HINTS & TIPS FOR
VIDEOGAME PIONEERS

2ND EDITION

ANDREW HEWSON

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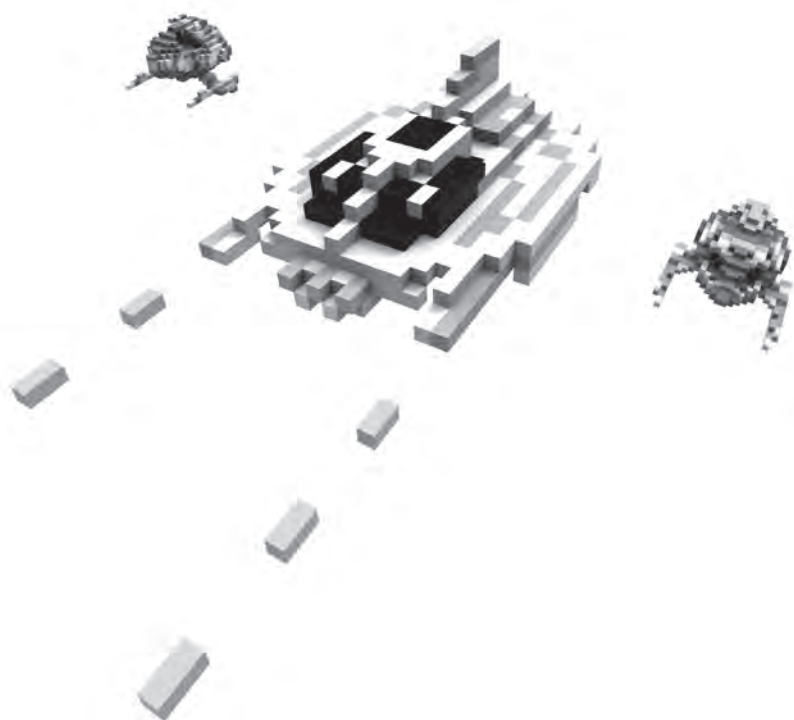
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FOREWORD

Writing this book has been far more difficult than I imagined when I finally succumbed, after two or three years of faltering resistance, to the pleading of my son, Robert. His birth in 1981 pretty much coincided with the birth of the UK videogames industry and perhaps that is the reason that his single fixed ambition when he was growing up was to follow in my haphazard footsteps and become a games designer. I think it is fair to say that with credits on his CV now including LEGO Batman 3, LEGO The Lord of the Rings, LEGO Star Wars: The Force Awakens, the World Snooker Championship series and Hydrophobia, plus experience of working with the likes of Microsoft, Warner Brothers, Sega and Atari, Robert has now made his mark. Unfortunately, as I discovered the hard way, that was not enough. Robert wanted me to write this book.

There was a time when I would have leapt at the opportunity. I have never been one to hold back with my opinions and, as the reader will discover in due course, it was the desire to write a book, or more accurately, the desire to learn how to write intelligently and intelligibly, which brought me into the videogames market in the first place. I have been branded on occasion as "outspoken", or more gently as "thought-provoking". Indeed, my wife has told me more than once that when we first met she had marked me down as "cocky". Ouch.

I think over the years I have mellowed somewhat and I have learnt the wisdom that a well-chosen silence can be more helpful than a well-meaning speech. However, that is not the reason that writing this book has been so difficult.

The book opens with the period when the videogames market exploded into existence, like a new Big Bang. A corner of our human universe inflated prodigiously in a few short years and it continues to grow steadily to this day. Quite by accident, I was there when the explosion took place and as the universe inflated, my life inflated with it. When things eased back to a more orderly rate of expansion I found myself running a company, employing people, publishing videogames and generally having to behave as if I knew what I was doing.

I didn't of course. I was doing what everyone does when life takes an unexpected turn. I was flying by the seat of my pants. In the early days I was excited by the new technology and I revelled in the ability of our programmers to extract the maximum performance from the hardware. Perhaps by luck, or perhaps by judgement, the people I identified and worked with created some of the greatest games of the period. I made mistakes, one or two of which shame me to this day. But on the whole it was a period of great success.

And then things began to change. The free-for-all, rough and tumble market where anyone could develop and publish games on any machine was slowly replaced by a market where the successful hardware manufacturers controlled access to their platforms. The market, as always, was driven by the consumers. Early-adopters enjoyed the hardware itself and accepted its intricacies as it became more varied and more complex. However, those who came later to the party found the hardware variety frustrating and confusing and were happy to sacrifice originality and creativity in return for simplicity and reliability.

I found this change unpalatable for a number of reasons. Partly, of course, having cut my teeth in a buccaneering era where I and the team around me made all the important decisions, I was dismayed at the thought of handing control to anyone else. Partly, I was tired and in need of a good long break after ten or a dozen years of making things up as I went along. But mainly, I hated the thought of creating the safe, more-of-the-same titles which the hardware manufacturers were likely to support – albeit with "better graphics" than the last time. I foresaw a life on a treadmill producing another football simulator, another first-person-shooter, another dinky-donky platform game.

As it happened, luck intervened. I was able to conceive and execute a different strategy from my contemporaries, continuing to exploit the remaining open platforms and developing a new market in Pinball simulators, courtesy of a hugely talented group of Swedish developers who later went on to conquer the world themselves. It was, admittedly, another treadmill, but at least it was one of my own making.

However, by this time, the fire in my belly had dimmed and I just wanted to crawl into a corner and be myself for a long, long while. So when the opportunity presented itself I did just that.

Until, that is, my son started his campaign to get this book written and I eventually gave way to his blandishments. I dutifully started writing, and to begin with it went well as I described the threads in my early life which would lead, by accident not design, to my launching into what was then the home computer business at the age of 29.

Robert heard that a documentary about the early UK videogame industry was in the making – *From Bedrooms to Billions* by Anthony and Nicola Caulfield – and I spent a happy but exhausting five hours in front of the camera recording my opinions for posterity. Robert did all the hard work, as he has done throughout this project, creating a briefing document beforehand, and afterwards talking the producers into allowing us to make a transcript of the of the recording, which was to prove very helpful in due course.

And then I had a heart attack. It wasn't planned. It wasn't, to my mind, deserved. I was sitting in my living room watching the final lap of the Australian Grand Prix, which Lewis Hamilton had led from start to finish, and I was just about thinking that it had been a bit boring when I suddenly felt awful, as if I had the worse bout of flu imaginable. There was no pain to speak of at the time, although it did come on later and by the time I was in hospital it was making me quite tetchy. I just felt dreadful.

After a couple of minutes of sitting and hoping that whatever it was would go away, I managed to call feebly for help and in next to no time I was whisked away to have two stents fitted late that evening. In two days I was out of hospital and back home and whilst I was well on the road to recovery I was aware that everyone around me, understandably I suppose, was keeping an eye on me. Not surprisingly, the book took a back seat.

I was, in any case, finding it a struggle. In the early days I had been jumping back and forth in time, writing different sections as they came to mind. I discovered that, for me at least, it is not easy to recall events accurately from thirty years ago and Robert, remorselessly checking facts against Internet records in particular, caught me out more than once. I found errors when I re-read sections that I had thought were put to bed. The whole project was becoming a bit of a muddle.

Eventually, after I had blundered around far more than I should have, Robert came to my rescue. He diligently typed up the transcript from my interview and then set about re-writing it himself. He was already running all the liaison with the other contributors to this book and corresponding with the more active of the Kickstarter subscribers. He began to know more about my activities in the games business than I could recall myself.

Gradually, thanks to Robert's efforts, the book began to take shape. The transcript helped us to construct the skeleton of the story and I wrote and re-wrote and re-re-wrote. Paragraphs became sections and sections became chapters.

The first half of the book started to feel quite polished, but the second half was continuing to cause me difficulties. Robert, with his usual persistence, gently forced me back to it time and time again. The problem, of course, was that I was describing the period when my own interest in the business was on the wane, when we were not the success that we once were, when I personally just wanted to up sticks and go and do something else. It was a period when I was not happy and, I found out, I was not happy to be made to write about it.

However, thanks to Robert's diligence and persistence, we gradually brought matters to a conclusion. Drafts of the book have now been reviewed, the manuscript has been proof-read, commas have been added, superfluous material has been cut and lengthy paragraphs have been tidied and made more meaningful. As I write these words, I have a manageably short list of material to be added to make the whole complete.

It will already be clear that I owe a huge debt of thanks to Robert but I also want to thank Janet, my wife, who patiently typed my first book back in the spring of 1981 and who has tolerated and supported so many of my

whims and fancies down the years. Our Kickstarter supporters have been absolutely wonderful, barely complaining about the inordinate delay in this book's production. I am also indebted to the many programmers, graphics artists, musicians and producers who created so many great videogames for me in the 1980s and 1990s and who have generously contributed their comments and observations to this book.

There will be errors of course, for which I take full responsibility. I decided early on to avoid including images in the book because the number we would have had to include, in order to be remotely representative, would have overwhelmed the narrative. I am sorry if that is a disappointment to some readers.

I am reasonably sure that the lists of Awards and Accolades are acceptably accurate because I mostly kept copies of them and put them on display. I am acutely aware, however, that the Product Summaries are built from my own hopelessly fallible memory and the records we have found on the Internet. Please forgive the occasional mistake and if you have the time, the inclination and the skill, visit the relevant Wiki on our webpage and make a correction.

And now it is over to you, the reader. I hope you enjoy the slow journey through my early years, the excitement of the videogame Big Bang, the years when we were at our peak and the gentle slide into obscurity. And if you are, or are intending to become a Videogame Pioneer, I hope most of all that you will pick out the Hints & Tips, read them, absorb them, learn from them and use them to become a far greater Videogame Pioneer than I could ever hope to be.

Andrew Hewson
Blewbury, UK 2016

INTRODUCTION

In 1980 I set up a company called Hewson Consultants, which went on to publish some of the most celebrated computer games of the decade. In the early 1990s I became the founding chairman of ELSPA, the first widely recognised body for the games industry in the UK, which established the first age-ratings system for games. And in 1991 I co-founded 21st Century Entertainment which published a series of smash-hit pinball simulation titles.

These were the pioneering years of the UK games industry, which rose from hobbyist roots to grow into the multi-billion dollar industry that we know today. Alongside other key figures, some of whom are interviewed in this book, I was fortunate enough to be there right at the beginning, helping to build a foundation when games were emerging as an exciting new medium.

It is a story of humble beginnings, happenstance and hits, of a winding road from the science lab to the high street, of gifted coders creating novelty from nowhere, all driven by a human hunger to weave magical worlds from the wonders of a new technology.

I have been out of the industry for more than 15 years now, and so I can look back on my career with a more measured and objective view than when I was involved. As the title of this book suggests, I will attempt to identify the key lessons from my days as a videogame pioneer, with the hope they may prove useful to the technological pioneers of tomorrow.

Of course to fully appreciate any story you must first understand its context, so before I begin to examine my games career, I will take the liberty of talking a little bit about the personal circumstances which paved the way.
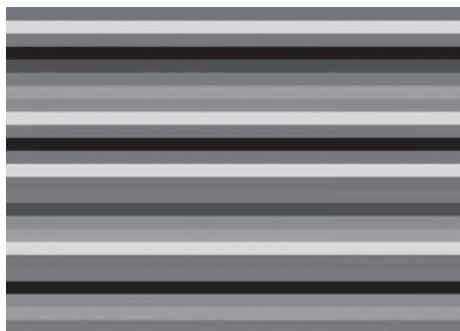
PRE—1930
LOADING SCREEN

I have a theory that all creativity comes from technological development. Whether it is the invention of the printing press in the 1500s, the development of the pianoforte in the eighteenth century, the arrival of electronic guitars in the 1960s, or the introduction of the first iPhone in 2007, the pattern is always the same. First there is an innovation in technology and then an explosion of creativity follows.

TRUE CREATIVITY

In a sense my theory is unarguably true, without a paint brush there can be no painting, without a pencil there can be no drawing, without a chisel there can be no sculpture. The tool, the technology, must exist before it can be put to a creative use.

But I would take the argument further, much further. I would argue that the exciting period, the period that is "creative" in the proper sense of the word, is *only* the period following the initial innovation. This is the period of rapid evolution, the period when ideas are first popping into existence, the

period when nobody knows quite where the new tool, the new technology, is going. During this period there is a sense of exploration, of mapping out new territory, of finding the limits of what is possible and then of testing those limits and extending them further. It is during this period that new knowledge is created.

And for me it is the creation (and sharing) of new knowledge which is the only truly creative activity. After knowledge has come into existence and has been widely disseminated, then the use of that knowledge, however diverting, entertaining or amusing, is a derivative, no longer a creative act.

I understand, of course, that there are many, many people who would find my theory wholly disagreeable. These people, working in the arts, the theatre, in the music industry, in the book industry, in advertising and else-where, regard their own activities as "creative" and would fight tooth and nail to retain their right to use the word no matter how ancient, how well-established, how run-of-the-mill the technical landscape within which they are operating.

But for me the repetitive use of a technology inevitably transforms the user from a creator to a copier, from an inventor to a repeater, from a pioneer to a settler.

There is a debate to be had about how long it takes for the transfor-mation to take place, for a technology to mature and for the creative edge to fade away. To my mind, although there is no hard and fast rule, it is partly a matter of cost and barriers to entry. The first novels were written fully three hundred years after the invention of the printing press and the great piano composers followed a hundred years after their instrument was first conceived because in both cases the technology was wildly expensive and therefore inaccessible for the large majority of the population. In contrast, the electronic guitar and associated amplifier was within the price range of many youngsters in the 1960s and so the music that was invented for the new technology, developed and matured within, perhaps, ten years.

When Clive Sinclair, and other electronic pioneers, first made computer technology available to the mass of the population in the home computer revolution of the early 1980s, an opportunity for creativity exploded into

being. I was one of many people who leapt upon the new bandwagon with the intention of riding it, careering wildly, into the future.

Why? What was it about this new opportunity that drew me in? What events in my past had pre-disposed me to join the rush? Why did I think I had something to contribute?

A NERDY FAMILY

The story begins with my grandfathers. Both of them.

My maternal grandfather, born in 1896, was a Scot named, well, Jim Scott, the son of a carpenter-turned-cabinetmaker living in Edinburgh. The First World War kicked off when my grandfather was in his teens and as he was already a Private in the Gordon Highlanders he was sent to do his bit for the country believing like everyone else, I suppose, that it would all be over by Christmas. Four years later, deafened by shellfire from his service in the artillery, and lucky to survive having been wounded three times, he returned to Edinburgh an older and no doubt wiser man.

Presumably he had saved some money from his pay and perhaps he secured some sort of veteran's grant because he opted to put himself through Edinburgh University from whence he later emerged with a degree. He found himself a sweetheart, married her, sired my mother and then, when he landed himself a job as the head teacher, and in fact the only teacher, at a remote Scottish primary school, he moved his young family 200 miles north to Lonmay, Aberdeenshire.

Lonmay ranks as a village but in truth it's more a scattering of farmsteads in a big, open landscape. Travel three miles north and you tumble into the sea and very cold it is too. Range ten miles southeast and you meet the remote fishing town of Peterhead with its bleak prison looming over the harbour. Strike two miles southwest and you encounter the mysterious military golf balls squatting atop Strichen, the local highpoint. This is the part of the UK closest to Norway, and those golf balls were built in the 1950s to keep an eye on the long range bombers roaming over the pole

from the Soviet Union, intent on testing the military reflexes of NATO and the political nerve of the UK government.

My mother was joined, in due course, by two sisters and all three were tall, raven-haired, brown-eyed beauties. My grandfather, not having a great deal to occupy his time perhaps, apart from teaching and gardening, hatched a plan to spirit his three daughters away from their rural home and the farm workers who would otherwise capture their hearts, and launch them into the wider world. They would all, he decided with a far-sightedness way beyond the era, get a proper education. They would all go to university.

He could not, he believed, save enough from his teacher's salary to fund them all and so he would pay for my mother, who was in any case naturally quiet and bookish, and then she would work and pay for her middle sister and her middle sister would pay for the third. And his plan worked, in a somewhat modified form. The Second World War intervened and my mother won a war-time bursary to study Maths and Physics at Edinburgh in return for a commitment to join the war effort as a radio operator thereafter.

But, to use her own words, when she emerged with a degree in 1944, not as many radio operators had been killed as had been expected and so she was posted 600 miles south to a laboratory at a radio manufacturing company in Mitcham, south London. And there we will leave her for the moment, a soft-spoken Scottish lass swept away by her father's vision and war time fate from rural green to urban grey, from agricultural peace to metropolitan bustle, from the predictability of friends and family to a new life which was yet to fully announce itself.

My paternal grandfather arrived on this earth a full twenty years before his opposite number on the other side of the family. By the time my father (and his twin) were born in 1920 he and his wife had already had seven children and were living in Jarrow in the North East. They were both of farming stock – both had family trees littered with agricultural labourers all living in and around south Yorkshire. My grandmother's maiden name was Pickering which I guess points to an origin in the town a dozen miles inland from the coast at Scarborough.

My grandfather was an industrial chemist and his big break came in the late 1920s when he secured the post of Chief Chemist at Battersea Power

Station, then in construction on the south bank of the River Thames more or less opposite Victoria Station in central London. He and his wife moved south with their four surviving children, the others having died as infants of dreadful diseases such as diphtheria, diseases which fortunately we never see today. One of them died of scarlet fever at the age of seven and was still remembered with affection by her siblings when they were old enough to be my aunts and uncles and I was old enough to be interested in their memories.

The family settled in a largish house opposite a park in Farnaby Road, Bromley and my grandfather commuted to work from Shortlands railway station. Battersea was a coal-fired power station hence its location on the Thames where there was enough flat land on which to build it and ready supplies of fuel and water, both of which came via or from the Thames itself. But it was not without its problems. Even in the 1930s, twenty years before the Clean Air Act of 1953, there was significant public concern at the "smogs" – filthy, black fogs generated by millions of coal-heated homes, offices and factories, thousands of coal-driven steam locomotives and half a dozen electricity generating coal-fired edifices like Battersea, Bankside, Fulham and the other power stations which then lined the Thames.

My grandfather was at the forefront of the early efforts to manage and combat this pollution. We have copies of academic papers written by him both as solo efforts and with colleagues explaining various chemical techniques that they were developing at Battersea. In due course he won the Gold Medal of the Society of Chemical Engineers and so he must have been of some standing amongst his peers. He was certainly called upon as an expert by the House of Commons because we have mention of it in a letter, which I will re-visit shortly, written to my father in 1944.

Under this parental influence it is perhaps not surprising that my father also chose to train as a chemist following a school career at Bromley Grammar School (at a cost of two shillings per half term). He won a place at University College London but spent next to no time in Bloomsbury because the Second World War intervened and the students and staff were evacuated to the Welsh coast at Aberystwyth. "Did you drink much beer?" I asked him with fake innocence in later life once my own student days were safely behind me. "I must have drunk my share," he answered somewhat primly.

But I didn't believe him. He was quiet and bookish just like my mother and happiest when he was pottering about making some new Heath Robinson device to charge a car battery, water the garden or provide him with a steady supply of de-ionised water. Yes, my father designed and built a pair of ion exchange columns and installed them in the garage. He needed pure water, so he said, for his experiments.

He graduated and returned to London in about 1941 to work at the same laboratory in south London that my mother was fated to join three years later. At about the time they met he must have taken "digs", as he would have called it, close to his job because the father-to-son letter I mentioned above is written from Farnaby Road to an address in south London. In it my grandfather hopes my father enjoys the cake that his sisters have baked for him, reminds him to bring home his dirty laundry at the weekend and then expands on the development work they are undertaking at Battersea and compares it favourably with the techniques that are under development at ICI (Imperial Chemical Industries – once an industry leviathan but now defunct) which he has learnt about via the House of Commons committee. His technique for scrubbing pollutants from power station effluent gases, my grandfather opines, is superior because it will scale up with ease from the laboratory to an industrial application whereas the ICI method, he believes, will not.

And then, in amongst the family gossip and scientific elaborations, comes a bombshell. "We still don't know," muses my grandfather in this 1944 family missive, "We still don't know what powers the sun." And there you have it. An experienced chemist well-versed in the techniques for extracting chemical energy from coal and no doubt in his own mind competent to extract chemical energy from oil or gas or wood, must have looked up every day at the ball of fire hanging in the sky, perhaps through the window of his train to work, and thought, "What on earth or in heavens is powering that?"

But he was wrong in his assertion to my father because by 1944 humanity collectively had some idea of what was going on up there in the sky, 93 million miles away. Granted the fusion bomb, which releases energy using the same pathway as the sun, didn't burst onto the scene until 1951 but the first fusion of hydrogen isotopes was accomplished in 1932

and the Manhattan Project's objective to release prodigious quantities of energy from heavy elements reached its awful conclusion at Hiroshima and Nagasaki in 1945.

My grandfather in later years, by the way, was not a believer in the benefits of nuclear power. Perhaps it is understandable that a specialist in one technique of power generation should be sceptical about the benefits of a succeeding system. He scoffed, according to my mother, at the notion put about in the 1950s by the pioneers of nuclear power that it would be "too cheap to meter" and always pointed, with a prescience that does him credit, to the costs and dangers of the radio-nuclides and the radioactive contamination being created.

My parents met over the test tubes, so to speak, in the laboratory of the Mullard Radio Valve Co Ltd of Mitcham. Radio valves, by the way, were the precursors to transistors which are the active component in all modern computers, and so in a sense my parents were in at the start of the computer revolution, not that they would have recognised their situation as such at the time.

My father was in a "reserved occupation", also known as an essential service, that is to say that the work he was doing was considered important enough to exempt him and in fact to forbid him from entering military service. His speciality then and later was the development, manufacture and deposition of fluorescing chemicals of the sort which were used to coat the inside of cathode ray tubes (CRTs). CRTs formed the screens of war time radar systems, post-war television sets and the computer monitors of recent years until they were superseded by the liquid crystal displays (LCDs) that we enjoy today. At a time when radar was being frantically developed, improved and miniaturised it is easy to see why his work and that of his fellow workers was considered so important.

He was a nerd of course. We have a picture of him from the time accepting the award of a "Golden Orange" from his company for some important piece of work. He is wearing owlish, John Lennon glasses and the kind of striped blazer that these days would look over-the-top at the Henley Royal Regatta. He also looks a bit clueless. He admitted to me many years later while showing me the photograph that he had not appreciated at the

time that his company were trying to acknowledge whatever it was that he had done and to say thank you and well done. "I was a bit green," he said to me. Like father, like son I have to say. I was much the same at the same age when I set up Hewson Consultants.

By now I hope it is clear that I came from a nerdy family. Physics, mathematics, engineering and chemistry were common topics of discussion at the dinner table and much of our spare time was spent reading books. We children were always encouraged to ask questions and to try to figure out how things work.

I think a person's family background plays an important role in the kind of career they ultimately follow. Had I come from an artistic family background or from a family of musicians, perhaps I would have been drawn down a different path. But I came from a scientific family background, so my ambition, from my earliest conscious days, was to be a scientist.

With hindsight I can see that becoming a videogame pioneer was serendipitous. It happened because the motive, means and opportunity fell into place, and that process started with my nerdy, scientific family. But of course when I set out to follow the family tradition and become a scientist, I had no idea that my path would set me on a collision course with the birth of the home computer market and ultimately, the birth of the videogames market in the UK.

However, that is just one part of the picture. My wider family background in the sciences launched me towards a rendezvous with computers and in doing so helped to open up an important opportunity. Having the means to capitalise on that opportunity was a different matter entirely.

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"My dad was a computer maintenance engineer and at times he would take me to work with him and I was fascinated by the mass of equipment that was then required to do the relatively mundane tasks that were the norm. I can distinctly remember an occasion where one of the test programs for one of these monsters would show a poorly animated dog walk across a ghostly green screen past a representation of a lamp post where

*it would stop, do what it needed to do and walk on. This was
state of the art graphics in those days as there was nothing other
than these huge mainframes. I thought it was fantastic."*
Mike Male, creator of Pilot, Nightflite, Southern Belle and Evening Star

*"My dad thought computers had a future and got us one around
1983. It was an ABC 80 manufactured by the Swedish company
Luxor. It came with a manual for programming in BASIC, and
luckily it was in Swedish, as I didn't know enough English at the
time. Initially I was just playing games, but my dad tried out the
programming, and I figured since we were both novices, I could
learn as fast as him. Turned out I beat him quickly."*
Andreas Axelsson, co-founder of DICE & programmer on Pinball Dreams

NUMBERS MAN

My parents met in 1944 and married in 1947. My sister arrived in 1948 and
I followed in 1951. In 1953 the family moved to Hadleigh, Essex after my
father took the job of Chief Chemist at Cathodeon of Southend, a company
that manufactured TV tubes. My parents paused for breath, so to speak, and
then my two brothers arrived in 1958 and 1961.

It was inevitable that the household should view Science as the Holy
Grail and I absorbed respect for all things scientific from my parents. I can
remember for example one Saturday when I was about seven, asking how
the motors worked in my electric train set, of which I was a very big fan.
My father chuckled and standing in front of the fireplace in what we called
the "back room" (we rarely used the "front room" because it was too cold)
he asked me how I thought they might work. I invented some fiction about
electrons flowing around a circuit, because I knew electrons were somehow
involved, and then being caught in some fashion in the wheels of the toy
locomotives so that they pushed the wheels around.

My father laughed and then explained how electrons flowing in a
coil created a magnetic field which could be made to push away from an

opposing magnetic field. Thereby, with a bit of ingenuity and clever design, the opposing forces could be harnessed to cause an electric motor to spin.

But in truth neither science nor technology was my first love. It was numbers that had me hooked. The telephone number of my father's company in Southend: 68451. My mother's Co-op number: 12-18-96. I would lie awake in bed at night, playing with them in my head and enjoying their symmetries and patterns. They were like music to me.

Inevitably I was the class nerd at junior school and the first to put my hand up with the answer to any arithmetic question which, I have to say, did not make me very popular with my class mates. One of the teachers took a shine to me and nicknamed me the Professor but for the others, I suspect, I was a bit of a pain.

When we learnt, in the final year of school about Pi, the ratio between the circumference of a circle and its diameter, I discussed it with my mother and then returned to school and solemnly explained to my teacher that the correct value was not 22 divided by 7 as he had been teaching us because that was only an approximation. My teacher stuck to his guns (and to be honest he must have been sorely tempted to clout me) and when I reported his response back to my mother she advised me to hold my tongue because in all likelihood, she suggested, he knew no better. Ouch, methinks! Such is the contempt of the mathematically literate for the rest of humanity.

There were forty children in my class during my final year at junior school and about the same in the other class in the year. We sat at pairs of desks in lines facing the front five deep with four paired lines of desks across the width of the classroom. I was dimly aware that we were graded by ability and doubtless due to my prowess in maths, I was at the clever side of the class next to the window with a view across a stretch of tarmac to the hedge lining the adjacent back garden. In due course we sat the "Eleven Plus", as it was called. Most of the class passed with a few tearful exceptions. I assume that children in the other class mostly failed.

The failures were all allocated places at the local "Secondary Modern", their parents no doubt resentful, disappointed or perhaps indifferent. Those of us who passed were given places at various schools further away. I

was sent, with a couple of others from my class, to a grammar school in Rayleigh. Instead of a one mile journey to junior school I now had a three mile journey in a different direction. What I did not have was anyone living nearby of my own age. I think I was quite lonely.

It was only at grammar school that I found companionship, certainly after the first year when my ability in maths once again put me into the top class, with a peer group that remained unchanged until the sixth form. In retrospect it is bizarre to realise that there was such a rigid attitude to ability and a determination to classify children and allocate them to a station in life long before they reached adulthood. But that is how the world was and I dare say there were plenty of experts on hand to tell anyone who cared to listen that a rigid attitude was right and that the resulting classification was appropriate. I wonder if our educational theories are any better these days. I would like to think so but only time will tell. In retrospect I can see that I was one of the fortunate few.

At my new school, for the first, but by no means the last, time in my life I met someone who was better at maths than I was. He was also a talented musician, read computer science at university and played the flute in the National Youth Orchestra before moving to Canada to become an IT networking expert. But that was later. In the meantime I settled in quite happily to play second fiddle in maths tests and exams. Apart from anything else I found I was quicker-witted than most and so I had a subsidiary role as the class clown, a role that I still get to play on appropriate occasions to this day. And much to my satisfaction I discovered that whereas I had been the smallest in my year at junior school, I was now only third smallest at grammar school. Of such tiny victories we construct our self-esteem. Mind you, later on in the sixth form, when someone else threatened to pinch my second spot in maths I was a bit put out.

When I was young, the six mile trip to Southend required a half mile walk to "the top of the road" and the expense of a half hour bus ride, an extravagance which my Aberdonian mother would contemplate at most twice a year. But in my early teenage years, my parents acquired a second-hand car and, as a bizarre consequence, I developed an interest in electronics. On a Saturday morning, all six of us would pile into our Austin Cambridge and

tootle off to the centre of Southend to spend the day wandering around the shops. I learnt to make a beeline for a huge and magical wonderland called WH Smiths, because, I discovered, in amongst the magazine racks, they stocked inexpensive books of electronic circuits.

I studied the circuits and, with a little help from my father, found a couple of shops which sold resistors, capacitors, coils and transistors. My father had a soldering iron and I soon had my first radio in operation, dangling a wire out of my bedroom window for an aerial, and clipping a crocodile clip to the radiator for an earth. The pirate radios, broadcasting from ships in the Thames estuary, had not yet been shut down by the Wilson government and I well remember falling asleep with the soft tones of John Peel, then with Radio London, burbling in my ear.

By an extraordinary stroke of luck, my family heard of someone, a few miles away, who wanted to dispose of his late father's collection of radio and other equipment. I remember being taken to a shed at the bottom of the garden which was like an Aladdin's cave full of treasure. I salvaged a record player, a valve amplifier, a couple of broken radios, an oscilloscope, a radiogram and any number of electronic components including a drawer full of beautiful radio valves. I took the whole lot home and stowed the best of it in my bedroom and the rest in the garage. Half of the equipment was faulty but the circuitry was all fairly elementary and as often as not, a repair could be effected by identifying dry joints and adding a dab of solder.

I was particularly pleased with the valve amplifier. It consisted off a bare metal chassis with a couple of small valves, an output transformer and a huge "Class B" output valve the size of two fists sitting on top of one another. I knew that the "Class B" design would make it particularly powerful so I tidied up the soldering underneath, found a suitable loudspeaker, attached a turntable and soon I was broadcasting my choice of the Beatles and other music to the neighbourhood.

I also traded a little on my good fortune. I had met a girl I was keen on at school and so I took one of the broken radios, repaired it and presented it to her as a token of my affection. Not for me the box of chocolates, the flowers or the meal at a fancy restaurant. A second-hand radio, that's the way to win a fair lady. Trust me it works. I am still married to her.

GCE 'O' levels came and went and being only allowed to take three 'A' levels (another example of the rigidly prescriptive educational system) I naturally chose Maths, Physics and Chemistry. I thoroughly enjoyed my time in the sixth form. The girls who had been our classmates for the past half dozen years (it was a co-educational school) became, err, more interesting. And my social life was transformed half way through when I passed my driving test and I wangled the use of my parents' Mini. The only cloud was that my chemistry teacher estimated I'd get a D grade whereas I needed a B to get into my chosen university. I'll show him, I thought. And I did, taking great delight in waving my A grade under his nose when it came through. I think he thought the examiners had made a mistake. Perhaps they had.

In the meantime, another formative event had come and gone. In the June when I sat my GCE 'O' levels my father was Chief Chemist at Cathodeon, a subsidiary of Pye of Cambridge. By Christmas Philips, the Dutch giant, had bought a controlling interest in Pye. Cathodeon was closed and my father, together with many of his colleagues, was out of a job. He was offered a post at another Philips subsidiary in Skelmersdale in Lancashire but he turned it down and set up instead as a Consultant Chemist.

This was in the mid-sixties when "full employment" was the mantra on the lips of every politician in the country. As far as I knew everyone who wanted a job could have one, no-one ever lost their job, and no-one was ever made redundant. In fact I doubt that I had ever heard of the word "redundancy" until it was applied to my father.

I doubt my father would ever have claimed that he made a success of working for himself. He got by. He set up a company with a partner to re-cycle television tubes and in the process very nearly incinerated himself in an acetone fire (acetone is the highly flammable solvent with the distinctive aroma which is the main constituent of nail varnish remover). He pioneered a new method of separating powders for use in chromatography by allowing them to settle in his specially de-ionised water. Eventually, after about ten years of struggle during which time I took my A levels, my degree and settled into my job at the British Museum, he took a job with GEC in Boreham Wood. And there he stayed until I asked him to come and run our cassette duplication plant at Hewson Consultants in 1984.

In retrospect I think my father's redundancy and the way it aborted an otherwise satisfactory career had a big impact on me. By the time he had taken the job at GEC, and I was working at the British Museum, I had decided that I would, if possible, construct myself an escape route. I would not, if I could help it, continue to drift into a life where someone else could take away my living. It was this impetus, in part, which led me to strike out on my own and form Hewson Consultants when the opportunity presented itself a few years later. I believed, I think rightly, that even if I failed I would learn so much that I would in due course be in a much stronger position to deal with whatever other challenges life might fling my way.

If my father's redundancy was part of my motive for setting up Hewson Consultants, then my love of Mathematics was a part of the means. Having an analytical, logical mind was an essential advantage when learning to program the first micro-computers, which were almost completely devoid of any sort of user interface. If you were good at Maths, according to the conventional wisdom at the time, then you could learn to be good at programming too.

The means and motive for a career in computing were quietly developing, but the concept of a home computer was barely on the radar and my opportunity was yet to present itself. However, it would not be long before I was able to get hands-on with the technology.

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"My first programs were all Maths related, things like printing the Fibonacci series. I later learnt Fortran and worked with a schoolmate to print out thousands of prime numbers. That excited our maths teacher. We kept optimising it so we could print more. We also worked on perhaps the world's first computer dating system (1971) with a couple more friends. We sold input forms for charity and the kids bought them to fill in for all their friends. We had good and bad options you could tick so you could fix your mate up with a skinny, spotty geek. We printed all the matches on a huge listing that was displayed by the canteen. I kept reels of paper tape and later

punch cards for ages but eventually they became obsolete and got thrown away."
Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

"Two of my major subjects at school were Computer Studies and Music Theory and Practice. From the music side of things, at around the age of eight, I was grateful to have the opportunity to take complimentary cello lessons from my school after scoring favourably in a regional music exam. My passion for computers enabled me to program my own sound routines on the C64, dipping my toes into the world of synthesizers. Near the end of my final year at school, which was during 1987, I attended an interview with Interceptor Micros after seeing their advert in the back of a magazine. I demoed a few uncompleted games and a music editor I was working on as they were in need of a composer. I returned with an offer and would join a few months later after completing my final exams."
Gari Biasillo, creator of Slayer, Steel and Future Basketball

"I first came across a computer in September 1980. My school had an Ohio Scientific in a side room from the chemistry lab. Not many people knew about the computer and I used to sit quietly in a corner and watch some of the older kids type in simple BASIC programs.

The Ohio Scientific had a "machine code monitor" mode and Mr Baron, the teacher in charge of the computer, explained that machine code was so difficult to understand, no one knew how to use it, what it did or what you could do with it. From that moment on I had a mission."
Simon Cobb, creator of Dilithium Lift

THE BRITISH MUSEUM

I completed my degree in chemical physics in the summer of 1972. I had chosen the subject partly because my grandfather was a chemist and my father was a chemist. Indeed, my sister had already completed her degree also in chemistry – that is how imbued we both were with the family tradition.

In retrospect it would have been wiser to have taken a degree in maths or computer science, both of which were close to my heart. I thoroughly enjoyed maths as a subject at school and I still look back fondly on the things that I learnt in my A-level maths course.

Nonetheless, armed with my degree in chemical physics, I set about making my way in the world. It would have been conventional to get a job but first I took time out to get married. Janet and I had met at school when we were both in the sixth form. She had joined me in Brighton while I was at university and, somewhat contrary to the received wisdom, we were wedded in the summer after I completed my degree. We settled in a flat on the outskirts of Southend and I committed myself to finding a career.

I steadfastly refused to apply for any jobs working in the private sector. I simply could not see myself disappearing into a lab at a pharmaceutical or an oil company. Instead I walked into the Employment Exchange (these days known as the Job Centre) in Southend and I got a job in a local factory which made brushes – hairbrushes, shoe brushes, all sorts of brushes. I landed a job in the warehouse, packing boxes, sealing boxes, carrying boxes to lorries and carrying boxes back again.

Fortunately for my future career, an advertisement appeared in the weekly magazine New Scientist for someone to work in the radiocarbon lab at the British Museum Research Laboratory. This job I deemed worthy of my attention and so I applied and was offered an interview. The afternoon before the appointed day, my father, taking time off from his own somewhat intermittent activities, came to visit me in my flat in Southend and together we talked through how the radiocarbon lab might operate.

The advertisement gave us some clues. It described converting the carbon in an archaeological sample to benzene and then measuring the amount of radioactive carbon present in a liquid scintillation counter. We

worked out between us that the logical way to do this would be to burn the sample and capture the carbon dioxide produced, absorb the carbon dioxide onto molten silver to produce silver carbide (and silver oxide as a by-product), add water to the silver carbide to create acetylene and then trimerise the acetylene to form benzene. That may sound complicated to the uninitiated but in fact the various processes are more or less straight out of the 'A' level chemistry syllabus that I had covered at school.

So the next day I trotted off to the interview in London. The board of interviewers did indeed ask me how I would synthesise benzene and I gave them the answer that my father and I had worked out the day before. Our chosen reaction train was broadly correct although the actual intermediary used was molten lithium instead of molten silver, no doubt on the grounds of its lower cost.

My reward for being such a clever-clogs was to repeat the reaction three times a week for the next six or seven years. It also set me on course for my first rendezvous with a computer.

I was drawn to the job at the British Museum, just as I was later drawn to the new frontiers of home computing, because my interest in science and technology was underpinned by a sense of wonder at the existence of our world and the universe that it sits within. I was intrigued by the organisation and structure implicit in all that we see around us and I was, and still am, forever wanting to understand and internalise whatever was passing before my eyes. For me, science was not a narrow inward-looking discipline defined, like every other topic, by its boundaries. For me, science was unbounded. I was more than happy to use science to explain anything, including archaeology, if someone would pay me a salary to do so.

The technique of radiocarbon dating had been conceived by an American, Willard Libby, in the 1950s working at the University of Chicago and it had won him the Nobel Prize for chemistry. His method relies on the constant stream of cosmic rays zipping in from all over the galaxy and beyond and crashing into the Earth's upper atmosphere and in particular striking the nitrogen atoms which form roughly 80% of the air that we breathe. The stream converts a very small proportion of the nitrogen atoms to radioactive carbon atoms, designated C14 or radiocarbon. The fourteen refers to the six

protons and eight neutrons, i.e. fourteen nucleons in total, which together form the nucleus. A newly formed radiocarbon atom will react rapidly with oxygen to form carbon dioxide and so the effect of the cosmic ray bombardment is to dose the carbon dioxide in the atmosphere with a tiny amount, roughly one molecule in a million million, of radioactivity.

Libby's insight was to see that if there was a constantly replenished supply of radiocarbon in the atmosphere in the form of carbon dioxide with the radiocarbon at its heart, then all plants, which of course absorb carbon dioxide from the atmosphere, and all animals, which live on plants either directly or indirectly, will also contain radiocarbon. In fact, every living thing on earth has a quantity of radiocarbon within it which reflects the quantity of radiocarbon in the atmosphere.

But only up until the moment that the living thing dies. Once death occurs no more radiocarbon is absorbed from the atmosphere and so the amount of radiocarbon within the formerly living thing starts to decline, halving every 5,500 years in line with the half-life of radiocarbon. In other words radiocarbon dating is a way of measuring how long it is since the death of any given animal or plant.

The difficulty with radiocarbon dating is that most living things decay and disappear after death except in unusual circumstances. As a result the supply and type of items left to us which can be radiocarbon dated is strictly limited.

In my time the most common samples were charcoal from the ashes of a fire and human or animal bones. We typically needed 25 grams of charcoal (roughly a rounded dessert spoonful) to give us sufficient material to generate a reasonably accurate date. On receiving a sample of charcoal I would wash it in hydrochloric acid to remove any chalk or limestone and then pass the sample through the week-long process to convert the carbon to benzene before "counting" the radioactivity for a further week in a scintillation counter.

Bones, both human and animal, were more of a problem and a bit more fun. As with charcoal, we needed to remove any contaminating carbonates by bathing the bone in hydrochloric acid, but the acid also dissolves the physical structure of bone. After a week in an acid bath, all that is left is

a shrunken, rubbery web of collagen which, when it is washed free of acid and dried ready for processing, shrinks alarmingly to a reddish-brown brittle residue. So we needed to start with a pretty large bone sample in order end up with enough material for our process. In human terms that means both bones from the lower arm or the long thigh bone from someone's leg. So yes, I admit it. Before I was a videogame pioneer I used to chop people up for a living. Fortunately, they were all many hundreds if not thousands of years old.

HEWLETT PACKARD 2100C

A year after I joined the British Museum Research Laboratory, it took delivery of a Hewlett Packard 2100c computer with 64k of 16-bit memory, two demountable and two fixed 2 megabyte disk drives, two reel-to-reel tape drives, a paper tape reader, a line printer and a teletype. The machinery was the size of a modern-day fitted kitchen and was housed in a specially air-conditioned room on the top floor of the house in Bloomsbury where we all worked. Two new members of staff were recruited to take charge of the machine and within a few weeks a cable had been run down through the building to a VDU (visual display unit) placed in the library on the ground floor and a second RS232 cable had been connected to our liquid scintillation counter which squatted in the corner of the radiocarbon laboratory down in the basement.

I was delighted, captivated even, by this new toy and quickly set about ingratiating myself with the new members of staff. I had had a certain limited contact with computers previously, both at school, where I had written in assembler code for a machine housed twenty miles away in Chelmsford, and at university where I had benefitted from a week of tuition in Fortran. But this was the first time a computer and I had ever been up close and personal.

The lab already had an Algol program to analyse the results from the liquid scintillation counter, which ran on the IBM 360 housed in a computer centre owned by the University of London about half a mile away. The liquid

scintillation counter would count each sample for a hundred minutes and then output the result to a teletype fitted with a paper tape writer. Each week during my first year at the Museum, once a batch of samples had been counted for long enough, I would edit the paper tape by hand, cutting, copying and splicing it as necessary, and then take it to the computer centre, returning an hour or two later with a printout of the results.

After the Hewlett Packard machine arrived I was given the job of converting the Algol program to run on it. I shouldered the task with a lot more energy than skill and after much time and any number of errors and mistakes, I emerged with a passably efficient and wholly accurate program. Unfortunately it was written in Fortran 4, a horrible programming language, although I was far too ignorant to understand its weaknesses at the time.

My first encounter with any kind of computer game was in the mid-1970s when a crude version of Star Trek was implemented, presumably by the manufacturers, on the HP machine. It ran on the VDU located on the ground floor of the building in the scientific library. We staff gathered in the library twice a day, ostensibly to pool work and share ideas, but in actuality to drink tea and gossip.

The game was a version of Battleships laid out, I think, in three dimensions rather than two, with the character S to represent the USS Enterprise, K to represent Klingon ships, asterisks to represent stars and so forth. In those days, by the way, the Klingons, with their distinctly unprincipled cloaking technology, were the primary adversary of the good Captain James T Kirk and his righteous band of adventurers. Players could warp across the galaxy and zap Klingon ships with phasers and photon torpedoes at the risk, of course, that on entering a new sector the Klingons might get their revenge. My colleagues and I played the game at lunchtimes and it is possible that we lingered over it rather longer than perhaps we should have.

My family background and by extension my career path had led me to a rendezvous with computers, and my passion for mathematics had helped to equip me with the ambition and ability to operate one. I had, in the early 1970s, written my first successful computer program – a relatively rare achievement at the time, and an important milestone on my journey towards

becoming a videogame pioneer. I had also experienced my first computer game in Star Trek, but a home computer was, at the time, something beyond our comprehension.

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"I first started programming on Texas Instruments calculators, the Ti57 and later the Ti58c, before moving on to Z80 assembly language on the Research Machines 380Z and Sinclair ZX81. I scrounged a Mostek Z80 instruction set manual from my then Mathematics teacher Francis Glassborow and taught myself from that (Francis later went on to found the ACCU conference which still runs to this day). The Z80 wasn't too much of a jump after the calculators, the programming facilities on which were not that different to assembly languages, albeit with floating point rather than integers."
Dominic Robinson, Spectrum programmer for Uridium and co-creator of Zynaps

"I joined a computer club at my school when I was about 14. This was in 1968 when home computers only existed in science fiction. We were taught Algol 60 and wrote small programs that we had to type onto punched tape. This got fed into a big box about the size of a desk. I remember a row of flashing lights and switches where you could override the tape and key in individual instructions in binary. The source tapes had to be "translated" into machine code before the computer could run them. To do that a translator program had to be fed in from a huge reel of paper tape that filled a big bin after it was read. The computer printed the machine code onto paper tapes that could be fed back into the computer after a runtime program had been loaded from another huge paper tape. Our results were printed on an output paper tape and we fed them into a teletypewriter to get printed results. It all seems so long winded now but it was sheer magic at the time. The computer club also built its own "computer" which

could add up two binary numbers input on switches. The answer was shown on a series of lights."
Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

"I had a Sinclair programmable calculator first of all in the mid-70s. It had 32 programmable steps but because the floating point calculator wasn't very accurate, you ended up using the programming steps to improve the calculator accuracy. It was pretty neat though.

At secondary school we had a computer class where we used a terminal in the classroom and we would have an afternoon each week at the local technical college on their mainframe which was a PDP8E. The school terminal used an acoustic coupler (a giant plastic mount to cradle the telephone handset) and connected to the college mainframe at 300 baud. In today's money that would only transfer 3.2MB of data in one day. I programmed the mainframe in BASIC and after reading the manual on the PDP8E I was able to covertly write and execute machine code and run programs way more advanced than the rest of the class. It was clear this was my forte."
Steve Marsden, co-creator of Technician Ted and co-founder of Spidersoft

"The amazing thing about the computer was that if you learned how to program it, you had control of what was displayed on the screen. It may sound cheesy but to see your own name on the screen was incredible at the time."
Simon Cobb, creator of Dilithium Lift

THE COMMODORE PET

Out in the wider world, the 1970s was a miserable decade. Politically and socially the country was divided against itself right from the beginning. I have a clear memory of sitting shivering in the dark in my second year at

university in the winter of 1970/71 because some group or other was on strike and the power was cut. In 1973 Ted Heath, the then Prime Minister, called an election under the slogan, "Who runs the country?" a question which at least one of my new colleagues at the British Museum found laughable, his retort being, "The miners, of course." I remember thinking that could not be a good thing, whatever the political rights and wrongs. Ted Heath was voted out.

And the problems were not confined to the UK. In 1973 and again in 1979 the OPEC group of oil-producing countries used their monopoly power to force up the price of oil causing major economic disruption. Motorists queued at petrol stations and we were all issued with motor fuel ration books. The economy went into recession and the ensuing unemployment added to the social tensions. There was a widespread sense that since the Vietnam War in the late 1960s the world in general, and the UK in particular, had lost its way.

In 1979 Margaret Thatcher, having been leader of her party since 1976, came to power quoting St Francis of Assisi: "Where there is discord, may we bring harmony." I have to say she pretty much failed in that regard, her eleven year rule being pockmarked with war in the Falklands, war with the miners and towards the end, war with the poll tax protesters. After an initial period when she was patronised and manipulated by her own party, by mid-1982, following an extraordinary success in the South Atlantic, her popularity soared and she became the polarising figure that we remember to this day. By the end of the decade the various battles had been won and lost and the country settled down. It was as if at long last, after two grim and overcast decades, the clouds had cleared and the sun had come out.

Back in the late 1970s, while I was still working at the British Museum, I came across computer games in shops for the first time. Tottenham Court Road is a short walk from the Museum and in those days it was a happy hunting ground for electronics goods – hi-fis, TVs, radios and the like. Calculators had arrived in the early 70s and believe it or not there were shops in Tottenham Court Road dedicated solely to selling calculators where customers could pick and choose between them. They were the mobile phone shops of the day. "This calculator's got an extra memory location.

That one can calculate percentages. There's one over there that has extra decimal places in the display." All very tame in retrospect.

The first time I eyeballed a Commodore Pet was in one of those shops. My colleagues and I gazed at it unsure whether to laud or laugh at it. After several years of effort the Hewlett Packard machine back at the Research Laboratory was beginning to deliver serious results but it was the size of half a dozen filing cabinets. More recently, one of the labs on the first floor of the building had acquired a PDP11 which was "only" the size of a largish fridge. We believed we were at the leading edge. And yet here was a computer, a screen, a cassette player and a keyboard all housed in a single case about the size of a cash register and available to be purchased by any admittedly well-heeled Tom, Dick or Harry who walked in off the street. We vacillated between astonishment and arrogance.

There were a few games available on cassette and I remember noticing even then that the packaging was very crude with simple black and white lettering on coloured card. It was not very impressive but demonstrated very clearly to me that if you created something new, really new, something that nobody had ever seen before, then it would sell, with or without fancy packaging. My interest was piqued.

Back at work, my dream job at the British Museum had not really lived up to my expectations. I thought the Research Laboratory would be working at the cutting edge and in a way we were but only, in my case, in the service of archaeology. And archaeology may be interesting in a wet-Sunday-afternoon-documentary-on-television sort of way but nobody in their right mind would regard it as being as compelling as proper science.

One or two of our fellow radiocarbon labs around the world were beginning to turn their attention to using C14 to measure and monitor the change in the carbon dioxide levels in the atmosphere. There was a growing realisation that the C14 record in tree rings showed that the burning of fossil fuels had been pushing up atmospheric carbon dioxide levels since the industrial revolution. "So what?" you might say, as I did when I first learned about it. And then, I remember very clearly, my then boss explaining the potential implications for global warming. This would have been in 1976 or 1977, fully ten years before the media alerted the general public to the issue

and the Intergovernmental Panel on Climate Change was formed under the auspices of the United Nations.

We could have switched our attention to the new topic but a Museum is focussed on the past, not the future. I was frustrated, more than a little bored and not sufficiently well paid to passively accept my fate.

My response was to go back to my first love; mathematics. Working in the evenings and at weekends and with some support from the Museum, I took a Master's Degree in Probability and Statistics and a year or two later, in 1979, I took a new job working on flood statistics at the Institute of Hydrology in Oxfordshire.

When moving day came, I locked the door of our terraced house on the outskirts of Harpenden for the last time, and joined my wife and two year old daughter in our Vauxhall Viva, to chug our way fifty odd miles south-westwards and start the next phase of our lives.

We soon settled into our new home in an Oxfordshire village and I joined a four-man car pool for the 20 minute drive every weekday to the Institute of Hydrology perched on the banks of the Thames just outside the market town of Wallingford. After the tedium and frustration of the commute to and from London I was delighted to gaze out of the car window morning and evening at the green and pleasant countryside slipping by.

When I joined the Flood Studies team I was assigned to study the data on high water flows where the flood waters of the bigger rivers in the UK, such as the Trent and the Yorkshire Ouse, meet the incoming tide. In truth I never made much headway on the project partly because I could not for the life of me understand why anyone would be interested in such a statistical model. Fortunately the Institute won some EU funding to study flooding in Europe and I was assigned Germany and Switzerland. I had a great time visiting various regional organisations in the two countries while collecting statistical records.

Back at the Institute I also started, at my own initiative, a study of the time of occurrence of flood events in the UK using the same statistical methods that I had learnt and developed in my study of the Ashanti Gold-weights back at the Museum. There is an annual rhythm to flood records just as there was a sequential rhythm to the Goldweight data and so anal-

ogous analytical techniques could be used. After some floundering about I was beginning to make some headway in the visual presentation of the data and I had identified a wonderful and interesting east-west effect as well as a spectacular peculiarity in the region of the Spey River in northern Scotland, fifty miles west of my mother's old stamping ground in Lonmay. I was starting to think that instead of working on the radiocarbon dating of climate change, a PhD beckoned, followed by an obscure career as a flood statistics specialist.

Then the world of computer gaming intervened.

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"The first game I ever played was Moon Lander on a teletype! After that, it was the early arcade machines – Space Invaders, Pacman and so on. I got drawn in by a certain Mr Anthony Crowther, who was the year above me at school, and who needed some notes writing out."
Ben Daglish, composer on Firelord

"It was a combination of videogames and Commodore Pet computers at school that drew me into programming. I'd spend every lunchtime playing games like Galaxian and Defender, and I knew that I wanted to create games like that too."
Raffaele Cecco, creator of Exolon, Cybernoid and Stormlord

1980–1983
THE BIRTH OF
A PUBLISHER

Although I was not aware of it at the time, the means and motive for a career as a videogame pioneer were now instilled within me. However, they would have remained dormant had it not been for the opportunity that Sir Clive Sinclair provided to us all.

