



In the chair with...

GEOFF CRAMMOND

Only a select few developers have the ability to shift units by merely attaching their name to their titles, and Geoff Crammond is unquestionably a member of this elite club. In this exclusive interview, he speaks to Damien McFerran about the past, present and future

EARMARKED FOR A successful career in electronics, Geoff Crammond approached the concept of creating videogames as an outlet for his creative urges; what was supposed to be a harmless hobby ended up becoming his full-time job. After cutting his teeth on the BBC Micro, Crammond went on to create some of the finest driving simulations the videogame industry has ever seen, as well as crafting *The Sentinel* – a game that still has the power to enchant more than two decades after its initial release. However, since his last game – 2002's *Grand Prix 4* – Crammond has fallen off the radar and out of the public eye. Until now, that is...

*** RETRO GAMER:** It's a predictable first question, but how did you become involved with programming?

GEOFF CRAMMOND: When I left university I worked for Marconi and there I learnt the high-level language Fortran, which I used to do maths modelling optimisation work; that was my first experience of programming. The computer had 32K of RAM and filled a large room. It was replaced with something considerably more powerful during my eight years there.

RG: What led you to work on the BBC Micro?

GC: A couple of years before leaving Marconi I had noticed that home computers were starting to appear

and had the idea of doing some sort of 3D flying program just as a hobby. I went to a show at Olympia where the BBC Micro was on display for the first time; I was so impressed that I ordered one there and then. It arrived about six months later, probably one of the first to be dispatched. I quickly got to grips with its inbuilt language, BASIC, which I found was very similar to Fortran, but also rather slow when running. Each line of code was being interpreted into machine code in real-time rather than having been compiled into machine code before running. I realised that I would have to program the computer using a low-level assembler language, which the BBC was able to compile to produce a fast-running program.

RG: *Super Invaders* was your first game. Can you tell us a bit about this title?

GC: I bought a book on the 6502 microprocessor assembly language and then had to decide what to do. I suppose *Super Invaders* just seemed like a good game to develop in order to learn how to write a game. I instantly became addicted to the whole experience; it was like discovering a new world. I remember that visiting cousins had a go at designing some of the aliens and I actually incorporated some of them.

I added a caterpillar track effect to the shooting thing at the bottom of the screen and added a tougher mode as well, where the bombs are slightly homing and the aliens' space gets narrower. The game was finished and, amazingly, compared with what was to follow, it only took me three months to complete it.

RG: How did you market the game when it came out?

GC: As I worked on it I had the idea of maybe putting an advert in a magazine and sending off cassettes when people ordered it. By the time it was finished someone who saw it suggested approaching Acornsoft to see if they wanted to publish it. I was lucky in that although they had done versions of other popular arcade games, they hadn't done a *Space Invaders*-style title. I took it to Cambridge to show them and they liked it and published it. My foot was in the door.

RG: Can you tell us a little bit about your next game, *Aviator*?

GC: Well, after doing *Super Invaders*, Acornsoft asked what I was going to do next, and I still had my original goal in mind of creating some sort of 3D flying game. I went away and started work, with the key difference this time being that I knew it would be published, which was quite

GEOFF CRAMMOND

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"To be honest, I didn't follow motor racing before *Revs*. That would all change in the future once I had been introduced to the sport"

GEOFF CRAMMOND'S TIMELINE

- Super Invaders 1981
- Aviator 1983
- Revs 1984
- Revs Plus 1986
- The Sentinel 1986
- Stunt Car Racer 1989
- Formula One Grand Prix 1992
- Grand Prix 2 1996
- Grand Prix 3 2000
- Grand Prix 3 2000 2001
- Grand Prix 4 2002

awesome, really. I chose a Spitfire simply because that seemed like something that I would like to fly given a choice; I even got hold of a pilot's manual for a Spitfire and other data so I could do the simulation. *Aviator* was fascinating to work on. I hadn't done a flight sim before so it was very interesting developing the simulation. Also, I hadn't done 3D graphics before so that was all new. It was my first 3D world and took me a year to do it. I remember the game's launch was good: we did it at the Hendon Air Museum next to a real Spitfire and we had an actual Spitfire pilot from World War II as a guest.

RG: *Revs* came next and was your first experience of the genre in which you would later find worldwide fame. Were you a fan of racing beforehand?

GC: To be honest, no, I didn't follow motor racing. That would all change in the future once I had been introduced to the sport. *Revs* came about because Acorn Computers were sponsoring a Formula 3 racing driver by the name of David Hunt – the younger brother of the ex-F1 champion James Hunt. After the launch of *Aviator*, Acornsoft asked me if I could do a Formula 3 racing game given that I would have access to David and his team, who were, at that time, Eddie Jordan Racing based at Silverstone. This sounded great, so naturally I agreed.

RG: This, of course, marked a massive turning point in your career...

