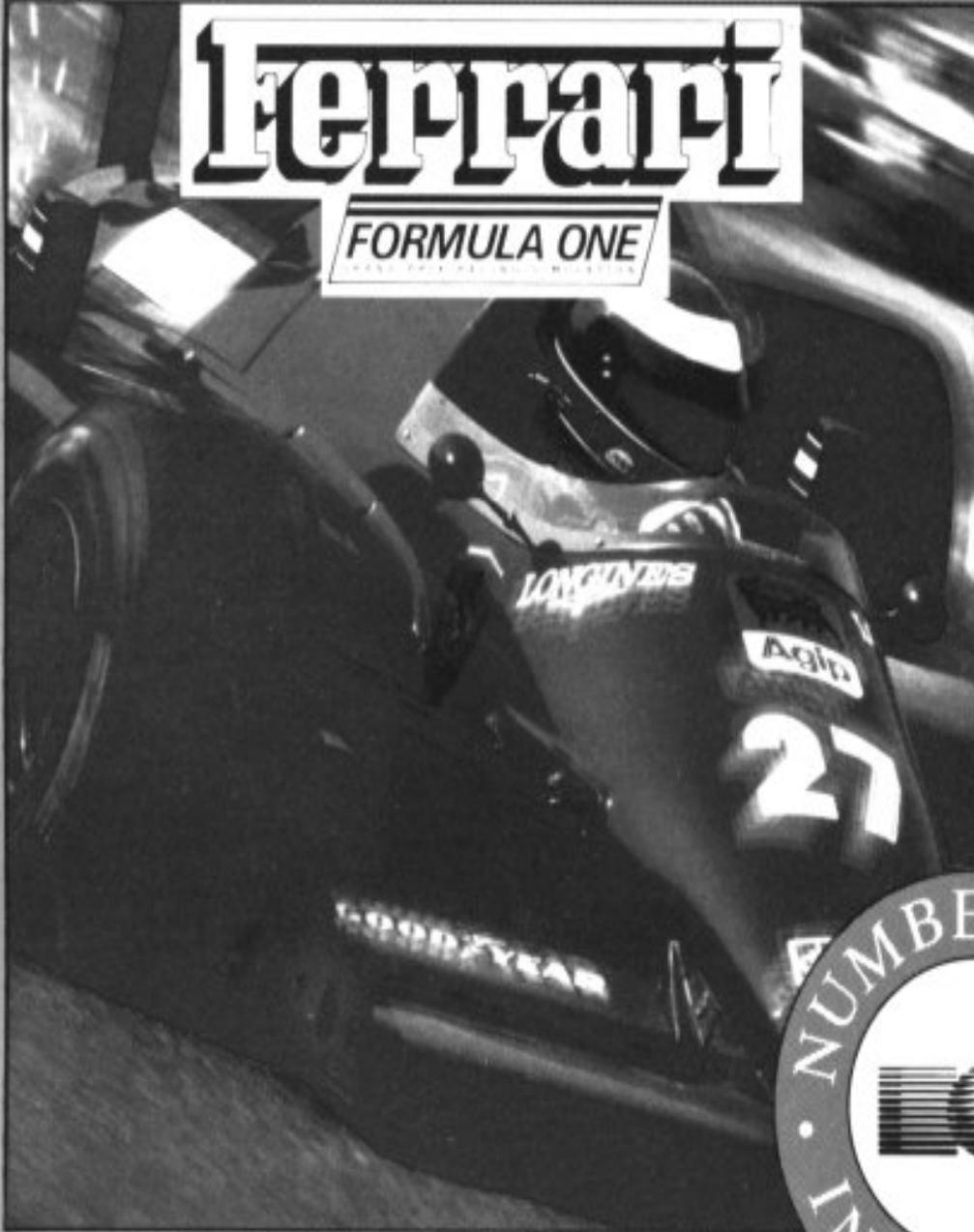


MANUAL

Ferrari

FORMULA ONE



ELECTRONIC ARTS™

Ferrari Formula One

START YOUR ENGINES!

Grand Prix/Formula One racing is one of the most exciting sports in the world. To be a Grand Prix driver, you must not only have a mind like a computer and reflexes like a mongoose, but you must also be an expert on racing technology and an excellent business manager.

Ferrari Formula One brings all of the depth and excitement of the Grand Prix race circuit to your computer. You'll have plenty of races to run, but you'll also have a pit crew to manage, a Ferrari Formula One 1986 (F186) race car to modify and test, deadlines to meet, and schedules to keep. But all of this is only for those who want to run the full simulation. If you just want to get behind the wheel of a Ferrari (the most successful Grand Prix racing team in the world), then you can do that as well.

HOW TO USE THIS MANUAL

This manual is designed so that you can use just as much of it as you want. It covers everything about the Ferrari Formula One simulation, from Formula One World Driving Championship rules, to travelling to and competing in your first race. However, if you want to simply drive without worrying about schedules and your season standing, then you probably don't need to read this manual.

Just take a moment to carefully read the Driver's Reference Guide. It provides everything you need to get started quickly including how to control your Ferrari, the specific features and keyboard shortcuts for your computer, and other information you'll probably want to keep handy as you race. And because Ferrari Formula One is available on a number of different computers with differing capabilities, some of the features and functions described in this manual may be different on your computer. The Driver's Reference Guide will help you deal with those differences as well.

ABOUT THE GRAND PRIX AND THIS SIMULATION

There are a lot of rules in Formula One World Driving Championship racing. The majority of Formula One rules apply to car design and specifications. You won't need to worry about these rules too much because Ferrari Formula One won't let you modify your car beyond the parameters laid down by Formula One rules. In other words, Ferrari Formula One lets you make adjustments to your F186 (like changing the attack of the wings), but you won't be able to alter the car's structure (like making the wings larger), because this is against Formula One rules.

A Grand Prix race season consists of a series of races, each at a different track.

Each race consists of:

Practice One (P1)

In the morning, two days before the race. This is where you get acquainted with the track and your opponents.

Qualifying One (Q1)

In the afternoon, after P1. This is the first real competition of the race. In qualifying you're competing with the other drivers for the best grid position for the start of the race. Your starting position is based upon your best lap time during qualifying. You'll want to adjust your car radically and push it to its limits.

Practice Two (P2)

In the morning of the day before the race. Continue to familiarise yourself with the track and prepare to improve your time for the second qualifying session.

Qualifying Two (Q2)

In the afternoon, after P2. Once again, adjust and push your car to its limits to try and make the best qualifying time.

Warm-up

On the morning of the race. This is a 30 minute session in which you'll make a final inspection of the track, and your opponents' strengths and weaknesses. Take it easy on your car during the warm-up race -don't take the risk of destroying your engine before the race even starts because you probably won't have time to replace the engine before the race begins.

Note: Track testing time is probably your most limited resource during a Grand Prix.

In a little over four hours you must:

- * Learn the track and its layout.
- * Find the fastest setting for the Qualifying sessions.
- * Secure a good grid position.
- * Find the best combination of speed and endurance for the race.
- * Find the fuel economy that will let you complete the race.

Make sure that you spend time driving your car in race trim. The wrong time to find the right settings is after the green flag drops.

Race

With your car tuned to the best balance of speed and endurance, this is where you'll engage in competition for the race trophy. A Grand Prix race normally lasts two-hours or about 315 kilometres, whichever comes first, but you can use the race control (described later) to select races as short as 2-5 laps (about 18 kilometres). If the race doesn't run the full distance within two hours (or the time limit for a shorter race), then the lead car is the winner. Unlike the practice, qualifying, and warm-up sessions, you can't refuel during the actual race.

Ferrari Formula One, the simulation, operates just like the Grand Prix race circuit in the real world. The moment you boot the program the clock starts ticking. You must get yourself and your car into shape in time to transport yourself, your equipment, and your crew to the first race of the season. Car repair and travel time is accelerated, but all other aspects of Ferrari Formula One are in real-time. Furthermore, if you damage your car before, during, or after

the race, you'll receive a time penalty in the amount it would really take to put your car back in working condition, or your body back in shape if you were injured in the crash. A really bad crash may put you out for the rest of the season.

