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1 FOREWORD

With Extreme 500, you can compete in motorcycle races at home on your PC under exactly the same conditions as you would on an actual course.
This simulation has been developed in close co-operation with the "Racing Factory" team of Bochum, Germany, and we take this opportunity to thank the team for their invaluable assistance which has enabled us to make Extreme 500 absolutely realistic. Engineers Konrad Hefele and Wolfgang Martens worked to perfect the vehicle configuration, while Alex Hofmann, himself a rider and 1998 German 250 class champion, had the controls honed ever more finely until the feel of the joystick was just like the feel of his racing machine.

You can challenge the computer on your own or you can compete in a network with friends and acquaintances. If you want to play in network mode, you can include two other players per CD in your network game.

Whether you are racing solo against your computer opponent or competing against other players in a network, we wish you lots of racing pleasure!

Your Ascaron Team

2 SYSTEM REQUIREMENTS

Minimum: Pentium 133, 16 MB RAM, 4xCDROM, around 70 MB hard disk space, 3D accelerator card with 4 MB, Win95 / Windows NT, Glide or DirectX 5, Mouse, Joystick
Recommended: P 200, 32 MB RAM, 3dfx graphics card, DirectX 6.0
Network: Network card, TCP/IP protocol

3 INSTALLATION

Please follow the programme instructions when installing Extreme 500. There are 4 different options for installing the programme, each option requiring a different amount of hard disk space:

Installing the full version
With this option the programme is copied to the hard disk together with all its functions.
Normal: Only the main programme is copied to hard disk. This requires 70 MB.
Complete: Main programme and race track data are copied to hard disk. 220 MB is required for this.

Complete with Intro: All in all you will need 250 MB of available disk space.

Installing the network version (Client only)
You can incorporate 2 network installations in your network game for every CD inserted during the game. In the network versions, use is restricted to the network mode. You will need about 220 MB of disk space.
The total number of network players is limited to 26.

Warning: To play the full version the Extreme 500 CD must be in your CDROM drive!

4 OUR SERVICE

With today's huge variety of possible configurations it is not easy to eliminate every potential problem before a product goes on the market, even though our programmers and testers make every effort to ensure that our products are as fault-free as possible. However these tests can only cover the standard configurations.
If you have any difficulty with our programme and you cannot find an answer in Chapter 13 (Troubleshooting), you can contact our service in one of the following ways:

Telephone: 0797 223 388
open Mondays to Fridays from 9.00 – 17.00
Fax : 01483 770727

Or you can write to us at the address below:

Customer Support
THQ International
Dukes Court
Dukes Street
Woking Surrey
GU21 5BH

You can e-mail us at the following address:
eurtechsupport@thq.com

You will also find us on the Internet of course.
Our Homepage address is:
www.thq.com

On our website you will find all the latest on current and forthcoming products, tips & tricks about our games, the latest patches, press reviews, competitions and lots more. It's worth a visit!

5 QUICK START

Once you have started the programme you must first tell it which graphic card you have and the resolution in which you want the programme to run.
When you have made these settings you will see the main menu of Extreme 500. In the main menu you can make settings using the big menu bar at the left-hand edge of the screen or perform actions with the button bar at the bottom of the screen.

For a quick start just select the input control in the centre of the button bar. We suggest you select the joystick for the ride controls. Joystick buttons 1 and 2 are used to change gear. You will find a description of the keyboard control assignment in Section 10.

When the game starts the following default settings apply:
Level: Beginner
Mode: Racing
Track: Nürburgring (Germany)
Laps: 3
Rider: Alex Hofmann
Weather: Sunny
Settings: Engine trouble off, ride options on
Opponent: realistic
Start position: 1

Click the starting flag at bottom right to go straight to the track - you can now ride the first laps using our default settings.

You can freeze the game at any time with the **<Pause>** or **<P>** buttons.

Press **<ESC>** to go to the interim race screen. From here you can return to the main menu by clicking the arrow at bottom left. Click the start flag again to return to the race!

Click once on the arrow at bottom left in the button bar to start another game.

The other ride control options are described in Chapter 10 of this User Guide.

6 THE MENUS

Most of the menus are designed to be used independently. You can avoid tedious clicking through different submenu levels and go from the main menu direct to the most important submenus whose settings are valid for all subsequent changes of selection. For example, the number of riders or laps applies to all of the courses. However many

of the options are only active when you are NOT racing in Grand Prix or World Championship mode. The start position cannot of course be selected for a race in one of these modes because it must first be decided by qualifying.

6.1 MAIN MENU

The button bar at the foot of the menu changes depending on the selected menu option. The most common icons are described below:

General

Exit, End, Off... You quit the screen and go back one level in the game. In the main menu this means you quit Extreme 500. If you have made a selection, clicking on the "Abort" arrow means that the settings will not be saved.

Save/Ok: The settings will be saved when you quit the screen.

Information: You see detailed information about the courses. You can also see information about the weather during a Grand Prix race.

Overview: You can see all the riders in the selected class or all the courses at a glance, and make a selection by clicking with the mouse.

Scroll: You can scroll forwards and backwards through the lists in the driver and course screens using the arrow keys.

Setup: Click on this icon to go to the Setup menu.

Start: A click and the race starts (resumes).

Selection

The weather: Sunny, overcast, rainy.

Engine classes: 125, 250 or 500. The class setting determines the choice of rider.

Ride control: You can play using a joystick or the keyboard. The joystick must be configured under Windows and calibrated before the game starts. If you have a joypad connected to your PC, then the same conditions apply to this input control as to a joystick.

Saving and Loading
These icons are used in many different screens:

You can use this icon to save your current settings or scores.

Use this icon to load previous settings or scores.

6.1.1 THE MODES

6.1.1.1 TEST RIDE

In this mode you can ride on your selected circuit for as long as you wish - you have the circuit all to yourself. The last 12 laps are recorded in the Data Recording function. You can start from the pits or from a good way before the starting line ("Realism/Settings/Start Position" option) to allow the first lap to be scored. This also applies to training in Grand Prix mode.

6.1.1.3 GRAND PRIX

A Grand Prix comprises Training and Qualifying sessions on the Friday and Saturday plus a Warm-Up and the race itself on the Sunday. Of course you do not have to enter the training and qualifying rounds - you can just start with the race itself if you wish.

Warning: If you do not enter the qualifying rounds you will naturally be on the last start position for lack of qualifying.
If you do not take part in the warm-up on the Sunday, you can find out about weather conditions during the race from the course information screen displayed before each race but you will not be able to change the bike setup to suit the weather. You should therefore do the warm-up, look at the weather and then change your bike setup if necessary. The weather does not change over the course of a race day and so it applies automatically to the race.

Click on the logo of the desired option to go to the track.

When you have completed a Grand Prix section it is displayed more brightly and cannot be selected again.

You can save your result after every heat. The data for all the steps you have previously completed will be saved. You can also re-load your results.

6.1.1.3.1 TRAINING

With the Training option you can use Realism/Settings to decide whether you wish to go for your best time in a period of 30 minutes or whether you want to ride 12 laps. The best lap is scored. You can also decide whether you want to start from the pits or from in front of the starting line (see section 6.1.5.4).

Your lap time, remaining training time, current speed and current gear are displayed at the top of the screen.

During training you can press <ESC> to go to the training evaluation screen.

Once you have completed training, you can continue your Grand Prix weekend with the qualifying session on the appropriate day.

6.1.1.3.2 QUALIFYING

The time by which you qualify for the start position in the race is the overall best time from the qualifying rounds you have run. Depending on your setting, you have either 30 minutes or 12 laps in which to ride your fastest lap.

After qualifying you can continue the Grand Prix with training on the Saturday or with the warm-up on the Sunday.

6.1.1.3.3 WARM-UP

On the day of the race you can tune the settings of your vehicle to match the track conditions (temperature and weather) during the warm-up.

6.1.1.3.4 THE RACE

For the actual race you start from the position which you have obtained in qualifying. If you skipped the qualifying rounds you start from the back. After the race you go to the scoring screen.

6.1.1.4 WORLD CHAMPIONCHIP

In a world championship the Grand Prix circuits are run in a preset order as indicated by the track numbers, so you do not have a free choice of tracks. Click on the arrow to quit this menu option.
A world championship can only be run within one class at a time. After every Grand Prix heat the score can be saved in the appropriate scoring screen and can also be loaded from the main menu. You can of course save and load after every part of a Grand Prix.

6.1.1.5 NETWORK

If you want to play with other people in a network, after you have selected the mode and clicked the start flag you can choose whether you want to start a new game or return to an existing one.

6.1.1.5.1 SERVER

The computer acts as the server if you want to start a new network game. Unlike the clients, you can specify the constraints for the race.

The Master Screen

Name:	Here you enter a name for the network game. The client will be able to find the game in the network under this name and join the session.
Port:	This item should be on **"Auto"**. Only if other applications have occupied all the ports and the computers cannot find each other is it possible to manually enter a port on which the PCs can then agree.
Latency:	You may have to experiment a little with this setting. If it is set too high, the controls may respond too sluggishly, if it is too low, the graphics may be jerky.
Weather:	You can choose between sunny, overcast, rainy and changeable weather. This last option is especially interesting if you wish to run several circuits in succession in the network.
Laps:	You can set from 1 to 20 laps. This setting applies to all the circuits which you specify in the **"Course selection"** option.
Time for setup:	You can specify how much time the players in the network have left to complete their Setup settings before the start of a race.
Start placings:	If you have specified **"By Points"** and have selected several courses, then the start placings will depend on the results of the previous race. The placings are drawn by lots for the first race (or if you have only selected one course).

Course:	Click on this option to see a Course Selection screen where you can decide which race track you want to select or deselect. In the network mode you can run several tracks in direct succession without having to return to the network menu screen. The sequence of tracks is displayed when you quit the selection screen.

Click the start flag to continue.

The Network Player Screen

Name:	Enter a name by which you want to be known to the other players in the network. You can go to the next option when you have confirmed your entry with **<Enter>**.
Rider:	Choose one of the riders whose skills you would like to use! This name will not be displayed in the network.
Machine:	You have a choice of different motorcycle makes. The number depends on the cc class you have selected.
Ride options:	The ride options are the same as the ones described under Menus/Realism/Ride Options. Please read about them in that section.

Click the start flag to enter the log-on phase. When all clients who appear in the following list are on **"ready"**, the OK button appears at bottom right. Just click and off you go.

