



# ENGINEER'S HANDBOOK

# SEMI-PRO AND SIMULATION MODES

## PRE-RACE

### GARAGE TAB, SETUP 1 SCREEN

Changes can be made in the Garage at any time before a race begins. Once a race starts, the Garage will not be viewable.

Default setups vary by car.

### BRAKES

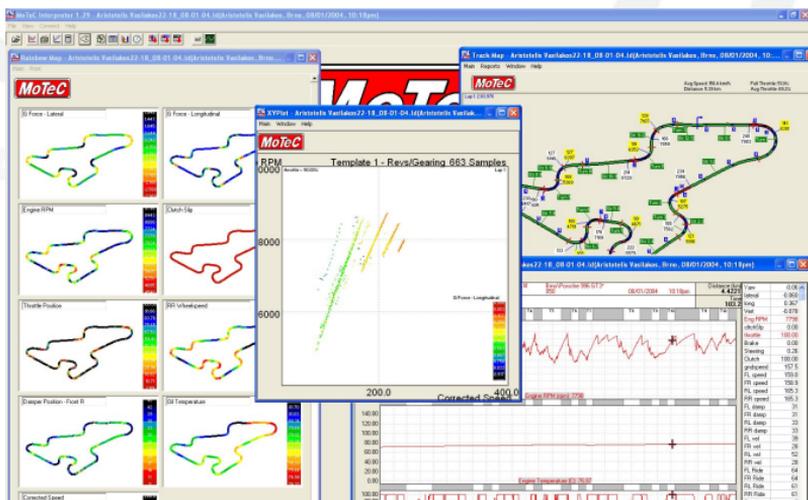
**Pressure** - Adjusts overall force applied on the brakes. At 100%, full force will be applied to the brakes. When the best percentage of brake pressure is applied for a car for a specific circuit, the brakes are less likely to lock up when cornering.

**Bias** - Adjusts the balance of braking pressure between the front and the rear brakes.

**Duct** - Increases or decreases the duct to adjust the brake temperature. Too cool or too warm brakes are less efficient, not stopping/slowing the car as quickly.

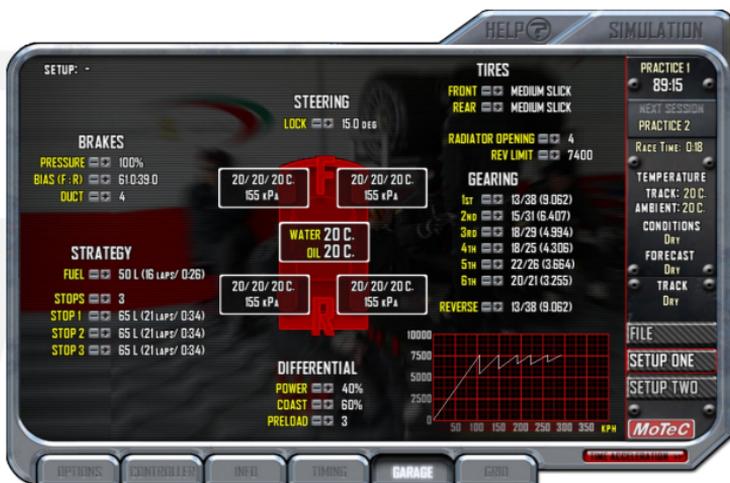
### MoTeC

Click on the MoTeC button to open MoTeC Interpreter, a separate program that analyzes the player's race performance down to the smallest detail. Visit <http://www.motec.com/support.htm> for more information.



# SEMI-PRO AND SIMULATION MODES

## PRE-RACE



Garage Tab, Setup One screen

## STRATEGY

**Fuel-** Adjust the amount of fuel with which the car starts the race. The number of laps the car can go on how much fuel is also displayed.

**Stops** - Select the number of pit stops to take during the race.

**Stop 1** - Select the amount of fuel to take at the first pit stop.

**Stop 2** - Select the amount of fuel to take at the second pit stop.

**Stop 3** - Select the amount of fuel to take at the third pit stop.

# SEMI-PRO AND SIMULATION MODES

## PRE-RACE

GARAGE TAB, SETUP 1 SCREEN, con't.

