

## **id as Super-Ego: The Creation of *Duke Nukem 3D***

“What do you think of *Quake* and its legacy in the history of the game industry?”  
Ken Silverman: “It’s a huge influence—especially to 3D Realms.”

## Today's Games Just Ain't Right

There is absolutely no doubt that id Software's *Doom* is the most prominent game created during the period of the first generation of first-person shooters; it more or less defined the genre. There were precursors, of course—Origin's *Ultima Underworld* was the first mass-market game to use a first-person three-dimensional perspective and id's own *Wolfenstein 3-D* was very popular in its own right. However no other "FPS" game and, more generally, few games in the other genres have had the cultural impact of *Doom*, then or now. Every FPS game created today, no matter how technologically advanced it is, must bear the weight of being compared to *Doom* and few games measure up. Everybody looks upon his memories of *Doom* with nostalgia, and, much like the fact that today's kids just ain't right, today's games just ain't right.

It is no surprise therefore that id Software enjoys a privileged position in the game industry. Every id game since *Doom* has been on the bestseller list. In fact, the talented few who are allowed to join the ranks of id become gods to the gaming world; in a very real way, they are worshipped. Indeed, id fans frequently refer to John Carmack, lead programmer and one of the founders of id, not as John or Mr. Carmack, but as "The Carmack." Furthermore, id employees enjoy comfortable positions on governing boards throughout the industry and have a very tangible power to decide the future of gaming.

Therefore, one measure of a company's success in making games is to what extent they can match the success of id Software. id serves as a paragon to which other game design houses can hope to aspire. So the question one must ask becomes, to what extent can a company really hope to compete with the id juggernaut? Many companies have certainly made attempts—Valve Software's *Half-Life* and Epic Games' *Unreal* series come to mind as examples of recent popular

games. Yet it is unclear at this moment as to whether any of these games or companies will have the sheer historical impact that id Software has had.

However, there is at least one example of a company whose history can assuredly be said to have had a great impact on the game industry and who did try to squeeze into the FPS niche already cornered by id. This company, Apogee Software, now known as 3D Realms, developed a slew of groundbreaking games and initiated a particular business model that changed the face of the industry in the late 1980s and early 1990s. One of Apogee's games in particular, *Duke Nukem 3D*, rose to the forefront of the gaming world and actually set out to challenge id's supremacy in the FPS genre. That game, therefore, serves as an interesting example of an underdog's attempt to find its place, and this paper will chronicle Apogee's and its history.

### **The Beginning of Apogee and the Episode Model**

In 1987, Scott Miller wrote the first in a series of games set in the fictional world of Kroz. This game, *Caverns of Kroz*, marks the foundation of Apogee, and was published as part of the disk magazine, *I.B. Magazette*. 6 other games followed in the Kroz series. The third game in the series, *Kingdom of Kroz*, was published by the renowned disk magazine, *Softdisk*, in 1988, and became Apogee's first hit.

The *Kroz* series is particularly notable for a reason that is totally separate from its successes as a game: it marked the debut of the software business model that would become synonymous with Apogee and many games that followed, namely the episodic model or, more simply, the Apogee model. At the time, Miller knew that he did not have the brand recognition to release games directly to the public through traditional channels, and so he chose the shareware model, in which he would give away part of his software for free in the hopes that people would like it to such an extent that it influenced them to purchase the rest. However, the shareware

model was then highly unprofitable to program authors; only about 1% of all shareware programs made money.

Miller set out to find a way to encourage people to purchase his games. To this end, he decided to deviate from the normal shareware practice of providing software that was largely crippled (i.e. many features were rendered inoperable). Instead, he chose to provide games that would be fully functional, yet would be short enough to leave the players wanting more. These games would take the form of “episodes,” in that they were only a small part of a larger story arc. Miller hoped that by providing a single free episode to the public, fans of the game would be influenced to buy the remainder of the episodes. Initially, each episode was sold separately (e.g. at \$7.50 each for the *Kroz* series or slightly less if multiple episodes were purchased at once), including a registration fee for the shareware episode. However this was later amended to a system in which one bought all the episodes for one single cost.

One cannot overemphasize the impact that this episodic model had on the games industry. It revolutionized the way games were distributed during this time period. The model allowed for lesser-known game developers, such as Apogee itself, to disseminate their games to the public in a very efficient and rewarding way. Word-of-mouth and a download were the only tools necessary for a person to get a copy of a game and start playing—this is, of course, the nature of shareware. Yet because the game was completely functional, players could instantly get an accurate picture of whether they would be getting their money’s worth if they purchased the entire game, and therefore quality became the final arbiter in the decision to purchase, not the strength of the developer’s name. Suddenly, companies like Apogee and id Software itself came out of nowhere and became huge names in the industry. Even after such companies hit it big, they still depended on the episodic model as a means to promote their games (both the subject of

this paper, *Duke Nukem 3D*, and id Software's *Quake*, its contemporary, were released in this fashion).

### **The Rise of id**

Apogee has of course released a number of legendary games (*Rise of the Triad*, *Raptor*, and *Terminal Velocity* come to mind), but few can rival the attention garnered by those games that were created by the then novice game developer, id Software, and that were published by Apogee, *Commander Keen* and *Wolfenstein 3-D*. The histories of these two companies are deeply intertwined, so now a brief history of the founding of id Software is also warranted.

Before the onset of the episodic model, disk magazines were one of the chief means with which unknown developers could market their games. One of the more well known of such magazines was *Softdisk*, which was based out of Shreveport, Louisiana. The work life at Softdisk was extremely rigid and not particularly open for creativity; people in different departments were not allowed by the management to collaborate on projects. Therefore, when three men from different departments of that company decided they wanted to work together to design games, namely Tom Hall, John Romero, and John Carmack, they were forced to begin secretly working after hours.

One such surreptitious night, Carmack began experimenting with ways with which to emulate the smooth background scrolling used by the Nintendo Entertainment System on the less technologically advanced EGA video in computers. When at last he hit upon the solution, he and Hall decided to reverse engineer the first level of Nintendo's *Super Mario Bros. 3* in order to showcase this breakthrough, replacing the Mario character with the newly devised Dangerous Dave and calling the project *Dangerous Dave in Copyright Infringement*.

Seeing the immense power of this new engine compared to what else was currently being created for the PC, Hall, Romero, and Carmack tried to see if they could find a market for it. A famous apocryphal story is told involving *Softdisk* project manager and later id Software employee, Jay Wilbur, who supposedly brought *Dangerous Dave* to the management at Nintendo to see if Nintendo would be interested in using the technology to port *Super Mario Bros. 3* to the PC. Unfortunately this dream was never realized, and Hall, Romero, and Carmack were left to look for other markets. Because *Softdisk* was not interested in using the side-scrolling technology, as it was not portable to CGA, and therefore could not be used by *Softdisk's* entire target audience, the three continued to work on the project by themselves and in secret, eventually starting an entirely new game. The result of this work was the beginnings of original *Commander Keen*.

John Romero at this time had developed a small cult following based on some of the other games he had designed. As a result, he received some amount of fan mail while at *Softdisk*. However, a lot of the mail that was supposedly from different fans, were actually coming from the same address in Garland, Texas. Romero, wanting to find out who was behind the obvious misrepresentation, sent a response, asking that the matter be cleared up. In this way, Romero first met Scott Miller, who admitted that all the letters had merely been a ploy to get Romero to produce games for Miller's new company Apogee. Romero responded by sending a few games that he had done with Hall and Carmack to Miller, among which was *Dangerous Dave*. When Miller saw the technology for the game, he immediately offered to finance their current project *Commander Keen: Invasion of the Vorticons*.

Thus, with some financial support, Hall, Romero, and Carmack continued their efforts on the first *Commander Keen* at night, while still performing their regular duties at *Softdisk*. The

game was finally released on December 14, 1990, based, of course, on Miller's episodic model. That game, like many others that Apogee produced, became an instant hit. Armed with the game's success, Hall, Carmack, Romero, and another employee of *Softdisk*, Adrian Carmack (unrelated to John), who had done the art for the game, left *Softdisk* and formed id Software on February 1, 1991. The *Commander Keen* universe in general was very profitable for both id Software and Apogee, spawning several sequel episodes, all of which were published by Apogee.

During this time, however, the founders of id Software were still under contract to *Softdisk* to produce more games for the disk magazine, which they were forced to do. One such game was *Keen Dreams*, a special *Commander Keen* episode that featured game-play that was largely unique from the other games in the series. Another game that id developed for *Softdisk* was a very early first-person shooter called *Catacomb 3D*. Arguments pertaining to the fact that *Catacomb 3D* may very well be the first FPS aside, the game itself was not especially popular or noteworthy. However, this game did catch Miller's eye, and he asked id to create a 3D shareware game for Apogee. id was initially reluctant, for they knew that if they made another *Commander Keen* game they would be assured success, whereas starting a new property was less of a sure thing. Furthermore, id was still under contract at *Softdisk*, and they did not think they had the resources to develop two games simultaneously, especially one which featured 3d graphics. To rectify this, George Broussard, vice-president of Apogee, designed the game *Scubadventure* to fulfill the contract, freeing id to work on a game for Apogee. id finally agreed to Miller's terms, and the result was the legendary *Wolfenstein 3-D*.

*Wolfenstein 3-D* is, of course, often considered to be the father of the first-person shooter genre. Granted, it would later be far surpassed in terms of popularity and cultural penetration by

*Doom*, and there were other 3D games at the time that featured a first-person perspective, such as id's own *Catacomb 3D* and Origin's *Ultima Underworld*. However, *Wolfenstein 3-D* introduced many gamers to FPS games for the first time. This game, even more than *Commander Keen*, began id's road to the top, because it was id's first successful game in the genre for which they would become famous. *Doom*, and later *Quake*, merely continued on the tradition established by *Wolfenstein 3-D*. id's long-term success is largely due to the fact they invented the genre that is currently the most popular in the world of computer gaming and that they have continuously revolutionized that genre ever since. If the recent technology demonstration for id's latest game, a new sequel to *Doom*, is any indication, they will certainly continue to do so.