6.1.1.5.2 CLIENT

As a client you must first choose which of the games running in the network you want to play in.

You can either specify a port directly or select a game from the list (if a server has already logged on). You will see the word "free" after the name in games that have not yet started. You can still join these games. Otherwise there will be "in use" after the name.

When you have joined a game you will see the same network player screen as the one displayed on the server PC. For settings, please refer to the description in this point in the previous section.

6.1.1.5.3 GHOSTRACE

While playing the "Ghostrace" mode, you can tape your race and save it, so that you will be able to compete with your "ghost" in a later race. You can even exchange your ghost data's with your friends, or send them by email.
That is why the "Ghostrace" mode is an excellent way to compete with others or to improve your own skills.

6.1.2 LEVELS

In Extreme 500 there are three different levels of difficulty in which you can ride. They differ in the bike's engine power, its braking power and the number of ride options that can be activated.

6.1.2.1 BEGINNER

This level allows you to acquire a thorough knowledge of the courses and the vehicles. As a beginner you can activate all the ride options, however engine power has been slightly reduced so as not to make things too easy and to give you some incentive to work your way up to the other levels. On the other hand this level still lets you brake in situations where you would otherwise be risking your neck. For this reason you are not compelled to slow down to the maximum possible speed before a bend - you can also reduce speed in the bend if you need to. Remember this point when selecting one of the other levels!

In Beginner mode the tyres are not worn but you should still make the right choice to ensure correct grip.

6.1.2.2 AMATEUR

This level can be regarded as good preparation for the Professional level, which is why assisted brakes and steering are not available. All other ride options can be activated so you can concentrate on handling the vehicle.

6.1.2.3 PROFESSIONAL

On this level you can no longer activate all the ride options because you are now a "professional", having mastered both bike and course, and you can pit yourself against the other championship contenders. Your motorcycle also now has the full engine power.

6.1.3 THE RIDERS

There are 25 or 26 different riders available for each cc class. They differ in four characteristics, each of which has six different grades.

Talent: Talent indicates how well the rider has his bike under control. This is particularly important for negotiating bends.

Reaction: Here you can set the rider's speed of reaction - this will affect his ability to make be quick off the mark, for example.

Condition: This characteristic describes the rider's ability to adjust to changing conditions, e.g. being able to ride at a reasonable speed even after many laps.

Technique: This characteristic determines how good the rider is at getting the most out of his machine, changing gear at the right time etc.

Data such as name, date and place of birth and the characteristics of the riders can be changed with the Editor. The Editor is an external programme and is started directly under Windows.

6.1.4 THE COURSES

You can choose from 15 true-to-life race courses and 3 extra courses whose main details are listed below. Items such as "Weather" and "Temperature" only apply to the "Race" mode because the weather can change during a Grand Prix (and during a world championship as well, of course). The month with the highest rainfall is shown because this gives an indication of the likelihood of rain on the day of the race.

The state of the track surface affects tyre grip - the better the surface the better you will be able to take bends.

The courses are listed below in their world championship order. Each course display gives you information about the speeds and gears for taking the bends. All speeds have been measured at the summit of the bends, and so they are not necessarily the speeds to which a motorcycle should be braked before entering a given bend. This information is given merely as guidance for taking bends.

Legend: The figures at the top of the box are for 125 cc machines, those in the centre were run on a 250 cc machine and the figures at the bottom were run on a 500 class motorcycle. The number on the left is the gear in which the bend is taken, the number on the right is the speed.

125	250	500
18	19	21

The number of laps that must be run in a Grand Prix depends on the cc class. If you have dragged the slide in the "Realism/Settings/Laps" menu option to "realistic", then the setting will be for exactly this number of laps.

6.1.4.1 JAPAN
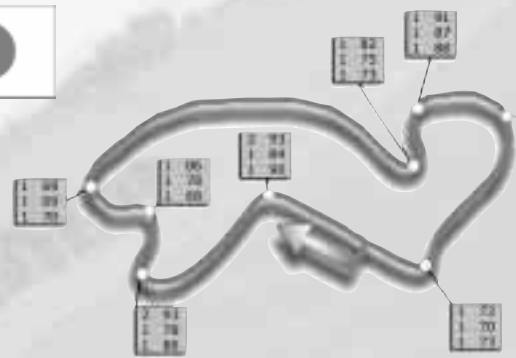
Country: Japan
Course Length: 3474 m
Track Surface: average
Month with highest Rainfall: November

Number of Laps per Class for a Grand Prix:

125	250	500
24	26	28

6.1.4.2 MALAYSIA
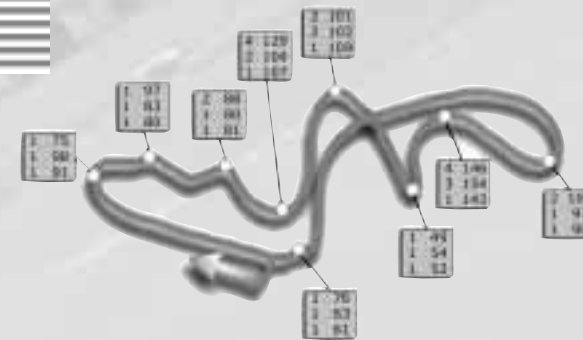
Country: Malaysia
Course Length: 5905 m
Track Surface: good
Month with highest Rainfall: September

Number of Laps per Class for a Grand Prix:

125	250	500
18	19	21

6.1.4.3 BRAZIL
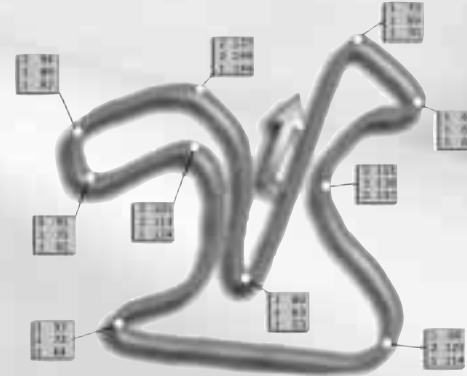
Country:	Brazil
Course Length:	4425 m
Track Surface:	bad
Month with highest Rainfall:	November

Number of Laps per Class for a Grand Prix:

125	250	500
23	26	27

6.1.4.4 SAN MARINO
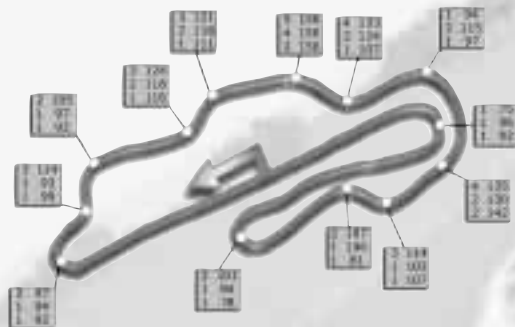
Country:	San Marino
Course Length:	5240 m
Track Surface:	good
Month with highest Rainfall:	October

Number of Laps per Class for a Grand Prix:

125	250	500
20	21	23

6.1.4.5 NETHERLANDS
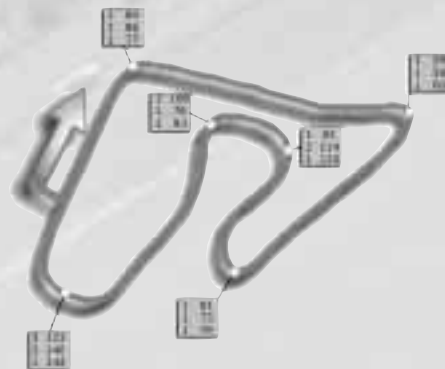
Country:	Netherlands
Course Length:	4323 m
Track Surface:	bad
Month with highest Rainfall:	June

Number of Laps per Class for a Grand Prix:

125	250	500
24	26	28

6.1.4.6 CATALUNYA

Country: Catalunya
Course Length: 3795 m
Track Surface: average
Month with highest Rainfall: November

Number of Laps per Class for a Grand Prix:

125	250	500
27	29	31

6.1.4.7 CHEZ REPUBLIC
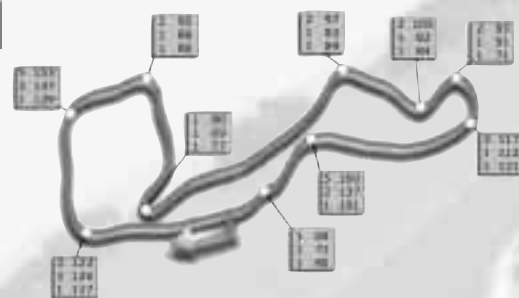
Country: Chez Republic
Course Length: 6056 m
Track Surface: good
Month with highest Rainfall: August

Number of Laps per Class for a Grand Prix:

125	250	500
17	18	20

6.1.4.8 SPAIN
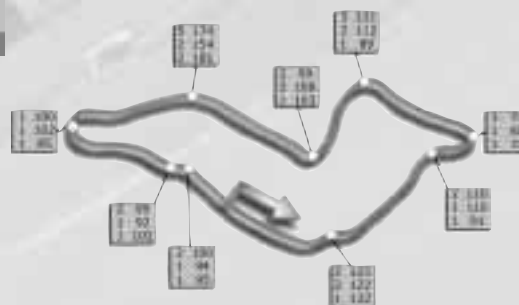
Country: Spain
Course Length: 4861 m
Track Surface: bad
Month with highest Rainfall: October

Number of Laps per Class for a Grand Prix:

125	250	500
21	23	25

6.1.4.9 AUSTRIA
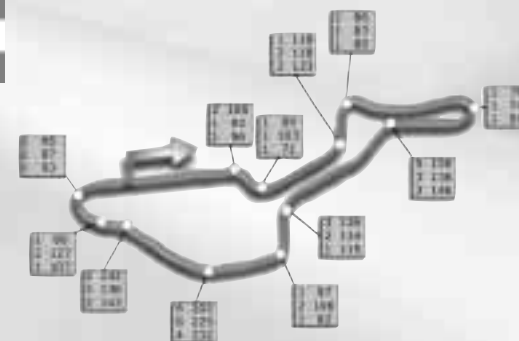
Country: Austria
Course Length: 4482 m
Track Surface: average
Month with highest Rainfall: November

Number of Laps per Class for a Grand Prix:

125	250	500
23	25	27

6.1.4.10 INDONESIA
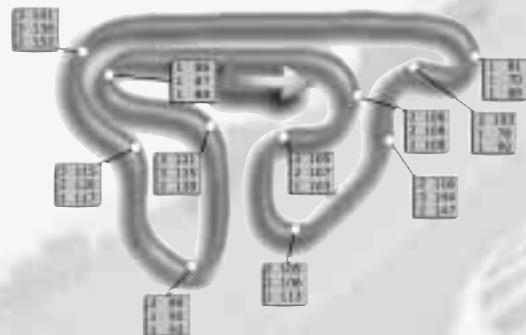
Country: Indonesia
Course Length: 4863 m
Track Surface: bad
Month with highest Rainfall: December

Number of Laps per Class for a Grand Prix:

125	250	500
21	22	24

6.1.4.11 AUSTRALIA
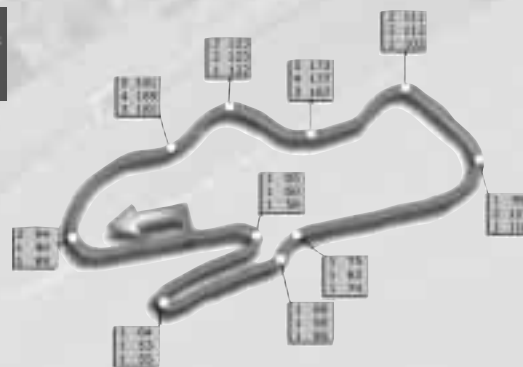
Country: Australia
Course Length: 3994 m
Track Surface: average
Month with highest Rainfall: August

Number of Laps per Class for a Grand Prix:

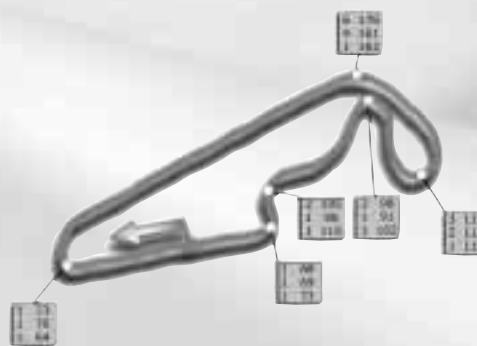| 125	250	500
26	27	30

6.1.4.12 Germany
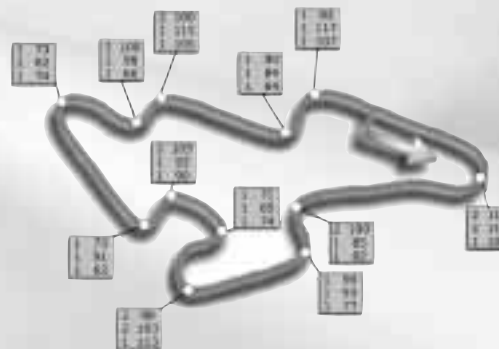
Country: Germany
Course Length: 5338 m
Track Surface: bad
Month with highest Rainfall: June

Number of Laps per Class for a Grand Prix:

125	250	500
19	20	22
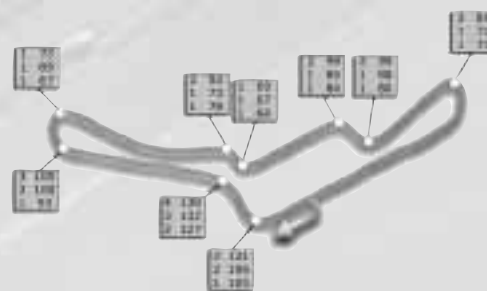
6.1.4.13 ITALY

Country: Italy
Course Length: 4730 m
Track Surface: average
Month with highest Rainfall: September

Number of Laps per Class for a Grand Prix:

125	250	500
22	23	25

6.1.4.14 FRANCE
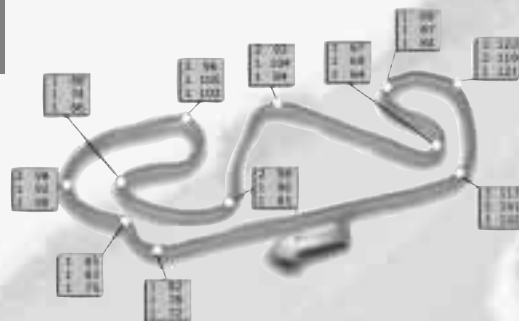
Country: France
Course Length: 3961 m
Track Surface: good
Month with Highest Rainfall: January

Number of Laps per Class for a Grand Prix:
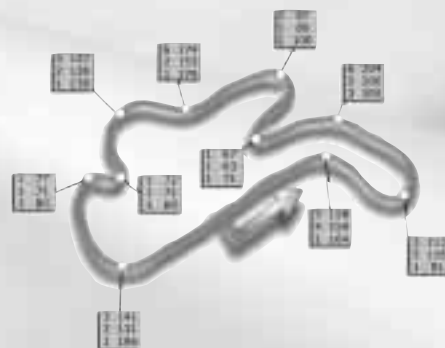
125	250	500
26	28	30

6.1.4.15 GREAT BRITAIN

Country: Great Britian
Course Length: 4392
Track Surface: average
Month with highest Rainfall: October

Number of Laps per Class for a GP:

125	250	500
23	25	27

6.1.4.16 Hexagon-Ring
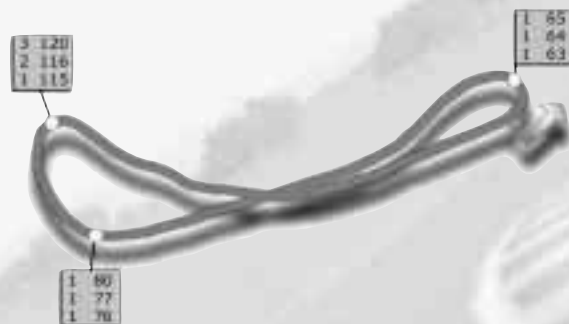
Country: Ascaron
Course Length: 1770 m
Track Surface: good
Month with highest Rainfall: April

6.1.4.17 Lake Vermeer
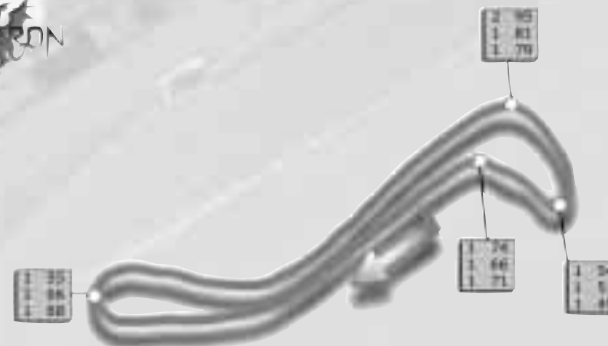
Country: Ascaron
Course Length: 2022 m
Track Surface: average
Month with highest Rainfall: April

6.1.4.18 Mount Elisabeth
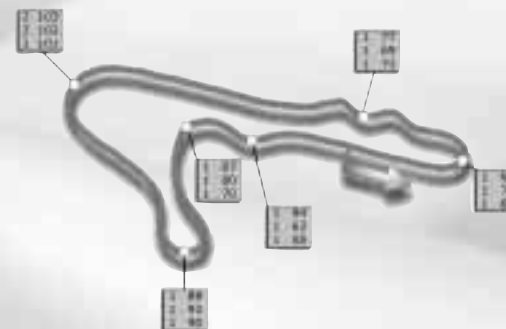
Country: Ascaron
Course Length: 2541 m
Track Surface: bad
Month with highest Rainfall: April

6.1.5 Realism

6.1.5.1 Ride Options

To help you get used to what happens during a race, the programme offers a number of ride options which can be activated. In the Amateur and Professional modes some of these options are disabled. You can activate all available options with the "All" setting.

The levels in which the ride options are available are indicated at the beginning of each option description. The following abbreviations are used for the levels: L1 = Beginner, L2 = Amateur, L3 = Professional.

Some ride options can be activated with the function keys during a race, if the level permits.

6.1.5.1.1 Automatic gear change <F1>

L1, L2: If you have activated this option then you need not worry about changing gear or operating the clutch - the computer automatically selects the optimum gear for your bike's engine revs and output.

6.1.5.1.2 Automatic clutch <F2>

L1- L3: This setting is only important for pulling away (e.g. at the race start). The computer allows the clutch to slip until the bike has reached top speed in 1st gear. Engine revs are kept high enough for them to be within a range in which the engine has sufficient power (approx. 11,000 r.p.m). If this option is not turned on then you must operate the clutch yourself. There is no point in disabling the automatic clutch unless your joystick has a 3rd axis.

6.1.5.1.3 Brake assistance <F3>

L1, L2: The brake assistance feature reduces the bike's speed to a level where it is impossible for it to be thrown out of the bend and onto the verge or gravel bed. Note that this speed is not (!) the ideal speed at which the bend could be taken, but is a little below that ideal speed.

6.1.5.1.4 Steering assistance <F4>

L1, L2: The computer tries to steer the rider into the ideal riding line all the time. For this reason the brake assistance option is also active, otherwise the excessive speed could throw the motorcycle out of the bend.

TIP: The closer you ride to the ideal line the more effectively the steering assistance can be used, so the ideal line feature should also be active.

6.1.5.1.5 Skidding inactive

L1 - L3: The vehicle will not skid even if tyre adhesion has theoretically been lost.

6.1.5.1.6 Accidents inactive

L1 - L3: Should you ever collide with an opponent or find yourself on the gravel bed, your own motorcycle cannot fall over and be damaged. A collision will reduce your speed slightly, but you can continue riding unharmed.

6.1.5.1.7 Ideal line <F5 >

L1, L2: The ideal line for the particular cc class is projected on the track.

6.1.5.1.8 Bend warnings <F6>

L1 - L3: You will see a warning showing the type of bend you can next expect to have to negotiate.

6.1.5.1.9 Automatic righting <F7>

L1 - L3: This option is relevant if you are using a keyboard to control your game. If active, the motorcycle will right itself automatically if you let go of the key that controls leaning after you have taken a bend. Otherwise you will have to actively counter-steer.

6.1.5.1.10 All

All ride options are active.

TIP: Once you have got some practice under your belt, try playing without the active ride options such as steering assistance, automatic braking and automatic gear change! This is the only way to get to know the motorcycles properly and learn to get the very best out of them.

6.1.5.2 Weather
6.1.5.2.1 Type of weather

You can choose between **Sunny**, **Overcast** and **Rainy**. Your chosen setting will determine the weather for the "Race" mode.

