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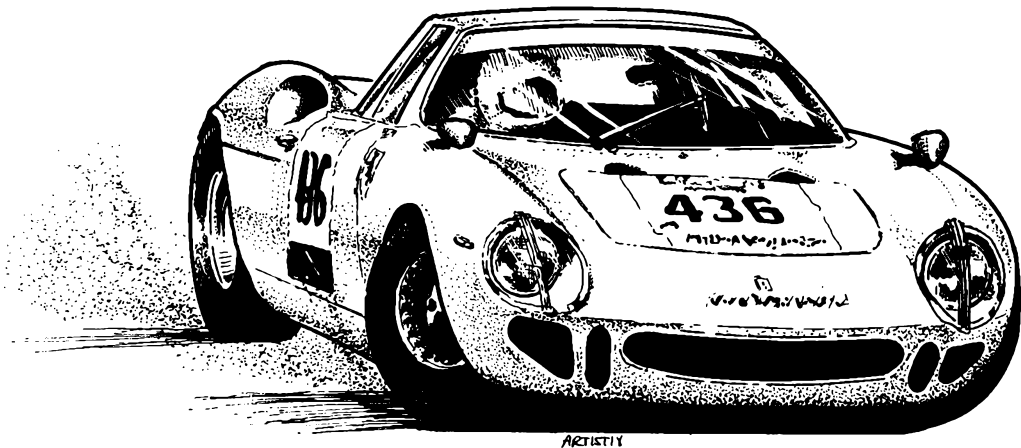
CAR

RACER



*Micro-
Style*

Geoff Crammond



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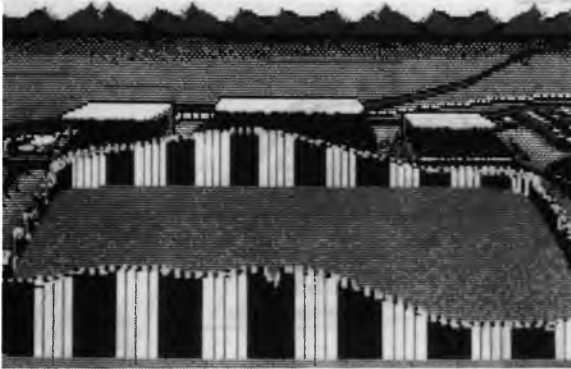
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INTRODUCTION

You weren't no racing rookie. You'd served your time on the old Formula 1 tracks, before the cars got too quick for 'em and they all got shut down after the 2006 season . . .

What was it they said again? Oh yeah . . . *safety*. You'd never managed to work that one out. Hell, every-



body knew the only reason people went to those old F1 races in the '90s was on the off chance of seeing some Hash-Ecsted sucker silch himself against a kevoprene guard rail. The geeks up in CenCom who'd banned Formula 1 were just riled because they weren't getting their nice little rake-off

from the race promoters. *Jeez . . . what a joke.*

Now, here you were: your number had come up, all the bribes had paid off, and you were on the Stunt Car circuit at last. You'd come through the last days of Formula 1 more or less in one piece. The left leg was still rated at 76 percent efficiency the last time you'd been able to afford to have it checked out. Sure, that Australian shunt in '02 had re-rated your right leg down to 35, but you could manage with that . . . Anyway, if the cramps came back, the accelerator pedal was as good a place as any to rest it against, heh heh. One thing was for certain: the synthplast foot on the end of that gnarly ol' right leg would'nt be going anywhere near the brake pedal in a div four stunt race.

Division four . . . shoot! Things were really getting

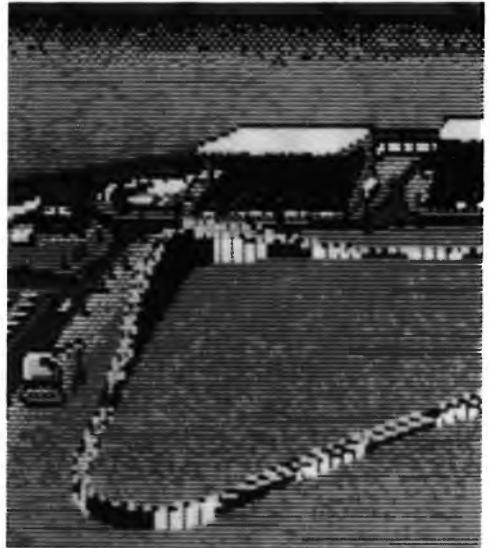


bad . . . Div four was for wimps, computer programmers, and mummy's boys. The cheesy old track you'd picked from the McFax listings was hardly worth the Transcorp fare . . . but rules are rules, as the man said. To get up to where you belong, back up there with the big boys in Division One, you've got to mix it with the herbies again. That's what he'd said.

If - no, **when** - you get through the penny-ante tracks in Four, that would be one step closer to the big one, where all the creds are, where the livin' is good and the beer still has alcohol in it: Division One. It'd be so **good** to upstage some of those silk-scarfed jerkwaters up there in the Green Zone. Hell, some of those guys in Div One, they haven't even earned the right to race in a div four night reserve match.

That creep Dare Devil, for example. Oh sure, he knows how to throw his car around all right, but under that beauty parlour complexion the guy's just a blown-up hot shot with a big ego and a few friends in the right places. Hey, I'm not saying anything, y'understand, at least, nothing I'd like to repeat within range of a Cit-Scan. But if he's so good, why does he have to come out and strut his stuff at these backwoods div four meets?

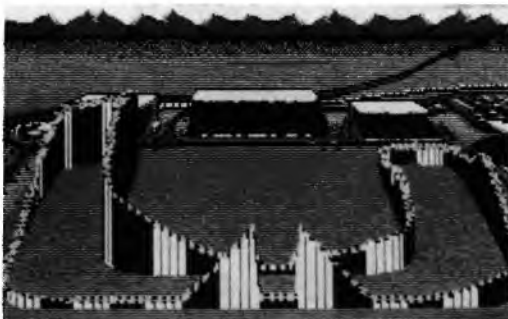
And that other guy, Road Hog, he's here as well, slumming it with the rest of us low-lives. I guess both





these characters are expecting to tan our hides here, you know, just to show who's boss. Well, maybe they might be in for a little shock . . . I may not have the hottest motor in town, but it ain't far off. And I've got one thing over on both of these prima donnas - **experience**.

Yeah . . . I was a pretty good driver in the old days.



Set a few lap records, grabbed a handful of pole positions, surprised a few people . . . It wasn't my fault I hot hitched up to the wrong team, with the wrong cars and the wrong engines . . . Don't get me wrong, I know this stunt car stuff is different. I'm not stupid. Maybe the old F1 cars **did** only touch

two-eighty-five when the wind was in the right direction, but these stunters don't scare me. I can handle speed.

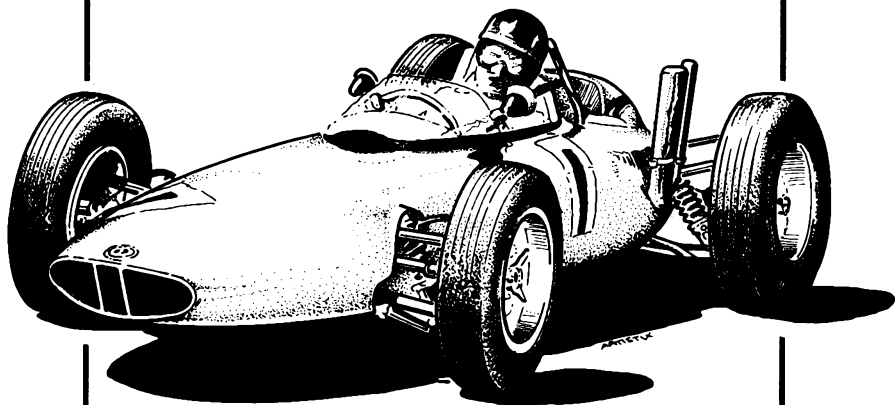
Okay, **so what** if the stunt tracks make the worst rollercoasters look tame? The only place to go is up, right?

Yeah, well sure, you can go down too - but only if you don't know what you're doing. I've reached twenty-eight. How many other racers can say that? Maybe I **have** taken a couple of hard landings too many, but I'll be able to get my back fixed with the creds I'm gonna win in Div One, right? right!

