# 1

# The 3D First-Person
# Shoot-'Em-Up Game Genre

The world of computer games keeps expanding and expanding at an almost incomprehensible pace. Each new game seems to outperform those released only a few months prior. The graphics become more spectacular, the sound is more awesome, and the features get more diverse. This evolving progression in technology is most evident in the 3D first-person perspective games, which generally involve annihilating enemies while traversing an ominous course from point A to point B.

# BEFORE *DUKE NUKEM* WENT 3D

One of the earliest first-person games for the computer was *Wizardry*, by Sir-Tech Software. *Wizardry* featured a wire frame maze that a party of characters could explore. *Wizardry* featured very little, if any, animation. The maze was constructed on a grid, much like a sheet of graph paper. Each square in the grid was either solid, representing a thick wall, or clear, representing an area a player could walk through. From any square on the grid, one of four static views was generated, depending on if the players were facing north, south, east, or west. Monsters were represented as either single-frame or simple two-frame animation. Fighting was done by pressing the F key. You would get to strike the monster, then the monster would get to strike you. Then it was your turn again and then the monster's and so on until someone was dead.

Later, along came *Wolfenstein 3D* from id software. This game offered many new features in both graphics quality and game play that made it far superior to *Wizardry*. First and foremost, *Wolfenstein 3D* was one of the earliest first-person games to use a technology known as *texture mapping*. Texture mapping is a process whereby some

type of image is drawn onto a flat surface in a three-dimensional environment. The image, or *texture,* is said to be *mapped* onto the surface, hence the name. Texture mapping provided a new level of realism to computer games because it allowed a totally flat surface to appear like wood, rock, or water, simply by changing the image that was mapped onto that flat surface.

In addition to texture mapping, *Wolfenstein 3D* was a fully animated game. There was not a finite number of views available to be seen by the player. Instead, the game *rendered* a given view based on a player's location and direction, and whatever objects were in front of the player. This meant that objects, especially monsters, could move around on the map along with the player. The player had freedom to move in any direction along a plane. In fact, *Wolfenstein 3D* modeled movement so accurately for a game of its time that some people reported getting motion sickness by playing it.

Despite all of the advancements made by *Wolfenstein 3D* over its predecessors, the game still had some fairly large limitations. Walls were still restricted to only one length and had to be at 90-degree angles to one another. Floors and ceilings were all one height, which severely limited the types of rooms that could be created. All rooms were also the same light level, which left the levels feeling too uniform and stale.

## THE DOOM LEGACY

The next game to really up the technology ante, of course, was id software's *DOOM* and games built on the *DOOM* engine, like *Heretic* and *Hexen*. *DOOM*'s basic premise was the same as *Wolfenstein 3D*'s: The player explored various levels in a 3D first-person perspective. However, *DOOM*'s graphics engine was rewritten from the ground up, instead of trying to expand the existing *Wolfenstein* engine. Although it was still at its core a texture-mapping engine like its predecessor, the new *DOOM* engine was a major advancement in graphics technology, providing much more varied and realistic levels.

The *DOOM* engine made it possible for the walls to be at arbitrary angles to one another, which allowed for nonrectangular rooms. The floors and ceilings of each room could also be at different elevations, which allowed for balconies, steps, pits, and other similar features. *DOOM* featured a much better lighting model, which allowed some rooms to appear darker and others brighter; this feature also allowed for more realistic shadow effects. Finally, the *DOOM* engine allowed floors and sectors to move up and down, which made additional features like elevators and crushing ceilings possible. This enhanced 3D environment served to immerse the player into the game more than any other game before it. People who got dizzy playing *Wolfenstein 3D* had to fight off waves of nausea playing *DOOM*.

Apart from the graphics engine, three other factors made *DOOM* the most popular game of its time. The first was its multiplayer ability. Gone were the days when the only opponents were computer-based. *DOOM* provided a human opponent to combat within its 3D world. Alternately, several players could play the same game as teammates, tackling the battles and puzzles within the game together. All that was required for multiple players were additional computers and a network or modem to send the game data back and forth.

The second factor contributing to *DOOM*'s popularity was id software's provision for expandability. If you had the means to create a new *DOOM* level, it was very easy to play that level in the game. Furthermore, id took a lenient stance toward programmers who wanted to write tools for creating levels. In fact, id software even published various parts of the *DOOM* level format so programmers could more easily write tools for users to create their own worlds.

The third event contributing to *DOOM*'s popularity was the dynamic growth of the online world, especially the Internet and the World Wide Web. People from all over the world could now share common interests via online services such as newsgroups, mailing lists, and FTP sites. This allowed level creators to share ideas, allowed programmers to share code so better utilities could be written, and allowed users all over the planet to upload and share literally thousands of new *DOOM* levels.

Even with all of the fantastic improvements that the *DOOM* graphics engine had to offer, there were still a few restrictions on the types of structures that you could create. Ceilings and floors had to all be parallel to each other, which meant no sloping floors or ceilings were possible. Also, for every x and y coordinate on a *DOOM* map, there could be only *one* floor z coordinate. This meant that it was impossible to create any structure directly over any other, which ruled out structures like catwalks or two-story buildings.