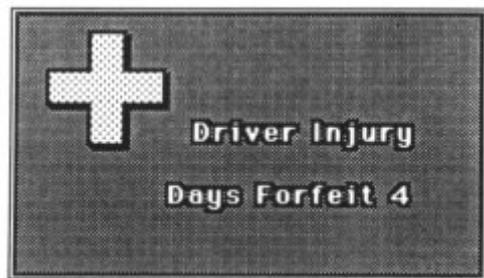


Figure 1: An Injury Penalty

FIORANO - LAUNCHING YOUR CAREER

Fiorano (pronounced FEE-OH-RON-OH) is your home base and test track. Fiorano has all the facilities you'll need to coax the best performance out of your Ferrari and to hone your own driving skills. And your crew chief is always available to help you make the set-up decisions that can determine race outcome.

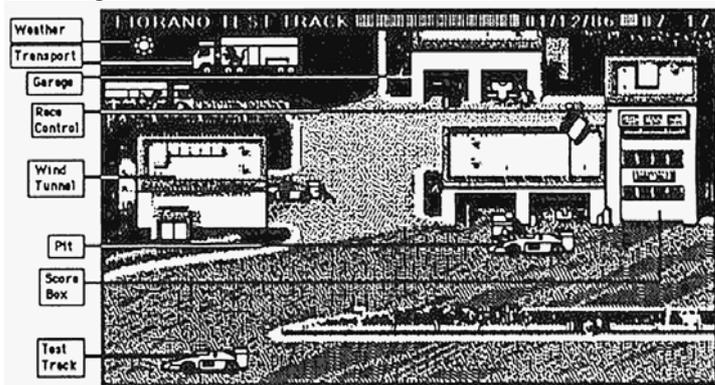


Figure 2: Fiorano Paddock

WHO'S MAURO?

Mauro is your computerised crew chief who's always available when your car is in the pit or garage.

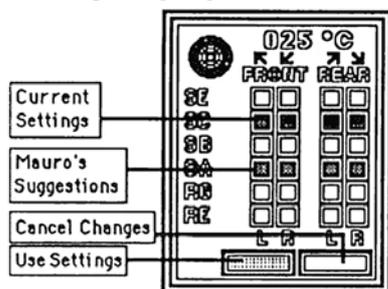


Figure 3: Ferrari Control Panel With Current Settings And Mauro's Suggestions

Select the toolbox to get Mauro's suggestions on car adjustments. When you select the toolbox, all the control panels for your Ferrari will open. Solid squares highlight Mauro's suggested settings just as if you had selected them yourself.

If Mauro's settings are the same as the current settings, only Mauro's settings will show on the control panel. When you are playing

playing at F3 level, Mauro's settings automatically take effect each time you go to a new track.

Note: After you have driven the car, some of the current setting squares may be partially blacked-out, indicating wear. A solid black square means that component is no longer operational.

MAP OF FIORANO

The Fiorano paddock is made up of seven different areas. You can get to the different areas of Fiorano by selecting one from the paddock screen. See the Driver's Reference Guide to learn how to select screen areas on your computer. Fiorano paddock is very similar to the paddocks of the competition tracks, except that it has some additional facilities that you won't find at the competition tracks (see "Competition Track Layout" under Your First Race for more information on competition tracks). The following sections describe each of Fiorano's areas in detail.

RACE CONTROL

This is where you pick the race settings such as track, session, race length, and driver name. The race control panel appears when you select the second floor race control building. Figure 4 below shows the race control panel and each of its controls.

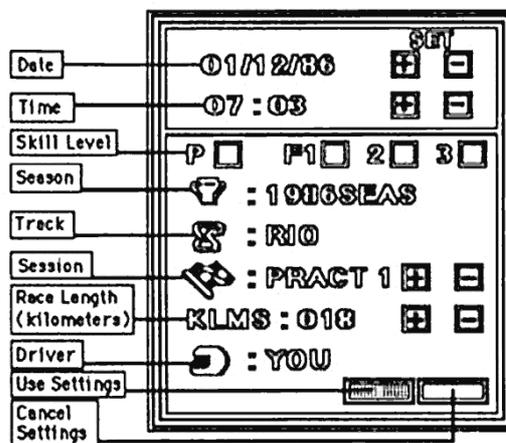


Figure 4: Race Control Panel

You can use the date and time controls, or the track and session controls to quickly advance a race season if you are trying to run a season from start to finish. When you choose the track control, a list of the various race tracks appears for you to choose from. Choosing a track resets the clock, calendar, and session control to the first session of that race.

The session control changes the selected session and resets the clock and calendar for that session. You'll notice that once you pass the last session of a race, the session control also switches the track control to the next race of the season.

Note: Unlike the transport trucks, selecting a new track or session from the race control panel sets the clock and calendar ahead to the day of the current track session. This means that you can use it to skip races. But if you are keeping a record of your season standings, you won't have scores for the races you've skipped. Also, if you use the race control to go back and repeat a session, you'll forfeit your accumulated season standings.

The skill level control lets you set Ferrari Formula One's difficulty from Formula One (F1 - the hardest) to Formula Three (F3 - the easiest). The harder the skill level, the more skillfully your opponents will drive and the more likely that wear and tear will cause

amechanical failure in your car. At the F1 level, you must also shift gears manually(see the Driver's Reference Guide for information on manual shifting).The P in the skill level area of the control panel lets you leave the driving to us soyou can view the race as a passenger. (But you still call the shots when it comes to carrepairs, even though you're only a passenger during the race.)

The driver control lets you enter your own name as a driver for the season.The name you enter here will appear before your score on the season standings screen.The trophy control lets you save your current season to disk, or load another season from disk.You'll need a formatted/initialised, blank disk in order to save your seasons.See the Driver's Reference Guide for more information on saving your season statistics,and see your computer's users' manual for instructions on formatting or initialising blankdisks.

GARAGE

The garage is where you'll adjust your Ferrari's major systems before you take it out to the test track or to a race.

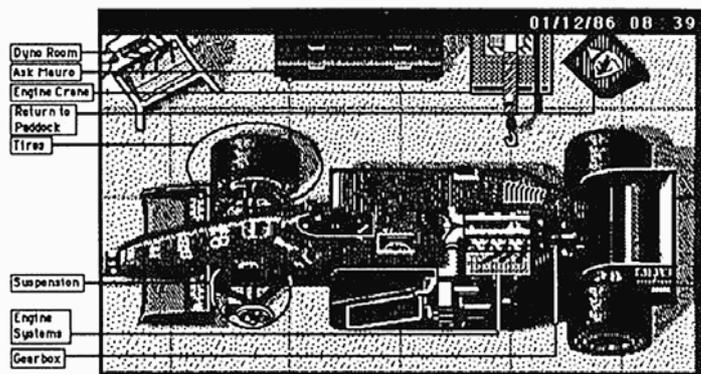


Figure 5: The Garage

Select the garage building to enter the garage. Figure 5 (above) shows the inside of the garage and the eight screen areas you can select for garage functions. See the Setting Up Your Ferrari section below for more detailed information on using the garage. The dyno room is also located in the garage (at Fiorano only). See "Dyno Room" in the Testing Your Car"section below for a description of, and information on using the dyno room.

WIND TUNNEL

The Fiorano wind tunnel is where you'll learn to make adjustments to your Ferrari's wings, and then test to make sure your adjustments are aerodynamically sound.

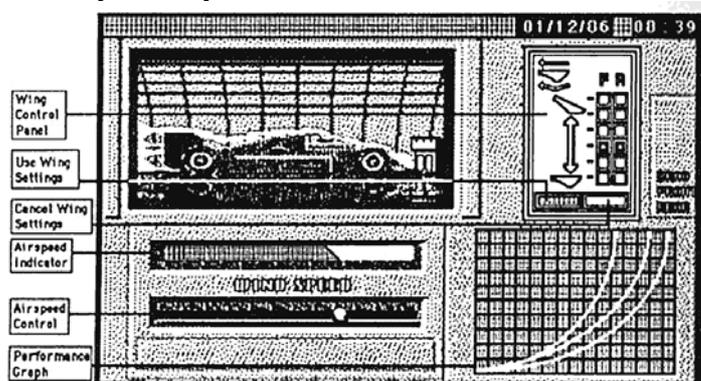


Figure 6: The Wind Tunnel

The adjustments you make to your Ferrari's wings affects the way the car handles on the track, so the wind tunnel plays an important

part in developing a winning Ferrari. Select the wind tunnel building to put your Ferrari in the wind tunnel. Figure 6 (above) shows the inside of the wind tunnel and the controls you can use. See "Wind Tunnel" in the Testing Your Car section below for more detailed information on using the wind tunnel.