GC: True. It was then that I decided to leave my full-time job. Using up all my spare time on games while working at Marconi was no longer

* FIVE TO PLAY

THE SENTINEL



[Amiga] Few games have the ability to challenge *The Sentinel's* overwhelmingly spooky vibe.

ALTHOUGH MANY WOULD argue that the *Formula One Grand Prix* series is Crammond's enduring legacy, this 1986 release remains one of the most mesmerising videogames in existence. Essentially a game in which energy management is of paramount importance, the ultimate objective is to guide your Synthoid robot to the highest point of the map, thus absorbing the power of the malevolent Sentinel, which drains your life-force whenever its gaze falls upon you. As your Synthoid is incapable of movement, you must achieve your aim by accumulating energy from other objects and creating clones, to which you can transfer your consciousness. *The Sentinel* is a timeless game despite the crude nature of the 3D visuals. In 1998 an updated version was released under the title *Sentinel Returns* from developer Hookstone, with Crammond having no direct input.

FORMULA ONE GRAND PRIX



[Atari ST] Even today, *FIGP* retains its tight gameplay and intense realism.

IT'S DIFFICULT TO understate the sheer impact that Crammond's 1992 racer had on the genre as a whole; without it, games like *Gran Turismo* and *Forza Motorsport* would not exist. It was one of the first games to offer a truly accurate representation of driving a Formula 1 car and introduced players to the concept of fine-tuning their vehicle in order to get the best performance. It's a testament to the game's enduring popularity that a small community continues to tinker with the code via the open-source editor Chequered Flag. Although *GPI* has been comfortably eclipsed by later racers – including the three sequels it spawned – it's still devilishly good fun to play, even today.

FORMULA ONE GRAND PRIX 4



[PC] *GP4* is kept up to date with fan-produced mods.

THE UNDISPUTED PINNACLE of Crammond's near-legendary *Grand Prix* series, *Grand Prix 4* is deemed by many fans to be the most accurate representation of motorsport ever created, benefiting from Crammond's finely honed physics engine and an astonishingly realistic weather system. Sadly, due to arcane licensing issues, the game was saddled with a LAN multiplayer mode at a time when every other developer was looking to internet-based player-to-player link-ups, but, despite this minor niggle, *GP4* is a tremendous achievement that is unlikely to be bettered until Crammond himself starts work on *GP5*... whenever that may be.

STUNT CAR RACER



[Amiga] *Stunt Car Racer* is a four-wheeled riot. It's still realistic.

COMPARED TO CRAMMOND'S other racing titles, *Stunt Car Racer* feels refreshingly chaotic. The action takes place on a race track elevated from the ground, and misjudging a corner results in your car booking an appointment with terra firma. As the title suggests, much of the enjoyment to be gained revolves around performing outlandish tricks and jumps, all of which look and feel authentic thanks to the incredibly realistic physics engine. Many fans have described the game as a rollercoaster ride, which is a very apt manner in which to sum up this truly unique racer. It's a shame, then, that the proposed sequel – *Stunt Car Racer Pro* – never saw the light of day.

AVIATOR



[BBC Micro] Back in 1983, this was mind-blowing stuff.

CRAMMOND'S SECOND GAME looks positively archaic now, but it's nevertheless an important release in his career and one that is worth checking out even today. The basic wireframe visuals belie an astonishing level of depth and physical realism – for example, the game featured a realistic interpretation of the g-forces that would attack your plane's wings as it dove towards the Earth. Although the game featured combat, with marauding aliens providing ample targets for your Spitfire's bullets, it's often more fun to fly around the map. Indeed, the game actively encourages it, awarding points for spectacular piloting.

tenable for me, them or my wife, so I decided with this commission that I would go full-time into a new career doing computer games. A lot of people thought I was taking a big risk and that the computer games industry might come and go like a fad. Another consideration was that we were expecting an addition to the family within months. For me, though, it was a no-brainer. I had always wanted to have my own business in something, I really liked the work, and I could see incredible opportunities ahead. Besides my technical background, I also have an arty side; I had done some oil painting when I was younger and, just before getting my first home computer, I was experimenting with airbrush painting. Also, I have played guitar since the age of about 13 and used to spend a lot of time multi-tracking and building guitar effects equipment; I even played in a band briefly. So computer games with their graphics and sound and their potential for simulation were an ideal fit for my interests in art, music and physics.

RG: What kind of research did you indulge in when you started creating *Revs*?

GC: Well, one of the first things I did was to go round the Thruxton racing circuit as a passenger in a new BMW driven by David Hunt at a corporate event. That experience made me realise that racing cars on a track was unrecognisable as an activity compared with driving a car on the road. My recollection is one of incredible g-forces and the feeling of being continually in a slide all the way round the circuit – a bit like a theme park ride, actually. I was amazed at the way David was able to feel the balance of the car and he showed me how he could steer with the throttle instead of the steering wheel. When we arrived back in the pit lane I got out of the car and saw that the tyres, which had been new when we started, were now strangely worn such that each chunk of tread had a sideways bevel of 45 degrees due to the way it had distorted while on the limit around a predominately clockwise circuit.