Depending on the type of weather the course will look different, even down to the spectators' umbrellas! Riding conditions will be different too, of course - the type of weather will affect tyre adhesion, air temperature and air pressure. Your machine setup settings should be made to allow for these conditions.

6.1.5.2.2 Consistency

This setting relates to different periods of time.

Constant: This affects the weather over a weekend, i.e. weather conditions do not change from Friday to Sunday.
Changeable: With this setting the weather can change from one day to another on a Grand Prix weekend, but not within the same day.
Fixed: The weather stays just as you set it in the "Weather situation" menu option.

6.1.5.3 Character of opponents
6.1.5.3.1 Level

Your computer opponents have different rider characteristics which are distributed differently depending on your setting.
Realistic: All riders have individual dedicated characteristics which never change from race to race, so you can learn to predict how they will respond to different situations.
Identical: All riders have the same characteristics, the only differences are down to the machines they ride.
Random: Characteristics are assigned to the riders on a random basis. They respond differently from one race to the next, just as if they had good days and bad days.

6.1.5.3.2 Behaviour

Cautious: The computer generated riders tend to steer clear of any risk and prefer to stay behind another even though they could overtake it
Normal: Opponents ride according to their character.
Aggressive: Other riders try to overtake at the least opportunity, and accept that collisions and accidents may happen.

6.1.5.4 Settings

6.1.5.4.1 Number of laps

Here you can set the number of laps you want to run on your chosen circuit. You can a number of laps from 1 to 20 or you can drag the slide to "realistic", in which case the number of laps is the one usually run in the Grand Prix. This number is given in the descriptions of each course, and varies from one cc class to another.

6.1.5.4.2 Number of opponents

Here you can select the number of riders you will be competing against! You can choose between 4 and 25 (125 and 500) or 4 and 26 (250) riders. With slower PCs it might be advisable to keep the number of riders down.

6.1.5.4.3 Start position

The start position in a race depends on the number of riders you have set. You can select any position from Pole to the last grid position. If you are in Grand Prix or World Championship mode this setting has no effect of course, because the start positions are decided in qualifying.

6.1.5.4.4 Training

If you have selected **"30 min."** you must attempt your best lap time within this preset time. Once the 30 minutes have elapsed you can complete the lap you are on if you can do this within the next 10 minutes, otherwise your last lap will not be counted.

If you have selected the **"Laps"** setting, then you have the specified number of laps (max. 1 hour) to clock up your fastest lap time. Only complete laps run from the start to the finish line will be counted. The first lap you start from the pit lane does not count.

6.1.5.4.5 Starting point

In the Test and Training modes you can opt to start your ride either from the pit lane or from a point in front of the start and finish line. The advantage of this is that - in the latter case - your first lap can be counted as a complete lap.

6.1.5.4.6 Engine trouble

If this option is active, your engine can overheat or run too cold, it can lose power and in the worst case fail altogether. Keep your eye on the temperature gauge in the cockpit!
Running at high revs for too long can cause gearbox trouble, and the gear you are in when this happens can no longer be selected.
If you have an accident, your chassis is not damaged - a bike that has crashed or been in contact with another vehicle is returned to the track and may continue the race.

6.1.5.4.6 Engine tuning

If you activate engine tuning, then the settings you have made in Setup - and which you may have already tested - will be used for a race. Otherwise the computer will take care of engine tuning for you.

6.1.5.4.7 Time penalties

If you deactivate this option, the racing flags will be displayed but you will not be penalised if you choose to ignore them. The black flag with the white "10" will not be displayed so you will not have to sit out the 10 second time penalty in the pits. This means of course that the computer riders are also exempt from time penalties.

6.1.6 Options

Here you can make settings that affect the actual game.

6.1.6.1 Intro Video

If you want to watch the Intro again the next time you start the programme, please turn it **"on"**! Otherwise the programme will start straight into the main menu.

6.1.6.2 Graphics

Range of vision: You can use the slide controller to set the range to which textures will be displayed in detail. You can set a range of vision from 200 to 1200 m. Ideally you should match the range of vision to your PC's power, and it may be worth sacrificing a little range of vision for the sake of a smoother game. With a fast PC of course you can enjoy the full range of track detail.

Details: Here again you should set this option according to the power of your PC. The greater the wealth of detail, the more computer power is needed.

6.1.6.3 Sound

Volume: Use the slide to set the volume for the sound (from 0 - 100 %).

Music: Music can be turned on or off here.

Music during the race: The pieces of music that are played during selection in the menus can also be played as background music when you set the switch to **"on"**.

Sampling rate: This option lets you set the quality of the sound reproduction. If your sound seems delayed, set the rate down a stage.

Buffer size: The size of the sound buffer is set here. Delays can occur here too, so if this happens please reduce the buffer size.

Channels: With this option you set the number of sound channels used in the game (please refer to your sound card specifications). The more channels you select the more computer time will be needed.

Interpolated: This setting is used to reduce noise. It should be on **"off"** for very slow PCs..

6.1.6.4 Controls

With few exceptions, you can assign the keyboard and the joystick as you like. To do this, proceed as follows:
Click on a keyboard assignment with the mouse! The display will disappear. Now press the key, a joystick button or move the joystick. This key, button or axis is saved and displayed.

Warning: Keys that cannot be selected: 1-0, Enter, PgUp, PgDn, Home, End, ESC, P, Pause, function keys F1-F7 and all keys already selected. You will find the default layout in Section 10 "Controls".

Please note that you need a complete joystick axis for the clutch.

6.1.7 Loading

You can load previously saved scores here.

6.1.8 Demo

The Demo mode lets you look at your selected course in peace. The riders are viewed by a kind of TV camera while you are doing this.

7 The Screens
7.1 The Race Screen

Click the starting flag to display the race screen. The camera takes you to your start position. While this is happening you can check out the positions of the other riders. The race starts when the traffic light switches from red to green.

Pressing <ESC> takes you back to the starting line again.

During the race you will see certain information displayed on your monitor:

In a race

`POS 16/26` The relative position of your rider compared with the other riders on the course is displayed here.

`LAP 1/10` The number of laps run out of the total preset laps is shown.

`1:47:500`
`0:08:474` At the foot of the display you will see how far you are behind the current race leader.

`KMH 89` Your current speed is shown here.

`1` Your current gear selection is displayed.

In training, qualifying and warm-up
You will see different features in the top left corner of the screen depending on whether you have set **"30 min"** or **"12 laps"**. If you have selected **"30 min"**, a digital clock will count down from 30 minutes to 0. If you have selected a number of laps, you will see a clock that counts down from 60 minutes to 0 and a lap counter which runs from 12 to 0.

`1:08:081`
`1:42:383` In training, qualifying and warm-up modes, the lap time is displayed at the top centre of the screen. The upper figure is the elapsing time on the current lap, the lower figure is your fastest time in this heat.

`1:47:500`
`0:08:474` At each measuring point on the course, the difference between your time and the stage time recorded by the fastest rider in this heat and in this stage of the course is displayed for a short time at the bottom of the screen. The lap time is frozen while this is happening. After the first lap your own best time is displayed at the bottom of the screen, unless the time difference is being shown.

7.1.1 Views

You can choose to ride your race from one of a number of views which you select with different keys.

7.1.1.1 Cockpit View <1>

The cockpits of the various motorcycles may differ in their appearance, but they all have 3 indicators in common.

On the left you will see the engine temperature gauge. Make sure that your engine temperature stays within a range of 50 - 75° C, otherwise you engine may be damaged (if this option is active)! The ideal engine temperature is 60° C.

The flashing lamp tells you when you should change gear (unless you are letting the computer do this for you).

The circular instrument in the cockpit is the rev counter.

7.1.1.2 External Cameras <2>, <3>

In these views you are looking at yourself and your machine. You can also see a temperature gauge and a rev counter at the bottom right of your screen, and the lamp that tells you the best moment to change gear.

Press the **<5>** key to zoom into the display and **<6>** to zoom back out again.

7.1.1.2.1 The static camera <2>

In this view the horizon is always level - only the motorcycle leans over.

Use the **<7>** key to reduce the camera distance as you view, and **<8>** to increase it. Keys **<9>** and **<10>** change the camera angle relative to the motorcycle.

7.1.1.2.2 The dynamic camera <3>

In the dynamic camera view the horizon tilts with the angle of the machine, it recedes as you accelerate and comes closer when you brake. It is therefore a combination of cockpit view and the static camera.

7.1.1.3 The Observer Camera <4>

This camera is like the TV OB cameras that are set up around the circuit. When the motorcycle leaves the field of vision of one camera the programme automatically switches to the next camera down the track, allowing you to keep the selected machine in view all the time.

You can use the **<PgUp>** and **<PgDn>** keys to step through the various riders. The current rider's position is shown in the top left corner of the screen. Press **<Home>** to skip to the current race leader, and **<End>** to the tail-ender. You can return to your own rider at any time by pressing **<Enter>**.

7.2 The Result Screens

There is a difference between the display that you can view during Test Ride, Training and Warm-Up with **<ESC>** and the actual result screens after the race.

7.2.1 The Test Ride Result Screen

During your test rides (and during training/warm-up) you can press **<ESC>** to view an interim screen that lists the laps completed in order of lap time. Each course is divided up into sectors, and your time is recorded when you pass the measuring point in each sector. The last measuring point is the finishing line.
The same applies to your Training and Warm-Up sessions, which is why these screens are not described separately here.
You can view other details of your run by making the appropriate selection on the menu bar:

Exit: Click this button to end your test ride.

Info: Click this button to see a display of the current course.

Setup: Click this button to go to the Setup screen.

Data Recording: Clicking on this icon allows you to see the results of your laps provided you have completed at least one valid lap, otherwise this option is disabled.

Start: This returns you to the course. You can now resume your ride.

7.2.2 The Training Result Screen

This table lists the fastest times of the other riders currently on the course. The total lap times are listed on the left, and on the right are the times measured at the measuring points in the individual course sectors. Use the slide control at the right-hand edge of the screen to view the results of any other riders.

The elapsed time and the number of valid laps since the start of training in the pits is shown here.

Here again, there are a number of additional options you can select:

Exit: Click this button to end your Training session and go to the Training Result screen.
Observer mode: In the observer mode you can watch the other riders who are currently on the course. Your own training time continues to run of course. The time remaining is shown at the top right of your screen. Press **<ESC>** to quit the observer screen.
Times: You can toggle between a display of the fastest times of all the riders on the course and your own lap times. The times of 12 riders are displayed - drag the slide at the right-hand edge of the screen to view the other times.
Time-lapse: You can elapse the time up to eight times faster in double steps.
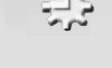
7.2.3 The Interim Race Screen

Should you wish to look at your competitors' last laps during the race, you can do this by pressing **<ESC>**.

