



Race Engineer Center

User manual

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1. Introduction

Race Engineer Center (REC) is the telemetry analyzing and race monitoring software, which can be used both to analyze telemetry after practice or hotlap session, and for realtime car monitoring. REC connects to the simulator's memory mapped file and reads data from it with chosen frequency. REC currently supports realtime recording from Assetto Corsa and offline loading iRacing binary telemetry files (*.ibt). With iRacing, you can also record in-game telemetry (using Alt+L hotkey) and import the resulting .ibt file into REC.

Key features:

- Recording all key telemetry parameters
- Fastest lap detection and calculation of lapttime delta
- Flexible recording options
- Quick and easy review of telemetry in specially designed widget
- Custom user calculations

To connect REC to your simulator just run REC, run simulator and hit connect button on the REC main toolbar. Connect button should remain down, which means that connection is successful and REC is now ready to record your telemetry.

Enter the track and do a couple of quick laps. REC records your telemetry in memory during the lap and saves it to disk when you are crossing start-finish line. All telemetry files are placed in /var/telemetry folder. When session is over review your laps using lap manager, add data to the telemetry view widget to review telemetry and analyze your speed. Speed data will show you if your fastest lap was the combination of fastest turns and if you have some more time ta gain. Try different lines and analyze, which one of them gets you fastest speed at turn exit.

2. Quick start

1. Run the simulator and then run REC
2. Adjust recording options in the REC's options window
 - a) Do you need to record incomplete laps (for example if you've teleported in pit in the middle of the lap)?
 - b) Do you need realtime telemetry recording or disk-based recording? See chapter 3 for more details.

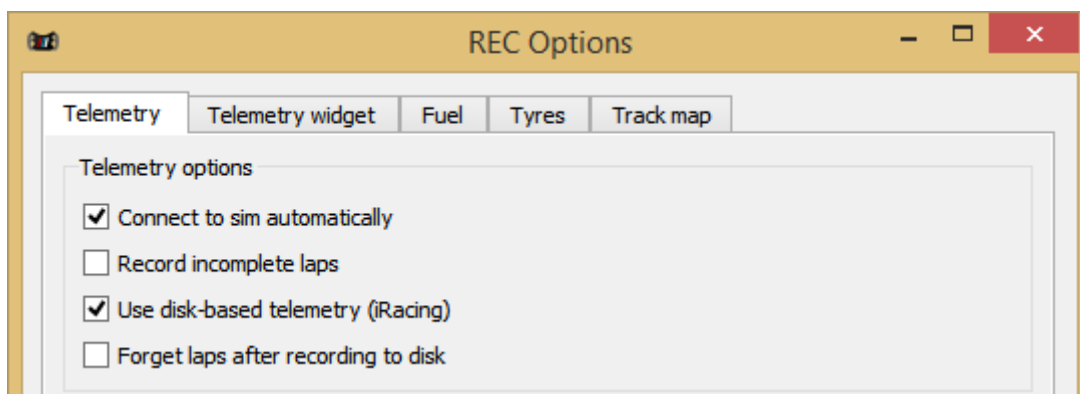


Figure 2.1. Telemetry setup window

3. If “connect to sim automatically” option is enabled, REC will automatically try to connect to sim every 10 seconds. If not, you have to connect REC manually by hitting connect button on the main toolbar. Check status panel and logs to be sure that connection is successful.



Figure 2.2. Connection

4. REC is now recording all telemetry data from your car according to your setup.
5. Do some quick laps. REC will record all data to the memory and record lap to disk when you are crossing start-finish line.

- All your laps are shown in Lap Manager. Your fastest lap is marked purple, your fastest lap in each stint is marked green. Click on the lap to see its info (car and driver names, lap time, number of lap in session etc) in Lap Info panel.