RG: Like *Aviator*, *Revs* was praised for its incredible realism and convincing physics. What was it like moving from a plane to a car? Did this present any challenges from a coding point of view, or was it, in fact, easier to create a realistic game engine based around the physics of a land-based vehicle?

GC: Surprisingly, I found the physics of how a car turns a corner to be

trickier – or perhaps less obvious – than the physics of flight. Also, the body of a car and its wheels have a more direct connection with the road than a plane's body in air, and that makes the equations more sensitive to the attitude of the car. Refresh rates have to be higher in order to maintain mathematical stability. One of the things I did was to map the circuit in true 3D co-ordinates, which I hadn't seen done before. Racing games at that time were like *Pole Position* where a bend seemed like a distorted straight rather than something you actually arrived at. I also put red and white striped kerbs at the apexes and exits. The combination of 3D-mapped co-ordinates, apex and exit kerbs, a physics simulation and analogue joysticks meant that, even though the graphics were really crude, the brain was able to perceive the reality present and many an hour could be enjoyed just trying to squeeze another

“For me, going into the games industry full-time was a no-brainer”

0.1 seconds off the lap time. David Hunt raced it during development and gave me excellent feedback, so I knew it was performing realistically. Like *Aviator*, *Revs* took about a year, but this time I was working on it full-time.

RG: Your next project, *The Sentinel*, was something of a deviation. Can you tell us where the inspiration came from?

GC: Well, the idea for *The Sentinel* came about because it crossed my mind that, although computers at that time were not powerful enough to do detailed real-time 3D action, there was a way that it could be done – albeit with some restriction on movement. With a slight tweak to the formula for 3D projection I was able to do 3D polygon rendering such that, once constructed, the scene could be scrolled without having to re-render except for the new bit that was coming on from the edge of the screen. That meant that I only had to render a small percentage of the scene when panning around. The panning was still done in jerks, but it was real-time enough to

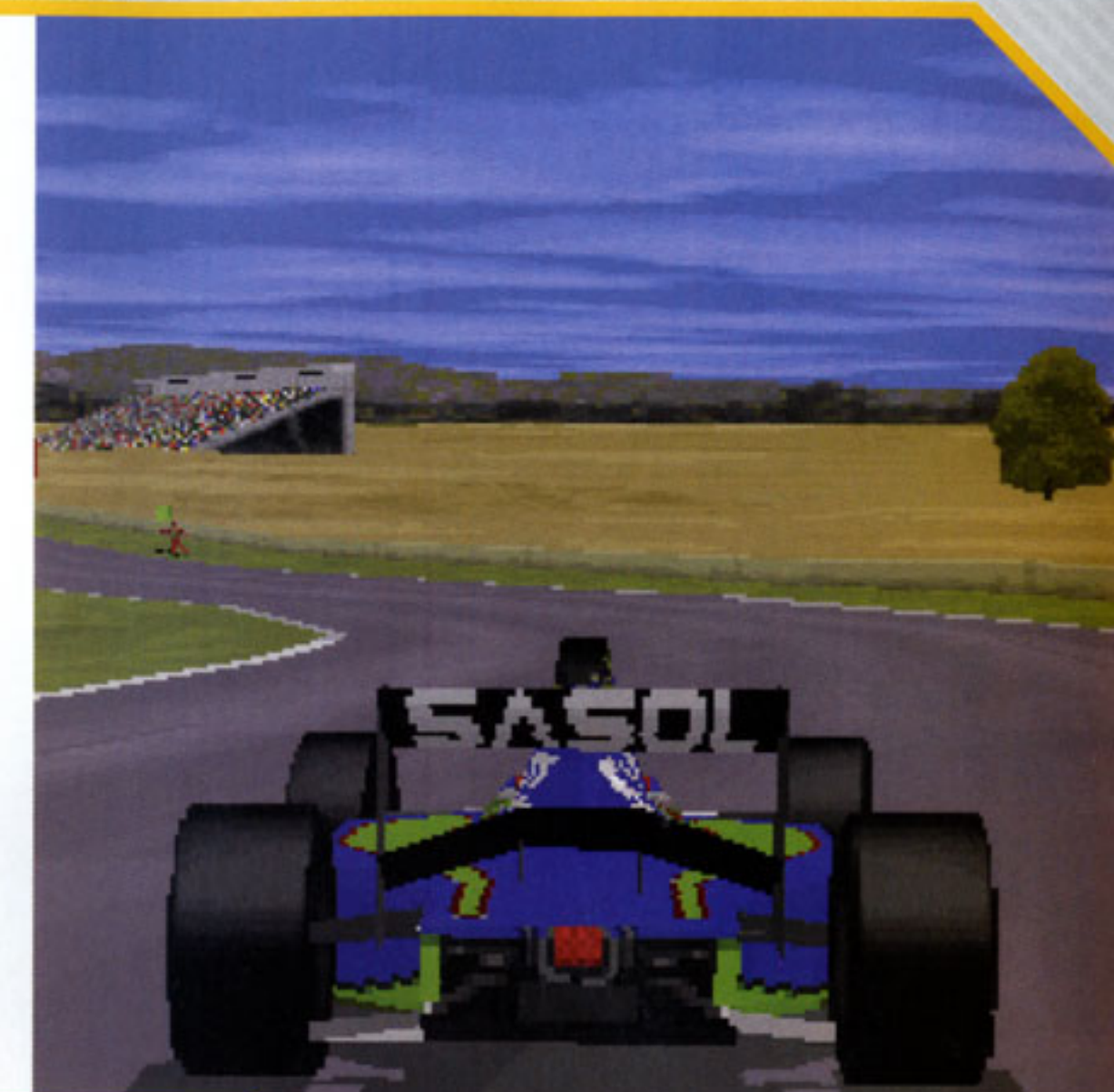
work, and I believed that the ability to explore a 3D world would more than compensate for that characteristic. Once I had the landscape system, I then needed to devise a game to play on it. I seem to remember that it took two or three weeks to come up with the initial idea of something on a tower that you had to defeat, but once I had that then the rest fell into place shortly afterwards. The first version took about six months from start to finish. I spent the next six