You will see details about the current placings of the riders, their distance behind the race leader, the best lap that each rider has ridden and his average lap time.

From here you can also go back to the starting line if you have not started the race well or if you have landed in the gravel prematurely. Click the starting light and try to catch up with the other riders. Who knows - you may still manage to score a point or two!

From this screen you can of course also go to Data Recording to analyse your laps in detail.

7.2.4 The Race Result Screen

This screen lists the riders by places - it also displays their distance behind the race leader, their fastest lap times and their average lap speeds. Unlike the Interim Screen, in the Race Result Screen you can check the course information again, and quit the screen. You cannot return to the race and repeat it.

7.2.5 World Championship Placings

After each World Championship heat the riders are listed in this table in order of their point totals, so you can see how many points each rider has accumulated in the Grand Prix events raced so far. Drag the slide at the right-hand edge of the screen to view the results of all the riders not displayed on this screen page.

8 The Setup Menu

The Setup menu can be called from a number of screens by clicking this button. The Setup menu lets you make adjustments to your machine and set it up to suit a particular circuit and weather conditions.

Experienced mechanics contribute just as much to the success of a victorious motorcycle racing team as good riders. One of the skills of a good mechanic is the ability to take information supplied by his rider and to set up a machine to match the prevailing conditions on a course and the rider's individual wishes.

You can change the mechanical settings of your motorcycle in Setup. This allows you to optimise your bike's performance and efficiency by adjusting it to suit the characteristics of a particular course and local weather conditions.

You can go into Setup from various points in the programme. It is advisable to test ride different courses to familiarise yourself with their different characteristics first. Each time you stop in the pits you can call Setup and make changes to your machine. Once you are happy with your settings, click the disk icon to save them.
You can now use this setup for a single race by clicking on the Setup symbol under the "Courses" option in the main menu and loading the saved setup for a course.
If you are racing in a Grand Prix or running a complete World Championship, you can of course set your bike up during Training, Qualifying and Warm Up.

When you call Setup, you will see at the bottom of the screen a symbol bar with the various setup options that are explained in this section. The current setup is displayed in a short chart at the left - hand edge of the screen.

The Setup function is limited to the main settings that make perceptible differences to the motorcycle's performance. These individual aspects are described below in more detail.

Explanation of the notes
The following notes are intended to indicate the effect of the Setup on the different degrees of difficulty (levels)!

Notes for the different levels

Beginner
Setup on the Beginner level does not have the vital importance that it does on the Professional level. You can also score some respectable successes with the default setup, but always remember to set the correct type of tyres and select suitable gearing!

Amateur
The right settings will give you decisive advantages if you want to up with the race leaders. Create your personal setup for each separate course!

Professional
An excellent setup is absolutely essential if the professional rider is to meet the demanding challenges of motorcycle racing. Your opponents will show you no mercy, so test ride the courses under different conditions and save a selection of alternative setups. This will save you some fundamental work during a World Championship.

8.1 Tyres

Tyres are a very important factor for the performance of a competition motorcycle as they have to transmit the vehicle's power onto the track. The right choice of tyres can make a difference of several seconds to each lap. Each set of tyres is used for one race and cannot be used again.

Different types of tyres are used depending on the weather conditions. Basically, the softer a tyre, the better its grip. But remember that softer tyres wear faster - especially if you brake and accelerate hard and often - and this means that the quality of your tyres will rapidly deteriorate and your machine will not be able to transmit its full power onto the track. You also run the risk of suddenly losing grip at high cornering speeds and reluctantly taking a wider line that often ends in

the gravel.
Your tyre setting should also allow for the grip offered by the track's asphalt surface. Basically, the more grip a track has, the harder your tyres can be.

Should you ever come off the track, remember that your tyres can get very dirty and lose a lot of their grip. An unscheduled encounter with the gravel bed in particular can leave countless particles of dirt sticking to the hot rubber compound. These particles will greatly impair performance, but they will wear off in the course of a lap or two.

In modern motorcycle racing, riders often select a different tyre hardness for the front and rear wheels. There are no set rules here - riders select tyres according to their personal style.

The load on the rear wheel increases during acceleration owing to the extra power that is being transmitted, and a harder tyre is usually fitted to the rear wheel as a result. Riders usually use the front brake for braking. It is advisable to fit a softer front tyre because of the relatively short stopping distances.
For courses with a lot of bends, it is also better to fit softer tyres which offer more grip when cornering.

Use the Data Recording function in Training to monitor the grip of the different tyre types over a number of laps!

The following tyre types are available:

Slick	Very soft	Soft	Medium	Hard	Very hard
Intermediate		Soft	Medium	Hard	
Wet		Soft	Medium	Hard	

First click on the desired tyre type to make your choice, then choose the desired tyre hardness for the front and rear wheel from the options displayed in the middle of the screen.

8.1.1 Slicks

The Slicks tyre mixture is divided into five levels of hardness. Slicks should only be used on absolutely dry tracks. Even with a minimum amount of moisture they rapidly begin to lose adhesion as they have no tread and cannot therefore displace the film of water between them and the track surface.

Before each race the tyres are heated to over 80C with heating blankets. During the actual race however the tyres will need the first few laps to attain their ideal running temperature and hence their maximum grip. From then on, tyre condition will deteriorate.

A softer tyre is normally used for time training because there are far fewer laps to complete than in a race.

8.1.2 Intermediates

Intermediates have a simple tread and a somewhat softer mixture than Slicks. They are used whenever there has been heavy rain before a race, or when the asphalt cannot dry out because of light drizzle. Intermediates can provide good grip on both wet and dry spots.

8.1.3 Rain Tyres

The decision to fit rain tyres is not one to be taken lightly. In rain or on wet roads rain tyres have definite advantages over intermediates because they have a very soft rubber compound and a deep tread. This is necessary because during a race rain tyres have to warm up more in order to build up adhesion. The cool asphalt and the rain makes them lose a lot of heat. But if the rain stops during the race and the track dries out, rain tyres will heat up too much and lose a lot of rubber and a lot of grip as well. Because of the nature of the rubber compound and the tread, a motorcycle fitted with rain tyres cannot attain the top speed that it can with slicks.

Notes for the different levels
Beginner
On Beginner level the tyres provide consistently good adhesion even over a long race. This allows you to take the bends at high speed. You will find it easier to control your machine even if you have to brake on a bend now and then. If the tyres get dirty they will lose some of their grip for quite a while.

Amateur
On the Amateur level, tyre quality deteriorates as wear advances, but it will not fall below a certain grip. Tyre adhesion on bends decreases slightly.

Professional
On the Professional level the wrong choice of tyre can make itself felt very quickly. On bends the tyres have a realistic grip which can lead to sliding or even crashing. Remember that by the end of a race your tyres will have lost a lot of their grip! If you select less than the normal number of laps in a race, then the tyres will wear accordingly, i.e. at 50 % of the full distance, tyre wear will be the same whether you have covered the 50 % in 2 laps or 12.

8.2 Brakes

Modern motorcycles of all classes usually have a carbon brake system that exerts a strong counterforce on the wheels. Because the front brake is usually used for stopping, inertia relieves the load on the rear wheel which can actually leave the ground if braking is too violent. If too much adhesion is lost between the tyre and the asphalt during braking, the wheels may lock up and a crash may result.

The different braking forces in the different classes affect their ideal lines. The higher classes have much more powerful brakes than the 125 class, but their weight gives them a lot more inertia. The higher classes approach bends at an increasingly sharper angle and brake more heavily so as to shorten the relative rolling time and accelerate away again more quickly. 125 class riders on the other hand try to ride bends as smoothly and evenly as possible to maintain their machine's momentum throughout the curve.

When braking to negotiate a bend, make sure that you have slowed your motorcycle to the ideal speed at the moment you enter the bend and roll through the bend summit!

There are three different brake systems that you can click on beneath the brake diagram. These systems have different effects on their braking power and retardation.

8.2.1 Dynamic Brakes

With the dynamic system, there is no delay in braking, i.e. you feel the braking force acting on the front wheel immediately. Because of the braking force distribution however this system does not develop any great counterforce. With its short reaction time, the dynamic brake system allows you to delay braking until you are almost upon a bend and to out-brake your opponents and display an altogether aggressive style of riding.

8.2.2 Normal Brakes

The normal brake system is a compromise between a short braking delay and high braking power. When you first start using this system, ride with average performance data, otherwise there is a risk that your engine will lose power too quickly and that you will be in the wrong gear! Once you have a good ‚feel‘ for the braking points around a course you should select one of the other brake systems and match it to suit your needs.

8.2.3 Sluggish Brakes

This system is the opposite of the dynamic brake system. Your brakes exert a massive counterforce on the front wheel, but this force acts with a distinct delay, so you must know exactly where your braking points are to be able take your bends at the ideal speed. Once you have properly mastered this system you can delay braking until the very last split-second and so cut braking time to a minimum. The disadvantage of this sluggish system is that minor corrections do not always have the desired effect.

8.2.4 Power Curve

With the power curve of your brake system you can adjust the braking response to your personal requirements. This feature lets you specify the time each brake system takes to develop its full power. This setting simulates the distance you cover when you pull on the brake lever.

Notes for the different levels
Beginner
As a beginner you can perform controlled braking at any time - your machine stays stable even at extreme bank angles.

Amateur
Braking response on a bend is affected by inertia and the reduced tyre grip, but minor rider errors can still be corrected by light braking.

Professional
Should you attempt to brake while banking within a bend, your machine will right itself and you will quickly lose control. Remember - you must be down to the ideal speed before you enter the bend! You can then roll through the bend! Remember too that the same inertia acts when you accelerate away from a bend!

8.3 Suspension

Your motorcycle‘s suspension is responsible for maintaining permanent contact between tyres and asphalt. With the suspension you control the vertical movement of the telescopic struts relative to the vehicle‘s chassis. Suspension can be adjusted independently for front and rear wheel, and greatly affects the grip of your tyres on the track. Be aware of this interaction!