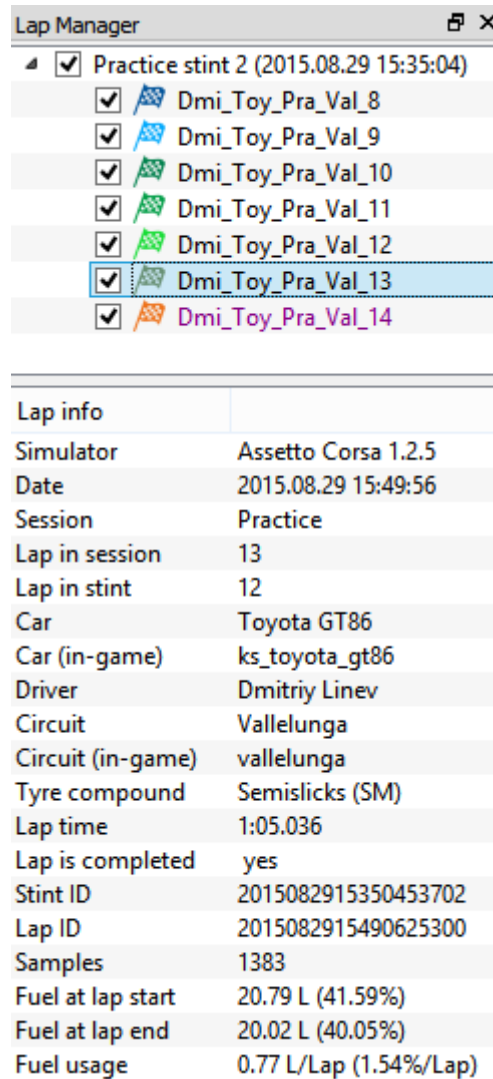


Figure 2.3. Lap Manager and Lap Info

- You also can load previously recorded laps into REC using Lap Library (added in 0.0.5)



Figure 2.4. Lap Library icon

REC stores telemetry files in telemetry folder (in program root folder), each lap in separate file. For your convenience REC provides the Lap Library window, where all telemetry polder scanning results are collected. Results are being represented as a chart with all necessary lap data. You can hide columns that you don't need right now using the

View menu. You can also swap columns (drag-n-drop the headline), sort laps by every parameter or use “Text Search” option in the textbox on the upper right side of the window.

Driver	Track	Car	Session	Lap in session	Lap in stint	Tyre compound	Lap time	Date
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	12	11	Semislicks (SM)	1:04.385	2015.08.29 15:48:51
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	11	10	Semislicks (SM)	1:03.141	2015.08.29 15:47:47
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	10	9	Semislicks (SM)	1:02.260	2015.08.29 15:46:44
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	9	8	Semislicks (SM)	1:09.203	2015.08.29 15:45:41
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	8	7	Semislicks (SM)	1:07.279	2015.08.29 15:44:32
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	7	6	Semislicks (SM)	1:09.380	2015.08.29 15:43:25
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	6	5	Semislicks (SM)	1:05.375	2015.08.29 15:42:16
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	5	4	Semislicks (SM)	1:02.616	2015.08.29 15:41:10
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	4	3	Semislicks (SM)	1:02.850	2015.08.29 15:40:07
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	3	2	Semislicks (SM)	1:17.626	2015.08.29 15:39:05
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	2	1	Semislicks (SM)	1:03.472	2015.08.29 15:37:47
Dmitriy Linev	Vallelunga	Toyota GT86	Practice	1	0	Semislicks (SM)	1:34.860	2015.08.29 15:36:44
Dmitriy Linev	Vallelunga	Toyota GT86	Qualify	2	0	Semislicks (SM)	2:37.848	2015.08.29 15:05:01
Dmitriy Linev	Vallelunga	Toyota GT86	Qualify	1	0	Semislicks (SM)	1:53:918	2015.08.29 15:02:24
Dmitriy Linev	Vallelunga	Toyota GT86	Qualify	1	0	Semislicks (SM)	1:21:928	2015.08.29 14:58:12
Dmitriy Linev	Vallelunga	Toyota GT86	Qualify	1	0	Semislicks (SM)	1:38:987	2015.08.29 14:56:07
Dmitriy Linev	Monza	BMW Z4 GT3	Race	8	10	Slick Medium (M)	1:53:814	2015.08.29 14:27:32
Dmitriy Linev	Monza	BMW Z4 GT3	Race	7	9	Slick Medium (M)	1:51:457	2015.08.29 14:25:39
Dmitriy Linev	Monza	BMW Z4 GT3	Race	6	8	Slick Medium (M)	1:54:093	2015.08.29 14:23:47
Dmitriy Linev	Monza	BMW Z4 GT3	Race	5	7	Slick Medium (M)	1:54:554	2015.08.29 14:21:53
Dmitriy Linev	Monza	BMW Z4 GT3	Race	4	6	Slick Medium (M)	1:53:936	2015.08.29 14:19:59
Dmitriy Linev	Monza	BMW Z4 GT3	Race	3	5	Slick Medium (M)	1:56:560	2015.08.29 14:18:05
Dmitriy Linev	Monza	BMW Z4 GT3	Race	2	4	Slick Medium (M)	1:54:188	2015.08.29 14:16:08
Dmitriy Linev	Monza	BMW Z4 GT3	Race	1	3	Slick Medium (M)	2:09:641	2015.08.29 14:14:14

Figure 2.5. Lap Library window

To load lap telemetry in REC just select laps and push Load button on the main toolbar on library window. Also you can select laps and press Enter.