months or so doing conversions to many other home computers of the day.

RG: It's quite a surreal and abstract game compared to your ultra-realistic simulations. Did you feel like a change of pace when you started on it?

GC: All my games involved writing my own graphics engine, so *The Sentinel* was just another project in that respect, but I didn't see myself as necessarily

only working on vehicle simulations. I was just inspired by the interactive virtual reality



>> [PC] *Grand Prix 2* was a world apart from its predecessor, showcasing texture-mapped cars and increased realism.

experience of playing the game; I suppose I consider virtual reality to be a simulation anyway.

RG: *Sentinel Returns* updated the concept for the PlayStation generation. Were you involved with the production of this title?

GC: I wasn't that heavily involved, no. I would have been too busy myself with whatever I was working on at the time. My business manager, John Cook, was a big fan of *The Sentinel* and he basically drove the *Sentinel Returns* project. I think I did supply the source code so that they would have such things as landscape generation algorithms and so on, but I expect they created the rest from their overall knowledge of how the game was supposed to play. They certainly had some nice ideas with regard to the look and feel of the 3D.

RG: 1989's *Stunt Car Racer* was your second car-based title, but this time with an emphasis on bouncy physics and exhilarating action. Why did you choose to create a title that was far more manic and action-packed?

GC: I once described how I developed *Stunt Car Racer* in a previous magazine interview and was bemused to read afterwards that someone thought I was re-writing



history and that I got the idea after seeing *Hard Drivin'* in the arcades. The truth is that I can honestly say that *Hard Drivin'* had absolutely zero influence on *Stunt Car Racer*, which had taken me three years to create. I only became aware of *Hard Drivin'* a few months before the release of *Stunt Car Racer*. The game actually started out as a sort of land-roving vehicle sim, driving around on a randomly undulating landscape. Early in development I put in physics for the suspension and was driving it around when I noticed that I had the most fun when I encountered a bit of a ramp in the landscape and took off and landed. That started me thinking, so I flattened the landscape apart from an 'up' ramp and 'down' ramp in the middle of a big field. I immediately got a great sensation when I jumped the ramp, so I added a couple more. The next thing I realised was that it was too difficult to find the ramps in the big field they were in and so I needed a track to follow to easily get from one obstacle to another. I didn't want it to be a road-racing game with cornering as the main challenge, so I chose to make the corners banked so they could be driven without having to consider taking a best racing line. I was about a year into development by now and was coding the game on the Commodore 64. I had the basic system and did a lot of experimenting with different circuits and types of track gradient. I also thought the C64 was not powerful enough to have another car on the track, and so the idea was to just do timed laps around various obstacle courses. Fortunately, I later decided that the game needed the racing mode, so I put in a single opponent. The damage system seemed like a natural counter to just keeping the foot to the floor and the boost system also added to the gameplay.

RG: What about the 16-bit versions of the game?
GC: When it came to doing the Atari ST and Amiga versions I went for polygon plotting instead of the solid fill technique on the C64. While I was working on them I noted that both machines had an RS-232 serial port. I had already done some RS-232 stuff on the BBC Micro years before - to output some *Aviator* data in real-time - and thought it would be cool to be able to link machines by connecting these ports and having a head-to-head race with a friend. That turned out to be a popular addition and I think it was quite a novelty that an Atari ST could be connected to a Commodore Amiga.

RG: What has happened to *Stunt Car Racer Pro*, which you were working on at one point with Lost Toys Studios?