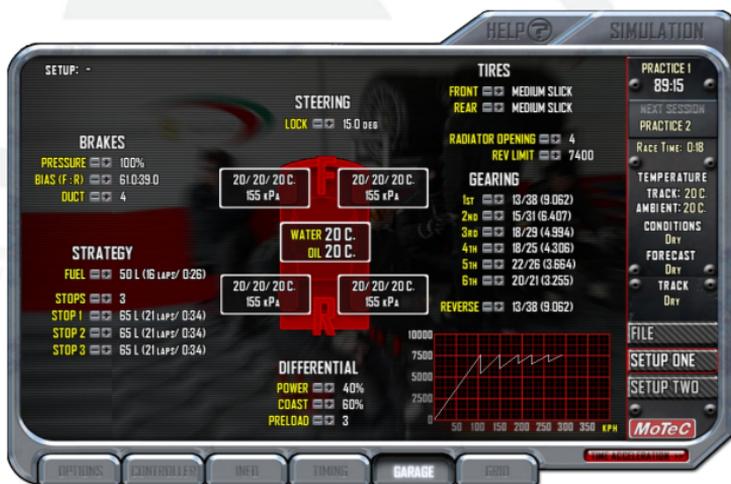
**Steering Lock** - Adjusts the steering sensitivity a few degrees. Greater lock yields tighter steering response.

**Differential** - Adjusts the Differential Power and Coast to tweak the distribution of torque to the rear wheels for traction and speed.

**Power** - Adjusts the amount (percentage) of force used to lock the inside and outside tyres together when accelerating, as when exiting a corner.

**Coast** - Adjusts the amount (percentage) of force used to lock the inside and outside tyres together when off of the throttle, as when entering a corner.

**Pre-load 1-5** - Adjusts the amount of lock built in before any acceleration/deceleration effects take place, as when in a neutral throttle condition (holding speed).

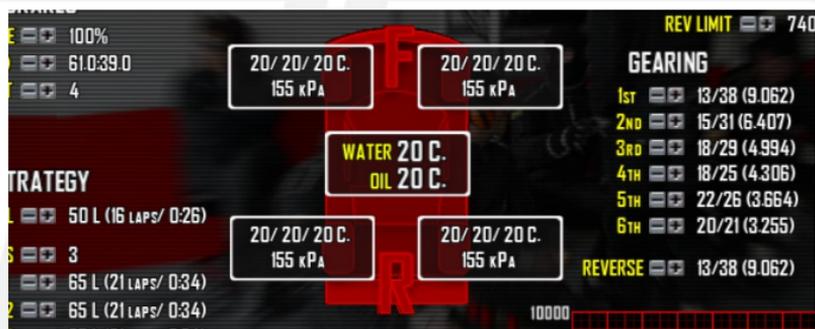


Garage Tab, Setup One screen

# SEMI-PRO AND SIMULATION MODES

## PRE-RACE

### Tyre Temperature and Pressure Readouts (Centre Screen)



Detail of tyre temperature and pressure readouts

View the tyre temperatures and pressure for each of the four tyres.

For tyres on the left side of the car, the upper numbers represent temperature for the outside, middle, and inside of the tyre. For tyres on the right side of the car, the upper numbers represent temperatures for the inside, middle, and outside of the tyre.

The bottom number is the tyre pressure of each tyre as of the last time the car was on the grid/circuit.

Tyre temperature and pressure impact how well the car grips the road, which in turn affects how well the car handles. For more detail on this, see the sections on Tyre Pressure and Camber.

In Simulation mode, it takes approximately 2-3 laps for the tyre temperature and pressure to equalize for maximum grip and pressure gradients.

## SEMI-PRO AND SIMULATION MODES

### PRE-RACE

GARAGE TAB, SETUP 1 SCREEN, con't.

**Water Readout** - Temperature of the car's water cooling system. Try to keep this temperature under 100C. Air temperature extremes can affect the water cooling system. To adjust water temperature, use a smaller or larger radiator opening.

**Oil Readout** - Temperature of the car's oil. Temperature will change during practice and qualifying sessions. Try to keep this under 100C. Oil temperature is tied to the water temperature and its radiator opening. To adjust oil temperature, use a smaller or larger radiator opening.

**Automatic Gearbox** - When enabled, the game does all the shifting. Recommended for keyboard players and beginners while mastering acceleration, braking, and finding the optimum driving line.

**Front and Rear Tyres** - Choose the best compound for the front and rear tyres for the circuit and weather conditions.

Soft, Medium and Hard tyre compounds are recommended for dry conditions. Soft tyres provide maximum grip, but wear out quickly. Medium tyres have slightly less grip than soft ones, but will last longer on the track. Hard tyres have less grip than medium ones, but will have a long life on the track.

Intermediate, wet, and Heavy Rain tyre compounds are recommended for wet and combination conditions. Intermediate tyres are able to grip the road in both wet and dry conditions. Wet tyres will perform under normal rain conditions, and Heavy Rain tyres should be used under heavy rain conditions.