HINTS & TIPS
FOR THE ZX80

In 1980, about a year after I joined the Institute of Hydrology, Clive Sinclair started advertising the ZX80, a Z80 based home computer with an 8K ROM (read only memory), 1K of RAM (random access memory) and a built-in keyboard. The price was about £100 plus perhaps the same again for a cheap black and white television to act as a VDU (visual display unit) and a cassette recorder as offline storage.

I knew the specification was pretty ropey but I was not deterred. A couple of months' previously I had been on a visit with my new boss at the

Institute to the North West Water Authority in Warrington. On the way home we had stopped for the night in Stratford upon Avon and with it being a warm evening, my boss suggested we wander around the town. We ended up in front of a television shop featuring a window display of the Teletext system through which data about holidays, TV schedules, news and sports was available in the home, in real-time, on purpose-built televisions.

I was happy to rubbish the new system because I knew that only a limited amount of data could be sent on the analogue TV carrier wave during the frame-fly-back time. For this reason, only text and the odd special character could be encoded in a limited range of primary colours on a simple 40 x 24 grid. I thought the system was very limited and I said so. But my boss took the opposite view. For him it was new and exciting and he wanted, he really, really wanted, a teletext-equipped TV.

As a result, when the ZX80 was later announced, I knew it would sell like hot cakes to people like my boss who would want it just for the fun, just for the excitement, of having a new electronic toy. It was obvious to me that many, many people like my boss would leap at the chance of having a computer of their own, irrespective of the capabilities of the machine itself.

I talked the matter over with my wife and I made a commitment to her and to myself that if I were to buy a ZX80 I would aim to make money from the machine. I went to the bank manager and, having explained my project to him, borrowed £500 on an overdraft. He was an old chap and I think he was really rather bemused by the whole business. However, he was happy enough to lend me the money.

I then set about getting myself kitted out. I ordered a ZX80 by mail-order and while I waited for it to arrive I went out and bought a small black-and-white television and a small portable cassette recorder. I visited an auction and bought a beaten up old desk. I found a typewriter in a junk shop and I bought that too.

My ZX80 arrived within a week or so and I commandeered our spare bedroom and set up the equipment. The machine came with a handbook which explained the BASIC language encoded in the 8K ROM, along with a rudimentary explanation of the so-called system variables which controlled the machine's operation. I wrote a program in BASIC to play Hangman

and another one to simulate a crude Lunar Lander. I wrote several more short programs, all the time taking notes of what I was doing and how the machine was working. I gradually gained confidence and began to work out some little tricks with the system variables for myself.

Means, motive and opportunity. All had finally fallen into place and with the ZX80 in front of me I set about recouping my £500 investment. However, despite having written a few simple games of my own, I did not intend to publish computer games, at least not initially.

My plan was to write a book. I was determined to make some money for me and for my young family and when my ZX80 arrived I soon realised that the manual supplied with the machine was little more than a primer in the built-in BASIC programming language. I had some knowledge of computing in general to supplement the insight I could gain from PEEKing and POKEing my ZX80. I also had a desire, conceived a few years previously, to prove to myself that I could write.

Much to my surprise, I had discovered when working at the Museum that despite a university education, I was incapable of putting pen to paper and delivering a manuscript in a timely manner. The sentences I put on paper were incomplete, incoherent and ungrammatical. The paragraphs I assembled waffled and wobbled. It had taken me a year of struggle to write my first academic paper. I knew that if I was ever to make a contribution as a scientist I would need to become much more proficient at presenting and broadcasting my results.

Now, with the ZX80 as my subject, I set about proving to myself that I could overcome my writing difficulties. I deliberately set my sights low, aiming only to record some useful information about the computer before me. I edited my notes into some kind of order and then asked my wife, Janet, who was now pregnant with our second child, to type them up as a book. I added my BASIC programs as an appendix and voila, I had my first publication which I entitled, with reasonable accuracy I believe, "Hints & Tips for the ZX80".

Did I think there was a market? Yes, I did. Computers were new and exciting. They were to the early 1980s what the Internet was to the late 1990s. I was interested in how they worked and new magazines like

Personal Computer World appeared on the shop shelves attesting to a wider interest from the rest of the population. The social impact of the arrival of home computers was at least as intense as the impact of the Internet half a generation later. For roughly the price of a colour television anyone and everyone could join in the fun.

I never attempted to seek out a publisher for the book because the idea of placing a person or organisation between me and what I wanted to do, was too awful to contemplate. Only my wife knew anything about what I was up to. I found myself a printer in Wallingford who had a new-fangled photocopying machine. The photocopies would be expensive individually but could be produced to order allowing me to avoid the upfront cost and risk of committing to a conventional offset litho print run. I put small advertisements in Personal Computer World and Practical Computing and sat back to await the results. I did not expect to make a lot of money but I was certainly expecting to make some kind of profit.

Amazingly, my plan worked. Letters started arriving from far and near with cheques and postal orders tucked inside. Every morning I would come downstairs and find two or three missives waiting for me on the mat by the front door. I was delighted.

My first book had been a relative success, so when the ZX81 arrived in March 1981 the next step was obvious – I was going to write another book. I now had enough money to buy a decent electric typewriter and soon enough "Hints & Tips for the ZX81" rolled off my printer's photocopying machine. He must have been making money as well because he bought himself a much bigger photocopier and installed it proudly in his shop window.

The main improvement in the ZX81 compared with the ZX80, once you discount the superficial change from a white and blue case to a black one, was the persistence of the screen display. In the ZX80 the processor swapped between writing to the screen and running calculations, so as soon as the user gave the computer a job to do the screen went blank. For example, when a calculation was started, such as asking the machine to calculate 2 + 2, the ZX80 responded as if to say "right, just a second" because the screen went blank. It was as if the machine was closing its eyes to think. After a delay the screen would flick back on with the answer.

With the ZX81 the screen display remained visible the whole time. That apart, the two machines were fairly similar, although the ZX81 added floating point arithmetic and carried a larger range of arithmetic, logical and display instructions.

Hints & Tips for the ZX81 was produced in the same crude way as its predecessor – photocopied and stapled together by hand. The first book sold exclusively by mail order but during the lifetime of the second book we acquired a few retail outlets. I am not aware of any surviving copies of the ZX80 book although I dutifully sent copies to the British Library for their national archive. I have a copy of *Hints & Tips for the ZX81*, which is in fairly good condition apart from a torn corner on the front cover, and I know that the National Computing Museum has another, because they asked me to sign it after my talk at Revival 2014 in Wolverhampton. The original book about the ZX80, however, is missing in action, so if you happen to have a copy gathering dust in the loft, do let me know!

Sitting here looking through my second book, flicking through pages of code snippets and careful explanation, I can't help but feel a little bit disconnected from my past self. I know I wrote all the code and I also understood what it meant. I've done enough coding in the subsequent decades to understand all of the core concepts and naturally plenty of the detail comes back to me on close inspection, but these days it would take me a bit of time and effort to reacquaint myself with it all.

I can, however, admire some of the prose, without any sense or recollection that it was me who actually wrote it, such as this rather charming snippet from the book's preface:

"Sadly, the modus operandi of a computer is as unreal to the uninitiated as are the shadows in a darkened room. If this book can help to kindle the torch of understanding in the minds of its readers it will have served its purpose. If it can lead the reader towards better, more enjoyable, more entertaining use of his ZX81 then its author will be a happy man."

I find the first sentence rather illuminating. Today the modus operandi of a computer, down at the system level, remains just as unreal to the uninitiated as it was in June 1981 when I wrote those words. The fact that almost anybody can now operate a computer is testament to the sophistication

of the software which a generation of engineers have built up, layer upon layer, taking the user experience further and further away from the fundamentals of the computer's operation. In 1981, to make a computer do anything, it was necessary to be a bit of a nerd. Nowadays there is no such requirement.

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"I had just managed to figure out what machine code / assembly language was. That was primarily down to the ZX81 manual which had a list of bytes 0-255 in the appendix alongside each character it represented and what the Z80 assembly language instruction was for that byte. I remember suddenly making the connection between bytes and machine code. So I initially started programming machine code on a ZX81."
Nick Jones, C64 programmer for Exolon, Cybernoid and Stormlord

"If you count type-in-listings, my first game was published in Computer Gamer and was a mix of BASIC and assembly language. It was also terrible, but it was the first time that my name was up in lights, and at the age of 14 it was a great feeling and I was the envy of my friends in the school computer club."
Gari Biasillo, creator of Slayer, Steel and Future Basketball

"My first game was written on the ZX80. It was a grid-based submarine game. You were hunted by destroyers and had to decide which way to go and whether to surface to fire torpedoes.

It was written in BASIC and I ran out of memory before I had finished. I was forever trying to shorten the program. It was a real pain having line numbers because sometimes loads had to change. Also it makes no sense with things like GOSUB 65 rather than being able to write a meaningful name.

The ZX80 had the problem that it used the CPU as a graphics chip so it couldn't display anything and do any computing at the same time. If you were careful you could try to execute your

code in between the frames of display. I managed to get a single asteroid travelling across the screen but gave up when the ZX81 was launched. The ZX81 could do graphics and execute code at the same time making the ZX80 games worthless."

Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

THE HEWSON HELPLINE

At the beginning of 1981 there were no home computer retail outlets to speak of in the UK and the entire market operated by mail order. That changed later in the year when the first ZX Microfair was held at the Central Hall, Westminster following an advertising campaign in Personal Computer World and Practical Computing. The event was organised like a car boot sale. Exhibitors paid to take a six foot table and laid out their wares for the public to peruse.

Except the public did not peruse, they besieged. The event was rammed. People arrived with their hard earned cash in their pockets and with big grins on their faces and left with books, tapes, bits of hardware and even bigger grins. ZX Microfairs became recurring events over the next couple of years. Before and after the feeding frenzy, we would wander around the other stands, meeting fellow entrepreneurs and admiring the ingenuity that was on display. It was at a ZX Microfair that I met Roger Kean, the man behind CRASH magazine. It was at a ZX Microfair that I first saw 3D Monster Maze – a fabulously brilliant game for the ZX81. And it was at a ZX Microfair the following year that we watched in shock as British Armed Forces fought Argentinians for control of a rocky windswept archipelago six thousand miles away.

The arrival of the ZX81 also put a significant gust of wind in my sails. More and more people were taking an interest in the home computing market and since I had been advertising my books in the relevant magazines some of those people started to get in contact with me.

An electronics company, for example, asked me to retail their add-on memory. They wanted to focus on manufacturing rather than selling and

saw us as a potential customer for multiple units. So alongside the books we started selling their plug-in memory for the ZX81 to go with a few simple games I had written and some other quirky bits of software.

By the end of 1981 things were really motoring. I was still operating out of our small spare bedroom at home and working full-time in the flood statistics team. However, early the following year an opportunity arose which primed the fuse for Hewson Consultants Ltd to be launched towards its destiny as a games publisher proper.

The fuse was lit in April 1982 when I received a phone call out of the blue from London.

"We're setting up a magazine called Sinclair User. Would you like to write a column for us?" said the man on the other end of the line.

"Yeah, sure... sorry who are you?" was my reply.

"It's not really important who we are, we're just setting up the magazine, but it's going to be published by a company called EMAP," he said.

I was rather perplexed: "You mean you're creating a magazine and not bothering to publish it?"

"No we're selling it on, that's how it works".

"Right, okay, but you want me to write a column?"

"Yes, we'd like you to write a Helpline column for the magazine because you've written these books about the ZX80 and the ZX81."

Naturally I said yes. It was obviously a good opportunity to generate some additional publicity, although I had no idea at the time just how pivotal it would turn out to be.

The next thing I knew a photographer was being sent all the way from Croydon to our little house in Oxfordshire to take a photograph of me. I was more than a little impressed, and perhaps that is why the photograph made me look rather startled, standing in front of our brick fireplace. This was my first taste of the media, such as it was, so I dare say I felt a bit sheepish.

And that is how a huge, gormless photograph of yours truly appeared smack in the middle of the first "Hewson Helpline" column in issue one of Sinclair User. In it I answered a few readers' questions about the ZX81 and before I knew it I was receiving twenty or thirty letters a month from people asking about the system variables or how to move memory around.

I wrote my column for around a decade, month after month, right up until the magazine closed. Looking back it is extraordinary to think that it all came about from a couple of books which were photocopied and stapled together by hand.

The fact that they called the column "Hewson Helpline" was fortuitous. The name Hewson Consultants had its origins in some consultancy work I had done very early on when I earned a little bit of cash doing statistical analysis for people. The bank account was therefore under the name Hewson Consultants, so the books were badged in the same way and we continued to use the name in the magazine adverts. Hewson is not a particularly common surname, so it was easy for people to make the connection between the magazine column and the advertisements.

Serendipity is a powerful thing. After I started writing the column my name became known and people began to send me the games they had developed themselves. Without the Hewson Helpline column this might never have happened, certainly not in sufficient quantity for us to be selective about what we published. Up until this point I did not consider us to be a games publisher. But things were about to change.

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"My first real memory is the surprise I felt that anyone would actually buy something that I had produced. My other strong memory of that early period is of the way these programs were sold which was at various computer 'exhibitions' (I use the word loosely) where the vendors would turn up with some form of collapsible table and a whole bunch of boxes, and would bang programs out at the princely sum of £5.95 or thereabouts, or selling the programs via really primitive but interesting PC game magazines."
Mike Male, creator of Pilot, Nightflite, Southern Belle and Evening Star

"The first game I wrote was Mastermind (a version of the board game) on the Ti57. It would set the puzzles and score attempts to guess the solution. This had to be typed in each time as the Ti57

had no persistent memory. The first recognisable videogame I remember writing was a version of Scramble for the ZX81. Tapes of this were circulated amongst friends but nothing was ever done with it commercially."

Dominic Robinson, Spectrum programmer for Uridium and co-creator of Zynaps

CASSETTES ON THE DOORMAT

1982 was a transformative year for Hewson Consultants Ltd. The debut of the Hewson's Helpline column in Sinclair User magazine had swept me to the crest of a wave. From that position there were only two choices; retreat back into calmer waters or plunge forward in pursuit of the compelling opportunities which lay ahead. In truth I never considered retreat.

When we think about success it is tempting to imagine it as a breakthrough which flows swiftly and easily to a happy resolution, but in my experience that is not the reality. Success, if it arrives at all, only arrives following commitment and hard work and when it arrives it demands further commitment and further hard work. In some ways a lack of success is easier, provided only that you can bear the thought of giving up.

During 1982 my workload increased and it came to the point where I was regularly working for Hewson Consultants until 4am before heading to bed and then waking a few hours later to travel to my day job. I continued to use our spare bedroom as a home office, even after we started renting an office in Wallingford and so I found it very hard to take my mind off all that had to be done. I would come home from my day job, grab a bite to eat and then head upstairs to start my evening shift. If I left the room to do anything else I had to be careful to close the door behind me otherwise a casual glance backwards would remind me of the work that was waiting and as often as not I would end up back in the room putting in another stint.

However, as demanding as it was, there is no denying that it was also an exciting year. Following the arrival of the Hewson's Helpline column,

programmers from across the country started to send me their creations. It started with a trickle and developed into a flood of cassettes landing on my doormat. At its peak we must have been receiving five or ten per day.

It is worth noting that at this point in 1982 the idea of a games publisher was a new concept, although it was a well-known model in other industries like books or music. It was never my particular intention to become a games publisher. My plan was to write a few books and make myself some money.

Since I had dabbled extensively with the ZX80 and ZX81 while researching my books, and had written code at work mainly in Fortran, I was very conscious of how much time and commitment was required to produce an operational computer program. It seemed obvious to me that creating an even half decent computer game would be no easy task. But plenty of people were prepared to have a go and having created something that they were pleased with, the next step was to send it to someone for a second opinion.

In the early days the quality of the offerings was pretty low and the only game of any significance that I can remember receiving for the ZX81 was Pilot by Mike Male. We found a music cassette duplicator in London, sent them a master copy, and took delivery in return of boxes packed with 500 copies of the game.

Pilot was a success but it was not until the launch of the ZX Spectrum that our destiny as a games publisher began to come into focus.

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"In those days they would teach you to fly while training to become an Air Traffic Controller and I was still flying when this all started (a lot of Air Traffic Controllers give up flying when they have to pay for it themselves!).

I had created some simple calculation related programs for various purposes while I was learning BASIC and I just decided to try something a bit more interesting. I was then, and still am now, a pilot that only flies in good weather and looks out of the window of the aircraft, but I had a limited experience of using aircraft navigation instruments which are used when the

weather is poor. So I decided that would be the first subject for anything a little more complex. That was Pilot.

I then decided to try to sell the programs I had written and I looked around for how to do it. I had taught myself BASIC, but in those days if you wanted to do anything fast or efficiently it needed to be machine code (or assembler language, whichever way you want to describe it). My entry into Z80 assembler was from a slim book produced by Andrew Hewson called Hints & Tips for the ZX80. So, as he was the only 'expert' that I had any knowledge of I gave him a call, met with him, showed him Pilot and away we went."

Mike Male, creator of Pilot, Nightflite, Southern Belle and Evening Star

THE IMPACT OF
THE ZX SPECTRUM

The ZX Spectrum was not the first games machine in the UK, but when it launched in 1982 it was a major turning point for the UK home computer market and was instrumental in bringing gaming into the mainstream. Before it arrived we were an embryonic industry serving a growing niche of enthusiasts. Machines like the ZX80 and the ZX81 had taken us to that point, but their wider success was still tempered by their clunky design and rudimentary performance. When the ZX Spectrum came along we reached a tipping point.

Typing on the ZX80 and the ZX81 was hard work because there was virtually no up and down motion in the keys. The spongy keys of the ZX Spectrum were a significant improvement, although nobody thought they were ideal. The machine also sported a diagonal rainbow stripe across the bottom right corner of the keyboard announcing that this was a machine with a colour display.

The first time I saw a Spectrum was at one of the ZX Microfairs in London. I remember pushing those spongy keys and thinking they were not great but that they were better than those of the ZX81. There is no way

they would be acceptable these days, but in a market thirsty for cheap home computers it soon turned out that they were good enough.

It was clear that the Spectrum was an evolution of the ZX81 across the entire system. Same Z80 chip, same memory layout, same built-in BASIC programming language, extended yet again with additional instructions, soft-wired into the keyboard. Now we had 16K or even 48K of RAM instead of 1K, colour instead of monochrome graphics and crucially we still had a low price point. It all came together beautifully to create a machine that was more than the sum of its parts and lifted everything to a level where it caught the attention not just of the enthusiasts, but also of the man in the street.

I think it is fair to say that without Clive Sinclair's determination to create a "good enough" machine at a bargain price, there would have been no UK games industry. Sinclair had the first mover advantage. Other home grown machines appeared – the Dragon, the Jupiter Ace, the Orion and others that I can barely remember – but Clive Sinclair already had a user-base and the support of activists like me who were trying to build businesses on the back of his machines. Sinclair's true rivals in the market came from the US in the form of the Commodore 64 and the Atari console.

After the ZX Spectrum arrived the market suddenly opened up. When retailers like WH Smith got behind the machine, stocking the Spectrum, the games and programming guide books like mine, the whole industry acquired momentum. The market was expanding, the games were selling in greater numbers than ever before and most importantly they were becoming more and more sophisticated.

During 1982 the papers were full of hype about bedroom coders making a fortune, with stories stoked by the PR from Imagine, based in Liverpool. Meanwhile at Hewson Consultants we were inundated with cassettes. Not surprisingly, most of the games we received were not very good.

I was very busy. Very, very busy. I had recruited my brother, Gordon, to help and we had another part-time employee, but I was still working full time at the Institute of Hydrology. I was working on a new book – *20 Best Programmes for the ZX Spectrum* – and so we were very selective about the games we wanted to pursue, partly through lack of time.

We took Pilot for the ZX81 and later Nightflite for the ZX Spectrum, both flight simulators from Mike Male which were hugely popular. We published a Space Invaders clone which we called Specvaders and another arcade clone called Spectral Panic. We had our Pac-Man clones Maze Chase and Puckman. We were not very creative when it came to naming our games and our material was not wholly original, at least not at first. We also had one or two eccentric titles like Backgammon and Countries of the World. The latter title was our one and only attempt at an educational product. It did not sell well.

Not that it mattered. At this time "not selling well" meant selling only hundreds instead of thousands of units. In 1982 the market was exploding. At the beginning of the year we were selling to half a dozen specialist shops, at the ZX Microfairs, and by mail order. By the end of the year we were shipping serious volumes into WH Smith and into new distributors that had sprung up, seemingly from nowhere, that in turn were selling to tens, even hundreds, of new outlets up and down the country.

The ZX Spectrum was not the first games machine in the UK, but it was a technological leap forward which undoubtedly led to a surge in creativity. Using the flood of cassettes which we were receiving we positioned ourselves to benefit from this surge. We supported the creators of our games and encouraged them to explore the new medium. We became the conduit for their work, but it was the ZX Spectrum itself which provided the environment in which they could express themselves.

I finished my new book and we found a printer in Northampton who typeset it properly and supplied it printed and bound in boxes of 50. We were sufficiently confident to order an initial print run of 10,000 and, I am delighted to say, WH Smith stocked it in sufficient quantities to guarantee that initial print run and many more which followed.

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"As a mail order operation before the launch of CRASH we
had included Hewson Consultants' products in our catalogue.
Those early games generally received praise from the local
players. But the first contact came at Alexandra Palace.

I distinctly remember meeting Andrew Hewson at those Spectrum sales fairs, at a trestle table with Blue Peter-style cardboard adornments.

I note we weren't particularly kind to Maze Chase in the software round-up that featured in CRASH #1, though the wording went: '...considering the quality of Hewson's programs...', but we were much nicer about Backgammon. Hewson failed to advertise in that first issue (which was supposed to be the law!) but made up for it with two colour pages in the second issue."

Roger Kean, co-founder of Newsfield, publishers of CRASH and ZZAP! 64

MIKE MALE

Mike Male, the author of Nightflite for the ZX Spectrum (an upgrade of his Pilot title for the ZX81), was an Air Traffic Controller at Heathrow Airport. It is not an easy job, guiding aircraft through the crowded airspace of southern England, and the consequences of making a mistake are unthinkable. For this reason ATCs work short shifts and have rather more spare time than most people. Mike, being interested in flying and all things associated with flying, had chosen to use to his spare time to create a flight simulator. And being a well-educated and serious-minded individual like most ATCs, his flight simulator was very good.

Nightflite, like Pilot before it, avoided the problems of producing a 3D simulation of the ground below a flying aircraft by simply setting the simulator in the night sky so that the pilot had to fly on instruments alone. The only view ahead was of the landing lights of the airstrip from which you took off and on to which you later landed. I love it when programmers come up with a dodge like that which makes their life easier but which doesn't really detract from the game. By concentrating on the instrumentation and making that work realistically, and by adding a simple sound effect, a sort of buzz-buzz-buzz-buzz, to simulate the aircraft engine, Mike created a realistic, effective and entertaining simulator.

Nightflite sold well for us and for Mike, although it was eventually overtaken by other simulators which came on to the market. We never went further with it because Mike adjusted course and produced Heathrow Air Traffic Control, a simulation of his job at the airport guiding aircraft safely in to land, in sequence, from their holding patterns over Biggin Hill and three other stacking points to the north-east, north-west and south-west of the airport.

One of the features of Mike's games, which made him particularly successful and wonderful to work with, was that he was meticulous in everything that he did. When we received a product from Mike it was ready to go on the market. It was tested. The instructions were written. It was tested some more. Working with Mike made me realise that Air Traffic Controllers are trained and trained and trained again to be absolutely precise in everything that they do.

Heathrow Air Traffic Control was not a huge hit, but sales were acceptable and best of all it sold consistently and repeatedly. I came to realise in later years how important those repeat sales are to any business.

In due course, Mike ported Heathrow Air Traffic Control onto other platforms. We had a BBC Micro version, and I have to say it is the sort of product that would appeal to BBC Micro owners, and we also published it on the C64. Mike also created and we sold a version based on Schiphol Airport in Holland. It is not as compelling as the original because the skies over Holland are not as crowded as they are over the south east of England but it gave us both an excuse to fly there and photograph him at the Dutch airport.

Mike was working full time during this period and he was earning handsomely from our royalties as well, so he bought himself a light aircraft with the profits. He offered me a flight in it and I accepted readily. I also saw it as a publicity opportunity and we organised a photo of the two of us in front of his plane with me handing him a platinum cassette, as I remember, to record that we had shipped over 100,000 units of his products. I remember journalists were a bit cynical about this award from us to ourselves. But I think why not? We were both delighted with how well things had gone.

The next idea from Mike came from a fellow air traffic controller who was a railway enthusiast in his spare time. Between them they wanted to create a steam engine simulator. I was more than happy to put that kind of product on the market, if only because it was different, and so Southern Belle was born. It was a simulation of driving a steam locomotive from London Victoria to Brighton, a journey of about an hour which I knew well enough from my time as a student at Sussex University.

As it happens we were based just a few miles from Didcot, a junction on the London to Bristol main line where it connects to the line for Oxford, Banbury and Birmingham. Didcot is maybe an hour from London, where many journalists are based, and so we organised a day out for the press at the Didcot Railway Centre complete with tickets for a train from Paddington. We arranged lunch in two Pullman coaches and everybody had a ride on the footplate of a steam engine chugging up and down the railway at the centre. As you can imagine the day was a huge success. Or perhaps, more honestly, I thoroughly enjoyed it and I hope everybody else did too.

Southern Belle was reasonably successful for us and so Mike and his friend followed it up with a second simulator. They called it Evening Star, after the last steam engine built by British Rail, and based it on the Somerset and Dorset line running from Bath to Bournemouth.

PIONEER'S PERSPECTIVE: MIKE MALE

We had computer driven simulators at Heathrow but they were big expensive beasts. With the advent of the Spectrum you now had a computer with a decent screen in terms of colour and resolution and it became possible to try it on a home computer. I knew the subject and although it was never going to be a top seller, I thought it would be a subject of interest to the computer owning public at the time. I had by then gone completely over to using assembler language and Heathrow Air Traffic Control was only possible because of the improved speed of that over BASIC.

By that time I was quite successful and was really enjoying it (as well as making good money from a hobby!), so I was looking around for another

subject of a similar vein. One of my very good friends in AirTraffic (who is still one of my very good friends) was really into trains and was (still is) nuts about steam engines. I chatted with him a bit and did some research and realised we could produce a simulation that would be of interest to the enthusiast and would also be very challenging. So, once again it was a simulation of something real with a challenge.

I was truly addicted and used to spend many evenings working into the small hours just beavering away. I have always found writing computer programs very creative and satisfying and even now, in the rare occasions I look at source code, I love it.

Everything else was great for me, but I know it was a lot tougher at Hewson at times. Remember this was my second income so it was all bonus.

CASSETTE DUPLICATION

Nightflite had forced us to take cassette duplication seriously. We had a product that was in demand. At first we had the game duplicated in West London but we soon found it was more convenient to switch to a more local source in Witney, about 45 minutes' drive from our office.

Cassette duplication is interesting in its own right. The Philips cassette, as it is sometimes called, was invented by the Dutch electronics giant Philips in the 1960s. The Philips team took the concept of a standard reel to reel tape recorder, reduced the size of the tape by slicing it lengthways to make it much narrower and packaged the two reels inside a single plastic envelope. In so doing they created a new means of selling pre-recorded music to the public.

A cassette about the size of a policeman's notebook could record forty minutes or so of music which is about the same as a twelve inch diameter long playing record (or LP). The quality of reproduction was not as good (the sound was a bit "hissy") but for many people the convenience of a pocket-sized package outweighed the reduction in quality.

The obvious way to duplicate a cassette is to play a master copy on one cassette player and to record from it onto a blank tape turning on a second cassette player. The analogue quality of the result is mixed at best but that does not matter so much for a digital copy. I experimented a few times with this method in the early days but I soon realised that it was too slow and cumbersome to be acceptable.

By the time we became seriously involved in the market the accepted means of duplication was to take a huge reel of cassette tape, perhaps 30cm in diameter and record onto it repeatedly, fitting as many as 500 copies of the original master of a Spectrum game onto a single reel. The gap between each copy was marked by a magnetic signal. When the copying phase was finished the reel was transferred by hand to a dedicated cassette winding machine. The cassette winder span the reel to identify the magnetic signal, cut the tape, spliced it to the lead-in tape of an empty cassette shell and then wound in the tape at high speed until the next magnetic signal was identified, at which point the reel was cut again and the trailing end spliced onto the lead-out tape of the newly completed cassette. The cassette was spat out into a bin with its place being taken by another empty shell and the whole process repeated until either the reel was completed, the shells ran out or the machine failed for some other reason. The machines were wonderfully Heath Robinson to look at and hypnotic to watch in action. They were also more than a little noisy.

I got to know the production engineer at the tape duplicators in Witney very well. He could see that computer gaming would lead to an explosion in demand for cassette duplication and he decided to use the opportunity as a springboard for his own career. Before long he had found a business partner and set up his own operation further west along the A40 in Northleach, Gloucestershire, taking new customers such as ourselves with him.

I would jump in the car, drive to Northleach, collect maybe 2000 tapes, heave them into the boot of the car and drive back to our office in Wallingford. The tapes were packaged with our artwork, or inlay as it was called, in cassette boxes and the instructions for the game were printed on the back of the inlay. This system worked fine for an arcade game like Maze Chase but when the instructions ran to 12,000 words, as they did for Heathrow

Air Traffic Control, we ran into serious difficulties. Our solution was to use the smallest font we could find and print inlays with half a dozen fold out leaves. Once we started exporting to Europe, as we did the following year, the translation of instructions and the extra packaging that was required became a major issue.

Single cassettes are small and light but I can assure you that lifting and carrying a box of 500 of them, packed with inlays, is not a bundle of fun. Our office at the time was above a printers (the same printers who produced the Hints & Tips books) in the Thameside town of Wallingford, across the river from my "proper job" at the Institute of Hydrology. I remember all too well carrying heavy, unwieldy boxes through the printers and up the stairs before gingerly packing them under tables or in our tiny storeroom hoping nothing would go amiss as the floor creaked and groaned in protest.

A MATURING MARKET

In the formative years Hewson Consultants operated mainly by selling through mail order, with demand generated purely from magazine advertisements. There was no real high-street presence for the industry, although a small number of independent shops had popped up around the country and we were able to supply some of them. It all happened through the magazines. We would see somebody advertising their new shop and give them a ring, or they would see our adverts and contact us. The links developed organically.

As a result, the early magazines were absolutely fundamental to the development of the industry in a way which is simply not the case today. Back then they were pretty much the only one-to-many communication medium available for the industry. They each operated according to an individual, carefully planned, fixed monthly cycle and so it became important for us to monitor when staff from each magazine would be writing reviews and to supply review copies to them to synchronise with their plans. I also remember being surprised to learn that it took several weeks for a finished magazine to be printed and shipped to retailers around the country. The net

result, I came to realise as I grew more experienced, was that there needed to be a three month lead time between a game being finished and it actually appearing in the shops.

It was obvious to anyone with a business brain that there was a huge new demand for home computers and anything and everything associated with them. WH Smith were first off the mark and rapidly opened up the market giving it a convincing high-street presence for the first time.

Arguably the average branch of WH Smith today does not seem progressive or cutting edge, but back in the 1980s they were a major and dynamic force on the High Street. Even before they had a head-office strategy to sell computer games and hardware across the country, we were already supplying some of their stores directly.

A friend of mine was the Manager at a local, biggish branch of WH Smith and he had placed a "local order" for significant quantities of both the ZX80 and ZX81 books, Pilot for the ZX81 and a few of our very early ZX Spectrum titles. My understanding is that his Area Manager then distributed the stock amongst the various branches under his control in the South of England. Presumably the stock sold through because not much later WH Smith announced that they were stepping into the new market for home computers.

Perhaps these kind of local arrangements, which I am sure other publishers must have also been putting in place, helped to convince the management of the company that they should take the sector seriously, allocate the floor space and release the finance that was required to stock it. From what I know the credit should go to a man called John Rolland because he recognised the potential and set up the internal arrangements. He was forward-thinking and had the energy, experience and ambition to organise and manage the roll out.

Of course as soon as WH Smith started stocking Sinclair computers right in the middle of the high street, a whole host of other retailers and distributors sat up and took notice. There was nothing half-hearted about WH Smith's commitment – they devoted a significant amount of store space to the machines and to supporting products like ours. The psychological impact was significant.

As a result other operations felt they had to get involved. Websters, a book distributor, entered the games market and soon signed a deal to supply Boots, the pharmacy. Suddenly it seemed that computer games were everywhere.

I could wander into my local WH Smith on a Saturday and see Nightflite cassettes and my books sitting on the shelf alongside the ZX Spectrum itself. I realised that I had stumbled upon a valuable business opportunity and as my confidence in the market grew so did my determination and resolve. I decided that computer game publishing would become my fulltime occupation.

GOING FULLTIME

In the August of 1983 I finally left my job at the Institute of Hydrology and started working full-time for Hewson Consultants – a change that was long overdue. At last I could give up my stints working until 4am whilst maintaining my full-time occupation as a hydrologist.

By this time we had several employees. We were crammed like sardines in a tin into our office in Wallingford, tripping over books, cassettes, add-on memory packs and each other. My third book, *20 Best Programmes for the ZX Spectrum*, was selling strongly through WH Smith and other retailers, when another opportunity presented itself.

One of the cassettes we received in the post, sent by a certain John Hardman, consisted of a collection of useful machine code routines. John thought we might like to publish them in that form but my reaction was to print them out and write some covering material to explain what they did and why.

I wrote two or three chapters of introduction, arranged the routines into groups, and sent the copy off to our printers in Northampton. A few weeks later our fourth book, *40 Best Machine Code Routines for the ZX Spectrum*, was ready to ship. Once again WH Smith was only too happy to stock it and we sold thousands upon thousands of copies.

These activities injected significant sums of money into our bank account and the icing on the cake came in mid-December 1983 when

Websters, the book distributors, ordered huge quantities of cassettes for distribution into the retail market. We thought they must have been mad – how could they possibly get the products on the market in time for Christmas? Nonetheless, we were more than happy to fulfil the order and even happier when we received payment in due course. Indeed, I have to admit we were tasteless enough to photocopy their cheque, frame it and hang it on the office wall so we could admire it. After a few weeks we thought better of it and took it down.

We now had plenty of money in the bank, enough to feel rather blasé when our accountants explained just how much we had to pay over to the Chancellor of the Exchequer. This was the days of 50, 60 and 70% tax rates. Ouch! Nonetheless we had enough cash to plan a move out of our cramped offices in Wallingford and I set about finding some new premises.

Meanwhile I was beginning to hatch a plan. I could see that for the next few years we would be producing large quantities of cassettes, so we needed space to warehouse our products as well as space to accommodate our staff. I also wanted to maintain control of production, which led to the idea of buying our own cassette duplication plant and recruiting my father, who was approaching retirement, to operate the equipment for us. I knew he had never been particularly happy working at GEC in Elstree and I saw it is an opportunity for my parents to move from north London to a more rural environment. I had total confidence in my father's ability to master the equipment – he was a scientist by training and had worked in industry all his life, qualifications which I saw as more than sufficient for the job.

And so it came about that we moved from the office in Wallingford to a 2000 square foot warehouse on an estate just outside of Didcot. Milton Park is not just any old trading estate, certainly not these days. Unusually, the landlords have their offices on site having bought the land in 1972 when it was pretty much a storage depot for newly manufactured and mostly unsellable cars, and to their great credit they have gradually improved it, building by building, over the years. The estate is located where the London to Bristol railway crosses the North-South A34 trunk route which runs from the M40 down to Southampton. Meanwhile the M4 is a just few miles to the south so it takes only an hour or so to drive to Heathrow. With all these

advantages Milton Park is the biggest and arguably the best trading estate for a 50 mile radius.

However, given my minimal business experience I would have struggled to recognise Milton Park's advantages when we first moved there. All I saw was a building that we could use, in a location that was convenient at a price that I thought we could afford. We made the move in 1984 with the cassette duplication equipment arriving swiftly afterwards and in next to no time we were up and running. My parents moved from Elstree to Didcot and my father, fulfilling my belief in his abilities, got the equipment and the production line under control. Soon we were duplicating and packing our own cassettes.

Ah! The joy of packing cassettes, I remember it well. Pick up the case, tuck in the inlay, pop in the cassette, shut the case, and put the case in the box. Pick up the case, tuck in the inlay, pop in the cassette, shut the case, and put the case in the box. Repeat ad nauseam, or at least until someone makes a cup of tea.

It sounds easy. It is easy. But it is surprisingly difficult to do quickly. What I learnt from the experience is that some people are significantly more dextrous than others and therefore significantly faster at packing cassettes. I also learnt that I am not one of those dextrous people.

Not that it was my job to pack cassettes. It was my job to be in charge. Me, the would-be scientist, the would-be statistician. No industrial experience, no commercial experience, no management experience to speak of. And here I was, making a name for myself, running a business, employing other people, winging it day-by-day, making it all up as I went along. It had all been a remarkable success story built on a modest ambition I had conceived a little over three years previously. I had little idea of how it had all happened and I had no clear idea of what would happen next. I naively assumed that success in the past would lead to success in the future. But that is not how the world works.

I was young, I was inexperienced – I was green as my father had been before me. I had to learn quickly and, truth be told, I learnt many lessons the hard way. We had successfully taken control of production but now we had a new challenge with which to come to terms.

THE DISTRIBUTION AND RETAIL PIPELINE

When products are being sold indirectly to consumers via distributors and retailers there is an important difference between shipping a product and it selling through. When we took an opening order for one of my books to be stocked by, say, five hundred shops across the UK taking two copies each, it meant we had to ship a thousand books immediately even though not one member of the public had actually bought a copy. We would record the sale of one thousand copies but at the moment we recorded the sale the number of copies paid for by members of the public, who are the only people who matter, was zero. All we had done was fill the pipeline with stocks of the book.

Two copies per shop, by the way, is the standard, if minimal, order to which a retailer might commit for a product that is not hugely in demand but is nonetheless expected to "sell through". The justification for the order size is in the saying, "One to show and one to go." One copy is put on sale in the shop and the second copy is kept in the stockroom. When the shop copy sells, it is replaced by the stockroom copy and at the end of the day an order is placed for a further copy which, once it arrives, is held in the stockroom.

In 1982 the computer games industry was still transitioning from a mail order to a retail business because the distribution pipeline was not yet fully established. A number of distributors opened their doors to put themselves between companies like ours, the so-called software houses, and the retail outlets. Of the price paid by a member of the public for a typical new game, say £5.99, the Chancellor of the Exchequer took a 15% cut by way of VAT, the retailer took a cut of 25% – 40% (depending on the buying strength of the retailer) and the distributor took a cut of 11% – 15%. We got the remainder out of which we paid the costs of manufacture, our own overheads and royalties to the programmer. If you "do the math", as the Americans would say, you can work out that we ended up with about £2 per cassette or thereabouts. Not bad, but not a fortune given the time and effort required to create and launch each product.

And launching a product was becoming more and more important because otherwise the pipeline flows backwards. If those cassettes, carefully

manufactured and shipped, do not flow off the shop shelves into the hands of the buying public then the pipeline becomes blocked and everyone in the business chain feels the pain.

In the early days of the business, circa 1982, purchasing errors by the distributors were not overly important. The demand from the public was huge and new retail outlets were joining the feeding frenzy month after month. As a result, slow moving products could be moved out of one retail outlet and used to line the shelves of a newer store opening elsewhere. This created an early grace period for the embryonic games industry, but of course it could not last.

When Websters placed their huge mid-December order with us in 1983 they must have been anticipating that demand for the same games would flow on into the spring. They were a book distributor and they assumed that the demand for a computer game title would last for two, three or four years, as it would for a book. They were wrong. We all learnt soon enough that a games title could live and die in a matter of two, three or four months.

The distribution pipeline flows backwards in terms of demand. The consumer makes demands of the retailer, the retailer relays the demands to the distributor, the distributor passes them to the publisher and the publisher shares the pain of a poor-selling product, through reduced royalties, with the developer.

In effect the sale of an item by a publisher or a distributor is more akin to a gift than a firm sale, irrespective of the wording on the accompanying invoice. Only when a member of the public makes a purchase does the gift turn into a sale (and not even then if there is a risk that the end purchaser can return the item for credit). If the gift does not sell within a reasonable period it gets returned up the chain and no-one involved earns anything despite considerable effort.

Of course as a publisher there is no point in questioning the orders received. They have to be fulfilled in the hope that not too many units will be returned. And whether it is the publisher, the distributor or the retailer which suffers the financial pain when a title fails to sell through depends on their relative strength in the market. When Websters made their misjudgement in December 1983, they took the hit because they had not taken the

precaution of including sale or return arrangements in their terms of trade. Naturally enough their competitors took note of the error and the effect was to place the onus for promoting and selling products firmly on the games publishers. Only we could address the consumer to create and stoke the demand which the pipeline needed in order to function effectively.

The role of a distributor is to act as a repository of expertise sitting between the publishers and the retailers. In the UK and other sophisticated markets a retail chain may have several hundred shop fronts spread across all the major and most of the minor cities and towns in the country. The goal of the chain is to drive down costs and improve its quality of performance by imposing uniform procedures and product selections across all its outlets and to improve its terms of trade by buying in bulk. It is important to the chain that it sells all the big titles that come on the market, because it is the big titles which generate by far the largest income and therefore profit.

Unfortunately, from the perspective of the managers of the chain, in a fast-moving, fast-changing market like videogames, the next big title may come from any one of a number of publishers. Therefore the chain is faced with developing and maintaining trading relationships with an ever-changing kaleidoscope of different suppliers. The management, naturally enough, prefer to sub-contract that task to a chosen distributor. In return they can, if the chain has sufficient leverage in the market, impose highly detailed requirements on the distributor, such as ensuring all deliveries are labelled to a uniform agreed standard or demanding that lorry loads arrive at a given warehouse within a narrow time window.

As more and more distributors came into the market in 1983 and 1984, our task was to relinquish the relatively small number of direct relationships that we had established with retailers up until that time and work with the incoming organisations to help them achieve their goals.

In return for lower prices we received larger orders. At the same time, our focus began to move away from the UK towards Germany, France, Italy, Spain, Scandinavia and elsewhere. In due course we were shipping new titles in bulk to perhaps fifty distributors scattered across the UK, Europe and the English-speaking territories of the world.

The maturing pipeline forced us to improve our marketing. Advertisements in magazines would no longer suffice – we had to learn about public relations. In retrospect I can see that we achieved this transition relatively painlessly, supported without doubt by the quality of the titles we were delivering. We were however, in the minority. Many others who, like us, sold their products in the early days by mail order and at ZX Microfairs, faded into history. They were replaced by new operations, some of them with very deep pockets, like BT and Virgin, some of them business sophisticates like Mastertronic and US Gold and some of them, which in fairness I should not name, barely less naïve than the start-ups that they replaced.

AWARDS AND ACCOLADES
1980−1983

COMPUTER TRADE ASSOCIATION

Year	Award	Recipient
1983	Computer Book of the Year	40 Best Machine Code Routines for the ZX Spectrum

PRODUCT SUMMARY
1980 - 1983

Year	Product	Primary Platform
1980	Hints & Tips for the ZX80	Book
1981	Hints & Tips for the ZX81	Book
1982	Programmer's Toolkit	ZX81
1982	Statistics	ZX81
1982	Z80 Op Codes	ZX81
1982	Language Dictionary	ZX81
1982	Mini Intruders	ZX81
1982	Planet Lander	ZX81
1982	16k Memopack	ZX81
1982	32k Memopack	ZX81
1982	56k Ram pack	ZX81
1982	64k Memopack	ZX81
1982	HRG Memopack Hi Res Graphics	ZX81
1982	Memopack Centronics printer interface	ZX81
1982	Line Renumber	ZX81
1982	Countries of the World	ZX Spectrum
1982	Space Intruders	ZX Spectrum
1982	Pilot	ZX81

Year	Product	Primary Platform
1982	Nightflite	ZX Spectrum
1982	Puckman	ZX81
1982	Machine Code Editor	ZX Spectrum
1982	Music & Sketch	ZX Spectrum
1982	Assembler	ZX Spectrum
1982	Disassembler	ZX Spectrum
1982	20 Best Programs for the ZX Spectrum	Book
1983	Backgammon	ZX Spectrum
1983	Maze Chase	ZX Spectrum
1983	Nightflite 2	ZX Spectrum
1983	Spectral Panic	ZX Spectrum
1983	Quest Adventure	ZX Spectrum
1983	Dragonfly	Dragon 32
1983	Dragonfly 2	Dragon 32
1983	Specvaders	ZX Spectrum
1983	40 Best Machine Code Routines for the ZX Spectrum	Book

1983-1985
SPECTRUM
SPECIALISTS

Our early success at retail was driven by sales of my books and a handful of games – most prominently Mike Male's Nightflite. Although the rate at which cassettes were landing on our doormat was steadily increasing, we received little of comparable quality to Nightflite. This was now our benchmark and we never considered publishing anything which fell short. I have no doubt that some of the titles we rejected were released by other publishers. We were choosey right from the beginning.

STEVE TURNER

The catalyst for expanding our product range further came when my brother Gordon loaded a cassette sent to us by a certain Steve Turner. He immediately identified it as something special – it was clearly a game which stood head and shoulders above the rest.

Steve, like Mike Male, had used the constraints of the hardware to define the setting of the game. He wanted to create a 3D effect within the

performance limitations of the Spectrum hardware. Mike had side-stepped the issue by setting his flight simulator at night. Steve set his game in space. Against the blackness he dotted in enemy fighters using pseudo vector graphics in a perspective view and added a frame to simulate the front of a spaceship with instrumentation beneath to create the effect of being in the cockpit shooting enemies in 3D.

It was beautifully elegant and expertly crafted so it was immediately clear that the game had been created by somebody who knew exactly what they were doing. Our decision as a publisher was very easy – we wanted to sign him.

Our game contracts were actually based on book publishing contracts. Early on I had met a couple of foreign book publishers at one of the ZX Microfairs and they had licensed the rights to my ZX Spectrum book for their territories. I had also licensed *Hints & Tips for the ZX81* to a US publisher and so I had an example of an American contract. These documents provided me with a starting point for drawing up the contracts for programmers like Mike Male and Steve Turner.

By this time I had bought an Osborne "portable" computer on which to write my continuing monthly columns for Sinclair User. The Osborne was a Z80 based machine running the CP/M operating system and featured two 5.25 inch floppy disk drives either side of a five inch screen, with the whole contraption tilted upwards to face the user by attaching a click-on keyboard. If you like the idea of lugging a sewing machine around with you all day, then you would be happy with the Osborne as a "portable" computer. To be fair, it did allow me to work at home as well as at the office, and lugging it back and forth was good exercise no doubt.

The Osborne became the repository for our steadily growing collection of licensing contracts, all of which were adapted by me from the early book contracts I had acquired. I even based the royalty rates we paid on the rates that I had originally received for the books. I had no other point of reference.

In later years I received contracts from other games publishers and I was surprised to see that many of them were very rough and ready. Our contracts were better than most because I put time and effort into defining the rights we were licensing, either inward or outward, and then getting the

definitions written down in plain and understandable English. It is not an easy task by any means but there is a certain satisfaction, when the job is done, in re-reading a contract and confirming that it says what it is intended it should say.

With Steve on board we set about bringing his first game to the market. The name we settled on, probably in next to no time, was 3D Space Wars. It is not the most original title in the world, but it was appropriate and it had echoes of Space Invaders and Star Wars, both of which were in the public consciousness at the time. Indeed, it is not entirely accidental that some of the enemy ships in the game look similar to the Imperial Shuttle from Star Wars.

I cannot recall how successful the game was at retail, but it must have done reasonably well both for ourselves and for Steve because we soon received another cassette from him.

Steve's second title was a conscious attempt to model the attack by Martians on the cities of the world as portrayed in H. G. Wells' book *The War of the Worlds*. We were clear that we could not use that phrase as the title of the product because the last thing we wanted was any kind of legal challenge from a third party. We re-named the game 3D Seiddab Attack. I'll leave you to work out how we came up with that one. Suffice it to say that it still makes me wince.

Steve's third game was 3D Lunattack; another evolution of 3D Space Wars built on the same technical foundations. Steve was working very hard to get as much mileage as possible from his technology. It was only in later years that I came to understand that Steve was way ahead of his time in adopting this development strategy. A lot of programmers in the early days had the urge to build from scratch every time because they wanted to be creative and try something new. It is an understandable urge, but it can also be one of the fastest ways to undermine your own success. Steve, on the other hand, intrinsically understood the logic of getting the most from his work and in hindsight it was a key component of the foundation we built together for a successful long term partnership.

By the time we published 3D Lunattack we had settled into an established relationship with Steve. I would drive around London to his home in

Essex and we would spend a few hours together reviewing what we were both up to and chatting about the future. Having produced three successful first-person shooters, Steve felt it was time to do something a bit different. That still did not mean starting again from scratch, it just meant taking his technology and developing it in a new direction.

With his debut shoot 'em up trio, Steve Turner had successfully emulated the kind of experience players were enjoying in the arcades at the time. His next game, however, would blaze a trail of its own.

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"I remember playing the Seiddab trilogy as a kid while I was still in school. They were great arcade games and pretty advanced for their time, and I enjoyed them a lot."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

PIONEER'S PERSPECTIVE: STEVE TURNER

I used to read computer magazines and was attracted by ads that asked readers to submit their own programs with a view to publishing. I chose three companies who advertised with full-page colour ads, because that showed they understood how to promote a game. When 3D Space Wars was ready I sent it off and got two offers to meet publishers and one polite refusal.

Hewson had its own tape production facility which impressed me. They also understood the creative programming process rather than being men in suits that sold games.

Hewson was a family business. Andrew Hewson did the commercial stuff, his brother Gordon Hewson was our producer and their dad ran the tape machine. I was offered a standard contract which I compared with the contract I had been offered from an alternate publisher.

I made my mind up that I would give up work if my game was published and handed my notice in when the contract was signed. At the time I thought games writing may not last but wanted to take the opportunity to do my own thing even if it lasted just a few years.

Memory was always an issue. 3D Space Wars was made for the lowest-spec RAM. Graphics were especially hungry in consuming RAM yet needed to be as big and varied as possible. This meant a lot of thought went into compressing graphics to use the smallest amount of memory without sacrificing run time speed which many packing methods demanded. We hated tape loads in the middle of a game and so we tried to pack everything into a single load. I can remember running out of memory at the end of each game.

To add things or apply fixes you had to search through code to see if you could remove a few bytes. This was a pain as you could easily introduce a new error. I had to initially write assembler code on squared paper then convert it into machine code by hand. I got quite fast at doing this by memorising common instructions and using a couple of look up grids for others. It was so easy to make a mistake. Then the hex had to be laboriously typed in via the rubber keyboard. If you hit it too hard the RAM on the back used to wobble and the machine crashed which resulted in you losing any unsaved typing. I used a disassembler to display and later print out my source code to check it.

BUILDING A CATALOGUE

Hewson Consultants was now beginning to build a catalogue. Mike Male and Steve Turner were both top tier programmers and it made sense as a publisher to invest time and effort in maintaining those relationships. Mike Male enjoyed building simulators. Steve Turner had already delivered a space-shooter trilogy, but his contribution to the Hewson Consultants catalogue was only just beginning.

These relationships were crucial to us, and despite being completely inexperienced as a businessman even I could see the importance of them. However, we also had some short-term relationships with programmers which delivered titles like Dilithium Lift, Quest Adventure and Fantasia

Diamond, before their creators decided to go on to other things. Although many people who remember the likes of Steve Turner may have forgotten about these one-off titles, they too played their part in filling out our line-up and establishing Hewson Consultants in the marketplace.

Dilithium Lift is a game I remember with particular fondness, because it was one of the first titles, in fact one of the few titles, to which I personally became addicted. The premise for the game was simple; the player controlled a small stick-figure character moving from square to square on a grid, collecting dilithium diamonds which spawned in random patterns on each level. At the sides of the grid were gun-turrets which tracked the player's movements and fired, with a slight delay, at the player character. The player needed to keep moving to avoid being shot by the turrets while trying to collect the dilithium diamonds at the same time. It was a classic arcade experience with cracking sci-fi sound effects and I remember being hooked into the compulsion loop it created. The programmer, Simon Cobb, went on to work at Ocean Software and then ultimately left the industry and, like so many of us, moved on to other things.

We published Quest Adventure in 1983 and Fantasia Diamond in 1984, both written for us by Kim Topley. Kim was uncomplicated and clever. He had taken a degree in Computer Science a few years previously and lived with a couple of housemates in a flat in Reading. He had set himself the task of writing a text adventure for the Spectrum and delivered on it, effortlessly it seemed to me, a few months later. It is no surprise to know that he now has an important IT position in New York.

PIONEER'S PERSPECTIVE: SIMON COBB

I had read about a game called Gridrunner for the C64 and although I hadn't seen or played it I wanted to create a game with a grid as a background as it kept the graphics simple, minimal & effective.