Of course, id would never be in this position were it not for the support of Apogee. Without the initial financial support that Apogee provided, id Software would never even have been formed, as they would never have gotten their *Commander Keen* project off the ground. If Apogee had not influenced id to create *Wolfenstein 3-D*, it is very likely that first-person shooters would not be so prevalent today. Perhaps everyone would be playing platform games such as *Commander Keen*, as id originally only wanted to make those games and did not see their future in 3D games. Finally, it is likely that none of id's games would have succeeded if they did not have the advantage of being produced under Apogee's brilliant episodic model, which allowed for the relatively unknown founders of id to promote their games pervasively and hence conquer the world.

Unfortunately, Apogee's and id Software's direct relationship ended after the release of *Wolfenstein 3-D*. Because their name was now fairly well known in the industry, id Software decided that it would make economic sense to publish their own games, starting with *Doom*, despite the fact that *Doom* was initially supposed to be an Apogee game. However, there did



continue to exist a less concrete relationship between Apogee and id Software. For example, Jay Wilbur, who had become CEO of id Software, received business advice from Miller on such things as marketing tactics and handling direct orders. Furthermore, one of Apogee's most popular games, *Rise of the Triad*, was designed by Tom Hall, now employee of Apogee, and was originally intended to be a sequel to *Wolfenstein 3-D*. Also, id now found itself in the same role that Apogee had had in id's formation: it was now publishing games produced by other start-up developers, such as *Heretic* by Raven Software. Finally, as will be shown, the relative roles of the two companies became completely reversed and the games created by id Software now had a significant influence on Apogee's later course. Thus, the ties between id Software and Apogee are still felt, even if they no longer formally exist. This sentiment is echoed by Joe Siegler:

Because of the close relationship of the companies at this time, most people (mistakenly) assumed that Apogee was id, or Apogee "owned" id or something of this nature. Far from it. Apogee & id were always separate companies. That error continued for a long time, especially after *Wolfenstein 3D* was released in the same manner. During the early days of *Doom*'s development, id was going to release *Doom* through Apogee as well. This confusion even continued into id's *Quake* era, as we still occasionally get a customer asking "Hey, *Quake* is a 3D Realms game, right?"

### **The Switch to 3D Realms**

Foremost of the evidence of such influence is the creation of the sub-division within Apogee known as 3D Realms. Owing to the success of id Software and the other companies that were doing well in the burgeoning first-person shooter genre, Apogee realized that the future of the computer game industry lay in 3D games. As Scott Miller said:

I think we're going to see more and more games from the first-person viewpoint or third-person over-the-shoulder viewpoint. Why? Simply because these viewpoints are more like how we live our real life, rather than from a birds-eye view or a third-person remote camera view.

Apogee wished to establish themselves as an industry power in this area. With this goal in mind, in June, 1994 they created 3D Realms with the motto "Reality is our game" to handle the

creation of 3D games for Apogee. All of Apogee's current 3D game projects, *Duke Nukem 3D*, *Shadow Warrior*, *Blood* (which was later sold to Monolith Productions), and *Ruins: Return of the Gods* (which was later sold to Playmates Interactive Entertainment and became *Powerslave*), were put under the jurisdiction of the new division. The first game released by 3D Realms was *Terminal Velocity* on May 1, 1995, which was a futuristic flight simulator in a 3D world and which was very well received by the gaming community.

When 3D Realms was formed, Apogee had no idea that the entirety of the gaming industry would be going completely 3D, however. When at last Apogee realized this, they decided that all future games released by the company would be 3D Realms games; no more games would be released under the Apogee label specifically. Miller gives the following reason:

We do not release games under the Apogee name anymore because we only make 3D action games, and that's why we created the 3D Realms banner, to help position our company as one of the leading 3D action game developers. Apogee is much better known for arcade-style action games, so that's why we wanted to create a new image for ourselves.

The last game that shipped with an Apogee logo was *Stargunner*, which was released in November 1996. Apogee has thrown itself entirely into the creation of 3D worlds, leaving behind many of its formative roots. So far this choice has paid off, as many of their most recent games have been solid hits.

### **The Birth of Duke Nukem**

However, Apogee did not abandon absolutely everything from its past when it re-christened itself as 3D Realms. One of 3D Realm's original products and the subject of this paper, *Duke Nukem 3D*, is of course descended from the successful series of 2D side-scrolling platform *Duke Nukem* games that Apogee itself had developed.

The original *Duke Nukem* was released in June 1991 in the typical episode manner and featured stunning (for the time) EGA graphics with parallax scrolling (the process by which 2D backgrounds can be made to look 3D by compositing several layers which scroll at different speeds) at a resolution of 320 by 200. The story for the game begins as follows:

The year is 1997. Doctor Proton and his army of Techbots have taken control of Earth's largest city. Once a respected scientist, Dr. Proton decided he could rule Earth with a new world order.

Duke Nukem enters this story when called upon a by the CIA to infiltrate Dr. Proton's secret lair and save mankind.

The story for Duke was obviously not very remarkable, as it is very similar to the story of every other game yet made. The game-play of *Duke Nukem* was not particularly revolutionary either, consisting mainly of jumping around and shooting Dr. Proton's minions. However, present even then was the reason why Duke Nukem has become such a cultural icon, namely his idealized American manliness and his heavy attitude, even if this attitude was limited by the technology of the game. As Miller says:

The problem in those days was the technical limitations of 16-color EGA graphics, and 320 by 200 resolution. This put a limit on the detail characters could have, so we had a one pixel line for teeth, gave Duke a square chin, and had him say things via pop-up text windows. Another thing we added to the original game to enhance Duke's ego-driven personality was a very flamboyant summersault jump.

Despite the fact the game itself was only mediocre, it was this pervasive no-holds-barred attitude that drew fans to the game and that has served as the legacy of the series as a whole.

The popularity of the Duke Nukem character encouraged Apogee to produce a sequel. *Duke Nukem II*, released in December 1993, differed from its predecessor largely in areas of technology: it featured better VGA graphics, sound card support, and larger sprites and levels. However, it still lacked in the exact same areas as the first game, namely original game-play and a well-developed storyline (the new plot involved Duke escaping from the clutches of the evil

alien Rigilatin). Nonetheless, the sequel was also successful, owing again to the irrepressible charm of its protagonist.

This attitude made the Duke character easily transferable to new gaming paradigms such as 3D. Whereas all of Apogee's other gaming properties were defined by the type of game they inhabited, the Duke Nukem character transcended the 2D platform games he had been created in; the character was strong enough that it could exist separate to a particular genre. Even the Space Marine in *Doom*, despite the game's popularity, is incapable of that. Furthermore, the move to 3D allowed for the Duke character to become even better developed, for the simple reason that better technology allows for better ways to depict a character. Scott Miller expresses this in the following seemingly quantified manner:

Quite simply, as tech advances, we're able to portray characters with more lifelike details and as these details become more intricate (such as being able to clearly see a character's face close-up), we can then portray emotions.

Such a well-developed character allows for a strong foundation in any game and thus it is easy to see why Apogee/3D Realms chose Duke Nukem to be the star of their developing flagship game.

### **Building Build**

Having a character with which to build a game, Apogee/3D Realms now needed to actually develop that game. The technology they chose as the basis for *Duke Nukem 3D* was the Build engine, which would also be used to power many other games during that period, including all the initial 3D Realms games except *Terminal Velocity*.

Ken Silverman was 18 and about to enter college at Brown University when he released the shareware game *Ken's Labyrinth* in 1993, which he had programmed completely by himself. The game was explicitly a *Wolfenstein 3-D* clone; its design had been an exercise in emulating the features present in that game. Seeing the potential of his son's work, Silverman's father

encouraged Silverman to attempt to see if any game companies would be interested in publishing it. Silverman agreed and so sent a letter to seven different game companies, including Apogee, to sign a non-disclosure agreement to review the game. Apogee responded to the letter and agreed to sign the NDA, however they did not appear to be particularly interested in actually publishing the game or using the engine, as they were currently publishing *Wolfenstein 3-D*. Frustrated with the lack of positive response from Apogee and the other companies, Silverman sent out even more letters, one of which finally received got the reaction that Silverman desired: Epic Megagames would publish the game.

However, around this time Apogee and id Software ended their formal relationship and Apogee was suddenly in the market for a new engine to use for future projects. Interested by what they had seen in *Ken's Labyrinth*, they encouraged Silverman to begin work on a new engine. After a few unsuccessful attempts at modifying the code for *Ken's Labyrinth*, Silverman finally began work on the code that would lead to the creation of his new engine, which he named Build, merely because it was a word related to "construction."

From the beginning, Silverman never intended to build an engine that would amaze the game industry. Such tasks were left for the likes of id Software to accomplish. Indeed, Apogee actively accepted the fact that the technology would be more or less outdated by the time any games were actually released that used it. They were instead more interested in getting an engine that would allow them to make interesting games, such as the planned *Duke Nukem 3D*. To this end, they felt as though they did not need to fix that which was not broken; Silverman was actively encouraged to use the 3D engine design paradigms already in place, especially those set by id Software. Specifically, he was told to do the exact same thing he had done before, namely, emulate an id Software game's engine, this time the yet unreleased *Doom*'s. The result of his

work towards this goal satisfied Apogee, and they offered Silverman employment on a temporary contractual basis.

While id Software was always busy working on the next big thing, Ken was busy keeping up with the current big thing. He started by adding angled walls to his engine, one of the big features that separated *Doom* from *Wolfenstein 3-D*, to Build. He then added another of *Doom*'s big features, namely variable height ceilings and floors. He also added less noticeable *Doom* features, such as the ability to place sprites on walls in order to decorate them.

One cannot over-emphasize the effect that id Software had on this period of the development of Build. For example, Silverman switched to using a new compiler, Watcom C, after Apogee thought that it would be a good idea that he use the same compiler that id was using for *Doom*. Furthermore, his initial design for Build used a grid system for drawing the 3d graphics that was extremely inefficient. After a telephone conversation with John Carmack himself, he switched to using sectors, the same method id was using for *Doom*.