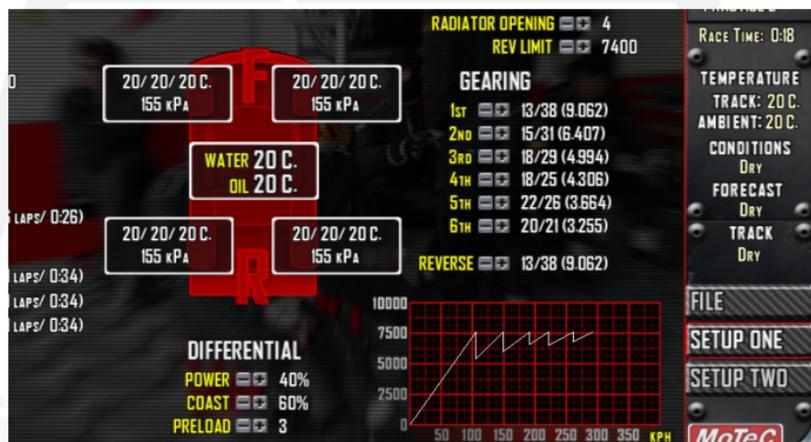


## SEMI-PRO AND SIMULATION MODES

### PRE-RACE

**Radiator Opening** - Adjusts the air flow to radiator, which helps cool the engine. Monitors water and oil temperatures. If they are higher than 100c, increase the air flow to the radiator. The larger the opening, the cooler the engine will run, making it safer to run at higher RPMs.

**Rev Limit** - Sets the maximum limit for the car's RPMs. The higher the RPMs, the faster the car will go, but the greater chance the car has of overheating.



Detail of gearing setup options

**1st - 6th and Reverse Engine Gear Ratios** - Adjusts the ratio of each engine gear. Taller gear ratio (smaller number) yields slower acceleration but higher achievable top speed in that gear. Shorter gear ratio (larger number) yields quicker acceleration but lower achievable top speed in that gear.

**Graph** - Graphical representation of selected gear ratios.

# SEMI-PRO AND SIMULATION MODES

## PRE-RACE

### GARAGE TAB, SETUP 2 SCREEN

Changes can be made in the Garage at any time before a race begins. Once a race starts, the Garage will not be viewable.



Garage Tab, Setup Two screen

**Symmetrical Setup** - Chooses whether to automatically match the right and left sides.

**Tyre Pressure** - Adjusts the amount of air pressure in the tyres. Tyre pressure affects car control as well as tyre wear.

Each tyre has an optimum amount of pressure at which it yields the most grip. Decreasing or increasing the pressure from this point lessens the grip. Ideally, the optimum pressure is when the centre tyre temperature is the average of the inner + outer tyre temperatures once the tyre gets up to operating temperature (about 85-95C). This usually takes 2-3 laps.

Additionally, the higher the pressure, the stiffer the car will be.

## SEMI-PRO AND SIMULATION MODES

### PRE-RACE

**Fast Bump** - Controls the rapid upward movement of this suspension corner following bumps and curbs. This Bump is described as "Fast" because the damper is moving up (compressing) in a rapid motion, usually above 100mm/sec (use telemetry). So this adjustment controls how a tyre conforms to the road as it's negotiating the leading edge-to-peak of a bump or road undulation. If you find the car pushing to the outside of the track in a "skating" fashion over bumps, then soften (lower) this setting. If the car floats and changes direction erratically, then stiffen (higher) this setting. When in doubt, go softer.

**Slow Bump** - Controls the mild UPWARD movement of this suspension corner caused by a driver input (steering, braking, throttle). This Bump is described as "Slow" because the damper is moving up (compressing) in a slow motion, usually below 70mm/sec damper speed (use telemetry). Used to affect chassis balance while we are transitioning into, and out, of the corners. Decreasing this number will speed up how quickly a corner accepts weight transfer while we are transitioning. Increasing will slow it down.

**Fast Rebound** - Controls the rapid DOWNWARD movement of this suspension corner following bumps and curbs. This Rebound is described as "Fast" because this damper is moving down (extending) in a rapid motion, usually above 100mm/sec (use telemetry). So this adjustment controls how a tyre conforms to the road as it's negotiating the peak-to-trailing edge of a bump or road undulation. If the fast bump setting has been changed, then it's usually a good idea to change fast rebound in a similar manner.

**Slow Rebound** - Controls the mild DOWNWARD movement of this suspension corner caused by a driver input (steering, braking, throttle). This Rebound is described as "Slow" because the damper is moving down (extending) in a slow motion, usually below 70mm/sec damper speed (use telemetry). Used to affect chassis balance while transitioning into, and out, of the corners. Decreasing this number will speed up how quickly this corner gives up - or "sheds" - weight transfer while we are transitioning. Increasing this setting will slow it down.



# SEMI-PRO AND SIMULATION MODES

## PRE-RACE

GARAGE TAB, SETUP 2 SCREEN, CONT.

**Springs** - Adjusts the tension of the springs. Less tension (or softer springs) yields better grip but slows response time to driver input. More tension (or stiffer springs) makes the car respond more quickly to driver input, but yields less grip.

