Once a session is in memory, you can use

the slider to go to a point in time and then hit the play button to play back the session either forwards or backwards. Jumping to point in time takes less than a second, so you can quickly find the point in the session you are looking for. You can use the Jump To button to go to a specific elapsed time.

- Note that the Replay Remote is still a beta feature so please use it with caution. The previous Relay option still exists and is useful even with the new Replay Remote feature as a way to get data into the system. You can only use Replay Remote on session data in memory, so you may need to replay a session into memory first before you can take advantage of the new features.



Play Until (Shift+Ctrl+G)

- Play Until – Play until is used to pause the playback at a designated stop point. This is helpful if you want to do analysis up to a certain point, or from a certain point. You can set the Play Until option to automatically pause the replay so you can leave the computer and come back to it at the point in the session you've entered. Enter the Elapsed Time (h:mm:ss), Lap (n), or flag ('G'.'Y','K','R','C') to pause replay.

Jump To (Shift+Ctrl+J)

- Jump To – Jump to a selected time, time of day, or flag to start the replay. It is designed for when you don't care about the data before a certain point in time and want to quickly jump to a point in the session and analyze data from that point forward.

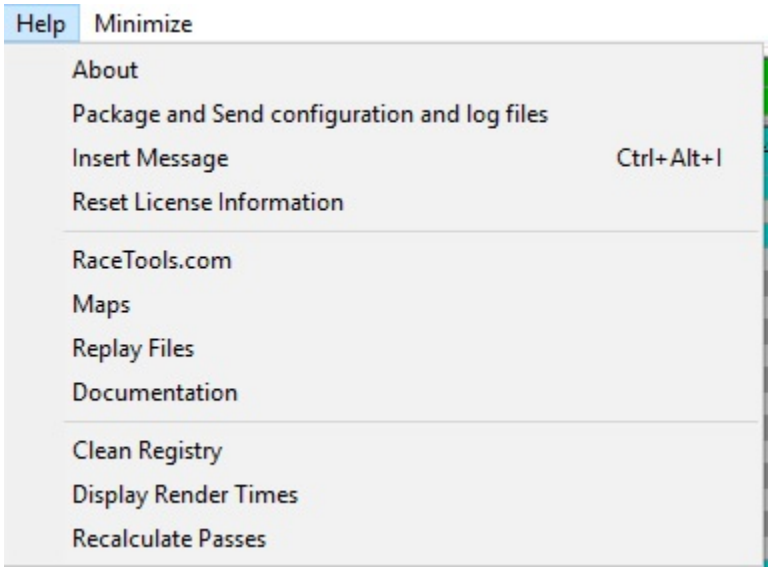
Disable DB

- Disable DB –.Disable DB is a feature to disable logging the replay file to the ABS file. This helps speed up playback.

Ignore New Session Prompt

- Ignore the 'New Session' prompt. During replay, you may want to ignore a new session prompt.

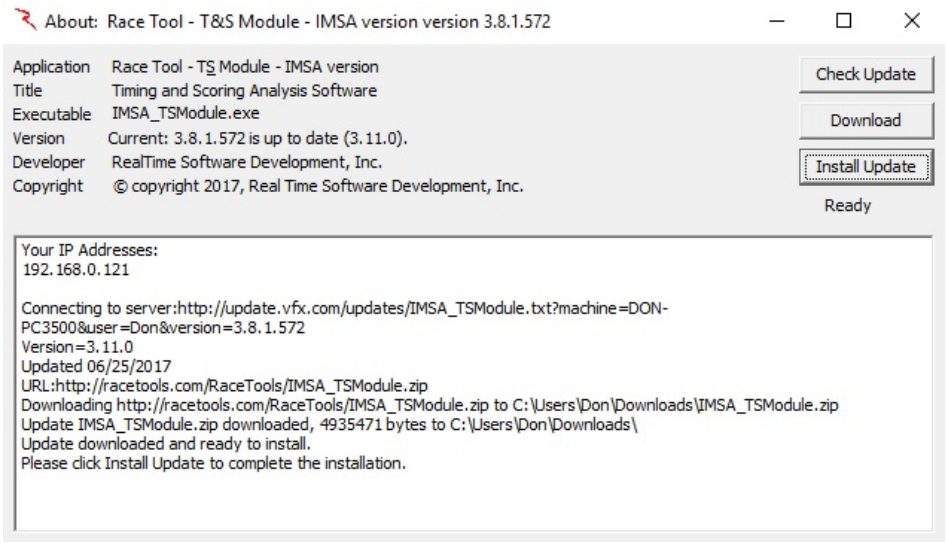
Help



About

- RaceTools is updated frequently, probably too frequently for many of you. To help you keep up to date with the latest version, I've integrated the Update function into the software so that you don't have to leave the software to check and get the latest version. The About window is also more descriptive and readable. To get the latest version of the software, click on Check Update, Download, and then Install Update. The software will take care of the details and replace the current copy with the updated version.

- You can check for Updates and download the new version using the About/Update feature within RaceTools, or download it from http://racetools.com/racetools/imsa_tsmodule.zip



Package and Send configuration and log files

- Package and Send the configuration and log files to the developer.

Insert Message (Ctrl+Alt+I)

- Insert a message in the LogFile.

Reset License Information

- Reset the License information.

RaceTools.com

- Go To RaceTools.com – Requires an internet connection.

Maps

- Maps – Takes you to the developers' web site for the latest map updates.

Replay Files

- Replay Files – Takes you to the IMSA results web site where you can download the replay files.

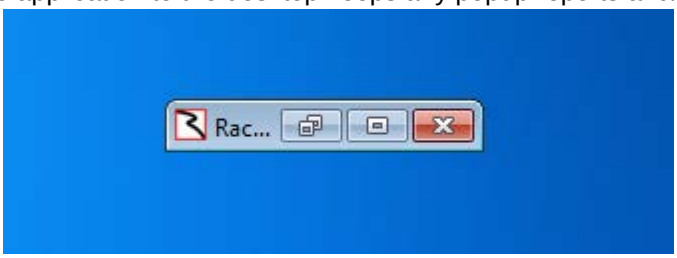
Documentation

- Documentation – Takes you to the RaceTools web site for the User's Manual.
- Clean Registry –
- Display Render Times -
- Recalculate Passes -

Minimize

Minimize To Desktop

- This menu option minimizes the application to the desktop. Rather than minimizing to the taskbar, it instead minimizes the program to the minimal footprint allowed by the header of the program. The reason you might want to minimize to the desktop rather than the taskbar is to keep elements associated with the application visible. For instance, all of the popup reports and clocks are tied to the program window. Minimizing the application to the taskbar also minimizes the popup reports and clocks. Minimizing the application to the desktop keeps any popup reports and/or clocks open.



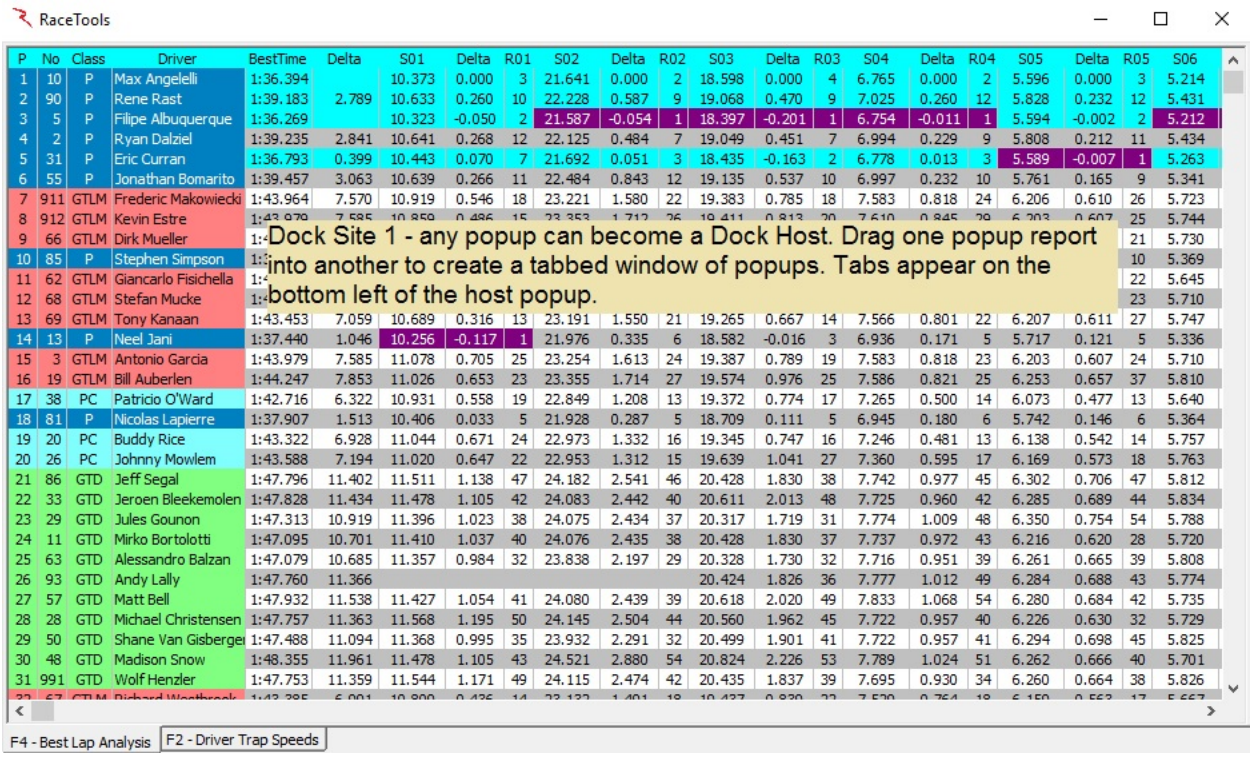
Appendix

Working With Docking

When the software launches, the 'Lock Docking' option is enabled so you won't accidentally dock/undock reports. Any previously docked reports will appear in their docked state. **To dock or undock a report, you must first disable the 'Lock Docking' option in the 'PopUps' dropdown menu.** With 'Lock Docking' selected, you cannot dock or undock any popups.