Originally Dilithium Lift just consisted of one screen and when you completed the screen, the game ended. Adding in the code for the additional levels, data for the position of the crystals and so on took a few days.

I remember wanting the game to have continuous sound and I achieved this on the Spectrum. The game wasn't overly processor intensive, although it did have nine 8x8 pixel characters moving around the screen, and it was all machine code so there was sufficient time to have a very short, very regular, modulating beep that gave the game an extra something.

When I was writing and testing the game, it was easy to become proficient at it and to therefore find it simple to complete. I added the timer to make sure that the player could not waste time. The duration allowed for each level was carefully worked out. The sound effects and background music also added to gameplay. Not knowing what happened when the level was completed or what the next level looked like kept players wanting to play.

I was very proud of it – I still am. It was a complete game, no known bugs, fun to play and it had that "one more go" appeal. It probably took around 7-10 days of the school holidays to write from start to finish all in 100% machine code. I knew it had commercial appeal and I was keen for the world to see it.

I ran off a dozen or so cassettes and sent them off to a range of publishers. Some publishers (including Virgin) wanted it, some didn't, but I was delighted when Hewson got in touch – they were a big name at the time.

Hewson seemed very professional. They had adverts in all of the magazines and seemed to know what they were doing. When I submitted the game, it was called "Grid Patrol" however Hewson wanted it to be called "Dilithium Lift" so it was renamed. Very few other changes were needed.

One of the changes was to make it Kempston joystick compatible and I was shocked and surprised when an early Kempston joystick and interface arrived in the post. The joystick was soldered onto the interface – there was no 9-pin "D connector" and no branding on the interface. It was the first time I had seen a joystick for the Spectrum and I was really excited that it had been sent to me. It took a couple of hours to rewrite the code for joystick control.

Dilithium Lift was released and my name appeared on the adverts in Sinclair User and other magazines which was great to see and to show to friends and family. It was also on sale in Boots and my mum was amazed

and delighted to see my work on sale in the high street. It was tangible, she could point to it, pick it up, and tell all her friends. She thought it was great.

AVALON

By the end of 1983 our business was very successful but, despite the obvious quality of our simulators and our arcade titles, we had yet to publish a truly original, ground-breaking game. That, however, was about to change.

The way Steve Turner developed his games is a classic example of how creativity flows from technological development. For 3D Lunattack he had written a routine which sketched the rocky lunar horizon against the black backdrop of space, and by experimenting with this technique he was able to set the stage, quite literally, for his next game.

At this time almost all games were developed by individuals or perhaps a pair of individuals working together. We as publishers had relatively little influence over the type of game that was developed and so when Steve Turner told me he was working on a Dungeons and Dragons style of game my reaction was to accept his idea, encourage him and leave him to get on with the job. I was interested in what he would be able to produce and hoped that he would be able to build on his track record to date and deliver another quality title. In the event he did much more than that. When I saw what he was working on I was blown away.

The game, which would later be entitled Avalon, was a sensation. Steve had repurposed his Lunattack horizon routine to create a wonderful colour border effect which sketched out a 3D theatre stage on the screen, dressed to depict a series of connected dungeons. Instead of trying to overload the screen with graphics, Steve had sketched in the defining features of each room, such as door frames and a modicum of brickwork to outline the corners. The empty blackness of the negative space between these sparse features was left to create the impression of darkness, much as it had in his earlier space-based titles and indeed in Mike Male's Nightflite. Like everything Steve produced it

was simple, elegant and efficient in terms of how it ran on the hardware, yet the overall effect was enough to create a convincing impression of place.

Having conjured up his dungeon setting, Steve's next job would be, in the normal course of product development, to animate the main character walking around. But not if you're Steve Turner. A walking character would require extra graphics to create the animation, which would mean more memory and extra time in the cycle to run those animations, which would mean more processing resources. The Spectrum memory was too restricted and the hardware speed too low. So instead of a walking character, Steve had his protagonist, Merlin the Wizard, floating around the screen on a magic carpet.

To my mind that was the genius of coders like Steve. He had the technical understanding to foresee the problems before they arose and the flexibility of mind to push the issues to one side. He could see that complex, time-consuming, memory-hungry walking animations would contribute nothing to the gameplay and very little to the visual richness of the scenes he was intent on creating. So he refused to be side-tracked and concentrated all the available resources where they could be most effective.

Arguably, a wizard who floats around on a carpet is quirky and more memorable than a wizard who walks around just like the rest of us and so the technical limitations to which Steve was responding actually added to the atmosphere of the game. In my experience this is often the case. Technical constraints drive inventiveness. The very limitations of the Spectrum, and other early hardware, allowed the very best coders to differentiate themselves from their rivals and showcase their virtuosity.

In fact, some of the most iconic characters from the early games industry were formed in part by the process of working around technical limitations. The classic example is Nintendo's Super Mario, who gained his trademark moustache and dungarees because it was a recognisable form which could be displayed within a very limited set of pixels. Constraints channel creativity, and the technical constraints of the early industry fostered some of the most innovative and charismatic games of the period.

When Avalon launched, most of the adventure games on the market had a text-based interface, sometimes accompanied by a series of static 2D

backgrounds to provide a visual setting. The player types in a command such as "Go north" and gets a written response, for example, "You now find yourself in a dark forest."

Naturally, we wanted to identify Avalon as an adventure game but we also wanted to distinguish it from ordinary text adventures and from graphic adventures like Fantasia Diamond which had 2D images to support a text interface. As a consequence we dubbed Avalon a "3D adventure movie" and used the phrase as the strap line in our marketing campaign.

Avalon was unique. For me, it was the first product we released which made people think "I've never seen anything like that before". That thought, I would later come to believe, is the mark of a great videogame.

Not that I understood it at the time. It was our commitment to only publish the very best titles that we could find which put us in contact with the very best developers. And it is the very best developers, like Steve, who thrive on creating something new. We stumbled upon originality by selecting for quality.

However, I also found that even when we had something new and original, like Avalon, I felt no certainty that it would blow people away once it was released in the wild. The games that I liked personally, I came to learn, did not necessarily appeal to the public at large and there were certainly some chart-topping games which I found disappointing, even annoying.

On this occasion, however, my taste matched that of the public. Avalon was the first of many games we produced which exhibited that sense of true innovation in the new medium of computer games and which captured the imagination of the buying public. And it remains one of the few Hewson Consultants games that I have personally completed from start to finish.

PIONEER'S PERSPECTIVE: STEVE TURNER

I used to play Dungeons and Dragons with Andrew Braybrook and a group of friends and thought it would be great to have a game where you explore a huge dungeon and have problems to solve.

I had tried to play a few text adventures but got bored with them. It used to annoy me, for example, when you are in a forest and you say "climb tree" and the game says "I see no trees".

So my plan was to create an adventure game that was displayed in an arcade style and didn't need any text input. The nearest thing I had seen to this idea was Atic Atac and I was sure I could do better using a pseudo 3D approach.

I started off drawing rooms on paper and moving them behind a paper frame representing the computer screen. From this I was convinced that the viewpoint could work. I used to call the display style a virtual stage as it was like stage scenery with side sheets and a backdrop.

When the first room was scrolling around I got a feeling about the game. It was very immersive. I made a plasticine model of the wizard and drew him from eight directions. This was the largest graphic I had ever put in a game but it was worth it for the effect. I did all the graphics by hand by drawing on squared paper and writing hex code alongside. When I put in the first meanies and sample problems I knew the idea was revolutionary.

That made it hard to explain to Hewson so I took along a demo of a wizard that could travel through rooms, firing wizards at wizards as I only had one graphic. However, they quickly saw the potential.

Some reviewers found the initial demo a little difficult as I had made the doors too realistic, so the reviews were mixed. To open the doors you nudged them but you had to get out of the way, just like in real life, or it bounced off you and closed. I eventually made the doors much wider for the release version to make it easier.

Reviewers like to categorise games but this one did not fit into an existing category. A few reviewers recognised this was something special but I can remember being disappointed at the overall level of reviews because die-hard text adventurists and arcade players were not getting on with it at first. However, over time it became accepted as one of the top games as shown by reader votes in the adventure charts. Indeed Avalon and Dragontorc dominated the charts for years.

DRAGONTORC

Working with Steve Turner was always very straightforward because we could count on him to make sensible business decisions which complemented his creative instincts. Avalon was our most successful title to date, so when Steve told us that he wanted to make a sequel we were naturally very pleased.

Sequels in the games industry make particularly good business sense because of the dependency each game has on its underlying technology and the inherent cost of developing that technology from scratch. Early developers like Steve had to create their own software tools and refine them as they went along and so their personal toolkits reflected the games they had developed previously. These toolkits represented a significant investment of time and expertise.

And of course, a ground-breaking product like Avalon carves out a new audience, and having played and enjoyed the game the audience is left thirsty for more.

Steve's goal was to refine the existing formula by polishing the elements that made Avalon so successful whilst smoothing a few rough edges. This process requires a high degree of self-discipline from the developer because it is all too easy to get drawn into re-writing substantial segments of code. There are jargon phrases that summarise what can happen. "Feature-creep" – succumbing to the temptation to add extra facilities during the development process which are not present in the design. "Gold-plating" – taking valuable development time to polish, improve and refine the underlying code whilst making little or no improvement in the end product. Fortunately, Steve showed his class by avoiding these traps and before long we were marketing the Avalon sequel.

Dragontorc was evolution rather than revolution. At a glance the game looked almost identical to Avalon, but it featured a fresh story for fans to explore. It centres on a magical relic called the Dragontorc, which although fictional, was inspired by a real-world artefact called simply a "torc" as I recognised from my time at the British Museum. The biggest and most famous, the Snettisham Torc, was found as part of a horde discov-

ered near the village of Snettisham in 1950. It is a meticulously crafted hoop of twisted gold from the Iron Age period which was worn around the neck, no doubt as a sign of great wealth. The highly skilled staff in the workshop along the corridor from where I worked at the British Museum made a copy of the Snettisham Torc in the 1970s for presentation and display. In fact I am one of a very small group of people who has handled the original and compared it with the modern copy. It is a striking piece and so we decided to use it as the model for the titular Dragontorc, with the addition of dragon-heads adorning each end, and to display it on the cover of the game box.

Recognising the authorial talent of the coders as we did, we had always sought to promote them as the stars of the show. The launch events we arranged were a key part of this strategy and also an important way of marking the end of a project. Games development and publishing can be very rewarding but it can also be something of an anti-climax when the finished article finally hits the market, as I came to know only too well, and so the launch events added an important sense of completeness to the journey.

Avalon's launch event was on London's South Bank with Brian Ferry music playing in the background. Our launch event for Dragontorc was held at the London Museum and Steve gave an enthusiastic speech to the press about the historical connotations of the game. For Mike Male's Southern Belle we spent our launch event riding the steam trains at the Didcot Railway Centre, and in subsequent years we would find ourselves exploring dungeons or simply hiring a central London restaurant.

The sheer originality of Avalon and Dragontorc was already creating something of a buzz around Steve Turner in the gaming press, and he would create many great titles in later years to ensure a lasting legacy. However, the developer who would become arguably our biggest star was yet to burst onto the scene, and it would be Steve Turner who introduced him to us. But that was later.

PIONEER'S PERSPECTIVE: STEVE TURNER

I knew that if I designed Avalon correctly I would be able to add new adventure sequences very quickly. Sales were good so it seemed like a good idea to program a sequel. I decided to revise a few things to increase the playability and add some embellishments.

Dragontorc was great fun to write. Re-using the majority of the Avalon code meant that I could spend more time on the adventure and special features like the AI. I added better AI for meanies so their actions depended on how friendly they were with you and whether they were frightened of you. These factors changed during the game allowing you to befriend the elves or frighten lesser meanies. Usually games have set patterns of movements for meanies, even today.

After an abortive attempt to use Microdrives I added a proper disk drive to my Spectrum and encased it in a reasonable keyboard. I was still hand assembling but managed to interface the disk system with the disassembler making it a lot easier to work. In those days we spent quite a bit of time having to program utilities and hardware.

Hewson had a speciality in intimate lunchtime press launches which were popular with both reviewers and games developers. It was our chance to meet the reviewers and demonstrate the game being released as well as previews of things we had in the pipeline. Andrew Hewson brought along a security guard with a gold replica of an actual Iron Age torc to show the press.

Unfortunately photos were not allowed but I can remember Andrew wearing it around his neck. The launch involved a brief tour of the relevant part of the London Museum to set the mood.

TECHNICIAN TED

Technician Ted was a game for the ZX Spectrum created by Steve Marsden and David Cooke which came to us, like all the other early games, in amongst the flood of cassettes that we received in the post. It caught our attention

immediately because it had its own bespoke loading screen instead of the usual coloured mush on the monitor and corresponding audio mush on the soundtrack. Instead, Technician Ted had a black screen with a crude block figure of a man walking back and forth.

We knew two things from this loading screen. Firstly, it was evidence that the programmers had well above average technical skills. Secondly it showed that they were well aware that piracy was rife and that rip-off cassettes were on sale in every school and on every street corner in the country. After all, why bother to write a bespoke saving and loading system unless you thought it would stop others from pinching your work?

We played the game and found that it was complete and more or less ready to ship, just as Mike Male and Steve Turner's first submissions had been. We contacted Steve Marsden, who was the front-man for the two of them, and arranged for him come down to see us in Oxfordshire. He lived in Lincoln and came to see me on a warm Saturday afternoon with his father. I have a clear memory of the three of us sitting in my office probably wishing that we were out and about enjoying the sunshine like everybody else. I certainly was. But the sacrifice was worth it. We signed the game after some to-ing and fro-ing and soon put it out on the market.

Steve and co-author Dave had met while working at GEC-Marconi in Lincoln where they were involved in the manufacture of computer chips. They had set their platform game in the factory where they worked – in fact, the original name for the game was "In the Chip Factory". I am pleased that we dropped the original name because I felt that it was rather misleading. However, I have to say, I am not sure that Technician Ted is that much better.

Of the two of them, Dave was the quiet one. Really, really quiet. So quiet that he was more or less invisible to some people. Scientific and technical establishments always have a quota of people like Dave. They are the kind of people who say very little because, from their point of view, speech, not to say language itself, is an unsatisfactory and imprecise vehicle for self-expression. Instead, their work speaks for them and they gain their satisfaction and self-belief from the work that they do and not from their interaction with the rest of humanity. You will not be surprised to learn that Dave was the author of Technician Ted's loading screen.

As an aside, it is blindingly clear to me that our society does not even come close to understanding the immense value delivered by people like Dave and there is a story here which I hope he won't mind me sharing. He had been recruited straight from university by GEC-Marconi and the expectation on both sides was no doubt that he would work for the company for many years. However, it was a requirement of his job that every now and again he stand up in front of a group of people and make a presentation about his work. I doubt that this requirement was actually written into his employment contract but nonetheless it was apparently made clear to him that a very dim view would be taken if he did not comply.

And Dave did not want to comply. Just as he was really, really quiet he was also really, really shy. He was happy to talk one-to-one about his work, albeit well aware in a quiet way that his interlocutor might struggle to understand what he was talking about, and both he and Steve had a mischievous sense of humour, as anyone who played Technician Ted could tell.

When sitting down to talk to Dave it would take a while to draw him out but that is absolutely typical of people of his ilk. Ask them a question and they consider it. They roll it around their mind. They look at it from different angles. Then they look at their interlocutor to try and guess how much of what they are going to say might be understood. And finally, they deliver an answer that seems to them to be both truthful and likely to be within the understanding of the person they are addressing.

I have known a number of people like Dave, both in the games business and previously, and I really like interacting with them because I always learn something and learning motivates me. However, it is important to respect such people for what they are and not for what others might wish them to be, and GEC-Marconi quite evidently did not respect Dave.

The management of GEC could quite easily have placed someone alongside him to act as an interpreter allowing Dave to get on with his work. But, for whatever reason, they chose not to do that. Instead they tried to bully him and Dave did what people like him always do when they get bullied. He walked away. He resigned. He resigned and GEC lost an employee who would have delivered enormous value to the company over a thirty to forty year career.

I had a standing joke with Dave in later years when he and Steve worked from a three storey house converted to offices on the outskirts of Lincoln.

Dave used to arrive at work at 9am and pad quietly up through the building to his little office on the top floor. He would go in and shut the door and no-one would see or hear from him until 1pm when he would open the door, descend through the building and go out for his lunch. At 2pm he would return and climb back up through the building to his room.

His room was more or less empty. Not unpleasant, not austere, just empty. There was a table along one side wall which never seemed to be used for anything and his desk faced the wall under the window so that he sat with his back to the door. Upon his desk sat his computer and TV monitor, while to the side was some A4 paper, say half a dozen sheets, and a pencil with an eraser. Dave would write his code softly in micro-writing on a piece of paper, rubbing it out carefully if necessary, revising it thoughtfully, re-reading it and re-writing it until he was sure it would do what he wanted it to do. I called it micro-writing because it was so small that it could only be read at close range.

Once he was completely satisfied with his code, Dave would copy it into his computer and test it. I have no doubt that it usually worked first time.

My joke with Dave was that he was still using the same six pieces of A4 paper in the mid-Nineties, when he was working on pinball products for us, that he had started with in the early 80s when he was creating Technician Ted with Steve. I pretended that I knew that it was easier for him to rub out his micro-writing, once he had entered the code into the machine, and start again from the top of the same piece of paper than it was for him to leave the room and fetch a fresh sheet. I would stand in his room and tell him the joke (again) and he would smile, grin even, and then wait politely for me to turn and leave so that he could get back to his work.

Despite his quietude, Dave had an almost instinctive understanding of the world outside. He had that plain-spoken, straightforward view of the way things worked which is common to many engineers. I suppose that if you wrestle with reality and bend it to your will each and every day of your working life then you naturally see the world more or less as a mechanical device. I once asked Dave if he was pleased to have left GEC-Marconi for a life working on computer games. "Yes." he replied, "The only problem is that I don't have a hobby anymore." That sentence, short and to the point, succinctly captures Dave's wisdom and self-knowledge.

Technician Ted was fiendishly difficult to play, partly because it had "pixel-perfect collision detection". I coined that phrase to describe the exact accuracy of the collision system and we used it in the press releases that we sent to journalists. We also put it on the back of the cassette box. I am pleased to say the journalists picked it up and used it themselves and so it became identified with the game. We were saying, in effect, that other games were inferior because they did not have pixel-perfect collision detection.

To tell the truth I was not the least convinced that the enjoyment of the game flowed directly from the collision detection system, but I was quite happy to make that suggestion in our PR campaign. I had begun to realise that it was our job to provide journalists and reviewers with words they needed to fill their columns. The easier we made their job, the happier they were to write about us. And the more they wrote about us and our products, the more our reputation grew and the more we sold.

Technician Ted was reasonably successful for us although it was never a chart topper. Fundamentally it was just another platform game, one of many on the market. Perhaps the fact that it was very hard to play counted against it too. The truth is that good games of an established genre like Technician Ted can sell well with the right marketing, but good games which are also highly original can sell much better.

It was about this time or perhaps a little later that Clive Sinclair announced the 128k version of the ZX Spectrum and we were asked, as were many other companies, to produce a 128k game for launch. We decided to ask Steve and Dave to create an extended 128k version of Technician Ted, and they duly obliged.

As part of the launch, we were invited to Sinclair's HQ in Cambridge. I was somewhat bemused by the invitation because the truth is we had never had any contact with the hardware company before and we had very little further contact thereafter. The invitation came out of the blue and the whole event was a one-off.

At this time, of course, I was continuing to write my monthly Hewson's Helpline column for Sinclair User. For some reason I got the idea into my head to write a spoof article about being asked by Clive Sinclair to visit the Sinclair HQ in Cambridge. In my spoof, I wrote that he had offered to send a car to pick me up from my home in Oxfordshire and whisk me off to

Cambridge, and that it was only on the day that I discovered that the car was a C5. The C5, of course, was the strange single-seater electric vehicle that Sinclair had recently put on the market. In my piece, I carefully described the trials of my fictional C5 journey cross-country to Cambridge. I sent it off to Sinclair User and somewhat to my surprise, they printed it with a cartoon of me sitting in the C5 at the head of the page.

By now Hewson Consultants had firmly established itself as a top-tier publisher of ZX Spectrum games, thanks to the success of titles like Technician Ted, Avalon and Nightflite. We had survived the transition from a hobbyist market to a professional, high-street retail industry and more importantly we had created a virtuous circle by attracting the best programmers, in no small part thanks to the lucky break of my Sinclair User column. We were very selective about the games we published and therefore created a reputation for quality which attracted more great programmers.

However, the industry was moving fast and there were plenty more challenges ahead. Success breeds competition and Sinclair would not have the market to themselves for long. It was an exciting time, but it was also no time for complacency and Hewson Consultants needed to stay on its toes.

PIONEER'S PERSPECTIVE: STEVE MARSDEN

I copied Technician Ted onto five cassettes and mailed them all out at the same time. Melbourne House was one of the largest publishers I contacted but the first company to respond was Hewson. They phoned me at work when I worked as an electronic engineer in a semiconductor (chip) factory (Marconi Electronic Devices Limited or MEDL for short), so I would get a tannoy announcement on the factory floor to go and answer personal phone calls. The other companies gradually wrote back to me and 3 turned it down flat with mainly negative comments that would eventually kick them in the arse. Firebird Software was the other serious company who wanted to buy the game but they saw it as a budget title so we plumped for Hewson.

I worked with Dave Cooke in the semiconductor plant for two years from 1982 – 1984 and we started writing Technician Ted in 1984. We were both nerdy electronic/computer types and we were always bouncing ideas off each

other at break times. After Manic Miner and Jet Set Willy became the biggest platform games of the day, I was convinced we could improve on the technical aspects of the programming – which we did.

Dave was always inspired to go and tinker with things after we'd brainstormed ideas. I'd work on something, he'd work on something else, and we'd join the ideas up at the weekends or evenings. Dave was quite an introvert though and over the years he settled into exclusively working back at the office (after we left the factory and set up in business). I was more outgoing and extroverted and the combination worked well for years.

Technician Ted wasn't really about a character; it was about all the processes required to make a real semiconductor. The name "Technician Ted" was really an afterthought hence its appearance as "featuring…" after the main title on the opening screen. I learned over the years that no matter what you call something, there is always someone else wanting to change the name. Americans do it all the time, hence their European imported products usually having different names. It was no biggie that the game was sold as Technician Ted but people have always asked me why the home screen says "The Chip Factory."

Monty Python was an inspiration for the game, as was Wile E Coyote and the ACME gags in the Warner Brothers cartoons. The Warner Brothers' animator Chuck Jones has always been a favourite of mine. The factory acronym "MEDL" was pronounced "medal" by employees but in the game, I rejigged it as "MUDL" or muddle – a jibe at some of the haphazard organisation in the factory.

It was good to see it in the shops because at that age, in my early 20s, the concept of accomplishing that was huge and you had no idea of the world and how things worked. I was buzzing and so were the rest of my family and friends. I guess it was a big deal for me being so young and so I've got fond memories of that era.

AWARDS AND ACCOLADES
1983–1985

THE GOLDEN JOYSTICK AWARDS

Year	Award	Recipient
1984	Game of the Year (commended)	Avalon
1984	Software House of the Year (commended)	Hewson Consultants

NEWSFIELD PUBLICATIONS

Year	Award	Recipient
1984	CRASH Smash Award	3D Lunattack
1984	CRASH Smash Award	Fantasia Diamond
1984	CRASH Smash Award	Avalon
1984	CRASH Smash Award	Technician Ted
1984	CRASH Smash Award	Dragontorc

PRODUCT SUMMARY
1983-1985

Year	Product	Primary Platform
1983	3D Space-Wars	ZX Spectrum
1983	Dilithium Lift	ZX Spectrum
1983	Heathrow Air Traffic Control	ZX Spectrum
1984	3D Seiddab Attack	ZX Spectrum
1984	3D Lunattack	ZX Spectrum
1984	Avalon	ZX Spectrum
1984	Technician Ted	ZX Spectrum
1984	Fantasia Diamond	ZX Spectrum
1984	Knight Driver	ZX Spectrum
1984	Heathrow International Air Traffic Control	ZX Spectrum
1985	Dragontorc	ZX Spectrum
1985	Southern Belle	ZX Spectrum
1985	Astro Clone	ZX Spectrum

1985—1986
COMMODORE KINGS

The arrival of the ZX Spectrum and the C64 were huge turning points for the industry. Other machines came into the market including the Oric, the Dragon 32 and the Amstrad CPC while the BBC, with the BBC Micro, got in on the act in their usual lumbering, heavyweight sort of fashion. However, for me the ZX Spectrum and the C64 were the key machines in terms of market share.

FORMAT WARS

Commodore called themselves Commodore Business Machines and always promoted their hardware, including the Amiga in later years, as business computers. I still find that bizarre. Everyone who bought a C64 knew they were going to use it for gaming. Maybe kids told their parents that it was to help them with their homework or husbands convinced their wives that it would help to track the family finances, but the reality is that everyone knew it was a gaming machine. So why on earth did Commodore stubbornly insist on marketing their machines as business computers all the way through to their demise? I didn't understand it then and I still don't understand it now.

The BBC helped albeit somewhat woodenly. It was evident that their top brass were simultaneously baffled and bemused that the public should be subverting their self-evident, God-given, government-protected right to dominate the nation's television sets and to project themselves into our living rooms. The Beeb made some truly dreadful TV programmes attempting to showcase computer games by asking one or two minor celebrities to interview a few youngsters while watching them play. None of the programmes worked and some of them were excruciating. Just as with Commodore, the BBC seemed to have no corporate understanding of why people loved their home computers or why they wanted to play games on them.

The BBC made no attempt, as far as I am aware, to reach out to the nascent games industry in order to try to understand what was going on. No-one in the business was pulled in by the BBC to act as an interpreter for example. A corporate reluctance to sully themselves by contacting developers or publishers directly would be understandable. Nonetheless they could have recruited a couple of journalists as advisers from one of the many computer magazines in the market. It is all very surprising considering that at the back of every control room in every studio there must have been a young computer enthusiast who was looking forward to playing a computer game at home at the end of the shift.

The BBC's failure to generate a corporate understanding of computers is a fine example of how an organisation which thrives in its early days by mastering a new technology can lose touch with the modern world once its own technology is no longer at the cutting edge. What were extraordinary achievements yesterday become routine requirements today and are barely worth mentioning tomorrow. Power moves from the creators, who move on to new, more exciting pastures, to the deliverers. The organisation continues to pride itself on its technical prowess without collectively realising it has become an empty shell like a mighty suit of armour with nobody inside to make it work.

In fairness the BBC Micro did play its role because serious people who were intellectual about owning a computer could buy a BBC Micro, which was big, heavy and serious looking, and talk about it at their next dinner party. Or parents could buy the BBC Micro and justify the purchase by

picking up some of the rudimentary educational software that was available. But of course their children cared not a jot about the educational software. All they wanted to do was to get a computer and play games or to try to write games of their own.

Crucially, all these machines were open platforms. Anybody could program a ZX Spectrum or a C64 or a BBC Micro and anybody could publish games and software for them. It was the open platforms that got the industry off the ground. The closed platforms, the consoles, did not take hold in the UK until a decade or so later.

GRIBBLY'S DAY OUT

Thanks to the talents of Mike Male, Steve Turner and others, Hewson Consultants had forged a positive reputation on the ZX Spectrum. However, the new 64k machine from Commodore was still virgin territory for us.

It was around this time that Steve Turner told us he had recruited a colleague, who started out converting some of Steve's titles to the Dragon 32 before going on to work on a C64 game. I don't know how Steve and Andrew Braybrook met, I think they were already friends, but Steve told me in his typically subdued fashion that Andrew's new game was looking "really good".

Talk about an understatement! The game was fantastic, in the proper sense of the word, and completely off the wall. Laying eyes on Gribbly's Day Out for the first time was a bit like watching an 8-bit, pixelated vision of somebody else's LSD trip.

It begins with a sycamore seed spiralling down from the top of the screen which then morphs on landing into something which looks a bit like a Greek column. The column starts to flip over and over like a slinky-spring as it walks across a psychedelic landscape brought to life by the C64's impressive colour palette.

Gribbly's Day Out was an expedition in a fantasy world full of weird and wonderful creatures, enriched by an enchanting backstory which Andrew Braybrook had written himself. We published that story in the cassette inlay just as he had written it.

Gribbly, the eventual eponymous protagonist of the game, was a one-legged gribblet who hopped along the screen with a "boing, boing, boing" sound effect when on the ground, but who could also levitate freely through the air. For each level his mission was to find a set number of baby gribblets and return them to the safety of his home cave. In order to accomplish this task the player had to navigate Gribbly through precarious electric force-field mazes which stretched across the sky while avoiding all manner of bizarre creatures, including terrifying flying crabs which stalked the player if they dared to venture too close.

The principal antagonist of each level was the dreaded black crab, Seon, and my daughter, who was six or seven years old when the game was released, still talks to this day about how frightening it was. In the opening act it dwelled somewhere near the top of the scrolling level, but the player never knew exactly where and would therefore avoid visiting the upper areas for as long as possible. Eventually, of course, the time would come when it was necessary to venture up there in search of the last few gribblets, which is when it would make its presence heard.

The chilling hiss of "kkkkk, kkkkk, kkkkk, kkkkk" cut through the otherwise tranquil soundscape of the game from somewhere off screen. The player never knew from which direction it was going to come, only that it *was* coming. Suddenly a dark shape would flash across the corner of the screen, moving fast but erratically, before disappearing once more.

"KKKKK, KKKKK, KKKKK, KKKKK"

When the harrowing abomination of spindly legs and snapping claws finally emerged fully into view all pretence of control would be lost as the player lurched at the joystick in a panicked attempt to escape. In its movement the black crab was like a huge, hairy house spider suddenly disturbed from beneath a bathroom towel; rushing in one direction before inexplicably darting in another. But unlike the innocent spider fleeing on instinct, the black crab was relentlessly hunting *you* and swiping away your carefully collected gribblets in the process.

This potent cocktail of anxiety and panic was no accident. Andrew Braybrook had crafted every exquisite detail to create the effect he desired, just as he had expertly crafted everything else from the colourful sprites to the

charming back story. It was immediately clear that Andrew was a superstar games creator in the making.

As well as being Andrew's debut title, Gribbly's Day Out was also our first game on the C64. We commissioned a suitably vibrant piece of cover art for it, sent copies to the press and shipped it to retailers. Just like Avalon before it, Gribbly's Day Out was strikingly original. The game received very positive critical reviews, but in truth the press did not yet yield the massive influence over consumers that they would later acquire. We were still in the early phases of the trade sucking goods into the distribution pipeline rather than consumer demand pulling them through and in any case the specialist press was still finding its groove.

What is more, although Gribbly's Day Out was obviously a brilliantly innovative game, it was so off-the-wall that it did not slot easily into any kind of recognisable genre. Avalon, which we released the year before, was equally original as a computer game experience but it had the advantage of appealing to existing demographics like Dungeons and Dragons players or Tolkien fans.

People rightly remember Andrew Braybrook for the likes of Uridium and Paradroid, but I still have a soft spot for Gribbly's. For me it is a cult classic Braybrook title which introduced us and the world to his unique talent and fantastic imagination. If you have yet to play it, I highly recommend hunting down a copy on eBay.

Even though it did not sell especially well, Gribbly's did make for a fine introduction of Hewson Consultants and Andrew Braybrook to the C64 market. Fortunately for us, the obvious quality and sheer originality of Gribbly's Day Out had captured the attention of the C64 press, laying the ground for another industry first; the Paradroid Diaries.

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"The first Hewson game I played as a reviewer was Gribbly's Day Out, which we reviewed in issue three of ZZAP! 64, and gave 90%. That was a really great game that in retrospect probably deserved another couple of points on its final rating.

I remember seeing it for the first time, and watching Gribbly as he made different expressions as I moved him around the

landscape. There wasn't anything else like it at the time, and I just fell in love with the character. Gribbly's Day Out was a very early character-driven game, and it was just really appealing. The gameplay was cute and fun too, making the whole package something really special.

In a way, it feels like a precursor to some of the popular Nintendo Entertainment System platformers, and character-driven games of the late 80's."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

PIONEER'S PERSPECTIVE: STEVE TURNER

I met Andrew through a mutual friend shortly after I moved to Witham. We all played in a local rock band called No Class. Andrew had written some games at work for an IBM mainframe and people played his multiplayer games via terminals.

When I left work to write games he started programming 3D Space Wars on his dad's Dragon 32 to prove he could write games and made it clear he wanted to work with me. I invited him to an interview and offered him a job which involved part payment and part royalties as I was not making much money.

The initial idea was that he would convert my games onto the Dragon. Unfortunately the Dragon went out of business and shops stopped ordering games overnight. Andrew's three conversions only sold a few copies. He then moved to the Commodore 64.

Andrew was really keen to design a game specifically for the C64. He had just finished work on a C64 version of Lunattack and realised that games designed for the Spectrum did not bring out the best in the C64. He started off by getting a backdrop scrolling around being inspired by Roger Dean landscapes on some of the Yes albums.

He then started work on the main character. This was specifically designed to fit in a couple of hardware sprites. He found that he only had room for a head and one foot – Gribbly was born. Originally he was going to

have a little flying saucer to travel in but this used too many sprites so went by the wayside.

I really liked the way Andrew animated the Gribbly character. It looked really good but at that time there was no real game idea other than it being a platform style game.

This started off because Andrew really liked the look of C64 games and the chip was related to the chip he coded for on the Dragon 32, albeit with a much more primitive code set.

When the Dragon 32 market collapsed overnight we were careful not to rely on only one platform. The big problem was which platform out of all the new ones to pick. In those days contenders were launched all the time. I was acutely aware of the Spectrum's limitations which meant it would soon be obsolete and was keen to move on, but while it was selling and before a new market leader emerged it would have been commercial suicide for me to stop.

THE PARADROID DIARIES

Not long after the release of Gribbly's Day Out I found myself on a train bound for Yeovil to meet Chris Anderson, the man who had been given the job of setting up a new Commodore 64 magazine called ZZAP! 64. I have little doubt that the quality of Gribbly's had helped to put us on their radar and might well have prompted the invitation. I had not met Chris before, but he was clearly a sharp guy and in the years to follow he would go on to make a fortune setting up Future Publishing.

At lunch time he took me to the local pub and we began to chew the fat, as you do. He told me that he had first entered the magazine business while working in the Far East and then he asked me what we were working on.

I told him that Andrew Braybrook was already developing his next C64 title hot on the heels of Gribbly's and that it was another entirely original concept. Chris was intrigued. He took a sip of his pint and sat back in his

chair, before casually telling me that he would like to do a "Programmer's Diary" for the game in his new magazine.

You have to understand that the concept of a programmer's diary was entirely new at that point in time, so I asked him for some more details. Chris's idea was for us to write a monthly column about the process of developing the game, which would be published in ZZAP! 64 each month, leading right up to release.

My head was spinning. Although I was still very green in the world of business, I had by this time gained an understanding of just how important PR was to the success of a game. I knew immediately that this was a massive marketing opportunity and that we would get acres of free coverage in the magazine.

Two further reactions also surfaced in my mind. Firstly, I knew that the column had to be written by Graftgold, not Hewson. If this was going to be presented as a "Programmer's Diary" then it needed to be an authentic, genuine account of what it was like to actually sit down and program a game. However, I also knew that Andrew and Steve were incredibly busy getting on with that very job – developing games was what they did day in and day out for a living and it was seriously hard work. Part of our role as their publisher was to shield them from external pressures as best we could so that they could concentrate on doing what they did best.

On the other hand, I already knew that Andrew Braybrook could put pen to paper and write – his wonderful Gribbly's Day Out storyline had proved that. In principle I knew that he could do it.

My next reaction seems rather daft in retrospect, but in the moment it felt prudent. This is an amazing opportunity, I thought to myself, but I must not overreact. I might feel like punching the air and jumping for joy, but I must not let Chris know that. If I react like that in front of him, I reasoned, he will take for granted our involvement and the extra work required. So I supressed my inner enthusiasm and did my best at playing hard to get.

I made it clear that I thought it was a good idea, because it obviously was, but I expressed to him my concern that it might be too much of a distraction for Graftgold from their development work. As I have said this was a genuine concern, but I had already convinced myself that it would

not be an issue, on account of Andrew Braybrook's obvious writing talents. "I'll have to talk to Graftgold about it and see what they think" I shrugged with feigned ambivalence, "but don't get me wrong, I think it's a good idea."

Perhaps Chris saw right through me, I have no way of knowing. We never talked about it in later years. In any case the conversation rolled on over a pint or two and then we wandered back to the train station. His parting remark as I jumped out of the car was "Don't forget to ask Graftgold about the programmer diary!" I half imagine now that he knew exactly what I was up to and said this with a knowing smile, but then again Chris was very young himself at the time.

I did not phone Graftgold immediately, I think I might have travelled over to Essex to discuss it with Steve and Andrew in person. Sure enough, they both bought into the idea and the deal was sealed. As expected Andrew was absolutely brilliant at producing the column each month. He recorded every step of the development process, from drawing up the sprites on graph paper to his methodology for programming the various routines under the hood.

We put ourselves as intermediaries between Graftgold and ZZAP! 64 and to begin with I edited Andrew's diaries here and there. Steve Turner told me recently that one edit in particular sticks out in his mind. The original copy that Graftgold sent to us told of Steve throwing a ruler at Andrew and missing. I added, for reasons that I have long since forgotten, that the ruler hit the cat. Steve and Andrew were still working from Steve's house at this time and Steve didn't own a cat, so of course they knew that I had added this embellishment. So, dear reader, if you followed the Paradroid Diaries every month in ZZAP! 64 then please accept my apologies for the fabricated feline.

However, I soon realised that Andrew's articles were always polished, complete and entertaining, much the same as Graftgold's games themselves. There was clearly no need for me worry about editing them, so I quickly took to simply reading the column when it arrived, smiling to myself and sending it straight on to the magazine.

The Paradroid Diaries were a huge success. Not only did they give us brilliant coverage for the game, but they engaged readers in the fascinating work that Andrew was undertaking and helped to build his profile as a

superstar developer in the process. It is difficult to conceive of a more effective means of building anticipation for the game's release.

What is more, I believe the Paradroid Diaries were the first developer diaries to appear in any magazine. I realise that is a bold claim and I cannot be completely certain, but until somebody proves otherwise that remains my belief. Of course all of this would have been rather meaningless if the game itself had turned out badly. Fortunately, as retrogaming history records, Paradroid was not just a great game, it was phenomenal.

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"I'm fairly certain ZZAP! 64 was a pioneer in the developer diary concept. It grew naturally from the Newsfield notion that computer games programmers should be given full credit for their efforts and promoted very much as pop stars are, which would be to the benefit of their 'record label' – the software house."
Roger Kean, co-founder of Newsfield, publishers of CRASH and ZZAP! 64

"I knew Andrew's quirky sense of humour would lead to an interesting article. I remember how Andrew Hewson edited the first episode to add a fictitious cat who got hit by a shattering shatterproof ruler. In the end Andrew Braybrook used to send his copy straight to ZZAP! 64. The Diary is online and reminds me of the fun and aggravation we had in those days dealing with machines that crashed at the slightest temptation."
Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

PARADROID

I have a confession to make. When Paradroid was being developed, I was not immediately convinced that it had hit potential, even though I had total faith in Andrew Braybrook and Steve Turner. As a rule, we only worked with people who were absolutely professional and knew what they were doing, so I never had any reason to doubt them. I could see what the game

was about, I could see how it related to popular science fiction franchises and I could see that it was another highly original Braybrook offering, but nevertheless on first encounter Paradroid did not hit me with the same kind of wow-factor as had Avalon and Gribbly's Day Out.

From a technical point of view, it was as fascinating as ever to listen to Andrew describe the processes and techniques he was employing. Being from a technical background, I liked to kid myself that I was able to communicate on the same wavelength as our programmers. I am not sure to what extent that is true but it certainly heightened my appreciation of their talent and dedication.

Given the amount of attention we had drawn to the game with the Paradroid Diaries it is fair to say that there was a small corner of my mind where I was nervous that the game might not live up to expectations. I worried that something might go wrong.

However, despite my inability to immediately grasp the genius of Paradroid, there was never any question of us interfering with the creative process. The upside of being a highly selective publisher who only pursues the cream of the crop is that it leaves you content to trust your developers and let them do what they do best. On some projects we provided feedback, acted as a sounding board or responded to requests for help, but I think it is fair to say that we never insisted on fundamental changes.

By the time Paradroid was released the specialist press was beginning to assert its influence over consumer demand and the column in ZZAP! 64 had whipped up anticipation for the game. We were ready to capitalise with a carefully orchestrated marketing campaign and everything was good to go.

Paradroid sold well on release, but it was not an explosive hit, at least not immediately. Looking at screen shots of Paradroid today it is instantly recognisable and it is not too much of an exaggeration to say that it remains one of the most visually distinct and iconic games of its era. However, at the time of release it was not an instant "I've never seen anything like that before" type of game. It benefited from the publicity of the Paradroid Diaries and some great critical reviews but it did not fly off the shelves as an impulse purchase. Somehow, I suppose, its minimalist visuals did not instantly grab the buying public.

However, the experience of playing Paradroid was and still is like no other game. As a game design case study it must surely go down as one of the most elegant and strategically beautiful titles in history. As a videogame experience it is a pure, stripped back demonstration of what all great games are at their heart – a carefully orchestrated set of interactive systems perfectly balanced for entertaining experience. The game is beautifully poised, with each system conspiring to pull the player a little further into its blend of arcade action and strategy. As a result, despite not being an instant hit, Paradroid became a word-of-mouth classic.

When a game is as elegant and well balanced as Paradroid, it is easy to think that it was straightforward to develop but that is only because it is a beautifully finished product. There is a quote often attributed to Winston Churchill which is appropriate. He apologises because he is about to deliver a long speech and then explains that he, "did not have enough time to write a shorter one." Similarly arriving at a game as refined as Paradroid is often a much more painstaking process than creating a bigger, more complex but less elegant game.

Most game developers are not like Andrew Braybrook. Everything he did was highly original and his catalogue remains distinctive to this day. I cannot name another game that is similar to Paradroid, leaving aside clones and emulated remakes. Nor is there anything to match Gribbly's Day Out. His later titles are similarly unique.

Uniqueness is one of the reasons why Paradroid continues to appear in many critics' lists of the top games of all time. Paradroid's simple rule set creates an open-ended system that fosters emergent gameplay and enables the player to take a different approach on each playing occasion. The self-balancing difficulty curve created by giving the more powerful robots a higher energy burn rate, and the natural reduction in opportunities for recovery as robot numbers decline, combine to make the completion of a level satisfyingly difficult without the artificial introduction of a conventional end-of-level monster. And the minimalist visuals that looked unremarkable on first release, are now instantly recognisable amongst the noise of generic screenshots when glimpsed from the corner of the eye in the pages of magazines like Retro Gamer.

Whatever it is that makes Paradroid so special, it was clear then and it is clear now that its creator was a unique talent. Andrew Braybrook, more than any developer I have known, was able to create completely original games seemingly from nowhere. But perhaps he was still warming up, because while Gribbly's Day Out largely sailed under the radar and Paradroid became a cult-classic rather than an instant smash, his next game was set to take the charts by storm.

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"Paradroid is one of my all-time favourites. It's a brilliantly designed title that has timeless gameplay in which you enter a space ship that's filled with robots and attempt to destroy them all. Superb controls, some great dynamic puzzle sequences and some white-knuckle shoot 'em up action all conspire to help make Paradroid one of the all-time great games."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

"The standout game was Paradroid, programmed by Andrew Braybrook at Graftgold. Andrew wrote a diary of the game's development in ZZAP! 64 which I read and re-read trying to understand and decipher any techniques and concepts to learn as much as I could about writing games. I recall eagerly awaiting it to be published, and was not disappointed when I finally played the game. I don't think I ever finished it but it's a game that I fondly remember to this day."
Gari Biasillo, creator of Slayer, Steel and Future Basketball

PIONEER'S PERSPECTIVE: STEVE TURNER

Cute robots had appeared in several films such as Star Wars, Black Hole and Silent Running so I thought that this could make a good game character.

I can remember giving Andrew a brief to design a game based on a cute robot, thinking of his brilliant characterisation of Gribbly. He came back

the next morning with a small bit of paper that outlined his Paradroid idea. It began with something like "cute and robots don't go", but essentially in a few lines it outlined Paradroid.

He wanted a droid that could take over other droids on a spaceship that was shown by a very hi-tech display. The hi-tech bit just didn't work on the C64 which didn't have the resolution for fine lines. I was a bit worried at first that the look was not working.

When Andrew faced a tough problem he would do things like the intro screen and font. The title graphic of the Paradroid name eventually inspired the bas-relief look that Paradroid used.

There was a period near the end of the game where the gunsight control mechanism was just not very playable. Andrew kept revising it putting in increasingly complex code. The issue was that the gunsight took too long to move over an enemy, especially if it was behind you. In the end the gunsight was removed being replaced with the simple rule of using the joystick direction for the bullet direction. This meant you could flick a bullet behind you if required. Simple is very often the best solution.

There was a lot of tension when Andrew delivered the copy to ZZAP! 64 to review. Andrew used to hate the moment a program was no longer his baby, and it was in the hands of reviewers and publishers. Having published the diary we felt the game just had to live up to the expectation the pre-publicity had engendered. I think they felt just the same at ZZAP! 64. They had a reputation of saying what they thought about a game and would be in an embarrassing position if they did not like it.

Any worries were dispelled when Julian Rignall gave it a thumbs up dubbing it "the thinking man's shoot-em-up". The success was a huge relief for me personally. Through no fault of his Andrew had been a loss to me for two years then suddenly sales of his new game were exceeding mine. This meant he would get a bonus based on royalties giving him a decent wage for the first time.

He always said he would work for me for nothing if he could afford it but he really did deserve proper pay. Unlike me he would work on when I "went

home" and would sometimes take a machine home to do more. People have often said to us it must be nice to play games all day. Generally, people have no idea of the hard work needed to complete a game.

I am very proud to have been involved with Paradroid and pleased for Andrew. I spent a long time thinking about why the game worked so well and used many ideas from it in my own games.

I think there is something very special about Paradroid that is hard to beat, even with today's hardware. I always use it as an example if I am talking about gameplay. The way advancement is balanced out with increased risk due to droid burnout is just a masterpiece of game design. This is also present in the way that killing the droids also makes it harder for the player as ultimately he needs them. Usually games where you can freely rove get tame when the enemies are cleared out. The fact that the timing of killing the last droids becomes crucial gives the game a crescendo of adrenaline at the end of a level.

THE POWER OF THE PRESS

The success of early pioneers like ourselves drew a lot of copycat operations into the market and without naming any names, the technical understanding of their business leadership left a lot to be desired. Many of them believed the get-rich-quick stories of bedroom coders making a fortune in their spare time. Few of them understood the hard graft that was required.

As a result, in the mid-1980s far too many inadequate products came on to the market, products which were released way too early in an unpolished state. The response from the buying public was that they soon learned to read the reviews in the specialist gaming press before parting with any hard-earned money. In next to no time, it seemed, computer magazines emerged as a formidable force in the industry and acquired a healthy amount of power over consumer behaviour. They became enormously influential.

The press, of course, had privileged access to the programmers and the publishers and so they were able to secure early review copies and demos. If

the journalists disliked a game they would mark it down, quite rightly, and so the quality of products rose steadily throughout the decade.

Interestingly, just as there were new games publishers who felt they could chuck out any old rubbish on to the market and expect it to sell, there were also magazine publishers who took the same never-mind-the-quality-feel-the-width attitude. The poor old journalists who worked for these, ahem, not so good magazines would arrive early at our press launches, look vaguely sheepish through the whole event and leave late wearing a hangdog expression. There really is nothing worse than being unable to take pride in your work.

The quantity of products flooding the market in the mid-80s and the poor quality of so many of them made the buying public very cynical and that cynicism was very corrosive. I remember later in the decade visiting WH Smith in Reading one Saturday afternoon and observing two or three young lads flicking through the pages of the computer magazines on display. By this time publishers were making immense efforts to provide quality products supported by stunning artwork, wonderful playable demos, brilliant screenshots and detailed explanations for the press to absorb and use. There were half a dozen major releases each month and the best games magazines were packed with informative, enjoyable double and triple page spreads. But as I watched that Saturday afternoon I saw these young lads pooh-pooh most of what was being laid before them. Their judgements took a few seconds at best and were mostly single word dismissals – crap, rubbish, boring. Oh dear, I thought to myself, how harsh we are to one another.

For the most part Hewson Consultants was able to achieve high scores in reviews on a fairly consistent basis. We were not perfect, far from it, but we got it right very much more often than we got it wrong. However, even when we got things wrong, we were still working incredibly hard. We certainly never set out to make a poor game, but sometimes things just do not work out. We were still risking our livelihoods.

As a publisher the magazines became very important to us, partly because they had a powerful influence over the sales potential of our games and partly because they wielded the barometer against which we measured our own standards.

Watching those young lads in WH Smith casting judgement was a sobering experience but the reality is that we all live in a consumer culture and we all have extremely high expectations. As consumers we are hugely dismissive of anything that fails to live up to our demands. A score of 4/10 in a computer gaming magazine is nothing like adequate, as far as consumers and indeed the publisher is concerned, but that score is not a measure of the effort, the hard work, the commitment, the risk, the challenges or even the professionalism of the team behind the product. It is a measure of the final experience and sometimes, despite best efforts, a game fails to come together as intended.

It is a harsh reality and at times it is tempting to lament the fact that the public fail to appreciate just how difficult it is to produce a videogame. However, I have no doubt that I am equally as clueless about a whole range of other industries where as a consumer I am ruthlessly judgemental of the end product or service. To succeed in a consumer society, nothing less than exceptional standards will suffice. That is just the way it is.

PIONEER'S PERSPECTIVE: ROGER KEAN

The press became an immensely powerful influence on games sales, not surprisingly considering the nature of the computer games market: newly emerging, fanatical, always grasping for the innovative and the next best thing. The school playground was the battlefield and the generals marshalled their forces under the banner of their favoured publication. Many people since, now in their late thirties or early forties, recall that both CRASH and ZZAP! 64 above all others were an essential part of their life. They read each issue from cover to cover and then started over again to while away the time to the next issue. That being the case, it's no wonder they had a profound influence over buying decisions.

There never was a formal agreement between Newsfield and WH Smith but there was a lot of weekly contact and we did fax completed reviews to the buyers in Swindon so they had some advance idea of what was – to put it in Twitterspeak – trending. I spent a long day at WH Smith head offices

in Swindon at some point between issues 3 and 4 of CRASH at which they expressed an interest in seeing early reviews or peer playtest opinion. Perhaps it's not surprising in as much as CRASH was the first magazine WH Smith stocked which lay claim to reviewing everything released in the month rather than the rivals who only reviewed what they fancied.

URIDIUM

The brilliance of Uridium was obvious to me from the first moment I saw it at Steve Turner's home in Essex. I had cut my teeth on the ZX series of machines from Sinclair, so I did not have the same level of technical knowledge of the C64, but even I could tell that this game was cutting edge. The silky smooth scrolling was beautiful to behold and utterly mesmerizing.

Unlike Paradroid there was absolutely no question that Uridium had that instant, "I've never seen anything like that before" wow-factor. It was a head-turner, pure and simple, and I knew that people would be immediately seduced by it.

So when I sat down with Andrew Braybrook to discuss the production plan for the project I wanted to convince him to produce a demo version of the game ahead of full release. Asking a programmer for a demo can be a dangerous thing. It is not like a movie where an assistant can just chop bits out and present an edited trailer, or a book where a sub-editor can polish up a section and send across the pages. A game is an entirety. It is a collection of interdependent systems that have to work together in harmony to create the final experience, so completing a demo requires the programmer to complete the majority of the work.

Time is a valuable commodity in games development so when a publisher requests a demo from a programmer the answer is always the same; "We can either work on the game or we can work on the demo, but we can't do both at the same time". I had never asked for a demo version before but the request had come down the line from our distributors. They were prepared

to ship demo copies free of charge to their retailers ahead of the release date so that the buying public could get a taste of what was coming by watching or playing the demo in store. It would also give us something to send out to journalists. Seeing was believing with Uridium and I knew the press would be all over it once they had laid their eyes on it. From a PR point of view, we needed the press to see it early.

I went through the development schedule and production plan with Andrew and Steve and after some discussion they agreed to do a one-level demo. It was delivered to us a couple of months before release day and although I recognised that it had been a significant effort for them I was confident their commitment would pay dividends.

By early 1986 when Uridium was released the industry was rocketing. The distribution pipeline was now fully mature and the specialist gaming press had seized the initiative and become the opinion-formers and trend-setters that shaped consumer demand.

The release of Paradroid had established Hewson Consultants as a serious C64 publishing house and Andrew Braybrook as a highly respected developer, so new opportunities were opening up for us. The Paradroid Diaries in ZZAP! 64 had been regarded with envious eyes by rival magazine editors who were anxious to establish their publication amongst the emerging press elite. Every journalist wanted to become one of the king-makers of the UK games industry. It all played beautifully into our hands.