The softer the suspension, the more your tyres will grip the track and the better surface ripples will be absorbed. However soft springs slow down the rate of reaction when braking or accelerating. The transmission of your machine‘s power onto the road is ‚deadened‘. Too soft a suspension can also cause uncontrollable wobble during rapid load changes, e.g. in a chicane.
The harder the suspension, the less the vehicle will tend to ‚nod‘ and the more control you will have over it. The bike will have a greater tendency to ‚skip‘ over surface ripples however. Tyres lose contact and you cannot steer, and this can easily cause a crash, especially on bends.

The suspension of a motorcycle consists in essence of the hardness of the springs and differences in the viscosity of the damper oil. Contrary to what you might think, suspension is affected more by the damper oil than by the hardness of the springs. You can vary the behaviour of the springs during compression with the damper oil which surrounds them. This oil is in the cylinder which encloses the spring. Make your setting by means of the slide controls in the appropriate menu option.

8.3.1 Spring hardness

You can choose your desired springs from five different degrees of hardness. The degree of hardness determines the amount of spring deflection, i.e. how far the spring can be compressed for a given amount of force. You should always match the spring hardness to your choice of tyres since tyres will wear faster with very hard springs.

8.3.2 Viscosity of Damper Oil

You have a choice of five different viscosities for the front dampers and five for the rear dampers. The thicker the oil, the slower the spring will move in it.

8.3.3 Extension and Compression Level

To an engineer, setting the tension and compression level is the most important tool for adjusting the suspension and has the greatest effect on suspension behaviour. This option lets you decide how fast the damper oil flows in and out of the strut. It is set by the number of clicks - the more clicks you select the softer the springs will extend and compress.

Notes for the different levels
Beginner
On this level the effects of the suspension can be ignored because your tyres with their permanent grip never lose contact with the ground.

Amateur
The wrong suspension setting will only have a limited effect on surface ripples or during cornering, but you should still match your suspension to the course, as you can ensure continuous grip in this way.

Professional
The suspension has a decisive effect on grip and hence on attainable cornering speeds. Make sure that it is properly set - the machine may ‚hop' if suspension is too hard!

8.4 Gears

The gears are one of the most important Setup settings. The primary and secondary drive ratios determine the theoretical top speed of the motorcycle, and the speeds of individual gears are set with the sprockets in the gearbox. Riders take a lot of time and trouble to get their gear settings right, as each course has its own particular relationship between bend characteristics and top speeds.

TIP: Practical experience has shown that it is better to set your engine power and gears first before you match your tyres and suspension to the course.

8.4.1 Primary and Secondary Drive

Gears with a different number of teeth can be selected for the pinion on the drive shaft (primary drive) and the sprocket - the so-called chainwheel - on the rear wheel (secondary drive) to match the gears to the characteristics of the course as ideally as possible. The more teeth there are on the pinion and fewer on the chainwheel, the higher the theoretically possible top speed is, but the lower the acceleration. The tables below give the limits for the different classes.

125 cc Class

Gearing	Pinion teeth	Sprocket wheel teeth	Difference	Ratio	Theoretical Top speed
Short	15	42	27	01:02,8	up to 210 km/h
Long	19	35	16	01:01,8	up to 300 km/h

250 cc Class

Gearing	Pinion teeth	Sprocket wheel teeth	Difference	Ratio	Theoretical Top speed
Short	15	39	24	01:02,6	up to 230 km/h
Long	18	30	12	01:01,7	up to 350 km/h

500 cc Class

Gearing	Pinion teeth	Sprocket wheel teeth	Difference	Ratio	Theoretical Top speed
Short	15	42	27	01:02,8	up to 245 km/h
Long	19	35	16	01:01,8	up to 400 km/h

To change the gearing setting, click on the plus or minus button in the bar beneath the gearing diagram.

The top speeds given in the tables are purely theoretical figures, as drag builds up with increasing speed. Rolling resistance also prevents the theoretical top speed from being attained.

To find the ideal gear ratios for any particular course, you can analyse the course characteristics from the circuit information provided. Short gearing is a definite benefit on courses that have a lot of bends and no long straights, while longer gearing is better for fast circuits with long, fast bends. When setting up your gearing, make sure you use the performance range of each gear!

8.4.2 Gear Ratios

Once you have set up the external gear ratios, you can now select the ideal number of teeth for each sprocket on the gearshaft. You have a different number of sets for each gear. By setting the gear ratios you are altering the acceleration-to-top-speed ratio of each individual gear. Ensure that the engine revs between two gears are not outside the optimum power range of the engine, otherwise your engine will lose power and will not accelerate strongly enough. The tables below give the gear ratio limits for the individual gears in the different classes.

125 cc Class

	Short Gearing	Long Gearing
1st Gear	01:02,1	01:01,8
2nd Gear	01:01,7	01:01,5
3rd Gear	01:01,4	01:01,3
4th Gear	01:01,3	01:01,2
5th Gear	01:01,2	01:01,1
6th Gear	01:01,1	01:01,0

250 cc Class

	Short Gearing	Long Gearing
1st Gear	01:02,4	01:01,1
2nd Gear	01:01,9	01:01,6
3rd Gear	01:01,6	01:01,3
4th Gear	01:01,4	01:01,2
5th Gear	01:01,3	01:01,1
6th Gear	01:01,2	01:01,0

500 cc Class

	Short Gearing	Long Gearing
1st Gear	01:02,1	01:01,8
2nd Gear	01:01,7	01:01,5
3rd Gear	01:01,4	01:01,3
4th Gear	01:01,3	01:01,2
5th Gear	01:01,2	01:01,1
6th Gear	01:01,1	01:01,0

It is advisable to look closely at the information in Data-Recording to see which bends you take in certain gears. If you find, for example, that you only use first gear for starting the race and that you take a number of bends in second gear, then you should select long ratios for first gear and keep the ratios from second to third gear short. This will give you better acceleration away from bends, which you can use for overtaking.

If you are not yet sufficiently familiar with a particular circuit, start off with a short primary drive and keep the overall gearing short as well! This will allow you to correct rider errors more quickly even if you may not reach the high top speeds. Then you can begin to extend the primary drive to the necessary length. This will allow you to set the gear ratios according to your own individual requirements!

Notes for the different levels
Beginner
You can fundamentally affect the performance characteristics of your machine with the gear ratios. However your bike has less power than a professional machine, so you should normally select shorter gearing.

Amateur
The gear ratios have their full effect on the performance of the motorcycle.

Professional
The gear ratios have their full effect on the performance of the motorcycle.

8.4.3 Clutch

The motorcycles used in modern racing have a semi-automatic clutch. This allows riders to change up without operating the clutch.
The clutch plays a decisive part when first gear is engaged, e.g. at the start of a race. Riders try to use the clutch to hold the engine revs in the optimum power band and then engage gear fully as speed increases. Try not to let the clutch in too fast, otherwise the engine will lose too many revs before you have attained the required speed! If you transmit too much power to the rear wheel on the other hand, your front wheel may ride up and you will be doing a wheely (warning: crash hazard!).
Top riders are able to use the engine's full power to accelerate over the whole start phase and win a decisive advantage in the battle for the best line into the first bend.

8.5 Engine Tuning

Grand Prix engines are designed purely for high performance, i.e. their output below 10,000 r.p.m. is relatively poor. For instance a 125 cc engine only develops 9 kilowatts (kW) at 8,000 r.p.m., while at 10,000 r.p.m. it is developing 24 kW and only generates its full 40 kW at around 12,400 r.p.m.

Engine tuning is a very delicate science and calls for a lot of experience on the part of the mechanics, as different weather conditions can also affect the engine's performance in different ways. Humidity and atmospheric pressure play a major part here, as well as air temperature. To save you the trouble of studying the art of engine tuning at length, the programme simulates an engine dynamometer which you can use to visually set the parameters on the basis of the resulting power curve. The following settings are possible:

CAUTION: Changes to the engine setup are not accepted unless the "Engine Tuning" option under Realism/Settings is activated.

8.5.1 Firing Point

The firing point is the moment when the spark plug ignites the fuel mixture in the combustion chamber when the piston is at a certain position in the cylinder. This is usually the instant at which the piston has compressed the mixture in the combustion chamber to its maximum. The ensuing explosion throws the piston of the two-stroke engine back down the cylinder. The piston transmits this released energy to the crankshaft and, in simple terms, drives the motorcycle via the gearbox. The engine develops maximum power when the firing point is set normally.
You can adjust the firing point with the slide control. If you retard the firing point, the plug will not fire until the piston has reached top dead centre. As a result, the engine's power peak will be in a higher range of revs. This is an advantage when you are racing on fast circuits with long straights and use your gears to their limits. However the engine will have a tendency to overheat with the higher revs.
If you advance your firing point the plug will fire before the piston gets to TDC, and peak power will be attained in an engine revolution range. This can be beneficial on courses with a lot of bends and frequent gear changing. But note that an advanced firing point can also cause rapid engine heating as a result of the extended combustion period.
Whatever your selection, remember that any departure from the standard setting can lead to a loss of maximum power!

8.5.2 Fuel Mixture

By varying the mixture you can control the ratio of injected fuel to combustion air. A rich mixture is one with a high proportion of fuel, while a lean mixture has more air.
There is a rule for setting the mixture: The amount of oxygen per cubic centimetre of air decreases at low atmospheric pressure, high temperature and high humidity. In this case you should set a leaner mix, i.e. feed less fuel, to maintain a constant mix ratio. When air pressure is high and temperature and humidity are low on the other hand, the amount of oxygen present in the air increases and the mixture must be set richer.
Fuel mixture settings only affect torque - they do not affect the power band.

8.5.3 Compression Ratio

You can use this option to change the size of the combustion chamber in which the fuel is ignited. In real life, mechanics will experiment with different cylinder heads, cylinder head gaskets and pistons.
Combustion can be controlled with combustion chambers of different shapes and sizes. This is necessary because the amount of time which the piston has to travel between the moment when the fuel mixture is ignited and the propagation and direction of the explosive force - as a function of the weather - can vary. Bear in mind that low air pressure or high air temperature calls for a higher compression ratio! As with changes to the firing point, when you alter the compression ratio you are also changing the engine's performance. If the compression ratio is too low, the fuel may not combust fully or the combustion gases are not discharged through the exhaust valve. This leaves behind combustion residue in the cylinder, and this can cause a loss of power and ultimately lead to engine damage.

Warning: Please remember to make your settings with "Engine tuning on" under "Realism/Settings", otherwise your selections will not be saved!