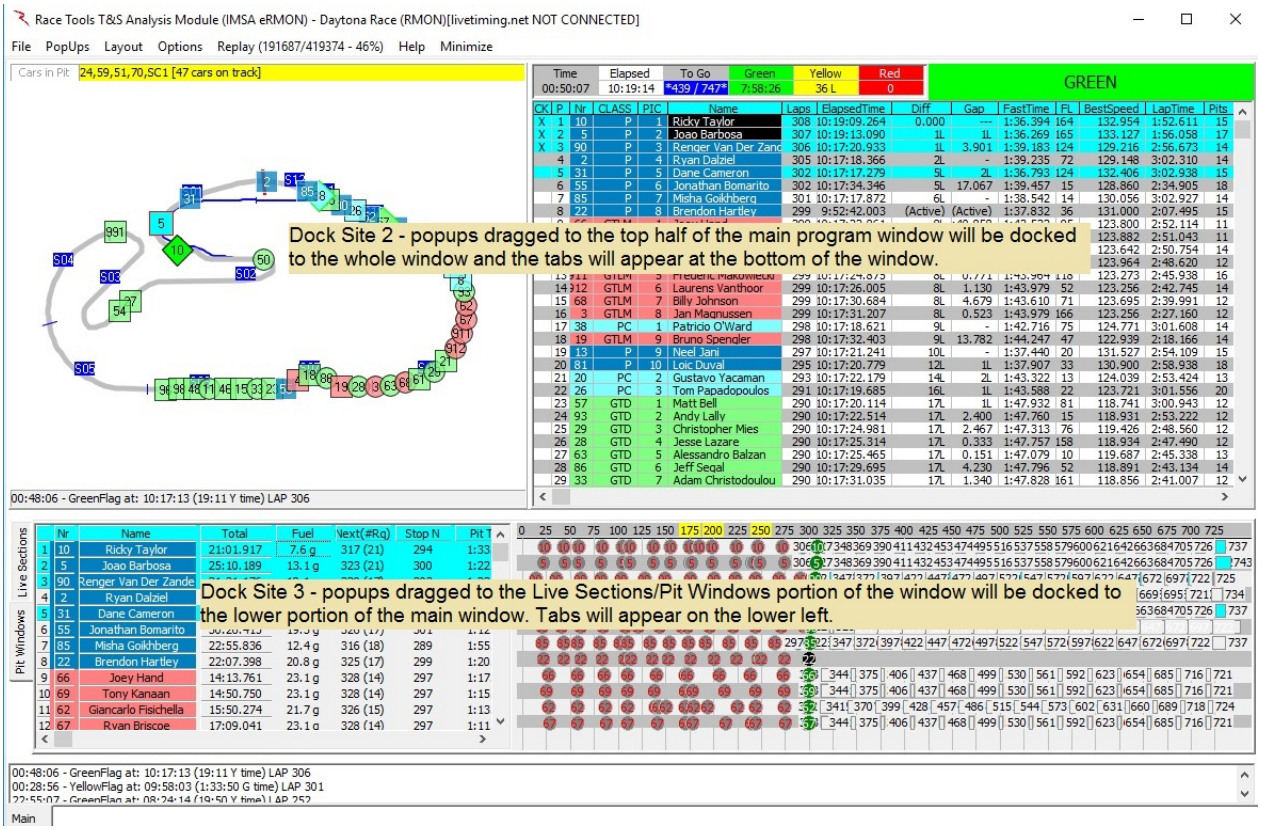
Docking is done by dragging the popup window to the area that you want to dock to. There are three areas you can dock to (dock sites).

Dock Site 1. You can dock to another report (creating a window to store a number of popup reports in a tab) by dragging one popup window into the other. The tabs are along the bottom of the popup window.



P	No	Class	Driver	BestTime	Delta	S01	Delta	R01	S02	Delta	R02	S03	Delta	R03	S04	Delta	R04	S05	Delta	R05	S06
1	10	P	Max Angelelli	1:36.394		10.373	0.000	3	21.641	0.000	2	18.598	0.000	4	6.765	0.000	2	5.596	0.000	3	5.214
2	90	P	Rene Rast	1:39.183	2.789	10.633	0.260	10	22.228	0.587	9	19.068	0.470	9	7.025	0.260	12	5.828	0.232	12	5.431
3	5	P	Filipe Albuquerque	1:36.269		10.323	-0.050	2	21.587	-0.054	1	18.397	-0.201	1	6.754	-0.011	1	5.594	-0.002	2	5.212
4	2	P	Ryan Dalziel	1:39.235	2.841	10.641	0.268	12	22.125	0.484	7	19.049	0.451	7	6.994	0.229	9	5.808	0.212	11	5.434
5	31	P	Eric Curran	1:36.793	0.399	10.443	0.070	7	21.692	0.051	3	18.435	-0.163	2	6.778	0.013	3	5.589	-0.007	1	5.263
6	55	P	Jonathan Bomarito	1:39.457	3.063	10.639	0.266	11	22.484	0.843	12	19.135	0.537	10	6.997	0.232	10	5.761	0.165	9	5.341
7	911	GTLM	Frederic Makowiecki	1:43.964	7.570	10.919	0.546	18	23.221	1.580	22	19.383	0.785	18	7.583	0.818	24	6.206	0.610	26	5.723
8	912	GTLM	Kevin Estre	1:43.979	7.585	10.859	0.486	15	23.353	1.712	26	19.411	0.813	20	7.610	0.845	29	6.203	0.607	25	5.744
9	66	GTLM	Dirk Mueller	1:4																21	5.730
10	85	P	Stephen Simpson	1:4																10	5.369
11	62	GTLM	Giancarlo Fisichella	1:4																22	5.645
12	68	GTLM	Stefan Mucke	1:4																23	5.710
13	69	GTLM	Tony Kanaan	1:43.453	7.059	10.689	0.316	13	23.191	1.550	21	19.265	0.667	14	7.566	0.801	22	6.207	0.611	27	5.747
14	13	P	Neel Jani	1:37.440	1.046	10.256	-0.117	1	21.976	0.335	6	18.582	-0.016	3	6.936	0.171	5	5.717	0.121	5	5.336
15	3	GTLM	Antonio Garcia	1:43.979	7.585	11.078	0.705	25	23.254	1.613	24	19.387	0.789	19	7.583	0.818	23	6.203	0.607	24	5.710
16	19	GTLM	Bill Auberlen	1:44.247	7.853	11.026	0.653	23	23.355	1.714	27	19.574	0.976	25	7.586	0.821	25	6.253	0.657	37	5.810
17	38	PC	Patricio O'Ward	1:42.716	6.322	10.931	0.558	19	22.849	1.208	13	19.372	0.774	17	7.265	0.500	14	6.073	0.477	13	5.640
18	81	P	Nicolas Lapierre	1:37.907	1.513	10.406	0.033	5	21.928	0.287	5	18.709	0.111	5	6.945	0.180	6	5.742	0.146	6	5.364
19	20	PC	Buddy Rice	1:43.322	6.928	11.044	0.671	24	22.973	1.332	16	19.345	0.747	16	7.246	0.481	13	6.138	0.542	14	5.757
20	26	PC	Johnny Mowlem	1:43.588	7.194	11.020	0.647	22	22.953	1.312	15	19.639	1.041	27	7.360	0.595	17	6.169	0.573	18	5.763
21	86	GTD	Jeff Segal	1:47.796	11.402	11.511	1.138	47	24.182	2.541	46	20.428	1.830	38	7.742	0.977	45	6.302	0.706	47	5.812
22	33	GTD	Jeroen Bleekemolen	1:47.828	11.434	11.478	1.105	42	24.083	2.442	40	20.611	2.013	48	7.725	0.960	42	6.285	0.689	44	5.834
23	29	GTD	Jules Gounon	1:47.313	10.919	11.396	1.023	38	24.075	2.434	37	20.317	1.719	31	7.774	1.009	48	6.350	0.754	54	5.788
24	11	GTD	Mirko Bortolotti	1:47.095	10.701	11.410	1.037	40	24.076	2.435	38	20.428	1.830	37	7.737	0.972	43	6.216	0.620	28	5.720
25	63	GTD	Alessandro Balzan	1:47.079	10.685	11.357	0.984	32	23.838	2.197	29	20.328	1.730	32	7.716	0.951	39	6.261	0.665	39	5.808
26	93	GTD	Andy Lally	1:47.760	11.366							20.424	1.826	36	7.777	1.012	49	6.284	0.688	43	5.774
27	57	GTD	Matt Bell	1:47.932	11.538	11.427	1.054	41	24.080	2.439	39	20.618	2.020	49	7.833	1.068	54	6.280	0.684	42	5.735
28	28	GTD	Michael Christensen	1:47.757	11.363	11.568	1.195	50	24.145	2.504	44	20.560	1.962	45	7.722	0.957	40	6.226	0.630	32	5.729
29	50	GTD	Shane Van Gisbergei	1:47.488	11.094	11.368	0.995	35	23.932	2.291	32	20.499	1.901	41	7.722	0.957	41	6.294	0.698	45	5.825
30	48	GTD	Madison Snow	1:48.355	11.961	11.478	1.105	43	24.521	2.880	54	20.824	2.226	53	7.789	1.024	51	6.262	0.666	40	5.701
31	991	GTD	Wolf Henzler	1:47.753	11.359	11.544	1.171	49	24.115	2.474	42	20.435	1.837	39	7.695	0.930	34	6.260	0.664	38	5.826
32	67	GTLM	Richard Westbrook	1:43.385	6.991	10.809	0.436	14	23.132	1.491	18	19.437	0.839	22	7.520	0.764	18	6.159	0.563	17	5.667

Dock Site 2. You can dock to the main program windows' full screen area by dragging a popup to the top half of the main program window.

