F ALPHA 24

VRC
VIRTUAL RACING CARS

Welcome to the Mod Manual for our latest endeavor – a comprehensive upgrade for the modern Formula Alpha cars in Assetto Corsa. In this guide, we'll explore the innovative new features we've incorporated to enhance your experience with these high-performance vehicles.

The Basics

Car Installation

Follow these simple steps to install the Formula Alpha 2024 mod for Assetto Corsa. Even if you're new to computers, these instructions will guide you through the process smoothly.

1. Extract the Mod:
   a. Find the downloaded mod file in your computer's downloads folder.
   b. Right-click on the file and choose "Extract" or "Extract Here". This will create a new folder with the mod's contents.
2. Locate the Assetto Corsa Directory:
   a. Open the FIle Explorer on your computer.
   b. Navigate to where Assetto Corsa is installed. Usually, it is located in "C:\Progam Files (x86)\Steam\steamapps\common\assettocorsa" for Steam users.
3. Copy the Mod Files:
   a. Open the folder you extracted in Step 1.
   b. Select all the mod folders (which are contained inside a folder called 'AC Files' including the 'apps' and 'content' folders.
   c. Copy these files by right-clicking and choosing "Copy".
4. Paste the Mod Files:
   a. Go back to the Assetto Corsa directory you found in Step 2.
   b. Paste the copied mod files into this folder by right-clicking and choosing "Paste".
5. Enjoy the Mod!
   a. Customize your car setup, choose a track, and start racing with the newly installed mod!

REQUIRED

MINIMUM CSP VERSION: **0.2.3**

MINIMUM CONTENT MANAGER VERSION: **v0.8.2663.39678**

Remember, these steps may vary slightly depending on your computer setup and the folders where you have installed Assetto Corsa.

For those familiar with installing Assetto Corsa mods, a quicker method is available. Inside the downloaded 7z file, you'll discover an "AC Files" folder. Here's how you can streamline the installation process:

1. Open the downloaded 7z file and locate the "AC Files" folder.
2. Drag and drop the contents of this folder directly into your Assetto Corsa root directory.
3. It's important to note that automated installations through Content Manager should be avoided. Content Manager may sometimes overlook or skip files, potentially leading to issues.

If you encounter any issues, don't hesitate to reach out to us for assistance. With these straightforward instructions, you'll be enjoying the Formula Alpha 2024 mod in Assetto Corsa in no time!

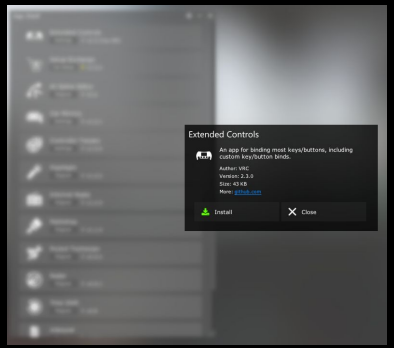
Extended Controls App Installation

In 2023, we developed the "EXTENDED CONTROLS" application, designed for effortless assignment of keybindings for an array of additional functionalities such as Engine Maps, Pedal Maps, Brake Migration Settings, and more, all while you're on the move! This app has now become a standard used by other modding teams and is included by default in the CSP App Shelf.

To set up the "EXTENDED CONTROLS" app, follow these updated steps:

1. Since the app is now part of the CSP App Shelf, there's no need for manual installation. Simply ensure that CSP is up-to-date, and the app will be automatically included.
2. Locate the "App Shelf" in the in-game UI apps menu.
3. In the App Shelf, find VRC's Extended Controls app and click on it.
4. You will be prompted with a message to install the app. Simply click "Install," and that's it.
5. Once installed, you will find the Extended Controls app among all other UI apps.

This integration ensures that you always have the latest version of the app, with updates handled automatically by CSP. This streamlined installation process not only simplifies setup but also ensures you always benefit from the latest enhancements and fixes.



Optional Setups

Within the 7z file of the Formula Alpha 2024 car mod, we are pleased to include a selection of pre-configured setups designed to optimize your racing experience. These setups serve as an excellent starting point, allowing you to fine-tune the car for various tracks and racing conditions. Whether you're aiming for top speed on a straightaway or precision handling through tight corners, our provided setups offer a solid foundation to achieve your desired performance. In the following sections, we will guide you through the process of installing these setups, ensuring you can quickly and easily get your car race-ready.

To ensure a seamless installation of the pre-configured setups for your Formula Alpha 2024 car mod, please follow these steps carefully:

1. Locate the "Optional Setups" Folder:
   a. Open the 7z file you downloaded from our website.
   b. Inside this file, find the folder named "Optional Setups."

