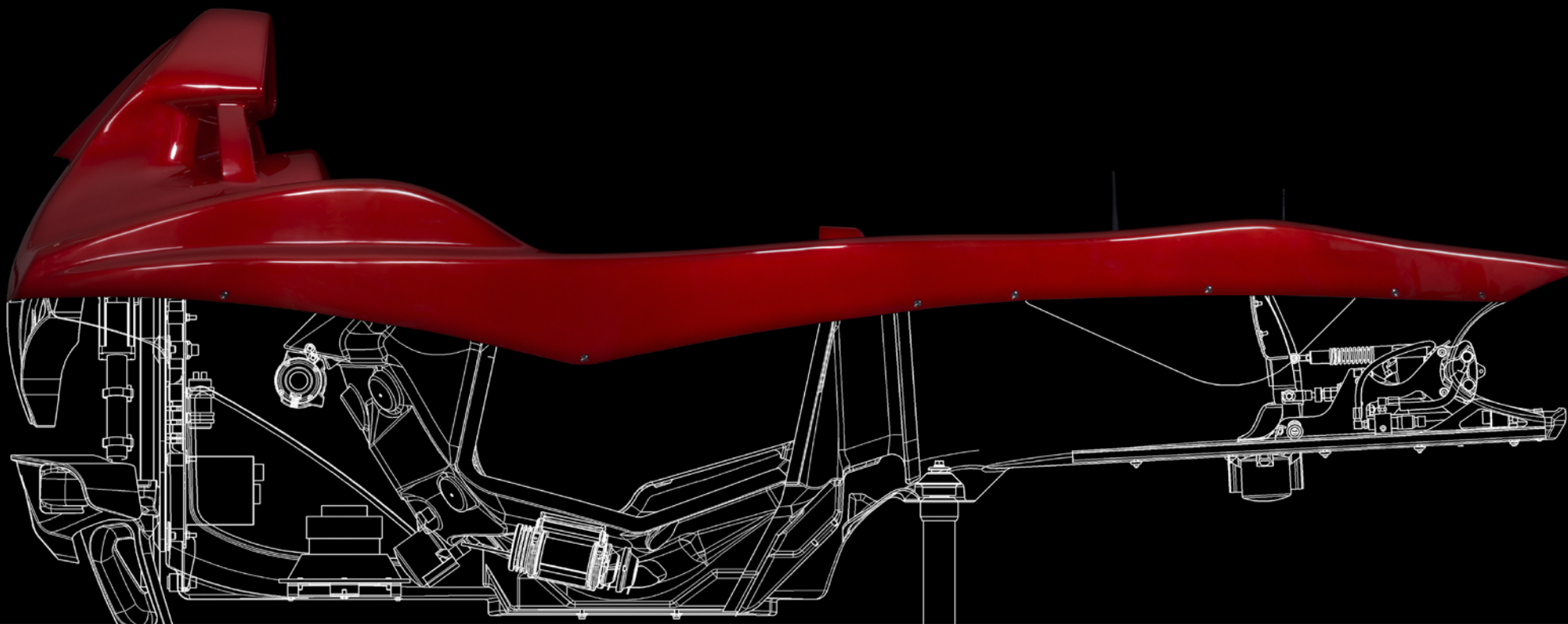




EVOTREK

SYM 027

Club



WHAT IS THE SIMULATOR?

The motion simulator or motion platform is a complex system developed to offer the sensation or perception of a moving vehicle. **The essential condition in a motion simulator is synchrony with the display.**

The graphics card and the motion system must work in tandem to produce coherent performances, since the limitations of the former also dictate the limitations of the latter.

WHAT IS SIMULATION?

Simulation is a virtual model of reality enabling the user to interactively assess and predict a dynamic series of events. Simulation is normally used in the scientific and technological fields to physically reproduce in the laboratory the conditions being studied. This is why it uses the high calculation possibilities offered by computer science and processing systems.

The virtual laboratory safely reproduces complex and costly experiments much more quickly and cheaply. The simulator has been widely used in Formula 1 recently as a psychophysical training aid for drivers and has been decisive for the improvement of driver and vehicle performance.

THE ART OF SIMULATION

The way in which our body perceives its surrounding environment is a function of how our brain interprets signals from the different sensory systems, such as sight, hearing and touch. It is well known that our eyes supply the brain with over two thirds of the sensory information coming from our surrounding environment. But visual information alone is not the only way we perceive.

Indeed, the human eye is not able to distinguish on its own whether a sequence of images on the retina is relative or absolute, in other words, whether it is due to the movement of the eye, the head or the entire body.