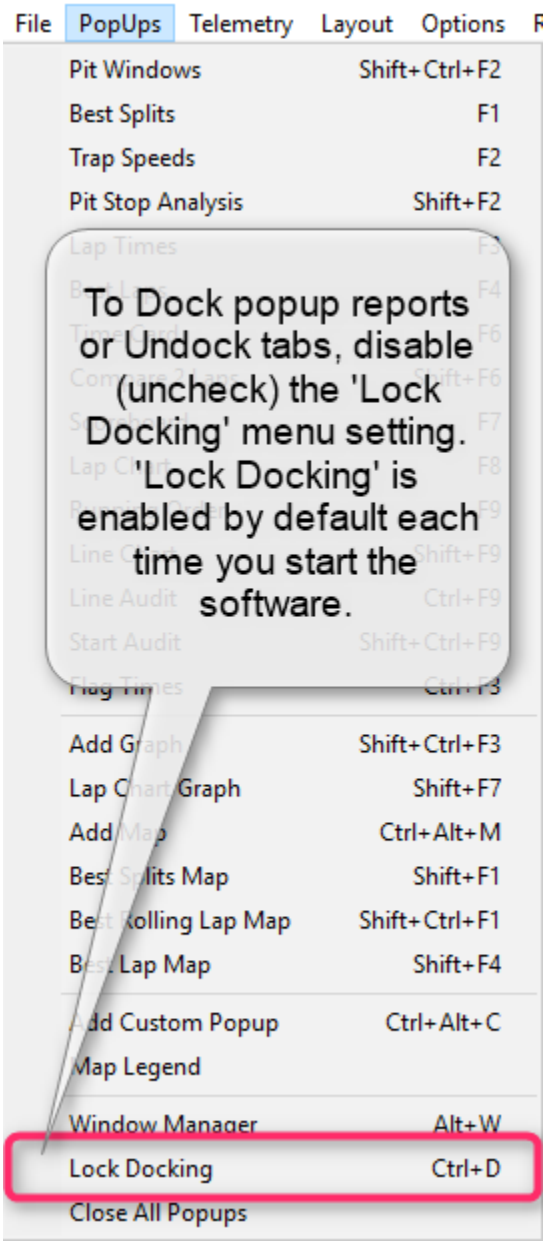


Dock Site 3. You can dock to the lower portion (Live Sections/Pit Windows tab) of the main program window by dragging a popup to the lower portion.

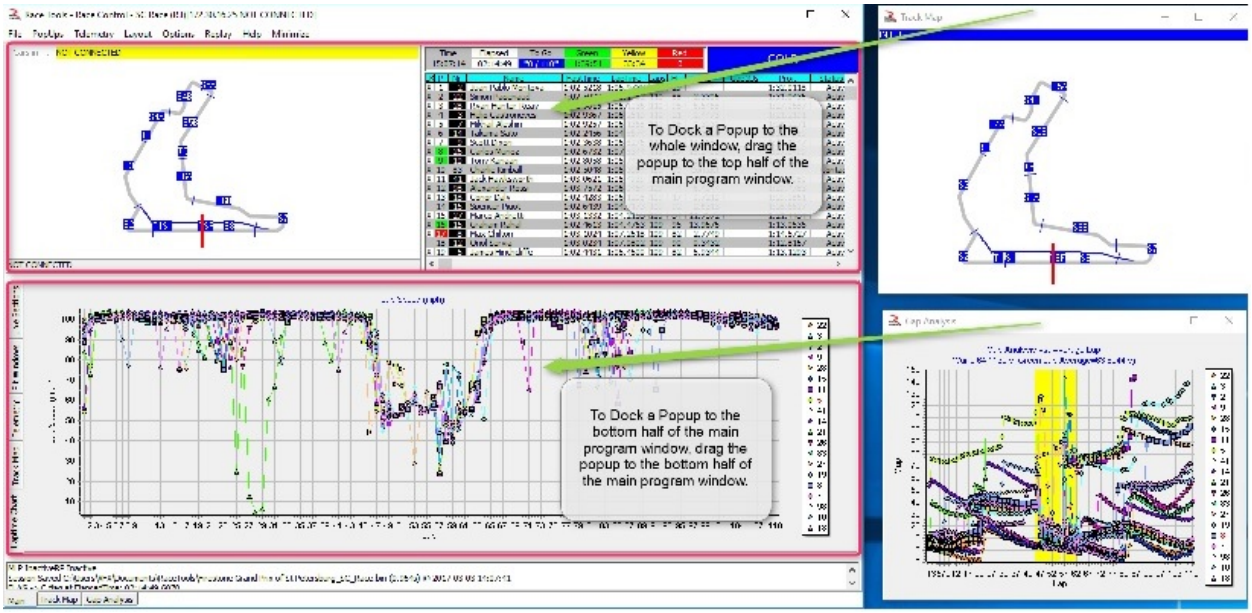
Undocking is done by dragging the tab out of the window (on to the desktop) or to another dock site.

To return to the default main window tabs, (Main tab, Pit Windows tab for race sessions, Live Sections tab for non-Race sessions), hit the HOME key. This is useful if you have a lot of reports docked to the main program window and need to quickly return to the main results window (track map, session results).

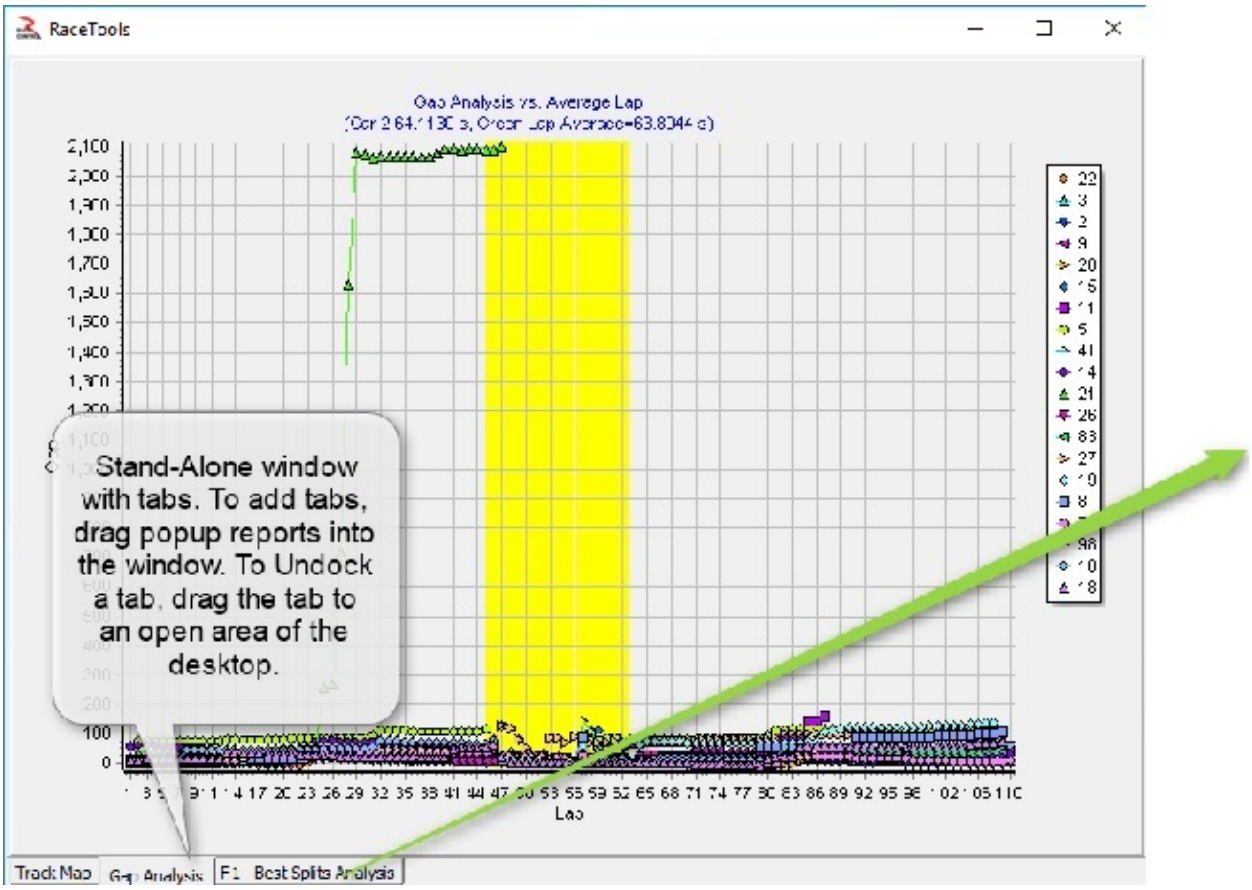
To modify the docked/undocked status of the reports, first disable the 'Lock Docking' setting in the PopUps menu. The 'Lock Docking' setting is enabled when the software starts so you have to disable it before you dock or undock windows.