I knew we were in a strong position. With the Paradroid Diaries we had secured some powerful publicity ahead of release almost by luck. Now I wanted to do even better with Uridium. To help me I had a spectacular demo that was guaranteed to generate an appetite for coverage amongst hungry magazine editors. Tim Metcalfe, editor of Computer and Video Games (C&VG), worked in London but lived just twenty miles away so I was more than happy to pop along and see him when he invited me to his home.

Tim was a lovely chap. Quiet and diffident, he played the one-level demo from start to finish in calm, comfortable silence but with total focus. He maintained his casual, understated persona when he was done but I could see that he liked it. It was then that I revealed the other asset that

I had brought with me – the stunning Uridium cover artwork that we had commissioned.

We had two good airbrush artists who we came to use on a regular basis and when we commissioned a piece somebody from the company would go out to the artist and demo an early version of the game. I claim no credit for the Uridium cover because it was not me that went along. To be fair to all concerned it was easier to conceptualise the cover artwork for Uridium after seeing the game in action than it was for a more abstract game like Paradroid. Anyone can see that the Uridium artwork has to feature the Manta fighter, it must have the Dreadnought as a background element and it has to be set against the darkness of space. The artwork almost briefs itself. Nonetheless there's many a slip twixt cup and lip and so we were always a little nervous when we commissioned a new piece. On this occasion there was no slip. The Uridium cover art was stunning.

There was no doubt in my mind that Tim had been sold on the demo, even if he was not letting on. The Uridium cover artwork was the clincher. He took one look at it and then asked me directly "Can we use it on the cover of the magazine?"

So let me get this straight, I thought to myself. Here is Tim Metcalfe, editor of C&VG, asking me if they can use our game artwork for the magazine's front cover. A magazine which is going to plaster that game artwork all over the shelves of WH Smith and elsewhere and sell several hundred thousand copies. I think I can cope with that.

In exchange he wanted early access to the title so that he could publish a review ahead of magazine rivals, particularly ZZAP! 64. After a short debate we agreed he would add a two page write-up and we would take out a full page advert beside the review. I was a bit nervous because I did not want to upset other magazine editors but I felt having already favoured ZZAP! 64 with the Paradroid Dairies we were entitled to level the playing field by favouring C&VG this time around. The offer from Tim was irresistible and to be fair to him, he was making a huge bet on Uridium purely from the experience of a one-level demo.

When the Uridium review issue of Computer and Video Games hit the shelves our artwork was not merely on the cover, it *was* the cover! The

artwork had been flipped horizontally to accommodate the magazine logo, but otherwise it was unchanged and encompassed the entire background. We could not have dreamed of a better advert for Andrew Braybrook's brilliant shooter.

I heard afterwards that poor Tim had been in hot water following the release of the magazine. Other publishers who had content or adverts in that particular issue were upset to find the Uridium box art plastered smack-bang on the front of the magazine in its entirety. So Tim took a lot of stick and the end result was that no gaming magazine from then on had the box art for a game occupy the entire cover, so far as I am aware. Uridium was the first and the last and issue 53 of Computer and Video Games is unique as a consequence, although most people may not realise why.

Having given C&VG a head start, at the appropriate time we ran off a batch of copies of the demo on our in-house cassette duplication plant and shipped them first to the press and our marketing agents overseas and then to our distributors. We wanted everyone to know what was coming and to prepare themselves for the big event. By this point the next Andrew Braybrook title was going to be significant regardless, but the demo was a statement of intent – we were gunning for the top of the charts.

The strategy worked beautifully. Normally we had to chase distributors and retailers to stock our latest game, but with Uridium they were chasing us instead. As the hype continued to build towards release we even received follow-up phone calls from outlets anxious to ensure their order was secure. Suddenly everyone in the world was our friend and everybody wanted a piece of the action.

Anticipation for Uridium, amongst the press, the distributors and the retailers could not have been greater. We had a dream game and the PR and marketing machine to go with it. All we had to do now was to ship it.

SHIPPING URIDIUM

February the 28th 1986 is a day forever burnt into my memory. That was the day we shipped Uridium to retail and it was by far the biggest release

we had ever undertaken. By the time we were packing each cassette and loading them onto the lorry we already knew that Uridium was going to be UK number one.

The hype had been steadily building in the press on the back of our killer demo and the distributors were all over us like a rash. We had never experienced anything like it before. For the first time the whole distribution industry was gearing up for *our* release day and pursuing *us* for information, interviews, quotes, shipment guarantees, order increases, point of sale assets, marketing materials and everything in-between. The implication was clear. Uridium was set to take the charts by storm.

So it was with a heady mixture of excitement and trepidation that I set off into work the day before we were due to ship the game. I stopped what I was doing midway through the afternoon and headed into the warehouse to help pack up the cassettes and five-and-a-quarter inch floppy disks ready for shipping the next day. As usual we did all our own cassette duplication in house and now every cassette had to be packed up by hand.

We all worked late and I stayed up the whole night packing, packing and packing some more. I am not sure that it was absolutely necessary for me to do so but there is also a certain amount of anxiety which comes along with the knowledge you are about to ship a sure-fire hit. Everything had to be absolutely right, so I decided that it was easier to stay up and ensure that it all ran smoothly than it was to go home and toss and turn all night.

What is more, helping to pack the games we were about to ship enabled me to grasp the numbers in a more tangible way. Of course I already knew the size of the orders we had taken but I am a numbers man, and so seeing, packing and counting the cassettes and disks was both compelling and reassuring.

So there I was at day-break on the 28th still mooching about in the warehouse. The staff arrived for work no doubt with a sense of anticipation and I hung around getting in everyone's way. In due course the carriers started to arrive and one by one the boxes were loaded and the lorries rattled away into the distance.

The warehouse emptied and our treasure hoard was gone. All that remained was a big empty space littered with a few spoiled inlays and

shattered jewel cases. Months of toil gave way to the lonely realisation that there was now nothing left to do, nothing left that could be done.

I was tired of course and so at four o'clock in the afternoon I took one last look around and headed home. I had not slept in over thirty hours. At home I had a meal and sat down and dozed a while, but I found it impossible to unwind. I was too hyped up.

By eleven o'clock at night I was miserable. We had just shipped the UK number one game and I was the most miserable person on the surface of the planet. I find it ridiculous to look back on, but in that moment I was trapped in a thought cycle, reviewing everything we had done to get the game out of the door, the months of preparation, the toil, the highs and the lows. My mind kept swirling back to the same questions. How did this happen in the first place? How could we possibly accomplish this ever again? How could there ever be another game as good as Uridium?

With the benefit of hindsight, I think this episode reveals how tenuous our achievements always felt to me. I had set out to make some money from the new market in personal computers and in a few short years I had built a reputation, quite unexpectedly, as a computer games publisher.

The programmers I worked with, however talented and determined, were all young and were also finding their way in the new world that was opening in front of us all. On the whole they were a few years younger than me and they tended to look to me for advice. Me! I did my best when asked but I never regarded myself as a source of wisdom. I thought that if others were looking to me for guidance then we all had good reason to be worried.

The major reason for my lack of self-confidence was that by this time, in 1986, competition was everywhere. In retrospect I think I always assumed that the heavy hitters who had joined us in the market – organisations like BT, Virgin and the BBC – would bring their superior skills to bear and push us ingénues to one side. These days I would laugh at the idea of corporate organisations being anything like as light on their feet as we could be, but back then I assumed as a matter of course that bigger must mean better.

An event from three years previously had stuck in my mind when a friend who was an investment manager with the Prudential had informed my brother and me that we had had our fun and had made some money, but

now we should exit the business because the serious players were moving in. I had a nagging feeling that my friend must be right, because he had a posh voice and a public school education and, to cap it all, he had a degree from Oxford. The fact that he had invested the Prudential's money in the Dragon computer, a machine which bombed in the market, should have alerted me to the value of his advice. Unfortunately, it did not.

In retrospect I find the misery that I suffered that evening to be revealing for several reasons. First and foremost, I think it shows how the competitive pressure was already beginning to take its toll. I should have been out celebrating, punching the air and telling anyone who would listen to me that a company that I ran had just achieved something that others could only dream of. At the very least I should have been planning a joint company celebration with Steve and Andrew. But it never occurred to me. I was too embroiled in my own concerns.

Secondly, I can see now that I had no experience of competitive success (or failure for that matter) and in that sense my posh friend who had warned us to get out of the market was on to something. Along with a small group of others I had achieved something remarkable but in doing so I discovered the hard way that I had no understanding of how to deal with the aftermath. It had never occurred to me that an aftermath might exist. In the words of Kipling's poem, *If*, I had met with Triumph but had never known that it was an Impostor and I had no inner resource with which to deal with it.

Finally, I think this incident is a fine example of the extent to which we are prisoners of our emotions. We like to think of ourselves as rational beings with perhaps a thin veneer of emotion that bestows on us our humanity. I would certainly have subscribed to this view during the early part of my life. But these days I think this view is wrong, quite wrong. Nowadays I think we are driven almost entirely by our emotions and we use our intellect to justify, post hoc, the decisions which our emotions have already made for us. Most of the time our emotions operate below the surface, affecting our lives deeply but quietly, like the Gulf Stream that warms the UK and ensures that it is habitable. Occasionally, in extremis, our emotions flood to the surface and displace all rational thought. When it happened to me that evening, quite unexpectedly, I had no point of

comparison and I found no way to respond. So I suffered for a while. And then I gave up and went to bed.

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"We were really excited about Uridium. It was essentially coming off the back of Gribbly's Day Out and Paradroid, which we both absolutely loved at ZZAP! 64 magazine, and had rated very highly. Andrew Braybrook's reputation at that point was at its peak, and when he told us that he was working on a scrolling shooter with "bas-relief graphics" we were really interested to see it.

I remember playing an early preview version of the game and being exceptionally impressed. The feel of the game was superb, and it looked fantastic too. The graphics had real depth and it all ran very smoothly. I couldn't wait to play the finished article, and when I did, I wasn't disappointed. I remember Andrew Braybrook telling me that he'd made the game especially hard so that people like me would be challenged by it. I certainly was!"
Julian Rignall, games journalist and former ZZAP! 64 reviewer

"I absolutely loved Uridium when it came out. I'd read the development diaries of Andrew Braybrook in ZZAP! 64, and was in awe of the games he created for Hewson. Uridium was amazing, nothing like it had ever been seen on the C64 before – true arcade quality. I got to thinking: what would it look like if you were actually piloting the space-ship? So I created a tribute picture on the C64, which turned out pretty well apart from some wonky perspective. It ended up being my main demo picture and was directly responsible for me getting work from Firebird. To be honest at the time I hadn't considered sending it in to Hewson – I probably should have, maybe I'd have got some work!"
Stephen Robertson, game designer and former C64 loading screen artist

PIONEER'S PERSPECTIVE: STEVE TURNER

Paradroid really upped the ante for Andrew. He was now expected to write another hit and he really felt the pressure. He was determined not to program a variation of Paradroid to ride on its success and so ditched the all-direction scrolling in favour of a faster linear scroll.

His aim was to make a game that felt as slick to play as a dedicated arcade machine with smooth scrolling and full framerate updating. This meant the game had to draw a frame of graphics in time with the television display of 50 frames per second in Europe, and even faster at 60 frames per second for the USA.

Few games had ever achieved that but he was determined, using a combination of highly efficient programming and chip technique along with discreet optimisations such as reducing the area scrolled.

Uridium almost fell out of this overriding requirement. Andrew measured the time each sprite took and designed the game around the number of sprites he could process. He put the game together very quickly.

We used to swap ideas and trade techniques with rival programmers. It was a small, friendly business and we used to meet at shows or launches where most programmers liked to show how much they knew. Andrew built upon techniques other programmers had discussed with him and took scrolling to a new level.

I wanted to do something special for Uridium as I did not have time to do the music for Paradroid. It was the first time I used a package to compose the music on. I tried to compose a kind of John Williams fanfare as at the start of Star Wars with lots of fifths and octaves. I imagined it being played by a full orchestra starting off with the brass for the intro then the strings coming in, ending up with full orchestral crashes with cymbals and everything. Perhaps one day I'll try an orchestral version.

It's probably my favourite computer track that I have personally composed. It all happened very quickly, composition is like that when you are on a roll. I used to like it when the guns fired over the tune, but that must have been in an early demo because the tune stops before the game starts in the final release.

> We had very good reactions from our friends that used to playtest the game. There was no game on any platform that delivered such a sleek shoot 'em up experience. I just hoped it was not too shallow for the reviewers who seemed to use the phrase "just another shoot 'em up" for more and more game reviews.

MARKET FORCES

As expected, Uridium was the UK number one. Its release also brought home to me the extent to which the organisation of the industry had matured. The retail chains that had entered the market in the previous couple of years required that all outlets should receive stock of a new title at the same time and they imposed their demand on their chosen distributor who then placed the same requirement on publishers such as ourselves.

As a result the distributors had become very slick at getting a product through their warehouses and onto the shop shelves for a specific, fixed release date. The consequence for us was that the first shipment of Uridium was particularly big because we needed to provide sufficient quantity for the distributors to fill all those shelves simultaneously.

We were off to a great start but I soon realised that Uridium was, in the jargon of a retailer I knew well, "not a cash cow but a shooting star". The re-orders in March were about half the volume of the original shipment and then the next month they halved again. My trepidation on the evening that we shipped Uridium about the world we had stumbled into and the demands that it would continue to make of us was fully justified. Any lingering hope I had harboured that a UK number one title might buck the trend and sell steadily for month after month was well and truly crushed. Sales figures don't lie.

One of the biggest factors in the rate of sales decline was undoubtedly the rampant piracy we were witnessing. Our games were pirated wholesale everywhere, so the sales we saw and therefore the royalties which paid the likes of Steve Turner and Andrew Braybrook, were a fraction of what they

should have been. I still struggle to find the words today when, on occasion, I meet somebody who used to play our games and they tell me, in a nonchalant manner; "I used to copy your games and give them to my friends in the playground!"

How am I supposed to respond? I understand that it happened and to an extent I understand that it was just school kids being school kids, but there is no question that they were committing theft. Every time one of our games was pirated it deprived people throughout the chain of their income, all the way from the retailers back to the programmers. Some people might say "who cares, it's just nasty, corporate, business people" but actually it was a chain of human beings who were all passionate about what they were doing and trying to make a living. That includes, of course, the actual creative people who came up with the games in the first place.

Andrew Braybrook was about as close to a genius as I have met. Here was a man with completely original, ground-breaking ideas and the ability to convert those ideas into sophisticated, highly-playable, totally polished games, yet his income, as with everybody else in the chain, was a fraction of what it should have been as a direct result of piracy. Unfortunately, the technology we were using offered no protection against piracy and the sad reality is that, given the opportunity, most consumers are pirates.

I would go so far as to say that it was piracy that destroyed the open and creative nature of the games business in the UK. It didn't happen overnight, but by the end of the decade the writing was on the wall.

The result was that the door was left open for Nintendo to establish a business model under which the hardware manufacturers ruthlessly controlled the market. I realise of course that Nintendo themselves have produced many innovative, original games and have played a central role in shaping the industry as it exists today, but they have done so at the expense of a whole generation of creative UK software engineers. In the 1980s British developers were creating the greatest games in the world, although this fact is largely overlooked today, but by the 1990s we had been usurped by Japanese and American corporations.

I take my hat off to the likes of Codemasters, who with bloody-minded determination, took on Nintendo and won. I admired their determination

but it was not a battle that I wanted to fight. We were a small publisher that thrived on the open platforms and delighted in the opportunity they provided for our programmers to get down to the metal and create.

In due course the industry split in two. The open platforms were crippled by piracy, the new closed platforms were guarded by money men. If there had been a third option, an open platform which also offered robust defences against the ravages of piracy, perhaps the evolution of the industry would have followed a very different path. Today we do have those platforms and the result has been a great blossoming of innovation and originality once again.

We did, of course, license Uridium for release on the Nintendo Entertainment System. That was a bit of fun and it was the first occasion, as far as I can recall, when we exploited software IP that we owned or controlled by licensing it to another publisher outside the European market. It was an income stream that we would tap into on many occasions in the following years.

In hindsight the release of Uridium provided clues to the struggles that lay a few years ahead. In the meantime, Uridium was our first big hit, but it was certainly not our last.

AWARDS AND ACCOLADES 1985–1986

THE GOLDEN JOYSTICK AWARDS

Year	Award	Recipient
1985	Best Original Game of the Year (runner up)	Paradroid
1985	Programmer of the Year (runner up)	Andrew Braybrook
1986	Game of the Year (runner up)	Uridium
1986	Software House of the Year (runner up)	Hewson Consultants
1986	Arcade Style Game of the Year	Uridium
1986	Programmer of the Year	Andrew Braybrook

NEWSFIELD PUBLICATIONS

Year	Award	Recipient
1985	ZZAP! 64 Gold Medal Award	Paradroid
1986	CRASH Smash Award	Quazatron
1986	CRASH Smash Award	Pyracurse
1986	CRASH Smash Award	Firelord
1986	CRASH Smash Award	Uridium
1986	CRASH Reader Awards: Best Programmer	Stephen Crow (Firelord)
1986	CRASH Reader Awards: Best Shoot 'Em Up	Uridium
1986	Newsfield Reader Awards: Best Advertisement	Firelord

YOUR SINCLAIR MAGAZINE

Year	Award	Recipient
1986	Megagame Award	Quazatron
1986	Megagame Award	Uridium
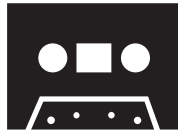
Year	Product	Primary Platform
1985	Gribbly's Day Out	C64
1985	Paradroid	C64
1986	Firelord	ZX Spectrum
1986	Pyracurse	ZX Spectrum
1986	Quazatron	ZX Spectrum

"One of the inspirations for Quazatron was Ant Attack from the early Spectrum days. I wanted to represent buildings in a more solid way than Avalon, without consuming too much graphics space. I had the idea of having top, middle and bottom wall pieces as I had previously used but this time filling them in and shaping them to fit together in an isometric projection. I drew many diagrams on squared paper to design the shapes of the pieces. I knew the solid approach would mean too many graphics to plot each cycle so I worked out a buffering system where a screen copy was kept so the backdrop could be rapidly restored if disturbed by a sprite moving on top. It was quite a different plot system than previous programs and it allowed me to plot multiple sprites on top of each other in 3D, in order, so the furthest were properly over-plotted by the nearest.

It was a technical exercise at first with no game. When Paradroid was selling well I realised a great deal of Paradroid

gameplay would work on the game world I had created. This also meant the game would be quickly playable."

Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

Year	Product	Primary Platform
1986	Uridium	C64
1986	Alleykat	C64
1986	Iridis Alpha	C64
1986	Uridium Plus	C64
1986	Technician Ted Megamix	ZX Spectrum
1986	City Slicker	ZX Spectrum

"City Slicker was developed around a pixel collision engine that was constantly being refined. Looking back, it was like building a car around an engine and I'm not sure that's the best way to do it. I think the car is analogous to the game that people want to buy and most customers don't know or care about the underlying technology – they just want a cool end product. Looking back, in the case of City Slicker there was too much emphasis on developing the pixel collision system at the expense of gameplay.

The games were being led by technology and platform games were the most suitable vehicle for the technology we developed starting with Technician Ted. Pinball eventually profited from that technology and it's a shame we didn't spot it earlier. Dave and I also used the same technology for other games like Super Cars and Grand Theft Auto."

Steve Marsden, co-creator of Technician Ted and co-founder of Spidersoft

1987-1989
THE GOLDEN YEARS

I have now been out of the games business for about fifteen years and have had time to develop a sense of perspective. As a result I feel that I am now able to reflect on what we achieved in a rather more measured way than when I was involved. Making games and putting them out on the market is a tough and stressful activity and it can be difficult to see the wood for the trees so perhaps it is not surprising that my opinion has developed and matured.

HEWSON'S REPUTATION

I think it is fair to say that we acquired a reputation for producing original, innovative, high-quality products. It is naturally very pleasing to hear that reputation sustained by retrogaming enthusiasts even today but I am not sure I was aware, back when I was in the eye of the storm, of the enthusiasm we were generating. Once the mail order market had been superseded by retail distribution there was very little direct connection between ourselves and the buying public. We addressed our consumers via our public relations activities but we saw that as a one-way street. We spoke and we asked them

to pay attention but we made no attempt to listen to them in return. Perhaps we should have. It would certainly have been good for morale if nothing else. But it was still the pre-Internet era and establishing a two-way communication medium with your customers was nowhere near as straightforward as it is today.

Recently I attended the premiere of the *From Bedrooms to Billions* documentary at Earl's Court in London, and while watching the movie I was struck by how little awareness I had at the time of many of the things which were going on in the wider industry. I suppose each of us lives our lives in our own little bubble and perhaps I do so more than most. Given the intensity of the job at hand it is perhaps easy to see how I came to miss many of the details.

I was very conscious that some other companies took what I regarded as a bizarre approach to the market. BT, for example, segregated their products, more or less from day one, into the Silverbird, Firebird and Rainbird ranges, the latter being their "quality" label and the other two being of lesser quality. I never understood what they thought they were trying to achieve. There were any number of poor quality titles on the market as testified by pages and pages of damning reviews. Why would you strive to create a poor game? Why would you not try to improve a poor game prior to release? Why would you try to sell something with the message, "This isn't very good", implicitly attached to it? To do so is an insult to the buying public.

It was against this rather weird backdrop that we were able to develop our reputation for quality and originality. BT, I suspect, came into the market as a defensive measure. Believing that eventually computer games would be delivered by wire and/or by wireless, they felt the need to plant their flag somewhere in the new territory. The BBC's reaction was similar. They believed computer games were a fad to which they had to react but which they need not take seriously. Neither they nor many of their corporate rivals understood what seemed obvious to me, that this was a new medium for creative endeavour.

So I am always a little surprised when people say Hewson stood out as a mark of quality, not because this was not our intention – it absolutely was, but because I do not understand why anyone would work intentionally in

any other way. Surely it is only natural that we should endeavour to put the best products we could achieve on to the market – what else should we try to do? The fact that we were able to stand out in that regard despite being a relatively small company indicates to me that others did not take product quality seriously.

Certainly we were extremely choosey about what we would publish. At the peak we were probably receiving 5-10 cassettes a day and most of them were frankly not very good. So we very carefully picked out the cream of the crop and tried to build strong working relationships with their creators. But other than being very picky, was there any other reason why we might have been better at delivering quality products than some of the other publishers?

I think another part of it was that I had written code myself, I had published programming guide books and I had the coding column "Hewson's Helpline" in Sinclair User magazine every month. I understood how difficult it was to write a good game precisely because I had programming experience and I knew both instinctively and from experience that I did not have the patience and the skill to be able to do it myself.

I respected the programmers and I was very admiring of what the best of them were able to achieve. I could also communicate with most of the programmers on their wavelength and I built a publishing team that had respect for the technical side of the business just as much as the marketing side. We chose to focus on original, innovative and high quality products because we recognised and respected technical brilliance and we promoted the geniuses behind them accordingly.

We were not interested in license tie-ins and with the exception of our very early games we were certainly not interested in creating lesser clones of successful games in an ill-conceived attempt to cash in. We were interested in what the brilliant technical minds behind our games could achieve and how far they were able to push the machines they worked with. We were interested in creating new experiences and promoting originality and innovation not just for its own sake, but also because we recognised that games were an exciting new medium and that the programmers were the stars who could exploit it.

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"Hewson started out small, but snowballed quickly into a publisher that seemed to have a great eye for games. The early Steve Turner and Andrew Braybrook titles were banner games for the company, and I think that helped it cement an early reputation for quality titles. That in turn helped it to attract really talented developers like Raffaele Cecco and Steve Crow, and the company seemed to pick up steam really quickly. Ultimately, the name became synonymous with quality – when a new Hewson title came into the offices, we'd sit up and take notice."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

DOWN TO THE METAL

Part of the fun of being a games programmer, I think, is that you can be creative in a way that is not possible when writing other types of code. In the ZX Spectrum era the game developers took total control of the machine and knew that nothing else was going to wrestle away that control.

In the early days of the UK games industry programmers had to employ all sorts of tricks to get the best out of the machines they were working with. People sometimes talk about "getting down to the metal" because early programmers had access to the hardware in its entirety. They would manipulate pretty much everything down to the machine-code level and certainly all of the best programmers were writing almost entirely in Assembly language. To establish yourself as a top-tier game developer, getting down to the metal was a fundamental requirement.

Today's videogame programmers do not work within the same constraints. There are many more layers of abstraction away from the hardware itself, from firmware to the OS and then all the tools and software packages that sit in layers on top. It is a much more mature ecosystem with far greater bandwidth available in terms of processing power and memory, so getting down to the metal just to unlock basic performance is neither necessary nor practical. Pretty much any game design can be implemented given enough time, resources and money.

It was different in the 1980s. Only programmers could be designers. I remember sitting through a presentation from a well-meaning arts school graduate outlining, through a whole series of visuals, his vision for a wacky racing game. He gave me no basis for judging whether his ideas could be implemented and he, poor chap, did not understand why I should have any doubts. For him, computers were miracle machines that could do anything. I knew better.

In comparison, when Dominic Robinson came to see me as a tall, shy, eighteen year old, and showed me his demo of a level from Uridium running on the Spectrum, I took a good long look at it and then hired him on the spot. Given what I knew about the relative strengths of the ZX Spectrum and the C64 I had doubted whether a worthwhile conversion of Uridium to the ZX machine was possible. I was naturally delighted when Dominic proved me wrong and in due course we were able to release our conversions on that machine and others also.

We always recognised, whereas I suspect some other publishers did not, that any game of consequence had to be designed to work within or around the tight constraints of the hardware. An ingenious piece of software engineering could do more than merely improve the performance of a game. It could allow developers to conjure up exciting new game designs or even spawn entirely new genres. In the 1980s game design was tech-led.

One of the key features of a successful ZX Spectrum game was the speed with which images were written to the screen. This was achieved by disabling the interrupts, to prevent the processor being called on to execute other tasks, and by careful coding to achieve the desired result in the minimum number of machine cycles.

The image that is written to the screen is, in the nature of things, made up of a number of different elements. Each element is often referred to as a sprite. Some machines, such as the Commodore 64, had a certain number of sprites of a certain size available as part of the hardware design. Other machines, such as the ZX Spectrum, had no such hardware support and so it was particularly important for Spectrum coders to be adept at writing sophisticated and efficient code. As with any process which requires many disparate elements to be brought together, a little thought beforehand can

identify small efficiencies and reduce the time taken for the job as a whole. It also helps if you are prepared to cheat.

All processors contain within them a number of registers. Computer code, in essence, consists of a long, long list of instructions telling the processor to move data from memory into one or more registers, operate on the data in some way and then move the data out of the registers and back into memory. "Operate" in this context means "change in a particular way" such as "add the contents of register B to register A", or "move the contents of each bit of register A one step to the left". Early processors contained only two registers – A and B. The Z80 has about eight. Unfortunately, no matter how many registers there are available, it is in the nature of things that some code will require rather more.

For this reason, the designers of microprocessors such as the Z80 which drives the ZX Spectrum provided two special, extra fast instructions, called PUSH and POP. These special instructions quickly move data between registers and a memory STACK.

Imagine for a second that you are a surgeon in the middle of a delicate operation with a scalpel in one hand and forceps in the other. The operation now requires you to pick up another tool but you can't, at least not immediately, because your hands are already full. So you put down one tool, say the forceps, and pick up the one you now need. But you don't put the forceps down just anywhere because you're going to need them again in a minute and you've got them set up just the way you want them. So you put them down in a special, I'm-going-to-need-them-in-a-minute sort of place, a place that is not in the way but nonetheless is within easy reach.

In a similar way the STACK is the Z80's I'm-going-to-need-them-in-a-minute place where data can be stored which is going to be needed again very shortly. The STACK has an additional last-in-first-out feature. When a register is full but is needed for something else, the programmer can PUSH the current value in the register on to the STACK, use the register for some other job and then when that job is finished, POP the value off the STACK and back to the register again. The last-in-first-out feature gives the programmer a way of knowing which value on the STACK needs to go back where without the system having to spend time recording the

information. It is this time-saving which makes the PUSH and POP instructions fast to execute.

The STACK is held in RAM (random access memory) and there is a STACK pointer which records where it starts and the chip keeps a record of where it finishes, incrementing the pointer when a data value is PUSHed onto the STACK and decrementing it when a data value is POPped off again.

It was clever manipulation of hardware features like these that allowed adept programmers like Raffaele Cecco to cheat and get more out of the ZX Spectrum than their peers. He would set aside an area of RAM in which to build the screen frame in its entirety and then point the STACK in successive steps to the various locations in memory where the required image elements were kept, POPping the images he selected speedily into place. Once the whole picture was assembled he would switch the screen pointer and the system would paint the completed result to the computer screen. It is a bit like that scene from the beginning of Peter Jackson's *The Hobbit* movie in which a team of Dwarves set the table for dinner in double-quick time and then the doors are flung open allowing the feast to begin.

Of course the programmer can only get away with using the STACK in this fashion (or misusing it as the chip designers might contend) if he or she has complete control of the machine because no other process can be allowed to access the STACK. With the ZX Spectrum the only way to achieve this result is to prevent other processes from being launched by the hardware by switching off the system interrupts. The disadvantage is that with the interrupts switched off the system cannot pass on any messages from the keyboard or the joystick ports and so either the programmer has to switch the interrupts on again in due course, or, more commonly, take on the responsibility for monitoring particular keys or ports. So there was a clear trade off which clever coders like Raff had to work around if they wanted to get the benefit of the STACK for generating really smooth graphics on screen.

Of course the STACK was never really intended to be used in this way; Raff was cheating the system and manipulating it to do what he wanted. The ability to hack the system like that was the hallmark of a great games programmer in the 1980s and it was the kind of insider knowledge that

needed to be acquired, whether through dialogue with fellow coders, obser-
vation and deduction or, in the case of the really gifted developers, inventing
ingenious new techniques for themselves.

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*"The Spectrum was a very simple machine – basically a Z80
processor with no hardware assistance for anything. After a few
years of programming it, you knew every nook and cranny and
how to get the best out of the limited resources.*

*Occasionally, you'd hear about some clever technique
and would implement and improve the concept yourself.
For example, when Knightlore came out, within a few weeks
everyone was using similar techniques, so it was just a constant
iteration of improvement over the Spectrum's lifespan."*
Raffaele Cecco, creator of Exolon, Cybernoid and Stormlord

*"The Z80 in the Spectrum could do a lot more than was initially
apparent once you abandoned the conventional wisdom and
the standard Z80 programming model. For example, the Z80's
STACK pointer was best used for moving memory about (for
scrolling graphics) rather than only being used as a STACK
pointer. Self-modifying code was standard practice too, saving
memory and improving performance. None of this was in any of
the books.*

*I think developers in those days knew no limits. There were
no rules to say what was possible or impossible, so you learned
to simply go for it and try things. Questioning established
wisdom which suggests that certain things aren't possible can
take you a long way."*
**Dominic Robinson, Spectrum programmer for Uridium and co-creator
of Zynaps**

NEBULUS

The simplicity of the early systems meant that a really good programmer could look at a particular game and figure out the fundamentals of how it worked. This led to a sense of competitiveness between programmers, with techniques borrowed and evolved from title to title.

Take the story of Nebulus by John Phillips which we released in the autumn of 1987. I remember John as a very quiet, very intense and incredibly focused person. In my experience the best programmers and engineers share this laser-like focus and intense determination. Any task of significant complexity demands patience, discipline and drive and John had all three attributes in spades. However, anybody who ever achieves anything meaningful also has to "stand on the shoulders of giants" as Isaac Newton famously acknowledged. John Phillips chose to stand on the shoulders of Andrew Braybrook.

Uridium was probably Hewson's biggest ever hit, at least until our evolution into 21st Century Entertainment and the arrival of Pinball Fantasies. The critical and commercial success of the game and, perhaps more significantly for other programmers, its technical accomplishments, therefore warranted study and analysis.

The first thing most programmers would have obsessed over is the silky-smooth scroll effect of Uridium. The game was as smooth as butter, running at a native 50Hz refresh rate (or 60Hz in North America). Some of the strategies deployed by Andrew to achieve this were fairly obvious. Most programmers worth their salt would have soon realised that he was only scrolling the central portion of the screen where the Dreadnought is in the background, while the star field at the top and bottom remained static. This was a fairly common trick, although in many other games of the period it was less well disguised. However, for John Phillips it was not the scroll effects which caught his imagination, it was something more subtle and obscure.

Programmers often bury little tricks in their code that are only visible to the discerning eye. Sitting on the title screen in Uridium, there is a rainbow effect cycling across the font. To those people not versed in the design of

the C64 this is an entirely superficial detail, a novel piece of decoration and nothing more. To John, however, it was a source of inspiration.

In order to have any kind of animation, smooth or otherwise, at some point the old frame has to be replaced on the screen with a new frame. The change cannot take place instantly because the computer processor has to write the bytes into each memory location in turn and then draw the pixels onto the screen one row at a time.

To understand how that works, imagine an old-fashioned typewriter. The typist enters a series of letters and spaces and then at the end of the line has to pause to push the carriage back to the beginning of the next line. As the carriage is being pushed back nothing can be typed. Exactly the same effect applies to a computer monitor. There is a period when the electron beam is switched off as it flies back to the beginning of the next line on the screen. This period of inactivity is very brief and occurs at the end of every frame line. A longer period, known as the frame fly back, occurs once the electron beam has got to the bottom of the screen (or frame). For savvy programmers who need to maximise every opportunity to optimise their code the line fly back and the frame fly back present tantalising windows of opportunity.

The operating speed of the C64, as with the other early home computers of the period, was such that smooth animation in a game could only be achieved by updating the screen exclusively during the frame fly back. And in order to know for certain when the frame fly back was taking place, it was necessary to switch off the system interrupts to prevent a piece of code external to the game cutting in and disrupting the game cycle. This approach rapidly became the standard procedure used by all game coders of the period.

The code which Andrew Braybrook wrote to create the rainbow effect on the title screen of Uridium used the same principle, but instead of updating the entire screen during the time it took for the electron beam to fly from the bottom of the screen back up to the top, he changed the colours of a narrow series of bands lying horizontally across the centre of the screen. He timed the changes in such a way as to create a varying rainbow effect and in doing so he achieved a result which was not supported by the C64

hardware, as would be known by every C64 game coder and any knowledge-able layman. In his own way, he was laying down the gauntlet to the rest of the coding community, challenging anybody and everybody to work out how his code operated.

When John Phillips studied the Uridium title screen he was quickly able to deduce the broad outline of the trick that Andrew Braybrook was employing. But where the rest of us saw only scrolling colour bars, John also perceived rotation and he challenged himself to stand on Andrew Braybrook's shoulders. He decided to animate a horizontally rotating cylinder filling the width and about a third of the height of the screen on the ZX Spectrum. John was able to create a technical demonstration of his cylinder with a sine-wave scrolling over the top of it to prove that he could still manipulate additional graphics at the same time. It was a very neat piece of work. The only problem was that we could not figure out how to incorporate it into a game.

The challenge for John was how to create a large cylinder and rotate it smoothly. To do so on the C64 he made use of the multiple, program-mable character sets which are built into the machine. He populated the character sets with new, whole, curved, brick-shapes and partial, curved, brick-shapes. During the frame fly back time he switched between character sets so that when the C64 hardware wrote new characters to the screen, the effect was to show the cylinder rotated to a new position. He then ran the C64 hardware sprites over the top of the rotating cylinder.

In July 1987, a couple of months after John visited us to show his hori-zontal cylinder demo, I went to see him at his home in Cornwall. By this time he had turned his rotating cylinder through 90° so that it looked like the tower of a castle with a few sprites rendered over the top. I asked him what he intended to do with it. John talked about creating multiple towers, linking them with walls and perhaps having some kind of battle scene.

Now, as I said earlier, Uridium had been a huge hit for us and while John had been inspired by it in on a technical level, it had also left a lasting impression on me. I suppose I had come to understand the oft-quoted maxim "less is more". I could see that it was the simplicity and elegance of Uridium that made it special.

As an aside, one Saturday afternoon in the retailer, John Menzies, in Abingdon I had watched a youngster playing our demo version of Uridium. He concentrated hard during the main part of the game sequence then visibly relaxed during the end of level sub-game. He then had time to take a look around to see if any of his mates had turned up before plunging back into the action.

The rhythm of the game was like a sine-wave, with a peak of activity on the part of the player followed by a rewarding trough of visual/audio pay-off, followed by another peak, another trough and so on. Today, game designers and academics studying game theory might recognise this as a method of helping to induce that all important state of "flow" in the mind of the player, but in the 1980s we were still making the discoveries which developers today take for granted.

I was very much under the influence of Uridium while discussing John's rotating tower demo and so I recommended a much simpler scenario than the battle scene he had in mind. It seemed to me that when we come across a tower, rotating or otherwise, our natural impulse is to want to climb it. Once we have climbed to the top of the tower, well, that's it, job done! All a game based on climbing towers would need would be a trough, similar to the end of level minigame and destruction sequence in Uridium, for the player to experience before moving on to tackle the next tower.

I asked John if he could create a gravitational effect so that things would fall down the tower. He scratched his head for a moment and explained that there was not much time left in the game cycle because so much of it was being used in processing the rotation effect. "Can we get an approximation of gravity?" I asked him, "It doesn't have to be perfectly accurate."

"I think so, yes" came the reply.

With that everything began to fall into place and the concept crystallised. We were going to take a platform game and wrap it around a tower to create something completely original. John added water at the bottom to act as hazard during the level and as a medium for transporting the player to the next tower afterwards, and recreated that structural sine-wave design which had worked so well in Uridium by adding a shooting minigame beneath the waves. Nebulus was born.

PIONEER'S PERSPECTIVE: JOHN PHILLIPS

I developed Nebulus on a BBC Micro (as a primary dev machine connected to a Spectrum and a C64). The initial version (with the horizontally scrolling cylinder) was developed for Spectrum as a Uridium-style shooter but the gameplay didn't gel. When converting to the C64 I couldn't get it running at a high enough framerate which was the main reason for changing to the vertical tower and the platform game mechanics just seemed to fall into place.

Although C64 raster interrupts were used (to allow colour bars on the background and extra hardware sprites, a technique known as sprite multiplexing) the tower itself was only created using programmable character sets. Using a character set allowed the effective resolution of the tower graphics to be reduced to 1/8th of the vertical resolution involving some nifty design of the tower graphics. This kept the frame rate at 60Hz as the tower could be redrawn and animated in a single frame.

Of course this worked fine with the hardware assisted graphics of the C64 but it meant the Spectrum (and later the Atari ST, Amiga and PC) versions involved a lot of code optimisation to maintain the frame rate.

I do recall one prototype version involved multiple towers with gangways between them though that approach had to be scrapped due to memory limitations and so I had to revert to the submarine minigame as a way of progressing between levels.

REELING IN RIGNALL

I would not claim to be much of a fisherman, although I have enjoyed the odd fishing trip while on holiday. I do remember, however, hooking ZZAP! 64 journalist, Julian Rignall.

In September 1987 we set up a demo-pod for Nebulus on our exhibition stand at London's Olympia. We had secured ourselves a strong position at the show facing out towards the main floor, with a small but colourful stand to attract the swirling mass of industry big wigs and journalists. This was

a trade-only show, but there were a small number of gaming enthusiasts in evidence, who had doubtlessly blagged tickets from friends in the industry. When I was not in a meeting or tied up with a press interview I would take a breather by perching discretely in a corner while observing the flow of traffic to and from our stand.

On one occasion I picked out a singular figure striding purposefully towards it and I immediately recognised that it was Julian Rignall, one of ZZAP! 64's journalists and a key opinion former. It was Julian's job to investigate the latest C64 titles, so it was pleasing but not particularly surprising to see him heading our way. He was obviously well aware of our reputation for putting quality games on the market – particularly after the trio of C64 gems from Andrew Braybrook.

Nebulus was the bait that day, sitting front and centre on our stand. As he approached he must have registered the game's blue, brick-work tower rising vertically up the screen, but as nobody was playing at the time, the game was completely stationary. That was a mistake of course. We should have included an automated repeating sequence showing the tower rotating. But we did not, probably because the game was still unfinished and we were very short of time if it was to be ready for the Christmas market.

A single joystick sat invitingly beneath the TV screen and fortunately Julian reached for it and prepared to play. As he did so, he must have nudged it slightly because the tower rotated briefly. At that moment I saw him lean forward, trying to work out what had happened on screen. It was as if he could not help himself. The rotation drew him into the game. He pushed the joystick again, intentionally this time, and watched, mesmerised, as the tower rotated. "Sold!" I thought, smiling to myself. Julian Rignall was on the hook.

From a PR point of view we had done very little. Okay we had invested in a nice stand to show off our games at the exhibition, but beyond that the game had basically captured Julian all by itself through the timeless application of novelty. Human beings are absolutely fascinated by novelty and at that time nobody had ever seen a platform game wrapped around a tower before.

Of course novelty, as enticing as it is, wears off pretty quickly if it turns out to be superficial. Julian was on the hook, but he still had to be reeled in.

If he found that there was little challenge or enjoyment in the game beyond its initial seduction, he would soon wriggle off the line and disappear back into the depths of the crowd.

Fortunately, Nebulus is no one-trick-pony. In fact the rotation effect is not merely a novelty, it actually unlocks a unique set of gameplay possibilities. By definition the tower itself provides an immediately intuitive goal for the player. After all, towers exist to be climbed. Wrapping the familiar gameplay of a platform game around the tower also naturally limits, without feeling unfair or contrived, the player's view of upcoming enemies and obstacles meaning they have to react quickly which heightens the tension of the game. The nature of the levels as a vertical ascent also creates a natural compulsion loop, because rather than dying when Pogo, the player's character, hits an enemy or mistimes a jump he only tumbles down a level or two. As a result, making a mistake in Nebulus is not as final as it can be in other games.

All of these features emerged almost inevitably from the core technology as applied to a platform game wrapped around a tower. On that foundation John Phillips then made some additional design decisions such as adding doors and elevators to provide a brief but welcome respite while transporting the player to a fresh gameplay space. Reaching a door or an elevator feels like a milestone and in the case of the elevators the reward is to be safely boosted further towards the goal. Finally, the Uridium-inspired post-level minigame recreated that captivating sine-wave flow, providing an opportunity for the player to regroup after the intense concentration required to successfully conquer a tower.

I am not much of a fisherman, but that day at Olympia I had no need to be. I did nothing other than set the bait. Nebulus hooked Julian Rignall with its novelty and reeled him in with its depth of design. The best games sell themselves.

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"I remember looking at the screen and then moving the character and watching as the tower scrolled around. It was really impressive-looking and it surprised the crap out of me. At a time when a lot of people were still producing basic platform

games, Nebulus felt like a quantum leap forward. The game just looked brilliant, and the concept was simple, but exceptionally clever. There just wasn't anything else like it."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

DIFFICULTY SPIKE

Nebulus, like Uridium before it, was a notoriously challenging game. So why did we make our games so difficult? It is a question I get asked often enough these days. By today's standards the likes of Uridium and Nebulus are brutally punishing, but our point of reference in the 1980s was very different.

For many years I thought I was the only person in the world who never got beyond level three in Uridium. In fact the only Hewson game I can clearly remember playing through from start to finish is Steve Turner's Avalon. In a way it is comforting to hear people telling me all these years later that our games were supremely challenging. It was not just me after all!

I think there were two clear reasons for this. Firstly, we were trying to recreate the arcade experience at home, as were most other companies in the industry at the time. Arcade games are designed to be intentionally difficult. The sooner you can present the player with a game over screen the sooner you can prompt them to insert another coin into the slot. It has to be remembered that there was no other precedent for us at all – we were making it all up as we went along so emulating the arcades was our only point of reference. It simply never occurred to us that we could make our games easier. Even if it had and we had been courageous enough to experiment I am not sure the resulting products would have been successful in the market back then. The majority of reviewers were game players first and journalists second and their expectation had been set by the arcades as well. I suspect that they would have taken a dim view of games that they felt were insufficiently challenging – the market was not nearly as broad back then as it is today.

Another reason our games were so difficult was because the people who were actually making them were making them for themselves and other people like them – people who were already fanatical gamers. In 1986

Andrew Braybrook set about programming Alleykat with the specific intention of creating a game which was too difficult for ZZAP! 64's Julian Rignall. Today most games companies would never dream of narrowing their focus in this way. On the contrary, they seek the broadest possible audience for their titles.

RAFFAELE CECCO

The success of titles like Uridium, Paradroid and Nebulus had helped to reinforce our reputation for delivering quality products and the result was that more and more programmers wanted to work with us. I remember the day that Chris Hindsley, who worked thirty miles down the road from us at Mikro-Gen in Bracknell, walked through the door with a certain Raffaele Cecco in tow. Raff was rather young at the time, probably still a teenager, and I clearly remember him being a bit shy. Chris was older and it seemed as if he had come along to offer moral support and to endorse Raffaele's talents.

I dare say I would have met Chris before at some event or other. I certainly knew of his work because he had produced a successful paint package on the Rainbird label from BT. I believe it was actually a software tool he had developed at Mikro-Gen intended for internal use that had then evolved into a consumer product.

So I knew Chris by reputation and I sensed from our discussion and the way he interacted with Raff that Chris was *de facto* team leader for the developers at Mikro-Gen. I also had respect for Mikro-Gen as a company because they had produced the excellent Wally Week series originally for the ZX Spectrum. Naturally I was very pleased to see the pair of them and intrigued to hear what they had to say.

One characteristic of such a meeting with developers from another company is that I would get to feel their pain. Everybody in the room is dealing with the same problems because everyone is in the same line of work. My job was to create a safe environment so that grievances could be expressed. It is also an opportunity for everyone, me included, to compare notes and find out how other people manage common difficulties.

The development process is hard work, seriously hard work. Developers sit in front of a screen for hours and hours, day after day and whilst they may have a fairly clear idea of what they are trying to achieve, it is never, ever easy. It is as if the machine always fights back. Developers have a great deal of work to get through and are under constant pressure to deliver their products. They are not, generally speaking, good communicators. Why should they be? Nobody on earth persuades a computer to work in a particular way by talking to it nicely, or by whispering sweet-nothings in its electronic ear, let alone by delivering an inspiring pep talk. So very often they can find it difficult to explain the strengths of their work. As a result, once their job is complete, people further down the supply chain can misunderstand the merits of the product that has been put into their hands and fail to exploit it effectively. Nothing is worse for morale than working diligently for months on end only for others, who with the best will in the world understand next to nothing about the challenges that have been faced and conquered, to screw up the packaging, marketing and duplication which, when all is said and done, is the pedestrian and routine part of the process of creating a product and putting it on the market.

For the programmers in particular there is a great deal of emotion attached to the product. I suspect it is the same with any creative activity. I am sure book authors find that finishing the book and handing it over to a publisher leaves them feeling uneasy. It must be like handing someone a piece of your soul and trusting that they will treat it with respect.

So naturally Chris and Raff were blowing off steam during our meeting and I got the sense that things were a bit rocky at Mikro-Gen. I was not surprised. Mikro-Gen were a company that had popped out of nowhere in the early days just as we had and were struggling with the competitive pressure in much the same way as we were. Chris was clearly a focal point for pressure from the company management and was doing his best to shield the other members of the development team, who for their part, were rallying to his support. The effect was to create strong bonds within the embattled programming group.

Anyway, there I was with a young, slightly sheepish Raffaele Cecco and Chris taking the lead and looking out for him. The message that came across

was that Raff wanted to create a game of his own and we talked a little bit about what the game might be. There was nothing to see at the time but I was willing to take their word for it because I had respect for Chris and his reputation. Importantly, Bracknell was only thirty miles down the road and so I could pop down and see Raff and monitor his progress every now and then.

That was it. We agreed on terms with Raff as a freelance programmer and off he went to work on Exolon.

A month or two later when I went to see him, he had a few demo screens up and running and importantly the backpack missile launcher was already operational. The missiles zipped up out of the backpack and fizzed across the screen to obliterate obstacles which exploded like fireworks against the blackness of space. It was a spectacularly colourful showcase for the game and gave it a destructive arcade feel. I came away excited about both the game and the potential of this talented young programmer.

In fact, I came away with a little more than that. While I was talking to Raff about the game, his girlfriend cut in and asked me if I would like to buy a kitten. My two children were still young at the time and would dote on a kitten, at least for a while, and so I agreed there and then to buy it from Raff's girlfriend for £25. I grumbled about the price but she explained carefully to me that it was half Persian and so it was, so to speak, an executive kitten.

And there was I thinking a cat is just a cat. Silly me.

Later that afternoon I was sat in front of the TV with the little black and white kitten fast asleep on my lap when the children came home with their mum. My daughter, who had not noticed the kitten, rushed over to give her dad a big hug and almost squashed the thing in the process. I imagine it had quite a fright. The children were over the moon and spent the rest of the evening swooning over the kitten, which I named Spider. The children seemed to regard that as an odd name for a cat, especially a half-Persian cat, but they accepted that since it was my £25 that had been spent, I had naming rights. Spider was with us for the next 15 years.

Our working relationship with Raffaele Cecco did not last quite as long, but it was very successful and resulted in Exolon, Cybernoid 1 & 2 and Stormlord. All were exceptional titles and Raffaele, like so many of our

great programmers, was propelled to stardom as a result. Not only was Raff immensely talented, but he was also a thoroughly pleasant guy with an impish sense of humour. He was a pleasure to work with.

EXOLON

In the early years we had published products in a wide range of genres, from simulation titles like Mike Male's air traffic control and steam engine games, to fantasy and adventure titles like Avalon and Dragontorc. However, in the second half of the decade we began to focus more and more on arcade-style games following on from the huge success of titles like Uridium and Nebulus.

Raffaele Cecco's development style was therefore a perfect match for us and the arcade action of Exolon was immediately dazzling. There were clear influences in the game from titles like Jetpac but Exolon had its own unique style with the trial-and-error based gameplay which became one of Raff's trademarks.

Flick-screen games like Exolon are not as dynamic at first sight as scrolling titles like Uridium, but Raffaele was an expert at designing within the technical constraints of the machine. There is also a pleasing granularity to the progression of flick-screen games because getting to the end of each screen gives the player a clear objective. The reward for reaching that objective is an updated re-spawn position should the player lose a life and there is usually an opportunity or two to re-attempt a particular puzzle or obstacle.

The main character in Exolon had two classes of weapon at his disposal; the handheld blaster and the back-pack rocket launcher. Raff established a simple rule whereby the dynamic enemies could be shot with the blaster while the larger, static obstacles needed to be destroyed with a rocket. It created a sense of rhythm in the game and ensured that there was plenty of opportunity to show off the spectacular visual effects.

The action was punctuated with other interesting mechanics like the teleporters and there was also an upgrade system layered over the top, so a little way into the game the player would progress from a single-barrelled

to a double-barrelled blaster. Best of all, the player could see the main character physically upgrade his exoskeleton, which I thought was a particularly nice touch.

One thing that became very clear to me over time was the importance of music and sound effects, because they actually carry a great deal of the emotional content in a game. As such we always strived for the best in audio design and Exolon was no different. Nick Jones, who was a friend of Raffaele's, did a wonderful job with the title music and the sound effects were crisp and punchy. I particularly liked the fizz of a rocket being launched and the unique "pow" of the resulting explosion.

I read in a recent issue of Retro Gamer magazine that Raffaele remembers me coming up with the name Exolon. Maybe I did, I am happy to take his word for it. The inspiration was, of course, the "exo" of the character's exoskeleton and the sense of "excellence" which I would have wanted the title to convey. There may also have been an echo of "Avalon", Steve Turner's title which we had released a few years earlier, lurking at the back of my mind. Perhaps we were being accidentally poetic.

Exolon was received very positively and I think people were particularly impressed with the effects that Raff was able to squeeze out of the aging ZX Spectrum. His technical prowess, as much as the quality of the game itself, propelled Raffaele Cecco to star status very quickly, with many people crediting him for helping to extend the lifespan of the 8-bit machines with 16-bit looming on the horizon.

Raff converted Exolon for the Amstrad in next to no time, Nick Jones did a stellar job with the C64 version and later on converted it for the Amiga and Atari ST, though by that point perhaps we had fallen behind the cutting edge.

Stormlord, which Raff developed for us a couple of years later, was a spiritual sequel of sorts, albeit set in an entirely different world. However, it was his next title Cybernoid and its sequel that really cemented his reputation as one of the greats.

PIONEER'S PERSPECTIVE: RAFFAELE CECCO

I had been working at Mikro-Gen, but they had made an unwise game choice (Shadow of the Unicorn) for development on their Mikro-Plus peripheral for the ZX Spectrum (basically a memory expansion and joystick port). The Mikro-Plus was an expensive investment, and it was clear there were problems at the company, so the atmosphere wasn't great. I decided to leave and work freelance.

I visited Hewson Consultants with an early demo of Exolon and Andrew Hewson immediately saw the potential – I remember him really liking the rocket launcher. We basically agreed to work together – life was a lot simpler in those days.