Okay. I've inflated the seat-suit, the engine's running, the turbo's whistling, and the nitrous oxide tank is primed. Probably won't even need the nitrous . . . Like I say, it's just like a rollercoaster. Sure, I know there's one big difference. You can't fall off a rollercoaster . . . But I'm not scared.

Am I?

THE HISTORY OF RACING





THE HISTORY OF MOTOR RACING 1895 - 2008

The spirit of competition has existed in Man since prehistoric times, when the ability to beat someone in the hunt for meat could mean the difference between life and death.

The dawn of civilisation brought a lighter aspect to this spirit of competition. Now, men vied with one another to gain respect and admiration from their peers rather than simple sustenance for their families. The mightiest leap, the longest run, the heaviest lift - these were the high Olympian ideals fought over by men from all corners of the globe.

But for some, the rewards had to be just as high, and the risks just as great, as they had been in the dark ages before civilisation. With the advent of the motor car in the late nineteenth century, this previously unrequited wish could at last be fulfilled. Speed and danger were the drugs, and it didn't take long for the daring young blades of the age to start challenging one another's prowess at the wheels of their 'horseless carriages' on the bumpy and dangerous roads of Europe.



Though the exact date of motor racing's birth can never be accurately pinned down, it's a fact that the first official motor races were held in France. The ultra-straight routes nationales which connected major towns and cities in that country were ideal for the purpose, bearing in mind the lack of development in chassis, tyres and brakes which would certainly have betrayed early racers on more testing courses.





Another factor in France's favour, compared to England at any rate, was the French government's willingness to allow races to take place on ordinary public roads. The British authorities not only refused to countenance such an outrage, they went one step further, restricting ordinary non-racing motorists to derisorily low speeds by way of eagerly-enforced legislation like the Red Flag Act. Headstrong would-be racers could jolly well go elsewhere for their amusement.

So it was in 1895 that the innocent horse riders and pedestrians of central and western France found themselves sharing the roads between Paris and Bordeaux with a snorting, smoky gaggle of powerful but wayward racing cars in the world's first organised motor race. Eight years and countless accidents later, the French authorities' misjudged permissiveness was exposed to critical public scrutiny when Marcel Renault crashed and died in one of his own cars during the Paris-Madrid race of 1903. From then on, races had to be held on properly fenced off (but still public) roads.



Distances were vast, over 1000 miles being by no means unusual. A trend towards larger and larger engines was the natural consequence, as the only recognised method of achieving higher maximum speeds through greater horsepower. Nonetheless, average speeds in the late 1800's and the early part of this century were less than 15mph. The only advantage of this leisurely performance as far as racers were concerned was that event went on for several gruelling but enjoyable days rather than a few hours. For race enthusiasts sitting in the comfort of their drawing rooms, it meant they could fol-

low the progress of their heroes in the daily press.

One of motor racing's most charismatic events, the Targa Florio, was first run in 1906. A rugged and attritional flog



around the mountain roads of Sicily in the Mediterranean, the Targa Florio attracted works entries every year from all the major factories right up until 1973, when it was removed from the international racing calendar. It remains one of the few annual events to be uninterrupted by anything other than the two World Wars (which put an end to all racing for a total of ten years). Back in 1906, it was a hair-raising combination of fast, smooth coastal roads and fog-shrouded, rain-lashed hillside tracks. In many ways, it was the forerunner of the modern rally.

Both in Sicily and in the rest of Europe, race car engines had grown to enormous proportions by the end of the century's first decade. The biggest four-cylinder examples, from such firms as Panhard & Levassor, Fiat and Opel, displaced between 16 and 18 litres (18,000cc). With pistons the size of dinner plates and as heavy as cast-iron saucepans, there was no question of running the crankshafts at anything other than a near-constant and necessarily low rate of rotation. Gearing was as a result extremely high, over 100mph at around 1000rpm. By way of a comparison, today's modern Grand Prix cars run at top speeds of up to 200mph at crank speeds in excess of 13,000rpm . . .

After a two-year break in the Grand Prix programme between 1909 and 1911, the French firm Peugeot took a revolutionary step by trimming down the size of their engines to a





relatively tiny 7.6 litre displacement. Smaller internals allowed higher crankshaft speeds, but most significant was Peugeot engineer Ernest Henry's change to inclined valvegear operated by twin overhead camshafts, a power-efficient theory that is still practiced by high-performance engine builders nearly eighty years later.

By this time, race-winning average speeds were up to nearly 70mph, with the new Peugeots usually setting the pace alongside the Teutonically efficient Mercedes works teams. Other names coming the fore at this time were those of Hispano-Suiza and Bentley, the latter firm's distinctively blunt-nosed products having already achieved fame (if not fortune) on the famous Brooklands track, near Weybridge in Surrey. This gigantic concrete oval with its steeply banked curves, the world's first purpose-built short circuit race-track, was completed in 1907 after a remarkably short construction effort by a massive local workforce. Also built and commis-



sioned at around this time was another race facility, on the other side of the Atlantic, that was destined to become synonymous with high-speed motor racing: Indianapolis.

The first big 500-mile race to be held at the Indiana track after the First World War in 1919 was ex-Peugeot visionary Ernest Henry again setting new standards for others to follow. His 4.0 litre eight-cylinder engine established a new pattern of smaller capacity, multi-cylindere power units which would later be taken up with legendary success by the Italian engineer Ettore Bugatti. The benefits of streamlining were being realised by this stage too, many cars developing long "boat tails" to enhance their ability to cut through the air at speed.

By the mid-1920's, British firms like Sunbeam and Vauxhall



had perfected 1.5 litre fours that were capable of producing over 130bhp at engine speeds in excess of 4000rpm. In Europe, the Italian giant Fiat was moving into the volatile but potent world of supercharging, whereby engine output was drastically increased through pressurised induction of the fuel/air mixture into the motor's inlet tracts. Fiat's early efforts in this field were dogged by mechanical frailty, but the super-charger or 'blower' were to make an astonishing comeback on the massively powerful race cars coming out of the Mercedes and Bentley works.

Although great strides were being made at this time in the engine bays, cars were still running with rudimentary chassis components. Tyres were a major restriction influence, combining with cart-like suspension to severely limit the handling potential. Braking systems were equally primitive.

But 1924 saw the arrival of two Italian thoroughbreds which evidenced a new approach to racing philosophy. From Alfa Romeo came the P2, a 2-litre 'straight eight' housed in a strong and well-braked chassis; and from Bugatti came the classic and even more advanced Type 35. The Alfa was good enough to win the first Grand Prix it was entered in, the French GP of 1924, while the electric blue Bugattis went on to become the most successful cars of the age, taking more race victories between 1924 and 1939 than any other marque.



Another important development in the mid-1920's was the decision to dispense with the 'co-driver' in Grand Prix cars, following a long history of deaths and injuries suffered by these unfortunate passengers. In the early days of racing, the co-pilot was almost as fully occupied as the

driver, priming petrol and oil pumps, acting as look-out for other drivers attempting to overtake, and generally assisting at pit stops etc.

But, as the cars were developed, co-pilots became increasingly unnecessary. Single-seaters had been the norm in America for some time before the European governing bodies relaxed their rules, but even after the decision was taken in 1925, there was no immediate switch over to narrow-cockpit bodies.

Moving into the 1930s, Adolf Hitler's thirst for propaganda saw the injection of huge sums of government money into Mercedes-Benz and Auto Union race research programmes. The result was the production of awesome machines like Mercedes' 1937 W125, a supercharged eight-cylinder 5.7 litre behemoth running on explosive fuel mixtures and pumping out some 640bhp, and Auto Union's supercharged 6.1 litre V16, rumoured to spin its wheels at 150mph. Clothed in state of the art aluminium bodywork, the tube chassis and fully independent suspension was well capable of transmitting most of this power to the racetracks of Europe, around which these German beasts stormed at speeds approaching 200mph.





Such was the disheartening effect on the opposition of these all-conquering German racers, the sport's rulemakers opted in 1938 to bring in a 3-litre maximum limit. Even then, the downsized Mercs poured out some 420bhp in their new V12 format, more than enough to subdue the multi-cylindere exoticia from competing Italian firms like Alfa Romeo and Maserati.