Silverman's Build Engine was not totally devoid of innovation, though. Both *Doom* and *Doom 2* had already been released at this point and had both become massive hits, and the *Duke Nukem 3D* team had already started work on the game design process, so he took the time he had to add features that improved upon the game engine that had been started as more or less a clone. For example, he added the ability for the player to look up and down in the game, after he discovered that all this required was shifting the view, a simple code modification. Also, whereas *Doom* had only supported VGA graphics, games based on Build would allow SVGA and at higher screen resolutions than *Doom* too. Silverman was also responsible for implementing the network and modem code, designing the first system that used prediction to reduce lag. (In other words, the game would predict an opponent's or a projectile's next position based on their

current velocity, if the connection between the players should be interrupted, and absolute position data could not be sent.)

The innovations in the Build engine for which Silverman is most known, however, involve improvements in the way with which levels could be designed within the framework of the engine. Chief of these was the level editor that he designed along with the engine, which, for the first time and surprisingly the last time, allowed a level designer to “walk” through the level in 3D as he was designing it. This WYSIWYG (what-you-see-is-what-you-get) mode allowed the designers to create levels in a far more natural way than they would be able if they were merely using lines on a grid. Build was the also the first engine to allow for sloping floors and ceilings. Lastly, Silverman gave the designers some ability to make the levels not look totally 2.5D, the technical term for games such as *Doom* and *Duke Nukem 3D*. ( The designation 2.5D comes from the fact that although such games appear to be 3D, the levels for these games cannot have two features at the same location on the xy-plane exist at different heights) To do this, Silverman added such features as the ability for Duke to go underwater or go up elevators, which would actually “warp” him, i.e. send him to an area completely differently from where he had originated, and the ability to use floor sprites as bridges.

Clearly, the influence of id Software was distinctly felt throughout the development of the Build engine. In fact, when 3D Realms heard about the capabilities of the next game that id was developing, *Quake*, they almost considered having Silverman write a new engine to compete with it, despite their initial confidence that proven technology was the way to go. Fortunately for *Duke Nukem 3D*'s release date, they eventually decided to trust fate and keep Build.

### **Creating a Game with Attitude**

Now that Apogee/3D Realms had an engine, they needed to create a game that not only would use the potential of that engine, but that would go above and beyond that potential. Knowing full well that the engine was not going to significantly impress the majority of gamers upon its release, the game designers realized that they should focus instead on innovating in terms of game-play. Two things allowed them to do this: the already mentioned strength of the Duke character and the tongue-in-cheek attitude with which the designers imbued the game, and the ability to design a game that was not focused on technology. These advantages allowed them to make the game, which, in their own opinions, was actually fun, something that is always missing from a lot of games.

Again, Duke Nukem was a natural choice for the lead character of Apogee/3D Realm's new game. The well-defined attitude and personality that the new manifestation of Duke inherited from his previous incarnations freed the designers from designing a character from scratch, and therefore allowed them to concentrate on perfecting it; the character would therefore be more appealing to gamers. As Lee Jackson, Music and Sound Director at 3D Realms points out:

Some people say that Doom was the "killer app" that made people take PC gaming seriously. Others would point back to Wolfenstein 3-D and say the same. These games' game-play and technology are what made them famous. Duke Nukem 3D presented the "killer personality" for PC games. Duke Nukem was a bona fide character people could really get into and enjoy – everybody *wanted* to be Duke, whereas no one really cared about the characters in any other game at the time... If Duke is remembered for nothing else, he will at least be remembered for introducing the concept of character into PC games.

Obviously, for a company such as 3D Realms that is trying to squeeze itself into a genre that has already been more or less cornered by a company such as id Software, such a distinction is very important. Therefore, all aspects of the design process boiled down to finding bigger and better ways to define the Duke character.



Equally important to the product that *Duke Nukem 3D* eventually became was the lack of pressure that the designers felt, as they were not trying to create a game that had to compete technologically against the other games that were also being developed, especially those by id Software. 3D Realms knew from the start that they would not be able to compete in such an area, but this inequality actually turned to their advantage. All the efforts that would have been spent trying to add some new graphical effect, could instead be spent making the game-play better, the levels more immersive, or the sounds more interesting. Richard “Levelord” Gray, then level designer for 3D Realms, talks about this aspect:

The other outstanding feature about Duke was it was being designed with last year’s technology. Remember Duke came out and butted heads with the first Quake. Since the engine was not absolutely cutting-edge, the team had time to focus on the Fun Factor, that is, all the little things that make a game fun. On most other games, a lot of time is spent just wrestling with new technology. Most of this technology does nothing more than make the game look more “real” and add more flash-and-glitter. The most important thing about a game, though, is if it is fun or not... the “Fun Factor.” We spent most of our time making sure it was fun!

Clearly, such attention to the “Fun Factor” is what made *Duke Nukem 3D* the hit that it eventually became. While people will always respond to eye candy, in their hearts, they prefer games that are essentially fun to play—witness the current celebrity of *Counter-Strike*, which features a horrendously outdated graphics engine. One of the main criticisms of *Quake* was that, while it allowed id to revolutionize the industry once more, the game design itself was mediocre. In contemporary comparisons of the two games, this was often the chief reason why a gamer would prefer *Duke Nukem 3D* over *Quake*.

Furthermore, this freedom from trying to innovate technologically had the effect of making the effort far more of a team project. For example, because none of the programmers were busy attempting to super-optimize their code, they were free to offer advice on the sound design. Everybody had a hand in everything else. Individuals were encouraged to play an active

role in the overall design of the game. Gray talks about what he calls the “Third Order of Coolness”:

All the cool things in Duke were arrived in this fashion: one person would think of a cool idea, a second would add to this idea, and a third would add the finishing touches. It always ended at the third donation.

An actual example of this process is given by Jackson, who refers to a level that is technically part of the *Plutonium Pak* expansion levels for the original *Duke Nukem 3D* game:

In the somewhat controversial level containing the “Duke Burger” restaurant and an attached (via tunnel) animal shelter, the shelter building did not originally have a big sign to identify it. It was going to be an SPCA building, plain and simple, which the aliens had taken over and were using the dogs as, well, ingredients over at the Duke Burger. I was watching over the shoulder of the mapper who did the level one day, and gave him the suggestion that the SPCA logo should be changed to SPCH—an acronym for the “Society for Preparing Canine Hamburgers.” He put it in immediately, and it made it into the shipped version... If someone had a cool idea, regardless of whom they were, the idea was at least tried.

The designers of *Duke Nukem 3D* look back at this aspect as the most pleasurable part of the game’s development. They feel as though it allowed them to truly express themselves creatively without any artificial constraints imposed by their official job title.

So far discussion has pertained to the design process of *Duke Nukem 3D* as a whole. The paper will now shift to focus on the individual aspects of its design.

### **The Design Process: Programming**

After Ken Silverman finished the core of the Build engine, his role shifted to of technological consultant and specific programming duties for the *Duke Nukem 3D* were given to Todd Replogle, a veteran employee at Apogee, who had also been chiefly responsible for the first two Duke Nukem games. His duties consisted mainly of adding features to the *Duke Nukem 3D* executables, such that they allowed for the overall design goals of the game to be met.

Replogle's main contribution took the form of what is now considered to be the first scripting language available in a first-person shooter. At the time, id Software was currently involved in the production of *Quake*, and one of *Quake*'s most touted features was the inclusion of a home-brewed scripting language named Quake-C, which controlled the specifics of *Quake*'s game-play and which allowed anybody who was so-inclined the ability to radically alter that game-play. For example, Quake-C could be used to turn the normal first-person shooter style of *Quake* into such things as a side-scrolling platform game or a flight simulator. All the hype surrounding Quake-C heavily influenced Replogle to try and put at least a portion of its functionality into *Duke Nukem 3D*. The result of this work is the .con script programming language, which, while nowhere near as robust as Quake-C, nonetheless powers a lot of the game's most popular features.

Chief among those features is the level of interactivity with the environment that the game allowed, which is often cited as the most innovative of *Duke Nukem 3D*'s features. Objects in the game were not merely decorations, but were integral parts to the player's experience, for as Richard Gray says, "not only did all objects made of glass and breakable material shatter into bits and pieces... every object in the world had function from telephones to the strippers." With the power of the scripting language, walls or objects could be made to disintegrate upon the impact of a projectile, allowing for the first time a deformable environment, something which none of the id games yet can claim to offer. Furthermore, if the player was not busy destroying his surroundings, they could actually use a significant portion of the objects in the game, from light switches which actually operated the lights to pool tables whose balls rolled when pushed. More modern games, such as *Half-life* have tried to emulate this, but do not allow a level of interaction to anywhere near the same extent. Finally, by using the scripting language, events

involving a collection of multiple objects at once could be orchestrated, such as intricate traps being sprung upon entry into a particular room, another feature which games like *Half-life* have copied.

Lastly, the use of scripting allowed for better manifestations of the mainstays of the FPS genre, namely monsters and weapons. The enemy AI was completely done with scripts; no hard-coded routines were used at all. This allowed for creatures that were able to interact with the environment in many of the ways the players could, if those creatures were programmed to do so. The weapons were also implemented with scripts, which allowed for more inventive weapons, as they could be designed in such a way that they did not just cause projectiles to be spawned that had a certain amount of damage associated with them to be applied on impact. For example, Duke could use the infamous and very popular shrink ray, which, as the name implies, shrunk the target, who could then be stepped on with the player's foot, or the freeze guns which would freeze the target until either the player broke it with another weapon or it thawed. *Duke Nukem 3D*'s pipe bombs, in particular, have been used extensively in many other games, because gamers delighted in the novel way with which they were allowed to blow things up.

### **The Design Process: Levels**

Again, possessing the most impressive technology in the world is useless to a game, if that game is uninteresting, because while technology may draw players, an interesting game will keep them. Making a game interesting, therefore, is the chief goal of the game design process. The task of accomplishing this goal falls most squarely on the shoulders of the members of the team who design the levels for the game, for ultimately it is the levels that the player directly experiences as he is playing the game and ultimately remembers. In the case of *Duke Nukem 3D*,

the level design task manifested itself as the responsibility to give the game the visible attitude and personality that was synonymous with its eponymous character.