Figure 2.6. Load laps icon

8. All available telemetry data for each lap is shown at Channels panel. To add the graph to the Telemetry Widget just drag it there and drop. Telemetry Widget consists of the number of viewports, usually each viewport is used for particular data type visualization (gas, brake, transmission etc.). If you drag a channel into the viewport, the graph will be added in the viewport highlighted by the red frame. Hold Ctrl while dropping a graph to create new viewport and add graphs there, or just double click on the channel in Channels panel to add this graph to the new viewport.
9. You can show and hide viewports using control tree. Check and uncheck viewports and graphs to show and hide them. Hold Ctrl when checking/unchecking graph to show/hide all graphs of the corresponding lap. Hold Alt to show only graphs of the corresponding lap and hide all other graphs. Drag and drop graphs between viewports in tree to regroup them. Right-click in the widget to see the viewport

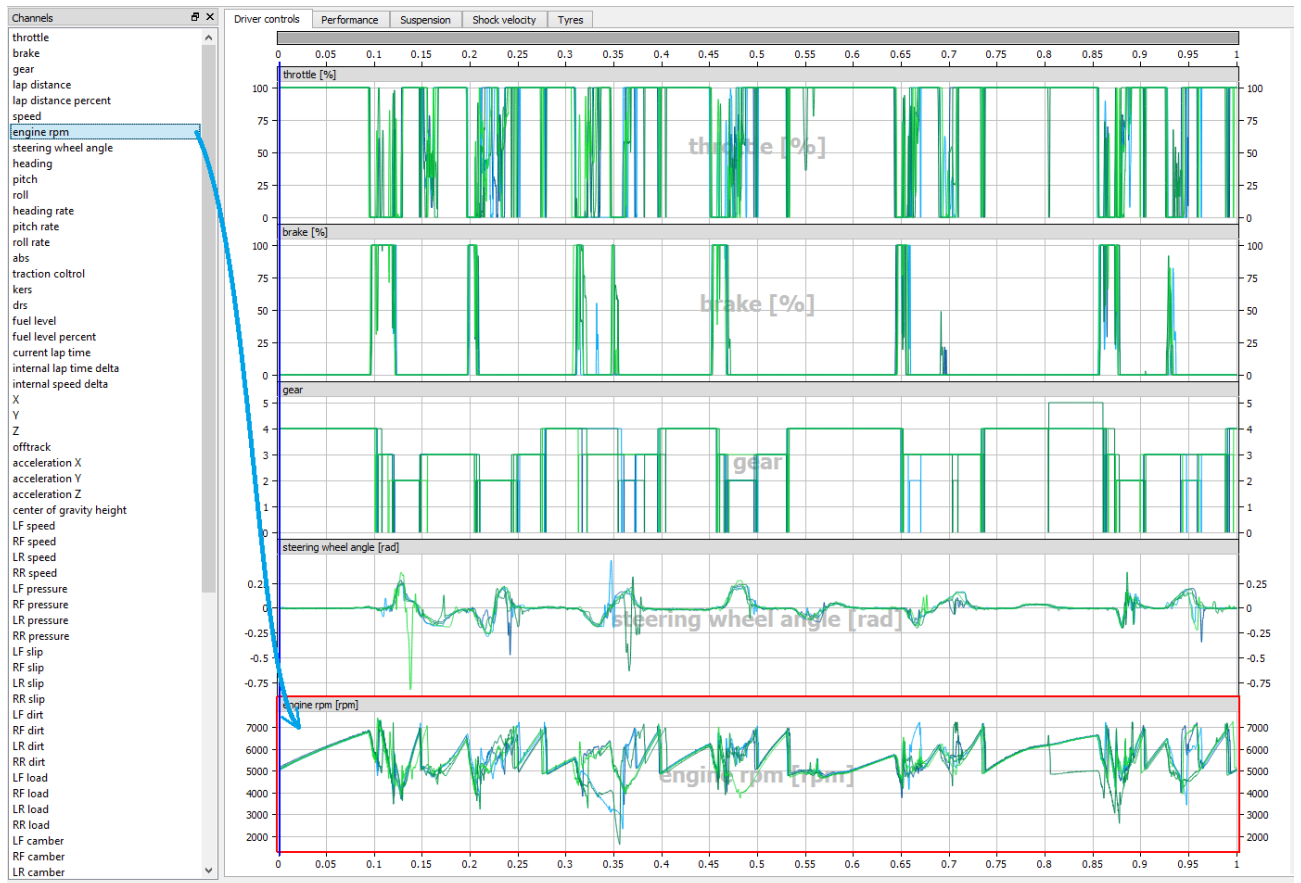


Figure 2.7. Adding new graph to telemetry widget

setup and widget setup, there are some cool features there, which will be described in the detailed manual soon.