# THE *DAWNING* OF *DUKE NUKEM 3D*

Well, this brings us to the present technology, and the ante has been upped again with the release of *Duke Nukem 3D* by 3D Realms Entertainment, a division of Apogee Software, Ltd. *Duke Nukem 3D* is the latest incarnation of the 3D first-person shoot-'em-ups. Its graphics engine, the great Build engine, allows for features the *DOOM*

engine couldn't perform. Build allows levels that have floors directly over other floors, and it can also provide sloped floors and ceilings. Sectors can move around, allowing for subway cars, swinging doors, and spinning gears. The lighting model is also more realistic, making the game even more intriguing. Those people who became dizzy from playing *Wolfenstein 3D* and *DOOM* can't even be contacted anymore; they're all locked in a small room somewhere taking Dramamine.

Let's look in a bit more detail at some of the features of this latest masterpiece in the 3D shoot-'em-up genre of computer games. Some of the features are similar to those that made the game's forerunners so popular, while some are new and unique to *Duke Nukem 3D*, offering an all-new game experience.

## MULTIPLAYER ABILITY

Like many modern-day games, *Duke Nukem 3D* allows multiple players to play the game simultaneously. Although the game's packaging states that up to eight players can play the game at the same time, according to lead programmer Todd Replogle the eight-player limit is a practical boundary and *not* an absolute one. Replogle instead claims that as many as twelve players should be able to fire up a multiplayer game at the same time!

There are two multiplayer modes. The first is cooperative play, or Co-Op mode for short. In this mode of play, all the players form a single team and all are directed toward the same goal: eliminating the evil presence and finding the exit. The going is not always easy, however, because each of the players is capable of injuring, and being injured by, the other players. Friendly fire is a definite additional obstacle in these levels.

The second multiplayer mode is known as *DukeMatch* mode. In this mode, it's every Duke for himself. The goal is to eliminate all the other players and be the last one standing. As with many other video games, however, dying is not the final act that it is in real life, so a killed player is quickly reincarnated to start to battle again. The result is a fast-action slugfest in the most advanced 3D game engine to date!

## WEAPONS

*Duke Nukem 3D* gives the player more weapons to choose from than any game before it. In all there are a staggering ten different weapons with which a player can dispatch

enemies. A player who has managed to collect each weapon is a walking armory indeed. The following list briefly describes each weapon:

**The mighty foot –** This is Duke's own heavily booted right foot, and it allows you to *literally* kick some serious butt!

**Handgun –** Each player starts off with a handgun, or pistol (along with the mighty foot, of course). This weapon can fire rapidly several times before Duke has to put in a new clip. The game handles this ammunition change automatically, but there is a slight pause as Duke loads the new clip. This pause often allows the current target to catch its breath and either retaliate or escape.

**Shotgun –** This weapon packs a much more powerful punch than the pistol, but it also takes more time to reload. The shotgun is often used as the *basic weapon* for many players, or the weapon the player carries around most of the time.

**Ripper chaingun –** This baby fires about a dozen rounds per second. It's great for dispatching enemies, but it runs out of ammo quickly.

**Rocket propelled grenade (RPG) launcher –** This powerful weapon causes a huge explosion upon impact, taking out most anything in its path with a single shot. The RPG launcher must be used with caution because it can also annihilate or injure critically the player who fires it, especially if it is fired at a close-range target or in tight quarters. For this reason, most discerning players use this as a long-range weapon only.

**Pipe bomb –** This weapon is a true delight. Lay one of these down, wait for something to cross its path, and then detonate it from a safe distance.

Small enough to remain unnoticed, this weapon is often extremely useful in DukeMatch mode.

**Shrinker –** This weapon instantly reduces most enemies to a few inches in height, after which they are easily compressed to a damp spot on the floor with a swift stomp of the mighty foot. The foot stomp is automatic once the player comes in range of a shrunken foe. If the enemy is not squished quickly enough, the foe will return to normal size in a few seconds.

**Devastator –** This weapon fires several miniature missiles per second that can destroy almost every enemy in seconds. It is easily the most lethal weapon in Duke's arsenal.

**Wall-mounted laser trip bomb –** This explosive device allows a player to lay a lethal trap. The device is placed against a wall, after which time it will emit a thin laser beam to an opposite wall. Any moving object that breaks the path of the laser sets off the trip bomb, causing a large explosive charge.

**Freezethrower –** This weapon turns enemies into ice cubes. Once they are frozen, Duke will automatically kick his victim into a thousand fragments. He has to act fast, though, because the victim will defrost in a few seconds.