The Second World War was more effective in snuffing out the German flame. When the Grands Prix restarted in 1947, it was the Italians who were able to assume the position of dominance which had been held by Mercedes before the war. Alfa Romeo in particular enjoyed success with their supercharged straight-eight Tipo 158, now displacing the 1.5 litre capacity



required under the new rules for forced aspiration engines. One of the leading marques entering the 4.5 litre normally aspirated class was Maserati, whose V12 unit put out around 300 bhp.

Just behind the Alfas in the late 1940s and early 1950s was another specialist Italian manufacturer, who would later go on to achieve the ultimate accolade as makers of the world's finest sports cars: Ferrari. In 1948 they brought out the 125



Grand Prix car, a supercharged 1.5 litre V12 based on a 2-litre road car. Although not especially competitive, the twelve-cylinder Ferrari mould was set at this time. The 4.5 litre 'twelves' subsequently entered in the normally aspirated Grand prix class formed the basis of a long line of aristocratic machines for both racetracks and open roads.

Less auspicious was Britain's attempt to re-establish itself at the forefront of Grand Prix racing with the appearance in 1949 of the BRM (British Racing Motor), a V-16 engined creation of just 1480cc. Incorporating many advanced features, and emitting a piercing shriek the like of which had not been heard since the glory days of the pre-war Mercs and Auto Unions, the BRM was potentially very fast. Unfortunately, it was let down by reliability problems which kept it out of serious competition.

Formula 1 Grands Prix languished in something of a backwater for a couple of years in the first half of the '50s, as manufacturers withdrew from racing in anticipation of another change in the engine format rules.

The smaller-engined Formula 2 class benefitted from this hiatus, with Ferrari more or less on their own in an unsupported F1 class until 1954 and the introduction of the new 2.5 litre regulation. This was brought in to counter criticism of the dead-end development (as far as ordinary automobile drivers and salesmen could see) of thirsty, noisy, supercharged, and generally

impractical small capacity engines, some of which returned fuel consumption figures of under 1.5mpg.

Some of the world's truly classic racing cars came out of this new era, including Maserati's great six-cylinder Formula 2-





derived 250F, Vandervell's four-cylinder Vanwall, and Mercedes-Benz's much-anticipated comeback machine, the super straight-eight W196. These new generation cars, despite giving away nearly four litres and a supercharger to the awe-inspiring pre-war monsters from Germany, gave away hardly anything in performance on the road thanks to developments in weight-saving and aerodynamics. There was a new generation of driver, too – the Argentinian Maserati ace Juan Fangio regularly clashed with Englishmen Stirling Moss and Mike Hawthorn for the title of world's finest throughout this period.



Two of the most significant changes affecting race car design in the mid and late Fifties were the shifting of the engine from in front to behind the driver, and the banning of fuels that did not fall into the category of 'petrol'. This last change hit some factories more than others, with the radically tuned Maseratis and Vanwalls – accustomed as they were to heady potions of alcohol and nitromethane having to be more or less redesigned to run on what would be a relatively thin





diet of high-octane aviation gas. The Masers couldn't make the switch, bowing out of GP racing for good and conveniently creating a gap for the newly-emerging British Lotus team.

Brainchild of the brilliant ex-Vanwall engineer Colin Chapman, the Lotus incorporated much advanced thinking in the important areas of suspension and chassis technology. One of the best balanced of the new rear-engined breed of car, the lightweight Coventry Climax-engined Lotus presented a formidable and ultimately championship-winning challenge to the suddenly-outdated opposition of the early 1960s. The positioning of the engine allowed Chapman to design the car with a very small frontal area, endowing it with superior aerodynamic qualities and, by extension, excellent high speed and top-end acceleration properties.

Another name coming into prominence in the Fifties was that of Jack Brabham, the three-time World Champion from New Zealand. Brabham it was who proved the worth of the rear-engine layout by taking those two titles in the last years of the old 2.5 litre formula from behind the wheel of a British Cooper. He

would later go on to gain more World Championship success, this time as a race team owner and manager; the first Brabham racer, the BT3, made its debut at the Nurburgring in the 1962 German Grand Prix.

By that time, yet another new formula had been devised for the Grand Prix class, with the advent of a 1.5-litre maximum engine size in 1961. This change opened the floodgates for a tidal wave of new car constructors, many of whom based their





creations around the Coventry Climax engine. Attention switched from the previously single-minded pursuit for power to what was a new and enlightened approach, namely, how best to transmit that power through the tyres to the track.



The front-engined racing car was effectively dead and buried. Taking its place at the top of the heap was the Lotus 18, a highly-specified and highly versatile space-frame device capable of running in several formulae, depending on the power unit chosen. However, it was originally designed to go with the well-established 2.5-litre Coventry Climax engine; the announcement of the new 1.5-litre limit caught the British teams napping, with no

new generation engines available. All they could do was fit a downsized version of the four-cylinder Climax motor.

Over in Italy, Ferrari showed themselves to be more aware of the new situation, producing a powerful 1500cc V6 for the revised formula. This engine was named after Enzo Ferrari's son Dino, who died at a tragically young age. A road-going Ferrari Dino, powered by a larger V6, later became a much sought-after classic car. The Dino-powered F1 car gained temporary ascendancy in the new formula, winning the inaugural 1.5-litre World Championship; but then along came Colin Chapman's Lotus 25.

In the hands of the terrifically talented Scottish driver Jim Clark, this revolutionary monocoque-chassis machine with its stressed-member engine and separate suspension incorporated many of the basic design elements which still feature on





modern GP cars. It was nearly an instant winner, being only narrowly beaten in the '62 season by BRM's powerful new V8 racer (driven by Graham Hill). Jim Clark and the Lotus were clear champions in 1963, but the wealth of driving talent in Grands Prix ensured that no one man could achieve dominance.

John Surtees was a prime example. Coming straight into car racing after a glittering career on two wheels in the world motorcycle GPs of the late '50s, the slightly built Englishman showed what a natural racer he was by regaining the Formula 1 championship for Ferrari in 1964. The following year was to be the last for the 1.5-litre cars; a new era of power was about to be ushered in with the arrival in 1966 of the 3-litre F1 racers.

Exotic 12-cylindered beasts from Ferrari and a stumblingly amateur Honda team, not to mention a 3-litre version of BRM's unsuccessful 16-cylinder unit, all provided an appropriate champagne reception for the new formula, but the first 'big engine' championship was taken by Jack Brabham in a relatively crude Oldsmobile V8 -based Brabham BT20. That was the beginning of the V8 age _ but the V8 engine which was about to dominate the F1 scene for nearly twenty years was not an Oldsmobile. It was a Ford.

The 'DFV' engine was financed by the giant American



company, and bore the Ford name on its camboxes, but it was actually designed and built by Keith Duckworth of Cosworth Engineering. Mounted in the chassis of the Lotus 49, the DFV powered Graham Hill and Jim Clark to the leading position in most of the '67 championship races. Teething problems put paid to its chances of hoisting the championship trophy in its first year, but as from 1968 this remarkably compact engine became available to any team with the money to buy it.



And buy it they did. But the Lotus team had a head start going into the '68 season, Hill's title-winning sequence marred only by the Hockenheim death of Jim Clark, the quiet Scotsman generally held to be the most skilled driver of his time. Technological innovations began to festoon F1 cars in the late '60s, the most visible of these being the huge scoops behind the driver which were designed to ram air into the engine for better combustion and hence more power. These scoops were eventually outlawed, as indeed were the enormous strait-mounted aerofoils which suddenly sprouted on top of every car at around this time.



Some teams also experimented with four-wheel drive systems, variations of which would eventually go on to revolu-



tionise the world of off road rallying. Although four-wheel-drive had been used with some small success in long-distance races like those annually held at Indianapolis (where other imaginative forces were also at work, producing such novelties like gas-turbine engines), the advantages of 4WD for F1 use were more than outweighed by the weight penalties and power-sapping transmission components necessitated by its fitment.



