

Paolo Cattani's



Virtual Grand Prix 2

The "Real" Simulation





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Welcome to Virtual Grand Prix 2! Thank you for purchasing the most advanced open-wheeled car simulator ever. We hope you will enjoy the adrenaline of virtual racing!

QUICK RACE

If this is the first time you have played Virtual Grand Prix 2 you may want to configure the input device you will play the game with. Select 'OPTIONS' from the main menu and then 'INPUT'.

You can play VGP2 with the mouse, keyboard or an InputSprocket or HID-compatible device (Select 'CALIBRATE JOYSTICK' to configure it). In the latter case you can configure the devices buttons (refer to section 'INPUT' in 'Configuring The Game').

Return to the main menu and select 'SINGLE RACE'. Select the track and then 'RACE'. Wait for the semaphore red lights, and off you go!



SYSTEM REQUIREMENTS

An Apple® Macintosh® computer (or compatible) equipped with a PowerPC® microprocessor, 64Mbytes of RAM, accelerated 3d video card with at least 8Mbytes of graphics RAM and CD-ROM drive (any speed).

MacOS Classic operating system 9.2 with OpenGL, SoundManager, InputSprocket, DrawSprocket and NetSprocket extensions
or MacOS X - 10.2 or higher.

INSTALLATION

VGP2 does not require any particular installation procedure (you can play it directly off the CD). Only by installing it onto your hard drive will you be able to save configuration files (game options, car setups, etc.). To install the game, simply drag the VGP2 directory to the preferred area of your hard drive.

To play the game, simply double click the appropriate VirtualGP2 icon in the VGP2 directory, depending on whether you are running MacOS Classic or MacOS X environments. For Mac OS X you can choose the ForceFeedback version (this will require 10.2.4 or better). Once loaded, the game will start (you can click the mouse to skip the intro).

CONFIGURING THE GAME

From the main menu select 'OPTIONS', then select the subsystem you want to configure:

VIDEO:

Select the screen resolution, screen depth and Z-buffer bits; the new settings will take effect the next time you play VGP2.

You can also configure the amount of visual effects and level of detail in the game.

The faster your hardware, the more effects you can turn on without loss of

performance. If you select a screen resolution not supported by your hardware, VGP2 will revert to a 640x480, 16bit-colour resolution.

AUDIO:

Select the volume level of music, game f/x, speech, etc.

INPUT:

Select and configure the device you will use to play the game with. Select 'JOYSTICK' for any HID-compatible device. You can configure it by selecting 'CALIBRATE JOYSTICK'. In this menu you can also assign the most useful in-game actions to keys/buttons.



SIMULATION:

Select the level of realism of the game, including car damage and the possibility of wet races. Be aware of the fact that 'REALISTIC' is probably the most advanced car simulation model even written for a computer game - more a real-time open-wheeled

car simulation than a racing game - so be prepared for it. We suggest that you first read the 'Techniques' section of this manual if you want to select this mode.

GAME:

Select the players driver/team you will be racing for, the opponents' AI level and the duration of qualifying session (100% = 1 hour) and race.

SAVE/LOAD:

Select 'SAVE AS DEFAULT' to have the settings saved for the next time you play VGP2. 'LOAD DEFAULT' will revert to the last settings saved.

IMPORTANT NOTE:

Settings are saved in the 'opzioni.config' file in the 'config' directory. If you want to revert to default game settings simply delete this file by dragging it to the trash.

NETWORK GAME

From the main menu, select 'NETWORK GAME' and then either 'SERVER' or 'CLIENT' depending on whether you are hosting a new game or joining an existing one. You can host or join a network game if your computer is currently connected to a network (either local or not).

IMPORTANT NOTE: In a network game each player **MUST** play as a different driver. VGP2 will not allow different players playing the same driver in the same game. The host will only accept the first one and then assign a different driver to any other users playing with the same driver name, as long as there are other drivers available.



If you select 'SERVER', configure the NetSprocket/OpenPlay panel by inserting your name and selecting the network protocol to use for the game (under MacOS X only TCP/IP will be available). If you select TCP/IP, configure the port number (remember that the first 1024 ports are reserved by many standard services, so you should not select any number below 1025).

If nothing goes wrong you will be prompted by a panel showing the number of players currently connected (including yourself). Wait until all the players have joined the game, then press the 'START EVENT' button.



If you select 'CLIENT', configure the NetSprocket/OpenPlay panel by inserting your name and selecting the network protocol to use for the game. Then select the computer hosting the game. If you select TCP/IP you must insert the host's IP address and port number.

If nothing goes wrong you'll be prompted by the 'WAITING FOR SERVER' panel. Wait until the host starts the game. (meanwhile, you can chat with players already online)

During a network game you can quit at any time by simply abandoning the current session/event. If you are a client you will simply be removed from the game. If you are the host, the game will be force terminated and clients will receive a 'NETWORK ERROR'. The host can abandon the current session without force quitting the online game only if the current session is over, in which case the host will have the possibility to start a new session again (this is particularly useful if you wish to host a qualifying session, followed by the race, for example).

PLAYING THE GAME

Select a new event/session to start the game.

If you select 'RACE' you will be on the starting grid, ready to race. Wait for the semaphore, then go! Don't jump start, otherwise you'll get a stop-and-go penalty.