**Camber** - Adjusts the angle of the wheel in relation to the driving surface.

Negative camber makes the top of the tyres tilt inward towards the centre of the chassis, and helps give better grip through the corners. Though used less frequently, positive camber means that the wheels tilt outward, which gives some stability in a straight line but less grip when cornering. For road racing cars, only negative camber is used.

Ideal camber can be tuned using tyre temperatures as the guide. The inner tyre temperatures should be about 7-10c hotter than the outer tyre temperatures, slightly less at the rear. The amount of (negative) camber used will vary, based on the type of suspension and amount of roll resistance (springs and antiroll bars) used in the set-up. The stiffer the roll resistance, the less negative camber needed. The less efficient the suspension, the more negative camber needed.

**Caster** - Adjust the degree the tyre leans forward or back at the top of the wheel. Caster increases or decreases directional stability. Positive caster provides the directional stability, yet too much positive caster makes steering more difficult. Negative caster requires less steering effort but can cause the car to wander down straights.

The screenshot displays a car simulation setup screen with the following parameters:

SETUP: -	SPLITTER	ANTI-ROLL BAR	TOE-IN	TYRE PRESSURE	FAST BUMP	SLOW BUMP	FAST REBOUND	SLOW REBOUND	SPRINGS	CAMBER	CASTER	PACKERS	RIDE HEIGHT	WATER	OIL	TYRE PRESSURE	FAST BUMP	SLOW BUMP	FAST REBOUND
145 kPa	2	140 N/MM	-0.10 DEG	145 kPa	6	4	8	4	270 N/MM	-3.0 DEG	2.5 DEG	0.0 CM	6.0 CM	20/ 20/ 20 C.	20/ 20/ 20 C.	145 kPa	6	4	8
155 kPa														20/ 20/ 20 C.	20/ 20/ 20 C.				
140 kPa				140 kPa	2	2	6									140 kPa	2	2	6

Additional settings shown in the center: WATER 20 C., OIL 20 C.

Additional settings shown at the bottom: TYRE PRESSURE 140 kPa, FAST BUMP 2, SLOW BUMP 2, FAST REBOUND 6.

Detail of setup options

# SEMI-PRO AND SIMULATION MODES



## SEMI-PRO AND SIMULATION MODES

### PRE-RACE

GARAGE TAB, SETUP 2 SCREEN, CONT.

**Packers** - Adjusts the number of packers. Extra spacers are put in to adjust how soon the bumpstops come into play to limit downward travel of the chassis. The more packers, the sooner and more effective the bumpstops will be at limiting travel, though they can cause chassis instability over bumps and heavy vertical G-force corners - like Spa's Eau Rouge. Use only if necessary as a last resort to avoid chassis scraping.

**Ride Height** - Adjusts how high the bottom of the car is off of the ground. The lower the ride height, the tighter the suspension, and the lower the car's centre of gravity will be. Adjusting the ride height too low can make bumpy tracks tricky because the car is more likely to bottom out.

**Splitter** - Adjusts the level of downforce applied by the splitter. Adds front-end grip at speed. The higher the number, the more air the front wing deflects, and the more downforce and drag (slowing top speed). There are only two choices: High-speed (setting of 1) and Normal (setting of 2). At most tracks, using normal (2) is recommended, but at Monza, high speed (1) is recommended.

#### **Tyre Temperature and Pressure Readouts (Centre Screen)**

View the tyre temperatures and pressure for each of the four tyres.

For tyres on the left side of the car, the upper numbers represent temperature for the outside, middle, and inside of the tyre. For tyres on the right side of the car, the upper numbers represent temperatures for the inside, middle, and outside of the tyre.

The bottom number is the tyre pressure of each tyre as of the last time the car was on the grid/circuit.

Tyre temperature and pressure impact how well the car grips the road, which in turn affects how well the car handles. For more detail on this, see the sections on Tyre Pressure and Camber.

In Simulation mode, it takes approximately 2-3 laps for the tyre temperature and pressure to equalize for maximum grip and pressure gradients.

## SEMI-PRO AND SIMULATION MODES



# SEMI-PRO AND SIMULATION MODES

## PRE-RACE

GARAGE TAB, SETUP 2 SCREEN, CONT.



Garage Tab, Setup Two screen

**Water Readout** - Temperature of the car's water cooling system. Try to keep this temperature under 100C. Air temperature extremes can affect the water cooling system. To adjust water temperature, use a smaller or larger radiator opening.

**Oil Readout** - Temperature of the car's oil. The temperature will change during practice and qualifying sessions. Try to keep this under 100C. Oil temperature is tied to the water temperature and its radiator opening. To adjust oil temperature, use a smaller or larger radiator opening.