Nonetheless, the potential benefits of having each wheel driving were not lost on the rally men, who were on the threshold of their own golden age after a relatively amateur period in which souped-up Minis could win major events like the Monte Carlo and the British RAC rallies. After Ford's rear wheel drive Escort in its various guises and developments had enjoyed a spell of supremacy in the hands of drivers like Roger Clark, a

new breed of super-drivers like Roger Clark, a new breed of super-drivers emerged from Scandinavia, most notably Hannu Mikkola and Timo Salonen. The arrival and subsequent domination of the world's first 4WD performance road car, Audi's quattro, led the way for a gaggle of ever-more complicated 4WD contenders from Lancia, Ford, Leyland, and latterly the Japanese giants Toyota, Mazda and Mitsubishi.

The power outputs of these rally supercars grew and grew with the addition of single turbochargers, and then twin turbos. Transmissions had to become incredibly sophisticated in order to give drivers the chance of controlling up to 700bhp in



treacherous conditions of ice, loose stones, or powdery sand. Inevitably, accidents became more frequent. Worries about the safety of spectators were horribly confirmed when a Lancia went out of control and ploughed into a crowd at high speed, killing dozens and simultaneously bringing about the demise of this firebreathing class of rallycar.

While Graham Hill was winning his Formula 1 world title, and the Swedes were making their presence felt on the international rally scene, a newly-organised event of an altogether different style was gaining in popularity over in the United States. Taking its name from its venue on the parched peninsula dangling from California's southern tip, the Baja 1000 race invited



car, truck and motorcycle pilots to drive from Baja's sun-baked northern district to La Paz in the south, taking in all manner of hazards _ natural and unnatural _ along the way.

The Baja challenge was one which appealed to any American with a spirit of adventure. Medical and breakdown backup facilities were practically non-existent, the weather conditions could change from 100-degree heat, through dense coastal fog, to windscreen-shattering hailstones in peninsula's central mountain ranges, and to cap it all you stood a fairly good chance of spending some time in a Mexican jail cell if a local policeman caught you speeding and you didn't have enough money to bribe your way out. Despite (or perhaps because of) these potential difficulties, the entry lists for the 1000 and its scarcely less taxing sister race, the Baja 500, were



never undersubscribed.

More significantly, the Baja showed that it was perfectly possible for quite ordinary people to take part in this type of competitive off-road motorsport, as was shown by the popularity of the 'Baja bugs' class. Little more than standard VW Beetles whose bodywork had been hacked around to make them more suitable for travelling over punishing terrain, the bugs were often driven to great effect by poor Mexicans. Compensating for their lack of horsepower or of the latest trick suspension bits

with a local knowledge which could see them through the kind of tricky situations that regularly tripped up the big-bucks American works teams, the 'Mex' bug drivers captured the hearts not just of the few Baja spectators, but also of their fellow competitors.

There was an explosion in off-road leisure vehicles in the States during the '70s and '80s, partly as a consequence of events like the Baja. The nearest equivalent for European drivers and bike riders was not in Europe at all, but Africa. Unlike the Bajas, the Paris-Dakar rally attracts only serious competitors. A murderously difficult and dangerous event, the entrance fee is set at a level high enough to discourage 'casual' entries. Organised by Frenchman Thierry Sabine, the 2000 mile race through France and Spain and then across the vast wastes of the Sahara desert has been criticised in the past for the way in





which it flaunts the expensive flowers of western technology through some of the poorest regions on Earth.

It is also criticised for what is seen by many as its excessively attritional nature. Rarely does a year pass without a fatality. Sabine himself was killed in 1988 when his spotter helicopter flew into an unseen dune during a ferocious Saharan sandstorm. Each time someone is killed, renewed calls to ban the 'Dak' are heard - but still it continues.

Off-road vehicle manufacturers, and indeed ordinary motorcar manufacturers, place great value on this event. Winning the Paris-Dakar, where reliability is much more important than outright speed, certainly is something worth boasting about. The German sports car makers Porsche have enjoyed the sweet taste of victory many times in recent years, and have undoubtedly reaped the benefits in their showrooms as a direct result.

Porsche have also had considerable success in sports car and endurance racing, but they are relative newcomers to Grand Prix racing. Porsches had made a brief appearance during the 2.5-litre Formula 1 era of 1958-60, but their forays in a single-seater version of the RSK were without distinction or, indeed, much in the way of serious factory support. Going into the 1970s, they were still some way from making a comeback. When they did eventually return to the F1 scene, it was as an





engine manufacturer.

Before then, in 1970, the focus of attention was (not for the first time) back on Colin Chapman's Lotus team. With the launch of his new model 72, Chapman re-cast the F1 car mould by relocating the engine's radiators on either side of the driver. By means



of this apparently simple modification, Chapman was able to alter the car's appearance quite radically, endowing it with a sleek profile and considerably enhanced aerodynamics. Armed with the Cosworth-Ford DFV, the Lotus 72 would go on to set new records all over the world.

One such record which the Lotus team would gladly have forsaken was the first (and, to date, last) posthumous world championship, ascribed by Jochen Rindt after a succession of early and mid-season victories at the wheel of the 72 had given him an unassailable points lead. Rindt met his end at the Italian GP, leaving the Brazilian driver Emerson Fittipaldi to fight a lonely battle in another Lotus 72 against Ferrari's mighty flat-12 312B.

The debut of Ken Tyrrell's March-based team in 1971 was spiced by the addition of one special extra ingredient: the driver. Jackie Stewart was a Scotsman, but a rather more flamboyant one than Jim Clark. His sporting background was rooted in guns, Olympic distinction marking the high point of his progress through the target shooting ranks. Bursting onto the F1 scene with a



driving flair that perfectly complemented the clinical coolness



required from a top-notch rifleman, Stewart was not liked by everyone. But there was no denying the smooth silkiness of his skill inside the first Tyrell.

He went on to win the Championship again in 1973, having lost it the previous year to the Lotus of 25-year-old Fittipaldi. In the process of taking the title, the Brazilian had become the youngest ever world champion. Another young man, this time an Englishman, was readying himself for the challenge of the 1974 season in an all-new, all-British car, Lord Hesketh's 308. But James Hunt would have to wait until 1976



for his world champion's trophy, for Fittipaldi was there again in '74 (this time in a McLaren) to nick the title from a snapping pack of competitors including Ferrari, Lotus, Tyrell and Brabham.

Ferrari had their revenge in '75, their Austrian pilot Niki Lauda steering the 312T to his first title victory (the first non-DFV car in seven years to do so). But by far the most amazing



event of the season was the unveiling by Tyrrell of a six-wheeled car, the P34. With four small wheels up front, the car could be driven much harder into corners, thanks to the increased tyre contact area available. Although these cars achieved individual successes, the most notable being the first and second places they scored in the 1976 Swedish GP, they eventually disappeared without trace.

The '76 season was marred by a horrific accident at the Nurburgring in Germany, when Niki Lauda crashed and was trapped inside his burning car. Although suffering severe internal and facial injuries, the gritty Austrian came back before the end of the season to contest the championship with James Hunt. Eventually however the Englishman triumphed, winning by just one point at the final face of the season, the Japanese GP at a rain-lashed Mount Fuji circuit.

Toward the end of the '70s, after brief flings with flexible under-car 'skirts' designed to tidy up the airflow, manufacturers



began to look at alternatives to the worthy but aging Cosworth DFV powerplant. Renault surprised everyone, not just by entering the F1 cauldron, but by doing so with a 1.5 litre turbocharged V6 engine. Brabham built a car whose engine sported a huge fan, designed to suck the car down onto the ground. It was effective; too effective, in fact, because it was quickly

banned after winning the Swedish GP by a mile.

Nonetheless, the so-called 'ground effect' concept was not lost on those other teams whose drivers had watched the Brabham steam away into the distance. Once again, Lotus were in the vanguard, scooping the rest with their brilliantly designed 79, a car which produced ground effects without resorting to grafted-on gimmickry. Ligier's version of the theory



behind the 79 worked even better than Lotus's own car, while Frank Williams' Patrick Head-designed FW07 was the best of the lot, as the Australian driver Alan Jones proved when he took the 1980 version to the F1 title.

