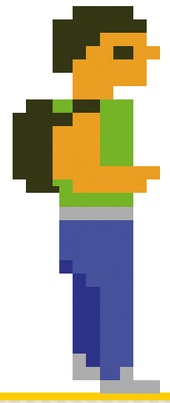
In the chair with...

DAVID CRANE

He's the designer of the bestselling game on one of the most iconic videogame consoles in history, and co-founder of the largest and most significant videogame company to come out of the Eighties. Join us as we look back on David Crane's amazing career

Following a telling company memo and a life-changing game of tennis, Crane left Atari in 1979 to form Activision with fellow Atari coders Larry Kaplan, Alan Miller, Bob Whitehead and music industry exec Jim Levy. Here this talented collective aimed to create original, high quality VCS titles, award programmers recognition for their work, and, most importantly, separate the software business from the hardware. Having completed his 68th published game, David chats to Stuart Hunt about his prolific career and shares his thoughts on the new-generation Activision…



RETRO GAMER: Thanks for giving up your time to speak with us today, David. Tell us, what did you want to do when you were at school?

DAVID CRANE: There were three main factors driving me through my early years at school. First, I was always fascinated with technology and engineering. I found it difficult to imagine that anyone could look at a television screen, for example, and not want to understand how a picture could be plucked out of thin air and 'painted' onto the back surface of a glass tube. By the time I was 12 years old I knew the answer to that question and thousands of other technological mysteries. Second, when we are young we don't have the financial resources to simply buy something to fill a need, so I became an inventor. Using junk from around the garage, or parts from an Erector Set, I tinkered in the basement at all hours (when I was supposed to be studying). Some examples include:

When our small town first opened a community swimming pool I spent so much time there that I sunburned my shoulders to a crisp. I built a foot-pedal-operated mechanism attached to the wall that sprayed my shoulders with sunburn spray.

For a science fair I designed and built an unbeatable Tic-Tac-Toe machine using nothing but rotary switches and lights. Sadly, it went up in smoke the night before the competition.

When I received an old, used black and white television as a birthday gift I dismantled it so that I could have the channel tuner near my bedside and the TV in a cabinet on my wall.

To impress the neighbourhood I fashioned a 'laser' that, in a flash of light, could ignite a match at the far end of a workbench (a loop of Nichrome wire around the match head completed that illusion).

Finally, my mother, an artist trained in a number of painting styles, made sure I experienced the arts. I took watercolour painting classes and such, but I never developed much of an interest. A painting took too long to perfect, and when you were finished you only had a single copy. So besides getting a little right-brain training I also learned the value of mass production.

Given these factors I was certain that I would end up designing household gadgets to improve the quality of people's lives. I had the technological skills to make almost anything work, and I had just enough aesthetic training to understand the need for look and feel. Ironically, videogame design was even a better fit for that combination of skills. But as I was growing up there was no such thing as a videogame, so how could I know?

RG: Tell us about your first experience with a computer…

DC: Home computers did not arrive until I was in college. But mainframe computers from IBM could be found in some businesses, and I had a lucky connection. I was in the Boy Scouts, and my Scoutmaster worked in data processing. On a visit to his office I became fascinated with the equipment. I asked to be one of the first to attempt to earn the newly created Computer Merit Badge. Through his help and access to his facility, I learned the Hollerith code for punched cards (I still remember

SELECTED TIMELINE

- Outlaw 1978
- Canyon Bomber 1978
- Slot Machine 1979
- Fishing Derby 1980
- Dragster 1980
- Laser Blast 1981
- Freeway 1981
- Pitfall! 1982
- Grand Prix 1982
- The Activision Decathlon 1983
- Pitfall II: Lost Caverns 1983
- Ghostbusters 1984
- Little Computer People 1985
- Transformers: The Computer Game 1986
- Skate Boardin': A Radical Adventure 1987
- Super Skateboardin' 1988
- A Boy And His Blob: Trouble On Blobolonia 1989
- Rescue of Princess Blobette 1990
- Bart Simpson's Escape from Camp Deadly 1991
- David Crane's Amazing Tennis 1992
- T*O*Y*S 1993
- Home Improvement: Power Tool Pursuit 1994
- Arcade Bowling 2009
- Ten Pin Championship Bowling 2009
- Boardwalk Games 2009
- Iron Horse 2010

"To impress the neighbourhood I fashioned a 'laser' that in a flash of light could ignite a match at the far end of a workbench"

that code), and got a good grounding in the technologies involved.