**Wing** - Adjusts the level of downforce at the rear of the car, and is the main adjustment for aerodynamic balance. After deciding on a front splitter, use the rear wing to dial-in the aerodynamic balance.

Total amount of adjustment is 10 for NGT cars and 12 for GT cars. For splitter setting "1", select a wing setting of 4-7. For splitter setting "2", select a wing setting of 8-12.

The greater the rear wing setting, the more aero drag, which slows top speed.

## SEMI-PRO AND SIMULATION MODES

### PRE-RACE

**Toe-in (Front and Rear)** - Adjusts the degree the front of the wheels angle towards or away from each other. This affects the directional stability and initial corner turn-in.

On the front, the preferred set-up is usually a slight amount of toe-out (negative settings), as this helps turn-in.

On the rear, the preferred set-up is usually toe-in (positive settings) as toe-out creates instability.

Too much toe (positive or negative) can slow the car down with increased rolling drag. Too much toe-in in either direction causes understeer and tyre wear. As this is not a major setup tweak, the default settings are recommended.



## THE EXPERTS SPEAK

***FIA GT race car drivers Henrik Roos and Christophe Bouchut join SimBin Development Team to share essential sim racing techniques that give gamers a competitive edge.***

**When braking after a long straight for a very slow turn, the car locks the wheels/brakes and starts sliding in forward motion.**

HR: I would adjust the brakes more to the rear.

CB: Turn the brake bias bar to that end of the car which is not locking; reduce camber, reduce anti drive and/or antilift; softer antiroll bars.

SBDT: Move the brake bias further to the rear or brake earlier.

**The car understeers in medium and high speed turns.**

HR: . It could be many things but first I would see if lowering the rear wing helps, because it also helps the car reach its top speed.

CB: Reduce front ride height; reduce rear wing

SBDT: Either increase the front splitter setting or reduce the rear wing angle. Further fine tuning could be done with the rake angle of the chassis. This would be facilitated by changes to the rideheight, which ideally should be at least an inch higher at the rear. As with all other settings though, this will affect other aspects of the setup.

**The car spins when I start applying the accelerator after passing an apex (presumably in a flat out zone).**

HR: This could result from many different things. Soften the low speed on the rear and follow up on loser antiroll bar rear. **WARNING:** Could give high speed understeer if over done.

CB: Reduce antisquat, soften rear damper, lower speed bump, increase rear toe in.

SBDT: Try decreasing the differential lock to aid power delivery here. Alternately, try softening the rear slow bump settings on the shocks in combination with more front slow rebound settings and stiffening the front antiroll bar.

## THE EXPERTS SPEAK

**The car loses grip/balance on bumpy areas of track.**

HR: Your car could have too hard springs, or to much high speed bump.

CB: Softer springs, soften rear damper and high speed bump.

SBDT: Initially, softer springs would be a solution, but with softer springs, the ride height should be increased as well because the suspension travel would be greater as would the likelihood of bottoming out on bad bumps. For example, Donington at the bottom of Craner curves has a bumpy section where if the springs are too soft you need a considerable amount more ride height to compensate. Additionally, some fine tuning with the fast bump and fast rebound to the balance would probably be needed. Remember:

Bump: How quickly the chassis is allowed to move down

Rebound: How quickly the chassis is allowed to move up



**SIMULATION**

## THE EXPERTS SPEAK

**What is the difference between different tyre brands and compounds? Why are my hard tyres so cold and why do my soft tyres overheat and wear quickly? What are the optimum tyre temperatures?**

HR: The difference in tyre manufacturing is a well-kept secret and changes from year to year. Optimum tyre temp is 80C with no more than 10 degrees difference from inside to outside of tyre.

CB: Different tyre brands have different constructions and different compounds: a soft compound (soft tyre) provides more grip and the tyre surface has to do more deformation work and so becomes hotter; the higher the temperature the more grip and the more wear; optimum temperature is 80-100C.

SBDT: *Dunlop:*

Most forgiving, heats up quickly, more low-speed grip with higher fall off at high loads. Needs most camber of the bunch. Softest spring rate. Medium wear. Highest rolling drag. Peak temperature of 99C.

*Michelin:*

The most precise tyre. Needs least amount of camber. Heats up relatively quickly (but a bit more slowly than the Dunlops). Features average grip with low fall off at high loads. Stiffest tyre with highest spring rate. Lowest rolling drag. Best wear. Peak temperature of 99C. Probably the fastest over long runs.

*Pirelli:*

Highest base grip once it gets up to temperature. This is the most sensitive tyre to temperature, so it feels like it takes a bit longer to warm up. Medium rolling drag, medium stiffness spring rate. Worst wear. Peak temperature of 105C.