If you select any other session, the car will be in the pitlane. Click the mouse and look at the panel on the bottom left of the screen. You can change the amount of fuel, change tyres, and go to the pits. In the top left of the screen the game will display tyres status (only meaningful in the REALISTIC mode).

If you select 'RETURN TO PITS' you will go into the pits, where you will be able to change car setup and, in REALISTIC mode, control telemetry (refer to the 'Techniques' section). Select 'ENTER COCKPIT' to return to the car.

To exit the pits and go to the track, simply accelerate. If you release the accelerator near your pits you will return smoothly to the starting position. Pay attention to the fact that when you return to the pits the speed limit in the pitlane is 120KPH. The car is equipped with a cruise-control system that prevents you from accelerating over 120KPH in the pitlane, but you can still get a pit speeding stop-and-go penalty if you

enter the pitlane too fast. When you are near your pits, release the accelerator and the car will be repositioned automatically.

You can abandon the session at any time by clicking the mouse and selecting 'RETURN TO PITS'.

Other useful in-game keys (that you can re-assign to any other key/button) are:



Arrows keys:

'A' and 'S'

1-4 numeric keys:

7-9 numeric keys:

0 numeric key:

*:

':

~:

^:

'SPACE BAR':

'RETURN':

'P':

Control car in KEYBOARD mode

Shift gear up/down

Control camera view

Control visual info (such as best lap-times, etc.)

Turn off visual info display

Toggle HUD on/off

Look at next car

Look at previous car

Record telemetry (only available in REALISTIC mode)

Reset car

Change tyres (only available in REALISTIC mode)

Enter INSTANT REPLAY mode

WORLD CHAMPIONSHIP

From the main menu select 'START CHAMPIONSHIP'. Now you will have to qualify and then race on all the tracks installed in the game. The 'SAVE CHAMPIONSHIP' button will be available in the event menu in order to save partial results. The game will save a file called 'campionato.config' in the 'config' directory, you can make backup copies of it if you like.

During the championship season you are not allowed to race before qualifying, nor to abandon an event before its completion. At the end of every race the first six drivers will be granted some championship points, according to the following table:

- First: 10 points
- Second: 6 points
- Third: 4 points
- Fourth: 3 points
- Fifth: 2 points
- Sixth: 1 point

When all the races are completed, the driver who scored more points will be the World Champion, and the World Championship will end.



INSTALLING NEW TRACKS

VGP2 is designed with the possibility for the user to expand it by designing new tracks or installing third party ones. For an explanation on how to design your own tracks with the TrackDesigner2 tool, refer to the 'TKD2' section of this manual.

A VGP2 track is a folder named after the track it represents and containing all the data required by the game. These folders are installed in the 'circuiti' directory of VGP2. To install a new track, simply copy its folder to this 'circuiti' directory and then edit the 'circuiti.config' text file located in the 'config' folder of VGP2. Insert the name of the new track in the position you would like, then save the file. Pay attention to the fact that, in championship mode, races will follow the order of the 'circuiti.config' file.

TECHNIQUES

Virtual Grand Prix 2 is probably the most advanced open-wheeled car simulator ever. This means that to get the most out of it, the “virtual” car must be driven like a real one-seater. This section of the manual, written by Emanuele Colombo (an ex-Formula Ford driver and currently working for an Italian automotive magazine as a car test driver), will explain the basic techniques used by real racecar drivers in open-wheeled motorsport competitions.

SKIDDING FORBIDDEN

Open-wheeled racing cars are critical to drive. They easily lose grip all of a sudden. You have to be very quick and precise to control them. How do race drivers cope with these reactions? They drive without putting themselves into trouble.

Unlike rally cars, open-wheeled ones are not made to be driven sideways. In other words, no-one makes them spin while turning. It's a matter of tyres and ground type. Track tyres perform best when they do not slip. Only in these conditions can they deliver to the ground maximum force. The very same force by which the car accelerates, slows down and turns. When tyres begin slipping, these forces weaken

dramatically, thus the driver feels a dramatic loss of control. Moreover each control manoeuvre will cost a lot of time, and will cause even the best driver to lap slower. That is why rally specialists never skid the car on tarmac too. The secret for being quicker is to take advantage of all the available grip for braking the shortest, cornering at the higher speed and giving full throttle sooner.



THE DRIVING TECHNIQUE

All you need (both with a racing and a stock car) is to be smooth, to give the car the best stability and grip in every condition. The basic technique is surprisingly simple: just do one thing at a time. If you are approaching a turn, you need to brake hard on the straight line (while your front wheel is still pointing straight ahead). Then, always with the steering wheel in the central position, you reduce the pressure on brakes to be more precise in the final speed adjustment. When you begin steering, you should not be braking anymore. You lead the car into the turn without pushing either the throttle nor the brakes. When you reach the right steering angle to run through the turn, it's time to use the throttle a bit to maintain a constant speed and stabilise the rear of the car. Finally, at the very same moment you begin to return the steering wheel toward the central position you can speed up progressively. But not sooner! In this phase, the throttle follows the steering wheel.