A few years later, in high school I attended a computer programming extension campus. I travelled by bus every morning to a nearby city, studied computers for three hours, and returned to my normal school for the afternoon. I was one of the few people in the Seventies to leave high school programming computers in three languages.

RG: And what was the first game you actually encountered?

DC: My parents bought the first Magnavox Odyssey home game console. This unit displayed squares of light on the screen with no graphics. Magnavox supplied coloured overlays that you would stick on the TV screen to make different games. I have to admit that I was bored by the rudimentary games, but I was fascinated by the potential of the technology.

RG: When did you first think: I could make a career out of this?

DC: It would be years before I thought of making a career in videogames. My head was brimming with inventions. Tired of resetting digital clocks after a power failure I invented a clock that derived its display by communicating over a power-line-interface with a master clock. To accompany me as I learned to play the guitar I created a programmable drum machine (I even tried to market that one through one of those late-night infomercial invention marketing companies). I even designed a 3D TV using a flat, spinning phosphor target inside an evacuated sphere.

I had too many things to invent – who had time for games?

RG: What did your parents think about you joining the industry?

DC: My parents helped me move to Silicon Valley after college. They looked around and saw ten high-tech businesses per block, and they knew I would be fine. To them Atari was just another computer business (my Mom was soon even happier, because I made her a *Slot Machine* game that she could play at home any time, day or night).

RG: What jobs did you do before working at Atari?

DC: My first job in the Valley was as a technician at National Semiconductor. I had worked for a couple of years at school as the lab professor's technician. When he created new lab projects for students I had to build them first and help tweak them for the class. I also built my first computer in college – a machine that plays Tic-Tac-Toe (which still works).

With all of the experience I had working with digital circuits, I recognised that there were some fields of electronics with which I had no practical experience. I took the job at National working with linear integrated circuits, stunning my advisors (that is as far away from computer chips that you can get). But I had a plan. To be the inventor I wanted to be, I needed to be proficient in many areas of electronic design. That job was just the next step in my career development.

RG: Can you tell us what was it like working at Atari?

DC: I wasn't sure I would like programming games. My first love has always been designing electronic circuits, and this would be only programming. As it turned out I still got my fill of circuit design over the years, developing a number of electronic circuits to help make game design easier. But I found that I enjoyed microprocessor programming and game design.

The working environment in my first days at Atari was very rewarding. My co-workers were dedicated professionals working hard to advance the state of gaming. Nolan Bushnell would come by occasionally to see what cool thing we were working on – although his catch word was "neat". The hot tub parties in the lobby and drug use in the office was long past, which is good because I wouldn't have tolerated that. I was only there for two years before Atari lost its way. I got out and started Activision just in time.

RG: How many games did you work on there?

DC: While at Atari I designed and programmed: *Outlaw*, *Slot Machine* and *Canyon Bomber*/*Depth Charge*. Then the Atari 800 computer needed software help so all of the original 2600 game designers stepped up and wrote the operating system for Atari's new line of personal computers.

RG: So tell us about the genesis of Activision; how was it formed?

DC: A lot went wrong at Atari in 1979, in spite of the fact that they were making $100 million per year selling videogame cartridges. They made a classic mistake, one that is repeated over and over in every business. They didn't follow rule number one: If you make your living on creative products, keep your creative talent happy.

Four of Atari's most successful game designers: Larry Kaplan, Alan Miller, Bob Whitehead and I tended to hang around together. One day we discovered that we four had created games that accounted for 60 per cent of Atari's $100M in game cartridge sales for the previous year. We were making less than $30K salaries.

When we asked Atari's new president (Nolan was no longer there) for a piece of the action, we were told 'You are no more important to the success of those products than the person on the assembly line who puts them together.'

We didn't agree so we left to form our own game publishing company. We met up with Jim Levy and together created Activision.

RG: You must have felt tremendous satisfaction when you were finally given credit for the games you made…

DC: That was a founding premise of the company. We started our own publishing house because we felt that people would like to know who authored their favourite game so that they could buy their next one.

» David invented many things before designing games, including a programmable drum machine.

> "I was only there for two years before Atari lost its way. I got out and started Activision just in time"

What was really fun was going into the game store the day our first four games shipped. The owner of the store was just unpacking the boxes and looking at our pictures as we entered the store. He did a classic double-take.