2. Navigate to the Setup Folder:
   a. Open the "Optional Setups" folder.
   b. Inside, you will find a subfolder named "vrc_formula_alpha_2024_csp."

3. Find Your Assetto Corsa Setups Folder:
   a. On your computer, navigate to the following path:
      C:\Users\...\Documents\Assetto Corsa\setups
      i. Note: Replace ... with your specific user directory.

4. Decompress the Setup Folder:
   a. Extract the "vrc_formula_alpha_2024_csp" folder from the 7z file.
   b. Copy or move the extracted "vrc_formula_alpha_2024_csp" folder into the setups directory mentioned above.

5. Verify Installation:
   a. Launch Assetto Corsa.
   b. In the game, go to the setup section for the Formula Alpha 2024 car.
   c. You should now see the new base setups available for quick loading.

Starting the Car

To start the car in the game, you need to do it manually. We have provided many ways to do this.

1. (Steering Wheel Preferred Method): assign the "IGNITION" and “STARTER” bindings with the Extended Controls App.
2. Clicking the “ACTIVATE” button next to the respective control in the Extended Controls App.
3. (Gamepad/Keyboard Preferred Method): Clicking the “IGNITION” and “STARTER” bindings with the VRC Car Cockpit Controls app. This app also has bindings for navigating the cockpit control options with your input of choice, which can be bound in Extended Controls under the Apps->VRC Advanced Setup tab.
4. In the CSP Unbound app, you can click the Extra A and Extra B buttons to control ignition and starter respectively.

We included this functionality due to the implementation of torque maps, which are discussed in more detail below. The engine's idle behavior has been revamped, and its RPM stays at around 3600 rpm in a lifelike manner. Once the Ignition is turned ON, you can then use the "Starter" assigned button to start the engine.

Physics

Deployment Strat Mapping

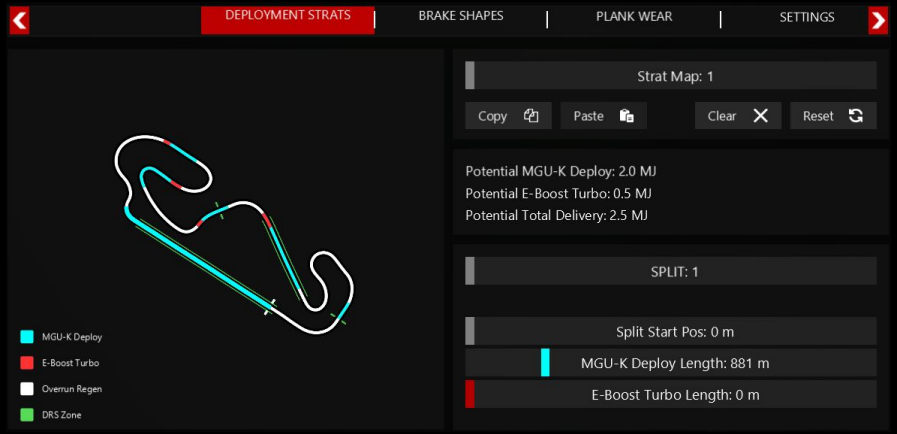
This car utilizes the new ERS mapping function included with the VRC Advanced Setup app. If you installed the car following the instructions on page 3 of this manual, the app should automatically install and open each time you enter the car's setup menu. This function allows you to define areas of the circuit where electric power can be deployed.

There are three modes to distinguish:

- **Cyan**: Areas where the battery (ES) powers the MGU-K to deliver 120 kW.
- **Red**: Areas where the ES powers the MGU-K to deliver 120 kW and also spins the turbo to deliver maximum power. This mode is very power-intensive and should be used sparingly, ideally at the beginning of straights.
- **White**: Areas where the car will be recovering energy to be deployed later.

ERS maps can be either automatically generated or user-defined. Automatically generated maps are not optimal, so it is recommended to create your own maps for better performance.
You can break down the circuit into multiple "splits." A split is defined by a starting position and a deployment length.

Once defined, maps will be automatically saved to the corresponding "STRAT MAPS" that can be selected in the setup menu or while driving (you will need to bind a key in Extended Controls for this).



You have several options for managing your maps:

- Use the "Clear" button to clear the map (right-click to clear all strategies).
- Use the "Copy/Paste" button to copy a map from the currently selected strategy to another (right-click to copy to all other strategies).
- Use the "Reset" button to revert to the default configuration.

Power Unit Modes

By understanding and utilizing these settings, you can optimize the hybrid system for better performance and efficiency on the track.