The first part of the 1980s saw much experimentation with the ground effect principle. Development proceeded apace, until the cars became dangerously unstable on bumpy surfaces as their suspension systems were gradually made obsolete by the clamping effect of underbody sideskirts. Inevitably, the ground effect cars had to be banned for the drivers' safety if nothing else. Colin Chapman once again applied lateral thinking to the situation by devising the ingenious 'double-chassis' Lotus 88, only to see it banned before it had hardly started racing.



The increasing popularity of turbocharging meant that the DFV-powered cars had to maximise their weight advantage in order to keep up with the considerably more powerful turbo interlopers. That meant making even more use of very expensive materials such as carbon fibre and Kevlar, but it was an uphill battle that was never going to be won. Bit by bit, the turbo cars achieved total supremacy, pouring out vast amounts of horsepower as the boost gauges recorded ever-higher pressures. Tank capacity restrictions finally brought a sense of realism to the F1 proceedings by requiring teams to trim turbo boost values in order to conserve fuel.



The Finnish driver Keke Rosberg demonstrated enough ability to drive the new breed of car to win the '82 championship in the Saudia-Williams, in the face of fierce competition from Rene Arnoux in the Renault. McLaren, stung into action

onship in the Saudia-Williams, in the face of fierce competition from Rene Arnoux in the Renault. McLaren, stung into action



by their relative lack of success, asked TAG-Porsche to produce a completely new V6 turbo for their new John Barnard-designed car. This decision would start to bring in a plentiful harvest of points for McLaren, but not until the season was almost over. Meanwhile, the Brazilian driver Nelson Piquet's ship was coming in much more quickly right from the start of the 1983 season, thanks to the all-new turbo BMW engine powering his Brabham BT52. He won the title that year.

Lotus too were enjoying something of a renaissance after some years in the doldrums, with the revitalising effect of newly acquired turbo Renault engines mounted in their new 94T chassis. One of Lotus's drivers at that time - Nigel Mansell - would go on to greater things in later life (and in other cars). Williams had lost their turbo engines, and there was an interesting return to Formula 1 by the Honda team, Stefan Johansson's Spirit car being powered by the as yet underdeveloped Japanese V6 turbo.

But the 1984 season turned out to be a benefit year for the TAG-McLarens, with teammates Niki Lauda and Alain Prost sharing 12 wins out of 16 races. For the record, Prost beat Lauda to the championship by just half a point, and established McLarens as the team to beat in the '80s. For 1985, Mansell moved to the Williams team, whose cars were to be





powered by Honda's now powerful, but still difficult to master F1 engine. Michele Alboreto drove Ferrari into a lead in the championship, only to see it stolen from him at the end of the day by Alain Prost.

At last, and typically for a Japanese firm, Honda's per-

sistence paid off in 1986, with both Mansell's and Piquet's Williams cars sharing most of the race wins. But consistent high placings by Alain Prost nicked the championship yet again for McLaren in their hat-trick year. For 1987, the sport's ruling body brought in a new law to govern turbo cars to a maximum boost pressure of just under 60psi, and attempted to resuscitate the chances of the normally aspirated cars by upping their maximum engine capacity to 3.5 litres.

There was no real change, however, the turbos continuing to dominate as they had over the previous three years. Nelson Piquet triumphed again, this time for the Williams team, after a rancorous seasons-long feud with his teammate Mansell. The Englishman's chances



were dashed then by a back-damaging crash at the Japanese GP, and in 1988 he lost out again when looking a certainty for the title when a tyre burst at high speed during the Australian GP.

1989 saw the demise of the all-dominating turbo cars in Formula 1. Instead, manufacturers were forced to return to the formula of big, normally-aspirated engines, such as, Honda's and Renault's V10s and Ferrari's blood-curdling 12-cylinder, 7-



speed machine. This was meant to bring about closer racing by making things more equal. But, as spectators and sponsors knew only too well, some cars are more equal than others...

However, just when it looked as if the wheel (if you pardon the phrase) had gone full circle, there were several factors which changed the direction of the sport.

Firstly, there was a change in technology. From the late 1970's, car manufacturers had been striving to make their polluting machines a little more acceptable. The US was pioneering in this respect, empowering the fitting of catalytic converters to all cars after 1981. Engine technology followed suit - the name of the game was to make engines more efficient in the combustion and use of fuel. The so-called 'lean burn' engines made an appearance in the mid-1980s. This was then followed by improvements in fuel.

In 1994, ethanol was added to petrolium in an 80-20 ratio. By 1996 this was 70-30. Ethanol (pure alcohol to you and I)

was produced commercially from maize, sugar beet and other crops. It had the advantage of being quite clean; the only by-product being CO₂, but the crops used more CO₂ in growing than they liberated in burning. This was the start of a whole series of additives. By 1998 in fact, few, if any, cars burnt petrolium. With new fuels came new engines. More efficient burning gave more power.



Then came the nitrous injected engines.

Secondly, motor racing was not keeping pace with the demands of the spectators. By 1995, the average 'sporting saloon' could pack around 200bhp. Partly due to this, partly because of other factors, Formula 1 began to lose it's traditional appeal. Motor racing turned another 'corner'. As always, speed, danger and excitement were all important, but it just needed a slight juggling act to bring about the right mix of



thrills and spills.

The first stunt car race was staged in 1998. The power output of these machines made the Formula 1 cars look like pedal cars. Nitrous oxide injected and running on a volatile concoction of 8 chemicals, these machines were capable of accelerating at well over 1g. In lay mans terms, this translated into a 0-60 mph time of around 2 seconds. To help transmit this power onto the road, special tyres were developed.



They were fabricated from bonded kevlar and carbon-plastic fibres. The tyre surface was actually 'sticky'. Braking systems were

water cooled, suspension systems made of titanium alloys and the car's chassis reinforced to withstand a 50mph impact.

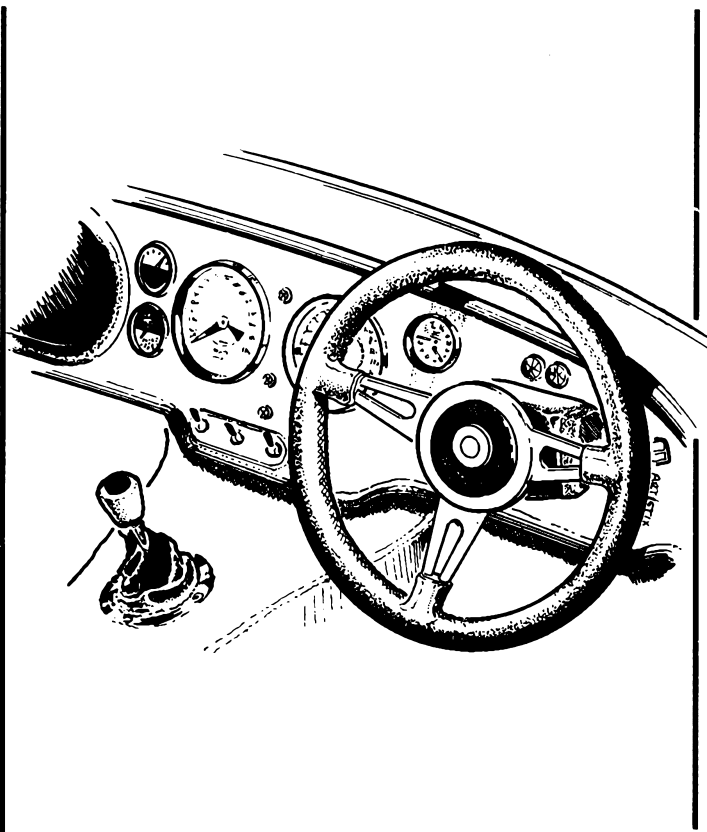
The ultimate machine had been developed, now all that was needed was the ultimate race circuit.

Special tracks were produced, culminating in the so called 'Draw Bridge' and 'Ski Jump' opened in 2006. These were no ordinary tracks. Gone were the Grand Prix circuits, in were the 500 ft elevated 'stunt tracks'. Todays racing spectators wanted power, excitement and... danger!

The year is 2008 and this promises to be the fastest and most dangerous season of the lot.