RG: When you co-founded Activision in 1979 did you ever anticipate it would become one of the biggest companies in the industry?

DC: At the founding of the company, videogames were largely considered a fad. We certainly knew better. The videogame provided a way to interact with your TV, which promised a more immersive experience than either television or movies. And both television and movies had proven themselves to be more than just a fad.

The Activision of the 1980s very quickly became the biggest company in the industry. So we didn't have long to wait to find that out. At one point a financial analyst made the case that Activision was the fastest-growing company in the history of American business. I think it is also great that the Activision of today has regained that dominance. The company's current management has done a great job of leveraging the Activision name and developing cutting-edge products that continue to keep it at the top.

RG: What would you say was the secret to Activision's early success?

DC: In the early days of Activision our primary focus was quality. We continued to work on a game until the whole group could say it's as good as it's going to get. Most times that meant a whole lot of rewriting and tweaking. And sometimes a game never reached that threshold and it was shelved.

Uncertain schedules played havoc with the sales and marketing folks, making it hard to predict when the next game would be coming. But

FIVE TO PLAY

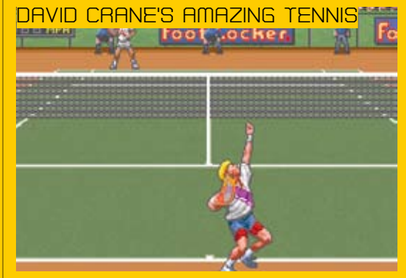
PITFALL!

THE CONCEPT MAY have taken David ten minutes to think up, but that didn't stop *Pitfall!* becoming the bestselling 2600 game of all time, selling over 4 million copies on the console alone. The game saw an adventurer named Pitfall Harry on a mission to find 32 pieces of treasure while having to negotiate various environmental hazards and deadly creatures along the way. *Pitfall!* was praised for its quality visuals, slick gameplay and animation, and quickly gained interest from VCS owners on its release owing that there was nothing else like it on the machine. The game's popularity and success helped to bring David and Activision immediately to the fore, and in the following year a sequel, *Pitfall 2: Lost Caverns*, was released. The follow-up was notable for featuring scrolling and for expanding and refining all areas of the game.

A BOY AND HIS BLOB: TROUBLE ON BLOBOLONIA

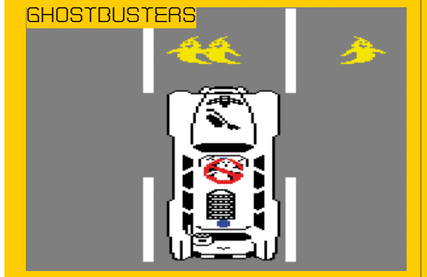
AFTER FINISHING *PITFALL 2*, David left the action/adventure game genre for a while and didn't return to it until 1989 with the release of this quirky NES platformer. *A Boy And His Blob* shares many similarities with the *Pitfall!* series. Where the games differ is *A Boy A His Blob*'s unique buddy system: the player controls the boy but is aided on their quest by a computer-controlled character named Blob, who acts like an obedient pet during the game. The player can influence Blob's actions by feeding him different flavoured jellybeans that transform him into a variety of useful objects to solve the game's puzzles. Released solely for the NES, the game was a huge hit.

DAVID CRANE'S AMAZING TENNIS



GIVEN THAT DAVID is a huge fan of tennis it comes as little surprise that he would decide to marry his passion for the sport with videogames, and in 1992 he did just that when he released *David Crane's Amazing Tennis* – a comprehensive tennis simulator. The game was notable for featuring a 3D court and an attention-grabbing perspective: the camera was positioned just behind the camera as opposed to above the court, which gave the game a more realistic feel. The game also featured a host of customisation options, as well as a large amount of shot types – such as lobs, slices, back and topspin, left or right-handed play – and slow-motion replays too.

GHOSTBUSTERS



ONLY DAVID CRANE could turn the most successful comedy film of the Eighties into a business sim and still capture the magic of the movie so brilliantly. Activision's *Ghostbusters* plonked players inside the slime-covered boots of the eponymous team of paranormal exterminators. Starting out by purchasing your very own Ecto-1, you equipped your team with various gadgets before traversing the many blocks of New York City, busting ghosts until your inevitable date with Gozer. Turned around in just six weeks, *Ghostbusters* boasted fantastic visuals, a catchy rendition of the theme tune, and varied gameplay you'd boot up time and time again, even after completion.