PIT

The pit is the place where you fine tune the major adjustments you performed on your Ferrari in the garage.

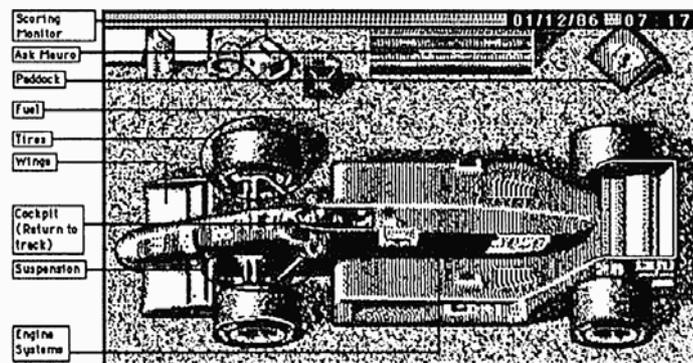


Figure 7: The Pit

You can select the pit building to put your car directly into the pit from the paddock, or if you have a problem on the track, just pull off the right side of the track after the start/finish line (the area without a curb) into the pit and ask Mauro's advice. The pit has most of the features of the garage except for the dyno room, the engine crane for changing engines, and the ability to change gear ratios. The dyno room is available only at Fiorano.

In the pit, however, you can also adjust your car's wings, refuel (except when Formula One rules prohibit it), and see your current lap times and the weather conditions on the scoring monitor. During competition, you can also use the scoring monitor to see the overall race scoring. When you're done in the pit you can return to the track by selecting the Ferrari's cockpit.

Figure 7 shows the inside of the pit and the nine screen areas you can select to use its various functions. See the Setting Up your Ferrari section below for more detailed information on using the pit.

Note: Your pit crew's accuracy and speed will vary depending on whether you're in the garage or the pit, and depending on whether you're practicing, qualifying, or racing.

TEST TRACK

Your pit crew's accuracy and speed will vary depending on whether you're in the garage or the pit, and depending on whether you're practicing, qualifying, or racing.

When you have your Ferrari set up in what you think will be a winning configuration, it's time to take to the test track to see how she performs. There are no other cars on the test track except yours, so this makes it a good place for you to learn to drive at high speeds. Select the car that's lined up on the track at the bottom of the paddock screen, or the cockpit of the Ferrari in the pit to move onto the track. See the Going for a Lap section of the Driver's Reference Guide for more information on getting behind the wheel of your car.

SEASON STANDINGS

Season standings is housed in the building directly below race control and shows your overall season standing.

		Current Season	Current Date	Current Time						
		1986 SEASON	08/08/86	11:32						
SEASON STANDINGS										
Driver Numbers		28	20	1	5	2	6	12	27	
Tracks & Scores		RIO	9	3	6	4	1	0	2	0
		JEREZ	9	0	1	0	3	4	6	2
		IMOLA	9	1	2	3	4	6	0	0
		MONACO	9	3	6	2	0	4	1	0
		SPA	9	6	3	4	0	0	1	2
		MONTREAL	9	6	0	4	0	3	1	2
		DETROIT	9	6	0	4	1	3	2	0
		RICARD	3	9	6	0	1	4	2	0
		HATCH	9	6	3	0	1	0	4	2
		HOCKENHEIM	4	0	3	6	2	1	0	9
Total Race Scores		TOTAL	79	40	30	27	13	25	19	17

Figure 8: Score Box

Figure 8 shows the season's standings. You can save your season standings screen to disk and view them again later using this screen (see your Driver's Reference Guide).

During the 1986 season, the season score for a driver was calculated by using the 11 best scores out of all 16 races. The driver gets a certain number of points per race, based upon his finishing position. Table 1 shows the correlation between points and finishing position.

TABLE 1:
POINTS – POSITION

9 - 1st place
6 - 2nd place
4 - 3rd place
3 - 4th place
2 - 5th place
1 - 6th place

TRANSPORT

The transport trucks take you to the competition track of your choice, and advances the clock for the amount of time it takes to travel there.

The transport trucks let you travel to tracks early or between races during the season so you can log extra test time. For instance, if you select the transport trucks in January at Fiorano and choose Rio, then you'll arrive at Rio two months before the race, which begins on March 19th (see "Appendix A - 1986 Season Schedule"). You can still do practice laps even though the track is closed.

When you select the transport trucks, a world map appears that shows your current location and all the other track locations. Weather icons appear near each track location to show you the weather conditions there. If you're testing your car or practicing between races, you can use the weather icons to select the weather conditions of your choice. Select a track and you'll see the route marker appear as you travel. The weather conditions you see on the

map are for the current day, and may change in the time it takes you to travel to your destination.

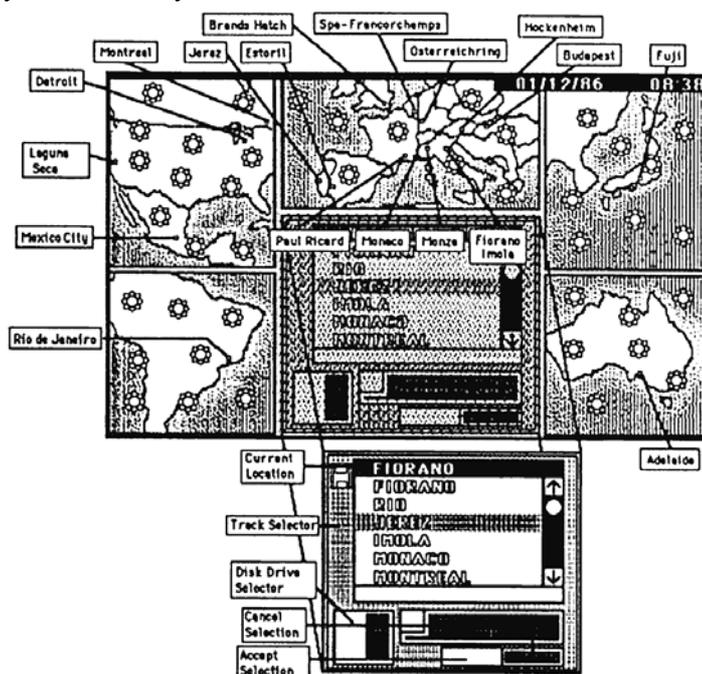


Figure 9: The Transport

SETTING UP YOUR FERRARI

Now that you've seen how to navigate through Ferrari Formula One, it's time for you to start thinking about getting your car ready for competition. Your Ferrari is basically composed of five systems: engine, gearbox, tires, suspension, and wings. You should look at track conditions to determine the best way to adjust your car's systems. For instance, you'll pick rain tires for a wet track, and slicks for a dry track. You'll also need to adjust the gearing and wings differently if a track has a lot of curves, or a lot of straights.

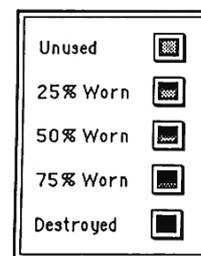


Figure 10: System Wear and Tear

You can tell when a system is worn, damaged, or completely destroyed by the amount of filling in the system's control box. A brand new system has a solid, completely filled control box, while a destroyed system has an empty control box (see figure 10). The amount of time it takes you to repair one of your car's systems will be subtracted from your game time. The following sections explain how you adjust, repair, or replace these systems, and the theories and concepts you should be aware of as you work with them.

ENGINE

Your Ferrari's engine is a V6 Turbo that delivers up to 1,000 horsepower at 11,000 rpm; it's one of the highest revving turbo-charged engines available. The engine itself is made up of five sub-systems that you repair or replace with the engine control. Just select the system you want to repair. The time it takes to repair the engine sub-system varies according to the amount of damage it has taken, and when and where you make the repair. The engine life

and fuel level indicators display engine age and the amount of fuel only -you can't adjust their status with the engine control.