A typical example of this is when we are sitting on a train and we see the adjacent train move. Human beings are not able to perceive speed and acceleration directly without some form of error or uncertainty.

Within the limited space of a laboratory, it is physically impossible to exactly simulate or reproduce reality, simply because it is not possible to dupe physics. However, by exploiting some of the flaws in the sensory and perceptive systems of our body, it is possible to create an environment in which the body perceives movement in any direction while remaining practically stationary or moving just a few centimeters.

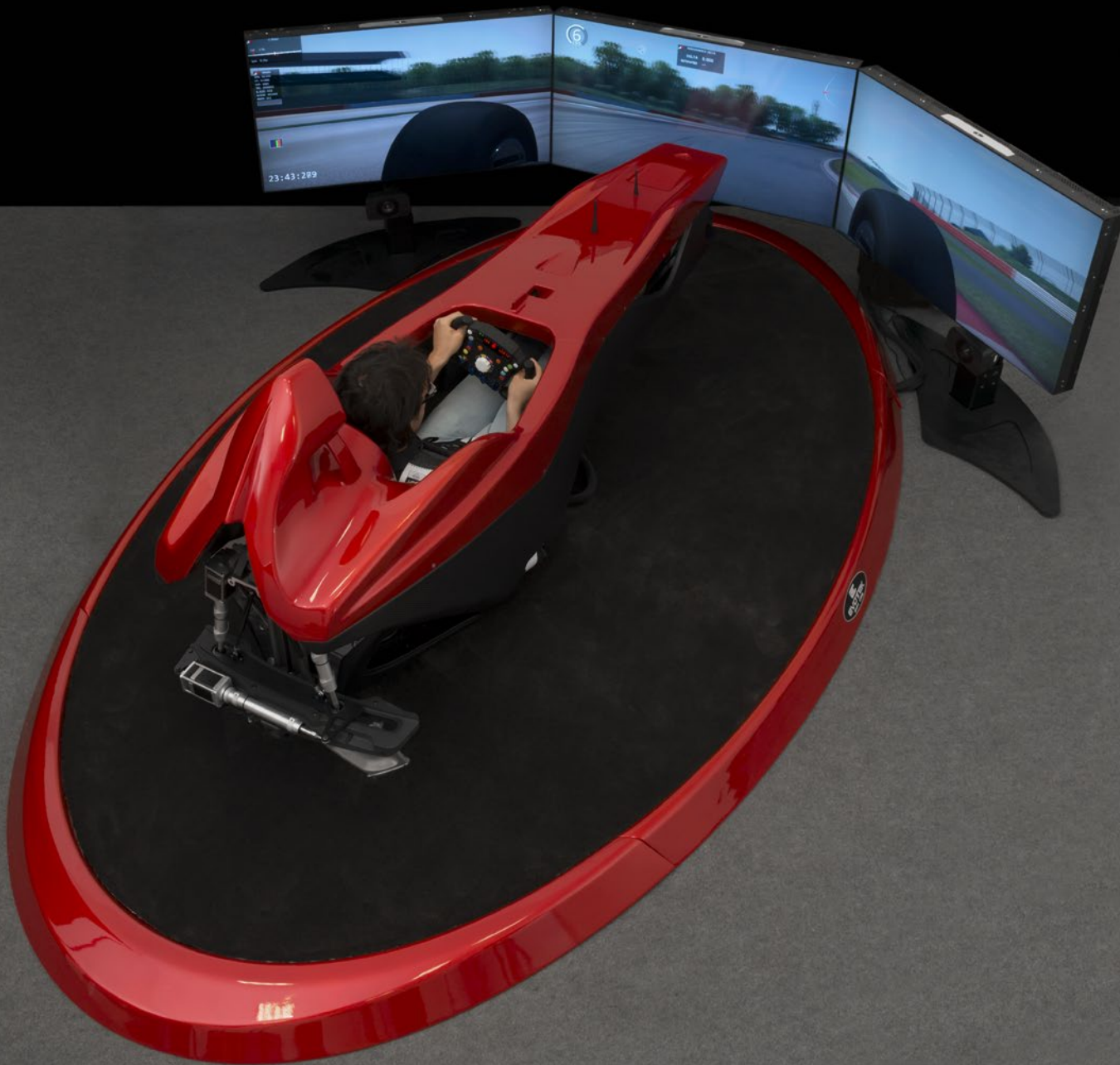
“The art of Simulation” is based on these principles.



WHAT IS THE SYM 027 CLUB IN TECHNICAL TERMS?