LITTLE COMPUTER PEOPLE

UNDOUBTEDLY A PRECURSOR to the Tamagotchi and Will Wright's super-successful *Sims* series, the high concept behind *Little Computer People* caused quite a stir on its release. The original idea can be credited to artist/musician Rich Gold, who came to Activision with an idea to produce a software version of the Pet Rock. Activision invested thousands in the project, and David helped Gold refine the concept – adding the interactivity and communication element that existed between the player and their suited man-pet. Amazingly, each LCP was unique to each disk, meaning each copy of the game would play slightly differently to the next.

after a while we got pretty good at predicting, and we were able to commit to a number of games from each designer (we just couldn't say what the game would be until it was finished).

We were the small, upstart company so we couldn't let our players down. And we succeeded... People raved that each Activision game was better than the last, and far ahead of the competition.

RG: Activision had always striven to create new IP instead of arcade ports. Why was this?

DC: That was a sign of the times. The Atari 2600 was designed to bring Atari's arcade games to the home. A lot of the game development time at Atari was taken up making home versions or their arcade games. Activision didn't own any arcade hits, so we had to create new games from scratch. Of course, that was more fun anyway.

The market was pretty small at that time as well. When there are only two dozen games on the shelf, a buyer can study all of them before making a choice. Once there were hundreds of games it made sense to attach a pre-sold label to a game.

RG: And how do you think the Activision of yesterday compares to the one of today?

DC: There is no comparison. The Activision of the Eighties was a research project. Every aspect of the business, from technology through marketing had to be invented. You could fill a textbook with the ideas pioneered by the over-achievers who flocked to work at Activision. And many of those ideas are still in use today.

Today's Activision is a highly evolved publishing business. They are very good at what they do. But to try to compare the two companies would be like comparing America's founding fathers to Washington DC of 2010.

RG: Where did the idea for *Little Computer People* originate?

DC: The germ of the idea came from an artist/musician by the name of Rich Gold. He wanted to make a software version of the Pet Rock. He raised some money and had some early programming done before showing it to Activision. I saw the start he had made and was intrigued. Activision covered his expenses and spent several hundred thousand dollars more on the project, including almost a year of my time.

Rich's idea had a flaw. The beauty of the Pet Rock was that you could sell for something that cost nothing for ten dollars, but only if you surrounded it with a great story. *Little Computer People* (which was originally called Pet Person) was the opposite. Its cost was astronomical, so it had to be sold at a high price, and therefore it had to provide some real entertainment value.

I added interactivity, communicating both to and from your LCP. Our marketing department surrounded it with a compelling story about gremlins living in your computer, etc. I worked with the production department to figure out how to make every disk unique, each with its own special LCP. It was one of the most demanding software projects developed in the 1980s. We weren't sending a man to the moon or anything, but we created a convincing life form inside the Commodore 64.

RG: Why do you think the *Pitfall!* franchise has proven to be so popular over the years?

DC: First, the platform game genre was the most expandable style of game on the early consoles. A game designer could take the player to any world that he could envision (as long as the console could display that vision).

Second, even as the first of its genre, *Pitfall!* provided a lot of game play. Within the limits of a 4KB ROM, it was rare to have more than a few game screens. The technical trick I pioneered for that game – using an 8-bit polynomial counter to define each screen – provided for more than 200 screens of game play.

Finally, in gaming, each sequel has to be bigger and better than the last. So when you start with an original game that has so much more in it than other games, each sequel is forced to be that much better.

Pitfall! represented a big leap in gameplay. And each sequel had to be even better, so the whole body of work tended to stay ahead of the curve, keeping new audiences happy while remaining true to the spirit of the original.

RG: Looking back over your career, what game are you most proud of and why?

DC: I recently completed my 68th published game, and each one has something about it that I consider special. Sometimes the part that makes me proud is a unique game play feature, and sometimes it is an extremely esoteric programming technique that might take several pages of explanation. To list a few:

Most obscure display technique: Atari 2600 *Dragster* for the moving 48-bit dragster kernel.

Best overall use of the Atari 2600 hardware: *Grand Prix* for the size and colour of the car, and the edge treatment of the disappearing cars.

Image compression/decompression: C64 *Transformers*, for run-time rendering of two-dimensional textured parts for transformation animations.