GC: *Stunt Car Racer Pro* was designed fundamentally as a multiplayer game and, of course, we wouldn't have had any restrictions with online play like we did with the F1 licence in the *Grand Prix* series. It's a real shame it never happened. It was a self-financed project that simply hit a patch where publishers just weren't signing

on the dotted line. We got it to a working demo stage, but as it was self-financed, we had a limited timeline before it became impractical to continue with the team. My business manager calls it the best game he never sold.

RG: Formula One Grand Prix is arguably the series for which you're most famous. Was it simply a natural progression from the Formula 3 action seen in *Revs*?

GC: Not long after finishing *Stunt Car Racer*, my publisher, which was MicroProse at the time, rang me up one day and said that they were in talks with McLaren about a possible licence deal and would I be interested in doing an F1 game. McLaren were, at that time, a top team with the likes of Ayrton Senna and Alain Prost driving for

them. I had followed F1 avidly since doing *Revs* and it was at a time when Nigel Mansell was on the scene - I always thought he was a particularly entertaining driver. I had always expected to do an F1 game one day and with the power of machines like the Atari ST and Amiga, plus the possible licence deal, this was just the right moment for me to do it. I started with a blank sheet and just tried to make things as realistic as I could. Putting in apex and overrun kerbs that were raised off the ground seemed like a big feature back then. I had a track - Silverstone - done and an F1 car as well by the time I went to my first meeting with McLaren. That was really interesting talking to them. As it turned out, the licence deal was never done, but the project was far enough advanced for me just to carry on and finish it.

RG: What were your ultimate objectives when you were creating *GP1*?

GC: For me, the simulator had to be realistic but also drivable. I didn't want a game where simply getting round the next bend was a big achievement - that just wouldn't feel right. It was essential for *GP1* that there was some steering help that was effective since even the joysticks for the Atari ST and Amiga were switched joysticks - in other words, 'all or nothing'. I knew from *Revs* that keyboard operation was inferior to the BBC Micro's analogue joysticks and yet that was all there was to work with. I really took the point of view that negotiating a corner should demand the same sort of dexterity and thought process as it does in real life, and that

“Putting in kerbs that were raised off the ground seemed like a big feature back then”



* NUMBER CRUNCHING

1981 was the year Crammond released his first game, *Super Invaders*. It made the equivalent of about two-thirds of his annual salary at the time

Magazine *PC Zone* awarded *Grand Prix 2* a whopping 95%

Despite his fame, Crammond has only produced 11 games in almost three decades

Revs originally shipped with just one track - Silverstone - but an expansion was later released that granted an additional 4 circuits

26 drivers from the 1994 season were included in *Grand Prix 2*, although Ayrton Senna and Roland Ratzenberger were omitted as a token of respect - both drivers perished during that year's campaign

It took around 3 seconds for each of the scenes to render in the C64 version of *The Sentinel*



>> Crammond talks us through the development of the *Grand Prix* series.

is how I decided on how steering help would work.

RG: With *Grand Prix 3* you introduced features such as variable weather effects that could change during a race - was this difficult to program?

GC: The wet weather feature was huge. That is why I left it out of *GP2*; I simply didn't have time to do it justice. *GP3* was my opportunity. The weather system was fully simulated, right down to rain-bearing clouds that come in from a distance. The wet track had variable water depth and therefore changes in grip and the whole thing could dry and have a drying line. It was also possible for one part of the circuit to be wet while the rest was dry, and so on.

RG: Although *GP3* received glowing scores, it is seen by many fans as the weakest in the series. Why do you think this is the case?

GC: If that is the case then perhaps people's perceptions are affected by graphics quality. Clearly the graphics quality of *GP2* was a big step up from *GP1*, and *GP4* is a big step up from *GP3*, but that's just the way that the graphics progressed. The reality from where I sit is that if I look at the advances in the physics of *GP4*

compared with *GP2* then most of the big developments actually went into *GP3*. *GP3*

had the all-new wet weather system, as I said, which was huge, but it was also the version where I completely overhauled the modelling of the transmission system and tyres and incorporated an active differential. You could do 'doughnuts' for the first time. Also, the cars were able to tumble upside down for the first time. That kind of enhancement was not trivial. *GP3 2000* also saw further additions, including being able to collide with debris, for example. The other thing to bear in mind is that sim enthusiasts can understandably sometimes get the wrong idea about something. I have seen forums where people can collectively arrive at all sorts of misconceptions about how the sim works, saying things like the simulator puts the car on rails when you use steering help or when you do a 'doughnut' the manoeuvre is 'canned', by which they mean a pre-programmed sequence of positions. The truth is that all the steering help does is feed a value to the steering wheel position in the simulator, absolutely nothing else, and 'doughnuts' are properly simulated, interactive and unique and never 'canned'. My experience has been that people have their loyalties regarding different sims and once they have decided something, there is little likelihood that they can be persuaded otherwise, particularly if they have already expressed an opinion online. If I tried to monitor all the forums trying to

correct misconceptions I wouldn't have time for anything else.