10. Pay attention that the visibility of laps and graphs in control tree is synchronized. You can hide telemetry control tree and manage laps visibility in Lap Manager. Check the lap or stint in the checkbox to hide/show the lap or stint. Use Alt to show checked lap and hide the others.

3. Telemetry recording setup

REC allows you to adjust how the telemetry will be recorded. Telemetry setup panel is shown at the fig. 3.1.

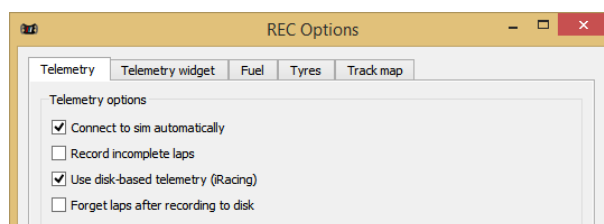


Figure 3.1. Telemetry setup panel

Autconnect to sim. If this option is checked REC will try to connect to the simulator once a 10 seconds. REC automatically defines the simulator. Use this option if you need to record telemetry all the time when REC and the sim are running.

Record incompleted laps. Sometimes you are not able to complete current lap, for example because session is ended, or you were teleported to pits. REC detects such laps as incompleted and provide you an option to record them. For incompleted laps REC sets laptime as 59:59.000

Use disk-based telemetry (iRacing). REC provides two ways to record telemetry from iRacing - realtime recording and disk-based recording. With the realtime way REC reads data from iRacing shared memory with the given rate and records it to the memory. With the disk-based way REC controls iRacing internal telemetry recording in .ibt (iRacing binary telemetry format). Telemetry file is being recorded when you cross start-finish line, REC reads this file and rewrite it in .rec (REC raw telemetry) format. REC provides this two ways because iRacing doesn't provide access to some important channels, such as wheel speed and tyre temperatures, when you are using realtime recording. You can access to these channels using disk-based recording. If you don't need these specific channels but you need internal iRacing recording, uncheck this option. Note that when you use disk-based recording REC controls iRacing telemetry recording and you don't have to turn on and off iRacing telemetry recording manually to avoid glitches.

Forget laps after recording to disk. REC automatically writes telemetry from lap you've just completed to disk. If this option is checked REC will automatically clean RAM from the telemetry data, and will not show this lap in Lap manager panel.

Telemetry from long races can take too much RAM which can lead to glitches and your race can be spoiled. Use this option in long races and when you don't need to analyze your telemetry on the fly. Note that all your laps are shown in Lap library and you can load them quickly and easily.

4. REC main window

Here will be the description of REC main window interface

4.1. Lap manager

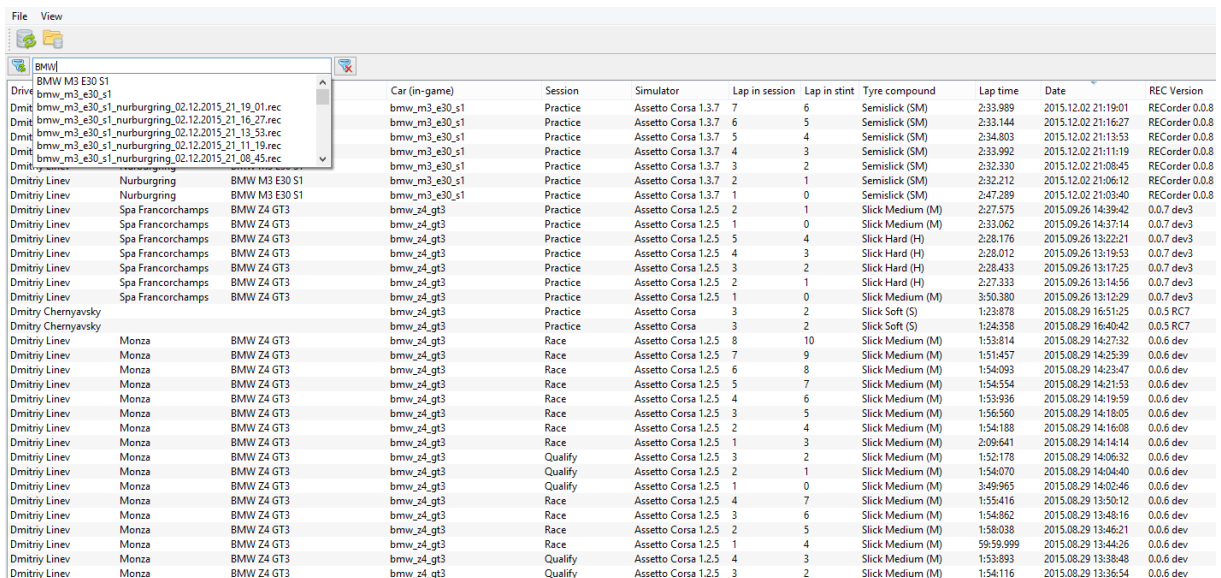
4.2. Telemetry controls

4.3. Telemetry view

4.4. Track map

5. Lap library

Lap library provides quick and easy access to all laps that are stored in REC telemetry folder. Using Lap library you can quickly see the information of the lap, filter laps by any header parameter, and quickly load telemetry from all laps you need to analyze. Lap library window is shown at fig. 5.1.