Digitised speech player: C64 *Transformers* again, for custom disk driver pulling real-time audio data from the flip side of the disk.

Best computer opponent: *Candystand Billiards*, computing bank shots through the use of phantom pocket projections.

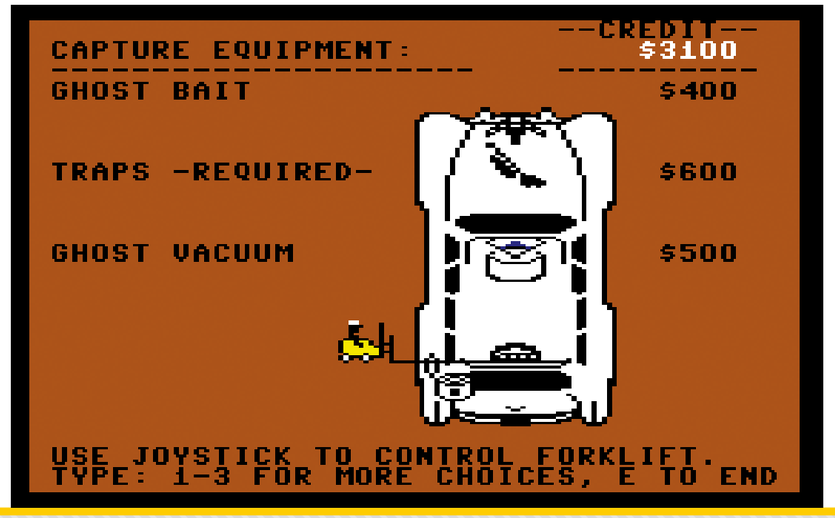
Screen data generation: *Pitfall!* 8-bit reversable polynomial counter.

> "If my name is on a game, you can be sure that I wrote the majority of the code"

RG: Are you still in touch with your former Activision co-founders?

DC: We will run into each other occasionally, particularly at classic gaming events. But despite the fact that we all still live in the Bay Area, it is a big place and we have spread out pretty far.

» [C64] Solving the problem of a short turnaround, this and the driving section of *Ghostbusters* were taken from a game Activision already had in production titled *Car Wars*.



*NUMBER CRUNCHING

David's first game was *Outlaw*, it was released in **1977**.

Pitfall! featured over **200** screens of gameplay.

Pitfall! quickly became one of the best-selling Atari 2600 games ever, with over **4** million copies of the game sold on the console alone.

David has recently completed his **68th** published game.

A Boy And His Blob featured **14** different flavoured jellybeans.

The concept behind *Pitfall!* took David around **10** minutes to think up, but it took him around **1,000** hours of programming to complete it.

For most of David's adult life he played tennis with an national tennis rating of **5.0**. Very few reach this level, and the best rating you can achieve is **7.0**.

There are **7** games in the *Pitfall!* series, including an arcade version of *Pitfall II* developed by Sega. David has only worked on **3** *Pitfall!* titles.

RG: Tell us a little about the forming of Absolute Entertainment; why did it come about?

DC: When the videogame business crashed in 1983, Garry Kitchen and his co-workers in Activision's eastern design centre spun off to form Imagineering Inc. to do contract game development. They developed the *Simpsons* games for Acclaim, and became the largest North American developer for Nintendo NES games.

After a few years of success as developers they decided to also publish games, creating Absolute Entertainment as a brand. Garry contacted me to help to create and expand a line of games for Absolute, and before long I joined the company full time and he and I were working together again.

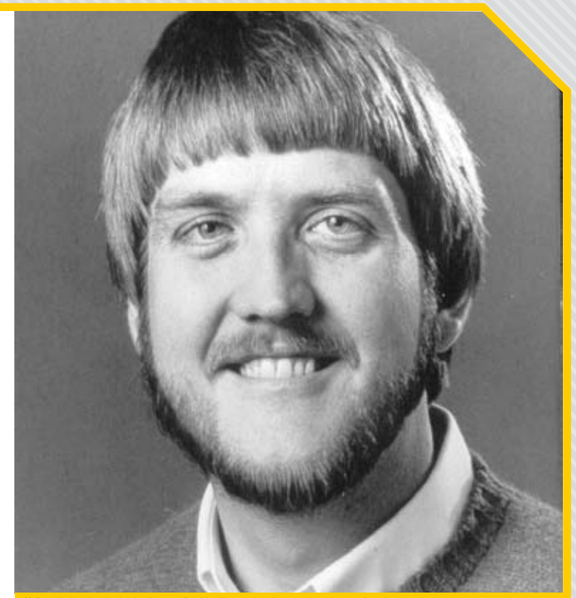
RG: How much involvement did you have with the games? Were you still coding at the time?