Notes for the different levels
Beginner
The engine settings have a full effect on the performance of the motorcycle.

Amateur
The engine settings have a full effect on the performance of the motorcycle.

Professional
The engine settings have a full effect on the performance of the motorcycle.

8.6 Cooling

Engines that are constantly running at high revs must not be allowed to overheat. Overheating is prevented by a water cooling system designed to maintain an ideal operating temperature of around 60° C. The cooling water flows through the radiator that is mounted in front of the engine block directly in the airstream. The heat of the water in the radiator is dissipated to the cooler air as it flows past.

This heat exchange mechanism is regulated by partially covering the radiator. The air temperature is the main factor to watch when you set up the cooling system. Other aspects that you should allow for when setting up the radiator are the fact that a lean fuel mix, an early firing point or a low compression ratio can all increase engine temperature.
You can cover the radiator in 10% steps. Remember that the engine's operating temperature should never fall below 50° C, otherwise the cylinder material will not expand enough to guarantee the smooth running of the piston rotating in the cylinder. As a result the piston would seize and the engine would suddenly lock up. If you cover too many radiator fins the engine may overheat and lose more and more power at high operating temperatures.

Warning: If you select "Engine trouble on" under Realism/Settings, then temperatures under 50° C and over 75° C can cause engine failure!

Notes for the different levels
Beginner
On this level the engine temperature can cause a loss of power when your engine overheats if you have set engine tuning to "on" in the Realism/Settings menu.

Amateur
In the Amateur mode you should keep your eye on the engine temperature to avoid a loss of power. The engine will lose power when the temperature deviates far from the ideal (60° C), but not so much as in the Professional mode.

Professional
Pay very close attention to temperature fluctuations, otherwise not even the best setup will help if you lose engine power through overheating! Correct setting of the cooling system is absolutely essential especially in changeable weather over a Grand Prix weekend. Failure to do this can cause a major loss of power owing to the varying weather conditions.

8.7 Data Recording

Data Recording is an extremely useful tool for riders and mechanics alike when it comes to setting up the performance of a machine to a specific course. Data Recording records all relevant telemetry data every 1/25th of a second and subsequently transmits them to a computer. These data are displayed as a performance curve and can be compared with each other.
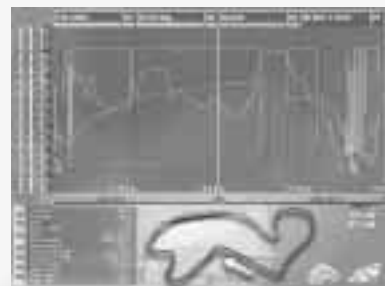
The following data are recorded:

Thrust	[%]	Accelerator grip opening
Degree of lock	[%]	Handlebar angle
Gear	[number]	Gear currently in use
Brake lever lever	[%]	Pulling force on the brake position
Speed	[Km/h]	Current vehicle speed
Revs	[r.p.m.]	Current engine revs
Engine temperature	[°C]	Current engine temperature
Spring travel, front	[mm]	Front spring compression
Spring travel, rear	[mm]	Rear spring compression
Power	[bhp]	Current engine output
Acceleration	[m/s≤]	Current rate of acceleration
Front tyre condition	[%]	Percentage of front tyre grip
Rear tyre condition	[%]	Percentage of rear tyre grip

8.7.1 Using the Data Recording Feature

This section contains a description of the individual Data Recording functions to make sure you get the best out of this feature.

8.7.1.1 Selecting Data

You can view and compare up to four performance parameters that are plotted together on a graph. Each plot is in a different colour that matches the bar beneath the parameter name. To select other performance graphs, just click on the name in the header bar. You will see a pull-down menu in which the data appear in the form of the icons shown above. When you move the mouse pointer onto one of these icons its name will appear in the header bar. Click the icon with the left-hand mouse button to display the selected performance curve. If you want to compare fewer than four parameters, select the red "X". The scales for the set performance curves are shown at the left-hand edge of the curve monitor and have the same colour coding.

The double white line in the centre of the curve monitor indicates the position of the data recording. You will find the exact data at the time of recording at the bottom left of your screen.

8.7.1.2 Number of Laps

Data Recording records the performance data for the last twelve laps. If you want to compare, say, your speed data for the last four laps instead of just the data for one lap, then set all four data names to "Speed" and click the number next to the data name. You will again see a pull-down menu with twelve numbers. Select a different number of laps for each column. The number of laps you have ridden so far, which you can select, is shown in black, otherwise the numbers are grey.

8.7.1.3 Displaying Different Laps

You can view performance data for different laps using the switch at bottom left. The colour of the switch and the colour of the data displayed in the window at bottom left is the same as the colour of the header of the column to which the data relate. The set colour corresponds to the colour selected at the top, so the data block displays the data for the corresponding lap.

8.7.1.4 Scaling the Data

When you first see the Data Recording screen, all the course data are displayed on the curve monitor, and this can make an accurate analysis rather difficult.

For this reason you can use the two slide controls beneath the curve monitor to scale the data on the X and Y axis as you require - the slide on the left scales the units, while the slide on the right varies the length of the visible course section. Click in the curve monitor to view the different parts of the course graph!. Hold the left-hand mouse button down to scroll the data horizontally by moving the mouse left or right. You can also scroll vertically through the data by holding down the right-hand mouse button. When you scale data, the section currently displayed on the graph monitor is highlighted in yellow on the small course display beneath the monitor.

8.7.1.5 Metres versus Seconds

Beneath the right-hand slide control is a small switch which can be used to change the display of the course in the monitor. It is highlighted in white when you move the mouse over it. The default setting is "Metres", but you can also see how the data look after you have spent a certain riding time on the course. Just click on "Metres" and it will change to "Sec".

8.7.2 Riding Line Screen

As well as technical data, Data Recording also stores the line you have ridden on the individual laps. Click the graph symbol at bottom right beside the starting flag to see another screen with a graphic of the course. The ideal line for the course is shown in white. Using the switch next to the two time displays at the bottom left of the screen you can activate up to two of your own lines which are displayed in different colours that match the colour of the lap times (see next screen!).

Similar to the data scaling feature in the graph monitor, you can also increase and reduce the size of the course with the right-hand slide to either zoom in on sections of the course for a better look, or step back for an overall view. Use the left-hand slide controller to move around the course.
Click the monitor beside the starting flag to return to Data Recording.

9 Ghostrace
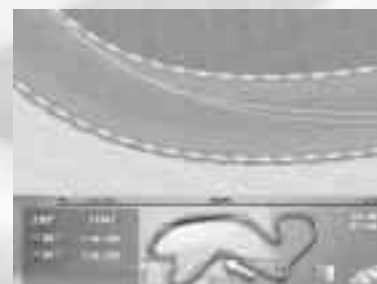
While playing the "Ghostrace" mode, you can tape your race and save it, so that you will be able to compete with your "ghost" in a later race. You can even exchange your ghost data's with your friends, or send them by email. That is why the "Ghostrace" mode is an excellent way to compete with others or to improve your own skills.

9.1 The Ghostrace-Screen

After you selected the "Ghostrace" mode in the main menu and pushed "start" you will see the Ghostrace-screen.
In this screen you can look at your saved "ghosts" and choose one of them. You can also see the conditions of the saved Ghostrace: course, weather and the level. On the right side you can see the time the ghost needed to finish a lap.
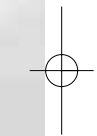
After you selected a ghost, push "start" to begin the race against the ghost.

In the bottom line of the screen you can fill in the name for a new ghost which you can save on your harddrive (see "export and import of ghost data ").

To delete a ghost, select it and click on the garbage can.

You can start a race without selecting a ghost. Your race will be taped anyway and you can save it.

When you race against a ghost you automatically will race under the same conditions as the ghost: the same course, weather and level. Only if you do not select a ghost, you will race under the conditions you selected in the main menu.

9.2 The Ghostrace

After you selected a ghost you will start behind the starting line, while the ghost will be waiting for you on the starting line. As soon as you pass the starting line, the ghost will start as well. You can race as many laps as you want to, but you can only compete with the ghost lap by lap:
If the ghost is faster than you are in one lap, he will wait for you at the finish line and only than continue.
Should you be the first one reaching the finish line, the ghost will reappear at the finish line, as soon as you pass it. This way you will start each lap with the same ghost and you will see, at which point in the course the ghost passes you.
If you are the first one to reach the finish line, you should save the lap as a new ghost immediately and compete against this faster ghost. You can save a completed lap at any time after passing the finish line, by pressing ESC. You will get to the ghost save-screen.

9.3 The Ghost save-screen

The ghost save-screen shows all preciously completed laps. If you want to save a lap as ghost, click on the save icon (the icon with the disk). Your lap will be saved under the previously selected name.
To select a lap as ghost, select a lap and then click on the ghost icon.
From the ghost save-screen you can get to the track info and to set up at any time.

9.4 Export and import of ghost data

All ghosts will be saved in the Grand Prix 500 directory under \Save\Ghost. Ghost data's will always have the name you selected in the ghostrace-screen prior to the race. A number will be attached to the name (0,1,2,...). With every ghost that save under the same name during a race, this number will increase. This way a ghost will never be overwritten.

To export a ghost, change to the ghost directory using the Windows®-Explorer and copy the ghost data for example on a disk.

To import a ghost (for example from a disk) just copy it in he ghost directory. As soon as you start a race and go to the ghostrace screen it will be shown in the list and you can select it.

You can delete a ghost also by deleting its data from the ghost directory.

9.5 A Word about Handling

The handling characteristics of a motorcycle are very different from those of a Formula 1 racing car, so we will briefly review the main points that you should bear in mind:

- Braking to take a bend should always be completed before you enter the bend because a motorcycle will always tend to come upright when you apply the brakes. In the worst case the machine will somersault sideways.
- The engine revs need to be very high when pulling away, so the rider allows the clutch to slip for a long time before finally letting it in.
- Most motorcycle engines are designed to operate at very high revs, and gears are not changed until the revs are in the red zone (small cockpit display).

10 Controls

Keyboard controls can be changed in the options menu. The joystick assignment cannot be changed. If you use a joystick with only 2 buttons, then the <Ctrl> key and the space bar remain active for wheelies and looking around.