This happens because all the forces needed to control the car are delivered to the ground by the wheels. Each tyre can withstand forces of a certain intensity, though. Breaking that limit would cause the car to slide away. In the toughest decelerations, for instance, all the available grip is used to slow down. That is why you cannot have the best deceleration unless the front wheels point exactly ahead. Should you steer, the force needed to change direction would add up to the one required to slow down, causing the wheels to slip. The same would happen if we push the brake or the throttle while cornering at the highest possible speed.



GRIP AND DYNAMIC WEIGHT TRANSFER

The force that a tyre can deliver to the ground depends heavily upon the weight pushing the wheel downward. This load is constant in static conditions (when the car is still) or if we drive straight on a flat horizontal plane, at a constant speed. But it changes when we steer, speed up or brake. When we brake, the nose of the car dives because part of the weight 'moves' ahead. When this happens, the front wheels can deliver to the ground higher forces than normal. They gain more grip while the rear wheels slip more easily. That is why braking while turning makes the car spin. While speeding up, the rear wheels bear a heavier load and consequently offer a better grip. So, approaching a turn in full acceleration makes it difficult to direct the car. And what about kicking the throttle in the middle of the turn? The car can react in two ways, according to the static mass distribution, the kind of tyres, the suspension set up and the engine power. Either the front or the rear wheels will slip. This is called 'understeer' and 'power oversteer', respectively.

CHAMPIONS' TRICKS

Drivers take advantage of dynamic weight transfer for cornering faster. Each kind of turn, however, has its own way to be approached.

We will call medium speed turns the third or fourth gear ones, such as Monza's Parabolica. We used to approach them without braking or accelerating. The car would spontaneously slow down, giving the front wheels the best grip to keep the nose on the line without making the rear wheels slip, if car set-up is correct.

We used to keep on braking a little more in very slow and narrow corners, such as Imola's Tosa. Due to the low speed it is rather easy to control the car, even if it slides a bit. Braking slightly helps us to better direct the nose as open-wheeled cars have little grip at slow speed.



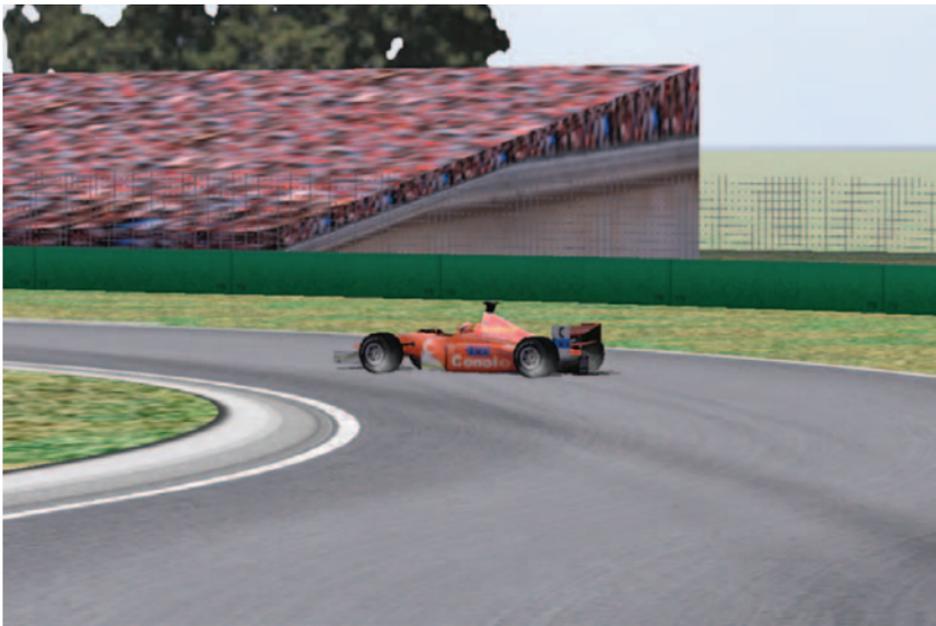
In fast turns like Imola's Piratella, we must preserve the best balance of the car. We do this by braking before steering and turning the wheel with total smoothness, while keeping the speed constant. With a light push on the throttle we keep the correct load on the rear wheels, preventing them from slipping.

But what about chicanes? We split them into two parts. We reach the end of the first turn keeping the foot on the brake whilst decreasing the pressure. When we change direction we go onto the throttle to stabilise the rear wheels, speeding up progressively at the end of the second turn.

EMERGENCY MANOEUVRES

If the wheels skid due to excessive braking or accelerating while we run straight, all we have to do is to stop braking or accelerating. But if this happens while cornering, the solution is not so easy.

We used to say that the car understeers (a 'push' car) if the front wheels skid while we turn. Now the car will not follow the line. What do we need to do? Just slow down and reduce the steering angle. In this way we 'move' the vertical load ahead, giving more grip to the nose.