Apogee/3D Realms had two level designers working on the *Duke Nukem 3D* project: Allen Blum, who had working at Apogee/3D Realms since the original *Duke Nukem*, and Richard “Levelord” Gray, who had entered into the industry by being a renowned amateur *Doom* level designer whose work had gotten noticed by the staff of Apogee/3D Realms around the time they started making *Duke Nukem 3D*. Blum and Gray shared the level design task more or less evenly; each designed approximately half of the levels.

Blum and Gray immediately realized that the one thing that would make their game stand out was a sense of humor, for they felt that this was one thing that the other contemporary FPS game distinctly lacked. For example, with the exception of John Romero’s head impaled on a stake in the final level of *Doom 2*, id Software had lost their flair for the campy humor that had been central to their early games such as *Commander Keen* when they moved to 3D. *Duke Nukem 3D* wanted to introduce off-the-wall comedy into the fledgling FPS genre, as had already been done for other genres (witness games such as *Leisure Suit Larry*). To this end, the level designers stocked the levels with tons of pop culture send-offs and masses of risqué jokes. At various points in the game, the player might be introduced to the hanging corpse of Indiana Jones or the impaled body of Luke Skywalker. He might also wander into a bathroom and discover an enemy busy using the facilities. The game would even lampoon aspects of the gaming community of which itself was a part. For example, one location in the game, parodying the practice of cheating in games, featured the following cryptic message, attributed to the Levelord, “You’re not supposed to be here,” because the location itself could not be reached without cheating.

One other such “gag” in *Duke Nukem 3D* deserves special mention, because it subtly shows the relationship between id Software and 3D Realms at the time. One of the levels that Blum designed was entitled “Death Row,” and was set in a maximum-security prison. In one part of the complex was a simple chapel with nothing but an altar, some pews, and a monk hanging from the rafters. Yet, if the player performed a specific series of actions, the cross on the altar would turn sideways and the room would fill with an eerie purple glow. A secret door would then open up behind the altar, and upon entering the player would be greeted with the dead body of *Doom*’s protagonist, to which Duke voiced the sentiment, “That’s one doomed space marine.” Gray passes this off as nothing more than another homage to popular culture, created because the employees of 3D Realms were huge *Doom* fans. This may explain why it takes place as it does inside a place of worship. However, it still seems equally likely that this was simultaneously the physical manifestation of an Oedipal complex directed towards the fathers of the FPS genre, id Software.

Another aspect that the level designers found was important to the success of their levels was making the player feel like they were actually inside the game. This, of course, was no small feat, owing to the already mentioned less-than-impressive technology. Therefore, instead of trying to make the graphics as realistic as possible, such as id Software was always doing, they decided to focus on making the levels believable. To this end, they placed the levels in real-world locations such as cities, football stadiums, or canyons, so that the player could at least identify with the setting in which he found himself, something not possible with games such as *Doom*, which were set in futuristic sci-fi worlds. Furthermore, the level designers wanted the player to be able to understand how each level fit into the context of the entire game, instead of just pummeling the player with a bunch of random levels that bore no connection to each other;

thus, every single level bled into the next. For example, getting captured by enemies in one level led to being planted on an electric chair in the next with no weapons, or boarding a space shuttle at the end of one episode would lead to the player fighting in space for the entire next episode.

With the aforementioned goals in mind, the level designers at 3D Realms were able to formulate a game that felt complete and coherent to those who played it, and thus was not merely a technology demo.

### **The Design Process: Sound**

While the level designers had the responsibility of designing a world that fit Duke's personality, the sound team had the role of actually delineating that personality. As *Duke Nukem 3D* was a first-person game, and therefore players *were* Duke and not just watching his actions from afar, there was no visual way other than adding the occasional mirror to describe his character visually. Because 3D Realms felt that the strength of their game was directly related to the strength of Duke's personality, they decided that sound was the best way to do reveal that personality, and thus *Duke Nukem 3D* became the first FPS to feature spoken dialogue. Finally, the desired attitude of the game could not be fully realized if appropriate music was not created for it, and so great attention was paid to that area as well.

Initially, two people were given the considerable responsibility of fleshing out Duke: Jim Dosé would program the sound engine and contractor Robert "Bobby" Prince would create sound effects and compose music. Both individuals had had extensive experience dealing with sound in games. Dosé had designed the sound engines for many of Apogee's previous games, including *Rise of the Triad*. Prince's accomplishments were even more impressive: besides composing the music for other games by *Apogee*, including *Duke Nukem II*, he had also done music for many other games, including id Software's *Wolfenstein 3-D* and *Doom* itself. A little

while later, Lee Jackson, who had done the music and sound effects for *Rise of the Triad* and was currently working in the technical support department, was added to the team to help create level music.

Like those involved in the other design areas, the sound team managed to innovate in subtle ways. For example, one of the chief problems facing sound designers in those days arose from the fact that all game music was done as MIDI sequences and that sound cards' implementations of MIDI technology were unreliable. Specifically, the sound produced by any particular sound card was not necessarily the same on another, given the exact same MIDI file. Obviously, one of a sound designer's greatest concerns is that their work will sound as they intended it. Therefore, Dosé, with musician's input from Jackson, designed the EMIDI sound system, which allowed a given MIDI file to sound more or less the same on all supported sound cards. This system thus freed Prince and Jackson to work on their sound design without having to worry about problems of sound fidelity.

Unfortunately some non-technical issues arose which hindered the sound design process. Foremost, because Prince was merely involved in the project on a contractual basis and was therefore not a full-fledged member of the team, he worked remotely and was often not kept abreast of the current overall development situation. For example, he was not immediately informed that Jackson had joined the team. Furthermore, Prince feels that, although 3D Realms knew what effect they wanted to achieve from the music and sound effects on the whole, they were never sure when it came to specifics; they were never totally clear as to what sort of sound they wanted. As a result, Prince created thousands of sound effects and dozens of songs, of which only a fraction actually ended up in the game. Finally, 3D Realms gave seemingly contradictory instructions to Prince and Jackson: Prince was told not to use guitars or electronic sounds,



whereas Jackson was encouraged to use both. Prince feels as though this led to some discontinuity in the music over the course of the game, which is especially shocking considering that continuity was an expressed focus in the overall design.

Despite these problems, the music and sounds that did make it into the game turned out really well in the opinions of all concerned, accomplishing all goals. From Duke's occasional pure profanity to exclamations such as "That's gotta hurt!" the player really got a sense of the personality of the Duke character they were playing and therefore could more fully imagine themselves as actually being that character. Furthermore, the music used for the game, with its eclectic blend of heavy metal and action movie-style rhythms—drawing on such influences as the music of Metallica and *Mission: Impossible*, for example—seemed to fit well with Duke's rough and tough bad boy image. Jackson and Prince were not above the same pop culture references that the level designers were using, either—one level, entitled "Fahrenheit 451," uses the chord structure of the theme created for the movie based on the book of the same name.

Finally, the long-term legacy of the sound design of *Duke Nukem 3D* is probably the infamous theme song that Jackson composed. That song, "Grabbag," was originally intended to be a throw-away song created mainly for the purpose of testing the sound technology, but was so well liked by George Broussard and Greg Malone, producer of *Duke Nukem 3D*, that they decided to make it the theme song, much to Jackson's surprise. When the game was eventually released, the song was so popular to its players that it has become synonymous with the Duke Nukem franchise. Indeed, the song has become so well known that several bands, including Megadeth, have produced cover versions.

### **Controversy: The World Meets a 3D Duke Nukem**

After all the effort, *Duke Nukem 3D* was finally released in January, 1996 to wide-spread acclaim. It is not necessary to describe why the game became an immediate hit, for it is simply for all the reasons already given in this paper: game players flocked to its fast action, interactive environments, wicked humor, pop culture references and compelling character. As a result, the game achieved everything that 3D Realms desired. It firmly placed them in the top echelon of game designers, although even then id Software could still look down upon them as gods—some things are just not attainable.

Nonetheless, for the very same reasons that hordes of players loved the game, some critics absolutely despised it. Many people blamed *Duke Nukem 3D* for what was then wrong with society. *Duke Nukem 3D* became a favorite scapegoat for those who wanted to condemn first-person shooters to the fiery pits of censorship.

Of course, one of the most oft-given criticisms about FPS games is that they encourage violence. *Duke Nukem 3D* could not escape fate and avoid such attacks. Critics stared in shock at the blood that seemed even redder and more ever-present than they remembered *Doom* as having. They listened in horror to the glee with which Duke dispatched enemies (“Kill them all and let God sort them out!” was one of his favorite expressions). They watched terrified the between-episode cut-scenes, which featured, among other things, Duke decapitating an alien and then defecating down his neck, while humming and reading the newspaper. The critics saw all this and immediately claimed that *Duke Nukem 3D* glorified violence.

While this criticism was justified to some extent, the truth of the matter comes down to the fact that the action in *Duke Nukem 3D* is far too over the top and based on cartoon violence to influence emulation. *Duke Nukem 3D* was just a modern day Bugs Bunny. As Richard Gray says:

There is something very entertaining about the mixture of violence and humor. This may be cultural, as I find it is an almost unique characteristic of Americans.

No one actually possesses a shrink ray with which to shrink others, despite the fact that running around trying to stomp shrunken enemies seems like a particularly malicious pastime.

Fortunately, the cry of violence was soon quieted when new FPS games came out to serve as fodder for anti-violence advocates.

Far more substantial was the claim that *Duke Nukem 3D* encouraged immorality and sexism. By far the most well known of all the levels in the game, “Red Light District,” featured intense sexual imagery, including a pornography store with private adult video watching booths, prostitutes, and strippers who could be induced to un-clasp their top, if the player offered them some money. Some efforts were actually taken by 3D Realms to curb the adult nature of the game prior to its release, as the marketing department forced the level designers to cover the stripper’s nipples with pasties and change some of the actions that the strippers were originally going to have. However, these were mostly small changes and in no way quelled the storm. Critics were especially upset that “Red Light District” was part of the free shareware episode, and was therefore playable by absolutely anyone, including any young child who happened to obtain a copy. Other levels in the game also featured women in less than flattering positions, mostly weak, helpless, and covered in alien tentacles. Lastly, when the player eventually won the game by defeating the final boss, they were treated with the sound of Duke and an anonymous woman having sexual intercourse.