RG: Around the time of *GP3*'s release, Sony had stepped up the production of its own *Formula One* franchise on the PlayStation. Although this series was markedly inferior to *Grand Prix* in terms of realism, did it influence your work on your own games?

GC: I mainly remember being impressed by the power of the PlayStation and its ability to do fast texturing. I thought leaving skid marks was a good idea.

RG: How many people worked on the development of *GP4*?

GC: There was a team of about 30 at MicroProse who worked on *GP4*. Basically I worked on the physics and AI and I took the raw GPS data and converted it into a 'physics track' mesh,



which comprised everything inside, including the fences. MicroProse took that from me and created a graphics track that incorporated the mesh of the physics track. MicroProse did the rest of the game, including all the graphics, sound and menus. Obviously I had to provide interfaces so that the sim could drive things like the sound, pit crew actions, the weather, car setups, race results, data logging and so on.

RG: Is it true that GP4 was planned for conversion to the Xbox console? Why was it cancelled?

GC: Yes, the Xbox version of GP4 was even demonstrated to the press during a promotion day. I thought it looked very good and worked well. It was a casualty of the MicroProse studio closure, which was announced two weeks after GP4 was released on the PC. A couple of months work was needed to finish the Xbox version, so sadly it couldn't be done.

RG: Fans continue to support GP4 with their own mods. Have you ever been consulted on them?

GC: I have never got involved with the mods. I think that because those activities are unofficial, there was never any question of me being involved for contractual reasons. However, with the closure of the studio, the support for the product, which I had expected to come from the MicroProse team and myself, has, at least in part, been replaced with the unofficial support, so in that respect it actually pleases me.

RG: Your background is actually in physics. Bearing this in mind, do you think it's possible that you

approach games from a slightly different perspective than other programmers; that you look first at the potential for realism and then build the game up around that?

GC: I don't know how other programmers approach things, but I like to develop a game 'hands-on' rather than on paper. That's how I find out if something is enjoyable or not.

RG: Over the years, the size of development teams has skyrocketed as games have become ever more complex, yet back when you started programming, single-man teams were the norm. Has this shift in the industry resulted in better games do you think, or is there an argument for having smaller dev teams, which might possibly result in a more cohesive end product?

GC: There seem to be opportunities now at both ends of the spectrum. As well as the games that require big teams, an individual now can self-publish an iPhone application, for example. I have always been a fan of the small-team ethic because it is easy to control the project, the ideas and the software. But some games just require too many man-hours to do that way. After my *Stunt Car Racer Pro* experience I know that the best thing

Super Invaders as my first game; *Aviator* as my first simulator; *Revs* as my first racing game; *The Sentinel* for its originality; and *Stunt Car Racer* for the game concept and linked play mode.

RG: Could you tell us one particularly amusing moment from your career?

GC: I was on a golf holiday in Spain with some guys who were unconnected with the games industry. We were driving in the rain and as we entered a tunnel I exclaimed loudly, with a note of surprise, "It's not raining in the tunnel!" I then had to explain that I was developing the wet weather simulation for my latest game and hadn't considered that the tunnel at Monaco would need code to stop it raining inside. They thought this was very amusing for some reason and often repeat the tale at various social events.

RG: Amiga Power had a running joke where you were referred to as 'Sir Geoff' within the pages of the

magazine. Did you see it as a term of endearment?

GC: Yes, very much so. I actually found it a source of encouragement.

RG: Has there been any one game that has been an influence on you during your programming career?

GC: I recall when I saw Papyrus's *Indy Car Racing* with texturing for the first time I knew I would at least have to achieve a similar standard with the GP2 graphics.

RG: Your old friend Jon Ritman recently commented that your attention to detail is astonishing and that you'd spent time incorporating features that might not necessarily get noticed by the gamer. Do you think you're somewhat obsessive in this respect, or do you feel that all of these layers of detail only add to the overall experience of realism?

GC: Look, the closest I have come to driving a real F1 car is sitting in one. The best way for me

to ensure that the simulator provides a realistic simulation of the real thing is to include as much real data and as much physics as is practically possible. The best corroboration of the simulator came when I managed to get hold of some real F1 data-logging charts. Other than that, lap times were the best way of evaluating the performance of all the teams. I saw a really good thing on YouTube where some guy had filmed a GP4 lap and also had real in-car footage of the same lap and played them simultaneously on the left and right of the screen. Visually it seemed almost identical, helped, of course, by the fact that the tracks were done using GPS data, but what was amazing was how the apexes and kerbs of each corner kept appearing in unison. I thought that was a very convincing demonstration of the simulator. I have had feedback from real drivers and it's all been positive.

RG: You've been absent from the world of videogames for a while now. Do you have any projects under development that you can tell us about?

GC: When GP4 was over and the studio closed I started a new phase called 'having a normal life' and no longer worked seven days a week including evenings. That enabled me to do things called 'hobbies' and pursue 'interests'. However, over the seven years of this phase I have also been doing various recreational programming projects, some of which have involved research into game physics. Oh, and now I program exclusively in C++, which I really like. I'm playing around with ideas that may or may not lead to something.