The hybrid system on this car allows extra control over deployment and recovery management through “MODES.” A mode is a set of parameters applied to the power unit for enhanced control. There are 9 modes available. In 99% of cases, you won’t need to adjust their settings, but here is a brief explanation of each:

- **PU mode**: Select the corresponding mode you want to be in. Modes 1(Recharge), 3 (Pre-Start), 4 (Start), have fixed settings and cannot be modified.
- **E-boost turbo**: This is the turbo boost level reached when the car enters a “Red” zone on the ERS map.
- **Overrun regen**: In part-throttle situations, the internal combustion engine (ICE) will regenerate electric energy through the MGU-K. The higher the value, the more fuel will be used.
- **Extra harvest frequency**: Controls how frequently the MGU-H switches between spinning the turbo and regenerating energy. This clever management allows the unlimited recovery by the MGU-H to benefit the MGU-K. Since MGU-K recovery is limited to 2MJ, extra harvest will stop regenerating energy once this limit is reached, so a higher frequency is not always the best option.

It is worth noting that the “Engine Brake” setting affects energy recovery: lower values will allow a bit more energy recovery.

Special Power Unit Modes

PU Modes 1-4 each have specific scenarios for when they should be used.

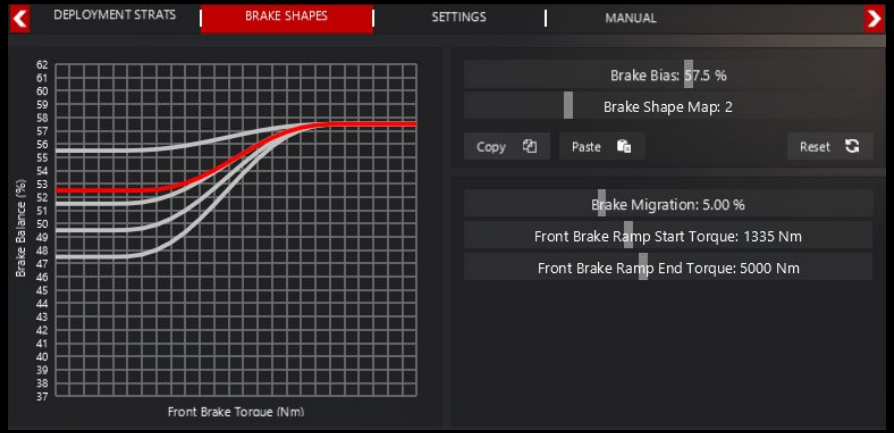
- Mode 1 (Recharge): This mode should be used to fully exploit the car's energy recovery potential, and prevent any energy delivery. Typically used before/after qualifying laps and during safety car periods. *Image 1
- Mode 2 (Quali): This mode is intended to put the car into a peak energy recovery and delivery state, this mode will have high fuel and energy consumption.
- Mode 3 (Pre-Start): Essentially a burnout mode, locks the differential and puts a 12.5k rpm limiter on the engine to allow for safe burnouts. *Image 2
- Mode 4 (Start): Forces E-Boost to be engaged while this mode is active.

Brake Shapes

In this section of the VRC Advanced Setup app, you can define brake migration shapes based on the front brakes' torque:

- **Brake Bias**: This is the peak brake bias that will be achieved at and after Front Brake Ramp End Torque is reached.
- **Brake Shape Map**: Allows you to select between different brake shape presets.
- **Brake Migration**: The percentage the overall brake bias will shift rearwards as the front brake torque approaches the Ramp Start Torque. For example, if you have 5% brake migration and a peak brake bias of 56%, it means that as front braking torque increases, brake bias will vary from 51% to 56%.
- **Front Brake Ramp Start Torque**: This is the front brake torque at which brake migration will start.
- **Front Brake Ramp End Torque**: This is the front brake torque at which peak brake bias will be reached.

You can visualize the brake shapes on the graph, with the selected brake shape highlighted in red.



You have several options for managing your maps:

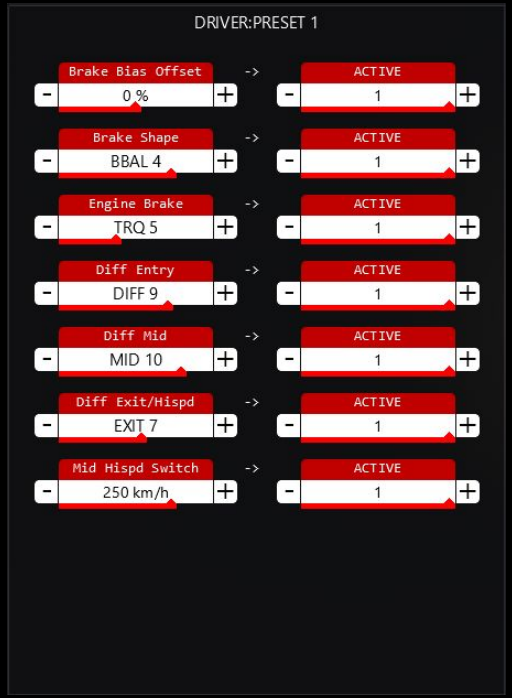
- Use the “Clear” button to clear the map (right-click to clear all shapes).
- Use the “Copy/Paste” button to copy a shape from the currently selected shape map to another (right-click to copy to all other maps).
- Use the “Reset” button to revert to the default configuration.