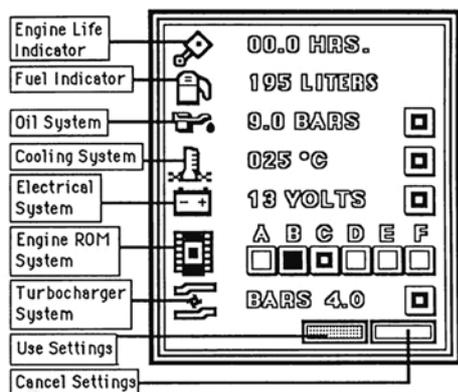


Figure 11: Engine Control

Engine life is a strong determining factor in engine performance. An average time for engine life in the Grand Prix circuit is roughly six hours, with a maximum life of 12 hours. This is when you'll get the optimum performance out of the engine. Luckily, no race will ever last that long, but you'll use up some engine life by burning it in during a pre-race warm-up. You'll see how engine life affects performance when you learn to use the dyno room in the next section, Testing Your Car.

Note: Formula One racing is one of the most expensive forms of motor racing in the world. Car chassis are constructed from exotic materials such as carbon fibre, and front line drivers can make more than three million dollars a year. Engines can cost in excess of \$60,000.00 dollars apiece, and drivers will generally use three engines during a Grand Prix (one for each Practice/Qualifying day, and a third in race configuration).

The time on the engine increases the longer you run the engine. Using the engine crane in the garage resets your engine's life to 0 - the equivalent of replacing your old engine with a new one. The only time you can replace your engine is when your car is in the garage. This means that you can't replace an engine once a race has begun, because leaving the pit to return to the garage is the same as dropping out of the race. If you lose an engine during a race, you may as well head for the next race in the season.

FUEL LEVEL

Shows the amount of fuel left in your tank, in litres (195 maximum, according to 1986 rules). Your Ferrari's fuel consumption is affected by other factors such as engine life, engine ROM's, turboboost, and wing settings. For instance, the older an engine gets, the less efficiently it will use fuel. Read the section on engine ROMs and turboboost below for more information on those systems, see the "Tires" section for more information on tire compounds. Using the fuel can in the pit during testing, practice, or before qualifying fills your Ferrari's tank. The amount of fuel will usually be less during qualifying runs so your car will be lighter and faster. The amount of fuel will also be less if you are running a race that is shorter than a regulation race. Because Grand Prix rules don't allow refuelling during a race, the fuel can is removed from the pit during an actual race.

OIL SYSTEM

Is affected by engine life, temperature, ROMs, and turboboost. Oil pressure is measured in bars (a bar is approximately 14.7 psi - pounds per square inch), and has a maximum level of 9.0. Pull into

the pit and fix your oil system immediately if the oil or temperature indicators drop below half during a race (see Driver's Reference Guide for cockpit controls and indicators). High oil pressure is good, low oil pressure is bad.

COOLING SYSTEM

And the oil system are closely interlinked. The lower you let your oil pressure get, the higher the water temperature will go. Engine temperatures will also rise if you've been racing hard with a high turboboost setting, or running a very lean mixture (see "Engine ROMs System" below).

ELECTRICAL SYSTEM

Provides the power which is essential to your Ferrari's ignition and fuel injection systems. Because these systems are drawing full current during a race, there is a continual drain on your electrical system. If your electrical system fails during race, so will your engine.

FUEL INJECTION/IGNITION COMPUTER ROM SYSTEM

Regulates your engine's fuel-air mixture and ignition timing. ROMs (Read Only Memory) are computer chips that are installed in the engine to tell it how to regulate the fuel to air ratio. The program contained in a ROM chip, and your turbocharger setting, determines the horsepower output, power curve, fuel economy, and wear characteristics of your engine. The ratio of fuel to air affects the temperature at which the fuel burns, and the energy it provides. A rich fuel to air ratio burns more fuel than a lean mixture.

A leaner mixture provides more horse power, but makes the engine run hotter, work harder, and makes it more sensitive to excess turboboost. A richer mixture is more conservative on the engine, and lets you use more boost from the turbocharger, but consumes fuel more rapidly.

Typically, you'll want a lean mixture during a race to conserve fuel, and also because burning more fuel with a rich mixture doesn't necessarily increase horsepower. The A-ROM is the leanest mixture, while the F-ROM is the richest mixture. The Q-ROM is an extremely rich mixture that you should use only in qualifying races.

Note: You can see just how the various ROMs and turbocharger settings affect your engine's performance in the dyno room. See the "Testing Your Car" section for more information on using the dyno room.

TURBOCHARGER SYSTEM

is a collection of components that increases the engine's horsepower by literally stuffing more air and fuel into the engine. A small turbine, placed in the flow of the engine's exhaust, spins an impeller that pumps pressurised air into the engine. The extra air forces the fuel injection system to balance the mixture with more fuel, thus greatly increasing the potential energy in the cylinder. But, as you might imagine, an increase in turboboost also increases the engine's fuel consumption. An F186 in qualifying trim won't win any fuel economy awards.

Turboboost is measured in bars (a bar is approximately 14.7 psi - pounds per square inch). The higher you set your turboboost, the more pressure you're putting on your engine. Thus turboboost and engine wear have a direct correlation. If you run a high turboboost setting for long periods of time, you increase your chances

of blowing the engine -especially at skill levels above F3. But the temptation to use full turboboost is always great because the turbo-charger can boost your Ferrari's overall horsepower by 100%, thus increasing your top speed dramatically. If the turbocharger system sustains damage, use the control in the engine control panel to repair it (the amount of time it takes to repair will depend on the extent of the damage). If you should happen to blow your engine during a race, then you'll lose the race.

GEARBOX

Use the gearbox control panel, shown in Figure 12 below, to adjust your Ferrari's gear ratio in response to track conditions.

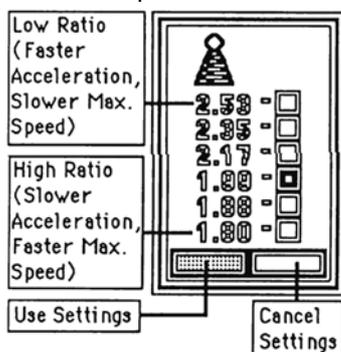


Figure 12: Gear Ratio Control

Short gear ratios provide fast acceleration, but lower maximum speed. This means that you should use a short gear ratio for slower tracks with tight turns so you can accelerate quickly out of the turns. Long gear ratios provide slow acceleration, but higher maximum speeds. This means that you should use a long gear ratio for straighter tracks where you can go fast for longer periods without slowing for curves.

Also be aware that shorter gears cause higher engine revs, and thus, greater fuel consumption. For some races you may want to use a longer gear to help conserve fuel.

TYRES

Almost no other area has improved as much over the years as the performance of Grand Prix tires. Cornering forces can reach better than three G's (forces of gravity). Tires have become highly specialised for their specific duty, and are categorised by their compound (the rubber composition that gives the tire its performance characteristics) and tread design (the grooves cut into a tire based on track conditions). For instance, there are different tire compounds and tread configurations for wet and dry weather, or for hot and cold weather. Typically, wet weather tires are the only types that are treaded. Dry weather tires have no treads, and are referred to as slicks. The goal in picking tire compounds is to get the best grip, and thus, the best lap time. The basic rule of thumb is: the softer the tire compound, the faster the lap time; but the greater the wear on the tire. This means that you should attempt to find a happy balance between lap time and tire longevity.

Choosing the appropriate tire compound is extremely important to the success of your race. Each tire of the Formula One car is subjected to its own distinctive form of stress, so you may have to pick a different tire compound for each tire of the vehicle. Your choices should be based upon the layout of the track, the weather conditions, and the track session you're competing in. Your goal is to pick tires that will become just the right temperature during the race so you'll get good grip on the track. If a tire stays too cold, it

won't get soft enough to grip. If it gets too hot, it will smear, become sticky, and deteriorate faster.

Let's say that you're racing on a track which has a lot of right-hand turns. You would probably want to select a hard front-left compound, a fairly soft front-right, and two medium-hard rear tires. The hard front-left compound will help the tire hold up under the punishment it will receive in all of those right turns, while the soft front-right compound will help provide additional grip. The medium-hard rear compounds will help these tires survive the fast acceleration out of all the corners, but since the compound is only medium-hard, it will also provide better grip than a very hard compound. Three completely different compounds on the same car are quite common in Formula One racing.