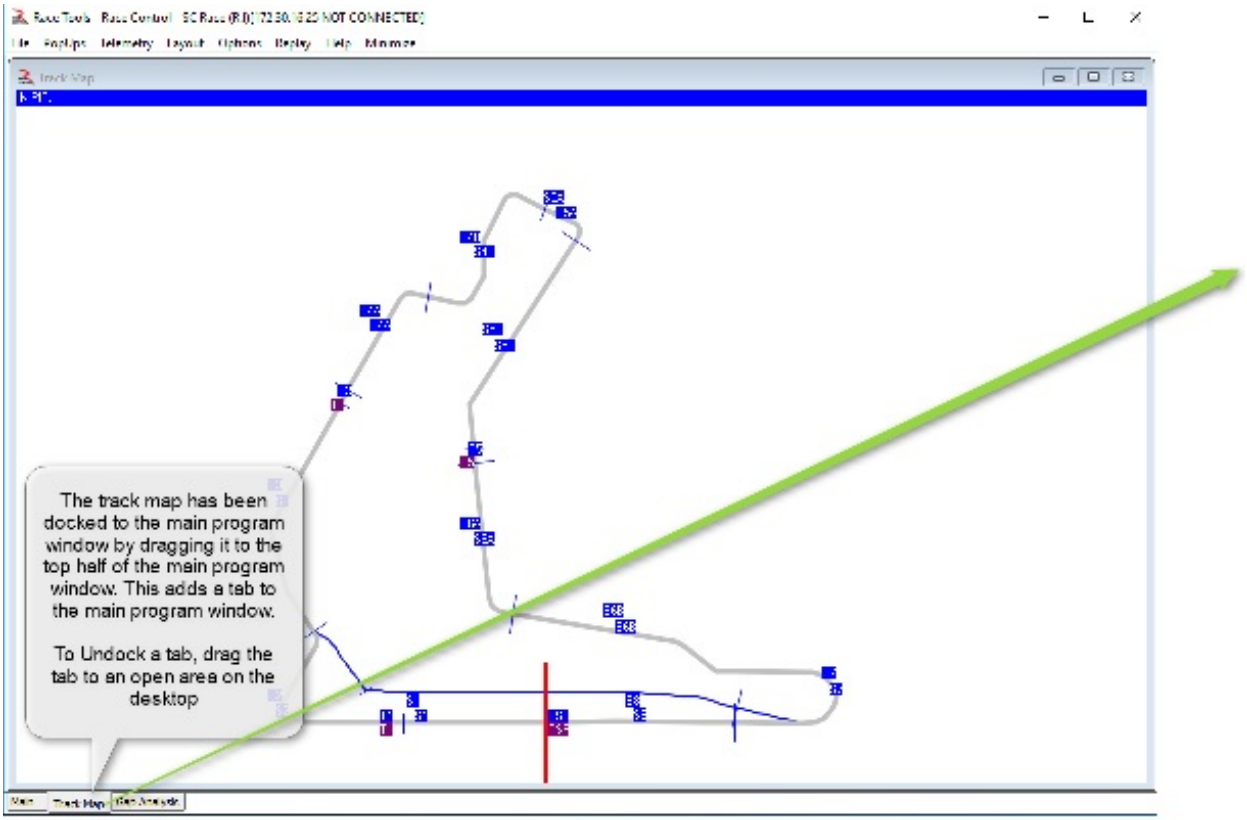


To dock a window, drag the title bar of the window to one of the dock sites. Dock sites are the main program window or one of the popup windows. The main program window has two docking areas. Dragging a window into the top half of the window will create a tab on the main program window and dock it to the whole window. Dragging a window to the bottom half of the main program window will create a tab in to bottom half of the program window. Dragging a popup window into another popup will add a tab to the popup tabbed window. Only one such window can exist at a time so if you already have a tabbed window (more than one popup in a window) and you drag a popup into another popup, they will both be added to the tabbed window. You can thus have the main program window with multiple tabs and a separate tabbed window that holds multiple tabs.



To undock a tabbed report, drag the tab title to an open space on the desktop.

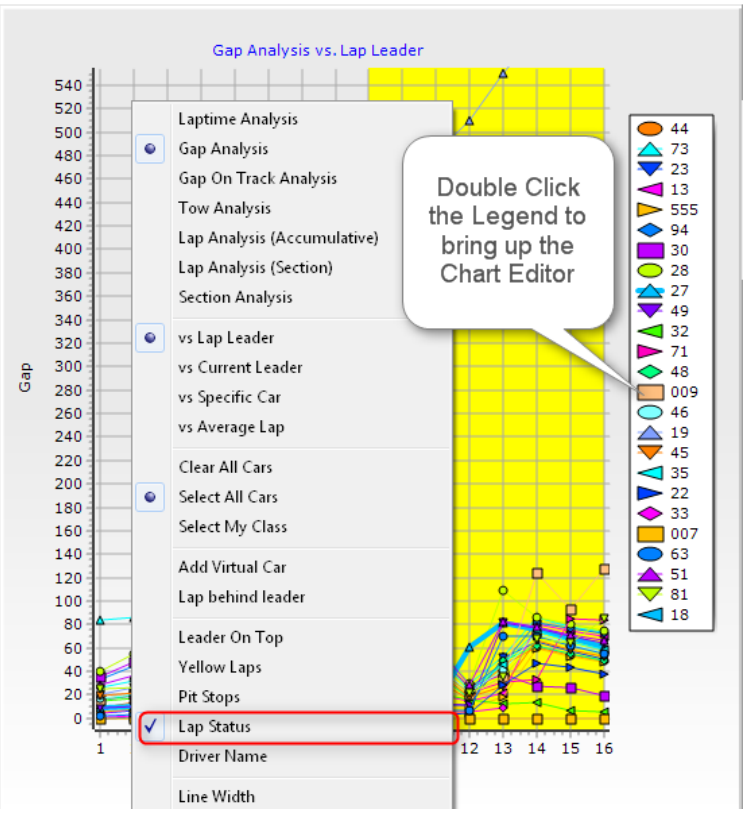


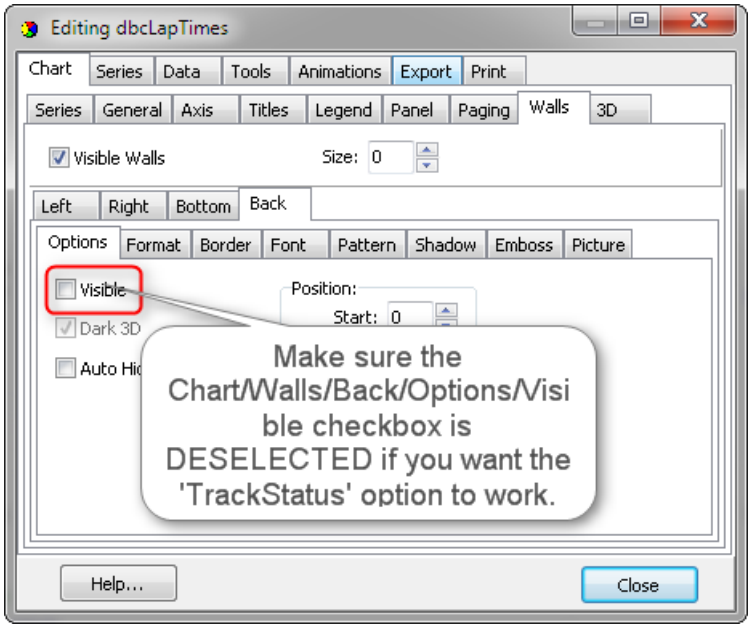


When you are finished modifying the tabbed/undocked settings of the popups, re-enable the 'Lock Docking' setting to prevent accidentally docking/undocking reports.

Lap Status Highlighting in Graphs

You can highlight caution laps in the Lap Times/Gap Analysis graph by selecting the 'Lap Status' menu option. If it does not display, check the 'Chart/Walls/Back/Options' tab of the Chart Editor and make sure the Back is NOT visible (unchecked). Note that using the Chart Editor is not recommended during a session as this can cause the software to hang.