OPERATING INSTRUCTIONS





OPERATING INSTRUCTIONS

GETTING STARTED

DRIVING CONTROLS

Plug the joystick into the relevant joystick port:

ST:port 2
Amiga:..... port 2
Commodore C64:Port 2
Spectrum:port 1
PC:depends on machine and joystick cards

1. Joystick controls:

Steeringjoystick left/ right
Accelerate forwardspush joystick forward
Brake/ reversepull joystick back
Boost (limited supply)Press fire button
of special fuel)

Note:

Once acceleration is selected by pushing the joystick forward, you can return the joystick to its central position as the car will continue to accelerate until you brake or freewheel the car. This avoids the need for constant forward pressure to be applied to the joystick. Pulling the stick back cancels the acceleration, and returning the stick to its central position allows the car to freewheel.

2. Keyboard (default keys)

The key controls differ slightly from the joystick in order to avoid the need to press more than two keys at any one time.

With the 'Boost and Accelerator' key depressed, your car will be accelerating with boost. Once the key is released, the car will continue to accelerate, but without the boost. Therefore, the key does not need to be held down continuously unless boost is required.

Forward acceleration is turned off by pressing either of the



two brake/ reverse keys. The car will then freewheel until another key is pressed.

Two brake/ reverse keys provide two braking/ reversing rates, i.e. with and without boost.

Key controls

Steering left.....'S' key
right.....'D' key
Boost+accelerator forward.....'RETURN' key
Boost+Brake/ Reverse:.....spacebar
Brake/ Reverse.....'=' key

Redefining keys

The car control keys are redefined from the cockpit. First of all, PAUSE the game (see Item 4 of 'Further Controls'). Then press the 'f1' key. The "PAUSED" message on screen will be replaced by a "DEFINE KEYS" message.

The computer then asks for the keys that you wish to use for the relevant controls. It then requests that you verify the keys that have been pressed. Enter the same keys again and the computer will then return to the main game. If the second entry does not match the first, the computer will ask for another set of keys to be pressed and verified. You must then unpause the game to continue.

In multi-player mode, each player can redefine the keys at any time during a race (preferably before the start). These settings are stored for each individual player and are automatically re-installed in subsequent races involving that player.

Auto-alignment

When the car is on a straight section of track and there is no steering input from the joystick or keys, the car will steer itself in the direction of the track (unless, of course, it is airborne).

Other controls

1. On the 'Name Selection' page, type in your name and press 'RETURN' to continue. Press 'SHIFT' for capital letters.



2. On the 'Menu' pages, push the joystick forwards or backwards to move the highlighted bar and then press the fire button to select and advance to the next screen. For those of you using key control, press 1,2,3, etc. to move the highlighted bar and select by pressing 'RETURN'.
3. Where appropriate, the fire button or the 'RETURN' key can be pressed to advance to the next screen.
4. There is a PAUSE facility available whilst driving. Pause the game by pressing:
Pause on 'P' key
Pause off 'O' key
5. You can retire from a race or practice using the 'COM-MODORE' key (C64), or the 'Esc' key (ST, Amiga, PC, Spectrum). Note that if you are racing, you will automatically lose the race and best lap time points.
6. You can drop out of a season's racing by holding down the 'f1' key at the same time as clicking the fire button on the NEXT RACE fixture page.
7. You can return to the game start by holding down the 'f1' key at the same time as clicking the fire button on REPLAY SEASON.

Practice mode

A player can practice on any track by selecting 'Practice' on the main menu and choosing the division containing the desired track. The tracks are as follows:

- Division 1** **The Drawbridge**
..... **The Ski Jump**
- Division 2** **The Rollercoaster**
..... **The High Jump**
- Division 3** **The Big Ramp**
..... **The Stepping Stones**
- Division 4** **The Hump Back**
..... **The Little Ramp**



If 'PRACTICE' mode is selected and the player is in the SUPER LEAGUE, then extra power and speed will be available to the player on each track.

Each practice session lasts three laps. After three laps, your car will automatically be repaired and refuelled. However, more practice sessions can follow if desired.

Note that only damage incurred during the practice session is repaired.

DASHBOARD

Lap Indicator

The lap number that you are currently completing is shown at the bottom left of the screen with the prefix 'L'. e.g. L2 means you are on your second lap.

Boost

This indicates how much boost you have left and is shown with the prefix 'B', e.g. B30 means you have 30 units of boost left.

Separation

At the bottom of the left hand side, there is the figure that gives the separation between you and your opponent in metres. If there is a '-' in front of the number, you are ahead of your opponent by however much the readout says. Conversely, if the figure is not prefixed, you are behind by x metres. The units indicated are metres and will always show the minimum separation.

Lap Time/ Stopwatch

The flag indicator on the left lights up when you are leading the race. The top right hand display shows current lap time. Under this is the best lap time (yours or your opponents). The stopwatch indicator to the left lights up if the best lap time is yours.

Speedometer

The speedometer reads in 10s of mph. If your speed exceeds 250mph, the speedometer wraps round and starts from the left



hand side again, whereupon your actual speed is 200mph + the indicated speed.

OTHER FEATURES

Damage

1. Chassis cracks

A crack in the chassis travels from left to right along the top bar of the roll cage when the car is put under severe stress as in hard cornering or hard landings. When the crack reaches the right hand side, the car is wrecked and is retired from the race. However, the cracks are repaired after each race. If your car is wrecked and does not finish the race then the points go to your opponent.

2. Structural damage

Severe impacts give rise to holes in the crossbar. These are permanent features and stay with you throughout the seasons. However, in Division 4, you always start the season with a completely undamaged car. The damage crack (point 1 above) makes faster progress when it encounters a hole.

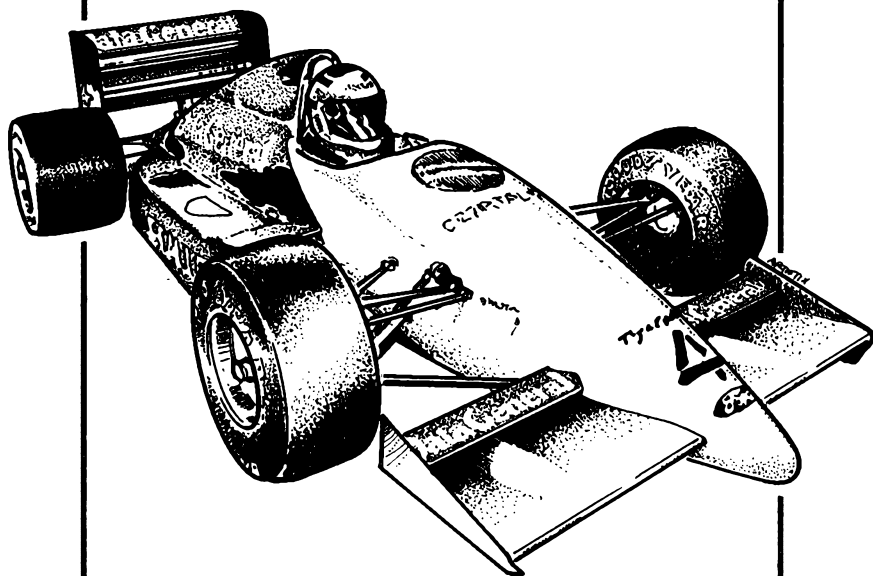
Crane

At the start of the race, the crane picks you up from the side of the track and swings you out over the start line. The message 'DROP START' appears on screen and, after a random interval, the crane releases you onto the track.

If your car falls off the track, a crane will pick up the car and reposition it over the track at the nearest, most suitable point. The crane avoids bends or gaps.

The message 'PRESS FIRE' will appear and, by so doing, you will release yourself from the crane. However, remember to wait until you are over the track before pressing the fire button to release you, otherwise you will fall off the side of the track again.

RACING





RACING

SINGLE PLAYER LEAGUE

Objective

The aim of the game is to become top of the first division in the Stunt Car Racer league. There are four divisions, each containing three drivers and two tracks. For first rate drivers, there is also a Super League.

Super League

The Super League can only be accessed once you have become Division One Champion. You are then offered the chance to mix it with the ultimate drivers in another series of races, this time with much improved engine power and brakes. You will start off in Division Four of the Super League on the same tracks as the normal league, i.e. Hump Back and Little Ramp. The only difference being that both you and your opponents are capable of higher speeds and accelerations. The aim of the Super League is to work your way through the four divisions to become Super League Champion.