The tire control (see Figure 13) in the garage and the pit gives you six tire compound/tread combinations to choose from. The arrows at the top of the compound columns point to a tire on the car in the following order from left to right; right-front, left-front, right rear, and left-rear. The temperature for that tire appears at the top of the tire control when you select one of the arrows. Table 1 lists the compounds, their types, and their degree of firmness.

Note: Remember, letting your tires get too hot makes them deteriorate faster and reduces their grip. You can monitor tire wear during a race by watching the movement patterns on the tires - they'll change pattern as they get hotter. (You can watch the rear tires in the corners of your rear-view mirrors.) If you see that the tire(s) are wearing too fast, slow down to conserve them. You'll lose some lap time, but it's sometimes better than pulling into the pit for a complete tire change.

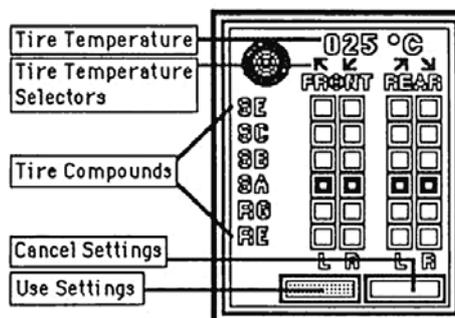


Figure 13: Tire Control

TABLE 2: Compounds, Types and Firmness

COMPOUND - TYPE - FIRMNESS		
SE	-	Qualifying - Very Soft
SA	-	Race A - Hard
SB	-	Race B - Medium
SC	-	Race C - Soft
RG	-	Rain Qual. - Very Soft/Tread
RE	-	Rain Race - Soft/Tread

Rain tires are the softest compound, are water compatible, and they are treated to help prevent hydroplaning. The rain compound lasts only so long as rainwater acts as a coolant for the tires during the race. This means that they'll deteriorate rapidly on a drying track.

The ideal situation is to have all four tires reach their best gripping temperature at full speed. Although you can reduce tire temperature by varying your driving tactics, remember that this usually means slower lap times. Of course, losing a little time to let the tires cool

off is better than losing your first place slot if you have a narrow lead. It takes less than 15 seconds to change the tires in the pit, but when you add the time it takes to decelerate into and acceleration out of the pit, you'll lose about a minute.

Note: Qualifying tires provide great grip because they are so soft, but they deteriorate fast. They're designed to be destroyed because you need fast lap times while qualifying, and you can usually afford the time it takes for a tire change during qualifying runs.

SUSPENSION

Your Ferrari's suspension system works in tandem with the wings and tires to help provide the best handling characteristics. You should adjust the suspension system in response to your own driving habits as well as to track conditions.

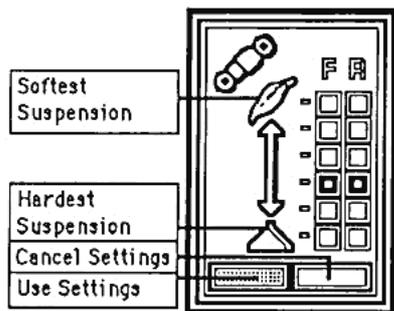


Figure 14: Suspension Control

The suspension system has a drastic effect on whether your car under or oversteers. Understeering is when you go into a turn and the front tires break traction first, causing them to wash-out (continue straight even though they're turned). Oversteering is when the rear tires break traction first and make the car fishtail or, in the worst cases, spin-out.

Firm suspension provides less sway, but is less forgiving of road inconsistencies and will break traction faster. Soft suspension has the exact opposite effect. For instance, firm rear suspension and soft front may make the car more likely to oversteer; i.e., the rear tires may break traction first and the car may fishtail or spin-out.

When you're adjusting your car's suspension, take into account whether the track is twisty or fairly straight, and whether it's wet or dry. Also, the F186 has a natural tendency to understeer, so calculate this into your adjustments. Finally, you must also consider your own driving habits. For instance, if you like to take corners at high speeds with little or no braking, then you'll probably want to use firmer rear suspension to make the car oversteer slightly. But keep in mind that the car is more likely to break traction and go into a skid if you have to use the brakes too heavily into a turn. You should also take your tire and wing setting into account when adjusting the suspension. If you're using a soft tire compound, and wing settings that provide less of downforce (see "Wings" below), then you can probably afford to use a firmer suspension system.

WINGS

Next to proper tires, your car's wings are the next most important factor affecting how the car handles on the track. Your Ferrari's front and rear airplane's wings operate exactly like an inverted airplane wing. While an airplane's wing provides lift, your Ferrari's wings are turned upside-down so they provide downforce. Essentially, they push your car down onto the track to provide better grip around corners and other areas where you might lose

ground. The wings also help compensate for under/oversteer which was discussed in the last section, "Suspension."

The higher you put the rear edge of the wing (or the greater the angle of attack), the more downforce it provides when the car moves forward. But this also creates more drag, which hinders the car's forward motion, and this, its acceleration. Your job is to find a happy medium between downforce and drag. But remember that the effect is exponential with speed; that is, the faster you go, the less wing you'll need to create the downforce, and straight line acceleration versus cornering speeds. Wing Control is used to adjust your car's front and rear wings.

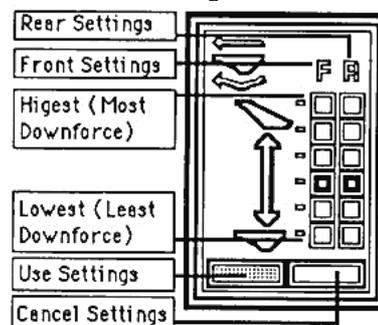


Figure 15: Wing Control

Like all the other components of your Ferrari, the way you adjust your wings depends upon track conditions. On a very twisty track, you might have to sacrifice some top speed (because of increased drag) in order to get a lot of cornering performance (because of increased downforce). On a track with a lot of straights, you might sacrifice speed (because of decreased drag). You can see the way wing adjustment affects downforce and drag by testing your car in the wind tunnel (see "Wind Tunnel" below).

TESTING YOUR CAR

Before you leave Fiorano for your first race, you should test your car using Fiorano's test lab facilities to learn exactly how your adjustments affect your car. The following sections describe each of Fiorano's test labs and how you should use them.

DYNO ROOM

By adjusting the various controls in the dyno room you can quickly see how engine performance is affected at various speeds (RPM) by the age of the engine (HRS), turbocharger settings (BST), and the ROM type. In all likelihood, the fuel efficiency in an older engine won't be nearly as good, and other factors such as the cooling and electrical systems will be less efficient also.

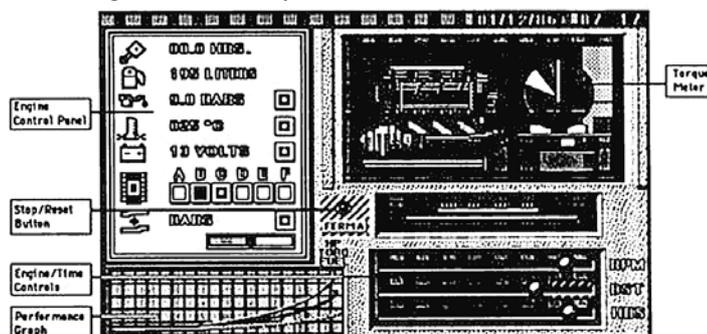


Figure 16: The Dyno Room

The performance graph below the engine control shows the way in which increasing the output of one engine factor decreases or increases the efficiency of another. For instance when you increase turboboost (the BST control), horsepower (HP) and engine torque (TORQ) increases but fuel efficiency (FUEL) drops. Try increasing the engine age with the HRS control and see what happens to the engine's performance (once you age an engine with the HRS control, you cannot make it young again; you must use the engine crane in the garage to install a new engine). Note also, the RPMs at which your engine reaches peak performance in its current tune. You should try to shift at this RPM if you use the same engine turn on the track.

WIND TUNNEL

The wind tunnel is where you see how your Ferrari's wings affect downforce and drag. Use the wing control panel to adjust the angle of attack of the car's wings, then use the airspeed control to increase the speed of airflow across the wings. The performance graph below the wing control shows you how downforce on the front and rear wings, and the overall drag will increase as the speed of your car increases.

Your goal is to find the greatest increase of downforce with the least drag at the highest wind speed. Naturally, this all depends on race track conditions - your wing settings will probably be different for every track.