It is a custom built hardware in the loop simulator made primarily of carbon fiber and aluminum alloys. Based on Evotek expertise gained as engineering supplier for both the Formula 1 department and Formula 1 simulators R&D. The SYM 027 is the result of 5 years of development, discoveries, studies, mistakes and experiments. It embodies the ***synthesis of simulation technology*** for Formula 1. As a single entity both hardware and software live and affect each other to reach the absolute coherence and sensation for the driver.





WHAT IS THE SYM 027 "CLUB EDITION"?

It's a simulator, but not in the usual sense. Let's say it's more of an object. It's not made by hundreds of people, hundreds of computers, hundreds of things that can't be touched, seen or understood. The Evotek SYM 027 Club is made by hand, by people who put their heart and soul into their work. In addition to this we have the unrivalled support of our partners who equally share our passion for the finished product. The idea has been to create a simulator that was light, reactive, original and beautiful, yet offering great performance, using the best technology available and inspired by Formula 1. A simulator to give you the chance to live the most realistic Formula 1 driving experience. Safely from your own living room...

The Evotek SYM 027 "Club edition" is where Italian Style meets simulation technology



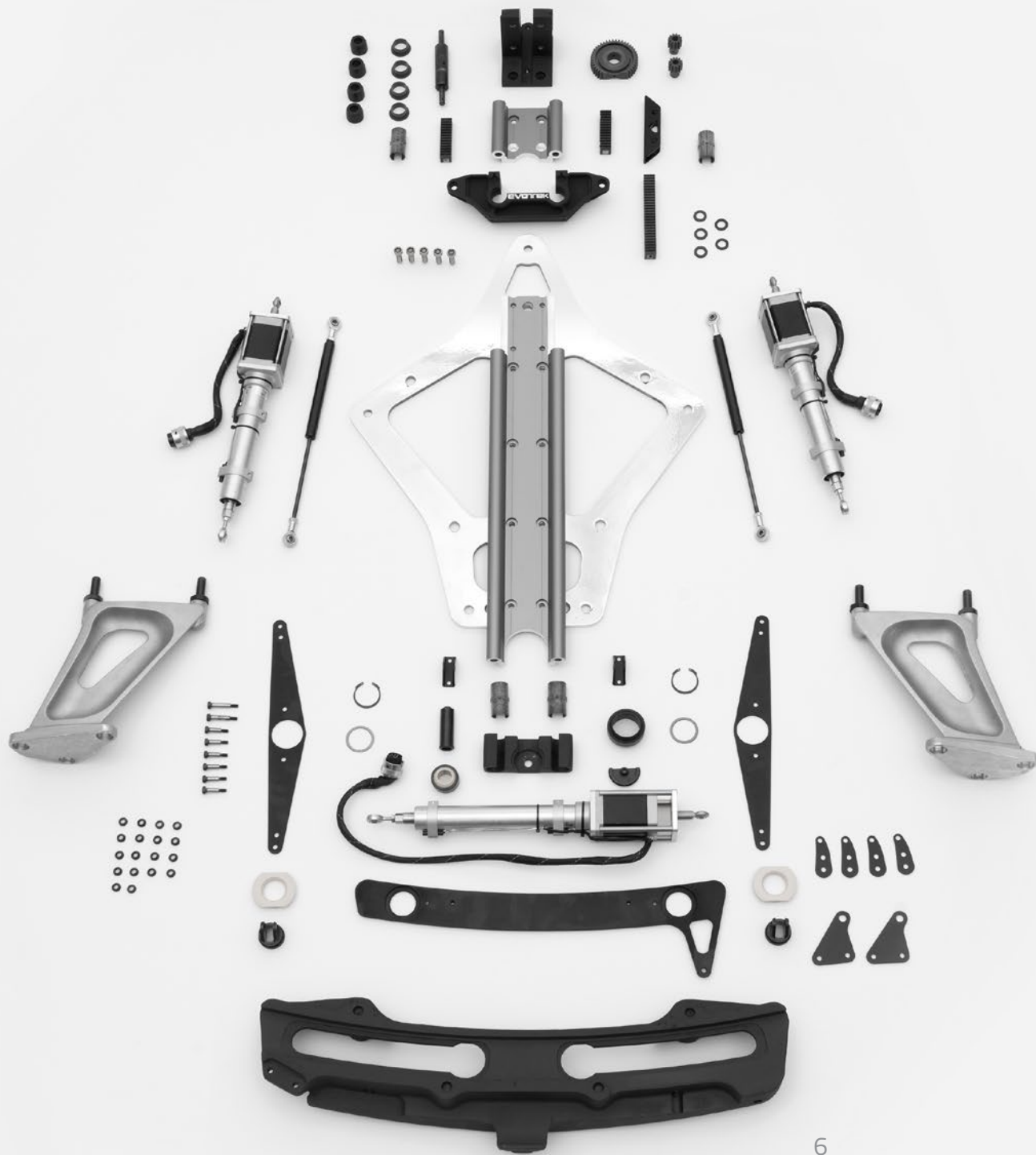
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THE BODYSHELL