Furthermore, critics claimed, and rightly so, that *Duke Nukem* actively promoted violence against those women to a certain degree. They based this on the fact that the game allowed the player to shoot and kill the women, even though Duke’s assigned task was to protect them—one shot and the women were reduced to a splatter of blood, occasionally joined by a few dollar bills if the woman was a prostitute or stripper. 3D Realms did make an effort to discourage players

from doing this, for they caused an enemy to spawn as punishment whenever a woman was killed. However, in the end, this was only a slight hindrance, especially when the game made it far too easy to accidentally shoot a woman. A number of the individuals involved in the game now actively regret the inclusion of this feature; they agree that it was not a particularly responsible decision to make. In fact, Scott Miller is actively campaigning at 3D Realms to disable the ability to shoot women in the upcoming sequel, *Duke Nukem Forever*, despite resistance from other current employees, as he feels it is not within Duke's character to kill women.

One final issue concerning *Duke Nukem 3D* that may not seem as serious, but nonetheless caused a considerable stir, is the charge that the game plagiarized some movies in some of Duke's dialogue. Specifically, a few of the lines spoken by Duke are taken directly from the movies *Army of Darkness* and *They Live*. However, Lee Jackson dismisses the claim that this represents plagiarism. Using lines such as "It's time to kick ass and chew bubblegum... and I'm all out of bubblegum" or "Hail to the king, baby" is merely a form of homage to both those movies, which were particular favorites of 3D Realms, Jackson insists. In fact, he believes that *Duke Nukem 3D* was no different than any other creative work in this regard, including *Army of Darkness*, which borrowed the magic-inciting line "Klaatu Barata Nikto" from the classic movie *The Day the Earth Stood Still*. Nonetheless, critics still balk at what they claim is pure unoriginality.

Obviously, none of these issues positively reflect on *Duke Nukem 3D*'s quality as a game. Nonetheless they did manage to add to the game's already considerable mystique and easily made it more popular—gamers could not resist experiencing what all the hype was about for themselves. Finally, if *Duke Nukem 3D* is considered to have less inherent artistic value as a

game as a result of the decisions made by its designers, its legacy in the history of gaming is all the more firm. One may find fault in some of 3D Realms' design tactics, but one must admit that those same tactics lead to the achievement of the 3D Realms' goal, namely to create a game that would stand out for a brief period in a heavily dominated genre.

### **The Final Analysis: *Duke Nukem 3D* vs. *Quake***

For, of course, the largest controversy surrounding *Duke Nukem 3D* was the ever-present question of which was the better game: it or *Quake*? Proponents of *Duke Nukem 3D* would clamor on the virtues of its interactive environments and well-designed levels, would laugh at *Quake*'s puny attempts at a storyline, and summarize that *Duke Nukem 3D* was assuredly a more fun game to play. *Quake* fans would counter by pointing to *Quake*'s impressive fully-3D graphics, impressive multi-player, and the far superior scripting language Quake-C.

The answer to that question is obviously a subjective one and will not be attempted by this paper. However, it is easily arguable that *Quake*, or for that matter any game by id Software, will have greater long-term influence, owing largely to its huge technological advancements. Just look at the mod community that *Quake* and its sequels have spawned and this is instantly visible. Even 3D Realms recognizes that the name *Quake* will be spoken long after everybody has forgotten Duke Nukem. As Richard Gray freely admits:

*Duke* does not get the same attention as *Quake*, obviously. *Quake* is an institution, while *Duke* is merely one game. A great majority of the first-person shooter industry is based on *Quake*, while *Duke* was only a one-time game made with nearly outdated technology.

While one must wonder what Gray thinks of all the add-on packs that were created for *Duke Nukem*, the numerous spin-off games that were created for console systems or are currently in the works, and last, but not least, *Duke Nukem Forever*, it is clear that he realizes that *Duke Nukem 3D*'s legacy is one of a game that was not intended to be largely revolutionary, but that

only tried to make a ripple in an ocean owned by id Software. It has surely succeeded in this regard. As Scott Miller says with a smile, “When id is zigging, the best thing for competitors to do is zag a little.”

**Notes on sources:**

Throughout this paper I have relied on numerous sources for information. In lieu of placing an absurd numbers of footnotes all pointing to the same sources, I have chosen to mention all the sources in regards to where I used them. 3D Realms’ own corporate history (<http://www.3drealms.com/history.html>) and the Official Apogee FAQ (<http://www.rinkworks.com/apogee/index.html>) were used for the history of Apogee/3D Realms. 3D Realms’ article on the history of *Commander Keen* (<http://www.3drealms.com/keenhistory/index.html>) and again the Official Apogee FAQ were used for the history of id Software. 3D Realms corporate history, Daily Radar’s short interview with Scott Miller ([http://www.dailyradar.com/features/game\\_feature\\_page\\_1233\\_7.html](http://www.dailyradar.com/features/game_feature_page_1233_7.html)), and Gamespot’s history of the Duke Nukem franchise ([http://www.gamespot.com/features/duke\\_hist/p1\\_01.html](http://www.gamespot.com/features/duke_hist/p1_01.html)) and the games themselves were used for the history of the original Duke Nukem games. Ken Silverman’s web page (<http://www.advsys.net/ken/default.htm>) provided information on the Build engine. Finally, direct contact with Scott Miller, Ken Silverman, Richard Gray, Lee Jackson, and Robert Prince provided the bulk of the information on *Duke Nukem 3D*’s development and legacy.


[www.3drealms.com](http://www.3drealms.com)

Max Payne

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Company Info



In 1987, Apogee released Kingdom of Kroz as shareware and invented a new way to market games. Here's a list of important Apogee milestones and contributions to the shareware and gaming world. We also have a detailed release history list for the entire history of the company. To see that, [click here](#).

## 1987

Invented the "Apogee model" of shareware marketing, in which only a part of a full game is released as shareware, which advertises the full game. It wasn't until 1991 that another company, Epic MegaGames, followed our lead and used the Apogee model. Many game companies have since use this marketing model, including Parallax Software (Descent), id Software, Capstone and dozens of others.

## 1987

Apogee was the first PC games developer to hide cheat modes within games, such as Kingdom of Kroz. Nowadays, nearly every game released has cheat codes and modes that are hidden in games and discovered by players.

## 1989

Apogee became the first shareware publisher, working with other authors and teams, releasing and marketing their games as shareware, and processing orders. (Caves of Thor was the first game released Apogee released that was from another author. This game's author, Todd Replogle, has been the lead programmer behind the first three Duke Nukem games).

## 1990

Convinced the original members of id Software, then a group of game designers working at Softdisk, Inc., to venture into the world of shareware, which they did with the release of Commander Keen through Apogee (with development funded by Apogee). The success of Commander Keen as a shareware game led to the creation of id Software, who, at the time, called themselves Ideas From the Deep. (A side note on this: the later-to-become-id Softdisk employees, John Carmack, John Romero and Tom Hall, had a hard time believing that it was possible to make money releasing a game as shareware. It took much convincing before they agreed to give it a try.)

## January 1991

Apogee's Dark Ages was the first shareware game with music and sound card support.

## 1991

Apogee became the first shareware game company with a home bulletin board system (Software Creations BBS) and a distribution network (reaching over 5000 BBSs at its peak). BBSs were the primary distribution mechanism before the Internet and web became popular. The Software Creations BBS quickly grew from a 3 line system to 150+ lines, and won Boardwatch Magazine's Reader's Choice Poll as the Best BBS two years straight.

## June 1991

Released the original Duke Nukem, a 2D EGA platform side-scroller with parallax scrolling. Easily the most advanced game of its type yet seen on the PC, and rated the best selling shareware software (of all categories) for 1991 and 1992 (even beating Wolfenstein 3-D in 1992).

## 1991

Worked a deal with id Software to create a 3D game for shareware release, titled Wolfenstein 3-D (yes, the hyphen is part of the game's name). At the time, id was tied up under an agreement with Softdisk and didn't have the time to make a shareware 3D game. Apogee, realizing the giant potential of such a game, developed a game for id to fulfill their obligation with Softdisk (titled ScubaVenture) allowing id to make Wolfenstein 3-D for Apogee. This game almost didn't see the light of day except that Apogee both helped id, and guaranteed them a large payment to make it happen.

## May 5, 1992

Released Wolfenstein 3-D to the world and started an entirely new genre of computer games: the first-person 3D shooter. This was the first PC game to voluntarily rate itself, alerting consumers to its violent content.

## September 1992

Apogee's founder, Scott Miller, helped form STAR (Shareware Trade Association and Resources), an organization designed to help shareware authors become successful.

## August 1993

Apogee hires Tom Hall, former id Software founder and owner, to lead our in-house development division, and help develop what was at the time a sequel to Wolfenstein 3-D, but which later became Rise of the Triad.

## April 1994

Apogee releases Raptor, a sleeper hit that sells extremely well and sets a new standard for scrolling shooters on the PC.

## July 1994

3D Realms Entertainment is created by Apogee, as a division solely focused on the quickly growing 3D action gaming market. We announce four 3D games to be based on our Build engine: Duke Nukem 3D, Shadow Warrior, Blood (later sold all rights to the developer) and Ruins (sold rights to the developer, who changed the name to Powerslave).

## December 1994

Apogee releases Rise of the Triad, which was originally a sequel to Wolfenstein 3-D, until id decided to pull the rug on the project. ROTT, as it became known, had many innovations, such as being the first game with a parental lock-out feature, 11-player LAN games, 9 multiplayer games built-in, 5 characters (with unique attributes) to play, and it was shipped with a random level generator. Unfortunately, the 90-degree walls was a serious limitation passed down from the game's Wolfenstein 3-D engine roots. (It still sold over 150,000 copies, which is a "hit" by industry standards.)

In July of 1997, an article was published online called [ROTT in Hell](#), calling ROTT the "..best Deathmatch game of all time"; showing how ROTT had many game industry firsts.