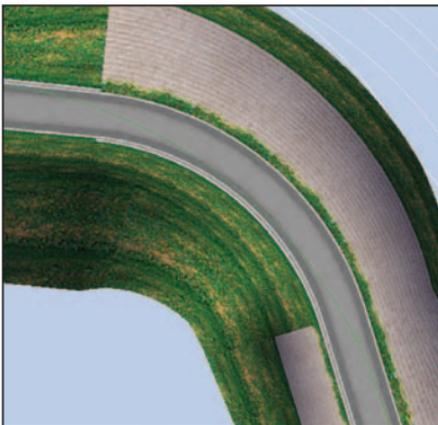


We call it oversteer (a 'loose' car) when the rear wheels skid and the car starts spinning. In this case we must quickly reverse steer (turn the steering wheel in the opposite way of the turn). Meanwhile, if we were slowing down we have to smoothly accelerate, to give the rear wheels more grip and stability. Otherwise, if we were already speeding up (power oversteer) we have to reduce the pressure on the throttle. We do this quickly but smoothly, because we should avoid transferring too much weight from the rear to the front, thus reducing the rear wheels grip. Anyway, when the back of the car stops moving sideways and is about to go back toward the line, we have to quickly turn the steering wheel to the central position. This is the most critical phase of the opposite lock manoeuvre, because if we are not quick or precise enough the car will spin to the other side (the so called 'pendulum effect').

LINES ON TRACK

Last but not least, correct racing lines to 'cut' corners are essential in order to be quick. Using the whole track width we will run through the turns with a reduced steering angle and at a higher speed.

We approach the turn running on the side of the track opposite to its direction: the external edge (i.e. if the track turns right, we start by keeping the car on the left side). Then we reach the inner edge of the track, keeping the car there as far as we can see the end of the turn. In that moment we turn the steer progressively back to the centre, to let the car go toward the external edge again. It is very important to choose the right point to reach the inner edge. We usually place this point exactly in the middle of high speed turns, 'moving it' further in slow turns. In this way we gain a



couple of meters to go straight and brake hard before the turn. So we can brake later and reach a higher speed on the straight line, precious meters if we want to overtake an opponent. Sure, we have to turn at a lower speed, but following this line we will be able to steer back to the centre sooner, and to speed up earlier. This is the most important rule: Be quick at the end of the turn to go faster on the straight line, even if we have to enter the turn slower.

CAR SETUP

The right driving technique is fundamental to make the car do what we want it to. But technicians and track engineers work a lot to optimise the car's behaviour and capabilities, according to the track and driver's style. Since engineers know each track very, in VGP2 you will find that your car has been already set up for each track. But if you still want to personalise the set up we are going to give you a short guide to explain how the various parameters can be altered and what kind of effect you can obtain by doing so.



TYRES:

COMPOUND: Soft tyres give better grip, but tend to wear out earlier. You can complete some laps with the same tyres and then determine how much they wear out, so that you can choose how many pit-stops will be required in the race. Remember, however, that you must choose the tyres compound during free practice, and then keep them for the whole event. Pay attention to the fact that these race tyres give optimum grip at a temperature of about 100° Celsius, so if you find that tyres are over-heating you had better choose a harder compound.

PRESSURE: There is not much to alter with the tyres pressure. Simply monitor their temperature after several laps. If the centre (Middle) is colder than the edges (Inside and Outside), the pressure is too low. If the centre is hotter, the pressure is too high. You should test the pressure each time you vary the aerodynamics or the weight distribution settings such as torsion/roll bars or ballast position.

CAMBER: This is a very important setting as it controls the degree of inclination of tyres in respect of the ground. While cornering, the lateral acceleration causes the car to roll and the tyres to deflect. Thus the angle between tyres and ground changes, and the tyre surface doesn't stick completely to the road. When this happens, of course, you cannot achieve the best grip. Varying the camber allows you to regain the perpendicularity of the tyre in the turns. How much you have to vary the camber angle depends upon the torsion and the antirolling bars stiffness. The more the car rolls the more you have to augment the camber. You can use telemetry to discover the right camber settings. Take a look at the tyre temperatures (IMO - Inside, Middle, Outside). Ideally the three values should be roughly equal. The hottest part is the one that works more. If it's the inner one, then you have to reduce the camber. If it's the outer one reaching higher temperatures, the camber should be increased. Do not forget, however, that an excessive camber angle gives you less grip on straight lines, both to speed up and to brake, and is a bad influence on car handling.

TOE-IN/TOE-OUT: Toe in the tyres, especially the rear ones, to gain more stability on the straight line and while braking. But if you exceed, the tyres will wear sooner and the car will corner less easily. This parameter also affects the heating of the tyres.

AERODYNAMICS:

WINGS: the higher the wing ran, the more downforce you have. As a consequence tyre grip will increase with the speed. So, you will be faster in fast corners. Unfortunately, drag will increase too, so the higher the wing ran, the less your maximum speed will be, and you should find the right trade-off between speed in fast turns and speed on the straights.



SUSPENSION:

TORSION BARS: These are the suspensions springs, their stiffness affects the road holding and the capability of the car to pass over kerbs, potholes and tarmac undulations. Soft springs give you more grip at low speed and allow you to glide over the kerbs, but they do compromise stability and road holding (due to the aerodynamic downforce loss) at high speed. If you want an understeering (push) car, for easier control on fast circuits, you had better tighten the front torsion bars and loosen the rear ones. Otherwise, for best handling on slow tracks, the right solution is to have soft front springs and stiff rear ones. But this makes the car tend to oversteer (too loose) which is critical during quick direction changes and while braking.

ANTIROLLING BARS (sway bars): These limit the roll angle of the car, thus are very useful in fast turns to keep the best aerodynamic efficiency. They should not be too tight in uneven tracks or if you want to run over the kerbs. Pay attention to the fact that asymmetric settings affect car balance. The stiffer the front bar, the more 'pushier' the car. The stiffer the rear one the 'looser' the rear.