DC: If my name is on a game, you can be sure that I wrote the majority of the code in the game. I find that programming is the best way to guarantee that a game will meet my standards. It is the program that breathes life into the characters and gameplay.

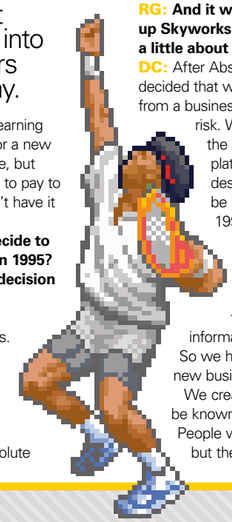
That often means learning a new game system or a new programming language, but that is the price I have to pay to keep control. I wouldn't have it any other way.

RG: Why did you decide to close the company in 1995? And how difficult a decision was that?

DC: The videogame business runs in cycles. I have been in the business for 33 years, and over that time there have been a number of boom and bust periods. Absolute ran into a bad patch in the business and couldn't sustain operations. The cost of ROM cartridges from Japan, coupled with heavy-handed retailers squeezed game publishers to the point that they could no longer make a profit. With ROM cartridge games, a publisher had to order goods far in advance. If you ordered too many you would be stuck with games you couldn't sell. If you ordered too few you would be giving up profits. It was painful to close down Absolute, but the same was happening to small publishers all around the world.



» Despite leaving Activision in 1986, David still occasionally sees the other co-founders.



RG: And it was then that you set up Skyworks Technologies. Tell us a little about it...

DC: After Absolute, Garry and I decided that we would stay away from a business that had inventory risk. We decided to treat the internet as a game platform, and we began designing games that could be played in a browser. In 1995, people had not yet become comfortable buying anything online – if you remember, people were terrified that their credit card information would be stolen. So we had to come up with a new business model.

We created what would later be known as Advergaming. People weren't shopping online, but they were browsing, and companies were trying to get the attention of the casual internet user. There is no better way to do that than to give people free games to play. So we developed games and licensed them to companies to put on their web sites. It made for a three-way partnership: we got paid for making games, people got to play games for free and advertisers could draw people to their web sites. It worked a lot like the early days of commercial television with sponsored shows.

RG: Tell us about Candystand...

DC: The Candystand was Advergaming applied to a dedicated gaming site. The Lifesavers Candy Company spent a lot of money on brand promotion. For the Candystand we took a small percentage of their promotions budget and built a place to play games. Lifesavers brands would sponsor the games as if they were outside advertisers. Skyworks provided dozens of brand-new games that could only be played on the site, generating as many as 80 million game plays per month.

The Candystand delivered the lowest cost per brand impression of any internet advertising method. In other words it was the most successful form of internet advertising in that decade.

RG: And your collaboration with ESPN... how did that come about?

DC: A number of times over the years, Skyworks worked with ESPN to provide games and promotions.

Eventually ESPN decided to hand over the reins of its gaming site. We created a special ESPN game site similar to the Candystand. But in this case they sold advertising space to other companies. This was a moderately successful arrangement, only limited by the learning curve of their salespeople who could never quite understand the difference between sponsorship and advertising.

RG: You later moved into the iPhone market. What do you think of the iPhone as a gaming device?

DC: I love the iPhone as a gaming device. I love the iPad even more. For years we have waited for the cell phone that could play games, and the iPhone is the first real candidate. But you don't need me to tell you that – just compare the number of games available for the iPhone to any other handheld device.

RG: So why did you set up AppStar Games?

DC: Garry and I sold Skyworks in 2007, but we agreed to continue to work with the company for a period of time. In October of 2009 we parted company.

I have been designing games since 1977, so it is only natural that I will continue to do so. At AppStar Games we plan to publish games for the iPhone, iPad and various other handheld devices.

RG: Are you happiest managing companies or simply programming?

DC: I still program games every day. The only distinction I might make is that I am not just a game programmer. We use the term 'game designer' to describe a programmer who also figures out how to put the fun into the game. That is what I do.