The chassis of the Sym 027 Club is structural and self-supporting. These choices mean the simulator is the lightest and most reactive 3 degrees-of-freedom platform currently available; the Sym 027 Club's response time is practically real time. The bodyshell is made of two upper and lower parts made entirely of carbon fiber. The lower part is the technological half of the Sym 027. Following a painstaking design process, the human-machine interfaces and the mechanical and electronic parts have been seamlessly integrated to reduce the number and weight of components. The upper part is the aesthetic half of the simulator and can be customized in any color.



MECHATRONIC SOLUTIONS, THE MOTION MODULE

In compliance with the latest trends in driving simulators, the Sym 027 Club Motion Module is based on the three classic axes of rotation: Pitch, Roll and Yaw. The module set directly on the bodyshell is a unique feature, making the Sym 027 the only simulator in the world with a load bearing bodyshell.

This original module was designed especially to achieve maximum system reactivity through an approach typical of Formula 1 suspensions, which seeks out the best compromise between rigidity and lightness.

The upper part of the Motion Module includes an original device for maintaining verticality during any movement.

The module is the logical technical evolution of the classic Sym 027 archetype, its predecessor, featuring technological advances and superior and more sophisticated materials and processes, resulting in increased quality and precision. The entire mechanical group is now 5.5 Kg lighter.

Two special gas cylinders (gas springs) have been added adjacent to the vertical actuators for partial compensation of the suspended mass, resulting in significantly increased performance and reliability. The actuators themselves have been specially developed for this simulator, attaining exceptional performance and reliability.

ACTIVE BELTS

The innovative device is designed and made by Evotek engineering, and comprises four rotary actuators for dynamic belt tensioning while braking and cornering. Made of a light alloy, they are fully integrated in a single module which also houses the electronics.



STEERING GROUP

The steering group feedback is generated by a highly advanced software model of the tires, which is one of the most advanced in the sector. The hardware reproduces the steering stress typical of the servo controlled driving of current Formula 1 single-seaters. The SYM 027 Club version features a steering system set up in a single module the mechanics of which are housed in a carbon box, offering excellent protection against electromagnetic disturbance and guaranteeing system stability.





MOVABLE PEDAL UNIT

The pedal unit has a built-in device for micrometric adjustment of the pedals' position for rapid and precise personalization of ergonomic posture.