SHOCKS: VirtualGP2 simulates 4-way shock-absorbers used in real open-wheeled cars. A shock absorber controls the speed of the wheel going up and down. Racing dampers have separate regulations for compression, rebounds, high frequency shocks and low frequency shocks. A compression takes place when the wheel goes up, because of a kerb for instance. After that a wheel usually rebounds. That means that the tyre goes down. This can happen both when it recovers from a compression, or when it sinks in a pothole. Kerbs and potholes cause high frequency shocks, that is why the high frequency trim should be kept loose. Roll and pitch caused by cornering, braking and speeding up are low freq shocks. That is why LF trim is usually stiffer.

RIDE HEIGHT: The lower the car is the better is its road holding and its aerodynamic efficiency, due to the 'Venturi effect'. Even so, the cars ride height must be enough to let suspensions absorb track roughness/kerbs without hitting the packers, because in that case the car will become abruptly difficult to handle. So this parameter is influenced by the springs stiffness, the aerodynamic downforce and the surface of the circuit. The flatter the track, the lower the car can be. You can use telemetry to discover the right ride height. If you find that the suspensions are hitting the packers ('pack!') while cornering or riding kerbs you should lift the car.

BALANCING:

BALLAST POSITION: the more you place it toward the rear of the car, the better traction you have, for best grip during acceleration. This can be the right solution when you race on circuits with slow corners followed by long straight lines (remember to increase the rear wing to compensate for the heavier rear in that case). But when many slow turns follow one another, it can be convenient to move the



ballast ahead, to reduce the cars understeer. It is a wise decision to leave the ballast as close as possible to the centre of the car as splitting it at the front and rear ends makes the handling get worse and the car more difficult to control when it skids.

BRAKE BALANCING: Usually it is the front wheels that do most of this job. But aerodynamics, ballast and ride height affect the braking distribution effectiveness, so if you change these settings brake balancing may need to be slightly changed as well.

ENGINE:

GEAR RATIOS: It can be useful to change gear ratios so not to be compelled to shift in the middle of a corner, or to compensate for high wing ran. Shorten gear ratios if you can't reach top revs in the fastest points of the track.

AUTO/MANUAL TRANSMISSION: This is self-explanatory

DIFFERENTIAL:

LIMITED SLIP DIFF: You can modify its behaviour in braking and during speed ups. A tight trim (30%-40%) in acceleration gives you better road holding, but is more difficult to control when the car skids. A tight trim in deceleration gives the car more stability, but less handling. That is why on winding circuits the differential deceleration trim should be loose (80%-90%).

TRACTION CONTROL: This limits power oversteer. When at 100 percent the car never skids, while at 0 percent you can taste the thrill of controlling 800+ hp all by your own. For best lapping, drivers look for the ideal compromise, commonly between 50% to 80%. "Ma si tu vuo' fa 'e sgumme..."

TRACK DESIGNER

Welcome to Track Designer 2. This section of the manual will explain how to use this powerful tool to modify existing VGP2 tracks and/or design brand new ones.

STARTING A NEW PROJECT

The first thing to do in order to modify/create a new track is to start a new project on your hard drive. A TrackDesigner2 'project' is simply a folder containing all the tracks related data.

The best way to create a new project is simply to copy the corresponding folder from the original VGP2 distribution CD to your hard drive. As an example, if you wish to modify the 'Monza' track, open the 'TrackDesigner2' folder on the CD and copy the 'Monza' folder to wherever you want on the hard drive. If you want to start a new track from scratch, copy the 'Empty_Project' folder.

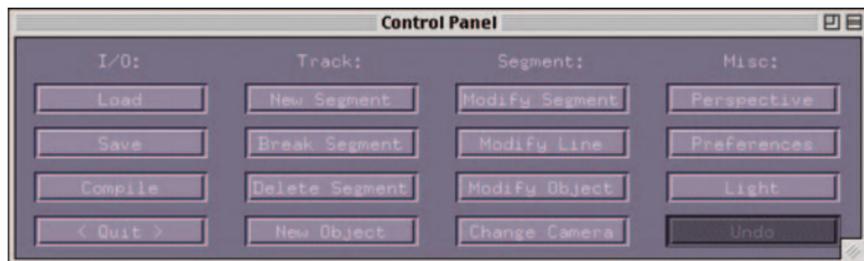
Then, open this new folder on the hard drive, locate the TrackDesigner2 icon and double-click it. TrackDesigner2 is a carbonised application, so it works both in Classic and X environments.

USER INTERFACE

As soon as you start TKD2 you will see two windows. These are the track preview window and the main control panel.

The first one is a real-time preview of your work, where you can modify the track with a point-and-click interface. It is, of course, empty at the start of the program. You can navigate the window using the numeric keyboard for moving up (8), down (2), left (4) and right (6), and the +/- keys for zooming in/out.

The main control panel is where you can perform many actions on the track, including saving and loading it, compiling it, creating new segments, etc. Some buttons on the main control panel may pop up additional panels, too.



To load a track, click the 'Load' button. Insert the track name in the 'File' control, press RETURN and then OK (the 'Dir' control is currently ignored). Tracks are located in the 'piste' directory of the current project folder. Many different tracks can coexist in a single project, allowing you to have, say, different versions/revisions of the same track or a group of tracks sharing common data (textures, objects, etc.).