Nick Jones and I had worked together at Mikro-Gen. I joined a few months after him, so we were both 'new boys' to a certain extent. I left Mikro-Gen first and Nick followed soon after. We lived pretty close to each other, me in Bracknell, him in Reading, and we got on really well, so it made sense to carry on working together. It helped that he was a C64 expert and I knew the ZX Spectrum.

Nick was so easy going, professional and very talented with a great work ethic. Working with him was never a hassle or a cause of undue stress for things like milestones. You could completely depend on him.

Nick was a good piano player (he did some of the music at Mikro-Gen), and he'd play me the latest song he'd learnt when I visited his place. We both liked Queen, and I remember being amazed when he played the whole of Bohemian Rhapsody. Nick has been in the USA for years now, but we remain in touch.

PIONEER'S PERSPECTIVE: NICK JONES

Raff made the first contact with Hewson and was commissioned to write Exolon. He put Andrew in touch with me with regard to converting it to the C64. Andrew really left us to get on with creating our games. There was no real serious involvement from him, which I really liked.

The main interfacing we had was taking milestones into the office to show off and to get our next payment. Usually, the game entered a crunch period at the end. I remember working crazy long hours and completing various versions of the game in the small hours. Andrew's accountant, an old Scottish guy called Bill, would be waiting for my phone call (usually around 2am to 3am) and would drive to my home in Reading from Didcot to pick up the latest version.

I loved Exolon. I'd mastered sprite multiplexing on the C64 (basically the ability to draw more than eight sprites on the screen at a time) and was eager to do bigger and better things. For Exolon, Raffaele had shown a propensity for big, bad-ass explosions – basically *many* sprites on the screen at once. Even with my sprite multiplexor, I couldn't match what he was trying to achieve. So I dabbled with software drawn sprites which is what the Spectrum does anyway.

I learnt to play the piano when I was a child so the musical pedigree was there. I just composed the music in my head, then I'd rush over to my digital piano and try it out before typing the notes into a data table in the game. Typing in the music in the form of numbers was very uncreative and it didn't allow me to be spontaneous. Luckily, I had the song fully in my head before I started.

Raff and I both worked from home. We'd talk on the phone a lot and we'd see each other often because we lived very close to one another. He wasn't just a work colleague; he was a great friend too. I always felt he had my back and I sure had his.

CYBERNOID & CECCO'S LOG

Exolon was an elegant, polished game but it was relatively simple conceptually. When it came to Cybernoid, Raff was beginning to stretch his legs as a designer. He retained the flip-screen approach and that trial-and-error style of gameplay, but used them to concoct a unique hybrid which was somewhere between a platformer and a shooter.

By this point he had refined his approach by ensuring that the game had tight, pixel-perfect collision. He then put a great deal of thought into the layout of the game world. There was a maze-like quality to the way each screen twisted and turned through a larger environment but the clear entry and exit points were retained, so the player never felt lost.

As with Exolon Raff built in an upgrade system and really went to town on the visuals, enhancing his trademark effect of colourful debris exploding across the screen like fireworks. In a strange way Cybernoid reminded me of Nebulus because it was ruthlessly tough and highly addictive. With each attempt the player would progress forwards just a little further than the last time, creating a "just one more go" compulsion.

Cybernoid was also stuffed full of weird and wonderful alien life-forms and eye-catching spectacles like volcanoes which spewed burning debris across the environment, so you never knew what to expect when crossing the threshold to a new screen. There was a constant sense of discovery as the game progressed.

The result was a game which received a rapturous reception in the press, with CRASH magazine awarding it 96% and Your Sinclair, in due course, listing it as number 36 in their top one hundred games of all time. Indeed it was referred to as the best shooter on the Spectrum by some and like all the big hits it was subsequently ported to a whole host of platforms. Nick Jones handled the C64 port once again and ultimately we licensed it to Acclaim for the NES, just as we had done with Nebulus.

Consequentially, as with Andrew Braybrook a few years earlier, the press were keen to get to know the man behind the games. Not to be outdone by ZZAP! 64 pioneering the programmer diary in the run up to Paradroid, CRASH were only too happy to land a Raffaele Cecco diary which they called "Cecco's Log" following the release of Cybernoid. I have forgotten exactly how it was arranged. By this point we had an in-house PR operation and so it was probably a member of that team who set it up, but judging by the first instalment in issue 53 of CRASH it was me who made the call to Raff:

"Just when I thought it was safe to come out of hibernation after the completion of Cybernoid, the dreaded phone rings and I am greeted by

Andrew Hewson's dulcet tones: 'Hello Raff, fancy doing this diary thing for CRASH?'. To which I reply, still wiping the sleep from my eyes, 'Well... err... um... I...'

'Great stuff Raff, I knew you wouldn't let me down – bye!'"

Raffaele Cecco was another programmer who could string together a sentence or two, and Cecco's Log always made for entertaining reading because he had a cheeky sense of humour. As a freelancer, we had to agree a contract with Raff for each project he undertook and he made reference to it in the first diary, as well as his plans to move away from his characteristic flick-screen system towards a full scrolling, "blast and think" style of game:

"There are some new and exciting ideas that Andrew Hewson and I have discussed for inclusion in the program. After a few cups of tea and a few bouts of arm twisting and Chinese burns, we decide a fantasy/ fairy-tale setting would make an interesting departure from the usual science-fiction ambience."

The "program" to which Raff is eluding is Stormlord, but in the wake of Cybernoid's runaway success we put the idea on hold deciding sensibly that a sequel would be a good strategic move.

"Andrew Hewson contacts me with his splendid car phone that sounds like there's a vacuum cleaner droning in the background."

Ah, the car phone, I remember it fondly. It made me feel quite the whiz-kid.

"Yet another phone call from Andrew (will this ever end?). He proposes the development of a Cybernoid II project, the idea being to extend the original Cybernoid concept even further with new gameplay, graphics and sound. Good idea, methinks, my only reservation being where am I going to find the time (I do actually lead a life outside of programming games you know!). Andrew reassures me that I am in fact super-human and will cope admirably (yes, Andrew – and for my next trick I shall make London disappear)."

Raffaele Cecco was a lovely young man and a real pleasure to work with. Reading through his diary each month always brought a smile to my face and occasionally I would take great pleasure in having the final laugh before sending it on to CRASH:

"Not only is Stormlord (the follow-up to Exolon) going full steam ahead, but Cybernoid II is also being started – and I thought slave labour had been abolished. (That's what you think, buster – Andrew Hewson)".

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"Those games were great! They really did seem to milk every last ounce of power out of the old 8-bit machines. A testament to that is that both games ported across to the ST and Amiga with very few changes other than to the graphics, and they were still very warmly received. Their fundamental gameplay is just rock solid."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

PIONEER'S PERSPECTIVE: RAFFAELE CECCO

There was no conscious decision to make Cybernoid a shooter/platform combo. I suppose Equinox and Exolon were like that if you think about it. The fact that the protagonist in Cybernoid happened to be a spaceship instead of a droid or human was irrelevant; it didn't preclude the designing of fiendish set pieces and puzzles just because it was a shooter.

Looking back, I suppose it was quite unusual to have a combination of platform elements with hardcore shooter, although it seemed perfectly natural at the time.

I'd worked really hard on the design, and it was great seeing all the hard work paying off, plus it has an enduring legacy – people seem quite fond of Cybernoid.

With Stormlord I'd simply grown tired of the space-based games and wanted another creative outlet. A fantasy setting fitted the bill because it still allows you to do weird things as in space-themed games without having to explain anything. You could easily have changed Stormlord to be spaceships and robots instead of fairies and dragons.

The 16-bit machines came out just as we'd peaked with what was possible on the 8-bit machines. It was good to get so much out of those old machines, but it was clear that 16-bit was the future. There was no deluding ourselves that we could take the 8-bit machines much further.

PIONEER'S PERSPECTIVE: NICK JONES

Working at Mikro-Gen was kind of like serving an apprenticeship. The programmers were always looking at each other's code and ideas were discussed amongst us all. Any code which was written was instantly familiar to everybody else, regardless of whether it was written in 6502 (C64 processor) or Z80 (Spectrum and Amstrad processor).

There was no magical tool for getting the Spectrum Z80 code into the C64's 6502; I'd just do it by hand. The levels were created on a tool called Art Studio which was written by fellow Mikro-Gen programmer Chris Hindsley, so it was easy to get the Spectrum levels to be useable on the C64. Initially, I'd use the Spectrum graphics too, then I started to convert them over to the more colourful C64 format.

From Cybernoid onwards, Paul Chamberlain at Hewson persuaded me to use the services of an artist called Hugh Binns and the first graphics I got from him clearly told me this was the right thing to do. The art was so much better than anything I could have created.

I probably enjoyed Cybernoid the most. It was the first game that had graphics (Hugh Binns) and audio (Jeroen Tel / Maniacs of Noise) produced by people other than myself. I'd get art or audio deliveries to drop into the game and it was always a good feeling to boot the game afterwards and see what goodies these guys had produced.

Cybernoid 2 was a very similar process to Cybernoid 1. The main change was to the ship you controlled. Raffaele had made it a 16x16 sprite on the Spectrum which I had to copy on the C64, but hardware sprites were 24 pixels wide on the C64 so I literally had wasted space. So for the sequel, we talked about it and made the ship 24x16 (technically 12 fat pixels x 16) so it would look much better on the C64.

I also wrote code to help with the sprite overload. Basically, when you shot alien ships and they dropped cargo, once the cargo hit the ground and was no longer moving, I had code that would draw the hardware sprite directly to the screen and then stop using the hardware sprite. This meant I could have a lot of cargo being dropped by the ships with zero sprite flicker.

With Stormlord Raffaele had decided he wanted to create a scrolling game with beautiful graphics. For the Spectrum version, Raff and I had competing ideas on how to pull off horizontal scrolling as fast as possible. Raff tried both methods and I remember that my solution was significantly faster than his.

Then there was the challenge of how to achieve the same on the C64. I was on my own here because Raff didn't really know much about the C64. What I wanted was horizontal scrolling but I also wanted the C64 to be in hi-res mode. These two modes were really considered to mutually exclusive. You could have hi-res, beautiful graphics and no scrolling, or scrolling in "character" mode which really limited the graphical capabilities. I came up with a way to do it; I never saw anybody else even try this in a commercial game. I saw demos doing it through hardware hackery but that was no good since it wasn't guaranteed to work on all C64's. My solution was a software one and it worked a dream.

I didn't really have much of a relationship with Jeroen Tel who composed the C64 music for the games. He lived in Holland and spoke no English and I spoke no Dutch so everything went through Hewson producer Paul Chamberlain. But I really wanted the music to be incredible.

Jeroen, through Paul, asked if he could play samples in the music to which I said yes and gave him a significant memory budget to do so. I got the first draft of music and it really was incredible. I was very excited to put it into the game, only to realize that having the C64 play samples basically used up the entire CPU of the C64. In other words, there was no way I could actually play the game *and* have the music playing. So I had to go back and ask Jeroen to remove the samples. I did this through my one phone call to him which was from a local phone box. Armed with a stash of phone cards, I phoned him and Charles Deenen. It was a complete failure. The line was bad, we had no common language and the phone box ate through my phone cards at an amazing rate.

Jeroen managed to make sound come out of the C64 which seemed impossible. This is a machine that's only supposed to be able to play three

notes at a time but you'd never be able to tell in Cybernoid. Also, the expression he managed to make the music have – I've had friends tell me they would record it and play it in their cars.

PIONEER'S PERSPECTIVE: JEROEN TEL

The first Hewson game I worked on was Battle Valley and we got to work on it because we met Andrew Hewson at the PCW show in London.

After that I was always approached by Charles Deenen and Charles was contacted by Hewson. So Charles would say "we're doing this Hewson project" and I would sit in my bedroom and create all the sounds, then deliver them to Charles who would deliver them to Hewson.

With the Cybernoid and Cybernoid 2 themes I spent a lot of time making them melodic and modern. Almost movie style melodic – you could play them with a violin and they would still sound good.

I wanted them to have a combination of a modern beat, because they were futuristic games and I was a teenager who went dancing at discotheques, and having this… well movie style is not the word because I only had the SID chip, but they had to sound bigger. Not just beeps and bleeps, it had to be big, dramatic, melodic, almost orchestral, but still modern and still with a solid beat. A bit like dubstep today, I think. Making them filtered really makes them organic and the melodies and the harmonies really stand their ground, not just bleeps and blops but a carried melody.

If I look at the first Cybernoid, I think that's an epic theme and I composed it when I was fifteen. I didn't have a concept of how it would affect people, so to speak, that people would actually buy the game just to listen to the music. When games came out people would rip the music and put it into demos. When I went to Venlo, which was basically a big Commodore 64 party, I would hear Cybernoid coming out of every speaker in different demos

PIONEER'S PERSPECTIVE: STEPHEN ROBERTSON

I can't remember how I made contact with Hewson, but it was probably the usual route of sending in a demo disk. My contact was Paul Chamberlain, and while it wasn't as lucrative as Firebird – £100 per screen – he passed a lot of work my way, and I got to do some of my best C64 screens. Mostly I did screens for the budget Rack It label, but I also got to do some full-price game releases too.

To be honest I don't have a particular favourite. I think Scorpion is a really fine representation of the box artwork with some very nice shading (though a bit cramped due to the C64 aspect ratio). Cybernoid was one of the most challenging to draw – I could only draw the spaceship by rotating the box 180 degrees – so it's one of my favourites too.

After I left Andromeda I got a call from Paul saying that they needed someone to take over doing the graphics for Cybernoid on the Amiga/ST conversion. The original artist couldn't finish the project for some reason. I had an Amiga 1000, so I could draw the graphics using Deluxe Paint, but the only decent animation package for games at that time was an ST program – OCP Art Studio published by Rainbird. Hewson offered to supply me with an Atari ST to draw the animated sprites and to do some graphic tile work.

I was introduced to the programmer, Tony Cooper, who gave me details of how to do the graphics in a way that would work with his game engine. This was all new to me. I'd done a C64 game (Blazer, by Nexus) and some static Amiga screens, but had no idea how animated graphics or tiles worked in 16-bit games, so it was a big learning experience.

I remember that Paul wasn't keen on some of my sprites for the game enemies, but he loved the Cybernoid ship sprite, which was true to both the original Spectrum design, but also incorporated some style from the box artwork ship.

I ended up staying with the programmer in his house to finish the game, which was an intense time, resulting in my first all-nighter to get the game done for the deadline. I'm pretty pleased with what I did in the end though.

PROGRAMMING SUPERSTARS

Steve Turner, Andrew Braybrook, John Phillips, Raffaele Cecco – in the 1980s they were games industry celebrities in the UK. We deliberately promoted our programmers, a little haphazardly at first, and then with more deftness as our confidence grew. In doing so I never bought into or attempted to emulate the "millionaire with a Ferrari" myth promoted in 1982 and 1983 by Imagine in Liverpool. I thought their approach was fatuous and insulted the public's intelligence. It was also founded on a lie and I believed, and still do, that a PR campaign built on a lie is always going to fail anywhere outside a totalitarian state.

Imagine also posited that in some way their Liverpudlian programmers had particular talents acquired from the city's pop icons of the 1960s. This idea was never going to fly unless you believe that the good fortune of being born with a melodious voice or the hours of work spent learning to play an instrument could somehow be held in suspense in the city's air for twenty years and then re-appear as insight and analytical skills at the computer keyboard. In truth the whole country was awash with people experimenting with personal computers. Only a very few of them, however, had the talent to exploit the opportunity and their physical proximity to Liverpool was irrelevant.

We preferred to promote the truth, which was that we were packaging and selling the output of some young, clever, creative individuals who had the drive, dedication and determination to make a funny shaped box with a keyboard dance and sing. We were the conduit for their creativity and I was delighted to point upstream from ourselves to the people who bestowed so much enjoyment upon the public.

Being a bit of a nerd myself, I thoroughly enjoyed interacting with our programmers, bouncing concepts back and forth and coming to an understanding of what was going on in their minds. I relished taking that understanding, searching for words to express it pithily and then packaging it and amplifying it to the press. This was the key role that we played as their publisher.

It took me a while to grasp that role and acquire the skills to perform it well. My column in Sinclair User helped because the requirement to deliver 2000 publishable words on a regular basis forced me to improve my writing ability. More importantly it gave me a peek behind the scenes at a magazine publisher and gave me an appreciation of the time and production pressures under which journalists work. It made me realise the importance of making our briefing material easy to digest and I learnt how hungry the magazines were for an insight into the personalities and processes behind our games.

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"I think Hewson was very good at this. They brought programmers to visit magazines and made them available to do interviews, diaries of a game and other such features. That exposure really helped cement them as personalities at a time when most publishers weren't particularly interested in promoting their talent. For most companies, it was more about cranking out games and not really giving developers much in the way of credit. Developers were seen more as a resource, rather than individual personalities. I think Hewson helped change perceptions of that."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

"I remember the interviews for magazines and talking to people at the trade game shows, but those were really pre-Internet days so there was a leisurely pace to everything. It was fun.

I think Hewson got a lot right in that moment. Everything was necessarily small scale, but the celebration of originality and of the individuals behind the games was a great thing. I have spoken to many younger game developers over the years who wished they could have been around at that time. I would not have missed it for the world.
Dominic Robinson, Spectrum programmer for Uridium and co-creator of Zynaps

"I was ambivalent about it really. On the one hand all the attention was a little embarrassing, but on the other, it was clear that this was a great PR tool, something Hewson excelled at in their own way. In retrospect, two or three pages in CRASH magazine every month was a masterstroke on Hewson's part.

I was not a huge fan of PR events or parties, but understood it was part and parcel of the selling machine. I do remember once when Hewson organised a fancy bash at L'Escargot restaurant in London. It was memorable because it was the first time I'd ever tasted pigeon, and a waiter decided to drop a dinner down my back. I did however receive a Cybernoid sweatshirt as a consolation."

Raffaele Cecco, creator of Exolon, Cybernoid and Stormlord

"Hewson recognised that it was the developers who the public and reviewers could relate to and did not pretend to have developed the games. It inspired us to further creations. We considered we were in the entertainment business and knowing that the public enjoyed our games meant a great deal to both Andrew and I.

Andrew eventually became better known having completed a few TV appearances. Occasionally we would be stopped in the street but mostly at shows. I still get emails 30 years later and that gives me the feeling that it was all worthwhile."

Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

RACK IT

The early UK games industry emerged from a hobbyist market. At the ZX Microfairs in London there would be a whole range of software on offer, but much of it had a very homemade, arts and crafts feel to it.

The documentary film *From Bedrooms to Billions* does a good job of capturing the collapse of the UK publishers as the consoles closed in during

the 16-bit era, but there were actually a whole host of home-brew operations that did not survive the transition as we had from the early hobbyist market of the ZX Microfairs to the business world which followed.

As the years rolled by and development expertise spread and matured, the general quality of the games we were being sent began to rise and the proportion which were polished enough for the market increased. By the late 1980s it became clear that the quality had risen sufficiently for us to enter the budget market without cannibalising the sales of our core products and the Rack It label was born.

The strategic advantages of running a budget label were obvious. Cash flow is a constant problem for a games publisher, because we would have to invest in a product and then wait many months for it to generate a return. Rack It provided us with a stream of smaller games which were easier and/ or quicker to develop and could provide ongoing income between the big releases. As an additional bonus, we could also re-release some of our older hits at a budget price via Rack It and enjoy a second bite of the cherry.

I like to think that the quality of the Rack It label held up very favourably with the competition. We still had stringent standards to satisfy and would never consider releasing a poor quality product under Rack It, so there were some real gems to be found. Games like Fifth Gear, Anarchy, Slayer, Steel, Subterranea and Battle Valley may have been a bit lost amongst the noise of bigger games at full price, but as budget titles they really came into their own.

PIONEER'S PERSPECTIVE: GARI BIASILLO

I left Ocean to start a two-man team with my friend Mike Williams and we formed Imperial Software Designs during the latter part of 1988. We set ourselves up in the spare back room of my dad's shop and began work on a prototype for a shoot 'em up, which was a very popular genre in those days. Our demo showed the basic core tech and concept level artwork, which you could flip through on the C64. The demo was sent out to various software publishers which, to our delight, garnered a lot of interest but we decided to go with Hewson as we were both huge fans of their games!

We didn't really have everyday contact with the guys at Hewson. Our main contact was Paul Chamberlain, who would call us on the phone once a week or so and give us any updates or feature requests. This would become more frequent as a project came to the end, mainly with bug reports and logistical matters. For example, we fried one of our C64s and Paul organised for a loaner to be sent to us while we had it repaired, and he'd supply us with an NTSC C64 so we could ensure our games worked correctly for the American market.

I really enjoyed working on Slayer. I used several techniques I had picked up while working at Ocean and put them to good use for the game. It had 20-line full screen colour scrolling and 32 multiplexed sprites, and the title music had sampled drums, using the trick of writing to the volume.

We were all ecstatic when it received the Silver Medal award in ZZAP! 64. I lost my copies of this game, in fact all my games from that era, and hope to get hold of some copies one day to show my kids.

Steel came about because I was a huge fan of Sci-Fi and I wanted to write a game about that genre. The main character was influenced by the robot in the movie The Black Hole but the game had no influence from it. For the C64 version I used the technique of overlaying hi-res sprites over multi-coloured sprites, which let you use the best of both worlds: square pixels and three colours. I picked that trick up when I worked at Ocean from Target Renegade. The background was flip screen and used the colour map to maximize the visual impact but I wish I had made it a left/right scroller as I think the gameplay would have been much more fluid that way. We later ported Steel to the Amiga and Atari ST.

PLAY TESTING

In the late 1980s we at Hewson Consultants had taken over much of the job of play-testing the games we were producing. In the early days teams like Graftgold sent games to us that were already tested to destruction and were

more or less ready to ship. By the end of the decade we had become much more professional about the whole process and we would ask developers to send early versions of the games for testing, no matter how buggy. However, we had yet to make the distinction between bug-testing, or Quality Assurance as it would be called today and play-testing a game to provide objective feedback and advice to the programmers.

A game is completely unlike any other piece of software on the computer. If it does not operate smoothly and intuitively then it will fail to entertain which means it will fail in its primary and indeed only purpose. Users of productivity programs, such as spreadsheets and word processors, will tolerate clunky code and design eccentricities. Games players will not.

With a computer game there is nothing else but the game. There is no external need or reason, other than the experience of using it, which will motivate users to play the game. Users will not accept quirky or irritating features. Enjoyment is all there is. Nothing more, nothing less.

Hewson Consultants was in the business of publishing games for more than a decade and in that time we produced well over a hundred titles. As a result, we built up a great deal of knowledge about how to balance a game in order to give the average user an optimal experience, even if the games remained fiendishly difficult. In the later years we were consistently providing feedback to help refine and balance the games we were putting on the market. We had established a reputation for quality by seeking out only the very best programmers, but as we grew, the volume of games we were producing increased, so maintaining our reputation for quality meant taking more responsibility for it in house.

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"Back then we didn't have the games testing companies that are around today. Pretty much all the testing and bug reporting was done in-house by Paul and myself. It was a time when we were supporting both 8-bit and 16-bit computers, so I remember testing games such as Stormlord, Onslaught and Paradroid '90 on the Commodore Amiga and Atari ST."
Barry Simpson, software manager at 21st Century Entertainment

THE DEVELOPER– PUBLISHER DIVIDE

In many ways the games industry today is unrecognisable from the one we helped to pioneer in the 1980s. The budgets are now astronomical and the technology has evolved to a point we would scarcely have been able to imagine back then. One thing that remains much the same, however, is the love-hate relationship between developers and publishers.

Developers don't like publishers. In fact, they often don't trust publishers. It was true in the 1980s and it is true today. I think that is completely understandable and in some cases a lack of trust is probably entirely justified. The developer-publisher relationship is always going to be fraught with difficulty. Development is seriously hard work and there is an intensity about the work that most publishers find difficult to appreciate. Although the company I founded evolved into a publisher I have written more than enough code in my life to appreciate how draining it can be.

I am not a great programmer by any means. I get by. I can acquire a new coding language from reading an engineering textbook (or these days from visiting websites) and then executing a new project in the new language. I have fought with computers, cursed at computers, railed at their rigid, repetitive failures, bellowed at their uninformative error messages, lost my cool and had to gather it together again and settle down and allow my mind to wander and locate a fresh path forward.

A programmer operates in a deliberate, puzzle-solving mode starting with an idea of what the code is going to do and an outline of how it is going to execute. Often enough, certainly in my case, flaws appear as the plan is put into practice and it is necessary to backtrack, junking some parts of the work and recasting others, inching forward towards the goal and then falling back as some new problem reveals itself. When I am coding I hit a level of concentration that is beyond day-to-day experience. People walk into the room and I barely notice them. Someone asks if I want a cup of tea and I look straight through them. Meal times come and go. If I am lucky, a plate appears before me with a sandwich. I tuck in wordlessly and carry on.

I am sure that many creative activities are as enjoyable and addictive as writing code. Sports men and women talk about being "in the zone" where everything they do seems to work. Book authors get hooked on the act of writing, painters can't wait to work on their watercolours. Football fans pour over their statistics. Is writing code any different?

For me, there is a clear relationship between writing code and writing a piece of text – be that text a poem, a newspaper article or a full-length novel. There is the same sense of a beginning, a middle and an end, of a logical flow from start to finish with loops, circumlocutions and cross-references along the way. Both an author and a coder start with nothing – a blank piece of paper or an empty area of RAM. Moving forward, things become messy and they fight to maintain momentum as the loose ends accumulate. They question whether they can keep control of their project and they worry that they have bitten off more than they can chew. And then eventually the smoke begins to clear.

So why is it that after an extended coding session I find myself to be monosyllabic? What is it about coding that robs me of the power of speech? I know what the effect feels like. I know what is like to sit in a crowded pub, hearing the conversation ebb and flow around me, knowing that I would normally be joining in enthusiastically and sharing my droplet of wisdom with the assembled company. I know what it is like to want to lean forward and inject my two-penn'orth, to want to say something, to be one of the company, but to find that I have nothing to say. To find that nothing, literally, nothing comes to mind and I am empty of all thought, like a water butt at the end of a long, hot, drought.

My suggestion is that the link between writing code and writing text is all too real as far as our brains are concerned. Our ability to write text is clearly derived from our ability to speak. In fact, I suggest, it is an extension of that ability. We all know that when we read a piece of text, we "hear" the author's voice speaking in our heads.

Thinking about it logically, there must be an area of our brain that generates what we are going to say, before we say it. I suggest that when we write text we harness that area of our brain and then re-direct the output away from our speech centre towards the motor control that drives the pen in our hand or the keyboard beneath our fingertips.

I also suggest that when we are writing code we harness that same speech centre, that same bunch of grey cells which "knows" that a sentence needs a subject, an object and a verb, that keeps track of past, present and future tenses, and that tracks the logic of sub-ordinate clauses and subjunctives. I suggest that we re-direct that speech centre and use it to track the logic of our code.

I cannot pretend that I have any proof of my suggestion because, apart from personal experience, I have not a shred of evidence to support it. But I do know what the phenomenon feels like to me. When I have been writing code with any intensity, my ability to formulate other ideas and speak at any length slips away. It is not a permanent effect. A good night's sleep, a weekend at rest or a snooze in the afternoon may be all that is needed to return me to my normal, voluble self. But it is real. Writing code and speaking are not compatible activities. Or, at the very least, they are not compatible activities for me.

One of the reasons I am not a great programmer, I suspect, is that I do not have the desire or the stamina to operate continuously in programming mode. Some of the most gifted game developers I have met, in contrast, have the sort of personalities where they are happy and able to sustain a laser-like focus day in and day out. When speaking to them, it can be hard to draw them out of themselves and into a position where they are able to engage socially. Not every programmer is like that of course, but in my experience many of the great ones are.

Not only is the work of a programmer very intensive, it is also very personal and insular. Programmers operate in a bubble of understanding that separates them from everyone else and within that bubble they painstakingly sculpt every detail of their art, creating a deep sense of ownership that naturally makes them quite particular about how their creation is subsequently handled.

I am sure it is much the same for book authors. Logically, they know they need an agent and a publisher in order to get their book onto the shop shelves. They know there is no other route to market for their work. But that does not mean they like the process and if something goes wrong it is easy to imagine them feeling bitter and resentful.

Most of the time there is a chasm of understanding between developers and publishers. On one side you have truly remarkable people consumed by the intensity of creating incredible games from nowhere and on the other side you have the money-men schmoozing their way to the latest big license agreement.

Hewson Consultants sat in the middle ground. We grew from the development side of the chasm and built a bridge for other, far more talented programmers to cross. I am not saying we had a perfect relationship with everybody we dealt with, far from it, but we understood and respected the people making the games.

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"Working with Hewson was great – they let me get on with my work, I let them get on with theirs! They had a good bunch of people and were very professional for such a small company. They would keep a close eye on what you were doing but left design and coding issues in the hands of the programmers. Certainly it felt like you could spread your creative wings without interference."
Raffaele Cecco, creator of Exolon, Cybernoid and Stormlord

"Working with Hewson was a much more personal relationship than with other publishers. We felt every game really mattered with Hewson and that it would get individual publicity very much enhanced by Andrew Hewson's personal relationship with the magazines. We were given the room to create the games that we wanted with very little interference. We also got enough royalties to fund the next game without being cap in hand to a publisher.

Hewson used to know how to regenerate a title nearing the end of its shelf life such as bundling Avalon and Dragontorc in a double pack or releasing different versions of Paradroid and Uridium. Those extra sales were very important for us being nearly all profit. Hewson used to pay royalties as regularly as

clockwork with full accounting. That was really important to me having to pay someone a monthly wage.

I think we got most things right for the time. We should of course have had formal contracts covering all the products. It always causes issues sooner or later without a clear definition of the relationship.

We did not have much success in developing across further platforms. Hewson did try to outsource some of this allowing Graftgold to concentrate on new titles but most were failures with the exception of Spectrum Uridium which was programmed in-house at Hewson rather than by a bedroom programmer."

Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

AWARDS AND ACCOLADES
1987-1989

THE GOLDEN JOYSTICK AWARDS

Year	Award	Recipient
1987/88	Best Original Game of the Year	Nebulus
1987/88	Programmer of the Year (runner up)	Andrew Braybrook
1988/89	Programmer of the Year	John Phillips

NEWSFIELD PUBLICATIONS

Year	Award	Recipient
1987	ZZAP! 64 Gold Medal Award	Nebulus
1987	CRASH Smash Award	Ranarama
1987	CRASH Smash Award	Zynaps
1987	CRASH Smash Award	Exolon
1987	CRASH Reader Awards: Best Shoot 'Em Up	Zynaps
1988	CRASH Smash Award	Cybernoid
1988	CRASH Smash Award	Marauder
1989	CRASH Smash Award	Stormlord

YOUR SINCLAIR MAGAZINE

Year	Award	Recipient
1987	Megagame Award	Impossaball
1987	Megagame Award	Ranarama
1987	Megagame Award	Exolon
1988	Megagame Award	Nebulus
1988	Megagame Award	Cybernoid
1988	Megagame Award	Cybernoid 2
1989	Megagame Award	Eliminator
1989	Megagame Award	Stormlord
1989	Megagame Award	Heatwave
1989	Megagame Award	Christmas Collection

COMPUTER LEISURE AWARDS

Year	Award	Recipient
1988	Best Graphics	Cybernoid
1988	Best Game Music	Cybernoid

TILT D'OR CANAL

Year	Award	Recipient
1988	Meilleur jeu d'action	Nebulus

FUTURE PUBLISHING

Year	Award	Recipient
1988	ACE Rating of 917	Zamzara

PRODUCT SUMMARY
1987-1989

Year	Product	Primary Platform
1987	Anarchy	C64
1987	Draughts Genius	ZX Spectrum
1987	Evening Star	ZX Spectrum
1987	Four Smash Hits (Compilation)	ZX Spectrum
1987	Herobotix	C64
1987	Eagles	C64
1987	Ocean Conqueror	C64
1987	Thunderforce	C64
1987	Tunnel Vision	C64
1987	Into Africa	ZX Spectrum
1987	Gunrunner	ZX Spectrum
1987	Exolon	ZX Spectrum
1987	Zynaps	ZX Spectrum

"As I remember it, Spectrum Uridium had gone so well that myself and John Cummings (who would do the C64 version of Zynaps) were given free rein to come up with another shoot 'em up. Having produced the largely monochrome Uridium, I wanted to see what could be done to introduce more colour to scrolling

games on the Spectrum. The result was a new scrolling graphics engine from which Zynaps evolved.

I remember being very happy with the way it turned out at the time, but I don't think I ever considered that it might one day be a 'classic'.

I am still regularly surprised when I run into people who remember it or still play it. There is something appealing about the simplicity of those early games that is missing these days."

Dominic Robinson, Spectrum programmer for Uridium and co-creator of Zynaps

Year	Product	Primary Platform
1987	Impossaball	ZX Spectrum
1987	Nebulus	C64
1987	Ranarama	ZX Spectrum

"I had seen Gauntlet at the arcades and I recognised that the top down approach could work well on the Spectrum which could only put colours in 8X8 pixel blocks. The design of the game was really based on Paradroid with a fantasy theme.

I couldn't do Paradroid on the Spectrum as I had already used part of it for Quazatron. I could however use elements of its gameplay to ensure Ranarama was really playable. I also used the bas-relief look of Paradroid for the walls.

I liked the idea of exploring in games so I thought it would be good to only see rooms that you had visited, rather like the way we built up a map in Dungeons and Dragons."

Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

Year	Product	Primary Platform
1988	Battle Valley	C64
1988	Eliminator	Atari ST
1988	Golf Master	C64
1988	Orion	C64
1988	Premier Collection (Compilation)	Atari ST
1988	Scorpion	C64
1988	Slayer	C64
1988	Subterranea	C64

"I met Hugh Binns via Compunet, and we made a demo together. When he started working on Subterranea for Rack It, he asked me to provide the music.

To be honest, the only thing I remember was how simple it was. I think I did the main tune for that game in one day.

I was so proud when the game came out, I'd been so interested in computer games and music up to that point. It was a revelation that I could also make some money from doing something I got so much pleasure from."

Jonathan Dunn, composer for Subterranea

Year	Product	Primary Platform
1988	Sunburst	C64
1988	Supercup Football	C64
1988	Hydrofool	ZX Spectrum
1988	Mr. Wino	C64
1988	Cybernoid	ZX Spectrum
1988	Netherworld	C64

Year	Product	Primary Platform
1988	Cybernoid 2: The Revenge	ZX Spectrum
1988	Marauder	C64
1988	Zamzara	C64
1989	Steel	C64
1989	Shockway Rider	ZX Spectrum
1989	Stormlord	ZX Spectrum
1989	Maze Mania	C64
1989	Head the Ball	C64
1989	5th Gear	C64
1989	Christmas Collection (Compilation)	ZX Spectrum
1989	Cyberdyne Warrior	C64
1989	Mission Impossibubble	C64
1989	Heatwave (Compilation)	ZX Spectrum
1989	Heavy Metal Paradroid	C64
1989	Insects in Space	C64

"Traditionally at Sensible we would follow up each major game with a budget game for a bit of light relief. After Parallax we made Galaxibirds, after Wizball we made Oh No! and after Microprose Soccer we made Insects in Space on the C64. The much poorer Amiga version was converted almost two years later by a different team.

Insects in Space was based on the arcade game Defender. Chris Yates, my partner at Sensible, wanted to push the C64 technically and he succeeded. Chris really loved a lot of those classic arcade games. The game was made by just the two of us (I did all of the art).

I think the stand out features of it are the controls, insect sound effects, up and down gameplay and the sharp style throughout. It is a highly polished game that took about three weeks to make.

The art is based loosely on the Rhineland. It wasn't until years later that I realised this game with a woman with naked breasts saving babies, had somehow stimulated my Freudian breastfeeding gland and inspired me to draw the Rhineland, which is where my mother comes from.

We had published our previous budget games through the now defunct Firebird, I think Hewson was recommended to us by a friend.

The whole process was pretty painless as far as I recall, I think the producer we worked with was called Paul Chamberlain, although I could be wrong. For us this was a very straightforward and quick deal to have a bit of fun finishing the game and to make sure the game was published by a company who knew what they were doing, and we got a bit of money out of it.

I think it is definitely our best budget game. Even though it was a bit of a throwback, even at the time, to the old arcade machines. It is actually one of our most obscure good games, alongside Mega lo Mania and Wizkid, but not as momentous as either of those titles due to its small scale."

Jon Hare, co-founder of Sensible Software, creators of Insects in Space
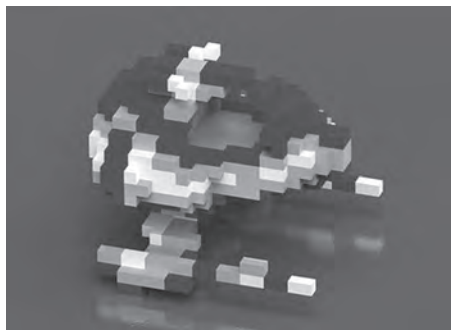
16-BIT BITES

By the late 1980s life was getting difficult. Development costs were rising and we were struggling to recoup those costs from direct sales. The life of a title that might have taken close to a year to develop could be measured in days and weeks. We could increase the direct income by re-packaging the title first as part of a compilation and then as a budget title. We could license the title to other publishers perhaps for particular territories. We could convert the title to other platforms at the price of paying additional development costs. But overall it seemed to me that product finance rather than product innovation was beginning to dominate the industry.

A TIGER BY THE TAIL

People have asked me whether I worried in the early days that computer games might be a passing fad. There were probably some people active in the industry who thought like that, but not very many and I was certainly never one of them. I would imagine there were far more doubters outside of the industry than within.

The belief I held at the time remains unchanged to this day – computer gaming is the art form of our time, just as cinema was before it.

However, it is very easy to sit back today with the benefit of hindsight and dismiss those who doubted the staying power of computer games as short-sighted. There are plenty of examples historically of products going from boom to bust, especially in the fickle entertainment sector.

My opinion at the time turned out to be correct, but there is a fine line between wisdom and foolishness, or as the saying goes "The wise man knows he knows nothing, the foolish man thinks he knows it all".

I was pleased to be there at the birth of a new era, having missed out twice before. At the British Museum, I had come to the realisation that I was twenty years too late when I started working in radiocarbon dating in 1972, the technique having been invented in the 1950s. Similarly, I joined the flood studies team at the Institute of Hydrology seven or eight years after they had published their major study. However, with computer gaming I was in at the beginning, at the birth of a new medium, a new era, a new industry.

It is probably no coincidence that new markets are often driven by the young and enthusiastic rather than the experienced and cautious. However, I could certainly have used a bit more experience later on when the going got tough at Hewson Consultants with the transition to the 16-bit machines. I have always thought that the UK industry as a whole lacked a leadership figure who could guide us all through the growing pains of the early 90s. We had a tiger by the tail and none of us could really foresee how it would turn around and bite us.

From about 1983 onwards we at Hewson Consultants had been very successful in shipping our titles into Europe. Something like 25% of our direct sales came from the German market, but European success brought problems as well as revenue. We had to translate the instruction manuals into multiple languages, supply marketing materials to the relevant overseas partners, brief them on the products they were receiving and co-ordinate release dates. We also had to be cognisant of the standards of taste in foreign markets and on occasion ask for detailed modifications to products to avoid falling foul of censorship issues. For example, Onslaught, our medieval battle game which launched on the Commodore Amiga and the

Atari ST, had red blood in the UK release and green "blood" in Germany so that we could claim that it did not depict the slaughter of real people.

In retrospect I can see that our UK strategy of addressing the consumers directly via the UK gaming press also worked for us in Europe because many of the better magazines were syndicated across the continent. We had also had some success in licensing our titles into other territories outside of Europe. Uridium, Nebulus (rebranded as Tower Toppler) and Cybernoid all appeared across the pond in the US market. But we never established a long term relationship with a partner over there. The European games markets, on the whole, looked to the UK (and the US) for inspiration, but the US market was far too self-involved to take much notice of what we were up to and we never established our own reputation in America.

At this time the consoles were beginning to tighten their grip on the market. The Nintendo Entertainment System (NES) had been around for a number of years and now the Sega Mega Drive and the Super Nintendo Entertainment System (SNES) were looming on the horizon. These products were not computers with keyboards for which anyone could develop products using the machines themselves. They were dedicated game consoles that were both simpler internally than proper computers and which required specialist hardware for product development. The manufacturer's business model was to sell the consoles themselves at cost or less or in order to establish a customer base and then sell the games, which were programmed onto plug-in cartridges, at an elevated price so that overall the manufacturer made money. Nintendo were particularly successful and for a period they made exceptional profits.

This business model required the manufacturers to maintain a ruthless control over who gained access to their hardware because they needed the excess income from cartridge sales to cover the losses incurred from selling the game consoles themselves. Ruthless control meant, in practice, refusing to supply development kits to all but a limited number of third parties, refusing to allow third parties to manufacture their own cartridges, demanding the right to playtest all games prior to sanctioning their release and requiring payment upfront for all manufacture of game cartridges. It was the kind of monopolistic trading which would have been outlawed by

the state authorities had it occurred in a more mature industry but video-gaming was barely ten years old. Governments viewed it as a disreputable activity for wayward teenagers not as an emerging art form and an industry worth nurturing.

However what Nintendo and Sega gained in control they lost in innovation, at least to begin with. Their activities would not have mattered so much if piracy on the one hand and a cavalier attitude to product quality amongst many of our competitors on the other, had not undermined the income stream of computer game publishers on the open platforms.

One of the main reasons why the shelf life of our products was so short was because as soon as a title hit the streets it was copied and sold in playgrounds and pubs by software thieves. Most of the people involved in copying saw themselves as indulging in a bit of harmless exploitation but the sum of their activities plus those of the criminal fringe was enough to rob conventional publishers like ourselves and the developers who depended on us of the just rewards for our hard work.

As the decade wore on hardware variations proliferated, initially, as far as we were concerned, with the launch of the 128K ZX Spectrum. By the end of the decade the IBM PC, which had been laughable as a games machine when it started life in 1981, had acquired a startling variety of third party sound and video cards and other add-ons which had turned it into a serious gaming platform thanks to its open architecture. It rapidly became impossible to playtest products with all IBM PC hardware variations and even the more carefully structured platforms like the Commodore Amiga came in a range of variants.

There is no doubt in my mind that boring gameplay and buggy software contributed to a "piracy is ok" attitude amongst the computer gaming public. Risking hard-earned cash on a legitimate purchase was seen as foolish by a proportion of potential purchasers because the game might fail on the purchaser's particular hardware configuration or it might prove to be tedious in action. The alternative was to acquire a pirate copy which would enhance a collection and incrementally improve bragging rights at no risk and little or no cost whether it worked or not and whether it was played it or not.

From 1987 onwards, roughly from the time of the first release of Nebulus, I had a growing sense of unease as to what the future had in store for us. It seemed to me that we were required, like the Red Queen in *Through the Looking Glass*, to run faster and faster just to stand still. Shakespeare tells us in Julius Caesar that, "There is a tide in the affairs of men, which taken at the flood, leads on to fortune," and we had certainly benefitted, as had many others, from the flood tide which flowed when home computers and computer gaming had first sparked the public's imagination. But Shakespeare fails to mention that tides run in both directions and I sensed that for us the tide had passed its peak and was already beginning to work against us. Life was becoming more and more difficult.

My problem, which I dimly recognised at the time and which I see much more clearly now, is that I had no support network to call on to help me understand what our strategy should be. I had a scientific education. My parents were scientists. My mother's family was full of teachers and my father's family, he being the youngest of his siblings, were too old for me to call on. I knew nobody who had created or run a business, not even a corner shop. In the UK as a whole politicians and their camps of followers were still squabbling over whether the state should own "the means of production, distribution and exchange" and as a result owning and running a private business was seen as immoral by a proportion of the population. Against this background I had difficulty believing that I would find a sympathetic ear.

Nonetheless I tried. I talked to business advisors, I went to the DTI (short for the Department of Trade and Industry and now badged the Department for Business, Enterprise and Regulatory Reform) and I spoke to the bank. The business advisors were poor. They were mostly men in their fifties made redundant by down-sizing PLCs and had no concept of the environment in which we operated. The DTI was well-meaning but it was still trying to escape from its previous focus on government-owned monsters like British Coal, British Leyland, British Rail, British Road Corporation, British Steel, British Telecom, the Central Electricity Generating Board, the National Bus Company and a few high-profile minnows like British Airways. Unfortunately, its concept of being helpful didn't extend much beyond offering discounts on training courses in health and safety.

I already knew that the bank would not be much help beyond lending me more money than I was happy to borrow. A few years previously, probably in early 1984, I had arranged a meeting with our new bank manager after the previous incumbent, who had granted me the £500 overdraft for the purchase of a ZX80, had retired. The new manager was balding, bespectacled and in his early fifties and when I met him I was clutching the cash flow forecast that I had dutifully prepared. He showed me to a chair in a wood-panelled room facing a fine teak desk behind which he eased himself into a black leather banker's chair with a high back. The chair rocked and swivelled and had substantial armrests so that he could rest his elbows in comfort, steeple his fingers and, no doubt, Think Great Thoughts.

I explained our business to him as best I could and, at the appropriate moment, placed my cash flow forecast before him, carefully turning it so that the numbers faced his way. I waited for him to absorb them and then bestow a Great Thought on me. He studied my figures.

"Is this a spreadsheet?" he asked quietly, fingering it carefully.

I nodded.

"Really?" he said, his voice tinged with reverence, "I've never seen one before."

As you can imagine my heart sank. Of course it was a spreadsheet! I used my trusty Osborne "portable" computer for everything and was already adept with SuperCalc (for spreadsheets) and Wordstar (for word processing). The previous year, in 1983, we had bought our first copy of Sage, the computerised accounting package, and we were now making good progress in understanding its eccentricities. I had assumed, naively of course, that banks, which had been using computers for the best part of twenty years, would have been the one organisation which could understand our use of technology. I could not have been more wrong.

That meeting with the bank manager did have one positive result. I returned to our building, lifted the stationery catalogue from its place beside the telephone directory on the shelf in the front office, found a picture of a banker's chair and ordered one for myself. I used it for a week or two after it was delivered but I found, like the bank manager, that it did not give rise to Great Thoughts and more disappointingly, that it was too big for me to

tilt and swivel satisfactorily. At five-foot-eight I am not unusually short but with my feet an inch or two off the floor that chair made me look less like a technocrat at the cutting edge and more like a toddler in a car seat. So I gave it to my father who, being in his sixties, was perhaps no longer seeking Great Thoughts but was certainly in the market for a comfy chair.

Even within the games industry itself none of the fellow pioneers that I knew had a background in business. We were mostly neophytes. There were a few exceptions – Mastertronic and Codemasters both had business masterminds behind them and were able to steer their way through troubled waters and Geoff Brown at Centresoft / US Gold put together a strong team that held together for a period but even they got into trouble in due course. Hats off to them for what they achieved, but they were the exception.

Looking back on it I am surprised that my sense of foreboding did not spur me to take more effective action. I think I felt that I lacked control. I had not intended to become a computer games publisher. I had wanted to prove to myself that I could write a book and I had wanted to make myself some money. I had achieved both of those objectives but the tidal flow which had helped me do so had swept me to a place that I had never expected to be. I was mentally unprepared for the challenges that were presented and I had an uneasy feeling that I was not entitled to all the good fortune that had come my way.

With the benefit of another twenty-five years of business experience under my belt I can now see that I should have cast aside my worries, kept a tight control of costs and returned to the route which had taken me into the business by writing another book – Hints & Tips for the Commodore Amiga perhaps. It would have generated recurring sales, brought us an additional crop of talented programmers and most importantly, given me a better understanding of the capabilities of the latest hardware. If we had pursued that route with sufficient energy we could have become a book as well as a games publisher using the books as a long term, low income cash cow to stabilise the lucrative but flash-in-the-pan income from our games. It would also have differentiated us clearly from our competition which is a huge advantage in any market and we would have beaten a path which it would have been difficult for others to follow.

Unfortunately, the idea did not occur to me at the time. The urge to prove myself as a book author had evaporated and in my own eyes I was now, whether I liked it or not, no longer the person who dug into the technical possibilities of the machines or developed products for them. I was the person who took other people's products and put them on the market.

As a manufacturing company we were running a big overdraft. Retailers tend to be cash rich, because customers are giving them money every day but manufacturing companies like Hewson Consultants are always cash poor. Until we generated money back from the sales of a product we were just living on fresh air and we relied on distributors and retailers to pay us what they owed for the orders they had taken, otherwise it would be fresh air for breakfast again tomorrow.

Hindsight is a wonderful thing. A quarter of a century later it still pains me that I foresaw that life was going to become difficult and yet I failed to address the coming difficulties in any meaningful way.

THE FOUNDING OF ELSPA

In the midst of our struggles to adapt to the transformations that were rippling through the business, the wider UK games industry itself was facing some tough challenges as a consequence of its own success.

Having burst on to the scene at the beginning of the 1980s with mostly absurd stories about bedroom coders making a fortune, by the end of the decade the industry was making a less savoury impact. MPs, responding to the concerns of parents, complained in Parliament about violence in videogames partly because, for the first time, instead of sitting with family in front of the television every evening the nation's teenagers were disappearing to their bedrooms to play games until all hours.

I for one regard excessive violence in films and videogames with distaste. I understand that Quentin Tarrantino enjoys making violent movies, but I have never liked watching them and I am not one of those who sees them as harmless escapism. I have never felt that it is necessary or appealing to portray horrendous violence and to this day I find certain first-person

shooters unacceptable. I think the closest we came to unpleasantness was with Onslaught from Chris Hindsley but I regarded it as acceptable because it presents a side-on view of a clearly imaginary world and the violence is, in the proper sense of the word, fantastic.

Whatever my personal opinions, people inside and outside of the industry were beginning to talk about the need for an age ratings system for video-games. The matter came to the fore at an industry conference arranged by one of the magazines that was held over a weekend on the island of Jersey. People were present from a couple of dozen different companies in the UK. We knew one another pretty well by this time and as we debated industry matters back and forth, the need for an industry-backed age ratings system was the key theme that arose. We agreed that if we did not introduce an age ratings system ourselves then in due course the Home Office would come in and impose one upon us. After all there was an age ratings system for movies and so we all accepted that something similar was needed for games.

I have never been one to keep my opinions to myself and at that meeting I must have spoken more than most because either then or shortly afterwards I was asked to chair the body that would become ELSPA – the European Leisure Software Publishers Association. It was symptomatic of how we saw ourselves that we had the chutzpah to include the word "European" in our title. We were nothing of the sort of course and in due course the word "European" became "Entertainment" instead, the latter word being chosen so that the ELSPA abbreviation, which appeared in the logo, could be retained.

We regarded the UK as the European market leader in the videogames business and we consciously included the European flag in the age-rating logo because we saw ourselves as establishing an age-rating system on behalf of the continent. We asked no-one's permission, we did not consult, we just got on with the job. And broadly speaking we succeeded. Today the UK videogames business is seen as a responsible, mature industry capable of self-governance and is an important earner of income for UK plc. In the 1980s MPs in Parliament questioned the effect of videogames on young minds. In the second decade of the 21st Century they voted to grant tax breaks to videogames developers. How times change.

The success of ELSPA owed a great deal to the energy and drive of its first General Secretary, Roger Bennett. Roger was a successful salesman and a keen horseman with a huge laugh and a firm handshake. He was "between jobs", to use a common euphemism, and drove the formation, launch and success of ELSPA from start to finish. The founding companies agreed a modest annual subscription fee sufficient to fund the first few months of Roger's rather more than modest salary. It was up to Roger to go and sign up the rest of the industry, including the major players and the hardware manufacturers, who would all have to cough up rather more than the founding companies.

Rod Cousens of Activision and Nick Alexander of Virgin, later Virgin Mastertronic, had already had a crack at forming an industry body as early as 1982. I remember being invited along to a post-event party after one of the ZX Microfairs to be told of the existence of the Guild of Software Houses (GOSH), but it had run out of steam perhaps because it never had a unifying purpose. The age-rating system was ELSPA's raison d'etre and it was both a necessary and a sufficient condition for the industry body to come into existence. It was also central to ELSPA's ability to win the support of heavy-weight companies like Nintendo.

Both ELSPA, now renamed UKIE, and the age-rating mechanism it spawned survive, essentially unchanged, to the present day.

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"There was a lot of fear about videogames during the 80's. It was unfounded, of course, but the press and many consumers were worried about the effects that games might have on the kids that played them. We also started to see more violent games – such as Barbarian – and I think that also created another level of controversy, and gave yet more ammo to the anti-videogame brigade. At point it was really important that games needed to be rated, so that the adults buying them could choose the right kind of games for their kids. I think that helped allay concerns, and make it apparent that the games industry was capable of

*being responsible and governing itself without someone else
having to step in and oversee it."*
Julian Rignall, games journalist and former ZZAP! 64 reviewer

THE DEMISE OF HEWSON CONSULTANTS

The demise of Hewson Consultants was a painful period in my life. Our ongoing inability to generate enough revenue from each product to fund the rising development costs of the next meant we had dug ourselves into a financial hole. With each successive product it felt as though we were holding our breath until release day and each time we had to hold our breath a little longer than before. Our overdraft had grown substantially. There was only so much longer we could hold our breath before we were going to suffocate.