RG: If resources and time weren't an issue, what kind of game do you think you would want to create? In other words, what would be your dream project?

GC: Actually, *Grand Prix 5* still feels like unfinished business, but then again something completely different could be more interesting.

RG: Are you still an avid follower of Formula One?

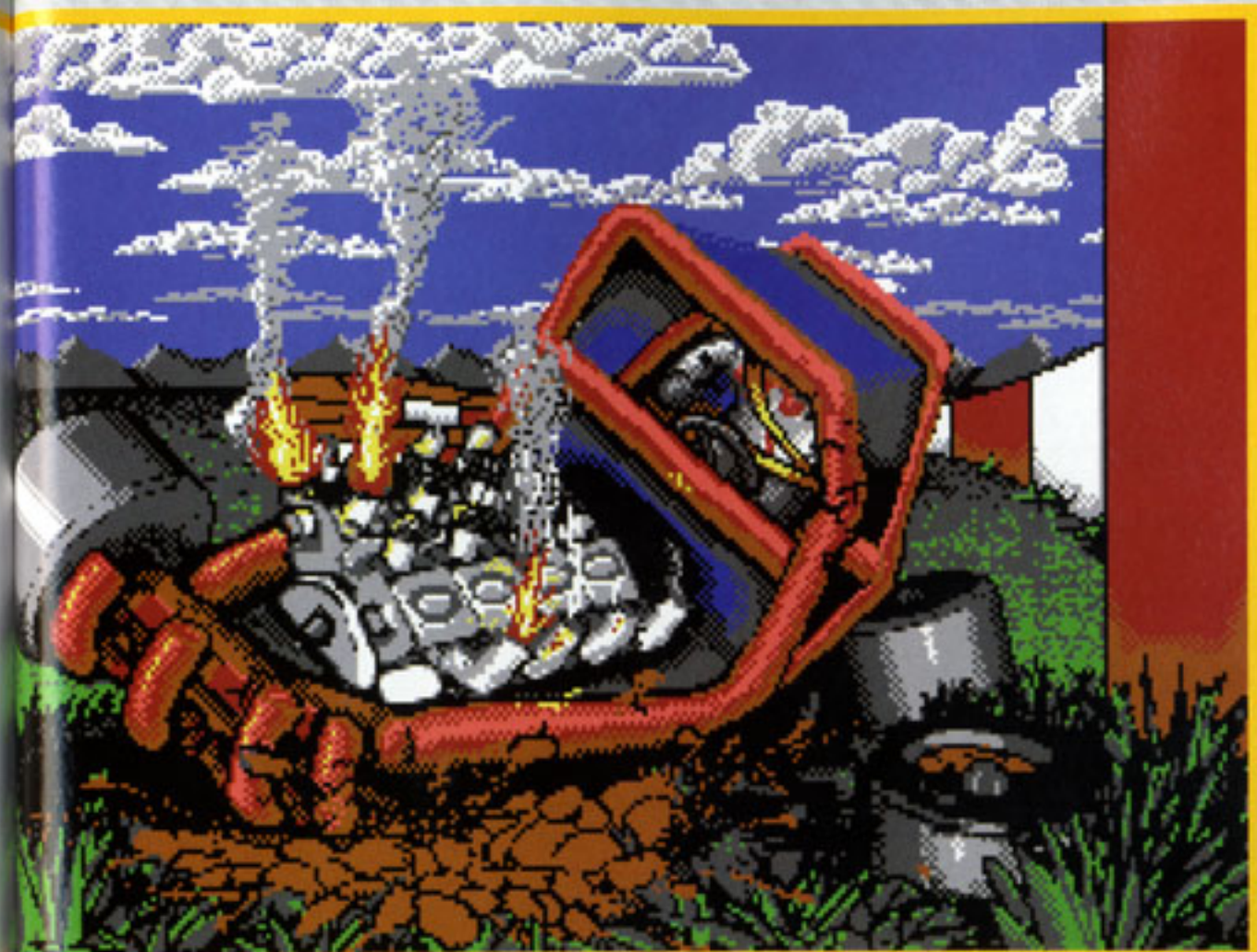
GC: After GP4, for a few years I would just watch the occasional race. I really became interested again with the arrival of Lewis Hamilton and was glad he managed to clinch the championship last year after just missing out the year before. It must have been tough for Jenson Button seeing this new kid on the block in a competitive car and doing so well, but he hung in there. Who could have predicted such a turnaround? This season has been amazing so far and I'd just like to say well done to Jenson and the Brawn team.

"I have always been a fan of small teams because it is easy to control the project"

about a small team is that they can develop cheaply.

RG: Out of all the games that you've created, which one do you hold the most dear?