## MONSTERS

The monsters in *Duke Nukem 3D* are as varied in number as they are deadly. Each creature has its own talents and its own nasty form of attack. You'll need to become familiar with each creature as both a *Duke Nukem 3D* player and as a game level designer. The following list briefly describes each enemy:

**Assault trooper –** This is the basic alien patrol soldier who is often accompanied by several other troopers. This enemy can hover above you

if he's equipped with a jetpack. A trooper is fairly easy to kill, but he packs a pretty powerful laser pistol that can do its share of damage.

**Assault captain** – This guy is very much like the trooper, but an assault captain also carries a device that allows him to teleport out of danger. He often teleports back into battle right behind his opponent.

**Pig cop** – This brawny mutant wields a nasty shotgun, and it often takes several shots to bring him down. Pig cops can also be found in hovering recon patrol vehicles (RPVs).

**Octabrain** – This bizarre creature can both fly and swim with equal dexterity. An octabrain's powerful mind blast can reduce you to a puddle of mental goo. It can also deliver a brutal bite at close range.

**Shark** – A bit more ruthless than a real shark, this critter goes for blood at every opportunity.

**Protozoid slimer** – This enemy is a gelatinous puddle that feeds on your innards. This egg-spawned nightmare quickly hops from ceiling to floor, making it extremely difficult to shoot. One shot with any weapon usually takes it down, if you ever do get a bead on one.

**Sentry drone** – This is a robot-controlled pod programmed to explode kamikaze-style after hunting down its target. A sentry drones is also programmed to avoid incoming fire.

**Enforcer** – This is a lizardlike alien humanoid that can either open fire with its ripper chainguns or spit a viscous glop of poison at your face. It can also leap high into the air, making it more difficult to track down.

**Assault commander** – This guy is a rotund alien that hovers freely on antigravity pads. He packs a large rocket that he can aim with amazing precision.

**The Bosses –** There are three of these supreme alien beings to conquer. I won't give away all of their secret forms of attack for now, just in case you've yet to do battle with them. Suffice it to say, anyone trying to take on these guys face to face might have a screw loose.

## POWER-UPS

The various power-ups available to resourceful players provide a surplus of splendid effects, which you will no doubt want to include in your own level designs. These items help complement strategy and prolong players' enjoyment by boosting health, providing access to otherwise restricted sectors, and aiding mobility in sectors that contain challenging terrain or environmental conditions. The following list provides a brief description of each power-up:

**Medkit** – This power-up is available in small and large sizes, with smaller ones generally being more prevalent. Small medkits increase health by 10 or 30 percent instantly. Large medkits contain a full 100 percent of health from which players can replenish their health levels up to 100 percent when they activate it. The amount it takes to replenish a player's health to 100 percent is deducted from the large medkit until it is used up.

**Atomic health unit** – Resembling glowing atoms, this lucky find increases a player's health to 50 percent, even if the increase takes the player's total health level above 100 percent. This power-up can maximize a player's health up to 200 percent!

**Armor** – This power-up allows a player to absorb more punishment from enemy barrages before it begins to diminish the player's health level.

**Keycard** – Available in red, yellow, or blue, this item allows a player to unlock a door or gate latch to provide

entry into otherwise closed sectors containing vital weapons, power-ups, or perhaps a better route to the level's much-sought-after exit.

**Steroids** – A player must activate this power-up (after finding and possessing it) to gain a brief period where energy, speed, and resiliency to enemy fire are boosted.

**Holoduke** – This power-up is a holographic likeness of Duke himself that allows a player to strategically divert the enemy's attention away from the real Duke temporarily.

**Jetpack** – This extremely useful power-up allows a player to become airborne for making quick getaways or commencing hovering attacks.

**Night vision goggles (NVG)** – Because some sectors and even entire levels can be poorly lit, this power-up enables a player to more confidently traverse darker passages and identify lurking enemies.

**Scuba gear** – The game's great variety of terrain includes plenty of water, and Duke can only hold his breath for so long before a player's health level is effected. This power-up activates automatically when a player submerges, supplying enough oxygen for extended underwater maneuvering.

**Protective boots** – Toxic sludge canals and intensely hot lava rivers add to the variety of terrain obstacles a player must overcome. Like the scuba gear, this power-up provides automatic protection from these environments for extended time periods.

# ADDING YOUR OWN TOUCH

If you've played *Duke Nukem 3D* to its full extent, your creative side has probably taken hold and you've decided to try and use the utilities that come with the game. Unfortunately, creating levels is not an easy task. A *Duke Nukem 3D* level is composed of many different individual data elements, and these elements interrelate in many different ways to create all the different types of structures and effects that you see during game play.

Perhaps you have wondered how the marvelous effects and architectural constructs were created. This book will hopefully illuminate these mysteries and grant you the title of supreme *Duke Nukem 3D* level creator. Your levels will inspire awe throughout the land. You will become rich, famous, and powerful. You will own a mansion and a yacht…wait, I'm getting ahead of myself, here. Before you can do any of those things, you'll need to read this book. To quote Duke one more time…

It's time to *kick* ass or chew bubblegum,
and I'm all out of gum. *—Duke Nukem*