Driver Presets

Formerly called “Quick Switches,” Driver Presets allow the driver to switch to a set of predefined settings with the press of a button.

- **Driver Presets (DP)**: There are two presets, DP1 and DP2, with DP2 having priority over DP1. If both are activated, DP2 settings will be selected.
- **Active Settings**: Only the settings marked as “Active” will be loaded when a Driver Preset is activated.

Using Driver Presets, you can quickly and easily switch between different configurations while driving. Driver Presets will be turned off after returning to the setup menu.

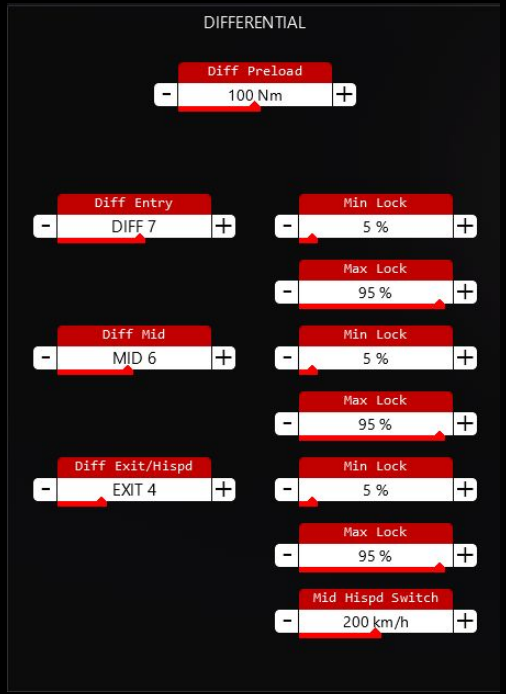


Differential

In this car, you can adjust the differential locking percentage for each phase of cornering:

- **DIFF**: Controls the locking value for corner entry, activated above a specified longitudinal deceleration value.
- **MID**: Controls the locking value mid-corner, activated below a specified longitudinal deceleration value.
- **EXIT**: Controls the locking value on corner exit, activated above a specified longitudinal deceleration value or above the "Mid Hispd Switch" speed value.
- **Mid Hispd Switch**: This is the speed threshold above which the differential switches to EXIT mode.

You can also adjust the minimum and maximum lock percentage values for each setting to finely tune the differential behavior for each phase of cornering.

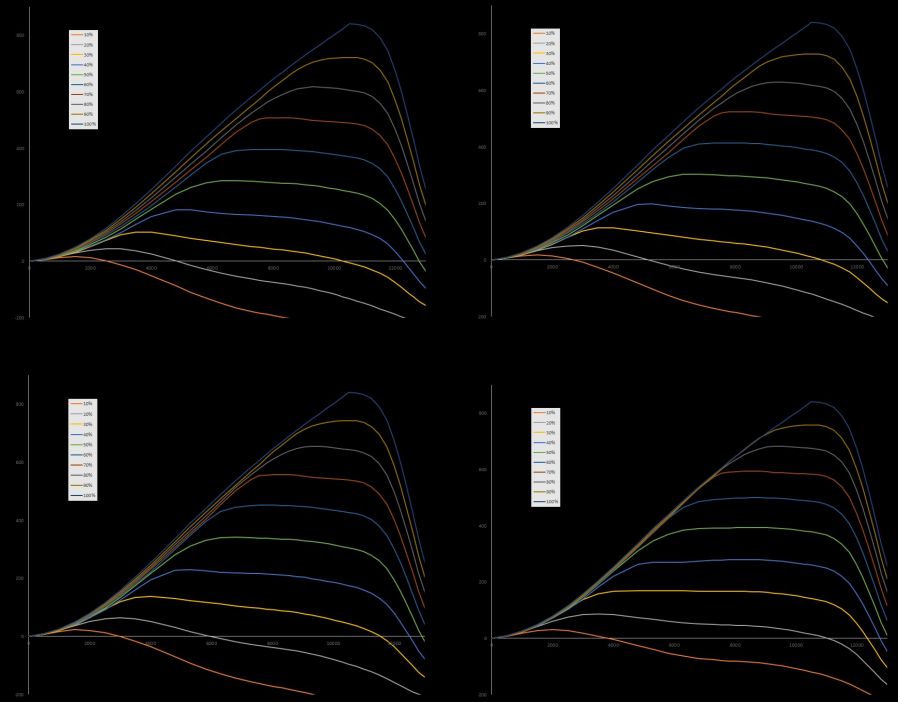


Engine Maps

These maps control how the Internal Combustion Engine (ICE) responds to throttle inputs. Adjust them accordingly to improve drivability or to achieve a more responsive throttle feel.