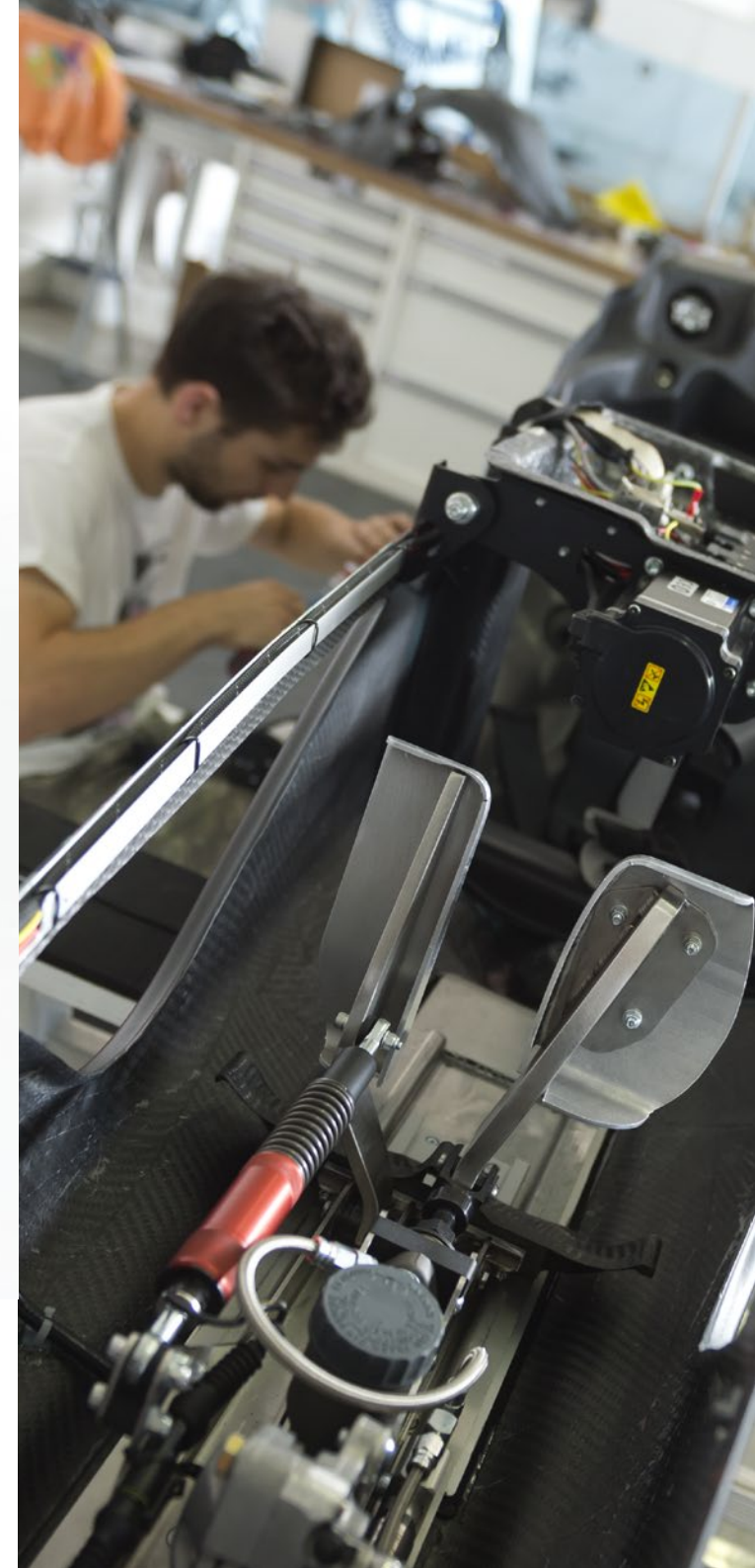
This solution, featured on our full range of simulators, has been optimized by positioning the adjustment device in correspondence with the force axis of the brake pedal.

Three years since presenting this solution, it has now been adopted on the top of the range car at a prestigious Italian car manufacturer.

The pedal unit is now made chiefly of high quality steel, enabling intense system use.

Brake: To those who have never had the opportunity to drive a real Formula 1 car, the brake pedal feedback may seem excessively stiff, but it is even more so in reality. The brake has a hydraulic circuit with pump and caliper, which contains the compressible device for feedback control. Circuit pressure is the input for the software braking control and it is acquired via a pressure sensor also used on Formula 1 cars.

Accelerator: The accelerator pedal is also made of steel. The accelerator is checked via a linear transducer. The sensor and the mechanical parts are the same as those widely used in Formula 1.





SEAT / POSTURE

The driving position of current Formula 1 cars is rather singular; aside from being very low for the purposes of center of gravity and aerodynamics, the feet and legs are in a raised position. This driving position has enabled the front wing to extend to full car width, leading to the modern cars with raised nose. The front wing on earlier Formula 1 cars was split into two parts and even the few cars with a single wing did not have today's advantages, as the low front chassis slowed the aerodynamics and limited efficiency. The driving posture in the SYM 027 Club is exactly the same as that in current Formula 1 cars, with the seat made of carbon. This required an extensive period of research and optimization to obtain a seat that could comfortably accommodate people of different body shapes as though made to measure.





BUILT-IN VENTILATION

Another unique feature of the Sym 027 is its driving seat ventilation. The excitement and adrenaline generated while experiencing the driving simulator usually leads to increased perspiration. Ventilation assists with this issue, meaning a Formula 1 experience is guaranteed, even "in a suit and tie".