TEST TRACK

The Fiorano test track is where you measure the F186's performance after making all your adjustments in the garage and pit. You should also work to hone your driving skills here before an actual race. In particular, practice braking into corners from high speed since this is typically where new drivers are overtaken by experienced Grand Prix race drivers.

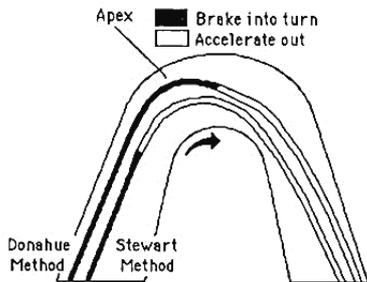


Figure 17: How To Corner

The most common tactic is to configure your car so it understeers into the corner, and oversteers out. You achieve this with a fine balance of wing and suspension settings. There are two schools of thought on the best way to negotiate a corner; the traditional method, recommended by Jackie Stewart and others; and the friction circle method, pioneered by Mark Donahue.

Using the friction circle method, you brake to the apex of the turn, and accelerate out. Using the traditional method, you brake into the beginning of the turn, then accelerate all the way through the apex and out of the turn. Use whichever method feels right for you.

Your main objective on the test track should be to increase your lap time and your car's performance. Pull into the pit after every few laps and check your car's systems for wear and tear, and check the race monitor for your lap times. If it looks like some of your car's systems are really taking a beating after only two or three laps, try driving more conservatively. Be prepared for longer lap times

though. If after two or three more laps your car is still taking a beating, you should make some adjustments to those systems that aren't holding up well.

SCORING MONITOR

The scoring monitor in the pit at Fiorano shows a lot more than just your lap times. There are sensors at every turn of the test track that record exactly how you performed during a given lap. Click the button next to the lap time you want to analyse, and the scoring monitor will show you the times recorded at each sensor. Using the information gathered by the sensors around the test track, you can isolate and work on the areas of your driving that need improvements.

The scoring monitor during a race shows the current status of all race participants, ranked by position. You can see what lap the other drivers are on, their times, and whether they're on the track or in the pit (a "P" appears next to the name of drivers who are currently in the pit).

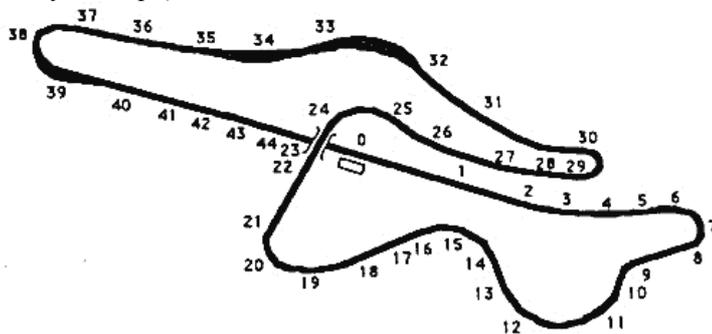


Figure 18: Fiorano Test Track and Sensor Placement

The time shown for each sensor location on the race monitor indicates the time it took you to reach that sensor from the last, and the total lap time up to that point. Compare the numbers with previous laps to note your improvement (or lack of improvement).

Note: Smoothness and consistency are the keys to turning fast lap times. The greatest cornering forces occur during the transition from braking to acceleration as the weight of the car is magnified by momentum. If you can make a smooth transition, you can reduce the impact of the transition. Consistency lets you avoid problems and execute the most important of all racing strategies - finishing. The more control you maintain, the closer you can drive to the car's limits.

TRANSPORT

When you feel confident in your car and your capabilities as a driver, it's time to head for your first race of the season (see "Appendix A - 1986 Season Schedule" for race dates). The first race is held at Rio, on March 23rd. If you have spent enough time testing and practising at Fiorano for the game date to almost reach the date of the first race, you can take the transport trucks there. Using the transport trucks to get to another track sets the game clock ahead only for the amount of travel time it takes to get there from your current location. This means that to get from Fiorano to Rio in time for the race you should leave Fiorano no later than March 19th.

The difference between using the transport trucks and the race control panel to go to races is that the transport trucks simulate real-time in the game, while the race control panel lets you advance the game clock and skip ahead to where you want to be. You can

use the race control to skip over the sessions except the race itself (but you forfeit a good starting position), or you can even use it to skip overentire races. But remember, you forfeit the races that you skip.

You can still take the transport trucks to competition tracks even if it's before or after the date of the actual race, but you can only test on the track when you get there. The travel times are as follows:

* One day to travel to another track in the same country as your current location.* Two days to travel to another track on the same continent as your current location.* Three days to travel to another track on a different continent from your current location.

If you want to go to the actual race, but the game clock hasn't yet reached the date of the race, then use the race control panel located in the race control building of the paddock, to select the track you want to go to. Race control automatically sets the game clock ahead to the track's opening.

YOUR FIRST RACE

It's March 19, 1986. You know your Ferrari like the back of your hand and you could drive Fiorano in your sleep. Now it's time to get your car and crew packed up in the transport trucks and head for your first race of the season - Rio.

Held at Rio de Janeiro in March, the Brazilian Grand Prix is 5.013 km/3.126 mil course that features one very long straight away, and a lot of challenging left-hand turns. The weather is typically hot and dry.

COMPETITION TRACK LAYOUT

Like Fiorano, each competition track has a paddock area that contains the transport trucks, garage, race control, scoring, pit, and race track access (see Figure 19).

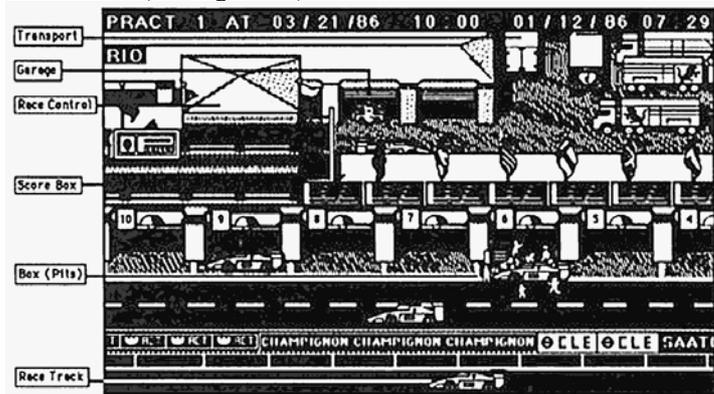


Figure 19: Competition Track Paddock

However, the competition tracks do not have wind tunnel or dyno room facilities. The first thing you should do when you arrive at a competition race track is to note the date, time, and weather conditions, which are shown as an icon near the upper-left corner of the paddock screen. If you're early for the race, you'll have time to take some practice laps around the track and get some first impressions. Then you should put your car in the garage and make your adjustments based on the track conditions and the current track session.

THE GRAND PRIX

A Grand Prix is broken into various track sessions that make up the entire race. There are a total of six track sessions, including the race itself, which are spread across a three day period. On each day, the first session is always at ten in the morning, and the second session is at one in the afternoon. You can check the main paddock to see what time it is and when the next session begins. The track sessions follow one another logically as you complete them, or you can select the session you want to race from the race control panel in the race control building of the paddock.

You can use the race control panel to skip the sessions before the actual race, but you'll have to settle for a grid position at the back of the pack if you skip both qualifying sessions.

DAY ONE

There are two sessions on the first day of the Grand Prix; the first practice session (P1) and the first qualifying session (Q1). P1 is a practice session in the morning that gets you acquainted with the track. Although you'll meet the other drivers on the track, don't expect to see them show all their capabilities during this session. You should hold back and take it easy during the practice session as well. Get to know the layout and trouble spots of the track, and don't risk damaging your car.

* A green flag means the race is on at full speed.* A white flag means there is one lap remaining.* A chequered flag means the end of the race.* A red flag means the course is closed, proceed to the pit.

Q1, in the afternoon, is the first real competition of the race. In this session you are trying to qualify for the best grid position; that is, the position your car occupies in the pack at the start of the race. The driver with the best flying lap (like a running start) time gets the pole position.

Note:

You'll need to find a free stretch of road in order to find your fastest qualifying time. As you start your second lap, make sure you have some traffic-free distance in front of you. Remember that there are other drivers also trying to get fast times. All will be running at different speeds, many in excess of 100 mph. This is one of the two most dangerous times in Formula One racing (the other is Q2).