If you choose the wrong compound for the conditions, the tyre temp gauge will tell you that. Optimum temp ranges are 85-105C usually. If you are too far out of this range with a MEDIUM tyre choice, then think about changing compounds. If the temps seem low (under 75C), switch to a SOFT compound. If the temps run high (over 110C), use a HARD tyre compound. Allow 4 or 5 laps for the tyres to really get up to their operating temperature.

## THE EXPERTS SPEAK

The soft tyres wear the most quickly even if you have the temperature within range; the mediums less and the hards the least. Keep in mind that softer tyres at 110C aren't always faster than the next harder compound at 85C.

**Soft** - To be used in qualifying or in cold conditions. Also some of the rear-heavy cars can use a soft front combined with a harder rear to good effect.

**Medium** - The most common choice. Gives the best combination of grip and heat.

**Hard** - Used when it is very hot out. Also sometimes used on the rear of a heavy car, or when you need maximum life out of your tyre and are willing to sacrifice a little grip.

The optimum tyre temperatures are 85-105C for Dunlops and Michelin, 90-110C for Pirelli's.

### **What are toe-in/toe-out settings and how will they physically affect the handling of my car?**

**HR:** Toe-in makes your car a little bit more steady during braking, and toe-out makes it steer into the corner a little better.

**CB:** *Toe-in:* Wheels aligned in a way that they are pointing inwards; toe-in generally increases lateral grip - but also increases tyre temperatures and rolling resistance; stabilizes car under braking.

*Toe-out:* Wheels aligned in a way that they are pointing outwards; front toe-out improves turn in.

**SBDT:** Having the front wheels toe out slightly can improve turn in response into corners, also can settle the front end down the straights reducing the tendency for the car to wander. Ideally a small amount for example  $-0.50$  would be a good starting point.

## THE EXPERTS SPEAK

### What are antiroll bar settings and how will they affect handling of the car?

HR: The setting of the Viper is hard in the front and medium in the back.

CB: Antiroll bars influence the dynamic wheel loads. Different settings provide different wheel load distributions and so different handling characteristics. Basically, stiffer front antiroll bar gives more understeer and stiffer rear antiroll bar gives more oversteer and vice versa.

SBDT: Stiff antiroll bars give the chassis a more rigid, direct feel and promote faster tyre degradation compared with softer settings. Softer settings may have a looser feel, but can improve the car's control by reducing the speed of the weight transfer (how quickly the chassis will respond to inputs from the driver controls), though it may not be precise enough for a fast chicane where fast weight transfer is more desirable.

Ideally the front antiroll bar would always be around 70% more than what the rear is set to.

### I never reach to use the 6th gear, what's wrong with my setup?

HR: In this case I would say change the gear ratio. Could also be too much wing sometimes.

CB: Too long gear ratios; individual gears or final drive or drop gear.

SBDT: The 6th gear ratio is too long. Reduce this so the RPM peaks in 6th gear at the end of the longest straight at the track, then evenly space the other ratios to suit.

## THE EXPERTS SPEAK

**What is the relation of tyre outer/centre/inner temperatures? What should I try to achieve for best grip and wear?**

HR: No more than 10 degrees difference.

CB: The camber setting is the main factor governing tyre temperature spread; the temperature spread should not be more than 10-15 degrees different.

SBDT: Tyre temperature should always be balanced across the tyre for optimum grip and wear. To balance the outer and inner temperatures, adjust camber. To balance the centre temperature, adjust tyre pressure.

**What do “hard and soft suspension settings” mean? Why are they called that and how does it affect the car?**

HR: Hard setting should be used on quick and very smooth tracks; soft should be used on narrow and bumpy tracks.

CB: Hard means stiff springs and/or stiff damper settings. Soft means soft springs and/or soft damper settings. Stiff suspension settings provide less mechanical grip but provide more stable aerodynamics and better driveability.

SBDT: A soft spring will give the chassis a more sloppy feel but be more predictable in most circumstances. The only reason to really use a stiffer spring is to stop the car from bottoming out on larger bumps or to speed up the response of the chassis from driver input.

## THE EXPERTS SPEAK

### **My tyres are gone after 2 laps, how can I make them last longer?**

HR: Check the tyre temperature. It could be that you have too much air pressure. Other possible tweaks would be making the fast bump softer, and using a harder tyre compound.

CB: Harder tyre compound, softer springs.

SBDT: A combination of events could be the cause of this. Firstly, a really stiff chassis would cause excessive wear on the tyres, so using softer suspension settings would be kinder to the tyres. Secondly, over driving the car could contribute to tyre wear. Lastly, having the wrong tyre compound selected would also contribute to excessive tyre wear. Tyres need to be kept within the specified operating temperatures for optimum wear and grip.