Driver	Car (in-game)	Session	Simulator	Lap in session	Lap in stint	Tyre compound	Lap time	Date	REC Version
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	7	6	Semislick (SM)	2:33.989	2015.12.02 21:19:01	RECorder 0.0.8
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	6	5	Semislick (SM)	2:33.144	2015.12.02 21:16:27	RECorder 0.0.8
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	5	4	Semislick (SM)	2:34.803	2015.12.02 21:13:53	RECorder 0.0.8
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	4	3	Semislick (SM)	2:33.992	2015.12.02 21:11:19	RECorder 0.0.8
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	3	2	Semislick (SM)	2:32.330	2015.12.02 21:08:45	RECorder 0.0.8
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	2	1	Semislick (SM)	2:32.212	2015.12.02 21:06:12	RECorder 0.0.8
Dmitriy Linev	BMW M3 E30 S1	Practice	Assetto Corsa 1.3.7	1	0	Semislick (SM)	2:47.289	2015.12.02 21:03:40	RECorder 0.0.8
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	2	1	Slick Medium (M)	2:27.575	2015.09.26 14:39:42	0.0.7 dev3
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	1	0	Slick Medium (M)	2:33.062	2015.09.26 14:37:14	0.0.7 dev3
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	5	4	Slick Hard (H)	2:28.176	2015.09.26 13:22:21	0.0.7 dev3
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	4	3	Slick Hard (H)	2:28.012	2015.09.26 13:19:53	0.0.7 dev3
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	3	2	Slick Hard (H)	2:28.433	2015.09.26 13:17:25	0.0.7 dev3
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	2	1	Slick Hard (H)	2:27.333	2015.09.26 13:14:56	0.0.7 dev3
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa 1.2.5	1	0	Slick Medium (M)	3:50.380	2015.09.26 13:12:29	0.0.7 dev3
Dmitriy Chernysvsky	BMW Z4 GT3	Practice	Assetto Corsa	3	2	Slick Soft (S)	1:23.878	2015.08.29 16:51:25	0.0.5 RC7
Dmitriy Linev	BMW Z4 GT3	Practice	Assetto Corsa	3	2	Slick Soft (S)	1:24.958	2015.08.29 16:40:42	0.0.5 RC7
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	8	10	Slick Medium (M)	1:53.814	2015.08.29 14:27:32	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	7	9	Slick Medium (M)	1:51.457	2015.08.29 14:25:39	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	6	8	Slick Medium (M)	1:54.093	2015.08.29 14:23:47	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	5	7	Slick Medium (M)	1:54.954	2015.08.29 14:21:53	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	4	6	Slick Medium (M)	1:53.936	2015.08.29 14:19:59	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	3	5	Slick Medium (M)	1:56.560	2015.08.29 14:18:05	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	2	4	Slick Medium (M)	1:54.188	2015.08.29 14:16:08	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	1	3	Slick Medium (M)	2:09.641	2015.08.29 14:14:14	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Qualify	Assetto Corsa 1.2.5	3	2	Slick Medium (M)	1:52.178	2015.08.29 14:06:32	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Qualify	Assetto Corsa 1.2.5	2	1	Slick Medium (M)	1:54.070	2015.08.29 14:04:40	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Qualify	Assetto Corsa 1.2.5	1	0	Slick Medium (M)	3:49.965	2015.08.29 14:02:46	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	4	7	Slick Medium (M)	1:55.416	2015.08.29 13:50:12	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	3	6	Slick Medium (M)	1:54.862	2015.08.29 13:48:16	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	2	5	Slick Medium (M)	1:58.038	2015.08.29 13:46:21	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Race	Assetto Corsa 1.2.5	1	4	Slick Medium (M)	59:59.999	2015.08.29 13:44:26	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Qualify	Assetto Corsa 1.2.5	4	3	Slick Medium (M)	1:53.893	2015.08.29 13:38:48	0.0.6 dev
Dmitriy Linev	BMW Z4 GT3	Qualify	Assetto Corsa 1.2.5	3	2	Slick Medium (M)	1:54.116	2015.08.29 13:36:54	0.0.6 dev

Figure 5.1. REC Lap library window

Open Lap library window (note that library update can take some time). Lap library table store all information about laps:

- Driver name
- Track name
- In-game track name
- Car name
- In-game car name
- Session
- Simulator
- Lap number in session
- Lap number in stint
- Tyre compound
- Lap time

- Date and time when lap was completed
- REC version
- Path to this file

You can hide columns with info that you don't need using View menu in the Lap library window. You can also rearrange columns by drag-and-dropping headers. Type something in the filter field in the top right part of the Lap library window to search by lap header info. Sort laps by any column by clicking on the column header. To load laps just select them in the table and click Load button on the Lap library window main toolbar (fig. 5.2) or just hit Enter.