However, slowly but surely things began to get better. Our strategy of reaching out to more international markets was beginning to bear fruit and although we did not yet have a killer 16-bit product our sales had still been reasonable. Meanwhile our Rack It budget label was doing well and had given us a more regular and consistent income stream to carry us through the periods between big releases. We were beginning to pay down our overdraft and I was getting more and more confident that we had succeeded in turning things around. Things were looking up.

Then one day out of the blue I received a phone call from the head honcho at our German distributor. Up until then I had only ever dealt with his subordinates. This was the first time I had actually spoken to him in person. He asked if we could meet in London and so I agreed, and arrived at his up-market hotel one afternoon a few days later.

I met him in the lobby and we went up to his room, except it was not a room, it was a suite with a fully furnished living area. His bedroom was just visible through a pair of double doors and after a minute or two of small talk in these lavish surroundings I asked him what was on his mind. The German market represented about 25% of our sales excluding licences and so I was hoping for some upbeat news.

Then he explained that they were in financial difficulty and could not pay our invoices.

It was a body blow. It was not just that he was our single biggest customer. Until then the Germans, and I had a variety of friends and contacts in that market, had always been exemplary when it came to paying their dues. You meet all sorts when you are in business on your own account and you need to become battle hardened when it comes to tracking and nailing recalcitrant payers. But my experience until then had been that the Germans were different, that with them it was matter of pride to pay what they owed, when they owed it. Just as they were very precise in specifying what they wanted and how many, explaining their requirements in great detail if they felt it necessary, they were also just as diligent, exact and timely in settling their accounts.

I remember very little of the rest of the meeting. I think he was looking for me to write off part of his bill and settle the remainder but I am not sure. I was not concentrating.

I returned home weighed down with the implications of what I had heard. I am the sort of person who takes responsibility quite seriously, perhaps too seriously. I like to face up to mistakes and live with the consequences. Companies that are in difficulties have a legal responsibility not to continue trading if the directors are unable to foresee a profitable path forward. I understood very clearly that that burden rested on my shoulders.

There was nobody else for me to look to. I was running the business on my own and I worried that I no longer had the drive to overcome this new setback. I had been concerned about the logic of our business model for a number of years, so I began to think that the right thing to do was to accept the inevitability of our situation.

I knew I would have to go to the bank and tell them that we needed to put the company into liquidation and I understood that it would trigger another set of problems – not the least of which was working out how I was going to feed my family. But, notwithstanding the difficulties it would create for me, I believed it was the right thing to do.

Could we have survived? In retrospect I think that it is perfectly possible that we could have if I had the appetite for the risk involved. I would have

had to cut staff numbers to the bone and chase licences for our 8-bit back catalogue which, over the next few years, acquired a new income stream from magazines that wanted to bundle games on front cover cassettes and disks. But that was not an income source that I could foresee at the time. Be that as it may, in truth I no longer had the stomach for the fight. The pressure and the responsibility to my staff had become too heavy a burden to carry.

I had absolutely no idea what the rules and regulations were, so I phoned the bank and they arranged to put receivers in place. In next to no time the company was closed and I felt a huge weight had been lifted from my shoulders.

However, it was not to be the end of my career in games. A few weeks later I would find myself ready to start a new company, this time working with a partner who had a significant amount of experience in business. The new company would need a new name of course, a name which communicated a statement of intent, a name to reflect my continuing belief that games are the new art form of our time.

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"We had built up an excellent relationship with Hewson and things were looking bright but one day the lights just turned off. It was a huge loss for the games industry, and at a personal level it marked the end of our own company as myself and Mike went our separate ways."
Gari Biasillo, creator of Slayer, Steel and Future Basketball

"I have great memories of working with Hewson. It was so primitive at the start and it was all enthusiastic amateurs (sorry Andrew), but there was this huge appetite from the marketplace. For Pilot to have sold any copies at all shows how primitive the market was and the interest the buying public had in almost any kind of program.

It was fantastic when the first cheque came in and it was fabulous when you first saw any reference to your programs or a review in a magazine. It felt daunting when people from

the computer press wanted to interview you; that kind of thing happened to others, not to people like me.

The launches were great fun, the best in my memory being the launch of Southern Belle at the Railway Preservation Society in Didcot – such a buzz. I also remember having a launch in London at St Martins I think – it felt a like big deal and it was all fun.

I have really fond memories of everyone at Hewson Consultants, especially Andrew. It was all new to everyone and I am sure there were lots of opportunities for things to go awry between an author and the company they work with but that never happened to me. Andrew and I had a rapport and respect from the very beginning and I believe only a company like Hewson would and could make a success out of the type of thing I was doing."

Mike Male, creator of Pilot, Nightflite, Southern Belle and Evening Star.

"I'd been well aware of Hewson Consultants Ltd as a teenager in the 80's; I owned and knew inside-out pretty much all of their Commodore 64 games and I knew that their office in Milton Park was really close to where I lived in Abingdon. I think it was in late 1988, just by chance, that my Dad spotted an advert in the Oxford Mail newspaper for a Software Assistant at Hewson, so I applied straight away, got an interview and then in early 1989 I started work there.

One of the first things that surprised me about Hewson was its size, as the office was a lot smaller than I expected and I think there were only around 8 employees, including myself. I remember thinking that it was pretty impressive that such a small team of people were behind some of the most well-known home computer games of that decade, managing the whole process of identifying these great games at an early stage, signing up the developers and then producing, manufacturing and selling those games right across the world.

For a 19 year old, as I was at the time, it was a dream job, helping to bring more great games to market under the well-known and respected Hewson label. I still remember the first time I spoke to Andrew Braybrook on the phone, it was all a bit surreal knowing that I was actually chatting to the guy behind what was probably my favourite C64 game of all – Uridium."
Barry Simpson, software manager at 21st Century Entertainment

"Those were exciting days in the industry. We were making up the technology as we went along, looking for ways to do things that had not been done before. It never felt like a job.

I remember having to move out of the office we (the programmers) were working in so that it could be decorated. We moved into a portacabin in the car park whilst the work was done, but never moved back because the marketing people (you know who you are) grabbed our shiny new office. As it turned out the portacabin was an improvement. Once we'd carpeted and decorated it ourselves it was comfortable, and being out in the carpark meant that no-one ever came out to disturb us or check up on us. We could keep our own hours and play music as loud as we wanted. The portacabin became our permanent home.

My fondest memory is probably the look on Andrew's face when I told him that we (myself and John Cumming) had created an entire new set of levels in a new graphical style for Spectrum Uridium over a weekend. They were hidden in the game and could be activated by a special code (that I can no longer remember). I think some of the wheels of the car he was driving at the time stayed on the road!"
Dominic Robinson, Spectrum programmer for Uridium and co-creator of Zynaps

"They were a fun, talented bunch at Hewson. I worked from home, but would often visit the offices and generally have a good laugh.

They had a couple of good programmers working in-house there. Dominic Robinson, author of Zynaps, was a great coder and I got on well with Paul Chamberlain, the producer, as well as people in the marketing and PR departments.

I remember one time when Andrew arranged an impromptu sightseeing trip to London for no apparent reason, apart from a vague request to get a photo of me with a Beefeater. I think we ended up with a photo of me next to Mr T at Madame Tussauds instead.

Nothing particularly bad stands out, but the last minute rushes to get things finished by a deadline were always unpleasant due to the lack of sleep. I remember doing the Amstrad CPC conversion of Cybernoid in 48 hours."
Raffaele Cecco, creator of Exolon, Cybernoid and Stormlord

"My only contact at Hewson was Paul Chamberlain who was a great guy. He gave me lots of materials to work on – I always had either posters, cassette slip cases or expensive colour photocopies of the logos and artwork. That made it much easier to get good quality results. I don't remember any hassles with getting paid on time either."
Stephen Robertson, game designer and former C64 loading screen artist

"Almost all my contact with software publishers was during the first year, with Imagine, Ocean, Melbourne House, Blaby, MC Lothlorien and Hewson. I feel Newsfield and Hewson always enjoyed a good relationship, but after that first year I was far more buried in management than at the editorial coal face and the contacts went through editors like Graeme Kidd, Gary Penn, Richard Eddy and so on. Obviously, it's much easier to maintain good relations with a publisher who produced so many great games and a list of major hits that showed a smaller software house punching well above its weight."
Roger Kean, co-founder of Newsfield, publishers of CRASH and ZZAP! 64

"Hewson came across as a small (but so were most), well-run enterprise with a steady stream of good product. Visits to their offices and meetings with Andrew confirmed a courteous and friendly attitude."
Oliver Frey, illustrator for ZZAP! 64 and CRASH

"When you look at the list of Hewson games produced over the years, there really aren't that many duds. Ultimately, I think that was down to the talent that published under the auspices of Hewson – there were some truly great games designers making products for the label.

Some of the early Hewson games were inspired by coin-ops, but subsequent releases became increasingly more original, and generally different from a lot of the me-too clones and copies of arcade games that were appearing at the time. I think the Graftgold duo of Andrew Braybrook and Steve Turner were instrumental in making this happen: they produced a series of all-new games of the like we hadn't really seen before – games like Avalon and Paradroid really helped blaze new trails."
Julian Rignall, games journalist and former ZZAP! 64 reviewer

AWARDS AND ACCOLADES
1989–1991

YOUR SINCLAIR MAGAZINE

Year	Award	Recipient
1990	Megagame Award	Cecco Collection
1990	Megagame Award	Deliverance: Stormlord 2

COMPUTER ARENA 90 – EUROPEAN COMPUTER LEISURE INDUSTRY

Year	Award	Recipient
1990	Individual Award for Excellence: The person contributing most to positive global awareness for the industry in 1989	Andrew Hewson

PRODUCT SUMMARY
1989-1991

Year	Product	Primary Platform
1989	Premier Collection 2 (Compilation)	Atari ST
1989	Astaroth: The Angel of Death	Amiga
1989	Onslaught	Amiga
1989	Custodian	Amiga
1990	Deliverance: Stormlord 2	ZX Spectrum
1990	4th Dimension (Compilation)	ZX Spectrum
1990	Cecco Collection	ZX Spectrum
1990	Future Basketball	Amiga

"Influenced by futuristic, post-apocalyptic genres, and films like The Running Man and Rollerball, we wanted to create a sports game with a similar vibe. Basketball seemed like a good starting point but we ended up removing a lot of the rules as they hindered the flow of the gameplay. If I could go back in time and rewrite this game, I think I would do it in a ¾ isometric view instead of overhead."

Gari Biasillo, creator of Slayer, Steel and Future Basketball

Year	Product	Primary Platform
1990	Paradroid 90	Amiga
1990	Premier Collection 3 (Compilation)	Amiga
1990	JoystickThunder	ZX Spectrum
1990	Klimax	ZX Spectrum
1990	Kraal	ZX Spectrum
1991	Zarathrusta	Amiga
1991	Rubicon	C64

"When I first started work at Hewson, one of my jobs was to review all of the game demos that we'd get sent in the post by programmers all over the country and abroad. They'd arrive on cassette or sometimes disk, if they were C64 demos. I remember the first time I loaded up the Rubicon demo on the C64 – it was a classic sideways scrolling shoot 'em up, a little like Thalamus' Hawkeye, but it had a huge array of large animated bosses to defeat, that were all completely different from one another. You literally had no idea what was going to appear from one level to the next!

It didn't take long for us to sign up the developer (Twisted Minds – Fredrik Kahl and Joachim Ljunggren), get the development finished and release the game. Later, we did 16-bit versions of it with Stewart Gilray, Andrew Buchanan, Keith McMurtrie, Mark Jones and Maniacs of Noise (Charles Deenen and Jeroen Tel)."
Barry Simpson, software manager at 21st Century Entertainment

"Keith McMurtrie asked me to work on the ST version of Rubicon whilst he did the Amiga version. I moved down to Barrowford, Lancashire from Aberdeen to do the work, but about a month in Hewson went into administration. Keith ended up

*leaving the games industry, so I moved back to Aberdeen and
Paul Chamberlain asked if I could take over development duties
on both the ST and Amiga versions. I roped in another friend
from Aberdeen, Andy Buchanan, to work on it with me and we
ended up finishing it off, but that was still a good 8–9 months of
work for us."*
Stewart Gilray, associate producer at 21st Century Entertainment

1991-2000
A GRIFFIN
FROM THE ASHES

By the time we closed down Hewson Consultants the energy and enthusiasm I had felt as one of the early pioneers of the UK games industry had long since evaporated. The truth is that there was a big part of me that felt relieved. A heavy weight had been lifted from my shoulders, but I did not have a clue what I was going to do next.

THE BIRTH OF 21ST
CENTURY ENTERTAINMENT

A couple of weeks after we closed our doors I found myself at a social event in my home village chatting to Eric Griffin, who was about ten years my senior. "I'm sorry to hear what happened to you." he said, "How much money would it take to restart this thing?"

Talk about a bolt from the blue. I had not given much thought to re-starting, but I gave him a number. Actually it was a rather modest number

looking back at it. Eric took a puff of his cigarette and replied casually, "That doesn't sound like too much to me."

If Eric had not come along I am not sure what I would have done next, I am not even sure I would have remained in the games industry. But he did come along and just like that the wheels were set in motion. We sat down and raised the money between us in a small group that included Eric and my parents.

As you may be aware when a company is closed a receiver comes in and takes possession of its assets, before auctioning them off to raise the funds needed to repay its creditors. Not surprisingly perhaps, we were the only people bidding for the assets of Hewson Consultants Ltd and so we were able to start a new company with many of the Hewson staff coming across as well.

Having Eric on board was of great comfort to me personally. He was a builder by trade and had been involved in the development of industrial buildings. Eric was a very practical, down to earth man and I learnt a great deal from him. "Andy…" he would say leaning back in his chair while puffing on another cigarette, "…I'm not very clever, but I do have a certain low cunning."

Eric was the kind of business mentor I wish I'd had around at Hewson Consultants. As a property developer he'd had highs and lows, and I mean real highs and lows. He'd lost his house at least twice, but he used to laugh and joke about driving a brand new Jaguar one week and being flat broke and homeless the next. He was that sort of chap.

He had developed arthritis in his early thirties and when I knew him his fingers were so twisted he struggled to light his omnipresent cigarettes. He wore a long sleeved shirt and trousers even in the hottest weather because he hated people seeing his gnarled and misshapen joints. The arthritis had put paid to his career "on the bench", as he called it, working as an engineer and so he had re-invented himself as the gaffer who oversaw the building site whilst his business partner raised the money and put the deals together.

By the time he approached me Eric was in his early fifties and living on sickness benefit and a small pension that he had funded from one successful property deal. He converted the space over his garage into a self-contained flat to generate a bit more income holding tools and bits and pieces as best he could whilst his broadly-built son did all the hard work. And despite all of

his difficulties he was probably the happiest person I have ever met. "Andy," he would say, pausing to chuckle and puff on another cigarette, "life is a bowl of cherries."

So there we were, up and running again with the Hewson IP (intellectual property) and most of the Hewson staff. Peter Howard, one of the other investors, joined us as a salesman. And what a salesman! He had spent thirty-five years selling cars – initially British-made cars, but eventually as the quality of British marques fell away during the seventies he began to sell for Mercedes. He would come into work, cigarette in hand (he was another heavy smoker) cracking jokes and laughing. He would make himself a cup of coffee, wander around the building chatting to people and then return to his desk, light another cigarette and gaze into space.

On his desk there was a telephone, an ashtray, a piece of paper and a pencil. Every now and again Peter's eyes would re-focus. He would put down his cigarette, pick up the pencil, make a note on the piece of paper, put down the pencil, pick up his cigarette and stare off into space again. This ritual would be repeated every few minutes for half an hour, maybe an hour – however long it took for Peter's multiple trains of thought to run to completion. Then he would pick up the phone and start selling.

He would ring people in the trade and tell them jokes. Some of his jokes were outrageous even though I have no doubt that he had toned them down for our benefit. After he had cracked one of his jokes, and to be fair most of them were funny rather than offensive, Peter would laugh uproariously as if he had only just heard the joke himself, whereas in truth he had been rehearsing and repeating it all morning. The people at the other end of the line would laugh along with him, perhaps, like me, rather against their better judgement, and somewhere along the line our products would get sold.

But under what name? I had always felt a little bit awkward about the name Hewson Consultants Ltd. It came about because in the early days, before anybody knew what a computer games publisher was, including me, I had done some consultancy work. When I started writing the Sinclair User column, which they called "Hewson's Helpline", the name was set and I have no doubt it served its purpose in terms of helping to introduce us to talented programmers like Mike Male and Steve Turner.

That time was now over. The industry was maturing fast and we were at the dawn of a new era. We needed a name to reflect both the changing times and our belief in games as the art form of the next century. I came up with 21st Century Entertainment and I am still proud of it, although an American contact at the time explained to me somewhat loftily that it sounded pornographic in the US. "Honi soit qui mal y pense," I responded (a reference to a retort attributed to Edward III, which translates as "May he be shamed who thinks badly of it"). I am no royalist, in fact I am very much the opposite, but being able to quote a medieval English King to a transatlantic cousin is a small recompense for all the other damage that royalism, past and present, has inflicted on us all. Be that as it may, I felt the name was a powerful statement. We were claiming an entire century for computer-based entertainment.

I was wrong of course. The Internet was just around the corner and who would doubt now that the 21st Century is the Internet Century?

Once 21st Century Entertainment was up and running we started out by simply working the Hewson back catalogue. Magazines used to carry games on their front covers, so we licensed a number of Hewson titles in that way, and this gave us enough cash to get by for the first year, but I was not optimistic about our chances. We plugged away at our phoenix from the ashes operation but I felt drained. The old company had gone. I knew I had let myself down and everybody else. I suppose it was natural to feel that way. I had to force myself to dust myself off, pull up my socks and get on with life. It was time to get back out there and start looking for new games.

We began to scout around for new talent and fortunately we met a team of five Swedish students at a show in London. They had a programmer, a graphics man, a brilliant audio guy and a very astute team leader – it was an impressive setup. We looked at their product – a simulation of a pinball table – and it clearly had some real class to it, even in the early version that we saw. I remember that the ball physics were already beautifully slick, so I said "great, fantastic – let's sign these people up". It all happened pretty quickly.

The five-man student team called themselves Digital Illusions (later Digital Illusions Creative Entertainment or DICE for short) and after creating

three Pinball simulators for us, they would go on to float their company on the Swedish stock exchange in 1998. They built their reputation with, among other titles, the Battlefield series, the first of which was launched in 2002, before selling their studios in Sweden and Canada to Electronic Arts in 2006. The Battlefield series is still in production to this day and arguably DICE have become one of the best known videogame development companies in the world.

Their debut title, published by 21st Century Entertainment, was Pinball Dreams.

PINBALL DREAMS

As we approached the launch of Pinball Dreams for the Commodore Amiga everybody around me was getting very excited. Barry Simpson, the games producer, kept enthusing about how brilliant the game was, indeed he could hardly stop playing it. I could see that the game was slick, but I still felt sick inside about the collapse of the old company. I struggled to let myself believe the game was going to be a success.

We had made some money from working the back catalogue of Hewson Consultants and we had managed to release some of the Hewson titles that were left in the lurch when the old company closed down, such as Moonfall, Rubicon and Nebulus 2. However, by the time we had signed Pinball Dreams we were beginning to run out of steam. We were up against it.

Looking back on it, I was worn out. I carried a sense of guilt about what we had all gone through and I did not trust myself to believe that we had a hit on our hands with Pinball Dreams, no matter how good everybody told me it was and despite the fact it captivated me just as much as it did others. I did not want to allow myself to believe, to get my hopes up all over again. The energy and enthusiasm I had felt almost a decade earlier seeing Avalon for the first time had simply evaporated. Nevertheless, Pinball Dreams came through ready for launch and we shipped it in April 1992.

We were living on borrowed time and needed to get the game out the door quickly, which meant we had little time or money to commission the

box art. So we turned to a new, unknown graphic artist who promised a quick turnaround.

To my mind it was not a complicated commission. It was a pinball game so the box art would be an illustration of a pinball table – simple. However, the artwork we got back looked garish and dated. It had a pink, purple and yellow colour scheme, the pinball table depicted looked like something out of the 1950s and the logo was messy. It was not to my taste. Not at all.

But it was too late, so the first shipment of 25,000 units went out with the garish box art. If you bought Pinball Dreams in a purple box then you bought one of those early copies, because we changed the box art thereafter.

I remember taking an Amiga home for my children to play on and they were totally engrossed by the game. They spent hours playing the same table over and over again in order to beat their previous high score, so I decided to fan the flames a little.

Barry was also totally addicted to it. He had racked up a cracking high score on the Steel Wheel table, and I gave it to my kids as an objective. For an entire weekend Olof Gustafsson's wonderful wild-west banjo sound track echoed through the house from upstairs. On Sunday evening there were triumphant screams from above, followed by frantic footsteps thumping down the stairs. The kids burst into the living room, cheering ecstatically. Barry's record had tumbled into the hands of my son, Robert.

Not content with mere victory, Robert quickly produced a hand written note mocking Barry for me to take into work with me on the Monday. As a parent I probably should have been instilling the virtues of grace and humility in victory, but the opportunity to poke a bit of fun at Barry was hard to resist. I pinned the note to the wall in Barry's office. He was not too pleased but he took it in good part.

Of course Barry being Barry he refused to let the matter rest. A couple of weeks later, while helping his mum with the grocery shopping in Tesco, Robert and Barry had a chance encounter in the cereal aisle. Barry stopped for a quick natter with Janet, and, before rolling his trolley forward to go about his business, he turned to Robert and said, simply: "Rob, one hundred and twenty four million mate". It was a bombshell for poor Rob. His score

had been almost doubled. Then again, he had pretty much asked for it with that cheeky note.

The reviews for Pinball Dreams were exceptional and the game sold very well indeed. It was a stroke of luck for 21st Century Entertainment. We had met a good team of programmers, a young team of students who were, I suppose, like students the world over. They spent their time playing videogames and pinball machines and had converted themselves into a programming team. The game they had developed captured pinball brilliantly and, as a result, it sold in huge numbers.

Things were looking up, but we needed to convert this stroke of luck into a long term opportunity for 21st Century Entertainment. It was clear from the reaction to Pinball Dreams both critically and commercially that players were hungry for more, so the next step was to secure a sequel.

PIONEER'S PERSPECTIVE: BARRY SIMPSON

I think the first time I actually met the Digital Illusions guys (Fredrik Liliegren, Andreas Axelsson, Olof Gustafsson and Markus Nyström) was at an ECTS (European Computer Trade Show) at Earl's Court in London. I remember them being quite quiet and a little shy, but that soon fell by the wayside as we got to know each other. I particularly remember Olof from that time as he used to make us all laugh with stories about the Austin Allegro he owned back in Sweden, and he was forever putting evil-looking snuff under his top lip, and got us all to try it too (like I said, evil).

They were great days. On the development side we always looked forward to getting a new update for any of the pinball games, as there'd always be massive improvements and new stuff to see from one demo to the next. I remember we used to receive updates via modem – an 880KB Amiga disk image took an hour to transfer!

I don't remember too much about the financial state of the company before the pinball games. Andrew was pretty good at shielding us from issues like that, which just allowed us to focus on our jobs and get the game development done and products to market.

During the production of Pinball Dreams I do remember thinking that there wasn't anything out there like it, and that ought to give it a good chance of succeeding – something a bit different for the games magazine reviewers to get stuck into (in those days, your games could live or die depending on magazine reviews).

We did the right thing with Pinball Dreams in offering four tables in the one game, and making sure that each was enjoyable to play in its own right. I think we must have got something right, as it reviewed well and sold like hot cakes.

I seem to remember the launch being fairly low-key, which was probably a result of the company's standing at the time. What I remember most are the weeks after the launch, and day after day hearing the sales team talking about more and more orders for Pinball Dreams. It became evident pretty quickly that we had an opportunity to follow up with a sequel, so we focused on getting on with that, paving the way to establishing ourselves as the market-leader in pinball simulation titles.

PIONEER'S PERSPECTIVE: DIGITAL ILLUSIONS

We were in this summer house in the south of Sweden, hacking away on the computers for our demo group The Silents, and one of our artists, Mikael Balle, had drawn some oversized pinball tables just for fun. We all played pinball whenever possible, but thought the existing computer versions were a bit dull, so we decided to write our own. We figured it'd be pretty easy. This was in 1989. In the end it took three years.

– Andreas Axelsson

We simply got tired of doing demos and wanted to expand our horizons and try doing a game instead. We also all enjoyed playing pinball in the arcades, so we thought let's do a pinball game to save us some money as well!

– Fredrik Liliegren

We were all determined to deliver the very best we could, and we didn't want to ruin the chance to show everyone what we were made of. I also think that we didn't fool around because most of us really enjoyed real pinball machines and we really wanted to emulate that as close as possible with the Amiga's limited but forward-thinking hardware.

I thought it was really fun composing music with tough hardware limitations. The limitations forced me to keep it simple and spawned many happy accidents. It is hard to compare writing music on the Amiga and in a studio environment but I think both ways have their charm.

I was lucky to have a small amusement hall close to where I lived and as I was already an avid pinball player I must have unconsciously registered how the sound structure worked in the real machines.

The music and sound effects were a breeze to compose, as I have always enjoyed all kinds of music styles. It was also lots of fun to record my own voice in the game for the extra ball, millions, and jackpot.

I really had only one thing in mind and that was to create music and sound that would be worthy of a real pinball machine.

I had my suspicions that the game could do well on the market, but its impact was far beyond anything I could have imagined.

– Olof Gustafsson

For our first visit to ECTS in London, we had been promised tickets by a publisher, but we didn't manage to meet up before the event started. We had spent most of our money on the plane ticket, and we're also from a part of Sweden known for holding our money pretty tightly, so we nagged at the guards to let us in for free, until they did.

We got a pretty cold reception from most publishers, the game was pretty basic still, and some didn't even want to see it when they heard it was a pinball game, so we took the feedback with us and worked for another year. We also prepared a bit more for the next visit, contacting more publishers in advance.

At this time 21st Century Entertainment had offered us a contract before the show, as the game had come quite a lot further. 21st Century was actually

the most reasonable publisher we talked to back then. Quite a few of them were unreasonably rude or obviously out to scam developers.
– Andreas Axelsson

Both Andrew and Barry seemed very genuine and actually played the game for a while, compared to other companies that didn't pay much attention to the game but still wanted us to sign a contract.

I was not good enough to do programming, art or sound and I had always been entrepreneurial including starting the demo group The Silents with 80 members worldwide, organising local computer parties and so on, so doing the project management and business side came naturally I guess.
– Fredrik Liliegren

As I recall it all went pretty quickly after ECTS. We took the contract back to check the details, and had some help from a friend who's a lawyer. I don't think we changed it that much from the initial offer.

We signed in the fall of 1991, and while the initial advance payment was not very large, for a student with literally no money, it was still a big deal. I was 18 at the time, Fredrik 22, Olof must have been around 20, and Markus 17. I spent most of the money to buy a fancy hi-fi setup.

We first realized that we had something really great going when Fredrik asked his university room-mate to try out the game over the weekend, while he was away. This was some time before it was completely finished. The guy declined and said he had to study. When Fredrik came back home a few days later, the guy was in his underpants with pizza stacks around him and bags under his eyes. He hadn't studied, nor slept, all weekend. He looked up at Fredrik and said 'I hate you'. Instant hit!
– Andreas Axelsson

We realised Pinball Dreams was a hit when the reviews started coming in via the university fax machine with scores in the high 90's across the board, and

when the first cheques from 21st Century Entertainment started coming in (great parties that summer!).

I recall walking into a computer store in Seattle, Washington, USA and seeing the game on the shelf that we had developed back in Sweden. That was pretty cool at the time!

– Fredrik Liliegren

Even though I thought it was a great game, nothing could have prepared me for the total embracement from the gamer and critic community. I was completely overwhelmed.

To this day, I still receive mail once in a while from people telling me that I was a big part of their childhood. That fact alone brings me a lot of joy, but at the same time it makes me think how unbelievably unaware I was of the influence we had. In short, I find all of it unbelievable.

– Olof Gustafsson

PINBALL FANTASIES

The hardest part about developing a game is finishing it. In the eyes of a developer a game never is finished, perhaps because it lacks all the intended features or because it is put together in a less than perfect way. Design features turn out to be too lengthy and/or too difficult to code, or too slow in execution. Completed code is always untidy to a greater or lesser extent.

After the release of Pinball Dreams I went to Sweden to visit the embryonic DICE, who still went under the label of Digital Illusions back then, to discuss the next steps. I knew already about their dissatisfaction with the ball physics. They felt that the code was untidy and they wanted to re-write the engine from scratch.

Of course I understood their motivation. I could well believe that the ball physics were less than perfect and that the code was a bit messy behind the scenes. But the public and the press only saw the end result

and they were happy with what they had already and were hungry for more. When I visited Digital Illusions I advised the team strongly against ripping up all their hard work. I wanted a sequel on the market for the following Christmas.

The games industry is unpredictable and having the audience in the palm of your hand is a rare and valuable privilege. If we took too long to produce a sequel the audience would have moved on to some other exciting new product. At that moment we had one of the gems of the industry. We would have been mad to let the opportunity slip through our fingers.

"Forget about re-writing the engine for now." I told them "All we need for a successful sequel is four fresh pinball tables and three simple but distinct new features to put on the back of the box."

Three new features would give us three bullet points. Three bullet points would give us something to talk about to the press. The buying public would be expecting a sequel and would want to know why the sequel was worth buying. Three strong new features would be enough to tip people over the purchase decision threshold. Two features is not enough, four is too many. Three is the magic number. I know not why. Ask Cicero, the Roman orator who lived around 50BC. He knew that exactly three bullet points was what was required to excite a crowd and what was true in the Forum more than two thousand years ago is just as true today.

Look at it another way. The press need topics to write about. It is their lifeblood. When we had a hit on our hands, they needed to write about it because that is what their customers wanted to read about. They wanted to write exciting content to sell their magazines. It was our duty to give them the source material they needed. Everybody loved Pinball Dreams, so everybody was going to be excited about a sequel and the press would need headlines and content to fill their column inches. They would need to explain why the sequel was better than Pinball Dreams. Three new features would give them the material that they required.

Digital Illusions were a well organised team even in their student days. Andreas Axelsson was the principal programmer, Olof Gustafsson the audio guy, Markus Nyström the artist and Fredrik Liliegren was the one they all looked to for leadership. It was not long before they had settled on the three

new features – more than two flippers per table, a dot-matrix score display and an enhanced colour palette. It is curious in retrospect to think that a dot-matrix display was the last word in modernity in 1992, but it was.

It was decided. Pinball Dreams came out in April 1992 and Digital Illusions went off to Seattle to write the sequel over the summer, with Pinball Fantasies launching in September of the same year. It was a lightning turn around and for the second time in that year we had a sure-fire chart topper on our hands.

In fact, Pinball Fantasies was by some margin the most successful product of my career, easily eclipsing even Uridium. It was ported to a wide range of platforms, from the Atari Jaguar and the Amiga CD32 to the Gameboy and the SNES. Everybody wanted a piece of the action.

Digital Illusions did go back to re-write the physics engine afterwards, resulting in Pinball Illusions some three years later. At 21st Century Entertainment, however, we were not willing to wait. It was clear that we were onto something special and a new strategy had already formed in my mind – we were going to position ourselves as *the* pinball publisher.

By the time Pinball Fantasies stormed the charts I had decided to take ownership of the genre. I knew that other publishers and other development teams would see our success and want to join in the fun. I guessed that we had about eighteen months before others started to release their own titles. My plan was to become the dominant player in a small niche, a niche that was big enough to support us but not so big as to bring in the heavy hitters with their mammoth chequebooks. I wanted to escape from the requirement to repeatedly re-invent the wheel that had driven Hewson Consultants over the brink.

By narrowing our focus to a particular niche, in our case the pinball genre, we would become specialists. We would be able to continuously improve our products because we would no longer spread our expertise too thinly. I was not the first publisher to establish that as a strategy. For example, both Microprose in their early days and Digital Integration for their entire existence concentrated exclusively on creating flight simulators, but it was certainly quite exceptional in the industry at the time. Not for the first time, we were leading the way. Today it is much more common and

indeed the niche we once owned has been cornered by Zen Studios, which is great to see. It is an obvious way to operate once the penny drops. It is just a shame that it took more than a decade and the closure of Hewson Consultants for that to happen.

Aside from the efficiency gains that arise from narrowing the company's focus to a reproducible IP, there is also a tangible PR benefit. It provides an identity that the audience can easily recognise. Nobody buys an Agatha Christie novel, for example, expecting a science fiction story. They buy one knowing they are buying a whodunit.

Pinball Fantasies had been a colossal, smash-hit of a game and that gave us the platform we needed to execute that strategy and claim ownership of the pinball genre. However, having successfully convinced Digital Illusions to hold off on re-writing their engine for Pinball Fantasies, they were now more determined than ever to rebuild their baby from the ground up and they now had an even more solid financial foundation on which to do it. Of course I wanted to publish their next pinball game, and in due course we did, but in the meantime we needed to find a new developer to develop the next pinball titles.

PIONEER'S PERSPECTIVE: BARRY SIMPSON

It was pretty much the same as when we did Pinball Dreams – everything was done on the phone and over the modem. The challenge was really to pack more features into the tables themselves, and make them more reminiscent of modern pinball tables rather than the simpler tables of the 60's and 70's. I remember there being a lot more testing due to the increased feature set, and cool things like the dot-matrix score panel with its animations.

We'd taken a calculated risk in publishing Pinball Dreams when other games companies had passed it by, but once it was out there, reviewed well and started flying off the shelves, I think (as always happens when something unique appears) some games publishers tried to jump on the bandwagon quickly to get a piece of the action, but competing with the DICE pinball games was something very tough to do as they looked, sounded and played really great.

I think getting Pinball Fantasies out quickly after Dreams was the key, as it showed that Pinball Dreams wasn't a one-off, and that we could improve on it time and again.

PIONEER'S PERSPECTIVE: DIGITAL ILLUSIONS

It was very exciting to see the Pinball Dreams get such great reviews, and we got a lot of fan mail. It really boosted our confidence and we immediately set out to write the follow-up, Pinball Fantasies. I graduated from school the same year that Pinball Dreams was released, and we all spent the summer in Seattle, where Fredrik's girlfriend was living. Me, Olof, and Markus filled a small apartment with some second hand furniture, spent as much again on cable TV and snacks, and then hacked away. I recall it took forever to upload builds to 21st Century on a 2400 baud modem.

I believe we had run into some restrictions with the engine that we needed to get rid of to fulfil our ideas with Fantasies. In the end we just upgraded the parts that mattered and Fantasies got finished in record time.
– Andreas Axelsson

We wanted to add some ramps as well as multiball to the game as we felt that would be necessary to make it feel like it was a new game and not just another four tables, so we made sure that happened!
– Fredrik Liliegren

We had a pretty good idea of what we wanted to improve on right away, as we had to cut back on features in order to finish the first game on time. We were all very excited about it too, so the ideas just came streaming out.
– Andreas Axelsson

It was funny because we really had more fun when we made Fantasies. We had more time to fool around and we got to live in Seattle during about half of the production time. I felt a bit spoiled by the attention we got from

Fantasies, but it was really fantastic to get to experience the warmth once again.
– Olof Gustafsson

I think we always had the attitude that if something was worth doing, it was worth doing it well. Workmanship pride was much more important than quick money, so we just kept polishing and polishing until it was right. Part of this probably came from our background in the underground demo scene, where we constantly competed to see who'd come up with the best looking and best performing features.
– Andreas Axelsson

I think coming from the demo scene where the competition was very tough made us really focus on making sure every aspect of what we put in front of people was the best that we could do, and that core value I believe is still driving DICE today.

We felt that we had improved all aspects of the game. Better gameplay, graphics, sound and design so we felt comfortable that it would be well received. Once we saw it go to number one in the UK sales chart Andreas and I decided to quit school and actually start a company (DICE) doing this full time. It took Markus and Olof another year to do the same.
– Fredrik Liliegren

We got our first 100% review with Pinball Fantasies, which felt absolutely phenomenal. Things were going well enough that I decided to quit the university course I was on to write games full-time.
– Andreas Axelsson

SPIDERSOFT

The success of Pinball Fantasies had generated a big opportunity to produce the game for other systems, so that was the first port of call. After successfully porting the game to a range of platforms, from the Atari Jaguar to the Nintendo Gameboy, we set about implementing the next step in our strategy to own the pinball space.

Spidersoft, who handled some of the pinball ports for us, were open to building on our successful relationship and unlike Digital Illusions they seemed more than happy to continue working on pinball titles. If we were going to secure ownership of the pinball niche, I decided, we needed to ensure we had a development partner who was committed to the same strategy in order to deliver a steady supply of products.

We acquired a controlling stake in Spidersoft, something I probably should have sought to achieve back in the Hewson days perhaps by merging with Graftgold, and we set about producing a new series of pinball products together.

Initially, the Spidersoft pinball titles were not as strong as those delivered by Digital Illusions, but the team there were more than capable and, importantly, were enthusiastic about the long term vision we outlined. The relationship led to a number of successful pinball products, from traditional titles like Absolute Pinball and Pinball Mania, to more innovative and experimental games like Pinball World and Pinball Construction Set.

Though none of these titles reached the chart-topping heights of Pinball Fantasies or indeed Pinball Dreams, they were successful enough to give us healthy finances and a consistent income. Our strategy had worked.

Spidersoft was built around the work of Steve Marsden and David Cooke, the duo who had brought us Technician Ted on the ZX Spectrum ten years previously. We also used our range of contacts around the world to secure development work for them which supplemented the pinball titles they developed for 21st Century Entertainment.

On one occasion Steve and I flew to the West Coast of the US to sign a deal with Sony for Spidersoft to develop the Gameboy version of Cliffhanger, based on the Silvester Stallone movie. By then I was well used

to travelling to North America as was Steve. He was also a qualified light aircraft pilot both in the US and the UK and he used the Cliffhanger trip to maintain his US licence. Several years previously, he had bought himself a US light aircraft in California, hopped it across the southern States to Miami and then had it crated and shipped back to the UK.

I always enjoyed visiting the US and it is a pleasure that has continued to this day. The country is both vast and vastly entertaining. From 1983 onwards I would set off twice a year, with others from the burgeoning games industry, to visit the Consumer Electronics Show (CES) which was held in Chicago in June and in Las Vegas in January.

Chicago is a fabulous, self-confident city whose merits are little known in the UK and so it took me several trips to appreciate it properly. It is built on the shores of Lake Michigan and film buffs will have seen any number of panoramic sweeps of its skyline filmed from helicopters swooping in from the lake. Walking the shoreline on a crisp, sunny Sunday morning after the close of CES was a particular pleasure.

Within walking distance of that shoreline, on various occasions whilst waiting for my flight home, I visited the Planetarium, the Aquarium, the Field Museum, Soldier Field (where the Chicago Bears play) and the Art Institute. Of all these destinations, the Art Institute was my favourite because it features, with an unselfconscious American practicality, "two of everything" – two pieces of work from every European painter of note from the fifteenth century to the present day. Two Titians, two El Grecos, two Canalettos, two van Goghs, two, two, two and then rather more Dalis and Picassos, perhaps because more examples of their work have come on to the market or maybe because they just lost count, all carefully arranged in date order for the convenience of visitors. In two hours you can see the whole lot. For a philistine like me this is art as it ought to be – sorted, organised and made into some kind of sense so that I can enjoy it for a while and then get on with my life.

And just inland from the lake before you get to the Chicago River that runs parallel to the shore, there is the entertainment district with theatres to rival the best in London or New York, and jazz clubs that put them both in the shade. Sinatra sang that Chicago is "my kind of town". Too right. It's mine too.

When Steve and I flew to the West Coast to sign the Cliffhanger deal, we chose to visit San Francisco first for some reason and so after an eleven hour flight we collected a car and headed north past Candlestick Park, which was then home to the San Francisco 49ers. We had a day to recover from our jetlag before our meeting with Sony and Steve had a plan for the rest of if it. I was just along for the ride.

We parked up at the small airport at Palo Alto and in next to no time Steve had found himself a four seater light aircraft and a pilot instructor and had hired them both. He needed to put in some flying time to maintain his US pilot's licence and he had to demonstrate his competence to the instructor who would then sign off the extension to his licence. I climbed into one of the rear seats, Steve took the pilot seat with the instructor on his right and soon we were airborne and flying northeast across the lower end of the San Francisco Bay towards an empty piece of airspace.

It was then that I learned over the intercom that this was not to be a mere joyride as I had naively thought. In due course Steve would have to demonstrate a number of techniques including the ability to fly "steep turns". This basically means turning the aircraft on its side and flying it in a circle and then flipping it onto its other side, like an insomniac tossing and turning in bed, to fly in a circle in the opposite direction.

After about ten minutes or so we arrived at the planned location for our steep turns and to my continuing surprise the landmark on the ground that was to be the centre of our circles was the Lawrence Livermore Laboratory. This is the place in the US where an army of American scientists puts the spit and polish on their vast arsenal of nuclear weapons, removing the uranium or plutonium every now and again from each weapon in turn, re-enriching it as necessary and then putting it back again. For the next twenty minutes or so those scientists were treated to the sight of our aircraft circling over their heads. They also very nearly received a recycled version of my all-you-can-eat breakfast.

I turned green. In due course Steve and the pilot instructor took pity on me and, chuckling happily, Steve took us back to Palo Alto to land. Steve's licence extension was signed off and we took to the road again, driving back to San Francisco airport to leave the car and make the hour long flight to

Los Angeles. We then took a taxi an hour north from the airport to Santa Monica and checked into our hotel to get ready for the morning.

Being still partly on UK time we were up bright and early and after a stroll along the beach to the Santa Monica pier, famously the end of Route 66, we returned to our hotel for breakfast. Steve checked the menu and ordered yoghurt followed by eggs Benedict. I can still picture the bemused grin which spread across his face when his yoghurt arrived. It was served, American style, in a ten-inch soup dish. If we'd had our trunks handy we could have dived in and started swimming lengths.

Suitably fortified we checked out of the hotel and took another hour long cab ride (every journey in Los Angeles takes at least an hour) inland to a building on Sunset Boulevard on the border of West Hollywood for our meeting with Sony. We were shown to a meeting room on the sixth floor with a stunning view westwards over the leafy glades of Beverley Hills with the Pacific Ocean glinting in the distance. It is a peculiarity of the political organisation of Los Angeles that the "cities" which form its constituent parts are as carefully delineated from one another as my back garden is from the back gardens on either side. The building we had entered was at the very western end of West Hollywood which, despite its association with the film industry, is somewhat seedy and down-at-heel. Here however the luxury homes of the world-renowned actors and celebrities, and the well-heeled doctors and dentists who can afford to live amongst them, were spread before us to be admired.

I remember nothing of the meeting but within an hour or so we were out and about again with the development contract tucked away safely in Steve's back pocket. On the flight home he flicked through the script of the movie, such as it was. The film starred the famously mumbling muscle-bound hulk, Sylvester Stallone, and the plot was built around a failed heist of a US Treasury plane flying over the ice and snow of the Rocky Mountains. Once the protagonists meet on the ground there's plenty of macho grunting, girly screaming and pointing of guns. Eventually, you will not be surprised to learn, the chief evil-doer succumbs to the hulk's exceptional courage, strength and stubborn refusal to give up and indulges in a bit of falling-to-his-death.

We were happy to land the Cliffhanger contract but a part of me was thoroughly disenchanted. I had started out fifteen years previously, delighted to have a computer in my hands to play with and to make money from and here I was orchestrating an empty interpretation of a paper-thin plot for a pedestrian platform. This was not my vision of what videogaming should be.

PIONEER'S PERSPECTIVE: BARRY SIMPSON

21st Century Entertainment totally cornered the market for computer pinball until Commodore's demise and the PC starting to become a really strong games platform. The turning point was probably the advent of 3D pinball games starting to appear, in conjunction with DICE wanting to branch out into other game types and the newer console platforms.

I was pretty much involved in all the porting work, liaising with and co-managing all the external teams working on each of the different platforms we were porting to. In terms of ups and downs, I'd say the downs were almost exclusively the headaches of handling the limitations of some of the platforms we were porting to; for example, imagine trying to take a 16-bit title such as Pinball Dreams Amiga and getting it to work on an 8-bit handheld like the Gameboy.

Personally, the biggest up I had on these porting jobs was working with Martin Walker on the music and sound effects – he single-handedly wrote a set of sound players that could take the original MOD music tracks used in the Amiga games, and play them back on the ported platforms. I'll never forget being in Martin's studio and listening to the Pinball Dreams intro music playing back on a Gameboy!

PIONEER'S PERSPECTIVE: STEVE MARSDEN

I'd been working with Gremlin Graphics in the late 80s. That petered out and Dave and I had worked with a variety of companies including Mirrorsoft, the

Robert Maxwell owned company. In 1991 we ported Speedball II onto the Game Boy for them.

We had also done the coin-op conversion of the pinball game Time Scanner for Activision. In early 1992 I met up with Andrew Hewson again and Spidersoft was born on May 5, 1992.

Generally it was a good time. I moved house and improved my standard of living. Spidersoft expanded to about 20 staff. We had a plum contract worth 300K from Sony Imagesoft for Cliffhanger and there were other quality jobs rolling in like Lemmings II for Psygnosis.

I think all the standalone pinball games were pretty good. They were products to be proud of with no real duffers.

PARTING WAYS WITH DIGITAL ILLUSIONS

Pinball Illusions was the final pinball title developed by the embryonic DICE team and it was a significant enhancement over their previous titles. It was pretty obvious after the release of Pinball Fantasies that Andreas, Fredrik, Markus and Olof had ambitions to grow their company and to go on and tackle other projects besides pinball. We understood and respected that ambition.

In the three years between the release of Pinball Fantasies and Pinball Illusions we had already started to release other pinball games, mostly developed by the Spidersoft team, and our strategy was bearing fruit. I suspect the team at Digital Illusions wanted to finish what they had started and finally implement their root and branch re-write of the engine for Pinball Illusions. Certainly the game was stuffed with a host of new features and really pushed the graphical limits of the Amiga.

The release of the game was our last collaboration with the team that would go on to be known as DICE, but it had clearly been a successful relationship for both of us. They had made enough money to launch their

ambitions and to go into games development full-time, and we too were on the path to realising a new ambition of owning a genre and enjoying the stability that a reproducible IP brings.

PIONEER'S PERSPECTIVE: DIGITAL ILLUSIONS

We explored a few other genres with the core pinball team but nothing specific came out of that and with the new A1200 and Amiga console there was enough new technology that we felt we needed to do one more game in the Pinball series to finish it off.

– Fredrik Liliegren

We did extensive rewrites for Illusions, both to support more advanced table designs, and to make it easier to work with, but also to squeeze more out of the Amiga. We had also moved to a new city, and brought in two other teams each working on their own games, so our focus was spread a bit thin for a while.

– Andreas Axelsson

We wanted to include multiball, more light effects and deeper game rules, and that required a brand new game engine.

– Olof Gustafsson

After Pinball Illusions, to be honest, I didn't think it was going to work, and it was part of our decision to move on with another publisher for our later titles. It was too niche of a market, and the conversion and extension work that Spidersoft was putting out was not of the same quality as what we were doing, in my humble opinion. We always strived to be the best at everything we did, never accepting second best.

– Andreas Axelsson

To tell you the truth, we felt like we had done what we had set out to achieve and we just wanted to get on to making games in other genres.

– Olof Gustafsson

Yes, I think after Pinball Fantasies' success we decided to build a company versus just having a few guys making some games, and from that point we had a vision of building one of the best games development companies in the world and looking at the continued success DICE has had since then, I think it is safe to say we succeeded in that vision.

It feels great to see that the seed we put in place and the core values we established the company on are still holding true today. Quality will always win!
– Fredrik Liliegren

CLOSING 21ST CENTURY ENTERTAINMENT

Over time, as with any reproducible IP, it became clear that things needed freshening up. Spidersoft were not the exclusive supplier of pinball products for us after Digital Illusions, indeed one of the other advantages of working the pinball niche as we did is that developers who had created pinball games would almost automatically look to us for a publishing deal.

When a developer called Liquid Design pitched their pinball game to us, it was immediately clear that they had a product which stood head and shoulders above the rest. I would say their pinball game matched if not surpassed the superb quality and technical accomplishments of Pinball Illusions, the final pinball title from Digital Illusions.

In order to set the game apart from our previous pinball titles from a marketing perspective, we decided to omit the word "pinball" from the title. Effectively we were saying that this was something different, something fresh. Slam Tilt was the name of the game, and although it was not the last title of my career in the games industry, it was probably the last great one.

Although we had decided to focus on the pinball niche, that did not mean we completely ignored games in other genres. Indeed, one of the advantages of having a reproducible IP like pinball was that it allowed us to take risks on other titles.

In the early days of 21st Century Entertainment, before the pinball games really took off, we published a number of other titles, many of which had been in development before Hewson closed. These included the 16-bit versions of Rubicon and Deliverance, along with Moonfall and Nebulus 2 on platforms like the Amiga and the Atari ST. Later on, after our pinball strategy was well underway, we continued to dabble with other games like Marvin's Marvellous Adventure – a colourful platformer for the Amiga CD32 and Synergist – a point and click adventure title.

Unfortunately, none of these titles really took off in a significant way. We rolled the dice, but we were simply not attracting the kind of innovative, boundary-pushing games we had as Hewson Consultants. This was probably due in part to us typecasting ourselves as the pinball publisher, but the truth is that as a pure business strategy it made so much more sense than the approach we had followed as Hewson Consultants. Innovating all the time is difficult, risky and ultimately it is almost impossible to maintain. 21st Century Entertainment, on the other hand, was financially stable and prosperous for many years without the reliance on finding the next breakout hit all the time.

However, becoming formulaic as a publisher also took a lot of the passion and excitement out of the process. This put me into a position where I was ready and willing to move on if and when an opportunity presented itself.

Being a pioneer in the UK games industry was all about having fun. In the early days the money I was making was almost incidental, although I would have rapidly given up if there had been no money in it at all. The important thing was the sense of excitement and adventure I felt in playing my part in exploring these new machines and discovering what was possible.

However, just like David Cooke, co-creator of Technician Ted, who discovered that he had lost his hobby when he swapped software engineering for games programming, I found that the fun had begun to evaporate. Games production required ever larger teams making it riskier and riskier, so the finance became a crucial consideration. As this happened my sense of excitement and exploration slowly faded away.

At the time it seemed that creativity was a word that was not used when discussing games development, yet to me it was blindingly obvious that this

was a hugely creative medium. Instead people would talk about games as if they were toys and viewed the development process as a purely mechanical activity like building a wall or planting a line of trees.

We never saw it that way. Right from the start we signed up some of the greatest artists the early industry had to offer, we allowed them to explore their creative visions and to produce pioneering experiences which nobody had ever seen before. We promoted them as the superstars that they were and for a time we had the great privilege of publishing some of the finest games of the period.

However, as development costs began to rise and as the consoles began to impose restrictions on who could develop and how, it became necessary to deal with money-men who, I felt, had no understanding of the creativity involved in generating the games they were signing. That was when, for me, the sense of fun had simply dried up.

Not that I understood that at the time. I think that if you had asked me I would have claimed that I was as involved as I had ever been. But with the benefit of hindsight I can see that my heart was no longer in it. I had given up sitting with the developers, getting to know them and looking to understand the problems with which they were wrestling. I no longer rejoiced with them when they found a subterfuge which speeded up their code or saved space in memory. I had stopped interrogating them looking for new ideas. I had become distant from the whole development process.

We had delivered on our pinball strategy and for me that was sufficient. The aching sorrow I had carried with me following the closure of the previous company was assuaged but not eliminated. For me the light was fading. Peter and Eric, my co-investors, were also looking to exit and so when, in 1997, some old contacts from the early 1980s asked me to join their Internet start-up we decided to go our separate ways. In a relatively short space of time we closed the company and tied up the loose ends.

It was the end of an era.

But it was not the end of my working life. I stayed with the Internet start-up for a couple of years until early 2000 and then started an Internet project of my own. It never went anywhere in the end but it gave me much needed breathing space in which to re-consider my life. In 2003, leveraging

all the experience of running my own companies, I launched an accountancy practice with the aim of sharing my hard-won business acumen with a new generation. That practice continues to this day.

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"Working with 21st Century Entertainment had many different aspects to it. They had published some of my favourite games by Andrew Braybrook, and I was very excited about that. On the other hand, they had a tiny office in the middle of nowhere, and Andrew's wife, I believe, packed boxes in the garage, which made the whole experience a bit surreal. But the for most part we had a good relationship. We got to control the game design the way we wanted and we got great help with testing, so in the end it was just what we needed.