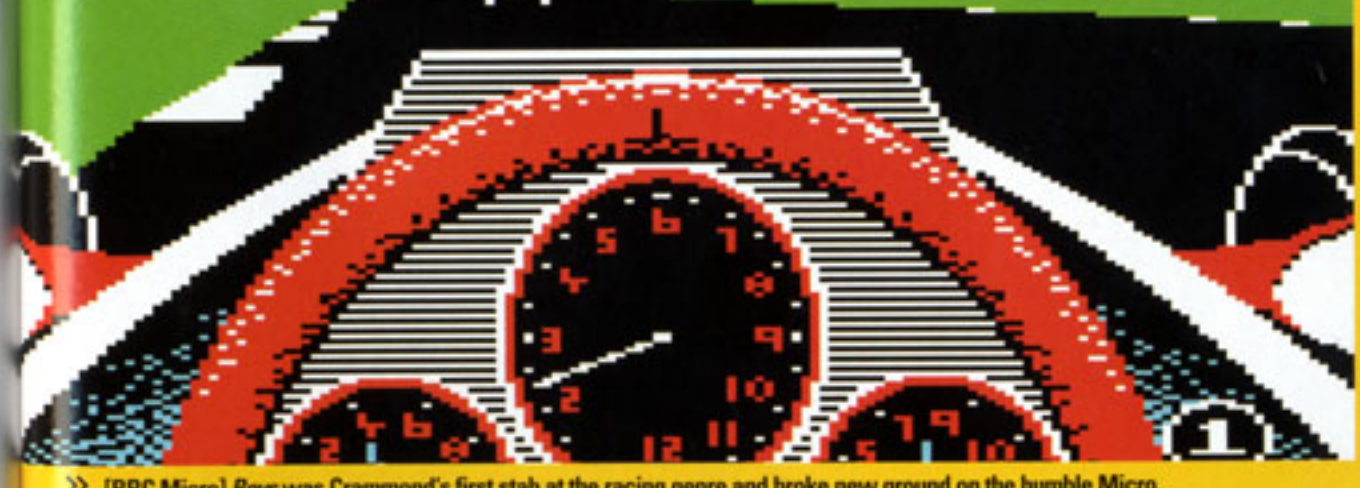
GC: Obviously the *Grand Prix* series of games is, for me, the pinnacle of all my games, but I think each one has been special for me for a variety of reasons:



>> [Amiga] *Stunt Car Racer* brings a whole new meaning to 'crashing the game'.



>> [BBC Micro] *Revs* was Crammond's first stab at the racing genre and broke new ground on the humble Micro.



YOU ASK THE QUESTIONS

We were inundated with questions for Geoff and he kindly visited our forum to answer those we didn't have time to ask. Check online if yours isn't here

■ Are you any good at driving a real racing car?

I have tried various 'experience' days at racing circuits, driving such things as a Peugeot saloon car, a Ferrari 355, a Porsche Cayman and a single-seater Formula Ford. When it comes to evaluating my skills, I will refer to my Peugeot saloon car experience at Silverstone that I did with an instructor in the car. When I was actually doing it, I found that because of my familiarity with driving the Silverstone circuit on the computer, I approached the whole thing very much like learning tracks. I still have a copy of a newspaper article that described how Mika Salo introduced GP2 to Jacques Villeneuve during his first year in F1. These are some of my favourite quotes from the interview with Jacques after qualifying at Spa: "I've been using it for the last three Grands Prix"; "The circuits are so realistic, amazingly close to what they are really like, and so are the cars"; "I've been using it since Hockenheim, and within ten laps I felt at home. The same in Hungary". The reason this all made the news was that he got pole position at Spa.



■ Are you aware if any F1 drivers played Grand Prix back in the day?

I am aware that there were a few drivers who used *Grand Prix* to learn tracks. I still have a copy of a newspaper article that described how Mika Salo introduced GP2 to Jacques Villeneuve during his first year in F1. These are some of my favourite quotes from the interview with Jacques after qualifying at Spa: "I've been using it for the last three Grands Prix"; "The circuits are so realistic, amazingly close to what they are really like, and so are the cars"; "I've been using it since Hockenheim, and within ten laps I felt at home. The same in Hungary". The reason this all made the news was that he got pole position at Spa.

■ Who's your favourite Doctor Who?

I find them all slightly irritating, to be honest. That's not to say I haven't watched it a lot.

■ Did you work on any games that never saw the light of day?

Yes. I got into a habit of starting a project, working on it for three months, and then having a more compelling idea that I would do instead. With bills to pay and a low boredom threshold, I didn't like to stew for more than two or three weeks just trying to think of my next game idea, so I would get started on something with potential and then invariably be struck by a better idea at a random moment away from my computer.

■ Is there any game you've seen and thought, 'I wish I'd programmed that?'

Tetris.

■ Have you ever thought, 'I'm bored with driving games, so for my next game I would really like to make...? Is that what happened with The Sentinel?'

When I did *The Sentinel*, I had only done one driving game, *Revs*, so I didn't feel that I was connected to any