Figure 5.2. Load telemetry button

Lap library provides you an option to import laps that are not placed in your REC telemetry folder, for example if you've downloaded them. Use File - Import files to library menu and choose files you need to import in the dialog. These files will be copied to the telemetry folder and shown in the library table.

You can also delete telemetry files that you don't need, just select them in lap library table and hit menu item File - Delete selected laps (or just hit Delete on your keyboard). This will delete all selected files permanently from disk, and you can't undo it.

You can export laps from lap library for example to copy them to external flash-drive or upload to net. Select laps you need to export in lap library table and select menu item File - Copy files to clipboard, or just hit Ctrl+C on your keyboard. Then go to the folder you need to paste these laps in your OS file manager and paste. This will paste files into selected folder.

6. Telemetry view widget

Here will be the description of telemetry view widget

7. Fuel analyzer

Here will be the description of fuel analyzer window

8. Race monitor window

Here will be the description of race monitor window

9. Stint analyzer window

Here will be the description of stint analyzer window

10. Calculations

Calculation module allows you to do custom calculations with recorded data using JavaScript. To show calculation window just hit script button on the main toolbar.



Figure 10.1. Calculation window icon

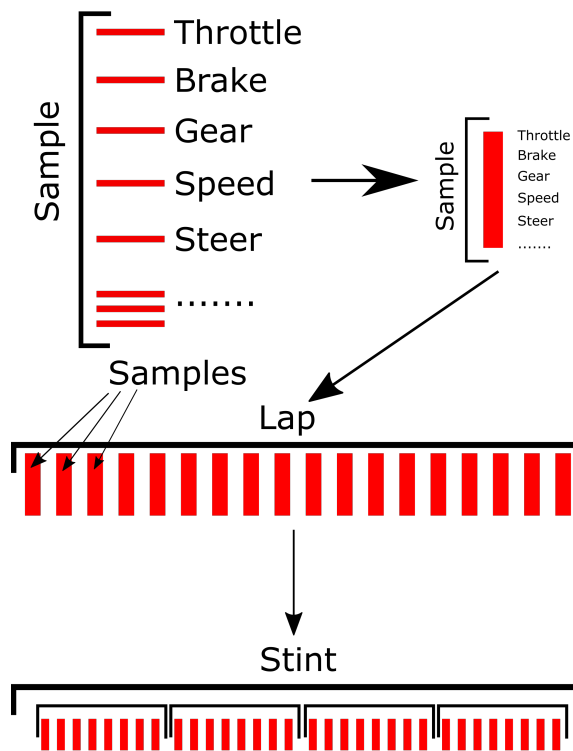


Figure 10.2. REC data handling

REC telemetry is divided into laps, each lap is stored in the separate file and can be loaded independently to provide flexible telemetry workflow. The lap contains a number of samples (see fig. 10.2) - each sample is the data structure that contains all telemetry data for one time moment - throttle pedal, brake pedal, gear, speed etc. A number of laps in a row without visiting pitlane forms stint. You can see the list of all laps that are