We did have some hard arguments about adding extra features to the game. Things that you wouldn't have on a real pinball table. We refused completely, saying this is a simulator. Another time there was an argument about access to the source code of the PC conversion which we didn't actually write ourselves. However, it all turned out well in the end.

21st Century Entertainment did a lot of things right; I think primarily in letting us do the game we wanted instead of trying to impose some 'market know-how' on the design. At the same time I think they didn't realize that the success of our games were based on the quality of execution we delivered. If they had, they would never have allowed all the Spidersoft spin-offs to be released."
Andreas Axelsson, co-founder of DICE & programmer on Pinball Dreams

"I really admire Andrew and the team for taking a chance on some young lads from Sweden who had no prior experience in the games industry whatsoever. I also like that they always treated the project with respect and let us do our thing without too much intervention. The only thing that I would have wanted

more of was advertising, even though word of mouth did the trick slowly but surely.

It was great and it seemed that you had a lot of trust in us young lads. That really helped us to develop freely. The many business/party trips to London were great fun and of course getting the opportunity to take a glance at a warehouse full of Pinball Dreams boxes – that was unreal to me.

The most difficult memory is the lack of sleep. I had an ordinary day job as a film cutter at an advertising firm, so I had to work on the game at night, which meant only around 4–5 hours sleep for a long period of time – and I really enjoy sleeping."
Olof Gustafsson, co-founder of DICE and audio designer on Pinball Dreams

"It felt like a family affair in the best way possible. 21st Century Entertainment really cared about how we wanted the game presented and marketed and wanted us both to succeed. One of the best memories was being invited over to the offices and seeing the stacks and stacks of Pinball games in the warehouse.

I cannot really see anything they did wrong, the sales where great. I think that they should have moved onto additional formats faster than they did, and of course paid us a higher royalty!"
Fredrik Liliegren, co-founder of DICE & producer on Pinball Dreams

"I think that at Hewson and 21st Century Entertainment, the thing that we got right more often than not, was being able to pick out the games that had potential to make money. In hindsight, what we probably got wrong was not being able to maximize the potential of these games to build enough wealth in order to compete financially with many of the other growing publishers in the games industry at that time. What this meant was that while now and again we'd get the opportunity to bid for the publishing deal on a great game, we'd lose out to other publishers simply by being out-bid.

Apart from working on a great range of games and with some amazing developers, I think my most fond memories are of the people I worked with in both companies, and the many laughs we had each and every day. When I look back on it, working in a computer games company back then was a lot of fun, and it didn't really feel like going to work at all.

In the mid-90's the games industry was really changing, expanding quickly and becoming much more commercial with the advent of new and more capable computers and consoles, and while this was an exciting time, I think that my favourite years in the games industry will always be those that I spent with Hewson and 21st Century Entertainment and the 8-bit computers, when some truly ground-breaking games were made entirely by one person, at home.

Personally, I think the most difficult period was in the latter years of the company, when I realised that we just didn't have enough of the right types of products to compete in an ever-expanding market. We were still being sent game demos by programmers or development teams looking for publishing deals, but because we were widely known for our pinball games, we weren't really seeing opportunities with other types of games. As a publisher, we needed good games in the marketplace, but not having access to them ultimately spelt the start of the end of 21st Century Entertainment."

Barry Simpson, software manager at 21st Century Entertainment

"My first memory was actually my first week at the company. Barry, Andrew and I drove up to Lincoln to see Spidersoft. I walked into reception and saw all these tanks at the back of the room. Steve Marsden said "those are the spiders". I was and still am a massive arachnophobe, so all I remember is walking with my back up against the opposite wall, some 12 foot from the tanks, freaking out.

My fondest memories? Aside from getting to work with THE Andrew Hewson you mean? A lot of the long hours, and

working next to some cow sheds had its own unique memories in the summer months. Also teaching, or trying to teach certain people to play the guitar (sorry I didn't keep it going Stewart – Rob Hewson). Getting to work with the DICE guys, working with Karthik Bala at Vicarious Visions, all great moments in my career and my life.

One of my worst memories was the passing of my father in September 1996. Andrew, Janet and the rest of the team were massively supportive of me during that time, and showed me a lot of compassion and support, so thank you for that.

The business was taking a strange turn in '97. PlayStation had launched and budgets on projects had grown, so I think we as a company didn't really cope with that transition very well. We started to move more into redistribution of titles from other countries and companies and so I didn't feel there was a place there for me anymore to advance my knowledge or career, so I reluctantly resigned to move to Grolier Interactive in Oxford.

I'd loved my time at the company and working with Barry, Andrew and the team, but I felt the time was right for me to move on."

Stewart Gilray, associate producer at 21st Century Entertainment

PRODUCT SUMMARY
1991–2000

Year	Product	Primary Platform
1991	Moonfall	Amiga
1991	Nebulus 2: Pogo a Gogo	Amiga
1992	Deliverance	Amiga
1992	Rubicon	Amiga
1992	Pinball Dreams	Amiga
1992	Pinball Fantasies	Amiga
1994	Pinball Dreams 2	PC
1994	Pinball Dreams Deluxe	PC

"I remember a couple of things about Pinball Dreams Deluxe actually. One was that I'd travelled across to Upton, near Cambridge, to record guitar parts with music Producer Greg Malcangi, who was at the time married to deaf percussionist Evelyn Glennie. Now where it really got weird was that Evelyn was from the same area of rural Aberdeenshire as I, and she also had the same music teacher as me, Mr Park. So I spent a couple of days there, with Greg and I re-recording the Pinball Dreams title music with real instruments.

The other memory was Barry being off ill and me having to step up to get Pinball Dreams Deluxe completed and ready for duplication in a three day window, which I managed to do, but

it included writing an install system and menu system for the game on PC.

Stewart Gilray, associate producer at 21st Century Entertainment

Year	Product	Primary Platform
1994	Special Edition Pinball Dreams & Pinball Fantasies	Amiga
1994	Pinball Arcade	PC
1994	Marvin's Marvelous Adventure	Amiga CD32

"When Florian Sauer finished off Nebulus 2, they had this idea for a Mario-style platformer. So they came to Barry and mentioned it to him. After a while they came back with a demo, which Barry and I played. We loved it, so got it signed.

I remember Commodore were about to launch the CD32 so we decided to put Marvin onto it. One of the things we could therefore do was to have real CD Audio, and I provided a very Bill & Ted's Excellent Adventure style guitar break. For the end of each level there was a group 'Marvellous' shouted out followed by me on guitar, which I recorded at home one weekend. That was fun actually."

Stewart Gilray, associate producer at 21st Century Entertainment

"Marvin's Marvellous Adventure was a really great game to work on. It was a very slick, colourful and highly playable side-scrolling platformer almost in a Super Mario Bros style, written for the AGA Amiga machines by Infernal Byte Systems who also put together Nebulus 2.

I remember it had a wide variety of great music tracks, and some really nice animation of the sprites and backgrounds. We had great fun working on this game as it was so varied from level-to-level, not just graphically but in the gameplay too. I remember one vertical jetpack level that was a complete

departure from the 'normal' levels. There were also some crazy end-of-level bosses to defeat such as a giant hammer that bounced around trying to crush you!

When it came to review time, I seem to remember that some magazines loved it and some didn't, so it didn't really get the following that it deserved. I think the main problem was that at this time (the mid-Nineties) the market was pretty crowded with these kind of platform games so competition was pretty tough and we probably blended into the crowd a little too much.

A great shame though, as the production value was really high and we even had features such as an in-line tutorial to ease you into the gameplay, and a back-story running between the levels."

Barry Simpson, software manager at 21st Century Entertainment

Year	Product	Primary Platform
1995	Pinball Illusions	Amiga AGA

"The Digital Illusions guys really pushed the boat out with Pinball Illusions, from showing their demo scene roots in the intro sequences, to packing-in modern-day pinball table features such as multiball, lots of animations in the dot-matrix score panel for the various table modes, plenty of speech samples and multiple music tracks in each table's audio. Pinball Illusions was by far the best-looking pinball game from DICE, and looked its best on the Amiga AGA machines with the increased colour palettes. I seem to remember if you had the PC CD-ROM version of the game, you got an extra table (The Vikings) to play on! We put the game onto the Amiga CD32 as well, which at the time was a pretty cool machine, also with the AGA chipset."

Barry Simpson, software manager at 21st Century Entertainment

Year	Product	Primary Platform
1995	Pinball Mania	Amiga AGA
1995	Pinball World	PC

*"Pinball World. I really don't have much in the way of memories
with that one, other than sleeping on the boardroom floor
at Spidersoft overnight on a Saturday, then driving to EMI
replication in Swindon the following day with the master."*
Stewart Gilray, associate producer at 21st Century Entertainment

Year	Product	Primary Platform
1995	Absolute Pinball	PC
1995	Perfect Pinball	PC
1996	Slam Tilt	Amiga AGA

*"After the DICE Pinball titles the best one we did was probably
Slam Tilt Amiga, by Liquid Design. It was just such a slick,
polished and feature-packed game which I think really pushed
the limits of what you could do in top-down 2D. It really had the
look and feel of real pinball tables and was great fun to play.
It even had minigames that you played in the dot matrix score
panel above the tables themselves!"*
Barry Simpson, software manager at 21st Century Entertainment

Year	Product	Primary Platform
1996	Pinball Gold Pack	PC
1996	Pinball Builder: A Construction Kit for Windows	PC

*"Pinball Construction Kit was an ambitious project and I learned
over the years that any kind of construction kit or game-maker*

type of product is fraught with problems because they become too nebulous. Basically you never know when there has been enough development and when is the right time to stop. From a money making perspective they are too random and they easily suck up too much time and energy for not enough reward."
Steve Marsden, co-creator of Technician Ted and co-founder of Spidersoft

Year	Product	Primary Platform
1996	It's a Funny Old Game	PC
1996	Total Pinball 3D	PC
1996	Pinball Fantasies Deluxe	PC
1996	Synergist	PC

"I managed to persuade Andrew to sign an adventure title from US developer Vicarious Visions, which ended up being gobbled by Activision a few years later. The game was Synergist and it had, of all people, David Warner (Time Bandits, Tron and The Omen) as the main bad guy in it. We also had graphic novel artist Dave McKean do the box cover for it. So that was a nice break from pinball."
Stewart Gilray, associate producer at 21st Century Entertainment

"I seem to remember that this title came about through an introduction from our North American office. Synergist was a PC title, the first game to be developed by Vicarious Visions, the company who went on to work on some really well-known titles such as Guitar Hero and Skylanders.

Synergist was a point and click murder-mystery/adventure game set in the near-future, and was quite unique in that the artwork for all the locations were hand-painted and then digitized. Pretty much all the characters you interacted with in the game would appear as digitized video sequences complete

with full speech, with variations of responses depending on the questions you asked them. The locations also had a wide variety of animations playing within them, which really helped set the atmosphere for the game.

I remember we worked on the game for a number of months, just in order to get the game-flow right and to make sure that you couldn't hit a dead-end in your investigation via the lead character, Tim Machin.

Working on Synergist was a real treat, as it was totally different to working on the pinball games. It also allowed us to explore what was possible with the PC platform, which at the time was just getting into its stride towards becoming a serious gaming platform."

Barry Simpson, software manager at 21st Century Entertainment

HINTS & TIPS for the ZX81

END OF A CENTURY

Until very recently I thought that our failure to transition to the new era was my fault entirely. I have carried that thought in the back of my mind for many years and my way of dealing with it has been to push aside that period of my life. I have not spent any great amount of time thinking about it or talking about it, because there are some painful memories.

THE RISE AND FALL OF THE BRITISH PIONEERS

Recently however, I spent a day being filmed for the *From Bedrooms to Billions* documentary movie and was subsequently invited along to the premier at Earl's Court in London. In the reception before the movie began I had the opportunity to catch up with some familiar faces. Rod Cousens, now of Codemasters, Gary Bracey, formerly of Ocean, Oliver Frey and Roger Kean of CRASH and ZZAP! 64, Dominic Wheatley of Domark, Nick Alexander of Virgin Mastertronic and the one-and-only Jeff Minter.

One of the key themes of the documentary was the collapse of the industry in the UK when the 16-bit consoles arrived. A few companies, it

argued, had managed to make the transition to the new world order but most of the UK publishers had been wiped out. Those who were not working on the Sega or Nintendo systems didn't survive.

I was not sure that was completely true. Certainly in my case we had made a good chunk of money producing pinball titles without really touching the consoles, but it was interesting to gain an understanding of what was going on in the wider industry back then. I existed in our bubble and concentrated on our problems and perhaps I was not the sort of person who spent a lot of time engaging with the rest of the industry.

In the months that followed, while I was still working on this book, the implications of the film began to soak into my mind. I have now come to realise that it had not been just me who failed to chart a successful course for my first company. The industry as a whole in the UK had been caught flat-footed and unable to react. I had always assumed that I had been swimming against the tide on my own, but the reality was that there was no water left to swim in, either for me or for anyone else. If anything, I was more successful than most because pinball gave us a little rock pool to call our own.

That realisation has been something of a relief for me. The fact that we were able to make money through the 1990s despite not making the transition to the consoles was actually something of an achievement. But why did it happen? Why did the UK companies not survive?

One obvious reason is that only a small number – US Gold and Virgin Mastertronic for example – had sufficient financial firepower. The rate of change which we were all trying to cope with was overwhelming and charting a consistently successful path was all but impossible. Ocean, for example, who had been massively successful with Robocop, later stumbled and fell.

We had all cut our teeth, just a few years previously, in a market where a modest investment could produce significant returns. We were all hopelessly unprepared for the rapid change to a market where a massive investment was required. None of us, I think, could see beyond the huge investment – and the huge risk that it implied – to the possibility of a commensurate return. For us it was like being asked to imagine life after death.

The advantages of the UK market, which helped new companies like mine to get started, turned into disadvantages in due course. English is

the world language and so when the Americans, the Japanese, the Finns or, these days, the South Koreans create a new technology the documentation and the marketing material was and is made available in our native language. Consequently, we are a nation of early adopters and so we have more than our fair share of technology entrepreneurs.

However, our use of English makes the country an easy and obvious target for overseas companies seeking new markets. We are the sixth largest economy in the world. By habit we are a trading nation. We speak the world language and we are open to new ideas. We are an obvious place to set up shop.

This is what happened in the games industry. Electronic Arts, for example, arrived very early on, in 1983, and were followed by Activision, Microprose and later US start-ups like Gametek. British companies like mine had established trading relationships with distributors and marketing companies in various European countries and American arrivals piggy-backed on these burgeoning relationships. Sega used a UK start-up, Mastertronic, which then reversed into Richard Branson's Virgin start-up, as their stepping stone from Japan, via the US into Europe. The effect was to make the UK market highly competitive and saturate it with new products. We had no place to hide.

A downside of the UK market is that while it is big, rich and English speaking it is not the biggest or the richest. There are 65 million of us which is roughly a fifth of the population of the US and so the American companies arriving here easily outgunned the home-grown competition simply because their US sales and US profits dwarfed the UK equivalents. For a while we pretended that the EU, current population 500 million plus, was "our" market but it was never true. The US, for all its divergence between East and West Coasts and the "flyover" states in between, has a uniformity which the EU will never achieve.

I remember asking the VP of Sales at Microprose how the strategies he adopted in New York varied from those he used in Los Angeles. "Not at all", was his mystified reply. In contrast, the major gaming markets in Europe – Spain, France, the UK, Germany and Italy – are all very different from one another. Germany is highly integrated, into recycling in a big way and viscerally anti-war. Prices are low in Spain and lower still in Italy. France is very supportive of home-grown products. And bear in mind that you have to

understand a market before you can sell into it. You cannot simply step off an aircraft, plonk a box on the table and expect it to sell.

One thing that we are very good at in the UK is small-scale innovation and creativity. When the industry first began to blossom in the early 80s, it was Britain that led the way. We had the nerds, the tinkerers, the enthusiasts and also the cultural richness which gave rise to some of the most spectacularly original, cutting edge games.

Today the gaming landscape is completely different and the industry is shifting once again. The era when only big corporate entities with very deep pockets were given access to the market has given way to an era of unprecedented opportunity. Digital distribution, the return of open platforms and an explosion in the reach and diversity of the addressable market has made it possible for small, creative teams to return to the fore.

The spirit of the 1980s will never truly return, because the world has moved on. Nevertheless, we are once again returning to the kind of ecosystem that can support small teams and foster innovation. What is more, there are exciting new platforms to explore, platforms like virtual reality and augmented reality, which have the potential to introduce a paradigm shift the likes of which we have not seen since the advent of 3D graphics. It is a mix of circumstances which is perfectly suited to the UK's unique cultural heritage.

THE FONDEST MEMORY

The first Kickstarter campaign for this book began with a talk at Play Expo 2013 in Manchester and since then I have appeared in documentaries, podcasts and magazines as well as interacting with retrogamers at Revival 2014 and Play Expo Blackpool 2015. I have had the pleasure of discussing long forgotten memories with our Kickstarter backers and friends on social media, and have been somewhat taken aback by the kind messages of appreciation and support which have flowed our way.

As a consequence, when plunging back through memories long forgotten, I am reminded that what really mattered was the consumer, and one particular memory forces its way to the front of my mind.

Before the awards and the accolades, the triumphs and the disasters, the pain and the ecstasy, was the simple pleasure of coming down the stairs in the morning to see a pile of envelopes on the front door mat, each addressed to me and each with a cheque or postal order inside.

We all care about our money. I don't know anybody who is not at least a little bit careful with their money, and we don't go dishing it out willy-nilly. But just knowing that somebody, somewhere, had felt sufficiently interested in what I had produced to put a cheque on my doorstep filled me with pleasure and appreciation. These were people I had never met, who in all probability I would never meet, and they had gone out of their way to endorse what I was doing.

No matter how hard it is, no matter how much or how little money you make, when all is said and done the best feeling in the world is knowing that people appreciate your work.

APPENDIX 1

HINTS & TIPS FOR VIDEOGAME PIONEERS

My top tip for any future videogame pioneer would be to make sure you have great basic and simple gameplay, even without fancy graphics or sounds. First of all, it's way faster to iterate and test different ideas if you don't need to redo a lot of assets for each change you make. For the pinball games we designed all the table features using a black and white outline, until it played well enough that only minor changes were needed. Only then did we add all the art, sound, and detailed designs.

Second of all, if your game is not fun, then all the fancy graphics and sounds in the world won't be able to hide that for very long. And if you don't want to make fun games, then you shouldn't ask me for help.
Andreas Axelsson, co-founder of DICE and programmer on Pinball Dreams

I think I'd advise them to always try to create something new – something that's not been seen or done before – but in doing so, never forget that what you're making is a game, and above all, a game must be easy to pick up and fun to play. Gameplay is king, it's not just about the graphics.
Barry Simpson, software manager at 21st Century Entertainment

Make lots of new things and be prepared to throw them away. The degree of polish that is possible these days is no substitute for originality.
Dominic Robinson, Spectrum programmer for Uridium & co-creator of Zynaps

1. *Know your platform. Our best games used the features available to their best advantage and did not fight the platform.*
2. *Don't be afraid to let the game design evolve. Our games were like living things often taking a direction we had not foreseen. You need to have time to try things. If they work use them, if they don't try something else.*
3. *Program the game you want to play, that way you know when it's good.*

Steve Turner, founder of Graftgold and creator of Avalon and Quazatron

I've been out of the loop for too long to give much advice to future videogame developers, but I would say that the best way to become a great programmer or designer (and without wanting to sound like a popular sports company) is to just do it.

The barrier to entry is now very low, so create a small game, let people scrutinize it, accept the criticisms, and move onto the next project with better insight. Eventually, you might come up with a classic, or just be offered a damned good job based on your library of work.

Raffaele Cecco, creator of Exolon, Cybernoid and Stormlord

One simple thing – remember it is a business every bit as much as it is a creative process.

Roger Kean, co-founder of Newsfield, publishers of CRASH and ZZAP! 64

Don't do or release anything which is less than your best. Don't sacrifice your integrity or vision or quality, in the end you need to be really proud of what you do. Financial success will come eventually!

Fredrik Liliegren, co-founder of DICE & producer on Pinball Dreams

Work hard and never give up.

Jonathan Dunn, composer on Subterranea

Just go ahead and make games! If you don't think you've got the skills to make an entire game then get into modding and learn that way. Games

companies are always looking for talented, passionate people and you can show that best by having some solid and creative pieces of work to demonstrate.
Stephen Robertson, game designer and former C64 loading screen artist

It seems that people are more interested in marketing themselves, which is all fine and dandy but you absolutely need the skills to back it up. Always push yourself and try to move outside your comfort zone. It's far easier to stay in the zone that you know and understand but venturing to new and difficult areas will only make you better equipped to deal with whatever is thrown at you. Never stop learning is the key.
Gari Biasillo, creator of Slayer, Steel and Future Basketball

Be original. Gameplay is more important and don't underestimate audio – it's fifty percent of the experience.

I've seen so many clones of other games and I know a lot of work goes into creating them but the one thing I see lacking sometimes is originality. One running game becomes very popular and suddenly there are five indie developers also making a running game. There are so many options in the universe! Think of something, have an imagination, think of something new!

So being original is the most important thing, gameplay is more important than looks and don't underestimate audio. Fifty percent of a game is gameplay, but if the music sucks and the sound sucks then the game goes off. I've seen great games where they've not had the budget left for sound design and then the whole project fails to sell.
Jeroen Tel, composer on Eliminator, Cybernoid and Stormlord

These days I do suggest to youngsters that they get involved with something like the Raspberry Pi or the Arduino and go back to basics programming a piece of hardware like that. We're not shackled with constraints like having hardly any memory or slow processors like we were in the 80s and there is a lot more enjoyment to be had when you develop projects on devices like the Raspberry Pi. Also, there are so many great free open source

tools available that make it easy and dirt cheap to learn and program pretty much anything. That would be my advice – go back to basics with the plethora of free software and cheap hardware at your disposal. Like a musician, practice often. Don't just read about programming – do it!
Steve Marsden, co-creator of Technician Ted and co-founder of Spidersoft

The downside of there being so many independent games currently in production is that it's often very difficult to be heard in such a crowded space. So if you're making a game, be prepared to put a great deal of time and effort into marketing your title and getting it out there.

If that's not something you think you can do, it might be a good idea to approach one of the many small publishers that are now beginning to appear – just as they did in the early days of the games industry in the UK – and leverage their expertise to get your game coverage.
Julian Rignall, games journalist and former ZZAP! 64 reviewer

I don't feel qualified to comment on the modern videogame industry but if I was to tell them one thing that would for sure make them appreciated it would be to deliver stuff that works, on time. That is something that is hard to find now!
Mike Male, creator of Pilot, Nightflite, Southern Belle and Evening Star

If it was easy, everyone would be doing it. It isn't easy at the start but be determined, don't give up and be single minded in achieving your goals. It will get easier.

Don't reinvent the wheel – try and think outside of the box. Accept help where it is offered, and if you can find shortcuts take them.
Simon Cobb, creator of Dilithium Lift

Keep at it and don't be afraid to cross the borders of what's expected of a videogame. And yeah, stay frosty :)
Olof Gustafsson, co-founder of DICE and audio designer on Pinball Dreams

Have passion. Have will power, and I mean will power to do whatever it takes to get the job done. Be reliable. These are the qualities I feel made me successful. I still can't believe I made that first game on the Oric without having any idea what the machine was about when I first bought it.

Do everything you can to make yourself as appealing as possible to developers. For programmers, that almost certainly means getting a degree – I don't think we even look at people now who don't have a degree or a significant amount of work experience. For artists, have a demo reel that shows capabilities that are appealing to game developers (such as lighting or texture / polygon counts) and make sense on a console.

Nick Jones, C64 programmer for Exolon, Cybernoid and Stormlord

1. *Believe in what you're doing. If you do others will too.*
2. *Take some risks, you might be surprised that others will appreciate your risks, for example – Fez!*
3. *"It's done when it's done" sounds attractive, but even when you're indie you need to have a plan and budget because there is no such thing as forever.*
4. *If you run a team, make sure you give positive feedback. Don't just assume that because you're not criticizing them your team know you're approving of their work, tell them.*
5. *If you want to criticize someone's work, tell them behind closed doors. That is also true in some cases when approving of their work.*
6. *Don't be afraid to speak up when a situation arises within your team. All too often teams fracture when people leave others to it.*
7. *Emotions and objectivity cannot be intertwined, keep them separate.*
8. *If you feel you need to vent, then vent up! Never down.*
9. *You can't ask your team to do what you wouldn't do yourself.*
10. *Lead by example.*
11. *Never betray confidences.*

Stewart Gilray, associate producer at 21st Century Entertainment

Work with great people all around you, trust your instincts, do not compromise game quality for the sake of keeping the peace, work hard,

then work harder, listen to everyone but always hold the casting vote. Never ever lose focus and remember the game is the king, you must love it and look after it and always give it what it needs to thrive.
Jon Hare, co-founder of Sensible Software, creators of Insects in Space

Ignore the blokes in suits – do what feels right to you.
Ben Daglish, composer on Firelord

APPENDIX 2

2ND EDITION
BONUS INTERVIEWS

Thank you for purchasing this 2nd Edition of the book. Please enjoy these exclusive bonus interviews with some of our contributors.

DICE INTERVIEW

How did you come to know the other DICE founders?
I met Fredrik through the local gathering of computer nerds in my home town when I was around 15. He knew Ulf, Olof and Markus through his engagement in the demo scene and hooked us up.
(Andreas Axelsson

What did you enjoy most about your Amiga demo scene days?
The experimentation and involvement in creating something together with other artists and getting my music out to others beside my immediate family.
(Olof Gustafsson

Your Pinball games have recently been re-released on platforms like iOS and PSN, how does it feel to know a whole new generation of gamers are enjoying the titles?
Awesome other than the fact that we are not earning a single cent from these titles now.
(Fredrik Liliegren

I don't know how well the iOS games are doing in terms of numbers, but I think it's absolutely fantastic that I can pull them out and say "Hey, this is the game I wrote as a teenager". Most people who did games back then will have to dig out some dusty emulator on their PC.
(Andreas Axelsson)

I think it's great that people can enjoy it on their phones, but at least to me it's really hard to get the same feeling without physical buttons for the flippers.
(Olof Gustafsson)

You more or less dropped Amiga development after Pinball Illusions, why was this? Did you anticipate the market was going to die out?
We wanted to expand to consoles and PC and yes we felt the Amiga's best days as a commercial platform were over.
(Fredrik Liliegren)

DICE has gone on to become one of the biggest developers in the world. How does it feel to know something you founded has become so big?
DICE was slowly growing over many, many years. It was not really until I decided to quit and move on in 2005, and I went to hear the Battlefield theme song at a concert hall, that I realized how big it had become. I always feel great when I think about it and when I see some of the amazing stuff they keep delivering.
(Andreas Axelsson)

It is fantastic! It is certainly nothing we could have imagined in the early days. However, I started thinking that we might have a good chance to become big when, later on, we got the opportunity to hire new uber-talented co-workers. I still follow their work with big admiration.
(Olof Gustafsson)

What are you doing today? Do you still work in the games industry?
Today I'm working in a new start-up, Directive Games, which I founded

together with a couple of friends in 2014 in Shanghai, China, where I've lived since 2010. We're focusing on mobile games, and the server platform required for large-scale social and competitive games.
(Andreas Axelsson)

I am currently the Vice President of Graphics and Portability at Transgaming in Toronto, Canada, so while not directly doing game development I am very much in the games industry!
(Fredrik Liliegren)

I still work with audio design. When I left DICE in 2006, I started a small games production company with a friend, which we decided to shut down in 2014. Since then, I have worked full-time as a music/sound designer for a major casino content developer. I still do freelance stuff for games in my spare time, just because I enjoy it so much.
(Olof Gustafsson)

BEN DAGLISH INTERVIEW

What are your fondest memories of the UK games industry in the 80s and 90s? What made it so special?
The inclusivity, I think. Anyone could go out, buy a machine, and be coding a top game in a couple of weeks.

There's a certain romance about the UK games industry in the 1980s. Why do you think that is?
Partially because that's when the people now running the world were teenagers, but it certainly was, as they say, a "more innocent age" as well – before the businessmen got involved.

What are your most difficult memories from that time?
Seeing some great talent being eaten by the industry.

Was music always a big part of your life?
Indeed – as long as I can remember.

Which games do you have the fondest memories of working on?
Probably some of the earlier stuff, working late into the night with Tony – particularly the "Trap" demo.

How did you choose which projects to work on? Was it important that you believed in the games quality beforehand?
Nooooooo! I took everything that was offered, I'm afraid. Many a time, I never even got to see the game before it was published!

How and why did the SID chip become so iconic?
It was by far the best quality sound chip of the time, but also, due to stuff like the dodgy filtering, each one felt *individual*, I think, which gave it the feel of a 'real' instrument.

How did your career as a musician blossom?
"Organically" I suppose. I started playing instruments when I was small, then started writing music for computers when I was a bit bigger. Then I just woke up one day and found I was doing music for a living!

Does programming give you a different perspective on music and vice-versa?
In some ways, I think it probably does. Programming certainly helps develop the bit of the brain that "manipulates" notes and sequences, and treating notes as numbers is a trick that's been used throughout history. I'm not sure about the other way around though – possibly playing music helps me relate to "real people" a bit more :)

What do you enjoy most about being a musician?
Jammin'

What do you enjoy most about programming?
Jammin' :)

How did the field of composing for games emerge in the early days?
Slowly.

How were you able to capitalize on that opportunity?
By being one of the only people doing it!

DOMINIC ROBINSON INTERVIEW

What do you miss about the early UK games industry?
The main thing I miss is the possibility of creating something new in just a few weeks. For example, when I wrote the Flying Shark arcade conversion for the Spectrum at Graftgold (for which John Cummings did the graphics), the whole thing was done in just under 6 weeks from scratch. Game engines such as Unity do allow people to make things quickly, but that is different to the thrill of making everything yourself.

Do you see similarities between the games industry in the 1980s and the indie scene today?
There are certainly similarities. It is great to see opportunities for game development happening on a more human scale. Tiny teams can once again create something original and get it out to market, albeit a massively crowded one.

You left Hewson to join Graftgold when they parted ways, how did you come to this decision?
This was the time when the Atari ST and Commodore Amiga were just appearing on the market. Both myself and John Cumming wanted to work on these new machines but didn't see much prospect of this happening in the immediate future at Hewson – the market for games on these new platforms was not yet established. Moving to Graftgold opened up opportunities to work for other publishers, and represented an opportunity to work closely with Steve Turner and Andy Braybrook, then two of the giants of the industry.

What are the most difficult memories of the early industry?

I don't remember anything particularly negative. There were inevitable frustrations, but all small beer when measured against the opportunity to be paid to make games. What wasn't there to like!

What are you doing today? Do you still work in the games industry?

I now work for SN Systems, part of the Sony Computer Entertainment Group, where we produce the tools for game developers on the PlayStation™ platforms. I work on distributed systems for speeding up C/C++ compilation and other game asset processing.

GARI BIASILLO
INTERVIEW

What are your fondest memories of the early games industry? What made it special?

I remember it as a golden era because it was a period when computers were just becoming popular and affordable for the home. I was also in my pre-teens, so it all seemed magical and fantastic to me. I frequently visited the local computer store, Computer Link, Boots, and WH Smiths, who had all the latest computers and games available to try out.

As music has always been an integral part of my life, I gravitated towards that side of things. The C64 was obviously a huge part of that, and I ended up buying a Sound Expander, which I had a love-hate relationship with. I enjoyed the polyphony, but to be honest, I was never a massive fan of FM synthesis and this peripheral confirmed that. The SID chip was streets ahead sound-wise.

Easy access to information, like you can get in seconds in today's internet society, was simply not possible then, so gaining information was a slow and arduous endeavour. I had to scour bookstores, libraries, and pick peoples brains to learn about computer programming and it involved a lot of trial and error. I couldn't 'google' for the best book on X or Y, so I had to literally go through books one by one until I found something that might be related to what I was looking for. Looking back, I think it helped to instil

discipline and learning instead of the answers being handed on a platter. We really had to work for our information in those days!

What do you miss the most about the early industry?
In all honesty, I can say that I miss the C64. I think I was just a shade too young during that era and if I was a few years older I could have accomplished more at that time. I know a lot of my colleagues will cringe at this but I miss the time when game development was accomplished with two or three people. You had a lot of control of everything to do with the projects, and whether or not you made the right or wrong decisions, you made those decisions yourself. I think the boom in mobile games has brought us round full circle, giving many developers the opportunity to work in a similar environment to those days.

When did you first get a computer and how did you go about learning to program?
My first contact with a computer was in 1982 when my friend's dad bought him a BBC Micro. We went through the usual process of typing in listings from game books, which got me hooked! Not really knowing much about what computers were available, I asked my dad for one and one day he brought home a Vic 20. After tinkering with it for a week, it was obvious to me that it wasn't as good as the BBC and I complained to my dad who kindly took it back and replaced it with a C64!

I went through the same route as many computer buffs typing in listings from magazines, which led to trying to write my own programs in BASIC. I found an advertisement for a BASIC compiler that claimed to give a 10-fold performance increase, so I went to the local computer store to buy it. Luckily the guys there knew their stuff and recommended Zeus 64 assembler instead. That was a key point in my learning, as it opened up the real world of writing games.

What games did you play when you were younger?
I played too many for sure! The first game that I recall playing was a space game by Commodore but I don't recall the name. The games that left an impression on me to this day are Paradroid, Manic Miner, Blagger, Killer

Watt, Daley Thompson's Decathlon, and Wizball. I spent a large amount of time playing games to listen to and analyse the music and sound effects.

Who influenced you in the early days?

Musically, the guys at the top were Martin Galway and Rob Hubbard. I had a preference for Galway's music as, to my ears, it sounded more atmospheric and I liked his sound palette. From a programming/game standpoint, I really liked the work of Tony Crowther. He was prolific, and I recall spending countless hours playing Killer Watt, Blagger, Son of Blagger, Haunted House, Loco, Suicide Express, Potty Pigeon, and many more!

What do you remember about the release of each game?

I don't really recall the exact specifics but I do remember the excitement at seeing the artwork, and the anticipation of waiting for the advertisements to appear in the games magazines. The wait for the reviews to come was always agonizing, hoping that our next game would be well received.

What was special about the SID chip?

The SID chip was, and still is in my humble opinion, a work of art. Being a hybrid analogue/digital sound chip gave it a unique sound that was way ahead of the competition, which was mainly the AY chip which paled in comparison to the SID's capabilities. I've always been a fan of the sound of pulse width modulation, and the SID excelled at this. It's a waveform that is my bread and butter and I still use it to this day. I've read that the original design was for higher polyphony but due to restrictions on the chip size, it had to be reduced to three. I can only imagine what music would have been possible if we had six channels!

What do you remember about your days as an in-house musician at Ocean?

During that period Ocean had some of the best talent in the industry. I joined after my school friend, David Blake, asked me to come into work with him and have an interview. I demoed my music for Joe Blade to Gary Bracey, and had the chance to chat to Martin Galway who was very open and willing to answer all my questions on sound programming techniques.

Shortly after starting to work there, I asked to write a game first to improve my programming skills, which led to me porting Basket Master to the C64, and with the guidance from John Meegan and Dave Collier, two incredibly talented programmers, I ramped up my skills quickly.

After completing the game I moved into a sound-proofed room where I undertook my composing, working on Arkanoid 2 and Target Renegade. For the latter, Paul Hughes wrote a new music driver for myself and Jon Dunn to use, and I learned a great deal about 6510 optimization techniques from him. My stay at Ocean was short but I remember it fondly and sometimes wonder what it would have been like if I had stayed at Ocean longer.

What are you doing today? Do you still work in the games industry?
Life after Hewson took me on a long journey. I worked in the USA for four years, then moved back to England for a couple of years with my wife-to-be before moving to Canada. I spent 14 great years working at EA before moving to Japan in 2013 to work on The Tomorrow Children at Q-Games in Kyoto. I also run my own music studio, composing music for TV and various multimedia projects focusing on cinematic trailer music, and am taking a part-time Master's Degree in music composition to firm up my skills.

JEROEN TEL INTERVIEW

What are your fondest memories of the early games industry in the UK? What made it so special?
A lot of the ground-breaking work of how videogames were supposed to be was done in that era and still applies today. Gameplay became very important, how a level was designed, all kinds of genres were invented during that time and still survive today.

It was also a very small industry compared to what it is today. What I liked about it most was that it was a very small developer's world – everybody knew everybody. When we used to go to the Commodore show most of the people there would be businessmen, actually, but the developers – the

programmers, the graphic designers, and a handful of musicians – everybody knew each other.

The fondest memory I think, for me personally, was when I went to the EA stand in 1987 and handed over a music disk to these guys from Electronic Arts, which was actually not a huge company yet. I was only fifteen but they sent me a huge, fat contract and they wanted me to work for Electronic Arts in America. I asked my mum if I could go and she said "No way! You're going to school!" I really wanted to go, so I asked if I could au pair or something, but in the end I had to call them back and say "guys I'm honoured but my mum won't let me". They said "Why not?" and I said "I'm only fifteen". "You're only fifteen?!" I guess they knew I was young, but not that young!

What are your most difficult memories from that time?

Money was one of them. At the time I think I was happy with any bucks I got because I was a kid. I could buy a moped when I got £300, which was a lot of money at the time, well it seemed like a lot of money at the time. But I didn't have a mortgage, I didn't have insurance, I didn't have a car. I should have thought more like that, but my father was absolutely not a businessman, and I didn't want him to be involved anyway. I think if I had asked for £3000 for a project that would still have been a bargain, but we asked for £300 and £500, and it was peanuts really.

It's a bit of a shame because once you reach a certain age you will have your driver's license, you will have your mortgage and your expenses and then £300 is nothing. So I think I did a bad job on that, but then I was a kid so I didn't know.

I mean the business was done by Charles and I was happy at the time with everything. You always get what you bargain for and apparently we didn't bargain for enough but that's not the fault of anyone because if you can get something for less anyone would do it! No matter how much money you make everybody is interested in something good for less, that's the way it is.

But that's the only thing that really bothered me, the rest of it was fun, we just had fun! Actually the most difficult thing was not having the right equipment. I didn't have a disk drive when I wrote the music for Cybernoid! I had to transfer all the memory back to a certain place where I could save

it on tape and then load it in again, transfer it back to the original address and then I could continue programming.

What do you miss about the games industry in the 80s and 90s?
In the 80s and early 90s you could make a game with just three people; a programmer, a graphic designer and what they called a musician (which I still think is a bit weird – it's a composer of course). That intimacy – that you could sit in your bedroom so to speak, or call each other up late at night saying we need this, this and this – everything was between just the three of you. There was no producer in between, especially in the late 80s, so it was a very intimate group of people.

Okay that still exists or has returned in indie gaming, but right now most games involve a lot of people and it's very strict, very streamlined – it's work, it's not like a hobby. That's what I miss – the closeness of the team and being free to do what you want without having to stick to a script. Anyone could have an idea – I'd have an idea for the graphic designer, the graphic designer would have ideas for the sound effects or for the programmer, the programmer had ideas for the music, it was a really close development team. That's the one thing I really miss.

Having said that I didn't have contact with any of the dudes from Hewson when I did the music for their games, but that's more that we weren't in the same country. I was in the Netherlands, they were in England and calling England was a very, very expensive thing compared to today.

What games did you play when you were younger?
Q-Bert, Jupitar Lander – I'm from the very beginning! Most of the time I loaded up games because I was interested in the music, but I played a lot. We had the cassette tapes, all the hacked versions, the cracked versions. I played Gribbly's Day Out, Boulderdash, H.E.R.O and Agent USA – which was one of the best games ever written, in my opinion. If they remake that one as a 3D version, I would so play it. It's so simple – the concept is simple but the way it's worked out is awesome. Eyeball, I loved that, Commando of course, not just the music but also the game was really good. There were hundreds of games, we used to play them all!

Has music always been an important part of your life?

I didn't stand a chance because I was raised with music since I was zero years old. All of my family has always been in music – apparently one of my ancestors was the first conductor of one of the first orchestras in the Netherlands, which I didn't know until a couple of years ago. So we were raised with music, we always had a piano at home and since age zero there was a classical choir coming to the house every Monday evening. From age four I could sing, even phonetically, all the parts of every song that was rehearsed – hundreds of them. They would rehearse deep into the night and when you're surrounded with stuff like that you just pick it up, that's what kids do.

It was so normal to have music playing – all the classical greats like Mozart, Beethoven, Bach, Vivaldi, they were all there. I also got piano lessons from my dad, I learnt to play flute from my mother and all these obscure instruments like the mouth harp.

Anything music related was big in our family but I only really became aware of it when I went to school for the first time aged four. We had music lessons but nobody knew about music! They'd heard music and they knew children's songs but there was no knowledge about music and they didn't know how to play an instrument! That was when I realized that something was different.

When I was six there was a piano in the library which I used to play and everybody wondered how it was possible for a six year old to play. It wasn't spectacular – I played *Boogie-Boogie* and other fun stuff, or music that was played on the radio at the time, I played it in a simple way but I was playing it nonetheless. It became apparent with the music lessons that I knew more than the teacher, who was just a general teacher, which was kind of funny.

I actually started composing on the piano when I was six. My brother got a drum kit when he was about seven and he drummed his ass off. It was so obvious in our family – my sister took up the violin and we used to rehearse songs together and play together. My uncle was a music teacher, my other uncle was a composer – which I didn't know! He wasn't a composer by profession but he composed music and I thought it was Beethoven or something! I recently found out because we heard all that music being played

when we were at his place that it was not composed by Beethoven, some of it, but by him!

I'd like to note that my brother Kees Tel had two #1 hits in the Netherlands and hundreds of his productions in the music charts since 2000.

How did Maniacs of Noise come about?

When I met Charles Deenen we decided to write a player together, well he wrote it and we expanded on it based on my input. We had decided to go to the PCW show in London and we thought we better have a name for ourselves before we went. We came up with a lot of names but in the end we really liked Maniacs of Noise. So we formed it – I was 15, he was 17 and we went to the PCW show and we got hired. That's how it came to be; me and Charles Deenen thought it was time to collaborate and that's that.

What was so special about the SID chip?

Bob Yannes, the designer of the SID chip, had a budget to actually design a synthesizer instead of just a music chip with beeps and bops. He actually wanted to make an 8-channel synthesizer – in fact he wanted to have many more features but he didn't have a budget for it. Nevertheless, what he did with those three channels – ring modulation, filters, and most importantly the pulse run (Pulse Width Modulation) – it made a huge difference and really defines the sound of the SID chip.

It's actually considered to be one of the most important chips in history because it's an actual synthesizer within a home computer from 1982! That's a big deal – and it's a good synthesizer, it's not just some crap, bleepy oscillator maker, like the Spectrum and the Amstrad. Even the Atari ST, which was a 16-bit machine, only had these three bleeps to manipulate. The Commodore 64 was way ahead of its time with the SID chip.

However, if you look at the examples Commodore made themselves when the machine first shipped in 1982, they are all terrible! Then composers like Rob Hubbard and Martin Galway appeared and I was like "Woah! Wait a minute, hold the phone!"

I suddenly realized that this was not a joke. I heard "Thing on a Spring", I remember that well, I listened to it with my brother and it had all these

incredible sounds. We listened to it every day, a couple of times at least for a long time and we showed it to friends and we were like "this is like it, this is going to be changing the world of music!"

If you look at that song or the stuff that came out later, it really has defined 8-bit music in a way. You hear it everywhere – in dubstep, even in rock there's often some beeps, some oscillator sounds – the 8-bit sound is everywhere.

It's amazing to think about but I believed it would happen because it's so recognizable that it almost became its own instrument. The SID chip is the one that really made it grow, together with the Game Boy of course.

What was the first game you worked on and how did you feel when it came out in the shops?
The first game I worked on was Hawkeye. I used a very primitive player and worked on it together with Boys Without Brains (BWB). They actually lived quite near to me and were friends of mine from the scene. It was a really good time – we stayed over at the programmer's house and I worked on the music on and off because they were really working hard on the game. I did the Hawkeye loader and the Hawkeye title and then I redid it a couple of times.

I was fourteen when I actually wrote it and then it came out when I was fifteen. I was mega proud, not just because I had my first game music released, but also because it was a great looking, awesome game. It had the first parallax scroller on the C64 and the game was just phenomenal. So that was the first game I worked on, but I think Battle Valley for Hewson was one of the very early ones also.

Your tracks had a unique style and you were able to cram really rich compositions into the C64. How did you accomplish this?
I knew I only had three channels and I knew I wanted to have a full drum, a higher snare drum, tom-toms, special effects, and I wanted to have chords, melodies and fillers. And I figured okay, some ground-breaking work has already been done by Rob Hubbard and Martin Galway. For example, Arpeggios – alternating between the two, three, four or five notes you needed for

a chord so quickly that you create the illusion of a chord using just one channel. This was a massively important factor because the technique revolutionized what was possible on the SID chip.

So for the drums and the base I thought let's combine them together, alternating the bass and snare so they're both there. Then I thought okay you can add a kick very fast before a bass – there's a name for that technique now, they actually made a name for that. Anyway now you have one channel for the base and the drums, one channel for the chords, and you're left with one complete channel available for the melody.

This meant I could have note, note, note, note, note, special effect, note, note, note. That's the cool thing with computers, you can alternate as fast as you want! It's not a musician, it's a computer, but you can program it with that combination. You could be really, really creative with the limited choices you had. You could pump so much out of it so it sounds like ten or twelve channels even though it's only three.

And of course you had a sample channel which I used mainly for drums and voices, but you had three channels left for everything else. That made a huge difference.

That's how I managed to create these big, rich compositions. It was a lot of creativity and a lot of puzzling everything out; I want this baseline, these drums, these chords and this melody line and for every part it would be different and you had to figure out where it would fit in. It was puzzling really.

What are you up to these days? What's the latest project?
I'm actually involved in a project called Pixel Racing, it's being developed by an Italian company called Bitween. It's a game in the style of Minecraft but it's actually a 3D game with pixel cars, pixel roads, pixel everything. It's going to be pretty cool and it's also going to be an Indiegogo project by the way!

JONATHAN DUNN
INTERVIEW

What are your fondest memories of the early games industry?

It was such a fun industry to work in. It was only when it became big business and the corporate culture started to take over that it became less fun. Oh, and the parties. To this day I have still never been to a company party that was anywhere near as much fun as an Ocean party.

What do you miss about those days?

I would say that I miss the simple games of the 80's and the creative and innovative games that a kid could do in his bedroom. But to some extent that has become possible again over the last few years.

What games did you play when you were younger and what drew you into making music for games?

I used to spend a lot of time in the local computer shop, I think I played everything that came out on the C64, but it was the early Rob Hubbard stuff that inspired me to start doing it myself.

How did you begin releasing demos on Compunet, what was the process?

There was a ZZAP! 64 music competition, and you could upload your entries on Compunet. That's where it all started.

Some readers will know you better as Choroid, where did the name come from?

I was studying at college at the time, and came across the word during a psychology class.

What do you remember about working with the SID chip and how did you get the most from it?

I loved working with the SID chip, I don't think I ever got the most out of it, and that's what was really interesting. It always seemed like there was something else to discover.

Did you have your own proprietary tools on the C64?
When I got to Ocean Software I started working with Martin Galway's driver, then I moved on to one written by Paul Hughes. Eventually I'd developed enough skills to make my own. I went on to code drivers for the NES and SNES too.

You are best known for your time at Ocean, composing themes for Total Recall, Platoon, Robocop 2, and Terminator 2 to name just a few. What was it like working on such huge franchises?
It was great fun working on these titles. When it came to the audio I pretty much had carte blanche to do what I liked. Platoon was a particular favourite. It was my first big title after starting work at Ocean, and it was just after Martin had left so there was a lot of pressure. I remember it getting a great review in ZZAP! 64, one of the few review clippings I've kept.

What was it like working at Ocean in general?
It was really great. We were all so young, and I have nothing but great memories of that time.

Of the games you have worked on, which is your favourite and why?
My favourite game is probably Addams Family for the SNES. It was easily the best game that Ocean had made, and everyone that worked on it did such a great job.

What are you doing today? Do you still work in the games industry?
I lived in California for a few years, working with a couple of ex-Ocean friends as Left Field Inc. These days I'm living in Ljubljana, Slovenia, working as the COO in a casino gaming company, and I also have a company that I run with my wife releasing mobile titles, www.fatleg.co.uk.

JON HARE INTERVIEW

There's a certain romance about the early games industry in the UK these days. Why do you think that is?

I think it is flattering, but also that commercially it is a fad that will pass over time. Already commercially we are seeing a slight downturn in this. Having said that the retro scene is still alive and kicking in many parts of Europe and I suspect that will continue for many years, but it will not be a big money making venture, more a labour of love on par with retro music scene events.

What do you miss about the games industry in the 80s and 90s?

I miss the control of everything. Machines that did what you told them to, developers that were all highly skilled at their jobs, the focus on gameplay first and graphics second and as artist/designer always being able to make the graphics support the gameplay.

I also miss offices with no internet or mobile phones, and publishers that supported us, paid us and trusted us as artists without the need for design documents and budget plans. I miss the huge sums of money we used to earn in royalties and the creative buzz of being at the heart of something happening and special. What I don't miss are microdrives and waiting for half an hour for a build to be created.

Do you see similarities between the games industry in the 1980s and the indie scene of today?

Yes and no. There are machines now prevalent in the market that facilitate relatively cheap and quick development for small teams of people who can publish their own original games on a virtually free platform. This opportunity is what had been missing during the 10 year void. However, the big difference now is the ferocious competition of so many games out there.

In 1992 when Sensible Soccer was first released 1,000 games were launched on the Amiga in that calendar year. Compare that to 3rd April 2014 when Word Explorer was first released on iOS, along with 500 other apps on just that one day. This means it is very hard for the public to

find great new games among the sea of titles out there, even if they are exceptional.

The knock on effect of this is increased risk in the creation of new IPs which means publishers are not willing to pay advances against royalties, so new studios with no royalty streams in place to keep them ticking over cannot easily survive. In the Sensible years 1986-1999 we always got paid advance royalties on every game and this money stabilised our company and allowed us to be creative without constant fear of financial implosion.

It is near-impossible to make great creative work with teams of people when most of them are worried about more basic problems like food and paying for their house. We are badly lacking strong mid-level publishers right now, to partner up with these new developers, provide them with some money and take away some of the increasingly baffling admin and marketing strain.

What's it like to be a retrogaming icon?
It is very nice to feel like your work is always remembered and that whatever may happen in the future your career and life was not entirely wasted.

Let's go back to the beginning of Sensible Software, which grew out of your band. Did that band mentality shape the way you went on to make games?
Yes, very much so. Sensible Software felt like a band to be in and created games with the same energy as a lot of albums are made. Our band toyed with different musical styles, much in the same way that Sensible Software toyed with different game styles, often touching on the more avant-garde but with a solid rock sensibility at the centre of it. As a band we were inspired by Rush, Pink Floyd and Gong – a mixture of main stream and out there – artists who did what the hell they liked when they liked, they were our main inspiration.

Sensible Software made some incredible games, can you tell us about your approach to development in general?
We believed that a game was ready when it was ready. That by focusing on every detail all the way through you minimize errors both technically and

in design. That if something is not working in your game you should get rid of it. We believed you should work until the work was done, sometimes until you dropped, and to keep on and on focussing and perfecting, like a sculptor. That is how we made all of our games until about 1994 when we spread ourselves too thinly and the intensity of focus could no longer be maintained by everyone in the company.

Around the mid-90s a lot of the British developers and publishers started to disappear, what happened?
Three things happened – globalisation, corporatisation and technology change. The new consoles emerged just at a time when business was becoming more global and also the world's big media companies were starting to smell money in games. The consoles killed off the home computers commercially and the corporations bought out or signed up all of the smaller publishers and developers that used to be so dominant. Once they signed us all up they demanded that we made games for the new globalized world, which meant they had to sell in the US, a thing very few British games had done before this point and sadly few of us made the transition. Those that did survive such as Bullfrog and Rare were all strong on one of two platforms; PC or Nintendo, the two most popular platforms in the US.

The advent of closed platforms with the consoles seemed to draw in a lot of non-technical, commercial people – do you think creativity suffered as a result?
Within less than five years creativity was pretty much strangled by these people. It became impossible to sell original games to anyone. Sequels, license tie-ins and me-too clone style games were all you could sell for about ten years after 1997.

Do you think the subsequent focus on huge budgets and better production values over innovation and creativity was inevitable? Did it happen at the right time?
I don't think there is ever a right time for this. My view is very much a minority one but I don't see why trust in artists should be allowed to diminish because the budgets get bigger. It is possible to have great production values and

great creativity at the same time. The problem is that accountants perceive artists as a liability rather than the goose that usually lays golden eggs. They can't handle the risk that one of the eggs might crack – it is the lack of trust that leads to over-control by non-creative people, which leads to non-creative games. These people usually prefer their creative managers to be the sort that have a relatively limited imagination and are more likely to take another slant on a trusted game genre rather than think entirely out of the box. They do not see the risk in mediocrity until it is too late.