Compared to vanilla, maps like these provide a significantly more realistic throttle behavior, and also allow us to have a more realistic launch behavior that doesn't require a high amount of pedal input.

From left to right and top to bottom: (En 01 Wet), (En 02 Low), (En 03 Balanced) and (En 04 High) maps

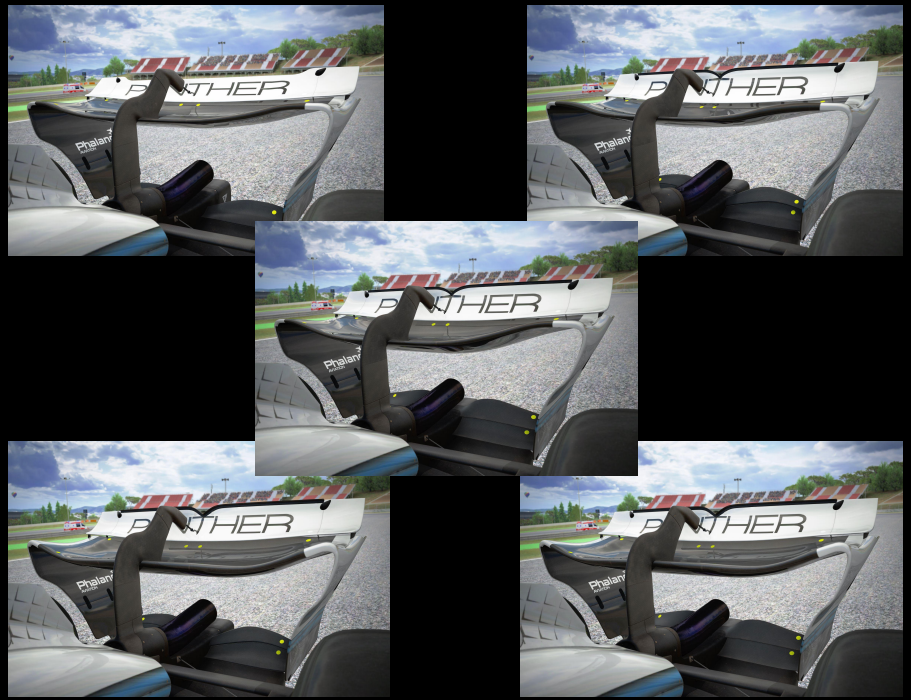


Aero

You can choose from 5 different aero kits depending on the track configuration. Each kit includes specific front wing, rear wing, and beam wing configurations. Each kit also has unique model component combinations that are easily distinguishable.

To fine-tune the aero balance, you can adjust the angle of the front wing upper flaps.

Since this car utilizes ground effect, these settings should be adjusted in conjunction with the ride height settings found in the SUSPENSION tab. Additionally, weight distribution plays a significant role in influencing the aero balance.



Plank Wear

Exceeding the 1 mm plank wear limit for any of the legality check zones, will result in all subsequent laps being invalidated.

A new floor plank can be installed only during practice sessions, planks cannot be replaced during qualifying or race sessions. A new plank will automatically be installed at the beginning of a qualifying session.

Planks should be replaced when making large setup alterations that may affect the plank wear significantly.

Audio & Visuals

Audio

Along with the usual high quality engine sounds, we added further notable features and improvements:

Tones
You now have the ability to choose from 3 different beep signals to further optimize your shifts or DRS activation timings. They are individually customizable in volume, pitch and pan.

Tyres
Significant improvements have been made to the tyre sounds, using additional parameters to further distinguish between various sliding scenarios, providing valuable feedback when driving on the edge of grip.

Other
In our ongoing effort to increasingly tie physics and sounds together, we have further improved our custom sound effect for the plank scraping the track. There is now a subtle but audible difference in the variety of collisions with the track, depending on the surface roughness or type of curb being struck.

Additionally, you will notice details such as the brake system locking under certain scenarios, the DRS mechanism engaging with an audible reduction in drag, and the subtle whine from the tread of the wet-weather tyre compounds.

Advanced Setup Tone Settings

Recommended Audio Settings

Model Adjustments

Under the VISUALS setup tab, it is possible to switch between different steering wheels, change the visibility of the HALO in first person view, remove the windshield and change the dummy camera housing position from left to right.