A Racing Season

A full racing season involves six races: all permutations with three drivers and two tracks. Two of the six races do not involve the player and so are conducted behind the scenes. Therefore, it is possible that the first race of the season is billed as 'Race 3 of 6'.

The driver at the top of the division table after six races is promoted into the next division.

Practice Sessions

Before entering a racing season, you can practice on the two tracks which feature in your present division.

Points Awarded

Win2 points
 Best Lap Time1 point



In the event of a draw at the end of a season, the driver with the greater number of points gained from wins will be promoted. If this number is the same, a random selection is made.

If you retire from a race or are wrecked without finishing a race, then the best lap and race points go to your opponent. If both cars are wrecked then the car that was wrecked first is the loser.

MULTI-PLAYER MODE

Driver's Championship

Up to eight players can take part in the Driver's Championship. The Championship can consist

of up to four racing seasons. Each season takes place on the two tracks of a league division where the players can gain points racing against computer drivers, with special track bonus points being awarded to the players with the fastest lap time and race time (sum of all lap times during a race).

Access to Tracks

Since there is no promotion in multi-player mode, access to tracks in divisions other than Division 4 standard league must be obtained by loading single-player game positions that have previously been saved. The greater the number of divisions that you have access to, the greater the choice of tracks when you come to race. Ultimately, access to all four divisions allows all 8 tracks to be included in a 4 season championship. Super League divisions can also be included to get more power and speed. Whatever the track selection, it must be remembered that the other drivers will perform to the standard of the league and division.

Save Game Position

If there isn't time to play 4 seasons then, before starting the next season, the game position, i.e. the players' names, points, etc., can be saved and the championship continued at a later date. In order to save your game position, select the SAVE option and use a file name starting with the letters 'MP...'. 'MP' distinguishes a multi-player game position from a single player game position which is used to gain race access to tracks.





Restart Championship

To restart the championship without having to re-enter the players' names, select the REPLAY option.

To restart the whole game and return to the single-player/ multi-player menu then hold down 'f1' whilst selecting the REPLAY option.

Multi-Player Racing Season

A racing season consists of two rounds, one on each track of a league division. A round consists of all the players racing in turn against a computer driven pace car.

For each race there are the usual points awarded: 2 points for a win, 1 point for best lap time.

At the end of the round, track bonus points are awarded to the player(s) with the best overall lap time (1 point) and best overall race time (2 points) provided, of course, that a lap time or race time were attained by completing at least one lap or completing a race. The computer pace cars' times are ignored.

When the second round is completed (on the other track), bonus points are added once again.

Quit the Season

It is possible to skip the remaining races in the current round when the next race fixture page is on the screen. Hold down 'f1' whilst pressing RETURN/FIRE and it will take you through to the 'end of round' track bonus screen.

An individual race can be skipped by getting into the race and pressing the 'RETIRE' key.

Hall of Fame

The Hall of Fame contains the track records and the names of the people who set them. It can be viewed from the main menu by selecting "Hall of Fame".

The track records are for fastest lap and fastest race time (sum of all lap times during race). They can be set during any race but not in practice mode. If a record is broken then the new record is announced on the scoreboard at the end of the race. The computer drivers do not contribute to these records.





Save Hall of Fame

The current Hall of Fame can be preserved by selecting the SAVE menu option and using a filename beginning with the letters 'HALL...'.
then preserves the optimum Hall of Fame.



Load Hall of Fame

Previously saved Hall of Fame files can be loaded by selecting the LOAD menu option and using the appropriate file name. It does not matter if some new records have already been created before loading the Hall of Fame as only records better than those times in the current Hall of Fame are accepted when loading.

This means that several Hall of Fame files can be combined simply by loading them all in. Saving

Load/ Save/ Replay

Selecting this option gives another menu with options LOAD, SAVE and REPLAY.

Load/ Save

Whether loading or saving, a filename has to be entered. Some special significance is attached to filenames that start with certain letters:

.....	Single Player game position
HALL	Hall of Fame
MP	Multi-Player game position
DIR	Disk directory (Commodore only)

Any other filename is taken to be a single player game position. Suggested names might be DIV4, DIV3, DIV2, DIV1 for the standard league and SDIV4, SDIV3, SDIV2, SDIV1 for the super league.

Pressing the 'ESCAPE' key while entering the filename will cause an exit back to the main menu.

A message saying 'file name inappropriate' will appear if, for example, a file name starting with 'MP' is used when saving a single players league position.



Data Storage

A blank formatted disk must be used to store all recorded information, such as, Hall of Fame, Save Game positions and Multi-Player Game positions. Do not attempt to use your Stunt Car Racer game disk. Refer to your specific machine's operating manual to see how to format a blank disk. Label this disk, say, Stunt Car Racer Game Positions and keep it with your game disk in the Stunt Car Racer packaging.

Replay

In the single player mode this can be used to replay the last season. This has the effect of restoring everything to how it was at the start of the last season. This saves having to reload a game position if the racing season ends with demotion for the player.

Game Reset

If 'f1' is held down while REPLAY is selected, then the game will totally reset and return to the single player/ multi player menu.

Computerlink

It is possible on some versions of Stunt Car Racer to link two machines together and for two players to race against each other. This is done via a lead interfacing the serial ports on both machines. See the technical insert for details on how to make up the lead.

To enter the Computerlink, first connect up the two computers and boot up both machines. Select the 'Computerlink' option on the main menu of each computer. Whichever is selected first will be the 'master' machine, whilst the other will be the 'slave' machine. From there on, all decisions are made by the 'master' machine, i.e. menu control.

Computerlink mode is similar to multi-player mode in that you can enter up to eight drivers, load and save game positions using files that start with 'MP..' and there are two rounds per season, each on a different track. Also, if there are more than two players, there are track bonus points for best overall lap and race times. The fixtures are designed to give each driver two races per track, whilst maximising the variety of pairings. The exception is where there are only two players, as they compete only once on each track.

The 'f1' key can be used in the normal way to skip to the end of the round, except where there are only two players, when this operation is not operative.



If, for any reason, the machines lock up, e.g. the other machine is turned off whilst linked, the link can be temporarily suspended by holding down the 'f5' key. This allows each computer to independently control menus, etc., without involving the other machine. Pressing 'f5' unnecessarily could cause the games in each machine to lose track of each other, thus necessitating a reboot of the system.

Racing tips

You will need to find the best places for overtaking on each track and then use your boost to get in front as soon as possible. It is always more difficult to come from behind to win than it is to hold the lead from the start of the race. Remember, boost is limited, so do not waste it.

When you exit from a bend, don't watch the side of the track, but look for the road ahead and concentrate on bringing that into the centre of your view.

Remember that with a joystick you do not need to keep it pressed forward. This also makes it easier for you to make use of the auto alignment.

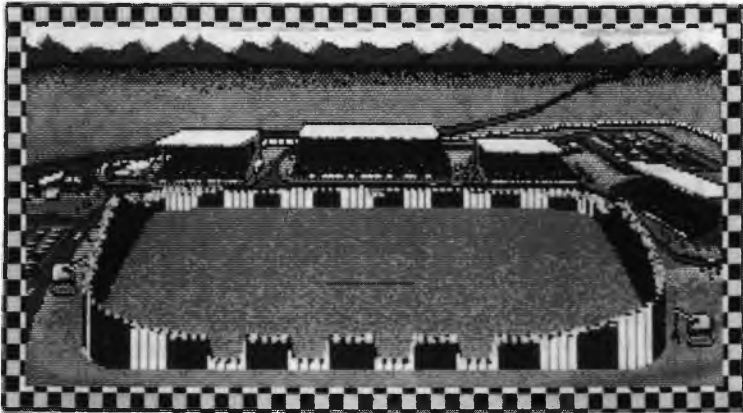
Whilst it is generally important that you go as fast as possible around the tracks, there are places on certain tracks that you must travel at a fairly crucial speed, otherwise it could lead to disaster. The Stepping Stones is one such track. You must hit the actual stepping stones at a constant speed (found out by trial and error) and keep this speed constant over every stepping stone. Other tracks, such as the High Jump, require you to have a minimum velocity in order to clear the obstacles. On the High Jump, for instance, you must attain a certain speed in order to clear the jump - a fraction too slow and you paste yourself and your car against the track supports.