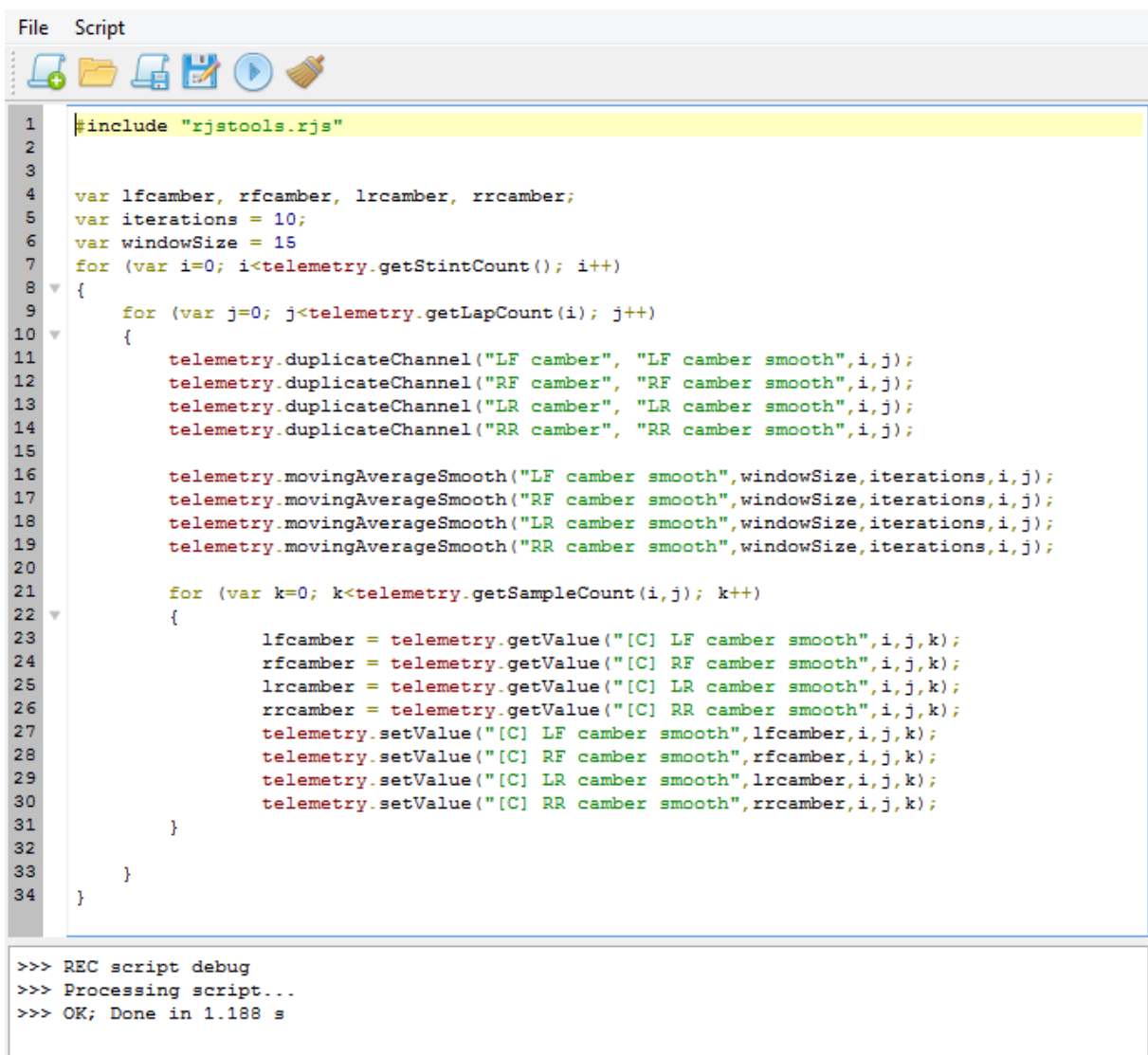
now loaded into REC grouped by stints in Lap Manager (see the main window interface description in chapter 4).

10.1. REC Script Extension

REC allows to extend user scripts with additional modules, which can't be done using vanilla JavaScript. You can import external file using C-like #include syntax:

```
#include "rjstools.rjs"
```

This will add contents of file `rjstools.rjs` into your script. REC support nested includes and will not include one file twice. Mentioned `rjstools.rjs` contain basic function library that are essential for basic telemetry calculations, users also can write extensions on JS and include them to scripts.



```
File Script
1 #include "rjstools.rjs"
2
3
4 var lfcamber, rfcamber, lrcamber, rrcamber;
5 var iterations = 10;
6 var windowSize = 15
7 for (var i=0; i<telemetry.getStintCount(); i++)
8 {
9     for (var j=0; j<telemetry.getLapCount(i); j++)
10    {
11        telemetry.duplicateChannel("LF camber", "LF camber smooth",i,j);
12        telemetry.duplicateChannel("RF camber", "RF camber smooth",i,j);
13        telemetry.duplicateChannel("LR camber", "LR camber smooth",i,j);
14        telemetry.duplicateChannel("RR camber", "RR camber smooth",i,j);
15
16        telemetry.movingAverageSmooth("LF camber smooth",windowSize,iterations,i,j);
17        telemetry.movingAverageSmooth("RF camber smooth",windowSize,iterations,i,j);
18        telemetry.movingAverageSmooth("LR camber smooth",windowSize,iterations,i,j);
19        telemetry.movingAverageSmooth("RR camber smooth",windowSize,iterations,i,j);
20
21        for (var k=0; k<telemetry.getSampleCount(i,j); k++)
22        {
23            lfcamber = telemetry.getValue("[C] LF camber smooth",i,j,k);
24            rfcamber = telemetry.getValue("[C] RF camber smooth",i,j,k);
25            lrcamber = telemetry.getValue("[C] LR camber smooth",i,j,k);
26            rrcamber = telemetry.getValue("[C] RR camber smooth",i,j,k);
27            telemetry.setValue("[C] LF camber smooth",lfcamber,i,j,k);
28            telemetry.setValue("[C] RF camber smooth",rfcamber,i,j,k);
29            telemetry.setValue("[C] LR camber smooth",lrcamber,i,j,k);
30            telemetry.setValue("[C] RR camber smooth",rrcamber,i,j,k);
31        }
32    }
33 }
34 }

>>> REC script debug
>>> Processing script...
>>> OK; Done in 1.188 s
```