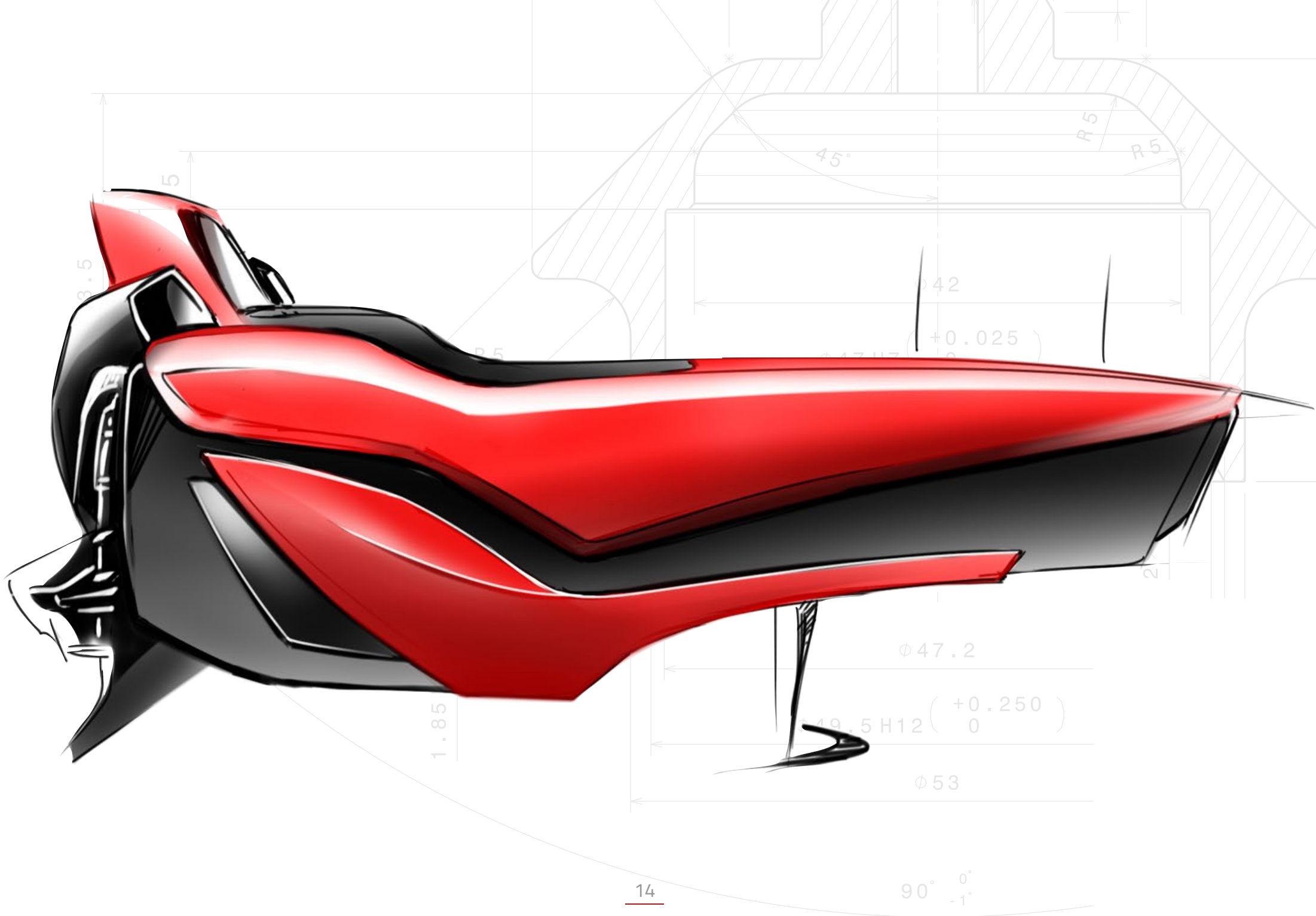
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SOUNDS&VIBRATIONS