10.1 Keyboard

Accelerate	A
Brake	Z
Left	Left Arrow Key
Right	Right Arrow Key
Change Up	Up Arrow Key
Change Down	Down Arrow Key
Wheely	Strg/Ctrl
Look around	Space Bar

10.2 Joystick/Pad

Accelerate	Joystick Forwards
Brake	Joystick Backwards
Left	Joystick Left
Right	Joystick Right
Change Up	Button 1
Change Down	Button 2
Wheely	Button 3
Look around	Button 4

10.3 Views

The various views can be selected and/or toggled by pressing one of the following buttons:

Rider's View	1
External Camera (Static)	2
External Camera (Dynamic)	3
Observer Camera	4
Zoom in	5
Zoom out	6
Reduce camera range (static only)	7
Increase camera range (static only)	8
Camera Angle (static only)	9
Camera Angle (static only)	0

10.4 Rider selection (in observer mode only)

Return	Own rider
Page Up	Rider in front
Page Down	Rider behind
Pos1	Leader
End	Last place

10.5 Ride Options

	Singleplayer	Multiplayer
Automatic Gear change	F1	Menu only
Automatic clutch	F2	Menu only
Automatic braking	F3	Menu only
Steering aid	F4	--
Ideal lines	F5	Menu and Keys
Bend indicator	F6	Menu and Keys
Automatic Centring (Keyboard)	F7	Menu and Keys

10.6 Other options

Pause	Pause or P
Pit menu or interim standings	ESC

11 Rules

Races are run according to F.I.M. rules (Fédération Internationale Motocycliste).

11.1 Scoring

Points for race placings are allotted according to F.I.M. rules:

Place	Points	Place	Points
1	25	9	7
2	20	10	6
3	16	11	5
4	13	12	4
5	11	13	3
6	10	14	2
7	9	15	1
8	8		

A rider who is disqualified naturally gets no points, even if he is first across the finish line.

11.2 The World Championship

In a World Championship there are 15 separate Grand Prix races which must be run in a set sequence. Each Grand Prix includes a Training and a Qualifying session on the Friday and Saturday, the Warm-Up, in which the bike's Setup can once more be tuned to the weather conditions prevailing on the day of the race, and the race itself. Please refer to the individual menu options for details of these functions.

11.3 A Short Lesson on Flags

Chequered: This flag signals the end of the race. The black and white chequered flag is waved on the final lap just before the leader crosses the finishing line.
Yellow: Warning: Hazard on the track - No overtaking.
Blue: Overtake: This flag tells you that another rider is approaching from behind and wants to lap you. It is a violation not to let him past.
White: Proceed with caution - slow moving vehicle ahead (e.g. a motorcycle with engine trouble)!
Green: All clear: The previous warning has been cleared.
Black: This flag means you are disqualified: you have committed a violation and can score no points.
Black+10: You have broken the rules and must make a pit stop. You usually have 3 laps in which to do this. On the last lap you must go straight into the pit lane, wait the 10 seconds and you can then cross the finishing line in the pit lane. If the last lap is just starting and you still haven't made your penalty stop and cross the finishing line instead, the race is over but you are unfortunately disqualified.

11.4 Violations

You can be penalised or disqualified for the following violations:

A slow vehicle must allow a lapping rider to overtake it. A blue flag tells you that another rider wants to lap you. You will get a 10 second time penalty if you don't let him past.
You will see a yellow flag if there is a hazard ahead of you on the circuit. You must not overtake if this happens. A violation of this rule will attract a time penalty.

A black flag indicates that you have got a time penalty. You are required to ride into the pits within the next 3 laps and sit out your penalty time (the computer takes the lead when you steer into the pit lane). If there are not enough laps left to go to the end of the race, you must go into the pits sooner of course. If you fail to enter the pit lane within this time you will be disqualified.

The direction in which the race is run is shown on the courses. You will be disqualified if you ride in the wrong direction for any length of time.

12 The Editor

You can call the Editor **externally** under Windows. You can use the Editor to edit all rider data.

First select the class in which the rider will be racing!
You can now enter the rider particulars under "Personal Data".

Entries have the following maximum lengths:

Name:	15 characters
First name:	15 characters
Team name:	27 characters
Birthplace:	31 characters

You must enter at least 2 characters per field. Please do not use any special characters!

End: Quit the Editor. Before you quit you are asked whether you want to save your data. If you wish to revert to your previous version, simply answer "No" and load your data again.
Save: Your edited data will be saved and transferred immediately to the main programme.
Load: You can load your edited data and then edit them again.
Load Backup: If your game won't start because the rider records cannot be loaded for some reason, this option lets you load the original data supplied with the package. Remember that any data which you have edited will be overwritten when you click on "Save"!

Rider Characteristics
You can vary the characteristics of each rider. "1" is the best grade, "6" is the worst.

13 Troubleshooting

13.1 General Tips

Using the ride options: the general rule is to try and stick to the ideal line as closely as possible to begin with. This may mean having to ride the first few laps fairly slowly, as any drift into the gravel bed can cost a lot of time.

If you have activated the steering assistance you should also display the ideal lines, otherwise you may not know why the computer is taking you one way while you are steering in another.

13.2 Technical Questions

Q: **What can I do to make my graphics more fluid during a race?**

A: Extreme 500 has been written for 3Dfx cards (Voodoo and Voodoo 2) and equally fast Direct3D cards. The graphics were optimised with the latest drivers and DirectX 6.
  • Use only the latest graphics drivers. Remember that DirectX 6 is fairly new and that many manufacturers have only recently started supplying optimised drivers. Speed losses of up to 50 % are not unusual with older drivers. If you know who made the chip in your graphics card you can obtain his reference driver. In many cases these are faster than the drivers of the card manufacturers.
  • Reduce the range of vision! Experiment a little to find the best settings for your configuration!
  • Reduce the graphic detail level!
  • Reduce the sound sampling rate and/or the number of sound channels!
  • Reduce the graphic resolution and only start the game in full screen mode!
  • The more opponent motorcycles that are visible, the more work your PC has to do. Reduce the number of opponents and/or start from the front row!
  • Many of the courses are graphically more complex than others. This is particularly true of the extra courses as these have been created with much attention to detail.

Q: **What must I remember in network mode?**

A: The following points are important:
  • The TCP/IP protocol must be installed. Check this under system control/network if necessary!
  • A network game requires a bit more computer power than a solo game, so there may be a delay in the response of the controls and the display on slower PCs. The power of your network card can also have an effect!

• Avoid running Extreme 500 at the same time as other applications in the network if you are experiencing network problems (jerky graphics, synchronisation problems). You should particularly avoid copying large volumes of data over the network.

Q: **My sound always plays with a delay!**
A: Reduce the sound buffer in the Options/Sound menu.

Q: **Which screen resolutions can I use?**
A: The standard resolution is 640x480 (65000 colours) and works on all 4 MB graphics cards. More memory will usually be needed for 800x600, but this will depend a lot on the card that is used (and on how it manages the graphic textures). The best option will be to experiment a little. You may be able to select a mode although it does not work properly - or work at all - with Extreme 500, in which case just change the mode over again. Note too that all the menus are displayed in 640x480 resolution and that a higher resolution takes up more PC time.

Q: **The Intro Video and Cup Video do not play correctly/do not play at all! Instead I get an error message (Quartz Core failed).**
A: These videos use ActiveMovie which is automatically installed during the Windows98 or Extreme 500 installation. Look under Start Menu/Programmes/Accessories/Entertainment Media to see whether the ActiveMovie controller is installed. Re-install ActiveMovie if necessary (it is on the Extreme 500 CD).

Q: **I get a Glide error message when I start the programme although I have not installed a 3Dfx card!**
A: Extreme 500 finds Glide drivers on your PC and tries to initialise the 3Dfx card. Delete the "GP5003dfx.dll" file in the main directory of Extreme 500 to clear the fault.

13.3 Riding Tips

Q: **When should I use brake and steering assistance?**
A: The assisted brake and steering features are sophisticated options that are a big help to the player as he rides. They are intended for players who are not yet very skilled in race games, and should be deactivated as soon as you have gained some experience - you will only learn properly if you try it out for yourself! You will also find that with a little practice you can actually ride faster without these aids.

Q: **I get the impression that the brakes on racing machines are fairly weak on bends. Am I right?**

A: Basically these machines have very powerful brakes (e.g. a 250 cc bike can go from 100 km/h to 0 km/h in just 25 metres), and this is absolutely fatal on bends. Because the reaction of a motorcycle to its brakes is naturally felt much less strongly in a simulation than in real life, we have changed the braking response on bends to prevent violent braking causing crashes. This means that the brakes only work as well as a motorcycle can take. Also, the brakes work rather better on the Beginner level than they do in real life or on the Professional level. See also Section 8.2.

Q: **Why does my motorcycle accelerate so poorly in first gear even though my engine revs are 12,000 r.p.m?**

A: Engines are designed to develop maximum output at 12,000-13,000 r.p.m., and it is therefore very important to try and attain these revs when accelerating away from a standstill. However this can only be achieved by revving up the engine but only letting the clutch in very slowly. This becomes very clear when the automatic clutch is on. You will naturally not achieve full acceleration until you can release the clutch, and this can take a while, especially with a 125 machine. See also Section 8.5.

Q: **I just cannot manage to stay on line in bends! What am I doing wrong?**

A: Finding just the right speed for taking bends is the most difficult thing of all in this sport. If you go too fast or accelerate too hard you will be thrown out of the bend. If you ride too defensively you will lose time. The important thing is to brake before you get to the bend, not once you're on it! Note where the braking points are for the various bends, brake at the right time and allow your machine to roll into the bend. Experiment with your acceleration on the bend and accelerate away hard at the right moment! Please remember: You will lose more time if you go off the track than if you ride carefully. Do not hesitate to brake a little more vigorously to begin with. In this way you will get to understand the machines more quickly and you will have a lot more fun! See also Section 8.2.

14 Credits

Programming

3D Engine	Boris Fornefeld and Bastian Rolf
Rider logic	Bernd Ludewig
Menu	Bastian Rolf
Network	Boris Fornefeld
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Installation programme	Henrik Nordhaus
Additional programming	Kay Struve

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3D models of the vehicles	Jörg Laurien
Rider motions	Jörg Delbrügge
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Texturing	Andreas Baciulis, Mark Külker, Christiane Pfeifer, Olaf Baydacz, Jörg Delbrügge, Torsten Asholt, Silke Schwengelbeck
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Packing design	Delia Wüllner-Schulz / XiMOX!, Bielefeld

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Extro, presentation ceremony	Mark Külker

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Effects	Dag Winderlich
Sound assistant	Jojo "Plänett Records"

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