Figure 10.3. Script window

Script window is shown on the Fig. 10.3. You can create new script, open existing script from disk, save current script, save current script in a new file (save as), run script and clear debug console using buttons on the main toolbar (on the top of the script window). All these commands are also available via the script window main menu.

To perform calculations with telemetry data write script in the editor or load script file from disk, and then run it using toolbar button or Ctrl+R hotkey. If as a result of script running new channels were created, they will be available in Channel Manager and can be added to the telemetry view widget as common channels. Calculated channels are placed in Calculated section of the Channel Manager and have [C] prefix.

10.2. REC Script API

You can use `telemetry` object in your script providing access to internal telemetry data:

```
function getStintCount()
```

Returns amount of stints loaded into REC

```
function getLapCount(stintIndex)
```

Returns amount of laps loaded into the stint with the given index or -1 if there is no stint with this index

```
function getSampleCount(stintIndex, lapIndex)
```

Returns amount of samples loaded into the lap with given stint index and lap index, or -1 if there is no lap and/or stint with the given index

```
function getFastestLapIndex(stintIndex)
```

Returns index of the fastest lap in the stint with given index or -1 if there is no stint with this index

```
function getFastestLapStint()
```

Returns index of the stint that contains the fastest lap from all loaded laps

```
function getLapTime(int stintIndex, int lapIndex)
```

Returns laptime (in ms) of lap with the given stint index and lap index or -1 if there is no lap and/or stint with the given index or this lap doesn't contain laptime

```
function getValue(channelName, stintIndex, lapIndex,  
sampleIndex)
```

Returns the value of channel with the given name in sample with the given sample index in lap with the given lap index in stint with the given stint index. Returns BLANK ($1e+25$) if there is no sample/lap/stint with the given index or there is no such channel in this lap

Pay attention that REC uses unit that is set for display. REC also does not perform any unit conversion or unit comparison in arithmetic operations.

```
function duplicateChannel(sourceName, copyName, stintIndex, lapIndex)
```

Copies channel with sourceName and adds it to Calculated section with copyName name in lap with lapIndex in stint with stintIndex. If channel with copyName already exists, it will be overwritten. Returned values:

0 - successful

1 - incorrect stint index

2 - incorrect lap index

3 - channel with sourceName not found

```
function movingAverageSmooth(channelName, smoothWindowSize, iterations,
stintIndex, lapIndex)
```

Applies moving average smoothing to the channel with channelName in stint stintIndex in lap lapIndex. smoothWindowSize parameter defines smooth window size (actual size is defined as $2*smoothWindowSize+1$, where smoothWindowSize is sample amount before and after current one), iterations parameter defines the amount of smoothing iterations. Returned values:

0 - successful

1 - incorrect stint index

2 - incorrect lap index

3 - incorrect smooth window size (less or equal than zero)

4 - channel not found

```
function isBlank(value)
```

Returns true if value is BLANK ($1e+25$), returns false otherwise

```
function setValue(name, value, stintIndex, lapIndex,
sampleIndex)
```

Sets the value of the channel with the given name of the sample with the given index of the lap with the given index of the stint the given index.

Returns:

0 - successful

1 - incorrect stint index

2 - incorrect lap index

3 - incorrect sample index

4 - target channel found but corrupted

```
function addParameterToStintHeader(parameterName, parameterValue, stintIndex
```

Adds parameter with parameterName and parameterValue to the given stint header

```
function addParameterToLapHeader(parameterName, parameterValue, stintIndex,  
lapIndex
```

Adds parameter with parameterName and parameterValue to the given lap header

Pay attention that all header parameters and user calculated channels are dimensionless and no unit conversion can be performed.

```
function clearCash()
```

REC uses caching to speed up telemetry data getting. REC saves channel to the cash every time you use getValue function first time for the given lap for the give channel. Use clearCash if you that you don't need any of the channels saved in cash.

```
function toDebug(value)
```

Outputs value (string, number or any combination) into the script debug console

```
function toLog(value)
```

Outputs value (string, number or any combination) into the REC log

11. RECorder

Here will be the description of RECorder utility