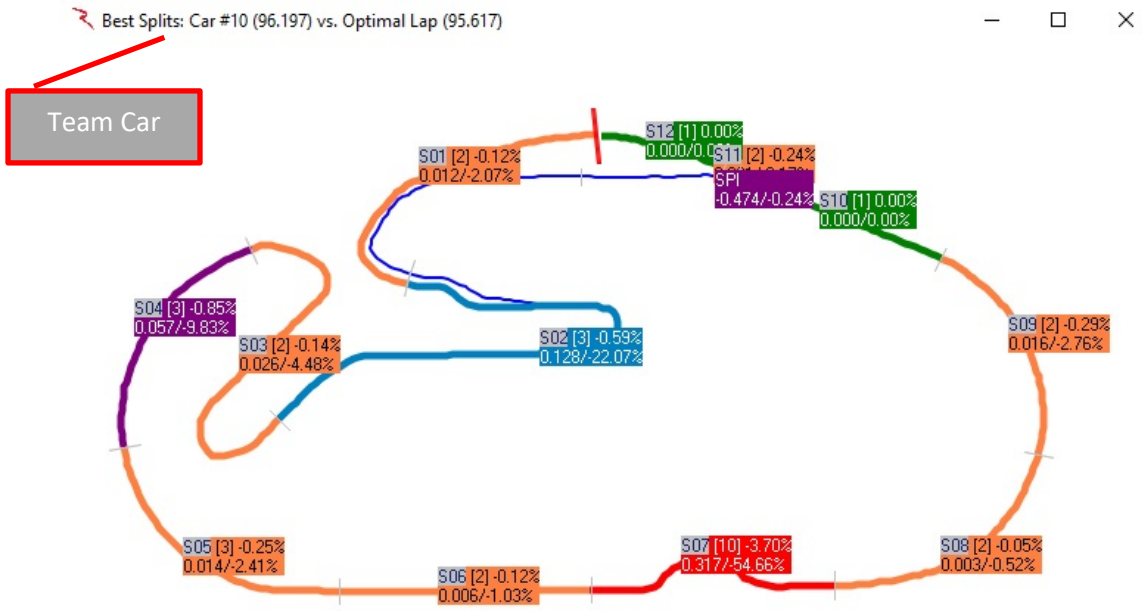




Enhanced Analysis Maps

The Analysis Maps have extra information in the session labels. The first line contains the Section Name, the Section Rank and the Section Delta %. The second line contains the Section Delta and % loss or gain.

The Section Name, Delta and Delta % were in the previous versions. The Section Rank has been available in the popup reports (F1 – Best Splits Analysis, F4 – Best Lap Analysis) and is the rank of each section time compared to the other competitors. The % Loss or Gain is the Section Delta / Lap Delta, which highlights the relative amount of time lost or gained for each section. Note that the Lap Delta is the sum of time lost and gained and that the sum of the deltas equals 100%. This means that if there is a mixture of both time lost and gained in a lap, the percentages are of the lap delta, not the 'time lost' / 'total time lost' or 'time gained' / 'total time gained', but the key is the relative percentages which can highlight which sections your car is losing the most time. To help highlight this further, there are now color codes for the top 3 time lost sections referred to as DeltaR1 (Red), DeltaR2 (Blue), and DeltaR3 (Purple). The other time lost sections are highlighted with the DeltaR (Orange) color. The time gained sections are highlighted with the DeltaG (Green) color.



Each splits/traps information label can be moved by left clicking and on the split/trap label and dragging. The track map can also be rotated in 45 degree steps by double clicking in the window.

DeltaR1 (Red) – Most time lost section

DeltaR2 (Blue) – 2nd most time lost section

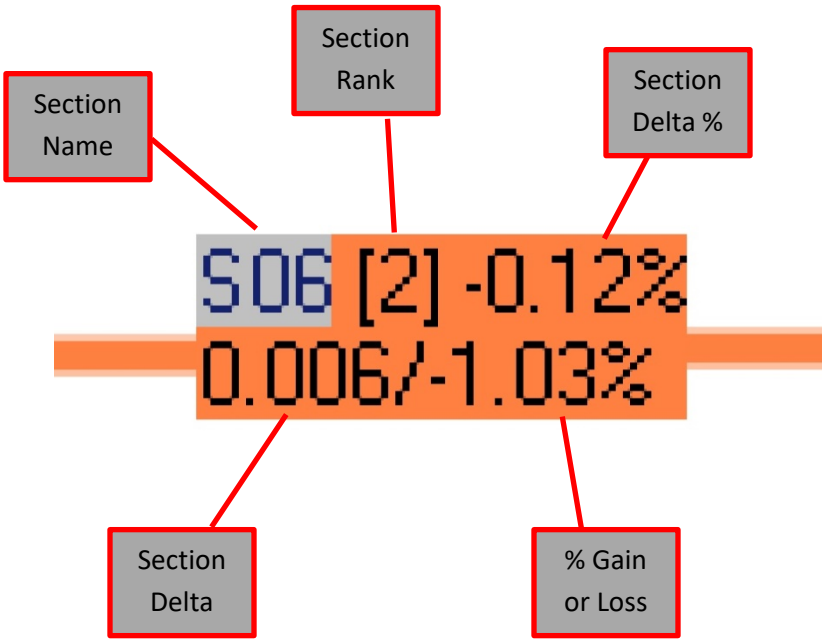
DeltaR3 (Purple) – 3rd most time lost section

DeltaR (Orange) – other time lost sections

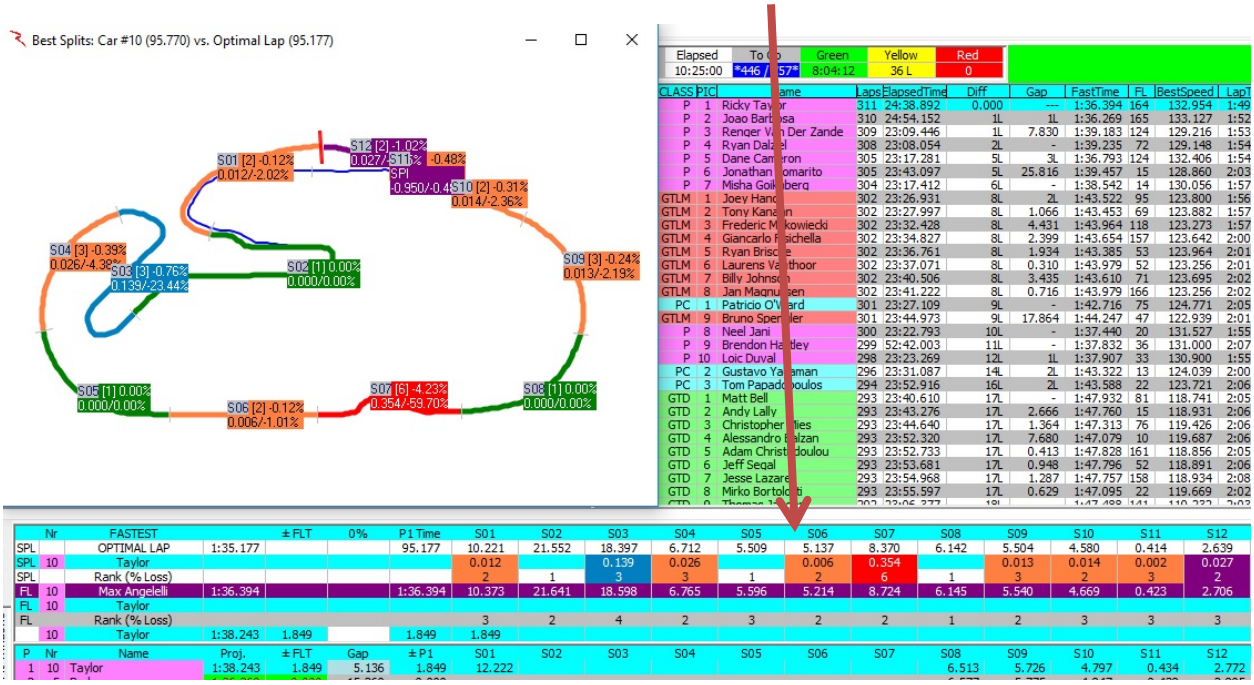
DeltaG (Green) – Time Gained sections

Default colors are shown above, but you can change them to suit your needs.

Below is a figure describing the information given in each of the labels on the various analysis maps.



The Delta color scheme is also used in the 'Live Sections' window as shown below.



Session Results Fields

- Here is a list of the available fields, not all of which are applicable depending on the series, session type and track type.

- Click on the field in the program window 'Session Results' tab to get a detailed description of the field as shown below.