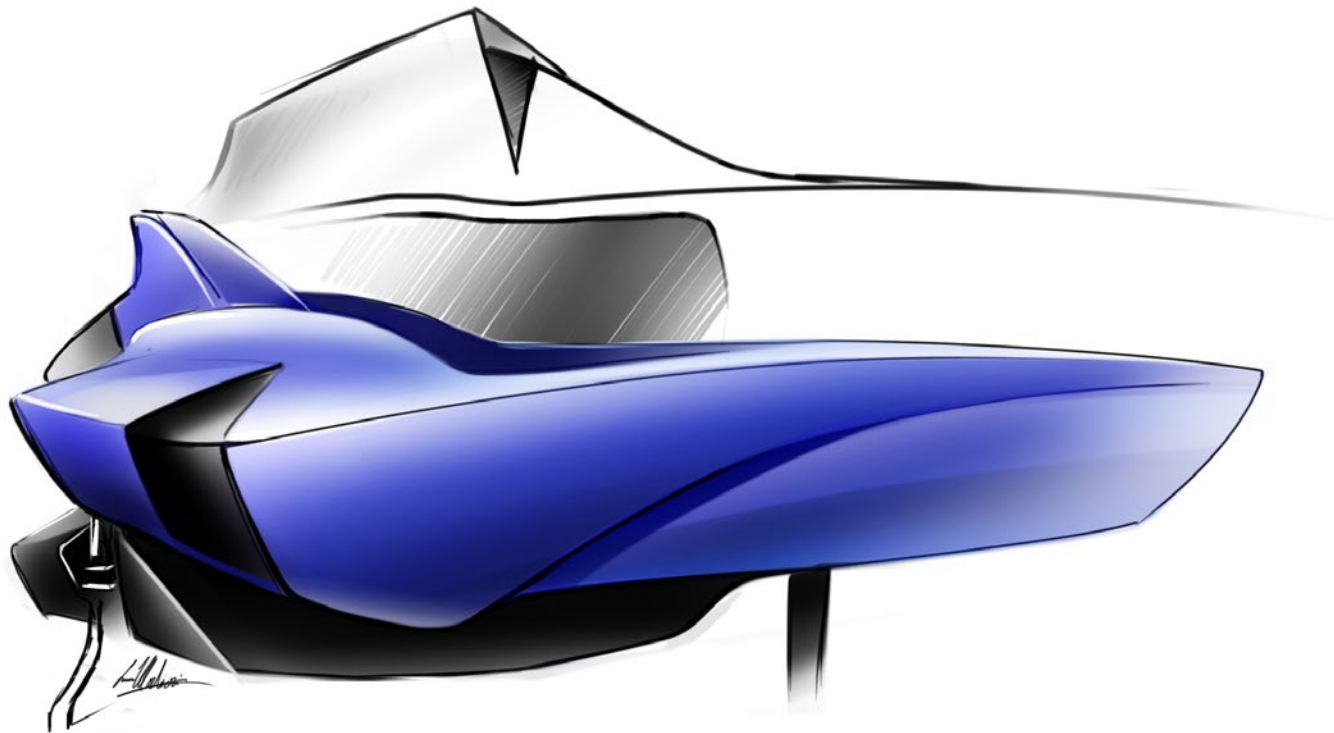
The SYM 027 Club uses exclusive sound samples recorded directly in the engine testing rooms of a prestigious Formula 1 team. The sound has then been analyzed, selected and equalized in the recording studio to heighten the experience and immersion in the simulator cab, making for a more exciting drive. Done in collaboration with music business professionals that share our passion for Formula 1, this activity has highlighted the sensory impact offered by sound.

The layout of the acoustic devices was worked out following numerous tests conducted in parallel in the recording studio and on the simulator. The system comprises a Dolby 5.1 system with built-in electromagnetic actuators (or vibration-powered generators), which reproduce the acoustic and vibration conditions inside the real cab.



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17.5



THE DESIGN

With the Sym 027 Club Edition, Evotek launches a new stylistic challenge aimed at characterizing its product with originality and coherence. The end result comes from wanting to find new directions and refusing to propose just a “fake” version of a real Formula 1. Evotek interprets the Sym as a high-tech product with its own identity and originality, capable of offering exciting experiences.

The cockpit design keeps scrupulously to the dimensions of a 2013 Formula 1 cab, while the lines and details have been chosen from some of the most successful single-seaters of recent years.

The lower part has been purposely left in natural looking carbon to underline the simulator’s technical function.

The tapered shape of the rear is a tribute to the genius of Lotus founder Colin Chapman, who revolutionized the shapes of Formula 1 cars. This takes us back to the “romantic” racing days, when an idea could really make the difference; in the late 70’s Chapman’s 480CV Lotus pushed the Ferrari 12-cylinder Boxer to its limits, as the 8-cylinder Cosworth 90° configuration exploited the “ground effect” to the full. At that moment, Formula 1 and sports car chassis changed forever and even today’s designers have to take “ground effect” into account when designing the rear section of the chassis.

Other historic inspiration comes from John Barnard at McLaren, the first to use carbon fiber for the Formula 1 chassis. This decision was taken precisely to reduce the

rear section of the chassis without losing out on structural performance and increasing the “ground effect” .

These fundamental concepts forever changed the design of the Formula 1 chassis and the SYM 027 Club chassis reflects that ideal chassis that every designer would always have wanted to create.

The cab ergonomics are the end result of painstaking research, in which we paid a great deal of attention to immersing the driver in the driving environment. While the simulator has attractive, modern lines seen from the outside, it is only when seated inside that we truly experience the driver’s viewpoint, through the array of devices and details that naturally fuse the real world with the virtual.



DO NOT CALL IT JUST "STEERING WHEEL"

A modern Formula 1 car is the most technologically sophisticated race car on the planet, modern Formula 1 controls are responsible for far more than directing the vehicle and contain 10 times the computer power required to launch the first astronauts into orbit, so naturally it's got an equally complex steering wheel that's jammed with enough switches and dials to make an airline pilot cross-eyed.