### **I made changes to some settings, how do I know if they work or not?**

CB: Compare laptime, driver comment and recorded data (runs to be under comparable conditions.)

SBDT: Change one setting at a time, then test for at least 3 – 5 laps to learn the effect on your car before making the next change.

### **How do I know how much fuel I have to put in the car for the race?**

CB: Calculate lap consumption out of the fuel used in the practise sessions. Lap consumption x number of race laps = required fuel.

SBDT: At the main garage screen on the right hand side near the top, the race length in laps is shown. Always add some more laps in the strategy just to be safe, as how the car is driven will also affect the economy of the car.

## THE EXPERTS SPEAK

### What are the differences between the Power/Coast differential settings?

CB: The power differential setting gives the differential locking rate when accelerating. The coast differential setting gives the differential locking rate when braking.

SBDT: The power side is the amount, or percentage, that is used to lock the inside and outside tyres together when accelerating, such as when exiting a corner. The Coast side is doing the same, but when you are off of the throttle, such as when entering a corner. The Pre-load is the amount of lock built in before any acceleration/deceleration effects take place, such as in a neutral throttle condition.

### My car understeers at low speed, but oversteers at high speed.

HR: Soften the antiroll bar front and more wing in the back.

CB: Try softer front antiroll bar or softer front springs and more rear wing and lower rear ride height.



**SIMULATION**

## THE EXPERTS SPEAK

SBDT: There is more than one possible reason for this, but in general, the lower speed handling is controlled by the springs, sway bars, and the higher speed handling is dominated by the aerodynamics. In this case, stiffen the rear springs or antiroll bars to address the low-speed understeer, and increase the rear wing to combat the high-speed oversteer.

### What are the different Aero adjustments and their effects on the car?

HR: You can work with the wing in the back and a smaller or wider rear diffuser. In the front you can adjust the inner wing in the bumper.

CB: *Ride height, Rake* (difference between front and rear ride height), *Wing setting, and size of gurney.*

Low ride height = more downforce.

Higher rake - downforce balance moves to the front.

More rear wing - more rear downforce, more drag--> less top speed

Bigger gurney - more rear downforce, more drag--> less top speed.

SBDT: *Front Splitter* - Adds front downforce. Basically there are only two splitters. One is for high-speed Monza (low drag / less downforce) and the other is for everywhere else. The splitter isn't used to fine tune the aerodynamic balance but rather sets the basic approach to the aerodynamic setup. High-speed = 1. Normal = 2.

*Rear wing* - Fine tune your aero balance. There are 12 wing adjustments. With a front splitter setting of (1) use wing settings of 4-7. For a front splitter setting of (2) use wing settings of 9-12.

*Ride height* - These control the underbody downforce, which is considerable on the GT cars and a lot less on the NGT's. The ride height and the "pitch" or "rake" of the car (difference between the front and rear ride height) control the amount of downforce. In general, you want the ride height as low as possible, plus a slight forward pitch for maximum effect. To achieve this on-track usually requires the rear ride height to be 20-25mm higher than the front when setting it in the garage. The NGT's can get away with 15mm difference. Having a "pitch up" condition will cause the car to lose a lot of the underbody downforce, so avoid this. Additionally, if the car comes down and touches the track, the air underneath will "stall" and you'll abruptly lose all underbody downforce!

## THE EXPERTS SPEAK

**When do you alter the fast bump or slow bump rates, and what effect do those have on handling?**

HR: The slow bump works more on the whole car's movement, almost like the rollbars, and the fast bump works more on track-related bumps.

CB: Slow bump setting controls the chassis movements under braking, cornering, and acceleration.

SBDT: *Fast Damping Adjustment* - You adjust fast bump if the car's handling is causing problems over bumpy sections of the track or riding the curbs. You want the fast bump setting just soft enough to absorb these undulations, but not so soft as to compromise the length of time the chassis takes to settle over these conditions. If you find the car understeering soften the FRONT fast bump and bring the fast rebound down along with it. If you find the car oversteering over the bumps, then soften the REAR fast bump and rebound. If you find that the whole car just skates to the outside of the corner (neither end first), then soften all four dampers. If the car seems not to notice the bumps at all then stiffen the shocks until a problem is felt, then back off a click or two.

*Slow Damping Adjustment* - Slow damping is mainly used for affecting the transitional balance of the racecar as it is forced to change direction - or attitude - away from any steady-state condition. This is anything having to do with the driver inputs. Steering, braking, and accelerating. The most common adjustments for slow damping is to cure contradictory handling of the racecar from the entrance to the exit of a corner, such as when the car understeers on the entrance to a corner, yet oversteers on the exit.

The slow bump adjustments will be the main contributors to these handling adjustments. To cure understeer on entrance only soften the front slow bump, or stiffen the rear slow rebound. To cure oversteer on corner entrance stiffen the front bumps, or soften the rear rebounds. To Cure power exit oversteer, soften the rear slow bump, or stiffen the front slow rebound.