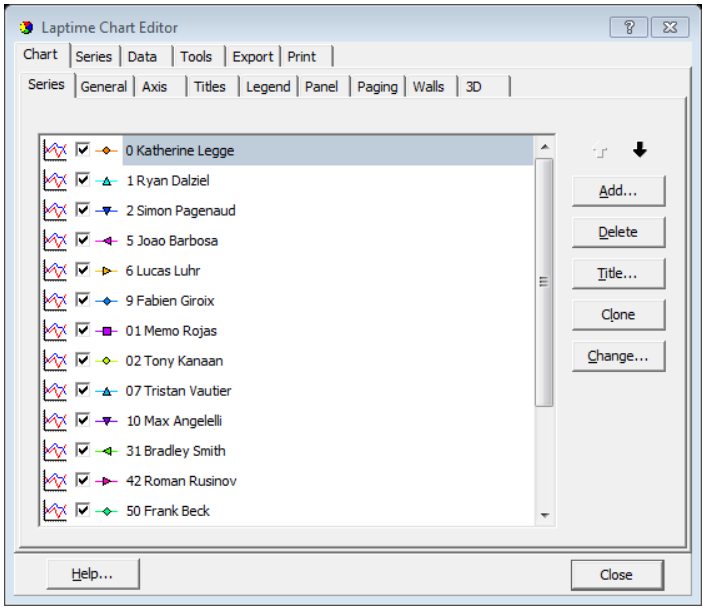
CK – Check box to select competitor for other reports.
P – Position
Nr – Car Number
Name – Driver Name
FL – Fast Lap
FastTime – Fast Lap Time
BestSpeed – Fast Lap Speed
LapTime – Last Lap Time
LastTime – Last Lap Time
Laps – Laps Completed
LastSpeed – Last Lap Speed
Pace – Last Lap Delta to P1
± FLT – Delta to Fast Lap Time
Gap – Delta to preceding car
Gap SPD – Delta in speed to preceding car
GapOnTrack – Delta to previous car on track, time behind previous car
GapToNext – Delta to next car on track, time ahead of next car
ElapsedTime – ElapsedTime of last S/F crossing
PTS – Points if race ended with current results
PTime – Previous Fast Lap Time
± PT – Delta to Previous Fast Lap Time
PIC – Place In Class
CLASS – Class Name
STINT – Elapsed Time of Current Stint
Diff – Delta to P1
Diff SPD – Delta to P1 in speed
Gap2Us – Gap to Team Car
Pits – Number of Pit Stops made
LSP – Laps Since Pit
LapsDown – Laps down to P1
OR – Overall Rank
BestTime – Best Overall Lap Time
Status – Competitor Status
St – Start Position
Led – Number of Laps Led
P2P – Push To Pass
Tire – Current Tire Type on Car
LPit – Lap of Last Pit Stop
Outing Laps – Visual display of laps since last pit
MSP – Distance since Pit Stop
ThisPit – Pit Lane time for current or latest pit stop

LastPit – Pit Lane time for previous pit stop
QWU – Oval Qualifying Warm Up Lap Time/Speed
QL1 – Oval Qualifying Lap 1 Time/Speed
QL2 – Oval Qualifying Lap 2 Time/Speed
QL3 – Oval Qualifying Lap 3 Time/Speed
QL4 – Oval Qualifying Lap 4 Time/Speed
QTotal – Oval Qualifying Total Lap Times or Average Lap Speed
QLTime – Oval Qualifying Average Lap Time
QSpeed – Oval Qualifying Average Lap Speed
QStatus – Qualifying Status
QLaps – Number of Qualifying Laps Completed
QRank – Qualifying Rank
QAttempt – Oval Qualifying Attempt Number
QDay – Oval Qualifying Day of attempt
QTarget – Lap Time required to match each competitor for current qualifier
QTotal+ – Projected Qualifying Total Time or Average Speed
Tow FL – minimum Gap On Track for Fast Lap, used to gauge tow factor of Fast Lap
Tow LL – minimum Gap On Track for Last Lap, used to gauge tow factor of Last Lap
Proj. – Projected Lap Time/Speed
P+ – Projected Rank based on Projected Lap Time/Speed
NTFLap – Non-Tow Fast Lap
NTFTime – Non-Tow Fast Lap Time
NTFSpeed – Non-Tow Fast Lap Speed
NTR – Non-Tow Rank
Team – Team Name
Engine – Engine Supplier
MaxL – Maximum Laps possible for competitor based on Time Remaining/Leader Laps
L2G – Maximum Laps To Go for competitor based on Time Remaining/Leader Laps
RollAvg – Rolling Lap Average, average of last x number of laps
BP – Best Position in session
CLSDiff – Gap to class leader
CLSGap – Gap to previous car in class
Optimal – Optimal Lap Time
LP+ – Live Projected Rank, including Projected Lap Times of active competitors
TackGap2Us – Gap to team car on track
BehindUsOnTrack – time ahead of team car on track
AheadUsOnTrack – time behind team car on track

Chart Editor

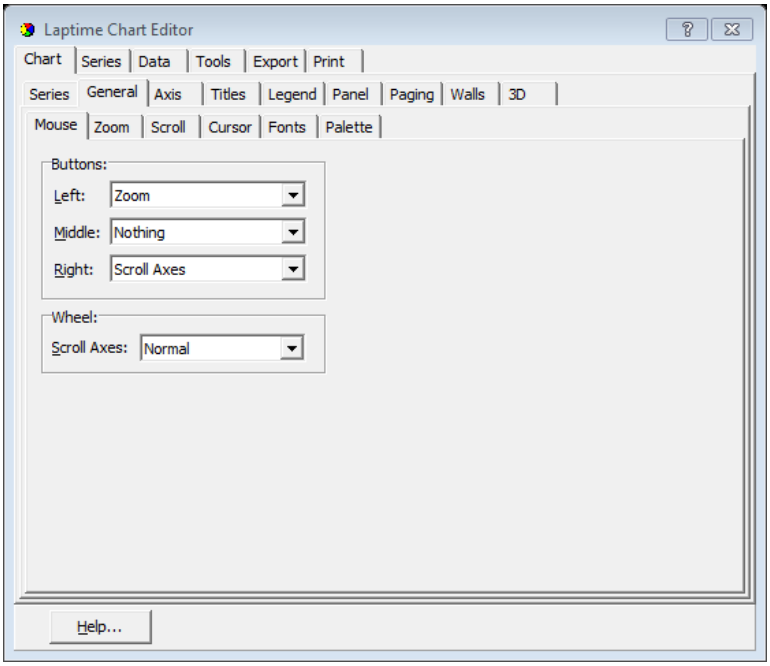
Chart

- Series
  - Uncheck the box to remove a car (or cars) from the chart. Check the box to add a car back into the chart.



- General

  This tab allows the user to set the mouse functions.

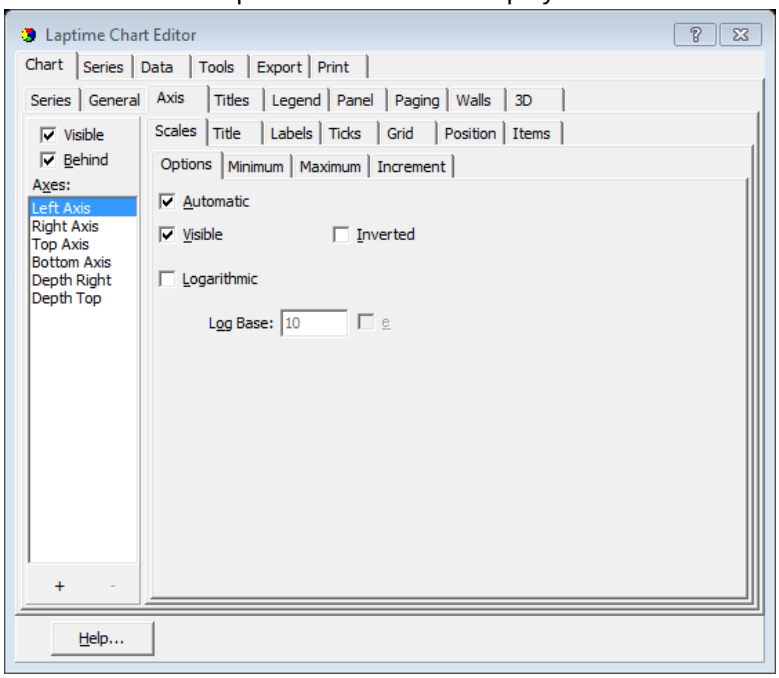


  - Mouse – Define mouse button function.
  - Zoom – Define the zoom options for the chart.
  - Scroll – Define the scroll options to allow.
  - Cursor – Define the cursor type.

- Fonts – Set the fonts for items on the chart.
- Palette – Select the color palette for the chart items.

- Axis

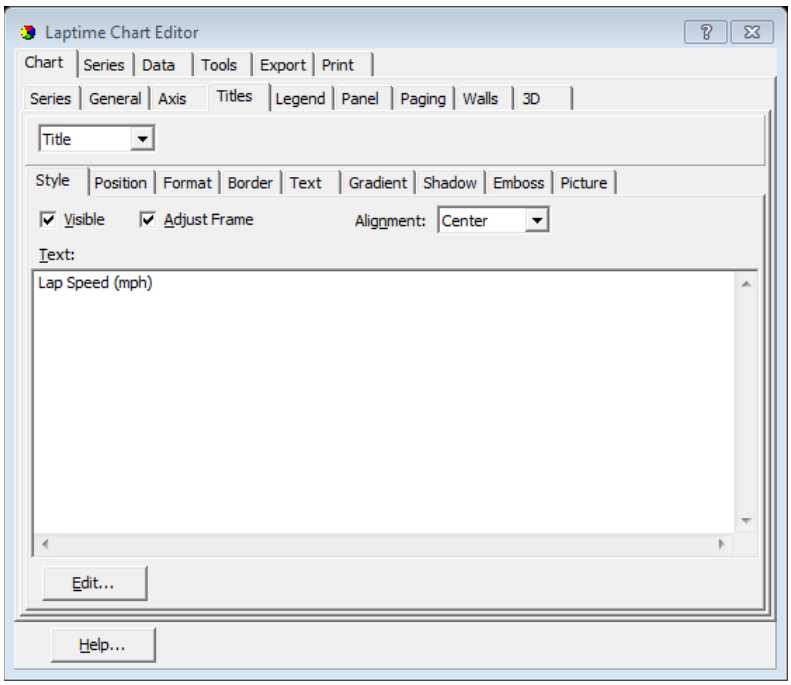
  This tab allows the user to set options on each axis displayed in the chart.