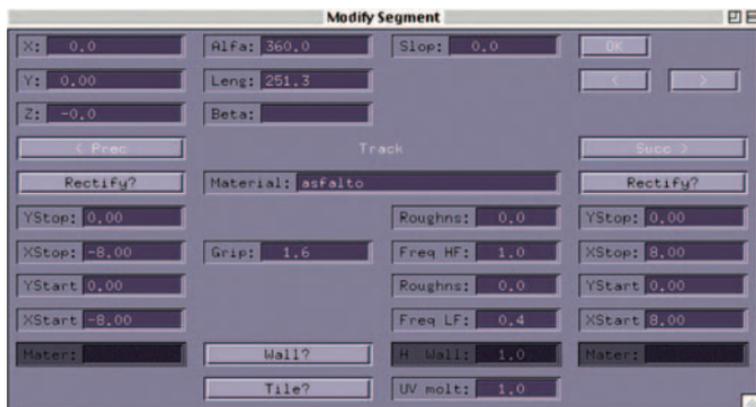
To save a track, click the 'Save' button, insert the name you prefer in the 'File' control, press RETURN and then OK. The track will be saved in the 'piste' directory located in the current project folder.

SEGMENTS

A track in TKD2 is made up of segments. You create a new segment with the 'New Segment' control in the main panel. You select the current segment by clicking on it in the preview window. You can destroy the current segment with the 'Delete Segment' control.

You can modify a segments geometry in two ways. Either by pressing the 'm' key in the preview window (while it is active) and then clicking on where you want it to end (press the space bar to exit this 'modify segment mode'), or by selecting the 'Modify Segment' control in the main panel. This will pop up a new panel containing many options. The top left part of this panel controls the X, Y and Z coordinate of the ending point of the current segment. Pay attention to the fact that the track lies in the X-Z plane (X positive to the left, Z positive to the bottom), Y controls the altitude of the track.

The track can be designed with as many segments as you want and with the geometry you want, but there are two important points that are mandatory:





1) The ending segment **MUST** finish where the starting segment starts. This should be obvious, but remember that TKD2 does not control this fact. If you do not 'close' the track this way and try to use it in the game, the game will malfunction or possibly crash. Pay attention to the fact that the finishing Y (altitude) value **MUST** be 0

2) The ending segment **MUST** be at least 200 meters long, and **MUST** contain a pit-lane (more on this later). This is the segment where the game will try to put the cars, if it is not long enough or if it doesn't contain a suitable pit-lane, problems will occur!

STRIPES

Each segment of track is made up of stripes. You can use as many as 20 stripes in a segment:

- 1 Outside Leftmost Trees [optional].
Named this way, but you can use it as you like
- 2 Outside Left Grass [optional]. Again, use it as you want
- 3 Leftmost Wall [mandatory]. The left wall of the track, **MUST** be present
- 4 Left PitLane [optional] *
- 5 Left PitLane Wall [optional]
- 6 Left Grass [optional]. The grass to the left of the track (if present)
- 7 Left Kerb [optional]. The left kerb (if present)
- 8 Track [mandatory]. The tarmac stripe, **MUST** be present
- 9 Right Kerb [optional]. The right kerb (if present)
- 10 Right Grass [optional]. The grass to the right of the track (if present)
- 11 Right PitLane Wall [optional]
- 12 Right PitLane [optional] *
- 13 Rightmost Wall [mandatory]. The right wall, **MUST** be present
- 14 Outside Right Grass [optional]. Use it as you want
- 15 Outside Rightmost Trees [optional]. Use it as you want
- 16-20 Auxiliary Stripes. For any use (outside hills, mountains, trees, etc.)

The game dynamics uses only stripes 3 to 13. This means that only these stripes influence car dynamics, the other stripes are only 'cosmetic' ones. They will be displayed in the game but cars will not interact with them, as they should only be placed outside of the track and be unreachable by cars.

You can modify a stripe in two ways. Either by pressing the 's' key in the preview window (while it is active) and then clicking on where you want it to end (press the space bar to exit this 'modify stripe mode'), or by selecting the 'Modify Segment' control in the main panel. This will pop up a new panel containing many options. The bottom part of this panel controls stripes.



You can cycle between stripes by using the two '< Prec' and 'Succ >' controls (the name of the currently selected stripe will appear in the centre).

You can modify stripe material (colour, lighting properties and texture) by inserting its name in the 'material' input box (more on materials later). The stripe is disabled until you specify a material for it.

You can modify the left and right offsets of the stripe from the segments centreline by inserting the values in the X input box. Stripes 3 to 13 are not changeable if they are not enabled by specifying a material for them. Disabled stripes will have 0 width and will be 'attached' to enabled ones.

You can change the stripes altitude offsets by inserting the values in the Y input boxes. This will let you modify the stripe banking, useful for designing kerbs, parabolic turns, etc. Pay attention to the fact that these values should not be modified for changing the whole segment altitude (change it in the top left corner of the panel), they must be used only to specify an offset from the centreline altitude of the track. The 'Rectify?' button toggles between rectified or curved edges of the stripe. The 'Grip' input box, meaningful only for stripes 3 to 13, let you insert the amount of grip a not-heated race tyre will have with the surface. Normally you should specify less than unity for grass, about unity for gravel/sand, well above unity for tarmac (1.6~1.7 suggested).