## December 1994

With the release of Rise of the Triad, Apogee had another major industry first: A parental lock-out feature that parents could use to password protect the game, preventing their children experiencing much of the game's violence and all of the gore. Several future releases employ this feature, including Duke Nukem 3D, Shadow Warrior and Balls of Steel. Other game companies have mimicked this feature, too.

## May 1995

First 3D Realms release, Terminal Velocity, created by Terminal Reality, Inc. This game won many awards and invented a new sub-genre of PC gaming. This was the first shareware game to get a magazine cover \*before\* its release (not even DOOM had a pre-release cover story).

## June 1995

Apogee's web site opens to the public.



## July 1995

Apogee wins a "Special Recognition Award" from the Shareware Industry Foundation for pioneering work in shareware games marketing, with Apogee's founder, Scott Miller, being awarded a "Lifetime Achievement" award. (Only five such awards have been given, and only one to a person in the game industry.)

## 1996

Scott Miller, Apogee's founder, is picked as "one of the game industry's 75 most important people," by Next Generation magazine, in recognition of Apogee's trail-blazing shareware marketing methods.

## January 1996

3D Realms releases Duke Nukem 3D, which finally, for most players, displaces the long-standing DOOM as the best 3D shooter. Duke revolutionizes 3D shooters with a strong action- hero character, and a realistic, highly interactive environment. Duke is the first 3D shooter released with the same editor and utilities that were used to create the game. This is 3D Realms' first in-house game and sets the tone for what people come to expect from 3D Realms in the future.

## November 1996

Apogee's last game released, titled Stargunner. No more Apogee games have been scheduled for production, with nearly all company focus shifted to the 3D Realms division.

## December 1996

3D Realms Releases Duke Nukem: Atomic Edition, notable as being the first first-person shooter to include "Bots," which are AI controlled, human-like opponents.

## February 1997

Apogee creates a new division, Pinball Wizards, which will focus exclusively on cutting- edge pinball games. Wildfire Studios, an Australian developer, partnered with Pinball Wizards to create Balls of Steel, due out September 1997, with five tables, one based on Duke Nukem 3D.

## April 1997

3D Realms announces that Duke Nukem Forever will be built upon id Software's Quake II technology. This is the fifth non-id game Apogee has developed on top of id's technology--the other four are Bio Menace (using the Commander Keen: Goodbye, Galaxy! scrolling engine), Blake Stone: Aliens of Gold (Wolfenstein 3-D engine), Blake Stone: Planet Strike, and Rise of the Triad (a highly enhanced Wolfenstein 3-D engine).

## May 1997

3D Realms releases Shadow Warrior, which is the last of many Build engine games by 3D Realms and many licensees. Build was the foundation for the following eight games, in order of their release: Witchaven, TekWar, Duke Nukem 3D, Witchaven II, Powerslave, Redneck Rampage, Blood and Shadow Warrior. The Build engine is undoubtedly one of the most prolific and successful engines ever used in the game industry.

## June 1997

The Prey engine and game are shown at Atlanta's E3, stuns viewers with its realism, speed and special effects, and wins strong accolades as the next generation leader in 3D gaming. (Prey is due out late 1998.) This engine's Portal Technology will be a standard setting landmark for all future 3D games to match.

## July 1997

3D Realms announces a partnership with Remedy Entertainment, a Finland-based developer with exceptional talent, to co-develop and co-market Max Payne, a new story-driven 3D 3rd-person action game.

## August 1997

Scott Miller was selected as one of the 15 Most Influential People in the Game Industry by Computer Gaming World magazine and Gamespot. Said the Gamespot article: "Scott Miller didn't create the

try-before-you-buy concept of shareware, but he was the first one to make it profitable."

## January 1998

3D Realms enters into a production agreement (not an option agreement) with Threshold Entertainment to create a big budgeted Duke Nukem movie, due out in late 2000.

## March 1998

3D Realms announces it has become a "founding partner" and equity owner of the new Dallas-based publisher, Gathering of Developers. Scott Miller is announced as being on the Board of Directors, as well as on the Board of Developers (along with Steve Blackburn from 3D Realms), whose task it is to review game submissions for potential publication by Gathering.

## July 1998

Duke Nukem Forever, recently shown to rave reviews at E3 in Atlanta and using the Quake engine, surprises the game industry by switching to Epic Games' Unreal engine. The reasons for the switch are to have larger game environments and take advantage of all the new features of the Unreal technology.

## October 1998

Duke Nukem: Time to Kill is released for the PlayStation. This is the first original Duke Nukem game not made by Apogee or 3D Realms, and is the beginning of several third-party original Duke Nukem games to come, such as Zero Hour for the N64, and an original Duke Nukem game for the Color Game Boy, both due out mid-1999.

## August 1999

Duke Nukem: Music to Score By is released. This is a hybrid music CD, containing a cover of the Duke Nukem Theme by the rock band Megadeth, as well as 10+ other songs. There is also extensive computer content, from screen savers, to puzzles, etc.. This is the first such CD/Computer data program released for a video game.

## September 1999

Duke Nukem: Zero Hour is released for the Nintendo 64. This is the first original Duke Nukem game on a Nintendo platform to date. This marks Duke's expansion into another platform of original gaming.


Also in September was another release for the Nintendo - Duke Nukem for the Nintendo Color Gameboy. This is the first time Duke Nukem has appeared on the handheld Nintendo platform, in yet another original cartridge game.

To be continued....




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Max Payne

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## A Look Back at Commander Keen

 10 years ago, a group of programmers and artists working at Softdisk created a piece of software that laid the foundation for just about every popular computer game today. Working for a company that didn't want to make use of the program that they created, these guys instead turned to shareware pioneer Scott Miller to publish their first game. The company is id Software, and the game is Commander Keen!

On December 14, 1990, a landmark computer game was released. Episode 1 of Commander Keen came out this day in 1990, and forever changed PC computing. Commander Keen was id Software's first big game, and along with the original Duke Nukem (released in 91), Apogee Software was recognized as the place to go to for hot, shareware games. Keen (like every other Apogee title) was released under the (at the time) unheard of concept of giving away part of your game for free. The entire first episode of Keen was released to the world as shareware. The idea was that you got a good sense of what it looks like and feels like, and if you liked it, you paid for it - and obtained the remaining parts of the game.



Commander Keen - a landmark game. This article tells the story of Commander Keen - how it was made, what the people behind it felt, and some things you may never have known before about the game. So put on your football helmet, grab your pogo stick, and help fight off Mortimer McMire by becoming **Commander Keen - Defender of the Universe!!**

## The Early Days

In September of 1987, Tom Hall (this picture is legendary) moved from Wisconsin to Shreveport to take a job programming games at Softdisk. Tom's games back then were for Softdisk's monthly subscriptions which included such awesome titles as "Duck Boop". In March of 1989, John Romero joined Softdisk and made Tom's acquaintance. John started working on programs for Softdisk's IBM PC line.

Romero's games soon attracted the attention of a free-lance programmer in Kansas City, John Carmack, who had been working in a pizza parlor and programming on the side. Carmack's programs impressed Softdisk enough that he too made the trek to Shreveport to work for Softdisk. The two Johns started working together, and it wasn't long before Tom started sneaking in at night to work with them because Softdisk management would not allow them to collaborate openly.

Then, the first breakthrough. John Carmack devised a smooth, scrolling routine similar to that used for the background of Nintendo games but never before possible on the PC. When Tom Hall saw the scrolling in action, his first thoughts were to pull a prank on Romero. In the course of one night, Hall and Carmack reproduced the first level of Super Mario 3, pixel by pixel, replacing Mario with a character of their own named Dangerous Dave. They finished the work around 5AM, calling it "Dangerous Dave in Copyright Infringement". Tom & John put the disk on Romero's desk, and left to get some sleep. John Romero arrived at Softdisk that day, booted up the game, and did not stop to take a breath until three hours later. More than a prank, Romero saw the staggering commercial potential of Carmack's design.



Tom Hall



There was also at Softdisk a project manager named Jay Wilbur. Romero approached Jay with a new Super Mario demo. Allured by the same visions of limitless wealth, Jay approached Nintendo. It is rumored that id's Mario demo (shown here) made it to the highest levels of Nintendo, but this has never actually been confirmed over the years. However, Nintendo declined the idea deciding that Mario wasn't for the PC, it was a console only title. In the end, the Softdisk guys decided to pursue the game on their own - in secret, of course, as they weren't supposed to be working together in the first place at Softdisk. Why? Who knows now?

Tom Hall remembers... *"Softdisk didn't want to use the smooth scrolling trick Carmack had discovered (since it didn't also work in CGA), so we thought, well, if they don't want it, we could do something ourselves... So we thought, hey, we'll make our own game. We needed a topic. I asked if they cared what topic - sci-fi, fantasy, whatever. I think Carmack mentioned a kid that saves the galaxy or something. I went off and fifteen minutes later, came back with the paragraph that you see in Keen 1. I read it in a Walter Winchell voice (he's a nasal 40s radio/newsreel announcer). Carmack clapped after I was finished, and we were off and running."*

The paragraph of text that Tom refers to is the text that appears at the beginning of Keen 1:

Billy Blaze, eight year-old genius, working diligently in his backyard clubhouse has created an interstellar starship from old soup cans, rubber cement and plastic tubing. While his folks are out on the town and the babysitter has fallen asleep, Billy travels into his backyard workshop, dons his brother's football helmet, and transforms into...

**COMMANDER KEEN--defender of Earth!**

In his ship, the Bean-with-Bacon Megarocket, Keen dispenses galactic justice with an iron hand!

Meanwhile, a series of peculiar fan letters had been arriving at Softdisk, praising John Romero's games. At first, seeming to represent the ravings of a wide number of Softdisk fans, Romero eventually determined that all the letters came from the same address in Garland, TX. Discovering the fraud, Romero fired off a threatening letter, and in this manner made contact with id's first benefactor. Scott Miller, anonymous author of the many letters, was a founder of Apogee Software, a pioneer in the shareware approach to marketing computer games. Miller told Romero that he loved the Softdisk games and wanted to lure them into the shareware market. Romero sent Miller a game called Catacombs, which whetted Miller's appetite. But once he got a glimpse of the Super Mario demo for the PC that Carmack & Romero had done, he offered to put up some money to finance their first real game. Hall, Romero, & Carmack asked for \$2,000 to get their game off the ground. Miller had \$5,000 in his bank account - he promptly sent them a check for 2/5 of that.