**I am experiencing motion sickness going around the track. Can I help that?**

SBDT: Yes, reduce the G-force simulation on the Options Tab.

## QUICK LIST OF COOL THINGS

***For gamers-on-the-go who just want a quick reference of hard to find details about the game.***

01. While in cockpit view, press the LMB and move the mouse forward/back to adjust seat forward/back.

02. While in cockpit view, press the RMB and move the mouse forward/back to adjust seat up/down.

03. Assign a key/button to "Free Look" (default "F"). Then, when in the car, press this key, and move your viewpoint by moving the mouse around.

04. While on the track, press the "PAGE UP" key, and use the NumPad keys to rotate around the car. ( use 3 and 4 in combination, to line the camera up for some creative screenshots )

05. While on the track, press the I key (default) to switch to/from AI control. Then press the PAGE DOWN key, and watch from trackside cams as the car zooms around the track.

06. Select nose-cam as default view, HUD on, Mirrors on, and virtual mirror, for an immersive arcade-style view.

07. While in cockpit mode, press the SPACE bar to cycle the Motec display. Observe tyre temps changing in realtime for eg.

08. On the Car Tab (Co-Driver), set Starting Driver to 2nd driver, and 2nd Driver Control to AI, and watch your teammate do the private practise.

09. On the Circuit Info screen, click on the Info symbols to hear information about each turn.

10. Follow close behind a few AI cars, and observe them driving and making mistakes based on a set of individual driving characteristics.

11. While racing, notice how the race groove builds up over time. The wheel grip drops off further away from the groove, and the marbles (pieces of rubber and other debris that comes off the wheels for example) build up next to the racing line. Notice how you can feel them through the steering wheel with FFB in addition to the obvious grip loss when driving over these marbles.

## QUICK LIST OF COOL THINGS

12. Do you own TrackIR hardware? GTR has full support for TrackIR enhanced mode, so be sure to try it in the game!

13. Drop MP3 music tracks into the Music folder in your GTR install, enable In-Car Music from the options menu, and enjoy racing while listening to your favorite songs.

14. Don't miss the Showroom feature under the CAR tab. You can use this to make great wallpapers for your windows desktop. Here's how: Select your favorite car, and click the Showroom button. Now, using the mouse you can left-click-drag to rotate the car, and right-click-drag to zoom. Once you're happy with the position of the car, press the PRINT-SCRN button. This will copy the screen to the windows clipboard. Next, start up a paint program (Photoshop or such), create a new doc, and paste the clipboard. That's it!

15. When watching an instant replay, you can use the arrow keys to fwd/rew/pause/reverse the replay. The INS and DEL keys on the numeric keypad will do two different speeds for slowmotion effects.



SIMULATION

# MULTIPLAYER ETIQUETTE

## MULTIPLAYER ETIQUETTE

*Multiplayer races can be quite different from races played against the game's AI. With experience, a player can predict how the AI cars will react in a given situation. Predicting the movements and reactions of live players is another matter entirely. The most challenging and enjoyable multiplayer races have drivers who understand and follow a common set of driving conduct rules.*

Whether the race is online or on a LAN, the following etiquette guidelines are recommended. The host of the race has the ability to enforce community standards by removing a driver from a race. The host can also exclude a driver from future races held by that host by blocking an IP.

01. Do not intentionally run into other cars on the track, ever.
02. Be careful not to make contact with another car when trying to pass, even if you are faster. Instead, keep up the quick pace and make a clean pass when the opportunity arises.
03. Avoid running other cars off of the track. If your opportunity to pass requires another car to leave the track to avoid an accident with you or someone else, wait for a different opportunity.
04. If you are running slower lap times than a car behind you, let it pass if it can do so without interrupting your driving line. Defending your position from a car with similar performance is acceptable, but blocking when your car is being out-performed is not.
05. Yield if your car is being lapped.
06. If your car has left the track, be conscious not to pull back on in front of another driver.
07. Drive on the track. Cutting across a corner to reduce lap times is considered cheating.
08. Take care of your car. When considering a move that might damage the car, think, "If I actually owned this car, and had to pay for its repair, is the risk worth it?"
09. If you are involved in an accident, take the approach of figuring out how to avoid the situation in the future instead of jumping to accuse and flame another driver, even if another driver caused the situation.

## MULTIPLAYER ETIQUETTE

10. Play nice! Save your competitive energies for running flawless laps rather than being discourteous to other drivers via chat.

Ultimately, drivers who win consistently have invested the time in finding the best car set-up and in learning the track. Concentrating effort on driving skill rather than trying to get ahead with poor driving etiquette pays off in the end.