The 'Roughness' input boxes are again meaningful only for stripes 3 to 13. This lets you insert the amount of micro-roughness of the stripe. The HF and LF freq controls the perturbation average frequency (leave them unmodified if you do not understand their use), while the other two control the height (in meters) of the roughness. Normally you should use numbers quite small for tarmac, about 0.2 for grass and about 0.3~0.4 for sand/gravel.

The 'Tile?' button toggles between two ways of applying textures to stripes. The standard way deforms the texture along the stripe (useful for tarmac or kerbs), the 'tile' way repeats the texture in the X and Z direction mapping it in a planar way. You can change the times a texture is repeated by modifying the 'UV molt' box. The 'Wall?' button toggles between a 'wall' stripe and a standard one. A wall stripe is exactly a wall, you can specify its height (in meters) and the left and right sides materials. Cars are not allowed to run on a wall stripe, instead they will collide in its left and right side. Stripes 3 and 13 should always be walls (of course), and stripes 5 and 11 should be used for pitlane walls. Pay attention to the fact that stripes 4, 8 and 12 are NOT allowed to be walls.

Stripes are named to suggest their use, but you are free to use them in different ways. As an example, you can use stripes 7, 8 and 9 for tarmac, 6 for a left kerb and 5 for a left grass. The only exception to this rule are PitLane stripes. They are RESERVED for pitlanes only, so DON'T use them for anything else. As stated before, the ending segment MUST contain a left or right pitlane stripe.

TEXTURES AND MATERIALS



As stated before, you should select a material for a stripe in order to enable it. A material represents some sort of visual information on how to render the stripe, including textures.

Materials are located in the 'material' directory of the current project folder. A material is normally described by a .a3em file, a simple text file containing information about the lighting properties of such a surface. If a texture is associated with it, its name will appear after the

TEXTURE tag in the .a3em file, and a corresponding .a3et file must be present, too. As an example, in order to use the tarmac material ('asfalto') the files 'asfalto.a3em' and 'asfalto.a3et' must be placed in the 'material' directory. In that case you can enable a stripe by typing 'asfalto' (without the extensions) in the 'material' input box in the 'modify segment' panel. You are free to re-use (for non commercial purposes) materials and textures in the tracks included with TKD2 for your own tracks.

Pay attention to the fact that materials only specify visual information on how to render the stripe. You still need to insert 'dynamics' information such as grip and roughness.

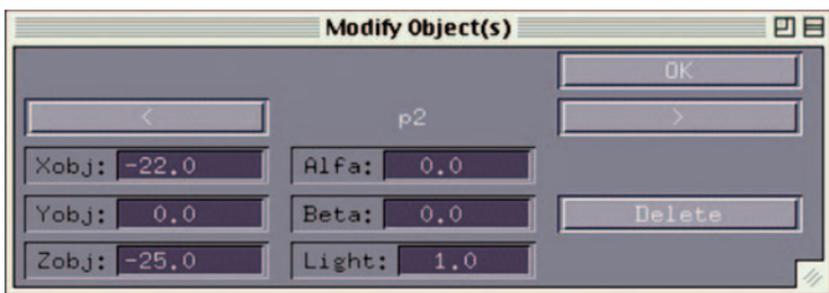
You can create your own textures, too, thanks to the TextureConverter utility. Any 24bit or 32bit colour image can be used as a texture, as long as its dimensions are power of two (64x64, 256x128, 16x16, etc.). Save the image from your preferred paint tool in 'raw/interleaved' format, then run TextureConverter. The tool will ask you the raw file name, the width and height, and the number of bytes per pixel (3 for 24bit images, 4 for 32bit ones). Then, it will ask you for the name of the texture file (enter the name of the texture you want to replace, including the .a3et suffix). Replace the old texture in the 'material' directory with this new one, and the new texture should be available in TKD2.

OBJECTS

Objects can be added to segments to improve visual realism. Objects are only 'cosmetic' entities. Cars will not collide into a building even if you place it in the middle of the track. Objects should be placed only 'around' the reachable part of the track.

Objects MUST be placed in the 'oggetti' directory of the current project folder. Objects are described by .a3ec files, so in order to use, say, a 'tower' object, the corresponding 'tower.a3ec' file must be placed in the 'oggetti' directory. You are free to re-use (for non commercial purposes) objects in the tracks included with TKD2 for your own tracks.

Pay attention to the fact that objects are made of materials, too, so in order to use an object you should copy its corresponding materials and textures in the 'materiali' directory. You can discover which materials are required by an object by loading the .a3ec file in a text editor (.a3ec files ARE text files). The second line, MATERIALI, shows the number of materials used by the object, and starting from the sixth line the file enumerates the materials required by the object.



You can add a properly installed object to the current segment by clicking the 'New Object' control in the main panel (insert the objects name WITHOUT the .a3ec extension). You can move and place the object around in two ways. Either by pressing the 'o' key in the preview window (while it is active) and then clicking on where you want the object (press the space bar to exit this 'modify object mode'), or by selecting the 'Modify Object' control in the main panel. This will pop up a new panel containing options to change the objects offset from the segment centreline (you can cycle through objects with the '<' and '>' controls, too).