  - Scales
    - Options – set Automatic, Visible, Inverted, Logarithmic options for each axis in the chart.
    - Minimum – Select Auto, or set a minimum for each axis.
    - Maximum – Select Auto, of set a maximum for each axis.
    - Increment – Change the increment for each axis.
  - Title
    - Style – Set the Title, Angle, and Size for each axis title.
    - Format – Adjust the format (look) of each axis.
  - Labels
    - Style – Select Visible, Multi-line, Round First, and Label on Axis, Alternate, Behind Grid options for each axis.
    - Format – Select the format for the values used in the chart.
    - Text – Select the font size and properties for each axis.
  - Ticks – Set the properties for the points on the chart.
  - Grid – Set the Grid properties for the each axis on the chart.
  - Position – Set position properties for each axis on the chart.
  - Items – Set the number of items for each axis. (Checking 'Automatic' will let the software show all data.

- Titles

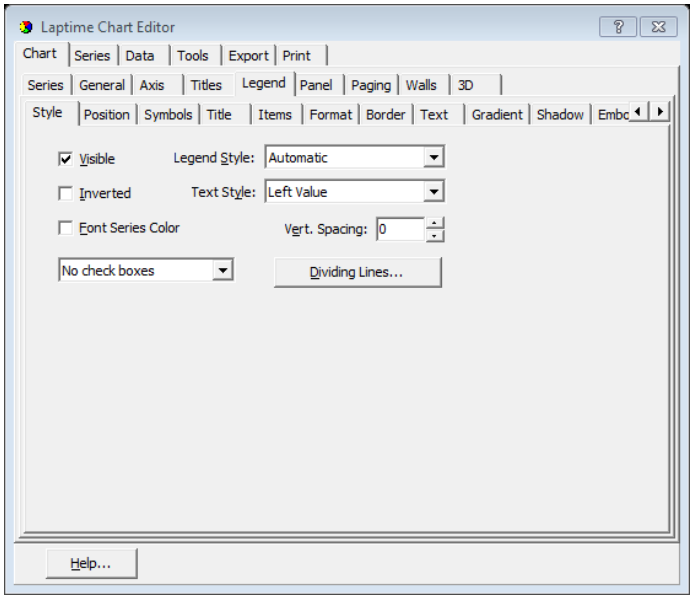
This tab allows the user to Name the chart and adjust the format properties of the chart name.



- Style
- Position
- Format
- Border
- Text
- Gradient
- Shadow
- Emboss
- Picture

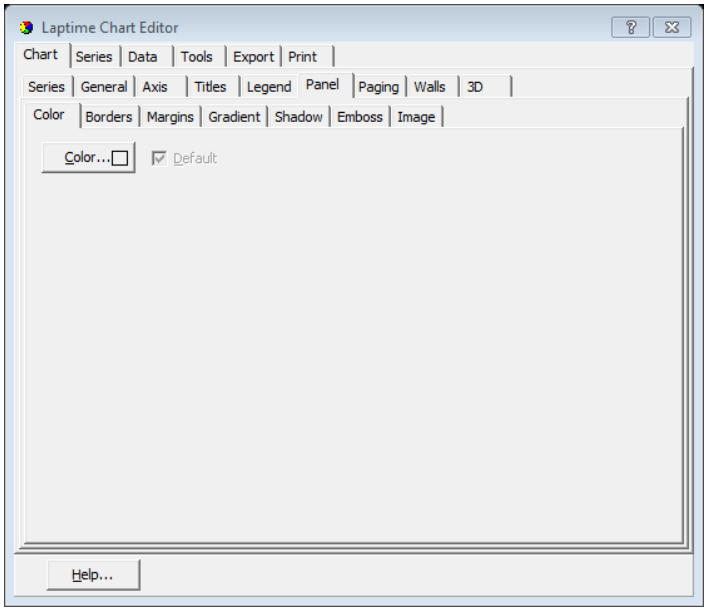
- Legend

  This tab allows the user to adjust the position and visibility properties of the chart Legend.



- Style
- Position
- Symbols
- Title
- Format
- Border
- Text
- Gradient
- Shadow
- Emboss
- Picture

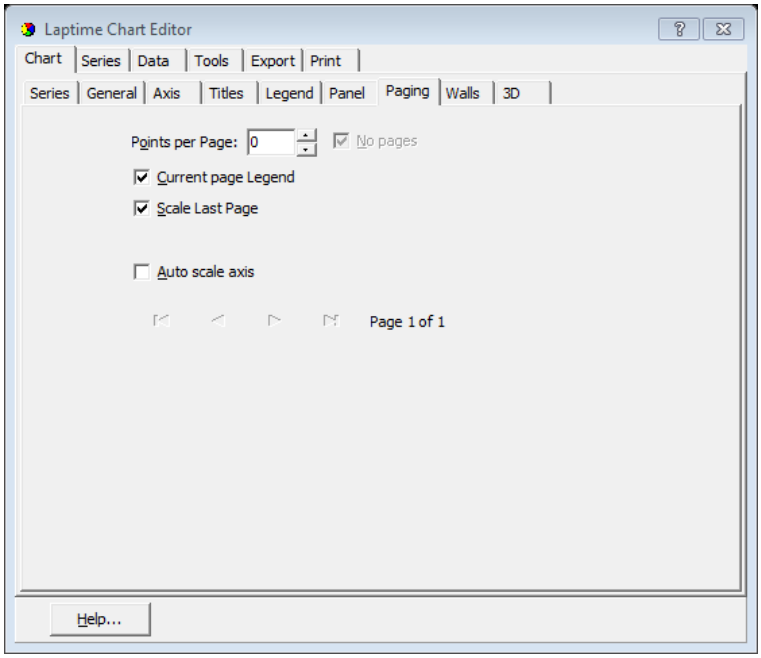
- Panel



- Color

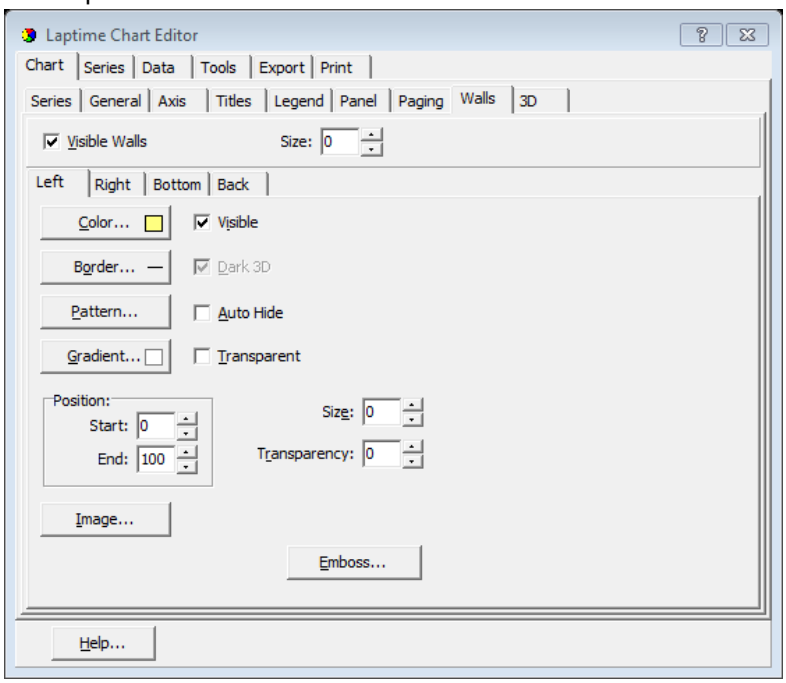
- Borders
- Margins
- Gradient
- Shadow
- Emboss
- Image

- Paging
  This tab allows page control for the chart.



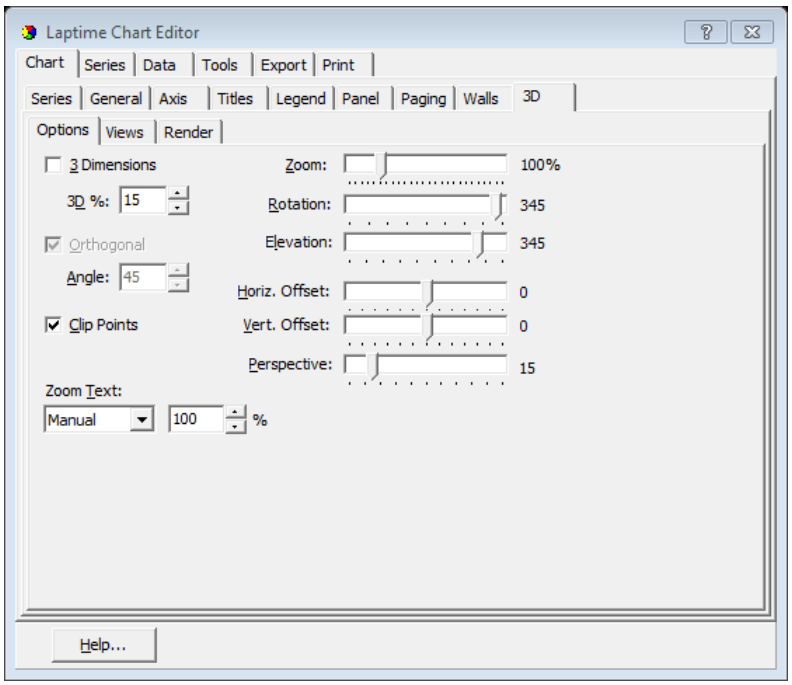
- Walls

  Select color and visibility properties for the chart. This is used if you have selected the 3D chart option.