All of these changes have solely a visual effect.

Steeringing Wheels: 0=RB, 1=AL, 2=AM, 3=FE, 4=MC, 5=ME, 6=WI

Halo: Visible, Transparent, Hidden. Only applicable in first person view, switches back to visible when not in fpv or if a replay is active.

Windshield: Toggles windshield visibility

Dummy Cam Position: 0=Left Side, 1=Right Side

Display - Settings

In the Settings tab in the VRC Advanced Setup app, you can change display-related visual settings:

- Change the amount of time splash screens popup on your display when changing settings.
- You can change the brightness of the display both for first-person view or external cameras and also for day and night conditions.

Night brightness settings take effect once the sun goes down.

Display - Info

A : Current gear

B: Speed (kph)

C: Delta to the best lap in quali sessions and to the “Drive Target” lap time in other sessions

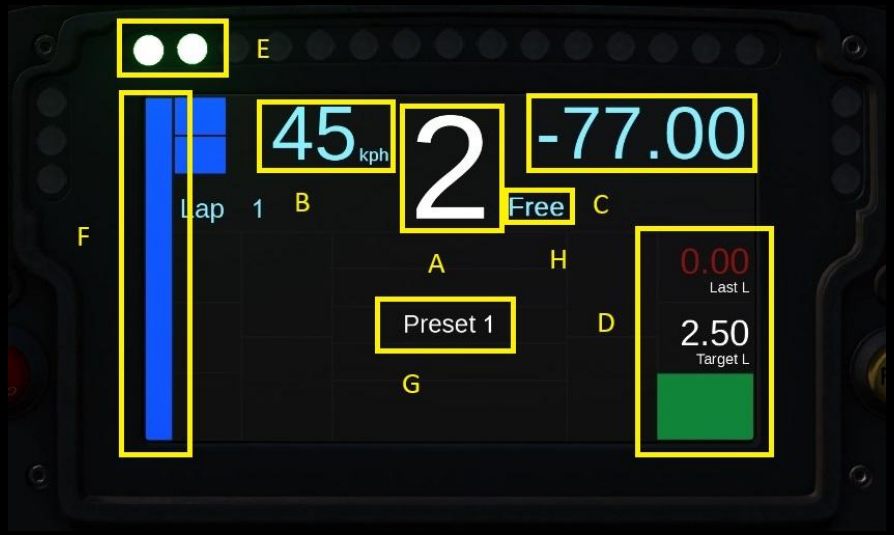
D: Fuel per lap target and last lap

E: DRS (1 led = available, 2 leds = active)

F: Battery level

G: Active driver preset (Preset 2 will override Preset 1 when both are active)

H: DRS is free to use whenever (not enforced yet)



A: Current lap energy allowance (4MJ total, each half represents 2MJ)

B: Lap count

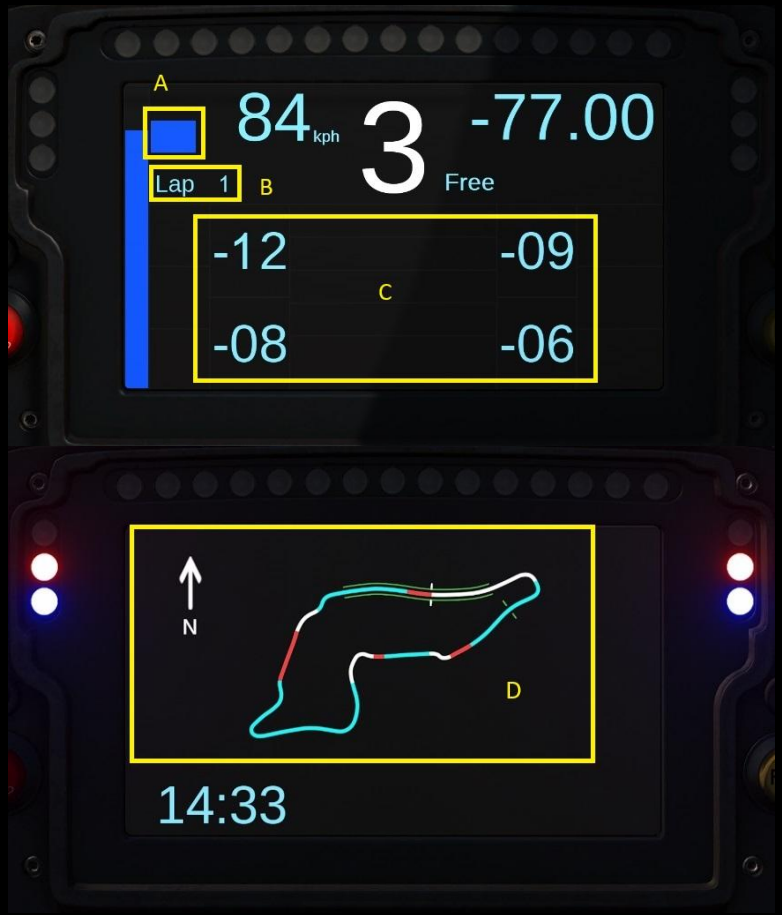
C: Deltas to optimal tyre temperatures

D: Current ERS map info

E: Recovery Mode enabled

F: Yellow Flag

G: Brake Warming information



Display - Info (Splashs)