BEST LINE

Although VGP2's Artificial Intelligence is very advanced, it still needs some help in order to discover the best line for cornering at maximum speed.

You can modify the segments best line either by pressing the 'I' key in the preview window (while it is active) and then clicking on where you want to place the ending point (press the space bar to exit this 'modify best line mode'), or by selecting the 'Modify Line' control in the main panel. This will pop up a new panel containing options to change the best line ending point, either by a relative offset from the segment ending point or by a global offset from the segments centreline. The panel will also display the expected speed at which cars will run, this will help you in discovering the best line.

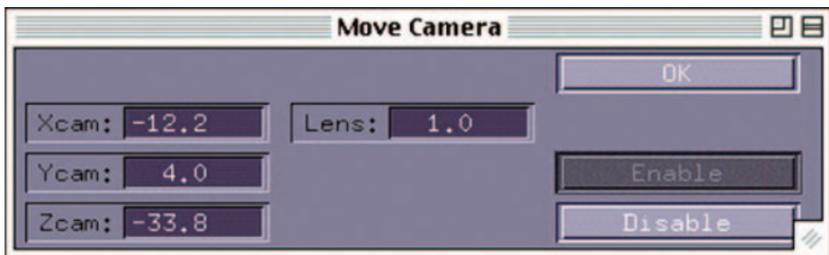


You are free to change the best line as you like, but there are two important points that are mandatory:

- 1) The best line **MUST** represent an ideal line on the track that cars can realistically follow. This means that, as an example, it cannot intersect walls, and should not be placed on grass or sand/gravel.
- 2) The ending point of the last segments best line must be connected to the starting one. Again, TKD2 does not control this and it is **YOU** that must design a closed path, otherwise be prepared for very strange things!

TRACK CAMERAS

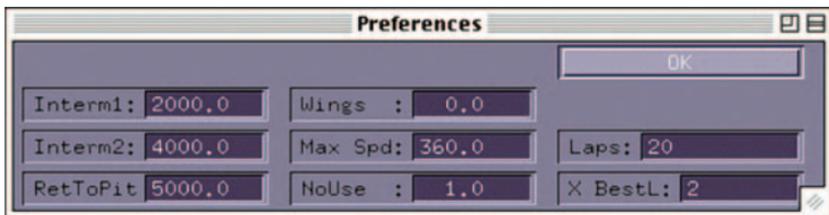
You can add external (track) cameras with the 'Change Camera' control in the main panel. This will pop up a new panel where you can enable an external camera for the segment and place it where you like.



You can change a camera position by pressing the 't' key in the preview window (while it is active) too, and then clicking in it (press the space bar to exit this 'modify camera position mode').

COMPILING THE TRACK

When you think you are done with the new track you can try to compile it for VGP2. 'Compiling' means that the track data will be transformed into pre-computed information that VGP2 needs in order to use it.



Before attempting to compile the track, a couple of things MUST be verified. Click the 'Prefs' control in the main panel, and verify that:

- 1) Intermediate points and 'return to pits' point are properly set up. Intermediate points are where intermediate lap times are taken. They will be displayed in TKD2 with white lines intersecting the track. The numbers in the boxes are the distance of these points from the start (in meters. Change them until the intermediate points are ok. 'Return to pits' point is where cars start to decelerate and change line when they



need to return to the pits. It MUST be placed somewhere before the pitlane entrance so that cars can return to the pitlane

2) Maximum speed (in KPH) and aerodynamics settings (ranging from 0 - minimum wings, to 1.0 - maximum wings) are properly set-up. Again, VGP2's Artificial Intelligence needs some help here, so you must select them

If everything is ok, click the 'Compile Track' button and wait until the button depresses itself. If nothing goes wrong the track will be present in the 'piste_gen' folder in TKD2. To install the new track in VGP2 simply copy this folder in the 'circuiti' directory of the game. First, rename this 'piste_gen' folder as the name of the new track (as an example, 'indianapolis'), and then edit the 'circuiti.config' text file as described earlier in this manual.

A final note: After compiling the track you can 'light' it. 'Lighting' means that TKD2 can pre-compute static shadows of the track, greatly improving the visual realism. Click the 'Light Track' button on the main panel and wait for the process to finish (the button will depress itself). Then you can re-generate the track. Be aware of the fact that TKD2 needs a compiled version of the track in order to lighten it, so you cannot do it until you have compiled a track at least once.

A FINAL NOTE ON TRACKS

Building a new track from scratch may be a not so easy task. You should pay particular attention to the 'continuity' of the track, because the VGP2 game dynamics expects a realistic racecar circuit. Unfortunately TKD2 can control this 'continuity' but to a limited degree, so if you fill the track with canyons, walls from nowhere, impossible best lines or other 'strange things', you may still be able to compile the track, but do not expect the game to work properly (or, even worse, to work at all).

So, to help you in starting to design your own tracks the VGP2 provides you with some 'tutorial' tracks. The 'Tutorial_Project' folder contains many skeletal tracks you can start with. Those tracks only contain the essential information required by the game dynamics so that you can immediately start to add your modifications and see how they affect the final result in the game without the need to build a brand new one from scratch. You can even use these skeletals to build complete tracks, as they are designed using the plans of some of the most famous circuits all over the world.



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