  - Left
  - Right
  - Bottom
  - Back

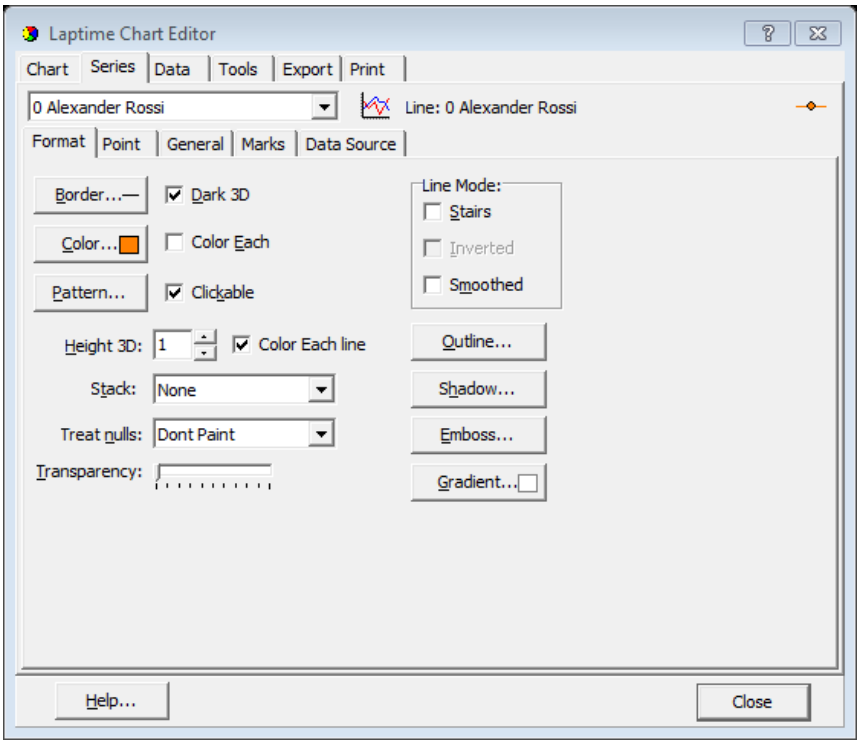
3D



- Options – Check the '3Dimensions' box to turn on the 3D chart, then adjust the various properties to get the visible effect you desire.
- Views
- Render

Series

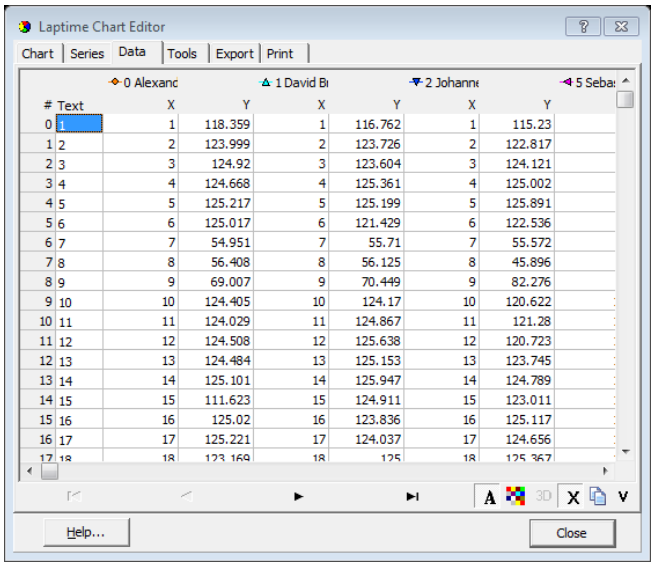
The 'Series' tab reveals options for changing the line colors and other properties for each car.



- Format
- Point
- General
- Marks
- Data Source

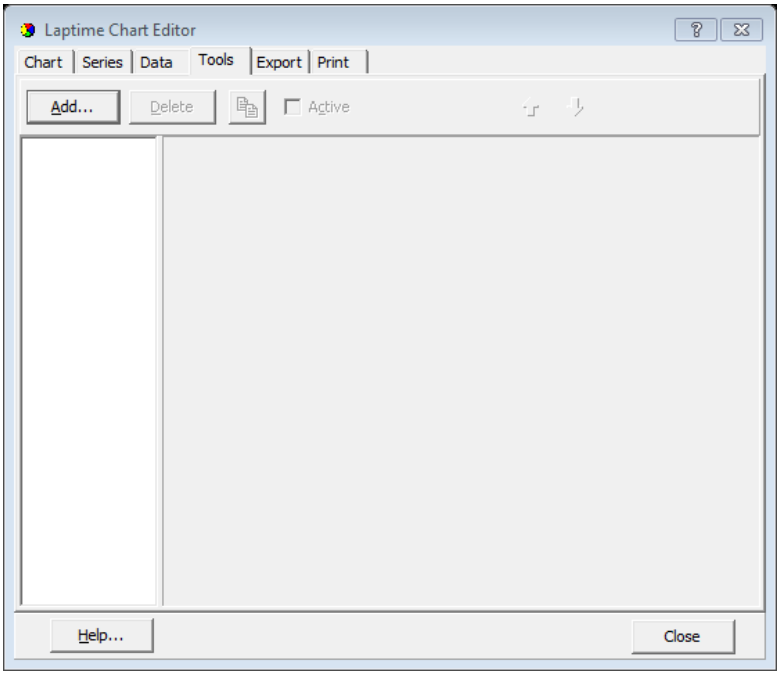
Data

The 'Data' tab displays the actual data points for each car.



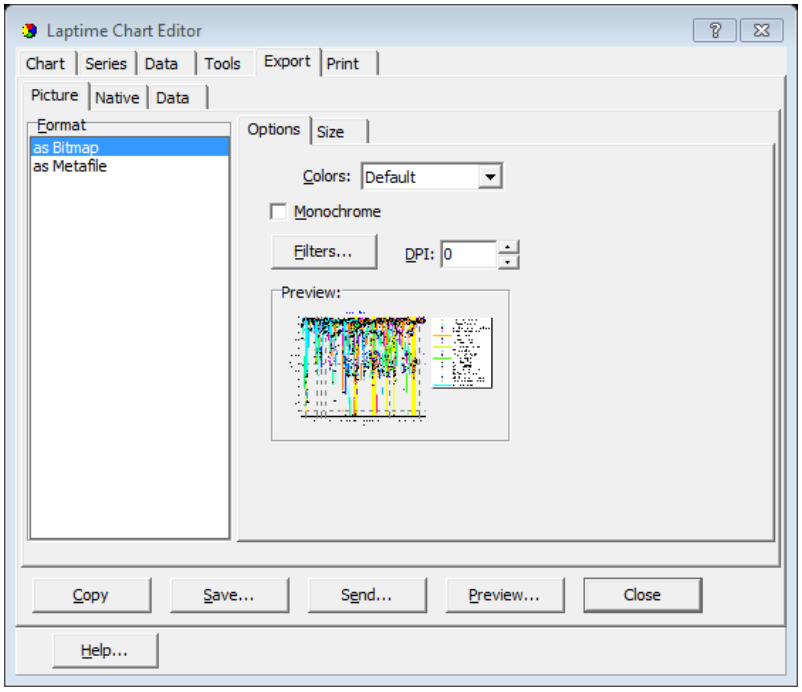
Tools

Various tools are available for modifying the chart.



Export

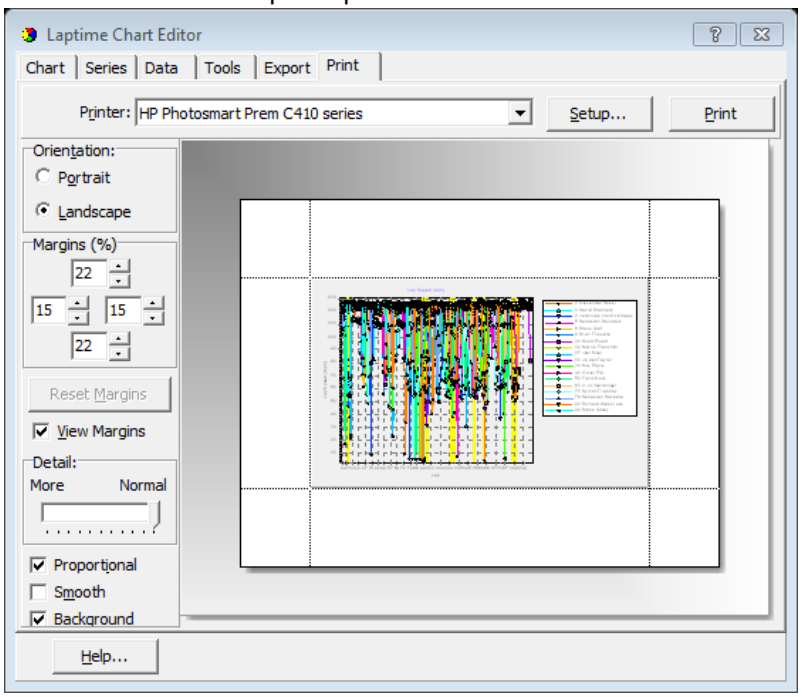
The 'Export' tab allows the user to export the graph in picture or data format.



- Picture – Select Bitmap or Metafile format.
- Native – Select Binary, Text, or XML.
- Data – Select the data format: Text, XML, HTML Table, or Excel.

Print

The 'Print' tab allows the user to set up and print the chart.



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