Since Formula 1 cars do not require a great deal of directional input, the steering wheel is shaped like a butterfly. The first Formula 1 steering wheel did not have any gauges, knobs, buttons or dials. It was just that, a steering wheel. Early Formula 1 cars used steering wheels taken directly from road cars. The advent of complex electronic systems in Formula 1 throughout the 1990s changed all that. Ferrari engineer John Barnard was the first to introduce the semiautomatic sequential gearbox in 1989 in the Ferrari 640, driven by Nigel Mansell.

This system enabled Mansell to shift gears without having to move a hand away from the steering wheel. As time went on, the trend continued. Excepting the throttle and brake pedals, few Formula 1 cars have any controls other than those on the face of the wheel. Buttons tend to be used for 'on/off' (digital) functions, such as engaging the pit-lane speed limiter system, while rotary controls govern functions with multiple settings, such as engine mapping, traction control program, fuel mixture and even the car's front-to-rear brake bias.



K KERS

- SETTING OF VALUES FOR SOME OF THE MAIN MENU OPTIONS

TALK CHAT WITH OTHER DRIVERS WHILE RACING IN MULTIPLAYER SETTING

N NEUTRAL

LL LOOK LEFT

DEFAULT SPEED FOR CROSSING THE PIT LANE **PIT**

DRS **DRS**

SETTING OF VALUES FOR SOME OF THE MAIN MENU OPTIONS **+**

CONFIRMS THE SELECTION MADE BY THE MAIN MENU ROTARY SWITCH **OK**

LOOK RIGHT **LR**



SET LEVEL DRIVING LEVELS

ABS ABS LEVEL

TCS TRACTION CONTROL LEVEL

BIAS BRAKE BIAS



EVOTEK STEERING WHEEL

The Evotek SYM 027 Club Edition steering wheel gives users the opportunity to set different levels of driving controls, from beginner to driving in exactly the same conditions as professional Formula 1 drivers while practicing and racing. The knobs and buttons provided allow control of the driving simulation as well as the gaming setting. The knob in the bottom left corner of the steering wheel lets users set the driving levels, activating devices such as the default traction control and ABS, as well as selecting between automatic and manual gearshift. Selecting level 4 simulates the environment of a real Formula 1 car and allows the driver to switch from OFF to high presence of Traction Control (TCS) and ABS, or percentage of Brake BIAS.

There are 12 buttons on the Evotek SYM 027 Club Edition steering wheel which give users the full control of the vehicle. Five selections have the task of simulating driving conditions. The 'N' and 'R' buttons set the Neutral or Reverse gear, the 'DRS' and Kers ('K') selections boost the lap performance, while "Pit" sets the default speed for crossing the pit lane. Six buttons are used for gaming purposes. 'LL' and 'LR' (Look Left and Look Right) are used to check opponent cars' position while overtaking. The 'OK' button confirms the selection made by the main menu rotary switch placed in the center of the steering wheel, while the '+' and '-' buttons allow the setting of values for some of the main menu options. The "Talk" button allows the user to chat with other drivers while racing in multiplayer setting.



THE SOFTWARE

Laser scan tracks (3D laser scan)

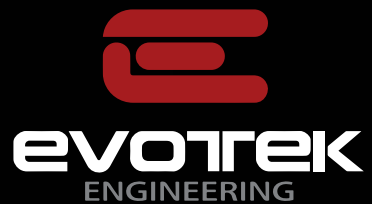
Laser scanning is consolidated technology enabling the precision capture and reproduction of objects and surfaces of any complexity and size, generating a 3D digital model entirely matching the original. Thanks to its millimetric precision, laser scanning is the most efficient and precise method for measuring and 3D documentation currently available for complex architectures such as circuits. All of our circuits are created using this innovative technology, which allows us, in digital post-production, to recreate an exact copy of the real circuit on which to run the simulation.

Assetto Corsa, the simulation software, is being designed to provide a very realistic

driving experience, with single player and multiplayer options. It uses the highest level of accuracy possible in reproducing real world motor racing environments. The software is developed by Kunos Simulazioni, an Italian software house active in the virtual driving sector offering a proprietary technology strongly focused on realism of dynamics models, supplying Evotek engineering and Car Manufacturers like Dallara and Ferrari. The Assetto Corsa physics engine is all new, using practical knowledge acquired from working closely with the elite of motorsport in order to engineer the best possible accuracy of physics and tactility of feeling.

The suppliers





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