Use the Q engine RPOM, lots of turboboost, and qualifying tires to try and get the best lap time. You will also lighten your car's load by using less fuel because you can refuel at any time during the qualifying and practice races. This means you can reach faster speeds and you don't need to worry about fuel efficiency. Do the best you can to get the best lap time you can, but don't risk damaging your car - you still have two more practices and another qualifying session to get through before the real thing. And watch the other drivers as well. Although they won't show you all their tricks during qualifying, some of their strategy and tactics may become apparent.

Note:

Pay attention to tire wear during the practice and qualifying sessions. If your tires are wearing unevenly, try to select a better balance of compounds to use in the race.

DAY TWO

Day two of a Grand Prix is also composed of two sessions: Practice Two and Qualifying Two. Like P1, P2 is intended to help you familiarise yourself with every inch of the track. The goal is to make your P2 times better than your P1 times of the day before. It also gives you a chance to tweek your car to peak performance.

Note: Outside of the Ferrari factory in Maranello, Italy, there is a bust of Gilles Villeneuve. Gilles was a Canadian Grand Prix driver for the Ferrari team in the late '70's and early '80's. Gilles was well liked for his competitive spirit, and his success. He placed second in the 1979 World Championship, and won six races in four years for Ferrari. Gilles was killed in the early '80's while trying to overtake another car during a qualifying session. The Canadian Grand Prix circuit was named in his honour.

Q2 is likely to be even crazier than Q1 as the drivers try to improve on their qualifying times from the previous day, and beat everyone else's times in the process. If your lap times happen to match another driver's from the previous day, the other driver receives that pole position (because he reached it first) and you get the next in line. Again, get radical with your car adjustments. Don't worry about fuel efficiency and tire wear, just try to get your best time. And don't forget to keep your eye on the competition.

Note: Many Grand Prix drivers like to replace their engines after Q1 and Q2 so they'll have a brand new engine for the sessions of the next day.

DAY THREE - THE RACE

Day three starts with a 30-minute warm-up session in the morning, followed by the race itself in that afternoon. The warm-up session is your final chance to overcome any problem area the track may present for you. It's also a last chance to tune your car one last time. Take it easy during the warm-up, burn-in that new engine gently, and conserve yourself and your car for the race.

Your place at the start of the race in the afternoon is based upon how well you performed in qualification. If you did well in Q1 and Q2, then you'll have a place at, or near, the front of the pack. If you didn't do so well during qualifying, you'll be at the back of the pack.

Note: The standing start is one of the most spectacular moments in all motor sport. Especially since turbo cars have found their way into Formula One. Cars often overtake six to eight spots on the grid before the first turn. Others may stall on the grid, causing gridlock at over 100 mph!

Drive aggressively, but remember, you can't refuel during the race, and a tire change is the most time-costly of the standard problems. By "standard" we mean a problem that probably won't cost you the race, only a lap or so. If you encounter a non-standard problem during the race - like having to change your turbo charger system - then you will lose the race.

A regulation Grand Prix is two hours or 310 kilometres (200 miles), whichever comes first. You can get a shorter distance using the race control panel in the race control building at the paddock if you want (this also scales down the time limit and fuel capacity). If the time limit is exceeded and you haven't run the full length of the race, then the lead car is declared the winner as he crosses the finish line and the race ends. After the race, you can save the season standings to disk (see your Driver's Reference Guide).

Note: If you did not finish the race, the reason will be listed in the race results screen. For instance, the word "SHUNT" means that you had an accident. "DNF" is short for Did Not Finish and appears when you deliberately leave the race. If a component from your car is listed (i.e., "WINGS", "ENGINE", and so on), then there was a mechanical failure in your car that prevented you from placing.

RETURNING TO FIORANO

Hopefully you did well in your first race, but if you didn't, then maybe it's time to return to Fiorano and practice some more. Use the transport trucks to return to Fiorano in the same way you used them to get to the first race. You can also go to other competition tracks to test if you want, but it won't register in your season standings if the track is closed.

APPENDIX A 1986 SEASON SCHEDULE

Race	- Date	- Location
Rio	- 3/21-3/23/86	- Jacarepagua, Rio de Janeiro
Jerez	- 4/11-4/13/86	- Jerez, Spain
Imola	- 4/25-4/27/86	- Imola, Italy
Monaco	- 5/9-5/11/86	- Monaco
Spa	- 5/23-5/25/86	- Spa, Belgium
Montreal	- 6/13-6/15/86	- Montreal, Canada
Detroit	- 6/20-6/22/86	- Detroit, United States
	- 7/4-7/6/86	- Paul Ricard, France
Hatch	- 7/11-7/13/86	- Brands Hatch, England
Hockenheim	- 7/25-7/27/86	- Hockenheim, Germany
Budapest	- 8/8-8/10/86	- Hungaroring, Budapest
Osterreich	- 9/5-9/7/86	- Osterreichring, Austria
Monza	- 9/5-9/7/86	- Monza, Italy
Estoril	- 9/19-9/21/86	- Estoril, Portugal
Mexico	- 10/10-10/12/86	- Mexico City, Mexico
Adelaide	- 10/24-10/26/86	- Adelaide, South Australia

Ferrari Formula One

Driver's Reference Guide

TO START FERRARI FORMULA ONE

1. Remove any peripherals not used i.e. 2nd disk drive, cartridge, printer, etc.
2. Plug your joystick into Port 2.
3. Switch on your disk drive and computer.
4. Insert the Ferrari Formula One disk into your drive label side up.
5. Type LOAD"*",8,1 and press RETURN.

GOING FOR A LAP

To begin racing quickly, let the Ferrari Formula One theme music finish, and the demo begin. The game will go briefly to the Race Control panel and then to the Paddock area of Rio, where the demo starts. You will then be asked to flip the disk to side 2. Once you have flipped the disk over, select the green ACCEPT button by moving the pointer over the green rectangle and pressing the fire button.

You will now go to the cockpit view of the cars lined up on the grid (similar to Figure A), ready to start the race. When this screen appears, press any key to end the demo and take the wheel of the Ferrari under your control. Race information such as the current flag, lap and lap time appears in the upper-right corner of the screen. You may want to watch a lap or two of the demo first, because once you press a key, you will have only a moment before you take control of the car. Note: If you let the demo run through to the end, you'll the race results screen appears. You can then continue the season if you want to. Read "Race Control" later in this guide for more information about continuing a season and using this control panel.

OVERHEAD MAP

In the top left-hand corner of the cockpit view, there is an overhead map of the track you are currently driving on. The coloured dots on the track represent the other drivers on the track and the flashing dot represents your car,

STEERING

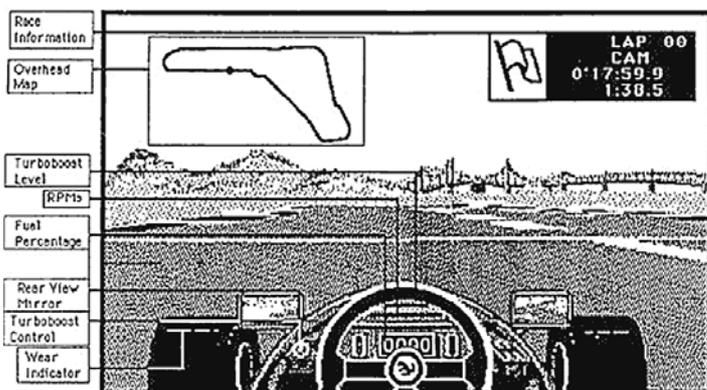


Figure A: The Ferrari Cockpit

You control your Ferrari with the joystick. Move the joystick to the right to steer right and to the left to steer left. The Ferrari is very responsive, so use small steering movements to avoid oversteering. Push the joystick forwards to accelerate and pull the joystick back to brake.

Note: You can only race in one direction - you cannot make a U-turn and race in the opposite direction.

SHIFTING

The demo automatically puts you at the beginner driving level (F3).

At this level you don't have to worry about shifting gears - it'll happen automatically.

At more advanced levels, you'll use the joystick and fire button to shift gears.

See the "Joystick Controls" section at the end of this guide for more information.