For three months, the trio programmed for Softdisk during the day, and slaved away on "Commander Keen: Invasion of the Vorticons" in every free moment. However, they needed some more folks to help complete the game, so they set out to recruit some new blood. They had long admired the artistry of an intern at Softdisk, Adrian Carmack (no relation). They invited Adrian to join them and finished Commander Keen with significant improvements to the look of the final levels.

Adrian Carmack remembers his initial involvement in Commander Keen:

"Hmm...well as I recall I drew and animated one of the characters. I don't recall the name off hand. I think he was some sort of a Ninja type of character. I created some teleport windows, a few awful illustrations, etc. Ugh..bad memories. I had just started creating computer art, so it was definitely not some of my better work. Plus I wasn't a cartoonist. I had quite a learning curve on the Keen series. My work on the later Keens was much improved."

## Keen is Released

The initial team was now complete.

With this, Apogee released [the first episode of Commander Keen](#) on December 14, 1990. Gamers who wanted the next two levels had to pay for them - and pay they did. In January, the id guys got their first royalty check, for approximately \$10,000. The two Johns went to lunch with the owner of Softdisk, told him they were leaving, and also informed him that Adrian was coming with them. They then returned to the office and informed Adrian that they had arranged for his resignation. As the entire design team was leaving, Adrian thought it was wise to comply. id Software was officially formed on Feb 1, 1991. With the release of Commander Keen, id Software & Apogee had a huge hit on their hands - the two companies getting a lot of great press over the landmark title for the PC. Joe Siegler remembers the relationship of the two companies....



"Because of the close relationship of the companies at this time, most people (mistakenly) assumed that Apogee was id, or Apogee "owned" id or something of this nature. Far from it. Apogee & id were always separate companies. That error continued for a long time, especially after Wolfenstein 3D was released in the same manner. During the early days of Doom's development, id was going to release Doom through Apogee as well. This confusion even continued into id's Quake era, as we still occasionally get a customer asking "Hey, Quake is a 3D Realms game, right?"



The group still had obligations to Softdisk, which they worked to fulfill even as they established id. Several other titles were produced for Softdisk during this time, in addition to concept work on further Commander Keen episodes. During this time, one of the titles produced for Softdisk was called "Keen Dreams". Keen Dreams is often referred by folks as the "lost episode" of Keen. Some others (including myself) refer to it as "Keen 3.5". The reason for this is that in terms of technology as well as the time that the game was produced, it falls in between the Vorticons series and the Galaxy series (Episodes 4-5). Tom Hall remembers the Keen Dreams project..

"As part of leaving, we agreed to do games so the Gamer's Edge product could continue. At the time, I really didn't want to do a Keen for them, but we needed a ramp-up for the next Keen trilogy. I was eventually convinced. We were doing this game and some other game at the same time. It was kinda crazy. But doing all those different types of games (puzzle, shooter, platform, and so on) was incredible training. You'd have to work for a decade on normal-sized games to get that experience. We did it in a year."

1991 was a crazy year for id and Keen. In January of 1991, they finished the final update to Keen Vorticons, and then worked on the aforementioned Softdisk titles. The guys moved from Shreveport to Madison, Wisconsin in September of 1991 - got shocked at how cold it was (even though Tom was from there), yet still managed to work on games up there for six months (they moved back to Dallas on April 1, 92). Anyway, it was during this time in Madison that work began on more Keen games...

[ [NEXT PAGE](#) - A Keen sequel & the future ]





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## Classic Games Week

### FPSs and Duke Nukem

#### Now: Any First Person Game

*Ultima Underworld's* creators, Warren Spector and Doug Church (among others), latched on to something very special with this first-person RPG. Its legacy can be seen in nearly every first-person game in some form or other, and is certainly one of the most important games in the history of PC gaming.



**PCGamer:** *When you and the team created *Ultima Underworld*, did you realize the impact that the first-person perspective would have on the future of PC gaming?*

**Doug Church:** As a team, we could tell

"Have you heard the one about the priest, the minister, and the rabbi?"

that there was a very powerful sense of player involvement, which the perspective really helped. I don't think we ever figured something like *Doom II* (or any first-person game) would ship a zillion units.

**Warren Spector:** I guess I always had a sense that *Underworld* was unlike anything anyone had ever seen before -- and cooler! Not to contradict Doug, but I really did think we were going to change the world, and thought we'd be the ones to sell a zillion units. Frankly, if we hadn't shipped within a month of *Ultima VII* and *Wolfenstein*, and if we'd gotten a bit more marketing and sales support, we might have done a lot better.

**PCG:** *Compare the size of the team and the amount of work needed to build a game like *UW* with the resources required for *Deus Ex*.*

**DC:** Back on *UW*, the core three people built levels, wrote conversations, and wrote code. We built the game and the editor, and then used the tool we wrote to build the levels.

**WS:** Nowadays, we have much larger teams and specialization is the order of the day. There are about 35 people on *Deus Ex*, and everyone does their bit on the assembly line. The need for passion and commitment hasn't changed.



Following the tradition set in *UW*, *Deus Ex* has one of the most immersive game worlds we've ever seen.

**PCG:** *How has technology helped (or hindered) the design process? Are developers getting lazy by giving us style over substance?*

**WS:** Any developer who gets lazy doesn't stay in business for long. The fundamentals of game design are fundamentally unchanged. I was reminded of that not too long ago when I reread Chris Crawford's 1982 book *The Art of Computer Game Design* (long out of print but available [online](#)). You know what? For all the dated game and technology references, there still isn't a better book on game design.

**DC:** As the complexity of the games rises, the time required to even get the basics together is large. This gives us less time to play and

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[Brian Fargo Interview](#)

Extras

iterate the designs we do come up with. Look at the huge leaps in the technology over the last 20 years, and then compare our design progress. It is pretty sad.

**PCG:** *What ideas would you like incorporated in first-person games to advance the genre?*

**WS:** What I'd like to see in gaming, in general, regardless of genre or platform, is more of a sense of player control and a greater effort to offer players real choices with significant consequences (that go beyond succeed/fail or live/die).

**DC:** As Warren says, I think our big problem is reliance on old approaches, and unwillingness to embrace real interactivity. As long as we are thinking of how clever our design is, or how sneaky some twist is, we are keeping our player from being the centerpiece. When the player stops thinking "What do I want to do?" and instead is asking "What does the designer want me to do?" we have stopped being an immersive interactive experience, and started being a puzzle game. There is nothing wrong with that, but I think our most powerful future games will be of the immersive type.

## Then

Remember the bit where...

You ran around dungeons and cities in first-person, seeing other characters and talking to them. The movement system worked superbly using the mouse, and the level of interaction with the game characters was unmatched. If there's any game on this month's classic CD to keep on your hard drive, make it *Ultima Underworld*.



It's a moving person. And he'll talk to you. This was revolutionary stuff.

## Now: Duke Nukem

An owner/partner of Apogee, Scott Miller has been involved in the creation of the *Duke Nukem* franchise since the early days. Here's what he had to say about everything Duke.

**PCG:** *How much is the Duke Nukem that we know today the same one that you envisioned and created for the original game?*

**Scott Miller:** Quite a bit, but obviously Duke keeps getting better and more fleshed out as technology allows. The Duke in the coming game will be even better realized, but I cannot reveal how.

**PCG:** *How many people were involved with the creation of the original Duke? And how many are on the DNF team, for comparison?*

**SM:** The original game had three primary people: Todd Replogle, Allen Blum, and myself. On Duke Nukem Forever, we have 17 people.

**PCG:** *What was the biggest challenge in trying to imbue a side-scrolling 2D game character with real personality?*

**SM:** The problem in those days was the technical limitations of 16-color EGA graphics, and 320 by 200 resolution. This put a limit on the detail characters could have, so we had a one pixel line for teeth, gave Duke a square chin, and had him say things via pop-up text windows. Another thing we added to the original game to enhance Duke's ego-driven personality was a very flamboyant summersault jump.



3D Realms is still keeping the lid on DNF for fear of spoiling the impact. We can't wait.

**PCG:** *How many times had you seen Evil Dead 2 when Duke was created?*

**SM:** Probably several times though Duke was never created to be anything like the ED2 character, Ash. Ash is kind of a wimpy hero who still manages to survive and Duke, on the other hand, is a politically incorrect combination of John Wayne and Clint Eastwood.

**PCG:** *With Duke's character created, is the future of a game hero like him now just set in what the technology allows the developers to do with environments?*

**SM:** Without any doubt, greater interactivity and realism can, if done right, create a far more immersive, compelling and fun game. This will certainly be demonstrated in DNF.

## Imagine Websites

- [Jobs4Gamers](#)
- [PC Gamer](#)
- [Next-Gen](#)
- [PSM Online](#)
- [Dreamcast](#)



By allowing the player to do far more interesting things in the environment, a character with Duke Nukem's personality and traits can be brought forth in ways we haven't seen yet in current games.



Still giving it to the aliens despite being 2D.

## Then

Remember the bit where...  
*Duke Nukem* was a side-scrolling action hero? Before making a huge impact with the wise-crackin', stogie-chompin', lady-lovin', alien-ass kickin' hero of the 3D (well, 2.5D if we're getting technical) version, the square-jawed action hero plied his trade in glorious parallax-scrolling 2D. Even then, Apogee's Scott Miller and Todd Replogle gave our hero the charismatic personality that we know and love to this day.

[To: Monkey Island and Alone in the Dark](#)



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FALLOUT SHELTER  
DUKE FOR PRAZ!

## The Man Who Nuked Too Much

Few video game personalities have a genealogy based on actual historical events. Duke is one such character. Before we track the history of his games we feel we should chart the history of his ancestors as recorded by the anthropology department of GT Interactive.