I rely on other experts – artists, animators, composers, sound effects specialists etc, but what I do is to take the work of these others and breathe life into them. I create a complete world in which they have an existence of their own, and it is this world into which the player is allowed a glimpse.

RG: Aside from your excellent Atari Magic apps, what else can we look forward to?

DC: I developed the Atari Magic apps just to document some of the more obscure tricks that were needed to make a game for the Atari 2600. It wasn't much more than a labour of love. I haven't had time to do more in that series, however, because we got busy developing *The Iron Horse* for the iPad and iPhone.

The *Iron Horse* is a very simple game – by design. At a recent conference I spoke to a number of contemporary game designers. One told me that "I can design a giant story game with hundreds of thing to do and see. But it is really hard to make a simple game that is just fun to play." Figuring out something that is simple to do and yet still fun is what Garry and I do best. That is embodied in *The Iron Horse.* At first blush you will think of it as too simple to be interesting. But a few minutes into the game you might be surprised.

As one reviewer put it, "When I sit down to play a game or two, it becomes nine or ten. It's just very easy to pick up and play, very intuitive. I never once played it for more than five to ten minutes at a time, but it's always one of the first games I'd play when sitting down with the iPad with intent to do something else."

> "[Atari] made a mistake – one that is repeated over and over in every business"

RG: Where do you see the games industry in ten years?

DC: Ten years is too far for my crystal ball to see. But the biggest thing in the past few years is direct-to-consumer sales. It is so easy to buy a game from the App Store that it is easy to forget that you used to drive to Toys R Us or the game specialty shop in the mall. Now you can own a game in seconds.

But as the number of game offerings go from hundreds of thousands to millions, new and better ways to identify good games will have to be created. I am anxious to see how that question will be answered.

RG: You've been working with Garry Kitchen for many years now. What's he like?

DC: Garry is a rare type – he's an entrepreneur businessman who can still roll up his sleeves after all of these years and write game code. Like me he realises that the best way to achieve a vision is to program the computer yourself.

He is also the most honest and responsible person I have met in business. If you sit down to make a deal with Garry, his goal is to make sure that both parties end up with a deal that makes sense for their respective businesses. I couldn't have a better business partner.

RG: How do you find the iPhone to program on compared to earlier systems?

DC: All game systems have their little quirks, and I suppose the iPhone is no different. But one of the most important issues when dealing with a game console is performance. How fast will my game operate on the device? The iPhone performance is great. And more importantly, because the iPhone doesn't run multiple apps simultaneously, a game designer can count on the same performance for every player, every time. When you hear complaints that the iPhone doesn't run multiple apps, consider what will happen on those devices with multiple programs vying for one CPU.

RG: What do you think of the current generation of videogames?

DC: There are some great console games on the market. There are games that required dozens of talented people working many years to complete. Those games are not my cup of tea, either making or playing, but as a player you should enjoy them. A lot of things have to come together to make them possible, and unless you support them with your purchasing dollars you won't get to see the next generation of that game.

RG: Do you own any current-generation consoles and, if so, what are your favourites?

DC: Unfortunately I don't have much time to play games. I suppose that seems funny since playing games led to my career in making games. But making a game takes so many hundreds of hours that there just doesn't seem to be much time.

RG: How has the industry changed since you started, and do you think it has changed for the better?

DC: As I have said, the biggest change in the industry has been direct-to-consumer sales of games. Large studio games will still be funded by one of the larger publishers like Activision, but direct sales make it possible for many smaller developers to create games and get them to market.

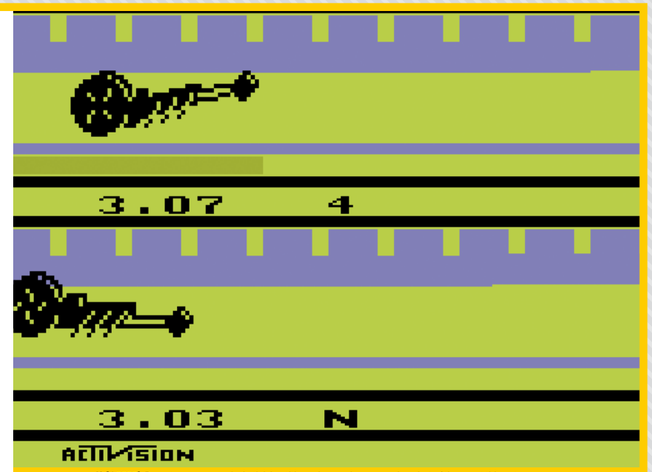
This can be a good thing for some, but it actually causes other problems. One of the biggest problems is the lower price points for games. A teenager making a game in his bedroom might be happy to make a few hundred dollars on a game, so he has no problem offering the game at 99 cents (I have read of guys who were perfectly happy that they were able to buy a new Mac on the proceeds of a game). But professional game studios have to pay half-a-dozen professionals, pay the rent, utilities and health insurance for two dozen employees. That is hard to do if the expectation is that a game is only worth 99 cents.