CURVES

Take curves cautiously at first. It's very easy to oversteer or understeer and wind up on the pilings. Let up on the accelerator going into the curve, use the brakes if you have to and accelerate out of the curve. Use the Overhead Map to determine when you are approaching a curve and brake accordingly. A useful tip is to steer left or right into the bend and then, at the apex of the bend, just push the joystick forwards (accelerate). The steering wheel will slowly straighten up on its own, steering you out of the bend.

FINISHING

Your first race runs for three laps. At the end you receive a breakdown of how you did against the other drivers. Your driver number is 28, and your initials are "S.J." (you can change these later of course, see "Race Control" later). Select the green "Accept" button in the upper right-hand corner of the screen when you are finished reading the standings, and you'll go to the pit.

SELECTING SCREEN REGIONS

Once you're in the pit, you should go to the track's paddock area. You do this by selecting the Ferrari placard in the top right-hand corner of the screen. The pit contains regions which you can select to perform other functions. For instance, hold down the fire button while the pointer is on a grey area of the pit floor. Continue to hold down the fire button and move the pointer around the screen. As the pointer passes over "hot spots," it will change into an icon that represents the function you can perform by selecting that spot - but nothing will happen until you release the fire button. The icons for the various screen regions are also located in the manual. If you want a detailed explanation for a particular icon, simply look for the icon in the manual, and read the adjacent section.

THE PADDOCK

You can learn more about the pit by reading about it in the manual. For right now, return to the track paddock by selecting the placard near the upper right-hand corner of the screen. After a moment, the track paddock appears. Move the pointer around while holding down the fire button to locate all of the hot spots identified in Figure B.

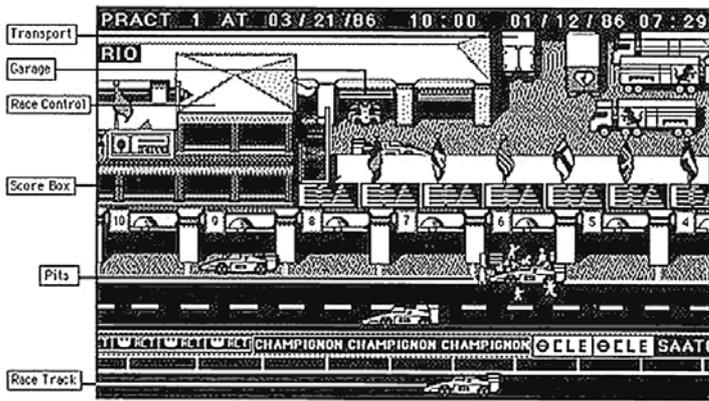


Figure B: Track Paddock

RACE CONTROL

When you locate the Race Control spot (a chequered flag icon) release the fire button to select it. The Race Control panel that appears is your key to controlling many aspects of Ferrari Formula One. For instance, select the track icon on the panel, and a requester appears that contains all of the tracks from the 1986 Formula One World Driving Championship.

The second track in the season, Jerez, is currently highlighted. If you want to continue the season now, select the red "Cancel" button to leave Jerez selected. Read the following sections about entering your name as a driver, and saving and loading seasons before you begin the season.

If you feel that you need more driving practice, and would like to experiment with car configurations select FIORANO to return to the Ferrari test track. Notice that this also resets the date and time to the beginning of the season. Select the green "Accept" button to confirm your track selection.

DRIVER NAME

Select the driver's helmet icon on the Race Control panel. Enter your name in the "Text Entry" box of the requester, and select the Accept button or press Return to confirm your name as a driver. Now select the Accept button on the Race Control panel to go to the paddock of the track you selected from the track requester in the previous section.

If you're going to begin a season, you should probably read "Your First Race" in the manual. If you're going to Fiorano, then read "Fiorano Launching Your Career" in the manual for a detailed description of the Ferrari test track.

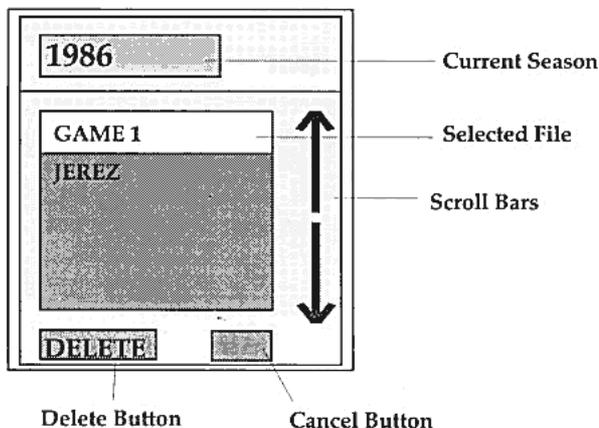


Figure C: The Save/Load requester

SAVE/LOAD SEASON STANDINGS

You will need a formatted, blank disk in order to save your season standings. To format a disk follow these instructions:

1. Turn on your disk drive and computer.
2. Insert your blank disk in the disk drive.
3. Type OPEN 1,8,15, "N0:SEASONS,EA and press RETURN.
4. Wait until the drive light goes off, then type CLOSE 1 and press RETURN.

SAVING

1. Bring up the Race Control panel.
2. Remove the Ferrari Formula One disk and insert your blank, formatted disk into the drive.
3. Select the trophy icon to open the Save/Load requester.
4. If you want to delete an existing file, select the name of an existing file in the requester and then select the blue "delete" button. The delete conformation requester will now come up. Select the green "Accept" button to delete the file or the red "Cancel" button to cancel this operation.
5. In the Save/Load requester, delete the text before the flashing cursor with the "DEL" key and then type in a name for your file and press RETURN.
Note: do not use extensions (e.g. GAME.1) as you will not be able to retrieve the file.
6. The save confirmation requester will now come up. Select the green "Accept" button to save the file or the red "Cancel" button to cancel this operation. Once this is saved replace the Ferrari Formula One disk in your drive.

Note: You can only save race statistics. You cannot save the qualifying times and pole positions you achieve before the actual race.

LOADING

1. Bring up the Race Control panel.
2. Remove the Ferrari Formula One disk and insert your blank, formatted disk into the drive.
3. Select the trophy icon to open the Save/Load requester. Click the button for the disk drive that holds the file you want to load (A = internal drive, B = external drive).
NOTE: If you have only one disk drive, eject the Ferrari Formula One disk and insert the disk containing the file.
4. In the Save/Load requester, select the name of the file you want to load and it will become highlighted, then select it once more to choose it.
5. The load confirmation requester will now come up. Select the green "Accept" button to load the file or the red "Cancel" button to cancel this operation. Once the file is loaded, replace the Ferrari Formula One disk and resume your season right were you left off.

FIORANO: DYNO ROOM - ADDITION

(Page 29 of your Ferrari Formula One Manual)

The performance graph displays fuel, torque and H.P. Fuel is in yellow, torque in red and H.P. in green.

The control sliders for the dyno room are from top to bottom RPM, turboboost and hours.

KEYBOARD COMMANDS

- [LEFT ARROW] - Pauses on/off (while on the track).
- [K] - Kill engine and go to the pit.
- [P] - Pits next (in P mode only).
- [0-9] - Turbo boost.
- [F1] - Toggle C128 mode on/off. If you are running Ferrari Formula One on a C128, then using this function will make the game run a little faster.
- [R] - Cancel Mauro's changes on all open windows. (Pit & Garage only)
- [G] - Use Mauro's settings on all open windows. (Pit & Garage only)

JOYSTICK CONTROLS

- [FORWARD] - Accelerate
- [BACK] - Decelerate
- [LEFT] - Steer Left
- [RIGHT] - Steer Right
- [FORWARD AND FIRE] - Shift Up (i.e. towards 5th)
- [BACK AND FIRE] - Shift Down (i.e. towards 1st)

RICK KOENIG

Rick Koenig became fascinated with computers while operating the computerized attendance system in high school. Needless to say, Rick's name never showed up on the absentee list. Rick's name never showed up on the absentee list. Rick's experience in racing games has culminated in Ferrari Formula One. He wanted to make a point-of-view racing game that would capture Formula One racing. "It's the most exciting and sophisticated racing in the world", Rick says, "and of course, Ferrari is a racing legend". Rick's hobbies are wind-surfing, water skiing, four wheeling, and getting 'airborne' on his off-road motorcycle.