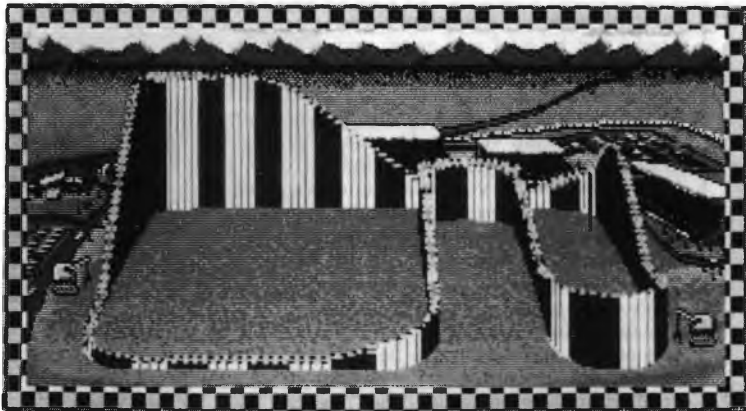
In Computerlink mode, it is possible to force the other player off the track by ramming into the side of his car. Your car can be damaged by this manoeuvre, so be careful you do not overstress your car. Likewise, if you have crashed and are being lifted out over the track by the crane, it is possible to drop your car onto your opponent's car as he drives through underneath, thus causing him severe damage and possibly forcing him off the track.



TRACKS



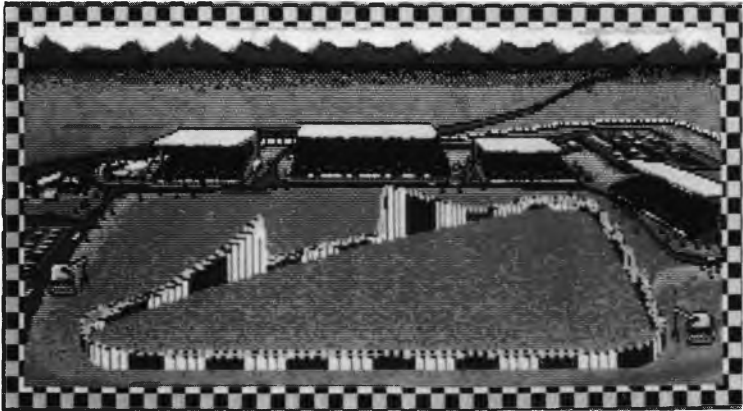
THE STEPPING STONES



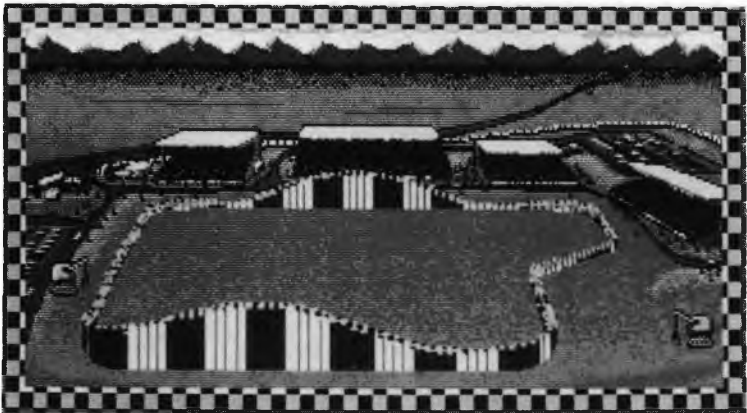
THE ROLLER COASTER



TRACKS



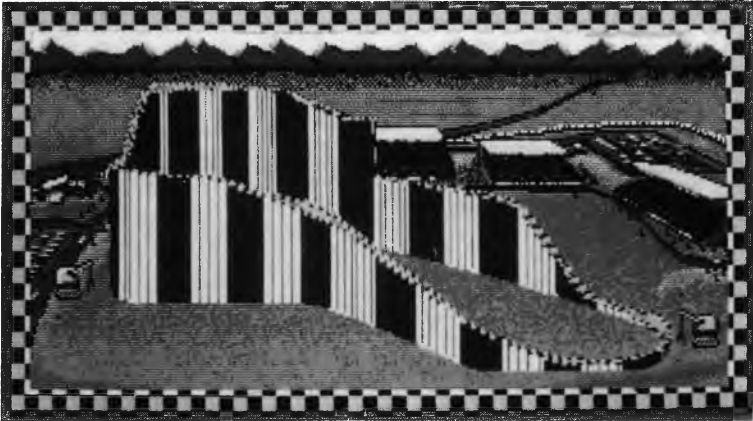
THE BIG RAMP



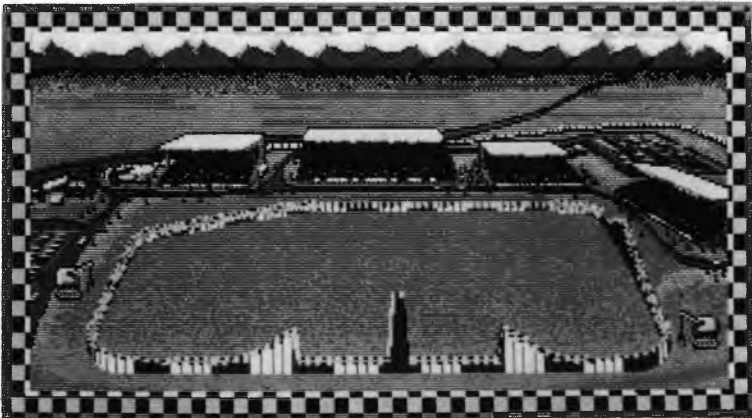
THE HUMP BACK



TRACKS



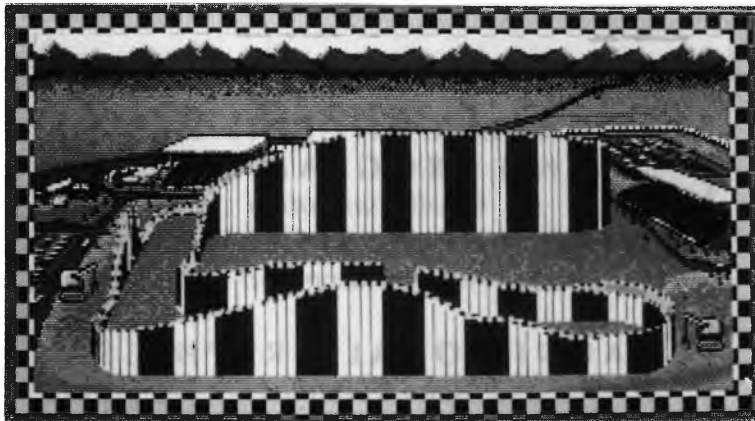
THE SKI JUMP



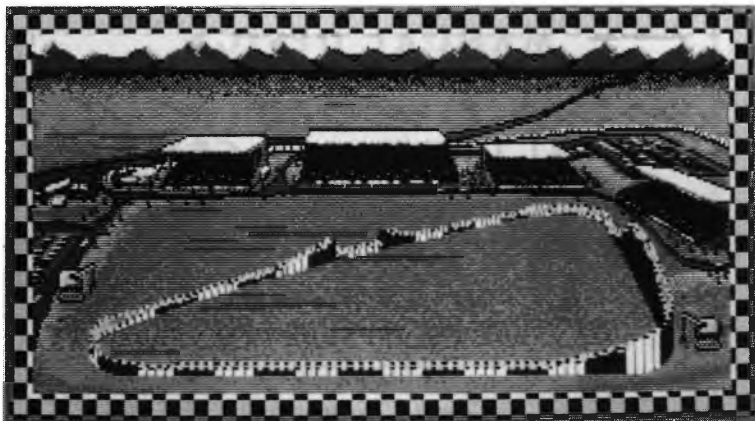
THE HIGH JUMP



TRACKS



THE DRAW BRIDGE



THE LITTLE RAMP

C R E D I T S

**PROGRAM CONCEPT, DESIGN
AND PROGRAMMING**

Geoff Crammond

WITH THE ASSISTANCE OF

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John Cummins

QUALITY CONTROL

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