When I spend thousands of hours making a game, including tens of thousands of dollars of art and sound development, I still have to sell the game for only a dollar or two. Thanks to thousands of teenagers making games at home, that is what the market has come to expect. Once you play a game made by a professional design team, you can certainly see the difference. But until you do, it is hard to get noticed.

RG: Before we go, we have to ask: how good are you at tennis?

DC: For most of my adult life I played tennis with an NTRP (National Tennis Rating Program) rating of 5.0 (this is a standardized scale from 1.0 for beginner to 7.0 for Roger Federer). A very small percentage of the millions of tennis players achieve a rating of 5.0 or better. Tennis has been a lifelong passion, and it helped to make *Amazing Tennis* into a realistic simulation of the game (*Amazing Tennis* was so named for the amazing 3D parallax display never before seen on the SNES).

I still play tennis in tournament and league competition, but due to age and injuries I no longer play at the 5.0 level.



» [A2600] *Dragster* was an early Activision title and served as a warning shot of the great things to come.

» [iPad] David's latest game is *Iron Horse,* an addictive game designed for the iPad.

» [SNES] David loves tennis, and *Amazing Tennis* is a great testament to his passion for the sport.

YOU ASK THE QUESTIONS

We were inundated with questions for David Crane. He managed to answer a good selection of them...

Who did that voice sample in the *Ghostbusters* game?

That is a good question – and one that I don't clearly remember. I had written an audio digitiser and driver for the C64. The actual voice sample would have come from Russell Lieblich, who sadly passed away in 2005. Russell provided music and sound effects for many of Activision's games in that period of time. I'm sure he would have first tried to use the voices from the movie theme song. But it is possible that he was unable to isolate that sample from the underlying theme music, which would have made the sample unusable. If that happened he would have probably set up a microphone and borrowed people in the company. But I don't know for certain, and I am sorry to say that we can no longer ask him.

Have you ever been tempted to make *Pitfall 3*?

Pitfall (the license) remained the property of Activision after I left in 1987. So I never thought much about resurrecting Pitfall Harry after my departure. But I do like side-view adventures, and I have done a number of games in the genre since then as online games.

Do you still have the personalised license plate "Pitfall"? If so, how much to buy it from you?

I still use that license plate since I put it on my car in 1982. I had an old 280Z that was due to be replaced, and I was on vacation thinking about a new car and what custom license plate I might like. There was no way to get "Activision" to look good with only seven letters, and that was a disappointment. When it struck me that Pitfall would fit perfectly, I cut my vacation short to get to the DMV.

As for buying it, I would gladly consider any seven-figure offer.

Have you ever finished a project and immediately thought of a dozen ways to improve it?

Every game project ends because it hits a limit, and that limit is rarely a lack of ideas. In the early days we ran up against the ROM limit before any other. As technology improved a project ran out of time or budget before running out of memory. But in either case the key to videogame design is to get as much playability into a game within the available limits.

There has never been a game that couldn't have been made better with more time, more budget or more memory.

What non-Activision Atari 2600 game impressed you the most?

While still at Atari, Rob Fulop did a great job on the 2600 version of *Missile Command.* Making a 2600 version of an established arcade game is one of the toughest challenges in our field, and that was very well done.

A second choice would also be a Rob Fulop game: *Demon Attack.* There wasn't a lot to the game graphically, but that could be said of most 2600 games. Rob tweaked the game very well, keeping the game compelling as it ramped up over time.

What was/is your biggest programming regret and why?

Looking back I wish that *Little Computer People* had been a commercial success. While it was a huge critical success, there was so much programming in the game that it cost more to produce than it made at retail. We had dozens of ideas for follow-up products, but if those ideas were going to lose money the company couldn't afford to produce them. I regret that we were unable to follow those ideas to see what might have become of the first large-scale simulated life form on a computer.