1 : End of the lap: Last lap time, last lap time delta, and lap count)

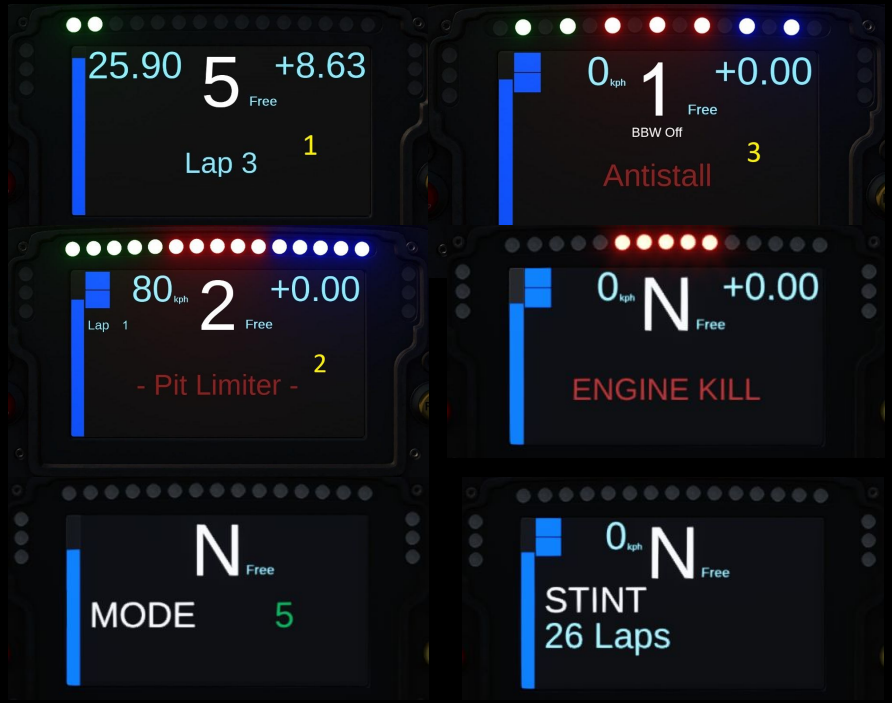
2 : Pit limiter: LEDs show over/under pit speed limit. If LEDs are lighting up from the middle then you are under the pit speed limit, if the LEDs are not lit in the middle but are on the outsides, then you are above the pit speed limit.

3: Antistall

4: Engine Kill

5: General cockpit settings

6: Driver target settings



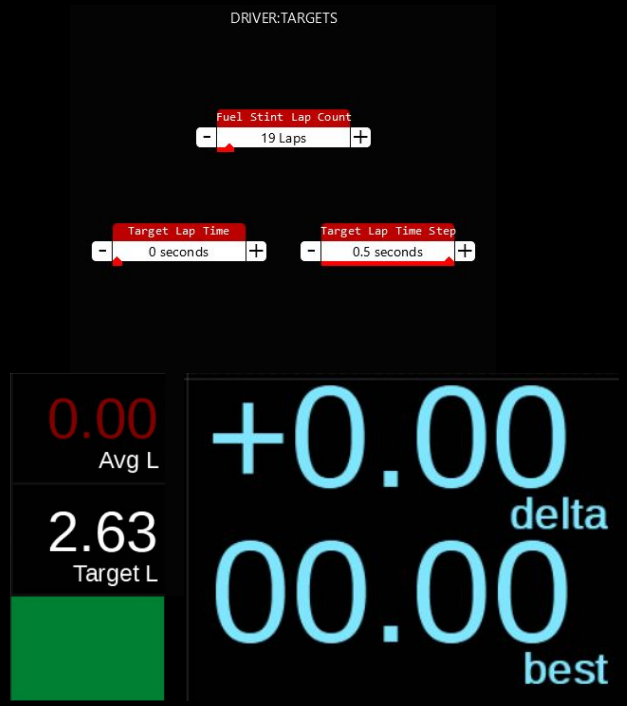
Display - Driver Targets

Driver targets are a helpful way to help maintain a set fuel consumption, and lap pace. Both of which can be increased/decreased with Extended Controls button binds.