How important are open platforms and digital distribution to the future of the industry?
Open platforms are critical in any expressive media. Digital distribution is a double edged sword; I believe free-to-play games are a symptom of human beings struggling to give any tangible value to something invisible such as a digital download. I like the concept and efficiency of digital distribution but strongly dislike the current prevalent monetization strategy for many games.

Are the British designers of the early industry as appreciated and respected as they should be on a global scale?
Most definitely not. The internet leads global thinking these days and it is heavily American dominated. Frequently you will see lists online of the best games ever entirely ignoring the home computers like they never existed, precisely because they were not big in the US. In 2007 Sensible World of Soccer was voted one of the ten most important video games of all time by a team of experts at Stanford University in California. This is probably our most stunning accolade, yet many American gamers have never heard of the game at all.

JULIAN RIGNALL
INTERVIEW

What are your fondest memories of the early UK games industry?
It seemed to come out of nowhere and just exploded in a short space of

time. In the early 80's in the UK, there were just a handful of games being produced, but just a couple of years later there was a huge games development industry in full swing, creating some of the best games you could buy anywhere.

What's odd is that at the same time in the United States, the games industry was going through the Great Videogame Crash of 1983, which was caused by massive oversupply of poor-quality console games. In the UK, completely the opposite was happening – you had some incredible games being made, new concepts seemed to appear every month, and sales of product was exceptionally good. The industry was gathering huge momentum, and videogames were exciting and vibrant in the UK.

In the US, people were really down on games because there was just so much rubbish being produced. Of course, the US games industry rebounded from the crash very quickly – companies like Epyx, Broderbund, Lucasfilm Games, Activision and Synapse produced some great computer games – but US gamers didn't really buy computers in the same way that people did over in Europe. As a consequence, the US games industry bumped along until Nintendo essentially came along and rescued it. Meanwhile, the UK games industry was hugely successful – and Britain was ultimately the place where the best games were being made.

Do you think there are similarities between the early games industry and the indie scene of today?
Yes – definitely. We had quite a long period of time from the mid 90's to the late 00's where the only way you could get any kind of exposure for your game was to go through a major publisher. Now it's possible to self-publish even one-man games and be very successful. Because of that, we're seeing all sorts of interesting and original games that only just a few years ago would not have been financially viable. That's great for gamers, and great for the industry – it helps keep things fresh and interesting.

Crowd funding is also changing the way games are made. Smaller indie developers can create games for a specialized audience and still make a little money. Again – that's great for the gamers and the industry in general.

MIKE MALE INTERVIEW

When did you stop making games and why?

I can't remember exactly why I stopped writing games but the next thing I did was to create a PC based, more professional version of Pilot/Night-flite which I sold directly to pilots via the aviation press. That grew nicely (although never reaching the level of income I received from Hewson in my heyday). It was interesting from the perspective of being responsible for the whole cycle of the business from advertising though to production and delivery. I did not think of it that way at the time but it taught me a lot.

How was the industry different in those days?

I'm in a different industry now but still in simulation. I can't really compare the industry I am in now with the games industry now or then. Certainly the industry was naïve and rapidly developing in those days and it is certainly not that now. It is certainly not as much fun.

Do you ever think about making games again?

No, I think games are so big these days and the investments are so huge, I would not know where to start.

What was the motivation behind the completeness and attention to detail in your titles?

I cannot say there was a specific motivation but I think the reason they ended up that way is because in each case I either knew the subject or had someone with me who knew. It was then a case of deciding what it should do and making sure it would do it. When I look back at the tools that we had available and the way we had to save and load the data, I am amazed that any of my stuff was as robust as it was.

What are you doing today?

I decided to give up being an Air Traffic Controller to make computers my sole source of income. My employers at that time thought that they would be losing a valuable resource so they asked if I would stay but move down to

their experimentation centre (called The Air Traffic Control Evaluation Unit) as clearly I had skills in both Air Traffic Control and computers.

When I arrived, they gave me a desk and things to read but no computer. I probably had 20 at home but they did not think enough of me to actually let me touch one. So I became bored quite quickly. Then they had a project to create a PC based Air Traffic Control simulator that was running out of steam, and as I had both PC experience and simulator experience they put me onto that – at least I had a computer.

Once I joined that team, they confided in me that they wanted to leave and produce this type of product professionally. I had already got my mind around leaving once and I had been really bored up to that point so we went for it (or at least one of the team and I did, the other two decided against it).

The guy that left with me got a call at our place of work literally on the last day, actually when he was clearing his desk, from a guy working from Rediffusion Simulation (a large manufacturer of flight simulators in those days) asking if we knew anything about Air Traffic simulation as they wanted to create a PC based simulator – so we were picked up and looked after from day one! We worked with them and the companies who bought them (they were bought by Hughes Aircraft and then they were bought by Raytheon) for 10 years but since then we have been on our own.

We are part of a small group of companies. My company Micro Nav has about 100 employees, won the Queens Award for Export in 2010 and was listed as one of the fastest growing technology companies in the UK in the same year (actually a quirk of accounting rather than real growth but nice to be mentioned anyway).

I do not do any front line programming now, although I do help the engineers at times when on site with them – I'm sure they hate it.

NICK JONES INTERVIEW

How long did it take you to make your first game and what motivated you?
My first game was a rip-off of an arcade game called Moon Alien which was a modified version of the Galaxians arcade game. We had Moon Alien in my

college and I was addicted to playing it. That first game took me about 18 months to write.

How did you come to work for Mikro-Gen at such a young age?
I'd been playing Spectrum games and in particular I loved Pyjamarama. I saw a Mikro-Gen advert in 'My Computer' (Mikro-Gen were the creators of Pyjamarama) for programmers and responded to that. I sent them a copy of my Galaxians rip-off so they could see I was capable of making games. I got an interview, then the job offer. When I started, it turned out that they had 3–4 other programmers all in the same age range as me.

How did you come to leave Mikro-Gen and how did your partnership with Raffaele Cecco come about?
Raff started at Mikro-Gen shortly after I did. The first game he made there was Equinox and I was tasked with converting it to the C64. We were also good friends. So I guess that's where our first partnership started. Mikro-Gen then went on to create the Mikro-Plus which should have been an instant hit but because the first game they put out was seriously flawed, it instantly spelt doom for the hardware. That was the beginning of the end for Mikro-Gen. The young team of programmers saw the writing on the wall and we all left one by one.

Is it true you once wrote a phone-dialling program and tried to call Raff Cecco using it?
Yes, I wanted to make it something that happened when a player completed one of my games. The idea was that it would phone a secret 'hotline' and the first person to do it would get, say, a thousand quid. Tone dialling on phones had just come into being so I wrote code to emulate the tones you hear when you press buttons. With my musical background, I created the tones by ear. I then had the Speccy play the notes while I held the phone headset to the speaker. I programmed it so that pressing the keys 0–9 produced the correct tone and then proceeded to phone Raffaele, being very proud of myself. I started typing his number and could hear the exchange acknowledging each key press. As I pressed the last digit, the phone started

ringing. I waited to hear Raffaele's voice. Somebody picked up the phone and I heard "999 emergency, which service do you require?" to which I just about pooped myself and slammed down the phone. I was waiting for some emergency service to show up at my door (which luckily they didn't). I immediately scrapped the idea and put the code into retirement.

What are you doing today? Do you still work in the games industry?
The industry has changed immensely. It's all 'grown-up' now. Everything has gotten bigger (the budgets, the number of people required to make a game, the time needed, and the risks too). I'm now working for 2K Sports making the NBA2K series of games. I've been here for a LONG time and worked on most of the 2K games. The NBA team is probably around 130 people. I'd say there's at least 50 programmers; a far cry from when I was the ONLY programmer. NBA2K is just doing incredibly well. I think we sell around 5 million copies a year.

Some of the games you worked on are still celebrated today by retro-enthusiasts, how do you feel about that?
Mildly amused. And old. And proud.

OLIVER FREY INTERVIEW

What are your fondest memories of the UK games industry in the 80s?
The sense of how a home-grown industry burst into being in such a short space of time, going from strength to strength thanks to the hard work of talented programmers and entrepreneurs; it was an entertainment industry that went global. The memories of being a part of this birth by helping to create a vast audience of teenage games players who fuelled its growth still make me proud.

What do you miss about those days?
What I miss is the sense of many diverse units creating what they thought would be good. Today everything is corporate, and the amount of invest-

ment needed to bring a game to the public stifles the potential for pioneers to get started.

What do you remember about your time at the London Film School and how did it shape your future career?
Quite apart from learning the ins and outs of practical film making, my two years at the London School of Film Technique in 1969 and 70 marked the start of my career as a commercial illustrator. I began illustrating comic strips and covers for War Picture Library to earn extra money to support my studies.

In the late 1970s your Superman strip was used in the opening of the iconic Christopher Reeve movie. How did that come about and how did it feel seeing it up on the big screen?
My cover art plus three pages of a 30s style comic for 1978's Superman came about through a recommendation from the film union. Director Richard Donner wanted the comic to start the movie off with; one meeting at Pinewood studios and three days later my work was done. Seeing the brief sequence at the Odeon Leicester Square, London was quite a thrill, even though I did not get the promised credit in the mile-long end credits.

How did the decision to form CRASH come about?
My brother Franco, Roger Kean and I had started a games mail-order business in 83. Our illustrated catalogue led to suggestions that we turn it into a news stand magazine, and so CRASH magazine started in early 1984.

Your covers for CRASH and ZZAP! 64 were hugely influential in the games industry at the time. Did you realise they would become so important?
Not really! I realised they did the job of selling the magazines and that they seemed popular, but not that they were important.

What were some of your favourite covers from the period?
I was proud of quite a lot of them, but it's difficult to isolate favourites – obviously CRASH 1 and 2!

Did you have a close relationship with the developers and publishers in general? What are some of your memories of working with them?

Even though I was a partner at Newsfield, I suppose I concentrated more on the art and design role. Nonetheless I met many of the publishers when they came on social visits to our offices, which was more frequent with the ones located in the Midlands area. It helped to give a feeling for their aims and concerns and the state of the industry.

Out of all the work you have done, what are you most proud of?

My years with Newsfield have been the highlight of my career. The sheer quantity and variety of work I did, and its continued popularity still amazes me.

RAFFAELE CECCO
INTERVIEW

There's a certain romance about the early UK games industry, why do you think that is?

All those old games formed part of the cultural backdrop we grew up with, just like music, TV and films, and hark back to a time when life was perhaps a bit simpler.

It was all pretty innocent too – there weren't huge corporate monsters sticking their noses in and bean-counting. You could count on the fact that a game was created because someone loved to do it, as opposed to being the product of a focus group and sales forecasts.

What do you miss about the early games industry?

Working primarily on your own on a game was very satisfying – you could really inject your own personality and quirky ideas into a product. The flip-side of that was that it could be quite isolating in some ways, and you'd hanker for interaction with other programmers and artists, and perhaps wonder if you were doing the right thing.

As games grew bigger in the later years, and you became a smaller cog in the development team, you lost some of that individuality and personal

input, but you did gain in being able to bounce ideas off other talented individuals.

What was the first game or program you remember writing? What became of it?

My first commercial game was called Equinox on the ZX Spectrum. I'd developed it in-house at Mikro-Gen (my first programming job). Not a classic, but it reviewed well and I was proud of it as my first game.

Did it feel like a dream come true to make games for a living at the age of 19? Were your school friends envious?

It sure was a dream come true – I didn't want to do anything else. Getting paid to pursue your hobby was a real luxury, even if the pay was rubbish at the time. I don't remember my friends being particularly jealous, but they did think it was a lot better than studying for A-Levels.

Digital distribution has once again lowered the barriers to entry for games development. Would you consider making a game again?

Yes, I would, and I am. Okay, an individual or two-person team is unlikely to create the next Call of Duty, but the popularity of games like Minecraft, Angry Birds and Candy Crush (amongst many others) shows that there's a whole other market out there. There are some interesting web-based technologies that I'm experimenting with as a bit of a feasibility study for games, and the results are looking promising.

ROGER KEAN INTERVIEW

What are your fondest memories of the early games industry?

My fondest memories are of the sheer excitement of helping to build a fantastic new industry, absorbing the thrill of the games players around me and translating that to print. Of the London exhibitions with queues of young readers waiting impatiently to get their t-shirts indelibly ruined by autographs of Penn, or Rignall, or Tipster Robin Candy, and an Olibug from

Oliver. Occasionally they even wanted mine. Of working with such a bunch of talented, enthusiastic young people, and it does the heart good to see just how many readers and those who left Newsfield University have gone on to further journalism, games development and in some cases to millions.

What are your most difficult memories from that time?
Apart from the occasional less-than-pleasant turnover of staff, sitting with a very expensive barrister on the two occasions when that 'rural piratical' attitude to journalism ended up with Newsfield in court.

Oliver Frey's cover artwork really made the magazine stand out on the shelf. Was that an intentional strategy from the beginning?
It certainly was. Oliver had great experience in drawing comic strips as well as all-action battle pictures in publications as far ranging as War Picture Library 'penny-dreadfuls' and Oxford University Press books. It was that dynamic that we wanted to bring to the covers. We wanted to get away from the all-techie look of the contemporary magazines. CRASH was intended to promote the thrill of games playing, so we needed exciting covers. Also, we wanted to stand out on the crowded news shelves and engage the potential reader immediately, which is why the early covers usually had a face staring straight out – not a usual thing in those days.

CRASH was perceived as edgy and at times a little controversial. Was there a pre-conceived attitude to push the envelope?
Our editorial policy was a reaction against, firstly, our earlier non-critical catalogue and secondly what we perceived as the generally lackadaisical approach of the existing magazines (or beside-the-point criticism). And to rub it in, try telling an opinionated young teenage reviewer to tone down his comments!

There seemed to be a rivalry with some of the other magazine publishers, what were the forces behind this?
CRASH was distinctly different from its rivals in several ways, not least in using three reviewers for each game to provide a greater balance in the crit-

icism and the fact that those reviewers were local schoolboys of the target market age. But we were also working from what ITV Midlands News called 'the sleepy market town of Ludlow' and we were regarded – as one London-based magazine publisher said – as 'rural pirates'. Edginess was part of Newsfield's DNA in the fight for acceptance, a sort of Jack versus the Giant or David against Goliath.

Some rivalry verged on warfare, but in the main it was friendly (or grudgingly neutral), such as the Personal Computer World show 'sticker wars', in which – after an exchange of artillery – Your Spectrum (later Your Sinclair) joined forces with CRASH and attacked C&VG's stand, plastering the walls with all our advertising stuff. No doubt such adolescent behaviour confirmed Newsfield's status as that of pirates.

How did the decision to launch ZZAP! 64 with Chris Anderson come about?
We'd had our eye on the Commodore 64 market the minute we saw that CRASH was going to survive and do well. We put out feelers to find a suitable editor and Chris Anderson, then editor of VNU's flashy Personal Computer Games magazine, rang me saying he wanted to work on a single-format magazine. We met and began the relationship that launched ZZAP! 64.

What was behind the decision to move ZZAP! 64 back to Ludlow?
Chris cited personal reasons for basing ZZAP! 64 where he lived in Yeovil, not least that he was fed up of commuting to VNU's London offices. Although editorial was handled at a remove, the layout and artwork was done in Ludlow. We tried to make the distance thing work, but it did cause problems and we became aware that two of the three staff writers, Gary Penn and Julian Rignall, were not entirely happy with the way – as they perceived it – that Chris ran things. In the end, we decided that the operation had to move to Ludlow, which Chris did not want and so he left. Bob Wade opted to remain with Chris, who famously founded Future Publishing shortly after.

How did the quality of the products change in the early days as the industry became more professional?
The rate of technological innovation between 1982 and the end of the

decade was astonishing, always bearing in mind the constrictions placed on developers by the memory limitations. Take for instance the massive gap in appearance, gameplay and quality in the two years between Artic's World Cup Football and Ocean's Matchday, and then again to Sensible Soccer. That two-year gap caught US Gold out badly when, desperate to fill the licensed box but without a game, they bought Artic's game and bolted on a new front end for their World Cup Carnival in 1986. No one was fooled.

The other noticeable improvement was in the manner of marketing games in a way that smacked more and more of Hollywood, and in the level of prizes offered to magazine reader competitions.

Later on in the life of CRASH the magazine started to carry cover tapes. What was the thinking behind that and how did it work out?
What became known as the "Cover-mount Wars" came about because of the increasing battle for newsagent shelf space between all the videogames magazine publishers. In order to get advantageous positioning in WH Smith and John Menzies stores, there had to be some extra promotion. It is possible that Newsfield was to blame for doing it first, but those were isolated occurrences tied to a special in-store promotion. The idea soon caught on and we moved to the permanent cover-mounted issue. It soon became clear that the first one to blink would be lost and I regret the cover-mounted magazines. They cost an enormous amount of money and the only one to really benefit was Ablex in Telford, the software industry's preferred cassette and disk duplicator. At its height, before ironically the cover-mounted tapes caused a decline in sales due to reduced magazine content, Newsfield was duplicating almost 400,000 cassettes each month.

As to the content, that was down to each editor. They were given a promotional budget and set loose on the software business to get the best possible games for the lowest price and to get the data to Ablex for assembly and duplication.

SIMON COBB INTERVIEW

What are your fondest memories of the early UK games industry?
My fondest memory of the early computer games industry was the pioneering attitude – nobody really knew what they were doing but anything was possible. We were pushing the hardware to its limit and doing things that hadn't been done before. It was the start of something new and exciting and I was delighted to be a part of it.

What are your most difficult memories from that time?
The difficult memories revolve around learning machine code on a ZX81. When I started out I hadn't heard of an assembler! I had a book called "Mastering Machine Code on your ZX81" when I was 14 and I took it everywhere with me. I didn't understand a word of it and found it incredibly frustrating and difficult. I used to say to myself "I will read it just one more time then I will give up if I don't understand it". I must have read it a dozen more times and still didn't understand but one day it all clicked into place. It was a "eureka" moment. I still have the book but I don't take it everywhere with me anymore.

Do you remember the first program you ever wrote?
I can't remember the first program I wrote but I was very proud of a Space Invaders type program that I put together. It was Space Invaders with a difference – the Space Invaders were static but the base, bullets, score and so on all worked.

You developed several ZX Spectrum games and did some ports too. Which was your favourite project and why?
I was very proud of the Spectrum version of "Lazy Jones" (published by Terminal Software) and also the Amstrad CPC version of "Hunchback II" (published by Ocean). I worked in house at Ocean with a great team of programmers including Nigel Alderton, Mike Webb, Richard Kay, Tony Promfret, Joffa Smith, Martin Galway, Bill Barna & Paul Owens. It was a great time in my life and one that I look back on with great fondness.

What projects did you work on at Ocean?

My ambition as a teenager was to get a job at Ocean Software and I was delighted when I was offered a position there. Working at Ocean was a joy for most of the time but towards the end there was a lack of direction and I left to work on other projects.

It wasn't like going to work, everyone got on together and we had a right laugh. It was almost as if the work was secondary to our enjoyment. It was amazing that despite the lack of organisation, planning and resources any games got finished at all. Some of the other programmers were real geniuses, it was a privilege to be working amongst them. I left midway through the development of Street Hawk having completed Hunchback II (Amstrad CPC) and also worked on Hyper Sports (Amstrad CPC).

Is it true that you had lunch with Sir Clive Sinclair? What was that like?

After Clive Sinclair sold out to Alan Sugar, he set up Cambridge Computing and released the Z88, an A4 size laptop with a small LCD screen. It was ahead of its time in many ways and from what I remember the built-in software wasn't quite finished when the machine was released. It was a Z80 based machine and looking back it probably should have been more successful commercially than it was.

I was invited to a software developers meeting at Sir Clive's house and upon my arrival I was introduced to Sir Jim Westwood who along with Sir Clive invented the pocket calculator and the digital watch. I was only 20 years old at the time and couldn't believe I was stood in Sir Clive Sinclair's house. It was a day I will never forget!

What are you doing today? Do you still work in the games industry?

I currently run 3 businesses, one involved in broadcast/professional video equipment sales, one involved in CD, DVD & Blu Ray disc production and a property company. I don't code anymore but one day when I have some time I would like to go back to it.

STEWART GILRAY INTERVIEW

What do you miss about the games industry of the 80s and 90s?

I miss some of the freedoms actually, and the fact that now you HAVE to throw over £1m to make a game, but there are so many more opportunities to sell today than there was then. Back then you could have two or three people making a game that sold enough for you to make a further two or three titles, and that's at retail. Whereas today that's next to impossible.

What games did you play when you were younger and what drew you into making your own games?

I played all sorts, Jet Set Willy, Brian Bloodaxe, The Wild Bunch. I was a Spectrum owner, never had a C64, but whilst I didn't play C64 games I saw them at mates houses all the time, so I saw stuff like Uridium and Paradroid. I think my favourite Hewson game was Firelord. I loved it, Stephen Crow was a genius. This is all before I got an ST/Amiga, at which point it was Eliminator and Nebulus and Stormlord – Keith and Marks' version that is.

As for how I got into making games, I was always creative so my best friend Richard Fox and I used to make games on the Speccy. I did code and he did art. Then we moved onto the ST and Amiga. I can't remember how it all happened but I think I got in touch with Tony Cooper as a bit of a fan boy of his stuff, like Cybernoid ST/Amiga, and he introduced me to Paul Chamberlain, and then Keith McMurtrie. Then I ended up being asked by Keith to do the ST version of Rubicon, so I moved down to Lancashire in 1991, when it all changed.

Tell us how Spidersoft / Enigma come to be and the relationship with EA.

Richard and I started, well formed, Spidersoft [not to be confused with Spidersoft Ltd which developed Pinball products] in the late 80s when we did our Spectrum stuff. We came to the conclusion that Spidersoft was a bit rubbish, so we came up with "Enigma Software" instead. We had stationery done, we'd introduced ourselves to a few companies, and then I opened a copy of CTW and there was a company in Harrogate called Enigma Varia-

tions advertising. I couldn't believe it, I even rang them up and said they should change their name, but they were having none of it, and rightly so. We ended up changing the name to Enigma Software Developments, or E.S.D. for short.

The EA thing started by way of an introduction from a guy called Philip Harman, who ran a company in Norwich. They had signed up the text adventure game that Richard and I wrote called Lost Soul. Just as we were finishing it off, Phil introduced me to Peter Molyneux and we ended up doing the introduction sequence for Powermonger. That went down so well that Peter introduced me to Joss Ellis at EA. Joss then asked us to do the intro for Argonauts Birds of Prey, which we did.

We also did an intro for Populous II, but that wasn't used in the end. It was completed, but EA decided they didn't want to pay for a second floppy disk, since our intros always filled a disc, c'est la vie.

What were the key titles you developed in those early days?
Now you're asking. The titles I can remember working on before joining 21st Century Entertainment were Lost Soul, Powermonger, Birds of Prey, Populous II, Moonfall, Rubicon and Paradroid 90. I can't remember anything else though.

Your colleague Richard did some cover art for Syndicate which was never used. What became of it?
Yeah. Richard was introduced to Paul McLaughlin at Bullfrog when we did the intros for Powermonger and Populous II. So when they were doing Syndicate Paul phoned up Richard and asked if he'd like to do the box art. Richard jumped at the chance and did the art. EA on the other hand had a different idea so it wasn't used. About 12 years ago I was driving past a bus shelter with the poster for the movie Equilibrium, and I thought, that looks familiar, and whilst it wasn't the exact same art, it was massively based on Richards Syndicate cover, which I later found out was used by EA in the USA in connection to Syndicate marketing. Richard asked for it back a few years ago, but was told by Paul that Peter has the original now, framed and on his wall.

Is it true that some of your code ended up being used in Paradroid 90?
Yeah myself and a friend, Russell Payne, wrote a compression system that had better results than Rob Northen's stuff so we licensed it for use in Paradroid 90, it was the reason the game was on a single disk if memory serves. We also wrote a disk protection system which was used in a number of Hewson and 21st Century Entertainment titles on ST and Amiga.

After that you took some time out. What did you do?
I was still living with my parents so I didn't need to be paying rent and so on. So other than a few jobs helping people out for a week or two at a time I ended up taking 8 months off. I took my last cheque from 21st Century Entertainment for Rubicon, banked it and went and bought a guitar for £360, then spent the majority of the next few months playing guitar six days a week, eight hours a day, relearning what I'd forgotten over the years. I started playing when I was 10, but hardly touched it for 2-3 years, so decided to take time out and play my socks off.

How did you end up being involved in the GBA version of Pinball Dreams?
I'd spent years working for other companies and decided in 2001 to setup my own studio. As I had the Amiga source code for Pinball Dreams and Pinball Fantasies, a friend (Paul Carter) and I decided to try and make a GBA version. Paul got a demo up and running quite quickly, so I arranged to meet Jason Kingsley at ECTS, the one and only time it was held at EXCEL in London, showed them the demo and they gave us permission to do a GBA version. We spent the next couple of months doing a full demo of all the tables.

I spoke to Ubisoft who signed us up 10 days after approaching them. I never was the kind of person that would deal with the usual business development people, so I actually managed to get the email address for Rob Cooper, Ubisoft's UK Managing Director, and wrote to him. Ten days later we had a draft contract which I think was worth eight times what the original Amiga contract for Pinball Dreams was, and we were on our way. We finished the GBA version four months later and it was released a couple of months after that.

Today you are the CEO of JAW and have enjoyed success with the Oddworld titles. What does the future hold for JAW?

We've had a busy few years working with the folks at Oddworld Inhabitants, almost exclusively since 2010. In the past few months, following the success of Oddworld: New 'n' Tasty on PS4/PC/Xbox One/PS3 we've decided to add some other clients to our roster. We're currently working with companies like Paradox Interactive and BOSSA Studios. We're all feeling very excited for the future just now and have lots of irons in fires. That in itself is massively refreshing to us having worked on the same IP for so long.

STEPHEN ROBERTSON
INTERVIEW

What are your fondest memories of the early games industry?

Seeing my work appear on sale, and pictured in magazines was really fantastic. Also the fact that things were changing so fast – every week there were new computers, new games, and new features appearing. I was so fortunate to have lived through that time and experienced it.

What are your most difficult memories of that time?

Trying to make ends meet and get enough work in to live on mainly. Luckily I lived with my parents so living costs were cheap. Unfortunately the work eventually dried up so I had to get a 'proper job' working for an electronics company. However, a couple of years later that job closed, so I got back into games again.

What do you miss about the games industry of the 80s and 90s?

I miss the simplicity, the small teams and the quick development times. Modern AAA games can take years to make.

How and when did you get your first computer?

My first computer was a ZX81 which I bought in 1983 from WH Smiths when I was 16 years old and in the sixth form at school. I really wanted a

Spectrum, but I couldn't afford one, so I scraped together the £70 to get a ZX81 instead. The first one I had developed a save problem, so I had to send it away to be repaired. As soon as I could I got a 16k RAM pack (a nice sleek and secure Memotek one instead of the blocky, wobbly Sinclair one).

I have very fond memories playing games like 3D Monster maze on it, as well as programming simple BASIC games.

How did you start producing loading screens on the C64?
I got a C64 a couple of years later. I wanted a BBC Micro but couldn't afford it, which seems to be a recurring theme in my early computer life. My first C64 picture was drawn using a friend's Koala Pad touch tablet (a very expensive piece of hardware back then), and it was a very crude picture of a spaceship flying over a planet's surface, but my friends thought it was pretty good.

At the time I was working in a computer shop selling Atari computers, and the vastly superior Atari Touch Tablet came into stock. I demoed that to customers and ended up drawing some other sci-fi pictures, which the customers really liked and I must have sold dozens of the tablets. That gave me the idea that perhaps I could actually draw computer graphics for a living. I found someone who had a Koala pad they wanted to sell, and I jumped at the chance to get it. Then I started doing pictures in my spare time, drawing screens based on films and games that I liked, and gradually built up a portfolio of example work and sent it off to a few companies.

I had a few rejections – one from Gremlin sticks in my mind because they sent me back a standard letter saying my 'game' didn't meet their standards (despite my Monty On The Run tribute picture being better than their loading screen). However, my approach to Activision in 1986 (using a picture based on the Lucasfilm Game Koronis Rift, which Activision distributed back then) led to a phone call from a company called Oxford Digital Enterprises to do a loading screen for their new Titanic videogame. They had been passed my demo disk by Rod Cousens (THE Rod Cousens!), the then head of Activision. They asked me if £100 was a reasonable fee. It was double my weekly wage at the time so I said yes, it was very, very reasonable!

You also did screens for Firebird. What are your memories of those first few commissions?

I was introduced to a producer at Firebird Software called Colin Fuidge by a mutual friend. By that time I'd met a fair few people in the C64 scene, via friends or via Compunet, the C64 modem network (a sort of predecessor to the internet). I gave him my demo disk and he liked what he saw. I was asked to do a loading screen for a budget game called 'Freak Factory'. Budget games were just becoming a big thing then – £1.99 for games instead of £5 – £10. They offered me £150 per picture which was a lot of money for me back in 1986.

I ended up doing quite a few pictures for them over the next two years, all for the budget range. I wanted to break into doing screens for their full price games, but they preferred to use the artist Bob Stevenson for those.

Did you prefer to make screens based on the box art or your own original ones?

I liked both. There was a certain pride to be taken in creating a really good copy of the box artwork, but also a lot of creative satisfaction doing original art. All the pictures I did for Hewson were copies of box art, though I did have some creative freedom to adapt them to the C64.

Who inspired you in the early days?

I was inspired by the sci-fi artists of the late 70's and early 80's, especially Chris Foss. Other C64 artists like Bob Stevenson were inspiring too, as well as the myriad of demo creation teams on Compunet.

Did you get the opportunity to interact with developers when you were working on screens for their games?

I never got to interact with the actual developers unfortunately. It's only years later that I met any of the programmers for games I'd done the loading screens for. Simon Pick, the author of Microrhythm is one of those.

You have remained in the game industry to this day. What are some of your career highlights?

Being part of the early computer games scene, getting to work on some

3DFX Nintendo games at Argonaut Software, being an Assistant Producer at Philips Media and learning a huge amount about publishing and marketing. Also being project lead on the 'Defiance' expansion for the space-sim Independence War and getting to do loads of different things from designing and implementing the missions to directing the voice actors and editing the audio. Finally getting a job at a AAA developer and working on some amazing, world beating games.

You now work as a designer on AAA games. How is it different from the industry you first started in?
Well the pay is better and the games are much more complex and higher profile. The team sizes are much bigger. But in many ways it's similar – there's still the thrill of seeing what you've worked on going on sale, and people talking about it.

Are you still passionate about playing games? What are some of your favourites?
I'm a passionate PC gamer. I used to be really into space-sims, but these days I'm into RPGs like Skyrim, and first/third person shooters in general. I've also played a lot of online games like Counterstrike and Planeside 2, though I mainly play single player recently.

STEVE TURNER INTERVIEW

What are your fondest memories of the early UK games industry?
Andrew Braybrook and I used to work in my dining room. I bought a couple of really nice desks and leather director style chairs and we set them up side by side. It was very comfortable and so much fun.

Unusually for the industry I used to work strictly nine to five and only on weekdays. This discipline was partly because I had a young son who was not allowed in the room except for during morning and afternoon breaks, but it also kept it fresh. I can remember how I looked forward to Monday morning rather than dreading it.

What are your most difficult memories from that time?

Many years after Graftgold had expanded to about 15 people I enlisted on an owner-manager course. I found it very enlightening and wished I had done this before employing so many staff. Writing games is one thing, managing the commercials of a small company and the different temperaments of artistic and programming staff is a completely different world. Looking back, at times I was swept along by events and peoples desires, leading to us working on uncommercial platforms. The course helped me to consider long term strategic thinking about the company and how to sell the plans to both staff and publishers.

Later on I regretted not getting into publishing myself perhaps in the way Bitmaps Brothers did with Renegade, but then early on when this was affordable we had no need because Hewson met our requirements.

Graftgold were lucky to survive when a number of its publishers went out of business in quick succession. So my regrets are more of what might have been if our products had not been dogged with such bad luck regarding publishers.

How did you feel when your first game was published and went on sale in the shops?

It was always a thrill seeing your game on the shelf or in a magazine as long as they said nice things about it. We used to go in all the local shops and move our programs to a prominent display space. It was also a thrill and a great relief when the royalty cheque arrived each month. In the early days we had no advances and I think this helped to give us creative freedom rather than being in debt to a publisher. So when we actually made money out of a game it meant we could carry on writing games rather than having a boring job.

The game music you composed was some of the best of the era. It must have been a very different discipline to coding the game logic itself. Which did you enjoy more and why?

I have always had a strange mix of artistic and scientific interests. I have always loved music and especially playing the guitar. I think I preferred

the coding but the music was a nice break, usually at the end of most of the coding. I liked the actual composing but it was hard turning it all to data and keying it in. One slight mistake and it was hard to find. Later we programmed some music utilities and it was much more fun but by then I just didn't have time to do everything.

Was composing game music more technical than traditional music creation? How did you approach it?
Each machine had very different musical capabilities so it was essential to understand this in order to get the best out of the hardware. Making up the tune was essentially the same as writing for a particular instrument or voice where you have to respect the range of notes available. I used to write most of the tunes on the guitar. Then it was a question of arranging them for the target machine.

On the original Spectrum you could only program an on or off. Doing this rapidly made a tone. I found a way of counting two frequencies at once and producing two tones simultaneously. In the end I used to set both tones to almost the same note to give a thick, phasey tone, as I found different Spectrums couldn't always handle the harmonies very well. I used to make up for the lack of harmonies by putting in lots of notes – similar, in a way, to fingerpicking on the guitar.

I used a program that came with the C64 for Uridium which allowed input of notes on a stave, but I also had my guitar handy for ideas. I then had to encode the tune from the stave into Graftgold music data. I tried to keep the music data standard between machines so I could begin by porting a tune and then enhancing it for the new machine.

What are your fondest memories of the early industry?
After using a quirky little assembler for Quazatron I decided that enough was enough and that we needed a proper cross development system. I bought a couple of PC clones. Andrew was not very happy at first because he wanted me to buy Amiga's but I wanted something I could buy cross assemblers to run on. I remember how he left his in its box until I had reverse engineered my Centronics printer interface to turn it into an input and output parallel

interface by moving one wire (I always wondered why it was not sold in this configuration). Then I could plug a cable into the PC and print out anything I wanted to send to the Spectrum. All I needed was a boot program at the Spectrum end to receive the data and all my source could be saved on PC floppy disks. Interfacing the C64 was easier as it had a parallel interface on it. I just had to buy a special plug-on one and fix a Centronics plug on the other end. When Andrew saw mine working he saw the light and unpacked his machine.

By this time I had moved and we had our own little office at the back of the house. On a sunny day when assemblies took twenty minutes I used to pop out and do a bit of gardening. One morning I heard this squealing sound like a dog was being sawed in half. I then realised it was coming from next doors bedroom window along with "please don't stop"!

In the 1990s games became more about bigger teams and less about one or two creative masterminds as it had been in the 80s. Which era do you remember most fondly?
It's difficult to say which era I preferred – there were good and bad times with both. I did like running a larger team and having our own office but it became harder and harder to keep enthusiasm going when products were either not published or delayed by publishers changing hands. Of our last ten products nearly all were finished with a different publisher than we started the product with or simply had to be abandoned when a publisher closed down. Yet when the team were firing on all cylinders it was a great feeling. However, the pioneering days of the eighties and the creative freedom we had were perhaps the best moments.

The modern industry is more open and diverse than ever before, and small teams can once again create and release very small, innovative titles. What would be your advice for anyone looking to create games today?
I would say join an established team to learn the business and if you want to start up your own team find a course to learn the extra skills you will need. It's not just a matter of developing, you need a clear idea of where you are going and why. You need to acquire the skills to formulate these ambitions,

sell them to others and work out the steps to realise your goals. Developing the games is the easy bit.

What do you think is the proudest achievement for Graftgold?
Personally I was proudest of the way I brought together the people in my team, many of whom had no commercial experience. They became one of the most formidable games teams in the country, renowned for both original and licenced products.

Rainbow Islands set a new standard in licensed products. Most licensed games were shallow imitations of the arcade titles which were only selling on the merits of the original arcade game. Rainbow Islands showed that a license could be as good as the original – especially in terms of gameplay on the lesser platforms.

I am also very proud of Realms which was our first large scale multi-platform original product. It required a completely new way of working and was Graftgold's first original product that involved a whole team approach.

APPENDIX 3

KICKSTARTER CONTRIBUTIONS

Our Kickstarter backers made this book possible and we are grateful to all of them for their support, patience and enthusiasm.

Amongst the reward tiers offered during our Kickstarter campaign for the 1st Edition were two which provided the opportunity to contribute to the book directly; "Interviewer", which allowed three backers to conduct their own interviews with their choice of videogame pioneers and "Benefactor" which allowed three backers to see their own remarks about the games we published printed in the book. Please enjoy their contributions.

BACKER'S INTERVIEW BY TIM NICHOLS

Question for Andrew Hewson:

The games you produced back in the 80s were part of a revolutionary new business. Fast-forward to today and do you see a direct connection between what you created then and the world of computer gaming now, or are things so far removed from where it started that it's hard to connect the two? The scope of games today and the audience they serve is far, far broader than when we were operating. There are so many genres and platforms, from simple word puzzles on your mobile phone right through to the AAA blockbusters which can cost hundreds of millions of dollars to develop.

Not long ago I saw an elderly lady on a flight enjoying a puzzle game on the handheld that she had brought with her. It would have been impossible to imagine such a scenario when we were in business.

However, the kind of games we published are still around within that vast landscape, and if you look closely you could argue that the DNA of a title like Uridium is evident in games like Resogun and perhaps there's a trace of Nebulus in a game like Fez. That's not to say that the creators of those games were in anyway inspired by, or even aware of the games we produced, but certainly those kind of genres are still around. The same could be said for adventures like Avalon and strategy games like Paradroid (although there's still nothing quite like Paradroid).

Outside of the games themselves, the developer-publisher model is still broadly the same, but then again how else would you operate? The age-ratings system we established at ELSPA (now UKIE) survives more or less unchanged and if anything the indie scene of today is actually a return to the kind of process which we would have recognized, so you could argue that the indie movement is the modern industry re-discovering the bedroom coder model which gave life to the UK industry in the first place.

Question for Nick Jones:
Z80 or 6502?
Both please. They are both such quirky processors. Much more interesting than the boring 68000 processors that were to follow. They both had real character. I programmed both and loved them both.

It's also not quite a simple choice. The 6502 had memory mapped I/O so dealing with hardware was just reading / writing to memory. And it was always the additional hardware that made the 6502 (C64) so powerful. Don't forget the C64 had 50/60fps games 30 years ago and we're still struggling to get that now with the latest generation consoles.

Very few Z80 games ran at 50/60fps, but one clear advantage of the Z80 was that you could come up with really creative software solutions. You had the horsepower (Z80's generally ran at 4 MHz whereas 6502's usually ran at 1 MHz) and significantly more registers. Alien 8 and Knightlore with their 3D look is testament to this. Ingenious programming at its best.

Question for Stewart Gilray:

How do you feel about your old games being remade by homebrew enthusiasts and made available via emulators?

I've got no issue at all, actually I think it's quite flattering to be honest. I've often thought myself of remaking Rubicon with Game Maker or something as I do have all the original source code and source assets so it would be possible, I just don't have the time.

Question for Mike Male:

When ZZAP! 64 reviewed Southern Belle, they said it was "…a superb simulation of a dull subject" Did that make you want to shake Chris Anderson by the hand or by the throat? How important were magazine reviews to you back then?

From my perspective I always liked reviews – I still do. Firstly, if any of our programs were being reviewed we were being noticed (which was a novelty to me) and you can always learn something. Even today I take criticism positively and consider whether I need to do something about whatever is at the heart of the complaint. In the review referred to, all of my programs were niche interests and would be boring to many, so for it to be referred to as a 'superb simulation' for sure put it in the 'shake by the hand' category. Before Southern Belle I knew nothing about steam engines at all (apart from the obvious) and I found it interesting to be told how they operate (by my co-author, Bob) and then make that work. The fact that others were/are ambivalent regarding the subject was no great surprise.

Question for Roger Kean:

How much trouble did you get into for THAT cover of issue 19, August 1985? I was 15 at the time and I remember it caused a massive stir at my school. Kids who didn't even OWN a Spectrum were buying it!

Sinclair User's publishing company East Midland Allied Press (EMAP) succeeded in having an injunction placed on the issue, which banned further sales unless the offending four pages were removed. This we actually did and then sent the cut copies back to circulation. However, CRASH sold

approximately 65% of copies on the Thursday and weekend of release, so that many copies had already sold before the injunction took effect.

EMAP hoped to then sue Newsfield for defamation. Unfortunately for them the injunction hearing went before the Queen's Bench not the Trade Bench and the judge in chambers, unused to commercial law, could not get the hang of what EMAP was after. In a moment of sheer comedic hilarity, EMAP's barrister held up their copy of Sinclair User with the image of George Cole as The Minder from the official game cassette inlay, intending to then wave Oliver's Unclear User spoof of the game cover's cartoon. He never got that far. On lifting up a copy of Sinclair User the judge exploded at the 'defamation of one of Britain's finest actors'!

In addition, he agreed that the typesetting we'd used was so exactly like that in Sinclair User he granted the injunction on the grounds of Newsfield's breach of EMAP's copyright – no mention of defamation. Of course the EMAP brief could have pointed out to his demented lordship that endless publications used Times Roman as a typeface, but either he didn't know or he thought they were best leaving it while they still had a case.

Had they got the injunction for defamation, Newsfield would have been fighting for its life in the High Court only weeks later, but a breach of copyright is a much lesser problem and anyway a very debatable matter which I'm fairly confident Newsfield would have won. The outcome was that after several months EMAP felt it had organised sufficient material to sue for defamation and we paid them £60,000 in an out of court settlement to make the business go away. Although it hurt, it was easy money, coming from the proceeds of almost doubled circulation as a result of the hoo-hah the case raised among Spectrum games players... and the doubled advertising revenue.

Perhaps the saddest outcome was that I had persuaded Sinclair User's fine editor Bill Scolding to come and join us but after the Unclear User spoof he honourably felt he could not do that. He resigned from EMAP shortly afterwards.

I suppose you could say EMAP got its own back when the Europress Group which bought the assets of Newsfield in 1992 went and swapped CRASH for a nearly defunct EMAP Atari ST title, incorporated the CRASH name into Sinclair User and then buried the name a month later.

BACKER'S INTERVIEW
BY STEVE PARKINSON
[SENTINELACTIVE.COM]

Question for Steve Turner:

If you could have done one thing better when building your business what would it be?

When the business expanded it was more a reaction to events that happened rather than part of a proactive plan. At times it felt like driving a heavy goods vehicle that was going downhill and it was hard to stop.

Later on I attended a business course and learnt a lot about planning your goals and working out how to get there. I would advise anyone thinking of starting a business to attend a course beforehand. This will give them the tools to create a realistic business plan.

It is so easy to be swept along especially when things are going well. Having clear, understandable aims is half the battle in getting staff behind you and achieving those aims.

One thing I realised as we became bigger was that it was impossible to be the team leader, a key programmer, the accountant and all the other things I was doing. You need to work out what your role will be as the company grows and get others to fulfil the roles that you cannot also be good at. I ended up working too many hours as a result. It is a dilemma for a specialist when their business expands. You have to decide if your expertise in your specialism is vital for the company's success. If so then that is what you should be doing. It may be your leadership is the biggest priority in which case you need another specialist to take your place.

Question for Jonathan Dunn:

Is it vital to know how to read music in the computer game world?

You don't need to be able to read music to compose music. If you can play, hum it or sing it then you've written a melody. I did actually study music, and can read musical notation, but I very rarely do.

Question for Ben Daglish:
Who has inspired you the most during your career?
Joe Zawinul. If you don't know his work, I urge you to check it out!

Question for Oliver Frey:
What age were you when you really noticed your artistic talents?
British comics, especially EAGLE, were a seminal influence and first woke my artistic instincts when I began copying some of their action-packed illustrations at age nine (the family moved to London from my native Switzerland for work reasons and stayed for three years in 1956).

Question for Jeroen Tel:
How did you actually get into computer game music?
Computer music didn't exist – well it existed in a very rare form somewhere in the world – like the experiments in Phillips' research labs in the 1960s. Anyway I noticed that some Casio watches had these oscillator, melody alarms. They were very simple oscillators playing things like *Jingle Bells* and *When the Saints Come Marching In*, but that sound, the oscillator, I thought was cool. It was so pure and unlike anything else because it stayed exactly the same tone throughout. A computer was creating it – not a piano, not a violin or anything else that was "live" so to speak, which gave it a very distinct oscillator sound. I was intrigued, very intrigued. I started to hear it in pop music and these sounds – sine waves, pulse waves, all that stuff had a magnetic effect on me.

Then in 1982 when I was 10 years old I got a ZX80 and there was a beep command, very simple, and I could actually recreate that oscillator sound with beeps. I did some stuff with that and it was really limited but at the same time I really thought it was cool. Of course the Commodore 64 also came out in 1982 and I got access to one at a friend's house. I started to program something on it in BASIC having read through the guide book thoroughly. I didn't have an assembler so I couldn't program in machine language, but I wrote this BASIC program which was actually pretty advanced because it had to process three channels in one data line.

Then in around 1985 when I was twelve or thirteen I got a monitor and I got hold of a cartridge – a Turbo cartridge I think it was called. So now I

could actually look at Rob Hubbard's source file and by just studying it for a few days I figured out what was the programming and what was the data.

By changing the data and starting the music again I could hear what I was actually doing. I figured out what the pulse form was and what the wave form was, what the effects were and so on. I figured out what the sequence was and what the steps were. The sequencer would put steps in order and the steps would have the notes. Anyway I figured it out somehow, I hacked into it and figured it out. Then I started to make new music with that and I thought "oh my God, this is it… this is literally what I want!"

So I made some songs and they sounded good but it was so time consuming because if I wanted to add a note I had to transfer all the memory to a different spot and then add one note. Can you imagine how time consuming that is? It was pure hexadecimal numbers being typed on screen in rows of eight. So I knew I needed to get hold of a player and I managed to disassemble Rob Hubbard's player somehow – I don't know how I did it, but I did it. Then I could edit the values without having to transfer all the memory and assemble it inside the memory and play it – that was the process. It was still a dirty process so to speak, but it worked.

When I was fourteen I ran into Charles Deenen and he was already working on a very simple player based on Rob Hubbard's routine. I think he was the guy who actually invented the demo. I'm not kidding here – because his first demo was the first one that had a picture, a ripped piece of music from a game and a scroller. I haven't been able to track anything down that was before it.

Anyway he was a really good programmer and he was already working on this player and I knew what the SID chip could do, but I was not able to program it in machine language. So we joined forces, he programmed all the routines and all the effects and I started making demo tunes, I think I was still fourteen, nearing fifteen.

We went to the PCW show, handed over the demo disk and got jobs from Ubisoft and from Hewson Consultants of course as well as Electronic Arts, Dinamic in Spain and lots of others. So apparently they were impressed and everything else is history.

BACKER'S INTERVIEW
BY LCD NINJA

Question for Andrew Hewson:

Do you think there is a future in paid apps on mobile?

It's been a long time since I've been involved in the games industry, so I'm not an expert on the mobile games era. However, my experience has always been that if you can show the world something that has never been seen before, then the world will buy it. I suspect paid apps will survive, but whether they will flourish is another matter. I would be worried if I was a mobile-only developer or publisher. It is hard to stand out from the crowd and the price erosion seems like a race to the bottom.

Question for Andrew Hewson:

Marketing, Gameplay, Graphics: Choose two.

Gameplay and marketing. Just look at Tetris.

Question for Andrew Hewson:

How important is it to build relationships with the press?

In the era in which we operated it was essential because the press provided the only mechanism for us to address the game-playing public. These days I suspect a broader approach is needed because social media channels now provide new ways of communicating directly with consumers. However, there will always be influential opinion formers, even if these days they might be YouTube personalities rather than traditional print journalists, and it will continue to be important to build relationships with them.

Question for Andrew Hewson:

Do you think game piracy benefits or destroys the industry?

I can only speak of my own experience which was that our games were copied wholesale. I have heard it argued that piracy helps to spread awareness of a title, but that is nonsense. Piracy robs games developers of their livelihoods. Full stop.

The fundamental problem is that copyright law, which was invented in the sixteenth century to provide an income for the king (hence the word "royalty") is a hopelessly inadequate mechanism for identifying and rewarding originality. In the music industry it has created millionaires out of barely adequate performers. In contrast, in the game industry, leading lights have often remained paupers. This is the world in which we live.

Question for Andrew Hewson:
How can an indie dev who's just starting out best measure success?
I suppose it depends on your goal. If your ambition is to make a living from games development, then success means just that – being able to make a decent living on a consistent basis. But that is not the only possible goal. I think you need to look into your own heart and decide what it is that would feel like success to you. In the final analysis that is all that counts.

KICKSTARTER BENEFACTORS

JOHN OGDEN

Favourite Hewson game: Quazatron

"Wanting to emulate Hewson games was what got me into programming and ultimately set the direction my life would take."

RETRO GAMES PARTY

Favourite Hewson games: Uridium, Paradroid and Alleykat

"Hewson games were iconic and developers strived to push the technology hard."

ROBERT TROUGHTON

Favorite Hewson game: Paradroid

"Fantastically blending shoot 'em up with strategy, Paradroid was undoubtedly my favourite Hewson game and one of my all-time favorites on any gaming platform."

1ST EDITION
KICKSTARTER BACKERS

SPECIAL THANKS

Why is there such enthusiasm for the early UK games industry? It is a question that recently I have had reason to ponder. I had considered that period of my life to be over, closed, finished and dealt with. I was pleased that my son was making his own way in the videogames industry but I took his interest in the retrogaming community with a pinch of salt.

When we were busy inventing the gaming world back in the 1980s, I never stopped to think about the long term impact that we might have been having on a generation of young consumers. It never occurred to me that we were helping to create the defining entertainment of their teenage years. I was intent on enjoying the new technology and using it to earn a living for myself and those around me.

It was, looking back on it, a very exciting time for those of us involved and there seemed to be no limit to the number of people who could join in the fun. Anyone wanting to be a part of it could spend a few hundred pounds on the equipment and set themselves up in business. All that was required was drive, determination and some good ideas. Success would follow.

For that reason, I rather assumed that the consumers we were selling to were less enthusiastic than those of us on the inside, so to speak. It turns out that I was wrong. Our Kickstarter campaign triggered a flood of flattering and supportive messages from the retrogaming community, a surprising portion of which were from developers working in the industry today.

I think there is a certain idolisation of the 1980s development process. Today, developers work in big teams on big IPs creating highly sophisticated, intricate systems. I get the sense that there is a romance about the unadulterated purity of early games development, when programmers had

complete and total ownership of both the technology and experiences they were creating.

Whatever the forces behind the retrogaming community, it is a real delight to witness just how much joy so many people still derive from playing, collecting and discussing the games we created all those years ago. Although I have my regrets about the demise of Hewson Consultants, it is immensely satisfying to realise that we clearly got something right.

It also makes it abundantly clear that I owe a debt of thanks to the passionate consumers who drove the early UK games industry for helping to make this book a reality and who continue to support the retrogaming community today. Without the enthusiasm of that community, I would not have been encouraged to test the waters, and without our Kickstarter backers embracing our experiment, this book would never have come into being. Thank you one and all.

LAUNCH EVENT SPECIAL THANKS

We announced the 1st Edition Kickstarter campaign for this book at Play Expo 2013 in Manchester and these generous people committed there and then to be day-one backers, helping to ensure the campaign got off to a really strong start.

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Mark D Ambrose	Stuart Price
Lee Taylor	Steve Parkinson
James Grimwood	

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Thank you to everybody who supported the Kickstarter campaign for this 2nd Edition of the book, in November to December 2024.

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Steve Parkinson (SentinelActive.com)
LCD Ninja

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DEDICATIONS

This 2nd Edition is dedicated to those contributors we have sadly lost since the 1st Edition was published. We miss you all.

Oliver Frey
Roger Kean
Ben Daglish
Stewart Gilray

The birth of a new era, a new medium, a new industry

"Ultimately the name became synonymous with quality – when a new Hewson title came into the offices, we'd sit up and take notice."

Julian Rignall, games journalist and former ZZAP! 64 reviewer

What is it like to plunge into the unknown as one of the early pioneers of an emerging technology-driven industry? How do you forge the future of an entirely new entertainment medium when there is no precedent to follow?

From Paradroid to Pinball Dreams and beyond, Andrew Hewson takes us on a journey through his pioneering videogames career, unearthing a rich tapestry of expertise for the next generation of digital trailblazers.

Featuring commentary and analysis from more than twenty retrogaming icons including Steve Turner, Raffaele Cecco, Jon Hare, and the founders of DICE, *Hints & Tips for Videogame Pioneers* reveals the secrets behind the string of smash-hit titles produced by Andrew's celebrated games companies – Hewson Consultants and 21st Century Entertainment.