- [The Man Who Nuked Too Much](#)
- [Seminal Duke](#)
- [Duke 3D](#)
- [Duke Expansion Packs](#)
- [Duke Attacks the Console Industry](#)
- [Duke in the Palm of Your Hand](#)
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### 1,000,000 BC - Nukanderthal Man

Have club, will travel. Simple, strong, primitive. The first Nukem.

### 400 BC - Nukocrates

Greek philosopher. Proposed theory relating righteous butt-kicking and pure contentment. Killed Aristotle.

### 200 BC - Nukulus Caesar

Roman emperor who divided his time between partying and conquering. Invented the combat toga.

### 150 AD - St. Nukus

Christian martyr. Thrown to the lions. Ate the lions.

### 400 AD - Bhodisattva Nukartha

Indian mystic and peace-loving wiseman... until he got a few beers in him, and then he was a maniac.

### 750 AD - Genghis Khanukem

Middle Eastern warrior. All barbarian. All Nukem.

### 990 AD - Nukem the Red

Helmets. Beer. Swords. Pillaging. Just like your average Nukem vacation.

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**1412 - Ducco Da Nuko**

Italian explorer. Reached America before Columbus. Too busy buffalo wrestling to get the publicity.

**1590 - Tsar Nukolas I**

Great Russian Leader. Bathed in vodka. Invented Cossack dancing. Wrestled bears. (Editor's note: Although unconfirmed by GT Interactive historians, there is evidence to show that Tsar Nukolas caught horses for his girlfriend Catherine.)

**1650 - Nukovsky**

Austrian composer known for military marching music and his 324 illegitimate children.

**1790 - Nukollean Bonaparte**

Imperious French general who conquered half the world. Court-martialed for excessive taunting.

**1850 - Nukazulu**

Fierce African chieftain who united 100 tribes under his leadership. Shrinking heads way before Duke.

**1940 - Dick Nukemheimer**

Failed physicist. Dismissed from Manhattan Project for advocating splitting atom with head-butt. Last seen babe hunting on Bikini Atoll.

**1997 - Duke Nukem**

The latest. The greatest. The butt kicker's butt kicker.

[Now show me Duke's PC beginnings.](#) 

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# Ken Silverman's Official Home Page

I live in Rhode Island and my hobby is computer programming.

## Some past projects of mine:

- [Build Engine](#) (1993-1996): Duke Nukem 3D, Shadow Warrior, Blood, etc...
- [Ken's Labyrinth](#) (1993) (The first Wolf3D clone)
- [Kentris](#) (1991) (2-player tetris game)

## Other pages of mine:

- [Download Page](#): Look here for my latest demos and for old projects which I have decided to release.
- [Utility Page](#): Get some utility programs I've made over the years here.
- [Build Source Code Page](#): Go here to download my Build source code (and test game).
- [Voxlap Page](#): Here are some scraps of information about a new engine I'm working on.
- [Kube Page](#): A viewer for cubic panoramas and some sample images to go along with it.

Picture of  
Ken #1



Originally taken at Sears in 1991. This 64\*64 tile was used in Ken's Labyrinth.

Taken at the Apogee office in 1995.

Taken at my brother's wedding in October, 1998.

## Story of my life

(last updated: 11/29/2000)

I am the younger of 2 brothers. According to my parents, I was born exactly at midnight on the night of Halloween (November 1, 1975). I was raised in Yorktown, NY until 1980 when my dad got a job as a professor at Brown University. So our family of 4 moved to a nice house in East Greenwich, Rhode Island, about a week before I started Kindergarten. My first computer was a TI-994/A which my parents bought for \$50 in December of 1983 during the "after Christmas" sale. Ever since then, I was hooked! (If you're really interested in how I got started, check out this long lost [newspaper article](#) from our local newspaper in 1984)

My family got me started in programming, but several years later I was beyond their help. In school, I used to love study halls because I would spend the time thinking about code. When my brother got shipped off to college in 1990, my hobby started to get more serious. I made games such as Kentris, Sibros, and Ken's Labyrinth (my first game on the market). In 1993, just a month before my first semester at college, I signed a contract with Apogee software to create a new 3D engine called the "Build engine".

My programming wasn't supposed to get in the way of college, but that's not the way it happened - I didn't do very well that first semester. When I found out I only passed half my [classes](#), my dad decided to let me take time off to work full time for Apogee. So for 3 years I worked on the Build engine. While I spent more than half my time in RI, I ended up taking a total of [10 trips](#) to Dallas and Seattle to help the game teams work with my code. After several games were released, things quieted down a bit and eventually I decided (with a lot of help from the parents) to return to college while I was still young.

College was fun while it lasted, but now I'm a 25-year old graduate (Yay!). Now I'm back to recreational programming full time. :)

When I show off demos, people often ask me which "computer courses" I've taken. I have to tell them the truth, which is "None!" Beyond the basics, I figured out almost everything I know about programming on my own. By starting young and being independent, I have the advantages of a better understanding and more experience.

Everyone in my family works in a technical field. My dad is a professor of electrical engineering at Brown and my mom works at GTech programming character recognition for lottery tickets. My brother is the head of his own small company, called Advanced Systems. (That's what "advsys" stands for) In the

old days, he was as much of a computer nut as I was. He still is, but we've grown into separate fields of interest. For me, programming is not just an interest or a hobby - it IS my life.

---

## Interests/Hobbies

- Computer programming! Was I clear enough about this?
  - Optimization: My favorite one: "sub eax, 128" -> "add eax, -128" Think about it.
  - Collecting maps: I can draw the borders of all U.S. states from memory. I used to draw maps for fun in elementary school.
  - Solar energy: Bought a [1kW photovoltaic system](#) from [Solar Works](#). See how much power they're producing: [SILVMETR.ZIP](#) (58,462 bytes) Also check out the [panoramic graph](#) on this page.
  - Astronomy: I look forward to waking up early on June 8, 2004. Play with my [GLOBE](#) simulator to find out why.
  - Geometric puzzles: [Rubik's cube](#), mazes, you name it - they all make great programming projects.
  - TV! You just can't escape it in our family.
  - Piano: I can play just about any song I've heard. People say I have a good ear.
  - Music: Besides my own, I like to collect TV theme songs and anything by Weird Al Yankovic.
  - Sports: Ping pong, volleyball
- 

## Ken's primary computers:

- 12/??/1983: TI-99 4/A
- ????? 1984: Kaypro II (CP/M 2.2)
- Late? 1985: HP 9836C Series 200 (98611A Opt.655 BASIC System + 98612A Opt.650 Extended BASIC 2.1)
- 11/23/1988: 386DX-20 (Proteus)
- 10/26/1990: 386DX-33 (Touche)
- 07/??/1992: 486DX-50
- 11/04/1993: 486DX2-66
- 08/11/1994: Pentium 90
- 03/??/1995: Pentium 100
- 07/27/1995: Pentium 75 (TI Travelmate 5000)
- 12/06/1995: Pentium 133
- 05/27/1997: Pentium II 266 (Gateway)
- 01/07/1999: Pentium II 450 (Comtrade)
- 07/12/2000: Pentium III 933 (Dell)

All computers have been sold, discarded, or returned except for: the TI-99 4/A, the Pentium 133, and the Pentium III 933 which I am currently using.

---

## Courses I took (note: past tense) at Brown University:

Major: Applied Math (ScB)

Semester 1	Fall 1993	EN3, MA18, <del>CS15</del> , <del>CH21</del>
Semester 2	Spring 1997	EN4, MA42, MA52, PH24, PL54
Semester 3	Fall 1997	EN41, AM33, MU11, <del>EN51</del>
Semester 4	Spring 1998	EN52, AM34, AM27, EC11, MA126
Semester 5	Fall 1998	AM165, EN157, EN163, GE5
Semester 6	Spring 1999	AM166, EN158, EN164, AM120, EN196
Semester 7	Fall 1999	AM117, AM121, EN253, MU40
Semester 8	Spring 2000	AM194, EN160, GE1, EL4

~~Strikeout~~: no credit / dropped

---

## Other cool **STuf**...

(03/06/2000) I plugged my name into Yahoo's search engine and I found some really neat stuff! Apparently, somebody spent the time to write a [colorful review](#) about my site. Sounds to me like this fan has a serious case of jealousy!

Continuing with my tradition of shameless self-promotion, I found something else which blows everything away: This [quote](#) from John Carmack. I am truly honored that he would pick me out of a crowd like that!

(07/11/2000) I found [another quote](#) from Carmack.

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## Web Site Update History:

12/15/2000: [Kube Page](#) updated.

11/20/2000: Made [Voxlap Page](#) less hidden and added some items to it. Also, check out the new [Kube Page](#).

10/08/2000: Put up a rare version of Ken's Labyrinth.

09/21/2000: Added 2 new programs on my [Utility Page](#) (KZIP and ZIPMIX). Used these utilites to reduce the sizes of all .ZIP files on my site.

08/30/2000: Added a new link at the bottom of the [Build Source Code Page](#).

08/12/2000: Converted all .GIF's on my site to .PNG's. The .PNG format is far superior to the .GIF format for many reasons. Go [here](#) if you want to see why.

07/15/2000: Added some more Q&A to both Build & Buildsrc FAQ's. Also added a little util in the description of SLAB6D (in the download page).

03/19/1999: My web site is born.

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## Contacting me:

E-mail me at: [kjs@lems.brown.edu](mailto:kjs@lems.brown.edu) I love to read what fans have to say, but please no junk E-mail!

Here's the number of E-mails I've received each day about my [Build source](#):

June 20-: 6,28,16,26,8,8,11,13,11,8,5

July 1-31: 7,3,0,2,7,2,1,5,9,9,4,6,4,4,4,7,3,1,2,2,4,1,2,1,6,2,1,5,4,3,2

August 1-: 2,4,6,3,4,4,0,1,0,1,1

(I also use AOL Instant Messenger, but I'm not on it very much these days. When contacting me, please think of something to talk about first. In other words, don't just call to say "hi".)

"<http://www.advsys.net/ken>" and subdirectories maintained by Ken Silverman.