Fuel Stint Lap Count: The number of laps you are expecting to complete for the “stint”. The stint in most cases will be an entire race, if refueling is not allowed. During practice sessions you can also utilize this to test varying fuel load runs. On some display pages you will notice a red/green rectangle in the bottom right, this will indicate if you are above/below your Target L (liters per lap).

Target Lap Time: The lap time you are currently aiming to hit per lap. If this value is set to ZERO, your delta times on your display will show you your delta to your BEST LAP. This value is ZERO by default.

Target Lap Time Step: This determines the increment change when using button binds to increase/decrease the target lap time.



LED - Info

A: DRS leds (1 led = available, 2 leds = Active)

B: RPM Leds

C: Crash Indicator, slowly blinks while car is stopped and has not sustained a large crash impact. Will blink quickly if the car crashed in a significant way.

D: When all three leds are active, it means that the PU is in recharge mode (MODE 1), otherwise, Blue = E-Boost is active

LED - Settings

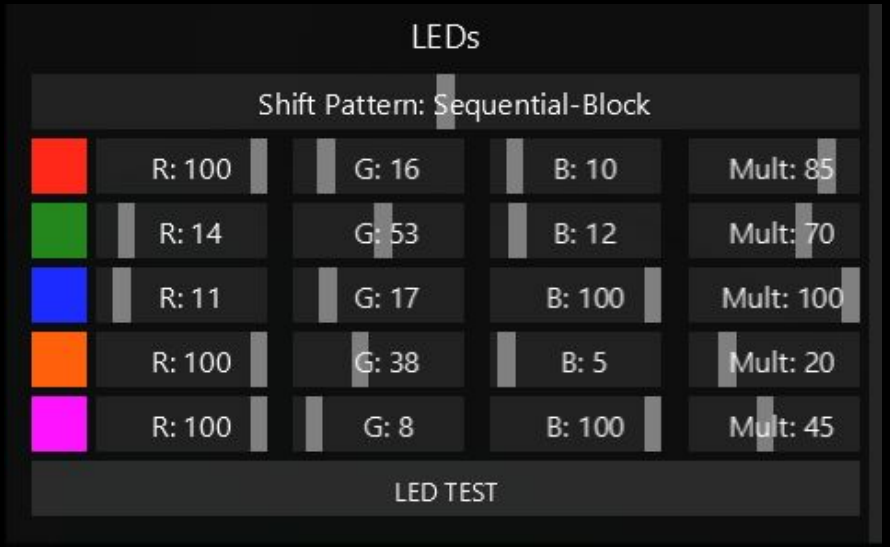
This car's leds can configured in the under the "Setting" tab using the VRCAS app that comes with this car.

Shift Pattern: Controls the rpm shift light pattern.

- Sequential; All red->blue leds will light up sequentially
- Sequential-Block; Red leds light up sequentially, blue leds light up as a block.
- Block-Block; Both red and blue led chunks light up as blocks.

LED Colors: You have full control over the led colors, and changes automatically get saved as you make them.

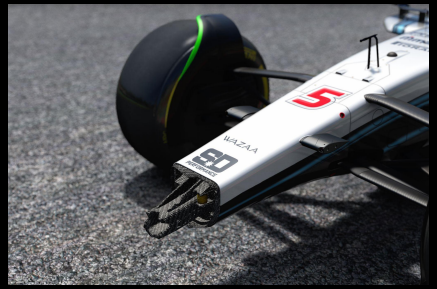
LED TEST: Turns all leds on so you can see what their current color and brightness is.



Visual Damage

This car features some extra visualized damage to better represent the current state the car is in. The new visual damage states are also reflected in replays.

1. Front Wing Damage: The front wing damage now includes 3 different states, left endplate broken, right endplate broke, and nose broken.
2. Engine Failure: Upon significantly damaging the engine, a puff of initial smoke and flame will shoot out the exhaust, followed by a trail of smoke indicating the engine has sustained severe damage.



Preferences

In the ext_config.ini file, you can change some parameters so that the car's speedometer and steering wheel style default to your preferences. Skin creators can also use the INDEX parameter in the STEERING_WHEEL field to set a default steering wheel for a given skin.

```
[DISPLAY_INSTRUMENTS]
SPEED_METRIC=1 ; 0=Speed in MPH | 1=Speed in KPH

[STEERING_WHEEL]
INDEX=-1 ; Sets default steering wheel |
-1=Disabled, 0=RB, 1=AL, 2=AM, 3=FE, 4=MC, 5=ME,
6=WI
OVERRIDE_SKIN=-1 ; -1=Apply any skin forced
steering wheel | 1=Ignore skin's auto-applied
steering wheel
```